THE DATASHEET OF

PAS4420F-352K-F10

Telecoil-antennas Inductors PAS4420F-SERIES

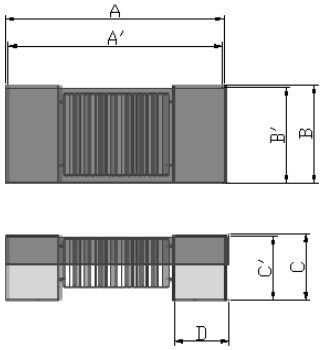
1. Features

1. Hearing Aid Compatibility-/Telecoil-antennas;
2. PAS4420F-series realizes small size and low profile. 4.4x2.0x2.0 mm.
3. 100% Lead (Pb) & Halogen-Free and RoHS compliant.
4. Meets the T3 FCC requirements (HAC-Act) acc. ANSI C63.19
5. Operating temperature -40~+125℃ (Including self - temperature rise)

2. Applications

1. T-coil/HAC-coil for hearing and aid compatible cell phones.
2. Decoupling in RF and IF-circuit.
3. Transponder antenna.

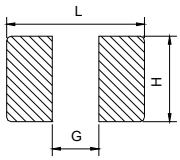
3. Dimensions



Size	A(mm)	A'(mm)	B(mm)	B'(mm)	C(mm)	C'(mm)	D(mm)
PAS4420F	4.75±0.20	4.40±0.20	2.25±0.20	2.00±0.20	1.80±0.30	1.80±0.20	0.80 ref.

Units : mm

Recommend PC Board Pattern



L(mm)	G(mm)	H(mm)
4.8	3.2	2.3

4. Part Numbering

PAS 4420 F - 252 M - F10

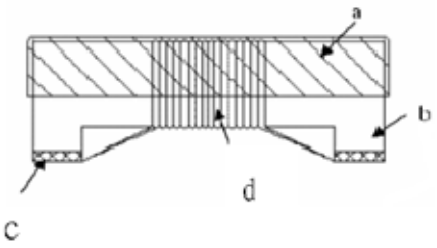
A B C D E F

A: Series
B: Dimension L x H
C: Lead Free Code
D: Inductance 252=2500 uH
E: Inductance Tolerance K=±10%, M=±20%
F: Test Frequency 10 KHZ

5. Specification

Part Number	Inductance (uH)	Tolerance	f_{L0} (kHz)	SRF MHz(min)	RDC (Ω)Max.	Rated current (mA) max.
PAS4420F-301□-F10	300	K,M	10	2.0	14	70
PAS4420F-401□-F10	400	K,M	10	1.5	17	50
PAS4420F-252□-F10	2500	K,M	10	1.0	82	40
PAS4420F-352□-F10	3500	K,M	10	1.0	85	20

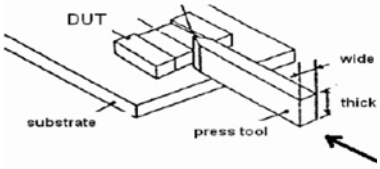
6. Material List



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
Rated Current		Applied the current to coils, the inductance change shall be less than 20% to initial value.
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 at50℃ 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 2 hrs then keep at -10℃ for 3 hrs 4. Keep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure 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 minute Equipment： Vibration checker Total Amplitude:10g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)。

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Bending</td><td rowspan="2">Appearance：No damage.
Inductance：within±10% of initial value
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>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.</td></tr>
<tr><td>Shock</td><td>
<table>
<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>
<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>
</table>
3 shocks in each direction along 3 perpendicular axes. (18 shocks).
</td></tr>
<tr><td>Solderability</td><td>More than 95% of the terminal electrode should be covered with solder。</td><td>a. Method B, 4 hrs @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</td></tr>
<tr><td>Resistance to Soldering Heat</td><td rowspan="2">Appearance：No damage.
Inductance：within±10% of initial value
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Depth: completely cover the termination
<table>
<tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr>
<tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Terminal Strength</td><td>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.
 
</td></tr>
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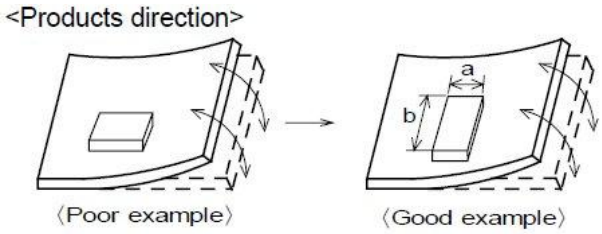
8. Soldering and Mounting

8-1. Attention regarding P.C.B. bending

The following shall be considered when designing P.C.B.'S

(1)P.C.B. shall be designed so that products are not subjected to the mechanical stress for board warpage.

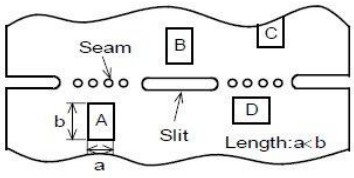


Products shall be located in the sideways direction (Length:a<b) to against the mechanical stress.

(2) Products location on P.C.B.

Products (A,B,C,D) shall be located carefully to prevent mechanical stress when warping the board.

Products may be subjected to the mechanical stress in the order of A>C>B≒D.



8-2. 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:

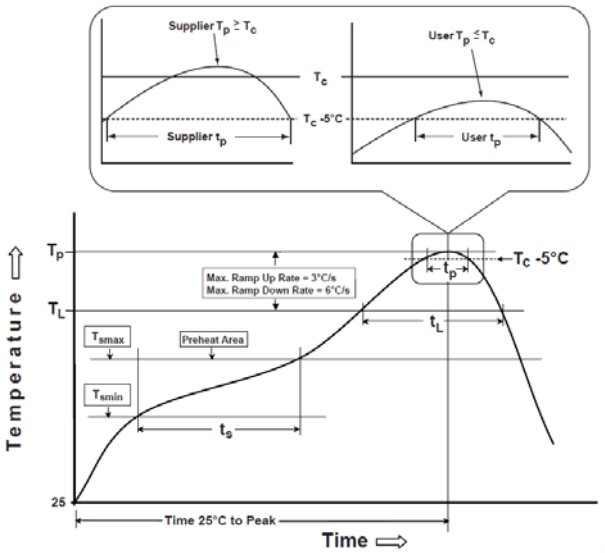
Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

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.)

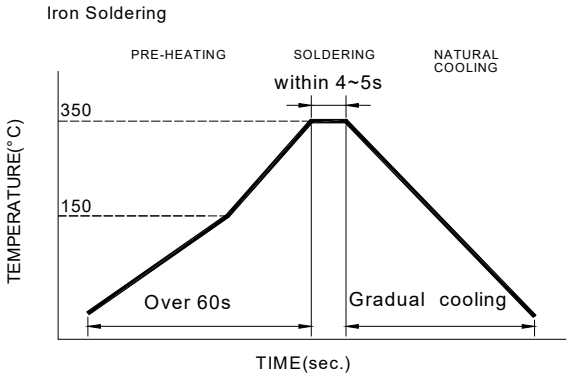
- Preheat circuit and products to 150℃
- 350℃ tip temperature (max)
- Never contact the ceramic with the iron tip
- 1.0mm tip diameter (max)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times：1 times max

Table (1.1): Reflow Profiles

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

Tp: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

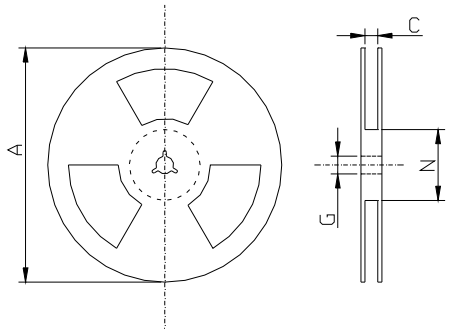
Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

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

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

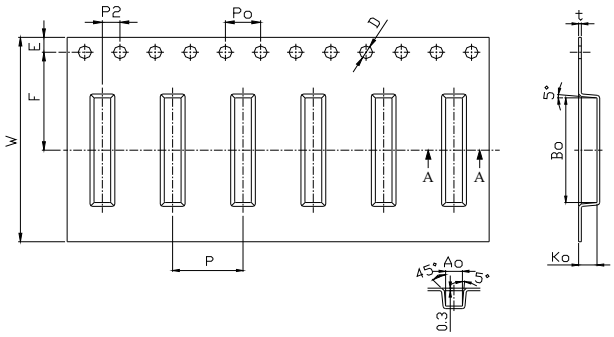
9. Packaging Information

9-1. Reel Dimension



Type	A(mm)	C(mm)	G(mm)	N(mm)
7"x12mm	180.0±2.0	16.5±1.0	13.5±0.5	100.0±2.0

9-2. Tape Dimension / 12mm

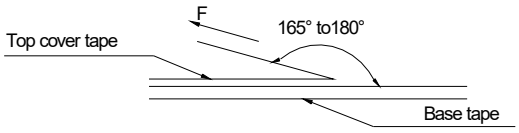


9-2. Packaging Quantity

Chip size	4420
Reel	1000
Reel Size	7"x12mm

Series	Size	P(mm)	Po(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	t(mm)
PAS	4420	8.0±0.1	4.0±0.1	2.0±0.1	5.00±0.10	2.5±0.10	2.1±0.10	0.3±0.05
Series	**Size**	D(mm)	E(mm)	F(mm)	W(mm)			
PAS	4420	1.5+0.1/-0	1.75±0.1	5.5±0.1	12±0.30			

9-3. Tearing Off Force



The force for tearing off cover tape is 10 to 80 grams in the arrow direction under the following conditions(referenced ANSI/EIA-481-C-2003 of 4.11 standard).

Room Temp. (℃)	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℃ 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.

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