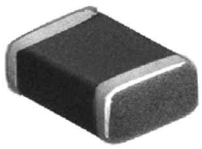
MULTILAYER CERAMIC CHIP CAPACITORS

THC Series / TMC Series

(Down sized) **(High Reliability)**



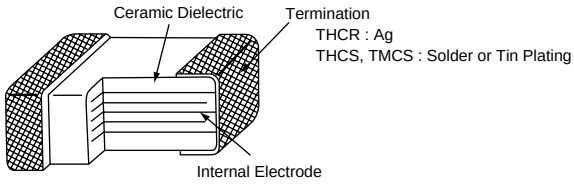
◆FEATURES

1. Small in size and wide capacitance range.
2. Temperature characteristic is Y5U in EIA code.
   Small temperature and DC bias dependency of capacitance.
3. Superior humidity characteristic and long life.
4. Excellent high frequency characteristic due to low ESR.
5. High rated ripple current.
6. Two types of terminal electrodes are available.
   Silver for reflow soldering and solder or tin plating for flow and reflow soldering.
7. 200Vdc items are available.

◆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℃
2. Rated Voltage Range	16, 25, 50, 100, 200Vdc
3. Rated Capacitance Range	0.047 to 100μF
4. Rated Capacitance Tolerance	M (±20%) , Z ($\pm^{80}_{20}$%)
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℃.
3	Rated Capacitance	Within specified tolerance.	Temperature : 20±2℃ Frequency : 1±0.1kHz Voltage : 1±0.2Vrms
4	Dissipation Factor	5.0% maximum.	Temperature : 20±2℃ Frequency : 1±0.1kHz Voltage : 1±0.2Vrms
5	Rated Ripple Current	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 Vp shall be less than the rated voltage.

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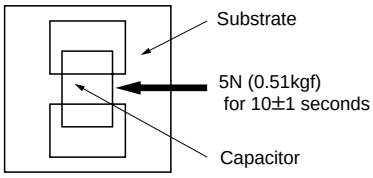
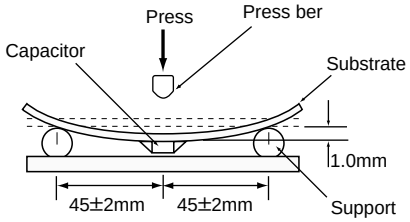
◆SPECIFICATIONS

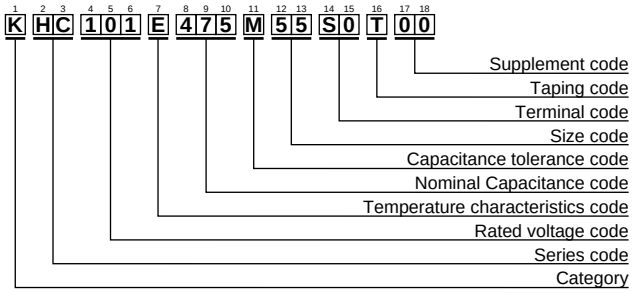
No.	Items	Specification	Test Condition
6	Adhesion	No visible damage.	
7	Bend strength of the face plating	Appearance : No visible damage. ΔC/C : ±15%	The substrate shall be bend by 1mm at a rate of 1mm/s for 5 seconds. 
8	Solderability	Min. 75% of surface of the termination shall be covered with new solder	Solder Temperature : 235±5℃ Dipping Time : 2±0.5 sec. Solder : Eutectic solder containning Ag2.5 to 3wt%
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. Withstand voltage : No abnormality.	Solder Temperature : 260±5℃ Dipping Time : 2±0.5 seconds Solder : Eutectic solder containning Ag2.5 to 3wt%
10	Temperature Cycle	Appearance : No visible damage. ΔC/C : ±15% D.F. : To meet the initial specification. I.R. : To meet the initial specification. Withstand voltage : No abnormality.	<table><tr><th>Step</th><th>Temperature (℃)</th><th>(min.)</th></tr><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 ±2</td><td>30±3</td></tr><tr><td>4</td><td>Room temperature</td><td>3 max.</td></tr></table><Cycle> THC series : 5 cycles TMC series : 100 cycles
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. Withstand voltage : No abnormality.	Temperature : 40±2℃ Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500^{+24}_{0}hours
12	Endurance	Appearance : No abnormality. ΔC/C : ±20% D.F. : 7% maximum I.R. : 100/C_R(MΩ) or 1000(MΩ) whichever is less. Withstand voltage : No abnormality.	Temperature : 85±2℃ Voltage : 200% of rated voltage. Time : 1000^{+48}_{0}hours Temperature : 125±3℃ Voltage : Rated voltage Time : 1000^{+48}_{0}hours

*C_R : Rated Capacitance(μF)

MULTILAYER CERAMIC CHIP CAPACITORS

THC Series

◆PART NUMBERING SYSTEM



◆THC SERIES STANDARD RATINGS

Part Number	Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Previous Part Number (Just for your reference)
			L	W	Tmax.	a	
KHC160E335M31S0T00	16	3.3	3.2±0.2	1.6±0.2	1.6	0.5±0.3	THCS30E1C335MT
KHC160E475M31S0T00		4.7					THCS30E1C475MT
KHC160E685M32S0T00		6.8	3.2±0.2	2.5±0.2	2.0	0.6±0.3	THCS40E1C685MT
KHC160E106M32S0T00		10					THCS40E1C106MT
KHC160E156M43S0T00		15	4.5±0.3	3.2±0.2	2.2	0.6±0.3	THCS50E1C156MT
KHC160E226M43S0T00		22					THCS50E1C226MT
KHC160E336M55S0T00		33	5.7±0.3	5.0±0.4	2.2	0.8±0.3	THCS60E1C336MT
KHC160E476M55S0T00		47					THCS60E1C476MT
KHC160E686M76S0T00		68	7.5±0.5	6.3±0.5	2.5	0.8±0.5	THCS70E1C686MT
KHC160E107M76S0T00		100					THCS70E1C107MT
KHC250E334M21S0T00	25	0.33	2.0±0.2	1.25±0.2	1.25	0.3±0.2	THCS20E1E334MT
KHC250E474M21S0T00		0.47					THCS20E1E474MT
KHC250E684M21S0T00		0.68					THCS20E1E684MT
KHC250E105M31S0T00		1.0	3.2±0.2	1.6±0.2	1.6	0.5±0.3	THCS30E1E105MT
KHC250E155M31S0T00		1.5					THCS30E1E155MT
KHC250E225M31S0T00		2.2					THCS30E1E225MT
KHC250E335M32S0T00		3.3	3.2±0.2	2.5±0.2	2.0	0.6±0.3	THCS40E1E335MT
KHC250E475M32S0T00		4.7					THCS40E1E475MT
KHC250E685M43S0T00		6.8	4.5±0.3	3.2±0.2	2.2	0.6±0.3	THCS50E1E685MT
KHC250E106M43S0T00		10					THCS50E1E106MT
KHC250E156M43S0T00		15			3.0		THCS50E1E156MT
KHC250E226M55S0T00		22	5.7±0.4	5.0±0.4	2.2	0.8±0.5	THCS60E1E226MT
KHC250E336M55S0T00		33			3.0		THCS60E1E336MT
KHC250E476M76S0T00		47	7.5±0.5	6.3±0.5	3.0	0.8±0.5	THCS70E1E476MT
KHC500E104M21S0T00	50	0.1	2.0±0.2	1.25±0.2	1.25	0.3±0.2	THCS20E1H104MT
KHC500E154M21S0T00		0.15					THCS20E1H154MT
KHC500E224M21S0T00		0.22					THCS20E1H224MT
KHC500E334M31S0T00		0.33	3.2±0.2	1.6±0.2	1.6	0.5±0.3	THCS30E1H334MT
KHC500E474M31S0T00		0.47					THCS30E1H474MT
KHC500E684M31S0T00		0.68					THCS30E1H684MT
KHC500E105M32S0T00		1.0	3.2±0.2	2.5±0.2	2.0	0.6±0.3	THCS40E1H105MT
KHC500E155M32S0T00		1.5					THCS40E1H155MT
KHC500E225M32S0T00		2.2			2.5		THCS40E1H225MT
KHC500E335M43S0T00		3.3	4.5±0.3	3.2±0.2	2.2	0.6±0.3	THCS50E1H335MT
KHC500E475M43S0T00		4.7			3.0		THCS50E1H475MT
KHC500E685M55S0T00		6.8	5.7±0.4	5.0±0.4	2.2	0.8±0.5	THCS60E1H685MT
KHC500E106M55S0T00		10					THCS60E1H106MT
KHC500E156M55S0T00		15			3.0		THCS60E1H156MT
KHC500E226M76S0T00		22	7.5±0.5	6.3±0.5	2.5	0.8±0.5	THCS70E1H226MT
KHC101E473M21S0T00	100	0.047	2.0±0.2	1.25±0.2	1.25	0.3±0.2	THCS20E2A473MT
KHC101E683M21S0T00		0.068					THCS20E2A683MT
KHC101E104M31S0T00		0.1	3.2±0.2	1.6±0.2	1.6	0.5±0.3	THCS30E2A104MT
KHC101E154M31S0T00		0.15					THCS30E2A154MT
KHC101E224M31S0T00		0.22					THCS30E2A224MT
KHC101E334M32S0T00		0.33	3.2±0.2	2.5±0.2	2.0	0.6±0.3	THCS40E2A334MT
KHC101E474M32S0T00		0.47					THCS40E2A474MT
KHC101E684M32S0T00		0.68			2.5		THCS40E2A684MT
KHC101E105M43S0T00		1.0	4.5±0.3	3.2±0.2	2.2	0.6±0.3	THCS50E2A105MT
KHC101E155M43S0T00		1.5					THCS50E2A155MT
KHC101E225M43S0T00		2.2			3.0		THCS50E2A225MT
KHC101E335M55S0T00		3.3	5.7±0.4	5.0±0.4	2.2	0.8±0.5	THCS60E2A335MT
KHC101E475M55S0T00		4.7			3.0		THCS60E2A475MT
KHC101E685M76S0T00		6.8	7.5±0.5	6.3±0.5	3.0	0.8±0.5	THCS70E2A685MT
KHC201E473M31S0T00	200	0.047	3.2±0.2	1.6±0.2	1.6	0.5±0.3	THCS30E2D473MT
KHC201E683M31S0T00		0.068					THCS30E2D683MT
KHC201E104M32S0T00		0.1	3.2±0.2	2.5±0.2	2.0	0.6±0.3	THCS40E2D104MT
KHC201E154M32S0T00		0.15					THCS40E2D154MT
KHC201E224M32S0T00		0.22			2.5		THCS40E2D224MT
KHC201E334M43S0T00		0.33	4.5±0.3	3.2±0.2	2.2	0.6±0.3	THCS50E2D334MT
KHC201E474M43S0T00		0.47			3.0		THCS50E2D474MT
KHC201E684M55S0T00		0.68	5.7±0.4	5.0±0.4	2.2	0.8±0.5	THCS60E2D684MT
KHC201E105M55S0T00		1.0			3.0		THCS60E2D105MT
KHC201E155M76S0T00		1.5	7.5±0.5	6.3±0.5	2.5	0.8±0.5	THCS70E2D155MT
KHC201E225M76S0T00		2.2			3.0		THCS70E2D225MT

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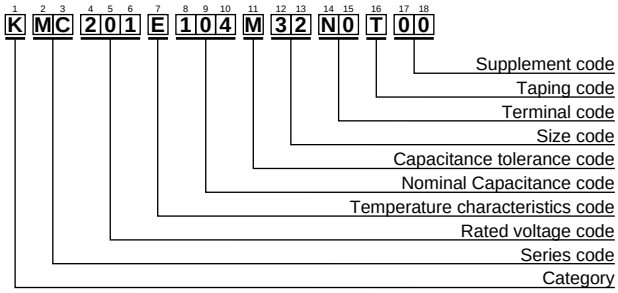

◆TMC SERIES STANDARD RATINGS

Part Number	Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Previous Part Number (Just for your reference)
			L	W	Tmax.	a	
KMC250E684M31N0T00	25	0.68	3.2±0.2	1.6±0.2	1.6	0.4±0.2	TMCS30E1E684MTF
KMC250E105M31N0T00		1					TMCS30E1E105MTF
KMC250E155M31N0T00		1.5					TMCS30E1E155MTF
KMC250E225M32N0T00		2.2	3.2±0.2	2.5±0.2	2.2	0.5±0.2	TMCS40E1E225MTF
KMC250E335M32N0T00		3.3					TMCS40E1E335MTF
KMC250E475M43N0T00		4.7	4.5±0.3	3.2±0.2	2.5	0.5±0.3	TMCS50E1E475MTF
KMC250E685M43N0T00		6.8					TMCS50E1E685MTF
KMC250E106M43N0T00		10			3.0		TMCS50E1E106MTF
KMC500E334M31N0T00	50	0.33	3.2±0.2	1.6±0.2	1.6	0.4±0.2	TMCS30E1H334MTF
KMC500E474M31N0T00		0.47					TMCS30E1H474MTF
KMC500E684M32N0T00		0.68	3.2±0.2	2.5±0.2	2.2	0.5±0.2	TMCS40E1H684MTF
KMC500E105M32N0T00		1.0					TMCS40E1H105MTF
KMC500E155M32N0T00		1.5			2.5		TMCS40E1H155MTF
KMC500E225M43N0T00		2.2	4.5±0.3	3.2±0.2	2.5	0.5±0.3	TMCS50E1H225MTF
KMC500E335M43N0T00		3.3					TMCS50E1H335MTF
KMC500E475M43N0T00		4.7			3.0		TMCS50E1H475MTF
KMC101E104M31N0T00	100	0.1	3.2±0.2	1.6±0.2	1.6	0.4±0.2	TMCS30E2A104MTF
KMC101E154M31N0T00		0.15					TMCS30E2A154MTF
KMC101E224M32N0T00		0.22	3.2±0.2	2.5±0.2	2.2	0.5±0.2	TMCS40E2A224MTF
KMC101E334M32N0T00		0.33					TMCS40E2A334MTF
KMC101E474M32N0T00		0.47					TMCS40E2A474MTF
KMC101E684M43N0T00		0.68	4.5±0.3	3.2±0.2	2.5	0.5±0.3	TMCS50E2A684MTF
KMC101E105M43N0T00		1.0					TMCS50E2A105MTF
KMC101E155M43N0T00		1.5			3.0		TMCS50E2A155MTF
KMC201E333M31N0T00	200	0.033	3.2±0.2	1.6±0.2	1.6	0.4±0.2	TMCS30E2D333MTF
KMC201E473M31N0T00		0.047					TMCS30E2D473MTF
KMC201E683M32N0T00		0.068	3.2±0.2	2.5±0.2	2.2	0.5±0.2	TMCS40E2D683MTF
KMC201E104M32N0T00		0.1					TMCS40E2D104MTF
KMC201E154M32N0T00		0.15			2.5		TMCS40E2D154MTF
KMC201E224M43N0T00		0.22	4.5±0.3	3.2±0.2	2.5	0.5±0.3	TMCS50E2D224MTF
KMC201E334M43N0T00		0.33					TMCS50E2D334MTF
KMC201E474M43N0T00		0.47			3.0		TMCS50E2D474MTF

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