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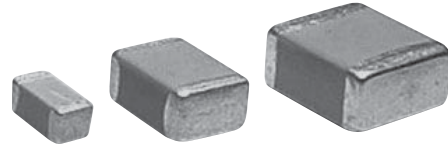
## NTS Series / NTF Series



Temperature cycle : 1000 cycles

### ◆FEATURES

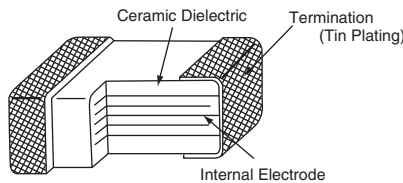
1. Large capacitance by small size.
2. Excellent noise absorption.
3. High permissible ripple current capability.
4. NTF: Temperature cycle : 1000 cycles.



### ◆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, 50, 100, 250V <sub>dc</sub>
3. Rated Capacitance Range	0.033 to 33μF
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.	250% of rated voltage shall be applied for 5 seconds. (Only 250V <sub>dc</sub> product : 475V)												
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.	<table border="1"> <tr> <td></td> <td>C<sub>R</sub>≤10μF</td> <td>C<sub>R</sub>&gt;10μF</td> </tr> <tr> <td>Temperature</td> <td colspan="2">25±2°C</td> </tr> <tr> <td>Frequency</td> <td>1±0.1kHz</td> <td>120±12Hz</td> </tr> <tr> <td>Voltage</td> <td>1±0.2V<sub>rms</sub></td> <td>0.5±0.2V<sub>rms</sub></td> </tr> </table>		C <sub>R</sub> ≤10μF	C <sub>R</sub> >10μF	Temperature	25±2°C		Frequency	1±0.1kHz	120±12Hz	Voltage	1±0.2V <sub>rms</sub>	0.5±0.2V <sub>rms</sub>
	C <sub>R</sub> ≤10μF	C <sub>R</sub> >10μF													
Temperature	25±2°C														
Frequency	1±0.1kHz	120±12Hz													
Voltage	1±0.2V <sub>rms</sub>	0.5±0.2V <sub>rms</sub>													
4	Dissipation Factor	5.0% maximum.	<table border="1"> <tr> <td>Frequency</td> <td>1±0.1kHz</td> <td>120±12Hz</td> </tr> <tr> <td>Voltage</td> <td>1±0.2V<sub>rms</sub></td> <td>0.5±0.2V<sub>rms</sub></td> </tr> </table>	Frequency	1±0.1kHz	120±12Hz	Voltage	1±0.2V <sub>rms</sub>	0.5±0.2V <sub>rms</sub>						
Frequency	1±0.1kHz	120±12Hz													
Voltage	1±0.2V <sub>rms</sub>	0.5±0.2V <sub>rms</sub>													
5	Rated Ripple Current	<table border="1"> <tr> <td>Size code</td> <td>31</td> <td>32</td> <td>43</td> <td>55</td> </tr> <tr> <td>Arms</td> <td>0.3</td> <td>0.5</td> <td>1.0</td> <td>2.0</td> </tr> </table>	Size code	31	32	43	55	Arms	0.3	0.5	1.0	2.0	10kHz~1MHz (sine curve) Ripple voltage V <sub>p</sub> shall be less than the rated voltage.		
Size code	31	32	43	55											
Arms	0.3	0.5	1.0	2.0											

## NTS Series / NTF Series

### ◆SPECIFICATIONS

No.	Items	Specification	Test Condition															
6	Adhesion	No visible damage.	<p>Substrate 5N (0.51kgf) for 10±1 seconds Capacitor</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> <th>Eutectic</th> </tr> </thead> <tbody> <tr> <td>Solder Temperature</td> <td>245±5°C</td> <td>235±5°C</td> </tr> <tr> <td>Dipping Time</td> <td colspan="2">2±0.5sec.</td> </tr> </tbody> </table>	Solder	Pb Free	Eutectic	Solder Temperature	245±5°C	235±5°C	Dipping Time	2±0.5sec.							
Solder	Pb Free	Eutectic																
Solder Temperature	245±5°C	235±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>Solder Temperature : 260±5°C Dipping Time : 2±0.5 seconds</p>															
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. $\Delta C/C : \pm 15\%$ D.F. : 10% maximum I.R. : 25/C <sub>R</sub> (MΩ) or 1000(MΩ) whichever is 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. $\Delta C/C : \pm 15\%$ D.F. : 10% maximum I.R. : 50/C <sub>R</sub> (MΩ) or 1000(MΩ) whichever is less.	<p>Temperature : 125±3°C Voltage : Rated voltage Time : 1000±<sup>48</sup><sub>0</sub>hours</p>															

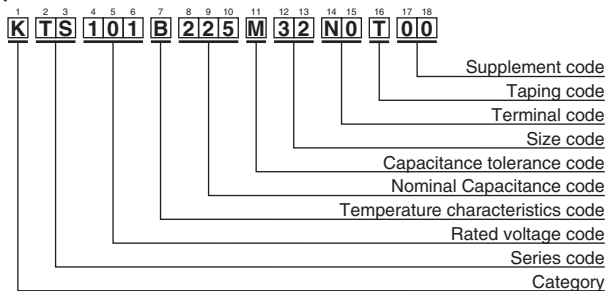
\*C<sub>R</sub> : Rated Capacitance(μF)

### ◆STANDARD RATINGS

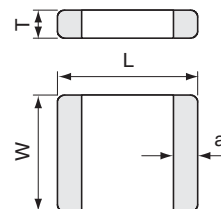
Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Maximum ripple current (Arms)	Part Number	Previous Part Number (Just for your reference)	
		L	W	Tmax.	a				
25	1.0	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS250B105M31N0T00	NTS30X7R1E105MT	
	1.5						KTS250B155M31N0T00	NTS30X7R1E155MT	
	2.2						KTS250B225M31N0T00	NTS30X7R1E225MT	
	3.3	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS250B335M32N0T00	NTS40X7R1E335MT	
	4.7						KTS250B475M32N0T00	NTS40X7R1E475MT	
	6.8						KTS250B685M32N0T00	NTS40X7R1E685MT	
	10	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS250B106M43N0T00	NTS50X7R1E106MT	
	15						KTS250B156M43N0T00	NTS50X7R1E156MT	
	22						5.7±0.4	5.0±0.4	2.8
	33	3.0	KTS250B336M55N0T00	NTS60X7R1E336MT					
50	0.33	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS500B334M31N0T00	NTS30X7R1H334MT	
	0.47						KTS500B474M31N0T00	NTS30X7R1H474MT	
	0.68						KTS500B684M31N0T00	NTS30X7R1H684MT	
	1.0						KTS500B105M31N0T00	NTS30X7R1H105MT	
	1.5	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS500B155M32N0T00	NTS40X7R1H155MT	
	2.2						KTS500B225M32N0T00	NTS40X7R1H225MT	
	3.3						KTS500B335M32N0T00	NTS40X7R1H335MT	
	4.7	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS500B475M43N0T00	NTS50X7R1H475MT	
	6.8						KTS500B685M43N0T00	NTS50X7R1H685MT	
	10						KTS500B106M55N0T00	NTS60X7R1H106MT	
	15	5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS500B156M55N0T00	NTS60X7R1H156MT	
	22						KTS500B226M55N0T00	NTS60X7R1H226MT	
	100	0.1	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS101B104M31N0T00	NTS30X7R2A104MT
0.15		KTS101B154M31N0T00						NTS30X7R2A154MT	
0.22		KTS101B224M31N0T00						NTS30X7R2A224MT	
0.33		KTS101B334M31N0T00						NTS30X7R2A334MT	
0.47		KTS101B474M31N0T00						NTS30X7R2A474MT	
0.68		KTS101B684M31N0T00						NTS30X7R2A684MT	
1.0		3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS101B105M32N0T00	NTS40X7R2A105MT	
1.5							KTS101B155M32N0T00	NTS40X7R2A155MT	
2.2							KTS101B225M32N0T00	NTS40X7R2A225MT	
1.5		4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS101B155M43N0T00	NTS50X7R2A155MT	
2.2							KTS101B225M43N0T00	NTS50X7R2A225MT	
3.3			3.2±0.5	3.2	2.8	0.8±0.5	2.0	KTS101B335M43J0T00	—
4.7		KTS101B475M43E0T00						—	
3.3		5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS101B335M55N0T00	—	
4.7							KTS101B475M55N0T00	—	
6.8							KTS101B685M55F0T00	—	
250		0.033	3.2±0.2	1.6±0.2	1.8	0.5±0.3	0.3	KTS251B333M31N0T00	NTS30X7R2E333MT
		0.047						KTS251B473M31N0T00	NTS30X7R2E473MT
		0.068						KTS251B683M31N0T00	NTS30X7R2E683MT
	0.1	KTS251B104M31N0T00						NTS30X7R2E104MT	
	0.15	3.2±0.4	2.5±0.3	2.6	0.6±0.3	0.5	KTS251B154M32N0T00	NTS40X7R2E154MT	
	0.22						KTS251B224M32N0T00	NTS40X7R2E224MT	
	0.33						KTS251B334M32N0T00	NTS40X7R2E334MT	
	0.47	4.5±0.4	3.2±0.4	2.8	0.6±0.3	1.0	KTS251B474M43N0T00	NTS50X7R2E474MT	
	0.68						KTS251B684M43N0T00	NTS50X7R2E684MT	
	1.0						KTS251B105M55N0T00	NTS60X7R2E105MT	
	1.5	5.7±0.4	5.0±0.4	2.8	0.8±0.5	2.0	KTS251B155M55N0T00	NTS60X7R2E155MT	
	2.2						KTS251B225M55N0T00	NTS60X7R2E225MT	

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

### ◆PART NUMBERING SYSTEM



### ◆DIMENSIONS



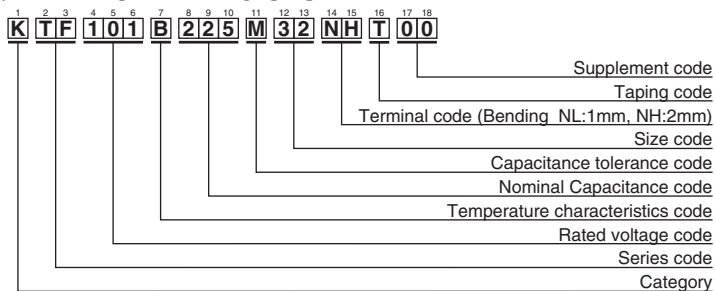
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### ◆STANDARD RATINGS

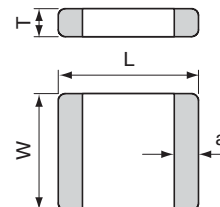
Rated voltage (Vdc)	Rated Capacitance (μF)	Dimensions(mm)				Maximum ripple current (Arms)	Part Number
		L	W	Tmax.	a		
25	1.0	3.2±0.3	1.6±0.2	1.8	0.7±0.2	0.3	KTF250B105M31NLT00
	1.5						KTF250B155M31NLT00
	2.2						KTF250B225M31NLT00
	3.3	3.2±0.4	2.5±0.3	2.6	0.7±0.2	0.5	KTF250B335M32NHT00
	4.7						KTF250B475M32NHT00
	6.8						KTF250B685M32NHT00
	10	4.5±0.4	3.2±0.4	2.8	0.7±0.2	1.0	KTF250B106M43NHT00
	15						KTF250B156M43NHT00
	22						5.7±0.4
	33	3.0	KTF250B336M55NHT00				
50	0.33	3.2±0.3	1.6±0.2	1.8	0.7±0.2	0.3	KTF500B334M31NLT00
	0.47						KTF500B474M31NLT00
	0.68						KTF500B684M31NLT00
	1.0						KTF500B105M31NLT00
	1.5	3.2±0.4	2.5±0.3	2.6	0.7±0.2	0.5	KTF500B155M32NHT00
	2.2						KTF500B225M32NHT00
	3.3						KTF500B335M32NHT00
	4.7	4.5±0.4	3.2±0.4	2.8	0.7±0.2	1.0	KTF500B475M43NHT00
	6.8						KTF500B685M43NHT00
	10						5.7±0.4
15	KTF500B156M55NHT00						
100	0.1	3.2±0.3	1.6±0.2	1.8	0.7±0.2	0.3	KTF101B104M31NLT00
	0.15						KTF101B154M31NLT00
	0.22						KTF101B224M31NLT00
	0.33						KTF101B334M31NLT00
	0.47						KTF101B474M31NLT00
	0.68						KTF101B684M31NLT00
	1.0	3.2±0.4	2.5±0.3	2.6	0.7±0.2	0.5	KTF101B105M32NHT00
	1.5						KTF101B155M32NHT00
	2.2						KTF101B225M32NHT00
	1.5	4.5±0.4	3.2±0.4	2.8	0.7±0.2	1.0	KTF101B155M43NHT00
	2.2						KTF101B225M43NHT00
	3.3						KTF101B335M43JHT00
	4.7	5.7±0.4	5.0±0.4	3.2	1.0±0.4	2.0	KTF101B475M43EHT00
	4.7			2.8			KTF101B475M55NHT00
	6.8			3.2			KTF101B685M55FHT00
	250	0.033	3.2±0.3	1.6±0.2	1.8	0.7±0.2	0.3
0.047		KTF251B473M31NLT00					
0.068		KTF251B683M31NLT00					
0.1		KTF251B104M31NLT00					
0.15		3.2±0.4	2.5±0.3	2.6	0.7±0.2	0.5	KTF251B154M32NLT00
0.22							KTF251B224M32NLT00
0.33							KTF251B334M32NLT00
0.47		4.5±0.4	3.2±0.4	2.8	0.7±0.2	1.0	KTF251B474M43NLT00
0.68							KTF251B684M43NLT00
1.0							5.7±0.4
1.5	KTF251B155M55NLT00						

※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.