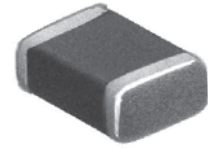




MULTILAYER CERAMIC CHIP CAPACITORS

THC Series / TMC Series (High Reliability)

RoHS
Compliant
-2012 ✕



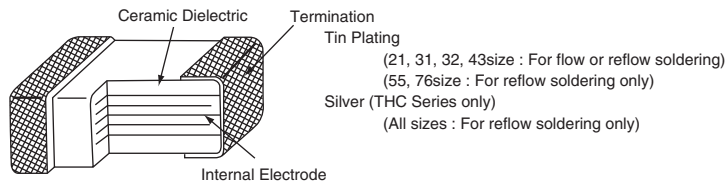
◆FEATURES

1. Small size and large capacitance, high ripple current.
2. Temperature characteristic is Y5U in EIA code.
3. Superior humidity characteristic and long life.
4. Excellent noise absorption.

◆APPLICATIONS

1. Smoothing circuit of small size DC-DC converter.
2. On-board power supply.
3. Noise suppressor for various kinds of equipments.
4. By-pass or decoupling circuits.

◆CONSTRUCTION



◆RATINGS

1. Category Temperature Range	-55 to +125°C
2. Rated Voltage Range	25, 50, 100, 200V _{dc}
3. Rated Capacitance Range	0.047 to 47μF
4. Rated Capacitance Tolerance	M (±20%), Z (±20%)
5. Temperature Characteristics	E (JIS) ≒ 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 _R (MΩ) or 10000(MΩ) whichever is less.	Rated voltage shall be applied for 60±5 seconds at temperature 20±2°C.														
3	Rated Capacitance	Within specified tolerance.	Temperature : 20±2°C Frequency : 1±0.1kHz Voltage : 1±0.2V _{rms}														
4	Dissipation Factor	5.0% maximum.	Temperature : 20±2°C Frequency : 1±0.1kHz Voltage : 1±0.2V _{rms}														
5	Rated Ripple Current	<table border="1"> <tr> <td>Size code</td> <td>21</td> <td>31</td> <td>32</td> <td>43</td> <td>55</td> <td>76</td> </tr> <tr> <td>Arms</td> <td>0.2</td> <td>0.3</td> <td>0.5</td> <td>1.0</td> <td>2.0</td> <td>3.0</td> </tr> </table>	Size code	21	31	32	43	55	76	Arms	0.2	0.3	0.5	1.0	2.0	3.0	10kHz~1MHz (sine curve) Ripple voltage V _p shall be less than the rated voltage.
Size code	21	31	32	43	55	76											
Arms	0.2	0.3	0.5	1.0	2.0	3.0											

✕ This series will be no more RoHS compliant as from January,2013.
NTS/NTF series are recommended for the new design.

◆ SPECIFICATIONS

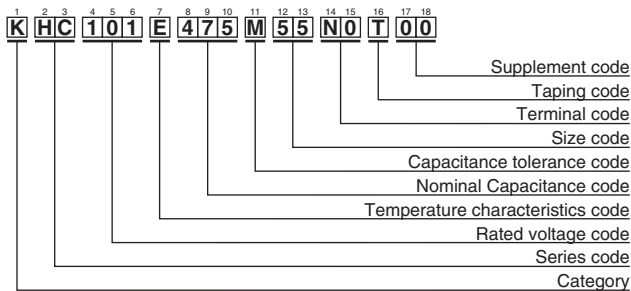
No.	Items	Specification	Test Condition															
6	Adhesion	No visible damage.	<p>Substrate 5N (0.51kgf) for 10±1 seconds Capacitor</p>															
7	Bend strength of the face plating	Appearance : No visible damage. ΔC/C : ±15%	<p>The substrate shall be bend by 1mm at a rate of 1mm/s for 5 seconds.</p> <p>Press Press bar Capacitor Substrate 1.0mm Support 45±2mm 45±2mm</p>															
8	Solderability	Min. 75% of surface of the termination shall be covered with new solder	<table border="1"> <thead> <tr> <th>Solder</th> <th>Pb Free</th> <th>Eutectic</th> </tr> </thead> <tbody> <tr> <td>Solder Temperature</td> <td>245±5°C</td> <td>235±5°C</td> </tr> <tr> <td>Dipping Time</td> <td colspan="2">2±0.5sec.</td> </tr> </tbody> </table>	Solder	Pb Free	Eutectic	Solder Temperature	245±5°C	235±5°C	Dipping Time	2±0.5sec.							
Solder	Pb Free	Eutectic																
Solder Temperature	245±5°C	235±5°C																
Dipping Time	2±0.5sec.																	
9	Resistance to Soldering Heat	Appearance : No visible damage. ΔC/C : ±15% D.F. : To meet the initial specification. I.R. : To meet the initial specification.	<p>Solder Temperature : 260±5°C Dipping Time : 2±0.5 seconds</p>															
10	Temperature Cycle	Appearance : No visible damage. ΔC/C : ±15% D.F. : To meet the initial specification. I.R. : To meet the initial specification.	<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 ±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>3 max.</td> </tr> <tr> <td>3</td> <td>Max. Category temperature ±3</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>3 max.</td> </tr> </tbody> </table> <p><Cycle> THC series : 5 cycles TMC series : 100 cycles</p>	Step	Temperature (°C)	(min.)	1	Min. Category temperature ±3	30±3	2	Room temperature	3 max.	3	Max. Category temperature ±3	30±3	4	Room temperature	3 max.
Step	Temperature (°C)	(min.)																
1	Min. Category temperature ±3	30±3																
2	Room temperature	3 max.																
3	Max. Category temperature ±3	30±3																
4	Room temperature	3 max.																
11	Humidity Load Life	Appearance : No abnormality. ΔC/C : ±20% D.F. : 7% maximum I.R. : 50/C _R (MΩ) or 1000(MΩ) whichever is less.	<p>Temperature : 40±2°C Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500±²⁴₀hours</p>															
12	Endurance	Appearance : No abnormality. ΔC/C : ±20% D.F. : 7% maximum I.R. : 100/C _R (MΩ) or 1000(MΩ) whichever is less.	<p>Temperature : 85±2°C Voltage : 200% of rated voltage. Time : 1000±⁴⁸₀hours</p> <p>Temperature : 125±3°C Voltage : Rated voltage Time : 1000±⁴⁸₀hours</p>															

*C_R : Rated Capacitance(μF)

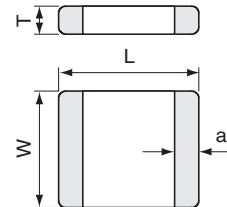
◆STANDARD RATINGS

Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Maximum ripple current (Arms)	Part Number	Previous Part Number (Just for your reference)				
		L	W	Tmax.	a							
25	0.33	2.0±0.2	1.25±0.2	1.25	0.3±0.2	0.2	KHC250E334M21N0T00	THCS20E1E334MTF				
	0.47						KHC250E474M21N0T00	THCS20E1E474MTF				
	0.68						KHC250E684M21N0T00	THCS20E1E684MTF				
	1.0						KHC250E105M31N0T00	THCS30E1E105MTF				
	1.5	3.2±0.2	1.6±0.2	1.6	0.5±0.3	0.3	KHC250E155M31N0T00	THCS30E1E155MTF				
	2.2						KHC250E225M31N0T00	THCS30E1E225MTF				
	3.3						KHC250E335M32N0T00	THCS40E1E335MTF				
	4.7						KHC250E475M32N0T00	THCS40E1E475MTF				
	6.8	4.5±0.3	3.2±0.2	2.2	0.6±0.3	1.0	KHC250E685M43N0T00	THCS50E1E685MTF				
	10						KHC250E106M43N0T00	THCS50E1E106MTF				
	15						KHC250E156M43N0T00	THCS50E1E156MTF				
	22						KHC250E226M55N0T00	THCS60E1E226MTF				
	33	5.7±0.4	5.0±0.4	3.0	0.8±0.5	2.0	KHC250E336M55N0T00	THCS60E1E336MTF				
	47						KHC250E476M76N0T00	THCS70E1E476MTF				
6.8	7.5±0.5						6.3±0.5	3.0	0.8±0.5	3.0	KHC500E104M21N0T00	THCS20E1H104MTF
0.15											KHC500E154M21N0T00	THCS20E1H154MTF
0.22		KHC500E224M21N0T00	THCS20E1H224MTF									
0.33		KHC500E334M31N0T00	THCS30E1H334MTF									
0.47	3.2±0.2	1.6±0.2	1.6	0.5±0.3	0.3	KHC500E474M31N0T00	THCS30E1H474MTF					
0.68						KHC500E684M31N0T00	THCS30E1H684MTF					
1.0						KHC500E105M32N0T00	THCS40E1H105MTF					
1.5						KHC500E155M32N0T00	THCS40E1H155MTF					
2.2	4.5±0.3	3.2±0.2	2.2	0.6±0.3	1.0	KHC500E225M32N0T00	THCS40E1H225MTF					
3.3						KHC500E335M43N0T00	THCS50E1H335MTF					
4.7						KHC500E475M43N0T00	THCS50E1H475MTF					
6.8						KHC500E685M55N0T00	THCS60E1H685MTF					
10	5.7±0.4	5.0±0.4	2.2	0.8±0.5	2.0	KHC500E106M55N0T00	THCS60E1H106MTF					
15						KHC500E156M55N0T00	THCS60E1H156MTF					
22						KHC500E226M76N0T00	THCS70E1H226MTF					
0.047						2.0±0.2	1.25±0.2	1.25	0.3±0.2	0.2	KHC101E473M21N0T00	THCS20E2A473MTF
0.068	KHC101E683M21N0T00	THCS20E2A683MTF										
0.1	KHC101E104M31N0T00	THCS30E2A104MTF										
0.15	KHC101E154M31N0T00	THCS30E2A154MTF										
0.22	3.2±0.2	1.6±0.2	1.6	0.5±0.3	0.3	KHC101E224M31N0T00	THCS30E2A224MTF					
0.33						KHC101E334M32N0T00	THCS40E2A334MTF					
0.47						KHC101E474M32N0T00	THCS40E2A474MTF					
0.68						KHC101E684M32N0T00	THCS40E2A684MTF					
1.0	4.5±0.3	3.2±0.2	2.2	0.6±0.3	1.0	KHC101E105M43N0T00	THCS50E2A105MTF					
1.5						KHC101E155M43N0T00	THCS50E2A155MTF					
2.2						KHC101E225M43N0T00	THCS50E2A225MTF					
3.3						KHC101E335M55N0T00	THCS60E2A335MTF					
4.7	5.7±0.4	5.0±0.4	3.0	0.8±0.5	2.0	KHC101E475M55N0T00	THCS60E2A475MTF					
6.8						KHC101E685M76N0T00	THCS70E2A685MTF					
0.047						3.2±0.2	1.6±0.2	1.6	0.5±0.3	0.3	KHC201E473M31N0T00	THCS30E2D473MTF
0.068											KHC201E683M31N0T00	THCS30E2D683MTF
0.1	KHC201E104M32N0T00	THCS40E2D104MTF										
0.15	KHC201E154M32N0T00	THCS40E2D154MTF										
0.22	4.5±0.3	3.2±0.3	2.2	0.6±0.3	1.0	KHC201E224M32N0T00	THCS40E2D224MTF					
0.33						KHC201E334M43N0T00	THCS50E2D334MTF					
0.47						KHC201E474M43N0T00	THCS50E2D474MTF					
0.68						KHC201E684M55N0T00	THCS60E2D684MTF					
1.0	5.7±0.4	5.0±0.4	3.0	0.8±0.5	2.0	KHC201E105M55N0T00	THCS60E2D105MTF					
1.5						KHC201E155M76N0T00	THCS70E2D155MTF					
2.2						KHC201E225M76N0T00	THCS70E2D225MTF					

◆PART NUMBERING SYSTEM



◆DIMENSIONS

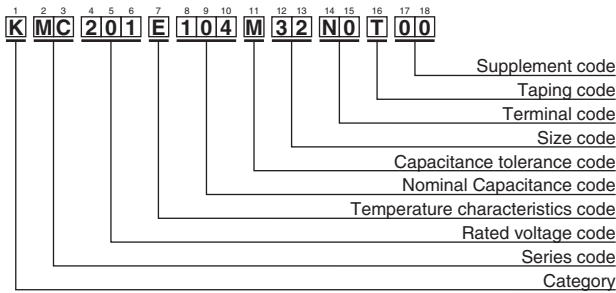


Please refer to "Part Numbering System" of the beginning of a catalog for the details.

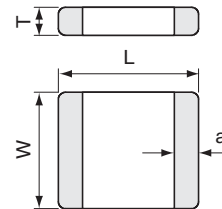
◆STANDARD RATINGS

Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Maximum ripple current (Arms)	Part Number	Previous Part Number (Just for your reference)					
		L	W	Tmax.	a								
25	0.68	3.2±0.2	1.6±0.2	1.6	0.4±0.2	0.3	KMC250E684M31N0T00	TMCS30E1E684MTF					
	1						KMC250E105M31N0T00	TMCS30E1E105MTF					
	1.5						KMC250E155M31N0T00	TMCS30E1E155MTF					
	2.2						KMC250E225M32N0T00	TMCS40E1E225MTF					
	3.3	3.2±0.2	2.5±0.2	2.2	0.5±0.2		0.5	KMC250E335M32N0T00	TMCS40E1E335MTF				
	4.7							KMC250E475M43N0T00	TMCS50E1E475MTF				
	6.8							4.5±0.3	3.2±0.2	2.5	0.5±0.3	KMC250E685M43N0T00	TMCS50E1E685MTF
	10											KMC250E106M43N0T00	TMCS50E1E106MTF
50	0.33	3.2±0.2	1.6±0.2	1.6	0.4±0.2	0.3		KMC500E334M31N0T00	TMCS30E1H334MTF				
	0.47							KMC500E474M31N0T00	TMCS30E1H474MTF				
	0.68							3.2±0.2	2.5±0.2	2.2	0.5±0.2	KMC500E684M32N0T00	TMCS40E1H684MTF
	1.0											KMC500E105M32N0T00	TMCS40E1H105MTF
	1.5	KMC500E155M32N0T00	TMCS40E1H155MTF										
	2.2	KMC500E225M43N0T00	TMCS50E1H225MTF										
	3.3	4.5±0.3	3.2±0.2	2.5	0.5±0.3		1.0	KMC500E335M43N0T00	TMCS50E1H335MTF				
	4.7							KMC500E475M43N0T00	TMCS50E1H475MTF				
100	0.1					3.2±0.2		1.6±0.2	1.6	0.4±0.2	0.3	KMC101E104M31N0T00	TMCS30E2A104MTF
	0.15											KMC101E154M31N0T00	TMCS30E2A154MTF
	0.22	3.2±0.2	2.5±0.2	2.2	0.5±0.2							KMC101E224M32N0T00	TMCS40E2A224MTF
	0.33											KMC101E334M32N0T00	TMCS40E2A334MTF
	0.47					KMC101E474M32N0T00		TMCS40E2A474MTF					
	0.68					4.5±0.3		3.2±0.2	2.5	0.5±0.3		KMC101E684M43N0T00	TMCS50E2A684MTF
	1.0	KMC101E105M43N0T00	TMCS50E2A105MTF										
	200	0.033	3.2±0.2	1.6±0.2	1.6		0.4±0.2					0.3	KMC201E333M31N0T00
0.047		KMC201E473M31N0T00									TMCS30E2D473MTF		
0.068		3.2±0.2				2.5±0.2		2.2	0.5±0.2	KMC201E683M32N0T00	TMCS40E2D683MTF		
0.1										KMC201E104M32N0T00	TMCS40E2D104MTF		
0.15			KMC201E154M32N0T00	TMCS40E2D154MTF									
0.22			4.5±0.3	3.2±0.2	2.5		0.5±0.3			KMC201E224M43N0T00	TMCS50E2D224MTF		
0.33		KMC201E334M43N0T00				TMCS50E2D334MTF							
0.47		KMC201E474M43N0T00				TMCS50E2D474MTF							

◆PART NUMBERING SYSTEM



◆DIMENSIONS



Please refer to "Part Numbering System" of the beginning of a catalog for the details.