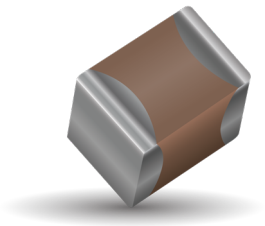
X7T Dielectric, KGM Series

General Specifications



X7T formulations are called “temperature stable” ceramics and fall into EIA Class II materials. Its temperature variation of capacitances within +22%/-33% from −55°C to +125°C. This capacitance change is non-linear. Capacitance for X7T varies under the influence of electrical operating conditions such as voltage and frequency. X7T dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

HOW TO ORDER

KGM	03	C	T7	0J	105	M	H
Series General Purpose Tin/Nickel Finish	**Size** 03= 0201 05= 0402 15= 0603 21= 0805	**Thickness** See Cap Chart	**Dielectric** T7 = X7T	**Voltage** 0G = 4.0V 0J = 6.3V 1A = 10V 1H = 50V 2A = 100V	**Capacitance Code Code (in pF)** 2 Significant Digits + Number of zeros eg. 106 = 10µF 103 = 10nF 470 = 47pF	**Capacitance Tolerance** K = +/- 10% M = +/- 20%	**Packaging**

RoHS COMPLIANT

PACKAGING CODES

Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13"Embossed
03	0201	0603	H		N	
05	0402	1005	H		N	
15	0603	1608	T		M	
21	0805	2012		U		L

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Specifications and Test Methods

X7T Specification Limits		X7T Specification Limits	Measuring Conditions (Complies with JIS C5101 / IEC60384)
Operating Temperature Range		-55ºC to +125ºC	Temperature Cycle Chamber
Capacitance		Within specified tolerance	Measure after heat treatment Capacitance Frequency Volt C≤10µF Frequency : 1kHz±10% Volt : 1.0±0.2Vrms *0.5±0.2Vrms C>10µF Frequency : 120Hz±10% Volt : 0.5±0.2Vrms The charge and discharge current of the capacitor must not exceed 50mA.
Dissipation Factor / Tanδ		Refer to https://spicat.kyocera-avx.com for individual part number specification	
Insulation Resistance		Refer to https://spicat.kyocera-avx.com for individual part number specification	Apply the rated voltage for 1 minute, and measure it in normal temperature and humidity. The charge and discharge current of the capacitor must not exceed 50mA.
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) * Note, Charge device with 150% rated voltage for 500V devices
Bending Strength		No significant damage with 1mm bending	Glass epoxy PCB: Fulcrum spacing: 90mm, duration time 10 seconds.
Solderability		Solder coverage : 95% min.	Soaking condition Sn-3Ag-0.5Cu 245±5ºC 3±0.5 sec.
Resistance to Solder Heat	**Appearance**	No problem observed	Take the initial value after heat treatment. Soak the sample in 260ºC±5ºC solder for 10±0.5 seconds and place in normal temperature and humidity, and measure after heat treatment. (Pre-heating conditions) Order Temperature Time 1 80 to 100ºC 2 minutes 2 150 to 200ºC 2 minutes The charge and discharge current of the capacitor must not exceed 50mA for IR and withstanding voltage measurement.
	Capacitance Variation	≤ ±7.5%	
	Dissipation Factor/ Tanδ	Within specification	
	Insulation Resistance	Within specification	
	Withstanding Voltage / Dielectric Strength	Resist without problem	
Thermal Shock	**Appearance**	No visual defects	Take the initial value after heat treatment. (Cycle) Room temperature (3 min.)→ Lowest operation temperature (30 min.)→ Room temperature (3 min.)→ Highest operation temperature(30 min.) After 5 cycles, measure after heat treatment. The charge and discharge current of the capacitor must not exceed 50mA for IR and withstanding voltage measurement.
	Capacitance Variation	≤ ±7.5%	
	Dissipation Factor	Within specification	
	Insulation Resistance	Within specification	
	Withstanding Voltage / Dielectric Strength	Resist without problem	
Load Life	**Appearance**	No visual defects	Take the initial value after heat treatment. After applying *1.0 the rated voltage at the highest operation temperature for 1000+12/ −0 hours, and measure the sample after heat treatment in normal temperature and humidity. The charge and discharge current of the capacitor must not exceed 50mA for IR measurement. *Apply 1.0 times when the rated voltage is 4V or less. Applied voltages for respective products are indicated in the chart below.
	Capacitance Variation	≤ ±12.5%	
	Dissipation Factor / Tanδ	≤ Initial Value x 2.0 (See Above)	
	Insulation Resistance	Over 1000MΩ or 50MΩ · µF, whichever is less. *Exceptions Listed Below	
Load Humidity	**Appearance**	No visual defects	Take the initial value after heat treatment. After applying rated voltage for 500+12/ −0 hours in the condition of 40ºC±2ºC and 90 to 95%RH, and place in normal temperature and humid- ity, then measure the sample after heat treatment. The charge and discharge current of the capacitor must not exceed 50mA for IR measurement.
	Capacitance Variation	≤ ±12.5%	
	Dissipation Factor / Tanδ	Within specification	
	Insulation Resistance	Over 1000MΩ or 50MΩ · µF, whichever is less. *Exceptions Listed Below	
Appearance		No problem observed	Microscope
Termination Strength		No problem observed	Apply a sideward force of 500g (5N) to a PCB-mounted sample. note : 2N for 0201 size, and 1N for 01005 size.
Vibration	**Appearance**	No problem observed	Take the initial value after heat treatment. Vibration frequency: 10 to 55 (Hz) Amplitude: 1.5mm Sweeping condition: 10→55→10Hz/ 1 minute in X, Y and Z directions: 2 hours each, 6 hours in total, and place in normal temperature and humidity, then measure the sample after heat treatment.
	Capacitance	Within tolerance	
	Tanδ	Within tolerance	
Heat treatment		Expose sample in the temperature of 150+0/ −10ºC for 1 hour and leave the sample in normal temperature and humidity for 24±2 hours.	

Rated Voltage		Products

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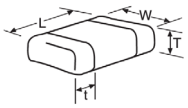
Capacitance Range



SIZE		0201			0402		0603				0805			
Soldering		Reflow Only			Reflow/Wave		Reflow/Wave				Reflow/Wave			
Packaging		All Paper			All Paper		Paper/Embossed				Paper/Embossed			
(L) Length	mm (in.)	0.60 ± 0.03 (0.024 ± 0.001)			1.00 ± 0.10 (0.040 ± 0.004)		1.60 ± 0.15 (0.063 ± 0.006)				2.01 ± 0.20 (0.079 ± 0.008)			
W) Width	mm (in.)	0.30 ± 0.03 (0.011 ± 0.001)			0.50 ± 0.10 (0.020 ± 0.004)		0.81 ± 0.15 (0.032 ± 0.006)				1.25 ± 0.20 (0.049 ± 0.008)			
(t) Terminal	mm (in.)	0.15 ± 0.05 (0.006 ± 0.002)			0.25 ± 0.15 (0.010 ± 0.006)		0.35 ± 0.15 (0.014 ± 0.006)				0.50 ± 0.25 (0.020 ± 0.010)			
WVDC		4	6.3	10	6.3	10	6.3	10	16	100	6.3	10	50	100
Cap 100	101													
(pF) 150	151													
220	221													
330	331													
470	471													
680	681													
1000	102													
1500	152													
2200	222													
3300	332													
4700	472													
6800	682													
Cap 0.010	103													
(µF) 0.012	153													
0.022	223													
0.033	333													
0.047	473													
0.068	683													
0.1	104													
0.15	154													
0.22	224													
0.33	334													
0.47	474													
0.68	684													
1.0	105		C											
1.55	155													
2.20	225													
3.30	335													
4.70	475					C	C	C	C					
10	106						C	C						
22	226										A	A		
47	476													
100	107													
WVDC		4	6.3	10	6.3	10	6.3	10		100	6.3	10	50	100
SIZE		0201			0402		0603				0805			

Case Size	0201 (KGM03)	0402 (KGM05)	0603 (KGM15)	0805 (KGM21)
Thickness Letter	C	C	C	A
Max Thickness (mm)	0.39	0.70	1.00	1.45
Carrier Tape	PAPER	PAPER	PAPER	EMB
Packaging Code 7" Reel	H	H	T	U
Packaging Code 13" Reel	N	N	M	L
	Paper			Embossed (EMB)