

Surface mount type

# TPE Series

Up Grade

RoHS compliance

Low ESR (B2,C2,C3 size)

This products is the miniaturized version of TPE series.



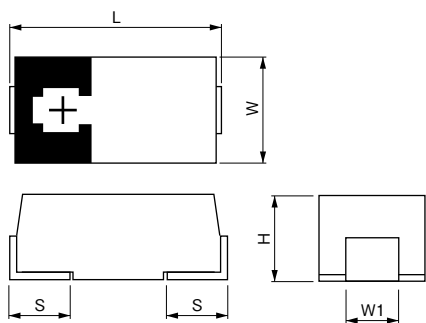
TPB  
(Standard)

TPE  
Low ESR

## Specifications

Items	Condition	Specifications					
Rated voltage (V)	—	2.0	2.5	4.0	6.3	8.0	10
Surge voltage (V)	—	2.3	2.9	4.6	7.2	9.2	12
Category temperature range (°C)	—	-55 to +105					
Capacitance tolerance (%)	120Hz/20°C	M : ±20					
Rated capacitance range (μF)	120Hz/20°C	47 to 330					
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 <sub>20°C</sub>	0.6 to 2.0			
		+105°C	Z/Z <sub>20°C</sub>	0.6 to 2.0			
Endurance	105°C, 2,000h, (B2size : 1,000h) rated voltage applied ※Rated temp, 85°C products: 85°C, 1,000h, rated voltage applied	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% (2R5TPE220MDGB(MAZB,MAPB,MAFB), 2R5TPE330MAZB, 2TPE330MIB(MFB,MAFB,MAFGB,MADGB), 2R5TPE330MFC2(CC2,9C2))				
		DF	Within+40%, -20% of the initial value (Except for the above model)				
		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, 1,000 cycles	ΔC/C	Within±5% of the initial value				
		DF	Within the initial limit				
		LC	≤ 3 times of the initial limit				

## Dimensions



(unit: mm)

Size code	L ±0.2	W ±0.2	H ±0.1※1	S ±0.2	W1 ±0.1
B2	3.5	2.8	1.9	0.8	2.2
C2	6.0	3.2	1.8	1.3	1.8
C3	6.0	3.2	2.5	1.3	1.8

※1 ±0.2:C3

## Size list

RV : Rated voltage

RV \ μF	2.0	2.5	4.0	6.3	8.0	10
47						B2
100			B2	B2	B2,C2	
120				B2		
150		B2	B2	B2,C2		C3
180						C3
220		B2	B2,C2	B2,C3		
330	B2	B2,C2				

TPE

POSCAP

POSCAP Line-up

Guidelines and precautions for use

Series system diagram

Image of case size

Products list

Explanation of part numbers

Packing specifications

Selection guide

Marking

Recommended land pattern dimension

Recommended soldering condition

Fundamental structure

Characteristics

Reliability

Technical data

TPSF

TPU

TPL·TPLF

TPF

TPG

TPE

TPB

TPC

TPD

TA

TH

TQC

Tantalum Solid Capacitors with Conductive Polymer

■ 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 (mΩmax) 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※2	6.3	85	220	5.0	105	8.0	138.6	35	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
	6TPE100MZB	6.3	105	100	6.3	105	8.0	63.0	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
	4TPE150MAUB	4.0	85	150	3.2	105	8.0	60.0	30	1500	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
	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
	2R5TPE220MIB	2.5	105	220	2.5	105	8.0	110.0	18	1800	3	3
	2R5TPE220MFGB	2.5	105	220	2.5	105	8.0	110.0	15/300kHz	1800	3	3
	2R5TPE220MDGB	2.5	105	220	2.5	105	8.0	110.0	13/300kHz	2000	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
	2R5TPE150MZB	2.5	105	150	2.5	105	8.0	37.5	35	1400	3	3
	2TPE330MIB	2.0	105	330	2.0	105	8.0	132.0	18	1800	3	3
2TPE330MFB	2.0	105	330	2.0	105	8.0	132.0	15	2000	3	3	
2TPE330MAFGB	2.0	85	330	1.8	105	8.0	132.0	15/300kHz	1800	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	
C2	8TPE100MPC2	8.0	105	100	8.0	105	8.0	80.0	25	2200	3	3
	6TPE150MPC2	6.3	105	150	6.3	105	8.0	94.5	25	2200	3	3
	6TPE150MIC2	6.3	105	150	6.3	105	8.0	94.5	18	2600	3	3
	4TPE220MIC2	4.0	105	220	4.0	105	8.0	88.0	18	2600	3	3
	4TPE220MFC2	4.0	105	220	4.0	105	8.0	88.0	15	2900	3	3
	2R5TPE330MFC2	2.5	105	330	2.5	105	8.0	82.5	15	2900	3	3
	2R5TPE330MCC2	2.5	105	330	2.5	105	8.0	82.5	12	3300	3	3
	2R5TPE330M9C2	2.5	105	330	2.5	105	8.0	82.5	9	3700	3	3
C3	10TPE180MGC	10	105	180	10	105	10.0	180.0	55	1500	—	3
	10TPE150MGC	10	105	150	10	105	10.0	150.0	55	1500	—	3
	6TPE220MPC	6.3	105	220	6.3	105	8.0	138.6	25	2400	3	3
	6TPE220MIC	6.3	105	220	6.3	105	8.0	138.6	18	2800	3	3

Please refer to page 65 for the compensation coefficient of maximum allowable ripple current.

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

T  
P  
E

**POSCAP**

POSCAP Line-up

Guidelines and precautions for use

Series system diagram

Image of case size

Products list

Explanation of part numbers

Packing specifications

Marking

Recommended land pattern dimension

Recommended soldering condition

Fundamental structure

Characteristics

Reliability

Tantalum Solid Capacitors with Conductive Polymer

TPSF

TPU

TPL-TPLF

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TA

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TQC

Surface mount type

# TPE Series

Up Grade

RoHS compliance

Low ESR (D2E, D3L, D4 size)

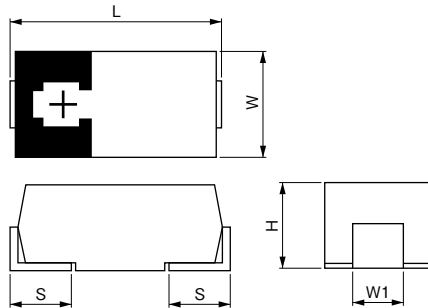
TPE series has low ESR and can aid in the miniaturization of many products.



## Specifications

Items	Condition	Specifications				
Rated voltage (V)	—	2.0	2.5	4.0	6.3	10
Surge voltage (V)	—	2.3	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 <sub>20°C</sub>	0.6 to 2.0		
		+105°C	Z/Z <sub>20°C</sub>	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	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.C.9.7), 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 *6TPE330MAP, 6TPE220MAP:85°C	ΔC/C	Within±5% of the initial value			
		DF	Within the initial limit			
		LC	≤ 3 times of the initial limit			

## Dimensions



## Size list

RV : Rated voltage

μF \ RV	2.0	2.5	4.0	6.3	10
68					D2E
100				D2E	
150				D2E	
220		D2E	D2E	D2E	D3L
330	D2E	D2E	D2E	D2E, D3L	D4
470	D2E	D2E	D3L	D4	
680		D3L	D4	D4	
1,000			D4		
1,500			D4		

(unit: mm)

Size code	L ±0.3	W ±0.2	H ±0.2*1	S ±0.2	W1 ±0.1
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

## 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 (mΩmax) 100kHz/20°C	Maximum allowable ripple current (mArms) 100kHz*1	MSL	
											Reflow temp. ≤ 260°C	Reflow temp. ≤ 250°C
D2E	10TPE68M	10	105	68	10	105	10.0	68.0	25	2400	3	2a
	6TPE330MAP	6.3	85	330	5.0	105	10.0	207.9	25	2400	3	2a
	6TPE220MAP	6.3	85	220	5.0	105	10.0	138.6	25	2400	3	2a
	6TPE220M	6.3	105	220	6.3	105	10.0	138.6	25	2400	3	2a
	6TPE220MI	6.3	105	220	6.3	105	10.0	138.6	18	2800	3	2a
	6TPE150M	6.3	105	150	6.3	105	10.0	94.5	25	2400	3	2a
	6TPE150MI	6.3	105	150	6.3	105	10.0	94.5	18	2800	3	2a
	6TPE150MF	6.3	105	150	6.3	105	10.0	94.5	15	3100	3	2a
	6TPE100M	6.3	105	100	6.3	105	10.0	63.0	25	2400	3	2a
	6TPE100MI	6.3	105	100	6.3	105	10.0	63.0	18	2800	3	2a

\*1 ±0.1:D2E

TPE

POSCAP Line-up

Guidelines and precautions for use

Series system diagram

Image of case size

Products list

Explanation of part numbers

Packing specifications

Marking

Recommended land pattern dimension

Recommended soldering condition

Fundamental structure

Characteristics

Reliability

TPSF

TPU

TPL-TPLF

TPF

TPG

TPE

TPB

TPC

TPD

TA

TH

TQC

Selection guide

Tantalum Solid Capacitors with Conductive Polymer

## ■ 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 (mΩmax) 100kHz/20°C	Maximum allowable ripple current (mA <sub>RMS</sub> ) 100kHz※1	MSL	
											Reflow temp. ≤260°C	Reflow temp. ≤250°C
D2E	4TPE330M	4.0	105	330	4.0	105	10.0	132.0	25	2400	3	2a
	4TPE330MI	4.0	105	330	4.0	105	10.0	132.0	18	2800	3	2a
	4TPE220M	4.0	105	220	4.0	105	10.0	88.0	25	2400	3	2a
	4TPE220MI	4.0	105	220	4.0	105	10.0	88.0	18	2800	3	2a
	4TPE220MF	4.0	105	220	4.0	105	10.0	88.0	15	3100	3	2a
	4TPE150M	4.0	105	150	4.0	105	10.0	60.0	25	2400	3	2a
	4TPE150MI	4.0	105	150	4.0	105	10.0	60.0	18	2800	3	2a
	2R5TPE470M	2.5	105	470	2.5	105	10.0	117.5	25	2400	3	2a
	2R5TPE470MI	2.5	105	470	2.5	105	10.0	117.5	18	2800	3	2a
	2R5TPE470MF	2.5	105	470	2.5	105	10.0	117.5	15	3100	3	2a
	2R5TPE470MC	2.5	105	470	2.5	105	10.0	117.5	12	3500	3	2a
	2R5TPE470M9	2.5	105	470	2.5	105	10.0	117.5	9	3900	3	2a
	2R5TPE470M7	2.5	105	470	2.5	105	10.0	117.5	7	4400	3	2a
	2R5TPE330M	2.5	105	330	2.5	105	10.0	82.5	25	2400	3	2a
	2R5TPE330MI	2.5	105	330	2.5	105	10.0	82.5	18	2800	3	2a
	2R5TPE330MF	2.5	105	330	2.5	105	10.0	82.5	15	3100	3	2a
	2R5TPE330MC	2.5	105	330	2.5	105	10.0	82.5	12	3500	3	2a
	2R5TPE330M9	2.5	105	330	2.5	105	10.0	82.5	9	3900	3	2a
	2R5TPE330M7	2.5	105	330	2.5	105	10.0	82.5	7	4400	3	2a
	2R5TPE220M	2.5	105	220	2.5	105	10.0	55.0	25	2400	3	2a
	2R5TPE220MI	2.5	105	220	2.5	105	10.0	55.0	18	2800	3	2a
	2R5TPE220MF	2.5	105	220	2.5	105	10.0	55.0	15	3100	3	2a
	2R5TPE220MC	2.5	105	220	2.5	105	10.0	55.0	12	3500	3	2a
	2R5TPE220M9	2.5	105	220	2.5	105	10.0	55.0	9	3900	3	2a
	2R5TPE220M7	2.5	105	220	2.5	105	10.0	55.0	7	4400	3	2a
	2TPE470M9	2.0	105	470	2.0	105	10.0	188.0	9	3900	—	3
	2TPE470M7	2.0	105	470	2.0	105	10.0	188.0	7	4400	—	3
	2TPE470M6	2.0	105	470	2.0	105	10.0	188.0	6	4700	—	3
2TPE330M9	2.0	105	330	2.0	105	10.0	132.0	9	3900	—	3	
2TPE330M7	2.0	105	330	2.0	105	10.0	132.0	7	4400	—	3	
2TPE330M6	2.0	105	330	2.0	105	10.0	132.0	6	4700	—	3	
D3L	10TPE220ML	10	105	220	10	105	10.0	220.0	25	2400	—	2a
	10TPE220ML※2	10	105	220	10	105	10.0	220.0	18	2800	—	2a
	6TPE330ML	6.3	105	330	6.3	105	10.0	207.9	25	2400	3	2a
	6TPE330MIL	6.3	105	330	6.3	105	10.0	207.9	18	2800	3	2a
	6TPE330MFL	6.3	105	330	6.3	105	10.0	207.9	15	3100	3	2a
	4TPE470ML	4.0	105	470	4.0	105	10.0	188.0	25	2400	3	2a
	4TPE470MIL	4.0	105	470	4.0	105	10.0	188.0	18	2800	3	2a
	4TPE470MFL	4.0	105	470	4.0	105	10.0	188.0	15	3100	3	2a
	4TPE470MCL	4.0	105	470	4.0	105	10.0	188.0	12	3500	3	2a
	2R5TPE680ML	2.5	105	680	2.5	105	10.0	170.0	25	2400	3	2a
	2R5TPE680MIL	2.5	105	680	2.5	105	10.0	170.0	18	2800	3	2a
	2R5TPE680MFL	2.5	105	680	2.5	105	10.0	170.0	15	3100	3	2a
2R5TPE680MCL	2.5	105	680	2.5	105	10.0	170.0	12	3500	3	2a	
D4	10TPE330M	10	105	330	10	105	10.0	330.0	25	3000	—	2a
	6TPE680M	6.3	105	680	6.3	105	15.0	428.4	25	3000	3	2a
	6TPE680MI	6.3	105	680	6.3	105	15.0	428.4	18	3500	3	2a
	6TPE470M	6.3	105	470	6.3	105	15.0	296.1	25	3000	3	2a
	6TPE470MI	6.3	105	470	6.3	105	15.0	296.1	18	3500	3	2a
	4TPE680M	4.0	105	680	4.0	105	15.0	272.0	25	3000	3	2a
	4TPE680MI	4.0	105	680	4.0	105	15.0	272.0	18	3500	3	2a
	4TPE680MF	4.0	105	680	4.0	105	15.0	272.0	15	3900	3	2a
	2R5TPE1000M	2.5	105	1000	2.5	105	15.0	250.0	25	3000	3	2a
	2R5TPE1000MI	2.5	105	1000	2.5	105	15.0	250.0	18	3500	3	2a
	2R5TPE1000MF	2.5	105	1000	2.5	105	15.0	250.0	15	3900	3	2a
	2R5TPE1500MF	2.5	105	1500	2.5	105	15.0	375.0	15	3900	—	2a
	2R5TPE1500MC	2.5	105	1500	2.5	105	15.0	375.0	12	4400	—	2a

Please refer to page 65 for the compensation coefficient of maximum allowable ripple current.

※1 100k to 500kHz, 45°C

※2 Under development

TPE

POSCAP

POSCAP  
Line-upGuidelines and  
precautions  
for use

Series system  
diagram

Image of  
case size

Products list

Explanation of  
part numbers

Packing  
specifications

Marking

Recommended  
land pattern  
dimension

Recommended  
soldering  
condition

Fundamental  
structure

Characteristics

Reliability

Tantalum Solid Capacitors with Conductive Polymer

TPSF

TPU

TPL-TPLF

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TPG

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