REV	Δ	Description	Sheet Effected	Date	Drawn	Checked
A				02.10.05	D.Lanuel	S.Cohen
B		New document		06.10.05	D.Lanuel	S.Cohen

EMC Laboratory

Ga-ofdm-700

Manufactured by
WaveIP Ltd.

EMC Test Report

According FCC Part2, 27, 15 Requirements

SEP 2005

	Function/Title	Name	Signature	Date
Prepared b	Test Engineer	D.Lanuel		06.10.05
Checked by	Test Engineer	D.Lanuel		06.10.05
Approved by	EMC Lab. Manager	S.Cohen		06.10.05

Table of Contents

Para **Page**

1 GENERAL Information

a. Description of equipment under test

Equipment Under Test:	Ga-ofdm-700
FCCID:	QQ2-GAOFDM700
Manufacturer:	WaveIP.
Serial Numbers:	00-50C21CCE7B
Mode of Operation:	TX MODE
Assigned frequency band:	740-746MHZ
Year of Manufacture:	2005

b. Applicant Information:

Applicant:	WaveIP Ltd.
Applicant Address	TAVOR Building YOKNEAM
Telephone:	+972-4-9937333
FAX:	+972-4-9592614
The testing was observed by:	Yoram Singer
Following applicant's personnel:	Yoram Singer

c. Test Performance:

Date of reception for testing:	18.09.05
Dates of testing	18.09.05 - 21.09.05
Test Laboratory Location	TADIRAN EMC LAB, Hashoftim 26 Holon 58102 ISRAEL Tel: 972-3-5574476 Fax: 972-3-5575320
Applicable EMC Specification:	Federal Communication Commission (FCC), Code of Federal Regulations 47, FCC Docket 89-103, Part 15: Radio Frequency Devices, Sections 15.109, 15.207, 15.111, 2.1046, 2.1049, 2.1055, 27.50, 27.53, 27.54.

2 Test Summary and Signatures.

The E.U.T was found to comply with the requirements of the FCC Part 2, 27, 15 Regulations given below

Test Description	Specification Reference	Date of Testing	Test Report Paragraph	Compliance PASS/FAIL
Occupied 26dbc bandwidth	2.1049	20.09.05	4	PASS
Max peak output power	2.1046 27.50c(1)i	18.09.05	5	PASS
Frequency Stability	2.1055, 27.54	21.09.05	6	PASS
Conducted spurious emission at antenna termination	2.1047, 2.1051, 27.53f	18.09.05	7	PASS
Spurious emission radiated	2.1053, 27.53f	18.09.05	9	PASS
Unintentional radiated emission	15.109	18.09.05	6	PASS
Antenna power conducted for receiver	15.111		10	PASS
Conducted emission	15.207	18.09.05	11	pass

a. **Test performed by:**

Mr. D. Lanuel Test Engineer

b. **Test Report prepared by:**

Mr. D. Lanuel Test Engineer

c. **Test Report Approved by:**

Mr. Samuel Cohen EMC Lab. Manager

3 EUT Description

a. **General**

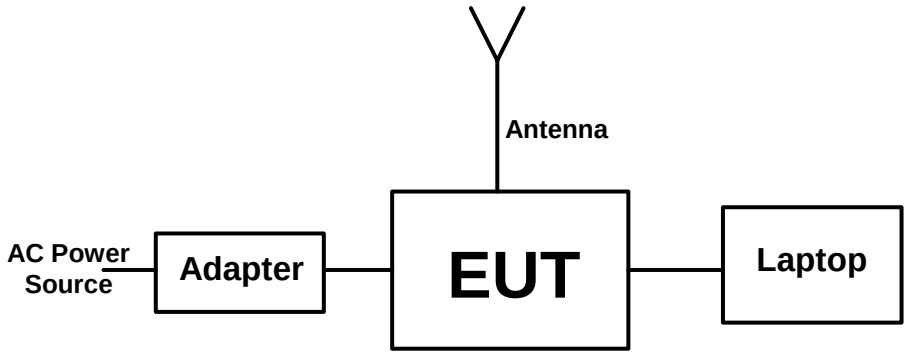
Model Number(s): Ga-ofdm-700

Brief Description (Purpose of Device):

GigAccess™ 700 is WaveIP's wireless point-to-point and point-to-multipoint broadband communication system. The basic subsystem is composed of a single sector, which consists of an AU (Access Unit) and up to 128 SUs (Subscriber Units). Each sector is a stand-alone communication network operating on a star topology with a gateway to the WAN, which allows two-way communication between the SUs and the WAN via the AU. A Sector may be divided into sub sectors, which are consecutive to the SUs within the sector.

b. **E.U.T Test Configuration**

EUT test configuration is shown in figure bellow



c. **E.U.T Mode of Operation description**

(1) Transmit -743MHz

(2) Receive

(3) Transmitter Power Source
Adapter 220VAC/12VDC

4 Occupied Bandwidth for According to 2.1049

E.U.T:	Ga-ofdm-700 S/N: 0050C21CCE7B
Date:	20.09.05
Relative Humidity:	34%
Ambient Temperature:	23c
Air Pressure:	1051hpa

Testing Engineer: D.Lanuel **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with OCCUPIED BANDWIDTH

b. **Limits of bandwidth**

The test unit shall meet the limits of Table 4.b

Table 4.b Limits For Bandwidth

Assigned Frequency band(MHz)	Modulation envelope reference point dbc
740 - 746	26dbc

c. **Test Results**

Table 4.c Bandwidth Test Result

Frequency (MHz)	Bandwidth	Bandwidth (MHz)	Plot Results	PASS/ FAIL
743	16QAM	5.1	Plot-1	PASS
743	64QAM	5.05	Plot-2	PASS
743	BPSK	5.27	Plot-3	PASS
743	QPSK	5.17	Plot-4	PASS

d. **Test Instrumentation and Equipment**

Table 4.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
Broadband Antenna	BTA-L	FRANKONIA	10.04.06
20db attenuator	2525-200	ATM	18.03.06

e. **Test Procedure**

The EUT output was connected to the spectrum analyzer through 40db attenuator, The test set up are shown in figure 4e bellow

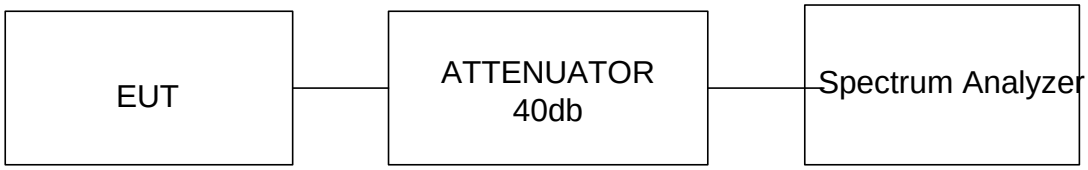


Figure 4e Test Setup for Occupied Bandwidth test

5 Maximum peak output power test according 2.1046 & 27.50

E.U.T:	Ga-ofdm-700 S/N: 0050C21CCE7B
Date:	18.09.05
Relative Humidity:	34%
Ambient Temperature:	23c
Air Pressure:	1051hpa
Test Setup:	Figure 5e

Testing Engineer: D.Lanuel **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with peak output power requirement

b. **Limits**

The test unit shall meet the limits of Table 5.b**.**

Table 5.b peak output power limits

Operating frequency (MHz)	Peak Max Limits(dbm)
743	60

c. **Test Results**

Table 5.c Peak output power Result

Frequency (MHz)	RF out power dbm	**ERP dbm	ERP limit dbm	Plots Result	Pass/ Fail
743MHz	28.91*	38.91	60	Plot-4	PASS

*See calculation bellow-based on test procedure paragraph 5e

**ERP (dbm) =RF output power+ antenna gain (10dbi)

(1) 943MHz peak power calculation –based on plot-4

a) BW correction factor is: 10log 6db BW of emission/analyzer RBW
b) 10log 6/3=3.01
c) Output power: 25.9+3.01=28.91

d. **Test Instrumentation and Equipment**

Table 5.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
20db attenuator	2525-200	ATM	18.03.06

e. **Test Procedure**

(1) Spectrum analyzer measured the transmitter peak output power while the RBW of analyzer is 3MHz and the RBW of transmitter is 5MHz.

(2) When the analyzer RBW is not large enough as required. The peak output power procedure is as follows:

a) Set the RBW and VBW to the maximum available.
b) Set the band limit to 6db
c) Set sweep to automatic
d) Set the span just enough to capture the emission
e) Use the peak detector on max hold
f) Set the analyzer on linear mode display
g) Let the emission stabilize before making a final reading

BW correction factor is: 10log 6db BW of emission/analyzer RBW

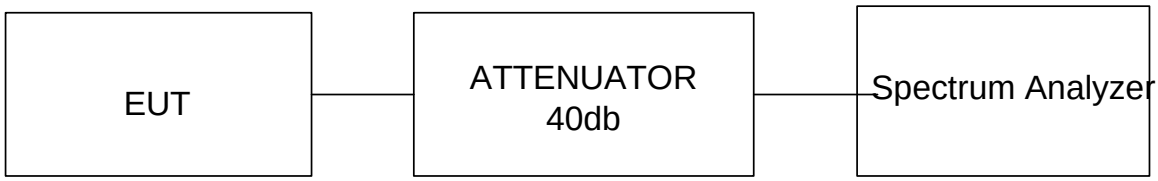


Figure 5e Test Setup for Peak output power

6 Frequency stability according to part 2.1055 & 27.54

E.U.T: Ga-ofdm-700 S/N: 0050C21CCE7B
Date: 18.09.05
Relative Humidity: 34%
Ambient Temperature: 23c
Air Pressure: 1051hpa
Test Setup: Figure 5e

Testing Engineer: D.Lanuel **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with f requirement of frequency stability

b. **Limits**

The test unit shall meet the limits of Table 6.b**.**

Table 6.b Frequency stability limits

6 MHz channel (MHz)	Maximum allowed freq displacement
740 - 746	26dbc point shall remain within the assigned band

c. **Test Results**

Table 6.b Frequency stability test results

T°c	Voltage (V)	Measured 26dbc point left (MHz)	Measured 26dbc point right(MHz)	Max Freq Drift(Hz)	Max Freq Drift (ppm)	Pass/ Fail
-30	Nominal	745.5352	740.5408	180800	242	Pass
-20	Nominal	745.4602	740.5409			Pass
-10	Nominal	745.3802	740.5701			Pass
0	Nominal	745.3704	740.5251			Pass
10	Nominal	745.4905	740.4654			Pass
20	+15%	745.5952	740.5105			Pass
20	Nominal	745.5808	740.5403			Pass
20	-15%l	745.5806	740.5408			Pass
30	Nominal	745.5205	740.6152			Pass
40	Nominal	745.4608	740.6157			Pass
50	Nominal	745.4008	740.6154			Pass

d. **Test Instrumentation and Equipment**

Table 5.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
20db attenuator	2525-200	ATM	18.03.06

e. **Test Procedure**

(1) The EUT was set as shown in figure 6e

(2) The 26dbc point was measured 10 minute after frequency had been stabilized at temperature rang of -30 - 50°c

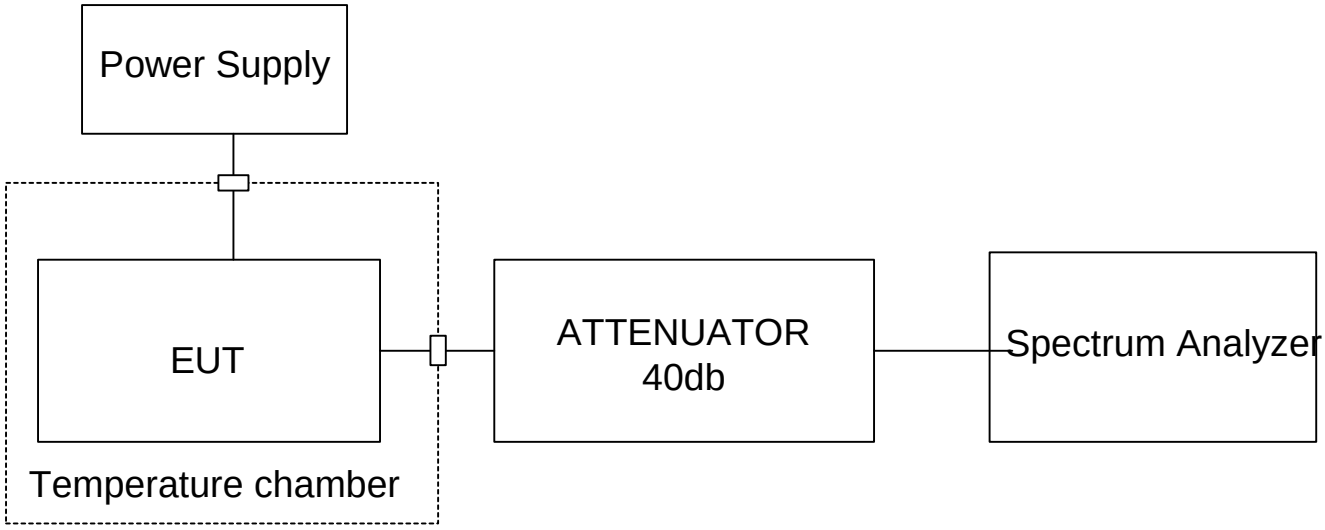


Figure 6e Test Setup for Frequency stability

7 Spurious emission at antenna termination test according t0 2.1047, 2.1051, 27.53f

E.U.T:	Ga-ofdm-700 S/N: 0050C21CCE7B
Date:	18.09.05
Relative Humidity:	34%
Ambient Temperature:	23c
Air Pressure:	1051hpa
Test Setup:	Figure 7.e

Testing Engineer: D.Lanuel **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with Spurious emission at antenna termination test

b. **Limits of conducted emission**

The test unit shall meet the limits of Table 7.b**.**

Table 7.b Limits For 15.247(c)

Frequency range(MHz)	Attenuation below carrier dbc	Limits dbm
0.009 – 7300	43+10logP	-13

c. **Test Results**

Table 7.c Spurious emission at antenna termination test results

Operating Frequency (MHz)	Frequency range (MHz)	Results (dBμV/m)	Plots Result
743MHz	0.009 – 7300	All emission were found Min 30db below the specified limits	5 - 12

d. **Test Instrumentation and Equipment**

Table 7.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
20db attenuator	2525-200	ATM	18.03.06

e. **Test Procedure**

The EUT output was connected to the spectrum analyzer through 40db attenuator. The test set up is shown in figure 6e bellow.

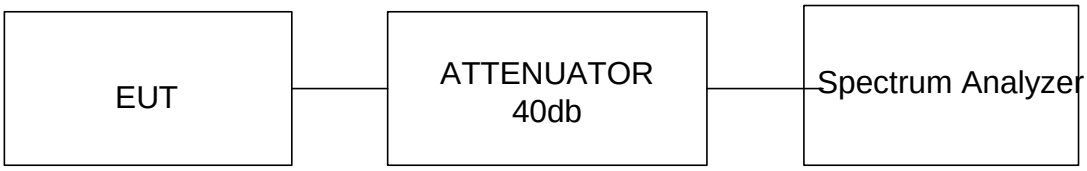


Figure 6e Test Setup for Conducted emission

8 Radiated spurious emission test according 2.053 & 27.53f

E.U.T:	Ga-ofdm-700 S/N: 0050C21CCE7B
Date:	18.09.05
Relative Humidity:	34%
Ambient Temperature:	23c
Air Pressure:	1051hpa
Test Setup:	Figure 8.e1 – 8.e.2

Testing Engineer: D.Lanuel **Date** 27/09/05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with radiated spurious emission test

b. **Limit**: The test unit shall meet the Limits. Of table 8.b

Table 8.b Radiated spurious emission limits

Frequency range (MHz)	Attenuation below carrier dbc	Limits dbm	Equivalent strength limit 3m dbµV/m
0.009 – 7300	43+10logP	-13	84.4*

*Equivalent field strength limit was calculated as follows:

$$E_{V/w} = \frac{1}{d}\sqrt{P_W x30x1.64}$$

P=ERP in W
E=field strength in V/m
1.64=gain of ideal dipole
D=test distance in meter

c. **Results**

(1) Preliminary Results

Table 8.c1 Spurious emission field strength test results

Transmitting Frequency	Measuring Frequency Range	Plots Results	PASS/FAIL
743MHz	9KHz- 7.2GHz	13 - 21	PASS

(2) Final Test Results

Table 8c2 ERP of Spurious emission test results

Freq (MHz)	Field strength dBµV/m	Ant pol	RF gen Out dbm	Cable loss	ERP dbm	Limit dbm	Margin db	Pass/ fail
All radiated spurious emission were found more than 20db below the limit								

d. **Test Instrumentation and Equipment**

Table 8.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
Loop Antenna	HFH2-Z2	Rohde &Schwarz	N.P.C.R
Double Ridge Guide Ant	3105	EMCO	24.04.06
Broadband Antenna	BTA-L	FRANKONIA	10.04.06
Low Noise Amplifier (0-1GHz)	AM-1300-N	MITEQ	14.01.06
Low Noise Amplifier (1-4GHz)	AMM 003N	AVANTEK	14.01.06
Low Noise Amplifier (2-6GHz)	MWA-02060	ELISRA	14.01.06
Low Noise Amplifier (6-18GHz)	MWA-06180	ELISRA	14.01.06
High pass filter 1000MHz	1/15G-10EE	WHK	10.02.06
Band reject filter 740 - 746MHz	WRCG700	WHK	10.02.06

e. **Test Procedure**

Test Procedure for field strength measurement

(1) The EUT was setup as shown in figure 8e1

(2) The EUT was adjusted to produce maximum power output

(3) The Spectrum analyzer was set to 3 MHz bandwidth

Test Procedure for substitution ERP measurement of spurious

(4) The EUT was setup as shown in figure 8e2

(5) RF signal generator was set to the EUT carrier frequency and the RF output level was adjusted to produce the same field strength as it was measured from the EUT

(6) The test antenna height was swept to find maximum emission from substitute antenna and RF signal generator was adjusted to produce the same field strength as it was measured from the EUT

(7) The ERP was calculated as a sum of signal generator output power in dbm and antenna gain

(8) Paragraph 4 through 7 was performed in both horizontal and vertical polarization of the test antenna

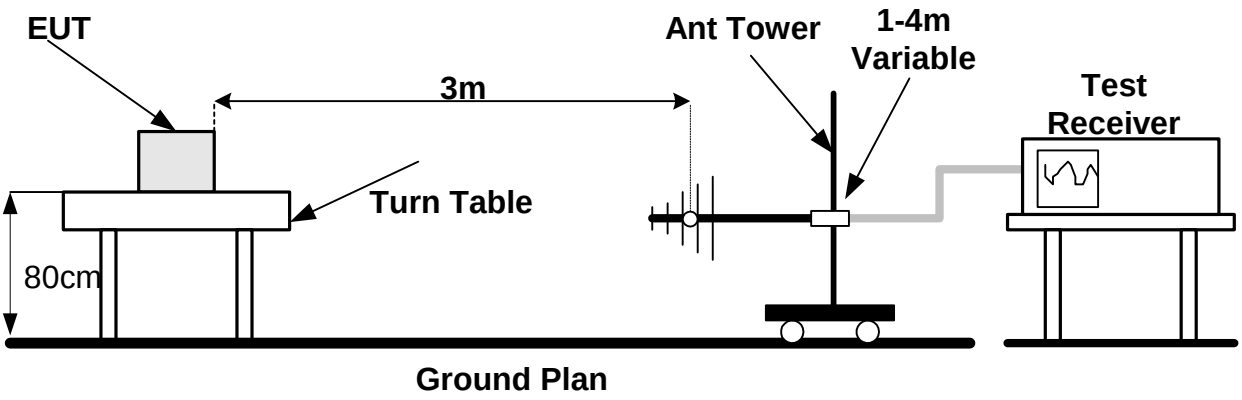


Figure 8e1 Test setup field strength peak power measurement

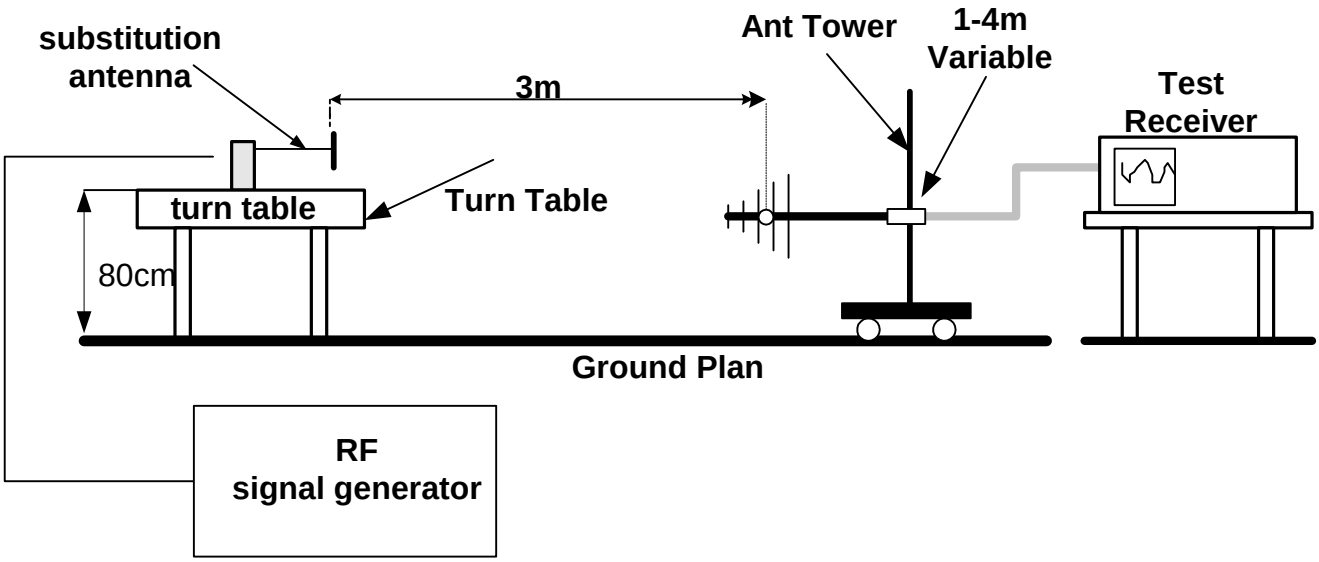
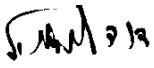


Figure 8e2 Test setup of ERP measurement

9 Unintentional radiated emission test according to 15.109

E.U.T: Ga-ofdm-700 S/N: 0050C21CCE7B
Date: 18.09.05
Relative Humidity: 34%
Ambient Temperature: 23c
Air Pressure: 1051hpa

Testing Engineer: D.Lanuel  **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with unintentional radiated emission requirements.

b. **Limit**:

Unintentional radiated emission must comply with 15.109 Limits. See limits in table 9b bellow.

Table 9b Limits For 15.109 Class B equipment

Frequency Range (MHz)	Quasi-peak Limits (dBμV/m)	Peak Limit	Average Limit
30 - 88	40	NA	NA
88 - 216	43.5		
216 - 960	46		
960 - 1000	54		
Above 1000	NA	74	54

c. **Test Results**

Table 9.c .Preliminary test results

Antenna Polarization	Frequency Range(MHz)	Plots Results	PASS/ FAIL
Both	30-1000	22	PASS
	1-2.8GHz	23	PASS
	2.8 – 6GHz	24	PASS
	6GHz – 6.5GHz	25	PASS
	6.5GHz – 7.5GHz	26	PASS

Table 9c1 Six Highest 15.109

Freq. (MHz	QP Reading (dbµV/m)	QP Limit (dbµV/m)	Margin (db)	Compliance PASS/FAIL	Plots
30.452	31.2	40	-8.8	PASS	21
42.105	31.6	40	-8.4	PASS	

d. **Test Instrumentation and Equipment**

Table 9.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
Loop Antenna	HFH2-Z2	Rohde &Schwarz	N.P.C.R
Double Ridge Guide Antenna(1-18GHz)	3105	EMCO	24.04.06
Broadband Antenna(30-1000MHz)	BTA-L	FRANKONIA	10.04.06
Low Noise Amplifier (0-1GHz)	AM-1300-N	MITEQ	14.01.06
Low Noise Amplifier (1-4GHz)	SMC-09	MITEQ	14.01.06
Low Noise Amplifier (2-6GHz)	SMC-09	MITEQ	14.01.06
Low Noise Amplifier (6-10GHz)	SMC-09	MITEQ	14.01.06

e. **Procedure**

The EUT output was connected to the spectrum analyzer through appropriate low noise amplifier while the EUT is in STBY mode.

10 Antenna power conduction for receive according part 15.111

E.U.T: Ga-ofdm-700 S/N: 0050C21CCE7B
Date: 18.09.05
Relative Humidity: 34%
Ambient Temperature: 23c
Air Pressure: 1051hpa

Testing Engineer: D.Lanuel **Date** 27/09/05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with Antenna power conduction for receive requirements.

b. **Limit**:

Antenna power conduction for receive must comply with 15.111 Limits. See limits in table 9b bellow.

Table 10b Limits For 15.111

Frequency range (MHz)	Mode of operation	Spurious (nw)	Spurious (dbµv)
30 - 2000	Receive	2	50

c. **Test Results**

Table 9.c Test results

Mode of Operation	Frequency Range(MHz)	Plots Results	PASS/ FAIL
Receive	30-1000	27	PASS
	1-2.8GHz	28	PASS

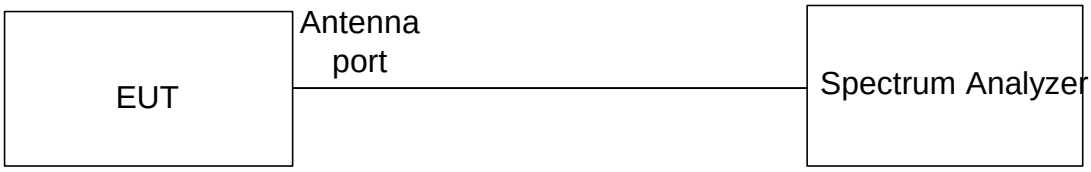
d. **Test Instrumentation and Equipment**

Table 9.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06

e. **Procedure**

The EUT output was connected to the spectrum analyzer while the EUT is in receiving mode.



11 Conducted emission test according to 15.207.15.107

E.U.T:	Ga-ofdm-700 S/N: 0050C21CCE7B-C3-3D
Date:	18.09.05
Relative Humidity:	34%
Ambient Temperature:	23°c
Air Pressure:	1051hpa
Test Setup:	Figure 11f, 12f

Testing Engineer: D.Lanuel **Date** 27.09.05

a. **Test Results Summary & Conclusions**

The E.U.T was found in compliance with conducted emission power leads requirements.

b. **Limit**:

Conducted emission must comply with 15.207 Limits. See limits in table 10b bellow.

Table 10.b Limits For 15.207 Class B equipment

Frequency (MHz)	Quasi-peak Limits (dBμV/m)
0.15 – 0.5	66-56
0.5 - 5	56
5 - 30	60

c. **Test Results –P LOTS 122,123**

Table 10.c Test results

Frequency Range (MHz)	Tested Line	Plots Results	PASS/ FAIL
0.15 - 30	PHASE	29	PASS
0.15 - 30	NEUTRAL	30	PASS

Table 10.c1 Six Highest 15.207

Freq. MHz	QP Reading (dbμV/m)	Limit (dbμV/m)	Margin (db)	Plots
1.535	50.1	56	-5.9	29
1.838	52.8	56	-3.2	30

d. **Test Instrumentation and Equipment**

Table 10.d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/06
LISN	DC-AC-20A/01	TADIRAN	N.P.C.R
20DB attenuator	2525	ATM	18.03.06

e. **Test Procedure**

a) The EUT was placed on the top of table 1m by 1.5m, raised 0.8 meters above the conducting ground plane

b) The rear panel of the EUT was located 40cm to the vertical wall of the screen room

c) Each EUT power leads were individually connected through an LISN to the input power source. Unused 50 ohm connector of the LISN was terminated in 50ohm and other was connected to the spectrum analyzer through 20db attenuator for maximum conducted interference

f. **Test setup**

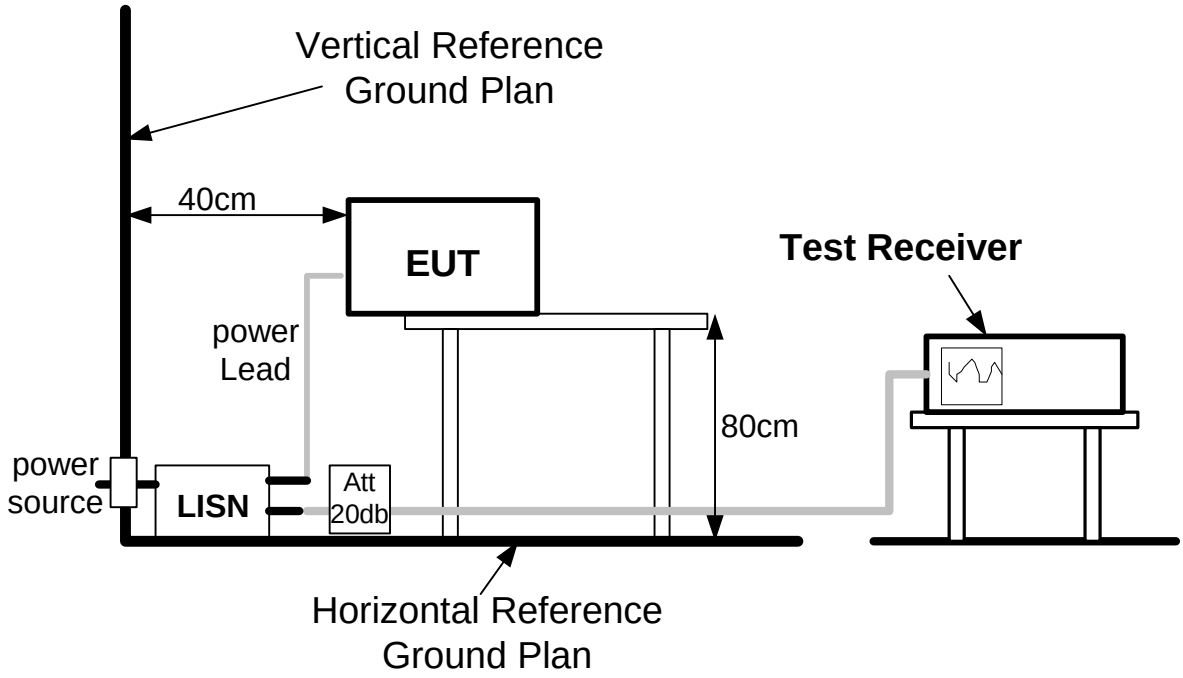


Figure- 11f Conducted emission Test Configuration

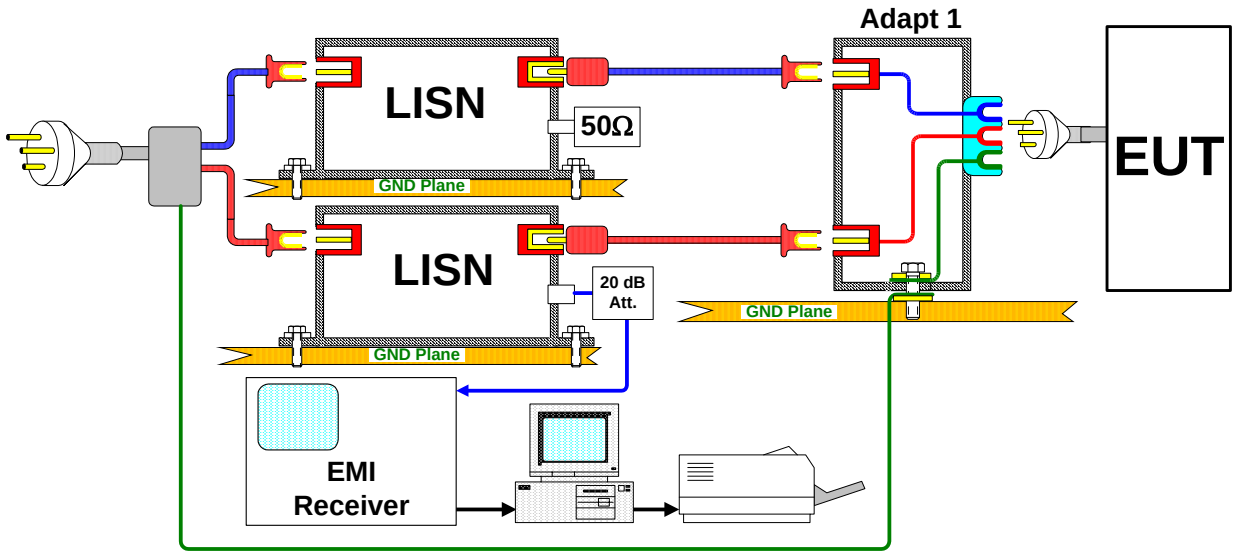
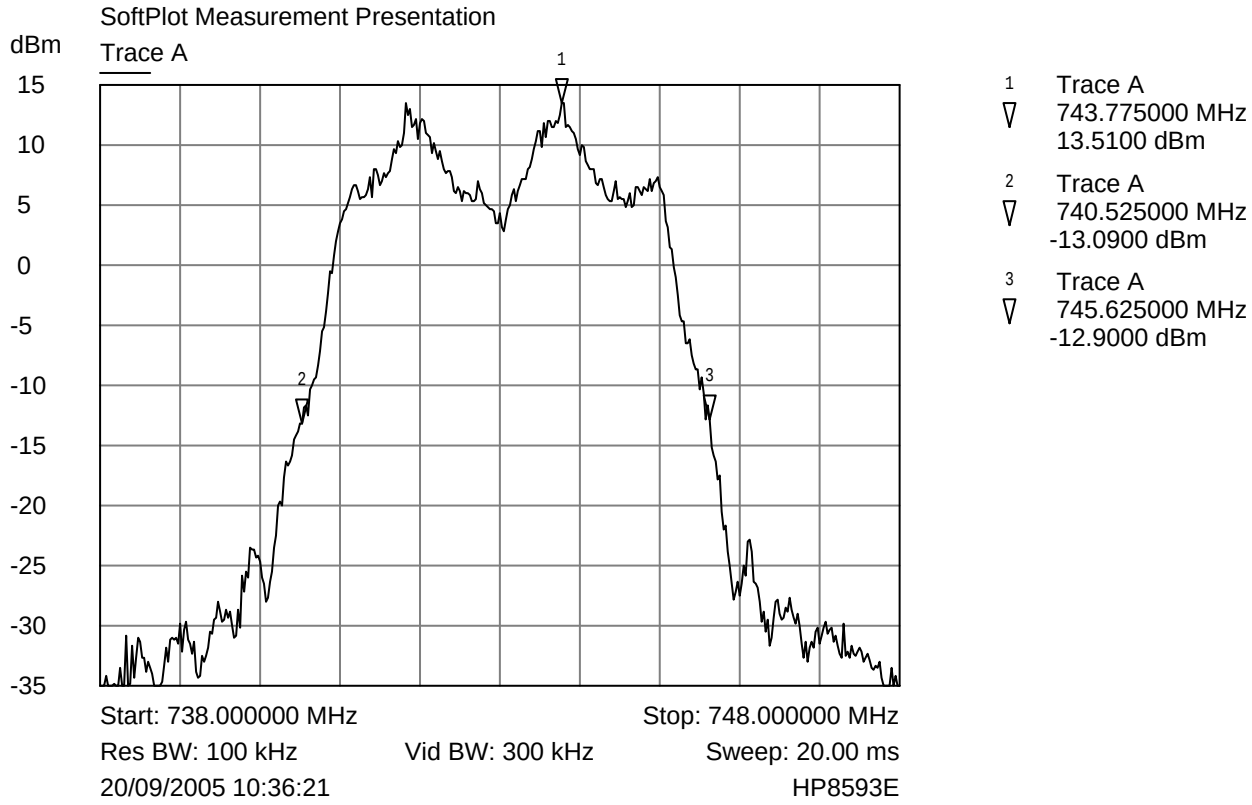


Figure- 12f Conducted emission Test setup

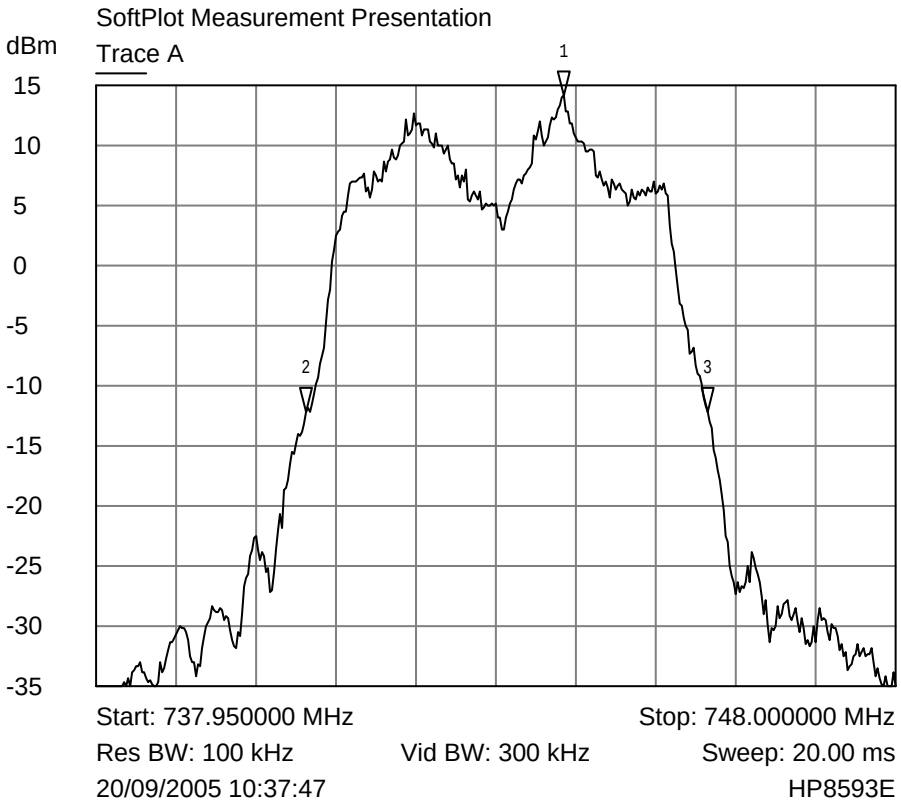
12 Plots

a. Occupied bandwidth plots 1-3

Test Results Plot No 1



Test Results Plot No 2

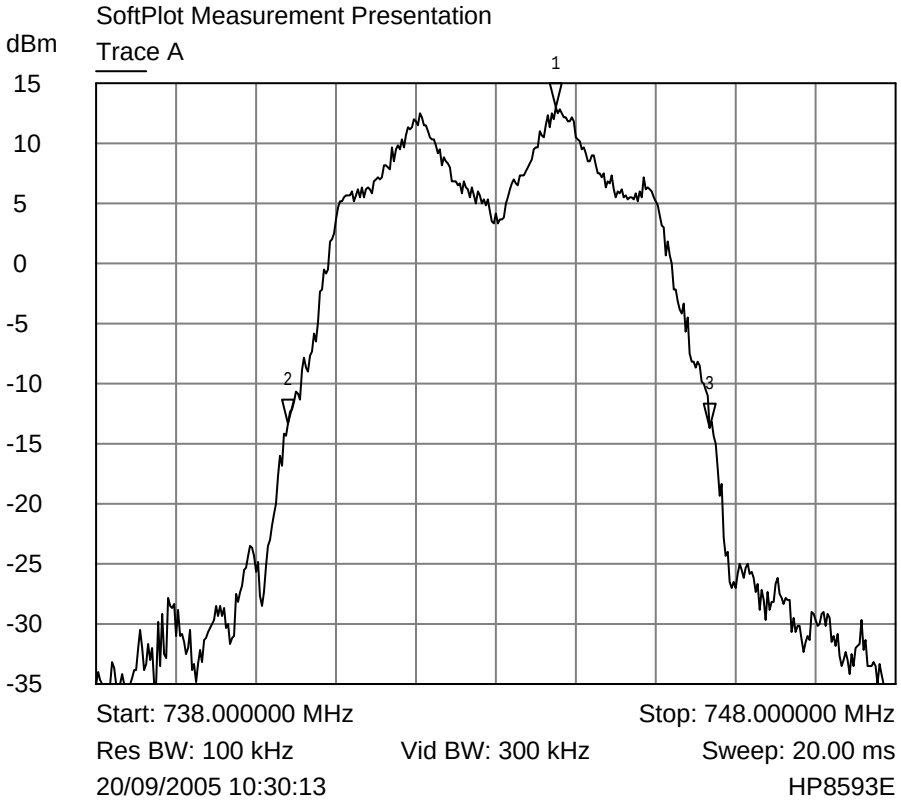


1 Trace A
743.829250 MHz
14.1100 dBm

2 Trace A
740.588125 MHz
-12.1700 dBm

3 Trace A
745.638250 MHz
-12.1100 dBm

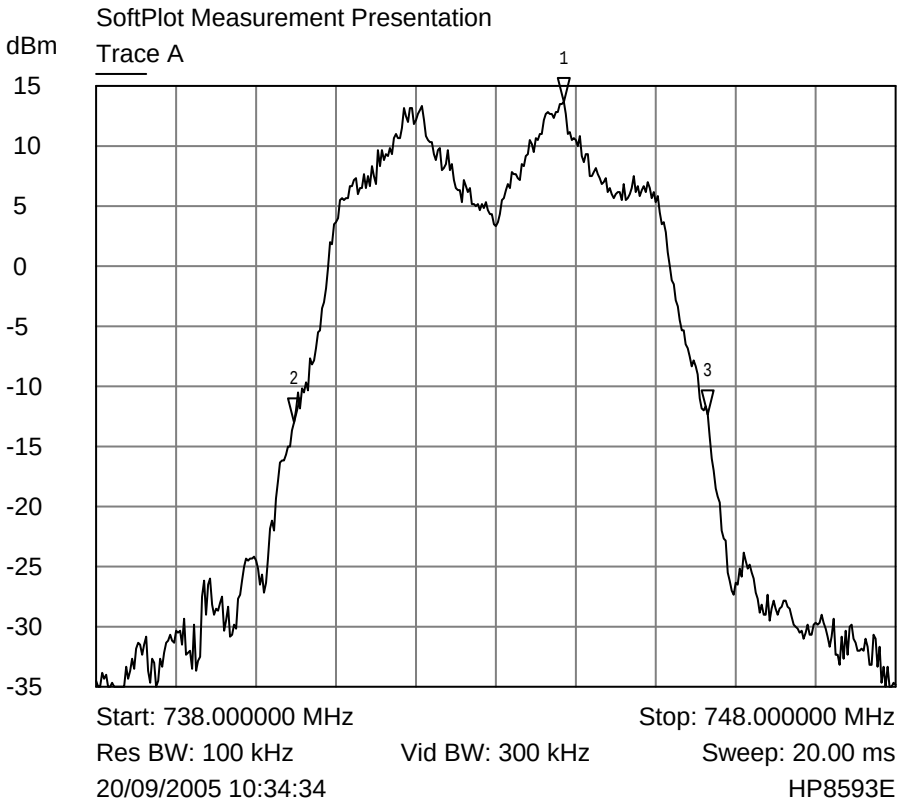
Test Results Plot No 3



1 Trace A
743.750000 MHz
12.9400 dBm

2 Trace A
740.400000 MHz
-13.3700 dBm

3 Trace A
745.675000 MHz
-13.6200 dBm



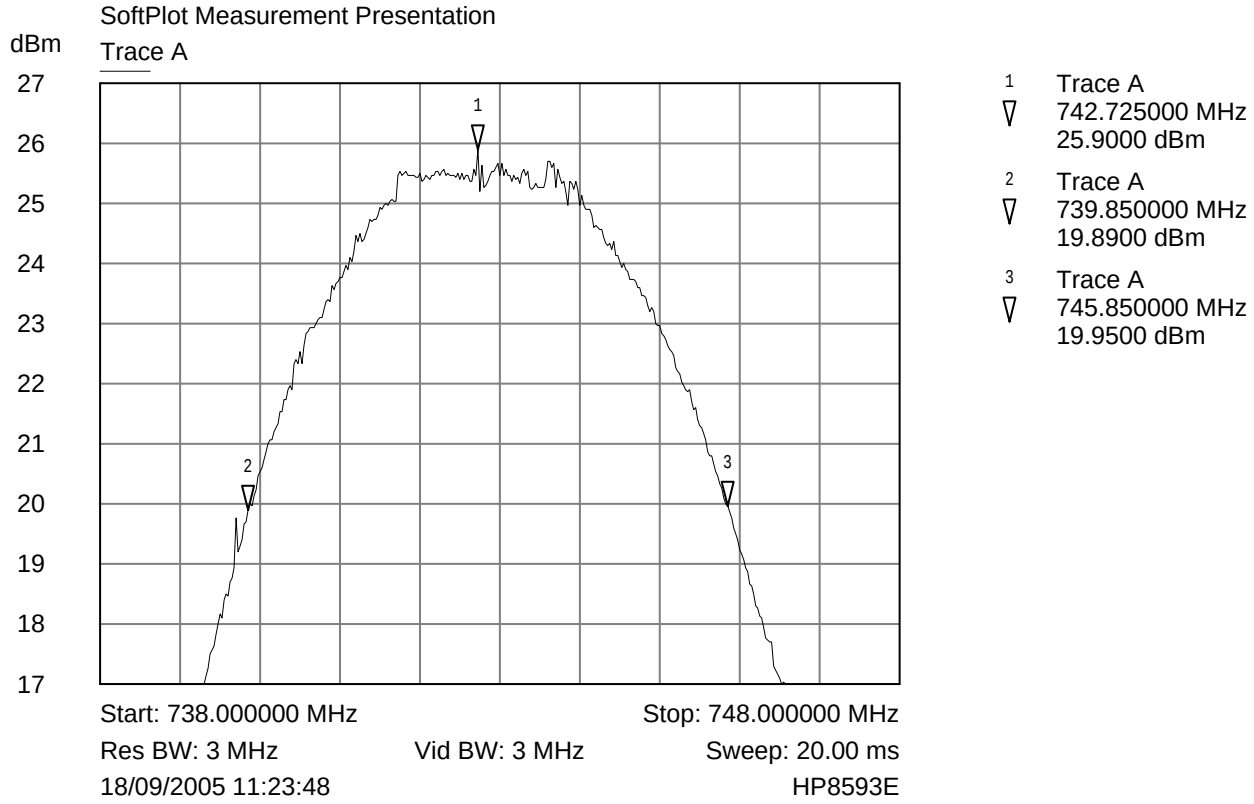
1 Trace A
743.850000 MHz
13.6800 dBm

2 Trace A
740.475000 MHz
-13.0500 dBm

3 Trace A
745.650000 MHz
-12.3700 dBm

b. **Maximum peak output power plots 4**

Test Results Plot No 4



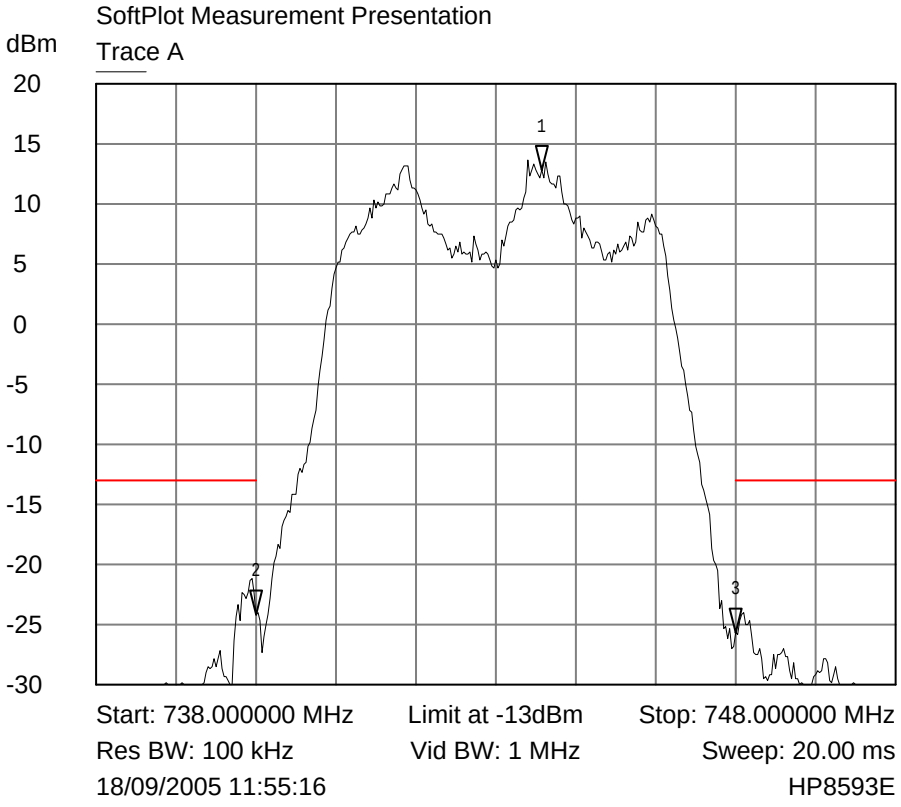
1 Trace A
742.725000 MHz
25.9000 dBm

2 Trace A
739.850000 MHz
19.8900 dBm

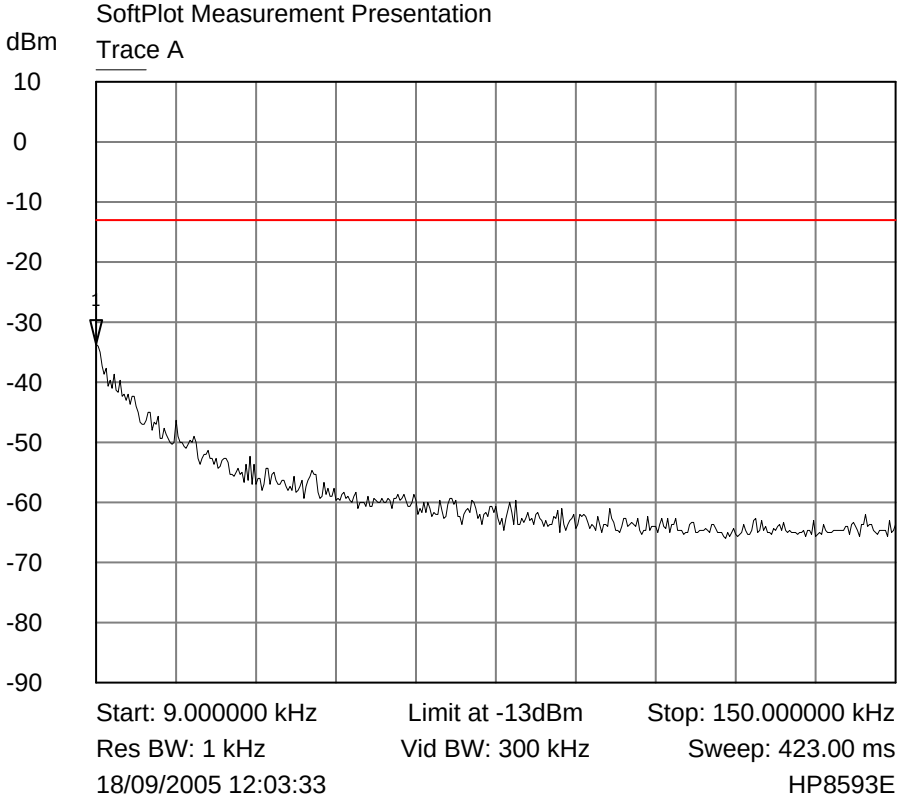
3 Trace A
745.850000 MHz
19.9500 dBm

c. **Spurious at antenna terminals 5 – 12**

Test Results Plot No 5

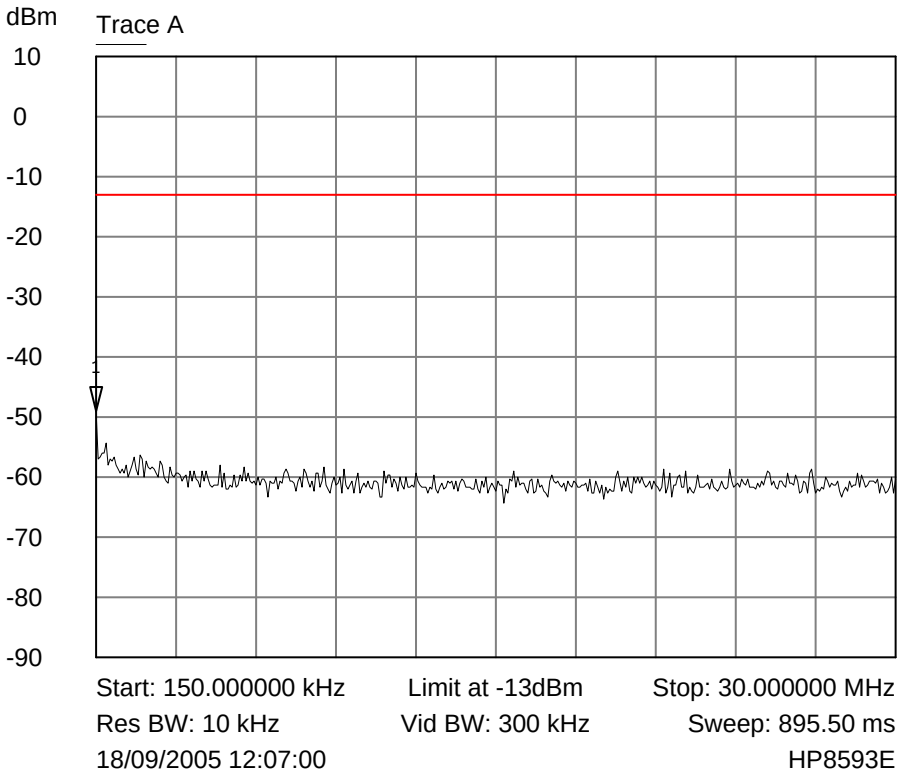


Test Results Plot No 6



Test Results Plot No 7

SoftPlot Measurement Presentation

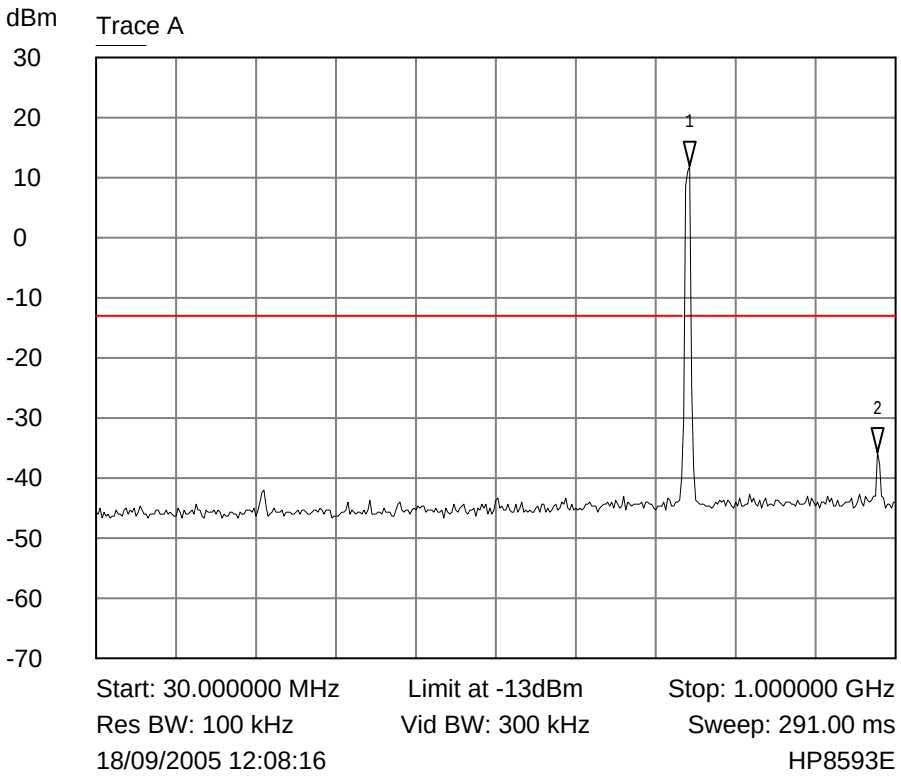


1 Trace A
150.000000 kHz
-49.1100 dBm

Start: 150.000000 kHz Limit at -13dBm Stop: 30.000000 MHz
Res BW: 10 kHz Vid BW: 300 kHz Sweep: 895.50 ms
18/09/2005 12:07:00 HP8593E

Test Results Plot No 8

SoftPlot Measurement Presentation



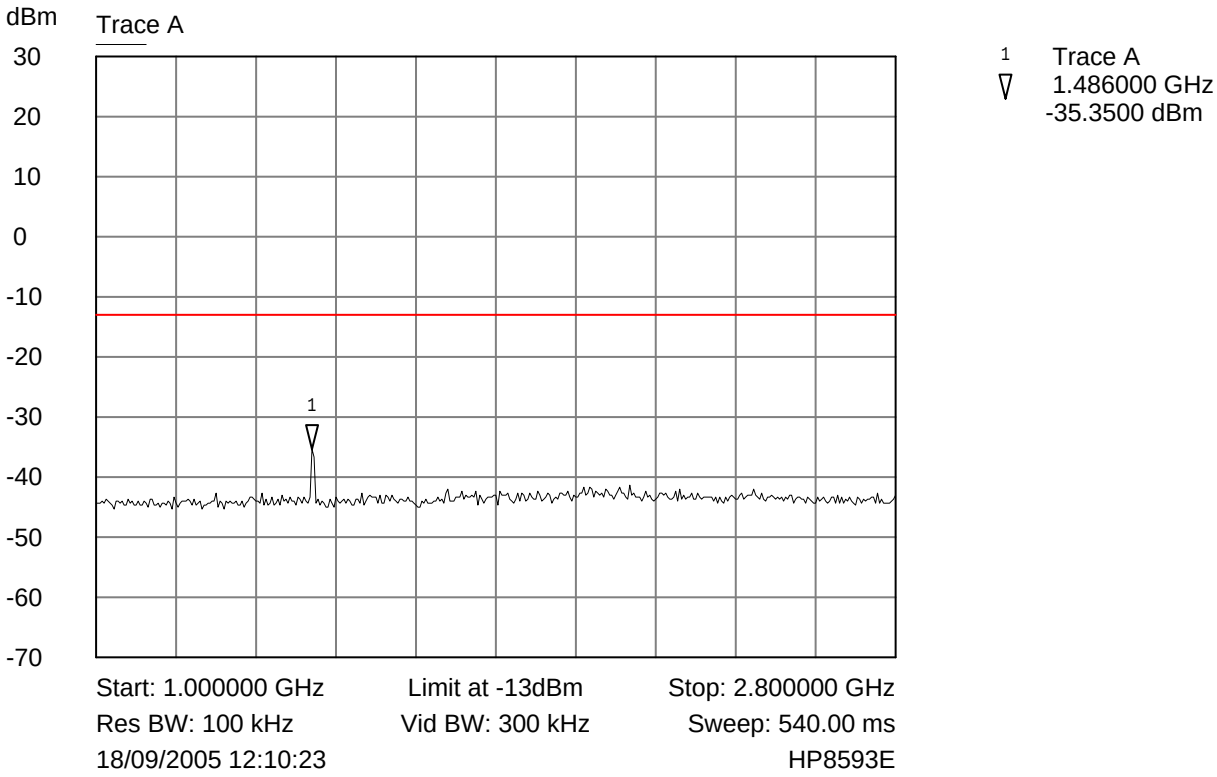
1 Trace A
750.225000 MHz
12.0600 dBm

2 Trace A
978.175000 MHz
-35.6700 dBm

Start: 30.000000 MHz Limit at -13dBm Stop: 1.000000 GHz
Res BW: 100 kHz Vid BW: 300 kHz Sweep: 291.00 ms
18/09/2005 12:08:16 HP8593E

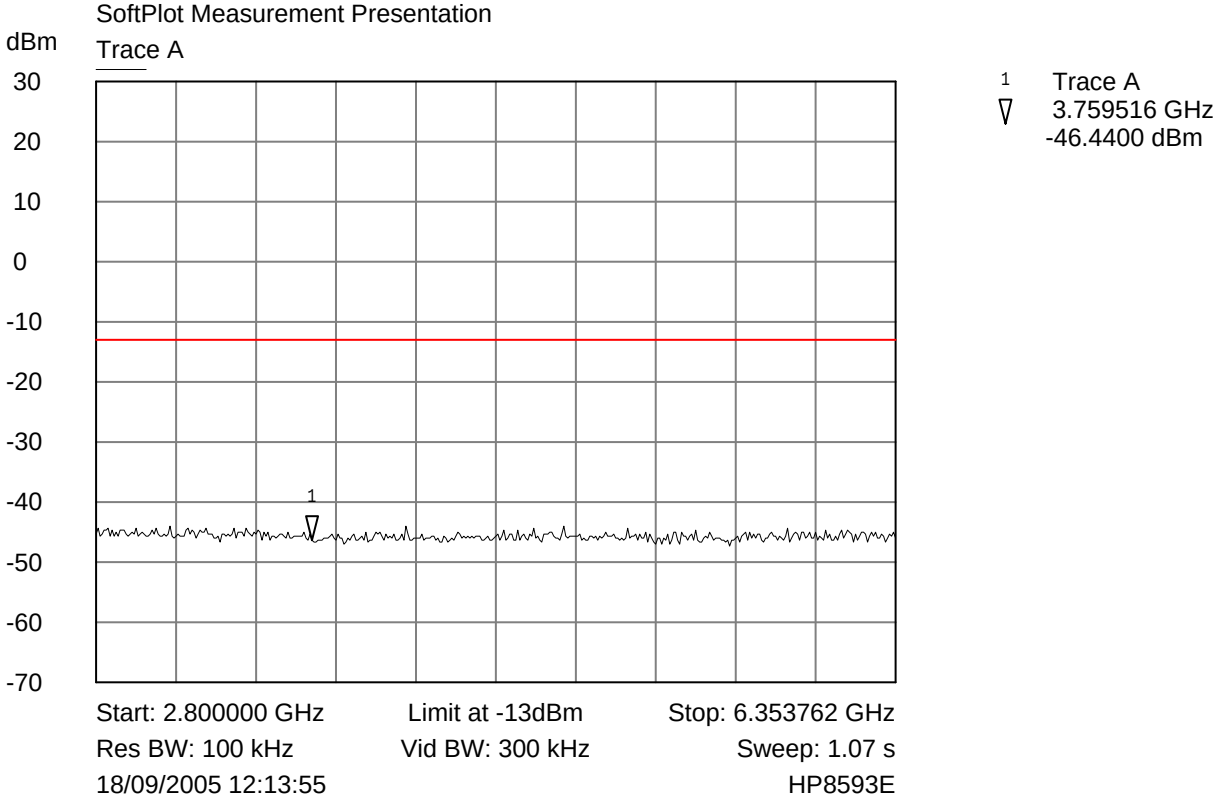
Test Results Plot No 9

SoftPlot Measurement Presentation



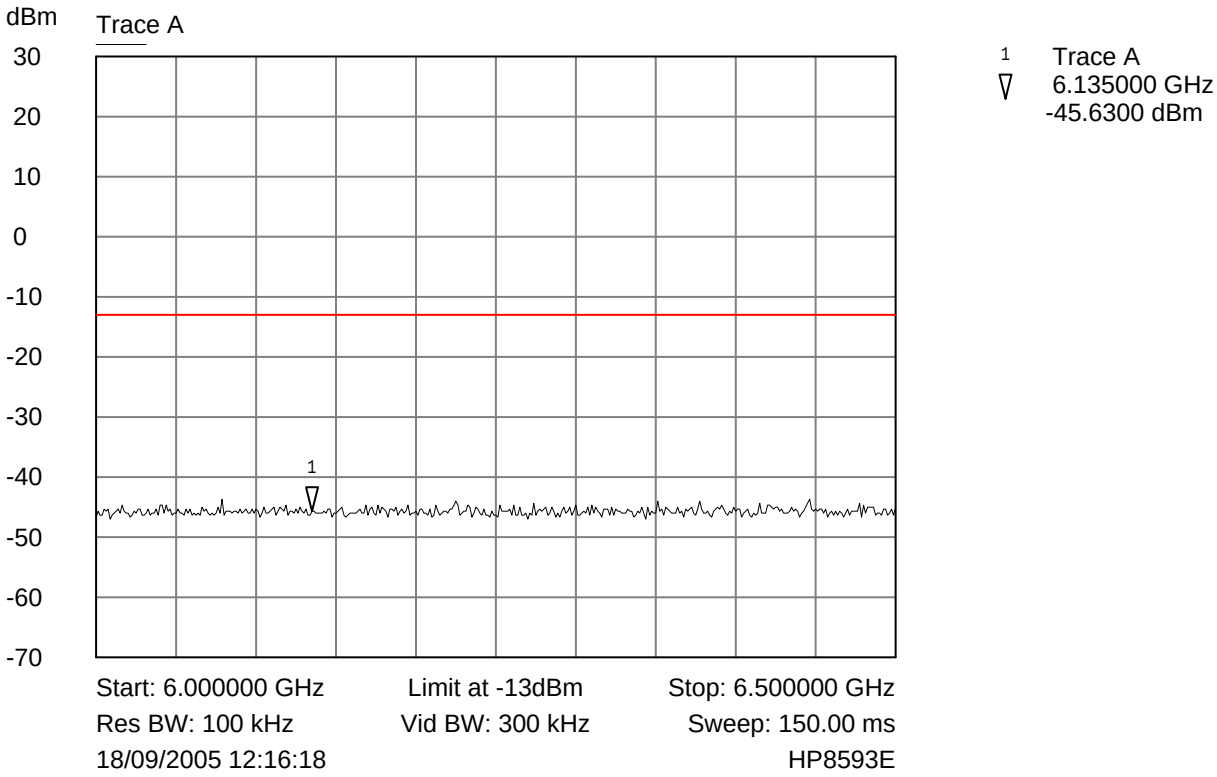
Test Results Plot No 10

SoftPlot Measurement Presentation



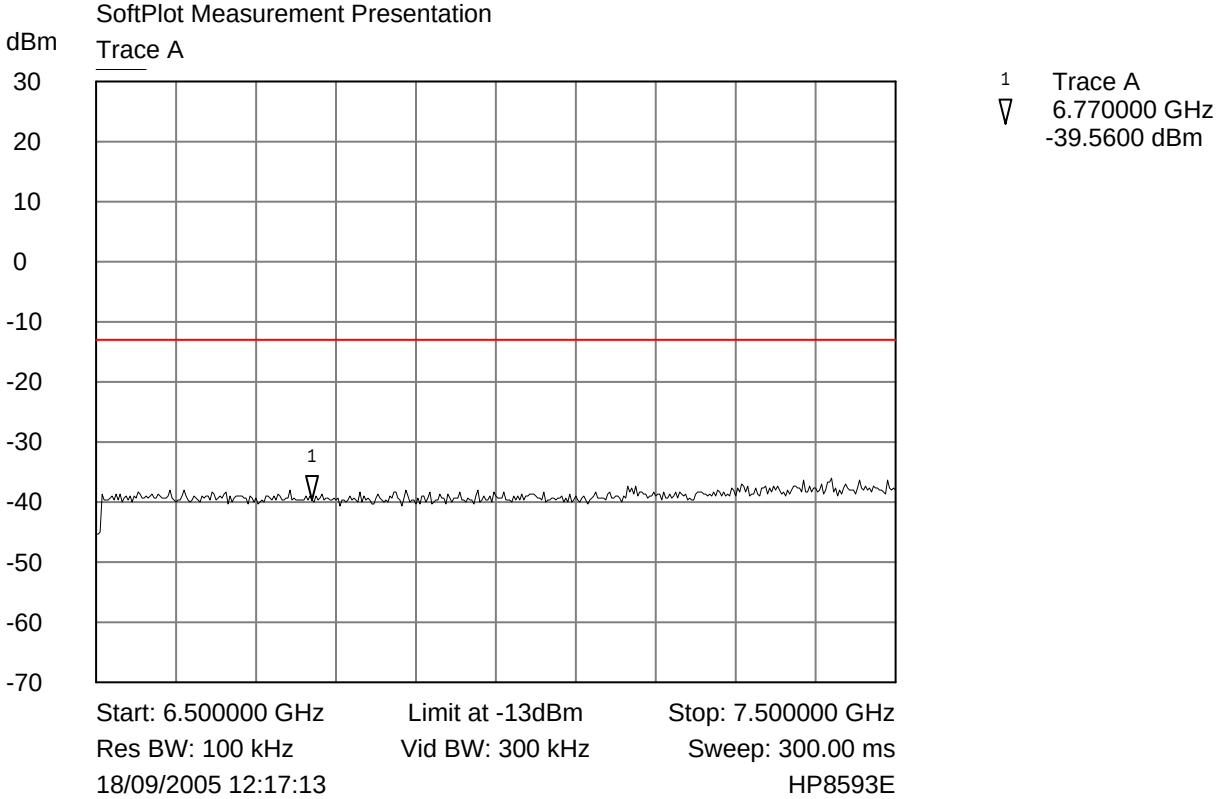
Test Results Plot No 11

SoftPlot Measurement Presentation



Test Results Plot No 12

SoftPlot Measurement Presentation



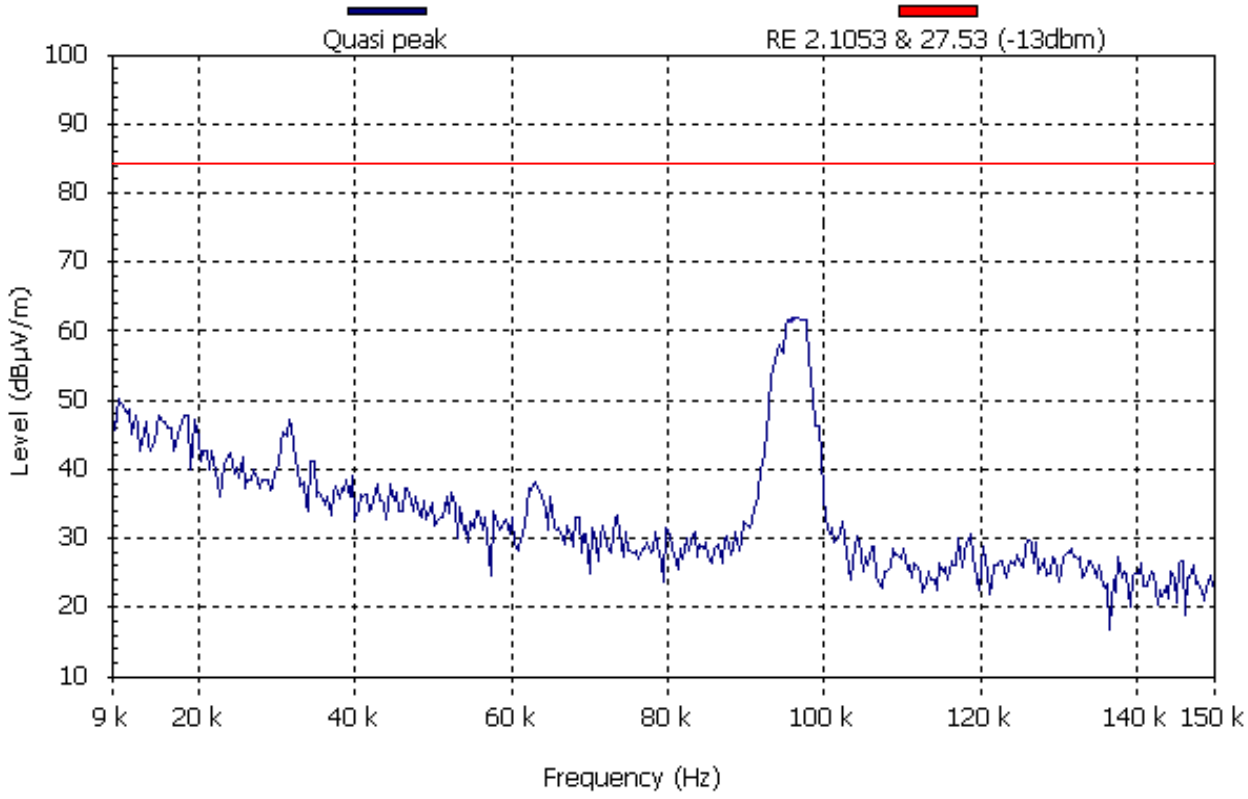
d. **Radiated spurious emission 13 – 21**

Test Results Plot No 13

FCC 2.1053, 27.53 Emission 0.009-0.15MHz 743 VER

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 Hz
Test Engineer:		VBW:	1000 kHz
Antenna:	RODE ANT.	Sweep Time:	Auto: 423 ms
Polarization:	Vertical	Pre Amplifier	LNA MITEQ 0.01-1GHz No-5

TEST REMARKS: 18-09-2005



MAXIMUM RESULT DEVIATION:

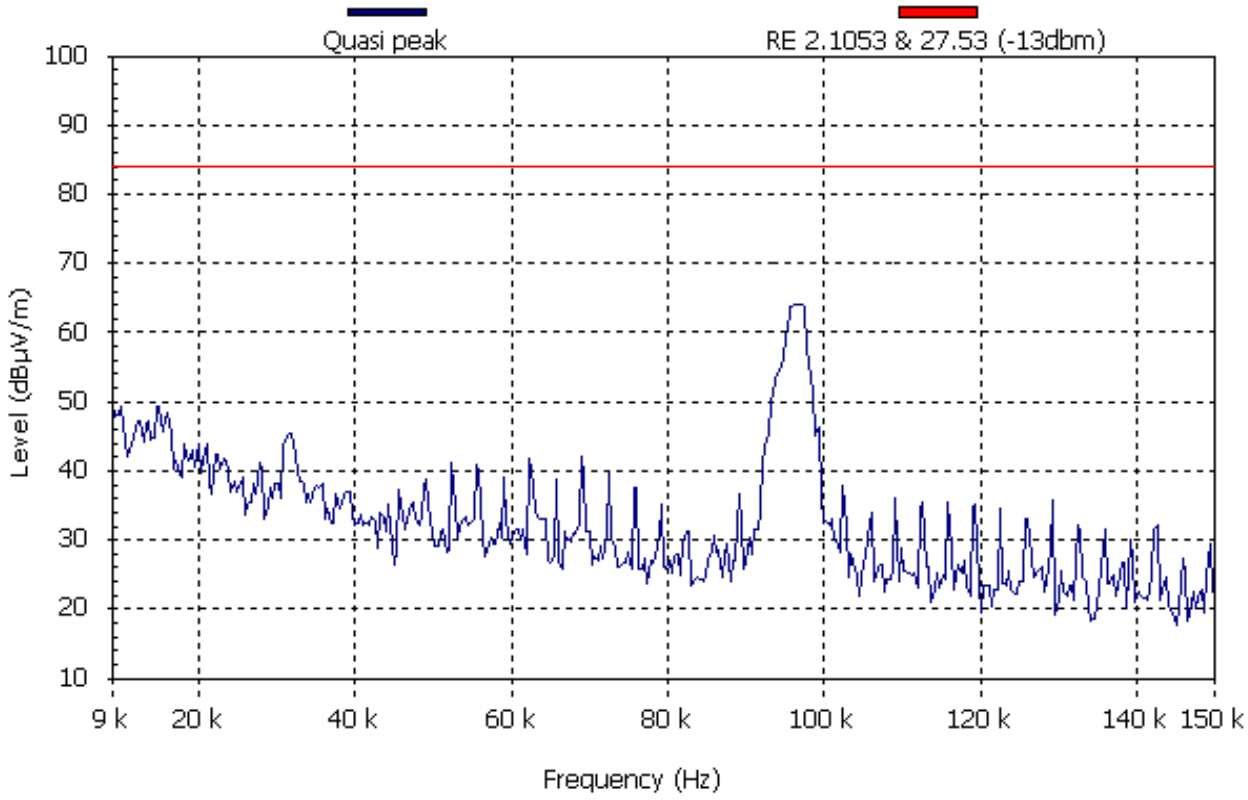
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 14

FCC 2.1053, 27.53 Emission 0.009-0.15MHz 743 HOR

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 Hz
Test Engineer:		VBW:	1000 kHz
Antenna:	RODE ANT.	Sweep Time:	Auto: 423 ms
Polarization:	Horizontal	Pre Amplifier	LNA MITEQ 0.01-1GHz No-5

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

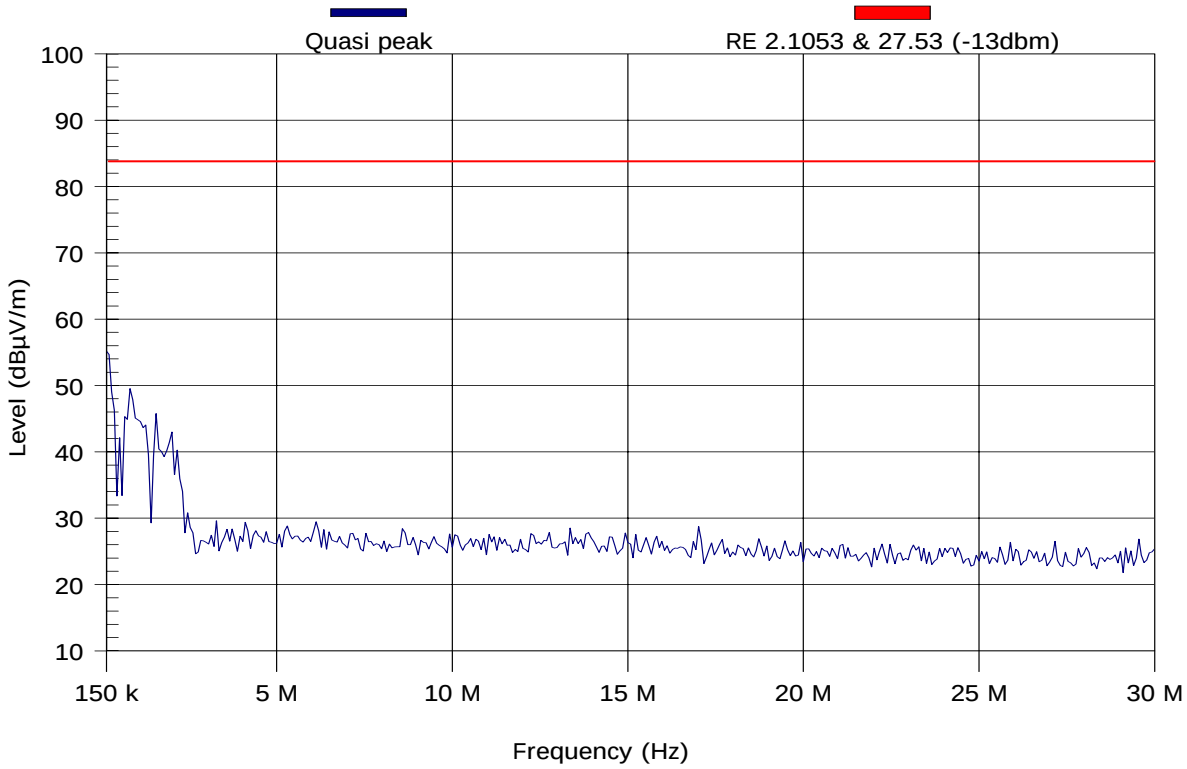
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 15

FCC 2.1053, 27.53 Emission 0.15 – 30MHz 743 VER

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	9 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	RODE ANT.	Sweep Time:	Auto: 1.11 s
Polarization:	Vertical	Pre Amplifier	LNA MITEQ 0.01-1GHz No-5

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

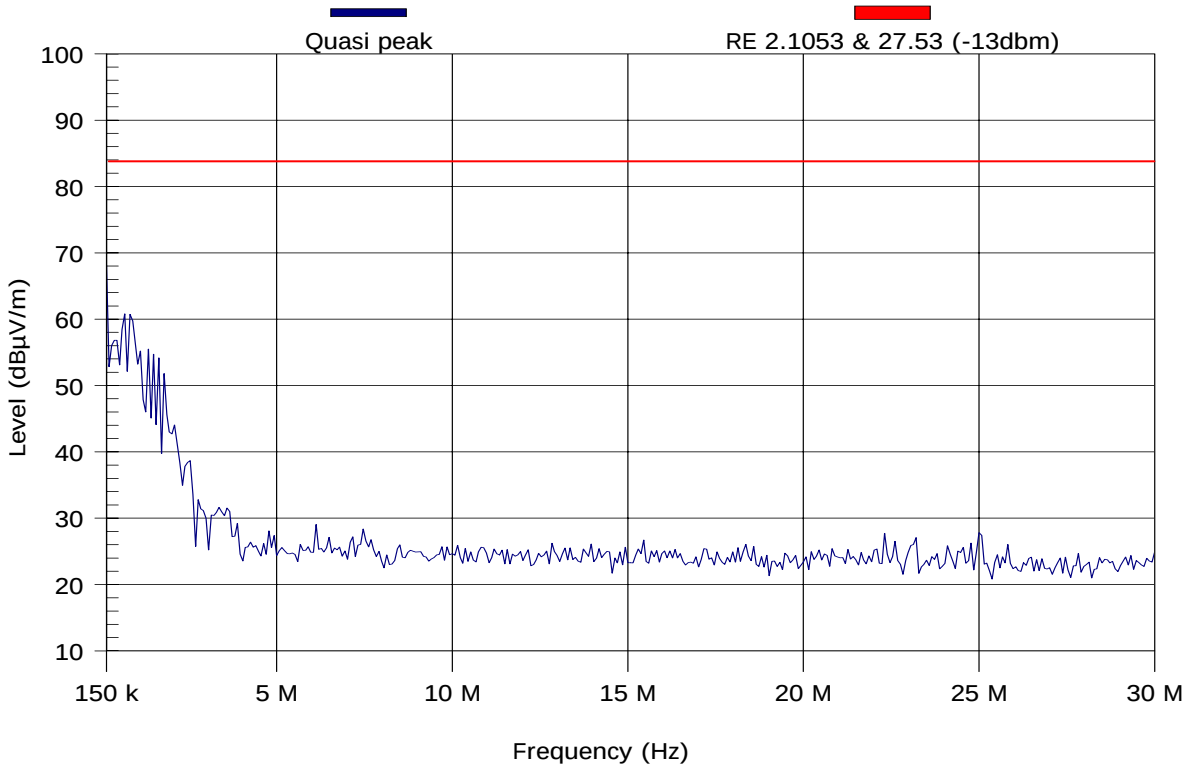
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 16

FCC 2.1053, 27.53 Emission 0.15 – 30MHz 743 HOR

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	9 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	RODE ANT.	Sweep Time:	Auto: 1.11 s
Polarization:	Horizontal	Pre Amplifier	LNA MITEQ 0.01-1GHz No-5

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

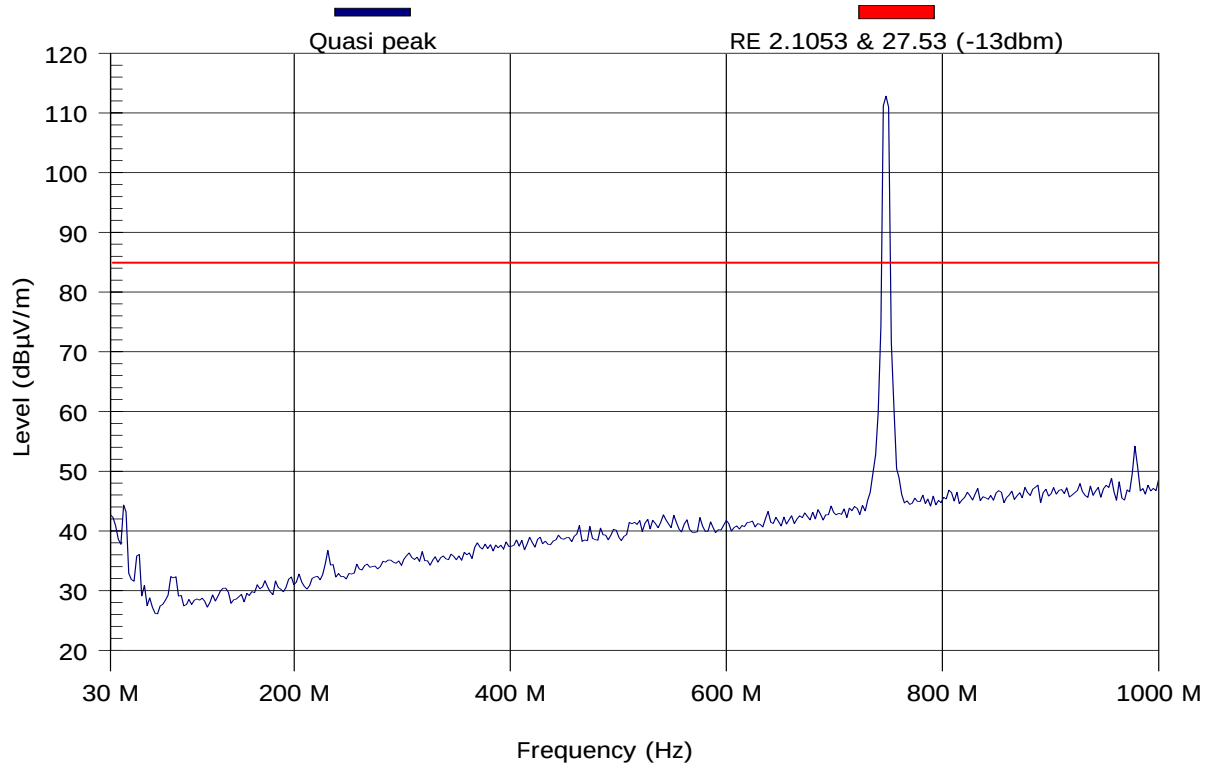
None

Test Results Plot No 17

FCC 2.1053, 27.53 Emission 30 -1000MHz 743

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	100 kHz
Test Engineer:		VBW:	300 kHz
Antenna:	Frankonia BTA-L_A 3m	Sweep Time:	Auto: 291 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

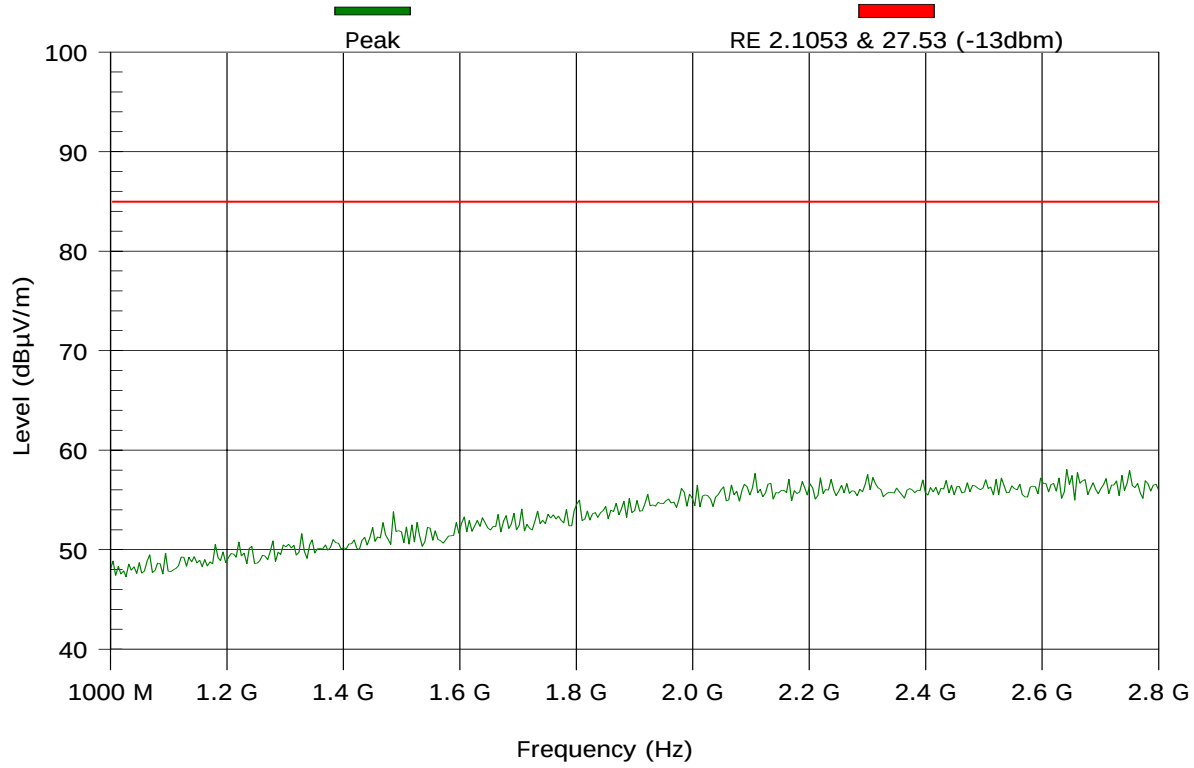
Freq (MHz)	PK MaxHold (dBµV/m)	PK (dBµV/m)	PK Limit (dBµV/m)	Result	Angle (deg)	Hig (m)	H / V
743.589	114.3	105.4	84.4	Fail	0	1	H

Test Results Plot No 18

FCC 2.1053, 27.53 Emission 1 -2.8GHz 743

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	100 kHz
Test Engineer:		VBW:	300 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 540 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

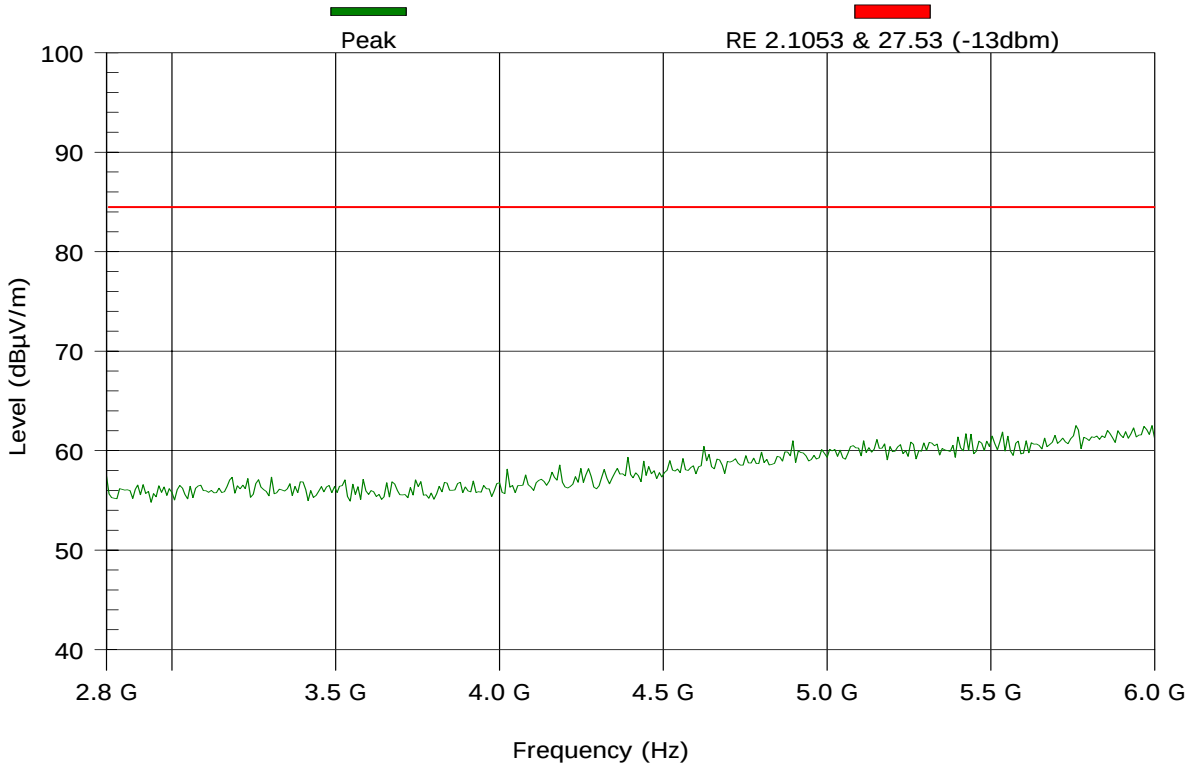
None

Test Results Plot No 19

FCC 2.1053, 27.53 Emission 2.8 -6GHz 743

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	100 kHz
Test Engineer:		VBW:	300 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 960 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

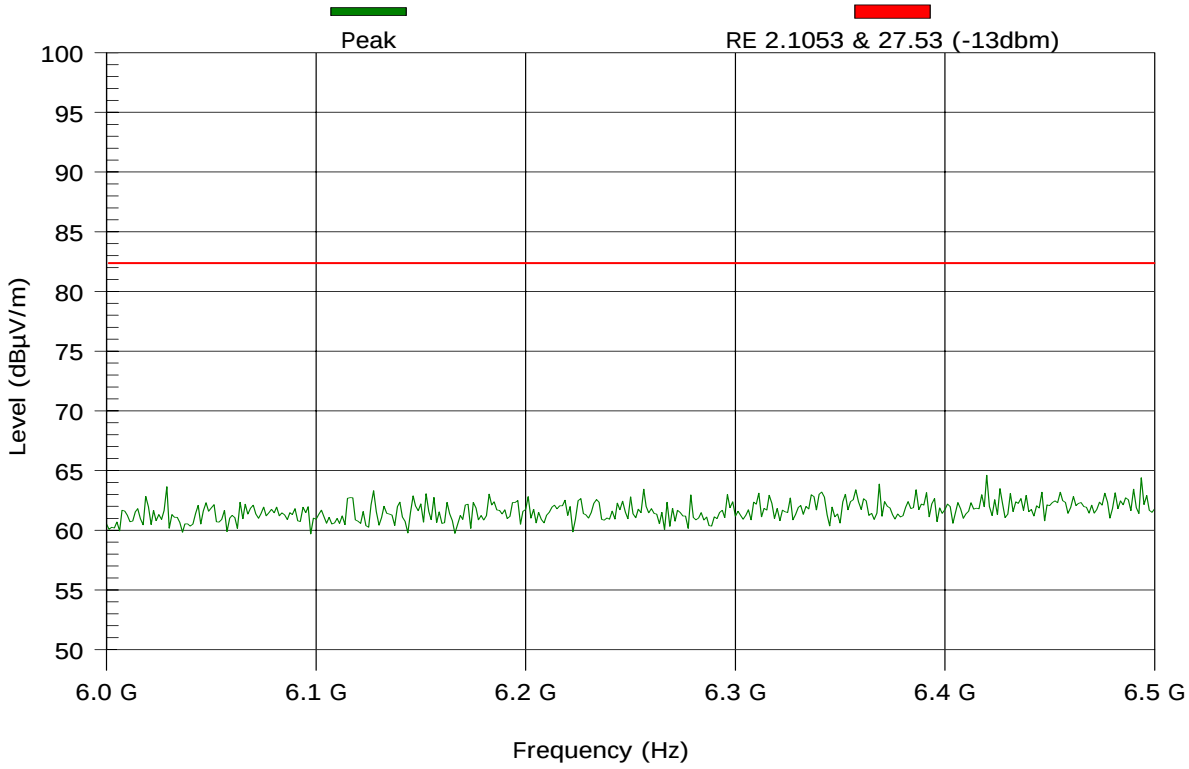
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 20

FCC 2.1053, 27.53 Emission 6 -6.5GHz 743

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	100 kHz
Test Engineer:		VBW:	300 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 150 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

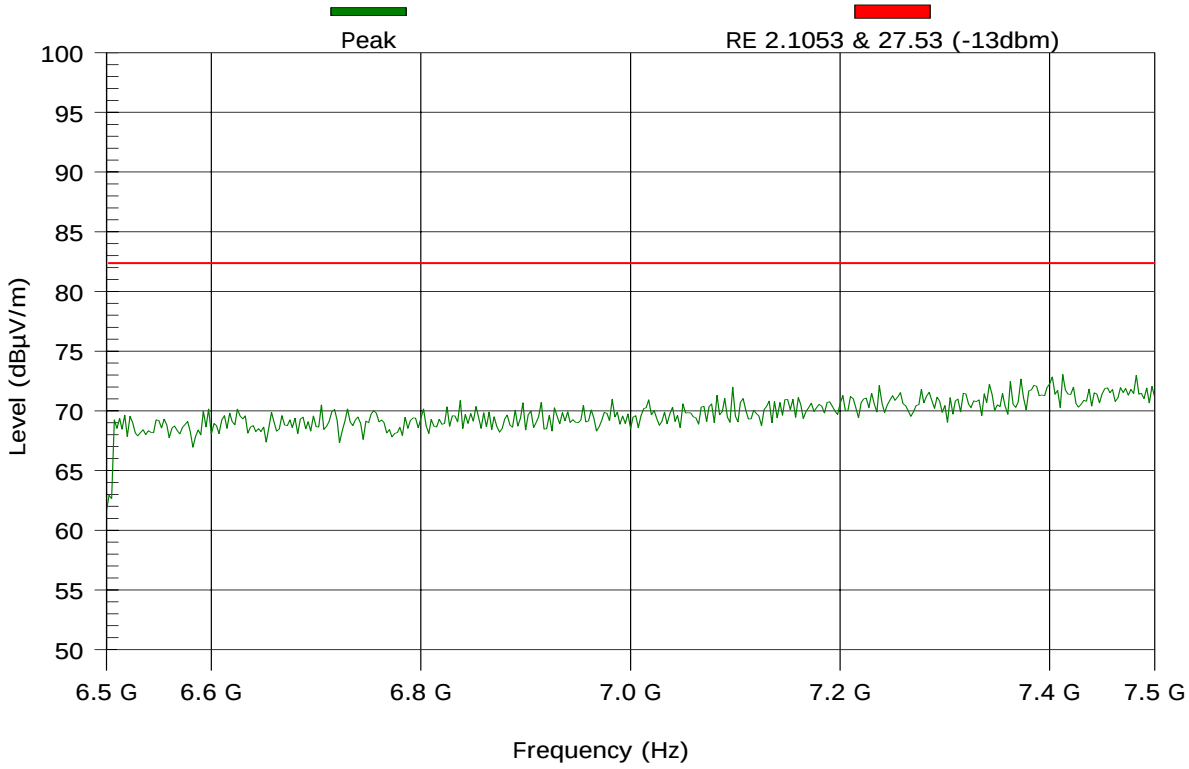
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 21

FCC 2.1053, 27.53 Emission 6.5 -7.5GHz 743

est & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	100 kHz
Test Engineer:		VBW:	300 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 300 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

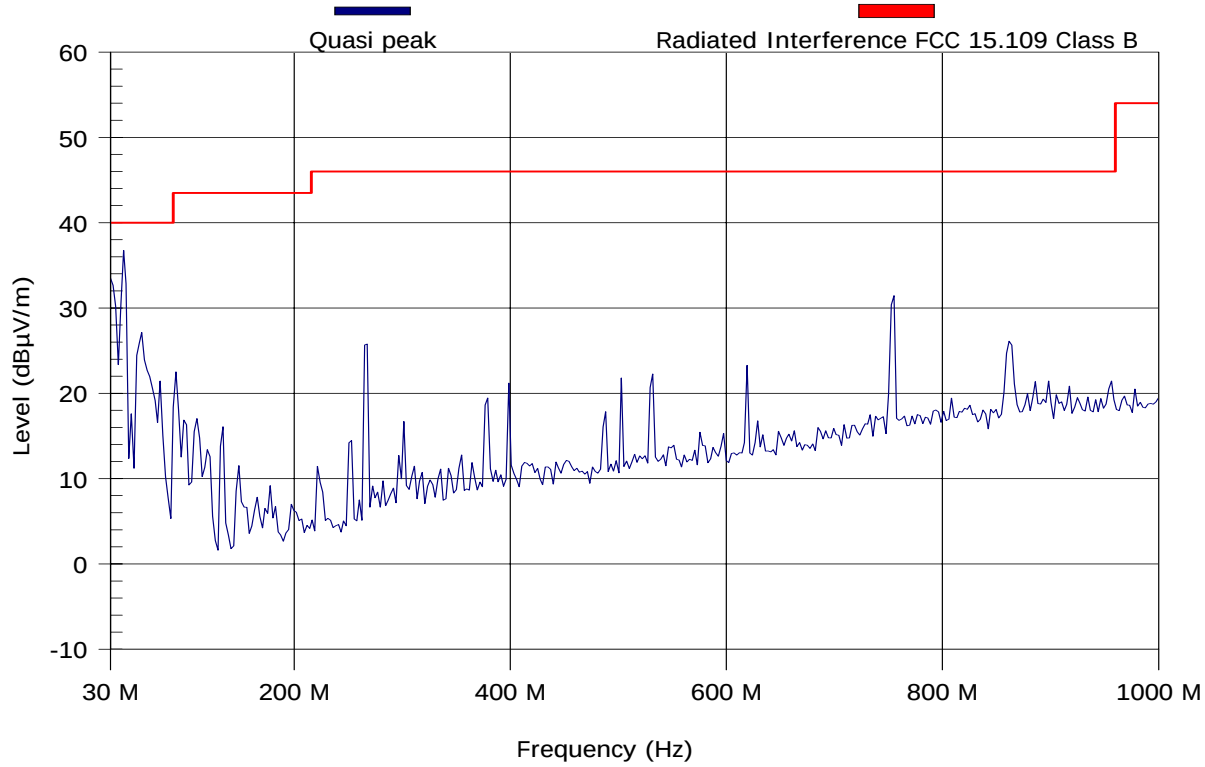
e. **Unintentional radiated emission 22 – 26**

Test Results Plot No 22

FCC 30-1000MHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	70 dBµV
Date of Test:		RBW:	120 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	Frankonia BTA-L_A 3m	Sweep Time:	Auto: 202.08 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

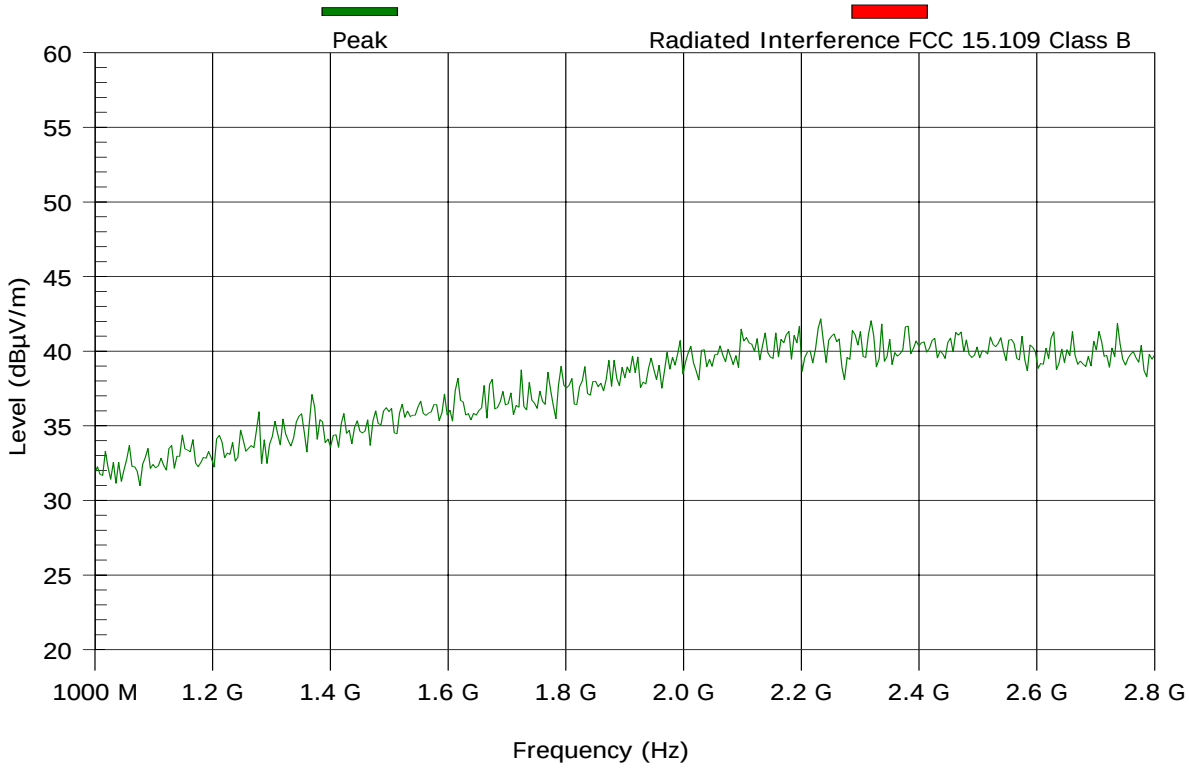
Freq (MHz)	PK Max (dBµV/m)	QP (dBµV/m)	QP Limit (dBµV/m)	Result	Angle (deg)	Hi (m)	H / V
33.452	34	31.2	40	Pass	5	1	H
42.105	39	31.6	40	Pass	0	1	V

Test Results Plot No 23

FCC 1-2.8GHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 36 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

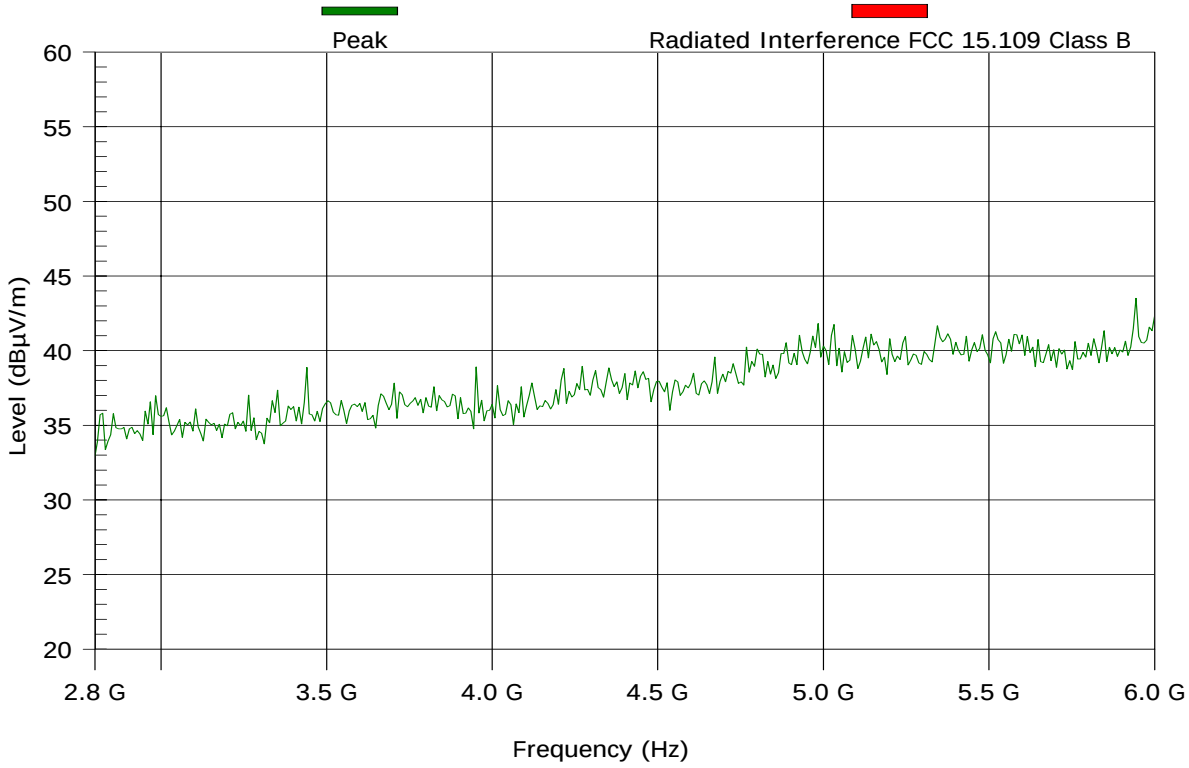
Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.
None

Test Results Plot No 24

FCC 2.8-6GHz stby

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	ARA DRG-118/A 1-18GHz 1319	Sweep Time:	Auto: 64 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	ELISRA AMP 6-18 GHz

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

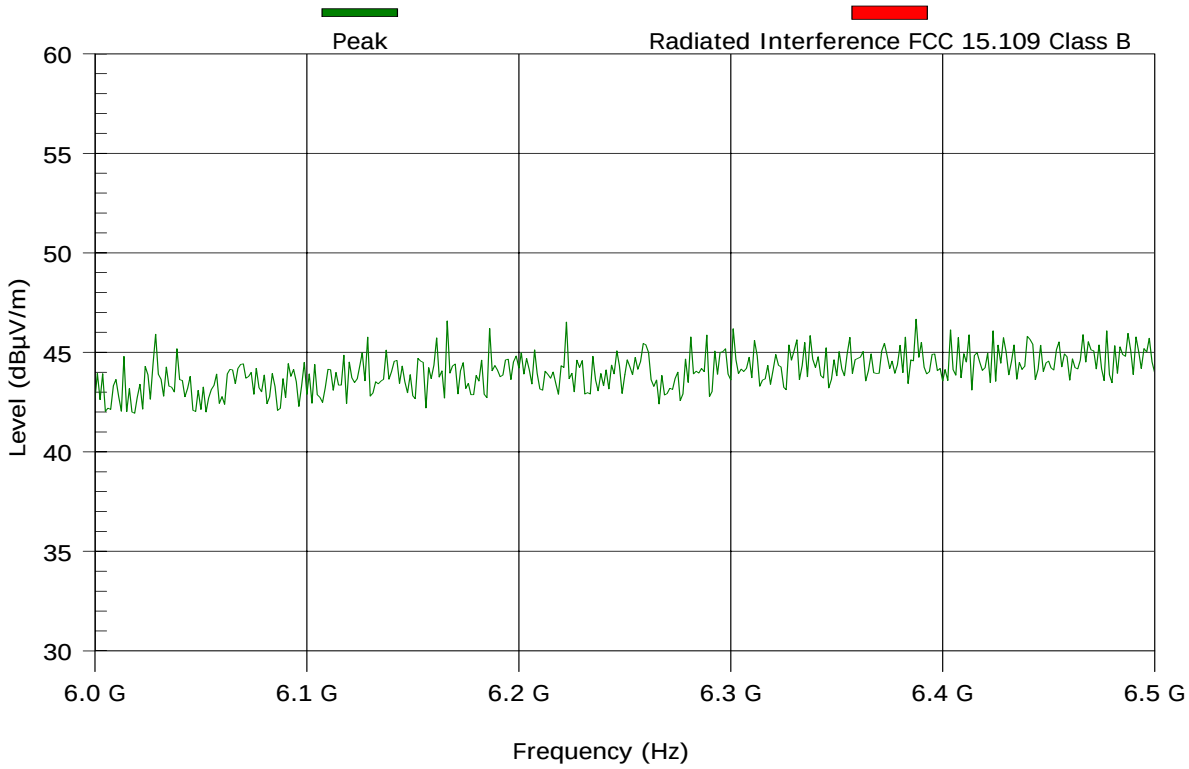
None

Test Results Plot No 25

FCC 6-6.5GHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	EMCO 3105 1-18GHz	Sweep Time:	Auto: 20 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	ELISRA AMP 2-6 GHz

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

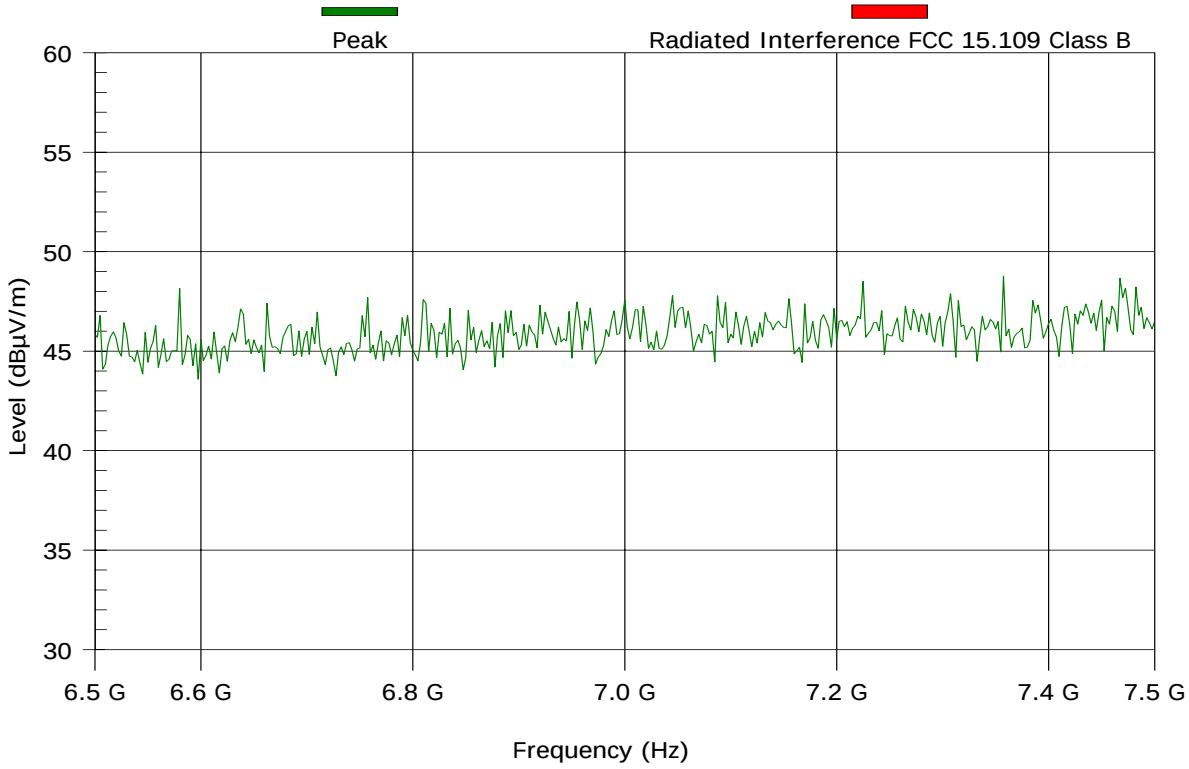
None

Test Results Plot No 26

FCC 6.5-7.5GHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	EMCO 3105 1-18GHz	Sweep Time:	Auto: 40 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	ELISRA AMP 2-6 GHz

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

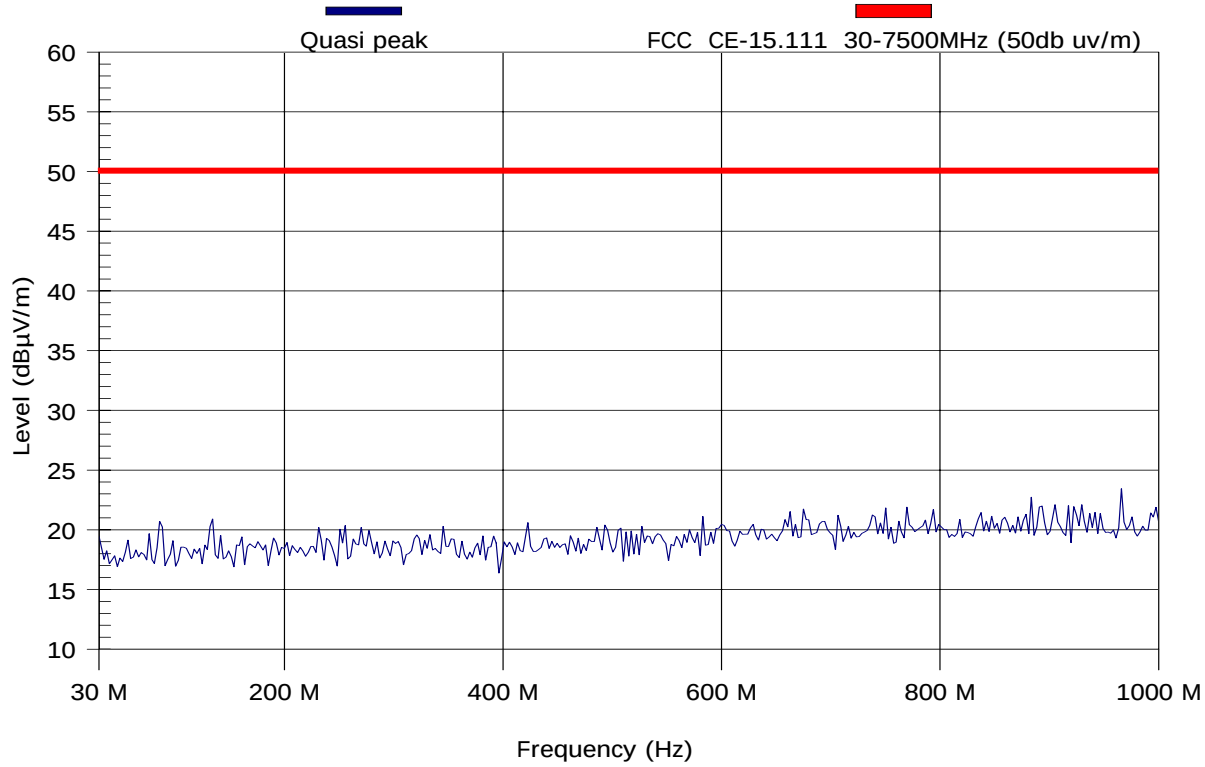
f. **Antenna power conduction for receiver 27 – 28**

Test Results Plot No 27

FCC CE-15.111 30-1000MHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	70 dBµV
Date of Test:		RBW:	120 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:		Sweep Time:	Auto: 202.08 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

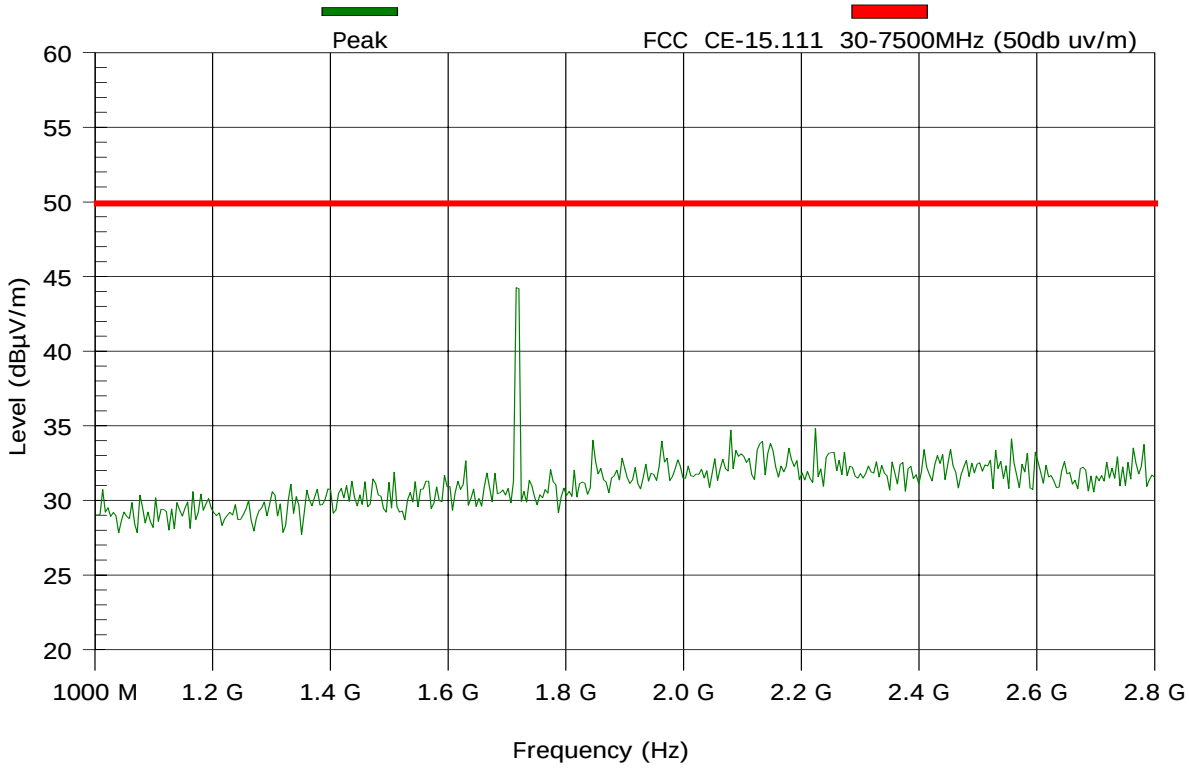
None

Test Results Plot No 28

FCC CE-15.111 1-2.8GHz STBY

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	90 dBµV
Date of Test:		RBW:	1000 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:	Frankonia BTA-L Corr. 0	Sweep Time:	Auto: 36 ms
Polarization:	Horizontal and Vertical	Pre Amplifier	No Description Available

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

Nr	Frequency (MHz)	PK MaxHold (dBµV/m)	PK Limit (dBµV/m)	Result	Angle (degrees)	Height (m)	H/V
1	1715.5	44.3	50	Pass	0	1	V

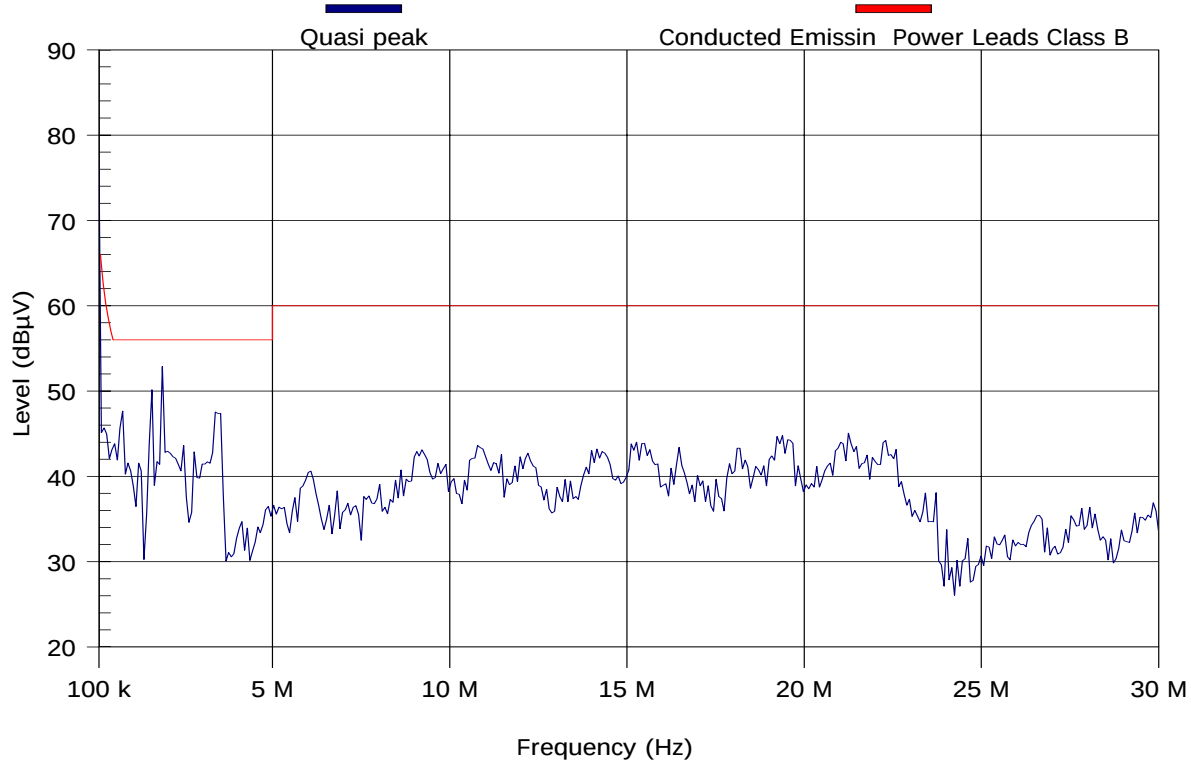
g. **Conducted emission on power leads 29 – 30**

Test Results Plot No 29

CE FCC 15.207 150K-30MHz NEUTRAL

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	80 dBµV
Date of Test:		RBW:	9 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:		Sweep Time:	Auto: 1.11 s
Polarization:	||9| polarization||	Pre Amplifier	LNA MITEQ 0.01-1GHz No-3

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

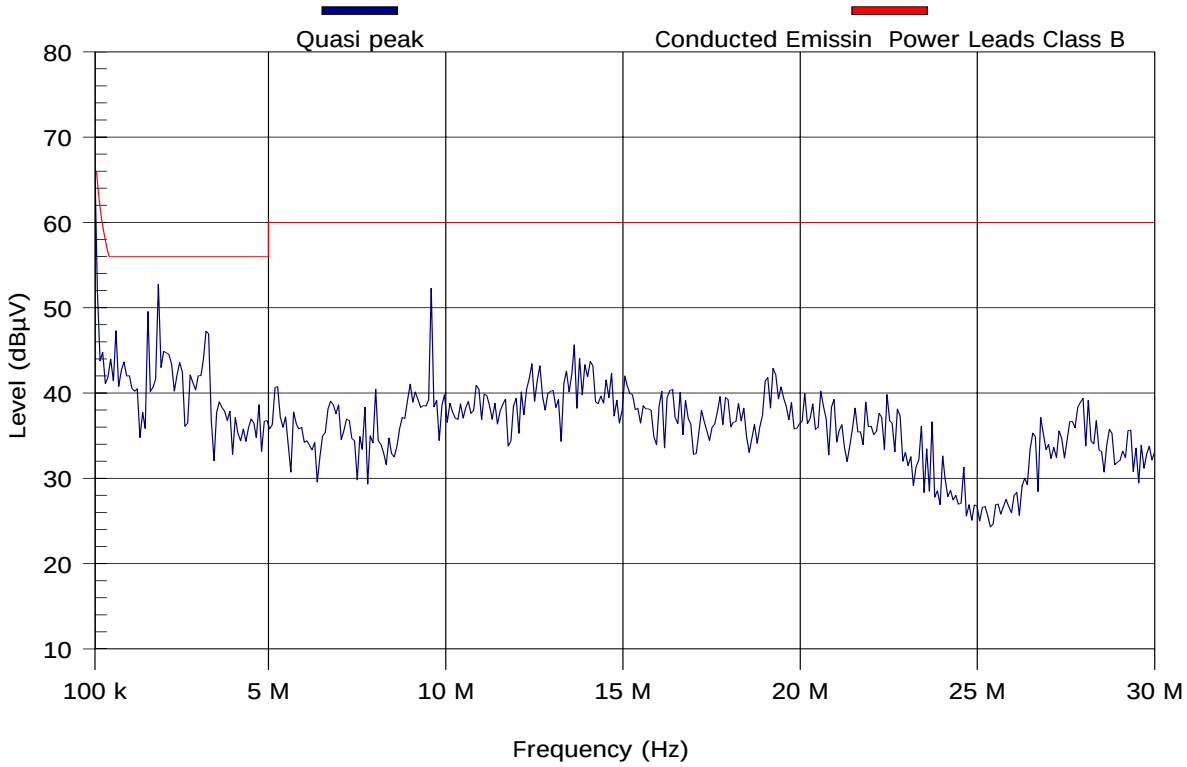
Frequency (MHz)	PK MaxHold (dBµV)	QP Limit (dBµV)	Result	Line	
1.535	50.4	50.1	56	Pass	Line 2
1.84	53.1	52.5	56	Pass	Line 2

Test Results Plot No 30

CE FCC 15.207 150K-30MHz PHASE

Test & EUT General Information		Receiver Setting	
EUT Name:	GA_OFDM_700	Spect Analyzer	S.A HP 8593E
S/N:	0050C21CCE7B	Ref. Level:	80 dBµV
Date of Test:		RBW:	9 kHz
Test Engineer:		VBW:	1000 kHz
Antenna:		Sweep Time:	Auto: 1.11 s
Polarization:	||1| polarization||	Pre Amplifier	LNA MITEQ 0.01-1GHz No-3

TEST REMARKS:18-09-2005



MAXIMUM RESULT DEVIATION:

Detect all peaks above 6 dB below the limit line with a maximum of 6 peaks.

Frequency (MHz)	PK MaxHold (dBµV)	QP Limit (dBµV)	Result	Line	
1.838	53.2	52.8	56	Pass	Line 1

13 CORRECTION FACTORS

Correction Factor for **line impedance stabilization network** model DC-AC-20A-01

Frequency (KHz)	Correction Factor (db)
10	4.4
20	1.6
30	0.8
40	0.4
50	0.3
60	0.25
70	0.15
100	0.1
200	0

DOUBLE RIDGE HORN Model 3105 S/N:0050C21CCE7B-C3-3D 2052 Antenna Factor

Frequency (MHz)	Ant. Factor (db/m)
1000	24.4
2000	26.2
3000	30
4000	32.6
5000	33.8
6000	34.9
7000	36.2
8000	36.9
7000	37.8
10000	38.4
11000	39.1
12000	40.1
13000	42
14000	40.6
15000	39.3
16000	40.3

Antenna Factor for broadband antenna model BTA-L S/N:0050C21CCE7B-C3-3D 980045L

Frequency (KHz)	Ant. Factor (db/m)	Frequency (KHz)	Ant. Factor (db/m)
30	19.05	300	14.35
32	19.13	310	14.28
34	18.74	320	14.43
36	18.03	330	14.13
38	16.61	340	14.48
40	15.44	350	14.89
45	13.66	360	15.12
50	11.52	370	15.70
55	10.04	380	15.78
60	7.68	390	16.22
65	6.11	400	16,45
70	5.47	425	16.99
75	5.98	450	17.59
80	6.86	475	17.28
85	7.20	500	17.69
90	7.47	525	18.91
95	7.23	550	19.06
100	7.20	575	18.20
105	7.30	600	18.87
110	7.37	625	18.81
115	7.02	650	19.64
120	6.82	675	19.92
125	7.05	700	20.66
130	7.83	725	21.08
135	9.61	750	21.53
140	7.93	775	22.39
145	8.03	800	22.66
150	8.29	825	22.87
160	8.72	850	22.65
170	9.18	875	23.12
180	9.05	700	23.70
190	9.80	925	23.40
200	10.61	950	23.43
210	10.34	975	23.30
220	11.21	1000	24.02
230	11.69		
240	11.62		
250	11.85		
260	12.45		
270	13.16		
280	13.48		
290	13.74		

14 Abbreviations and Acronyms

The following abbreviations and acronyms are applicable in this document

BW	Bandwidth
Db	Decibel
EMI	Electromagnetic interference
E.U.T	Equipment under test
LISN	Line impedance stabilization network
RBW	Resolution band width
S/N	Serial number
VBW	Video bandwidth

a.