

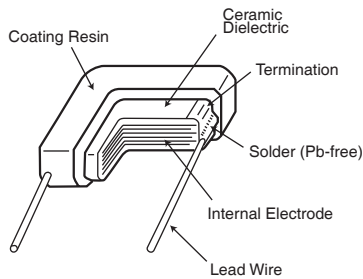
### ◆FEATURES

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. 500V<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%), K( $\pm$ 10%)
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"> <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"> <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"> <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"> <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)	Electrostatic Capacitance Temperature Characteristics	Dimensions(mm)					Maximum ripple current (Arms)	Part Number	Taping Quantity per reel (pcs. / reel)
			L max.	W max.	T max.	F±0.8	φd±0.05			
25	3.3	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD250B335□32A0T00	2,000
	4.7	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD250B475□32A0T00	2,000
	6.8	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD250B685□43A0T00	2,000
	10	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD250B106□43A0T00	2,000
	15	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD250B156□43A0T00	2,000
	15	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD250B156□55A0T00	2,000
	22	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD250B226□55A0T00	2,000
	33	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD250B336□55A0T00	2,000
	47	X7R	10.0	11.5	5.5	5.0	0.5	1.5	KTD250B476□76A0T00	1,000
	68	X7R	13.5	15.0	6.0	10.0	0.6	2.0	KTD250B686M80A0B00	—
	100	X7R	13.5	15.0	8.0	10.0	0.6	2.0	KTD250B107M80A0B00	—
	150	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD250B157M90A0B00	—
220	X7R	22.5	20.0	8.0	20.0	0.8	3.0	KTD250B227M90A0B00	—	
330	X7R	28.5	20.0	8.0	25.0	0.8	4.0	KTD250B337M99A0B00	—	
470	X7R	28.5	20.0	11.5	25.0	0.8	4.0	KTD250B477M99A0B00	—	
35	3.3	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD350B335□32A0T00	2,000
	4.7	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD350B475□32A0T00	2,000
	6.8	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD350B685□43A0T00	2,000
	10	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD350B106□43A0T00	2,000
	15	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD350B156□55A0T00	2,000
	22	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD350B226□55A0T00	2,000
	33	X7R	10.0	11.5	5.0	5.0	0.5	1.5	KTD350B336□76A0T00	1,000
47	X7R	10.0	11.5	5.5	5.0	0.5	1.5	KTD350B476□76A0T00	1,000	
50	1.0	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD500B105□32A0T00	2,000
	1.5	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD500B155□32A0T00	2,000
	2.2	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD500B225□32A0T00	2,000
	3.3	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD500B335□32A0T00	2,000
	4.7	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD500B475□43A0T00	2,000
	6.8	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD500B685□43A0T00	2,000
	10	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD500B106□55A0T00	2,000
	15	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD500B156□55A0T00	2,000
	22	X7R	10.0	11.5	5.0	5.0	0.5	1.5	KTD500B226□76A0T00	1,500
	33	X7R	13.5	15.0	5.5	10.0	0.6	2.0	KTD500B336M80A0B00	—
	47	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD500B476M90A0B00	—
	68	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD500B686M90A0B00	—
	100	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD500B107M90A0B00	—
	150	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD500B157M99A0B00	—
220	X7R	28.5	20.0	10.0	25.0	0.8	4.0	KTD500B227M99A0B00	—	
100	0.33	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B334□32A0T00	2,000
	0.47	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B474□32A0T00	2,000
	0.68	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B684□32A0T00	2,000
	1.0	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B105□32A0T00	2,000
	1.5	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B155□32A0T00	2,000
	2.2	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD101B225□32A0T00	2,000
	1.5	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD101B155□43A0T00	2,000
	2.2	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD101B225□43A0T00	2,000
	3.3	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD101B335□43A0T00	2,000
	4.7	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD101B475□43A0T00	2,000
	3.3	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD101B335□55A0T00	2,000
	4.7	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD101B475□55A0T00	2,000
	6.8	X7R	7.5	9.0	4.7	5.0	0.5	1.0	KTD101B685□55A0T00	2,000
	6.8	X7R	10.0	11.5	5.0	5.0	0.5	1.5	KTD101B685□76A0T00	1,500
	10	X7R	13.5	15.0	5.0	10.0	0.6	2.0	KTD101B106M80A0B00	—
	15	X7R	13.5	15.0	6.0	10.0	0.6	2.0	KTD101B156M80A0B00	—
	22	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD101B226M90A0B00	—
	33	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD101B336M90A0B00	—
	47	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD101B476M99A0B00	—
	68	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD101B686M99A0B00	—
100	X7R	28.5	20.0	9.0	25.0	0.8	4.0	KTD101B107M99A0B00	—	

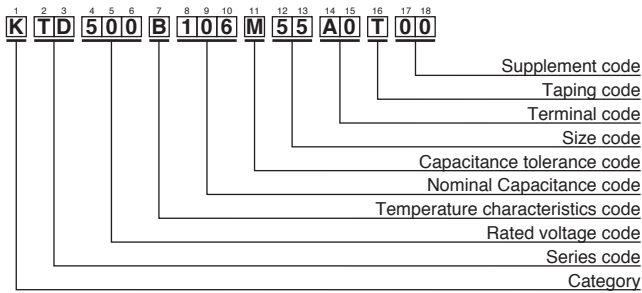
## NTD Series

### ◆ STANDARD RATINGS

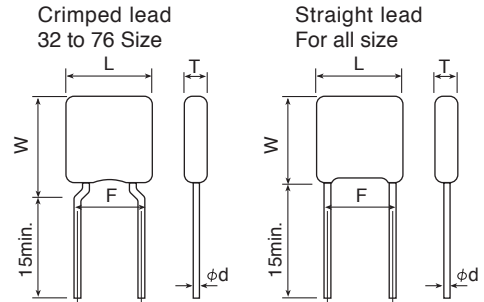
Rated voltage (Vdc)	Rated Capacitance (μF)	Electrostatic Capacitance Temperature Characteristics	Dimensions(mm)					Maximum ripple current (Arms)	Part Number	Taping Quantity per reel (pcs./reel)
			L max.	W max.	T max.	F±0.8	φd±0.05			
250	0.1	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD251B104□32A0T00	2,000
	0.15	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD251B154□32A0T00	2,000
	0.22	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD251B224□32A0T00	2,000
	0.33	X7R	5.0	6.0	3.5	5.0	0.5	0.3	KTD251B334□32A0T00	2,000
	0.47	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD251B474□43A0T00	2,000
	0.68	X7R	6.5	6.5	4.0	5.0	0.5	0.8	KTD251B684□43A0T00	2,000
	1.0	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD251B105□55A0T00	2,000
	1.5	X7R	7.5	9.0	4.5	5.0	0.5	1.0	KTD251B155□55A0T00	2,000
	2.2	X7R	10.0	11.5	6.0	5.0	0.5	1.5	KTD251B225□76A0T00	1,000
	2.2	X7R	13.5	15.0	5.0	10.0	0.6	2.0	KTD251B225M80A0B00	—
	3.3	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD251B335M90A0B00	—
	4.7	X7R	22.5	20.0	6.0	20.0	0.8	3.0	KTD251B475M90A0B00	—
	6.8	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD251B685M99A0B00	—
10	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD251B106M99A0B00	—	
15	X7R	28.5	20.0	7.5	25.0	0.8	4.0	KTD251B156M99A0B00	—	
500	0.47	X7R	7.5	9.0	3.5	5.0	0.5	0.8	KTD501B474□55A0T00	2,000
	0.56	X7R	7.5	9.0	3.5	5.0	0.5	0.8	KTD501B564□55A0T00	2,000
	0.68	X7R	10.0	11.5	3.4	5.0	0.5	1.0	KTD501B684□76A0T00	1,500
	1.0	X7R	10.0	11.5	3.8	5.0	0.5	1.0	KTD501B105□76A0T00	1,500
	1.2	X7R	10.0	11.5	4.2	5.0	0.5	1.0	KTD501B125□76A0T00	1,500

※ The square (□) in part numbers is replaced by a capacitance tolerance code: 'K' when ±10%, or 'M' when ±20%  
 ※ 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.



- Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.
- Request the Product Specification on the product of NIPPON CHEMI-CON CORPORATION to refer to it as well as this brochure prior to the order of the products. Some specific notes on use of the ordered product may be described in the specifications.
- The products listed in this catalog are designed and manufactured for general electronics equipment use and are not intended for use in applications that can adversely affect human life; where the malfunction of equipment may cause damage to life or property. In addition, our products are not intended to be used in specific applications that may cause a major social impact. Please consult with us in advance of usage of our products in the following listed applications. ① Aerospace equipment ② Power generation equipment such as thermal power, nuclear power etc. ③ Medical equipment ④ Transport equipment (automobiles, trains, ships, etc.) ⑤ Transportation control equipment ⑥ Disaster prevention / crime prevention equipment ⑦ Highly publicized information processing equipment ⑧ Submarine equipment ⑨ Other applications that are not considered general-purpose applications.
- The circuits described as examples in this catalog and the "delivery specifications" are featured in order to show the operations and usage of our products, however, this fact does not guarantee that the circuits are available to function in your equipment systems. We are not in any case responsible for any failures or damage caused by the use of information contained herein. You should examine our products, of which the characteristics are described in the "delivery specifications" and other documents, and determine whether or not our products suit your requirements according to the specifications of your equipment systems. Therefore, you bear final responsibility regarding the use of our products.  
Please make sure that you take appropriate safety measures such as use of redundant design and malfunction prevention measures in order to prevent fatal accidents and/or fires in the event any of our products malfunction.
- We strongly recommend our customers to purchase Nippon Chemi-Con products only through our official sales channels. We assume no responsibility for any defects or damages caused by using products purchased from outside our official sales channel or of counterfeit goods. In addition, we will ask the customer to pay the investigation cost for products purchased outside our official sales channel.
- We reserve the right to discontinue production and delivery of products. We do not guarantee that all the products included in this catalog will be available in the future.  
The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products
- We continually strive to improve the quality and reliability of our products, but in any case that our product does not meet our published specifications, please stop using it promptly and contact us immediately. As for compensation for non-conforming goods delivered by Chemi-Con, we will limit it only to goods found in non-compliance of our published specifications. This may be accomplished by a no cost replacement of non-conforming individual products, a credit of the piece price paid per each individual non-conforming product, or in other ways deemed necessary.  
In addition, we have an established system with enhanced traceability, therefore we will limit the applicable lot items for any potential compensation.

[Precautions and Guidelines](#) · [Recommended Soldering Conditions](#)

[Part Numbering System](#)

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[Characteristics Data](#)

[Minimum Packaging Quantity](#)