

Multilayer Ceramic Capacitors

for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

REFLOW

PART NUMBER

M	L	A	S	U	3	1	L	B	B	5	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)	
MLAS	Multilayer Ceramic Capacitor (High dielectric type) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II) Multilayer Ceramic Capacitor (Temperature compensating type) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II) Medium-High Voltage Multilayer Ceramic Capacitor for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)
MLAY	Low distortion design/Audible/Good bias Multilayer Ceramic Capacitor for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)
MLRL	LW Reversal Decoupling Low ESL Capacitor(LWDC™) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

(1) Product Group

Code	
M	Multilayer Ceramic Capacitor

(2) Category

Code	Recommended equipment	Quality Grade
L	Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)	3

(3) Type

Code	
A	2 terminals
R	LW reversal

(4) Features, Characteristics

Code	
S	Standard/General
Y	Low distortion design/Audible/Good bias
L	Low ESL

② Rated voltage

Code	Rated voltage [VDC]
P	2.5
A	4
J	6.3
L	10
E	16
T	25
G	35
U	50
H	100
Q	250
S	630
X	2000

④ Thickness

Code	Thickness [mm]
H	0.13 (1.5 max ※)
E	0.18 (1.1 max ※)
2	0.2
3	0.3
K	0.45
5	0.5
8	0.8
9	0.85
Q	1.15
G	1.25
L	1.6
N	1.9 (0.088 ※)
Y	2.0 max
M	2.5

Note : ※LW reverse type (MLRL)

③ Dimension

Code	(L × W) [mm]	JIS(mm)	EIA(inch)
04	0.4 × 0.2	0402	01005
06	0.6 × 0.3	0603	0201
1L	1.0 × 0.5	1005	0402
10	1.0 × 0.5	1005	0402
	0.52 × 1.0 ※	0510	0204
16	1.6 × 0.8	1608	0603
	0.8 × 1.6 ※	0816	0306
21	2.0 × 1.25	2012	0805
	1.25 × 2.0 ※	1220	0508
31	3.2 × 1.6	3216	1206
32	3.2 × 2.5	3225	1210
45	4.5 × 3.2	4532	1812

Note : ※LW reverse type (MLRL)

⑤Dimension tolerance

Code	Dimension code	L[mm]	W[mm]	T[mm]	Thickness code
A	06	0.6±0.05	0.3±0.05	0.3±0.05	3
	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
	45	4.5±0.40	3.2±0.30	2.0+0/-0.30	Y
B	06	0.6±0.09	0.3±0.09	0.3±0.09	3
	10	1.0+0.15/-0.05	0.5+0.15/-0.05	0.5+0.15/-0.05	5
	16	1.6+0.20/-0	0.8+0.20/-0	0.8+0.20/-0	8
	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
	32	3.2±0.30	2.5±0.20	1.9+0.1/-0.20	Y
C	10	1.0+0.20/-0	0.5+0.20/-0	0.5+0.20/-0	5
E	06	0.6+0.25/-0	0.3+0.25/-0	0.3+0.25/-0	3
H	31	3.2±0.15	1.6±0.15	0.85±0.10	9
				1.15±0.10	Q
J	16	1.6+0.20/-0	0.8+0.20/-0	0.45±0.05	K
	21	2.0+0.15/-0.05	1.25+0.15/-0.05	0.85±0.10	9
	32	3.2±0.30	2.5±0.20	0.85±0.10	9
L	21	2.0+0.20/-0	1.25+0.20/-0	1.15±0.10	Q
				0.85±0.10	9
	31	3.2±0.20	1.6±0.20	0.85±0.10	9
				0.85±0.10	9
S	04	0.4±0.02	0.2±0.02	0.2±0.02	2
	06	0.6±0.03	0.3±0.03	0.3±0.03	3
				0.52±0.05 ※	3
	10	1.0±0.05	0.5±0.05	0.5±0.05	5
				1.0±0.05	3
	16	1.6±0.10	0.8±0.10	0.8±0.10	8
				0.8±0.10 ※	5
	21	2.0±0.10	1.25±0.10	0.85±0.10	9
				1.25±0.10	G
				1.25±0.15 ※	9
31	3.2±0.15	1.6±0.15	1.6±0.20	L	
32	3.2±0.30	2.5±0.20	2.5±0.20	M	
			1.9±0.20	N	
45	4.5±0.40	3.2±0.30	2.5±0.20	M	
T	16	1.6±0.10	0.8±0.10	0.45±0.05	K
X	1L	1.0±0.05	0.5±0.05	0.13±0.02	H
				0.18±0.02	E
				0.2±0.02	2
Y	1L	1.0±0.05	0.5±0.05	0.3±0.03	3

Note :※LW reverse type (MLRL)

⑥ Temperature characteristics code

■ High dielectric type (SD: Excluding Low distortion design/Audible/Good bias Multilayer Ceramic Capacitor)

Code	Applicable standard		Temperature range [°C]	Ref. Temp. [°C]	Capacitance change	Capacitance tolerance	Tolerance code
B5	JIS	B	-25 ~ + 85	20	± 10%	± 10%	K
						± 20%	M
	EIA	X5R	-55 ~ + 85	25	± 15%	± 10%	K
						± 20%	M
B7	EIA	X7R	-55 ~ + 125	25	± 15%	± 10%	K
						± 20%	M
C6	EIA	X6S	-55 ~ + 105	25	± 22%	± 10%	K
						± 20%	M
C7	EIA	X7S	-55 ~ + 125	25	± 22%	± 10%	K
						± 20%	M
LD(※)	EIA	X5R	-55 ~ + 85	25	± 15%	± 10%	K
						± 20%	M

Note : ※.LD: Low distortion design/Audible/Good bias Multilayer Ceramic Capacitor

■ Temperature compensating type

Code	Applicable standard		Temperature range [°C]	Ref. Temp. [°C]	Capacitance change	Capacitance tolerance	Tolerance code		
CG	JIS	CG	-55 ~ + 125	20	0 ± 30ppm/°C	± 0.05pF	A		
						± 0.1pF	B		
	± 0.25pF	C							
	± 0.5pF	D							
	EIA	C0G		25		± 5%	J		
	JIS	CH		-55 ~ + 125		20	0 ± 60ppm/°C	± 0.1pF	B
								± 0.25pF	C
EIA	C0H		25			± 0.5pF		D	
						± 5%		J	
CJ	JIS		CJ	-55 ~ + 125		20	0 ± 120ppm/°C	± 0.05pF	A
								± 0.1pF	B
	EIA	C0J			25			± 0.25pF	C
CK	JIS	CK		-55 ~ + 125	20		0 ± 250ppm/°C	± 0.05pF	A
								± 0.1pF	B
	EIA	C0K			25			± 0.25pF	C

⑥ Series code

• Low distortion design/Audible/Good bias Multilayer Ceramic Capacitor

Code	Series code
SD	Standard

• Medium-High Voltage Multilayer Ceramic Capacitor

Code	Series code
SD	Standard

⑦ Nominal capacitance

Code (example)	Nominal capacitance
0R5	0.5pF
010	1pF
100	10pF
101	100pF
102	1,000pF
103	0.01μF
104	0.1μF
105	1μF
106	10μF
107	100μF

Note : R=Decimal point

⑧ Capacitance tolerance

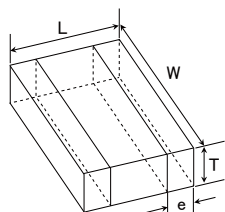
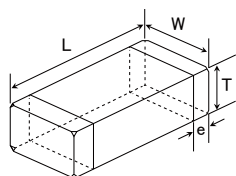
Code	Capacitance tolerance
A	± 0.05pF
B	± 0.1pF
C	± 0.25pF
D	± 0.5pF
G	± 2%
J	± 5%
K	± 10%
M	± 20%

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)
R	φ178mm Embossed Taping 1005type (2mm pitch) 1608type (4mm pitch)
W	φ178mm Embossed Taping (1mm pitch) 0402type

⑩ Internal code

STANDARD EXTERNAL DIMENSIONS



※LW reverse type

Type	JIS (mm)	EIA (inch)	Dimension [mm]				
			L	W	T	*1	e
MLAS□04	0402	01005	0.4 ± 0.02	0.2 ± 0.02	0.2 ± 0.02	2	0.1 ± 0.03
MLAS□06	0603	0201	0.6 ± 0.03	0.3 ± 0.03	0.3 ± 0.03	3	0.15 ± 0.05
MLAS□1L	1005	0402	1.0 ± 0.05	0.5 ± 0.05	0.13 ± 0.02	H	0.25 ± 0.10
					0.18 ± 0.02	E	
					0.2 ± 0.02	2	
					0.3 ± 0.03	3	
MLAS□10	1005	0402	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05	5	0.25 ± 0.10
MLAY□1L	1005	0402	1.0 ± 0.05	0.5 ± 0.05	0.3 ± 0.03	3	0.25 ± 0.10
MLAY□10	1005	0402	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05	5	0.25 ± 0.10
MLRL□10 ※	0510	0204	0.52 ± 0.05	1.0 ± 0.05	0.3 ± 0.05	3	0.18 ± 0.08
MLAS□16	1608	0603	1.6 ± 0.10	0.8 ± 0.10	0.45 ± 0.05	K	0.35 ± 0.25
					0.8 ± 0.10	8	
MLAY□16	1608	0603	1.6 ± 0.10	0.8 ± 0.10	0.8 ± 0.10	8	0.35 ± 0.25
MLRL□16 ※	0816	0306	0.8 ± 0.10	1.6 ± 0.10	0.5 ± 0.05	5	0.25 ± 0.15
MLAS□21	2012	0805	2.0 ± 0.10	1.25 ± 0.10	0.85 ± 0.10	9	0.5 ± 0.25
MLAY□21					1.25 ± 0.10	G	
MLRL□21 ※	1220	0508	1.25 ± 0.15	2.0 ± 0.15	0.85 ± 0.10	9	0.3 ± 0.2
MLAS□31	3216	1206	3.2 ± 0.15	1.6 ± 0.15	0.85 ± 0.10	9	$0.5 + 0.35 / - 0.25$
					1.15 ± 0.10	Q	
					1.6 ± 0.20	L	
MLAY□31	3216	1206	3.2 ± 0.15	1.6 ± 0.15	1.15 ± 0.10	Q	$0.5 + 0.35 / - 0.25$
					1.6 ± 0.20	L	
MLAS□32	3225	1210	3.2 ± 0.30	2.5 ± 0.20	0.85 ± 0.10	9	0.6 ± 0.3
					1.15 ± 0.10	Q	
					1.9 ± 0.20	N	
					$1.9 + 0.1 / - 0.20$	Y	
					2.5 ± 0.20	M	
MLAY□32	3225	1210	3.2 ± 0.30	2.5 ± 0.20	1.9 ± 0.20	N	0.6 ± 0.3
					2.5 ± 0.20	M	
					$2.0 + 0 / - 0.30$	Y	
MLAS□45	4532	1812	4.5 ± 0.40	3.2 ± 0.30	$2.0 + 0 / - 0.30$	Y	0.6 ± 0.4
					2.5 ± 0.20	M	

Note :※LW reverse type (MLRL), *1.Thickness code

■ STANDARD QUANTITY

Type			Thickness		Standard quantity [pcs]	
Code	JIS(mm)	EIA(inch)	[mm]	Code	Paper tape	Embossed tape
04	0402	01005	0.2	2	—	40000
06	0603	0201	0.3	3	15000	—
1L	1005	0402	0.13	H	—	20000
			0.18	E	—	15000
			0.2	2	20000	—
			0.3	3	15000	—
10	1005	0402	0.5	5	10000	—
	0510 ※	0204 ※	0.3	3		
16	1608	0603	0.45	K	4000	—
			0.8	8		
	0816 ※	0306 ※	0.5	5	—	4000
21	2012	0805	0.85	9	4000	—
			1.25	G	—	3000
	1220 ※	0508 ※	0.85	9	4000	—
31	3216	1206	0.85	9	4000	—
			1.15	Q	—	3000
			1.6	L	—	2000
32	3225	1210	0.85	9	—	2000
			1.15	Q		
			1.9	N		
			2.0 max	Y		
			2.5	M		
45	4532	1812	2.0 max	Y	—	1000
			2.5	M	—	500

Note : ※.LW Reverse type (MLRL)

PARTS NUMBER

Multilayer Ceramic Capacitors (Temperature compensating type) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

0402TYPE

【Temperature Characteristic $C\Delta : C\Delta/C0\Delta (-55\sim +125^{\circ}C)$ 】 0.2mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
							Rated voltage x %		
MLAST042SCK0R4[WNA01	TMK042 CK0R4[D-W	25	CK C0K	0.4 p	±0.05pF, ±0.1pF, ±0.25pF	408	200	0.2±0.02	
MLAST042SCK0R5[WNA01	TMK042 CK0R5[D-W	25	CK C0K	0.5 p	±0.05pF, ±0.1pF, ±0.25pF	410	200	0.2±0.02	
MLAST042SCK0R6[WNA01	TMK042 CK0R6[D-W	25	CK C0K	0.6 p	±0.05pF, ±0.1pF, ±0.25pF	412	200	0.2±0.02	
MLAST042SCK0R7[WNA01	TMK042 CK0R7[D-W	25	CK C0K	0.7 p	±0.05pF, ±0.1pF, ±0.25pF	414	200	0.2±0.02	
MLAST042SCKR75[WNA01	TMK042 CKR75[D-W	25	CK C0K	0.75 p	±0.05pF, ±0.1pF, ±0.25pF	415	200	0.2±0.02	
MLAST042SCK0R8[WNA01	TMK042 CK0R8[D-W	25	CK C0K	0.8 p	±0.05pF, ±0.1pF, ±0.25pF	416	200	0.2±0.02	
MLAST042SCK0R9[WNA01	TMK042 CK0R9[D-W	25	CK C0K	0.9 p	±0.05pF, ±0.1pF, ±0.25pF	418	200	0.2±0.02	
MLAST042SCK010[WNA01	TMK042 CK010[D-W	25	CK C0K	1 p	±0.05pF, ±0.1pF, ±0.25pF	420	200	0.2±0.02	
MLAST042SCK1R1[WNA01	TMK042 CK1R1[D-W	25	CK C0K	1.1 p	±0.05pF, ±0.1pF, ±0.25pF	422	200	0.2±0.02	
MLAST042SCK1R2[WNA01	TMK042 CK1R2[D-W	25	CK C0K	1.2 p	±0.05pF, ±0.1pF, ±0.25pF	424	200	0.2±0.02	
MLAST042SCK1R3[WNA01	TMK042 CK1R3[D-W	25	CK C0K	1.3 p	±0.05pF, ±0.1pF, ±0.25pF	426	200	0.2±0.02	
MLAST042SCK1R4[WNA01	TMK042 CK1R4[D-W	25	CK C0K	1.4 p	±0.05pF, ±0.1pF, ±0.25pF	428	200	0.2±0.02	
MLAST042SCK1R5[WNA01	TMK042 CK1R5[D-W	25	CK C0K	1.5 p	±0.05pF, ±0.1pF, ±0.25pF	430	200	0.2±0.02	
MLAST042SCK1R6[WNA01	TMK042 CK1R6[D-W	25	CK C0K	1.6 p	±0.05pF, ±0.1pF, ±0.25pF	432	200	0.2±0.02	
MLAST042SCK1R7[WNA01	TMK042 CK1R7[D-W	25	CK C0K	1.7 p	±0.05pF, ±0.1pF, ±0.25pF	434	200	0.2±0.02	
MLAST042SCK1R8[WNA01	TMK042 CK1R8[D-W	25	CK C0K	1.8 p	±0.05pF, ±0.1pF, ±0.25pF	436	200	0.2±0.02	
MLAST042SCK1R9[WNA01	TMK042 CK1R9[D-W	25	CK C0K	1.9 p	±0.05pF, ±0.1pF, ±0.25pF	438	200	0.2±0.02	
MLAST042SCK020[WNA01	TMK042 CK020[D-W	25	CK C0K	2 p	±0.05pF, ±0.1pF, ±0.25pF	440	200	0.2±0.02	
MLAST042SCK2R1[WNA01	TMK042 CK2R1[D-W	25	CK C0K	2.1 p	±0.05pF, ±0.1pF, ±0.25pF	442	200	0.2±0.02	
MLAST042SCK2R2[WNA01	TMK042 CK2R2[D-W	25	CK C0K	2.2 p	±0.05pF, ±0.1pF, ±0.25pF	444	200	0.2±0.02	
MLAST042SCK2R3[WNA01	TMK042 CK2R3[D-W	25	CK C0K	2.3 p	±0.05pF, ±0.1pF, ±0.25pF	446	200	0.2±0.02	
MLAST042SCK2R4[WNA01	TMK042 CK2R4[D-W	25	CK C0K	2.4 p	±0.05pF, ±0.1pF, ±0.25pF	448	200	0.2±0.02	
MLAST042SCK2R5[WNA01	TMK042 CK2R5[D-W	25	CK C0K	2.5 p	±0.05pF, ±0.1pF, ±0.25pF	450	200	0.2±0.02	
MLAST042SCK2R6[WNA01	TMK042 CK2R6[D-W	25	CK C0K	2.6 p	±0.05pF, ±0.1pF, ±0.25pF	452	200	0.2±0.02	
MLAST042SCK2R7[WNA01	TMK042 CK2R7[D-W	25	CK C0K	2.7 p	±0.05pF, ±0.1pF, ±0.25pF	454	200	0.2±0.02	
MLAST042SCK2R8[WNA01	TMK042 CK2R8[D-W	25	CK C0K	2.8 p	±0.05pF, ±0.1pF, ±0.25pF	456	200	0.2±0.02	
MLAST042SCK2R9[WNA01	TMK042 CK2R9[D-W	25	CK C0K	2.9 p	±0.05pF, ±0.1pF, ±0.25pF	458	200	0.2±0.02	
MLAST042SCK030[WNA01	TMK042 C030[D-W	25	CJ C0J	3 p	±0.05pF, ±0.1pF, ±0.25pF	460	200	0.2±0.02	
MLAST042SCK3R1[WNA01	TMK042 C3R1[D-W	25	CJ C0J	3.1 p	±0.1pF, ±0.25pF	462	200	0.2±0.02	
MLAST042SCK3R2[WNA01	TMK042 C3R2[D-W	25	CJ C0J	3.2 p	±0.1pF, ±0.25pF	464	200	0.2±0.02	
MLAST042SCK3R3[WNA01	TMK042 C3R3[D-W	25	CJ C0J	3.3 p	±0.1pF, ±0.25pF	466	200	0.2±0.02	
MLAST042SCK3R4[WNA01	TMK042 C3R4[D-W	25	CJ C0J	3.4 p	±0.1pF, ±0.25pF	468	200	0.2±0.02	
MLAST042SCK3R5[WNA01	TMK042 C3R5[D-W	25	CJ C0J	3.5 p	±0.1pF, ±0.25pF	470	200	0.2±0.02	
MLAST042SCK3R6[WNA01	TMK042 C3R6[D-W	25	CJ C0J	3.6 p	±0.1pF, ±0.25pF	472	200	0.2±0.02	
MLAST042SCK3R7[WNA01	TMK042 C3R7[D-W	25	CJ C0J	3.7 p	±0.1pF, ±0.25pF	474	200	0.2±0.02	
MLAST042SCK3R8[WNA01	TMK042 C3R8[D-W	25	CJ C0J	3.8 p	±0.1pF, ±0.25pF	476	200	0.2±0.02	
MLAST042SCK3R9[WNA01	TMK042 C3R9[D-W	25	CJ C0J	3.9 p	±0.1pF, ±0.25pF	478	200	0.2±0.02	
MLAST042SCH040[WNA01	TMK042 CH040[D-W	25	CH C0H	4 p	±0.1pF, ±0.25pF	480	200	0.2±0.02	
MLAST042SCH4R1[WNA01	TMK042 CH4R1[D-W	25	CH C0H	4.1 p	±0.1pF, ±0.25pF	482	200	0.2±0.02	
MLAST042SCH4R2[WNA01	TMK042 CH4R2[D-W	25	CH C0H	4.2 p	±0.1pF, ±0.25pF	484	200	0.2±0.02	
MLAST042SCH4R3[WNA01	TMK042 CH4R3[D-W	25	CH C0H	4.3 p	±0.1pF, ±0.25pF	486	200	0.2±0.02	
MLAST042SCH4R4[WNA01	TMK042 CH4R4[D-W	25	CH C0H	4.4 p	±0.1pF, ±0.25pF	488	200	0.2±0.02	
MLAST042SCH4R5[WNA01	TMK042 CH4R5[D-W	25	CH C0H	4.5 p	±0.1pF, ±0.25pF	490	200	0.2±0.02	
MLAST042SCH4R6[WNA01	TMK042 CH4R6[D-W	25	CH C0H	4.6 p	±0.1pF, ±0.25pF	492	200	0.2±0.02	
MLAST042SCH4R7[WNA01	TMK042 CH4R7[D-W	25	CH C0H	4.7 p	±0.1pF, ±0.25pF	494	200	0.2±0.02	
MLAST042SCH4R8[WNA01	TMK042 CH4R8[D-W	25	CH C0H	4.8 p	±0.1pF, ±0.25pF	496	200	0.2±0.02	
MLAST042SCH4R9[WNA01	TMK042 CH4R9[D-W	25	CH C0H	4.9 p	±0.1pF, ±0.25pF	498	200	0.2±0.02	
MLAST042SCH050[WNA01	TMK042 CH050[D-W	25	CH C0H	5 p	±0.1pF, ±0.25pF	500	200	0.2±0.02	
MLAST042SCH5R1[WNA01	TMK042 CH5R1[D-W	25	CH C0H	5.1 p	±0.1pF, ±0.25pF, ±0.5pF	502	200	0.2±0.02	
MLAST042SCH5R2[WNA01	TMK042 CH5R2[D-W	25	CH C0H	5.2 p	±0.1pF, ±0.25pF, ±0.5pF	504	200	0.2±0.02	
MLAST042SCH5R3[WNA01	TMK042 CH5R3[D-W	25	CH C0H	5.3 p	±0.1pF, ±0.25pF, ±0.5pF	506	200	0.2±0.02	
MLAST042SCH5R4[WNA01	TMK042 CH5R4[D-W	25	CH C0H	5.4 p	±0.1pF, ±0.25pF, ±0.5pF	508	200	0.2±0.02	
MLAST042SCH5R5[WNA01	TMK042 CH5R5[D-W	25	CH C0H	5.5 p	±0.1pF, ±0.25pF, ±0.5pF	510	200	0.2±0.02	
MLAST042SCH5R6[WNA01	TMK042 CH5R6[D-W	25	CH C0H	5.6 p	±0.1pF, ±0.25pF, ±0.5pF	512	200	0.2±0.02	
MLAST042SCH5R7[WNA01	TMK042 CH5R7[D-W	25	CH C0H	5.7 p	±0.1pF, ±0.25pF, ±0.5pF	514	200	0.2±0.02	
MLAST042SCH5R8[WNA01	TMK042 CH5R8[D-W	25	CH C0H	5.8 p	±0.1pF, ±0.25pF, ±0.5pF	516	200	0.2±0.02	
MLAST042SCH5R9[WNA01	TMK042 CH5R9[D-W	25	CH C0H	5.9 p	±0.1pF, ±0.25pF, ±0.5pF	518	200	0.2±0.02	
MLAST042SCH060[WNA01	TMK042 CH060[D-W	25	CH C0H	6 p	±0.1pF, ±0.25pF, ±0.5pF	520	200	0.2±0.02	
MLAST042SCH6R1[WNA01	TMK042 CH6R1[D-W	25	CH C0H	6.1 p	±0.1pF, ±0.25pF, ±0.5pF	522	200	0.2±0.02	
MLAST042SCH6R2[WNA01	TMK042 CH6R2[D-W	25	CH C0H	6.2 p	±0.1pF, ±0.25pF, ±0.5pF	524	200	0.2±0.02	
MLAST042SCH6R3[WNA01	TMK042 CH6R3[D-W	25	CH C0H	6.3 p	±0.1pF, ±0.25pF, ±0.5pF	526	200	0.2±0.02	
MLAST042SCH6R4[WNA01	TMK042 CH6R4[D-W	25	CH C0H	6.4 p	±0.1pF, ±0.25pF, ±0.5pF	528	200	0.2±0.02	
MLAST042SCH6R5[WNA01	TMK042 CH6R5[D-W	25	CH C0H	6.5 p	±0.1pF, ±0.25pF, ±0.5pF	530	200	0.2±0.02	
MLAST042SCH6R6[WNA01	TMK042 CH6R6[D-W	25	CH C0H	6.6 p	±0.1pF, ±0.25pF, ±0.5pF	532	200	0.2±0.02	
MLAST042SCH6R7[WNA01	TMK042 CH6R7[D-W	25	CH C0H	6.7 p	±0.1pF, ±0.25pF, ±0.5pF	534	200	0.2±0.02	
MLAST042SCH6R8[WNA01	TMK042 CH6R8[D-W	25	CH C0H	6.8 p	±0.1pF, ±0.25pF, ±0.5pF	536	200	0.2±0.02	
MLAST042SCH6R9[WNA01	TMK042 CH6R9[D-W	25	CH C0H	6.9 p	±0.1pF, ±0.25pF, ±0.5pF	538	200	0.2±0.02	
MLAST042SCH070[WNA01	TMK042 CH070[D-W	25	CH C0H	7 p	±0.1pF, ±0.25pF, ±0.5pF	540	200	0.2±0.02	
MLAST042SCH7R1[WNA01	TMK042 CH7R1[D-W	25	CH C0H	7.1 p	±0.1pF, ±0.25pF, ±0.5pF	542	200	0.2±0.02	
MLAST042SCH7R2[WNA01	TMK042 CH7R2[D-W	25	CH C0H	7.2 p	±0.1pF, ±0.25pF, ±0.5pF	544	200	0.2±0.02	
MLAST042SCH7R3[WNA01	TMK042 CH7R3[D-W	25	CH C0H	7.3 p	±0.1pF, ±0.25pF, ±0.5pF	546	200	0.2±0.02	
MLAST042SCH7R4[WNA01	TMK042 CH7R4[D-W	25	CH C0H	7.4 p	±0.1pF, ±0.25pF, ±0.5pF	548	200	0.2±0.02	
MLAST042SCH7R5[WNA01	TMK042 CH7R5[D-W	25	CH C0H	7.5 p	±0.1pF, ±0.25pF, ±0.5pF	550	200	0.2±0.02	
MLAST042SCH7R6[WNA01	TMK042 CH7R6[D-W	25	CH C0H	7.6 p	±0.1pF, ±0.25pF, ±0.5pF	552	200	0.2±0.02	
MLAST042SCH7R7[WNA01	TMK042 CH7R7[D-W	25	CH C0H	7.7 p	±0.1pF, ±0.25pF, ±0.5pF	554	200	0.2±0.02	
MLAST042SCH7R8[WNA01	TMK042 CH7R8[D-W	25	CH C0H	7.8 p	±0.1pF, ±0.25pF, ±0.5pF	556	200	0.2±0.02	
MLAST042SCH7R9[WNA01	TMK042 CH7R9[D-W	25	CH C0H	7.9 p	±0.1pF, ±0.25pF, ±0.5pF	558	200	0.2±0.02	
MLAST042SCH080[WNA01	TMK042 CH080[D-W	25	CH C0H	8 p	±0.1pF, ±0.25pF, ±0.5pF	560	200	0.2±0.02	
MLAST042SCH8R1[WNA01	TMK042 CH8R1[D-W	25	CH C0H	8.1 p	±0.1pF, ±0.25pF, ±0.5pF	562	200	0.2±0.02	
MLAST042SCH8R2[WNA01	TMK042 CH8R2[D-W	25	CH C0H	8.2 p	±0.1pF, ±0.25pF, ±0.5pF	564	200	0.2±0.02	
MLAST042SCH8R3[WNA01	TMK042 CH8R3[D-W	25	CH C0H	8.3 p	±0.1pF, ±0.25pF, ±0.5pF	566	200	0.2±0.02	
MLAST042SCH8R4[WNA01	TMK042 CH8R4[D-W	25	CH C0H	8.4 p	±0.1pF, ±0.25pF, ±0.5pF	568	200	0.2±0.02	

* This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification.
For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

■ PARTS NUMBER

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLAST042SCH8R5[WNA01	TMK042 CH8R5[D-W	25	CH	C0H	8.5 p	±0.1pF, ±0.25pF, ±0.5pF	570	200	0.2±0.02	
MLAST042SCH8R6[WNA01	TMK042 CH8R6[D-W	25	CH	C0H	8.6 p	±0.1pF, ±0.25pF, ±0.5pF	572	200	0.2±0.02	
MLAST042SCH8R7[WNA01	TMK042 CH8R7[D-W	25	CH	C0H	8.7 p	±0.1pF, ±0.25pF, ±0.5pF	574	200	0.2±0.02	
MLAST042SCH8R8[WNA01	TMK042 CH8R8[D-W	25	CH	C0H	8.8 p	±0.1pF, ±0.25pF, ±0.5pF	576	200	0.2±0.02	
MLAST042SCH8R9[WNA01	TMK042 CH8R9[D-W	25	CH	C0H	8.9 p	±0.1pF, ±0.25pF, ±0.5pF	578	200	0.2±0.02	
MLAST042SCH090[WNA01	TMK042 CH090[D-W	25	CH	C0H	9 p	±0.1pF, ±0.25pF, ±0.5pF	580	200	0.2±0.02	
MLAST042SCH9R1[WNA01	TMK042 CH9R1[D-W	25	CH	C0H	9.1 p	±0.1pF, ±0.25pF, ±0.5pF	582	200	0.2±0.02	
MLAST042SCH9R2[WNA01	TMK042 CH9R2[D-W	25	CH	C0H	9.2 p	±0.1pF, ±0.25pF, ±0.5pF	584	200	0.2±0.02	
MLAST042SCH9R3[WNA01	TMK042 CH9R3[D-W	25	CH	C0H	9.3 p	±0.1pF, ±0.25pF, ±0.5pF	586	200	0.2±0.02	
MLAST042SCH9R4[WNA01	TMK042 CH9R4[D-W	25	CH	C0H	9.4 p	±0.1pF, ±0.25pF, ±0.5pF	588	200	0.2±0.02	
MLAST042SCH9R5[WNA01	TMK042 CH9R5[D-W	25	CH	C0H	9.5 p	±0.1pF, ±0.25pF, ±0.5pF	590	200	0.2±0.02	
MLAST042SCH9R6[WNA01	TMK042 CH9R6[D-W	25	CH	C0H	9.6 p	±0.1pF, ±0.25pF, ±0.5pF	592	200	0.2±0.02	
MLAST042SCH9R7[WNA01	TMK042 CH9R7[D-W	25	CH	C0H	9.7 p	±0.1pF, ±0.25pF, ±0.5pF	594	200	0.2±0.02	
MLAST042SCH9R8[WNA01	TMK042 CH9R8[D-W	25	CH	C0H	9.8 p	±0.1pF, ±0.25pF, ±0.5pF	596	200	0.2±0.02	
MLAST042SCH9R9[WNA01	TMK042 CH9R9[D-W	25	CH	C0H	9.9 p	±0.1pF, ±0.25pF, ±0.5pF	598	200	0.2±0.02	
MLAST042SCH100D[WNA01	TMK042 CH100D	25	CH	C0H	10 p	±0.5pF	600	200	0.2±0.02	
MLAST042SCH110J[WNA01	TMK042 CH110J	25	CH	C0H	11 p	±5%	620	200	0.2±0.02	
MLAST042SCH120J[WNA01	TMK042 CH120J	25	CH	C0H	12 p	±5%	640	200	0.2±0.02	
MLAST042SCH130J[WNA01	TMK042 CH130J	25	CH	C0H	13 p	±5%	660	200	0.2±0.02	
MLAST042SCH150J[WNA01	TMK042 CH150J	25	CH	C0H	15 p	±5%	700	200	0.2±0.02	
MLAST042SCH160J[WNA01	TMK042 CH160J	25	CH	C0H	16 p	±5%	720	200	0.2±0.02	
MLAST042SCH180J[WNA01	TMK042 CH180J	25	CH	C0H	18 p	±5%	760	200	0.2±0.02	
MLAST042SCH200J[WNA01	TMK042 CH200J	25	CH	C0H	20 p	±5%	800	200	0.2±0.02	
MLAST042SCH220J[WNA01	TMK042 CH220J	25	CH	C0H	22 p	±5%	840	200	0.2±0.02	
MLAST042SCH240J[WNA01	TMK042 CH240J	25	CH	C0H	24 p	±5%	880	200	0.2±0.02	
MLAST042SCH270J[WNA01	TMK042 CH270J	25	CH	C0H	27 p	±5%	940	200	0.2±0.02	
MLAST042SCH300J[WNA01	TMK042 CH300J	25	CH	C0H	30 p	±5%	1000	200	0.2±0.02	
MLAST042SCH330J[WNA01	TMK042 CH330J	25	CH	C0H	33 p	±5%	1000	200	0.2±0.02	
MLAST042SCH360J[WNA01	TMK042 CH360J	25	CH	C0H	36 p	±5%	1000	200	0.2±0.02	
MLAST042SCH390J[WNA01	TMK042 CH390J	25	CH	C0H	39 p	±5%	1000	200	0.2±0.02	
MLAST042SCH430J[WNA01	TMK042 CH430J	25	CH	C0H	43 p	±5%	1000	200	0.2±0.02	
MLAST042SCH470J[WNA01	TMK042 CH470J	25	CH	C0H	47 p	±5%	1000	200	0.2±0.02	
MLAST042SCH510J[WNA01	TMK042 CH510J	25	CH	C0H	51 p	±5%	1000	200	0.2±0.02	
MLAST042SCH560J[WNA01	TMK042 CH560J	25	CH	C0H	56 p	±5%	1000	200	0.2±0.02	
MLAST042SCH620J[WNA01	TMK042 CH620J	25	CH	C0H	62 p	±5%	1000	200	0.2±0.02	
MLAST042SCH680J[WNA01	TMK042 CH680J	25	CH	C0H	68 p	±5%	1000	200	0.2±0.02	
MLAST042SCH750J[WNA01	TMK042 CH750J	25	CH	C0H	75 p	±5%	1000	200	0.2±0.02	
MLAST042SCH820J[WNA01	TMK042 CH820J	25	CH	C0H	82 p	±5%	1000	200	0.2±0.02	
MLAST042SCH910J[WNA01	TMK042 CH910J	25	CH	C0H	91 p	±5%	1000	200	0.2±0.02	
MLAST042SCH101J[WNA01	TMK042 CH101J	25	CH	C0H	100 p	±5%	1000	200	0.2±0.02	

【Temperature Characteristic CΔ : CΔ/C0Δ (-55~+125°C)】 0.2mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASE042SCK0R4[WNA01	EMK042 CK0R4[D-W	16	CK	C0K	0.4 p	±0.05pF, ±0.1pF, ±0.25pF	408	200	0.2±0.02	
MLASE042SCK0R5[WNA01	EMK042 CK0R5[D-W	16	CK	C0K	0.5 p	±0.05pF, ±0.1pF, ±0.25pF	410	200	0.2±0.02	
MLASE042SCK0R6[WNA01	EMK042 CK0R6[D-W	16	CK	C0K	0.6 p	±0.05pF, ±0.1pF, ±0.25pF	412	200	0.2±0.02	
MLASE042SCK0R7[WNA01	EMK042 CK0R7[D-W	16	CK	C0K	0.7 p	±0.05pF, ±0.1pF, ±0.25pF	414	200	0.2±0.02	
MLASE042SCK0R75[WNA01	EMK042 CKR75[D-W	16	CK	C0K	0.75 p	±0.05pF, ±0.1pF, ±0.25pF	415	200	0.2±0.02	
MLASE042SCK0R8[WNA01	EMK042 CK0R8[D-W	16	CK	C0K	0.8 p	±0.05pF, ±0.1pF, ±0.25pF	416	200	0.2±0.02	
MLASE042SCK0R9[WNA01	EMK042 CK0R9[D-W	16	CK	C0K	0.9 p	±0.05pF, ±0.1pF, ±0.25pF	418	200	0.2±0.02	
MLASE042SCK010[WNA01	EMK042 CK010[D-W	16	CK	C0K	1 p	±0.05pF, ±0.1pF, ±0.25pF	420	200	0.2±0.02	
MLASE042SCK1R1[WNA01	EMK042 CK1R1[D-W	16	CK	C0K	1.1 p	±0.05pF, ±0.1pF, ±0.25pF	422	200	0.2±0.02	
MLASE042SCK1R2[WNA01	EMK042 CK1R2[D-W	16	CK	C0K	1.2 p	±0.05pF, ±0.1pF, ±0.25pF	424	200	0.2±0.02	
MLASE042SCK1R3[WNA01	EMK042 CK1R3[D-W	16	CK	C0K	1.3 p	±0.05pF, ±0.1pF, ±0.25pF	426	200	0.2±0.02	
MLASE042SCK1R4[WNA01	EMK042 CK1R4[D-W	16	CK	C0K	1.4 p	±0.05pF, ±0.1pF, ±0.25pF	428	200	0.2±0.02	
MLASE042SCK1R5[WNA01	EMK042 CK1R5[D-W	16	CK	C0K	1.5 p	±0.05pF, ±0.1pF, ±0.25pF	430	200	0.2±0.02	
MLASE042SCK1R6[WNA01	EMK042 CK1R6[D-W	16	CK	C0K	1.6 p	±0.05pF, ±0.1pF, ±0.25pF	432	200	0.2±0.02	
MLASE042SCK1R7[WNA01	EMK042 CK1R7[D-W	16	CK	C0K	1.7 p	±0.05pF, ±0.1pF, ±0.25pF	434	200	0.2±0.02	
MLASE042SCK1R8[WNA01	EMK042 CK1R8[D-W	16	CK	C0K	1.8 p	±0.05pF, ±0.1pF, ±0.25pF	436	200	0.2±0.02	
MLASE042SCK1R9[WNA01	EMK042 CK1R9[D-W	16	CK	C0K	1.9 p	±0.05pF, ±0.1pF, ±0.25pF	438	200	0.2±0.02	
MLASE042SCK020[WNA01	EMK042 CK020[D-W	16	CK	C0K	2 p	±0.05pF, ±0.1pF, ±0.25pF	440	200	0.2±0.02	
MLASE042SCK2R1[WNA01	EMK042 CK2R1[D-W	16	CK	C0K	2.1 p	±0.05pF, ±0.1pF, ±0.25pF	442	200	0.2±0.02	
MLASE042SCK2R2[WNA01	EMK042 CK2R2[D-W	16	CK	C0K	2.2 p	±0.05pF, ±0.1pF, ±0.25pF	444	200	0.2±0.02	
MLASE042SCK2R3[WNA01	EMK042 CK2R3[D-W	16	CK	C0K	2.3 p	±0.05pF, ±0.1pF, ±0.25pF	446	200	0.2±0.02	
MLASE042SCK2R4[WNA01	EMK042 CK2R4[D-W	16	CK	C0K	2.4 p	±0.05pF, ±0.1pF, ±0.25pF	448	200	0.2±0.02	
MLASE042SCK2R5[WNA01	EMK042 CK2R5[D-W	16	CK	C0K	2.5 p	±0.05pF, ±0.1pF, ±0.25pF	450	200	0.2±0.02	
MLASE042SCK2R6[WNA01	EMK042 CK2R6[D-W	16	CK	C0K	2.6 p	±0.05pF, ±0.1pF, ±0.25pF	452	200	0.2±0.02	
MLASE042SCK2R7[WNA01	EMK042 CK2R7[D-W	16	CK	C0K	2.7 p	±0.05pF, ±0.1pF, ±0.25pF	454	200	0.2±0.02	
MLASE042SCK2R8[WNA01	EMK042 CK2R8[D-W	16	CK	C0K	2.8 p	±0.05pF, ±0.1pF, ±0.25pF	456	200	0.2±0.02	
MLASE042SCK2R9[WNA01	EMK042 CK2R9[D-W	16	CK	C0K	2.9 p	±0.05pF, ±0.1pF, ±0.25pF	458	200	0.2±0.02	
MLASE042SCJ030[WNA01	EMK042 CJ030[D-W	16	CJ	C0J	3 p	±0.05pF, ±0.1pF, ±0.25pF	460	200	0.2±0.02	
MLASE042SCJ3R1[WNA01	EMK042 CJ3R1[D-W	16	CJ	C0J	3.1 p	±0.1pF, ±0.25pF	462	200	0.2±0.02	
MLASE042SCJ3R2[WNA01	EMK042 CJ3R2[D-W	16	CJ	C0J	3.2 p	±0.1pF, ±0.25pF	464	200	0.2±0.02	
MLASE042SCJ3R3[WNA01	EMK042 CJ3R3[D-W	16	CJ	C0J	3.3 p	±0.1pF, ±0.25pF	466	200	0.2±0.02	
MLASE042SCJ3R4[WNA01	EMK042 CJ3R4[D-W	16	CJ	C0J	3.4 p	±0.1pF, ±0.25pF	468	200	0.2±0.02	
MLASE042SCJ3R5[WNA01	EMK042 CJ3R5[D-W	16	CJ	C0J	3.5 p	±0.1pF, ±0.25pF	470	200	0.2±0.02	
MLASE042SCJ3R6[WNA01	EMK042 CJ3R6[D-W	16	CJ	C0J	3.6 p	±0.1pF, ±0.25pF	472	200	0.2±0.02	
MLASE042SCJ3R7[WNA01	EMK042 CJ3R7[D-W	16	CJ	C0J	3.7 p	±0.1pF, ±0.25pF	474	200	0.2±0.02	
MLASE042SCJ3R8[WNA01	EMK042 CJ3R8[D-W	16	CJ	C0J	3.8 p	±0.1pF, ±0.25pF	476	200	0.2±0.02	
MLASE042SCJ3R9[WNA01	EMK042 CJ3R9[D-W	16	CJ	C0J	3.9 p	±0.1pF, ±0.25pF	478	200	0.2±0.02	
MLASE042SCH040[WNA01	EMK042 CH040[D-W	16	CH	C0H	4 p	±0.1pF, ±0.25pF	480	200	0.2±0.02	
MLASE042SCH4R1[WNA01	EMK042 CH4R1[D-W	16	CH	C0H	4.1 p	±0.1pF, ±0.25pF	482	200	0.2±0.02	
MLASE042SCH4R2[WNA01	EMK042 CH4R2[D-W	16	CH	C0H	4.2 p	±0.1pF, ±0.25pF	484	200	0.2±0.02	
MLASE042SCH4R3[WNA01	EMK042 CH4R3[D-W	16	CH	C0H	4.3 p	±0.1pF, ±0.25pF	486	200	0.2±0.02	

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■ PARTS NUMBER

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASE042SCH4R4[WNA01	EMK042 CH4R4[D-W	16	CH	C0H	4.4 p	±0.1pF, ±0.25pF	488	200	0.2±0.02	
MLASE042SCH4R5[WNA01	EMK042 CH4R5[D-W	16	CH	C0H	4.5 p	±0.1pF, ±0.25pF	490	200	0.2±0.02	
MLASE042SCH4R6[WNA01	EMK042 CH4R6[D-W	16	CH	C0H	4.6 p	±0.1pF, ±0.25pF	492	200	0.2±0.02	
MLASE042SCH4R7[WNA01	EMK042 CH4R7[D-W	16	CH	C0H	4.7 p	±0.1pF, ±0.25pF	494	200	0.2±0.02	
MLASE042SCH4R8[WNA01	EMK042 CH4R8[D-W	16	CH	C0H	4.8 p	±0.1pF, ±0.25pF	496	200	0.2±0.02	
MLASE042SCH4R9[WNA01	EMK042 CH4R9[D-W	16	CH	C0H	4.9 p	±0.1pF, ±0.25pF	498	200	0.2±0.02	
MLASE042SCH050[WNA01	EMK042 CH050[D-W	16	CH	C0H	5 p	±0.1pF, ±0.25pF	500	200	0.2±0.02	
MLASE042SCH5R1[WNA01	EMK042 CH5R1[D-W	16	CH	C0H	5.1 p	±0.1pF, ±0.25pF, ±0.5pF	502	200	0.2±0.02	
MLASE042SCH5R2[WNA01	EMK042 CH5R2[D-W	16	CH	C0H	5.2 p	±0.1pF, ±0.25pF, ±0.5pF	504	200	0.2±0.02	
MLASE042SCH5R3[WNA01	EMK042 CH5R3[D-W	16	CH	C0H	5.3 p	±0.1pF, ±0.25pF, ±0.5pF	506	200	0.2±0.02	
MLASE042SCH5R4[WNA01	EMK042 CH5R4[D-W	16	CH	C0H	5.4 p	±0.1pF, ±0.25pF, ±0.5pF	508	200	0.2±0.02	
MLASE042SCH5R5[WNA01	EMK042 CH5R5[D-W	16	CH	C0H	5.5 p	±0.1pF, ±0.25pF, ±0.5pF	510	200	0.2±0.02	
MLASE042SCH5R6[WNA01	EMK042 CH5R6[D-W	16	CH	C0H	5.6 p	±0.1pF, ±0.25pF, ±0.5pF	512	200	0.2±0.02	
MLASE042SCH5R7[WNA01	EMK042 CH5R7[D-W	16	CH	C0H	5.7 p	±0.1pF, ±0.25pF, ±0.5pF	514	200	0.2±0.02	
MLASE042SCH5R8[WNA01	EMK042 CH5R8[D-W	16	CH	C0H	5.8 p	±0.1pF, ±0.25pF, ±0.5pF	516	200	0.2±0.02	
MLASE042SCH5R9[WNA01	EMK042 CH5R9[D-W	16	CH	C0H	5.9 p	±0.1pF, ±0.25pF, ±0.5pF	518	200	0.2±0.02	
MLASE042SCH060[WNA01	EMK042 CH060[D-W	16	CH	C0H	6 p	±0.1pF, ±0.25pF, ±0.5pF	520	200	0.2±0.02	
MLASE042SCH6R1[WNA01	EMK042 CH6R1[D-W	16	CH	C0H	6.1 p	±0.1pF, ±0.25pF, ±0.5pF	522	200	0.2±0.02	
MLASE042SCH6R2[WNA01	EMK042 CH6R2[D-W	16	CH	C0H	6.2 p	±0.1pF, ±0.25pF, ±0.5pF	524	200	0.2±0.02	
MLASE042SCH6R3[WNA01	EMK042 CH6R3[D-W	16	CH	C0H	6.3 p	±0.1pF, ±0.25pF, ±0.5pF	526	200	0.2±0.02	
MLASE042SCH6R4[WNA01	EMK042 CH6R4[D-W	16	CH	C0H	6.4 p	±0.1pF, ±0.25pF, ±0.5pF	528	200	0.2±0.02	
MLASE042SCH6R5[WNA01	EMK042 CH6R5[D-W	16	CH	C0H	6.5 p	±0.1pF, ±0.25pF, ±0.5pF	530	200	0.2±0.02	
MLASE042SCH6R6[WNA01	EMK042 CH6R6[D-W	16	CH	C0H	6.6 p	±0.1pF, ±0.25pF, ±0.5pF	532	200	0.2±0.02	
MLASE042SCH6R7[WNA01	EMK042 CH6R7[D-W	16	CH	C0H	6.7 p	±0.1pF, ±0.25pF, ±0.5pF	534	200	0.2±0.02	
MLASE042SCH6R8[WNA01	EMK042 CH6R8[D-W	16	CH	C0H	6.8 p	±0.1pF, ±0.25pF, ±0.5pF	536	200	0.2±0.02	
MLASE042SCH6R9[WNA01	EMK042 CH6R9[D-W	16	CH	C0H	6.9 p	±0.1pF, ±0.25pF, ±0.5pF	538	200	0.2±0.02	
MLASE042SCH070[WNA01	EMK042 CH070[D-W	16	CH	C0H	7 p	±0.1pF, ±0.25pF, ±0.5pF	540	200	0.2±0.02	
MLASE042SCH7R1[WNA01	EMK042 CH7R1[D-W	16	CH	C0H	7.1 p	±0.1pF, ±0.25pF, ±0.5pF	542	200	0.2±0.02	
MLASE042SCH7R2[WNA01	EMK042 CH7R2[D-W	16	CH	C0H	7.2 p	±0.1pF, ±0.25pF, ±0.5pF	544	200	0.2±0.02	
MLASE042SCH7R3[WNA01	EMK042 CH7R3[D-W	16	CH	C0H	7.3 p	±0.1pF, ±0.25pF, ±0.5pF	546	200	0.2±0.02	
MLASE042SCH7R4[WNA01	EMK042 CH7R4[D-W	16	CH	C0H	7.4 p	±0.1pF, ±0.25pF, ±0.5pF	548	200	0.2±0.02	
MLASE042SCH7R5[WNA01	EMK042 CH7R5[D-W	16	CH	C0H	7.5 p	±0.1pF, ±0.25pF, ±0.5pF	550	200	0.2±0.02	
MLASE042SCH7R6[WNA01	EMK042 CH7R6[D-W	16	CH	C0H	7.6 p	±0.1pF, ±0.25pF, ±0.5pF	552	200	0.2±0.02	
MLASE042SCH7R7[WNA01	EMK042 CH7R7[D-W	16	CH	C0H	7.7 p	±0.1pF, ±0.25pF, ±0.5pF	554	200	0.2±0.02	
MLASE042SCH7R8[WNA01	EMK042 CH7R8[D-W	16	CH	C0H	7.8 p	±0.1pF, ±0.25pF, ±0.5pF	556	200	0.2±0.02	
MLASE042SCH7R9[WNA01	EMK042 CH7R9[D-W	16	CH	C0H	7.9 p	±0.1pF, ±0.25pF, ±0.5pF	558	200	0.2±0.02	
MLASE042SCH080[WNA01	EMK042 CH080[D-W	16	CH	C0H	8 p	±0.1pF, ±0.25pF, ±0.5pF	560	200	0.2±0.02	
MLASE042SCH8R1[WNA01	EMK042 CH8R1[D-W	16	CH	C0H	8.1 p	±0.1pF, ±0.25pF, ±0.5pF	562	200	0.2±0.02	
MLASE042SCH8R2[WNA01	EMK042 CH8R2[D-W	16	CH	C0H	8.2 p	±0.1pF, ±0.25pF, ±0.5pF	564	200	0.2±0.02	
MLASE042SCH8R3[WNA01	EMK042 CH8R3[D-W	16	CH	C0H	8.3 p	±0.1pF, ±0.25pF, ±0.5pF	566	200	0.2±0.02	
MLASE042SCH8R4[WNA01	EMK042 CH8R4[D-W	16	CH	C0H	8.4 p	±0.1pF, ±0.25pF, ±0.5pF	568	200	0.2±0.02	
MLASE042SCH8R5[WNA01	EMK042 CH8R5[D-W	16	CH	C0H	8.5 p	±0.1pF, ±0.25pF, ±0.5pF	570	200	0.2±0.02	
MLASE042SCH8R6[WNA01	EMK042 CH8R6[D-W	16	CH	C0H	8.6 p	±0.1pF, ±0.25pF, ±0.5pF	572	200	0.2±0.02	
MLASE042SCH8R7[WNA01	EMK042 CH8R7[D-W	16	CH	C0H	8.7 p	±0.1pF, ±0.25pF, ±0.5pF	574	200	0.2±0.02	
MLASE042SCH8R8[WNA01	EMK042 CH8R8[D-W	16	CH	C0H	8.8 p	±0.1pF, ±0.25pF, ±0.5pF	576	200	0.2±0.02	
MLASE042SCH8R9[WNA01	EMK042 CH8R9[D-W	16	CH	C0H	8.9 p	±0.1pF, ±0.25pF, ±0.5pF	578	200	0.2±0.02	
MLASE042SCH090[WNA01	EMK042 CH090[D-W	16	CH	C0H	9 p	±0.1pF, ±0.25pF, ±0.5pF	580	200	0.2±0.02	
MLASE042SCH9R1[WNA01	EMK042 CH9R1[D-W	16	CH	C0H	9.1 p	±0.1pF, ±0.25pF, ±0.5pF	582	200	0.2±0.02	
MLASE042SCH9R2[WNA01	EMK042 CH9R2[D-W	16	CH	C0H	9.2 p	±0.1pF, ±0.25pF, ±0.5pF	584	200	0.2±0.02	
MLASE042SCH9R3[WNA01	EMK042 CH9R3[D-W	16	CH	C0H	9.3 p	±0.1pF, ±0.25pF, ±0.5pF	586	200	0.2±0.02	
MLASE042SCH9R4[WNA01	EMK042 CH9R4[D-W	16	CH	C0H	9.4 p	±0.1pF, ±0.25pF, ±0.5pF	588	200	0.2±0.02	
MLASE042SCH9R5[WNA01	EMK042 CH9R5[D-W	16	CH	C0H	9.5 p	±0.1pF, ±0.25pF, ±0.5pF	590	200	0.2±0.02	
MLASE042SCH9R6[WNA01	EMK042 CH9R6[D-W	16	CH	C0H	9.6 p	±0.1pF, ±0.25pF, ±0.5pF	592	200	0.2±0.02	
MLASE042SCH9R7[WNA01	EMK042 CH9R7[D-W	16	CH	C0H	9.7 p	±0.1pF, ±0.25pF, ±0.5pF	594	200	0.2±0.02	
MLASE042SCH9R8[WNA01	EMK042 CH9R8[D-W	16	CH	C0H	9.8 p	±0.1pF, ±0.25pF, ±0.5pF	596	200	0.2±0.02	
MLASE042SCH9R9[WNA01	EMK042 CH9R9[D-W	16	CH	C0H	9.9 p	±0.1pF, ±0.25pF, ±0.5pF	598	200	0.2±0.02	
MLASE042SCH100D[WNA01	EMK042 CH100DD-W	16	CH	C0H	10 p	±5%	600	200	0.2±0.02	
MLASE042SCH110J[WNA01	EMK042 CH110JD-W	16	CH	C0H	11 p	±5%	620	200	0.2±0.02	
MLASE042SCH120J[WNA01	EMK042 CH120JD-W	16	CH	C0H	12 p	±5%	640	200	0.2±0.02	
MLASE042SCH130J[WNA01	EMK042 CH130JD-W	16	CH	C0H	13 p	±5%	660	200	0.2±0.02	
MLASE042SCH150J[WNA01	EMK042 CH150JD-W	16	CH	C0H	15 p	±5%	700	200	0.2±0.02	
MLASE042SCH160J[WNA01	EMK042 CH160JC-W	16	CH	C0H	16 p	±5%	720	200	0.2±0.02	
MLASE042SCH180J[WNA01	EMK042 CH180JC-W	16	CH	C0H	18 p	±5%	760	200	0.2±0.02	
MLASE042SCH200J[WNA01	EMK042 CH200JC-W	16	CH	C0H	20 p	±5%	800	200	0.2±0.02	
MLASE042SCH220J[WNA01	EMK042 CH220JC-W	16	CH	C0H	22 p	±5%	840	200	0.2±0.02	
MLASE042SCH240J[WNA01	EMK042 CH240JC-W	16	CH	C0H	24 p	±5%	880	200	0.2±0.02	
MLASE042SCH270J[WNA01	EMK042 CH270JC-W	16	CH	C0H	27 p	±5%	940	200	0.2±0.02	
MLASE042SCH300J[WNA01	EMK042 CH300JC-W	16	CH	C0H	30 p	±5%	1000	200	0.2±0.02	
MLASE042SCH330J[WNA01	EMK042 CH330JC-W	16	CH	C0H	33 p	±5%	1000	200	0.2±0.02	
MLASE042SCH360J[WNA01	EMK042 CH360JC-W	16	CH	C0H	36 p	±5%	1000	200	0.2±0.02	
MLASE042SCH390J[WNA01	EMK042 CH390JC-W	16	CH	C0H	39 p	±5%	1000	200	0.2±0.02	
MLASE042SCH430J[WNA01	EMK042 CH430JC-W	16	CH	C0H	43 p	±5%	1000	200	0.2±0.02	
MLASE042SCH470J[WNA01	EMK042 CH470JC-W	16	CH	C0H	47 p	±5%	1000	200	0.2±0.02	
MLASE042SCH510J[WNA01	EMK042 CH510JC-W	16	CH	C0H	51 p	±5%	1000	200	0.2±0.02	
MLASE042SCH560J[WNA01	EMK042 CH560JC-W	16	CH	C0H	56 p	±5%	1000	200	0.2±0.02	
MLASE042SCH620J[WNA01	EMK042 CH620JC-W	16	CH	C0H	62 p	±5%	1000	200	0.2±0.02	
MLASE042SCH680J[WNA01	EMK042 CH680JC-W	16	CH	C0H	68 p	±5%	1000	200	0.2±0.02	
MLASE042SCH750J[WNA01	EMK042 CH750JC-W	16	CH	C0H	75 p	±5%	1000	200	0.2±0.02	
MLASE042SCH820J[WNA01	EMK042 CH820JC-W	16	CH	C0H	82 p	±5%	1000	200	0.2±0.02	
MLASE042SCH910J[WNA01	EMK042 CH910JC-W	16	CH	C0H	91 p	±5%	1000	200	0.2±0.02	
MLASE042SCH101J[WNA01	EMK042 CH101JC-W	16	CH	C0H	100 p	±5%	1000	200	0.2±0.02	
MLASE042SCH221J[WNA01	EMK042 CH221JC-W	16	CH	C0H	220 p	±5%	1000	200	0.2±0.02	
MLASE042SCH241J[WNA01	EMK042 CH241JC-W	16	CH	C0H	240 p	±5%	1000	200	0.2±0.02	
MLASE042SCH271J[WNA01	EMK042 CH271JC-W	16	CH	C0H	270 p	±5%	1000	200	0.2±0.02	
MLASE042SCH331J[WNA01	EMK042 CH331JC-W	16	CH	C0H	330 p	±5%	1000	200	0.2±0.02	

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■ PARTS NUMBER

【Temperature Characteristic CG : CG/C0G (−55~+125°C)】 0.2mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT		Thickness*3 [mm]	Note
							Rated voltage x %			
MLAST042SCG0R4[WNA01	TMK042 CG0R4[D-W	25	CG C0G	0.4 p	±0.05pF, ±0.1pF, ±0.25pF	408	200		0.2±0.02	
MLAST042SCG0R5[WNA01	TMK042 CG0R5[D-W	25	CG C0G	0.5 p	±0.05pF, ±0.1pF, ±0.25pF	410	200		0.2±0.02	
MLAST042SCG0R6[WNA01	TMK042 CG0R6[D-W	25	CG C0G	0.6 p	±0.05pF, ±0.1pF, ±0.25pF	412	200		0.2±0.02	
MLAST042SCG0R7[WNA01	TMK042 CG0R7[D-W	25	CG C0G	0.7 p	±0.05pF, ±0.1pF, ±0.25pF	414	200		0.2±0.02	
MLAST042SCGR75[WNA01	TMK042 CGR75[D-W	25	CG C0G	0.75 p	±0.05pF, ±0.1pF, ±0.25pF	415	200		0.2±0.02	
MLAST042SCG0R8[WNA01	TMK042 CG0R8[D-W	25	CG C0G	0.8 p	±0.05pF, ±0.1pF, ±0.25pF	416	200		0.2±0.02	
MLAST042SCG0R9[WNA01	TMK042 CG0R9[D-W	25	CG C0G	0.9 p	±0.05pF, ±0.1pF, ±0.25pF	418	200		0.2±0.02	
MLAST042SCG010[WNA01	TMK042 CG010[D-W	25	CG C0G	1 p	±0.05pF, ±0.1pF, ±0.25pF	420	200		0.2±0.02	
MLAST042SCG1R1[WNA01	TMK042 CG1R1[D-W	25	CG C0G	1.1 p	±0.05pF, ±0.1pF, ±0.25pF	422	200		0.2±0.02	
MLAST042SCG1R2[WNA01	TMK042 CG1R2[D-W	25	CG C0G	1.2 p	±0.05pF, ±0.1pF, ±0.25pF	424	200		0.2±0.02	
MLAST042SCG1R3[WNA01	TMK042 CG1R3[D-W	25	CG C0G	1.3 p	±0.05pF, ±0.1pF, ±0.25pF	426	200		0.2±0.02	
MLAST042SCG1R4[WNA01	TMK042 CG1R4[D-W	25	CG C0G	1.4 p	±0.05pF, ±0.1pF, ±0.25pF	428	200		0.2±0.02	
MLAST042SCG1R5[WNA01	TMK042 CG1R5[D-W	25	CG C0G	1.5 p	±0.05pF, ±0.1pF, ±0.25pF	430	200		0.2±0.02	
MLAST042SCG1R6[WNA01	TMK042 CG1R6[D-W	25	CG C0G	1.6 p	±0.05pF, ±0.1pF, ±0.25pF	432	200		0.2±0.02	
MLAST042SCG1R7[WNA01	TMK042 CG1R7[D-W	25	CG C0G	1.7 p	±0.05pF, ±0.1pF, ±0.25pF	434	200		0.2±0.02	
MLAST042SCG1R8[WNA01	TMK042 CG1R8[D-W	25	CG C0G	1.8 p	±0.05pF, ±0.1pF, ±0.25pF	436	200		0.2±0.02	
MLAST042SCG1R9[WNA01	TMK042 CG1R9[D-W	25	CG C0G	1.9 p	±0.05pF, ±0.1pF, ±0.25pF	438	200		0.2±0.02	
MLAST042SCG020[WNA01	TMK042 CG020[D-W	25	CG C0G	2 p	±0.05pF, ±0.1pF, ±0.25pF	440	200		0.2±0.02	
MLAST042SCG2R1[WNA01	TMK042 CG2R1[D-W	25	CG C0G	2.1 p	±0.05pF, ±0.1pF, ±0.25pF	442	200		0.2±0.02	
MLAST042SCG2R2[WNA01	TMK042 CG2R2[D-W	25	CG C0G	2.2 p	±0.05pF, ±0.1pF, ±0.25pF	444	200		0.2±0.02	
MLAST042SCG2R3[WNA01	TMK042 CG2R3[D-W	25	CG C0G	2.3 p	±0.05pF, ±0.1pF, ±0.25pF	446	200		0.2±0.02	
MLAST042SCG2R4[WNA01	TMK042 CG2R4[D-W	25	CG C0G	2.4 p	±0.05pF, ±0.1pF, ±0.25pF	448	200		0.2±0.02	
MLAST042SCG2R5[WNA01	TMK042 CG2R5[D-W	25	CG C0G	2.5 p	±0.05pF, ±0.1pF, ±0.25pF	450	200		0.2±0.02	
MLAST042SCG2R6[WNA01	TMK042 CG2R6[D-W	25	CG C0G	2.6 p	±0.05pF, ±0.1pF, ±0.25pF	452	200		0.2±0.02	
MLAST042SCG2R7[WNA01	TMK042 CG2R7[D-W	25	CG C0G	2.7 p	±0.05pF, ±0.1pF, ±0.25pF	454	200		0.2±0.02	
MLAST042SCG2R8[WNA01	TMK042 CG2R8[D-W	25	CG C0G	2.8 p	±0.05pF, ±0.1pF, ±0.25pF	456	200		0.2±0.02	
MLAST042SCG2R9[WNA01	TMK042 CG2R9[D-W	25	CG C0G	2.9 p	±0.05pF, ±0.1pF, ±0.25pF	458	200		0.2±0.02	
MLAST042SCG030[WNA01	TMK042 CG030[D-W	25	CG C0G	3 p	±0.05pF, ±0.1pF, ±0.25pF	460	200		0.2±0.02	
MLAST042SCG3R1[WNA01	TMK042 CG3R1[D-W	25	CG C0G	3.1 p	±0.1pF, ±0.25pF	462	200		0.2±0.02	
MLAST042SCG3R2[WNA01	TMK042 CG3R2[D-W	25	CG C0G	3.2 p	±0.1pF, ±0.25pF	464	200		0.2±0.02	
MLAST042SCG3R3[WNA01	TMK042 CG3R3[D-W	25	CG C0G	3.3 p	±0.1pF, ±0.25pF	466	200		0.2±0.02	
MLAST042SCG3R4[WNA01	TMK042 CG3R4[D-W	25	CG C0G	3.4 p	±0.1pF, ±0.25pF	468	200		0.2±0.02	
MLAST042SCG3R5[WNA01	TMK042 CG3R5[D-W	25	CG C0G	3.5 p	±0.1pF, ±0.25pF	470	200		0.2±0.02	
MLAST042SCG3R6[WNA01	TMK042 CG3R6[D-W	25	CG C0G	3.6 p	±0.1pF, ±0.25pF	472	200		0.2±0.02	
MLAST042SCG3R7[WNA01	TMK042 CG3R7[D-W	25	CG C0G	3.7 p	±0.1pF, ±0.25pF	474	200		0.2±0.02	
MLAST042SCG3R8[WNA01	TMK042 CG3R8[D-W	25	CG C0G	3.8 p	±0.1pF, ±0.25pF	476	200		0.2±0.02	
MLAST042SCG3R9[WNA01	TMK042 CG3R9[D-W	25	CG C0G	3.9 p	±0.1pF, ±0.25pF	478	200		0.2±0.02	
MLAST042SCG040[WNA01	TMK042 CG040[D-W	25	CG C0G	4 p	±0.1pF, ±0.25pF	480	200		0.2±0.02	
MLAST042SCG4R1[WNA01	TMK042 CG4R1[D-W	25	CG C0G	4.1 p	±0.1pF, ±0.25pF	482	200		0.2±0.02	
MLAST042SCG4R2[WNA01	TMK042 CG4R2[D-W	25	CG C0G	4.2 p	±0.1pF, ±0.25pF	484	200		0.2±0.02	
MLAST042SCG4R3[WNA01	TMK042 CG4R3[D-W	25	CG C0G	4.3 p	±0.1pF, ±0.25pF	486	200		0.2±0.02	
MLAST042SCG4R4[WNA01	TMK042 CG4R4[D-W	25	CG C0G	4.4 p	±0.1pF, ±0.25pF	488	200		0.2±0.02	
MLAST042SCG4R5[WNA01	TMK042 CG4R5[D-W	25	CG C0G	4.5 p	±0.1pF, ±0.25pF	490	200		0.2±0.02	
MLAST042SCG4R6[WNA01	TMK042 CG4R6[D-W	25	CG C0G	4.6 p	±0.1pF, ±0.25pF	492	200		0.2±0.02	
MLAST042SCG4R7[WNA01	TMK042 CG4R7[D-W	25	CG C0G	4.7 p	±0.1pF, ±0.25pF	494	200		0.2±0.02	
MLAST042SCG4R8[WNA01	TMK042 CG4R8[D-W	25	CG C0G	4.8 p	±0.1pF, ±0.25pF	496	200		0.2±0.02	
MLAST042SCG4R9[WNA01	TMK042 CG4R9[D-W	25	CG C0G	4.9 p	±0.1pF, ±0.25pF	498	200		0.2±0.02	
MLAST042SCG050[WNA01	TMK042 CG050[D-W	25	CG C0G	5 p	±0.1pF, ±0.25pF	500	200		0.2±0.02	
MLAST042SCG5R1[WNA01	TMK042 CG5R1[D-W	25	CG C0G	5.1 p	±0.1pF, ±0.25pF, ±0.5pF	502	200		0.2±0.02	
MLAST042SCG5R2[WNA01	TMK042 CG5R2[D-W	25	CG C0G	5.2 p	±0.1pF, ±0.25pF, ±0.5pF	504	200		0.2±0.02	
MLAST042SCG5R3[WNA01	TMK042 CG5R3[D-W	25	CG C0G	5.3 p	±0.1pF, ±0.25pF, ±0.5pF	506	200		0.2±0.02	
MLAST042SCG5R4[WNA01	TMK042 CG5R4[D-W	25	CG C0G	5.4 p	±0.1pF, ±0.25pF, ±0.5pF	508	200		0.2±0.02	
MLAST042SCG5R5[WNA01	TMK042 CG5R5[D-W	25	CG C0G	5.5 p	±0.1pF, ±0.25pF, ±0.5pF	510	200		0.2±0.02	
MLAST042SCG5R6[WNA01	TMK042 CG5R6[D-W	25	CG C0G	5.6 p	±0.1pF, ±0.25pF, ±0.5pF	512	200		0.2±0.02	
MLAST042SCG5R7[WNA01	TMK042 CG5R7[D-W	25	CG C0G	5.7 p	±0.1pF, ±0.25pF, ±0.5pF	514	200		0.2±0.02	
MLAST042SCG5R8[WNA01	TMK042 CG5R8[D-W	25	CG C0G	5.8 p	±0.1pF, ±0.25pF, ±0.5pF	516	200		0.2±0.02	
MLAST042SCG5R9[WNA01	TMK042 CG5R9[D-W	25	CG C0G	5.9 p	±0.1pF, ±0.25pF, ±0.5pF	518	200		0.2±0.02	
MLAST042SCG060[WNA01	TMK042 CG060[D-W	25	CG C0G	6 p	±0.1pF, ±0.25pF, ±0.5pF	520	200		0.2±0.02	
MLAST042SCG6R1[WNA01	TMK042 CG6R1[D-W	25	CG C0G	6.1 p	±0.1pF, ±0.25pF, ±0.5pF	522	200		0.2±0.02	
MLAST042SCG6R2[WNA01	TMK042 CG6R2[D-W	25	CG C0G	6.2 p	±0.1pF, ±0.25pF, ±0.5pF	524	200		0.2±0.02	
MLAST042SCG6R3[WNA01	TMK042 CG6R3[D-W	25	CG C0G	6.3 p	±0.1pF, ±0.25pF, ±0.5pF	526	200		0.2±0.02	
MLAST042SCG6R4[WNA01	TMK042 CG6R4[D-W	25	CG C0G	6.4 p	±0.1pF, ±0.25pF, ±0.5pF	528	200		0.2±0.02	
MLAST042SCG6R5[WNA01	TMK042 CG6R5[D-W	25	CG C0G	6.5 p	±0.1pF, ±0.25pF, ±0.5pF	530	200		0.2±0.02	
MLAST042SCG6R6[WNA01	TMK042 CG6R6[D-W	25	CG C0G	6.6 p	±0.1pF, ±0.25pF, ±0.5pF	532	200		0.2±0.02	
MLAST042SCG6R7[WNA01	TMK042 CG6R7[D-W	25	CG C0G	6.7 p	±0.1pF, ±0.25pF, ±0.5pF	534	200		0.2±0.02	
MLAST042SCG6R8[WNA01	TMK042 CG6R8[D-W	25	CG C0G	6.8 p	±0.1pF, ±0.25pF, ±0.5pF	536	200		0.2±0.02	
MLAST042SCG6R9[WNA01	TMK042 CG6R9[D-W	25	CG C0G	6.9 p	±0.1pF, ±0.25pF, ±0.5pF	538	200		0.2±0.02	
MLAST042SCG070[WNA01	TMK042 CG070[D-W	25	CG C0G	7 p	±0.1pF, ±0.25pF, ±0.5pF	540	200		0.2±0.02	
MLAST042SCG7R1[WNA01	TMK042 CG7R1[D-W	25	CG C0G	7.1 p	±0.1pF, ±0.25pF, ±0.5pF	542	200		0.2±0.02	
MLAST042SCG7R2[WNA01	TMK042 CG7R2[D-W	25	CG C0G	7.2 p	±0.1pF, ±0.25pF, ±0.5pF	544	200		0.2±0.02	
MLAST042SCG7R3[WNA01	TMK042 CG7R3[D-W	25	CG C0G	7.3 p	±0.1pF, ±0.25pF, ±0.5pF	546	200		0.2±0.02	
MLAST042SCG7R4[WNA01	TMK042 CG7R4[D-W	25	CG C0G	7.4 p	±0.1pF, ±0.25pF, ±0.5pF	548	200		0.2±0.02	
MLAST042SCG7R5[WNA01	TMK042 CG7R5[D-W	25	CG C0G	7.5 p	±0.1pF, ±0.25pF, ±0.5pF	550	200		0.2±0.02	
MLAST042SCG7R6[WNA01	TMK042 CG7R6[D-W	25	CG C0G	7.6 p	±0.1pF, ±0.25pF, ±0.5pF	552	200		0.2±0.02	
MLAST042SCG7R7[WNA01	TMK042 CG7R7[D-W	25	CG C0G	7.7 p	±0.1pF, ±0.25pF, ±0.5pF	554	200		0.2±0.02	
MLAST042SCG7R8[WNA01	TMK042 CG7R8[D-W	25	CG C0G	7.8 p	±0.1pF, ±0.25pF, ±0.5pF	556	200		0.2±0.02	
MLAST042SCG7R9[WNA01	TMK042 CG7R9[D-W	25	CG C0G	7.9 p	±0.1pF, ±0.25pF, ±0.5pF	558	200		0.2±0.02	
MLAST042SCG080[WNA01	TMK042 CG080[D-W	25	CG C0G	8 p	±0.1pF, ±0.25pF, ±0.5pF	560	200		0.2±0.02	
MLAST042SCG8R1[WNA01	TMK042 CG8R1[D-W	25	CG C0G	8.1 p	±0.1pF, ±0.25pF, ±0.5pF	562	200		0.2±0.02	
MLAST042SCG8R2[WNA01	TMK042 CG8R2[D-W	25	CG C0G	8.2 p	±0.1pF, ±0.25pF, ±0.5pF	564	200		0.2±0.02	
MLAST042SCG8R3[WNA01	TMK042 CG8R3[D-W	25	CG C0G	8.3 p	±0.1pF, ±0.25pF, ±0.5pF	566	200		0.2±0.02	
MLAST042SCG8R4[WNA01	TMK042 CG8R4[D-W	25	CG C0G	8.4 p	±0.1pF, ±0.25pF, ±0.5pF	568	200		0.2±0.02	
MLAST042SCG8R5[WNA01	TMK042 CG8R5[D-W	25	CG C0G	8.5 p	±0.1pF, ±0.25pF, ±0.5pF	570	200		0.2±0.02	
MLAST042SCG8R6[WNA01	TMK042 CG8R6[D-W	25	CG C0G	8.6 p	±0.1pF, ±0.25pF, ±0.5pF	572	200		0.2±0.02	
MLAST042SCG8R7[WNA01	TMK042 CG8R7[D-W	25	CG C0G	8.7 p	±0.1pF, ±0.25pF, ±0.5pF	574	200		0.2±0.02	

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

■ PARTS NUMBER

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLAST042SCG8R8[WNA01	TMK042 CG8R8[D-W	25	CG	C0G	8.8 p	±0.1pF, ±0.25pF, ±0.5pF	576	200	0.2±0.02	
MLAST042SCG8R9[WNA01	TMK042 CG8R9[D-W	25	CG	C0G	8.9 p	±0.1pF, ±0.25pF, ±0.5pF	578	200	0.2±0.02	
MLAST042SCG090[WNA01	TMK042 CG090[D-W	25	CG	C0G	9 p	±0.1pF, ±0.25pF, ±0.5pF	580	200	0.2±0.02	
MLAST042SCG9R1[WNA01	TMK042 CG9R1[D-W	25	CG	C0G	9.1 p	±0.1pF, ±0.25pF, ±0.5pF	582	200	0.2±0.02	
MLAST042SCG9R2[WNA01	TMK042 CG9R2[D-W	25	CG	C0G	9.2 p	±0.1pF, ±0.25pF, ±0.5pF	584	200	0.2±0.02	
MLAST042SCG9R3[WNA01	TMK042 CG9R3[D-W	25	CG	C0G	9.3 p	±0.1pF, ±0.25pF, ±0.5pF	586	200	0.2±0.02	
MLAST042SCG9R4[WNA01	TMK042 CG9R4[D-W	25	CG	C0G	9.4 p	±0.1pF, ±0.25pF, ±0.5pF	588	200	0.2±0.02	
MLAST042SCG9R5[WNA01	TMK042 CG9R5[D-W	25	CG	C0G	9.5 p	±0.1pF, ±0.25pF, ±0.5pF	590	200	0.2±0.02	
MLAST042SCG9R6[WNA01	TMK042 CG9R6[D-W	25	CG	C0G	9.6 p	±0.1pF, ±0.25pF, ±0.5pF	592	200	0.2±0.02	
MLAST042SCG9R7[WNA01	TMK042 CG9R7[D-W	25	CG	C0G	9.7 p	±0.1pF, ±0.25pF, ±0.5pF	594	200	0.2±0.02	
MLAST042SCG9R8[WNA01	TMK042 CG9R8[D-W	25	CG	C0G	9.8 p	±0.1pF, ±0.25pF, ±0.5pF	596	200	0.2±0.02	
MLAST042SCG9R9[WNA01	TMK042 CG9R9[D-W	25	CG	C0G	9.9 p	±0.1pF, ±0.25pF, ±0.5pF	598	200	0.2±0.02	
MLAST042SCG100DWNA01	TMK042 CG100DD-W	25	CG	C0G	10 p	±0.5pF	600	200	0.2±0.02	
MLAST042SCG110JWNA01	TMK042 CG110JD-W	25	CG	C0G	11 p	±5%	620	200	0.2±0.02	
MLAST042SCG120JWNA01	TMK042 CG120JD-W	25	CG	C0G	12 p	±5%	640	200	0.2±0.02	
MLAST042SCG130JWNA01	TMK042 CG130JD-W	25	CG	C0G	13 p	±5%	660	200	0.2±0.02	
MLAST042SCG150JWNA01	TMK042 CG150JD-W	25	CG	C0G	15 p	±5%	700	200	0.2±0.02	
MLAST042SCG160JWNA01	TMK042 CG160JC-W	25	CG	C0G	16 p	±5%	720	200	0.2±0.02	
MLAST042SCG180JWNA01	TMK042 CG180JC-W	25	CG	C0G	18 p	±5%	760	200	0.2±0.02	
MLAST042SCG200JWNA01	TMK042 CG200JC-W	25	CG	C0G	20 p	±5%	800	200	0.2±0.02	
MLAST042SCG220JWNA01	TMK042 CG220JC-W	25	CG	C0G	22 p	±5%	840	200	0.2±0.02	
MLAST042SCG240JWNA01	TMK042 CG240JC-W	25	CG	C0G	24 p	±5%	880	200	0.2±0.02	
MLAST042SCG270JWNA01	TMK042 CG270JC-W	25	CG	C0G	27 p	±5%	940	200	0.2±0.02	
MLAST042SCG300JWNA01	TMK042 CG300JC-W	25	CG	C0G	30 p	±5%	1000	200	0.2±0.02	
MLAST042SCG330JWNA01	TMK042 CG330JC-W	25	CG	C0G	33 p	±5%	1000	200	0.2±0.02	
MLAST042SCG360JWNA01	TMK042 CG360JC-W	25	CG	C0G	36 p	±5%	1000	200	0.2±0.02	
MLAST042SCG390JWNA01	TMK042 CG390JC-W	25	CG	C0G	39 p	±5%	1000	200	0.2±0.02	
MLAST042SCG430JWNA01	TMK042 CG430JC-W	25	CG	C0G	43 p	±5%	1000	200	0.2±0.02	
MLAST042SCG470JWNA01	TMK042 CG470JC-W	25	CG	C0G	47 p	±5%	1000	200	0.2±0.02	
MLAST042SCG510JWNA01	TMK042 CG510JC-W	25	CG	C0G	51 p	±5%	1000	200	0.2±0.02	
MLAST042SCG560JWNA01	TMK042 CG560JC-W	25	CG	C0G	56 p	±5%	1000	200	0.2±0.02	
MLAST042SCG620JWNA01	TMK042 CG620JC-W	25	CG	C0G	62 p	±5%	1000	200	0.2±0.02	
MLAST042SCG680JWNA01	TMK042 CG680JC-W	25	CG	C0G	68 p	±5%	1000	200	0.2±0.02	
MLAST042SCG750JWNA01	TMK042 CG750JC-W	25	CG	C0G	75 p	±5%	1000	200	0.2±0.02	
MLAST042SCG820JWNA01	TMK042 CG820JC-W	25	CG	C0G	82 p	±5%	1000	200	0.2±0.02	
MLAST042SCG910JWNA01	TMK042 CG910JC-W	25	CG	C0G	91 p	±5%	1000	200	0.2±0.02	
MLAST042SCG101JWNA01	TMK042 CG101JC-W	25	CG	C0G	100 p	±5%	1000	200	0.2±0.02	

【Temperature Characteristic CG : CG/C0G (-55~+125°C)】 0.2mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASE042SCG0R4[WNA01	EMK042 CG0R4[D-W	16	CG	C0G	0.4 p	±0.05pF, ±0.1pF, ±0.25pF	408	200	0.2±0.02	
MLASE042SCG0R5[WNA01	EMK042 CG0R5[D-W	16	CG	C0G	0.5 p	±0.05pF, ±0.1pF, ±0.25pF	410	200	0.2±0.02	
MLASE042SCG0R6[WNA01	EMK042 CG0R6[D-W	16	CG	C0G	0.6 p	±0.05pF, ±0.1pF, ±0.25pF	412	200	0.2±0.02	
MLASE042SCG0R7[WNA01	EMK042 CG0R7[D-W	16	CG	C0G	0.7 p	±0.05pF, ±0.1pF, ±0.25pF	414	200	0.2±0.02	
MLASE042SCG0R75[WNA01	EMK042 CG0R75[D-W	16	CG	C0G	0.75 p	±0.05pF, ±0.1pF, ±0.25pF	415	200	0.2±0.02	
MLASE042SCG0R8[WNA01	EMK042 CG0R8[D-W	16	CG	C0G	0.8 p	±0.05pF, ±0.1pF, ±0.25pF	416	200	0.2±0.02	
MLASE042SCG0R9[WNA01	EMK042 CG0R9[D-W	16	CG	C0G	0.9 p	±0.05pF, ±0.1pF, ±0.25pF	418	200	0.2±0.02	
MLASE042SCG010[WNA01	EMK042 CG010[D-W	16	CG	C0G	1 p	±0.05pF, ±0.1pF, ±0.25pF	420	200	0.2±0.02	
MLASE042SCG1R1[WNA01	EMK042 CG1R1[D-W	16	CG	C0G	1.1 p	±0.05pF, ±0.1pF, ±0.25pF	422	200	0.2±0.02	
MLASE042SCG1R2[WNA01	EMK042 CG1R2[D-W	16	CG	C0G	1.2 p	±0.05pF, ±0.1pF, ±0.25pF	424	200	0.2±0.02	
MLASE042SCG1R3[WNA01	EMK042 CG1R3[D-W	16	CG	C0G	1.3 p	±0.05pF, ±0.1pF, ±0.25pF	426	200	0.2±0.02	
MLASE042SCG1R4[WNA01	EMK042 CG1R4[D-W	16	CG	C0G	1.4 p	±0.05pF, ±0.1pF, ±0.25pF	428	200	0.2±0.02	
MLASE042SCG1R5[WNA01	EMK042 CG1R5[D-W	16	CG	C0G	1.5 p	±0.05pF, ±0.1pF, ±0.25pF	430	200	0.2±0.02	
MLASE042SCG1R6[WNA01	EMK042 CG1R6[D-W	16	CG	C0G	1.6 p	±0.05pF, ±0.1pF, ±0.25pF	432	200	0.2±0.02	
MLASE042SCG1R7[WNA01	EMK042 CG1R7[D-W	16	CG	C0G	1.7 p	±0.05pF, ±0.1pF, ±0.25pF	434	200	0.2±0.02	
MLASE042SCG1R8[WNA01	EMK042 CG1R8[D-W	16	CG	C0G	1.8 p	±0.05pF, ±0.1pF, ±0.25pF	436	200	0.2±0.02	
MLASE042SCG1R9[WNA01	EMK042 CG1R9[D-W	16	CG	C0G	1.9 p	±0.05pF, ±0.1pF, ±0.25pF	438	200	0.2±0.02	
MLASE042SCG020[WNA01	EMK042 CG020[D-W	16	CG	C0G	2 p	±0.05pF, ±0.1pF, ±0.25pF	440	200	0.2±0.02	
MLASE042SCG2R1[WNA01	EMK042 CG2R1[D-W	16	CG	C0G	2.1 p	±0.05pF, ±0.1pF, ±0.25pF	442	200	0.2±0.02	
MLASE042SCG2R2[WNA01	EMK042 CG2R2[D-W	16	CG	C0G	2.2 p	±0.05pF, ±0.1pF, ±0.25pF	444	200	0.2±0.02	
MLASE042SCG2R3[WNA01	EMK042 CG2R3[D-W	16	CG	C0G	2.3 p	±0.05pF, ±0.1pF, ±0.25pF	446	200	0.2±0.02	
MLASE042SCG2R4[WNA01	EMK042 CG2R4[D-W	16	CG	C0G	2.4 p	±0.05pF, ±0.1pF, ±0.25pF	448	200	0.2±0.02	
MLASE042SCG2R5[WNA01	EMK042 CG2R5[D-W	16	CG	C0G	2.5 p	±0.05pF, ±0.1pF, ±0.25pF	450	200	0.2±0.02	
MLASE042SCG2R6[WNA01	EMK042 CG2R6[D-W	16	CG	C0G	2.6 p	±0.05pF, ±0.1pF, ±0.25pF	452	200	0.2±0.02	
MLASE042SCG2R7[WNA01	EMK042 CG2R7[D-W	16	CG	C0G	2.7 p	±0.05pF, ±0.1pF, ±0.25pF	454	200	0.2±0.02	
MLASE042SCG2R8[WNA01	EMK042 CG2R8[D-W	16	CG	C0G	2.8 p	±0.05pF, ±0.1pF, ±0.25pF	456	200	0.2±0.02	
MLASE042SCG2R9[WNA01	EMK042 CG2R9[D-W	16	CG	C0G	2.9 p	±0.05pF, ±0.1pF, ±0.25pF	458	200	0.2±0.02	
MLASE042SCG030[WNA01	EMK042 CG030[D-W	16	CG	C0G	3 p	±0.05pF, ±0.1pF, ±0.25pF	460	200	0.2±0.02	
MLASE042SCG3R1[WNA01	EMK042 CG3R1[D-W	16	CG	C0G	3.1 p	±0.1pF, ±0.25pF	462	200	0.2±0.02	
MLASE042SCG3R2[WNA01	EMK042 CG3R2[D-W	16	CG	C0G	3.2 p	±0.1pF, ±0.25pF	464	200	0.2±0.02	
MLASE042SCG3R3[WNA01	EMK042 CG3R3[D-W	16	CG	C0G	3.3 p	±0.1pF, ±0.25pF	466	200	0.2±0.02	
MLASE042SCG3R4[WNA01	EMK042 CG3R4[D-W	16	CG	C0G	3.4 p	±0.1pF, ±0.25pF	468	200	0.2±0.02	
MLASE042SCG3R5[WNA01	EMK042 CG3R5[D-W	16	CG	C0G	3.5 p	±0.1pF, ±0.25pF	470	200	0.2±0.02	
MLASE042SCG3R6[WNA01	EMK042 CG3R6[D-W	16	CG	C0G	3.6 p	±0.1pF, ±0.25pF	472	200	0.2±0.02	
MLASE042SCG3R7[WNA01	EMK042 CG3R7[D-W	16	CG	C0G	3.7 p	±0.1pF, ±0.25pF	474	200	0.2±0.02	
MLASE042SCG3R8[WNA01	EMK042 CG3R8[D-W	16	CG	C0G	3.8 p	±0.1pF, ±0.25pF	476	200	0.2±0.02	
MLASE042SCG3R9[WNA01	EMK042 CG3R9[D-W	16	CG	C0G	3.9 p	±0.1pF, ±0.25pF	478	200	0.2±0.02	
MLASE042SCG040[WNA01	EMK042 CG040[D-W	16	CG	C0G	4 p	±0.1pF, ±0.25pF	480	200	0.2±0.02	
MLASE042SCG4R1[WNA01	EMK042 CG4R1[D-W	16	CG	C0G	4.1 p	±0.1pF, ±0.25pF	482	200	0.2±0.02	
MLASE042SCG4R2[WNA01	EMK042 CG4R2[D-W	16	CG	C0G	4.2 p	±0.1pF, ±0.25pF	484	200	0.2±0.02	
MLASE042SCG4R3[WNA01	EMK042 CG4R3[D-W	16	CG	C0G	4.3 p	±0.1pF, ±0.25pF	486	200	0.2±0.02	
MLASE042SCG4R4[WNA01	EMK042 CG4R4[D-W	16	CG	C0G	4.4 p	±0.1pF, ±0.25pF	488	200	0.2±0.02	
MLASE042SCG4R5[WNA01	EMK042 CG4R5[D-W	16	CG	C0G	4.5 p	±0.1pF, ±0.25pF	490	200	0.2±0.02	
MLASE042SCG4R6[WNA01	EMK042 CG4R6[D-W	16	CG	C0G	4.6 p	±0.1pF, ±0.25pF	492	200	0.2±0.02	

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■ PARTS NUMBER

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASE042SCG4R7[WNA01	EMK042 CG4R7[D-W	16	CG	C0G	4.7 p	±0.1pF,±0.25pF	494	200	0.2±0.02	
MLASE042SCG4R8[WNA01	EMK042 CG4R8[D-W	16	CG	C0G	4.8 p	±0.1pF,±0.25pF	496	200	0.2±0.02	
MLASE042SCG4R9[WNA01	EMK042 CG4R9[D-W	16	CG	C0G	4.9 p	±0.1pF,±0.25pF	498	200	0.2±0.02	
MLASE042SCG050[WNA01	EMK042 CG050[D-W	16	CG	C0G	5 p	±0.1pF,±0.25pF	500	200	0.2±0.02	
MLASE042SCG5R1[WNA01	EMK042 CG5R1[D-W	16	CG	C0G	5.1 p	±0.1pF,±0.25pF,±0.5pF	502	200	0.2±0.02	
MLASE042SCG5R2[WNA01	EMK042 CG5R2[D-W	16	CG	C0G	5.2 p	±0.1pF,±0.25pF,±0.5pF	504	200	0.2±0.02	
MLASE042SCG5R3[WNA01	EMK042 CG5R3[D-W	16	CG	C0G	5.3 p	±0.1pF,±0.25pF,±0.5pF	506	200	0.2±0.02	
MLASE042SCG5R4[WNA01	EMK042 CG5R4[D-W	16	CG	C0G	5.4 p	±0.1pF,±0.25pF,±0.5pF	508	200	0.2±0.02	
MLASE042SCG5R5[WNA01	EMK042 CG5R5[D-W	16	CG	C0G	5.5 p	±0.1pF,±0.25pF,±0.5pF	510	200	0.2±0.02	
MLASE042SCG5R6[WNA01	EMK042 CG5R6[D-W	16	CG	C0G	5.6 p	±0.1pF,±0.25pF,±0.5pF	512	200	0.2±0.02	
MLASE042SCG5R7[WNA01	EMK042 CG5R7[D-W	16	CG	C0G	5.7 p	±0.1pF,±0.25pF,±0.5pF	514	200	0.2±0.02	
MLASE042SCG5R8[WNA01	EMK042 CG5R8[D-W	16	CG	C0G	5.8 p	±0.1pF,±0.25pF,±0.5pF	516	200	0.2±0.02	
MLASE042SCG5R9[WNA01	EMK042 CG5R9[D-W	16	CG	C0G	5.9 p	±0.1pF,±0.25pF,±0.5pF	518	200	0.2±0.02	
MLASE042SCG060[WNA01	EMK042 CG060[D-W	16	CG	C0G	6 p	±0.1pF,±0.25pF,±0.5pF	520	200	0.2±0.02	
MLASE042SCG6R1[WNA01	EMK042 CG6R1[D-W	16	CG	C0G	6.1 p	±0.1pF,±0.25pF,±0.5pF	522	200	0.2±0.02	
MLASE042SCG6R2[WNA01	EMK042 CG6R2[D-W	16	CG	C0G	6.2 p	±0.1pF,±0.25pF,±0.5pF	524	200	0.2±0.02	
MLASE042SCG6R3[WNA01	EMK042 CG6R3[D-W	16	CG	C0G	6.3 p	±0.1pF,±0.25pF,±0.5pF	526	200	0.2±0.02	
MLASE042SCG6R4[WNA01	EMK042 CG6R4[D-W	16	CG	C0G	6.4 p	±0.1pF,±0.25pF,±0.5pF	528	200	0.2±0.02	
MLASE042SCG6R5[WNA01	EMK042 CG6R5[D-W	16	CG	C0G	6.5 p	±0.1pF,±0.25pF,±0.5pF	530	200	0.2±0.02	
MLASE042SCG6R6[WNA01	EMK042 CG6R6[D-W	16	CG	C0G	6.6 p	±0.1pF,±0.25pF,±0.5pF	532	200	0.2±0.02	
MLASE042SCG6R7[WNA01	EMK042 CG6R7[D-W	16	CG	C0G	6.7 p	±0.1pF,±0.25pF,±0.5pF	534	200	0.2±0.02	
MLASE042SCG6R8[WNA01	EMK042 CG6R8[D-W	16	CG	C0G	6.8 p	±0.1pF,±0.25pF,±0.5pF	536	200	0.2±0.02	
MLASE042SCG6R9[WNA01	EMK042 CG6R9[D-W	16	CG	C0G	6.9 p	±0.1pF,±0.25pF,±0.5pF	538	200	0.2±0.02	
MLASE042SCG070[WNA01	EMK042 CG070[D-W	16	CG	C0G	7 p	±0.1pF,±0.25pF,±0.5pF	540	200	0.2±0.02	
MLASE042SCG7R1[WNA01	EMK042 CG7R1[D-W	16	CG	C0G	7.1 p	±0.1pF,±0.25pF,±0.5pF	542	200	0.2±0.02	
MLASE042SCG7R2[WNA01	EMK042 CG7R2[D-W	16	CG	C0G	7.2 p	±0.1pF,±0.25pF,±0.5pF	544	200	0.2±0.02	
MLASE042SCG7R3[WNA01	EMK042 CG7R3[D-W	16	CG	C0G	7.3 p	±0.1pF,±0.25pF,±0.5pF	546	200	0.2±0.02	
MLASE042SCG7R4[WNA01	EMK042 CG7R4[D-W	16	CG	C0G	7.4 p	±0.1pF,±0.25pF,±0.5pF	548	200	0.2±0.02	
MLASE042SCG7R5[WNA01	EMK042 CG7R5[D-W	16	CG	C0G	7.5 p	±0.1pF,±0.25pF,±0.5pF	550	200	0.2±0.02	
MLASE042SCG7R6[WNA01	EMK042 CG7R6[D-W	16	CG	C0G	7.6 p	±0.1pF,±0.25pF,±0.5pF	552	200	0.2±0.02	
MLASE042SCG7R7[WNA01	EMK042 CG7R7[D-W	16	CG	C0G	7.7 p	±0.1pF,±0.25pF,±0.5pF	554	200	0.2±0.02	
MLASE042SCG7R8[WNA01	EMK042 CG7R8[D-W	16	CG	C0G	7.8 p	±0.1pF,±0.25pF,±0.5pF	556	200	0.2±0.02	
MLASE042SCG7R9[WNA01	EMK042 CG7R9[D-W	16	CG	C0G	7.9 p	±0.1pF,±0.25pF,±0.5pF	558	200	0.2±0.02	
MLASE042SCG080[WNA01	EMK042 CG080[D-W	16	CG	C0G	8 p	±0.1pF,±0.25pF,±0.5pF	560	200	0.2±0.02	
MLASE042SCG8R1[WNA01	EMK042 CG8R1[D-W	16	CG	C0G	8.1 p	±0.1pF,±0.25pF,±0.5pF	562	200	0.2±0.02	
MLASE042SCG8R2[WNA01	EMK042 CG8R2[D-W	16	CG	C0G	8.2 p	±0.1pF,±0.25pF,±0.5pF	564	200	0.2±0.02	
MLASE042SCG8R3[WNA01	EMK042 CG8R3[D-W	16	CG	C0G	8.3 p	±0.1pF,±0.25pF,±0.5pF	566	200	0.2±0.02	
MLASE042SCG8R4[WNA01	EMK042 CG8R4[D-W	16	CG	C0G	8.4 p	±0.1pF,±0.25pF,±0.5pF	568	200	0.2±0.02	
MLASE042SCG8R5[WNA01	EMK042 CG8R5[D-W	16	CG	C0G	8.5 p	±0.1pF,±0.25pF,±0.5pF	570	200	0.2±0.02	
MLASE042SCG8R6[WNA01	EMK042 CG8R6[D-W	16	CG	C0G	8.6 p	±0.1pF,±0.25pF,±0.5pF	572	200	0.2±0.02	
MLASE042SCG8R7[WNA01	EMK042 CG8R7[D-W	16	CG	C0G	8.7 p	±0.1pF,±0.25pF,±0.5pF	574	200	0.2±0.02	
MLASE042SCG8R8[WNA01	EMK042 CG8R8[D-W	16	CG	C0G	8.8 p	±0.1pF,±0.25pF,±0.5pF	576	200	0.2±0.02	
MLASE042SCG8R9[WNA01	EMK042 CG8R9[D-W	16	CG	C0G	8.9 p	±0.1pF,±0.25pF,±0.5pF	578	200	0.2±0.02	
MLASE042SCG090[WNA01	EMK042 CG090[D-W	16	CG	C0G	9 p	±0.1pF,±0.25pF,±0.5pF	580	200	0.2±0.02	
MLASE042SCG9R1[WNA01	EMK042 CG9R1[D-W	16	CG	C0G	9.1 p	±0.1pF,±0.25pF,±0.5pF	582	200	0.2±0.02	
MLASE042SCG9R2[WNA01	EMK042 CG9R2[D-W	16	CG	C0G	9.2 p	±0.1pF,±0.25pF,±0.5pF	584	200	0.2±0.02	
MLASE042SCG9R3[WNA01	EMK042 CG9R3[D-W	16	CG	C0G	9.3 p	±0.1pF,±0.25pF,±0.5pF	586	200	0.2±0.02	
MLASE042SCG9R4[WNA01	EMK042 CG9R4[D-W	16	CG	C0G	9.4 p	±0.1pF,±0.25pF,±0.5pF	588	200	0.2±0.02	
MLASE042SCG9R5[WNA01	EMK042 CG9R5[D-W	16	CG	C0G	9.5 p	±0.1pF,±0.25pF,±0.5pF	590	200	0.2±0.02	
MLASE042SCG9R6[WNA01	EMK042 CG9R6[D-W	16	CG	C0G	9.6 p	±0.1pF,±0.25pF,±0.5pF	592	200	0.2±0.02	
MLASE042SCG9R7[WNA01	EMK042 CG9R7[D-W	16	CG	C0G	9.7 p	±0.1pF,±0.25pF,±0.5pF	594	200	0.2±0.02	
MLASE042SCG9R8[WNA01	EMK042 CG9R8[D-W	16	CG	C0G	9.8 p	±0.1pF,±0.25pF,±0.5pF	596	200	0.2±0.02	
MLASE042SCG9R9[WNA01	EMK042 CG9R9[D-W	16	CG	C0G	9.9 p	±0.1pF,±0.25pF,±0.5pF	598	200	0.2±0.02	
MLASE042SCG100D[WNA01	EMK042 CG100D[W	16	CG	C0G	10 p	±0.5pF	600	200	0.2±0.02	
MLASE042SCG110J[WNA01	EMK042 CG110J[W	16	CG	C0G	11 p	±5%	620	200	0.2±0.02	
MLASE042SCG120J[WNA01	EMK042 CG120J[W	16	CG	C0G	12 p	±5%	640	200	0.2±0.02	
MLASE042SCG130J[WNA01	EMK042 CG130J[W	16	CG	C0G	13 p	±5%	660	200	0.2±0.02	
MLASE042SCG150J[WNA01	EMK042 CG150J[W	16	CG	C0G	15 p	±5%	700	200	0.2±0.02	
MLASE042SCG160J[WNA01	EMK042 CG160J[W	16	CG	C0G	16 p	±5%	720	200	0.2±0.02	
MLASE042SCG180J[WNA01	EMK042 CG180J[W	16	CG	C0G	18 p	±5%	760	200	0.2±0.02	
MLASE042SCG200J[WNA01	EMK042 CG200J[W	16	CG	C0G	20 p	±5%	800	200	0.2±0.02	
MLASE042SCG220J[WNA01	EMK042 CG220J[W	16	CG	C0G	22 p	±5%	840	200	0.2±0.02	
MLASE042SCG240J[WNA01	EMK042 CG240J[W	16	CG	C0G	24 p	±5%	880	200	0.2±0.02	
MLASE042SCG270J[WNA01	EMK042 CG270J[W	16	CG	C0G	27 p	±5%	940	200	0.2±0.02	
MLASE042SCG300J[WNA01	EMK042 CG300J[W	16	CG	C0G	30 p	±5%	1000	200	0.2±0.02	
MLASE042SCG330J[WNA01	EMK042 CG330J[W	16	CG	C0G	33 p	±5%	1000	200	0.2±0.02	
MLASE042SCG360J[WNA01	EMK042 CG360J[W	16	CG	C0G	36 p	±5%	1000	200	0.2±0.02	
MLASE042SCG390J[WNA01	EMK042 CG390J[W	16	CG	C0G	39 p	±5%	1000	200	0.2±0.02	
MLASE042SCG430J[WNA01	EMK042 CG430J[W	16	CG	C0G	43 p	±5%	1000	200	0.2±0.02	
MLASE042SCG470J[WNA01	EMK042 CG470J[W	16	CG	C0G	47 p	±5%	1000	200	0.2±0.02	
MLASE042SCG510J[WNA01	EMK042 CG510J[W	16	CG	C0G	51 p	±5%	1000	200	0.2±0.02	
MLASE042SCG560J[WNA01	EMK042 CG560J[W	16	CG	C0G	56 p	±5%	1000	200	0.2±0.02	
MLASE042SCG620J[WNA01	EMK042 CG620J[W	16	CG	C0G	62 p	±5%	1000	200	0.2±0.02	
MLASE042SCG680J[WNA01	EMK042 CG680J[W	16	CG	C0G	68 p	±5%	1000	200	0.2±0.02	
MLASE042SCG750J[WNA01	EMK042 CG750J[W	16	CG	C0G	75 p	±5%	1000	200	0.2±0.02	
MLASE042SCG820J[WNA01	EMK042 CG820J[W	16	CG	C0G	82 p	±5%	1000	200	0.2±0.02	
MLASE042SCG910J[WNA01	EMK042 CG910J[W	16	CG	C0G	91 p	±5%	1000	200	0.2±0.02	
MLASE042SCG101J[WNA01	EMK042 CG101J[W	16	CG	C0G	100 p	±5%	1000	200	0.2±0.02	
MLASE042SCG221J[WNA01	EMK042 CG221J[W	16	CG	C0G	220 p	±5%	1000	200	0.2±0.02	
MLASE042SCG241J[WNA01	EMK042 CG241J[W	16	CG	C0G	240 p	±5%	1000	200	0.2±0.02	
MLASE042SCG271J[WNA01	EMK042 CG271J[W	16	CG	C0G	270 p	±5%	1000	200	0.2±0.02	
MLASE042SCG331J[WNA01	EMK042 CG331J[W	16	CG	C0G	330 p	±5%	1000	200	0.2±0.02	

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PARTS NUMBER

0603TYPE

【Temperature Characteristic CH : CH/C0H(-55~+125°C)】 0.3mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASU063SCH200JFNA01	UMK063 CH200JT-F	50	CH	C0H	20 p	±5%	800	200	0.3±0.03	
MLASU063SCH220JFNA01	UMK063 CH220JT-F	50	CH	C0H	22 p	±5%	840	200	0.3±0.03	
MLASU063SCH240JFNA01	UMK063 CH240JT-F	50	CH	C0H	24 p	±5%	880	200	0.3±0.03	
MLASU063SCH270JFNA01	UMK063 CH270JT-F	50	CH	C0H	27 p	±5%	940	200	0.3±0.03	
MLASU063SCH300JFNA01	UMK063 CH300JT-F	50	CH	C0H	30 p	±5%	1000	200	0.3±0.03	
MLASU063SCH330JFNA01	UMK063 CH330JT-F	50	CH	C0H	33 p	±5%	1000	200	0.3±0.03	
MLASU063SCH360JFNA01	UMK063 CH360JT-F	50	CH	C0H	36 p	±5%	1000	200	0.3±0.03	
MLASU063SCH390JFNA01	UMK063 CH390JT-F	50	CH	C0H	39 p	±5%	1000	200	0.3±0.03	
MLASU063SCH430JFNA01	UMK063 CH430JT-F	50	CH	C0H	43 p	±5%	1000	200	0.3±0.03	
MLASU063SCH470JFNA01	UMK063 CH470JT-F	50	CH	C0H	47 p	±5%	1000	200	0.3±0.03	
MLASU063SCH510JFNA01	UMK063 CH510JT-F	50	CH	C0H	51 p	±5%	1000	200	0.3±0.03	
MLASU063SCH560JFNA01	UMK063 CH560JT-F	50	CH	C0H	56 p	±5%	1000	200	0.3±0.03	
MLASU063SCH620JFNA01	UMK063 CH620JT-F	50	CH	C0H	62 p	±5%	1000	200	0.3±0.03	
MLASU063SCH680JFNA01	UMK063 CH680JT-F	50	CH	C0H	68 p	±5%	1000	200	0.3±0.03	
MLASU063SCH750JFNA01	UMK063 CH750JT-F	50	CH	C0H	75 p	±5%	1000	200	0.3±0.03	
MLASU063SCH820JFNA01	UMK063 CH820JT-F	50	CH	C0H	82 p	±5%	1000	200	0.3±0.03	
MLASU063SCH910JFNA01	UMK063 CH910JT-F	50	CH	C0H	91 p	±5%	1000	200	0.3±0.03	
MLASU063SCH101JFNA01	UMK063 CH101JT-F	50	CH	C0H	100 p	±5%	1000	200	0.3±0.03	
MLASU063SCH111JFNA01	UMK063 CH111JT-F	50	CH	C0H	110 p	±5%	1000	200	0.3±0.03	
MLASU063SCH121JFNA01	UMK063 CH121JT-F	50	CH	C0H	120 p	±5%	1000	200	0.3±0.03	
MLASU063SCH131JFNA01	UMK063 CH131JT-F	50	CH	C0H	130 p	±5%	1000	200	0.3±0.03	
MLASU063SCH151JFNA01	UMK063 CH151JT-F	50	CH	C0H	150 p	±5%	1000	200	0.3±0.03	
MLASU063SCH181JFNA01	UMK063 CH181JT-F	50	CH	C0H	180 p	±5%	1000	200	0.3±0.03	
MLASU063SCH201JFNA01	UMK063 CH201JT-F	50	CH	C0H	200 p	±5%	1000	200	0.3±0.03	
MLASU063SCH221JFNA01	UMK063 CH221JT-F	50	CH	C0H	220 p	±5%	1000	200	0.3±0.03	
MLAST063SCH241JFNA01	TMK063 CH241JT-F	25	CH	C0H	240 p	±5%	1000	200	0.3±0.03	
MLAST063SCH271JFNA01	TMK063 CH271JT-F	25	CH	C0H	270 p	±5%	1000	200	0.3±0.03	
MLAST063SCH301JFNA01	TMK063 CH301JT-F	25	CH	C0H	300 p	±5%	1000	200	0.3±0.03	
MLAST063SCH331JFNA01	TMK063 CH331JT-F	25	CH	C0H	330 p	±5%	1000	200	0.3±0.03	
MLAST063SCH361JFNA01	TMK063 CH361JT-F	25	CH	C0H	360 p	±5%	1000	200	0.3±0.03	
MLAST063SCH391JFNA01	TMK063 CH391JT-F	25	CH	C0H	390 p	±5%	1000	200	0.3±0.03	
MLAST063SCH431JFNA01	TMK063 CH431JT-F	25	CH	C0H	430 p	±5%	1000	200	0.3±0.03	
MLAST063SCH471JFNA01	TMK063 CH471JT-F	25	CH	C0H	470 p	±5%	1000	200	0.3±0.03	
MLAST063SCH511JFNA01	TMK063 CH511JT-F	25	CH	C0H	510 p	±5%	1000	200	0.3±0.03	
MLAST063SCH561JFNA01	TMK063 CH561JT-F	25	CH	C0H	560 p	±5%	1000	200	0.3±0.03	
MLAST063SCH621JFNA01	TMK063 CH621JT-F	25	CH	C0H	620 p	±5%	1000	200	0.3±0.03	
MLAST063SCH681JFNA01	TMK063 CH681JT-F	25	CH	C0H	680 p	±5%	1000	200	0.3±0.03	
MLAST063SCH751JFNA01	TMK063 CH751JT-F	25	CH	C0H	750 p	±5%	1000	200	0.3±0.03	
MLAST063SCH821JFNA01	TMK063 CH821JT-F	25	CH	C0H	820 p	±5%	1000	200	0.3±0.03	
MLAST063SCH911JFNA01	TMK063 CH911JT-F	25	CH	C0H	910 p	±5%	1000	200	0.3±0.03	
MLAST063SCH102JFNA01	TMK063 CH102JT-F	25	CH	C0H	1000 p	±5%	1000	200	0.3±0.03	

PARTS NUMBER

【Temperature Characteristic CG : CG/C0G (−55~+125°C)】 0.3mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT	Thickness*3 [mm]	Note
								Rated voltage x %		
MLASU063SCG200JFNA01	UMK063 CG200JT-F	50	CG	C0G	20 p	±5%	800	200	0.3±0.03	
MLASU063SCG220JFNA01	UMK063 CG220JT-F	50	CG	C0G	22 p	±5%	840	200	0.3±0.03	
MLASU063SCG240JFNA01	UMK063 CG240JT-F	50	CG	C0G	24 p	±5%	880	200	0.3±0.03	
MLASU063SCG270JFNA01	UMK063 CG270JT-F	50	CG	C0G	27 p	±5%	940	200	0.3±0.03	
MLASU063SCG300JFNA01	UMK063 CG300JT-F	50	CG	C0G	30 p	±5%	1000	200	0.3±0.03	
MLASU063SCG330JFNA01	UMK063 CG330JT-F	50	CG	C0G	33 p	±5%	1000	200	0.3±0.03	
MLASU063SCG360JFNA01	UMK063 CG360JT-F	50	CG	C0G	36 p	±5%	1000	200	0.3±0.03	
MLASU063SCG390JFNA01	UMK063 CG390JT-F	50	CG	C0G	39 p	±5%	1000	200	0.3±0.03	
MLASU063SCG430JFNA01	UMK063 CG430JT-F	50	CG	C0G	43 p	±5%	1000	200	0.3±0.03	
MLASU063SCG470JFNA01	UMK063 CG470JT-F	50	CG	C0G	47 p	±5%	1000	200	0.3±0.03	
MLASU063SCG510JFNA01	UMK063 CG510JT-F	50	CG	C0G	51 p	±5%	1000	200	0.3±0.03	
MLASU063SCG560JFNA01	UMK063 CG560JT-F	50	CG	C0G	56 p	±5%	1000	200	0.3±0.03	
MLASU063SCG620JFNA01	UMK063 CG620JT-F	50	CG	C0G	62 p	±5%	1000	200	0.3±0.03	
MLASU063SCG680JFNA01	UMK063 CG680JT-F	50	CG	C0G	68 p	±5%	1000	200	0.3±0.03	
MLASU063SCG750JFNA01	UMK063 CG750JT-F	50	CG	C0G	75 p	±5%	1000	200	0.3±0.03	
MLASU063SCG820JFNA01	UMK063 CG820JT-F	50	CG	C0G	82 p	±5%	1000	200	0.3±0.03	
MLASU063SCG910JFNA01	UMK063 CG910JT-F	50	CG	C0G	91 p	±5%	1000	200	0.3±0.03	
MLASU063SCG101JFNA01	UMK063 CG101JT-F	50	CG	C0G	100 p	±5%	1000	200	0.3±0.03	
MLASU063SCG111JFNA01	UMK063 CG111JT-F	50	CG	C0G	110 p	±5%	1000	200	0.3±0.03	
MLASU063SCG121JFNA01	UMK063 CG121JT-F	50	CG	C0G	120 p	±5%	1000	200	0.3±0.03	
MLASU063SCG131JFNA01	UMK063 CG131JT-F	50	CG	C0G	130 p	±5%	1000	200	0.3±0.03	
MLASU063SCG151JFNA01	UMK063 CG151JT-F	50	CG	C0G	150 p	±5%	1000	200	0.3±0.03	
MLASU063SCG181JFNA01	UMK063 CG181JT-F	50	CG	C0G	180 p	±5%	1000	200	0.3±0.03	
MLASU063SCG201JFNA01	UMK063 CG201JT-F	50	CG	C0G	200 p	±5%	1000	200	0.3±0.03	
MLASU063SCG221JFNA01	UMK063 CG221JT-F	50	CG	C0G	220 p	±5%	1000	200	0.3±0.03	
MLAST063SCG241JFNA01	TMK063 CG241JT-F	25	CG	C0G	240 p	±5%	1000	200	0.3±0.03	
MLAST063SCG271JFNA01	TMK063 CG271JT-F	25	CG	C0G	270 p	±5%	1000	200	0.3±0.03	
MLAST063SCG301JFNA01	TMK063 CG301JT-F	25	CG	C0G	300 p	±5%	1000	200	0.3±0.03	
MLAST063SCG331JFNA01	TMK063 CG331JT-F	25	CG	C0G	330 p	±5%	1000	200	0.3±0.03	
MLAST063SCG361JFNA01	TMK063 CG361JT-F	25	CG	C0G	360 p	±5%	1000	200	0.3±0.03	
MLAST063SCG391JFNA01	TMK063 CG391JT-F	25	CG	C0G	390 p	±5%	1000	200	0.3±0.03	
MLAST063SCG431JFNA01	TMK063 CG431JT-F	25	CG	C0G	430 p	±5%	1000	200	0.3±0.03	
MLAST063SCG471JFNA01	TMK063 CG471JT-F	25	CG	C0G	470 p	±5%	1000	200	0.3±0.03	
MLAST063SCG511JFNA01	TMK063 CG511JT-F	25	CG	C0G	510 p	±5%	1000	200	0.3±0.03	
MLAST063SCG561JFNA01	TMK063 CG561JT-F	25	CG	C0G	560 p	±5%	1000	200	0.3±0.03	
MLAST063SCG621JFNA01	TMK063 CG621JT-F	25	CG	C0G	620 p	±5%	1000	200	0.3±0.03	
MLAST063SCG681JFNA01	TMK063 CG681JT-F	25	CG	C0G	680 p	±5%	1000	200	0.3±0.03	
MLAST063SCG751JFNA01	TMK063 CG751JT-F	25	CG	C0G	750 p	±5%	1000	200	0.3±0.03	
MLAST063SCG821JFNA01	TMK063 CG821JT-F	25	CG	C0G	820 p	±5%	1000	200	0.3±0.03	
MLAST063SCG911JFNA01	TMK063 CG911JT-F	25	CG	C0G	910 p	±5%	1000	200	0.3±0.03	
MLAST063SCG102JFNA01	TMK063 CG102JT-F	25	CG	C0G	1000 p	±5%	1000	200	0.3±0.03	

Multilayer Ceramic Capacitors

■ PACKAGING

① Minimum Quantity

● Taped package

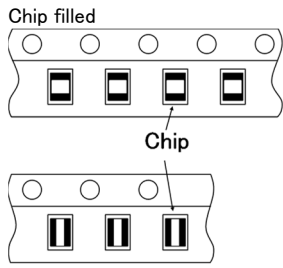
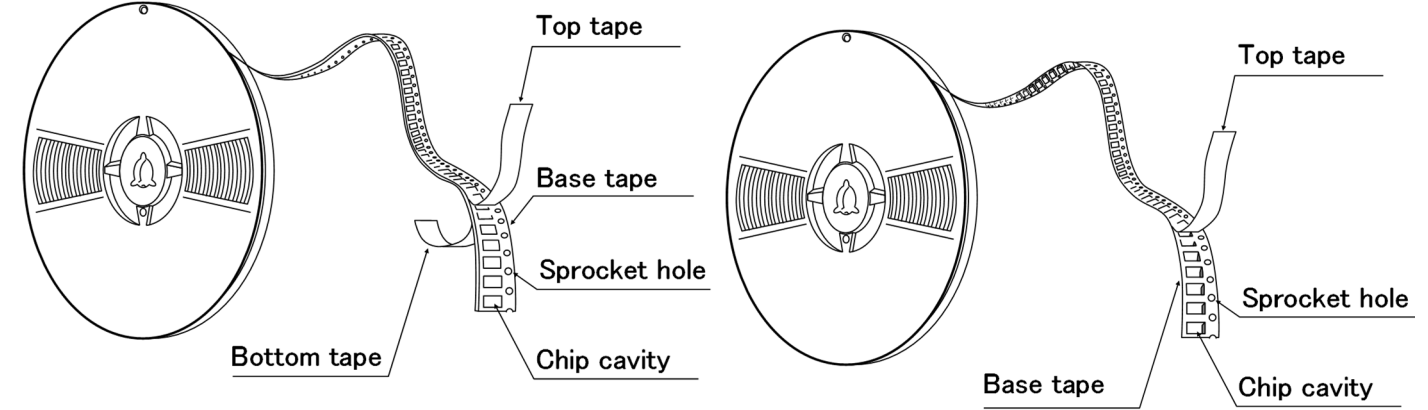
Type			Thickness		Standard Quantity [pcs]	
Code	JIS(mm)	EIA(inch)	[mm]	Code	Paper tape	Embossed tape
02	0201	008004	0.125	1	—	50000
04	0402	01005	0.2	2	—	40000
06	0603	0201	0.3	3	15000	—
1L	1005	0402	0.13	H	—	20000
			0.18	E	—	15000
			0.2	2	20000	—
			0.3	3	15000	—
10	1005	0402	0.5	5	10000	—
	0510 ※	0204	0.3	3	10000	—
16	1608	0603	0.45	K	4000	—
			0.7	7		
			0.8	8		
			0.8	8	3000 (Soft Termination)	3000 (Soft Termination)
	0816 ※	0306	0.5	5	—	4000
21	2012	0805	0.85	9	4000	—
			1.25	G	—	3000
			1.25	G	—	2000 (Soft Termination)
	1220 ※	0508	0.85	9	4000	—
31	3216	1206	0.85	9	4000	—
			1.15	Q	—	3000
			1.6	L	—	2000
32	3225	1210	0.85	9	—	2000
			1.15	Q		
			1.9	N		
			2.0 max	Y		
			2.5	M	—	500(T), 1000(P)
45	4532	1812	2.0 max	Y	—	1000
			2.5	M	—	500

注: ※LW Reverse type (MSRL, MCRL, MBRL, MLRL, MMRL)

② Taping material

※ No bottom tape for pressed carrier tape

- Card board carrier tape
- Embossed tape

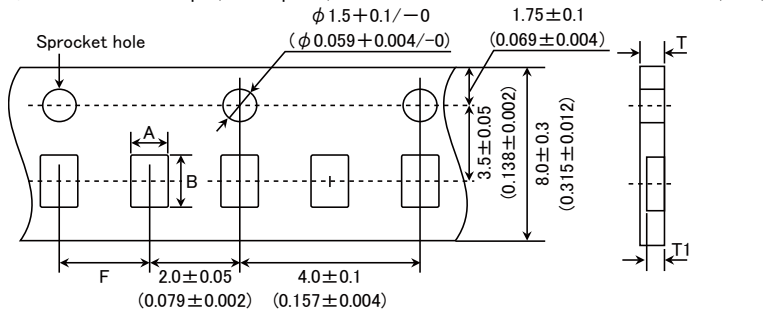


※ LW Reverse type.

③ Representative taping dimensions

● Paper Tape (8mm wide)

● Pressed carrier tape (2mm pitch)

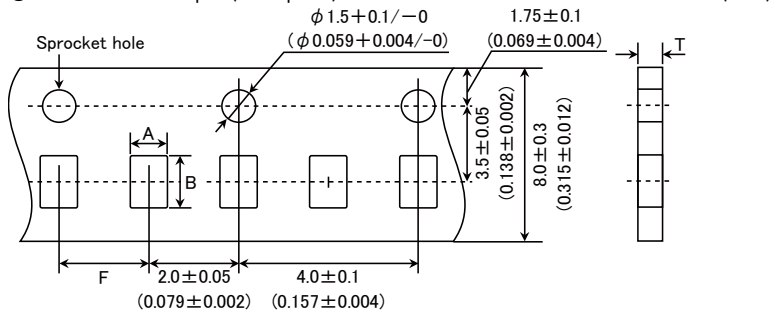


Type(EIA)	Chip Cavity		Insertion Pitch F	Tape Thickness	
	A	B		T	T1
0603 (0201)	0.37	0.67	2.0±0.05	0.45max.	0.42max.
0510 (0204) ※	0.65	1.15		0.4max.	0.3max.
1005 (0402) (*1 2)				0.45max.	0.42max.
1005 (0402) (*1 3)					

Note *1 Thickness, 2:0.2mm, 3:0.3mm. ※ LW Reverse type.

Unit: mm

● Punched carrier tape (2mm pitch)

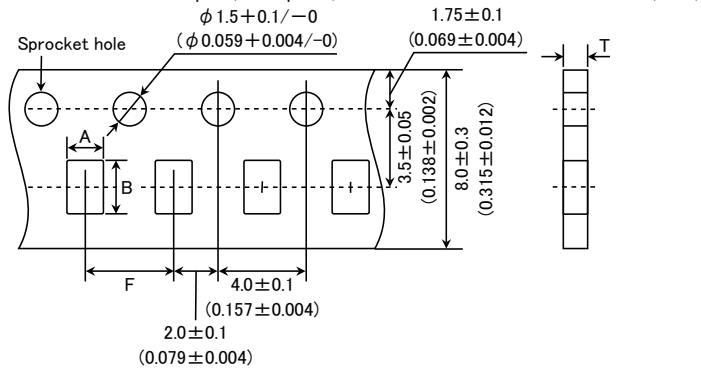


Type(EIA)	Chip Cavity		Insertion Pitch F	Tape Thickness
	A	B		T
1005 (0402)	0.65	1.15	2.0±0.05	0.8max.

Unit: mm

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● Punched carrier tape (4mm pitch)

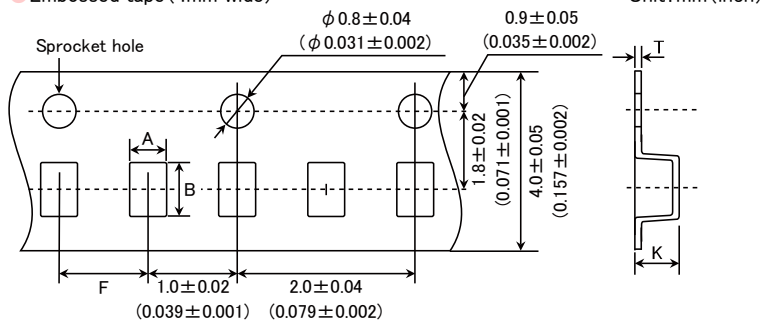


Type(EIA)	Chip Cavity		Insertion Pitch F	Tape Thickness	
	A	B		K	T
1608 (0603)	1.0	1.8	4.0 ± 0.1	1.1max.	1.1max.
0816 (0306) ※					
2012 (0805)					
1220 (0508) ※	1.65	2.4	4.0 ± 0.1	1.1max.	1.1max.
3216 (1206)	2.0	3.6			

Note: Taping size might be different depending on the size of the product. ※ LW Reverse type.

Unit: mm

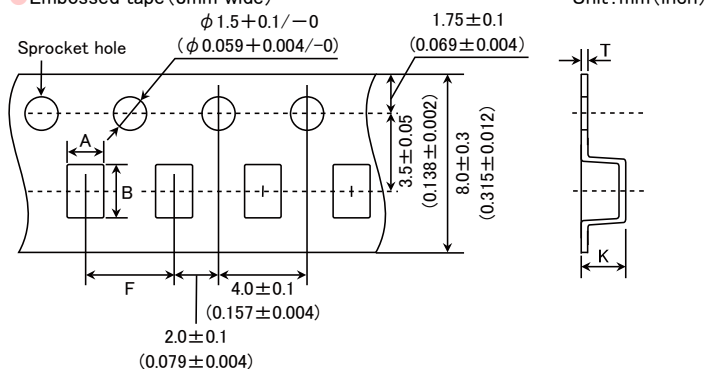
● Embossed tape (4mm wide)



Type(EIA)	Chip Cavity		Insertion Pitch F	Tape Thickness	
	A	B		K	T
0201 (008004)	0.135	0.27	1.0 ± 0.02	0.5max.	0.25max.
0402 (01005)	0.23	0.43			

Unit: mm

● Embossed tape (8mm wide)



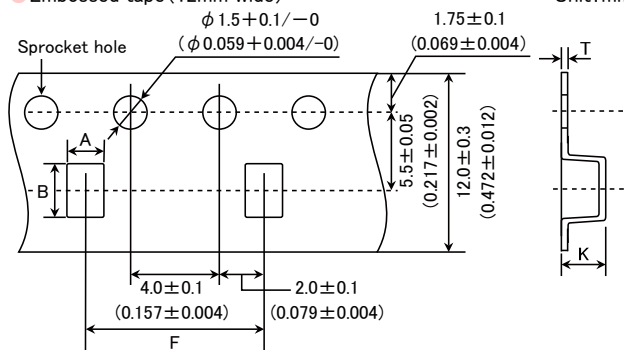
Type(EIA)	Chip Cavity		Insertion Pitch F	Tape Thickness	
	A	B		K	T
1005 (0402)	0.6	1.1	2.0 ± 0.1	0.6max	0.2 ± 0.1
0816 (0306) ※	1.0	1.8	4.0 ± 0.1	1.3max.	0.25 ± 0.1
2012 (0805)	1.65	2.4			
3216 (1206)	2.0	3.6			
3225 (1210)	2.8	3.6	4.0 ± 0.1	3.4max.	0.6max.

Note: ※ LW Reverse type.

Unit: mm

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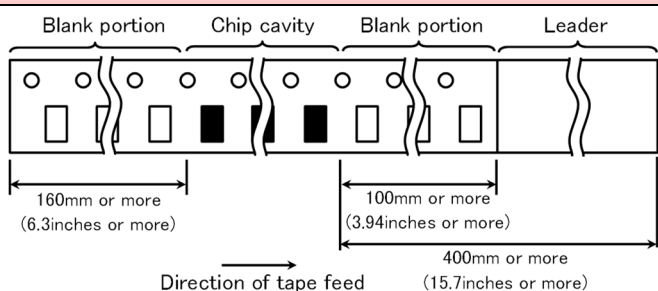
● Embossed tape (12mm wide) Unit: mm (inch)



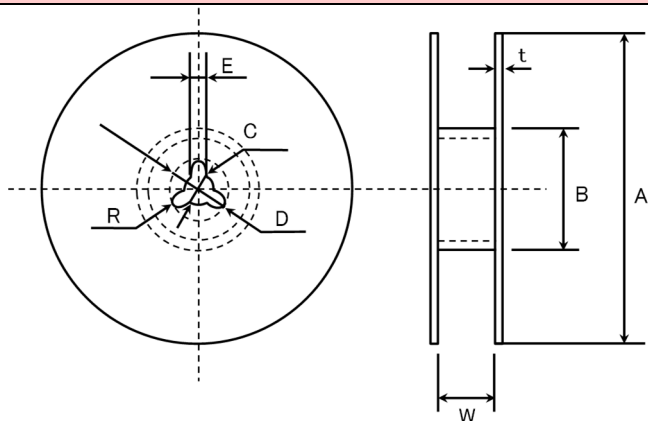
Type(EIA)	Chip Cavity		Insertion Pitch	Tape Thickness	
	A	B		K	T
3225 (1210)	3.1	4.0	8.0±0.1	4.0max.	0.6max.
4532 (1812)	3.7	4.9	8.0±0.1	4.0max.	0.6max.

Unit: mm

④ Trailer and Leader



⑤ Reel size



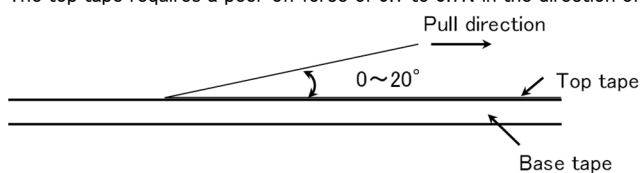
A	B	C	D	E	R
φ178±2.0	φ50min.	φ13.0±0.2	φ21.0±0.8	2.0±0.5	1.0

	T	W
4mm wide tape	1.5max.	5±1.0
8mm wide tape	2.5max.	10±1.5
12mm wide tape	2.5max.	14±1.5

Unit: mm

⑥ Top Tape Strength

The top tape requires a peel-off force of 0.1 to 0.7N in the direction of the arrow as illustrated below.



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Multilayer Ceramic Capacitors for General Electronic Equipment for Consumer
Multilayer Ceramic Capacitors
for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

■ RELIABILITY DATA

1. Operating Temperature Range

Specified Value	Temperature Compensating (Class1)	Standard	-55 to +125°C	
		High Frequency Type		
Specified Value	High Permittivity (Class2)		Specification	Temperature Range
		B5	B	-25 to +85°C
			X5R	-55 to +85°C
		B7	X7R	-55 to +125°C
		C6	X6S	-55 to +105°C
C7	X7S	-55 to +125°C		

2. Storage Conditions

Specified Value	Temperature Compensating (Class1)	Standard	-55 to +125°C	
		High Frequency Type		
Specified Value	High Permittivity (Class2)		Specification	Temperature Range
		B5	B	-25 to +85°C
			X5R	-55 to +85°C
		B7	X7R	-55 to +125°C
		C6	X6S	-55 to +105°C
C7	X7S	-55 to +125°C		

3. Rated Voltage

Specified Value	Temperature Compensating (Class1)	Standard	50VDC, 25VDC, 16VDC
		High Frequency Type	25VDC, 16VDC
	High Permittivity (Class2)		50VDC, 35VDC, 25VDC, 16VDC, 10VDC, 6.3VDC, 4VDC, 2.5VDC

4. Withstanding Voltage (Between terminals)

Specified Value	Temperature Compensating (Class1)	Standard	No breakdown or damage
		High Frequency Type	
Test Methods and Remarks	High Permittivity (Class2)		
		Class 1	Class 2
	Applied voltage	Rated voltage × 3	Rated voltage × 2.5
	Duration	1 to 5 sec.	
	Charge/discharge current	50mA max.	

5. Insulation Resistance

Specified Value	Temperature Compensating (Class1)	Standard	10000 MΩ min.
		High Frequency Type	
Test Methods and Remarks	High Permittivity (Class2) Note 1		$C \leq 0.047 \mu F$: 10000 MΩ min.
			$C > 0.047 \mu F$: $500 M\Omega \cdot \mu F$ (C: Nominal capacitance)
	Applied voltage	: Rated voltage	
Duration	: 60 ± 5 sec.		
Charge/discharge current	: 50mA max.		

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6. Capacitance (Tolerance)

Specified Value	Temperature Compensating (Class1)	Standard	$0.2\text{pF} \leq C \leq 5\text{pF} : \pm 0.25\text{pF}$ $5\text{pF} \leq C \leq 10\text{pF} : \pm 0.5\text{pF}$ $C > 10\text{pF} : \pm 5\%$	
		High Frequency Type	Refer to detailed specification	
	High Permittivity (Class2)		$\pm 10\%$ or $\pm 20\%$	
Test Methods and Remarks		Class 1		Class 2
		Standard	High Frequency Type	$C \leq 10 \mu\text{F}$ $C > 10 \mu\text{F}$
	Preconditioning	None		Thermal treatment (at 150°C for 1hr) Note 2
	Measuring frequency	1MHz \pm 10%	1GHz	1kHz \pm 10% 120 \pm 10Hz
	Measuring voltage Note 1	0.5 to 5Vrms		1 \pm 0.2Vrms 0.5 \pm 0.1Vrms
Bias application	None			

7. Q or Dissipation Factor

Specified Value	Temperature Compensating (Class1)	Standard	$C < 30\text{pF} : Q \geq 400 + 20C$ $C \geq 30\text{pF} : Q \geq 1000$ (C: Nominal capacitance)	
		High Frequency Type	Refer to detailed specification	
	High Permittivity (Class2) Note 1		2.5% max.	
Test Methods and Remarks		Class 1		Class 2
		Standard	High Frequency Type	$C \leq 10 \mu\text{F}$ $C > 10 \mu\text{F}$
	Preconditioning	None		Thermal treatment (at 150°C for 1hr) Note 2
	Measuring frequency	1MHz \pm 10%	1GHz	1kHz \pm 10% 120 \pm 10Hz
	Measuring voltage Note 1	0.5 to 5Vrms		1 \pm 0.2Vrms 0.5 \pm 0.1Vrms
Bias application	None			

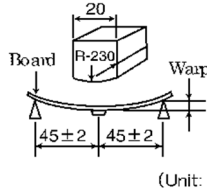
8. Temperature Characteristic (Without voltage application)

Specified Value	Temperature Compensating (Class1)	Standard	Temperature Characteristic [ppm/°C]		Tolerance [ppm/°C]		
			C□ : 0	CG(C0G) CH(C0H) CJ(C0J) CK(C0K)	G: ± 30 H: ± 60 J: ± 120 H: ± 250		
		High Frequency Type	Temperature Characteristic [ppm/°C]		Tolerance [ppm/°C]		
			C□ : 0	CG(C0G) CH(C0H)	G: ± 30 H: ± 60		
	High Permittivity (Class2)			Specification	Capacitance change	Reference temperature	Temperature Range
			B5	B X5R	$\pm 10\%$ $\pm 15\%$	20°C 25°C	-25 to +85°C -55 to +85°C
			B7	X7R	$\pm 15\%$	25°C	-55 to +125°C
			C6	XS	$\pm 22\%$	25°C	-55 to +105°C
			C7	X7S	$\pm 22\%$	25°C	-55 to +125°C

Test Methods and Remarks	Class 1 Capacitance at 20°C and 85°C shall be measured in thermal equilibrium, and the temperature characteristic shall be calculated from the following equation.			
	$\frac{(C_{85} - C_{20})}{C_{20} \times \Delta T} \times 10^6 (\text{ppm}/^\circ\text{C}) \quad \Delta T = 65$			
	Class 2 Capacitance at each step shall be measured in thermal equilibrium, and the temperature characteristic shall be calculated from the following equation.			
	Step	B	X5R, X7R, X6S, X7S	
	1	Minimum operating temperature		
2	20°C	25°C		
3	Maximum operating temperature			
	$\frac{(C - C_2)}{C_2} \times 100 (\%)$		C : Capacitance in Step 1 or Step 3 C ₂ : Capacitance in Step 2	
	※Measuring frequency and voltage: Refer to detailed specification			

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9. Deflection

Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 5\%$ or ± 0.5 pF, whichever is larger.	
		High Frequency Type	Appearance : No abnormality Capacitance change : Within ± 0.5 pF	
	High Permittivity (Class2)		Appearance : No abnormality Capacitance change : Within $\pm 12.5\%$	
Test Methods and Remarks	Multilayer Ceramic Capacitors		 <p>(Unit: mm) Capacitance measurement shall be conducted with the board bent</p>	
		0201, 0402, 0603, ※1005 Type		
		The other types		
	Board	Glass epoxy-resin substrate		
	Thickness	0.8mm		1.6mm
	Warp	1mm		
	Duration	10 sec.		
※1005 Type thickness, 2: 0.2mm, 3: 0.3mm.				

10. Adhesive Strength of Terminal Electrodes

Specified Value	Temperature Compensating (Class1)	Standard	No terminal separation or its indication.	
		High Frequency Type		
	High Permittivity (Class2)			
Test Methods and Remarks		0201Type	0402, 0603Type	1005Type or more
	Applied force	1N	2N	5N
	Duration	10 ± 1 sec		30 ± 5 sec

11. Vibration

Specified Value	Temperature Compensating (Class1)	Standard	Initial performance shall be satisfied.
		High Frequency Type	
	High Permittivity (Class2)		
Test Methods and Remarks	Preconditioning	: Thermal treatment (at 150°C for 1hr) Note2 (Only High permittivity)	
	Frequency range	: 10 to 55 Hz	
	Overall amplitude	: 1.5 mm	
	Sweeping method	: 10 to 55 to 10 Hz for 1 min Two hours each in X, Y, Z directions: 6 hrs in total	

12. Solderability

Specified Value	Temperature Compensating (Class1)	Standard	At least 95% of terminal electrode is covered by new solder.
		High Frequency Type	
	High Permittivity (Class2)		
Test Methods and Remarks		Eutectic solder	Lead-free solder
	Solder type	H60A or H63A	Sn-3.0Ag-0.5Cu
	Solder temperature	230 ± 5°C	
	Duration	4 ± 1 sec.	

13. Resistance to Soldering

Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger. Q : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
		High Frequency Type	Appearance : No abnormality Capacitance change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger. Q : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
	High Permittivity (Class2) Note 1		Appearance : No abnormality Capacitance change : Within $\pm 7.5\%$ Dissipation factor : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
Test Methods and Remarks	Class 1			
		0201, 0402, 0603 Type	1005 Type	
	Preconditioning	None		
	Preheating	150°C, 1 to 2 min.	80 to 100°C, 2 to 5 min. 150 to 200°C, 2 to 5 min.	
	Solder temp.	270 \pm 5°C		
	Duration	3 \pm 0.5 sec.		
	Recovery	24 \pm 2 hrs (Standard condition) Note 5		
	Class 2			
		0201, 0402, 0603 Type	1005, 1608, 2012 Type	3216, 3225, 4532 Type
	Preconditioning	Thermal treatment (at 150°C for 1 hr) Note 2		
	Preheating	150°C, 1 to 2 min.	80 to 100°C, 2 to 5 min. 150 to 200°C, 2 to 5 min.	80 to 100°C, 5 to 10 min. 150 to 200°C, 5 to 10 min.
	Solder temp.	270 \pm 5°C		
	Duration	3 \pm 0.5 sec.		
	Recovery	24 \pm 2 hrs (Standard condition) Note 5		

14. Temperature Cycle (Thermal Shock)

Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger. Q : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
		High Frequency Type	Appearance : No abnormality Capacitance change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$, whichever is larger. Q : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
	High Permittivity (Class2) Note 1		Appearance : No abnormality Capacitance change : Within $\pm 7.5\%$ Dissipation factor : Initial value Insulation resistance : Initial value Withstanding voltage (between terminals) : No abnormality	
Test Methods and Remarks	Class 1		Class 2	
	Preconditioning	None	Thermal treatment (at 150°C for 1 hr) Note 2	
	1 cycle	Step	Temperature (°C)	Time (min.)
		1	Minimum operating temperature	30 \pm 3
		2	Normal temperature	2 to 3
		3	Maximum operating temperature	30 \pm 3
4	Normal temperature	2 to 3		
Number of cycles	5 times			
Recovery	24 \pm 2 hrs (Standard condition) Note 5			

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15. Humidity (Steady State)			
Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 5\%$ or $\pm 0.5\text{pF}$, whichever is larger. Q : $C < 10\text{pF} : Q \geq 200 + 10C$ $10 \leq C < 30\text{pF} : Q \geq 275 + 2.5C$ $C \geq 30\text{pF} : Q \geq 350$ (C: Nominal capacitance) Insulation resistance : 1000 M Ω min.
		High Frequency Type	Appearance : No abnormality Capacitance change : Within $\pm 5\%$ or $\pm 0.5\text{pF}$, whichever is larger. Insulation resistance : 1000 M Ω min.
	High Permittivity (Class2) Note 1		Appearance : No abnormality Capacitance change : Within $\pm 12.5\%$ Dissipation factor : 5.0% max. Insulation resistance : 50 M Ω μF or 1000 M Ω whichever is smaller.
Test Methods and Remarks	Preconditioning : Thermal treatment (at 150°C for 1hr) Note2 (Only High permittivity) Temperature : 40 \pm 2°C Humidity : 90 to 95%RH Duration : 500 +24/-0 hrs Recovery : 24 \pm 2hrs under the standard condition Note 1,5		

16. Humidity Loading			
Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 7.5\%$ or $\pm 0.75\text{pF}$, whichever is larger. Q : $C < 30\text{pF} : Q \geq 100 + 10C/3$ $C \geq 30\text{pF} : Q \geq 200$ (C: Nominal capacitance) Insulation resistance : 500 M Ω min.
		High Frequency Type	Appearance : No abnormality Capacitance change : $C \leq 2\text{pF} : \text{Within } \pm 0.4 \text{ pF}$ $C > 2\text{pF} : \text{Within } \pm 0.75 \text{ pF}$ $C > 10\text{pF} : \text{Within } \pm 0.75\% \text{ (C: Nominal capacitance)}$ Insulation resistance : 500 M Ω min.
	High Permittivity (Class2) Note 1		Appearance : No abnormality Capacitance change : Within $\pm 12.5\%$ Dissipation factor : 5.0% max. Insulation resistance : 25 M Ω μF or 500 M Ω , whichever is smaller.
Test Methods and Remarks	Preconditioning : Voltage treatment (Rated voltage are applied for 1 hour at 40°C) Note 1,3 (Only High permittivity) Temperature : 40 \pm 2°C Humidity : 90 to 95%RH Duration : 500 +24/-0 hrs Applied voltage : Rated voltage Charge/discharge current : 50mA max. Recovery : 24 \pm 2hrs under the standard condition Note 1,5		

17. High Temperature Loading

Specified Value	Temperature Compensating (Class1)	Standard	Appearance : No abnormality Capacitance change : Within $\pm 3\%$ or $\pm 0.3\text{pF}$, whichever is larger. Q : $C < 10\text{pF}$: $Q \geq 200 + 10C$ $10 \leq C < 30\text{pF}$: $Q \geq 275 + 2.5C$ $C \geq 30\text{pF}$: $Q \geq 350$ (C: Nominal capacitance) Insulation resistance : $1000 \text{ M}\Omega$ min.
		High Frequency Type	Appearance : No abnormality Capacitance change : Within $\pm 3\%$ or $\pm 0.3\text{pF}$, whichever is larger. Insulation resistance : $1000 \text{ M}\Omega$ min.
	High Permittivity (Class2) Note 1	Appearance : No abnormality Capacitance change : Within $\pm 12.5\%$ Dissipation factor : 5.0% max. Insulation resistance : $50 \text{ M}\Omega \mu\text{F}$ or $1000 \text{ M}\Omega$, whichever is smaller.	
Test Methods and Remarks	Preconditioning : Voltage treatment (Twice the rated voltage shall be applied for 1 hour at 85°C , 105°C or 125°C) Note 1,3,4 (Only High permittivity) Temperature : Maximum operating temperature Duration : $1000 +24/-0$ hrs Applied voltage : Rated voltage $\times 2$ Note 4 Charge/discharge current : 50mA max. Recovery : 24 ± 2 hrs under the standard condition Note 1,5		

Note 1 The figures indicate typical specifications. Please refer to individual specifications in detail.

Note 2 Thermal treatment : Initial value shall be measured after test sample is heat-treated at $150 \pm 0 / -10^\circ\text{C}$ for an hour and kept at room temperature for 24 ± 2 hours.

Note 3 Voltage treatment : Initial value shall be measured after test sample is voltage-treated for an hour at both the temperature and voltage specified in the test conditions, and kept at room temperature for 24 ± 2 hours.

Note 4 150% of rated voltage is applicable to some items. Please refer to their specifications for further information.

Note 5 Standard condition: Temperature: 5 to 35°C , Relative humidity: 45 to 85% RH, Air pressure: 86 to 106kPa When there are questions concerning measurement results, in order to provide correlation data, the test shall be conducted under the following condition.

Temperature: $20 \pm 2^\circ\text{C}$, Relative humidity: 60 to 70% RH, Air pressure: 86 to 106kPa Unless otherwise specified, all the tests are conducted under the "standard condition".

Multilayer Ceramic Capacitors

PRECAUTIONS

1. Circuit Design

- Precautions**
- ◆ Verification of operating environment, electrical rating and performance
 1. A malfunction of equipment in fields such as medical, aerospace, nuclear control, etc. may cause serious harm to human life or have severe social ramifications. Therefore, any capacitors to be used in such equipment may require higher safety and reliability, and shall be clearly differentiated from them used in general purpose applications.
 - ◆ Operating Voltage (Verification of Rated voltage)
 1. The operating voltage for capacitors must always be their rated voltage or less.
 - If an AC voltage is loaded on a DC voltage, the sum of the two peak voltages shall be the rated voltage or less.
 - For a circuit where an AC or a pulse voltage may be used, the sum of their peak voltages shall also be the rated voltage or less.
 2. Even if an applied voltage is the rated voltage or less reliability of capacitors may be deteriorated in case that either a high frequency AC voltage or a pulse voltage having rapid rise time is used in a circuit.

2. PCB Design

- Precautions**
- ◆ Pattern configurations (Design of Land-patterns)
 1. When capacitors are mounted on PCBs, the amount of solder used (size of fillet) can directly affect the capacitor performance. Therefore, the following items must be carefully considered in the design of land patterns:
 - (1) Excessive solder applied can cause mechanical stresses which lead to chip breaking or cracking. Therefore, please consider appropriate land-patterns for proper amount of solder.
 - (2) When more than one component are jointly soldered onto the same land, each component's soldering point shall be separated by solder-resist.
 - ◆ Pattern configurations (Capacitor layout on PCBs)

After capacitors are mounted on boards, they can be subjected to mechanical stresses in subsequent manufacturing processes (PCB cutting, board inspection, mounting of additional parts, assembly into the chassis, wave soldering of the boards, etc.). For this reason, land pattern configurations and positions of capacitors shall be carefully considered to minimize stresses.

Technical considerations

- ◆ Pattern configurations (Design of Land-patterns)

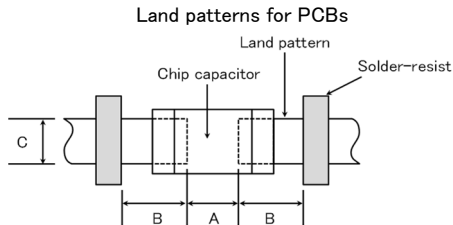
The following diagrams and tables show some examples of recommended land patterns to prevent excessive solder amounts.

(1) Recommended land dimensions for typical chip capacitors

 - Multilayer Ceramic Capacitors : Recommended land dimensions (unit: mm)

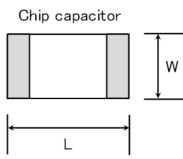
Wave-soldering

Type	1608	2012	3216	3225	
Size	L	1.6	2.0	3.2	3.2
	W	0.8	1.25	1.6	2.5
A	0.8 to 1.0	1.0 to 1.4	1.8 to 2.5	1.8 to 2.5	
B	0.5 to 0.8	0.8 to 1.5	0.8 to 1.7	0.8 to 1.7	
C	0.6 to 0.8	0.9 to 1.2	1.2 to 1.6	1.8 to 2.5	



Reflow-soldering

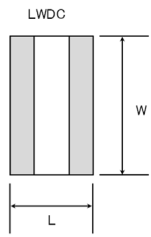
Type	0201	0402	0603	1005	1608	2012	3216	3225	4532
Size	L	0.25	0.4	0.6	1.0	1.6	2.0	3.2	4.5
	W	0.125	0.2	0.3	0.5	0.8	1.25	1.6	3.2
A	0.095~0.135	0.15~0.25	0.20~0.30	0.45~0.55	0.6~0.8	0.8~1.2	1.8~2.5	1.8~2.5	2.5~3.5
B	0.085~0.125	0.10~0.20	0.20~0.30	0.40~0.50	0.6~0.8	0.8~1.2	1.0~1.5	1.0~1.5	1.5~1.8
C	0.110~0.150	0.15~0.30	0.25~0.40	0.45~0.55	0.6~0.8	0.9~1.6	1.2~2.0	1.8~3.2	2.3~3.5



Note: Recommended land size might be different according to the allowance of the size of the product.

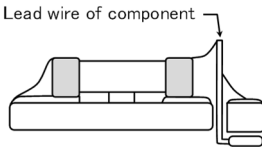
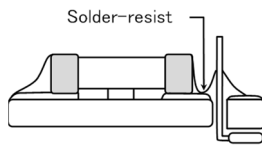
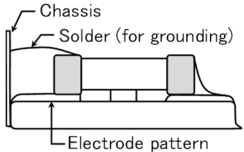
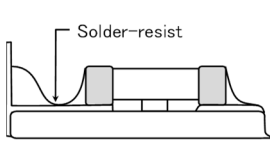
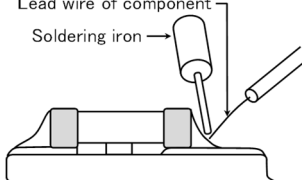
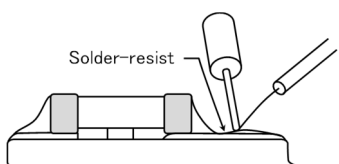
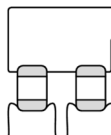
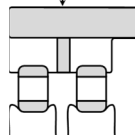
 - LWDC: Recommended land dimensions for reflow-soldering (unit: mm)

Type	0510	0816	1220	
Size	L	0.52	0.8	1.25
	W	1.0	1.6	2.0
A	0.18~0.22	0.25~0.3	0.5~0.7	
B	0.2~0.25	0.3~0.4	0.4~0.5	
C	0.9~1.1	1.5~1.7	1.9~2.1	



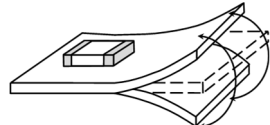
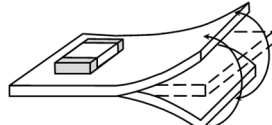
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(2) Examples of good and bad solder application

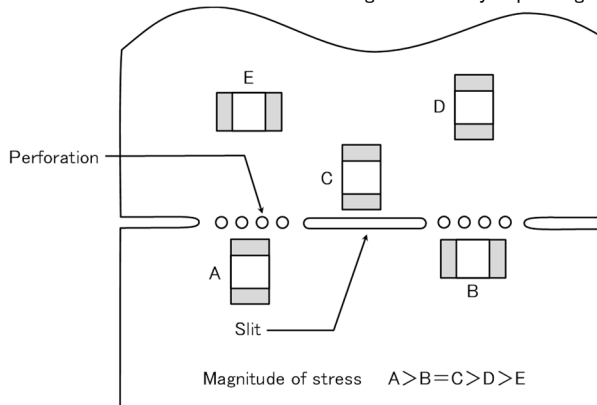
Item	Not recommended	Recommended
Mixed mounting of SMD and leaded components		
Component placement close to the chassis		
Hand-soldering of leaded components near mounted components		
Horizontal component placement		

◆ Pattern configurations (Capacitor layout on PCBs)

1-1. The following is examples of good and bad capacitor layouts ; capacitors shall be located to minimize any possible mechanical stresses from board warp or deflection.

Items	Not recommended	Recommended
Deflection of board		 Place the product at a right angle to the direction of the anticipated mechanical stress.

1-2. The amount of mechanical stresses given will vary depending on capacitor layout. Please refer to diagram below.



1-3. When PCB is split, the amount of mechanical stress on the capacitors can vary according to the method used. The following methods are listed in order from least stressful to most stressful: push-back, slit, V-grooving, and perforation. Thus, please consider the PCB, split methods as well as chip location.

3. Mounting

Precautions

◆ Adjustment of mounting machine

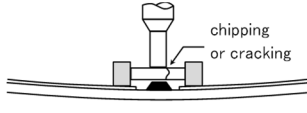
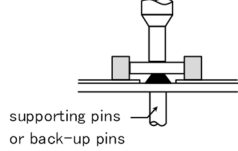
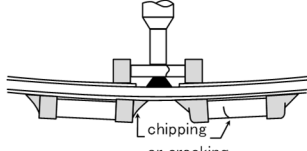
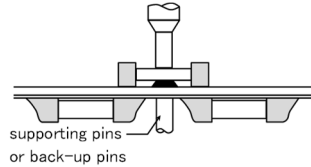
- When capacitors are mounted on PCB, excessive impact load shall not be imposed on them.
- Maintenance and inspection of mounting machines shall be conducted periodically.

◆ Selection of Adhesives

- When chips are attached on PCBs with adhesives prior to soldering, it may cause capacitor characteristics degradation unless the following factors are appropriately checked : size of land patterns, type of adhesive, amount applied, hardening temperature and hardening period. Therefore, please contact us for further information.

◆ Adjustment of mounting machine

1. When the bottom dead center of a pick-up nozzle is too low, excessive force is imposed on capacitors and causes damages. To avoid this, the following points shall be considerable.
 - (1) The bottom dead center of the pick-up nozzle shall be adjusted to the surface level of PCB without the board deflection.
 - (2) The pressure of nozzle shall be adjusted between 1 and 3 N static loads.
 - (3) To reduce the amount of deflection of the board caused by impact of the pick-up nozzle, supporting pins or back-up pins shall be used on the other side of the PCB. The following diagrams show some typical examples of good and bad pick-up nozzle placement:

Item	Improper method	Proper method
Single-sided mounting		
Double-sided mounting		

Technical considerations

2. As the alignment pin is worn out, adjustment of the nozzle height can cause chipping or cracking of capacitors because of mechanical impact on the capacitors. To avoid this, the monitoring of the width between the alignment pins in the stopped position, maintenance, check and replacement of the pin shall be conducted periodically.

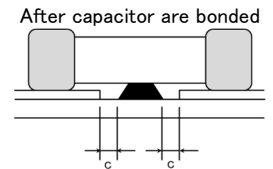
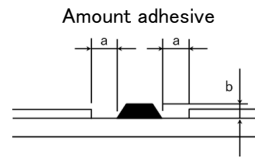
◆ Selection of Adhesives

Some adhesives may cause IR deterioration. The different shrinkage percentage of between the adhesive and the capacitors may result in stresses on the capacitors and lead to cracking. Moreover, too little or too much adhesive applied to the board may adversely affect components. Therefore, the following precautions shall be noted in the application of adhesives.

- (1) Required adhesive characteristics
 - a. The adhesive shall be strong enough to hold parts on the board during the mounting & solder process.
 - b. The adhesive shall have sufficient strength at high temperatures.
 - c. The adhesive shall have good coating and thickness consistency.
 - d. The adhesive shall be used during its prescribed shelf life.
 - e. The adhesive shall harden rapidly.
 - f. The adhesive shall have corrosion resistance.
 - g. The adhesive shall have excellent insulation characteristics.
 - h. The adhesive shall have no emission of toxic gasses and no effect on the human body.
- (2) The recommended amount of adhesives is as follows:

[Recommended condition]

Figure	2012/3216 case sizes as examples
a	0.3mm min
b	100 to 120 μm
c	Adhesives shall not contact land



4. Soldering

◆ Selection of Flux

- Since flux may have a significant effect on the performance of capacitors, it is necessary to verify the following conditions prior to use;
- (1) Flux used shall be less than or equal to 0.1 wt% (in Cl equivalent) of halogenated content. Flux having a strong acidity content shall not be applied.
 - (2) When shall capacitors are soldered on boards, the amount of flux applied shall be controlled at the optimum level.
 - (3) When water-soluble flux is used, special care shall be taken to properly clean the boards.

Precautions

◆ Soldering

Temperature, time, amount of solder, etc. shall be set in accordance with their recommended conditions. Sn-Zn solder paste can adversely affect MLCC reliability. Please contact us prior to usage of Sn-Zn solder.

Technical considerations

◆ Selection of Flux

- 1-1. When too much halogenated substance (Chlorine, etc.) content is used to activate flux, or highly acidic flux is used, it may lead to corrosion of terminal electrodes or degradation of insulation resistance on the surfaces of the capacitors.
- 1-2. Flux is used to increase solderability in wave soldering. However if too much flux is applied, a large amount of flux gas may be emitted and may adversely affect the solderability. To minimize the amount of flux applied, it is recommended to use a flux-bubbling system.
- 1-3. Since the residue of water-soluble flux is easily dissolved in moisture in the air, the residues on the surfaces of capacitors in high humidity conditions may cause a degradation of insulation resistance and reliability of the capacitors. Therefore, the cleaning methods

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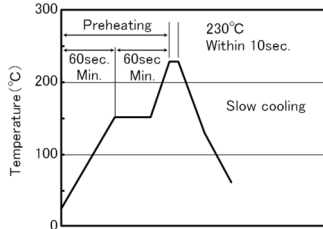
and the capability of the machines used shall also be considered carefully when water-soluble flux is used.

◆Soldering

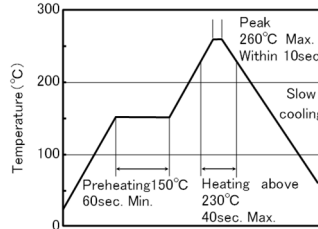
- Ceramic chip capacitors are susceptible to thermal shock when exposed to rapid or concentrated heating or rapid cooling.
- Therefore, the soldering must be conducted with great care so as to prevent malfunction of the components due to excessive thermal shock.
- Preheating : Capacitors shall be preheated sufficiently, and the temperature difference between the capacitors and solder shall be within 130°C.
- Cooling : The temperature difference between the capacitors and cleaning process shall not be greater than 100°C.

[Reflow soldering]

【Recommended conditions for eutectic soldering】

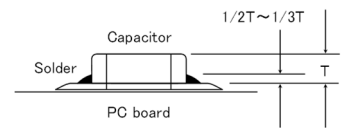


【Recommended condition for Pb-free soldering】



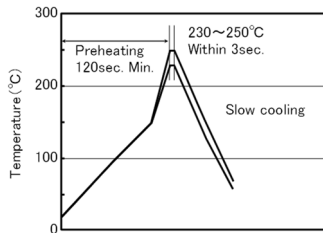
Caution

- ①The ideal condition is to have solder mass (fillet) controlled to 1/2 to 1/3 of the thickness of a capacitor.
- ②Because excessive dwell times can adversely affect solderability, soldering duration shall be kept as close to recommended times as possible. soldering for 2 times.

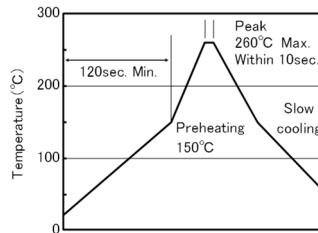


[Wave soldering]

【Recommended conditions for eutectic soldering】



【Recommended condition for Pb-free soldering】

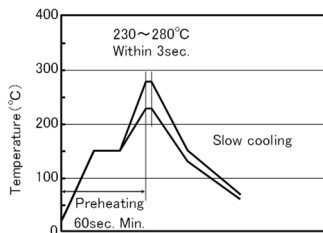


Caution

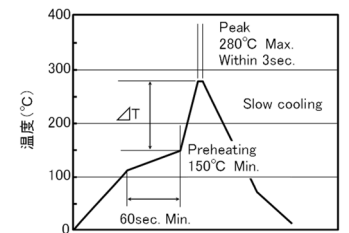
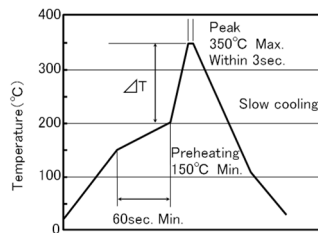
- ①Wave soldering must not be applied to capacitors designated as for reflow soldering only. soldering for 1 times.

[Hand soldering]

【Recommended conditions for eutectic soldering】



【Recommended condition for Pb-free soldering】



	ΔT
3216type or less	$\Delta T \leq 150^{\circ}\text{C}$

	ΔT
3225type or more	$\Delta T \leq 130^{\circ}\text{C}$

Caution

- ①Use a 50W soldering iron with a maximum tip diameter of 1.0 mm.
- ②The soldering iron shall not directly touch capacitors. soldering for 1 times.

5. Cleaning	
Precautions	<p>◆Cleaning conditions</p> <ol style="list-style-type: none"> When PCBs are cleaned after capacitors mounting, please select the appropriate cleaning solution in accordance with the intended use of the cleaning. (e.g. to remove soldering flux or other materials from the production process.) Cleaning condition shall be determined after it is verified by using actual cleaning machine that the cleaning process does not affect capacitor's characteristics.
Technical considerations	<ol style="list-style-type: none"> The use of inappropriate cleaning solutions can cause foreign substances such as flux residue to adhere to capacitors or deteriorate their outer coating, resulting in a degradation of the capacitor's electrical properties (especially insulation resistance). Inappropriate cleaning conditions (insufficient or excessive cleaning) may adversely affect the performance of the capacitors. In the case of ultrasonic cleaning, too much power output can cause excessive vibration of PCBs which may lead to the cracking of capacitors or the soldered portion, or decrease the terminal electrodes' strength. Therefore, the following conditions shall be carefully checked: Ultrasonic output : 20 W/l or less Ultrasonic frequency : 40 kHz or less Ultrasonic washing period : 5 min. or less

6. Resin coating and mold	
Precautions	<ol style="list-style-type: none"> With some type of resins, decomposition gas or chemical reaction vapor may remain inside the resin during the hardening period or while left under normal storage conditions resulting in the deterioration of the capacitor's performance. When a resin's hardening temperature is higher than capacitor's operating temperature, the stresses generated by the excessive heat may lead to damage or destruction of capacitors. The use of such resins, molding materials etc. is not recommended.

7. Handling	
Precautions	<p>◆Splitting of PCB</p> <ol style="list-style-type: none"> When PCBs are split after components mounting, care shall be taken so as not to give any stresses of deflection or twisting to the board. Board separation shall not be done manually, but by using the appropriate devices. <p>◆Mechanical considerations</p> <p>Be careful not to subject capacitors to excessive mechanical shocks.</p> <ol style="list-style-type: none"> If ceramic capacitors are dropped onto a floor or a hard surface, they shall not be used. Please be careful that the mounted components do not come in contact with or bump against other boards or components.

8. Storage conditions	
Precautions	<p>◆Storage</p> <ol style="list-style-type: none"> To maintain the solderability of terminal electrodes and to keep packaging materials in good condition, care must be taken to control temperature and humidity in the storage area. Humidity should especially be kept as low as possible. <ul style="list-style-type: none"> Recommended conditions Ambient temperature : Below 30°C Humidity : Below 70% RH The ambient temperature must be kept below 40°C. Even under ideal storage conditions, solderability of capacitor is deteriorated as time passes, so capacitors shall be used within 6 months from the time of delivery. <ul style="list-style-type: none"> Ceramic chip capacitors shall be kept where no chlorine or sulfur exists in the air. The capacitance values of high dielectric constant capacitors will gradually decrease with the passage of time, so care shall be taken to design circuits. Even if capacitance value decreases as time passes, it will get back to the initial value by a heat treatment at 150°C for 1hour.
Technical considerations	<p>If capacitors are stored in a high temperature and humidity environment, it might rapidly cause poor solderability due to terminal oxidation and quality loss of taping/packaging materials. For this reason, capacitors shall be used within 6 months from the time of delivery. If exceeding the above period, please check solderability before using the capacitors.</p>

※RCR-2335B (Safety Application Guide for fixed ceramic capacitors for use in electronic equipment) is published by JEITA.

Please check the guide regarding precautions for deflection test, soldering by spot heat, and so on.