

# TPE Series Low ESR Products (D2E, D3L, D4 Size)

## Feature

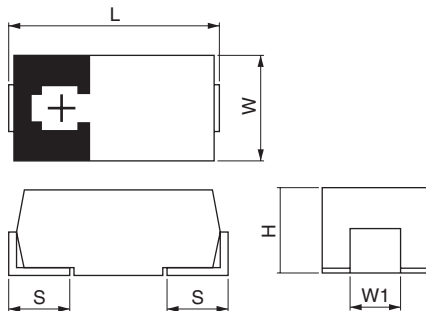
TPE series has low ESR and can aid in the miniaturization of many products.



## Specifications

Items	Condition	Characteristics		
Operating Temperature range	—	-55 to +105 (°C)		
Rated capacitance range	120Hz/20°C	68 to 1500 (μF)		
Capacitance tolerance	120Hz/20°C	M:±20%		
Rated voltage	—	2.5 to 10 (V.DC)		
Dissipation Factor (D.F.)	120Hz/20°C	≤ 10.0 (%) ★D4size:≤ 15.0 (%)		
Leakage current	Rated voltage applied, after 5 minutes	Please see the attached characteristics list		
Equivalent series resistance (E.S.R. mΩmax.)	100kHz/20°C	Please see the attached characteristics list		
Temperature characteristics of Impedance ratio	100kHz/+20°C	-55°C	Z/Z <sub>20°C</sub>	1.0 to 2.0
		+105°C	Z/Z <sub>20°C</sub>	0.6 to 1.0
Endurance	105°C,2000h, rated voltage applied ★Rated temp. 85°C products: 85°C, 1000h, rated voltage applied	ΔC/C	Within±20% of the initial value	
		D.F.	≤ 1.5 times the initial limit	
		L.C.	≤ The initial limit	
Damp heat (Steady state)	60°C,90 to 95%RH,500h, No voltage applied	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)) Within+40%, -20% of the initial value (Except for the above model)	
		D.F.	≤ 1.5 times the initial limit	
		L.C.	≤ 3 times the initial limit	
Surge	105°C,1000 cycles, 1kΩ discharge resistance, surge voltage applied ★6TPE330MAP,16TPE220MAP:85°C	ΔC/C	Within±5% of the initial value	
		D.F.	≤ The initial limit	
		L.C.	≤ 3 times the initial limit	

## Dimensions



(unit: mm)

Size code	L (±0.3)	W (±0.2)	H*1 (±0.2)	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

\*1 ±0.1:D2E

## Size List

μF	RV (sV)	2.5 (3.2)	4.0 (5.0)	6.3 (8.0)	10.0 (13.0)
68					D2E
100				D2E	
150			D2E	D2E	
220		D2E	D2E	D2E	D3L
330		D2E	D2E	D2E,D3L	D4
470		D2E	D3L	D4	
680		D3L	D4	D4	
1000		D4			

### Characteristics List

Size code	SANYO Part number	Rated Voltage (V)	Rated Temperature (°C)	Rated Capacitance (μF)	Category Voltage (V)	Category Temperature (°C)	D.F. (%max.)	L.C. (μA) max./5min.	E.S.R. (mΩmax.) 100kHz/20°C	Maximum allowable ripple current (mA rms) 100kHz*1	MSL		
											Reflow Temp. ≤ 260°C	Reflow Temp. ≤ 250°C	
D2E	10TPE68M	10.0	105	68	10.0	105	10.0	68.0	25	2400	3	2a	
	6TPE330MAP	6.3	85	330	5.0	105	10.0	207.9	25	2400			
	6TPE220MAP	6.3	85	220	5.0	105	10.0	138.6	25	2400			
	6TPE220M	6.3	105	220	6.3	105	10.0	138.6	25	2400			
	6TPE220MI								18	2800			
	6TPE150M	6.3	105	150	6.3	105	10.0	94.5	25	2400			
	6TPE150MI								18	2800			
	6TPE100M	6.3	105	100	6.3	105	10.0	63.0	25	2400			
	6TPE100MI								18	2800			
	4TPE330M	4.0	105	330	4.0	105	10.0	132.0	25	2400			
	4TPE330MI								18	2800			
	4TPE220M	4.0	105	220	4.0	105	10.0	88.0	25	2400			
	4TPE220MI								18	2800			
	4TPE220MF								15	3100			
	4TPE150M	4.0	105	150	4.0	105	10.0	60.0	25	2400			
	4TPE150MI								18	2800			
	2R5TPE470M	2.5	105	470	2.5	105	10.0	117.5	25	2400			
	2R5TPE470MI								18	2800			
	2R5TPE470MF								15	3100			
	2R5TPE470MC								12	3500			
	2R5TPE470M9								9	3900			
	2R5TPE470M7	2.5	105	470	2.5	105	10.0	235.0	7	4400			(*2)
	2R5TPE330M	2.5	105	330	2.5	105	10.0	82.5	25	2400			
	2R5TPE330MI								18	2800			
	2R5TPE330MF								15	3100			
	2R5TPE330MC								12	3500			
	2R5TPE330M9								9	3900			
	2R5TPE330M7	2.5	105	330	2.5	105	10.0	165.0	7	4400			(*2)
2R5TPE220M	2.5	105	220	2.5	105	10.0	55.0	25	2400				
2R5TPE220MI								18	2800				
2R5TPE220MF								15	3100				
2R5TPE220MC								12	3500				
2R5TPE220M9								9	3900				
2R5TPE220M7	2.5	105	220	2.5	105	10.0	110.0	7	4400	(*2)			
D3L	10TPE220ML	10.0	105	220	10.0	105	10.0	220.0	25	2400	3		
	6TPE330ML	6.3	105	330	6.3	105	10.0	207.9	25	2400			
	6TPE330MIL								18	2800			
	4TPE470ML	4.0	105	470	4.0	105	10.0	188.0	25	2400			
	4TPE470MIL								18	2800			
	4TPE470MFL								15	3100			
	4TPE470MCL	2.5	105	680	2.5	105	10.0	170.0	12	3500			
	2R5TPE680ML								25	2400			
	2R5TPE680MIL								18	2800			
	2R5TPE680MFL								15	3100			
2R5TPE680MCL	12	3500											
D4	10TPE330M	10.0	105	330	10.0	105	10.0	330.0	25	3000	3		
	6TPE680M	6.3	105	680	6.3	105	15.0	428.4	25	3000			
	6TPE680MI								18	3500			
	6TPE470M	6.3	105	470	6.3	105	15.0	296.1	25	3000			
	6TPE470MI								18	3500			
	4TPE680M	4.0	105	680	4.0	105	15.0	272.0	25	3000			
	4TPE680MI								18	3500			
	4TPE680MF								15	3900			
	2R5TPE1000M	2.5	105	1000	2.5	105	15.0	250.0	25	3000			
	2R5TPE1000MI								18	3500			
	2R5TPE1000MF								15	3900			
	2R5TPE1000MFL								15	3900			
2R5TPE1500M	2.5	105	1500	2.5	105	15.0	375.0	15	3900				
2R5TPE1500MC								12	4400				

\*1 100k to 500kHz, 45°C \*2 Under evaluation



## Characteristics List

Size code	SANYO Part number	Rated Voltage (V)	Rated Temperature (°C)	Rated Capacitance (μF)	Category Voltage (V)	Category Temperature (°C)	D.F. (%max.)	L.C. (μA) max./5min.	E.S.R. (mΩmax.) 100kHz/20°C	Maximum allowable ripple current (mA) 100kHz*1	MSL	
											Reflow Temp ≤ 260°C	Reflow Temp ≤ 250°C
B2	10TPE47MAZB	10.0	85	47	8.0	105	8.0	47.0	35	1400	3	3
	6TPE150MAZB	6.3	85	150	5.0	105	8.0	94.5	35	1400		
	6TPE120MAZB	6.3	85	120	5.0	105	8.0	75.6	35	1400		
	6TPE100MZB*2	6.3	105	100	6.3	105	8.0	63.0	35	1400		
	6PTE100MPB*2								25	1600		
	6TPE100MAZB	6.3	85	100	5.0	105	8.0	63.0	35	1400		
	6PTE100MAPB*2	6.3	85	100	5.0	105	8.0	63.0	25	1600		
	4TPE220MAZB	4.0	85	220	3.2	105	8.0	88.0	35	1400		
	4TPE150MAZB	4.0	85	150	3.2	105	8.0	60.0	35	1400		
	4TPE150MAUB								30	1500		
	4TPE100MZB	4.0	105	100	4.0	105	8.0	40.0	35	1400		
	2R5TPE330MAZB	2.5	85	330	2.0	105	8.0	82.5	35	1400		
	2R5TPE220MZB	2.5	105	220	2.5	105	8.0	55.0	35	1400		
	2R5TPE220MPB								25	1600		
	2R5TPE220MLB								21	1700		
	2R5TPE220MIB	2.5	105	220	2.5	105	8.0	110.0	18	1800		
	2R5TPE220MFB								15/300k	1800		
	2R5TPE220MAFB*2	2.5	85	220	2.0	105	8.0	110.0	15	2000		
	2R5TPE220MAZB	2.5	85	220	2.0	105	8.0	55.0	35	1400		
	2R5TPE220MAPB								25	1600		
2R5TPE150MZB	2.5	105	150	2.5	105	8.0	37.5	35	1400			
2TPE330MIB	2.0	105	330	2.0	105	8.0	132.0	18	1800			
2TPE330MAFGB	2.0	85	330	1.6	105	8.0	132.0	15/300k	1800			
2TPE330MAFB*2								15	2000			
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		
	6TPE150MIC2								18	2600		
	4TPE220MIC2	4.0	105	220	4.0	105	8.0	88.0	18	2600		
	4TPE220MFC2								15	2900		
	2R5TPE330MFC2	2.5	105	330	2.5	105	8.0	82.5	15	2900		
	2R5TPE330MCC2								12	3300		
	2R5TPE330M9C2								9	3700		
C3	10TPE150MGC	10.0	105	150	10.0	105	10.0	150.0	55	1500	(*3)	3
	6TPE220MPC	6.3	105	220	6.3	105	8.0	138.6	25	2400		
	6TPE150MPC	6.3	105	150	6.3	105	8.0	94.5	25	2400		
	4TPE220MPC	4.0	105	220	4.0	105	8.0	88.0	25	2400		
	4TPE220MIC								18	2800		
	2R5TPE330MPC	2.5	105	330	2.5	105	8.0	82.5	25	2400		
	2R5TPE330MIC								18	2800		
	2R5TPE330MFC								15	3100		

\*1 100k to 500kHz, 45°C \*2 Under development \*3 Under evaluation