

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 October 2021. 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.

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 fail-safe systems equipped with a protection circuit and a protection device and/or fail-safe systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a fail-safe 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 specification sheets and 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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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, 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 ¹³
	Equipment ¹⁴	Category (Part Number Code ¹⁵)	
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 Devices classified as GHTF Class C (Japan Class III)	M	2
Medical	Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)	L	3
	General Electronic Equipment	S	3

¹³Notes 1. Based on the general specifications required for electronic components for such equipment, which are recognized by TAIYO YUDEN. Use of our own 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 left 2nd code is a code indicating the "Category" as shown in the above table. For details, please check the explanatory materials regarding the part number system of each of our products.

3. Each product is assigned a Quality Grade, from 1 to 3 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.

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 equipment to which it is attributed thereto.

(1) Train/aircraft/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 equipment¹⁶

(3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices¹⁷

(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

¹⁶Notes 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., flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified 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.

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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 part number code of 2nd digit from the left side 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		
Classification according to the PMD Act of Japan (based on the GHTF Rules)	FDA Classification	Class I General Medical Devices (GHTF Class A)	Class II Controlled Medical Devices (GHTF Class B)	Class III Specially-controlled Medical Devices (GHTF Class C)	Class IV 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.] •In Vitro Diagnostic Devices •Nebulizer •Blood Gas Analyzer •Plethysmographs •Breathing Sensor •ECG-powered Operating Table •Surgical Light •Cholesterol Analysis Device •Blood Type Analysis Device, etc.	[Ex.] •Electronic Thermometer •Electronic Blood Pressure Gauge •Electronic Endoscope •Hearing Aid •Electrocardiograph •Mil •Ultrasonic Diagnostic System •Diagnostic Imaging Equipment •X-ray Diagnostic Equipment •Central Monitor •Pulse Oximeter, etc.	[Ex.] •Dialysis Machine •Radiation Therapy Equipment •Infusion Pump •Aerator •Glucose Monitoring System •AED (Automated External Defibrillator) •Skin Laser Scanner •Electric Surgical Unit •Insulin Pump, etc.	[Ex.] •Cardiac Pacemaker •Video Flexible Angioscope •Implantable Infusion Pump •Cardiac Electrosurgical Unit •Inspection Device with Cardiac Catheter •Defibrillator, etc.
		Class I General Controls	Class II General Controls and Special Controls	Class III 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) (Part Number Code of 2nd Digit from the Left Side: "L")	Product Series for Medical Devices classified as GHTF Class C (Japan Class III) (Part Number Code of 2nd Digit from the Left Side: "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

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for Medical Devices Equipment

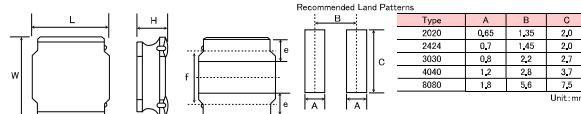
Wire-wound Ferrite Power Inductors LLXB/LLXN/LLXP series for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

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.: -25~+120°C (LLXN 4040/5050/6060/8080: -25~+125°C) (Including self-generated heat)															
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■ STANDARD EXTERNAL DIMENSIONS / STANDARD QUANTITY



Recommended Land Patterns

Type	A	B	C
2020	0,65	1,25	2,0
2424	0,7	1,45	2,0
3030	0,8	2,2	2,7
4040	1,2	2,8	3,7
6080	1,8	5,6	7,5

Unit:mm

Type	L	W	H	e	f	Standard quantity [pcs] Taping
2020KK	2,0±0,1 (0,79±0,004)	2,0±0,1 (0,79±0,004)	1,0 max (0,39 max)	0,5±0,2 (0,20±0,008)	1,25±0,2 (0,95±0,008)	2500
2020MK	2,0±0,1 (0,79±0,004)	2,0±0,1 (0,79±0,004)	1,2 max (0,47 max)	0,5±0,2 (0,20±0,008)	1,25±0,2 (0,95±0,008)	2600
2424KK	2,4±0,1 (0,95±0,004)	2,4±0,1 (0,95±0,004)	1,0 max (0,39 max)	0,6±0,2 (0,24±0,008)	1,45±0,2 (0,97±0,008)	2500
2424MK	2,4±0,1 (0,95±0,004)	2,4±0,1 (0,95±0,004)	1,2 max (0,47 max)	0,6±0,2 (0,24±0,008)	1,45±0,2 (0,97±0,008)	2500
3030KK	3,0±0,1 (1,18±0,004)	3,0±0,1 (1,18±0,004)	1,0 max (0,39 max)	0,9±0,2 (0,35±0,008)	1,9±0,2 (0,97±0,008)	2000
3030MK	3,0±0,1 (1,18±0,004)	3,0±0,1 (1,18±0,004)	1,2 max (0,47 max)	0,9±0,2 (0,35±0,008)	1,9±0,2 (0,97±0,008)	2000
3030QK	3,0±0,1 (1,18±0,004)	3,0±0,1 (1,18±0,004)	1,5 max (0,59 max)	0,9±0,2 (0,35±0,008)	1,9±0,2 (0,97±0,008)	2000
4040KK	4,0±0,2 (1,58±0,008)	4,0±0,2 (1,58±0,008)	1,0 max (0,39 max)	1,1±0,2 (0,43±0,008)	2,5±0,2 (0,98±0,008)	5000
4040MK	4,0±0,2 (1,58±0,008)	4,0±0,2 (1,58±0,008)	1,2 max (0,47 max)	1,1±0,2 (0,43±0,008)	2,5±0,2 (0,98±0,008)	4500
4040TK	4,0±0,2 (1,58±0,008)	4,0±0,2 (1,58±0,008)	1,8 max (0,71 max)	1,1±0,2 (0,43±0,008)	2,5±0,2 (0,98±0,008)	3500
8080KK	8,0±0,2 (3,15±0,008)	8,0±0,2 (3,15±0,008)	3,0 max (1,18 max)	1,60±0,3 (0,63±0,012)	5,6±0,3 (2,22±0,012)	1000
8080FK	8,0±0,2 (3,15±0,008)	8,0±0,2 (3,15±0,008)	4,0 max (1,58 max)	1,60±0,3 (0,63±0,012)	5,6±0,3 (2,22±0,012)	1000
8080YB	8,0±0,2 (3,15±0,008)	8,0±0,2 (3,15±0,008)	4,2 max (1,65 max)	1,60±0,3 (0,63±0,012)	5,6±0,3 (2,22±0,012)	1000

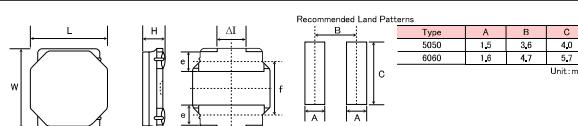
Unit:mm (inch)

* 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.yuden.com>).

CATALOG 2022

TAIYO YUDEN

LsmdNRL_Lr-E10R01



Recommended Land Patterns

Type	A	B	C
5050KK	1,2±0,2 (0,49±0,008)	3,6±0,2 (1,93±0,008)	4,0±0,2 (2,0±0,008)
5050MK	1,2±0,2 (0,49±0,008)	3,6±0,2 (1,93±0,008)	4,0±0,2 (2,0±0,008)

Unit:mm

Type	L	W	H	e	f	ΔI	Standard quantity [pcs] Taping
5050KK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	1,0 max (0,39 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	1000
5050MK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	1,2 max (0,47 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	1000
5050PK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	1,4 max (0,55 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	1000
5050WK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	2,0 max (0,79 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	800
5050WD	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	2,4 max (0,93 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	2500
5050WE	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	2,6 max (0,98 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	2500
5050XK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	3,0 max (1,18 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	500
5050XA	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	3,1 max (1,22 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	500
5050YK	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	4,0 max (1,58 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	1500
5050YA	4,9±0,2 (1,93±0,008)	4,9±0,2 (1,93±0,008)	4,1 max (1,65 max)	1,2±0,2 (0,47±0,008)	3,3±0,2 (1,32±0,008)	1,27yp (0,91typ)	1500
6060KK	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	1,0 max (0,39 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	1000
6060MK	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	1,2 max (0,47 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	1000
6060PK	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	1,4 max (0,55 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	1000
6060WK	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	2,0 max (0,79 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	2500
6060WH	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	2,3 max (0,93 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	2000
6060YE	6,0±0,2 (2,36±0,008)	6,0±0,2 (2,36±0,008)	4,5 max (1,77 max)	1,35±0,2 (0,53±0,008)	4,0±0,2 (1,58±0,008)	2,27yp (0,91typ)	1500

Unit:mm (inch)

* 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.yuden.com>).

CATALOG 2022

TAIYO YUDEN

LsmdNRL_Lr-E10R01

PART NUMBER

④ 6050PK type

New part number	Old part number (for references)	EHS	Normal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current [I_R] (mA)	Measuring frequency [MHz]
LLXN05050PK17R01N00	NR5017T 17N00MGJ	RoHS	1.2	±30%	61	0.055	3.000	2.300
LLXN05050PK17R02N00	NR5017T 17N02MGJ	RoHS	2.2	±30%	61	0.055	3.500	2.300
LLXN05050PK17R03N00	NR5017T 17N03MGJ	RoHS	3.3	±30%	41	0.075	2.500	2.600
LLXN05050PK17R04N00	NR5017T 17N04MGJ	RoHS	4.3	±30%	73	0.090	2.000	1.900
LLXN05050PK17R05N00	NR5017T 17N05MGJ	RoHS	5.8	±30%	30	0.115	1.700	1.800
LLXN05050PK17R06N00	NR5017T 17N06MGJ	RoHS	10	±30%	24	0.140	1.540	1.400
LLXN05050PK17R07N00	NR5017T 17N07MGJ	RoHS	13	±30%	26	0.150	1.500	1.300
LLXN05050PK17R22N00	NR5017T 22N00MGJ	RoHS	22	±30%	16	0.300	955	1.000

④ 6050WK type

New part number	Old part number (for references)	EHS	Normal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current [I_R] (mA)	Measuring frequency [MHz]
LLXN05050WK17R01N00	NR5020T 17N00MGJ	RoHS	0.8	±30%	110	0.020	6.400	7.400
LLXN05050WK17R02N00	NR5020T 17N02MGJ	RoHS	1.5	±30%	93	0.025	4.300	5.300
LLXN05050WK17R03N00	NR5020T 17N03MGJ	RoHS	2.2	±30%	73	0.030	3.500	4.200
LLXN05050WK17R04N00	NR5020T 17N04MGJ	RoHS	3.3	±30%	55	0.040	2.900	3.400
LLXN05050WK17R05N00	NR5020T 17N05MGJ	RoHS	4.3	±30%	43	0.058	2.400	2.800
LLXN05050WK17R06N00	NR5020T 17N06MGJ	RoHS	5.8	±30%	39	0.070	2.000	2.400
LLXN05050WK17R07N00	NR5020T 17N07MGJ	RoHS	6.8	±30%	25	0.083	2.900	3.000
LLXN05050WK17R08N00	NR5020T 17N08MGJ	RoHS	10	±30%	20	0.085	1.900	2.200
LLXN05050WK17R09N00	NR5020T 17N09MGJ	RoHS	15	±30%	17	0.090	1.600	1.900
LLXN05050WK17R22N00	NR5020T 22N00MGJ	RoHS	22	±30%	12	0.155	1.300	1.600
LLXN05050WK17R30N00	NR5020T 30N00MGJ	RoHS	33	±30%	10	0.220	1.000	1.300
LLXN05050WK17R40N00	NR5020T 40N00MGJ	RoHS	41	±30%	8	0.300	1.000	1.300
LLXN05050WK17R50N00	NR5020T 50N00MGJ	RoHS	68	±30%	5	0.420	800	950
LLXN05050WK17R60N00	NR5020T 60N00MGJ	RoHS	100	±30%	3	0.600	680	750

④ 6050W type

New part number	Old part number (for references)	EHS	Normal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current [I_R] (mA)	Measuring frequency [MHz]
LLXN05050WK17R01N00	NR5020T 17N00MGJ	RoHS	0.8	±30%	90	0.012	8.700	7.400
LLXN05050WK17R02N00	NR5020T 17N02MGJ	RoHS	1.5	±30%	78	0.015	7.500	8.200
LLXN05050WK17R03N00	NR5020T 17N03MGJ	RoHS	2.2	±30%	68	0.020	4.200	5.100
LLXN05050WK17R04N00	NR5020T 17N04MGJ	RoHS	3.3	±30%	55	0.023	3.900	4.300
LLXN05050WK17R05N00	NR5020T 17N05MGJ	RoHS	4.3	±30%	43	0.030	3.200	3.600
LLXN05050WK17R06N00	NR5020T 17N06MGJ	RoHS	5.8	±30%	39	0.040	2.900	3.200
LLXN05050WK17R07N00	NR5020T 17N07MGJ	RoHS	6.8	±30%	25	0.043	2.900	3.000
LLXN05050WK17R08N00	NR5020T 17N08MGJ	RoHS	10	±30%	20	0.055	1.900	2.200
LLXN05050WK17R09N00	NR5020T 17N09MGJ	RoHS	15	±30%	17	0.060	1.600	1.900
LLXN05050WK17R22N00	NR5020T 22N00MGJ	RoHS	22	±30%	12	0.155	1.300	1.600
LLXN05050WK17R30N00	NR5020T 30N00MGJ	RoHS	33	±30%	10	0.220	1.000	1.300
LLXN05050WK17R40N00	NR5020T 40N00MGJ	RoHS	41	±30%	8	0.300	1.000	1.300
LLXN05050WK17R50N00	NR5020T 50N00MGJ	RoHS	68	±30%	4	0.304	1.100	1.300
LLXN05050WK17R60N00	NR5020T 60N00MGJ	RoHS	100	±30%	3	0.468	900	1.200

④ The saturation current value (I_{s1}) is the DC current value having inductance decreases down to 30% (at 20°C)④ The temperature rise current value (ΔI_{s1}) is the DC current value having temperature increase up to 40°C (at 20°C)

④ The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

TAIYO YUDEN

④ 6050X type

New part number	Old part number (for references)	EHS	Normal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current [I_R] (mA)	Measuring frequency [MHz]
LLXN05050X17R01N00	NR5020T 17N00MGJ	RoHS	1.0	±30%	110	0.014	9.800	11.000
LLXN05050X17R02N00	NR5020T 17N02MGJ	RoHS	1.5	±30%	95	0.018	9.200	9.300
LLXN05050X17R03N00	NR5020T 17N03MGJ	RoHS	2.2	±30%	80	0.019	7.200	8.100
LLXN05050X17R04N00	NR5020T 17N04MGJ	RoHS	3.3	±30%	60	0.023	6.400	6.600
LLXN05050X17R05N00	NR5020T 17N05MGJ	RoHS	4.3	±30%	50	0.027	5.600	5.800
LLXN05050X17R06N00	NR5020T 17N06MGJ	RoHS	5.8	±30%	40	0.030	4.800	5.000
LLXN05050X17R07N00	NR5020T 17N07MGJ	RoHS	6.8	±30%	30	0.033	4.200	4.400
LLXN05050X17R08N00	NR5020T 17N08MGJ	RoHS	10	±30%	27	0.038	3.800	4.300
LLXN05050X17R09N00	NR5020T 17N09MGJ	RoHS	15	±30%	12	0.046	3.100	3.800
LLXN05050X17R22N00	NR5020T 22N00MGJ	RoHS	22	±30%	10	0.055	2.500	3.000
LLXN05050X17R30N00	NR5020T 30N00MGJ	RoHS	22	±30%	7	0.107	2.000	2.400
LLXN05050X17R40N00	NR5020T 40N00MGJ	RoHS	33	±30%	6	0.141	1.850	2.000
LLXN05050X17R50N00	NR5020T 50N00MGJ	RoHS	41	±30%	5	0.175	1.700	1.900
LLXN05050X17R60N00	NR5020T 60N00MGJ	RoHS	68	±30%	4	0.304	1.100	1.300

④ 6050YB, 6050YK type

New part number	Old part number (for references)	EHS	Normal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current [I_R] (mA)	Measuring frequency [MHz]
LLXN05050Y17R01N00	NR5020T 17N00MGJ	RoHS	0.8	±30%	120	0.009	7.900	9.300
LLXN05050Y17R02N00	NR5020T 17N02MGJ	RoHS	1.5	±30%	85	0.012	6.200	7.800
LLXN05050Y17R03N00	NR5020T 17N03MGJ	RoHS	2.2	±30%	65	0.015	5.500	6.500
LLXN05050Y17R04N00	NR5020T 17N04MGJ	RoHS	3.3	±30%	50	0.018	4.200	5.200
LLXN05050Y17R05N00	NR5020T 17N05MGJ	RoHS	4.3	±30%	40	0.023	3.600	4.100
LLXN05050Y17R06N00	NR5020T 17N06MGJ	RoHS	5.8	±30%	30	0.027	3.000	3.400
LLXN05050Y17R07N00	NR5020T 17N07MGJ	RoHS	6.8	±30%	24	0.030	2.400	2.800
LLXN05050Y17R08N00	NR5020T 17N08MGJ	RoHS	10	±30%	22	0.033	2.000	2.300
LLXN05050Y17R09N00	NR5020T 17N09MGJ	RoHS	15	±30%	16	0.036	1.900	2.000
LLXN05050Y17R22N00	NR5020T 22N00MGJ	RoHS	22	±30%	13	0.120	1.300	1.600
LLXN05050Y17R30N00	NR5020T 30N00MGJ	RoHS	33	±30%	10	0.200	1.000	1.200
LLXN05050Y17R40N00	NR5020T 40N00MGJ	RoHS	41	±30%	8	0.340	1.000	1.200
LLXN05050Y17R50N00	NR5020T 50N00MGJ	RoHS	68	±30%	7	0.420	800	950
LLXN05050Y17R60N00	NR5020T 60N00MGJ	RoHS	100	±30%	6	0.600	600	800
LLXN05050Y17R75N00	NR5020T 75N00MGJ	RoHS	150	±30%	5	0.800	600	800
LLXN05050Y17R90N00	NR5020T 90N00MGJ	RoHS	150	±30%	5	0.800	600	800
LLXN05050Y17R22M00	NR5020T 22N00MGJ	RoHS	22	±30%	22	0.030	2.000	2.300
LLXN05050Y17R30M00	NR5020T 30N00MGJ	RoHS	33	±30%	18	0.050	1.500	1.800
LLXN05050Y17R40M00	NR5020T 40N00MGJ	RoHS	41	±30%	16	0.080	1.200	1.500
LLXN05050Y17R50M00	NR5020T 50N00MGJ	RoHS	68	±30%	12	0.120	1.000	1.200
LLXN05050Y17R60M00	NR5020T 60N00MGJ	RoHS	100	±30%	10	0.200	1.000	1.200
LLXN05050Y17R75M00	NR5020T 75N00MGJ	RoHS	150	±30%	8	0.300	1.000	1.200
LLXN05050Y17R90M00	NR5020T 90N00MGJ	RoHS	150	±30%	8	0.300	1.000	1.200
LLXN05050Y17R22M00	NR5020T 22N00MGJ	RoHS	22	±30%	21	0.030	2.000	2.300
LLXN05050Y17R30M00	NR5020T 30N00MGJ	RoHS	33	±30%	18	0.050	1.500	1.800
LLXN05050Y17R40M00	NR5020T 40N00MGJ	RoHS	41	±30%	16	0.080	1.200	1.500
LLXN05050Y17R50M00	NR5020T 50N00MGJ	RoHS	68	±30%	12	0.120	1.000	1.200
LLXN05050Y17R60M00	NR5020T 60N00MGJ	RoHS	100	±30%	10	0.200	1.000	1.200
LLXN05050Y17R75M00	NR5020T 75N00MGJ	RoHS	150	±30%	8	0.300	1.000	1.200
LLXN05050Y17R90M00	NR5020T 90N00MGJ	RoHS	150	±30%	8	0.300	1.000	1.200
LLXN05050Y17R22M00	NR							

PART NUMBER

④ 3030KX type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3030KX0304T10RN	HR 301ST 10RN	RoHS	1.0	±30%	37	0.040	2,100	2,100	100	
LLX3030KX0304T10RN	HR 301ST 10RN	RoHS	1.5	±30%	67	0.040	1,800	1,820	100	
LLX3030KX0304T20RM	HR 301ST 20RM	RoHS	2.2	±30%	64	0.060	1,480	1,500	100	
LLX3030KX0304T20RM	HR 301ST 20RM	RoHS	3.3	±30%	48	0.060	1,270	1,290	100	
LLX3030KX0304T47RM	HR 301ST 47RM	RoHS	4.7	±30%	40	0.120	1,020	1,040	100	
LLX3030KX0304T80RM	HR 301ST 80RM	RoHS	6.8	±30%	38	0.160	870	890	100	
LLX3030KX0304T100RM	HR 301ST 100RM	RoHS	10	±30%	38	0.200	700	710	100	
LLX3030KX0304T150RM	HR 301ST 150RM	RoHS	15	±30%	23	0.380	560	580	100	
LLX3030KX0304T200RM	HR 301ST 200RM	RoHS	22	±30%	20	0.520	470	470	100	
LLX3030KX0304T300RM	HR 301ST 300RM	RoHS	33	±30%	18	0.800	380	370	100	
LLX3030KX0304T470RM	HR 301ST 47RM	RoHS	47	±30%	17	1.34	320	300	100	

④ 4040KK type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3040KX0401K10RN	HR 401ST 10RN	RoHS	1.0	±30%	116	0.100	1,800	1,850	100	
LLX3040KX0401K20RN	HR 401ST 20RN	RoHS	2.2	±30%	73	0.150	1,150	880	100	
LLX3040KX0401K30RM	HR 401ST 30RM	RoHS	3.3	±30%	58	0.150	920	920	100	
LLX3040KX0401K47RM	HR 401ST 47RM	RoHS	4.7	±30%	47	0.210	750	750	100	
LLX3040KX0401K80RM	HR 401ST 80RM	RoHS	6.8	±30%	38	0.300	740	620	100	
LLX3040KX0401K120RM	HR 401ST 120RM	RoHS	10	±30%	31	0.400	580	580	100	
LLX3040KX0401K150RM	HR 401ST 150RM	RoHS	15	±30%	24	0.510	470	510	100	
LLX3040KX0401K200RM	HR 401ST 200RM	RoHS	22	±30%	19	0.870	380	450	100	
LLX3040KX0401K300RM	HR 401ST 300RM	RoHS	33	±30%	15	1.200	380	380	100	
LLX3040KX0401K470RM	HR 401ST 47RM	RoHS	47	±30%	13	1.81	240	230	100	

④ 4040MK type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3040KX0401K10RN	HR 401ST 10RN	RoHS	1.0	±30%	131	0.080	2,500	1,500	100	
LLX3040KX0401K20RM	HR 401ST 20RM	RoHS	2.2	±30%	66	0.090	1,650	1,200	100	
LLX3040KX0401K30RM	HR 401ST 30RM	RoHS	3.3	±30%	50	0.100	1,250	950	100	
LLX3040KX0401K47RM	HR 401ST 47RM	RoHS	4.7	±30%	45	0.140	1,050	950	100	
LLX3040KX0401K80RM	HR 401ST 80RM	RoHS	6.8	±30%	35	0.180	900	840	100	
LLX3040KX0401K120RM	HR 401ST 120RM	RoHS	10	±30%	30	0.250	750	750	100	
LLX3040KX0401K150RM	HR 401ST 150RM	RoHS	15	±30%	23	0.400	560	600	100	
LLX3040KX0401K200RM	HR 401ST 200RM	RoHS	22	±30%	16	0.840	490	580	100	
LLX3040KX0401K300RM	HR 401ST 300RM	RoHS	33	±30%	12	1.200	420	420	100	
LLX3040KX0401K470RM	HR 401ST 47RM	RoHS	47	±30%	10	1.650	570	420	100	
LLX3040KX0401K80RM	HR 401ST 80RM	RoHS	68	±30%	8.3	1.90	470	320	100	
LLX3040KX0401K120RM	HR 401ST 120RM	RoHS	100	±30%	6.5	2.50	400	270	100	
LLX3040KX0401K150RM	HR 401ST 150RM	RoHS	150	±30%	5.5	2.90	310	220	100	
LLX3040KX0401K211RM	HR 401ST 211RM	RoHS	220	±30%	4.0	4.00	270	170	100	

④ 4040MK type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3040KX0401K10RN	HR 401ST 10RN	RoHS	1.0	±30%	80	0.080	4,000	1,830	100	
LLX3040KX0401K20RM	HR 401ST 20RM	RoHS	2.2	±30%	52	0.080	2,700	1,440	100	
LLX3040KX0401K30RM	HR 401ST 30RM	RoHS	3.3	±30%	44	0.080	2,300	1,220	100	
LLX3040KX0401K47RM	HR 401ST 47RM	RoHS	4.7	±30%	34	0.090	1,700	1,200	100	
LLX3040KX0401K80RM	HR 401ST 80RM	RoHS	6.8	±30%	29	0.110	1,450	1,050	100	
LLX3040KX0401K120RM	HR 401ST 120RM	RoHS	10	±30%	23	0.250	1,000	1,000	100	
LLX3040KX0401K150RM	HR 401ST 150RM	RoHS	15	±30%	18	0.380	800	700	100	
LLX3040KX0401K200RM	HR 401ST 200RM	RoHS	22	±30%	12	0.880	700	630	100	
LLX3040KX0401K300RM	HR 401ST 300RM	RoHS	33	±30%	8	1.700	590	530	100	
LLX3040KX0401K470RM	HR 401ST 47RM	RoHS	47	±30%	6	2.000	400	400	100	
LLX3040KX0401K80RM	HR 401ST 80RM	RoHS	68	±30%	3	3.200	440	410	100	
LLX3040KX0401K100RM	HR 401ST 100RM	RoHS	100	±30%	1	2.18	350	320	100	

④ 5050YA 5050YX type

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 (characteristic graph, reliability information, precautions for use, and so on), see our Web site (<http://www.sony-elec.com>).

CATALOG 2022

TAIYO YUDEN

Lsimd_NRL_e-E10R01

④ 6060MK type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3040KX0401K20RN	HR 601ST 20RN	RoHS	2.5	±30%	45	0.090	2,100	1,730	100	
LLX3040KX0401K47RN	HR 601ST 47RN	RoHS	4.0	±30%	39	0.105	1,800	1,570	100	
LLX3040KX0401K75RN	HR 601ST 75RN	RoHS	5.5	±30%	34	0.120	1,500	1,400	100	
LLX3040KX0401K100RN	HR 601ST 100RN	RoHS	8.0	±30%	30	0.180	1,000	1,180	100	
LLX3040KX0401K120RN	HR 601ST 120RN	RoHS	10	±30%	22	0.235	1,000	1,000	100	
LLX3040KX0401K150RN	HR 601ST 150RN	RoHS	15	±30%	18	0.380	800	700	100	
LLX3040KX0401K200RN	HR 601ST 200RN	RoHS	22	±30%	12	0.880	700	630	100	
LLX3040KX0401K300RN	HR 601ST 300RN	RoHS	33	±30%	8	1.700	590	530	100	
LLX3040KX0401K470RN	HR 601ST 47RM	RoHS	47	±30%	6	2.000	400	320	100	
LLX3040KX0401K80RN	HR 601ST 80RM	RoHS	68	±30%	3	3.200	400	300	100	
LLX3040KX0401K100RN	HR 601ST 100RM	RoHS	100	±30%	1	2.18	350	320	100	

④ 6060MK type

New part number	Old part number (for reference)	EHS	Nominal inductance [μ H]	Inductance tolerance	Self-resonant frequency [MHz] (max.)	DC Resistance [Ω] (±30%)	Rated current (31) [mA]	Saturation current, 161	Temperature rise current, 162	Measuring frequency [MHz]
LLX3040KX0401K20RN	HR 601ST 20RN	RoHS	1.5	±30%	63	0.070	9,000	7,000	100	
LLX3040KX0401K47RN	HR 601ST 47RN	RoHS	2.2	±30%	64	0.080	7,000	5,700	100	
LLX3040KX0401K75RN	HR 601ST 75RN	RoHS	3.3	±30%	50	0.100	5,000	5,000	100	
LLX3040KX0401K100RN	HR 601ST 100RN	RoHS	4.7	±30%	34	0.150	4,500	4,900	100	
LLX3040KX0401K120RN	HR 601ST 120RN	RoHS	6.8	±30%	30	0.180	4,700	4,100	100	
LLX3040KX0401K150RN	HR 601ST 150RN	RoHS	10	±30%	22	0.300	3,400	3,100	100	
LLX3040KX0401K200RN	HR 601ST 200RN	RoHS	15	±30%	16	0.500	2,700	2,400	100	
LLX3040KX0401K300RN	HR 601ST 300RN	RoHS	22	±30%	13	0.800	2,200	2,200	100	
LLX3040KX0401K470RN	HR 601ST 47RM	RoHS	33	±30%	12	1.000	1,900	1,700	100	
LLX3040KX0401K80RN	HR 601ST 80RM	RoHS	47	±30%	8	1.500	1,500	1,400	100	
LLX3040KX0401K100RN	HR 601ST 100RM	RoHS	68	±30%	6	2.000	1,200	1,100	100	
LLX3040KX0401K150RN	HR 601ST 150RM	RoHS	100	±30%	4	2.500	900	900	100	

Wire-wound Ferrite Power Inductors LSXB/LSXN/LSXP/LCXN/LCXP/LBXN/LBXP/

LLXB/LLXN/LLXP/LMXN/LMXP series

Wire-wound Ferrite Power Inductors LCXH/LBXH/LMXH series

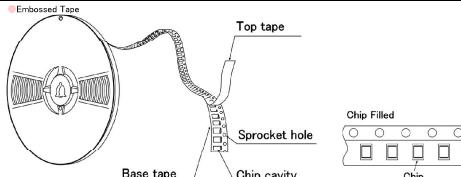
Wire-wound Ferrite Inductors for Class D Amplifier LCXA

■PACKAGING

① Minimum Quantity

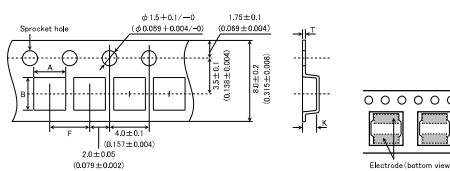
Type	Standard Quantity [pcs]		Type	Standard Quantity [pcs]	
	Tape & Reel	Tape & Reel		Tape & Reel	Tape & Reel
2020KK	2500		5050KK	1000	
2020MK	2500		5050MM	1000	
2424KK	2500		5050PK	1000	
2424MK	2500		5050WB	900	
3030KK	2000		5050WK	800	
3030MK	2000		5050WD	2500	
3030QK	2000		5050WE	500	
4040KK	5000		5050XK		
4040MK	4500		5050XA		
4040TK	3500		5050YA		
4040WK	700		5050YK	1500	

② Tape Material



③ Taping dimensions

■ Embossed tape 8mm wide (0.315 inches wide)



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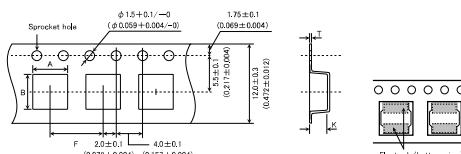
UmoJHjyokjwE1002

TAIYO YUDEN

Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
2020KK	2.2 ± 0.1	2.2 ± 0.1		0.28 ± 0.05 (0.009 ± 0.002)	1.2 ± 0.1 (0.051 ± 0.004)
2020MK	(0.102 ± 0.004)	(0.102 ± 0.004)		0.28 ± 0.05 (0.009 ± 0.002)	1.2 ± 0.1 (0.051 ± 0.004)
2424KK	2.6 ± 0.1	2.6 ± 0.1		0.28 ± 0.05 (0.009 ± 0.002)	1.2 ± 0.1 (0.051 ± 0.004)
2424MK	(0.087 ± 0.004)	(0.102 ± 0.004)		0.28 ± 0.05 (0.009 ± 0.002)	1.2 ± 0.1 (0.051 ± 0.004)
3030KK				0.3 ± 0.05 (0.012 ± 0.002)	1.5 ± 0.1 (0.063 ± 0.004)
3030MK		3.2 ± 0.1 (0.126 ± 0.004)	0.2 ± 0.1 (0.028 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	1.5 ± 0.1 (0.063 ± 0.004)
3030QK					

Unit:mm(inch)

■ Embossed tape 12mm wide (0.47 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		F	T
4040KK					1.4 ± 0.1 (0.055 ± 0.004)
4040MK		4.3 ± 0.1 (0.169 ± 0.004)			1.4 ± 0.1 (0.063 ± 0.004)
4040TK					1.4 ± 0.1 (0.063 ± 0.004)
4040WK					1.4 ± 0.1 (0.063 ± 0.004)
5050KK					1.4 ± 0.1 (0.055 ± 0.004)
5050MK					1.4 ± 0.1 (0.063 ± 0.004)
5050PK		5.25 ± 0.1 (0.207 ± 0.004)			1.4 ± 0.1 (0.063 ± 0.004)
5050WB					1.4 ± 0.1 (0.063 ± 0.004)
5050WD					2.3 ± 0.1 (0.091 ± 0.004)
5050WE					2.7 ± 0.1 (0.109 ± 0.004)
5050XK					3.2 ± 0.1 (0.126 ± 0.004)
5050XA					4.2 ± 0.1 (0.163 ± 0.004)
5050YK		5.15 ± 0.1 (0.203 ± 0.004)			4.2 ± 0.1 (0.163 ± 0.004)
5050YA		5.15 ± 0.1 (0.203 ± 0.004)			4.2 ± 0.1 (0.163 ± 0.004)
6060KK					1.4 ± 0.1 (0.055 ± 0.004)
6060MK					1.4 ± 0.1 (0.063 ± 0.004)
6060PK		6.2 ± 0.1 (0.248 ± 0.004)			1.4 ± 0.1 (0.063 ± 0.004)
6060WK					1.4 ± 0.1 (0.063 ± 0.004)
6060WH					2.3 ± 0.1 (0.091 ± 0.004)
6060YE					3.4 ± 0.1 (0.127 ± 0.004)
6060YK					4.2 ± 0.1 (0.163 ± 0.004)

Unit:mm(inch)

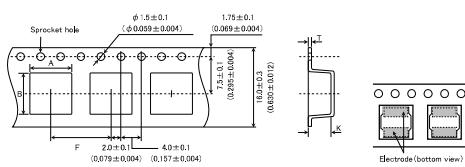
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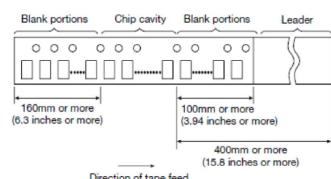
Embossed tape 16mm wide (0.63 inches wide)



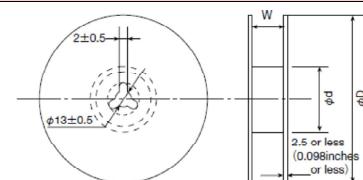
Type	Chip cavity A	Chip cavity B	Insertion pitch F	Tape thickness T	K
8080XX	6.3 ± 0.1 (0.327 ± 0.004)	6.3 ± 0.1 (0.327 ± 0.004)	12.0 ± 0.1 (0.472 ± 0.004)	0.5 ± 0.1 (0.020 ± 0.004)	3.4 ± 0.1 (0.134 ± 0.004)
8080YK					4.5 ± 0.1 (0.177 ± 0.004)
8080YB					

Unit:mm(inch)

④ Leader and Blank portion



⑤ Reel size



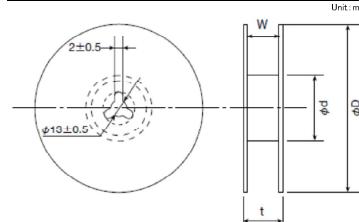
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Type	Reel size (Reference values)		
	ϕD	ϕd	W
2020KK			
2020MK			
2424KK			
2424MK	180 ± 0.5 (7.087 ± 0.019)	60 ± 1.0 (2.36 ± 0.04)	10.0 ± 1.5 (0.394 ± 0.059)
3030KK			
3030MK			
3030K			
4040KK			
5050KK			
5050MK			
5050PK			
5050WB	180 ± 3.0 (7.087 ± 0.118)	60 ± 2.0 (2.36 ± 0.08)	14.0 ± 1.5 (0.551 ± 0.059)
5050WK			
5050XA			
5050KK			
6060KK			
6060MK			
6060PK			

Unit: mm(inch)

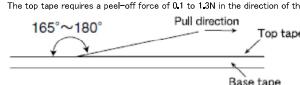


Type	Reel size (Reference values)			
	ϕD	ϕd	$t_{(max.)}$	W
4040KK				
4040MK				
4040K				
5050WD				
5050WE				
5050YA	330 ± 3.0 (12.99 ± 0.118)	80 ± 2.0 (3.15 ± 0.078)	18.5 (0.72)	13.5 ± 1.0 (0.531 ± 0.04)
5050YK				
6060WK				
6060WH				
6060YE				
8080KK				
8080YK				
8080YB				

Unit: mm(inch)

⑥ Top Tape Strength

The top tape requires a peel-off force of 0.1 to 1.2N in the direction of the arrow as illustrated below.



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TAIYO YUDEN

**Wire-wound Ferrite Power Inductors LSXB/LSXN/LSXP series
for General Electronic Equipment for Consumer
Wire-wound Ferrite Power Inductors LLXB/LLXN/LLXP series
for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)**

RELIABILITY DATA

RELIABILITY DATA													
1. Operating Temperature Range													
Specified Value	–25 ~ +120°C (LSXB: 3030~8080 type, LSXN: 2020~3030 type, LSXP: 2020~3030 type) –25 ~ +125°C (LSXN: 4040~8080 type) –25 ~ +120°C (LLXB: 3030~8080 type, LLXN: 2020~3030 type, LLXP: 2020~3030 type) –25 ~ +125°C (LLXN: 4040~8080 type)												
Test Methods and Remarks	Including self-generated heat												
2. Storage Temperature Range													
Specified Value	–40 ~ +85°C												
Test Methods and Remarks	–5 to 40°C for the product with taping.												
3. Rated current													
Specified Value	Within the specified tolerance												
4. Inductance													
Specified Value	Within the specified tolerance												
Test Methods and Remarks	Measuring equipment : LCR Meter (HP 4285A or equivalent) Measuring frequency : 100kHz, 1V												
5. DC Resistance													
Specified Value	Within the specified tolerance												
Test Methods and Remarks	Measuring equipment : DC ohmmeter (HIOKI 3227 or equivalent)												
6. Self resonance frequency													
Specified Value	Within the specified tolerance												
Test Methods and Remarks	Measuring equipment : Impedance analyzer/material analyzer (HP4291A or equivalent HP4191A, 4192A or equivalent)												
7. Temperature characteristic													
Specified Value	Inductance change : Within $\pm 20\%$												
Test Methods and Remarks	Measurement of inductance shall be taken at temperature range within –25°C ~ +85°C. With reference to inductance value at +20°C, change rate shall be calculated. Change of maximum inductance deviation in step 1 to 5												
	<table border="1"> <tr> <td>Step</td> <td>Temperature(°C)</td> </tr> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>Minimum operating temperature</td> </tr> <tr> <td>3</td> <td>20 (Standard temperature)</td> </tr> <tr> <td>4</td> <td>Maximum operating temperature</td> </tr> <tr> <td>5</td> <td>20</td> </tr> </table>	Step	Temperature(°C)	1	20	2	Minimum operating temperature	3	20 (Standard temperature)	4	Maximum operating temperature	5	20
Step	Temperature(°C)												
1	20												
2	Minimum operating temperature												
3	20 (Standard temperature)												
4	Maximum operating temperature												
5	20												

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UmsNR5UJUHLU-E1090

TAIYO YUDEN

8. Resistance to flexure of substrate																																									
Specified Value	No damage																																								
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow. As illustrated below, apply force in the direction of the arrow indicating the direction of the test board surface to 2 mm. Test board size : 100 x 40 x 1.0 Test board material : Glass epoxy+resin Solder cream thickness : 0.10mm (2020~3030 type) : 0.15mm (4040~8080 type)																																								
<table border="1"> <tr> <td>Land dimension</td> <td>Type</td> <td>A</td> <td>B</td> <td>C</td> </tr> <tr> <td></td> <td>2020</td> <td>0.65</td> <td>0.7</td> <td>2.0</td> </tr> <tr> <td></td> <td>2424</td> <td>0.7</td> <td>0.75</td> <td>2.0</td> </tr> <tr> <td></td> <td>3030</td> <td>0.8</td> <td>1.4</td> <td>2.7</td> </tr> <tr> <td></td> <td>4040</td> <td>1.2</td> <td>1.6</td> <td>3.7</td> </tr> <tr> <td></td> <td>5050</td> <td>1.5</td> <td>2.1</td> <td>4.0</td> </tr> <tr> <td></td> <td>6060</td> <td>1.6</td> <td>3.1</td> <td>5.7</td> </tr> <tr> <td></td> <td>8080</td> <td>1.8</td> <td>3.8</td> <td>7.5</td> </tr> </table>		Land dimension	Type	A	B	C		2020	0.65	0.7	2.0		2424	0.7	0.75	2.0		3030	0.8	1.4	2.7		4040	1.2	1.6	3.7		5050	1.5	2.1	4.0		6060	1.6	3.1	5.7		8080	1.8	3.8	7.5
Land dimension	Type	A	B	C																																					
	2020	0.65	0.7	2.0																																					
	2424	0.7	0.75	2.0																																					
	3030	0.8	1.4	2.7																																					
	4040	1.2	1.6	3.7																																					
	5050	1.5	2.1	4.0																																					
	6060	1.6	3.1	5.7																																					
	8080	1.8	3.8	7.5																																					
9. Insulation resistance : between wires																																									
Specified Value	—																																								
10. Insulation resistance : between wire and core																																									
Specified Value	—																																								
11. Withstanding voltage : between wire and core																																									
Specified Value	—																																								
12. Adhesion of terminal electrode																																									
Specified Value	Shall not come off PC board																																								
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow. Applied force : 10N to X and Y directions. Duration : 5s. Solder cream thickness : 0.10mm (2020~3030 type) : 0.15mm (4040~8080 type)																																								
13. Resistance to vibration																																									
Specified Value	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.																																								
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow. Then it shall be submitted to below test conditions.																																								
	<table border="1"> <tr> <td>Frequency Range</td> <td>10~55Hz</td> </tr> <tr> <td>Total Amplitude</td> <td>1.2mm (May not exceed acceleration 196m/s²)</td> </tr> <tr> <td>Sweeping Method</td> <td>10Hz to 55Hz to 10Hz for 1min.</td> </tr> <tr> <td>Time</td> <td>X Y Z</td> </tr> <tr> <td></td> <td>For 2 hours on each X, Y, and Z axis.</td> </tr> </table>	Frequency Range	10~55Hz	Total Amplitude	1.2mm (May not exceed acceleration 196m/s ²)	Sweeping Method	10Hz to 55Hz to 10Hz for 1min.	Time	X Y Z		For 2 hours on each X, Y, and Z axis.																														
Frequency Range	10~55Hz																																								
Total Amplitude	1.2mm (May not exceed acceleration 196m/s ²)																																								
Sweeping Method	10Hz to 55Hz to 10Hz for 1min.																																								
Time	X Y Z																																								
	For 2 hours on each X, Y, and Z axis.																																								
	Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.																																								

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14. Solderability																			
Specified Value	At least 90% of surface of terminal electrode is covered by new solder.																		
Test Methods and Remarks	<p>The test samples shall be dipped in flux, and then immersed in molten solder as shown in below table.</p> <p>Flux : Ethanol solution containing resin 25%</p> <table border="1"> <tr><td>Solder Temperature</td><td>245±5°C</td></tr> <tr><td>Time</td><td>5±1.0 sec.</td></tr> </table> <p>※Immersion depth : All sides of mounting terminal shall be immersed.</p>	Solder Temperature	245±5°C	Time	5±1.0 sec.														
Solder Temperature	245±5°C																		
Time	5±1.0 sec.																		
15. Resistance to soldering heat																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test sample shall be exposed to reflow oven at 230±5°C for 40 seconds, with peak temperature at 260±5°C for 5 seconds, 2 times.</p> <p>Test board material : Glass epoxy-resin Test board thickness : 1.0mm</p>																		
16. Thermal shock																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow. The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown in below table in sequence. The temperature cycle shall be repeated 100 cycles.</p> <table border="1"> <tr><td colspan="3">Conditions of 1 cycle</td></tr> <tr><td>Step</td><td>Temperature (°C)</td><td>Duration (min)</td></tr> <tr><td>1</td><td>-40±3</td><td>30±3</td></tr> <tr><td>2</td><td>Room temperature</td><td>Within 3</td></tr> <tr><td>3</td><td>+85±2</td><td>30±3</td></tr> <tr><td>4</td><td>Room temperature</td><td>Within 3</td></tr> </table> <p>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.</p>	Conditions of 1 cycle			Step	Temperature (°C)	Duration (min)	1	-40±3	30±3	2	Room temperature	Within 3	3	+85±2	30±3	4	Room temperature	Within 3
Conditions of 1 cycle																			
Step	Temperature (°C)	Duration (min)																	
1	-40±3	30±3																	
2	Room temperature	Within 3																	
3	+85±2	30±3																	
4	Room temperature	Within 3																	
17. Damp heat																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow.</p> <p>The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.</p> <table border="1"> <tr><td>Temperature</td><td>60±2°C</td></tr> <tr><td>Humidity</td><td>90~95%RH</td></tr> <tr><td>Time</td><td>500+24/-0 hour</td></tr> </table> <p>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.</p>	Temperature	60±2°C	Humidity	90~95%RH	Time	500+24/-0 hour												
Temperature	60±2°C																		
Humidity	90~95%RH																		
Time	500+24/-0 hour																		
18. Loading under damp heat																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow.</p> <p>The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table.</p> <table border="1"> <tr><td>Temperature</td><td>60±2°C</td></tr> <tr><td>Humidity</td><td>90~95%RH</td></tr> <tr><td>Applied current</td><td>Rated current</td></tr> <tr><td>Time</td><td>500+24/-0 hour</td></tr> </table> <p>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.</p>	Temperature	60±2°C	Humidity	90~95%RH	Applied current	Rated current	Time	500+24/-0 hour										
Temperature	60±2°C																		
Humidity	90~95%RH																		
Applied current	Rated current																		
Time	500+24/-0 hour																		
19. Low temperature life test																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow. After that, the test samples shall be placed at test conditions as shown in below table.</p> <table border="1"> <tr><td>Temperature</td><td>-40±2°C</td></tr> <tr><td>Time</td><td>500+24/-0 hour</td></tr> </table> <p>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.</p>	Temperature	-40±2°C	Time	500+24/-0 hour														
Temperature	-40±2°C																		
Time	500+24/-0 hour																		
20. High temperature life test																			
Specified Value	-																		
21. Loading at high temperature life test																			
Specified Value	Inductance change : Within ±10% No significant abnormality in appearance.																		
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow soldering.</p> <table border="1"> <tr><td>Temperature</td><td>85±2°C</td></tr> <tr><td>Applied current</td><td>Rated current</td></tr> <tr><td>Time</td><td>500+24/-0 hour</td></tr> </table> <p>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.</p>	Temperature	85±2°C	Applied current	Rated current	Time	500+24/-0 hour												
Temperature	85±2°C																		
Applied current	Rated current																		
Time	500+24/-0 hour																		
22. Standard condition																			
Specified Value	<p>Standard test condition :</p> <p>Unless otherwise specified, temperature is 20±15°C and 65±20% of relative humidity.</p> <p>When there is any question concerning measurement result: In order to provide correlation data, the test shall be condition of 20±2°C of temperature, 65±5% relative humidity.</p> <p>Inductance is in accordance with our measured value.</p>																		

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Ums-NR531-14-E(090)

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Ums-NR531-14-E(090)

TAIYO YUDEN

Wire-wound Ferrite Power Inductors LSXB/LSXN/LSXP series
for General Electronic Equipment for Consumer
Wire-wound Ferrite Power Inductors LSXBH10050 for General Electronic Equipment for Consumer
Wire-wound Ferrite Power Inductors LSRN series for General Electronic Equipment for Consumer
Wire-wound Ferrite Power Inductors LLXB/LLXN/LLXP series
for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)
Wire-wound Ferrite Power Inductors LLXBH10050
for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)
Wire-wound Ferrite Power Inductors LLRN series
for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

PRECAUTIONS

1. Circuit Design

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

2. PCB Design

Precautions	<p>◆ Land pattern design</p> <p>1. Please refer to a recommended land pattern.</p> <p>2. There is stress, which has been caused by distortion of a PCB, to the inductor. (LSXB/LSXN/LSXP/LLXB/LLXN/LLXP)</p>
	<p>◆ Land pattern design</p> <p>Surface Mounting</p> <p>1. Mounting and soldering conditions should be checked beforehand.</p> <p>2. Applicable soldering process to this products is reflow soldering only.</p> <p>3. Please use the recommended land pattern shown as below. Electrical characteristics and the mounting ability of the product are being considered in the recommended land pattern. If a PCB is designed with other dimensions, defective soldering and stress to a product may occur due to misalignment. The performance of the product may not be brought out. If an adopted land pattern is different from the recommended land pattern, stress to the inductor will increase. It may cause cracks or defective electrical characteristics of the product. Please conduct validation completely before applying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (LSXB/LSXN/LSXP/LLXB/LLXN/LLXP)</p> <p>4. As coefficients of thermal expansion between an inductor and a PCB differs, cracks may occur on a ferrite core when thermal stress is applied to them after mounting an inductor. (Please refer to the drawings below) Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (LSXB/LSXN/LSXP/LLXB/LLXN/LLXP)</p>

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Technical considerations	<p>5. SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflections. When splitting the PC board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board. (LSXB/LSXN/LSXP/LLXB/LLXN/LLXP)</p>
	<p>A product tends to undergo stress in order "A>C>B>D". Please consider the layouts of a product to minimize any stresses.</p>

Precautions	<p>◆ Considerations for automatic placement</p> <p>1. Excessive impact load should not be imposed on the products when mounting onto the PC boards.</p> <p>2. Mounting and soldering conditions should be checked beforehand.</p>
	<p>◆ Adjustment of mounting machine</p> <p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p> <p>2. Stress may be applied to a product with a warp or a twist in handling of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (LSXB/LSXN/LSXP/LLXB/LLXN/LLXP)</p>

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Precautions	<p>◆ Rework soldering</p> <p>1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified.</p> <p>2. The product shall be used reflow soldering only.</p> <p>3. Please do not add any stress to a product until it returns in normal temperature after reflow soldering.</p>
	<p>◆ Lead free soldering</p> <p>1. When using products with lead free soldering, we request to use them after confirming adhesion, temperature of resistance to soldering heat, soldering etc sufficiently.</p> <p>◆ Recommended condition for using a soldering iron (LSXBH10050/LLXBH10050)</p> <ul style="list-style-type: none"> 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 directly touch the inductor.

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Technical considerations	<p>◆ Cleaning conditions</p> <p>1. Washing by supersonic waves shall be avoided.</p>
	<p>◆ Cleaning conditions</p> <p>1. If washed by supersonic waves, the products might be broken.</p>

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6. Handling	
Precautions	<ul style="list-style-type: none"> ◆ Handling <ul style="list-style-type: none"> 1. Please keep product away from all magnetic and magnetic objects. ◆ Breakaway PCB boards (splitting along perforations) <ul style="list-style-type: none"> 1. When splitting the PC board after mounting product, care should be taken not to give any stresses of deflection or twisting to the board. 2. Board separation should not be done manually, but by using the appropriate devices. ◆ Mechanical considerations <ul style="list-style-type: none"> 1. Please do not give the product any excessive mechanical shock. 2. Please do not add any shock and power to a product in transportation. ◆ Pull-up pressure <ul style="list-style-type: none"> 1. Please do not push to add any pressure to a winding part. Please do not give any shock and push into a ferrite core exposure part. ◆ Packing <ul style="list-style-type: none"> 1. Please avoid accumulation of a packing box as much as possible.
Technical considerations	<ul style="list-style-type: none"> ◆ Handling <ul style="list-style-type: none"> 1. There is a case that a characteristic varies with magnetic influence. ◆ Breakaway PCB boards (splitting along perforations) <ul style="list-style-type: none"> 1. The position of the product on PCBs shall be carefully considered to minimize the stress caused from splitting of the PCBs. ◆ Mechanical considerations <ul style="list-style-type: none"> 1. There is a case to be damaged by a mechanical shock. 2. There is a case to be broken by the handling in transportation. ◆ Pull-up pressure <ul style="list-style-type: none"> 1. Damage and a characteristic can vary with an excessive shock or stress. ◆ Packing <ul style="list-style-type: none"> 1. If packing boxes are accumulated, that could cause a deformation on packing tapes or a damage on the products.
7. Storage conditions	
Precautions	<ul style="list-style-type: none"> ◆ Storage <ul style="list-style-type: none"> 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"> • Recommended conditions <ul style="list-style-type: none"> Ambient temperature : -5~40°C Humidity : Below 70% RH • The ambient temperature must be kept below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. <ul style="list-style-type: none"> 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.
Technical considerations	<ul style="list-style-type: none"> ◆ Storage <ul style="list-style-type: none"> 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of tape/packaging materials may take place.

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