

Shielded SMD Power Inductors **multicomp**PRO

**RoHS
Compliant**



Features

- Close magnetic loop with magnetic resin shielded.
- Low profile, High inductance.

Applications

- General propose power inductor in DC power system.
- Inductor in DC/DC converter.
- Low profile for portable and wearable device.
- LC filter in Audio D class Amplifier.

Electrical Characteristics

WLPN404018 Series	L (uH)	Symbol	Inductance Tolerance	DCR ($\Omega \pm 20\%$)	SRF (MHz)Min	Rated Current (mA) Max	
						Saturation Current Idc1	Temperature Rise Current Idc2
WLPN404018N1R0LB	1	A	$\pm 30\%$	0.027	90	4000	3200
WLPN404018N1R5LB	1.5	B	$\pm 30\%$	0.037	75	3300	2400
WLPN404018M2R2LB	2.2	C	$\pm 20\%$	0.042	60	3000	2200
WLPN404018M3R3LB	3.3	E	$\pm 20\%$	0.055	45	2300	2000
WLPN404018M4R7LB	4.7	H	$\pm 20\%$	0.07	35	2000	1700
WLPN404018M6R8LB	6.8	I	$\pm 20\%$	0.098	30	1600	1450
WLPN404018M100LB	10	K	$\pm 20\%$	0.15	25	1300	1200
WLPN404018M150LB	15	M	$\pm 20\%$	0.21	18	1100	850
WLPN404018M220LB	22	N	$\pm 20\%$	0.29	15	900	720
WLPN404018M330LB	33	P	$\pm 20\%$	0.46	12	700	550
WLPN404018M470LB	47	S	$\pm 20\%$	0.65	10	600	440
WLPN404018M680LB	68	T	$\pm 20\%$	1	8.3	520	320
WLPN404018M101LB	100	V	$\pm 20\%$	1.45	6.5	420	280
WLPN404018M151LB	150	W	$\pm 20\%$	2.3	5.5	340	220
WLPN404018M221LB	220	X	$\pm 20\%$	3.8	4	275	170

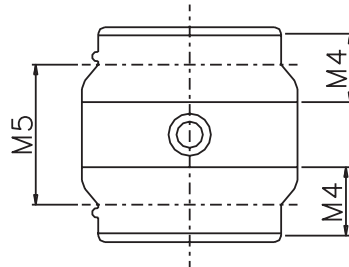
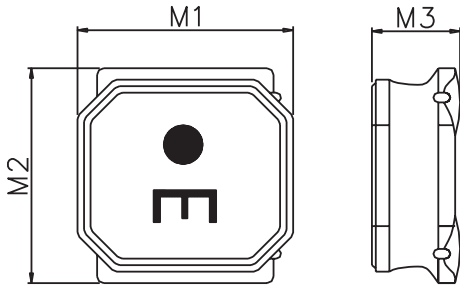
Test Frequency	: 100KHz
Test Equipment	: Inductance: Chroma 3302+1320 or equivalent. DCR: Chroma 16502 or equivalent. SRF: HP4291B or equivalent.
Saturation Current Idc1	: The value of current causes a 30% inductance reduction from initial value.
Temperature rise current Idc2	: The value of current causes a 40°C temperature rise.
Rated Current	: Either Idc1 or Idc2 whichever is smaller.
Operating Temperature Range	: -25°C to +125°C (Including self-temperature rise)
Storage Temp. Range	: -40°C to +85°C.
MSL	: Level 1

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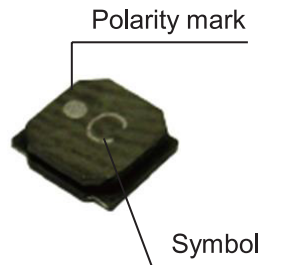
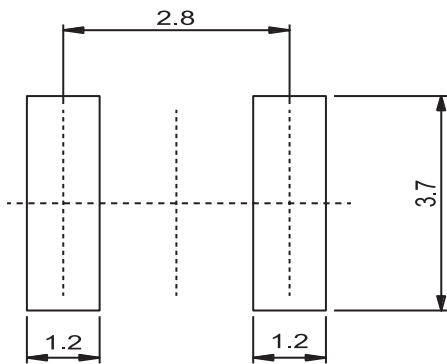
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Shape and Dimension



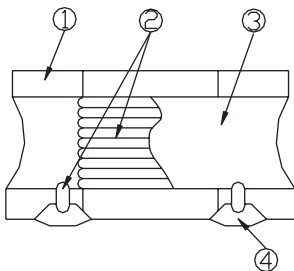
	Dim.	Tolerance
M1	4	±0.2
M2	4	±0.2
M3	1.8	Max.
M4	1.1	±0.2
M5	2.5	±0.2

Recommended Land-Pattern



Dimensions : Millimetres

Structural Drawing

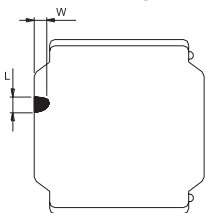


(Magnetic Shielded Type)

1. Ferrite core : Ni-Zn ferrite
2. Winding wire : Polyurethane-copper wire
3. Over-coating resin : Epoxy resin, containing ferrite powder
4. Electrode : External electrode (substrate) Ag
External electrode (base plating) Ni-Sn
External electrode (top surface solder coating) Sn-Ag-Cu

Core Chipping

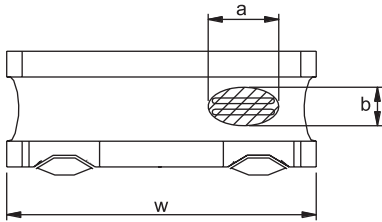
The appearance standard of the chipping size in top side, of bottom side ferrite Core is following dimension.



L	W
1mm (Max.)	1mm (Max.)

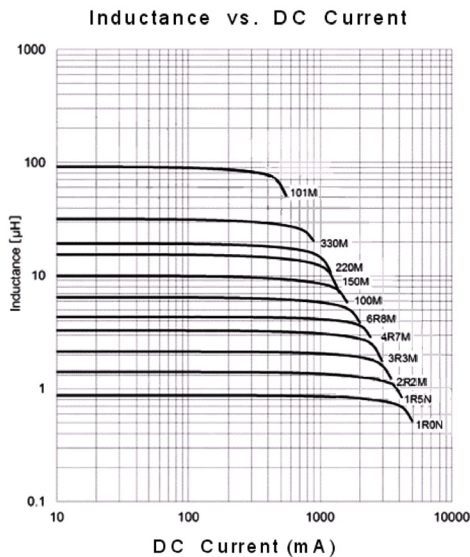
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Exposed wire tolerance limit of coating resin part on product side
 Size of exposed wire occurring to coating resin is specified below.

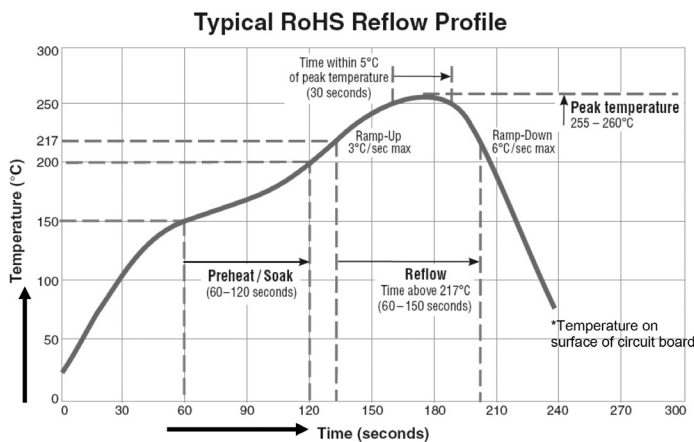


1. Width direction (dimension a): Acceptable when $a \leq w/2$
 Nonconforming when $a > w/2$
2. Length direction (dimension b): Dimension b is not specified.
3. When total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, that is acceptable.

Characteristic Curve



Reflow Profile Chart (Reference)



The products may be exposed to reflow soldering process of above profile up to two times.

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Mechanical Performance / Environmental Test Performance Specifications

Item	Test condition	Requirements								
Resistance to Deflection	No damage.	<p>The test samples shall be soldered to the test board by the reflow soldering conditions show.</p> <p>As illustrated below, apply force in the direction of the Arrow indicating until deflection of the test board Reaches to 2mm.</p> <p>Test board size : 100mm×40mm×10mm Test board material I: glass epoxy-resin Solder cream thickness : 0.1</p>								
Adhesion of Terminal Electrode	Shall not come off PC board	<p>The test samples shall be soldered to the test board By the reflow soldering conditions shown</p> <p>Applied force: 10 N to X and Y directions Duration: 5 s. Solder cream thickness: 0.1mm (Refer to recommended Land Pattern Dimensions Defined in "Precaution")</p>								
Body Strength	No Damage	<p>Applied force : 20N Duration : 10s</p>								
Resistance to Vibration	$\Delta L/L$: within $\pm 10\%$ No abnormality observed In appearance	<p>The test samples shall be soldered to the test board by The reflow soldering conditions shown. Then It shall be submitted to below test conditions</p> <table border="1"> <tr> <td>Frequency range</td> <td>10Hz~55Hz</td> </tr> <tr> <td>Total Amplitude</td> <td>1.5mm(May not exceed acceleration 196 m/S²)</td> </tr> <tr> <td>Sweeping Method</td> <td>10Hz to 55Hz to 10 Hz for 1 min.</td> </tr> <tr> <td>Time</td> <td>For 2 hours on each X, Y, and Z axis.</td> </tr> </table>	Frequency range	10Hz~55Hz	Total Amplitude	1.5mm(May not exceed acceleration 196 m/S ²)	Sweeping Method	10Hz to 55Hz to 10 Hz for 1 min.	Time	For 2 hours on each X, Y, and Z axis.
Frequency range	10Hz~55Hz									
Total Amplitude	1.5mm(May not exceed acceleration 196 m/S ²)									
Sweeping Method	10Hz to 55Hz to 10 Hz for 1 min.									
Time	For 2 hours on each X, Y, and Z axis.									
Resistance to Soldering heat (Reflow)	$\Delta L/L$: within $\pm 10\%$ No abnormality observed In appearance	<p>The test sample shall be exposed to reflow oven at $230\pm 5^{\circ}\text{C}$ for 40 seconds, with peak temperature at 260 ± 5 deg C for 5 seconds, 2 times. Test board thickness: 1mm Test board material : glass epoxy-resin</p>								

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Item	Test condition	Requirements															
Solder ability	At least 90% of surface of terminal electrode is covered by new solder.	<p>The test samples shall be dipped in flux, and then Immersed in molten solder as shown in below table. Flux: Methanol solution containing rosin 25%</p> <table border="1"> <tr> <td>Solder Temperature</td> <td>245 ± °C</td> </tr> <tr> <td>Time</td> <td>5 ± 1S.</td> </tr> <tr> <td>Immersing Speed</td> <td>25mm/s</td> </tr> </table>	Solder Temperature	245 ± °C	Time	5 ± 1S.	Immersing Speed	25mm/s									
Solder Temperature	245 ± °C																
Time	5 ± 1S.																
Immersing Speed	25mm/s																
Temperature Characteristics	ΔL/L: within ±20% No abnormality observed in appearance	<p>Measurement of inductance shall be taken at temperature Range within -25°C to +85°C. With reference to inductance value at +20°C, change Rate shall be calculated.</p>															
Thermal Shock	ΔL/L: within ±10% No abnormality observed in appearance	<p>The test samples shall be soldered to test board By the reflow soldering conditions shown in Table. The test samples shall be placed at specified Shown in below table in sequence. The temperature cycle shall be repeated 100 cycles.</p> <p>Conditions of steps for 1 cycle</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 3°C</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room Temp</td> <td>3 maximum</td> </tr> <tr> <td>3</td> <td>85 ± 2°C</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room Temp</td> <td>3 maximum</td> </tr> </tbody> </table>	Step	Temperature	Time (min)	1	-40 ± 3°C	30 ± 3	2	Room Temp	3 maximum	3	85 ± 2°C	30 ± 3	4	Room Temp	3 maximum
Step	Temperature	Time (min)															
1	-40 ± 3°C	30 ± 3															
2	Room Temp	3 maximum															
3	85 ± 2°C	30 ± 3															
4	Room Temp	3 maximum															
Low Temperature life Test	ΔL/L: within ±10% No abnormality observed in appearance	<p>The test samples shall be soldered to the test board by The reflow soldering conditions shown in Table After that, the test samples shall be placed at test Conditions as shown in below table.</p> <table border="1"> <tr> <td>Temperature</td> <td>-40 ± 2°C</td> </tr> <tr> <td>Time</td> <td>500 +24/-0 h</td> </tr> </table>	Temperature	-40 ± 2°C	Time	500 +24/-0 h											
Temperature	-40 ± 2°C																
Time	500 +24/-0 h																
Loading at high temperature life test	ΔL/L: within ±10% No abnormality observed in appearance	<p>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table. The test samples shall be placed in thermostatic oven set at specified temperature and applied the rated current continuously as shown in below table.</p> <table border="1"> <tr> <td>Temperature</td> <td>85 ± 2°C</td> </tr> <tr> <td>Applied current</td> <td>Rated current (Refer to Electrical Characteristics)</td> </tr> <tr> <td>Time</td> <td>500+24/-0 h</td> </tr> </table>	Temperature	85 ± 2°C	Applied current	Rated current (Refer to Electrical Characteristics)	Time	500+24/-0 h									
Temperature	85 ± 2°C																
Applied current	Rated current (Refer to Electrical Characteristics)																
Time	500+24/-0 h																
Damp heat life test	ΔL/L: within ±10% No abnormality observed in appearance	<p>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table 1. The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.</p> <table border="1"> <tr> <td>Temperature</td> <td>60 ± 2°C</td> </tr> <tr> <td>Humidity</td> <td>90~95%RH</td> </tr> <tr> <td>Time</td> <td>500+24/-0 h</td> </tr> </table>	Temperature	60 ± 2°C	Humidity	90~95%RH	Time	500+24/-0 h									
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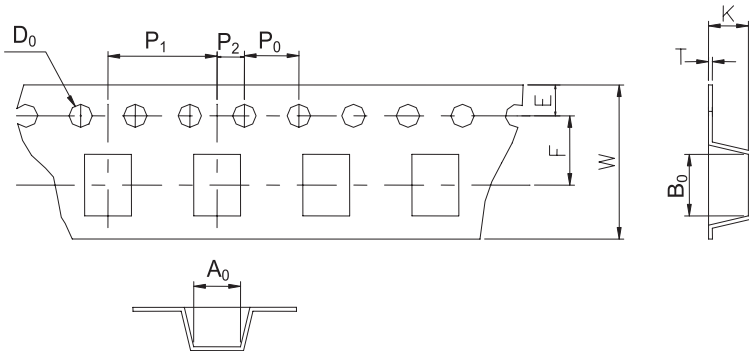
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Item	Test condition	Requirements	
Loading under Damp heat life test	$\Delta L/L$: within $\pm 10\%$ No abnormality observed in appearance.	The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table. The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table.	
		Temperature	$60 \pm 2^\circ\text{C}$
		Humidity	90~95%RH
		Applied current	Rated current (Refer to Electrical Characteristics)
		Time	500 +24/-0 h

Part Number Explanation

<u>WL</u>	<u>PN</u>	<u>4040</u>	<u>18</u>	<u>N</u>	<u>1R0</u>	<u>L</u>	<u>B</u>
Product Code	Series	Dimensions	Thickness	Tolerance	Value	Packing Code	
WL: Inductor	Shielded SMD Power Inductors	4mm×4mm	1.8mm	M : $\pm 20\%$ N : $\pm 30\%$	1R0 = 1 μH 100 = 10 μH	L=13" Reeled (Embossed Tape)	B:STD

Tape & Reel Packaging Dimensions

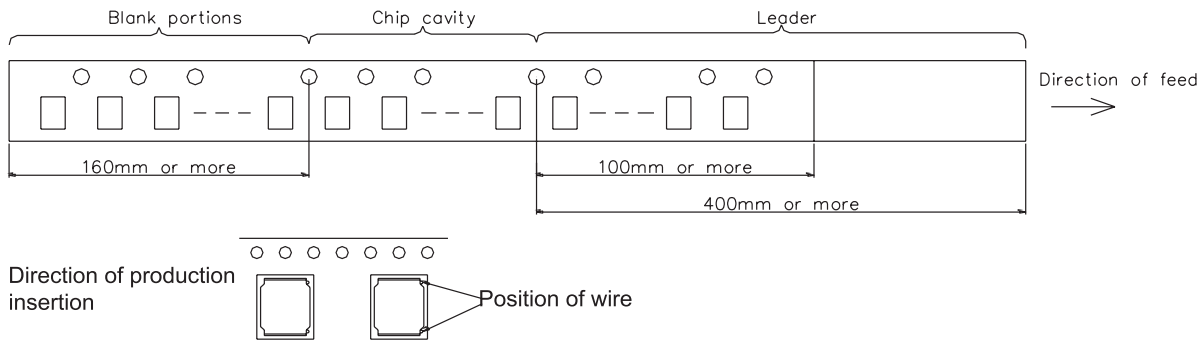


A ₀	B ₀	W	F	E	P ₁	P ₂	P ₀	D ₀	T	K
4.3 ±0.1	4.3 ±0.1	12 ±0.3	5.5 ±0.1	1.75 ±0.1	8 ±0.1	2 ±0.1	4 ±0.1	$\varnothing 1.5_{-0}^{+0.1}$	0.3 ±0.05	2.1 ±0.1

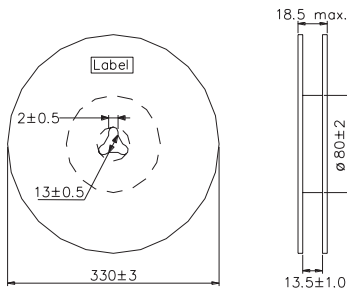
Dimensions : Millimetres

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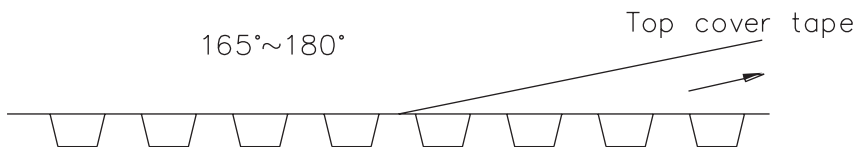
Direction of rolling



Reel



Top tape strength



Peel-off strength: 0.1N~1.3N

Peel-off angle: 165°~180°

Peel-off speed: 300mm/mm

Quantity per reel: 3.5K pcs (3500 pcs)

Dimensions : Millimetres

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