

## NTS Series / NTF Series

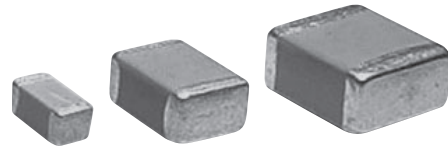
(General product)

Temperature cycle : 1000 cycles



### ◆FEATURES

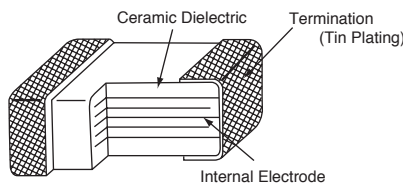
1. Large capacitance by small size.
2. X7R and X7S temperature characteristics.
3. High permissible ripple current capability.
4. NTF: Temperature cycle : 1000 cycles.



### ◆APPLICATIONS

1. Smoothing circuit of DC-DC converters.
2. On-board power supplies.
3. Voltage regulators for computers.
3. Noise suppressor for various kinds of equipments.
4. High reliability 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	0.010 to 47μF
4. Rated Capacitance Tolerance	M (±20%) : Standard, K (±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	No abnormality.	Rated voltage	Withstand voltage	
			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> (MΩ) or 4000(MΩ) whichever is less.	Rated voltage shall be applied for 60±5 seconds at temperature 25±2°C.		
3	Rated Capacitance	Within specified tolerance.	C <sub>R</sub> ≤10μF	C <sub>R</sub> >10μF	
			Temperature 25±2°C		
4	Dissipation Factor	X7R temperature characteristics of 5.0% or less X7S temperature characteristics of 7.5% or less	Frequency	1±0.1kHz	120±12Hz
			Voltage	1±0.2V <sub>rms</sub>	0.5±0.2V <sub>rms</sub>
5	Rated Ripple Current	See STANDARD RATINGS	10kHz~1MHz (sine curve) Ripple voltage V <sub>p</sub> shall be less than the rated voltage.		

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

## NTS Series / NTF Series

### ◆SPECIFICATIONS

No.	Items	Specification	Test Condition															
6	Adhesion	No visible damage.	<p>Substrate Capacitor 5N (0.51kgf) for 10±1 seconds</p>															
7	Bend strength of the face plating	Appearance : No visible damage. $\Delta C/C : \pm 15\%$	<p>The substrate shall be bend at a rate of 1mm/s for 5 seconds.</p> <p>Press Press bar Capacitor Substrate Support Bending capability*</p> <p>*Bending capability NTS : 1mm NTF : 1mm or 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> </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 visible damage. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification.	<p>Preheating Condition :</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>100±10°C</td> <td>2min.</td> </tr> <tr> <td>2</td> <td>200±10°C</td> <td>2min.</td> </tr> </tbody> </table> <p>Solder Temperature : 260±5°C Dipping Time : 2±0.5 seconds</p>	Step	Temperature	Time	1	100±10°C	2min.	2	200±10°C	2min.						
Step	Temperature	Time																
1	100±10°C	2min.																
2	200±10°C	2min.																
10	Temperature Cycle	Appearance : No visible damage. $\Delta C/C : \pm 15\%$ 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> <p>For above temperature cycle. NTS : For 5 cycles NTF : For 1000 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. $\Delta C/C : \pm 15\%$ I.R. : 25/C <sub>R</sub> (MΩ) or 1000(MΩ) whichever is less. Dissipation Factor X7R temperature characteristics D.F: 10% or less X7S temperature characteristics D.F: 15% or less	<p>Temperature : 40±2°C Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500±<sup>24</sup><sub>0</sub>hours</p>															
12	Endurance	Appearance : No abnormality. $\Delta C/C : \pm 15\%$ I.R. : 50/C <sub>R</sub> (MΩ) or 1000(MΩ) whichever is less. Dissipation Factor X7R temperature characteristics D.F: 10% or less X7S temperature characteristics D.F: 15% or less	<p>Temperature : 125±3°C Voltage : Rated voltage Time : 1000±<sup>48</sup><sub>0</sub>hours</p>															

\*C<sub>R</sub> : Rated Capacitance(μF)



# MULTILAYER CERAMIC CHIP CAPACITORS

**NTS** 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	W	T max.	a												
25	1.0	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS250B105M31N0T00	3,000									
	1.5	X7R						KTS250B155M31N0T00	3,000									
	2.2	X7R						KTS250B225M31N0T00	3,000									
	3.3	X7S						KTS250B335M31N0T00	2,000									
	3.3	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS250B335M32N0T00	1,600									
	4.7	X7R						KTS250B475M32N0T00	1,600									
	6.8	X7R						KTS250B685M32N0T00	1,600									
	10	X7S						KTS250S106M32N0T00	1,600									
	10	X7R	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS250B106M43N0T00	800									
	15	X7R						KTS250B156M43N0T00	800									
	22	X7S						KTS250S226M43N0T00	800									
	22	X7R						KTS250B226M55N0T00	800									
	33	X7R	5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS250B336M55N0T00	800									
	33	X7R			3.0			KTS250B336M55N0T00	800									
47	X7R	7.5±0.5	6.3±0.5	4.0	1.0±0.5	3.0	KTS250B476M76N0T00	300										
35	1.0	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS350B105M31N0T00	3,000									
	1.5	X7R						KTS350B155M31N0T00	3,000									
	2.2	X7R						KTS350B225M31N0T00	3,000									
	3.3	X7R						KTS350B335M32N0T00	1,600									
	4.7	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS350B475M32N0T00	1,600									
	6.8	X7R						KTS350B685M43N0T00	800									
	10	X7R						KTS350B106M43N0T00	800									
	15	X7R						KTS350B156M55N0T00	800									
	22	X7R	5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS350B226M55N0T00	800									
	33	X7R						KTS350B336M76N0T00	300									
	47	X7R	7.5±0.5	6.3±0.5	4.0	1.0±0.5	3.0	KTS350B476M76N0T00	300									
	50	0.33	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS500B334M31N0T00	3,000								
		0.47	X7R						KTS500B474M31N0T00	3,000								
		0.68	X7R						KTS500B684M31N0T00	3,000								
1.0		X7R	KTS500B105M31N0T00						3,000									
1.5		X7R	KTS500B155M31N0T00						2,000									
2.2		X7R	KTS500B225M31N0T00						2,000									
1.5		X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS500B155M32N0T00	1,600									
2.2		X7R						KTS500B225M32N0T00	1,600									
3.3		X7R						KTS500B335M32N0T00	1,600									
4.7		X7R						KTS500B475M32N0T00	1,600									
4.7		X7R						KTS500B475M43N0T00	800									
6.8		X7R						KTS500B685M43N0T00	800									
10		X7R	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS500B106M43N0T00	800									
10		X7R						KTS500B106M55N0T00	800									
15		X7R						KTS500B156M55N0T00	800									
22		X7R						KTS500B226M76N0T00	300									
0.1		X7R						3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS101B104M31N0T00	3,000				
0.15		X7R											KTS101B154M31N0T00	3,000				
0.22	X7R	KTS101B224M31N0T00	3,000															
0.33	X7R	KTS101B334M31N0T00	3,000															
0.47	X7R	KTS101B474M31N0T00	3,000															
0.68	X7R	KTS101B684M31N0T00	3,000															
1.0	X7R	KTS101B105M31N0T00	2,000															
1.5	X7R	KTS101B155M31N0T00	2,000															
2.2	X7R	KTS101B225M31N0T00	2,000															
1.0	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS101B105M32N0T00						1,600					
1.5	X7R						KTS101B155M32N0T00						1,600					
2.2	X7R						KTS101B225M32N0T00						1,600					
3.3	X7R						KTS101B335M32N0T00						1,600					
1.5	X7R						4.5±0.4						3.2±0.4	2.8	0.6±0.3	1.0	KTS101B155M43N0T00	800
2.2	X7R																KTS101B225M43N0T00	800
3.3	X7R	KTS101B335M43J0T00	800															
4.7	X7R	KTS101B475M43E0T00	800															
6.8	X7R	5.7±0.4	5.0±0.4	2.8	0.6±0.3	1.0	KTS101B685M43N0T00						800					
3.3	X7R						KTS101B335M55N0T00	800										
4.7	X7R						KTS101B475M55N0T00	800										
6.8	X7R						KTS101B685M55F0T00	800										
10	X7R						KTS101B106M55NH0T00	800										
6.8	X7R						7.5±0.5	6.3±0.5	3.5	1.0±0.5	3.0	KTS101B685M76N0T00	300					

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

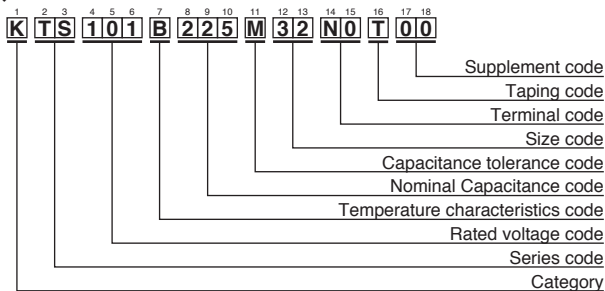
## NTS Series

### ◆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	W	Tmax.	a			
250	0.01	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS251B103M31N0T00	3,000
	0.022	X7R						KTS251B223M31N0T00	3,000
	0.033	X7R						KTS251B333M31N0T00	3,000
	0.047	X7R						KTS251B473M31N0T00	3,000
	0.068	X7R						KTS251B683M31N0T00	3,000
	0.1	X7R						KTS251B104M31N0T00	3,000
	0.15	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS251B154M32N0T00	1,600
	0.22	X7R						KTS251B224M32N0T00	1,600
	0.33	X7R						KTS251B334M32N0T00	1,600
	0.47	X7R	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS251B474M43N0T00	800
	0.68	X7R						KTS251B684M43N0T00	800
	1.0	X7R	5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS251B105M55N0T00	800
	1.5	X7R						KTS251B155M55N0T00	800
	1.5	X7R	7.5±0.5	6.3±0.5	3.5	1.0±0.5	3.0	KTS251B155M76N0T00	300
2.2	X7R	5.0			KTS251B225M76N0T00			300	
500	0.47	X7R	5.7±0.4	5.0±0.4	2.7	0.8±0.5	1.5	KTS501B474M55N0T00	800
	0.56	X7R			3.0			KTS501B564M55N0T00	800
	0.68	X7R	7.5±0.5	6.3±0.5	2.5	1.0±0.5	2.0	KTS501B684M76N0T00	500
	1.0	X7R			3.2			KTS501B105M76N0T00	300
					3.5				
	1.2	X7R						KTS501B125M76N0T00	300

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

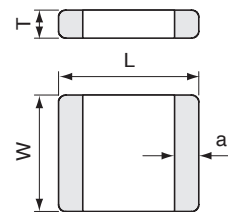
### ◆PART NUMBERING SYSTEM



Size Code

Size Code	Code	
	JIS	EIA
31	3216	1206
32	3225	1210
43	4532	1812
55	5750	2220
76	7563	3025

### ◆DIMENSIONS



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

### ◆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	W	T max.	a								
25	1.0	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTF250B105M31NLT00	3,000					
	1.5	X7R						KTF250B155M31NLT00	3,000					
	2.2	X7R						KTF250B225M31NLT00	3,000					
	3.3	X7S						KTF250S335M31NLT00	2,000					
	3.3	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTF250B335M32NHT00	1,600					
	4.7	X7R						KTF250B475M32NHT00	1,600					
	6.8	X7R						KTF250B685M32NHT00	1,600					
	10	X7S						KTF250S106M32NHT00	1,600					
	10	X7R	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTF250B106M43NHT00	800					
	15	X7R						KTF250B156M43NHT00	800					
	22	X7S						KTF250S226M43NHT00	800					
	22	X7R						5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTF250B226M55NHT00	800
	33	X7R	KTF250B336M55NHT00	800										
	47	X7R	7.5±0.5	6.3±0.5	4.0	1.0±0.5	3.0	KTF250B476M76NHT00	300					
35	1.0	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTF350B105M31NLT00	3,000					
	1.5	X7R						KTF350B155M31NLT00	3,000					
	2.2	X7R						KTF350B225M31NLT00	3,000					
	3.3	X7R						KTF350B335M32NHT00	1,600					
	4.7	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTF350B475M32NHT00	1,600					
	6.8	X7R						KTF350B685M43NHT00	800					
	10	X7R						KTF350B106M43NHT00	800					
	15	X7R						4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTF350B156M55NHT00	800
	22	X7R	KTF350B226M55NHT00	800										
	50	0.33	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTF500B334M31NLT00	3,000				
0.47		X7R	KTF500B474M31NLT00						3,000					
0.68		X7R	KTF500B684M31NLT00						3,000					
1.0		X7R	KTF500B105M31NLT00						3,000					
1.5		X7R	KTF500B155M31NLT00						2,000					
2.2		X7R	KTF500B225M31NLT00						2,000					
1.5		X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTF500B155M32NHT00	1,600					
2.2		X7R						KTF500B225M32NHT00	1,600					
3.3		X7R						KTF500B335M32NHT00	1,600					
4.7		X7R						KTF500B475M32NHT00	1,600					
4.7		X7R						KTF500B475M43NHT00	800					
6.8		X7R						KTS500B685M43NHT00	800					
10		X7R	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTF500B106M43NHT00	800					
10		X7R						KTF500B106M55NHT00	800					
15		X7R						5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTF500B156M55NHT00	800
22		X7R											KTF500B226M76NHT00	300
100	0.1	X7R	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTF101B104M31NLT00	3,000					
	0.15	X7R						KTF101B154M31NLT00	3,000					
	0.22	X7R						KTF101B224M31NLT00	3,000					
	0.33	X7R						KTF101B334M31NLT00	3,000					
	0.47	X7R						KTF101B474M31NLT00	3,000					
	0.68	X7R						KTF101B684M31NIT00	3,000					
	1.0	X7R						KTF101B105M31NLT00	2,000					
	1.5	X7R						KTF101B155M31NLT00	2,000					
	2.2	X7R	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTF101B225M31NLT00	2,000					
	1.0	X7R						KTF101B105M32NHT00	1,600					
	1.5	X7R						KTF101B155M32NHT00	1,600					
	2.2	X7R						KTF101B225M32NHT00	1,600					
	3.3	X7R						KTF101B335M32NHT00	1,600					
	1.5	X7R						4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTF101B155M43NHT00	800
	2.2	X7R	KTF101B225M43NHT00	800										
	3.3	X7R	KTF101B335M43JHT00	800										
	4.7	X7R	KTF101B475M43EHT00	800										
	6.8	X7R	5.7±0.4	5.0±0.4	2.8	0.6±0.3	1.0	KTF101B685M43NHT00	800					
	4.7	X7R						2.8	0.8±0.5	2.0	KTF101B475M55NHT00	800		
	6.8	X7R									KTF101B685M55FHT00	800		
	10	X7R						2.8	1.0±0.4		KTF101B106M55NHT00	800		

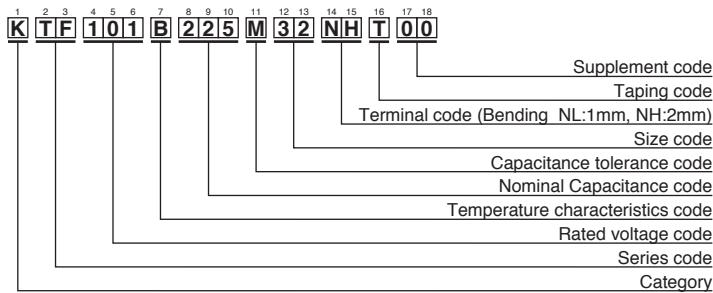
\*Please consult with us when you consider the rating other than a standard table.

◆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	W	Tmax.	a			
250	0.033	X7R	3.2±0.3	1.6±0.2	1.8	0.7±0.2	0.3	KTF251B333M31NLT00	3,000
	0.047	X7R						KTF251B473M31NLT00	3,000
	0.068	X7R						KTF251B683M31NLT00	3,000
	0.1	X7R						KTF251B104M31NLT00	3,000
	0.15	X7R	3.2±0.4	2.5±0.3	2.6	0.7±0.2	0.5	KTF251B154M32NLT00	1,600
	0.22	X7R						KTF251B224M32NLT00	1,600
	0.33	X7R						KTF251B334M32NLT00	1,600
	0.47	X7R	4.5±0.4	3.2±0.4	2.8	0.7±0.2	1.0	KTF251B474M43NLT00	800
	0.68	X7R						KTF251B684M43NLT00	800
	500	1.0	X7R	5.7±0.4	5.0±0.4	2.8	1.0±0.4	2.0	KTF251B105M55NLT00
1.5		X7R	KTF251B155M55NLT00						800
0.47		X7R	5.7±0.4	5.0±0.4	2.7	1.5	KTF501B474M55NLT00	800	
0.56		X7R			3.0		KTF501B564M55NLT00	800	

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

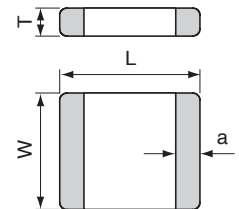
◆PART NUMBERING SYSTEM



Size Code

Size Code	Code	
	JIS	EIA
31	3216	1206
32	3225	1210
43	4532	1812
55	5750	2220
76	7563	3025

◆DIMENSIONS



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