

Notice for TAIYO YUDEN Products

Please read this notice before using the TAIYO YUDEN products.

? REMINDERS

Product Information in this Catalog

Product information in this catalog is as of March 2023. All of the contents specified herein and production status of the products listed in this catalog are subject to change without notice due to technical improvement of our products, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

Please note that TAIYO YUDEN shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

Approval of Product Specifications

Please contact TAIYO YUDEN for further details of product specifications as the individual product specification sheets are available. When using our products, please be sure to approve our product specifications or make a written agreement on the product specification with TAIYO YUDEN in advance.

Pre-Evaluation in the Actual Equipment and Conditions

Please conduct validation and verification of our products in actual conditions of mounting and operating environment before using our products.

Limited Application

1. Equipment Intended for Use

The products listed in this catalog are intended for general-purpose and standard use in general electronic equipment for consumer (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and other equipment specified in this catalog or the individual product specification sheets, or the equipment approved separately by TAIYO YUDEN.

TAIYO YUDEN has the product series intended for use in the following equipment. Therefore, when using our products for these equipment, please check available applications specified in this catalog or the individual product specification sheets and use the corresponding products.

Application	Product Series	Quality Grade*3	
Application	Equipment *1	Category (Part Number Code *2)	Quality Grade 9
Automotive	Automotive Electronic Equipment (POWERTRAIN, SAFETY)	А	1
Adtornotive	Automotive Electronic Equipment (BODY & CHASSIS, INFOTAINMENT)	С	2
Industrial	Telecommunications Infrastructure and Industrial Equipment	В	2
Medical	Medical Devices classified as GHTF Class C (Japan Class III)	M	2
iviedicai	Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)	L	3
Consumer	General Electronic Equipment	S	3
Consumer	Only for Mobile Devices *4	E	4

^{*}Notes:1. Based on the general specifications required for electronic components for such equipment, which are recognized by TAIYO YUDEN, the use of each product series for the equipment is recommended. Please be sure to contact TAIYO YUDEN before using our products for equipment other than those covered by the product series.

^{2.} On each of our part number, the 2nd code from the left is a code indicating the "Category" as shown in the above table. For details, please check the explanatory materials regarding the part numbering system of each of our products.

^{3.} Each product series is assigned a "Quality Grade" from 1 to 4 in order of higher quality. Please do not incorporate a product into any equipment with a higher Quality Grade than the Quality Grade of such product without the prior written consent of TAIYO YUDEN.

^{4.} The applications covered by this product series are limited to mobile devices (smartphone, tablet PC, smartwatch, handheld game console, etc.) among general electronic equipment for consumer. The design, specifications and operating environment, etc. differ from those of the product series for "General Electronic Equipment" (Category: S), so please check the individual product specification sheets for details. The product series for "General Electronic Equipment" (Category: S) can also be used for mobile devices.

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

2. Equipment Requiring Inquiry

Please be sure to contact TAIYO YUDEN for further information before using the products listed in this catalog for the following equipment (excluding intended equipment as specified in this catalog or the individual product specification sheets) which may cause loss of human life, bodily injury, serious property damage and/or serious public impact due to a failure or defect of the products and/or malfunction attributed thereto.

- (1) Transportation equipment (automotive powertrain control system, train control system, and ship control system, etc.)
- (2) Traffic signal equipment
- (3) Disaster prevention equipment, crime prevention equipment
- (4) Medical devices classified as GHTF Class C (Japan Class III)
- (5) Highly public information network equipment, data-processing equipment (telephone exchange, and base station, etc.)
- (6) Any other equipment requiring high levels of quality and/or reliability equal to the equipment listed above

3. Equipment Prohibited for Use

Please do not incorporate our products into the following equipment requiring extremely high levels of safety and/or reliability.

- (1) Aerospace equipment (artificial satellite, rocket, etc.)
- (2) Aviation equipment *1
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices *2
- (4) Power generation control equipment (nuclear power, hydroelectric power, thermal power plant control system, etc.)
- (5) Undersea equipment (submarine repeating equipment, etc.)
- (6) Military equipment
- (7) Any other equipment requiring extremely high levels of safety and/or reliability equal to the equipment listed above
- *Notes:1. There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by TAIYO YUDEN. Please be sure to contact TAIYO YUDEN for further information before using our products for such aviation equipment.
 - 2. Implantable medical devices contain not only internal unit which is implanted in a body, but also external unit which is connected to the internal unit.

4. Limitation of Liability

Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment that is not intended for use by TAIYO YUDEN, or any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

Safety Design

When using our products for high safety and/or reliability-required equipment or circuits, please fully perform safety and/or reliability evaluation. In addition, please install (i) systems equipped with a protection circuit and a protection device and/or (ii) systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a failsafe design to ensure safety.

Intellectual Property Rights

Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.

Limited Warranty

Please note that the scope of warranty for our products is limited to the delivered our products themselves conforming to the product specifications specified in the individual product specification sheets, and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a failure or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement, provided, however, that our products shall be used for general-purpose and standard use in the equipment specified in this catalog or the individual product specification sheets.

■ TAIYO YUDEN's Official Sales Channel

The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "TAIYO YUDEN's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than TAIYO YUDEN's official sales channel.

Caution for Export

Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

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Medical Application Guide

According to the medical devices classified as GHTF Classes A to C (Japan Classes I to III), we have the corresponding product series (the 2nd code from the left side of the part number is "M" or "L") intended for use in the medical devices. Therefore, when using our products for the medical devices, please be sure to check the classification based on the GHTF Rules and use the corresponding product series.

On the other hand, we don't have the product series intended for use in (i) all medical devices classified as GHTF Class D (Japan Class IV) and (ii) implantable medical devices (bone-anchored hearing aid, artificial retina system, and external unit which is connected to internal unit which is implanted in a body, etc.). Therefore, please do not incorporate our products into these medical devices. Should you have any questions on this matter, please contact us.

Risk I	Level	Low					High
		Class I General Medical Devices (GHTF Class A)	Med	Class II Controlled dical Devices HTF Class B)	Class III Specially-cont Medical Devi (GHTF Class	rolled ices	Class IV Specially-controlled Medical Devices (GHTF Class D)
	g to an ules)	Medical devices with extremely low risk to the human body in case of problems	relativel	devices with y low risk to the body in case of is	Medical devices relatively high ris human body in c problems	k to the	Medical devices highly invasive to patients and with life-threatening risk in case of problems
Japan	Classification according to the PMD Act of Japan (based on the GHTF Rules)	 [Ex.] In Vitro Diagnostic Devices Nebulizer Blood Gas Analyzer Plethysmographs Breathing Sensor AC-powered Operating Table Surgical Light Cholesterol Analysis Device Blood Type Analysis Device, etc. 	• Electr Press • Electr • Hearii • Electr • MRI • Ultras Syste • Diagn Equip • X-ray Equip • Centr	ocardiograph conic Diagnostic m ostic Imaging ment Diagnostic	[Ex.] Dialysis Machi Radiation There Equipment Infusion Pump Respirator Glucose Moniform System AED (Automathe External Defibrows Skin Laser Scient Pump,	rapy toring ed rillator) anner eal Unit	[Ex.] Cardiac Pacemaker Video Flexible Angioscope Implantable Infusion Pump Cardiac Electrosurgical Unit Inspection Device with Cardiac Catheter Defibrillator, etc.
	ation	Class I General Controls		General C	ss II ontrols and Controls		Class III General Controls and Premarket Approval
U.S.A.	FDA Classifica	Medical devices without the possibility of causing serious injury or harm to the patient or user even if there is a defect o malfunction in such medical devices		Medical devices possibility of cau harm to the patie there is a defect in such medical	sing injury or possit nt or user if injury, or malfunction patien pevices malful		al devices with the ility of causing serious disability or death to the or user if a defect or ction occurs in such al devices
Corresponding TAIYO YUDEN Product Series		Product Series for classified as GHT (Japan Cla (The 2nd Code from the Numb	F Classo	es A or B	Product Serie Medical Dev classified as (Class C (Japan ((The 2nd Code the Left Side of the Number: "M (See the Note be	ices GHTF Class III) from he Part I")	N/A

^{*} Note: It is prohibited that our products are used in some medical devices such as implantable medical devices even if such medical devices are classified as GHTF Class C (Japan Class III).

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Multilayer Ceramic Capacitors

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

REFLOW

■PART NUMBER

М	L	Α	S	U	3	1	L	В	В	5	1	0	6	K	Т	N	Α	0	1
	(1)		2	(;	3)	(4)	(5)	(6)		(7)		8	9		(1	0	

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	
М	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)	T	У	р

Code	
Α	2 terminals
R	LW reversal

(4) Features, Characteristics

<u> </u>	*
Code	
S	Standard/General
Υ	Low distortion design/Audible/Good bias
L	Low ESL

2Rated voltage

Code	Rated voltage[VDC]
Р	2.5
Α	4
J	6.3
L	10
Е	16
Т	25
G	35
U	50
Н	100
Q	250
S	630
Х	2000
•	<u> </u>

3Dimension

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
10	0.52 × 1.0 ※	0510	0204
16	1.6 × 0.8	1608	0603
10	0.8 × 1.6 ※	0816	0306
21	2.0 × 1.25	2012	0805
21	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)

4 Thickness

_	
Code	Thickness[mm]
Н	0.13 (1.5 max ※)
Е	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 🔆)
Υ	2.0 max
М	2.5

Note: XLW reverse type(MLRL)

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⑤Dimension tolerance

Code	Dimension code	L[mm]	W[mm]	T[mm]	Thickness code
	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
Code A B C E H J L S T X Y	16	1.6+0.15/-0.05	0.8+0.15/-0.05	0.8+0.15/-0.05	8
Α	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	М
	45	4.5±0.40	3.2±0.30	2.0+0/-0.30	Y
	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
В	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
С	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
				0.85±0.10	9
Н	31	3.2±0.15	1.6±0.15	1.15±0.10	Q
	16	1.6+0.20/-0	0.8+0.20/-0	0.45±0.05	К
C E H	21	2.0+0.15/-0.05	1.25+0.15/-0.05	0.85±0.10	9
	0.0		25.1000	0.85±0.10	9
	32	3.2±0.30	2.5±0.20	1.15±0.10	Q
	21	2.0+0.20/-0	1.25+0.20/-0	0.85±0.10	9
L	31	3.2±0.20	1.6±0.20	0.85±0.10	9
	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
	4.0	1.0±0.05	0.5±0.05	0.5±0.05	5
	10	0.52±0.05 ※	1.0±0.05	0.3±0.05	3
	4.0	1.6±0.10	0.8±0.10	0.8±0.10	8
	16	0.8±0.10 ※	1.6±0.10	0.5±0.05	5
S		001010	1.05 1.0.10	0.85±0.10	9
	21	2.0±0.10	1.25±0.10	1.25±0.10	G
		1.25±0.15 ※	2.0±0.15	0.85±0.10	9
	31	3.2±0.15	1.6±0.15	1.6±0.20	L
	0.0	001000	25.1000	2.5±0.20	М
	32	3.2±0.30	2.5±0.20	1.9±0.20	N
	45	4.5±0.40	3.2±0.30	2.5±0.20	М
Т	16	1.6±0.10	0.8±0.10	0.45±0.05	К
				0.13±0.02	Н
C E H J S T X	1L	1.0±0.05	0.5±0.05	0.18±0.02	Е
				0.2±0.02	2
Υ	1L	1.0±0.05	0.5±0.05	0.3±0.03	3

Note: XLW reverse type (MLRL)

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6Temperature characteristics code

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

Code	Applicable				• •		Ref Temp C Canacitance change		Capacitance	Tolerance
Oode	stan	dard	range[°C]	rtor. romp.[O]	$ \begin{array}{c c} $	code				
	JIS B −25~+ 85 20		±1004	±10%	K					
B5	JIS	В	-25~+ 85	20	±10%	±20%	М			
Вэ		X5R	-55 ~ + 85	Ref. Temp. [*C] Capacitance change 25 20 25 ±15% 25 ±15% 25 ±25% 25 ±22%	±10%	K				
	EIA	ASK	-55~+ 85		±15%	±20%	М			
D7	F14	V7D	FF. 1 10F	0.5	05 ±150/		K			
В7	EIA	X7R	−55 ~ +125	25	±15%	±20%	М			
	F1.4	V.00	FF. 1 10F	0.5	05		K			
C6	EIA	X6S	−55 ~ +105	25	±22%	±20%	М			
	F1.4	V70	FF. 1 10F	0.5	1.000/	±10%	K			
C7	EIA	X7S	−55 ~ +125	25	±22%	±20%	М			
1.0(\%)				514 V5D	FF. 1 0F	0.5	1.150/	±10%	K	
LD(※)	EIA	X5R	−55 ~ + 85	25	±15%	±20%	М			

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

■Temperature compensating type

Code		cable	Temperature	Ref. Temp.[°C]	Capacitance change	Capacitance	Tolerance
	stan	dard	range[°C]		-	tolerance	code
						±0.05pF	Α
	JIS	CG		20		±0.1pF	В
CG			$-55 \sim +125$		0 ± 30 ppm/°C	±0.25pF	С
	EIA	COG		25	1	tolerance code ±0.05pF A ±0.1pF B ±0.25pF C ±0.5pF D ±5% J ±0.1pF B ±0.25pF C ±0.5pF D ±5% J ±0.05pF A ±0.1pF B ±0.25pF C ±0.05pF A ±0.1pF B ±0.1pF B	D
	EIA	COG		25			J
	IIC	СН		20		±0.1pF	В
011	JIS	СП	FF 140F	20	0.1.00 /00	±0.25pF	С
СП	ГТА	COH	-55∼+125 25 0±	0±60ppm/°C	±0.5pF	D	
	EIA	COH		25		±0.5pF D	J
	II.O	0.1		00		±0.05pF	Α
CJ	JIS	CJ	-55~+125	20	0 ± 120 ppm/°C	±0.1pF	В
	EIA	C0J		25		±0.25pF	С
	II.O	OK		00		±0.05pF	Α
СН	JIS	CK	-55 ~ +125	20	0 ± 250 ppm/°C	±0.1pF	В
	EIA	C0K		25		±0.25pF C ±0.5pF D ±5% J ±0.1pF B ±0.25pF C ±0.5pF D ±5% J ±0.05pF A ±0.05pF A ±0.1pF B	С

Series code

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

Code Series code		 	
SD Standard	Code	Series code	
Gtaridard	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
Α	±0.05pF
В	±0.1pF
С	±0.25pF
D	±0.5pF
G	±2%
J	±5%
K	±10%
М	±20%

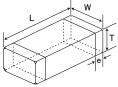
Packaging

Code	Packaging					
F	ϕ 178mm Taping (2mm pitch)					
Т	ϕ 178mm Taping (4mm pitch)					
Р	φ178mm Taping (4mm pitch, 1000 pcs/reel)					
	3225 type (Thickness code M)					
	φ178mm Embossed Taping					
R	1005type (2mm pitch)					
	1608type (4mm pitch)					
W	φ178mm Embossed Taping(1mm pitch)					
	0402type					

10Internal code

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■STANDARD EXTERNAL DIMENSIONS





XLW reverse type

Tura	JIS	EIA	Dimension [mm]															
Туре	(mm)	(inch)	L	W	Т	*1	е											
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											
					0.13±0.02	Н												
MLAS□1L	1005	0402	1.0±0.05	0.5±0.05	0.18±0.02	Е	0.25±0.10											
MILASLIT	1003	0402	1.0 ± 0.03	0.0 ± 0.00	0.2±0.02	2	0.25 ± 0.10											
					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											
WILAS LI 10	1000	0003	1.0 ± 0.10	0.6±0.10	0.8±0.10	8	0.35 ± 0.25											
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	2012	0000	2.0 ± 0.10	1.25±0.10	1.25±0.10	G	0.5±0.25											
MLRL□21 ※	1220	0508	1.25±0.15	2.0±0.15	0.85±0.10	9	0.3 ± 0.2											
					0.85±0.10	9												
MLAS□31	3216	3216	3216	3216	3216	3216	3216	3216	3216	3216	3216	1206	3.2±0.15	1.6±0.15	1.15±0.10	Q	0.5 + 0.35 / -0.25	
			İ		<u>. </u>					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											
WLAT LIST	3210	1200	3.2±0.15	1.0 ± 0.15	1.6±0.20	L	0.5 + 0.35/ - 0.25											
					0.85±0.10	9												
					1.15±0.10	Q												
MLAS□32	3225	1210	3.2 ± 0.30	2.5±0.20	1.9±0.20	N	0.6 ± 0.3											
					1.9+0.1/-0.20	Υ												
					2.5±0.20	М												
MI AVE 22	2225	1210	2 2 4 0 20	254020	1.9±0.20	N	06+02											
MLAY□32	3225	1210	3.2±0.30	2.5±0.20	2.5±0.20	М	0.6 ± 0.3											
MI AS T 45	4522	1012	45+040	3 3 4 0 30	2.0+0/-0.30	Υ	0.6±0.4											
MLAS□45	4532	1812	4.5 ± 0.40	3.2±0.30	2.5±0.20	М	0.9±0.6											

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

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■STANDARD QUANTITY

	Type		Thick	ness	Standard q	uantity[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	_
			0.13	Н	_	20000
11	1005	0402	0.18	E	_	15000
1L	1005	0402	0.2	2	20000	_
1005			0.3	3	15000	_
10	1005	0402	0.5	5	10000	
10	0510 ※	0204 ※	0.3	3	10000	_
	1000	0000	0.45	К	4000	
16	1608	0603	0.8 8		4000	_
	0816 🔆	0306 ※	0.5	5	— 4 4000	4000
21 2012	0005	0.85	9	4000	_	
	2012	0805	1.25	G	_	3000
	1220 ※	0508 ※	0.85	0.3 0.13 H 0.18 E 0.2 2 0.3 3 0.5 5 0.3 3 0.45 K 0.8 8 0.5 5 0.85 9 1.25 G 0.85 9 1.15 Q 1.16 L 0.85 9 1.15 Q 1.15 Q 1.19 N 2.0 max Y	4000	_
			0.85	9	4000	_
21	3216	1206	1.15	Q	_	3000
			1.6	5 10000 - 3 K 4000 - 8 4000 - 5 - 4000 9 4000 - 9 4000 - 9 4000 - Q - 3000 L - 2000 9 Q - N - 2000	2000	
			0.85	9		
			1.15	Q		0000
32	3225	1210	1.9	N	7 -	2000
			2.0 max	Υ		
			2.5	М	_	1000
45	4500	1010	2.0 max	Υ	_	1000
45	4532	1812	2.5	М	_	500

Note: ※.LW Reverse type(MLRL)

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- · All the Multilayer Ceramic Capacitors of the catalog lineup are RoHS Compliant.
- Capacitance tolerance code is applied to [] of part number.
- · All the Multilayer Ceramic Capacitors in the catalog lineup are applicable for reflow-soldering. Please contact us for flow compatible products.

Note)

- *1 We may provide X7R/X7S for some items according to the individual specification.

 *2 The exchange of individual specification is necessary depending on the application and circuit condition. Please contact TAIYO YUDEN sales channels.

 *3 The size standard should look at Dimension, Thickness, Dimension tolerance, and STANDARD EXTERNAL DIMENSIONS.

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

●0402TYPE

[Temperature Characteristic B5(BJ): $B(-25\sim+85^{\circ}C)/X5R(-55\sim+85^{\circ}C)$] 0.2mm thickness

Li emperature Gharact	eristic ba(ba). b(23.4 1 83 0	// AJK	(33.4	1 00 0/1	U.ZIIIIII UIICKIIESS				
New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASE042SB5101[]WNA01	EMK042 BJ101 C-W	16		X5R	100 p	±10, ±20	5	200	0.2 ± 0.02	
MLASE042SB5151[]WNA01	EMK042 BJ151∏C-W	16		X5R	150 p	±10, ±20	5	200	0.2 ± 0.02	
MLASE042SB5221[]WNA01	EMK042 BJ221∏C-W	16		X5R	220 p	±10, ±20	5	200	0.2 ± 0.02	
MLASE042SB5331[]WNA01	EMK042 BJ331∏C-W	16		X5R	330 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASE042SB5471[]WNA01	EMK042 BJ471 ☐ C-W	16		X5R	470 p	±10, ±20	5	200	0.2 ± 0.02	
MLASE042SB5681[]WNA01	EMK042 BJ681∏C-W	16		X5R	680 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASE042SB5102[]WNA01	EMK042 BJ102∏C-W	16	В	X5R	1000 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASE042SB5152[]WNA01	EMK042 BJ152[]C-W	16		X5R	1500 p	±10, ±20	10	150	0.2 ± 0.02	
MLASE042SB5222[]WNA01	EMK042 BJ222[]C-W	16		X5R	2200 p	±10, ±20	10	150	0.2 ± 0.02	
MLASE042SB5332[]WNA01	EMK042 BJ332∏C-W	16		X5R	3300 p	±10, ±20	10	150	0.2 ± 0.02	
MLASE042SB5472[]WNA01	EMK042 BJ472[]C-W	16		X5R	4700 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASE042SB5682[]WNA01	EMK042 BJ682∏C-W	16		X5R	6800 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASE042SB5103[]WNA01	EMK042 BJ103[]C-W	16		X5R	0.01 μ	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5101 WNA01	LMK042 BJ101[]C-W	10		X5R*1	100 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5151 WNA01	LMK042 BJ151∏C-W	10		X5R*1	150 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5221 WNA01	LMK042 BJ221 C-W	10		X5R*1	220 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5331 WNA01	LMK042 BJ331[]C-W	10		X5R*1	330 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5471 WNA01	LMK042 BJ471[]C-W	10		X5R*1	470 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5681 WNA01	LMK042 BJ681∏C-W	10		X5R*1	680 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5102[WNA01	LMK042 BJ102[]C-W	10	В	X5R*1	1000 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02	
MLASL042SB5152[WNA01	LMK042 BJ152[]C-W	10		X5R	1500 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5222 WNA01	LMK042 BJ222[]C-W	10		X5R	2200 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5332 WNA01	LMK042 BJ332∏C-W	10		X5R	3300 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5472[WNA01	LMK042 BJ472[]C-W	10		X5R	4700 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5682[WNA01	LMK042 BJ682∏C-W	10		X5R	6800 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASL042SB5103[WNA01	LMK042 BJ103[]C-W	10		X5R	0.01 μ	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASJ042SB5152[WNA01	JMK042 BJ152∏C-W	6.3		X5R*1	1500 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASJ042SB5222 WNA01	JMK042 BJ222∏C-W	6.3		X5R*1	2200 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASJ042SB5332 WNA01	JMK042 BJ332∏C-W	6.3		X5R*1	3300 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASJ042SB5472 WNA01	JMK042 BJ472∏C-W	6.3		X5R*1	4700 p	$\pm 10, \pm 20$	10	150	0.2 ± 0.02	
MLASJ042SB5682 WNA01	JMK042 BJ682∏C-W	6.3		X5R*1	6800 p	±10, ±20	10	150	0.2 ± 0.02	
MLASJ042SB5103[WNA01	JMK042 BJ103∏C-W	6.3		X5R*1	0.01 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ042SB5223 WNA01	JMK042 BJ223∏C-W	6.3		X5R	0.022μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ042SB5473 WNA01	JMK042 BJ473∏C-W	6.3		X5R	0.047 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ042SB5104 WNA01	JMK042 BJ104□C-W	6.3		X5R	0.1 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASA042SB5473[WNA01	AMK042 BJ473[]C-W	4		X5R	0.047 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASA042SB5104[]WNA01	AMK042 BJ104[]C-W	4		X5R	0.1 μ	±10, ±20	10	150	0.2±0.02	

[Temperature Characteristic B7: X7R(-55~+125°C)] 0.2mm thickness

Tremperature Characteristic B7. X/K(-55°+125 C) 1 0.2min thickness										
New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
MLASE042SB7101[]WNA01	EMK042 B7101[]C-W	16	X7R	100 p	±10, ±20	5	200	0.2±0.02		
MLASE042SB7151[]WNA01	EMK042 B7151[]C-W	16	X7R	150 p	±10, ±20	5	200	0.2±0.02		
MLASE042SB7221[]WNA01	EMK042 B7221[]C-W	16	X7R	220 p	±10, ±20	5	200	0.2 ± 0.02		
MLASE042SB7331[]WNA01	EMK042 B7331[]C-W	16	X7R	330 p	±10, ±20	5	200	0.2 ± 0.02		
MLASE042SB7471[]WNA01	EMK042 B7471 C-W	16	X7R	470 p	±10, ±20	5	200	0.2 ± 0.02		
MLASE042SB7681[]WNA01	EMK042 B7681∏C-W	16	X7R	680 p	±10, ±20	5	200	0.2 ± 0.02		
MLASE042SB7102[]WNA01	EMK042 B7102 C-W	16	X7R	1000 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7101 WNA01	LMK042 B7101[]C-W	10	X7R	100 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7151 WNA01	LMK042 B7151[]C-W	10	X7R	150 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7221 WNA01	LMK042 B7221[]C-W	10	X7R	220 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7331 WNA01	LMK042 B7331[]C-W	10	X7R	330 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7471 WNA01	LMK042 B7471[]C-W	10	X7R	470 p	±10, ±20	5	200	0.2 ± 0.02		
MLASL042SB7681 WNA01	LMK042 B7681[]C-W	10	X7R	680 p	$\pm 10, \pm 20$	5	200	0.2 ± 0.02		
MLASL042SB7102[WNA01	LMK042 B7102[]C-W	10	X7R	1000 p	±10, ±20	5	200	0.2±0.02		

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●0603TYPE

[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 0.3mm thickness

Tremperature onaract	CHISCIO DO (DO). D (20 1000	/// XOIX	(00	1 00 0/1	0.011111 CHICKICSS				
New part number	Old part number	Rated voltage		erature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	teristics	[F]	[%]	[%]	Rated voltage x %	Triickness [illin]	14000
MLASU063SB5101[FNA01	UMK063 BJ101∏P-F	50	В	X5R*1	100 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB5151[FNA01	UMK063 BJ151∏P-F	50	В	X5R*1	150 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB5221[FNA01	UMK063 BJ221∏P-F	50	В	X5R*1	220 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB5331[FNA01	UMK063 BJ331∏P-F	50	В	X5R*1	330 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB5471[FNA01	UMK063 BJ471∏P-F	50	В	X5R*1	470 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB5681[FNA01	UMK063 BJ681∏P-F	50	В	X5R*1	680 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB5102[FNA01	UMK063 BJ102∏P-F	50	В	X5R*1	1000 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB5152[]FNA01	UMK063 BJ152∏P-F	50	В	X5R	1500 p	±10, ±20	5	200	0.3 ± 0.03	
MLASU063SB5222[]FNA01	UMK063 BJ222∏P-F	50	В	X5R	2200 p	±10, ±20	5	200	0.3 ± 0.03	
MLASU063SB5332[]FNA01	UMK063 BJ332∏P-F	50	В	X5R	3300 р	±10, ±20	5	200	0.3 ± 0.03	
MLASU063SB5472[]FNA01	UMK063 BJ472∏P-F	50	В	X5R	4700 p	±10, ±20	5	200	0.3 ± 0.03	
MLASU063SB5682[]FNA01	UMK063 BJ682∏P-F	50	В	X5R	6800 p	±10, ±20	5	200	0.3 ± 0.03	
MLASU063SB5103[]FNA01	UMK063 BJ103∏P-F	50	В	X5R	0.01 μ	±10, ±20	5	200	0.3 ± 0.03	
MLASG063SB5104[]FNA01	GMK063 BJ104∏P-F	35		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLAST063SB5152[]FNA01	TMK063 BJ152∏P-F	25	В	X5R	1500 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5222[FNA01	TMK063 BJ222□P-F	25	В	X5R	2200 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5332[FNA01	TMK063 BJ332∏P-F	25	В	X5R	3300 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5472[FNA01	TMK063 BJ472∏P-F	25	В	X5R	4700 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5682[FNA01	TMK063 BJ682∏P-F	25	В	X5R	6800 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5103[FNA01	TMK063 BJ103∏P-F	25	В	X5R	0.01 μ	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB5223 FNA01	TMK063 BJ223∏P-F	25	В	X5R	0.022 μ	±10, ±20	7.5	200	0.3 ± 0.03	
MLAST063AB5104[FNA01	TMK063ABJ104∏P-F	25		X5R	0.1 μ	±10, ±20	10	150	0.3±0.05	
MLASE063SB5152[]FNA01	EMK063 BJ152 P-F	16	В	X5R*1	1500 p	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB5222[]FNA01	EMK063 BJ222∏P-F	16	В	X5R*1	2200 p	±10, ±20	5	200	0.3±0.03	
MLASE063SB5332[]FNA01	EMK063 BJ332∏P-F	16	В	X5R*1	3300 p	±10, ±20	5	200	0.3±0.03	
MLASE063SB5472[]FNA01	EMK063 BJ472∏P-F	16	В	X5R*1	4700 p	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB5682[]FNA01	EMK063 BJ682[]P-F	16	В	X5R*1	6800 p	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB5103[]FNA01	EMK063 BJ103∏P-F	16	В	X5R*1	0.01 μ	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB5153[]FNA01	EMK063 BJ153∏P-F	16		X5R	0.015 μ	±10, ±20	7.5	200	0.3 ± 0.03	
MLASE063SB5223[]FNA01	EMK063 BJ223∏P-F	16	В	X5R	0.022 μ	±10, ±20	7.5	200	0.3 ± 0.03	
MLASE063SB5333[]FNA01	EMK063 BJ333∏P-F	16		X5R	0.033 μ	±10, ±20	7.5	150	0.3 ± 0.03	
MLASE063SB5473[]FNA01	EMK063 BJ473∏P-F	16		X5R	0.047 μ	±10, ±20	7.5	150	0.3 ± 0.03	
MLASE063SB5683[]FNA01	EMK063 BJ683∏P-F	16		X5R	0.068 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASE063SB5104[]FNA01	EMK063 BJ104∏P-F	16		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASE063SB5224[]FNA01	EMK063 BJ224∏P-F	16		X5R	0.22 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASE063BB5474[]FNB33	EMK063BBJ474[]PLF	16		X5R	0.47 μ	±10, ±20	10	150	0.3 ± 0.09	
MLASL063SB5223 FNA01	LMK063 BJ223[]P-F	10	В	X5R	0.022 μ	±10, ±20	7.5	150	0.3 ± 0.03	
MLASL063SB5333 FNA01	LMK063 BJ333[]P-F	10		X5R	0.033 μ	±10, ±20	7.5	150	0.3 ± 0.03	
MLASL063SB5473 FNA01	LMK063 BJ473[]P-F	10		X5R	0.047 μ	±10, ±20	7.5	150	0.3 ± 0.03	
MLASL063SB5683[FNA01	LMK063 BJ683[]P-F	10		X5R	0.068 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL063SB5104[FNA01	LMK063 BJ104[]P-F	10		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL063SB5224[FNA01	LMK063 BJ224[]P-F	10		X5R	0.22 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL063BB5474[FNB33	LMK063BBJ474[]PLF	10		X5R	0.47 μ	±10, ±20	10	150	0.3±0.09	
MLASL063BB5105MFNB33	LMK063BBJ105MPLF	10		X5R	1 μ	±20	10	150	0.3±0.09	
MLASJ063SB5104[FNA01	JMK063 BJ104[]P-F	6.3		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASJ063SB5224[FNA01	JMK063 BJ224[]P-F	6.3		X5R	0.22 μ	±10, ±20	10	150	0.3±0.03	
MLASJ063SB5334MFNA01	JMK063 BJ334MP-F	6.3		X5R	0.33 μ	±20	10	150	0.3±0.03	
MLASJ063SB5474[]FNA01	JMK063 BJ474∏P-F	6.3		X5R	0.47 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASJ063AB5105[FNA01	JMK063ABJ105∏P−F	6.3		X5R	1 μ	±10, ±20	10	150	0.3±0.05	
MLASP063EB5475MFNA01	PMK063EBJ475MP-F	2.5		X5R	4.7 μ	±20	10	150	0.3+0.25/-0	
	•	•					•	•		

[Temperature Characteristic C6: X6S($-55\sim+105^{\circ}$ C)] 0.3mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	mickness [mm]	14000
MLAST063SC6104[FNA01	TMK063 C6104[]P-F	25	X6S	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASE063AC6104[]FNA01	EMK063AC6104 P-F	16	X6S	0.1 μ	$\pm 10, \pm 20$	10	150	0.3 ± 0.05	
MLASL063SC6104[]FNA01	LMK063 C6104∏P-F	10	X6S	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL063SC6224[]FNA01	LMK063 C6224[]P-F	10	X6S	0.22 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL063BC6474[FNB33	LMK063BC6474 PLF	10	X6S	0.47 μ	$\pm 10, \pm 20$	10	150	0.3 ± 0.09	
MLASJ063SC6104[]FNA01	JMK063 C6104[]P-F	6.3	X6S	0.1 μ	$\pm 10, \pm 20$	10	150	0.3 ± 0.03	
MLASJ063SC6224[]FNA01	JMK063 C6224[]P-F	6.3	X6S	0.22 μ	$\pm 10, \pm 20$	10	150	0.3 ± 0.03	
MLASJ063BC6474[]FNA01	JMK063BC6474[]P-F	6.3	X6S	0.47 μ	$\pm 10, \pm 20$	10	150	0.3 ± 0.09	
MLASJ063BC6105MFNA01	JMK063BC6105MP-F	6.3	X6S	1 μ	±20	10	150	0.3 ± 0.09	
MLASA063SC6474[]FNA01	AMK063 C6474[]P-F	4	X6S	0.47 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASA063AC6105[FNA01	AMK063AC6105[]P-F	4	X6S	1 μ	±10, ±20	10	150	0.3±0.05	

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[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 0.3mm thickness

Name and according	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	tan δ	HTLT	*3 - 1	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLASU063SB7101[FNA01	UMK063 B7101[P-F	50	X7R	100 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB7151[FNA01	UMK063 B7151 P-F	50	X7R	150 p	$\pm 10, \pm 20$	3.5	200	0.3 ± 0.03	
MLASU063SB7221[FNA01	UMK063 B7221 P-F	50	X7R	220 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB7331[]FNA01	UMK063 B7331 P-F	50	X7R	330 р	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB7471[]FNA01	UMK063 B7471[P-F	50	X7R	470 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB7681[]FNA01	UMK063 B7681∏P-F	50	X7R	680 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLASU063SB7102[]FNA01	UMK063 B7102[]P-F	50	X7R	1000 p	±10, ±20	3.5	200	0.3 ± 0.03	
MLAST063SB7152[FNA01	TMK063 B7152 P-F	25	X7R	1500 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLAST063SB7222 FNA01	TMK063 B7222 P-F	25	X7R	2200 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLAST063SB7332[FNA01	TMK063 B7332 P-F	25	X7R	3300 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLAST063SB7472[FNA01	TMK063 B7472∏P-F	25	X7R	4700 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB7682[FNA01	TMK063 B7682∏P-F	25	X7R	6800 p	±10, ±20	5	200	0.3 ± 0.03	
MLAST063SB7103[FNA01	TMK063 B7103[P-F	25	X7R	0.01 μ	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB7152[]FNA01	EMK063 B7152[P-F	16	X7R	1500 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLASE063SB7222[]FNA01	EMK063 B7222 P-F	16	X7R	2200 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLASE063SB7332[]FNA01	EMK063 B7332 P-F	16	X7R	3300 p	$\pm 10, \pm 20$	5	200	0.3 ± 0.03	
MLASE063SB7472[]FNA01	EMK063 B7472[]P-F	16	X7R	4700 p	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB7682[]FNA01	EMK063 B7682[]P-F	16	X7R	6800 p	±10, ±20	5	200	0.3 ± 0.03	
MLASE063SB7103[]FNA01	EMK063 B7103[]P-F	16	X7R	0.01 μ	±10, ±20	5	200	0.3±0.03	
MLASE063SB7223[]FNA01	EMK063 B7223[]P-F	16	X7R	0.022 μ	±10, ±20	7.5	150	0.3 ± 0.03	

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[Temperature Characteristic B5(BJ): $B(-25\sim +85^{\circ}C)/X5R(-55\sim +85^{\circ}C)$] 0.5mm thickness

L remperature Gharacti	eristic Do(Do). D(20 - 100 0	// NOIN	(00 -	1 00 0/1	O.OHIIII GIICKIICSS				
New part number	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU105SB5223[FNA01	UMK105 BJ223[]V-F	50		X5R	0.022μ	$\pm 10, \pm 20$	5	200	0.5 ± 0.05	
MLASU105SB5473[[FNA01	UMK105 BJ473∏V-F	50		X5R	0.047 μ	±10, ±20	5	200	0.5 ± 0.05	
MLASU105SB5104[[FNA01	UMK105 BJ104[]V-F	50		X5R	0.1 μ	$\pm 10, \pm 20$	10	150	0.5 ± 0.05	
MLASU105SB5224[[FNA01	UMK105 BJ224[]V-F	50		X5R	0.22 μ	$\pm 10, \pm 20$	10	150	0.5±0.05	
MLASU105AB5474[[FNA01	UMK105ABJ474[]V-F	50		X5R	0.47 μ	$\pm 10, \pm 20$	10	150	0.5±0.10	
MLASU105CB5105[FNA01	UMK105CBJ105[]V-F	50		X5R	1 μ	$\pm 10, \pm 20$	10	150	0.5+0.20/-0	
MLASG105SB5104[]FNA01	GMK105 BJ104[]V-F	35	В	X5R	0.1 μ	±10, ±20	5	150	0.5 ± 0.05	
MLASG105AB5105[FNA01	GMK105ABJ105[]V-F	35		X5R	1 μ	±10, ±20	10	150	0.5±0.10	
MLAST105SB5153[FNA01	TMK105 BJ153[]V-F	25	В	X5R*1	0.015μ	$\pm 10, \pm 20$	3.5	200	0.5 ± 0.05	
MLAST105SB5223[FNA01	TMK105 BJ223[]V-F	25	В	X5R*1	0.022μ	$\pm 10, \pm 20$	3.5	200	0.5 ± 0.05	
MLAST105SB5333 FNA01	TMK105 BJ333[]V-F	25	В	X5R*1	0.033 μ	$\pm 10, \pm 20$	3.5	150	0.5 ± 0.05	
MLAST105SB5473[FNA01	TMK105 BJ473[]V-F	25	В	X5R*1	0.047μ	$\pm 10, \pm 20$	3.5	150	0.5 ± 0.05	
MLAST105SB5104[FNA01	TMK105 BJ104[]V-F	25	В	X5R	0.1 μ	$\pm 10, \pm 20$	5	150	0.5±0.05	
MLAST105SB5224[FNA01	TMK105 BJ224□V-F	25		X5R	0.22 μ	$\pm 10, \pm 20$	10	200	0.5 ± 0.05	
MLAST105AB5474[]FNA01	TMK105ABJ474[]V-F	25		X5R	0.47 μ	$\pm 10, \pm 20$	10	200	0.5±0.10	
MLAST105SB5105[FNA01	TMK105 BJ105∏V-F	25		X5R	1 μ	$\pm 10, \pm 20$	10	150	0.5 ± 0.05	
MLAST105CB5225[FNA01	TMK105CBJ225[]V-F	25		X5R	2.2 μ	$\pm 10, \pm 20$	10	150	0.5+0.20/-0	
MLASE105SB5224[]FNA01	EMK105 BJ224□V-F	16	В	X5R	0.22 μ	±10, ±20	5	150	0.5 ± 0.05	
MLASE105AB5474[FNA01	EMK105ABJ474UV-F	16		X5R	0.47 μ	±10, ±20	10	200	0.5±0.10	
MLASE105SB5105[]FNA01	EMK105 BJ105∏V-F	16		X5R	1 μ	±10, ±20	10	150	0.5±0.05	
MLASE105AB5225[FNA01	EMK105ABJ225□V-F	16		X5R	2.2 μ	±10, ±20	10	150	0.5±0.10	
MLASL105SB5225[FNA01	LMK105 BJ225[]V-F	10		X5R	2.2 μ	±10, ±20	10	150	0.5±0.05	
MLASL105BB5475MFNB33	LMK105BBJ475MVLF	10		X5R	4.7 μ	±20	10	150	0.5+0.15/-0.05	
MLASJ105SB5225[]FNA01	JMK105 BJ225∏V-F	6.3		X5R	2.2 μ	±10, ±20	10	150	0.5 ± 0.05	
MLASJ105BB5475MFNA01	JMK105BBJ475MV-F	6.3		X5R	4.7 μ	±20	10	150	0.5+0.15/-0.05	

[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 0.3mm thickness

New part number	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU1L3YB5104[FNA01	UMK105 BJ104[]P-F	50		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLAST1L3YB5103[FNA01	TMK105 BJ103∏P-F	25	В	X5R	0.01 μ	±10, ±20	5	150	0.3 ± 0.03	
MLAST1L3YB5104[FNA01	TMK105 BJ104∏P-F	25		X5R	0.1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLAST1L3YB5224[FNA01	TMK105 BJ224∏P-F	25		X5R	0.22 μ	±10, ±20	10	150	0.3 ± 0.03	
MLAST1L3YB5474[FNA01	TMK105 BJ474∏P-F	25		X5R	0.47 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASE1L3YB5474[FNA01	EMK105 BJ474∏P-F	16		X5R	0.47 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASL1L3YB5105[]FNB33	LMK105 BJ105[]PLF	10		X5R	1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASJ1L3YB5105[[FNA01	JMK105 BJ105∏P-F	6.3		X5R	1 μ	±10, ±20	10	150	0.3 ± 0.03	
MLASA1L3YB5225MFNA01	AMK105 BJ225MP-F	4		X5R	2.2 μ	±20	10	150	0.3 ± 0.03	

[Temperature Characteristic B5(BJ): X5R($-55 \sim +85 ^{\circ} C$)] 0.2mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASL1L2XB5104 FNA01	LMK105 BJ104∏C-F	10		X5R	0.1 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ1L2XB5224[FNA01	JMK105 BJ224∏C-F	6.3		X5R	0.22 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ1L2XB5474[]FNA01	JMK105 BJ474∏C-F	6.3		X5R	0.47 μ	±10, ±20	10	150	0.2 ± 0.02	
MLASJ1L2XB5105MFNA01	JMK105 BJ105MC-F	6.3		X5R	1 μ	±20	10	150	0.2 ± 0.02	

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[Temperature Characteristic B5(BJ): $X5R(-55\sim+85^{\circ}C)$] 0.18mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperati characteris		apacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASL1LEXB5104 RNA01	LMK105 BJ104[]E-R	10	>	(5R	0.1 μ	±10, ±20	10	150	0.18 ± 0.02	
MLASJ1LEXB5224 RNA01	JMK105 BJ224∏E-R	6.3	>	(5R	0.22 μ	±10, ±20	10	150	0.18 ± 0.02	
MLASJ1LEXB5474 RNA01	JMK105 BJ474∏E-R	6.3	>	K5R	0.47 μ	±10, ±20	10	150	0.18±0.02	
MLASA1LEXB5105MRNA01	AMK105 BJ105MF-R	4)	(5R	1 //	+20	10	150	0.18 + 0.02	

[Temperature Characteristic B5(BJ): X5R($-55{\sim}+85{\circ}$ C)] 0.13mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
MLASL1LHXB5104MRNA01	LMK105 BJ104MH-R	10		X5R	0.1 μ	±20	10	150	0.13 ± 0.02		
MLASJ1LHXB5224MRNA01	JMK105 BJ224MH-R	6.3		X5R	0.22 μ	±20	10	150	0.13 ± 0.02		
MLASA1LHXB5474MRNA01	AMK105 BJ474MH-R	4		X5R	0.47 μ	±20	10	150	0.13 ± 0.02		-

[Temperature Characteristic C6: $X6S(-55\sim+105^{\circ}C)$] 0.5mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASG105CC6105[FNA01	GMK105CC6105□V-F	35		X6S	1 μ	±10, ±20	10	150	0.5+0.20/-0	
MLAST105AC6105[FNA01	TMK105AC6105∏V-F	25		X6S	1 μ	±10, ±20	10	150	0.5±0.10	
MLAST105CC6105MFNA01	TMK105CC6105MV-F	25		X6S	1 μ	±20	10	150	0.5+0.20/-0	
MLASE105SC6105[FNA01	EMK105 C6105 V-F	16		X6S	1 μ	±10, ±20	10	150	0.5±0.05	
MLASE105CC6225[FNA01	EMK105CC6225∏V-F	16		X6S	2.2 μ	±10, ±20	10	150	0.5+0.20/-0	
MLASL105SC6105[]FNA01	LMK105 C6105[]V-F	10		X6S	1 μ	±10, ±20	10	200	0.5±0.05	
MLASL105AC6225[FNA01	LMK105AC6225[]V-F	10		X6S	2.2 μ	±10, ±20	10	150	0.5±0.10	
MLASJ105SC6225[]FNA01	JMK105 C6225∏V-F	6.3		X6S	2.2 μ	±10, ±20	10	150	0.5±0.05	
MLASJ105BC6475MFNA01	JMK105BC6475MV-F	6.3		X6S	4.7 μ	±20	10	150	0.5+0.15/-0.05	
MLASA105BC6475MFNA01	AMK105BC6475MV-F	4		X6S	4.7 μ	±20	10	200	0.5+0.15/-0.05	

[Temperature Characteristic B7 : $X7R(-55\sim+125^{\circ}C)$] 0.5mm thickness

Tremperature onaract	The state of the s	1 1200	7 2 0.0111111 01110	111000					
New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	14000
MLASU105SB7152[]FNA01	UMK105 B7152□V-F	50	X7R	1500 p	±10, ±20	2.5	200	0.5 ± 0.05	
MLASU105SB7222[]FNA01	UMK105 B7222 UV-F	50	X7R	2200 p	±10, ±20	2.5	200	0.5 ± 0.05	
MLASU105SB7332[[FNA01	UMK105 B7332 UV-F	50	X7R	3300 p	$\pm 10, \pm 20$	2.5	200	0.5±0.05	
MLASU105SB7472[[FNA01	UMK105 B7472 U-F	50	X7R	4700 p	$\pm 10, \pm 20$	2.5	150	0.5±0.05	
MLASU105SB7682[[FNA01	UMK105 B7682∏V-F	50	X7R	6800 p	$\pm 10, \pm 20$	2.5	150	0.5±0.05	
MLASU105SB7103[FNA01	UMK105 B7103∏V-F	50	X7R	0.01 μ	±10, ±20	3.5	150	0.5±0.05	
MLASU105SB7223[]FNB25	UMK105 B7223 V-FR	50	X7R	0.022 μ	±10, ±20	10	200	0.5 ± 0.05	
MLASU105SB7473[]FNB25	UMK105 B7473 U−FR	50	X7R	0.047 μ	$\pm 10, \pm 20$	10	200	0.5±0.05	
MLASU105SB7104[]FNB25	UMK105 B7104 UV-FR	50	X7R	0.1 μ	$\pm 10, \pm 20$	10	150	0.5±0.05	
MLAST105SB7223[FNA01	TMK105 B7223 U-F	25	X7R	0.022μ	$\pm 10, \pm 20$	3.5	150	0.5±0.05	
MLAST105SB7473[FNA01	TMK105 B7473 U-F	25	X7R	0.047 μ	$\pm 10, \pm 20$	3.5	150	0.5±0.05	
MLAST105SB7104[FNB25	TMK105 B7104 U-FR	25	X7R	0.1 μ	$\pm 10, \pm 20$	10	200	0.5 ± 0.05	
MLAST105SB7224[FNB25	TMK105 B7224 U-FR	25	X7R	0.22 μ	$\pm 10, \pm 20$	10	150	0.5 ± 0.05	
MLASE105SB7223[]FNA01	EMK105 B7223 U-F	16	X7R	0.022μ	$\pm 10, \pm 20$	3.5	200	0.5 ± 0.05	
MLASE105SB7473[]FNA01	EMK105 B7473 V-F	16	X7R	0.047 μ	$\pm 10, \pm 20$	3.5	200	0.5±0.05	
MLASE105SB7104[]FNA01	EMK105 B7104 U-F	16	X7R	0.1 μ	$\pm 10, \pm 20$	5	150	0.5±0.05	
MLASE105SB7224[]FNB25	EMK105 B7224 U-FR	16	X7R	0.22 μ	$\pm 10, \pm 20$	10	150	0.5 ± 0.05	
MLASL105SB7224[FNB25	LMK105 B7224[]V-FR	10	X7R	0.22 μ	±10, ±20	10	150	0.5±0.05	
MLASL105SB7474 FNA01	LMK105 B7474[]V-F	10	X7R	0.47 μ	±10, ±20	10	150	0.5±0.05	
MLASJ105SB7224[]FNA01	JMK105 B7224[]V-F	6.3	X7R	0.22 μ	±10, ±20	5	150	0.5±0.05	
MLASJ105SB7474[]FNA01	JMK105 B7474[]V-F	6.3	X7R	0.47 μ	$\pm 10, \pm 20$	10	150	0.5 ± 0.05	

●1608TYPE

[Temperature Characteristic B5(BJ): X5R($-55 \sim +85 ^{\circ} C$)] 0.8mm thickness

	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	*3.5.3	NI i
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLASU168AB5474[]TNA01	UMK107ABJ474[]A-T	50	X5R	0.47 μ	±10, ±20	10	150	0.8+0.15/-0.05	
MLASU168SB5105[]TNA01	UMK107 BJ105∏A-T	50	X5R	1 μ	±10, ±20	10	150	0.8 ± 0.10	
MLASU168BB5225[]TNA01	UMK107BBJ225∏A-T	50	X5R	2.2 μ	±10, ±20	10	150	0.8+0.20/-0	
MLASG168BB5475[]TNA01	GMK107BBJ475∏A-T	35	X5R	4.7 μ	±10, ±20	10	150	0.8+0.20/-0	
MLAST168AB5225[]TNA01	TMK107ABJ225[]A-T	25	X5R	2.2 μ	±10, ±20	10	150	0.8+0.15/-0.05	
MLAST168BB5475[]TNA01	TMK107BBJ475[]A-T	25	X5R	4.7 μ	±10, ±20	10	150	0.8+0.20/-0	
MLAST168BB5106MTNA01	TMK107BBJ106MA-T	25	X5R	10 μ	±20	10	150	0.8+0.20/-0	
MLASE168AB5475 TNA01	EMK107ABJ475[]A-T	16	X5R	4.7 μ	±10, ±20	10	150	0.8+0.15/-0.05	
MLASE168BB5106MTNA01	EMK107BBJ106MA-T	16	X5R	10 μ	±20	10	150	0.8+0.20/-0	
MLASL168BB5106 TNB33	LMK107BBJ106 ALT	10	X5R	10 μ	$\pm 10, \pm 20$	10	150	0.8+0.20/-0	
MLASL168BB5226MTNA01	LMK107BBJ226MA-T	10	X5R	22 μ	±20	10	150	0.8+0.20/-0	
MLASJ168AB5106 TNA01	JMK107ABJ106[]A-T	6.3	X5R	10 μ	±10, ±20	10	150	0.8+0.15/-0.05	
MLASJ168BB5226MTNA01	JMK107BBJ226MA-T	6.3	X5R	22 μ	±20	10	150	0.8+0.20/-0	
MLASA168BB5476MRCA01	AMK107BBJ476MA-RE	4	X5R	47 μ	±20	20	150	0.8+0.20/-0	

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[Temperature Characteristic B5(BJ): $X5R(-55 \sim +85^{\circ}C)$] 0.45mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLAST16KTB5105[]TNA01	TMK107 BJ105[]K-T	25		X5R	1 μ	±10, ±20	10	150	0.45 ± 0.05	
MLASE16KTB5105[]TNA01	EMK107 BJ105∏K-T	16		X5R	1 μ	$\pm 10, \pm 20$	10	150	0.45 ± 0.05	
MLASE16KJB5225[]TNA01	EMK107BBJ225∏K-T	16		X5R	2.2 μ	±10, ±20	10	150	0.45 ± 0.05	
MLASL16KTB5105[]TNA01	LMK107 BJ105[]K-T	10		X5R	1 μ	±10, ±20	10	150	0.45 ± 0.05	
MLASL16KTB5225[]TNA01	LMK107 BJ225∏K-T	10		X5R	2.2 μ	$\pm 10, \pm 20$	10	150	0.45 ± 0.05	
MLASL16KJB5475MTNB33	LMK107BBJ475MKLT	10		X5R	4.7 μ	±20	10	150	0.45 ± 0.05	
MLASJ16KTB5105[]TNA01	JMK107 BJ105∏K-T	6.3		X5R	1 μ	$\pm 10, \pm 20$	10	150	0.45 ± 0.05	
MLASJ16KTB5225[TNA01	JMK107 BJ225∏K-T	6.3		X5R	2.2 μ	$\pm 10, \pm 20$	10	150	0.45 ± 0.05	
MLASJ16KTB5475MTNA01	JMK107 BJ475MK-T	6.3		X5R	4.7 μ	±20	10	150	0.45 ± 0.05	

[Temperature Characteristic C6: $X6S(-55\sim+105^{\circ}C)$] 0.8mm thickness

New part number	Old part number	Rated voltage	Temper	ature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characte	ristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLAST168BC6225[TNA01	TMK107BC6225[]A-T	25		X6S	2.2 μ	±10, ±20	10	150	0.8+0.20/-0	
MLASE168SC6105[TNA01	EMK107 C6105∏A-T	16		X6S	1 μ	$\pm 10, \pm 20$	5	150	0.8±0.10	
MLASE168BC6225[]TNA01	EMK107BC6225∏A-T	16		X6S	2.2 μ	$\pm 10, \pm 20$	10	150	0.8+0.20/-0	
MLASE168BC6475[]TNA01	EMK107BC6475∏A-T	16		X6S	4.7 μ	$\pm 10, \pm 20$	10	150	0.8+0.20/-0	
MLASE168BC6106MTNA01	EMK107BC6106MA-T	16		X6S	10 μ	±20	10	150	0.8+0.20/-0	
MLASL168SC6105[]TNA01	LMK107 C6105∏A-T	10		X6S	1 μ	$\pm 10, \pm 20$	5	150	0.8±0.10	
MLASL168AC6475[TNA01	LMK107AC6475∏A-T	10		X6S	4.7 μ	$\pm 10, \pm 20$	10	150	0.8+0.15/-0.05	
MLASL168BC6106MTNA01	LMK107BC6106MA-T	10		X6S	10 μ	±20	10	150	0.8+0.20/-0	
MLASJ168SC6475[]TNA01	JMK107 C6475∏A-T	6.3		X6S	4.7 μ	±10, ±20	10	150	0.8±0.10	
MLASJ168BC6106MTNA01	JMK107BC6106MA-T	6.3		X6S	10 μ	±20	10	150	0.8+0.20/-0	
MLASA168BC6226MTNA01	AMK107BC6226MA-T	4		X6S	22 μ	±20	10	150	0.8+0.20/-0	
MLASA168BC6476MRCA01	AMK107BC6476MA-RE	4		X6S	47 μ	±20	20	150	0.8+0.20/-0	

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 0.8mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASU168SB7224∏TNB25	UMK107 B7224∏A-TR	50	X7R	0.22 μ	±10, ±20	10	150	0.8±0.10	
MLASU168SB7474 TNB25	UMK107 B7474[]A-TR	50	X7R	0.47 μ	±10, ±20	10	150	0.8±0.10	
MLASU168AB7105[TNA01	UMK107AB7105∏A-T	50	X7R	1 μ	±10, ±20	10	150	0.8+0.15/-0.05	,
MLAST168SB7474 TNB25	TMK107 B7474[]A-TR	25	X7R	0.47 μ	±10, ±20	10	150	0.8±0.10	,
MLAST168SB7105[TNA01	TMK107 B7105[]A-T	25	X7R	1 μ	±10, ±20	10	150	0.8±0.10	
MLASE168SB7474[]TNA01	EMK107 B7474[]A-T	16	X7R	0.47 μ	$\pm 10, \pm 20$	3.5	150	0.8±0.10	
MLASE168SB7105[]TNA01	EMK107 B7105[]A-T	16	X7R	1 μ	$\pm 10, \pm 20$	5	150	0.8±0.10	
MLASE168BB7225[]TNA01	EMK107BB7225[]A-T	16	X7R	2.2 μ	$\pm 10, \pm 20$	10	150	0.8+0.20/-0	
MLASL168SB7225 TNB25	LMK107 B7225[]A-TR	10	X7R	2.2 μ	$\pm 10, \pm 20$	10	150	0.8±0.10	
MLASJ168SB7225[]TNB25	JMK107 B7225[]A-TR	6.3	X7R	2.2 μ	$\pm 10, \pm 20$	10	200	0.8±0.10	
MLASJ168BB7475 TNA01	JMK107BB7475[]A-T	6.3	X7R	4.7 μ	±10, ±20	10	150	0.8+0.20/-0	

2012TYPE

[Temperature Characteristic B5(BJ): X5R($-55 \sim +85 ^{\circ}$ C)] 1.25mm thickness

New part number		Rated voltage		Capacitance		tan δ	HTLT	Thickness*3 [mm]	Note
How part number	(for reference)	[V]	characteristic	[F]	[%]	[%]	Rated voltage x %	THICKHESS [IIIII]	11000
MLASU21GBB5475[]TNA01	UMK212BBJ475[]G-T	50	X5F	4.7 μ	±10, ±20	10	150	1.25+0.20/-0	
MLASG21GBB5106[]TNA01	GMK212BBJ106∏G-T	35	X5F	10 μ	±10, ±20	10	150	1.25+0.20/-0	
MLAST21GAB5475[]TNA01	TMK212ABJ475[]G-T	25	X5F	4.7 μ	±10, ±20	10	150	1.25+0.15/-0.05	
MLAST21GBB5106 TNA01	TMK212BBJ106[]G-T	25	X5F	10 μ	±10, ±20	10	150	1.25+0.20/-0	
MLAST21GBB5226MTNC12	TMK212BBJ226MG-TT	25	X5F	22 μ	±20	10	150	1.25+0.20/-0	
MLASE21GAB5106[]TNA01	EMK212ABJ106[]G-T	16	X5F	10 μ	±10, ±20	10	150	1.25+0.15/-0.05	
MLASE21GBB5226MTNA01	EMK212BBJ226MG-T	16	X5F	22 μ	±20	10	150	1.25+0.20/-0	
MLASL21GBB5226MTNA01	LMK212BBJ226MG-T	10	X5F	22 μ	±20	10	150	1.25+0.20/-0	
MLASL21GBB5476MTNA01	LMK212BBJ476MG-T	10	X5F	47 μ	±20	10	150	1.25+0.20/-0	
MLASJ21GAB5226[TNA01	JMK212ABJ226[]G-T	6.3	X5F	22 μ	±10, ±20	10	150	1.25+0.15/-0.05	
MLASJ21GBB5476MTNA01	JMK212BBJ476MG-T	6.3	X5F	47 μ	±20	10	150	1.25+0.20/-0	
MLASA21GBB5107MTCA01	AMK212BBJ107MG-TE	4	X5F	100 μ	±20	20	150	1.25+0.20/-0	

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ľΤ	Temperature Characteristic	B5(BJ): B	$(-25 \sim +85^{\circ}C)/X5R($	$-55 \sim +85 ^{\circ}C)$	0.85mm thickness
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Name and according	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	Note
MLASU219JB5105[]TNA01	UMK212ABJ105[]D-T	50		X5R	1 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASU219LB5225[]TNA01	UMK212BBJ225[]D-T	50		X5R	2.2 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASG219LB5475[]TNA01	GMK212BBJ475□D-T	35		X5R	4.7 μ	±10, ±20	10	150	0.85 ± 0.10	
MLAST219SB5474[]TNA01	TMK212 BJ474[]D-T	25	В	X5R	0.47 μ	±10, ±20	3.5	200	0.85 ± 0.10	
MLAST219SB5105[]TNA01	TMK212 BJ105[]D-T	25	В	X5R	1 μ	±10, ±20	5	200	0.85 ± 0.10	
MLAST219JB5225[]TNA01	TMK212ABJ225[]D-T	25		X5R	2.2 μ	$\pm 10, \pm 20$	5	150	0.85 ± 0.10	
MLAST219LB5475[]TNA01	TMK212BBJ475[]D-T	25		X5R	4.7 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLAST219LB5106[TNA01	TMK212BBJ106[]D-T	25		X5R	10 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASE219SB5105[]TNA01	EMK212 BJ105□D-T	16	В	X5R*1	1 μ	$\pm 10, \pm 20$	5	200	0.85 ± 0.10	
MLASE219JB5225[]TNA01	EMK212ABJ225□D-T	16		X5R*1	2.2 μ	$\pm 10, \pm 20$	5	200	0.85 ± 0.10	
MLASE219SB5475[]TNA01	EMK212 BJ475∏D-T	16		X5R	4.7 μ	±10, ±20	10	150	0.85 ± 0.10	
MLASE219JB5106[]TNA01	EMK212ABJ106□D-T	16		X5R	10 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASL219SB5105[TNA01	LMK212 BJ105[]D-T	10	В	X5R*1	1 μ	$\pm 10, \pm 20$	3.5	200	0.85 ± 0.10	
MLASL219SB5225[TNA01	LMK212 BJ225[]D-T	10		X5R*1	2.2 μ	$\pm 10, \pm 20$	5	200	0.85 ± 0.10	
MLASL219JB5106 TNA01	LMK212ABJ106[]D-T	10		X5R	10 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASL219LB5226MTNA01	LMK212BBJ226MD-T	10		X5R	22 μ	±20	10	150	0.85 ± 0.10	
MLASJ219JB5106 TNA01	JMK212ABJ106[]D-T	6.3		X5R	10 μ	±10, ±20	10	200	0.85 ± 0.10	
MLASJ219JB5226MTNA01	JMK212ABJ226MD-T	6.3		X5R	22 μ	±20	10	150	0.85 ± 0.10	

[Temperature Characteristic C6 : X6S(-55~+105°C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
MLAST21GBC6106[]TNA01	TMK212BC6106[]G-T	25		X6S	10 μ	±10, ±20	10	150	1.25+0.20/-0		
MLASE21GBC6226MTNC12	EMK212BC6226MG-TT	16		X6S	22 μ	±20	10	150	1.25+0.20/-0		
MLASL21GBC6226MTNA01	LMK212BC6226MG-T	10		X6S	22 μ	±20	10	150	1.25+0.20/-0		
MLASJ21GBC6226MTNA01	JMK212BC6226MG-T	6.3		X6S	22 μ	±20	10	150	1.25+0.20/-0		
MLASA21GAC6226MTNA01	AMK212AC6226MG-T	4		X6S	22 μ	±20	10	150	1.25+0.15/-0.05		
MLASA21GBC6476MTNA01	AMK212BC6476MG-T	4		X6S	47 μ	±20	10	150	1.25+0.20/-0		

[Temperature Characteristic C6: $X6S(-55 \sim +105^{\circ}C)$] 0.85mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	erature eristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASL219JC6106[]TNA01	LMK212AC6106 D-T	10	X6S	10 μ	±10, ±20	10	150	0.85 ± 0.10	
MLASA219LC6226MTNA01	AMK212BC6226MD-T	4	X6S	22 μ	±20	10	150	0.85 ± 0.10	

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperatur characteristi	•	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note		
MLASU21GSB7224[]TNA01	UMK212 B7224∏G-T	50	X7	R 0.22 μ	±10, ±20	3.5	150	1.25±0.10			
MLASU21GSB7474 TNA01	UMK212 B7474[]G-T	50	X7	R 0.47 μ	±10, ±20	3.5	150	1.25±0.10			
MLASU21GSB7105 TNA01	UMK212 B7105[]G-T	50	X7	1 μ	±10, ±20	10	150	1.25±0.10			
MLASU21GBB7225[]TNA01	UMK212BB7225[]G-T	50	X7	2.2 μ	±10, ±20	10	150	1.25+0.20/-0			
MLASG21GSB7105 TNA01	GMK212 B7105∏G-T	35	X7	R 1 μ	±10, ±20	10	150	1.25±0.10			
MLAST21GSB7225 TNB25	TMK212 B7225∏G-TR	25	X7	R 2.2 μ	±10, ±20	10	150	1.25±0.10			
MLAST21GAB7475[]TNA01	TMK212AB7475∏G-T	25	X7	4.7 μ	±10, ±20	10	150	1.25+0.15/-0.05			
MLASE21GSB7475[]TNA01	EMK212 B7475[]G-T	16	X7	Α 4.7 μ	±10, ±20	10	150	1.25±0.10			
MLASE21GBB7106MTNA01	EMK212BB7106MG-T	16	X7	Π 10 μ	±20	10	150	1.25+0.20/-0			
MLASL21GAB7106 TNA01	LMK212AB7106[]G-T	10	X7	Π 10 μ	±10, ±20	10	150	1.25+0.15/-0.05			
MLASJ21GAB7106∏TNA01	JMK212AB7106∏G-T	6.3	X7	R 10 μ	±10, ±20	10	150	1.25+0.15/-0.05			

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 0.85mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU219JB7104[]TNA01	UMK212AB7104[]D-T	50	X7R	0.1 μ	±10, ±20	10	150	0.85±0.10	
MLASU219JB7224[]TNA01	UMK212AB7224□D-T	50	X7R	0.22 μ	±10, ±20	10	150	0.85±0.10	
MLASU219JB7474[]TNA01	UMK212AB7474□D-T	50	X7R	0.47 μ	±10, ±20	10	150	0.85±0.10	
MLASU219JB7105[TNA01	UMK212AB7105□D-T	50	X7R	1 μ	±10, ±20	10	150	0.85±0.10	
MLAST219JB7225[]TNB25	TMK212AB7225 D-TR	25	X7R	2.2 μ	±10, ±20	10	150	0.85±0.10	
MLASE219SB7474[]TNA01	EMK212 B7474[]D-T	16	X7R	0.47 μ	±10, ±20	3.5	200	0.85±0.10	
MLASE219SB7105[]TNA01	EMK212 B7105[]D-T	16	X7R	1 μ	±10, ±20	5	200	0.85±0.10	
MLASE219JB7225[]TNA01	EMK212AB7225 D-T	16	X7R	2.2 μ	±10, ±20	5	150	0.85 ± 0.10	
MLASE219LB7475MTNA01	EMK212BB7475MD-T	16	X7R	4.7 μ	±20	10	150	0.85 ± 0.10	
MLASL219SB7105 TNA01	LMK212 B7105[]D-T	10	X7R	1 μ	±10, ±20	3.5	200	0.85 ± 0.10	
MLASL219JB7225 TNA01	LMK212AB7225[]D-T	10	X7R	2.2 μ	±10, ±20	5	200	0.85±0.10	
MLASL219JB7475[]TNB25	LMK212AB7475∏D-TR	10	X7R	4.7 μ	±10, ±20	10	150	0.85±0.10	

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●3216TYPE

Temperature Characteristic	B5(BJ): X5R($-55\sim+85^{\circ}$ C)	1.6mm thickness
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New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact	rature eristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASU31LSB5475[]TNA01	UMK316 BJ475[]L-T	50		X5R	4.7 μ	±10, ±20	10	150	1.6±0.20	
MLASU31LBB5106 TNA01	UMK316BBJ106□L-T	50		X5R	10 μ	$\pm 10, \pm 20$	10	150	1.6±0.30	
MLAST31LBB5226MTNA01	TMK316BBJ226ML-T	25		X5R	22 μ	±20	10	150	1.6±0.30	
MLASE31LBB5476MTNA01	EMK316BBJ476ML-T	16		X5R	47 μ	±20	10	150	1.6±0.30	
MLASL31LAB5476MTNA01	LMK316ABJ476ML-T	10		X5R	47 μ	±20	10	150	1.6±0.20	
MLASJ31LAB5107MTNA01	JMK316ABJ107ML-T	6.3		X5R	100 μ	±20	10	150	1.6±0.20	
MLASA31LAB5107MTNA01	AMK316ABJ107ML-T	4		X5R	100 μ	±20	10	150	1.6±0.20	
MLASA31LBB5157MTNA01	AMK316BBJ157ML-T	4		X5R	150 μ	±20	10	150	1.6±0.30	
MLASP31LBB5227MTNA01	PMK316BBJ227ML-T	2.5		X5R	220 μ	±20	10	150	1.6±0.30	

[Temperature Characteristic B5(BJ): B($-25 \sim +85 ^{\circ} C$)/X5R($-55 \sim +85 ^{\circ} C$)] 0.85mm thickness

Name and according	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	Note
MLASU319HB5105[]TNA01	UMK316 BJ105∏D-T	50	В	X5R	1 μ	±10, ±20	3.5	150	0.85±0.10	
MLASU319HB5225[]TNA01	UMK316 BJ225 D-T	50	В	X5R	2.2 μ	±10, ±20	3.5	150	0.85±0.10	
MLASU319LB5475 TNA01	UMK316ABJ475∏D-T	50		X5R	4.7 μ	±10, ±20	10	150	0.85±0.10	
MLAST319HB5105[TNA01	TMK316 BJ105∏D-T	25	В	X5R	1 μ	±10, ±20	3.5	200	0.85±0.10	
MLAST319HB5225 TNA01	TMK316 BJ225[]D-T	25	В	X5R	2.2 μ	±10, ±20	3.5	150	0.85±0.10	
MLAST319HB5475 TNA01	TMK316 BJ475[]D-T	25		X5R	4.7 μ	±10, ±20	5	150	0.85±0.10	-
MLAST319LB5106[]TNA01	TMK316ABJ106[]D-T	25		X5R	10 μ	±10, ±20	10	150	0.85±0.10	
MLASE319HB5225[]TNA01	EMK316 BJ225 D-T	16	В	X5R	2.2 μ	±10, ±20	3.5	200	0.85±0.10	
MLASE319HB5475[]TNA01	EMK316 BJ475[]D-T	16	В	X5R	4.7 μ	±10, ±20	5	200	0.85±0.10	
MLASE319HB5106[]TNA01	EMK316 BJ106□D-T	16		X5R	10 μ	$\pm 10, \pm 20$	10	150	0.85 ± 0.10	
MLASE319LB5226MTNA01	EMK316ABJ226MD-T	16		X5R	22 μ	±20	10	150	0.85 ± 0.10	
MLASL319HB5475 TNA01	LMK316 BJ475□D-T	10	В	X5R	4.7 μ	$\pm 10, \pm 20$	5	200	0.85 ± 0.10	
MLASL319HB5106 TNA01	LMK316 BJ106 D-T	10		X5R	10 μ	±10, ±20	10	200	0.85±0.10	
MLASL319LB5226MTNA01	LMK316ABJ226MD-T	10		X5R	22 μ	±20	10	150	0.85±0.10	
MLASJ319HB5106∏TNA01	JMK316 BJ106□D-T	6.3		X5R	10 μ	±10, ±20	10	200	0.85±0.10	
MLASJ319LB5226MTNA01	JMK316ABJ226MD-T	6.3		X5R	22 μ	±20	10	150	0.85±0.10	
MLASJ319LB5476MTNA01	JMK316ABJ476MD-T	6.3		X5R	47 μ	±20	10	150	0.85±0.10	

[Temperature Characteristic C6: X6S($-55\sim+105^{\circ}$ C)] 1.6mm thickness

New part number		Rated voltage			Capacitance		tan δ	HTLT	Thickness*3 [mm]	Note
Treff pare manuser	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %		11010
MLASE31LBC6226MTNA01	EMK316BC6226ML-T	16		X6S	22 μ	±20	10	150	1.6±0.30	
MLASL31LBC6476MTNA01	LMK316BC6476ML-T	10		X6S	47 μ	±20	10	150	1.6±0.30	
MLASJ31LAC6476MTNA01	JMK316AC6476ML-T	6.3		X6S	47 μ	±20	10	150	1.6±0.20	
MLASA31LAC6476MTNA01	AMK316AC6476ML-T	4		X6S	47 μ	±20	10	200	1.6±0.20	
MLASA31LAC6107MTNA01	AMK316AC6107ML-T	4		X6S	100 μ	±20	10	150	1.6±0.20	

[Temperature Characteristic C7 : X7S($-55 \sim +125 ^{\circ}$ C)] 1.6mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASJ31LAC7476MTNA01	JMK316AC7476ML-T	6.3		X7S	47 μ	±20	10	150	1.6±0.20	
MLASA31LAC7476MTNA01	AMK316AC7476ML-T	4		X7S	47 μ	±20	10	150	1.6±0.20	

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 1.6mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASU31LSB7225[]TNA01	UMK316 B7225□L-T	50	X7R	2.2 μ	±10, ±20	10	150	1.6±0.20	
MLASU31LAB7475[]TNA01	UMK316AB7475[]L-T	50	X7R	4.7 μ	±10, ±20	10	150	1.6±0.20	
MLASG31LAB7106[TNB25	GMK316AB7106□L-TR	35	X7R	10 μ	$\pm 10, \pm 20$	10	150	1.6±0.20	
MLAST31LAB7475[]TNA01	TMK316AB7475[]L-T	25	X7R	4.7 μ	±10, ±20	10	200	1.6±0.20	
MLAST31LAB7106[]TNA01	TMK316AB7106□L-T	25	X7R	10 μ	$\pm 10, \pm 20$	10	150	1.6±0.20	
	EMK316 B7475[L-T	16	X7R	4.7 μ	$\pm 10, \pm 20$	5	200	1.6±0.20	
	EMK316AB7106 L-T	16	X7R	10 μ	$\pm 10, \pm 20$	10	200	1.6±0.20	
MLASL31LAB7106[TNA01	LMK316AB7106[]L-T	10	X7R	10 μ	±10, ±20	10	200	1.6±0.20	
MLASL31LAB7226 TNB25	LMK316AB7226[]L-TR	10	X7R	22 μ	±10, ±20	10	150	1.6±0.20	

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}C$)] 0.85mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempera character		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASU319HB7225 TNA01	UMK316 B7225 D-T	50		X7R	2.2 μ	±10, ±20	10	150	0.85 ± 0.10	
MLAST319LB7475[]TNA01	TMK316AB7475[]D-T	25		X7R	4.7 μ	±10, ±20	10	150	0.85 ± 0.10	
MLASL319LB7106MTNA01	LMK316AB7106MD-T	10		X7R	10 μ	±20	10	150	0.85±0.10	

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/).

●3225TYPE

Temperature Characteristic	B5(BJ): X5R($-55\sim +85^{\circ}$ C)	2.5mm thickness
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New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU32MSB5106 PNA01	UMK325 BJ106[]M-P	50		X5R	10 μ	±10, ±20	5	150	2.5±0.20	
MLASG32MSB5226MPNA01	GMK325 BJ226MM-P	35		X5R	22 μ	±20	5	150	2.5±0.20	
MLAST32MAB5476MPNDT1	TMK325ABJ476MM-P	25		X5R	47 μ	±20	10	150	2.5±0.30	
MLASE32MAB5107MPNA01	EMK325ABJ107MM-P	16		X5R	100 μ	±20	10	150	2.5±0.30	
MLASL32MAB5107MPNA01	LMK325ABJ107MM-P	10		X5R	100 μ	±20	10	150	2.5±0.30	
MLASJ32MAB5157MPNDT1	JMK325ABJ157MM-P	6.3		X5R	150 μ	±20	10	150	2.5±0.30	
MLASJ32MAB5227MPNDT1	JMK325ABJ227MM-P	6.3		X5R	220 μ	±20	10	150	2.5±0.30	
MLASA32MAB5157MPNDT1	AMK325ABJ157MM-P	4		X5R	150 μ	±20	10	150	2.5±0.30	
MLASA32MAB5227MPNDT1	AMK325ABJ227MM-P	4		X5R	220 μ	±20	10	150	2.5±0.30	

[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 1.9mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU32NSB5475[]TNA01	UMK325 BJ475∏N-T	50		X5R	4.7 μ	±10, ±20	10	150	1.9±0.20	
MLASG32NSB5225 TNA01	GMK325 BJ225∏N-T	35	В	X5R	2.2 μ	$\pm 10, \pm 20$	3.5	200	1.9±0.20	
MLASG32NSB5475 TNA01	GMK325 BJ475∏N-T	35		X5R	4.7 μ	$\pm 10, \pm 20$	10	150	1.9±0.20	
MLASG32NSB5106☐TNA01	GMK325 BJ106□N-T	35		X5R	10 μ	±10, ±20	5	150	1.9±0.20	
MLAST32NSB5335MTNA01	TMK325 BJ335MN-T	25	В	X5R*1	3.3 μ	±20	3.5	200	1.9±0.20	
MLAST32NSB5475[]TNA01	TMK325 BJ475[]N-T	25	В	X5R*1	4.7 μ	±10, ±20	3.5	200	1.9±0.20	
MLAST32NSB5106[]TNA01	TMK325 BJ106∏N-T	25		X5R	10 μ	$\pm 10, \pm 20$	5	200	1.9±0.20	
MLASE32NSB5475[]TNA01	EMK325 BJ475[]N-T	16	В	X5R*1	4.7 μ	$\pm 10, \pm 20$	3.5	200	1.9±0.20	
MLASE32NSB5106[TNA01	EMK325 BJ106∏N-T	16		X5R	10 μ	$\pm 10, \pm 20$	3.5	200	1.9±0.20	
MLASE32YBB5476MTNA01	EMK325 BJ476MY-T	16		X5R	47 μ	±20	10	150	1.9+0.1/-0.2	
MLASL32NSB5106[]TNA01	LMK325 BJ106∏N-T	10		X5R	10 μ	$\pm 10, \pm 20$	3.5	200	1.9±0.20	
MLASL32YBB5226MTNA01	LMK325 BJ226MY-T	10	В	X5R	22 μ	±20	5	150	1.9+0.1/-0.2	
MLASJ32YBB5226MTNA01	JMK325 BJ226MY-T	6.3	В	X5R	22 μ	±20	5	200	1.9+0.1/-0.2	

$\begin{tabular}{ll} \textbf{[Temperature Characteristic B5(BJ): B($-25$$$$\sim$+85$$°C)/X5R($-55$$\sim$+85$$°C)]} & 0.85mm thickness \\ \end{tabular}$

Name and according	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	*3 - 1	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLAST329JB5106[]TNA01	TMK325 BJ106□D-T	25		X5R	10 μ	±10, ±20	5	150	0.85±0.10	
MLASE329JB5106[]TNA01	EMK325 BJ106□D-T	16		X5R	10 μ	±10, ±20	5	150	0.85±0.10	
MLASE329JB5226MTNA01	EMK325 BJ226MD-T	16		X5R	22 μ	±20	10	150	0.85±0.10	
MLASL329JB5335[]TNA01	LMK325 BJ335∏D-T	10	В	X5R	3.3 μ	±10, ±20	3.5	200	0.85±0.10	
MLASL329JB5475[]TNA01	LMK325 BJ475∏D-T	10	В	X5R	4.7 μ	±10, ±20	5	200	0.85±0.10	
MLASL329JB5106∏TNA01	LMK325 BJ106∏D-T	10		X5R	10 μ	±10. ±20	5	150	0.85 ± 0.10	

[Temperature Characteristic C6: X6S(-55~+105°C)] 2.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASE32MAC6476MPNDT1	EMK325AC6476MM-P	16		X6S	47 μ	±20	10	150	2.5±0.30	
MLASL32MAC6107MPNA01	LMK325AC6107MM-P	10		X6S	100 μ	±20	10	150	2.5±0.30	
MLASA32MAC6157MPNDT1	AMK325AC6157MM-P	4		X6S	150 μ	±20	10	150	2.5±0.30	
MLASA32MAC6227MPNDT1	AMK325AC6227MM-P	4		X6S	220 μ	±20	10	150	2.5±0.30	
MLASP32MAC6227MPNDT1	PMK325AC6227MM-P	2.5		X6S	220 μ	±20	10	200	2.5±0.30	

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 2.5mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASU32MSB7335 PNA01	UMK325 B7335[]M-P	50		X7R	3.3 μ	±10, ±20	3.5	200	2.5±0.20	
MLASU32MSB7475[]PNA01	UMK325 B7475∏M-P	50		X7R	4.7 μ	$\pm 10, \pm 20$	5	150	2.5±0.20	
MLASU32MAB7106[]PNA01	UMK325AB7106[]M-P	50		X7R	10 μ	$\pm 10, \pm 20$	10	150	2.5±0.30	
MLAST32MAB7106 PNA01	TMK325AB7106□M-P	25		X7R	10 μ	$\pm 10, \pm 20$	10	200	2.5±0.30	
MLAST32MSB7226[]PNB25	TMK325 B7226 M-PR	25		X7R	22 μ	$\pm 10, \pm 20$	10	150	2.5±0.20	
MLASE32MSB7226 PNB25	EMK325 B7226 M-PR	16		X7R	22 μ	$\pm 10, \pm 20$	10	150	2.5±0.20	
MLASL32MSB7476∏PNB25	LMK325 B7476[]M-PR	10		X7R	47 μ	$\pm 10, \pm 20$	10	150	2.5±0.20	
MLASJ32MSB7476 PNB25	JMK325 B7476[]M-PR	6.3		X7R	47 μ	±10, ±20	10	200	2.5±0.20	

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 1.9mm thickness

Manna and annual an	Old part number	Rated voltage	Temperatur	e Capacita	nce	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note	
New part number	(for reference)	[V]	characterist	cs [F]		[%]	[%]	Rated voltage x %	Inickness [mm]	Note	
MLASU32NSB7475[]TNB25	UMK325 B7475[N-TR	50	X.	R 4.7	' μ	±10, ±20	10	150	1.9±0.20		
MLAST32NSB7335[]TNA01	TMK325 B7335□N-T	25	X.	R 3.3	μ	±10, ±20	3.5	200	1.9±0.20		
MLAST32NSB7475[]TNA01	TMK325 B7475□N-T	25	X.	R 4.7	' μ	±10, ±20	3.5	150	1.9±0.20		
MLAST32NSB7106 TNB25	TMK325 B7106□N-TR	25	X.	R 10	μ (±10, ±20	10	150	1.9±0.20		
MLASE32NSB7475 TNA01	EMK325 B7475∏N-T	16	X.	R 4.7	μ	±10, ±20	3.5	200	1.9±0.20		
MLASE32NSB7106 TNA01	EMK325 B7106□N-T	16	X.	R 10) μ	±10, ±20	3.5	150	1.9±0.20		
MLASL32NSB7106[]TNA01	LMK325 B7106[]N-T	10	X.	R 10) μ	±10, ±20	3.5	200	1.9±0.20		

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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

Mate	Temperature Characte	eristic $C\Delta : C\Delta/C0$	△(-55~-	F125°C)] 0.2n	nm thickne	ss	Q			
MASTORDORNEON MACE MACE CORNEO Part Part MASTORDORNEON MACE MACE CORNEO Part MACE New part number	· · · · · · · · · · · · · · · · · · ·					Capacitance tolerance		HTLT	Thickness*3 [mm]	Note	
MAGT99200000 MAGT MAGT CORDING P. P. P. D. C. O. K. 0.5 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.1 0.000 0.0	A HARMAN AND ALKAR AFTERNAL AND A								_	001000	
MACTIPESCORIE] NINNOT TREAD COUNTY 25											
MASTRESCORT/PINARI MISCAS DEVINED											
MACTORESCORED MACTORESCORED W 25				CK				414		0.2±0.02	
MASTPESCOORI] NAME TWOSQ CORED DW 20											
MASTRESSCRIPT MANUAL TROPOSE CHERTID											
MASTRESSCRIPT MANUAL TRANSPORT (CITED W)											
MASTPESCRIPTION THROSE CORNELLOW 75						_					
MASTPESSKICHE MANAD THROSE CORNES OF 2 5 KK COK 1.4 ±0.006, #.0.017 1.005 1.00											
MASTEGSCORPS MANDO TRACE CORRES P.W. 25 CK CGK 1.9 ± 0.056 ± 0.056 ± 0.02 200 0.7±0.072											
MASTOSCOCKERS MANUAL MASTOSCOCKES D. W. 25											
MASTGESCHER MARCH MASTGESCHER Dev 20											
MASTOSSCKRIPE MANO TOMOS CKITRO D-W 25											
MAST005SCX000_INMAGE IMMOGE CROSSILD W 25											
MAST045SCREEN MANOR MONTE CREATED W 25											
MASTORSCORPE MANO TIMOGO CORPE 0-W 25											
MASTONSSCRIPT WAND TIMOGE CORPS D-W 25 OK OK 2.5 p ±0.00pf ±0.10pf ±0.02pf = 448 200 0.2±0.002											
MASTORSSCRIENT MARCH CORPS D=W 25											
MASTORSCORRI] WARD											
MAST049SCREPNIMAD TMO04 CKPRID W 25 CK COK C2 p ±0.006 ± 0.15 ± 0.25 p 45.00											
MAST045SCARRI] WINDO MIKORY CKRRI] D-W 25 CK COK 29 p ±0.05pf; ±0.1pf; ±0.25pf 688 200 0.2±0.02 MAST045SCARRI] WINDO MAST045SCARRI] WIND		TMK042 CK2R7[]D-W	25	CK	C0K	2.7 p	±0.05pF,±0.1pF,±0.25pF	454	200	0.2±0.02	
MAST0425CL038 INMAD IMMOGE CL980 P											
MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 CJ OQJ 3.1 p ±0.1pf.±0.2pf 464 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.3 p ±0.1pf.±0.2pf 464 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.3 p ±0.1pf.±0.2pf 468 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.5 p ±0.1pf.±0.2pf 468 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.5 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.5 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.8 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.8 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.8 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.8 p ±0.1pf.±0.2pf 478 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ 3.8 p ±0.1pf.±0.2pf 480 200 0.2±0.02 MLASTONSCORPRI]NMADI MMOGREGARI]D-W 25 OJ OQJ OQJ DV ODJ DV ODJ DV ODJ											
MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.2 p ±0.1pf.±0.25pf 464 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.4 p ±0.1pf.±0.25pf 468 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 468 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 468 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 470 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 472 CO.J. 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 472 CO.J. 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 478 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 478 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 3.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200 0.2±0.02 MIASTOWSCOURGE TWAND TMOGREG CURRED D-W 25 C.J. CO.J. 4.5 p ±0.1pf.±0.25pf 480 200											
MAST042SCABRI MANO TMK042 CJSRR D-W 25	MLAST042SCJ3R2[WNA01	TMK042 CJ3R2[]D-W			C0J			464			
MLASTIQUESCURSP[]WARD TMKOQUE CJSRR[]D-W 25											
MLASTOWSCAJSRS[]WAND TMKORQ CJSRS[]D-W 25											
MLAST0428CSJ87R] WADD TMK042 CJ87R] D-W 25 CJ COJ 37 p											
MLAST042SCH0MQ TAMONQ CJ8R8[D-W 25											
MLAST042SCH0R[]WAA01 MCQ4C CH4R[]D-W 25											
MLASTGYSCHERI[WNAD1 TMKO42 CHERI]D—W 25											
MLASTOWSCHRRIDWAND1 TMCQC 2HRRID-W 25											
MLASTGY2SCH4RS_UNANO TMK042 CH4RRS_ID-W 25 CH COH 4.4 p ±0.1pf±0.25pf 490 200 0.2±0.02											
MLAST042SCH4RS[]WANDI TMKQ42 CH4RS[]D—W 25											
MLAST042SCH4RE[]MNA01 TMKQ42 CH4RE] D-W 25 CH COH 4.6 p ±0.1pf.±0.25pf 494 200 0.2±0.02 MLAST042SCH4RE] MNA01 TMKQ42 CH4RE] D-W 25 CH COH 4.8 p ±0.1pf.±0.25pf 496 200 0.2±0.02 MLAST042SCH4RE] MNA01 TMKQ42 CH4RE] D-W 25 CH COH 4.8 p ±0.1pf.±0.25pf 496 200 0.2±0.02 MLAST042SCH4RE] MNA01 TMKQ42 CH4RE] D-W 25 CH COH 4.9 p ±0.1pf.±0.25pf 498 200 0.2±0.02 MLAST042SCH4RE] MNA01 TMKQ42 CH4RE] D-W 25 CH COH 5.p ±0.1pf.±0.25pf 500 200 0.2±0.02 MLAST042SCH5RE] MNA01 TMKQ42 CH4RE] D-W 25 CH COH 5.1 p ±0.1pf.±0.25pf ±0.5pf ±0.5pf ±0.5pf ±0.2ph											
MLAST042SCH4R7[]WAA01 TMK042 CH4R7[]D-W 25											
MLAST042SCH9RQ MA01 TMK042 CH9RQ D=W 25 CH COH 49 p											
MLAST042SCH950 WA01 TMK042 CH587 D=W 25 CH COH 5p											
MLAST042SCH5RE]UMA01 TMK042 CH5RE]D=W 25											
MLAST042SCH5R2[UNAO]											_
MLASTO42SCH5R4[]WNAD1											
MLASTO42SCHSRS[]WNA01 TMK042 CHSRS[]D-W 25											
MLAST042SCH5R6[WNA01 TMK042 CH5R6[]D-W 25 CH COH 5.6 p ±0.1pf.±0.25pf.±0.5pf 512 200 0.2±0.02											
MLAST042SCH5R7 WNA01											
MLAST042SCH5R8[]WNA01 TMK042 CH5R8[]D-W 25											
MLAST042SCH660[]WNA01 TMK042 CH660[]D-W 25	MLAST042SCH5R8 WNA01	TMK042 CH5R8 D-W	25	CH	C0H	5.8 p	±0.1pF,±0.25pF,±0.5pF	516	200	0.2±0.02	
MLAST042SCH6RI WNA01											
MLAST042SCH6R2[]WNA01 TMK042 CH6R3[]D-W 25 CH C0H 6.2 p ±0.1pF,±0.25pF,±0.5pF 526 200 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 CH6R3[]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 MLAST042SCH6R8[]WNA01 TMK042 CH6R6]D-W 25 CH C0H 6.6 p ±0.1pF,±0.25pF,±0.5pF 534 200 0.2±0.02 MLAST042SCH6R8[]WNA01 TMK042 CH6R6]D-W 25 CH C0H 6.8 p ±0.1pF,±0.25pF,±0.5pF 536 200 0.2±0.02 MLAST042SCH6R8[]WNA01 TMK042 CH6R6]D-W 25 CH C0H 6.8 p ±0.1pF,±0.25pF,±0.5pF 536 200 0.2±0.02 MLAST042SCH6R8[]WNA01 TMK042 CH6R6]D-W 25 CH C0H 6.9 p ±0.1pF,±0.25pF,±0.5pF 538 200 0.2±0.02 MLAST042SCH6R8[]WNA01 TMK042 CH6R6]D-W 25 CH C0H 7.0 p ±0.1pF,±0.25pF,±0.5pF 538 200 0.2±0.02 MLAST042SCH7R1[]WNA01 TMK042 CH7R1[]D-W 25 CH C0H 7.1 p ±0.1pF,±0.25pF,±0.5pF 540 200 0.2±0.02 MLAST042SCH7R1[]WNA01 TMK042 CH7R2[]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 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH C0H 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH C0H 7.4 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH C0H 7.8 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH C0H 7											
MLAST042SCH6R3 □ WNA01 TMK042 CH6R3 □ D-W 25 CH COH 6.3 p ±0.1 pF, ±0.25 pF, ±0.5 pF 526 200 0.2±0.02 MLAST042SCH6R6 □ WNA01 TMK042 CH6R6 □ WNA01 TMK042 CH6R8 □ WNA01 TMK042 CH6R9 □ WNA0		TMK042 CH6R2□D-W									
MLAST042SCH6RS] WNA01 TMK042 CH6RS D-W 25 CH COH 6.5 p ±0.1pF,±0.25pF,±0.5pF 530 200 0.2±0.02	MLAST042SCH6R3 WNA01	TMK042 CH6R3 D-W	25	CH	C0H	6.3 p	±0.1pF,±0.25pF,±0.5pF	526	200		
MLAST042SCH6R6[]WNA01 TMK042 CH6R6[]D-W 25 CH C0H 6.6 p ±0.1pF,±0.25pF,±0.5pF 532 200 0.2±0.02 MLAST042SCH6R8[]WNA01 TMK042 CH6R8[]D-W 25 CH C0H 6.8 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 538 200 0.2±0.02 MLAST042SCH6R9[]WNA01 TMK042 CH6R8[]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 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH C0H 7.2 p ±0.1pF,±0.25pF,±0.5pF 544 200 0.2±0.02 MLAST042SCH7R6[]WNA01 <											
MLAST042SCH6R7[]WNA01 TMK042 CH6R7[]D-W 25 CH COH 6.7 p ±0.1pF,±0.25pF,±0.5pF 534 200 0.2±0.02											
MLAST042SCH6R8[WNA01] TMK042 CH6R8[D-W 25 CH COH 6.8 p ±0.1pF,±0.25pF,±0.5pF 536 200 0.2±0.02 MLAST042SCH6R9[WNA01] TMK042 CH6R9[D-W 25 CH COH 6.9 p ±0.1pF,±0.25pF,±0.5pF 538 200 0.2±0.02 MLAST042SCH070[WNA01] TMK042 CH070[D-W 25 CH COH 7 p ±0.1pF,±0.25pF,±0.5pF 540 200 0.2±0.02 MLAST042SCH7R1[WNA01] TMK042 CH7R1[D-W 25 CH COH 7.1 p ±0.1pF,±0.25pF,±0.5pF 542 200 0.2±0.02 MLAST042SCH7R2[WNA01] TMK042 CH7R2[D-W 25 CH COH 7.2 p ±0.1pF,±0.25pF,±0.5pF 544 200 0.2±0.02 MLAST042SCH7R3[WNA01] TMK042 CH7R3[D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 546 200 0.2±0.02 MLAST042SCH7R6[WNA01] TMK042 CH7R6[D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6[WNA01] TMK0											
MLAST042SCH070□WNA01 TMK042 CH070□D-W 25 CH COH 7 p ±0.1pF,±0.25pF,±0.5pF 540 200 0.2±0.02 MLAST042SCH7R1□WNA01 TMK042 CH7R1□D-W 25 CH COH 7.1 p ±0.1pF,±0.25pF,±0.5pF 542 200 0.2±0.02 MLAST042SCH7R2□WNA01 TMK042 CH7R2□D-W 25 CH COH 7.2 p ±0.1pF,±0.25pF,±0.5pF 544 200 0.2±0.02 MLAST042SCH7R3□WNA01 TMK042 CH7R3□D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 546 200 0.2±0.02 MLAST042SCH7R4□WNA01 TMK042 CH7R3□D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R6□WNA01 TMK042 CH7R6□D-W 25 CH COH 7.5 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6□WNA01 TMK042 CH7R6□D-W 25 CH COH 7.7 p ±0.1pF,±0.25pF,±0.5pF 552 200 0.2±0.02 MLAST042SCH7R8□WNA01 TMK042 CH7R8		TMK042 CH6R8 D-W	25	CH	C0H	6.8 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	536	200	0.2±0.02	
MLAST042SCH7R1[WNA01 TMK042 CH7R1[D-W 25 CH COH 7.1 p ±0.1pF,±0.25pF,±0.5pF 542 200 0.2±0.02 MLAST042SCH7R2[WNA01] TMK042 CH7R2[D-W 25 CH COH 7.2 p ±0.1pF,±0.25pF,±0.5pF 544 200 0.2±0.02 MLAST042SCH7R3[WNA01] TMK042 CH7R3[D-W 25 CH COH 7.3 p ±0.1pF,±0.25pF,±0.5pF 546 200 0.2±0.02 MLAST042SCH7R4[WNA01] TMK042 CH7R4[D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R5[WNA01] TMK042 CH7R4[D-W 25 CH COH 7.5 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6[WNA01] TMK042 CH7R6[D-W 25 CH COH 7.6 p ±0.1pF,±0.25pF,±0.5pF 552 200 0.2±0.02 MLAST042SCH7R6[WNA01] TMK042 CH7R6[D-W 25 CH COH 7.7 p ±0.1pF,±0.25pF,±0.5pF 556 200 0.2±0.02 MLAST042SCH7R9[WNA01] TMK											
MLAST042SCH7R2[]WNA01 TMK042 CH7R2[]D-W 25 CH COH 7.2 p ±0.1pF,±0.25pF,±0.5pF 544 200 0.2±0.02 MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH COH 7.3 p ±0.1pF,±0.25pF,±0.5pF 546 200 0.2±0.02 MLAST042SCH7R4[]WNA01 TMK042 CH7R4[]D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R5[]WNA01 TMK042 CH7R5[]D-W 25 CH COH 7.5 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6[]WNA01 TMK042 CH7R6[]D-W 25 CH COH 7.6 p ±0.1pF,±0.25pF,±0.5pF 552 200 0.2±0.02 MLAST042SCH7R7[]WNA01 TMK042 CH7R7[]D-W 25 CH COH 7.7 p ±0.1pF,±0.25pF,±0.5pF 554 200 0.2±0.02 MLAST042SCH7R8[]WNA01 TMK042 CH7R8[]D-W 25 CH COH 7.8 p ±0.1pF,±0.25pF,±0.5pF 556 200 0.2±0.02 MLAST042SCH080[]WNA01											
MLAST042SCH7R3[]WNA01 TMK042 CH7R3[]D-W 25 CH COH 7.3 p ±0.1pF,±0.25pF,±0.5pF 546 200 0.2±0.02 MLAST042SCH7R4[]WNA01 TMK042 CH7R4[]D-W 25 CH COH 7.4 p ±0.1pF,±0.25pF,±0.5pF 548 200 0.2±0.02 MLAST042SCH7R5[]WNA01 TMK042 CH7R5[]D-W 25 CH COH 7.5 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6[]WNA01 TMK042 CH7R6[]D-W 25 CH COH 7.6 p ±0.1pF,±0.25pF,±0.5pF 552 200 0.2±0.02 MLAST042SCH7R7[]WNA01 TMK042 CH7R7[]D-W 25 CH COH 7.7 p ±0.1pF,±0.25pF,±0.5pF 554 200 0.2±0.02 MLAST042SCH7R8[]WNA01 TMK042 CH7R8[]D-W 25 CH COH 7.8 p ±0.1pF,±0.25pF,±0.5pF 556 200 0.2±0.02 MLAST042SCH7R9[]WNA01 TMK042 CH7R9[]D-W 25 CH COH 7.9 p ±0.1pF,±0.25pF,±0.5pF 558 200 0.2±0.02 MLAST042SCH8R1[]WNA01											
MLAST042SCH7R5[]WNA01 TMK042 CH7R5[]D-W 25 CH COH 7.5 p ±0.1pF,±0.25pF,±0.5pF 550 200 0.2±0.02 MLAST042SCH7R6[]WNA01 TMK042 CH7R6[]D-W 25 CH COH 7.6 p ±0.1pF,±0.25pF,±0.5pF 552 200 0.2±0.02 MLAST042SCH7R7[]WNA01 TMK042 CH7R7[]D-W 25 CH COH 7.7 p ±0.1pF,±0.25pF,±0.5pF 554 200 0.2±0.02 MLAST042SCH7R8[]WNA01 TMK042 CH7R8[]D-W 25 CH COH 7.8 p ±0.1pF,±0.25pF,±0.5pF 556 200 0.2±0.02 MLAST042SCH7R9[]WNA01 TMK042 CH7R9[]D-W 25 CH COH 7.9 p ±0.1pF,±0.25pF,±0.5pF 558 200 0.2±0.02 MLAST042SCH880[]WNA01 TMK042 CH80[]D-W 25 CH COH 8 p ±0.1pF,±0.25pF,±0.5pF 560 200 0.2±0.02 MLAST042SCH8R1[]WNA01 TMK042 CH8R1[]D-W 25 CH COH 8.1 p ±0.1pF,±0.25pF,±0.5pF 564 200 0.2±0.02 MLAST042SCH8R3[]WNA01 <t< td=""><td>MLAST042SCH7R3[]WNA01</td><td>TMK042 CH7R3[D-W</td><td>25</td><td>CH</td><td>C0H</td><td>7.3 p</td><td>±0.1pF,±0.25pF,±0.5pF</td><td>546</td><td>200</td><td>0.2±0.02</td><td></td></t<>	MLAST042SCH7R3[]WNA01	TMK042 CH7R3[D-W	25	CH	C0H	7.3 p	±0.1pF,±0.25pF,±0.5pF	546	200	0.2±0.02	
MLAST042SCH7R6[\bar{\text{\text{WNA01}}} \bar{\text{TMK042}} \cdot CH7R6[\text{\te\text{\te											
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 MLAST042SCH880[WNA01] TMK042 CH8080[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 8.2 p ±0.1pF,±0.25pF,±0.5pF 564 200 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 8.2 p ±0.1pF,±0.25pF,±0.5pF 564 200 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						7.8 p					
MLAST042SCH8R1[\text{\tint{\text{\te\tinte\text{\tex{\tex	MLAST042SCH7R9[]WNA01	TMK042 CH7R9[D-W					±0.1pF,±0.25pF,±0.5pF				
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											
MLAST042SCH8R3[WNA01 TMK042 CH8R3[D-W 25 CH C0H 8.3 p ±0.1pF,±0.25pF,±0.5pF 566 200 0.2±0.02											
	MLAST042SCH8R3[]WNA01										
	MLAST042SCH8R4[]WNA01	TMK042 CH8R4∏D-W	25	CH	C0H	8.4 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	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/).

New part number	Old part number	Rated voltage		erature	Capacitance	Capacitance tolerance	Q (at 1MHz)	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	Oapacitatice toleratice	(min)	Rated voltage x %	Inickness [mm]	Note
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	СН	C0H	8.7 p	±0.1pF, ±0.25pF, ±0.5pF	574	200	0.2 ± 0.02	
MLAST042SCH8R8[]WNA01	TMK042 CH8R8∏D-W	25	СН	C0H	8.8 p	±0.1pF,±0.25pF,±0.5pF	576	200	0.2±0.02	
MLAST042SCH8R9[]WNA01	TMK042 CH8R9□D-W	25	СН	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	580	200	0.2 ± 0.02	
MLAST042SCH9R1 WNA01	TMK042 CH9R1 D-W	25	CH	C0H	9.1 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	582	200	0.2 ± 0.02	
MLAST042SCH9R2[WNA01	TMK042 CH9R2□D-W	25	СН	C0H	9.2 p	±0.1pF, ±0.25pF, ±0.5pF	584	200	0.2±0.02	
MLAST042SCH9R3[WNA01	TMK042 CH9R3□D-W	25	СН	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	588	200	0.2 ± 0.02	
MLAST042SCH9R5 WNA01	TMK042 CH9R5□D-W	25	CH	C0H	9.5 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	590	200	0.2 ± 0.02	
MLAST042SCH9R6 WNA01	TMK042 CH9R6□D-W	25	CH	C0H	9.6 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	592	200	0.2 ± 0.02	
MLAST042SCH9R7 WNA01	TMK042 CH9R7□D-W	25	CH	C0H	9.7 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	594	200	0.2 ± 0.02	
MLAST042SCH9R8 WNA01	TMK042 CH9R8□D-W	25	CH	C0H	9.8 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	596	200	0.2 ± 0.02	
MLAST042SCH9R9[WNA01	TMK042 CH9R9□D-W	25	CH	C0H	9.9 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	598	200	0.2 ± 0.02	
MLAST042SCH100DWNA01	TMK042 CH100DD-W	25	CH	C0H	10 p	±0.5pF	600	200	0.2 ± 0.02	
MLAST042SCH110JWNA01	TMK042 CH110JD-W	25	CH	C0H	11 p	±5%	620	200	0.2 ± 0.02	
MLAST042SCH120JWNA01	TMK042 CH120JD-W	25	CH	C0H	12 p	±5%	640	200	0.2 ± 0.02	
MLAST042SCH130JWNA01	TMK042 CH130JD-W	25	CH	C0H	13 p	±5%	660	200	0.2 ± 0.02	
MLAST042SCH150JWNA01	TMK042 CH150JD-W	25	CH	C0H	15 p	±5%	700	200	0.2 ± 0.02	
MLAST042SCH160JWNA01	TMK042 CH160JC-W	25	CH	C0H	16 p	±5%	720	200	0.2 ± 0.02	
MLAST042SCH180JWNA01	TMK042 CH180JC-W	25	CH	C0H	18 p	±5%	760	200	0.2 ± 0.02	
MLAST042SCH200JWNA01	TMK042 CH200JC-W	25	CH	C0H	20 p	±5%	800	200	0.2 ± 0.02	
MLAST042SCH220JWNA01	TMK042 CH220JC-W	25	CH	C0H	22 p	±5%	840	200	0.2 ± 0.02	
MLAST042SCH240JWNA01	TMK042 CH240JC-W	25	CH	C0H	24 p	±5%	880	200	0.2 ± 0.02	
MLAST042SCH270JWNA01	TMK042 CH270JC-W	25	CH	C0H	27 p	±5%	940	200	0.2 ± 0.02	
MLAST042SCH300JWNA01	TMK042 CH300JC-W	25	CH	C0H	30 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH330JWNA01	TMK042 CH330JC-W	25	CH	C0H	33 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH360JWNA01	TMK042 CH360JC-W	25	CH	C0H	36 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH390JWNA01	TMK042 CH390JC-W	25	CH	C0H	39 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH430JWNA01	TMK042 CH430JC-W	25	CH	C0H	43 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH470JWNA01	TMK042 CH470JC-W	25	CH	C0H	47 p	±5%	1000	200	0.2±0.02	
MLAST042SCH510JWNA01	TMK042 CH510JC-W	25	CH	C0H	51 p	±5%	1000	200	0.2±0.02	
MLAST042SCH560JWNA01	TMK042 CH560JC-W	25	CH	C0H	56 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH620JWNA01	TMK042 CH620JC-W	25	CH	C0H	62 p	±5%	1000	200	0.2±0.02	
MLAST042SCH680JWNA01	TMK042 CH680JC-W	25	CH	C0H	68 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH750JWNA01	TMK042 CH750JC-W	25	CH	C0H	75 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCH820JWNA01	TMK042 CH820JC-W	25	CH	C0H	82 p	±5%	1000	200	0.2±0.02	
MLAST042SCH910JWNA01	TMK042 CH910JC-W	25	CH	C0H	91 p	±5%	1000	200	0.2±0.02	
MLAST042SCH101JWNA01	TMK042 CH101JC-W	25	CH	C0H	100 p	±5%	1000	200	0.2 ± 0.02	

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New part number	Old part number (for reference)	Rated voltage [V]	Tempe		Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT Rated voltage x %	Thickness*3 [mm]	Note
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	COK	0.1 p	±0.05pF,±0.1pF,±0.25pF	410	200	0.2±0.02	_
MLASE042SCK0R6∏WNA01	EMK042 CK0R6∏D-W	16	CK	COK	0.6 p	±0.05pF,±0.1pF,±0.25pF	412	200	0.2±0.02	
MLASE042SCK0R7∏WNA01	EMK042 CK0R7∏D-W	16	CK	COK	0.7 p	±0.05pF,±0.1pF,±0.25pF	414	200	0.2±0.02	
MLASE042SCKR75 WNA01	EMK042 CKR75∏D-W	16	CK	COK	0.75 p	±0.05pF,±0.1pF,±0.25pF	415	200	0.2±0.02	
MLASE042SCK0R8∏WNA01	EMK042 CK0R8∏D-W	16	CK	COK	q 8.0	±0.05pF,±0.1pF,±0.25pF	416	200	0.2±0.02	
MLASE042SCK0R9∏WNA01	EMK042 CK0R9∏D-W	16	CK	COK	0.9 p	±0.05pF,±0.1pF,±0.25pF	418	200	0.2±0.02	
MLASE042SCK010∏WNA01	EMK042 CK010∏D-W	16	CK	COK	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\(\text{WNA01}\)	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	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	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	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	456	200	0.2 ± 0.02	
MLASE042SCK2R9[]WNA01	EMK042 CK2R9□D-W	16	CK	C0K	2.9 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	458	200	0.2 ± 0.02	
MLASE042SCJ030 WNA01	EMK042 CJ030[]D-W	16	CJ	C0J	3 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	460	200	0.2 ± 0.02	-
MLASE042SCJ3R1[]WNA01	EMK042 CJ3R1□D-W	16	C	C0J	3.1 p	$\pm 0.1 pF, \pm 0.25 pF$	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	$\pm 0.1 pF, \pm 0.25 pF$	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	$\pm 0.1 pF, \pm 0.25 pF$	470	200	0.2 ± 0.02	-
MLASE042SCJ3R6[]WNA01	EMK042 CJ3R6□D-W	16	C	C0J	3.6 p	$\pm 0.1 pF, \pm 0.25 pF$	472	200	0.2 ± 0.02	
MLASE042SCJ3R7[]WNA01	EMK042 CJ3R7[D-W	16	C	C0J	3.7 p	$\pm 0.1 pF, \pm 0.25 pF$	474	200	0.2 ± 0.02	
MLASE042SCJ3R8[]WNA01	EMK042 CJ3R8∏D-W	16	CJ	C0J	3.8 p	$\pm 0.1 pF, \pm 0.25 pF$	476	200	0.2 ± 0.02	
MLASE042SCJ3R9[]WNA01	EMK042 CJ3R9∏D-W	16	CJ	C0J	3.9 p	$\pm 0.1 pF, \pm 0.25 pF$	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	$\pm 0.1 pF, \pm 0.25 pF$	482	200	0.2 ± 0.02	
MLASE042SCH4R2[]WNA01	EMK042 CH4R2[]D-W	16	CH	C0H	4.2 p	$\pm 0.1 pF, \pm 0.25 pF$	484	200	0.2 ± 0.02	
MLASE042SCH4R3[]WNA01	EMK042 CH4R3 D-W	16	CH	C0H	4.3 p	$\pm 0.1 pF, \pm 0.25 pF$	486	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/).

New part number	Old part number (for reference)	Rated voltage		erature teristics	Capacitance	Capacitance tolerance	Q (at 1MHz)	HTLT	Thickness*3 [mm]	Note
		[V]					(111117)	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 MLASE042SCH4R6[]WNA01	EMK042 CH4R5 D-W EMK042 CH4R6 D-W	16 16	CH CH	C0H	4.5 p 4.6 p	±0.1pF,±0.25pF ±0.1pF,±0.25pF	490 492	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH4R7 WNA01	EMK042 CH4R7 D-W	16	CH	C0H	4.0 p	±0.1pF,±0.25pF	494	200	0.2±0.02	
MLASE042SCH4R8[]WNA01	EMK042 CH4R8 D-W	16	CH	COH	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 MLASE042SCH5R4[]WNA01	EMK042 CH5R3[]D-W EMK042 CH5R4[]D-W	16 16	CH CH	C0H	5.3 p 5.4 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	506 508	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH5R5[]WNA01	EMK042 CH5R5 D-W	16	CH	C0H	5.5 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$ $\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	510	200	0.2±0.02	
MLASE042SCH5R6[]WNA01	EMK042 CH5R6 D-W	16	CH	COH	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	516	200	0.2±0.02	
MLASE042SCH5R9[]WNA01	EMK042 CH5R9[]D-W	16	CH	C0H	5.9 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF	518	200	0.2±0.02	
MLASE042SCH060 WNA01	EMK042 CH060[]D-W	16	CH	C0H	6 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	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 MLASE042SCH6R4[]WNA01	EMK042 CH6R3 D-W EMK042 CH6R4 D-W	16 16	CH CH	C0H	6.3 p 6.4 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	526 528	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH6R5[]WNA01	EMK042 CH6R5 D-W	16	CH	C0H	6.5 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$ $\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	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 MLASE042SCH7R5[]WNA01	EMK042 CH7R4 D-W EMK042 CH7R5 D-W	16 16	CH	C0H	7.4 p 7.5 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	548 550	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH7R5[]WNA01	EMK042 CH7R5 D-W	16	CH	C0H	7.5 p	$\pm 0.1pF, \pm 0.25pF, \pm 0.5pF$ $\pm 0.1pF, \pm 0.25pF, \pm 0.5pF$	552	200	0.2±0.02 0.2±0.02	
MLASE042SCH7R7[]WNA01	EMK042 CH7R7 D-W	16	CH	C0H	7.0 p	±0.1pF,±0.25pF,±0.5pF	554	200	0.2±0.02	
MLASE042SCH7R8[]WNA01	EMK042 CH7R8 D-W	16	CH	COH	7.8 p	±0.1pF,±0.25pF,±0.5pF	556	200	0.2±0.02	
MLASE042SCH7R9[]WNA01	EMK042 CH7R9[]D-W	16	CH	COH	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	562	200	0.2 ± 0.02	
MLASE042SCH8R2[]WNA01	EMK042 CH8R2[]D-W	16	CH	C0H	8.2 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF	564	200	0.2±0.02	
MLASE042SCH8R3[]WNA01	EMK042 CH8R3 D-W	16	CH	C0H	8.3 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	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 CH	C0H	8.5 p	±0.1pF,±0.25pF,±0.5pF	570	200 200	0.2±0.02	
MLASE042SCH8R6[]WNA01 MLASE042SCH8R7[]WNA01	EMK042 CH8R6 D-W EMK042 CH8R7 D-W	16 16	CH	C0H	8.6 p 8.7 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	572 574	200	0.2±0.02 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	COH	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	582	200	0.2±0.02	
MLASE042SCH9R2[]WNA01	EMK042 CH9R2[]D-W	16	CH	C0H	9.2 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	584	200	0.2±0.02	
MLASE042SCH9R3[]WNA01	EMK042 CH9R3[D-W	16	CH	C0H	9.3 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF	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 MLASE042SCH9R6[]WNA01	EMK042 CH9R5∏D-W EMK042 CH9R6∏D-W	16 16	CH CH	C0H	9.5 p 9.6 p	±0.1pF,±0.25pF,±0.5pF	590 592	200 200	0.2±0.02 0.2±0.02	
	EMK042 CH9R7 D-W	16	CH	C0H	9.6 p 9.7 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	594	200	0.2±0.02 0.2±0.02	
MLASE042SCH9R8[]WNA01	EMK042 CH9R8 D-W	16	CH	C0H	9.7 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	
MLASE042SCH100DWNA01	EMK042 CH100DD-W	16	CH	C0H	10 p	±0.5pF	600	200	0.2±0.02	
MLASE042SCH110JWNA01	EMK042 CH110JD-W	16	CH	C0H	11 p	±5%	620	200	0.2±0.02	
MLASE042SCH120JWNA01	EMK042 CH120JD-W	16	CH	C0H	12 p	±5%	640	200	0.2±0.02	
MLASE042SCH130JWNA01	EMK042 CH130JD-W	16	CH	C0H	13 p	±5%	660	200	0.2±0.02	
MLASE042SCH150JWNA01 MLASE042SCH160JWNA01	EMK042 CH150JD-W	16 16	CH	C0H	15 p	±5% +504	700 720	200	0.2±0.02 0.2±0.02	
MLASE042SCH180JWNA01	EMK042 CH160JC-W EMK042 CH180JC-W	16	CH	C0H	16 p	±5% ±5%	720	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH200JWNA01	EMK042 CH200JC-W	16	CH	C0H	20 p	±5%	800	200	0.2±0.02 0.2±0.02	
MLASE042SCH220JWNA01	EMK042 CH220JC-W	16	CH	C0H	20 p	±5%	840	200	0.2±0.02	
MLASE042SCH240JWNA01	EMK042 CH240JC-W	16	CH	C0H	24 p	±5%	880	200	0.2±0.02	
MLASE042SCH270JWNA01	EMK042 CH270JC-W	16	CH	C0H	27 p	±5%	940	200	0.2±0.02	
MLASE042SCH300JWNA01	EMK042 CH300JC-W	16	CH	C0H	30 p	±5%	1000	200	0.2±0.02	
MLASE042SCH330JWNA01	EMK042 CH330JC-W	16	CH	C0H	33 p	±5%	1000	200	0.2±0.02	
MLASE042SCH360JWNA01	EMK042 CH360JC-W	16	CH	C0H	36 p	±5%	1000	200	0.2±0.02	
MLASE042SCH390JWNA01	EMK042 CH390JC-W	16	CH	C0H	39 p	±5%	1000	200	0.2±0.02	
MLASE042SCH430JWNA01 MLASE042SCH470JWNA01	EMK042 CH430JC-W EMK042 CH470JC-W	16 16	CH CH	C0H	43 p 47 p	±5% ±5%	1000 1000	200 200	0.2±0.02 0.2±0.02	
MLASE042SCH470JWNA01 MLASE042SCH510JWNA01	EMK042 CH470JC-W	16	CH	C0H	47 p 51 p	±5%	1000	200	0.2±0.02 0.2±0.02	
MLASE042SCH560JWNA01	EMK042 CH560JC-W	16	CH	C0H	56 p	±5%	1000	200	0.2±0.02	
MLASE042SCH620JWNA01	EMK042 CH620JC-W	16	CH	C0H	62 p	±5%	1000	200	0.2±0.02	
MLASE042SCH680JWNA01	EMK042 CH680JC-W	16	CH	C0H	68 p	±5%	1000	200	0.2±0.02	
MLASE042SCH750JWNA01	EMK042 CH750JC-W	16	CH	C0H	75 p	±5%	1000	200	0.2±0.02	
MLASE042SCH820JWNA01	EMK042 CH820JC-W	16	CH	C0H	82 p	±5%	1000	200	0.2±0.02	
MLASE042SCH910JWNA01	EMK042 CH910JC-W	16	CH	C0H	91 p	±5%	1000	200	0.2±0.02	
MLASE042SCH101JWNA01	EMK042 CH101JC-W	16	CH	C0H	100 p	±5%	1000	200	0.2±0.02	
MLASE042SCH221JWNA01	EMK042 CH221JC-W	16	CH	C0H	220 p	±5%	1000	200	0.2±0.02	
MLASE042SCH241JWNA01 MLASE042SCH271JWNA01	EMK042 CH241JC-W EMK042 CH271JC-W	16 16	CH	C0H	240 p 270 p	±5% ±5%	1000 1000	200 200	0.2±0.02 0.2±0.02	
	EMK042 CH2713C-W	16	CH	C0H	330 p	±5%	1000	200	0.2±0.02 0.2±0.02	
MEAGEO-2001 100 TOWNAUT	Limito72 Of 100 100 11	10	OH	0011	550 р	± 0 70	1000	200	U.L _ U.UL	

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/).

[Temperature Characteristic CG : CG/C0G($-55\sim+125^{\circ}$ C)] 0.2mm thickness

Temperature Characte	eristic CG : CG/C0G	(−55 ~ +1	25°C)] 0.2mm	thickness		Q			
New part number	Old part number (for reference)	Rated voltage [V]		perature cteristics	Capacitance [F]	Capacitance tolerance	(at 1MHz)		Thickness*3 [mm]	Note
MLAST042SCG0R4[WNA01	TMK042 CG0R4 D-W	25				±0.05pF,±0.1pF,±0.25pF	()	Rated voltage x %		
MLAST042SCG0R4[]WNA01	TMK042 CG0R4DD-W	25	CG	C0G C0G	0.4 p 0.5 p	± 0.05 pF, ± 0.1 pF, ± 0.25 pF ± 0.05 pF, ± 0.1 pF, ± 0.25 pF	408 410	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG0R6[]WNA01	TMK042 CG0R6□D-W	25	CG	COG	0.6 p	±0.05pF,±0.1pF,±0.25pF	412	200	0.2±0.02	
	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	COG	0.75 p	±0.05pF,±0.1pF,±0.25pF	415	200	0.2±0.02	
MLAST042SCG0R8 WNA01 MLAST042SCG0R9 WNA01	TMK042 CG0R8□D-W TMK042 CG0R9□D-W	25 25	CG	C0G C0G	0.8 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$ $\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	416 418	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG010[]WNA01	TMK042 CG010 D-W	25	CG	COG	1 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	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 MLAST042SCG1R4[WNA01	TMK042 CG1R3 D-W TMK042 CG1R4 D-W	25 25	CG	C0G C0G	1.3 p 1.4 p	±0.05pF,±0.1pF,±0.25pF ±0.05pF,±0.1pF,±0.25pF	426 428	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG1R4[]WNA01	TMK042 CG1R4DD-W	25	CG	COG	1.4 p	±0.05pF,±0.1pF,±0.25pF ±0.05pF,±0.1pF,±0.25pF	430	200	0.2±0.02 0.2±0.02	
MLAST042SCG1R6 WNA01	TMK042 CG1R6□D-W	25	CG	COG	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	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	434	200	0.2±0.02	
MLAST042SCG1R8 WNA01 MLAST042SCG1R9 WNA01	TMK042 CG1R8 D-W	25	CG	C0G C0G	1.8 p 1.9 p	±0.05pF,±0.1pF,±0.25pF	436 438	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG020[]WNA01	TMK042 CG1R9□D-W TMK042 CG020□D-W	25 25	CG	COG	2 p	± 0.05 pF, ± 0.1 pF, ± 0.25 pF ± 0.05 pF, ± 0.1 pF, ± 0.25 pF	440	200	0.2±0.02	
MLAST042SCG2R1[]WNA01	TMK042 CG2R1□D-W	25	CG	COG	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	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	444	200	0.2±0.02	
MLAST042SCG2R3[]WNA01	TMK042 CG2R3 D-W	25	CG	COG	2.3 p	±0.05pF,±0.1pF,±0.25pF	446	200	0.2±0.02	
MLAST042SCG2R4[WNA01 MLAST042SCG2R5[WNA01	TMK042 CG2R4∏D-W TMK042 CG2R5∏D-W	25 25	CG	C0G C0G	2.4 p 2.5 p	± 0.05 pF, ± 0.1 pF, ± 0.25 pF ± 0.05 pF, ± 0.1 pF, ± 0.25 pF	448 450	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG2R6[WNA01	TMK042 CG2R6 D-W	25	CG	COG	2.5 p	±0.05pF,±0.1pF,±0.25pF ±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	COG	2.8 p	±0.05pF,±0.1pF,±0.25pF	456	200	0.2±0.02	
MLAST042SCG2R9[]WNA01 MLAST042SCG030[]WNA01	TMK042 CG2R9□D-W TMK042 CG030□D-W	25 25	CG CG	C0G C0G	2.9 p 3 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$ $\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	458 460	200 200	0.2±0.02 0.2±0.02	
	TMK042 CG030[]D-W	25	CG	COG	3.1 p	±0.1pF,±0.25pF	462	200	0.2±0.02 0.2±0.02	
MLAST042SCG3R2[]WNA01	TMK042 CG3R2□D-W	25	CG	COG	3.2 p	±0.1pF,±0.25pF	464	200	0.2±0.02	
MLAST042SCG3R3[WNA01	TMK042 CG3R3[D-W	25	CG	COG	3.3 p	±0.1pF,±0.25pF	466	200	0.2±0.02	
MLAST042SCG3R4[]WNA01 MLAST042SCG3R5[]WNA01	TMK042 CG3R4 D-W	25 25	CG	C0G C0G	3.4 p 3.5 p	±0.1pF,±0.25pF	468 470	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG3R6[]WNA01	TMK042 CG3R5□D-W TMK042 CG3R6□D-W	25	CG	COG	3.5 p	±0.1pF,±0.25pF ±0.1pF,±0.25pF	470	200	0.2±0.02 0.2±0.02	
MLAST042SCG3R7[]WNA01	TMK042 CG3R7□D-W	25	CG	COG	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	COG	3.9 p	±0.1pF,±0.25pF	478	200	0.2±0.02	
MLAST042SCG040[]WNA01 MLAST042SCG4R1[]WNA01	TMK042 CG040□D-W TMK042 CG4R1□D-W	25 25	CG	C0G C0G	4 p 4.1 p	±0.1pF,±0.25pF ±0.1pF,±0.25pF	480 482	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG4R2[WNA01	TMK042 CG4R2□D-W	25	CG	COG	4.1 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	COG	4.4 p	±0.1pF,±0.25pF	488	200	0.2±0.02	
MLAST042SCG4R5 WNA01 MLAST042SCG4R6 WNA01	TMK042 CG4R5 D-W TMK042 CG4R6 D-W	25 25	CG CG	C0G C0G	4.5 p 4.6 p	±0.1pF,±0.25pF ±0.1pF,±0.25pF	490 492	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG4R0[WNA01	TMK042 CG4R7[D-W	25	CG	COG	4.0 p	±0.1pF,±0.25pF ±0.1pF,±0.25pF	494	200	0.2±0.02	
MLAST042SCG4R8[WNA01	TMK042 CG4R8□D-W	25	CG	COG	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 MLAST042SCG5R1[]WNA01	TMK042 CG050 D-W TMK042 CG5R1 D-W	25 25	CG	C0G C0G	5 p 5.1 p	±0.1pF,±0.25pF	500 502	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG5R1 WNA01	TMK042 CG5R2[]D-W	25	CG	COG	5.1 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	504	200	0.2±0.02	
MLAST042SCG5R3[]WNA01	TMK042 CG5R3□D-W	25	CG	COG	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	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	508	200	0.2±0.02	
	TMK042 CG5R5[]D-W	25	CG	COG	5.5 p	±0.1pF,±0.25pF,±0.5pF	510	200	0.2±0.02	
MLAST042SCG5R6☐WNA01 MLAST042SCG5R7∏WNA01	TMK042 CG5R6□D-W TMK042 CG5R7□D-W	25 25	CG	C0G C0G	5.6 p 5.7 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	512 514	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG5R8[]WNA01	TMK042 CG5R8 D-W	25	CG	COG	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	COG	6 p	±0.1pF,±0.25pF,±0.5pF	520	200	0.2±0.02	
MLAST042SCG6R1 WNA01 MLAST042SCG6R2 WNA01	TMK042 CG6R1□D-W TMK042 CG6R2□D-W	25 25	CG CG	C0G C0G	6.1 p 6.2 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	522 524	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG6R3[WNA01	TMK042 CG6R3 D-W	25	CG	COG	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	
	TMK042 CG6R5 D-W	25	CG	C0G	6.5 p	±0.1pF,±0.25pF,±0.5pF	530	200	0.2±0.02	
MLAST042SCG6R6 WNA01 MLAST042SCG6R7 WNA01	TMK042 CG6R6□D-W TMK042 CG6R7□D-W	25 25	CG	C0G C0G	6.6 p 6.7 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	532 534	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG6R7 WNA01	TMK042 CG6R8[]D-W	25	CG	COG	6.7 p	$\pm 0.1pF, \pm 0.25pF, \pm 0.5pF$ $\pm 0.1pF, \pm 0.25pF, \pm 0.5pF$	536	200	0.2±0.02 0.2±0.02	
MLAST042SCG6R9[]WNA01	TMK042 CG6R9[]D-W	25	CG	COG	6.9 p	±0.1pF,±0.25pF,±0.5pF	538	200	0.2±0.02	
MLAST042SCG070[]WNA01	TMK042 CG070□D-W	25	CG	COG	7 p	±0.1pF,±0.25pF,±0.5pF	540	200	0.2±0.02	
MLAST042SCG7R1 WNA01	TMK042 CG7R1[]D-W	25	CG	COG	7.1 p	±0.1pF,±0.25pF,±0.5pF	542	200	0.2±0.02	
MLAST042SCG7R2[WNA01 MLAST042SCG7R3[WNA01	TMK042 CG7R2□D-W TMK042 CG7R3□D-W	25 25	CG	C0G C0G	7.2 p 7.3 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	544 546	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG7R4[WNA01	TMK042 CG7R4[D-W	25	CG	COG	7.5 p	$\pm 0.1 \text{pF}, \pm 0.25 \text{pF}, \pm 0.5 \text{pF}$ $\pm 0.1 \text{pF}, \pm 0.25 \text{pF}, \pm 0.5 \text{pF}$	548	200	0.2±0.02	
MLAST042SCG7R5[]WNA01	TMK042 CG7R5∏D-W	25	CG	COG	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 MLAST042SCG7R8[]WNA01	TMK042 CG7R7□D-W TMK042 CG7R8□D-W	25 25	CG	C0G C0G	7.7 p 7.8 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	554 556	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG7R8[]WNA01	TMK042 CG7R9[D-W	25	CG	COG	7.8 p 7.9 p	±0.1pF,±0.25pF,±0.5pF ±0.1pF,±0.25pF,±0.5pF	558	200	0.2±0.02 0.2±0.02	
MLAST042SCG080[]WNA01	TMK042 CG080[]D-W	25	CG	COG	8 p	±0.1pF,±0.25pF,±0.5pF	560	200	0.2±0.02	
	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 C0G	8.3 p 8.4 p	± 0.1 pF, ± 0.25 pF, ± 0.5 pF ± 0.1 pF, ± 0.25 pF, ± 0.5 pF	566 568	200 200	0.2±0.02 0.2±0.02	
MLAST042SCG8R4□WNA01	TMK042 CG8R4∏D-W	25								
MLAST042SCG8R4[WNA01 MLAST042SCG8R5[WNA01	TMK042 CG8R4 D-W TMK042 CG8R5 D-W	25 25	CG	COG	8.5 p	±0.1pF,±0.25pF,±0.5pF	570	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/).

	Old part number	Rated voltage	Tempe	rature	Capacitance	0 "	Q	HTLT	*3 5 3	N
New part number	(for reference)	[V]	charact	eristics	[F]	Capacitance tolerance	(at 1MHz) (min)	Rated voltage x %	Thickness*3 [mm]	Note
MLAST042SCG8R8 WNA01	TMK042 CG8R8∏D-W	25	CG	COG	8.8 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	576	200	0.2 ± 0.02	
MLAST042SCG8R9 WNA01	TMK042 CG8R9∏D-W	25	CG	COG	8.9 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	578	200	0.2 ± 0.02	
MLAST042SCG090[]WNA01	TMK042 CG090□D-W	25	CG	COG	9 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	580	200	0.2 ± 0.02	
MLAST042SCG9R1 WNA01	TMK042 CG9R1 D-W	25	CG	COG	9.1 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	582	200	0.2 ± 0.02	
MLAST042SCG9R2[WNA01	TMK042 CG9R2□D-W	25	CG	COG	9.2 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	584	200	0.2 ± 0.02	
MLAST042SCG9R3[WNA01	TMK042 CG9R3∏D-W	25	CG	COG	9.3 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	586	200	0.2 ± 0.02	
MLAST042SCG9R4[]WNA01	TMK042 CG9R4 D-W	25	CG	C0G	9.4 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	588	200	0.2 ± 0.02	
MLAST042SCG9R5[]WNA01	TMK042 CG9R5∏D-W	25	CG	COG	9.5 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	590	200	0.2 ± 0.02	
MLAST042SCG9R6 WNA01	TMK042 CG9R6□D-W	25	CG	COG	9.6 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	592	200	0.2 ± 0.02	
MLAST042SCG9R7 WNA01	TMK042 CG9R7□D-W	25	CG	COG	9.7 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	594	200	0.2 ± 0.02	
MLAST042SCG9R8 WNA01	TMK042 CG9R8□D-W	25	CG	COG	9.8 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	596	200	0.2 ± 0.02	
MLAST042SCG9R9[]WNA01	TMK042 CG9R9∏D-W	25	CG	COG	9.9 p	$\pm 0.1 pF, \pm 0.25 pF, \pm 0.5 pF$	598	200	0.2 ± 0.02	
MLAST042SCG100DWNA01	TMK042 CG100DD-W	25	CG	COG	10 p	±0.5pF	600	200	0.2 ± 0.02	
MLAST042SCG110JWNA01	TMK042 CG110JD-W	25	CG	COG	11 p	±5%	620	200	0.2 ± 0.02	
MLAST042SCG120JWNA01	TMK042 CG120JD-W	25	CG	COG	12 p	±5%	640	200	0.2 ± 0.02	
MLAST042SCG130JWNA01	TMK042 CG130JD-W	25	CG	COG	13 p	±5%	660	200	0.2 ± 0.02	
MLAST042SCG150JWNA01	TMK042 CG150JD-W	25	CG	COG	15 p	±5%	700	200	0.2 ± 0.02	
MLAST042SCG160JWNA01	TMK042 CG160JC-W	25	CG	COG	16 p	±5%	720	200	0.2 ± 0.02	
MLAST042SCG180JWNA01	TMK042 CG180JC-W	25	CG	COG	18 p	±5%	760	200	0.2 ± 0.02	
MLAST042SCG200JWNA01	TMK042 CG200JC-W	25	CG	COG	20 p	±5%	800	200	0.2 ± 0.02	
MLAST042SCG220JWNA01	TMK042 CG220JC-W	25	CG	COG	22 p	±5%	840	200	0.2 ± 0.02	
MLAST042SCG240JWNA01	TMK042 CG240JC-W	25	CG	COG	24 p	±5%	880	200	0.2 ± 0.02	
MLAST042SCG270JWNA01	TMK042 CG270JC-W	25	CG	COG	27 p	±5%	940	200	0.2 ± 0.02	
MLAST042SCG300JWNA01	TMK042 CG300JC-W	25	CG	COG	30 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG330JWNA01	TMK042 CG330JC-W	25	CG	COG	33 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG360JWNA01	TMK042 CG360JC-W	25	CG	COG	36 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG390JWNA01	TMK042 CG390JC-W	25	CG	COG	39 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG430JWNA01	TMK042 CG430JC-W	25	CG	COG	43 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG470JWNA01	TMK042 CG470JC-W	25	CG	COG	47 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG510JWNA01	TMK042 CG510JC-W	25	CG	COG	51 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG560JWNA01	TMK042 CG560JC-W	25	CG	COG	56 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG620JWNA01	TMK042 CG620JC-W	25	CG	COG	62 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG680JWNA01	TMK042 CG680JC-W	25	CG	COG	68 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG750JWNA01	TMK042 CG750JC-W	25	CG	COG	75 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG820JWNA01	TMK042 CG820JC-W	25	CG	COG	82 p	±5%	1000	200	0.2 ± 0.02	
MLAST042SCG910JWNA01	TMK042 CG910JC-W	25	CG	COG	91 p	±5%	1000	200	0.2±0.02	
MLAST042SCG101JWNA01	TMK042 CG101JC-W	25	CG	COG	100 p	±5%	1000	200	0.2 ± 0.02	

N	Old part number	Rated voltage	Tempe	erature	Capacitance	0 3 11	Q	HTLT	*3.5.3	N
New part number	(for reference)	[V]	charact	eristics	[F]	Capacitance tolerance	(at 1MHz) (min)	Rated voltage x %	Thickness*3 [mm]	Note
MLASE042SCG0R4[]WNA01	EMK042 CG0R4[]D-W	16	CG	COG	0.4 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	408	200	0.2 ± 0.02	
MLASE042SCG0R5[]WNA01	EMK042 CG0R5[]D-W	16	CG	COG	0.5 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	410	200	0.2 ± 0.02	
MLASE042SCG0R6[]WNA01	EMK042 CG0R6 D-W	16	CG	COG	0.6 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	412	200	0.2 ± 0.02	
MLASE042SCG0R7[]WNA01	EMK042 CG0R7[]D-W	16	CG	COG	0.7 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	414	200	0.2 ± 0.02	
MLASE042SCGR75[]WNA01	EMK042 CGR75 D-W	16	CG	COG	0.75 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	415	200	0.2 ± 0.02	
MLASE042SCG0R8[]WNA01	EMK042 CG0R8 D-W	16	CG	C0G	0.8 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	416	200	0.2 ± 0.02	
MLASE042SCG0R9[]WNA01	EMK042 CG0R9[]D-W	16	CG	COG	0.9 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	418	200	0.2 ± 0.02	
MLASE042SCG010 WNA01	EMK042 CG010[]D-W	16	CG	COG	1 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	420	200	0.2 ± 0.02	
MLASE042SCG1R1[]WNA01	EMK042 CG1R1 D-W	16	CG	COG	1.1 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	422	200	0.2 ± 0.02	
MLASE042SCG1R2[]WNA01	EMK042 CG1R2[]D-W	16	CG	COG	1.2 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	424	200	0.2 ± 0.02	
MLASE042SCG1R3[]WNA01	EMK042 CG1R3[D-W	16	CG	COG	1.3 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	426	200	0.2 ± 0.02	
MLASE042SCG1R4[]WNA01	EMK042 CG1R4D-W	16	CG	COG	1.4 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	428	200	0.2 ± 0.02	
MLASE042SCG1R5[]WNA01	EMK042 CG1R5[]D-W	16	CG	COG	1.5 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	430	200	0.2 ± 0.02	
MLASE042SCG1R6[]WNA01	EMK042 CG1R6 D-W	16	CG	COG	1.6 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	432	200	0.2 ± 0.02	
MLASE042SCG1R7[]WNA01	EMK042 CG1R7[]D-W	16	CG	COG	1.7 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	434	200	0.2 ± 0.02	
MLASE042SCG1R8[]WNA01	EMK042 CG1R8 D-W	16	CG	COG	1.8 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	436	200	0.2 ± 0.02	
MLASE042SCG1R9[]WNA01	EMK042 CG1R9D-W	16	CG	COG	1.9 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	438	200	0.2 ± 0.02	
MLASE042SCG020 WNA01	EMK042 CG020[]D-W	16	CG	COG	2 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	440	200	0.2 ± 0.02	
MLASE042SCG2R1[]WNA01	EMK042 CG2R1□D-W	16	CG	COG	2.1 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	442	200	0.2 ± 0.02	
MLASE042SCG2R2[]WNA01	EMK042 CG2R2[]D-W	16	CG	COG	2.2 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	444	200	0.2 ± 0.02	
MLASE042SCG2R3[]WNA01	EMK042 CG2R3[]D-W	16	CG	COG	2.3 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	446	200	0.2 ± 0.02	
MLASE042SCG2R4[]WNA01	EMK042 CG2R4[]D-W	16	CG	COG	2.4 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	448	200	0.2 ± 0.02	
MLASE042SCG2R5[]WNA01	EMK042 CG2R5[]D-W	16	CG	COG	2.5 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	450	200	0.2 ± 0.02	
MLASE042SCG2R6[]WNA01	EMK042 CG2R6 D-W	16	CG	COG	2.6 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	452	200	0.2 ± 0.02	
MLASE042SCG2R7[]WNA01	EMK042 CG2R7[]D-W	16	CG	COG	2.7 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	454	200	0.2 ± 0.02	
MLASE042SCG2R8[]WNA01	EMK042 CG2R8 D-W	16	CG	COG	2.8 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	456	200	0.2 ± 0.02	
MLASE042SCG2R9[]WNA01	EMK042 CG2R9∏D-W	16	CG	COG	2.9 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	458	200	0.2 ± 0.02	
MLASE042SCG030 WNA01	EMK042 CG030[]D-W	16	CG	COG	3 p	$\pm 0.05 pF, \pm 0.1 pF, \pm 0.25 pF$	460	200	0.2 ± 0.02	
MLASE042SCG3R1[]WNA01	EMK042 CG3R1 D-W	16	CG	COG	3.1 p	$\pm 0.1 pF, \pm 0.25 pF$	462	200	0.2 ± 0.02	
MLASE042SCG3R2[]WNA01	EMK042 CG3R2[]D-W	16	CG	COG	3.2 p	$\pm 0.1 pF, \pm 0.25 pF$	464	200	0.2 ± 0.02	
MLASE042SCG3R3[]WNA01	EMK042 CG3R3[]D-W	16	CG	COG	3.3 p	$\pm 0.1 pF, \pm 0.25 pF$	466	200	0.2 ± 0.02	
MLASE042SCG3R4[]WNA01	EMK042 CG3R4[]D-W	16	CG	COG	3.4 p	$\pm 0.1 pF, \pm 0.25 pF$	468	200	0.2 ± 0.02	
MLASE042SCG3R5[]WNA01	EMK042 CG3R5[]D-W	16	CG	COG	3.5 p	±0.1pF,±0.25pF	470	200	0.2 ± 0.02	
MLASE042SCG3R6[]WNA01	EMK042 CG3R6 D-W	16	CG	COG	3.6 p	±0.1pF,±0.25pF	472	200	0.2 ± 0.02	
MLASE042SCG3R7[]WNA01	EMK042 CG3R7[]D-W	16	CG	COG	3.7 p	$\pm 0.1 pF, \pm 0.25 pF$	474	200	0.2 ± 0.02	
MLASE042SCG3R8[]WNA01	EMK042 CG3R8 D-W	16	CG	COG	3.8 p	$\pm 0.1 pF, \pm 0.25 pF$	476	200	0.2 ± 0.02	
MLASE042SCG3R9[]WNA01	EMK042 CG3R9[]D-W	16	CG	COG	3.9 p	$\pm 0.1 pF, \pm 0.25 pF$	478	200	0.2 ± 0.02	
MLASE042SCG040 WNA01	EMK042 CG040[]D-W	16	CG	COG	4 p	$\pm 0.1 pF, \pm 0.25 pF$	480	200	0.2 ± 0.02	
MLASE042SCG4R1[]WNA01	EMK042 CG4R1[]D-W	16	CG	C0G	4.1 p	$\pm 0.1 pF, \pm 0.25 pF$	482	200	0.2 ± 0.02	
MLASE042SCG4R2[]WNA01	EMK042 CG4R2[]D-W	16	CG	COG	4.2 p	±0.1pF,±0.25pF	484	200	0.2±0.02	
MLASE042SCG4R3[]WNA01	EMK042 CG4R3[]D-W	16	CG	COG	4.3 p	±0.1pF,±0.25pF	486	200	0.2±0.02	
MLASE042SCG4R4[]WNA01	EMK042 CG4R4[]D-W	16	CG	COG	4.4 p	±0.1pF,±0.25pF	488	200	0.2±0.02	
MLASE042SCG4R5[]WNA01	EMK042 CG4R5[]D-W	16	CG	COG	4.5 p	±0.1pF,±0.25pF	490	200	0.2±0.02	
MLASE042SCG4R6[]WNA01	EMK042 CG4R6[]D-W	16	CG	COG	4.6 p	±0.1pF,±0.25pF	492	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/).

MARCH MARCH MARCH CONTROL MARCH MA	New part number	Old part number (for reference)	Rated voltage [V]		erature teristics	Capacitance [F]	Capacitance tolerance	Q (at 1MHz)	HTLT	Thickness*3 [mm]	Note
MASSESCORES MARCH MARCH CORNELL 7. 18	MI 4 050 400 00 4 D75 WALA 04						104 5 1005 5		_	0.0 1.0 00	
MASSESSORIENT MANY COUNTY MASS											
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MASSESSCORE DIVIDATE INVESTIGATION THE CO. CO. CO. S. 4.0 pt. 20											
MARSENGESCORPIT MARKE											
MARGHESCORIED MARGE MARG											
MASCHESCOGNET MASCH 1											
MASCHESCOSTINI NAME MASCH SCORES W 16 CC CGG 18 p ±0 pt ±0.05pt ±0.05pt 18 200 0.2±0.02											
MASCHESSCORIED WAR											
MASCHESCOMPT MANUAL MONTE CORREST 1											
MASSEGGGREF MANOL MASSEGGGREF DW 18											
MASSESSCORES MANORE COGERS D.W. 18											
MASEQUESCORIES MANOR MACRO CORPE M. 18											
MASSQUESCORRES WAMD MASQUESCORRES D-W 16											
MASSEGSCORES MANUAL MASSEGSCORES M. 16											
MASEGSGORFINNAD MASEGSGORFINNAD MASEGSGORFIN											
MASE045CORRETINATION EMROGY CORPEI]D-W 16											
MASSESSCORES WAND MANGE COGNIGO W 16											
MASEGSGORPH WAND EMKOUZ CORPRI]D-W 16											
MASEGSSCORT MANADI EMRKGQ CGRYT D=W 16											
MLASENSSCORT INNAIO MLOSE CORTE] D-W 16											
MLASENSCOTRE WINDOI MMONE CORTRE D=W 16 CG COG 7.2 p ±0.1 p ±0.25 p ±0.5 p ±0.5 p ±0.2											
MLASENSSCOTRI] MINOSE COTRE] D-W 16 CG COG 7.3 p ±0.1 p ±0.2 p ±0.5 p											
MLASBESSCORT WARD EMMONE COFREID-W 16											
MLASE042SCGFRE(]WARD MEMOGE CGFRE(]D-W 16 CG COG 7.5 p d. 10 pf. ±10.25pf. ±0.5pf 552 200 0.2±0.02											
MLASEGASCORFE WAN-01 MINCAY COPRE D-W 16											
MLASE042SCG7FT WAND1 MMCQ4C CG7FE D-W 16											
MLASEQUEZGOTRS WAND EMKOLQ CORRE D—W 16											
MLASEQUESCORING EMROLEQ CORRES D-W											
MLASEQUESCOGRO[]WAND EMKOUZ CORRE] D=W 16											
MLASER/ASCOGRE/[WAND] EMNO/A CORRET[D-W 16 CG COG 8.1 p ±01pf-102pf-103pf 564 200 0.2±0.02											
MLASER/28CGGREZ/[WHAD]											
MLASER/USCOGRRS(]WAND EMKOUZ CORREST)D-W 16											
MLASEQUESCOGREQIMMAD1 EMMORQ COGRRIDID-W 16											
MLASEQUESCOBRE]\text{WADISCOBRE}											
MLASEGYSCOSRG\[MAN01 EMMOY2 COSRR\[D-W 16											
MLASEPUZSCGRR] [MANO] EMROJ2 CORRRI] D-W 16 CG COO 8.7 p ±0.1p±±0.2p=±0.5p= 574 200 0.2±0.02											
MLASECH2SCGGRR[]\max\rightarrow											
MLASE042SC0690[MMAD] EMRO42 C0390[D—W 16											
MLASE042SC098FT WAND EMMQ42 CG98FT D—W 16											
MLASE042SCG9RT_WAND EMK042 CG9RT_D-W											
MLASE042SCG98R3 WANAI MMO42 CG98R3 D-W 16 CG COG 9.2 p ± 0.1 pf ± 0.2 sp ± 4.0 pf ± 5.8 pf ± 5.											
BLASE042SCG9R4[]WNAOI EMK042 CG9R5[]D-W 16 CG COG 9.3 p ± 0.1pf.±0.25pf.±0.5pf 586 200 0.2±0.02											
MLASE042SCG9R5 WNA01 EMK042 CG9R4 D-W 16											
MLASE042SCG9RS[]WAND1											
MLASE042SCG9RE[]WNAD1											
MLASE042SCG9RF[]mVAND1											
MLASE042SCG3R8E WNA01 EMK042 CG9R8 D-W 16 CG COG 9.8 p ±0.1pf.±0.25pf.±0.5pf 598 200 0.2±0.02											
MLASE042SCG190DWNA01											
MLASE042SGG110,DWNA01											
MLASE042SCG110,JWNA01 EMK042 CG110,JD-W 16											
MLASE042SCG120JWNA01 EMK042 CG120JD−W 16 CG COG 12 p ±596 640 200 0.2±0.02 MLASE042SCG130JWNA01 EMK042 CG130JD−W 16 CG COG 15 p ±596 660 200 0.2±0.02 MLASE042SCG150JWNA01 EMK042 CG150JD−W 16 CG COG 16 p ±596 700 200 0.2±0.02 MLASE042SCG150JWNA01 EMK042 CG160JC−W 16 CG COG 16 p ±596 720 200 0.2±0.02 MLASE042SCG20JWNA01 EMK042 CG26JGC-W 16 CG COG 16 p ±596 720 200 0.2±0.02 MLASE042SCG22JWNA01 EMK042 CG22JUC−W 16 CG COG 20 p ±596 800 200 0.2±0.02 MLASE042SCG22JWNA01 EMK042 CG24JUC−W 16 CG COG 22 p ±596 800 200 0.2±0.02 MLASE042SCG27JWNA01 EMK042 CG27JUC−W 16 CG COG 22 p ±596 8											
MLASE042SCG130JWNA01 EMK042 CG130JD-W											
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MLASE042SCG200JWNA01 EMK042 CG200JC-W 16 CG C0G 20 p ±5% 800 200 0.2±0.02											
MLASE042SCG220JWNA01 EMK042 CG220JC-W 16 CG C0G 22 p ±5% 840 200 0.2±0.02											
MLASE042SCG240JWNA01											
MLASE042SCG270JWNA01 EMK042 CG270JC-W 16 CG C0G 27 p ±5% 940 200 0.2±0.02											
MLASE042SCG300JWNA01 EMK042 CG300JC-W 16 CG C0G 30 p ±5% 1000 200 0.2±0.02 MLASE042SCG3330JWNA01 EMK042 CG330JC-W 16 CG C0G 33 p ±5% 1000 200 0.2±0.02 MLASE042SCG360JWNA01 EMK042 CG360JC-W 16 CG C0G 36 p ±5% 1000 200 0.2±0.02 MLASE042SCG390JWNA01 EMK042 CG390JC-W 16 CG C0G 39 p ±5% 1000 200 0.2±0.02 MLASE042SCG430JWNA01 EMK042 CG430JC-W 16 CG C0G 43 p ±5% 1000 200 0.2±0.02 MLASE042SCG470JWNA01 EMK042 CG430JC-W 16 CG C0G 47 p ±5% 1000 200 0.2±0.02 MLASE042SCG510JWNA01 EMK042 CG560JC-W 16 CG C0G 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG620JWNA01 EMK042 CG560JC-W 16 CG C0G 56 p ±5% <	-										
MLASE042SCG330JWNA01 EMK042 CG330JC-W 16 CG COG 33 p ±5% 1000 200 0.2±0.02 MLASE042SCG360JWNA01 EMK042 CG360JC-W 16 CG COG 36 p ±5% 1000 200 0.2±0.02 MLASE042SCG390JWNA01 EMK042 CG390JC-W 16 CG COG 39 p ±5% 1000 200 0.2±0.02 MLASE042SCG430JWNA01 EMK042 CG430JC-W 16 CG COG 43 p ±5% 1000 200 0.2±0.02 MLASE042SCG470JWNA01 EMK042 CG470JC-W 16 CG COG 47 p ±5% 1000 200 0.2±0.02 MLASE042SCG510JWNA01 EMK042 CG510JC-W 16 CG COG 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG COG 56 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG COG 68 p ±5% <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>											
MLASE042SCG360JWNA01											
MLASE042SCG390JWNA01 EMK042 CG390JC-W 16 CG C0G 39 p ±5% 1000 200 0.2±0.02 MLASE042SCG430JWNA01 EMK042 CG430JC-W 16 CG C0G 43 p ±5% 1000 200 0.2±0.02 MLASE042SCG470JWNA01 EMK042 CG470JC-W 16 CG C0G 47 p ±5% 1000 200 0.2±0.02 MLASE042SCG510JWNA01 EMK042 CG510JC-W 16 CG C0G 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG C0G 56 p ±5% 1000 200 0.2±0.02 MLASE042SCG682JWNA01 EMK042 CG620JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG688JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% <td< td=""><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	-										
MLASE042SCG430JWNA01 EMK042 CG430JC-W 16 CG C0G 43 p ±5% 1000 200 0.2±0.02 MLASE042SCG470JWNA01 EMK042 CG470JC-W 16 CG C0G 47 p ±5% 1000 200 0.2±0.02 MLASE042SCG510JWNA01 EMK042 CG510JC-W 16 CG C0G 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG C0G 56 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG620JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG320JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>											
MLASE042SCG470JWNA01 EMK042 CG470JC-W 16 CG C0G 47 p ±5% 1000 200 0.2±0.02 MLASE042SCG510JWNA01 EMK042 CG510JC-W 16 CG C0G 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG620JWNA01 EMK042 CG620JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG820JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>											
MLASE042SCG510JWNA01 EMK042 CG510JC-W 16 CG C0G 51 p ±5% 1000 200 0.2±0.02 MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG C0G 56 p ±5% 1000 200 0.2±0.02 MLASE042SCG620JWNA01 EMK042 CG620JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG820JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>											
MLASE042SCG560JWNA01 EMK042 CG560JC-W 16 CG C0G 56 p ±5% 1000 200 0.2±0.02 MLASE042SCG620JWNA01 EMK042 CG620JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG320JWNA01 EMK042 CG750JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG920JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG21JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% <td< td=""><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	-										
MLASE042SCG620JWNA01 EMK042 CG620JC-W 16 CG C0G 62 p ±5% 1000 200 0.2±0.02 MLASE042SCG6880JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG320JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG101JWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG21JWNA01 EMK042 CG241JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5%											
MLASE042SCG680JWNA01 EMK042 CG680JC-W 16 CG C0G 68 p ±5% 1000 200 0.2±0.02 MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG820JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG101JWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG241JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 240 p ±5%											
MLASE042SCG750JWNA01 EMK042 CG750JC-W 16 CG C0G 75 p ±5% 1000 200 0.2±0.02 MLASE042SCG820JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG10JJWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5%											
MLASE042SCG820JWNA01 EMK042 CG820JC-W 16 CG C0G 82 p ±5% 1000 200 0.2±0.02 MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG101JWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02											
MLASE042SCG910JWNA01 EMK042 CG910JC-W 16 CG C0G 91 p ±5% 1000 200 0.2±0.02 MLASE042SCG101JWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5% 1000 200 0.2±0.02											
MLASE042SCG101JWNA01 EMK042 CG101JC-W 16 CG C0G 100 p ±5% 1000 200 0.2±0.02 MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG241JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5% 1000 200 0.2±0.02											
MLASE042SCG221JWNA01 EMK042 CG221JC-W 16 CG C0G 220 p ±5% 1000 200 0.2±0.02 MLASE042SCG241JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5% 1000 200 0.2±0.02											
MLASE042SCG241JWNA01 EMK042 CG241JC-W 16 CG C0G 240 p ±5% 1000 200 0.2±0.02 MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5% 1000 200 0.2±0.02											
MLASE042SCG271JWNA01 EMK042 CG271JC-W 16 CG C0G 270 p ±5% 1000 200 0.2±0.02											
MLASE042SCG331JWNA01 EMK042 CG331JC-W 16 CG C0G 330 p ±5% 1000 200 0.2±0.02											
	MLASE042SCG331JWNA01	EMK042 CG331JC-W	16	CG	C0G	330 p	±5%	1000	200	0.2 ± 0.02	

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●0603TYPE

[Temperature Characteristic CH : CH/C0H($-55\sim+125^{\circ}$ C)] 0.3mm thickness

	Old part number	Rated voltage		erature	Capacitance	0 3 11	Q	HTLT	*3 5 3	N
New part number	(for reference)	[V]	charact	eristics	[F]	Capacitance tolerance	(at 1MHz) (min)	Rated voltage x %	Thickness*3 [mm]	Note
MLASU063SCH200JFNA01	UMK063 CH200JT-F	50	СН	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	СН	C0H	1000 p	±5%	1000	200	0.3±0.03	

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

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

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Low distortion design/Audible/Good bias Multilayer Ceramic Capacitors (CFCAP) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

●1005TYPE

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 0.5mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	inickness [mm]	Note
MLAYU105SSD391KFNA01	UMK105 SD391KV-F	50	Standard Type	390 p	±10	0.1	200	0.5 ± 0.05	
MLAYU105SSD471KFNA01	UMK105 SD471KV-F	50	Standard Type	470 p	±10	0.1	200	0.5 ± 0.05	
MLAYU105SSD561KFNA01	UMK105 SD561KV-F	50	Standard Type	560 p	±10	0.1	200	0.5 ± 0.05	
MLAYT105SSD681KFNA01	TMK105 SD681KV-F	25	Standard Type	680 p	±10	0.1	200	0.5 ± 0.05	
MLAYT105SSD821KFNA01	TMK105 SD821KV-F	25	Standard Type	820 p	±10	0.1	200	0.5 ± 0.05	
MLAYT105SSD102KFNA01	TMK105 SD102KV-F	25	Standard Type	1000 p	±10	0.1	200	0.5 ± 0.05	
MLAYT105SSD122KFNA01	TMK105 SD122KV-F	25	Standard Type	1200 p	±10	0.1	200	0.5 ± 0.05	
MLAYE105SSD152KFNA01	EMK105 SD152KV-F	16	Standard Type	1500 p	±10	0.1	200	0.5 ± 0.05	
MLAYE105SSD182KFNA01	EMK105 SD182KV-F	16	Standard Type	1800 p	±10	0.1	200	0.5 ± 0.05	
MLAYE105SSD222KFNA01	EMK105 SD222KV-F	16	Standard Type	2200 p	±10	0.1	200	0.5 ± 0.05	
MLAYE105SSD272KFNA01	EMK105 SD272KV-F	16	Standard Type	2700 p	±10	0.1	200	0.5 ± 0.05	
MLAYL105SSD332KFNA01	LMK105 SD332KV-F	10	Standard Type	3300 p	±10	0.1	200	0.5 ± 0.05	
MLAYL105SSD392KFNA01	LMK105 SD392KV-F	10	Standard Type	3900 p	±10	0.1	200	0.5 ± 0.05	
MLAYL105SSD472KFNA01	LMK105 SD472KV-F	10	Standard Type	4700 p	±10	0.1	200	0.5 ± 0.05	

[Temperature Characteristic SD : Standard (-55 \sim +125 °C)] 0.3mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYL1L3YSD152KFNA01	LMK105 SD152KP-F	10	Standard Type	1500 p	±10	0.1	200	0.3 ± 0.03	<u>.</u>
MLAYJ1L3YSD272KFNA01	JMK105 SD272KP-F	6.3	Standard Type	2700 p	±10	0.1	200	0.3 ± 0.03	<u> </u>

●1608TYPE

[Temperature Characteristic SD : Standard $(-55 \sim +125 ^{\circ}\text{C})$] 0.8mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness [min]	14000
MLAYU168SSD102KTNA01	UMK107 SD102KA-T	50	Standard Type	1000 p	±10	0.1	200	0.8 ± 0.10	
MLAYU168SSD122KTNA01	UMK107 SD122KA-T	50	Standard Type	1200 p	±10	0.1	200	0.8±0.10	
MLAYU168SSD152KTNA01	UMK107 SD152KA-T	50	Standard Type	1500 p	±10	0.1	200	0.8±0.10	
MLAYU168SSD182KTNA01	UMK107 SD182KA-T	50	Standard Type	1800 p	±10	0.1	200	0.8 ± 0.10	
MLAYU168SSD222KTNA01	UMK107 SD222KA-T	50	Standard Type	2200 p	±10	0.1	200	0.8 ± 0.10	
MLAYU168SSD272KTNA01	UMK107 SD272KA-T	50	Standard Type	2700 p	±10	0.1	200	0.8±0.10	
MLAYU168SSD332KTNA01	UMK107 SD332KA-T	50	Standard Type	3300 p	±10	0.1	200	0.8±0.10	
MLAYT168SSD392KTNA01	TMK107 SD392KA-T	25	Standard Type	3900 p	±10	0.1	200	0.8±0.10	
MLAYT168SSD472KTNA01	TMK107 SD472KA-T	25	Standard Type	4700 p	±10	0.1	200	0.8±0.10	
MLAYE168SSD562KTNA01	EMK107 SD562KA-T	16	Standard Type	5600 p	±10	0.1	200	0.8 ± 0.10	
MLAYE168SSD682KTNA01	EMK107 SD682KA-T	16	Standard Type	6800 p	±10	0.1	200	0.8 ± 0.10	<u>.</u>
MLAYE168SSD822KTNA01	EMK107 SD822KA-T	16	Standard Type	8200 p	±10	0.1	200	0.8 ± 0.10	
MLAYE168SSD103KTNA01	EMK107 SD103KA-T	16	Standard Type	0.01 μ	±10	0.1	200	0.8 ± 0.10	<u>.</u>
MLAYL168SSD123KTNA01	LMK107 SD123KA-T	10	Standard Type	0.012 μ	±10	0.1	200	0.8±0.10	
MLAYL168SSD153KTNA01	LMK107 SD153KA-T	10	Standard Type	0.015 μ	±10	0.1	200	0.8±0.10	
MLAYL168SSD183KTNA01	LMK107 SD183KA-T	10	Standard Type	0.018 μ	±10	0.1	200	0.8±0.10	
MLAYL168SSD223KTNA01	LMK107 SD223KA-T	10	Standard Type	0.022μ	±10	0.1	200	0.8 ± 0.10	

2012TYPE

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYG21GSSD183KTNA01	GMK212 SD183KG-T	35	Standard Type	0.018 μ	±10	0.1	200	1.25±0.10	
MLAYG21GSSD223KTNA01	GMK212 SD223KG-T	35	Standard Type	0.022μ	±10	0.1	200	1.25±0.10	
MLAYG21GSSD273KTNA01	GMK212 SD273KG-T	35	Standard Type	0.027 μ	±10	0.1	200	1.25±0.10	
MLAYL21GSSD683KTNA01	LMK212 SD683KG-T	10	Standard Type	0.068 μ	±10	0.1	200	1.25±0.10	
MLAYL21GSSD823KTNA01	LMK212 SD823KG-T	10	Standard Type	0.082 μ	±10	0.1	200	1.25±0.10	
MLAYL21GSSD104KTNA01	LMK212 SD104KG-T	10	Standard Type	0.1 μ	±10	0.1	200	1.25±0.10	

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 0.85mm thickness

New part number		Rated voltage	Temperature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	THIORNIOSS [HIII]	
MLAYU219SSD392KTNA01	UMK212 SD392KD-T	50	Standard Type	3900 р	±10	0.1	200	0.85±0.10	
MLAYU219SSD472KTNA01	UMK212 SD472KD-T	50	Standard Type	4700 p	±10	0.1	200	0.85±0.10	
MLAYU219SSD562KTNA01	UMK212 SD562KD-T	50	Standard Type	5600 p	±10	0.1	200	0.85±0.10	
MLAYU219SSD682KTNA01	UMK212 SD682KD-T	50	Standard Type	6800 p	±10	0.1	200	0.85±0.10	
MLAYU219SSD822KTNA01	UMK212 SD822KD-T	50	Standard Type	8200 p	±10	0.1	200	0.85±0.10	
MLAYU219SSD103KTNA01	UMK212 SD103KD-T	50	Standard Type	0.01 μ	±10	0.1	200	0.85±0.10	
MLAYG219SSD123KTNA01	GMK212 SD123KD-T	35	Standard Type	0.012 μ	±10	0.1	200	0.85±0.10	
MLAYG219SSD153KTNA01	GMK212 SD153KD-T	35	Standard Type	0.015 μ	±10	0.1	200	0.85±0.10	
MLAYE219SSD333KTNA01	EMK212 SD333KD-T	16	Standard Type	0.033μ	±10	0.1	200	0.85±0.10	
MLAYL219SSD473KTNA01	LMK212 SD473KD-T	10	Standard Type	0.047μ	±10	0.1	200	0.85±0.10	

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●3216TYPE

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 1.6mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness ^{*3} [mm]	Note
MLAYT31LSSD823KTNA01	TMK316 SD823KL-T	25	Standard Type	0.082 μ	±10	0.1	200	1.6±0.20	
MLAYT31LSSD104KTNA01	TMK316 SD104KI -T	25	Standard Type	0.1 //	+10	0.1	200	16+020	

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	Note
MLAYG31QHSD333KTNA01	GMK316 SD333KF-T	35	Standard Type	0.033 μ	±10	0.1	200	1.15±0.10	
MLAYG31QHSD393KTNA01	GMK316 SD393KF-T	35	Standard Type	0.039 μ	±10	0.1	200	1.15±0.10	
MLAYT31QHSD473KTNA01	TMK316 SD473KF-T	25	Standard Type	0.047 μ	±10	0.1	200	1.15±0.10	
MLAYT31QHSD563KTNA01	TMK316 SD563KF-T	25	Standard Type	0.056μ	±10	0.1	200	1.15±0.10	
MLAYT31QHSD683KTNA01	TMK316 SD683KF-T	25	Standard Type	0.068μ	±10	0.1	200	1.15±0.10	

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Low distortion design/Audible/Good bias Multilayer Ceramic Capacitors (CF LD) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

●1608TYPE

[Temperature Characteristic LD : $X5R(-55 \sim +85^{\circ}C)$] 0.8mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe characte		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYU168BLD224 TNA01	UMK107BLD224[]A-T	50		X5R	0.22 μ	±10, ±20	10	150	0.8+0.20/-0	
MLAYT168BLD474[]TNA01	TMK107BLD474∏A-T	25		X5R	0.47 μ	±10, ±20	10	150	0.8+0.20/-0	
MLAYT168BLD105[]TNA01	TMK107BLD105∏A-T	25		X5R	1 μ	±10, ±20	10	150	0.8+0.20/-0	

2012TYPE

[Temperature Characteristic LD: X5R(-55~+85°C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYG21GSLD105[]TNA01	GMK212 LD105[]G-T	35		X5R	1 μ	±10, ±20	10	150	1.25±0.10	
MLAYG21GBLD225[]TNA01	GMK212BLD225[]G-T	35		X5R	2.2 μ	±10, ±20	10	150	1.25+0.20/-0	

●3216TYPE

[Temperature Characteristic LD : $X5R(-55 \sim +85^{\circ}C)$] 1.6mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperat characteris		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYU31LSLD105[]TNA01	UMK316 LD105□L-T	50		X5R	1 μ	±10, ±20	10	150	1.6±0.20	
MLAYG31LBLD475 TNA01	GMK316BLD475[]L-T	35		X5R	4.7 μ	±10, ±20	10	150	1.6±0.30	-
MLAYT31LBLD106∏TNA01	TMK316BLD106□L-T	25		X5R	10 μ	±10, ±20	10	150	1.6±0.30	

■3225TYPE

[Temperature Characteristic LD : $X5R(-55 \sim +85^{\circ}C)$] 1.9mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLAYU32NSLD105[]TNA01	UMK325 LD105∏N-T	50		X5R	1 μ	±10, ±20	10	200	1.9 ± 0.20	

[Temperature Characteristic LD : X5R(-55~+85°C)] 2.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe characte		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
MLAYU32MSLD475 PNA01	UMK325 LD475∏M-P	50		X5R	4.7 μ	±10, ±20	10	200	2.5±0.20		•

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Medium-High Voltage Multilayer Ceramic Capacitors for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

●1005TYPE

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 0.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
MLASH105SB7221[]FNA01	HMK105 B7221 ŪV-F	100	X7R	220 p	±10, ±20	2.5	200	0.5±0.05		
MLASH105SB7331 FNA01	HMK105 B7331 ŪV-F	100	X7R	330 р	±10, ±20	2.5	200	0.5±0.05	<u> </u>	
MLASH105SB7471[]FNA01	HMK105 B7471[]V-F	100	X7R	470 p	±10, ±20	2.5	200	0.5±0.05		
MLASH105SB7681[[FNA01	HMK105 B7681 ŪV-F	100	X7R	680 p	±10, ±20	2.5	200	0.5 ± 0.05		
MLASH105SB7102[FNA01	HMK105 B7102 U-F	100	X7R	1000 p	±10, ±20	2.5	200	0.5 ± 0.05		
MLASH105SB7152[[FNA01	HMK105 B7152□V-F	100	X7R	1500 p	±10, ±20	2.5	200	0.5 ± 0.05		
MLASH105SB7222[]FNA01	HMK105 B7222 ŪV-F	100	X7R	2200 p	±10, ±20	2.5	200	0.5 ± 0.05		
MLASH105SB7332[]FNA01	HMK105 B7332 ŪV-F	100	X7R	3300 p	±10, ±20	2.5	200	0.5 ± 0.05		
MLASH105SB7472[FNA01	HMK105 B7472 U-F	100	X7R	4700 p	±10, ±20	2.5	200	0.5 ± 0.05		

[Temperature Characteristic CH : CH/C0H($-55\sim+125^{\circ}$ C)] 0.5mm thickness

New part number	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	Q (at 1MHz)	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	Capacitance tolerance	(min)	Rated voltage x %	Inickness [mm]	Note
MLASH105SCH080DFNA01	HMK105 CH080DV-F	100	CH	C0H	8 p	±0.5pF	560	200	0.5±0.05	
MLASH105SCH090DFNA01	HMK105 CH090DV-F	100	CH	C0H	9 p	±0.5pF	580	200	0.5±0.05	
MLASH105SCH100DFNA01	HMK105 CH100DV-F	100	CH	C0H	10 p	±0.5pF	600	200	0.5±0.05	
MLASH105SCH120JFNA01	HMK105 CH120JV-F	100	CH	C0H	12 p	±5%	640	200	0.5±0.05	
MLASH105SCH150JFNA01	HMK105 CH150JV-F	100	CH	C0H	15 p	±5%	700	200	0.5±0.05	
MLASH105SCH180JFNA01	HMK105 CH180JV-F	100	CH	C0H	18 p	±5%	760	200	0.5±0.05	
MLASH105SCH220JFNA01	HMK105 CH220JV-F	100	CH	C0H	22 p	±5%	840	200	0.5 ± 0.05	
MLASH105SCH240JFNA01	HMK105 CH240JV-F	100	CH	C0H	24 p	±5%	880	200	0.5 ± 0.05	
MLASH105SCH270JFNA01	HMK105 CH270JV-F	100	CH	C0H	27 p	±5%	940	200	0.5 ± 0.05	
MLASH105SCH330JFNA01	HMK105 CH330JV-F	100	CH	C0H	33 p	±5%	1000	200	0.5 ± 0.05	
MLASH105SCH390JFNA01	HMK105 CH390JV-F	100	CH	C0H	39 p	±5%	1000	200	0.5 ± 0.05	
MLASH105SCH470JFNA01	HMK105 CH470JV-F	100	CH	C0H	47 p	±5%	1000	200	0.5±0.05	
MLASH105SCH560JFNA01	HMK105 CH560JV-F	100	CH	C0H	56 p	±5%	1000	200	0.5±0.05	
MLASH105SCH680JFNA01	HMK105 CH680JV-F	100	CH	C0H	68 p	±5%	1000	200	0.5 ± 0.05	
MLASH105SCH820JFNA01	HMK105 CH820JV-F	100	CH	C0H	82 p	±5%	1000	200	0.5 ± 0.05	
MLASH105SCH101JFNA01	HMK105 CH101JV-F	100	CH	C0H	100 p	±5%	1000	200	0.5±0.05	

[Temperature Characteristic CG: CG/C0G($-55\sim+125^{\circ}$ C)] 0.5mm thickness

Temperature official control of the										
New part number	Old part number (for reference)	Rated voltage [V]		erature ceristics	Capacitance [F]	Capacitance tolerance	Q (at 1MHz) (min)	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH105SCG080DFNA01	HMK105 CG080DV-F	100	CG	COG	8 p	±0.5pF	560	200	0.5±0.05	
MLASH105SCG090DFNA01	HMK105 CG090DV-F	100	CG	COG	9 p	±0.5pF	580	200	0.5±0.05	
MLASH105SCG100DFNA01	HMK105 CG100DV-F	100	CG	COG	10 p	±0.5pF	600	200	0.5±0.05	
MLASH105SCG120JFNA01	HMK105 CG120JV-F	100	CG	COG	12 p	±5%	640	200	0.5±0.05	
MLASH105SCG150JFNA01	HMK105 CG150JV-F	100	CG	COG	15 p	±5%	700	200	0.5±0.05	
MLASH105SCG180JFNA01	HMK105 CG180JV-F	100	CG	C0G	18 p	±5%	760	200	0.5±0.05	
MLASH105SCG220JFNA01	HMK105 CG220JV-F	100	CG	COG	22 p	±5%	840	200	0.5±0.05	
MLASH105SCG240JFNA01	HMK105 CG240JV-F	100	CG	COG	24 p	±5%	880	200	0.5±0.05	
MLASH105SCG270JFNA01	HMK105 CG270JV-F	100	CG	COG	27 p	±5%	940	200	0.5±0.05	
MLASH105SCG330JFNA01	HMK105 CG330JV-F	100	CG	COG	33 p	±5%	1000	200	0.5±0.05	
MLASH105SCG390JFNA01	HMK105 CG390JV-F	100	CG	COG	39 p	±5%	1000	200	0.5±0.05	
MLASH105SCG470JFNA01	HMK105 CG470JV-F	100	CG	COG	47 p	±5%	1000	200	0.5±0.05	
MLASH105SCG560JFNA01	HMK105 CG560JV-F	100	CG	COG	56 p	±5%	1000	200	0.5±0.05	
MLASH105SCG680JFNA01	HMK105 CG680JV-F	100	CG	C0G	68 p	±5%	1000	200	0.5±0.05	
MLASH105SCG820JFNA01	HMK105 CG820JV-F	100	CG	C0G	82 p	±5%	1000	200	0.5±0.05	
MLASH105SCG101JFNA01	HMK105 CG101JV-F	100	CG	COG	100 p	±5%	1000	200	0.5±0.05	

●1608TYPE

[Temperature Characteristic B5(BJ): $B(-25\sim+85^{\circ}C)/X5R(-55\sim+85^{\circ}C)$] 0.8mm thickness

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New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact	erature eristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH168SB5102[]TNA01	HMK107 BJ102□A-T	100	В	X5R*1	1000 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5152[]TNA01	HMK107 BJ152□A-T	100	В	X5R*1	1500 p	±10, ±20	3.5	200	0.8±0.10	-
MLASH168SB5222[TNA01	HMK107 BJ222∏A-T	100	В	X5R*1	2200 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5332[]TNA01	HMK107 BJ332∏A-T	100	В	X5R*1	3300 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5472[]TNA01	HMK107 BJ472∏A-T	100	В	X5R*1	4700 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5682[]TNA01	HMK107 BJ682∏A-T	100	В	X5R*1	6800 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5103[]TNA01	HMK107 BJ103∏A-T	100	В	X5R*1	0.01 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5153[]TNA01	HMK107 BJ153∏A-T	100	В	X5R*1	0.015 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5223[]TNA01	HMK107 BJ223∏A-T	100	В	X5R*1	0.022μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5333 TNA01	HMK107 BJ333∏A-T	100	В	X5R*1	0.033μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5473[]TNA01	HMK107 BJ473∏A-T	100	В	X5R*1	0.047 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5104[]TNA01	HMK107 BJ104□A-T	100	В	X5R*1	0.1 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB5224[]TCA01	HMK107 BJ224∏A-TE	100	В	X5R*1	0.22 μ	±10, ±20	3.5	150	0.8 ± 0.10	<u>-</u>

[Temperature Characteristic C7 : X7S($-55 \sim +125$ °C)] 0.8mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperatu characterist		Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH168SC7224[]TCA01	HMK107 C7224∏A-TE	100	Х	'S 0.22 μ	±10, ±20	3.5	150	0.8±0.10	

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[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 0.8mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	-rı∵ı *3 r 1	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLASH168SB7102[]TNA01	HMK107 B7102□A-T	100	X7R	1000 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7152[]TNA01	HMK107 B7152□A-T	100	X7R	1500 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7222[]TNA01	HMK107 B7222□A-T	100	X7R	2200 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7332[]TNA01	HMK107 B7332□A-T	100	X7R	3300 р	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7472[]TNA01	HMK107 B7472□A-T	100	X7R	4700 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7682[]TNA01	HMK107 B7682∏A-T	100	X7R	6800 p	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7103[]TNA01	HMK107 B7103∏A-T	100	X7R	0.01 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7153[]TNA01	HMK107 B7153∏A-T	100	X7R	0.015 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7223[]TNA01	HMK107 B7223∏A-T	100	X7R	0.022μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7333[]TNA01	HMK107 B7333∏A-T	100	X7R	0.033μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7473[]TNA01	HMK107 B7473∏A-T	100	X7R	0.047 μ	±10, ±20	3.5	200	0.8±0.10	
MLASH168SB7104[]TNA01	HMK107 B7104□A-T	100	X7R	0.1 μ	±10, ±20	3.5	200	0.8±0.10	

[Temperature Characteristic SD : Standard(-55~+125°C)] 0.8mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	Note
MLASH168SSD101KTNA01	HMK107 SD101KA-T	100	Standard Type	100 p	±10	0.1	200	0.8±0.10	
MLASH168SSD121KTNA01	HMK107 SD121KA-T	100	Standard Type	120 p	±10	0.1	200	0.8±0.10	
MLASH168SSD151KTNA01	HMK107 SD151KA-T	100	Standard Type	150 p	±10	0.1	200	0.8±0.10	
MLASH168SSD181KTNA01	HMK107 SD181KA-T	100	Standard Type	180 p	±10	0.1	200	0.8±0.10	
MLASH168SSD221KTNA01	HMK107 SD221KA-T	100	Standard Type	220 p	±10	0.1	200	0.8±0.10	
MLASH168SSD271KTNA01	HMK107 SD271KA-T	100	Standard Type	270 p	±10	0.1	200	0.8±0.10	
MLASH168SSD331KTNA01	HMK107 SD331KA-T	100	Standard Type	330 р	±10	0.1	200	0.8±0.10	
MLASH168SSD391KTNA01	HMK107 SD391KA-T	100	Standard Type	390 p	±10	0.1	200	0.8±0.10	
MLASH168SSD471KTNA01	HMK107 SD471KA-T	100	Standard Type	470 p	±10	0.1	200	0.8±0.10	
MLASH168SSD561KTNA01	HMK107 SD561KA-T	100	Standard Type	560 p	±10	0.1	200	0.8±0.10	
MLASH168SSD681KTNA01	HMK107 SD681KA-T	100	Standard Type	680 p	±10	0.1	200	0.8±0.10	
MLASH168SSD821KTNA01	HMK107 SD821KA-T	100	Standard Type	820 p	±10	0.1	200	0.8±0.10	
MLASH168SSD102KTNA01	HMK107 SD102KA-T	100	Standard Type	1000 p	±10	0.1	200	0.8±0.10	

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[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage	Tempe	erature	Capacitance [F]	Capacitance tolerance	tan δ [%]	HTLT	Thickness*3 [mm]	Note
	(for reference)	[4]	Cilaract	.01130103	E I	[,0]	[/0]	Rated voltage x %		
MLASH21GSB5103[TNA01	HMK212 BJ103∏G-T	100	В	X5R*1	0.01 μ	$\pm 10, \pm 20$	3.5	200	1.25 ± 0.10	
MLASH21GSB5153[]TNA01	HMK212 BJ153∏G-T	100	В	X5R*1	0.015 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5223[]TNA01	HMK212 BJ223∏G-T	100	В	X5R*1	0.022 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5333[]TNA01	HMK212 BJ333∏G-T	100	В	X5R*1	0.033 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5473[]TNA01	HMK212 BJ473∏G-T	100	В	X5R*1	0.047 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5683[]TNA01	HMK212 BJ683∏G-T	100	В	X5R*1	0.068 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5104[]TNA01	HMK212 BJ104 G-T	100	В	X5R*1	0.1 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5224[]TNA01	HMK212 BJ224 G-T	100	В	X5R*1	0.22 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB5474[]TCA01	HMK212 BJ474 G-TE	100	В	X5R*1	0.47 μ	±10, ±20	3.5	150	1.25±0.10	
MLASH21GBB5105[]TCA01	HMK212BBJ105[]G-TE	100	В	X5R*1	1 μ	±10, ±20	3.5	150	1.25+0.20/-0	
MLASQ21GSB5472 TNA01	QMK212 BJ472[]G-T	250	В	X5R*1	4700 p	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB5682[TNA01	QMK212 BJ682[]G-T	250	В	X5R*1	6800 p	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB5103[TNA01	QMK212 BJ103[]G-T	250	В	X5R*1	0.01 μ	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB5153[TNA01	QMK212 BJ153[]G-T	250	В	X5R*1	0.015 μ	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB5223 TNA01	QMK212 BJ223[]G-T	250	В	X5R*1	0.022 μ	±10, ±20	2.5	150	1.25±0.10	

[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 0.85mm thickness

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New part number	Old part number (for reference)	Rated voltage [V]		erature ceristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASQ219SB5102[]TNA01	QMK212 BJ102[]D-T	250	В	X5R*1	1000 p	±10, ±20	2.5	150	0.85 ± 0.10	
MLASQ219SB5152[]TNA01	QMK212 BJ152[]D-T	250	В	X5R*1	1500 p	±10, ±20	2.5	150	0.85±0.10	
MLASQ219SB5222 TNA01	QMK212 BJ222 D-T	250	В	X5R*1	2200 p	±10, ±20	2.5	150	0.85 ± 0.10	
MLASQ219SB5332∏TNA01	QMK212 BJ332∏D-T	250	В	X5R*1	g 0088	±10. ±20	2.5	150	0.85±0.10	

[Temperature Characteristic C7 : X7S($-55\sim+125^{\circ}$ C)] 1.25mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH21GSC7474 TCA01	HMK212 C7474[]G-TE	100		X7S	0.47 μ	±10, ±20	3.5	150	1.25 ± 0.10	
MLASH21GBC7105[]TCA01	HMK212BC7105[]G-TE	100		X7S	1 μ	±10, ±20	3.5	150	1.25+0.20/-0	

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[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 1.25mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	tan δ	HTLT	*3 r 1	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLASH21GSB7103 TNA01	HMK212 B7103[]G-T	100	X7R	0.01 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7153[TNA01	HMK212 B7153∏G-T	100	X7R	0.015 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7223 TNA01	HMK212 B7223∏G-T	100	X7R	0.022 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7333 TNA01	HMK212 B7333∏G-T	100	X7R	0.033μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7473 TNA01	HMK212 B7473∏G-T	100	X7R	0.047 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7683 TNA01	HMK212 B7683∏G-T	100	X7R	0.068 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7104 TNA01	HMK212 B7104∏G-T	100	X7R	0.1 μ	±10, ±20	3.5	200	1.25±0.10	
MLASH21GSB7224 TNA01	HMK212 B7224∏G-T	100	X7R	0.22 μ	±10, ±20	3.5	200	1.25±0.10	
MLASQ21GSB7472 TNA01	QMK212 B7472∏G-T	250	X7R	4700 p	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB7682 TNA01	QMK212 B7682∏G-T	250	X7R	6800 p	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB7103 TNA01	QMK212 B7103[]G-T	250	X7R	0.01 μ	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB7153[TNA01	QMK212 B7153 G-T	250	X7R	0.015 μ	±10, ±20	2.5	150	1.25±0.10	
MLASQ21GSB7223[]TNA01	QMK212 B7223 G-T	250	X7R	0.022 μ	±10, ±20	2.5	150	1.25±0.10	

[Temperature Characteristic B7: $X7R(-55 \sim +125 ^{\circ}C)$] 0.85mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASQ219SB7102 TNA01	QMK212 B7102 D-T	250	X7R	1000 p	±10, ±20	2.5	150	0.85±0.10	
MLASQ219SB7152 TNA01	QMK212 B7152□D-T	250	X7R	1500 p	±10, ±20	2.5	150	0.85 ± 0.10	
MLASQ219SB7222 TNA01	QMK212 B7222 D-T	250	X7R	2200 p	±10, ±20	2.5	150	0.85±0.10	
MLASQ219SB7332 TNA01	QMK212 B7332□D-T	250	X7R	3300 p	±10, ±20	2.5	150	0.85 ± 0.10	

[Temperature Characteristic SD: Standard($-55 \sim +125$ °C)] 0.85mm thickness

N I	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	*3 5 3	NI I
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Thickness*3 [mm]	Note
MLASH219SSD222KTNA01	HMK212 SD222KD-T	100	Standard Type	2200 p	±10	0.1	200	0.85±0.10	
MLASH219SSD472KTNA01	HMK212 SD472KD-T	100	Standard Type	4700 p	±10	0.1	200	0.85 ± 0.10	
MLASQ219SSD101KTNA01	QMK212 SD101KD-T	250	Standard Type	100 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD121KTNA01	QMK212 SD121KD-T	250	Standard Type	120 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD151KTNA01	QMK212 SD151KD-T	250	Standard Type	150 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD181KTNA01	QMK212 SD181KD-T	250	Standard Type	180 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD221KTNA01	QMK212 SD221KD-T	250	Standard Type	220 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD331KTNA01	QMK212 SD331KD-T	250	Standard Type	330 р	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD391KTNA01	QMK212 SD391KD-T	250	Standard Type	390 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD471KTNA01	QMK212 SD471KD-T	250	Standard Type	470 p	±10	0.1	150	0.85 ± 0.10	
MLASQ219SSD561KTNA01	QMK212 SD561KD-T	250	Standard Type	560 p	±10	0.1	150	0.85±0.10	
MLASQ219SSD681KTNA01	QMK212 SD681KD-T	250	Standard Type	680 p	±10	0.1	150	0.85±0.10	
MLASQ219SSD821KTNA01	QMK212 SD821KD-T	250	Standard Type	820 p	±10	0.1	150	0.85±0.10	
MLASQ219SSD102KTNA01	QMK212 SD102KD-T	250	Standard Type	1000 p	±10	0.1	150	0.85±0.10	

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 1.25mm thickness

	New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
М	LASH21GSSD392KTNA01	HMK212 SD392KG-T	100	Standard Type	3900 p	±10	0.1	200	1.25±0.10		

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[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 1.6mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASH31LSB5473[]TNA01	HMK316 BJ473□L-T	100	В	X5R*1	0.047 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB5683[]TNA01	HMK316 BJ683∏L-T	100	В	X5R*1	0.068 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB5104[]TNA01	HMK316 BJ104□L-T	100	В	X5R*1	0.1 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB5154[]TNA01	HMK316 BJ154□L-T	100	В	X5R*1	0.15 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB5224[]TNA01	HMK316 BJ224□L-T	100	В	X5R*1	0.22 μ	±10, ±20	3.5	200	1.6 ± 0.20	
MLASH31LSB5334[]TNA01	HMK316 BJ334□L-T	100	В	X5R*1	0.33 μ	±10, ±20	3.5	200	1.6 ± 0.20	
MLASH31LSB5474[]TNA01	HMK316 BJ474□L-T	100	В	X5R*1	0.47 μ	±10, ±20	3.5	200	1.6 ± 0.20	
MLASH31LSB5105[]TNA01	HMK316 BJ105□L-T	100	В	X5R*1	1 μ	±10, ±20	3.5	200	1.6 ± 0.20	
MLASH31LAB5225[TCA01	HMK316ABJ225∏L-TE	100	В	X5R*1	2.2 μ	±10, ±20	3.5	150	1.6 ± 0.20	
MLASQ31LSB5333 TNA01	QMK316 BJ333[]L-T	250	В	X5R*1	0.033μ	±10, ±20	2.5	150	1.6 ± 0.20	
MLASQ31LSB5473[TNA01	QMK316 BJ473[]L-T	250	В	X5R*1	0.047μ	±10, ±20	2.5	150	1.6 ± 0.20	
MLASQ31LSB5683[TNA01	QMK316 BJ683[]L-T	250	В	X5R*1	0.068μ	±10, ±20	2.5	150	1.6 ± 0.20	
MLASQ31LSB5104[TNA01	QMK316 BJ104[]L-T	250	В	X5R*1	0.1 μ	±10, ±20	2.5	150	1.6 ± 0.20	
MLASS31LSB5153[]TNA01	SMK316 BJ153[L-T	630	В	X5R*1	0.015 μ	±10, ±20	2.5	120	1.6±0.20	
MLASS31LSB5223[]TNA01	SMK316 BJ223 L-T	630	В	X5R*1	0.022μ	±10, ±20	2.5	120	1.6±0.20	

[Temperature Characteristic B5(BJ): B($-25 \sim +85 ^{\circ}$ C)/X5R($-55 \sim +85 ^{\circ}$ C)] 1.15mm thickness

Name and according	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASS31QHB5102[TNA01	SMK316 BJ102[F-T	630	В	X5R*1	1000 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5152[TNA01	SMK316 BJ152∏F-T	630	В	X5R*1	1500 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5222 TNA01	SMK316 BJ222∏F-T	630	В	X5R*1	2200 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5332[TNA01	SMK316 BJ332∏F-T	630	В	X5R*1	3300 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5472 TNA01	SMK316 BJ472∏F-T	630	В	X5R*1	4700 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5682[TNA01	SMK316 BJ682[F-T	630	В	X5R*1	6800 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB5103[TNA01	SMK316 BJ103[F-T	630	В	X5R*1	0.01 μ	±10, ±20	2.5	120	1.15±0.10	

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Temperature	Characteristic	C7 - Y7S (-55~ ±125°C)	1 1.6mm thickness	
Liemberature	Unaracteristic	C/:X/S(-00~ + 120 C/	1 Lomm thickness	

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New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH31LAC7225[]TCA01	HMK316AC7225∏L-TE	100	X7S	2.2 μ	±10. ±20	3.5	150	1.6 ± 0.20	

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 1.6mm thickness

Name and according	Old part number	Rated voltage	Temperatu	re Capa	acitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characterist	ics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASH31LSB7473[]TNA01	HMK316 B7473□L-T	100	Х	7R 0	0.047 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7683[]TNA01	HMK316 B7683□L-T	100	Х	7R 0	0.068μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7104[]TNA01	HMK316 B7104□L-T	100	Х	7R	0.1 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7154[]TNA01	HMK316 B7154□L-T	100	Х	7R	0.15 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7224[]TNA01	HMK316 B7224□L-T	100	Х	7R	0.22 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7334[]TNA01	HMK316 B7334□L-T	100	Х	7R	0.33 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7474[]TNA01	HMK316 B7474□L-T	100	Х	7R	0.47 μ	±10, ±20	3.5	200	1.6±0.20	
MLASH31LSB7105[]TNA01	HMK316 B7105□L-T	100	Х	7R	1 μ	±10, ±20	3.5	200	1.6±0.20	
MLASQ31LSB7333[]TNA01	QMK316 B7333 L-T	250	Х	7R 0	0.033μ	±10, ±20	2.5	150	1.6±0.20	
MLASQ31LSB7473[]TNA01	QMK316 B7473[L-T	250	Х	7R 0	0.047 μ	±10, ±20	2.5	150	1.6±0.20	
MLASQ31LSB7683[]TNA01	QMK316 B7683[L-T	250	Х	7R 0	0.068μ	±10, ±20	2.5	150	1.6±0.20	
MLASQ31LSB7104[]TNA01	QMK316 B7104[L-T	250	Х	7R	0.1 μ	±10, ±20	2.5	150	1.6±0.20	
MLASS31LSB7153[]TNA01	SMK316 B7153[]L-T	630	Х	7R 0	0.015 μ	±10, ±20	2.5	120	1.6±0.20	
MLASS31LSB7223[]TNA01	SMK316 B7223∏L-T	630	Х	7R 0	0.022μ	±10, ±20	2.5	120	1.6±0.20	
MLASS31LAB7333[]TNA01	SMK316AB7333 L-T	630	Х	7R 0	0.033μ	±10, ±20	2.5	120	1.6±0.20	
MLASS31LAB7473[]TNA01	SMK316AB7473∏L-T	630	Х	7R 0	0.047 μ	±10, ±20	2.5	120	1.6±0.20	

[Temperature Characteristic B7 : $X7R(-55 \sim +125 ^{\circ}C)$] 1.15mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact	erature eristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASS31QHB7102[TNA01	SMK316 B7102∏F-T	630		X7R	1000 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7152[TNA01	SMK316 B7152∏F-T	630		X7R	1500 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7222 TNA01	SMK316 B7222∏F-T	630		X7R	2200 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7332[TNA01	SMK316 B7332∏F-T	630		X7R	3300 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7472 TNA01	SMK316 B7472∏F-T	630		X7R	4700 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7682[]TNA01	SMK316 B7682[]F-T	630		X7R	6800 p	±10, ±20	2.5	120	1.15±0.10	
MLASS31QHB7103[]TNA01	SMK316 B7103∏F-T	630		X7R	0.01 μ	±10, ±20	2.5	120	1.15±0.10	

[Temperature Characteristic SD : Standard($-55 \sim +125 ^{\circ}$ C)] 1.6mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH31LSSD223KTNA01	HMK316 SD223KL-T	100	Standard Type	0.022 μ	±10	0.1	200	1.6±0.20	
MLASQ31LSSD103KTNA01	QMK316 SD103KL-T	250	Standard Type	0.01 μ	±10	0.1	150	1.6±0.20	

●3225TYPE

[Temperature Characteristic B5(BJ): $B(-25\sim+85^{\circ}C)/X5R(-55\sim+85^{\circ}C)$] 2.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]		erature teristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH32MSB5225 PNA01	HMK325 BJ225∏M−P	100	В	X5R*1	2.2 μ	±10, ±20	3.5	200	2.5 ± 0.20	
MLASH32MSB5475[]PCA01	HMK325 BJ475∏M−PE	100	В	X5R*1	4.7 μ	±10, ±20	3.5	150	2.5±0.20	

[Temperature Characteristic B5(BJ): $B(-25\sim+85^{\circ}C)/X5R(-55\sim+85^{\circ}C)$] 1.9mm thickness

New part number	Old part number	Rated voltage	Tempe	erature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	teristics	[F]	[%]	[%]	Rated voltage x %	Thickness [mm]	Note
MLASH32NSB5154[]TNA01	HMK325 BJ154□N-T	100	В	X5R*1	0.15 μ	±10, ±20	3.5	200	1.9±0.20	-
MLASH32NSB5224[]TNA01	HMK325 BJ224□N-T	100	В	X5R*1	0.22 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB5334[]TNA01	HMK325 BJ334□N-T	100	В	X5R*1	0.33 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB5474[]TNA01	HMK325 BJ474□N-T	100	В	X5R*1	0.47 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB5684[]TNA01	HMK325 BJ684∏N-T	100	В	X5R*1	0.68 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB5105[]TNA01	HMK325 BJ105∏N-T	100	В	X5R*1	1 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB5475[]TCA01	HMK325 BJ475∏N-TE	100	В	X5R*1	4.7 μ	±10, ±20	3.5	150	1.9±0.20	
MLASQ32NSB5473 TNA01	QMK325 BJ473[N-T	250	В	X5R*1	0.047μ	±10, ±20	2.5	150	1.9 ± 0.20	
MLASQ32NSB5104 TNA01	QMK325 BJ104[]N-T	250	В	X5R*1	0.1 μ	±10, ±20	2.5	150	1.9 ± 0.20	
MLASQ32NSB5154 TNA01	QMK325 BJ154[]N-T	250	В	X5R*1	0.15 μ	±10, ±20	2.5	150	1.9±0.20	
MLASQ32NSB5224 TNA01	QMK325 BJ224[]N-T	250	В	X5R*1	0.22 μ	±10, ±20	2.5	150	1.9±0.20	
MLASS32NSB5223[]TNA01	SMK325 BJ223 N-T	630	В	X5R*1	0.022μ	±10, ±20	2.5	120	1.9±0.20	
MLASS32NSB5333[]TNA01	SMK325 BJ333∏N-T	630	В	X5R*1	0.033 μ	±10, ±20	2.5	120	1.9±0.20	
MLASS32NSB5473[]TNA01	SMK325 BJ473∏N-T	630	В	X5R*1	0.047 μ	±10, ±20	2.5	120	1.9±0.20	

$\begin{tabular}{ll} \textbf{[Temperature Characteristic B5(BJ): B($-25$$$$\sim$$+85$$°C)/X5R($-55$$\sim$+85$$°C)]} & 1.15mm thickness \\ \end{tabular}$

New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness ^{*3} [mm]	Note	
MLASH32QJB5104∏TNA01	HMK325 BJ104∏F-T	100	B X5R*1	0.1 μ	±10. ±20	3.5	200	1.15±0.10		

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 2.5mm thickness

	New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
Ī	MLASH32MSB7225 PNA01	HMK325 B7225[]M-P	100		X7R	2.2 μ	±10, ±20	3.5	200	2.5±0.20		-

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[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 1.9mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLASH32NSB7154[]TNA01	HMK325 B7154□N-T	100	X7R	0.15 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB7224[]TNA01	HMK325 B7224□N-T	100	X7R	0.22 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB7334[]TNA01	HMK325 B7334∏N-T	100	X7R	0.33 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB7474[]TNA01	HMK325 B7474□N-T	100	X7R	0.47 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB7684[]TNA01	HMK325 B7684∏N-T	100	X7R	0.68 μ	±10, ±20	3.5	200	1.9±0.20	
MLASH32NSB7105[]TNA01	HMK325 B7105∏N-T	100	X7R	1 μ	±10, ±20	3.5	200	1.9±0.20	
MLASQ32NSB7473 TNA01	QMK325 B7473∏N-T	250	X7R	0.047 μ	±10, ±20	2.5	150	1.9±0.20	
MLASQ32NSB7104 TNA01	QMK325 B7104□N-T	250	X7R	0.1 μ	±10, ±20	2.5	150	1.9±0.20	
MLASQ32NSB7154 TNA01	QMK325 B7154□N-T	250	X7R	0.15 μ	±10, ±20	2.5	150	1.9±0.20	
MLASQ32NSB7224 TNA01	QMK325 B7224□N-T	250	X7R	0.22 μ	±10, ±20	2.5	150	1.9±0.20	
MLASS32NSB7223[]TNA01	SMK325 B7223[]N-T	630	X7R	0.022 μ	±10, ±20	2.5	120	1.9±0.20	
MLASS32NSB7333[]TNA01	SMK325 B7333[]N-T	630	X7R	0.033 μ	±10, ±20	2.5	120	1.9±0.20	
MLASS32NSB7473[]TNA01	SMK325 B7473[]N-T	630	X7R	0.047 μ	±10, ±20	2.5	120	1.9±0.20	

[Temperature Characteristic C7 : X7S($-55 \sim +125$ °C)] 2.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempe charact		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH32MSC7475[]PCA01	HMK325 C7475∏M-PE	100		X7S	4.7 μ	±10, ±20	3.5	150	2.5 ± 0.20	

[Temperature Characteristic B7 : X7R($-55\sim+125^{\circ}$ C)] 1.15mm thickness

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New part number	Old part number (for reference)	Rated voltage [V]	Temperature characteristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH32QJB7104∏TNA01	HMK325 B7104∏F-T	100	X7R	01 //	+10 +20	3.5	200	1 15+0 10	

●4532TYPE

[Temperature Characteristic B5(BJ): B($-25\sim+85^{\circ}$ C)/X5R($-55\sim+85^{\circ}$ C)] 2.5mm thickness

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New part number	Old part number (for reference)	Rated voltage [V]	age Temperature Characteristics		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASH45MSB5474[]TNA01	HMK432 BJ474∏M−T	100	В	X5R*1	0.47 μ	±10, ±20	3.5	200	2.5±0.20	
MLASH45MSB5105 TNA01	HMK432 BJ105∏M-T	100	В	X5R*1	1 μ	±10, ±20	3.5	200	2.5±0.20	
MLASH45MSB5155 TNA01	HMK432 BJ155∏M-T	100	В	X5R*1	1.5 μ	±10, ±20	3.5	200	2.5±0.20	
MLASH45MSB5225 TNA01	HMK432 BJ225∏M-T	100	В	X5R*1	2.2 μ	±10, ±20	3.5	200	2.5±0.20	
MLASQ45MSB5104[]TNA01	QMK432 BJ104[]M-T	250	В	X5R*1	0.1 μ	±10, ±20	2.5	150	2.5±0.20	
MLASQ45MSB5224[]TNA01	QMK432 BJ224[]M-T	250	В	X5R*1	0.22 μ	±10, ±20	2.5	150	2.5±0.20	
MLASQ45MSB5334[]TNA01	QMK432 BJ334[]M-T	250	В	X5R*1	0.33 μ	±10, ±20	2.5	150	2.5±0.20	
MLASQ45MSB5474[]TNA01	QMK432 BJ474[]M-T	250	В	X5R*1	0.47 μ	±10, ±20	2.5	150	2.5±0.20	
MLASS45MSB5473 TNA01	SMK432 BJ473∏M-T	630	В	X5R*1	0.047 μ	±10, ±20	2.5	120	2.5±0.20	
MLASS45MSB5683 TNA01	SMK432 BJ683∏M-T	630	В	X5R*1	0.068 μ	±10, ±20	2.5	120	2.5±0.20	
MLASS45MSB5104 TNA01	SMK432 BJ104□M-T	630	В	X5R*1	0.1 μ	±10, ±20	2.5	120	2.5±0.20	

[Temperature Characteristic B7: X7R($-55\sim+125^{\circ}$ C)] 2.5mm thickness

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New part number	Old part number (for reference)	Rated voltage	Temperature characteristics	Capacitance [F]	Capacitance tolerance	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note	
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MLASH45MSB7474 TNA01	HMK432 B7474∏M-T	100	X7R	0.47 μ	$\pm 10, \pm 20$	3.5	200	2.5 ± 0.20		
MLASH45MSB7105[TNA01	HMK432 B7105∏M-T	100	X7R	1 μ	$\pm 10, \pm 20$	3.5	200	2.5±0.20		
MLASH45MSB7155 TNA01	HMK432 B7155∏M-T	100	X7R	1.5 μ	$\pm 10, \pm 20$	3.5	200	2.5±0.20		
MLASH45MSB7225 TNA01	HMK432 B7225∏M-T	100	X7R	2.2 μ	±10, ±20	3.5	200	2.5±0.20		
MLASQ45MSB7104[]TNA01	QMK432 B7104□M-T	250	X7R	0.1 μ	$\pm 10, \pm 20$	2.5	150	2.5 ± 0.20		
MLASQ45MSB7224[]TNA01	QMK432 B7224[M-T	250	X7R	0.22 μ	$\pm 10, \pm 20$	2.5	150	2.5±0.20		
MLASQ45MSB7334[]TNA01	QMK432 B7334∏M-T	250	X7R	0.33 μ	±10, ±20	2.5	150	2.5±0.20		
MLASQ45MSB7474[]TNA01	QMK432 B7474[M-T	250	X7R	0.47 μ	$\pm 10, \pm 20$	2.5	150	2.5±0.20		
MLASS45MSB7473[]TNA01	SMK432 B7473[]M-T	630	X7R	0.047 μ	$\pm 10, \pm 20$	2.5	120	2.5±0.20		
MLASS45MSB7683[]TNA01	SMK432 B7683[]M-T	630	X7R	0.068μ	±10, ±20	2.5	120	2.5±0.20		
MLASS45MSB7104∏TNA01	SMK432 B7104∏M-T	630	X7R	0.1 μ	±10. ±20	2.5	120	2.5 ± 0.20		

[Temperature Characteristic B7: $X7R(-55 \sim +125^{\circ}C)$] 2.0mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	Tempera characteri		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLASX45YAB7222KTCA01	XMK432 B7222KY-TE	2000		X7R	2200 p	±10	2.5	110	2.0+0/-0.30	
MLASX45YAB7472KTCA01	XMK432 B7472KY-TE	2000		X7R	4700 p	±10	2.5	110	2.0+0/-0.30	

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LW Reversal Decoupling Low ESL Capacitors (LWDC™) for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

0510TYPF

[Temperature Characteristic B5(BJ): X5R($-55\sim+85^{\circ}$ C)] 0.3mm thickness

New part number	Old part number	Rated voltage	Tempe	rature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	charact	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLRLT103SB5104MFNA01	TWK105 BJ104MP-F	25		X5R	0.1 μ	±20	5	150	0.3 ± 0.05	
MLRLE103SB5224MFNA01	EWK105 BJ224MP-F	16		X5R	0.22 μ	±20	10	150	0.3 ± 0.05	
MLRLL103SB5474MFNA01	LWK105 BJ474MP-F	10		X5R	0.47 μ	±20	10	150	0.3 ± 0.05	
MLRLJ103SB5104MFNA01	JWK105 BJ104MP-F	6.3		X5R*1	0.1 μ	±20	5	150	0.3 ± 0.05	
MLRLJ103SB5474MFNA01	JWK105 BJ474MP-F	6.3		X5R*1	0.47 μ	±20	10	150	0.3 ± 0.05	
MLRLJ103SB5105MFNA01	JWK105 BJ105MP-F	6.3		X5R	1 μ	±20	10	150	0.3 ± 0.05	
MLRLJ103SB5225MFNA01	JWK105 BJ225MP-F	6.3		X5R	2.2 U	±20	10	150	0.3 ± 0.05	

[Temperature Characteristic C6: $X6S(-55 \sim +105 ^{\circ}C)$, C7: $X7S(-55 \sim +125 ^{\circ}C)$] 0.3mm thickness

New part number	Old part number	Rated voltage	Temperatu	ire	Capacitance	Capacitance tolerance	tan δ	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characterist	tics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLRLE103SC6104MFNA01	EWK105 C6104MP-F	16	X	.6S	0.1 μ	±20	5	150	0.3 ± 0.05	
MLRLL103SC7104MFNA01	LWK105 C7104MP-F	10	Х	.7S	0.1 μ	±20	5	150	0.3 ± 0.05	
MLRLL103SC6224MFNA01	LWK105 C6224MP-F	10	X	.6S	0.22 μ	±20	10	150	0.3 ± 0.05	
MLRLJ103SC7104MFNA01	JWK105 C7104MP-F	6.3	X	78	0.1 μ	±20	5	150	0.3 ± 0.05	
MLRLJ103SC7224MFNA01	JWK105 C7224MP-F	6.3	X	78	0.22 μ	±20	10	150	0.3 ± 0.05	
MLRLJ103SC6474MFNA01	JWK105 C6474MP-F	6.3	X	.6S	0.47 μ	±20	10	150	0.3 ± 0.05	
MLRLA103SC6224MFNA01	AWK105 C6224MP-F	4	X	.6S	0.22 μ	±20	10	150	0.3±0.05	
MLRLA103SC6474MFNA01	AWK105 C6474MP-F	4	X	.6S	0.47 μ	±20	10	150	0.3±0.05	
MLRLA103SC6105MFNA01	AWK105 C6105MP-F	4	Х	.6S	1 μ	±20	10	150	0.3±0.05	
MLRLA103SC6225MFNA01	AWK105 C6225MP-F	4	Х	.6S	2.2 μ	±20	10	150	0.3±0.05	

●0816TYPE

[Temperature Characteristic B5(BJ): $X5R(-55 \sim +85^{\circ}C)$] 0.5mm thickness

New part number	Old part number	Rated voltage	Temperature		Capacitance		$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characte	eristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLRLT165SB5104MTNA01	TWK107 BJ104MV-T	25		X5R*1	0.1 μ	±20	5	150	0.5±0.05	
MLRLE165SB5224MTNA01	EWK107 BJ224MV-T	16		X5R*1	0.22 μ	±20	5	150	0.5±0.05	
MLRLE165SB5474MTNA01	EWK107 BJ474MV-T	16		X5R*1	0.47 μ	±20	5	150	0.5±0.05	
MLRLL165SB5105MTNA01	LWK107 BJ105MV-T	10		X5R	1 μ	±20	10	150	0.5±0.05	
MLRLL165SB5225MTNA01	LWK107 BJ225MV-T	10		X5R	2.2 μ	±20	10	150	0.5±0.05	
MLRLJ165SB5105MTNA01	JWK107 BJ105MV-T	6.3		X5R*1	1 μ	±20	10	150	0.5±0.05	
MLRLJ165SB5225MTNA01	JWK107 BJ225MV-T	6.3		X5R	2.2 μ	±20	10	150	0.5±0.05	
MLRLJ165SB5475MTNA01	JWK107 BJ475MV-T	6.3		X5R	4.7 μ	±20	10	150	0.5±0.05	
MLRLA165SB5106MTNA01	AWK107 BJ106MV-T	4		X5R	10 μ	±20	10	150	0.5±0.05	

[Temperature Characteristic B7: X7R($-55 \sim +125 ^{\circ}$ C), C6: X6S($-55 \sim +105 ^{\circ}$ C), C7: X7S($-55 \sim +125 ^{\circ}$ C)] 0.5mm thickness

New part number	Old part number (for reference)	Rated voltage [V]	erature eristics	Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLRLT165SB7104MTNA01	TWK107 B7104MV-T	25	X7R	0.1 μ	±20	5	150	0.5 ± 0.05	
MLRLE165SB7224MTNA01	EWK107 B7224MV-T	16	X7R	0.22 μ	±20	5	150	0.5±0.05	
MLRLE165SB7474MTNA01	EWK107 B7474MV-T	16	X7R	0.47 μ	±20	5	150	0.5±0.05	
MLRLJ165SC7105MTNA01	JWK107 C7105MV-T	6.3	X7S	1 μ	±20	10	150	0.5±0.05	
MLRLA165SC7225MTNA01	AWK107 C7225MV-T	4	X7S	2.2 μ	±20	10	150	0.5±0.05	
MLRLA165SC6475MTNA01	AWK107 C6475MV-T	4	X6S	4.7 μ	±20	10	150	0.5±0.05	
MLRLP165SC6106MTNA01	PWK107 C6106MV-T	2.5	X6S	10 μ	±20	10	150	0.5±0.05	

1220TYPE

[Temperature Characteristic B5(BJ): X5R($-55\sim+85^{\circ}$ C)] 0.85mm thickness

New part number	Old part number	Rated voltage	Temperature	Capacitance	Capacitance tolerance	$ an\delta$	HTLT	Thickness*3 [mm]	Note
New part number	(for reference)	[V]	characteristics	[F]	[%]	[%]	Rated voltage x %	Inickness [mm]	Note
MLRLT219SB5475[]TNA01	TWK212 BJ475□D-T	25	X5R	4.7 μ	±10, ±20	10	150	0.85±0.10	
MLRLE219SB5106MTNA01	EWK212 BJ106MD-T	16	X5R	10 μ	±20	10	150	0.85 ± 0.10	
MLRLL219SB5475[]TNA01	LWK212 BJ475[]D-T	10	X5R	4.7 μ	±10, ±20	10	150	0.85±0.10	
MLRLL219SB5106MTNA01	LWK212 BJ106MD-T	10	X5R	10 μ	±20	10	150	0.85±0.10	
MLRLJ219SB5226MTNA01	JWK212 BJ226MD-T	6.3	X5R	22 μ	±20	10	150	0.85±0.10	

 $\begin{tabular}{ll} \textbf{[Temperature Characteristic B7: X7R($-55$$$$$$$$\sim$+125$$$°C), C6: X6S($-55$$$$$\sim$+105$$$°C)]} & 0.85mm thickness \\ \end{tabular}$

New part number	Old part number (for reference)	Rated voltage [V]	Temper characte		Capacitance [F]	Capacitance tolerance [%]	tan δ [%]	HTLT Rated voltage x %	Thickness*3 [mm]	Note
MLRLT219SB7225[]TNA01	TWK212 B7225□D-T	25		X7R	2.2 μ	±10, ±20	5	150	0.85±0.10	
MLRLE219SC6475[TNA01	EWK212 C6475□D-T	16		X6S	4.7 μ	$\pm 10, \pm 20$	10	150	0.85±0.10	
MLRLL219SC6106MTNA01	LWK212 C6106MD-T	10		X6S	10 μ	±20	10	150	0.85±0.10	
MLRLA219SC6226MTNA01	AWK212 C6226MD-T	4		X6S	22 μ	±20	10	150	0.85±0.10	

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Multilayer Ceramic Capacitors

PACKAGING

1)Minimum Quantity

Taped package

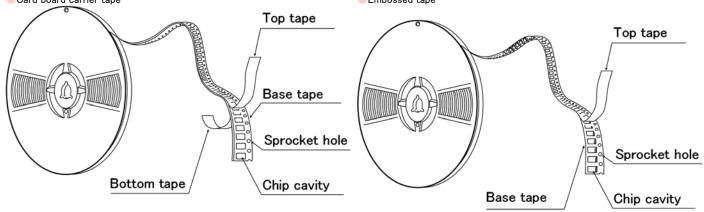
	Type		Thick	ness	Standard Q	uantity[pcs]		
Code	JIS(mm)	EIA(inch)	[mm]	Code	Paper tape	Embossed tape		
02	0201	008004	0.125	1	_	50000		
04	0402	01005	0.2	2	_	40000		
06	0603	0201	0.3	3	15000	_		
			0.13	Н	_	20000		
41	1005	0.400	0.18	Е	_	15000		
1L	1005	0402	0.2	2	20000	_		
			0.3	3	15000	_		
10	1005	0402	0.5	5	10000	_		
10	0510 💥	0204	0.3	3	10000	_		
			0.45	K				
			0.7	7	4000	_		
16	1608	0603	0.8	8				
10			0.8	8	3000	3000		
			0.0	0	(Soft Termination)	(Soft Termination		
	0816 💥	0306	0.5	5	_	4000		
				0.85	9	4000	_	
	2012	0805	1.25	G –		3000		
21	2012	0003	1.25	G	_	2000 (Soft Termination		
	1220 💥	0508	0.85	9	4000	_		
		0300	0300	0308	0.85	9	4000	_
31	3216	1206	1.15	Q	_	3000		
			1.6	L	_	2000		
			0.85	9				
			1.15	Q		2000		
32	3225	1210	1.9	N	_	2000		
			2.0 max	Υ				
			2.5	М	_	500(T), 1000(P)		
45	4532	1812	2.0 max	Υ	_	1000		
40	4532	1812	2.5	M	_	500		

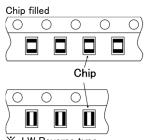
注:※LW Reverse type(MSRL, MCRL, MBRL, MLRL, MMRL)

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②Taping material

XNo bottom tape for pressed carrier tape Card board carrier tape Embossed tape Top tape

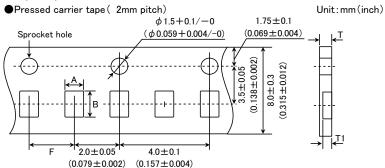




X LW Reverse type

3 Representative taping dimensions

Paper Tape (8mm wide)



T (FIA)	Chip	Cavity	Insertion Pitch	Tape Thickness			
Type(EIA)	Α	В	F	Т	T1		
0603 (0201)	0.37 0.67			0.45	0.40		
0510 (0204) 💥			001005	0.45max.	0.42max.		
1005 (0402) (*1 2)	0.65	1.15	2.0±0.05	0.4max.	0.3max.		
005 (0402) (*1 3)				0.45max.	0.42max.		
N-+- 44 Thistones 0.0	0 2.02 * 1.4	/ D			Harthaman		

Note *1 Thickness, 2:0.2mm, 3:0.3mm.

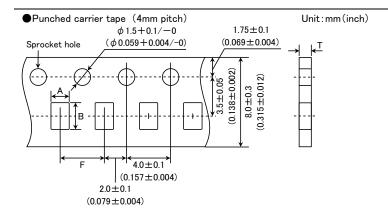
** LW Reverse type.

Unit:mm

●Punched carrier tape (2mm	pitch)		Unit:mm(inch)
Sprocket hole	ϕ 1.5+0.1/-0 $(\phi$ 0.059+0.004/-0)	$ \begin{array}{c} 1.75 \pm 0.1 \\ (0.069 \pm 0.004) \\ \hline \end{array} $	→
(·		3.5±0.05 (0.138±0.002) 8.0±0.3 (0.315±0.012)	
$\begin{array}{c c} & & & \\ \hline & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ \end{array}$	4.0±0.1 0.157±0.004)		

Type(EIA)	Chip Cavity		Insertion Pitch	Tape Thickness
Type(EIA)	Α	В	F	Т
1005 (0402)	0.65	1.15	2.0±0.05	0.8max.
				Unit:mm

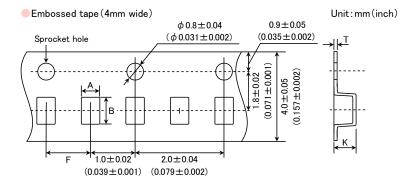
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Type(EIA)	Chip Cavity		Insertion Pitch	Tape Thickness
Type(EIA)	Α	В	F	Т
1608 (0603) 0816 (0306) ※	1.0	1.8		1.1max.
2012 (0805) 1220 (0508) ※	1.65	2.4	4.0±0.1	1.1max.
3216 (1206)	2.0	3.6		

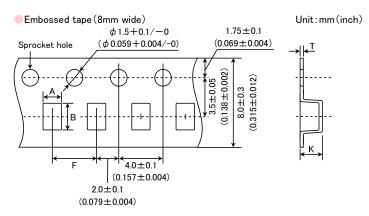
Note: Taping size might be different depending on the size of the product. X LW Reverse type.

Unit:mm



Type(EIA)	Chip Cavity		Insertion Pitch	Tape Thickness	
	Α	В	F	K	Т
0201 (008004)	0.135	0.27	1.0±0.02	0.5max.	0.25max.
0402 (01005)	0.23	0.43	1.0 ± 0.02	u.amax.	0.25max.
					Harden arms

Unit:mm



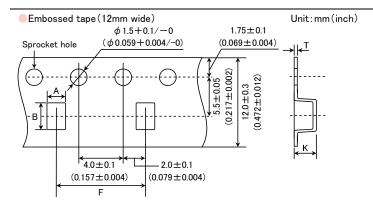
Type(EIA)	Chip Cavity		Insertion Pitch	Tape Thickness	
	Α	В	F	K	Т
1005 (0402)	0.6	1.1	2.0±0.1	0.6max	0.2±0.1
0816 (0306) 💥	1.0	1.8	4.0±0.1	1.3max.	0.25±0.1
2012 (0805)	1.65	2.4			
3216 (1206)	2.0	3.6		3.4max.	0.6max.
3225 (1210)	2.8	3.6			

Note:

* LW Reverse type.

Unit:mm

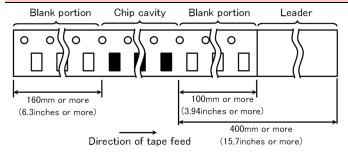
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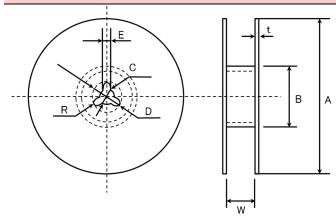
Type(EIA)	Chip Cavity		Insertion Pitch	Tape Th	Tape Thickness	
Type(EIA)	Α	В	F	K	Т	
3225 (1210)	3.1	4.0	8.0±0.1	4.0max.	0.6max.	
4532 (1812)	3.7	4.9	8.0±0.1	4.0max.	0.6max.	

Unit:mm

4 Trailer and Leader



5Reel size



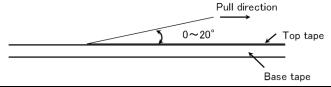
Α	В	С	D	E	R
ϕ 178±2.0	<i>ф</i> 50min.	ϕ 13.0 \pm 0.2	ϕ 21.0 ± 0.8	2.0±0.5	1.0

	Т	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

⑥Top 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

	Temperature	Standard	55 to -	L 125°C					
	Compensating(Class1)	High Frequency Type	- 55 16 -	-55 to +125°C					
		High Permittivity (Class2)		Specification	Temperature Range				
Specified				В	−25 to +85°C				
Value	High Dayseithicity (Class)			X5R	−55 to +85°C				
	nigh Permittivity (Glassz			X7R	−55 to +125°C				
			C6	X6S	-55 to +105°C				
			C7	X7S	-55 to +125°C				

	Temperature	Standard	_55+o_4	-125°C					
	Compensating(Class1)	High Frequency Type	-55 16 +	−55 to +125°C					
		High Permittivity (Class2)		Specification	Temperature Range				
Specified				В	-25 to +85°C				
Value	High Bormittivity (Close?)			X5R	−55 to +85°C				
	riigii Feriiittivity (Olassz)			X7R	−55 to +125°C				
				X6S	−55 to +105°C				
			C7	X7S	−55 to +125°C				

3. Rated Voltage							
	Temperature	Standard	50VDC, 25VDC, 16VDC				
Specified Value	Specified Compensating (Class 1)	High Frequency Type	25VDC, 16VDC				
	High Permittivity (Class2))	50VDC, 35VDC, 25VDC, 16VDC, 10VDC, 6.3VDC, 4VDC, 2.5VDC				

4. Withstanding	Withstanding Voltage (Between terminals)							
Specified C Value	Temperature		Standard					
	Compensating(Class1)	High F	requency Type	No breakdown o	No breakdown or damage			
	High Permittivity (Class2)							
Toot			Clas	ss 1	Class 2			
Test Methods and	Applied voltage		Rated voltage × 3		Rated voltage × 2.5			
Remarks	Duration		1 to 5 sec.					
Remarks	Charge/discharge current			50mA	max.			

5. Insulation R	5. Insulation Resistance								
Specified Compensating(Class1) Value High Permittivity (Class	Temperature	Standard	10000 MΩ min.						
	High Frequency Type	TOUCH IN 32 min.							
	High Permittivity (Class2)	Note 1	C \leq 0.047 μ F : 10000 M Ω min. C > 0.047 μ F : 500M $\Omega \cdot \mu$ F (C:Nominal capacitance)						
Test	Applied voltage	: Rated voltage							
Methods and	Duration : 60±5 sec.								
Remarks	Charge/discharge current	: 50mA max.							

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6. Capacitance	e (Tolerance)							
Specified	Temperature Compensating(Class1)	Standard		0.2pF≦C≦5pF 5pF≦C≦10pF C>10pF	$5pF \leq C \leq 10pF$: $\pm 0.5pF$			
Value	High Permittivity (Class2)		requency Type	Refer to detailed specification				
				±10% or ±20%				
	Standard			Class 1		Class 2		
- .			Standard	High Freque	ncy Type	C≦10 <i>μ</i> F	C>10 μ F	
Test	Preconditioning			None		Thermal treatment (at 150°C for 1hr) Note 2		
Methods and	Measuring frequency		1MHz±10%	1MHz±10% 1GHz		1kHz±10%	120±10Hz	
Remarks	Measuring voltage Note	1		0.5 to 5Vrms		1±0.2Vrms	0.5±0.1Vrms	
	Bias application					None		

7. Q or Dissipa	tion Factor							
Specified Value	Temperature	Standard		$C \le 30pF : Q \ge 400 + 20C$ $C \ge 30pF : Q \ge 1000$ (C:Nominal capacitance)				
	Compensating(Class1)	High Frequency Type		Refer to detailed specificati	on			
	High Permittivity (Class2)	h Permittivity(Class2) Note 1		2.5% max.				
	Standard			Class 1	Class 2			
- .			Standard	High Frequency Type	C≦10 μ F	C>10 μ F		
Test	Preconditioning			None	Thermal treatment (at 150°C for 1hr) Note 2			
Methods and	Measuring frequency 1M		1MHz±10%	1GHz	1kHz±10%	120±10Hz		
Remarks	Measuring voltage Note 1			0.5 to 5Vrms	1±0.2Vrms	0.5±0.1Vrms		
	Bias application		None					

			Tem	perature Charac	teristic [ppm/°	C]	Tolerance [ppm/°C]		
					CG(C0G)		G: ±30	
		Standard	C□:	0	CH(C0H)		H: ±60	
Temperature Compensating(Class1) Specified Value	Temperature		ОШ.	U	CJ(C0J))		J: ±120	
				CK(C0K))		H: ±250		
		High Frequency Type	Tem	perature Charac	teristic [ppm/°	eristic [ppm/°C]		Tolerance [ppm/°C]	
			C□: 0		CG(C0G	CG(C0G)		G: ±30	
					CH(C0H	CH(C0H)		H: ±60	
v alac					Capacitance	Ref	erence	T D	
				Specification	change	temp	erature	Temperature Range	
			B5	В	±10%	2	.0°C	−25 to +85°C	
	High Permittivity (Class2))	БЭ	X5R	±15%	2	.5°C	-55 to +85°C	
			B7	X7R	±15%	2	.5°C	-55 to +125°C	
			C6	XS	±22%	2	.5°C	-55 to +105°C	
					±22%	2	.5°C	-55 to +125°C	

Capacitance at 20°C and 85°C shall be measured in thermal equilibrium, and the temperature characteristic shall be calculated from the following equation.

$$\frac{(C_{85}-C_{20})}{C_{20}\times\Delta T} \times 10^{6} (ppm/^{\circ}C) \qquad \Delta T = 65$$

Test Methods and Remarks

Capacitance at each step shall be measured in thermal equilibrium, and the temperature characteristic shall be calculated from the following

Step	В	X5R, X7R, X6S, X7S					
1	Minimum operating temperature						
2	20°C	25°C					
3	Maximum operating temperature						

C : Capacitance in Step 1 or Step 3 × 100 (%) C2 C2 : Capacitance in Step 2 *Measuring frequency and voltage: Refer to detailed specification

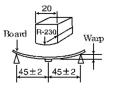
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9. Deflection				
	Temperature	Standard	Appearance Capacitance change	: No abnormality : Within $\pm 5\%$ or ± 0.5 pF, whichever is larger.
Specified Value	Compensating(Class1)	High Frequency Type	Appearance Capacitance change	: No abnormality : Within±0.5 pF
	High Permittivity (Class2))	Appearance Capacitance change	: No abnormality : Within ±12.5%

Test	
Methods	and
Remarks	

	Multilayer Cera	mic Capacitors
	0201, 0402, 0603, *1005	Th
	Туре	The other types
Board	Glass epoxy-r	esin substrate
Thickness	0.8mm	1.6mm
Warp	1m	nm
Duration	10 s	sec.

*1005 Type thickness, 2: 0.2mm , 3: 0.3mm.



Capacitance measurement shall be conducted with the board bent

10. Adhesive S	Strength of Termina	al Electro	des				
	Temperature		Standard				
Specified Value	Compensating (C	lass1)	High Frequency	Туре	No terminal sepa	ration or its indication.	
Value	High Permittivity	(Class2))				
Test		C	0201Type	04	02,0603Type	1005Type or more	
Methods and	Applied force		1N		2N	5N	
Remarks	Duration		10±	1 sec		30±5 sec	

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

12. Solderabilit	у				
	Temperature	Standard			
Specified Value	Compensating(Class1)	High Frequency Type	At least 95	% of terminal electrode is covered	by new solder.
• dide	High Permittivity (Class2)				
T		Eutectic sol	der	Lead-free solder	
Test Methods and	Solder type	H60A or H6	3A	Sn-3.0Ag-0.5Cu	
Remarks	Solder temperature	230±5°C	;	245±3°C	
Remarks	Duration		4±1	sec.	

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13. Resistance	e to Soldering					
	Temperature	Standard	Q Insulat	rance tance change ion resistance anding voltage	: No abnormality : Within ±2.5% or ± : Initial value : Initial value (between terminals)	0.25pF, whichever is larger. : No abnormality
Specified Value	Compensating(Class1)	High Frequency Type	Q Insulat	rance tance change ion resistance anding voltage	: No abnormality : Within ±2.5% or ± : Initial value : Initial value (between terminals)	0.25pF, whichever is larger. : No abnormality
	High Permittivity(Cla	ss2) Note 1	Dissipa Insulat	rance tance change ation factor ion resistance anding voltage	: No abnormality : Within ±7.5% : Initial value : Initial value (between terminals)): No abnormality
			Cla			
		0201, 0402, 0603 Typ			005 Type	
	Preconditioning		No			
	Preheating	150°C, 1 to 2 min.			0°C, 2 to 5 min. 10°C, 2 to 5 min.	
	Solder temp.		270=	±5°C		
	Duration		3±0.	5 sec.		
Test	Recovery	24±2 hrs	(Standar	d condition)No	te 5	
Methods and						
Remarks				(Class 2	
		0201, 0402, 0603 Typ	ре	1005, 16	08, 2012 Type	3216, 3225, 4532 Type
	Preconditioning		Ther	mal treatment	(at 150°C for 1 hr) No	ote 2
	Preheating	150°C, 1 to 2 min.			0°C, 2 to 5 min. 10°C, 2 to 5 min.	80 to 100°C, 5 to 10 min. 150 to 200°C, 5 to 10 min.
	1 				,	

270±5°C

3±0.5 sec.

24±2 hrs (Standard condition) Note 5

14. Temperatu	re Cycle (Thermal Shock)					
	Temperature	Standard	Appearance Capacitance change Q Insulation resistance Withstanding voltage	: No abnormality : Within ±2.5% or ±0.2 : Initial value : Initial value (between terminals):	25pF, whichever is larger. No abnormality	
Specified Value	Compensating(Class1)	High Frequency Type	Appearance Capacitance change Q Insulation resistance Withstanding voltage	: No abnormality : Within ±2.5% or ±0.2 : Initial value : Initial value (between terminals) :	25pF, whichever is larger. No abnormality	
	High Permittivity (Class2) Note 1	Appearance Capacitance change Dissipation factor Insulation resistance Withstanding voltage	: No abnormality : Within ±7.5% : Initial value : Initial value (between terminals):	No abnormality	
		C	Class 1		Class 2	
	Preconditioning		None	Thermal trea	atment(at 150°C for 1 hr Note 2)
Test Methods and Remarks	1 cycle	Step 1 2 3 4	Normal te Maximum operat	ing temperature mperature ing temperature mperature	Time (min.) 30±3 2 to 3 30±3 2 to 3	
	Number of cycles		04+0 (0+-	5 times	=	
	Recovery		24±2 hrs (Sta	ndard condition)Note 5)	

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Solder temp.

Duration

Recovery

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

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

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17. High Temp	erature Loading			
	Temperature Compensating(Class1)	Standard	Appearance Capacitance change Q Insulation resistance	: No abnormality : Within $\pm 3\%$ or ± 0.3 pF, whichever is larger. : C<10pF: Q\ge 200+10C 10\leq C<30pF: Q\ge 275+2.5C C\ge 30pF: Q\ge 350 (C:Nominal capacitance) : 1000 M\Omega min.
Specified Value		High Frequency Type	Appearance Capacitance change Insulation resistance	: No abnormality : Within $\pm 3\%$ or ± 0.3 pF, whichever is larger. : $1000~M\Omega$ min.
	High Permittivity (Class2)	Note 1	Appearance Capacitance change Dissipation factor Insulation resistance	: No abnormality : Within $\pm 12.5\%$: 5.0% max. : 50 M Ω μ F or 1000 M Ω , whichever is smaller.
	Preconditioning	: Voltage treatment ((Only High permittiv	_	shall be applied for 1 hour at 85°C, 105°C or 125°C) Note 1,3,4
Test	Temperature	: Maximum operating	temperature	
Methods and	Duration	: 1000 + 24/-0 hrs		
Remarks	Applied voltage	: Rated voltage × 2 N	Note 4	
	Charge/discharge current	: 50mA max.		
	Recovery	: 24±2hrs 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 $150 \pm 0/-10^{\circ}$ 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±2hours.
- 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: $20\pm2^{\circ}$ C, Relative humidity: 60 to 70 % RH, Air pressure: 86 to 106kPa Unless otherwise specified, all the tests are conducted under the "standard condition".

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Low distortion design/Audible/Good bias Multilayer Ceramic Capacitors for General Electronic Equipment for Consumer Low distortion design/Audible/Good bias Multilayer Ceramic Capacitors for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

■RELIABILITY DATA

1. Operating Temper	rature Rang	ge	
		Specification	Temperature Range
Specified Value	LD	X5R	-55 ~ +85°C
	SD	_	-55~ ±125°C

Z. Otorage Temperat	ui o i turigo		
		Specification	Temperature Range
Specified Value	LD	X5R	-55 ~ +85°C
	CD		FF 140F°O

3. Rated Voltage	
Specified Value	6.3VDC, 10VDC, 16VDC, 25VDC, 35VDC, 50VDC
4. Dielectric Withsta	anding Voltage (Between terminals)

4. Dielectric Withst	anding Voltage(Between terr	ninals)
Specified Value	No breakdown or damage	
Test Methods and Remarks	Applied voltage Duration Charge/discharge current	:Rated voltage × 2.5(LD), Rated voltage × 3(SD) : 1 to 5 sec. : 50mA max.

5. Insulation Resist	ance	
Specified Value Note 1	10000 M Ω or 500M Ω μ F, ν	whichever is smaller
Test Methods and Remarks	Applied voltage Duration Charge/discharge current	: Rated voltage : 60±5 sec. : 50mA max.

6. Capacitance (To	olerance)			
Specified Value	±10% or ±20%			
Test Methods and Remarks	Measuring frequency Measuring voltage Bias application	: 1kHz±10% : 1±0.2Vrms : None		

7. Dissipation Fact	cor		
Specified Value	10% max (LD) , 0.1% max	SD)	
Test Methods and Remarks	Measuring frequency Measuring voltage Bias application	: 1kHz±10% : 1±0.2Vrms : None	

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8, Temperature Characteristic (Without voltage application)

			errage approactions			
- ::::! \/ - l	Specific	cation	Capacitance change	Reference temperature	Temperature Range	
Specified Value	LD	X5R	±15%	25°C	-55~+85°C	
	Capacitan	ce at eac	h step shall be measured	in thermal equilibrium, and the	e temperature characteris	stic shall be calculated from
	equation.					
	Step		X5R			
	1	Minimum operating temperature		:		
est Methods and	2	25°C				
lemarks	3	Maximum operating temperature				
	/-	- \				
	(C-		- × 100(%)	C :Capacitance value in Ste	·	
	С	2		C ₂ :Capacitance value in St	epz	

9. Bending Streng	yth
Specified Value	Appearance : No abnormality Capacitance change : Within±12.5%(LD), Within±5%(SD)
Test Methods and Remarks	Warp : 1mm Speed : 0.5mm/second Duration : 10 seconds Test board : glass epoxy resin substrate Thickness : 1.6mm Capacitance measurement shall be conducted with the board bent.

10. Adhesive Force	of Terminal Electrodes
Specified Value	Terminal electrodes shall be no exfoliation or a sign of exfoliation.
Test Methods	Applied force : 5N
and Remarks	Duration : 30 ±5 seconds

11. Vibration		
Specified Value	Initial performance shall	be satisfied.
Test Methods and Remarks	Preconditioning Frequency range Overall amplitude Sweeping method	: Thermal treatment(at 150°C for 1hr) Note2 (Only LD) : 10 to 55 Hz : 1.5 mm : 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	At least 95% of terminal elect	rode is covered by new solder.	
		Eutectic solder	Lead-free solder
Test Methods	Solder type	H60A or H63A	Sn-3.0Ag-0.5Cu
and Remarks	Solder temperature	230±5°C	245±3°C
	Duration	4±1	sec.

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13. Resistance to Soldering Heat : No abnormality Appearance : Within ± 7.5% (LD), Within ± 2.5% (SD) Capacitance change Dissipation factor Specified Value : Initial value Insulation resistance Withstanding voltage : No abnormality (between terminals) 1608, 2012type 3216,3225type Thermal treatment (at 150°C for 1 hr) Note 2 Preconditioning 80 to 100°C 2 to 5 min 80 to 100°C 5 to 10 min Preheating conditions 150 to 200°C 5 to 10 min 150 to 200°C 2 to 5 min Solder temp. 270 ±5°C 3 ±0.5 sec. Duration Measurement shall be conducted 24±2hrs under the standard condition Note 5 Test Methods and Remarks 1005, 1608, 2012type 3216type 80 to 100°C 2 to 5 min 80 to 100°C 5 to 10 min Preheating conditions 150 to 200°C 2 to 5 min 150 to 200°C 5 to 10 min Solder temp. 270 ±5°C 3 ±0.5 sec. Duration 24 ± 2 hrs under the standard condition Note 5 Measurement shall be conducted

14. Temperature C	ycle (Thermal Shock)					
Specified Value	Appearance Capacitance change Dissipation factor Insulation resistance Withstanding voltage (between terminals)	: No abnormality : Within±7.5%(L : Initial value : Initial value : No abnormality	.D), Within±2.5%(SD)			
			LD		SD	
	Preconditioning		nt (at 150°C for 1 hr) ote 2	None		
		Step temperature(°C) Time(min.)		
Test Methods	1 cycle	1	Minimum operating temperature Normal temperature		30±3 min.	
and Remarks		2			2 to 3 min.	
		3	Maximum operating temperature		30±3 min.	
		4	4 Normal temperature		2 to 3 min.	
	Number of cycles					
	Measurement shall be conducted	2				

15. Humidity (Steady state)						
Specified Value Note 1	Capacitance change : Within Dissipation factor : 20%m	ponormality $\pm 12.5\% (LD)$, $\pm 5\% Within(SD)$ $\pm 5\% (LD)$, $\pm 5\% Within(SD)$ $\pm 12.5\% (LD)$, $\pm 12.5\% (LD)$				
		LD	SD			
T . M .!	Preconditioning	Thermal treatment (at 150°C for 1 hr) Note 2	None			
Test Methods and Remarks	Temperature	40±2°C				
and nemarks	Humidity	90 to 95% RH				
	Duration	500 + 24/-0 hrs				
	Measurement shall be conducted	24 ± 2 hrs under the standa	ard condition Note 5			

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16. Humidity Loadi	1.				
	Appearance	: No abn	-		
Specified Value	Capacitance change	: Within :	\pm 12.5%(LD), Within \pm 7.5%(SD)		
Note 1	Dissipation factor	: 20%max	x(LD), 0.5%max(SD)		
	Insulation resistance : $25M\Omega$ μ F or $500M\Omega$, whichever is smaller				
			LD	SD	
			Voltage treatment		
	Preconditioning		(Rated voltage are applied for 1 hour at 40 °C)	None	
T . M .! !			Note 3		
Test Methods and Remarks	Temperature		40±2°C		
and Remarks	Humidity		90 to 95% RH		
	Duration		500 + 24/-0 hrs		
	Applied voltage		Rated voltage		
	Charge/discharge current		50mA max		
	Measurement shall be cor	nducted	24 ±2hrs under the standard condition Note 5		

	Appearance :						
Specified Value	Capacitance change :	Within±12.5%(LD), Within±3%(SD)					
Note 1	Dissipation factor :	20%max(LD), 0.35%max(SD)	%max(LD), 0.35%max(SD)				
	Insulation resistance : $50M\Omega$ μ F or $1000M\Omega$, whichever is smaller						
		LD	SD				
		Voltage treatment					
	Preconditioning	(Twice the rated voltage shall be applied for 1 hour at 85°C or 125°C)	None				
Test Methods		Note 3, Note 4					
and Remarks	Temperature	Maximum operating temperature	Maximum operating temperature				
	Duration	1000 +48/-0 hrs					
	Applied voltage	Rated voltage x 2 Note 4	Rated voltage x 2				
	Charge/discharge current	50mA max	50mA max				
	Measurement shall be conduc	24 ±2hrs under the standard condition Note 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 $150 \pm 0/-10^{\circ}$ 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±2hours.
- 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: $20\pm2^{\circ}$ C, Relative humidity: 60 to 70 % RH, Air pressure: 86 to 106kPa Unless otherwise specified, all the tests are conducted under the "standard condition".

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Medium-High Voltage Multilayer Ceramic Capacitor for General Electronic Equipment for Consumer Medium-High Voltage Multilayer Ceramic Capacitor

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

RELIABILITY DATA

1. Operating Temp	erature Range				
	Temperature Compensating(Class1)	COG, COH : -55 to +125°C			
Specified Value	High Permittivity (Class2)	X7R, X7S : -55 to +125°C X5R : -55 to +85°C B : -25 to +85°C SD : -55 to +125°C			
2. Storage Temper	rature Range				
	Temperature Compensating(Class1)	COG, COH : -55 to +125°C			
Specified Value	High Permittivity (Class2)	X7R, X7S : -55 to $+125$ °C X5R : -55 to $+85$ °C B : -25 to $+85$ °C SD : -55 to $+125$ °C			
3. Rated Voltage		T			
Specified Value	Temperature Compensating(Class1)	100VDC(Code:H)			
	High Permittivity (Class2)	100VDC(Code: H), 250VDC(Code: Q), 630VDC(Code: S), 2000VDC(Code: X)			
	Itage (Between terminals)				
Specified Value	No breakdown or damage				
Test Methods and Remarks	Applied voltage : Rated voltage(H) × 2.5, Rated voltage(Q) × 2, Rated voltage(S, X) × 1.2 Duration : 1 to 5sec. Charge/discharge current : 50mA max.				
5. Insulation Resist	tance				
o. Irisdiation (CSIS)	Temperature Compensating(Class1)	10000 MΩ min.			
Specified Value					
Test Methods and Remarks	High Permittivity (Class2) $100M \Omega \cdot \mu \text{F} \text{or} 10G \Omega$, whichever is smaller. Applied voltage : Rated voltage (H, Q), $500V(S, X)$ Duration : $60 \pm 5 \text{sec.}$ Charge/discharge current : $50 \text{mA} \text{max.}$				
6. Capacitance (T	olerance)				
Specified Value	Temperature Compensating(Class1)	C≦10pF : ±0.5pF C>10pF : ±5% (C: Nominal capacitance)			
	High Permittivity (Class2)	±10%, ±20%			
Test Methods	Temperature Compensating(Class1)	Measuring frequency : 1MHz±10% Measuring voltage : 0.5∼5Vrms Bias application : None			
and Remarks	High Permittivity (Class2)	Measuring frequency: 1kHz±10%, 1MHz±10%(SD: 1608type(H), 2012type(Q))Measuring voltage: 1±0.2VrmsBias application: None			

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Specified Value	Temperature Compensating(Class1)	$C < 30pF : Q \ge 400 + 20C$ $C \ge 30pF : Q \ge 1000$	(C:Nominal capacitance)
	High Permittivity (Class2)	3.5%max (H: 1608type min),2.5%max(H: 1005type,Q, S, X),0.1type max (SD)
Test Methods and Remarks	Temperature Compensating(Class1)	Measuring frequency Measuring voltage Bias application	: 1MHz±10% : 0.5∼5Vrms : None
	High Permittivity (Class2)	Measuring frequency Measuring voltage Bias application	: 1kHz±10%, 1MHz±10%(SD:1608type(H), 2012type(Q)); : 1±0.2Vrms : None

8. Temperature Cha	3. Temperature Characteristic of Capacitance					
	Temperature Compensating(Class1)	COG :0±30ppm/°C(-55 to +125°C) COH :0±60ppm/°C(-55~+125°C)				
Specified Value	High Permittivity(Class2)	B : $\pm 10\%(-25 \text{ to } +85^{\circ}\text{C})$ X5R : $\pm 15\%(-55 \text{ to } +85^{\circ}\text{C})$ X7R : $\pm 15\%(-55 \text{ to } +125^{\circ}\text{C})$ X7S : $\pm 22\%(-55 \text{ to } +125^{\circ}\text{C})$				
	I					

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.

$$\frac{(C_{85}-C_{20})}{C_{20}\times\Delta T} \times 10^{6} (ppm/^{\circ}C) \qquad \Delta T = 65$$

Class 2

Test Methods and Remarks

Capacitance at each step shall be measured in thermal equilibrium, and the temperature characteristic shall be calculated from the following equation.

Step	В	X5R、X7R、X7S		
1	Minimum operating temperature			
2	20°C	25°C		
3	Maximum operating temperature			

$$\frac{(C-C_2)}{C_2}$$
 ×100(%)

C : Capacitance value in Step 1 or Step 3

C2 : Capacitance value in Step 2

Specified Value	Temperature Compensating(Class1) High Permittivity (Class2)	Appearance : No abnormality Capacitance change : Within ±5% or ±0.5 pF, whichever is larger. Appearance : No abnormality
specified value	High Permittivity (Class2)	Appearance : No abnormality
	, , , , , , , , , , , , , , , , , , , ,	Capacitance change :±10%, ±5%,(SD)
est Methods nd Remarks	Warp : 1mm Duration : 10sec. Test board : Glass epoxy-resin substrate Thickness : 1.6mm Canacitance measurement shall be conducted.	Warp 45 ± 2 (Unit: mm)

10. Adhesive Strength of Terminal Electrodes						
Specified Value	Temperature Compensating(Class1)	No terminal separation or its indication.				
Specified Value	High Permittivity (Class2)	No terminal separation or its indication.				
Test Methods	Applied force : 5N					
and Remarks	Duration : 30±5sec.					

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11. Vibration	_				
C:::	Temperature Compensating(Class1) High Permittivity (Class2)				
Specified Value			Initial performan	ce shall be satisfied.	
Test Methods and Remarks	Preconditioning Frequency range Overall amplitude Sweeping method	: 10 to 55 Hz : 1.5 mm : 10 to 55 to 10		1hr)Note1 (Only High permittivity) ons: 6 hrs in total	
12. Solderability					
-	Temperature Compensat	ing(Class1)			
Specified Value			At least 95% of t	erminal electrode is covered by new solder	
	High Permittivity (Class	<u> </u>			
			tic solder	Lead-free solder	
Test Methods	Solder type		or H63A	Sn-3.0Ag-0.5Cu	
and Remarks	Solder temperature	230	±5°C	245±3°C	
	Duration		4±1	sec.	
Specified Value	Temperature Compensating(Class1) High Permittivity (Class2)		Appearance Capacitance cha Q Insulation resista Withstanding vol Appearance Capacitance cha Dissipation facto	: Initial value : Initial value : Initial value (between terminals) : No abnormality : No abnormality : Within±7.5%(H: 1005type), ±15%(H: 1608type min) ±10%(Q, S, X), ±2.5%(SD) : Initial value	
			Insulation resista Withstanding vol		
		_			
	D Pri		re Compensating(C	Jiass I)	
	Preconditioning	None			
	Solder temperature	270±5°C			
	Duration	3±0.5sec. 80 to 100°C, 2 to 5	5 min.		
	Preheating conditions	150 to 200°C, 2 to			
Test Methods	Recovery	24±2hrs under th	e standard conditio	n Note3	
rest Methods and Remarks					
and Nematks			High Pe	rmittivity (Class2)	
	Preconditioning	Thermal treatment	(at 150°C for 1hr)	Note1	
	Solder temperature	270±5°C			
	Duration	3±0.5sec.			
	Preheating conditions	•		ax), 5 to 10 min(3216type min)	
		150 to 200°C, 2 to 5min.(2012type max), 5 to 10 min(3216type min)			

 24 ± 2 hrs under the standard condition Note3

Recovery

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14. Temperature C	Cycle (Thermal Shock)					
	Temperature Compensa	nting(Class1)	Appearance Capacitance change Q Insulation resistance Withstanding voltage	: No abnormality : Within ±2.5% or : Initial value : Initial value (between terminal		-
Specified Value	High Permittivity(Clas	s2)	Appearance Capacitance change Dissipation facto Insulation resistance Withstanding voltage	: No abnormality : Within±7.5%(H: ±10%(Q, S, X), : Initial value : Initial value (between terminal	±2.5%(SD)	
		Class 1			Class 2	
	Preconditioning	None		Thermal treatn	nent (at 150°C fo	or 1 hr) Note 1
		Step	Temperature (°C)		Time (min.)	
T		1	Minimum operation	ng temperature	30±3]
Test Methods	1 cycle	2	Normal ten	perature	2 to 3]
and Remarks		3	Maximum operating temperature		30±3]
		4	Normal temperature		2 to 3	1
	Number of cycles		Ę	times		-
	Recovery		24±2 hrs(Stan	dard condition)Note	e 3	

15. Humidity (Stea	dy state)			
Sec. : End Value	Temperature Compensating(Class1)		Appearance Capacitance change Q Insulation resistance	: No abnormality : Within $\pm 5\%$ or ± 0.5 pF, whichever is larger. : $C < 10$ pF : $Q \ge 200 + 10$ C $10 \le C < 30$ pF : $Q \ge 275 + 2.5$ C $C \ge 30$ pF: $Q \ge 350$ (C:Nominal capacitance) : $1000 \text{ M}\Omega$ min.
Specified Value	High Permittivity (Class2)		Appearance Capacitance change Dissipation factor Insulation resistance	: No abnormality $:\pm 12.5 \text{max} (1005 \text{type}), \ \pm 15 \text{max} (1608 \text{type min}), \\ \pm 5 \text{max} (\text{SD}) \\ : 5 \text{max} (\text{H: } 1005 \text{type}, \text{Q, S, X}), 7 \text{max} (\text{H: } 1608 \text{type min}), \\ 0.5 \text{max} (\text{SD}). \\ : 25 \text{M} \ \Omega \ \mu \text{F} \ \text{or } 1000 \text{M} \ \Omega, \ \text{whichever is smaller}.$
Test Methods and Remarks	Preconditioning Temperature Humidity Duration Recovery	: Thermal treatment(at 150°C for 1hr) Note1 (Only High permittivity) : 40±2°C : 90 to 95%RH : 500 +24/-0 hrs : 24±2hrs under the standard condition Note3		

16. Humidity Loadi	ng			
	Temperature Compensating (Class1) High Permittivity (Class2)		Appearance Capacitance change Q Insulation resistance	: No abnormality : Within $\pm 7.5\%$ or ± 0.75 pF, whichever is larger : C < 30 pF: Q $\ge 100 + 10$ C/3 C ≥ 30 pF: Q ≥ 200 (C:Nominal capacitance) : 500 M Ω min.
Specified Value			Appearance Capacitance change Dissipation factor Insulation resistance	: No abnormality $:\pm 12.5 \text{max} (1005 \text{type}), \ \pm 15 \text{max} (1608 \text{type min}), \\ \pm 7.5 \text{max} (\text{SD}) \\ : 5 \text{max} (\text{H}: 1005 \text{type}, \text{Q}, \text{S}, \text{X}), 7 \text{max} (\text{H}: 1608 \text{type min}), \\ 0.5 \text{max} (\text{SD}) \\ : 10 \text{M} \ \Omega \ \mu \text{F} \ \text{or} \ 500 \text{M} \ \Omega, \ \text{whichever} \ \text{is} \ \text{smaller}.$
Test Methods and Remarks	Preconditioning Temperature Humidity Duration Applied voltage Charge/discharge current Recovery	: Voltage treatment (Rated voltage are applied for 1 hour at 40°C) Note : 40±2°C : 90 to 95%RH : 500 +24/-0 hrs : Rated voltage : 50mA max. : 24±2hrs under the standard condition Note3		

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·		·	Appearance	: No abnormality			
		Temperature Compensating(Class1)		: Within $\pm 3\%$ or ± 0.3 pF, whichever is larger			
	T			: C<10pF: Q≧200+10C			
	Temperature Compensating			10≦C<30pF: Q≧275+2.5C			
				C≧30pF: Q≧350 (C:Nominal capacitance)			
Specified Value			Insulation resistance	: 1000 M Ω min.			
Specified value			Appearance	: No abnormality			
			Capacitance change	± 12.5 %max(1005type), ± 15 %max(1608type min),			
	High Permittivity (Class2)			$\pm 3\%$ max(SD)			
	Tilgit Chilitavity (Olass2)		Dissipation factor	: 5%max(H:1005type,Q, S, X), 7%max(H:1608type min),			
				0.35%max(SD)			
			Insulation resistance	: $50 \mathrm{M}\Omega~\mu$ F or $1000 \mathrm{M}\Omega$, whichever is smaller.			
	Preconditioning	Preconditioning : Voltage treatment (Twice the rated voltage shall be applied for 1 hour at 85°C or 125°C) Note 2					
		(Only High permittivity)					
Test Methods	Temperature	: Maximum oper	ating temperature				
and Remarks	Duration	Duration : $1000 + 24/-0$ hrs					
and Nomanio	Applied voltage : Rated voltage(H) \times 2, Rated voltage(Q) \times 1.5, Rated voltage \times 1.2(S, X) \times 1.2						
	Charge/discharge current : 50mA max.						
	Recovery	Recovery : 24±2hrs under the standard condition Note3					
Note1 Thermal tre	eatment : Initial value shall be m	easured after tes	t sample is heat-treated	at $150+0/-10^{\circ}$ C for an hour and kept at room temperature			
	for 24 ± 2 hours.						
Note2 Voltage tre			· -	d for an hour at both the temperature and voltage specified in the			
			erature for 24±2hours.				
Note3 Standard c	ondition : Temperature: 5 to 35°		•				
	·	_	neasurement results, in or	der to provide correlation data, the test shall be conducted under			
	the following condition			00 : 100LB			
	Lemperature: 20 ± 2°C	 Relative humidi 	ty: 60 to 70 % RH, Air pres	ceure: Xh to IllhkDa			

Unless otherwise specified, all the tests are conducted under the "standard condition".

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PRECAUTIONS

1. Circuit Design

- ◆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.

Precautions

- ◆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
 - 2. Even if an applied voltage is the rated voltage or less reliability of capacitors may be deteriorated in case that either a high frequence 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.

◆Pattern configurations (Design of Land-patterns)

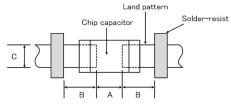
The following diagrams and tables show some examples of recommended land patterns to prevent excessive solder amounts.

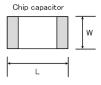
- (1) Recommended land dimensions for typical chip capacitors
- Multilayer Ceramic Capacitors : Recommended land dimensions (unit: mm)

Wave-soldering

	6					
Туре		1608	2012	3216	3225	
Size	L	1.6	2.0	3.2	3.2	
Size	W	0.8	1.25	1.6	2.5	
P	١	0.8 to 1.0	1.0 to 1.4	1.8 to 2.5	1.8 to 2.5	
В		0.5 to 0.8	0.8 0.8 to 1.5 0.8 to 1.7		0.8 to 1.7	
С		0.6 to 0.8	0.9 to 1.2	1.2 to 1.6	1.8 to 2.5	

Land patterns for PCBs





Technical considerations

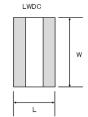
Reflow-soldering

	The state of the s									
Ty	/ре	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	3.2	4.5
Size	W	0.125	0.2	0.3	0.5	0.8	1.25	1.6	2.5	3.2
	Ą	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
	В	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
(С	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.

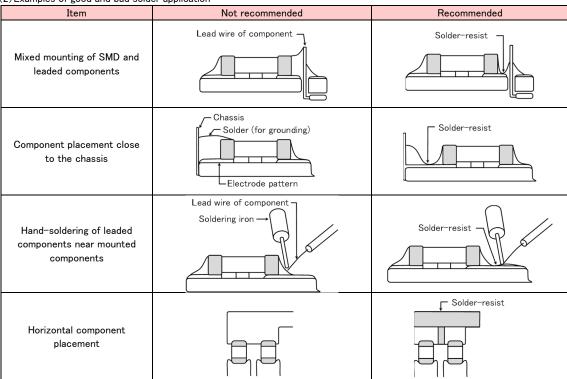
● LWDC: Recommended land dimensions for reflow-soldering (unit: mm)

Туре		0510 0816		1220	
Size	┙	0.52	0.8	1.25	
Size	W	1.0	1.6	2.0	
1	١	0.18~0.22	0.25~0.3	0.5~0.7	
В		0.2~0.25	0.3~0.4	0.4~0.5	
С		0.9~1.1	1.5~1.7	1.9~2.1	

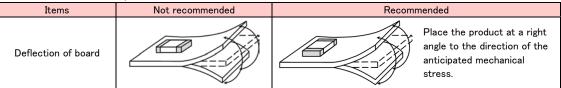


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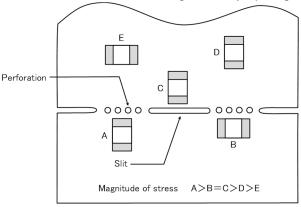
(2) Examples of good and bad solder application



- ◆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.



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

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

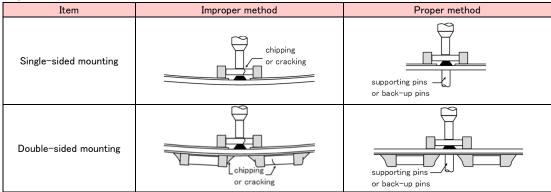
Precautions

- ◆Selection of Adhesives
 - 1. 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.

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◆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:



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.

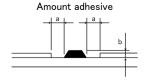
◆Selection of Adhesives

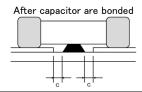
Some adhesives may cause IR deterioration. The different shrinkage percentage of between the adhesive and the capacitors may result in stresses on the capacitors and lead to cracking. Moreover, too little or too much adhesive applied to the board may adversely affect components. Therefore, the following 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	Figure 2012/3216 case sizes as examples		
а	0.3mm min		
b	100 to 120 μ m		
c Adhesives shall not contact land			





4. Soldering

Precautions

Technical

considerations

◆Selection of Flu

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 CI 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.

◆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.

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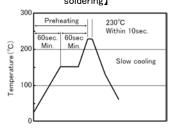
and the capability of the machines used shall also be considered carefully when water-soluble flux is used.

♦Soldering

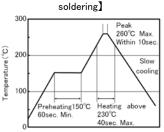
- · Ceramic chip capacitors are susceptible to thermal shock when exposed to rapid or concentrated heating or rapid cooling.
- · Therefore, the soldering must be conducted with great care so as to prevent malfunction of the components due to excessive thermal shock
- Preheating: Capacitors shall be preheated 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】

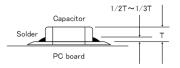


[Recommended condition for Pb-free



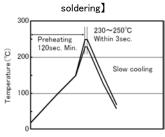
Caution

- 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.

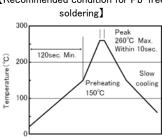


[Wave soldering]

[Recommended conditions for eutectic



[Recommended condition for Pb-free

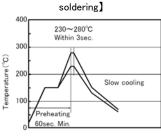


Caution

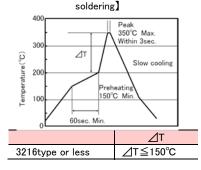
①Wave soldering must not be applied to capacitors designated as for reflow soldering only. soldering for 1 times.

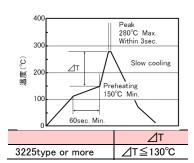
[Hand soldering]

[Recommended conditions for eutectic



[Recommended condition for Pb-free





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.

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5. Cleaning ◆Cleaning conditions 1. When PCBs are cleaned after capacitors mounting, please select the appropriate cleaning solution in accordance with the intended use Precautions of the cleaning. (e.g. to remove soldering flux or other materials from the production process.) 2. Cleaning condition shall be determined after it is verified by using actual cleaning machine that the cleaning process does not affect capacitor's characteristics. 1. 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). 2. 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 Technical capacitors or the soldered portion, or decrease the terminal electrodes' strength. Therefore, the following conditions shall be carefully considerations Ultrasonic output: 20 W/l or les Ultrasonic frequency: 40 kHz or less Ultrasonic washing period: 5 min. or less

6. Resin coating and mold 1. 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. 2. When a resin's hardening temperature is higher than capacitor's operating temperature, the stresses generated by the excessive heat Precautions may lead to damage or destruction of capacitors. The use of such resins, molding materials etc. is not recommended.

7. Handling	
Precautions	 ◆Splitting of PCB 1. 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. 2. Board separation shall not be done manually, but by using the appropriate devices. ◆Mechanical considerations Be careful not to subject capacitors to excessive mechanical shocks. (1) If ceramic capacitors are dropped onto a floor or a hard surface, they shall not be used. (2) Please be careful that the mounted components do not come in contact with or bump against other boards or components.

8. Storage condit	tions		
Precautions	 ◆Storage 1. 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. •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. •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 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.			
%RCR-2335B(S	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.

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MLAST021SCG1R2CWNA01	MLAST021SCG1R3BWNA01	MLAST021SCG1R3CWNA01
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MLASA042SB5104MWNA01	MLASA042SB5473KWNA01	MLASA042SB5473MWNA0	MLASA063AC6105KFNA01
MLASA063AC6105MFNA01	MLASA063SC6474KFNA01	MLASA063SC6474MFNA01	MLASA105BC6475MFNA01
MLASA168BB5476MRCA01	MLASA168BC6226MTNA01	MLASA168BC6476MRCA01	MLASA1L3YB5225MFNA01