APPROVAL SHEET

(RoHS Compliant & Halogen Free)

CUSTOMER :

CUSTOMER'S PART NO. :

DESCRIPTION : Multi-layer Band Pass Filter

PART NO. : LTB-1608-HXVHB-A2

DATE :

AUTHORIZED BY : Derek Wei

	FULLY APPROVED	PARTIALLY APPROVED	REJECTED
SIGN			
SUGGESTION			

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REVISION HISTORY

Version	Date	Description	Approved by	Prepared by
1	2019/03/27	Initial specification.	CF	KC
2	2019/06/20	Update T.	CF	Jasper
3	2020/05/21	Update storage condition. Add MSL rating.	CF	Jasper
4	2020/11/18	Update Reliability test.	CF	Melody

APPLICATION

GSM/WCDMA/LTE mobile communication systems.

FEATURES

- **Compact Size**
  Miniaturized SMD packaged in low profile and lightweight.
- **Low loss**
  Low insertion loss, high attenuation.
- **High Soldering Heat Resistance**
  High quality termination allows both flow and re-flow soldering methods to be applied.
- **Characteristics**
  Eliminate noise over a wide frequency range. Ideal for high frequency and space limited designs.
- **Available in tape and reel packaging for automatic mounting**

PRODUCT IDENTIFICATION

LTB	-	1608	-	###xx	-	A2	-	□□
①		②		③		④		⑤

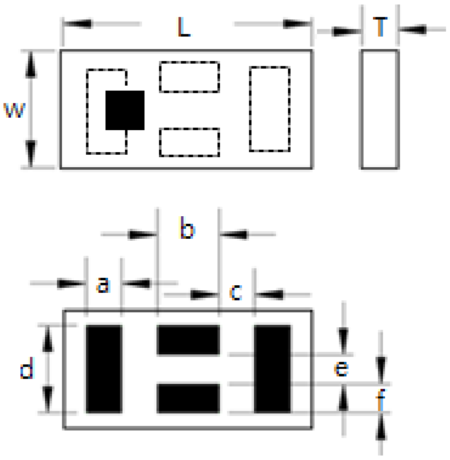
① Product Code
② Dimension Code
③ Series Type (### represents center frequency and xx represents material type)
④ Design Code
⑤ Pattern Code

ELECTRICAL REQUIREMENTS

Part No.	Pass Band	Insertion Loss in BW	Return loss In BW	Attenuation
LTB-1608-HXVHB-A2-RW	1805~2025 MHz	2.1 dB max.	10 dB min.	30 dB min. at 700~950 MHz 15 dB min. at 950~1050 MHz 35 dB min. at 2400~2500 MHz 35 dB min. at 2700~5150 MHz 35 dB min. at 5150~5850 MHz 32 dB min. at 5850~12750 MHz

Operating Temperature Range：-40~85°C
Rated Power：3W max.

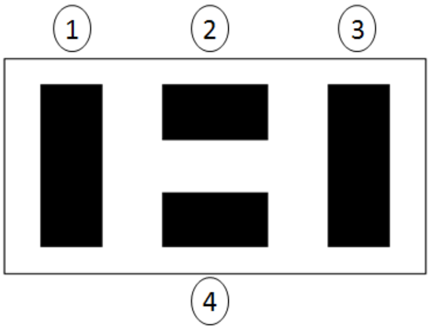
PRODUCT DIMENSION



L	W	T	a
1.60±0.15	0.80±0.15	0.70±0.05	0.25±0.05
b	c	d	e
0.40±0.10	0.23±0.10	0.55±0.10	0.21±0.05
f			
0.20±0.05			

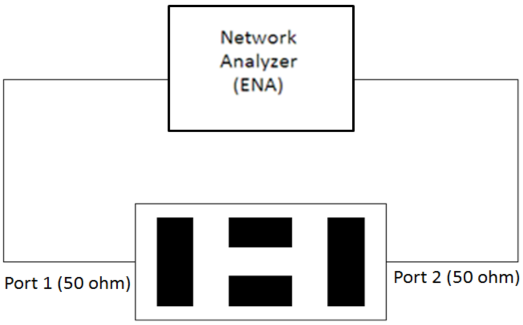
NOTE：Dimensions in mm.

TERMINAL CONFIGURATION



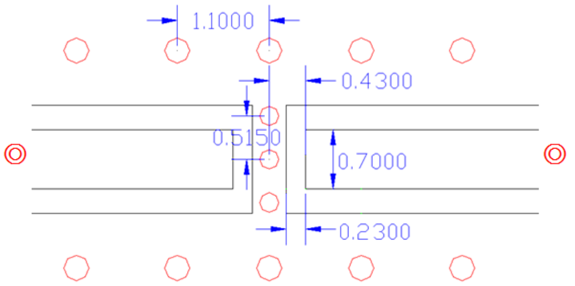
①Input port
②GND
③Output port
④GND

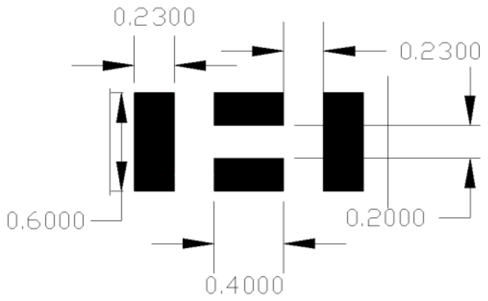
MEASURING DIAGRAM



Test Instrument：
Agilent E5071C Network Analyze.

RECOMMENDED PCB LAYOUT AND LAND PATTERN

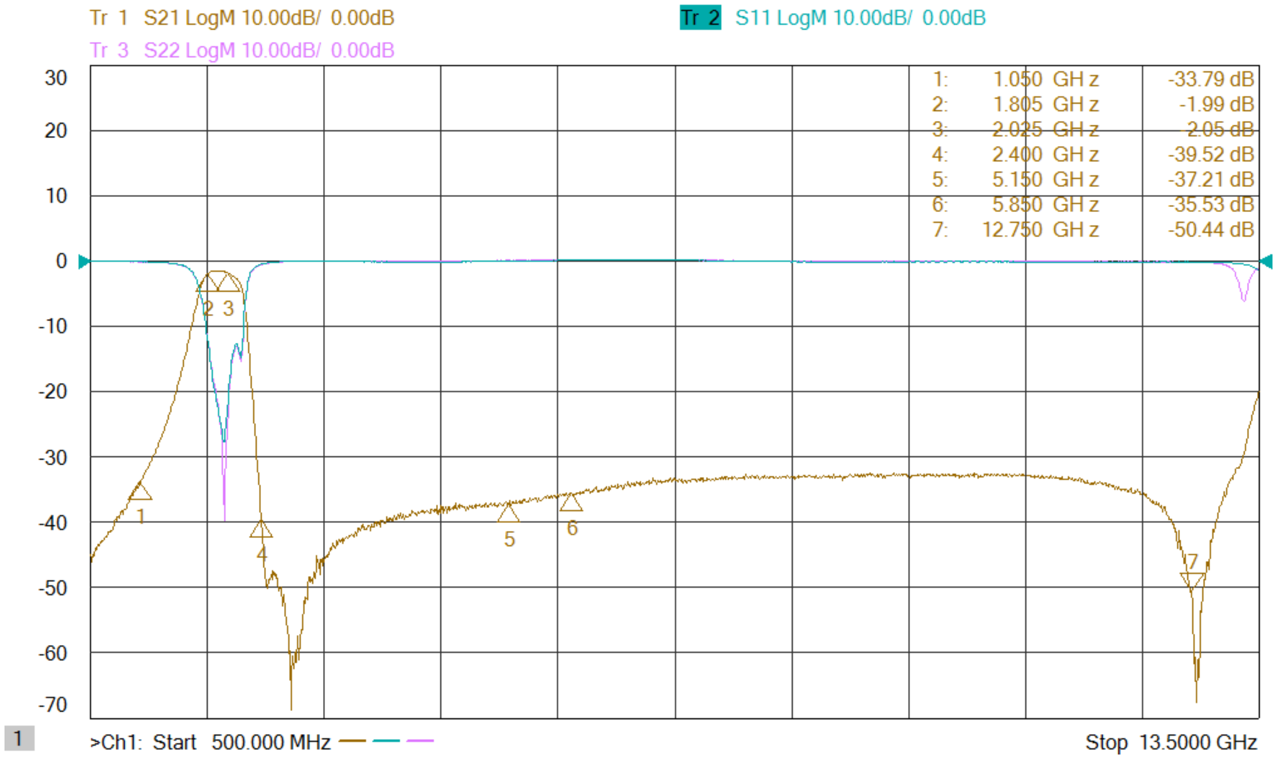




Unit：mm

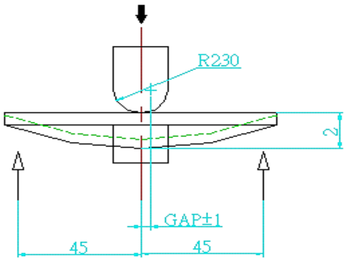
◎Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

ELECTRICAL CHARACTERISTICS (T=25℃)



RELIABILITY TEST

Mechanical Test

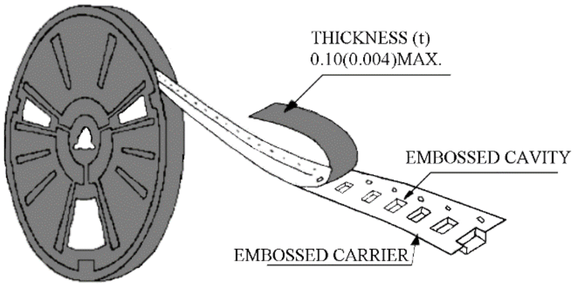
Item	Test Condition	Specification
Vibration	10 Hz/min~55 Hz/min~10 Hz/min vibration frequency with 1.5 mm amplitude for two hours in x, y, z directions	No apparent damage
Drop shock	Dropped onto printed circuit board from 100cm height three times in x, y, z directions. The terminals shall be protected.	No apparent damage
Soldering heat resistance	Preheating temperature : 150±10℃ Preheating time : 1 to 2 minutes Solder bath temperature : 260±5℃ Bathing time : 10±1 seconds	Loss of metallization on the edges of each electrode shall not exceed 25%.
Bending test onto printed circuit board	Solder specimen LTCC components on the test printed circuit board (L: 100 x W: 40 x T: 1.6mm) in appended recommended PCB pattern. Apply the load in direction of the arrow until bending reaches 2 mm. 60sec holding time.  Unit: mm	No apparent damage
Solderability	*Solder bath temperature：245±5℃ *Immersion time：3±1 seconds. Solder：Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Adhesive strength	Standard is as follows 0605~1005 >0.1KgF 1109~2016 >0.5KgF 2520~>1KgF	No apparent damage

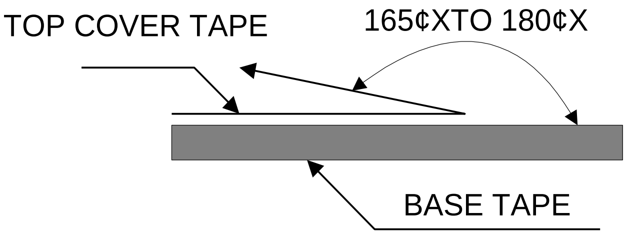
Environment Test

Thermal shock	-40℃~85℃ for 100 cycles each cycle being 30 min	No apparent damage Fulfill the electrical spec. after test
Humidity resistance	85±2℃,80~90% R.H. for 1000 hours	No apparent damage Fulfill the electrical spec. after test
High temperature resistance	85±2℃ for 1000 hours	No apparent damage Fulfill the electrical spec. after test
Low temperature resistance	-40±3℃ for 1000 hours	No apparent damage Fulfill the electrical spec. after test

PACKAGING FOR SMC

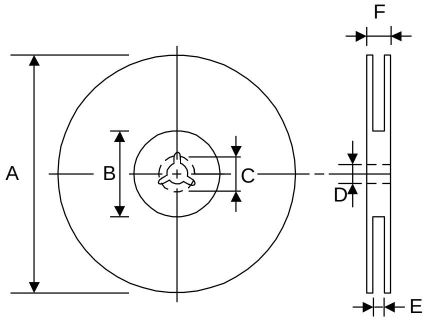
Peel-off force





The force for peeling off cover tape is 10 grams in the arrow direction.

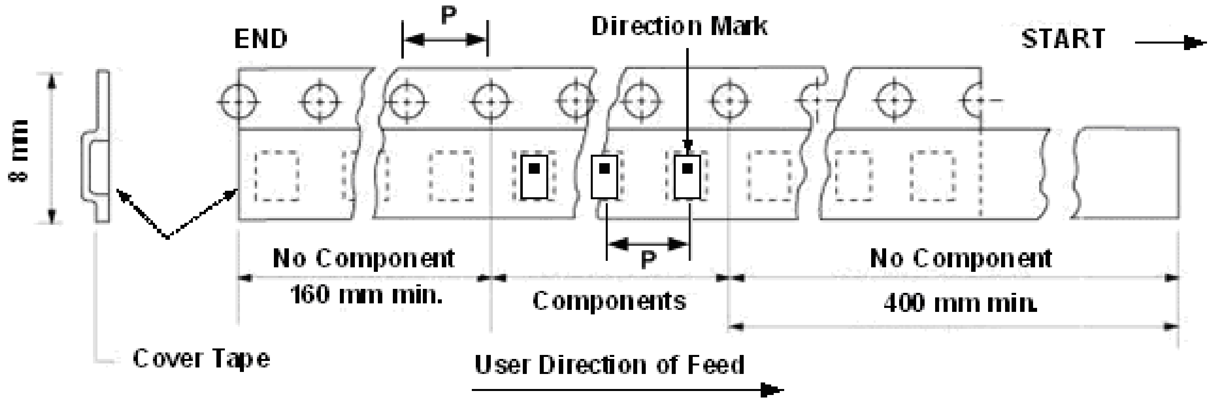
Dimension (Unit: mm)



TYPE	A	B	C	D	E	F
8 mm	178±1	60+0.5 -0	-	13±0.2	9±0.5	12±0.5
12 mm	178±0.3	60±0.2	19.3±0.1	13.5±0.1	13.6±0.1	-

Taping quantity

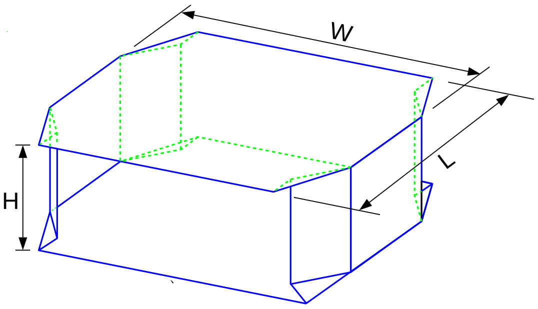
SERIES	5824 5724	5320 5220	4532	4516	3225	3216 2520	2012 1608	1005
PCS/Reel	5000	3000	1000	2000	2500	3000	4000	10000



P=4 mm

TAPE PACKING CASE

Unit:cm



No. of Reels	W	L	H
2	18±0.5	18±0.5	2.4±0.2
3	18±0.5	18±0.5	3.6±0.2
4	18±0.5	18±0.5	4.8±0.2
5	18±0.5	18±0.5	6.0±0.2

MSL RATING

Level 1

OPERATION TEMPERATURE

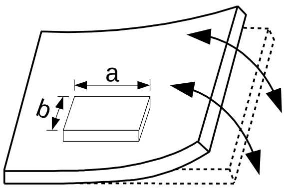
-40℃~85℃

STORAGE CONDITION

The temperature should be within -40~85℃ and humidity should be less than 75% RH. The product should be used within 6 months from the time of delivery.

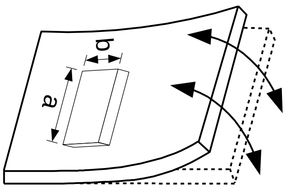
ATTENTION REGARDING PCB BENDING

(a) PCB shall be designed so that products are not subjected to the mechanical stress for board wrapage. Product shall be located in the sideway direction to the mechanical stress.



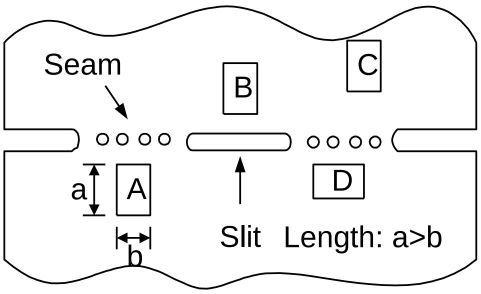
(Poor example)

Length: a>b

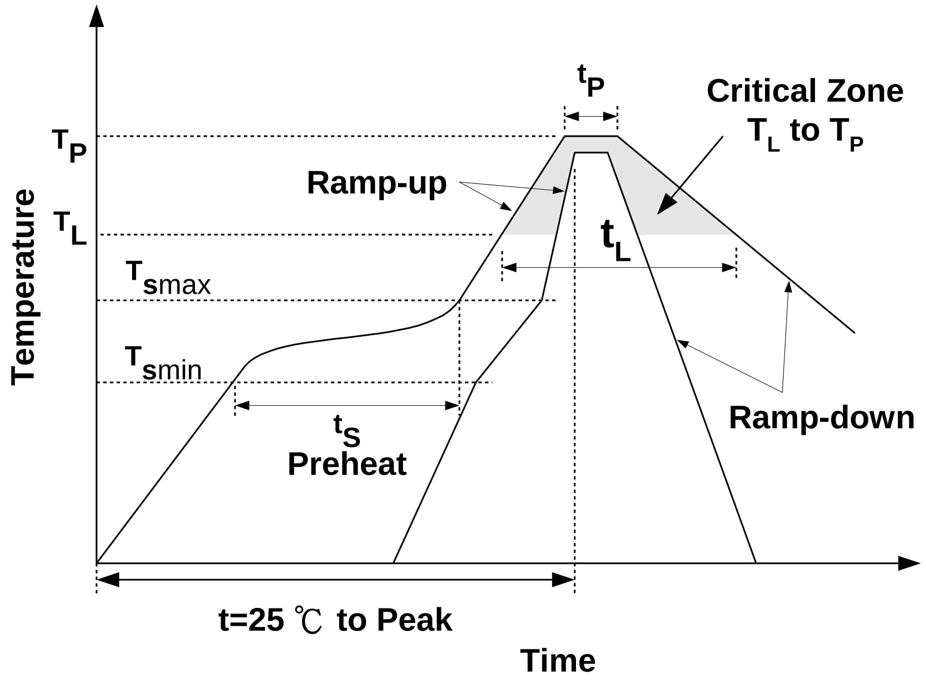


(Good example)

(b) Products (A,B,C,D) shall be located carefully so that products are not subjected to the mechanical stress due to warping the board. Because they may be subjected to the mechanical stress in order of A>C>B≒D.



RECOMMENDED REFLOW SOLDERING PROFIL



Profile Feature		Sn-Pb	Pb-Free
Preheat	t_S	60~120 seconds	60~180 seconds
	T_{smin}	100℃	150℃
	T_{smax}	150℃	200℃
Average ramp-up rate ($T_{smax}$to T_P)		3℃/second max.	3℃/second max.
Time main above	Temperature (T_L)	183℃	217℃
	Time (t_L)	60~150 seconds	60~150 seconds
Peak temperature (T_P)		230℃	250~260℃
Time within 5℃ of actual peak temperature (t_P)		10 seconds	10 seconds
Ramp-down rate		6℃/sec max.	6℃/sec max.
Time 25℃ to peak temperature		6 minutes max.	8 minutes max.

NOTES

The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.