

TPF series achieves low ESR and high capacitance in the standard form.



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			150 to 1000				
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	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(2TPF220M6,2TPF330M6,ETPF1000M6H(5H))				
				Within+40%, −20% of the initial value (Except for the above model)				
		DF		≤ 1.5 times of the initial limit				
Surge	105°C, 1,000 cycles, 1kΩ discharge resistance, surge voltage applied	LC		≤ 3 times of the initial limit				
		ΔC/C		Within±5% of the initial value				
		DF		Within the initial limit				

POSCAP

Line-up

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Series system diagram

Image of case size

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Recommended soldering condition

Fundamental structure

Characteristics

Reliability

TPU

TPH

TPG

TPSF

TPC

TPE

TPB

TPL·TPLF

TPF

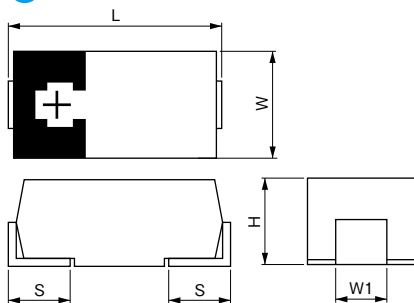
TA

TV

TH

TQC

Dimensions



(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

*1 ±0.1:D2E

Size list

RV : Rated voltage

RV μF	2.0	2.5	4.0	6.3	10.0
150					D3L
220	D2E			D3L	
330	D2E	D3L	D3L	D3L	
470		D4,D3L	D3L	D4	
680		D4,D3L	D4		
1,000		D4			

 TPF 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
D2E	2TPF330M6	2.0	105	330	2.0	105	10.0	132.0	6	4400	—	2a
	2TPF220M6	2.0	105	220	2.0	105	10.0	88.0	6	4400	—	2a
D3L	10TPF150ML	10	105	150	10	105	10.0	150.0	15	3600	—	2a
	6TPF330M9L	6.3	105	330	6.3	105	10.0	207.9	9	3900	3	2a
	6TPF220ML	6.3	105	220	6.3	105	10.0	138.6	12	4000	3	2a
	6TPF220M9L*2	6.3	105	220	6.3	105	10.0	138.6	9	3900	3	2a
	6TPF220M5L*2	6.3	105	220	6.3	105	10.0	138.6	5	4400	3	2a
	4TPF470ML	4.0	105	470	4.0	105	10.0	188.0	10	4400	3	2a
	4TPF330ML	4.0	105	330	4.0	105	10.0	132.0	12	4000	3	2a
	2R5TPF680ML	2.5	105	680	2.5	105	10.0	170.0	10	4400	3	2a
	2R5TPF680M7L	2.5	105	680	2.5	105	10.0	170.0	7	4400	3	2a
	2R5TPF680M6L	2.5	105	680	2.5	105	10.0	170.0	6	4400	3	2a
	2R5TPF470ML	2.5	105	470	2.5	105	10.0	117.5	10	4400	3	2a
	2R5TPF470M7L	2.5	105	470	2.5	105	10.0	117.5	7	4400	3	2a
	2R5TPF470M6L	2.5	105	470	2.5	105	10.0	117.5	6	4400	3	2a
	2R5TPF330M7L	2.5	105	330	2.5	105	10.0	82.5	7	4400	3	2a
	6TPF470MAH	6.3	105	470	6.3	105	10.0	296.1	10	4400	3	2a
	4TPF680MAH	4.0	105	680	4.0	105	10.0	272.0	10	4400	3	2a
D4	ETPF1000M6H	2.5	105	1000	2.5	105	10.0	250.0	6	5600	3	2a
	ETPF1000M5H	2.5	105	1000	2.5	105	10.0	250.0	5	6100	3	2a
	ETPF680M5H*2	2.5	105	680	2.5	105	10.0	170.0	5	6100	3	2a
	ETPF470M5H*2	2.5	105	470	2.5	105	10.0	117.5	5	6100	3	2a

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

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

POSCAPPOSCAP
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for use

Selection guide

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dimension
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condition
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structure
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Surface mount type

TPU
TPH
TPG
TPSF
TPC
TPE
TPB
TPL·TPLF**TPF**TA
TV
TH
TQC

* Red letters : New models