



TOKEN ELECTRONICS IND. CO., LTD.

HONESTY PERFECTION SHARING

Catalogue of Chip Inductors

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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

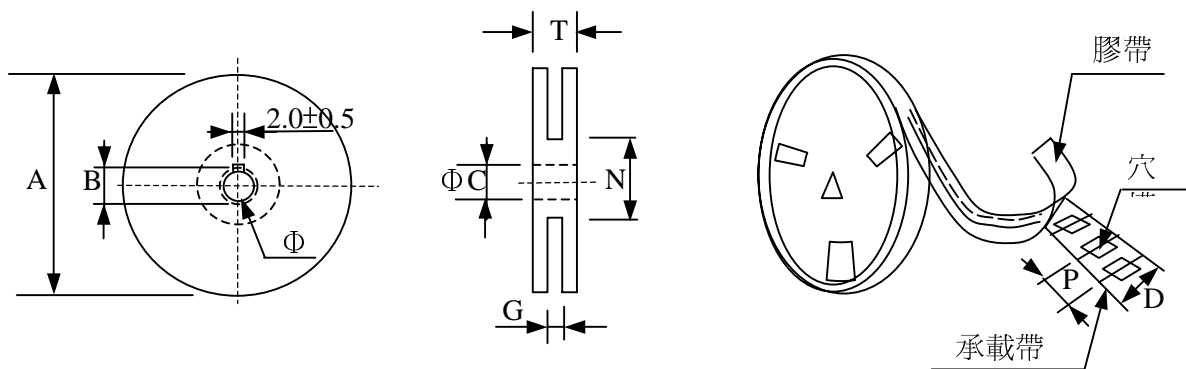
CM ○○○○○○ — □□□ ○ EXAMPLE CM322522-100K

TYPE: CM322522 CM453232

INDUCTANCE :100K(10 μ H)

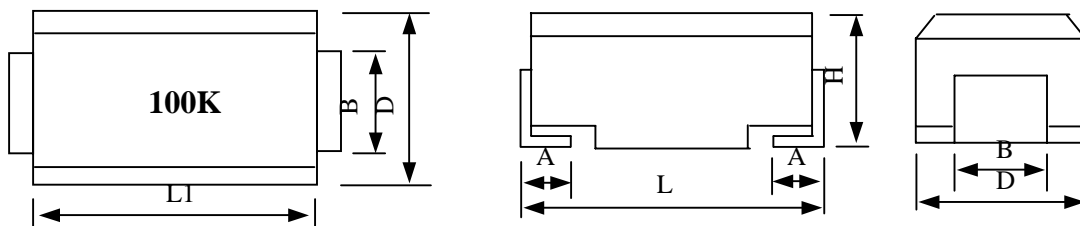
TOLERANCE: J:±5% K:±10% M:±20%

PACKAGING



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

CONFIGURATION



CODE	CM322522	CM453232
L	3.2±0.2	4.5±0.3
L1	3.0±0.2	4.3±0.3
H	2.2±0.2	3.2±0.3
D	2.5±0.2	3.2±0.2
A	0.4± ^{+0.1} ₋₀	0.4± ^{+0.1} ₋₀
B	1.9±0.2	2.6±0.1



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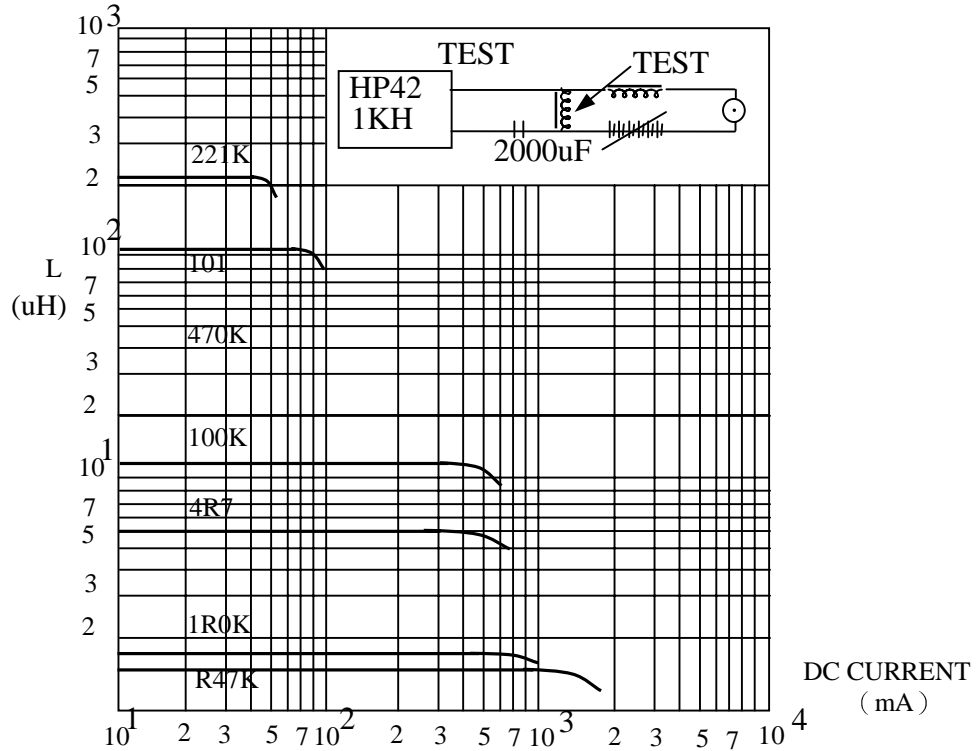
RATINGS

PART NO.	INDUCTANCE (μ H)	Q MIN	TEST FREQ (MHZ)	SRF MIN (MHZ)	RDC MAX (Ω)	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

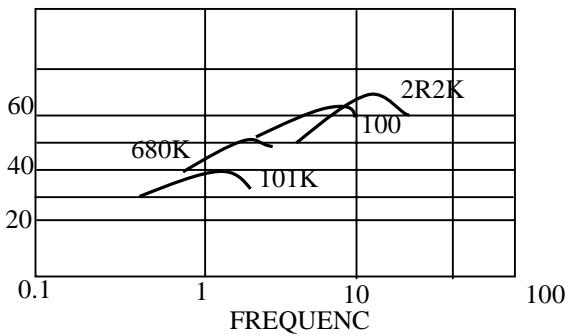


ELECTRICAL CHARACTERISTICS

INDUCTANCE VS. DC SUPERPOSITION CHARACTERISTICS

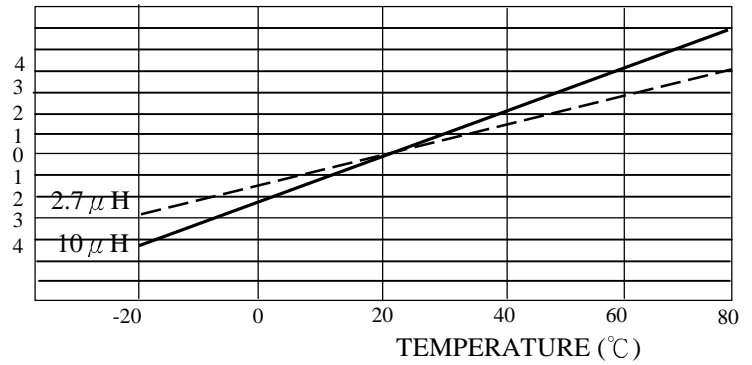


Q VS. FREQUENCY RESPONSE



TEST EQUIPMENT: Q METER HP4342A

INDUCTANCE CHANGE VS. TEMPERATURE RESPONSE



TEST EQUIPMENT: LCZ METER HP4274A



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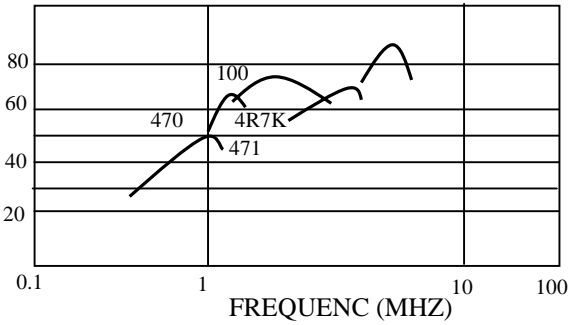
CM453232 SERIES CHIP INDUCTORS

PART NO.	INDUCTANCE (μ H)	Q (Min)	TEST FREQ (MHz)	SRF (MHz)	RDC (Ω) 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



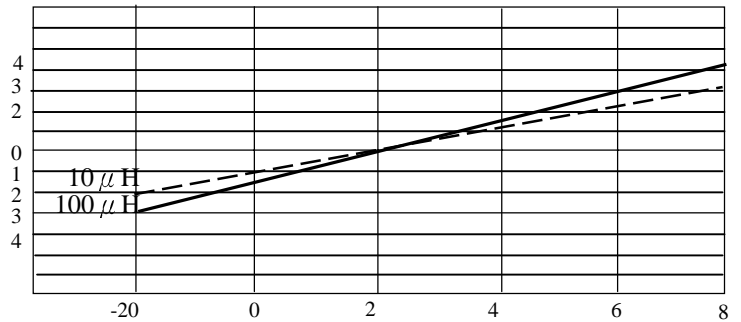
ELECTRICAL CHARACTERISTICS

Q VS.FREQUENCY RESPONSE



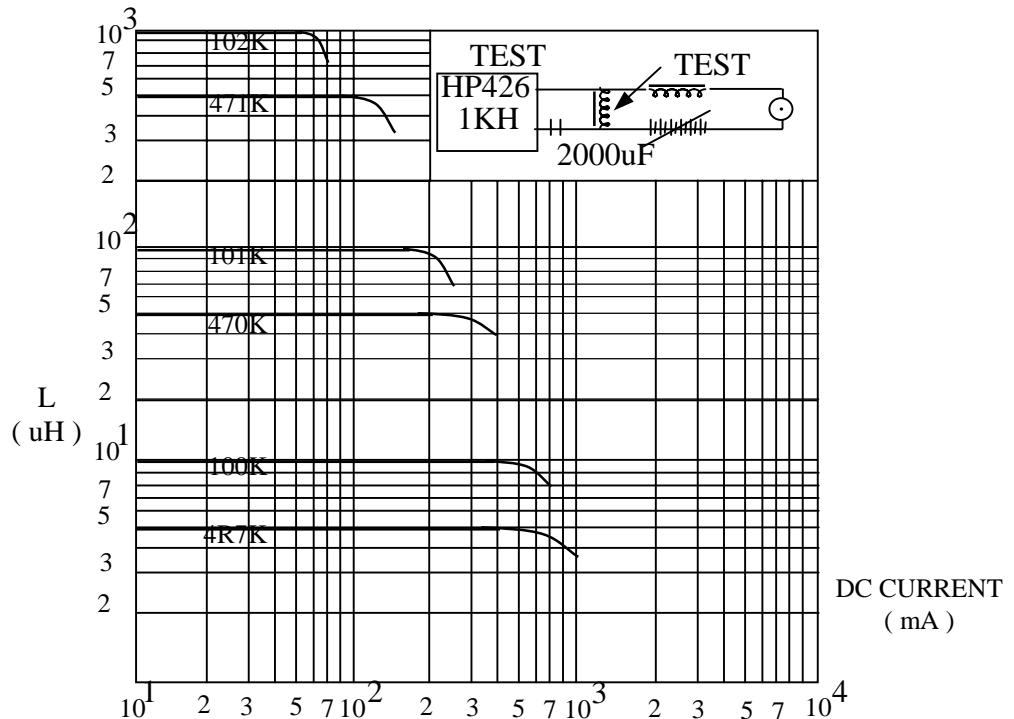
TEST EQUIPMENT: Q METER HP4342A

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 ± 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 ± 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 ± 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°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 ± 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 ± 2 hrs in a bath of TEMP. $-85\pm 2^\circ\text{C}$, measurements shall be performed after 1~2hrs at normal TEMP.



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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.

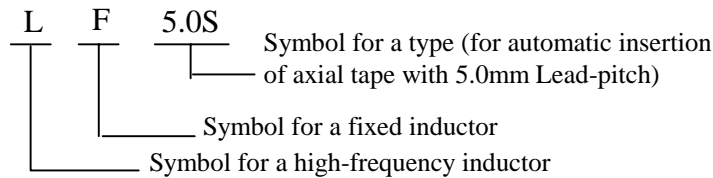
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Materials

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

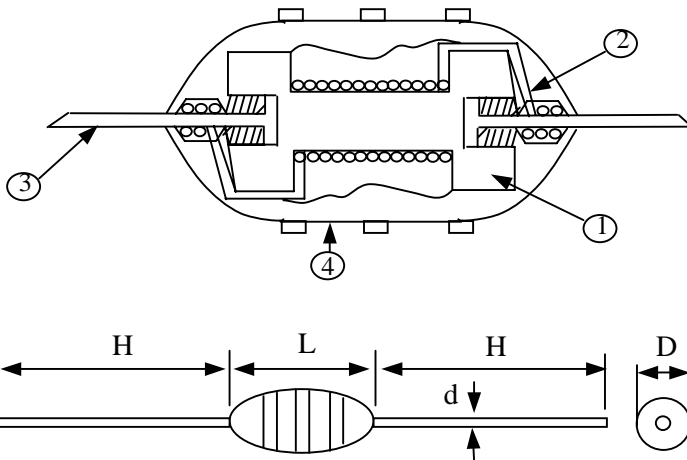
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Type Designation



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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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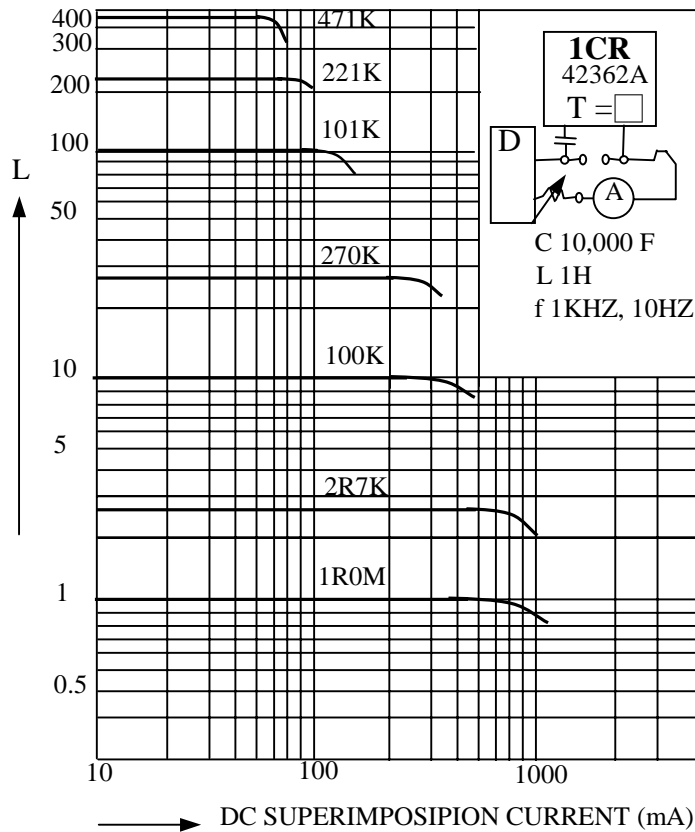
RATING

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% ± 10%	35	25.2	300	0.18	700	Brown	Black	Sliver			
R12	0.12					0.20	660		Red		Red		
R15	0.15					0.22	620		Orange		Green		
R18	0.18					0.24	600		Grey		Grey		
R22	0.22				± 10%	40	2.52	150	0.40		400	Red	Red
R27	0.27								0.43		380	Orange	Violet
R33	0.33							0.48	370		Yellow	Orange	
R39	0.39							0.51	350		Green	White	
R47	0.47							0.56	330		Blue	Violet	
R56	0.56							0.61	320		Grey	Blue	
R68	0.68							0.67	310		Blue	Grey	
R82	0.82							0.74	290		Grey	Red	
1R0	1.0							0.80	270		Brown	Black	Gold
1R2	1.2							110	0.90			260	
1R5	1.5	80	1.00	250	Green								
1R8	1.8	60	1.10	240	Grey								
2R2	2.2	± 10% ± 5%	40	7.96	7.96	45	1.20	230	Red	Red			
2R7	2.7					40	1.30	220	Violet				
3R3	3.3				38	1.40	210	Orange	Orange				
3R9	3.9				35	1.60	200	White	White				
4R7	4.7				32	1.70	190	Yellow	Violet				
5R6	5.6				30	1.90	180	Green	Blue				
6R8	6.8				28	2.00	175	Blue	Grey				
8R2	8.2				26	2.20	165	Grey	Red				
100	10				24	2.50	160	Brown	Black	Black			
120	12				22	2.50	150		Red				
150	15	20	2.80	145		Green							
180	18	18	3.10	140		Grey							
220	22	± 5%	40	2.52	17	3.40	130	Red	Red				
270	27					16	4.30	80	Violet				
330	33				14	4.70	76	Orange	Orange				
390	39				13	5.20	74	White	White				
470	47				12	5.80	70	Yellow	Violet				
560	56				11	6.40	68	Green	Blue				
680	68				10	7.20	64	Blue	Grey				
820	82				9.5	11.00	46	Grey	Red				
101	100				9.0	12.00	44	Brown	Black		Brown		
121	120				8.0	13.00	42		Red				
151	150	6.0	16.00	39		Green							
181	180	5.5	18.00	37		Grey							
221	220	0.796	5.0	20.00	35	Red	Red						
271	270		4.6	26.00	28	Violet							
331	330		4.2	30.00	26	Orange	Orange						
391	390		3.8	34.00	25	White	White						
471	470		3.5	38.00	24	Yellow	Violet						

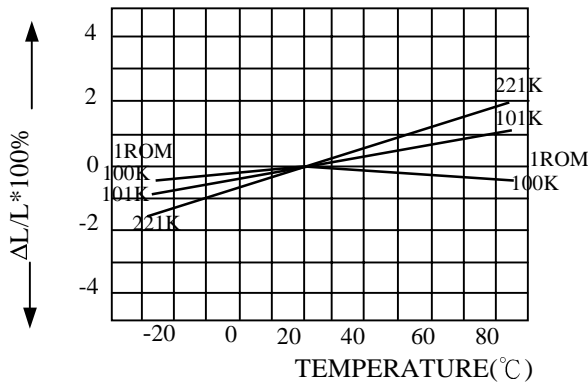


ELECTRICAL CHARACTERISTICS

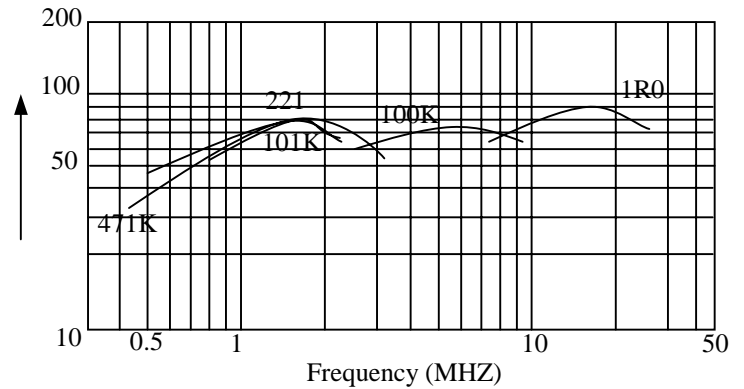
DC SUPERIMPOSITION



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 ± 1 sec, leave for 2hrs at normal TEMP.
Rise in Temperature	Within 20°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 ± 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 ± 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

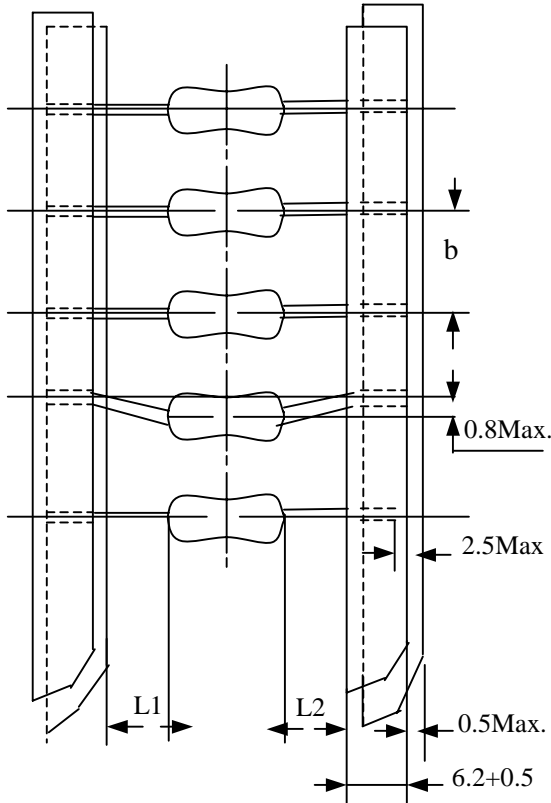
REQUIREMENTS	CHARACTERISTICS	TEST, METHOD (JIS C 5321)
LOW TEMP. Characteristics	$\Delta L/L$ within $\pm 10\%$, Q: 30 and over	Leave for 1000 hrs in a bath of TEMP. $-25\pm 2^\circ\text{C}$.
Resistance of Heat	$\Delta L/L$ within $\pm 10\%$, Q: 30 and over	Leave for 1000 hrs in a bath of TEMP. $85\pm 2^\circ\text{C}$.
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°C and $+85^\circ\text{C}$ as based on the temperature of 20°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 $85\pm 2^\circ\text{C}$



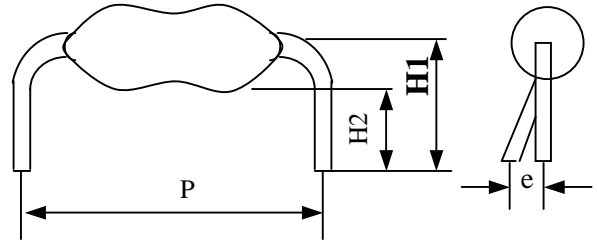
TAPING FORMING DIMENSIONS

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-Forming
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