



### ◆FEATURES

1. Small in size and wide capacitance range.  
Max. 470 $\mu$ F is available.
2. Temperature characteristic is X7R in EIA code.
3. Superior humidity characteristic and long life.
4. Excellent high frequency characteristic due to low ESR.
5. High rated ripple current.
6. 250V<sub>dc</sub> items are available.
7. Resin(UL94 V-0) used for coating.
8. Pb-free design(also ceramic dielectric)

### ◆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.

### ◆CONSTRUCTION



### ◆RATINGS

1. Category Temperature Range	-55 to +125°C
2. Rated Voltage Range	25, 35, 50, 100, 250, 500V <sub>dc</sub>
3. Rated Capacitance Range	0.1 to 470 $\mu$ F
4. Rated Capacitance Tolerance	M( $\pm$ 20%)
5. Temperature Characteristics	X7R
6. Rated Ripple Current	See No.5 on the following table

### ◆SPECIFICATIONS

No.	Items		Specification	Test Condition		
1	Withstand Voltage	Between Terminals	No abnormality.	Rated voltage	Withstand voltage	
		Terminals to Coating Resin		Less than 250V	250% of rated voltage	
				More than 250V Less than 500V	100V + 150% of rated voltage	
				More than 500V	130% of rated voltage	
Shall be applied for 5 seconds.						
2	Insulation Resistance		100/C <sub>R</sub> (M $\Omega$ ) or 4000(M $\Omega$ ) whichever is less.	Rated voltage shall be applied for 60 $\pm$ 5 seconds at temperature 25 $\pm$ 2°C.		
3	Rated Capacitance		Within specified tolerance.		C <sub>R</sub> $\leq$ 10 $\mu$ F	C <sub>R</sub> >10 $\mu$ F
				Temperature	25 $\pm$ 2°C	
4	Dissipation Factor		5.0% maximum.	Frequency	1 $\pm$ 0.1kHz	120 $\pm$ 12Hz
				Voltage	1 $\pm$ 0.2V <sub>rms</sub>	0.5 $\pm$ 0.2V <sub>rms</sub>

As customer requirement, Chemi-Con has submits the test results according to AEC-Q200 for Multilayer ceramic capacitors. Please contact us for more information.



# DIPPED RADIAL LEAD MULTILAYER CERAMIC CAPACITORS

**NTD**Series

## ◆ SPECIFICATIONS

No.	Items	Specification	Test Condition															
5	Rated Ripple Current	See STANDARD RATINGS	10kHz to 1MHz (sine curve) Ripple voltage $V_p$ shall be less than the rated voltage.															
6	Robustness of Terminations	No visible damage.	The force applied shall be : <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Lead <math>\phi</math> (mm)</th> <th>Tensile(N)</th> <th>(sec.)</th> </tr> </thead> <tbody> <tr> <td>0.5 max.</td> <td>5</td> <td>10±1</td> </tr> <tr> <td>0.6 min.</td> <td>10</td> <td>10±1</td> </tr> </tbody> </table>	Lead $\phi$ (mm)	Tensile(N)	(sec.)	0.5 max.	5	10±1	0.6 min.	10	10±1						
	Lead $\phi$ (mm)		Tensile(N)	(sec.)														
0.5 max.	5	10±1																
0.6 min.	10	10±1																
	Bending		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Lead <math>\phi</math> (mm)</th> <th>Bending(N)</th> <th>(kg)</th> </tr> </thead> <tbody> <tr> <td>0.5 max.</td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td>0.6 min.</td> <td>5</td> <td>0.51</td> </tr> </tbody> </table> Time : 2times.	Lead $\phi$ (mm)	Bending(N)	(kg)	0.5 max.	2.5	0.25	0.6 min.	5	0.51						
Lead $\phi$ (mm)	Bending(N)	(kg)																
0.5 max.	2.5	0.25																
0.6 min.	5	0.51																
7	Vibration	Appearance : No abnormality. Capacitance : To meet the initial specification. D.F. : To meet the initial specification.	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.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Solder</th> <th>Pb Free</th> </tr> </thead> <tbody> <tr> <td>Solder Temperature</td> <td>245±5°C</td> </tr> <tr> <td>Dipping Time</td> <td>2±0.5sec.</td> </tr> </tbody> </table>	Solder	Pb Free	Solder Temperature	245±5°C	Dipping Time	2±0.5sec.									
Solder	Pb Free																	
Solder Temperature	245±5°C																	
Dipping Time	2±0.5sec.																	
9	Resistance to Soldering Heat	Appearance : No abnormality. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification.	Solder Temperature : 350±10°C Dipping Time : 3±0.5 sec. Depth : 1.5 to 2mm															
10	Temperature Cycle	Appearance : No abnormality. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification.	<table border="1" style="width: 100%; border-collapse: collapse;"> <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> For 5 cycles for above temperature cycle.	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. $\Delta C/C : \pm 20\%$ D.F. : 10% maximum I.R. : 25/ $C_R$ (M $\Omega$ ) or 1000(M $\Omega$ ) whichever is less.	Temperature : 40±2°C Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500± <sub>0</sub> <sup>24</sup> hours															
12	Endurance	Appearance : No abnormality. $\Delta C/C : \pm 20\%$ D.F. : 10% maximum I.R. : 50/ $C_R$ (M $\Omega$ ) or 1000(M $\Omega$ ) whichever is less.	Temperature : 125±3°C Voltage : Rated voltage Time : 1000± <sub>0</sub> <sup>48</sup> hours															

\* $C_R$  : Rated Capacitance( $\mu$ F)



# DIPPED RADIAL LEAD MULTILAYER CERAMIC CAPACITORS

**NTD** Series

◆ **STANDARD RATINGS**

Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions (mm)					Maximum ripple current (Arms)	Part Number	Taping Quantity per reel (pcs./box)					
		Lmax.	Wmax.	Tmax.	F±0.8	φd±0.05								
25	3.3	5.0	6.0	3.5	5.0	0.5	0.3	KTD250B335M32A0T00	2,000					
	4.7							KTD250B475M32A0T00	2,000					
	6.8							KTD250B685M43A0T00	2,000					
	10	6.5	6.5	4.0	5.0	0.5	0.8	KTD250B106M43A0T00	2,000					
	15							KTD250B156M43A0T00	2,000					
	15							KTD250B156M55A0T00	2,000					
	22	7.5	9.0	4.5	5.0	0.5	1.0	KTD250B226M55A0T00	2,000					
	33							KTD250B336M55A0T00	2,000					
	47							KTD250B476M76A0T00	1,000					
	68	13.5	15.0	6.0	10.0	0.6	2.0	KTD250B686M80A0B00	—					
	100			8.0				KTD250B107M80A0B00	—					
	150			6.0				KTD250B157M90A0B00	—					
	220	22.5	20.0	8.0	20.0	0.8	3.0	KTD250B227M90A0B00	—					
	330			8.0				KTD250B337M99A0B00	—					
470	11.5			KTD250B477M99A0B00				—						
35	3.3	5.0	6.0	3.5	5.0	0.5	0.3	KTD350B335M32A0T00	2,000					
	4.7							KTD350B475M32A0T00	2,000					
	6.8							KTD350B685M43A0T00	2,000					
	10	6.5	6.5	4.0	5.0	0.5	0.8	KTD350B106M43A0T00	2,000					
	15							KTD350B156M55A0T00	2,000					
	22							KTD350B226M55A0T00	2,000					
	33	10.0	11.5	5.0	5.0	0.5	1.5	KTD350B336M76A0T00	1,000					
	47			5.5				KTD350B476M76A0T00	1,000					
1.0	5.0			6.0				3.5	5.0	0.5	0.3	KTD500B105M32A0T00	2,000	
1.5		KTD500B155M32A0T00	2,000											
2.2		KTD500B225M32A0T00	2,000											
3.3	6.5	6.5	4.0	5.0	0.5	0.8	KTD500B335M32A0T00	2,000						
4.7							KTD500B475M43A0T00	2,000						
6.8							KTD500B685M43A0T00	2,000						
10	7.5	9.0	4.5	5.0	0.5	1.0	KTD500B106M55A0T00	2,000						
15							KTD500B156M55A0T00	2,000						
22							KTD500B226M76A0T00	1,000						
33	13.5	15.0	5.5	10.0	0.6	2.0	KTD500B336M80A0B00	—						
47			6.0				KTD500B476M90A0B00	—						
68			22.5				20.0	6.0	20.0	0.8	3.0	KTD500B686M90A0B00	—	
100	28.5	20.0	7.0	25.0	0.8	4.0	KTD500B107M90A0B00	—						
150			7.5				KTD500B157M99A0B00	—						
220			10.0				KTD500B227M99A0B00	—						
100	0.33	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B334M32A0T00	2,000					
	0.47							KTD101B474M32A0T00	2,000					
	0.68							KTD101B684M32A0T00	2,000					
	1.0							KTD101B105M32A0T00	2,000					
	1.5							KTD101B155M32A0T00	2,000					
	2.2							KTD101B225M32A0T00	2,000					
	1.5	6.5	6.5	4.0	5.0	0.5	0.8	KTD101B155M43A0T00	2,000					
	2.2							KTD101B225M43A0T00	2,000					
	3.3							KTD101B335M43A0T00	2,000					
	4.7							KTD101B475M43A0T00	2,000					
	3.3							KTD101B335M55A0T00	2,000					
	4.7							KTD101B475M55A0T00	2,000					
	6.8	10.0	11.5	4.7	5.0	0.5	1.5	KTD101B685M55A0T00	2,000					
	6.8			5.0				KTD101B685M76A0T00	1,000					
	10			5.0				KTD101B106M80A0B00	—					
	15			6.0				KTD101B156M80A0B00	—					
	22			22.5				20.0	6.0	20.0	0.8	3.0	KTD101B226M90A0B00	—
	33			KTD101B336M90A0B00				—						
	47	28.5	20.0	7.5	25.0	0.8	4.0	KTD101B476M99A0B00	—					
	68			7.5				KTD101B686M99A0B00	—					
	100			9.0				KTD101B107M99A0B00	—					

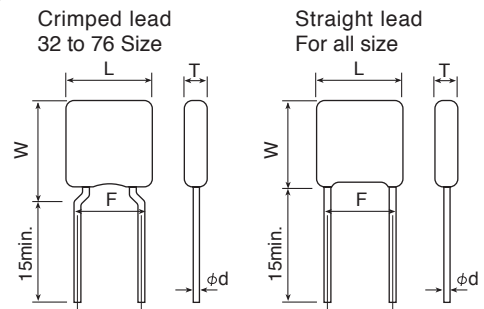
250	0.1	5.0	6.0	3.5	5.0	0.5	0.3	KTD251B104M32A0T00	2,000
	0.15							KTD251B154M32A0T00	2,000
	0.22							KTD251B224M32A0T00	2,000
	0.33							KTD251B334M32A0T00	2,000
	0.47	6.5	6.5	4.0	5.0	0.5	0.8	KTD251B474M43A0T00	2,000
	0.68							KTD251B684M43A0T00	2,000
	1.0							KTD251B105M55A0T00	2,000
	1.5	7.5	9.0	4.5	5.0	0.5	1.0	KTD251B155M55A0T00	2,000
	2.2	10.0	11.5	6.0	5.0	0.5	1.5	KTD251B225M76A0T00	1,000
	2.2	13.5	15.0	5.0	10.0	0.6	2.0	KTD251B225M80A0B00	—
	3.3	22.5	20.0	6.0	20.0	0.8	3.0	KTD251B335M90A0B00	—
	4.7							KTD251B475M90A0B00	—
	6.8							KTD251B685M99A0B00	—
	10							KTD251B106M99A0B00	—
15	28.5	20.0	7.5	25.0	0.8	4.0	KTD251B156M99A0B00	—	
500	0.47	7.5	9.0	3.5	5.0	0.5	0.8	KTD501B474M55A0T00	2,000
	0.56							KTD501B564M55A0T00	2,000
	0.68	10.0	11.5	3.4	5.0	0.5	1.0	KTD501B684M76A0T00	1,500
	1.0			3.8				KTD501B105M76A0T00	1,500
	1.2			4.2				KTD501B125M76A0T00	1,500

※Please consult with us when you consider the rating other than a standard table.

### ◆PART NUMBERING SYSTEM



### ◆DIMENSIONS



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