Datasheet of SAW Device

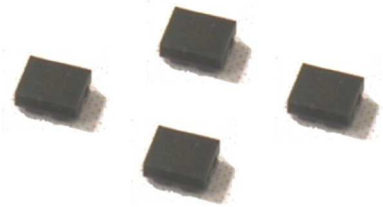
SAW Single Filter

for GPS / Unbalanced / 4pin /0907

Murata PN : SAFBA1G17AA0E0A

■ Feature

- ➢ World Smallest GPS(L5) Filter
- ➢ Next Gen. Industry Standard Size
- ➢ Very Low Insertion Loss



Note : This Murata SAW Component is Industry grade product and applicable for higher reliability & wide operating temperature requirement in Consumer & Industry application.
Please also read Important Notice at the end of this document.

Revision
C

General Information

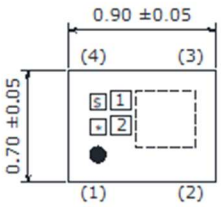
- Operating temperature	: -40 to +85deg.C
- Storage temperature	: -40 to +105deg.C
- Input Power	: +15.0 dBm 5000 h +50 deg.C (*)Input signal shall be applied to Terminal number (4)
- D.C. Voltage between the terminals	: 3V (25+/-2 deg.C)
- Minimum Resistance between the terminals	: 10M ohm
- RoHS compliance	: Yes
- ESD (ElectroStatic Discharge) sensitive device	

Package Dimensions & Recommended Land Pattern

unit: mm

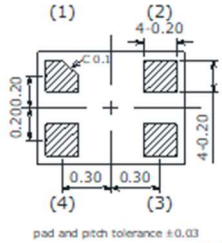
Dimensions

TOP VIEW



FRONT VIEW

BOTTOM VIEW

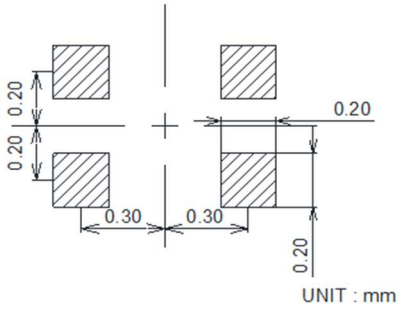


Marking : Laser Printing
* : Month code
$: Date code
1 : A
2 : A

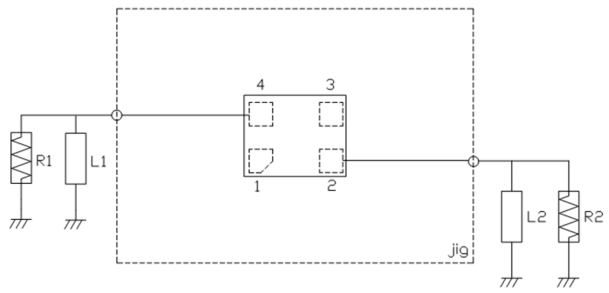
Terminal Number
(4) : Unbalanced port (Input)
(2) : Unbalanced port (Output)
Others : GND

Notice) Please refer to Measurement Circuit for Port information in detail.

Land Pattern



Measurement Circuit (Top Thru View)



R1 : 50 ohm	L1 : 30 nH (Ideal inductor)
R2 : 50 ohm	L2 : 30 nH (Ideal inductor)

Electrical Characteristic

Single Filter					Characteristics (-20~+85deg.C)			Unit	Note
					min.	typ.*	max.		
Center Frequency						1176.45		MHz	
Insertion Loss	1166.22	to	1186.68	MHz		0.9	1.5	dB	
	1166.22	to	1186.68	MHz		0.9	1.3	dB	+23 to +27deg.C
Ripple Deviation	1166.22	to	1186.68	MHz		0.1	1.0	dB	
GDT Ripple Deviation	1166.22	to	1186.68	MHz		7	22	ns	
VSWR	1166.22	to	1186.68	MHz		1.2	2.0		
Absolute Attenuation	638.	to	960.	MHz	35	39		dB	
	1330.	to	1427.	MHz	28	34		dB	
	1427.	to	1511.	MHz	33	39		dB	
	1640.	to	1695.	MHz	30	39		dB	
	1695.	to	1710.	MHz	40	48		dB	
	1710.	to	2200.	MHz	40	47		dB	
	2300.	to	2400.	MHz	39	44		dB	
	2400.	to	2483.	MHz	38	43		dB	
	2483.	to	2690.	MHz	35	41		dB	
	3300.	to	3800.	MHz	28	34		dB	n78
	3300.	to	4200.	MHz	28	34		dB	n77
	4400.	to	5000.	MHz	26	31		dB	n79
	5150.	to	5950.	MHz	24	30		dB	5G ISM

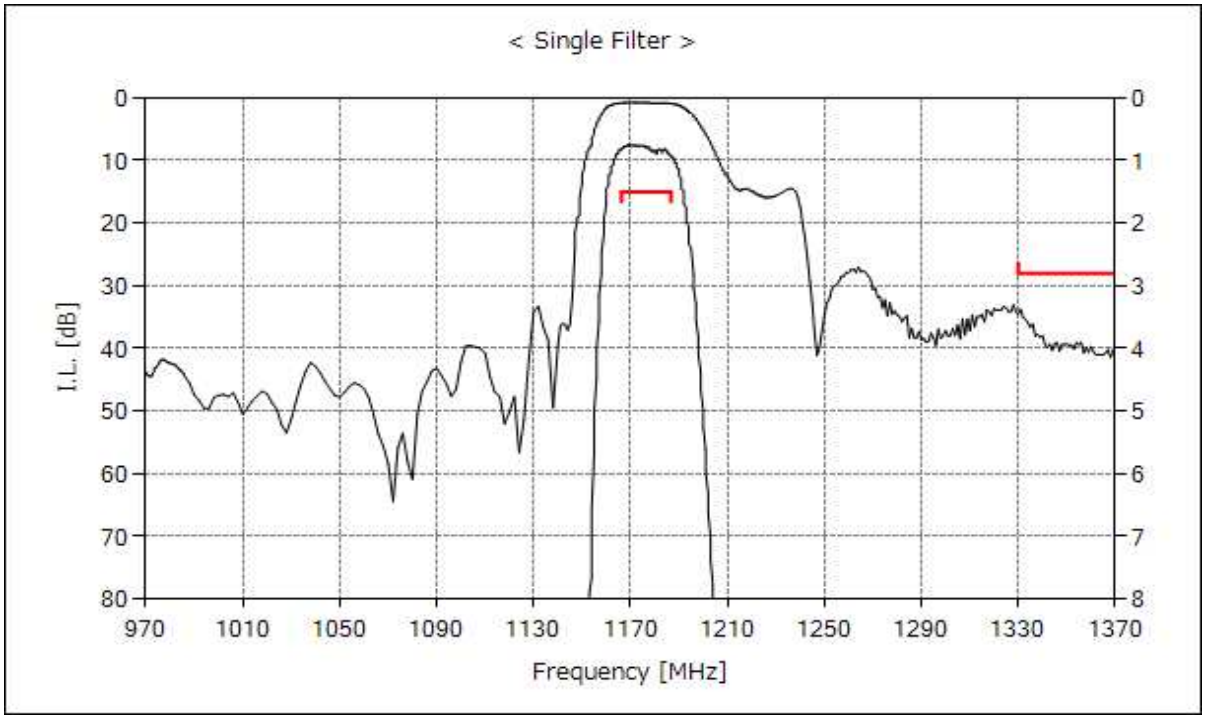
* Typical value at 25±2deg.C

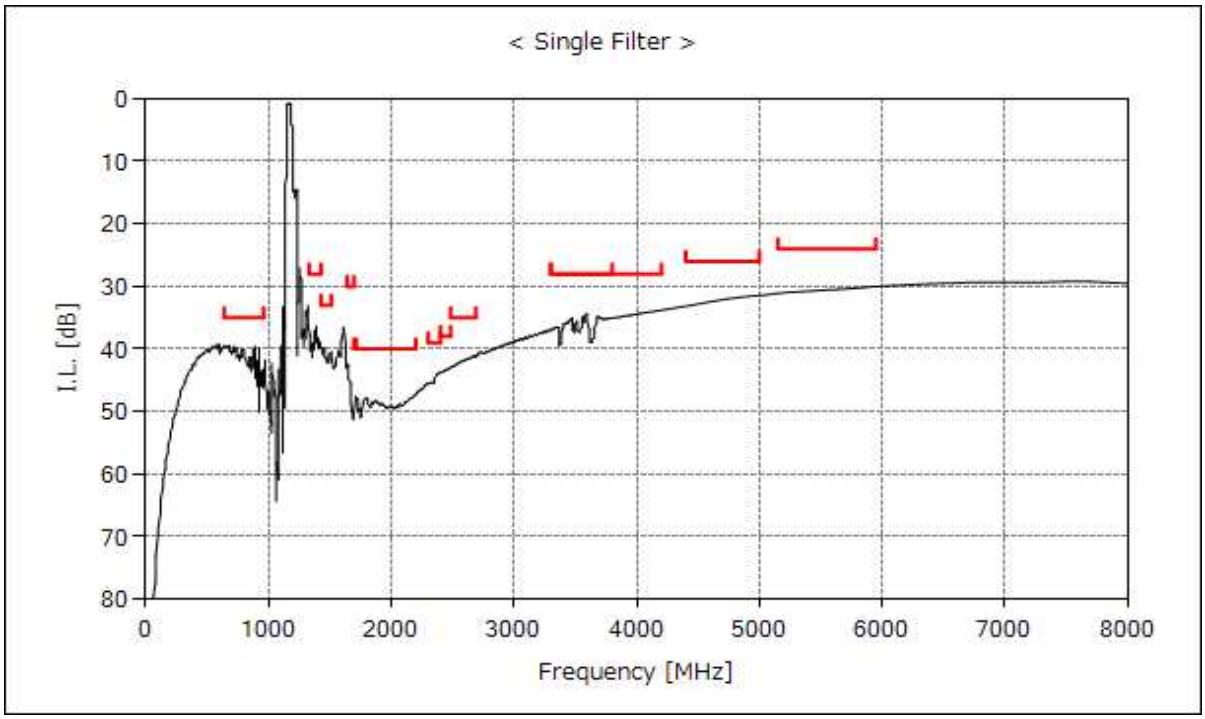
Electrical Characteristic

Single Filter					Characteristics (-40~+85deg.C)			Unit	Note
					min.	typ.*	max.		
Center Frequency						1176.45		MHz	
Insertion Loss	1166.22	to	1186.68	MHz		0.9	1.8	dB	
	1166.22	to	1186.68	MHz		0.9	1.3	dB	+23 to +27deg.C
Ripple Deviation	1166.22	to	1186.68	MHz		0.1	1.3	dB	
GDT Ripple Deviation	1166.22	to	1186.68	MHz		7	25	ns	
VSWR	1166.22	to	1186.68	MHz		1.2	2.3		
Absolute Attenuation	638.	to	960.	MHz	35	39		dB	
	1330.	to	1427.	MHz	28	34		dB	
	1427.	to	1511.	MHz	33	39		dB	
	1640.	to	1695.	MHz	30	39		dB	
	1695.	to	1710.	MHz	40	48		dB	
	1710.	to	2200.	MHz	40	47		dB	
	2300.	to	2400.	MHz	39	44		dB	
	2400.	to	2483.	MHz	38	43		dB	
	2483.	to	2690.	MHz	35	41		dB	
	3300.	to	3800.	MHz	28	34		dB	n78
	3300.	to	4200.	MHz	28	34		dB	n77
	4400.	to	5000.	MHz	26	31		dB	n79
	5150.	to	5950.	MHz	24	30		dB	5G ISM

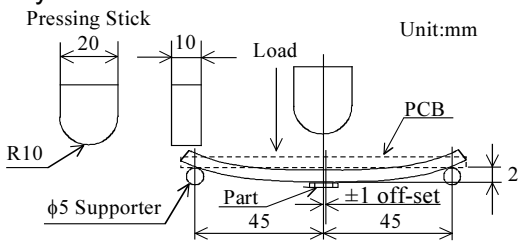
* Typical value at 25±2deg.C

Electrical Characteristic





PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

	Test Item	Test Condition	Criteria
7.1	PCB Bend Strength	Filter is soldered onto the center of 0.8mm thickness PCB which is laid on the two small supporters spaced 90mm as shown in below figure. PCB is deflected to 2mm below from horizontal level by the pressing stick. The force is supplied for 1 second, 5 times repeatedly. 	No visible damage should be induced and the electrical performance should meet Table 1.
7.2	Vibration	The electrical performance is measured after being applied vibration of amplitude of 1.5mm with 10 to 55Hz of vibration frequency to each of 3 perpendicular directions for 2 hours.	The electrical performance should meet Table 1.
7.3	Drop Test	The electrical performance is measured after a dropping with housing (around 150g) from a height of 150cm onto the concrete plate 3 times in each of 6 perpendicular directions.	
7.4	Solderability	In accordance to the following conditions solder wettability is satisfied. Solder Paste: Sn-3.0Ag-0.5Cu Pre-heat: 150~180 deg.C, 60~120sec Peak temperature: 235 deg.C max. Over 225 deg.C: 15s~25s	95% minimum of the immersed surface should be covered with solder.
7.5	Resistance to Soldering Heat	Filter is preheated at 170±10°C for 90 seconds, immersed whole electrode in soldering bath at 255±5°C for 3±1 seconds, then measured after being placed in standard atmospheric conditions for 2 hours.	The electrical performance should meet Table 1.
7.6	Temperature Characteristics	The electrical performance is measured over -40...+85 ° C temperature range.	The electrical performance should meet chapter 6.
7.7	Humidity	The electrical performance is measured after being placed in a chamber with 85% R.H. at 85°C for 1000 hours and then being placed in standard atmospheric conditions for 2 hours.	The electrical performance should meet Table 1.
7.8	Life Test (High Temperature)	The electrical performance is measured after being placed in a chamber with 105°C for 1000 hours and then being placed in standard atmospheric conditions for 2 hours.	
7.9	Life Test (Low Temperature)	The electrical performance is measured after being placed in a chamber with -40°C for 1000 hours and then being placed in standard atmospheric conditions for 2 hours.	
7.10	Temperature Cycle Test	After temperature cycling of -40°C for 30 minutes to +85°C for 30 minutes performed 500 times, filter shall be returned to room temperature. And the electrical performance is measured after being placed in standard atmospheric conditions for 2 hours.	
7.11	Resistance to Reflow Soldering	The electrical performance is measured after being soldered by reflow 3 times with the following reflow profile (see Graph. 1) and then being placed in standard atmospheric conditions for 24 hours.	

SAFBA1G17AA0E0A (GPS / Unbalanced / 4pin / 0907)

Table 1 Electrical Characteristics

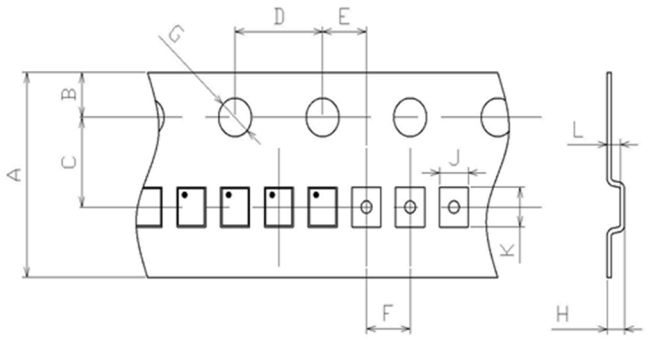
< Refer to Measurement Circuit >

Single Filter					Characteristics		Unit	Note
					min.	max.		
Insertion Loss	1166.22	to	1186.68	MHz		1.8	dB	
Ripple Deviation	1166.22	to	1186.68	MHz		1.3	dB	
GDT Ripple Deviation	1166.22	to	1186.68	MHz		25	ns	
VSWR	1166.22	to	1186.68	MHz		2.3		
Absolute Attenuation	638.	to	960.	MHz	35		dB	
	1330.	to	1427.	MHz	28		dB	
	1427.	to	1511.	MHz	33		dB	
	1640.	to	1695.	MHz	30		dB	
	1695.	to	1710.	MHz	40		dB	
	1710.	to	2200.	MHz	40		dB	
	2300.	to	2400.	MHz	39		dB	
	2400.	to	2483.	MHz	38		dB	
	2483.	to	2690.	MHz	35		dB	
	3300.	to	3800.	MHz	28		dB	n78
	3300.	to	4200.	MHz	28		dB	n77
	4400.	to	5000.	MHz	26		dB	n79
	5150.	to	5950.	MHz	24		dB	5G ISM

* All the tests shall be carried out on the following conditions.
[Temperature: 25±2°C, Humidity: 65±5% R.H.]

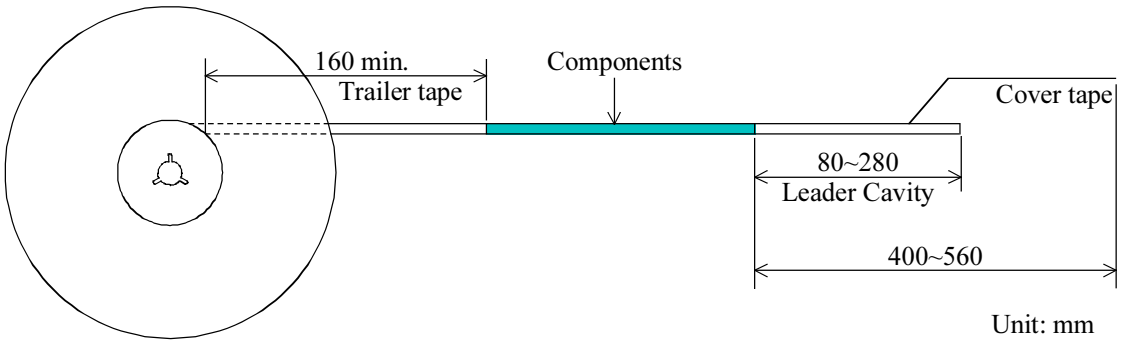
Dimensions of Tape & Reel unit: mm

Carrier Tape

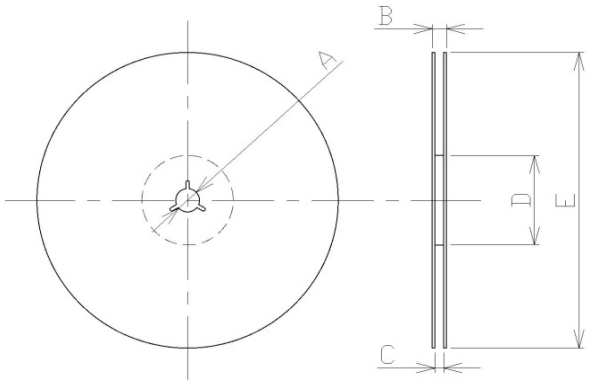


A: 8.0
B: 1.75
C: 3.50
D: 4.0
E: 2.00
F: 2.0
G: φ1.5
H: 0.83
J: 0.85
K: 1.05
L: 0.63

Tape



Reel



φ178Reel	φ330Reel
A: φ13.0	A: φ13.0
B: 13.5max	B: 15.5max
C: 9.0	C: 9.5
D: φ60	D: φ100
E: φ178	E: φ330

SAFBA1G17AA0E0AR1X… 10000pcs (φ178)
SAFBA1G17AA0E0AR1S… Sample Order (φ178/330)

Important Notice (1/2)

PLEASE READ THIS NOTICE BEFORE USING OUR PRODUCTS.

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All the items and parameters in this product specification/datasheet/catalog have been prescribed on the premise that our Product is used for the purpose, under the condition and in the environment specified in this specification. You are requested not to use our Product deviating from the condition and the environment specified in this specification.
Please note that the only warranty that we provide regarding the Product is its conformance to the specifications provided herein. Accordingly, we shall not be responsible for any defects in products or equipment incorporating such Products, which are caused under the conditions other than those specified in this specification.
Please refer to product specifications for further details of terms of liabilities and warranties.

WE HEREBY DISCLAIMS ALL OTHER WARRANTIES REGARDING THE PRODUCTS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, THAT THEY ARE DEFECT-FREE, OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.

The Product shall not be used for any application which requires especially high reliability or accuracy in order to prevent defect which incurs high possibility of damage to the third party's life, body or property such as the applications listed below as item (a) to (j) (the “Prohibited Application”). You acknowledge and agree that, if you use our Products in the Prohibited Applications, we will not be responsible for any damage caused by such use.
Furthermore, YOU AGREE TO INDEMNIFY AND DEFEND US AND OUR AFFILIATES AGAINST ALL CLAIMS, DAMAGES, COSTS, AND EXPENSES THAT MAY BE INCURRED, INCLUDING WITHOUT LIMITATION, ATTORNEY FEES AND COSTS, DUE TO THE USE OF OUR PRODUCTS IN THE PROHIBITED APPLICATIONS.

(a) Aircraft equipment.
(b) Aerospace equipment
(c) Undersea equipment.
(d) Power plant control equipment
(e) Medical equipment.
(f) Transportation equipment (vehicles, automotive, trains, ships, etc.).
(g) Traffic signal equipment.
(h) Disaster prevention / crime prevention equipment.
(i) Burning / explosion control equipment
(j) Application of similar complexity and/ or reliability requirements to the applications listed in the above.

For the avoidance of doubt, the Product is not automotive grade, and will not support such requests for automotive as below, also not support other specific requests for automotive.

- AEC-Q200
- PPAP
- IATF16949,VDA6.3
- Zero Defect program
- Long product life cycle
- Automotive 8D failure analysis and report

Important Notice (2/2)

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We provide no warranty as to the Product, including any warranty as to quality and safety, in case the Product is molded into module(s) (the “Molded Condition”). You shall indemnify and hold us and our affiliates harmless from any claims, losses and damages caused under the Molded Condition. If you use the Product under the Molded Condition, you shall take all measures to ensure that adequacy, validity, quality and safety required for use of the Product shall be attained, secured and maintained at your own cost and responsibility.

This product is ESD (ElectroStatic Discharge) sensitive device. When you install or measure this, you should be careful not to add antistatic electricity or high voltage. Please be advised that you had better check anti serge voltage.

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Please do not use our Products, our technical information and other data provided by us for the purpose of developing of mass-destruction weapons and the purpose of military use.
Moreover, you must comply with "foreign exchange and foreign trade law", the "U.S. export administration regulations", etc.

Please note that we may discontinue the manufacture of our products, due to reasons such as end of supply of materials and/or components from our suppliers. We will provide you with written notice of such discontinuation as soon as reasonably practicable but no less than twelve (12) months prior to such discontinuation (the “EOL Notice Requirement”). While we will make commercially reasonable effort to adhere to the EOL Notice Requirement, the notice period may be less than twelve (12) months in the event of unavoidable circumstances.

Customer acknowledges that Murata will, if requested by you, conduct a failure analysis for defect or alleged defect of Products only at the level required for consumer grade Products, and thus such analysis may not always be available or be in accordance with your request (for example, in cases where the defect was caused by components in Products supplied to Murata from a third party).

The Product shall not be used in any other application/model than that of claimed to Murata.

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- deviation or lapse in function of engineering sample,
- improper use of engineering samples.

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