

PART NUMBER SYSTEM (I)

RADIAL TYPE

<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Series	Rated Voltage	Capacitance	Tolerance	Lead Forming Type	Lead Length	Case Dimension	Special Request

(1) Series

SM . PS . PF . PW . LM . LS . LF . LL . EM . ES . EL . EB . ED . EJ . EG . SS . SS-H . SB .
SB-H . ND . ND-H . BP . LB . LB-H

(2) Rated Voltage

Code	0G	0J	1A	1C	1E	1F	1V	1H	1J	1K	2A	2C	2Z	2D	2P	2E	2V	2G	2S	2W
WV	4	6.3	10	16	25	30	35	50	63	80	100	160	180	200	220	250	350	400	420	450

(3) Capacitance

Code	R10	R47	010	4R7	100	470	101	471	102	472	473
μ F	0.1	0.47	1.0	4.7	10	47	100	470	1000	4700	47000

(4) Tolerance

Code	J	Q	R	K	V	M	H
%	+5 -5	+30 -10	+20 -0	+10 -10	+20 -10	+20 -20	+20 -5

(5) Lead Forming Type

Code	C	B	J	D	F	H	L	T	R	S	G	E	P
Description	Cutting	Kink & Cutting		Forming & Cutting									Taping
Drawing	Fig1	Fig2	Fig3	Fig4	Fig5	Fig6	Fig7	Fig8	Fig9	Fig10	Fig11	Fig12	

(6) Lead Length

Code	Z	2	B	E	G	M	3	T	C	D	4	5	6	7
Length	2.0	2.5	2.8	3.1	3.3	3.5	3.5	3.8	3.8	4.0	4.5	5.0	6.3	7.0
Tolerance	± 0.2						± 0.5	± 0.3	± 0.5					
Code	I	8	J	9	K	A	L	H	F	Q	S	---		
Length	7.5	8.0	8.5	9.0	9.5	10	10.5	12	15	23	26	---		
Tolerance	± 0.5						± 1.0					---		

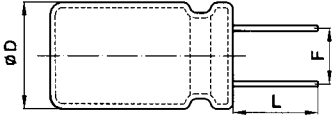
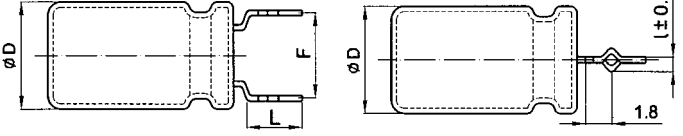
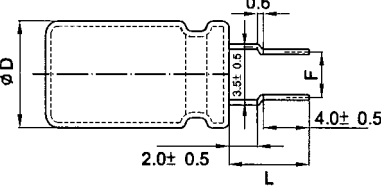
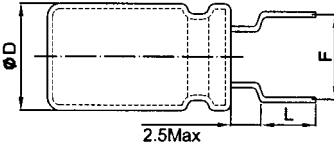
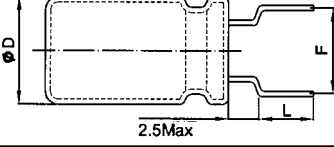
(7) Case Dimension

Code	0407	0511	6311	0812	1016	1325	1636	1840
Size	04x07	05x11	6.3x11	08x12	10x16	13x25	16x36	18x40

(8) Special Request

Code	R		F		L		D	
Description	High Ripple Current		Long Life		Low Leakage Current		Low Dissipation Factor	
Code	H		E		P		---	
Description	High Temperature		Low Impedance & ESR		PET Sleeve		---	

LEAD FORMING TYPE

Type	Part Number	Dimensions (mm)																											
		φD	F	ℓ	L (Part number for lead length and pitch for taping)																±0.1								
					Z	2	B	E	G	M	T	3	C	D	4	5	6	7	I	8		J	9	K	A	L	H	Q	S
					2.0	2.5	2.8	3.1	3.3	3.5	3.8	3.5	3.8	4.0	4.5	5.0	6.3	7.0	7.5	8.0		8.5	9.0	9.5	10	10.5	12	23	26
±0.2				±0.3	±0.5																								
Cutting	C	4	1.5	---																	FIG1								
		5	2.0	---																									
		6.3	2.5	---																									
		8	3.5	---																									
		10	5.0	---																									
		13	5.0	---																									
		16	7.5	---																									
		18	7.5	---																									
Kink & Cutting	B	4	5.0	1.1																	FIG2								
		5	5.0	1.1																									
		6.3	5.0	1.1																									
		8	5.0	1.3																									
		10	5.0	1.3																									
		13	5.0	1.3																									
		16	7.5	1.3																									
		18	7.5	1.3																									
		Forming & Cutting	D	8	2.5	----																	FIG3						
			F	4	5.0	----																	FIG4						
5	5.0			----																									
6.3	5.0			----																									
Forming & Cutting	H		13	7.5	----																	FIG5							
			13	7.5	----																								

LEAD FORMING TYPE

Type	Part Number	Dimensions (mm)																												
		φD	F	ℓ	L (Part number for lead length and pitch for taping)																									
					Z	2	B	E	G	M	T	3	C	D	4	5	6	7	I	8	J	9	K	A	L	H	Q	S		
					2.0	2.5	2.8	3.1	3.3	3.5	3.8	3.5	3.8	4.0	4.5	5.0	6.3	7.0	7.5	8.0	8.5	9.0	9.5	10	10.5	12	23	26		
					±0.2			±0.3		±0.5															±0.1					
Forming & Cutting	L	5	2.0	2.5																									FIG6	
		6.3	2.5	2.5																										
		8	3.5	2.5																										
		10	5.0	2.5																										
		13	5.0	2.5																										
		16	7.5	2.5																										
		18	7.5	2.5																										
	T	5	2.0	1.5																									FIG7	
		6.3	2.5	1.5																										
		8	3.5	1.5																										
		10	5.0	1.5																										
		13	5.0	1.5																										
		16	7.5	1.5																										
		18	7.5	1.5																										
	R	5	2.0	1.5																									FIG8	
		6.3	2.5	1.5																										
		8	3.5	1.5																										
		10	5.0	1.5																										
		13	5.0	1.5																										
		16	7.5	1.5																										
		18	7.5	1.5																										
	S	5	2.0	2.5																									FIG9	
		6.3	2.5	2.5																										
		8	3.5	2.5																										
		10	5.0	2.5																										
		13	5.0	2.5																										
		16	7.5	2.5																										
		18	7.5	2.5																										
G	5	2.0	---																									FIG10		
	6.3	2.5	---																											
	8	3.5	---																											
	10	5.0	---																											
	13	5.0	---																											
	16	7.5	---																											
	18	7.5	---																											
E	5	2.0	---																									FIG11		
	6.3	2.5	---																											
	8	3.5	---																											
	10	5.0	---																											
	13	5.0	---																											
	16	7.5	---																											
	18	7.5	---																											

TAPING

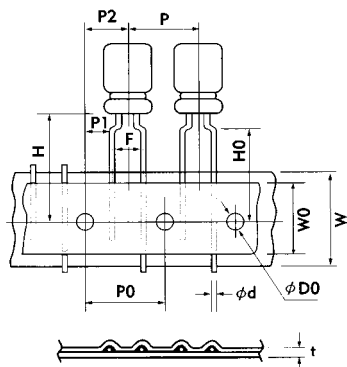


FIG 12- I

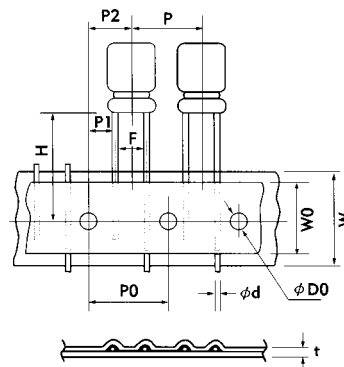


FIG 12- II

Item	Symbol	Tolerance	Formed Lead Type (12- I)						
			ϕ 4x5 ϕ 4x7	ϕ 5x5 ϕ 5x7	ϕ 6.3x5	ϕ 6.3x7	ϕ 5x11 ϕ 6.3x11	ϕ 8x5 ϕ 8x7 ϕ 8x9	ϕ 8x12 ϕ 8x16 ϕ 8x20
Lead wire diameter	ϕ d	± 0.05	0.45	0.45	0.45	0.45	0.5	0.45/0.5	0.6
Pitch of component	P	± 1.0	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Feed hole pitch	P0	± 0.2	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Hole center to lead	P1	± 0.5	3.85	3.85	3.85	3.85	3.85	3.85	3.85
Feed hole center to component	P2	± 1.0	6.35	6.35	6.35	6.35	6.35	6.35	6.35
Lead-to-lead distance	F	+0.8/-0.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Height of component from tape center	H	± 0.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Lead wire clinch height	H0	± 0.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Tape width	W	± 0.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Hole down tape width	W0	Min	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Feed hole diameter	ϕ D0	± 0.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total tape thickness	t	± 0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Item	Symbol	Tolerance	Formed Lead Type (12- II)							
			ϕ 4	ϕ 5	ϕ 6.3	ϕ 8	ϕ 10	ϕ 13	ϕ 16	ϕ 18
Lead wire diameter	ϕ d	± 0.05	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Pitch of component	P	± 1.0	12.7	12.7	12.7	12.7	12.7	15.0	30.0	30.0
Feed hole pitch	P0	± 0.2	12.7	12.7	12.7	12.7	12.7	15.0	15.0	15.0
Hole center to lead	P1	± 0.5	5.6	5.35	5.1	4.6	3.85	5.0	3.75	3.75
Feed hole center to component	P2	± 1.0	6.35	6.35	6.35	6.35	6.35	7.5	7.5	7.5
Lead-to-lead distance	F	+0.8/-0.2	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Height of component from tape center	H	± 0.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Tape width	W	± 0.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Hole down tape width	W0	Min	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Feed hole diameter	ϕ D0	± 0.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total tape thickness	t	± 0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Available Terminals For Snap-In Type (Unit:mm)

<p>D=30 to 35mm</p>	<p>Sleeve</p> <p>Vent</p> <p>$\phi D+1max.$</p> <p>$L\pm 2$</p> <p>4.5 ± 1</p> <p>PC board pin-out</p> <p>$2-1.2\times 6$</p> <p>4.2 ± 0.5</p> <p>5 ± 0.5</p> <p>14.2 ± 1</p>
<p>D=22 to 35 mm</p>	<p>Sleeve</p> <p>Vent</p> <p>$\phi D+1max.$</p> <p>$L\pm 2$</p> <p>5.5 ± 0.5</p> <p>PC board pin-out</p> <p>10</p> <p>$2-\phi 2$</p>
<p>D=35 to 40mm</p>	<p>Sleeve</p> <p>Vent</p> <p>$\phi D+1max.$</p> <p>$L\pm 2$</p> <p>5.5 ± 0.5</p> <p>PC board pin-out</p> <p>60°</p> <p>60°</p> <p>22.5</p> <p>$4-\phi 2$</p> <p>Terminal B=positive Terminal A & C=blank</p>
<p>D=40 mm</p>	<p>Sleeve</p> <p>Vent</p> <p>$\phi 40+1max.$</p> <p>$L\pm 2$</p> <p>6.5 ± 1</p> <p>PC board pin-out</p> <p>10</p> <p>10</p> <p>10.4</p> <p>3.3</p> <p>7.7</p> <p>7.1</p> <p>2.5</p> <p>10</p> <p>Terminal C=positive Terminal A, B & D=blank</p>
<p>D=20x25 to 61mm, D=25x31 to 61mm</p>	<p>Sleeve</p> <p>Vent</p> <p>$\phi D+1max.$</p> <p>$L\pm 2$</p> <p>4 ± 1</p> <p>Negative mark</p> <p>1.5 ± 0.1</p> <p>8 ± 1</p>

PS

Feature: Standard Downsized.
105°C 1,000 hours assured.

SPECIFICATIONS

Item	Performance Characteristics	
Category Temperature Range	-40 to +105°C	-25 to +105°C
Working Voltage Range	6.3 to 100Vdc	160 to 450Vdc
Capacitance Range	0.1 to 22,000 μ F	0.47 to 470 μ F
Capacitance Tolerance	$\pm 20\%$ (at 25°C 120Hz)	
Dissipation Factor ($\tan \delta$) (at 25°C 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100
	$\tan \delta$ (Max)	0.26 0.22 0.18 0.16 0.14 0.12 0.10 0.10
	Rated Voltage (V)	160 to 250 350 to 450
	$\tan \delta$ (Max)	0.15 0.20
The above values should be increased by 0.02 for every additional 1000 μ F		
Leakage Current	$I=0.01CV$ or 3μ A whichever is greater	$I=0.03CV + 10 \mu$ A
	I: Leakage current. (μ A) C: Rated capacitance. (μ F) V: Rated voltage. (V) The rated voltage is impressed for two minutes.	
Endurance	After applying rated voltage to the capacitor for 1,000 hours at 105°C, the following characteristics shall be satisfied when the capacitor has been restored to 25°C. Capacitance change $\leq \pm 20\%$ of the initial value Dissipation factor ($\tan \delta$) $\leq 200\%$ of the specified value Leakage current \leq specified value	
Shelf Life	After exposing the capacitor for 500 hours at 105°C, without applying voltage, the following characteristics shall be satisfied when the capacitor has been restored to 25°C. Capacitance change $\leq \pm 20\%$ of the initial value Dissipation factor ($\tan \delta$) $\leq 200\%$ of the specified value Leakage current $\leq 200\%$ of the specified value	
Others	Conforms to JIS C-5141 (1991), characteristic W	

RIPPLE CURRENT MULTIPLIERS

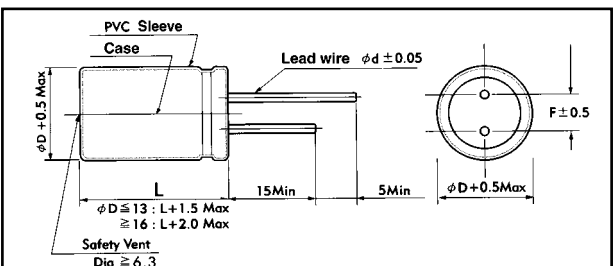
Temperature Multipliers

Temp (°C)	40	60	70	85	95	105
Factor	1.90	1.75	1.61	1.40	1.25	1.00

Frequency Multipliers

Vdc	Freq.(Hz)					
	Cap.(μ F)	50(60)	120	1K	10K	100K
6.3 to 100	0.1 to 68	0.75	1.00	1.57	2.00	2.00
	100 to 680	0.80	1.00	1.34	1.50	1.50
	1000 to 22000	0.85	1.00	1.13	1.15	1.15
160 to 450	0.47 to 220	0.80	1.00	1.40	1.60	1.60
	330 to 470	0.90	1.00	1.13	1.15	1.15

DIMENSIONS(mm)



ϕ D	5	6.3	8	10	13	16	18	20	22
ϕ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	10

PS

Case size & Permissible Ripple Current

μF \ Vdc	6.3		10		16		25		35		50		63		100	
0.1											5x11	1.3			5x11	1.4
0.22											5x11	2.9			5x11	3.3
0.33											5x11	4.3			5x11	4.9
0.47											5x11	7			5x11	6.9
1											5x11	13			5x11	14
2.2											5x11	20			5x11	20
3.3											5x11	24			5x11	25
4.7							5x11	25	5x11	28	5x11	29	5x11	34	5x11	30
10					5x11	35	5x11	35	5x11	39	5x11	45	5x11	47	6.3x11	45
22	5x11	45	5x11	51	5x11	55	5x11	50	5x11	60	5x11	65	5x11	65	6.3x11	90
33	5x11	55	5x11	59	5x11	65	5x11	65	5x11	70	6.3x11	88	6.3x11	95	8x12	125
47	5x11	65	5x11	68	5x11	70	5x11	75	5x11	91	6.3x11	112	6.3x11	115	10x12	135
68	5x11	69	5x11	72	5x11	80	6.3x11	95	6.3x11	105	6.3x11	145	8x12	150	10x12	185
100	5x11	85	5x11	95	5x11	100	6.3x11	120	6.3x11	145	8x12	185	10x12	195	10x16	235
150	5x11	100	5x11	105	6.3x11	145	6.3x11	145	8x12	195	10x12	230	10x12	230	13x20	300
220	5x11	130	5x11	150	6.3x11	185	8x12	195	8x12	245	10x12	290	10x16	325	13x25	380
330	6.3x11	180	6.3x11	205	8x12	220	8x12	265	10x12	340	10x20	400	13x20	495	16x25	525
470	6.3x11	220	6.3x11	245	8x12	305	10x12	370	10x16	450	13x20	525	13x20	625	16x25	700
680	8x12	295	8x12	295	10x12	320	10x16	400	10x20	505	13x20	600	13x25	700	16x36	840
1000	8x12	380	10x12	450	10x16	490	10x20	595	13x20	790	13x25	930	16x25	880	18x36	940
2200	10x16	620	10x20	690	13x20	695	13x25	1065	16x25	1230	16x36	1380	18x36	1570		
3300	10x20	820	13x20	980	13x25	1145	16x25	1370	16x36	1470	18x36	1730				
4700	13x20	1065	13x25	1230	16x25	1470	16x32	1535	18x36	1740						
6800	13x25	1320	16x25	1535	16x32	1565	18x36	1810								
10000	16x25	1615	16x32	1780	18x36	1890										
15000	16x36	1780	18x36	2005												
22000	18x36	2230	18x40	2370												

↑ Ripple current (mA rms) at 105°C, 120Hz
 ↓ Case size ϕ DXL(mm)

μF \ Vdc	160		200		250		350		400		450	
0.47	5x11	9	5x11	10	5x11	11	5x11	11	6.3x11	11	6.3x11	12
1	5x11	14	5x11	15	6.3x11	16	6.3x11	16	6.3x11	16	8x12	17
2.2	6.3x11	20	6.3x11	24	6.3x11	24	8x12	23	8x12	26	8x12	19
3.3	6.3x11	25	6.3x11	29	8x12	33	8x12	31	8x12	33	10x12	27
4.7	6.3x11	30	8x12	38	8x12	40	10x12	39	10x16	42	10x16	41
10	8x12	41	8x12	55	10x12	69	10x16	62	10x20	76	13x20	75
22	10x16	90	10x20	110	10x20	105	13x20	105	13x25	135	13x25	100
33	10x20	120	10x20	140	13x20	150	13x25	165	16x25	170	16x25	125
47	13x20	160	13x20	190	13x20	190	16x25	205	16x25	200	16x32	155
68	13x25	245	13x25	245	16x25	260	16x32	245	16x36	240	18x32	185
82	13x25	265	13x25	260	16x25	285	18x32	305	18x32	265	18x36	190
100	13x25	300	16x25	310	16x32	310	18x32	315	18x32	300	18x40	200
120	13x25	335	16x25	335	16x32	335	18x32	335	18x36	340	18x45	210
150	16x25	365	16x32	385	16x36	380	18x36	375	18x40	370		
180	16x32	385	16x36	460	18x36	455	18x40	405	18x45	450		
220	16x32	420	16x36	515	18x36	475						
330	18x36	590	18x36	620	18x40	585						
470	18x40	835	18x40	880								

↑ Ripple current (mA rms) at 105°C, 120Hz
 ↓ Case size ϕ DXL(mm)

LOAD LIFE TEST

