

APPROVAL SHEET

RF SAW Duplexer Series – RoHS Compliance

LTE Band 5 system

For TRx Single Type

824 ~ 849 / 869 ~ 894 MHz
Band Working Frequency

P/N : DF18140836B507T

Approval Sheet

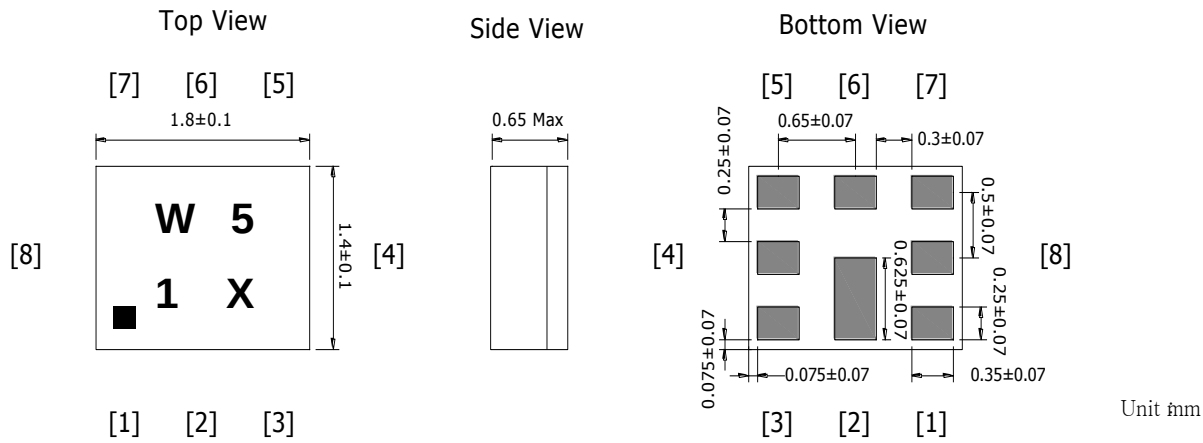
Features

Low loss, Low pass band ripple
Package for Surface Mount Technology (SMT)
Electrostatic Sensitive Device (ESD)
Ultra small package : (1.8mm × 1.4mm × 0.65mm)
RoHS Compliance
Moisture Sensitive Level 3 (MSL3)

Application

- LTE Band 5 system

Package Dimensions



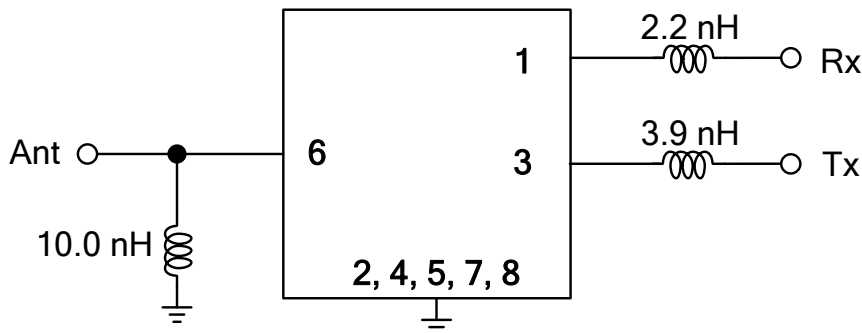
Pin Descriptions

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

Marking Descriptions

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

Test Circuit



Approval Sheet

Electrical Specifications (Tx to ANT)

Item			Frequency (MHz)	Specification			Unit
				Min	Typ	Max	
Tx to ANT	Insertion loss		824 ~ 849	-	1.8	2.5	dB
	Pass band ripple		824 ~ 849	-	0.6	1.5	dB _{p-p}
	VSWR	Tx	824 ~ 849	-	1.65	2.0	-
		ANT		-	1.6	2.0	-
	Absolute attenuation		10 ~ 420	35	40	-	dB
			420 ~ 494	35	39	-	dB
			494 ~ 701	35	39	-	dB
			699 ~ 716	35	43	-	dB
			701 ~ 728	35	43	-	dB
			704 ~ 716	35	43	-	dB
			728 ~ 764	35	41	-	dB
			764 ~ 804	25	31	-	dB
			860 ~ 869	5	22	-	dB
			869 ~ 894	44	49	-	dB
			1559 ~ 1563	33	38	-	dB
			1565.42 ~ 1573.37	33	38	-	dB
			1573.37 ~ 1577.47	33	38	-	dB
			1577.47 ~ 1585.42	33	38	-	dB
			1597.55 ~ 1605.89	33	37	-	dB
			1683 ~ 1708	30	36	-	dB
			1710 ~ 1785	30	35	-	dB
			1844.9 ~ 1879.9	30	35	-	dB
			1884.5 ~ 1910.6	28	34	-	dB
			1920 ~ 1980	28	34	-	dB
			2110 ~ 2170	25	32	-	dB
			2400 ~ 2494	25	30	-	dB
			3286 ~ 3406	15	26	-	dB
			4110 ~ 4255	12	18	-	dB
			4900 ~ 5950	10	17	-	dB
			6582 ~ 6802	15	28	-	dB
			7406 ~ 7651	15	29	-	dB

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Electrical Specifications (ANT to Rx)

Item			Frequency (MHz)	Specification			Unit
				Min	Typ	Max	
ANT to Rx	Insertion loss		869 ~ 894	-	1.9	2.5	dB
	Pass band ripple		869 ~ 894	-	0.8	1.5	dB _{p-p}
	VSWR	Rx	869 ~ 894	-	1.65	2.0	-
		ANT		-	1.6	2.0	-
	Absolute attenuation		10 ~ 447	35	41	-	dB
			45	50	80	-	dB
			447 ~ 824	32	37	-	dB
			779 ~ 804	35	38	-	dB
			824 ~ 849	47	53	-	dB
			1693 ~ 1743	35	40	-	dB
			1710 ~ 1785	35	40	-	dB
			1788 ~ 1788	35	40	-	dB
			1850 ~ 1920	35	40	-	dB
			1920 ~ 1980	35	41	-	dB
			1980 ~ 2400	35	41	-	dB
			2305 ~ 2315	35	41	-	dB
			2400 ~ 2500	35	42	-	dB
			2467 ~ 2494	35	42	-	dB
			2517 ~ 2592	35	42	-	dB
			2607 ~ 2682	35	42	-	dB
			3476 ~ 3576	30	38	-	dB
			4345 ~ 4470	25	30	-	dB
			4900 ~ 5950	20	33	-	dB
			5214 ~ 5364	25	38	-	dB
			6083 ~ 6258	20	32	-	dB
			6952 ~ 7152	15	24	-	dB

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Electrical Specifications (Tx to Rx)

Item		Frequency (MHz)	Specification			Unit
			Min	Typ	Max	
Tx to Rx	Isolation	824 ~ 849	50	54	-	dB
		869 ~ 894	48	52	-	dB
		1574 ~1577	40	62	-	dB
		1683 ~ 1708	20	62	-	dB
		2462 ~ 2557	20	66	-	dB
Terminating impedance		Tx port (Single-ended)	50			Ohm
		Rx port (Single-ended)	50			Ohm
		Ant port (Single-ended)	50			Ohm

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

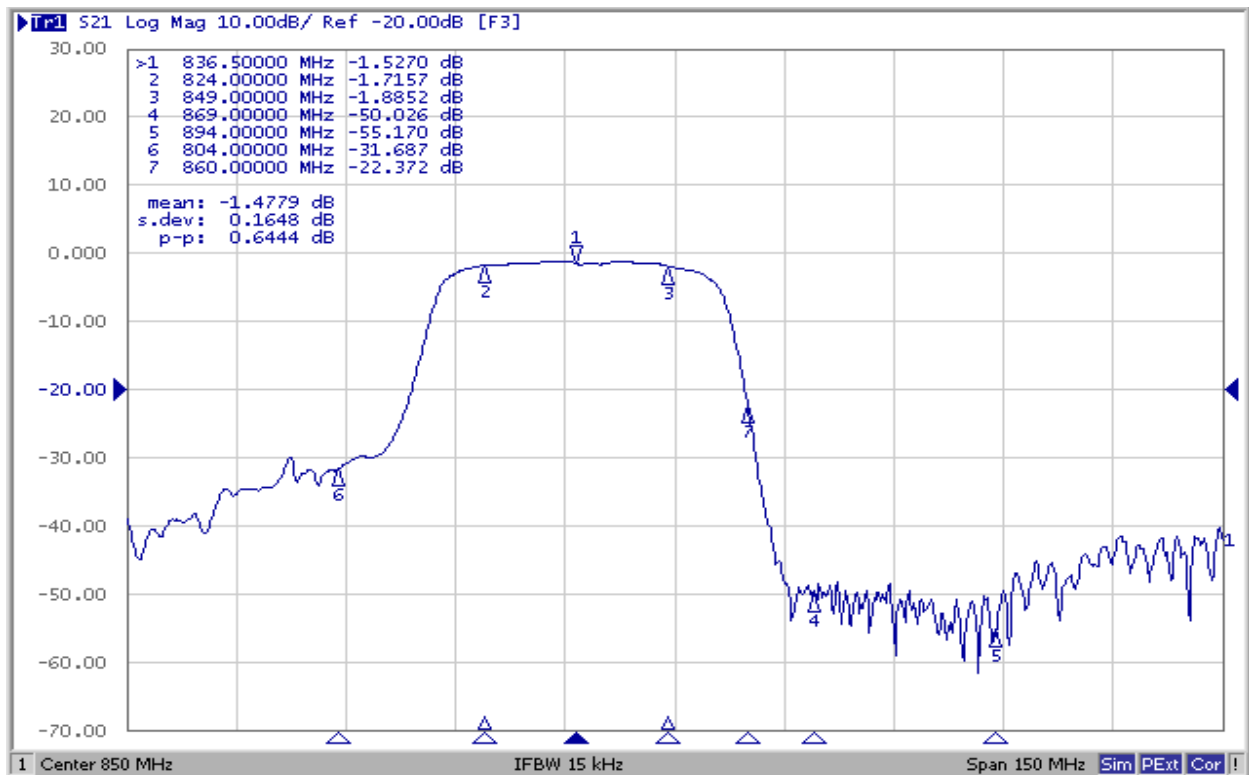
Absolute Maximum Ratings

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

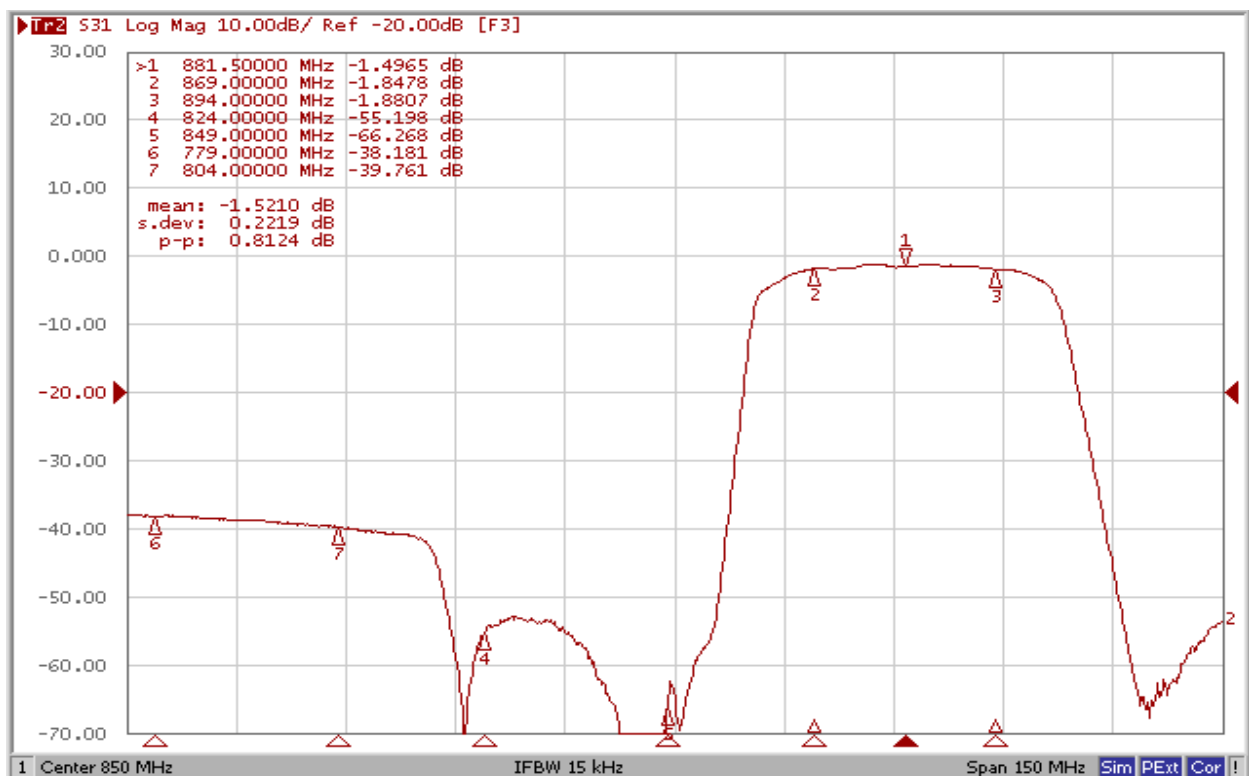
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Typical Frequency Response

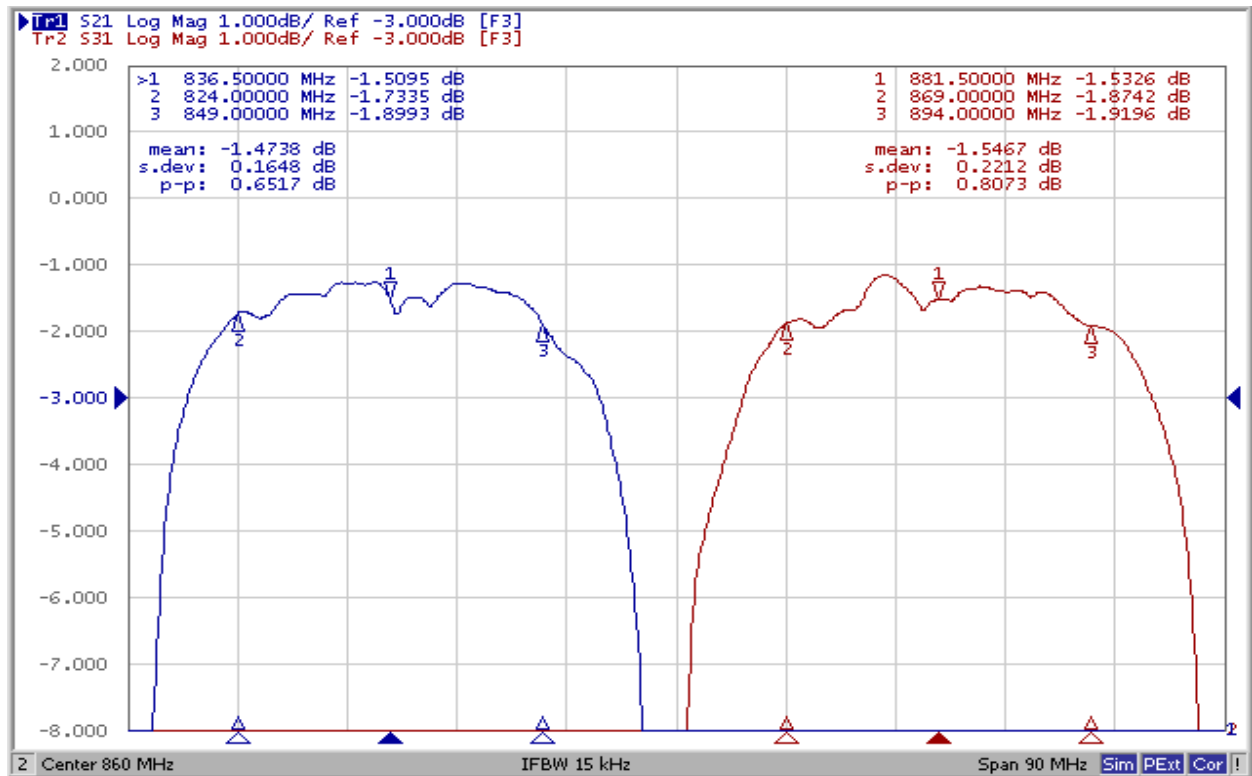
■ Tx to Ant



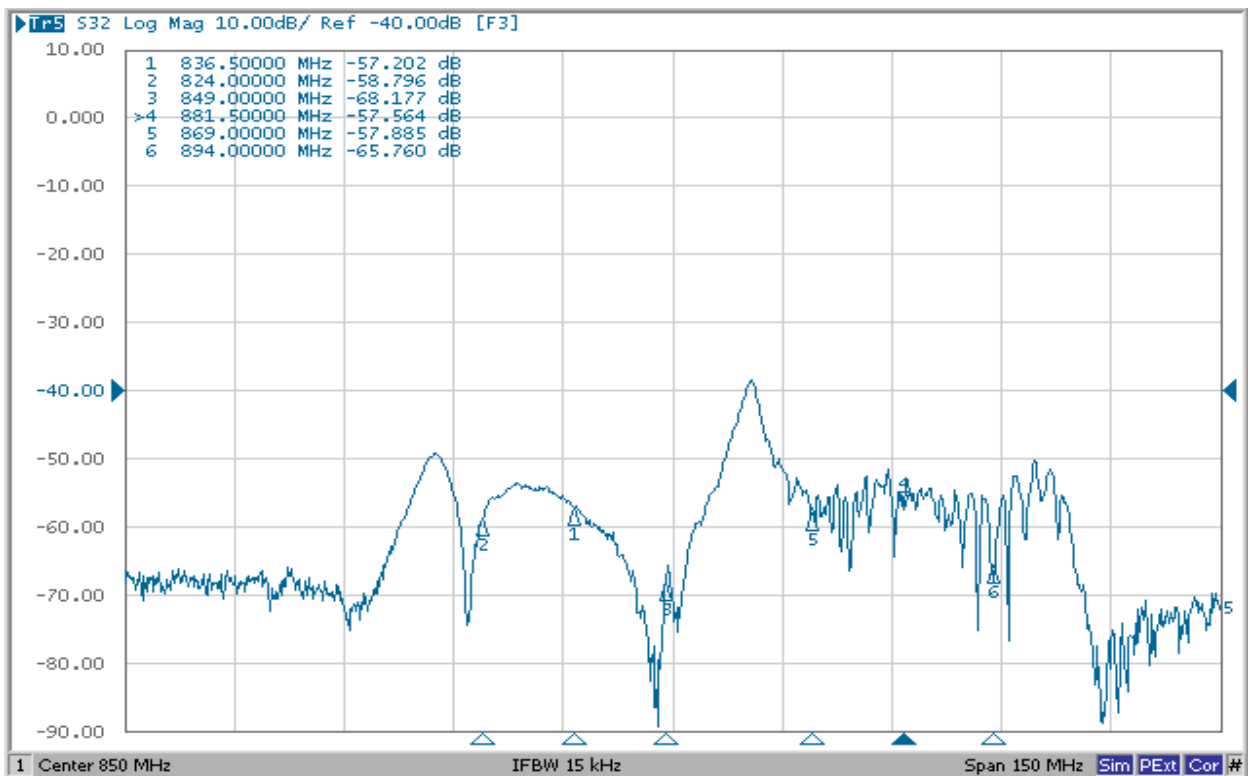
■ Ant to Rx



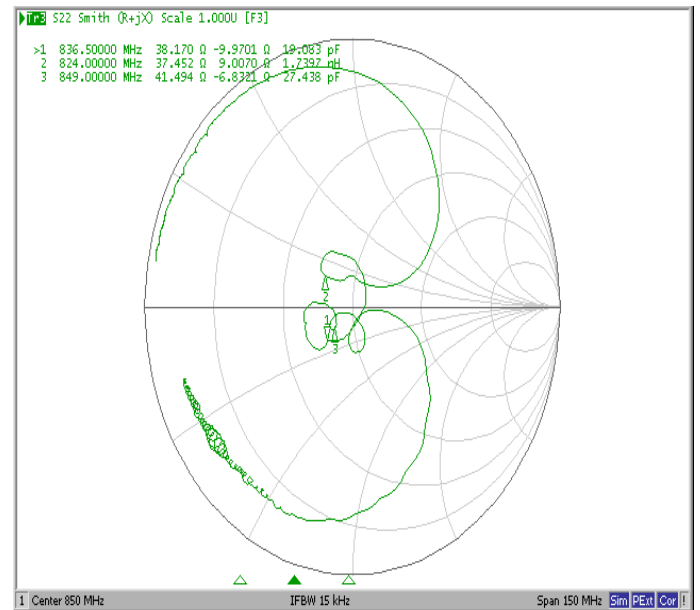
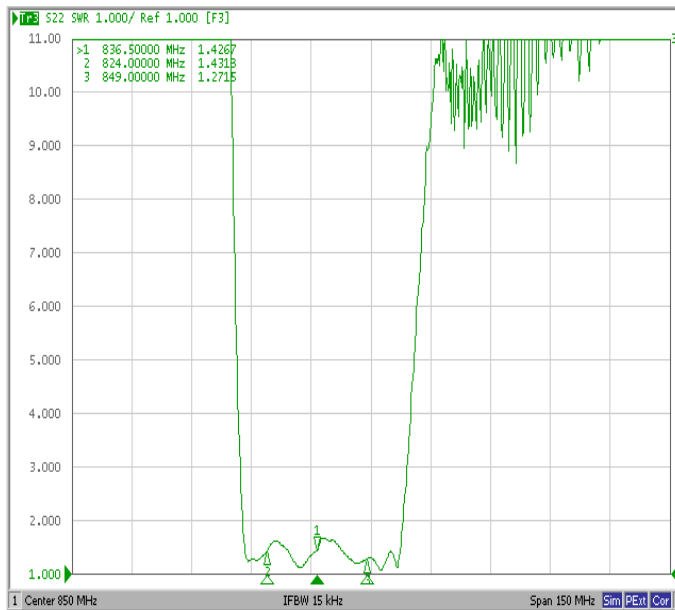
■ Ripple Deviation



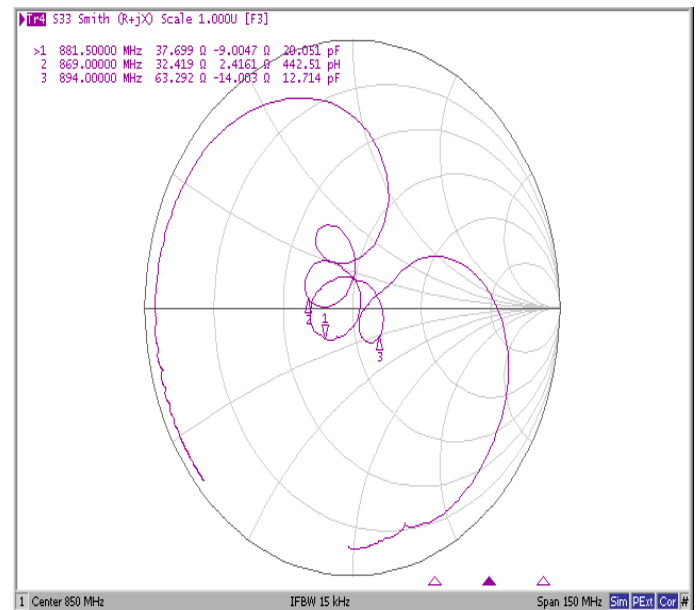
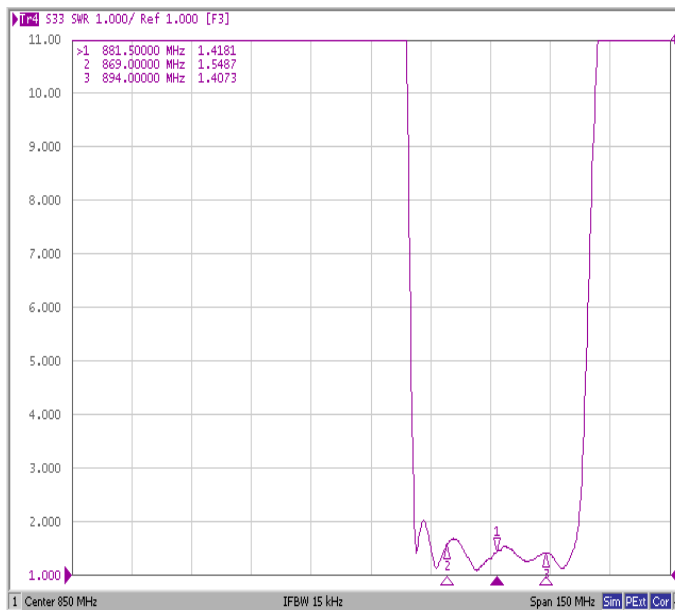
■ Isolation



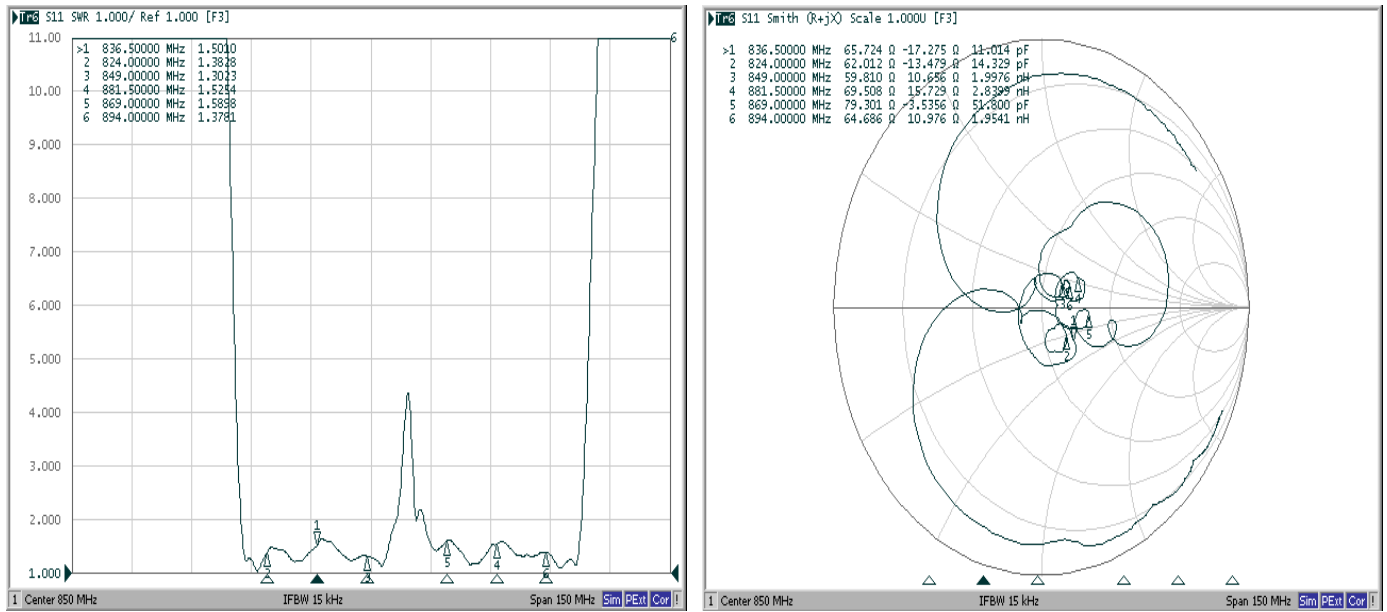
■ VSWR & Smith chart (Tx Port)



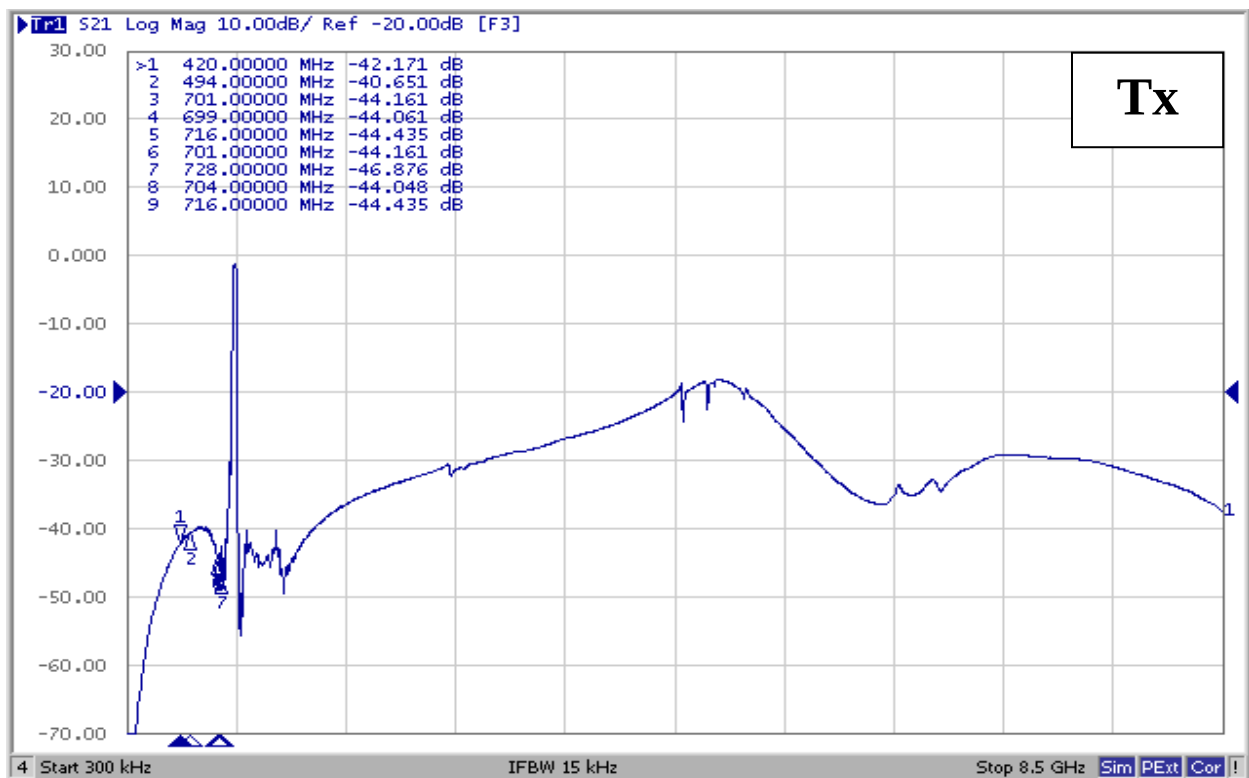
■ VSWR & Smith chart (Rx Port)



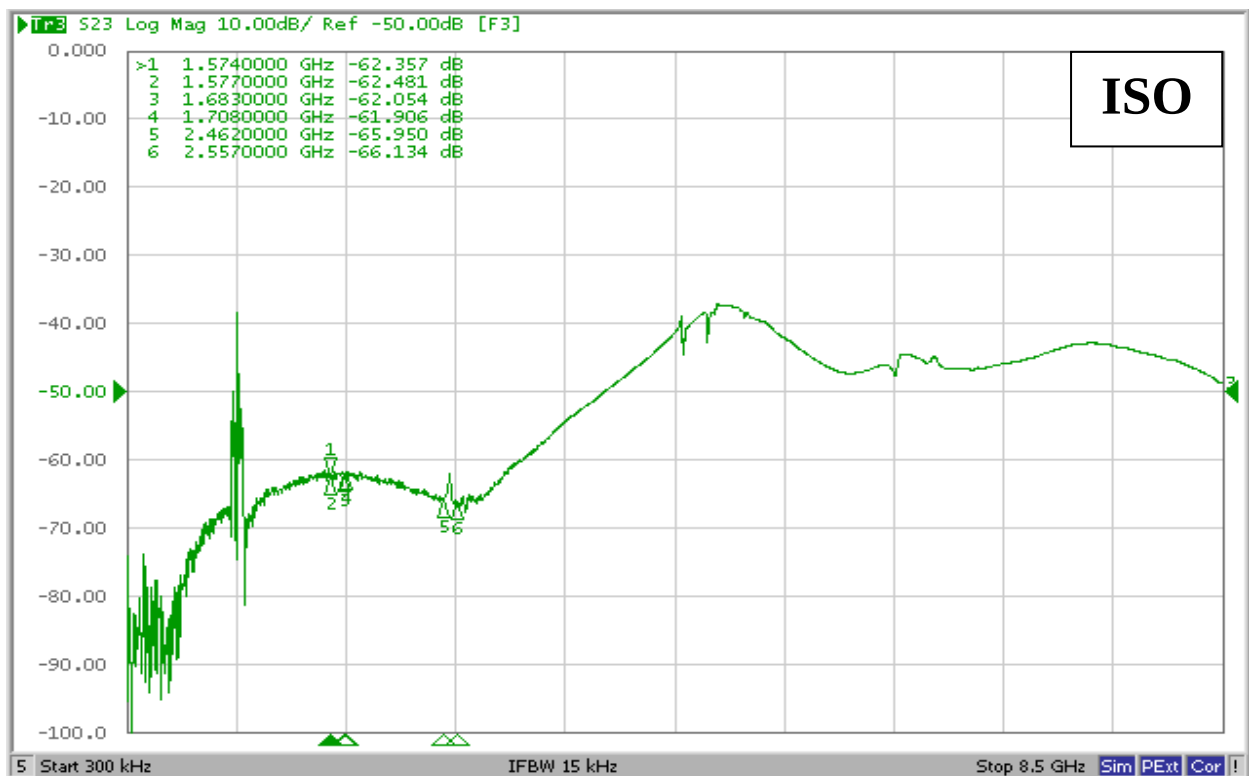
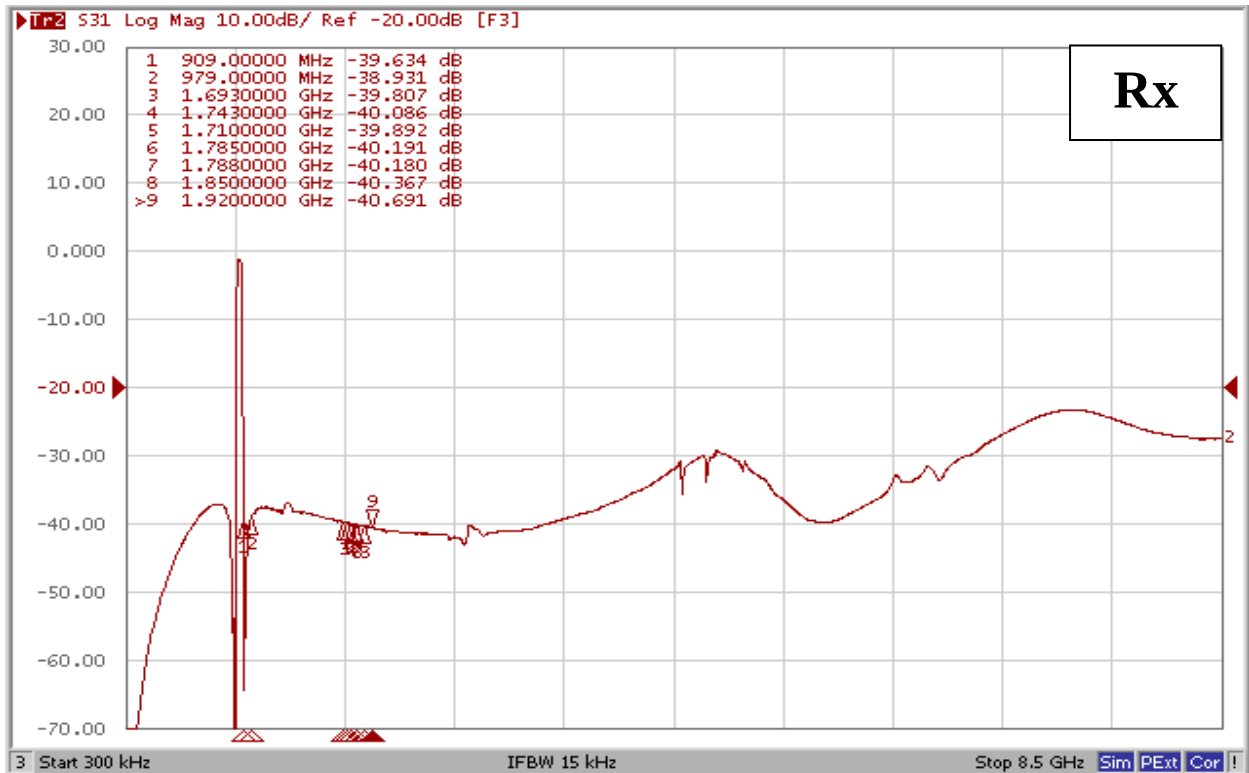
■ VSWR & Smith chart (ANT Port)



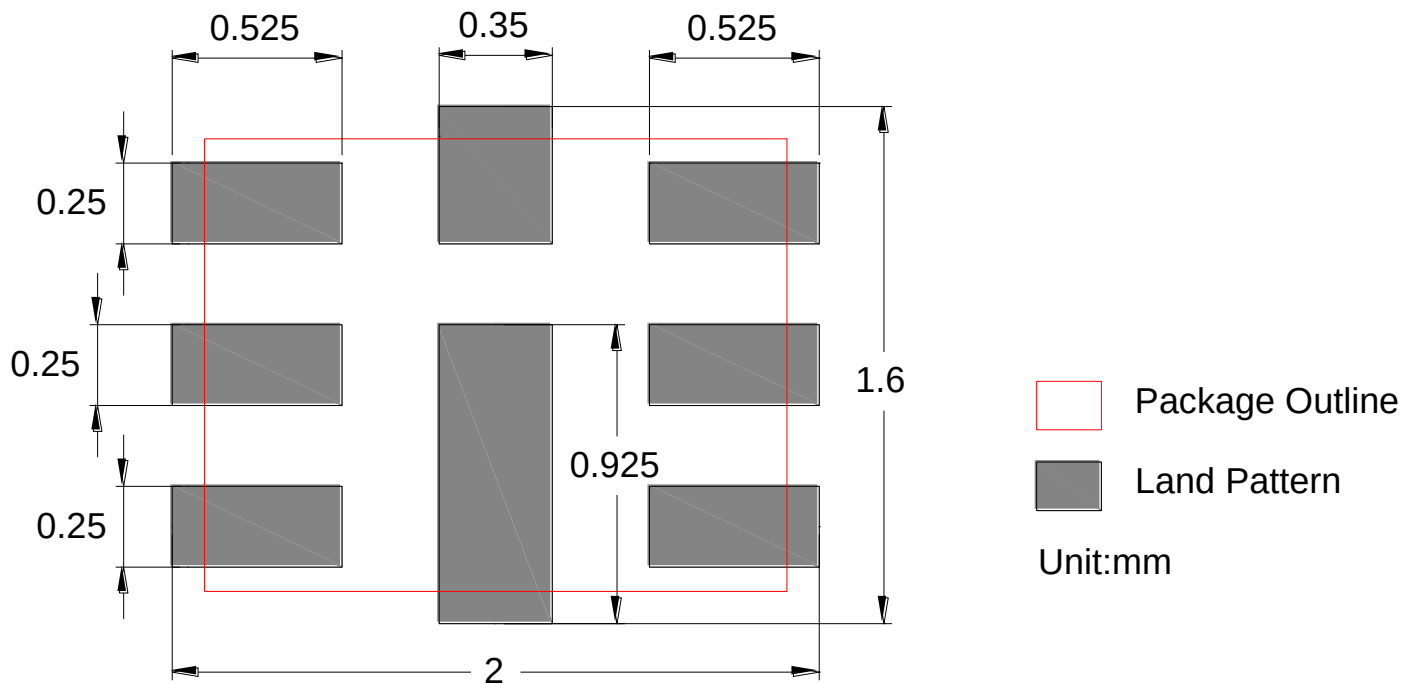
■ Wide Span(Tx)



■ Wide Span(Rx & Iso)



Solder Land Pattern

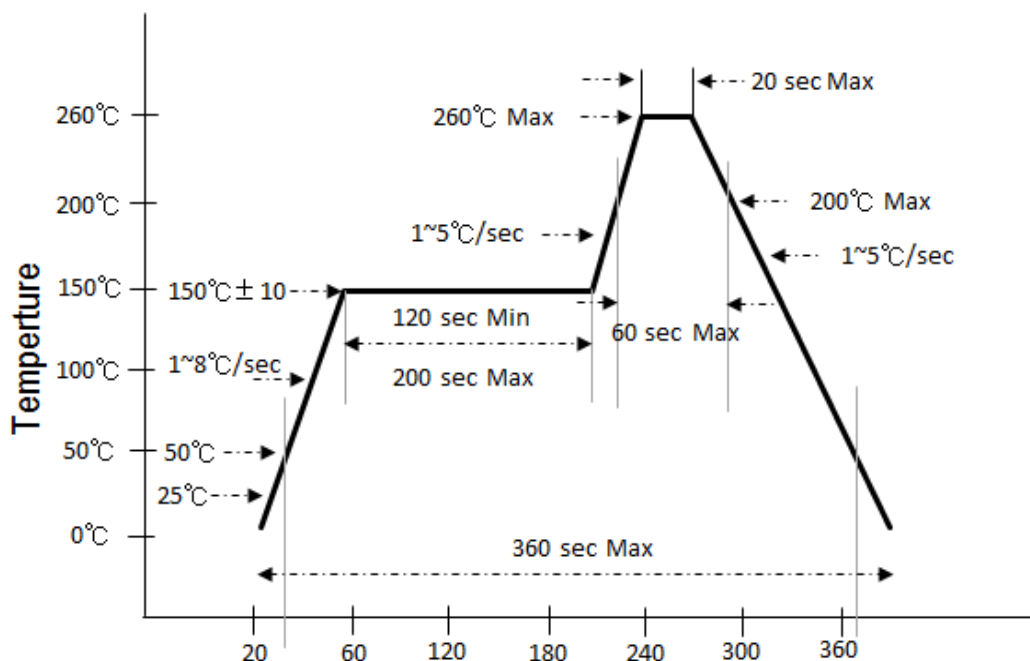


Reliability Test

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 : $+70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ *Relative humidity : 90% *Duration : 96 hours	
Temperature cycling	1. 30 minutes at -40°C , 2. 30 minutes at $+85^{\circ}\text{C}$, *cycle time : 100 times	
High temperature exposure	*Exposure temperature : $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ *Exposure duration : 240 hours	
Low temperature exposure	*Exposure temperature : $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ *Exposure duration : 240 hours	
Reflow soldering	*Temperature / Duration : 275°C / 10sec *Total time : 6 minute (IR-reflow)	

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Soldering Condition

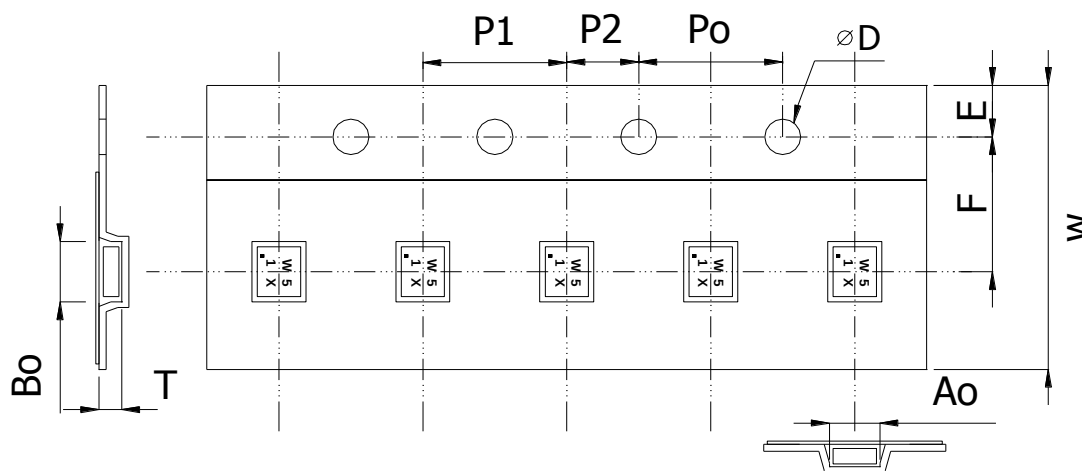
260°C Suggested Solder Reflow



Ordering Code

DF	1814	0836	B5	07	T
Series	Dimension code	Frequency	Application	Serial Number	Packing
DF: Single SAW Duplexer	Per 2 digits of Length, Width 1814= Length 1.8mm Width 1.4mm	836 : Center Freq (836MHz)	B5 : LTE Band 5	Design Code	T : Reeled

Packing

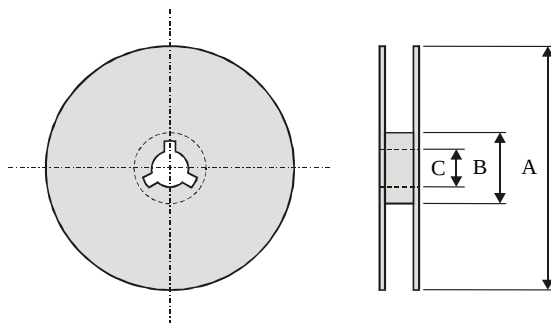


Plastic Tape specifications

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.8 ± 0.10	2.2 ± 0.10	1.55 ± 0.05	0.47 ± 0.05	8.0 ± 0.20
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	3.50 ± 0.10	4.00 ± 0.10	2.0 ± 0.10

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Reel Dimensions



Index	A	B	C
Dimension (mm)	$\Phi 180.0 +0/-1.5$	$\Phi 66.0 \pm 0.5$	$\Phi 13.0 \pm 0.2$

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 **Moisture Sensitive Level 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 **Electrostatic Sensitive Device**.
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.