

TPE series characteristics list

Size code	Part number	Rated voltage (V)	Rated temperature (°C)	Rated capacitance (μF)	Category voltage (V)	Category temperature (°C)	DF (% max)	LC (μA) max/5min.	ESR (mΩ max) 100kHz/20°C	Maximum allowable ripple current (mA rms) 100kHz※1	MSL Reflow temp. ≤ 260°C Reflow temp. ≤ 250°C	
B2	10TPE47MAZB	10	85	47	8.0	105	8.0	47.0	35	1400	3	3
	8TPE100MAZB	8.0	85	100	6.3	105	8.0	80.0	35	1400	3	3
	6TPE220MAZB	6.3	85	220	5.0	105	10	138.6	35	1400	3	3
	6TPE220MAPB※2	6.3	85	220	5.0	105	10	138.6	25	1400	3	3
	6TPE150MAZB	6.3	85	150	5.0	105	8.0	94.5	35	1400	3	3
	6TPE150MAPB	6.3	85	150	5.0	105	8.0	94.5	25	1600	3	3
	6TPE120MAZB	6.3	85	120	5.0	105	8.0	75.6	35	1400	3	3
	6TPE100MPB	6.3	105	100	6.3	105	8.0	63.0	25	1600	3	3
	6TPE100MAZB	6.3	85	100	5.0	105	8.0	63.0	35	1400	3	3
	4TPE220MAZB	4.0	85	220	3.2	105	8.0	88.0	35	1400	3	3
	4TPE150MAZB	4.0	85	150	3.2	105	8.0	60.0	35	1400	3	3
	4TPE100MZB	4.0	105	100	4.0	105	8.0	40.0	35	1400	3	3
	2R5TPE330MAZB	2.5	85	330	2.0	105	8.0	82.5	35	1400	3	3
	ETPE330MAFB※2	2.5	85	330	2.0	105	8.0	165.0	15	2700	3	3
	ETPE330MA9GB※2	2.5	85	330	2.0	105	8.0	165.0	9/300kHz	3200	3	3
	2R5TPE220MZB	2.5	105	220	2.5	105	8.0	55.0	35	1400	3	3
	2R5TPE220MLB	2.5	105	220	2.5	105	8.0	55.0	21	1700	3	3
	2R5TPE220MFGB	2.5	105	220	2.5	105	8.0	110.0	15/300kHz	1800	3	3
	2R5TPE220MAZB	2.5	85	220	2.0	105	8.0	55.0	35	1400	3	3
	2R5TPE220MAPB	2.5	85	220	2.0	105	8.0	55.0	25	1600	3	3
	2R5TPE220MAFB	2.5	85	220	2.0	105	8.0	110.0	15	2000	3	3
	2TPE470MAJGB	2.0	85	470	1.8	105	10	188.0	11/300kHz	2300	3	3
	2TPE330MFB	2.0	105	330	2.0	105	8.0	132.0	15	2000	3	3
	2TPE330MAFB	2.0	85	330	1.8	105	8.0	132.0	15	2000	3	3
	2TPE330MADGB	2.0	85	330	1.8	105	8.0	132.0	13/300kHz	2000	3	3

※1 100k to 500kHz,45°C ※2 Under development

Specifications

Items	Condition		Specifications			
Rated voltage (V)	—		2.5	4.0	6.3	10
Surge voltage (V)	—		2.9	4.6	7.2	12
Category temperature range (°C)	—		-55 to +105			
Capacitance tolerance (%)	120Hz/20°C		M : ±20			
Rated capacitance range (μF)	120Hz/20°C		68 to 1,500			
Dissipation Factor (DF)	120Hz/20°C		Please see the attached characteristics list			
Leakage current	Rated voltage applied, after 5 minutes		Please see the attached characteristics list			
Equivalent series resistance (ESR)	100kHz/20°C		Please see the attached characteristics list			
Characteristics of impedance ratio at high temp. and low temp.	100kHz/+20°C	-55°C	Z/Z _{20°C}	0.6 to 2.0		
		+105°C	Z/Z _{20°C}	0.6 to 2.0		
Endurance	105°C, 2,000h, rated voltage applied ※Rated temp, 85°C products: 85°C, 1,000h, rated voltage applied 6TPE330MAP,6TPE470MAZU:85°C,2,000h	ΔC/C		Within±20% of the initial value		
		DF		≤ 1.5 times of the initial limit		
		LC		Within the initial limit		
Damp heat (Steady State)	60°C, 90 to 95%RH, 500h, No-applied voltage	ΔC/C		Within+50%, -20% of the initial value (2R5TPE470M (I,F,C,9,7), 2R5TPE330M (I,F,C,9,7), 2R5TPE220M (I,F,9), 2R5TPE1000M (I,F), 2R5TPE1500M (F,C))		
		DF		≤ 1.5 times of the initial limit		
		LC		≤ 3 times of the initial limit		
Surge	105°C, 1,000 cycles, 1kΩ discharge resistance, surge voltage applied ※Rated temp. 85°C products: 85°C	ΔC/C		Within±5% of the initial value		
		DF		Within the initial limit		
		LC		≤ 3 times of the initial limit		

Marking and dimensions

Technical drawings of the capacitor showing top, side, and end views with dimensions L, W, H, S, and W1.

Diagram of the capacitor marking showing Rated capacitance, Anode (+), Rated voltage※1, and Lot. No.※2.

※1 The rated voltage is as follows.

R.V.	2.5	4.0	6.3	10
Mark	e	g	j	A

※2 Lot.No.shows roughly manufacturing date.

(unit : mm)

Size code	L ±0.3	W ±0.2	H ±0.2※1	S ±0.2	W1 ±0.1
D15E	7.3	4.3	1.4	1.1	2.4
D2E	7.3	4.3	1.8	1.3	2.4
D3L	7.3	4.3	2.8	1.3	2.4
D4	7.3	4.3	3.8	1.3	2.4

※1 ±0.1 : D2E, D15E

Recommended land pattern dimension of PWB

(unit : mm)

Size code	a	b	c
D15E	2.4	2.9	3.7
D2E	2.4	2.9	3.7
D3L	2.4	2.9	3.7
D4	2.4	2.9	3.7

Size list

		RV:Rated voltage			
μF	RV	2.5	4.0	6.3	10.0
68					D2E
100				D2E	
150			D2E	D2E	
220	D2E		D2E	D2E	D3L
330	D2E		D2E	D2E,D3L,D4	D4
470	D2E		D3L	D4,D15E	
680	D3L			D4	
1,000	D4				
1,500	D4				

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											Reflow temp. ≤ 260°C	Reflow temp. ≤ 250°C
D15E	6TPE470MAZU	6.3	85	470	5.0	105	10	296.1	35	1700	3	2a
D2E	10TPE68M	10	105	68	10	105	10	68.0	25	2400	3	2a
	6TPE330MAP	6.3	85	330	5.0	105	10	207.9	25	2400	3	2a
	6TPE220MAP	6.3	85	220	5.0	105	10	138.6	25	2400	3	2a
	6TPE220M	6.3	105	220	6.3	105	10	138.6	25	2400	3	2a
	6TPE220MI	6.3	105	220	6.3	105	10	138.6	18	2800	3	2a
	6TPE150M	6.3	105	150	6.3	105	10	94.5	25	2400	3	2a
	6TPE150MI	6.3	105	150	6.3	105	10	94.5	18	2800	3	2a
	6TPE150MF	6.3	105	150	6.3	105	10	94.5	15	3100	3	2a
	6TPE100M	6.3	105	100	6.3	105	10	63.0	25	2400	3	2a
	6TPE100MI	6.3	105	100	6.3	105	10	63.0	18	2800	3	2a
	4TPE330M	4.0	105	330	4.0	105	10	132.0	25	2400	3	2a
	4TPE330MI	4.0	105	330	4.0	105	10	132.0	18	2800	3	2a
	4TPE220M	4.0	105	220	4.0	105	10	88.0	25	2400	3	2a
	4TPE220MI	4.0	105	220	4.0	105	10	88.0	18	2800	3	2a
	4TPE220MF	4.0	105	220	4.0	105	10	88.0	15	3100	3	2a
	4TPE150MI	4.0	105	150	4.0	105	10	60.0	18	2800	3	2a
	2R5TPE470MI	2.5	105	470	2.5	105	10	117.5	18	2800	3	2a
	2R5TPE470MF	2.5	105	470	2.5	105	10	117.5	15	3100	3	2a
	2R5TPE470MC	2.5	105	470	2.5	105	10	117.5	12	3500	3	2a
	2R5TPE470M9	2.5	105	470	2.5	105	10	117.5	9	3900	3	2a
	2R5TPE470M7	2.5	105	470	2.5	105	10	117.5	7	4400	3	2a
	2R5TPE330M	2.5	105	330	2.5	105	10	82.5	25	2400	3	2a
	2R5TPE330MI	2.5	105	330	2.5	105	10	82.5	18	2800	3	2a
	2R5TPE330MF	2.5	105	330	2.5	105	10	82.5	15	3100	3	2a
	2R5TPE330MC	2.5	105	330	2.5	105	10	82.5	12	3500	3	2a
	2R5TPE330M9	2.5	105	330	2.5	105	10	82.5	9	3900	3	2a
	2R5TPE330M7	2.5	105	330	2.5	105	10	82.5	7	4400	3	2a
	2R5TPE220M	2.5	105	220	2.5	105	10	55.0	25	2400	3	2a
	2R5TPE220MI	2.5	105	220	2.5	105	10	55.0	18	2800	3	2a
	2R5TPE220MF	2.5	105	220	2.5	105	10	55.0	15	3100	3	2a
	2R5TPE220M9	2.5	105	220	2.5	105	10	55.0	9	3900	3	2a
D3L	10TPE220ML	10	105	220	10	105	10	220.0	25	2400	—	2a
	10TPE220MIL	10	105	220	10	105	10	220.0	18	2800	—	2a
	6TPE330MAL	6.3	85	330	5.0	105	10	207.9	25	2400	3	2a
	6TPE330MA9EL	6.3	85	330	5.0	105	10	207.9	9/500kHz	3900	3	2a
	6TPE330ML	6.3	105	330	6.3	105	10	207.9	25	2400	3	2a
	6TPE330MIL	6.3	105	330	6.3	105	10	207.9	18	2800	3	2a
	6TPE330MFL	6.3	105	330	6.3	105	10	207.9	15	3100	3	2a
	4TPE470ML	4.0	105	470	4.0	105	10	188.0	25	2400	3	2a
	4TPE470MIL	4.0	105	470	4.0	105	10	188.0	18	2800	3	2a
	4TPE470MFL	4.0	105	470	4.0	105	10	188.0	15	3100	3	2a
	4TPE470MCL	4.0	105	470	4.0	105	10	188.0	12	3500	3	2a
	4TPE470MAL ※2	4.0	105	470	4.0	105	10	188.0	10	4400	3	2a
D4	2R5TPE680MFL	2.5	105	680	2.5	105	10	170.0	15	3100	3	2a
	2R5TPE680MCL	2.5	105	680	2.5	105	10	170.0	12	3500	3	2a
	10TPE330M	10	105	330	10	105	10	330.0	25	3000	—	2a
	6TPE680M	6.3	105	680	6.3	105	15	428.4	25	3000	3	2a
	6TPE680MI	6.3	105	680	6.3	105	15	428.4	18	3500	3	2a
	6TPE470M	6.3	105	470	6.3	105	15	296.1	25	3000	3	2a
	6TPE470MI	6.3	105	470	6.3	105	15	296.1	18	3500	3	2a
	6TPE330MAA	6.3	85	330	5.0	105	15	207.9	10	4400	3	2a
	2R5TPE1000MF	2.5	105	1000	2.5	105	15	250.0	15	3900	3	2a
	2R5TPE1500MF	2.5	105	1500	2.5	105	15	375.0	15	3900	—	2a
	2R5TPE1500MC	2.5	105	1500	2.5	105	15	375.0	12	4400	—	2a

※1 100k to 500kHz,45°C

※2 Under development