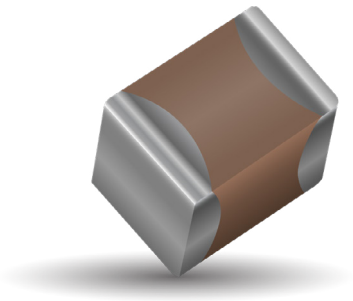
X6S Dielectric, KGM Series

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 ofour 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 if 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

KGM	05	H	S6	0G	106	M	N
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

RoHS COMPLIANT

PACKAGING CODES

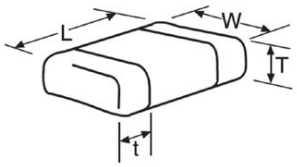
Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13"Embossed
03	0201	0603	H		N	
05	0402	1005	H		N	
15	0603	1608	T		M	
21	0805	2012		U		L

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

CAPACITANCE RANGE

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

Case Size	0201 (KGM03)		0402 (KGM05)					0603 (KGM15)		0805 (KGM21)	
Thickness Letter	C	D	A	B	C	H	D	A	C	A	F
Max Thickness(mm)	0.39	0.55	0.55	0.65	0.70	0.75	0.8	0.90	1.00	1.45	1.52
Carrier Tape	PAPER		PAPER					PAPER		EMB	
Packaging Code 7"reel	H	H	H	H	H	H	H	T	T	U	U
Packaging Code 13"reel	N	N	N	N	N	N	N	M	M	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		-55ºC to +105ºC	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			
Insulation Resistance		Refer to https://spicat.kyocera-avx.com for individual part number specifiction	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±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 *1.5 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 40ºC±2ºC 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/ −10ºC 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