

Winding Type Chip Inductor

WNL252018RF-SERIES

1. Features

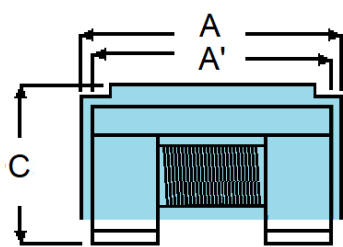
1. Ferrite core wire wound construction.
2. High Reliability due to wire wound type construction.
3. Small footprint as well as low profile.
4. 100% Lead (Pb) & Halogen-Free and RoHS compliant.
5. Operating temperature-40~+125°C (Including self - temperature rise)



2. Application

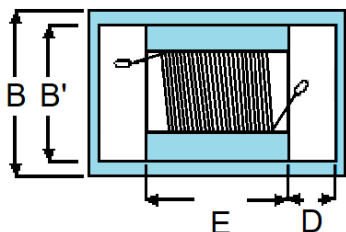
Smart meters, AV equipment, xDSL, electronic devices for communications
Infrastructure such as mobile base stations, industrial equipment, other

3. Dimension

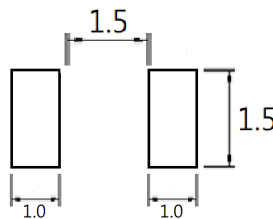


Size	A	A'	B	B'
	2.60±0.30	2.45±0.20	2.00±0.20	1.45±0.20
WNL252018	C	D	E	
	1.80±0.20	0.45±0.10	1.55Min	

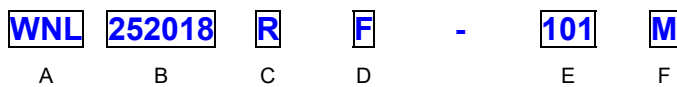
Unit:mm



Recommend PC Board Pattern



4. Part Numbering



- A: Series
- B: Dimension L x W x H
- C: Application Low DCR
- D: Lead free type
- E: Inductance 101=100uH
- F: Inductance Tolerance M=±20%

5. Specification

TAI-TECH Part Number	Ls(uH)	Frequency	DCR (Ω) $\pm 20\%$	IDC(A)
WNL252018RF-1R0M	1.00 $\pm 20\%$	7.96M	0.07	0.455
WNL252018RF-1R5M	1.50 $\pm 20\%$	7.96M	0.09	0.350
WNL252018RF-2R2M	2.20 $\pm 20\%$	7.96M	0.10	0.315
WNL252018RF-3R3M	3.30 $\pm 20\%$	7.96M	0.20	0.280
WNL252018RF-4R7M	4.70 $\pm 20\%$	7.96M	0.24	0.210
WNL252018RF-6R8M	6.80 $\pm 20\%$	7.96M	0.29	0.175
WNL252018RF-100M	10.0 $\pm 20\%$	2.52M	0.36	0.155
WNL252018RF-150M	15.0 $\pm 20\%$	2.52M	0.75	0.130
WNL252018RF-220M	22.0 $\pm 20\%$	2.52M	1.00	0.105
WNL252018RF-330M	33.0 $\pm 20\%$	2.52M	1.40	0.085
WNL252018RF-470M	47.0 $\pm 20\%$	2.52M	1.70	0.060
WNL252018RF-680M	68.0 $\pm 20\%$	2.52M	3.30	0.050
WNL252018RF-101M	100 $\pm 20\%$	0.796M	4.00	0.040

Winding Type Chip Inductor

WNL322522RF-SERIES

1. Features

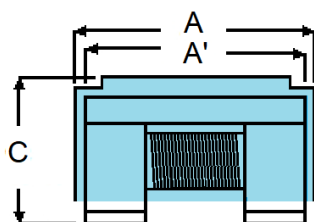
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2. High Reliability due to wire wound type construction.
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5. Operating temperature-40~+125°C (Including self - temperature rise)



2. Application

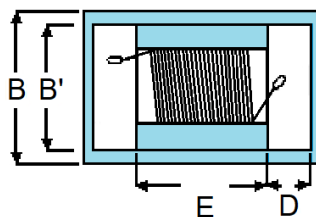
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 Infrastructure such as mobile base stations, industrial equipment, other

3. Dimension

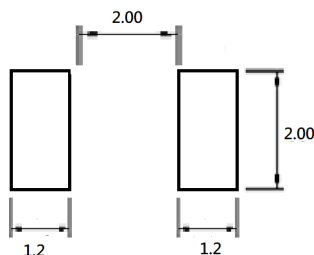


Size	A	A'	B	B'
	3.20±0.30	3.15±0.20	2.50±0.30	1.95±0.20
WNL322522	C	D	E	
	2.20±0.20	0.55±0.10	2.00 ref	

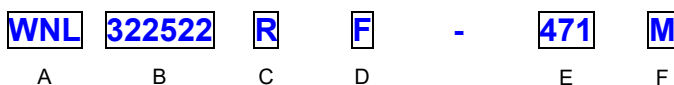
Unit:mm



Recommend PC Board Pattern



4. Part Numbering



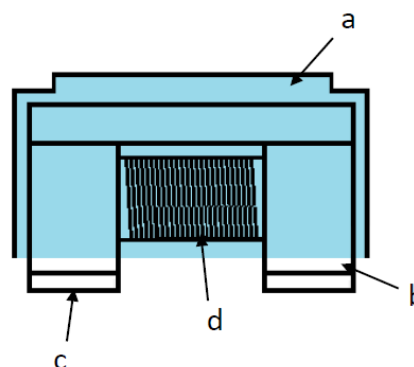
- A: Series
- B: Dimension L x W x H
- C: Application Low DCR
- D: Lead free type
- E: Inductance 471=470uH
- F: Inductance Tolerance M=±20%

5. Specification

TAI-TECH Part Number	Ls(uH)	Frequency	DCR±20% (Ω)	IDC (A)
WNL322522RF-1R0M	1.00±20%	7.96M	0.06	0.750
WNL322522RF-2R2M	2.20±20%	7.96M	0.09	0.500
WNL322522RF-3R3M	3.30±20%	7.96M	0.11	0.420
WNL322522RF-4R7M	4.70±20%	7.96M	0.13	0.360
WNL322522RF-6R8M	6.80±20%	7.96M	0.17	0.260
WNL322522RF-100M	10.0±20%	2.52M	0.20	0.250
WNL322522RF-220M	22.0±20%	2.52M	0.40	0.140
WNL322522RF-330M	33.0±20%	2.52M	0.65	0.095
WNL322522RF-470M	47.0±20%	2.52M	0.85	0.090
WNL322522RF-680M	68.0±20%	2.52M	1.30	0.070
WNL322522RF-101M	100±20%	0.796M	2.20	0.055
WNL322522RF-151M	150±20%	0.796M	2.90	0.050
WNL322522RF-221M	220±20%	0.796M	5.10	0.040
WNL322522RF-331M	330±20%	0.796M	6.80	0.035
WNL322522RF-471M	470±20%	0.796M	14.50	0.030
WNL322522RF-681M	680±20%	0.796M	18.50	0.025
WNL322522RF-102M	1000±20%	0.796M	22.50	0.020

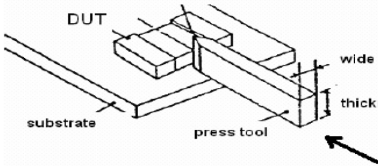
6. Materials

No.	Description	Specification
a.	Upper Plate	UV Glue
b.	Core	Ferrite Core
c.	Termination	Ag/Ni/Sn
d.	Wire	Enameled Copper Wire



7. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	-40~+125℃ (on board)	
Electrical Performance Test		
Inductance L	Refer to standard electrical characteristic list	Agilent E4991A , Keysight E4991B ,Keysight 4980AL Agilent-4287, Agilent-4285
SRF		Agilent E4991A , Keysight E4991B
DC Resistance		Agilent-34420A Agilent-4338B
IDC	$\Delta L \leq 30\%$	1. Applied the current to coils, the inductance change shall be less than 30% to initial value. 2. Heat Rated Current (I _{rms}) will cause the coil temperature rise $\Delta T(^{\circ}C)$ without core loss. (1.) Applied the allowed DC current. (2.) Temperature measured by digital surface thermometer
	$\Delta T \leq 40^{\circ}C$	
Reliability Test		
Life Test	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 125±2℃ Applied current : rated current Duration : 1000±12hrs Measured at room temperature after placing for 24 hrs.
Load Humidity		Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85±3% R.H. Temperature : 85℃±2℃ Duration : 1000hrs Min. Bead : with 100% rated current Inductance : with 10% rated current Measured at room temperature after placing for 24 hrs.
Moisture Resistance		Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) 1. Baked at 50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs, keep at 25℃ for 2hrs then keep at -10℃ for 3hrs. 4. Keep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measured at room temperature after placing for 1~2 hrs.
Thermal shock		Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1 : -40±2℃ 30±5min Step2 : 125±2℃ ≤0.5min Step3 : 125±2℃ 30±5min Number of cycles : 500 Measured at room temperature after placing for 24 hrs.
Vibration		Oscillation Frequency : 10Hz~2kHz~10Hz for 20 minutes Equipment : Vibration checker Total Amplitude : 10g Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations)

Item	Performance	Test Condition															
Bending		Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.															
Shock	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	<table border="1" data-bbox="970 409 1404 544"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table> <p>3 shocks in each direction along 3 perpendicular axes. (18 shocks).</p>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine	11.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	50	11	Half-sine	11.3													
Lead	50	11	Half-sine	11.3													
Solderability	More than 95% of the terminal electrode should be covered with solder	a. Method B, 4hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3. (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds															
Resistance to Soldering Heat		Depth: completely cover the termination <table border="1" data-bbox="976 719 1407 833"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1							
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles														
260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1														
Terminal Strength	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) With the component mounted on a PCB with the device to be tested, apply a force (>0805:1kg , <=0805:0.5kg) to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 															

8. Soldering and Mounting

8-1. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

8-2.1 Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

8-2.2 Soldering Iron:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. (Figure 2.)

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4-5sec.

Fig.1 Soldering Reflow

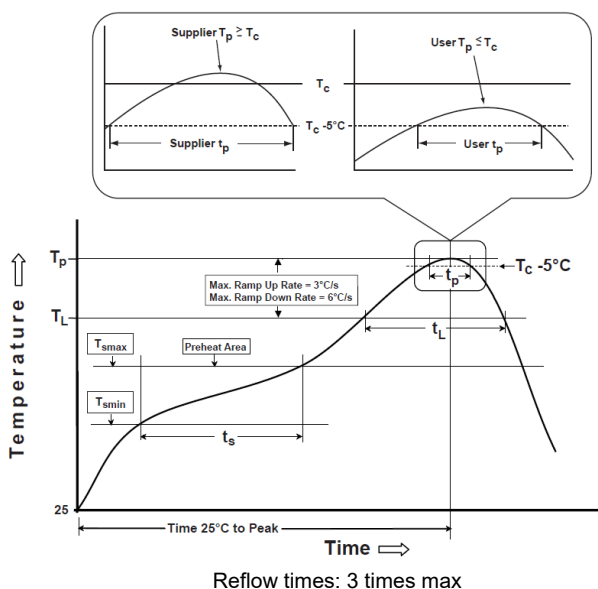


Fig.2 Iron soldering temperature profiles

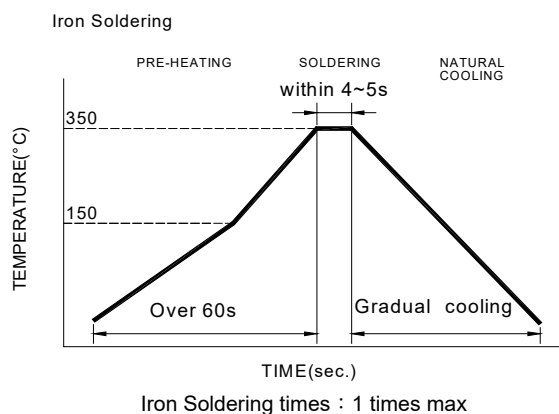


Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat	
-Temperature Min(T_{smin})	150°C
-Temperature Max(T_{smax})	200°C
-Time(t_s)from(T_{smin} to T_{smax})	60-120seconds
Ramp-up rate(T_L to T_p)	3°C/second max.
Liquidus temperature(T_L)	217°C
Time(t_L)maintained above T_L	60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at $T_c - 5^\circ C$ (T_p should be equal to or less than T_c .)	< 30 seconds
Ramp-down rate(T_p to T_L)	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

T_p : maximum peak package body temperature, T_c : the classification temperature.

For user (customer) T_p should be equal to or less than T_c .

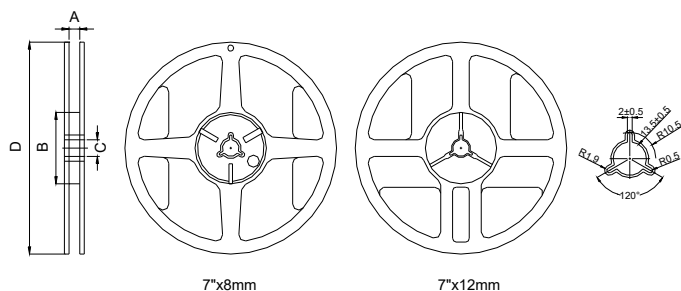
Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

	Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E ◦

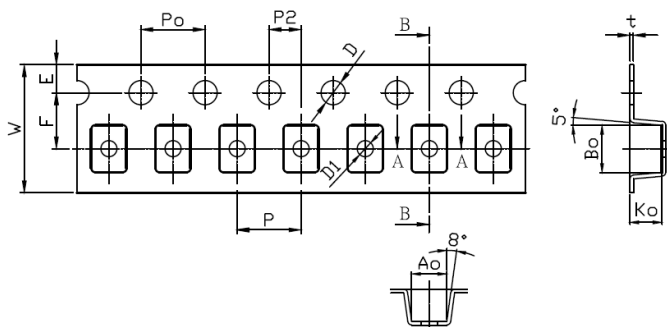
9. Packaging Information

9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60.0±2.0	13.5±0.5	178.0±2.0

9-2. Tape Dimension / 8mm

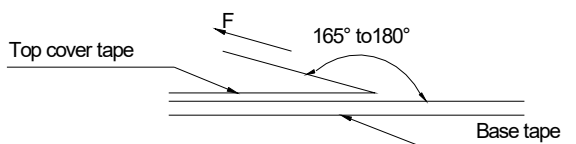


Series	Size	W(mm)	P(mm)	E(mm)	F(mm)	P2(mm)	D(mm)	D1(mm)	Bo(mm)	Ao(mm)	Ko(mm)	Po(mm)	t(mm)
WNL	252018	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05	2.00±0.05	1.50+0.10-0.00	1.00±0.10	2.95±0.10	2.20±0.10	2.00±0.10	4.00±0.10	0.24±0.05

9-3. Packaging Quantity

WNL	252018
Chip / Reel	2000
Reel Size	7"x8mm

9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 grams in the arrow direction under the following conditions.

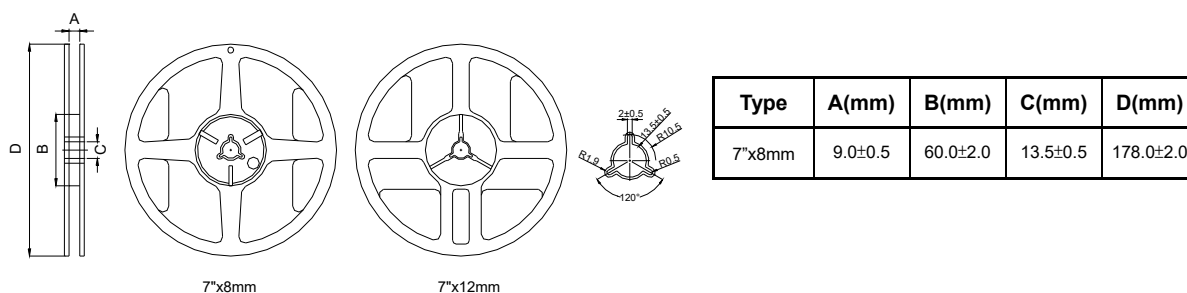
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

Application Notice

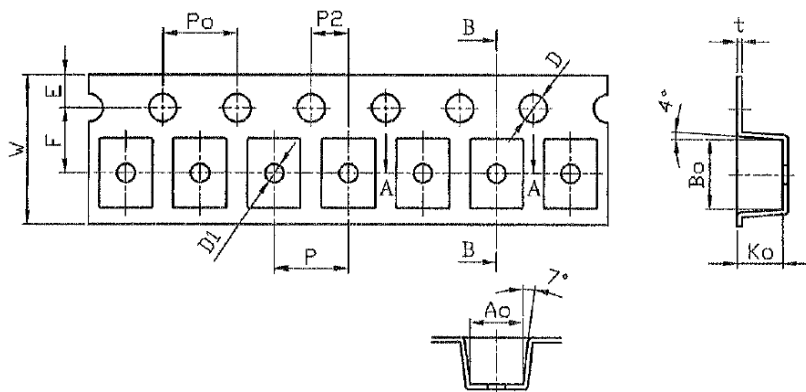
- Storage Conditions(component level)
 - To maintain the solderability of terminal electrodes:
 - 1.TAI-TECH products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
 2. Temperature and humidity conditions: Less than 40°C and 60% RH.
 3. Recommended products should be used within 12 months form the time of delivery.
 4. The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
 1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
 2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
 3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

9. Packaging Information

9-1. Reel Dimension



9-2. Tape Dimension / 8mm

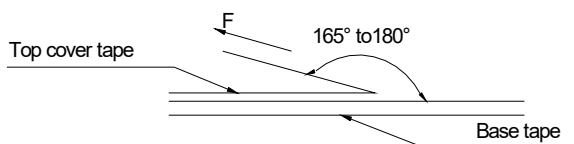


Series	Size	W(mm)	P(mm)	E(mm)	F(mm)	P2(mm)	D(mm)	D1(mm)	Bo(mm)	Ao(mm)	Ko(mm)	Po(mm)	t(mm)
WNL	322522	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05	2.00±0.05	1.50+0.10-0.00	1.00±0.10	3.72±0.10	2.88±0.10	2.50±0.10	4.00±0.10	0.26±0.05

9-3. Packaging Quantity

WNL	322522
Chip / Reel	2000
Reel Size	7"x8mm

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