TBL-1608-245-MA3 THIN FILM BALUN

1. Feature

   1-1 2.45GHz Thin Film Balun.

   1-2 For ISM Band applications like Bluetooth/WLAN.

   1-3 Lead Free, RoHS compliance

2. Part Number

   TBL — 1608 — 245 — MA3 — XX
   (1) (2) (3) (4) (5)

   Where (1) TBL : Thin Film Balun

   (2) Size :

   4 digits of number —1608 = 1.60×0.8 mm

   (3) Center Frequency :

   245 = 2.45 GHz

   (4) Type

   Refer to Table 3-1

   (5) XX

   Internal Code

3. Ratings

   3-1 Specifications

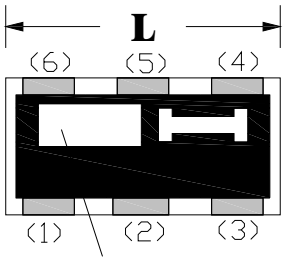
Part Number	TBL-1608-245-MA3
Unbalance Port Impedance	50Ω
Balance Port Impedance	Conjugate match to Atheros AR6003 QFN TX chipset
Nominal Center Frequency	2450MHz
Bandwidth	2400 ~ 2500MHz
Phase Balance	180 ±10°
Amplitude Balance	0 ±2dB max
Insertion Loss	1.7 dB Max. at +25℃
VSWR at Unbalance Port in BW	2.0 Max.
Power Capacity	500mW Max.

   3-2 Operation Temperature: –40℃ to +85℃

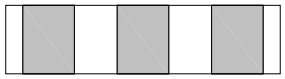
   3-3 Storage Temperature: -40℃ to +85℃

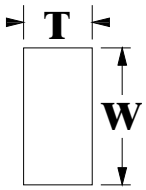
4. Outline Dimension

TopView

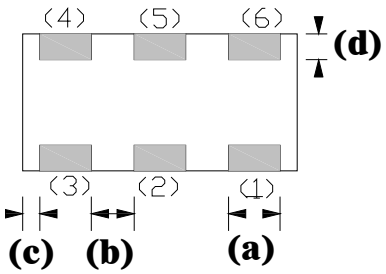


Directional Marking





BackView



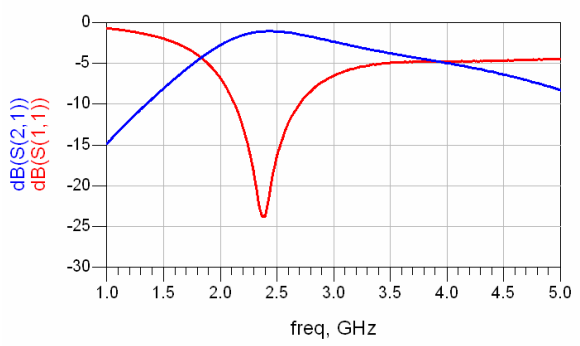
Code	Dimension(mm)	Code	Dimension(mm)
L	1.6±0.1	(a)	0.4±0.1
W	0.8±0.2	(b)	0.2±0.1
T	0.4±0.1	(c)	0.1±0.1
		(d)	0.2±0.1

Terminal Configuration

(1)	Unbalance Port
(2)	DC feed or RF GND
(3)	GND
(4)	Balance Port
(5)	GND
(6)	Balance Port

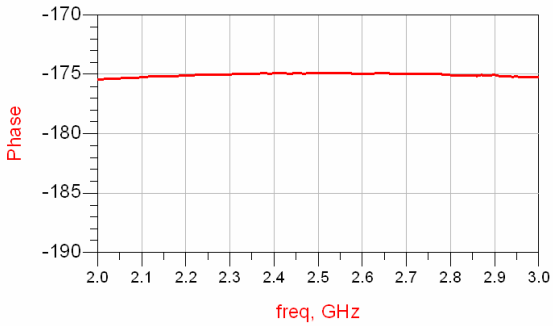
5. Electrical Performance

Insertion Loss and Return Loss

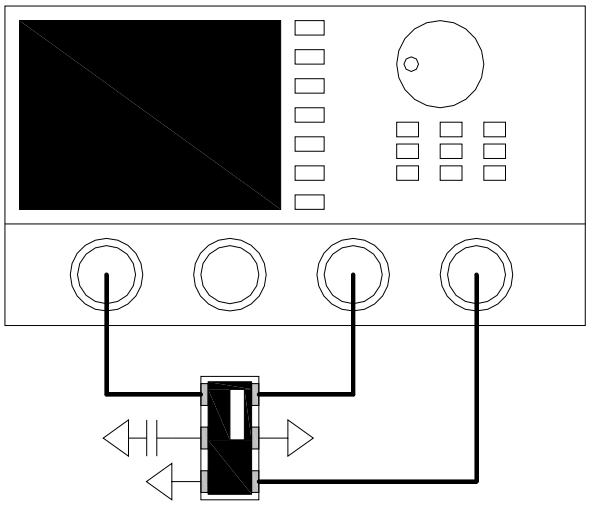


Amplitude Balance

Phase Balance

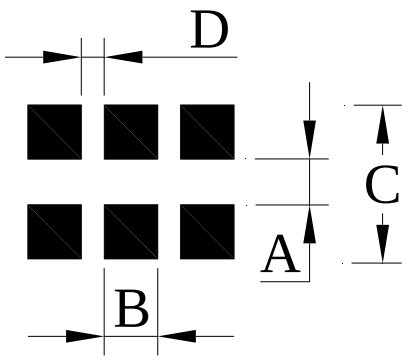


6. Measurement



Network analyzer：Agilent PNA N5230A

7. Recommended Land Pattern



A	0.3
B	0.35
C	1.0
D	0.15

Unit : mm

8. Reliability Test

8-1 Electrical

ITEM	Specification and Requirement	Test Method
Temperature Characteristics	Satisfy electrical characteristics	Solder the sample on PCB. Exposure at each temperature, -40℃, -20℃, 0℃, +25℃, +50℃, +85℃ for 30minutes

8-2 Mechanical

ITEM	Specification and Requirement	Test Method
Solderability	The Surface of terminal immersed shall be minimum of 95% covered with a new coating of solder	Solder bath : After immersing in flux, dip in245 ± 5 ℃ molten solder bath for 2 ± 0.5 seconds
Resistance to solder Heat	Satisfy electrical characteristics without distinct deformation in appearance	A. Pre-heat : 100 ~ 110 ℃ for 30 seconds B. Immersed at solder bath of 270 ± 5℃ for 20 ± 1 seconds
Vibration	Satisfy electrical characteristics without Mechanical damage such as break	Vibrate as apply 20 to 2,000Hz, 186m/s^2 (19G) acceleration 1.5mm amplitude for 2 hours in each of three (X, Y, Z) axis (total 6 hours).
Shock	Satisfy electrical characteristics without mechanical damaged such as break	(1) Break value : 490 N (2) Duration of pulse : 11ms (3) 3 times in each positive and negative direction of 3 mutual perpendicular directions.
Bending Test	Satisfy electrical characteristics without mechanical damage such as break	Bending value : 3mm for 30 ± 1 seconds
Solvent Resistant	Marking should be legible without mechanical and distinct damage in appearance	(1) Solvent : Trichloroethane or Isopropyl alcohol. (2) Immersed in solvent at room temperature for 90 seconds
Drop Test	Satisfy electrical characteristics without mechanical damage	Drop the sample from a height of 1m to concrete ground for 10 times

8-3 Load Life

ITEM	Specification and Requirement	Test Method
Rapid change of temperature	Satisfy Electrical Characteristics. Without distinct damage.	Perform 5 cycles as follows : –55℃ for 30minutes → room temperature for 3 minutes→ +125℃ for 30minutes → room temperature for 3 minutes. (Dwell time : 5 to 8 minutes)
Humidity Resistance Test	Satisfy Electrical Characteristics. Without distinct damage.	Precondition at +25℃ for 1hour. Let stand at temperature +40 ± 3 ℃, 90~95% relative humidity for 1,000 hours before taking final measurements.
Low Temperature Store	Satisfy Electrical Characteristics. Without distinct damage.	Solder the sample on PCB. Exposure at –55 ± 3℃ for 1,000 hours. 1~2 hours exposure at room temperature and humidity, prior to measurement.
High Temperature Store	Satisfy Electrical Characteristics. Without distinct damage.	Solder the sample on PCB. Exposure at +85 ± 3℃ for 1,000 hours. 1~2 hours exposure at room temperature and humidity, prior to measurement.

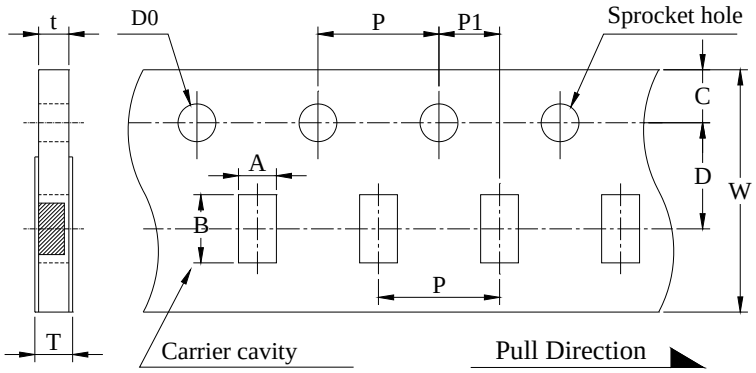
9. Packaging

9-1 Dimensions

9-1-1 Tape packaging dimensions

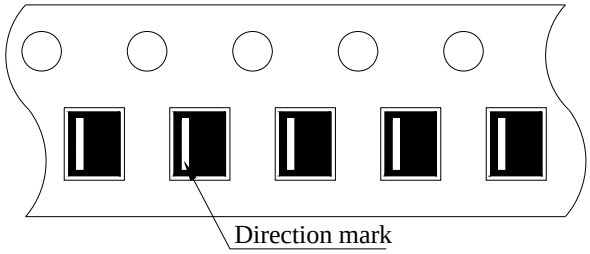
Cover Material : Polyethylene

Tape Material : Paper

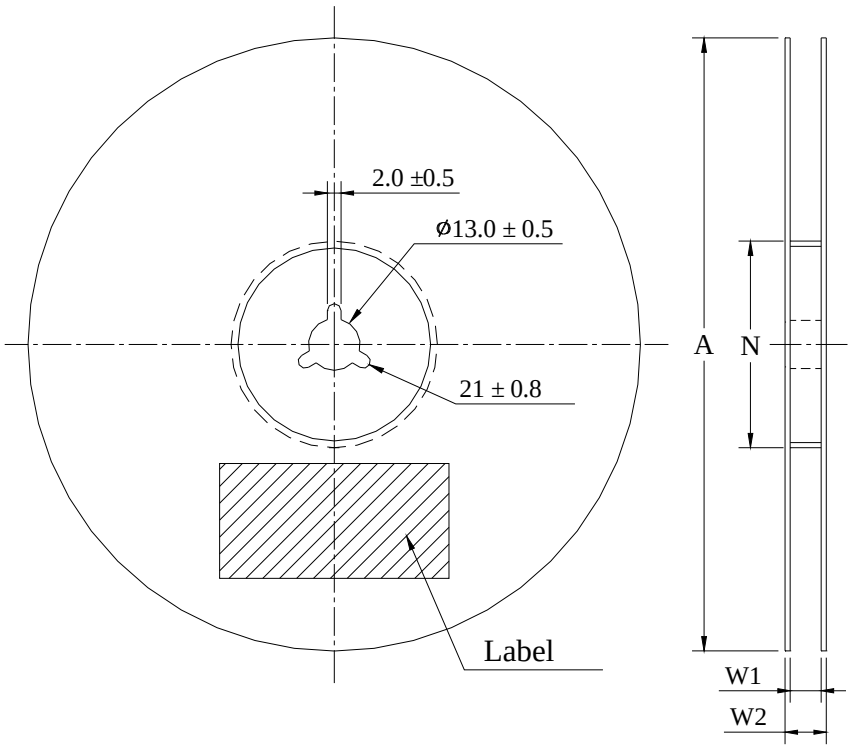


Code	Dimensions (mm)
A	1.10 ±0.10
B	1.90 ±0.10
C	1.75 ±0.1
D	3.5 ±0.05
W	8.0 ±0.3
P	4.0 ±0.1
P1	2.0 ±0.05
T	0.65 ±0.10
t	0.6 ±0.10
D0	ϕ 1.5 $^{+0.1}_{-0.0}$

9-1-2 Setting Direction



9-1-2 Reel dimensions(Material : Polystyrene)



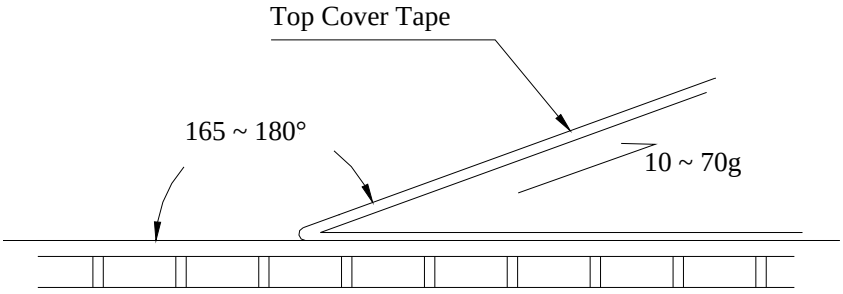
A	ϕ 178 ± 2
N	ϕ 60 ± 2
W1	9.0 ± 0.3
W2	11.4 ± 1.0

Unit : mm

9-2 Peel force of top cover tape

The peel speed shall be about 300 mm/minute

The peel force of top cover tape shall be between 10 to 70g



9-3 Numbers of taping

4,000 pieces/reel

9-4 Label marking

The following items shall be marked on the production and shipping Label on the reel.

9-4-1 Production Label

(1) Part No.
(2) Description
(3) Quantity
(4) Taping No.

9-4-2 Shipping Label

(1) *Customer's name
(2) *Customer's part No.
(3) Manufacturer's part No.
(4) Manufacturer's name
(5) Manufacturer's country

*Note : Item (1) and (2) are listed by request