FCC Licensed Transmitter Test Report
for

S5 series beltpack transmitter
S5.5LTX

Reference Standard 47CFR Part 2, Subpart J: Oct 2007
Manufacturer BBM Electronics Group Ltd
For type of equipment and serial number, refer to section 3
Report Number 10-215A/3479/1/07
Supersedes report number 10-215/3479/1/07
Report Produced by: -

R.N. Electronics Ltd.
1 Arnolds Court
Arnolds Farm Lane
Mountnessing
Essex
CM13 1UT
U.K.

www.RNelectronics.com

Telephone +44 (0) 1277 352219
Facsimile +44 (0) 1277 352968

This page has been left blank intentionally.

1. Contents

2. Summary of Test Results

The S5 series beltpack transmitter S5.5LTX was tested for compliance to the following standard for licensed transmitters: -

47CFR Part 2, Subpart J: Oct 2007
47CFR Part 74, Subpart H: Oct 2007
Class **TBT** Intentional radiator

Title	References		Results
1. RF Power Output.	47CFR Part 2, Subpart J	conducted:	PASSED
		radiated:	PASSED
2. Modulation Characteristics.	47CFR Part 2, Subpart J	frequency response:	PASSED
		modulation limiting:	PASSED
3. Occupied Bandwidth	47CFR Part 2, Subpart J		PASSED
4. Spurious Emissions at Antenna Terminals.	47CFR Part 2, Subpart J		PASSED
5. Field Strength of Spurious Radiation.	47CFR Part 2, Subpart J		PASSED
6. Frequency Stability.	47CFR Part 2, Subpart J		PASSED

This report relates to the equipment tested as identified by a unique serial number and at the time it was tested. It does not relate to any other similar equipment and performance of the product before or after the test cannot be guaranteed.

The measurement uncertainty, where stated, is the expanded uncertainty based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Date of Test: 12th-17th October 2007

Test Engineer: Daniel Sims — Digitally signed by Daniel Sims DN: CN = Daniel Sims, C = GB, O = RN Electronics Date: 2008.01.08 13:13:05 Z

Approved By: Paul Darragh — Digitally signed by Paul Darragh DN: CN = Paul Darragh, C = GB, OU = RN Electronics Date: 2008.01.08 13:10:57 Z

Customer Representative:

3. Information about Equipment Under Test

Applicant	BBM Electronics Group Ltd subsidery of TOA Corporation Kestral House Garth Road Morden Surrey SM4 4LP
Brand name of EUT	Trantec
Model Number(s) of EUTs	S5.5LTX
Serial Numbers of EUTs	Tst2
FCC ID (if applicable):	F3SS5LX
Date when equipment was received by RN Electronics Limited	11th October 2007
Date of test:	12th-17th October 2007
Customer order number:	SB5 Series
Visual description of EUT:	Small metal enclosure with antenna, Off/On switch and audio Mic input socket on the top. The unit has an LCD display & two control buttons on its front. The battery compartment access is located on the bottom.
Main function of the EUT:	Professional Radio Microphone

EUT Information specification.

Height	80mm
Width	55mm
Depth	20mm
Weight	110g
Voltage	1.5V
Current required from above voltage source	120mA
Highest Frequencies used / generated	685.9 – 758.1 MHz

EUT Configurations for testing.

Choice of model(s) for type testing	Prototype
Method of achieving an unmodulated carrier frequency	No audio applied to Mic input
Audio capsule / test fixture used	Audio Input lead
Declared power level (dBm)	+20dBm
Declared channel bandwidth (kHz)	200kHz

Description of ancillary equipment connected to the equipment under test, for the purpose of tests, can be found in Section 10. Auxiliary Equipment.

Any modifications made to the EUT, whilst under test, can be found in Section 11. Modifications

This report was printed on: 08 January 2008

4. Specifications

The tests were performed by RN Electronics Engineer Daniel Sims who set up the tests, the test equipment, and operated it in accordance with the ***R.N. Electronics Ltd*** procedures manual and the relevant standards listed below.

4.1 Relevant Standards

	Standard Number	Version	Description
4.1.1	47CFR Part 74, Subpart H	Oct 2006	Part 74 - Experimental Radio, Auxiliary, Special Broadcast And Other Program Distributional Services.
4.1.2	47CFR Part 2, Subpart J	Oct 2004	Part 2 - Frequency Allocations And Radio Treaty Matters; General Rules And Regulations.
4.1.3	ITU Rec. SM.329	10 (02/03)	Unwanted emissions in the spurious domain
4.1.4	TIA -603-C	2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

4.2 Deviations Applied

None.

4.3 Measurement Uncertainty

Parameter	**Uncertainty**
RF frequency	<±7 x 10-8
Conducted RF power into 50ohms	<±0.82 dB
Maximum frequency deviation:	<±1 %
Occupied Bandwidth	<±2 %
Radiated emissions (valid up to 26.5 GHz).	<±3.4 dB

4.4 Tests at Extremes of Temperature and Voltage

The following test conditions were used to simulate testing at nominal or extremes.

Voltage Test Conditions	
V nom	1.5V
V min	1.2V
V max	1.5V

☐ A permanent internal RF port was used for testing.
☐ A test fixture was used for testing.
☒ A temporary RF port was created for testing.
☐ The equipment external RF port was used for testing.

5. Tests, Methods and Results

5.1 RF Power Output

5.1.1 Conducted

5.1.1.1 Test Methods

Test Requirements	47CFR Part 2, Subpart J
Test Method:	TIA -603-C, Clause 2.2.1.
Limits:	47CFR Clause §74.861(e)(1)(ii)

5.1.1.1.1 Configuration of EUT

The EUT was tested on a test bench. Measurements were made via a soldered lead connected to the RF output point on the PCB.

5.1.1.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. The power stated is the maximum power observed from an average power detector.

5.1.1.2 Test results

Ambient conditions.
Temperature: 22°C Relative humidity: 52%

	Low Channel	Middle Channel	High Channel
Power measured (dBm)	+11.85	+11.64	+11.90
Converted to mW	15.31	14.59	15.49

Max power observed	Variation in power observed
+11.9dBm	0.26dB

LIMITS: 250mW (+24dBm).

5.1.1.3 Test Equipment used

E290, E291, E253

See Section 9 for more details

5.1.2 Radiated

5.1.2.1 Test Methods

Test Requirements	47CFR Part 2, Subpart J
Test Method:	TIA -603-C, Clause 2.2.17.2
Limits:	47CFR Clause §74.861(e)(1)(ii)

5.1.2.1.1 Configuration of EUT

The EUT was placed in a vertical position in a shielded anechoic chamber. New batteries were used in the EUT. It was confirmed from rotation in three orthogonal planes that a maximum was found. Measurements were made at 3m distance, then substitution was performed using a known signal generator.

5.1.2.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. The power stated is the maximum power observed using a peak detector. The generator level was offset for loss in cables used. A reference dipole antenna was used, hence no antenna factors are recorded.

5.1.2.2 Test results

Ambient conditions.
Temperature: 17°C Relative humidity: 64%

	Low Channel	Middle Channel	High Channel
Received level (dBm)	-25.3	-26.9	-28.8
LOSS (dB)	34.4	35.6	37.2
E.R.P. (dBm)	+9.1	+8.7	+8.4
Polarisation of measuring Antenna	Vertical	Vertical	Horizontal

LIMITS: 250mW (+24dBm).

5.1.2.3 Test Equipment used

E266, TMS814, E285, E327

See Section 9 for more details

5.2 Modulation Characteristics

5.2.1 Frequency response

5.2.1.1 Test Methods

Test Requirements	47CFR Part 2, Subpart J
Test Method:	47CFR Part 2, Subpart J, §2.1047
Limits:	47CFR Clause §74.861(e)(3)

5.2.1.1 Configuration of EUT

The EUT was tested on the bench and ambient conditions were monitored. The audio input was connected to an audio analyser. The audio gain was set to maximum (level 9).

5.2.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. The generated audio input was varied from 100Hz to 15kHz whilst the FM deviation was measured relative to that found at 1kHz.

5.2.2 Test Results

Ambient conditions.
Temperature: 19°C Relative humidity: 62%

Results for this test are presented graphically, please refer to section6. Graphical Results.

LIMITS: +/- 75 kHz Max Deviation

5.2.3 Test Equipment used

TMS49, TMS55

See Section 9 for more details

5.2.2 Modulation Limiting

5.2.2.1 Test Methods

Test Requirements	47CFR Part 2, Subpart J
Test Method:	47CFR Part 2, Subpart J, §2.1047
Limits:	none stated

5.2.2.1 Configuration of EUT

The EUT was tested on the bench and ambient conditions were monitored. The audio input was connected to an audio analyser. The audio gain was set to maximum (level 9).

5.2.2.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. For each input frequency chosen, the audio input level was varied and the FM deviation measured.

5.2.3 Test Results

Ambient conditions.
Temperature: 19°C Relative humidity: 62%

Results for this test are presented graphically, please refer to section6. Graphical Results.

LIMITS: No Limits specified for this test.

5.2.4 Test Equipment used

TMS49, TMS55, E252

See Section 9 for more details

5.3 Occupied Bandwidth

5.3.1 Test Methods

Test Requirements:	47CFR Part 2, Subpart J
Test Method:	47CFR Part 2, Subpart J, §2.1049
Limits:	47CFR Clause §74.861(e)(5)

5.3.1.1 Configuration of EUT

The EUT was tested on the bench and ambient conditions were monitored. The audio input was connected to an audio analyser. The audio gain was set to maximum (level 9).

5.3.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above, using the measuring equipment noted in the 'Test Equipment' section.

5.3.1.3 Test Results

Ambient conditions.
Temperature: 20°C Relative humidity: 52%

	Low Channel	Middle Channel	High Channel
99% Bandwidth measured (kHz)	107	107	109

Results for this test are also presented graphically, please refer to section6. Graphical Results.

LIMITS: 200 kHz.

5.3.1.4 Test Equipment used

TMS6-2, TMS55, TMS49

See Section 9 for more details

5.4 Spurious Emissions at Antenna Terminals

5.4.1 Conducted

5.4.1.1 Test Methods

Test Requirements	47CFR Part 2, Subpart J
Test Methods:	TIA -603-C, Clause 2.2.13 ITU-R Rec. SM.329
Limits:	47CFR Clause §74.861(e)(6)(iii)

5.4.1.1.1 Configuration of EUT

The EUT was tested on a test bench. Measurements were made via a soldered lead connected to the RF output point on the PCB.

5.4.1.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. The power stated is the maximum power observed using a peak detector. Bandwidth settings are per FCC / ITU-R rules, not the TIA reference. Bandpass filters are used at frequencies of interest, not a notch filter as stated in the TIA reference.

5.4.1.2 Test results

Ambient conditions.
Temperature: 22°C Relative humidity: 52%

TABLE OF SPURIOUS EMISSIONS

Channel Name	Low (685.9MHz)
Channel Spacing	200kHz
Modulation Type	FM
Power Level	+20dBm

Spurious Frequency (MHz)	Measured Spurious Level (dBm)
NONE FOUND WITHIN 20dB	
Frequency Range	**Plot Number**
9 – 150 kHz	001
150k – 30 MHz	002
30 – 500 MHz	003
500 – 1000 MHz	004
1 – 2 GHz	005
2 – 3 GHz	006
3 – 4 GHz	007
4 – 6 GHz	008
6 – 8 GHz	009

TABLE OF SPURIOUS EMISSIONS

Channel Name	Middle (722MHz)
Channel Spacing	200kHz
Modulation Type	FM
Power Level	+20dBm

Spurious Frequency (MHz)	Measured Spurious Level (dBm)
NONE FOUND WITHIN 20dB	
Frequency Range	**Plot Number**
9 – 150 kHz	010
150k – 30 MHz	011
30 – 500 MHz	012
500 – 1000 MHz	013
1 – 2 GHz	014
2 – 3 GHz	015
3 – 4 GHz	016
4 – 6 GHz	017
6 – 8 GHz	018

TABLE OF SPURIOUS EMISSIONS

Channel Name	High (758.1MHz)
Channel Spacing	200kHz
Modulation Type	FM
Power Level	+20dBm

Spurious Frequency (MHz)	Measured Spurious Level (dBm)
NONE FOUND WITHIN 20dB	
Frequency Range	**Plot Number**
9 – 150 kHz	019
150k – 30 MHz	020
30 – 500 MHz	021
500 – 1000 MHz	022
1 – 2 GHz	023
2 – 3 GHz	024
3 – 4 GHz	025
4 – 6 GHz	026
6 – 8 GHz	027

LIMITS: 43+10log10 (mean output power in watts) dB. I.e. -13dBm.

The plots referred to in the above table may be found in section 6. Graphical Results

5.4.1.3 Test Equipment used

E253, E250, E266, TMS6-2

See Section 9 for more details

5.5 Field Strength of Spurious Radiation.

5.5.1 Test Methods

Test Requirements:	47CFR Part 2, Subpart J
Test Methods:	TIA -603-C, Clause 2.2.12 ITU-R Rec. SM.329
Limits:	47CFR Clause §74.861(e)(6)(iii)

5.5.1.1 Configuration of EUT

The EUT was placed in a vertical position in a shielded anechoic chamber. New batteries were used in the EUT. It was confirmed from rotation in three orthogonal planes that a maximum was found. Measurements were made at 3m distance, then substitution was performed using a known signal generator.

5.5.1.2 Test Procedure

Tests were made in accordance with the Test Methods noted above using the measuring equipment noted in the 'Test Equipment' Section. Bandwidth settings are per FCC / ITU-R rules, not the TIA reference.

5.5.2 Test Results

Ambient conditions.
Temperature: 17°C Relative humidity: 64%

Table of spurious emissions within 20dB of limits.

Channel Name	Low
Channel Frequency	685.9 MHz
Channel Spacing	200kHz
Power Level	Max power

Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Antenna Polarisation	EUT Polarisation
NONE FOUND			

Table of spurious emissions within 20dB of limits.

Channel Name	Middle
Channel Frequency	722 MHz
Channel Spacing	200kHz
Power Level	Max power

Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Antenna Polarisation	EUT Polarisation
NONE FOUND			

Table of spurious emissions within 20dB of limits.

Channel Name	High
Channel Frequency	758.1 MHz
Channel Spacing	200kHz
Power Level	Max power

Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Antenna Polarisation	EUT Polarisation
NONE FOUND			

LIMITS: 43+10log10 (mean output power in watts) dB. I.e. -13dBm.

5.5.3 Test Equipment Used

E136, E266, E268, E285, E3, E327, TMS77, TMS814, TMS82, N438, E238, E239, E320

See Section 9 for more details

5.6 Frequency Error

5.6.1 Test Methods

Test Requirements:	47CFR Part 2, Subpart J
Test Method:	47CFR Part 2, Subpart J, Clause §2.1055
Limits:	47CFR Clause §74.861(e)(4)

5.6.1.1 Configuration of EUT

The EUT was placed in a temperature controlled chamber and thermal balance was achieved at each temperature set before testing commenced.

5.6.1.2 Test Procedure

Tests were made in accordance with the Test Method noted above using the measuring equipment noted in the 'Test Equipment' Section. At each temperature extreme, the EUT was switched on in the transmit condition for one minute, after which the tests were conducted.

5.6.2 Test results

Ambient conditions.
Temperature: 20°C Relative humidity: 52%

Radio parameters.
O/P Power: Max Power Modulation: CW

TABLE OF FREQUENCY ERROR

Temperature	Voltage	Low Channel	Middle Channel	High Channel
-30°C	Nominal	685.900470	722.001437	758.096749
-20°C	Nominal	685.899064	721.998669	758.097541
-10°C	Nominal	685.902176	722.002660	758.102992
0°C	Nominal	685.902636	722.002779	758.103000
+10°C	Nominal	685.901899	722.001897	758.101932
+20°C	Nominal	685.899749	721.999641	758.099530
+20°C	Minimum	685.899698	721.999494	758.099466
+20°C	Maximum	685.899749	721.999641	758.099530
+30°C	Nominal	685.897986	721.997883	758.098129
+40°C	Nominal	685.896313	721.995866	758.095844
+50°C	Nominal	685.894865	721.994634	758.094356

	Bottom Channel	Middle Channel	Top Channel
Variation in Frequency (+/-Hz)	+2636 / -5135	+2779 / -5366	+3000 / -5644
Worst case observed (%)	+0.0004 / -0.0007		

LIMITS: +/-0.005% (50ppm)

5.6.3 Test Equipment used

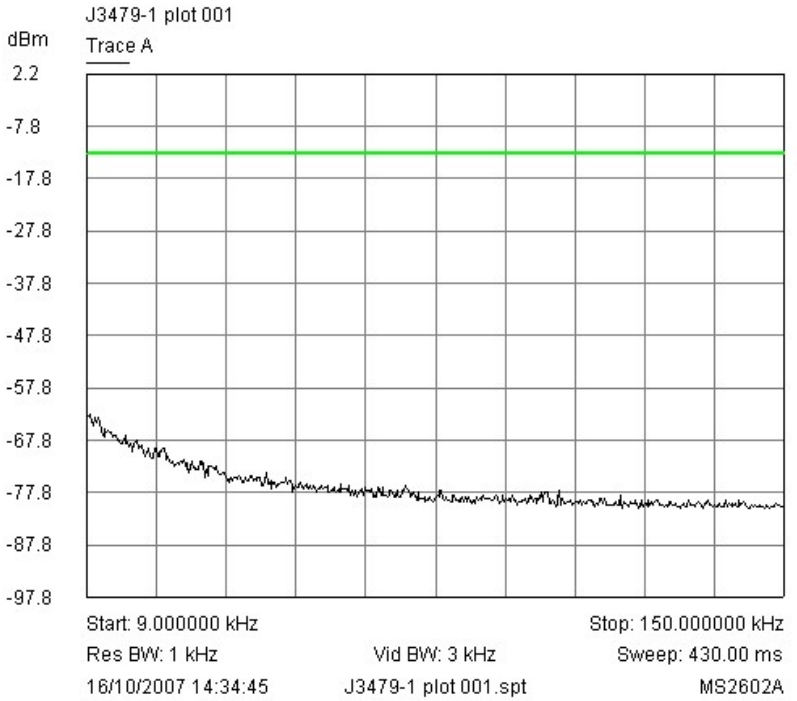
E227, TMS57, E3, TMS38, TMS73, TMS80

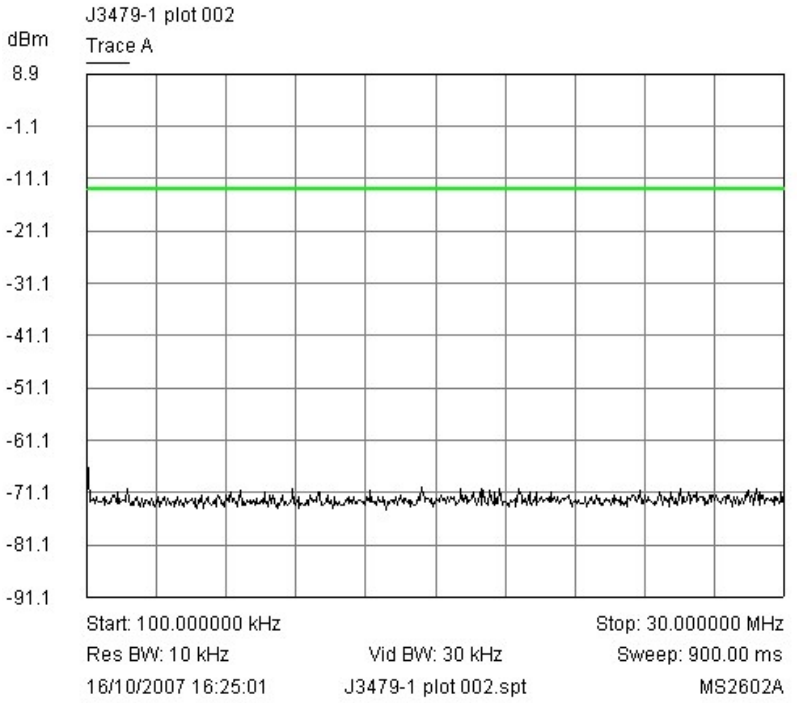
See Section 9 for more details

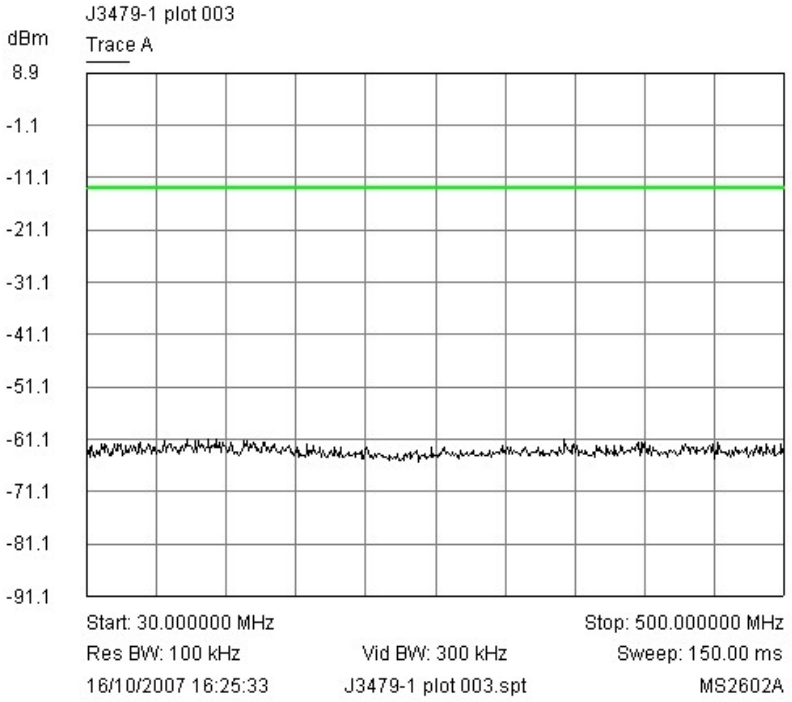
6. Graphical Results

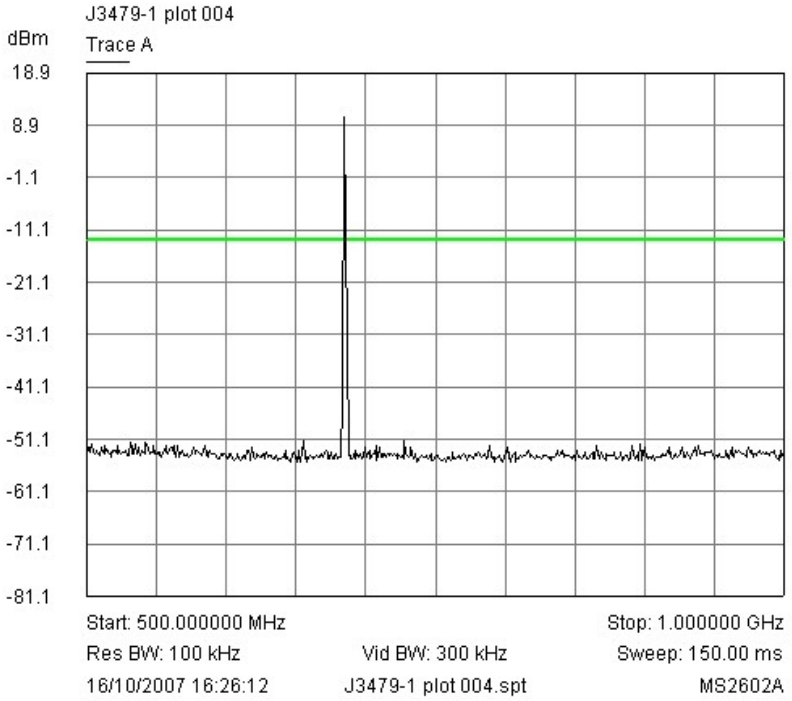
6.1 Conducted Emissions.

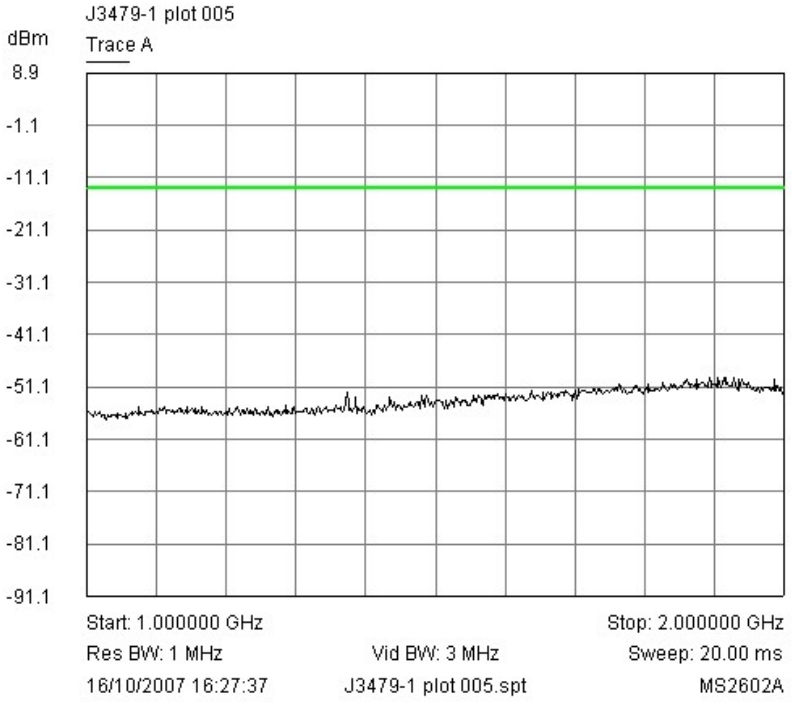
Low Channel.

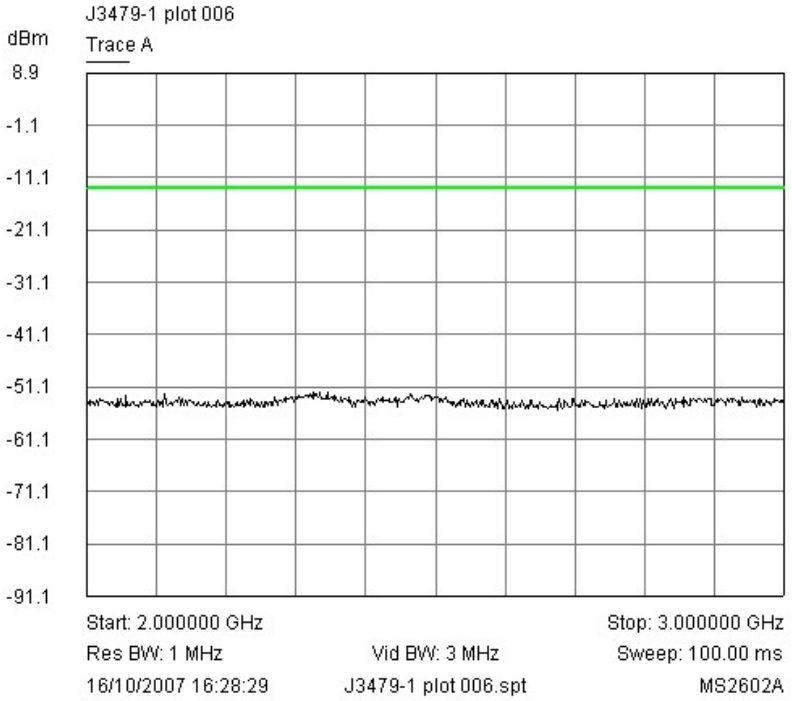


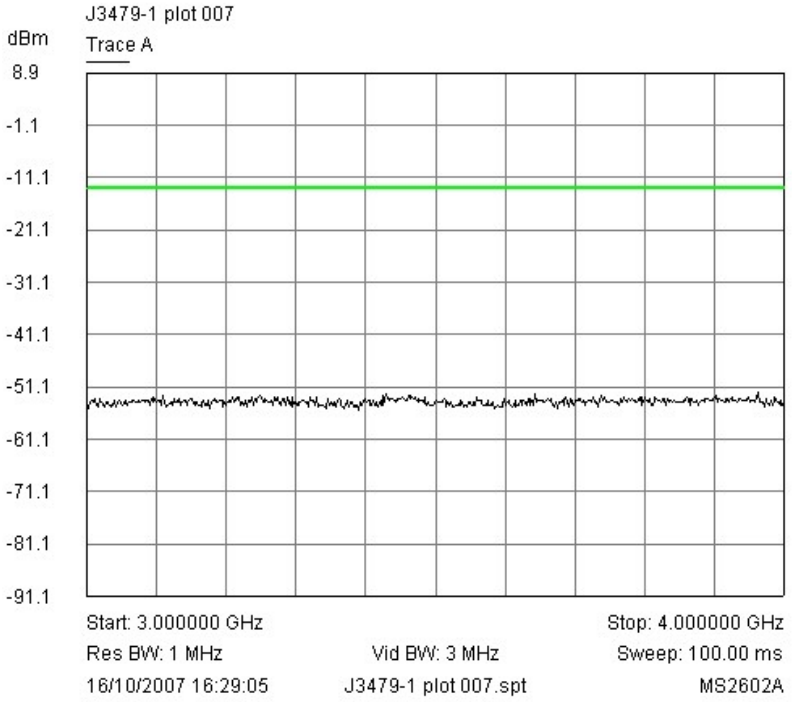


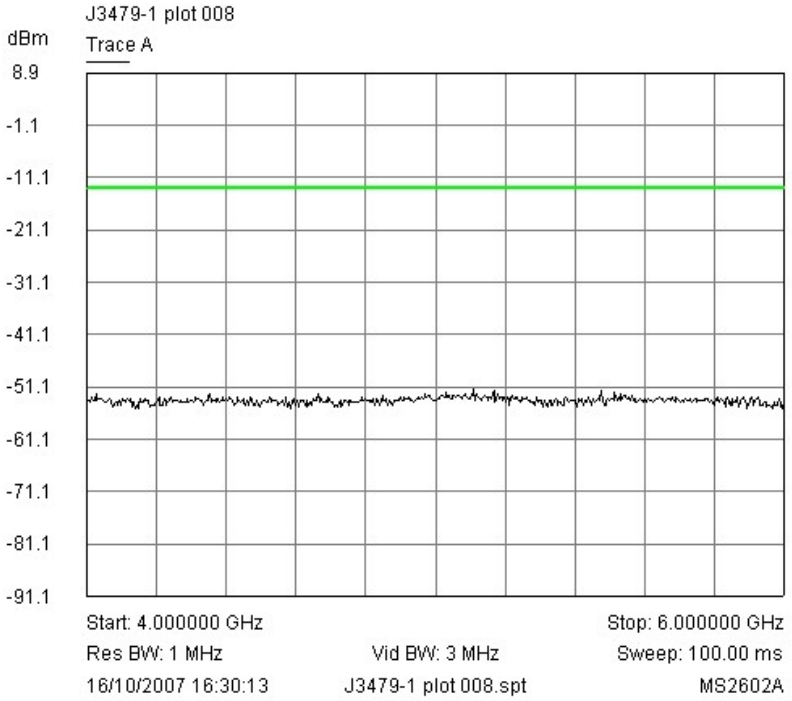


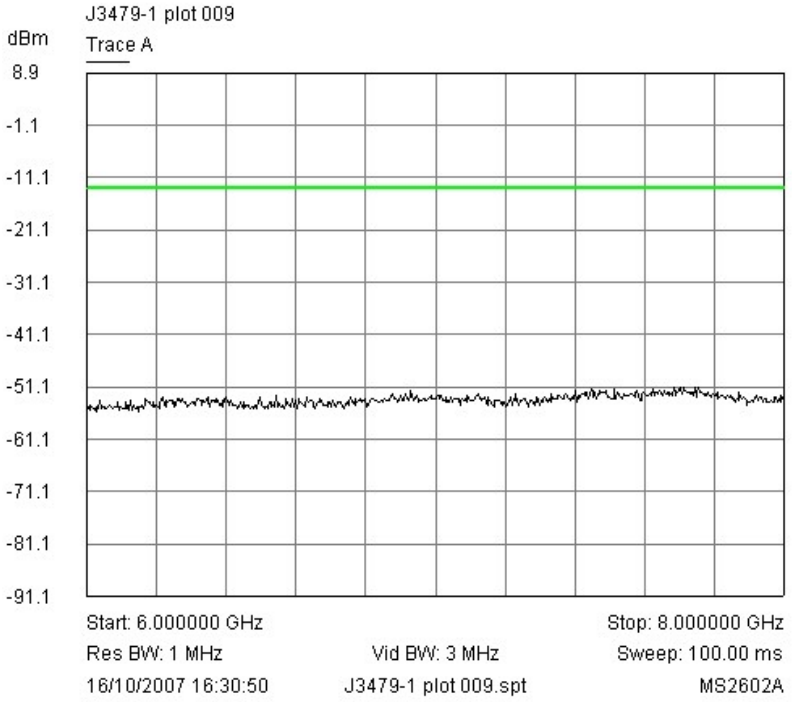



J3479-1 plot 005
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 1.000000 GHz
Stop: 2.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 20.00 ms
16/10/2007 16:27:37
J3479-1 plot 005.spt
MS2602A

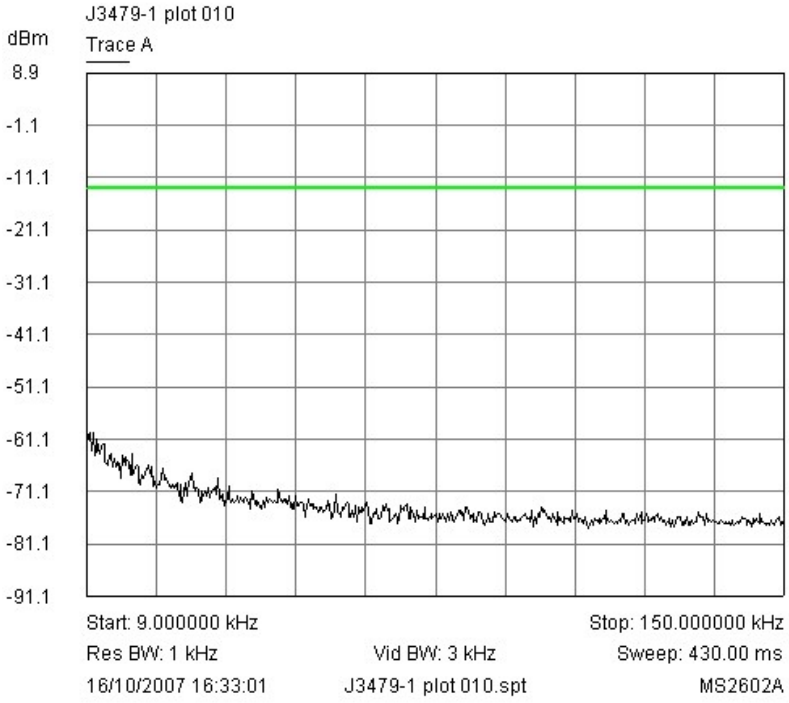

J3479-1 plot 006
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 2.000000 GHz
Stop: 3.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:28:29
J3479-1 plot 006.spt
MS2602A

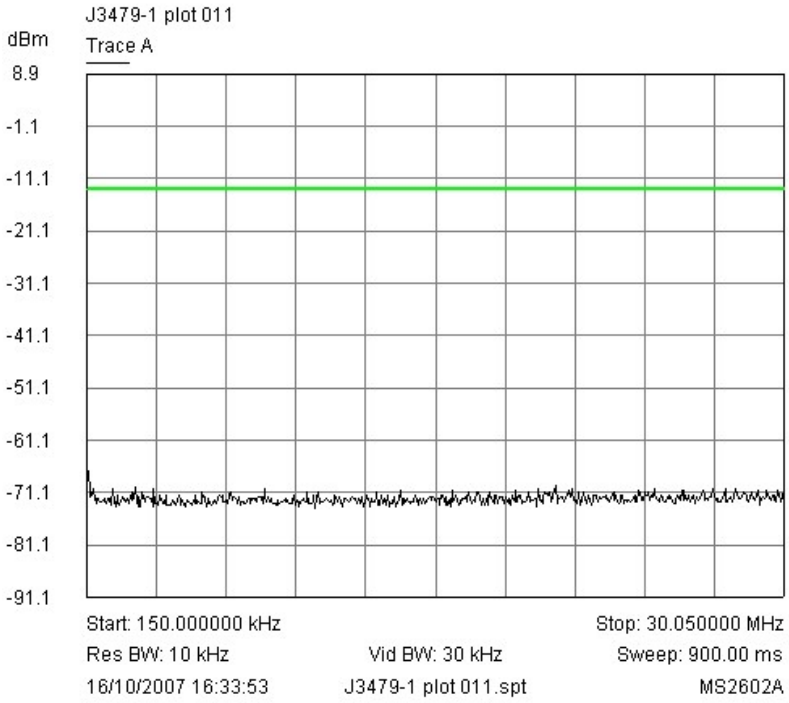

J3479-1 plot 007
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 3.000000 GHz
Stop: 4.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:29:05
J3479-1 plot 007.spt
MS2602A

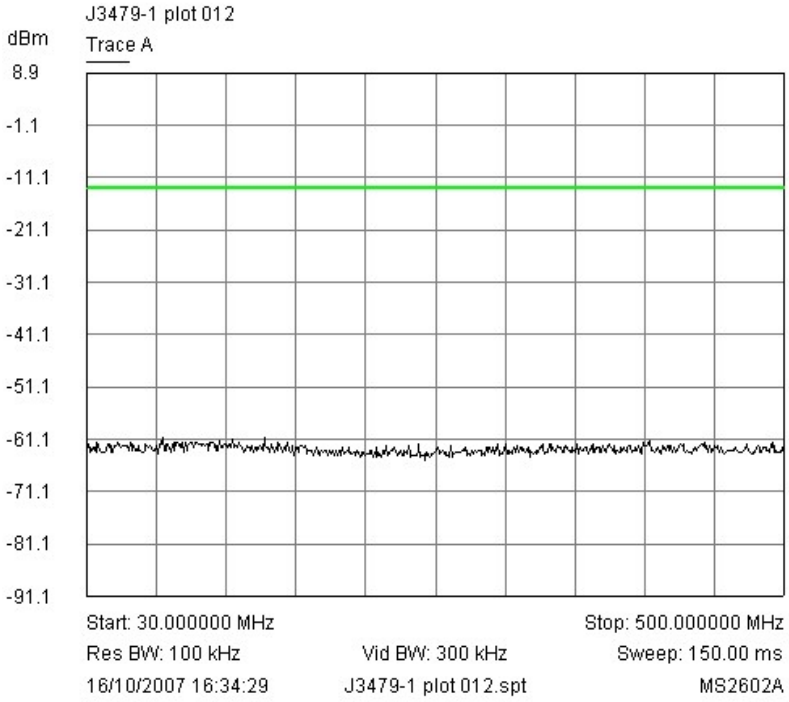

J3479-1 plot 008
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 4.000000 GHz
Stop: 6.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:30:13
J3479-1 plot 008.spt
MS2602A

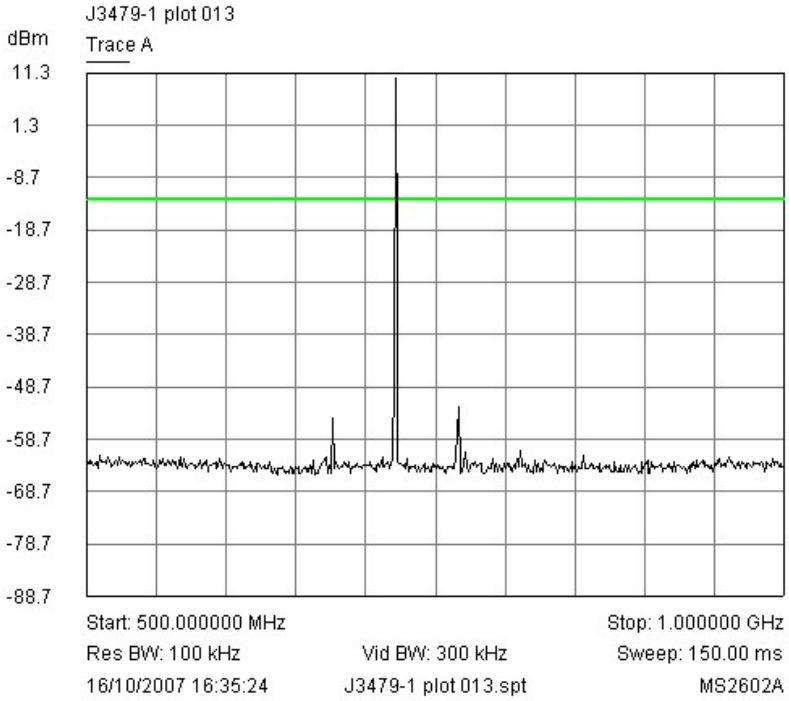

J3479-1 plot 009
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 6.000000 GHz
Stop: 8.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:30:50
J3479-1 plot 009.spt
MS2602A

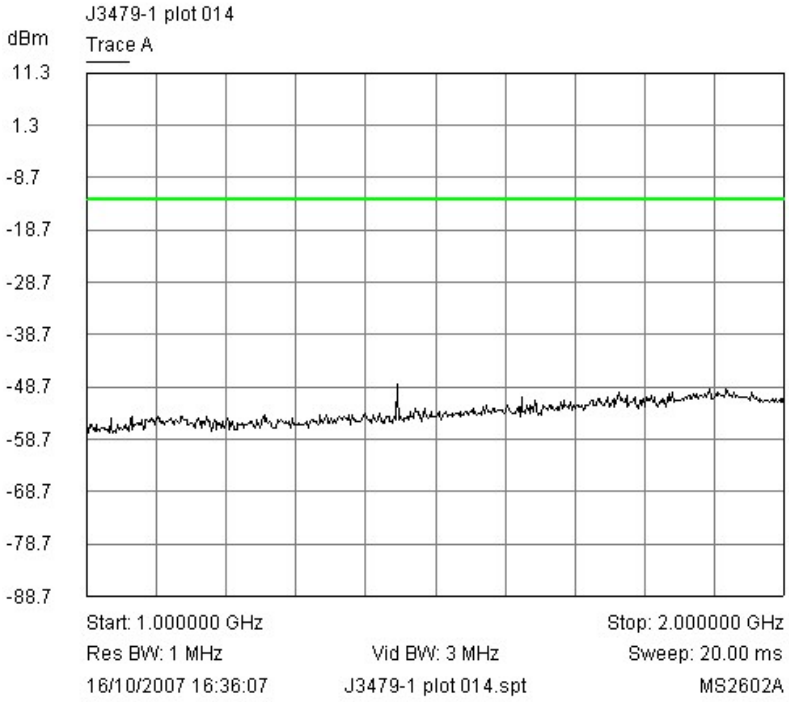
Middle Channel

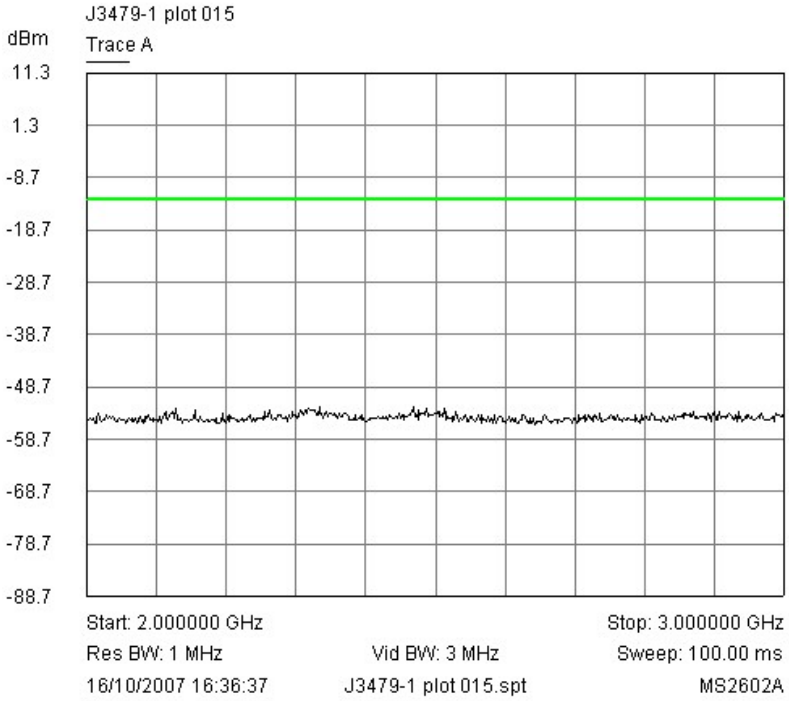


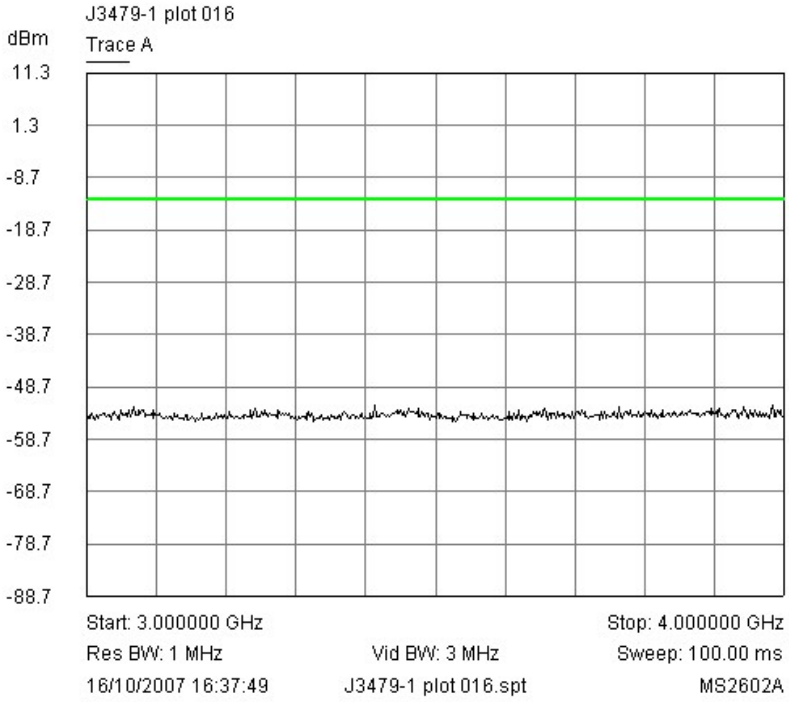


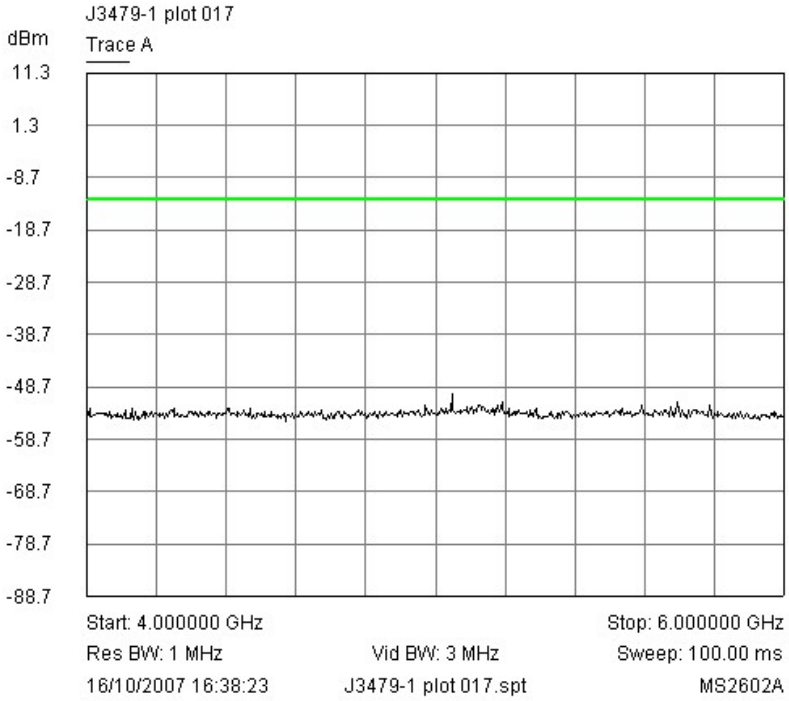

J3479-1 plot 012
Trace A
dBm
8.9
-1.1
-11.1
-21.1
-31.1
-41.1
-51.1
-61.1
-71.1
-81.1
-91.1
Start: 30.000000 MHz
Stop: 500.000000 MHz
Res BW: 100 kHz
Vid BW: 300 kHz
Sweep: 150.00 ms
16/10/2007 16:34:29
J3479-1 plot 012.spt
MS2602A

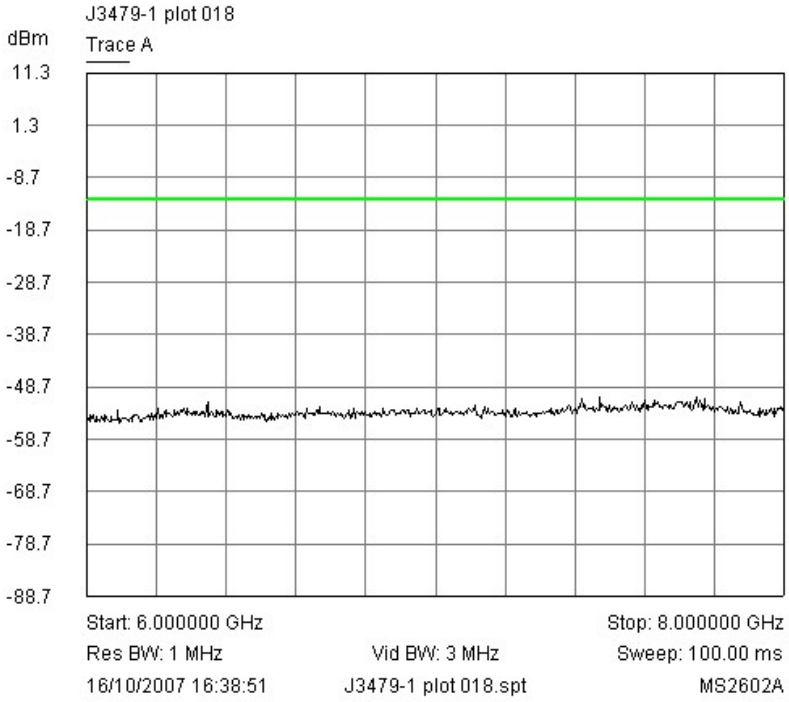

J3479-1 plot 013
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 500.000000 MHz
Stop: 1.000000 GHz
Res BW: 100 kHz
Vid BW: 300 kHz
Sweep: 150.00 ms
16/10/2007 16:35:24
J3479-1 plot 013.spt
MS2602A


J3479-1 plot 014
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 1.000000 GHz
Stop: 2.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 20.00 ms
16/10/2007 16:36:07
J3479-1 plot 014.spt
MS2602A

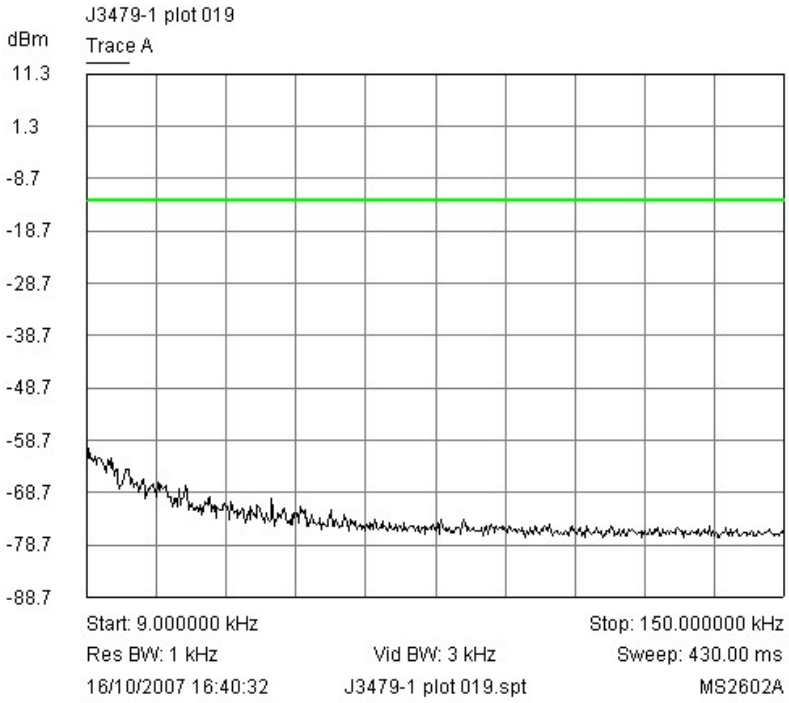

J3479-1 plot 015
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 2.000000 GHz
Stop: 3.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:36:37
J3479-1 plot 015.spt
MS2602A

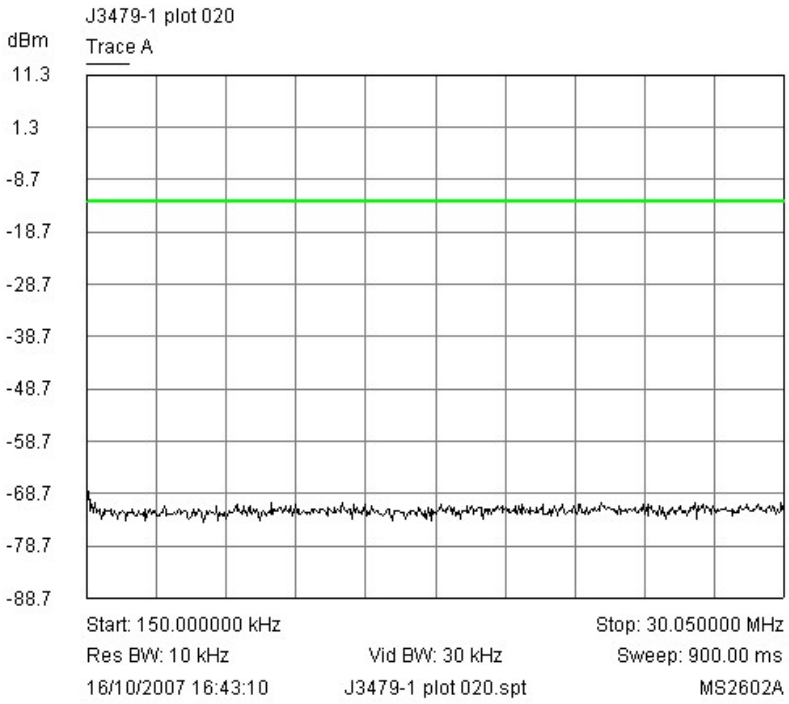

J3479-1 plot 016
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 3.000000 GHz
Stop: 4.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:37:49
J3479-1 plot 016.spt
MS2602A

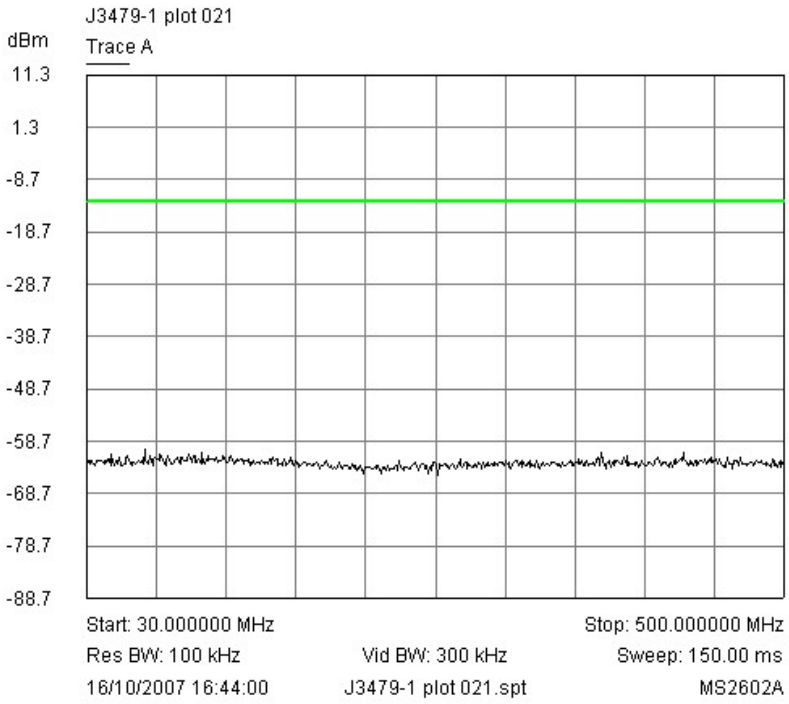

J3479-1 plot 017
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 4.000000 GHz
Stop: 6.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:38:23
J3479-1 plot 017.spt
MS2602A

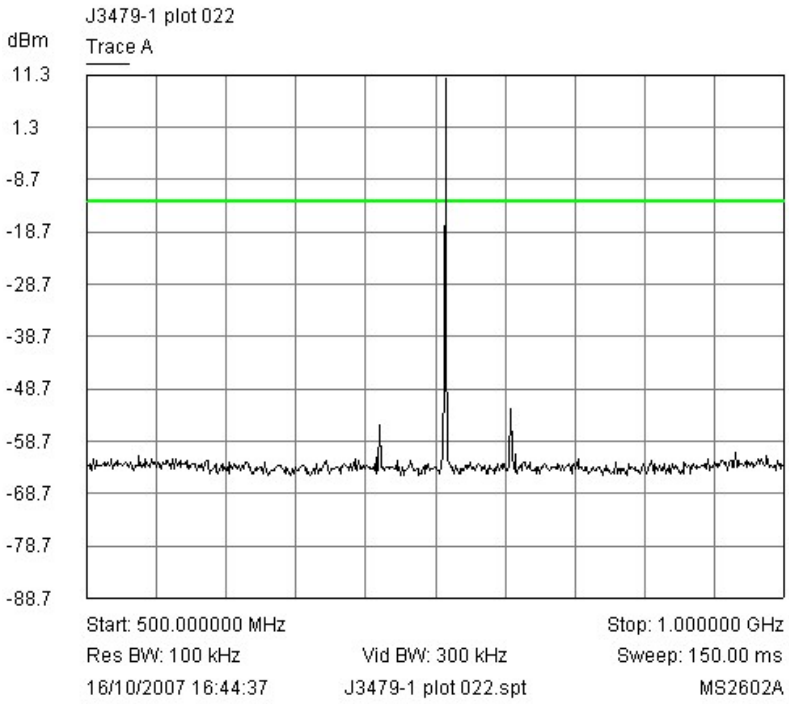


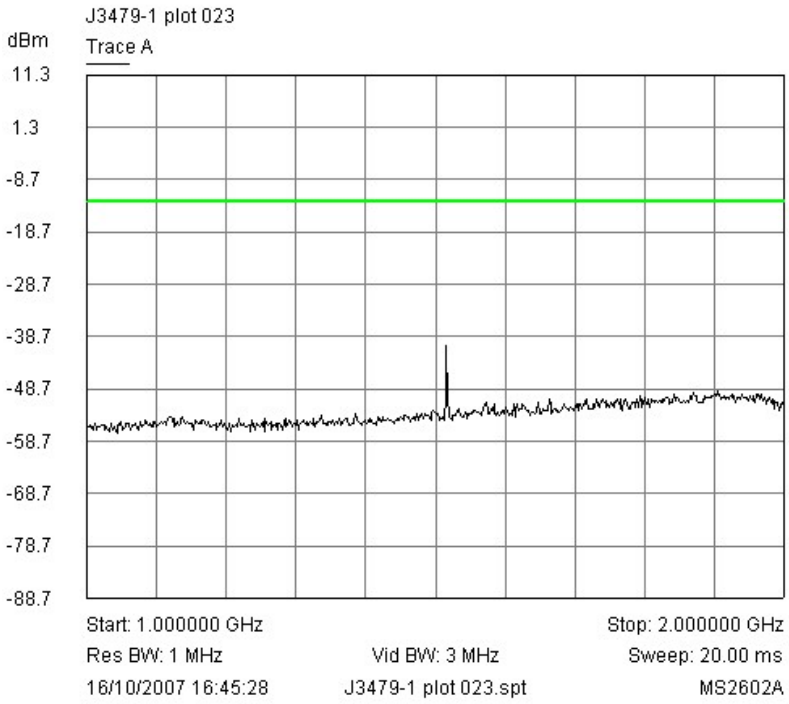
High Channel.

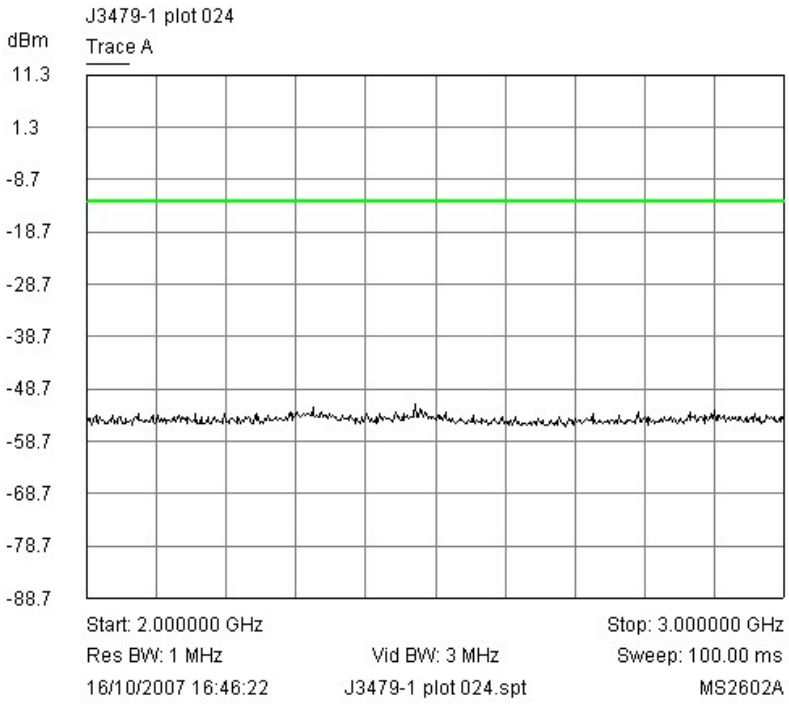


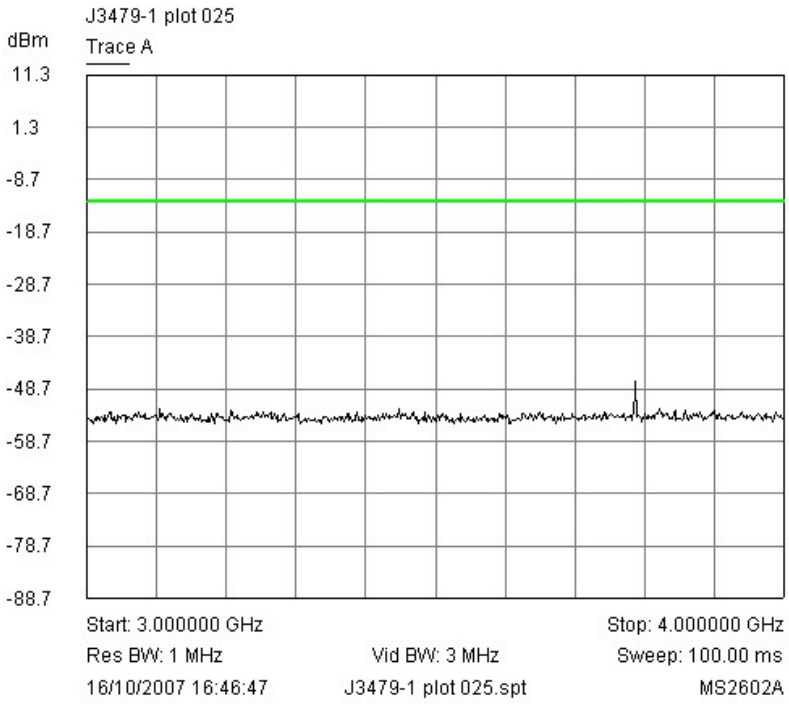

J3479-1 plot 020
dBm
Trace A
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 150.000000 kHz
Stop: 30.050000 MHz
Res BW: 10 kHz
Vid BW: 30 kHz
Sweep: 900.00 ms
16/10/2007 16:43:10
J3479-1 plot 020.spt
MS2602A

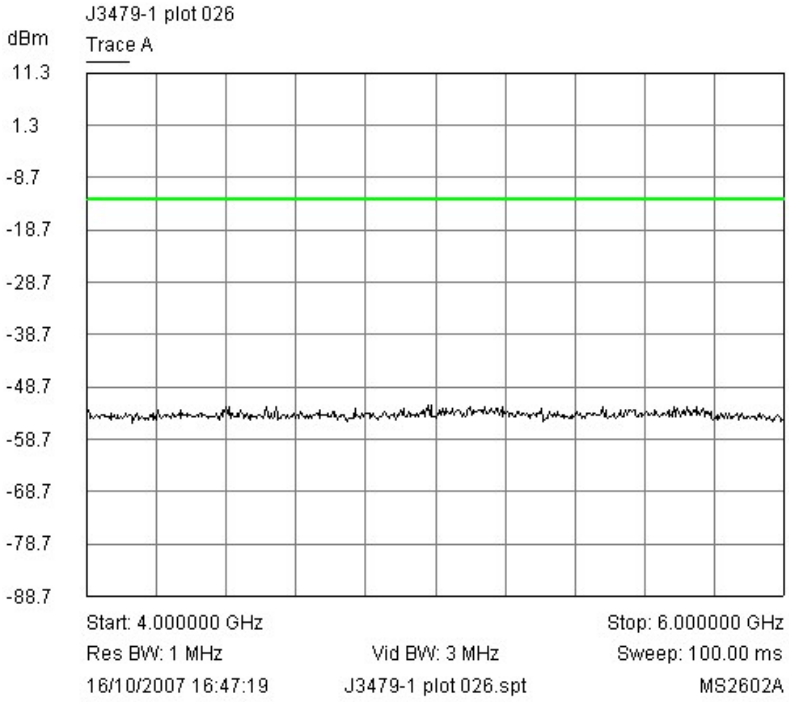

J3479-1 plot 021
dBm
Trace A
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 30.000000 MHz
Stop: 500.000000 MHz
Res BW: 100 kHz
Vid BW: 300 kHz
Sweep: 150.00 ms
16/10/2007 16:44:00
J3479-1 plot 021.spt
MS2602A

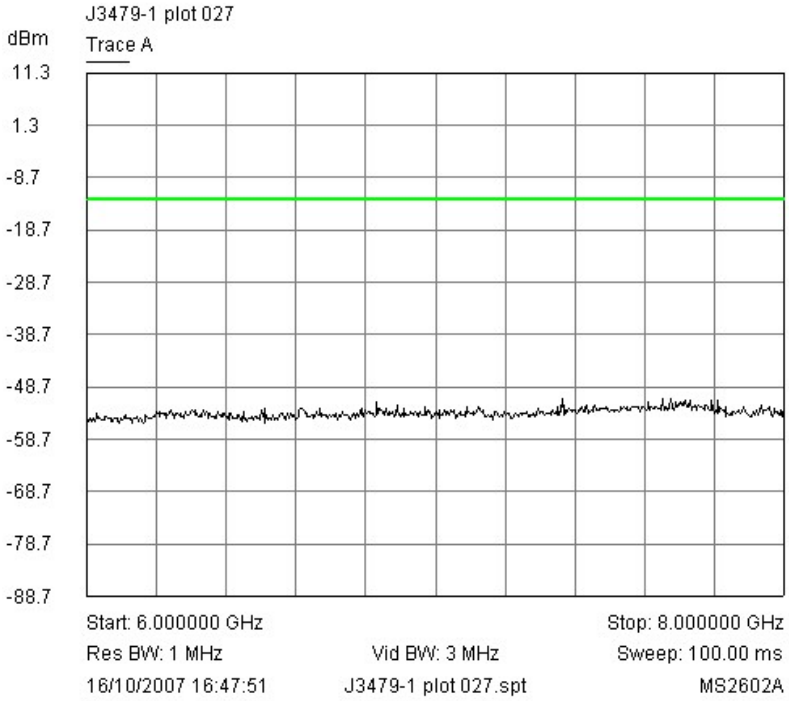

J3479-1 plot 022
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 500.000000 MHz
Stop: 1.000000 GHz
Res BW: 100 kHz
Vid BW: 300 kHz
Sweep: 150.00 ms
16/10/2007 16:44:37
J3479-1 plot 022.spt
MS2602A


J3479-1 plot 023
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 1.000000 GHz
Stop: 2.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 20.00 ms
16/10/2007 16:45:28
J3479-1 plot 023.spt
MS2602A

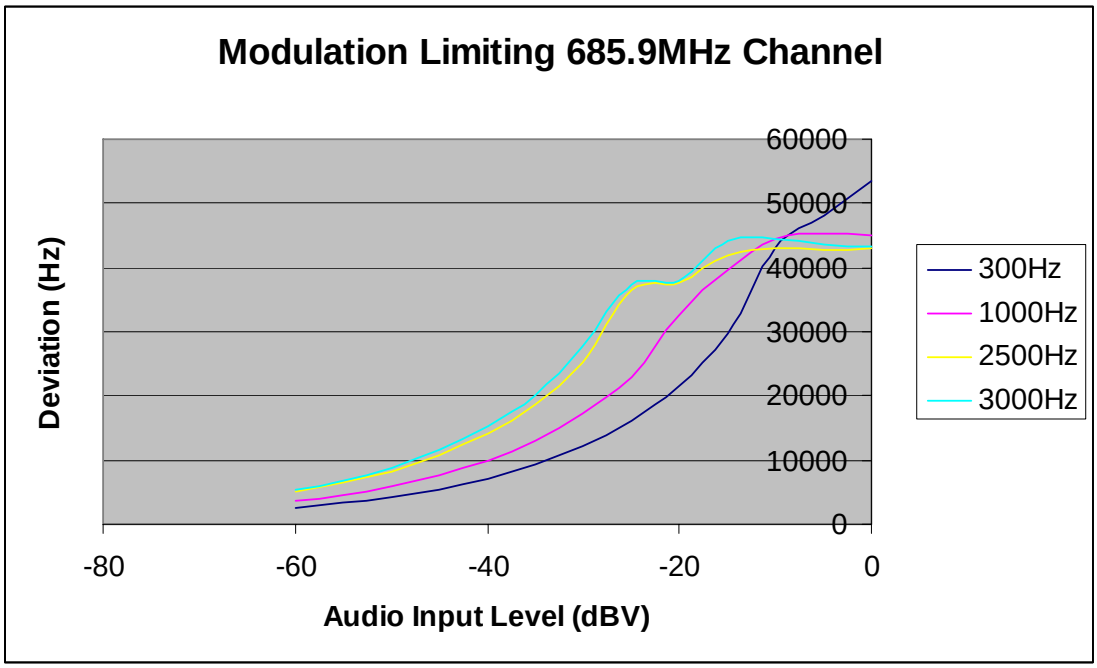


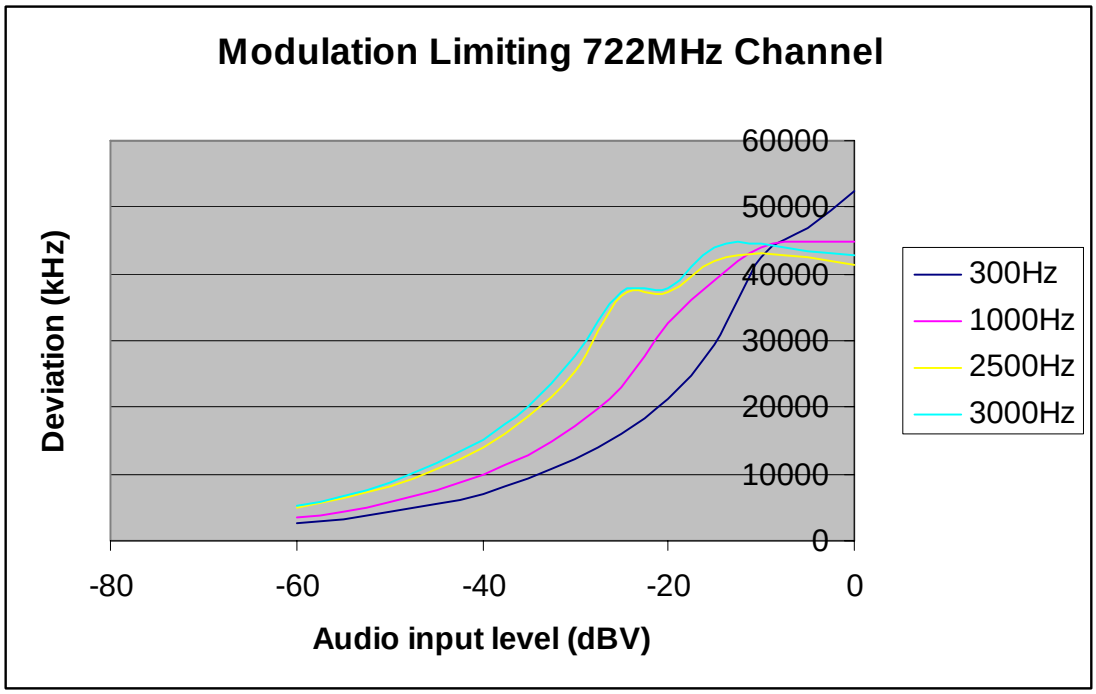


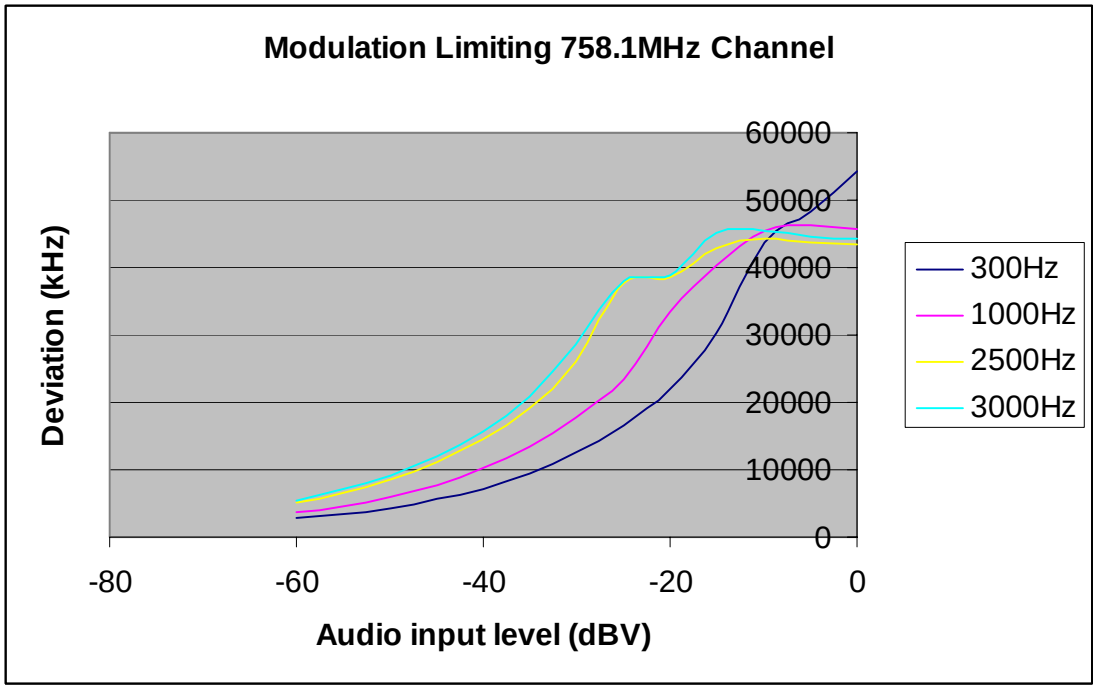

J3479-1 plot 026
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 4.000000 GHz
Stop: 6.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:47:19
J3479-1 plot 026.spt
MS2602A


J3479-1 plot 027
Trace A
dBm
11.3
1.3
-8.7
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
-88.7
Start: 6.000000 GHz
Stop: 8.000000 GHz
Res BW: 1 MHz
Vid BW: 3 MHz
Sweep: 100.00 ms
16/10/2007 16:47:51
J3479-1 plot 027.spt
MS2602A

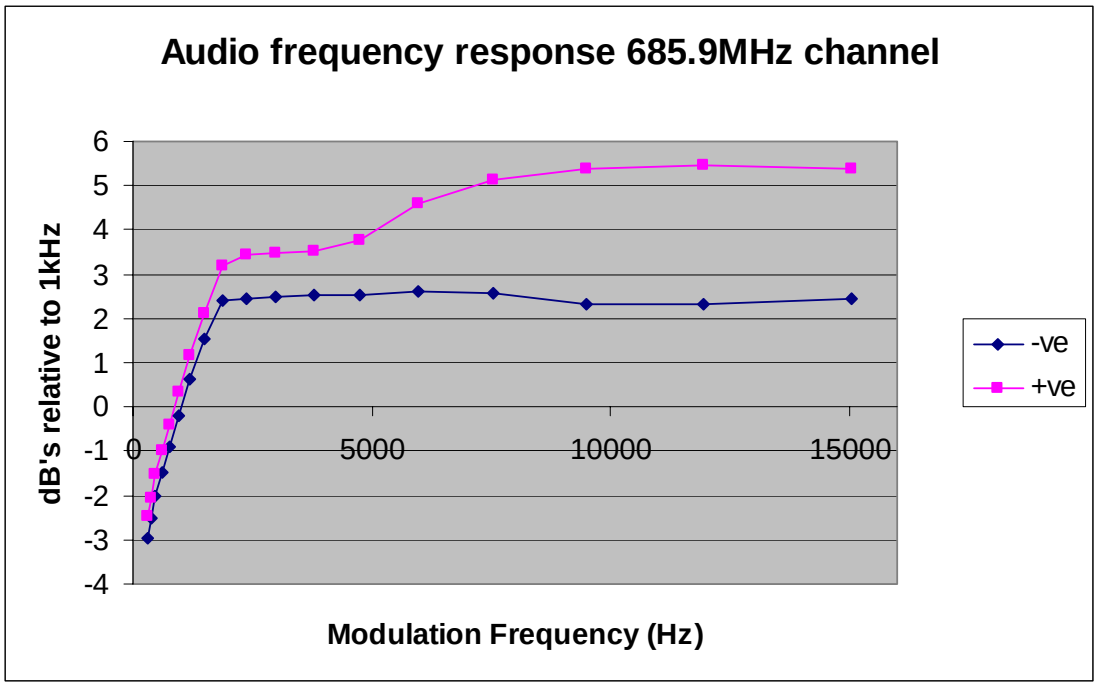
6.2 Modulation Limiting.

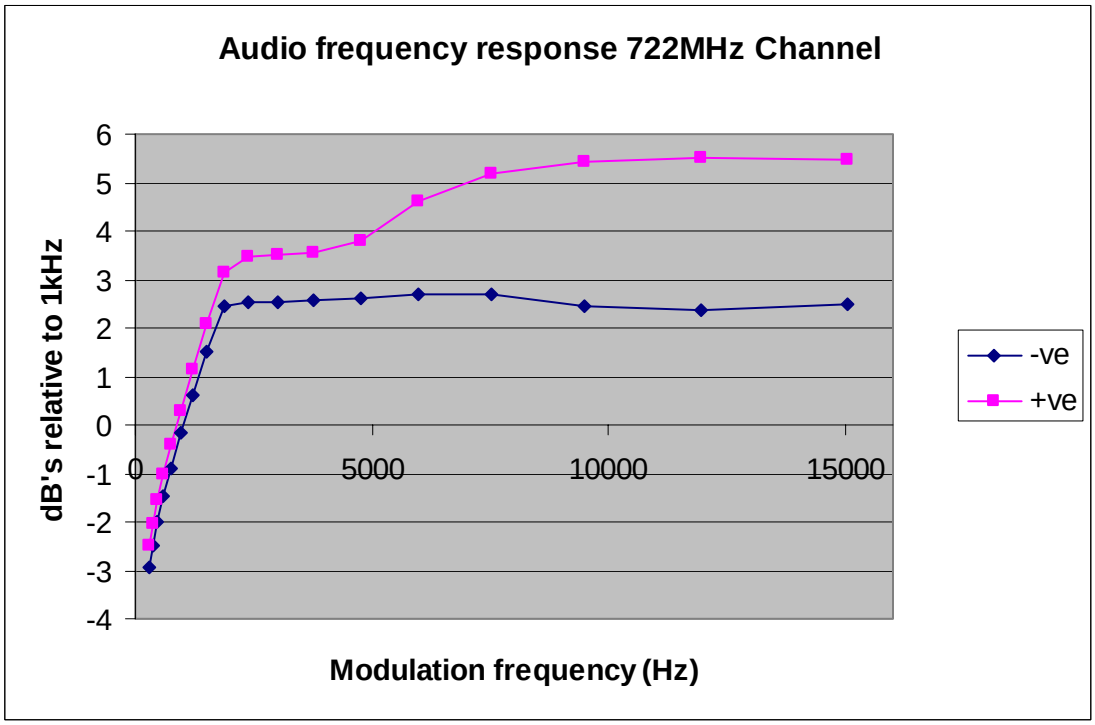


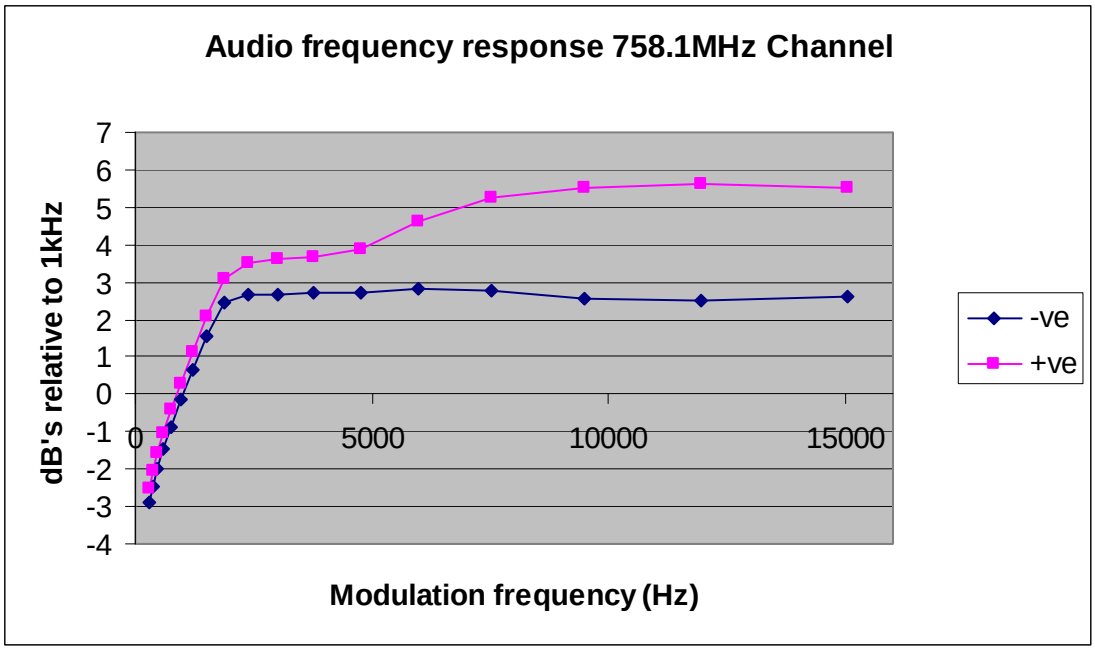



Modulation Limiting 758.1MHz Channel
Deviation (kHz)
60000
50000
40000
30000
20000
10000
0
-80
-60
-40
-20
0
Audio input level (dBV)
300Hz
1000Hz
2500Hz
3000Hz

6.3 Audio Response.

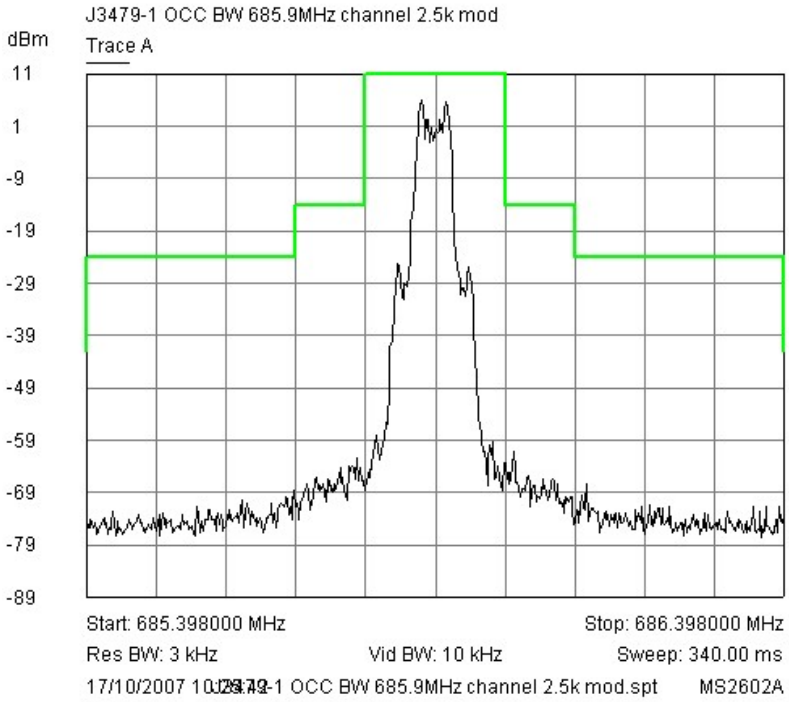


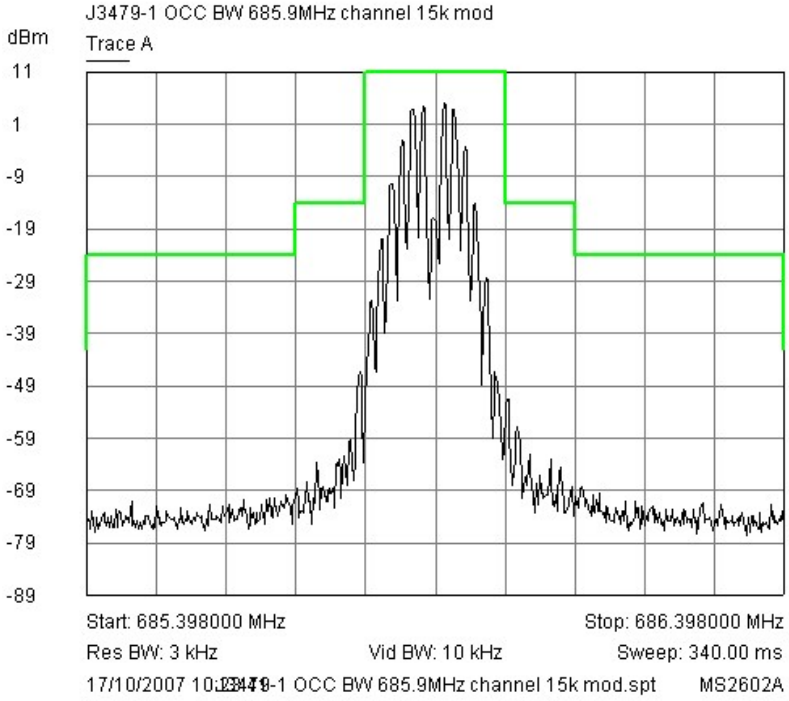



Audio frequency response 758.1MHz Channel
dB's relative to 1kHz
7
6
5
4
3
2
1
0
-1
-2
-3
-4
0
5000
10000
15000
Modulation frequency (Hz)
-ve
+ve

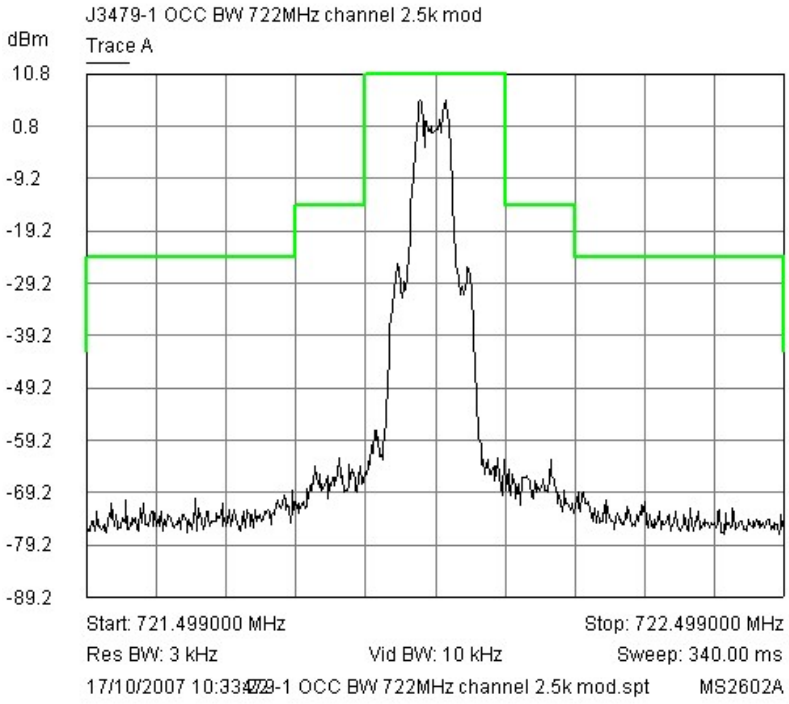
6.4 Channel Bandwidth.

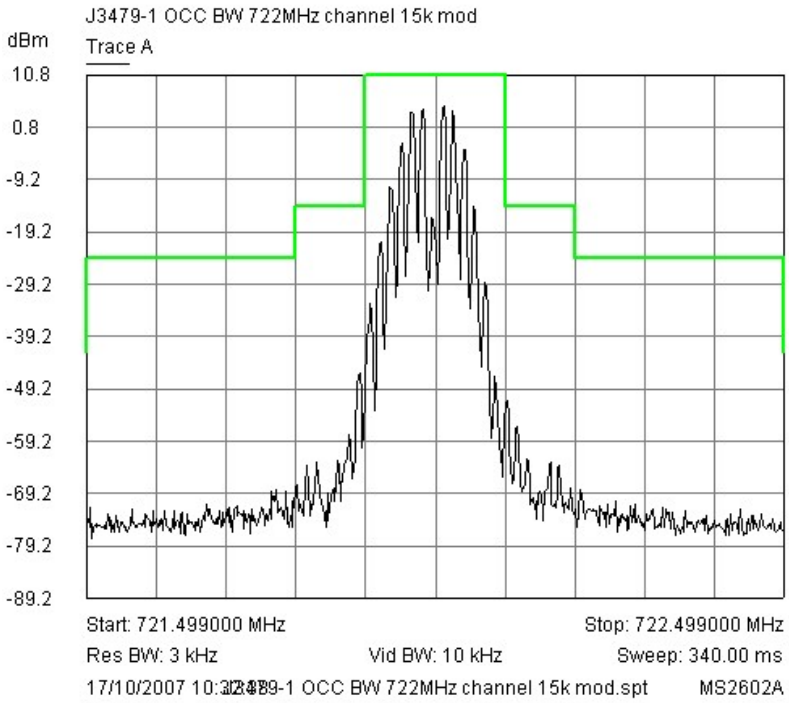
Low Channel.



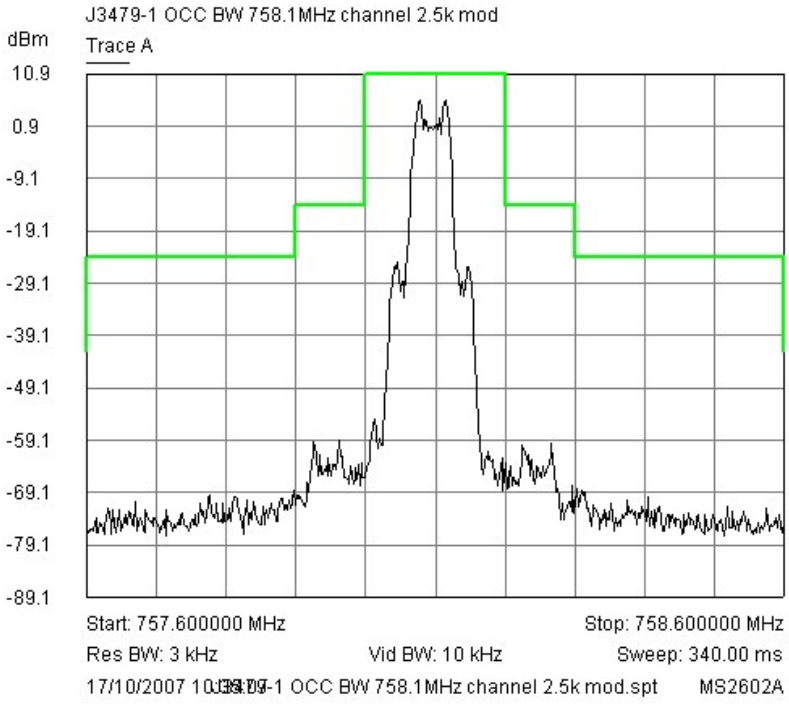


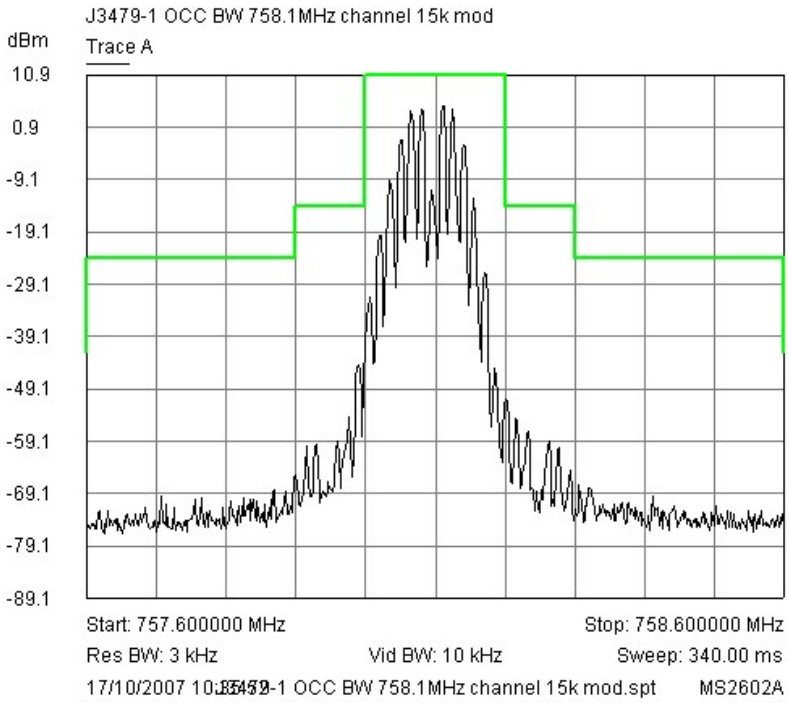
Middle Channel.





High Channel.





7. Photographs

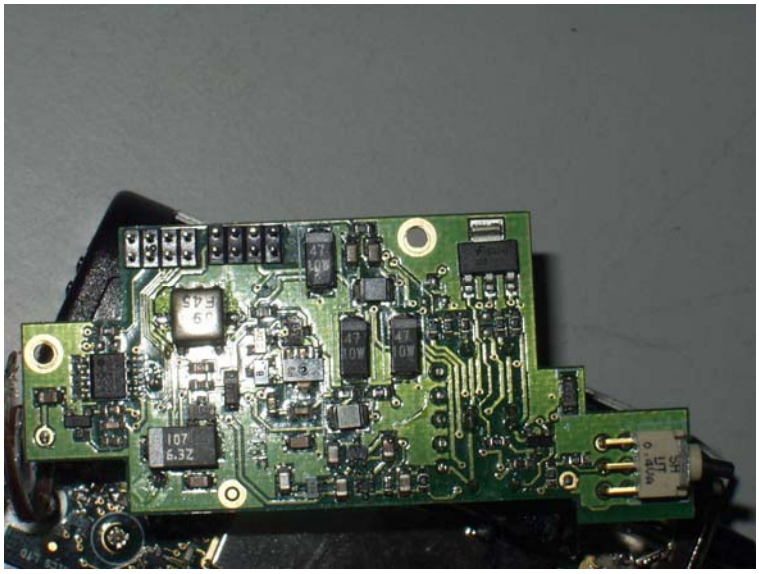
7.1 EUT Front View

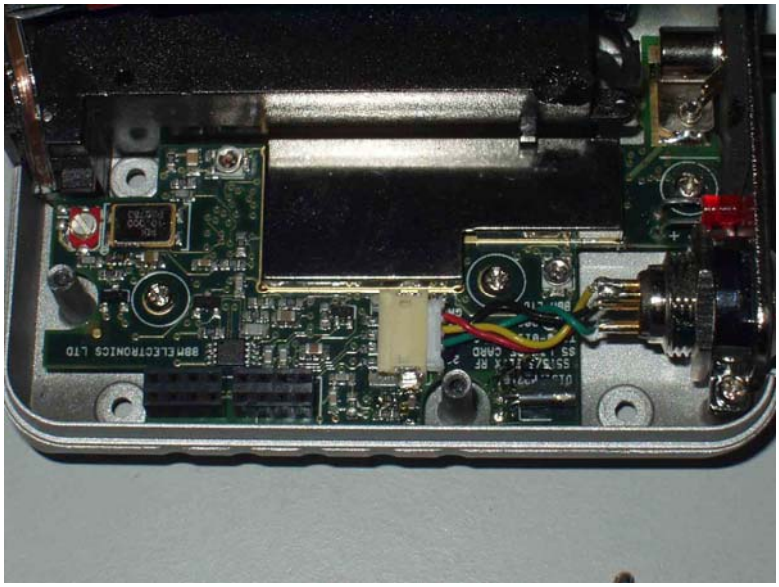
7.2 EUT Reverse Angle

7.3 EUT Antenna Connector Port

7.4 EUT Display / Controls

7.5 EUT Internal Construction



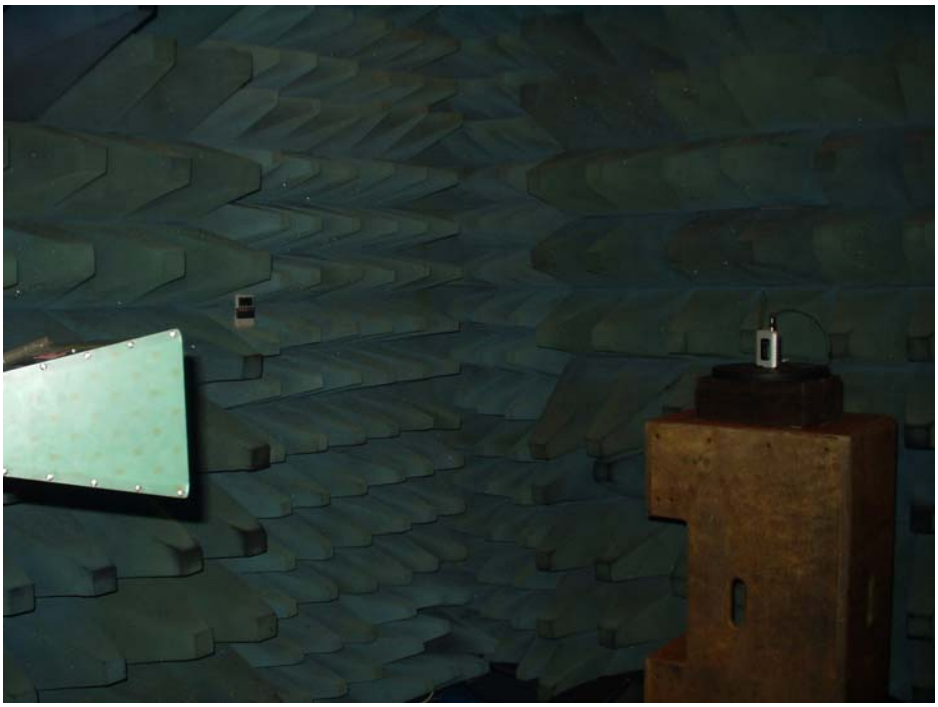


7.6 EUT Identification Label

NOT TAKEN

7.7 EUT Chassis

7.8 Test set-up, spurious emissions



8. Signal Leads

Port Name	Cable Type
Audio Mic input	2 core screened

9. Test Equipment Calibration list

The Following is a list of the test equipment currently in use at ***R.N. Electronics Ltd.*** EMC test facility. In line with our quality procedures, the equipment used will be within calibration for the period during which testing was carried out.

RNNo	Model	Description	Manufacturer	Date Calibrated	Period
E1	HP8542E	EMI Receiver & RF Filter	Hewlett Packard	31-Oct-06	12
E136	3105	Horn Antenna	EMCO	N/A	N/A
E227	6632A	System DC Power Supply	Hewlett Packard	13-Oct-06	12
E238	FC5343A	2.7 - 5.0 GHz BPF	IFR	N/A	N/A
E239	H-34-2720-01	2.0 - 2.9 GHz BPF	Marconi	N/A	N/A
E250	6806.19.A	6dB Attenuator	Hewlett Packard	03-Oct-07	12
E252	6810.19.A	10 dB Attenuator	Suhner	03-Oct-07	12
E253	6810.19.A	10 dB Attenuator	Suhner	03-Oct-07	12
E266	2032	5.4GHz Signal Generator	Marconi Instruments	14-Feb-06	24
E268	BHA 9118	1-18 GHz Horn Antenna	Schaffner	26-May-06	60
E285	8546A	EMI Receiver	Hewlett Packard	07-Sep-07	12
E285	8546A	EMI Receiver	Hewlett Packard	07-Sep-07	12
E290	6914	Power Sensor	Marconi Instruments	08-Nov-06	24
E291	6960A	RF Power Meter	Marconi Instruments	08-Nov-06	24
E3	HP8593E	Spectrum Analyser	Hewlett Packard	20-Sep-06	24
E320	8430A	Bandpass Filter 800 MHz - 2.0 GHz	HP	N/A	N/A
E327	CBL6141A	Bi-log Antenna	Schaffner	22-Oct-07	24
N438	3513 172 1208	3.9 - 7.5 GHz BPF	MEL	N/A	N/A
TMS38	VMT04/140	Environmental Oven	Heraeus Votsch	N/A	N/A
TMS49	8901B	Modulation Analyser	Hewlett Packard	24-Mar-06	24
TMS55	8903B	Audio Analyser	Hewlett Packard	07-Nov-06	24
TMS57	2534	Digital Multimeter	Philips	14-Dec-05	24
TMS6-2	MS2602A	Spectrum Analyser	Anritsu	17-Mar-07	12
TMS73	0.083333333	Off Air Standard	Quartzlock	N/A	N/A
TMS77	8673B	Synthesised Signal Generator	Hewlett Packard	14-Nov-05	24
TMS80	206-3722	Digital Thermometer & K Probe	RS Components Ltd	12-May-07	12
TMS814	MP627A	Doublet Antenna 200-1700 MHz	Anritsu Electric Co Ltd	08-Feb-05	36
TMS82	8449B	Pre Amplifier 1 - 26 GHz	Agilent	26-Oct-07	12
TMS933	CBL6141A	Bilog Antenna 30MHz - 2GHz	York EMC	10-Sep-07	36

10. Auxiliary Equipment

10.1 Supplied by BBM Electronics

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

NONE.

10.2 Supplied by RN Electronics Limited

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

NONE.

11. Modifications

In order for the EUT to produce the results shown within this report the following modifications, if any, were implemented.

NONE.

RN Electronics
EMC & RADIO TEST SERVICES

Certificate of Test

The equipment noted below has been tested by ***R.N. Electronics Limited*** and conforms with the relevant subpart of chapter 47 of the Code of Federal Regulations tested per 47CFR2 subpart J.

This certificate relates to the equipment, as identified by unique serial number(s) and further detailed in the referenced report, in the condition(s) at the time it was tested. It does not relate to any other similar equipment and performance of the product before or after the test cannot be guaranteed. Furthermore, this is a certificate of test only and should not be confused with an equipment authorisation.

Equipment:	Trantec S5 series beltpack transmitter S5.5LTX
FCC ID (if applicable):	F3SS5LX
Manufacturer:	BBM Electronics Group Ltd
Customer Purchase Order Number:	SB5 Series
R.N. Electronics Limited Report Number:	10-215A/3479/1/07
Test Standards:	47CFR Part 2, Subpart J: Oct 2007 ↳47CFR Part 74, Subpart H: Oct 2007 Class TBT Intentional radiator
Date:	12th-17th October 2007

The measurement uncertainty gives a 95% confidence that the equipment meets the limits specified in the standards

For and on behalf of
R.N. Electronics Limited

Signature: Paul Darragh

Digitally signed by Paul Darragh
DN: CN = Paul Darragh, C = GB, OU = RN Electronics
Date: 2008.01.08 13:10:43 Z

Technical Manager

RN Electronics Ltd www.RNelectronics.com
Arnolds Court, Arnolds Farm Lane, Mountnessing, Brentwood, Essex CM13 1UT
Tel: +44 1277 352219 E-mail: sales@RNelectronics.com Fax: +44 1277 352968