



TAI-SAW TECHNOLOGY CO., LTD.

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Product Specifications Approval Sheet

Product Description: 467.751 MHz 12.5MHz BW SMD 3.0 x 3.0 mm SAW IF Filter

TST Parts No.: TB1141A (This part is compliance with AEC-Q200)

Manufacture Factory: TST Taiwan

Customer Parts No.: _____

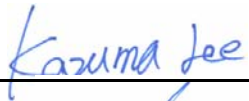
Customer signature required

Company: _____

Division: _____

Approved by : _____

Date: _____

Checked by: _____ Kazuma Lee 

Approval by: _____ Bob Chau 

Date: _____ 04 / 25 / 2016

1. Customer signed back is required before TST can proceed with sample build and receive orders.
2. Orders received without customer signed back will be regarded as agreement on the specifications.
3. Any specifications changes must be approved upon by both parties and a new revision of specifications shall be released to reflect the changes.



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SAW Filter 467.751MHz 12.5MHz BW (SMD 3.0×3.0 mm)

MODEL NO.: TB1141A

REV. NO.3

A. MAXIMUM RATING:

1. Operating temperature range: -40°C to 105°C
2. Storage temperature range: -40°C to 125°C
3. Input Power Level : 10 dBm
4. Maximum DC Voltage : 10V

RoHS Compliant
Lead free
Lead-free soldering

Electrostatic Sensitive Device

B. CHARACTERISTICS:

Item	Unit	Min.	Type.	Max.
Center frequency, F_c	MHz	-	467.751	-
Insertion Loss, IL	dB	-	11.2	15.5
-1.5dB bandwidth	MHz	12.5	14.5	16.5
-3dB bandwidth	MHz	13.0	14.8	17.0
Passband Ripple				
F _c -6.250MHz ~ F _c -4.393MHz	dB	-	0.40	1.50
F _c -4.393MHz ~ F _c -2.253MHz	dB	-	0.20	1.50
F _c -2.253MHz ~ F _c -0.025MHz	dB	-	0.18	1.50
F _c +0.025MHz ~ F _c +2.253MHz	dB	-	0.15	1.50
F _c +2.253MHz ~ F _c +4.393MHz	dB	-	0.23	1.50
F _c +4.393MHz ~ F _c +6.250MHz	dB	-	0.45	2.00
Group Delay Variation				
F _c -6.250MHz ~ F _c -4.393MHz	Ns	-	55	170
F _c -4.393MHz ~ F _c -2.253MHz	Ns	-	25	100
F _c -2.253MHz ~ F _c -0.025MHz	Ns	-	20	100
F _c +0.025MHz ~ F _c +2.253MHz	Ns	-	20	100
F _c +2.253MHz ~ F _c +4.393MHz	Ns	-	25	100
F _c +4.393MHz ~ F _c +6.250MHz	Ns	-	50	170
Attenuation:(Reference level from Min IL)				
< F _c -12MHz	dB	30	33	-
F _c -12MHz ~ F _c -10.5MHz	dB	30	33	-
F _c +9MHz ~ F _c +12.5MHz	dB	20	30	-
>F _c +12.5MHz	dB	30	32	-
Temperature Coefficient	ppm/°C	-	-23	-
Source Impedance	Ohm	-	50	-
Load Impedance	Ohm	-	50	-

C. FREQUENCY CHARACTERISTICS: (Measuring at room temperature 25°C)

(1) Wide band Response:(Single-end; $Z_0=50\ \Omega$)

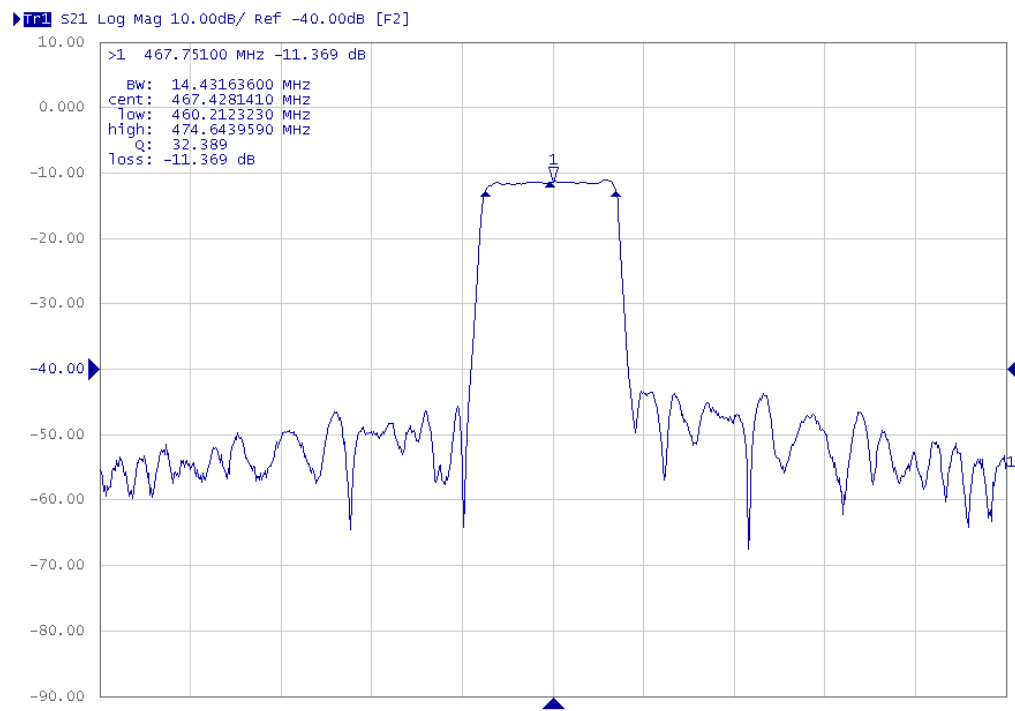


Fig1. Horizontal: 10MHz/Div Vertical: 10dB/Div

(2) Pass band Response and Group Time Delay response: (Single-end; $Z_0=50\ \Omega$)

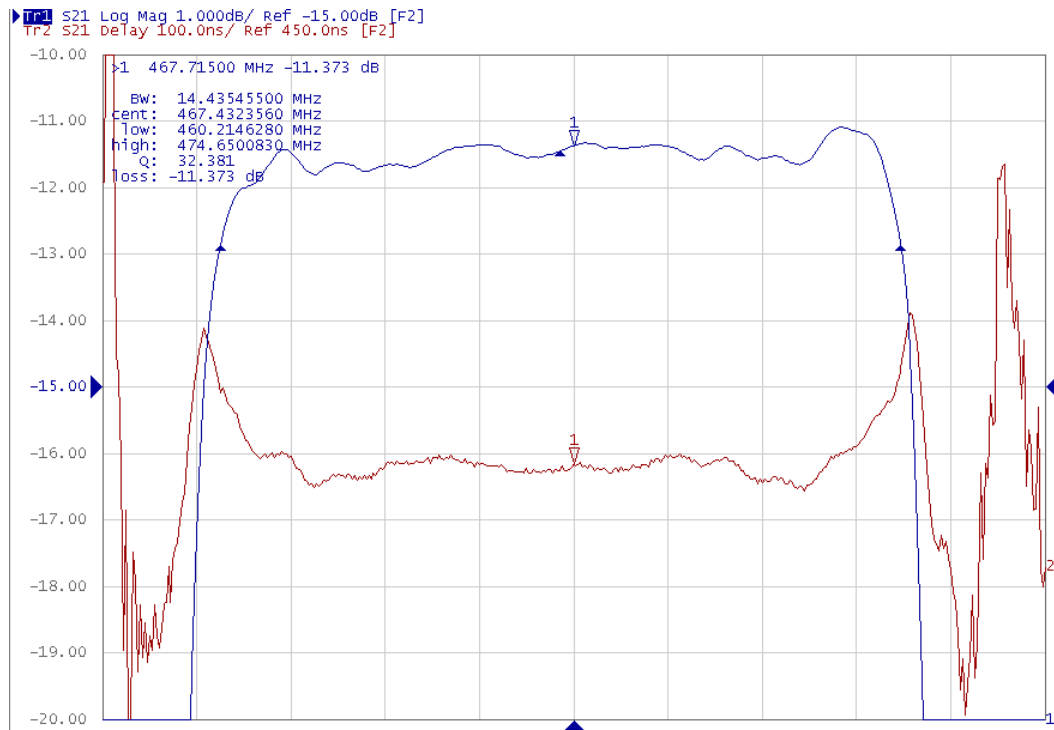
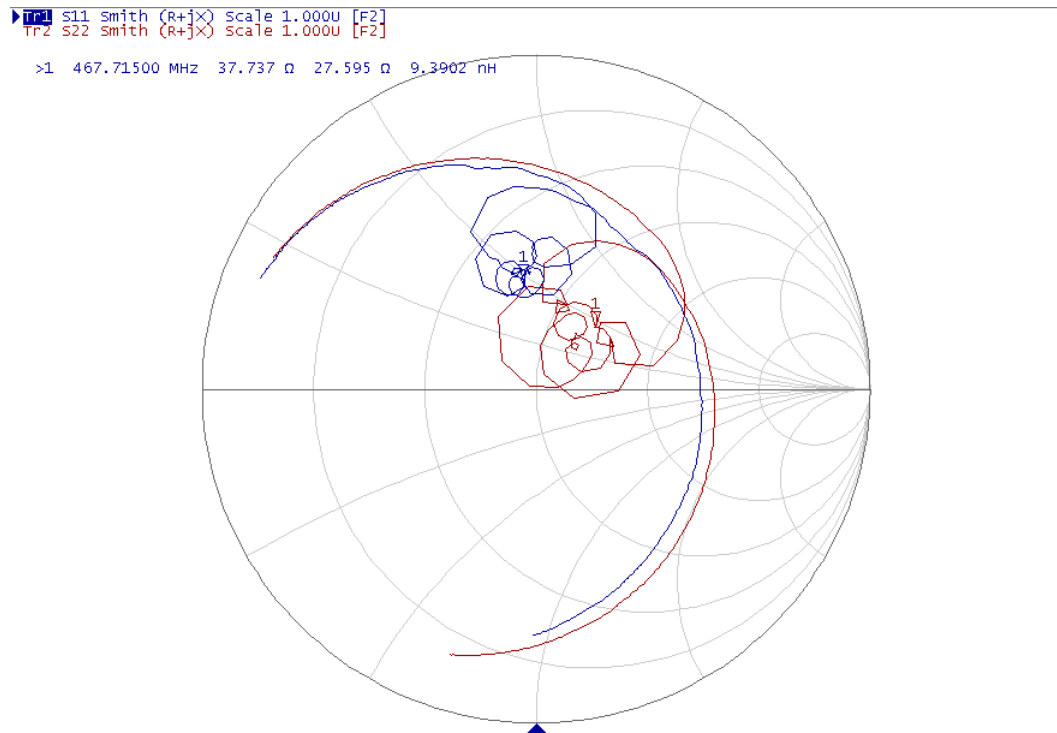


Fig2. Horizontal: 2MHz/Div Vertical: 10dB/Div
Vertical: 100dB/Div

(3) Smith Chart: (Single-end; $Z_0=50\ \Omega$)



(4) Wide band Response: (Differential; $Z_0=150\ \Omega$)

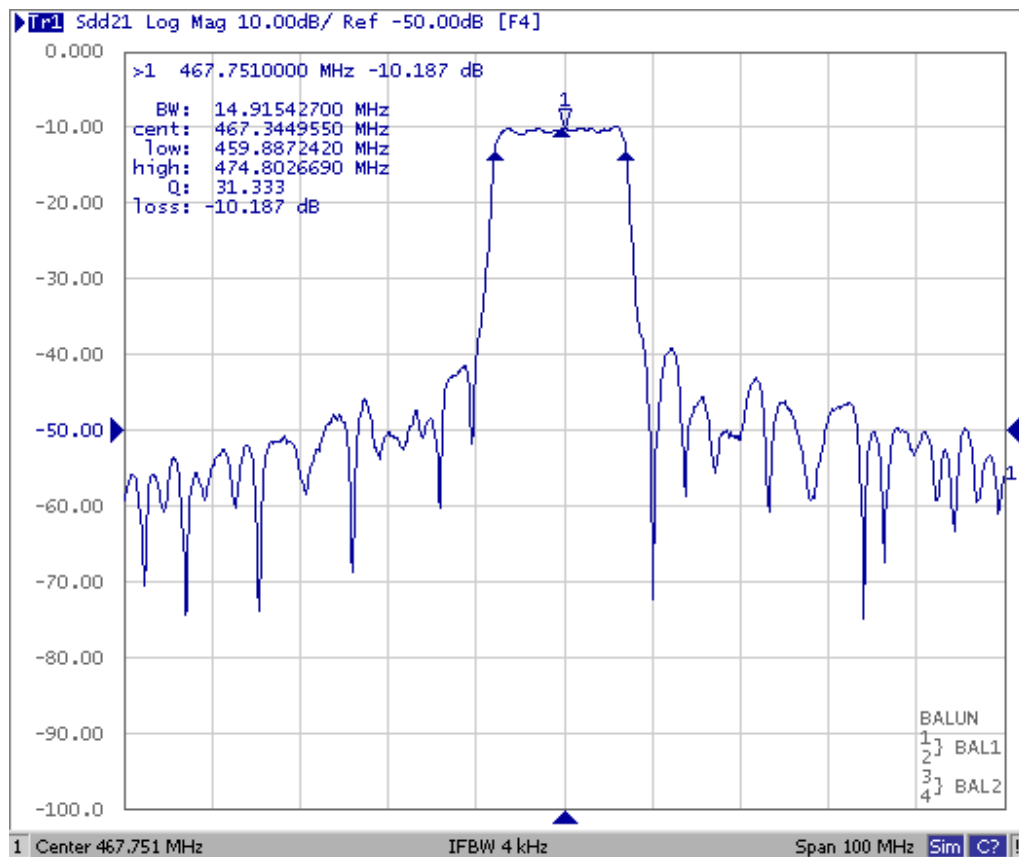


Fig4. Horizontal: 10MHz/Div Vertical: 10dB/Div

(5) Pass band Response and Group Time Delay response: (Differential; $Z_0=150\ \Omega$)

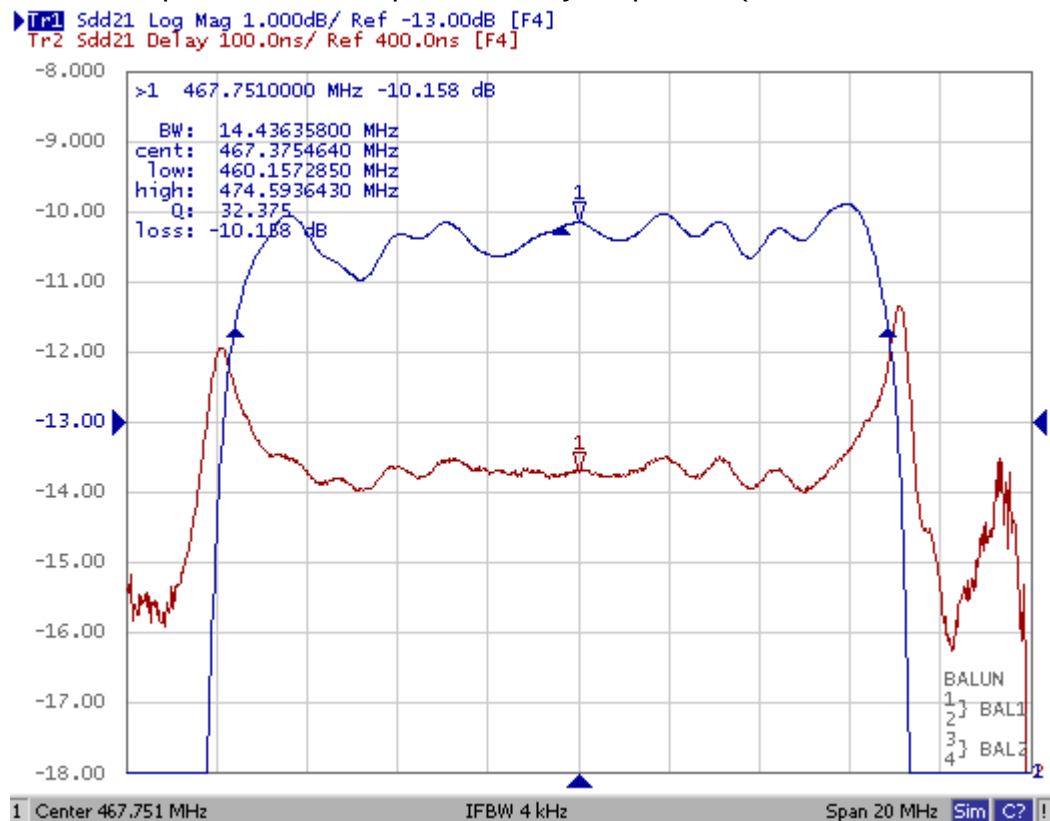
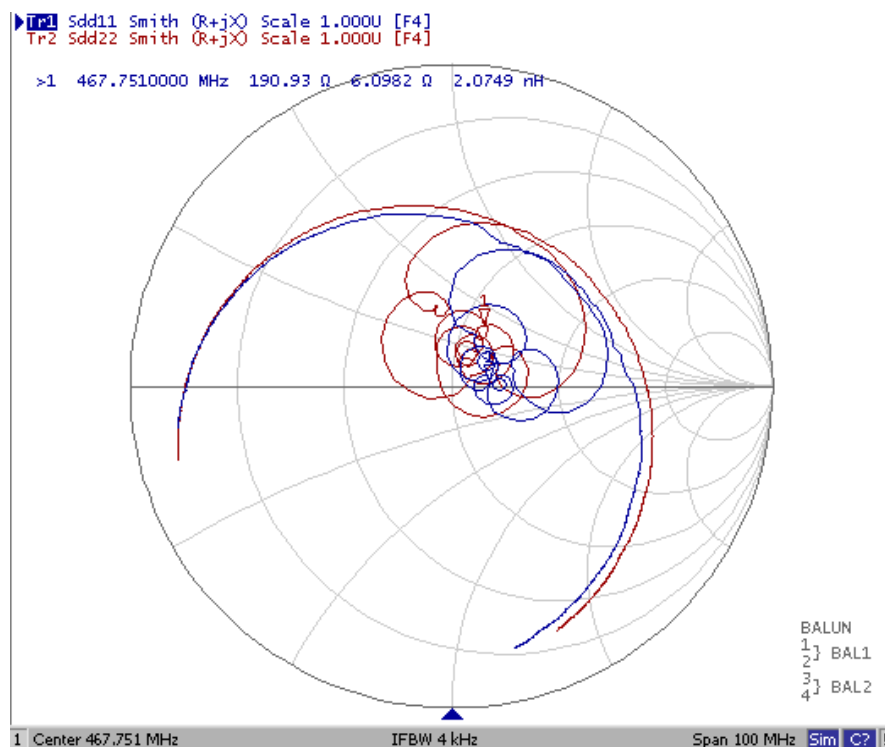


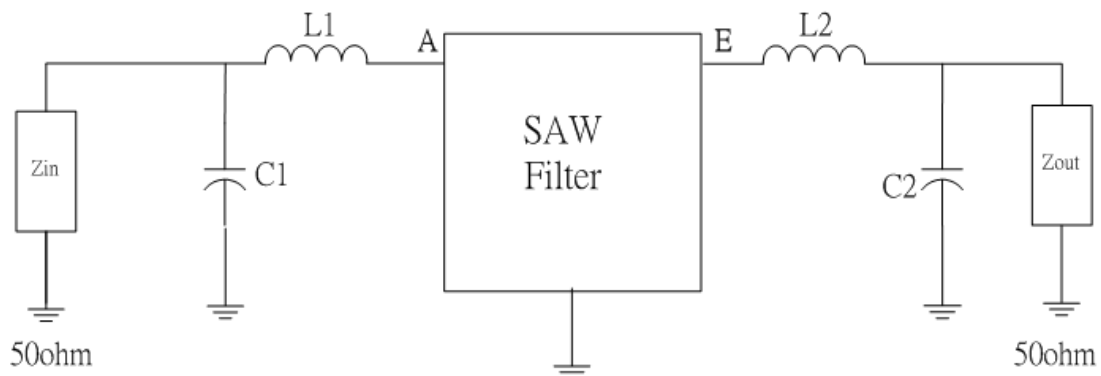
Fig52. Horizontal: 2MHz/Div Vertical: 10dB/Div
Vertical: 100dB/Div

(6) Smith Chart: (Differential; $Z_0=150\ \Omega$)



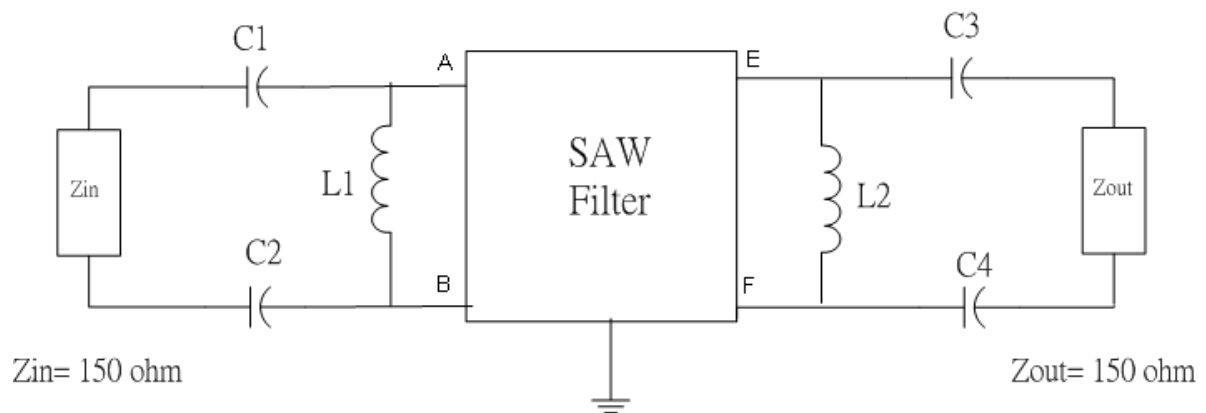
D. MATCHING CIRCUIT:

Single-end:



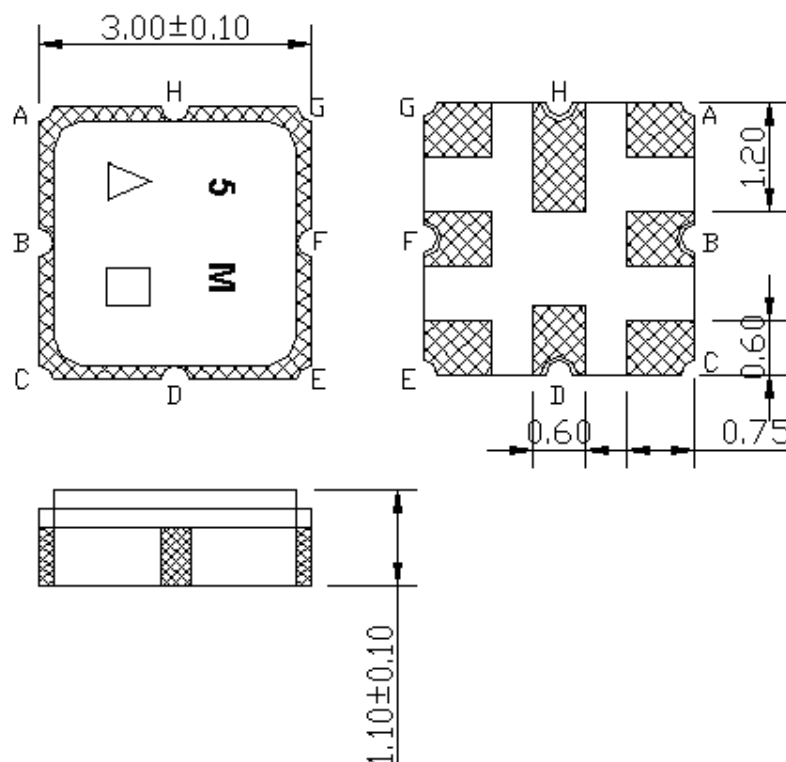
$$L1=18\text{nH} \quad L2=22\text{nH} \quad C1=12\text{pF} \quad C2=12\text{pF}$$

Differential:



$$L1=L2=18\text{nH} \quad C1=C2=3.9\text{pF} \quad C3=C4=3.9\text{pF}$$

E. OUTLINE DRAWING:



#A –Input

#B –Balance Input or to be ground

#E – Output

#F – Balance Output to be ground

#C,D,G,H – Ground

□ : Week Code

Unit : mm

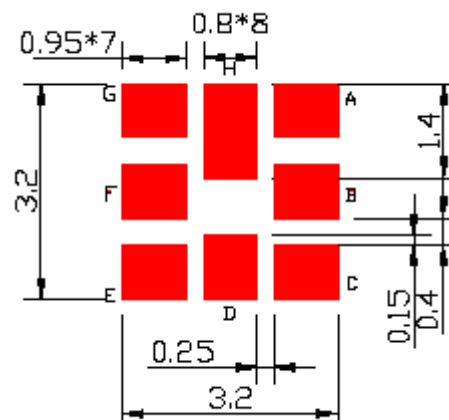
△ : Product / Year Code

Product / Year Code:2010→0, 2011→1, ... 2019→9, 2020→0 ...

Week Code Table

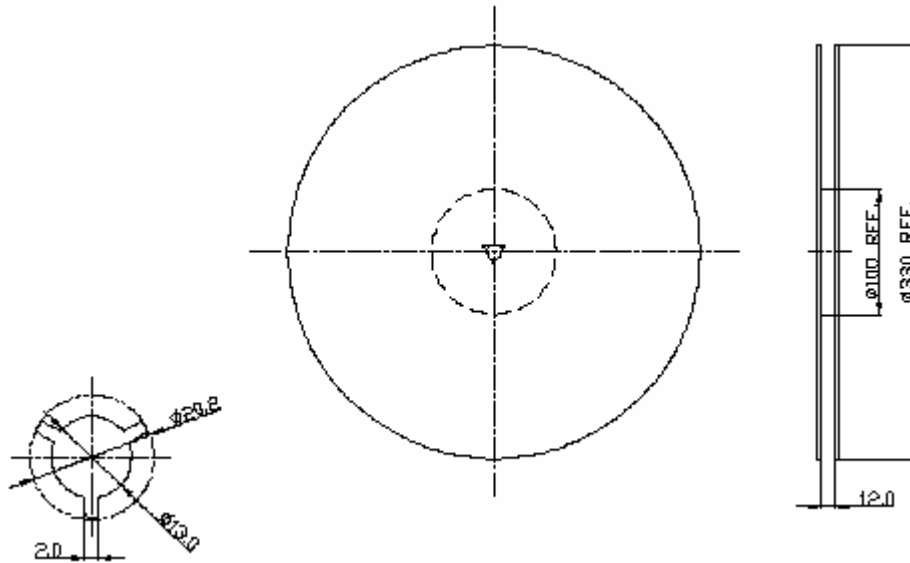
WK01	WK02	WK03	WK04	WK05	WK06	WK07	WK08	WK09	WK10	WK11	WK12	WK13
A	B	C	D	E	F	G	H	I	J	K	L	M
WK14	WK15	WK16	WK17	WK18	WK19	WK20	WK21	WK22	WK23	WK24	WK25	WK26
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
WK27	WK28	WK29	WK30	WK31	WK32	WK33	WK34	WK35	WK36	WK37	WK38	WK39
a	b	c	d	e	f	g	h	i	j	k	l	m
WK40	WK41	WK42	WK43	WK44	WK45	WK46	WK47	WK48	WK49	WK50	WK51	WK52
n	o	p	q	r	s	t	u	v	w	x	y	z

F. PCB FOOTPRINT:

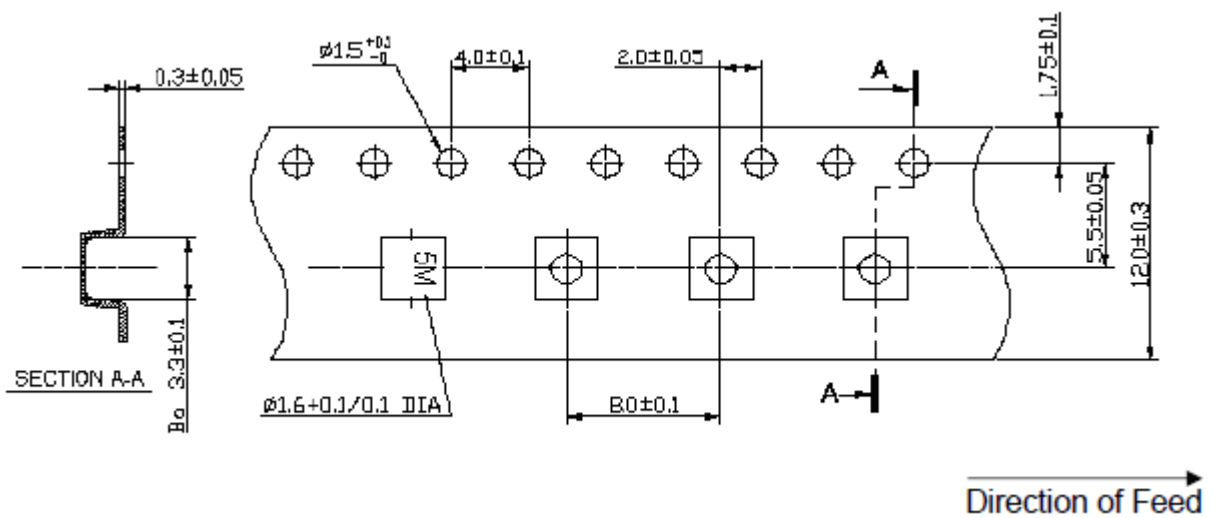


G. PACKING:

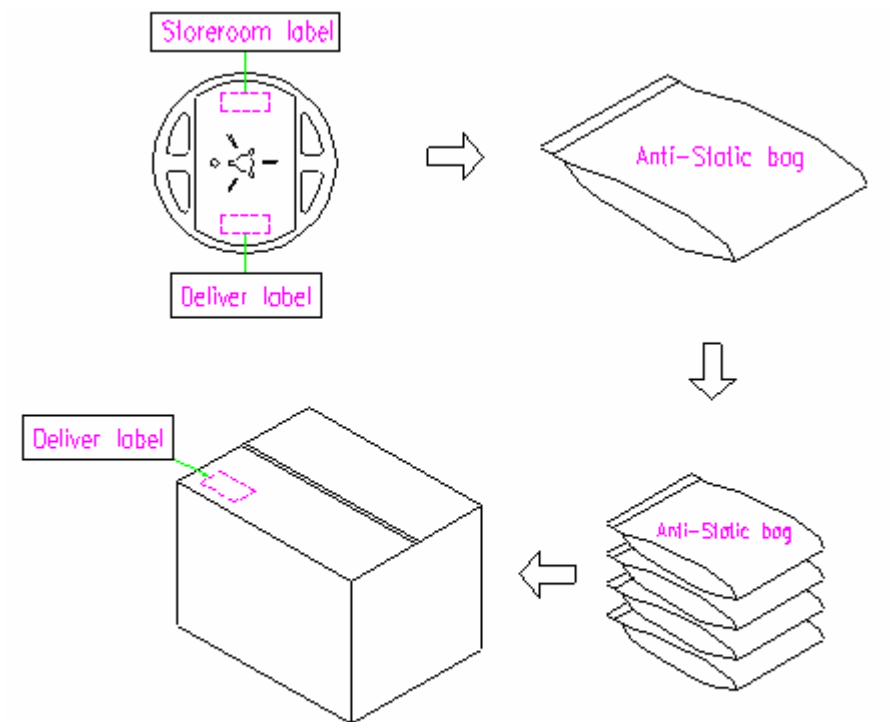
1. REEL DIMENSION: (Please refer to FR-75D10 for packing quantity)



2. TAPE DIMENSION:



3. PROCEDURE:



Box label

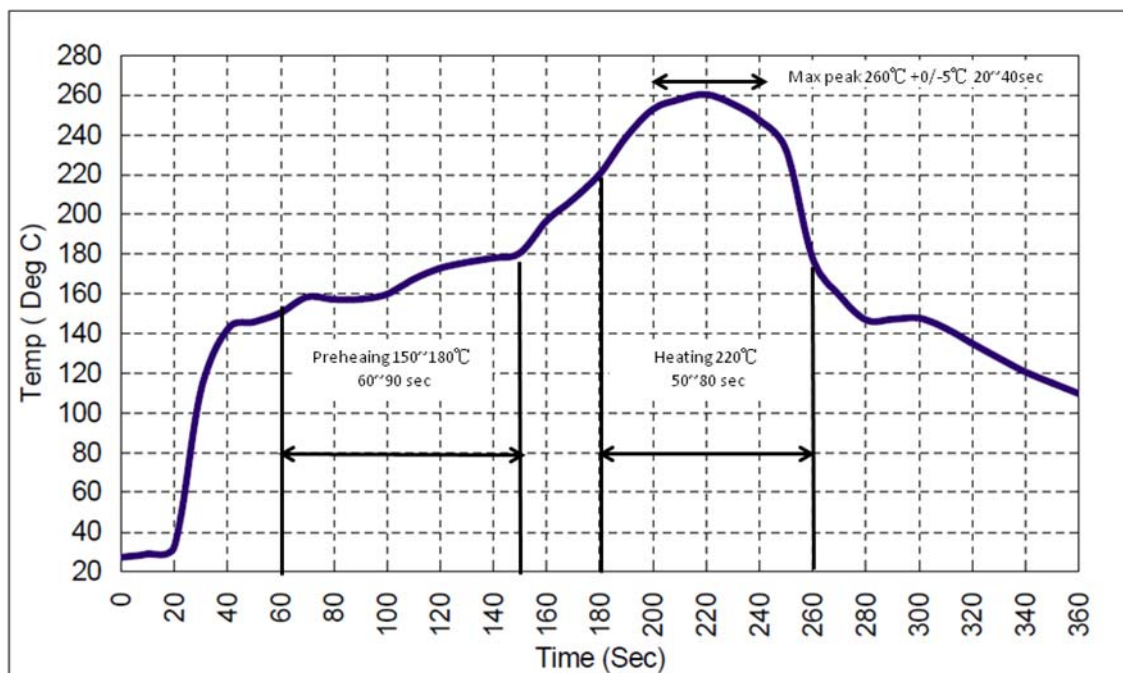
TST 台灣嘉碩科技股份有限公司 TAI-SAW TECHNOLOGY CO., LTD.	
Customer: TECHNOLOGIES, INC. 科技股份有限公司	
Part No: TZ0629A	Customer Part No: 18G000262-01
Vendor Code: TST	Customer PO No: 980110017
Quantity: 6000	RoHS Compliant Lead free Lead-free soldering
Shipping Date: 2009/02/02	Description: 26/10/10, 8/5, 0x3, 2 Xtal Resonator

Reel label

TST 台灣嘉碩科技股份有限公司 TAI-SAW TECHNOLOGY CO., LTD.	
Customer: TECHNOLOGIES, INC. 科技股份有限公司	
Part No: TZ0629A	C. Part No: 18G000262-01
Vendor Code: TST	C. PO No: 980110017
Quantity: 3000	RoHS Compliant Lead free Lead-free soldering
Shipping Date: 2009/02/02	Description: 26/10/10, 8/5, 0x3, 2 Xtal Resonator

H. RECOMMENDED REFLOW PROFILE:

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (20~40sec).
4. Time: 2 times.



I. STORAGE CONDITIONS:

- 1) Store in manufacturer's package or tightly reclosed box with the following conditions.
[Temperature: -10...+40°C, Humidity: 30...85%RH] Examine solderability before using this component, since more than 6 months storage might be a cause of degradation of solderability. Notice that long-term storage might be a cause of the discoloration.
- 2) To keep solderability of outer-electrode, do not store in the following environments.
 - Ambient air containing corrosive gas (C12, H2S, NH3, SOX, NOX, etc.)
 - Ambient air containing volatile or combustible gas
 - In dusty place
 - In the places where the water splashes and it tends to condense for high humid
 - In direct sunlight
 - In the places under the strong influence of static electricity or electric field strengthContact the manufacturer before using the component in any of the above environments.
- 3) Do not open minimum packing unit until usage.
- 4) The product meet MSL: Level 1 and ESD H600V/ M400V.

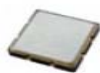
J. RELIABILITY SPECIFICATIONS:

Test name	Test process / method	Reference standard
Mechanical characteristics		
resistance to	Temp./Duration : 265°C /10sec	EIAJED-4701
Soldering heat (IR reflow)	Total time : 4min.(IR-reflow)	-300(301)M(II)
Vibration	Total peak amplitude : 1.5mm Vibration frequency : 10 to 55 Hz Sweep period : 1.0 minute Vibration directions : 3 mutually perpendicular Duration : 2 hr / direc.	MIL-STD 202F method 201A
Vibration	Total peak amplitude: 1.5mm Vibration frequency: 10 to 2000 Hz Sweep period: 20 minute The cycle: 12 cycles Vibration directions: 3 mutually perpendicular	MIL-STD-202 Method 213
Mechanical Shock	directions : 3 impacts per axis Acceleration : 6000g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine	MIL-STD 202F method 213C
Solderability	Solder Temperature: 265±5°C Duration time: 5±0.5 seconds.	MIL-STD 883 method 2003
Environmental characteristics		
Thermal Shock	Heat cycle conditions -55 °C (30min) ↔ 125 °C (30min) * cycle time : 1000 times	MIL-STD 883D method 1010.7
Humidity test	Temperature : 85 ± 2 °C Relative humidity : 85% Duration : 1000 hours	MIL-STD 202F method 103B
Dry heat (Aging test)	Temperature : 125 ± 2 °C Duration : 1000 hours	MIL-STD 202F method 108A
Cold resistance	Temperature : -40 ± 3 °C Duration : 1000 hours	condition C JIS C6703 7.4.1

K. MTTF:



Confidential Proprietary
Report by : 2014/05/13



SAW Filter Devices(3x3mm SMD Seam Type Series)

MTTF(Mean Time To Failure) By High Temperature Storage Test

Refer to Military Handbook MIL-HDBK-217F

Reliability prediction of electronic equipment – section 5.6 / Microcircuits, SAW devices.

Total Test Hours	1500000	Hours
Expected customer Ave. Operating Tem	55	°C
Test Temperature	125	°C
Quantity Failed	0	Pcs
Activation Enrgy	0.437	Ev
Upper Confidence Level	90%	
Chi Sqr Value	4.605	
Acceleration Factor	15.14	