



## RFS Diplexer Field-Test Procedure

***This bench test procedure is intended to be used as a troubleshooting guide for RFS diplexers. This procedure is written for experienced certified technicians. It is not a substitute for specific carrier test procedures.***

### Required test equipment and documents:

- Diplexer spec sheet
- Network Analyzer(NA)/Site Master
- Clean tested jumper cable
- Calibration: Termination load, short and open

Note: It is recommended that all diplexers be tested and detached from the system. Use caution when testing, be sure to test each band individually.

Figure 1



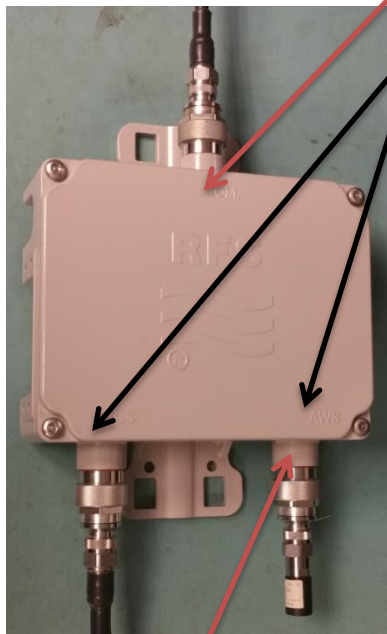
Figure 2

Technical Specifications	
Product Type	Diplexer/Cross Band Combiner
Application	AWS-1, PCS, AWS-3, AWS-4(U)
Frequency Range 1, MHz	1850-1910 & 1930-1990
Frequency Range 2, MHz	1695-1780 & 2110-2200
Configuration	ShareLite Single/Double diplexer, outdoor/indoor, full DC pass
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports, Min, dB	20
Power Handling Continuous, Max, W	500
Impedance, Ohms	50
Insertion Loss, Path 1, dB	.20 typ.
Insertion Loss, Path 2, dB	.20 typ.
Rejection between Bands, Min, dB	50
IMP Level at the COM Port, Max, dBm	-112 @ 2x43
Temperature Range, °C (°F)	-40 to +65 (-40 to +149)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	IEC61000-4-5 Level 4 / 20kA, 8/20us
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	2.9 (6.4)
Dimensions, H x W x D, mm (in)	165 x 210 x 85 (6.5 x 8.3 x 3.3)
Housing	Aluminum
Notes	
*Voltage Sensing Details: DC/AISG 1.1/2.0	
<b>Normal Operation:</b> AWS Bias Voltage >8 +/-1 VDC	
• AWS Port: DC and AISG pass through to ANT port	
• Fault detection circuit draw 20 mA typical	
• PCS Port: DC dummy load 100 +/-20 mA	
<b>Fault Operation:</b> AWS Bias Voltage <8 +/-1 VDC	
• AWS Port: No DC pass through, AISG pass through to ANT port (only DC pass is open circuit)	
• PCS Port: DC and AISG pass through to ANT port	

1. Review the diplexer specifications and make note of the operating frequency bands.
2. Make note of the return loss of the diplexer in dB.

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Figure 3

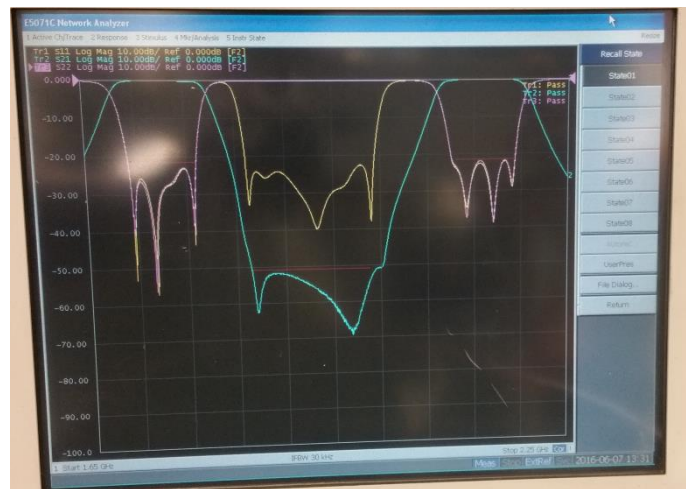


Common (COM) port

Frequency/Band Specific (FBS) ports

50 ohm termination load

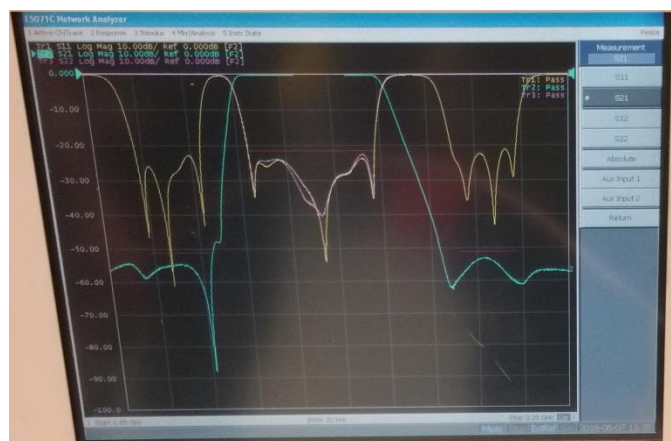
Figure 4



RL test for first port using network analyzer test equipment

3. Calibrate all test equipment with the correct frequency range as indicated on the data sheet (always include test jumper as part of the calibration process.)
4. (If you are in the field please skip to step 8 otherwise continue with bench test.) Connect one jumper to port 1 of NA and COM port of diplexer. Connect other jumper to port 2 of NA and a FBS port as shown in Figure 3.
5. Connect a 50Ω ohm load to the FBS port not being tested. (Do not use PIM load for Return Loss (RL)) and proceed with testing refer to Figures 4, 5, and 6.
6. Swap FBS ports and repeat steps 4 and 5.
7. Note: Figure 4 and 5 show the RL of the diplexer.

Figure 5



RL test for second port using network analyzer test equipment

# RFS Diplexer Field-Test Procedure

Figure 6



Sweep results circled for band being tested for RL  
PASS when using return loss analyzer

8. Calibrate analyzer per entire device spectrum from lowest to highest frequency on specification sheet. Connect a 50Ω ohm load to both FBS ports and connect analyzer to COM port. (Do not use PIM load for Return Loss (RL)) and proceed with testing.
9. Test each input band per specification sheet frequency ranges.
10. Check figure 6 for PASS/FAIL. If a diplexer fails to meet the published minimum RL, verify that the equipment is calibrated correctly, has no loose connections and ensure that a user error does not exist.

**Summary:** This test procedure shall serve as a guide to validate whether the diplexer meets the minimum published spec before requesting an RMA. It is written as a result of No Fault Found returns. Each diplexer is fully tested and inspected prior to shipping. For factory test data, contact the Applications Engineering department at 800-659-1880 with RFS model number and serial number.

Note: For diplexers with alarm issues, refer to the specific unit configuration diagram on the specification sheet.