FCC 47CFR part 15C
Test Report
For
EPOP900

Reference Standard: FCC 47CFR part 15C
Manufacturer: ZBD Displays Ltd
For type of equipment and serial number, refer to section 3
Report Number: 05-475/4696/3/11
Report Produced by: -

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1. Contents

2. Summary of Test Results

The EPOP900 was tested to the following standards: -

FCC 47CFR Part 15C (effective date October 1st, 2010); Class DXT Intentional Radiator

Any compliance statements are made reliant on the modes of operation as instructed to us by the Manufacturer based on their specific knowledge of the application and functionality of the equipment tested. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of equipment not meeting the intentions of the standard, particularly under different conditions to those during testing.

Title	Reference	Results
1. Conducted Emissions	FCC Part 15C §15.207	NOT APPLICABLE[2]
2. Radiated Emissions	FCC Part 15C §15.205, §15.209 & §15.249	PASSED
3. Modulation Bandwidth	FCC Part 15C §15.215(c), §15.249	PASSED
4. Intentional Radiator Field Strength	FCC Part 15C §15.249	PASSED
5. Frequency Tolerance	FCC Part 15C §15.225, §15.229, §15.233, §15.249(b)	NOT APPLICABLE[1]
6. Duty Cycle	FCC Part 15C §15.231, §15.240	NOT APPLICABLE[1]
7. Power Spectral Density	FCC Part 15C §15.247	NOT APPLICABLE[1]

[1] No specification requirement for this type of equipment.
[2] EUT is a battery powered product.

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.

Date of Test: 3rd & 4th May 2011

Test Engineer: Digitally signed by: Daniel Sims DN: CN = Daniel Sims C = GB O = RN Electronics Date: 2011.05.25 15:33:34 Z

Approved By:

Customer Representative:

3. Equipment Under Test (EUT)

3.1 Equipment Specification

Applicant	ZBD Displays Ltd Longford Business Centre Orchard Lea Winkfield Lane Windsor SL4 4RU
Manufacturer of EUT	ZBD Displays Ltd
Brand name of EUT	ZBD Displays Ltd
Model Number of EUT	EPOP900
Serial Number of EUT	GA00000024B
Date when equipment was received by RN Electronics	3rd May 2011
Date of test:	3rd & 4th May 2011
Customer order number:	5816
Visual description of EUT:	Flat plastic enclosure with an LCD covering one side. On the rear is a battery compartment.
Main function of the EUT:	An electronic shelf edge label.
Height	120 mm
Width	155 mm
Depth	25 mm
Weight	0.2 g
Voltage	4.5V DC (3 off AA 1.5V batteries)
Current required from above voltage source	0.035 mA

3.2 EUT Configurations for testing

Frequency range	902.5 – 927.5 MHz
Normal use position	Shelf edge
Normal test signals	GFSK
Declared Power Level	+10dBm
Declared Channel Bandwidth	Wideband
Highest Frequencies generated/used	927.5MHz

3.3 EUT Modes

Mode	Description of mode	Used for Testing
Unmodulated carrier TX 902.5MHz	constant CW transmission	YES
Unmodulated carrier TX 915MHz	constant CW transmission	YES
Unmodulated carrier TX 927.5MHz	constant CW transmission	YES
Standby /RX mode 902.5MHz	Receive mode	YES
Standby /RX mode 915MHz	Receive mode	YES
Standby /RX mode 927.5MHz	Receive mode	YES
Constant Transmit data 902.5MHz	constant system modulated transmission	YES
Constant Transmit data 915MHz	constant system modulated transmission	YES
Constant Transmit data 927.5MHz	constant system modulated transmission	YES

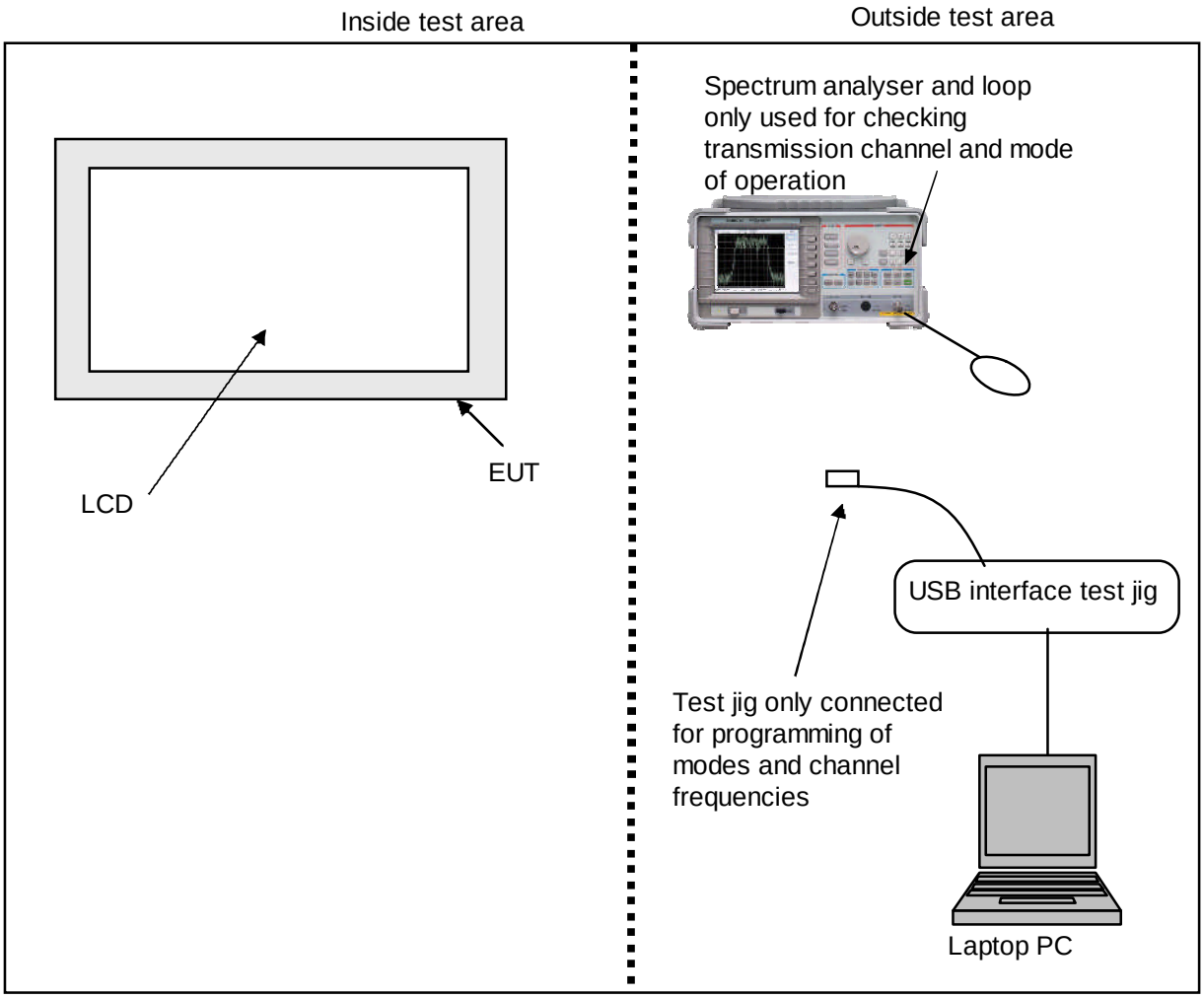
Other channels between the frequencies selected above were available each at 500 kHz channel spacing, however only the top, middle & bottom channels (covering the entire range) were selected for tests.

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

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

This report was printed on: 25 May 2011

3.4 Emissions Configuration



New batteries were fitted into the unit before tests began and monitored to ensure supply parameters were maintained.

*The unit was only connected to the test jig and laptop for programming of channels and modes, and once programmed the EUT was disconnected from the programming jig and placed back into the test area.

The spectrum analyser was only used to ensure the correct operating channel and modes of operation were programmed by detecting the RF carrier signal. Power level settings for tests were as described in section 3.3.

Bottom, middle & top channels were selected for tests were appropriate in combination with the above mentioned modes. These were:-

Bottom = 902.5 MHz
Middle = 915.0 MHz
Top = 927.5 MHz

The EUT had no ports of any kind available to the end user.

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, FCC Part 15 and those specifications incorporated by reference into 47CFR15 (e.g. ANSI C63.4-2003).

R.N. Electronics Ltd sites M and OATS are listed with the FCC. Registration Number 293246

4.1 Deviations

None.

4.2 Test Fixture/ Antenna configuration

☐ 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 integral Antenna was used for testing.

4.3 Measurement Uncertainties

Parameter	Uncertainty
Transmitter Tests	
Bandwidth	<± 1.9 %
Radiated RF Power	<± 3.5 dB
Radiated Spurious Emissions	<± 3.4 dB
H-Field Emissions	<± 2.8 dB
Spectrum Mask	<± 4.1 dB
Receiver Tests	
Radiated Spurious Emissions	<± 3.4 dB

5. Tests, Methods and Results
5.1 Conducted Emissions

Test not applicable, EUT is battery powered only.

5.2 Radiated Emissions

5.2.1 Test Methods

Test Requirements	FCC Part 15C, Reference (15.209)
Test Method:	ANSI C63.4, Reference (8.)

5.2.1.1 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The EUT was rotated in all three orthogonal planes. Radiated Emissions testing was performed with a new battery.

5.2.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Below 30MHz, measurements were made in a semi-anechoic chamber (pre-scan) with final measurements on an OATS without a ground plane. The antenna was placed 1m above the ground. The equipment and the antenna were rotated 360° to record the worst case emissions.

30MHz - 1GHz, measurements were made on a site listed with the FCC. The equipment was rotated 360° and the antenna scanned 1 – 4 metres in both horizontal and vertical polarisations to record the worst case emissions.

Above 1GHz, measurements were made in a semi-anechoic chamber with appropriate absorbing material for use in this range. The antenna was placed 1m above the ground in line with the EUT, which was rotated through 360° to record the worst case emissions.

At least 6 signals within 20dB and all signals within 10dB of the limit were investigated.

5.2.2 Test results

Tests were performed using Test Site M**.**

Test Environment: M

Temperature: 16-18°C Humidity: 38-40%

Analyser plots for the Quasi-Peak / Average values as applicable and any table of signals within 20dB of the limit line can be found in Section 6.2 of this report. Band Edge Compliance plots can be found in section 6.6 of this report.

These show that the **EUT** has **PASSED** this test.

5.2.2.1 Test Equipment used

E410, E411, E412, TMS933E268, E342, E429, TMS82

See Section 10 for more details

5.3 Intentional Radiator Field Strength

5.3.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.249)

Test Method: FCC Part 15C, Reference (15.249)

5.3.1.1 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The antenna was scanned 1-4m in height in both Horizontal and Vertical polarisations. The EUT was rotated in all three orthogonal planes.

5.3.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Measurements were made in a semi-anechoic chamber.

The equipment was rotated 360° to record the maximised emission.

5.3.2 Test results

Test Environment: Temperature: 16°C Humidity: 39%

Any Analyser plots can be found in Section 6.3 of this report.

Channel	Duty cycle adjustment (dB)	Total (dBuV/M @3m)	Result (mW)
Bottom	N/A	90.9	0.369
Middle	N/A	90.6	0.344
Top	N/A	90.8	0.360

Limits: 94dBuV/M @ 3metres.

The maximised field strength measured was 90.9dBuV/m @ 3metres, measured on the bottom channel with a horizontal measuring antenna with the EUT in a flat horizontal plane.

These results show that the EUT has **PASSED** this test.

5.3.2.1 Test Equipment used

E410, E411, E412, TMS933

See Section 10 for more details

5.45.4 Frequency Tolerance

Test not applicable. No requirement for this type of device and frequency range.

5.5 Duty Cycle

Test not applicable. No requirement for this type of device and frequency range.

5.6 Maximum Spectral Power Density

Test not applicable. No requirement for this type of device and frequency range.

5.7 20dB Bandwidth

5.7.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.215)

Test Method: FCC Part 15C, Reference (15.215)

5.7.1.1 Configuration of EUT

The EUT was tested on a bench within a test fixture and referenced to the Intentional radiator field strengths as listed within this report.

5.7.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

5.7.2 Test results

Tests were performed using Test Site **B**.

Temperature of test Environment: 16°C

Analyser plots for the 20dB bandwidth can be found in Section 6.5 of this report.

Channel	Result	Plot reference
Bottom	78 kHz	J4696-3, Bottom channel 20dB BW (repeated transmit packet bursts)
Middle	78 kHz	J4696-3, Centre channel 20dB BW (repeated transmit packet bursts)
Top	78 kHz	J4696-3, Top channel 20dB BW (repeated transmit packet bursts)

Limits: Remain within the assigned band (902 – 928 MHz).

These results show that the **EUT** has **PASSED** this test.

5.7.2.1 Test Equipment used

E001

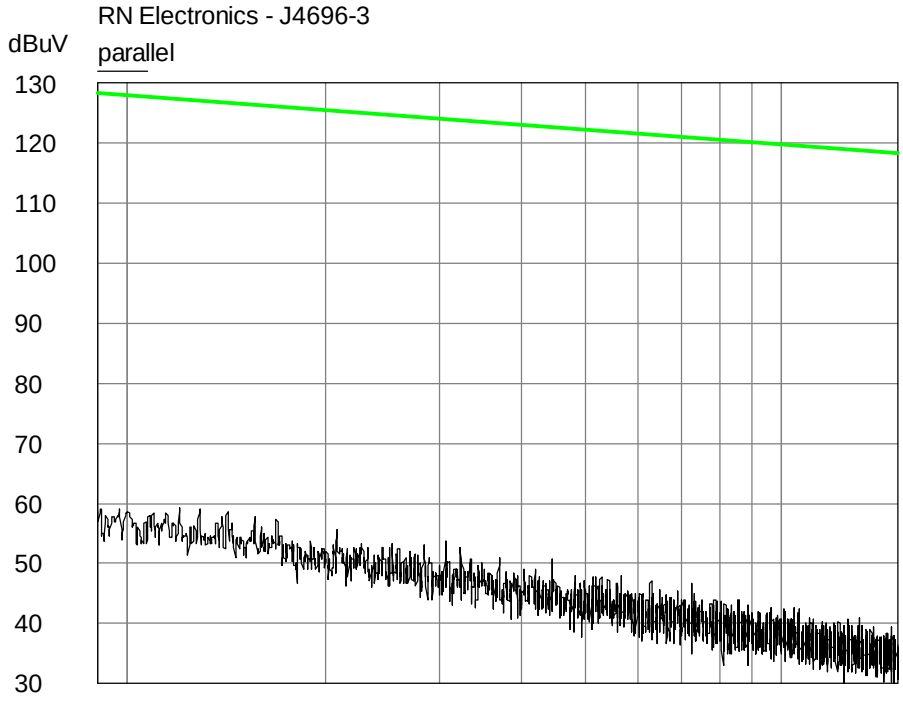
See Section 10 for more details.

6. Plots and Results
6.1 Conducted Emissions

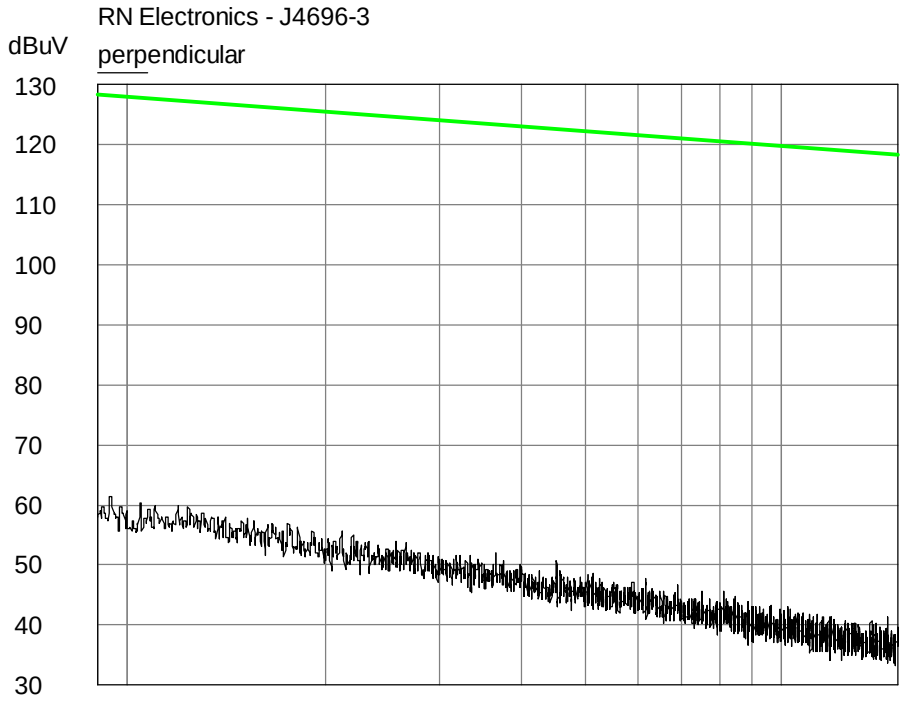
Test not applicable, EUT is battery powered.

6.2 Radiated Emissions

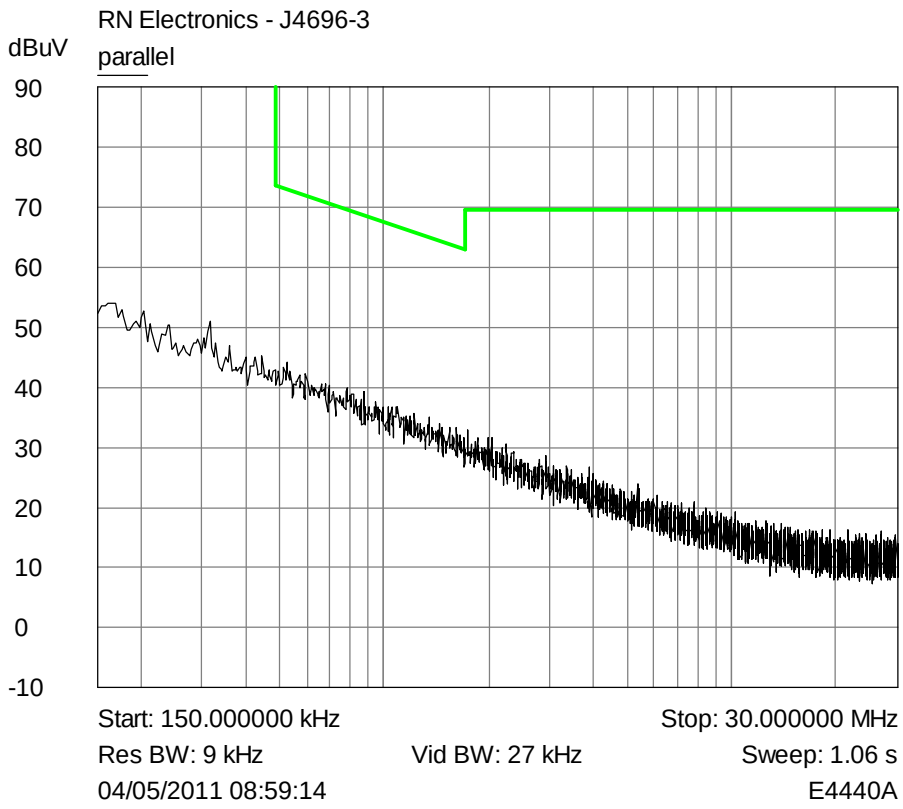
Plots shown are for Middle channel Transmit mode only.



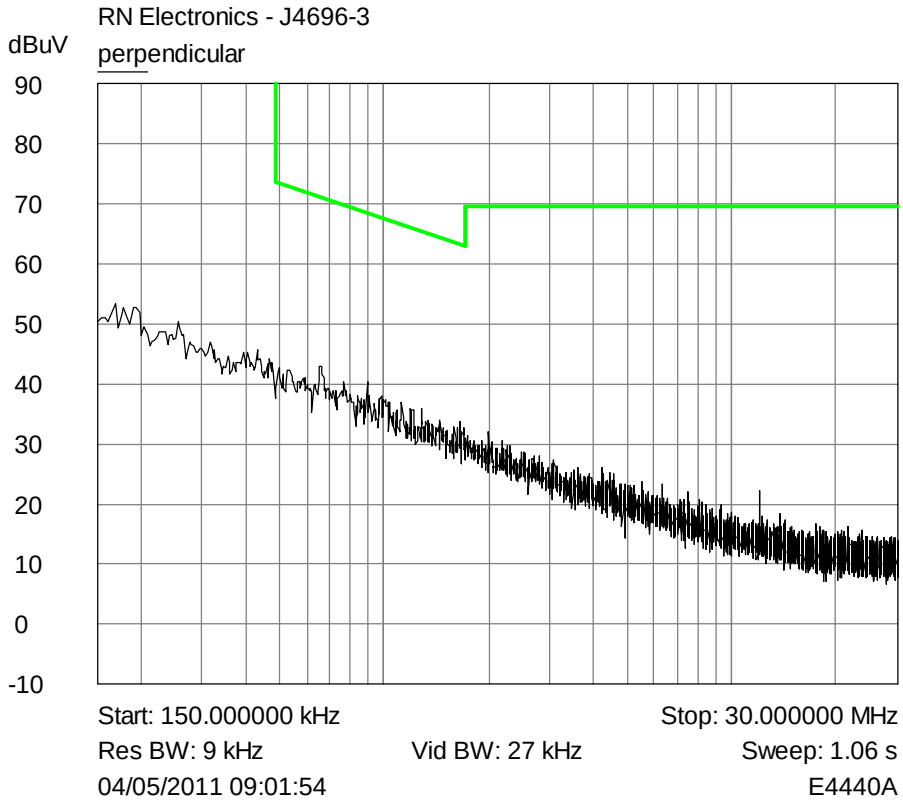
Plot of peak Parallel emissions 9kHz – 150kHz against the quasi-peak limit line.



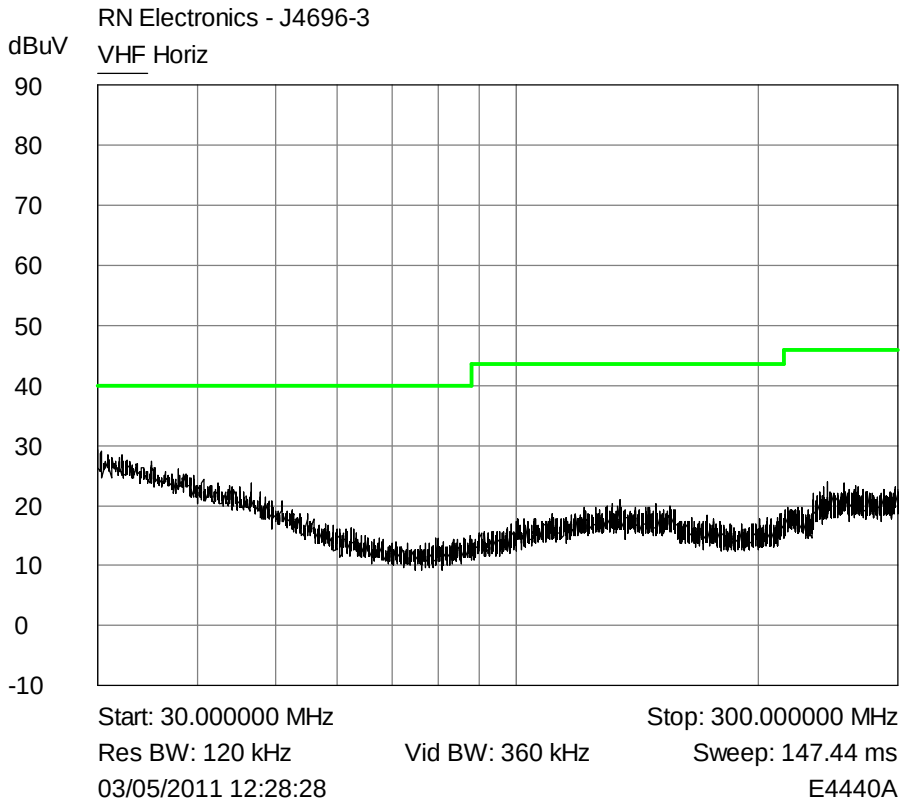
Plot of peak Perpendicular emissions 9kHz – 150kHz against the quasi-peak limit line.



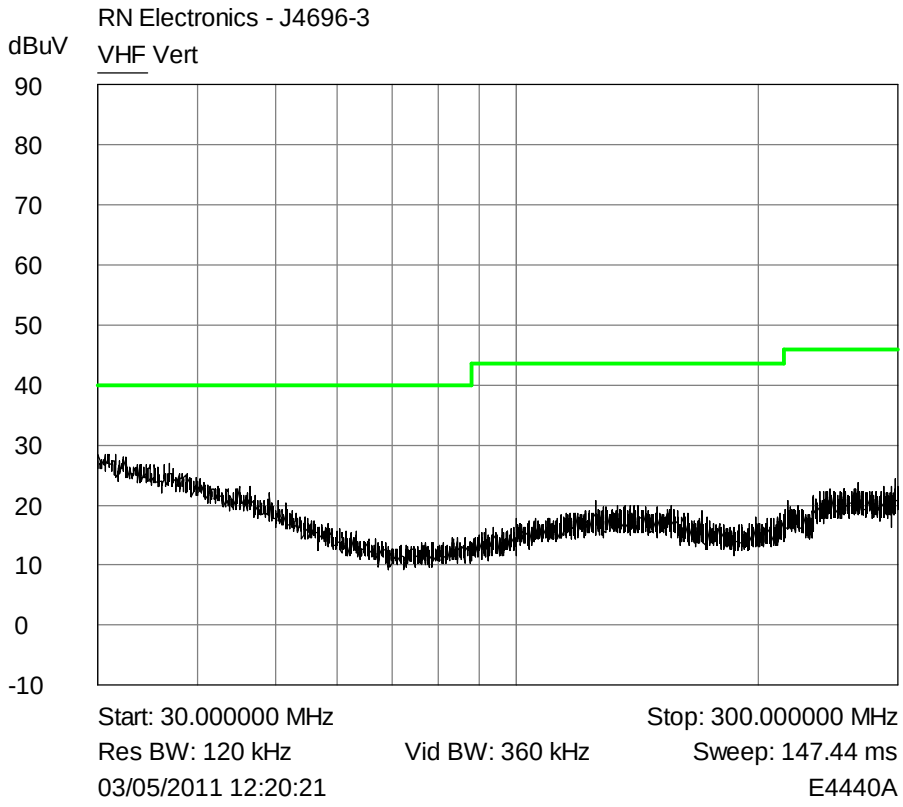
Plot of peak Parallel emissions 150kHz - 30MHz against the quasi-peak limit line.



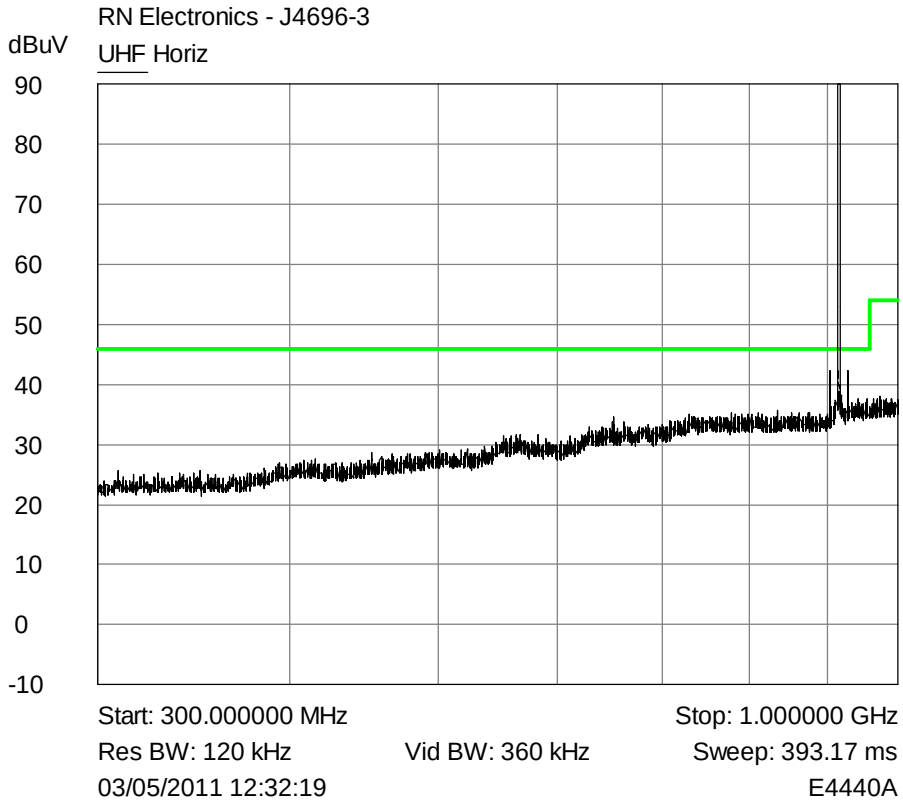
Plot of peak Perpendicular emissions 150kHz - 30MHz against the quasi-peak limit line.



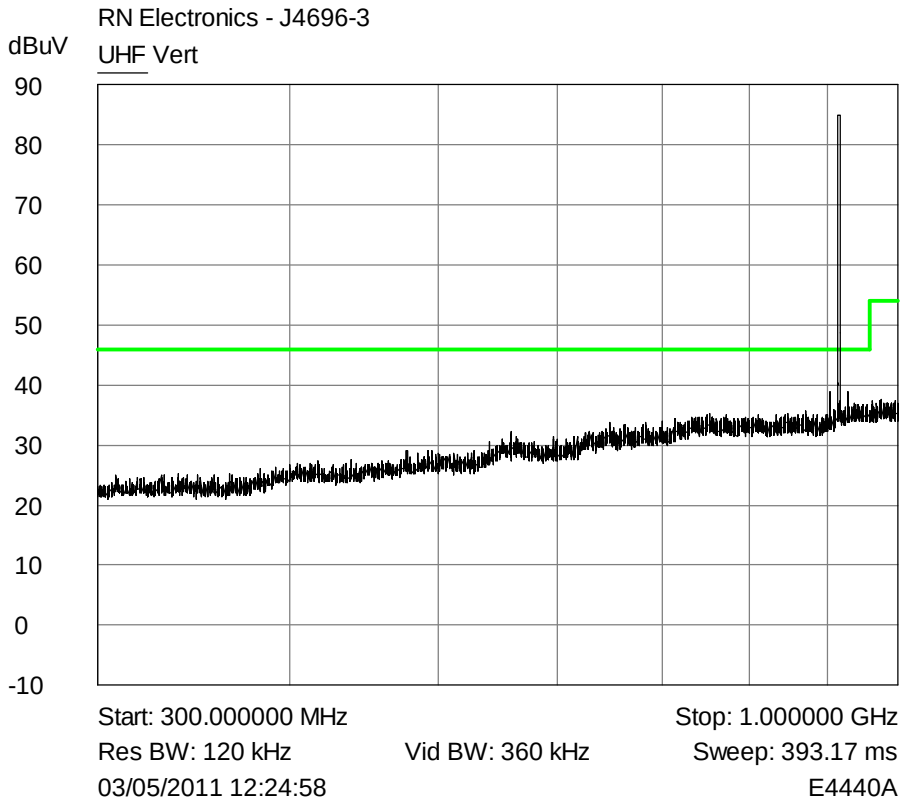
Plot of peak horizontal emissions 30MHz - 300MHz against the quasi-peak limit line.



Plot of peak vertical emissions 30MHz - 300MHz against the quasi-peak limit line.



Plot of peak horizontal emissions 300MHz - 1GHz against the quasi-peak limit line.



Plot of peak vertical emissions 300MHz - 1GHz against the quasi-peak limit line.

Table of signals measured below 1GHz.

Horizontal bottom Channel

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	889.503	43.4	41.7	-4.3
2	915.503	44	42.3	-3.7

Vertical bottom channel

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	889.503	42.8	40.8	-5.2
3	915.503	43.1	41.2	-4.8

Horizontal middle Channel

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	902.003	43.8	41.8	-4.2
3	928.003	43.5	41.3	-4.7

Vertical middle channel

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	902.003	41.5	38.1	-7.9
3	928.003	40.7	37.7	-8.3

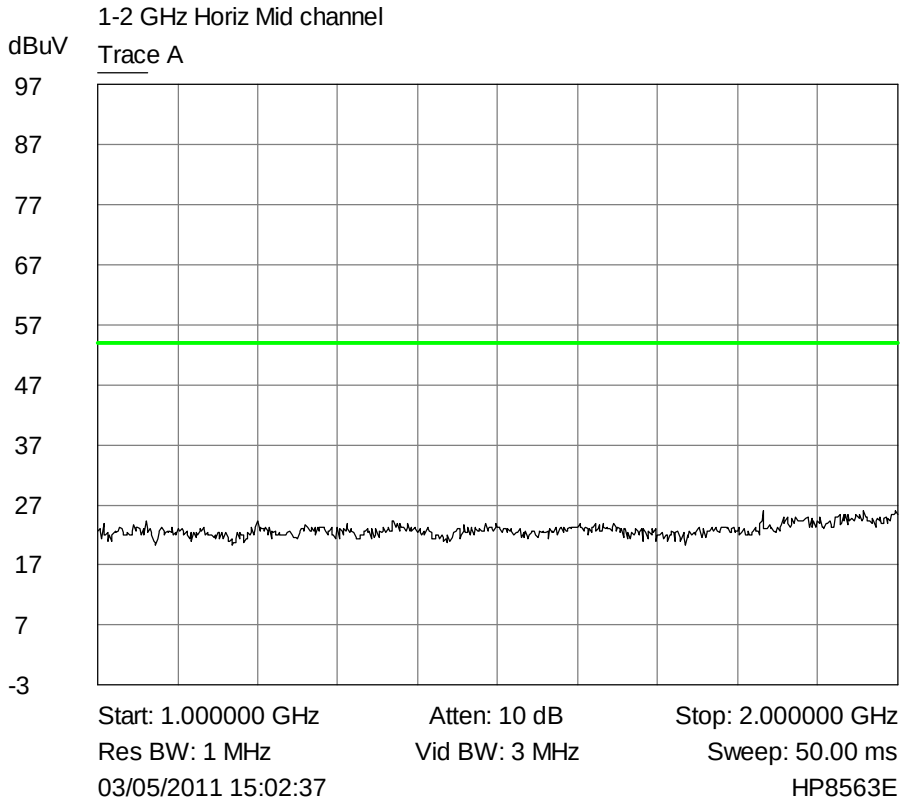
Horizontal Top Channel

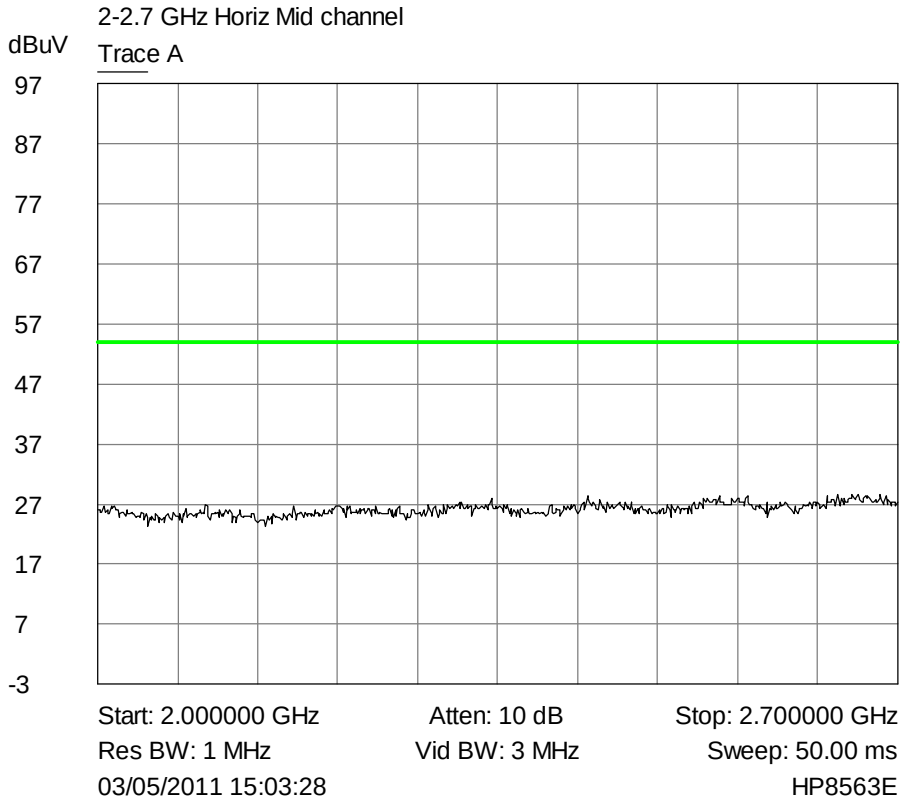
Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	914.503	42.3	39.9	-6.1
3	940.503	43.9	41.6	-4.4

Vertical Top channel

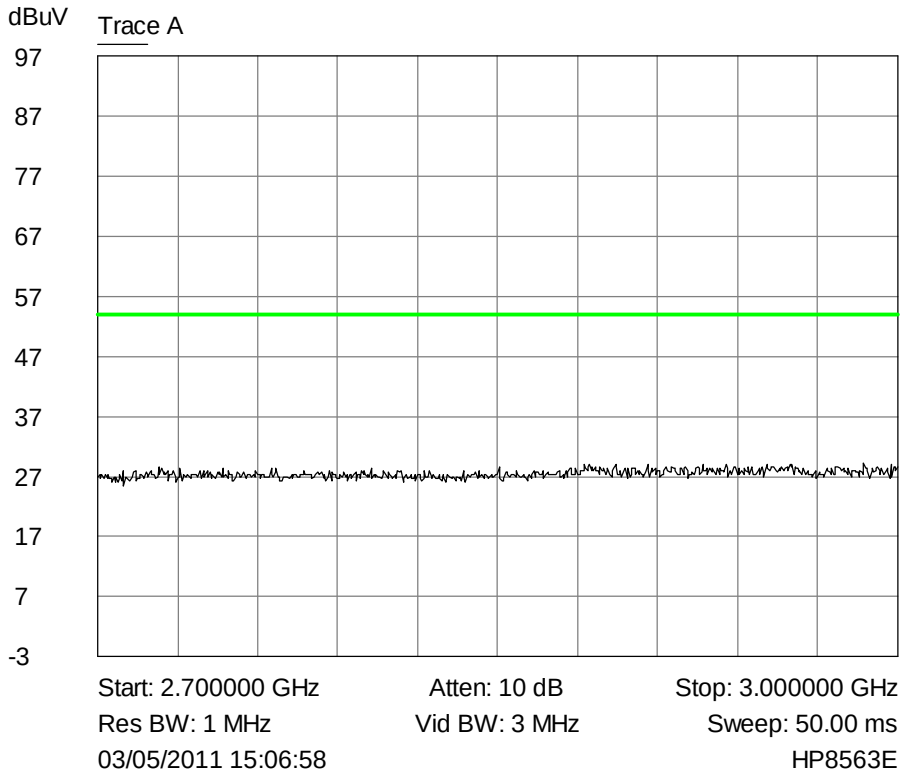
No signals measureable.

Plots of Average horizontal emissions 1GHz - 9.3GHz against the Average limit line.

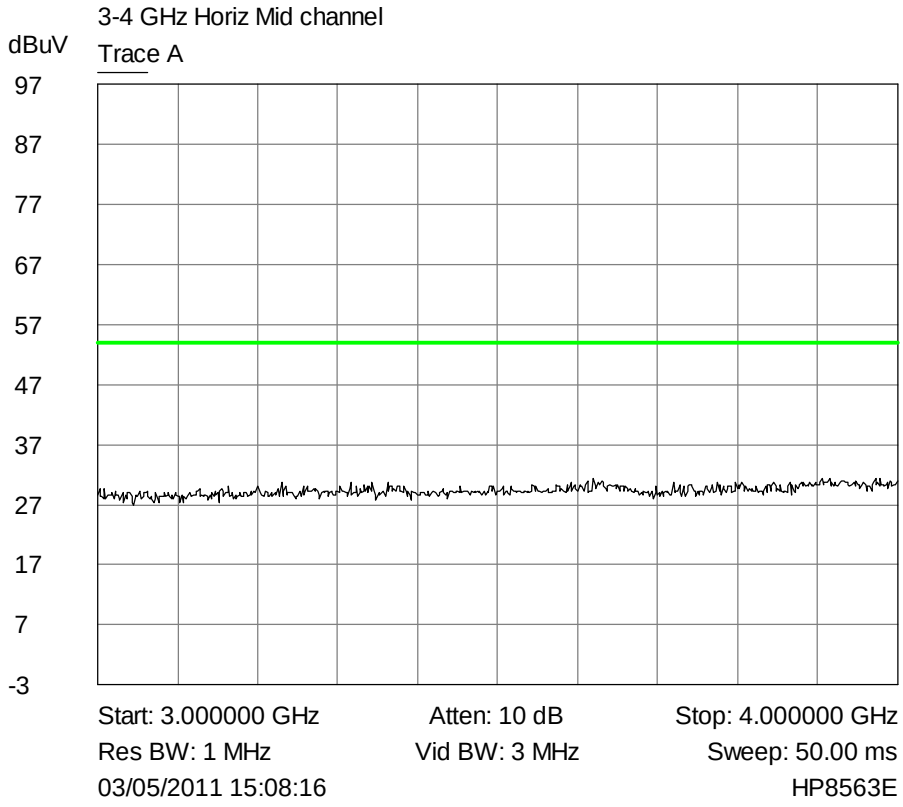




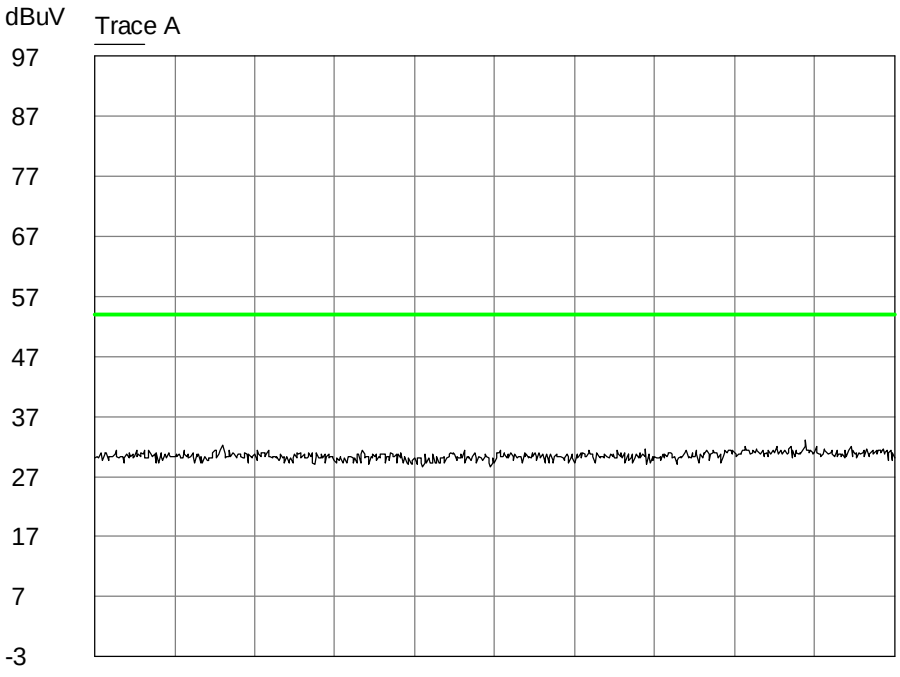
2.7-3 GHz Horiz Mid channel



3-4 GHz Horiz Mid channel

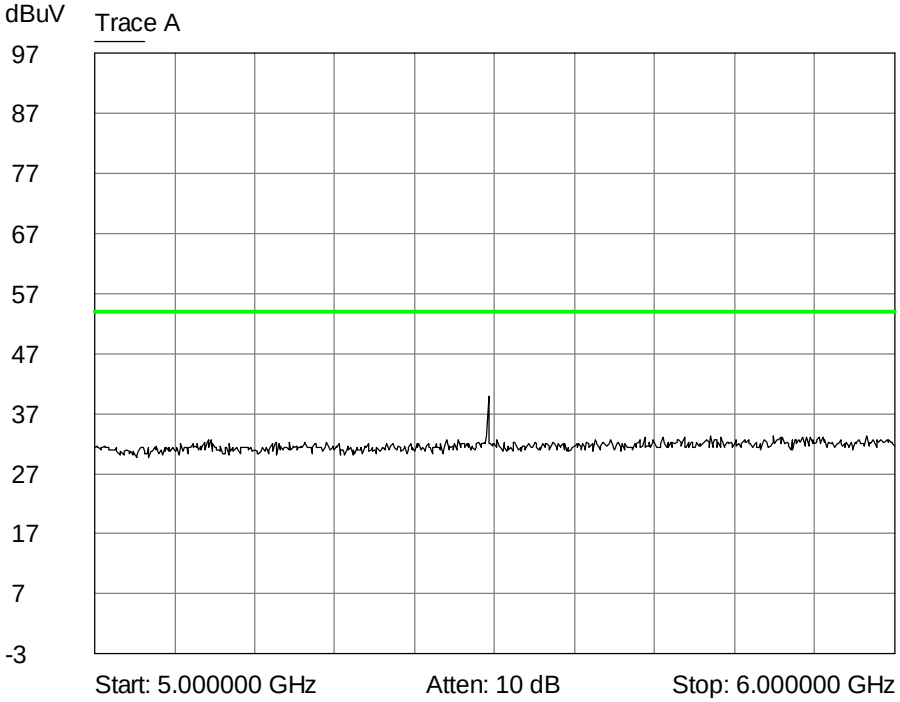


4-5 GHz Horiz Mid channel



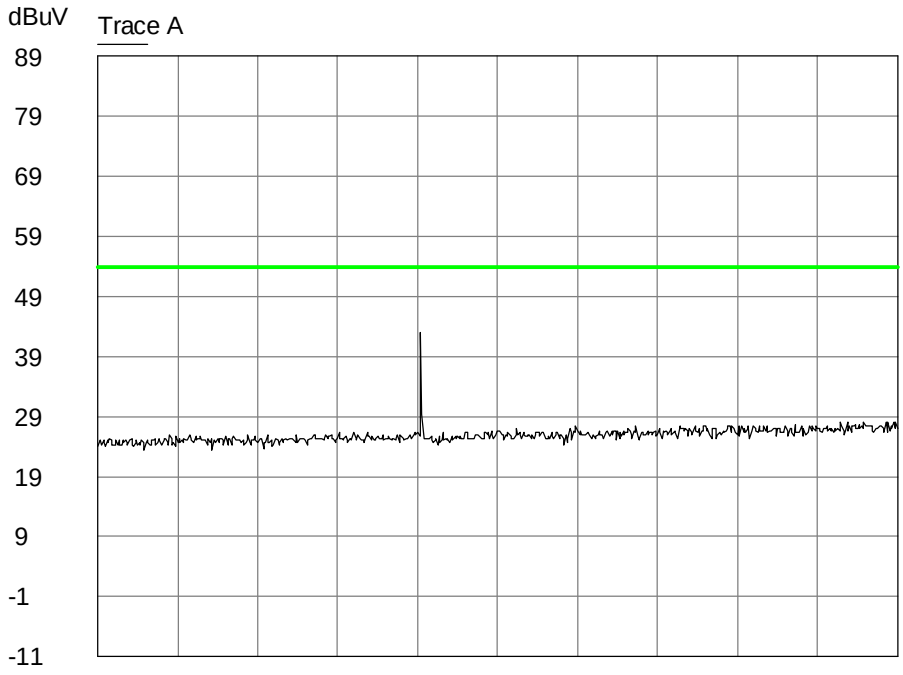
Start: 4.000000 GHz Atten: 10 dB Stop: 5.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 15:10:03 HP8563E

5-6 GHz Horiz Mid channel



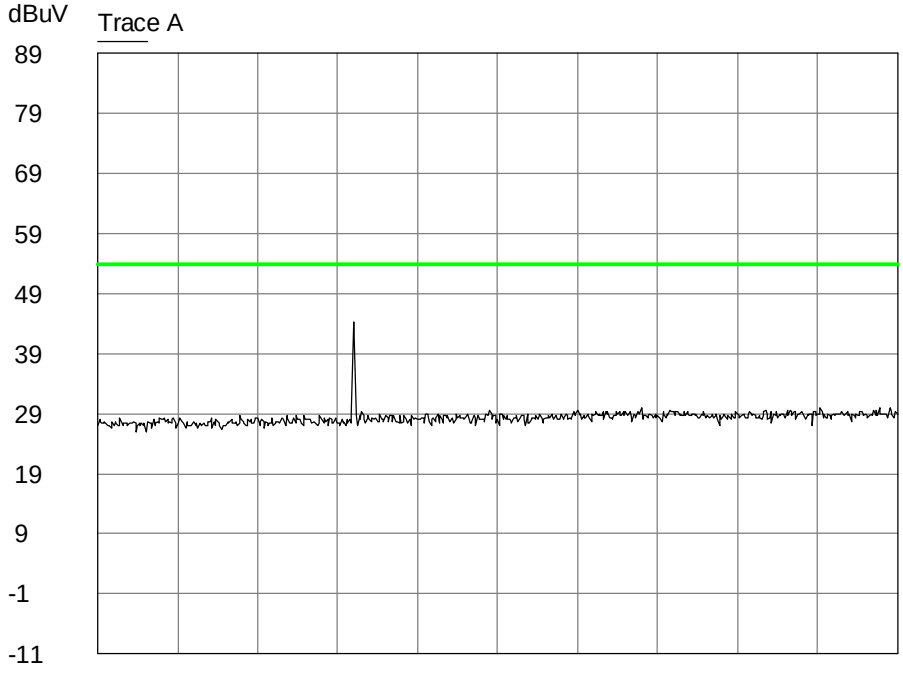
Start: 5.000000 GHz Atten: 10 dB Stop: 6.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 15:16:16 HP8563E

6-7GHz Horiz Mid channel



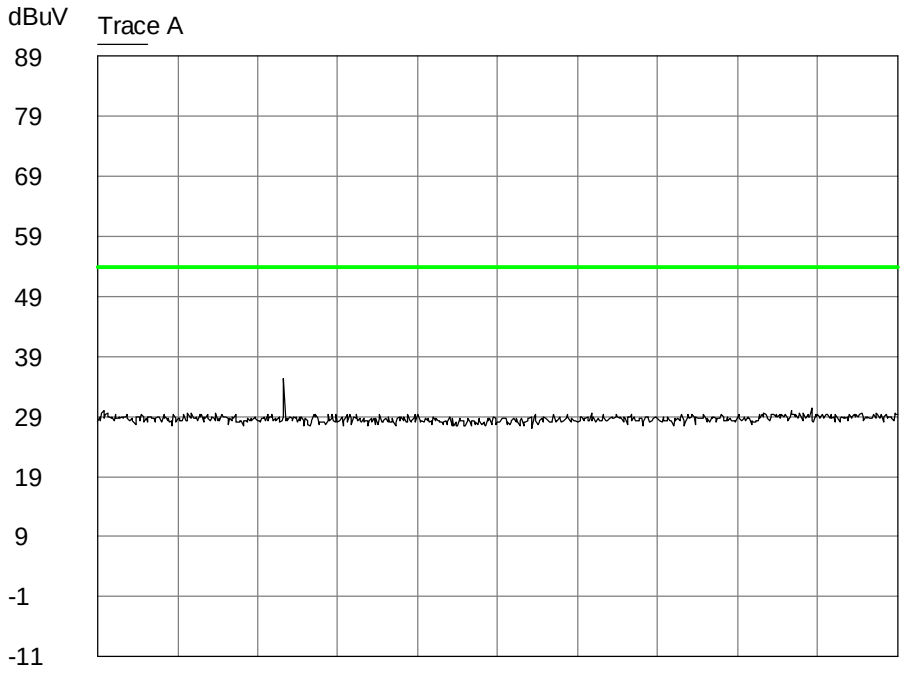
Start: 6.000000 GHz Atten: 10 dB Stop: 7.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:08:42 HP8563E

7-8GHz Horiz Mid channel



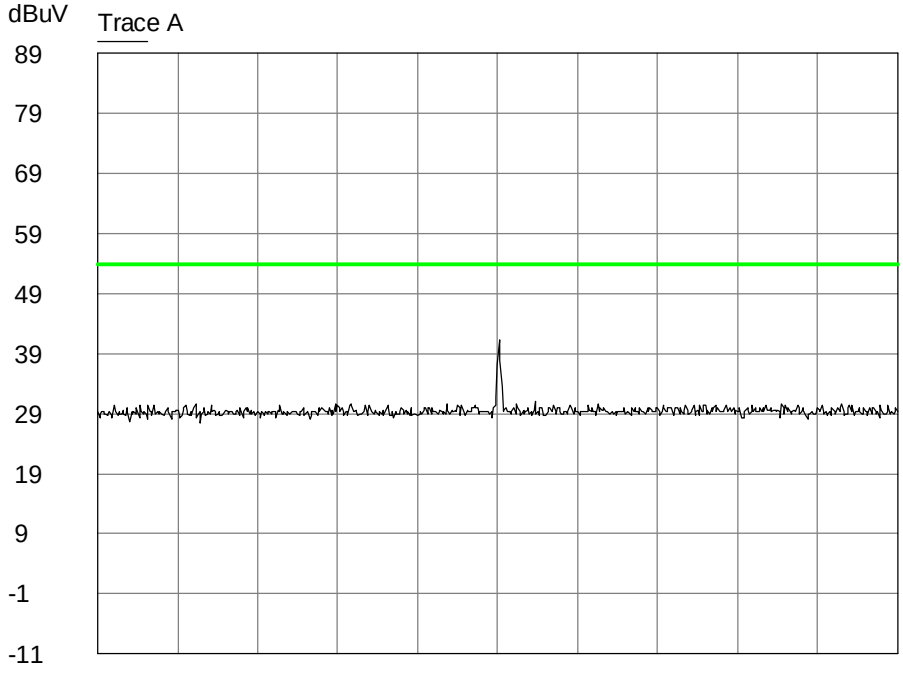
Start: 7.000000 GHz Atten: 10 dB Stop: 8.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:07:13 HP8563E

8-9GHz Horiz Mid channel



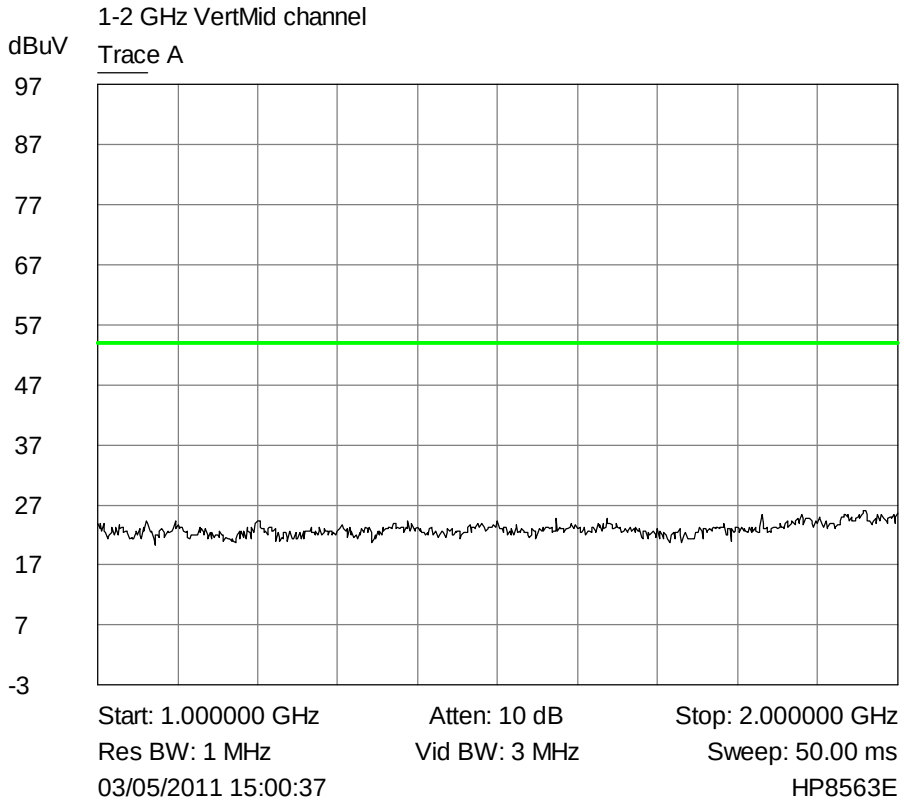
Start: 8.000000 GHz Atten: 10 dB Stop: 9.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:05:52 HP8563E

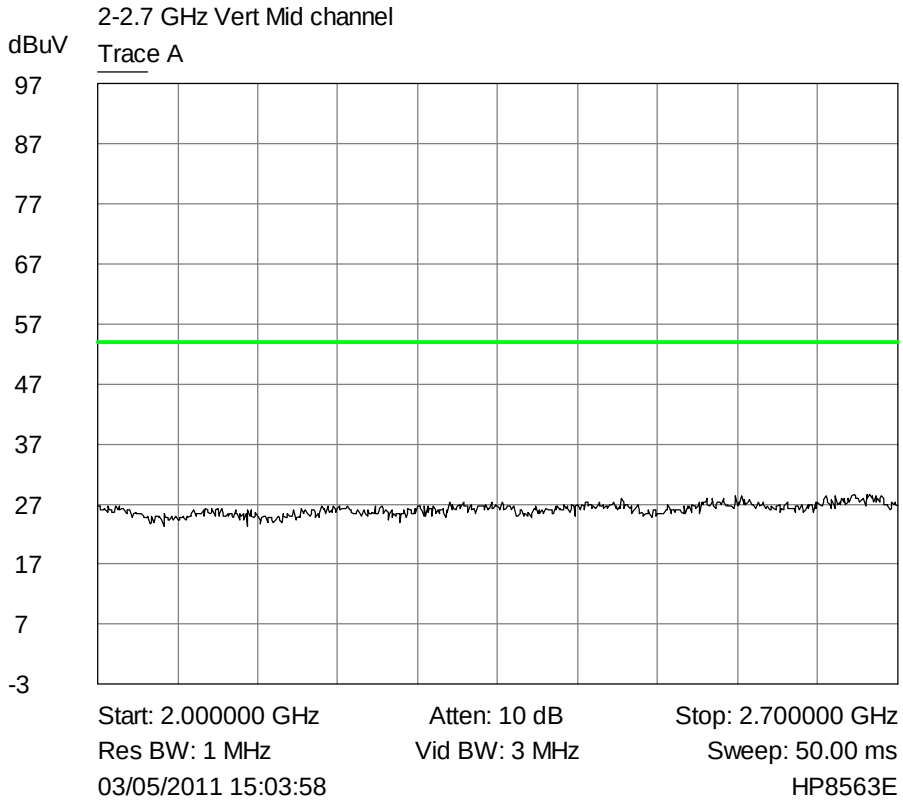
9-9.3GHz Horiz Mid channel



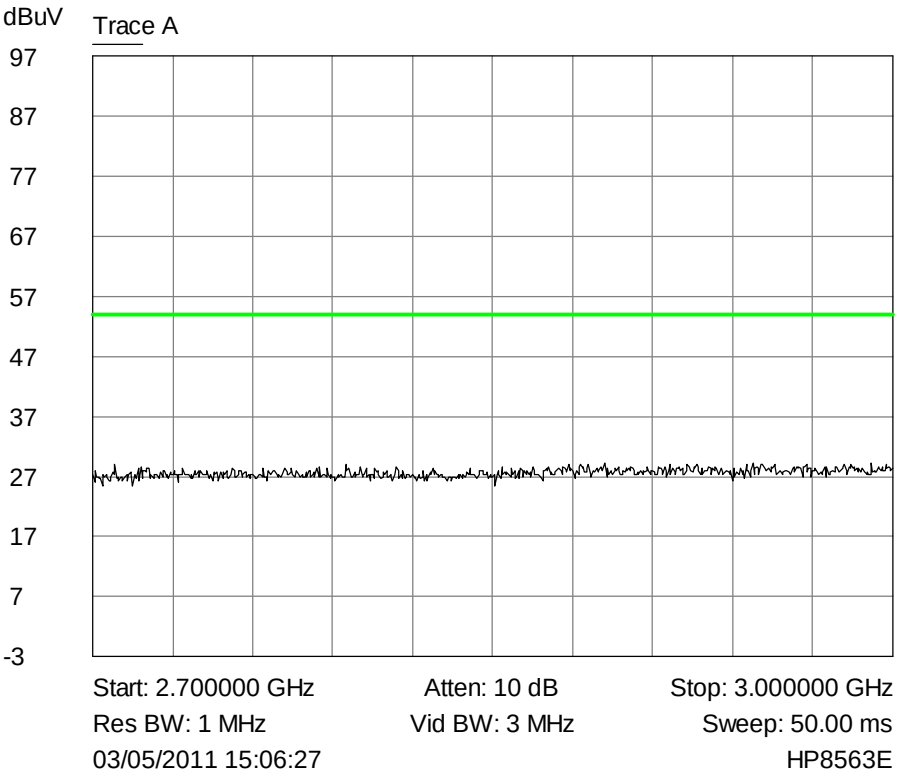
Start: 9.000000 GHz Atten: 10 dB Stop: 9.300000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:04:40 HP8563E

Plot of Average Vertical emissions 1GHz – 9.3GHz against the Average limit line.

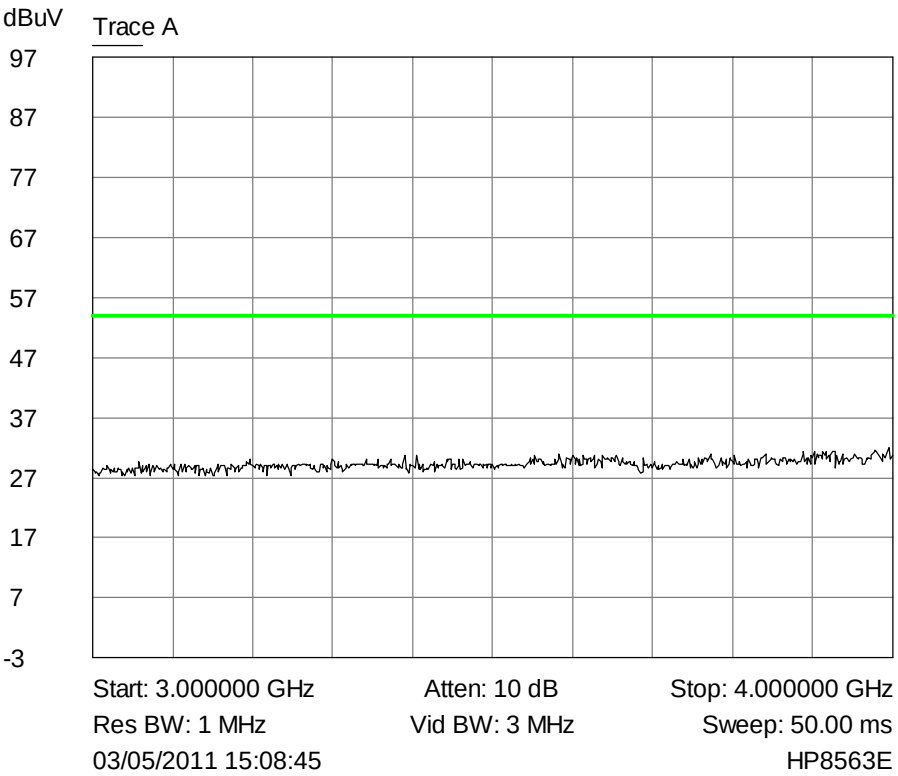




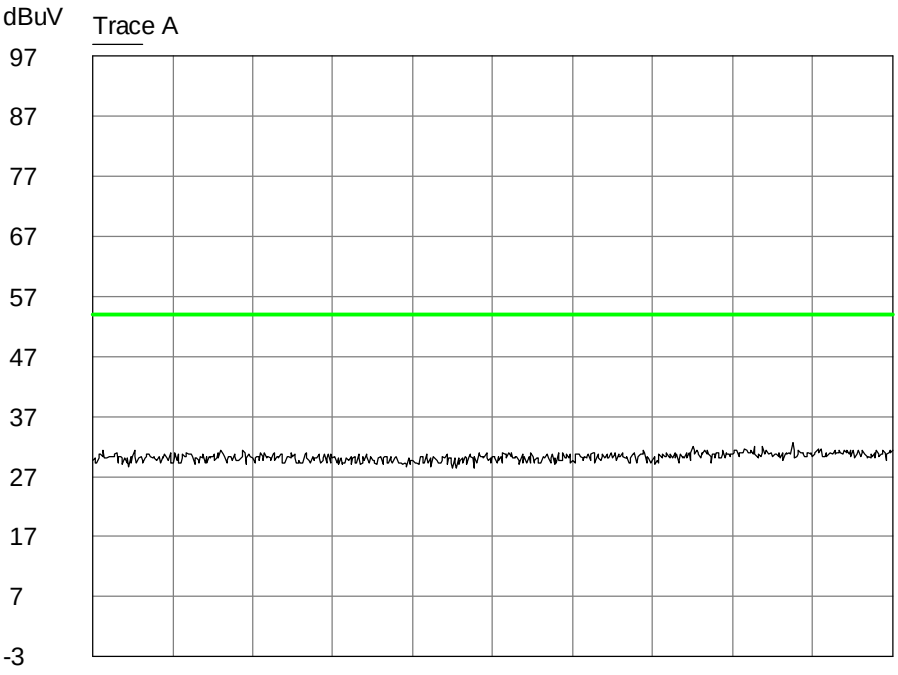
2.7-3 GHz Vert Mid channel



3-4 GHz Vert Mid channel

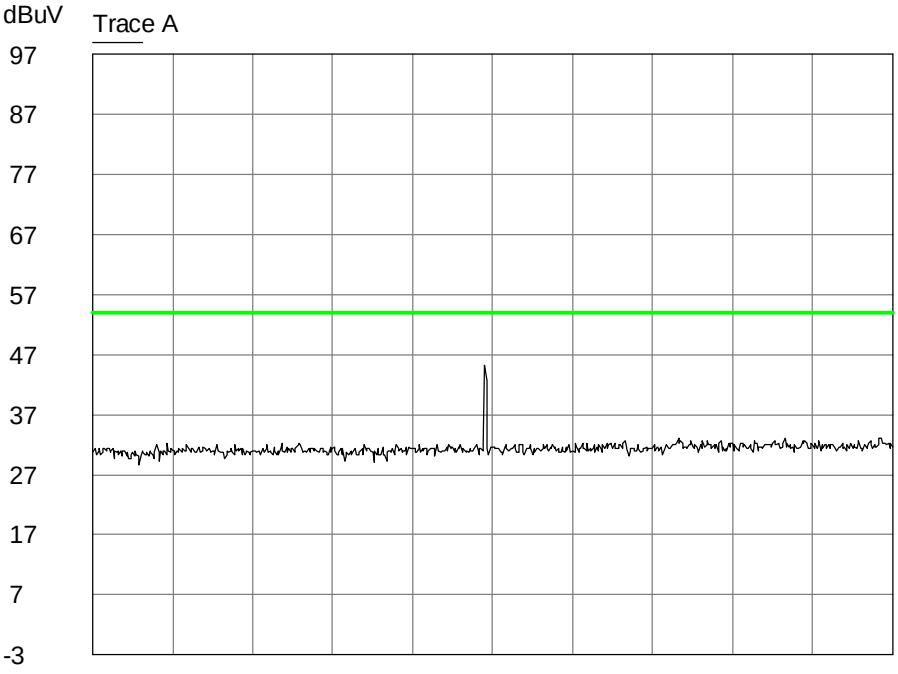


4-5 GHz Vert Mid channel



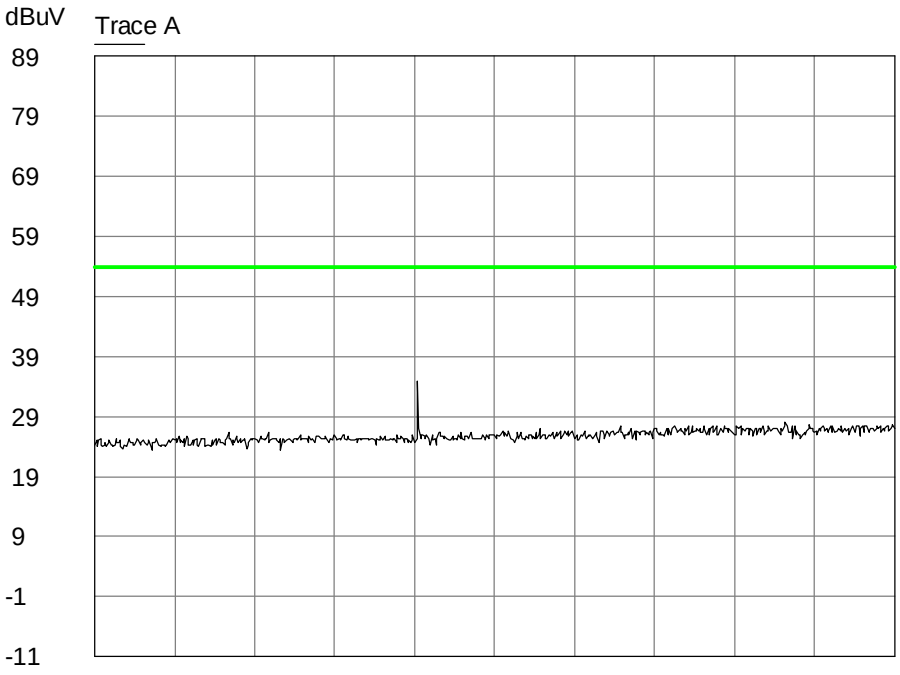
Start: 4.000000 GHz Atten: 10 dB Stop: 5.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 15:09:29 HP8563E

5-6 GHz Vert Mid channel



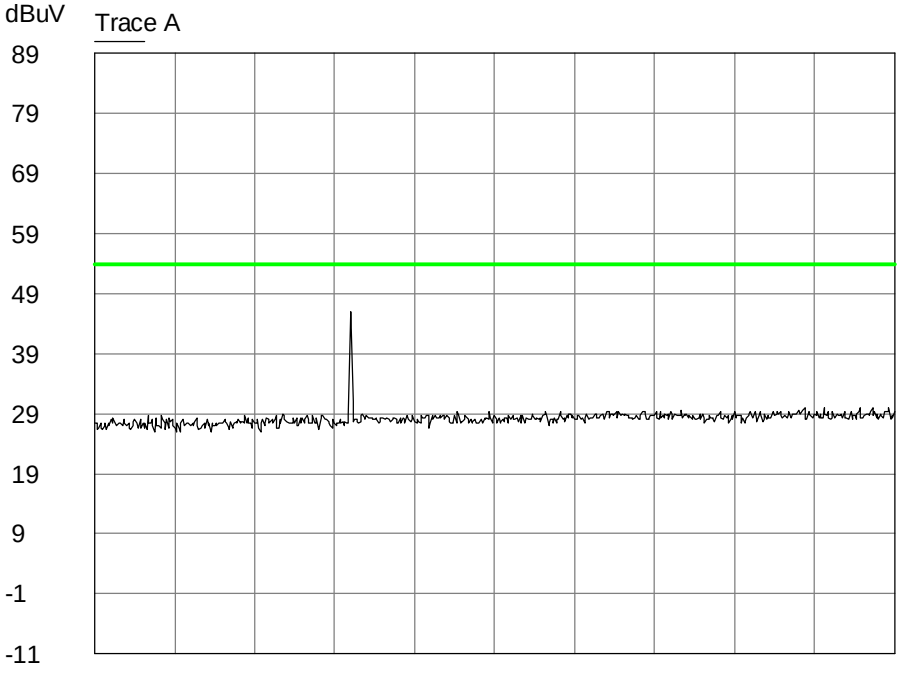
Start: 5.000000 GHz Atten: 10 dB Stop: 6.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 15:14:55 HP8563E

6-7GHz Vert Mid channel



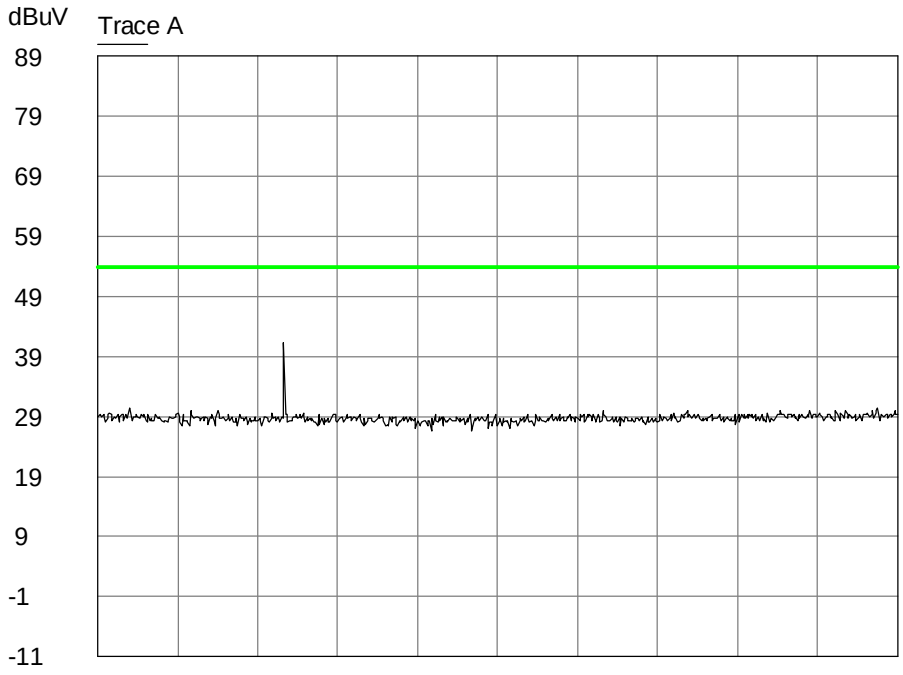
Start: 6.000000 GHz Atten: 10 dB Stop: 7.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 16:53:39 HP8563E

7-8GHz Vert Mid channel



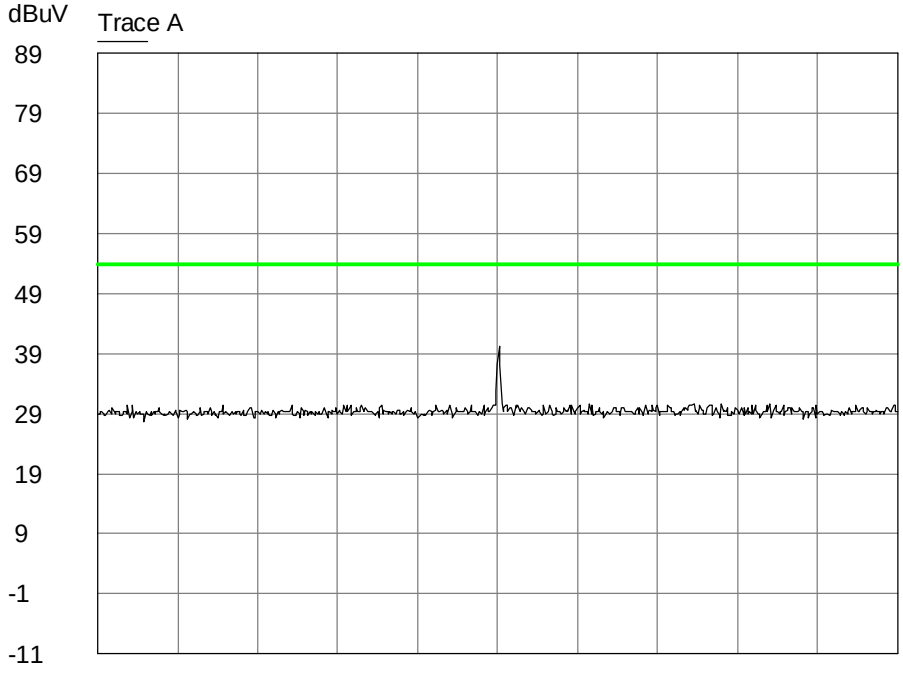
Start: 7.000000 GHz Atten: 10 dB Stop: 8.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 16:59:57 HP8563E

8-9GHz Vert Mid channel



Start: 8.000000 GHz Atten: 10 dB Stop: 9.000000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:01:46 HP8563E

9-9.3GHz Vert Mid channel



Start: 9.000000 GHz Atten: 10 dB Stop: 9.300000 GHz
Res BW: 1 MHz Vid BW: 3 MHz Sweep: 50.00 ms
03/05/2011 17:03:16 HP8563E

Table of signals measured above 1GHz.

Horizontal

Bottom channel

Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
1805	38.5	30.0	-24.0
5415	50.7	46.0	-8.0

Middle channel

Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
5490	48.1	39.0	-15.0
6405	54.8	53.2	-0.8
7320	52.8	51.0	-3.0
8235	50.5	48.0	-6.0
9150	52.9	49.7	-4.3

Top channel

Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
5565	54.0	51.0	-3.0
6492	47.0	40.0	-14.0

Vertical

Bottom channel

Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
1805	39.0	30.0	-24.0
5415	48.0	41.5	-12.5
6317	40.0	36.0	-18.0

Middle channel

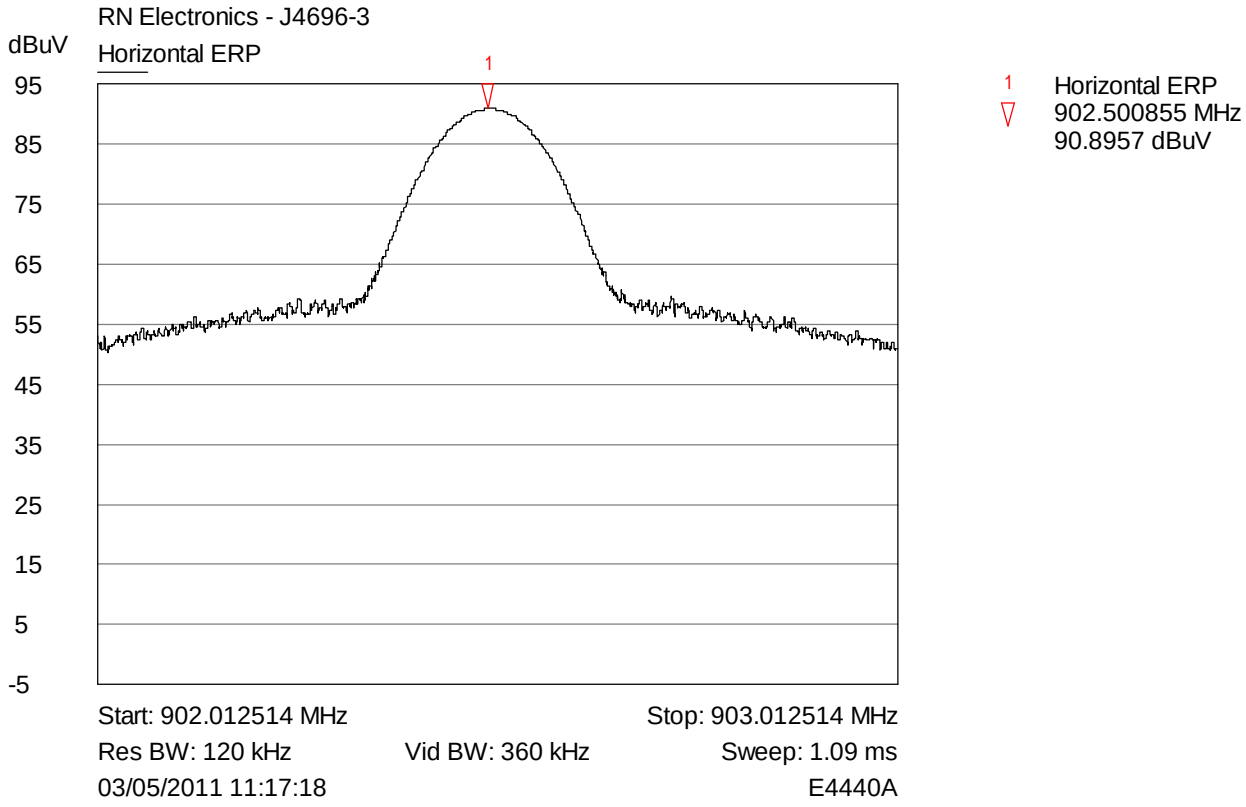
Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
1830	39.0	31.0	-23.0
5490	50.0	44.5	-9.5
6405	42.5	40.0	-14.0
7320	54.5	50.0	-4.0
8235	43.8	40.0	-14.0
9150	51.0	47.5	-6.5

Top channel

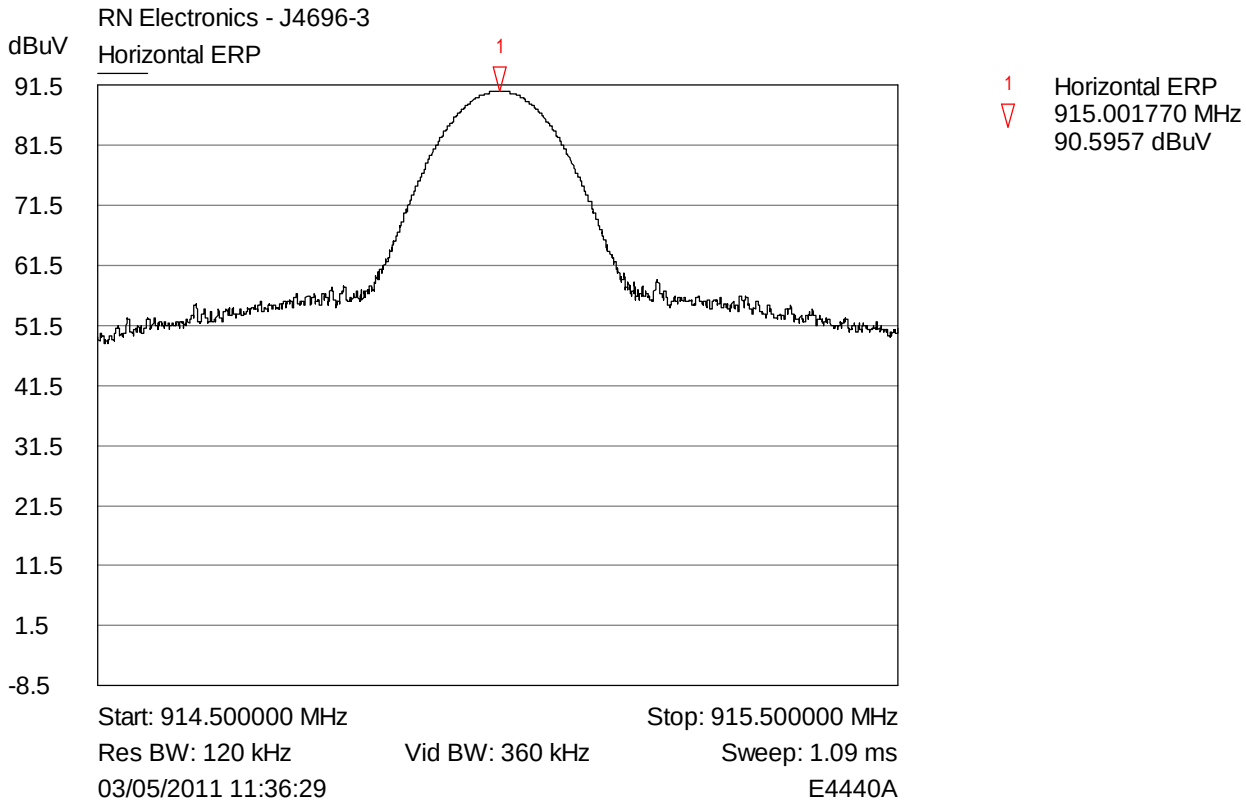
Frequency (MHz)	Measured Peak	Measured Average	AV- Limit
7420	50.0	44.0	-10.0
8347	52.0	49.0	-5.0
9275	53.1	48.0	-6.0

6.3 Fundamental Emissions

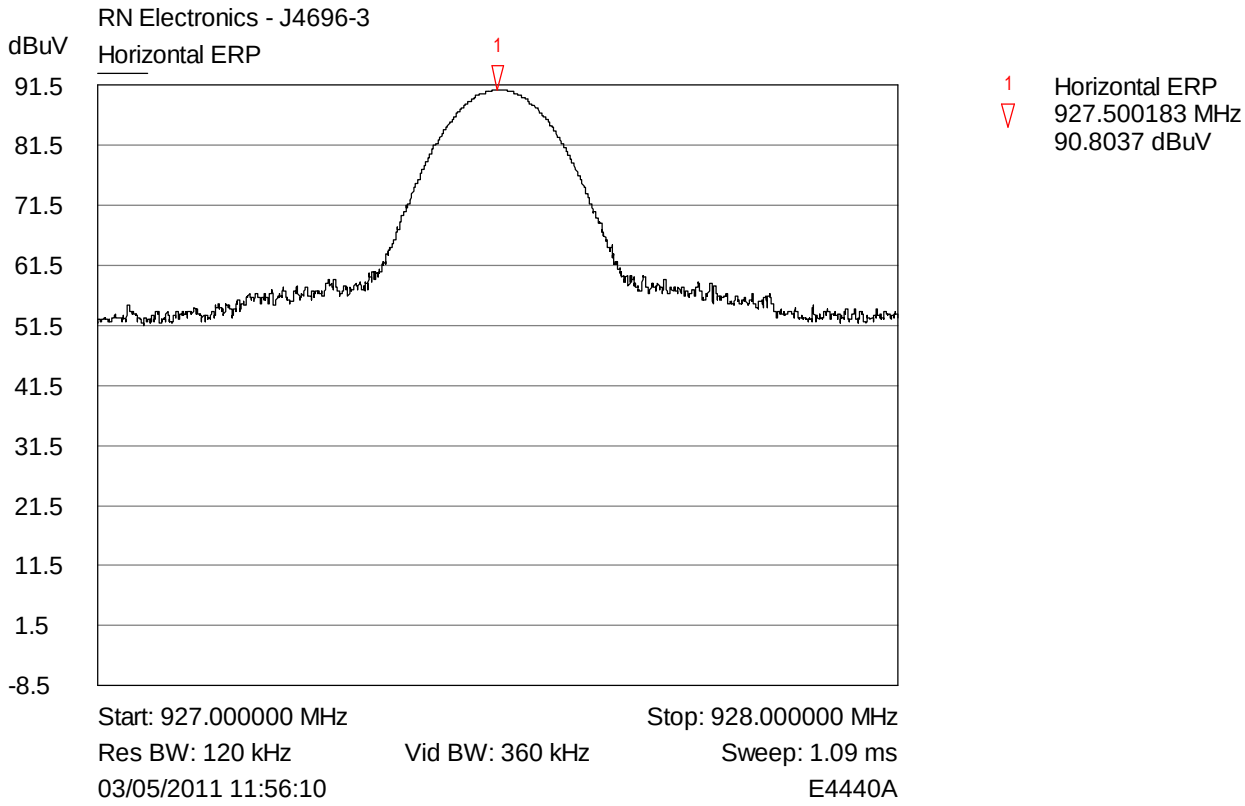
Bottom Channel



Middle Channel



Top Channel

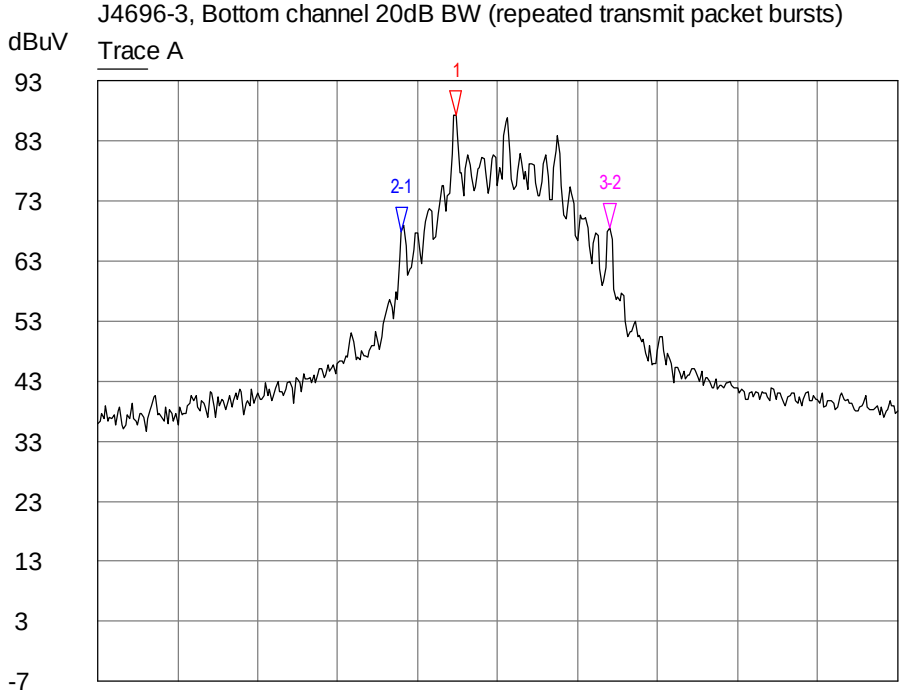

RN Electronics - J4696-3
Horizontal ERP
dBuV
91.5
81.5
71.5
61.5
51.5
41.5
31.5
21.5
11.5
1.5
-8.5
1
Start: 927.000000 MHz
Stop: 928.000000 MHz
Res BW: 120 kHz
Vid BW: 360 kHz
Sweep: 1.09 ms
03/05/2011 11:56:10
E4440A
1 Horizontal ERP
927.500183 MHz
90.8037 dBuV

6.4 Duty Cycle

Not applicable.

6.5 20dB Bandwidth

J4696-3, Bottom channel 20dB BW (repeated transmit packet bursts)



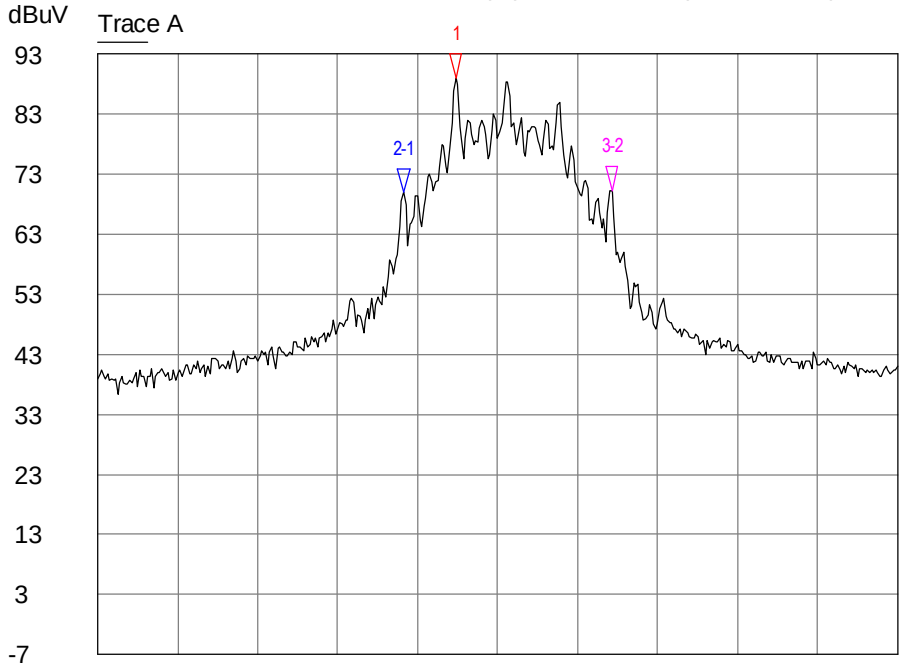
1 Trace A
902.484250 MHz
87.2700 dBuV

2-1 Trace A
-20.250000 kHz
-19.2000 dB

3-2 Trace A
78.000000 kHz
0.6900 dB

Start: 902.350000 MHz Stop: 902.650000 MHz
Res BW: 1 kHz Vid BW: 3 kHz Sweep: 900.00 ms
04/05/2011 10:29:58 HP8542E

J4696-3, Centre channel 20dB BW (repeated transmit packet bursts)



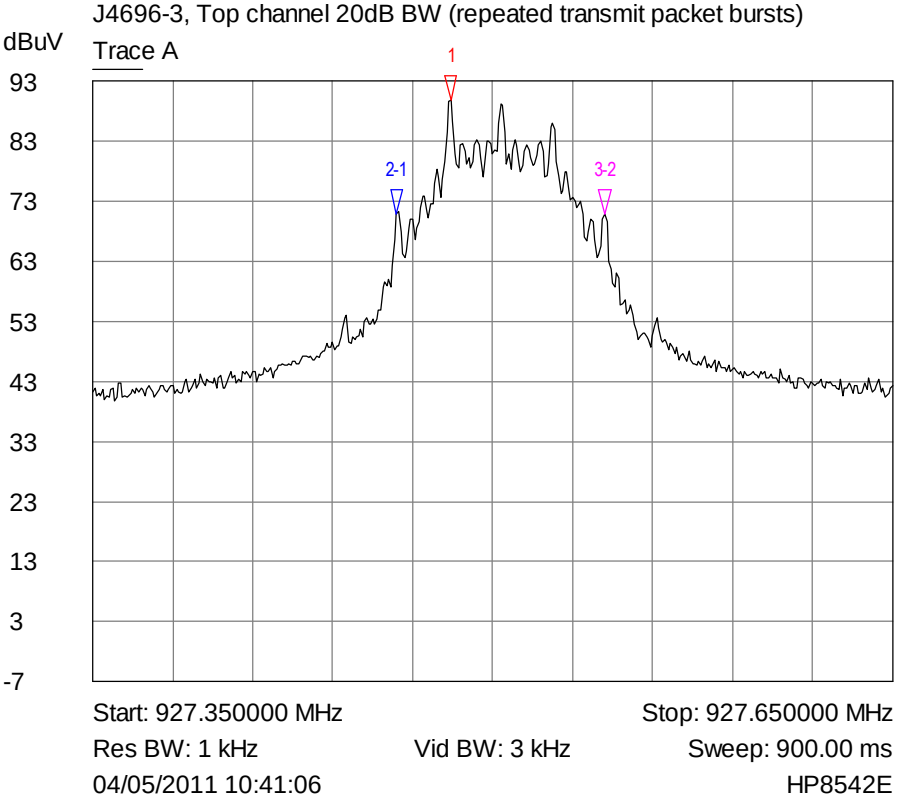
1 Trace A
914.984250 MHz
88.8800 dBuV

2-1 Trace A
-19.500000 kHz
-18.8000 dB

3-2 Trace A
78.000000 kHz
0.2300 dB

Start: 914.850000 MHz Stop: 915.150000 MHz
Res BW: 1 kHz Vid BW: 3 kHz Sweep: 900.00 ms
04/05/2011 10:33:18 HP8542E

J4696-3, Top channel 20dB BW (repeated transmit packet bursts)



1 Trace A
927.484250 MHz
90.0000 dBuV

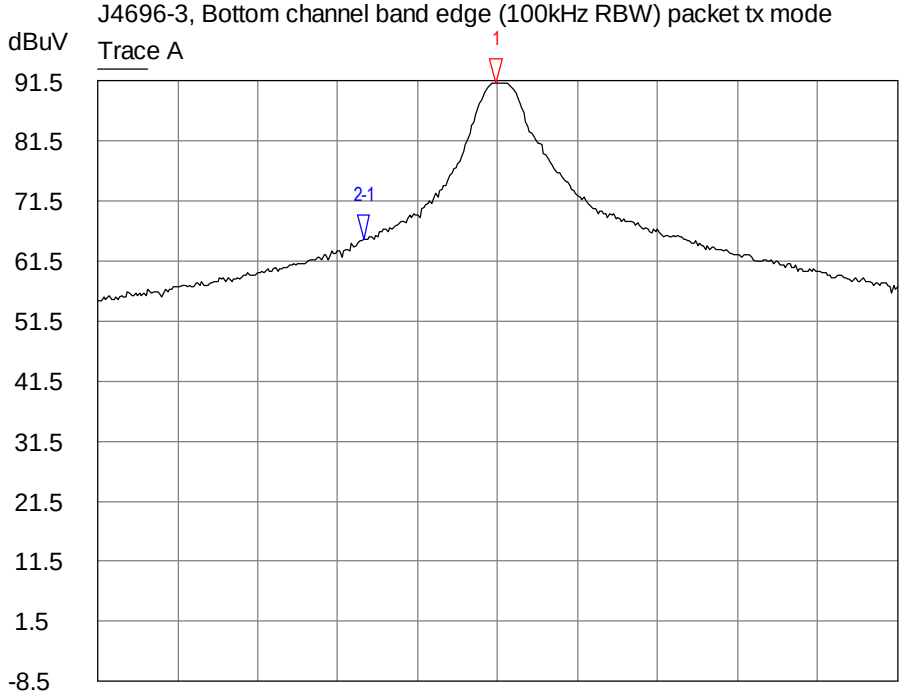
2-1 Trace A
-20.250000 kHz
-18.9100 dB

3-2 Trace A
78.000000 kHz
-0.2300 dB

Start: 927.350000 MHz
Stop: 927.650000 MHz
Res BW: 1 kHz
Vid BW: 3 kHz
Sweep: 900.00 ms
04/05/2011 10:41:06
HP8542E

6.6 Band Edge Compliance

J4696-3, Bottom channel band edge (100kHz RBW) packet tx mode

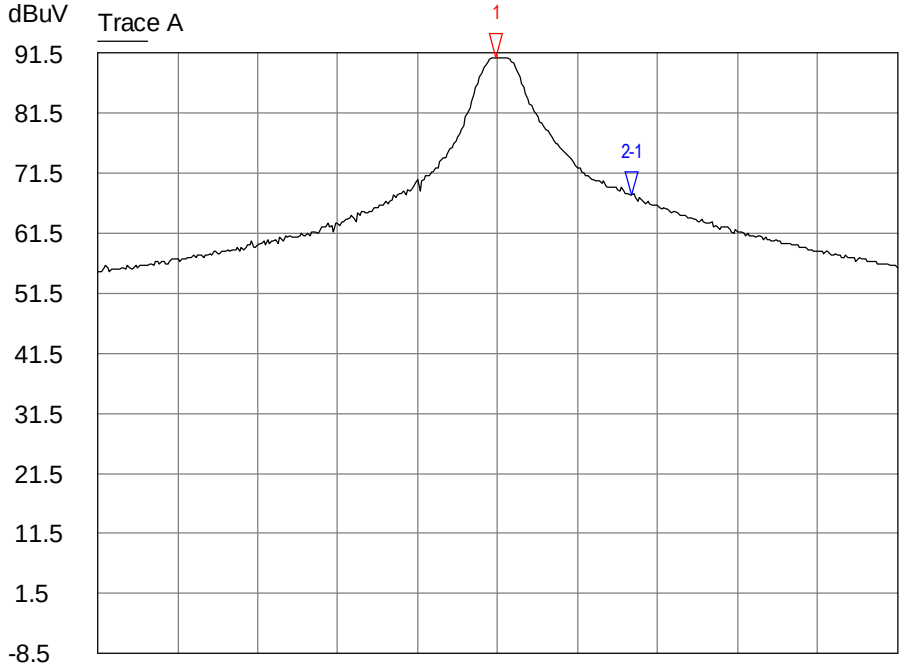


1 Trace A
902.492500 MHz
91.2900 dBuV

2-1 Trace A
-495.000000 kHz
-26.2300 dB

Start: 901.000000 MHz Stop: 904.000000 MHz
Res BW: 100 kHz Vid BW: 300 kHz Sweep: 20.00 ms
04/05/2011 11:18:18 HP8542E

J4696-3, Top channel band edge (100kHz RBW) packet tx mode



1 Trace A
927.492500 MHz
90.9300 dBuV

2-1 Trace A
510.000000 kHz
-23.2100 dB

Start: 926.000000 MHz Stop: 929.000000 MHz
Res BW: 30 kHz Vid BW: 100 kHz Sweep: 20.00 ms
04/05/2011 11:10:41 HP8542E

7 Explanatory Notes

7.1 Explanation of FAIL LIMIT 1 Statement

The **FAIL MARGIN 1** statement(s) may appear on the graphical plots when the receiver used to measure your equipment detects a signal that exceeds the dashed line. This does not mean that the **EUT** has failed the test, only that the 10 dB calculation margin set, has been exceeded on a peak measurement.

Following the indication that the margin has been exceeded, measurements are made at the frequency (ies) of the peaks. These peaks have been calculated to either Quasi Peak or Average Peak dependant on the test. A table of results has been printed on the reverse of the page. This table looks similar to the one illustrated below: -

Signal Number	Frequency (MHz)	Peak (dBμV)	PK Delta L 1 (dB)	Avg (dBμV)	Av Delta L 1 (dB)
1	12345.0000	12.9	-2.5	10.2	-5.2

The First column, labelled Signal Number, is a number that the receiver has given to each signal, which has been calculated.

Column Two, labelled Frequency (MHz), is the frequency of the signal received.

Column Three, labelled Peak (dBμV), (can also be labelled, in the case of Quasi Peak, Peak dBμV/m) is the Level that was received at peak amount in dB above 1μV.

Column Four, labelled PK Delta L1 (dB), is the same level as Column three but is given in a level relative to the limit line required.

Column Five, labelled AVG (dBμV), (can also be labelled, in the case of Quasi Peak, QP dBμV/m) when undertaking a Quasi peak test, This is the Average or Quasi peak calculation results given in dBμV or dBμV/m above 1μV.

Column Six, labelled AV Delta L 1 (dB), (can also be labelled, in the case of Quasi Peak, QP Delta L 1 (dB)) is the Average or Quasi Peak calculation relevant to the limit line. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

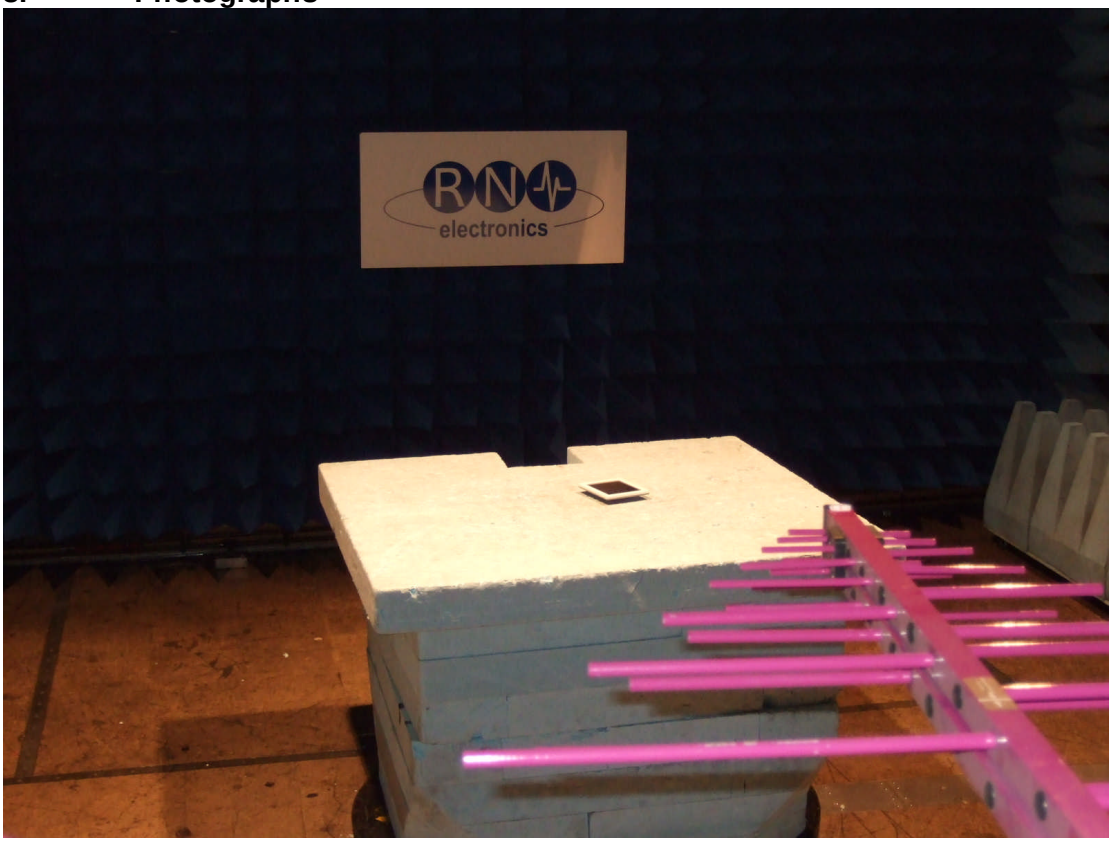
7.2 Explanation of limit line calculations for radiated measurements

The limits given in the test standard are normally expressed as absolute values (e.g. in μV/m at a specified distance), whereas the measured values are expressed as peak, quasi peak or average values in dBμV/m referenced to the measuring instrument inputs. RN Electronics calibrate the test set-up to account for any path losses, antenna gains, etc. so that the value read at the receiver relates directly to the absolute value required, except that it is expressed in dB relative to one microVolt and may need to take account of any alternative measuring distance used. Examples:

(a) limit of 500 μV/m equates to 20.log (500) = 54 dB μV/m.

(b) limit of 300 μV/m at 10m equates to 20.log (300 . 10/3) = 60 dB μV/m at 3m

8. Photographs



Photograph of the EUT as viewed from in front of the antenna, site M.

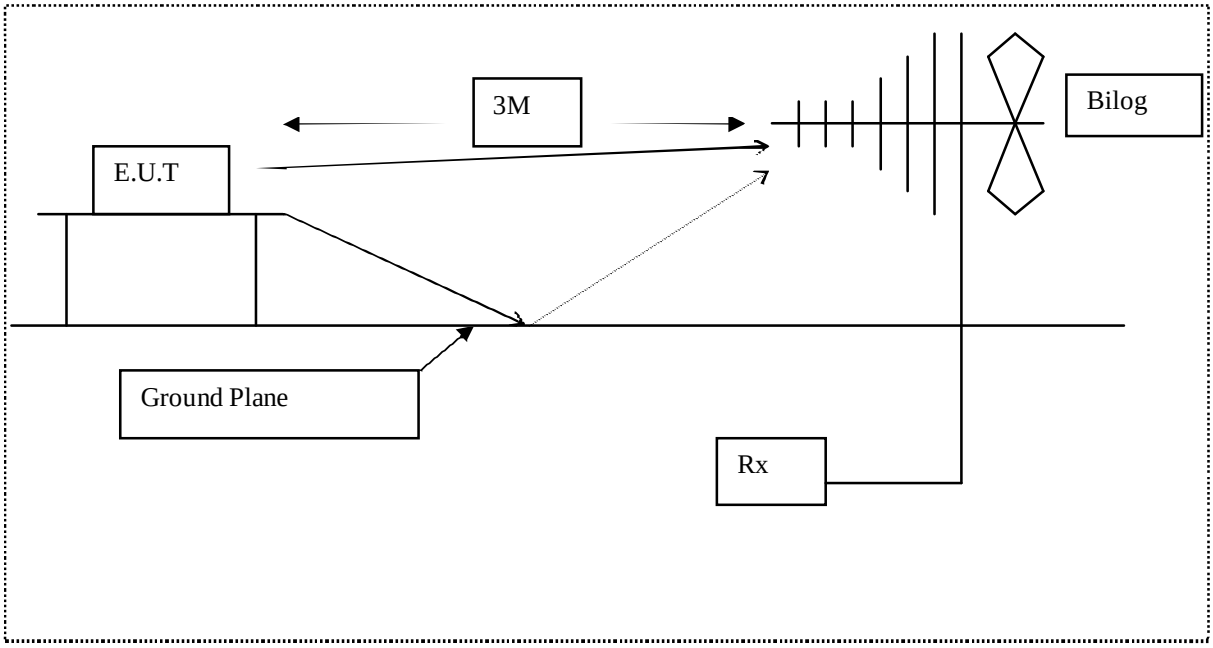


Diagram of the radiated emissions test setup.

NOT APPLICABLE, EUT IS BATTERY POWERED

Photograph of the EUT as viewed from screened room (conducted emissions)

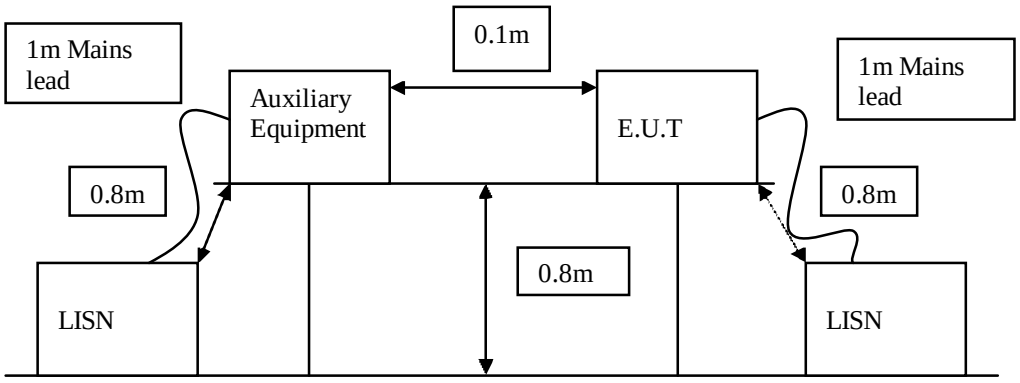


Diagram of the conducted emissions test setup.

Identifying Photographs of the EUT

9. Signal Leads

EUT did not have any ports or signal leads.

10. Test Equipment Calibration list

The following table lists the test equipment used, last calibration date and calibration interval. All test equipment used has been maintained within the calibration requirements of ***R.N. Electronics Ltd.*** test facility quality system. Calibration intervals are regularly reviewed dependent on equipment manufacturer's recommendations and actual usage of the equipment.

RNNo	Model	Description	Manufacturer	Date Calibrated	Period
E268	BHA 9118	1-18 GHz Horn Antenna	Schaffner	02-Mar-09	60
E342	8563E	Spectrum Analyser 26.5 GHz	HP	30-Mar-11	24
E410	N5181A	3 GHz MXG Signal Generator	Agilent Technologies	06-Oct-10	12
E411	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies	05-Oct-10	12
E412	E4440A	3 Hz - 26.5 GHz PSA	Agilent Technologies	05-Oct-10	12
E429	-	5 Switch Filter Box 0.91 GHz - 16.3 GHz	RN Electronics	N/A	N/A
TMS81	6502	Active Loop Antenna	EMCO	13-Apr-10	24
TMS82	8449B	Pre Amplifier 1 - 26 GHz	Agilent	29-Oct-10	12
TMS933	CBL6141A	Bilog Antenna 30MHz - 2GHz	York EMC	09-Sep-10	36

11. Auxiliary equipment

11.1 Auxiliary equipment supplied by ZBD Displays Ltd

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

Manufacturer	Description	Model Number	Serial Number
Microsoft	USB Mouse	X08-70400	-
Toshiba	Laptop PC & power supply	Satellite Pro A120	Y6043523H
ZBD Displays Ltd	Bounce Communicator	version 2	770
ZBD Displays Ltd	EPOP900 test jig Interface	120-0050-02	016

11.2 Auxiliary equipment supplied by RN Electronics Limited

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

No auxiliary equipment was supplied by RN Electronics Ltd.

12. Modifications

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

12.1 Modifications before test

There were no modifications made by R.N. Electronics Ltd before testing commenced.

12.2 Modifications during test

There were no modifications made by R.N. Electronics Ltd during testing.

13. Compliance information

Products subject to the Declaration of Conformity procedure are required to be supplied with a compliance information statement. A copy of this statement may be included here:

EUT is not subject to the DoC Authorisation procedure.

14 Description of Test Sites

Site A	Radio / Calibration Laboratory and anechoic chamber
Site B	Semi-anechoic chamber
Site B1	Control Room for Site B
Site C	Transient Laboratory
Site D	Screened Room (Conducted Immunity)
Site E	Screened Room (Control Room for Site D)
Site F	Screened Room (Conducted Emissions) VCCI Registration No. C-2823
Site K	Screened Room (Control Room for Site M)
Site M	3m Semi-anechoic chamber (indoor OATS) FCC Registration No. 293246
Site Q	Fully-anechoic chamber
Site OATS	3m and 10m Open Area Test Site FCC Registration No. 293246 IC Registration No. 5612A-1 VCCI Registration No. R-2580

15 Abbreviations and Units

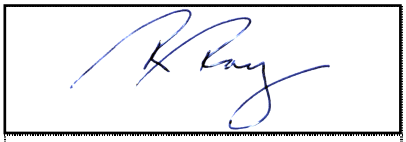
%	Percent
µA/m	microAmps per metre
µV	microVolts
µW	microWatts
AC	Alternating Current
ALSE	Absorber Lined Screened Enclosure
AM	Amplitude Modulation
Amb	Ambient
ATPC	Automatic Transmit Power Control
BER	Bit Error Rate
ºC	Degrees Celsius
C/I	Carrier / Interferer
CEPT	European Conference of Postal and Telecommunications Administrations
COFDM	Coherent OFDM
CS	Channel Spacing
CW	Continuous Wave
dB	deciBels
dBµA/m	deciBels relative to 1µA/m
dBµV	deciBels relative to 1µV
dBc	deciBels relative to Carrier
dBm	deciBels relative to 1mW
DC	Direct Current
DTA	Digital Transmission Analyser
EIRP	Equivalent Isotropic Radiated Power
ERP	Effective Radiated Power
EU	European Union
EUT	Equipment Under Test
FM	Frequency Modulation
FSK	Frequency Shift Keying
g	Grams
GHz	GigaHertz
Hz	Hertz
IF	Intermediate Frequency
kHz	kiloHertz
LBT	Listen Before Talk
LO	Local Oscillator
mA	milliAmps
max	maximum
mbar	milliBars
Mbit/s	MegaBits per second
MHz	MegaHertz
mic	Microphone
min	minimum
mm	milliMetres
ms	milliSeconds
mW	milliWatts
NA	Not Applicable
nom	Nominal
nW	nanoWatt
OATS	Open Area Test Site
OFDM	Orthogonal Frequency Division Multiplexing
ppm	Parts per million
PRBS	Pseudo Random Bit Sequence
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
R&TTE	Radio and Telecommunication Terminal Equipment
Ref	Reference
RF	Radio Frequency
RFC	Remote Frequency Control
RSL	Received Signal Level
RTP	Room Temperature and Pressure
RTPC	Remote Transmit Power Control
Rx	Receiver
s	Seconds
SINAD	Signal to Noise And Distortion
Tx	Transmitter
V	Volts

RN Electronics
EMC & RADIO TEST SERVICES

Certificate of Test 4696/3

The equipment noted below has been tested by ***R.N. Electronics Limited*** and conforms with the relevant subpart of FCC 47CFR part 15, subject to deviations as detailed in this report.

This certificate relates to the unit, 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:	EPOP900
Model Number(s):	EPOP900
Unique Serial Number(s):	GA00000024B
Manufacturer:	ZBD Displays Ltd Longford Business Centre Orchard Lea Winkfield Lane Windsor SL4 4RU
Customer Purchase Order Number:	5816
R.N. Electronics Limited Report Number:	05-475/4696/3/11
Test Standards:	FCC 47CFR Part 15C: effective date **October 1st 2010,** Class DXT Intentional Radiator
Date:	3rd to 4th May 2011
For and on behalf of R.N. Electronics Limited	
Signature:	
Notes:	

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