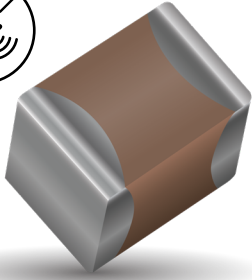


Space Level BME X7R MLCC

ESCC QPL 3009/041 Approved



The KYOCERA AVX Space , 3009041, BME (Base Metal Electrode) X7R surface mount MLCC QPL approved since 2015. The technology utilizes the leading edge technology in MLCC construction and processing. This technology delivers high reliability with a superior capacitance voltage capability compared values in the smaller case sizes not only reduces the amount of board space used but also the weight of components. The surface mount components also incorporate Flexiterm®, which greatly improves the resistance to the mechanical stress experienced by MLCCs either during assembly or during the product life time. Flexiterm® technology provides greater protection against board flexure and promotes an open circuit failure mode under PCB bend testing.

BENEFITS

- Space BME enables customers to down size MLCCs and save PCB space.
- The Space BME range provides a high CV range 16 – 100 volts, 2.2 n F – 22 u F
- The range comes with Flexiterm® termination which protection against board flexure either during assembly or product lifetime.

HOW TO ORDER

3009041	07	226	J	E
Detailed Spec 3009041	Component Variant 01 (0402) 02 (0603) 03 (0805) 04 (1206) 05 (1210) 06 (1812) 07 (2220)	Capacitance Code 2 significant digits + number of zeros e.g. 103 = 10nF 225 = 2.2µF 226 = 22µF	Capacitance Tolerance J = 5% K = 10% M = 20%	Voltage X = 16V A = 25V C = 50V E = 100V

Packaging, Waffle as standard, for Tape and Reel add \TR to end of the part number, e.g. 300904107226KA\TR

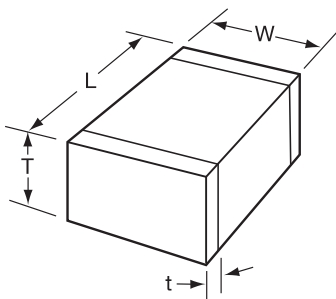
Please note all parts are terminated with a minimum 10% Pb plating.

Lot Validation Testing (LVT) can be ordered separately, LVT Groups 3, 2b, 2a, 1.

DIMENSIONS

mm (inches)

Size	0402		0603		0805		1206		1210		1812		2220	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
(L) Length	0.90 (0.035)	1.15 (0.045)	1.45 (0.057)	1.75 (0.069)	1.80 (0.071)	2.20 (0.087)	3.00 (0.118)	3.40 (0.134)	3.00 (0.118)	3.40 (0.134)	4.20 (0.165)	4.80 (0.189)	5.3 (0.208)	6.1 (0.24)
(W) Width	0.41 (0.016)	0.61 (0.024)	0.65 (0.026)	0.95 (0.037)	1.05 (0.041)	1.45 (0.057)	1.40 (0.055)	1.80 (0.071)	2.30 (0.091)	2.70 (0.106)	3.00 (0.118)	3.40 (0.124)	4.60 (0.18)	5.41 (0.213)
(T) Thickness	0.61 Max. (0.024)		1.00 Max. (0.039)		1.52 Max. (0.060)		1.80 Max. (0.071)		2.80 Max. (0.110)		2.80 Max. (0.110)		2.80 Max. (0.110)	
(t) terminal	0.1 (0.004)	0.40 (0.015)	0.20 (0.008)	0.50 (0.020)	0.25 (0.010)	0.75 (0.030)	0.25 (0.010)	0.75 (0.030)	0.25 (0.010)	0.75 (0.030)	0.25 (0.010)	0.95 (0.037)	0.25 (0.009)	1.03 (0.041)



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PREFERRED SIZES ARE SHADED

Case Sizes		0402			0603			0805			1206			1210			1812			2220			
Code	Value	16/25V	50V	100V	16/25V	50V	100V	16/25V	50V	100V	16/25V	50V	100V	16/25V	50V	100V	16/25V	50V	100V	16/25V	50V	100V	
222	2.2 (nF)	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded																
272	2.7	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded																
332	3.3	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded																
392	3.9	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded																
472	4.7	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
562	5.6	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
682	6.8	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
822	8.2	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
103	10	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
123	12	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
153	15	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded													
183	18	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded										
223	22	Shaded	Shaded	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded										
273	27	Shaded	Shaded	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded										
333	33	Shaded	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded										
393	39	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded										
473	47	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded							
563	56	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded				
683	68	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
823	82	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
104	100	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
124	120	White	White	White	Shaded	Shaded	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
154	150	White	White	White	Shaded	White	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
184	180	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
224	220	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
274	270	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
334	330	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
394	390	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
474	470	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
564	560	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
684	680	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
824	820	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
105	1 (µF)	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
125	1.2	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
155	1.5	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
185	1.8	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
225	2.2	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
275	2.7	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
335	3.3	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
395	3.9	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
475	4.7	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
565	5.6	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
685	6.8	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
825	8.2	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
106	10	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
126	12	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
156	15	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
186	18	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
226	22	White	White	White	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded

Space Level BME X7R MLCC

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ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

The measurements shall be performed at $T_{amb} = +22 \pm 3^{\circ}\text{C}$.

Charateristics	Symbol	Test Method and Conditions	Tolerance (\pm %)	Limits		Unit
				Min.	Max.	
Capacitance (Note 1)	C_A	ESCC No. 3009	5 10 20	$0.95C_n$ $0.9C_n$ $0.8C_n$	$1.05C_n$ $1.1C_n$ $1.2C_n$	pF
Tangent of Loss Angle	$tg\delta$	ESCC No. 3009 For $U_R = 50V, 100V$: For $U_R = 16V, 25V$:	All	- -	250×10^{-4} 300×10^{-4}	- -
Insulation Resistance	R_I	ESCC No. 3009 For $C_n \leq 10000\text{pF}$: For $C_n > 10000\text{pF}$:	All	100 1000	- -	GΩ GΩ nF
Voltage Proof	VP	ESCC No. 3009	All	$2.5U_R$	-	V

NOTE: 1. 300 max for 16 volt and 25 volt rated components

ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURE

Charateristics	Symbol	Test Method and Conditions (Note 1)	Limits		Unit
			Min.	Max.	
Insulation Resistance	R_I	ESCC No. 3009 For $C_n \leq 10000\text{pF}$: For $C_n > 10000\text{pF}$:	100 1000	-	GΩ GΩ nF
Temperature Characteristic	TC	ESCC No. 3009 $T_{amb} = -55 \pm 2^{\circ}\text{C}, +20 \pm 2^{\circ}\text{C}, +125 \pm 2^{\circ}\text{C}$ (Note 2 and 3) For VT = no voltage applied:	-15	+15	%

NOTE: 1. Single Sample, Inspection Level S3, AQL = 2.5%
2. If 1 failure out of 5 parts, then test 100%. 1.0% rejects maximum allowed in case of 100% testing.
3. X7R dielectric: Delta C/C at U_R is typically -10% to -70% dependant on capacitance value. (See curves on next page)

LVT 3009041 TEST DETAIL

LVT Group Test Number	LVT 3009041 Test Detail, Parametric Data Recorded	Min No. Of Pcs for Test
3	Solderability	3
2b	PCB Mounting, Capacitance Temperature Characteristics and Robustness of Termination	3
2a	PCB Mounting, Life testing for 1000 hours, 2 x RV @ 125°C	10
1	PCB Mounting, Rapid Change of Temperature, Steady state humidity testing, (1.5 Volts DC @ 85°C / 85% Hum) 1000 hours, external visual inspection	20

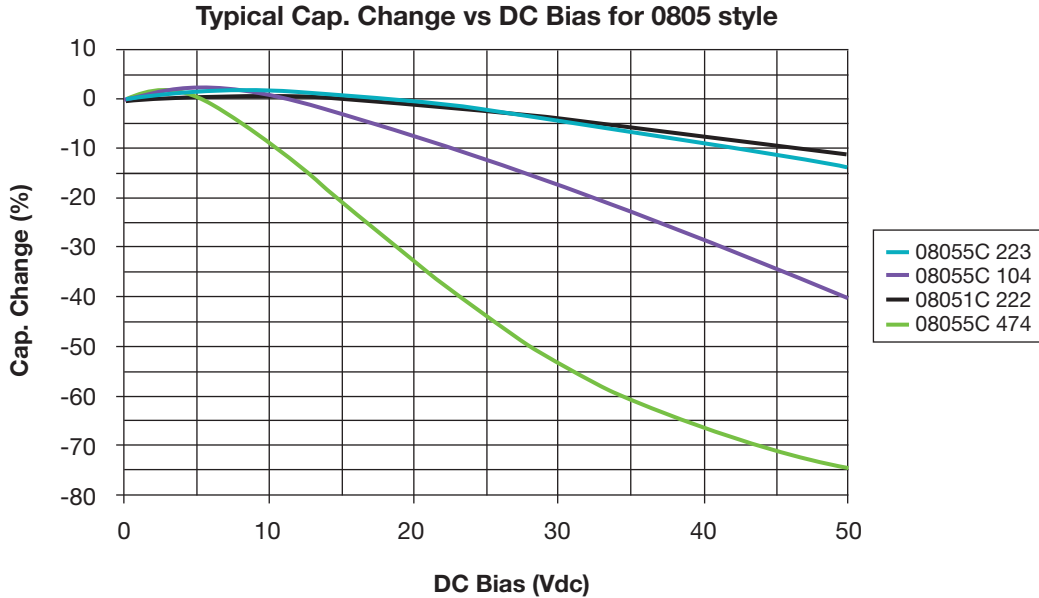
Space Level BME X7R MLCC

ESCC QPL 3009/041 Approved

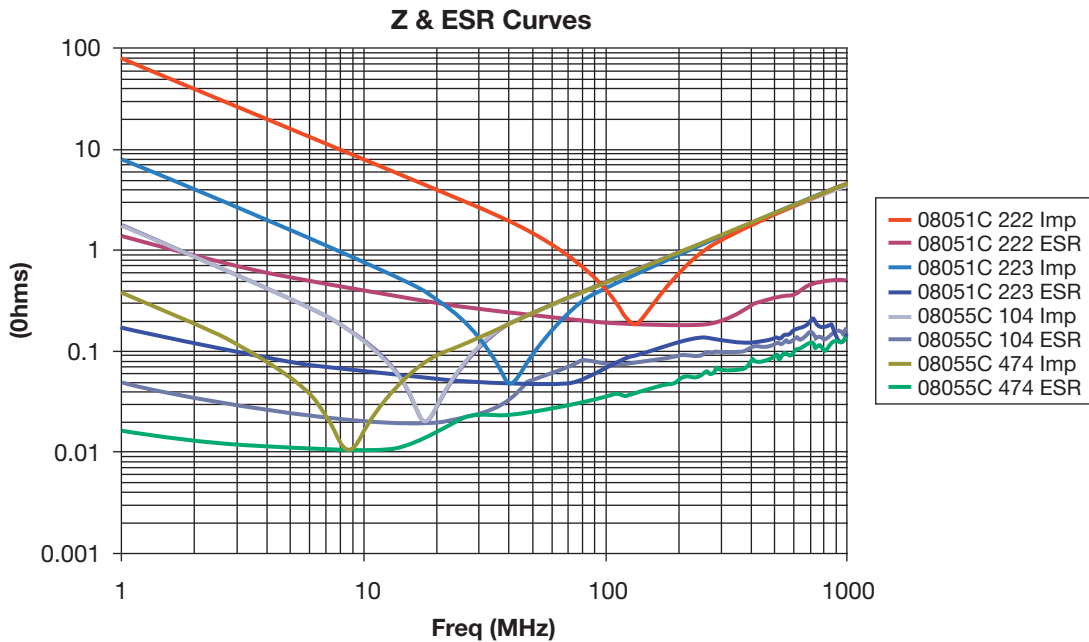


TYPICAL ELECTRICAL CHARACTERISTICS FOR ESCC BME SURFACE MOUNT

CAPACITANCE TEMPERATURE CHARACTERISTICS FOR 0805 STYLE (WITH DC BIAS)



IMPEDANCE WITH ESR CHARACTERISTICS FOR 0805 CAPACITANCE RANGE



If required KYOCERA AVX will produce a data sheet for each part number with the following information:

- a) Impedance/ESR Frequency Sweep
- b) Capacitance Change with Temperature from -55°C to +125°C
- c) Capacitance Change with DC Voltage up to the rated voltage of the component
- d) Temperature Change with AC Current applied for higher capacitance values.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

Mouser Electronics

Authorized Distributor

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