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目 录

TABLE OF CONTENTS

公司简介 Company Profile	P1
产品系列表 Capacitor Series Table	P2
导针型铝电解电容器 Radial Lead type Aluminum Electrolytic Capacitors	P4~72
基板自立型铝电解电容器 Snap-in Type Aluminum Electrolytic Capacitors	P73~100
螺栓端子型铝电解电容器 Screw Terminal Type Aluminum Electrolytic Capacitors	P101~115
使用注意事项 Attention Before Using	P116~117
失效模式及原因分析 Typical Failure Modes & Factors	P118
制造流程图 Production Flow Chart	P119
产品编码规则 Part Number Guidance	P120
加工方式 Diagram of Lead Cutting And Forming or Taping	P121~124

公 司 简 介

绿宝石以“精诚·卓越”的企业精神，追求卓尔不凡的电容器品质。一直以来，在LED照明、移动通讯、智能仪表、专业音响有优异表现，享负盛名。

绿宝石秉持“品质取信，服务取胜，变革创新，超越期望”的质量方针，以“在客户的立场想，在专业的角度做，在共赢的层面定”的服务承诺，为客户提供优质产品和服务。

多年来，绿宝石在“科技领先，文化强企”的双引擎驱动下，超越极限，不断推出超长寿命电解电容器，开创LED照明驱动电源专用电容器的先河。如今，绿宝石再度引领高电压固态电容器研发技术。为各类电源、电器升级换代提供最前沿的电容器技术支持。

今后，绿宝石将坚持“承载责任，服务全球，共享成果，永夯基业”的经营理念，与员工、客户、股东、产业链各方合作共赢。回报产业，回馈社会。

Company Profile

BERYL goes for the extraordinary high quality capacitors based on the enterprise spirit of "Dedication to excellence". Which is well known in the field of LED lighting, Mobile communication, Intelligent instruments & Pro audio, etc.

BERYL runners run their company under the firm implement of quality policy of "Get confidence with quality, Get victory with service, Get leading with technology, Get exceeding on expectancy" and our service commitment: "to stand on the position of the customer perspective, to Manufacture in professional insight, to Deal under win-win relationship", to provide high quality products and service to customers.

Over the years, driven by the two engines of "Leading technology, strong enterprise culture", BERYL goes beyond the limit and continuously issues super long life electrolytic capacitors, who pioneers capacitor especially for LED driving power supply as well. Today, BERYL leads the research technology of high voltage Solid capacitors, to provide the cutting-edge technical support for all types of power supplies and electric appliances to upgrade.

In the future, BERYL will insist on the principle of “Responsibility bearing, Global servicing, Fruit sharing, Permanent foundation tamping.” to build up a win-win relationship with employees, customers, shareholders and industry chains, and to feed back the industry and society.

Capacitor Series Table

RADIAL LEAD TYPE

Series		Page	Features	Voltage Range(Vdc)	Capacitance Range(μF)	Temperature	Endurance (Hours)
Mini Size	RA	4	High ripple current, miniature size with 7 to 9 mm. height	6.3 to 35	33 to 470	-40℃~105℃	2,000
Standard	NQ	6	Non-Polar High temperature.	6.3 to 250	4.7 to 2,200	-40℃~105℃	1,000
	LM	9	Low Leakage Current, High temperature.	6.3 to 100	2.2 to 4,700	-40℃~105℃	2,000
	KE	12	General, Downsize.	6.3 to 550	2.2 to 22,000	-40℃~85℃	2,000
	ME	16	General, Downsize.	6.3 to 550	0.47 to 22,000	-40℃~105℃	2,000
High Frequency, Low Impedance	RC	22	Extremely Low Impedance, Downsize.	6.3 to 100	1.0 to 15,000	-40℃~105℃	2,000~3,000
	RD	25	Low Impedance , Long Life.	6.3 to 100	1.0 to 10,000	-40℃~105℃	3,000 to 5,000
	RF	28	Low Impedance, High ripple current.	6.3 to 100	6.8 to 6,800	-40℃~105℃	4,000 to 7,000
	RT	31	Low impedance and High ripple current.	6.3 to 100	15 to 8,200	-40℃~105℃	6,000 to 8,000
	RG	34	Low Impedance , High Ripple Current	6.3 to 100	6.8 to 5600	-40℃~105℃	6,000 to 10,000
	RJ	38	Miniaturized, Low impedance, High ripple current.	6.3 to 100	6.8 to 18,000	-40℃~105℃	8,000 to 10,000
	RK	42	Low impedance, Downsize, Long life.	10 to 100	22 to 27,000	-40℃~105℃	10,000 to 12,000
High reliability	HG	44	High-temperature 115℃, high reliability.	10 to 450	4.7 to 1,000	-40℃~115℃	2,000
	HE	47	High-temperature 125℃, long life.	10 to 450	2.2 to 4,700	-40℃~125℃	2,000 to 5,000
	HH	50	High-temperature 130℃, high reliability.	10 to 450	3.3 to 4,700	-40℃~130℃	1,000 to 4,000
	HX	53	High-temperature 135℃, long life.	10 to 50	22 to 3,900	-40℃~135℃	2,000 to 3,000
Power supply with the product	PW	55	High ripple current, Downsize.	160 to 550	10 to 470	-40℃~105℃	2,000
	PV	57	Downsize with high ripple current.	160 to 500	33 to 560	-40℃~105℃	5,000
	PL	59	High stability, High ripple current , Long life.	160 to 450	1 to 330	-40℃~105℃	3,000
	PJ	61	long life 8,000 to 10,000 hours.	160 to 500	10 to 560	-40℃~105℃	8,000 to 10,000
	PK	63	Downsize, High ripple current , Long life.	160 to 450	6.8 to 560	-40℃~105℃	10,000 to 12,000
	PY	65	Downsize, High ripple current, Long life.	160 to 450	6.8 to 470	-40℃~105℃	12,000 to 15,000
	MW	67	Low ESR, High ripple current.	160 to 450	33 to 560	-40℃~105℃	2,000
	MV	69	Low ESR, High ripple current , long life.	160 to 450	33 to 560	-40℃~105℃	5,000
	MJ	71	Low ESR, Downsize , High ripple current , long life.	160 to 450	10 to 560	-25℃~105℃	8,000 to 10,000

SNAP-IN TYPE

Series		Page	Features	Voltage Range(Vdc)	Capacitance Range(μF)	Temperature	Endurance (Hours)
General Purpose	LS	73	General , Standard.	16 to 550	47 to 68,000	-40℃~85℃	2,000
	LP	77	General , Long life.	200 to 500	56 to 2,200	-25℃~85℃	5,000
	KM	80	General, High temperature.	16 to 550	39 to 56,000	-40℃~105℃	2,000
	KS	85	General, High temperature, Long life.	200 to 500	56 to 2,200	-25℃~105℃	3,000
	KN	88	Smaller size with higher ripple current , Long life.	200 to 500	56 to 1,800	-25℃~105℃	5,000
	KJ	91	High reliability. Extremely Long life.	200 to 550	47 to 2,200	-40℃~105℃	10,000
Server product	SP	94	Snap-in terminal, more downsized.	400 to 450	68 to 680	-25℃~105℃	2,000
	SQ	97	Snap-in terminal, downsized.	400 to 450	56 to 680	-25℃~105℃	3,000
High reliability	TG	98	High-temperature 125℃, Long life.	10 to 100	680 to 47,000	-40℃~125℃	5,000

SPECIAL TYPE

Series		Page	Features	Voltage Range(Vdc)	Capacitance Range(μF)	Temperature	Endurance (Hours)
Screw General Purpose	WN	101	Long life.	160 to 450	1,000 to 68,000	-40℃~85℃	5,000
	WS	104	Standard.	200 to 600	820 to 33,000	-25℃~85℃	2,000
	WL	107	High ripple current , Long life.	350 to 450	1,000 to 39,000	-40℃~85℃	20,000
	SS	110	High temperature , Long life.	200 to 400	1,000 to 39,000	-40℃~105℃	2,000
	SN	113	High temperature , Long life.	200 to 400	1,000 to 39,000	-40℃~105℃	5,000

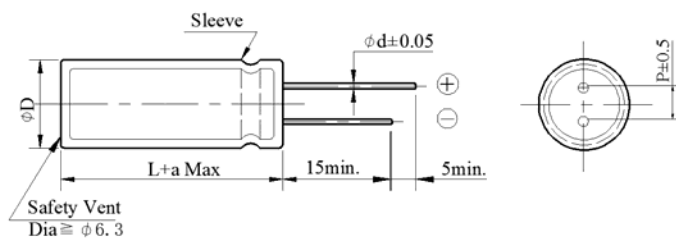
RA Series

- Low impedance, high ripple current and miniature size with 7 to 9 mm.
- Wide temperature range of -40°C to +105°C.
- Load life 2,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics						
Category Temperature Range	-40 ~ +105℃						
Working Voltage Range	6.3 ~35Vdc						
Capacitance Range	33 ~ 470μF						
Capacitance Tolerance	±20% (at 20℃ and 120Hz)						
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	
	tan δ (Max)	0.24	0.20	0.16	0.14	0.14	
	The above values should be increased by 0.02 for every additional 1000μF						
Leakage Current	I≤0.01CV or 3 μA, whichever is greater. I:Leakage current (μA) C:Rated capacitance (μF) V:Rated voltage (V) Impress the rated voltage for 2 minutes.						
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	(at 120Hz)
	Z(-40℃)/Z(+20℃)	3	3	3	3	3	
Endurance	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 2,000hours at 105℃.						
	Capacitance change	≒±25% of the initial value					
	Dissipation factor(tan δ)	≒200% of the specified value					
	Leakage current	≒specified value					
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.						
	Capacitance change	≒ ±25% of the initial value					
	Dissipation factor(tan δ)	≒ 200% of the specified value					
	Leakage current	≒ 200% of the specified value					
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4						

◆ DIMENSIONS(mm)



ΦD	8×7	8×9
ΦD	ΦD ± 0.5 Max	
dΦ	0.5/0.6	0.5/0.6
F	3.5	
a	L ± 1.5Max	

◆ PART NUMBER SYSTEM(Example :25V 220μF)

R A 0 2 5 M 2 2 1 L O 0 8 0 9

Special Request	
Size code(0809: 08×09)	
Lead length code	
Capacitance code(220μF)	
Capacitance tolerance code(M: ±20%)	
Voltage code(25V)	
Series code(RA)	

RA Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
6.3	150	8×7	0.230	360	10	150	8×7	0.210	380
	220	8×7	0.150	430		220	8×7	0.140	420
	330	8×7	0.140	460		330	8×9	0.130	495
	470	8×9	0.130	525		470	8×9	0.120	540
16					25	33	8×7	0.360	285
						47	8×7	0.280	330
						56	8×7	0.230	360
						68	8×7	0.190	380
	100	8×7	0.240	380		100	8×7	0.150	430
	150	8×7	0.150	435		150	8×7	0.140	515
	180					180	8×9	0.120	810
	220	8×7	0.130	455		220	8×7	0.360	285
30	33				35				
	47								
	56								
	68								
	100								
	150	8×7	0.130	750					
	180	8×9	0.110	845					
	220								

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K~
6.3 ~ 35	33 ~ 82	1.00	1.10	1.15	1.20
	100 ~ 470	1.00	1.15	1.25	1.30

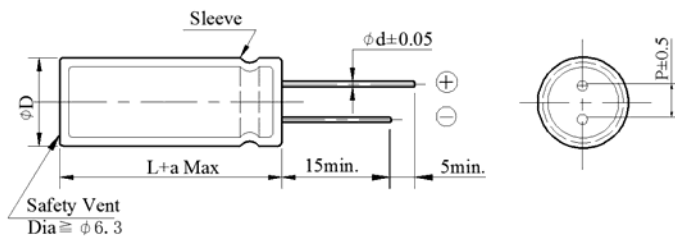
NQ Series

- Suitable for conditions where polarity reverses or where polarity is not constant.
- NQ series 105°C 1,000Hrs.

SPECIFICATIONS

Item	Performance Characteristics										
Category Temperature Range	-40~ +105℃						-25~ +105℃				
Working Voltage Range	6.3 ~100 Vdc						160~250 Vdc				
Capacitance Range	4.7~2,200 μF						1.0~100 μF				
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 250	
	tan δ (Max)	0.26	0.24	0.22	0.20	0.16	0.14	0.12	0.10	0.20	
	The above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes										
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160 ~250	(at 120Hz)
	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2	
	Z(-40℃)/Z(+20℃)	10	8	6	5	4	4	3	3	3	
Endurance	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃.During this test rated DC voltage shall be reversed on the capacitor for every 250 hours.										
	Capacitance change		≒±20% of the initial value								
	Dissipation factor(tan δ)		≒200% of the specified value								
	Leakage current		≒specified value								
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 105℃without voltage applied.										
	Capacitance change		≒±25% of the initial value								
	Dissipation factor(tan δ)		≒200% of the specified value								
	Leakage current		≒200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

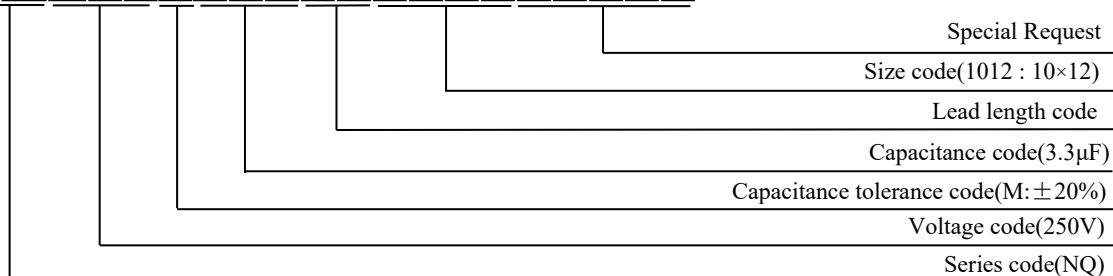
DIMENSIONS(mm)



ΦD	5	6.3	8	10	12	16	18
ΦD	ΦD ± 0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

PART NUMBER SYSTEM(Example :250V 3.3 μ F)

N Q 2 5 0 M 3 R 3 L O 1 0 1 2



NQ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
6.3				10	22	5×11	35
	33	5×11	65		33	5×11	46
	47	5×11	75		47	5×11	50
	100	6.3×11	120		100	6.3×11	68
	220	6.3×11	220		220	8×11	135
	330	8×11	277		330	8×11	150
	470	8×11	161		470	10×12	215
	1000	10×16	360		1000	10×20	380
	2200	12.5×20	480		2200	12.5×25	500
16	10	5×11	30	25	10	5×11	30
	22	5×11	35		22	5×11	38
	33	5×11	50		33	5×11	50
	47	5×11	54		47	6.3×11	68
	100	6.3×11	84		100	8×11	115
	220	8×11	140		220	10×12	182
	330	10×12	202		330	10×16	247
	470	10×16	265		470	10×20	333
	1000	12.5×20	475		1000	12.5×25	510
	2200	16×25	625		2200	16×31	660
35				50	1.0	5×11	12
					2.2	5×11	18
					3.3	5×11	19
	4.7	5×11	24		4.7	5×11	24
	10	5×11	30		10	5×11	30
	22	6.3×11	44		22	6.3×11	45
	33	6.3×11	56		33	8×11	65
	47	8×11	86		47	8×11	80
	100	10×12	142		100	10×16	150
	220	10×20	256		220	12×20	280
	330	12×20	364		330	12×25	365
	470	12×25	472		470	16×25	450
	1000	16×25	560		1000	16×35	615
63	1.0			100	1.0	5×11	15
	2.2				2.2	6.3×11	24
	3.3	5×11	20		3.3	6.3×11	28
	4.7	6.3×11	24		4.7	6.3×11	34
	10	6.3×11	41		10	8×11	51
	22	8×11	68		22	10×12	70
	33	10×12	69		33	10×16	95
	47	10×16	130		47	12×20	173
	100	10×20	165		100	12×25	205
	220	12×25	310		220	16×30	365
	330	16×25	410		330		
	470	16×35	455		470		

NQ Series

Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	1.0	5×11	8	200	1.0	6.3×11	8
	2.2	6.3×11	12		2.2	8×11	14
	3.3	8×11	17		3.3	10×12	21
	4.7	10×12	25		4.7	10×16	27
	10	10×16	40		10	12×20	50
	22	12×20	76		22	12×25	86
	33	12×25	95		33	16×25	119
	47	16×25	144		47	16×30	158
	100	18×30	210		100		
250	1.0	6.3×11	9				
	2.2	10×12	17				
	3.3	10×12	21				
	4.7	10×16	29				
	10	12×20	50				
	22	16×25	97				
	33	16×30	130				
	47	16×35	166				

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)				
	50/60	120	1K	10K	100K
4.7 ~ 47	0.75	1.00	1.70	1.75	2.00
100 ~ 470	0.80	1.00	1.34	1.40	1.50
1000 ~ 2200	0.85	1.00	1.13	1.20	1.40

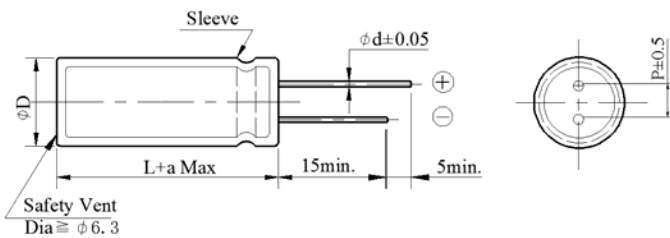
LM Series

- Low leakage current .
- Load life 2,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics									
Category Temperature Range	-40 ~ +105℃									
Working Voltage Range	6.3 ~100Vdc									
Capacitance Range	0.47 ~ 4,700μF									
Capacitance Tolerance	±20% (at 20℃ and 120Hz)									
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.10	0.10
The above values should be increased by 0.02 for every additional 1000μf.										
Leakage Current	I≤0.01CV or 3 μA, whichever is greater. I: Leakage current (μA) C: Rated capacitance (μF) V: Rated voltage (V) Impress the rated voltage for 2 minutes.									
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100
	Z(-40℃)/Z(+20℃)	12	10	8	5	4	3	3	3	3
(at 120Hz)										
Endurance	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.									
	Capacitance change	≒±20% of the initial value								
	Dissipation factor(tan δ)	≒200% of the specified value								
	Leakage current	≒ specified value								
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.									
	Capacitance change	≒ ±20% of the initial value								
	Dissipation factor(tan δ)	≒ 200% of the specified value								
	Leakage current	≒ 200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4									

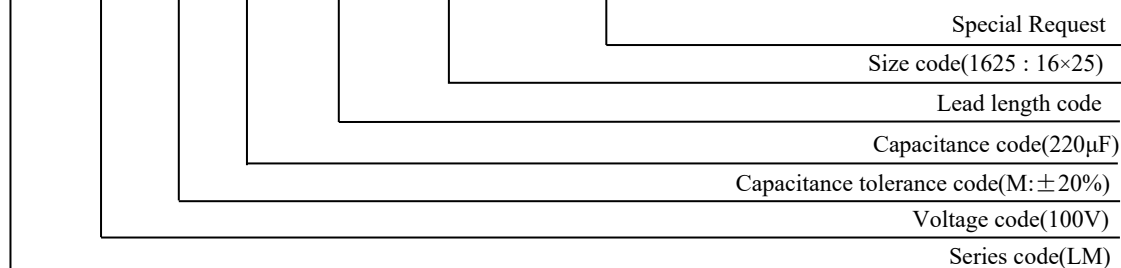
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	12.5	16	18
ΦD	$\Phi D \pm 0.5$ Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5$ Max $\geq 20 L \pm 2.0$ Max						

◆ PART NUMBER SYSTEM(Example :100V 220μF)

L M 1 0 0 M 2 2 1 L O 1 6 2 5



LM Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C /120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
6.3	47			10	47	5×11	72
	68	5×11	86		68	6.3×11	104
	100	5×11	114		100	6.3×11	120
	150	6.3×11	146		150	8×11.5	160
	220	6.3×11	180		220	8×11.5	204
	330	8×11.5	270		330	10×12.5	294
	470	10×12.5	318		470	10×16	396
	680	10×16	384		680	10×20	504
	1000	10×20	554		1000	10×20	684
	1500	12.5×20	720		1500	12.5×20	904
	2200	12.5×20	948		2200	12.5×25	1152
	3300	16×25	1240		3300	16×25	1434
	4700	16×31.5	1530		4700	16×31.5	1700
16	22			25	22	5×11	60
	33	5×11	66		33	6.3×11	82
	47	6.3×11	90		47	6.3×11	96
	68	6.3×11	122		68	8×11.5	132
	100	8×11.5	156		100	8×11.5	162
	150	8×11.5	210		150	10×12.5	238
	220	10×12.5	270		220	10×16	312
	330	10×16	360		330	10×20	414
	470	10×16	468		470	12.5×20	552
	680	12.5×20	636		680	12.5×20	780
	1000	12.5×20	810		1000	12.5×25	900
	1500	12.5×25	1032		1500	16×31.5	1218
	2200	16×25	1260		2200	16×31.5	1482
	3300	16×31.5	1902		3300	18×40	1956
	4700	18×35.5	2268		4700	18×40	2568
35	15	5×11	48	50	2.2	5×11	15
	22	6.3×11	72		3.3	5×11	22
	33	6.3×11	88		4.7	5×11	26
	47	8×11.5	120		6.8	5×11	32
	68	8×11.5	162		10	5×11	36
	100	10×12.5	204		15	5×11	48
	150	10×16	285		22	5×11	60
	220	10×20	366		33	6.3×11	78
	330	12.5×20	498		47	6.3×11	112
	470	12.5×25	642		68	8×11.5	134
	680	12.5×25	864		100	8×11.5	192
	1000	16×25	1044		150	10×12.5	248
	1500	16×35.5	1338		220	10×16	348
	2200	18×35.5	1632		330	10×20	444
	3300	18×40	2160		470	12.5×20	546
					680	16×25	782
					1000	16×25	1032
					1500	16×31.5	1224
					2200	18×40	1584
					3300	18×40	1896

LM Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C /120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
63	2.2	5×11	15	80	2.2	5×11	15
	3.3	5×11	24		3.3	5×11	25
	4.7	5×11	29		4.7	5×11	30
	6.8	5×11	36		6.8	5×11	38
	10	5×11	44		10	6.3×11	50
	15	6.3×11	60		15	8×11.5	66
	22	8×11.5	78		22	8×11.5	90
	33	8×11.5	102		33	10×12.5	114
	47	8×11.5	126		47	10×12.5	160
	68	10×12.5	174		68	10×16	186
	100	10×16	240		100	10×20	264
	150	10×20	302		150	12.5×20	336
	220	12.5×20	396		220	12.5×20	437
	330	12.5×20	497		330	12.5×25	540
	470	12.5×25	660		470	16×31.5	780
	680	16×25	870		680	16×35.5	966
	1000	16×31.5	1200		1000	18×35.5	1296
	1500	18×35.5	1464				
100	1.0	5×11	18	100	1.0	5×11	18
	2.2	5×11	26		2.2	5×11	26
	3.3	5×11	32		3.3	5×11	32
	4.7	6.3×11	43		4.7	6.3×11	43
	6.8	6.3×11	54		6.8	6.3×11	54
	10	8×11.5	73		10	8×11.5	73
	15	10×12.5	98		15	10×12.5	98
	22	10×12.5	127		22	10×12.5	127
	33	10×16	170		33	10×16	170
	47	10×20	220		47	10×20	220
	68	12.5×20	288		68	12.5×20	288
	100	12.5×20	360		100	12.5×20	360
	150	12.5×25	497		150	12.5×25	497
	220	16×25	640		220	16×25	640
	330	16×31.5	842		330	16×31.5	842
	470	18×35.5	1068		470	18×35.5	1068

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)				
	50/60	120	1K	10K	100K
2.2 ~ 68	0.75	1.00	1.57	1.75	2.00
100 ~ 680	0.80	1.00	1.34	1.40	1.50
1000 ~ 4700	0.85	1.00	1.13	1.15	1.35

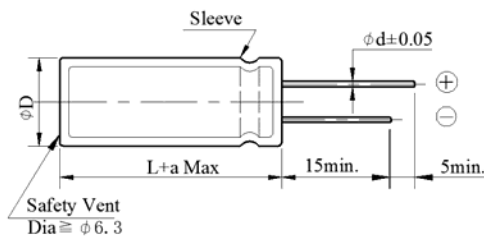
KE Series

- Standard series for general purpose .
- 2,000 hours assured at 85°C.

◆ SPECIFICATIONS

Item	Performance Characteristics												
Category Temperature Range	-40 ~ +85℃								-25 ~ +85℃				
Working Voltage Range	6.3 ~ 100Vdc								160 ~550Vdc				
Capacitance Range	2.2~ 22,000μF								2.2 ~470 μF				
Capacitance Tolerance	±20% (at 20℃ and 120Hz)												
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 250	350 ~ 500	550	
	tan δ(Max)	0.26	0.22	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20	0.25	
	The above values should be increased by 0.02 for every additional 1000μF												
Leakage Current	I≤0.01CV or 3μA whichever is greater(6.3 ~ 100V) I≤0.02CV+10μA (160 ~ 550V) I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes												
Low Temperature Characteristics Impedance Ratio(MAX)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 250	350 ~ 500	550	(at 120Hz)
	Z(-25℃)/Z(+20℃)	5	4	3	2	2	2	2	2	6	6	8	
	Z(-40℃)/Z(+20℃)	12	10	8	5	4	3	3	3	—	—	—	
Endurance	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 2,000 hours at 85℃.												
	Capacitance change					≒ ±20% of the initial value							
	Dissipation factor(tan δ)					≒ 200% of the specified value							
	Leakage current					≒ specified value							
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 85℃ without voltage applied.												
	Capacitance change					≒ ±20% of the initial value							
	Dissipation factor(tan δ)					≒ 200% of the specified value							
	Leakage current					≒ 200% of the specified value							
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4												

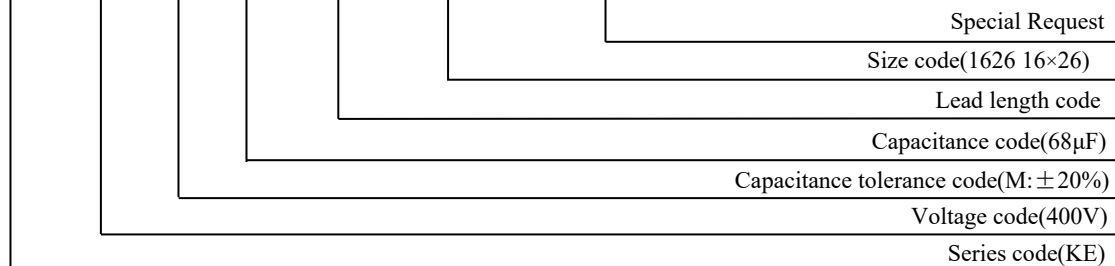
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	12.5	16	18	20	22
ΦD	ΦD ± 0.5 Max								
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	10
a	< 20 L ± 1.5Max ≥ 20 L ± 2.0Max								

◆ PART NUMBER SYSTEM(Example :400V 68μF)

K E 4 0 0 M 6 8 0 L O 1 6 2 6



KE Series

◆ Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)
6.3	22	5×11	65	10	22	5×11	65
	33	5×11	80		33	5×11	85
	47	5×11	95		47	5×11	100
	68	5×11	100		68	5×11	110
	100	5×11	134		100	5×11	150
	150	5×11	150		150	5×11	160
	220	5×11	220		220	5×11	220
	330	6.3×11	280		330	6.3×11	300
	470	6.3×11	360		470	6.3×11	360
	680	8×11.5	503		680	8×11.5	580
	1000	8×11.5	590		1000	10×12.5	650
	2200	10×16	930		2200	10×16	1090
	3300	10×20	1230		3300	12.5×20	1450
	4700	12.5×20	1520		4700	12.5×25	1790
	6800	12.5×25	1920		6800	16×25	2250
	10000	16×25	2370		10000	16×31.5	2550
	15000	16×35.5	2590		15000	18×35.5	2880
	22000	18×35.5	3220		22000	18×40	3400
16	4.7			25	4.7	5×11	30
	10	5×11	40		10	5×11	55
	22	5×11	75		22	5×11	80
	33	5×11	90		33	5×11	95
	47	5×11	115		47	5×11	120
	68	5×11	120		68	6.3×11	145
	100	5×11	175		100	6.3×11	190
	150	6.3×11	210		150	6.3×11	210
	220	6.3×11	280		220	8×11.5	370
	330	8×11.5	370		330	8×11.5	440
	470	8×11.5	460		470	10×12.5	550
	680	10×12.5	690		680	10×16	605
	1000	10×12.5	720		1000	10×20	930
	2200	12.5×20	1555		2200	12.5×25	1550
	3300	12.5×25	1990		3300	16×25	1980
	4700	16×25	2100		4700	16×31.5	2140
	6800	16×31.5	2280		6800	16×35.5	2600
	10000	18×35.5	2750				

KE Series**Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz**

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)
35	2.2	5×11	25	50	2.2	5×11	28
	3.3	5×11	30		3.3	5×11	35
	4.7	5×11	35		4.7	5×11	41
	10	5×11	60		10	5×11	65
	22	5×11	90		22	5×11	95
	33	5×11	110		33	5×11	125
	47	5×11	135		47	6.3×11	160
	68	6.3×11	160		68	6.3×11	210
	100	6.3×11	215		100	8×11.5	270
	150	8×11.5	290		150	10×12.5	345
	220	8×11.5	385		220	10×12.5	430
	330	10×12.5	490		330	10×16	590
	470	10×16	650		470	10×20	760
	680	10×20	820		680	12.5×20	875
	1000	12.5×20	1200		1000	12.5×25	1360
	2200	16×25	1880		2200	16×35.5	2060
	3300	16×31.5	2100		3300	18×35.5	2500
	4700	16×35.5	2500				
63	2.2	5×11	30	100	2.2	5×11	34
	3.3	5×11	37		3.3	5×11	42
	4.7	5×11	45		4.7	5×11	50
	10	5×11	70		10	6.3×11	80
	22	5×11	100		22	6.3×11	130
	33	6.3×11	140		33	8×11.5	180
	47	6.3×11	170		47	10×12.5	220
	68	8×11.5	220		68	10×12.5	270
	100	8×11.5	280		100	10×16	340
	150	10×12.5	345		150	12.5×20	490
	220	10×16	490		220	12.5×20	550
	330	10×20	710		330	12.5×25	760
	470	12.5×20	900		470	16×25	1000
	680	12.5×25	1000		680	16×35.5	1100
	1000	16×25	1310		1000	18×35.5	1350
	2200	18×35.5	2300				
160	2.2	6.3×11	26	200	2.2	6.3×11	26
	3.3	6.3×11	35		3.3	6.3×11	35
	4.7	6.3×11	40		4.7	8×11.5	45
	10	8×11.5	65		10	8×11.5	70
	22	10×16	110		22	10×20	110
	33	10×20	150		33	10×20	160
	47	12.5×20	180		47	12.5×20	180
	68	12.5×25	230		68	12.5×25	230
	82	12.5×25	250		82	12.5×25	260
	100	12.5×25	300		100	16×25	330
	120	12.5×25	325		120	16×25	350
	150	16×25	360		150	16×31.5	400
	180	16×31.5	415		180	16×35.5	430
	220	16×31.5	510		220	16×35.5	520
	330	18×35.5	600		330	18×35.5	635
	470	18×40	700		470	18×40	705

KE Series

Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @85°C/120Hz (mA rms)
250	2.2	6.3×11	30	350	2.2	8×11.5	28
	3.3	8×11.5	35		3.3	8×11.5	35
	4.7	8×11.5	45		4.7	10×12.5	41
	10	10×12.5	70		10	10×16	70
	22	10×20	130		22	12.5×20	110
	33	12.5×20	160		33	12.5×25	140
	47	12.5×20	210		47	16×25	220
	68	16×25	250		68	16×31.5	260
	82	16×25	265		82	18×31.5	270
	100	16×31.5	310		100	18×31.5	305
	120	16×31.5	345		120	18×31.5	340
	150	16×35.5	530		150	18×35.5	380
	180	18×35.5	540		180	18×40	410
	220	18×35.5	600				
	330	18×40	650				
400	1	6.3×11	18	450	1	8×11.5	19
	2.2	8×11.5	28		2.2	8×11.5	25
	3.3	8×11.5	32		3.3	10×12.5	32
	4.7	10×16	41		4.7	10×16	50
	10	10×20	70		10	12.5×16	75
	22	12.5×25	110		22	12.5×25	110
	33	16×25	140		33	16×25	150
	47	16×25	160		47	16×31.5	220
	68	16×35.5	280		68	18×31.5	310
	82	18×31.5	290		82	18×35.5	330
	100	18×31.5	300		100	18×40	360
	120	18×35.5	330		120	18×45	400
	150	18×40	360				
	180	18×45	400				
500	1	6.3×11	19	550	1	6.3×11	20
	2.2	8×11.5	28		2.2	8×15	30
	3.3	10×12.5	35		3.3	10×16	40
	4.7	10×16	55		4.7	10×20	60
	10	12.5×20	78		10	12.5×25	85
	22	12.5×30	135		22	12.5×35	150
	33	16×25	160		33	16×31.5	180
	47	16×31.5	240		47	16×35.5	280
	68	18×31.5	350		68	18×35.5	400
	82	18×35.5	380		82	18×40	430
	100	18×40	430		100	18×45	480
	120	18×45	480		120	18×50	550

◆ **RIPPLE CURRENT MULTIPLIERS**
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)				
		50/60	120	1K	10K	100K
6.3 ~ 100	0.1 ~ 68	0.75	1.00	1.75	2.30	2.50
	100 ~ 680	0.80	1.00	1.50	1.60	1.70
	1000 ~ 22000	0.85	1.00	1.15	1.40	1.50
160 ~ 550	0.47 ~ 220	0.80	1.00	1.40	1.55	1.70
	330 ~ 470	0.90	1.00	1.13	1.40	1.13

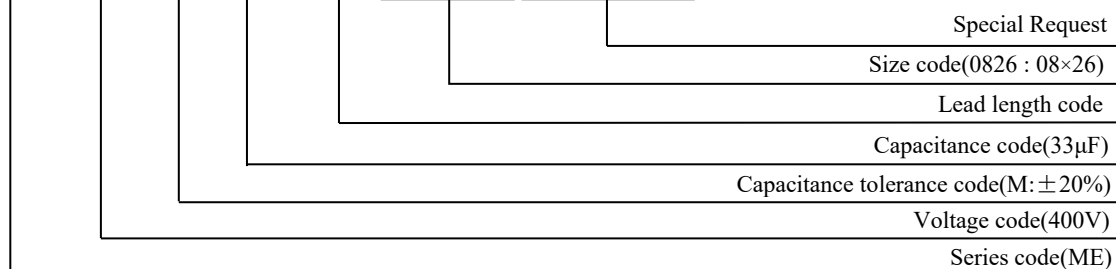
- **Fast charging of GaN.**
- **Load life 2,000 hours at 105°C.**
- **RoHS, REACH Compliant.**

[illegible]

Technical drawing of a Safety Vent assembly. The side view shows a cylindrical body with a diameter of ϕD , a length of $L+a \text{ Max}$, and a sleeve at the top. The end view shows a diameter of $\phi d \pm 0.05$ and a thickness of $P \pm 0.5$. The drawing also indicates a 15min. and 5min. time period for the assembly.

[illegible]

M	E	4	0	0	M	3	3	0	L	O	0	8	2	6				
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ME Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
6.3	22	5×11	45	10	22	5×11	51
	33	5×11	55		33	5×11	60
	47	5×11	65		47	5×11	75
	68	5×11	70		68	5×11	80
	100	5×11	100		100	5×11	110
	150	6.3×11	120		150	6.3×11	130
	220	6.3×11	180		220	6.3×11	190
	330	6.3×11	195		330	6.3×11	210
	470	8×11	300		470	8×11	330
	680	10×12	320		680	10×12	420
	1000	10×12	480		1000	10×12	460
	2200	10×16	600		1500	10×20	750
	3300	10×20	830		2200	12.5×20	980
	4700	10×20	840		3300	12.5×25	1250
	6800	12.5×20	1090		4700	16×25	1350
	10000	12.5×25	1350		6800	16×32	1670
	15000	16×25	1650		10000	18×35	2010
	22000	16×32	1820		15000	18×40	2360
16	10	5×11	40	25	10	5×11	43
	15	5×11	45		15	5×11	47
	22	5×11	55		22	5×11	60
	33	5×11	70		33	5×11	75
	47	5×11	85		47	5×11	90
	68	5×11	100		68	6.3×11	125
	100	5×11	115		100	6.3×11	145
	150	8×11.5	180		150	8×11	200
	220	8×11.5	240		220	8×11	250
	330	8×11.5	285		330	10×12	350
	470	10×12	380		470	10×16	460
	680	10×16	530		680	10×20	650
	1000	10×20	680		1000	12.5×20	830
	1500	12.5×20	860		1500	12.5×25	1020
	2200	12.5×25	1130		2200	16×25	1210
	3300	16×25	1270		3300	16×32	1540
	4700	16×32	1570		4700	16×35	1650
	6800	18×35	1930		6800	18×35	1950
	10000	18×40	2060		10000	18×40	2100

ME Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
35	10	5×11	47	50	0.47	5×11	11
	15	5×11	50		1	5×11	16
	22	5×11	65		2.2	5×11	23
	33	5×11	88		3.3	5×11	29
	47	6.3×11	100		4.7	5×11	34
	68	6.3×11	110		6.8	5×11	35
	100	6.3×11	150		10	5×11	50
	150	10×12	240		15	5×11	52
	220	10×12	320		22	5×11	75
	330	10×16	420		33	6.3×11	100
	470	10×20	570		47	6.3×11	125
	680	12.5×20	730		68	8×11	159
	1000	12.5×25	1000		100	8×11	210
	1500	16×25	1110		150	10×12	290
	2200	16×32	1450		220	10×16	370
	3300	18×32	1600		330	10×20	550
	4700	18×35	1910		470	10×20	660
			680	12.5×25	860		
			1000	13×25	1020		
			1500	16×32	1350		
			2200	16×35	1690		
			3300	18×40	2060		
			4700	22×40	2310		
63	0.47	5×11	8	100	0.47	5×11	12
	1	5×11	12		1	5×11	18
	2.2	5×11	20		2.2	5×11	27
	3.3	5×11	24		3.3	5×11	33
	4.7	5×11	34		4.7	5×11	39
	6.8	5×11	37		6.8	5×11	46
	10	5×11	50		10	6.3×11	65
	15	5×11	65		15	6.3×11	66
	22	6.3×11	85		22	6.3×11	85
	33	6.3×11	110		33	8×11	130
	47	8×11	150		47	10×12	165
	68	10×12	198		68	10×16	200
	100	10×12	250		100	10×20	265
	150	10×16	330		150	12.5×20	335
	220	10×20	410		220	12.5×25	440
	330	12.5×20	550		330	16×25	660
	470	12.5×25	720		470	16×32	880
	680	16×25	1000		680	16×35	1202
	1000	16×32	1130		1000	18×35	1300
	1500	16×35	1450				
2200	18×40	1780					

ME Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	0.47	5×11	13	200	0.47	5×11	13
	1	5×11	18		1	5×11	15
	2.2	6.3×11	27		2.2	6.3×11	27
	3.3	6.3×11	28		3.3	6.3×11	28
	4.7	6.3×11	32		4.7	8×11	36
	6.8	8×11	38		6.8	8×11	40
	10	8×11	55		10	10×12	60
	15	10×12	70		15	10×16	75
	22	10×20	140		22	10×20	150
	33	10×20	145		33	12.5×20	160
	47	12.5×20	195		47	12.5×20	195
	56	12.5×20	215		56	12.5×20	215
	68	12.5×25	270		68	12.5×25	270
	82	12.5×25	290		82	16×25	305
	100	16×25	340		100	16×25	340
	120	16×25	360		120	16×32	370
	150	16×32	435		150	16×32	440
	180	16×35	450		180	16×35	460
	220	16×32	500		220	16×35	500
	330	18×35	600		330	18×35	610
	470	18×45	740		470	18×45	750
	560	18×50	800		560	18×50	805
250	0.47	5×11	13	350	0.47	5×11	11
	1	6.3×11	18		1	6.3×11	18
	2.2	6.3×11	23		2.2	8×11	23
	3.3	8×11	30		3.3	8×11	30
	4.7	8×11	39		4.7	10×12	40
	6.8	10×12	42		6.8	10×16	42
	10	10×16	75		10	10×20	75
	15	10×16	85		15	12.5×20	140
	22	12.5×20	160		22	12.5×20	165
	33	12.5×20	165		33	16×25	165
	47	12.5×25	195		47	16×25	200
	56	12.5×25	215		56	16×32	230
	68	16×25	280		68	16×35	290
	82	16×25	305		82	18×32	315
	100	16×32	350		100	18×32	370
	120	16×32	380		120	18×35	390
	150	16×35	460		150	18×40	470
	180	18×35	470		180	18×45	480
	220	18×35	510		220		
	330	18×45	610		330		

ME Series**Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.**

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
400	0.47	6.3×11	15	450	0.47	6.3×11	16
	1	6.3×9	14		1	8×12	31
	2.2	6.3×9	21		2.2	8×11	25
		8×12	35				
	3.3	6.3×11	35		3.3	8×9	40
		8×9	40			10×12	52
	4.7	6.3×11	42		4.7	8×14	60
		8×12	55			10×12	72
	6.8	8×12	65		6.8	10×13	84
		10×13	75				
	8.2	6.3×16	78		8.2		
		8×12	80				
	10	7×16	90		10	8×14	88
		8×12	88			10×13	98
		10×12	95				
	15	7×20	112		15	8×18	149
		8×16	138			10×16	165
		10×14	145				
	22	7×25	163		22	10×20	205
		8×18	165			12.5×20	233
		10×16	185			13×16	256
		12.5×16	206				
	27	8×23	170		27	10×18	195
		10×18	189			13×17	200
		13×16	211				
	33	8×26	186		33	13×20	230
		10×20	210			16×20	280
		13×16	233				
	47	8×45	245		47	10×40	267
		10×25	302			12.5×30	374
		13×20	340			13×25	400
		16×18	370			16×20	437
	56	10×35	236		56	10×50	296
		13×20	289			16×25	440
		16×20	400			18×30	470
	68	13×30	366		68	16×25	420
		16×25	403			18×20	455
		18×20	437				
	82	16×32	390		82	18×32	550
	100	18×32	430		100	18×35	620
	120	18×35	480		120	18×40	690
	150	18×40	660		150	18×45	760
	180	18×45	720		180	18×50	840

ME Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
500	2.2	8×12	49	550	2.2	8×12	27
	3.3	8×12	60		3.3	8×12	34
	4.7	10×13	78		4.7	8×12	46
	6.8	10×13	98		6.8	10×13	80
	10	10×16	105		10	10×16	112
	15	8×30	162		15	10×20	220
		12.5×25	180			13×16	242
	22	13×20	260		22	13×20	283
		16×17	288				
	33	13×30	250		33	13×25	320
		16×25	305			16×30	360
	47	18×20	440		47	18×25	470
	56	18×32	460		56	16×40	540
		18×35	540			18×40	586
	68	18×35	560		68	18×35	590
	82	18×40	600		82	18×45	635
	100	18×45	660		100	18×50	710
	120	18×50	740		120		

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)				
		50/60	120	1K	10K	100K
6.3 ~ 160	0.47 ~ 68	0.75	1.00	1.35	1.57	2.00
	100 ~ 680	0.80	1.00	1.30	1.40	1.50
	1000 ~ 22000	0.85	1.00	1.10	1.13	1.15
200 ~ 550	0.47 ~ 220	0.80	1.00	1.25	1.40	1.40
	330 ~ 560	0.90	1.00	1.10	1.13	1.15

- **Suitable for main board.**
- **Extremely low impedance, downsize and high ripple current.**

[illegible]

Sleeve

$\phi d \pm 0.05$

ϕD

$L+a \text{ Max}$

15min.

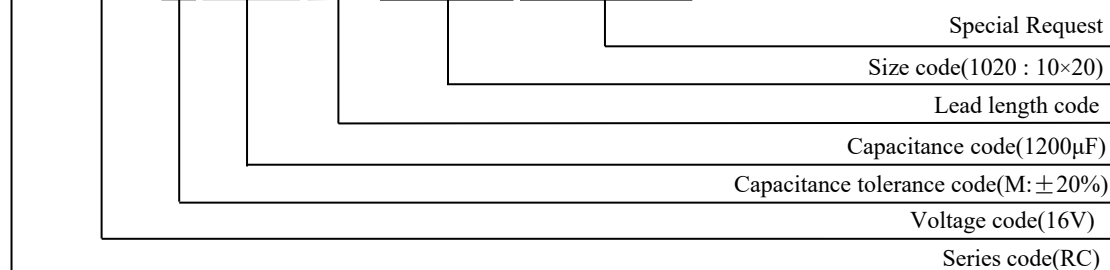
5min.

Safety Vent
Dia $\geq \phi 6.3$

$P \pm 0.5$

ΦD	5	6.3	8	10	12.5	16	18
ΦD	ΦD ± 0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

R	C	0	1	6	M	1	2	2	L	O	1	0	2	0				
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RC Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
6.3	33	5×11	1.0	100	10	22	5×11	1.0	100
	47	5×11	1.0	125		33	5×11	1.0	125
	100	5×11	0.550	165		47	5×11	1.0	150
	150	5×11	0.500	200		100	5×11	0.500	165
	220	6.3×11	0.450	250		150	6.3×11	0.450	220
	330	6.3×11	0.260	295		220	6.3×11	0.350	275
	470	8×12	0.180	410		330	8×12	0.180	470
	680	8×16	0.140	580		470	8×12	0.120	560
	820	8×20	0.120	680		680	10×13	0.100	710
	1000	10×13	0.090	730		820	10×16	0.080	850
	2200	13×20	0.045	1455		1,000	10×16	0.068	1050
	3300	13×25	0.038	1650		2,200	13×20	0.038	1670
	4700	16×26	0.030	2310		3300	13×25	0.030	1950
	6800	16×32	0.017	2880		4700	16×26	0.022	2310
	10000	16×36	0.017	3160		6800	16×32	0.020	3050
	15000	18×36	0.015	3690		10000	18×36	0.016	3250
16	10	5×11	2.0	125	25	4.7	5×11	2.8	80
	22	5×11	1.0	150		6.8	5×11	2.5	95
	33	5×11	1.0	150		10	5×11	1.5	125
	47	5×11	0.500	150		22	5×11	0.900	140
	100	6.3×11	0.250	220		33	5×11	0.900	150
	150	6.3×11	0.220	300		47	5×11	0.500	160
	220	8×12	0.180	410		68	6.3×11	0.420	180
	330	8×12	0.160	470		100	6.3×11	0.250	220
	470	10×13	0.090	740		150	8×12	0.220	330
	680	10×16	0.075	800		220	8×12	0.200	450
	820	10×20	0.065	1050		330	10×13	0.090	670
	1000	10×20	0.052	1230		470	10×16	0.068	950
	2200	13×25	0.032	1960		680	10×20	0.055	1100
	3300	16×26	0.022	2520		820	10×20	0.050	1250
	4700	16×32	0.019	3020		1000	13×20	0.045	1450
	6800	18×36	0.015	3720		2200	16×32	0.022	2520
	10000	18×40	0.015	3810		3300	18×36	0.019	3020
35	4.7	5×11	4.2	110	50	1.0	5×11	5.0	80
	6.8	5×11	2.8	120		2.2	5×11	4.0	90
	10	5×11	1.2	135		3.3	5×11	3.2	95
	22	5×11	0.800	150		4.7	5×11	2.7	110
	33	5×11	0.500	180		6.8	5×11	2.5	120
	47	6.3×11	0.400	220		10	5×11	2.0	145
	68	6.3×11	0.300	250		22	5×11	1.5	170
	100	6.3×11	0.230	286		33	6.3×11	1.0	220
	150	8×12	0.180	550		47	6.3×11	0.800	260
	220	10×13	0.090	730		68	8×12	0.630	330
	330	10×16	0.068	860		100	8×12	0.520	490
	470	10×20	0.052	1056		150	10×13	0.300	650
	680	13×20	0.045	1250		220	10×16	0.088	820
	820	13×20	0.040	1400		330	10×20	0.073	930
	1000	13×25	0.031	1870		470	13×20	0.072	1230
	2200	16×32	0.019	2530		680	13×25	0.070	1450
	3300	18×36	0.025	3390		820	16×26	0.070	1550
	4700	18×40	0.016	4130		1000	16×26	0.070	1960

RC Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
63	1.0	5×11	5.5	80	100	1.0	5×11	6.0	80
	2.2	5×11	4.5	90		2.2	5×11	5.5	90
	3.3	5×11	4.0	95		3.3	5×11	4.5	95
	4.7	5×11	3.0	110		4.7	6.3×11	4.0	130
	6.8	5×11	2.8	120		6.8	6.3×11	3.8	145
	10	5×11	2.0	145		10	6.3×11	3.2	180
	22	6.3×11	1.0	220		22	8×12	2.5	285
	33	6.3×11	0.900	250		33	10×13	2.0	385
	47	8×12	0.850	305		47	10×16	1.5	510
	68	8×12	0.700	365		68	10×20	1.0	600
	100	10×13	0.270	535		100	13×20	0.800	900
	150	10×16	0.220	650		150	13×25	0.650	1250
	220	10×20	0.130	860		220	16×26	0.090	1450
	330	13×20	0.090	1010		330	16×32	0.090	1550
	470	13×25	0.087	1520		470	18×36	0.060	1980
	680	16×26	0.065	1700					
	1000	16×32	0.036	2270					

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50/60	120	1K	10K	100K
6.3 ~ 16	0.60	0.75	0.90	0.98	1.00
25 ~ 100	0.50	0.62	0.85	0.95	1.00

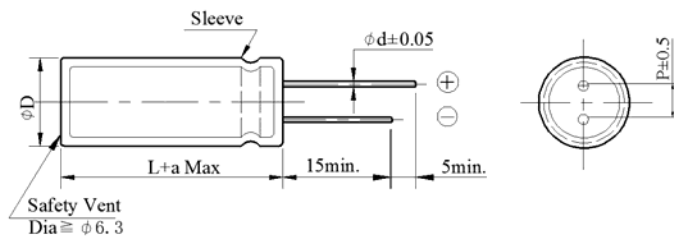
RD Series

- Low impedance and High ripple current.
- Load life 3,000 to 5,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics									
Category Temperature Range	-40~ +105℃									
Working Voltage Range	6.3 ~ 100Vdc									
Capacitance Range	10 ~10,00μF									
Capacitance Tolerance	±20% (at 20℃ and 120Hz)									
Dissipation Factor (tan δ) (at 25℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
	The above values should be increased by 0.02 for every additional 1000μF									
Leakage Current	I≤0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) The rated voltage is impressed for 2 minutes.									
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	(at120Hz)
	Z(-25℃)/Z(+25℃)	3	2	2	2	2	2	2	2	
	Z(-40℃)/Z(+25℃)	4	3	3	3	3	3	3	3	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 3,000~5,000 hours at 105℃.									
	Capacitance change		≒ ±20% of the initial value					Size		Life time (hours)
	Dissipation factor(tan δ)		≒ 200% of the specified value					≒ 6.3Φ		3,000
	Leakage current		≒ specified value					8Φ~10Φ		4,000
								≒ 13Φ		5,000
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.									
	Capacitance change		≒ ±20% of the initial value							
	Dissipation factor(tan δ)		≒ 200% of the specified value							
	Leakage current		≒ 200% of the specified value							
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4									

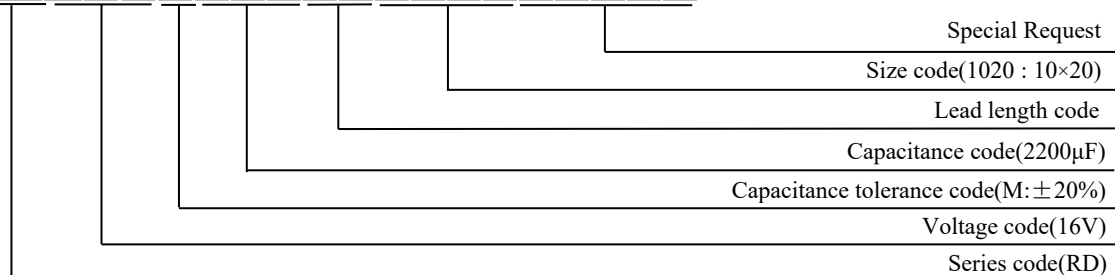
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	12.5	16	18
ΦD	$\Phi D \pm 0.5$ Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5$ Max $\geq 20 L \pm 2.0$ Max						

◆ PART NUMBER SYSTEM(Example :16V 1200 μ F)

R	D	0	1	6	M	2	2	2	L	0	1	0	2	0						
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RD Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz.

WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
6.3	100	5×11	0.650	135	10	100	5×11	0.580	180
	220	6.3×11	0.400	235		220	6.3×11	0.220	300
	330	6.3×11	0.220	320		330	8×12	0.210	370
	470	8×12	0.180	380		470	8×12	0.130	430
	560	8×12	0.170	430		560	8×15	0.120	605
	680	8×12	0.130	600		680	8×15	0.087	770
	820	8×15	0.095	680		820	8×20	0.085	805
	1000	8×15	0.087	790		1000	10×16	0.060	910
	1200	8×20	0.069	990		1200	10×20	0.046	1100
	1500	10×20	0.046	1330		1500	10×20	0.045	1140
	2200	10×20	0.045	1380		2200	13×20	0.035	1600
	2700	10×30	0.035	1810		2700	13×25	0.034	1645
	3300	13×20	0.030	1850		3300	13×25	0.027	1830
	3900	13×25	0.027	2130		3900	13×30	0.024	2250
	4700	13×30	0.024	2350		4700	13×35	0.020	2280
	5600	13×35	0.020	2480		5600	13×40	0.017	3050
	6800	13×40	0.017	3050		6800	16×32	0.017	3050
	8200	16×31.5	0.017	3050		8200	16×35	0.015	3110
	10000	16×35.5	0.015	3010		10000	16×40	0.013	3580
16	47	5×11	0.800	90	25	47	5×11	0.580	190
	68	6.3×11	0.560	120		68	6.3×11	0.360	210
	100	6.3×11	0.520	205		100	6.3×11	0.220	310
	150	8×12	0.210	300		150	8×12	0.200	385
	220	8×12	0.200	365		220	8×12	0.130	600
	330	8×12	0.130	600		330	8×15	0.087	805
	470	8×15	0.087	800		470	10×16	0.060	950
	560	8×20	0.085	805		560	10×20	0.058	1020
	680	8×20	0.069	950		680	10×20	0.046	1200
	820	10×20	0.058	1020		820	10×25	0.042	1350
	1000	10×20	0.046	1200		1000	13×20	0.035	1600
	1200	10×25	0.042	1350		1200	13×25	0.034	1930
	1500	13×20	0.035	1600		1500	13×25	0.027	2350
	2200	13×25	0.027	1930		2200	13×35	0.020	2480
	2700	13×30	0.024	2350		2700	13×40	0.017	3050
	3300	13×35	0.020	2480		3300	16×32	0.017	3050
	3900	13×40	0.017	3050		3900	16×35	0.015	3210
	4700	16×32	0.017	3050		4700	16×40	0.013	3880
	5600	16×35	0.015	3210					
	6800	16×40	0.013	3880					

RD Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100kHz.

WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
35	10	5×11	1.500	90	50	10	5×11	1.450	105
	22	5×11	0.750	140		22	5×11	0.700	180
	33	5×11	0.580	180		33	6.3×11	0.480	215
	47	6.3×11	0.490	205		47	6.3×11	0.400	220
	68	8×12	0.210	330		68	8×12	0.280	355
	100	8×12	0.200	375		100	8×12	0.170	555
	150	8×12	0.130	600		150	8×14	0.120	730
	220	8×14	0.087	805		220	10×16	0.084	1050
	330	10×16	0.060	1010		330	10×25	0.055	1440
	470	10×20	0.046	1300		470	13×20	0.045	1660
	560	10×25	0.042	1450		560	13×25	0.034	1950
	680	10×30	0.031	1310		680	13×30	0.030	2310
	820	13×25	0.030	1638		820	13×35	0.025	2510
	1000	13×25	0.027	2030		1000	16×25	0.025	2555
	1200	13×30	0.024	2250		1200	16×30	0.022	3010
	1500	13×35	0.020	2480		1500	16×35	0.019	3150
	2200	16×32	0.017	3150		2200	18×35	0.017	3680
	2700	16×35	0.015	3210		2700	18×40	0.014	3800
	3300	16×40	0.013	3880					
	3900	18×40	0.012	4080					
63	10	5×11	2.850	28	100	1	5×11	5.0	79
	22	6.3×11	1.850	55		2.2	5×11	4.0	89
	33	6.3×11	1.200	110		3.3	5×11	3.2	95
	47	8×12	1.000	160		4.7	5×11	2.8	110
	68	8×12	0.610	225		10	6.3×11	2.0	180
	100	8×14	0.430	285		22	8×12	0.66	286
	100	10×13	0.430	285		33	10×13	0.5	385
	220	10×20	0.210	420		47	10×16	0.32	504
	220	10×25	0.200	511		100	10×20	0.16	895
	330	13×25	0.120	784		220	13×20	0.12	1200
	470	13×30	0.100	905		330	16×20	0.09	1350
	560	13×35	0.083	1050		470	16×26	0.08	1588
	680	13×40	0.071	1180		1000	18×35	0.062	2100
	820	16×32	0.054	1570					
	1000	16×35	0.045	1790					
	1200	16×40	0.040	2020					
	1500	18×40	0.036	2330					

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)				
		60	120	1K	10K	100K
6.3~ 100	1.0 ~33	0.45	0.55	0.75	0.90	1.00
	47 ~ 330	0.60	0.70	0.85	0.95	1.00
	470 ~ 1000	0.65	0.75	0.90	0.98	1.00
	1200 ~ 10000	0.75	0.80	0.95	1.00	1.00

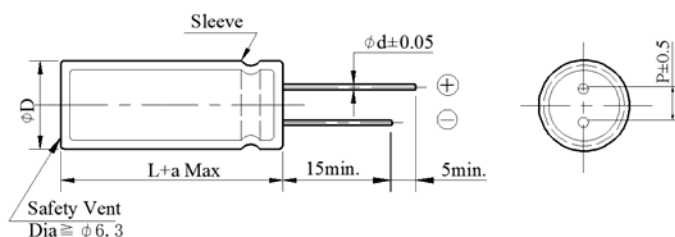
RF Series

- Suitable for use in high ripple current capability.
- Miniaturized, Low E.S.R and low impedance.
- Load life 4,000~7,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics										
Category Temperature Range	-40 ~ +105℃										
Working Voltage Range	6.3 ~ 100Vdc										
Capacitance Range	6.8~6,800 μF										
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100		
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08		
	The above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) The rated voltage is impressed for 2 minutes.										
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	(at120Hz)
	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2	
	Z(-40℃)/Z(+20℃)	8	6	6	5	4	3	3	3	3	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 4,000~7,000 hours at 105℃										
	Capacitance change		≒ ±25% of the initial value					Size		Life time (hours)	
	Dissipation factor(tan δ)		≒ 200% of the specified value					5Φ~ 6.3Φ		4,000	
	Leakage current		≒ specified value					8 Φ~ 10Φ		5,000	
								12.5Φ ~ 18Φ		7,000	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.										
	Capacitance change		≒ ±25% of the initial value								
	Dissipation factor(tan δ)		≒ 200% of the specified value								
	Leakage current		≒ 200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

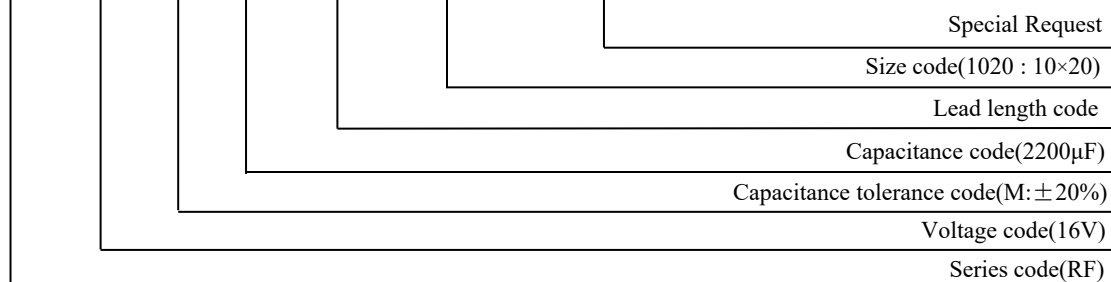
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	13	16	18
ΦD	$\Phi D + 0.5$ Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L + 1.5$ Max $\geq 20 L + 2.0$ Max						

◆ PART NUMBER SYSTEM(Example :16V 2200 μ F)

R F 0 1 6 M 2 2 2 L O 1 0 2 0



◆ **Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz**

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25℃	Max.Rated Ripple current @105℃/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25℃	Max.Rated Ripple current @105℃/100kHz (mA rms)
6.3	150	5x11	0.30	250	10	100	5x11	0.30	250
	330	6.3x11	0.13	405		220	6.3x11	0.13	405
	560	8x12	0.072	760		470	8x12	0.072	760
	820	8x16	0.056	995		680	8x16	0.056	995
	1000	10x13	0.053	1030			10x13	0.053	1030
	1200	8x20	0.041	1250		1000	8x20	0.041	1250
		10x16	0.038	1430			10x16	0.038	1430
	1500	10x20	0.023	1820		1200	10x20	0.023	1820
	2200	10x25	0.022	2150		1500	10x25	0.022	2150
	3300	13x20	0.021	2360		2200	13x20	0.021	2360
	3900	13x25	0.018	2770		3300	13x25	0.018	2770
	4700	13x30	0.16	3290		3900	13x30	0.16	3290
	5600	13x35	0.015	3400			16x21	0.018	3140
		16x21	0.018	3140		4700	13x35	0.015	3400
6800	16x26	0.016	3460	5600	16x26	0.016	3460		
16	56	5x11	0.30	250	25	47	5x11	0.30	250
	120	6.3x11	0.13	405		100	6.3x11	0.13	405
	330	8x12	0.072	760		220	8x12	0.072	760
	470	8x16	0.056	995		330	8x16	0.056	995
		10x13	0.053	1030			10x13	0.053	1030
	680	8x20	0.041	1250		470	8x20	0.041	1250
		10x16	0.038	1430			10x16	0.038	1430
	820	10x20	0.035	1550		680	10x20	0.023	1820
	1000	10x20	0.023	1820		820	10x25	0.022	2150
	1200	10x25	0.022	2150		1000	13x20	0.021	2360
	1500	13x20	0.021	2360		1500	13x25	0.018	2770
	2200	13x25	0.018	2770		1800	13x30	0.016	3290
	2700	13x30	0.016	3290			16x21	0.018	3140
		16x21	0.018	3140		2200	13x35	0.015	3400
	3300	13x35	0.015	3400		2700	16x26	0.016	3460
	3900	16x26	0.016	3460					
35	33	5×11	0.30	250	50	22	5×11	1.88	238
	56	6.3×11	0.13	405		56	6.3×11	1.65	385
	150	8×12	0.072	760		100	8×12	1.45	724
	220	8×16	0.056	995		120	8×16	1.22	950
		10x13	0.053	1030		150	10x13	1.23	979
	270	8×20	0.041	1250		180	8×20	1.16	1190
	330	10x16	0.038	1430		220	10x16	1.12	1370
	470	10x20	0.023	1820		270	10x20	0.98	1580
	560	10x25	0.022	2150		330	10x25	0.89	1870
	680	13×20	0.021	2360		470	13×20	0.078	2050
	1000	13×25	0.018	2770		560	13×25	0.056	2410
	1200	13×30	0.16	3290		680	13×30	0.053	2860
		16×21	0.18	3140		820	13*35	0.041	2960
	1500	13×35	0.015	3400			16×21	0.039	2730
1800	16×26	0.016	3460	1000	16×26	0.036	3010		

RF Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
63	15	5×11	1.99	250	80	68	10×13	1.55	480
	33	6.3×11	1.88	405		100	10×16	1.32	600
	56	8×12	1.55	760		120	10×20	1.21	800
	82	8×12	1.32	995		150	10×25	1.11	900
		10×12	1.19	1030			13×16	1.11	750
	120	8×16	0.099	1250		220	13×20	0.062	1100
		10×13	0.099	1430		330	13×25	0.047	1250
	180	10×14	0.096	1820			16×20	0.048	1350
		10×16	0.092	2150		390	13×30	0.042	1500
	220	10×16	0.089	2360		470	13×35	0.036	1650
	270	10×16	0.088	2770			16×26	0.038	1700
	330	10×16	0.089	2770			18×20	0.045	1500
	390	10×20	0.085	3290		560	13×40	0.032	1800
	470	13×20	0.085	3140		680	16×32	0.032	1850
		13×25	0.081	3400			18×26	0.036	1750
	560	13×30	0.078	3460		820	16×35	0.029	2000
	680	13×30	0.078	2800			18×32	0.03	1900
		16×26	0.086	2600		1000	16×40	0.027	2200
		18×20	0.099	2500			18×35	0.027	2200
	820	16×32	0.085	2850		1200	18×40	0.026	2700
		18×26	0.092	2800					
100	1000	16×35	0.065	2900					
	1200	16×40	0.061	3400					
		18×32	0.088	3300					
	1500	18×35	0.058	3400					
	1800	18×40	0.048	3500					
	6.8	5×11	1.4	125					
	15	6.3×11	0.57	205					
	27	8×12	0.36	355					
	39	8×16	0.25	450					
	47	10×13	0.17	480					
	56	8×20	0.19	565					
	68	10×16	0.11	600					
	82	10×20	0.084	800					
	100	13×16	0.11	750					
	120	10×25	0.069	900					
	150	13×20	0.062	1100					
	220	13×25	0.047	1250					
		16×20	0.048	1350					
	270	13×30	0.042	1500					
	330	13×35	0.036	1650					
		16×26	0.038	1700					
		18×20	0.045	1500					
	390	13×40	0.032	1800					
	470	16×32	0.032	1850					
		18×26	0.036	1750					
	560	16×35	0.029	2000					
		13×30	0.030	1900					
	680	16×40	0.027	2200					
		18×35	0.027	2200					
	820	18×40	0.026	2700					

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

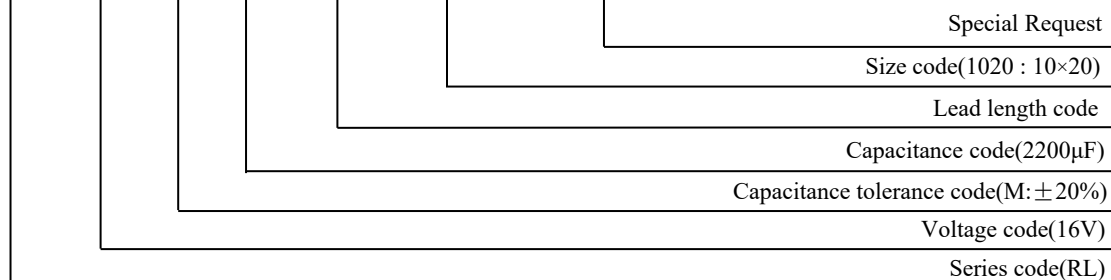
Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
6.3 ~ 100	6.8 ~ 68	0.30	0.65	0.85	1.00
	82 ~ 220	0.50	0.70	0.90	1.00
	330 ~ 820	0.60	0.75	0.95	1.00
	1000 ~ 6800	0.70	0.80	0.98	1.00

- Low impedance and High ripple current.
- Load life 6000~8,000 hours at 105°C.

[illegible]

ΦD	5	6.3	8	10	12.5	16	18
ΦD	$\Phi D + 0.5 \text{ Max}$						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

R	T	0	1	6	M	2	2	2	L	O	1	0	2	0				
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RT Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
6.3	220	5x11	0.22	345	10	150	5x11	0.22	345
	470	6.3x11	0.094	540		330	6.3x11	0.094	540
	820	8x12	0.056	945		680	8x12	0.056	945
	1200	8x16	0.045	1250		1000	8x16	0.045	1250
	1200	10x13	0.039	1330		1000	10x13	0.039	1330
	1500	8x20	0.029	1500		1500	8x20	0.029	1500
	1800	10x16	0.028	1760		1500	10x16	0.028	1760
	2200	10x20	0.020	1960		1800	10x20	0.020	1960
	2700	10x25	0.018	2250		2200	10x25	0.018	2250
	3900	13x20	0.017	2480		3300	13x20	0.017	2480
	4700	13x25	0.015	2900		3900	13x25	0.015	2900
	5600	13x30	0.013	3450		4700	13x30	0.013	3450
	6800	13x35	0.012	3570		4700	16x21	0.015	3250
	6800	16x21	0.015	3250		5600	13x35	0.012	3570
	8200	16x26	0.013	3630		6800	16x26	0.013	3630
	10000	18x26	0.012	3650		8200	18x26	0.012	3650
16	100	5x11	0.22	345	25	68	5x11	0.22	345
	220	6.3x11	0.094	540		150	6.3x11	0.094	540
	470	8x12	0.056	945		330	8x12	0.056	945
	680	8x16	0.045	1250		390	8x16	0.045	1250
	680	10x13	0.039	1330		470	10x13	0.039	1330
	1000	8x20	0.029	1500		560	8x10	0.029	1500
	1000	10x16	0.028	1760		680	10x16	0.028	1760
	1500	10x20	0.020	1960		820	10x20	0.020	1960
	1800	10x25	0.018	2250		1000	10x25	0.018	2250
	2200	13x20	0.017	2480		1500	13x20	0.017	2480
	2700	13x25	0.015	2900		1800	13x25	0.015	2900
	3300	13x30	0.013	3450		2200	13x30	0.013	3450
	3300	16x21	0.015	3250		2200	16x21	0.015	3250
	3900	13x35	0.012	3570		2700	13x35	0.012	3570
	4700	16x26	0.013	3630		3300	16x26	0.013	3630
	5600	18x26	0.012	3650		3900	18x26	0.012	3650
35	47	5x11	0.22	345	50	27	5x11	0.34	238
	100	6.3x11	0.094	540		56	6.3x11	0.14	385
	220	8x12	0.056	945		100	8x12	0.074	724
	270	8x16	0.045	1250		120	8x16	0.061	950
	330	10x13	0.039	1330		150	10x13	0.061	979
	390	8x20	0.029	1500		180	8x20	0.046	1190
	470	10x16	0.028	1760		220	10x16	0.042	1370
	560	10x20	0.020	1960		270	10x20	0.030	1580
	680	10x25	0.018	2250		330	10x25	0.028	1870
	1000	13x20	0.017	2480		470	13x20	0.027	2050
	1200	13x25	0.015	2900		560	13x25	0.023	2410
	1500	13x30	0.013	3450		680	13x30	0.021	2860
	1500	16x21	0.015	3250		820	13x35	0.019	2960
	1800	13x35	0.012	3570		820	16x21	0.023	2730
	2200	16x26	0.013	3630		1000	16x26	0.021	3010
	2700	18x26	0.012	3650		1500	18x26	0.019	3290

RT Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25℃	Max.Rated Ripple current @105℃/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25℃	Max.Rated Ripple current @105℃/100kHz (mA rms)																															
63	15	5x11	0.88	168	80																																			
	33	6.3x11	0.35	270																																				
	56	8x12	0.22	505		68	10x13	0.17	487																															
	82	8x16	0.16	660		100	10x16	0.11	608																															
		10*13	0.11	695																																				
	120	8x20	0.12	825		120	10x20	0.084	808																															
		10x16	0.076	950																																				
	180	10x20	0.056	1157		150	10x25	0.069	905																															
		13x16	0.072	1154			13x16	0.11	459																															
	220	10x25	0.046	1355		220	13x20	0.062	1102																															
	270	13x20	0.041	1503		330	13x25	0.047	1255																															
	390	13x25	0.031	1905			16x21	0.048	1359																															
	470	13x30	0.028	2303		390	13x30	0.042	1506																															
		16x21	0.032	2005																																				
	560	13x35	0.024	2505		470	13x35	0.036	1658																															
	680	13x40	0.021	2807			16x26	0.038	1709																															
		16x26	0.025	2605		560	18x21	0.045	1505																															
		18x21	0.03	2807			13x40	0.032	1807																															
	820	16x32	0.021	2859		680	16x32	0.032	1857																															
		18x26	0.024	2803			18x26	0.036	1758																															
	1000	16x35	0.019	2905		820	16x35	0.029	2005																															
							18x32	0.03	1907																															
	1200	16x40	0.018	3408		1000	16x40	0.027	2203																															
		18x32	0.020	3306			18x36	0.027	2205																															
	1500	18x26	0.018	3405		1200	18x40	0.026	2708																															
	1800	18x40	0.017	3510																																				
100	15	6.3x11	0.57	207	◆ RIPPLE CURRENT MULTIPLIERS Frequency Multipliers <table><tr><th rowspan="2">Vdc</th><th rowspan="2">Cap(uF)</th><th colspan="4">Frequency (Hz)</th></tr><tr><th>120</th><th>1K</th><th>10K</th><th>100K</th></tr><tr><td rowspan="4">6.3 ~ 100</td><td>15 ~ 68</td><td>0.30</td><td>0.55</td><td>0.80</td><td>1.00</td></tr><tr><td>82 ~ 220</td><td>0.40</td><td>0.60</td><td>0.85</td><td>1.00</td></tr><tr><td>330 ~ 820</td><td>0.50</td><td>0.65</td><td>0.90</td><td>1.00</td></tr><tr><td>1000 ~ 8200</td><td>0.60</td><td>0.70</td><td>0.95</td><td>1.00</td></tr></table>					Vdc	Cap(uF)	Frequency (Hz)				120	1K	10K	100K	6.3 ~ 100	15 ~ 68	0.30	0.55	0.80	1.00	82 ~ 220	0.40	0.60	0.85	1.00	330 ~ 820	0.50	0.65	0.90	1.00	1000 ~ 8200	0.60	0.70	0.95	1.00
	Vdc	Cap(uF)	Frequency (Hz)																																					
			120	1K						10K	100K																													
	6.3 ~ 100	15 ~ 68	0.30	0.55						0.80	1.00																													
		82 ~ 220	0.40	0.60						0.85	1.00																													
		330 ~ 820	0.50	0.65						0.90	1.00																													
		1000 ~ 8200	0.60	0.70						0.95	1.00																													
	27	8x12	0.36	358																																				
	39	8x16	0.25	457																																				
	47	10x13	0.17	488																																				
	56	8x20	0.19	568																																				
	68	10x16	0.11	609																																				
	82	10x20	0.084	808																																				
	100	13x16	0.11	753																																				
	120	10x25	0.069	907																																				
	150	13x20	0.062	1103																																				
	220	13x25	0.042	1253																																				
		16x21	0.048	1354																																				
	270	13x30	0.047	1506																																				
		13x35	0.056	1655																																				
	330	16x26	0.068	1706																																				
		18x21	0.045	1509																																				
	390	13x40	0.062	1808																																				
	470	16x32	0.032	1855																																				
		18x26	0.036	1758																																				
	560	16x35	0.029	2004																																				
		18x32	0.03	1905																																				
	680	16x40	0.027	2206																																				
		18x36	0.027	2202																																				
	820	18x40	0.026	2709																																				

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
6.3 ~ 100	15 ~ 68	0.30	0.55	0.80	1.00
	82 ~ 220	0.40	0.60	0.85	1.00
	330 ~ 820	0.50	0.65	0.90	1.00
	1000 ~ 8200	0.60	0.70	0.95	1.00

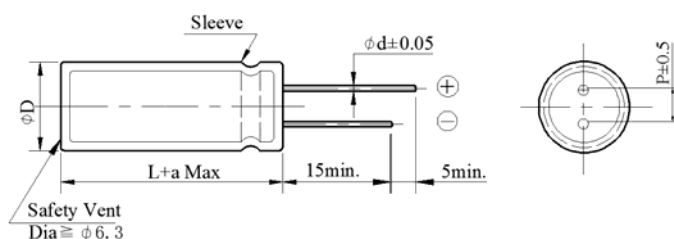
RG Series

- Low impedance and High ripple current.
- Load life 6,000~10,000 hours at 105°C.

SPECIFICATIONS

SPECIFICATIONS											
Item	Performance Characteristics										
Category Temperature Range	-40 ~ +105℃										
Working Voltage Range	6.3 ~100Vdc										
Capacitance Range	6.8~ 5600μF										
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	
	The above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3 μA, whichever is greater. I: Leakage current (μA) C: Rated capacitance (μF) V: Rated voltage (V) Impress the rated voltage for 2 minutes.										
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	(at 120Hz)
	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2	
	Z(-40℃)/Z(+20℃)	8	6	4	3	3	3	3	3	3	
Endurance	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 6,000 to 10,000 hours at 105℃.										
	Capacitance change		≒ ±25% of the initial value						Size	Life time (hours)	
	Dissipation factor(tan δ)		≒ 200% of the specified value						5~6.3Φ	6,000	
	Leakage current		≒ specified value						8~10Φ	8,000	
									13Φ	10,000	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.										
	Capacitance change		≒ ±25% of the initial value								
	Dissipation factor(tan δ)		≒ 200% of the specified value								
	Leakage current		≒ 200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

DIMENSIONS(mm)



ΦD	5	6.3	8	10	13	16	18
ΦD	ΦD±0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	< 20 L ± 1.5Max ≥ 20 L ± 2.0Max						

PART NUMBER SYSTEM(Example :25V 220μF)

R G 0 2 5 M 2 2 1 L O 0 8 0 9

Special Request	
Size code(0809: 08×09)	
Lead length code	
Capacitance code(220μF)	
Capacitance tolerance code(M: ±20%)	
Voltage code(25V)	
Series code(RG)	

RG Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100kHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
6.3	180	5x11	0.29	340	10	120	5x11	0.29	350
	390	6.3x11	0.15	540		330	6.3x11	0.15	540
	820	8x12	0.087	840		560	8x12	0.087	840
	1200	8x16	0.069	1050		820	8x16	0.069	1050
		10x13	0.064	1050		1000	8x20	0.060	1210
	1500	8x20	0.060	1210			10x13	0.064	1050
	1800	10x16	0.049	1400		1200	10x16	0.049	1400
	2200	10x20	0.037	1650		1800	10x20	0.037	1650
	2700	10x25	0.037	1910		2200	10x25	0.031	1910
	3300	10x30	0.027	2230		2700	10x30	0.027	2230
	3900	13x20	0.027	2230			13x20	0.027	2230
	4700	13x25	0.024	2530		3900	13x25	0.024	2530
	6800	13x30	0.021	2860		4700	13x30	0.021	2860
		16x21	0.025	2610			16x21	0.025	2610
	8200	13x35	0.018	3140		5600	13x35	0.018	3140
		18x21	0.021	3000			12x40	0.017	3640
	10000	13x40	0.017	3640		6800	16x26	0.020	3140
		16x26	0.020	3140			18x21	0.021	3000
	12000	16x32	0.016	3610		8200	16x32	0.016	3610
		18x26	0.017	3530		8200	18x26	0.017	3530
16	15000	16x35	0.014	4080	25	10000	16x35	0.014	4080
		18x32	0.014	4220			18x32	0.014	4220
	18000	16x40	0.013	4220		12000	16x40	0.013	4220
		18x35	0.012	4280			18x35	0.012	4280
	22000	18x40	0.011	4700		15000	18x40	0.011	4700
	120	5x11	0.29	340		82	5x11	0.29	340
	270	6.3x11	0.15	540		150	6.3x11	0.15	540
	470	8x12	0.087	840		330	8x12	0.087	840
	680	8x16	0.069	1050		390	8x16	0.039	1050
		10x13	0.064	1050		470	10x13	0.064	1050
	820	8x20	0.060	1210		560	8x20	0.060	1210
	1000	10x16	0.049	1400		680	10x16	0.049	1400
	1500	10x20	0.037	1650		1000	10x20	0.037	1650
	1800	10x25	0.031	1910		1200	10x25	0.031	1910
	2200	10x30	0.027	2230		1500	10x30	0.027	2230
		13x20	0.027	2230			13x20	0.027	2230
	3300	13x25	0.024	2530		2200	13x25	0.024	2530
	3900	13x30	0.021	2860		2700	13x30	0.021	2860
		16x21	0.025	2610			16x21	0.025	2610
	4700	13x35	0.018	3140		3300	13x35	0.018	3140
		18x21	0.021	3000			18x21	0.021	3000
	5600	13x40	0.017	3640		3900	13x40	0.017	3640
		16x26	0.020	3140			16x26	0.020	3140
	6800	16x32	0.016	3610		4700	16x32	0.016	3610
		18x26	0.017	3530			18x26	0.017	3530
	8200	16x35	0.014	4080		5600	16x35	0.016	4080
		18x32	0.014	4220		6800	16x40	0.013	4220
	10000	16x40	0.013	4220			18x32	0.014	4220
		18x35	0.012	4280		8200	18x35	0.012	4280
	12000	18x40	0.011	4700					

RG Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
35	47	5x11	0.29	340	50	27	5x11	0.48	238
	100	6.3x11	0.15	540		56	6.3x11	0.20	385
	180	8x12	0.087	840		100	8x12	0.12	620
	270	8x16	0.069	1050		150	8x16	0.093	810
	330	8x20	0.060	1210			10x13	0.10	810
	330	10x13	0.064	1050		180	8x20	0.075	980
	470	10x16	0.049	1400		220	10x16	0.069	1100
	680	10x20	0.037	1650		270	10x20	0.050	1300
	820	10x25	0.031	1910		390	10x25	0.043	1600
	1000	10x30	0.027	2230		470	10x30	0.038	1820
		13x20	0.027	2230			13x20	0.034	1820
	1500	13x25	0.024	2530		680	13x25	0.030	2100
	1800	13x30	0.021	2860		820	13x30	0.025	2450
		16x21	0.025	2610			16x21	0.028	2350
	2200	13x35	0.018	3140		1000	13x35	0.021	2800
		18x21	0.021	3000			18x21	0.025	2600
	2700	13x40	0.017	3640		1200	13x40	0.019	3100
		16x26	0.020	3140		1200	16x26	0.024	2750
	3300	16x32	0.016	3610		1500	16x32	0.019	3150
		18x26	0.017	3530			18x26	0.021	2890
	3900	16x35	0.014	4080		1800	16x35	0.016	3550
63	4700	16x40	0.013	4220		2200	16x40	0.014	3900
		18x32	0.014	4220			18x32	0.014	3800
	5600	18x35	0.012	4280		2700	18x35	0.013	4100
	18	5X11	0.50	220	63	1000	16X26	0.025	2730
	33	6.3X11	0.25	350		1200	16X32	0.020	3000
	56	8X12	0.16	530			18X26	0.022	2800
	82	8X16	0.12	700		1500	16X35	0.018	3200
	120	8X20	0.085	880			18X32	0.018	3300
		10X13	0.11	725		1800	16X40	0.016	3590
	180	10X16	0.073	1050			18X35	0.017	3570
	220	10X20	0.055	1300		2200	18X40	0.016	3670
	330	10X25	0.045	1550					
	390	10X30	0.040	1780					
		13X20	0.036	1780					
	560	13X25	0.030	2100					
	680	13X30	0.026	2415					
		16X21	0.028	2250					
	820	13X35	0.022	2700					
		18X21	0.028	2500					
	1000	13X40	0.020	3000					

RG Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ω _{max} /100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
80	12	5x11	0.80	163	100	6.8	5X11	0.80	163
	22	6.3x11	0.43	260		15	6.3X11	0.43	276
	39	8x12	0.18	462		27	8X12	0.18	462
	56	8x16	0.14	585		39	8X16	0.14	585
	82	8x20	0.11	735		56	8X20	0.11	735
		10x13	0.14	624			10X13	0.14	625
	120	10x16	0.10	780		82	10X16	0.10	780
	180	10x20	0.075	1040		100	10X20	0.075	1040
	220	10x25	0.060	1170		120	10X25	0.060	1170
	270	10x30	0.053	1350		150	10X30	0.053	1350
		13x20	0.048	1430		180	13X20	0.048	1430
	390	13x25	0.039	1620		220	13X25	0.039	1620
	470	13x30	0.033	1950		270	13X30	0.033	1950
		16x21	0.036	1750			16X21	0.036	1750
	560	13x35	0.026	2250		330	16X26	0.028	2250
		18x21	0.032	2100		390	13X35	0.026	2250
	680	13x40	0.024	2450			18X21	0.032	2100
		16x26	0.028	2250		470	13X40	0.024	2450
	820	16x32	0.022	2400			16X32	0.022	2400
		18x26	0.027	2270		560	16X35	0.020	2600
	1000	16x35	0.020	2600			18X26	0.027	2270
	1200	16x40	0.018	2900		680	16X40	0.018	2900
		18x32	0.020	2550			18X32	0.020	2550
	1500	18x35	0.018	3050		820	18X35	0.018	3050
						1000	18X40	0.017	3510

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)			
	120	1K	10K	100K
6.8~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~	0.85	0.95	0.98	1.00

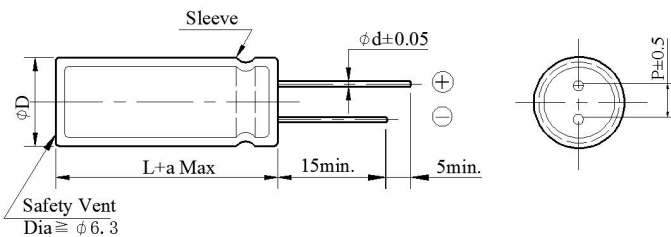
RJ Series

- Miniaturized, Low E.S.R and Low impedance.
- Suitable for use in high ripple current capability..
- Load life 8,000~10,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics								
Category Temperature Range	-40~ +105℃								
Working Voltage Range	6.3 ~ 100Vdc								
Capacitance Range	6.8 ~18,000μF								
Capacitance Tolerance	±20% (at 20℃ and 120Hz)								
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	The above values should be increased by 0.02 for every additional 1000μF								
Leakage Current	I≤0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) The rated voltage is impressed for 2 minutes.								
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z(-25℃)/Z(+25℃)	3	2	2	2	2	2	2	2
	Z(-40℃)/Z(+25℃)	4	3	3	3	3	3	3	3
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 8,000~10,000 hours at 105℃.								
	Capacitance change		≒±25% of the initial value				Size		Life time (6.3~100WV)
	Dissipation factor(tan δ)		≒ 200% of the specified value						
	Leakage current		≒specified value						
							8 ~ 18 Φ	10,000	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.								
	Capacitance change		≒±25% of the initial value						
	Dissipation factor(tan δ)		≒ 200% of the specified value						
	Leakage current		≒ 200% of the specified value						
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4								

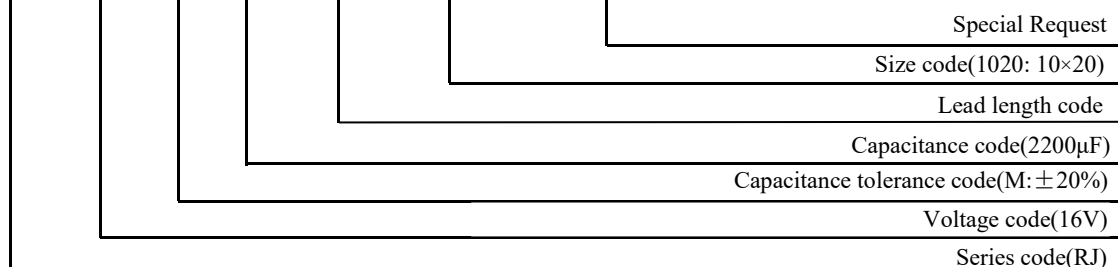
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	12.5	16	18
ΦD	ΦD±0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	<20 L±1.5Max ≥ 20 L±2.0Max						

◆ PART NUMBER SYSTEM(Example :16V 2200μF)

R J 0 1 6 M 2 2 2 L O 1 0 2 0



RJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max. Rated ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max. Rated ripple current @105°C/100kHz (mA rms)
6.3	100	5×11	0.900	165	10	100	5×11	0.580	215
	150	5×11	0.570	210		150	5×11	0.580	230
	220	6.3×11	0.250	320		220	6.3×11	0.220	340
	330	6.3×11	0.210	350		330	6.3×11	0.220	380
	470	8×11.5	0.150	410		470	8×11.5	0.130	640
	680	8×11.5	0.130	645		680	8×15	0.086	845
		10×12.5					10×12.5	0.080	865
	820	10×12.5	0.080	865		820	10×16	0.070	1015
	1000	8×15	0.085	870		1000	8×20	0.068	1050
							10×16	0.060	1215
	1200	8×20	0.069	1050		1200	10×20	0.045	1410
		10×16	0.062	1215					
	1500	10×20	0.045	1410		1500	10×25	0.041	1610
	1800						12.5×16	0.049	1450
		12.5×16	0.048	1460		1800	12.5×20	0.039	1710
	2200	10×20	0.042	1650		2200	10×30	0.030	1920
							12.5×20	0.035	1910
							16×16	0.042	1900
	2700	10×30	0.030	1910		2700	18×15	0.042	2220
		16×15	0.041	1945					
	3300	12.5×20	0.034	1950		3300	12.5×25	0.026	2250
	3900	12.5×25	0.026	2240		3900	12.5×30	0.023	2660
		18×15	0.042	2210			16×20	0.026	2540
	4700	12.5×30	0.023	2670		4700	12.5×35	0.020	2890
	5600	12.5×35	0.020	2890		5600	12.5×40	0.016	3360
							16×25	0.020	2940
		16×20	0.026	2540			18×20	0.025	2870
	6800	12.5×40	0.016	3350		6800	16×31.5	0.016	3460
		16×25	0.020	2940					
		18×20	0.025	2870			18×25	0.018	3150
	8200	16×31.5	0.016	3460		8200	16×35.5	0.015	3610
							18×31.5	0.015	4180
	10000	16×35.5	0.014	3620		10000	16×40	0.013	4090
		18×25	0.018	3150			18×35.5	0.012	4150
	12000	16×40	0.012	4090		12000	18×40	0.011	4290
		18×31.5	0.014	4180					
	15000	18×35.5	0.013	4230		15000			
	18000	18×40	0.012	4290		18000			

RJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100kHz

WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
16	10	5×11	1.100	96	25	10	5×11	1.100	100
	22	5×11	0.750	120		22	5×11	0.700	140
	47	5×11	0.600	180		47	5×11	0.570	205
	56	5×11	0.570	220		56	5×11	0.570	240
	100	5×11	0.350	260		100	6.3×11	0.210	360
		6.3×11	0.210	310					
	120	6.3×11	0.210	340					
	220	6.3×11	0.150	450		220	8×11.5	0.120	650
		8×11.5	0.190	650					
	330	8×11.5	0.120	760		330	8×15	0.087	850
							10×12.5	0.081	870
	470	8×15	0.086	850		470	8×20	0.070	1050
		10×12.5	0.080	865			10×16	0.060	1210
	680	8×20	0.069	1060		680	10×20	0.045	1410
		10×16	0.060	1210			12.5×16	0.049	1460
	820	10×20	0.052	1310		820	10×25	0.041	1660
	1000	10×20	0.045	1410		1000	10×30	0.030	1920
		12.5×16	0.050	1450			12.5×20	0.034	1910
							16×16	0.042	1940
	1200	10×25	0.043	1650		1200	18×15	0.043	2220
	1500	10×30	0.030	1920		1500	12.5×25	0.026	2240
		12.5×20	0.035	1910					
		16×16	0.042	1940					
	1800	12.5×25	0.028	2140		1800	12.5×30	0.024	2660
							16×20	0.026	2540
	2200	12.5×25	0.026	2240		2200	12.5×35	0.020	2890
		18×15	0.042	2220			18×20	0.025	2870
	2700	12.5×30	0.023	2650		2700	12.5×40	0.016	3360
		16×20	0.026	2540			16×25	0.021	2940
	3300	12.5×35	0.020	2890		3300	16×30	0.016	3460
							18×25	0.018	3150
	3900	12.5×40	0.016	3350		3900	16×35.5	0.014	3620
		16×25	0.021	2930			18×31.5	0.015	4180
		16×20	0.025	2860		4700	16×40	0.012	4090
	4700	16×31.5	0.016	3450			18×35.5	0.013	4230
		18×25	0.018	3150		5600	18×40	0.011	4290
	5600	16×35.5	0.015	3620					
		18×31.5	0.015	4180					
	6800	16×40	0.012	4080					
	8200	18×35.5	0.014	4230					
	18000	18×40	0.011	4290					

RJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100kHz

WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz) 25°C	Max.Rated Ripple current @105°C/100kHz (mA rms)
35	10				50	10	5×11	1.300	135
	22					22	5×11	0.700	190
	33	5×11	0.560	220		33	6.3×11	0.600	225
	47	6.3×11	0.350	280		47	6.3×11	0.380	380
	56	6.3×11	0.210	340		56	8×11.5	0.300	460
	100	8×11.5	0.150	510		100	8×11.5	0.160	560
	150	8×11.5	0.130	650		150	8×15	0.120	740
	220	8×15	0.086	850		220	10×16	0.083	1060
	330	10×16	0.060	1210		330	10×25	0.053	1460
	470	10×20	0.045	1410		470	12.5×20	0.044	1670
	560	10×25	0.041	1670		560	12.5×25	0.033	1960
	680	10×30	0.030	1920		680	12.5×30	0.030	2320
	820	12.5×25	0.029	2050		820	12.5×35	0.023	2530
	1000	12.5×25	0.028	2250		1000	16×25	0.025	2565
	1200	12.5×30	0.023	2660		1200	16×31.5	0.021	3020
	1500	12.5×35	0.020	2890		1500	16×35.5	0.018	3160
	2200	16×31.5	0.016	3470		2200	18×35.5	0.017	3690
	2700	18×35.5	0.015	3620		2700	18×40	0.014	3810
63	3300	16×40	0.013	4090	100				
	3900	18×40	0.012	4290					
	6.8					6.8	5×11	2.200	56
	15	5×11	2.200	56		15	6.3×11	1.200	120
	33	6.3×11	1.200	120		33	8×15	0.580	160
	47	8×11.5	0.680	190		47	10×12.5	0.430	290
	68	8×11.5	0.600	255		68	10×16	0.300	350
	100	10×16	0.350	320		100	10×25	0.200	535
	120	10×16	0.300	355		120	10×30	0.150	665
	180	10×20	0.200	470		180	12.5×25	0.120	790
	220	10×25	0.200	535		220	12.5×30	0.100	905
	330	12.5×25	0.120	790		330	12.5×40	0.070	1190
	470	12.5×30	0.100	910		470	16×35.5	0.045	1790
	560	12.5×35	0.082	1050		560	16×40	0.040	2030
	680	12.5×40	0.070	1190		680	18×35.5	0.040	2100
	820	16×31.5	0.053	1580		820	18×40	0.036	2340
	1000	18×35.5	0.045	1790					
	1200	16×40	0.040	2020					
	1500	18×40	0.035	2340					

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
6.3 ~ 100	6.8 ~ 68	0.30	0.55	0.80	1.00
	82 ~ 220	0.40	0.60	0.85	1.00
	330 ~ 820	0.50	0.65	0.90	1.00
	1000 ~ 18000	0.60	0.70	0.95	1.00

- Miniaturized, Low impedance.
- Suitable for use in high ripple current capability.
- Load life 10,000~12,000 hours at 105°C.

Item	Performance Characteristics								
Category Temperature Range	-40~ +105℃								
Working Voltage Range	10~ 100Vdc								
Capacitance Range	22~2700μF								
Capacitance Tolerance	±20% (at 20℃ and 120Hz)								
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	The above values should be increased by 0.02 for every additional 1000μF								
Leakage Current	I≤0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) The rated voltage is impressed for 2 minutes.								
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z(-25℃)/Z(+25℃)	4	3	3	3	3	3	3	3
	Z(-40℃)/Z(+25℃)	8	6	4	4	4	4	4	4
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 10,000~12,000 hours at 105℃.								
	Capacitance change	≒ ±25% of the initial value						Size	Life time (hours)
	Dissipation factor(tan δ)	≒ 300% of the specified value						6.3Φ	1,000
	Leakage current	≒ specified value						≧ 8 Φ	12,000
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.								
	Capacitance change	≒ ±25% of the initial value							
	Dissipation factor(tan δ)	≒ 300% of the specified value							
	Leakage current	≒ 200% of the specified value							
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4								

Sleeve

ϕD

$\phi d \pm 0.05$

$L+a \text{ Max}$

15mm.

5mm.

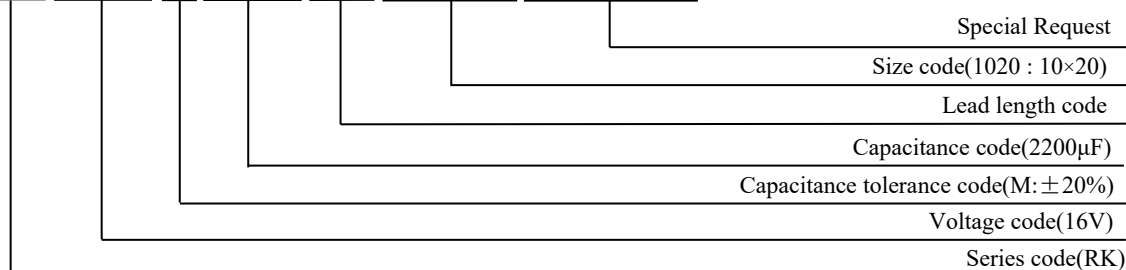
Safety Vent

Dia $\phi 6.3$

$P \pm 0.5$

ΦD	5	6.3	8	10	12.5	16	18
ΦD	ΦD ± 0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

R	K	0	1	6	M	2	2	2	L	O	1	0	2	0				
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RK Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz.

WV(V)	Nominal capacitance (uF)	Case size ΦD×L (mm)	Max. Rated ripple current @105°C/100kHz (mA rms)
10	100	6.3x11	130
	220	6.3x11	210
	330	8x12	330
16	68	6.3x11	47
	100	6.3x11	100
	220	8x12	220
	2200	13x20	2300
	2700	12.5x25	2480
25	100	6.3x11	210
	150	6.3*12	270
35	47	6.3x11	210
	100	8x11.5	330
	1000	13x20	1060
50	33	6.3x11	190
	47	6.3x11	190
	100	8x12	270
	680	13x20	1725
63	22	6.3x11	170
	33	6.3x11	170
	47	8x12	240
	330	13x20	1437
	470	13x25	1900
	680	13x25	2200
80	270	13x20	1750
	470	16x25	1300
	470	18x20	1300
100	22	8x12	230
	150	10x25	900
	390	16x25	1370

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
10~ 100	6.8 ~ 68	0.30	0.55	0.80	1.00
	82 ~ 220	0.40	0.60	0.85	1.00
	330 ~ 2700	0.50	0.65	0.90	1.00

- **High-temperature 115°C, High reliability.**
- **Load life 2,000 hours at 115°C.**

[illegible]

Sleeve

ϕD

$L+a$ Max

$\phi d \pm 0.05$

15min.

5min.

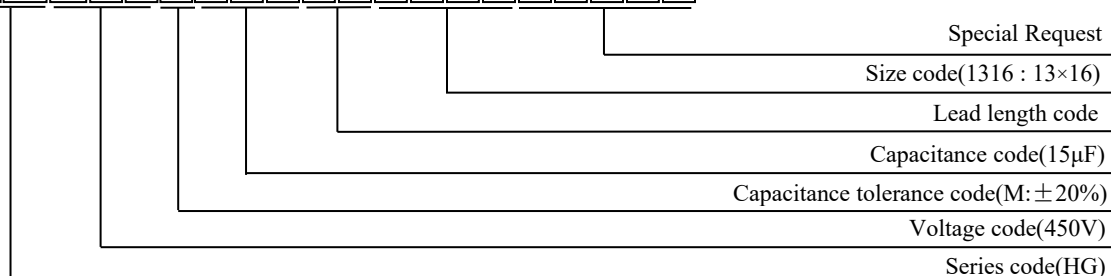
Safety Vent

Dia $\phi 6.3$

$P \pm 0.5$

ΦD	5	6.3	8	10	12.5	16	18
ΦD	ΦD ±0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

H	G	4	5	0	M	1	5	0	L	O	1	3	1	6				
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HG Series

◆ Case size & Permissible rated ripple current: (mA rms) at 115°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @115°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @115°C /120Hz (mA rms)
10	22			16	22		
	33				33	6.3×11	70
	47	6.3×11	80		47	6.3×11	82
	100	6.3×11	105		100	8×11.5	146
	220	8×11.5	230		220	10×12.5	300
	330	10×12.5	310		330	10×12.5	385
	470	10×12.5	420		470	10×16	520
	1000	10×20	760		1000	12.5×20	800
25	22	6.3×11	70	35	22	8×11.5	78
	33	8×11.5	90		33	8×11.5	105
	47	8×11.5	110		47	8×11.5	148
	100	8×11.5	220		100	10×12.5	252
	220	10×12.5	450		220	10×16	530
	330	10×16	620		330	10×20	710
	470	10×20	800		470	12.5×20	890
	1000	12.5×25	900		1000	16×25	1100
50	4.7			100	4.7	8×11.5	72
	10				10	8×11.5	120
	22	8×11.5	150		22	10×12.5	200
	33	8×11.5	182		33	10×12.5	225
	47	8×15	205		47	10×16	330
	100	10×16	442		100	12.5×20	550
	220	10×20	690		220	16×25	763
	330	10×25	885		330	16×30	950
	470	12.5×25	1120				
	1000	16×30	1405				
160	10			200	10	10×20	86
	22	10×20	120		22	10×25	138
	33	10×25	160		33	12.5×20	172
	47	12.5×20	195		47	12.5×25	224
	68	12.5×25	255		68	16×20	275
	100	16×25	345		100	16×25	360
	150	16×30	450		150		
250	10	10×20	90	350	4.7	10×20	58
	22	12.5×20	140		10	10×25	94
	33	12.5×25	188		22	12.5×25	152
	47	16×25	250		33	16×25	208
	68	16×30	320		47	16×30	265
	100						
	150						
400	4.7	10×20	60	450	4.7	10×25	70
	10	10×25	100		10	12.5×20	103
	22	12.5×30	163		22	16×25	185
	33	16×25	217		33	16×30	245
	47	16×30	280		47		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)				
		50/60	120	1K	10K	100K
10 ~ 100	<100	0.75	1.00	1.57	1.83	2.00
	100 ~ 470	0.80	1.00	1.34	1.43	1.50
	>470	0.85	1.00	1.10	1.12	1.15
160 ~ 450	4.7~33	0.75	1.00	1.50	1.75	1.80
	47~150	0.80	1.00	1.30	1.40	1.50

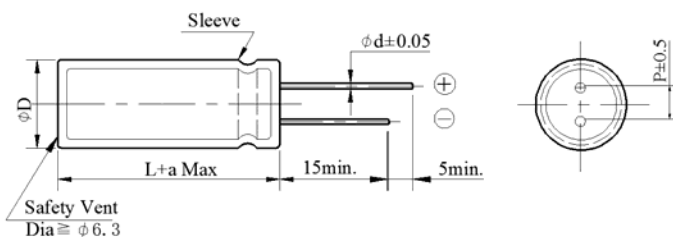
HE Series

- High-temperature 125°C, High reliability.
- Load life 2,000~ 5,000 hours at 125°C.

◆ SPECIFICATIONS

Item	Performance Characteristics										
Category Temperature Range	-40~ +125℃						-25~ +125℃				
Working Voltage Range	10~400Vdc						450Vdc				
Capacitance Range	2.2~4700 μF						1~100 μF				
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	
	tan δ (Ma×)	0.20	0.16	0.14	0.12	0.10	0.10	0.09	0.20	0.24	
	the above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3μA whichever is greater(10 to 100Vdc) I≤0.02CV+10(160 to 450Vdc) I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes										
Low Temperature Characteristics Impedance Ratio(MA×)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	(at 120Hz)
	Z(-25℃)/Z(+25℃)	3	3	3	5	5	2	2	6	6	
	Z(-40℃)/Z(+20℃)	6	6	6	6	6	3	3	10	18	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for2,000~5,000 hours at 125℃.										
	Capacitance change		≒ ±25% of the initial value					Size		Life time (hours)	
	Dissipation factor(tan δ)		≒ 200% of the specified value					≒ 6.3Φ		2,000	
	Leakage current		≒ specified value					8 Φ		3,000	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 125℃ without voltage applied. After test : UR to be applied for 30 minutes, 24 to 48 hours before measurement.										
	Capacitance change		≒ ±25% of the initial value					≒ 10 Φ		5,000	
	Dissipation factor(tan δ)		≒ 200% of the specified value								
	Leakage current		≒ 200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

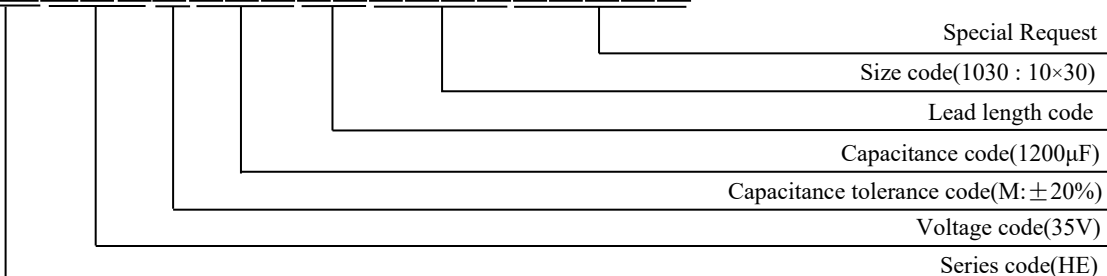
◆ DIMENSIONS(mm)



	5	6.3	8	10	12.5	16	18
ΦD	ΦD ± 0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

◆ PART NUMBER SYSTEM(Example :35V 1200 μ F)

H E 0 3 5 M 1 2 2 L O 1 0 3 0



HE Series

◆ Case size & Permissible rated ripple current: (mA rms) at 125°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)
10	22			16	22		
	33				33	6.3×11	90
	47	6.3×11	90		47	6.3×11	100
	100	6.3×11	130		100	6.3×11	155
	220	8×11.5	242		220	8×11.5	348
	330	10×12.5	335		330	10×12.5	405
	470	10×16	440		470	10×16	550
	1000	10×20	800		1000	10×20	900
	1500	13×20	1021		1500	12.5×20	861
	2200	13×25	1152		2200	13×20	1240
	3300	16×25	1620		3300	13×25	1998
	4700	16×31.5	2012		4700	16×31.5	2112
25	22	6.3×11	100	35	22	8×11.5	130
	33	8×11.5	115		33	8×11.5	155
	47	8×11.5	130		47	8×11.5	170
	100	8×11.5	250		100	10×12.5	272
	220	10×12.5	472		220	10×16	565
	330	10×16	690		330	10×20	733
	470	10×20	875		470	12.5×20	895
	1000	13×20	1050		1000	16×25	1137
	1500	16×25	1333		1500	16×31.5	1711
	2200	16×31.5	1603		1500	16×35.5	1849
	3300	16×35.5	2106		2200	18×35.5	2100
50	22	8×11.5	185	63	22		
	33	8×11.5	210		33	8×11.5	120
	47	8×15	245		47	10×12.5	190
	100	10×16	480		100	10×16	270
	220	10×20	810		220	13×20	572
	330	10×25	1085		330	13×25	772
	470	12.5×25	1210		470	16×25	1031
	1000	16×30	1470		1000	16×31.5	1309
	2200	18×40	2255		1500	18×40	2000
100	3.3			160	3.3	6.3×11	26
	4.7				4.7	8×11.5	34
	5.6				5.6	8×11.5	40
	6.8	8×11.5	48		6.8	8×11.5	44
	10	8×11.5	72		10	8×16	58
	22	8×11.5	105		22	10×16	124
	33	10×12.5	151		33	10×20	162
	47	10×16	200		47	13×20	207
	68				68	13×25	263
	100	10×20	383		100	16×25	369
	220	12.5×20	695		220	16×31.5	723
	330	16×31.5	923		330		
	470	18×31.5	1111		470		

HE Series

◆ Case size & Permissible rated ripple current: (mA rms) at 125°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)
200	2.2			250	2.2		
	3.3	6.3×11	28		3.3	6.3×11	30
	4.7	8×11.5	34		4.7	8×11.5	44
	5.6	8×16	48		5.6	8×11.5	44
	6.8	8×16	54		6.8	8×16	54
	8.2	8×20	72		8.2	8×16	66
	10	8×20	124		10	8×16	72
	15	10×20	162		15	8×20	88
	22	13×20	207		22	10×16	120
	33	16×20	263		33	13×20	203
					47	13×20	214
					68	13×30	288
					100	13×35	320
					150	16×35.5	461
350	2.2	6.3×11	24	400	2.2	8×16	40
	3.3	8×11.5	34		3.3	8×20	50
	4.7	8×11.5	44		4.7	10×16	50
	5.6	8×16	50		5.6	10×20	60
	6.8	8×20	60		6.8	10×20	66
	8.2	8×20	68		8.2	10×20	76
	10	10×20	78		10	10×25	86
	15	10×20	100		15	13×20	104
	22	13×20	124		22	13×25	138
	33	16×20	203		33	16×25	207
	47	16×20	243		47	18×25	261
	68	18×25	290		68	18×31.5	297
	100	18×31.5	383		100	18×40	396
450	1	8×11.5	26				
	2.2	8×16	38				
	3.3	8×16	40				
	4.7	8×20	50				
	5.6	10×16	54				
	6.8	10×20	66				
	8.2	10×20	76				
	10	10×25	86				
	10	13×20	86				
	15	13×20	104				
	22	10×40	140				
	22	16×20	138				
	22	16×25	154				
	33	10×50	203				
	33	16×25	218				
	33	16×31.5	245				
	47	13×45	254				
	47	16×35.5	270				
	68	18×31.5	297				
	100	18×40	396				

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		50/60	120	1K	≥10K
10 ~ 100	<100	0.65	1.00	1.57	2.00
	100 ~ 470	0.60	1.00	1.34	1.50
	>470	0.55	1.00	1.10	1.15
16 ~ 450	<33	0.60	1.00	1.15	1.30
	>33	0.55	1.00	1.10	1.15

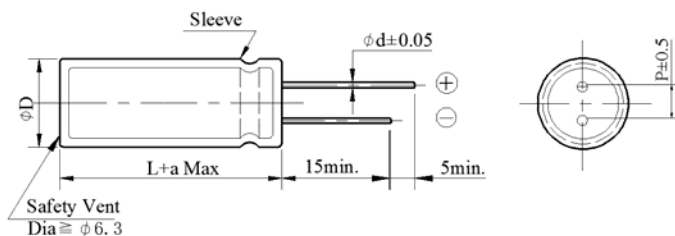
HH Series

- High-temperature 130°C, high reliability.
- Load life 1,000~4,000 hours at 130°C.
- For automotive electronics and lighting equipment and other high temperature applications.

◆ SPECIFICATIONS

Item	Performance Characteristics										
Category Temperature Range	-40~ +130℃						-25~ +130℃				
Working Voltage Range	10~100Vdc						200 ~450Vdc				
Capacitance Range	4.7~4,700 μF						3.3~100 μF				
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	
	tan δ (Max)	0.20	0.16	0.14	0.12	0.10	0.10	0.09	0.20	0.24	
	The above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3μA whichever is greater (10 ~ 100V) I≤0.02CV+10μA (160 ~ 450V) I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes										
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	(at 120Hz)
	Z(-25℃)/Z(+25℃)	3	2	2	2	2	2	2	3	6	
	Z(-40℃)/Z(+20℃)	6	4	4	4	4	4	4	6	10	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 1,000~4,000 hours at 130℃.										
	Capacitance change		≒ ±25% of the initial value					Case Size	Life time (hours)		
	Dissipation factor(tan δ)		≒ 200% of the specified value						10~100V	200~450V	
	Leakage current		≒ specified value						≒ 6.3Φ	—	1,000
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 130℃ without voltage applied. After test : UR to be applied for 30 minutes, 24 to 48 hours before measurement.										
	Capacitance change		≒ ±25% of the initial value					ΦD ≧ 12.5	4,000		3,000
	Dissipation factor(tan δ)		≒ 200% of the specified value						2,000		
	Leakage current		≒ 200% of the specified value						2,000		
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

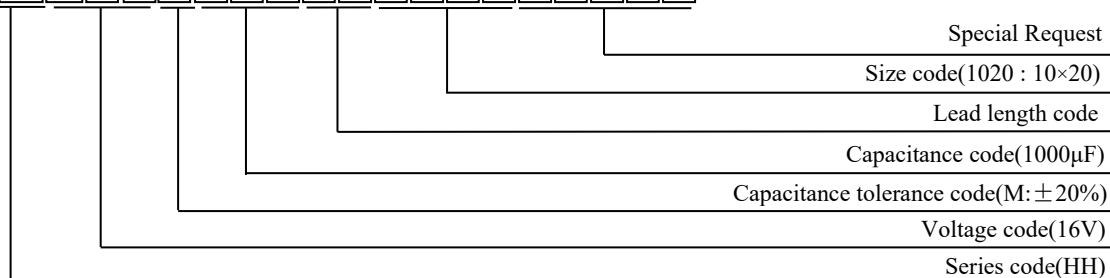
◆ DIMENSIONS(mm)



ΦD	5	6.3	8	10	12.5	16	18
ΦD	$\Phi D \pm 0.5$ Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5$ Max $\geq 20 L \pm 2.0$ Max						

◆ PART NUMBER SYSTEM(Example : 16V 1000 μ F)

HH 016 M 102 L O 102 0



HH Series

◆ Case size & Permissible rated ripple current: (mA rms) at 130°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @130°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @130°C/100kHz (mA rms)
10	220			16	220		
	330	8×11.5	360		330	8×11.5	360
	470	10×12.5	620		470	10×12.5	620
	1000	10×20	960		1000	10×20	960
	2200	12.5×25	1430		2200	12.5×25	1430
	3300	16×25	1900		3300	16×31.5	2300
	4700	16×31.5	2300		4700	16×35.5	2550
25	220	8×11.5	360	35	100	8×11.5	360
	330	10×12.5	620		220	10×12.5	620
	470	10×16	800		330	10×16	800
	1000	12.5×20	1100		470	10×25	960
	2200	16×31.5	2300		1000	12.5×30	1430
	3300	16×35.5	2550		1500	16×31.5	1800
					2200	16×35.5	2550
50	4.7	8×11.5	100	63	4.7		
	10	8×11.5	200		10		
	22	8×11.5	260		22		
	33	8×11.5	300		33	8×11.5	250
	47	8×11.5	300		47	10×12.5	400
	100	10×12.5	520		100	10×16	450
	220	10×20	890		220	12.5×25	820
	330	12.5×20	1000		330	12.5×30	1000
	470	12.5×25	1200		470	16×25	1500
	1000	16×31.5	2180		1000	18×35.5	1850
	1500	18×35.5	2450		1500	18×40	2350
	2200	18×40	2800		2200		
	3300				3300		
100	4.7			200	4.7	6.3×11	100
	5.6				5.6	8×11.5	130
	6.8				6.8	8×11.5	130
	10	8×16	200		10	8×16	200
	15	8×16	210		15	8×16	220
	22	8×16	220		22	8×20	300
	33	10×12.5	260		33	10×20	320
	47	10×16	330		47	10×25	345
	56	10×20	350		56	10×30	370
	68	10×25	400		68	12.5×25	450
	82	10×30	435		82	12.5×30	485
	100	12.5×25	670		100	16×25	600
	220	16×25	1100		220		
	330	16×31.5	1300		330		
	470	18×30	1650		470		

HH Series

◆ Case size & Permissible rated ripple current: (mA rms) at 130°C / 100KHz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @130°C/100kHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @130°C/100kHz (mA rms)
250	3.3			400	3.3	8×16	110
	4.7	8×11.5	115		4.7	8×20	120
	5.6	8×11.5	140		5.6	10×16	130
	6.8	8×11.5	140		6.8	10×20	150
	10	8×16	220		10	10×25	220
	15	8×20	245		15	10×30	240
	22	10×16	320		22	12.5×20	270
	33	10×25	350		33	12.5×25	305
	47	12.5×20	375		47	16×25	400
	56	12.5×25	400		56	16×31.5	435
	68	16×20	480		68	16×35.5	480
	82	16×25	505		82		
420	3.3	8×16	120	450	3.3	8×20	135
	4.7	8×20	130		4.7	10×12.5	150
	5.6	10×16	140		5.6	10×16	160
	6.8	10×20	155		6.8	10×20	170
	10	10×25	240		10	12.5×20	260
	15	10×30	255		15	12.5×25	300
	22	12.5×25	300		22	16×20	345
	33	12.5×30	340				
	47	16×31.5	445				

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)				
		50/60	120	1K	10K	100K
10 ~ 100	<100	0.40	0.60	0.85	0.95	1.00
	100 ~ 470	0.50	0.65	0.90	0.98	1.00
	>470	0.60	0.70	0.95	1.00	1.00
160 ~ 450	3.3~15	/	0.30	0.60	0.90	1.00
	22~100	/	0.50	0.80	0.90	1.00

- **High-temperature 135℃, high reliability.**
- **Load life 2,000~3,000 hours at 135℃.**
- **For automotive electronics and lighting equipment and other high temperature applications.**

[illegible]

Sleeve

ϕD

$L+a$ Max

$\phi d \pm 0.05$

15min.

5min.

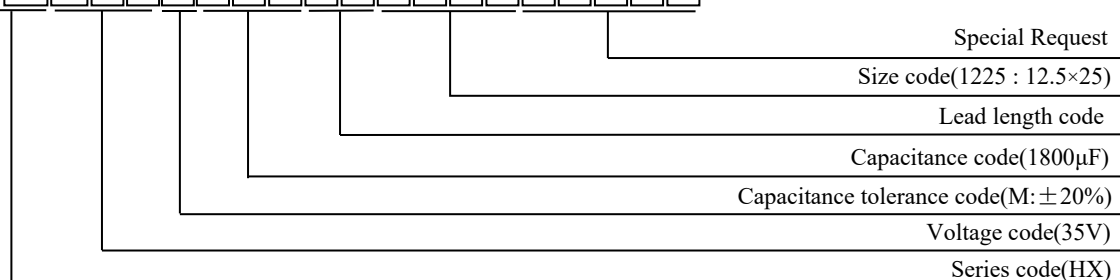
Safety Vent

Dia $\geq \phi 6.3$

$P \pm 0.5$

ΦD	6.3	8	10	12.5	16
ΦD	ΦD ± 0.5 Max				
Φd	0.5	0.5/0.6	0.6	0.6	0.8
F	2.5	3.5	5.0	5.0	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$				

H	X	0	3	5	M	1	8	2	L	O	1	2	2	5				
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HX Series

- Case size & Permissible rated ripple current: (mA rms) at 135°C / 100KHz.

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @135°C/100KHz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @135°C/100KHz (mA rms)
10	22			16	22		
	33				33	6.3×11	155
	47	6.3×11	180		47	6.3×11	190
	100	6.3×11	420		100	8×11.5	455
	220	8×11.5	500		220	10×12.5	590
	330	10×12.5	580		330	10×12.5	600
	470	10×12.5	620		470	10×16	755
	1000	10×20	900		1000	12.5×20	1010
25	22	6.3×11	135	35	22	8×11.5	170
	33	8×11.5	175		33	8×11.5	185
	47	8×11.5	225		47	8×11.5	240
	100	8×11.5	480		100	10×12.5	490
	220	10×12.5	600		220	10×16	770
	330	10×16	745		330	10×20	880
	470	10×20	900		470	12.5×20	1020
	1000	10×25	1290		1000	12.5×25	1450
	1800	12.5×25	1450		1800	16x20	1880
	2200	12.5×25	1560		2200	16x25	2210
	3900	16×30	1780		3900		
50	22	8×11.5	185				
	33	8×11.5	210				
	47	10×12.5	280				
	100	10×16	490				
	220	10×20	820				
	330	12.5×20	900				
	470	12.5×25	1095				
	1000	16×20	1480				
	1800	16x25	1900				
	2200	16x31.5	2280				
	3900						

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
10 ~ 50	<100	0.40	0.75	0.90	1.00
	100 ~ 470	0.50	0.85	0.94	1.00
	>470	0.60	0.87	0.95	1.00

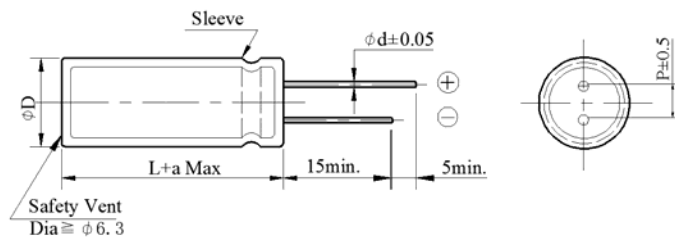
PW Series

- Downsize and high ripple.
- Load life 2,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics								
Category Temperature Range	-40~ +105℃(160~400V.DC) -25~ +105℃(550V.DC)								
Working Voltage Range	160~550Vdc								
Capacitance Range	10~470 μF								
Capacitance Tolerance	±20% (at 20℃ and 120Hz)								
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160 ~350	400 ~ 550						
	tan δ (Max)	0.15	0.20						
	The above values should be increased by 0.02 for every additional 1000μF								
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes								
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160 ~ 250	350	400	420	475	500	550	(at 120Hz)
	Z(-25℃)/Z(+20℃)	3	5	5	6	6	6	6	
	Z(-40℃)/Z(+20℃)	6	6	6	6	6	8	8	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.								
	Capacitance change		≒ ±20% of the initial value						
	Dissipation factor(tan δ)		≒ 200% of the specified value						
	Leakage current		≒ specified value						
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.								
	Capacitance change		≒ ±20% of the initial value						
	Dissipation factor(tan δ)		≒ 200% of the specified value						
	Leakage current		≒ 200% of the specified value						
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4								

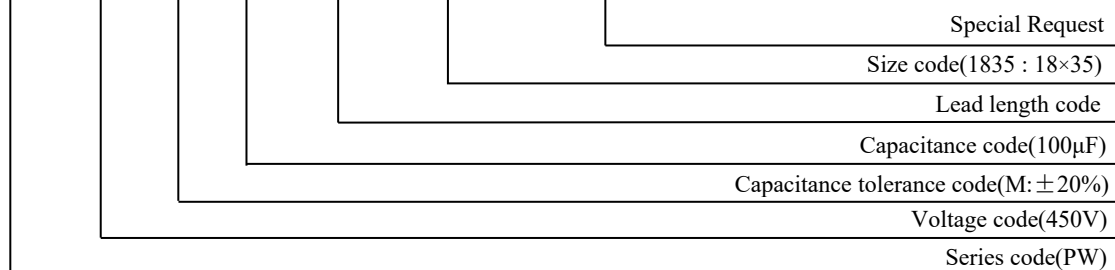
◆ DIMENSIONS(mm)



ΦD	10	12.5	16	18
ΦD	ΦD ± 0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

◆ PART NUMBER SYSTEM(Example : 450V 100μF)

P	W	4	5	0	M	1	0	1	L	0	1	8	3	5					
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PW Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	33			200	33	10×16	440
	47	10×16	490		47	10×20	510
	56	10×20	540		56	10×25	560
	68	10×25	600		68	10×30	610
	82	10×30	640		82	12.5×20	660
	100	12.5×20	770		100	12.5×25	790
	120	12.5×25	840		120	12.5×30	860
	150	16×20	960		150	16×25	980
	180	16×25	1030		180	16×31.5	1050
	220	16×31.5	1120		220	18×25	1140
	330	16×35.5	1180		330	18×31.5	1230
	390	18×31.5	1230		390	18×35.5	1300
	470	18×35.5	1300		470	18×40	1370
	560	18×40	1370		560	18×45	1430
250	33	10×20	460	400	33		
	47	10×25	530		47		
	56	10×30	580		56	12.5×30	530
	68	12.5×20	630		68	16×25	560
	82	12.5×25	680		82	16×31.5	600
	100	16×20	810		100	16×35.5	630
	120	16×25	880		120	18×31.5	700
	150	16×31.5	1000		150	18×35.5	880
	180	18×25	1080		180	18×40	1030
	220	18×31.5	1180		220		
	330	18×35.5	1280		330		
	390	18×40	1370		390		
	470	18×45	1430		470		
	560				560		
420	39			450	39		
	47	16×20	430		47	16×25	480
	56	16×25	480		56	16×31.5	540
	68	16×31.5	530		68	16×35.5	600
	82	16×35.5	560		82	18×31.5	660
	100	18×31.5	600		100	18×35.5	710
	120	18×35.5	660		120	18×40	800
	150	18×40	760		150	18×45	960
	180	18×45	810		180		
475	33			500	33	16×25	500
	39	16×25	480		39	16×31.5	540
	47	16×31.5	510		47	18×25	600
	56	18×25	580		56	18×31.5	650
	68	18×31.5	630		68	18×35.5	735
	82	18×35.5	700		82	18×40	790
	100	18×40	760		100	18×45	870
	120	18×45	850		120	18×50	1040
	150	18×50	1010		150		
	180				180		

PW Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
550	10	12.5×20	305
	15	12.5×25	340
	22	12.5×35	380
	33	16×30	470
	47	18×31.5	560
	56	16×40	670
	68	18×35.5	776
	82	18×45	805
	100	18×50	885

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Frequency (Hz)				
	50	120	1K	10K	100K
160 ~ 550	0.80	1.00	1.30	1.40	1.50

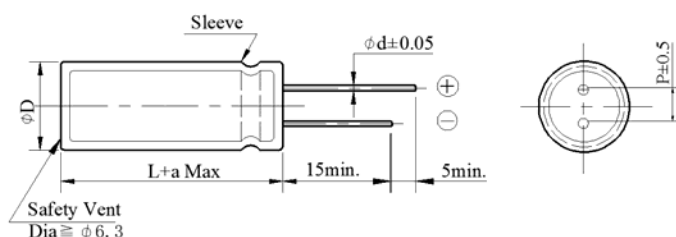
PV Series

- Downsize and high ripple.
- Load life 5,000 hours at 105°C.

◆ SPECIFICATIONS

Item	Performance Characteristics						
Category Temperature Range	-40~ +105℃ (160~400V.DC) -25~ +105℃ (500V.DC)						
Working Voltage Range	160~ 500Vdc						
Capacitance Range	33~560 μF						
Capacitance Tolerance	±20% (at 20℃ and 120Hz)						
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160	200	250	400	420	450
	tan δ (Max)	0.20	0.20	0.20	0.20	0.20	0.20
	The above values should be increased by 0.02 for every additional 1000μF						
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes						
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160~250	400	420 ~ 450	500	(at 120Hz)	
	Z(-25℃)/Z(+20℃)	3	5	6	6		
	Z(-40℃)/Z(+20℃)	6	6	6	8		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃						
	Capacitance change		≒ ±20% of the initial value				
	Dissipation factor(tan δ)		≒ 200% of the specified value				
	Leakage current		≒ specified value				
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.						
	Capacitance change		≒ ±20% of the initial value				
	Dissipation factor(tan δ)		≒ 200% of the specified value				
	Leakage current		≒ 200% of the specified value				
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4						

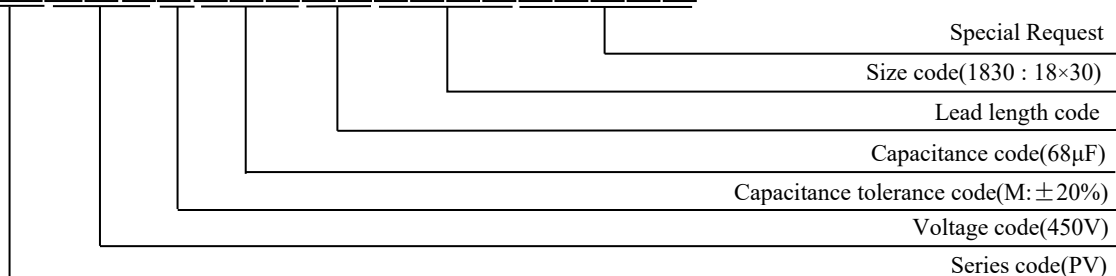
◆ DIMENSIONS(mm)



ΦD	10	12.5	16	18
ΦD	$\Phi D \pm 0.5$ Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5$ Max $\geq 20 L \pm 2.0$ Max			

◆ PART NUMBER SYSTEM(Example : 450V 68 μ F)

P	V	4	5	0	M	6	8	0	L	O	1	8	3	0						
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PV Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

Case size & Permissible Rated Ripple current (mA rms) at 105 °C / 120Hz																																		
WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)																											
160	33	10×16	440	200	33	10×20	460																											
	47	10×20	510		47	10×25	530																											
	56	10×25	560		56	10×30	580																											
	68	10×30	610		68	12.5×20	630																											
	82	12.5×20	660		82	12.5×25	680																											
	100	12.5×25	790		100	16×20	810																											
	120	12.5×30	860		120	16×25	880																											
	150	16×25	980		150	16×31.5	1000																											
	180	16×31.5	1050		180	18×25	1080																											
	220	18×25	1140		220	18×31.5	1180																											
	330	18×31.5	1230		330	18×35.5	1280																											
	390	18×35.5	1300		390	18×40	1370																											
	470	18×40	1370		470	18×45	1430																											
	560	18×45	1430		560	18×50	1500																											
250	33	10×25	480	400	33																													
	47	12.5×16	540		47	16×20	385																											
	56	12.5×20	600		56	16×25	470																											
	68	12.5×25	650		68	16×31.5	580																											
	82	16×20	700		82	16×35.5	630																											
	100	16×25	830		100	18×31.5	670																											
	120	18×20	900		120	18×35.5	740																											
	150	18×25	1020		150	18×40	930																											
	180	18×31.5	1110		180	18×45	1060																											
	220	18×35.5	1230		220																													
	330	18×40	1370		330																													
	390	18×45	1430		390																													
	470				470																													
	560				560																													
420	39	12.5×30	460	450	39	16×25	480																											
	47	16×25	530		47	16×31.5	500																											
	56	16×31.5	560		56	16×35.5	580																											
	68	18×25	600		68	18×31.5	630																											
	82	18×31.5	660		82	18×35.5	690																											
	100	18×35.5	710		100	18×40	750																											
	120	18×40	800		120	18×45	840																											
	150	18×45	980		150	18×50	1060																											
	180	18×50	1100		180																													
500	33	16×31.5	515	◆ RIPPLE CURRENT MULTIPLIERS Frequency Multipliers <table><tr><th rowspan="2">Vdc</th><th rowspan="2">Cap(uF)</th><th colspan="4">Frequency (Hz)</th></tr><tr><th>120</th><th>1K</th><th>10K</th><th>100K</th></tr><tr><td rowspan="2">160 ~ 450</td><td>33~82</td><td>1.00</td><td>1.75</td><td>2.25</td><td>2.50</td></tr><tr><td>100~</td><td>1.00</td><td>1.67</td><td>2.05</td><td>2.25</td></tr><tr><td>500</td><td>33~100</td><td>1.00</td><td>1.75</td><td>2.25</td><td>2.50</td></tr></table>				Vdc	Cap(uF)	Frequency (Hz)				120	1K	10K	100K	160 ~ 450	33~82	1.00	1.75	2.25	2.50	100~	1.00	1.67	2.05	2.25	500	33~100	1.00	1.75	2.25	2.50
	Vdc	Cap(uF)	Frequency (Hz)																															
			120					1K	10K	100K																								
	160 ~ 450	33~82	1.00					1.75	2.25	2.50																								
		100~	1.00					1.67	2.05	2.25																								
	500	33~100	1.00					1.75	2.25	2.50																								
	39	16×35.5	560																															
	47	18×31.5	620																															
	56	18×35.5	670																															
68	18×40	760																																
82	18×45	815																																
100	18×50	895																																
120																																		
150																																		

- **High stability, High ripple current capability.**
- **Load life 3,000 hours at 105°C.**

[illegible]

Sleeve

$\phi d \pm 0.05$

ϕD

$L+a \text{ Max}$

15min.

5min.

Safety Vent

Dia $\geq \phi 6.3$

$P \pm 0.5$

ΦD	5	6.3	8	10	13	16	18
ΦD	ΦD ± 0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

[illegible]

PL Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	2.2	6.3x12	32	200	2.2	6.3x12	32
	3.3	6.3x12	40		3.3	6.3x12	40
	4.7	6.3x12	47		4.7	8x12	47
	6.8	8x12	62		6.8	10x12	70
	10	8x12	75		10	10x12	80
	15	10x16	115		15	10x16	118
	22	10x20	140		22	10x20	140
	33	10x20	175		33	10x20	160
	47	12.5x20	240		47	12.5x20	250
	68	12.5x25	370		68	12.5x25	330
	100	16x25	430		100	16x25	440
	150	16x25	500		150	16x25	600
	220	16x30	815		220	18x30	680
	270	18x30	880		270	18x40	1040
	330	18x40	980				
250	2.2	6.3x12	37	350	2.2	8x12	40
	3.3	8x12	50		3.3	8x12	52
	4.7	8x12	58		4.7	10x12	65
	6.8	10x12	72		6.8	10x20	88
	10	10x16	100		10	10x20	105
	15	10x16	120		15	12.5x20	130
	22	10x20	168		22	12.5x20	182
	33	12.5x20	210		33	12.5x25	240
	47	12.5x25	320		47	16x25	305
	68	16x25	410		68	16x30	390
	100	16x30	530		100	18x30	480
	150	18x25	550				
	220	18x35	710				
400	2.2	8x12	40	450	1	8x12	35
	3.3	10x12	55		2.2	10x12	40
	4.7	10x16	76		3.3	10x16	65
	6.8	10x20	80		4.7	10x16	85
	10	12.5x20	110		6.8	10x20	90
	15	12.5x20	135		10	12.5x20	140
	22	12.5x25	205		15	16x20	160
	33	16x20	255		22	16x25	200
	47	16x25	330		33	16x25	320
	68	16x35	400		47	18x25	350
	82	18x30	420		68	18x30	440
	100	18x35	495		82	18x35	500
	120	18x40	520		100	18x40	560

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
160 ~ 450	1~47	1.00	1.50	1.75	1.85
	68~330	1.00	1.30	1.40	1.60

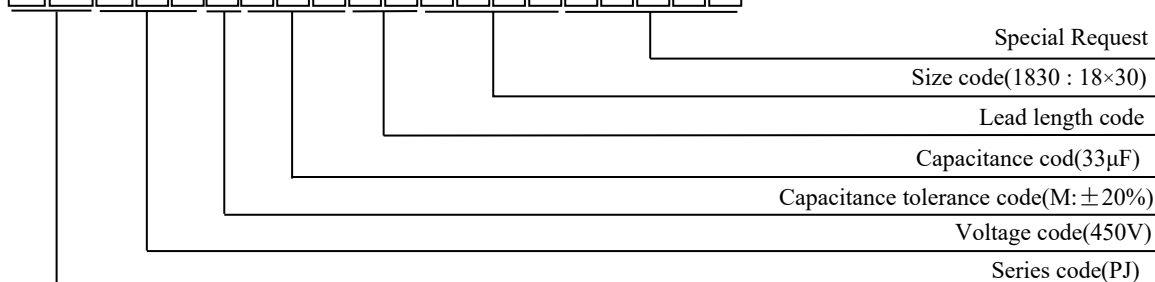
- **Load life: 8,000 to 10,000 hours at 105°C**
- **For electronic ballast circuits and long life.**
- **High ripple current**

Item	Performance Characteristics															
Category Temperature Range	-40~ +105℃ (160~400V.DC) -25~ +105℃ (500V.DC)															
Working Voltage Range	160 ~ 500Vdc															
Capacitance Range	10~ 560μF															
Capacitance Tolerance	±20% (at 20℃ and 120Hz)															
Dissipation Factor (tanδ) (at 20℃, 120Hz)	<table border="1"> <tr> <td>Rated Voltage (V)</td><td>160</td><td>200</td><td>250</td><td>400</td><td>450</td><td>500</td></tr> <tr> <td>tan δ(Max)</td><td>0.20</td><td>0.20</td><td>0.24</td><td>0.24</td><td>0.24</td><td>0.24</td></tr> </table>	Rated Voltage (V)	160	200	250	400	450	500	tan δ(Max)	0.20	0.20	0.24	0.24	0.24	0.24	
Rated Voltage (V)	160	200	250	400	450	500										
tan δ(Max)	0.20	0.20	0.24	0.24	0.24	0.24										
Leakage Current	$I \leq 0.02CV + 10\mu A$ I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes															
Low Temperature Characteristics Impedance Ratio(MAX)	<table border="1"> <tr> <td>Rated voltage (V)</td><td>160 ~ 250</td><td>400</td><td>420 ~ 450</td><td>500</td></tr> <tr> <td>Z(-25℃)/Z(+20℃)</td><td>3</td><td>5</td><td>6</td><td>6</td></tr> <tr> <td>Z(-40℃)/Z(+20℃)</td><td>6</td><td>6</td><td>8</td><td>8</td></tr> </table>	Rated voltage (V)	160 ~ 250	400	420 ~ 450	500	Z(-25℃)/Z(+20℃)	3	5	6	6	Z(-40℃)/Z(+20℃)	6	6	8	8
Rated voltage (V)	160 ~ 250	400	420 ~ 450	500												
Z(-25℃)/Z(+20℃)	3	5	6	6												
Z(-40℃)/Z(+20℃)	6	6	8	8												
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 10,000 (8,000 hours for Φ 10) hours at 105℃ <table border="1"> <tr> <td>Capacitance change</td><td>≒ ±20% of the initial value</td></tr> <tr> <td>Dissipation factor(tan δ)</td><td>≒ 200% of the specified value</td></tr> <tr> <td>Leakage current</td><td>≒ specified value</td></tr> </table>	Capacitance change	≒ ±20% of the initial value	Dissipation factor(tan δ)	≒ 200% of the specified value	Leakage current	≒ specified value									
Capacitance change	≒ ±20% of the initial value															
Dissipation factor(tan δ)	≒ 200% of the specified value															
Leakage current	≒ specified value															
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied. <table border="1"> <tr> <td>Capacitance change</td><td>≒ ±20% of the initial value</td></tr> <tr> <td>Dissipation factor(tan δ)</td><td>≒ 200% of the specified value</td></tr> <tr> <td>Leakage current</td><td>≒ 500% of the specified value</td></tr> </table>	Capacitance change	≒ ±20% of the initial value	Dissipation factor(tan δ)	≒ 200% of the specified value	Leakage current	≒ 500% of the specified value									
Capacitance change	≒ ±20% of the initial value															
Dissipation factor(tan δ)	≒ 200% of the specified value															
Leakage current	≒ 500% of the specified value															
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4															

Technical drawing of a sleeve assembly. The side view shows a sleeve with a diameter ϕD and a length $L+a$ Max. The sleeve is secured with a pin of diameter $\phi d \pm 0.05$. The pin is inserted through the sleeve and a base plate. The base plate has a thickness of 15mm. The sleeve has a safety vent with a diameter of $\phi 6.3$. The end view shows the sleeve with a thickness of 5mm and a pin diameter of $\phi 0.5$.

ΦD	10	12.5	16	18
ΦD	ΦD ± 0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

P	J	4	5	0	M	3	3	0	L	O	1	8	3	0							
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PJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	10			200	10		
	15				15		
	22				22		
	33	10×20	280		33		
	47	10×25	350		47	12.5×16	360
	56	12.5×16	400		56	12.5×20	420
	68	12.5×20	450		68	12.5×25	470
	82	12.5×25	500		82	16×20	520
	100	16×20	630		100	16×25	650
	120	16×25	700		120	18×20	720
	150	18×20	820		150	18×25	840
	180	18×25	900		180	18×31.5	930
	220	18×31.5	1000		220	18×35.5	1050
	330	18×35.5	1120		330	18×40	1190
	390	18×40	1190		390	18×45	1250
	470	18×45	1250		470	18×50	1320
	560	18×50	1320		560		
250	10	10×12.5	130	400	39	12.5×30	280
	15	10×16	170		47	16×25	320
	22	10×20	200		56	16×31.5	400
	33	12.5×16	320		68	18×25	430
	47	12.5×20	390		82	18×31.5	480
	56	12.5×25	460		100	18×35.5	550
	68	16×20	520		120	18×40	600
	82	16×25	560		150	18×45	820
	100	18×20	680	420	180	18×50	950
	120	18×25	750		39	16×25	300
	150	18×31.5	860		47	18×20	380
	180	18×35.5	950		56	18×25	420
	220	18×40	1130		68	18×31.5	460
	330	18×45	1250		82	18×35.5	510
	390	18×50	1320		100	18×40	580
					120	18×45	650
					150	18×50	850
450	39	18×20	320	500	33	18×25	350
	47	18×25	350		39	18×31.5	400
	56	18×31.5	450		47	18×35.5	460
	68	18×35.5	500		56	18×40	510
	82	18×40	540		68	18×45	600
	100	18×45	620		82	18×50	660
	120	18×50	700				

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)			
	120	1K	10K	100K
160 ~ 500	1.00	1.75	2.25	2.50

- Downsize and high ripple current.
- Load life: 10,000 to 12,000 hours at 105°C.
- For electronic ballast circuits and other long life applications.

Item	Performance Characteristics	
Category Temperature Range	-40~ +105℃(160~400V.DC) -25~ +105℃(450V.DC)	
Working Voltage Range	160~450Vdc	
Capacitance Range	6.8 ~560 μF	
Capacitance Tolerance	±20% (at 20℃ and 120Hz)	
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V) 160 ~ 250 350 ~ 450	
	tan δ (Max) 0.20 0.24	
	The above values should be increased by 0.02 for every additional 1000μF	
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes	
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V) 160~250 400 450	
	Z(-25℃)/Z(+20℃) 4 5 6	
	Z(-40℃)/Z(+20℃) 6 6 -	
	(at 120Hz)	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 12,000(10,000 hours for Φ 10)hours at 105℃.	
	Capacitance change	≒±20% of the initial value
	Dissipation factor(tan δ)	≒200% of the specified value
	Leakage current	≒specified value
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.	
	Capacitance change	≒±20% of the initial value
	Dissipation factor(tan δ)	≒200% of the specified value
	Leakage current	≒200% of the specified value
others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4	

Sleeve

$\phi d \pm 0.05$

ϕD

$L+a \text{ Max}$

15min.

5min.

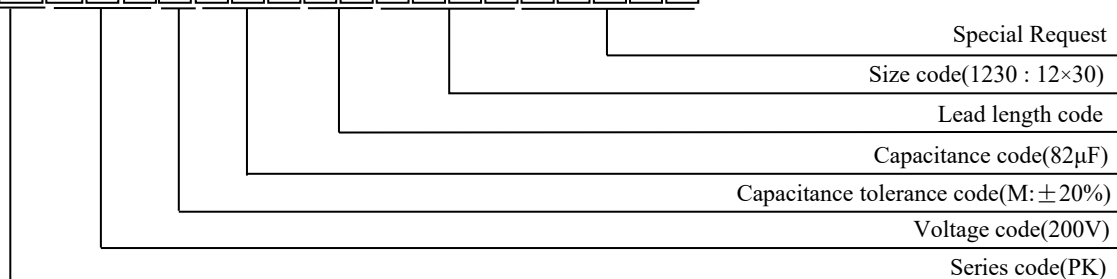
Safety Vent

Dia $\geq \phi 6.3$

$P \pm 0.5$

ΦD	10	12.5	16	18
ΦD	ΦD±0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

P	K	2	0	0	M	8	2	0	L	O	1	2	3	0				
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PK Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	10	10×16	150	200	10	10×16	150
	22	10×20	210		22	10×20	210
	33	10×20	265		33	10×20	270
	47	10×25	330		47	12.5×20	405
	68	12.5×20	485		68	12.5×25	475
	82	12.5×25	520		82	12.5×30	560
	100	12.5×30	625		100	16×20	640
		16×20	640				
	150	16×25	785		150	16×25	855
	220	16×30	1040		220	18×30	1055
	330	18×31.5	1400		330	18×35.5	1440
	470	18×40	1495		470	18×45	1530
560	18×45	1535	560	18×50	1575		
250	10	10×20	160	350	6.8	10×16	125
	22	10×20	215		10	10×20	150
	33	10×25	330		15	10×20	205
	47	12.5×25	405		22	12.5×20	270
	68	16×20	530		33	16×20	370
	82	16×25	565		47	16×25	450
	100	16×30	690		68	16×30	575
					82	18×25	630
	150	18×30	875		100	18×30	708
	220	18×35.5	1150		120	18×31.5	845
	330	18×45	1455		150	18×40	975
	400	6.8	10×16		125	450	6.8
10		10×20	150	10	12.5×20		190
15		12.5×20	235	15	12.5×25		255
22		12.5×25	275	22	12.5×30		308
33		16×20	370	33	16×25		400
					18×20		390
47		16×25	485	47	18×25		495
		18×20	460				
68		18×25	600	68	18×31.5		640
82		18×30	630	82	18×35.5		730
100		18×31.5	770	100	18×40		835
120		18×35.5	875	120	18×50		920
150	18×45	990	150				

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)			
	120	1K	10K	100K
<100	1.00	1.75	2.25	2.50
≥100	1.00	1.67	2.05	2.25

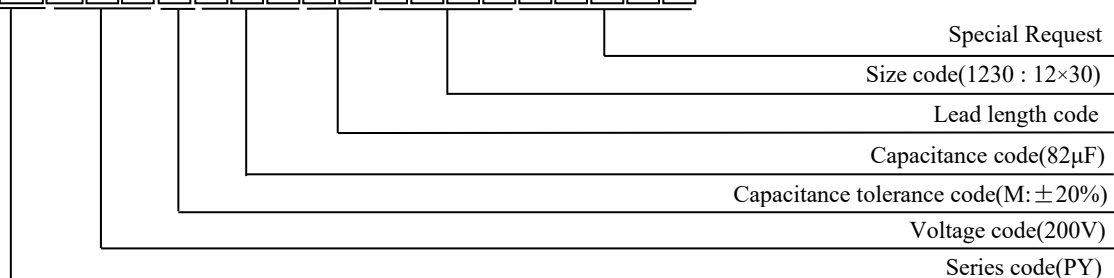
- **Downsize and high ripple current.**
- **Load life: 12,000 to 15,000 hours at 105°C.**
- **For electronic ballast circuits and other long life applications.**

Item	Performance Characteristics					
Category Temperature Range	-40~+105℃(160~400V.DC) -25~+105℃(450V.DC)					
Working Voltage Range	160~450Vdc					
Capacitance Range	6.8~470 μF					
Capacitance Tolerance	±20% (at 20℃ and 120Hz)					
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160 ~ 250	350 ~ 450			
	tan δ (Max)	0.20	0.24			
	The above values should be increased by 0.02 for every additional 1000μF					
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes					
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160~250	400	450	(at 120Hz)	
	Z(-25℃)/Z(+20℃)	4	5	6		
	Z(-40℃)/Z(+20℃)	6	6	-		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 15,000(12,000 hours for Φ 10)hours at 105℃.					
	Capacitance change		≒±20% of the initial value			
	Dissipation factor(tan δ)		≒200% of the specified value			
	Leakage current		≒specified value			
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.					
	Capacitance change		≒±20% of the initial value			
	Dissipation factor(tan δ)		≒200% of the specified value			
	Leakage current		≒200% of the specified value			
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4					

Technical drawing of a Safety Vent assembly. The drawing shows a side view and a top view. The side view shows a cylindrical body with a diameter of ϕD , a length of $L+a \text{ Max}$, and a sleeve with a diameter of $\phi d \pm 0.05$. The sleeve has a length of 15min. and a 5min. section. The top view shows a circular cross-section with a diameter of $\phi 6.3$ and a thickness of $P \pm 0.5$.

ΦD	10	12.5	16	18
ΦD	ΦD±0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

P	Y	2	0	0	M	8	2	0	L	O	1	2	3	0				
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PY Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	10	10×16	160	200	10	10×16	160
	22	10×20	225		22	10×20	225
	33	10×20	280		33	12.5×20	340
	47	10×25	350		47	12.5×25	425
	68	12.5×20	500		68	12.5×30	510
	82	12.5×25	540		82	16×20	550
	100	12.5×30	650		100	16×25	680
	150	16×25	800		150	16×31.5	880
	220	16×31.5	1075		220	18×35.5	1100
	330	18×35.5	1450		330	18×45	1500
	470	18×45	1540		470	18×50	1580
250	10	10×20	170	400	6.8	10×16	150
	22	10×20	230		10	10×20	175
	33	10×25	330		15	12.5×20	255
	47	12.5×25	425		22	12.5×25	300
	68	16×25	550		33	16×20	395
	82	16×31.5	580		47	18×20	490
	100	18×31.5	740		56	18×25	560
	150	18×35.5	905		68	18×31.5	650
	220	18×40	1195		82	18×31.5	680
	330				100	18×35.5	805
	470				120	18×40	900
					150	18×45	1000
420	6.8	10×16	150	450	6.8	10×20	150
	10	10×20	190		10	12.5×20	215
	15	12.5×20	265		15	12.5×25	275
	22	12.5×25	310		22	16×20	320
	33	16×20	420		33	16×25	460
	47	18×25	510		47	18×31.5	550
	56	18×25	590		56	18×31.5	630
	68	18×31.5	685		68	18×35.5	725
	82	18×35.5	730		82	18×40	810
	100	18×40	835		100	18×50	900
	120	18×45	940		120		
	150				150		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)			
	120	1K	10K	100K
<100	1.00	1.75	2.25	2.50
≥100	1.00	1.67	2.05	2.25

- **LOW ESR.**
- **Load life 2,000 hours at 105°C.**

Item	Performance Characteristics							
Category Temperature Range	-40~ +105℃(160~400V.DC) -25~ +105℃(450V.DC)							
Working Voltage Range	160~450Vdc							
Capacitance Range	33 ~560μF							
Capacitance Tolerance	±20% (at 20℃ and 120Hz)							
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160 ~250	400 ~ 550					
	tan δ (Max)	0.15	0.20					
	The above values should be increased by 0.02 for every additional 1000μF							
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes							
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160 ~ 250	350	400	450	(at 120Hz)		
	Z(-25℃)/Z(+20℃)	4	5	5	6			
	Z(-40℃)/Z(+20℃)	6	6	6	-			
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.							
	Capacitance change		≒±20% of the initial value					
	Dissipation factor(tan δ)		≒200% of the specified value					
	Leakage current		≒specified value					
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.							
	Capacitance change		≒±20% of the initial value					
	Dissipation factor(tan δ)		≒200% of the specified value					
	Leakage current		≒200% of the specified value					
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4							

Sleeve

ϕD

$L+a$ Max

$\phi d \pm 0.05$

15min.

5min.

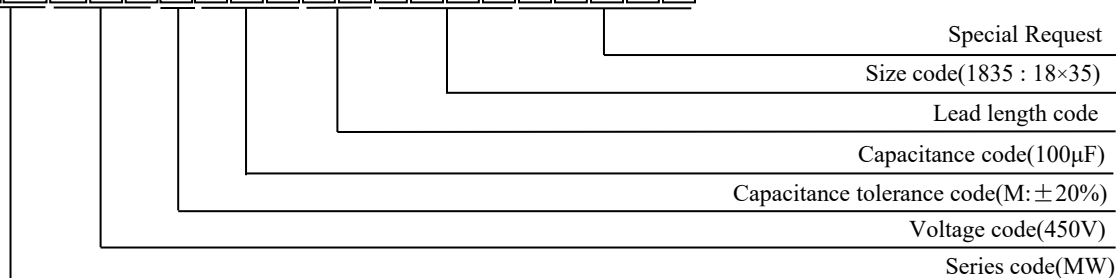
Safety Vent

Dia $\phi 6.3$

$P \pm 0.5$

ΦD	10	12.5	16	18
ΦD	ΦD ±0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

M	W	4	5	0	M	1	0	1	L	O	1	8	3	5						
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MW Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160	33			200	33	10×16	350
	47	10×16	380		47	10×20	420
	56	10×20	500		56	10×25	520
	68	10×25	560		68	10×30	580
	82	10×30	600		82	12.5×20	630
	100	12.5×20	720		100	12.5×25	745
	120	12.5×25	770		120	12.5×30	800
	150	16×20	870		150	16×25	930
	180	16×25	1050		180	16×31.5	1090
	220	16×31.5	1095		220	18×25	1120
	330	16×35.5	1150		330	18×31.5	1190
	390	18×31.5	1320		390	18×35.5	1350
	470	18×35.5	1375		470	18×40	1400
	560	18×40	1440		560	18×45	1460
250	33	10×20	360	400	33		
	47	10×25	440		47		
	56	10×30	540		56	12.5×30	410
	68	12.5×20	620		68	16×25	450
	82	12.5×25	660		82	16×31.5	560
	100	16×20	780		100	16×35.5	650
	120	16×25	850		120	18×31.5	780
	150	16×31.5	950		150	18×35.5	960
	180	18×25	1120		180	18×40	1000
	220	18×31.5	1190		220		
	330	18×35.5	1220		330		
	390	18×40	1385		390		
	470	18×45	1460		470		
420	47	16×20	380	450	47	16×25	400
	56	16×25	450		56	16×31.5	480
	68	16×31.5	510		68	16×35.5	550
	82	16×35.5	595		82	18×31.5	620
	100	18×31.5	660		100	18×35.5	680
	120	18×35.5	820		120	18×40	840
	150	18×40	970		150	18×45	1000
	180	18×45	1050		180		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
160 ~ 450	33 ~ 220	1.00	1.50	1.75	1.80
	330 ~ 560	1.00	1.30	1.40	1.50

- **High ripple current.**
- **LOW ESR.**
- **Load life 5,000 hours at 105°C.**

Item	Performance Characteristics							
Category Temperature Range	-40~ +105℃(160~400V.DC) -25~ +105℃(450V.DC)							
Working Voltage Range	160~ 450Vdc							
Capacitance Range	33~560μF							
Capacitance Tolerance	±20% (at 20℃ and 120Hz)							
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160 ~250	400 ~ 450					
	tan δ (Max)	0.15	0.20					
	The above values should be increased by 0.02 for every additional 1000μF							
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes							
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160 ~ 250	350	400	450	(at 120Hz)		
	Z(-25℃)/Z(+20℃)	4	5	5	6			
	Z(-40℃)/Z(+20℃)	6	6	6	-			
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃.							
	Capacitance change		≒ ±20% of the initial value					
	Dissipation factor(tan δ)		≒ 200% of the specified value					
	Leakage current		≒ specified value					
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.							
	Capacitance change		≒ ±20% of the initial value					
	Dissipation factor(tan δ)		≒ 200% of the specified value					
	Leakage current		≒ 200% of the specified value					
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4							

Sleeve

ϕD

$\phi d \pm 0.05$

$L+a \text{ Max}$

15min.

5min.

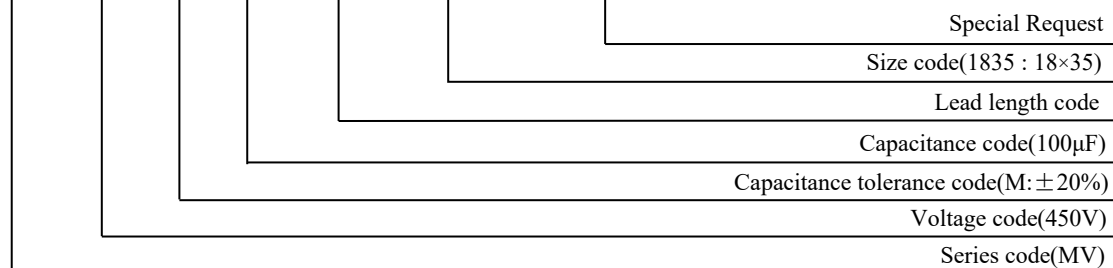
Safety Vent

Dia $\geq \phi 6.3$

$P \pm 0.5$

ΦD	10	12.5	16	18
ΦD	ΦD ± 0.5 Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$			

M	V	4	5	0	M	1	0	1	L	O	1	8	3	5				
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MV Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C/120Hz (mA rms)
160V	33	10×16	350	200V	33	10×20	360
	47	10×20	400		47	10×25	440
	56	10×25	520		56	10×30	540
	68	10×30	580		68	12.5×20	600
	82	12.5×20	630		82	12.5×25	650
	100	12.5×25	745		100	16×20	760
	120	12.5×30	800		120	16×25	820
	150	16×25	960		150	16×31.5	950
	180	16×31.5	1090		180	18×25	1120
	220	18×25	1120		220	18×31.5	1190
	330	18×31.5	1190		330	18×35.5	1220
	390	18×35.5	1350		390	18×40	1385
	470	18×40	1400		470	18×45	1430
	560	18×45	1460		560	18×50	1495
250V	33	10×25	380	400V	39		
	47	12.5×16	460		47	16×20	360
	56	12.5×20	560		56	16×25	450
	68	12.5×25	630		68	16×31.5	500
	82	16×20	680		82	16×35.5	595
	100	16×25	800		100	18×31.5	660
	120	18×20	880		120	18×35.5	800
	150	18×25	980		150	18×40	970
	180	18×31.5	1160		180	18×45	1050
	220	18×35.5	1220		220		
	330	18×40	1350		330		
	390	18×45	1420		390		
	470				470		
	560				560		
420V	39	12.5×30	360	450V	39	16×25	390
	47	16×25	400		47	16×31.5	420
	56	16×31.5	480		56	16×35.5	510
	68	18×25	550		68	18×31.5	595
	82	18×31.5	620		82	18×35.5	650
	100	18×35.5	680		100	18×40	700
	120	18×40	835		120	18×45	865
	150	18×45	990		150	18×50	1050
	180	18×50	1100		180		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50/60	120	1K	10K	100K
160 ~ 350	0.80	1.00	1.20	1.30	1.40
400 ~ 450	0.80	1.00	1.15	1.25	1.35

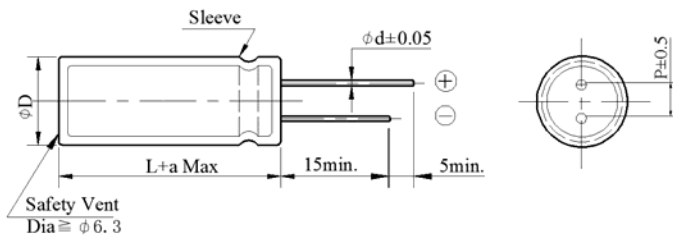
MJ Series

- Load life: 8,000 to 10,000 hours at 105°C.
- For electronic ballast circuits and long life.
- Low ESR.

◆ SPECIFICATIONS

Item	Performance Characteristics				
Category Temperature Range	-25~ +105℃				
Working Voltage Range	160~450Vdc				
Capacitance Range	10~560 μF				
Capacitance Tolerance	±20% (at 20℃ and 120Hz)				
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	160 ~250	400 ~ 450	The above values should be increased by 0.02 for every additional 1000μF	
	tan δ (Max)	0.15	0.20		
Leakage Current	I≤0.02CV+10μA I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes				
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	160 ~250	400	420 ~ 450	(at 120Hz)
	Z(-25℃)/Z(+20℃)	3	5	6	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 10,000(8,000 hours for Φ 10)hours at 105℃.				
	Capacitance change		≒ ±20% of the initial value		
	Dissipation factor(tan δ)		≒ 200% of the specified value		
	Leakage current		≒ specified value		
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.				
	Capacitance change		≒ ±20% of the initial value		
	Dissipation factor(tan δ)		≒ 200% of the specified value		
	Leakage current		≒ 200% of the specified value		
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4				

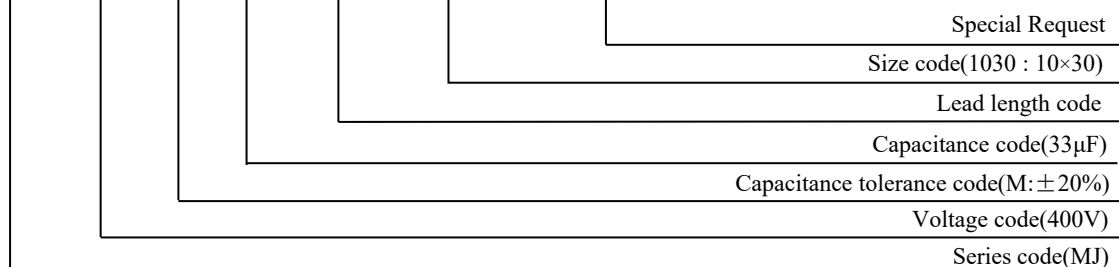
◆ DIMENSIONS (mm)



ΦD	10	12.5	16	18
ΦD	$\Phi D \pm 0.5$ Max			
Φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5$ Max $\geq 20 L \pm 2.0$ Max			

◆ PART NUMBER SYSTEM(Example : 400V 33 μ F)

M J 4 0 0 M 3 3 0 L O 1 0 3 0



MJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C /120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @105°C /120Hz (mA rms)
160	33	10×20	360	200	33		
	47	10×25	420		47	12.5×16	460
	56	12.5×16	540		56	12.5×20	560
	68	12.5×20	600		68	12.5×25	620
	82	12.5×25	650		82	16×20	660
	100	16×20	760		100	16×25	780
	120	16×25	830		120	18×20	850
	150	18×20	960		150	18×25	980
	180	18×25	1120		180	18×31.5	1160
	220	18×31.5	1190		220	18×35.5	1220
	330	18×35.5	1220		330	18×40	1350
	390	18×40	1385		390	18×45	1420
	470	18×45	1430		470	18×50	1460
	560	18×50	1495				
250	10	10×12.5	185	400	10		
	15	10×16	230		15		
	22	10×20	300		22		
	33	12.5×16	400		39	12.5×30	360
	47	12.5×20	480		47	16×25	380
	56	12.5×25	580		56	16×31.5	480
	68	16×20	650		68	18×25	550
	82	16×25	700		82	18×31.5	620
	100	18×20	830		100	18×35.5	680
	120	18×25	900		120	18×40	820
	150	18×31.5	1000		150	18×45	980
	180	18×35.5	1190		180	18×50	1100
	220	18×40	1280		220		
	330	18×45	1385		330		
	390	18×50	1460		390		
420	39	16×25	390	450	39	18×20	420
	47	18×20	420		47	18×25	450
	56	18×25	510		56	18×31.5	550
	68	18×31.5	600		68	18×35.5	630
	82	18×35.5	650		82	18×40	680
	100	18×40	700		100	18×45	720
	120	18×45	850		120	18×50	880
	150	18×50	1000		150		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap(uF)	Frequency (Hz)			
	120	1K	10K	100K
10 ~ 82	1.00	1.75	2.25	2.50
100 ~ 560	1.00	1.67	1.75	2.25

LS Series

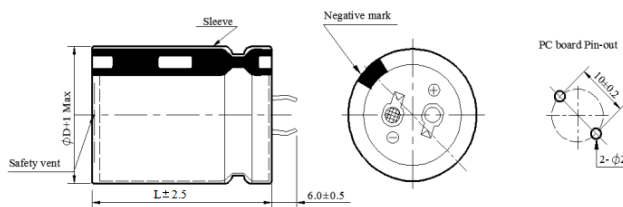
- Standard series for general purpose.
- Large size for PCB board mounting hole.
- Load life 2,000 hours at 85°C.

SPECIFICATIONS

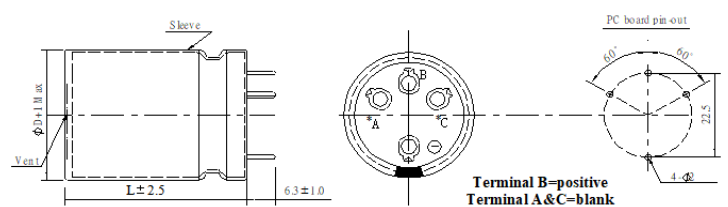
Item	Performance Characteristics												
Category Temperature Range	-40 ~ +85℃						-25 ~ +85℃						
Working Voltage Range	16~ 100Vdc						160 ~550Vdc						
Capacitance Range	820~68,000μF						47~3,300 μF						
Capacitance Tolerance	±20% (at 20℃ and 120Hz)												
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	16	25	35	50	63	80 ~ 100	160 ~ 250	350 ~ 450	500~550			
	tan δ (Max)	0.35	0.35	0.25	0.25	0.25	0.20	0.15	0.15	0.20			
	The above values should be increased by 0.02 for every additional 1000μF												
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes												
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	16	25	35	50	63	80 ~100	100	160 ~ 250	350	400	420 ~ 550	(at 120Hz)
	Z(-25℃)/Z(+20℃)	—	—	—	—	—	—	—	4	4	4	8	
	Z(-40℃)/Z(+20℃)	15	10	8	6	6	5	5	—	—	—	—	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.												
	Capacitance change				≒±20% of the initial value								
	Dissipation factor(tan δ)				≒200% of the specified value								
	Leakage current				≒specified value								
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 85℃ without voltage applied.												
	Capacitance change				≒±20% of the initial value								
	Dissipation factor(tan δ)				≒200% of the specified value								
	Leakage current				≒200% of the specified value								
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4												

DIMENSIONS(mm)

Terminal Code :S2



Terminal Code :S5



PART NUMBER SYSTEM(Example : 450V 330μF)

L	S	4	5	0	M	3	3	1	S	2	3	0	3	0					
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Special Request

Size code(3030 : 30×30)

Lead length code

Capacitance code(330μF)

Capacitance tolerance code(M: ± 20%)

Voltage code(450V)

Series code(LS)

◆ **Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz**

[illegible]

LS Series

◆ Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

Case size & Permissible Rated Ripple current (mA rms) at 65 °C / 120Hz																	
Vdc ΦD uF	420								Vdc ΦD uF	450							
	Φ 22		Φ 25		Φ30		Φ35			Φ 22		Φ25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
									82	22×25	830						
100	22×25	970							100	22×30	930						
120	22×30	1070							120	22×35	1040	25×25	1070				
150	22×35	1300	25×25	1290					150	22×40	1190	25×30	1190				
180	22×40	1480	25×30	1480	30×25	1480			180	22×45	1350	25×35	1350	30×25	1380		
220	22×45	1500	25×35	1500	30×30	1500			220	22×50	1550	25×40	1500	30×30	1550		
270	22×50	1940	25×40	1940	30×35	1940	35×25	1940	270			25×45	1780	30×35	1780	35×25	1780
330			25×45	2170	30×40	2170	35×30	2170	330			25×50	2010	30×40	2010	35×30	2010
390			25×50	2270	30×45	2220	35×35	2270	390					30×45	2240	35×35	2240
470					30×50	2500	35×40	2610	470					30×50	2530	35×40	2530
560							35×45	2820	560							35×45	2620
680							35×50	2900	680							35×50	2700

Vdc ΦD uF	500								Vdc ΦD uF	550							
	Φ 22		Φ 25		Φ30		Φ35			Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
56									47	22×25	385						
68									56	22×30	420	25×25	420				
82	22×25	785							68	22×35	465	25×25	465				
100	22×30	840	25×25	800					82	22×40	600	25×30	600	30×25	600		
120	22×35	920	25×30	890					100	22×45	785	25×35	785	30×25	785	35×25	785
150	22×40	1070	25×35	1070	30×25	1100			120	22×50	840	25×40	840	30×30	840	35×25	840
180	22×45	1380	25×40	1380	30×30	1380	35×25	1380	150			25×45	920	30×35	920	35×25	920
220	22×50	1610	25×45	1600	30×35	1610	35×30	1610	180			25×50	1245	30×40	1245	35×30	1245
270			25×50	1750	30×40	1810	35×35	1810	220					30×45	1380	35×35	1380
330					30×45	1985	35×40	1985	270					30×50	1610	35×40	1610
390					30×50	2100	35×45	2120	330							35×45	1810
470							35×50	2480	390							35×50	1985

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50	120	1K	10K	≥50K
16 ~ 100	0.80	1.00	1.15	1.19	1.20
160 ~ 250	0.81	1.00	1.32	1.45	1.50
350 ~ 550	0.77	1.00	1.30	1.40	1.43

- Large size for PCB board mounting hole.
- Load life 5,000 hours at 85°C.

Item		Performance Characteristics				
Category Temperature Range		-25 ~ +85℃				
Working Voltage Range		200~500Vdc				
Capacitance Range		56~2200 μF				
Capacitance Tolerance		±20% (at 20℃ and 120Hz)				
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200 ~ 450	500			
	tan δ (Max)	0.15	0.20			
	The above values should be increased by 0.02 for every additional 1000μF					
Leakage Current		$I \leq 3 \sqrt{CV}$ I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes				
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	200 ~250	400	420 ~450	500	(at 120Hz)
	Z(-25℃)/Z(+20℃)	4	4	8	8	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃.					
	Capacitance change		≦ ±20% of the initial value			
	Dissipation factor(tan δ)		≦ 200% of the specified value			
	Leakage current		≦ specified value			
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 85℃ without voltage applied.					
	Capacitance change		≦ ±20% of the initial value			
	Dissipation factor(tan δ)		≦ 200% of the specified value			
	Leakage current		≦ 200% of the specified value			
Others		Conforms to JIS-C-5101-4 (1998) and IEC 60384-4				

PART NUMBER SYSTEM (Example: 4567 8901)																			
L	P	4	5	0	M	5	6	1	S	2	3	5	5	0					

◆ **Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz**

[illegible]

LP Series

◆ Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

Vdc uF	500							
	Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
56	22×25	595						
68	22×30	630						
82	22×35	805	25×25	805				
100	22×40	900	25×30	900				
120	22×45	985	25×35	985	30×25	985		
150	22×50	1350	25×40	1350	30×30	1350	35×25	1350
180			25×45	1400	30×35	1400	35×30	1400
220			25×50	1720	30×40	1720	35×35	1720
270					30×45	1865	35×40	1865
330					30×50	2030	35×45	2030
390							35×50	2225

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50/60	120	1K	10K	100K
200 ~ 250	0.80	1.00	1.15	1.17	1.20
400 ~ 500	0.90	1.00	1.10	1.12	1.15

KM Series

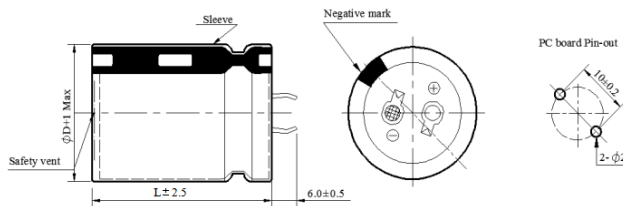
- Large size for PCB board mounting hole.
- Load life 2,000 hours at 105°C.

◆ SPECIFICATIONS

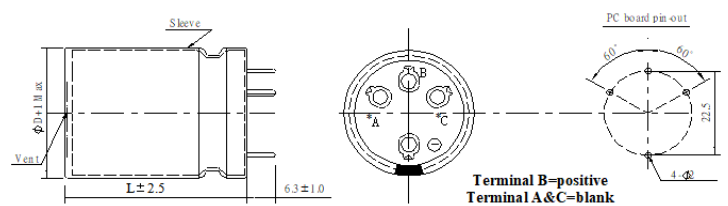
Item	Performance Characteristics												
Category Temperature Range	-40 ~ +105℃							-25 ~ +105℃					
Working Voltage Range	16~ 100Vdc							160 ~ 550Vdc					
Capacitance Range	560~56,000μF							39~2,200μF					
Capacitance Tolerance	±20% (at 20℃ and 120Hz)												
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	16	25	35	50	63	80	100 ~ 250	350 ~ 450	475~550			
	tan δ (Max)	0.35	0.35	0.25	0.25	0.25	0.20	0.15	0.15	0.20			
	The above values should be increased by 0.02 for every additional 1000μF												
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes												
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	16	25	35	50	63	80~100	100	160 ~ 250	350	400	420 ~ 550	(at 120Hz)
	Z(-25℃)/Z(+20℃)	—	—	—	—	—	—	—	4	4	4	8	
	Z(-40℃)/Z(+20℃)	15	10	8	6	6	5	5	—	—	—	—	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.												
	Capacitance change			≒ ±20% of the initial value									
	Dissipation factor(tan δ)			≒ 200% of the specified value									
	Leakage current			≒ specified value									
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.												
	Capacitance change			≒ ±20% of the initial value									
	Dissipation factor(tan δ)			≒ 150% of the specified value									
	Leakage current			≒ 200% of the specified value									
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4												

◆ DIMENSIONS(mm)

Terminal Code :S2

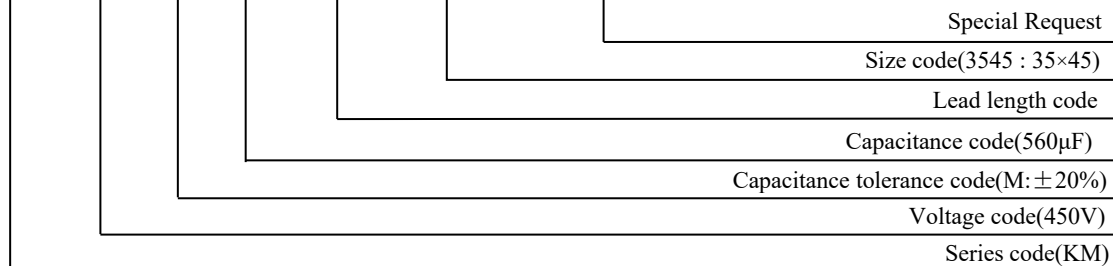


Terminal Code :S5



◆ PART NUMBER SYSTEM(Example : 450V 560μF)

K	M	4	5	0	M	5	6	1	S	2	3	5	4	5					
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KM Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

Vdc ΦD uF	500								Vdc ΦD uF	550							
	Φ 22		Φ 25		Φ30		Φ35			Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
39									39	22×25	330						
47	22×25	410							47	22×30	400	25×25	400				
56	22×25	500							56	22×35	450	25×30	450				
68	22×30	580							68	22×40	520	25×35	520				
82	22×30	700	25.4×25	730					82	22×45	600	25×40	600	30×25	600		
100	22×35	800	25.4×30	810					100	22×50	720	25×45	720	30×30	720		
120	22×40	900	25.4×35	890	30×25	900			120			25×50	830	30×35	830	35×25	830
150	22×50	1150	25.4×40	1100	30×30	1070	35×25	1090	150					30×40	960	35×30	960
180			25.4×45	1220	30×35	1200	35×30	1190	180					30×45	1050	35×35	1050
220			25.4×50	1330	30×40	1300	35×35	1290	220					30×50	1170	35×40	1170
270					30×45	1400	35×40	1380	270							35×45	1300
									330							35×50	1420

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50	120	1K	10K	≥50K
16 ~ 50	0.95	1.00	1.05	1.08	1.08
63~100	0.90	1.00	1.10	1.13	1.19
160 ~ 250	0.81	1.00	1.32	1.45	1.50
315 ~ 550	0.77	1.00	1.30	1.41	1.43

KS Series

- Long life and high temperature, down size and high ripple current.
- Load life 3,000 hours at 105°C.

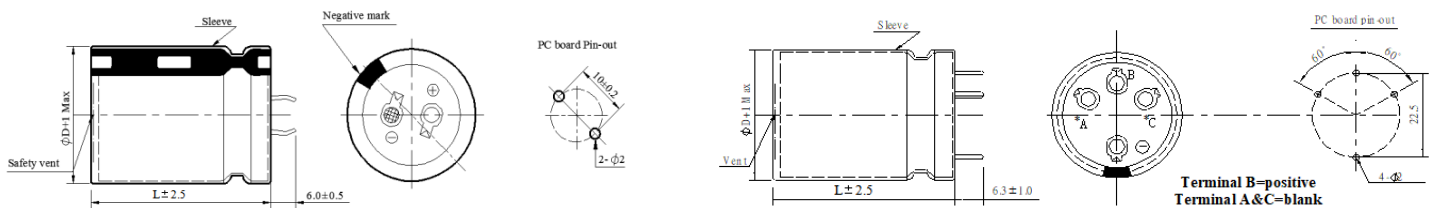
◆ SPECIFICATIONS

Item	Performance Characteristics									
Category Temperature Range	-25 ~ +105℃									
Working Voltage Range	200 ~ 500Vdc									
Capacitance Range	56 ~ 2,200μF									
Capacitance Tolerance	±20% (at 20℃ and 120Hz)									
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200	220	250	350	400	420	450	500	
	tan δ (Max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	
	The above values should be increased by 0.02 for every additional 1000μF									
Leakage Current	I≤3√CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes									
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	200~250	350	400	420 ~ 450	500	(at 120Hz)			
	Z(-25℃)/Z(+20℃)	4	4	4	8	8				
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 105℃.									
	Capacitance change		≦±20% of the initial value							
	Dissipation factor(tan δ)		≦200% of the specified value							
	Leakage current		≦specified value							
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.									
	Capacitance change		≦±15% of the initial value							
	Dissipation factor(tan δ)		≦150% of the specified value							
	Leakage current		≦200% of the specified value							
Others	Conforms to JIS-C-5101-4 (1998)									

◆ DIMENSIONS(mm)

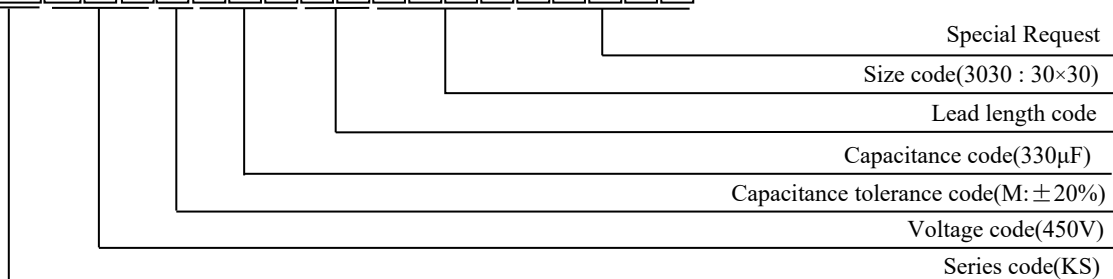
Terminal Code :S2

Terminal Code :S5



◆ PART NUMBER SYSTEM(Example : 450V 330μF)

K	S	4	5	0	M	3	3	1	S	2	3	0	3	0						
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◆ **Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.**

uF	Vdc ΦD	420								uF	Vdc ΦD	450							
		Φ 22		Φ 25		Φ30		Φ35				Φ 22		Φ 25		Φ30		Φ35	
		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC			ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
82		22×25	640							68									
100		22×30	700							82	22×25	640							
120		22×35	810	25×25	810					100	22×30	690	25×25	690					
150		22×40	930	25×30	950					120	22×35	810	25×30	810					
180		22×45	1040	25×35	1020	30×25	1060			150	22×40	940	25×35	930	30×25	930			
220		22×50	1200	25×40	1180	30×30	1180	35×25	1180	180	22×45	1060	25×40	1060	30×30	1060			
270				25×45	1360	30×35	1360	35×30	1300	220	22×50	1200	25×45	1200	30×35	1180	35×25	1240	
330				25×50	1500	30×40	1480	35×35	1550	270			25×50	1320	30×40	1340	35×30	1400	
390						30×45	1700	35×40	1710	330					30×45	1520	35×35	1500	
470						30×50	1900	35×45	1950	390					30×50	1730	35×40	1710	
560								35×50	2170	470							35×45	1950	
680								35×55	2200	560							35×50	2010	

KS Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

V _{dc} ΦD uF	500							
	Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
56	22×25	510						
68	22×30	580						
82	22×35	720	25×25	740				
100	22×40	830	25×30	820				
120	22×45	930	25×35	930	30×25	910		
150	22×50	1020	25×40	1020	30×30	1040		
180			25×45	1200	30×35	1170	35×25	1100
220			25×50	1300	30×40	1310	35×30	1320
270					30×45	1410	35×35	1420
330					30×50	1510	35×40	1560
390							35×45	1700
470							35×50	1900

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

V _{dc}	Frequency (Hz)				
	50	120	1K	10K	≥50K
200 ~ 250	0.81	1.00	1.32	1.45	1.50
350 ~ 500	0.77	1.00	1.30	1.41	1.43

KN Series

- Long life and high temperature, down size and high ripple current.
- Load life 5,000 hours at 105°C.

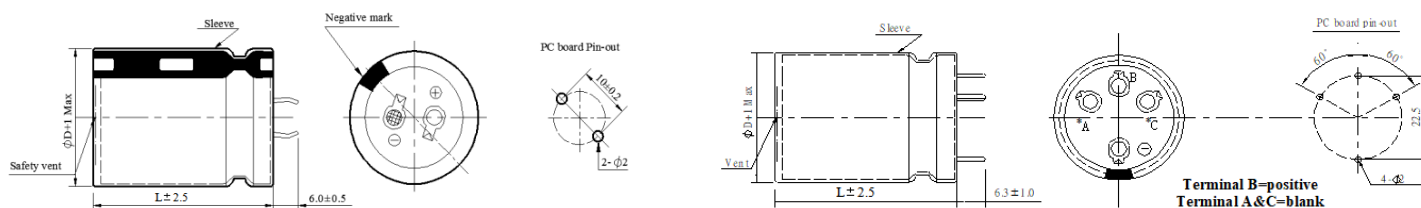
◆ SPECIFICATIONS

Item	Performance Characteristics							
Category Temperature Range	-25 ~ +105℃							
Working Voltage Range	200~500Vdc							
Capacitance Range	56~1,800μF							
Capacitance Tolerance	±20% (at 20℃ and 120Hz)							
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200	220	250	400	420	450	500
	tan δ (Max)	0.20	0.20	0.20	0.25	0.25	0.25	0.25
	The above values should be increased by 0.02 for every additional 1000μF							
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes							
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	200~250	350	400	420 ~ 450	500	(at 120Hz)	
	Z(-25℃)/Z(+20℃)	4	4	4	8	8		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃.							
	Capacitance change		≒±20% of the initial value					
	Dissipation factor(tan δ)		≒200% of the specified value					
	Leakage current		≒specified value					
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.							
	Capacitance change		≒±20% of the initial value					
	Dissipation factor(tan δ)		≒150% of the specified value					
	Leakage current		≒200% of the specified value					
Others	Conforms to JIS-C-5101-4 (1998)							

◆ DIMENSIONS(mm)

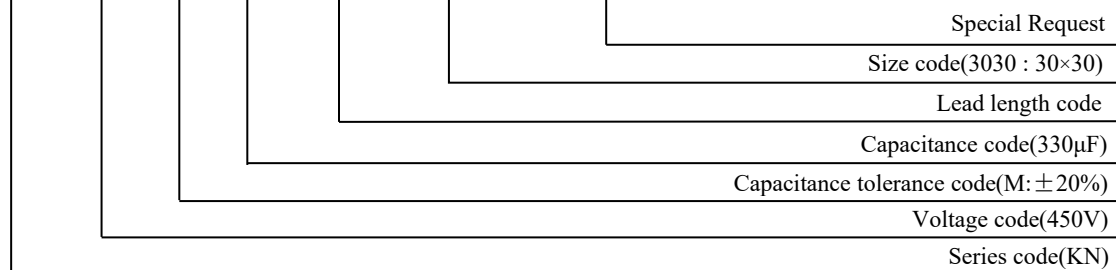
Terminal Code :S2

Terminal Code :S5



◆ PART NUMBER SYSTEM(Example : 450V 330μF)

K	N	4	5	0	M	3	3	1	S	2	3	0	3	0					
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◆ **Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.**

uF	Vdc		420								uF	Vdc		450							
	ΦD	ΦD	Φ 22		Φ 25		Φ30		Φ35			ΦD	ΦD	Φ 22		Φ 25		Φ30		Φ35	
			ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC				ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
68	22×25	460																			
82	22×30	580								68	22×25	490									
100	22×30	630	25×25	520						82	22×30	580	25×25	580							
120	22×35	730	25×30	620						100	22×35	690	25×30	700							
150	22×40	860	25×35	850	30×25	840				120	22×40	770	25×35	830	30×25	810					
180	22×50	1060	25×40	1050	30×30	980	35×25	950		150	22×45	880	25×40	880	30×30	880					
220			25×45	1180	30×35	1140	35×30	1070		180	22×50	900	25×45	920	30×35	1030	35×25	1050			
270			25×50	1330	30×40	1310	35×35	1380		220			25×50	1200	30×40	1170	35×30	1200			
330					30×45	1480	35×40	1480		270					30×45	1340	35×35	1330			
390					30×50	1500	35×45	1630		330					30×50	1510	35×40	1390			
470							35×50	1950		390							35×45	1710			
560							35×55	2170		470							35×50	1830			

KN Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

Vdc ΦD uF	500							
	Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
56	22×25	560						
68	22×30	610	25×25	650				
82	22×35	720	25×30	740	30×25	740		
100	22×40	770	25×35	780	30×25	820		
120	22×45	930	25×40	930	30×30	910	35×25	880
150	22×50	1080	25×45	1080	30×35	1040	35×25	1080
180			25×50	1100	30×40	1170	35×30	1100
220					30×45	1330	35×35	1230
270					30×50	1500	35×40	1420
330							35×45	1600
390							35×50	1780

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50/60	120	1K	10K	100K
200 ~ 250	0.80	1.00	1.20	1.30	1.40
400 ~ 500	0.80	1.00	1.10	1.12	1.15

KJ Series

- High reliability. Extremely long life series
- Endurance with ripple current: 10,000 hours at 105°C.

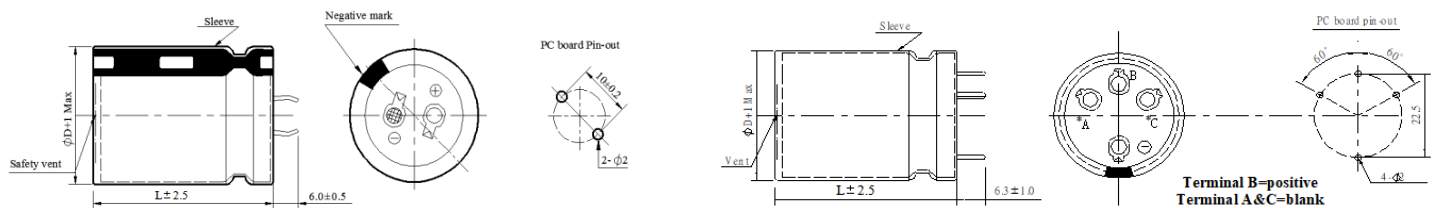
SPECIFICATIONS

Item	Performance Characteristics							
Category Temperature Range	-25~ +105℃							
Working Voltage Range	200~550Vdc							
Capacitance Range	47~2,200μF							
Capacitance Tolerance	±20% (at 20℃ and 120Hz)							
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200	220	250	400	450	500	550
	tan δ (Max)	0.15	0.15	0.15	0.15	0.20	0.20	0.20
	The above values should be increased by 0.02 for every additional 1000μF							
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes							
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	200~250	350	400	420 ~ 450	500	(at 120Hz)	
	Z(-25℃)/Z(+20℃)	4	4	4	8	8		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for10,000 hours at 105℃.							
	Capacitance change		≒ ±20% of the initial value					
	Dissipation factor(tan δ)		≒ 200% of the specified value					
	Leakage current		≒ specified value					
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃without voltage applied.							
	Capacitance change		≒ ±20% of the initial value					
	Dissipation factor(tan δ)		≒ 200% of the specified value					
	Leakage current		≒ 200% of the specified value					
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4							

DIMENSIONS(mm)

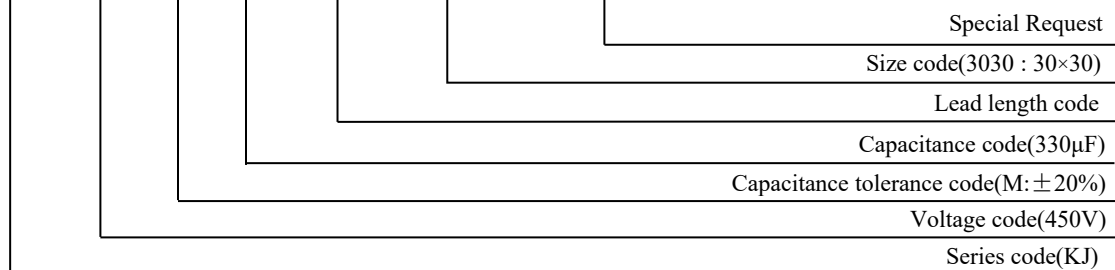
Terminal Code :S2

Terminal Code :S5



PART NUMBER SYSTEM(Example : 450V 330μF)

K	J	4	5	0	M	3	3	1	S	2	3	0	3	0					
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KJ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

Case size & Permissible Rated Ripple current: (mA rms) at 105 °C / 120Hz																	
Vdc ΦD uF	500								Vdc ΦD uF	550							
	Φ 22		Φ 25		Φ30		Φ35			Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
47	22×25	460															
56	22×25	550	25×25	630													
68	22×30	630	25×25	730													
82	22×35	730	25×25	820													
100	22×40	820	25×35	820	30×30	820											
120	22×45	960	25×40	950	30×35	970	35×30	980									
150	22×50	1120	25×45	1080	30×35	1140	35×30	1180	220							35×40	1200
180			25×50	1230	30×35	1310	35×30	1380	270							35×50	1330
220			25×50	1380	30×45	1480	35×30	1480	330							35×55	1630
270					30×50	1500	35×35	1670	390							35×60	1710
330							35×40	1840	470							35×70	1930
390							35×50	2110									
560							35×65	2238									

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	50/60	120	1K	10K	100K
200 ~ 250	0.80	1.00	1.20	1.30	1.40
400 ~ 500	0.80	1.00	1.10	1.12	1.15

SP Series

- Endurance with ripple current: 2,000 hours at 105°C.

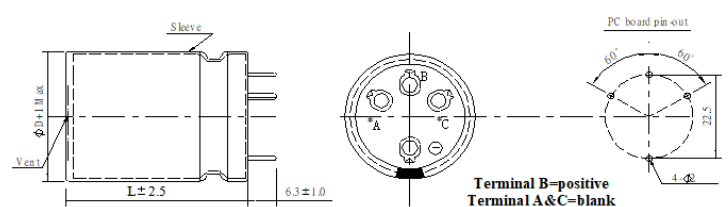
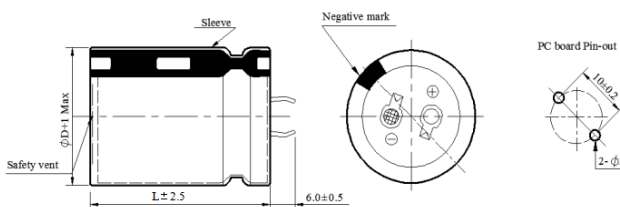
SPECIFICATIONS

Item	Performance Characteristics			
Category Temperature Range	-25 ~ +105℃			
Working Voltage Range	400~450Vdc			
Capacitance Range	68~680μF			
Capacitance Tolerance	±20% (at 20℃ and 120Hz)			
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	400	420	450
	tan δ (Max)	0.15	0.20	0.20
	The above values should be increased by 0.02 for every additional 1000μF			
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes			
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	400	420	450
	Z(-25℃)/Z(+20℃)	4	8	8
(at 120Hz)				
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.			
	Capacitance change	≒±20% of the initial value		
	Dissipation factor(tan δ)	≒200% of the specified value		
	Leakage current	≒specified value		
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.			
	Capacitance change	≒±20% of the initial value		
	Dissipation factor(tan δ)	≒200% of the specified value		
	Leakage current	≒200% of the specified value		
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4			

DIMENSIONS(mm)

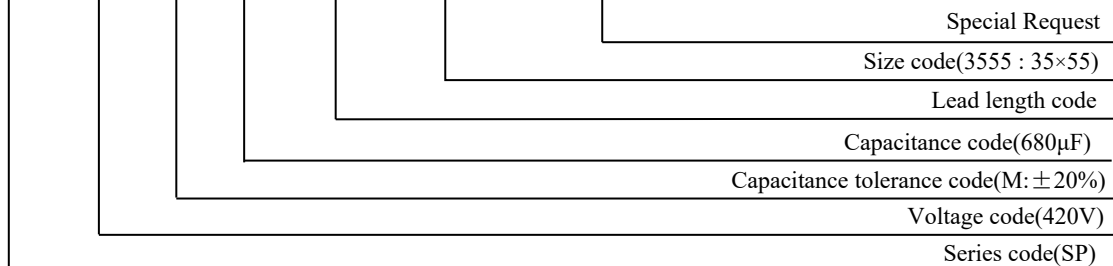
Terminal Code :S2

Terminal Code :S5



PART NUMBER SYSTEM(Example : 420V 680μF)

S	P	4	2	0	M	6	8	1	S	2	3	5	5	5					
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SP Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz.

Vdc ΦD uF	400								420							
	Φ 22		Φ 25		Φ30		Φ35		Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
82									22×25	0.60						
100	22×25	0.66							22×30	0.63	25×25	0.63				
120	22×30	0.67							22×35	0.77	25×25	0.77				
150	22×35	0.84	25×30	0.84					22×40	0.80	25×30	0.80	30×25	0.80		
180	22×40	0.90	25×30	0.90					22×45	0.86	25×35	0.86	30×30	0.86		
220	22×45	1.05	25×35	1.05	30×30	1.05			22×50	0.99	25×40	0.99	30×30	0.99	35×25	0.99
270	22×50	1.16	25×40	1.16	30×30	1.16	35×30	1.16			25×45	1.18	30×40	1.18	35×30	1.18
330			25×50	1.36	30×35	1.36	35×30	1.36			25×55	1.35	30×40	1.35	35×35	1.35
390			25×55	1.47	30×40	1.47	35×35	1.47					30×45	1.53	35×40	1.53
470					30×45	1.50	35×40	1.50					30×50	1.76	35×40	1.76
560					30×55	1.80	35×40	1.80							35×50	1.99
680							35×50	2.01							35×55	2.09

Vdc ΦD uF	450							
	Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
68	22×25	08						
82	22×30	0.53						
100	22×30	0.60	25×25	0.60				
120	22×35	0.68	25×30	0.68				
150	22×40	0.75	25×35	0.75	30×25	0.75		
180	22×50	0.82	25×40	0.82	30×30	0.82		
220			25×45	0.95	30×35	0.95	35×30	0.95
270			25×50	1.13	30×40	1.13	35×30	1.13
330					30×45	1.38	35×35	1.38
390					30×50	1.58	35×40	1.60
470							35×45	1.65
560							35×50	1.80

◆ RIPPLE CURRENT MULTIPLIERS

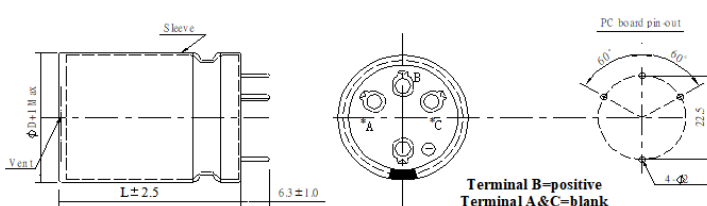
Frequency Multipliers

Vdc	Frequency (Hz)					
	50	120	300	1K	10K	50K
400 ~ 450	0.77	1.00	1.16	1.30	1.41	1.43

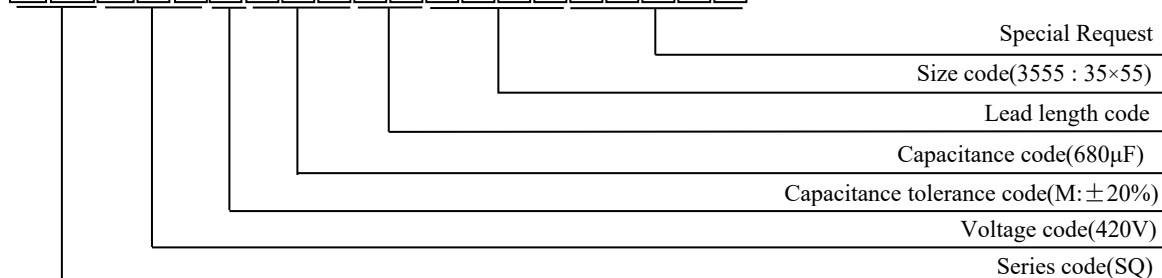
- **Endurance with ripple current:3,000 hours at 105℃.**

Item	Performance Characteristics			
Category Temperature Range	-25 ~ +105℃			
Working Voltage Range	400~450Vdc			
Capacitance Range	56~680μF			
Capacitance Tolerance	±20% (at 20℃ and 120Hz)			
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	400	420	450
	tan δ (Max)	0.15	0.20	0.20
	The above values should be increased by 0.02 for every additional 1000μF			
Leakage Current	$I \leq 3 \sqrt{CV}$ I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes			
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	400	420	450
	Z(-25℃)/Z(+20℃)	4	8	8
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 105℃.			
	Capacitance change	≒ ±20% of the initial value		
	Dissipation factor(tan δ)	≒ 200% of the specified value		
	Leakage current	≒ specified value		
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied.			
	Capacitance change	≒ ±20% of the initial value		
	Dissipation factor(tan δ)	≒ 200% of the specified value		
	Leakage current	≒ 200% of the specified value		
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4			

Terminal Code :S2



S	Q	4	2	0	M	6	8	1	S	2	3	5	5	5					
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SQ Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

Vdc ΦD uF	400								420							
	Φ 22		Φ 25		Φ30		Φ35		Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
82	22×25	0.61							22×25	0.61	25×25	0.62				
100	22×30	0.66	25×25	0.67					22×30	0.66	25×25	0.66				
120	22×35	0.71	25×25	0.71	30×25	0.73			22×35	0.71	25×30	0.71	30×25	0.71		
150	22×40	0.83	25×30	0.84	30×25	0.84	35×25	0.84	22×40	0.84	25×35	0.84	30×25	0.84		
180	22×45	0.93	25×35	0.93	30×30	0.93	35×25	0.93	22×45	0.91	25×35	0.91	30×30	0.91	35×25	0.91
220	22×50	1.05	25×40	1.05	30×30	1.05	35×25	1.05	22×50	1.05	25×45	1.05	30×35	1.05	35×25	1.05
270			25×45	1.16	30×35	1.16	35×30	1.16			25×50	1.16	30×40	1.16	35×30	1.16
330			25×50	1.37	30×40	1.37	35×30	1.37					30×45	1.40	35×35	1.40
390			25×60	1.44	30×45	1.44	35×35	1.44					30×50	1.50	35×40	1.50
470					30×50	1.81	35×40	1.81							35×45	1.81
560					30×60	2.00	35×45	2.00							35×50	2.05
680							35×50	2.15							35×60	2.15

Vdc ΦD uF	450							
	Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
56	22×25	0.61						
68	22×30	0.66	25×25	0.67				
82	22×30	0.71	25×25	0.71				
100	22×35	0.76	25×30	0.76	30×25	0.76		
120	22×40	0.83	25×35	0.84	30×25	0.84	35×25	0.84
150	22×45	0.93	25×35	0.93	30×30	0.93	35×25	0.93
180	22×50	1.05	25×40	1.05	30×30	1.05	35×30	1.05
220			25×45	1.16	30×35	1.16	35×30	1.16
270			25×60	1.37	30×40	1.37	35×35	1.37
330					30×50	1.81	35×40	1.81
390					30×60	2.00	35×40	2.00
470							35×50	2.15
560							35×60	2.15

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)					
	50	120	300	1K	10K	50K
400 ~ 450	0.77	1.00	1.16	1.30	1.41	1.43

TG Series

- Load life 5,000 hours at 125°C.
- High ripple current, High reliability.

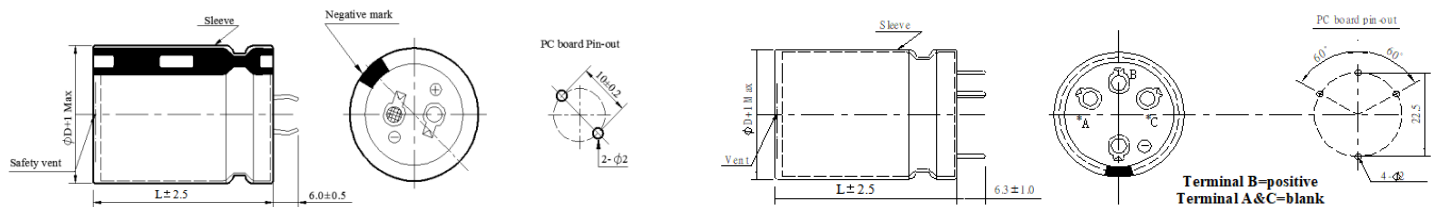
SPECIFICATIONS

Item	Performance Characteristics									
Category Temperature Range	-40 ~ +125℃									
Working Voltage Range	10~ 100Vdc									
Capacitance Range	680~47,000μF									
Capacitance Tolerance	±20% (at 20℃ and 120Hz)									
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	80	100	
	tan δ (Max)	0.35	0.35	0.35	0.25	0.25	0.25	0.20	0.15	
	The above values should be increased by 0.02 for every additional 1000μF									
Leakage Current	I≤3 √CV I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes									
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	10	16	25	35	50	63	80	100	(at 120Hz)
	Z(-40℃)/Z(+20℃)	15	15	10	8	6	6	5	5	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 125℃.									
	Capacitance change			≦ ±20% of the initial value						
	Dissipation factor(tan δ)			≦ 200% of the specified value						
	Leakage current			≦ specified value						
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 125℃ without voltage applied.									
	Capacitance change			≦ ±20% of the initial value						
	Dissipation factor(tan δ)			≦ 200% of the specified value						
	Leakage current			≦ 200% of the specified value						
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4									

DIMENSIONS(mm)

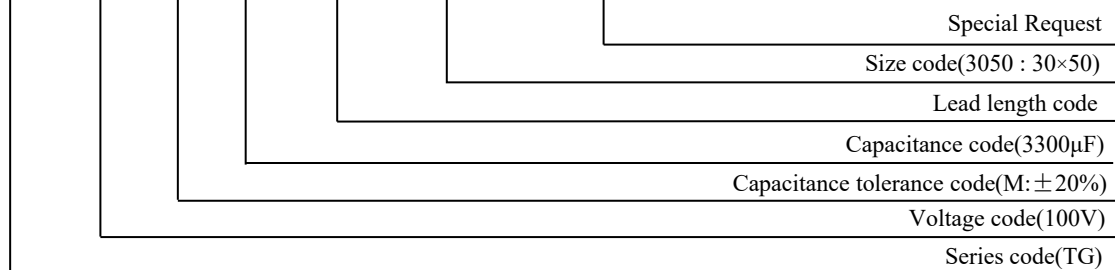
Terminal Code :S2

Terminal Code :S5



PART NUMBER SYSTEM(Example : 100V 3300μF)

T	G	1	0	0	M	3	3	2	S	2	3	0	5	0					
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TG Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 120Hz

Vdc ΦD uF	80								Vdc ΦD uF	100							
	Φ 22		Φ 25		Φ30		Φ35			Φ 22		Φ 25		Φ30		Φ35	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC		ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
820	22×25	945							680	22×25	1030						
1000	22×30	1050	25×25	1050					820	22×30	1145	25×25	1145				
1200	22×35	1200	25×30	1200					1000	22×35	1280	25×30	1280				
1500	22×40	1380	25×35	1380	30×25	1380			1200	22×40	1460	25×35	1460	30×25	1460		
1800	22×45	1555	25×40	1555	30×30	1555			1500	22×45	1700	25×40	1700	30×30	1700		
2200	22×50	1790	25×45	1790	30×35	1790	35×25	1790	1800	22×50	1900	25×45	1900	30×35	1900	35×25	1900
2700			25×50	2040	30×40	2040	35×30	2040	2200			25×50	2300	30×40	2300	35×30	2300
3300					30×45	2320	35×35	2320	2700					30×45	2460	35×35	2460
3900					30×50	2650	35×40	2650	3300					30×50	2800	35×40	2800
4700							35×45	2930	3900							35×45	3140
5600							35×50	3290	4700							35×50	3250

◆ RIPPLE CURRENT MULTIPLIERS

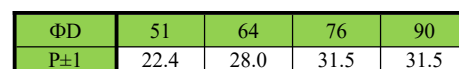
Frequency Multipliers

Vdc	Frequency (Hz)				
	50	120	1K	10K	≥50K
10 ~ 100	0.95	1.00	1.05	1.08	1.08

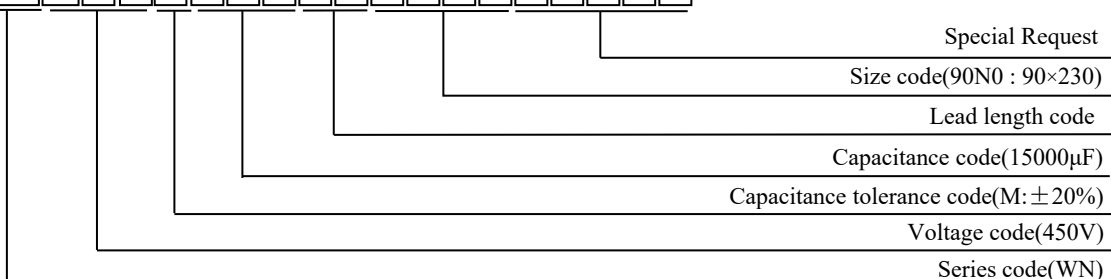
- **High ripple, suitable to use in industrial power supplies for inverter circuitry**
- **Endurance:5,000 hours at 85°C.**

Item	Performance Characteristics		
Category Temperature Range	-40~+85℃		-25 ~ +85℃
Working Voltage Range	160~250Vdc		350~450Vdc
Capacitance Range	2,700~68,000μF		1,000~18,000μF
Capacitance Tolerance	±20% (at 20℃ and 120Hz)		
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200 ~ 250	350 ~ 450
	tan δ (Max)	0.25	0.20
	The above values should be increased by 0.02 for every additional 1000μF		
Leakage Current	I=0.01CV or 5000μA, whichever is smaller I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes (at 120Hz)		
Low Temperature Characteristics Impedance Ratio(MAX) Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃.		
	Capacitance change	≒±20% of the initial value	
	Dissipation factor(tan δ)	≒200% of the specified value	
	Leakage current	≒specified value	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 85℃ without voltage applied.		
	Capacitance change	≒±20% of the initial value	
	Dissipation factor(tan δ)	≒200% of the specified value	
	Leakage current	≒specified value	
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4		

Terminal Code :SW



W	N	4	5	0	M	1	5	3	S	W	9	0	N	0					
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WN Series

◆ Case size & Permissible rated ripple current: (A rms) at 85°C / 120Hz

Vdc ΦD uF	160								200							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
3300									51×80	4.5						
3900	51×80	5.1							51×80	5.3						
4700	51×80	5.6							51×100	7.1	64×80	6.8				
5600	51×100	6.4							51×120	8.2	64×80	7.9				
6800	51×100	7.5	64×80	7.2					51×120	9.2	64×100	8.9				
8200	51×120	8.4	64×100	8.1							64×100	10.0				
10000	51×120	11.1	64×100	9.8							64×120	11.0				
12000			64×100	10.8							64×140	11.5	76×100	11.1		
15000			64×120	12.7							64×160	12.8	76×120	12.4		
18000			64×150	14.0	76×100	13.6							76×140	13.5	90×110	13.0
22000			64×150	17.0	76×120	16.6							76×160	15.6	90×130	15.1
27000					76×150	18.1	90×120	17.6					76×190	17.6	90×150	17.1
33000					76×150	19.4	90×120	18.9					76×220	18.8	90×170	18.3
39000					76×190	20.8	90×150	20.3							90×200	19.6
47000					76×220	22.2	90×170	21.7								
68000							90×230	22.3								

Vdc ΦD uF	250								350							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1200									51×80	5.5						
1500									51×80	6.1						
1800									51×100	7.4						
2200									51×100	7.9	64×80	7.6				
2700	51×80	4.2							51×120	9.8	64×100	9.5				
3300	51×100	5.0							51×120	10.8	64×110	10.5				
3900	51×120	5.9	64×80	5.6							64×120	12.3	76×100	11.9		
4700	51×120	6.9	64×100	6.6							64×130	14.2	76×100	13.8		
5600			64×100	7.8							64×150	15.9	76×120	15.5	90×100	15.0
6800			64×120	8.7									76×150	18.0	90×100	17.5
8200			64×120	10.1	76×100	9.7							76×150	21.0	90×120	20.5
10000			64×150	11.1	76×110	11.7									90×150	25.3
12000			64×170	13.0	76×130	12.6									90×170	28.4
15000					76×150	14.9	90×120	14.4							90×190	34.6
18000					76×170	16.4	90×130	15.9							90×230	39.7
22000					76×200	17.9	90×160	17.4								
27000							90×180	19.3								
33000							90×220	21.2								

WN Series

◆ Case size & Permissible rated ripple current: (A rms) at 85°C / 120Hz

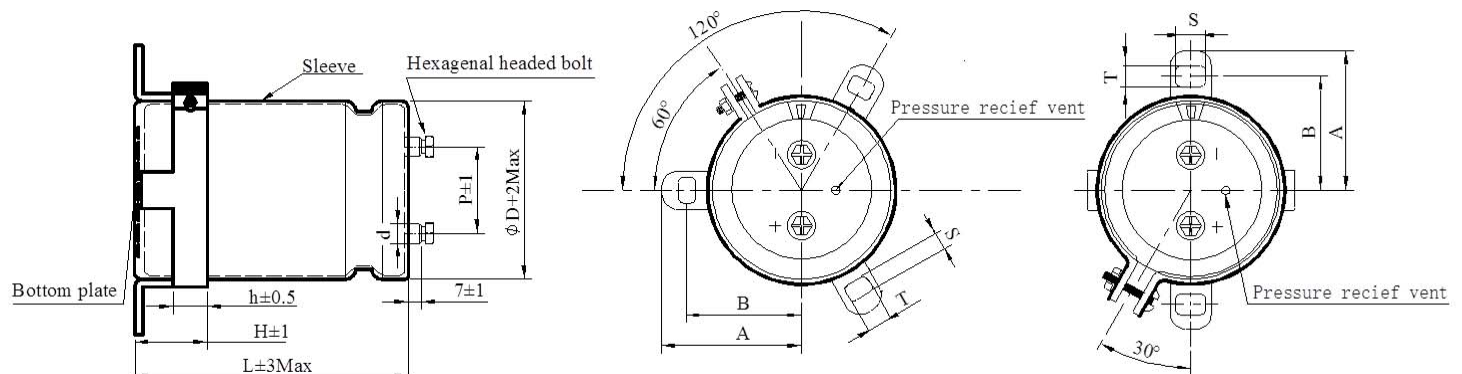
Vdc ΦD uF	400								450							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1000	51×80	5.0							51×80	5.0						
1200	51×80	5.5							51×100	5.5	64×80	5.2				
1500	51×100	6.5	64×80	6.2					51×120	6.9	64×100	6.6				
1800	51×100	7.1	64×80	6.8					51×120	8.1	64×100	7.7				
2200	51×120	8.8	64×100	8.5							64×100	9.0				
2700			64×100	9.9							64×120	10.3	76×100	9.9		
3300			64×120	11.3	76×100	10.9					64×130	11.6	76×100	11.2		
3900			64×130	12.9	76×100	12.5					64×150	13.4	76×120	13.0	90×100	12.5
4700			64×150	14.5	76×120	14.1	90×100	13.6					76×130	15.0	90×100	14.5
5600					76×130	16.3	90×100	15.8					76×150	17.5	90×120	17.0
6800					76×150	19.2	90×120	18.7					76×170	21.9	90×150	21.4
8200					76×170	24.0	90×150	23.5					76×200	24.0	90×170	23.5
10000					76×200	26.4	90×170	25.9					76×230	28.8	90×190	28.3
12000					76×230	31.5	90×190	31.0							90×230	33.0
15000							90×230	36.5								

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	60	120	300	1K	10K
160 ~ 450	0.82	1.00	1.20	1.35	1.40

◆ DIMENSIONS (Screw-Mount) [mm]



◆ Terminal pitch and Nominal dia.of bolt

Terminal Code	ΦD	P±1	Nominal dia.of bolt	d±0.5
LS	51	22.4	M5	10
	64	28.0	M5	10
	76	31.5	M5	10
	90	31.5	M5	10
LA	64	28.0	M5	13
	76	31.5	M5	13
	90	31.5	M5	13
LB	76	31.5	M6	17
	90	31.5	M6	17

◆ Dimensions of mounting bracket

Leg shape	D	A±2	B±1	T±0.5	S±0.5	H±1	h±0.5
2 – Leg (Code:K1)	51	40.0	34.0	7.0	5.0	30	24
	64	46.5	40.5	7.0	5.0	30	24
	76	53.0	46.8	7.0	5.0	30	24
	90	60.3	54.0	7.0	5.0	35	20
3 – Leg (Code:K2)	51	36.5	31.8	7.0	5.0	30	24
	64	43.6	38.1	7.0	5.0	30	24
	76	50.2	44.5	7.0	5.0	30	24
	90	56.5	50.8	7.0	5.0	30	24

WS Series

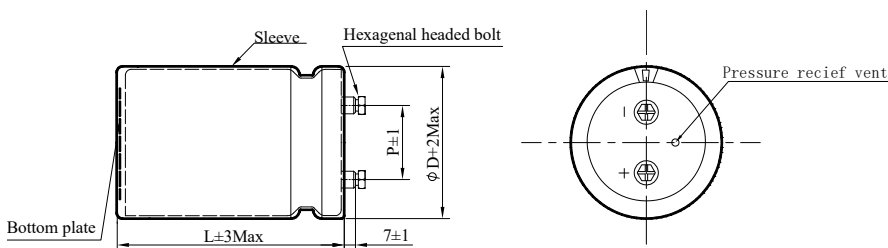
- High ripple, suitable to use in industrial power supplies for inverter circuitry, etc.

SPECIFICATIONS

Item	Performance Characteristics			
Category Temperature Range	-25 ~ +85℃			
Working Voltage Range	200~600Vdc			
Capacitance Range	820~33,000μF			
Capacitance Tolerance	±20% (at 20℃ and 120Hz)			
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200 ~ 250	350 ~ 450	500 ~600
	tan δ (Max)	0.20	0.20	0.25
	The above values should be increased by 0.02 for every additional 1000μF			
Leakage Current	I=0.01CV or 5000μA, whichever is smaller I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes(at 120Hz)			
Low Temperature Characteristics Impedance Ratio(MAX) Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.			
	Capacitance change	≒±15% of the initial value		
	Dissipation factor(tan δ)	≒ 175% of the specified value		
	Leakage current	≒ specified value		
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 85℃ without voltage applied.			
	Capacitance change	≒±15% of the initial value		
	Dissipation factor(tan δ)	≒ 175% of the specified value		
	Leakage current	≒ specified value		
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4			

DIMENSIONS(mm)

Terminal Code :SW



ΦD	51	64	76	90
P±1	22.4	28.0	31.5	31.5

PART NUMBER SYSTEM(Example : 420V 680μF)

W	S	4	2	0	M	6	8	1	S	W	7	6	F	0						
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Special Request

Size code(76F0 : 76×150)

Lead length code

Capacitance code(680μF)

Capacitance tolerance code(M: ±20%)

Voltage code(420V)

Series code(WS)

WS Series

◆ Case size & Permissible rated ripple current: (A rms) at 85°C / 120Hz.

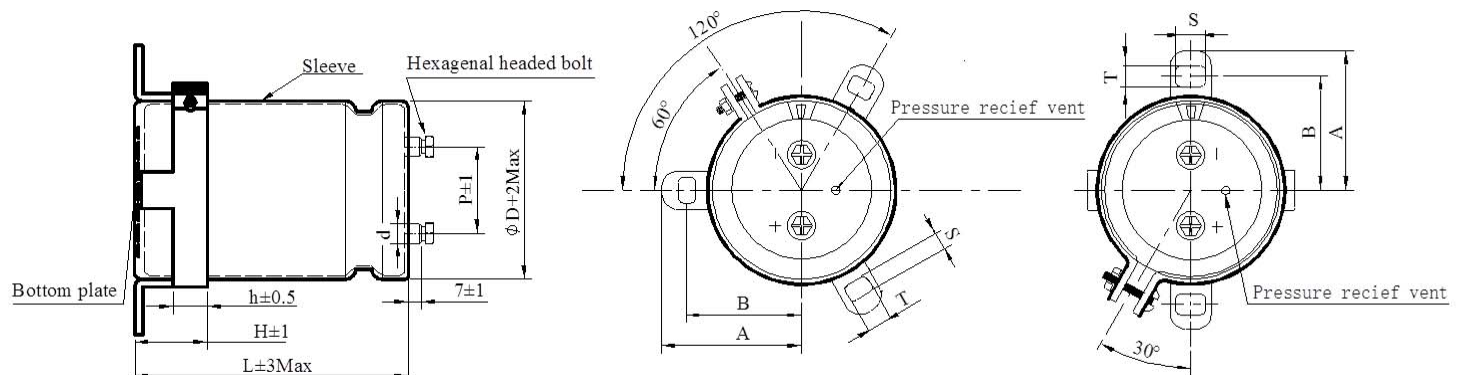
Vdc ΦD uF	550								600					
	Φ51		Φ64		Φ76		Φ90		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
820	51×90	3.9												
1000	51×110	4.3												
1200	51×130	5.0	64×90	4.8					64×100	5.4				
1500			64×110	5.9					64×120	6.6				
1800			64×120	6.3					64×135	7.5	76×100	7.2		
2200			64×140	7.5	76×110	7.5			64×155	8.3	76×120	8.0		
2700			64×170	8.9	76×130	8.7			64×185	9.7	76×135	9.4		
3300					76×150	10.1	90×120	10.1	64×220	11.0	76×160	10.8		
3900					76×170	11.6	90×130	11.4			76×185	12.4	90×140	12.2
4700					76×190	13.5	90×150	13.2			76×215	14.3	90×165	14.0
5600							90×170	15.6					90×190	16.5
6800							90×200	16.3					90×220	17.1

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	60	120	300	1K	10K
200 ~ 450	0.82	1.00	1.20	1.35	1.40
500 ~ 600	0.80	1.00	1.10	1.30	1.35

◆ DIMENSIONS (Screw-Mount) [mm]



◆ Terminal pitch and Nominal dia.of bolt

Terminal Code	ΦD	P±1	Nominal dia.of bolt	d±0.5
LS	51	22.4	M5	10
	64	28.0	M5	10
	76	31.5	M5	10
	90	31.5	M5	10
LA	64	28.0	M5	13
	76	31.5	M5	13
	90	31.5	M5	13
LB	76	31.5	M6	17
	90	31.5	M6	17

◆ Dimensions of mounting bracket

Leg shape	D	A±2	B±1	T±0.5	S±0.5	H±1	h±0.5
2 – Leg (Code:K1)	51	40.0	34.0	7.0	5.0	30	24
	64	46.5	40.5	7.0	5.0	30	24
	76	53.0	46.8	7.0	5.0	30	24
	90	60.3	54.0	7.0	5.0	35	20
3 – Leg (Code:K2)	51	36.5	31.8	7.0	5.0	30	24
	64	43.6	38.1	7.0	5.0	30	24
	76	50.2	44.5	7.0	5.0	30	24
	90	56.5	50.8	7.0	5.0	30	24

WL Series

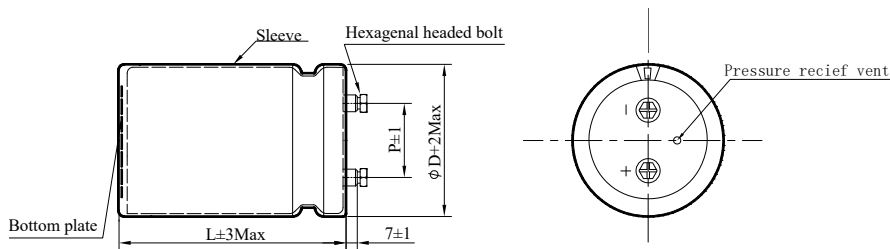
- High ripple current, suitable to use in industrial power supplies for inverter circuitry, etc
- Load life 20,000 hours at 85°C

SPECIFICATIONS

Item	Performance Characteristics				
Category Temperature Range	-40 ~ +85℃			-25 ~ +85℃	
Working Voltage Range	200 ~ 250Vdc			350 ~ 400Vdc	
Capacitance Range	1,500 ~ 39,000μF			1,000 ~ 15,000μF	
Capacitance Tolerance	±20% (at 20℃ and 120Hz)				
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200	250	350	400
	tan δ(Max)	0.25	0.25	0.20	0.20
Leakage Current	I=0.01CV or 5000μA, whichever is smaller I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes				
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 20,000 hours at 85℃				
	Capacitance change		≒ ±20% of the initial value		
	Dissipation factor(tan δ)		≒ 200% of the specified value		
	Leakage current		≒ specified value		
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 85℃ without voltage applied.				
	Capacitance change		≒ ±20% of the initial value		
	Dissipation factor(tan δ)		≒ 200% of the specified value		
	Leakage current		≒ specified value		
Others	Conforms to JIS-C-5101-4 (1998), characteristic W				

DIMENSIONS(mm)

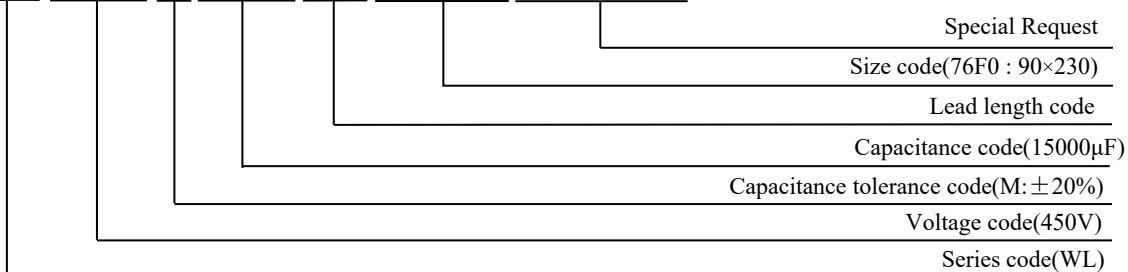
Terminal Code :SW



ΦD	51	64	76	90
P±1	22.4	28.0	31.5	31.5

PART NUMBER SYSTEM(Example : 450V 15000μF)

W L 4 5 0 M 1 5 3 S W 9 0 N 0



WL Series

◆ Case size & Permissible rated ripple current: (A rms) at 85°C / 120Hz

Vdc ΦD uF	200								250							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1500									51×80	2.4						
1800									51×100	2.8						
2200	51×80	2.9							51×100	3.2	64×80	3.0				
2700	51×100	3.4							51×120	3.7	64×80	3.6				
3300	51×100	3.9	64×80	3.7					51×120	4.4	64×100	4.3				
3900	51×120	4.6	64×100	4.4							64×100	5.0				
4700			64×100	5.1							64×120	5.9	76×100	5.6		
5600			64×120	6.1							64×120	6.6	76×100	6.4		
6800			64×120	7.2	76×100	7.0					64×150	7.3	76×120	7.1		
8200			64×120	7.9	76×100	7.6					64×150	8.9	76×120	8.6		
10000			64×150	8.5	76×120	8.2							76×150	10.0	90×120	9.6
12000					76×120	9.3	90×100	8.9					76×190	11.5	90×150	11.1
15000					76×150	10.4	90×120	9.9							90×170	12.7
18000					76×170	13.2	90×120	12.7							90×190	14.1
22000					76×190	15.7	90×150	15.1							90×230	15.4
27000					76×190	15.7	90×150	15.1								
33000							90×190	15.9								
39000							90×230	18.0								

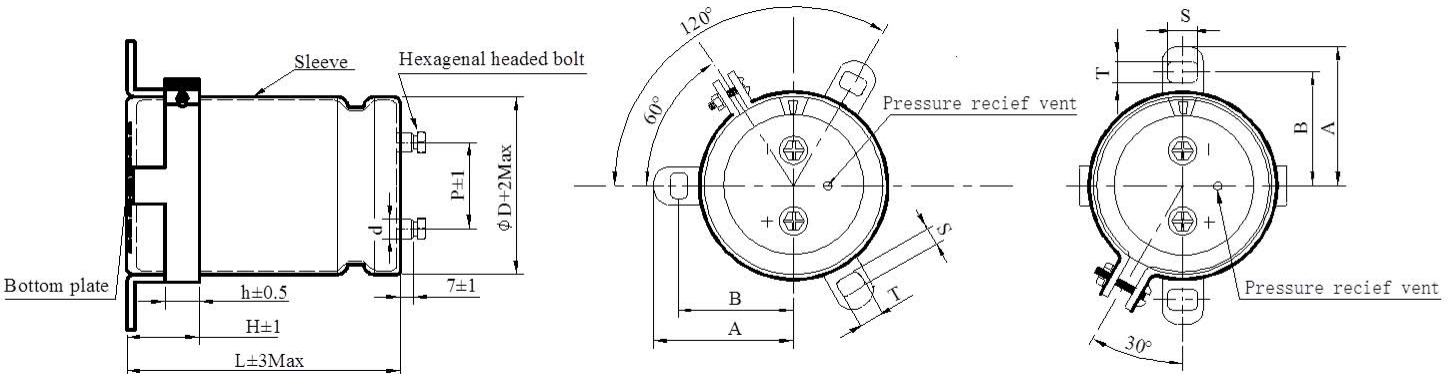
Vdc ΦD uF	350								400							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1000	51×80	3.9							51×80	3.9						
1200	51×80	4.2							51×100	4.6	64×80	4.2				
1500	51×100	5.2							51×120	5.6	64×80	6.0				
1800	51×100	5.7	64×80	5.4					51×120	6.4	64×100	5.2				
2200	51×120	7.1	64×100	6.7							64×100	6.9				
2700			64×100	7.7							64×120	8.2	76×100	7.7		
3300			64×120	9.1							64×120	9.5	76×100	9.0		
3900			64×120	10.4	76×100	9.8					64×150	11.1	76×120	10.5	90×100	9.9
4700			64×150	12.2	76×120	11.5							76×120	12.0	90×100	11.4
5600					76×120	13.1	90×100	12.4					76×150	14.0	90×120	13.3
6800					76×150	15.5	90×120	14.7					76×190	17.3	90×150	16.5
8200					76×170	19.0	90×150	18.1							90×170	18.1
10000					76×190	20.9	90×150	19.9							90×190	21.7
12000							90×190	23.8							90×230	25.8
15000							90×230	28.8								

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	60	120	300	1K	10K
200 ~ 400	0.70	1.00	1.10	1.30	1.40

◆ DIMENSIONS (Screw-Mount) [mm]



◆ Terminal pitch and Nominal dia.of bolt

Terminal Code	ΦD	$P \pm 1$	Nominal dia.of bolt	$d \pm 0.5$
LS	51	22.4	M5	10
	64	28.0	M5	10
	76	31.5	M5	10
	90	31.5	M5	10
LA	64	28.0	M5	13
	76	31.5	M5	13
	90	31.5	M5	13
LB	76	31.5	M6	17
	90	31.5	M6	17

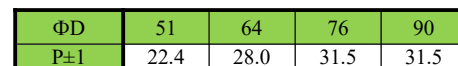
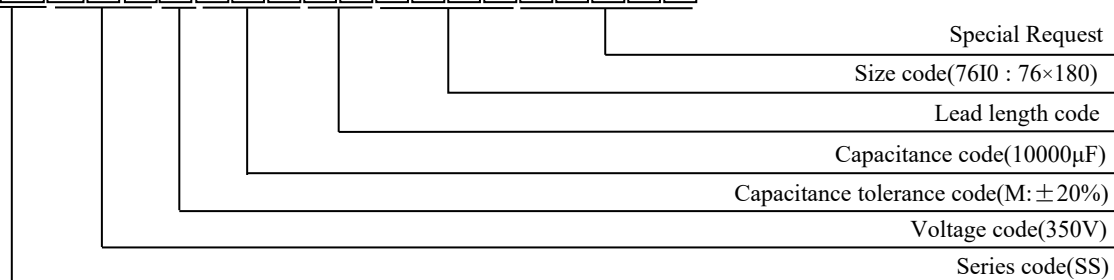
◆ Dimensions of mounting bracket

Leg shape	D	$A \pm 2$	$B \pm 1$	$T \pm 0.5$	$S \pm 0.5$	$H \pm 1$	$h \pm 0.5$
2 – Leg (Code:K1)	51	40.0	34.0	7.0	5.0	30	24
	64	46.5	40.5	7.0	5.0	30	24
	76	53.0	46.8	7.0	5.0	30	24
	90	60.3	54.0	7.0	5.0	35	20
3 – Leg (Code:K2)	51	36.5	31.8	7.0	5.0	30	24
	64	43.6	38.1	7.0	5.0	30	24
	76	50.2	44.5	7.0	5.0	30	24
	90	56.5	50.8	7.0	5.0	30	24

- High ripple, suitable to use in industrial power supplies for inverter circuitry, etc.
- Load life 2,000 hours at 105°C.

Item	Performance Characteristics		
Category Temperature Range	-40 ~ +105℃		-25 ~ +105℃
Working Voltage Range	200~250Vdc		350~400Vdc
Capacitance Range	1,500~39,000μF		1,000~15,000μF
Capacitance Tolerance	±20% (at 20℃ and 120Hz)		
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200 ~ 250	350 ~ 400
	tan δ (Max)	0.25	0.20
	The above values should be increased by 0.02 for every additional 1000μF		
Leakage Current	I=0.01CV or 5000μA, whichever is smaller I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes(at 120Hz)		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.		
	Capacitance change	≒ ±20% of the initial value	
	Dissipation factor(tan δ)	≒ 200% of the specified value	
	Leakage current	≒ specified value	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 105℃ without voltage applied.		
	Capacitance change	≒ ±20% of the initial value	
	Dissipation factor(tan δ)	≒ 200% of the specified value	
	Leakage current	≒ specified value	
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4		

Terminal Code :SS

[illegible]

SS Series

◆ Case size & Permissible rated ripple current: (A rms) at 105°C / 120Hz

Vdc uF	ΦD	200								250							
		Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
		ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC
1500										51× 80	2.4						
1800										51×100	2.8						
2200		51× 80	2.9							51×100	3.2	64×80	3.0				
2700		51×100	3.4							51×120	3.7	64×80	3.6				
3300		51×100	3.9	64×80	3.7					51×120	4.4	64×100	4.3				
3900		51×120	4.6	64×100	4.4							64×100	5.0				
4700				64×100	5.1							64×120	5.9	76×100	5.6		
5600				64×120	6.1							64×120	6.6	76×100	6.4		
6800				64×120	7.2	76×100	7.0					64×150	7.3	76×120	7.1		
8200				64×120	7.9	76×100	7.6					64×150	8.9	76×120	8.6		
10000				64×150	8.5	76×120	8.2							76×150	10.0	90×120	9.6
12000						76×120	9.3	90×100	8.9					76×190	11.5	90×150	11.1
15000						76×150	10.4	90×120	9.9							90×170	12.7
18000						76×170	13.2	90×120	12.7							90×190	14.1
22000						76×190	15.7	90×150	15.1							90×230	15.4
27000						76×190	15.7	90×150	15.1								
33000								90×190	15.9								
39000								90×230	18.0								

Vdc uF	ΦD	350								400							
		Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
		ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC	ΦD× L	RC
1000		51× 80	3.9							51× 80	3.9						
1200		51× 80	4.2							51×100	4.6	64× 80	4.2				
1500		51×100	5.2							51×120	5.6	64× 80	6.0				
1800		51×100	5.7	64×80	5.4					51×120	6.4	64×100	6.5				
2200		51×120	7.1	64×100	6.7							64×100	6.9				
2700				64×100	7.7							64×120	8.2	76×100	7.7		
3300				64×120	9.1							64×120	9.5	76×100	9.0		
3900				64×120	10.4	76×100	9.8					64×150	11.1	76×120	10.5	90×100	9.9
4700				64×150	12.2	76×120	11.5							76×120	12.0	90×100	11.4
5600						76×120	13.1	90×100	12.4					76×150	14.0	90×120	13.3
6800						76×150	15.5	90×120	14.7					76×190	17.3	90×150	16.5
8200						76×170	19.0	90×150	18.1							90×170	18.1
10000						76×190	20.9	90×150	19.9							90×190	21.7
12000								90×190	23.8							90×230	25.8
15000								90×230	28.8								

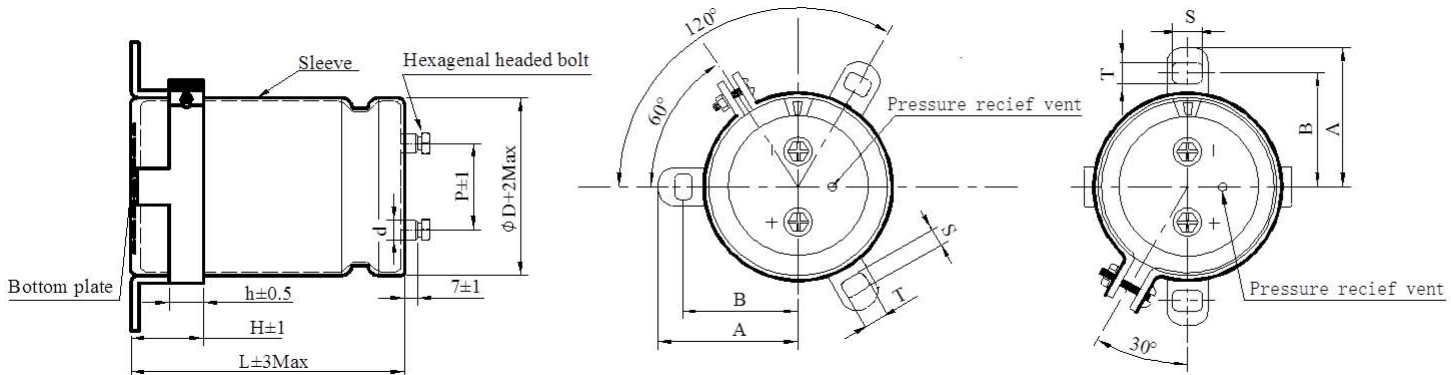
◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	60	120	300	1K	10K
200 ~ 400	0.70	1.00	1.10	1.30	1.40

SS Series

◆ DIMENSIONS (Screw-Mount) [mm]



◆ Terminal pitch and Nominal dia.of bolt

Terminal Code	ϕD	$P \pm 1$	Nominal dia.of bolt	$d \pm 0.5$
LS	51	22.4	M5	10
	64	28.0	M5	10
	76	31.5	M5	10
	90	31.5	M5	10
LA	64	28.0	M5	13
	76	31.5	M5	13
	90	31.5	M5	13
LB	76	31.5	M6	17
	90	31.5	M6	17

◆ Dimensions of mounting bracket

Leg shape	D	$A \pm 2$	$B \pm 1$	$T \pm 0.5$	$S \pm 0.5$	$H \pm 1$	$h \pm 0.5$
2 – Leg (Code:K1)	51	40.0	34.0	7.0	5.0	30	24
	64	46.5	40.5	7.0	5.0	30	24
	76	53.0	46.8	7.0	5.0	30	24
	90	60.3	54.0	7.0	5.0	35	20
3 – Leg (Code:K2)	51	36.5	31.8	7.0	5.0	30	24
	64	43.6	38.1	7.0	5.0	30	24
	76	50.2	44.5	7.0	5.0	30	24
	90	56.5	50.8	7.0	5.0	30	24

SN Series

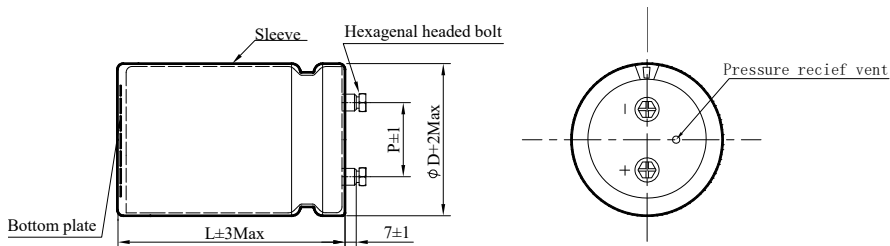
- High ripple, suitable to use in industrial power supplies for inverter circuitry, etc.
- Load life 5,000 hours at 105°C

◆ SPECIFICATIONS

Item	Performance Characteristics				
Category Temperature Range	-40~+105℃			-25 ~ +105℃	
Working Voltage Range	200~250Vdc			350~400Vdc	
Capacitance Range	1,500~39,000μF			1,000~15,000μF	
Capacitance Tolerance	±20% (at 20℃ and 120Hz)				
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	200 ~ 250	350 ~ 400	The above values should be increased by 0.02 for every additional 1000μF	
	tan δ (Max)	0.25	0.20		
Leakage Current	I=0.01CV or 5000μA, whichever is smaller I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 5 minutes(at 120Hz)				
Low Temperature Characteristics Impedance Ratio(MAX) Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃.				
	Capacitance change	≒ ±20% of the initial value			
	Dissipation factor(tan δ)	≒ 200% of the specified value			
	Leakage current	≒ specified value			
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 105℃ without voltage applied.				
	Capacitance change	±20% of the initial value			
	Dissipation factor(tan δ)	≒ 200% of the specified value			
	Leakage current	≒ specified value			
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4				

◆ DIMENSIONS(mm)

Terminal Code :SS



ΦD	51	64	76	90
P±1	22.4	28.0	31.5	31.5

◆ PART NUMBER SYSTEM(Example : 350V 10000μF)

S	N	3	5	0	M	1	0	3	S	W	7	6	I	0						
															Special Request					
															Size code(7610 : 76×180)					
															Lead length code					
															Capacitance code(10000μF)					
															Capacitance tolerance code(M: ±20%)					
															Voltage code(350V)					
															Series code(SN)					

SN Series

◆ Case size & Permissible rated ripple current: (A rms) at 105°C / 120Hz

uF \ Vdc ΦD	200								250							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1500									51×80	2.4						
1800									51×100	2.8						
2200	51×80	2.9							51×100	3.2	64×80	3.0				
2700	51×100	3.4							51×120	3.7	64×80	3.6				
3300	51×100	3.9	64×80	3.7					51×120	4.4	64×100	4.3				
3900	51×120	4.6	64×100	4.4							64×100	5.0				
4700			64×100	5.1							64×120	5.9	76×100	5.6		
5600			64×120	6.1							64×120	6.6	76×100	6.4		
6800			64×120	7.2	76×100	7.0					64×150	7.3	76×120	7.1		
8200			64×120	7.9	76×100	7.6					64×150	8.9	76×120	8.6		
10000			64×150	8.5	76×120	8.2							76×150	10.0	90×120	9.6
12000					76×120	9.3	90×100	8.9					76×190	11.5	90×150	11.1
15000					76×150	10.4	90×120	9.9							90×170	12.7
18000					76×170	13.2	90×120	12.7							90×190	14.1
22000					76×190	15.7	90×150	15.1							90×230	15.4
27000					76×190	15.7	90×150	15.1								
33000							90×190	15.9								
39000							90×230	18.0								

uF \ Vdc ΦD	350								400							
	Φ51		Φ64		Φ76		Φ90		Φ51		Φ64		Φ76		Φ90	
	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC	ΦD×L	RC
1000	51×80	3.9							51×80	3.9						
1200	51×80	4.2							51×100	4.6	64×80	4.2				
1500	51×100	5.2							51×120	5.6	64×80	6.0				
1800	51×100	5.7	64×80	5.4					51×120	6.4	64×100	5.2				
2200	51×120	7.1	64×100	6.7							64×100	6.9				
2700			64×100	7.7							64×120	8.2	76×100	7.7		
3300			64×120	9.1							64×120	9.5	76×100	9.0		
3900			64×120	10.4	76×100	9.8					64×150	11.1	76×120	10.5	90×100	9.9
4700			64×150	12.2	76×120	11.5							76×120	12.0	90×100	11.4
5600					76×120	13.1	90×100	12.4					76×150	14.0	90×120	13.3
6800					76×150	15.5	90×120	14.7					76×190	17.3	90×150	16.5
8200					76×170	19.0	90×150	18.1							90×170	18.1
10000					76×190	20.9	90×150	19.9							90×190	21.7
12000							90×190	23.8							90×230	25.8
15000							90×230	28.8								

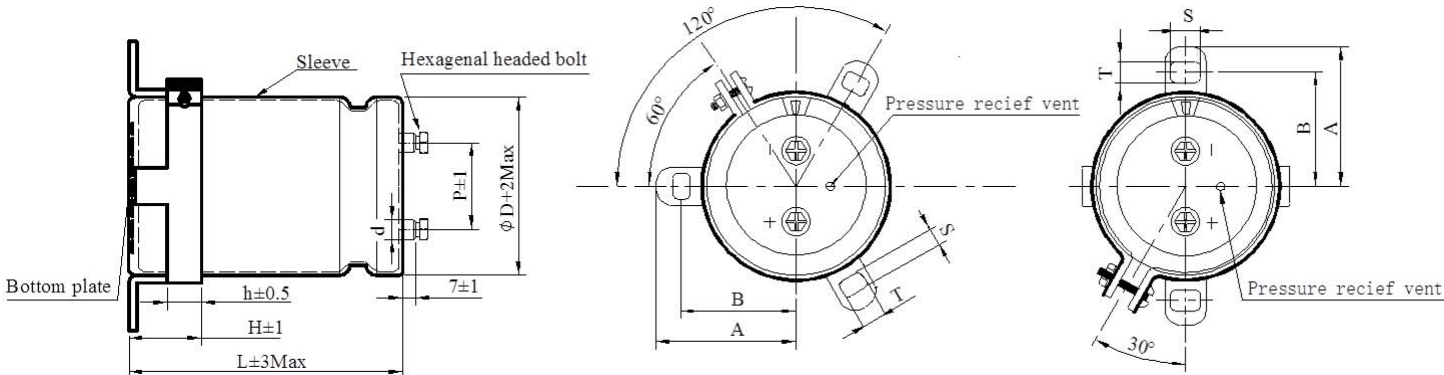
◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Frequency (Hz)				
	60	120	300	1K	10K
200 ~ 400	0.70	1.00	1.10	1.30	1.40

SN Series

◆ DIMENSIONS (Screw-Mount) [mm]



◆ Terminal pitch and Nominal dia.of bolt

Terminal Code	ΦD	$P \pm 1$	Nominal dia.of bolt	$d \pm 0.5$
LS	51	22.4	M5	10
	64	28.0	M5	10
	76	31.5	M5	10
	90	31.5	M5	10
LA	64	28.0	M5	13
	76	31.5	M5	13
	90	31.5	M5	13
LB	76	31.5	M6	17
	90	31.5	M6	17

◆ Dimensions of mounting bracket

Leg shape	D	$A \pm 2$	$B \pm 1$	$T \pm 0.5$	$S \pm 0.5$	$H \pm 1$	$h \pm 0.5$
2 – Leg (Code:K1)	51	40.0	34.0	7.0	5.0	30	24
	64	46.5	40.5	7.0	5.0	30	24
	76	53.0	46.8	7.0	5.0	30	24
	90	60.3	54.0	7.0	5.0	35	20
3 – Leg (Code:K2)	51	36.5	31.8	7.0	5.0	30	24
	64	43.6	38.1	7.0	5.0	30	24
	76	50.2	44.5	7.0	5.0	30	24
	90	56.5	50.8	7.0	5.0	30	24

◆铝电解电容器的使用注意事项：

一、电路设计

1.在确认使用及安装环境时，作为按产品设计说明书上所规定的额定工作范围内使用的电容器，应当避免在下述情况中使用：

- (1) 超温 (温度超过上限类别温度，或低于下限类别温度)；
- (2) 过流 (电流超过额定纹波电流)；
- (3) 过压 (电压超过额定电压)；
- (4) 施加反向电压或交流电压；
- (5) 使用于反复多次充电和放电的电路中。
- (6) 直接与水、盐水及油类相接触、或结露的环境；
- (7) 充满有害气体的环境 (O₃、H₂S、SO₂、NO₂、Cl₂、NH₄等)；
- (8) 置于日照、紫外线及有放射性物质的环境；
- (9) 振动及冲击条件超过了样本说明书的规定范围。

2、在设计电路，选用电容器型号时，必须确认以下内容：

- (1) 温度及频率的变化所引起电容器电性能变化，不超出电容器的电气特性额定范围；
- (2) 当电容器套管的绝缘不能保证时，在有特定绝缘性能要求的地方请不要使用。
- (3) 两只或两只以上电容器串联连接时的电压均衡。
- (4) 在电路设计时，请选用与机器寿命相当的电容器；
- (5) 机器对产品性能有特殊要求时，可与我司研发人员探讨，制作适用的特殊电容器。

3、在设计电容器的安装时，必须确认下述内容：

- (1) 电容器正、负极引脚间距必须与线路板孔距相吻合；
- (2) 保证电容器防爆阀上方留有一定的空间；
- (3) 电容器防爆阀上方尽量避免设计、安装其它组件；
- (4) 电容器在电路板上的安装位置，请不要有其它配线；
- (5) 电容器四周及电路板上尽量避免设计、安装发热元件。
- (6) 电容器外壳、辅助引出端子与正、负极以及电路板间必须完全隔离。
- (7) 双面印刷板上安装电容器时，电容器的安装位置避免多余的基板孔和过孔；

二、组件安装

1、 安装时，请遵守以下内容：

- (1) 对整机中且已通过电压后卸下的电容器，除了是为了定期检测的外，请不要再使用；
- (2) 当电容器产生再生电压时，需通过约 1kΩ左右的电阻进行放电；
- (3) 产品的漏电流在产品存储超过 1 年后会升高；如果漏电流升高，请使用 1KΩ的电阻进行加电压处理。产品的保管期限，原则上为制造后 2 年以内。
- (4) 确认规格(静电容量及额定电压等)和极性后，再安装；
- (5) 不要让电容器掉到地上，掉下的电容器请确认特性合格后再使用；
- (6) 变形的电容器不要安装；
- (7) 电容器正、负极间距与电路板孔距必须相吻合；
- (8) 自动插件机的机械手力量不宜过大。

2、焊接时，请确认下面内容：

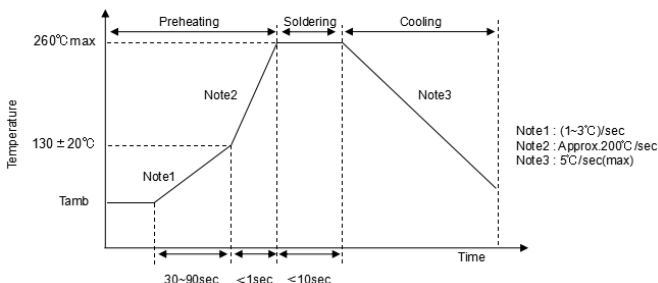
(1) 电烙铁焊接

在焊接铝电解电容器时，其焊接时间和焊接温度不应超过 10 秒钟及 400 摄氏度。注意不要将焊锡附在端子以外的电容器表面上；电烙铁等高温发热装置应与电解电容器塑料外壳保持适当的距离，以防止过热造成塑料套管破裂。

(2) 正流焊接（不适用 SMD 品）

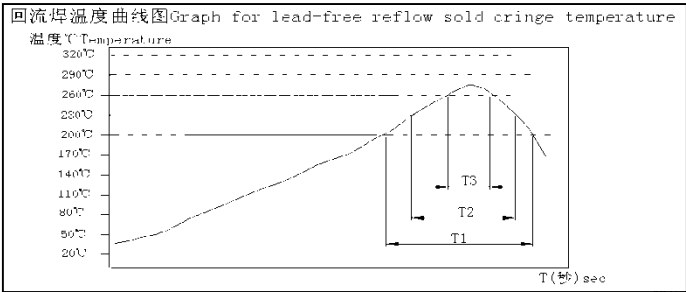
请在以下正流焊流的条件范围内

Flow Soldering (Radial Lead Type)



步骤	温度	时间	次数
预热	120℃以下	120 秒以下	1 次
焊接	260±5℃	10 秒以下	1 次或 2 次

(3) 回流焊 (ΦD*L ≤ 10*16)



时间段	T1	T2	T3
温度要求 (°C)	160	170	180
时间 (秒)	≤15	≤10	≤5
最高温度: ≤185			

3、焊接后的处理应不产生以下的机械应力：包括使电容器发生倾倒、扭转；使电容器碰到线路板或其它元件。

4、焊接后清洗：

清洗剂	清洗方法
Pine Alpha ST-100S Clean Through 750H IPA(异丙醇) Aqua Cleaner 210SEP	使用浸渍、超声波等方法，清洗剂为 60℃以下，清洗时间不超过 5 分钟。 清洗后，请将安装电容器的电路板以热风干燥 10 分钟以上 (热风温度控制电容器的上限类别温度以下)

(1) 请不要使用含卤溶剂、强碱类、石油类溶剂以及含有二甲苯、丙酮溶剂的清洗剂；

(2) 为保护地球环境，请充分做好清洗剂污染管理(电导率、PH 值、比重、水分含水率等)； (3) 根据不同的清洗方法，有时会造成产品标识模糊等后果。

5、使用固定剂、涂层剂时，请确认以下内容：

- (1) 不使用含卤素的固定剂、树脂涂层剂；
- (2) 在使用固定剂、涂层剂前，请将电路板与电容器之间清扫干净，不能残留焊接残渣及污垢；
- (3) 固定剂，涂层剂吸附前， 确保无清洗液残留，并进行干燥处理；
- (4) 固定剂，涂层剂吸附前， 请勿将电容器封口部分的整个面堵塞。

三、组装使用：

1、组装中，请确认电容器的端子间没有直接接触，或经导体物质或导电性溶液引起的短路。

2、使用中，直接接触电容器的端子，会有导致触电的危险。

3、请确认所安装电容器所处环境不属于以下环境：

- (1) 与水或油污接触或处于结露环境中；
- (2) 日光、紫外线、O3 及放射线直接照射或接触电容器；
- (3) 处于充满酸性、或碱性气体的环境(H2S、SO2、NO2 、 Cl2、NH4 等)；
- (4) 处于酸性、或碱性溶剂溅落的场所；
- (5) 震动及冲击超出样本或规格说明中的规定值。

四、保守点检

工厂企业用的电容器，必须定期点检（其项目包括外观检查及电性能的测试）。

五、意外情况

- 1、组装使用过程中，如电容器防爆阀打开，请切断组装主电源或拔下电源线插头。
- 2、电容器防爆阀动作时，因有超过 100℃高温气体喷出，此时不可将脸接近，一旦喷出的气体进入眼睛时立即用水清洗眼睛；若电解液溅入口中，应立即用清水反复漱口进行清理；电解液溅到皮肤上时，先用肥皂清洗，然后用清水冲干净。

六、熏蒸处理

当组装电容器的电子产品出口到海外时，用溴化钾等卤化物进行熏蒸处理，采用此方法可能会产生由卤素离子引起的腐蚀反应，请务必小心；熏蒸时，熏蒸液不能直接接触电子产品，同时有必要进行充分干燥处理；不能确定有无熏蒸液附着及干燥是否充分时，有必要对安全性进行检验。

七、储存条件

- 1、在温度为 5~30℃，湿度在 75%一下的室内储存；
- 2、确认存放场所不属于{三、组装使用.3}的环境及同等条件下。

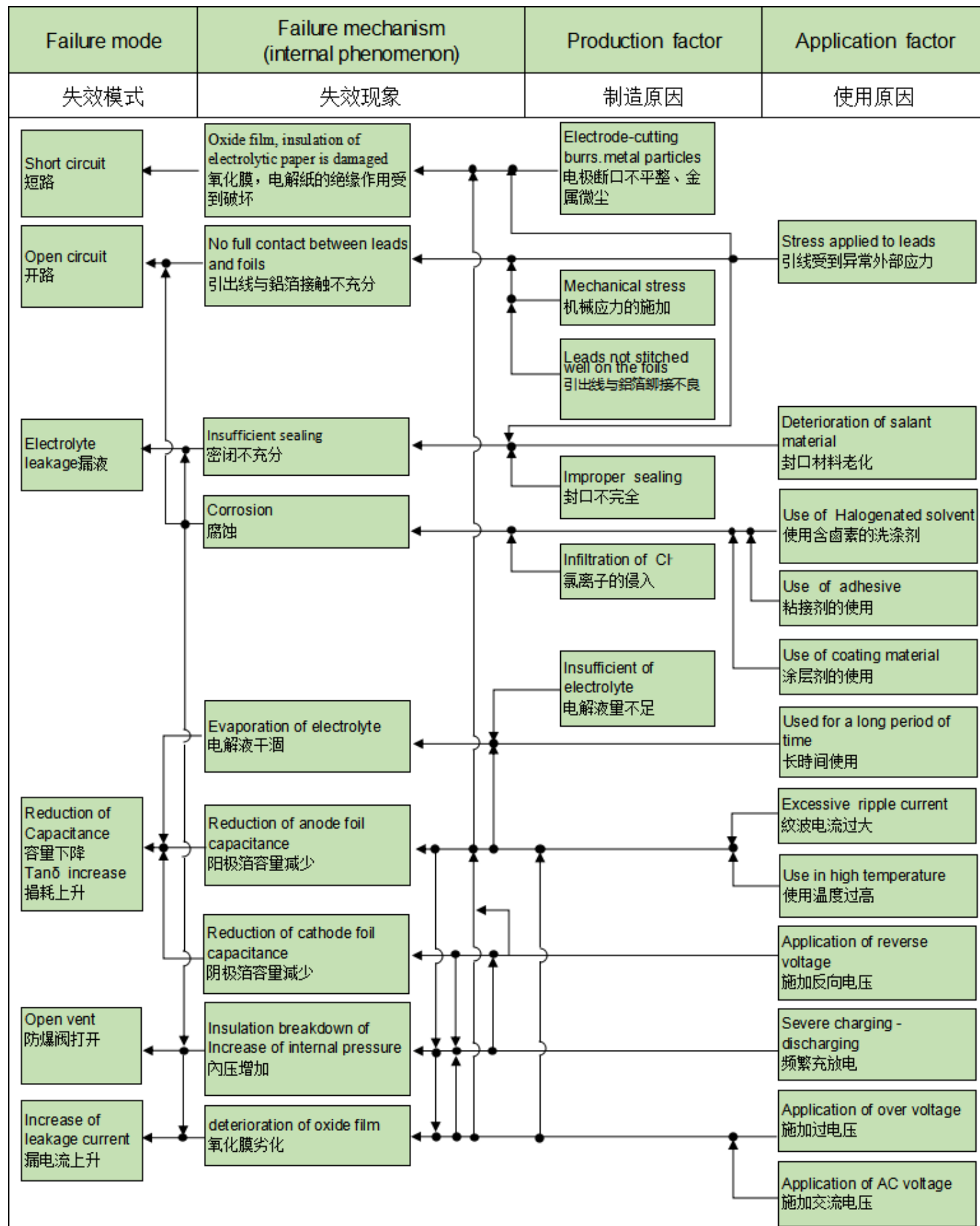
八、报废情况：

废弃的电容器，确认其已放电后，可选用下面的方法进行处理：

- 1、电容器上开孔或压碎后焚烧；
- 2、交由专业的工业废弃物处理厂处理。

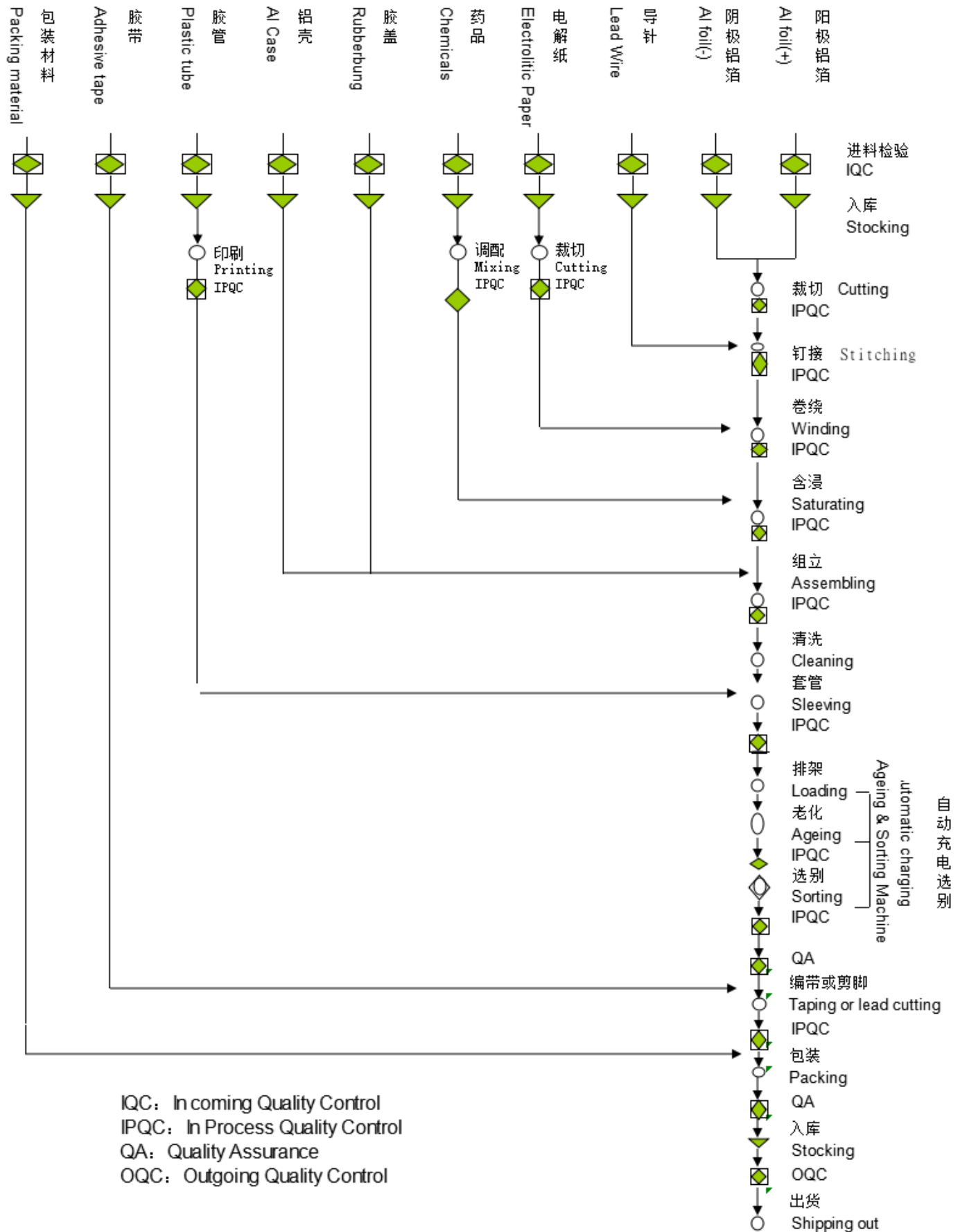
◆ 铝电解电容器失效模式及原因分析.

◆ Typical failure modes and factors of aluminum electrolytic capacitors.

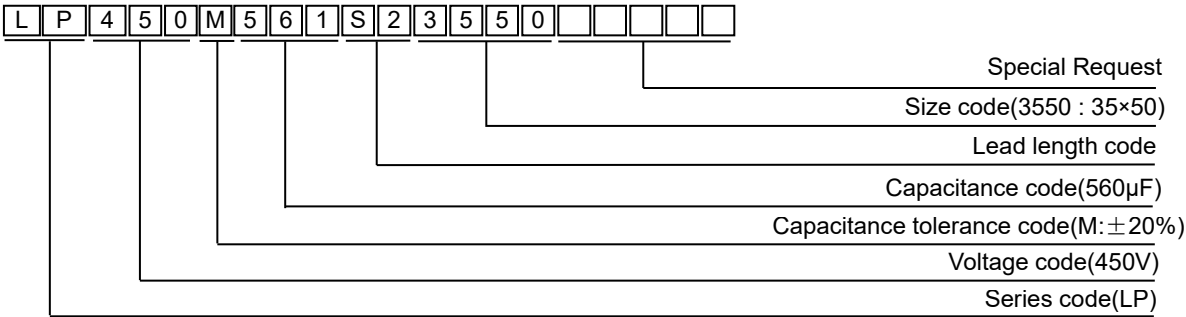


◆ 生产流程图

◆ Production Flow Chart



- ◆ 产品编码规则
- ◆ Product coding rules.

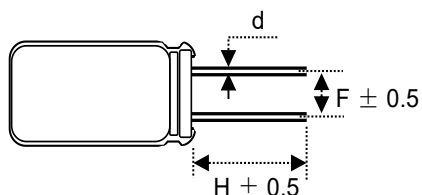


Note: Please refer to our APPROVAL SHEET for specific Product numbers.

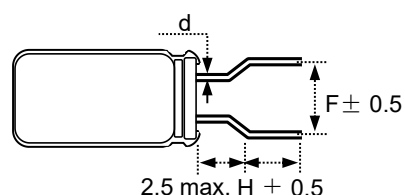
详细的制品编码，见《承认书》。

◆ Diagram Of Lead Cutting And Forming(Unit:mm)

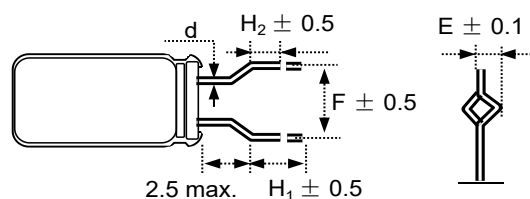
[Shape (A)]



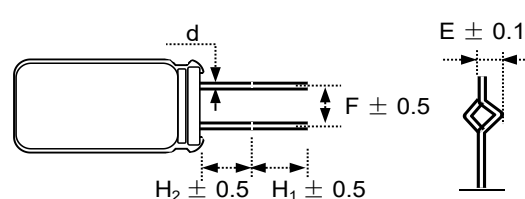
[Shape (B)]



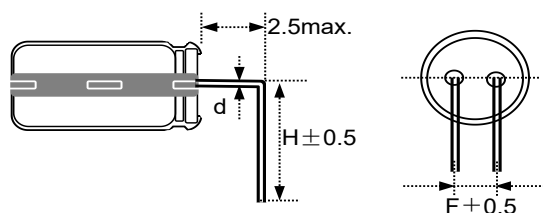
[Shape (C)]



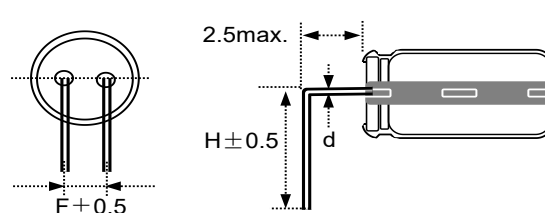
[Shape (D)]



[Shape (E)]



[Shape (F)]

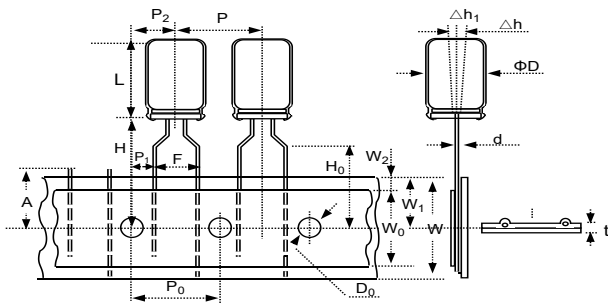
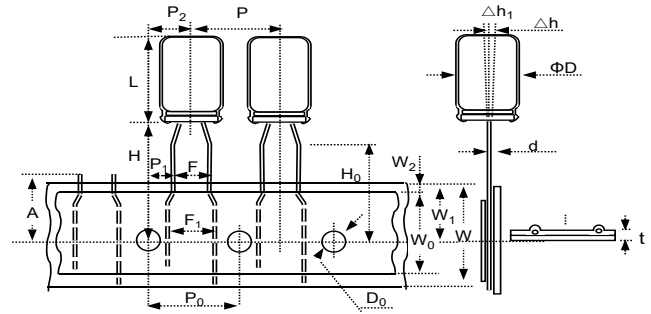
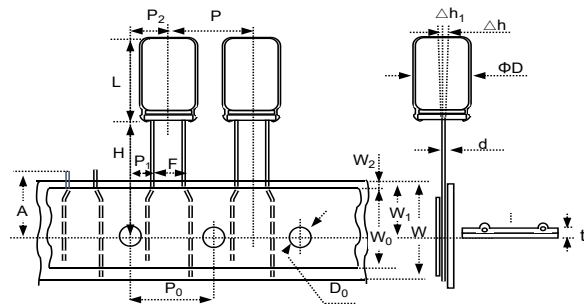
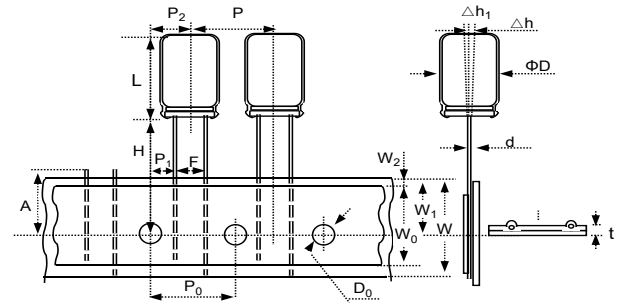


◆ 尺寸表 (单位:mm) Dimension (Unit:mm)

Shape	Cutting & Forming Methods	DΦ	4Φ	5Φ	6.3Φ	8Φ	10Φ	13Φ	16Φ	18Φ	22Φ
A	Lead Cut Only	F	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
		H	—	—	—	—	—	—	—	—	—
		d	0.45	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
B	Lead Cut and Form	F	5.0	5.0	5.0	5.0	—	—	—	—	—
		H	4.0	5.0	5.0	5.0	—	—	—	—	—
		d	0.45	0.5	0.5	0.5	—	—	—	—	—
C	Lead Cut,Crimp and Form	F	5.0	5.0	5.0	5.0	—	—	—	—	—
		H ₁	4.0	5.0	5.0	5.0	—	—	—	—	—
		H ₂	1.8	1.8	1.8	1.8	—	—	—	—	—
		d	0.45	0.5	0.5	0.5	—	—	—	—	—
D	Lead Cut and Crimp	F	—	—	—	—	5.0	5.0	7.5	7.5	10
		H ₁	—	—	—	—	5.0	5.0	5.0	5.0	5.0
		H ₂	—	—	—	—	1.8	1.8	1.8	1.8	1.8
		d	—	—	—	—	0.6	0.6	0.8	0.8	0.8
E	Facing negative mark Lead Cutting and Bending 90° turn right (BR).	F	—	—	—	3.5	5.0	5.0	7.5	7.5	—
		H	—	—	—	—	—	—	—	—	—
		d	—	—	—	0.5	0.6	0.6	0.8	0.8	—
F	Facing negative mark Lead Cutting and Bending 90° turn left (BL).	F	—	—	—	3.5	5.0	5.0	7.5	7.5	—
		H	—	—	—	—	—	—	—	—	—
		d	—	—	—	0.5	0.6	0.6	0.8	0.8	—

For Automatic Insertion Taping Capacitors

◆ Diagram Of Taping Dimensions (Unit:mm)

[Fig. 1 (Diameter for $\Phi 4$ to $\Phi 5$)][Fig. 2 (Diameter for $\Phi 4$ to $\Phi 5$)][Fig. 3 (Diameter for $\Phi 6$ to $\Phi 8$)][Fig. 4 (Diameter for $\Phi 10$, $\Phi 13$ 、 $\Phi 16$)]

BERYL

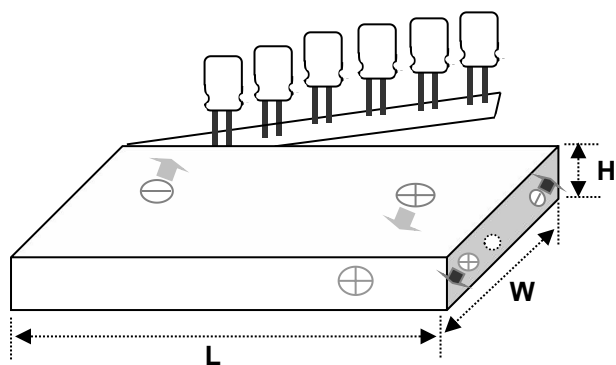
◆ 尺寸表 (单位:mm) Dimension (Unit:mm)

[illegible]

◆ 尺寸表 (单位:mm) Dimension (Unit:mm)

Item	Symbol	Case Size						Tolerance	Remark
		13×21	13×25	13×30	16×26	16×32	16×36		
Lead Wire diameter	d	0.6			0.8			±0.05	
Body height	L	24.0	27.0	32.0	28.0	34.0	38.0	max	
Intervals of bodies	P	15.0			30.0			±1.0	Fig.4
Intervals of punched holes	P0	15.0						±0.2	
Distance between holes and	P1	5.0			3.75			±0.7	
Distance between holes and	P2	7.5						±1.0	
Distance between lead and lead	F	5.0			7.5			+0.8	
								-0.2	
Base tape width	W	18.0						±0.5	
Adhesive tape width	W0	12						min	
Deviation between holes and	W1	9.0						±0.5	
Deviation between adhesive	W2	1.5						min	
Deviation between body	H	18.5						±0.75	Fig.4
Punched hole diameter	D0	4.0						±0.3	
Length of not good idea slit	A	11.0						max	
Base and adhesive tape	t	0.7						±0.3	
Deviation of body alignment	△h	0						±2.0	
Deviation of body alignment	△h1	0						±1.0	

• 包装信息 Packing Information



L	W	H	Case size ΦD×L (mm)	Q'TY(pcs)
340	150	50	3×5	2,000
340	200	50	4×5、4×7	2,000
340	250	50	5×5、5×7	2,000
			8×5、8×7	1,000
340	300	50	6.3×5、6.3×6、6.3×7	2,000
340	260	54	4×11、5×9、5×11	2,000
			8×9、8×10、8×12.5、8×15	1,000
340	200	54	10×8、10×9、10×10、10×13、10×15、10×16	500
340	300	54	6.3×9、6.3×11、6.3×15	2,000
340	260	62	8×20	1,000
340	200	62	10×20	500
340	200	65	10×25	500
330	290	65	13×13、13×15、13×20	500
			13×25	500
			18×15、18×20、18×25	250
320	230	65	16×15、16×20、16×25	250