



DIPPED RADIAL LEAD MULTILAYER CERAMIC CAPACITORS

THD Series

Radial Lead Type (Down sized)

New!

TMD Series

Radial Lead Type (Non flammable resin coated.
High reliability.)



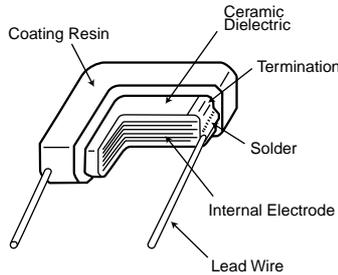
◆FEATURES

1. Small in size and wide capacitance range.
Max. 470 μ F is available.(THD Series)
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. 250V_{dc} items are available.
7. Resin(UL94 V-0) used for coating. (THD Series)
8. Non flammable resin coating. (TMD Series)
9. High temperature cycle durability. (TMD Series)

◆APPLICATIONS

1. Smoothing circuit of switching mode AC-DC or DC-DC converter.
2. Noise suppressor for various kinds of equipments.
3. By-pass or decoupling circuits.
4. Automotive equipments. (TMD Series)

◆CONSTRUCTION



◆RATINGS

1. Category Temperature Range	-55 to +125°C
2. Rated Voltage Range	25, 50, 100, 250 V _{dc}
3. Rated Capacitance Range	0.1 to 470 μ F(THD), 0.1 to 68 μ F(TMD)
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 Between Terminals Terminals to Coating Resin	No abnormality.	250% of rated voltage shall be applied for 5 seconds.
2	Insulation Resistance	1000/C _R (M Ω) or 10000(M Ω) 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 μ F, 120Hz) Voltage : 1 \pm 0.2V _{rms}
4	Dissipation Factor	5.0% maximum.	Temperature : 20 \pm 2°C Frequency : 1 \pm 0.1kHz(\geq 100 μ F, 120Hz) Voltage : 1 \pm 0.2V _{rms}



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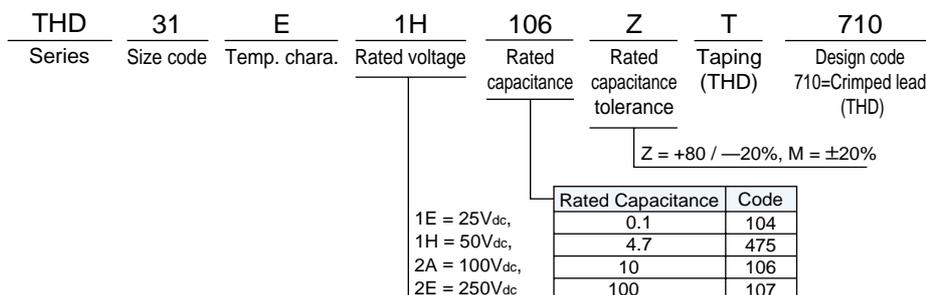
THD Series / TMD Series

◆SPECIFICATIONS

No.	Items	Specification	Test Condition																		
5	Rated Ripple Current	<table border="1"> <tr> <td>Size code</td> <td>21</td> <td>30</td> <td>31</td> <td>41</td> <td>51</td> <td>60</td> <td>61</td> </tr> <tr> <td>Arms</td> <td>0.3</td> <td>0.8</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>3.0</td> <td>4.0</td> </tr> </table> (TMD : 21size to 51size)	Size code	21	30	31	41	51	60	61	Arms	0.3	0.8	1.0	1.5	2.0	3.0	4.0	10kHz to 1MHz (sine curve) Ripple voltage Vp shall be less than the rated voltage.		
Size code	21	30	31	41	51	60	61														
Arms	0.3	0.8	1.0	1.5	2.0	3.0	4.0														
6	Robustness of Terminations	No visible damage.	The force applied shall be : <table border="1"> <tr> <td>Lead φ (mm)</td> <td>Tensile(N)</td> <td>(sec.)</td> </tr> <tr> <td>0.5 max.</td> <td>5</td> <td>10±1</td> </tr> <tr> <td>0.6 to 0.8 max.</td> <td>10</td> <td>10±1</td> </tr> </table> <table border="1"> <tr> <td>Lead φ (mm)</td> <td>Bending(N)</td> <td>(kg)</td> </tr> <tr> <td>0.5 max.</td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td>0.6 to 0.8 max.</td> <td>5</td> <td>0.51</td> </tr> </table> Time : 2times.	Lead φ (mm)	Tensile(N)	(sec.)	0.5 max.	5	10±1	0.6 to 0.8 max.	10	10±1	Lead φ (mm)	Bending(N)	(kg)	0.5 max.	2.5	0.25	0.6 to 0.8 max.	5	0.51
Lead φ (mm)	Tensile(N)	(sec.)																			
0.5 max.	5	10±1																			
0.6 to 0.8 max.	10	10±1																			
Lead φ (mm)	Bending(N)	(kg)																			
0.5 max.	2.5	0.25																			
0.6 to 0.8 max.	5	0.51																			
7	Vibration	Appearance : No abnormality. Capacitance : To meet the initial specification. D.F. : To meet the initial specifications.	Amplitude : 1.5mm Frequency range : 10-55-10Hz (1 min) Direction and time : 2 hours each to X, Y, Z axis. Total 6 hours.																		
8	Solderability	Min. 75% of surface of the termination shall be covered with new solder.	Solder Temperature : 235±5°C Dipping Time : 2±0.5 sec. Solder : H60A or H63A																		
9	Resistance to Soldering Heat	Appearance : No abnormality. ΔC/C : ±15% D.F. : Satisfy the initial spec.	Solder Temperature : 350±10°C Dipping Time : 3±0.5 sec. Depth : 1.5 to 2mm																		
10	Temperature Cycle	Appearance : No abnormality.	<table border="1"> <tr> <th>Step</th> <th>Temperature (°C)</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> For 5 cycles for above temperature cycle. (THD) For 100 cycles for above temperature cycle. (TMD)	Step	Temperature (°C)	(min.)	1	Min. Category temperature ±3	30±3	2	Room temperature	3 max.	3	Max. Category temperature ±2	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 ±2	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. Withstand voltage : No abnormality.	Temperature : 40±2°C 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°C Voltage : 200% of rated voltage. Time : 1000± ⁴⁸ ₀ hours Temperature : 125±3°C Voltage : Rated voltage Time : 1000± ⁴⁸ ₀ hours																		

*C_R : Rated Capacitance(μF)

◆PART NUMBERING SYSTEM



New!

THD Series / TMD Series

◆THD SERIES STANDARD RATINGS

Part Number	Rated voltage (V _{dc})	Rated Capacitance (μF)	Dimensions (mm)					
			Lmax.	Wmax.	Tmax.	F±0.8	φd±0.05	
THD21E1E335 □	25	3.3	5.0	6.5	3.0	5.0	0.5	
THD21E1E475 □		4.7			3.5			
THD30E1E685 □		6.8			3.5			
THD30E1E106 □		10	5.0					
THD30E1E156 □		15		4.0				
THD31E1E226 □		22	7.5	9.0	4.0	5.0	0.5	
THD31E1E336 □					33			4.5
THD41E1E476 □		47	10.0	11.5	4.5	5.0	0.5	
THD51E1E686 □		68	13.5	15.0	5.0	10.0	0.6	
THD51E1E107 □								100
THD60E1E157 □		150	22.5	20.0	6.0	20.0	0.8	
THD60E1E227 □								220
THD61E1E337 □		330	28.5	20.0	7.5	25.0	0.8	
THD61E1E477 □								470
THD21E1H105 □		50	1.0	5.0	6.5	3.0	5.0	0.5
THD21E1H155 □			1.5			3.5		
THD21E1H225 □			2.2					
THD30E1H335 □			3.3	6.5	7.0	3.5	5.0	0.5
THD30E1H475 □	4.7					4.0		
THD31E1H685 □	6.8		7.5	9.0	4.0		5.0	0.5
THD31E1H106 □					10	4.5		
THD31E1H156 □	15		5.0	0.5				
THD41E1H226 □	22				10.0	11.5	4.5	5.0
THD51E1H336 □	33		13.5	15.0	5.0	10.0	0.6	
THD60E1H476 □	47		22.5	20.0	6.0	20.0	0.8	
THD60E1H686 □								68
THD60E1H107 □	100		28.5	20.0	7.5	25.0	0.8	
THD61E1H157 □								150
THD61E1H227 □	220							
THD21E2A334 □	100		0.33	5.0	6.5	3.0	5.0	0.5
THD21E2A474 □			0.47			3.5		
THD21E2A684 □			0.68					
THD30E2A105 □		1.0	6.5	7.0	3.5	5.0	0.5	
THD30E2A155 □					1.5			4.0
THD30E2A225 □		2.2	7.5	9.0	4.0	5.0	0.5	
THD31E2A335 □					3.3			4.5
THD31E2A475 □		4.7	5.0	0.5				
THD41E2A685 □		6.8			10.0	11.5	4.5	5.0
THD51E2A106 □		10	13.5	15.0	5.0	10.0	0.6	
THD51E2A156 □								15
THD60E2A226 □		22	22.5	20.0	6.0	20.0	0.8	
THD60E2A336 □								33
THD61E2A476 □		47	28.5	20.0	7.5	25.0	0.8	
THD61E2A686 □								68
THD61E2A107 □		100						
THD30E2E104 □		250	0.1	6.5	7.0	3.5	5.0	0.5
THD30E2E154 □			0.15			4.0		
THD30E2E224 □	0.22		5.0					
THD30E2E334 □	0.33			4.0				
THD31E2E474 □	0.47		7.5		9.0	4.0	5.0	0.5
THD31E2E684 □				0.68		4.5		
THD41E2E105 □	1.0		10.0	11.5	4.5		5.0	0.5
THD41E2E155 □						1.5		
THD51E2E225 □	2.2		13.5	15.0	5.0	10.0	0.6	
THD60E2E335 □	3.3		22.5	20.0	6.0	20.0	0.8	
THD60E2E475 □								4.7
THD61E2E685 □	6.8		28.5	20.0	7.5	25.0	0.8	
THD61E2E106 □								10
THD61E2E156 □	15							

*Specify M or Z in □.

◆TMD SERIES STANDARD RATINGS

Part Number	Rated voltage (V _{dc})	Rated Capacitance (μF)	Dimensions (mm)						
			Lmax.	Wmax.	Tmax.	F±0.8	φd±0.05		
TMD21E1E155 □	25	1.5	6.0	7.0	3.5	5.0	0.5		
TMD21E1E225 □		2.2							
TMD21E1E335 □		3.3							
TMD30E1E475 □		4.7	7.0	7.5	4.0	5.0	0.5		
TMD30E1E685 □								6.8	
TMD30E1E106 □		10	8.5	9.0	4.5	5.0	0.5		
TMD31E1E156 □		15							
TMD31E1E226 □		22	10.5	11.5	5.0	5.0	0.5		
TMD41E1E336 □		33							
TMD51E1E476 □		47	13.5	15.0	5.5	10.0	0.6		
TMD51E1E686 □								68	
TMD21E1H105 □		50	1.0	6.0	7.0	3.5	5.0	0.5	
TMD21E1H155 □			1.5						4.0
TMD30E1H225 □			2.2						
TMD30E1H335 □			3.3	7.0	7.5	4.0	5.0	0.5	
TMD31E1H475 □									4.7
TMD31E1H685 □			6.8	8.5	9.0	4.5	5.0	0.5	
TMD31E1H106 □									10
TMD41E1H156 □	15		10.5	11.5	5.0	5.0	0.5		
TMD41E1H226 □	22							5.5	10.0
TMD51E1H336 □	33		13.5	15.0	5.5	10.0	0.6		
TMD21E2A334 □	100		0.33	6.0	7.0	3.5	5.0	0.5	
TMD21E2A474 □			0.47						4.0
TMD30E2A684 □			0.68						
TMD30E2A105 □			1.0	7.0	7.5	4.0	5.0	0.5	
TMD30E2A155 □									1.5
TMD31E2A225 □			2.2	8.5	9.0	4.5	5.0	0.5	
TMD31E2A335 □									3.3
TMD41E2A475 □			4.7	10.5	11.5	5.0	5.0	0.5	
TMD51E2A685 □		6.8	13.5	15.0	5.5	10.0	0.6		
TMD51E2A106 □								10	
TMD30E2E104 □		250	0.1	7.0	7.5	4.0	5.0	0.5	
TMD30E2E154 □			0.15						4.0
TMD30E2E224 □			0.22						
TMD31E2E334 □			0.33	8.5	9.0	4.5	5.0	0.5	
TMD31E2E474 □									0.47
TMD41E2E684 □			0.68	10.5	11.5	5.0	5.0	0.5	
TMD41E2E105 □									1.0
TMD51E2E155 □			1.5	13.5	15.0	5.5	10.0	0.6	
TMD51E2E225 □	2.2								

*Specify M or Z in □.

◆DIMENSIONS

