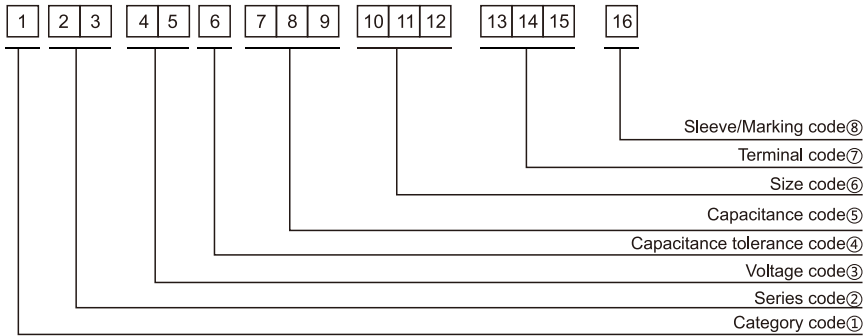


Part Numbering System



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
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

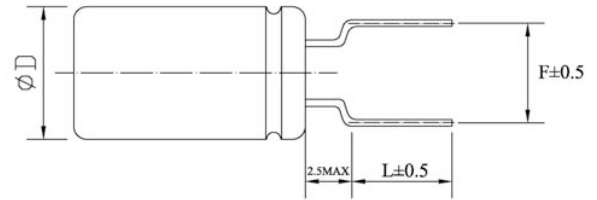
Lead Forming

Lead Forming & Cut

Code:C
RANGE: $\Phi 4 \sim \Phi 18$



Code:F
RANGE: $\Phi 4 \sim \Phi 8$



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	-	-	-

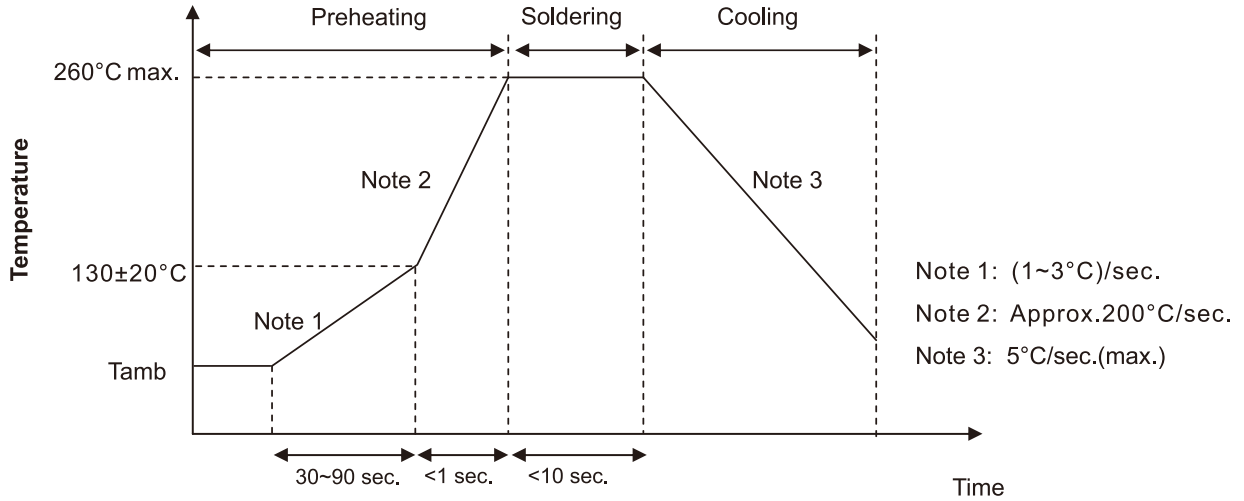
Code:J
RANGE: $\Phi 10 \sim \Phi 18$



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

Solering Recommendation

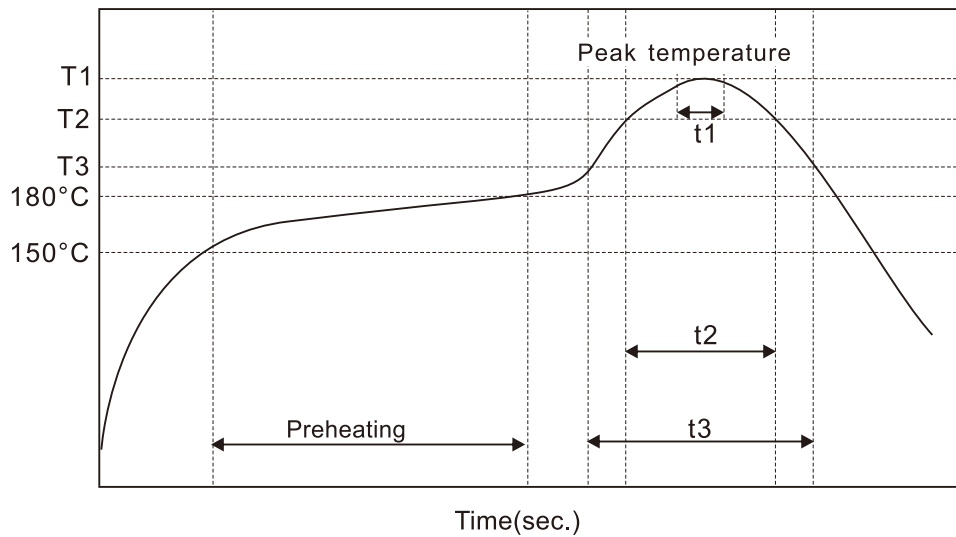
■ Flow Soldering(Radial Lead Type)



■ Reflow Soldering

- (For Polymer SMD Type)

Recommended Reflow Profile

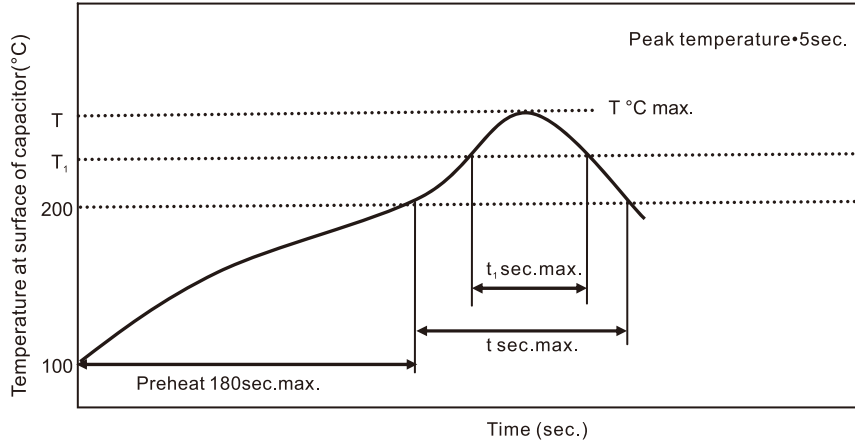


Item	Preheating	T1(°C)	T2(°C)	T3(°C)	t1(sec.)	t2(sec.)	t3(sec.)	Reflow cycle
Condition 1	150°C to 180°C Within 90sec.	≤260	230	200	≤10	≤40	≤60	1
Condition 2		≤250	230	200	≤10	≤40	≤60	2

● (For Liquid SMD Type)

Case size: $\Phi 6.3$ – $\Phi 10$ mm:

- Temperature at surface of capacitor shall not exceed $T^{\circ}\text{C}$.
- The duration for over 200°C temperature and $T_1^{\circ}\text{C}$ 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.

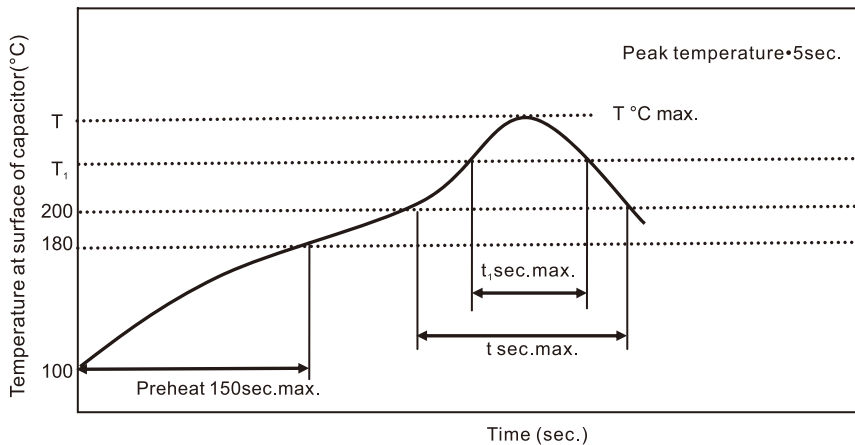


Case size (mm)	$T(^{\circ}\text{C})$ ①	$T_1(^{\circ}\text{C})$	$t(\text{sec.})$ ②	$t_1(\text{sec.})$ ③	Reflow cycle
$\Phi 6.3$	250	230	90	40	1
$\Phi 8$	240	230	90	30	1
$\Phi 10$	235	230	60	30	1

- ① Peak temperature
- ② The duration over 200°C (max.)
- ③ The duration over $T_1^{\circ}\text{C}$
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

Case size: $\Phi 12.5$ – $\Phi 18$ mm:

- Temperature at surface of capacitor shall not exceed $T^{\circ}\text{C}$.
- The duration for over 200°C temperature and $T_1^{\circ}\text{C}$ 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)	$T(^{\circ}\text{C})$ ①	$T_1(^{\circ}\text{C})$	$t(\text{sec.})$ ②	$t_1(\text{sec.})$ ③	Reflow cycle
$\Phi 12.5$ – $\Phi 18$	240	230	60	30	1

- ① Peak temperature
- ② The duration over 200°C (max.)
- ③ The duration over $T_1^{\circ}\text{C}$
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.



PZ series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦDxL(mm)	ESR (mΩ,20°C,100kHz)(max.)	Rated ripple current (mA _{rms} /105°C,100kHz)	Leakage Current (μA)(max.)
6.3 (7.2)	47	6.3*5	40	1100	500
	82	6.3*5	40	1100	500
	100	4*7	30	1500	500
		5*7	30	1800	500
	150	6.3*6	40	1900	500
		4*7	30	2100	500
	180	5*7	30	2600	500
		5*7	20	3500	500
	220	6.3*7	20	3550	500
		6.3*8	15	3600	500
	270	5*7	20	3800	500
		5*6	20	3200	500
	330	5*8	20	4000	500
		6.3*5	25	3160	500
	390	6.3*8	15	4000	500
		5*9	20	4100	500
	470	5*10	20	4300	592
		5.5*9	20	4100	592
	500	6.3*7	20	3900	592
		6.3*8	15	4400	592
	560	5*9	20	4100	630
		6.3*7	20	4200	706
	680	6.3*8	20	4800	706
		5.5*9	20	4300	706
	820	6.3*9	20	5080	857
		5.5*9	20	4800	857
	1000	8*9	20	4600	857
		5.5*10	20	4800	1033
	1200	6.3*9	20	5080	1033
		8*9	15	4700	1033
	1500	6.3*10	10	5150	1260
		8*9	12	4800	1260
1800	8*11	10	5200	1260	
	6.3*11	10	5200	1512	
2200	8*11	10	5300	1512	
	8*11	10	5400	1890	
3300	10*12	10	5500	1890	
	10*10	10	5560	2268	
4700	8*14	10	5700	2772	
	10*12	10	5800	2772	
5600	10*14	10	5900	4158	
	10*17	10	6100	5000	
6.8 (7.8)	220	10*18	10	6300	5000
	270	5*7	20	3300	500
		5*7	20	3600	500
	330	6.3*8	20	3900	500
		5*8	20	3800	500
	390	6.3*5	25	3100	500
		6.3*7	20	3400	500
	470	5*9	20	3900	530
		5*9	20	4100	639
	560	6.3*7	20	3700	639
		6.3*8	20	4500	762
	680	6.3*9	20	4800	925
6.3*9		20	4900	1115	
1000	6.3*11	12	5100	1360	
	8*11	10	5150	1360	
7 (8)	150	5*6	30	1500	500
	220	5*7	20	3200	500
	270	5*8	20	3400	500
	330	5*9	20	3600	500
	470	6.3*8	20	3800	658
		5.5*9	20	3600	658
	560	6.3*8	20	4000	784
	680	6.3*9	12	4200	952
6.3*10		12	4500	1148	
820	8*9	12	4600	1148	
7.5 (8.6)	220	5*7	20	3100	500
	270	5*8	20	3300	500
	330	5*9	20	3500	500
	390	5*9	20	3500	585
		6.3*7	25	3200	705
	470	5.5*9	20	3550	705
		5*9	20	3550	705
	500	5.5*8	25	3100	705
		5.5*9	20	3600	750
	560	6.3*8	20	3900	840
	680	6.3*9	12	4100	1020
		6.8*8	20	4000	1020
	820	6.3*10	12	4400	1230
		8*9	12	4550	1230
1000	8*11	12	4700	1500	
	6.3*11	12	4500	1500	
1200	8*11	12	4800	1800	
	6.8*11	12	4600	1800	

PZ series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦDxL(mm)	ESR (mΩ,20°C,100kHz)(max.)	Rated ripple current (mArms/105°C,100kHz)	Leakage Current (μA)(max.)
7.5 (8.6)	1500	8*11	12	4900	2250
	1800	7*13	12	4800	2250
	1800	8*14	12	5100	2700
	2200	10*12	12	5700	3300
10 (11.5)	47	5*7	35	2200	500
	56	5*7	35	2250	500
	68	5*7	35	2300	500
	82	5*7	35	2350	500
		5*7	35	2400	500
	100	6.3*5	30	2300	500
		5*5	30	2000	500
	120	5*7	20	2450	500
	150	5*7	20	2500	500
	180	6.3*7	20	2800	500
		5*8	20	2700	500
		5*9	20	2820	500
	220	6.3*5	25	2800	500
		6.3*8	15	3160	500
	270	6.3*8	20	3100	540
		6.3*8	20	3300	660
	330	8*9	15	3400	660
		6.3*10	12	3500	660
	390	6.3*8	20	3400	780
		5.5*9	20	3400	940
	470	6.3*8	20	3500	940
		8*9	15	3550	940
		8*11	12	5650	940
	560	6.3*10	13	3600	1120
		8*9	15	3600	1120
		6.3*11	15	3800	1360
	680	8*11	12	3900	1360
		8*8	20	3300	1360
	820	8*11	12	4000	1640
	1000	8*11	12	4200	2000
		10*12	10	5300	2000
	1200	8*12	10	4500	2400
	10*12	10	5450	2400	
1500	10*12	10	5500	3000	
	8*14	10	4800	3000	
1800	10*13	10	5800	3600	
2200	10*15	10	6100	4400	
3300	10*18	10	6200	5000	
220	4*10	15	2100	528	
12 (13.8)	330	5.5*9	20	3100	792
		6.3*8	20	3100	792
	470	5*10	20	3100	792
		5.5*9	20	3200	1128
	560	6.3*9	20	3450	1128
		6.3*10	15	3400	1344
	680	6.3*11	15	3600	1632
		8*10	15	3700	1632
	820	8*11	12	3800	1968
		6.8*11	13	3200	1968
	1000	8*12	12	4000	2400
	1200	8*14	12	4400	2880
	1500	8*16	12	4800	3600
	16 (18.4)	22	5*9	80	1600
47		5*7	20	2050	500
56		5*7	20	2100	500
68		5*7	20	2150	500
82		5*8	20	2200	500
		5*7	20	2250	500
100		6.3*5	25	2100	500
		6.3*8	20	2800	500
120		5*8	20	2350	500
150		5*8	20	2400	500
180		5*8	20	2450	576
		6.3*7	16	2500	576
		5*10	20	2600	704
220		6.3*8	20	2700	704
		6.3*10	15	2900	704
		5.5*9	20	2750	864
270		6.3*8	20	2800	864
		8*9	20	2900	864
		5.5*9	20	2900	1056
330		6.3*9	20	2900	1056
		6.3*10	15	3100	1056
		5.5*10	20	3000	1504
470		6.3*11	15	3100	1504
		8*11	11	4600	1504
		8*9	13	4100	1504
		8*11	11	3200	1792
560		8*13	11	3300	1792
		10*12	11	3500	1792
		8*11	11	3400	2176
680		10*12	11	3600	2176
		6.8*11	11	3200	2176
		8*13	11	3500	2624
820		10*12	11	3800	2624
		10*12	11	4000	3200
1000		8*14	11	3600	3200

Conductive Polymer Radial Type

PZ series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦDxL (mm)	ESR (mΩ, 20°C, 100kHz)(max.)	Rated ripple current (mArms/105°C, 100kHz)	Leakage Current (μA)(max.)
16 (18.4)	1200	10*15	11	4300	3840
		10*12	11	4200	3840
	1500	10*12	11	4800	4800
		10*18	11	5500	4800
	1800	10*14	11	5400	5000
		10*17	11	5800	5000
	2200	10*15	11	5500	5000
	3300	13*18	11	6100	5000
20 (23)	33	5*8	40	1900	500
	39	5*8	40	1950	500
	47	5*8	40	2200	500
	56	5*9	40	2100	500
	68	6.3*8	30	2100	500
	82	6.3*8	30	2150	500
	100	6.3*8	30	2200	500
	120	6.3*8	30	2300	500
	150	6.3*10	20	2350	600
	180	8*9	30	2450	720
	220	8*11	20	2550	880
	270	8*11	20	2700	1080
	330	8*11	20	2800	1320
		6.3*11	20	2100	1320
		10*12	20	2900	1880
	470	8*16	20	3000	1880
		8*11	20	2400	1880
		10*12	20	3100	2240
	560	8*16	20	3200	2240
	680	10*15	20	3300	2720
	8*14	20	2700	2720	
820	10*18	20	3400	3280	
1000	10*18	20	3900	4000	
25 (29)	6.8	6.3*6	100	1100	500
	10	5*8	70	1800	500
	22	5*9	60	1810	500
	33	5*9	50	1850	500
	39	5*8	40	1900	500
	47	5*9	40	1950	500
	56	5*9	40	2050	500
	68	6.3*7	30	2100	500
	82	6.3*7	30	2150	500
		6.3*8	30	2200	500
	100	6.3*10	20	2300	500
		8*11	20	2450	500
	120	6.3*8	30	2300	600
	150	6.3*10	20	2350	750
	180	6.3*10	20	2350	900
		8*9	30	2450	900
		8*11	20	2550	1100
	220	10*12	20	2900	1100
		5.5*10	20	1900	1100
	270	8*11	20	2700	1350
		8*11	20	2800	1650
	330	10*12	20	3100	1650
		10*10	25	2800	1650
		10*12	20	2800	2350
	470	8*16	20	2700	2350
		8*11	20	2300	2350
	10*10	25	2300	2350	
560	10*12	20	3000	2800	
	8*11	20	2400	2800	
	10*15	20	3200	3400	
680	10*12	20	2800	3400	
	8*14	20	2500	3400	
	10*18	20	3300	4100	
820	10*12	20	2600	4100	
	8*16	20	2600	4100	
1000	10*18	20	3800	5000	
1500	13*16	20	4000	5000	
35 (41)	4.7	5*8	60	1700	500
	10	5*8	60	1800	500
	15	5*8	60	1850	500
	22	5*9	100	1950	500
	33	5*9	50	2000	500
	39	5*9	50	2050	500
	47	6.3*7	50	2100	500
	56	6.3*7	50	2150	500
	68	6.3*7	50	2200	500
	82	6.3*7	50	2250	574
		6.3*8	50	2350	700
	100	6.3*10	40	2400	700
		8*11	40	2600	700
	120	6.3*10	40	2500	840
	150	6.3*10	40	2550	1050
	180	6.3*11	40	2600	1260
		8*11	40	2800	1540
	220	10*12	30	2900	1540
		6.3*11	30	2700	1540
	270	10*12	30	3000	1890
	330	10*12	30	3100	2310
	470	10*13	20	3200	3290

PZ series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size ΦDxL(mm)	ESR (mΩ,20°C,100kHz)(max.)	Rated ripple current (mArms/105°C,100kHz)	Leakage Current (μA)(max.)
35 (41)	560	10*14	20	3300	3920
	680	10*16	20	3400	4760
	820	10*18	20	3500	5000
	1000	10*18	20	3700	5000
50 (58)	4.7	5*8	60	1600	500
	10	6.3*7	35	1850	500
		5*8	70	1630	500
	15	5*8	70	1660	500
	22	6.3*7	40	1900	500
	33	6.3*7	40	2000	500
	47	6.3*8	35	2100	500
	56	6.3*8	35	2120	560
	68	6.3*10	30	2150	680
	100	8*11	30	2300	1000
		8*9	40	2100	1000
	120	8*11	30	2400	1200
	150	10*12	30	2500	1500
	180	10*12	30	2600	1800
	220	10*12	30	2700	2200
	270	10*13	20	2900	2700
330	10*15	20	3000	3300	
440	10*18	20	3100	4400	
470	10*18	20	3150	4700	
680	13*18	20	3300	5000	
63 (73)	4.7	6.3*8	60	1600	500
	6.8	6.3*8	60	1650	500
	10	6.3*5	60	1600	500
	33	6.3*8	30	1700	500
	39	6.3*8	30	1750	500
	47	6.3*9	30	1900	592
	56	8*9	30	1800	706
	68	8*11	30	2000	857
	82	8*11	30	2100	1033
	100	10*12	30	2200	1260
	150	10*12	30	2500	1890
	180	10*13	20	2600	2268
	220	10*15	20	2650	2772
	270	10*17	20	2850	3402
	330	10*18	20	2950	4158
	470	13*18	20	3100	5000
80 (92)	4.7	6.3*8	60	1500	500
	6.8	6.3*8	60	1550	500
	22	6.3*10	60	1650	500
	33	8*11	35	1700	528
	47	10*12	35	1850	752
	68	10*12	35	1900	1088
	100	10*14	35	2100	1600
	220	13*18	35	2700	4400
100 (115)	4.7	6.3*8	60	1400	500
	6.8	6.3*8	60	1450	500
	10	6.3*10	50	1500	500
	15	8*11	50	1550	500
	22	10*12	35	1600	500
	33	10*14	35	1650	660
	47	10*16	35	1800	940

Conductive Polymer Radial Type

※ Specifications subject to change without notice.