

FEATURES

- RoHS compliant
- Lead-free materials is used for the plating on the terminals.
- The product uses metal terminals, which realize excellent connection reliability.
- High resistance to heat, humidity, mechanical shocks and presser. Accurate dimensions for automatically surface mounted.
- The product has good heat durability that withstands lead-free compatible reflow soldering conditions.
- Operate temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ (Including self temp. rise)



APPLICATIONS

- Audio-visual equipment including TVs, VCRs and digital cameras.
- Electronic equipment used in communication infrastructures including xDSL and mobile base stations.
- Electronic equipment used in onboard automobile equipment including car audio and ECU systems.
- Other electronic equipment including HDDs and ODDs.

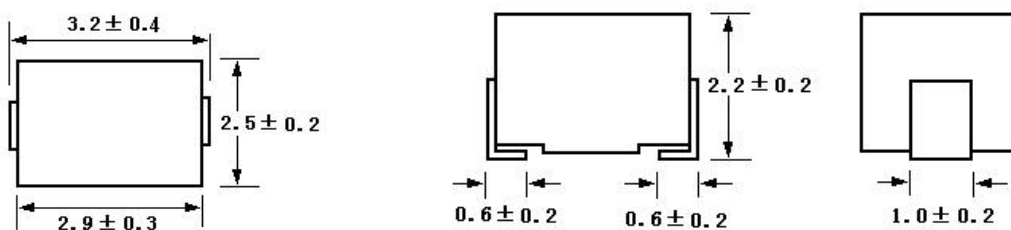
PRODUCT IDENTIFICATION

NL 32 T- 2R2 M T

① ② ③ ④ ⑤ ⑥

- ① Series Name:
- ② Size Code: L*W*T
- ③ Feature Type: Standard
- ④ Initial inductance value: 2R2 = 2.2uH
- ⑤ Inductance Tolerance: M $\pm$ 20%, K $\pm$ 10%, J $\pm$ 5%
- ⑥ Packing: Tape & Reel

Dimensions: [mm]



Electrical Characteristics List

Part No.	Inductance (μ H)	Inductance tolerance	Q min.	Test frequency L, Q (MHz)	Self-resonant frequency (MHz)min.	DC resistance (Ω) max.	Rated current. (mA)max.
NL32T-R10XT	0.1	$\pm 20, \pm 10\%$	28	100	700	0.44	450
NL32T-R12XT	0.12	$\pm 20, \pm 10\%$	30	25.2	500	0.22	450
NL32T-R15XT	0.15	$\pm 20, \pm 10\%$	30	25.2	450	0.25	450
NL32T-R18XT	0.18	$\pm 20, \pm 10\%$	30	25.2	400	0.28	450
NL32T-R22XT	0.22	$\pm 20, \pm 10\%$	30	25.2	350	0.32	450
NL32T-R27XT	0.27	$\pm 20, \pm 10\%$	30	25.2	320	0.36	450
NL32T-R33XT	0.33	$\pm 20, \pm 10\%$	30	25.2	300	0.4	450
NL32T-R39XT	0.39	$\pm 20, \pm 10\%$	30	25.2	250	0.45	450
NL32T-R47XT	0.47	$\pm 20, \pm 10\%$	30	25.2	220	0.5	450
NL32T-R56XT	0.56	$\pm 20, \pm 10\%$	30	25.2	180	0.55	450
NL32T-R68XT	0.68	$\pm 20, \pm 10\%$	30	25.2	160	0.6	450
NL32T-R82XT	0.82	$\pm 20, \pm 10\%$	30	25.2	140	0.65	450
NL32T-1R0XT	1	$\pm 10, \pm 5\%$	30	7.96	120	0.7	400
NL32T-1R2XT	1.2	$\pm 10, \pm 5\%$	30	7.96	100	0.75	390
NL32T-1R5XT	1.5	$\pm 10, \pm 5\%$	30	7.96	85	0.85	370
NL32T-1R8XT	1.8	$\pm 10, \pm 5\%$	30	7.96	80	0.9	350
NL32T-2R2XT	2.2	$\pm 10, \pm 5\%$	30	7.96	75	1	320
NL32T-2R7XT	2.7	$\pm 10, \pm 5\%$	30	7.96	70	1.1	290
NL32T-3R3XT	3.3	$\pm 10, \pm 5\%$	30	7.96	60	1.2	260
NL32T-3R9XT	3.9	$\pm 10, \pm 5\%$	30	7.96	55	1.3	250
NL32T-4R7XT	4.7	$\pm 10, \pm 5\%$	30	7.96	50	1.5	220
NL32T-5R6XT	5.6	$\pm 10, \pm 5\%$	30	7.96	45	1.6	200
NL32T-6R8XT	6.8	$\pm 10, \pm 5\%$	30	7.96	40	1.8	180
NL32T-8R2XT	8.2	$\pm 10, \pm 5\%$	30	7.96	35	2	170
NL32T-100XT	10	$\pm 10, \pm 5\%$	30	2.52	30	2.1	150
NL32T-120XT	12	$\pm 10, \pm 5\%$	30	2.52	20	2.5	140
NL32T-150XT	15	$\pm 10, \pm 5\%$	30	2.52	20	2.8	130
NL32T-180XT	18	$\pm 10, \pm 5\%$	30	2.52	20	3.3	120
NL32T-220XT	22	$\pm 10, \pm 5\%$	30	2.52	20	3.7	110
NL32T-270XT	27	$\pm 10, \pm 5\%$	30	2.52	20	5	80
NL32T-330XT	33	$\pm 10, \pm 5\%$	30	2.52	17	5.6	70
NL32T-390XT	39	$\pm 10, \pm 5\%$	30	2.52	16	6.4	65
NL32T-470XT	47	$\pm 10, \pm 5\%$	30	2.52	15	7	60
NL32T-560XT	56	$\pm 10, \pm 5\%$	30	2.52	13	8	55
NL32T-680XT	68	$\pm 10, \pm 5\%$	30	2.52	12	9	50
NL32T-820XT	82	$\pm 10, \pm 5\%$	30	2.52	11	10	45
NL32T-101XT	100	$\pm 10, \pm 5\%$	20	0.796	10	10	40
NL32T-121XT	120	$\pm 10, \pm 5\%$	20	0.796	10	11	70
NL32T-151XT	150	$\pm 10, \pm 5\%$	20	0.796	8	15	65
NL32T-181XT	180	$\pm 10, \pm 5\%$	20	0.796	7	17	60
NL32T-221XT	220	$\pm 10, \pm 5\%$	20	0.796	7	21	50

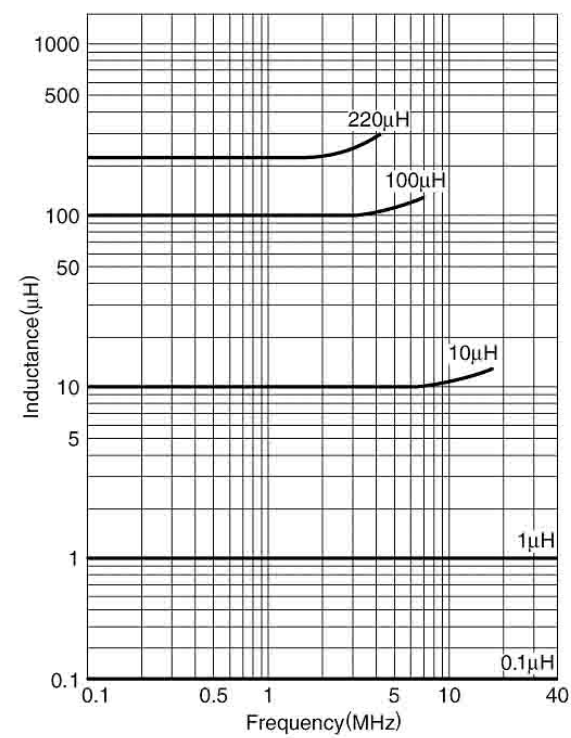
Inductance Tolerance: M $\pm 20\%$, K $\pm 10\%$, J $\pm 5\%$

Rated current: Value obtained when current flows and the temperature has risen to 20°C or when DC current flows and the initial value of inductance has fallen by 10%, whichever is smaller.

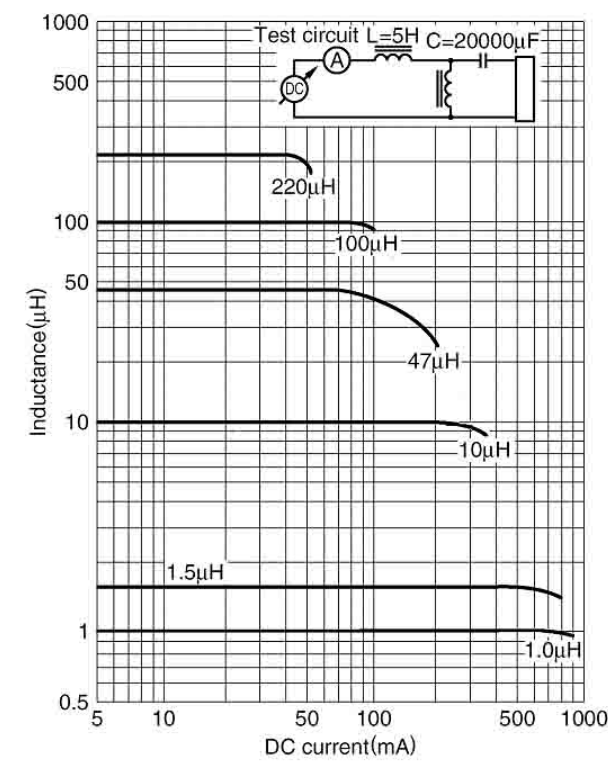
•Test equipment L, Q: HP4194A IMPEDANCE/GAIN PHASE ANALYZER+HP16085A+HP16093 B+TF-1
SRF: HP8753C NETWORK ANALYZER
Rdc: MATSUSHITA VP-2941A DIGITAL MILLIOHM METER

TYPICAL ELECTRICAL CHARACTERISTICS

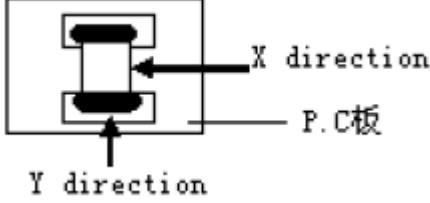
Inductance vs Frequency Characteristics

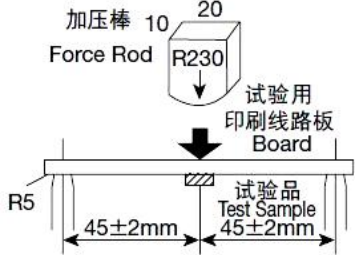


Inductance vs DC Current Characteristics

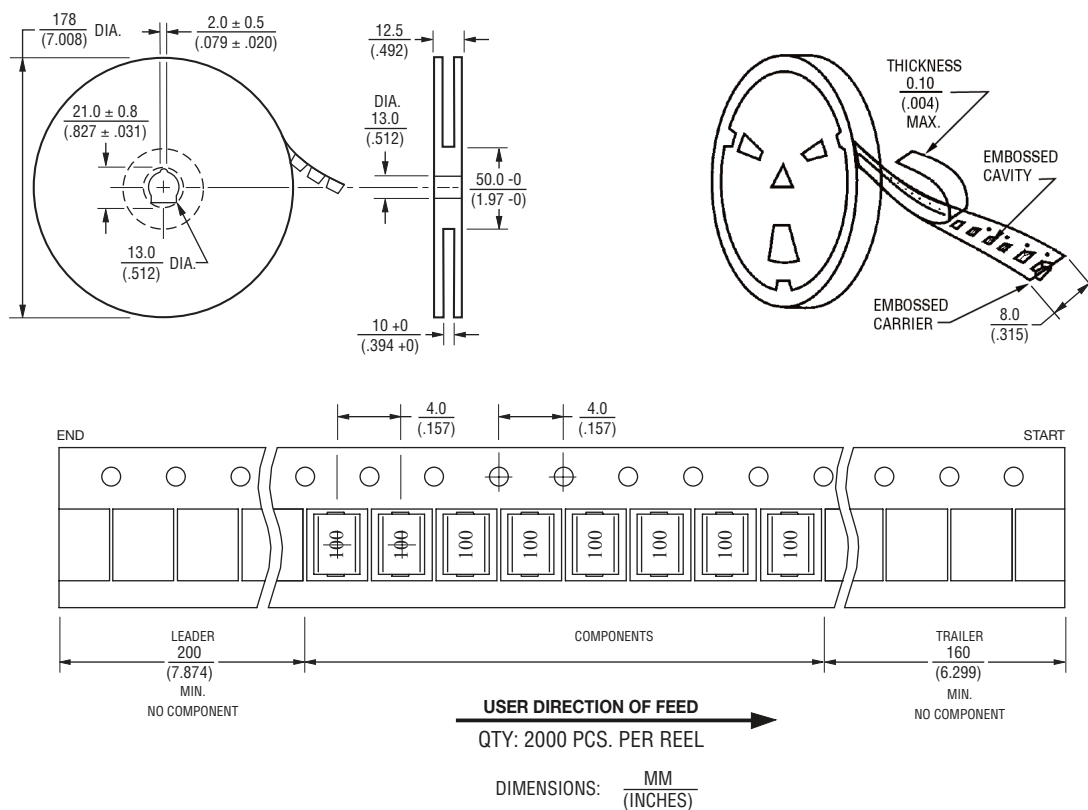


Reliability

项目 Requirements	试验条件 Test method	性能要求 Characteristics																		
高温试验 High TEMP life test	温度: $125\pm 3^{\circ}\text{C}$; 放置时间: $1000\pm 6\text{Hrs}$; TEMP. $125\pm 3^{\circ}\text{C}$, Load $1000\pm 6\text{Hrs}$.	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.																		
低温试验 Low TEMP life test	温度: $-40\pm 2^{\circ}\text{C}$; 放置时间: $1000\pm 6\text{Hrs}$; TEMP. $-40\pm 2^{\circ}\text{C}$, Load $1000\pm 6\text{Hrs}$	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.																		
高湿试验 Damp heat	温度: $40\pm 2^{\circ}\text{C}$, 相对湿度 $90\sim 95\%\text{RH}$; 放置时间: $1000\pm 6\text{Hrs}$; TEMP. $40\pm 2^{\circ}\text{C}$, Humidity. $90\sim 95\%\text{RH}$, Load $1000\pm 6\text{Hrs}$	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.																		
热冲击试验 Thermal shock	将试验品焊接到印刷电路板上, 按下表所示循环步骤, 10个循环 <table border="1"> <thead> <tr> <th colspan="3">1个循环条件Conditions of 1 cycle</th></tr> <tr> <th>步骤 Step</th><th>温度 ($^{\circ}\text{C}$) TEMP</th><th>时间 (min) Duration</th></tr> </thead> <tbody> <tr> <td>1</td><td>-40 ± 3</td><td>30 ± 3</td></tr> <tr> <td>2</td><td>常温 Room TEMP</td><td>3以下 Within 3</td></tr> <tr> <td>3</td><td>$+125\pm 2$</td><td>30 ± 3</td></tr> <tr> <td>4</td><td>常温 Room TEMP</td><td>3以下 Within 3</td></tr> </tbody> </table>	1个循环条件Conditions of 1 cycle			步骤 Step	温度 ($^{\circ}\text{C}$) TEMP	时间 (min) Duration	1	-40 ± 3	30 ± 3	2	常温 Room TEMP	3以下 Within 3	3	$+125\pm 2$	30 ± 3	4	常温 Room TEMP	3以下 Within 3	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.
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1	-40 ± 3	30 ± 3																		
2	常温 Room TEMP	3以下 Within 3																		
3	$+125\pm 2$	30 ± 3																		
4	常温 Room TEMP	3以下 Within 3																		
端子强度试验 Adhesion of terminal electrode	试验品焊接到试验用印刷电路板上, 施加力 $9.8\text{N}(1\text{kg})$, 施加时间 $10\pm 2\text{sec}$, 方向: X、Y The test samples shall be soldered to the test board by the reflow. 	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.																		
耐振性 Resistance to vibration	将产品焊接到印刷电路板上, 按下示条件进行测试: 振动频率范围: $10\sim 55\text{Hz}$; 振幅: 1.5mm (但加速度不能超过 196m/s^2); 1个循环: 1分钟 ($10\rightarrow 55\rightarrow 10\text{Hz}$); 时间: X、Y、Z方向各2小时 The test samples shall be soldered to the test board by the reflow. Then it shall be submitted to below conditions. Frequency Range: $10\sim 55\text{Hz}$; Total Amplitude : 1.5mm (May not exceed acceleration 196m/s^2); Sweeping Method: $10\rightarrow 55\rightarrow 10\text{Hz}$ for 1min Time: For 2 hours on each X, Y, and Z axis.	外观无显著异常; 电感值变化率: $\pm 10\%$ 以内; Inductance change : Within $\pm 10\%$; No significant abnormality in appearance.																		

抗弯强度试验 Resistance to flexure of substrate	将试验品焊接到试验用印刷线路板上，如图所示在印刷线路板上按箭头方向施加荷重，使其弯曲 2mm 为止。 	外观无显著异常，无破损； 电感值变化率：±10%以内； Inductance change : Within ±10%; No significant abnormality in appearance, No damage.
可焊性试验 Solderability	焊锡温度：245±5℃ 浸渍时间：5±0.5ses 浸渍深度：安装端子面浸入。 Solder Temperature:245±5℃ Time: 5±0.5ses All sides of mounting terminal shall be immersed.	端电极新锡覆盖面积达95%以上 At least 95% of surface of terminal electrode is covered by new solder.
耐焊接热试验 Resistance to soldering heat	方法1:将端子在350±10℃的焊液中浸入4±1秒后常温放置2小时以上 Method 1:Immerse in the solder of 350±10℃ for 4±1sec, load in room Temperature 2 hours. 方法2: 峰值温度 260±5℃保持 20-40 秒回流焊接两遍试验，放置 30 分钟后检测（Per MIL-STD-202F） Method 2: The test sample shall be exposed to reflow with peak temperature at 260±5℃ for 20 to 40 seconds, 2 times. Load in room Temperature 30 min. (Per MIL-STD-202F)	外观无显著异常； 电感值变化率：±10%以内； Inductance change : Within ±10%; No significant abnormality in appearance.
温度特性 Temperature characteristic	在-40℃～+125℃环境温度范围内测试，并以20℃时的值为基准计算得出。 步骤1～5中最大电感值偏差变化率： 步骤1的温度：20℃ 步骤2的温度：最低使用温度 步骤3的温度：20℃（基准温度） 步骤4的温度：最高使用温度 步骤5的温度：20℃ Measurement of inductance shall be taken at temperature range within -40℃～+125℃. With reference to inductance value at +20℃., change rate shall be calculated. Change of maximum inductance deviation in step 1 to 5: Temperature at step 1: 20℃ Temperature at step 2: Minimum operating temperature Temperature at step 3: 20℃ (Standard temperature) Temperature at step 4 :Maximum operating temperature Temperature at step 5 :20℃	外观无显著异常； 电感值变化率：±20%以内； Inductance change : Within ±20%; No significant abnormality in appearance.
跌落试验 Dropping	包装 OK 的产品，1m 高/木质地板或水泥地板，三次。 Packing ok product, Dropping 1m over the ground of concrete or cement, 3 times.	外观无显著异常，无破损； 电感值变化率：±10%以内； Inductance change : Within ±10%; No significant abnormality in appearance, No damage.

Packing



Re-flowing Profile:

