

CUSTOMER :

SPEC NO. : LPI-0604-010

DATE : 26-Jun-12

RoHS Compliant

SPECIFICATIONS

Product

Description: Wire Wound Chip Inductor

Part Number : LPI0603FTXXXX Series

Customer

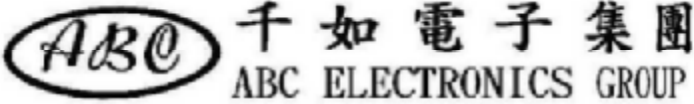
Part Number : _____

【For Customer approval Only】

Date:

Approved By	Verified By	Rechecked By	Checked By

Approved By	Verified By	Prepared By
ISKANDAR NG		SHIKIN



FACTORY:

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HISTORY OF CHANGE

Rev.	Effective Date	Changed Contents	Change Reason	Approved by
A	1-Dec-09	New release	-	Iskandar Ng

WIRE WOUND CHIP INDUCTORS LPI SERIES

Introduction

Product : LPI Miniature SMD Inductor For Power Line

Size : 0603

The LPI series are low profile inductor used in notebooks, PC's, Cellular phone backlight, Inverter and etc. The devices are designed smallest possible sizes and highest performance.

Features

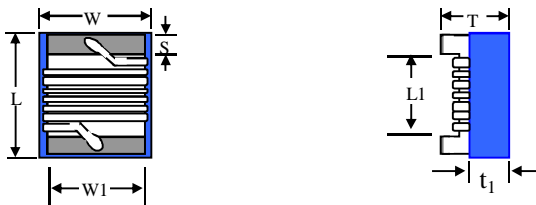
- * Operating temperature -40 to +85°C.
- * Excellent solderability and resistance to soldering heat .
- * Suitable for reflow soldering..
- * High reliability and easy surface mount assembly.
- * Wide range of inductance values are available for flexible needs.

Part Number Code

LPI 0603 F T 1R0 K -□□
1 2 3 Taping 4 5 6 (Internal Code)

1 Product Type

2 Chip Dimension



Size (inch) mm	Length (L) (inch) mm	Width (W) (inch) mm	Thickness (T) (inch) mm	Terminal (S) (inch) mm	L1 (Ref.) mm	W1 (Ref.) mm	(t ₁) (Ref.) mm
0603	(0.063 ± 0.008)	(0.041 ± 0.008)	(0.041 ± 0.004)	(0.014 ± 0.004)			
1608	1.60 ± 0.20	1.05 ± 0.20	1.05 ± 0.10	0.35 ± 0.10	0.80	0.95	0.50

3 Material Type

F : Ferrite Material

4 Inductance Value

1R0 = 1.0 uH

100 = 10 uH

5 Tolerance

K = ± 10 %

M = ± 20 %

6 Internal Code (If any)

CHIP INDUCTOR SPECIFICATIONS

1. Scope

This specification applies to miniature wire wound inductors for power line of the following types used in electronics equipment :

2. Construction

Configuration

& Dimension : Please refer to the attached figures and tables.

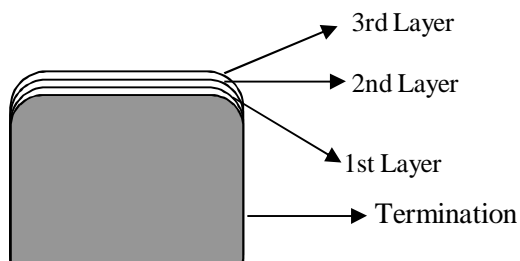
Terminals : LPI series terminals shall consist of Ag alloy followed by nickel then solder plating for easier soldering

3. Operating Temperature Range

Operating Temperature Range is the scope of ambient temperature at which the inductor can be operated continuously at rated current.

Temp. Range : Ferrite Material : - 40°C to + 85°C
:

4. Ingredient of terminals electrode.



- a) 1st layer : Ag
- b) 2nd layer : Nickel
- c) 3rd layer : Sn

5. Characteristics

Standard Atmospheric Conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows :

Ambient Temperature : 25 °C (20 °C) ± 2 °C

Relative Humidity : 60% to 70%

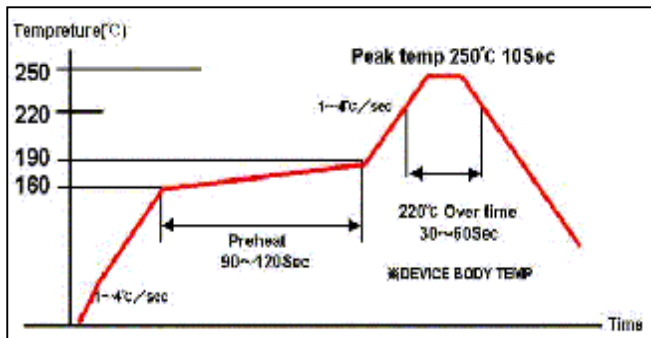
Air Pressure : 86 Kpa to 106 Kpa

CHIP INDUCTOR SPECIFICATIONS

Temperature profile

a. Reflow temperature profile

(Temperature of the mounted parts surface on the printed circuit board)



Recommended Peak Temperature : 250°C Max

250°C up /within 10secs

Max. Reflow temperature : 260°C.

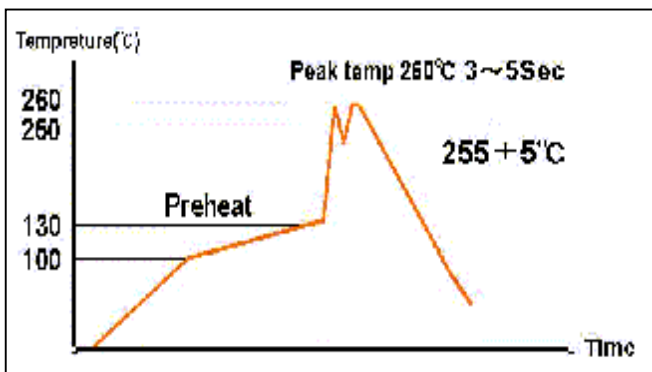
Gradient of temperature rise : av 1-4°C/sec

Preheat : 160-190°C/within 90-120secs

220°C up /within 30-60secs

Composition of solder Sn-3Ag-0.5Cu

b. Dip temperature



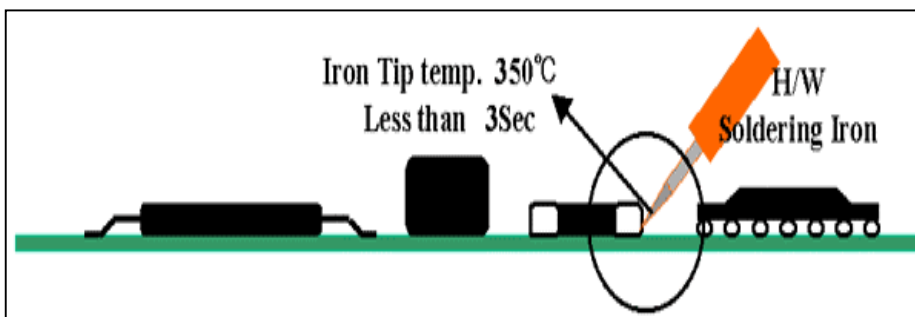
Solder bathtub temperature: 260°C max within 5secs.

Preheating temperature: 100~130°C

deposit solder temperature.

Composition of solder Sn-3Ag-0.5Cu

c. Soldering iron tip temperature : 350°C max / within 3 seconds.



Specification

Part No.	Inductance ¹ (uH)	Percent Tolerance	Q ² Min	S.R.F. ³	RDC ⁴	IDC ⁵
				Min (MHz)	Max (Ω)	Max (mA)
LPI 0603 FT 1R0 □-□□	1.0 @ 100 KHz	K, M	6 @ 1MHz	400	0.60	680
LPI 0603 FT 1R2 □-□□	1.2 @ 100 KHz	K, M	6 @ 1MHz	300	0.65	650
LPI 0603 FT 1R5 □-□□	1.5 @ 100 KHz	K, M	6 @ 1MHz	150	0.90	520
LPI 0603 FT 1R8 □-□□	1.8 @ 100 KHz	K, M	6 @ 1MHz	120	0.95	480
LPI 0603 FT 2R2 □-□□	2.2 @ 100 KHz	K, M	7 @ 1MHz	80	1.00	470
LPI 0603 FT 2R7 □-□□	2.7 @ 100 KHz	K, M	7 @ 1MHz	80	1.10	460
LPI 0603 FT 3R3 □-□□	3.3 @ 100 KHz	K, M	7 @ 1MHz	70	1.25	450
LPI 0603 FT 3R9 □-□□	3.9 @ 100 KHz	K, M	7 @ 1MHz	65	1.35	430
LPI 0603 FT 4R7 □-□□	4.7 @ 100 KHz	K, M	8 @ 1MHz	60	1.50	420
LPI 0603 FT 5R6 □-□□	5.6 @ 100 KHz	K, M	8 @ 1MHz	55	2.10	270
LPI 0603 FT 6R8 □-□□	6.8 @ 100 KHz	K, M	8 @ 1MHz	50	2.30	250
LPI 0603 FT 8R2 □-□□	8.2 @ 100 KHz	K, M	8 @ 1MHz	28	2.50	230
LPI 0603 FT 100 □-□□	10.0 @ 100 KHz	K, M	10 @ 1MHz	25	2.90	220
LPI 0603 FT 120 □-□□	12.0 @ 100 KHz	K, M	10 @ 1MHz	20	3.10	190

1. Inductance is measured in HP-4284A / 4285A RF LCR meter with SMD-A fixture.
2. Q is measured in HP-4284A / 4285A RF LCR meter with SMD-A fixture.

3. SRF is measured in ENA E5071B network analyzer
4. RDC is measured in HP-4338B milliohmeter.
5. For 25 °C Rise.
Unit weight = 0.0049g (for ref.)

WIRE WOUND CHIP INDUCTOR**SPECIFICATION**

	ITEM	CONDITION	SPECIFICATION
	Inductance and Tolerance	Measuring Frequency : As shown in Product Table	Within Specified Tolerance
	Quality Factor	Measuring Temperature : + 25 °C	
Mechanical Characteristics	Insulation Resistance	Measured at 100V DC between inductor terminals and center of case.	1000 mega ohms minimum
	Dielectric Withstanding Voltage	Measured at 500V AC between inductor terminals and center of case for a maximum of 1 minute.	No damage occurs when the test voltage is applied.
	Temperature Coefficient of Inductance (TCL)	Over - 40 °C to + 85°C at frequency specified in Product Table.	+ 25 to 500 ppm / °C $TCL = \frac{L1 - L2}{L1(T1-T2)} \times 10^6$ (ppm /°C)
	Component Adhesion (Push Test)	The component shall be reflow soldered onto a P. C. Board (240 °C ± 5°C for 20 seconds). Then a dynamometer force gauge shall be applied to any side of the component.	0603 series - 0.40Kg min.
Electrical Characteristics	Drop Test	The inductor shall be dropped two times on the concrete floor or the vinyl tile from 1M naturally.	Change In Inductance: No more than 5%
	Thermal Shock Test	Each cycle shall consist of 30 minutes at -40 °C followed by 30 minutes at +85 °C with a 20-second maximum transition time between temperature extremes. Test duration is 10 cycles.	Change In Q: No more than 10% Change In Appearance: Without distinct damage

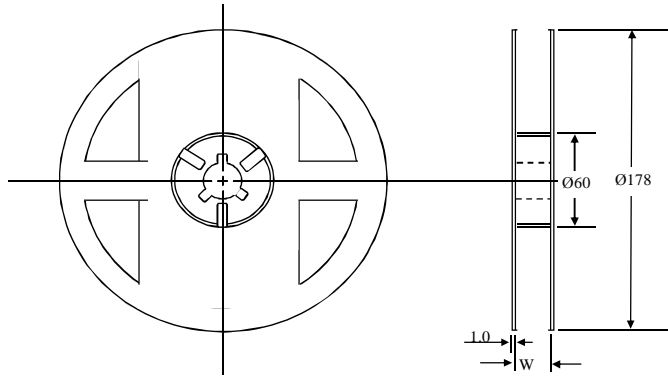
WIRE WOUND CHIP INDUCTOR**SPECIFICATION**

	ITEM	CONDITION	SPECIFICATION
Endurance Characteristics	Solderability	Dip pads in flux and dip in solder pot containing lead free solder at $240\text{ }^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 5 seconds.	A minimum of 80% of the metalized area must be covered with solder.
	Resistance to Soldering Heat	Dip the components into flux and dip into solder pot containing lead free solder at $260\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for 5 ± 2 seconds.	Change In Inductance: No more than 5%
	Vibration (Random)	Inductors shall be randomly vibrated at amplitude of 1.5mm and frequency of 10 - 55 Hz: 0.04 G / Hz for a minimum of 15 minutes per axis for each of the three axes.	Change In Q: No more than 10%
	Cold Temperature Storage	Inductors shall be stored at temperature of $-40\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 1000hrs (+ 48 -0 hrs.) Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.	Change In Appearance : Without distinct damage
	High Temperature Storage	Inductors shall be stored at temperature of $85\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 1000hrs (+48 - 0hrs.) Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.	
	Moisture Resistance	Inductors shall be stored in the chamber at $45\text{ }^{\circ}\text{C}$ at 90 - 95 R. H. for 1000 hours. Then inductors are to be tested after 2 hours at room temperature.	Inductors shall not have a shorted or open winding.
	High Temperature with Loaded	Inductors shall be stored in the chamber at $+85\text{ }^{\circ}\text{C}$ for 1000 hours with rated current applied. Inductors shall be tested at the beginning of test at 500 hours and 1000 hours. Then inductors are to be tested after 1 hour at room temperature.	

Packaging Information

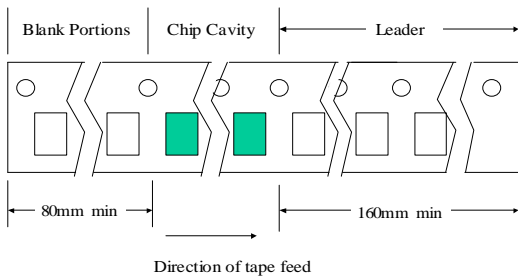
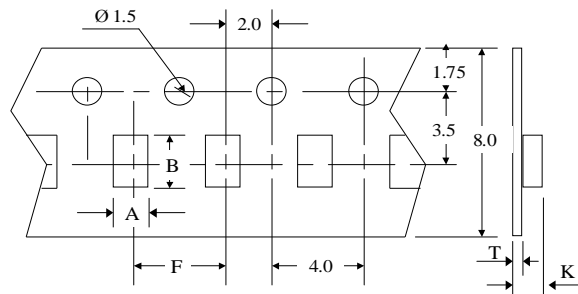
Packing Quantity

Type	Pcs / Reel
LPI0603	3,000



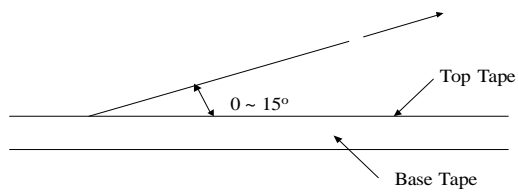
Dimensions (unit: m/m)

Type	Chip Cavity		Insert Pitch	Tape Thickness		
	A	B	F	K	T	W
LPI0603	1.40	1.90	4.00	1.15	0.22	8.00



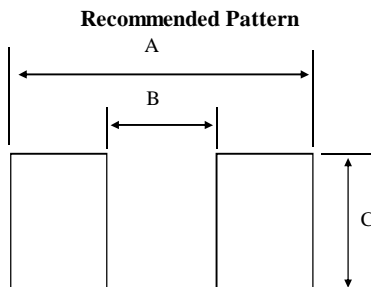
Top Tape Strength

The top tape requires a peel-off force of 0.2 to 0.7N in the direction of the arrow as illustrated below.



Dimensions (unit : m/m)

TYPE	A	B	C
LPI0603	1.90	0.65	1.20



CHIP INDUCTOR SPECIFICATION

Operating Environment

Do not use this product under the following environmental conditions, on deterioration of performance, such as insulation resistance may result from the use.

1. In corrosive gases (acidic gases, alkaline gases, chlorine, sulfur gases, organic gases and etc.)
2. In the atmosphere where liquid such as organic solvent, may splash on the products.

Storage Condition

1. Storage period

Use the product within 12 months after delivered.

Solderability should be checked if this period is exceeded.

2. Storage environment conditions

- * Product should be store in the warehouse on the following conditions.

Temperature : -10 ~ +40°C

Humidity : 20 to 70% relative humidity. No rapid change on temperature and humidity.

- * Products should not be stored in corrosive gases, such as sulfurous, acid gases, alkaline gases, to prevent the following deterioration.

Poor solderability due to the oxidized electrode.

- * Products should be stored on the pallet for the prevention of the influence from humidity, dust and so on.

- * Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.

- * Do not unpack the minimum package until immediately before use. After unpacking, re-seal promptly or store in desiccator with a desiccant.

Delivery

Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.