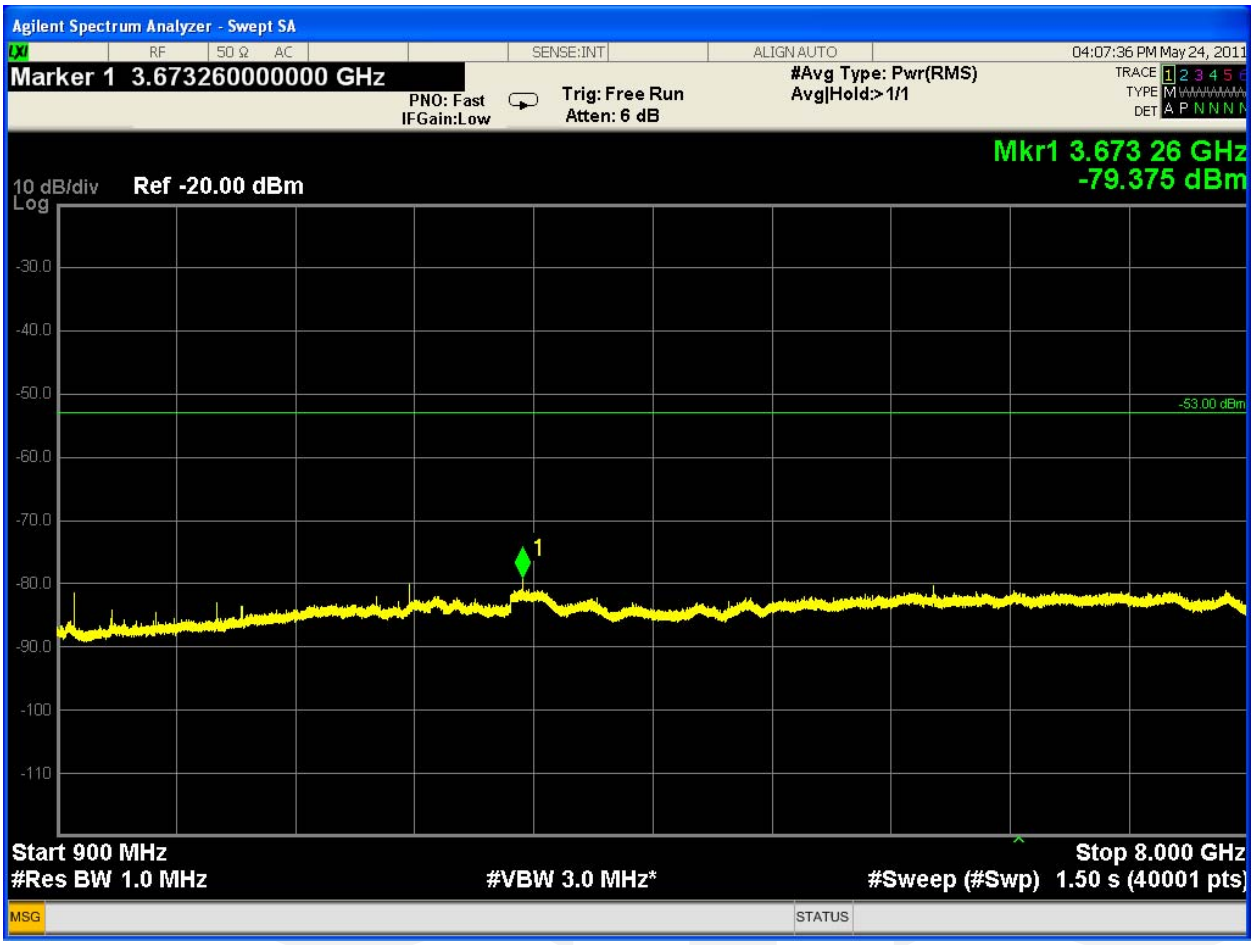
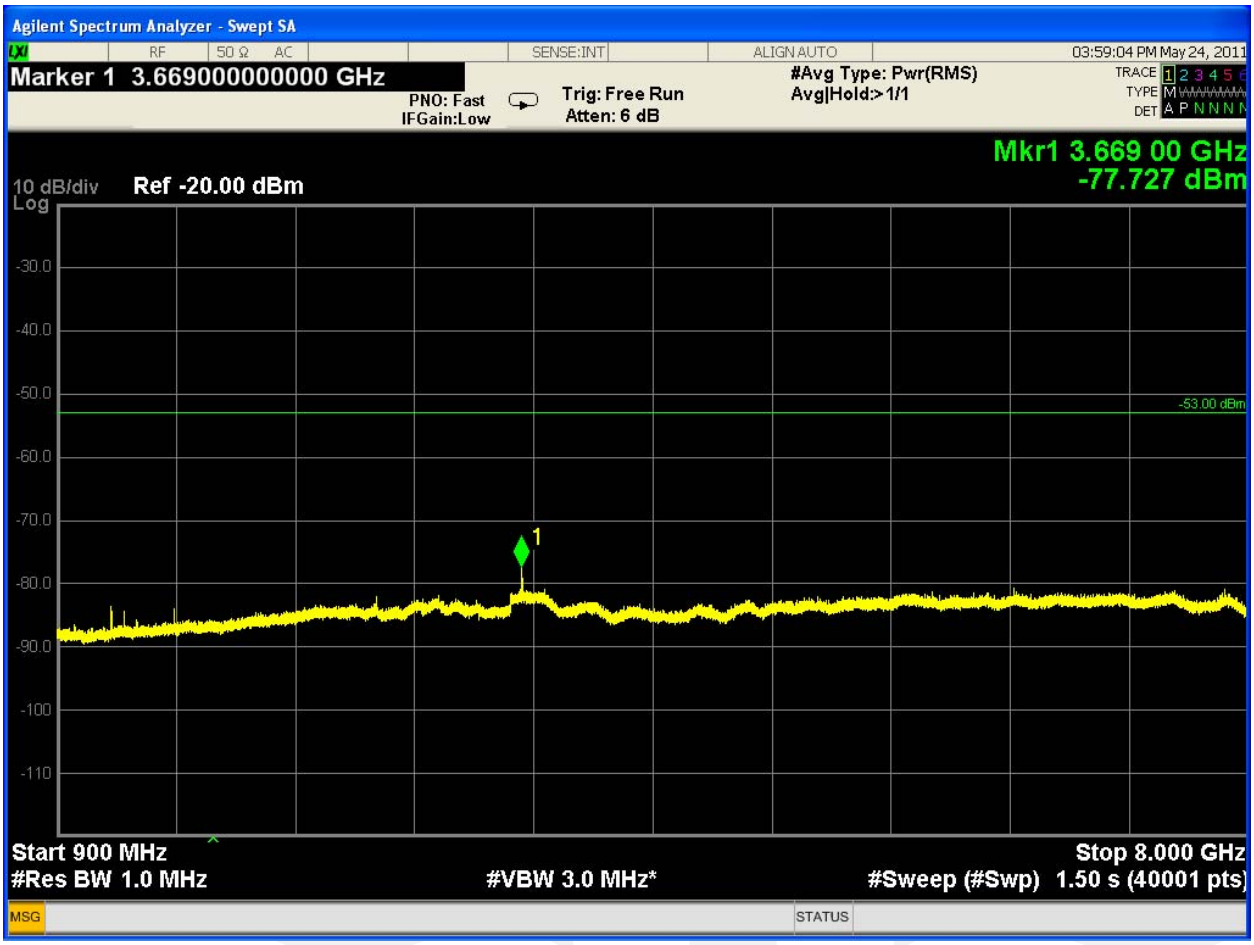


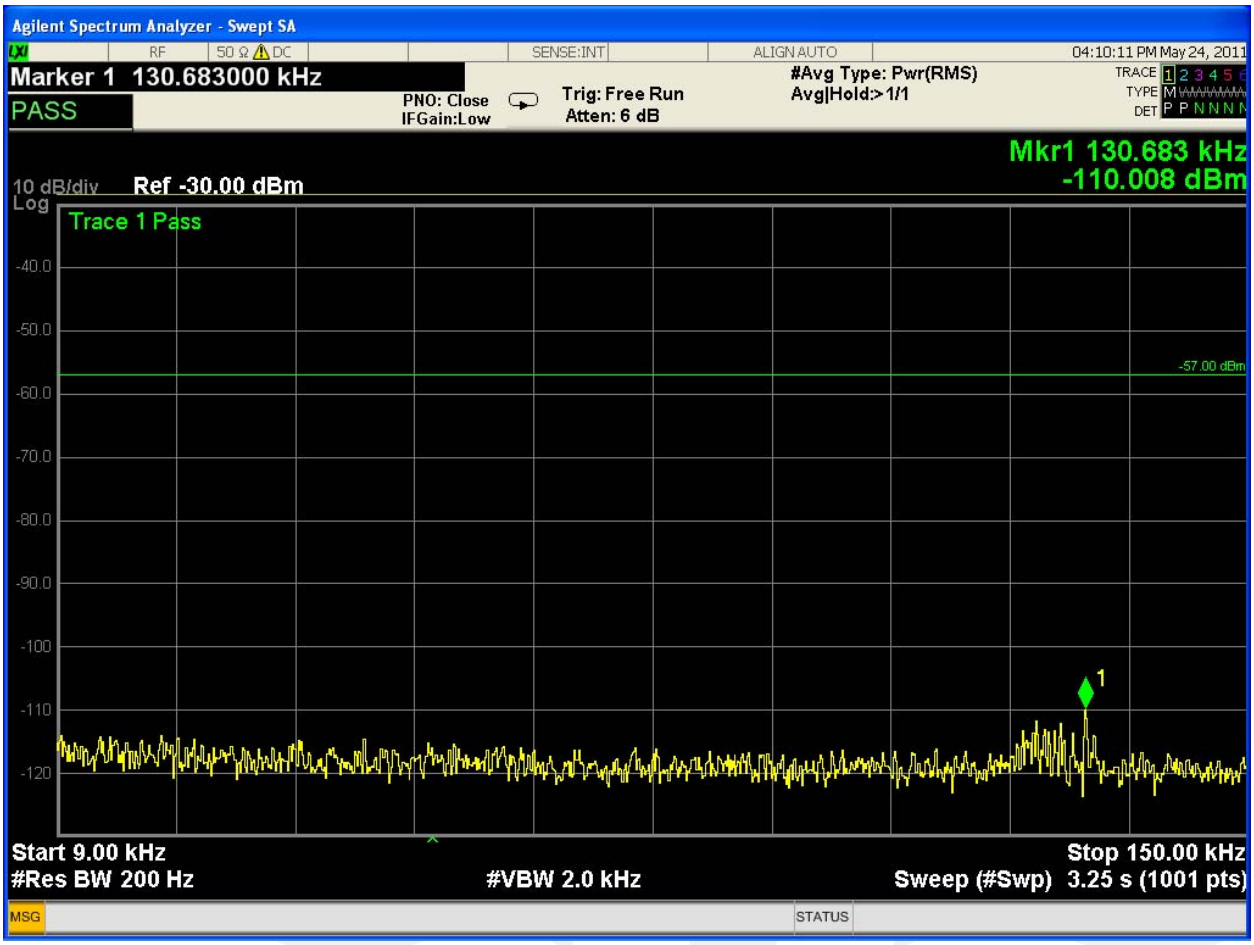
Rx1 Port
Receive mode
Low channel: 220.0125 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



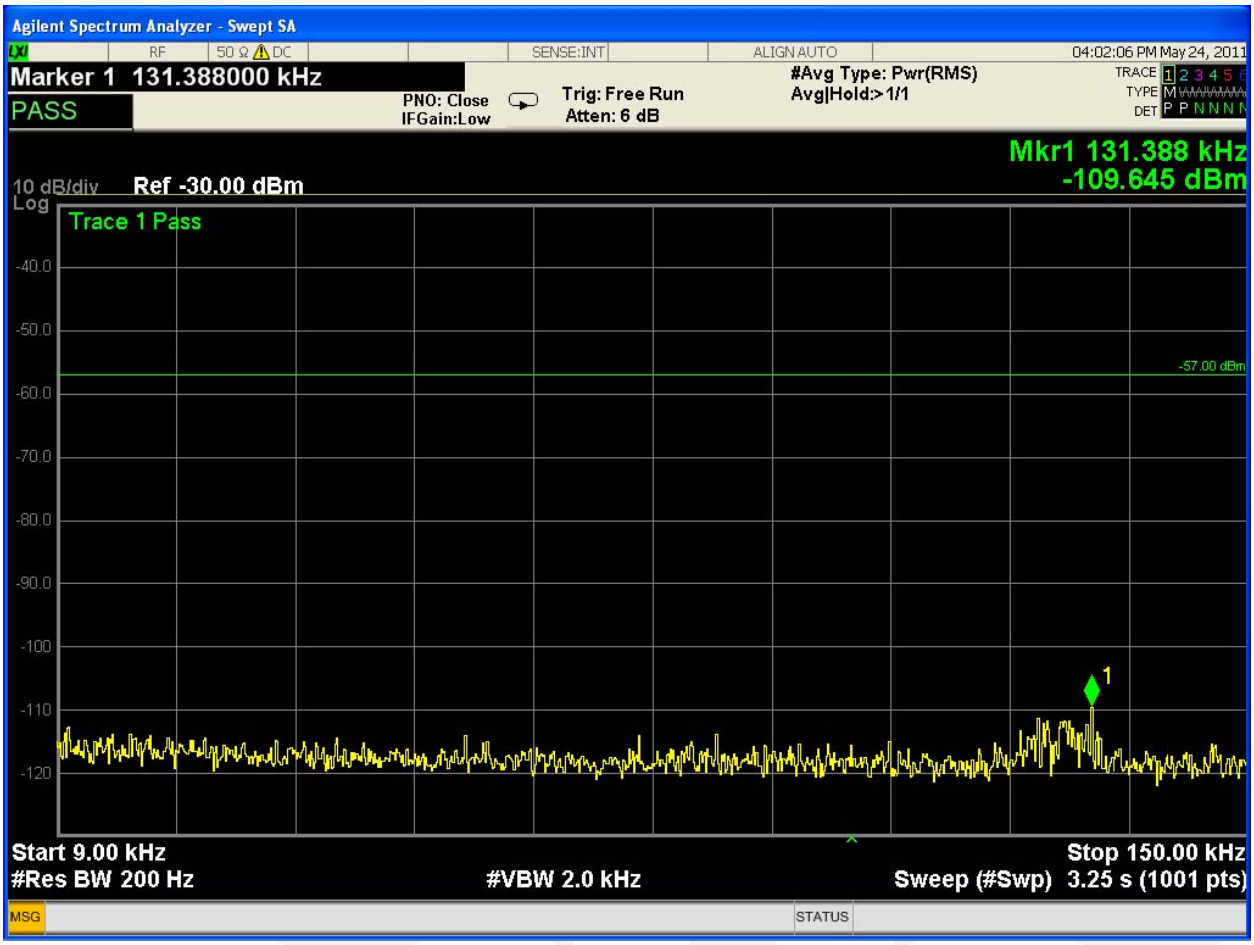
Rx2 port
Receive mode
Low channel: 220.0125 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



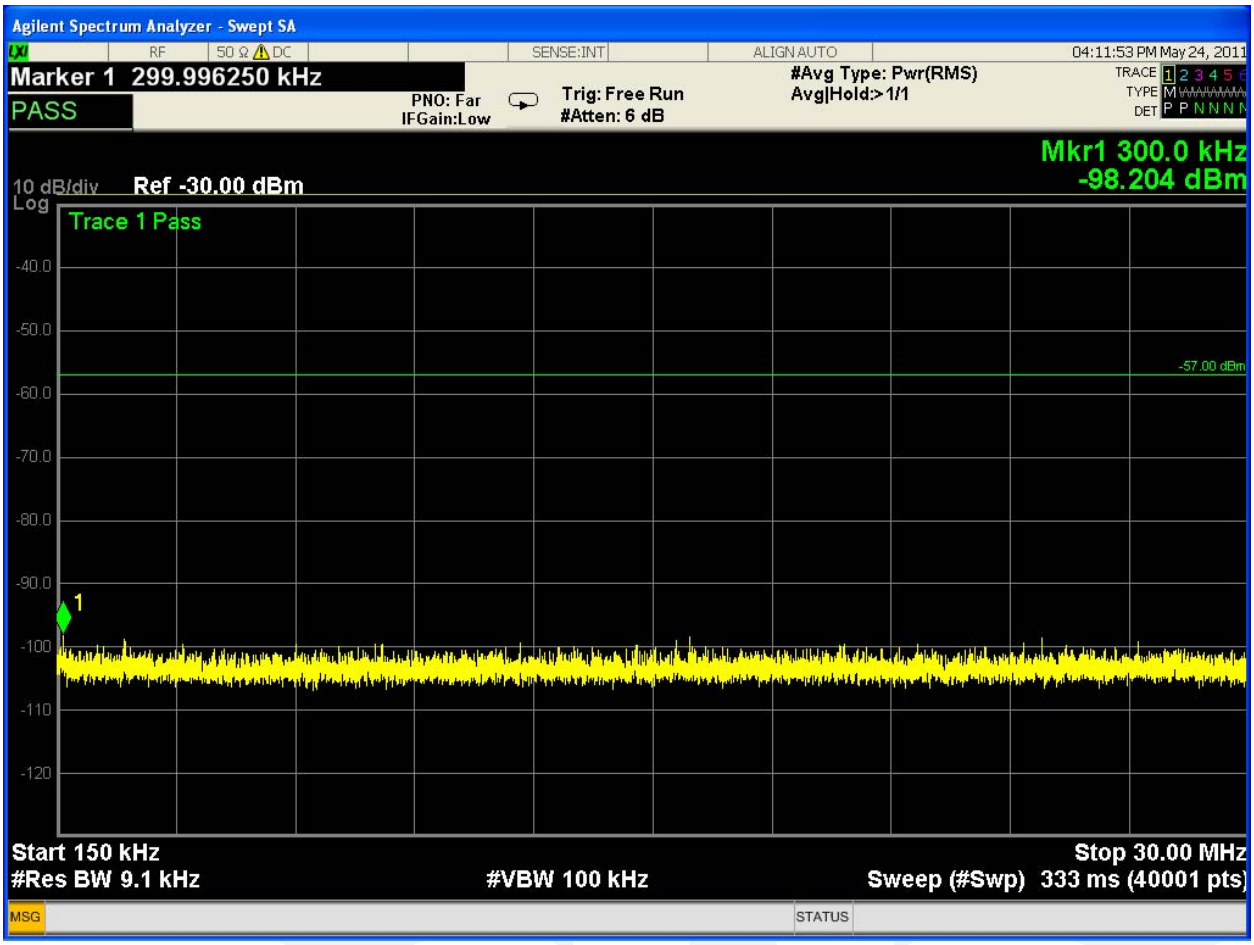
Rx1 Port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



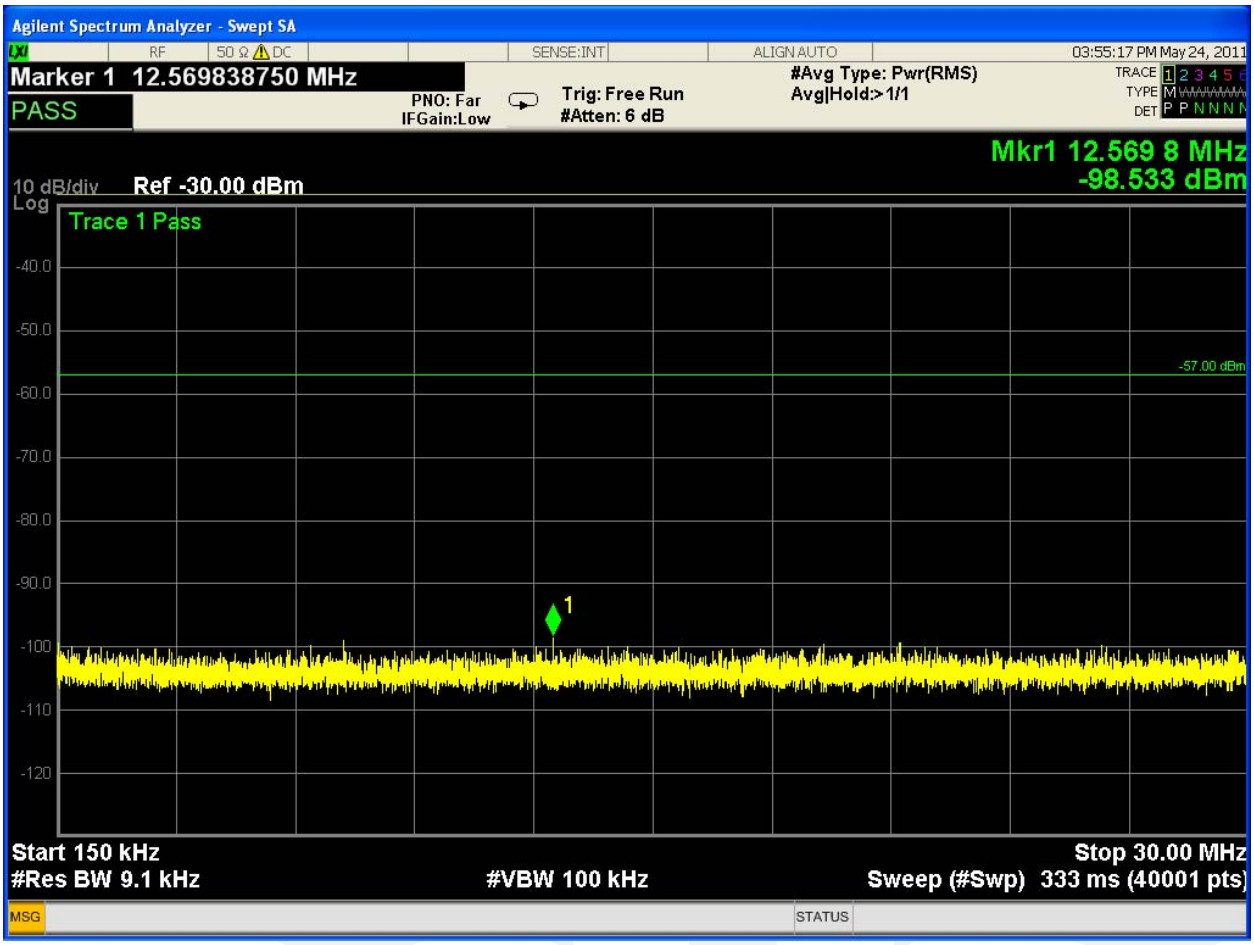
Rx2 port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



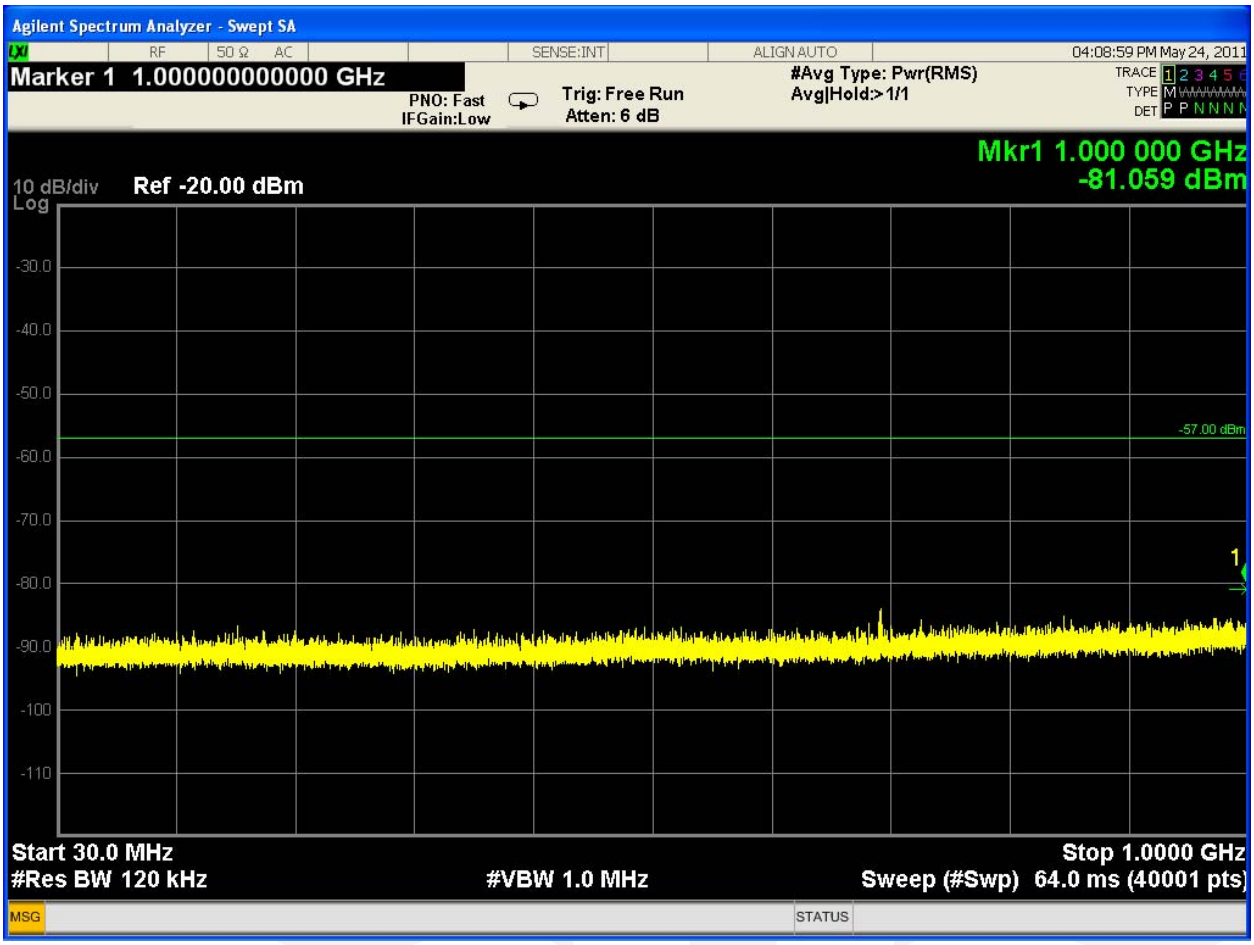
Rx1 Port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



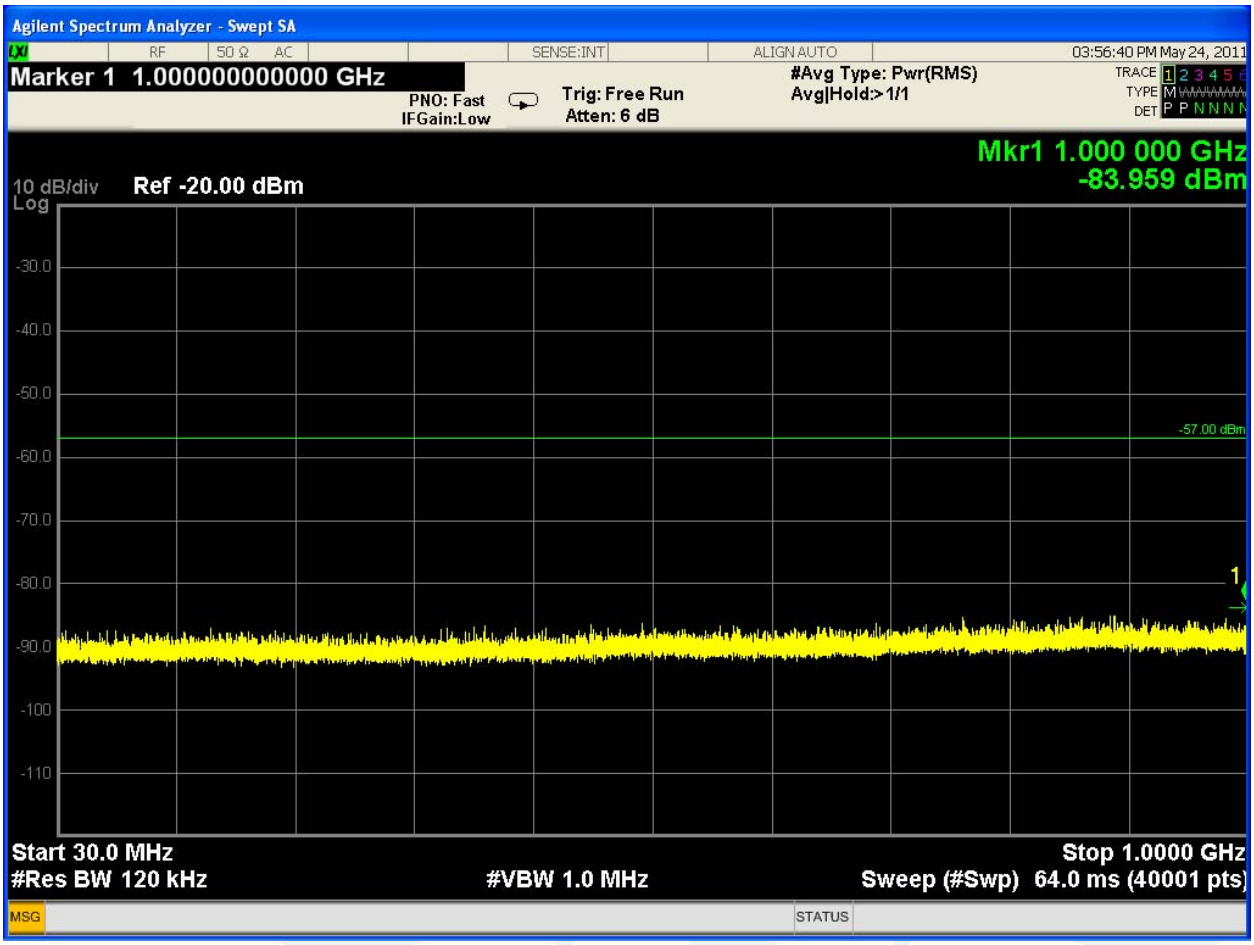
Rx2 port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



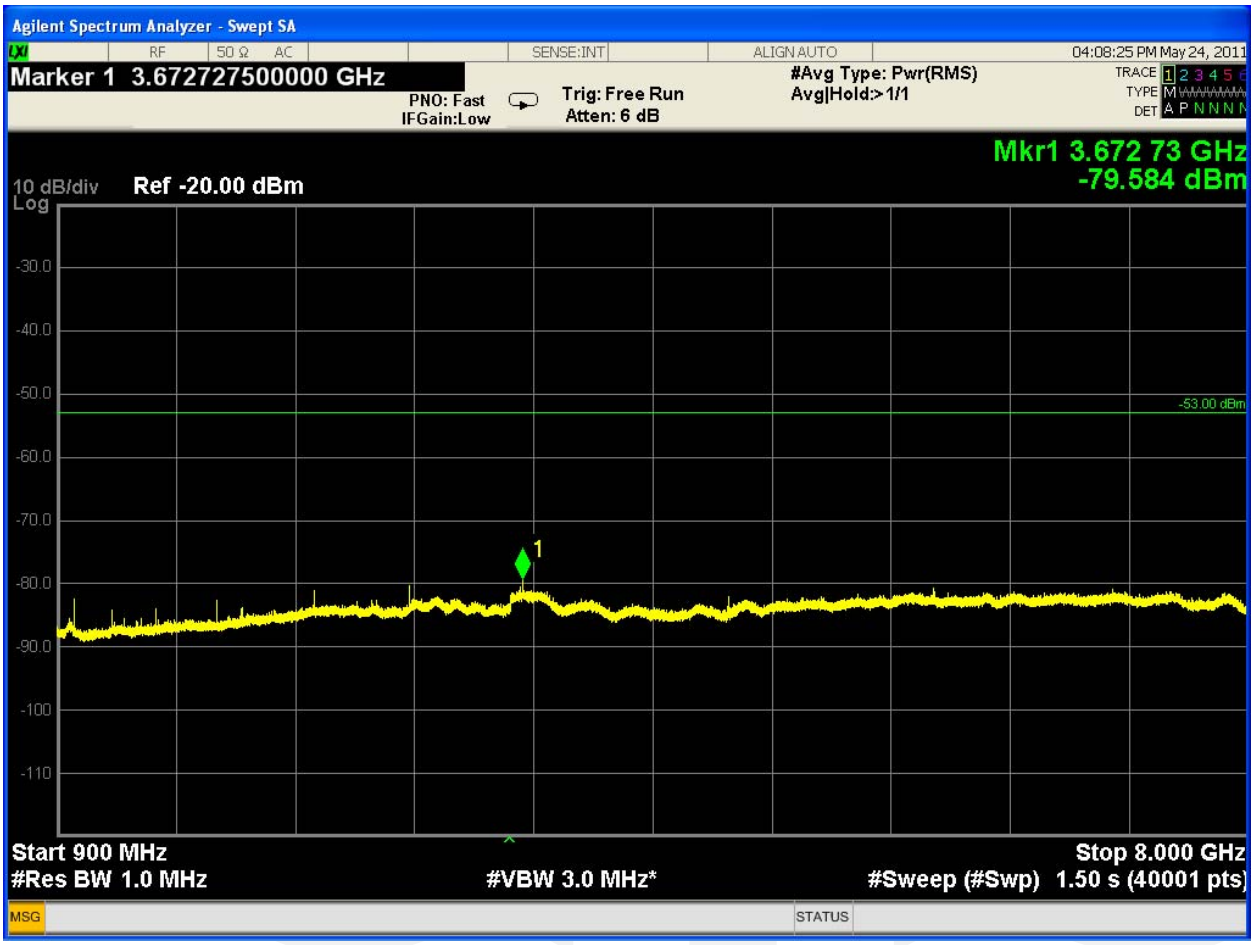
Rx1 Port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



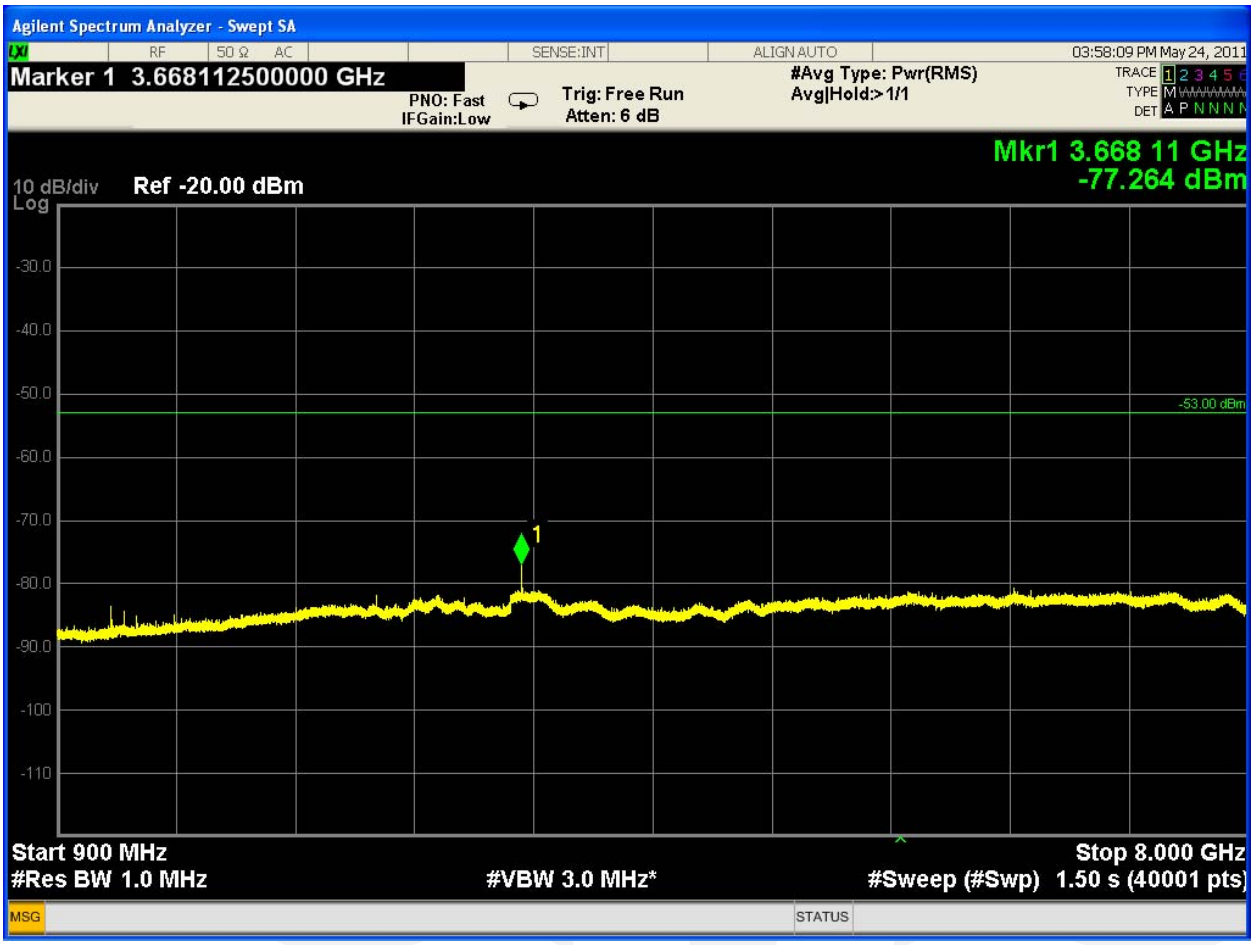
Rx2 port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

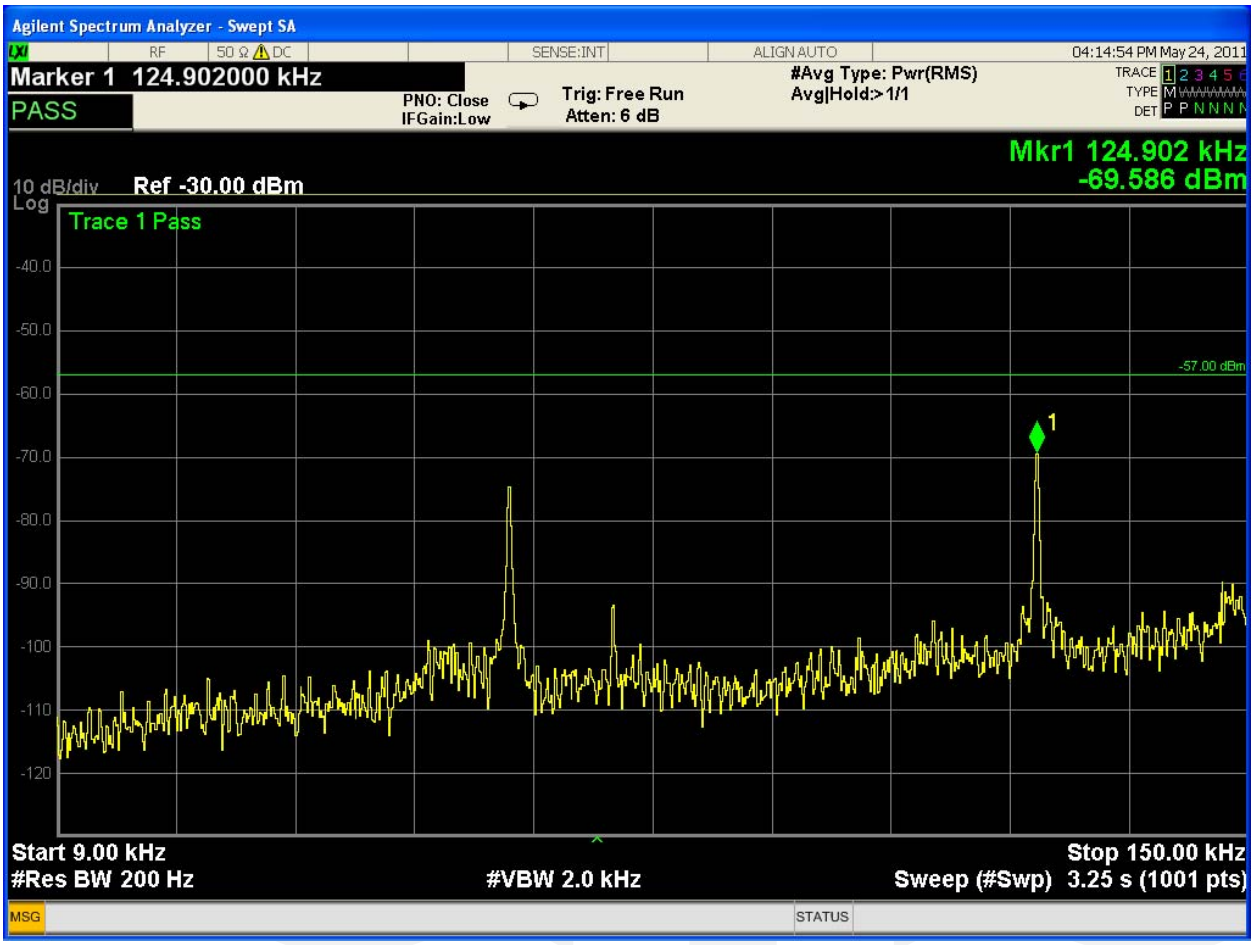


Rx1 Port
Receive mode
High channel: 221.9875 MHz

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

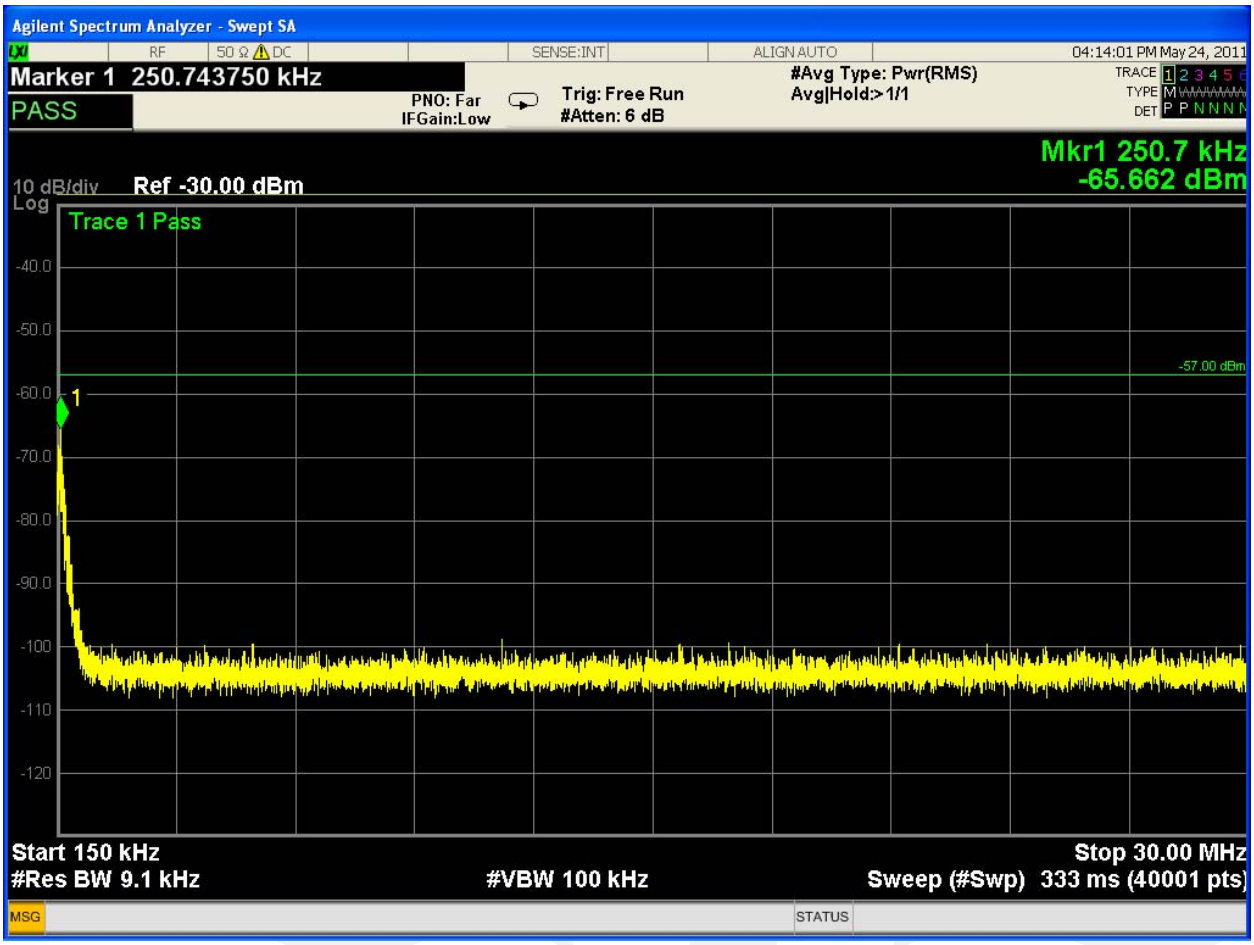


Rx2 port
Receive mode
High channel: 221.9875 MHz



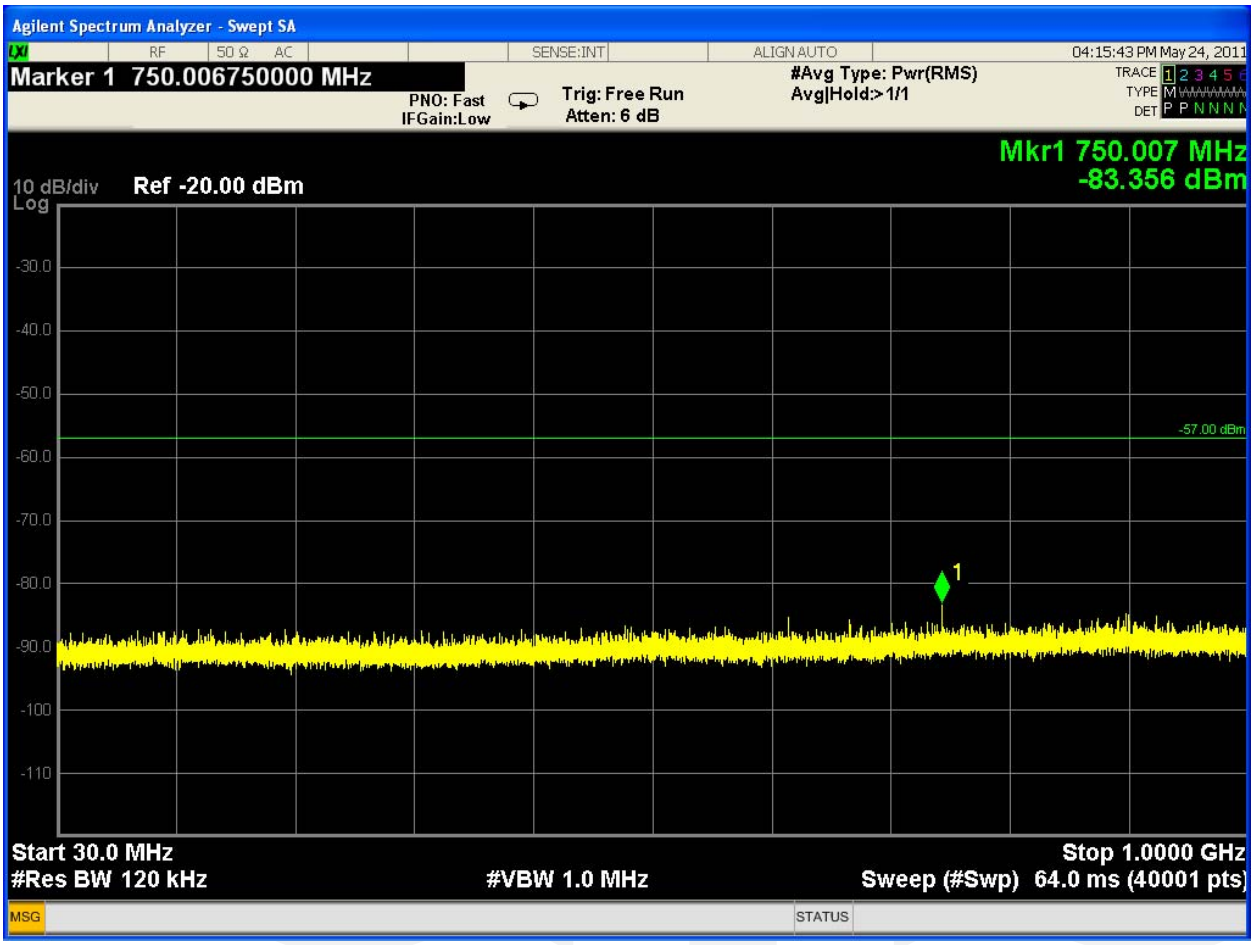
GPS Port

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



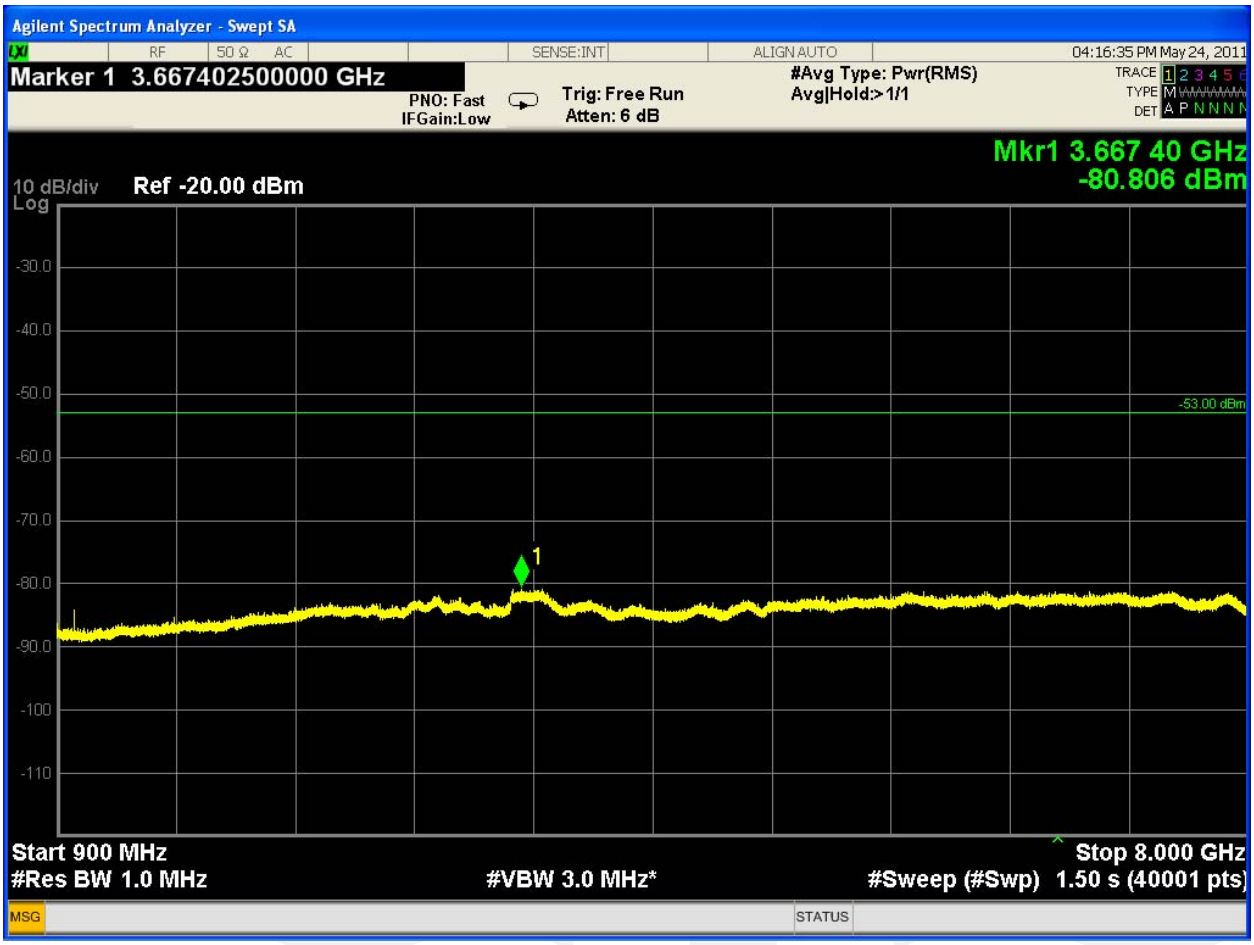
GPS Port

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



GPS Port

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298



GPS Port

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

9. Test-setup photo(s):

Radiated emissions

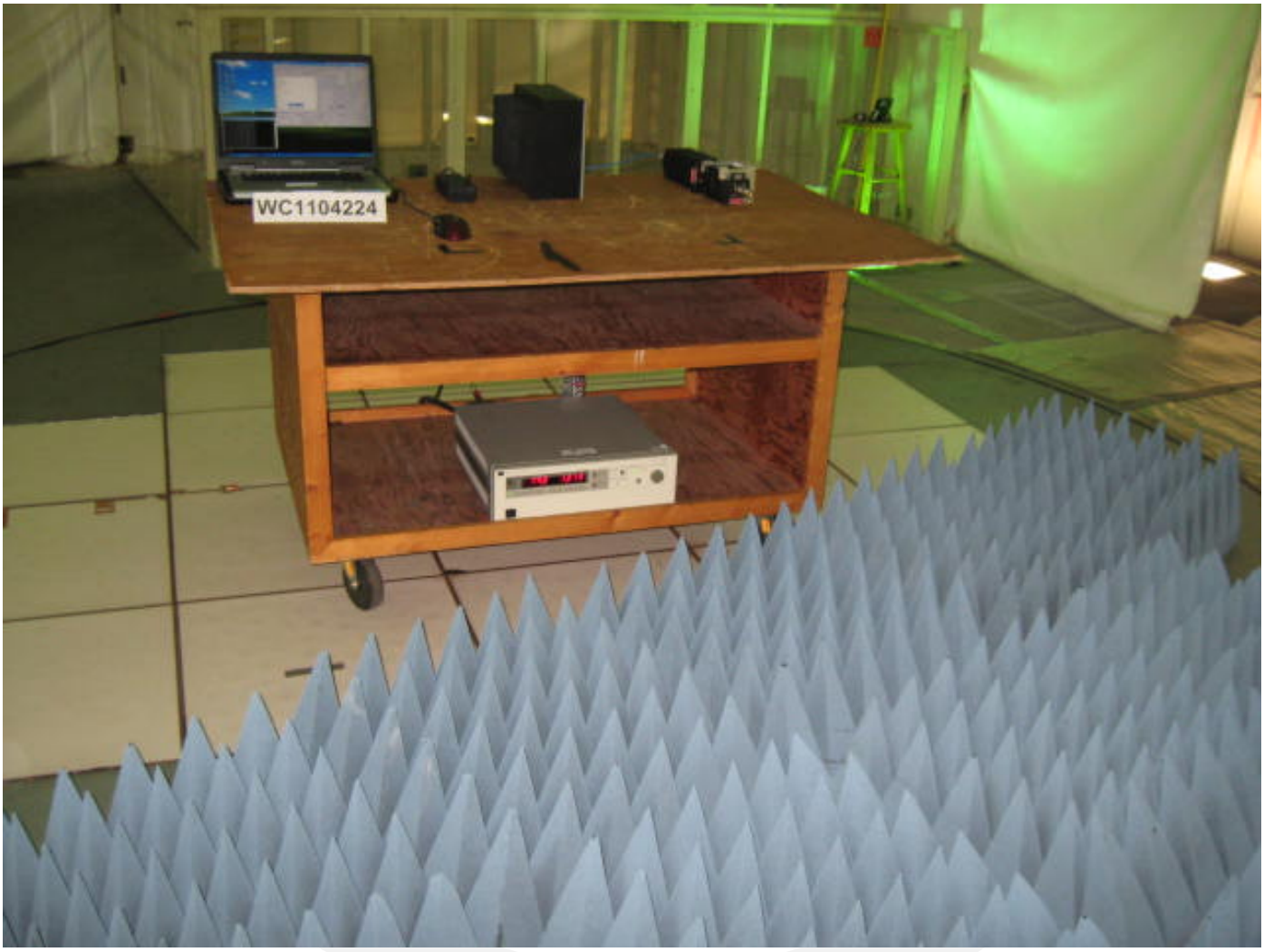
TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

Radiated emissions

Radiated emissions

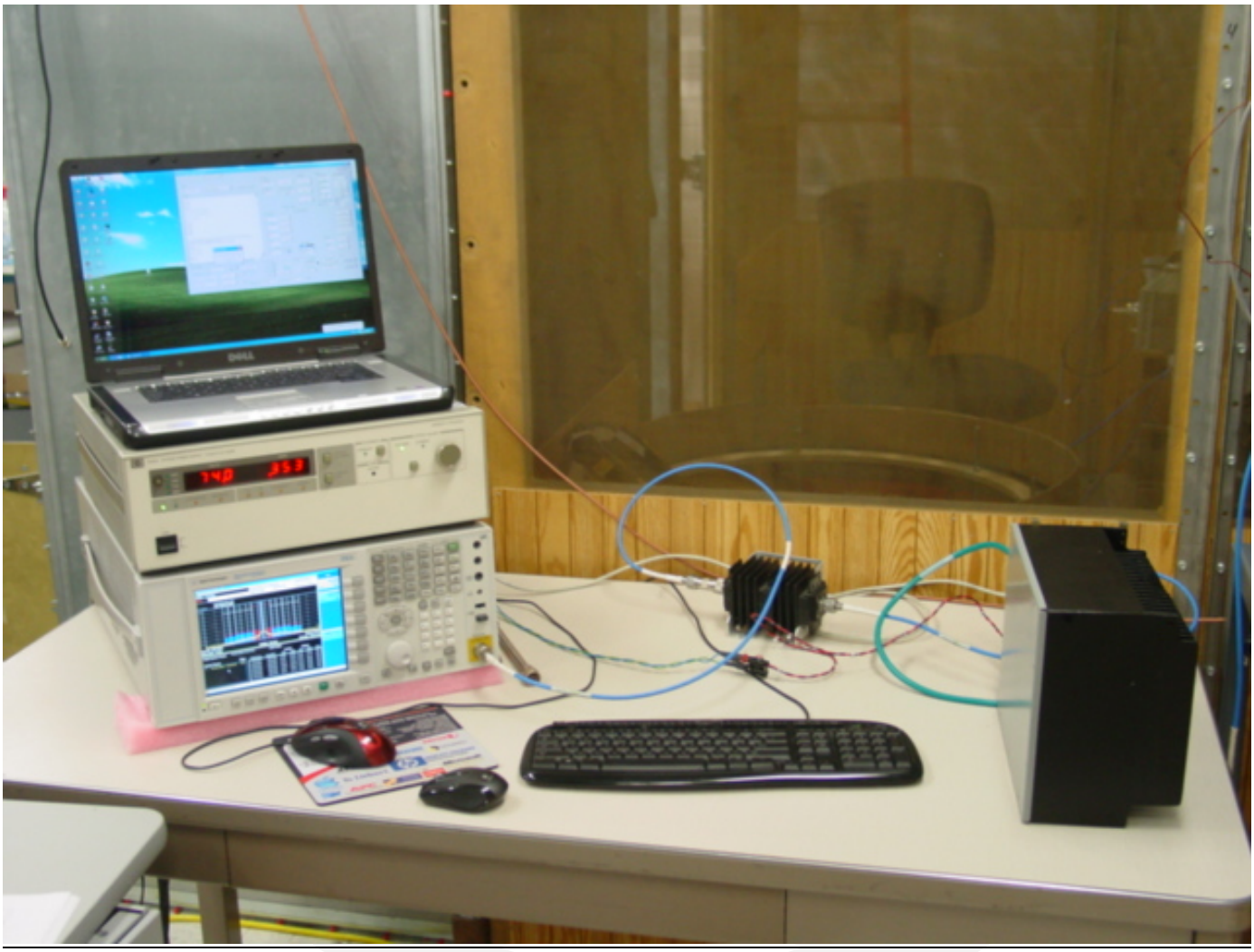
TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

Radiated emissions



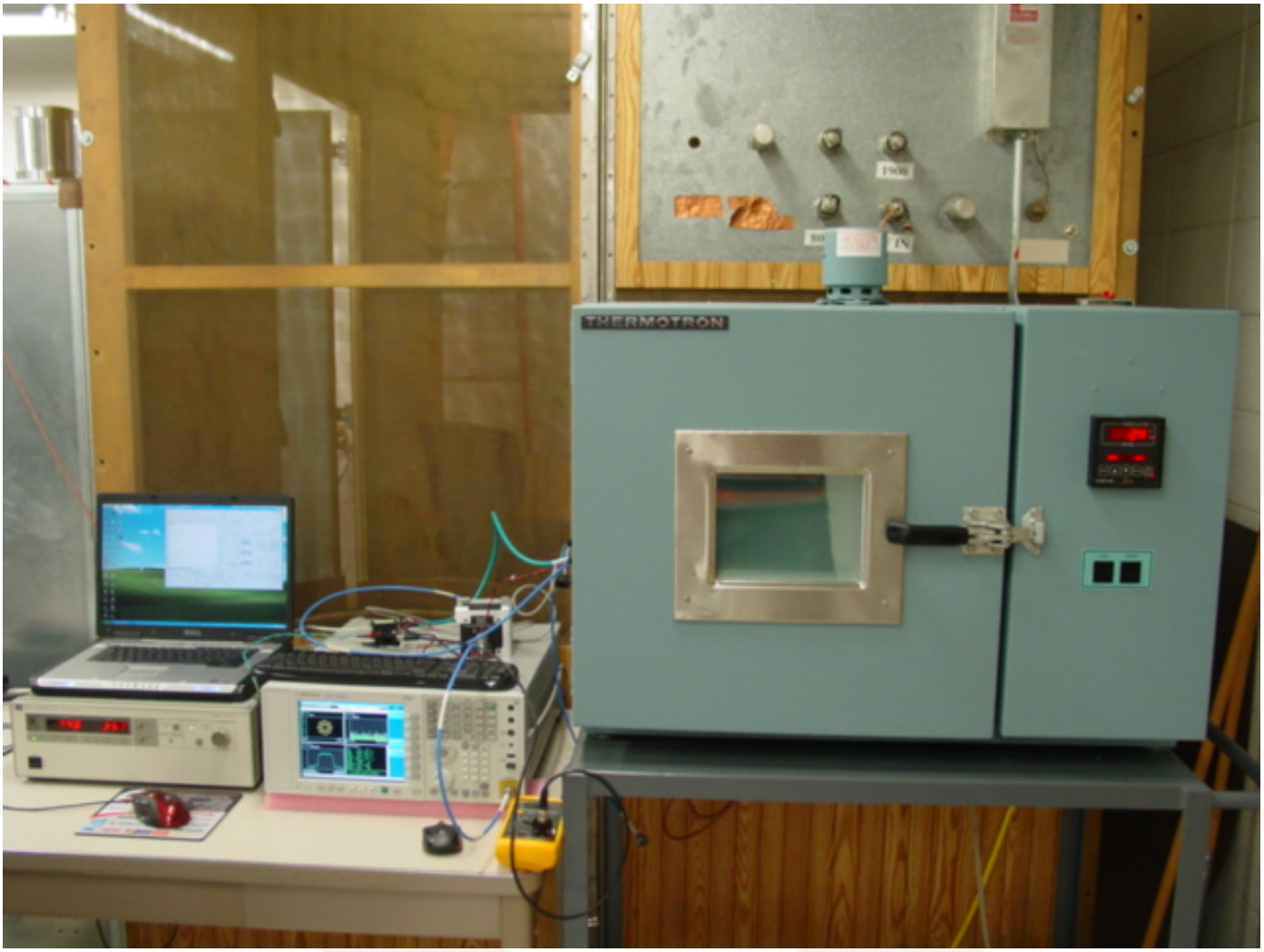
TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

Conducted emissions



TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

Conducted emissions, frequency stability



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10. EUT information

TÜV SÜD AMERICA INC 19333 Wild Mountain Road Taylors Falls MN USA 55084-1786 Tel: 651 638 0297 Fax: 651 638 0298

Form

EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company:	Meteorcomm LLC		
Address:	1201 SW 7th St		
	Renton, WA 98057		
Contact:	Fred Cleveland	Position:	Principal RF Design Engineer
Phone:	253-872-2521 x128	Fax:	253-872-7662
E-mail Address:	fcleveland@meteorcomm.com		

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description	Locomotive Radio		
EUT Name	Locomotive Radio		
Model No.:	63020	Serial No.:	FCC #2
Product Options:	LAN		
Configurations to be tested:	LAN		

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)*

Modifications since last test:

Modifications made during test:

Test Objective(s): ***Please indicate the tests to be performed, entering the applicable standard(s) where noted.***

☐ EMC Directive 2004/108/EC (EMC)	☒ FCC:	Class ☐ A ☒ B Part 15
Std:	☐ VCCI:	Class ☐ A ☐ B
☐ Machinery Directive 89/392/EEC (EMC)	☐ BSMI:	Class ☐ A ☐ B (Separate Report)
Std:	☒ Canada:	Class ☐ A ☒ B
☐ Medical Device Directive 93/42/EEC (EMC)	☐ Australia:	Class ☐ A ☐ B
Std:	☒ Other:	FCC 90 / IC RSS-119
☐ Vehicle Directive - 2004/104/EC (EMC)	☐ Ag Directive *2009/64/EC (EMC)	
☐ Other Vehicle Std:		
☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)		

Third Party Certification (contact TÜV for quote), if applicable (*Signature on last page required).

☐ Attestation of Compliance (AoC)*	☐ EMC Certification (used with Octagon Mark)*
☐ Statement of Compliance (SoC, previously CoC)* - All aspects of the essential requirements were assessed	
Protection Class (Req'd for AoC, SoC, EMC Cert. N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III (Press **F1** when field is selected to show additional information on Protection Class.)	
☒ FCC / TCB Certification	☐ Taiwan Certification
☒ Industry Canada / FCB Certification	☐ Korean Certification
☐ e-Mark Certification	

EMC Test Plan and Constructional Data Form

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TÜV SÜD America should:

☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____

☐ Continue testing to complete test series.

☒ Continue testing to define corrective action.

☐ Stop testing.

EUT Specifications and Requirements

Length: 9" Width: 4" Height: 9" Weight: 15 lb

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 120Vac/74Vdc (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 5ac/4.5dc Current (Amps/phase(nominal)): 3ac/3.5dc

Other _____

Other Special Requirements

none

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

Industrial

EUT Power Cable

☐ Permanent OR ☒ Removable Length (in meters): 1.7

☐ Shielded OR ☒ Unshielded

☐ Not Applicable

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables

Type	During Test: Analog	During Test: Digital	During Test: Active	During Test: Passive	Qty	Shielding: Yes	Shielding: No	Shielding: Type	Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
EXAMPLE:										*Metallized 9-pin D-Sub*	*Characteristic Impedance*			
RS232	☐	☒	☒	☐	*2*	☒	☐	*Foil over braid*	*Coaxial*			*6*	☒	☐
LAN	☐	☒	☒	☐	1	☐	☒	twisted pair	100 ohm differential	RJ45	100	1	☒	☐
MAINT	☐	☒	☐	☒	1	☐	☒	twisted pair	open	RJ45	100	n/a	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
Rx2	☒	☐	☒	☐	1	☒	☐	foil over braid	coaxial	type N	50	0	☒	☐
dc +/-	☒	☐	☒	☐	1	☐	☒	twisted pair	pin	circular	dc	1.7	☒	☐
Tx/Rx1	☒	☐	☒	☐	1	☒	☐	foil over braid	coaxial	type N	50	.5	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: Sprint v16.01

Description: ITC Application Software Image

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Transmitter radiated emissions 30 Mhz - 2200 MHz
   Flow = 217.6125 MHz / Modulation = DQPSK
   Fhigh = 221.9875 MHz / modulation = DQPSK_HALF
2. Receiver radiated emissions 30 MHz - 2200 MHz
   Flow = 217.6125 MHz / Modulation = DQPSK
   Fhigh = 221.9875 MHz / modulation = DQPSK_HALF
3. Power line conducted emissions

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
Master processor	custom	N/A	N/A
RF/DC Power	custom	N/A	N/A
Rx - Tx LPF	custom	N/A	N/A
Modulator	custom	N/A	N/A
Driver	custom	N/A	N/A
PA Final	custom	N/A	N/A
DC Converter	custom	N/A	N/A