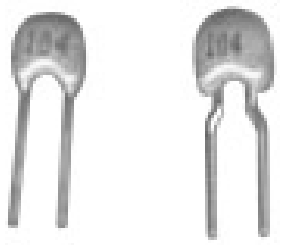
Multilayer Ceramic Capacitor - Radial Leaded Type

Features

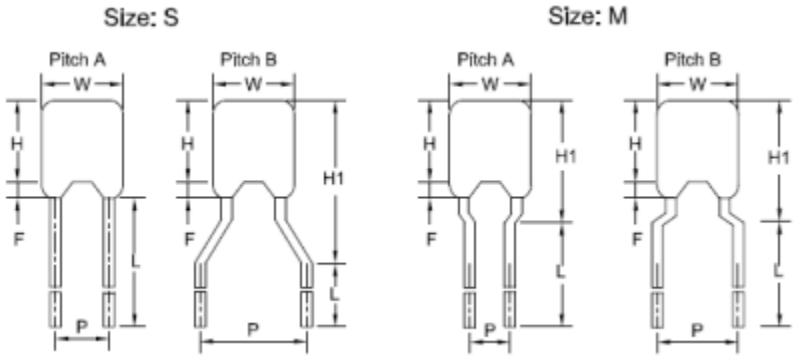


- Superior moisture and shock resistant epoxy coating
- Available in bulk, tape& reel, or ammo packing

Applications

- Bypassing
- Coupling and Decoupling
- Filtering

Dimensions (in mm)



Size	Chip Size	Pitch Code	Lead Spacing (P)	W Max.	H Max.	T Max.	H1 Max.	F Max.	Lead Diameter (dØ)	Lead Length (L)
S	0603/ 0805	A	2.5±0.25	3.8	3.8	2.5	----	1.5	0.5±0.05	6.0±0.5 for bulk packing 16.0±0.5 for tape packing 28.0±1.0 for special bulk packing
		B	5.0±0.50				7.6			
M	1206	A	2.5±0.25	5.0	5.0	3.0	7.6			
		B	5.0±0.50							

TMR Series

Class I: NPO Dielectric

Description	Symbol	Value	Condition
Operation Temperature Range	T_{OP}	-55 ~ +125 °C	
Temperature Coefficient		0 ± 30 ppm/°C	
Capacitance Range	C_R	10 pF ~ 1,000 pF	1 ± 0.2 Vrms at 25°C and 1MHz
		1,200 pF ~0.01μF	1 ± 0.2 Vrms at 25°C and 1KHz
Capacitance Tolerance		± 5%(J)	
Rated Voltage	U_{RDC}	50/100/200V	
Max. Dissipation Factor	tan δ	0.1%	1 ± 0.2 Vrms at 25°C and 1MHz for 10 pF ~ 1,000 pF
			1 ± 0.2 Vrms at 25°C and 1KHz for 1,200 pF ~0.01μF
Insulation Resistance (Note)	R_{INS}	≥10 GΩ or 500 MΩ*μF Whichever is less	Rated voltage applied at 25°C, Test Time: 120 sec
Withstanding Voltage	U_{OL}	2.5 x U_R	Charging/discharging Current < 50mA for 1 □ 5 sec

Note: For example, IR(.47μF)=500MΩ*μF=500MΩ*(1/.47μF)(μF)=500MΩ*2.13=1064MΩ=1.06GΩ.

Size and Capitance Specifications

Cap. Value	Cap. Code	S			M			Cap. Value	Cap. Code	S			M		
		50V	100V	200V	50V	100V	200V			50V	100V	200V	50V	100V	200V
10 pF	100	■	■	■	■	■	■	560 pF	561	■	■	■	■	■	■
18 pF	180	■	■	■	■	■	■	1000 pF	102	■	■	■	■	■	■
22 pF	220	■	■	■	■	■	■	1200 pF	122	■	■		■	■	■
30 pF	300	■	■	■	■	■	■	1500 pF	152	■	■		■	■	■
33 pF	330	■	■	■	■	■	■	2200 pF	222	■	■		■	■	■
39 pF	390	■	■	■	■	■	■	2700 pF	272	■	■		■	■	■
47 pF	470	■	■	■	■	■	■	3300 pF	332	■	■		■	■	■
56 pF	560	■	■	■	■	■	■	3900 pF	392	■	■		■	■	■
68 pF	680	■	■	■	■	■	■	4700 pF	472	■	■		■	■	■
100 pF	101	■	■	■	■	■	■	5600 pF	562	■	■		■	■	
180 pF	181	■	■	■	■	■	■	6800 pF	682	■	■		■	■	
220 pF	221	■	■	■	■	■	■	8200 pF	822	■	■		■	■	
390 pF	391	■	■	■	■	■	■	0.01 μF	103	■	■		■	■	
470 pF	471	■	■	■	■	■	■								

Note： Please consult factory if other capacitance or tolerance or voltage is required.

TMR Series

Class II: X7R Dielectric

Description	Symbol	Value	Condition
Operation Temperature Range	T_{OP}	-55 ~ +125 °C	
Temperature Coefficient	ΔC/C(25°C)	± 15%	
Capacitance Range	C_R	220 pF ~10 μF	1 ± 0.2 Vrms at 25°C and 1KHz
Capacitance Tolerance		± 5%(J), 10%(K), 20%(M)	
Rated Voltage	U_R	50/100/200V	
Max. Dissipation Factor	tan δ	3.0%	1 ± 0.2 Vrms at 25°C and 1KHz
Insulation Resistance (Note)	R_{INS}	≥10 GΩ or 500 MΩ*μF Whichever is less	Rated voltage applied at 25°C Test Time: 120 sec
Withstanding Voltage	U_{OL}	2.5 x U_R	Charging/discharging Current < 50mA for 1 □ 5 sec

Note: For example, IR(.47μF)=500MΩ*μF=500MΩ*(1/.47μF)(μF)=500MΩ*2.13=1064MΩ=1.06GΩ.

Size and Capitance Specifications

Cap. Value	Cap. Code	S			M			Cap. Value	Cap. Code	S			M		
		50V	100V	200V	50V	100V	200V			50V	100V	200V	50V	100V	200V
220 pF	221	■	■	■	■	■	■	0.022 μF	223	■	■	■	■	■	■
390 pF	391	■	■	■	■	■	■	0.027 μF	273	■	■	■	■	■	■
470 pF	471	■	■	■	■	■	■	0.033 μF	333	■	■	■	■	■	■
560 pF	561	■	■	■	■	■	■	0.039 μF	393	■	■		■	■	■
1000 pF	102	■	■	■	■	■	■	0.047 μF	473	■	■		■	■	■
1200 pF	122	■	■	■	■	■	■	0.056 μF	563	■	■		■	■	■
1500 pF	152	■	■	■	■	■	■	0.068 μF	683	■	■		■	■	■
2200 pF	222	■	■	■	■	■	■	0.082 μF	823	■	■		■	■	■
2700 pF	272	■	■	■	■	■	■	0.1 μF	104	■	■		■	■	■
3300 pF	332	■	■	■	■	■	■	0.15 μF	154	■	■		■	■	
3900 pF	392	■	■	■	■	■	■	0.18 μF	184	■	■		■	■	
4700 pF	472	■	■	■	■	■	■	0.22 μF	224	■	■		■	■	
5600 pF	562	■	■	■	■	■	■	0.33 μF	334	■			■	■	
6800 pF	682	■	■	■	■	■	■	0.47 μF	474	■			■		
8200 pF	822	■	■	■	■	■	■	0.68 μF	684	■			■		
0.01 μF	103	■	■	■	■	■	■	1.0 μF	105	■			■		
0.012 μF	123	■	■	■	■	■	■	2.2 μF	225				■		
0.015 μF	153	■	■	■	■	■	■	10 μF	106				■		

Note： Please consult factory if other capacitance or tolerance or voltage is required.

TMR Series

Class II: Y5V Dielectric

Description	Symbol	Value	Condition
Operation Temperature Range	T_{OP}	-30 ~ +85 °C	
Temperature Coefficient	ΔC/C(25°C)	- 82% ~+ 22%	
Capacitance Range	C_R	1000 pF ~ 10 μF	1 ± 0.2 Vrms at 25°C and 1KHz
Capacitance Tolerance		± 20%(M), +80%/-20%(Z)	
Rated Voltage	U_R	50/100V	
Max. Dissipation Factor	tan δ	5.0%	1 ± 0.2 Vrms at 25°C and 1KHz
Insulation Resistance (Note)	R_{INS}	≥10 GΩ or 100 MΩ*μF Whichever is less	Rated voltage applied at 25°C Test Time: 120 sec
Withstanding Voltage	U_{OL}	2.5 x U_R	Charging/discharging Current < 50mA for 1 □ 5 sec

Note: For example, IR(.47μF)=500MΩ*μF=500MΩ*(1/.47μF)(μF)=500MΩ*2.13=1064MΩ=1.06GΩ.

Size and Capitance Specifications

Cap. Value	Cap. Code	S		Cap. Value	Cap. Code	S	
		50V	100V			50V	100V
1000 pF	102			0.033 μF	333		
1200 pF	122			0.039 μF	393		
1500 pF	152			0.047 μF	473		
2200 pF	222			0.056 μF	563		
2700 pF	272			0.068 μF	683		
3300 pF	332			0.082 μF	823		
3900 pF	392			0.1 μF	104		
4700 pF	472			0.15 μF	154		
5600 pF	562			0.18 μF	184		
6800 pF	682			0.22 μF	224		
8200 pF	822			0.33 μF	334		
0.01 μF	103			0.47 μF	474		
0.012 μF	123			0.68 μF	684		
0.015 μF	153			1.0 μF	105		
0.022 μF	223			2.2 μF	225		
0.027 μF	273			10 μF	106		
Note： Please consult factory if other capacitance or tolerance or voltage is required.							

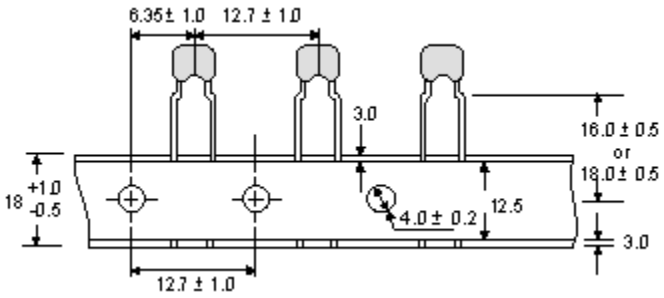
Reliability Test Condition

<table>
<tr><th>No</th><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>1</td><td>Solderability</td><td>Lead wire shall be soldered with uniformly coated on the Axial or Radial direction over 95% of the circumferential direction.</td><td>The lead wire of a capacitor shall be dipped into a rosin and then into molten solder of 235±5℃ for 5 seconds, in both cases the depth of dipping is up to about 2.5 to 3.0 mm from the root of lead wires.</td></tr>
<tr><td>2</td><td>Resistance to Soldering Heat</td><td>1. Appearance：No marked defect
2. Capacitance change：
<table>
<tr><td></td><td>NPO</td><td>X7R</td><td>Y5V</td></tr>
<tr><td>ΔC/C</td><td>≦ ±0.5%,or ±0.5pF</td><td>≦ ±7.5%</td><td>≦ ±20%</td></tr>
</table></td><td>The lead wire shall be immersed into the melted solder of 265±5℃, up to about 2.5 to 3.0 mm from the main body and the specified items shall be measured after leaving for 24±2 hours.</td></tr>
<tr><td>3</td><td>Life Test</td><td>1. Appearance：No marked defect
2. Change value：
<table>
<tr><td></td><td>NPO</td><td>X7R</td><td>Y5V</td></tr>
<tr><td>ΔC/C</td><td>≦±2%, or ±2pF</td><td>≦ ±10%</td><td>≦±30%</td></tr>
<tr><td>DF</td><td colspan="3">≦1.5 × initial requirement</td></tr>
<tr><td>IR</td><td colspan="3">≧0.25 × initial requirement</td></tr>
</table></td><td>
<table>
<tr><td>Condition</td><td>NPO</td><td>X7R</td><td>Y5V</td></tr>
<tr><td>Temperature</td><td colspan="2">+125℃</td><td>+85℃</td></tr>
<tr><td>Time</td><td colspan="3">1000 hours</td></tr>
<tr><td>Voltage</td><td colspan="3">1.5×rated voltage applied</td></tr>
<tr><td>Recovery time</td><td colspan="3">24±2 hours</td></tr>
</table></td></tr>
<tr><td>4</td><td>Strength of Leads</td><td>Pull ： ＞1 kg</td><td>Fix the body of capacitor, apply a tensile weight gradually to each lead.</td></tr>
</table>

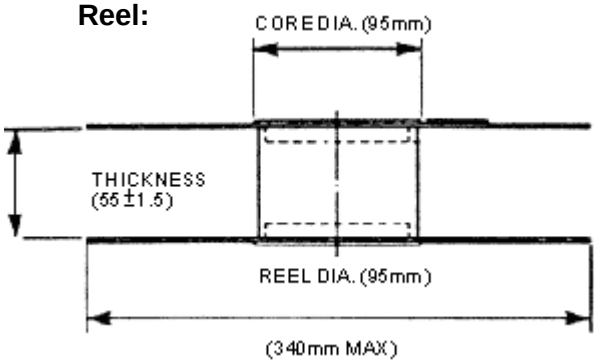
TMR Series

Packing Information (Unit:mm)

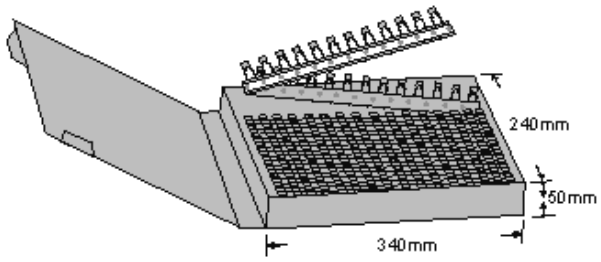
Tape:



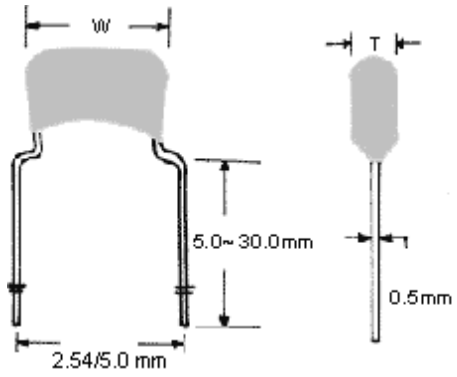
Reel:



Ammo:



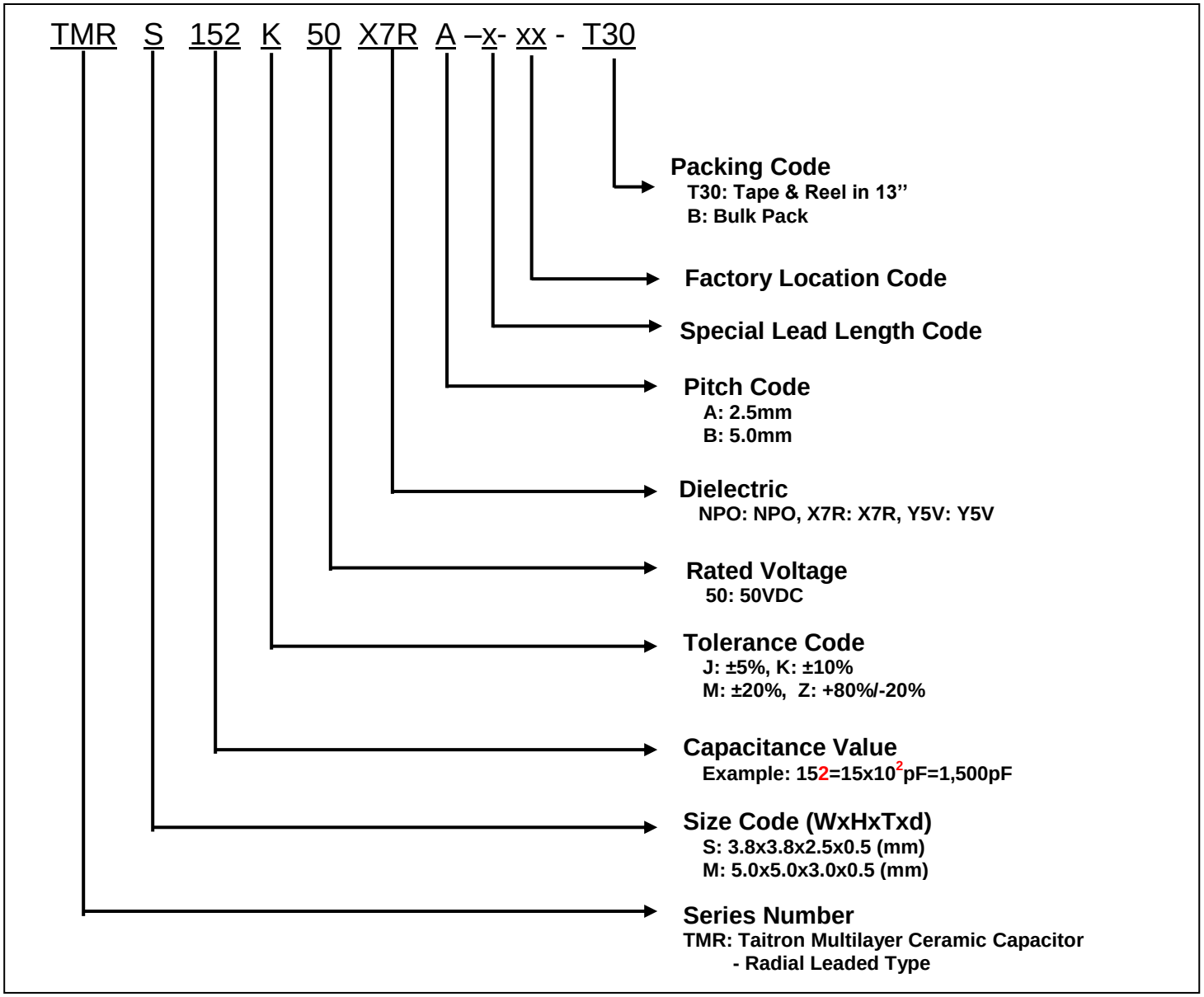
Bulk:



Packing	QTY
Bulk	1000 pcs/Bag
Tape & Ammo	2000 pcs/Box
Tape & Reel	4000 pcs/Reel

TMR Series

How to order:



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