FCC
Test Report
For
Plextek
Two Way Communicating Smart Meter
Ampy 5252

Report Number 04-258/3641/2/08
Report Produced by: -

R.N. Electronics Ltd.
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1. Contents

2. Summary of Test Results

The Ampy 5252 was tested to the following standards: -

FCC Part 15C (effective date October, 2007); Class DXX 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	PASSED
2. Radiated Emissions	FCC Part 15C §15.205, §15.209, §15.249(a) and §15.249(d)	PASSED
3. Intentional Radiator Field Strength	FCC Part 15C §15.249(a)	PASSED
4. 20dB Bandwidth	FCC Part 15C §15.215(c)	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.

Date of Test: 24/04/08

Test Engineer: 

Approved By: Paul Darragh Digitally signed by: Paul Darragh DN: CN = Paul Darragh C = GB OU = RN Electronics Date: 2008.06.26 09:17:07 Z

Customer Representative:

3. Information about Equipment Under Test

3.1 Equipment Specification

Applicant	Plextek Ltd London Road Great Chesterford Essex CB10 1NY
Manufacturer/Brand Name	Ampy metering Ltd
Full name of EUT	Ampy 5252
Model Number of EUT	Not Available
Serial Number of EUT	5252A02604-010208 including 6R535(Radio)
FCC ID (if applicable):	U3R-5252-01
Date when equipment was received by RN Electronics Limited	24/04/08
Date of test:	24/04/08
Customer order number:	P000058841
A visual description of EUT is as follows:	A large light grey metalic enclosure with a raised cicular section on the front housing incorporating an LCD display. A mains connector block is situatd on the top right hand side.
The main function of the EUT is:	To monitor the consumption of electricity used and relay the information over a radio link.
Antenna:	Integral

Equipment Under Test Information specification:

Height	400mm
Width	280mm
Depth	220mm
Weight	7.25kg
Voltage	230V AC
Current required from above voltage source	2.5A
Highest Frequencies used / generated	919.625 MHz

Purpose of Test: To demonstrate compliance with FCC OET rules for unlicensed intentional radiators.

Modes of operation:
The device is capable of two transmit and receive modes. Low power (LCC) mode under 15.249 is used for communications peer-to-peer, i.e. with other metering stations. A Spread spectrum (SS) mode is used for communications with a base station. Results for the device operating in the SS mode, which comes under a different sub-part of the FCC rules are contained in R.N. Electronics Ltd. test report # 04-254a/3641/1/08.

Channel arrangements:
For low power LCC mode, operation is possible in any one of 12 channels.
Bottom LCC = 911.975 MHz, Top LCC = 919.625 MHz.

Description of ancillary equipment connected to the equipment under test, for the purpose of tests, can be found in Section 11.

Any modifications made to the **EUT**, whilst under test, can be found in Section 12.

This report was printed on: 26 June 2008

4. Specifications

The tests were performed by RN Electronics Engineer Peter Finley 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

5. Tests, Methods and Results

5.1 Conducted Emissions

5.1.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.207)

Test Method: FCC Part 15C, Reference (15.207)

5.1.1.1 Configuration of EUT

The EUT was placed on a wooden table 0.8m above the ground plane and connected to a LISN via a 1m mains cable.

The EUT was operated in the Low Power Fixed Frequency and Receive modes.

5.1.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted in the 'Test Equipment' Section. Measurements were made on the live and neutral conductors using both average and quasi-peak detection. At least 6 signals within 20dB and/or all signals within 10dB of the limit were investigated.

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

5.1.2 Test results

Temperature of test Environment: 18°C

Analyser plots for the Quasi-Peak / Average values as applicable and a table of signals can be found in Section 6.1 of this report.

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

5.1.2.1 Test Equipment used

E1, E10, E35,TMS938

See Section 10 for more details.

5.2 Radiated Emissions

5.2.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.209)

Test Method: FCC Part 15C, Reference (15.209)

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 operated in the Low Power Fixed Frequency and Receive modes.

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 or OATS**.**

Test Environment: M

Temperature: 18°C Humidity: 45%

Analyser plots for the Quasi-Peak / Average values as applicable and any table of signals can be found in Section 6.2 of this report.

Note the limits shown on the plots and in the tables are all referenced to §15.209. The limits for harmonic emissions of the LCC mode, §15.249(a) are the same as §15.209 i.e. 500uV/m at 3m.

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

5.2.2.1 Test Equipment used

E1, TMS933,TMS938,TMS81E268,E3,TMS82,E328,E319,E239,E238,N438,E242

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 EUT was operated in the Low Power Fixed Frequency mode. The supply to the EUT was varied greater than the required +/- 15%.

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° and the antenna scanned 1 – 4 metres in both horizontal and vertical polarisations to record the worst case emissions.

5.3.2 Test results

Tests were performed using Test Site **.**

Test Environment: M

Temperature: 18°C Humidity: 48 %

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

The maximised field strength measured in Low Power (LCC) mode was:

Antenna Horizontal:

Conditions AC Supply (Vrms)	Fundamental Field Strength Bottom Channel (dBµV/m)	Top Channel (dBµV/m)
176	90.4	90.2
230	90.4	90.2
270	90.4	90.2

Antenna Vertical:

Conditions AC Supply (Vrms)	Fundamental Field Strength Bottom Channel (dBµV/m)	Top Channel (dBµV/m)
176	92.8	92.1
230	93.0	92.0
270	92.8	92.0

Effect of power supply variation was negligible.

Limit §15.249(a) 50mV/m @ 3m (94dBµV @ 3m).

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

5.3.2.1 Test Equipment used

E1,TMS933,TMS938

See Section 10 for more details

5.4 20dB Bandwidth

5.4.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.215)

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

5.4.1.1 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 operated in the Low Power Fixed Frequency mode.

5.4.1.2 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.

Test site 'M' has been listed with the FCC.

5.4.2 Test results

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

Temperature of test Environment: 18°C

Analyser plots for the 20dB bandwidth and band-edge measurements can be found in Sections 6.3 and 6.4 of this report.

Limits §15.215(c) - contained within the frequency band 902 - 928 MHz.

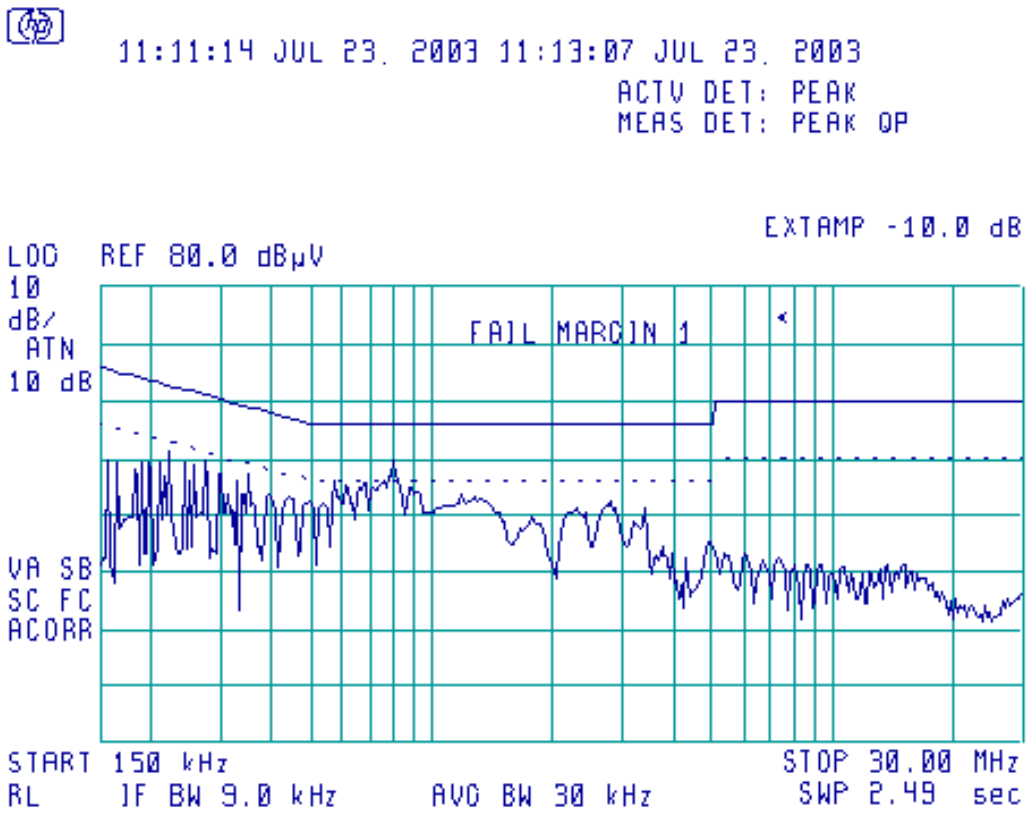
These results show that the **EUT** has **PASSED** this test.

5.4.2.1 Test Equipment used

E1,TMS933,TMS938

See Section 10 for more details.

6. Plots and Results
6.1 Conducted Emissions



Quasi-peak values of mains live feed

Low Power Mode

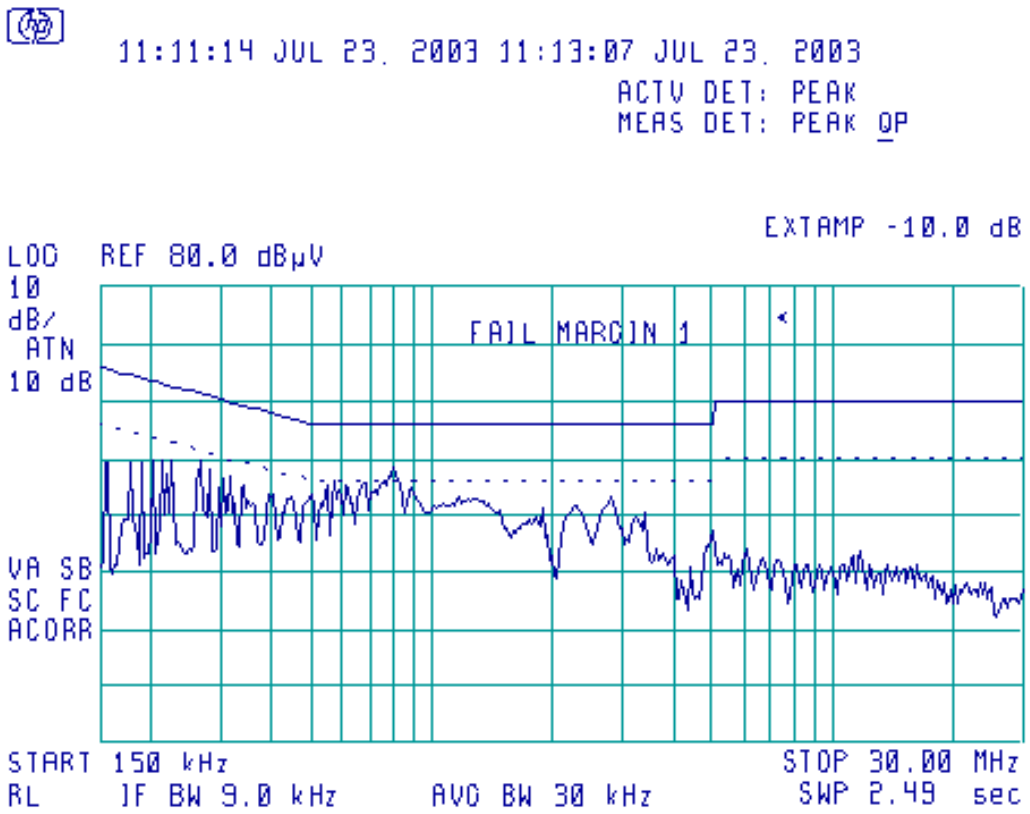
The plot shows a swept response of peak values using the quasi-peak limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 10dB of the limit line for Quasi-Peak Live

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)
1	0.809376	50.84	-5.16	46.80	-9.20
2	0.816186	49.73	-6.27	46.88	-9.12
3	0.824288	49.79	-6.21	46.43	-9.57

Measurement Uncertainty of ± 3.6dB Applies



Quasi-peak values of mains neutral feed

Low Power Mode

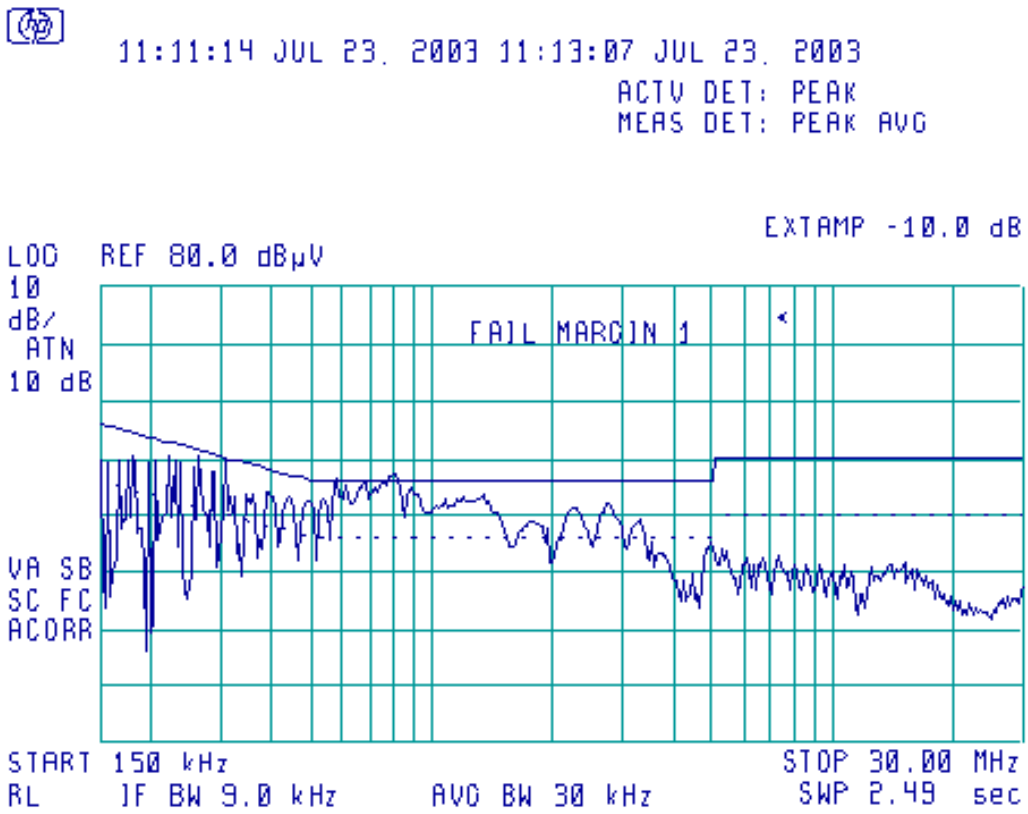
The plot shows a swept response of peak values using the quasi-peak limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 10dB of the limit line for Quasi-peak Neutral

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)
1	0.572189	45.40	-10.60	37.55	-18.45
2	0.815478	48.99	-7.01	46.73	-9.27
3	0.818471	49.14	-6.86	46.89	-9.11
4	0.819294	50.06	-5.94	46.79	-9.21
5	0.824186	44.47	-11.53	44.42	-11.58

Measurement Uncertainty of ± 3.6dB Applies



Average values of mains live feed

Low Power Mode

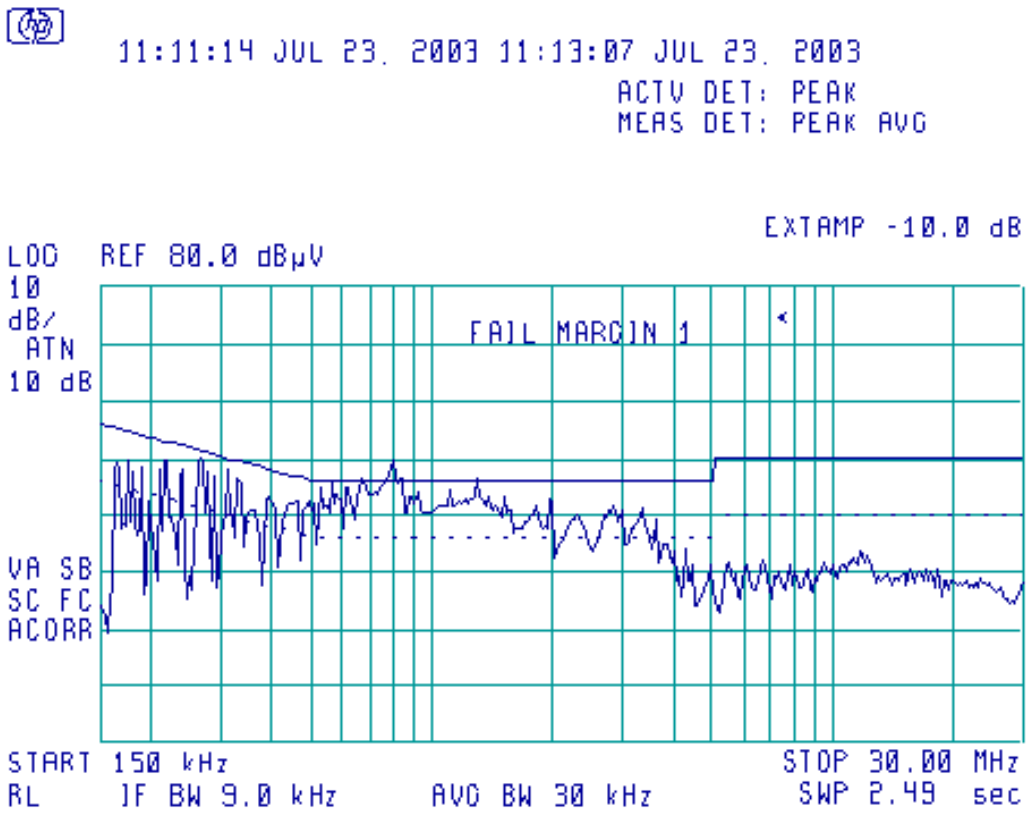
The plot shows a swept response of peak values using the average limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals for Average Live

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	Avg Amp (dBuV)	Avg - Lim1 (dB)
1	0.242290	50.50	-1.53	12.87	-39.16
2	0.397480	39.19	-8.73	29.23	-18.69
3	0.549717	45.62	-0.38	31.51	-14.49
4	0.595021	48.65	2.65	32.75	-13.25
5	0.593902	48.08	2.08	34.12	-11.88
6	0.671405	48.42	2.42	35.06	-10.94
7	0.686505	47.25	1.25	34.48	-11.52
8	0.826266	50.77	4.77	34.37	-11.63
9	0.785102	48.95	2.95	29.32	-16.68
10	0.816039	40.74	-5.26	33.99	-12.01
11	0.918071	46.57	0.57	32.54	-13.46
12	1.279666	43.71	-2.29	33.92	-12.08

Measurement Uncertainty of ± 3.6dB Applies



Average values of mains neutral feed

Low Power Mode

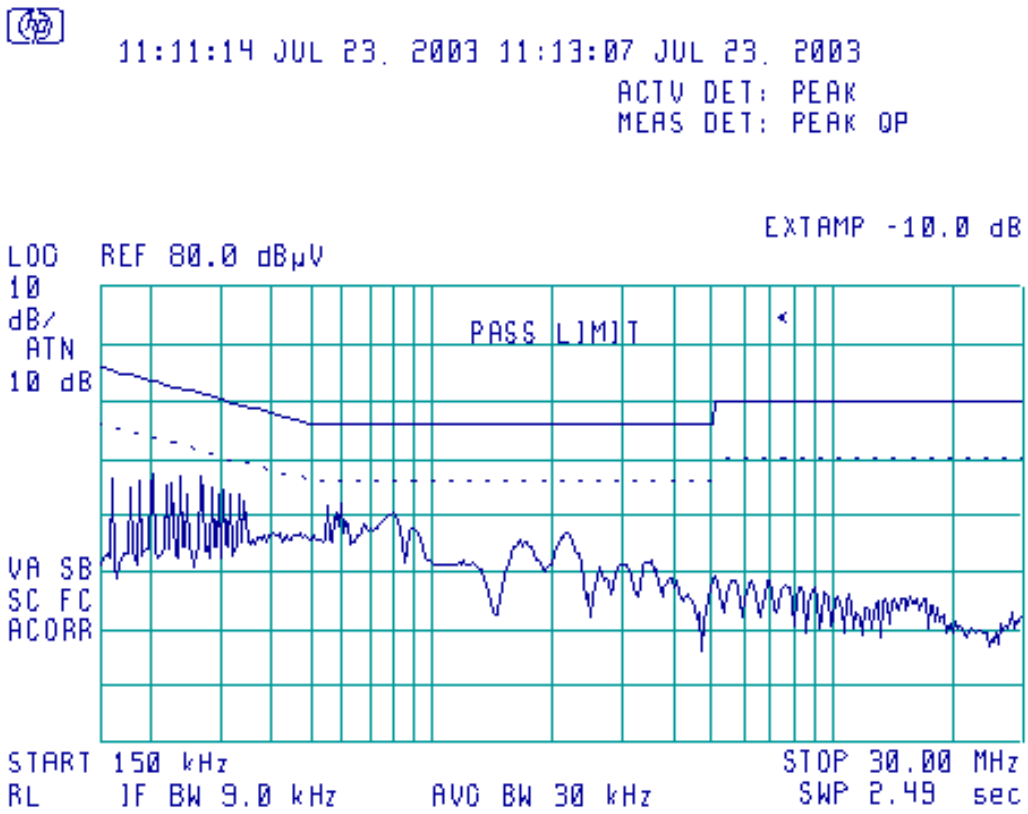
The plot shows a swept response of peak values using the average limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals for Average Neutral

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	Avg Amp (dBuV)	Avg - Lim1 (dB)
1	0.315794	49.02	-0.82	35.07	-14.77
2	0.353105	43.76	-5.19	31.56	-17.39
3	0.406810	44.06	-3.68	36.32	-11.42
4	0.459396	45.62	-1.14	32.89	-13.87
5	0.528650	45.10	-0.90	30.00	-16.00
6	0.532279	46.03	0.03	33.01	-12.99
7	0.547620	40.51	-5.49	33.78	-12.22
8	0.599936	48.27	2.27	28.65	-17.35
9	0.617461	45.87	-0.13	32.28	-13.72
10	0.674005	46.90	0.90	34.98	-11.02
11	0.755764	46.42	0.42	34.98	-11.02
12	0.794721	40.06	-5.94	35.04	-10.96
13	0.808784	48.87	2.87	37.47	-8.53
14	0.820145	40.61	-5.39	37.44	-8.56
15	0.826524	48.84	2.84	35.24	-10.76
16	0.831566	46.90	0.90	31.98	-14.02
17	0.917741	45.16	-0.84	31.15	-14.85
18	0.921269	36.48	-9.52	30.51	-15.49
19	0.950336	43.57	-2.43	29.54	-16.46
20	1.011735	42.14	-3.86	29.86	-16.14
21	1.051535	44.57	-1.43	31.58	-14.42
22	1.080385	45.76	-0.24	30.61	-15.39
23	1.101080	43.65	-2.35	32.48	-13.52
24	1.114760	45.34	-0.66	30.12	-15.88
25	1.134460	43.17	-2.83	30.72	-15.28
26	1.152705	43.66	-2.34	31.57	-14.43
27	1.168505	43.73	-2.27	31.02	-14.98
28	1.181005	45.37	-0.63	31.68	-14.32
29	1.215390	45.87	-0.13	30.78	-15.22
30	1.228485	46.04	0.04	32.61	-13.39
31	1.241400	45.13	-0.87	33.32	-12.68
32	1.286230	44.08	-1.92	33.88	-12.12
33	1.310325	46.08	0.08	30.98	-15.02
34	1.321105	44.45	-1.55	31.60	-14.40
35	1.347660	44.38	-1.62	30.68	-15.32
36	1.350415	44.12	-1.88	30.71	-15.29
37	1.357510	43.90	-2.10	30.87	-15.13
38	1.420655	28.03	-17.97	32.86	-13.14
39	1.428505	43.76	-2.24	30.67	-15.33
40	1.440675	45.53	-0.47	30.05	-15.95
41	1.463605	43.64	-2.36	32.09	-13.91
42	1.507905	44.70	-1.30	30.65	-15.35
43	1.513530	40.96	-5.04	30.49	-15.51
44	1.559963	41.12	-4.88	28.48	-17.52
45	1.795625	34.57	-11.43	27.97	-18.03
46	1.850188	42.18	-3.82	29.11	-16.89
47	1.863838	41.17	-4.83	29.96	-16.04
48	1.960625	32.25	-13.75	26.15	-19.85

Measurement Uncertainty of ± 3.6dB Applies



Quasi-peak values of mains live feed

RX Mode

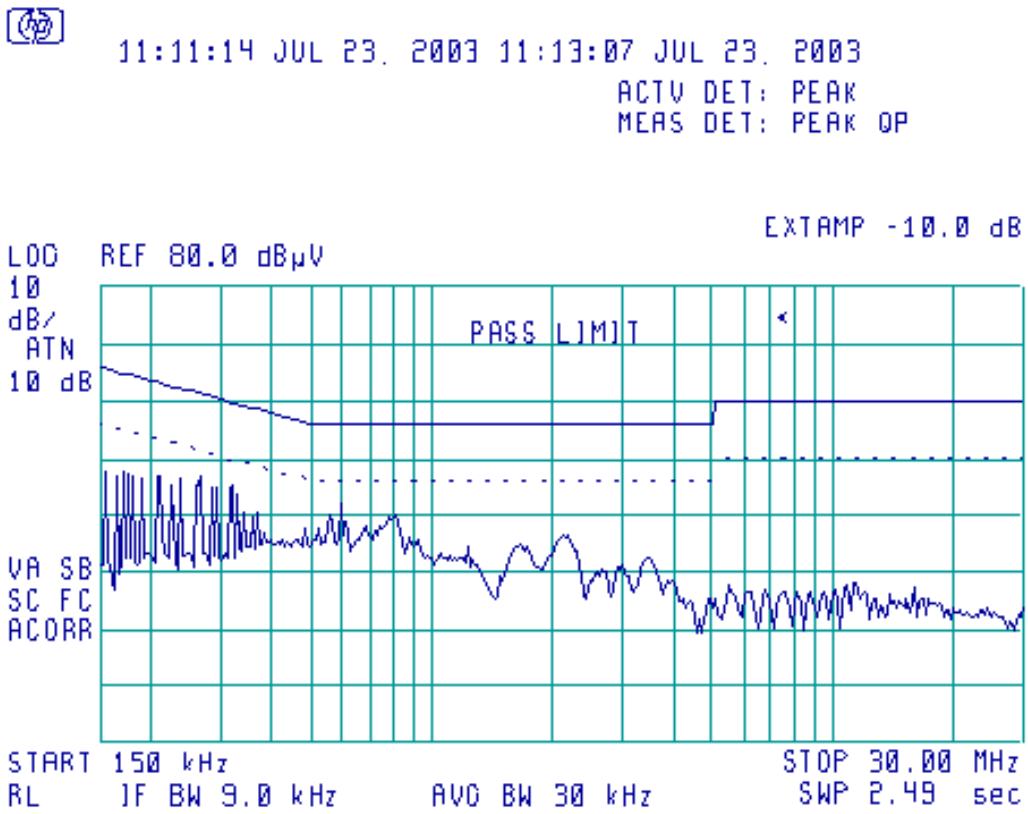
The plot shows a swept response of peak values using the quasi-peak limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 10dB of the limit line for Quasi-Peak Live

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)
1	0.162969	46.96	-18.41	38.91	-26.46
2	0.191719	46.69	-17.28	38.76	-25.21
3	0.204875	47.65	-15.82	39.11	-24.36
4	0.230656	48.02	-14.45	38.72	-23.75
5	0.248625	47.54	-14.29	38.41	-23.42
6	0.279031	45.85	-15.06	37.52	-23.39
7	0.300469	45.72	-14.54	37.25	-23.01
8	0.314688	46.62	-13.24	37.45	-22.41
9	0.336219	45.28	-14.07	37.03	-22.32
10	0.355281	45.67	-13.23	35.98	-22.92

Measurement Uncertainty of ± 3.6dB Applies



Quasi-peak values of mains neutral feed

RX Mode

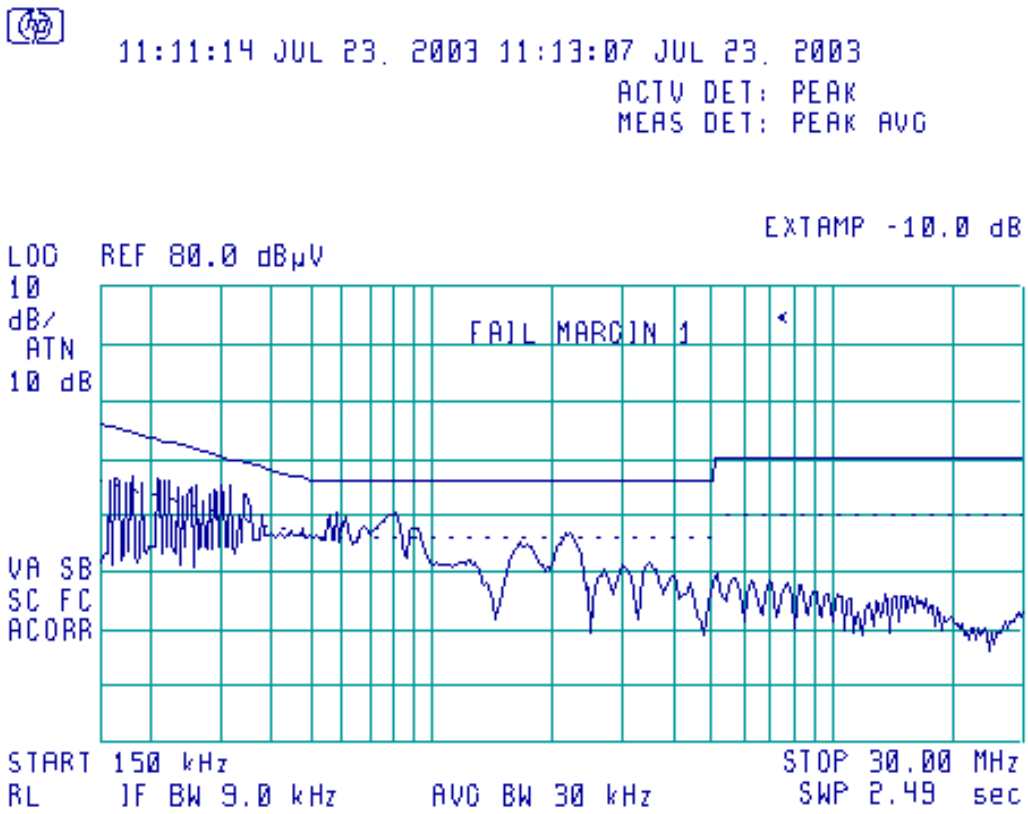
The plot shows a swept response of peak values using the quasi-peak limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 10dB of the limit line for Quasi-peak Neutral

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)
1	0.157938	48.44	-17.17	39.74	-25.87
2	0.165750	47.83	-17.40	39.27	-25.96
3	0.185469	47.41	-16.86	39.15	-25.12
4	0.201281	48.42	-15.18	39.60	-24.00
5	0.202938	48.52	-15.02	39.33	-24.21
6	0.226375	48.15	-14.49	38.83	-23.81
7	0.263469	47.47	-13.91	38.32	-23.06
8	0.288094	46.92	-13.71	37.38	-23.25
9	0.292969	46.85	-13.64	37.91	-22.58
10	0.307781	46.28	-13.76	37.50	-22.54
11	0.349375	44.75	-14.29	35.87	-23.17
12	0.361375	44.65	-14.10	35.50	-23.25
13	0.375188	41.68	-16.74	34.55	-23.87

Measurement Uncertainty of ± 3.6dB Applies



Average values of mains live feed

RX Mode

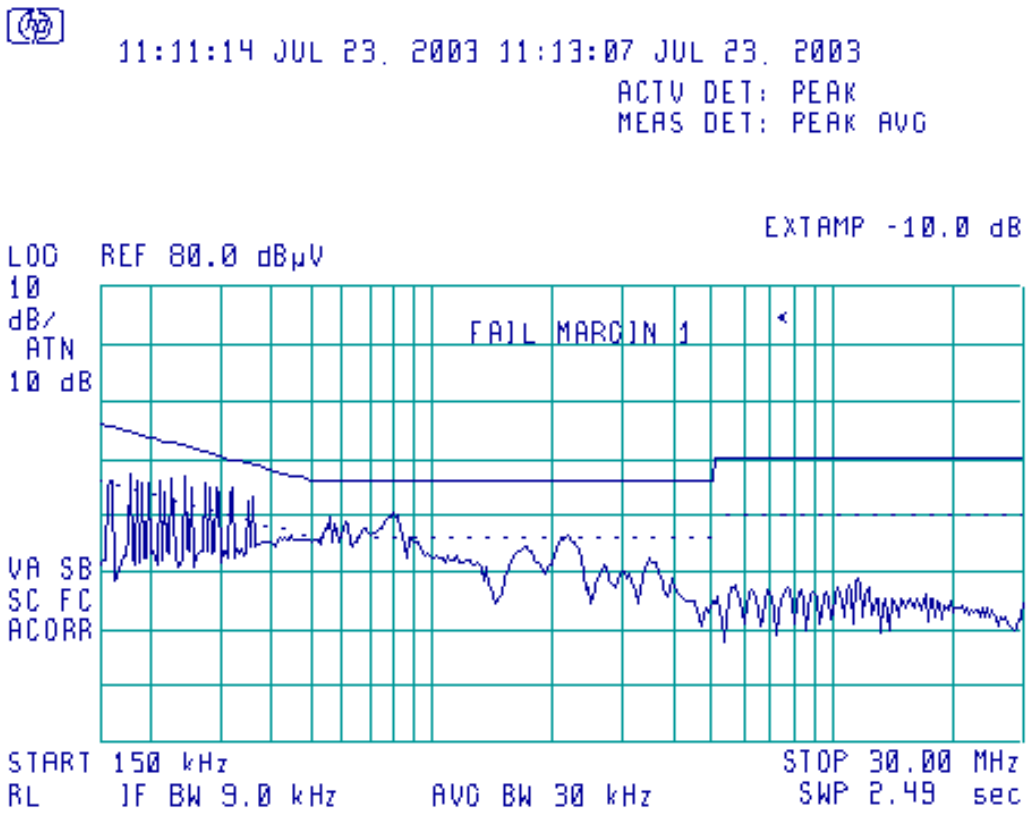
The plot shows a swept response of peak values using the average limit line

(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals for Average Live

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	Avg Amp (dBuV)	Avg - Lim1 (dB)
1	0.178150	47.41	-7.22	30.48	-24.15
2	0.226303	47.76	-4.88	29.61	-23.03
3	0.263539	47.01	-4.37	24.80	-26.58
4	0.337698	46.45	-2.87	29.82	-19.50
5	0.597333	44.33	-1.67	30.39	-15.61
6	0.805359	40.99	-5.01	33.55	-12.45
7	0.918998	39.36	-6.64	31.57	-14.43
8	2.186000	37.54	-8.46	31.84	-14.16

Measurement Uncertainty of ± 3.6dB Applies



Average values of mains neutral feed

RX Mode

The plot shows a swept response of peak values using the average limit line

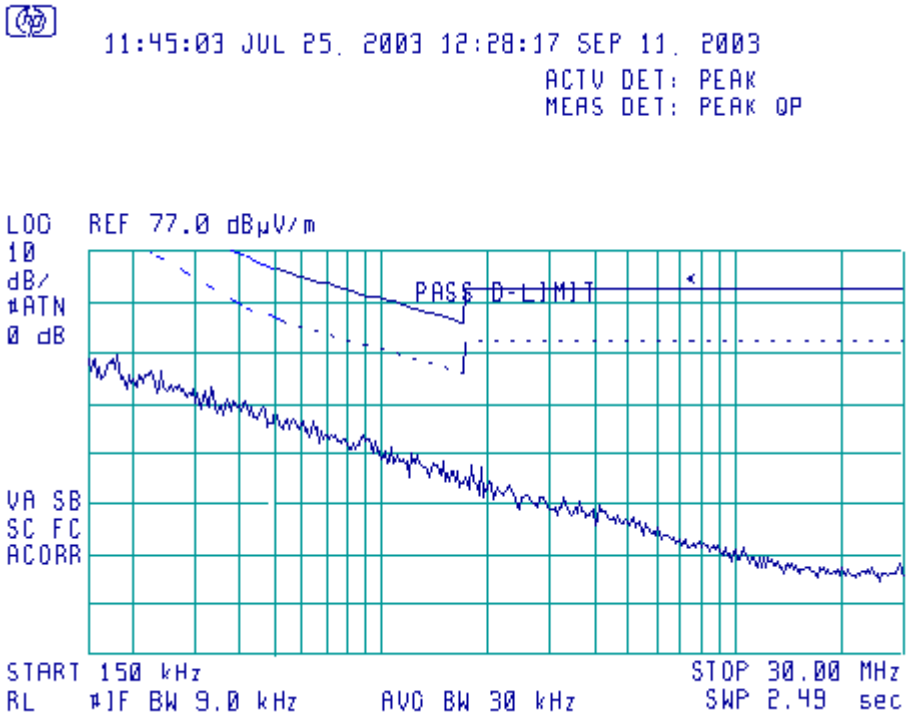
(Any peaks within 10dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals for Average Neutral

Signal	Freq (MHz)	Peak Amp (dBuV)	Peak - Lim1 (dB)	Avg Amp (dBuV)	Avg - Lim1 (dB)
1	0.156124	47.70	-8.00	29.82	-25.88
2	0.226406	47.91	-4.73	28.74	-23.90
3	0.228425	47.73	-4.83	28.23	-24.33
4	0.277241	46.34	-4.62	23.58	-27.38
5	0.316186	45.30	-4.53	28.55	-21.28
6	0.571204	43.64	-2.36	29.88	-16.12
7	0.597400	43.35	-2.65	30.32	-15.68
8	0.821361	40.92	-5.08	34.56	-11.44
9	2.214068	37.79	-8.21	30.32	-15.68

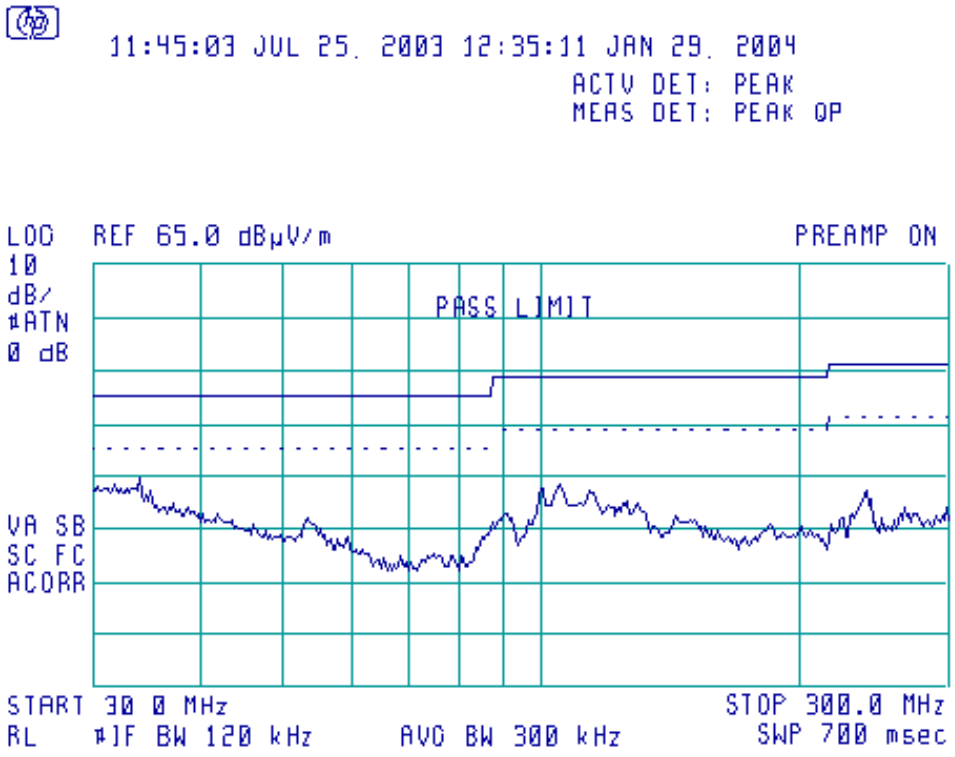
Measurement Uncertainty of ± 3.6dB Applies

6.2 Radiated Emissions



Quasi-Peak Values 9kHz to 30MHz.

The plot shows a swept response of peak values using the quasi-peak limit line



LOW POWER

Quasi-Peak Values of 30 MHz. to 300 MHz.

Horizontal Polarisation

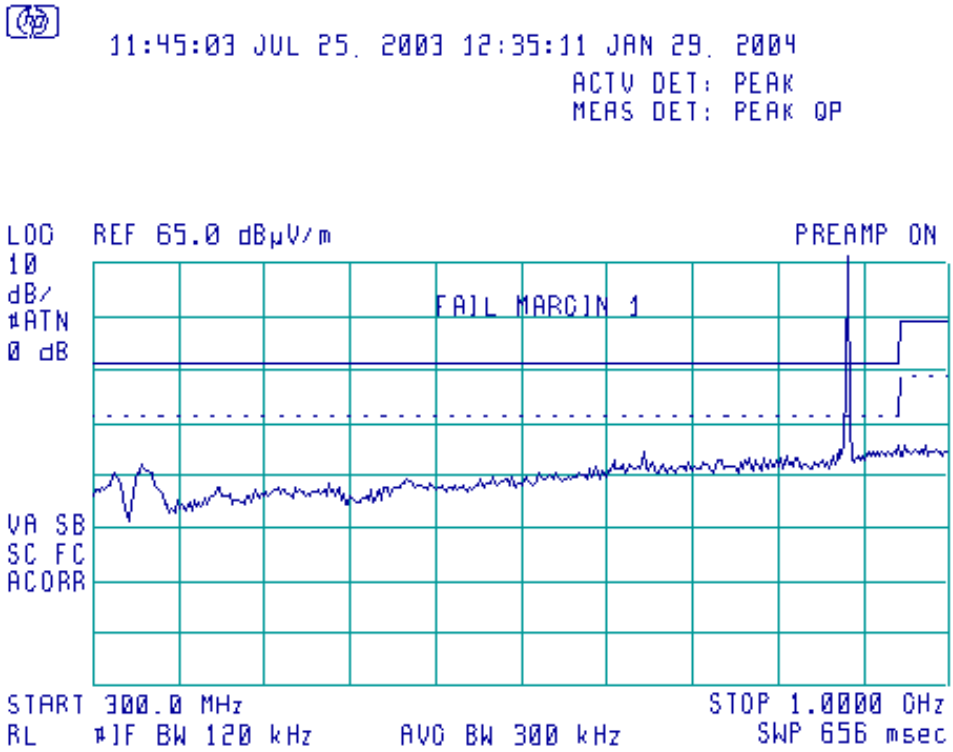
The plot shows a swept response of peak values using the quasi-peak limit line

(Any peaks within 20dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 20dB of the limit line for Quasi-Peak Horizontal

NONE

Measurement Uncertainty of ± 5.2dB Applies



LOW POWER

Quasi-Peak Values of 30 MHz. to 300 MHz.

Vertical Polarisation

The plot shows a swept response of peak values using the quasi-peak limit line

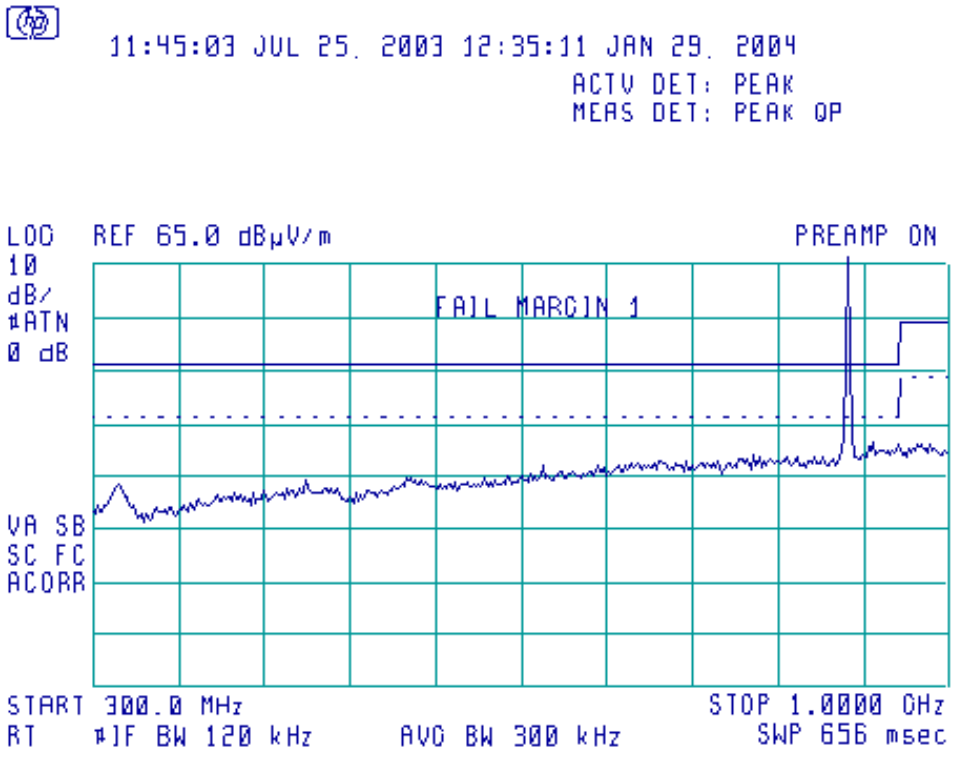
(Any peaks within 20dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 20dB of the limit line for Quasi-peak Vertical

Signal	Freq (MHz)	Peak Amp (dBuV/m)	Peak - Lim1 (dB)	QP Amp (dBuV/m)	QP - Lim1 (dB)
1	915.000000			93.17	-0.83[1]

Measurement Uncertainty of ± 5.2dB Applies

[1] Fundamental Emission



LOW POWER

Quasi-Peak Values of 300 MHz. to 1 GHz.

Horizontal Polarisation

The plot shows a swept response of peak values using the quasi-peak limit line

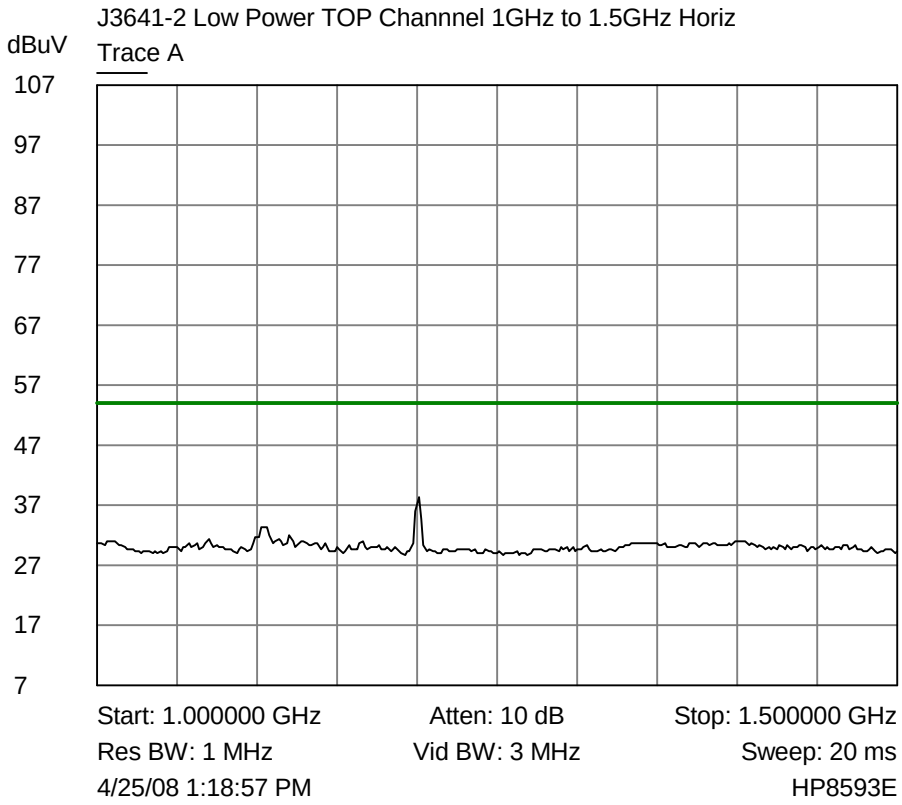
(Any peaks within 20dB of the limit line have been calculated and appear in the table on following page of this report)

Table of signals within 20dB of the limit line for Quasi-Peak Horizontal

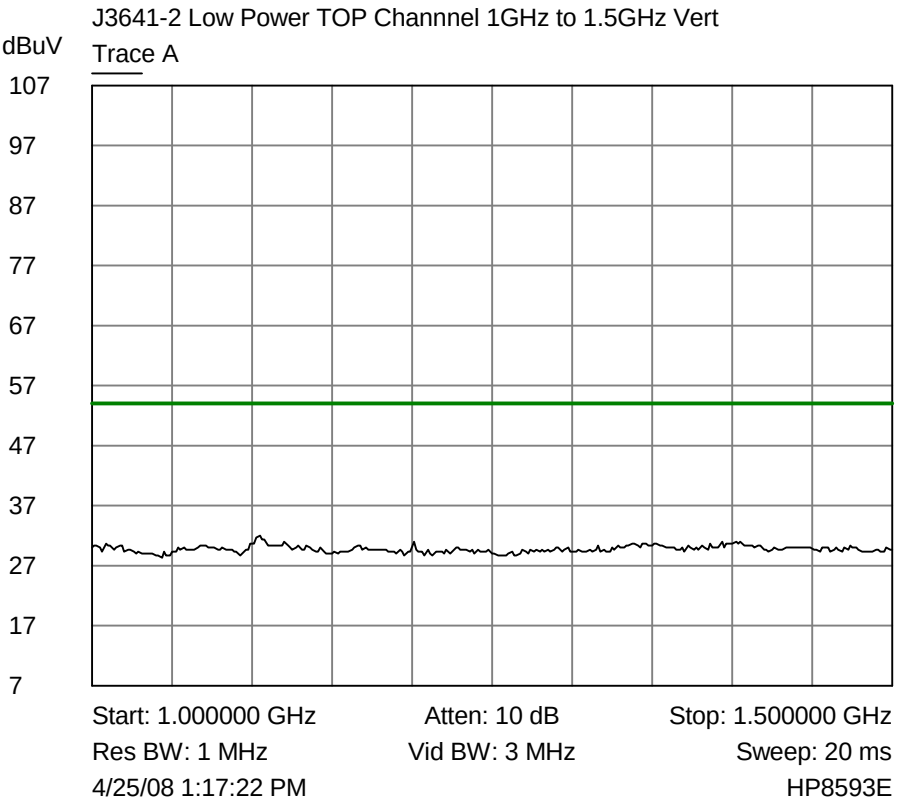
Signal	Freq (MHz)	Peak Amp (dBuV/m)	Peak - Lim1 (dB)	QP Amp (dBuV/m)	QP - Lim1 (dB)
1	915.000000			90.39	-3.61[2]

Measurement Uncertainty of ± 5.2dB Applies

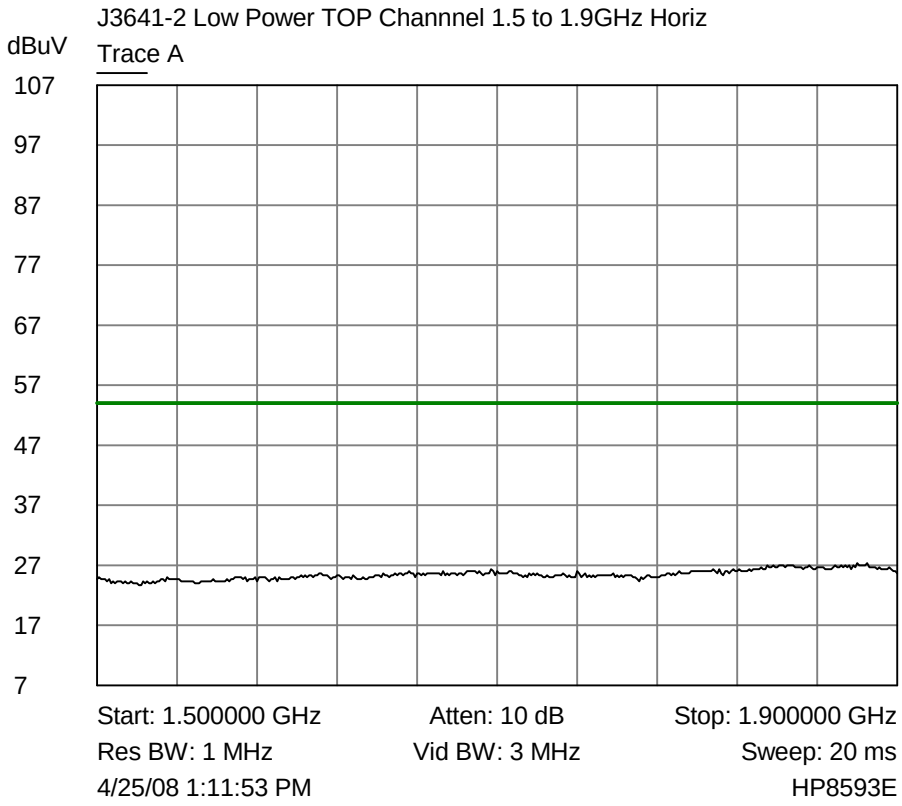
[2] Fundamental Emission



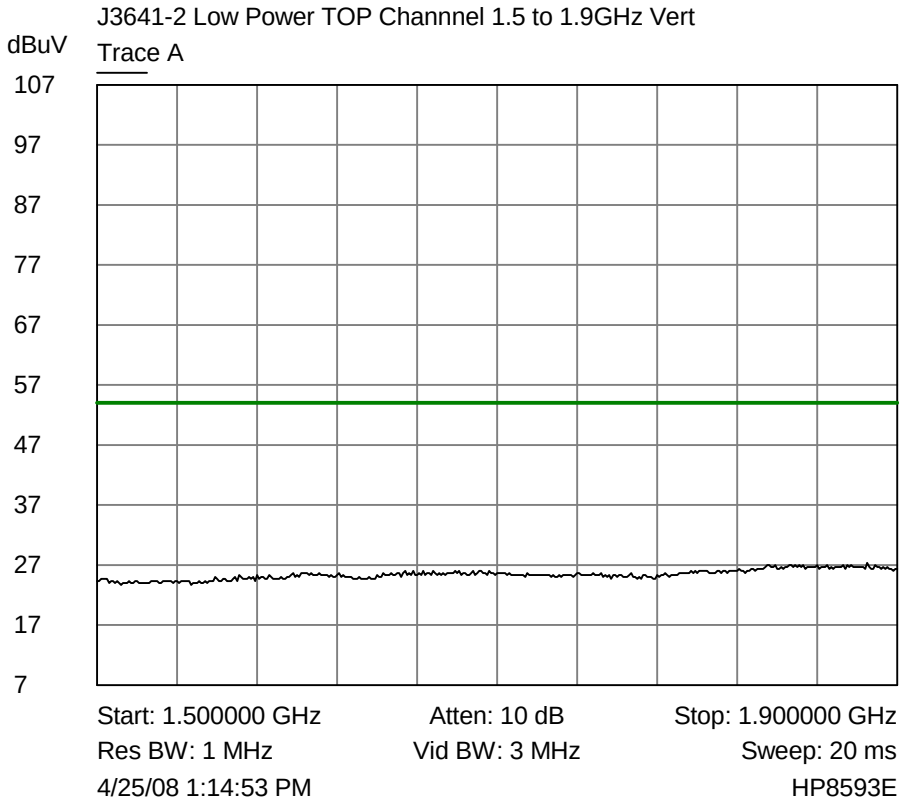
Low Power
Average Values of 1 to 1.5GHz.
Horizontal Polarisation



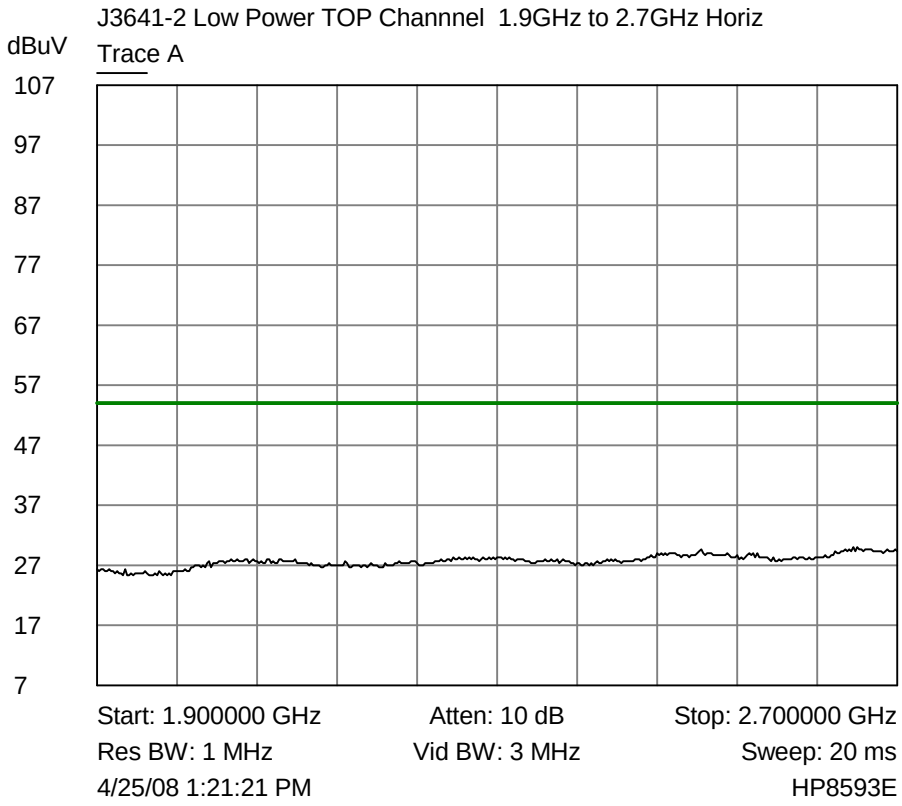
Low Power
Average Values of 1 to 1.5GHz.
Vertical Polarisation



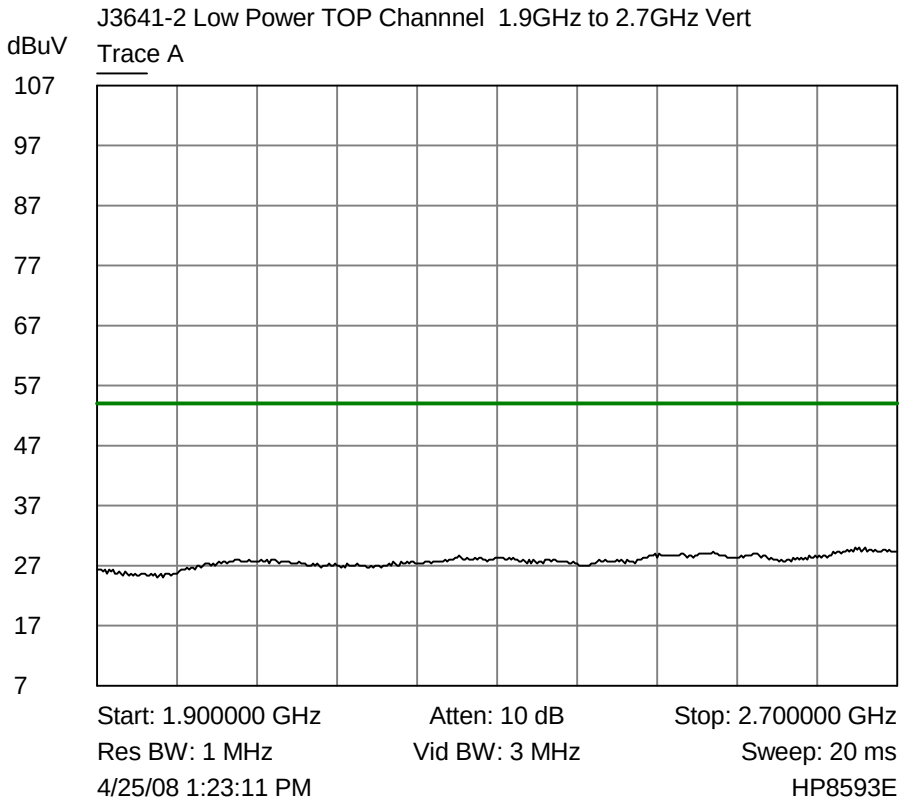
Low Power
Average Values of 1.5 – 1.9 GHz.
Horizontal Polarisation



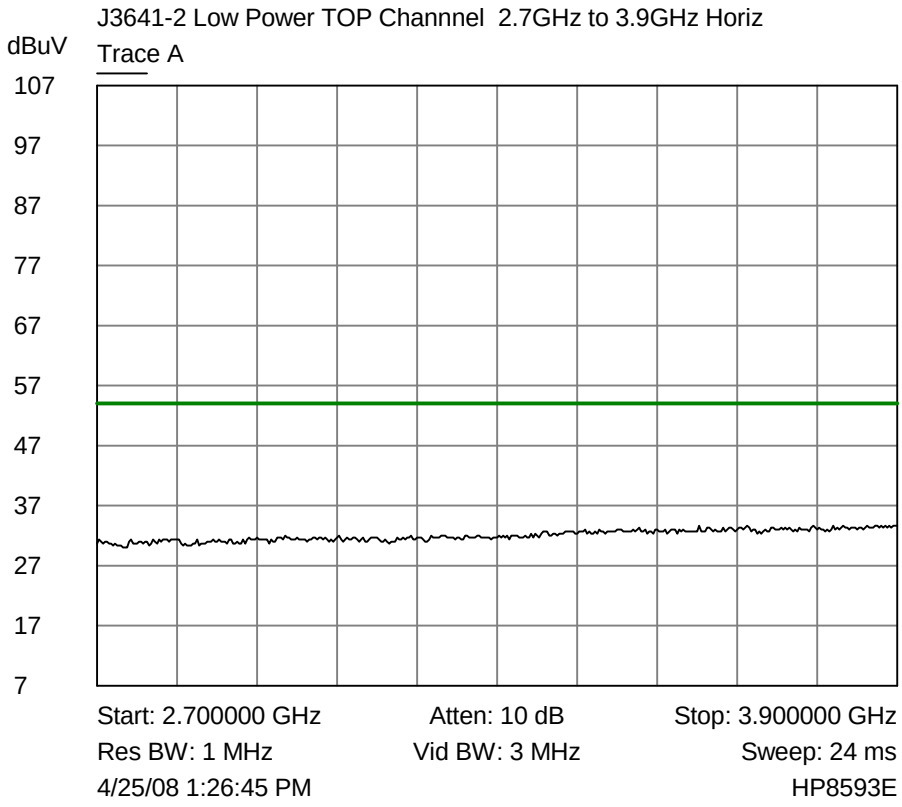
Low Power
Average Values of 1.5 - 1.9 GHz.
Vertical Polarisation



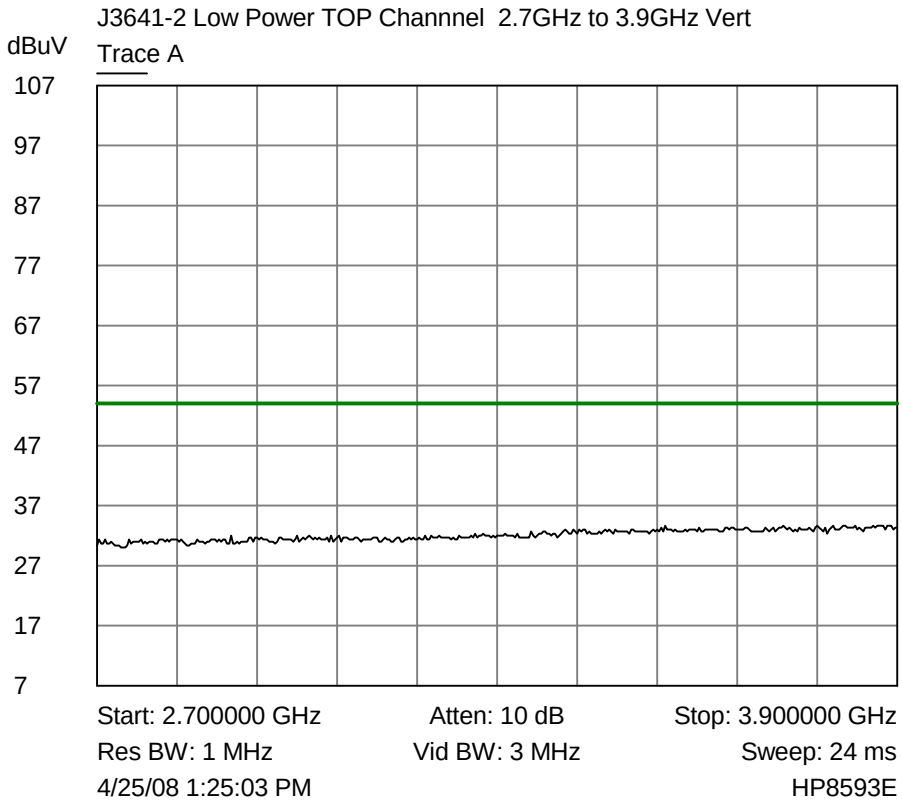
Low Power
Average Values of 1.9 to 2.7 GHz.
Horizontal Polarisation



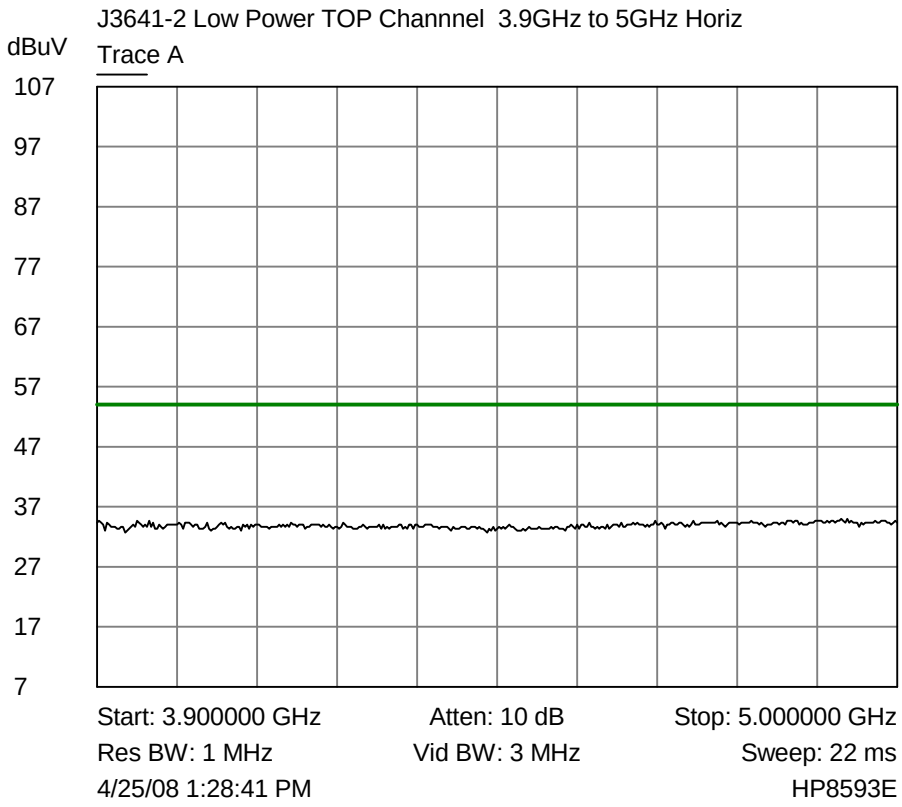
Low Power
Average Values of 1.9 to 2.7 GHz.
Vertical Polarisation



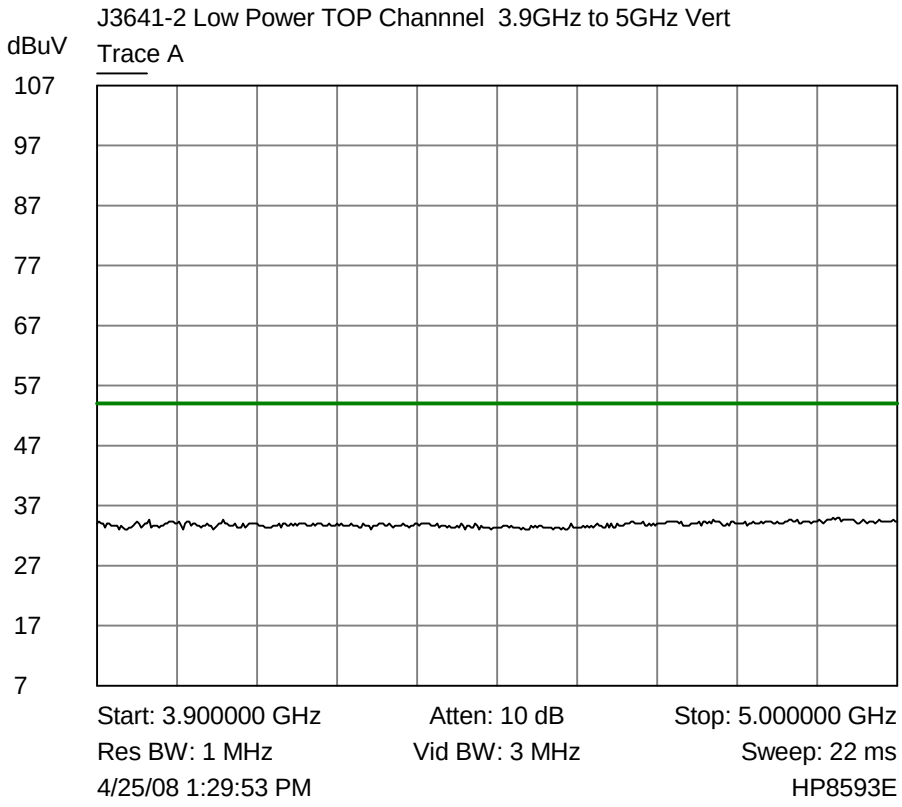
Low Power
Average Values of 2.7 – 3.9 GHz.
Horizontal Polarisation



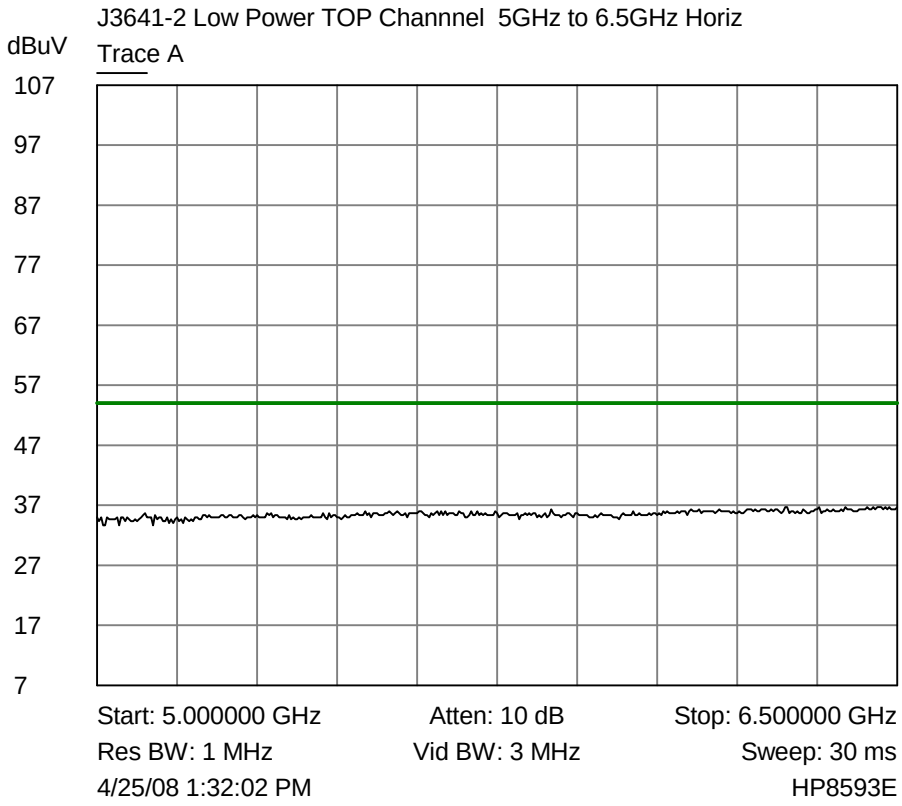
Low Power
Average Values of 2.7 – 3.9 GHz.
Vertical Polarisation



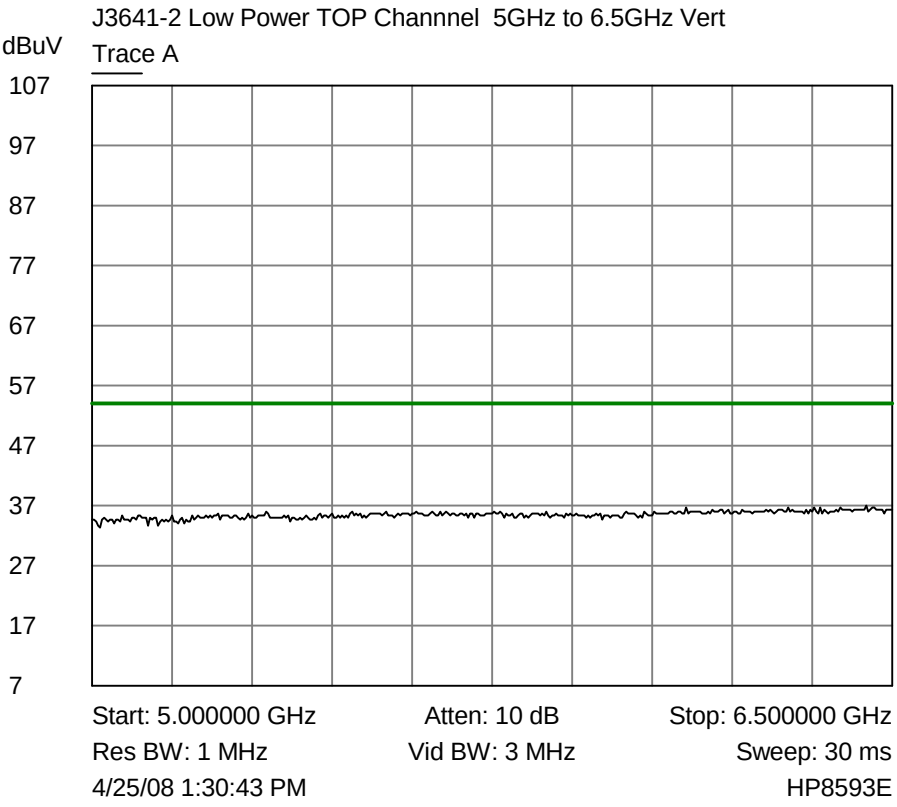
Low Power
Average Values of 3.9 - 5 GHz.
Horizontal Polarisation



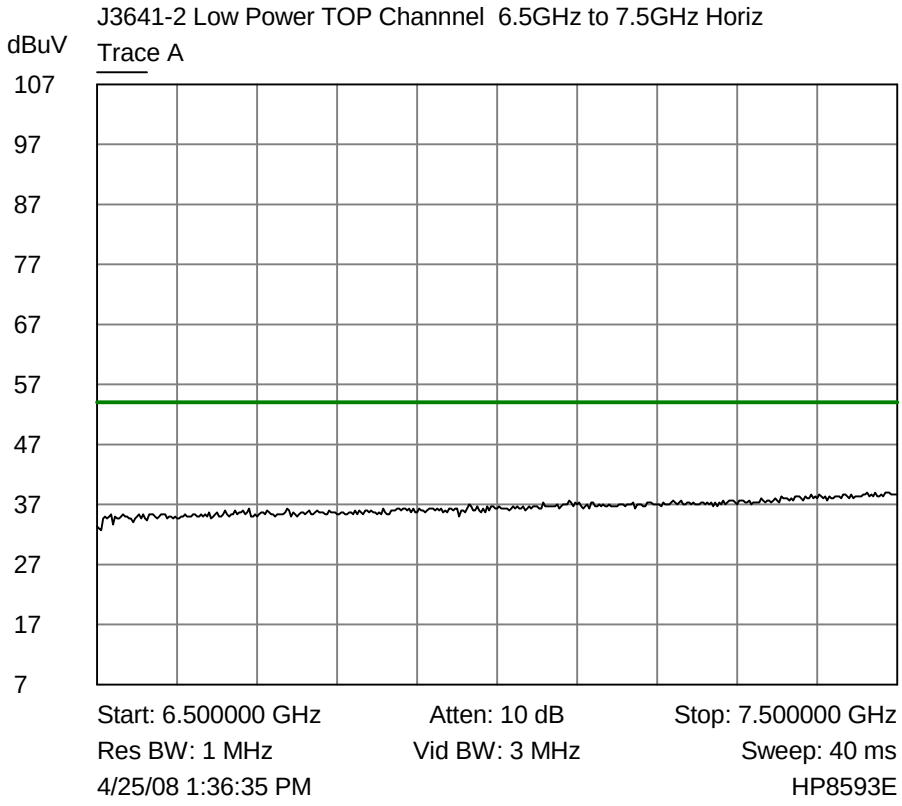
Low Power
Average Values of 3.9 - 5 GHz.
Vertical Polarisation



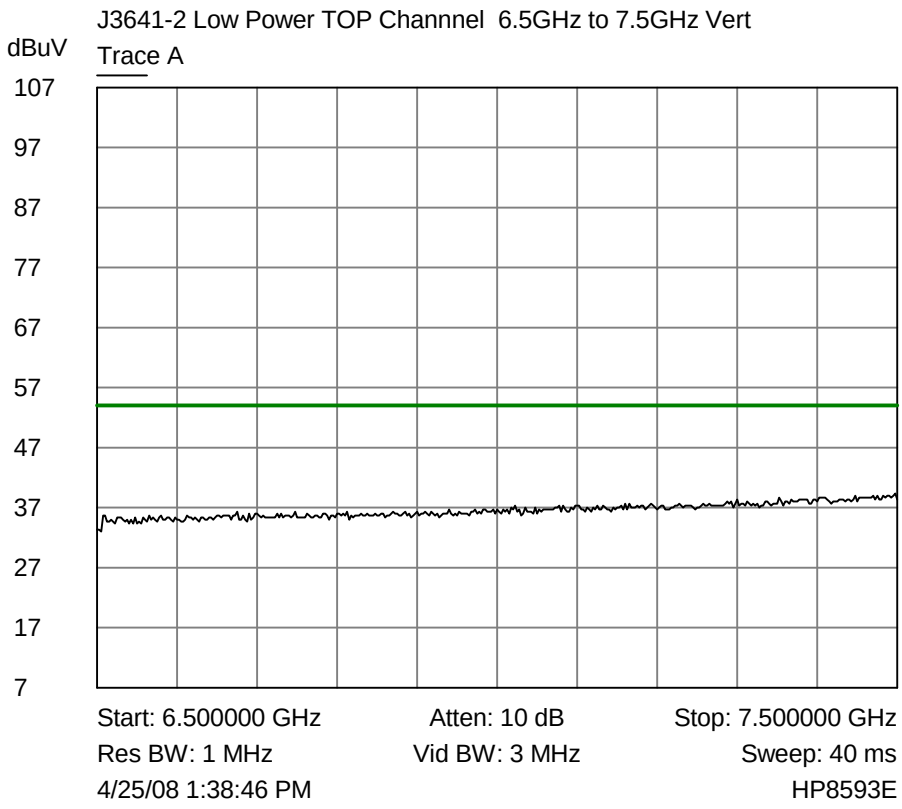
Low Power
Average Values of 5 – 6.5 GHz.
Horizontal Polarisation



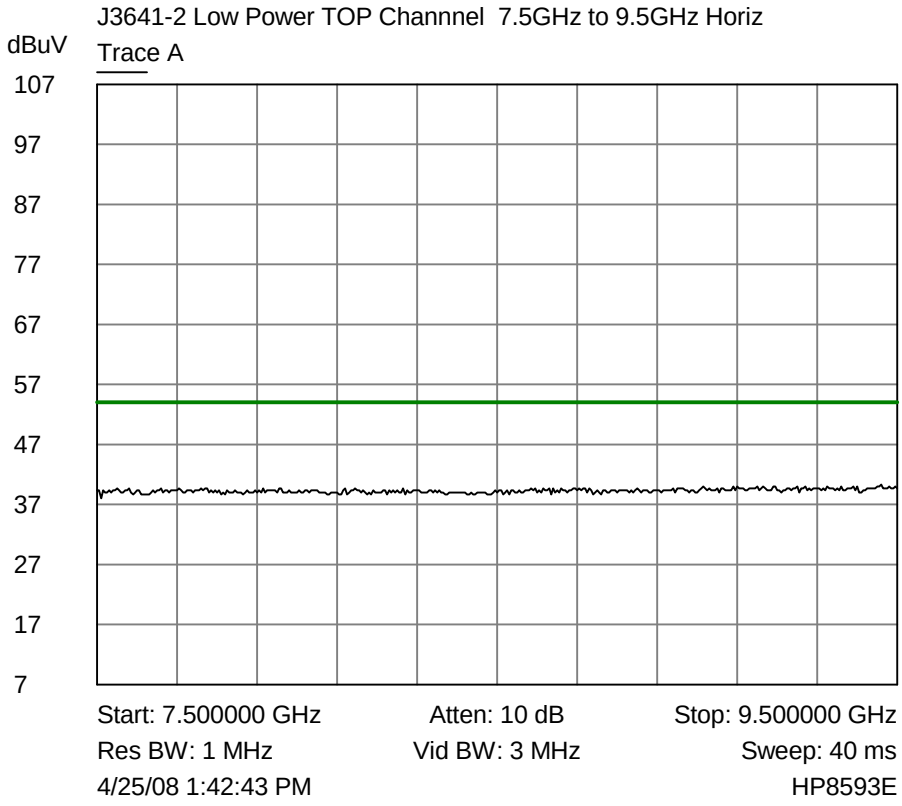
Low Power
Average Values of 5 – 6.5 GHz.
Vertical Polarisation



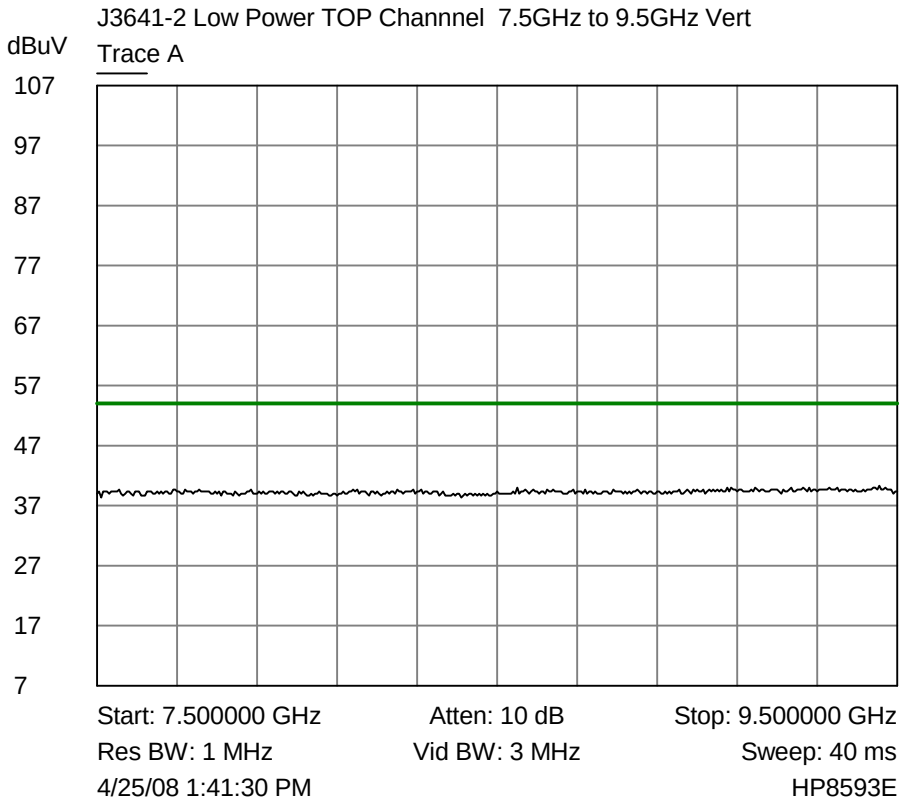
Low Power
Average Values of 6.5 – 7.5 GHz.
Horizontal Polarisation



Low Power
Average Values of 6.5 – 7.5 GHz.
Vertical Polarisation



Low Power
Average Values of 7.5 – 9.5 GHz.
Horizontal Polarisation



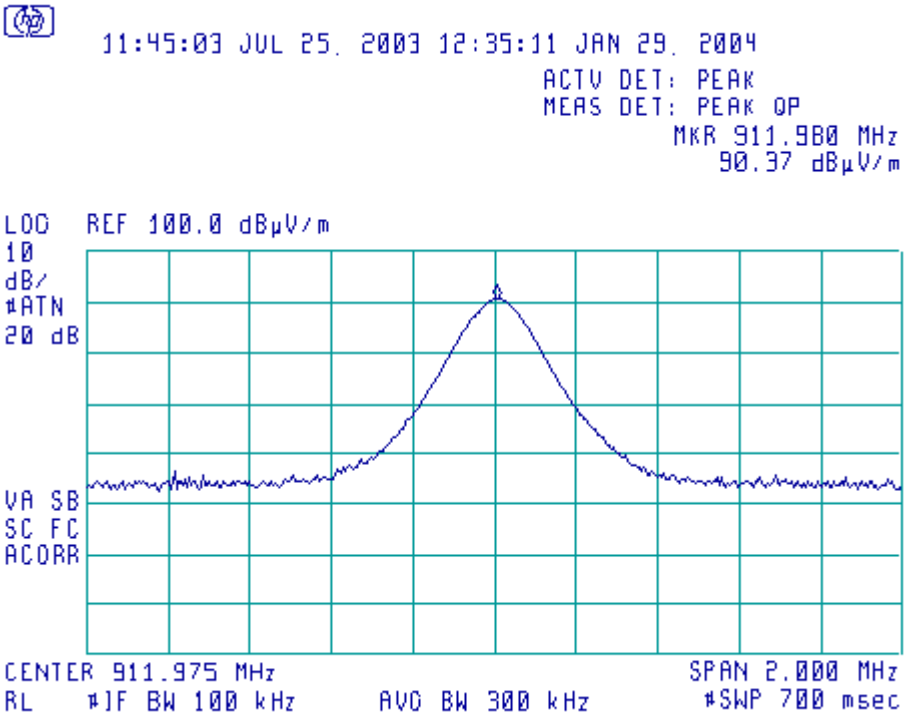
Low Power
Average Values of 7.5 – 9.5 GHz.
Vertical Polarisation

Table of signals Between 1GHz to 9.5GHz

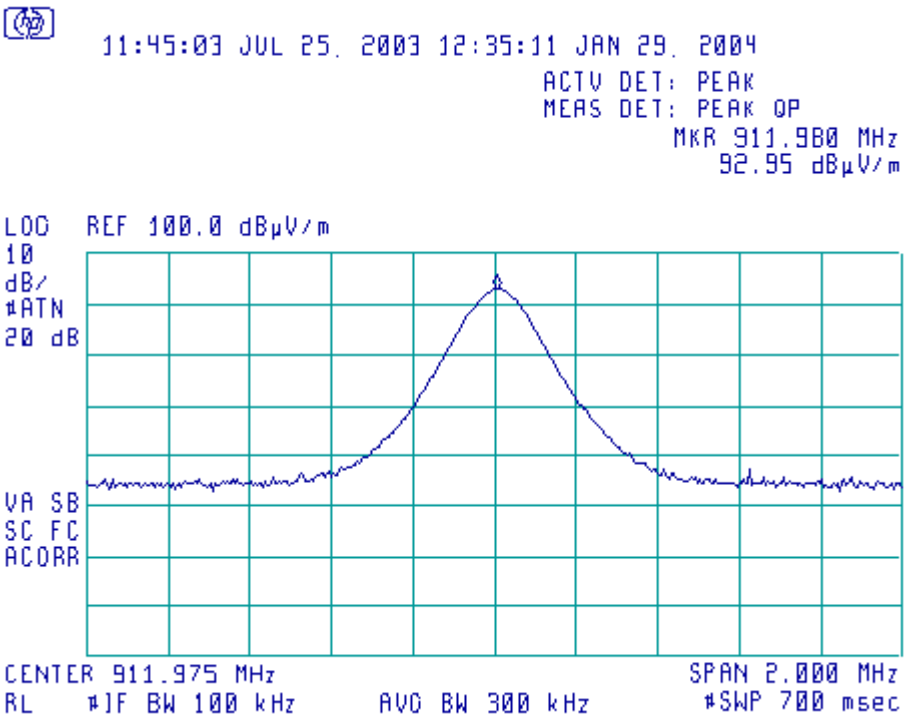
All worst case, top channel:

Frequency/GHz	Vertical/dBuV	Horizontal/dBuV
1.20075	-	38.43

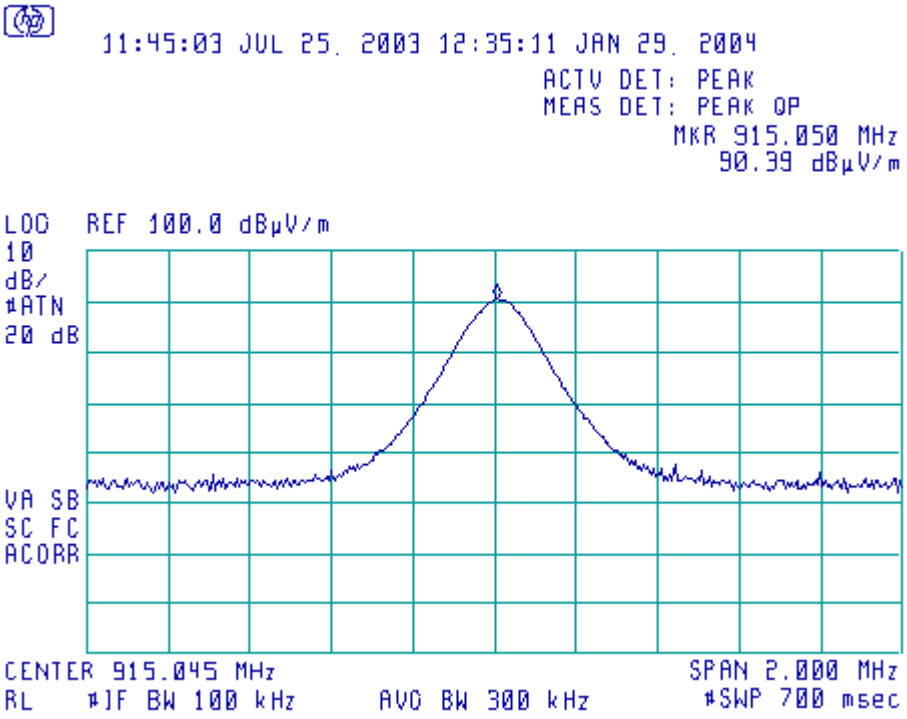
6.3 Fundamental Emissions / 20dB Bandwidth



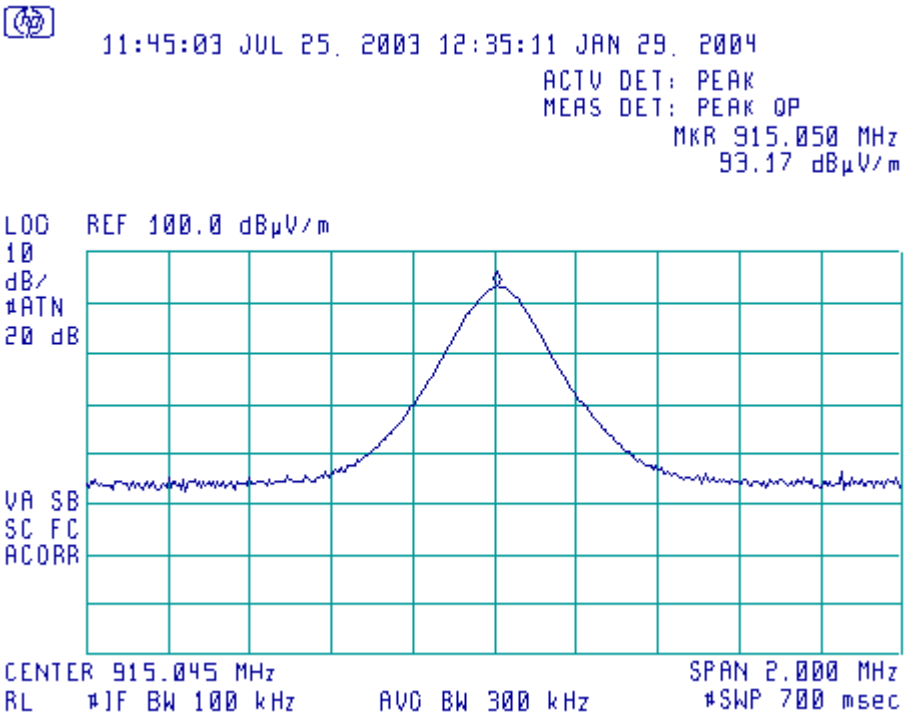
Low Power Horiz BOT Chan 230V 60Hz



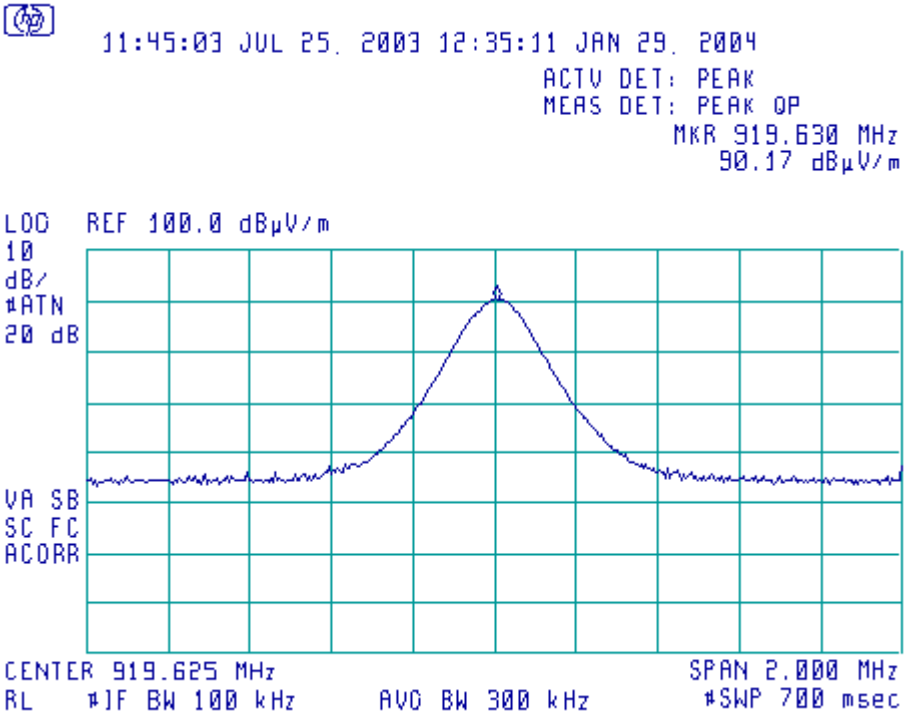
Low Power VERT BOT Chan 230V 60Hz



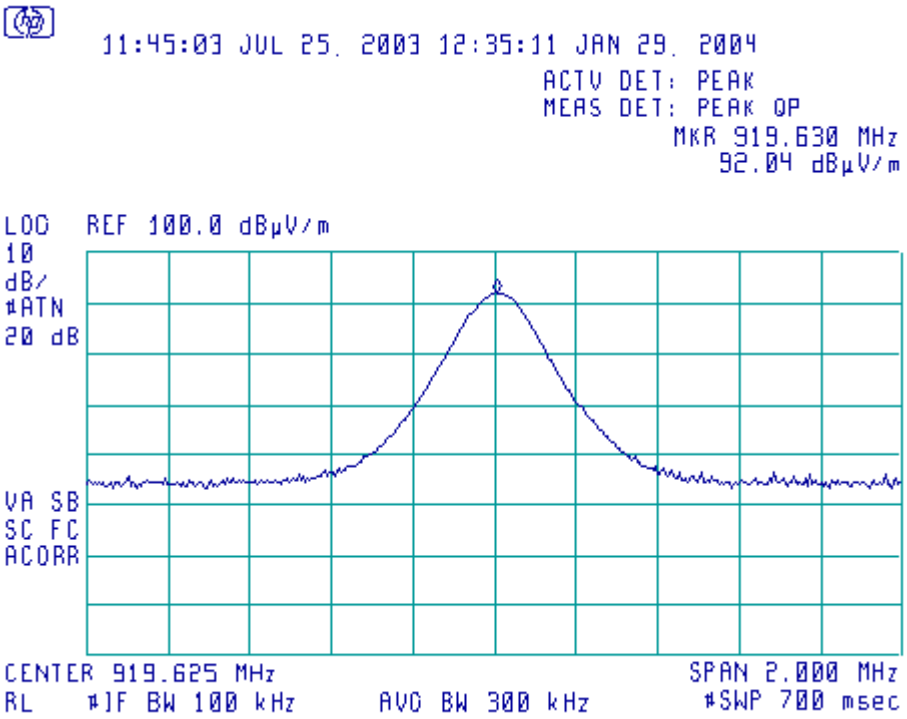
Low Power Horiz Mid Chan 230V 60Hz



Low Power VERT Mid Chan 230V 60Hz



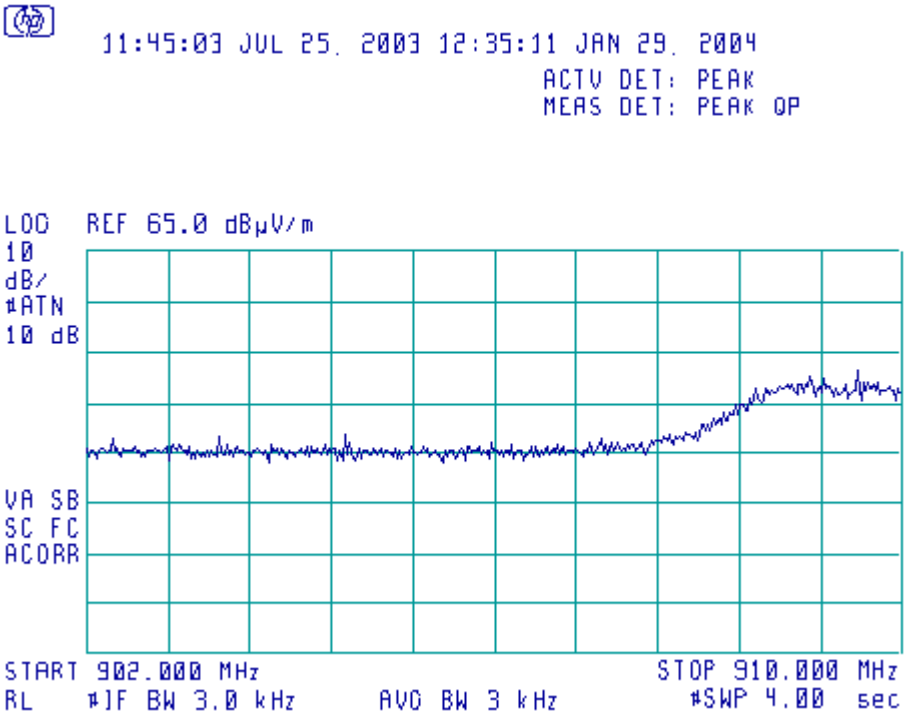
Low Power Horiz TOP Chan 230V 60Hz

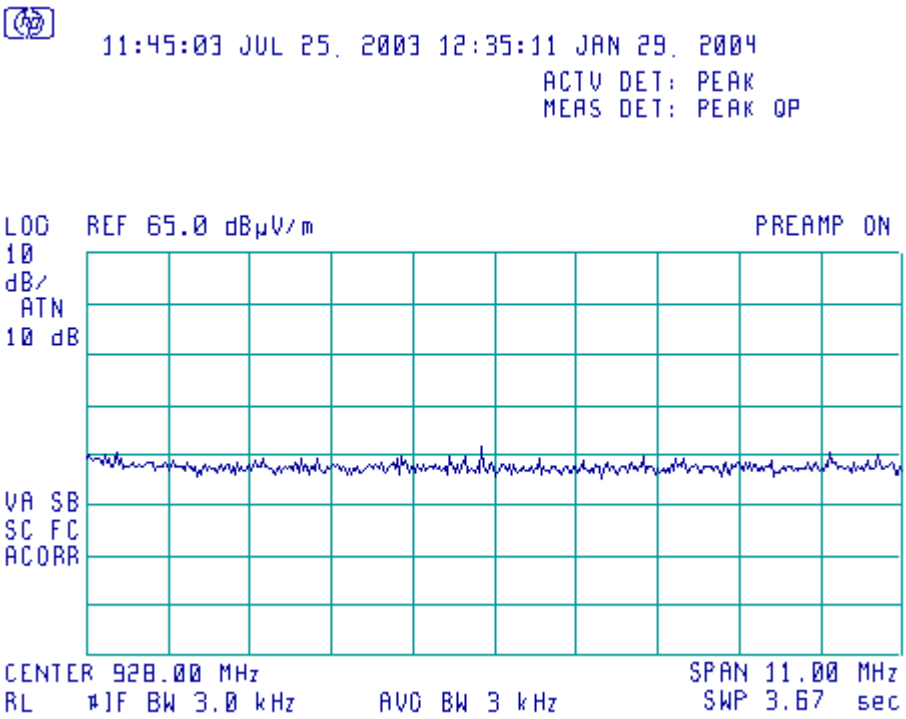


Low Power VERT TOP Chan 230V 60Hz

6.4 Band Edge Emission Plots

Limit 216 - 960 MHz (outside of 902 - 928MHz) is 200uV/m @ 3m = 46dBuV/m on the plots.





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.

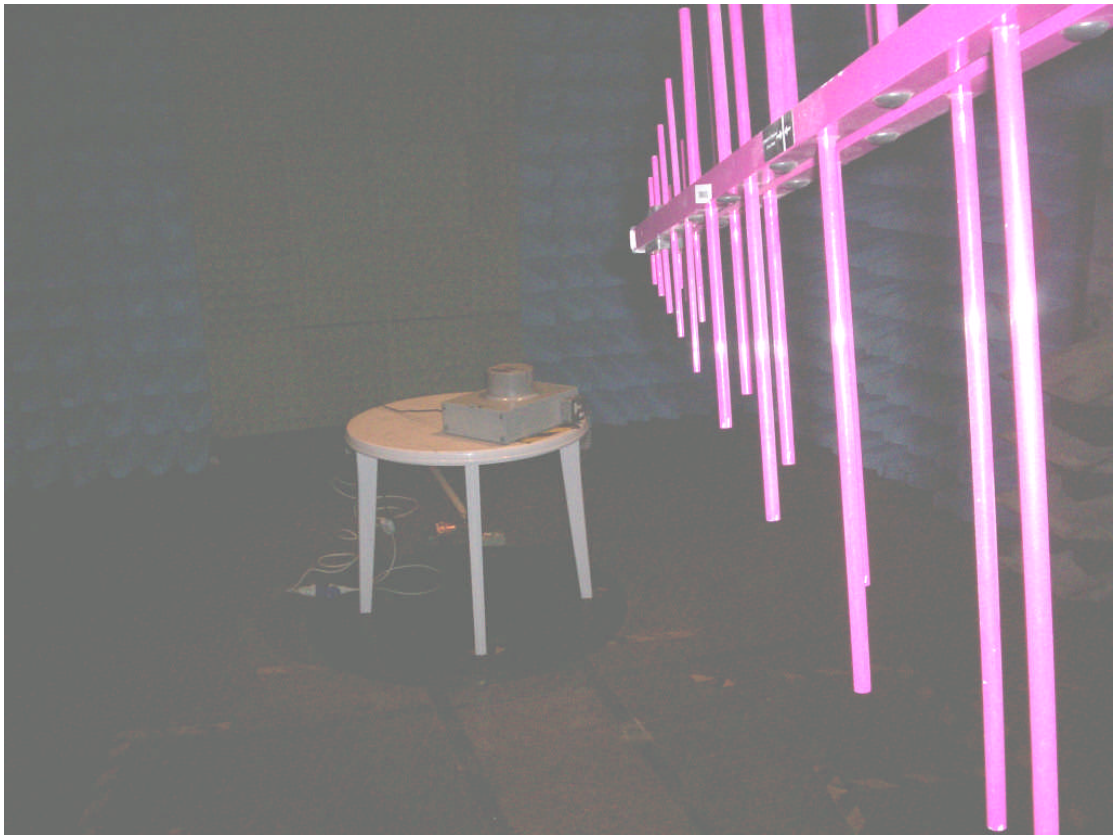
7.2 Explanation of limit line calculations for radiated measurements

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:

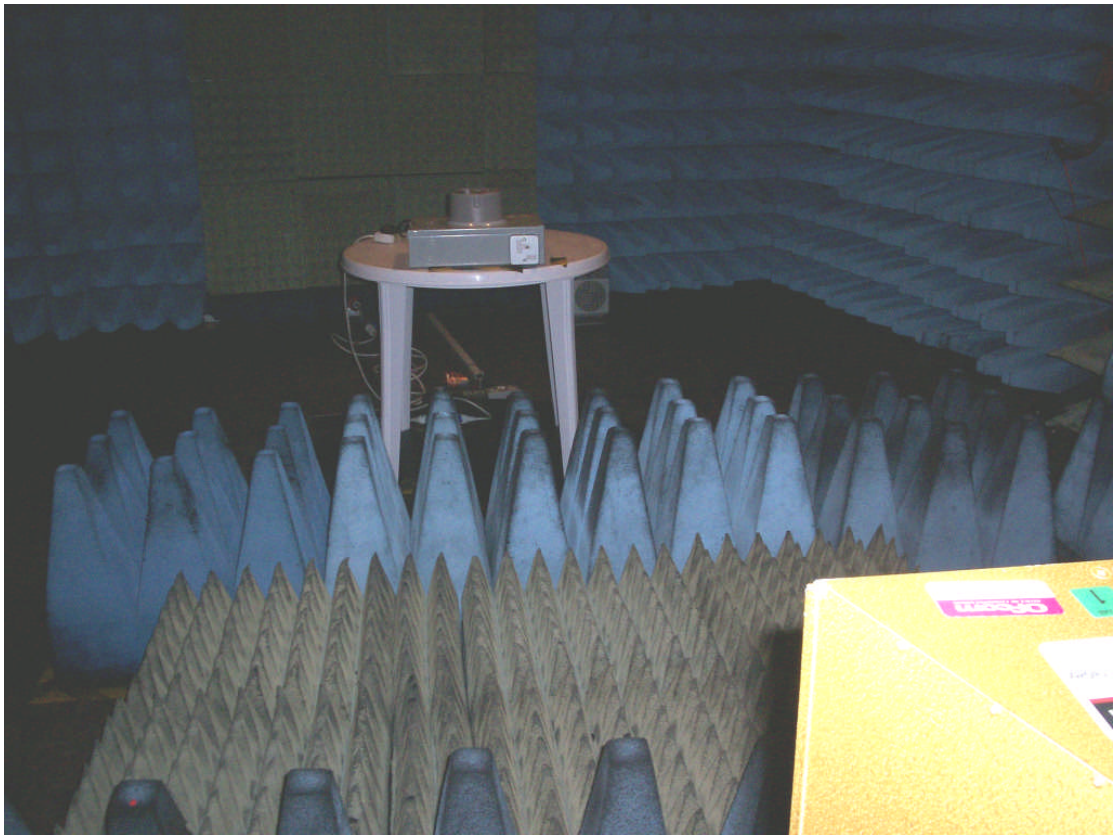
(a) limit of 500 µV/m equates to 20.log (500) = 54 dB µV/m.

(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, 30MHz - 1GHz.



Photograph of the EUT as viewed from in front of the antenna, site M, above 1GHz.

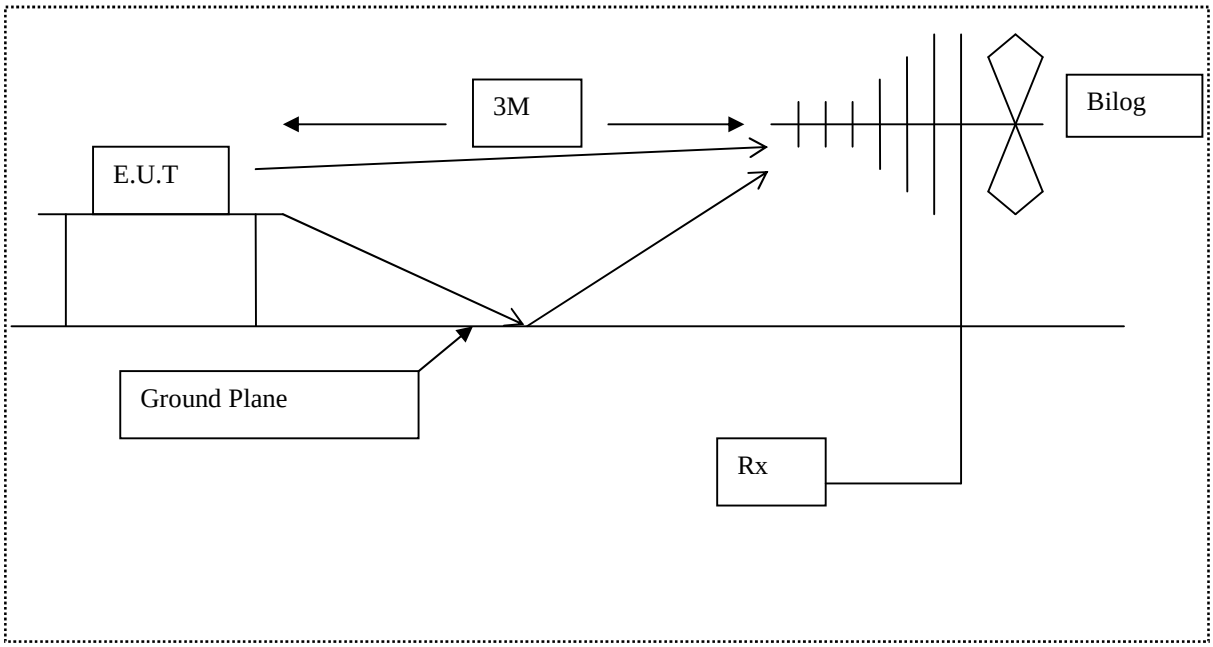


Diagram of the radiated emissions test setup.

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

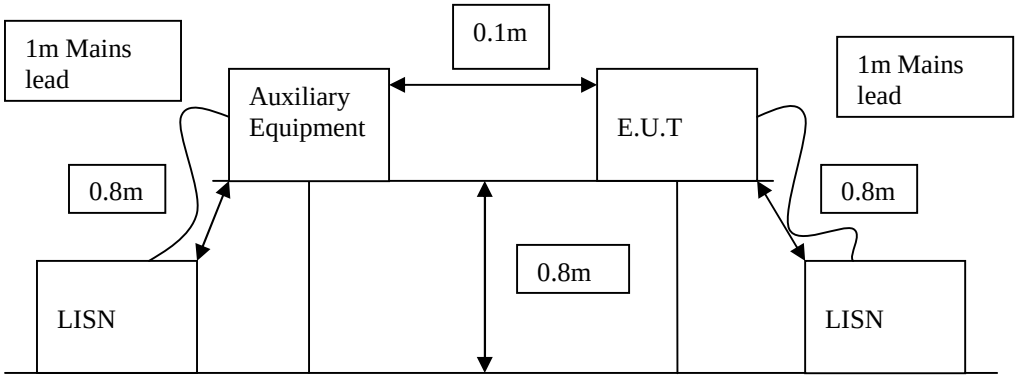
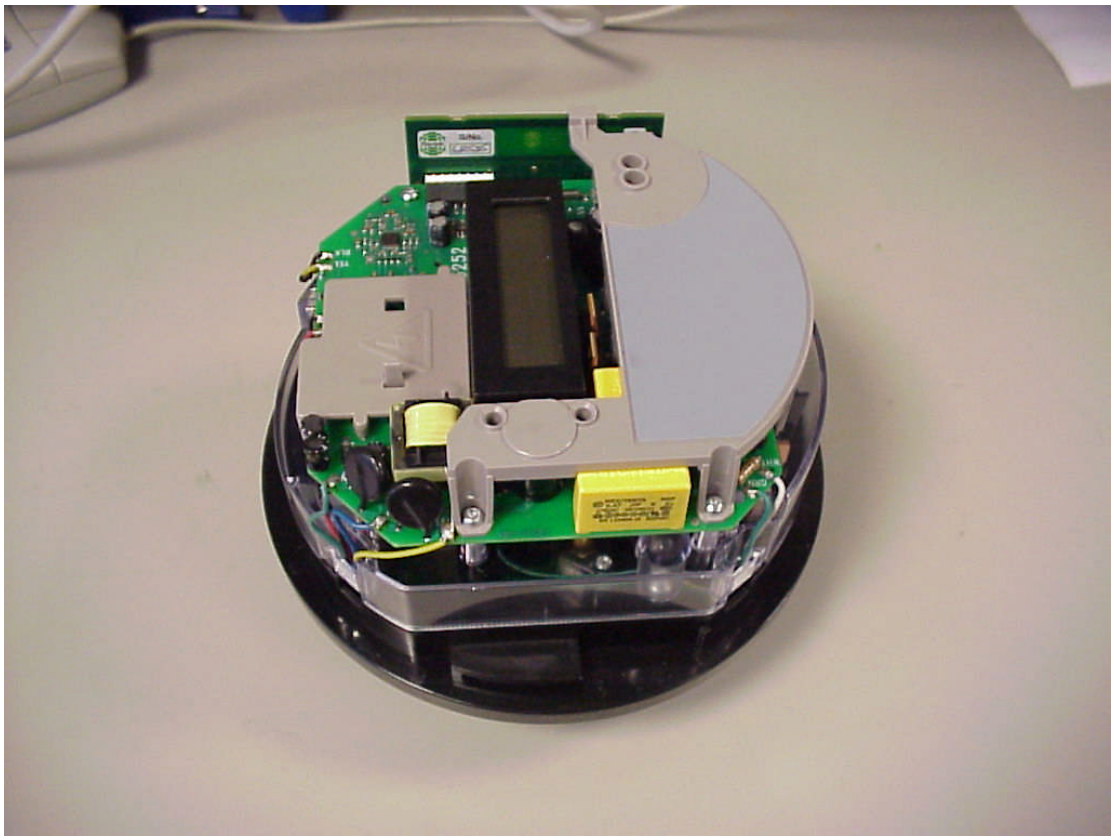
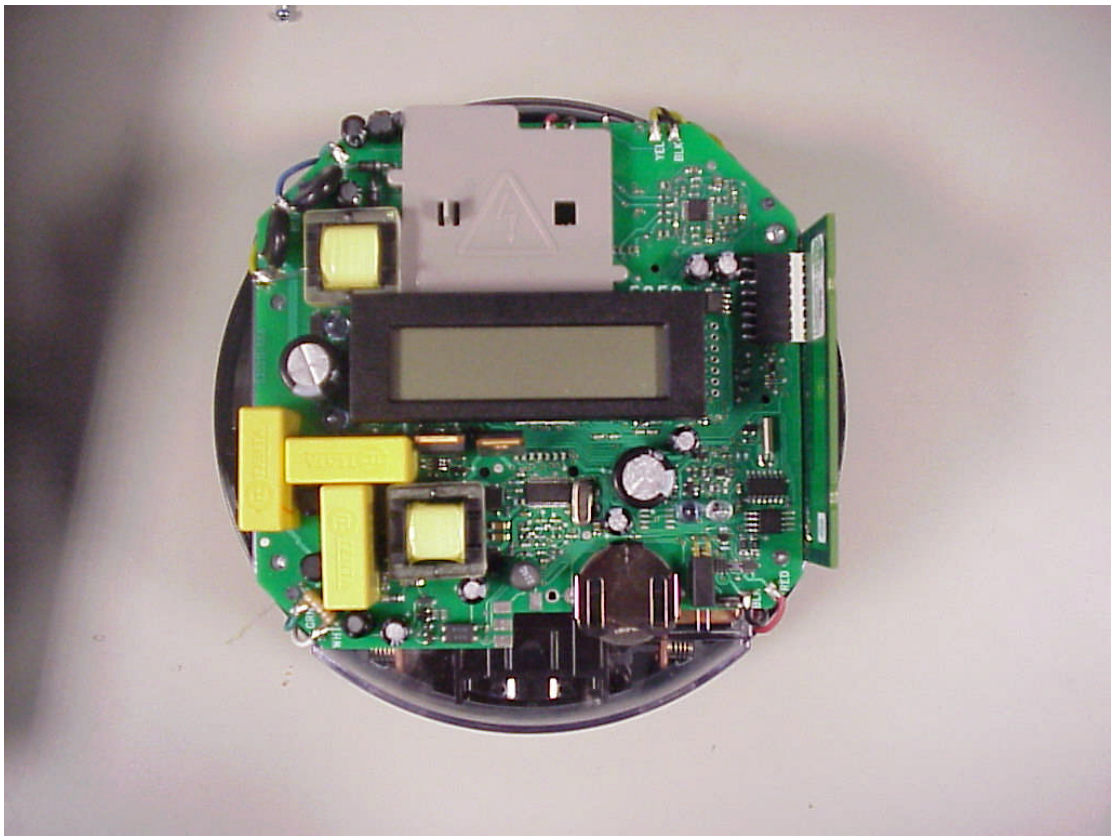


Diagram of the conducted emissions test setup.

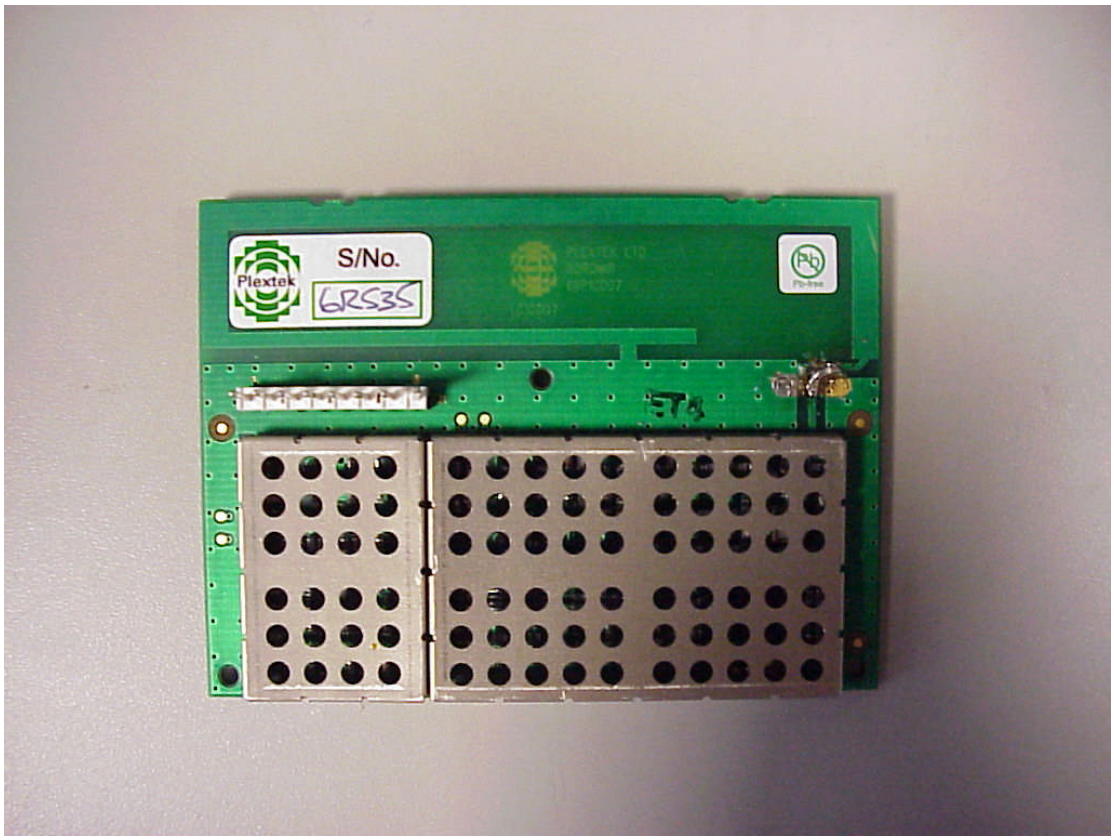
Identifying Photograph of EUT



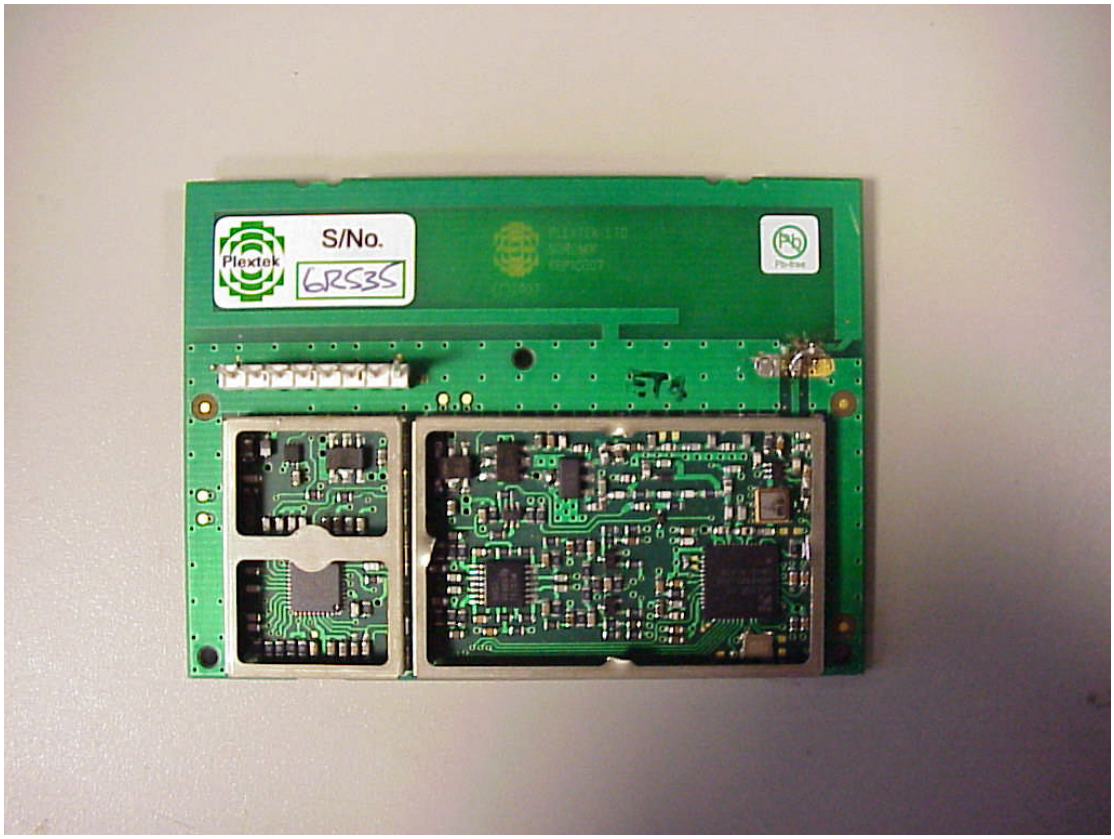
Internal Photograph of EUT controller

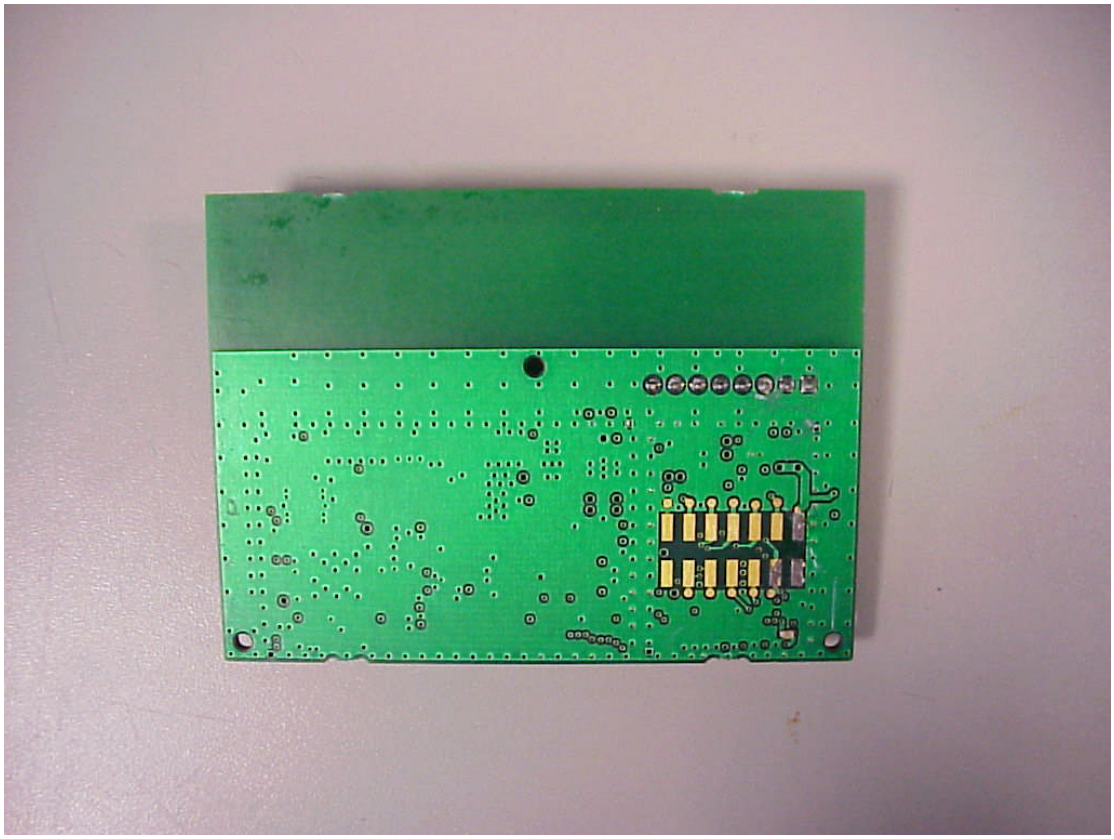


Internal Photograph of EUT Radio



PCB Photograph of EUT RF module





PCB Photograph of EUT RF module

9. Signal Leads

Port Name	Cable Type
Mains Input	3 Core

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
E1	HP8542E	EMI Receiver & RF Filter	Hewlett Packard	13-Nov-07	12
E10	MN2050	LISN 13A	Chase	04-Sep-07	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
E242	22102	Bandpass filter 7.8 - 16 GHz	Merimec	N/A	N/A
E268	BHA 9118	1-18 GHz Horn Antenna	Schaffner	26-May-06	60
E3	HP8593E	Spectrum Analyser	Hewlett Packard	20-Sep-06	24
E319	H-34-2720-01	Transmit Filter 1.5-2.0 GHz	The Marconi Company Ltd	N/A	N/A
E328	564230-001	Notch Filter 915 MHz	BRF	N/A	N/A
E35	HP11947A	Transient Limiter + 10dB Atten.	Hewlett Packard	18-Jan-08	6
N438	3513 172 1208	3.9 - 7.5 GHz BPF	MEL	N/A	N/A
TMS81	6502	Active Loop Antenna	EMCO	11-Dec-07	24
TMS82	8449B	Pre Amplifier 1 - 26 GHz	Agilent	26-Oct-07	12
TMS933	CBL6141A	Bilog Antenna 30MHz - 2GHz	York EMC	10-Sep-07	36
TMS938	NSG1007	3kV AC Power Source	Schaffner	12-Feb-08	24

11. Auxiliary equipment

11.1 Auxiliary equipment supplied by Plextek LTD

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

NONE.

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

NONE.

12. Modifications

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

NONE.

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:

Not applicable.
Device to be Certified.

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 FCC part 15, subject to deviations as detailed in this report.

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:	Ampy 5252
Model Number(s):	Not Available
Unique Serial Number(s):	5252A02604-010208 including 6R535(Radio)
Manufacturer:	Ampy Metering Ltd
Applicant:	Plextek Ltd
Customer Purchase Order Number:	P000058841
R.N. Electronics Limited Report Number:	04-254/3641/1/08 and 04-258/3641/2/08
Test Standards:	FCC Part 15C: effective date October 2007 Class **DSS** Intentional Radiator and Class **DXX** Intentional Radiator
Date:	24/04/08

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: 2008.06.26 09:16:41 Z

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