Quick Reference

Series	Features	WVDC	Capacitance	Temp Range	Page
General Purpose					
GR	85'C, 2000hrs	6.3~100 160~450	0.1~22000	-40~+85'C -25~+85'C	9
SM	105'C, 2000hrs	6.3~100 160~400 450	0.1~15000	-55~+105'C -40~+105'C -25~+105'C	11
BM	105'C, 2000hrs, Shorter profile for SM	6.3~100 160~250	10~15000	-40~+105'C -25~+105'C	13
Long Life					
FM	105'C, 2000~5000hrs Long life	10~250	0.47~4700	-55~+105'C	15
Low Profile					
SS	85'C, 1000hrs, Miniature for 7mm/9mm height	4~63	0.1~470	-40~+85'C	17
SX	105'C, 1000hrs, Miniature for 7mm/9mm height	4~63	0.1~470	-40~+105'C	19
SF	85'C, 1000hrs, Ultra-miniature for 5mm height	4~50	0.1~330	-40~+85'C	21
FX	105'C, 1000hrs, Ultra-miniature for 5mm height	4~50	0.1~330	-40~+105'C	23
Low Leakage Current					
LL	85'C, 1000hrs	6.3~100	0.1~15000	-40~+85'C	25
LX	105'C, 1000hrs	6.3~100	0.1~15000	-40~+105'C	27
SL	85'C, 1000hrs, Miniature for 7mm height	4~63	0.1~220	-40~+85'C	29
SH	105'C, 1000hrs, Miniature for 7mm height	4~63	0.1~220	-40~+105'C	31
Low Impedance					
LZ	105'C, 2000hrs	6.3~50	4.7~10000	-55~+105'C	33
LB	105'C, 2000hrs	160~450	2.2~220	-40~+105'C	35
LC	105'C, 5000hrs	160~450	3.3~330	-40~+105'C	37
LU	105'C, 1000~5000hrs Low Impedance & Long life	6.3~100	5.6~6800	-55~+105'C	39
LW	105'C, 2000hrs Ultra low ESR	4~16	470~3300	-40~+105'C	42
Bi/Non Polar					
RN	85'C, 1000hrs, Non-polar	6.3~250	0.47~6800	-40~+85'C	44
RX	105'C, 1000hrs, Non-polar	6.3~250	0.47~6800	-40~+105'C	46
SN	85'C, 1000hrs, Non-polar, Miniature for 7mm height	4~63	0.1~100	-40~+85'C	48
SP	105'C, 1000hrs, Non-polar, Miniature for 7mm height	4~63	0.1~100	-40~+105'C	50
RB	85'C, 1000hrs, Non-polar for crossover & speaker network	25~100	1~33	-40~+85'C	52
BP	85'C, 1000hrs, Bi-polar, Horizontal correction	25~50	1~33	-40~+85'C	54
BX	105'C, 1000hrs, Bi-polar, Horizontal correction	25~50	1~100	-40~+105'C	56
Snap-in Terminal					
TW	85'C, 2000hrs	10~100 160~450	56~56000	-40~+85'C -25~+85'C	58
HW	105'C, 2000hrs	10~100 160~450	56~68000	-40~+105'C -25~+105'C	63
DW	105'C, 2000hrs,20mm height	10~100 160~450	27~10000	-40~+105 -25~+105	68
SW	105'C, 3000hrs, 20mm height &Long life	10~100 160~450	27~10000	-40~+105 -25~+105	71
Electric Double Layer Capacitors					
EL	60'C, 2.5V, 1000hrs	2.5	7~54	-25~+60'C	74
EG	60'C, 2.5V, 1000hrs, High capacitance	2.5	4~70	-25~+60'C	75
SMD Chip Type					
GV	85'C, 2000hrs, Low profile	4~100	0.1~1000	-40~+85'C	76
FV	85'C, 3000~5000hrs, Long life	4~100	0.1~1000	-40~+85'C	78
SV	105'C, 1000hrs, Low profile	4~100	0.1~1000	-40~+105'C	80
DV	105'C, 2000hrs, Long Life	6.3~100	0.1~1000	-40~+105'C	82
RV	85'C, 1000hrs, Non-polar	6.3~50	0.22~47	-40~+85'C	84
ZV	105'C, 1000hrs, Low impedance	4~50	0.1~1000	-40~+105'C	86
EV	105'C, 1000hrs, Ultra Low impedance	6.3~25	4.7~1000	-40~+105'C	88

Part Number Instruction

1	2~3	4~6	7	8~10	11~12	13	14	15~17	18	19
E	**GR**	**107**	**M**	**6R3**	**S1**	**A**	**1**	**C11**	**0**	**RH**
TYPE	SERIES	CAP	TOL.	VOLTAGE	LEAD	SPEC.	SLEEVE	CASE	OTHERS	RoHS

Code 1 Type

Code	Model Type
E	Standard Type
V	SMD (V-Chip) Type
L	Snap-in Type

Code 2~3 Series Name (as content page 3&4)

Code 4~6 Capacitance

0.47 μF = 474
4.7 μF = 475
47 μF = 476
470 μF = 477
4700 μF = 478

Code 7 Tolerance M = ±20% , K = ±10% ,V = +20～－10%

Code 8~10 Voltage

6.3V = 6R3
63V = 063
100V = 100
450V = 450

Code 11~12 Lead Process

Explanation for code 11° (also see Diagram below)

S : Standard T : Ammo tape R : Reel tape
C : Straight cut K : Kink(Crimp)cut F : Forming cut

		Description
S	0	Standard SMD type
	1	Standard Dip & Snap-in type
T	1	Standard ammo tape (pitch 5mm for dia .~ 13mm)
	2	Ammo tape with straight lead (available for dia. 4~8mm)
	4	Ammo forming tape with pitch 2.5mm (available for dia.4~5mm)
R	1	Standard reel tape (pitch 5mm for dia.~ 10mm)
	2	Reel tape with straight lead (available for dia. 4~8mm)
	3	Reel forming tape with pitch 2.5mm (available for dia.4~5mm)

Code 11&12		Description
C	3	Straight cut lead with L : 3.2+/-0.2mm
	5	Straight cut lead with L : 4.0+/-0.2mm
	7	Straight cut lead with L : 5.0+/-0.2mm
K	2	Kink cut lead with L : 4.5+/-0.5mm
F	6	Forming cut lead with L : 4.0+/-0.3 (Pitch : 5mm)

Code 13 Special specification

A : Standard D : Impedance
B : DF (tan δ) E : Ripple current
C : ESR F : Leakage current

Code 14 Sleeve code

Code	Series	Color
1	GR,SR	Royal blue with white printing
3	LL,LX,SL,SH	Orange with black printing
5	SM,BM,LM,HM,FM,AM,SS,SX SF,FX,RN,RX,SN,SP,BP,BX,TW,HW	Black with white printing
6	LB,LH,LY,LZ	Black with golden printing
H	LW	Royal blue with golden printing
N	DV,FV,GV,SV,RV,ZV	(SMD standard pack)

Code 15~17 Case size code

For Dip & Snap-in type

Code	Size (mm)	Code	Size (mm)	Code	Size (mm)	Code	Size (mm)	Code	Size (mm)	Code	Size (mm)
A05	3*5	G09	8*9	H25	10*25	M32	16*32	Q45	22*45	S35	30*35
B05	4*5	G11	8*11	H30	10*30	M36	16*36	Q50	22*50	S40	30*40
B07	4*7	G14	8*14	L13	13*13	M40	16*40	R25	25*25	S45	30*45
C05	5*5	G16	8*16	L16	13*16	N32	18*32	R30	25*30	S50	30*50
C07	5*7	G20	8*20	L20	13*20	N36	18*36	R35	25*35	T25	35*25
C11	5*11	H1C	10*12.5	L25	13*25	N40	18*40	R40	25*40	T30	35*30
E05	6.3*5	H15	10*15	L32	13*32	Q25	22*25	R45	25*45	T35	35*35
E07	6.3*7	H16	10*16	L36	13*36	Q30	22*30	R50	25*50	T40	35*40
E11	6.3*11	H17	10*17	M16	16*16	Q35	22*35	S25	30*25	T45	35*45
G07	8*7	H20	10*20	M26	16*26	Q40	22*40	S30	30*30	T50	35*50

For SMD type

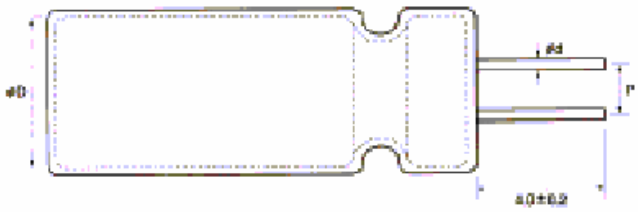
Code	A01	B01	C01	E01	G02	G03	H03
Size (mm)	3*5.4	4*5.4	5*5.4	6.3*5.4	8*6.2	8*10.2	10*10.2

Code 18 Other special instruction (“ 0 ” for standard)

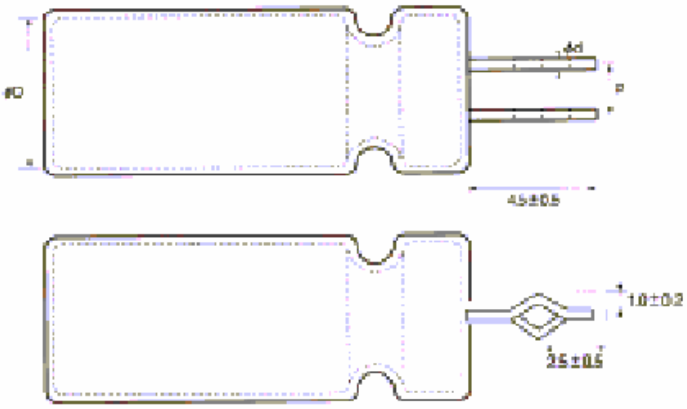
Code 19 Blank for Standard; “RH” for RoHS Compliant

Detailed Diagrams for Code 11-12

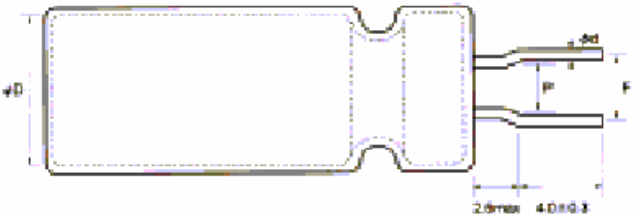
Code C5 : Straight Cut



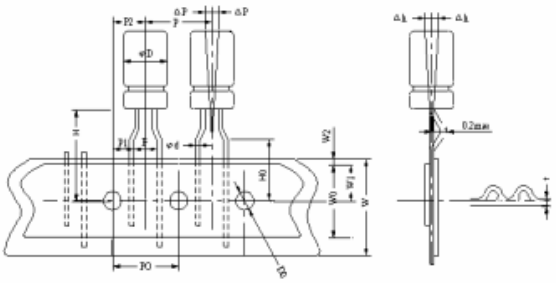
Code K2 : Kink cut, & Crimping



Code F6 : Forming Cut (ø4~ø8)



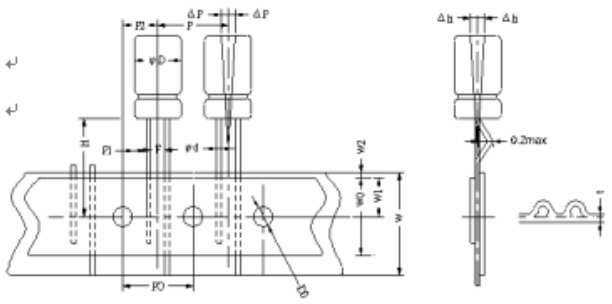
Code T1/R1 : Ammo / Reel Tape (ϕ 4 - ϕ 8)



SYMBOL	CASE SIZE				TOLERANCE
	4× 5~7	5× 5~11	6.3× 5~11	8× 7~14	
Φ d	0.45	0.45 or 0.5		0.6	± 0.05
P	12.7				± 1.0
P0	12.7				± 0.3
P1	3.85				± 0.5
P2	6.35				± 1.0
F	5.0				+0.6 –0.2
W	18.0				± 0.5
W0	12.0 min				-
W1	9.0				± 0.5
W2	3.0 max				-
H	18.5 (20.0)				± 0.75
H0	16.0				± 0.5
D0	4.0				± 0.3
ΔP	0.2 max				-
Δh	0.2max				-
t	0.7				± 0.3

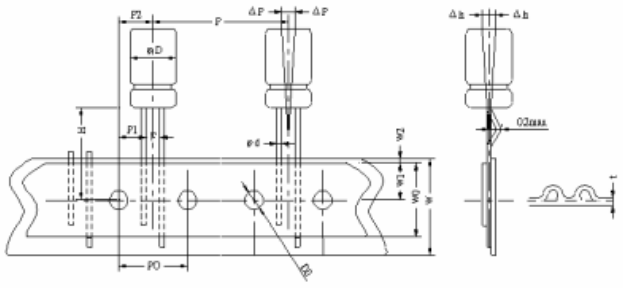
( ) : Code T6

Code T1/R1 : Ammo / Reel Tape (ϕ 10)



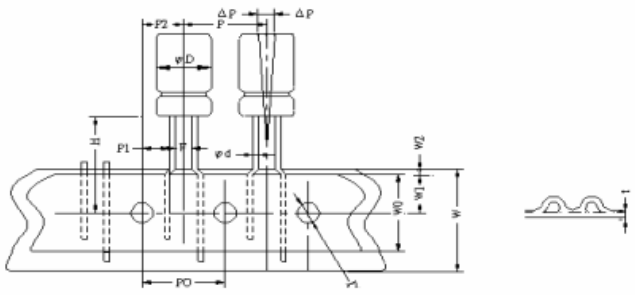
SYMBOL	CASE SIZE	TOLERANCE
	10*12~20	
Φ d	0.6	± 0.05
P	12.7	± 1.0
P0	12.7	± 0.3
P1	3.85	± 0.5
P2	6.35	± 1.0
F	5.0	+0.6 –0.2
W	18.0	± 0.5
W0	12.0 min	-
W1	9.0	± 0.5
W2	3.0 max	-
H	18.5	± 0.75
D0	4.0	± 0.3
ΔP	0.2 max	-
Δh	0.2max	-
t	1.0	± 0.3

Code T1/R1 : Ammo / Reel Tape (ϕ 13-ϕ 16)



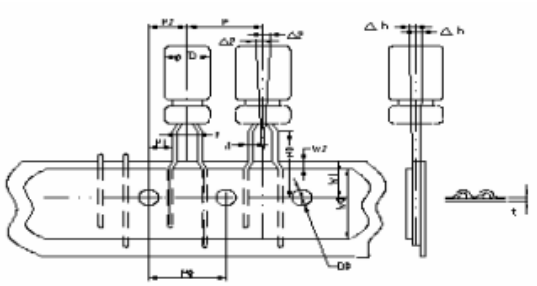
SYMBOL	CASE SIZE		TOLERANCE
	13*13~25	16*16~26	
Φ d	0.6	0.8	± 0.05
P	30.0		± 1.0
P0	15.0		± 0.3
P1	5.0	3.75	± 0.7
P2	7.5		± 1.3
F	5.0	7.5	+0.6 -0.2
W	18.0		± 0.5
W0	12.0 min		-
W1	9.0		± 0.5
W2	3.0 max		-
H	18.5		± 0.75
D0	4.0		± 0.3
ΔP	0.2 max		-
Δh	0.2max		-
t	1.0		± 0.3

Code T2/R2 : Ammo / Reel Tape with straight lead



SYMBOL	CASE SIZE				TOLERANCE
	4×5~7	5×5~11	6.3×5~11	8×7~14	
Φ d	0.45	0.45 or 0.5		0.6	± 0.05
F	1.5	2.0	2.5	3.5	+0.6 -0.2
P1	5.6	5.35	5.10	4.60	± 0.5
P0		12.7			± 0.3
P		12.7			± 1.0
P2		6.35			± 1.0
W		18.0			± 0.5
W0		12.0min			-
W1		9.0			± 0.5
W2		3.0max			-
H		18.5			± 0.75
D0		4.0			± 0.3
Δp		0.2max			-
t		0.7			± 0.2

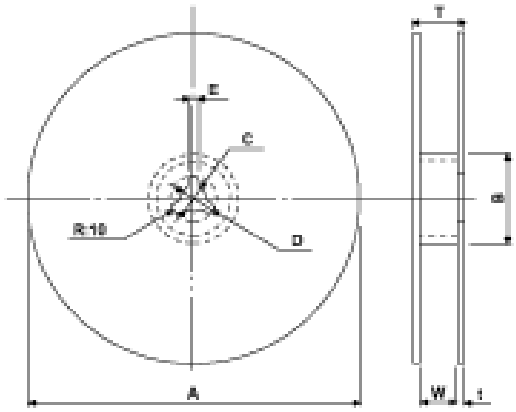
Code T4/R3 : Ammo / Reel Formed Tape (ϕ 4～ϕ 5／pitch 2.5mm)



SYMBOL	Case Sizes		Tolerance
	4x 5~4x 7	5x 5~5x 11	
Φ d	0.45	0.45 or 0.5	± 0.05
P	12.7		± 1.0
P0	12.7		± 0.3
P1	5.10		± 0.5
P2	6.35		± 1.0
F	2.5		+0.6 −0.2
W	18.0		± 0.5
W0	12.05 min		-
W1	9.0		± 0.5
W2	2.0 max		-
H	18.5		± 0.75
H0	17.9		± 0.5
D0	4.0		± 0.3
ΔP	0.2max		-
Δh	0.2 max		-
t	0.7		± 0.2

V-chip Packaging Specifications

•Reel Dimensions in mm(not to scale)

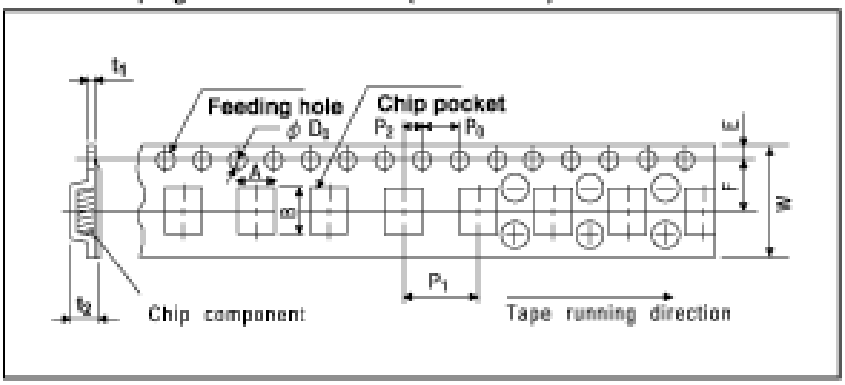


Size	A	B	C	D	E	W	T	t
φ4 ~ φ5	380±2	50min	13.0±0.5	21.0±0.8	2.0±0.5	14±1	20±1	3.0
φ6.3 ~ φ8*1	380±2	50min	13.0±0.5	21.0±0.8	2.0±0.5	18±1	24±1	3.0
φ8*2 ~ φ10	380±2	50min	13.0±0.5	21.0±0.8	2.0±0.5	26±1	32±1	3.0

*1: = 6.2 mm *2: = 10.2 mm

Reel Tape

Taping Dimensions in mm(not to scale)



*Ask factory for technical specifications.

Symbol / Size	W	A	B	Po±0.1	P1	P2±0.1	F	φ Do	t1	E	t2
φ 4x5.4	12.0	4.7	4.7	4.0	8.0	2.0	5.5	$1.5^{+0.1}_{-0}$	0.4	1.75	5.8
φ 5x5.4	12.0	5.7	5.7	4.0	12.0	2.0	5.5	$1.5^{+0.1}_{-0}$	0.4	1.75	5.8
φ 6.3x5.4	16.0	7.0	7.0	4.0	12.0	2.0	7.5	$1.5^{+0.1}_{-0}$	0.4	1.75	5.8
φ 8x6.2	16.0	8.7	8.7	4.0	12.0	2.0	7.5	$1.5^{+0.1}_{-0}$	0.4	1.75	6.8
φ 8x10.2	24.0	8.7	8.7	4.0	16.0	2.0	11.5	$1.5^{+0.1}_{-0}$	0.4	1.75	11.0
φ 10x10.2	24.0	10.7	10.7	4.0	16.0	2.0	11.5	$1.5^{+0.1}_{-0}$	0.4	1.75	11.0

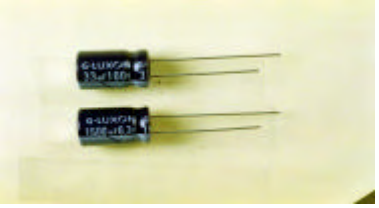
Packaging Specification

Size (mm)	Q'ty per reel	Inner carton / measurement (mm)		Outer carton / measurement (mm)	
φ 4x5.4	2,000	20,000	390x195x395	40,000	420x410x414
φ 5x5.4	1,000	10,000	390x195x395	20,000	420x410x414
φ 6.3x5.4	1,000	10,000	390x235x405	20,000	420x410x492
φ 8x6.2	1,000	10,000	390x235x405	20,000	420x410x492
φ 8x10.2	500	4,000	390x255x405	8,000	420x410x530
φ 10x10.2	500	4,000	390x255x405	8,000	420x410x530

GR Series

■ Features
- Lifetime:85℃,2000hrs
- General purpose

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~100VDC / 160~450VDC
Operating Temperature Range	-40 ~ +85℃ / -25 ~ +85℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
SV	8	13	20	32	44	63	79	125	200	250	300	400	450	500

Leakage Current (Max) (20℃)

I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes)

I≦0.03CV+10μA (After rated voltage applied for 3 minutes)

I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
tan δ	0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.10	0.20	0.20	0.20	0.24	0.24	0.24

When nominal capacitance is over 1000μF, tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	2	3	3	3	4	4	4
Z(-40℃) / Z(20℃)	8	6	4	4	3	3	3	3	-	-	-	-	-	-

Load Life

After applying rated voltage for 2000 hours at 85℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

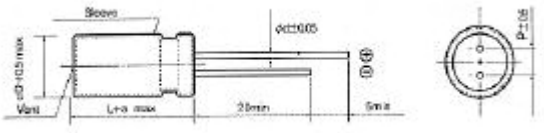
Shelf Life

After placed at 85℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC)	Freq.(Hz) / Cap (μF)	50	120	1K	10K
6.3~100	0.1~82	0.75	1.00	1.57	2.00
	100~820	0.80	1.00	1.34	1.50
	1000~22000	0.85	1.00	1.13	1.15
160~450	0.47~1000	0.80	1.00	1.40	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size & Max Ripple Current

CASE SIZE (ψDxL(mm)) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

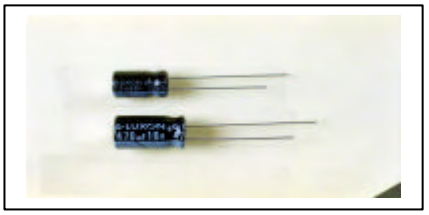
WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1											5x11	1	5x11	1
0.22											5x11	2	5x11	2
0.33											5x11	3	5x11	3
0.47											5x11	5	5x11	5
1											5x11	10	5x11	10
2.2											5x11	20	5x11	20
3.3											5x11	30	5x11	30
4.7							5x11	45	5x11	45	5x11	50	5x11	50
10					5x11	50	5x11	55	5x11	60	5x11	70	5x11	75
22	5x11	65	5x11	75	5x11	75	5x11	85	5x11	95	5x11	100	5x11	120
33	5x11	80	5x11	85	5x11	95	5x11	105	5x11	110	5x11	130	6.3x11	145
47	5x11	95	5x11	105	5x11	110	5x11	120	5x11	135	6.3x11	170	8x11	195
100	5x11	135	5x11	155	5x11	160	6.3x11	195	6.3x11	220	8x11	270	10x12.5	325
220	5x11	240	6.3x11	255	8x11	265	8x11	330	10x15	390	10x17	500	10x20	580
330	6.3x11	300	8x11	355	8x11	375	8x14	450	10x17	500	10x20	600	13x20	780
470	6.3x11	390	8x11	425	8x11	450	10x15	640	10x20	760	13x20	880	13x25	990
1000	10x12.5	550	10x12.5	665	10x17	800	10x20	900	13x25	1170	13x30	1360	16x32	1770
2200	10x20	935	10x20	1000	13x20	1200	13x25	1450	16x32	1840	16x36	1940	18x40	2170
3300	13x20	1290	13x20	1330	13x25	1550	16x26	1850	16x36	2130	18x40	2460		
4700	13x20	1420	13x25	1850	13x30	1880	16x36	2360	18x36	2530				
6800	16x26	1980	16x26	2030	16x32	2360	16x40	2540						
10000	16x36	2170	18x36	2390										
15000	18x36	2430	18x36	2630										
22000	18x40	2650	18x45	2900										

WV	100		160		200		250		350		400		450	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47	5x11	5	5x11	5	5x11	5	5x11	5	5x11	5	6.3x11	5	6.3x11	5
1	5x11	10	5x11	15	5x11	15	6.3x11	15	6.3x11	15	6.3x11	15	8x11	15
2.2	5x11	20	6.3x11	30	6.3x11	30	6.3x11	30	8x11	30	8x11	30	10x12.5	30
3.3	5x11	30	6.3x11	45	6.3x11	45	8x11	45	8x14	45	10x15	45	10x15	45
4.7	5x11	50	6.3x11	55	8x11	70	8x11	70	10x12.5	70	10x15	70	10x17	70
10	6.3x11	85	10x15	120	10x17	135	10x17	145	10x17	155	10x20	170	13x20	180
22	8x11	135	10x17	190	10x17	205	10x20	230	13x20	265	13x25	305	16x26	365
33	10x15	195	10x20	240	13x20	300	13x25	360	13x25	365	16x26	430	16x36	530
47	10x15	265	13x20	325	13x25	385	13x25	420	16x26	460	16x26	470		
100	10x20	385	16x26	600	16x26	610	16x32	650	18x36	700	18x36	850		
220	13x30	750	16x32	810	18x36	960	18x36	1020						
330	16x26	870	18x36	1090	18x40	1360								
470	16x36	1190	18x45	1510										
1000	18x45	2140												

SM Series

■ Features
- Lifetime:105℃,2000hrs
- Wide temperature range for GR
- General purpose

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~100 VDC / 160~400 VDC / 450 VDC
Operating Temperature Range	-55 ~ +105℃ / -40 ~ +105℃/ -25 ~ +105℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
SV	8	13	20	32	44	63	79	125	200	250	300	400	450	500

Leakage Current (Max) (20℃)

I≦0.01CV or3μA whichever is greater (After rated voltage applied for 2 minutes)

I≦0.03CV+10μA (After rated voltage applied for 3 minutes)

I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
tan δ	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.15	0.15	0.15	0.20	0.20	0.20

When nominal capacitance is over 1000μF, tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z(120Hz)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	2	3	3	3	4	4	4
Z(-40℃) / Z(20℃)	8	6	4	4	3	3	3	3	-	-	-	-	-	-

Load Life

After applying rated voltage for 2000 hours at 105℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

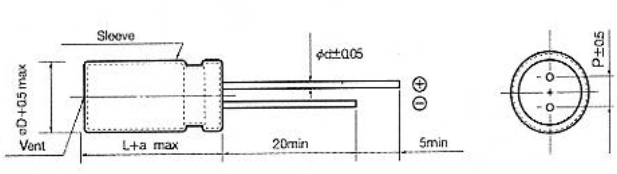
Shelf Life

After placed at 105℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC)	Freq. (Hz) / Cap (μF)	50	120	1K	10K
6.3~100	0.1~82	0.75	1.00	1.57	2.00
	100~820	0.80	1.00	1.34	1.50
	1000~22000	0.85	1.00	1.13	1.15
160~450	0.47~330	0.80	1.00	1.40	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1											5x11	1	5x11	1
0.22											5x11	2	5x11	2
0.33											5x11	3	5x11	3
0.47											5x11	5	5x11	5
1											5x11	10	5x11	10
2.2											5x11	20	5x11	20
3.3											5x11	30	5x11	30
4.7							5x11	35	5x11	40	5x11	45	5x11	50
10					5x11	45	5x11	50	5x11	50	5x11	55	5x11	60
22			5x11	60	5x11	65	5x11	70	5x11	75	5x11	85	6.3x11	95
33	5x11	60	5x11	70	5x11	75	5x11	85	5x11	95	6.3x11	105	8x11	120
47	5x11	75	5x11	85	5x11	95	5x11	105	6.3x11	120	6.3x11	135	8x11	160
100	5x11	110	5x11	130	6.3x11	155	6.3x11	160	8x11	190	8x11	220	10x12.5	290
220	6.3x11	190	6.3x11	210	8x11	215	8x11	270	10x15	350	10x17	400	10x20	470
330	8x11	270	8x11	290	8x11	300	8x14	365	10x17	450	10x20	520	13x20	630
470	8x11	330	8x11	340	8x11	365	10x15	510	10x20	610	13x20	705	13x25	790
680	8x14	410	8x14	440	8x14	460	10x17	555	10x20	725	13x20	815	16x26	1030
1000	10x12.5	440	10x15	560	10x17	645	10x20	715	13x25	935	13x30	1040	16x32	1320
1500	10x17	620	10x17	640	13x20	800	13x25	1040	16x26	1160	16x32	1410	16x36	1470
2200	10x20	750	10x20	810	13x20	970	16x26	1280	16x32	1470	16x36	1570		
3300	13x20	1040	13x20	1060	13x25	1240	16x32	1570	16x36	1700				
4700	13x20	1140	13x25	1490	13x30	1560	16x36	1790						
6800	16x26	1590	16x26	1620	16x32	1890								
10000	16x36	1950	18x36	2180	18x36	2220								
15000	18x36	2340	18x36	2410										
22000	18x40	2560												

WV	100		160		200		250		350		400		450	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47	5x11	5	5x11	5	5x11	5	6.3x11	5	6.3x11	5	8x11	5	8x11	5
1	5x11	10	5x11	15	5x11	15	6.3x11	15	6.3x11	15	8x11	15	8x11	15
2.2	5x11	20	6.3x11	30	6.3x11	30	8x11	30	8x11	30	10x12.5	30	10x12.5	30
3.3	5x11	30	8x11	45	8x11	45	8x11	45	10x12.5	45	10x15	45	10x15	45
4.7	5x11	50	8x11	55	8x11	60	10x12.5	70	10x12.5	70	10x17	70	10x17	70
10	6.3x11	70	10x15	100	10x17	120	10x17	120	10x17	130	10x20	135	13x20	170
22	8x11	110	10x17	155	10x20	170	10x20	190	13x20	215	13x25	240	16x26	300
33	10x15	160	10x20	195	13x20	255	13x25	305	13x25	310	16x26	360	16x36	425
47	10x15	215	13x20	265	13x25	305	13x25	340	16x26	375	16x36	435	18x36	545
100	10x20	305	16x26	475	16x26	485	16x32	530	18x36	580	18x36	680		
220	13x30	605	16x32	650	18x36	765								
330	16x26	700	18x40	910										
470	16x36	990												
680	18x36	1270												
1000	18x45	1740												

BM Series

■ Features
- Lifetime:105℃,2000hrs
- Wide temperature range for SR
- Shorter profile for SM
- General purpose

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication

Specifications

Items	Characteristics											
Capacitance Tolerance	±20% (M) (120Hz,20℃)											
Rated Voltage Range (WV)	6.3~100 VDC									160~250 VDC		
Operating Temperature Range	-40 ~ +105℃									-25 ~ +105℃		
Surge Voltage (V) (20℃)	WV	6.3	10	16	25	35	50	63	100	160	200	250
	SV	8	13	20	32	44	63	79	125	200	250	300
Leakage Current (Max) (20℃)	I≦0.01CV or3μA whichever is greater (After rated voltage applied for 2 minutes)									I≦0.03CV+10μA (After rated voltage applied for 3 minutes)		
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)											
Dissipation Factor (Max) (tanδ) (120Hz ,20℃)	WV	6.3	10	16	25	35	50	63	100	160	200	250
	tanδ	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.15	0.15	0.15
	When nominal capacitance is over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF.											

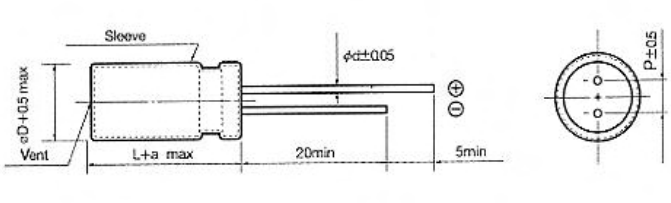
Low Temperature Stability Impedance Ratio (Max)	WV / Z (120Hz)	6.3	10	16	25	35	50	63	100	160	200	250
	Z(-25℃) / Z(20℃)	4	3	2	2	2	2	3	3	3	4	4
	Z(-40℃) / Z(20℃)	8	6	4	4	3	3	4	4	4	5	5

Load Life: After applying rated voltage for 2000 hours at 105℃, the capacitor shall meet the following requirement.

Capacitance Change	Within±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life	After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.
Applicable standards	Refer to JIS C 5101

Dimensions (mm)



ΨD	10	13	16	18
P	5.0	5.0	7.5	7.5
Ψd	0.6	0.6	0.8	0.8
a	1.0	2.0	2.0	2.0

Multiplier for Ripple Current

Frequency coefficient

WV (VDC)	Freq. (Hz) / Cap (μF)	50	120	1K	10K~100K
6.3~100	10~82	0.75	1.00	1.57	2.00
	100~820	0.80	1.00	1.34	1.50
	1000~10000	0.85	1.00	1.13	1.15
160~250	10~100	0.80	1.00	1.40	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT （RC(mArms) / 120Hz,105℃）

WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
100											10x12.5	270	10x12.5	195
220									10x12.5	325	13x16	450	13x16	375
330					10x12.5	360	10x12.5	400	13x16	510	13x16	555	16x16	460
470			10x12.5	410	10x12.5	440	13x16	610	13x16	650	16x16	730	16x20	710
1000	10x12.5	440	10x12.5	520	13x16	730	16x20	940	16x20	870	18x20	1050	18x26	970
2200	13x16	790	13x16	850	16x16	1000	16x20	1140	18x20	1290				
3300	16x16	1070	16x16	1100	16x20	1280	18x26	1530						
4700	16x16	1170	18x20	1560	18x26	1760								
6800	16x20	1430	18x20	1630										
10000	18x26	1810	18x26	1900										

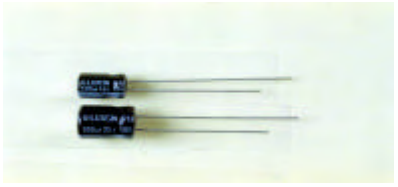
WV	100		160		200		250	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
10			10x12.5	95	10x12.5	100	10x12.5	110
22			13x16	170	13x16	180	13x16	205
33	10x12.5	145	13x16	215	13x16	240	16x16	270
47	13x16	255	13x16	250	16x16	290	18x16	340
100	13x16	325	16x20	425	18x20	470	18x26	520
220	18x20	620						
330	18x26	750						

FM Series

Specifications

■ Features
- Lifetime:105℃, 2000~ 5000hrs
- Wide temperature range
- Long life

■ Recommended Applications
- Circuit for control(Low voltage)
- Electronic Ballast(High voltage)
- SMPS



Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	10~250 VDC
Operating Temperature Range	-55 ~ +105℃

Surge Voltage (V) (20℃)

WV	10	16	25	35	50	63	100	160	200	250
SV	13	20	32	44	63	79	125	200	250	300

Leakage Current (Max) (20℃)

I≦0.01CV or3μA whichever is greater (After rated voltage applied for 2 minutes)

I≦0.03CV+10μA (After rated voltage applied for 3 minutes)

I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	10	16	25	35	50	63	100	160	200	250
tan δ	0.30	0.25	0.22	0.18	0.15	0.15	0.15	0.20	0.20	0.20

When nominal capacitance is over 1000μF, tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	10	16	25	35	50	63	100	160	200	250
Z(-40℃) / Z(20℃)	3	2	2	2	2	2	2	2	2	2
Z(-55℃) / Z(20℃)	9	6	6	5	5	5	5	5	5	5

Load Life

After applying rated voltage for 5000 hours at 105℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±30% of the initial value
Dissipation Factor	Not more than 300% of the specified value
Leakage Current	Not more than the specified value

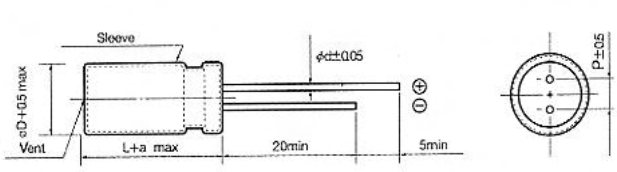
Shelf Life

After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



φD	8	10	13	16	18
P	3.5	5.0	5.0	7.5	7.5
φd	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC)	Freq.(Hz) / Cap (μF)	50	120	1K	10K
10~100	0.47~82	0.75	1.00	1.57	2.00
	100~820	0.80	1.00	1.34	1.50
	1000~4700	0.85	1.00	1.13	1.15
160~250	0.47~100	0.80	1.00	1.40	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT （RC(mArms) / 120Hz,105℃）

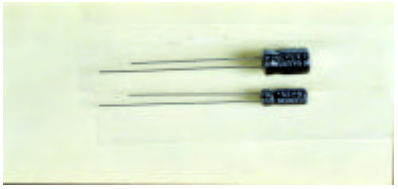
WV	10		16		25		35		50		63		100	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47													8x11	5
1													8x11	15
2.2													8x11	30
3.3													8x11	45
4.7									8x11	70	8x11	70	8x11	70
10									8x11	85	8x11	90	8x11	105
22									8x11	130	8x11	135	10x15	190
33							8x11	150	10x12.5	175	10x12.5	190	10x20	240
47					8x11	160	8x11	170	10x12.5	225	10x12.5	250	13x20	365
100	8x11	210	8x11	220	10x12.5	275	10x12.5	295	10x17	390	10x20	450	16x26	570
220	10x12.5	350	10x12.5	360	10x17	470	10x20	500	13x20	630	13x25	760	16x32	890
330	10x15	490	10x17	520	10x20	620	13x20	740	13x25	840	16x26	1030	16x36	1050
470	10x17	600	10x20	710	13x20	840	13x25	1000	16x26	1100	16x32	1260		
1000	13x20	960	13x25	1130	16x26	1300	16x26	1310	16x36	1630	18x40	2000		
2200	16x26	1470	16x26	1815	16x36	1910	18x36	2100						
3300	16x32	1910	16x36	2160	18x40	2340								
4700	16x36	2630	18x36	2650										

WV	160		200		250	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47					8x11	5
1					8x11	15
2.2	8x11	30	8x11	30	10x12.5	30
3.3	10x12.5	45	10x12.5	45	10x15	45
4.7	10x12.5	70	10x17	70	10x17	70
10	10x17	135	10x20	160	13x20	180
22	13x20	240	13x25	280	13x25	305
33	13x25	315	16x26	400	16x26	430
47	16x26	410	16x26	450	16x32	560
100	16x36	710	18x36	770		

SS Series

■ Features
- Lifetime:85℃,1000hrs
- Low profile/Miniature
- 7mm/9mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Small signal



Specifications

Items	Characteristics								
Capacitance Tolerance	±20% (M) (120Hz,20℃)								
Rated Voltage Range (WV)	4~63 VDC								
Operating Temperature Range	-40 ~ +85℃								
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50	63
	SV	5	8	13	20	32	44	63	79
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)								
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	4	6.3	10	16	25	35	50	63
	tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08

Low Temperature Stability Impedance Ratio (Max)

Z (120Hz) \ WV	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	4	4	4

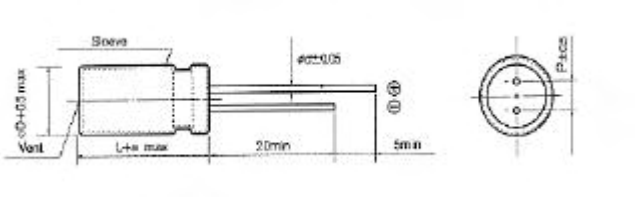
Load Life: After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than in specified value

Shelf Life: After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.

Applicable standards: Refer to JIS C 5101

Dimensions (mm)



ψD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
ψd	0.45	0.5	0.5	0.5 (0.6)
a	1.0	1.0	1.0	1.0

( ) : L = 9

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq.(Hz)	50	120	1K	10K
4~16	0.80	1.00	1.10	1.20
25~35	0.80	1.00	1.50	1.70
50~63	0.80	1.00	1.60	1.90

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

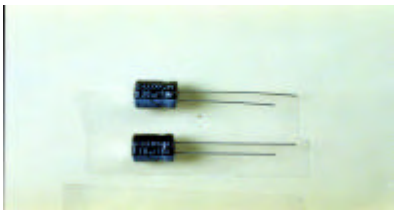
WV	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
2.2							4x7	10				
3.3							4x7	10				
4.7							4x7	20	4x7	20	4x7	25
10							4x7	30	4x7	35	4x7	40
22					4x7	35	4x7	40	4x7	50	5x7	60
33	4x7	35	4x7	40	4x7	45	4x7	50	5x7	65	6.3x7	75
47	4x7	40	4x7	50	4x7	60	5x7	70	6.3x7	75	6.3x7	80
100	5x7	65	5x7	80	5x7	90	6.3x7	110	8x7	120	8x7	145
220	6.3x7	110	6.3x7	120	6.3x7	135	8x7	180				
330			8x7	170	8x9	170	8x9	230				
470			8x9	230	8x9	240	8x9	280				

WV	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	10	4x7	10
2.2	4x7	20	4x7	20
3.3	4x7	25	4x7	30
4.7	4x7	35	5x7	40
10	5x7	45	6.3x7	55
22	6.3x7	70		
33	8x7	85		
47	8x7	100		

SX Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for SS
- Low profile/Miniature
- 7mm/9mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Small signal



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~63 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50	63
SV	5	8	13	20	32	44	63	79

Leakage Current (Max)

I≦0.01CV or 3μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V) (20℃)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	4	6.3	10	16	25	35	50	63
tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	4	4	4

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.

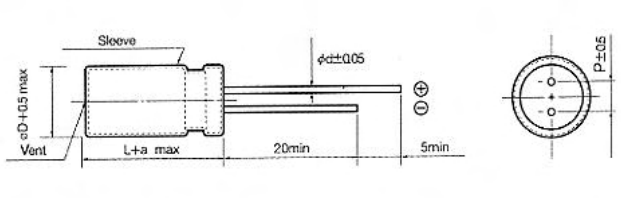
Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life

After placed at 105℃ without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards	Satisfied JIS C 5101

Dimensions (mm)



ψD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
ψd	0.45	0.5	0.5	0.5 (0.6)
a	1.0	1.0	1.0	1.0

( ) : L = 9

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
4~16	0.80	1.00	1.10	1.20
25~35	0.80	1.00	1.50	1.70
50~63	0.80	1.00	1.60	1.90

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

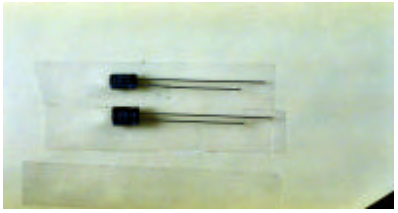
WV	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
2.2							4x7	10				
3.3							4x7	10				
4.7							4x7	15	4x7	20	4x7	25
10							4x7	25	4x7	30	4x7	35
22					4x7	30	4x7	35	5x7	50	6.3x7	60
33	4x7	30	4x7	35	4x7	40	5x7	50	6.3x7	65	6.3x7	70
47	4x7	35	5x7	50	5x7	60	6.3x7	70	6.3x7	70	8x7	80
100	5x7	55	5x7	70	6.3x7	90	8x7	110	8x7	115	8x9	145
220	6.3x7	95	6.3x7	110	8x7	135	8x9	180				
330			8x7	150	8x9	160	8x9	210				
470			8x9	200	8x9	210						

WV	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	10	4x7	10
2.2	4x7	20	4x7	20
3.3	4x7	25	4x7	25
4.7	4x7	30	5x7	35
10	5x7	40	6.3x7	50
22	6.3x7	65		
33	8x7	80		
47	8x9	100		

SF Series

■ Features
- Lifetime:85℃,1000hrs
- Low profile/Ultra -miniature
- 5mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Small signal



Specifications

Items	Characteristics							
Capacitance Tolerance	±20% (M) (120Hz,20℃)							
Rated Voltage Range (WV)	4~50 VDC							
Operating Temperature Range	-40 ~ +85℃							
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50
	SV	5	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)							
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	4	6.3	10	16	25	35	50
	tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	4	6.3	10	16	25	35	50
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	4	4

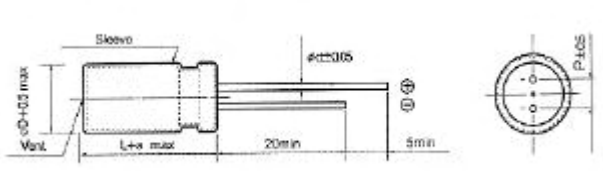
Load Life: After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life: After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.

Applicable standards: Refer to JIS C 5101

Dimensions (mm)



ψD	4	5	6.3
P	1.5	2.0	2.5
ψd	0.45	0.45	0.45
a	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
4~16	0.80	1.00	1.10	1.20
25~50	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

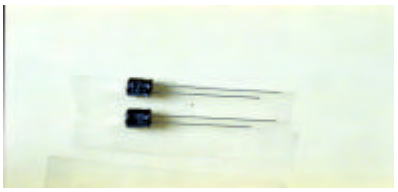
CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

WV	4		6.3		10		16		25		35		50	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1													4x5	1
0.22													4x5	2
0.33													4x5	3
0.47													4x5	5
1													4x5	10
2.2													4x5	15
3.3													4x5	20
4.7							4x5	10	4x5	15	4x5	20	5x5	25
10			4x5	20	4x5	20	4x5	25	4x5	30	5x5	35	6.3x5	40
22	4x5	25	4x5	30	5x5	30	5x5	35	5x5	40	6.3x5	55	6.3x5	60
33	4x5	30	5x5	35	5x5	40	5x5	45	6.3x5	60				
47	5x5	35	5x5	40	6.3x5	50	6.3x5	60						
100	6.3x5	60	6.3x5	70	6.3x5	75	6.3x5	95						
220	6.3x5	80	6.3x5	95										

FX Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for SF
- Low profile/Ultra -miniature
- 5mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Small signal



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~50 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50
SV	5	8	13	20	32	44	63

Leakage Current (Max) (20℃)

I≦0.01CV or 3μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	4	6.3	10	16	25	35	50
tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	4	6.3	10	16	25	35	50
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	4	4

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

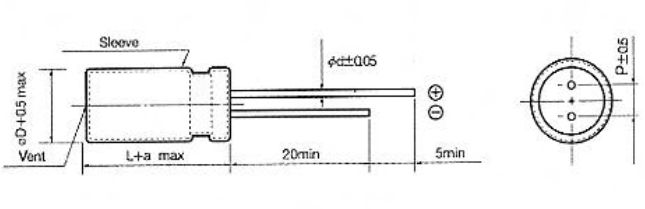
Shelf Life

After placed at 105℃without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



φD	4	5	6.3	8
P	1.5	2.0	2.5	2.5
φd	0.45	0.45	0.45	0.45
a	1.0	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) / Freq. (Hz)	50	120	1K	10K
4~16	0.80	1.00	1.10	1.20
25~50	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT(RC(mArms) / 120Hz,105℃)

WV	4		6.3		10		16		25		35		50	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1													4x5	1
0.22													4x5	2
0.33													4x5	3
0.47													4x5	5
1													4x5	10
2.2													4x5	15
3.3													4x5	15
4.7							4x5	10	4x5	15	4x5	15	5x5	20
10			4x5	15	4x5	20	4x5	20	4x5	25	5x5	30	6.3x5	35
22	4x5	20	4x5	25	5x5	25	5x5	30	6.3x5	40	6.3x5	45	6.3x5	55
33	4x5	25	5x5	30	5x5	35	5x5	40	6.3x5	50				
47	5x5	30	5x5	35	6.3x5	45	6.3x5	55						
100	6.3x5	50	6.3x5	60	6.3x5	70	6.3x5	90						
220	6.3x5	70	8x5	95										
330	8x5	110	8x5	120										

LL Series

■ Features
- Lifetime:85℃,1000hrs
- Low leakage current

■ Recommended Applications
- AV(TV, Video, Audio)
- OA/HA/Communication
- Hi- Fi Pre-Amp
- Timer/Oscillation circuit

Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~100 VDC
Operating Temperature Range	-40 ~ +85℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	80	100
SV	8	13	20	32	44	63	79	100	125

Leakage Current (Max) (20℃)

I≦0.002CV or 0.4μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	80	100
tan δ	0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.07

When rated capacitance is over 1000μF,
tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	80	100
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	1.5	1.5

Load Life

After applying rated voltage for 1000 hours at 85℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

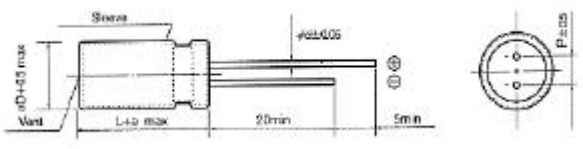
Shelf Life

After placed at 85℃ without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



φD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) / Freq. (Hz)	50	120	1K	10K
6.3~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~50	0.80	1.00	1.50	1.70
63~100	0.80	1.00	1.60	1.90

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT （RC(mArms) / 120Hz,85℃）

WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1											5x11	1		
0.22											5x11	2		
0.33											5x11	3		
0.47											5x11	5		
1											5x11	10		
2.2											5x11	20		
3.3											5x11	30		
4.7							5x11	35	5x11	40	5x11	40	5x11	40
10					5x11	45	5x11	50	5x11	55	5x11	60	5x11	55
22			5x11	60	5x11	65	5x11	70	5x11	75	5x11	85	6.3x11	100
33	5x11	65	5x11	70	5x11	80	5x11	85	5x11	90	6.3x11	110	6.3x11	120
47	5x11	80	5x11	85	5x11	95	5x11	100	6.3x11	120	6.3x11	135	8x11	160
100	5x11	110	5x11	120	6.3x11	160	6.3x11	170	8x11	210	8x11	225	10x12.5	270
220	6.3x11	190	6.3x11	210	8x11	270	8x11	290	10x12.5	360	10x17	460	10x20	500
330	6.3x11	230	8x11	290	8x11	330	10x12.5	410	10x17	520	10x20	610	13x20	710
470	8x11	320	8x11	350	10x12.5	460	10x17	570	10x20	660	13x20	850	13x25	930
1000	10x12.5	550	10x17	700	10x17	780	13x20	1040	13x25	1230	16x26	1560	16x32	1710
2200	13x20	1090	13x20	1180	13x25	1420	16x26	1810	16x32	1980	18x36	2400		
3300	13x20	1290	13x25	1520	16x26	1890	16x32	2170	18x36	2590				
4700	16x26	1870	16x26	2000	16x32	2370	18x36	2780	18x40	3060				
6800	16x26	2120	16x32	2470	18x36	2970	18x40	3230						
10000	16x32	2600	18x36	3090	18x40	3430								
15000	18x36	3230												

WV	80		100	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.47			5x11	5
1			5x11	10
2.2			5x11	20
3.3			5x11	30
4.7			5x11	45
10	6.3x11	70	6.3x11	75
22	8x11	120	8x11	130
33	8x11	150	10x12.5	180
47	10x12.5	210	10x17	260
100	10x17	350	13x20	460
220	13x20	650	16x26	880
330	13x25	880	16x26	1080
470	16x26	1200	16x32	1400
1000	18x36	2140		

LX Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for LL
- Low leakage current

■ Recommended Applications
- AV(TV, Video, Audio)
- OA/HA/Communication
- Hi- Fi Pre-Amp
- Timer/Oscillation circuit

Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~100 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	80	100
SV	8	13	20	32	44	63	79	100	125

Leakage Current (Max) (20℃)

I≦0.002CV or 0.4μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	80	100
tan δ	0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.07

When rated capacitance is over 1000μF,
tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	80	100
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	1.5	1.5
Z(-40℃) / Z(20℃)	8	6	4	4	3	3	3	2	2

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the initial specified value

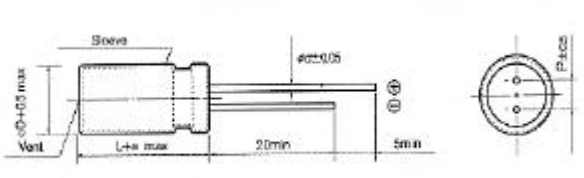
Shelf Life

After placed at 105℃ without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
6.3~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~50	0.80	1.00	1.50	1.70
63~100	0.80	1.00	1.60	1.90

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

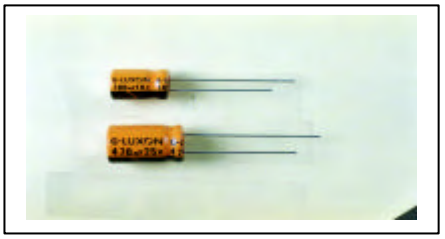
WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.1											5x11	1		
0.22											5x11	2		
0.33											5x11	3		
0.47											5x11	5		
1											5x11	10		
2.2											5x11	20		
3.3											5x11	30		
4.7							5x11	30	5x11	35	5x11	35	5x11	35
10					5x11	40	5x11	40	5x11	45	5x11	55	5x11	50
22			5x11	50	5x11	55	5x11	60	5x11	65	5x11	75	6.3x11	80
33	5x11	55	5x11	60	5x11	70	5x11	75	5x11	80	6.3x11	100	6.3x11	100
47	5x11	65	5x11	75	5x11	85	5x11	90	6.3x11	110	6.3x11	120	8x11	140
100	5x11	95	5x11	110	6.3x11	140	6.3x11	140	8x11	180	8x11	200	10x12.5	230
220	6.3x11	165	6.3x11	180	8x11	230	8x11	250	10x12.5	320	10x17	400	10x20	430
330	6.3x11	195	8x11	250	8x11	280	10x12.5	360	10x17	450	10x20	520	13x20	610
470	8x11	270	8x11	300	10x12.5	400	10x17	490	10x20	570	13x20	730	13x25	800
1000	10x12.5	465	10x17	600	10x17	660	13x20	880	13x25	1060	16x26	1330	16x32	1460
2200	13x20	925	13x20	1000	13x25	1210	16x26	1550	16x32	1700	18x36	2100		
3300	13x20	1100	13x25	1300	16x26	1610	16x32	1860	18x36	2200				
4700	16x26	1600	16x26	1700	16x32	2020	18x36	2380	18x40	2610				
6800	16x26	1810	16x32	2100	18x36	2520	18x40	2770						
10000	16x32	2210	18x36	2630	18x40	2910								
15000	18x36	2760												

WV	80		100	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.47			5x11	5
1			5x11	10
2.2			5x11	20
3.3			5x11	30
4.7			5x11	40
10	6.3x11	60	6.3x11	65
22	8x11	110	8x11	115
33	8x11	130	10x12.5	160
47	10x12.5	180	10x17	230
100	10x17	310	13x20	410
220	13x20	560	16x26	750
330	13x25	750	16x26	920
470	16x26	1020	16x32	1200
1000	18x36	1830		

SL Series

■ Features
- Lifetime:85℃,1000hrs
- Low leakage current
- Low profile/Miniature
- 7mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Hi- Fi Pre-Amp
- Timer/Oscillation circuit



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~63 VDC
Operating Temperature Range	-40 ~ +85℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50	63
SV	5	8	13	20	32	44	63	79

Leakage Current (Max) (20℃)

I≦0.002CV or 0.4μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	4	6.3	10	16	25	35	50	63
tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	3	3	3

Load Life

After applying rated voltage for 1000 hours at 85℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

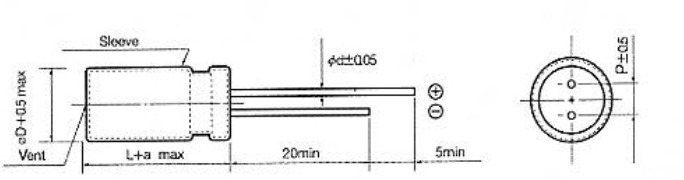
Shelf Life

After placed at 85℃without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	4	5	6.3
P	1.5	2.0	2.5
ψd	0.45	0.5	0.5
a	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz) / WV (VDC)	50	120	1K	10K
4~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~63	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

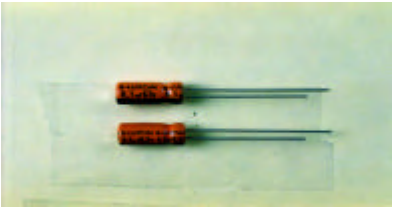
WV	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
4.7											4x7	25
10					4x7	25	4x7	30	4x7	30	5x7	35
22	4x7	30	4x7	35	4x7	40	4x7	45	5x7	55	6.3x7	55
33	4x7	40	4x7	45	5x7	50	5x7	60	5x7	65	6.3x7	70
47	4x7	45	5x7	50	6.3x7	60	6.3x7	65	6.3x7	80		
100	5x7	75	5x7	80	6.3x7	90	6.3x7	95				
220	6.3x7	125	6.3x7	135	6.3x7	145						

WV	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	15	4x7	15
2.2	4x7	20	4x7	25
3.3	4x7	25	5x7	30
4.7	5x7	30	6.3x7	35
10	6.3x7	45		

SH Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for SL
- Low leakage current
- Low profile/Miniature
- 7mm height

■ Recommended Applications
- AV(TV, Video, Audio)
- OA/HA/Communication
- Hi- Fi Pre-Amp
- Timer/Oscillation circuit



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~63 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50	63
SV	5	8	13	20	32	44	63	79

Leakage Current (Max) (20℃)

I≦0.002CV or 0.4μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	4	6.3	10	16	25	35	50	63
tan δ	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	3	3	3

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.

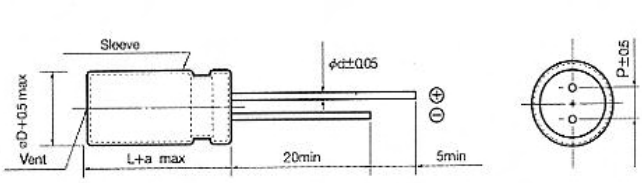
Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life

After placed at 105℃without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards	Refer to JIS C 5101

Dimensions (mm)



ψD	4	5	6.3	8
P	1.5	2.0	2.5	3.5
ψd	0.45	0.5	0.5	0.5
a	1.0	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
4~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~63	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

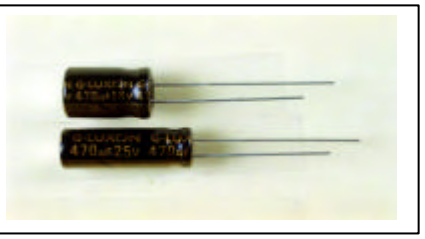
WV	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
4.7											4x7	20
10					4x7	25	4x7	25	4x7	25	5x7	30
22	4x7	25	4x7	30	4x7	35	4x7	35	5x7	45	6.3x7	45
33	4x7	35	4x7	40	5x7	40	5x7	50	5x7	55	6.3x7	60
47	4x7	40	5x7	45	6.3x7	50	6.3x7	55	6.3x7	70		
100	5x7	70	5x7	75	6.3x7	80	6.3x7	85				
220	6.3x7	115	6.3x7	125	8x7	150						

WV	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	15	4x7	15
2.2	4x7	20	4x7	20
3.3	4x7	20	5x7	25
4.7	5x7	25	6.3x7	30
10	6.3x7	40		

LZ Series

■ Features
- Lifetime:105℃,2000hrs
- Wide temperature range
- Low Impedance

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Converter/Inverter
- Adapter
- SMPS



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~50 VDC
Operating Temperature Range	-55 ~ +105℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	100
SV	8	13	20	32	44	63	79	125

Leakage Current (Max) (20℃)

I≦0.01CV or3μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tanδ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	100
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

When nominal capacitance is over 1000μF,
tanδ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	100
Z(-25℃) / Z(20℃)	4	3	3	3	3	2	2	2
Z(-40℃) / Z(20℃)	8	6	4	4	4	4	4	4

Load Life

After applying rated voltage for 2000 hours at 105℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

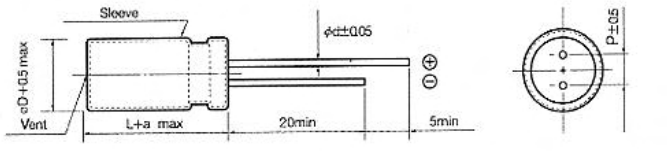
Shelf Life

After placed at 105℃without voltage applied for 1000 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

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Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	50	120	1K	10K	100K
Coefficient	0.45	0.55	0.75	0.85	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / Impedance

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 100KHz,105℃) /
MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

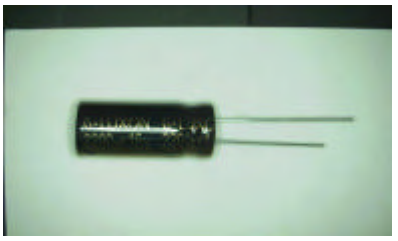
WV	6.3			10			16			25			35		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
4.7													5x11	100	1.20
10													5x11	120	0.90
22													5x11	170	0.42
33													5x11	180	0.42
47							5x11	150	0.50	5x11	170	0.42	6.3x11	200	0.36
100				5x11	170	0.42	6.3x11	250	0.25	8x11	310	0.22	8x11	400	0.14
220				6.3x11	260	0.22	8x11	400	0.14	8x14	560	0.10	10x12.5	650	0.085
330	6.3x11	250	0.25	8x11	400	0.14	8x14	560	0.10	10x16	820	0.069	10x20	1070	0.044
470	8x11	400	0.14	8x14	560	0.10	10x12.5	680	0.085	10x16	900	0.068	10x25	1110	0.039
1000	8x14	700	0.10	10x16	900	0.068	10x20	1110	0.044	13x20	1200	0.038	13x25	1460	0.029
1200	10x16	810	0.064	10x20	1070	0.044	13x20	1200	0.038	13x25	1460	0.029	13x30	1670	0.025
1500	10x20	1070	0.044	10x25	1110	0.039	13x20	1420	0.036	13x30	1670	0.026	16x32	2150	0.024
2200	10x25	1100	0.042	13x20	1200	0.038	13x25	1670	0.030	13x36	2150	0.022	16x36	2530	0.019
3300	13x20	1250	0.038	13x25	1470	0.030	13x36	1890	0.022	16x36	2270	0.019	18x36	3100	0.016
4700	13x30	1740	0.025	13x36	1890	0.022	16x36	1920	0.019						
6800	16x26	1930	0.022	16x36	1920	0.019									
10000	16x36	2210	0.019												

WV	50			63			100		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
4.7	5x11	85	2.00	5x11	90	2.00	5x11	95	2.00
10	5x11	100	1.70	5x11	110	2.00	6.3x11	120	1.00
22	5x11	150	0.70	6.3x11	180	1.00	8x11	220	0.53
33	6.3x11	190	0.65	6.3x11	200	0.90	8x14	260	0.40
47	6.3x11	220	0.52	8x11	260	0.80	10x20	400	0.35
100	8x14	440	0.25	10x15	540	0.30	13x20	720	0.20
220	10x16	530	0.20	10x20	620	0.090	16x26	950	0.070
330	10x25	810	0.072	13x25	990	0.060	16x32	1310	0.050
470	13x20	950	0.065	16x26	1460	0.050	18x32	1650	0.045
1000	16x26	1370	0.039	16x32	1780	0.030			
1200	16x32	1630	0.025						
1500	16x36	1800	0.025						

LB Series

■ Features
- Lifetime:105℃,2000hrs
- Wide temperature range
- Low Impedance

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Converter/Inverter
- SMPS
- Ballast



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	160~450VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	160	200	250	350	400	450
SV	200	250	300	400	450	500

Leakage Current (Max) (20℃)

I≦0.03CV +10μA
(After rated voltage applied for 3 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	160	200	250	350	400	450
tan δ	0.15	0.15	0.15	0.24	0.24	0.24

Low Temperature Stability Impedance Ratio (Max)

Z (120Hz) \ WV	160	200	250	350	400	450
Z(-25℃) / Z(20℃)	3	3	3	3	3	3
Z(-40℃) / Z(20℃)	6	6	6	6	6	6

Load Life

After applying rated voltage for 2000 hours at 105℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not More than the specified value

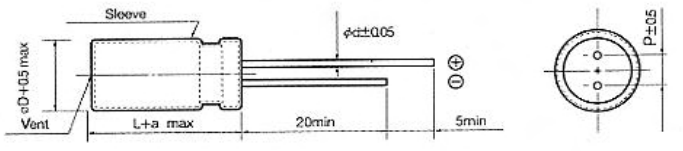
Shelf Life

After placed at 105℃ without voltage applied for 1000 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	10	13	16	18
P	5.0	5.0	7.5	7.5
ψd	0.6	0.6 (0.8)	0.8	0.8
a	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)		50	120	1K	10K	100K
Coefficient	<33μF	0.45	0.55	0.75	0.85	1.00
	≧33μF	0.60	0.70	0.90	0.95	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / Impedance

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC (mArms) / 120Hz&100KHz,105℃) / MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

WV	160				200				250			
SPEC / μF	ψDxL	RC		Z	ψDxL	RC		Z	ψDxL	RC		Z
		120Hz	100KHz			120Hz	100KHz			120Hz	100KHz	
10									10x20	120	220	2.80
22	10x20	195	350	1.00	10x20	195	350	1.00	13x25	165	300	1.40
33	13x20	315	450	0.71	13x20	365	520	0.71	13x25	280	400	1.20
47	13x25	420	600	0.46	13x25	420	600	0.46	16x26	505	720	0.50
68	13x25	420	600	0.45	16x26	665	950	0.25	16x32	570	810	0.22
100	16x26	665	950	0.24	16x32	840	1200	0.17	18x36	735	1050	0.20
220	18x36	980	1400	0.14								

WV	350				400				450			
SPEC / μF	ψDxL	RC		Z	ψDxL	RC		Z	ψDxL	RC		Z
		120Hz	100KHz			120Hz	100KHz			120Hz	100KHz	
2.2	10x16	30	50	3.50	10x16	80	140	4.20	10x16	60	110	7.90
3.3	10x16	35	60	3.50	10x20	110	195	2.90	10x20	75	135	6.20
4.7	10x20	45	78	2.50	10x25	120	220	2.30	13x20	105	190	3.70
10	13x20	75	130	1.40	13x25	200	360	1.30	13x25	140	250	2.60
22	16x26	115	205	0.73	16x26	315	570	0.65	16x32	265	480	1.00
33	16x32	180	255	0.65	16x32	490	700	0.46	18x36	455	650	0.65
47	18x32	225	320	0.50	18x32	600	860	0.33				
100	18x45	370	530	0.45								

LC Series

■ Features
- Lifetime:105℃,5000hrs
- Wide temperature range
- Low ESR
- Low Impedance

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Converter/Inverter
- SMPS
- Ballast

Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	160~450VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	160	200	250	350	400	450
SV	200	250	300	400	450	500

Leakage Current (Max) (20℃)

I≦0.03CV +40μA (CV≦1000)　　I≦0.02CV +25μA (CV＞1000)
(After rated voltage applied for 5 minutes)
I= Leakage Current (μA)　C= Nominal Capacitance (μF)　V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	160	200	250	350	400	450
tan δ	0.15	0.15	0.15	0.24	0.24	0.24

Low Temperature Stability Impedance Ratio (Max)

Z (120Hz) / WV	160	200	250	350	400	450
Z(-40℃) / Z(20℃)	6	6	6	6	6	6

Load Life

After applying rated voltage for 5000 hours at 105℃,
the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not More than the specified value

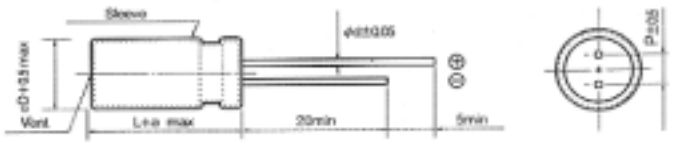
Shelf Life

After placed at 105℃without voltage applied for 1000 hours,
the capacitor shall meet the same requirement as load life

Others

Satisfied JIS C 5101

Dimensions (mm)



ψD	10	13	16	18
P	5.0	5.0	7.5	7.5
ψd	0.6	0.6 (0.8)	0.8	0.8
a	1.0	2.0	2.0	2.0

(　) : L≧

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	50	120	1K	10K	100K
Coefficient	0.45	0.55	0.75	0.85	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / Impedance

CASE SIZE (ψDxL)/ MAX PERMISSIBLE RIPPLE CURRENT (RC (mArms) /100KHz,105℃) /
MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

WV	160			200			250		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
10							10x20	300	3.5
22	10x20	415	1.52	10x20	440	1.50	13x20	480	2.3
33	10x20	565	1.30	13x20	590	0.91	13x25	630	1.7
47	13x20	725	0.91	13x20	780	0.91	13x25	630	1.7
68	13x25	970	0.63	13x25	950	0.63	16x26	1000	0.78
100	16x26	1280	0.27	16x26	1280	0.27	16x32	1400	0.63
220	16x32	1300	0.22	18x32	1700	0.22	18x40	1485	0.35
330	18x36	1700	0.22						

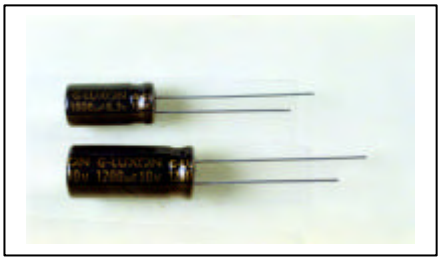
WV	350			400			450		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
3.3							10x12.5	120	8.5
4.7							10x12.5	165	6.5
10	10x20	100	3.0	10x20	180	2.9	13x20	315	2.5
22	13x20	270	2.1	13x25	300	1.35	16x26	570	1.7
33	13x25	600	1.0	16x26	600	0.95	16x32	620	1.1
47	16x26	700	0.75	16x32	700	0.75	18x32	900	0.93
100	18x32	1170	0.40	18x36	1250	0.34			

LU Series

Specifications

■ Features
- Lifetime:105℃, 1000 5000hrs
- Long life
- Low Impedance

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Converter/Inverter
- Adapter
- SMPS



Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~100VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	100
SV	8	13	20	32	44	63	79	125

Leakage Current (Max) (20℃)

I≦0.01CV or3μA whichever is greater
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	100
tan δ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

When nominal capacitance is over 1000μF,
tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	100
Z(-25℃) / Z(20℃)	2	2	2	2	2	2	2	2
Z(-40℃) / Z(20℃)	3	3	3	3	3	3	3	3

Load Life

After applying rated voltage with max ripple current for 1000~5000 hours at 105℃,the capacitor shall meet the following requirement.

Capacitance Change	Within±25% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Case (ψ)	Life time (hrs)
L=7	1000
ψD≦6.3	2000
ψD = 8	3000
ψD = 10	4000
ψD≧13	5000

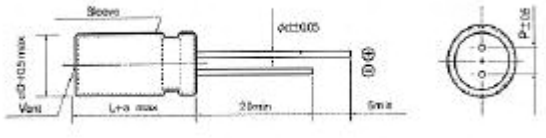
Shelf Life

After placed at 105℃without voltage applied for 1000 hours (500 hours for L=7), the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	4	5	6.3	8	10	13	16	18
P	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.45	0.5	0.5	0.6 [0.5]	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0

[ ] : L = 7 ( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz) / Cap (μF)	50	120	1K	10K	100K
5.6~390	0.60	0.70	0.85	0.95	1.00
470~1000	0.65	0.75	0.90	0.98	1.00
1200~6800	0.75	0.80	0.95	1.00	1.00

Temperature coefficient

Ambient Temperature (℃)	≦65	85	105
Coefficient	2.0	1.5	1.00

Case Size & Max Ripple Current / Impedance

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 100KHz,105℃) /
MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

WV	6.3			10			16			25			35		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
10													4x7	130	0.96
15										4x7	130	0.94	5x7	190	0.57
18							4x7	130	0.92	5x7	170	0.69	5x7	210	0.47
27				4x7	130	0.89	5x7	190	0.61	5x7	210	0.46	5x11	230	0.37
33				5x7	160	0.75	5x7	210	0.45	5x11	220	0.42	5x11	250	0.30
39	4x7	130	0.85	5x7	175	0.64	5x11	220	0.43	5x11	230	0.36	6.3x7	300	0.25
47	5x7	175	0.70	5x7	190	0.53	5x11	230	0.36	5x11	250	0.30	6.3x11	380	0.15
													8x7	350	0.19
56	5x7	190	0. 56	5x7	210	0.44	5x11	250	0.30	6.3x7	300	0.24	6.3x11	410	0.13
													8x7	380	0.16
68	5x7	210	0.43	5x11	210	0.44	6.3x7	300	0.24	6.3x11	340	0.19	8x11	510	0.12
										8x7	310	0.22			
100	5x11	200	0.43	5x11	250	0.30	6.3x11	370	0.16	6.3x11	410	0.13	8x11	620	0.105
	6.3x7	240	0.35				8x7	350	0.18	8x7	380	0.15			
120	5x11	220	0.38	6.3x7	300	0.23	6.3x11	410	0.13	8x11	560	0.12	8x11	680	0.088
	6.3x7	270	0.29				8x7	380	0.15						
150	5x11	250	0.30	8x7	350	0.18	8x11	510	0.12	8x11	630	0.105	8x11	760	0.072
	6.3x7	300	0.23												
180	8x7	340	0.18	8x7	380	0.15	8x11	560	0.11	8x11	690	0.088	8x16	910	0.068
													10x12.5	930	0.065
220	8x7	380	0.15	6.3x11	410	0.13	8x11	620	0.10	8x11	760	0.072	8x16	1000	0.056
													10x12.5	1030	0.053
270	6.3x11	370	0.16	8x11	580	0.12	8x11	690	0.088	8x16	900	0.068	8x20	1250	0.041
										10x12.5	930	0.065			
330	6.3x11	410	0.13	8x11	640	0.10	8x11	760	0.072	8x16	1000	0.056	10x16	1430	0.038
										10x12.5	1030	0.053			
470	8x11	680	0.086	8x11	760	0.072	8x16	1000	0.056	8x20	1250	0.041	10x20	1820	0.026
							10x12.5	1030	0.053	10x16	1430	0.038			
560	8x11	760	0.072	8x16	910	0.068	8x20	1140	0.049	10x20	1650	0.032	10x25	2150	0.023
				10x12.5	940	0.064	10x16	1300	0.046						
680	8x14	900	0.062	8x16	1000	0.056	8x20	1250	0.041	10x20	1820	0.026	13x20	2360	0.023
				10x12.5	1030	0.053	10x16	1430	0.038						
820	8x16	1000	0.056	8x20	1130	0.050	10x20	1650	0.032	10x25	2150	0.023	13x25	2510	0.020
				10x16	1300	0.046									
1000	10x12.5	1030	0.053	8x20	1250	0.041	10x20	1820	0.026	13x20	2360	0.021	13x25	2770	0.018
				10x16	1430	0.038									
1200	8x20	1250	0.041	10x20	1820	0.026	10x25	2150	0.023	13x25	2510	0.020	13x30	3290	0.016
	10x16	1430	0.038										16x20	3140	0.018
1500	10x20	1820	0.026	10x25	2150	0.023	13x20	2360	0.021	13x25	2770	0.018	13x36	3400	0.015
1800	10x25	1940	0.025	13x20	2230	0.022	13x25	2510	0.020	13x30	3290	0.016	16x25	3460	0.016
										16x20	3140	0.018			
2200	10x25	2150	0.023	13x20	2360	0.021	13x25	2770	0.018	13x36	3400	0.015			
2700	13x20	2230	0.022	13x25	2510	0.020	13x30	3290	0.016	16x25	3460	0.016			
							16x20	3140	0.018						
3300	13x20	2360	0.021	13x25	2770	0.018	13x36	3400	0.015						
3900	13x25	2770	0.018	13x30	3290	0.016	16x25	3460	0.016						
				16x20	3140	0.018									
4700	13x30	3290	0.016	13x36	3400	0.015									
5600	13x36	3400	0.015	16x25	3460	0.016									
	16x20	3140	0.018												
6800	16x25	3460	0.016												

Case Size / Max Ripple Current / Impedance

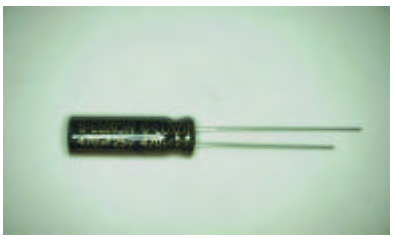
CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 100KHz,105℃) / MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

WV	50			63			100		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
5.6	4x7	130	1.0						
6.8	5x7	170	0.74				5x11	125	1.4
10	5x7	210	0.50				6.3x11	170	0.95
15	6.3x7	220	0.38	5x11	170	0.88	6.3x11	210	0.57
	5x11	215	0.48						
22	6.3x7	300	0.26	6.3x11	220	0.65	8x11	330	0.44
	5x11	240	0.34						
27	8x7	340	0.21	6.3x11	240	0.43	8x11	360	0.36
33	8x7	380	0.17	6.3x11	270	0.35	8x14	375	0.30
39	6.3x11	330	0.16	8x11	385	0.31	8x16	450	0.25
47	6.3x11	360	0.15	8x11	420	0.26	10x12.5	450	0.24
56	6.3x11	390	0.14	8x11	500	0.22	8x20	570	0.19
68	8x11	600	0.11	8x16	610	0.19	10x16	580	0.18
				10x12.5	625	0.18			
82	8x11	660	0.090	8x16	670	0.16	10x20	750	0.13
				10x12.5	690	0.15	13x16	740	0.13
100	8x11	730	0.074	10x15	800	0.12	10x25	880	0.12
120	8x16	950	0.065	8x20	820	0.12	13x20	1050	0.094
				10x16	950	0.11			
150	10x12.5	980	0.061	10x20	1010	0.096	13x25	1100	0.085
				13x16	1040	0.098			
180	8x20	1190	0.046	10x20	1100	0.080	13x25	1200	0.071
				13x16	1140	0.082			
220	10x16	1370	0.042	10x25	1300	0.073	13x30	1410	0.063
							16x20	1300	0.071
270	10x20	1580	0.030	13x20	1500	0.060	13x36	1560	0.052
							16x25	1600	0.053
							18x20	1470	0.069
330	10x25	1870	0.028	13x25	1850	0.043	13x40	1700	0.046
390	13x20	1870	0.028	13x30	2050	0.047	16x32	1750	0.041
				16x20	1810	0.054	18x25	1620	0.049
470	13x20	2050	0.027	13x30	2250	0.045	16x36	1890	0.033
				16x20	1990	0.045	18x32	1780	0.039
560	13x25	2410	0.023	13x36	2450	0.035	16x40	2080	0.030
				16x25	2550	0.032	18x36	2060	0.031
680	13x30	2860	0.021	13x40	2780	0.029	18x40	2570	0.028
				18x20	2450	0.038			
820	13x36	2960	0.019	16x32	2810	0.026			
	16x20	2730	0.023	18x25	2780	0.031			
1000	16x32	3350	0.021	16x36	2840	0.021			
				18x32	3270	0.025			
1200				16x40	3340	0.019			
				18x36	3310	0.020			
1500				18x40	3420	0.018			

LW Series

■ Features
- Lifetime:105℃,2000hrs
- Ultra-low ESR

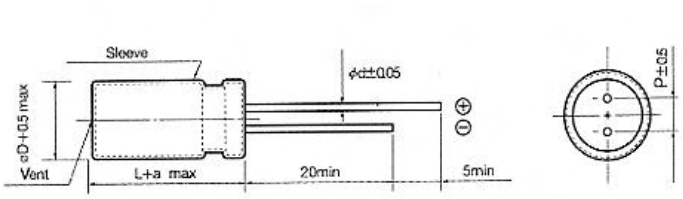
■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Converter/Inverter
- Adapter
- SMPS



Specifications

Items	Characteristics			
Capacitance Tolerance	±20% (M) (120Hz,20℃)			
Rated Voltage Range (WV)	6.3~16VDC			
Operating Temperature Range	-40 ~ +105℃			
Surge Voltage (V) (20℃)	WV	6.3	10	16
	SV	8	13	20
Leakage Current (Max) (20℃)	I≦0.01CV (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)			
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	6.3	10	16
	tan δ	0.22	0.19	0.16
	When nominal capacitance is over 1000μF, tan δ shall be added 0.02 to the listed value with increase of every 1000μF.			
Low Temperature Stability Impedance Ratio (Max)	WV / Z (120Hz)	6.3	10	16
	Z(-25℃) / Z(20℃)	2	2	2
	Z(-40℃) / Z(20℃)	3	3	3
Load Life	After applying rated voltage for 2000 hours at 105℃, the capacitor shall meet the following requirement.			
	Capacitance Change	Within ±25% of the initial value		
	Dissipation Factor	Not more than 200% of the specified value		
	Leakage Current	Not More than the specified value		
Shelf Life	After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.			
Applicable standards	Refer to JIS C 5101			

Dimensions (mm)



ψD	8	10
P	3.5	5.0
ψd	0.6	0.6
a	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	50	120	1K	10K	100K
Coefficient	0.45	0.55	0.75	0.85	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / ESR

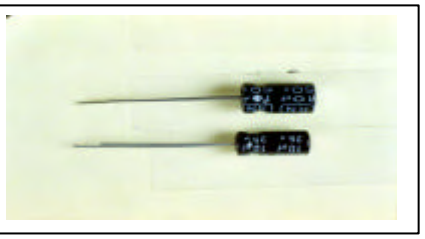
CASE SIZE (ψDxL)/MAX PERMISSIBLERIPPLE CURRENT(RC (mArms) / 100KHz,105℃) /
MAX EQUIVALENT SERIES RESISTANCE (ESR(mΩ) / 100KHz,20℃)

WV	6.3			10			16		
SPEC / μF	ψDxL	RC	ESR	ψDxL	RC	ESR	ψDxL	RC	ESR
470							8x11	1140	36
680				8x11	1140	36	8x16	1490	28
							10x12.5	1540	26
820	8x11	1140	36						
1000	8x16	1360	28	8x16	1490	28	8x20	1870	21
	10x12.5	1390	26	10x12.5	1540	26	10x16	2000	19
1200	8x16	1490	28						
1500	8x20	1610	21	8x20	1870	21	10x20	2550	13
	10x16	1720	19	10x16	2000	19			
1800	8x20	1870	21	10x20	2550	13	10x25	2800	12
	10x16	2000	19						
2200	10x20	2550	13	10x25	2800	12			
3300	10x25	2800	12						

RN Series

■ Features
- Lifetime:85℃,1000hrs
- Non-polarized/Polarity reversing

■ Recommended Applications
- Small crossover network
- Reversed polarity circuit
- Coupling



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~250 VDC
Operating Temperature Range	-40 ~ +85℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	80	100	160	200	250
SV	8	13	20	32	44	63	79	100	125	200	250	300

Leakage Current (Max) (20℃)

I≦0.03CV+4μA
(After voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	80	100	160	200	250
tan δ	0.24	0.20	0.17	0.15	0.15	0.15	0.10	0.10	0.10	0.20	0.20	0.20

When nominal capacitance is over 1000μF,
tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	80	100	160	200	250
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	2	2	6	6	6
Z(-40℃) / Z(20℃)	8	6	4	4	3	3	3	3	3	12	12	12

Load Life

After applying rated voltage for 1000 hours at 85℃,
the capacitor shall meet the following requirement.
(The polarity shall be reversed every 250 hours)

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

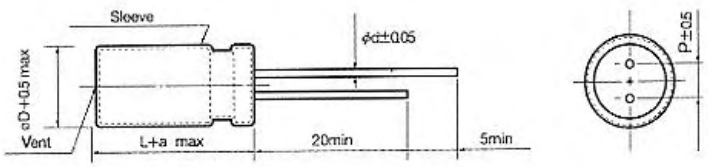
Shelf Life

After placed at 85℃ without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

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Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz) / WV (VDC)	50	120	1K	10K
6.3~16	0.80	1.00	1.10	1.20
25~35	0.80	1.00	1.50	1.70
50~100	0.80	1.00	1.60	1.90
160~250	0.80	1.00	1.50	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

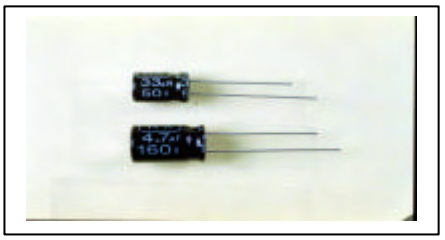
WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47											5x11	5		
1											5x11	10	5x11	10
2.2											5x11	20	5x11	20
3.3											5x11	30	5x11	30
4.7									5x11	30	5x11	30	6.3x11	35
10					5x11	40	5x11	40	5x11	40	6.3x11	45	6.3x11	55
22			5x11	50	5x11	55	6.3x11	65	6.3x11	70	8x11	80	8x11	90
33	5x11	60	5x11	65	5x11	70	6.3x11	80	8x11	100	8x11	105	10x12.5	135
47	5x11	70	5x11	75	6.3x11	95	6.3x11	95	8x11	120	8x14	140	10x17	180
100	6.3x11	115	6.3x11	125	8x11	160	8x11	160	10x17	230	10x20	265	13x20	320
220	8x11	205	8x11	215	10x12.5	275	10x17	305	13x20	410	13x25	480	16x26	575
330	8x11	265	10x15	345	10x17	375	13x20	450	13x20	505	16x26	650	16x32	750
470	10x12.5	370	10x17	410	10x20	485	13x20	540	13x25	655	16x32	835	18x36	965
1000	10x20	650	13x20	720	13x25	855	16x26	950	16x32	1140				
2200	13x25	1160	16x26	1280	16x32	1510	18x36	1620						
3300	16x26	1570	16x32	1690	18x36	1980								
4700	16x32	2020	18x36	2160										
6800	18x36	2600												

WV	80		100		160		200		250	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47			5x11	5	6.3x11	5				
1			5x11	10	6.3x11	15	6.3x11	15	8x11	15
2.2	5x11	30	6.3x11	25	8x11	20	8x11	20	10x12.5	25
3.3	6.3x11	35	6.3x11	35	10x12.5	30	10x12.5	30	10x12.5	30
4.7	6.3x11	40	6.3x11	40	10x12.5	35	10x15	40	10x17	40
10	8x11	65	8x11	70	10x17	55	13x20	70	13x20	70
22	10x15	105	10x17	135	13x25	105	13x25	120	16x26	135
33	10x17	160	13x20	220	16x26	165	16x26	165	16x32	180
47	10x20	215	13x20	240	16x26	200	16x32	220	16x36	230
100	13x25	385	16x26	425	18x36	360				
220	16x32	690	18x36	720						
330	18x36	860								

RX Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for RN
- Non-polarized/Polarity reversing

■ Recommended Applications
- Small crossover network
- Reversed polarity circuit
- Coupling



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	6.3~250 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	6.3	10	16	25	35	50	63	80	100	160	200	250
SV	8	13	20	32	44	63	79	100	125	200	250	300

Leakage Current (Max) (20℃)

I≦0.03CV+4μA
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	6.3	10	16	25	35	50	63	80	100	160	200	250
tan δ	0.24	0.20	0.17	0.15	0.15	0.15	0.10	0.10	0.10	0.20	0.20	0.20

When nominal capacitance is over 1000μF,
tan δ shall be added 0.02 to the listed value with increase of every 1000μF.

Low Temperature Stability Impedance Ratio (Max)

WV / Z (120Hz)	6.3	10	16	25	35	50	63	80	100	160	200	250
Z(-25℃) / Z(20℃)	4	3	2	2	2	2	2	2	2	6	6	6
Z(-40℃) / Z(20℃)	8	6	4	4	3	3	3	3	3	12	12	12

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.
(The polarity shall be reversed every 250 hours)

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

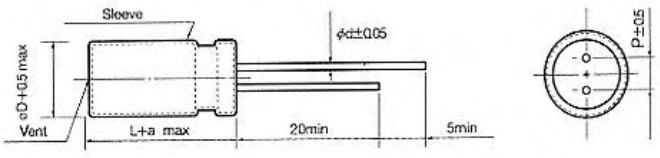
Shelf Life

After placed at 105℃ without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

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Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
6.3~16	0.80	1.00	1.10	1.20
25~35	0.80	1.00	1.50	1.70
50~100	0.80	1.00	1.60	1.90
160~250	0.80	1.00	1.50	1.60

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

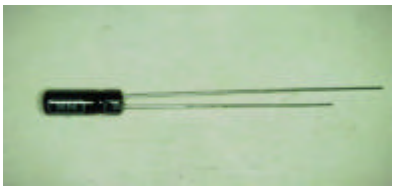
WV	6.3		10		16		25		35		50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47											5x11	5		
1											5x11	10	5x11	10
2.2											5x11	20	5x11	20
3.3											5x11	25	5x11	25
4.7									5x11	25	5x11	25	6.3x11	30
10					5x11	35	5x11	35	5x11	35	6.3x11	40	6.3x11	50
22			5x11	45	5x11	50	6.3x11	55	6.3x11	60	8x11	70	8x11	80
33	5x11	55	5x11	55	5x11	60	6.3x11	70	8x11	85	8x11	90	10x12.5	115
47	5x11	60	5x11	65	6.3x11	85	6.3x11	85	8x11	105	8x14	120	10x17	155
100	6.3x11	100	6.3x11	110	8x11	140	8x11	140	10x17	195	10x20	225	13x20	275
220	8x11	175	8x11	185	10x12.5	235	10x17	260	13x20	350	13x25	410	16x26	490
330	8x11	225	10x15	295	10x17	320	13x20	385	13x20	430	16x26	555	16x32	640
470	10x12.5	315	10x17	350	10x20	415	13x20	460	13x25	560	16x32	710	18x36	820
1000	10x20	555	13x20	615	13x25	730	16x26	810	16x32	970				
2200	13x25	990	16x26	1090	16x32	1285	18x36	1380						
3300	16x26	1335	16x32	1440	18x36	1685								
4700	16x32	1720	18x36	1840										
6800	18x36	2210												

WV	80		100		160		200		250	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
0.47			5x11	5	6.3x11	5				
1			5x11	10	6.3x11	15	6.3x11	15	8x11	15
2.2	5x11	25	6.3x11	20	8x11	20	8x11	20	10x12.5	20
3.3	6.3x11	30	6.3x11	30	10x12.5	25	10x12.5	25	10x12.5	25
4.7	6.3x11	35	6.3x11	35	10x12.5	30	10x15	35	10x17	35
10	8x11	55	8x11	60	10x17	50	13x20	60	13x20	60
22	10x15	90	10x17	115	13x25	100	13x25	105	16x26	115
33	10x17	140	13x20	190	16x26	140	16x26	140	16x32	155
47	10x20	185	13x20	205	16x26	170	16x32	190	16x36	195
100	13x25	330	16x26	365	18x36	310				
220	16x32	590	18x36	615						
330	18x36	735								

SN Series

■ Features
- Lifetime:85℃,1000hrs
- Non-polarized/Polarity reversing
- Low profile/Miniature
- 7mm height

■ Recommended Applications
- Reversed polarity circuit
- Coupling



Specifications

Items	Characteristics								
Capacitance Tolerance	±20% (M) (120Hz,20℃)								
Rated Voltage Range (WV)	4~63 VDC								
Operating Temperature Range	-40 ~ +85℃								
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50	63
	SV	5	8	13	20	32	44	63	79
Leakage Current (Max) (20℃)	I≦0.06CV+10μA (After rated voltage applied for 2 minutes)								
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)								
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	4	6.3	10	16	25	35	50	63
	tan δ	0.35	0.24	0.20	0.16	0.16	0.14	0.12	0.10

Low Temperature Stability Impedance Ratio (Max)

Z (120Hz) \ WV	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	3	3	3

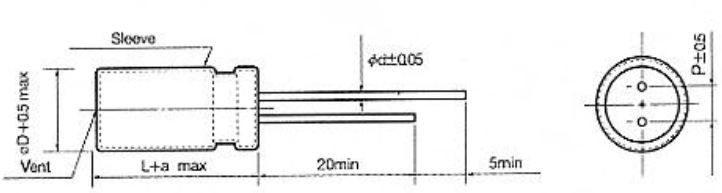
Load Life

After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirement. (The polarity shall be reversed every 250 hours)

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life	After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.
Applicable standards	Refer to JIS C 5101

Dimensions (mm)



φD	4	5	6.3
P	1.5	2.0	2.5
φd	0.45	0.5	0.5
a	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz) / WV (VDC)	50	120	1K	10K
4~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~63	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

CASE SIZE (ψDxL(mm)) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃)

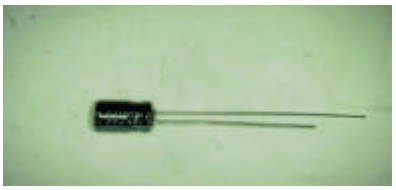
	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
2.2											4x7	15
3.3									4x7	15	5x7	20
4.7							4x7	20	5x7	20	5x7	25
10					4x7	25	5x7	30	6.3x7	35	6.3x7	40
22			5x7	35	5x7	40	6.3x7	45	6.3x7	50		
33	5x7	35	5x7	40	6.3x7	50	6.3x7	60	6.3x7	65		
47	5x7	40	6.3x7	50	6.3x7	60	6.3x7	70				
100	6.3x7	60										

	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	10	4x7	15
2.2	4x7	20	5x7	25
3.3	5x7	25	6.3x7	30
4.7	6.3x7	30	6.3x7	35

SP Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for SN
- Non-polarized/Polarity reversing
- Low profile/Miniature
- 7mm height

■ Recommended Applications
- Reversed polarity circuit
- Coupling



Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~63 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50	63
SV	5	8	13	20	32	44	63	79

Leakage Current (Max) (20℃)

I≦0.06CV+10μA
(After rated voltage applied for 2 minutes)
I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

WV	4	6.3	10	16	25	35	50	63
tan δ	0.35	0.24	0.20	0.16	0.16	0.14	0.12	0.10

Low Temperature Stability Impedance Ratio (Max)

Z (120Hz) \ WV	4	6.3	10	16	25	35	50	63
Z(-25℃) / Z(20℃)	6	4	3	2	2	2	2	2
Z(-40℃) / Z(20℃)	12	8	6	4	4	3	3	3

Load Life

After applying rated voltage for 1000 hours at 105℃,
the capacitor shall meet the following requirement.
(The polarity shall be reversed every 250 hours)

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

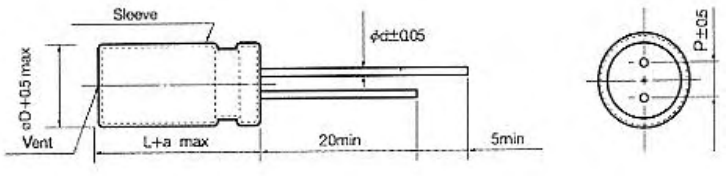
Shelf Life

After placed at 105℃without voltage applied for 500 hours,
the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C-5101

Dimensions (mm)



ψD	4	5	6.3
P	1.5	2.0	2.5
ψd	0.45	0.5	0.5
a	1.0	1.0	1.0

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K
4~10	0.80	1.00	1.10	1.20
16~25	0.80	1.00	1.20	1.30
35~63	0.80	1.00	1.50	1.70

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size & Max Ripple Current

CASE SIZE (ψDxL(mm)) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,105℃)

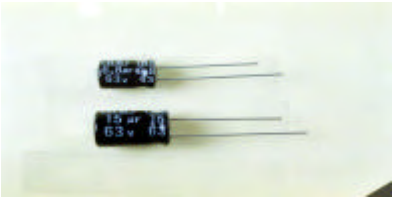
WV	4		6.3		10		16		25		35	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
2.2											4x7	15
3.3									4x7	15	5x7	15
4.7							4x7	20	5x7	20	5x7	20
10					4x7	20	5x7	25	6.3x7	30	6.3x7	35
22			5x7	30	5x7	35	6.3x7	40	6.3x7	45		
33	5x7	30	5x7	35	6.3x7	45	6.3x7	50	6.3x7	55		
47	5x7	35	6.3x7	45	6.3x7	55	6.3x7	60				
100	6.3x7	55										

WV	50		63	
SPEC / μF	ψDxL	RC	ψDxL	RC
0.1	4x7	1	4x7	1
0.22	4x7	2	4x7	2
0.33	4x7	3	4x7	3
0.47	4x7	5	4x7	5
1	4x7	10	4x7	15
2.2	4x7	15	5x7	20
3.3	5x7	20	6.3x7	25
4.7	6.3x7	25	6.3x7	30

RB Series

■ Features
- Lifetime:85℃,1000hrs
- Non-polarized/Polarity reversing
- High ripple current

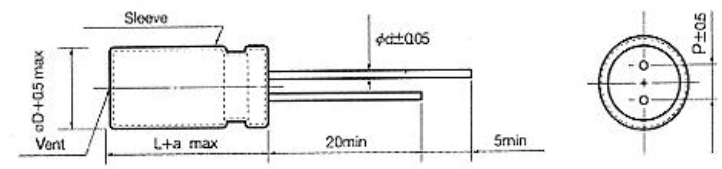
■ Recommended Applications
- Crossover/Speaker network
- Reversed polarity circuit



Specifications

Items	Characteristics						
Capacitance Tolerance	±10% (K) (1KHz,20℃)						
Rated Voltage Range (WV)	25~100 VDC						
Operating Temperature Range	-40 ~ +85℃						
Surge Voltage (V) (20℃)	WV	25	35	50	63	80	100
	SV	32	44	63	79	100	125
Leakage Current (Max) (20℃)	I≦0.03CV or 3μA whichever is greater (After rated voltage applied for 2 minutes)						
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)						
Dissipation Factor (Max) (tan δ) (1KHz ,20℃)	WV	25	35	50	63	80	100
	tan δ	0.17	0.15	0.15	0.12	0.10	0.10
Load Life	After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirement. (The polarity shall be reversed every 250 hours)						
	Capacitance Change	Within ±20% of the initial value					
	Dissipation Factor	Not more than 200% of the specified value					
	Leakage Current	Not more than the specified value					
Shelf Life	After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.						
Applicable standards	Refer to JIS C-5101						

Dimensions (mm)



ψD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ψd	0.5	0.5	0.6	0.6	0.6 (0.8)	0.8	0.8
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Frequency coefficient

WV (VDC) \ Freq. (Hz)	50	120	1K	10K	100K
25~35	0.80	0.90	1.00	1.60	1.80
50~100	0.80	0.90	1.00	1.70	2.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current

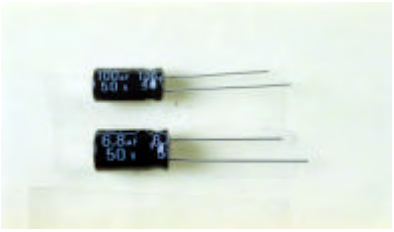
CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 1KHz,85℃)

WV	25		35		50		63		80		100	
SPEC / μF	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC	ψDxL	RC
1											6.3x11	70
1.5											6.3x11	85
2.2									6.3x11	95	8x11	110
3.3							6.3x11	105	8x11	130	8x11	140
4.7							8x11	145	8x11	155	10x12.5	200
5.6					6.3x11	130	8x11	160	10x12.5	200	10x12.5	215
6.8					8x11	170	8x11	180	10x12.5	220	10x12.5	235
8.2					8x11	185	8x11	195	10x12.5	245	10x15	290
10			6.3x11	170	8x11	205	10x12.5	255	10x12.5	270	10x15	320
15	6.3x11	200	8x11	240	10x12.5	295	10x12.5	310	10x17	390	10x20	445
22	8x11	280	10x12.5	340	10x12.5	360	10x15	420	10x20	505	13x20	625
33	8x11	340	10x12.5	420	10x17	515	10x20	580	13x20	720	13x25	845
47	10x12.5	480	10x15	555	10x20	660	13x20	805	13x25	945	16x26	1155
56	10x12.5	520	10x17	640	13x20	835	13x20	880	13x25	1030	16x26	1260
68	10x15	635	10x17	705	13x20	920	13x25	1070	16x26	1300	16x32	1520
82	10x15	700	10x20	830	13x20	1010	13x25	1175	16x26	1430	16x36	1765
100	10x17	820	13x20	1065	13x25	1230	16x36	1480	16x36	1820	18x36	2080

BP Series

■ Features
- Lifetime:85℃,1000hrs
- Bi-polarized/Polarity reversing
- High ripple current

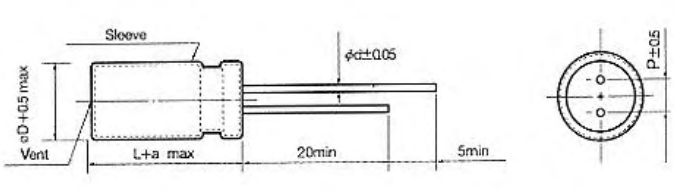
■ Recommended Applications
- TV/Monitor
- Horizontal deflection correction



Specifications

Items	Characteristics			
Capacitance Tolerance	±10% (K) (120Hz,20℃)			
Rated Voltage Range (WV)	25~50 VDC			
Operating Temperature Range	-40 ~ +85℃			
Surge Voltage (V) (20℃)	WV	25	35	50
	SV	32	44	63
Leakage Current (Max) (20℃)	I≦100μA (After rated voltage applied for 2 minutes)			
	I= Leakage Current (μA)			
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	25	35	50
	tan δ	0.05	0.05	0.05
Load Life	After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirement.			
	Capacitance Change	Within ±15% of the initial value		
	Dissipation Factor	Not more than 200% of the specified value		
	Leakage Current	Not more than the specified value		
Shelf Life	After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.			
Applicable standards	Refer to JIS C-5101			

Dimensions (mm)



ψD	10	13	16	18	22	25
P	5.0	5.0	7.5	7.5	10.0	12.5
ψd	0.6	0.6 (0.8)	0.8	0.8	0.8	0.8
a	1.0	2.0	2.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / Max Ripple Current / ESR

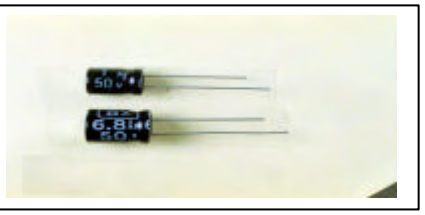
CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT（RC(A_{p-p}) / Sawtooth wave 15.75KHz,85℃）/ MAX EQUIVALENT SERIES RESISTANCE（ESR(Ω) / 120Hz,20℃）

WV	25			35			50		
SPEC / μF	ψDxL	RC	ESR	ψDxL	RC	ESR	ψDxL	RC	ESR
1							10x20	1.6	66.4
1.2				10x20	1.8	55.3	13x20	2.1	55.3
1.5				10x20	2.1	44.3	13x20	2.4	44.3
1.8	10x20	2.2	36.9	13x20	2.6	36.9	13x20	2.6	36.9
2.2	13x20	2.9	30.2	13x20	2.9	30.2	13x20	2.9	30.2
2.7	13x20	3.2	24.6	13x20	3.2	24.6	13x25	3.5	24.6
3.3	13x20	3.6	20.1	13x25	3.9	20.1	16x26	4.5	20.1
3.9	13x20	3.9	17.0	13x25	4.2	17.0	16x26	4.8	17.0
4.7	13x25	4.7	14.1	16x26	5.3	14.1	16x26	5.3	14.1
5.6	16x26	5.9	11.9	16x26	5.9	11.9	16x32	6.4	11.9
6.8	16x26	6.5	9.76	16x32	7	9.76	16x36	8	9.76
8.2	16x26	7.1	8.09	16x32	7.7	8.09	18x36	8.7	8.10
10	16x32	8.6	6.64	16x36	9	6.64	18x40	10	6.64
12	16x36	10	5.53	18x36	10	5.53	22x40	11	5.53
15	18x36	11	4.43	18x40	12	4.43	22x40	13	4.43
18	18x40	13	3.69	22x40	14	3.69	25x40	16	3.69
22	22x40	15	3.02	22x40	16	3.02	25x40	18	3.02
27	22x40	18	2.46	25x40	19	2.46			
33	25x40	22	2.01						

BX Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for BP
- Bi-polarized/Polarity reversing

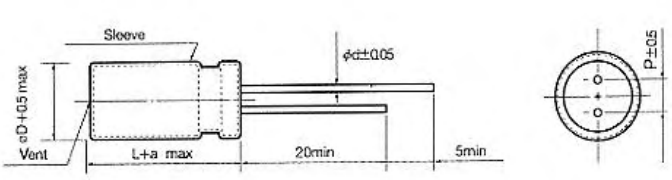
■ Recommended Applications
- TV/monitor
- Horizontal deflection correction



Specifications

Items	Characteristics			
Capacitance Tolerance	±10% (K) (120Hz,20℃)			
Rated Voltage Range (WV)	25~50 VDC			
Operating Temperature Range	-40 ~ +105℃			
Surge Voltage (V) (20℃)	WV	25	35	50
	SV	32	44	63
Leakage Current (Max) (20℃)	I≦100μA (After rated voltage applied for 2 minutes)			
	I= Leakage Current (μA)			
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	25	35	50
	tan δ	0.05	0.05	0.05
Load Life	After applying rated voltage for 1000 hours at 105℃, the capacitor shall meet the following requirement. (The polarity shall be reversed every 250 hours)			
	Capacitance Change	Within ±15% of the initial value		
	Dissipation Factor	Not more than 200% of the specified value		
	Leakage Current	Not more than the specified value		
Shelf Life	After placed at 105℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.			
Applicable standards	Refer to JIS C-5101			

Dimensions (mm)



ψD	10	13	16	18	22	25
P	5.0	5.0	7.5	7.5	10.0	12.5
ψd	0.6	0.6 (0.8)	0.8	0.8	0.8	0.8
a	1.0	2.0	2.0	2.0	2.0	2.0

( ) : L≧30

Multiplier for Ripple Current

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT （RC(A_{p-p}) / Sawtooth wave 15.75KHz,105℃） / MAX EQUIVALENT SERIES RESISTANCE（ESR(Ω) / 120Hz,20℃）

WV	25			35			50		
SPEC / μF	ψDxL	RC	ESR	ψDxL	RC	ESR	ψDxL	RC	ESR
1							10x20	1.4	66.4
1.2				10x20	1.5	55.3	13x20	1.8	55.3
1.5				10x20	1.8	44.3	13x20	2	44.3
1.8	10x20	1.9	36.9	13x20	2.2	36.9	13x20	2.2	36.9
2.2	13x20	2.5	30.2	13x20	2.5	30.2	13x20	2.5	30.2
2.7	13x20	2.7	24.6	13x20	2.7	24.6	13x25	3	24.6
3.3	13x20	3.1	20.1	13x25	3.3	20.1	16x26	3.8	20.1
3.9	13x20	3.3	17.0	13x25	3.6	17.0	16x26	4	17.0
4.7	13x25	4	14.1	16x26	4.5	14.1	16x26	4.5	14.1
5.6	16x26	5	11.9	16x26	5	11.9	16x32	5.4	11.9
6.8	16x26	5.5	9.76	16x32	6	9.76	16x36	6.8	9.76
8.2	16x26	6	8.09	16x32	6.5	8.09	18x36	7.4	8.10
10	16x32	7.3	6.64	16x36	7.6	6.64	18x40	8.5	6.64
12	16x36	8.5	5.53	18x36	8.5	5.53	22x40	9.3	5.53
15	18x36	9.3	4.43	18x40	10	4.43	22x40	11	4.43
18	18x40	11	3.69	22x40	12	3.69	25x40	14	3.69
22	22x40	13	3.02	22x40	14	3.02	25x40	15	3.02
27	22x40	15	2.46	25x40	16	2.46			
33	25x40	18	2.01						

TW Series

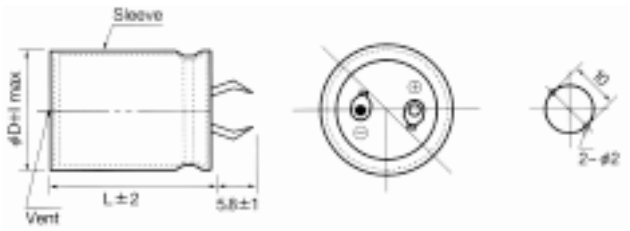
Specifications

■ Features
- Lifetime:85℃,2000hrs
- Snap-in terminal
- Large ripple current
- High reliability

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Smoothing circuit
- AC Adapter
- SMPS

Items	Characteristics														
Capacitance Tolerance	±20% (M) (120Hz,20℃)														
Rated Voltage Range (WV)	6.3~100 VDC									160~450 VDC					
Operating Temperature Range	-40 ~ +85℃									-25 ~ +85℃					
Surge Voltage (V) (20℃)	WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	SV	8	13	20	32	44	63	79	125	200	250	300	400	450	500
Leakage Current (Max)	I≦0.02CV or 3mA whichever is smaller (After rated voltage applied for 5 minutes)														
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V) (20℃)														
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Dissipation Factor(tan δ)shall not exceed the values showed in the table of standard rating														
Load Life	After applying rated voltage for 2000 hours at 85℃, the capacitor shall meet the following requirement.														
	Capacitance Change: Within±20% of the initial value														
	Dissipation Factor: Not more than 200% of the specified value														
	Leakage Current: Not more than the specified value														
Shelf Life	After placed at 85℃ without voltage applied for 500 hours, the capacitor shall meet the same requirement as load life.														
Other	Satisfied JIS C-5141														

Dimensions (mm)



Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	~10K
Coefficient	0.80	0.85	1.00	1.14	1.23	1.30	1.36	1.40

Temperature coefficient

Ambient Temperature (℃)	40	45	50	55	60	65	70	75	80	85
Coefficient	2.32	2.21	2.10	1.98	1.85	1.72	1.57	1.40	1.22	1.00

Case Size & Max Ripple Current / tan δ / ESR

CASE SIZE (ϕ DxL(mm)) & MAX DISSIPATION FACTOR (tanδ / 120Hz,20℃) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) & MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	10							16						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
8200								22x25				0.4	2.45	0.065
10000								22x30				0.4	2.6	0.053
12000	22x25				0.4	2.45	0.044	22x35	25x25			0.4	2.9	0.044
15000	22x30				0.4	2.8	0.035	22x40	25x30	30x25		0.4	3.3	0.035
18000	22x35	25x25			0.4	3.15	0.029	22x45	25x35	30x30		0.4	3.7	0.029
22000	22x40	25x30	30x25		0.4	3.5	0.024	22x50	25x45	30x30	35x25	0.4	4.15	0.024
27000	22x45	25x35	30x30		0.4	4	0.020		25x45	30x35	35x30	0.4	4.65	0.020
33000	22x50	25x40	30x30	35x25	0.4	4.45	0.016			30x40	35x35	0.4	5.25	0.016
39000		25x45	30x35	35x30	0.4	4.9	0.014			30x45	35x35	0.4	5.8	0.014
47000		25x50	30x40	35x30	0.4	5.5	0.011				35x40	0.4	6.45	0.011
56000			30x45	35x35	0.4	6.05	0.009							

WV	25							35						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
3900								22x25				0.35	2.1	0.119
4700								22x30	25x25			0.35	2.3	0.099
5600	22x25				0.35	2.2	0.083	22x35	25x35	30x25	35x25	0.35	2.6	0.083
6800	22x30	25x25			0.35	2.45	0.068	22x40	25x35	30x30	35x25	0.35	2.9	0.068
8200	22x35	25x30			0.35	2.75	0.057	22x45	25x35	30x30	35x25	0.35	3.2	0.057
10000	22x40	25x30	30x25		0.35	3.1	0.046	22x50	25x40	30x30	35x25	0.35	3.6	0.046
12000	22x45	25x35	30x30	35x25	0.35	3.4	0.039		25x45	30x35	35x30	0.35	4	0.039
15000		25x40	30x35	35x30	0.35	3.9	0.031			30x40	35x35	0.35	4.6	0.031
18000		25x45	30x40	35x30	0.35	4.3	0.026			30x45	35x40	0.35	5.1	0.026
22000			30x45	35x35	0.35	4.85	0.021				35x45	0.35	5.7	0.021
27000			30x50	35x40	0.35	5.45	0.017				35x50	0.35	6.45	0.017
33000				35x45	0.35	6.15	0.014							

Case Size & Max Ripple Current / tan δ / ESR

CASE SIZE (ϕ DxL(mm)) & MAX DISSIPATION FACTOR (tanδ / 120Hz,20℃) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) & MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	50							63						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
1800								22x25				0.25	1.8	0.184
2200	22x25				0.3	1.8	0.180	22x30	25x25			0.25	2	0.151
2700	22x30				0.3	1.95	0.147	22x35	25x30			0.25	2.3	0.123
3300	22x35	25x25			0.3	2.2	0.120	22x40	25x30	30x25		0.25	2.55	0.101
3900	22x40	25x30			0.3	2.4	0.102	22x45	25x35	30x30		0.25	2.8	0.085
4700	22x45	25x35	35x25		0.3	2.7	0.085	22x50	25x40	30x30	35x25	0.25	3.15	0.071
5600		25x35	30x30	35x25	0.3	3	0.071		25x45	30x35	35x30	0.25	3.5	0.059
6800		25x40	30x35	35x30	0.3	3.35	0.059		25x50	30x40	35x30	0.25	3.9	0.049
8200		25x50	30x40	35x30	0.3	3.7	0.049			30x45	35x35	0.25	4.35	0.040
10000			30x45	35x35	0.3	4.2	0.040			30x50	35x40	0.25	4.9	0.033
12000			30x50	35x40	0.3	4.65	0.033				30x50	0.25	5.45	0.028
15000				35x45	0.3	5.3	0.027							
18000				35x50	0.3	5.9	0.022							

WV	80							100						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
820								22x25				0.2	1.7	0.324
1000								22x30	25x25			0.2	1.95	0.265
1200	22x25				0.2	1.7	0.221	22x35	25x30			0.2	2.15	0.221
1500	22x30	25x25			0.2	1.95	0.177	22x40	25x30	30x25		0.2	2.45	0.177
1800	22x35	25x30			0.2	2.15	0.147	22x45	25x35	30x30		0.2	2.75	0.147
2200	22x40	25x30	30x25		0.2	2.45	0.121	22x50	25x40	30x30	35x25	0.2	3.05	0.121
2700	22x45	25x35	30x30		0.2	2.75	0.098		25x45	30x35	35x30	0.2	3.45	0.098
3000	22x50	25x40	30x30	35x25	0.2	3.1	0.080		25x50	30x40	35x30	0.2	3.9	0.080
3900		25x45	30x35	35x30	0.2	3.4	0.068			30x45	35x35	0.2	4.3	0.068
4700		25x50	30x40	35x30	0.2	3.8	0.056				35x40	0.2	4.75	0.056
5600			30x45	35x35	0.2	4.2	0.047				35x50	0.2	5.3	0.047
6800			30x50	35x40	0.2	4.7	0.039							
8200				35x50	0.2	5.25	0.032							

Case Size & Max Ripple Current / tan δ / ESR

CASE SIZE (ϕ DxL(mm)) & MAX DISSIPATION FACTOR (tanδ / 120Hz,20℃) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) & MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	160							180						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
270								22x25				0.15	1.1	0.737
330	22x25				0.15	1.15	0.603	22x30				0.15	1.25	0.603
390	22x30				0.15	1.3	0.510	22x30	25x25			0.15	1.4	0.510
470	22x35	25x25			0.15	1.5	0.423	22x35	25x30			0.15	1.6	0.423
560	22x35	25x30			0.15	1.7	0.355	22x40	25x30	30x25		0.15	1.8	0.355
680	22x40	25x35	30x25		0.15	1.95	0.293	22x45	25x35	30x30		0.15	2.05	0.292
820	22x50	25x35	30x30		0.15	2.15	0.243	22x50	25x40	30x30	35x25	0.15	2.25	0.243
1000		25x40	30x35	35x25	0.15	2.45	0.199		25x45	30x35	35x30	0.15	2.55	0.199
1200		25x50	30x40	35x30	0.15	2.75	0.166			30x40	35x35	0.15	2.85	0.166
1500			30x45	35x35	0.15	3	0.133			30x50	35x40	0.15	3.1	0.130
1800			30x50	35x40	0.15	3.5	0.111				35x45	0.15	3.6	0.111
2200				35x45	0.15	3.9	0.090				35x50	0.15	4	0.090

WV	200							250						
SPEC / μF	ϕ DxL				tanδ	RC	ESR	ϕ DxL				tanδ	RC	ESR
180								22x25				0.15	1	1.11
220	22x25	22x30			0.15	1	0.905	22x30	22x35			0.15	1.15	0.905
270	22x30	25x25			0.15	1.15	0.737	22x30	25x25			0.15	1.3	0.737
330	22x35	25x25	22x40		0.15	1.3	0.603	22x35	25x30	22x40		0.15	1.45	0.603
390	22x35	25x30	30x25		0.15	1.45	0.510	22x40	25x35	30x25		0.15	1.6	0.510
470	22x40	25x35	30x25	22x40	0.15	1.65	0.423	22x45	25x40	30x30	35x25	0.15	1.8	0.423
560	22x45	25x40	30x30	22x40	0.15	1.85	0.355		25x40	30x35	35x30	0.15	2	0.355
680	22x50	25x40	30x35	35x30	0.15	2.1	0.293		25x50	30x40	35x30	0.15	2.3	0.293
820		25x50	30x40	35x30	0.15	2.3	0.243			30x45	35x35	0.15	2.55	0.243
1000			30x45	35x35	0.15	2.6	0.199			30x50	35x40	0.15	2.9	0.199
1200			30x50	35x40	0.15	2.9	0.166				35x45	0.15	3.25	0.166
1500				35x50	0.15	3.25	0.133							

Case Size & Max Ripple Current / tan δ / ESR

CASE SIZE (φ DxL(mm)) & MAX DISSIPATION FACTOR (tanδ / 120Hz,20℃) & MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) & MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

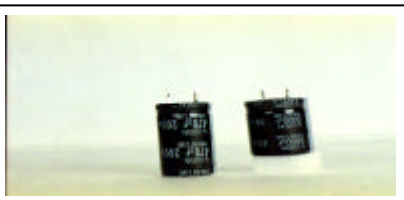
WV	315							350						
SPEC / μF	φ DxL				tanδ	RC	ESR	φ DxL				tanδ	RC	ESR
82								22x25				0.15	0.7	2.43
100	22x25				0.15	0.75	1.99	22x30				0.15	0.8	1.99
120	22x30				0.15	0.8	1.66	22x30	25x25			0.15	0.85	1.66
150	22x30	25x25			0.15	1	1.33	22x35	25x25			0.15	1.05	1.33
180	22x35	25x30			0.15	1.1	1.11	22x40	25x35	30x25		0.15	1.15	1.11
220	22x40	25x30	30x25		0.15	1.25	0.905	22x45	25x35	30x30	35x25	0.15	1.3	0.905
270	22x45	25x35	30x30	35x25	0.15	1.4	0.737		25x45	30x35	35x25	0.15	1.45	0.737
330	22x50	25x40	30x35	35x25	0.15	1.6	0.603		25x50	30x40	35x30	0.15	1.65	0.603
390		25x45	30x35	35x30	0.15	1.75	0.510			30x45	35x35	0.15	1.85	0.510
470			30x40	35x35	0.15	2	0.423			30x50	35x40	0.15	2.1	0.423
560			30x45	35x40	0.15	2.2	0.355				35x45	0.15	2.3	0.355
680				35x45	0.15	2.5	0.293				35x50	0.15	2.6	0.293
820				35x50	0.15	2.8	0.243							

WV	400							450						
SPEC / μF	φ DxL				tanδ	RC	ESR	φ DxL				tanδ	RC	ESR
56								22x25				0.15	0.65	3.56
68	22x25				0.15	0.65	2.93	22x30				0.15	0.75	2.93
82	22x25				0.15	0.75	2.43	22x30	25x25			0.15	0.85	2.43
100	22x30	25x25			0.15	0.85	1.99	22x35	25x30			0.15	0.9	1.99
120	22x35	25x25	18x36		0.15	0.9	1.66	22x40	25x35	30x25		0.15	1.1	1.66
150	22x40	25x30	30x25		0.15	1.1	1.33	22x50	25x40	30x30		0.15	1.2	1.33
180	22x45	25x35	30x30		0.15	1.2	1.11		25x45	30x35	35x25	0.15	1.35	1.11
220	22x50	25x40	30x30	35x25	0.15	1.35	0.905		25x50	30x40	35x30	0.15	1.5	0.905
270		25x45	30x35	35x30	0.15	1.5	0.737			30x45	35x35	0.15	1.7	0.737
330		25x50	30x40	35x35	0.15	1.7	0.603			30x50	35x40	0.15	1.9	0.503
390			30x45	35x35	0.15	1.9	0.510				35x45	0.15	2.1	0.510
470				35x40	0.15	2.1	0.423				35x50	0.15	2.3	0.423
560				35x50	0.15	2.3	0.355							
680				35x50	0.15	2.53	0.292							

HW Series

■ Features
- Lifetime:105℃,2000hrs
- Wide temperature range for TW
- Snap-in terminal
- Large ripple current

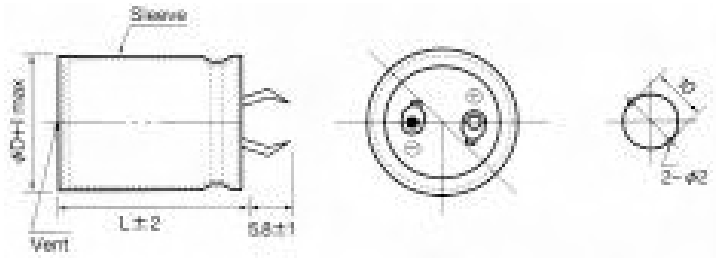
■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication
- Smoothing circuit
- Adapter
- SMPS



Specifications

Items	Characteristics															
Capacitance Tolerance	±20% (M) (120Hz,20℃)															
Rated Voltage Range (WV)	10~100 VDC								160~450 VDC							
Operating Temperature Range	-40 ~ +105℃								-25 ~ +105℃							
Surge Voltage (V) (20℃)	WV	10	16	25	35	50	63	80	100	160	180	200	250	315	350	400	450
	SV	13	20	32	44	63	79	100	125	200	225	250	300	365	400	450	500
Leakage Current (Max) (20℃)	I≦0.02CV or 3mA whichever is smaller (After rated voltage applied for 5 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)															
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Dissipation Factor(tan δ)shall not exceed the values showed in the table of standard rating															
Load Life	After applying rated voltage for 2000 hours at 105℃, the capacitor shall meet the following requirement. Capacitance Change: Within ±20% of the initial value Dissipation Factor: Not more than 200% of the specified value Leakage Current: Not more than the specified value															
Shelf Life	After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.															
Applicable standards	Refer to JIS C 5101															

Dimensions (mm)



Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	10K~100K
Coefficient	0.80	0.85	1.00	1.14	1.23	1.30	1.36	1.40

Temperature coefficient

Ambient Temperature (℃)	40	45	50	55	60	65	70	75	80	85	105
Coefficient	2.73	2.60	2.47	2.33	2.18	2.02	1.85	1.65	1.44	1.18	1.00

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE（ESR(Ω) / 120Hz,20℃）

WV	10						16					
SPEC / μF	ψDxL / RC				tan δ	ESR	ψDxL / RC				tan δ	ESR
6800							22x25 1.80				0.5	0.098
8200							22x30 2.05	25x25 2.05			0.5	0.081
10000	22x25 1.80				0.5	0.066	22x35 2.45	25x30 2.45			0.5	0.066
12000	22x30 2.05	25x25 2.05			0.5	0.055	22x40 2.73	25x30 2.60	30x25 2.68		0.5	0.055
15000	22x35 2.45	25x30 2.45	30x25 2.55		0.5	0.044	22x45 2.99	25x35 2.90	30x30 3.02		0.5	0.044
18000	22x40 2.94	25x30 2.80	30x30 3.11		0.5	0.037	22x50 3.43	25x40 3.33	30x30 3.30	35x25 3.37	0.5	0.037
22000	22x45 3.24	25x35 3.15	30x30 3.28	35x25 3.37	0.5	0.030		25x45 3.70	30x35 3.70	35x30 3.81	0.5	0.030
27000		25x40 3.50	30x35 3.67	35x30 3.78	0.5	0.025			30x40 4.15	35x35 4.27	0.5	0.025
33000		25x45 4.00	30x40 4.20	35x30 4.08	0.5	0.020			30x50 4.65	35x40 4.65	0.5	0.020
39000		25x50 4.45	30x45 4.67	35x35 4.63	0.5	0.017				35x45 5.25	0.5	0.017
47000				35x40 4.90	0.5	0.014				35x50 5.80	0.5	0.014
56000				35x45 5.50	0.5	0.012						
68000				35x50 6.05	0.5	0.010						

WV	25						35					
SPEC / μF	ψDxL / RC				tan δ	ESR	ψDxL / RC				tan δ	ESR
2700							22x25 1.45				0.35	0.172
3300							22x30 1.60				0.35	0.141
3900	22x25 1.50				0.4	0.136	22x30 1.80				0.35	0.119
4700	22x30 1.80				0.4	0.113	22x35 2.23	25x25 2.10			0.35	0.099
5600	22x30 1.95	25x25 1.95			0.4	0.095	22x40 2.41	25x30 2.30	30x25 2.37		0.35	0.083
6800	22x35 2.20	25x30 2.20			0.4	0.078	22x45 2.68	25x35 2.60	30x30 2.70		0.35	0.068
8200	22x40 2.47	25x35 2.50	30x25 2.45		0.4	0.065	22x50 3.02	25x40 2.93	30x30 2.90	35x25 2.96	0.35	0.057
10000	22x45 2.75	25x40 2.80	30x30 2.75		0.4	0.053		25x45 3.20	30x35 3.20	35x30 3.30	0.35	0.046
12000	22x50 3.13	25x45 3.22	30x35 3.19	35x25 3.10	0.4	0.044		25x50 3.64	30x40 3.67	35x30 3.60	0.35	0.039
15000		25x50 3.43	30x40 3.47	35x30 3.40	0.4	0.035			30x45 4.04	35x35 4.00	0.35	0.031
18000			30x45 3.94	35x35 3.90	0.4	0.029				35x40 4.60	0.35	0.026
22000			30x50 4.30	35x40 4.30	0.4	0.024				35x50 5.10	0.35	0.021
27000				35x45 4.85	0.4	0.020						

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	50						63					
SPEC / μF	ψDxL / RC				tan δ	ESR	ψDxL / RC				tan δ	ESR
1200							22x25 1.25				0.25	0.276
1500	22x25 1.25				0.30	0.265	22x30 1.45	25x25 1.45			0.25	0.221
1800	22x30 1.45				0.30	0.221	22x35 1.60	25x30 1.60			0.25	0.184
2200	22x30 1.60	25x25 1.60			0.30	0.181	22x40 1.89	25x30 1.80	30x25 1.85		0.25	0.151
2700	22x35 1.80	25x30 1.80			0.30	0.147	22x45 2.06	25x35 2.00	30x30 2.08		0.25	0.123
3300	22x40 2.05	25x30 1.95	30x25 2.01		0.30	0.121		25x40 2.32	30x30 2.30	35x25 2.35	0.25	0.101
3900	22x45 2.27	25x35 2.20	30x30 2.29		0.30	0.102		25x45 2.55	30x35 2.55	35x30 2.63	0.25	0.085
4700	22x50 2.50	25x40 2.42	30x30 2.40	35x25 2.45	0.30	0.085		25x50 2.83	30x40 2.86	35x30 2.80	0.25	0.071
5600		25x45 2.70	30x35 2.70	35x30 2.78	0.30	0.071			30x45 3.18	35x35 3.15	0.25	0.059
6800			30x40 3.06	35x30 3.00	0.30	0.059			30x50 3.50	35x40 3.50	0.25	0.048
8200			30x45 3.38	35x35 3.35	0.30	0.049				35x45 3.90	0.25	0.040
10000				35x40 3.70	0.30	0.040						
12000				35x50 4.20	0.30	0.033						

WV	80						100					
SPEC / μF	ψDxL / RC				tan δ	ESR	ψDxL / RC				tan δ	ESR
560							22x25 1.20				0.2	0.474
680							22x30 1.35				0.2	0.390
820	22x25 1.20				0.2	0.324	22x30 1.50	25x25 1.50			0.2	0.324
1000	22x30 1.35				0.2	0.265	22x35 1.70	25x30 1.70			0.2	0.265
1200	22x35 1.59	25x25 1.50			0.2	0.221	22x40 1.97	25x35 1.99	30x25 1.95		0.2	0.221
1500	22x40 1.78	25x30 1.70	30x25 1.75		0.2	0.177	22x45 2.15	25x40 2.19	30x30 2.15	35x25 2.21	0.2	0.177
1800	22x45 2.01	25x35 1.95	30x30 2.03		0.2	0.147		25x45 2.45	30x35 2.45	35x30 2.52	0.2	0.147
2200		25x40 2.17	30x30 2.15	35x25 2.19	0.2	0.121		25x50 2.75	30x40 2.75	35x35 2.86	0.2	0.121
2700		25x45 2.45	30x35 2.45	35x30 2.52	0.2	0.098			30x45 3.08	35x35 3.05	0.2	0.098
3300			30x40 2.75	35x35 2.83	0.2	0.080			30x50 3.45	35x40 3.45	0.2	0.080
3900			30x45 3.13	35x35 3.10	0.2	0.068				35x45 3.90	0.2	0.068
4700				35x40 3.40	0.2	0.056				35x50 4.30	0.2	0.056
5600				35x50 3.80	0.2	0.047						

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tanä / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	160						180					
SPEC / μF	ψDxL RC				tan δ	ESR	ψDxL RC				tan δ	ESR
270	22x25 0.85				0.15	0.737	22x25 0.85				0.15	0.737
330	22x30 1.00				0.15	0.603	22x30 1.10				0.15	0.603
390	22x30 1.15	25x25 1.15			0.15	0.510	22x35 1.32	25x25 1.25			0.15	0.510
470	22x35 1.30	25x30 1.30			0.15	0.423	22x40 1.47	25x30 1.40			0.15	0.423
560	22x40 1.57	25x30 1.50	30x25 1.54		0.15	0.355	22x45 1.70	25x35 1.63	30x25 1.60		0.15	0.355
680	22x45 1.75	25x35 1.70	30x30 1.77		0.15	0.293	22x50 1.87	25x40 1.82	30x30 1.80	35x25 1.84	0.15	0.293
820	22x50 2.03	25x40 1.97	30x30 1.95	35x25 1.99	0.15	0.243		25x45 2.05	30x35 2.05	35x30 2.11	0.15	0.243
1000		25x45 2.15	30x35 2.15	35x30 2.21	0.15	0.199		25x50 2.27	30x40 2.29	35x30 2.25	0.15	0.199
1200			30x40 2.45	35x35 2.52	0.15	0.166			30x45 2.57	35x35 2.55	0.15	0.166
1500			30x50 2.75	35x40 2.75	0.15	0.133				35x40 2.85	0.15	0.133
1800				35x45 3.00	0.15	0.111				35x50 3.10	0.15	0.111
2200				35x50 3.50	0.15	0.090						

WV	200						250					
SPEC / μF	ψDxL RC				tan δ	ESR	ψDxL RC				tan δ	ESR
150							22x25 0.75				0.15	1.33
180							22x30 0.85				0.15	1.11
220	22x25 0.85				0.15	0.905	22x30 1.00	25x25 1.00			0.15	0.905
270	22x30 1.00				0.15	0.737	22x35 1.22	25x25 1.15			0.15	0.737
330	22x30 1.15	25x25 1.15			0.15	0.603	22x40 1.36	25x30 1.30			0.15	0.603
390	22x35 1.30	25x30 1.30			0.15	0.510	22x45 1.54	25x35 1.48	30x25 1.45	35x25 1.59	0.15	0.510
470	22x40 1.52	25x35 1.54	30x25 1.49		0.15	0.423	22x50 1.78	25x40 1.75	30x30 1.72	35x30 1.88	0.15	0.423
560	22x45 1.70	25x35 1.65	30x30 1.72		0.15	0.355		25x40 1.80	30x35 1.89	35x30 1.94	0.15	0.355
680		25x45 1.97	30x35 1.97	35x30 2.02	0.15	0.293		25x50 2.10	30x40 2.10	35x35 2.18	0.15	0.293
820		25x50 2.20	30x35 2.10	35x30 2.16	0.15	0.243			30x45 2.30	35x40 2.39	0.15	0.243
1000			30x45 2.32	35x35 2.30	0.15	0.199			30x50 2.55	35x45 2.65	0.15	0.199
1200			30x50 2.75	35x40 2.75	0.15	0.166				35x50 2.90	0.15	0.166
1500				35x45 2.90	0.15	0.133						

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tanä / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

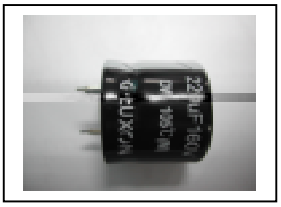
WV	315						350					
SPEC / μF	ψDxL RC				tan δ	ESR	ψDxL RC				tan δ	ESR
82	22x25 0.55				0.15	2.43	22x25 0.60				0.15	2.43
100	22x30 0.65				0.15	1.99	22x30 0.70	25x25 0.70			0.15	1.99
120	22x30 0.75	25x25 0.75			0.15	1.66	22x35 0.80	25x30 0.80			0.15	1.66
150	22x35 0.80	25x30 0.80			0.15	1.33	22x40 0.86	25x35 0.87	30x25 0.85		0.15	1.33
180	22x40 1.01	25x35 1.02	30x25 1.00		0.15	1.11	22x45 1.05	25x40 1.07	30x30 1.05		0.15	1.11
220	22x45 1.10	25x40 1.12	30x30 1.10		0.15	0.905	22x50 1.16	25x45 1.20	30x35 1.18	35x25 1.15	0.15	0.905
270		25x45 1.25	30x35 1.25		0.15	0.737		25x50 1.31	30x40 1.33	35x30 1.30	0.15	0.737
330		25x50 1.53	30x40 1.53	35x30 1.50	0.15	0.603			30x45 1.46	35x35 1.45	0.15	0.603
390			30x45 1.71	35x30 1.60	0.15	0.510			30x50 1.65	35x40 1.65	0.15	0.510
470			30x50 1.85	35x35 1.75	0.15	0.423				35x45 1.85	0.15	0.423
560				35x40 2.00	0.15	0.355				35x50 2.10	0.15	0.355
680				35x45 2.20	0.15	0.293						

WV	400						450					
SPEC / μF	ψDxL RC				tan δ	ESR	ψDxL RC				tan δ	ESR
56							22x25 0.55				0.2	4.74
68	22x25 0.55				0.15	2.93	22x30 0.65				0.2	3.90
82	22x30 0.65	25x25 0.65			0.15	2.43	22x35 0.80	25x25 0.75			0.2	3.24
100	22x35 0.79	25x25 0.75			0.15	1.99	22x40 0.89	25x30 0.85			0.2	2.65
120	22x40 0.89	25x30 0.85	30x25 0.87		0.15	1.66	22x45 0.95	25x35 0.92	30x25 0.90		0.2	2.21
150	22x45 0.93	25x35 0.90	30x30 0.94	35x25 0.96	0.15	1.33	22x50 1.14	25x40 1.11	30x30 1.10		0.2	1.77
180	22x50 1.14	25x40 1.11	30x30 1.10	35x25 1.12	0.15	1.11		25x45 1.25	30x35 1.24	35x25 1.20	0.2	1.47
220		25x45 1.20	30x35 1.20	35x30 1.24	0.15	0.905		25x50 1.36	30x40 1.38	35x30 1.35	0.2	1.20
270		25x50 1.36	30x40 1.38	35x30 1.35	0.15	0.737			30x45 1.51	35x35 1.50	0.2	0.982
330			30x45 1.51	35x35 1.50	0.15	0.603			30x50 1.70	35x40 1.70	0.2	0.804
390			30x50 1.70	35x40 1.70	0.15	0.510				35x45 1.90	0.2	0.680
470				35x45 1.90	0.15	0.423				35x50 2.10	0.2	0.564

DW Series

■ Features
- Lifetime:105℃,2000hrs ,with 20mm height
- Snap-in terminal
- Large ripple current

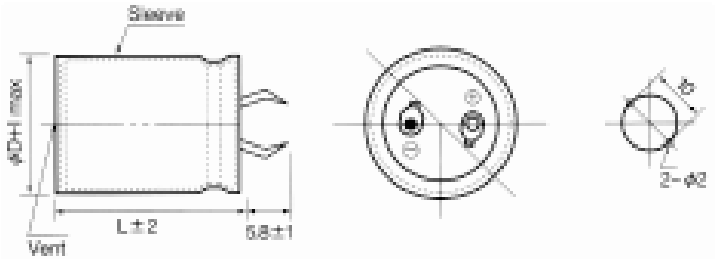
■ Recommended Applications
- Smoothing circuit
- Adapter



Specifications

Items	Characteristics															
Capacitance Tolerance	±20% (M) (120Hz,20℃)															
Rated Voltage Range (WV)	10~100 VDC								160~450 VDC							
Operating Temperature Range	-40 ~ +105℃								-25 ~ +105℃							
Surge Voltage (V) (20℃)	WV	10	16	25	35	50	63	80	100	160	180	200	250	315	350	400	450
	SV	13	20	32	44	63	79	100	125	200	225	250	300	365	400	450	500
Leakage Current (Max) (20℃)	I≦0.02CV or 3mA whichever is smaller (After rated voltage applied for 5 minutes)															
	I= Leakage Current (μ A) C= Nominal Capacitance (μ F) V= Rated Voltage (V)															
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Dissipation Factor(tan δ)shall not exceed the values showed in the table of standard rating															
Load Life	After applying rated voltage for 2000 hours at 105℃, the capacitor shall meet the following requirement.															
	Capacitance Change: Within±20% of the initial value															
	Dissipation Factor: Not more than 200% of the specified value															
	Leakage Current: Not more than the specified value															
Shelf Life	After placed at 105℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.															
Applicable standards	Refer to JIS C 5101															

Dimensions (mm)



Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	10K~100K
Coefficient	0.80	0.85	1.00	1.14	1.23	1.30	1.36	1.40

Temperature coefficient

Ambient Temperature (℃)	105	85	65≧
Coefficient	1.0	1.7	2.1

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE（ESR(Ω) / 120Hz,20℃）

WV	10				16				25				35			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
1500													20x20	0.40	0.80	0.354
1800													22x20	0.40	0.94	0.295
2200									20x20	0.45	0.98	0.271	22x20	0.40	1.04	0.241
2700									22x20	0.45	1.08	0.221	25x20	0.40	1.29	0.196
3300					20x20	0.50	1.06	0.201	22x20	0.45	1.29	0.181	30x20	0.40	1.45	0.161
3900					20x20	0.50	1.25	0.170	25x20	0.45	1.58	0.153				
4700	20x20	0.55	0.98	0.155	22x20	0.50	1.38	0.141	25x20	0.45	1.61	0.127				
5600	20x20	0.55	1.16	0.130	25x20	0.50	1.68	0.118								
6800	22x20	0.55	1.31	0.107	25x20	0.50	1.80	0.098								
8200	25x20	0.55	1.59	0.089												
10000	25x20	0.55	1.77	0.073												

WV	50				63				80				100			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
330													20x20	0.20	0.60	0.804
390													20x20	0.20	0.71	0.680
470									20x20	0.25	0.65	0.705	22x20	0.20	0.78	0.564
560									20x20	0.25	0.70	0.592	25x20	0.20	0.95	0.474
680					20x20	0.30	0.83	0.585	22x20	0.25	0.84	0.488	25x20	0.20	1.09	0.390
820					22x20	0.30	0.99	0.485	25x20	0.25	1.04	0.404	30x20	0.20	1.32	0.323
1000	20x20	0.35	0.87	0.464	22x20	0.30	1.10	0.398	25x20	0.25	1.19	0.332				
1200	22x20	0.35	1.02	0.387	25x20	0.30	1.20	0.332	30x20	0.25	1.44	0.276				
1500	25x20	0.35	1.15	0.309	30x20	0.30	1.47	0.265								
1800	25x20	0.35	1.34	0.258	30x20	0.30	1.52									
2200	30x20	0.35	1.60	0.211												

WV	160				180				200				250			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
100													20x20	0.15	0.59	1.99
120									20x20	0.15	0.63	1.66	22x20	0.15	0.65	1.66
150					20x20	0.15	0.66	1.33	20x20	0.15	0.66	1.33	25x20	0.15	0.74	1.33
180	20x20	0.15	0.69	1.11	22x20	0.15	0.80	1.11	22x20	0.15	0.80	1.11	25x20	0.15	0.77	1.11
220	22x20	0.15	0.81	0.904	25x20	0.15	0.90	0.904	25x20	0.15	0.87	0.904	30x20	0.15	0.95	0.904
270	25x20	0.15	0.98	0.737	25x20	0.15	0.95	0.737	25x20	0.15	0.95	0.737	30x20	0.15	1.00	0.737
330	25x20	0.15	1.02	0.603	30x20	0.15	1.15	0.603	30x20	0.15	1.15	0.603	35x20	0.15	1.16	0.603
390	30x20	0.15	1.25	0.510	30x20	0.15	1.20	0.510	35x20	0.15	1.20	0.510				
470	30x20	0.15	1.30	0.423	35x20	0.15	1.36	0.423	35x20	0.15	1.25	0.423				
560	35x20	0.15	1.46	0.355	35x20	0.15	1.43	0.355								
680	35x20	0.15	1.51	0.293												

Case Size / Max Ripple Current / tan δ / ESR

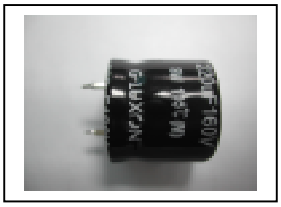
CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	315				350				400				450			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
27													20x20	0.20	0.26	9.82
33													20x20	0.20	0.30	8.04
39									20x20	0.15	0.34	5.10	22x20	0.20	0.36	5.10
47					20x20	0.15	0.38	4.23	22x20	0.15	0.39	4.23	25x20	0.20	0.41	4.23
56	20x20	0.15	0.41	3.55	20x20	0.15	0.40	3.55	22x20	0.15	0.40	3.55	25x20	0.20	0.43	3.55
68	22x20	0.15	0.48	2.93	22x20	0.15	0.45	2.93	25x20	0.15	0.49	2.93	30x20	0.20	0.50	2.93
82	22x20	0.15	0.51	2.43	25x20	0.15	0.54	2.43	30x20	0.15	0.55	2.43	30x20	0.20	0.53	2.43
100	25x20	0.15	0.57	1.99	25x20	0.15	0.57	1.99	30x20	0.15	0.60	1.99	35x20	0.20	0.61	1.99
120	30x20	0.15	0.65	1.66	30x20	0.15	0.65	1.66	35x20	0.15	0.75	1.66	35x20	0.20	0.68	1.66
150	30x20	0.15	0.70	1.33	35x20	0.15	0.78	1.33	35x20	0.15	0.80					
180	35x20	0.15	0.85	1.11	35x20	0.15	0.85	1.11								
220	35*20	0.15	0.9	0.904												

SW Series

■ Features
- Lifetime:105℃,3000hrs ,with 20mm height
- Longer life range than DW
- Snap-in terminal
- Large ripple current

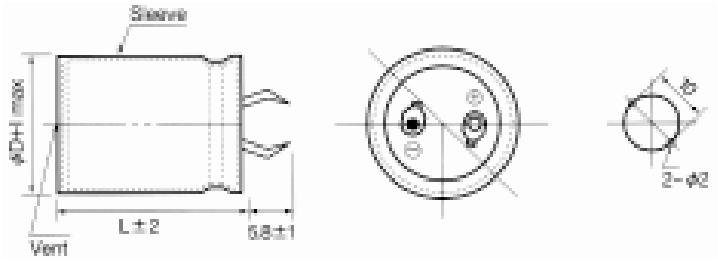
■ Recommended Applications
- Smoothing circuit
- Adapter



Specifications

Items	Characteristics															
Capacitance Tolerance	±20% (M) (120Hz,20℃)															
Rated Voltage Range (WV)	10~100 VDC								160~450 VDC							
Operating Temperature Range	-40 ~ +105℃								-25 ~ +105℃							
Surge Voltage (V) (20℃)	WV	10	16	25	35	50	63	80	100	160	180	200	250	315	350	400	450
	SV	13	20	32	44	63	79	100	125	200	225	250	300	365	400	450	500
Leakage Current (Max) (20℃)	I≦0.02CV or 3mA whichever is smaller (After rated voltage applied for 5 minutes)															
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)															
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Dissipation Factor(tan δ)shall not exceed the values showed in the table of standard rating															
Load Life	After applying rated voltage for 3000 hours at 105℃, the capacitor shall meet the following requirement.															
	Capacitance Change: Within±20% of the initial value															
	Dissipation Factor: Not more than 200% of the specified value															
	Leakage Current: Not more than the specified value															
Shelf Life	After placed at 105℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.															
Applicable standards	Refer to JIS C 5101															

Dimensions (mm)



Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	10K~100K
Coefficient	0.80	0.85	1.00	1.14	1.23	1.30	1.36	1.40

Temperature coefficient

Ambient Temperature (℃)	105	85	65≧
Coefficient	1.0	1.7	2.1

Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE（ESR(Ω) / 120Hz,20℃）

WV	10				16				25				35			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
1500													20x20	0.40	0.80	0.354
1800													22x20	0.40	0.94	0.295
2200									20x20	0.45	0.98	0.271	22x20	0.40	1.04	0.241
2700									22x20	0.45	1.08	0.221	25x20	0.40	1.29	0.196
3300					20x20	0.50	1.06	0.201	22x20	0.45	1.29	0.181	30x20	0.40	1.45	0.161
3900					20x20	0.50	1.25	0.170	25x20	0.45	1.58	0.153				
4700	20x20	0.55	0.98	0.155	22x20	0.50	1.38	0.141	25x20	0.45	1.61	0.127				
5600	20x20	0.55	1.16	0.130	25x20	0.50	1.68	0.118								
6800	22x20	0.55	1.31	0.107	25x20	0.50	1.80	0.098								
8200	25x20	0.55	1.59	0.089												
10000	25x20	0.55	1.77	0.073												

WV	50				63				80				100			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
330													20x20	0.20	0.60	0.804
390													20x20	0.20	0.71	0.680
470									20x20	0.25	0.65	0.705	22x20	0.20	0.78	0.564
560									20x20	0.25	0.70	0.592	25x20	0.20	0.95	0.474
680					20x20	0.30	0.83	0.585	22x20	0.25	0.84	0.488	25x20	0.20	1.09	0.390
820					22x20	0.30	0.99	0.485	25x20	0.25	1.04	0.404	30x20	0.20	1.32	0.323
1000	20x20	0.35	0.87	0.464	22x20	0.30	1.10	0.398	25x20	0.25	1.19	0.332				
1200	22x20	0.35	1.02	0.387	25x20	0.30	1.20	0.332	30x20	0.25	1.44	0.276				
1500	25x20	0.35	1.15	0.309	30x20	0.30	1.47	0.265								
1800	25x20	0.35	1.34	0.258	30x20	0.30	1.52									
2200	30x20	0.35	1.60	0.211												

WV	160				180				200				250			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
100													20x20	0.15	0.59	1.99
120									20x20	0.15	0.63	1.66	22x20	0.15	0.65	1.66
150					20x20	0.15	0.66	1.33	20x20	0.15	0.66	1.33	25x20	0.15	0.74	1.33
180	20x20	0.15	0.69	1.11	22x20	0.15	0.80	1.11	22x20	0.15	0.80	1.11	25x20	0.15	0.77	1.11
220	22x20	0.15	0.81	0.904	25x20	0.15	0.90	0.904	25x20	0.15	0.87	0.904	30x20	0.15	0.95	0.904
270	25x20	0.15	0.98	0.737	25x20	0.15	0.95	0.737	25x20	0.15	0.95	0.737	30x20	0.15	1.00	0.737
330	25x20	0.15	1.02	0.603	30x20	0.15	1.15	0.603	30x20	0.15	1.15	0.603	35x20	0.15	1.16	0.603
390	30x20	0.15	1.25	0.510	30x20	0.15	1.20	0.510	35x20	0.15	1.20	0.510				
470	30x20	0.15	1.30	0.423	35x20	0.15	1.36	0.423	35x20	0.15	1.25	0.423				
560	35x20	0.15	1.46	0.355	35x20	0.15	1.43	0.355								
680	35x20	0.15	1.51	0.293												

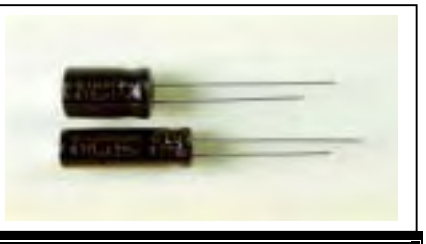
Case Size / Max Ripple Current / tan δ / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	315				350				400				450			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
27													20x20	0.20	0.26	9.82
33													20x20	0.20	0.30	8.04
39									20x20	0.15	0.34	5.10	22x20	0.20	0.36	5.10
47					20x20	0.15	0.38	4.23	22x20	0.15	0.39	4.23	25x20	0.20	0.41	4.23
56	20x20	0.15	0.41	3.55	20x20	0.15	0.40	3.55	22x20	0.15	0.40	3.55	25x20	0.20	0.43	3.55
68	22x20	0.15	0.48	2.93	22x20	0.15	0.45	2.93	25x20	0.15	0.49	2.93	30x20	0.20	0.50	2.93
82	22x20	0.15	0.51	2.43	25x20	0.15	0.54	2.43	30x20	0.15	0.55	2.43	30x20	0.20	0.53	2.43
100	25x20	0.15	0.57	1.99	25x20	0.15	0.57	1.99	30x20	0.15	0.60	1.99	35x20	0.20	0.61	1.99
120	30x20	0.15	0.65	1.66	30x20	0.15	0.65	1.66	35x20	0.15	0.75	1.66	35x20	0.20	0.68	1.66
150	30x20	0.15	0.70	1.33	35x20	0.15	0.78	1.33	35x20	0.15	0.80					
180	35x20	0.15	0.85	1.11	35x20	0.15	0.85	1.11								
220	35*20	0.15	0.9	0.904												

EL

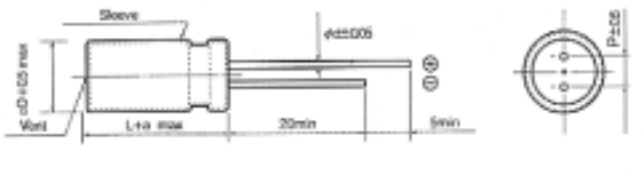
■ Features
· Lifetime:60℃,2.5V,1000hrs



Specifications

Items	Characteristics	
Capacitance Tolerance	-20 ~ +40% (25℃)	
Rated Voltage Range (WV)	2.5VDC	
Operating Temperature Range	-25 ~ +60℃	
	C= Nominal Capacitance (F) V= Rated Voltage (V)	
Low Temperature Stability	Capacitance Change	±30%(25℃)
	AC(1KHz)	≦ 4 times
Load Life	After applying rated voltage for 1000 hours at 60℃, the capacitor shall meet the following requirement.	
	Capacitance Change	Within±30% of the initial value
	AC(1KHz)	Not more than 200% of the specified value
Shelf Life	After placed at 60℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as Load life.	

Dimensions (mm)



ψD	13	16	18	22
P	7.5	7.5	7.5	10.0
ψd	0.6	0.8	0.8	1.0

DIP

WV	2.5(V.DC)	
SPEC / F	ΨDxL(mm)	AC(Ω) at 1KHZ
7	13x25	0.1
14	16x26	0.08
20	16x32	0.06
30	18x36	0.06
36	18x40	0.05
45	22x35	0.05
54	22x40	0.05

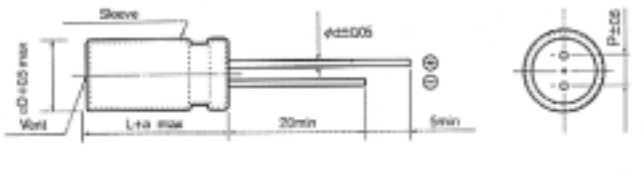
EG

■ Features
- Lifetime:60℃,2.5V,1000hrs
- High Capacitance

Specifications

Items	Characteristics	
Capacitance Tolerance	-20 ~ +40% (25℃)	
Rated Voltage Range (WV)	2.5 VDC	
Operating Temperature Range	-25 ~ +60℃	
	C= Nominal Capacitance (F) V= Rated Voltage (V)	
Low Temperature Stability	Capacitance Change	±30%(25℃)
	AC(1KHz)	≦ 4 times
Load Life	After applying rated voltage for 1000 hours at 60℃, the capacitor shall meet the following requirement.	
	Capacitance Change	Within±30% of the initial value
	AC(1KHz)	Not more than 200% of the specified value
Shelf Life	After placed at 60℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as Load life.	

Dimensions (mm)



ψD	8	10	13	16	18	22
P	3.5	5.0	7.5	7.5	7.5	10.0
ψd	0.6	0.6	0.6	0.8	0.8	1.0

DIP

WV	2.5(V.DC)	
SPEC / F	ΨDxL(mm)	AC(Ω) at 1KHZ
4	10x20	0.2
10	13x25	0.1
15	16x26	0.06
25	16x32	0.05
40	18x36	0.05
50	18x40	0.04
55	22*35	0.04
70	22*40	0.03

GV Series

■ Features
- Lifetime:85℃,2000hrs
- Low profile vertical chip

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication

Specifications

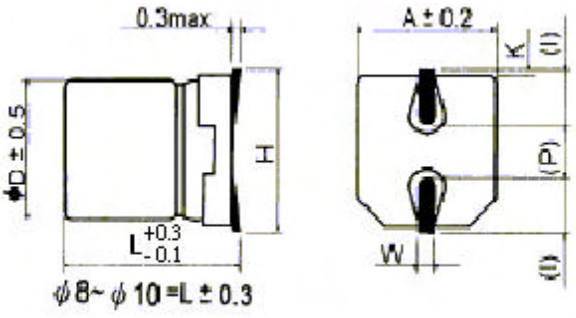
Items	Characteristics							
Capacitance Tolerance	±20% (M) (120Hz,20℃)							
Rated Voltage Range (WV)	4~50 VDC							
Operating Temperature Range	-40 ~ +85℃							
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50
	SV	5	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3 μA whichever is greater (After rated voltage applied for 2 minutes)							
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)							
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Shown in the table of standard rating							

Low Temperature Stability Impedance Ratio (Max)	WV / Z(120Hz)	4	6.3	10	16	25	35	50
	Z(-25℃) / Z(20℃)	7	4	3	2	2	2	2
	Z(-40℃) / Z(20℃)	15	8	6	4	4	3	3

Load Life	After applying rated voltage for 2000 hours at 85℃, the capacitor shall meet the following requirement.	
	Capacitance Change	Within±20% of the initial value
	Dissipation Factor	Not move than 200% of the specified value
	Leakage Current	Not more than the specified value

Shelf Life	After placed at 85℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.
Applicable standards	Refer to JIS C 5101

Dimensions (mm)



( ) : Reference size

ψD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	60	120	1K	10K~100K
Coefficient	0.80	1.00	1.15	1.25

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / tan δ / Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tanδ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	4				6.3				10				16			
SPEC / μF	ψDxL	tanδ	RC	ESR	ψDxL	tanδ	RC	ESR	ψDxL	tanδ	RC	ESR	ψDxL	tanδ	RC	ESR
4.7													4x5.4	0.16	20	45.1
10													4x5.4	0.16	28	21.1
22	4x5.4	0.35	19	21.1	4x5.4	0.26	20	15.6	4x5.4	0.30	28	18.0	4x5.4	0.26	27	15.6
													5x5.4	0.16	39	
33	4x5.4	0.35	26	14.0	5x5.4	0.26	22	10.4	4x5.4	0.30	29	12.0	5x5.4	0.26	45	10.4
									5x5.4	0.20	43	8.03	6.3x5.4	0.16	66	6.43
47	4x5.4	0.35	34	9.87	5x5.4	0.26	46	7.33	5x5.4	0.30	43	8.46	6.3x5.4	0.16	70	4.51
100	5x5.4	0.35	61	4.64	6.3x5.4	0.26	71	3.44	6.3x5.4	0.26	70	3.44	6.3x5.4	0.20	70	2.65
220	6.3x5.4	0.35	82	2.11	8x6.2	0.35	250	2.11	8x6.2	0.26	250	1.56	8x10.2	0.20	280	1.20
330					8x6.2	0.35	300	1.40	8x10.2	0.26	330	1.04	10x10.2	0.20	380	0.803
470					8x10.2	0.35	380	0.987	10x10.2	0.26	400	0.733	10x10.2	0.20	420	0.564
1000					10x10.2	0.35	700	0.464	10x10.2	0.26	580	0.344				

WV	25				35				50			
SPEC / μF	ψDxL	tanδ	RC	ESR	ψDxL	tanδ	RC	ESR	ψDxL	tanδ	RC	ESR
0.1									4x5.4	0.12	1	1593
0.22									4x5.4	0.12	2	723
0.33									4x5.4	0.12	3	482
0.47									4x5.4	0.12	5	338
1									4x5.4	0.12	10	159
2.2					4x5.4	0.12	8	72.3	4x5.4	0.12	16	72.3
3.3					4x5.4	0.12	10	48.2	4x5.4	0.12	16	48.2
4.7	4x5.4	0.14	22	39.5	4x5.4	0.12	22	33.8	5x5.4	0.12	23	33.8
10	4x5.4	0.20	24	26.5	4x5.4	0.16	24	21.2	6.3x5.4	0.12	35	15.9
	5x5.4	0.14	28	18.5	5x5.4	0.12	30	15.9				
22	6.3x5.4	0.14	55	8.44	6.3x5.4	0.12	60	7.23	8x6.2	0.12	110	7.23
33	6.3x5.4	0.14	65	5.62	8x6.2	0.14	130	5.62	8x10.2	0.12	120	4.82
47	6.3x5.4	0.20	70	5.64	8x6.2	0.14	165	3.95	10x10.2	0.12	130	3.38
	8x6.2	0.16	96	4.51								
100	8x10.2	0.16	180	2.12	10x10.2	0.14	210	1.85	10x10.2	0.12	190	1.59
220	10x10.2	0.16	310	0.964	10x10.2	0.14	310	0.844				

FV Series

■ Features
- Lifetime:85℃,3000~5000hrs
- Long life for GV
- Low profile vertical chip

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication

Specifications

Items	Characteristics							
Capacitance Tolerance	±20% (M) (120Hz,20℃)							
Rated Voltage Range (WV)	4~50 VDC							
Operating Temperature Range	-40 ~ +85℃							
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50
	SV	5	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes)							
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)							
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Shown in the table of standard rating							

Low Temperature Stability Impedance Ratio (Max)	WV	4	6.3	10	16	25	35	50
	Z(120Hz)							
	Z(-25℃) / Z(20℃)	7	4	3	2	2	2	2
	Z(-40℃) / Z(20℃)	15	8	6	4	4	3	3

Load Life

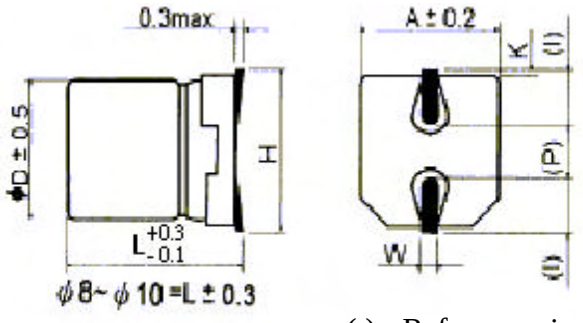
After applying rated voltage for 3000 ~ 5000 hours at 85℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not move than 200% of the specified value
Leakage Current	Not more than the specified value

Case (ψ)	Life time (hrs)
ψD≦6.3	3000
ψD≧8	5000

Shelf Life	After placed at 85℃without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.
Applicable standards	Refer to JIS C 5101

Dimensions (mm)



( ) : Reference size

ψD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	60	120	1K	10K~100K
Coefficient	0.80	1.00	1.15	1.25

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / tan δ/ Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tanä / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz,85℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	4				6.3				10				16			
SPEC / μF	ΨDxL	tanä	RC	ESR	ψDxL	tanä	RC	ESR	ψDxL	tanä	RC	ESR	ψDxL	tanä	RC	ESR
4.7													4x5.4	0.16	20	45.1
10													4x5.4	0.16	28	21.1
22	4x5.4	0.35	19	21.1	4x5.4	0.26	20	15.6	4x5.4	0.30	28	18.0	4x5.4	0.26	27	15.6
													5x5.4	0.16	39	
33	4x5.4	0.35	26	14.0	5x5.4	0.26	22	10.4	4x5.4	0.30	29	12.0	5x5.4	0.26	45	10.4
									5x5.4	0.20	43	8.03	6.3x5.4	0.16	66	6.43
47	4x5.4	0.35	34	9.87	5x5.4	0.26	46	7.33	5x5.4	0.30	43	8.46	6.3x5.4	0.16	70	4.51
100	5x5.4	0.35	61	4.64	6.3x5.4	0.26	71	3.44	6.3x5.4	0.26	70	3.44	6.3x5.4	0.20	70	2.65
220	6.3x5.4	0.35	82	2.11	8x6.2	0.35	250	2.11	8x6.2	0.26	250	1.56	8x10.2	0.20	280	1.20
330					8x6.2	0.35	300	1.40	8x10.2	0.26	330	1.04	10x10.2	0.20	380	0.803
470					8x10.2	0.35	380	0.987	10x10.2	0.26	400	0.733	10x10.2	0.20	420	0.564
1000					10x10.2	0.35	700	0.464	10x10.2	0.26	580	0.344				

WV	25				35				50			
SPEC / μF	ψDxL	tanä	RC	ESR	ψDxL	tanä	RC	ESR	ψDxL	tanä	RC	ESR
0.1									4x5.4	0.12	1	1593
0.22									4x5.4	0.12	2	723
0.33									4x5.4	0.12	3	482
0.47									4x5.4	0.12	5	338
1									4x5.4	0.12	10	159
2.2					4x5.4	0.12	8	72.3	4x5.4	0.12	16	72.3
3.3					4x5.4	0.12	10	48.2	4x5.4	0.12	16	48.2
4.7	4x5.4	0.14	22	39.5	4x5.4	0.12	22	33.8	5x5.4	0.12	23	33.8
10	4x5.4	0.20	24	26.5	4x5.4	0.16	24	21.2	6.3x5.4	0.12	35	15.9
	5x5.4	0.14	28	18.5	5x5.4	0.12	30	15.9				
22	6.3x5.4	0.14	55	8.44	6.3x5.4	0.12	60	7.23	8x6.2	0.12	110	7.23
33	6.3x5.4	0.14	65	5.62	8x6.2	0.14	130	5.62	8x10.2	0.12	120	4.82
47	6.3x5.4	0.20	70	5.64	8x6.2	0.14	165	3.95	10x10.2	0.12	130	3.38
	8x6.2	0.16	96	4.51								
100	8x10.2	0.16	180	2.12	10x10.2	0.14	210	1.85	10x10.2	0.12	190	1.59
220	10x10.2	0.16	310	0.964	10x10.2	0.14	310	0.844	10x10.2	0.12	300	0.723

SV Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range for GV
- Low profile vertical chip

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication

Specifications

Items	Characteristics
Capacitance Tolerance	±20% (M) (120Hz,20℃)
Rated Voltage Range (WV)	4~50 VDC
Operating Temperature Range	-40 ~ +105℃

Surge Voltage (V) (20℃)

WV	4	6.3	10	16	25	35	50
SV	5	8	13	20	32	44	63

Leakage Current (Max) (20℃)

I≦0.01CV or 3μA whichever is greater(After rated voltage applied for 2 minutes)

I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)

Dissipation Factor (Max) (tan δ) (120Hz ,20℃)

Shown in the table of standard rating

Low Temperature Stability Impedance Ratio (Max)

WV / Z(120Hz)	4	6.3	10	16	25	35	50
Z(-25℃) / Z(20℃)	7	4	3	2	2	2	2
Z(-40℃) / Z(20℃)	15	8	6	4	4	3	3

Load Life

After applying rated voltage for 1000 hours at 105℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

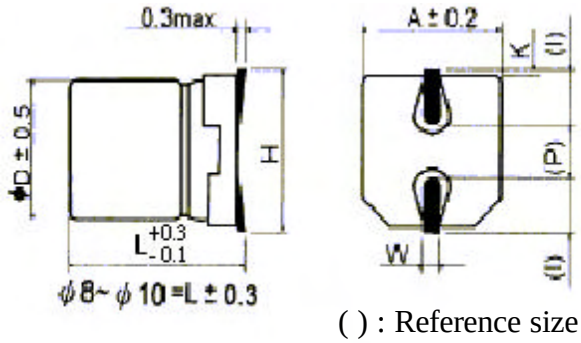
Shelf Life

After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.

Applicable standards

Refer to JIS C 5101

Dimensions (mm)



( ) : Reference size

ψD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency(Hz)	60	120	1K	10K~100K
Coefficient	0.85	1.00	1.15	1.25

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / tan δ / Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz, 105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	4				6.3				10				16			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
4.7													4x5.4	0.16	20	45.1
10									4x5.4	0.30	24	39.7	4x5.4	0.16	28	21.2
22	4x5.4	0.35	20	21.1	4x5.4	0.30	29	18.0	4x5.4	0.30	36	18.0	5x5.4	0.16	39	9.64
33	4x5.4	0.35	26	14.0	4x5.4	0.30	43	12.0	4x5.4	0.30	45	12.0	6.3x5.4	0.20	65	8.03
47	4x5.4	0.35	34	9.87	5x5.4	0.30	46	8.46	6.3x5.4	0.30	70	8.46	6.3x5.4	0.20	70	5.64
100	5x5.4	0.35	61	4.64	6.3x5.4	0.35	71	4.64	8x6.2	0.30	110	3.97	8x6.2	0.20	130	2.65
220	6.3x5.4	0.35	82	2.11	8x6.2	0.35	130	2.11	8x10.2	0.26	160	1.80	10x10.2	0.20	210	1.20
330					8x10.2	0.35	230	1.40	10x10.2	0.26	230	1.04	10x10.2	0.20	230	0.803
470					10x10.2	0.35	260	0.987	10x10.2	0.26	270	0.733	10x10.2	0.20	275	0.564
1000					10x10.2	0.35	380	0.464	10x10.2	0.26	390	0.344				

WV	25				35				50			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
0.1									4x5.4	0.12	1	1593
0.22									4x5.4	0.12	2	723
0.33									4x5.4	0.12	3	482
0.47									4x5.4	0.12	5	338
1									4x5.4	0.12	10	159
2.2					4x5.4	0.12	15	72.3	4x5.4	0.12	16	72.3
3.3					4x5.4	0.12	18	48.2	4x5.4	0.12	16	48.2
4.7	4x5.4	0.14	22	39.5	4x5.4	0.12	22	33.8	5x5.4	0.12	23	33.8
10	5x5.4	0.14	28	18.5	5x5.4	0.12	30	15.9	6.3x5.4	0.12	35	15.9
22	6.3x5.4	0.14	55	8.44	6.3x5.4	0.14	60	8.44	8x6.2	0.12	70	7.23
33	6.3x5.4	0.16	65	6.43	8x6.2	0.14	84	5.62	8x10.2	0.12	91	4.82
47	8x6.2	0.16	91	4.51	8x10.2	0.14	98	3.95	10x10.2	0.12	100	3.38
100	8x10.2	0.16	130	2.12	10x10.2	0.14	160	1.85	10x10.2	0.12	145	1.59
220	10x10.2	0.16	273	0.964	10x10.2	0.14	240	0.844				

DV Series

■ Features
- Lifetime:105℃,2000hrs
- Long life for SV
- Low profile vertical chip

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Computer
- OA/HA/Communication

Specifications

Items	Characteristics						
Capacitance Tolerance	±20% (M) (120Hz,20℃)						
Rated Voltage Range (WV)	6.3~50 VDC						
Operating Temperature Range	-40 ~ +105℃						
Surge Voltage (V) (20℃)	WV	6.3	10	16	25	35	50
	SV	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater(After rated voltage applied for 2 minutes)						
	I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)						
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Shown in the table of standard rating						

Low Temperature Stability Impedance Ratio (Max)

WV / Z(120Hz)	6.3	10	16	25	35	50
Z(-25℃) / Z(20℃)	4	3	2	2	2	2
Z(-40℃) / Z(20℃)	8	6	4	4	3	3

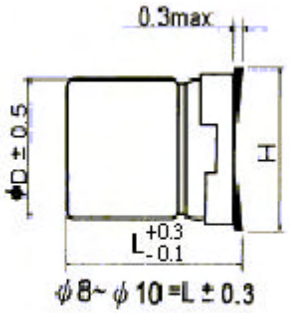
Load Life

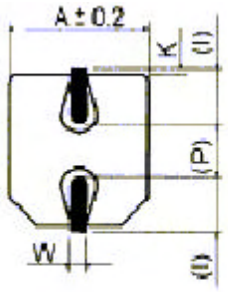
After applying rated voltage for 2000 hours at 105℃,
the capacitor shall meet the following requirement.

Case (ψ)	ψ4 to ψ6.3	ψ8 to ψ10
Capacitance Change	Within ±25% of the initial value	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value	
Leakage Current	Not more than the specified value	

Shelf Life	After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.
Applicable standards	Refer to JIS C 5101

Dimensions (mm)





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ψD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	60	120	1K	10K~100K
Coefficient	0.85	1.00	1.15	1.25

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / tan δ/ Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz, 105℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

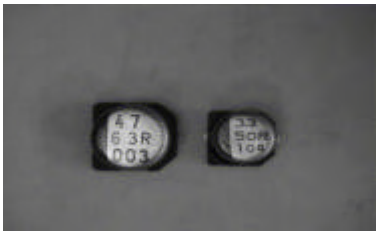
WV	6.3				10				16			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
10									4x5.4	0.16	28	21.2
22	5x5.4	0.30	29	18.0	5x5.4	0.22	36	13.2	5x5.4	0.16	39	9.64
33	5*x5.4	0.30	43	12.0	5x5.4	0.22	45	8.84	6.3x5.4	0.16	65	6.43
47	6.3x5.4	0.30	46	8.46	6.3x5.4	0.22	70	6.20	6.3x5.4	0.16	70	4.51
100	6.3x5.4	0.30	71	3.97	8x6.2	0.30	110	3.97	8x10.2	0.20	140	2.65
220	8x10.2	0.35	150	2.11	8x10.2	0.30	160	1.80	10x10.2	0.20	210	1.20
330	8x10.2	0.35	230	1.40	10x10.2	0.26	230	1.04	10x10.2	0.20	230	0.803
470	10x10.2	0.35	260	0.987	10x10.2	0.26	270	0.733	10x10.2	0.20	275	0.564
1000	10x10.2	0.35	380	0.464	10x10.2	0.26	390	0.344				

WV	25				35				50			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
0.1									4x5.4	0.12	1	1593
0.22									4x5.4	0.12	2	723
0.33									4x5.4	0.12	3	482
0.47									4x5.4	0.12	5	338
1									4x5.4	0.12	10	159
2.2									4x5.4	0.12	16	72.3
3.3									4x5.4	0.12	16	48.2
4.7	4x5.4	0.14	22	39.5	5x5.4	0.12	23	33.8	5x5.4	0.12	23	33.8
6.8	4x5.4	0.14	25	27.3	5x5.4	0.12	27	23.4	5x5.4	0.12	30	23.4
10	5x5.4	0.14	28	18.5	5x5.4	0.12	30	15.9	5x5.4	0.12	35	15.9
22	6.3x5.4	0.14	55	8.44	6.3x5.4	0.14	60	7.23	8x10.2	0.12	70	7.23
33	6.3x5.4	0.14	65	5.62	8x6.2	0.14	84	5.62	8x10.2	0.12	91	4.82
47	8x6.2	0.16	91	4.51	8x10.2	0.14	98	3.95	10x10.2	0.12	100	3.38
100	8x10.2	0.16	130	2.12	10x10.2	0.14	160	1.85	10x10.2	0.12	145	1.59
220	10x10.2	0.16	273	0.964	10x10.2	0.14	240	0.844				

RV Series

■ Features
- Lifetime:85℃,1000hrs
- Non-polarized
- Low profile vertical chip
- 5.5mm height (≦ψ6.3)

■ Recommended Applications
- AV(TV, Video, Audio)
- Monitor/Co mputer
- OA/HA/Communication
- Reversed polarity circuit



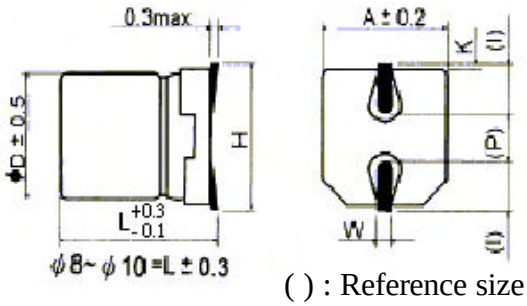
Specifications

Items	Characteristics						
Capacitance Tolerance	±20% (M) (120Hz,20℃)						
Rated Voltage Range (WV)	6.3~50 VDC						
Operating Temperature Range	-40 ~ +85℃						
Surge Voltage (V) (20℃)	WV	6.3	10	16	25	35	50
	SV	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)						
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	Shown in the table of standard rating						

Low Temperature Stability Impedance Ratio (Max)	WV / Z(120Hz)	6.3	10	16	25	35	50
	Z(-25℃) / Z(20℃)	4	3	2	2	2	2
	Z(-40℃) / Z(20℃)	8	6	4	4	3	3

Load Life	After applying rated voltage for 1000 hours at 85℃, the capacitor shall meet the following requirements. (The polarity shall be reversed every 250 hours)	
	Capacitance Change	Within ±20% of the initial value
	Dissipation Factor	Not more than 200% of the specified value
	Leakage Current	Not more than the specified value
Shelf Life	After placed at 85℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.	
Applicable standards	Refer to JIS C 5101	

Dimensions (mm)



( ) : Reference size

ψD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	60	120	1K	10K
Coefficient	0.85	1.00	1.10	1.20

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85
Coefficient	1.36	1.25	1.00

Case Size / tan δ / Max Ripple Current / ESR

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan ä / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 120Hz, 85℃) / MAX EQUIVALENT SERIES RESISTANCE (ESR(Ω) / 120Hz,20℃)

WV	6.3				10				16				25			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
2.2																
3.3													4x5.4	0.28	12	100
4.7									4x5.4	0.32	20	70.5	5x5.4	0.28	21	70.5
10					4x5.4	0.40	25	39.7	5x5.4	0.32	25	33.1	6.3x5.4	0.28	28	33.1
22	5x5.4	0.52	29	21.1	6.3x5.4	0.40	39	18.0	6.3x5.4	0.32	39	15.0				
33	6.3x5.4	0.52	43	12.0	6.3x5.4	0.40	43	14.0								
47	6.3x5.4	0.52	46	9.87												

WV	35				50			
SPEC / μF	ψDxL	tan δ	RC	ESR	ψDxL	tan δ	RC	ESR
0.22					4x5.4	0.24	2	1507
0.33					4x5.4	0.24	3	1004
0.47					4x5.4	0.24	5	705
1					4x5.4	0.24	10	331
2.2	4x5.4	0.24	12	150	5x5.4	0.24	16	150
3.3	5x5.4	0.24	21	100	5x5.4	0.24	21	100
4.7	5x5.4	0.24	22	70.5	6.3x5.4	0.24	31	70.5
10	6.3x5.4	0.24	30	33.1				

ZV Series

■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range
- Low profile vertical chip
- Low impedance

■ Recommended Applications
- Monitor/Computer
- Battery charger
- DC/DC converter
- SMPS
- Noise filter

Specifications

Items	Characteristics							
Capacitance Tolerance	±20% (M) (120Hz,20℃)							
Rated Voltage Range (WV)	6.3~50 VDC							
Operating Temperature Range	-40 ~ +105℃							
Surge Voltage (V) (20℃)	WV	4	6.3	10	16	25	35	50
	SV	5	8	13	20	32	44	63
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)							
Dissipation Factor (Max) (tan δ) (120Hz ,20℃)	WV	4	6.3	10	16	25	35	50
	tan δ	0.35	0.26	0.19	0.16	0.14	0.12	0.12

Low Temperature Stability Impedance Ratio (Max)

WV / Z(120Hz)	4	6.3	10	16	25	35	50
Z(-25℃) / Z(20℃)	4	2	2	2	2	2	2
Z(-40℃) / Z(20℃)	8	4	4	3	3	3	3

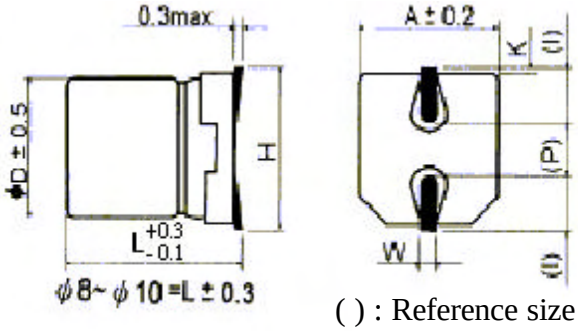
Load Life: After applying rated voltage for 1000 hours at 105℃, the capacitor shall meet the following requirement.

Capacitance Change	Within ±20% of the initial value
Dissipation Factor	Not more than 200% of the specified value
Leakage Current	Not more than the specified value

Shelf Life: After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.

Applicable standards: Refer to JIS C 5101

Dimensions (mm)



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φD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	120	1K	10K	100K
Coefficient	0.70	0.80	0.90	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / Max Ripple Current / Impedance

CASE SIZE (ψDxL(mm)) / MAX PERMISSIBLE RIPPLE CURRENT（RC(mArms) / 100KHz,105℃）
/ MAX IMPEDANCE（Z(Ω) / 100KHz,20℃）

WV	4			6.3			10			16		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
4.7	4x5.4	60	4.0							4x5.4	60	4.0
6.8	4x5.4	60	4.0							4x5.4	60	4.0
10	4x5.4	60	4.0				4x5.4	60	4.0	4x5.4	60	4.0
22	4x5.4	60	4.0	4x5.4	60	4.0	5x5.4	95	2.6	5x5.4	95	2.6
33	4x5.4	60	4.0	5x5.4	95	2.6	5x5.4	95	2.6	5x5.4	95	2.6
47	4x5.4	60	4.0	5x5.4	95	2.6	6.3x5.4	95	1.3	6.3x5.4	140	1.3
68	4x5.4	60	4.0	6.3x5.4	140	1.3	6.3x5.4	140	1.3	8x6.2	230	0.8
100	5x5.4	95	3.0	6.3x5.4	140	1.3	6.3x5.4	140	1.3	8x6.2	230	0.8
150	6.3x5.4	140	2.6	8x6.2	230	0.8	8x6.2	230	0.8	10x10.2	450	0.5
220	6.3x5.4	140	2.6	8x6.2	230	0.8	8x6.2	230	0.8	10x10.2	450	0.5
330				8x10.2	450	0.5	8x10.2	450	0.5	10x10.2	670	0.3
470				10x10.2	670	0.3	10x10.2	670	0.3	10x10.2	670	0.3
1000				10x10.2	670	0.3	10x10.2	670	0.3			

WV	25			35			50		
SPEC / μF	ψDxL	RC	Z	ψDxL	RC	Z	ψDxL	RC	Z
0.1							4x5.4	60	5.0
0.22							4x5.4	60	5.0
0.33							4x5.4	60	5.0
0.47							4x5.4	60	5.0
1				4x5.4	60	4.0	4x5.4	60	5.0
2.2				4x5.4	60	4.0	4x5.4	60	5.0
3.3				4x5.4	60	4.0	4x5.4	60	5.0
4.7	4x5.4	60	4.0	4x5.4	60	4.0	5x5.4	95	4.0
6.8	4x5.4	60	4.0	5x5.4	95	2.6	6.3x5.4	140	2.6
10	5x5.4	95	2.6	5x5.4	95	2.6	6.3x5.4	140	2.6
22	6.3x5.4	140	1.3	6.3x5.4	140	1.3	8x6.2	230	1.3
33	6.3x5.4	140	1.3	8x6.2	230	0.8	8x10.2	300	1.1
47	6.3x5.4	140	1.3	8x6.2	230	0.8	10x10.2	670	0.8
68	8x10.2	450	0.5	8x10.2	450	0.5	10x10.2	670	0.8
100	8x10.2	450	0.5	10x10.2	670	0.3	10x10.2	670	0.8
150	10x10.2	670	0.3	10x10.2	670	0.3			
220	10x10.2	670	0.3	10x10.2	670	0.3			

EV Series

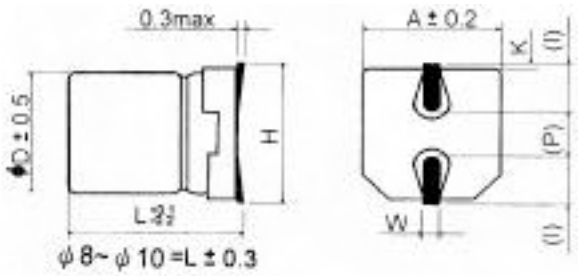
■ Features
- Lifetime:105℃,1000hrs
- Wide temperature range
- Low profile vertical chip
- Ultra low impedance

■ Recommended Applications
- Monitor/Computer
- Battery charger
- DC/DC converter
- SMPS
- Noise filter

Specifications

Items	Characteristics				
Capacitance Tolerance	±20% (M) (120Hz,20℃)				
Rated Voltage Range (WV)	6.3~25 VDC				
Operating Temperature Range	-40 ~ +105℃				
Surge Voltage (V) (20℃)	WV	6.3	10	16	25
	SV	8	13	20	32
Leakage Current (Max) (20℃)	I≦0.01CV or 3μA whichever is greater (After rated voltage applied for 2 minutes) I= Leakage Current (μA) C= Nominal Capacitance (μF) V= Rated Voltage (V)				
Dissipation Factor (Max) (tanδ) (120Hz ,20℃)	Shown in the table of standard rating				
Low Temperature Stability Impedance Ratio (Max)	WV / Z(120Hz)	6.3	10	16	25
	Z(-25℃) / Z(20℃)	2	2	2	2
	Z(-40℃) / Z(20℃)	3	3	3	3
Load Life	After applying rated voltage for 1000 hours at 105℃, the capacitor shall meet the following requirement.				
	Capacitance Change	Within±20% of the initial value			
	Dissipation Factor	Not more than 200% of the specified value			
	Leakage Current	Not more than the specified value			
Shelf Life	After placed at 105℃ without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.				
Applicable standards	Refer to JIS C 5101				

Dimensions (mm)



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φD	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35 +0.15 -0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35 +0.15 -0.20
6.3	5.4	6.6	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35 +0.15 -0.20
8.0	6.2	8.3	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35 +0.15 -0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.2
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.2

Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	120	1K	10K	100K
Coefficient	0.70	0.80	0.90	1.00

Temperature coefficient

Ambient Temperature (℃)	≦50	70	85	105
Coefficient	1.90	1.75	1.40	1.00

Case Size / tan δ/ Max Ripple Current / Impedance

CASE SIZE (ψDxL(mm)) / MAX DISSIPATION FACTOR (tan δ / 120Hz,20℃) / MAX PERMISSIBLE RIPPLE CURRENT (RC(mArms) / 100KHz,105℃) / MAX IMPEDANCE (Z(Ω) / 100KHz,20℃)

WV	6.3				10			
SPEC / μF	ψDxL	tan δ	RC	Z	ψDxL	tan δ	RC	Z
22	4x5.4	0.26	75	2.40	5x5.4	0.30	120	1.20
33	5x5.4	0.26	120	1.20	5x5.4	0.20	120	1.20
47	5x5.4	0.26	120	1.20	6.3x5.4	0.26	200	0.60
68	6.3x5.4	0.26	200	0.60	6.3x5.4	0.26	200	0.60
100	6.3x5.4	0.26	200	0.60	8*6.2	0.26	280	0.30
150	8x6.2	0.35	280	0.30	8x6.2	0.26	280	0.30
220	8x6.2	0.35	280	0.30	8x10.2	0.26	560	0.22
330	8x10.2	0.35	560	0.22	8x10.2	0.26	560	0.22
470	10x10.2	0.35	800	0.12	10x10.2	0.26	800	0.12
1000	10x10.2	0.35	800	0.12	10x10.2	0.26	800	0.12

WV	16				25			
SPEC / μF	ψDxL	tan δ	RC	Z	ψDxL	tan δ	RC	Z
4.7	4x5.4	0.26	75	2.40	4x5.4	0.14	75	2.40
6.8	4x5.4	0.26	75	2.40	4x5.4	0.14	75	2.40
10	4*5.4	0.16	75	2.40	5x5.4	0.14	120	1.20
22	5x5.4	0.16	120	1.20	6.3x5.4	0.14	200	0.60
33	6.3*5.4	0.16	200	0.60	6.3x5.4	0.14	200	0.60
47	6.3x5.4	0.16	200	0.60	8x6.2	0.16	280	0.30
68	8x6.2	0.20	280	0.30	8x10.2	0.16	560	0.22
100	8x6.2	0.20	280	0.30	8x10.2	0.16	560	0.22
150	8x10.2	0.20	560	0.22	10x10.2	0.16	800	0.12
220	8x10.2	0.20	560	0.22	10x10.2	0.16	800	0.12
330	10x10.2	0.20	800	0.12				
470	10x10.2	0.20	800	0.12				