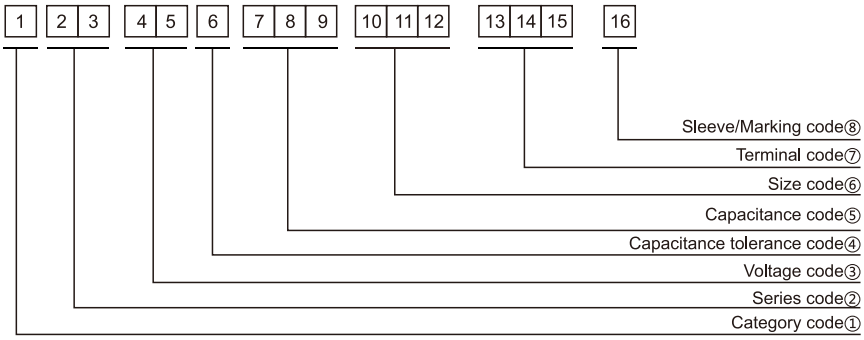
Part Numbering System



① Category code

Type	Code
	1
Electrolytic Capacitor	E
Conductive Polymer	S

② Series code

Series name	Code	
	2	3
WH	W	H
CD11GE	G	E
CD11GES	G	X
CD11GAS	G	W
CD11GHS	G	S
NR	N	R
PZ	P	Z

③ Voltage code

WV (V_{dc})	Code	
	4	5
2.5	0	E
3	0	D
4	0	G
6.3	0	J
6.8	0	C
7	0	Q
7.5	0	A
10	1	A
12	1	T
16	1	C
25	1	E
35	1	V
40	1	G
50	1	H
63	1	J
80	1	B
100	1	K
120	2	B
160	2	C
180	2	L
200	2	D
220	2	N
250	2	E
315	2	F
350	2	V
380	2	P
400	2	G
420	2	T
450	2	W
500	2	H
550	2	J
600	2	K

④ Capacitance tolerance code

Tol. (%)	Code
	6
-10~+10	K
-20~+20	M
-10~+30	Q
-10~+20	V
0~+20	A
-5~+20	C
-10~-20	B
-5~+5	D
0~+10	E
-5~-20	F
-15~+5	N

⑤ Capacitance code

Cap (μF)	Code		
	7	8	9
0.10	R	1	0
0.22	R	2	2
0.33	R	3	3
0.47	R	4	7
0.68	R	6	8
1	0	1	0
2.2	2	R	2
3.3	3	R	3
4.7	4	R	7
6.8	6	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
68	6	8	0
100	1	0	1
220	2	2	1
330	3	3	1
470	4	7	1
680	6	8	1
1000	1	0	2
2200	2	2	2
3300	3	3	2
4700	4	7	2
6800	6	8	2
10000	1	0	3
22000	2	2	3
33000	3	3	3
68000	6	8	3

⑥ Size code

ΦD (mm)	Code
	10
4	C
5	D
6.3	E
8	F
10	G
11	H
12	J
12.5	W
13	K
14	X
16	L
18	M
19	Z
20	N
22	O
25	P
30	Q
35	R
40	Y
51.6	S
64.3	T
76.9	U
91	V
100	A

L (mm)	Code	
	11	12
5	0	5
7	0	7
11	1	1
12	1	2
16	1	6
20	2	0
25	2	5
30	3	0
35	3	5
40	4	0
46	4	6
50	5	0
60	6	0
80	8	0
100	A	0
115	B	5
120	C	0
130	D	0
140	E	0
160	G	0
200	K	0
220	M	0
236	N	6
250	P	0

⑦ Terminal code

Specification	Code	Size	
	13	14	15
Bulk packing	O	-	-
Taping (SMD Type)	D	0	0
Φ4~8 Taping F=5.0mm	P	5	0
Φ10~12.5 Taping F=5.0mm	B	5	0
Lead Cut L=3.5mm	C	3	5
Lead Cut L=11.0mm	C	B	0
Lead Forming & Cut L=4.5mm	F	-	-
Kink & Cut L=4.5mm	J	-	-
Snap-in type Terminal 4.0mm in length	K	-	-
Three Terminals	T	-	-
Ring clip mounting standard design	A	0	0
Ring clip mounting special design	S	-	-

⑧ Sleeve/Marking code

Sleeve/Marking	Code
	16
PVC	C
PET	T
Dark blue	B
Bright red	R
Sky-blue	S
Light blue	T
Pink	Z
Black	H
Purple-blue	V
Red	O

Lead Forming

Taping Specifications

Fig.1 code: X

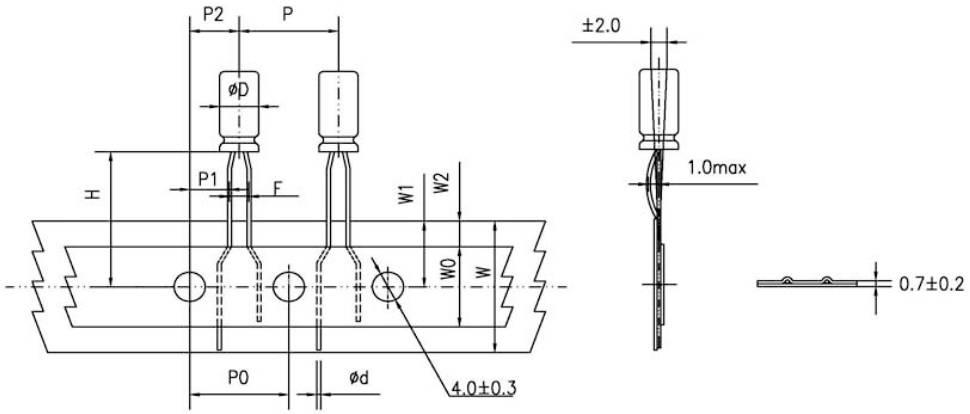


Fig.2 code: B

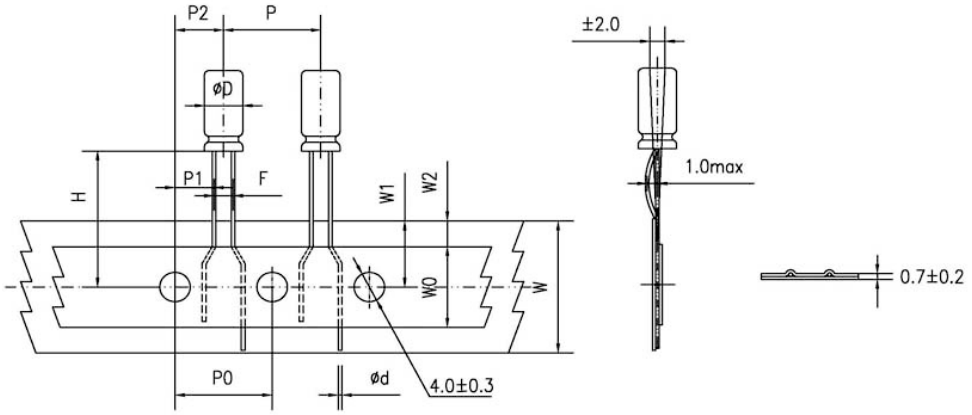


Fig.3 code: B

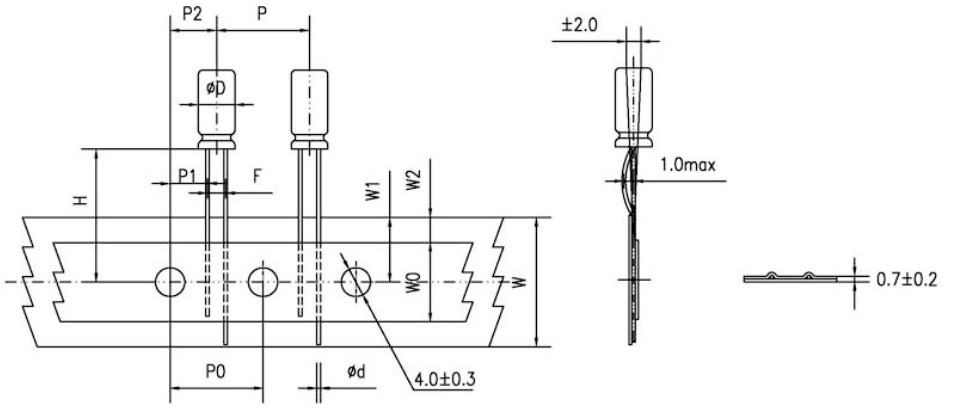
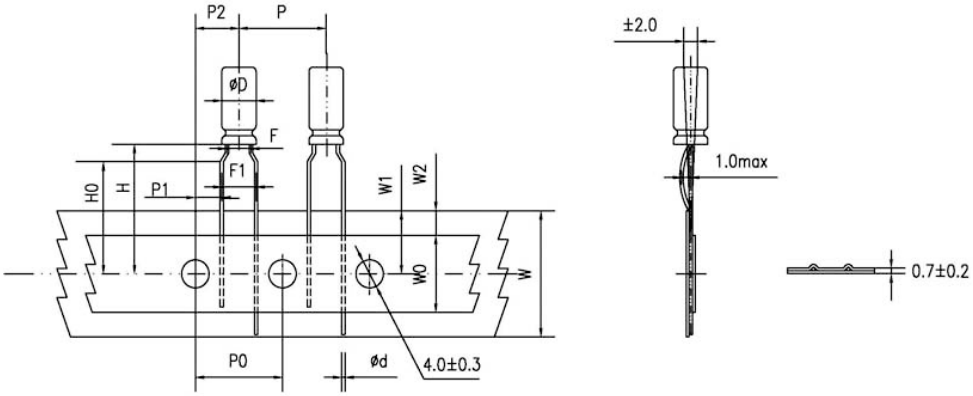


Fig.4 code: P



Lead Forming

Specification Fig.1 & Fig.2 & Fig.3

Items	Symbol	Case size									Tolerance
		4*5 4*7	5*5 5*7	5*11	6.3*5	6.3*7 6.3*9	6.3*11 6.3*12	8*5/7 8*9/11 8*11.5 8*12	8*16 8*20	10*9/12 10*12.5 10*13/16 10*20/25	
Pin Code		X B	X B	X B	B	B	B	B	B	B	
Lead wire diameter	Φd	0.45	0.45	0.5	0.45	0.5	0.5	0.45/0.5	0.6	0.6	±0.05
Pitch of body	P	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±1.0
Feed hole pitch	P0	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±0.2
Distance from hole center to lead	P1	5.1 5.6	5.1 5.35	5.1 5.35	5.1	5.1	5.1	4.6	4.6	3.85	±0.7
Distance from feed hole center to body center	P2	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	±1.0
Lead-to-lead distance	F	2.5 1.5	2.5 2.0	2.5 2.0	2.5	2.5	2.5	3.5	3.5	5.0	±0.5
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	±0.75
Base tape width	W	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	11.0	min
Hole position	W1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	+0.75 -0.5
Hole down tape position	W2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	max

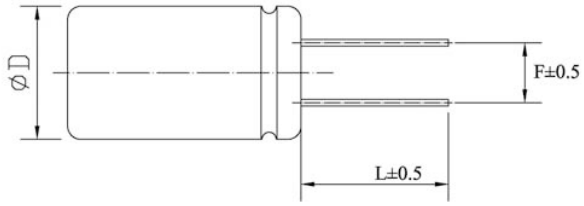
Specification Fig.4

Items	Symbol	Case size									Tolerance
		4*5 4*7	5*5	5*7	5*11	6.3*5	6.3*7 6.3*9	6.3*11 6.3*12	8*5/7 8*9/11 8*11.5/12	8*16 8*20	
Pin Code		P	P	P	P	P	P	P	P	P	
Lead wire diameter	Φd	0.45	0.45	0.45	0.5	0.45	0.5	0.5	0.45/0.5	0.6	±0.05
Pitch of body	P	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±1.0
Feed hole pitch	P0	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±0.2
Distance from hole center to lead	P1	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	±0.7
Distance from feed hole center to body center	P2	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	±1.0
Lead-to-lead distance	F	1.5	2.0	2.0	2.0	2.5	2.5	2.5	3.5	3.5	±0.5
Lead to lead distance	F1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	+0.8 -0.2
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	±0.75
Lead wire clinch height	H0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	±0.5
Base tape width	W	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	min
Hole position	W1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	+0.75 -0.5
Hole down tape position	W2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	max

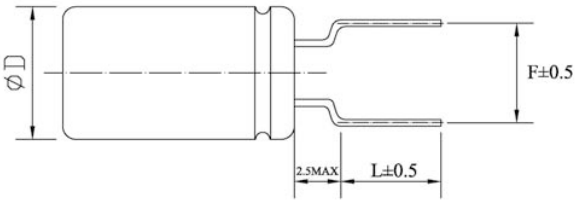
Lead Forming

Lead Forming & Cut

Code:C
RANGE: Φ4~Φ18

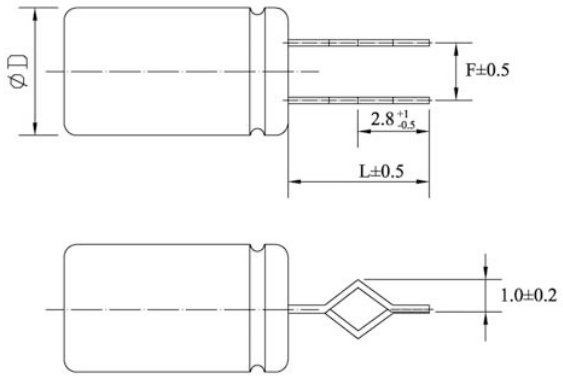


Code:F
RANGE: Φ4~Φ8



ΦD	F	L	ΦD	F	L
4	1.5	3.0~12.0	4	5.0	3.5, 4.5, 5.0, 7.0
5	2.0	3.0~12.0	5	5.0	3.5, 4.5, 5.0, 7.0
6.3	2.5	3.0~12.0	6.3	5.0	3.5, 4.5, 5.0, 7.0
8	3.5	3.0~12.0	8	5.0	3.5, 4.5, 5.0, 7.0
10	5.0	3.0~12.0	-	-	-
12.5	5.0	3.0~12.0	-	-	-
16	7.5	3.0~12.0	-	-	-
18	7.5	3.0~12.0	-	-	-

Code:J
RANGE: Φ10~Φ18



ΦD	F	L
10	5.0	4.0, 4.5, 5.0
12.5	5.0	4.0, 4.5, 5.0
16	7.5	4.0, 4.5, 5.0
18	7.5	4.0, 4.5, 5.0

CD11GC series



- Endurance: +130°C 4,000~5,000 hours +105°C 15,000~20,000 hours
- Withstand high temperature, extremely long life
- Suitable for output circuit and input circuit of LED driving power, electronic ballast and electronic energy saving lamp.
- **RoHS Compliant**

SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−40~+130°C(160~450 Vdc)							
Rated Voltage Range	160~450 Vdc							
Capacitance Tolerance	±20%(M)							(at 20°C,120Hz)
Leakage Current	160~400 Vdc	450 Vdc	Where, I: Max.leakage current (μA),C:Nominal capacitance (μF), V: Rated voltage (V)					
	I≤0.02CV+10μA	I≤0.03CV+10μA						(at 20°C after 2 minutes)
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	160	200	250	350	400	450	
	tanδ (max.)	0.15	0.15	0.15	0.20	0.20	0.20	(at 20°C,120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(Vdc)	160	200	250	350	400	450	
	Z(-25°C)/Z(+20°C)	3	3	3	5	5	6	
	Z(-40°C)/Z(+20°C)	6	6	6	6	6	9	(at 120Hz)

Endurance

The specifications listed below shall be met when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 130°C or 105°C, the peak voltage shall not exceed the rated voltage.

Capacitance Change	≤±30% of the initial value
D.F. (tanδ)	≤300% of the initial specified value
Leakage Current	≤The initial specified value

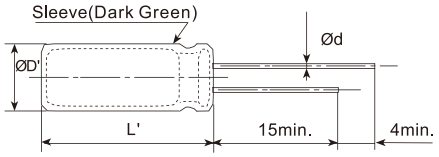
Height (mm)	130°C Load life (hours)	105°C Load life (hours)
L≤10	4,000	15,000
L>10	5,000	20,000

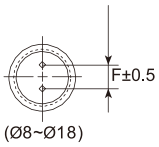
Shelf Life

The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.

Capacitance Change	≤±20% of the initial value
D.F. (tanδ)	≤200% of the initial specified value
Leakage Current	≤200% of the initial specified value

DIMENSIONS[mm]





ØD	8		10	12.5	16	18
Ød	0.5	0.6	0.6	0.6	0.8	0.8
F	3.5		5.0	5.0	7.5	7.5
ØD'	ØD+0.5max.					
L'	L+2max.					

PART NUMBERING SYSTEM

E GC 2G M 3R3 G16 O- - T

- T: Sleeve Code: “C” for PVC, “T” for PET
- O- -: Terminal code
- G16: Size code
- 3R3: Capacitance code
- M: Capacitance tolerance code
- 2G: Voltage code
- GC: Series code
- E: Category code

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq.(Hz) / Rated voltage(Vdc)	120	1k	10k	100k
160~450	0.50	0.80	0.90	1.00

CD11GC series

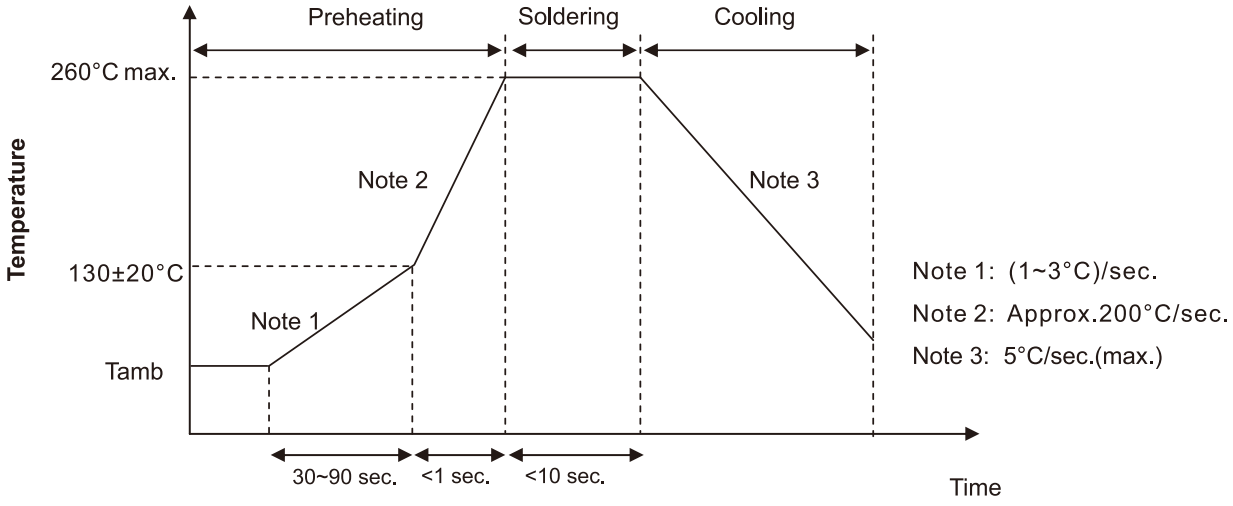
■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦDxL(mm)	tanδ	Rated ripple current (mArms/130°C,100kHz)
160(2C)	3.3	8*12	0.15	70
	4.7	8*12	0.15	77
	5.6	8*16	0.15	82
		10*9	0.15	80
	6.8	8*16	0.15	88
	8.2	10*9	0.15	145
		10*16	0.15	183
	10	10*9	0.15	190
		10*16	0.15	223
	15	10*16	0.15	300
	22	10*20	0.15	400
	33	12.5*20	0.15	480
	47	12.5*25	0.15	590
	68	16*25	0.15	750
	82	16*25	0.15	825
	100	16*25	0.15	960
		18*20	0.15	960
	150	18*30	0.15	1050
	220	18*35	0.15	1500
200(2D)	2.8	8*12	0.15	64
	3.3	8*12	0.15	73
	4.7	8*16	0.15	126
		10*9	0.15	100
		10*12	0.15	126
	5.6	8*16	0.15	148
		10*9	0.15	120
	6.8	8*16	0.15	160
		10*9	0.15	145
		10*16	0.15	200
	8.2	10*9	0.15	165
		10*16	0.15	203
	10	10*9	0.15	215
		10*16	0.15	230
		10*20	0.15	245
	15	10*20	0.15	327
	22	12.5*20	0.15	430
	33	12.5*20	0.15	500
	47	12.5*25	0.15	650
		16*20	0.15	650
	68	16*25	0.15	750
	82	16*30	0.15	900
		18*25	0.15	900
	100	16*30	0.15	1100
		18*25	0.15	1100
	150	18*35	0.15	1350
250(2E)	2.2	8*12	0.15	64
	2.8	8*12	0.15	72
	3.3	8*12	0.15	80
	4.7	8*16	0.15	133
	5.6	10*9	0.15	120
		10*16	0.15	150
	6.8	10*16	0.15	169
	8.2	10*9	0.15	165
		10*16	0.15	203
	10	10*16	0.15	238
		10*20	0.15	250
	15	10*20	0.15	327
	22	12.5*20	0.15	430
	33	12.5*25	0.15	530
		16*20	0.15	530
	47	16*25	0.15	690
		18*20	0.15	690
	68	16*30	0.15	780
		18*25	0.15	780
	82	18*25	0.15	900
	100	18*30	0.15	970

WV (Vdc)	Cap (μF)	Size ΦDxL(mm)	tanδ	Rated ripple current (mArms/130°C,100kHz)
350(2V)	1	8*12	0.20	49
	1.5	8*16	0.20	73
	1.8	8*16	0.20	75
		10*9	0.20	65
	2.2	10*9	0.20	75
		10*16	0.20	90
	2.8	10*16	0.20	95
	3.3	10*16	0.20	100
	4.7	10*20	0.20	142
	5.6	10*20	0.20	152
		12.5*20	0.20	165
	6.8	10*20	0.20	190
		12.5*20	0.20	200
	8.2	12.5*20	0.20	205
	10	12.5*20	0.20	250
		12.5*25	0.20	270
	15	12.5*25	0.20	335
		16*20	0.20	335
	22	16*25	0.20	450
	33	16*30	0.20	535
		16*35	0.20	555
	47	18*30	0.20	700
		18*35	0.20	750
	68	18*40	0.20	900
400(2G)	1	8*12	0.20	54
		8*16	0.20	60
	1.5	8*16	0.20	73
	1.8	8*16	0.20	75
		10*9	0.20	65
	2.2	10*9	0.20	76
		10*16	0.20	92
	2.8	10*16	0.20	100
	3.3	10*16	0.20	105
		10*20	0.20	120
	4.7	10*20	0.20	142
		12.5*20	0.20	150
	5.6	12.5*20	0.20	165
	6.8	12.5*20	0.20	225
	8.2	12.5*20	0.20	230
	10	12.5*25	0.20	280
	15	12.5*25	0.20	335
		16*20	0.20	335
	22	16*25	0.20	480
		16*30	0.20	500
	33	18*30	0.20	635
	47	18*35	0.20	750
	68	18*40	0.20	900
	100	18*50	0.20	1030
450(2W)	1.5	8*16	0.20	70
	1.8	8*16	0.20	74
	2.2	10*16	0.20	77
	2.8	10*16	0.20	80
	3.3	10*16	0.20	88
		10*20	0.20	92
	4.7	10*20	0.20	104
	5.6	12.5*20	0.20	144
	6.8	12.5*20	0.20	175
	8.2	12.5*20	0.20	183
	10	12.5*20	0.20	225
	15	12.5*25	0.20	294
	22	16*25	0.20	395
		16*30	0.20	420
	33	18*30	0.20	500
	47	18*35	0.20	615
	68	18*40	0.20	710
	100	18*50	0.20	840

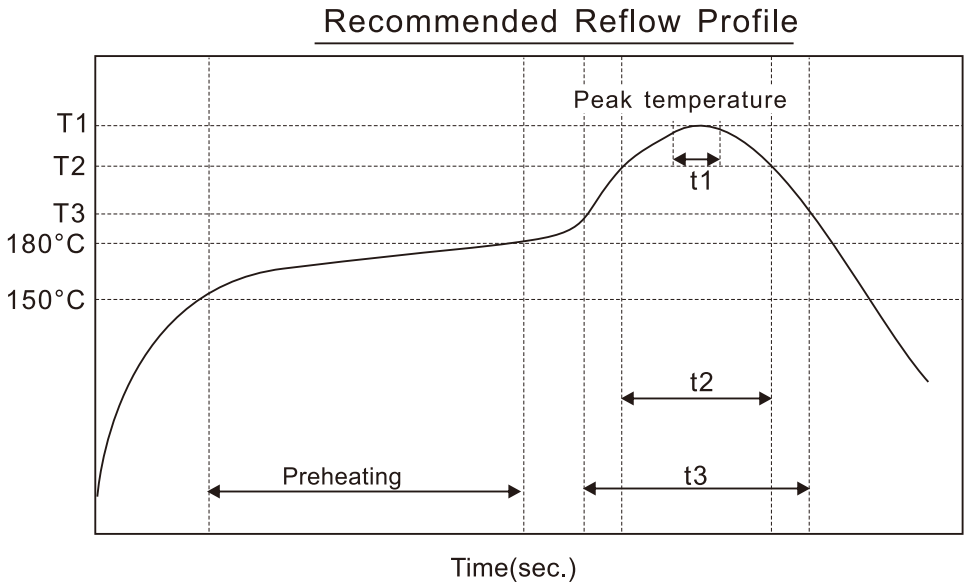
Solering Recommendation

■ Flow Soldering(Radial Lead Type)



■ Reflow Soldering

• (For Polymer SMD Type)

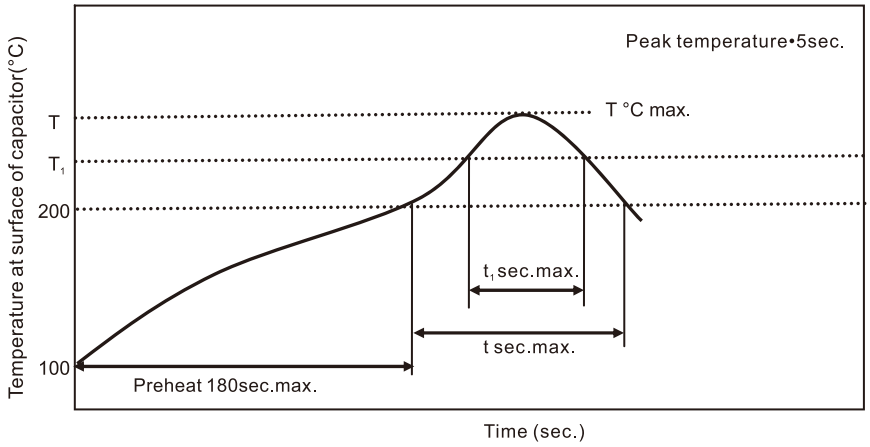


Item	Preheating	T1(°C)	T2(°C)	T3(°C)	t1(sec.)	t2(sec.)	t3(sec.)	Reflow cycle
Condition 1	150°C to 180°C Within 90sec.	≤260	230	200	≤10	≤40	≤60	1
Condition 2		≤250	230	200	≤10	≤40	≤60	2

• (For Liquid SMD Type)

Case size:Φ6.3~Φ10mm:

- Temperature at surface of capacitor shall not exceed T°C.
- The duration for over 200°C temperature and T_1°C at surface of capacitor shall not exceed t and $t_1$seconds,respectively.
- Preheat shall be done at 100°C to 200°C and for Maximum 180 seconds.

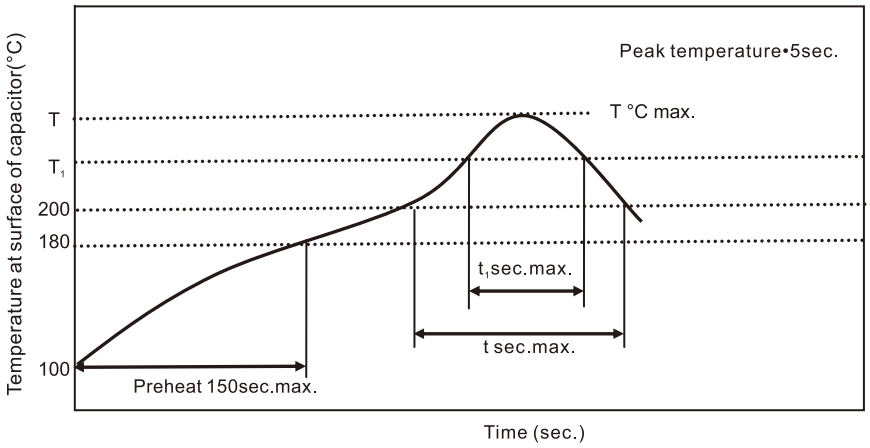


Case size (mm)	T(°C) ①	T_1(°C)	t(sec.) ②	t_1(sec.) ③	Reflow cycle
Φ6.3	250	230	90	40	1
Φ8	240	230	90	30	1
Φ10	235	230	60	30	1

① Peak temperature
② The duration over 200°C (max.)
③ The duration over T_1°C
■ Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

Case size:Φ12.5~Φ18mm:

- Temperature at surface of capacitor shall not exceed T°C.
- The duration for over 200°C temperature and T_1°C at surface of capacitor shall not exceed t and t_1 seconds,respectively.
- Preheat shall be done at 100°C to 180°C and for Maximum 150 seconds.



Case size (mm)	T(°C) ①	T_1(°C)	t(sec.) ②	t_1(sec.) ③	Reflow cycle
Φ12.5~Φ18	240	230	60	30	1

① Peak temperature
② The duration over 200°C (max.)
③ The duration over T_1°C
■ Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

AiSHi:

ERF1BM221G20OT ERS1HM4R7D11OT ERS1HM561W16OT ERS1KM220F09OT ERS1VM221F16OT ERZ1HM101E12OTG EMK1EM221FB0D00R ERF1BM471L20OT ERF1KM151G20OT EWH1HM101F11OT SPZ1AM221E05O00R ERF1KM101G20OT ERJ1CM102G16OT ERM1EM470D11OT ERS1HM2R2D11OT ERE1EM221F12OT ERR1VM220D07OT SPZ1EM470D07O00RAXXX EMK1VM330E83D00R ERS1EM220D11OT EWH1EM331F12OT ERJ1HM560E11OT ERJ1VM471F20OT ERR1HM222L30OT EHS2WM470L25OT ERM1HM100D11OT EWH2WM820M25OT ERF1EM681G16OT ERF1VM471G20OT ERS1HM221G16OT