

FB 1608 Series

Multilayer Chip Low Pass Filter + Balun

Features

- ❖ Monolithic SMD with small, low-profile and light-weight type.
- ❖ HF & RoHS Compliant

Applications

- ❖ Sub-1 GHz Ultra-Low Power Wireless communication systems, etc.



Specifications

Part Number	Frequency Range (MHz)	Unbalanced Impedance (ohm)	Balanced Impedance (ohm)	Insertion Loss @ BW (dB)	VSWR @ BW	Phase Diff. (degree)	Amp. Diff. (dB)	Attenuation (dB)
FB1608-T4NR85A	770~ 860	50	Conjugate match to TI CC13XX chipset	1.6 max.	2.0 max.	180±17	3.5 max.	8 min.@ 1540~1720 MHz 15 min.@ 1720~1736 MHz 15 min.@ 1736~1856MHz
	860~928			2.2 max.		180±15	2.0 max.	30 min.@ 2310~2580 MHz 30 min.@ 2580~2784 MHz 33 min.@ 3080~3440MHz 35 min.@ 3440~3712 MHz

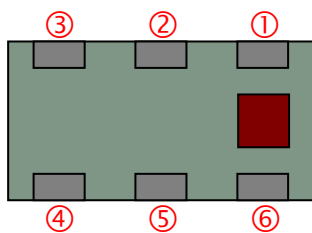
Q'ty/Reel (pcs) : 4000
 Operating Temperature Range : -40 ~ +105 °C
 Storage Temperature Range : -40 ~ +105 °C
 Storage Period : 12 months max.
 Power Capacity : 2W max.

Part Number

FB 1608 - T4 N R85 A □ /LF
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Type	FB : Low Pass Filter +Balun	② Dimensions (L × W)	1.6 × 0.8 mm
③ Balanced Impedance	T4 : Conjugate match to TI CC13XX chipset	④ Material Code	N
⑤ Central Frequency	R85 : 850MHz	⑥ Specification Code	A
⑦ Packaging	T: Tape & Reel B: Bulk	⑧ Soldering	/LF=lead-free

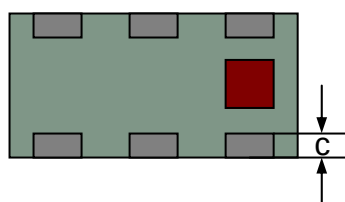
Terminal Configuration



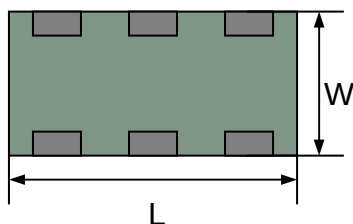
No.	Terminal Name	No.	Terminal Name
①	Unbalanced Port	④	Balanced Port
②	RX_TX	⑤	GND
③	Balanced Port	⑥	GND

Dimensions and Recommended PC Board Pattern

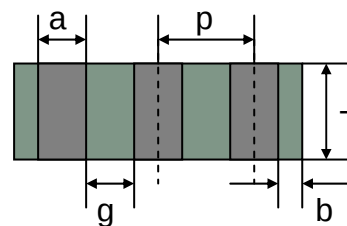
Unit : mm



< Top View >

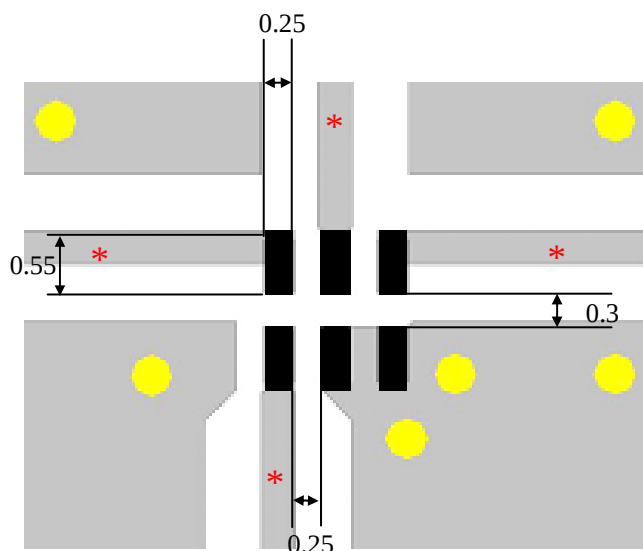


< Bottom View >



< Side View >

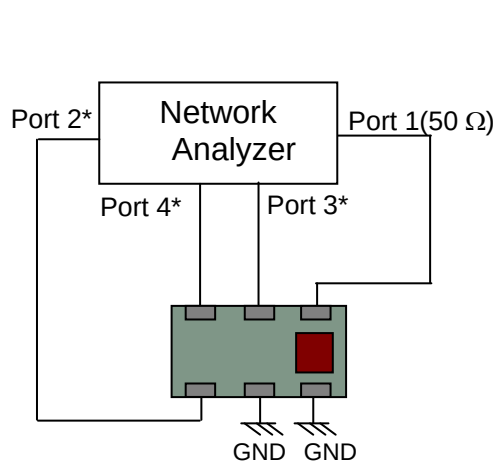
Mark	L	W	T	a	b	c	g	g
Dimensions	1.6 ± 0.1	0.8 ± 0.1	0.6 ± 0.1	0.2 ± 0.1	0.2+0.1/ -0.15	0.15± 0.1	0.3± 0.1	0.50± 0.05



- Solder Resist
- Land
- Through-hole (ϕ 0.35)

*Line width should be designed to match 50 Ω characteristic impedance, depending on PCB material and thickness.

Measuring Diagram



Port 1: Unbalanced Port

Ports 2 and 4: Balanced Port

*Ports 2 and 4 Terminate impedance

=Conjugate match to TI CC13XX chipset

Ports 3: RX_TX Port

*Ports 3 Terminate impedance

=The loading Impedance looking into RX_TX pin
of TI CC13XX chipset

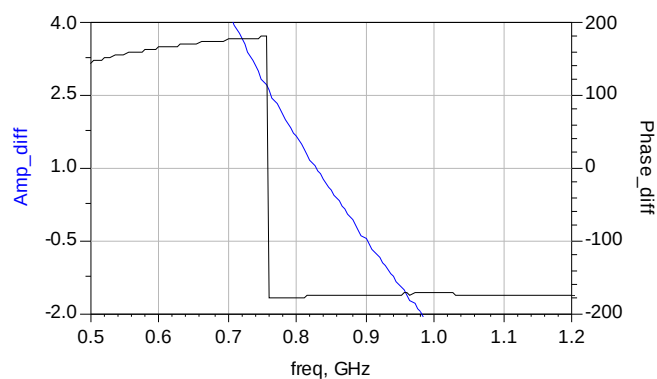
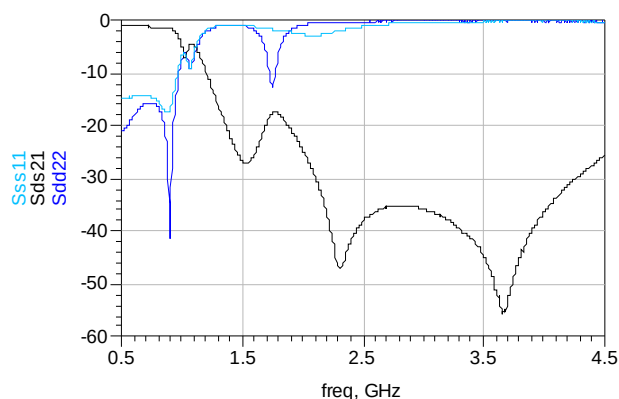
$$IL = S_{ds21}$$

$$RL = S_{ss11}$$

$$\text{Amp_balance} = \text{dB}(S(2,1)/S(4,1))$$

$$\text{Phase_balance} = \text{Phase}(S(2,1)/S(4,1))$$

Typical Electrical Characteristics (T=25°C)

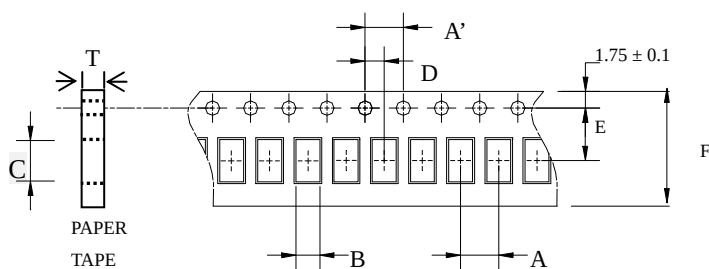


Notes

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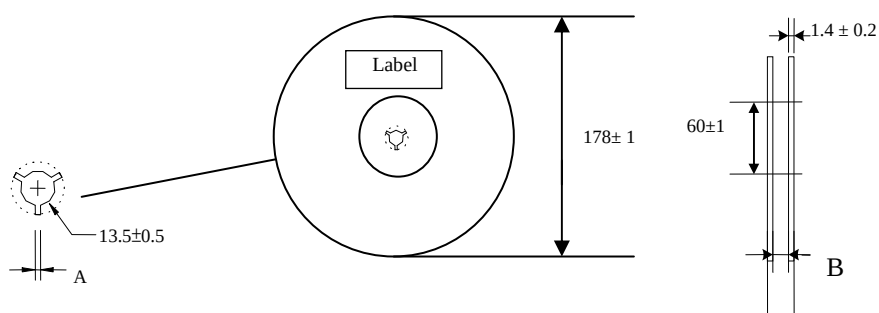
Taping Specifications

❖Tape Dimensions (Unit: mm) & Quantity



Type	A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
1608	4.0±0.1	4.0±0.1	1.10±0.1	1.92±0.1	2.0±0.1	3.5±0.1	8.0±0.1	0.75±0.05	4,000pcs	Paper

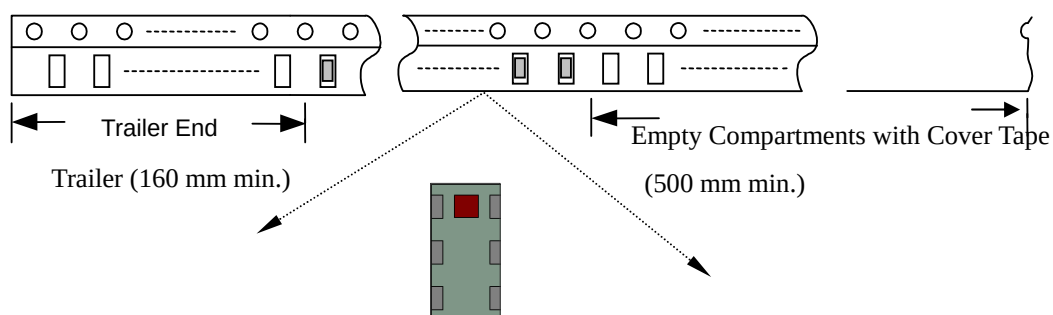
❖Reel Dimensions (Unit: mm)



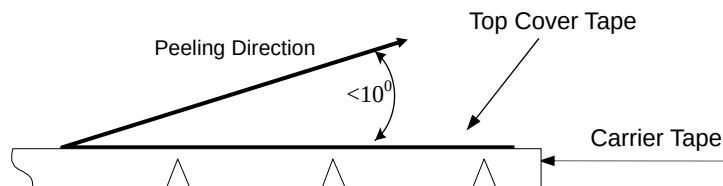
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

Type	A	B
1608	2.3±0.5	9.0±0.3

❖Leader and Trailer Tape



❖ Peel-off Force



Peel-off force should be in the range of 0.1 – 0.6 N at a peel-off speed of 300 ± 10 mm/min .

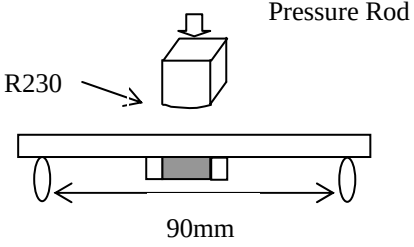
❖ Storage Conditions

- (1) Temperature: $5 \sim 35^\circ\text{C}$, relative humidity (RH): 45~75%.
- (2) Non-corrosive environment.

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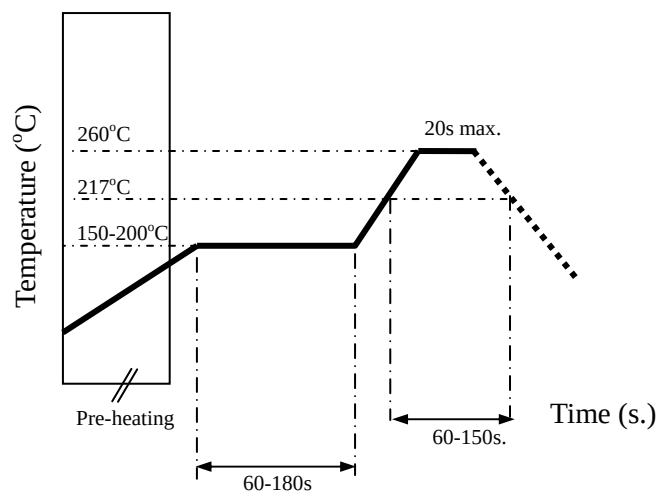
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	1. No apparent damage 2. More than 95% of the terminal electrode shall be covered with new solder	1. Preheat: $120 \pm 5^{\circ}\text{C}$ 2. Solder: $245 \pm 5^{\circ}\text{C}$ for 5 ± 1 sec
Soldering strength (Termination Adhesion)	1. 10N minimum	1. Solder specimen onto test jig. 2. Apply push force at 0.5mm/s until electrode pads are peeled off or ceramic are broken. Pushing force is applied to longitude direction.
Deflection (Substrate Bending)	1. No apparent damage	1. Solder specimen onto test jig (FR4, 1.6mm) using the recommend soldering profile. 2. Apply a bending force of 2mm deflection 
Heat/Humidity Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: $85 \pm 2^{\circ}\text{C}$ 2. Humidity: 90% ~ 95% RH 3. Duration: 1000 ± 48hrs 4. Recovery: 1-2hrs
Thermal shock (Temperature Cycle)	1. No apparent damage 2. Fulfill the electrical specification after test	1. One cycle/step 1 : $125 \pm 5^{\circ}\text{C}$ for 30 min step 2 : $-40 \pm 5^{\circ}\text{C}$ for 30 min 2. No of cycles : 100 3. Recovery: 1-2 hrs
Low Temperature Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: $-40 \pm 5^{\circ}\text{C}$ 2. Duration: 500 ± 24hrs 3. Recovery: 1-2hrs

Soldering Conditions

❖ Typical Soldering Profile for Lead-free Process

Reflow Soldering :



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