

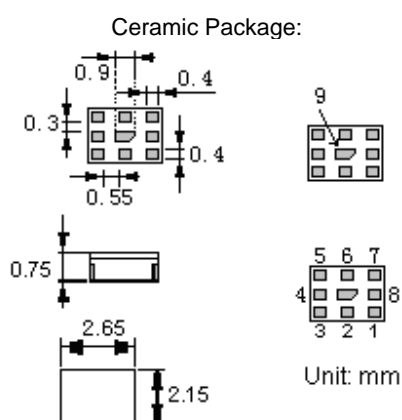
Application

- Low-loss SAW duplexer for mobile telephone
- Low amplitude ripple
- Low insertion attenuation

Features

- Ceramic Package for **Surface Mounted Technology (SMT)**
- **RoHS** compatible
- Package size 2.5x2.0
- Approx. weight 0.014g
- **Electrostatic Sensitive Device(ESD)**

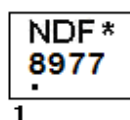
Package Dimensions



Pin Configuration

6	Antenna
3	TX Input
1	RX Output
2, 4, 5, 7, 8, 9	To Be Grounded

Marking



Top View, Laser Marking

"ND": Manufacturer's mark

"F": SAW filter

"8977": Part number

" . ": Terminal 1

" * ": Lot number (The code shown below varies in a 4-year cycle)

Code	1	2	3	4	5	6	7	8	9	10	11	12
2009	A	B	C	D	E	F	G	H	J	K	L	M
2010	N	P	Q	R	S	T	U	V	W	X	Y	Z
2011	a	b	c	d	e	f	g	h	i	j	k	m
2012	n	p	q	r	s	t	u	v	w	x	y	z

Maximum Ratings

Rating		Value	Unit
Operating Temperature Range	T_A	-30 ~ +85	°C
Storage Temperature Range	T_{stg}	-40 ~ +85	°C
DC Voltage (between any Terminals)	V_{DC}	5	V
RF Power (in BW)	P	27 max	dBm
ESD Voltage (HB)	V_{ESD}	400	V

Electrical Characteristics TX-ANT:

Antenna terminating impedance: $Z_{ANT}=50\ \Omega$ || 7.5nH

RX terminating impedance: $Z_{RX}=50\ \Omega$

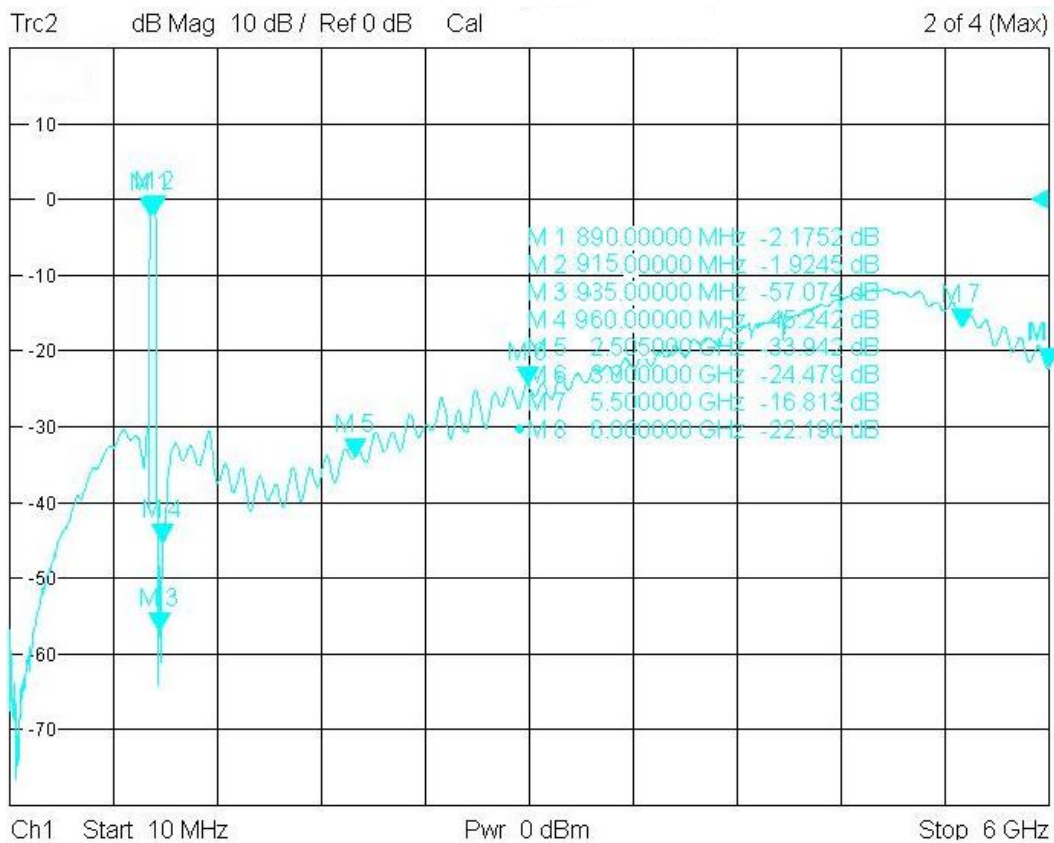
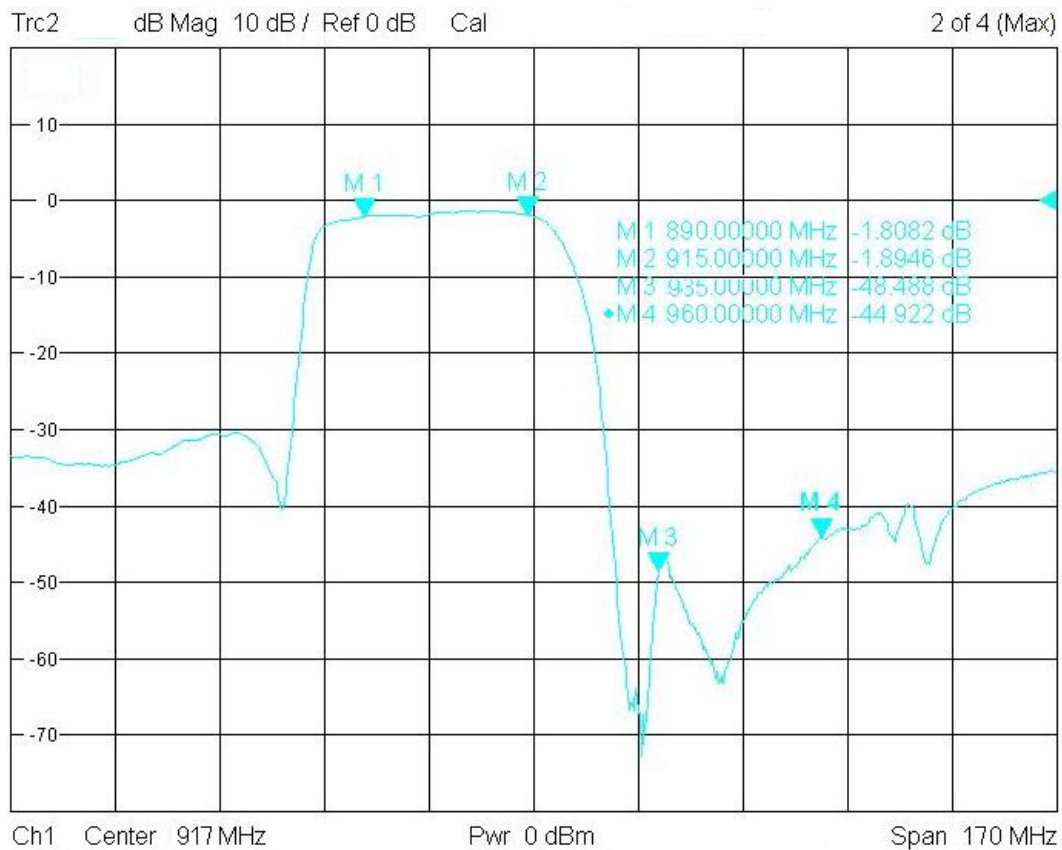
TX terminating impedance: $Z_{TX}=50\ \Omega$

Item		Minimum	Typical	Maximum	Unit
Center Frequency	f_c	-	902.5	-	MHz
Insertion Loss in 890.0 MHz–915.0MHz	IL	-	1.8	2.3	dB
Amplitude Variation in 890.0 MHz–915.0MHz			0.6	1.0	dB
Absolute Attenuation	α				
0.35 ... 840.5MHz		25	33	-	dB
840.5 ... 867.5 MHz		27	29	-	dB
938.0 ... 965.0 MHz		43	46	-	dB
1698.0 ... 1702.0MHz		36	43	-	dB
1778.0 ... 1832.0 MHz		35	39	--	dB
2667.0 ... 2745.0 MHz		23	26	--	dB
3556.0 ... 3664.0 MHz		10	18	--	dB
Input VSWR(TX port)					
in 890.0 MHz–915.0MHz		-	1.9:1	2.1:1	
Output VSWR(ANT port)					
in 890.0 MHz–915.0MHz		-	1.6:1	2.0:1	

 **RoHS Compliant**

 **Electrostatic Sensitive Device**

Typical Frequency Response TX-ANT



Electrical Characteristics ANT- RX-:

 Antenna terminating impedance: $Z_{ANT}=50\ \Omega \parallel 7.5nH$

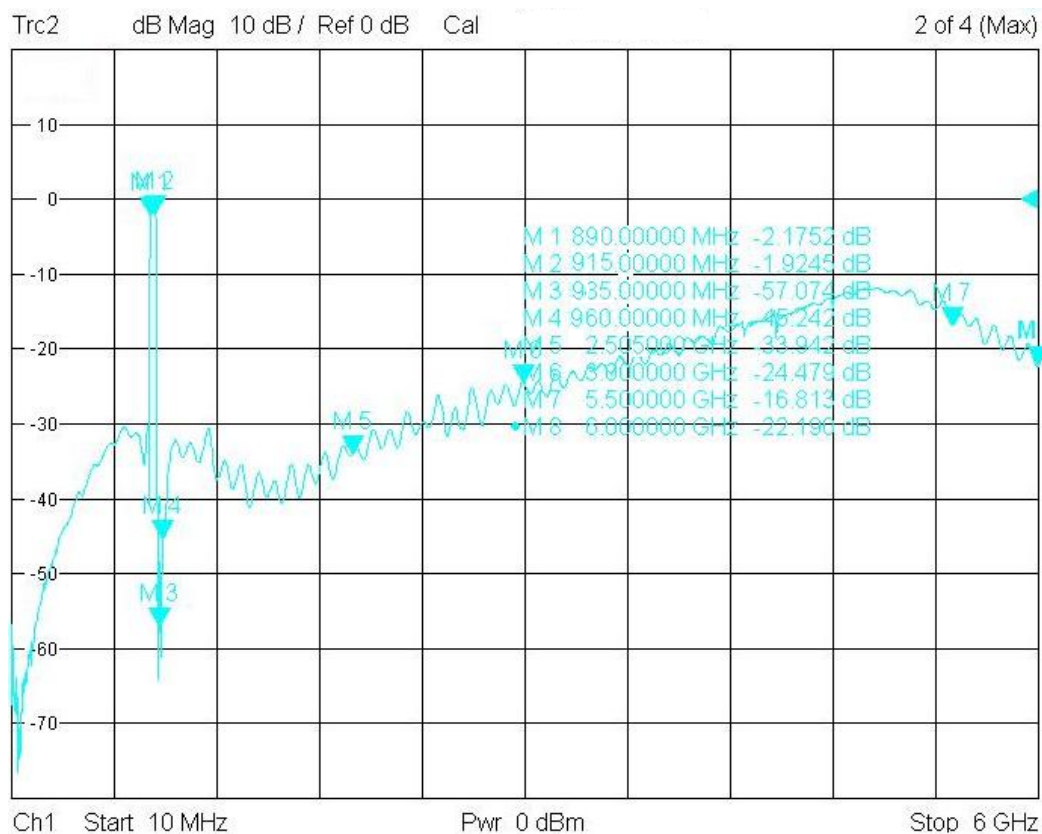
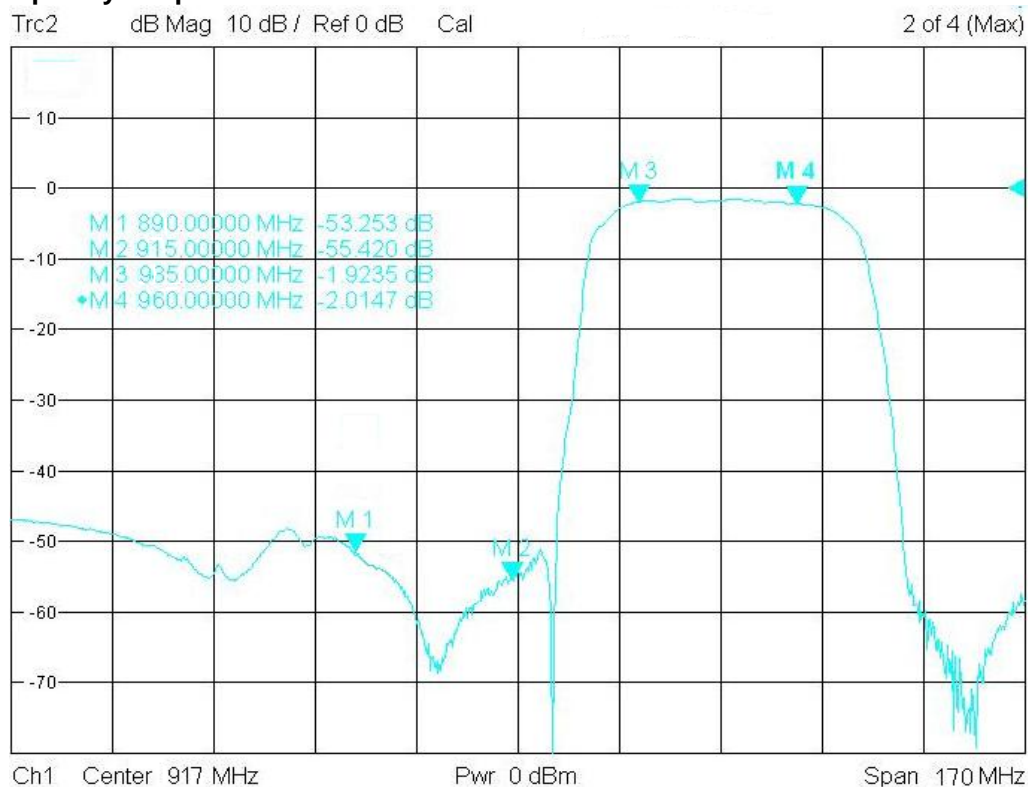
 RX terminating impedance: $Z_{RX}=50\ \Omega$

 TX terminating impedance: $Z_{TX}=50\ \Omega$

Item		Minimum	Typical	Maximum	Unit
Center Frequency	f_c	-	947.5	-	MHz
Insertion Loss in 930.0 MHz–960.0MHz	IL	-	2.4	3.0	dB
Amplitude Variation in 930.0 MHz–960.0MHz			1.0	1.5	dB
Absolute Attenuation	α				
0.35 ... 840.5MHz		35	47	-	dB
840.5 ...867.5 MHz		38	52	-	dB
890.0 ... 915.0 MHz		51	55	-	dB
1875.0 ... 1929.0MHz		40	57	-	dB
2590.0 ... 2698.0 MHz		40	56	--	dB
2813.0 ... 2894.0 MHz		35	45	--	dB
3750.0 ... 3858.0 MHz		30	42	--	dB
Input VSWR(ANT port)					
in 930.0 MHz–960.0MHz		-	1.6:1	2.0:1	
Output VSWR(RX port)					
in 930.0 MHz–960.0MHz		-	1.7:1	2.0:1	

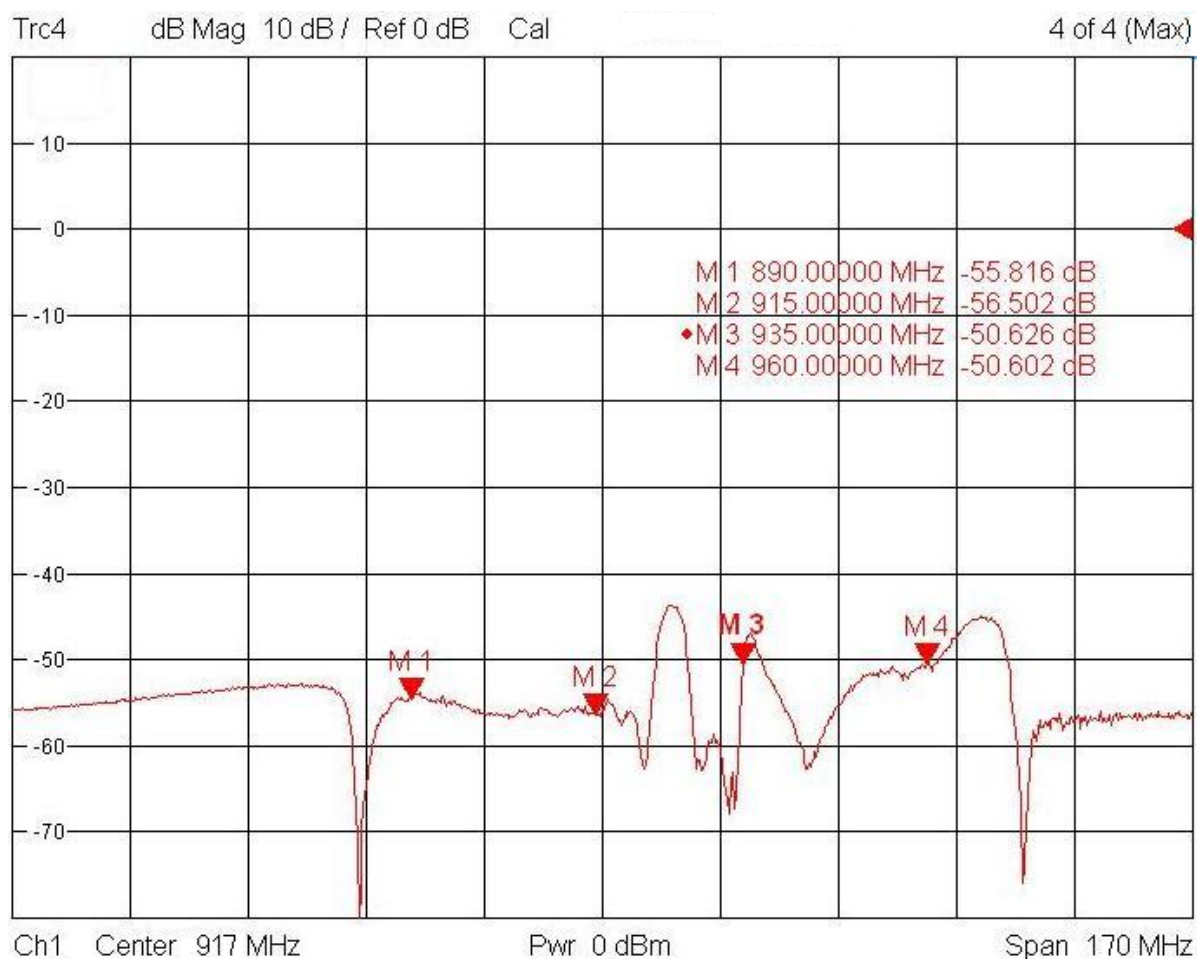
 **RoHS Compliant**
 **Electrostatic Sensitive Device**

Typical Frequency Response ANT- RX



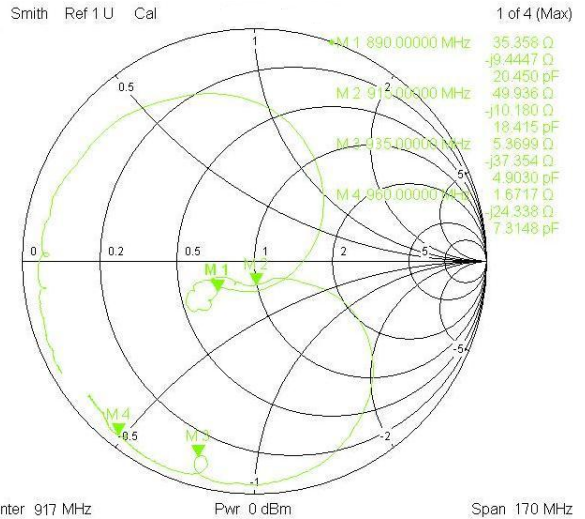
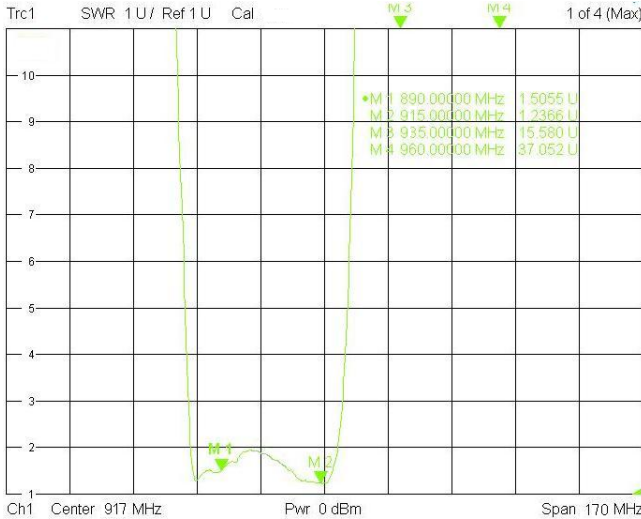
Electrical Characteristics TX-RX:

Item		Minimum	Typical	Maximum	Unit
Isolation		-		-	
890.0 MHz–915.0MHz	<i>IL</i>	53	56		dB
930.0 MHz–960.0MHz		45	48		dB

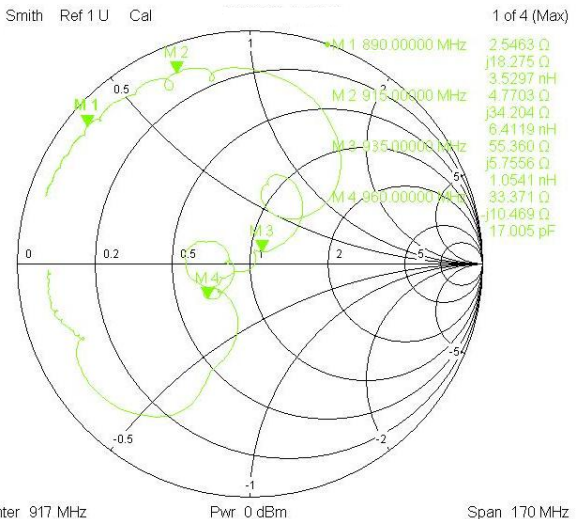
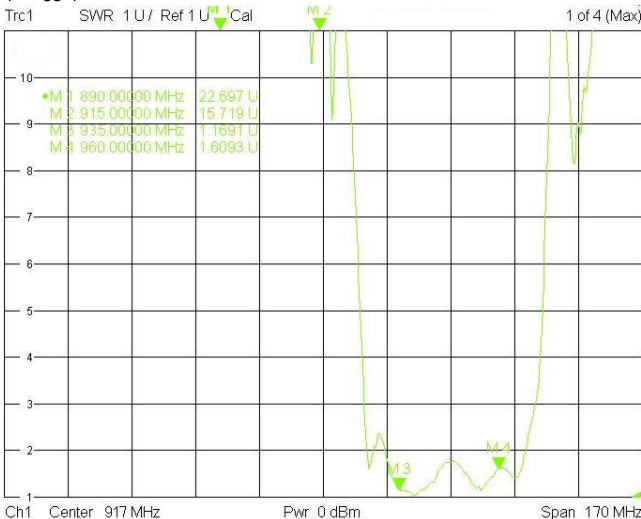
 **RoHS Compliant**
 **Electrostatic Sensitive Device**
Typical Frequency Response TX-RX


Return Loss S_{11} TX-port S_{22} ANT-port S_{33} RX-port

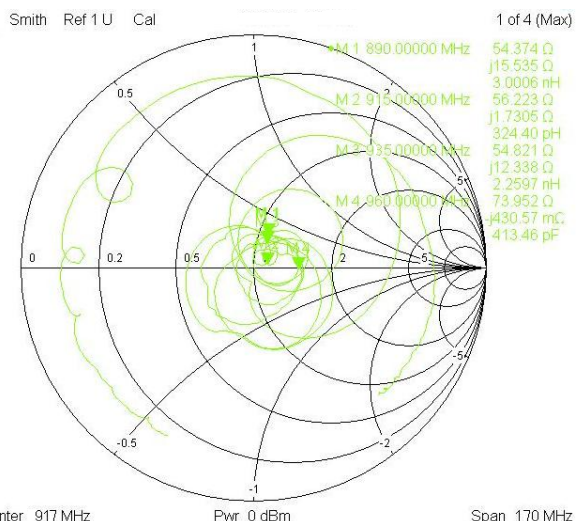
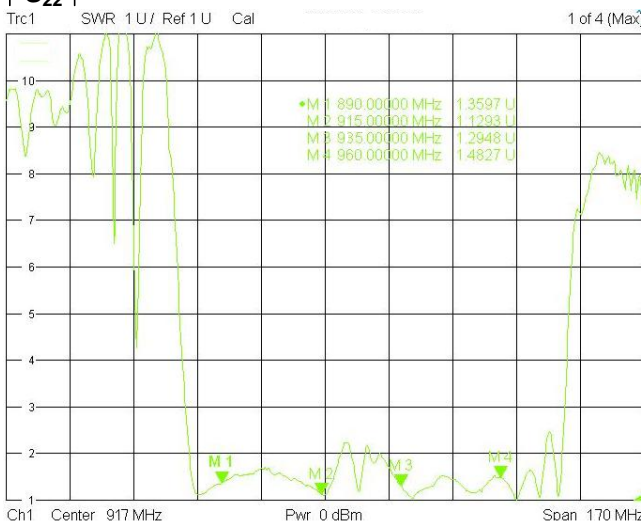
S_{11}



S_{33}



S_{22}



Stability Characteristics

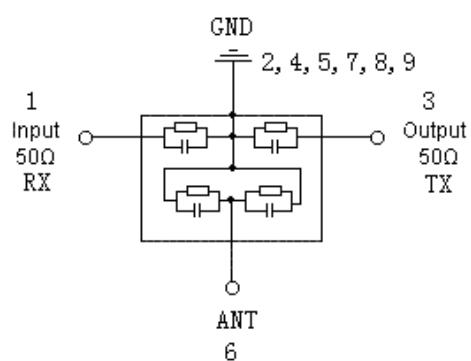
	Test item	Condition of test
1	Mechanical shock	(a) Drops: 3 times on concrete floor (b) Height: 1.0 m
2	Vibration resistance	(a) Frequency of vibration: 10~55Hz (c) Directions: X,Y and Z (b) Amplitude: 1.5 mm (d) Duration: 2 hours
3	Moisture resistance	(a) Condition: 40°C ± 2°C , 93 ⁺² ₋₃ % RH. (b) Duration: 96 hours (c) Wait 4 hours before measurement
4	Climatic sequence	(a) +70°C for 16 hours (c) -25°C for 2 hours (e) Wait 4 hours before measurement (b) +55°C for 24 hours, 90~95% R.H. (d) +40°C for 24 hours, 90~95% R.H.
5	High temperature exposure	(a) Temperature: 85°C (c) Wait 4 hours before measurement (b) Duration: 250 hours
6	Temperature cycling	(a) +85°C for 30 minutes ⇒ -40°C for 30 minutes repeated 120 times (b) Wait 4 hours before measurement

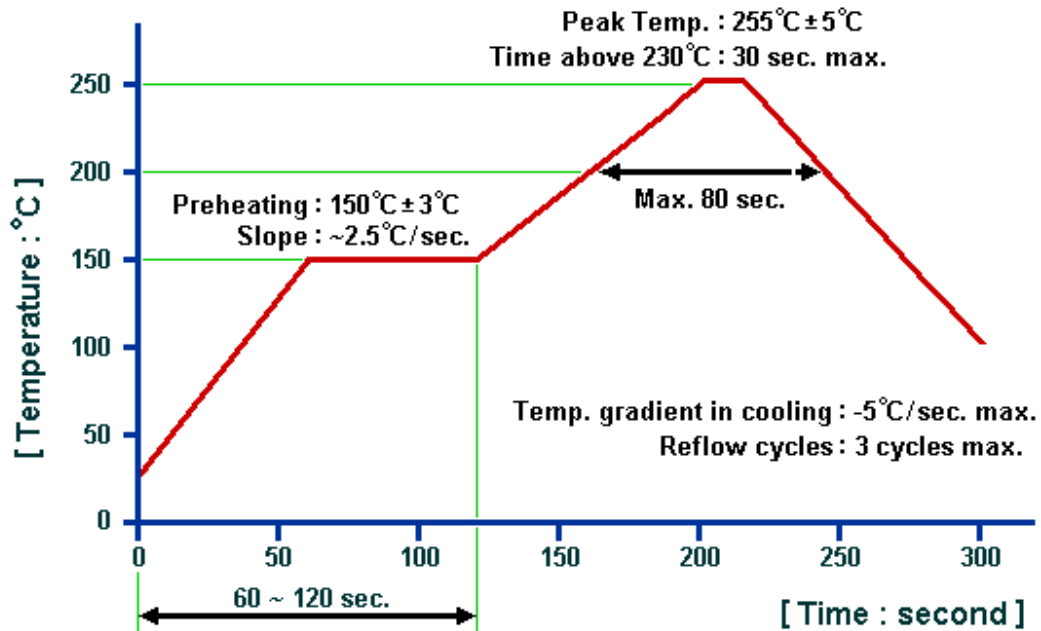
Requirements: The SAW filter shall remain within the electrical specifications after tests.

Remarks

- SAW devices should not be used in any type of fluid such as water, oil, organic solvent, etc.
- Be certain not to apply voltage exceeding the rated voltage of components.
- Do not operate outside the recommended operating temperature range of components.
- Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.
- Be careful of soldering temperature and duration of components when soldering.
- Do not place soldering iron on the body of components.
- Be careful not to subject the terminals or leads of components to excessive force.
- SAW devices are electrostatic sensitive. Please avoid static voltage during operation and storage.
- Ultrasonic cleaning shall be avoided. Ultrasonic vibration may cause destruction of components.

Test Circuit



Recommended Soldering Profile


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1. The specifications of this device are subject to change or obsolescence without notice.
2. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
3. Our liability is only assumed for the Surface Acoustic Wave (SAW) component(s) per se, not for applications, processes and circuits implemented within components or assemblies.
4. For questions on technology, prices and delivery, please contact our sales offices or e-mail winnsky@winnsky.com