

Selection guide

Technical dat

Surface mount type

Radial lead type

Catalog Deletion and EOL series

POSCAP

POSCAP
Line-up

Guidelines and precautions

Series system diagram
Image of case size
Products list
Explanation of part numbers
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Characteristics	hni
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Catalog Deletio	n and

Surface mount type

TPE Update
Series

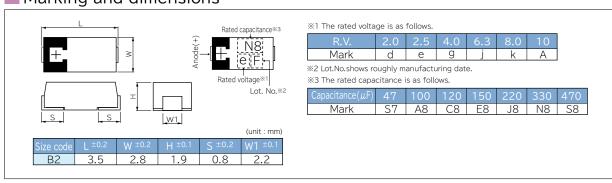
RoHS compliance, Halogen free Small size: L3.5xW2.8xH1.9mm

Low ESR: $9m\Omega$ *at 300kHz

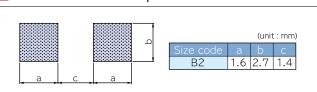
Specifications

Items	Condition	1		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 (℃)	_			−55 to	+105						
Capacitance tolerance (%)	120Hz/20℃					M::	±20				
Rated capacitance range (μF)	120Hz/20℃			47 to	470						
Dissipation Factor (DF)	120Hz/20℃	Ple	ease see	the attach	ed charac	teristics li	st				
Leakage current	Rated voltage applied, af	Ple	ease see	the attach	ed charac	teristics li	st				
Equivalent series resistance (ESR)	100kHz/20%	Ple	ease see	the attach	ed charac	teristics li	st				
Characteristics of impedance	100kHz/+20℃	-55℃ Z/Z	Z _{20℃}	0.6 to 2.0							
ratio at high temp. and low temp.	100KHZ/120C	+105℃ Z/Z	Z 20℃	0.6 to 2.0							
	105°C, 1,000h rated voltage applied	∆C/C		Within±20% of the initial value							
Endurance	*Rated temp. 85°C products: 85°C, 1,000h, rated voltage applied	DF		≤ 1.5 times of the initial limit							
	os e, 1,00011, facea voltage applied	LC		Within the initial limit							
		ΔC/C		Within+50%, -20% (2R5TPE220MAFB(MAZB,MAPB), 2R5TPE330MAZB,2TPE330MFB(MAFB,MADGB) ETPE330MA9GB(MAFB),2TPE470MAJGB)							
Damp heat (Steady State)	60°C, 90 to 95%RH, 500h, No-applied voltage				Within+40%, -20% of the initial value (Except for the above model)						
		DF		≤ 1.5 times of the initial limit							
		LC		≤ 3 times of the initial limit							
	105°C 1 000 cycles 1k0 discharge	∆C/C		Within±5% of the initial value							
Surge	105°C, 1,000 cycles, 1kΩ discharge resistance, surge voltage applied *Rated temp 85°C products:85°C	DF		Within the initial limit							
	mkated temp 85 C products:85 C	LC		≤ 3 times of the initial limit							

Marking and dimensions



Recommended land pattern dimension of PWB



■ TPE series characteristics list

Size		Rated	Rated	Rated	Category	Category	DF	LC	ESR	Maximum allowable	M	
code	Part number	voltage (V)	temperature (°C)	capacitance (μF)	voltage (V)	temperature (℃)	(% max)	(μA) max/5min.	(mΩmax) 100kHz/20℃	ripple current (mArms) 100kHz ^{*1}	Reflow temp. ≤ 260°C	Reflow temp. ≤ 250°C
	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
B2	2R5TPE330MAZB	2.5	85	330	2.0	105	8.0	82.5	35	1400	3	3
02	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℃ %2 Under development

OS-CON
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Guidelines and precautions

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Series system diagram
Image of case size
Products list
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Recommended soldering condition
Fundamental structure
Characteristics

TPU
TPH
TPG
TPSF
TPE
TPE
TPC
TPC
TA

Reliability

Catalog Deletion and EOL models

TV

OS-CON

Surface mount type

POSCAP

Series system diagram Products list

Reliability

TPU TPH TPG TPSF Surface mount type TPB TPF TA TV TH Catalog Deletion and EOL models

Surface mount type



RoHS compliance, Halogen free

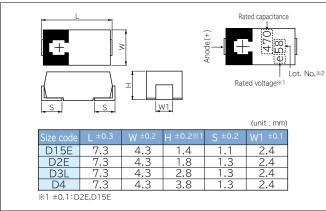
Low profile: 1.5mm and Large capacitance: $6.3V470\,\mu\text{F}$ (D15E)

Low ESR: $7m\Omega(D2E)$

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 tc	+105			
Capacitance tolerance (%)	120Hz/20°C				M::	±20			
Rated capacitance range (µF)	120Hz/20°C	2			68 to	1,500			
Dissipation Factor (DF)	120Hz/20°C			Please	see the attach	ed characteris	tics list		
Leakage current	Rated voltage applied, at	Please	see the attach	ed characteris	tics list				
Equivalent series resistance (ESR)	100kHz/20°	Please	see the attach	ed characteris	tics list				
Characteristics of impedance	100kHz/+20℃	-55℃	Z/Z20℃	0.6 to 2.0					
ratio at high temp. and low temp.	1001(12) 120 C	+105℃	Z/Z20℃	0.6 to 2.0					
	105°C, 2,000h,	∆C/C		Within±20% of the initial value					
Endurance	rated voltage applied *Rated temp, 85°C products: 85°C, 1,000h, rated voltage applied 6TPE330MAP,6TPE470MAZU:85°C,2,000h	DF		≤ 1.5 times of the initial limit					
	6TPE330MAP,6TPE470MAZU:85°C,2,000h	LC	-	Within the initial limit					
		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)〉					
Damp heat (Steady State)	60°C, 90 to 95%RH, 500h, No-applied voltage			Within+40%, -20% of the initial value (Except for the above model)					
		DF		≤ 1.5 times of the initial limit					
		LC	2						
	105°C, 1,000 cycles,	ΔC	/C	Within±5% of the initial value					
Surge	105℃, 1,000 cycles, 1kΩ discharge resistance, surge voltage applied *Rated temp. 85℃ products:85℃	DI	F	Within the initial limit					
	*Rated temp. 85℃ products:85℃	LC	2		\leq 3 times of t	he initial limit			

Marking and dimensions

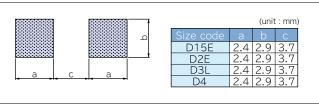


%1 The rated voltage is as follows.

R.V.	2.5	4.0	6.3	10
Mark	е	g	j	Α

※2 Lot.No.shows roughly manufacturing date.

Recommended land pattern dimension of PWB



Size list

RV:Rated voltage

				_
RV μF	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			

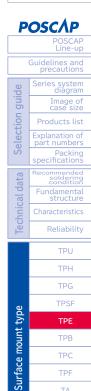
■ TPE series characteristics list

Cima		Rated	Rated	Rated	Category	Category	DF	LC	ESR	Maximum allowable	М	SL
Size	Part number	voltage	temperature			temperature	(% max)	(µA)	$(m\Omega max)$	ripple current (mArms)	Reflow temp.	Reflow temp.
		(V)	(℃)	(μF)	(V)	(℃)		max/5min.	100kHz/20℃	100kHz*1	temp. ≤ 260°C	temp. ≤ 250°C
D15E	6TPE470MAZU	6.3	85	470	5.0	105	10	296.1	35	1700	3	2a
	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
D2E	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
	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
D3I	4TPE470ML	4.0	105	470	4.0	105	10	188.0	25	2400	3	2a
DJL	4TPE470MIL	4.0	105	470	4.0	105	10	188.0	18	2800	3	2a 2a
	4TPE470MFL	4.0	105	470	4.0	105	10	188.0	15	3100	3	2a 2a
	4TPE470MCL	4.0	105	470	4.0	105	10	188.0	12	3500	3	2a 2a
	4TPE470MCL	4.0	105	470	4.0	105	10	188.0	10	4400	3	
	2R5TPE680MFL	2.5	105	680	2.5	105	10	170.0	15	3100	3	2a
											3	2a
	2R5TPE680MCL	2.5	105	680	2.5	105	10	170.0	12	3500	<u>3</u>	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
D4	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℃



atalog Deletion and



TPF
TA
TV
TH