

**FEATURES**

- Capacitance ranging from 0.1  $\mu$ F to 3300  $\mu$ F
- Voltage ratings of 6V – 500V
- Operating temperature rang:
  - 55°C~85°C for X5R
  - 55°C~125°C for X7R
- Epoxy molded, high physical strength
- Tin/Lead solder plated (4% Pb minimum)
- 100% temperature cycling
- 100% accelerated steady state aging



**APPLICATIONS**

This series is designed for the COTS requirements, it's conditioned with MIL – PRF – 49470 Group A testing, typical applications include decoupling, filtering in high frequency DC-DC.

**ORDERING INFORMATION**

CT4502	T	X5R	25V	477	K	T	A
Series	Size code	Dielectric	Rated voltage	Capacitance code(pF)	Capacitance tolerance	Packaging	Test Level For COTS
CT4502	E N M T L	X7R X7S X5R	6V 10V 16V 25V 35V 50V 100V 200V 500V 1KV 2KV	First two digits represent significant figures, Third digit specifies number of zeros. Example: 477=4700000 00pF	K= $\pm$ 10% M= $\pm$ 20%	T= Bulk	A B C

**DIMENSIONS**

Unit: mm



	E	N	M	T	L
L	7.30 $\pm$ 0.20	L 12.7 $\pm$ 0.50	L 12.7 $\pm$ 0.50	L 20.50 $\pm$ 0.50	L 30.50 $\pm$ 0.50
W	4.30 $\pm$ 0.20	W 4.70 $\pm$ 0.20	W 8.40 $\pm$ 0.20	W 8.40 $\pm$ 0.20	W 9.90 $\pm$ 0.20
H	4.10 $\pm$ 0.30	H 4.10 $\pm$ 0.25	H 7.60 $\pm$ 0.25	H 7.60 $\pm$ 0.25	H 8.50 $\pm$ 0.25
W1	2.40 $\pm$ 0.20	W1 3.00 $\pm$ 0.20	W1 5.20 $\pm$ 0.20	W1 5.20 $\pm$ 0.20	W1 6.60 $\pm$ 0.20
A	1.25 $\pm$ 0.30	A 1.50 $\pm$ 0.30	A 2.00 $\pm$ 0.30	A 2.00 $\pm$ 0.30	A 3.00 $\pm$ 0.30

**ELECTRICAL CHARACTERISTICS**

Item	Specification Limits	Measuring Conditions															
Operating Temperature Range	X7R:-55°C to +125°C X5R:-55°C to +85°C	—															
Capacitance	Within specified tolerance	<table border="1"> <thead> <tr> <th>Item</th> <th>Frequency</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td><math>C_R \leq 10 \mu F</math></td> <td>1.0kHz <math>\pm 10\%</math></td> <td>1.0Vrms <math>\pm 0.2V</math></td> </tr> <tr> <td><math>10 \mu F &lt; C_R &lt; 470 \mu F</math></td> <td>120Hz <math>\pm 10\%</math></td> <td>0.5Vrms <math>\pm 0.2V</math></td> </tr> <tr> <td><math>470 \mu F \leq C_R &lt; 2000 \mu F</math></td> <td>50Hz <math>\pm 10\%</math></td> <td>0.5Vrms <math>\pm 0.1V</math></td> </tr> <tr> <td><math>2000 \mu F \leq C_R &lt; 4700 \mu F</math></td> <td>25Hz <math>\pm 10\%</math></td> <td>0.25Vrms <math>\pm 0.1V</math></td> </tr> </tbody> </table>	Item	Frequency	Voltage	$C_R \leq 10 \mu F$	1.0kHz $\pm 10\%$	1.0Vrms $\pm 0.2V$	$10 \mu F < C_R < 470 \mu F$	120Hz $\pm 10\%$	0.5Vrms $\pm 0.2V$	$470 \mu F \leq C_R < 2000 \mu F$	50Hz $\pm 10\%$	0.5Vrms $\pm 0.1V$	$2000 \mu F \leq C_R < 4700 \mu F$	25Hz $\pm 10\%$	0.25Vrms $\pm 0.1V$
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Dissipation Factor	<table border="1"> <thead> <tr> <th>Series</th> <th><math>U_R \leq 50V</math></th> <th><math>50V &lt; U_R \leq 500V</math></th> <th><math>tg \delta</math></th> </tr> </thead> <tbody> <tr> <td>X7R</td> <td><math>U_R \leq 50V</math></td> <td><math>50V &lt; U_R \leq 500V</math></td> <td><math>tg \delta \leq 3.5\%</math></td> </tr> <tr> <td>X5R</td> <td><math>U_R \leq 50V</math></td> <td><math>50V &lt; U_R \leq 100V</math></td> <td><math>tg \delta \leq 3.5\%</math></td> </tr> <tr> <td>X5R</td> <td><math>100V &lt; U_R \leq 500V</math></td> <td></td> <td><math>tg \delta \leq 2.5\%</math></td> </tr> </tbody> </table>	Series	$U_R \leq 50V$	$50V < U_R \leq 500V$	$tg \delta$	X7R	$U_R \leq 50V$	$50V < U_R \leq 500V$	$tg \delta \leq 3.5\%$	X5R	$U_R \leq 50V$	$50V < U_R \leq 100V$	$tg \delta \leq 3.5\%$	X5R	$100V < U_R \leq 500V$		$tg \delta \leq 2.5\%$
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Insulation Resistance	100MΩ · μF	Rated voltage applied for 2 minutes, charge and discharge current limited to 50mA (max).															
Dielectric Strength	No breakdown or visual defects	Voltage shall be applied with follow conditions for 5 seconds: $U_R < 500V$ $2.5U_R$ $U_R = 500V$ $1.5U_R$ Charging and discharging current shall be 50mA or less.															
Temperature characteristics	$\pm 15\%$	Capacitance change with reference to +25°C															

**CAPACITANCE AND RATED VOLTAGE RANGE**

Size code	E壳						N壳						M壳						T壳						L壳																
	6	10	16	25	35	50	100	200	500	4	6	10	16	25	35	50	100	200	500	4	6	10	16	25	35	50	100	200	500	4	6	10	16	25	35	50	100	200	500		
104								M																																	
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■ X5R    ■ X7R    ■ X7S

M( $\pm 20\%$ ) accuracy is recommended for this specification  
 # Size code (mm) :L (7.30 $\pm$ 0.20) ×W (4.50 $\pm$ 0.30) ×H (4.60 $\pm$ 0.50)

**TEST LEVEL**

Level A	Level B	Level C
Temperature cycling	Temperature cycling	Temperature cycling
Accelerated steady state aging @48h	Accelerated steady state aging @96h	Accelerated steady state aging @96h
Appearance	Appearance	Resistance to moisture
Solderability	Solderability	Appearance
		Solderability
		Resistance to soldering heat
		Steeping

**MARKING**

