

# 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
	Equipment *1	Category (Part Number Code *2)	
Automotive	Automotive Electronic Equipment (POWERTRAIN, SAFETY)	A	1
	Automotive Electronic Equipment (BODY & CHASSIS, INFOTAINMENT)	C	2
Industrial	Telecommunications Infrastructure and Industrial Equipment	B	2
Medical	Medical Devices classified as GHTF Class C (Japan Class III)	M	2
	Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)	L	3
Consumer	General Electronic Equipment	S	3
	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.

## 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.


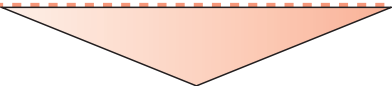
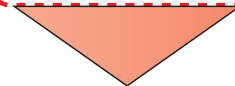
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► This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our product specification sheets. For details of each product (characteristics graph, reliability information,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

# 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 Level		Low  High			
Japan	Classification according to the PMD Act of Japan (based on the GHTF Rules)	<b>Class I</b> General Medical Devices (GHTF Class A)	<b>Class II</b> Controlled Medical Devices (GHTF Class B)	<b>Class III</b> Specially-controlled Medical Devices (GHTF Class C)	<b>Class IV</b> Specially-controlled Medical Devices (GHTF Class D)
		Medical devices with extremely low risk to the human body in case of problems	Medical devices with relatively low risk to the human body in case of problems	Medical devices with relatively high risk to the human body in case of problems	Medical devices highly invasive to patients and with life-threatening risk in case of problems
		[Ex.] <ul style="list-style-type: none"><li>• In Vitro Diagnostic Devices</li><li>• Nebulizer</li><li>• Blood Gas Analyzer</li><li>• Plethysmographs</li><li>• Breathing Sensor</li><li>• AC-powered Operating Table</li><li>• Surgical Light</li><li>• Cholesterol Analysis Device</li><li>• Blood Type Analysis Device, etc.</li></ul>	[Ex.] <ul style="list-style-type: none"><li>• Electronic Thermometer</li><li>• Electronic Blood Pressure Gauge</li><li>• Electronic Endoscope</li><li>• Hearing Aid</li><li>• Electrocardiograph</li><li>• MRI</li><li>• Ultrasonic Diagnostic System</li><li>• Diagnostic Imaging Equipment</li><li>• X-ray Diagnostic Equipment</li><li>• Central Monitor</li><li>• Pulse Oximeter, etc.</li></ul>	[Ex.] <ul style="list-style-type: none"><li>• Dialysis Machine</li><li>• Radiation Therapy Equipment</li><li>• Infusion Pump</li><li>• Respirator</li><li>• Glucose Monitoring System</li><li>• AED (Automated External Defibrillator)</li><li>• Skin Laser Scanner</li><li>• Electric Surgical Unit</li><li>• Insulin Pump, etc.</li></ul>	[Ex.] <ul style="list-style-type: none"><li>• Cardiac Pacemaker</li><li>• Video Flexible Angioscope</li><li>• Implantable Infusion Pump</li><li>• Cardiac Electrosurgical Unit</li><li>• Inspection Device with Cardiac Catheter</li><li>• Defibrillator, etc.</li></ul>
U.S.A.	FDA Classification	<b>Class I</b> General Controls	<b>Class II</b> General Controls and Special Controls		<b>Class III</b> General Controls and Premarket Approval
		Medical devices without the possibility of causing serious injury or harm to the patient or user even if there is a defect or malfunction in such medical devices	Medical devices with the possibility of causing injury or harm to the patient or user if there is a defect or malfunction in such medical devices		Medical devices with the possibility of causing serious injury, disability or death to the patient or user if a defect or malfunction occurs in such medical devices
					
Corresponding TAIYO YUDEN Product Series		Product Series for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II) (The 2nd Code from the Left Side of the Part Number: “L”)		Product Series for Medical Devices classified as GHTF Class C (Japan Class III) (The 2nd Code from the Left Side of the Part Number: “M”) (See the Note below.)	
				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).

► 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/>).

# Wire-wound Ferrite Power Inductors LMQN/LMQPA series

## for Medical Devices classified as GHTF Class C (Japan Class III)

Code in front of Series have been extracted from Part number, which describes the segment of products, such as kinds and characteristics.

REFLOW

PART NUMBER

\*Operating Temp. : -40~105°C(Including self-generated heat)

L	M	Q	N	A	2	0	1	2	1	2	T	1	0	0	M		
①	②	③	④	⑤	⑥	⑦	⑧	⑨									

## ①Series

Code (1)(2)(3)(4)	
LMQN	Wire-wound Ferrite Power Inductor for Medical Devices classified as GHTF Class C (Japan Class III)
LMQP	Wire-wound Ferrite Power Inductor for Medical Devices classified as GHTF Class C (Japan Class III)

## (1) Product Group

Code	
L	Inductors

## (2) Category

Code	Recommended equipment	Quality Grade
M	Medical Devices classified as GHTF Class C (Japan Class III)	2

## (3) Type

Code	
Q	Ferrite Wire-wound (Horizontal type)

## (4) Features, Characteristics

Code	
N	Standard Power choke
P	High current power choke

## ②Features

Code	Feature
A	5-surface electrode (Ag-resin × Sn-plate)

## ③Dimensions (L × W)

Code	Type (inch)	Dimensions (L × W) [mm]
2012	2012 (0805)	2.0 × 1.25
2016	2016 (0806)	2.0 × 1.6
2518	2518 (1007)	2.5 × 1.8
3225	3225 (1210)	3.2 × 2.5

## ④Dimensions (T)

Code	Dimensions (T) [mm]
12	1.25
16	1.6
18	1.8
25	2.5

## ⑤Packaging

Code	Packaging
T	Taping

## ⑥Nominal inductance

Code (example)	Nominal inductance [μH]
1R0	1.0
100	10
101	100

※R=Decimal point

## ⑦Inductance tolerance

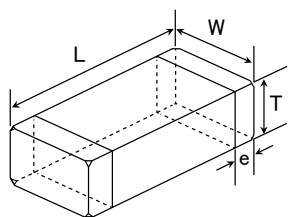
Code	Inductance tolerance
K	±10%
M	±20%

## ⑧Special code

Code	Special code
R	Low Rdc type

## ⑨Internal code

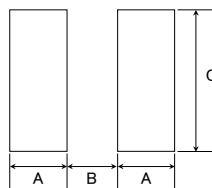
# STANDARD EXTERNAL DIMENSIONS / STANDARD QUANTITY



## Recommended Land Patterns

### Surface Mounting

- Mounting and soldering conditions should be checked beforehand.
- Applicable soldering process to these products is reflow soldering only.



Type	A	B	C
A2012	0.60	1.0	1.45
A2016	0.60	1.0	1.8
A2518	0.60	1.5	2.0
A3225	0.85	1.7	2.7

Unit : mm

Type	L	W	T	e	Standard quantity [pcs]	
					Paper tape	Embossed tape
A201212	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.2 (0.020±0.008)	—	3000
A201616	2.0±0.2 (0.079±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.020±0.008)	—	2000
A251818	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.5±0.2 (0.020±0.008)	—	2000
A322525	3.2±0.2 (0.126±0.008)	2.5±0.2 (0.098±0.008)	2.5±0.2 (0.098±0.008)	0.6±0.3 (0.024±0.012)	—	1000

Unit : mm (inch)

## PART NUMBER

- All the Wire-wound Ferrite Power Inductors of the catalog lineup are RoHS compliant.

## Notes)

- The exchange of individual specifications is necessary depending on your application and/or circuit condition. Please contact TAIYO YUDEN's official sales channel.
- The products are for Medical Devices classified as GHTF Class C (Japan Class III).  
Please consult with TAIYO YUDEN's official sales channel for the details of the product specifications, etc., and please review and approve the product specifications before ordering.

## ● 2012 (0805) type

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQNA201212T1R0M	CB 2012T1R0M 8	1.0	$\pm 20\%$	100	0.15	500	700	7.96
LMQNA201212T2R2M	CB 2012T2R2M 8	2.2	$\pm 20\%$	80	0.23	410	620	7.96
LMQNA201212T3R3M	CB 2012T3R3M 8	3.3	$\pm 20\%$	55	0.30	330	550	7.96
LMQNA201212T4R7M	CB 2012T4R7M 8	4.7	$\pm 20\%$	45	0.40	300	430	7.96
LMQNA201212T6R8M	CB 2012T6R8M 8	6.8	$\pm 20\%$	38	0.47	250	350	7.96
LMQNA201212T100K	CB 2012T100K 8	10	$\pm 10\%$	32	0.70	190	300	2.52
LMQNA201212T100M	CB 2012T100M 8	10	$\pm 20\%$	32	0.70	190	300	2.52
LMQNA201212T100KR	CB 2012T100KR 8	10	$\pm 10\%$	32	0.50	200	300	2.52
LMQNA201212T100MR	CB 2012T100MR 8	10	$\pm 20\%$	32	0.50	200	300	2.52
LMQNA201212T150K	CB 2012T150K 8	15	$\pm 10\%$	28	1.3	170	240	2.52
LMQNA201212T150M	CB 2012T150M 8	15	$\pm 20\%$	28	1.3	170	240	2.52
LMQNA201212T220K	CB 2012T220K 8	22	$\pm 10\%$	16	1.7	135	220	2.52
LMQNA201212T220M	CB 2012T220M 8	22	$\pm 20\%$	16	1.7	135	220	2.52
LMQNA201212T470K	CB 2012T470K 8	47	$\pm 10\%$	11	3.7	90	140	2.52
LMQNA201212T470M	CB 2012T470M 8	47	$\pm 20\%$	11	3.7	90	140	2.52
LMQNA201212T680K	CB 2012T680K 8	68	$\pm 10\%$	10	6.0	70	100	2.52
LMQNA201212T680M	CB 2012T680M 8	68	$\pm 20\%$	10	6.0	70	100	2.52
LMQNA201212T101K	CB 2012T101K 8	100	$\pm 10\%$	8	7.0	60	100	0.796
LMQNA201212T101M	CB 2012T101M 8	100	$\pm 20\%$	8	7.0	60	100	0.796

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQPA201212T1R0M	CB C2012T1R0M 8	1.0	$\pm 20\%$	100	0.19	700	640	7.96
LMQPA201212T2R2M	CB C2012T2R2M 8	2.2	$\pm 20\%$	70	0.33	530	485	7.96
LMQPA201212T4R7M	CB C2012T4R7M 8	4.7	$\pm 20\%$	45	0.50	360	395	7.96
LMQPA201212T100K	CB C2012T100K 8	10	$\pm 10\%$	40	1.2	240	255	2.52
LMQPA201212T100M	CB C2012T100M 8	10	$\pm 20\%$	40	1.2	240	255	2.52
LMQPA201212T220K	CB C2012T220K 8	22	$\pm 10\%$	16	3.7	170	145	2.52
LMQPA201212T220M	CB C2012T220M 8	22	$\pm 20\%$	16	3.7	170	145	2.52
LMQPA201212T470K	CB C2012T470K 8	47	$\pm 10\%$	11	5.8	120	115	2.52
LMQPA201212T470M	CB C2012T470M 8	47	$\pm 20\%$	11	5.8	120	115	2.52

## ● 2016 (0806) type

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQNA201616T1R0M	CB 2016T1R0M 8	1.0	$\pm 20\%$	100	0.09	600	720	7.96
LMQNA201616T1R5M	CB 2016T1R5M 8	1.5	$\pm 20\%$	80	0.11	550	650	7.96
LMQNA201616T2R2M	CB 2016T2R2M 8	2.2	$\pm 20\%$	70	0.13	510	600	7.96
LMQNA201616T3R3M	CB 2016T3R3M 8	3.3	$\pm 20\%$	55	0.20	400	440	7.96
LMQNA201616T4R7M	CB 2016T4R7M 8	4.7	$\pm 20\%$	45	0.25	340	410	7.96
LMQNA201616T6R8M	CB 2016T6R8M 8	6.8	$\pm 20\%$	38	0.35	300	330	7.96
LMQNA201616T100K	CB 2016T100K 8	10	$\pm 10\%$	32	0.50	250	270	2.52
LMQNA201616T100M	CB 2016T100M 8	10	$\pm 20\%$	32	0.50	250	270	2.52
LMQNA201616T150K	CB 2016T150K 8	15	$\pm 10\%$	28	0.70	210	220	2.52
LMQNA201616T150M	CB 2016T150M 8	15	$\pm 20\%$	28	0.70	210	220	2.52
LMQNA201616T220K	CB 2016T220K 8	22	$\pm 10\%$	16	1.0	165	190	2.52
LMQNA201616T220M	CB 2016T220M 8	22	$\pm 20\%$	16	1.0	165	190	2.52
LMQNA201616T330K	CB 2016T330K 8	33	$\pm 10\%$	14	1.7	130	140	2.52
LMQNA201616T330M	CB 2016T330M 8	33	$\pm 20\%$	14	1.7	130	140	2.52
LMQNA201616T470K	CB 2016T470K 8	47	$\pm 10\%$	11	2.4	110	120	2.52
LMQNA201616T470M	CB 2016T470M 8	47	$\pm 20\%$	11	2.4	110	120	2.52
LMQNA201616T680K	CB 2016T680K 8	68	$\pm 10\%$	10	3.0	90	110	2.52
LMQNA201616T680M	CB 2016T680M 8	68	$\pm 20\%$	10	3.0	90	110	2.52
LMQNA201616T101K	CB 2016T101K 8	100	$\pm 10\%$	8	4.5	70	90	0.796
LMQNA201616T101M	CB 2016T101M 8	100	$\pm 20\%$	8	4.5	70	90	0.796

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

※) The temperature rise current value (Idc2) is the DC current value having temperature increase by 20°C. (at 20°C)

※) The rated current value is following either Idc1 or Idc2, which is the lower one.

## PART NUMBER

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQPA201616T1R0M	CB C2016T1R0M 8	1.0	$\pm 20\%$	100	0.10	1,100	885	7.96
LMQPA201616T1R5M	CB C2016T1R5M 8	1.5	$\pm 20\%$	80	0.15	1,000	775	7.96
LMQPA201616T2R2M	CB C2016T2R2M 8	2.2	$\pm 20\%$	70	0.20	750	625	7.96
LMQPA201616T3R3M	CB C2016T3R3M 8	3.3	$\pm 20\%$	55	0.27	600	535	7.96
LMQPA201616T4R7M	CB C2016T4R7M 8	4.7	$\pm 20\%$	45	0.37	550	460	7.96
LMQPA201616T6R8M	CB C2016T6R8M 8	6.8	$\pm 20\%$	38	0.59	450	360	7.96
LMQPA201616T100K	CB C2016T100K 8	10	$\pm 10\%$	32	0.82	380	305	2.52
LMQPA201616T100M	CB C2016T100M 8	10	$\pm 20\%$	32	0.82	380	305	2.52
LMQPA201616T150K	CB C2016T150K 8	15	$\pm 10\%$	28	1.2	300	255	2.52
LMQPA201616T150M	CB C2016T150M 8	15	$\pm 20\%$	28	1.2	300	255	2.52
LMQPA201616T220K	CB C2016T220K 8	22	$\pm 10\%$	16	1.8	250	205	2.52
LMQPA201616T220M	CB C2016T220M 8	22	$\pm 20\%$	16	1.8	250	205	2.52
LMQPA201616T330K	CB C2016T330K 8	33	$\pm 10\%$	14	2.8	220	165	2.52
LMQPA201616T330M	CB C2016T330M 8	33	$\pm 20\%$	14	2.8	220	165	2.52
LMQPA201616T470K	CB C2016T470K 8	47	$\pm 10\%$	11	4.3	150	130	2.52
LMQPA201616T470M	CB C2016T470M 8	47	$\pm 20\%$	11	4.3	150	130	2.52
LMQPA201616T680K	CB C2016T680K 8	68	$\pm 10\%$	10	7.0	130	105	2.52
LMQPA201616T680M	CB C2016T680M 8	68	$\pm 20\%$	10	7.0	130	105	2.52
LMQPA201616T101K	CB C2016T101K 8	100	$\pm 10\%$	8	8.0	110	95	0.796
LMQPA201616T101M	CB C2016T101M 8	100	$\pm 20\%$	8	8.0	110	95	0.796

## 2518 (1007) type

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQNA251818T1R0M	CB 2518T1R0M 8	1.0	$\pm 20\%$	100	0.06	1,200	1,250	7.96
LMQNA251818T1R5M	CB 2518T1R5M 8	1.5	$\pm 20\%$	80	0.07	650	1,100	7.96
LMQNA251818T2R2M	CB 2518T2R2M 8	2.2	$\pm 20\%$	68	0.09	510	1,000	7.96
LMQNA251818T3R3M	CB 2518T3R3M 8	3.3	$\pm 20\%$	54	0.11	440	900	7.96
LMQNA251818T4R7MR	CB 2518T4R7MR8	4.7	$\pm 20\%$	46	0.10	310	820	7.96
LMQNA251818T4R7M	CB 2518T4R7M 8	4.7	$\pm 20\%$	46	0.13	340	820	7.96
LMQNA251818T6R8M	CB 2518T6R8M 8	6.8	$\pm 20\%$	38	0.15	270	750	7.96
LMQNA251818T100K	CB 2518T100K 8	10	$\pm 10\%$	30	0.25	250	600	2.52
LMQNA251818T100M	CB 2518T100M 8	10	$\pm 20\%$	30	0.25	250	600	2.52
LMQNA251818T150K	CB 2518T150K 8	15	$\pm 10\%$	23	0.32	180	500	2.52
LMQNA251818T150M	CB 2518T150M 8	15	$\pm 20\%$	23	0.32	180	500	2.52
LMQNA251818T220K	CB 2518T220K 8	22	$\pm 10\%$	19	0.50	165	390	2.52
LMQNA251818T220M	CB 2518T220M 8	22	$\pm 20\%$	19	0.50	165	390	2.52
LMQNA251818T330K	CB 2518T330K 8	33	$\pm 10\%$	15	0.70	130	320	2.52
LMQNA251818T330M	CB 2518T330M 8	33	$\pm 20\%$	15	0.70	130	320	2.52
LMQNA251818T470K	CB 2518T470K 8	47	$\pm 10\%$	12	0.95	110	270	2.52
LMQNA251818T470M	CB 2518T470M 8	47	$\pm 20\%$	12	0.95	110	270	2.52
LMQNA251818T680K	CB 2518T680K 8	68	$\pm 10\%$	9.5	1.5	70	210	2.52
LMQNA251818T680M	CB 2518T680M 8	68	$\pm 20\%$	9.5	1.5	70	210	2.52
LMQNA251818T101K	CB 2518T101K 8	100	$\pm 10\%$	9.0	2.1	60	190	0.796
LMQNA251818T101M	CB 2518T101M 8	100	$\pm 20\%$	9.0	2.1	60	190	0.796
LMQNA251818T151K	CB 2518T151K 8	150	$\pm 10\%$	7.0	3.2	55	140	0.796
LMQNA251818T151M	CB 2518T151M 8	150	$\pm 20\%$	7.0	3.2	55	140	0.796
LMQNA251818T221K	CB 2518T221K 8	220	$\pm 10\%$	5.5	4.5	50	110	0.796
LMQNA251818T221M	CB 2518T221M 8	220	$\pm 20\%$	5.5	4.5	50	110	0.796
LMQNA251818T331K	CB 2518T331K 8	330	$\pm 10\%$	4.5	7.0	40	90	0.796
LMQNA251818T331M	CB 2518T331M 8	330	$\pm 20\%$	4.5	7.0	40	90	0.796
LMQNA251818T471K	CB 2518T471K 8	470	$\pm 10\%$	3.5	10	35	70	0.796
LMQNA251818T471M	CB 2518T471M 8	470	$\pm 20\%$	3.5	10	35	70	0.796
LMQNA251818T681K	CB 2518T681K 8	680	$\pm 10\%$	3.0	17	30	50	0.796
LMQNA251818T681M	CB 2518T681M 8	680	$\pm 20\%$	3.0	17	30	50	0.796
LMQNA251818T102K	CB 2518T102K 8	1000	$\pm 10\%$	2.4	24	25	45	0.252
LMQNA251818T102M	CB 2518T102M 8	1000	$\pm 20\%$	2.4	24	25	45	0.252

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

※) The temperature rise current value (Idc2) is the DC current value having temperature increase by 20°C. (at 20°C)

※) The rated current value is following either Idc1 or Idc2, which is the lower one.



## PART NUMBER

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQPA251818T1R0M	CB C2518T1R0M 8	1.0	$\pm 20\%$	100	0.08	1,000	775	7.96
LMQPA251818T1R5M	CB C2518T1R5M 8	1.5	$\pm 20\%$	80	0.11	950	730	7.96
LMQPA251818T2R2M	CB C2518T2R2M 8	2.2	$\pm 20\%$	68	0.13	890	630	7.96
LMQPA251818T3R3M	CB C2518T3R3M 8	3.3	$\pm 20\%$	54	0.16	730	560	7.96
LMQPA251818T4R7M	CB C2518T4R7M 8	4.7	$\pm 20\%$	41	0.20	680	510	7.96
LMQPA251818T6R8M	CB C2518T6R8M 8	6.8	$\pm 20\%$	38	0.30	550	420	7.96
LMQPA251818T100K	CB C2518T100K 8	10	$\pm 10\%$	30	0.36	480	375	2.52
LMQPA251818T100M	CB C2518T100M 8	10	$\pm 20\%$	30	0.36	480	375	2.52
LMQPA251818T150K	CB C2518T150K 8	15	$\pm 10\%$	23	0.65	350	285	2.52
LMQPA251818T150M	CB C2518T150M 8	15	$\pm 20\%$	23	0.65	350	285	2.52
LMQPA251818T220K	CB C2518T220K 8	22	$\pm 10\%$	19	0.77	320	250	2.52
LMQPA251818T220M	CB C2518T220M 8	22	$\pm 20\%$	19	0.77	320	250	2.52
LMQPA251818T330K	CB C2518T330K 8	33	$\pm 10\%$	15	1.5	270	185	2.52
LMQPA251818T330M	CB C2518T330M 8	33	$\pm 20\%$	15	1.5	270	185	2.52
LMQPA251818T470K	CB C2518T470K 8	47	$\pm 10\%$	12	1.9	240	165	2.52
LMQPA251818T470M	CB C2518T470M 8	47	$\pm 20\%$	12	1.9	240	165	2.52
LMQPA251818T680K	CB C2518T680K 8	68	$\pm 10\%$	9.5	2.8	200	140	2.52
LMQPA251818T680M	CB C2518T680M 8	68	$\pm 20\%$	9.5	2.8	200	140	2.52
LMQPA251818T101K	CB C2518T101K 8	100	$\pm 10\%$	9.0	3.7	160	125	0.796
LMQPA251818T101M	CB C2518T101M 8	100	$\pm 20\%$	9.0	3.7	160	125	0.796
LMQPA251818T151K	CB C2518T151K 8	150	$\pm 10\%$	7.0	6.1	140	95	0.796
LMQPA251818T151M	CB C2518T151M 8	150	$\pm 20\%$	7.0	6.1	140	95	0.796
LMQPA251818T221K	CB C2518T221K 8	220	$\pm 10\%$	5.5	8.4	115	80	0.796
LMQPA251818T221M	CB C2518T221M 8	220	$\pm 20\%$	5.5	8.4	115	80	0.796
LMQPA251818T331K	CB C2518T331K 8	330	$\pm 10\%$	4.5	12.3	100	65	0.796
LMQPA251818T331M	CB C2518T331M 8	330	$\pm 20\%$	4.5	12.3	100	65	0.796
LMQPA251818T471K	CB C2518T471K 8	470	$\pm 10\%$	3.5	22	80	50	0.796
LMQPA251818T471M	CB C2518T471M 8	470	$\pm 20\%$	3.5	22	80	50	0.796
LMQPA251818T681K	CB C2518T681K 8	680	$\pm 10\%$	3.0	28	65	45	0.796
LMQPA251818T681M	CB C2518T681M 8	680	$\pm 20\%$	3.0	28	65	45	0.796

## 3225(1210) type

New part number	Old part number (for reference)	Nominal inductance [ $\mu$ H]	Inductance tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [ $\Omega$ ] ( $\pm 30\%$ )	Rated current ※) [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
LMQPA322525T1R0MR	CB C3225T1R0MR8	1.0	$\pm 20\%$	250	0.055	2,000	1,100	0.1
LMQPA322525T1R5MR	CB C3225T1R5MR8	1.5	$\pm 20\%$	220	0.060	2,000	1,000	0.1
LMQPA322525T2R2MR	CB C3225T2R2MR8	2.2	$\pm 20\%$	190	0.080	2,000	930	0.1
LMQPA322525T3R3MR	CB C3225T3R3MR8	3.3	$\pm 20\%$	160	0.095	2,000	850	0.1
LMQPA322525T4R7MR	CB C3225T4R7MR8	4.7	$\pm 20\%$	70	0.100	1,250	830	0.1
LMQPA322525T6R8MR	CB C3225T6R8MR8	6.8	$\pm 20\%$	50	0.120	950	760	0.1
LMQPA322525T100KR	CB C3225T100KR8	10	$\pm 10\%$	23	0.133	900	720	0.1
LMQPA322525T100MR	CB C3225T100MR8	10	$\pm 20\%$	23	0.133	900	720	0.1
LMQPA322525T150KR	CB C3225T150KR8	15	$\pm 10\%$	20	0.195	730	590	0.1
LMQPA322525T150MR	CB C3225T150MR8	15	$\pm 20\%$	20	0.195	730	590	0.1
LMQPA322525T220KR	CB C3225T220KR8	22	$\pm 10\%$	17	0.27	620	500	0.1
LMQPA322525T220MR	CB C3225T220MR8	22	$\pm 20\%$	17	0.27	620	500	0.1
LMQPA322525T330KR	CB C3225T330KR8	33	$\pm 10\%$	13	0.41	500	400	0.1
LMQPA322525T330MR	CB C3225T330MR8	33	$\pm 20\%$	13	0.41	500	400	0.1
LMQPA322525T470KR	CB C3225T470KR8	47	$\pm 10\%$	10	0.67	390	320	0.1
LMQPA322525T470MR	CB C3225T470MR8	47	$\pm 20\%$	10	0.67	390	320	0.1
LMQPA322525T680KR	CB C3225T680KR8	68	$\pm 10\%$	8.0	1.0	320	260	0.1
LMQPA322525T680MR	CB C3225T680MR8	68	$\pm 20\%$	8.0	1.0	320	260	0.1
LMQPA322525T101KR	CB C3225T101KR8	100	$\pm 10\%$	6.0	1.4	270	220	0.1
LMQPA322525T101MR	CB C3225T101MR8	100	$\pm 20\%$	6.0	1.4	270	220	0.1
LMQPA322525T221KR	CB C3225T221KR8	220	$\pm 10\%$	3.0	2.5	190	170	0.1
LMQPA322525T221MR	CB C3225T221MR8	220	$\pm 20\%$	3.0	2.5	190	170	0.1
LMQPA322525T821KR	CB C3225T821KR8	820	$\pm 10\%$	1.8	12	110	80	0.1
LMQPA322525T821MR	CB C3225T821MR8	820	$\pm 20\%$	1.8	12	110	80	0.1
LMQPA322525T102KR	CB C3225T102KR8	1000	$\pm 10\%$	1.6	13	100	75	0.1
LMQPA322525T102MR	CB C3225T102MR8	1000	$\pm 20\%$	1.6	13	100	75	0.1

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. ( at 20°C)

※) The temperature rise current value (Idc2) is the DC current value having temperature increase by 20°C. ( at 20°C)

※) The rated current value is following either Idc1 or Idc2, which is the lower one.

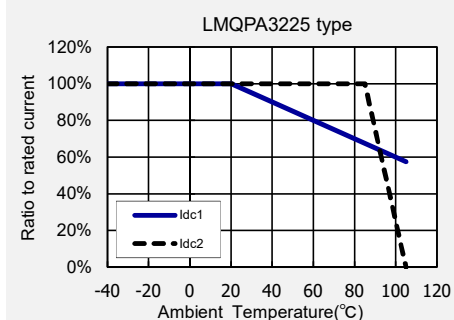
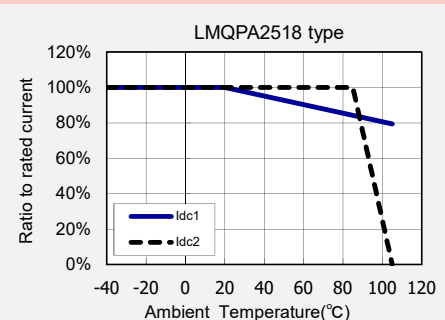
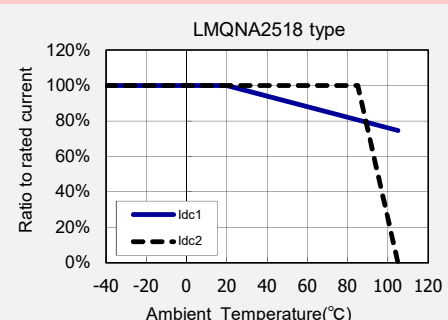
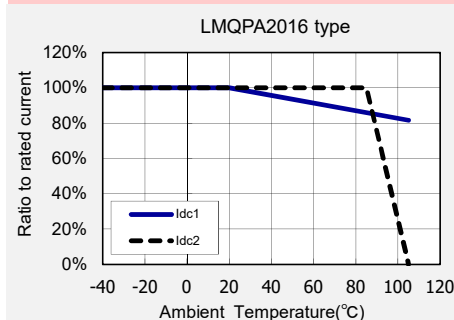
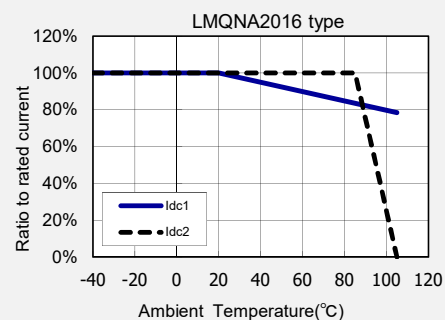
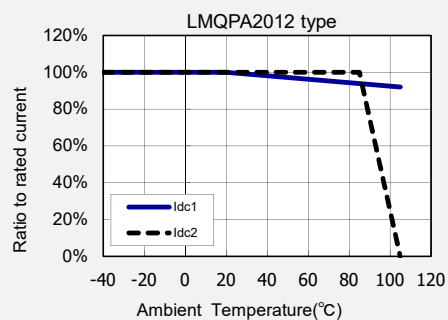
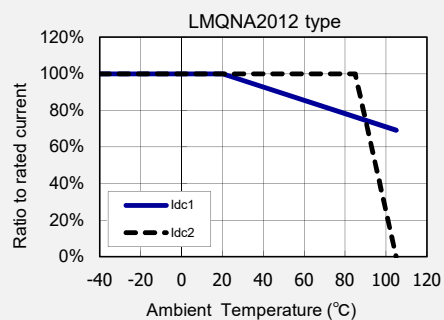


## Derating of Rated Current

### LMQN/LMQPA series

Derating of current is necessary for LMQN/LMQPA series depending on ambient temperature.

Please refer to the chart shown below for appropriate derating of current.



Wire-wound Ferrite Inductors LSQB/LSQC/LSQE/LLQB/LLQC/LLQE/LMQB/LMQC/LMQE/  
LBQB/LBQC/LBQE series  
Wire-wound Ferrite Power Inductors LSQN/LSQPA/LLQN/LLQPA/LMQN/LMQPA/  
LBQN/LBQPA series  
Wire-wound Ferrite Inductors for Signal Lines LSQM/LLQM/LMQM/LBQM series

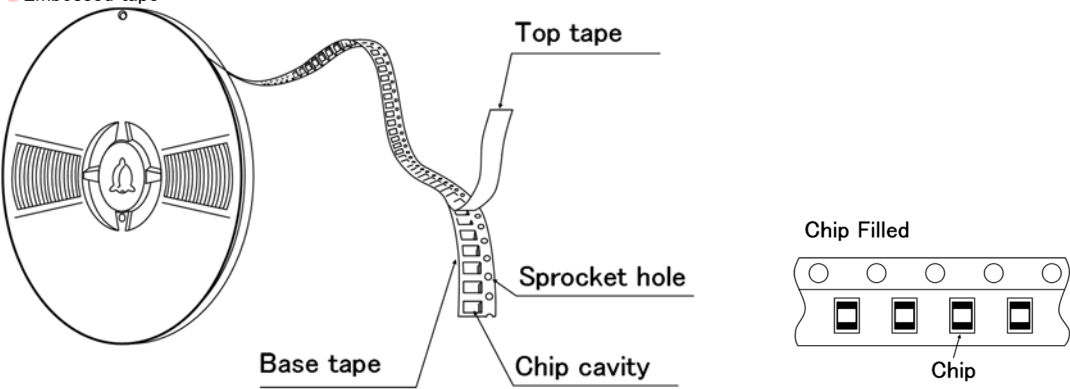
PACKAGING

① Minimum Quantity

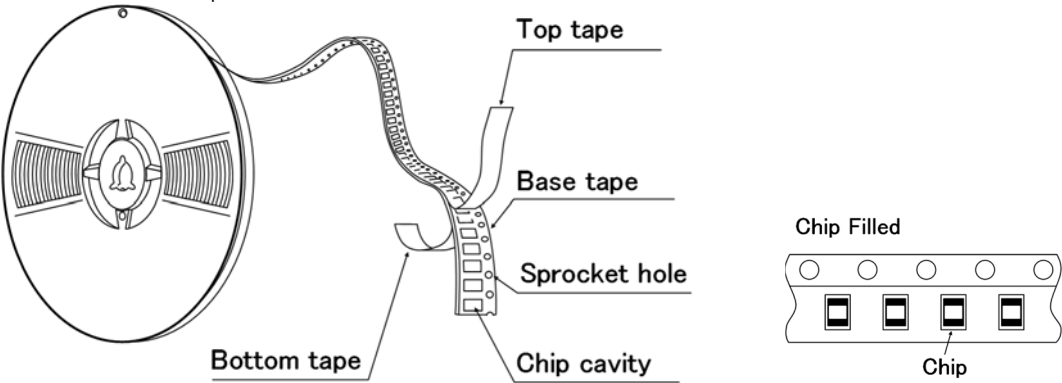
Type	Standard Quantity [pcs]	
	Paper Tape	Embossed Tape
A322525	—	1000
A321818	—	2000
A251818	—	2000
B201616	—	2000
A201616	—	2000
A201212	—	3000
A201209	4000	—
A160808	4000	—
B160808	—	3000

② Tape material

Embossed tape



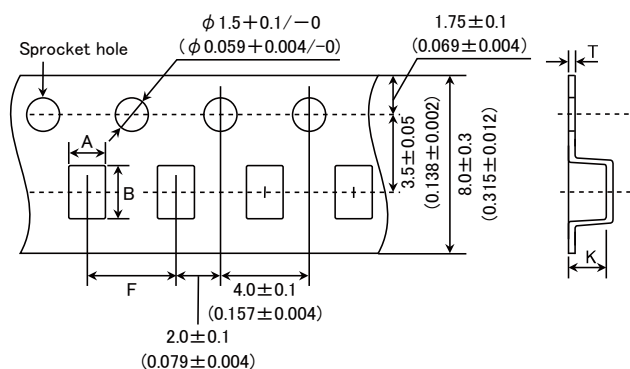
Card board carrier tape



► 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/>) .

### ③ Taping Dimensions

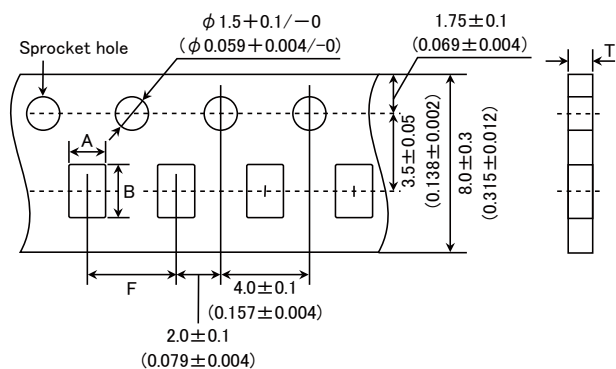
#### ● Embossed Tape (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
B201616	$1.75 \pm 0.1$ ( $0.069 \pm 0.004$ )	$2.1 \pm 0.1$ ( $0.083 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.3 \pm 0.05$ ( $0.012 \pm 0.002$ )	$1.9 \text{ max.}$ ( $0.075 \text{ max.}$ )
A322525	$2.8 \pm 0.1$ ( $0.110 \pm 0.004$ )	$3.5 \pm 0.1$ ( $0.138 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.3 \pm 0.05$ ( $0.012 \pm 0.002$ )	$4.0 \text{ max.}$ ( $0.157 \text{ max.}$ )
A321818	$2.1 \pm 0.1$ ( $0.083 \pm 0.004$ )	$3.5 \pm 0.1$ ( $0.138 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.3 \pm 0.05$ ( $0.012 \pm 0.002$ )	$2.2 \text{ max.}$ ( $0.087 \text{ max.}$ )
A251818	$2.15 \pm 0.1$ ( $0.085 \pm 0.004$ )	$2.7 \pm 0.1$ ( $0.106 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.3 \pm 0.05$ ( $0.012 \pm 0.002$ )	$2.2 \text{ max.}$ ( $0.087 \text{ max.}$ )
A201616	$1.75 \pm 0.1$ ( $0.069 \pm 0.004$ )	$2.1 \pm 0.1$ ( $0.083 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.3 \pm 0.05$ ( $0.012 \pm 0.002$ )	$1.9 \text{ max.}$ ( $0.075 \text{ max.}$ )
A201212	$1.45 \pm 0.1$ ( $0.057 \pm 0.004$ )	$2.25 \pm 0.1$ ( $0.089 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.25 \pm 0.05$ ( $0.010 \pm 0.002$ )	$1.45 \text{ max.}$ ( $0.057 \text{ max.}$ )
B160808	$1.1 \pm 0.1$ ( $0.043 \pm 0.004$ )	$1.9 \pm 0.1$ ( $0.075 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$0.25 \pm 0.05$ ( $0.010 \pm 0.002$ )	$1.2 \text{ max.}$ ( $0.047 \text{ max.}$ )

Unit : mm (inch)

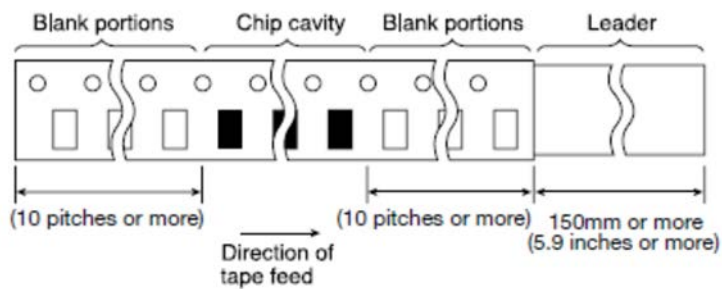
#### ● Card board carrier tape (0.315 inches wide)



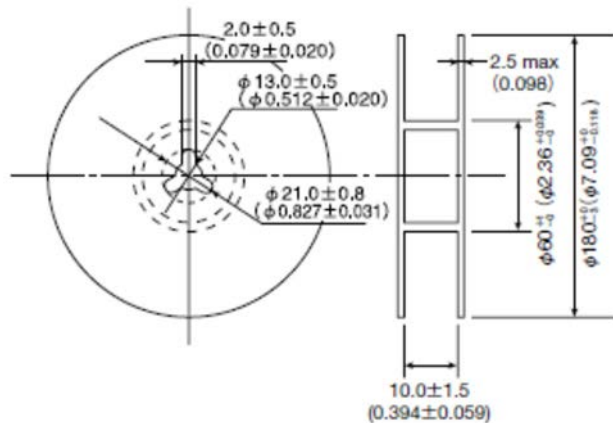
Type	Chip cavity		Insertion pitch	Tape thickness
	A	B		T
A201209	$1.55 \pm 0.1$ ( $0.061 \pm 0.004$ )	$2.3 \pm 0.1$ ( $0.091 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$1.1 \text{ max.}$ ( $0.043 \text{ max.}$ )
A160808	$1.0 \pm 0.1$ ( $0.039 \pm 0.004$ )	$1.8 \pm 0.1$ ( $0.071 \pm 0.004$ )	$4.0 \pm 0.1$ ( $0.157 \pm 0.004$ )	$1.1 \text{ max.}$ ( $0.043 \text{ max.}$ )

Unit : mm (inch)

#### ④Leader and Blank Portion

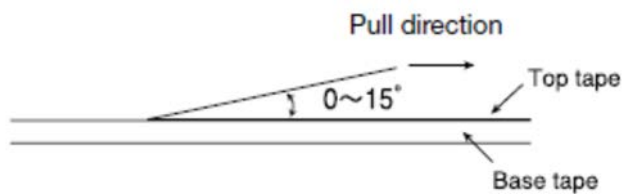


#### ⑤Reel Size



#### ⑥Top Tape Strength

The top tape requires a peel-off force 0.1 to 1.0N in the direction of the arrow as illustrated below.



Wire-wound Ferrite Power Inductors LBQB/LBQC/LBQE series  
for Telecommunications Infrastructure and Industrial Equipment

Wire-wound Ferrite Power Inductors LBQN/LBQPA series  
for Telecommunications Infrastructure and Industrial Equipment

Wire-wound Ferrite Inductors for Signal Lines LBQM series  
for Telecommunications Infrastructure and Industrial Equipment

Wire-wound Ferrite Power Inductors LMQB/LMQC/LMQE series  
for Medical Devices classified as GHTF Class C (Japan Class III)

Wire-wound Ferrite Power Inductors LMQN/LMQPA series  
for Medical Devices classified as GHTF Class C (Japan Class III)

Wire-wound Ferrite Inductors for Signal Lines LMQM series  
for Medical Devices classified as GHTF Class C (Japan Class III)

#### ■ RELIABILITY DATA

##### 1. Operating temperature Range

Specified Value	−40~+105°C (Including self-generated heat)
Test Methods and Remarks	Including self-generated heat

##### 2. Storage Temperature Range (after soldering)

Specified Value	−40~+85°C
Test Methods and Remarks	Wire-wound Ferrite Inductors, Wire-wound Ferrite Power Inductors: Please refer the term of "7. storage conditions" in precautions.

##### 3. Rated Current

Specified Value	Within the specified tolerance
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##### 4. Inductance

Specified Value	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : LCR Meter (HP4285A or its equivalent)

##### 5. Q

Specified Value	Wire-wound Ferrite Inductors for Signal Lines: Within the specified tolerance
Test Methods and Remarks	Wire-wound Ferrite Inductors for Signal Lines : Measuring equipment : LCR Meter (HP4285A or its equivalent)

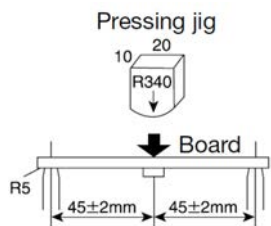
##### 6. DC Resistance

Specified Value	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : DC Ohmmeter (HIOKI 3227 or its equivalent)

##### 7. Self-Resonant Frequency

Specified Value	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : Impedance analyzer (HP4291A or its equivalent)

8.Temperature Characteristic					
Specified Value	LBQMB2016			Inductance change : Within±10%	
	LMQMB2016				
	LBQBA2012	LBQEA2012	LBQNA2012	LBQBA2016	Inductance change : Within±20%
	LBQNA2016	LBQBA2518	LBQEA2518	LBQNA2518	
	LBQCA3225	LBQPA3225			
	LMQBA2012	LMQEA2012	LMQNA2012	LMQBA2016	
	LMQNA2016	LMQBA2518	LMQEA2518	LMQNA2518	
	LMQCA3225	LMQPA3225			
	LBQCA2016	LBQPA2016	LBQCA2518	LBQPA2518	Inductance change : Within±25%
	LBQBA3218				
LMQCA2016	LMQPA2016	LMQCA2518	LMQPA2518		
	LMQBA3218				
	LBQCA2012	LBQPA2012		Inductance change : Within±35%	
	LMQCA2012	LMQPA2012			
Test Methods and Remarks	Change of maximum inductance deviation in step 1-5				
	Step	Temperature (°C)			
	1	20			
	2	－40			
	3	20 (Reference temperature)			
	4	＋85 (Maximum operating temperature)			
	5	20			

9.Rasistance to Flexure of Substrate	
Specified Value	No damage.
Test Methods and Remarks	Warp : 2mm Test substrate : Board according to JIS C0051 Thickness : 1.0mm
	

10.Body Strength	
Specified Value	No damage.
Test Methods and Remarks	Applied force : 10N
	Duration : 10sec.

11.Adhesion of terminal electrode	
Specified Value	No abnormality.
Test Methods and Remarks	Applied force : 10N to X and Y directions
	Duration : 5 sec.
	Test substrate : Printed board

12. Resistance to vibration	
Specified Value	Inductance change : Within $\pm 20\%$ No significant abnormality in appearance.
Test Methods and Remarks	According to JIS C5102 clause 8.2. Vibration type : A Directions : 2 hrs each in X, Y and Z directions. Total: 6 hrs Frequency range : 10 to 55 to 10 Hz (1min.) Amplitude : 1.5mm Mounting method : Soldering onto printed board Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
13. Drop test	
Specified Value	—
14. Solderability	
Specified Value	At least 90% of surface of terminal electrode is covered by new
Test Methods and Remarks	Solder temperature : $245 \pm 5^\circ\text{C}$ Duration : $5 \pm 0.5\text{sec}$ Flux : Ethanol solution with 25% of colophony
15. Resistance to soldering	
Specified Value	Inductance change : Within $\pm 20\%$
Test Methods and Remarks	3 times of reflow oven at $230^\circ\text{C}$ MIN for 40sec. with peak temperature at $260^\circ\text{C}$ for 5sec.
16. Resistance to solvent	
Specified Value	—
Test Methods and Remarks	Solvent temperature : Room temperature Type of solvent : Isopropyl alcohol Cleaning conditions : 90s. Immersion and cleaning.
17. Thermal shock	
Specified Value	Inductance change : Within $\pm 20\%$ No significant abnormality in appearance.
Test Methods and Remarks	$-40 \sim +85^\circ\text{C}$ , maintain times 30min. ,100 cycle Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
18. Damp heat life test	
Specified Value	Inductance change : Within $\pm 20\%$ No significant abnormality in appearance.
Test Methods and Remarks	Temperature : $60 \pm 2^\circ\text{C}$ Humidity : $90 \sim 95\% \text{RH}$ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
19. Loading under damp heat life test	
Specified Value	Inductance change : Within $\pm 20\%$ No significant abnormality in appearance.
Test Methods and Remarks	Temperature : $60 \pm 2^\circ\text{C}$ Humidity : $90 \sim 95\% \text{RH}$ Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.



20.High temperature life test	
Specified Value	Wire-wound Ferrite Power Inductors, Wire-wound Ferrite Inductors for Signal Lines : Inductance change : Within $\pm 20\%$ No significant abnormality in appearance
Test Methods and Remarks	Temperature : $85 \pm 2^\circ\text{C}$ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
21.Loading at high temperature life test	
Specified Value	Wire-wound Ferrite Inductors : Inductance change : Within $\pm 20\%$ No significant abnormality in appearance
Test Methods and Remarks	Temperature : $85 \pm 2^\circ\text{C}$ Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
22.Low temperature life test	
Specified Value	Inductance change : Within $\pm 20\%$ No significant abnormality in appearance.
Test Methods and Remarks	Temperature : $-40 \pm 2^\circ\text{C}$ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
23.Standard condition	
Specified Value	Standard test conditions Unless specified, Ambient temperature is $20 \pm 15^\circ\text{C}$ and the Relative humidity is $65 \pm 20\%$ . If there is any doubt about the test results, further measurement shall be had within the following limits: Ambient Temperature: $20 \pm 2^\circ\text{C}$ Relative humidity: $65 \pm 5\%$ Inductance value is based on our standard measurement systems.

## Wire-wound Ferrite Inductors LSQB/LSQC/LSQE/LLQB/LLQC/LLQE/LMQB/LMQC/LMQE/ LBQB/LBQC/LBQE series

## Wire-wound Ferrite Power Inductors LSQN/LSQPA/LLQN/LLQPA/LMQN/LMQPA/ LBQN/LBQPA series

## Wire-wound Ferrite Inductors for Signal Lines LSQM/LLQM/LMQM/LBQM series

### ■ PRECAUTIONS

#### 1. Circuit Design

##### Precautions

- ◆ Verification of operating environment, electrical rating and performance
  1. A malfunction in medical equipment, spacecraft, nuclear reactors, etc. may cause serious harm to human life or have severe social ramifications. As such, any inductors to be used in such equipment may require higher safety and/or reliability considerations and should be clearly differentiated from components used in general purpose applications.
  2. When inductors are used in places where dew condensation develops and/or where corrosive gas such as hydrogen sulfide, sulfurous acid, or chlorine exists in the air, characteristic deterioration may occur. Please do not use inductors under such environmental conditions.
- ◆ Operating Current (Verification of Rated current)
  1. The operating current including inrush current for inductors must always be lower than their rated values.
  2. Do not apply current in excess of the rated value because the inductance may be reduced due to the magnetic saturation effect.
- ◆ Temperature rise
 

Temperature rise of power choke coil depends on the installation condition in end products.

Make sure that temperature rise of power choke coils in actual end products is within the specified temperature range.

#### 2. PCB Design

##### Precautions

- ◆ Land pattern design
  1. Please contact any of our offices for a land pattern, and refer to a recommended land pattern of a right figure or specifications.

##### Technical considerations

- PRECAUTIONS**  
**【Recommended Land Patterns】**
- Surface Mounting
    - Mounting and soldering conditions should be checked beforehand.
    - Applicable soldering process to those products is reflow soldering only.

#### 3. Considerations for automatic placement

##### Precautions

- ◆ Adjustment of mounting machine
  1. Excessive impact load should not be imposed on the products when mounting onto the PC boards.
  2. Mounting and soldering conditions should be checked beforehand.

##### Technical considerations

1. When installing products, care should be taken not to apply distortion stress as it may deform the products.

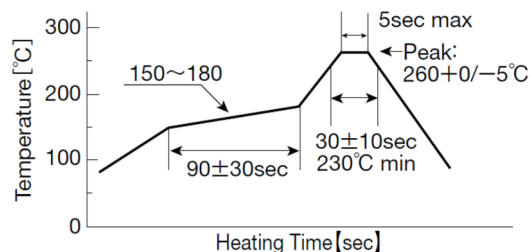
#### 4. Soldering

##### Precautions

- ◆ Reflow soldering (Wire-wound Ferrite Inductors, Wire-wound Ferrite Power Inductors)
  1. For reflow soldering with either leaded or lead-free solder, the profile specified in "point for controlling" is recommended.
- ◆ Recommended conditions for using a soldering iron
  1. Put the soldering iron on the land-pattern. Soldering iron's temperature – Below 350°C Duration-3 seconds or less. The soldering iron should not come in contact with inductor directly.

##### Technical considerations

- ◆ Reflow soldering (Wire-wound Ferrite Inductors, Wire-wound Ferrite Power Inductors)
  1. Reflow profile



- ◆ Recommended conditions for using a soldering iron
  1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

5. Cleaning	
Precautions	<ul style="list-style-type: none"> <li>◆Cleaning conditions Washing by supersonic waves shall be avoided.</li> </ul>
Technical considerations	<ul style="list-style-type: none"> <li>◆Cleaning conditions If washed by supersonic waves, the products might be broken.</li> </ul>
6. Handling	
Precautions	<ul style="list-style-type: none"> <li>◆Handling               <ol style="list-style-type: none"> <li>1. Keep the inductors away from all magnets and magnetic objects.</li> </ol> </li> <li>◆Breakaway PC boards ( splitting along perforations)               <ol style="list-style-type: none"> <li>1. When splitting the PC board after mounting inductors, care should be taken not to give any stresses of deflection or twisting to the board.</li> <li>2. Board separation should not be done manually, but by using the appropriate devices.</li> </ol> </li> <li>◆Mechanical considerations               <ol style="list-style-type: none"> <li>1. Please do not give the inductors any excessive mechanical shocks.</li> </ol> </li> </ul>
Technical considerations	<ul style="list-style-type: none"> <li>◆Handling               <ol style="list-style-type: none"> <li>1. There is a case that a characteristic varies with magnetic influence.</li> </ol> </li> <li>◆Breakaway PC boards ( splitting along perforations)               <ol style="list-style-type: none"> <li>1. Planning pattern configurations and the position of products should be carefully performed to minimize stress.</li> </ol> </li> <li>◆Mechanical considerations               <ol style="list-style-type: none"> <li>1. There is a case to be damaged by a mechanical shock.</li> </ol> </li> </ul>
7. Storage conditions	
Precautions	<ul style="list-style-type: none"> <li>◆Storage               <ol style="list-style-type: none"> <li>1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.                   <ul style="list-style-type: none"> <li>▪ Storage conditions Ambient temperature : 0~40°C Humidity : Below 70% RH</li> <li>▪ The recommended ambient temperature is below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, product should be used within 6 months from the time of delivery. In case of storage over 6 months, solderability shall be checked before actual usage.</li> </ul> </li> </ol> </li> </ul>
Technical considerations	<ul style="list-style-type: none"> <li>◆Storage               <ol style="list-style-type: none"> <li>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.</li> </ol> </li> </ul>

# Mouser Electronics

Authorized Distributor

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Taiyo Yuden:

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