APPROVAL SHEET

RF SAW Duplexer Series – RoHS Compliance

LTE Band 1 system

For Rx Balanced Type

1920~1980 / 2110~2170 MHz
Band Working Frequency

P/N：DB18141950B105T

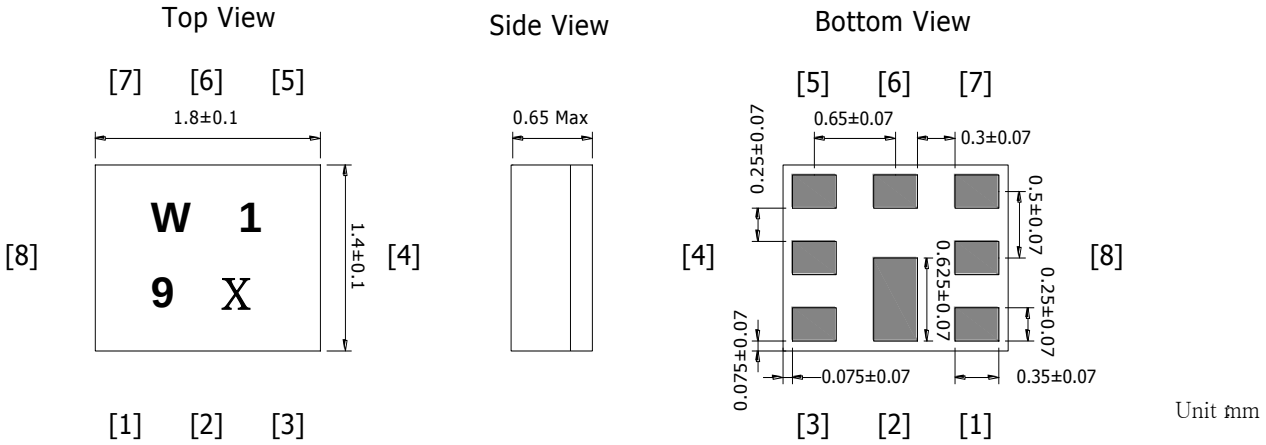
Features

- Low loss, Low pass band ripple
- Single ended to balanced transformation
- Impedance transformation 50 Ohm to 100 Ohm
- Package for **S**urface **M**ount **T**echnology (SMT)
- **E**lectrostatic **S**ensitive **D**evice (ESD)
- Small package：(1.8mm × 1.4mm x 0.65mm)
- RoHS Compliance
- **M**oisture **S**ensitive **L**evel 3 (MSL3)

Application

- LTE Band 1 system

Package Dimensions



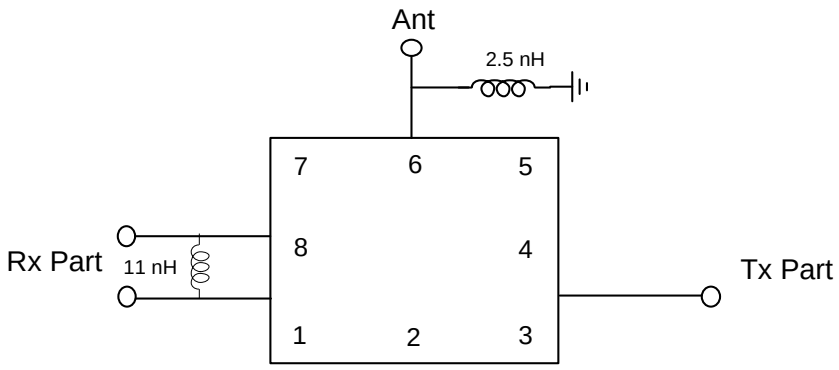
Pin Descriptions

Pin	Description	Pin	Description
[1]	Rx	[5]	GND
[2]	GND	[6]	Ant
[3]	Tx	[7]	GND
[4]	GND	[8]	RX

Marking Descriptions

Marking	Description
W	WTC
1	Band Class
9	Series Number
X	Date Code(Year + Month)

Test Circuit



Electrical Specifications (Tx to ANT & ANT to RX)

Item			Condition (MHz)	Specification			Unit
				Min.	Typ.	Max.	
Tx to ANT	Insertion loss		1920 ~ 1980	-	1.7	2.3	dB
	Pass Band Ripple		1920 ~ 1980	-	0.4	1.3	dB_{p-p}
	VSWR	ANT	1920 ~ 1980	-	1.5	2	-
		Tx		-	1.7	2	-
	Absolute attenuation		824 ~ 849	40	47	-	dB
			869 ~ 894	40	46	-	dB
			880 ~ 915	40	46	-	dB
			925 ~ 960	40	45	-	dB
			1565.42 ~ 1605.88	35	39	-	dB
			1805 ~ 1880	20	38	-	dB
			2010 ~ 2025	10	20	-	dB
			2110 ~ 2170	40	45	-	dB
			2400 ~ 2500	30	43	-	dB
			3840 ~ 3960	30	37	-	dB
			4900 ~ 5950	16	24	-	dB
ANT to RX	Insertion loss		2110 ~ 2170	-	2.2	2.6	dB
	Pass Band Ripple		2110 ~ 2170	-	0.6	1.2	dB_{p-p}
	VSWR	ANT	2110 ~ 2170	-	1.5	2	-
		Rx		-	1.9	2.3	-
	Phase Balance		2110 ~ 2170	-20	-11/-1.5	+20	deg
	Amplitude Balance		2110 ~ 2170	-2.0	+0.1/+1.0	+2.0	dB
	Absolute attenuation		824 ~ 849	45	69	-	dB
			880 ~ 915	45	68	-	dB
			1710 ~ 1785	40	47	-	dB
			1920 ~ 1980	44	47	-	dB
			1980 ~ 2025	25	43	-	dB
			2400 ~ 2500	30	40	-	dB
			4900 ~ 5950	35	45	-	dB

Electrical Specifications (TX to RX)

Item		Condition (MHz)	Specification			Unit
			Min.	Typ.	Max.	
TX to RX	Isolation	1920 ~ 1980	50	54	-	dB
		2110 ~ 2170	50	52	-	dB
Terminating Impedance		Tx port	50			Ohm
		Rx port	100			Ohm
		Ant port	50			Ohm

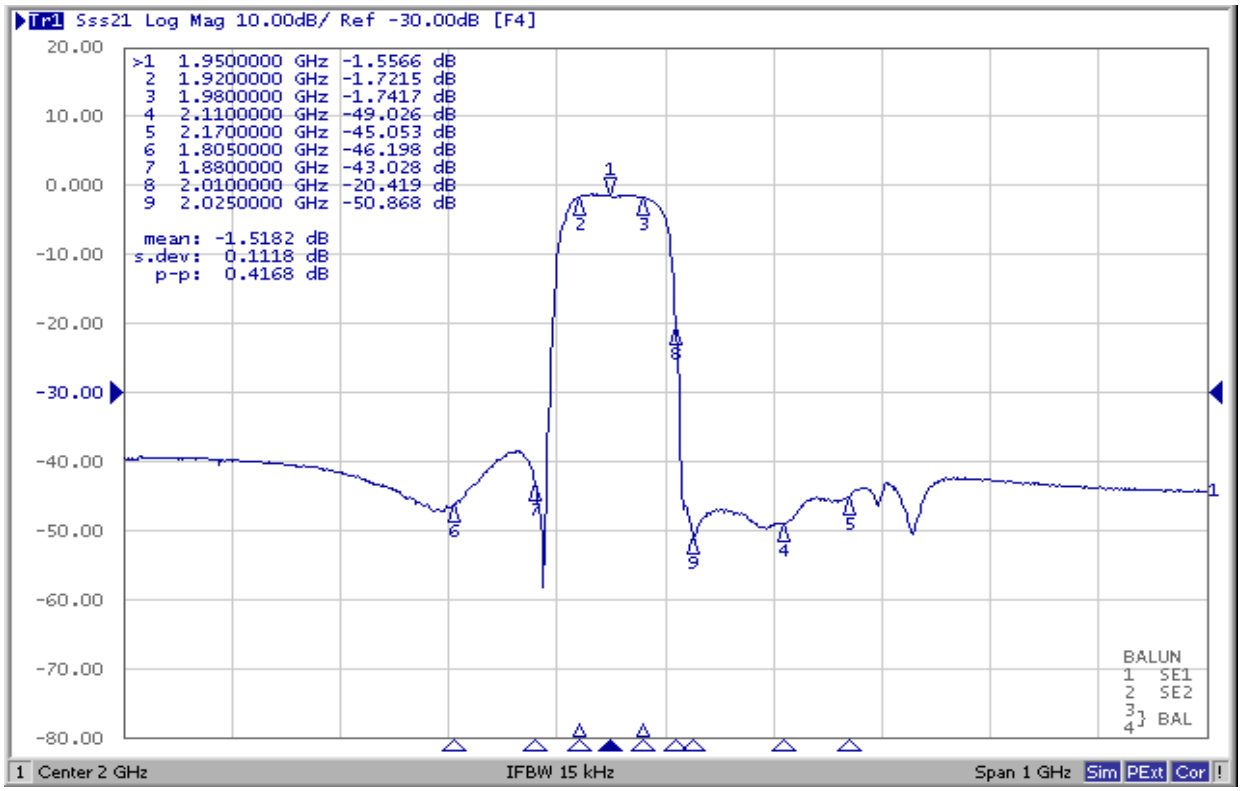
Note：With matching network (Ref. testing environment circuit as shown above).

Absolute Maximum Ratings

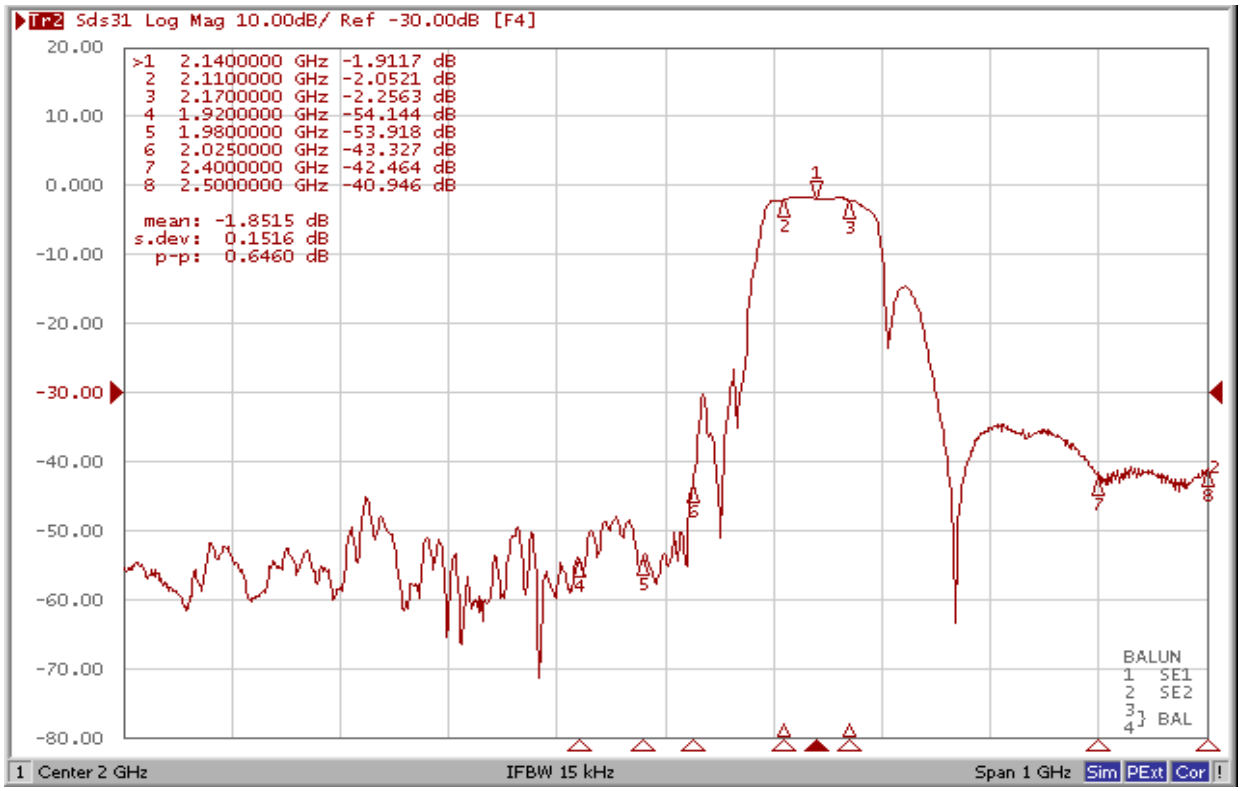
Item	Rating	Unit
DC permissive voltage	0	V
Maximum input power	29	dBm
Operating temperature range	-20 ~ +85	℃
Storage temperature range	-40 ~ +85	℃

Typical Frequency Response

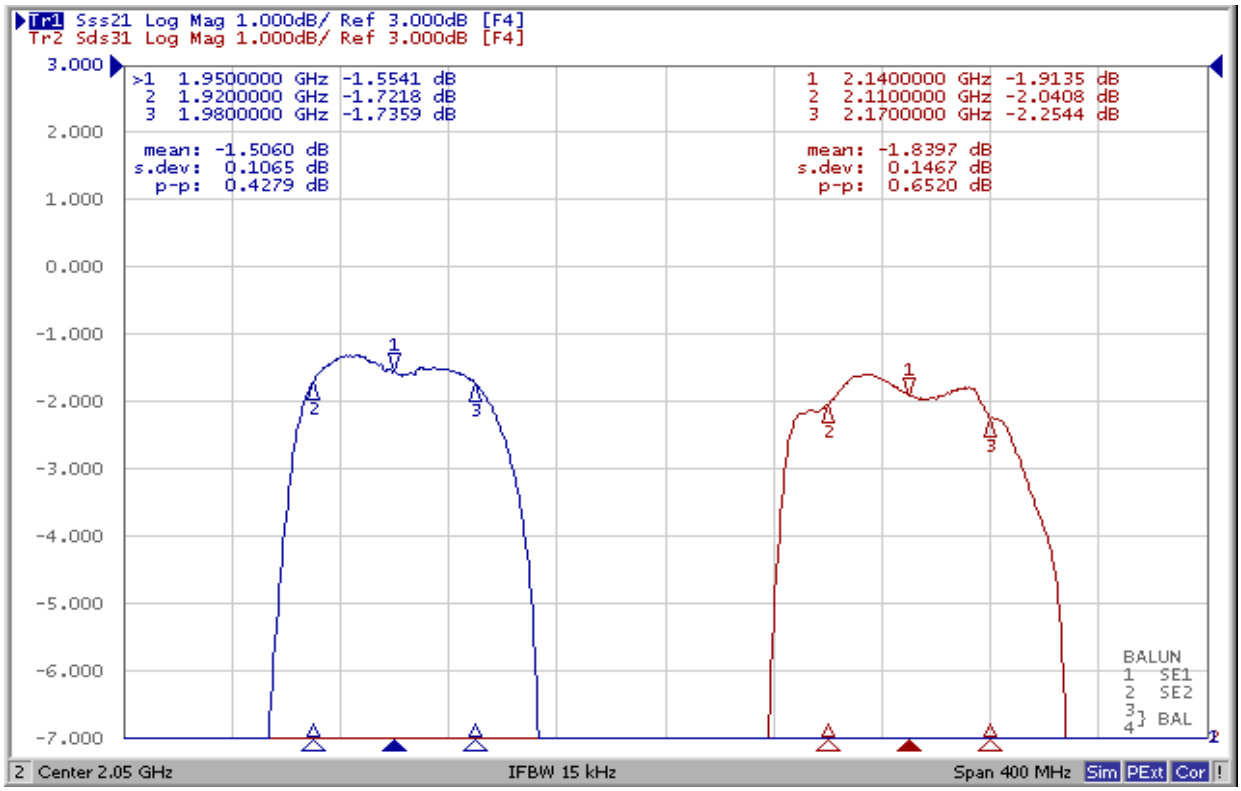
■ **Tx to Ant**



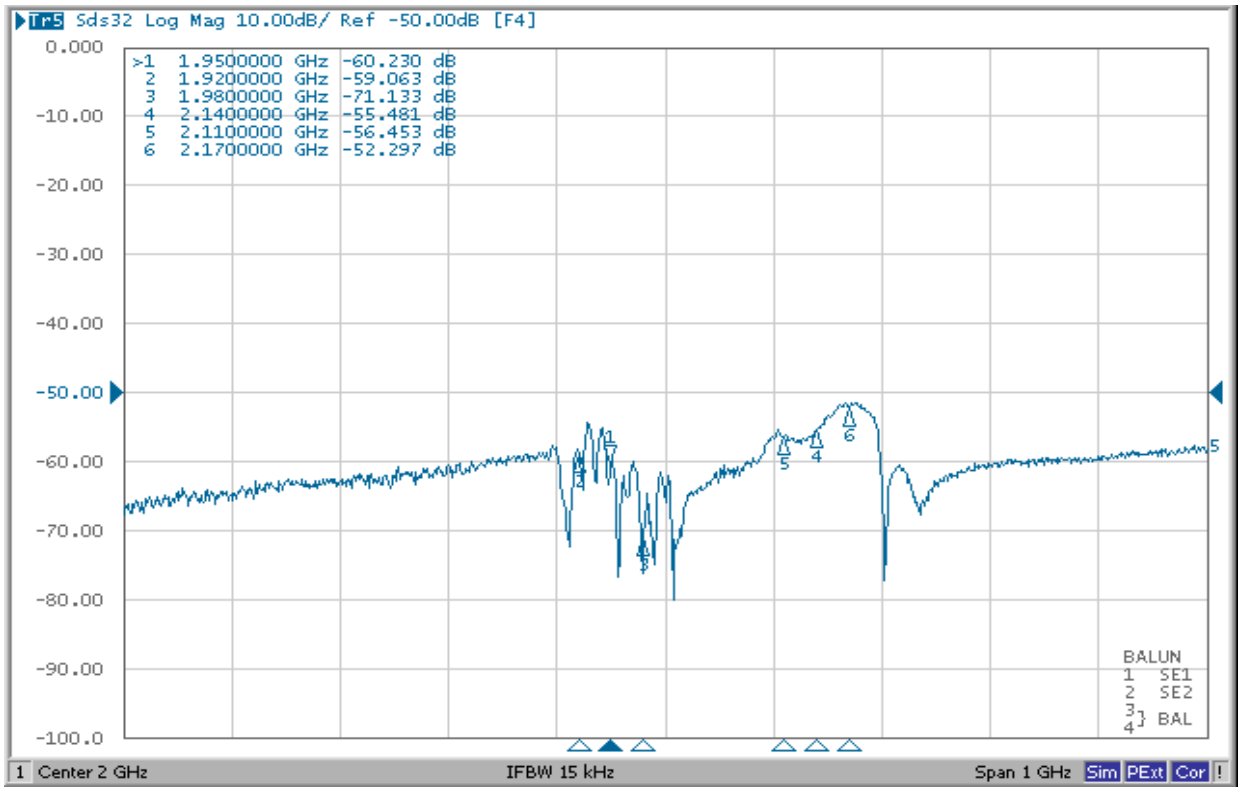
■ **Ant to Rx**



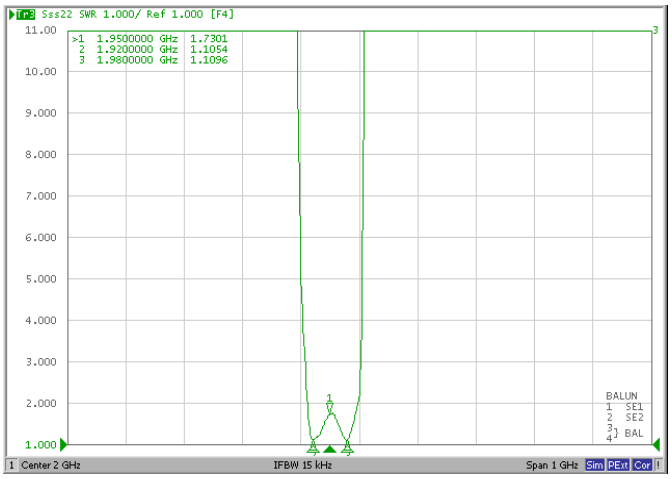
■ **Ripple**

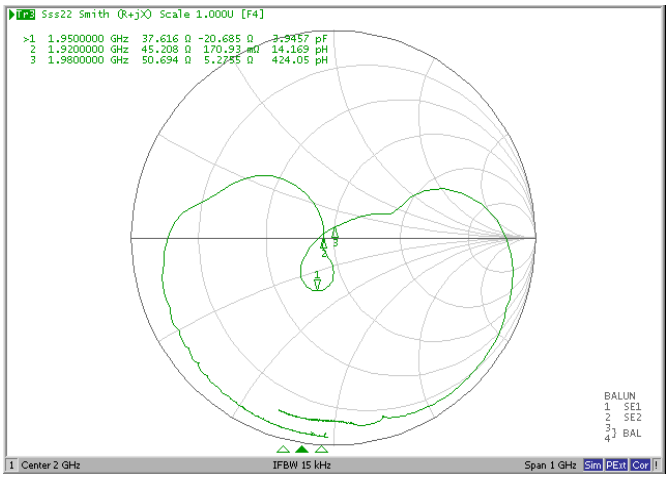


■ **Isolation**

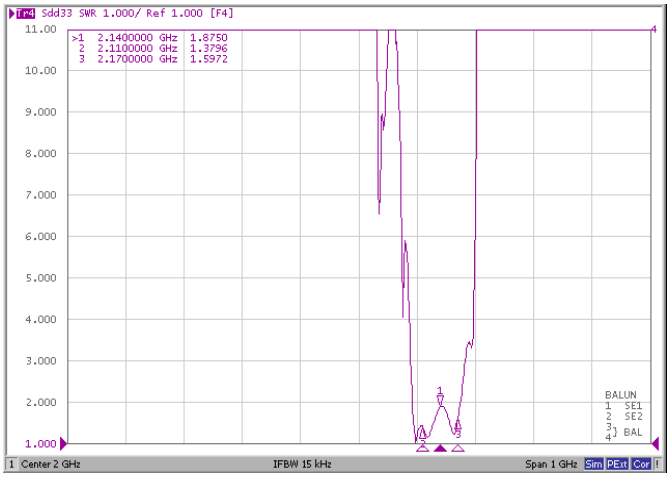


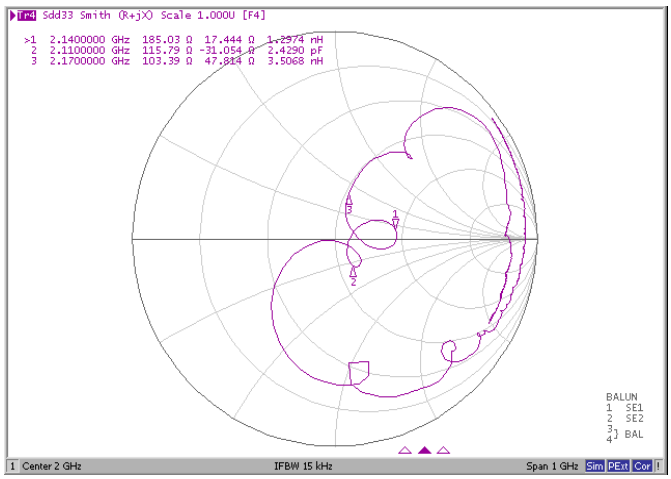
■ VSWR & Smith chart (Tx Port)



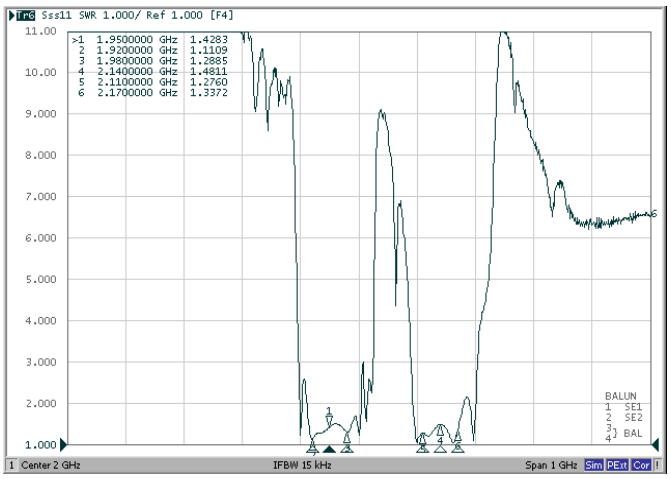


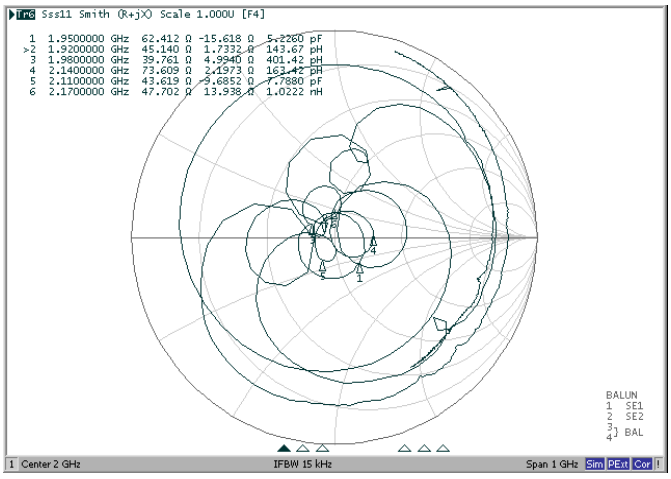
■ VSWR & Smith chart (Rx Port)



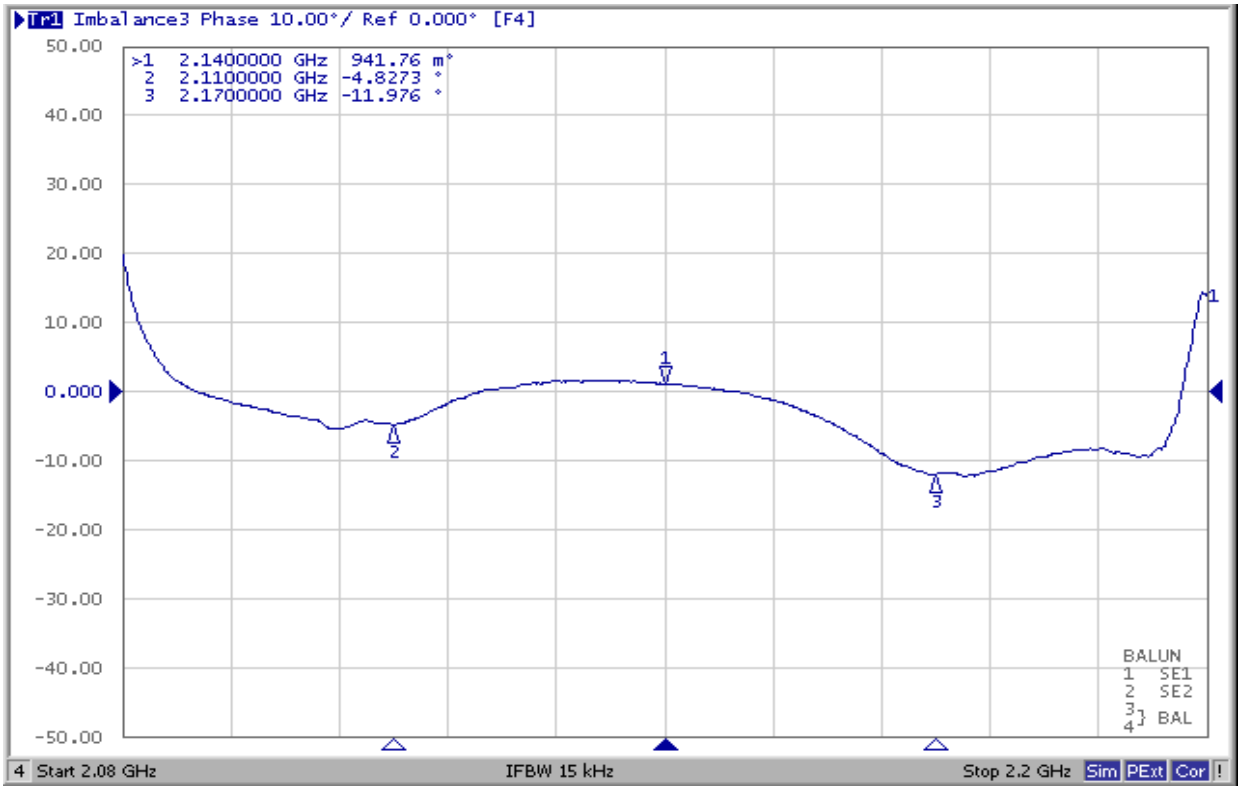


■ VSWR & Smith chart (ANT Port)

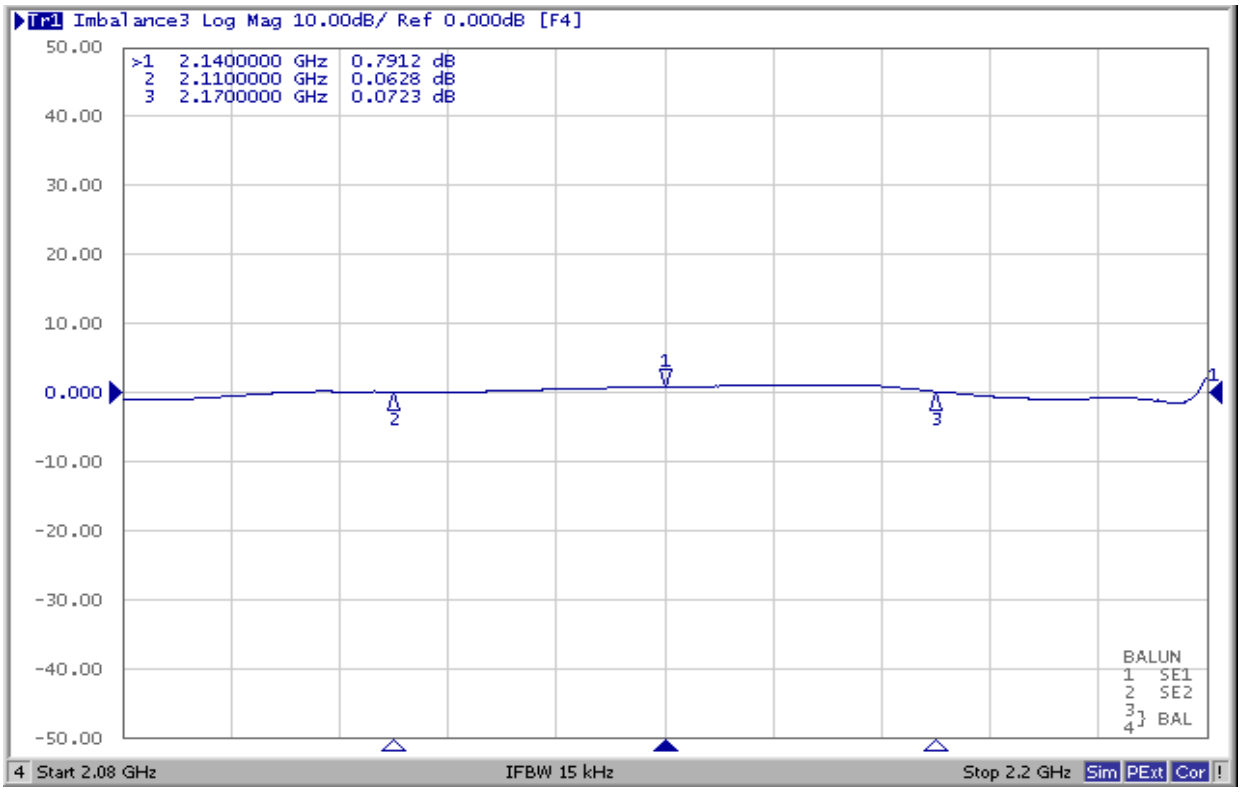




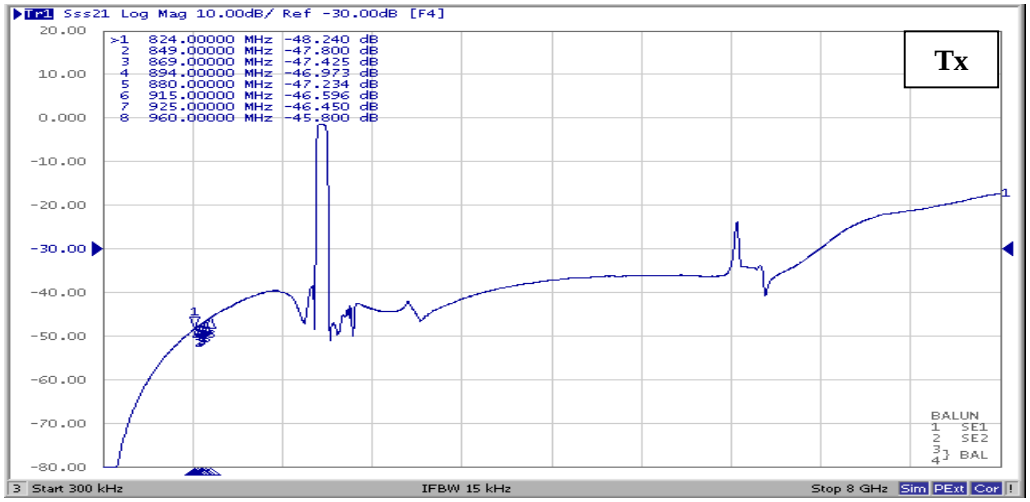
■ **Phase Balance**

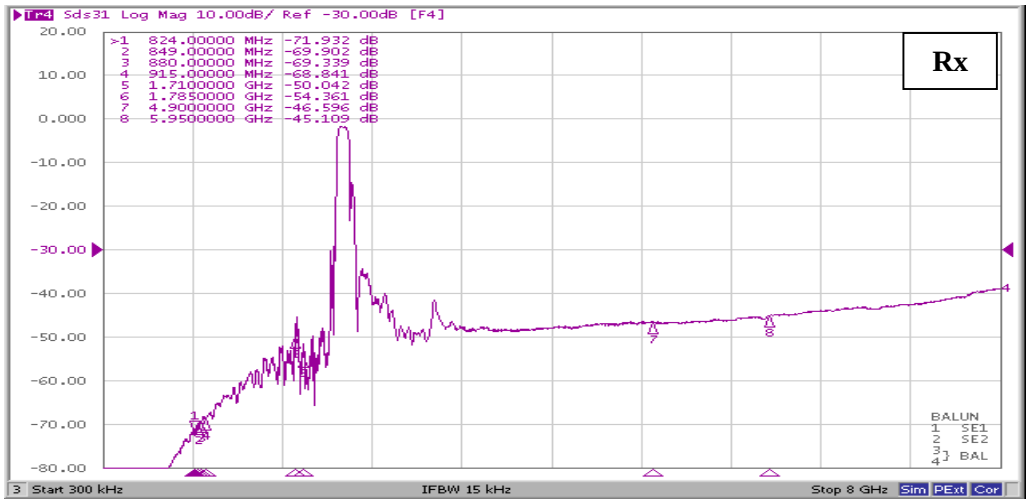


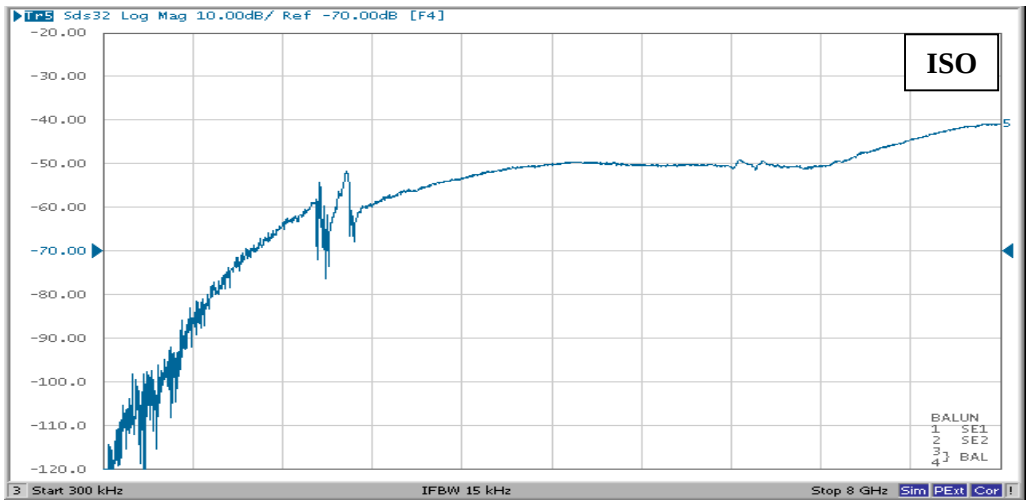
■ **Amplitude Balance**



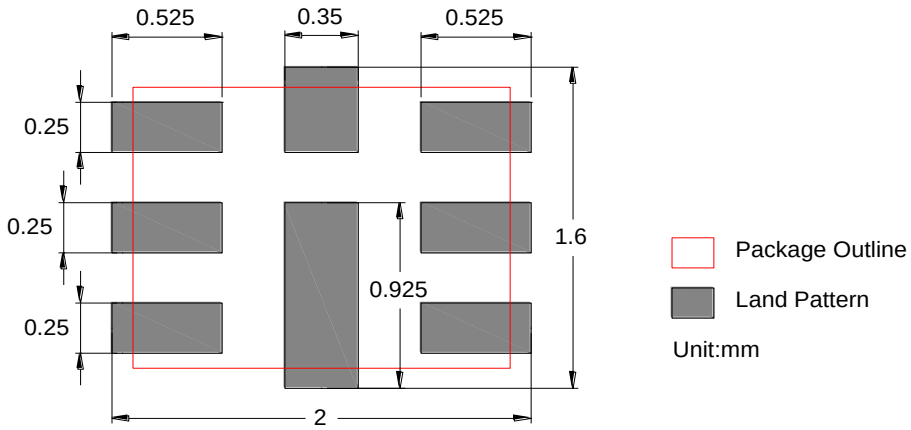
■ **Wide Span**







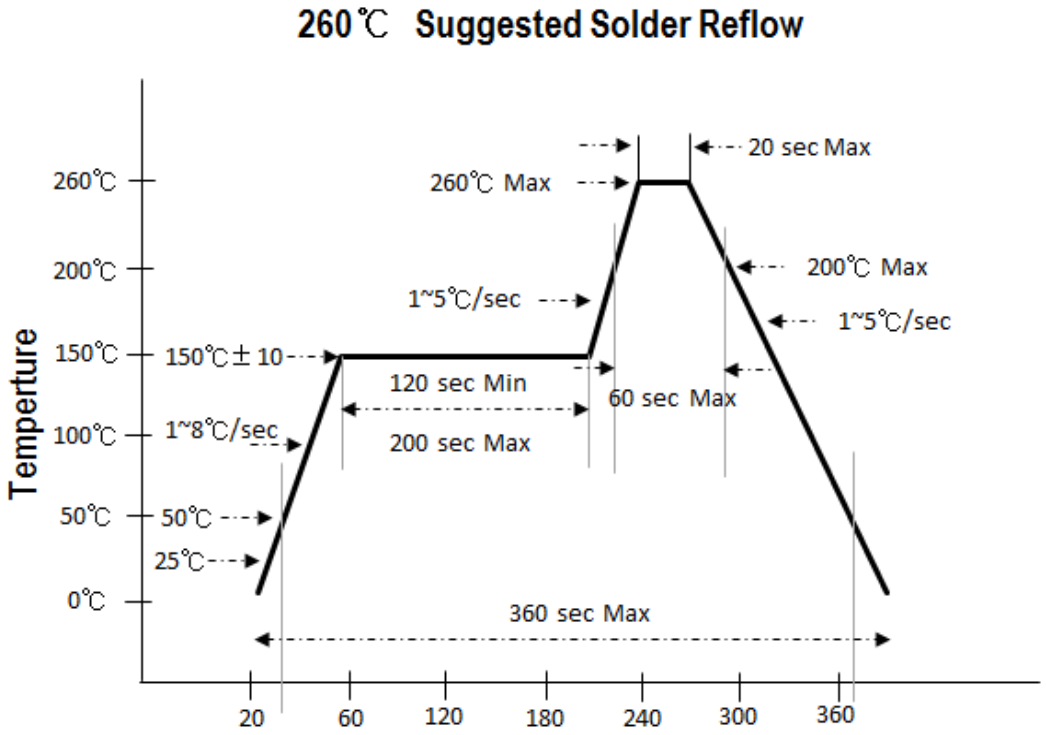
Solder Land Pattern



Reliability Test

Test	Procedure/Test method	Requirements
Vibration	*Frequency：10Hz ~ 55Hz *Total amplitude：1.5mm *Sweep period：1.0 minute *Vibration directions：3 mutually perpendicular *Duration：2 hours / direct	After the test, specimen would be kept at room temperature for 2 hours. And then the measured values shall fulfill the Electrical Specifications.
Drop test	*Height：1.0 m *Test surface：Rigid surface of concrete or steel *Times：10 times	
Static humidity	*Temperature：+70℃± 2℃ *Relative humidity：90% *Duration：96 hours	
Temperature cycling	1. 30 minutes at -40℃, 2. 30 minutes at +85℃, *cycle time：100 times	
High temperature exposure	*Exposure temperature：85℃± 5℃ *Exposure duration：240 hours	
Low temperature exposure	*Exposure temperature：-40℃± 5℃ *Exposure duration：240 hours	
Reflow soldering	*Temperature / Duration：275℃ / 10sec *Total time：6 minute (IR-reflow)	

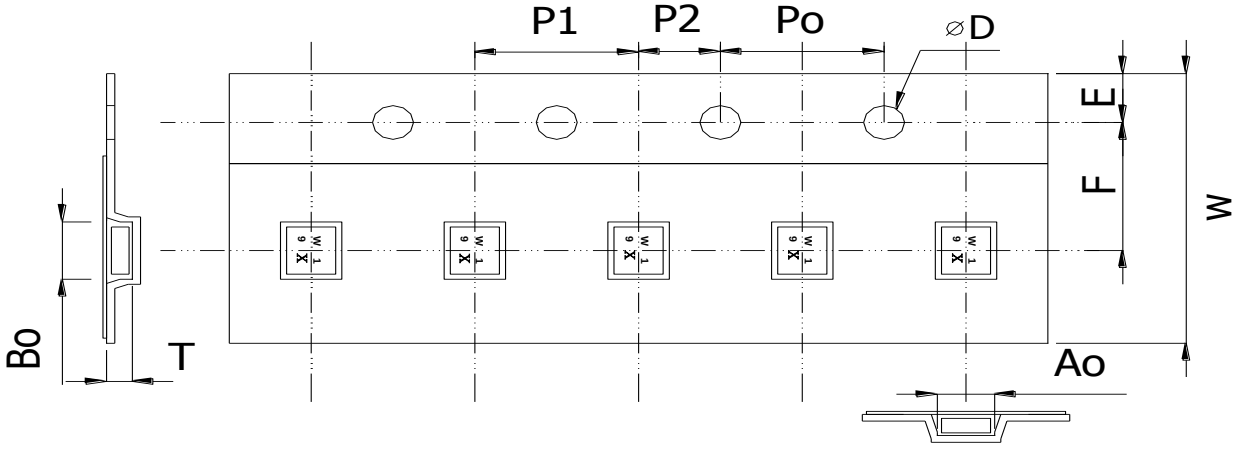
Soldering Condition



Ordering Code

DB	1814	1950	B1	05	T
Series	**Dimension code**	**Frequency**	**Application**	**Serial Number**	**Packing**
DB：Balanced SAW Duplexer	Per2 digits of Length, Width 1814= Length 1.8mm Width 1.4mm	1950：Center Freq (1950MHz)	B1：LTE Band 1	Design Code	T：Reeled

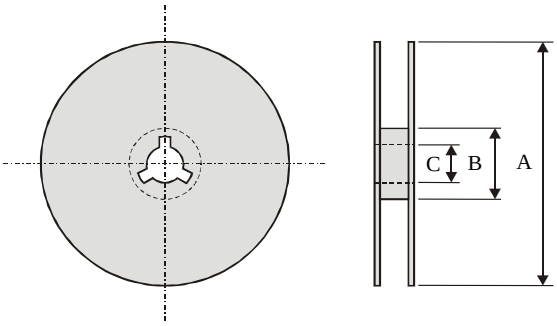
Packing



Plastic Tape specifications

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.8 ± 0.10	2.2 ± 0.10	1.55 ± 0.05	0.65 ± 0.10	8.0 ± 0.20
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.0 ± 0.10

Reel Dimensions



Index	A	B	C
Dimension (mm)	Φ180.0 +0/-1.5	Φ60.5 ± 0.5	Φ15.0 ± 0.2

Note：The product shall be packed properly not to be damaged during transportation and storage.
Taping Quantity：3000 pieces per 7”reel

Caution Of Handling

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party’s life, body or property.

(1) Aircraft equipment
(2) Aerospace equipment
(3) Undersea equipment
(4) Medical equipment
(5) Disaster prevention / crime prevention equipment
(6) Traffic signal equipment
(7) Transportation equipment (vehicles, trains, ships, etc.)
(8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

Storage Condition

(1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.
(2) Storage environment condition.

- Products should be storage in the warehouse on the following conditions.
- Temperature : -10 to +40°C
- Humidity : 30 to 70% relative humidity
- Don’t keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
- Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
- Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
- Products should be storage under the airtight packaged condition.

Important Notes

(1) This device should not be used in any type of fluid such as water, oil, organic solvent, etc.
(2) Cleaning agent isopropyl alcohol and ethyl alcohol can be used.
(3) As rapid temperature change for cleaning after reflow soldering might be a cause of degradation or destruction, clean this component after confirming that temperature of this component goes down to room temperature.
(4) As ultrasonic vibration might be a cause of degradation or destruction, do not use ultrasonic cleaning.
(5) This device follows JEDEC standards for moisture classifications.
The following this device is classified as **M**oisture **S**ensitive **L**evel **3**
This device is moisture sensitive and need to be handled within proper MSL 3 guidelines to avoid damage from moisture absorption and exposure to solder reflow temperatures that can result in yield and reliability degradation
(6) This is an **E**lectrostatic **S**ensitive **D**evice.
Please avoid static voltage during operation and storage.
(7) Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.
(8) If any malfunction due to designing or manufacturing which is out of specification occurs within one year after the products have been delivered, the maker should exchange the defective products.