

Conductive polymer type / Surface mount type

RoHS compliance

# TPL·TPLF Series



Low ESR · Low ESL  
Face down terminal type

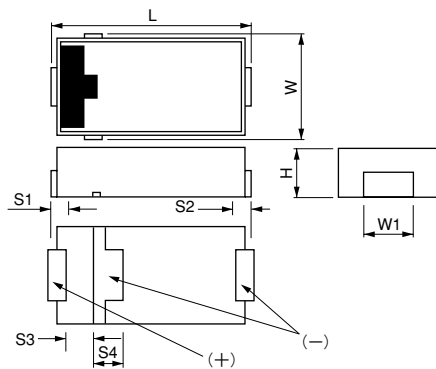
TPL series has a low ESL and low ESR advantage using an unique face down terminal structure.



## Specifications

Items	Condition	Specifications			
Rated voltage (V)	—	2.0	2.5	4.0	6.3
Surge voltage (V)	—	2.6	3.2	5.0	8.0
Category temperature range (°C)	—	-55 to +105			
Capacitance tolerance (%)	120Hz/20°C	M : ±20			
Rated capacitance range (μF)	120Hz/20°C	220 to 560			
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	ΔC/C	Within ±20% of the initial value		
		DF	≤ 1.5 times of the initial limit		
		LC	≤ 1.5 times of 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		
		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	ΔC/C	Within ±5% of the initial value		
		DF	≤ 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
100				D12T
150			D12T	D15T
220	D12T, D2T	D15T, D2T	D15T	D15T
330	D2T	D15T, D2T		
470		D2T		
560	D2T			

(unit: mm)

Size code	L ±0.3	W ±0.2	H ±0.1	S1/S2 ±0.2	S3 ±0.1	S4 ±0.2	W1 ±0.1
D12T	7.3	4.3	1.1	1.1	1.1	2.3	2.8
D15T	7.3	4.3	1.4	1.1	1.1	2.3	2.8
D2T	7.3	4.3	1.8	1.1	1.1	2.3	2.8

**■ TPL·TPLF series characteristics list**
**(TPL)**

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
D12T	6TPL100MD※2	6.3	105	100	6.3	105	10.0	126.0	25	2100	3	2a
	4TPL150MD※2	4.0	105	150	4.0	105	10.0	120.0	25	2100	3	2a
	2TPL220MD※2	2.0	105	220	2.0	105	10.0	88.0	25	2100	3	2a
D15T	6TPL150MU	6.3	105	150	6.3	105	10.0	189.0	25	2100	3	2a
	6TPL220MU※2	6.3	105	220	6.3	105	10.0	277.2	25	2100	3	2a
	4TPL220MKU	4.0	105	220	4.0	105	10.0	176.0	20	2400	3	2a
	2R5TPL330MFU	2.5	105	330	2.5	105	10.0	165.0	15	2800	3	2a
	2R5TPL220MIU	2.5	105	220	2.5	105	10.0	110.0	18	2500	3	2a
D2T	2R5TPL470MC	2.5	105	470	2.5	105	10.0	117.5	12	3400	3	2a
	2R5TPL470M9	2.5	105	470	2.5	105	10.0	117.5	9	3900	3	2a
	2R5TPL470M8	2.5	105	470	2.5	105	10.0	235.0	8	4100	3	2a
	2R5TPL470M7※2	2.5	105	470	2.5	105	10.0	235.0	7	4400	3	2a
	2R5TPL330MC	2.5	105	330	2.5	105	10.0	82.5	12	3400	3	2a
	2R5TPL330M9	2.5	105	330	2.5	105	10.0	82.5	9	3900	3	2a
	2R5TPL330M8	2.5	105	330	2.5	105	10.0	165.0	8	4100	3	2a
	2R5TPL330M7※2	2.5	105	330	2.5	105	10.0	165.0	7	4400	3	2a
	2TPL330M6E※2	2.0	105	330	2.0	105	10.0	132.0	6/500kHz	4100	—	2a

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

**(TPLF)**

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
D2T	2TPLF560M6※2	2.0	105	560	2.0	105	10.0	224.0	6	4700	3	2a
	2TPLF560M5※2	2.0	105	560	2.0	105	10.0	224.0	5	5200	3	2a
	2TPLF470M6	2.0	105	470	2.0	105	10.0	188.0	6	4700	3	2a
	2TPLF470M5※2	2.0	105	470	2.0	105	10.0	188.0	5	5200	3	2a
	2TPLF330M7	2.0	105	330	2.0	105	10.0	132.0	7	4400	3	2a
	2TPLF330M6	2.0	105	330	2.0	105	10.0	132.0	6	4700	3	2a
	2TPLF330M5	2.0	105	330	2.0	105	10.0	132.0	5	5200	3	2a
	2TPLF220M7	2.0	105	220	2.0	105	10.0	88.0	7	4400	3	2a
	2TPLF220M6	2.0	105	220	2.0	105	10.0	88.0	6	4700	3	2a

Please refer to page 71 for the compensation coefficient of maximum allowable ripple current.

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