

MULTILAYER CHIP INDUCTORS

TF Series (High Frequency)



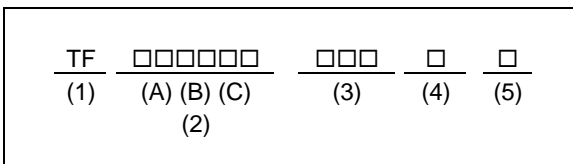
FEATURES

- Monolithic structure for highly reliable surface mount applications.
- Excellent solderability and high heat resistance for either flow or reflow soldering.
- Superior Q characteristics guaranteed over the wide frequency allow high frequency application.
- Dimensions are suitable for automatic mounting.

APPLICATIONS

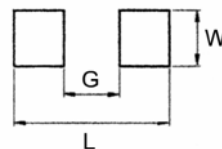
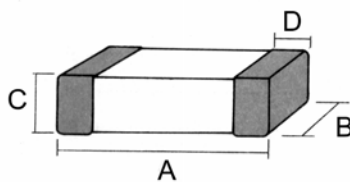
- RF module of telecommunication products, personal handy-phone systems, pagers, cellular phones, computer communications, etc..

PRODUCT IDENTIFICATIONS



- (1) Product Symbol: Multilayer Chip Inductors
- (2) Dimensions: Length (A) × Width (B) × Thickness (C)
- (3) Inductance
- (4) Tolerance
- (5) Packaging style: B = bulk T = Tape & Reel

SHAPES AND DIMENSIONS / RECOMMENDED PC BOARD PATTERN



Dimensions in mm (inch)

TYPE	A	B	C	D	L	W	G
100505	1.0±0.1 (0.040±0.004)	0.5±0.1 (0.020±0.004)	0.5±0.1 (0.020±0.004)	0.1 (MIN.) (0.004)	1.4 (0.055)	0.5 (0.020)	0.5 (0.020)
160808	1.6±0.2 (0.063±0.008)	0.8±0.2 (0.031±0.008)	0.8±0.2 (0.031±0.008)	0.3±0.2 (0.012±0.008)	2.1 (0.083)	0.7 (0.028)	0.7 (0.028)
201209	2.0±0.2 (0.079±0.008)	1.2±0.2 (0.047±0.008)	0.9±0.2 (0.035±0.008)	0.5±0.3 (0.020±0.012)	2.6 (0.102)	1.0 (0.039)	1.0 (0.039)
201212	2.0±0.2 (0.079±0.008)	1.2±0.2 (0.047±0.008)	1.2±0.2 (0.047±0.008)	0.5±0.3 (0.020±0.012)	2.6 (0.102)	1.0 (0.039)	1.0 (0.039)
321611	3.2±0.2 (0.126±0.008)	1.6±0.2 (0.063±0.008)	1.1±0.2 (0.043±0.008)	0.5±0.3 (0.020±0.012)	4.4 (0.173)	1.4 (0.055)	2.2 (0.087)

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ELECTRICAL CHARACTERISTICS

1005 TYPE

Part Number	Inductance (nH) at 100MHz	Inductance Tolerance	Q MIN	SRF (MHZ) MIN	DC Resistance (Ω)MAX.	Rated Current (mA)MAX.
TF100505-1N0S	1.0	S	8	10000	0.12	300
TF100505-1N2S	1.2	S	8	10000	0.12	300
TF100505-1N5S	1.5	S	8	6000	0.13	300
TF100505-1N8S	1.8	S	8	6000	0.14	300
TF100505-2N2S	2.2	S	8	6000	0.16	300
TF100505-2N7S	2.7	S	8	6000	0.17	300
TF100505-3N3□	3.3	S, K	8	6000	0.19	300
TF100505-3N9□	3.9	S, K	8	4000	0.22	300
TF100505-4N7□	4.7	S, K	8	4000	0.24	300
TF100505-5N6□	5.6	S, K	8	4000	0.27	300
TF100505-6N8□	6.8	J, K	8	3900	0.32	250
TF100505-8N2□	8.2	J, K	8	3600	0.40	250
TF100505-10N□	10.0	J, K	8	3200	0.45	250
TF100505-12N□	12.0	J, K	8	2700	0.50	250
TF100505-15N□	15.0	J, K	8	2300	0.60	250
TF100505-18N□	18.0	J,K	8	2100	0.65	200
TF100505-22N□	22.0	J,K	8	1900	0.80	200
TF100505-27N□	27.0	J,K	8	1600	0.90	200
TF100505-33N□	33.0	J,K	8	1300	1.00	200
TF100505-39N□	39.0	J, K	8	1200	1.20	150
TF100505-47N□	47.0	J, K	8	1000	1.30	150
TF100505-56N□	56.0	J,K	8	1300	2.00	150
TF100505-68N□	68.0	J,K	8	1300	2.20	100
TF100505-82N□	82.0	J,K	8	1300	2.50	100
TF100505-R10□	100.0	J, K	8	1300	2.50	100
TF100505-R12□	120.0	J, K	8	1300	2.50	100

□ : Inductance tolerance (J: $\pm 5\%$, K : $\pm 10\%$, S : $\pm 0.3\text{nH}$)

MULTILAYER CHIP INDUCTORS

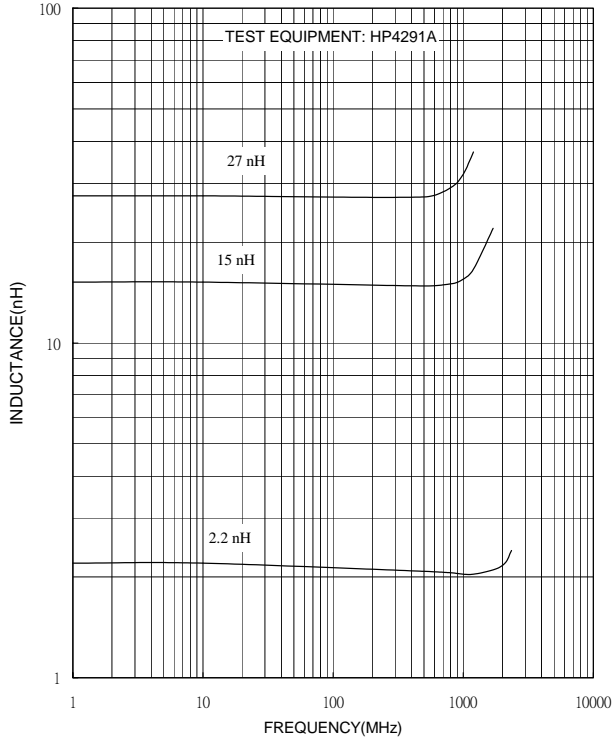
TF Series (High Frequency)



1005 TYPE

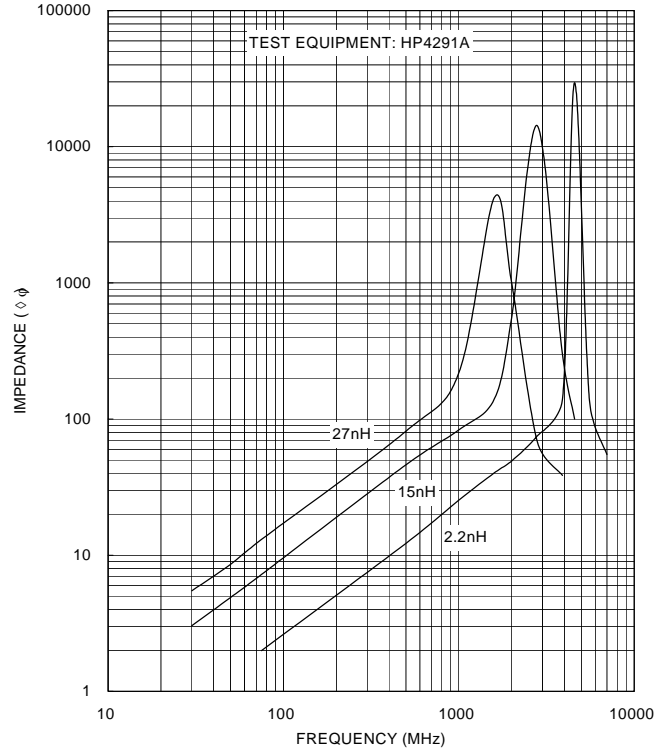
INDUCTANCE vs. FREQUENCY

CHARACTERISTICS



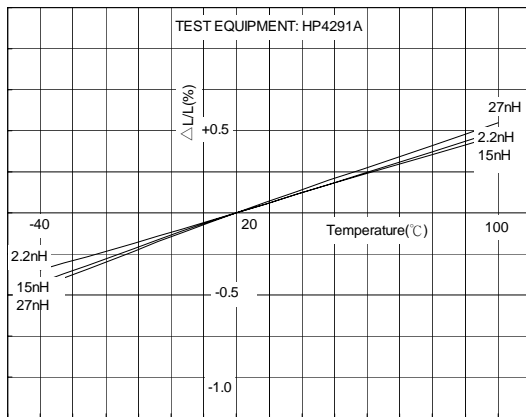
IMPEDANCE vs. FREQUENCY

CHARACTERISTICS

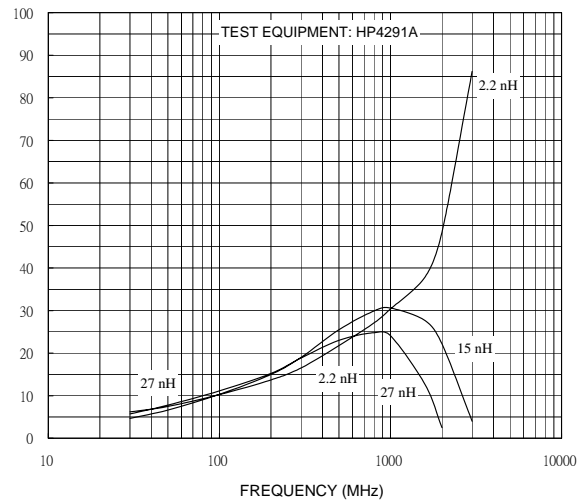


INDUCTANCE vs. TEMPERATURE

CHARACTERISTICS



Q vs. FREQUENCY CHARACTERISTICS

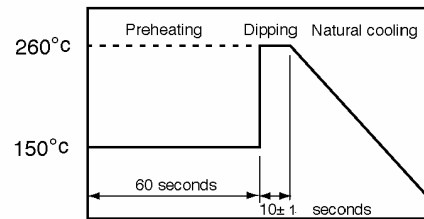


MULTILAYER CHIP INDUCTORS RELIABILITY TEST

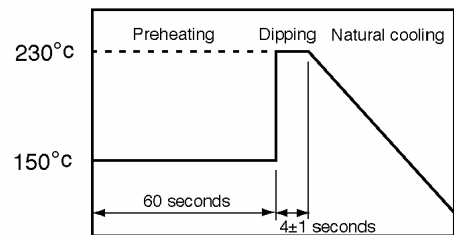


RELIABILITY TEST

Item	Performance	Test condition
Operating temperature range	-40 °C to + 125 °C	
Storage temperature and umidity ranges	40 °C MAX., 70% RH MAX.	
Soldering heat resistance	The chip shall not be cracks. More than 75% of terminal electrode shall be covered with solder. Inductance: Within $\pm 10\%$ of the initial value.	Preheat: 150 °C, 60 seconds Solder temperature : 260 ± 5 °C Flux: Rosin Dip time: 10 ± 1 seconds



Solderability	More than 90% of the terminal electrode shall be covered with new solder.	Preheat: 150 °C, 60 seconds Solder temperature: 230 ± 5 °C Flux: Rosin Dip time: 4 ± 1 seconds
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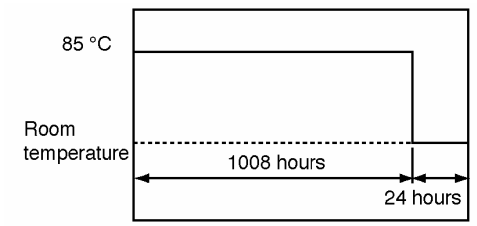
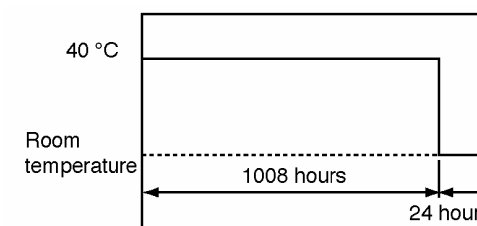
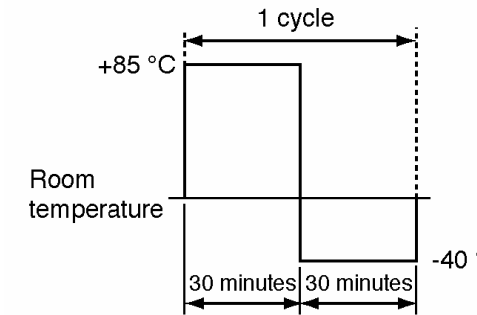
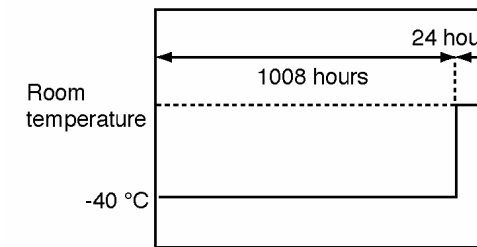
Terminal strength	The terminal electrode and the Body shall not be damaged by the forces applied on the right conditions.		<table border="1"> <thead> <tr> <th>Type</th> <th>P (kgf)</th> <th>Time (s)</th> </tr> </thead> <tbody> <tr> <td>T□100505</td> <td>0.3</td> <td></td> </tr> <tr> <td>T□160808</td> <td>0.5</td> <td></td> </tr> <tr> <td>T□201209</td> <td>0.6</td> <td>30 ± 5</td> </tr> <tr> <td>T□201212</td> <td>0.8</td> <td></td> </tr> <tr> <td>T□321611</td> <td>1.0</td> <td></td> </tr> </tbody> </table>			Type	P (kgf)	Time (s)	T□100505	0.3		T□160808	0.5		T□201209	0.6	30 ± 5	T□201212	0.8		T□321611	1.0	
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T□321611	1.0																						

Bending Strength	The Body shall not be damaged by the forces applied on the right conditions.		<table border="1"> <thead> <tr> <th>Type</th> <th>A (mm)</th> <th>P (kgf)</th> </tr> </thead> <tbody> <tr> <td>T□160808</td> <td>1.0</td> <td>0.5</td> </tr> <tr> <td>T□201209</td> <td>1.4</td> <td>1.0</td> </tr> <tr> <td>T□201212</td> <td>1.4</td> <td>1.2</td> </tr> <tr> <td>T□321611</td> <td>2.0</td> <td>2.0</td> </tr> </tbody> </table>			Type	A (mm)	P (kgf)	T□160808	1.0	0.5	T□201209	1.4	1.0	T□201212	1.4	1.2	T□321611	2.0	2.0
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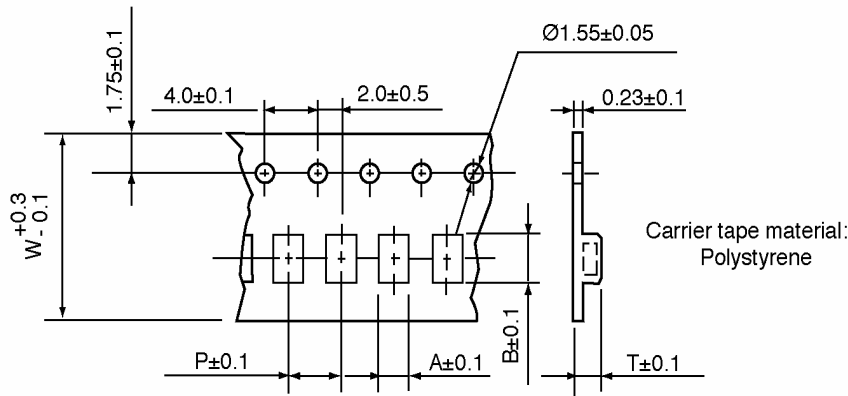


RELIABILITY TEST

Item	Performance	Test condition
High temperature resistance	Appearance : Body shall not be damaged. Inductance : Within $\pm 10\%$ of the initial value. Q: Within $\pm 30\%$ of the initial value.	Temperature: $85\pm 2^{\circ}\text{C}$ Testing time: 1008 ± 12 hours Measurement: After placing for 24 hours min 
Humidity resistance	Appearance: Body shall not be damaged. Inductance: Within $\pm 10\%$ of the initial value Q: Within $\pm 30\%$ of the initial value.	Humidity: 90 to 95% RH Temperature: $40\pm 2^{\circ}\text{C}$ Testing time: 1008 ± 12 hours Measurement: After placing for 24 hours min 
Thermal Shock	Appearance: Cracking, chipping or any other defects harmful to the characteristics shall not be allowed. Inductance: Within $\pm 10\%$ of the initial value Q: Within $\pm 30\%$ of the initial value.	Temperature: -40°C , $+85^{\circ}\text{C}$, kept stabilized for 30 minutes each Cycle: 100 cycles Measurement: After placing for 24 hours min 
Low temperature storage life test	Appearance: Cracking, chipping or any other defects harmful to the characteristics shall not be allowed. Inductance: Within $\pm 10\%$ of the initial value. Q: Within $\pm 30\%$ of the initial value.	Temperature: $-40\pm 2^{\circ}\text{C}$ Testing time: 1008 ± 12 hours Measurement: After placing for 24 hours min 

PACKAGING

TAPE DIMENSIONS AND PACKAGING QUANTITIES

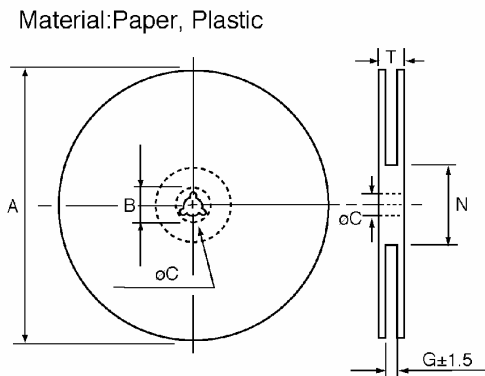


Dimensions in mm

TYPE	A	B	W	P	T	CHIPS / REEL
100505	0.65	1.15	8.00	2.00	0.60	10000
160808	0.94	1.82	8.00	4.00	0.92	4000
201209	1.42	2.25	8.00	4.00	1.04	4000
201212	1.50	2.35	8.00	4.00	1.22	2000
321611	1.88	3.42	8.00	4.00	1.26	3000

REEL DIMENSIONS

Dimensions in mm



TYPE	8mm	12mm
A	178±2	178±2
B	21.0±0.8	21.0±0.8
C	13.0±0.8	13.0±0.8
G	10.0	14.0
N	75	75
T	12.5	16.5

