

# Multilayer Ceramic Capacitors for Automotive Powertrain and Safety

REFLOW

AEC-Q200

## ■ PART NUMBER

M	A	A	S	J	3	1	L	A	B	7	1	0	6	K	T	N	A	0	1
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩										

### ① Series

Code (1)(2)(3)(4)	
MAAS	Multilayer Ceramic Capacitor (High dielectric type) for Automotive Powertrain and Safety

### (1) Product Group

Code	
M	Multilayer Ceramic Capacitor

### (3) Type

Code	
A	2 terminals

### (2) Category

Code	Recommended equipment	Quality Grade
A	Automotive Electronic Equipment (Powertrain, Safety)	1

### (4) Features, Characteristics

Code	
S	Standard/General

### ② Rated voltage

Code	Rated voltage [VDC]
A	4
J	6.3
L	10
E	16
T	25
U	50
H	100

### ④ Thickness

Code	Thickness [mm]
3	0.3
5	0.5
8	0.8
Q	1.15
G	1.25
L	1.6
N	1.9
M	2.5

### ③ Dimension (L × W)

Code	L × W [mm]	JIS(mm)	EIA(inch)
06	0.6 × 0.3	0603	0201
10	1.0 × 0.5	1005	0402
16	1.6 × 0.8	1608	0603
21	2.0 × 1.25	2012	0805
31	3.2 × 1.6	3216	1206
32	3.2 × 2.5	3225	1210

### ⑤ Dimension tolerance

Code	Dimension code	L [mm]	W [mm]	T [mm]	Thickness code
A	10	1.0±0.10	0.5±0.10	0.5±0.10	5
	16	1.6+0.15/-0.05	0.8+0.15/-0.05	0.8+0.15/-0.05	8
	21	2.0+0.15/-0.05	1.25+0.15/-0.05	1.25+0.15/-0.05	G
	31	3.2±0.20	1.6±0.20	1.6±0.20	L
	32	3.2±0.30	2.5±0.30	2.5±0.30	M
B	21	2.0+0.20/-0	1.25+0.20/-0	1.25+0.20/-0	G
	31	3.2±0.30	1.6±0.30	1.6±0.30	L
C	10	1.0+0.20/-0	0.5+0.20/-0	0.5+0.20/-0	5
	21	2.0+0.25/-0	1.25+0.25/-0	1.25+0.25/-0	G
H	31	3.2±0.15	1.6±0.15	1.15±0.10	Q
S	06	0.6±0.03	0.3±0.03	0.3±0.03	3
	10	1.0±0.05	0.5±0.05	0.5±0.05	5
	16	1.6±0.10	0.8±0.10	0.8±0.10	8
	21	2.0±0.10	1.25±0.10	1.25±0.10	G
	31	3.2±0.15	1.6±0.15	1.6±0.20	L
	32	3.2±0.30	2.5±0.20	1.9±0.20 2.5±0.20	N M

## ⑥ Temperature characteristics code

## ■ High dielectric type

Code	Applicable standard		Temperature range [°C]	Ref. Temp. [°C]	Capacitance change	Capacitance tolerance	Tolerance code
B7	EIA	X7R	-55 ~ +125	25	±15%	±10%	K
						±20%	M
C7	EIA	X7S	-55 ~ +125	25	±22%	±10%	K
						±20%	M
D7	EIA	X7T	-55 ~ +125	25	+22% / -33%	±10%	K
						±20%	M

## ⑦ Nominal capacitance

Code (example)	Nominal capacitance
101	100pF
102	1,000pF
103	0.01μF
104	0.1μF
105	1μF
106	10μF

## ⑨ Packaging

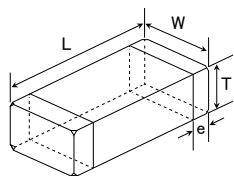
Code	Packaging
F	φ178mm Taping (2mm pitch)
T	φ178mm Taping (4mm pitch)
P	φ178mm Taping (4mm pitch, 1000 pcs/reel) 3225 type (Thickness code M)

## ⑩ Internal code

## ⑧ Capacitance tolerance

Code	Capacitance tolerance
K	±10%
M	±20%

## ■ STANDARD EXTERNAL DIMENSIONS



Type	JIS (mm)	EIA (inch)	Dimension [mm] (inch)				
			L	W	T	*1	e
MAAS□06	0603	0201	0.6±0.03 (0.024±0.001)	0.3±0.03 (0.012±0.001)	0.3±0.03 (0.012±0.001)	3	0.15±0.05 (0.006±0.002)
MAAS□10	1005	0402	1.0±0.05 (0.039±0.002)	0.5±0.05 (0.020±0.002)	0.5±0.05 (0.020±0.002)	5	0.25±0.10 (0.010±0.004)
MAAS□16	1608	0603	1.6±0.10 (0.063±0.004)	0.8±0.10 (0.031±0.004)	0.8±0.10 (0.031±0.004)	8	0.35±0.25 (0.014±0.010)
MAAS□21	2012	0805	2.0±0.10 (0.079±0.004)	1.25±0.10 (0.049±0.004)	1.25±0.10 (0.049±0.004)	G	0.5±0.25 (0.020±0.010)
MAAS□31	3216	1206	3.2±0.15 (0.126±0.006)	1.6±0.15 (0.063±0.006)	1.15±0.10 (0.045±0.004)	Q	0.5+0.35/-0.25 (0.020+0.014/-0.010)
					1.6±0.20 (0.063±0.008)	L	
MAAS□32	3225	1210	3.2±0.30 (0.126±0.012)	2.5±0.20 (0.098±0.008)	1.9±0.20 (0.075±0.008)	N	0.6±0.3 (0.024±0.012)
					2.5±0.20 (0.098±0.008)	M	

\*1.Thickness code

## ■ STANDARD QUANTITY

Type			Thickness		Standard quantity [pcs]	
Code	JIS(mm)	EIA(inch)	[mm]	Code	Paper tape	Embossed tape
06	0603	0201	0.3	3	15000	—
10	1005	0402	0.5	5	10000	—
16	1608	0603	0.8	8	4000	—
21	2012	0805	1.25	G	—	3000
31	3216	1206	1.15	Q	—	3000
			1.6	L	—	2000
32	3225	1210	1.9	N	—	2000
			2.5	M	—	500(T), 1000(P)