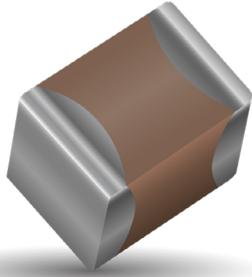


# X6S Dielectric, KGM Series

## General Specifications



### FEATURES

- Offered in a complete range of products for both general and specialized applications and designed to meet a wide variety of needs.
- We have a worldwide network in order to supply our global customer bases quickly and efficiently.
- All of our products are highly reliable due to their monolithic structure of high-purity and superfine uniform ceramics and their integral internal electrodes.
- By combining superior manufacturing technology and materials with high dielectric constants, we produce extremely compact components with exceptional specifications.
- Our stringent quality control in every phase of production from material procurement to shipping ensures consistent manufacturing and superior quality.

### DIELECTRIC CHARACTERISTICS

- Temperature Range: -55 to + 105°C
- Standard Temperature: 25°C
- ΔC Max: ±22%

### HOW TO ORDER

<b>KGM</b>	<b>05</b>	<b>H</b>	<b>S6</b>	<b>0G</b>	<b>106</b>	<b>M</b>	<b>N</b>
General Purpose Tin/ Nickel Finish	Size 03 = 0201 05 = 0402 15 = 0603 21 = 0805	Thickness See Cap Chart	Dielectric S6 = X6S	Voltage 0E = 2.5V 0G = 4.0V 0J = 6.3V 1A = 10V 1C = 16V 1E = 25V	Capacitance Code Code (in pF) 2 Significant Digits +Number of zeros eg. 10μF = 106 10nF = 103 47pF = 470	Capacitance Tolerance K = ±10% M = ±20%	Packaging See Table Below



### PACKAGING CODES

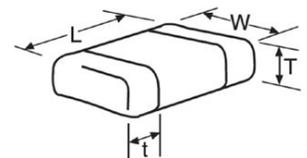
Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13" Embossed
03	0201	0603	H		N	
05	0402	1005	H		N	
15	0603	1608	T		M	
21	0805	2012		U		L

\*Note: The thickness determines if packaging is paper or embossed.

### CAPACITANCE RANGE

SIZE	0201				0402				0603				0805				1206				1210														
Packaging	All Paper				All Paper				All Paper				All Embossed				All Embossed				All Embossed														
(L) Length	mm 0.60 ± 0.09 (in.) (0.024 ± 0.004)				mm 1.00 ± 0.20 (in.) (0.040 ± 0.002)				mm 1.60 ± 0.20 (in.) (0.063 ± 0.008)				mm 2.01 ± 0.20 (in.) (0.079 ± 0.008)				mm 3.20 ± 0.30 (in.) (0.126 ± 0.012)				mm 3.20 ± 0.40 (in.) (0.130 ± 0.016)														
(W) Width	mm 0.30 ± 0.09 (in.) (0.011 ± 0.004)				mm 0.50 ± 0.20 (in.) (0.020 ± 0.008)				mm 0.80 ± 0.20 (in.) (0.030 ± 0.008)				mm 1.25 ± 0.20 (in.) (0.049 ± 0.008)				mm 1.60 ± 0.30 (in.) (0.063 ± 0.012)				mm 2.50 ± 0.30 (in.) (0.098 ± 0.012)														
(t) Terminal	mm. 0.18 ± 0.005 (in.) (0.007 ± 0.002)				mm. 0.25 ± 0.10 (in.) (0.010 ± 0.004)				mm. 0.40 ± 0.20 (in.) (0.016 ± 0.008)				mm. 0.50 ± 0.25 (in.) (0.020 ± 0.010)				mm. 0.50 ± 0.25 (in.) (0.020 ± 0.010)				mm. 0.60 ± 0.30 (in.) (0.024 ± 0.012)														
WVDC	2.5	4	6.3	10	4	6.3	10	16	25	2.5	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25
Cap (μF)	0.47						A	A							A																				
	1.0		C	C	C		A	A	A	A																									
	2.2		C	D			C	C	A	C																									
	4.7	D					B/C	C				A	B	C	C																				
	10	D					H	C				C	C	C	C					F							H	H	H	H					
	22						D					C	C	C				A	A	A							H	H	H	H			L	L	L
	47											C	C					A	A							H	H					L	L	L	
	100																	A								H						L			
WVDC	2.5	4	6.3	10	4	6.3	10	16	25	2.5	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	25
Size	0201				0402				0603				0805				1206				1210														

Case Size	0201 (KGM03)		0402 (KGM05)					0603 (KGM15)			0805 (KGM21)		1206 (KGM31)		1210 (KGM32)	
Thickness Letter	C	D	A	B	C	H	D	A	B	C	A	F	H		L	
Max Thickness(mm)	0.39	0.55	0.55	0.65	0.70	0.75	0.8	0.90	0.95	1.00	1.45	1.52	1.90		2.80	
Carrier Tape	PAPER		PAPER					PAPER			EMB		EMB		EMB	
Packaging Code 7" reel	H	H	H	H	H	H	H	T	T	T	U	U	U		U	
Packaging Code 13" reel	N	N	N	N	N	N	N	M	M	M	L	L	L		L	
	PAPER										Embossed (EMB)					



# X6S Dielectric, KGM Series

## Specifications and Test Methods



X6S Specification Limits		X6S Specification Limits	Measuring Conditions (Complies with JIS C5101 / IEC60384)
Operating Temperature Range		-55°C to +105°C	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
Dissipation Factor / Tanδ			C>10µF Frequency : 120Hz±10% Volt : 0.5±0.2Vrms The charge and discharge current of the capacitor must not exceed 50mA.
Insulation Resistance		Refer to <a href="https://spicat.kyocera-avx.com">https://spicat.kyocera-avx.com</a> 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			Soaking condition Sn-3Ag-0.5Cu 245±5°C 3±0.5 sec.
Resistance to Solder Heat	Appearance	No problem observed	Soak the sample in 260°C±5°C 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 100°C          2 minutes 2          150 to 200°C          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 *1.5 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 40°C±2°C and 90 to 95%RH, and place in normal temperature and humidity, 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			Microscope
Termination Strength			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/ -10°C for 1 hour and leave the sample in normal temperature and humidity for 24±2 hours.	

Voltage to be applied in the High Temperature Load (Applied voltage is the multiple of the rated voltage)

Rated Voltage		
×1.0	2.5V	KGM03DS60E475
	4V	KGM03CS60G105, KGM05DS60G226, KGM15CS60G226, KGM21AS60G476
	6.3V	KGM03CS60J105, KGM05BS60J475, KGM05CS60J106, KGM15CS60J226
	10V	KGM03CS61A105, KGM05AS61A474, KGM05AS61A105, KGM05CS61A475, KGM15CS61A226, KGM21AS61A226
	16V	KGM05AS61C474, KGM05AS61C225, KGM15CS61C106, KGM21AS61C226
	25V	KGM05AS61E105

Load Life / Load Humidity > Insulation Resistance: Over 10MΩ · µF

S6	03	KGM03DS60E475, KGM03CS60G105, KGM03CS60J105, KGM03CS61A105
	05	KGM05DS60G226, KGM05CS60J475, KGM05BS60J475, KGM05CS60J106, KGM05AS61A474, KGM05AS61A105, KGM05CS61A475, KGM05AS61C474, KGM05AS61C225, KGM05AS61E105
	15	KGM15CS60G226M, KGM15CS60J226, KGM15CS61A106, KGM15CS61A226, KGM15CS61C106
	21	KGM21AS60G476, KGM21AS60J226, KGM21AS61A226, KGM21AS61C226