



**TOKEN ELECTRONICS IND. CO., LTD.**

*HONESTY PERFECTION SHARING*

## **Catalogue of Chip Inductors**

**Taiwan:** No. 137, Sec. 1, Chung Shin Rd.,  
Wu Ku Hsiang, Taipei Hsien, Taiwan, R.O.C

**TEL:** 886-2-2981 0109

**FAX:** 886-2-2988 7487

**China:** 3F South, Zhongxing Industry Bld.,  
Changye Rd., Nanshan District,  
Shen Zhen, Guangdong 518054

**TEL:** 86-755-2605 5363~4; 2605 5440~1

**FAX:** 86-755-2605 5365

**Contact:** [token@token.com.tw](mailto:token@token.com.tw)

**Support:** [support@tokenonline.net](mailto:support@tokenonline.net)

**Homepage:** 1. <http://www.token.com.tw>

2. <http://www.tokenonline.net>



## INDUCTORS INDEX

● CM322522 SERIES CHIP INDUCTORS .....	2
● CM453232 SERIES CHIP INDUCTORS .....	5
● LF-5.0S (LGA0203) SERIES OF High FREQUENCY FIXED INDUCTORS .....	8



## CM SERIES CHIP INDUCTORS

### CM322522

**Features:** HIGH RESISTANCE TO HEAT AND HUMIDITY  
 RESISTANCE TO MECHANICAL SHOCKS AND PRESSURE  
 ACCURATE DIMENSIONS FOR AUTOMATICALLY SURFACE MOUNTED

### PRODUCT IDENTIFICATIONS

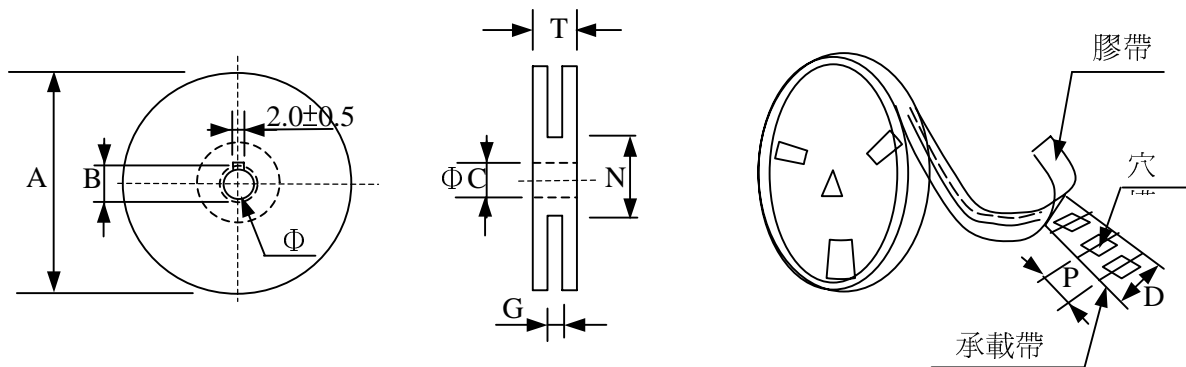
CM ○○○○○○ — □□□ ○ EXAMPLE CM322522-100K

TYPE: CM322522 CM453232

INDUCTANCE :100K(10  $\mu$  H)

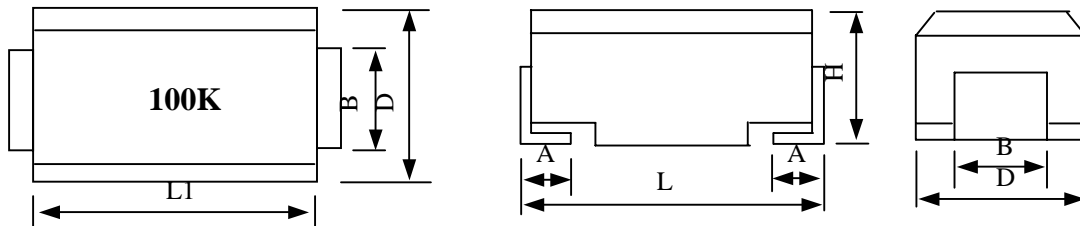
TOLERANCE: J: $\pm$ 5% K: $\pm$ 10% M: $\pm$ 20%

### PACKAGING



TYPE	A	B	C	D	G	N	T
8mm	178	21.0 $\pm$ 0.8	13.0 $\pm$ 0.5	8	10MAX	50MIN	14.4MAX
12mm	178	21.0 $\pm$ 0.8	13.0 $\pm$ 0.5	10	14MAX	50MIN	18.4MAX

### CONFIGURATION



CODE	CM322522	CM453232
L	3.2 $\pm$ 0.2	4.5 $\pm$ 0.3
L1	3.0 $\pm$ 0.2	4.3 $\pm$ 0.3
H	2.2 $\pm$ 0.2	3.2 $\pm$ 0.3
D	2.5 $\pm$ 0.2	3.2 $\pm$ 0.2
A	0.4 $\pm$ <sup>+0.1</sup> <sub>-0</sub>	0.4 $\pm$ <sup>+0.1</sup> <sub>-0</sub>
B	1.9 $\pm$ 0.2	2.6 $\pm$ 0.1



# TOKEN MEANS QUALITY AND SERVICE

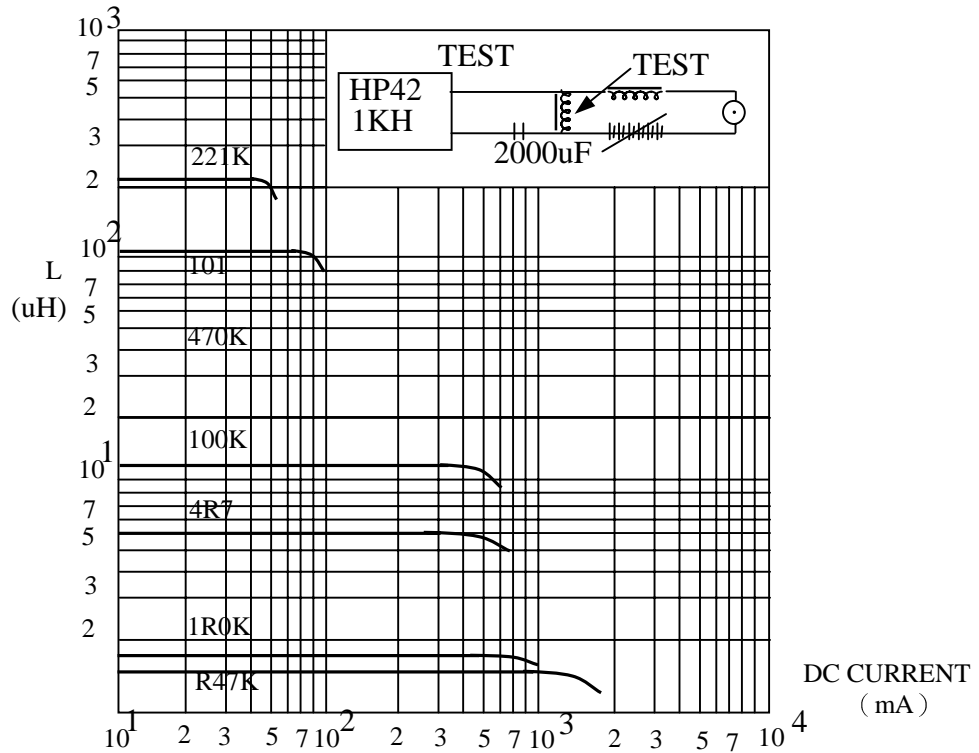
## RATINGS

PART NO.	INDUCTANCE ( $\mu$ H)	Q MIN	TEST FREQ (MHZ)	SRF MIN (MHZ)	RDC MAX ( $\Omega$ )	IDC (mA)
CM322522-R12M	0.12 $\pm$ 20%	30	25.2	500	0.22	450
-R15M	0.15 $\pm$ 20%	30	25.2	450	0.25	450
-R18M	0.18 $\pm$ 20%	30	25.2	400	0.28	450
-R22M	0.22 $\pm$ 20%	30	25.2	350	0.32	450
-R27M	0.27 $\pm$ 20%	30	25.2	320	0.36	450
-R33M	0.33 $\pm$ 20%	30	25.2	300	0.40	450
-R39M	0.39 $\pm$ 20%	30	25.2	250	0.45	450
-R47M	0.47 $\pm$ 20%	30	25.2	220	0.50	450
-R56M	0.56 $\pm$ 20%	30	25.2	180	0.55	450
-R68M	0.68 $\pm$ 20%	30	25.2	160	0.60	450
-R82M	0.82 $\pm$ 20%	30	25.2	140	0.65	450
-1R0M	1.0 $\pm$ 20%	30	7.96	120	0.70	400
-1R2M	1.2 $\pm$ 20%	30	7.96	100	0.75	390
-1R5M	1.5 $\pm$ 20%	30	7.96	85	0.85	370
-1R8M	1.8 $\pm$ 20%	30	7.96	80	0.90	350
-2R2M	2.2 $\pm$ 20%	30	7.96	75	1.00	320
-2R7M	2.7 $\pm$ 20%	30	7.96	70	1.10	290
-3R3K	3.3. $\pm$ 10%	30	7.96	60	1.20	260
-3R9K	3.9 $\pm$ 10%	30	7.96	55	1.30	250
-4R7K	4.7 $\pm$ 10%	30	7.96	50	1.50	220
-5R6K	5.6 $\pm$ 10%	30	7.96	47	1.60	200
-6R8K	6.8 $\pm$ 10%	30	7.96	43	1.80	180
-8R2K	8.2 $\pm$ 10%	30	7.96	40	2.00	170
-100K	10.0 $\pm$ 10%	30	2.52	36	2.10	150
-120K	12.0 $\pm$ 10%	30	2.52	33	2.50	140
-150K	15.0 $\pm$ 10%	30	2.52	30	2.80	130
-180K	18.0 $\pm$ 10%	30	2.52	27	3.30	120
-220K	22.0 $\pm$ 10%	30	2.52	25	3.70	110
-270K	27.0 $\pm$ 10%	30	2.52	20	5.00	80
-330K	33.0 $\pm$ 10%	30	2.52	17	5.60	70
-390K	39.0 $\pm$ 10%	30	2.52	16	6.40	65
-470K	47.0 $\pm$ 10%	30	2.52	15	7.00	60
-560K	56.0 $\pm$ 10%	30	2.52	13	8.00	55
-680K	68.0 $\pm$ 10%	30	2.52	12	9.00	50
-820K	82.0 $\pm$ 10%	30	2.52	11	10.00	45
-101K	100 $\pm$ 10%	20	0.796	10	10.00	40
-121K	120 $\pm$ 10%	20	0.796	10	11.00	70
-151K	150 $\pm$ 10%	20	0.796	8	15.00	65
-181K	180 $\pm$ 10%	20	0.796	7	17.00	60
-221K	220 $\pm$ 10%	20	0.796	7	21.00	50

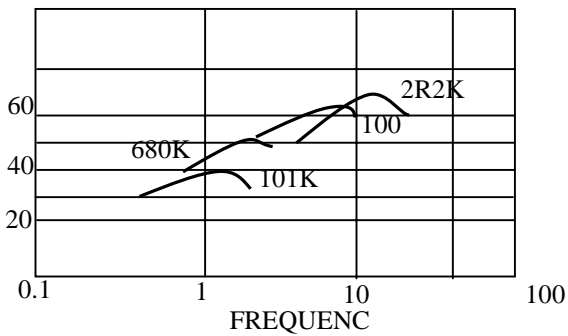


## ELECTRICAL CHARACTERISTICS

INDUCTANCE VS. DC SUPERPOSITION CHARACTERISTICS

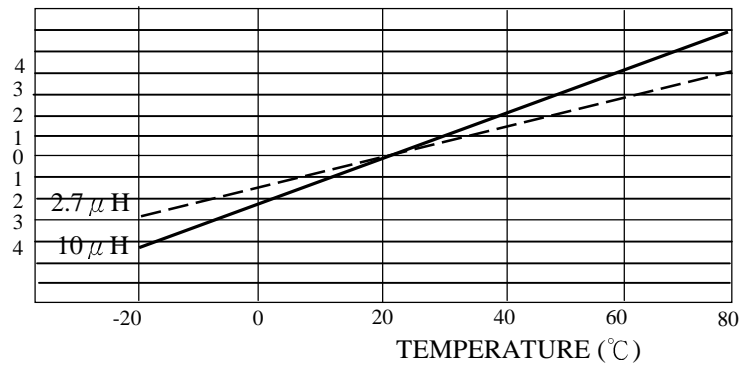


Q VS. FREQUENCY RESPONSE



TEST EQUIPMENT: Q METER HP4342A

INDUCTANCE CHANGE VS. TEMPERATURE RESPONSE



TEST EQUIPMENT: LCZ METER HP4274A



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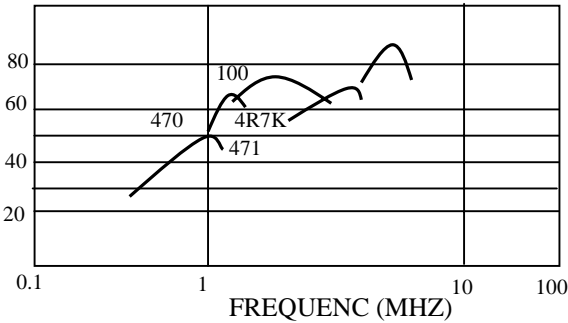
## CM453232 SERIES CHIP INDUCTORS

PART NO.	INDUCTANCE ( $\mu$ H)	Q (Min)	TEST FREQ (MHz)	SRF (MHz)	RDC ( $\Omega$ ) Max	IDC (mA)
CM453232-R10M	0.10 $\pm$ 20%	35	25.2	300	0.18	800
CM453232-R12M	0.12 $\pm$ 20%	25	25.2	280	0.20	770
CM453232-R15M	0.15 $\pm$ 20%	25	25.2	250	0.22	730
CM453232-R18M	0.18 $\pm$ 20%	25	25.2	220	0.24	700
CM453232-R22M	0.22 $\pm$ 20%	25	25.2	200	0.25	665
CM453232-R27M	0.27 $\pm$ 20%	30	25.2	180	0.26	635
CM453232-R33M	0.33 $\pm$ 20%	30	25.2	165	0.28	605
CM453232-R39M	0.39 $\pm$ 20%	30	25.2	150	0.30	575
CM453232-R47M	0.47 $\pm$ 20%	30	25.2	145	0.32	545
CM453232-R56M	0.56 $\pm$ 20%	30	25.2	140	0.36	520
CM453232-R68M	0.68 $\pm$ 20%	30	25.2	135	0.40	500
CM453232-R82M	0.82 $\pm$ 20%	30	25.2	130	0.45	475
CM453232-1R0K	1.0 $\pm$ 20%	40	7.96	100	0.50	450
CM453232-1R2K	1.2 $\pm$ 20%	40	7.96	80	0.55	430
CM453232-1R5K	1.5 $\pm$ 20%	40	7.96	70	0.55	410
CM453232-1R8K	1.8 $\pm$ 20%	40	7.96	60	0.65	390
CM453232-2R2K	2.2 $\pm$ 20%	40	7.96	55	0.70	380
CM453232-2R7K	2.7 $\pm$ 20%	40	7.96	50	0.75	370
CM453232-3R3K	3.3 $\pm$ 10%	40	7.96	45	0.80	355
CM453232-3R9K	3.9 $\pm$ 10%	40	7.96	40	0.90	330
CM453232-4R7K	4.7 $\pm$ 10%	40	7.96	35	1.00	315
CM453232-5R6K	5.6 $\pm$ 10%	40	7.96	33	1.10	300
CM453232-6R8K	6.8 $\pm$ 10%	40	7.96	27	1.20	285
CM453232-8R2K	8.2 $\pm$ 10%	40	7.96	25	1.40	270
CM453232-100K	10.0 $\pm$ 10%	40	2.52	20	1.60	250
CM453232-120K	12.0 $\pm$ 10%	40	2.52	18	2.00	225
CM453232-150K	15.0 $\pm$ 10%	40	2.52	17	2.50	200
CM453232-180K	18.0 $\pm$ 10%	40	2.52	15	2.80	190
CM453232-220K	22.0 $\pm$ 10%	40	2.52	13	3.20	180
CM453232-270K	27.0 $\pm$ 10%	40	2.52	12	3.60	170
CM453232-330K	33.0 $\pm$ 10%	40	2.52	11	4.00	160
CM453232-390K	39.0 $\pm$ 10%	40	2.52	10	4.50	150
CM453232-470K	47.0 $\pm$ 10%	40	2.52	10	5.00	140
CM453232-560K	56.0 $\pm$ 10%	40	2.52	9.0	5.50	135
CM453232-680K	68.0 $\pm$ 10%	40	2.52	9.0	6.00	130
CM453232-820K	82.0 $\pm$ 10%	40	2.52	8.0	7.00	120
CM453232-101K	100 $\pm$ 10%	30	0.796	8.0	8.00	110
CM453232-121K	120 $\pm$ 10%	30	0.796	6.0	8.00	110
CM453232-151K	150 $\pm$ 10%	30	0.796	5.0	9.00	105
CM453232-181K	180 $\pm$ 10%	30	0.796	5.0	9.50	102
CM453232-221K	220 $\pm$ 10%	30	0.796	4.0	10.0	100
CM453232-271K	270 $\pm$ 10%	30	0.796	4.0	12.0	92
CM453232-331K	330 $\pm$ 10%	30	0.796	3.5	14.0	85
CM453232-391K	390 $\pm$ 10%	30	0.796	3.0	18.0	80
CM453232-471K	470 $\pm$ 10%	30	0.796	3.0	26.0	62
CM453232-561K	560 $\pm$ 10%	20	0.796	3.0	30.0	50
CM453232-681K	680 $\pm$ 10%	20	0.796	3.0	30.0	50
CM453232-821K	820 $\pm$ 10%	20	0.796	2.5	35.0	30
CM453232-102K	1000 $\pm$ 10%	20	0.252	2.5	40.0	30



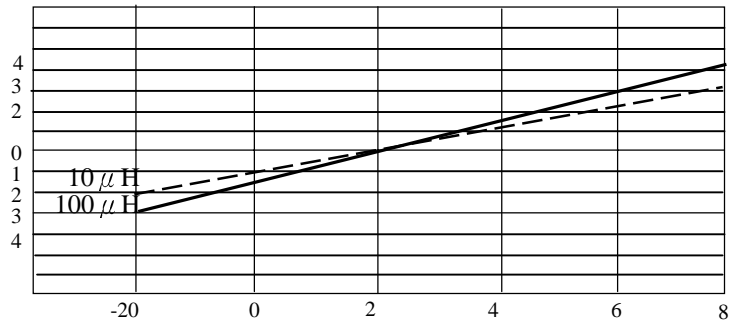
## ELECTRICAL CHARACTERISTICS

Q VS.FREQUENCY RESPONSE



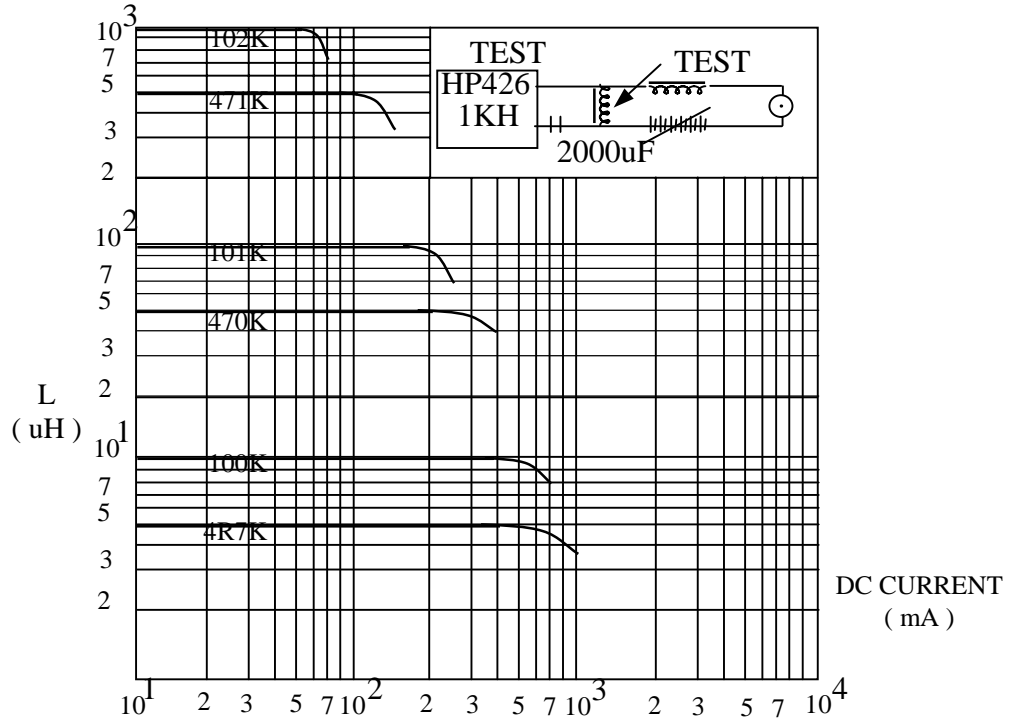
TEST EQUIPMENT: Q METER HP4342A

INDUCTANCE CHANGE VS. TEMPERATURE RESPONSE



TEST EQUIPMENT: LCZ METER HP4274A

INDUCTANCE VS.DC SPERPOSITION CHARACTERISTICS



## Mechanical Characteristics

REQUIREMENTS	CHARACTERISTICS	TEST, ETHOD(DIS C 5321)
Terminal Strength (PULL)	No evidence of damage	Terminals shall withstand a pull of 0.5Kgf in a horizoninal direction.
Vibration	$\Delta L/L$ shall be within $\pm 3\%$ . No evidence of damage	2 hours in each direction of X, Y, Z on p-Board at a frequency range of 10-55-10HZ with 1.5mm amplitude.
Dropping	$\Delta L/L$ shall be within $\pm 3\%$ . No evidence of damage	Dropping 1m over the ground of concretete or cement.



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## Electrical Characteristics

REQUIREMENTS	CHARACTERISTICS	TEST, METHOD (JIS C 5321)
Resistance to Soldering Heat	No evidence of outer damage, $\Delta L/L$ shall be within $\pm 3\%$ .	Immerse in the solder (H63A) of $260\pm 5^\circ\text{C}$ for $10\pm 1$ sec, leave for 2hrs at normal TEMP.
Solderability	More than 90% surface to be covered with new soldering.	Immerse in th solder (H63A) of $260\pm 5^\circ\text{C}$ for $4\pm 1$ sec.
Dielectric with standing voltage	No evidence of damage	AV100V 60 SEC.
Insulation	No veidence of breakdown, resistor 1000 mohm and over.	DC500V 30 SEC

## Endurance Test

REQUIREMENTS	CHARACTERISTICS	TEST, METHOD (JIS C 5321)
LOW TEMP. Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$ , $\Delta Q/Q$ within $\pm 30\%$	Leave for $96\pm 2$ hrs in a bath of TEMP. $-40\pm 2^\circ\text{C}$ , measurements shall be performed after 1~2hrs at normal TEMP.
TEMP.Cycling	No evidence of damage, $\Delta L/L$ within $\pm 5\%$	Keep for 30 Min. at TEMP. of $-25^\circ\text{C} \sim +85^\circ\text{C}$ at 5 cycle case of TEMP. Change from low to high and V.V..
Temperature Characteristics	$\Delta L/L$ within $\pm 3\%$	$\Delta L/L$ to be measured at the temperature of between $-25^\circ\text{C}$ and $+85^\circ\text{C}$
Moisture load Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$ , $\Delta Q/Q$ within $\pm 30\%$	TEMP. $-40\pm 2^\circ\text{C}$ , Humidity 90~95% $96\pm 2$ hrs, measurements shall be performed after 1~2hrs at normal TEMP..
High Temp. overload Characteristics	No evidence of damage, $\Delta L/L$ within $\pm 5\%$ , $\Delta Q/Q$ within $\pm 30\%$	Leave for $96\pm 2$ hrs in a bath of TEMP. $-85\pm 2^\circ\text{C}$ , measurements shall be performed after 1~2hrs at normal TEMP.





# TOKEN MEANS QUALITY AND SERVICE

## LF-5.0S (LGA0203) SERIES OF High FREQUENCY FIXED INDUCTORS

### A Brief Introduction to the Product

The LF-5.0(LGA0203) mini fixed inductor is made by automatic winding the thinner enamel -insulated wire on the " I " model magnetic core. Our company imported the most advanced technology and equipment in the world and the whole process, from wire terminal inserting to wire winding and coating, is fully computerized controlled. The quality of the products is in compliance with JIS- C - 5321 standard. It is widely used in the electronic circuits of television sets, camcorders, video sets, VCD, communicating equipment and automobile working equipment.

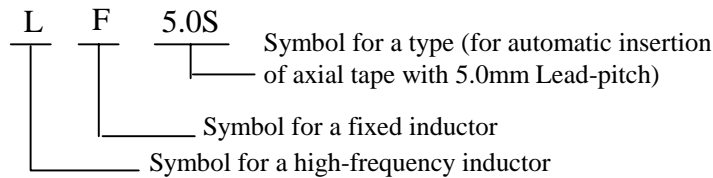
### Feature

1. Small dimension, light weight, stable structure and high reliability.
2. Automated pass production and reasonable price.

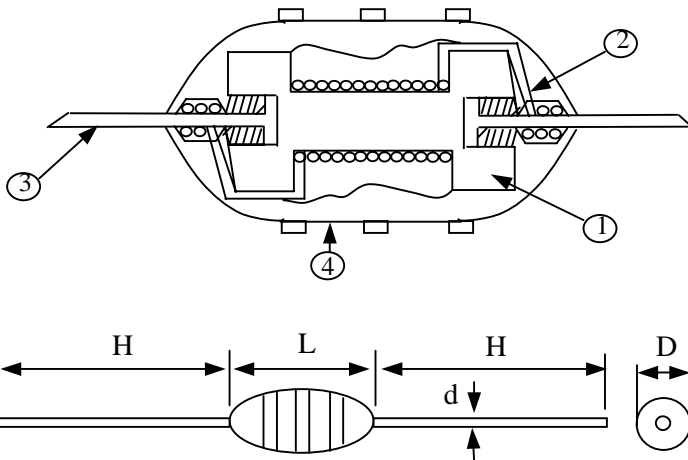
### Materials

Ferrite DR core, enamelled copper wire, tinned copper flat, epoxy novolac moldind compound

### Type Designation



### Configuration



1. FERRITE DR CORE
2. ENAMELLED COPPER WIRE
3. TINNED COPPER LEAD
4. EPOXY NOVOLAC MOLDIND COMPOUND

TYPE	L	D	d	H
LF - 5.0S	3.4Max.	2.3Max.	0.45	22Min



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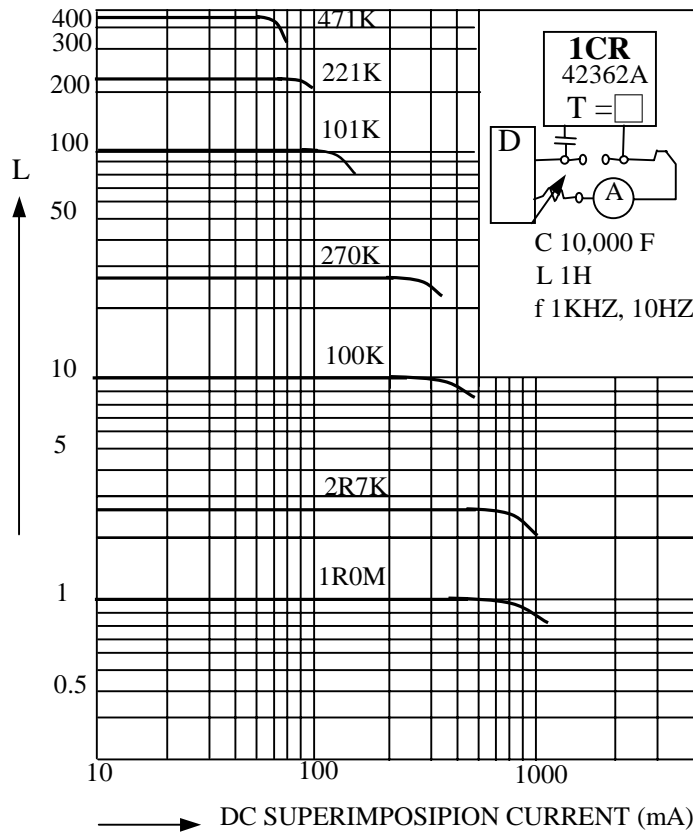
## RATING

Lf-5.0 ordering code	Normal inductance	Inductance tolerance	Q (min)	LQ measuring frequency	Self-resonant Frequency MHz	DC resistance (max)	Allowable DC, current (mA)	Color marking									
								1ST	2ND	3RD							
R10	0.10	± 20%	35	25.2	300	0.18	700	Brown	Black		Sliver						
R12	0.12					0.20	660		Red								
R15	0.15					0.22	620		Green								
R18	0.18					0.24	600		Grey								
R22	0.22				± 10%	35	25.2	150	0.40	400		Red	Red				
R27	0.27								0.43	380		Violet					
R33	0.33							0.48	370	Orange		Orange					
R39	0.39							0.51	350			White					
R47	0.47							0.56	330	Yellow		Violet					
R56	0.56							0.61	320	Green		Blue					
R68	0.68							0.67	310	Blue		Grey					
R82	0.82							0.74	290	Grey		Red					
1R0	1.0							± 10%	40	7.96		110	0.90	260	Brown	Black	
1R2	1.2												1.00	250		Red	
1R5	1.5	1.10	240	Green													
1R8	1.8	1.20	230	Grey													
2R2	2.2	± 5%	40	7.96	45	1.30	220				Red	Red					
2R7	2.7					1.40	210				Violet						
3R3	3.3				1.60	200	Orange				Orange						
3R9	3.9				1.70	190					White						
4R7	4.7				1.90	180	Yellow				Violet						
5R6	5.6				2.00	175	Green				Blue						
6R8	6.8				2.20	165	Blue				Grey						
8R2	8.2				2.50	160	Grey				Red						
100	10				± 10%	40	2.52				22	2.50	150	Brown	Black		
120	12											2.80	145		Red		
150	15	3.10	140	Green													
180	18	3.40	130	Grey													
220	22	± 5%	40	2.52				17	4.30	80	Red	Red					
270	27								4.70	76	Violet						
330	33							5.20	74	Orange	Orange						
390	39							5.80	70		White						
470	47							6.40	68	Yellow	Violet						
560	56							7.20	64	Green	Blue						
680	68							11.00	46	Blue	Grey						
820	82							12.00	44	Grey	Red						
101	100							± 5%	40	0.796	8.0	13.00	42	Brown	Black		
121	120											16.00	39		Red		
151	150	18.00	37	Green													
181	180	20.00	35	Grey													
221	220	± 5%	40	0.796	4.6	26.00	28				Red	Red					
271	270					30.00	26					Violet					
331	330				34.00	25	Orange				Orange						
391	390				38.00	24					White						
471	470				3.5	38.00	24				Yellow	Violet					

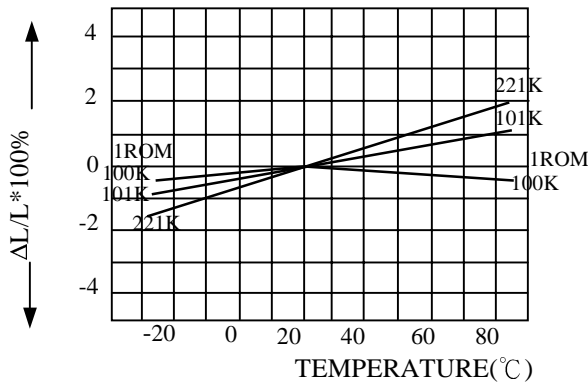


## ELECTRICAL CHARACTERISTICS

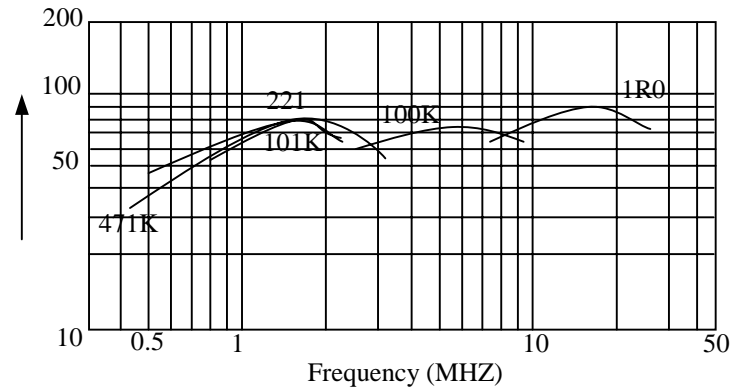
### DC SUPERIMPOSITION



### TEMPERATURE



### Q-FREQUENCY CHARACTERISTICS



## Mechanical Characteristics

REQUIREMENTS	CHARACTERISTICS	TEST METHOD(DIS C 5321)
Terminal Strength (PULL)	No evidence of damage	Terminals shall withstand a pull of 0.5Kgf in a horizontal direction.
Terminal Strength (BEND)	No evidence of breakdown	Terminals shall withstand a return bend of 250gf for 5 sec at a right angle to the axis, while being repeated the same to the opposite direction.
Vibration	No evidence of breakdown	2 hours in each direction of X, Y,



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		Z on p-Board at a frequency range of 10-55-10HZ with 1.5mm amplitude.
Dropping	No evidence of damage	Dropping 1m over the ground of concrete or cement.

## Electrical Characteristics

REQUIREMENTS	CHARACTERISTICS	TEST, METHOD (JIS C 5321)
DC Superimposition	No evidence of outer damage, $\Delta L/L$ shall be within $\pm 3\%$ .	Immerse in the solder (H63A) of $260\pm 5^\circ\text{C}$ for $10\pm 1$ sec, leave for 2hrs at normal TEMP.
Rise in Temperature	Within $20^\circ\text{C}$	A rise in temperature, when the allowable current is applied for 30 min., to be measured by a thermoelectric thermometer.
Overcurrent Test	No evidence of fuming or flaming.	The current twice the allowable current to be applied for 5 min.
Resistance to Soldering Heat	No evidence of outer damage	Immerse in the solder (H63A) of $270\pm 5^\circ\text{C}$ for $5\pm 0.5$ sec.
Solderability	More than 75% circumference to be covered with new soldering.	Immerse in the solder (H63A) of $260\pm 5^\circ\text{C}$ for $2\pm 0.5$ sec.
Dielectric with standing voltage	No evidence of fuming, flaming or breakdown	500V 5 SEC.: V Block.
Insulation Resistance	1000 Mohm and over	500V 1 min. : V Block.

## Endurance Test

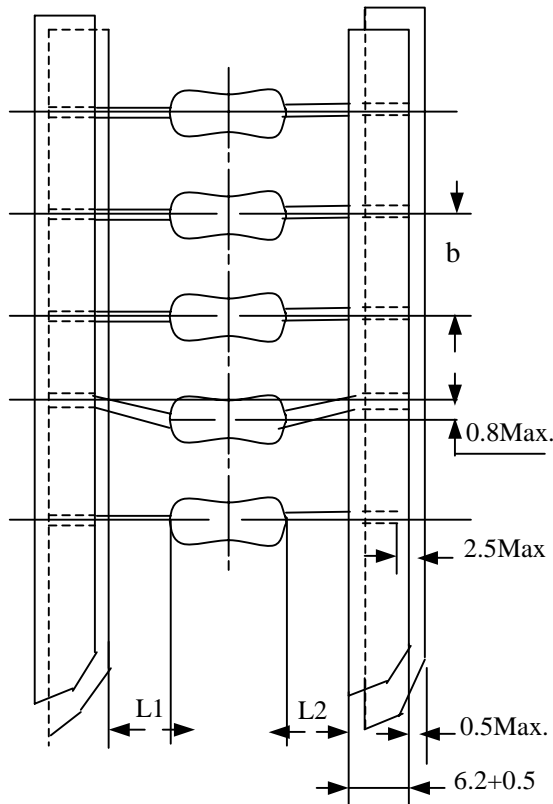
REQUIREMENTS	CHARACTERISTICS	TEST, METHOD (JIS C 5321)
LOW TEMP. Characteristics	$\Delta L/L$ within $\pm 10\%$ , Q: 30 and over	Leave for 1000 hrs in a bath of TEMP. $-25\pm 2^\circ\text{C}$ .
Resistance of Heat	$\Delta L/L$ within $\pm 10\%$ , Q: 30 and over	Leave for 1000 hrs in a bath of TEMP. $85\pm 2^\circ\text{C}$ .
TEMP. Cycling	$\Delta L/L$ within $\pm 10\%$ , Q: 30 and over	Keep for 30 Min. at TEMP. of $-25^\circ\text{C} \sim +85^\circ\text{C}$ at 5 cycle case of TEMP. Change from low to high and V.V., leave for 10-15 min. at normal TEMP.
Temperature Characteristics	$\Delta L/L$ within $\pm 5\%$	$\Delta L/L$ to be measured at the temperature of between $-25^\circ\text{C}$ and $+85^\circ\text{C}$ as based on the temperature of $20^\circ\text{C}$ .
Moisture load Characteristics	$\Delta L/L$ within $\pm 10\%$	TEMP. $-40\pm 2^\circ\text{C}$ , Humidity 90~95% 1000 hrs.
Endurance (moisture load)	$\Delta L/L$ within $\pm 10\%$	Allowable current on for 1000 hrs continuously TEMP. $40\pm 2^\circ\text{C}$ Humidity: 90-95%
Endurance (high Temp. overload)	$\Delta L/L$ within $\pm 10\%$	Allowable current on for 1000 hrs continuously at TEMP. of $85\pm 2^\circ\text{C}$



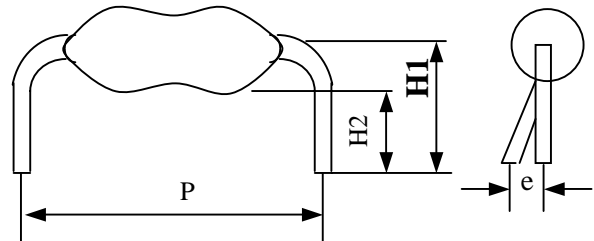
## TAPING FORMING DIMENSIONS

AXIAL	M - FORMING
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Configuration Symbol (B) T-25T-26



Configuration Symbol (B) M



TYPE	Configuration Symbol	DIMENSION mm			
		P+1	H1+1	H2+1	e
LF-5.0S	M5-5	5.0	6.1	5	1.7
LF-7.5S	M7.5-7	7.5	6.7	5	1.7

Configuration Symbol	DIMENSION mm		
	a	b	c
T-26	26+1	5.0+0.3	0.5
T-52	56+1	5.0+0.38	1.0

## PACKAGING

1. Bulk products are packed in bags, the bags are put in boxes;
2. Taping type products are folded packed in the printed packaged.

## STANDARD PACKING

Configuration	Bulk	Axiala Style-Taping	Axiala Style-Taping	M-Foroming
LF-5.0s	A box containing 10 bags A bag of 200pcs	A box of 2000pcs	A box containing 10 bags	A bag of 200pcs