



# METAL CAP TYPE MULTILAYER CERAMIC CAPACITORS

## THP Series / TMP Series (High Reliability)



### ◆FEATURES

1. Small mounting area.
2. Small in size and large capacitance. (maximum 200 $\mu$ F)
3. High rated ripple current.
4. Excellent temperature cycle durability and most suitable for aluminum substrate.
5. Y5U temperature characteristics.
6. Excellent high frequency characteristics.
7. 200V<sub>dc</sub> items are available.
8. For reflow soldering use.

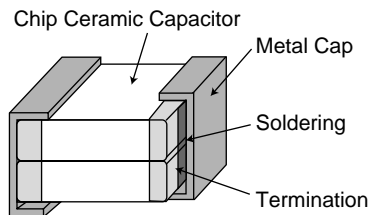
### ◆APPLICATIONS

1. Smoothing circuit of switching mode AC-DC or DC-DC converter.
2. On-board power supply.
3. Noise suppressor for various kinds of equipments.

### ◆CUSTOM MADE PRODUCTS

We can offer custom made one element metal cap type capacitors for request of customers. Please contact us if you have questions for details.

### ◆CONSTRUCTION



### ◆RATINGS

1. Category Temperature Range	-55~+125°C
2. Rated Voltage Range	16, 25, 50, 100, 200V <sub>dc</sub>
3. Rated Capacitance Range	0.45 to 200 $\mu$ F
4. Rated Capacitance Tolerance	M( $\pm$ 20%), Z( $\pm$ 80%)
5. Temperature Characteristics	E(JIS) $\approx$ Y5U(EIA)
6. Rated Ripple Current	See No.5 on the following table

### ◆SPECIFICATIONS

No.	Items	Specification	Test Condition								
1	Withstand Voltage	No abnormality.	250% of rated voltage shall be applied for 5 seconds.								
2	Insulation Resistance	1000/C <sub>R</sub> (M $\Omega$ ) or 10000(M $\Omega$ ) whichever is less.	Rated voltage shall be applied for 60 $\pm$ 5 seconds at temperature 20 $\pm$ 2°C.								
3	Rated Capacitance	Within specified tolerance.	Temperature : 20 $\pm$ 2°C Frequency : 1 $\pm$ 0.1kHz ( $\geq$ 100 $\mu$ F, 120Hz) Voltage : 1 $\pm$ 0.2V <sub>rms</sub>								
4	Dissipation Factor	5.0% maximum	Temperature : 20 $\pm$ 2°C Frequency : 1 $\pm$ 0.1kHz ( $\geq$ 100 $\mu$ F, 120Hz) Voltage : 1 $\pm$ 0.2V <sub>rms</sub>								
5	Rated Ripple Current	<table border="1"> <tr> <td>Size</td> <td>43</td> <td>55</td> <td>76</td> </tr> <tr> <td>Arms</td> <td>1.5</td> <td>3.0</td> <td>4.0</td> </tr> </table>	Size	43	55	76	Arms	1.5	3.0	4.0	10kHz~1MHz (sine curve) Ripple voltage V <sub>p</sub> shall be less than the rated voltage.
Size	43	55	76								
Arms	1.5	3.0	4.0								

## THP Series / TMP Series

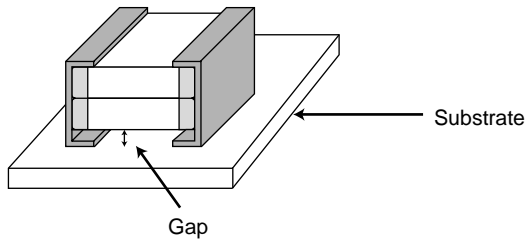
### ◆SPECIFICATIONS

No.	Items	Specification	Test Condition															
6	Temperature Cycle	Appearance : No visible damage. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification. Withstand voltage : No abnormality.	<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>(min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. Category temperature <math>\pm 3</math></td> <td>30 <math>\pm</math> 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>3 max.</td> </tr> <tr> <td>3</td> <td>Max. Category temperature <math>\pm 2</math></td> <td>30 <math>\pm</math> 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>3 max.</td> </tr> </tbody> </table> <p>&lt;Cycle&gt; THP series : 100 cycles TMP series : 500 cycles</p>	Step	Temperature (°C)	(min.)	1	Min. Category temperature $\pm 3$	30 $\pm$ 3	2	Room temperature	3 max.	3	Max. Category temperature $\pm 2$	30 $\pm$ 3	4	Room temperature	3 max.
Step	Temperature (°C)	(min.)																
1	Min. Category temperature $\pm 3$	30 $\pm$ 3																
2	Room temperature	3 max.																
3	Max. Category temperature $\pm 2$	30 $\pm$ 3																
4	Room temperature	3 max.																
7	Humidity Load Life	Appearance : No abnormality. $\Delta C/C : \pm 20\%$ D.F. : 7% max. I.R. : 50/ $C_R$ (M $\Omega$ ) or 1000(M $\Omega$ ) whichever is less. Withstand voltage : No abnormality.	Temperature : 40 $\pm$ 2°C Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500 $\pm$ $_{0}^{24}$ hours															
8	Endurance	Appearance : No abnormality. $\Delta C/C : \pm 20\%$ D.F. : 7% max. I.R. : 100/ $C_R$ (M $\Omega$ ) or 1000(M $\Omega$ ) whichever is less. Withstand voltage : No abnormality.	<table border="1"> <tbody> <tr> <td>Temperature : 85 <math>\pm</math> 2°C Voltage : 200% of rated voltage. Time : 1000 <math>\pm</math> <math>_{0}^{48}</math> hours</td> </tr> <tr> <td>Temperature : 125 <math>\pm</math> 3°C Voltage : Rated voltage Time : 1000 <math>\pm</math> <math>_{0}^{48}</math> hours</td> </tr> </tbody> </table>	Temperature : 85 $\pm$ 2°C Voltage : 200% of rated voltage. Time : 1000 $\pm$ $_{0}^{48}$ hours	Temperature : 125 $\pm$ 3°C Voltage : Rated voltage Time : 1000 $\pm$ $_{0}^{48}$ hours													
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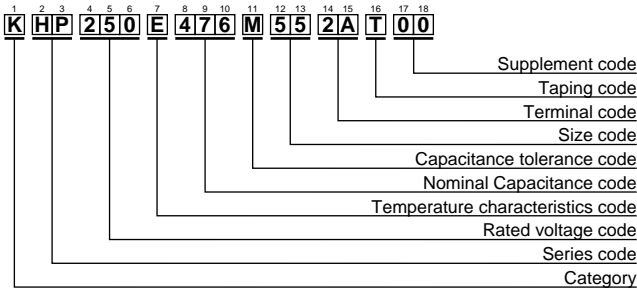
\* $C_R$  : Rated Capacitance( $\mu F$ )

### ◆Note of mountig for THP series.

1. The face of wider gap between a capacitor and a substrate shall be the mounting face.
2. To prevent degredation of heat cycling capability, if need to be careful about amount of solder that would not go into the inner side of terminations.



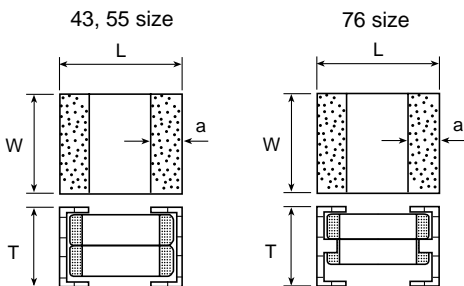
◆PART NUMBERING SYSTEM



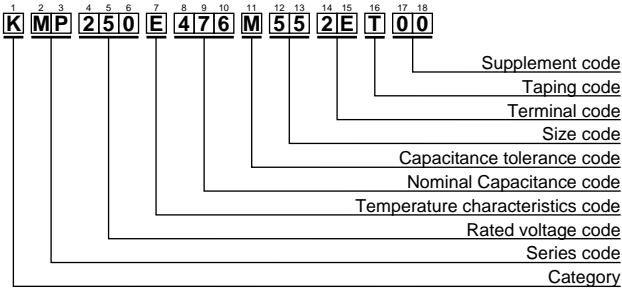
◆THP SERIES STANDARD RATINGS

Part Number	Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Previous Part Number (Just for your reference)
			L	W	Tmax.	a	
KHP160E336M432AT00	16	33	4.8±0.4	3.5±0.4	5.5	1.3±0.3	THP50E1C336MT002
KHP160E476M432AT00		47			THP50E1C476MT002		
KHP160E686M552AT00		68	6.0±0.4	5.0±0.4	5.0	1.3±0.3	THP60E1C686MT002
KHP160E107M552AT00		100			5.6		THP60E1C107MT002
KHP160E157M762BT00		150	7.8±0.5	6.6±0.5	6.5	1.5±0.3	THP70E1C157MT002
KHP160E207M762BT00		200					THP70E1C207MT002
KHP250E156M432AT00		25	15	4.8±0.4	3.5±0.3	5.5	1.3±0.3
KHP250E206M432AT00	20		THP50E1E206MT002				
KHP250E336M552AT00	33		6.0±0.4	5.0±0.4	4.5	1.3±0.3	THP60E1E336MT002
KHP250E476M552AT00	47				5.6		THP60E1E476MT002
KHP250E686M552AT00	68		7.8±0.5	6.6±0.5	6.5	1.5±0.3	THP60E1E686MT002
KHP250E107M762BT00	100						THP70E1E107MT002
KHP500E455M432AT00	50		4.5	4.8±0.4	3.5±0.3	5.5	1.3±0.3
KHP500E685M432AT00		6.8	THP50E1H685MT002				
KHP500E106M552AT00		10	6.0±0.4	5.0±0.4	4.5	1.3±0.3	THP60E1H106MT002
KHP500E156M552AT00		15			5.6		THP60E1H156MT002
KHP500E226M552AT00		22	7.8±0.5	6.6±0.5	6.5	1.5±0.3	THP60E1H226MT002
KHP500E336M762BT00		33					THP70E1H336MT002
KHP500E476M762BT00		47	THP70E1H476MT002				
KHP101E155M432AT00	100	1.5	4.8±0.4	3.5±0.3	5.5	1.3±0.3	THP50E2A155MT002
KHP101E205M432AT00		2.0					THP50E2A205MT002
KHP101E305M432AT00		3.0	6.0±0.4	5.0±0.4	4.5	1.3±0.3	THP50E2A305MT002
KHP101E475M552AT00		4.7					THP60E2A475MT002
KHP101E685M552AT00		6.8	7.8±0.5	6.6±0.5	6.5	1.5±0.3	THP60E2A685MT002
KHP101E106M552AT00		10					THP60E2A106MT002
KHP101E156M762BT00		15	THP70E2A156MT002				
KHP201E454M432AT00	200	0.45	4.8±0.4	3.5±0.3	5.5	1.3±0.3	THP50E2D454MT002
KHP201E684M432AT00		0.68					THP50E2D684MT002
KHP201E105M432AT00		1.0	6.0±0.4	5.0±0.4	4.5	1.3±0.3	THP50E2D105MT002
KHP201E155M552AT00		1.5			5.6		THP60E2D155MT002
KHP201E225M552AT00		2.2	7.8±0.5	6.6±0.5	6.5	1.5±0.3	THP60E2D225MT002
KHP201E335M762BT00		3.3					THP70E2D335MT002
KHP201E475M762BT00		4.7	THP70E2D475MT002				

◆DIMENSIONS



### ◆PART NUMBERING SYSTEM



### ◆TMP SERIES STANDARD RATINGS

Part Number	Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Previous Part Number (Just for your reference)		
			L	W	Tmax.	a			
KMP250E336M552ET00	25	33	6.0±0.4	5.0±0.4	5.0	1.3±0.3	TMP60E1E336MT002		
KMP250E476M552ET00		47					TMP60E1E476MT002		
KMP250E686M762ET00		68	7.8±0.5	6.6±0.5			6.5	1.5±0.3	TMP70E1E686MT002
KMP250E107M762ET00		100							TMP70E1E107MT002
KMP500E106M552ET00	50	10	6.0±0.4	5.0±0.4	5.0	1.3±0.3	TMP60E1H106MT002		
KMP500E156M552ET00		15					TMP60E1H156MT002		
KMP500E226M552ET00		22					TMP60E1H226MT002		
KMP500E336M762ET00		33	7.8±0.5	6.6±0.5			6.5	1.5±0.3	TMP70E1H336MT002
KMP500E476M762ET00		47							TMP70E1H476MT002
KMP101E475M552ET00	100	4.7	6.0±0.4	5.0±0.4	5.0	1.3±0.3	TMP60E2A475MT002		
KMP101E685M552ET00		6.8					TMP60E2A685MT002		
KMP101E106M762ET00		10	7.8±0.5	6.6±0.5			6.5	1.5±0.3	TMP70E2A106MT002
KMP101E156M762ET00		15							TMP70E2A156MT002
KMP201E155M552ET00	200	1.5	6.0±0.4	5.0±0.4	5.0	1.3±0.3	TMP60E2D155MT002		
KMP201E225M552ET00		2.2					TMP60E2D225MT002		
KMP201E335M762ET00		3.3	7.8±0.5	6.6±0.5			6.5	1.5±0.3	TMP70E2D335MT002
KMP201E475M762ET00		4.7							TMP70E2D475MT002

### ◆DIMENSIONS

