TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: IPWireless (UK) Ltd.
2.5 GHz V4 Node B Model RK1/RC

To: FCC Part 27

Test Report Serial No:
RFI/MPTE2/RP47702JD01A

Supersedes Test Report Serial No:
RFI/MPTE1/RP47702JD01A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Raul Recio 	**Checked By: Tony Henriques** 
Report Copy No: **PDF01**	
Issue Date: 01 December 2005	**Test Dates: 11 October 2005 to 17 October 2005**

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RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901

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1. Client Information

Company Name:	IPWireless (UK) Ltd.
Address:	Unit 7 Greenways Business Park Bellinger Close Chippenham Wiltshire SN15 1BN
Contact Name:	Mr P Warburg

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification of Equipment Under Test (EUT)

Description:	2.5GHz V4 Node B Radio Shelf
Brand Name:	IPWireless
Model Number:	RK1
Serial Number:	RK1B437000218
FCC ID Number:	PKTNODEBRK
Country of Manufacture:	UK
Date of Receipt:	11 October 2005

Description:	V4C Node B Digital Shelf
Brand Name:	IPWireless
Model Name or Number:	RC
Serial Number:	RC1A451000210
Country of Manufacture:	UK
Date of Receipt:	11 October 2005

2.2. Description of EUT

The equipment under test is a wireless broadband base station. The base station provides high speed internet access networks.

2.3. Modifications Incorporated in EUT

During the course of testing the EUT was not modified.

2.4. Additional Information Related to Testing

Power Supply Requirement:	-48 VDC		
Intended Operating Environment:	Residential, Commercial and Light industry		
Equipment Category:	Miscellaneous Wireless Communications Services		
Type of Unit:	Wireless Broadband Base Station		
Chip Rate:	High: 7.68 Mcps; Low : 3.84 Mcps		
Transmit Frequency Range:	High Chip Rate: 2506 MHz to 2680 MHz Low Chip Rate: 2503 MHz to 2683 MHz		
Transmit Channels Tested: **(High Chip Rate: 7.68 Mcps):**	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	N/A	2506.0
	Middle	N/A	2596.0
	Top	N/A	2680.0
Transmit Channels Tested: **(Low Chip Rate: 3.84 Mcps)**	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	N/A	2503.0
	Middle	N/A	2596.0
	Top	N/A	2683.0
Highest Fundamental Frequency:	2683.0 MHz		
Maximum Rated Power Output:	7.68 Mcps Chip Rate: 37 dBm per 11 MHz channel 3.84 Mcps Chip Rate: 40 dBm per 5.5 MHz channel		

2.5. Port Identification

Port	Description	Type/Length
1	Tx/Rx Antenna Port x2	Coaxial RF Port
2	Ethernet Port x 1	10m / Shielded Twisted Pair
3	E1/T1 Port x 4	10m / Shielded Twisted Pair
4	E3/T3 Port x 2	10m / Shielded Twisted Pair
5	Serial Port x 1	Not Applicable
6	Alarm Interface x 2	5m / Shielded Pairs
7	GPS Interface x 2	Not Applicable
8	LNA Port x 3	10m / Shielded Twisted Pair
9	I/O & Clock Interface (1 per radio shelf, 3 per digital shelf [2 unused])	0.5m Shielded
10	CTRL & CPLD Interface (1 per radio shelf, 3 per digital shelf [2 unused])	0.5m Shielded
11	LMT Port x 1	Not Applicable
12	Debug Interface x 1	Not Applicable
13	-48 V DC Input (one per shelf)	10m / Multi-core

2.6. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Laptop PC
Brand Name:	Dell Latitude
Model Name or Number:	PP01X
Serial Number:	CN-03J010-12961-34F-3624
Cable Length and Type:	N/A, not connected during testing
Connected to Port:	N/A, not connected during testing

3. Test Specification, Methods and Procedures

3.1. Test Specifications

Reference:	FCC Part 27: 2004 Section 27.53(l)
Title:	Code of Federal Regulations, Part 27 (47CFR) Subpart C Miscellaneous Wireless Communications Services

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003
Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

None.

5. Operation of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated.

Preliminary radiated spurious emissions pre-scans were performed in both high and low chip rate modes (3.84 Mcps and 7.68 Mcps) on the top, middle and bottom channels of each chip rate. Final measurements were then performed if emissions were identified.

The measurement was performed with the EUT transmitting at full power for 10 of the 15 time slots (the maximum allowable number of time slots that can be used for transmit when the equipment is operating normally i.e. the worst case mode of operation).

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

Radio shelf and digital shelf connected and supplied via a -48V DC supply with ports terminated as shown in the radiated emissions set up photograph.

The antenna ports of the EUT were terminated with 50 Ohm loads whilst the following ports were terminated with cables: Ethernet Port, E1/T1 Ports 1 & 2, E3/T3 Port, both Alarm Interface ports, LNA Port 1, I/O & Clock Interface and CTRL & CPLD Interface for Shelf 1

6. Summary of Test Results

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Transmitter Radiated Emissions	CFR 47: 2004 FCC Part 2.1053, Part 27.53 (l)	Antenna	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of
RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, England.

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%.
Please refer to section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1. Transmitter Radiated Emissions: Part 2.1053 & Part 27.53(l)

The EUT was configured as for transmitter radiated emission testing as described in section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results: 3.84 Mcps Chip Rate

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-40.8	-13.0	27.8	Complied
2499.990	-41.8	-13.0	28.8	Complied

Middle Channel

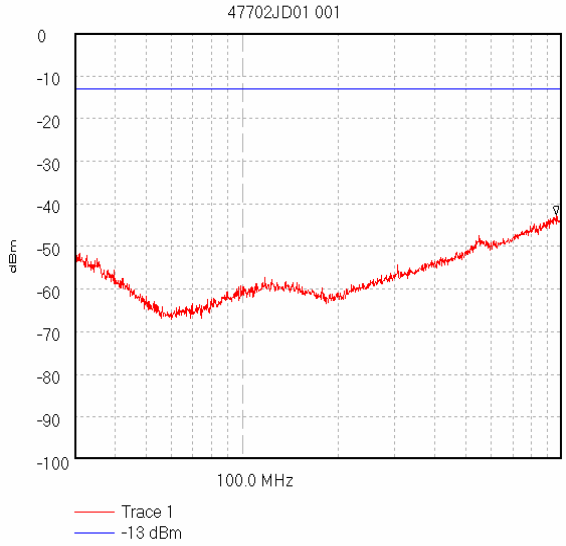
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-41.2	-13.0	28.2	Complied

Top Channel

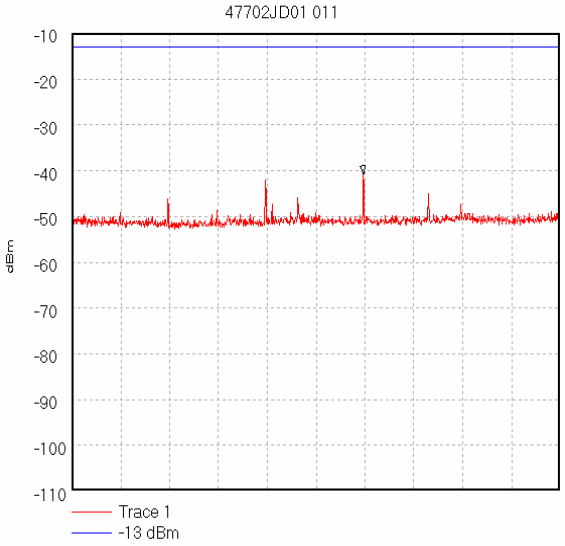
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-40.7	-13.0	27.7	Complied
2686.009	-38.7	-13.0	25.7	Complied

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

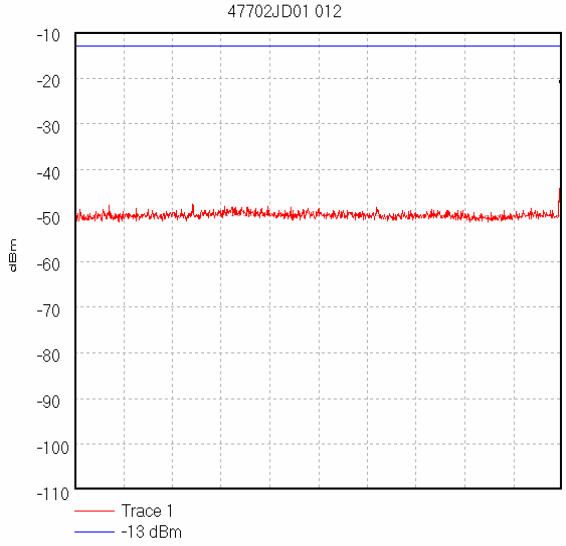
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Bottom Channel (Continued),



Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref 0 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 380.0 mS
Peak 958.047488 MHz, -42.66 dBm
Limit/Mask: ; Limit Test Passed
Transducer Factors: A490
10/11/2005 10:11:04 AM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -40.8 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 11:28:00 AM



Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.5 GHz, -22.49 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
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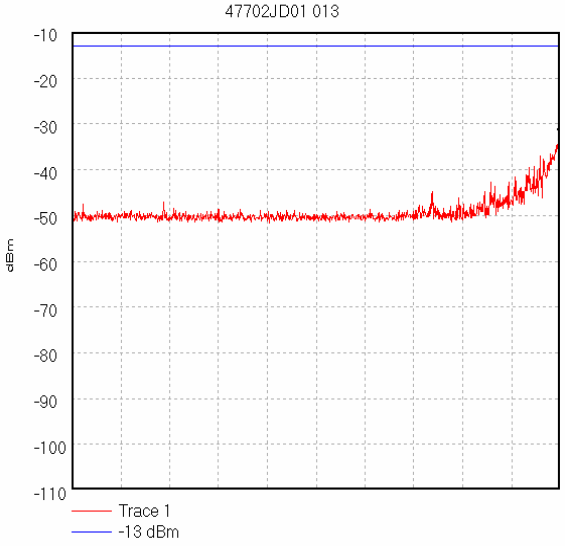
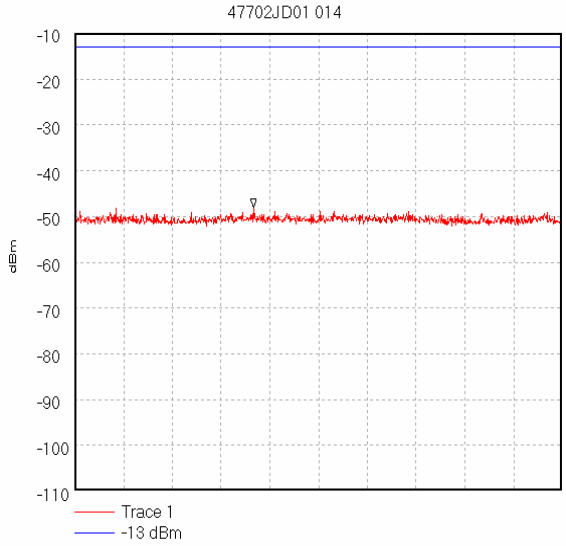
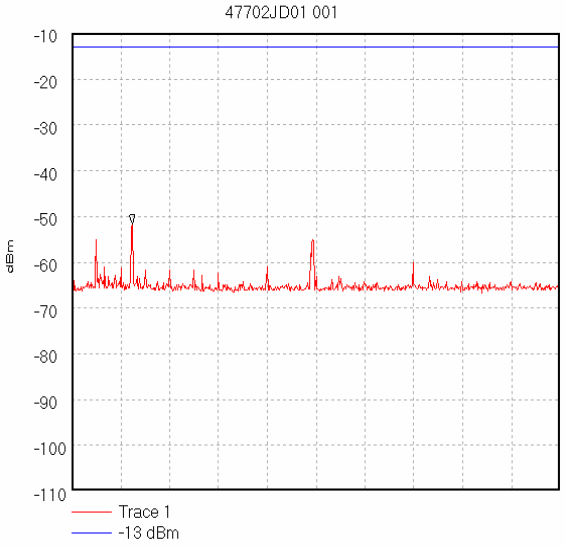


Start 2.49 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.5 GHz, -32.93 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 11:39:05 AM

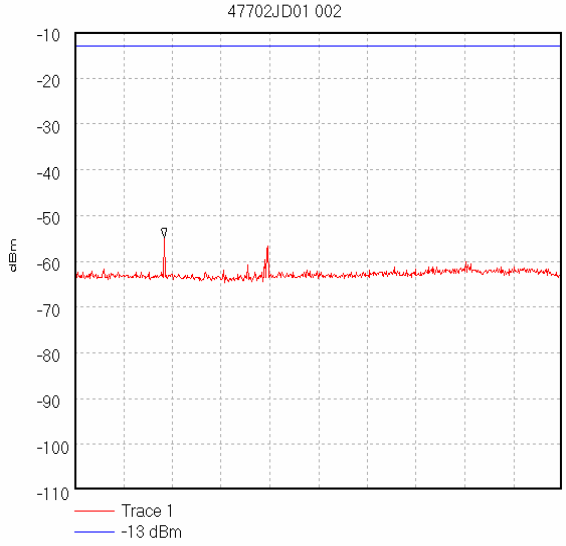
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Bottom Channel (Continued),



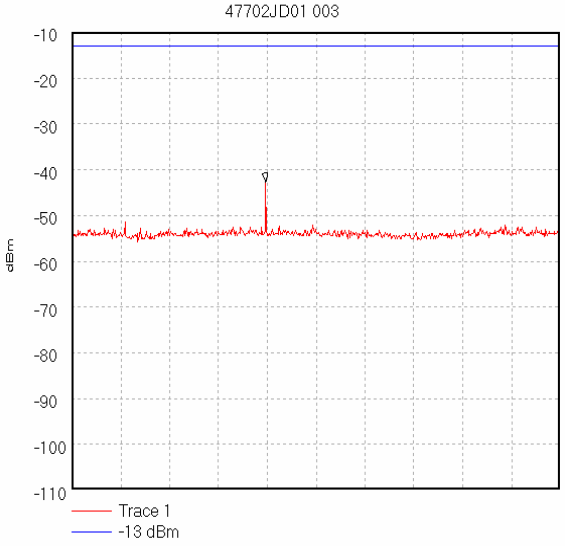
Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.1678 GHz, -48.06 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 11:42:37 AM



Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 50.0 mS
Peak 4.246667 GHz, -51.67 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 10:20:06

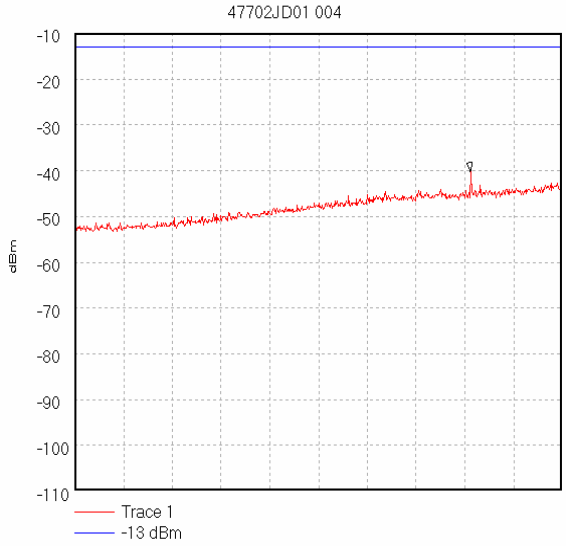


Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 50.0 mS
Peak 6.366667 GHz, -54.83 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 10:27:17

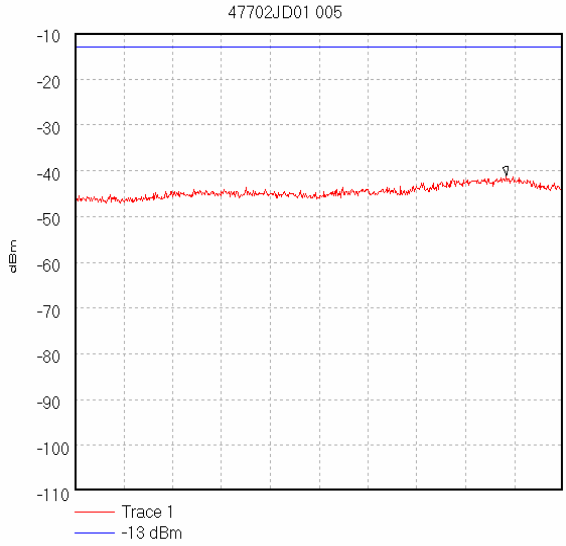


Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 90.0 mS
Peak 9.785 GHz, -42.67 dBm
Display Line: -13 dBm;
Transducer Factors: 12,5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 10:53:30

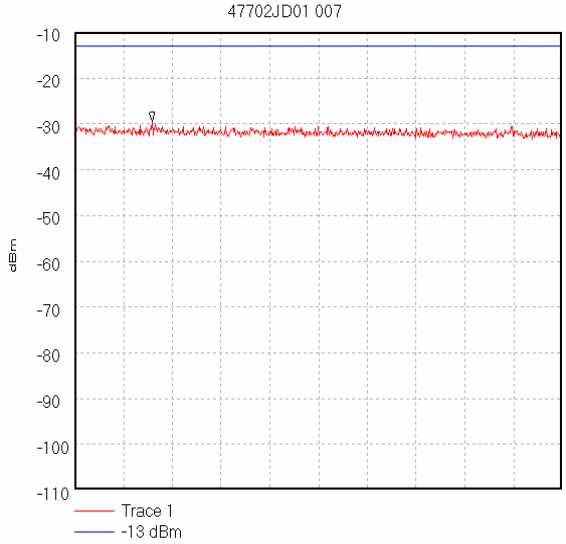
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Bottom Channel (Continued),



Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 110.0 mS
Peak 16.964167 GHz, -40.17 dBm
Display Line: -13 dBm;
Transducer Factors: 12,5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 10:58:33

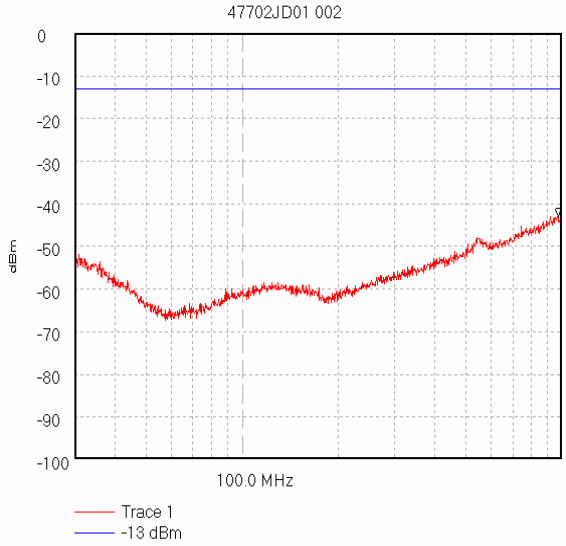


Start 18.0 GHz; Stop 26.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 170.0 mS
Peak 25.508333 GHz, -41.17 dBm
Display Line: -13 dBm;
Transducer Factors: 18-26,5_Horn(@0,5m,3m_cable,A1534)
17/10/2005 11:15:28

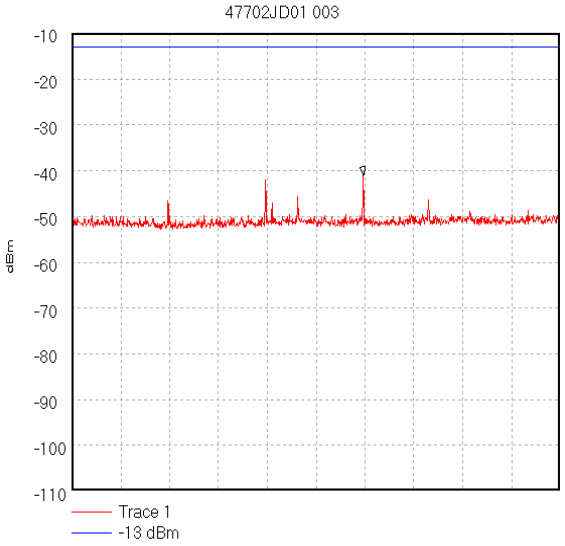


Start 26.5 GHz; Stop 27.0 GHz
Ref -10 dBm; Ref Offset -17.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 20 dB; Swp 50.0 mS
Peak 26.579167 GHz, -29.5 dBm
Display Line: -13 dBm;
Transducer Factors: 26,5-40G
17/10/2005 11:45:45

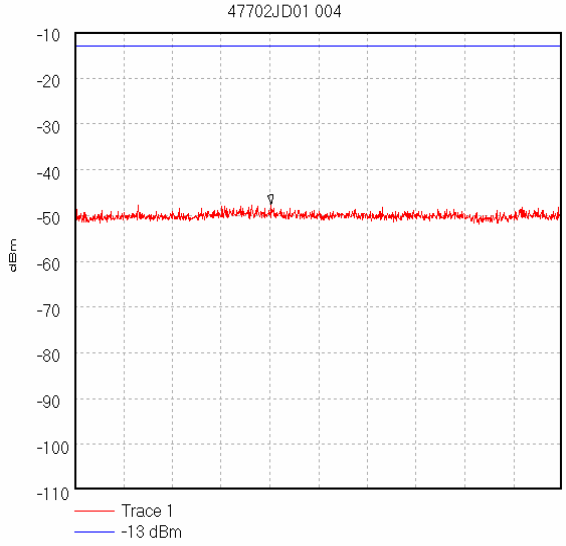
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Middle Channel (Continued),



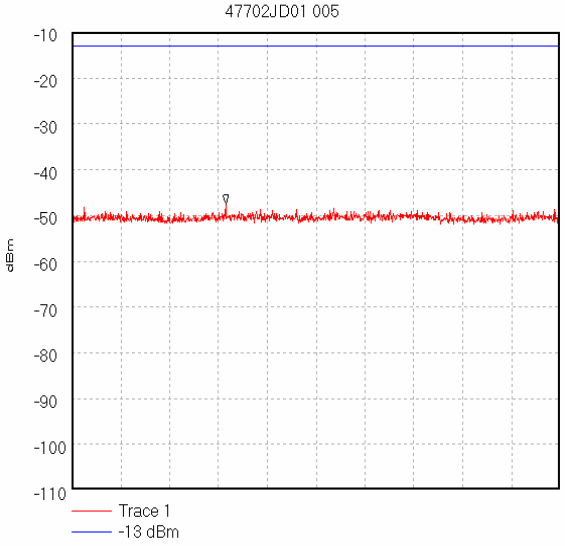
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref 0 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 80.0 mS
Peak 973.095488 MHz, -42.99 dBm
Limit/Mask: ; Limit Test Passed
Transducer Factors: A490
10/11/2005 10:23:55 AM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -41.15 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 10:37:54 AM



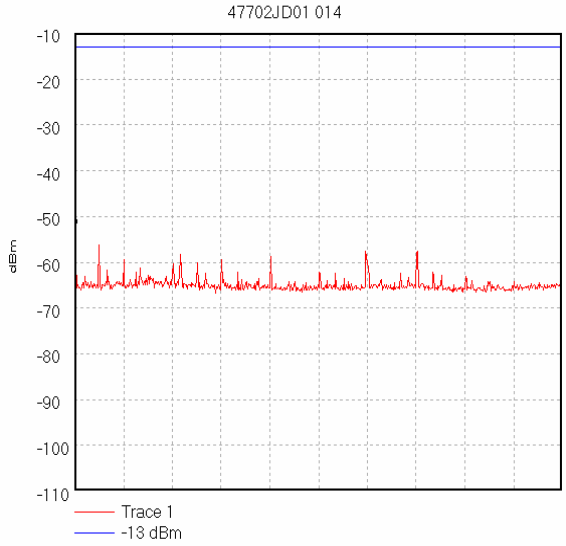
Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.201667 GHz, -47.48 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 10:44:37 AM



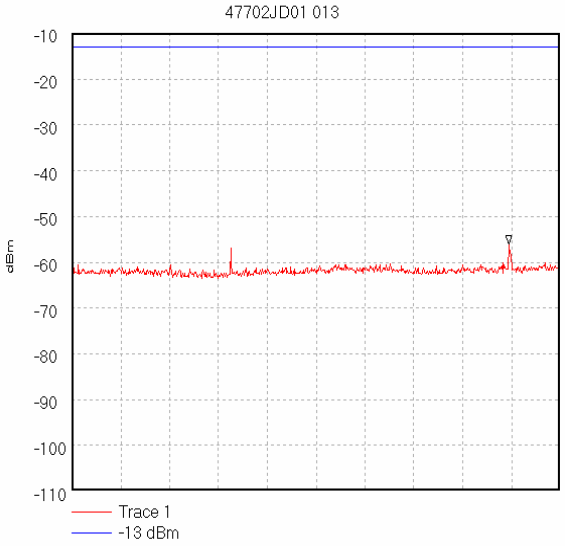
Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.10064 GHz, -47.5 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 10:51:09 AM

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

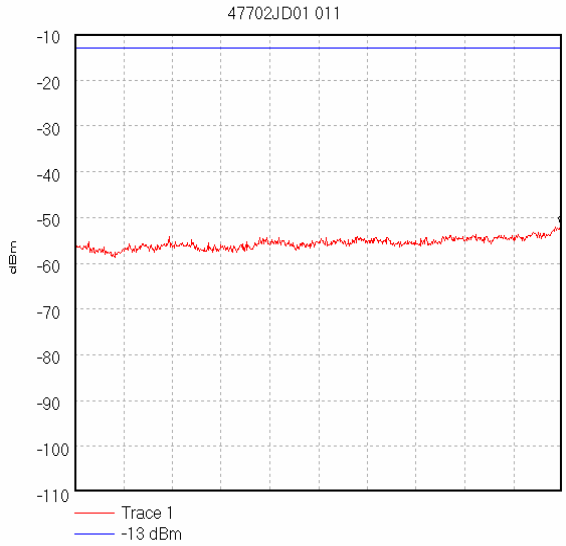
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Middle Channel (Continued),



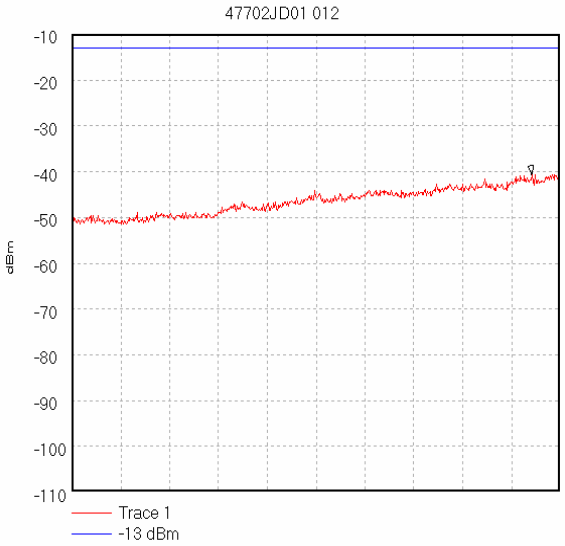
Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 50.0 mS
Peak 4.0 GHz, -52.83 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:14:09



Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 50.0 mS
Peak 7.79 GHz, -56.17 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:11:37



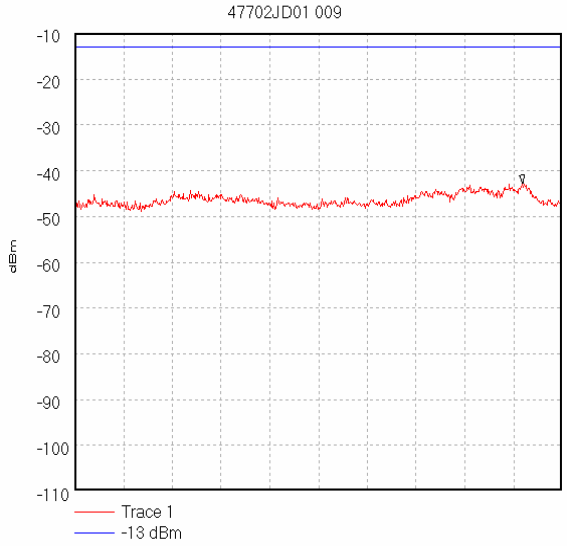
Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 90.0 mS
Peak 12.4925 GHz, -51.83 dBm
Display Line: -13 dBm;
Transducer Factors: 8G-12.5G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:06:12



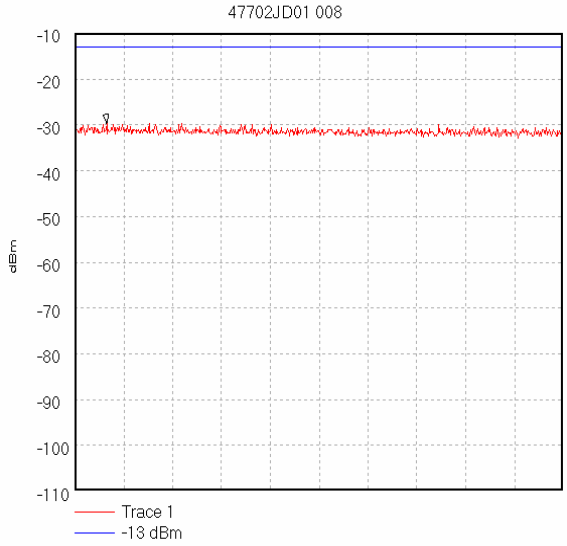
Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 110.0 mS
Peak 17.679167 GHz, -40.67 dBm
Display Line: -13 dBm;
Transducer Factors: 12.5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:08:53

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Middle Channel (Continued),



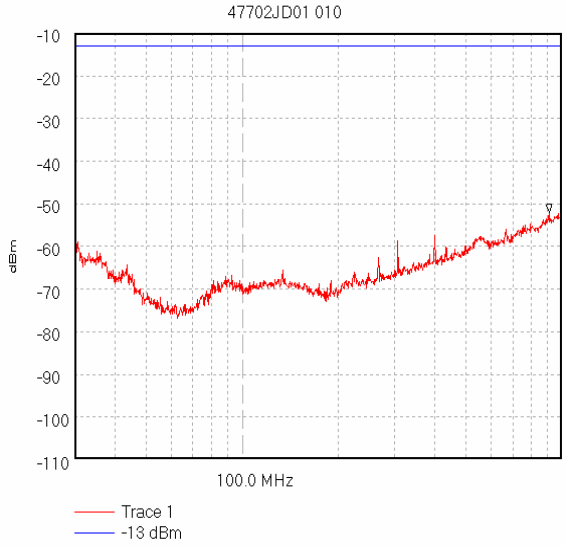
Start 18.0 GHz; Stop 26.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 170.0 mS
Peak 25.805833 GHz, -42.83 dBm
Display Line: -13 dBm;
Transducer Factors: 18-26,5_Horn(@0,5m,3m_cable,A1534)
17/10/2005 11:53:01



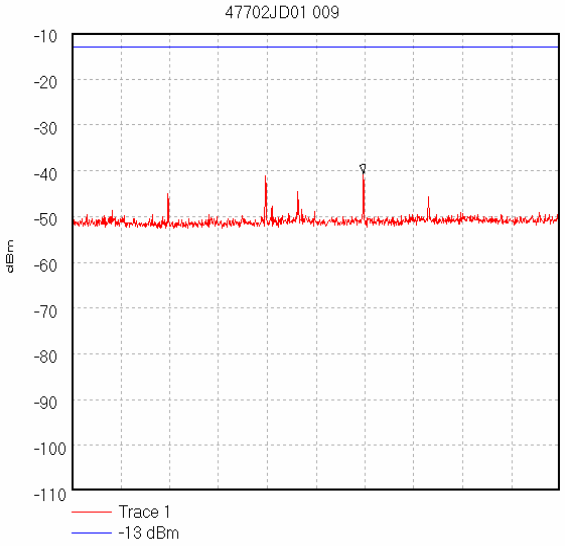
Start 26.5 GHz; Stop 27.0 GHz
Ref -10 dBm; Ref Offset -17.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 20 dB; Swp 50.0 mS
Peak 26.5325 GHz, -29.67 dBm
Display Line: -13 dBm;
Transducer Factors: 26,5-40G
17/10/2005 11:46:56

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

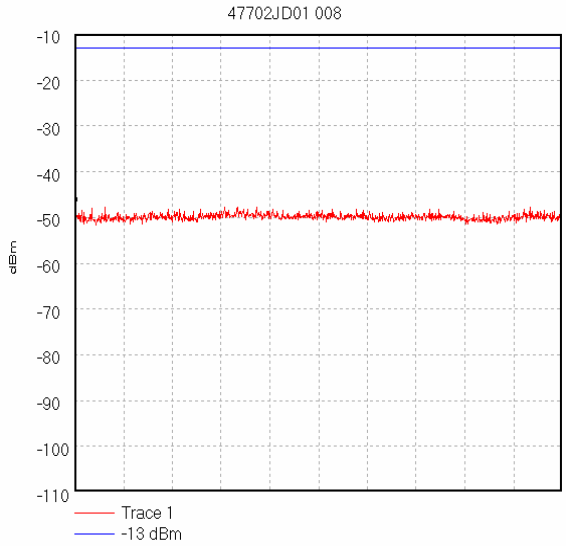
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Top Channel (Continued),



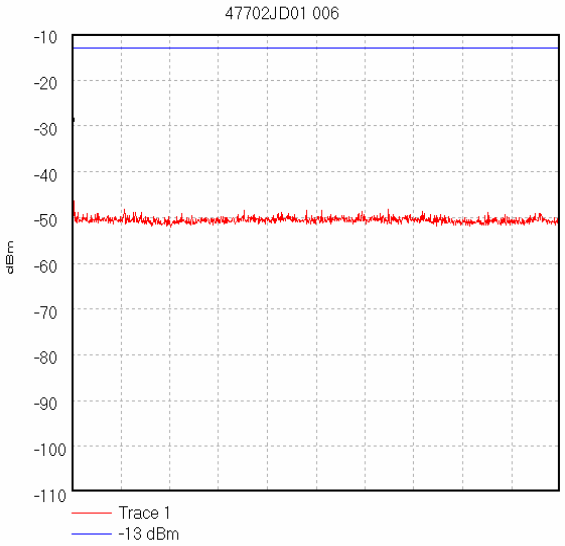
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 80.0 mS
Peak 910.730752 MHz, -52.0 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
10/11/2005 11:19:13 AM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -40.65 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 11:12:11 AM



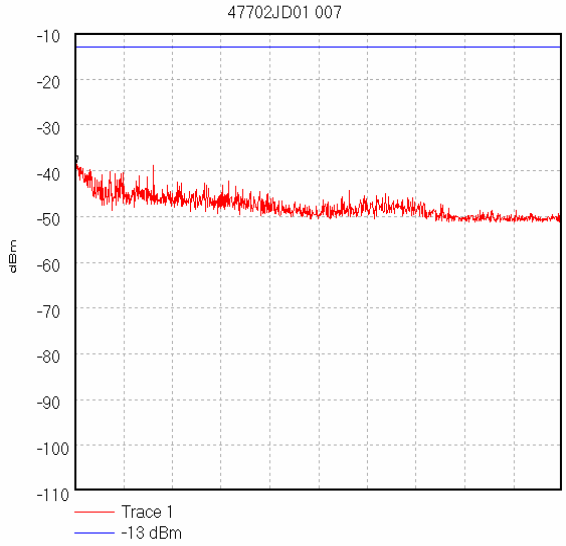
Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.0 GHz, -47.68 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 11:07:07 AM



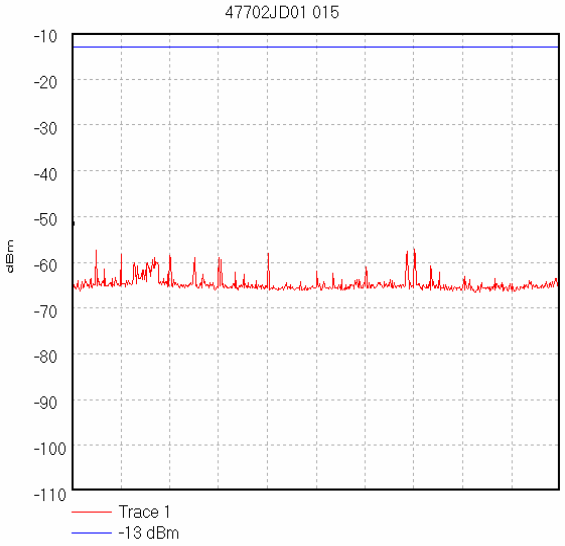
Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.686 GHz, -30.34 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 10:57:27 AM

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

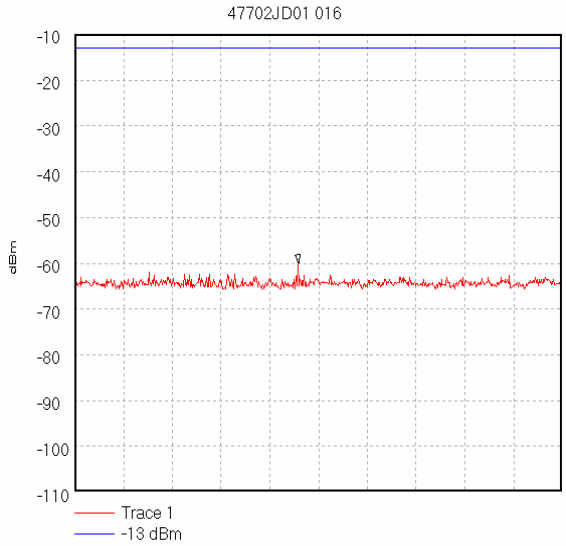
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Top Channel (Continued),



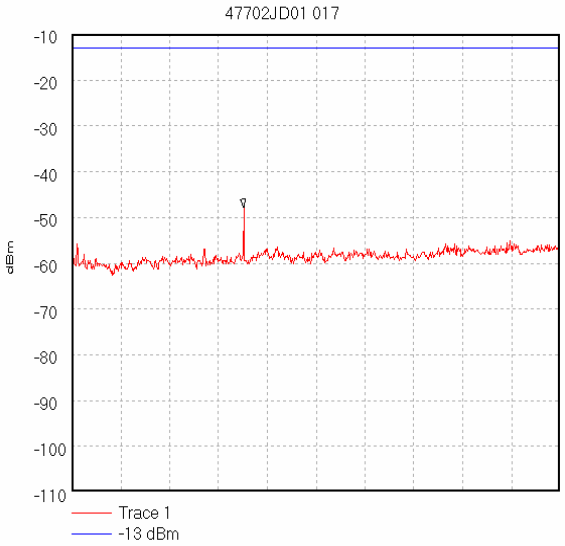
Start 2.686 GHz; Stop 2.69 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.686009 GHz, -38.72 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 11:02:50 AM



Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 10 dB; Swp 50.0 mS
Peak 4.0 GHz, -53.17 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:22:41

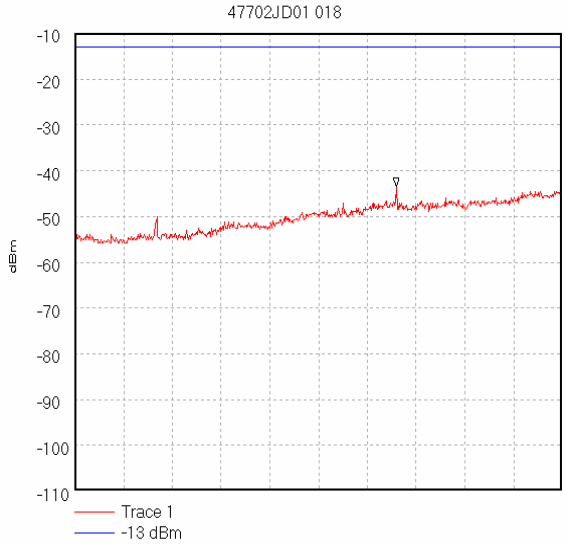


Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 6.916667 GHz, -60.0 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:27:52

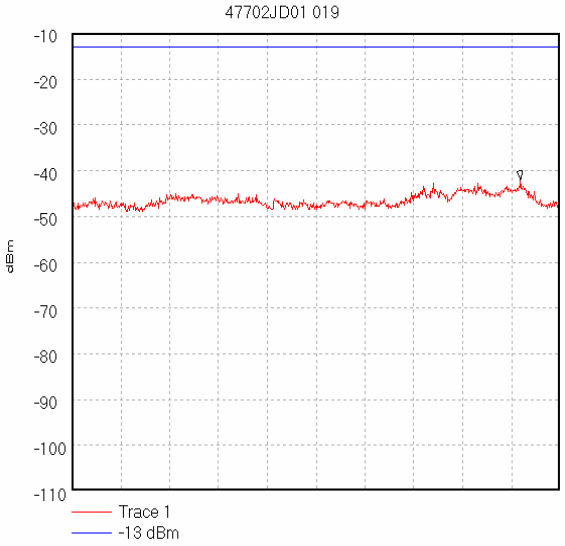


Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 90.0 mS
Peak 9.5825 GHz, -47.83 dBm
Display Line: -13 dBm;
Transducer Factors: 8G-12.5G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:33:44

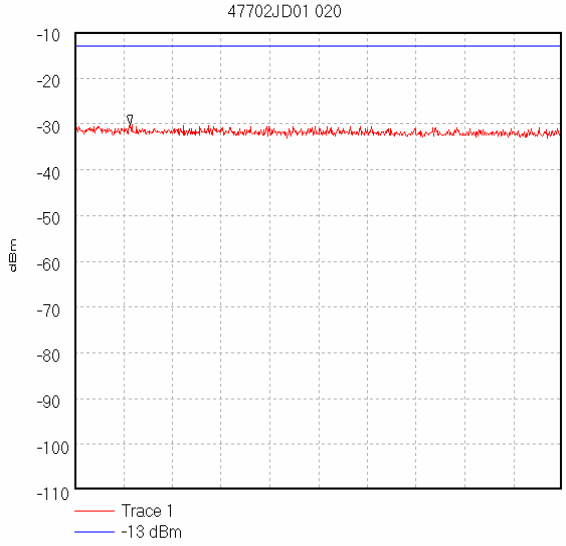
Transmitter Radiated Emissions: 3.84 Mcps Chip Rate; Top Channel (Continued),



Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 110.0 mS
Peak 16.13 GHz, -43.5 dBm
Display Line: -13 dBm;
Transducer Factors: 12,5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 12:38:39



Start 18.0 GHz; Stop 26.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 170.0 mS
Peak 25.805833 GHz, -42.0 dBm
Display Line: -13 dBm;
Transducer Factors: 18-26,5_Horn(@0,5m,3m_cable,A1534)
17/10/2005 12:42:13



Start 26.5 GHz; Stop 27.0 GHz
Ref -10 dBm; Ref Offset -17.7 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 20 dB; Swp 50.0 mS
Peak 26.556667 GHz, -30.17 dBm
Display Line: -13 dBm;
Transducer Factors: 26,5-40G
17/10/2005 12:47:54

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

7.2.2. Transmitter Radiated Emissions: Part 2.1053 & Part 27.53(l)

The EUT was configured as for transmitter radiated emission testing as described in section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results: 7.68 Mcps Chip Rate

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-38.6	-13.0	25.6	Complied
2500.000	-35.1	-13.0	22.1	Complied

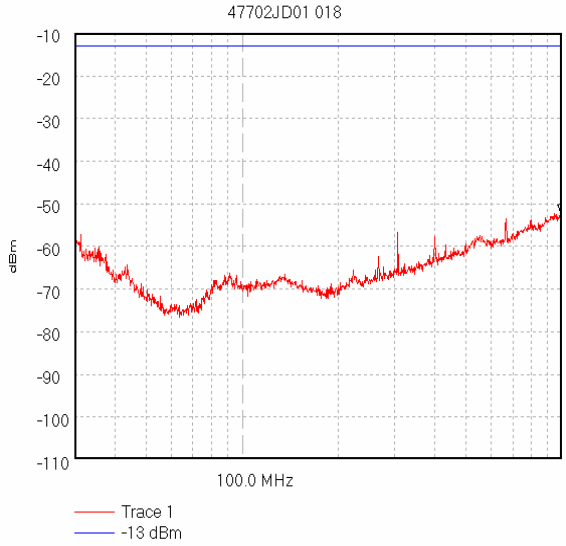
Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-40.9	-13.0	27.9	Complied

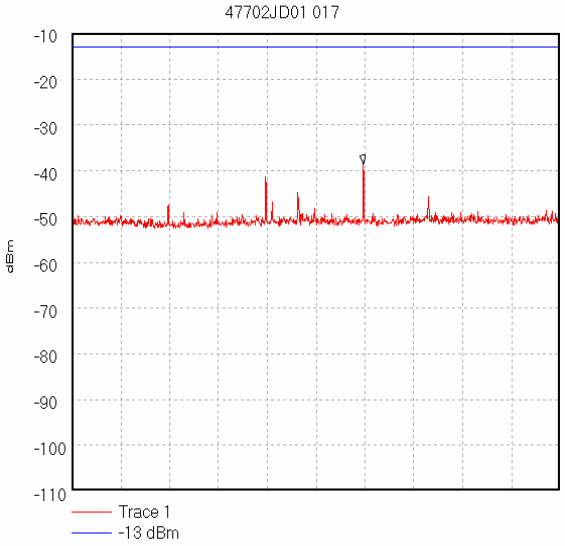
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1596.667	-41.4	-13.0	28.4	Complied
2686.000	-40.3	-13.0	27.3	Complied

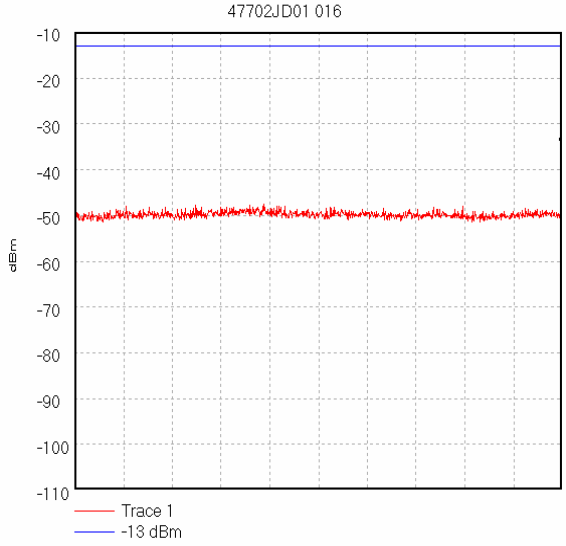
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Bottom Channel (Continued),



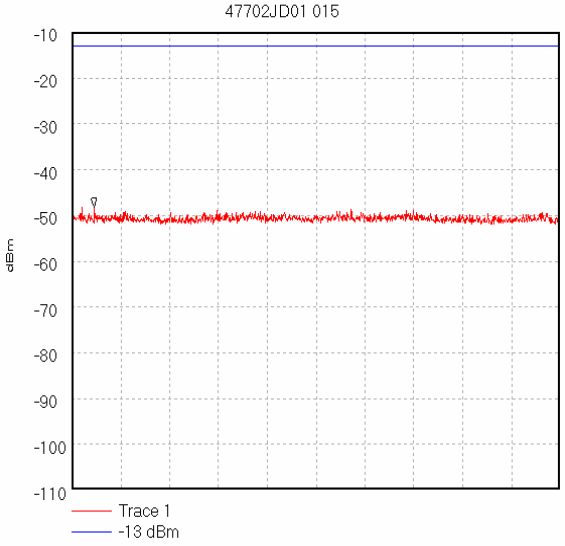
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 380.0 mS
Peak 988.379648 MHz, -52.15 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
10/11/2005 12:22:06 PM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -38.64 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 12:09:52 PM

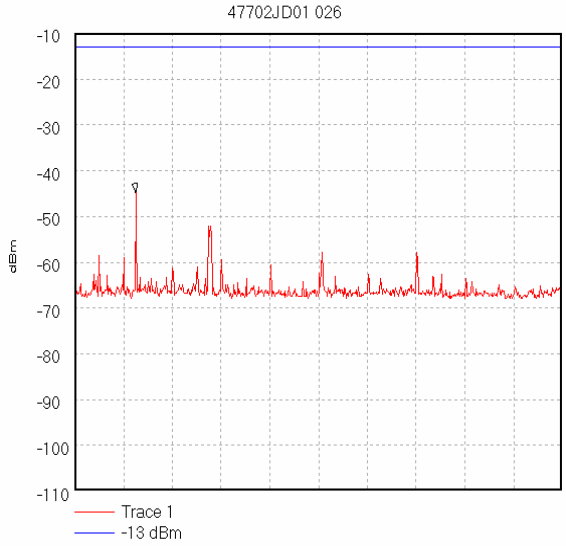


Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.5 GHz, -35.06 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 12:04:28 PM

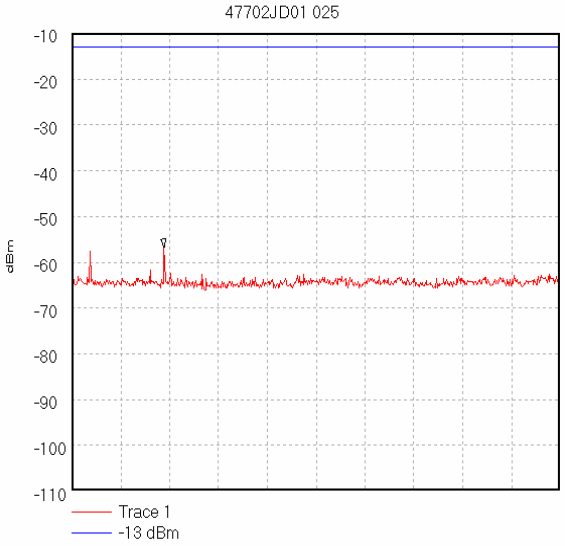


Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.74586 GHz, -48.19 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 11:57:36 AM

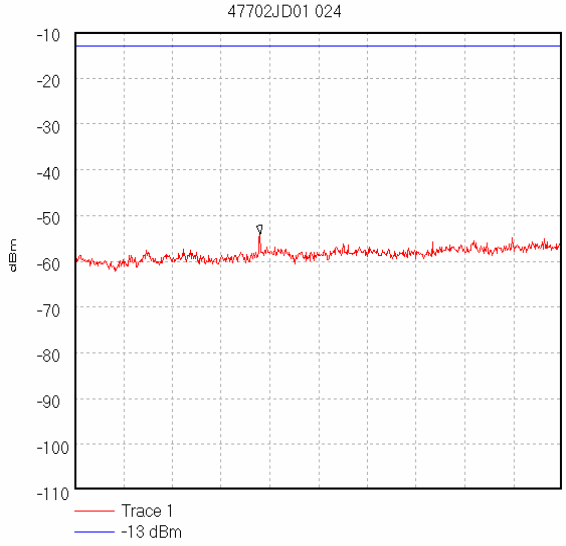
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Bottom Channel (Continued),



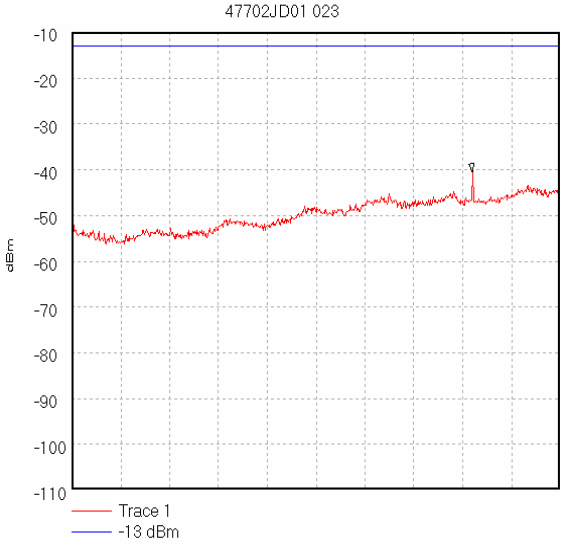
Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 4.25 GHz, -44.83 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:11:05



Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 6.376667 GHz, -56.83 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:07:39

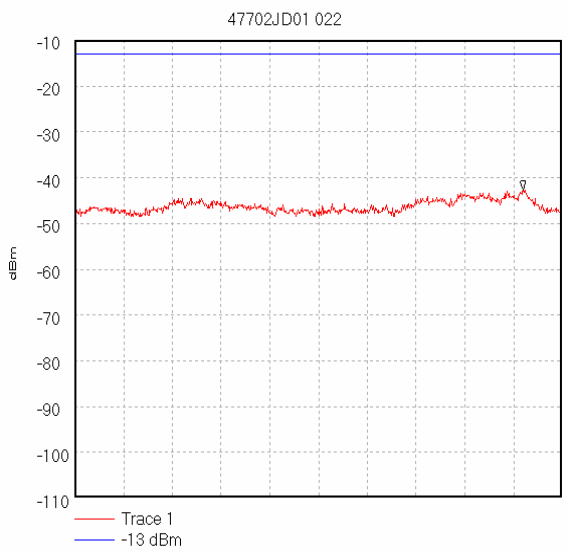


Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 90.0 mS
Peak 9.71 GHz, -54.17 dBm
Display Line: -13 dBm;
Transducer Factors: 8G-12.5G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:04:07

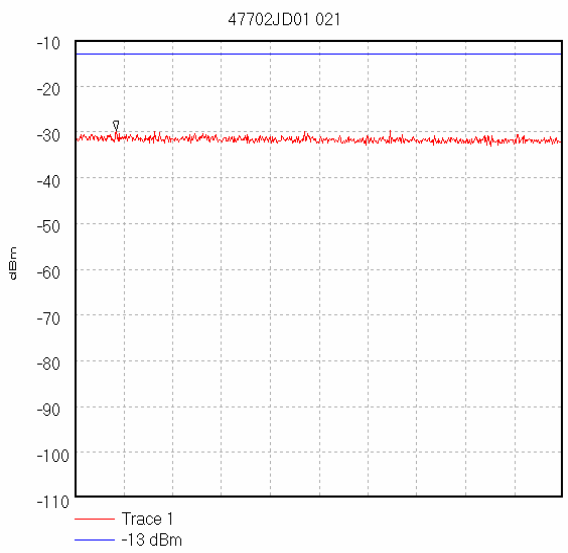


Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 110.0 mS
Peak 17.01 GHz, -40.5 dBm
Display Line: -13 dBm;
Transducer Factors: 12.5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 13:59:40

Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Bottom Channel (Continued),

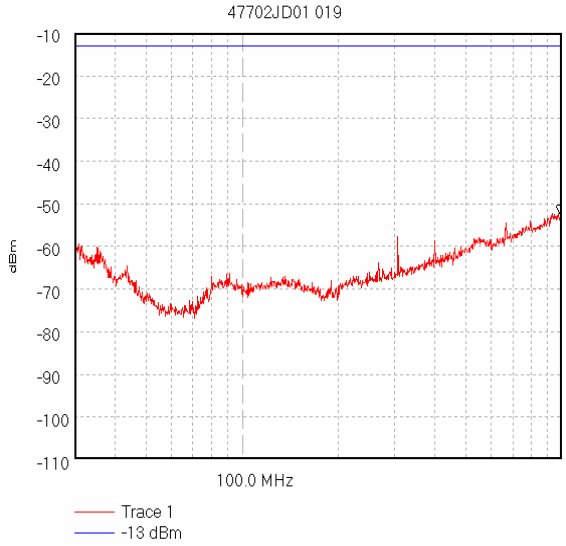


Start 18.0 GHz; Stop 26.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 170.0 mS
Peak 25.82 GHz, -42.67 dBm
Display Line: -13 dBm;
Transducer Factors: 18-26,5_Horn(@0,5m,3m_cable,A1534)
17/10/2005 13:56:16

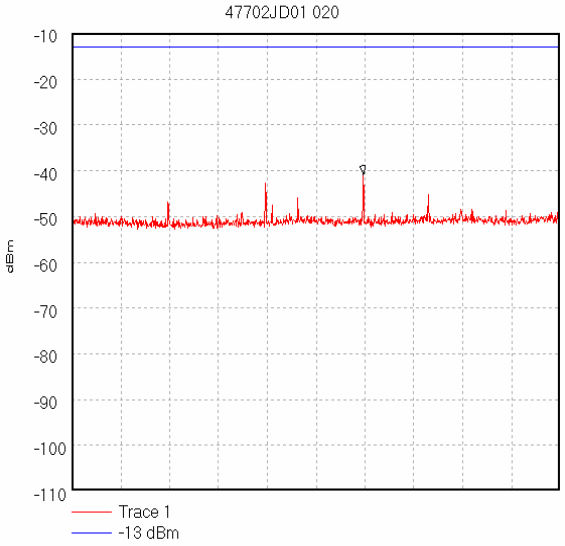


Start 26.5 GHz; Stop 27.0 GHz
Ref -10 dBm; Ref Offset -17.7 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 20 dB; Swp 50.0 mS
Peak 26.5425 GHz, -29.67 dBm
Display Line: -13 dBm;
Transducer Factors: 26,5-40G
17/10/2005 13:47:31

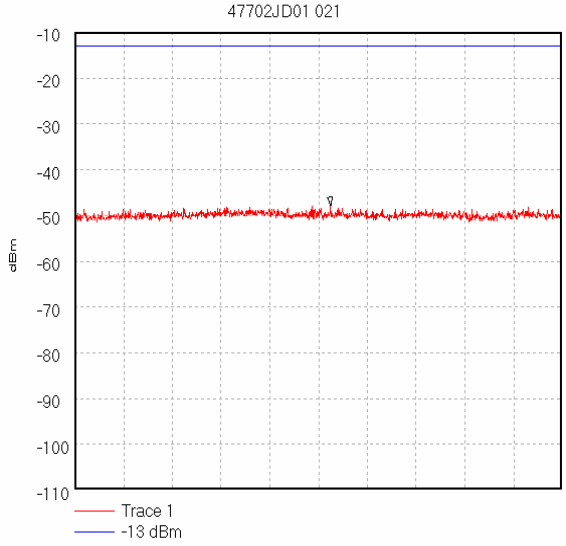
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Middle Channel (Continued),



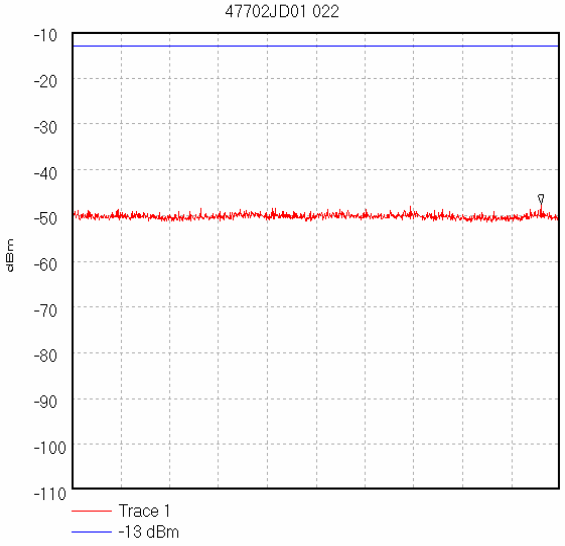
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 80.0 mS
Peak 976.894208 MHz, -52.2 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
10/11/2005 1:51:25 PM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -40.85 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 1:58:31 PM



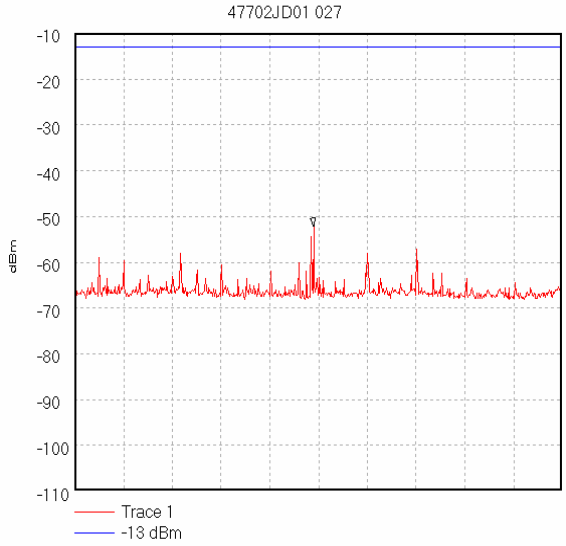
Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.262222 GHz, -47.83 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 2:04:32 PM



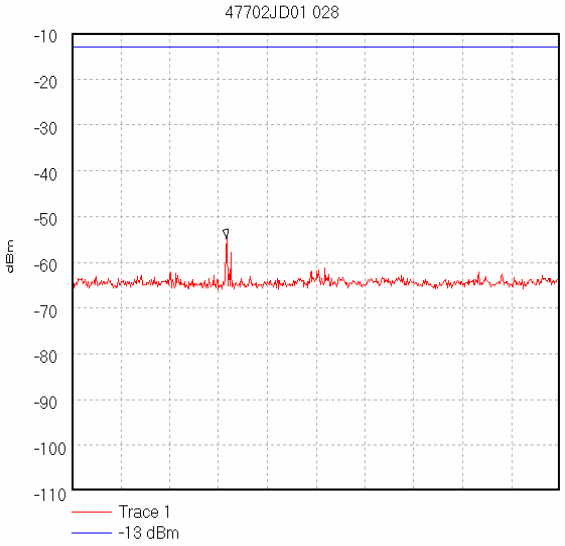
Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.9489 GHz, -47.58 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 2:13:42 PM

Test of: **IPWireless (UK) Ltd.**
2.5 GHz V4 Node B Model RK1/RC
To: **FCC Part 27**

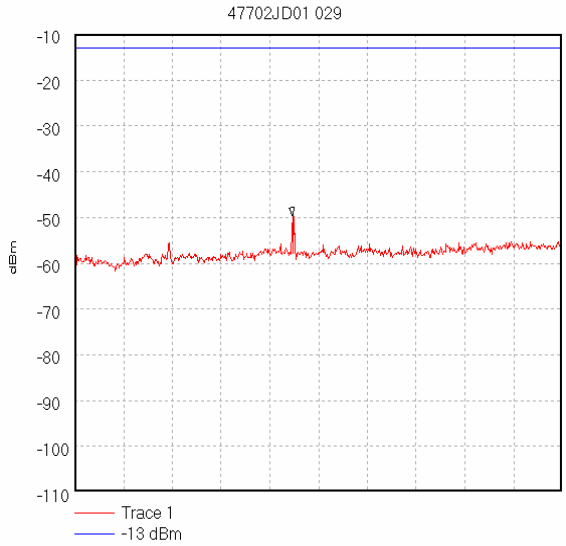
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Middle Channel (Continued),



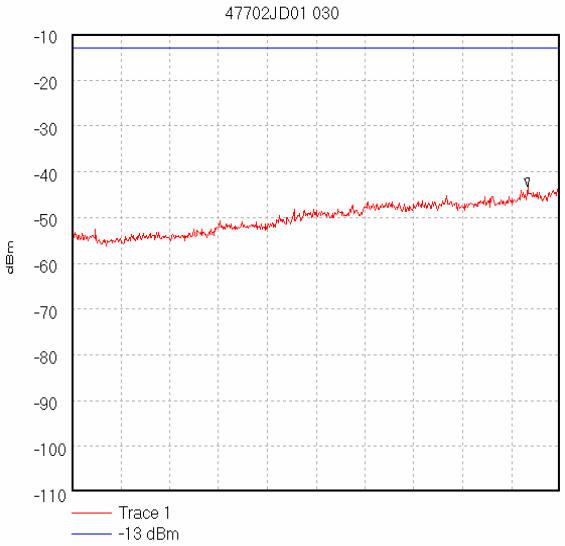
Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 4.98 GHz, -52.17 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:38:14



Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 6.633333 GHz, -54.83 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:43:33

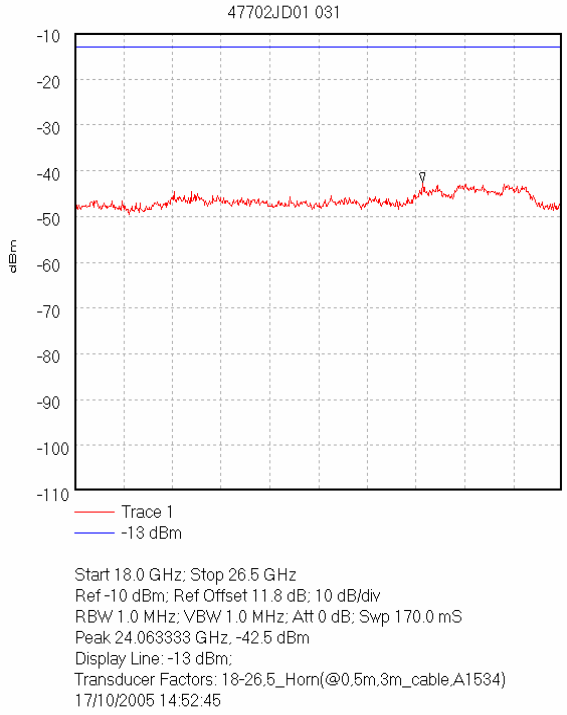


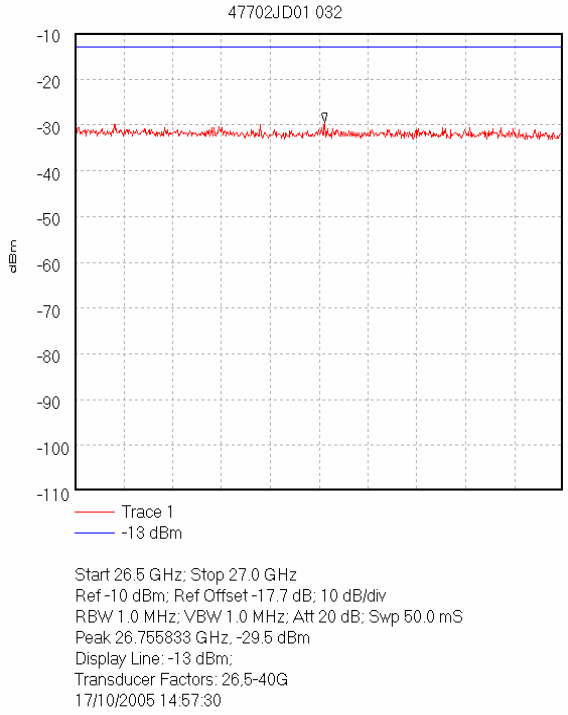
Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 90.0 mS
Peak 10.01 GHz, -49.67 dBm
Display Line: -13 dBm;
Transducer Factors: 8G-12.5G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:46:44



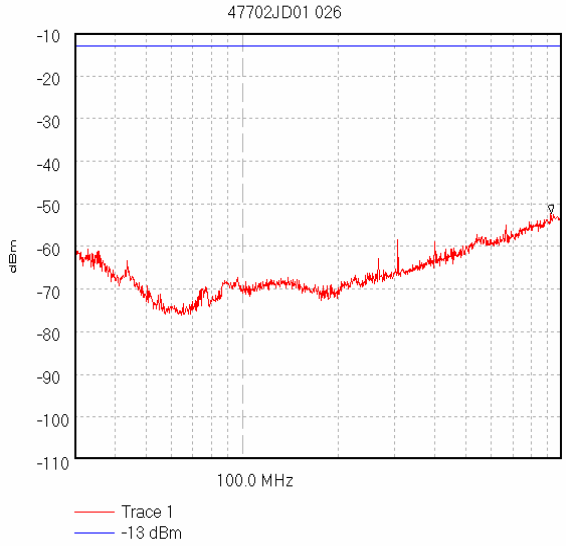
Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 110.0 mS
Peak 17.633333 GHz, -43.33 dBm
Display Line: -13 dBm;
Transducer Factors: 12.5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 14:49:54

Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Middle Channel (Continued),

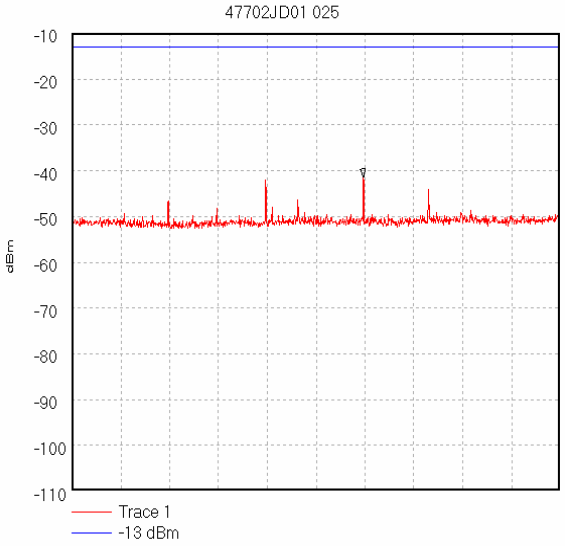




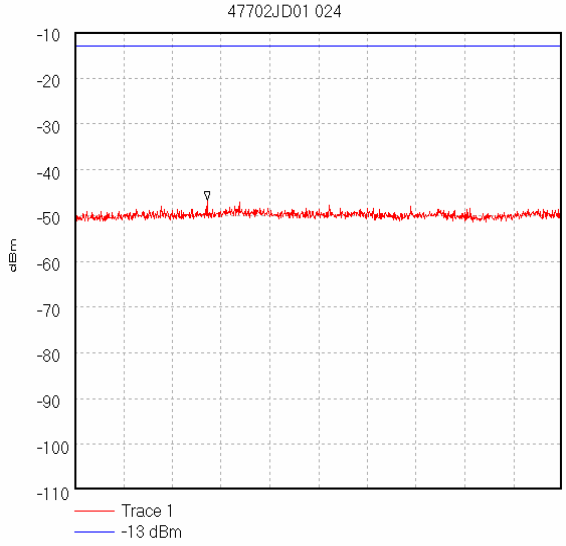
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Top Channel (Continued),



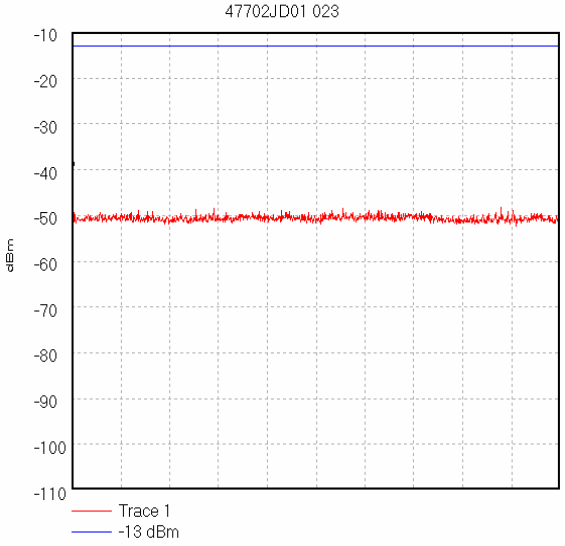
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 0 dB; Swp 80.0 mS
Peak 921.438272 MHz, -52.35 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A490
10/11/2005 2:39:37 PM



Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.596667 GHz, -41.43 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 1 to 2
10/11/2005 2:29:38 PM

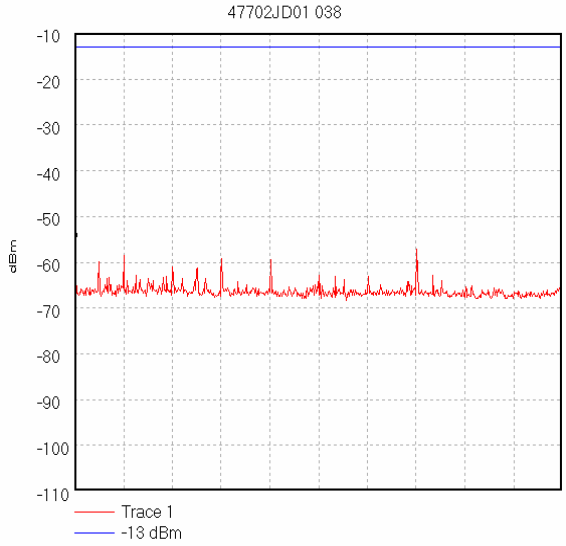


Start 2.0 GHz; Stop 2.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.136111 GHz, -46.69 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 2:24:52 PM

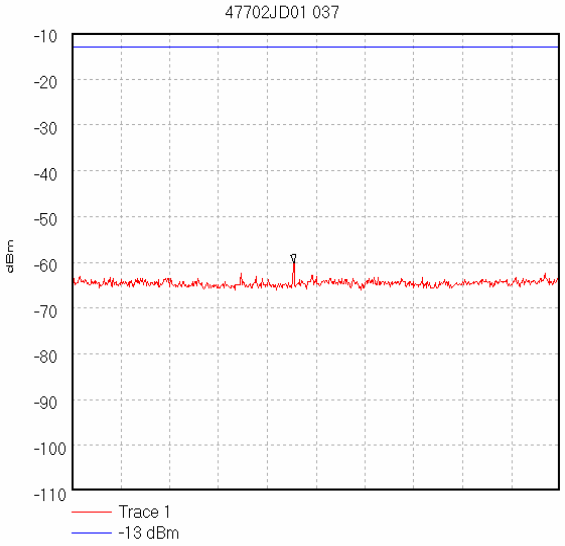


Start 2.686 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.686 GHz, -40.26 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: 2 to 4
10/11/2005 2:20:59 PM

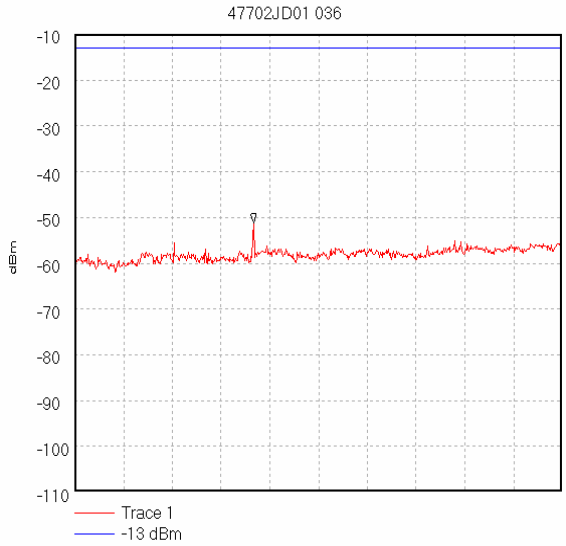
Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Top Channel (Continued),



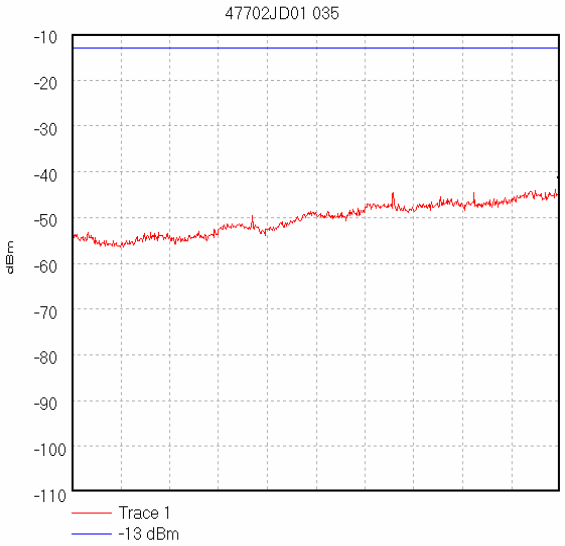
Start 4.0 GHz; Stop 6.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 4.0 GHz, -55.67 dBm
Display Line: -13 dBm;
Transducer Factors: 4G-6G_Horn(@1m,3m_cable,A1534)
17/10/2005 15:25:04



Start 6.0 GHz; Stop 8.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 6.91 GHz, -60.17 dBm
Display Line: -13 dBm;
Transducer Factors: 6G-8G_Horn(@1m,3m_cable,A1534)
17/10/2005 15:20:49

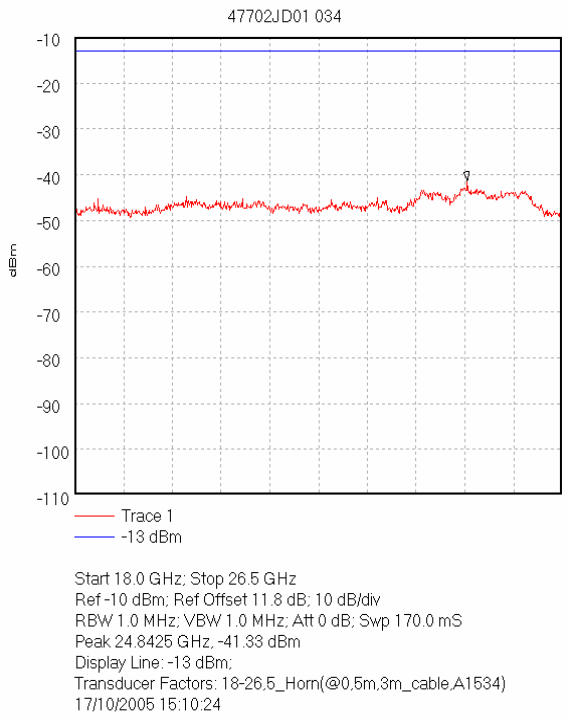


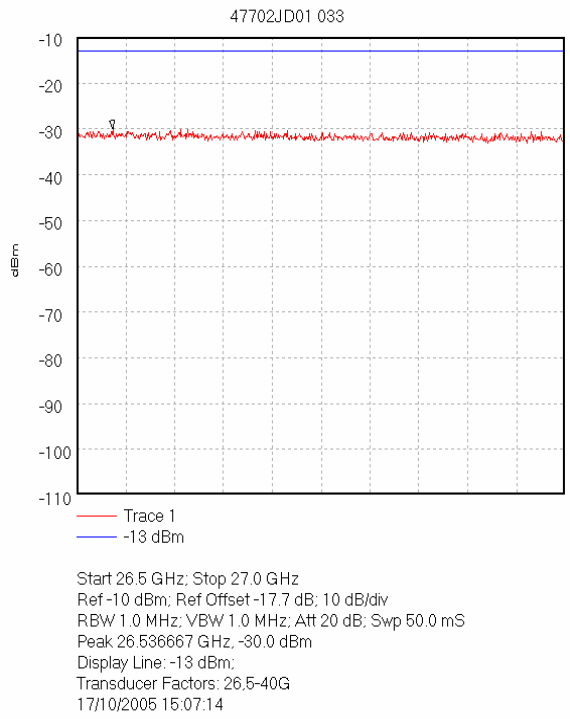
Start 8.0 GHz; Stop 12.5 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 90.0 mS
Peak 9.65 GHz, -51.17 dBm
Display Line: -13 dBm;
Transducer Factors: 8G-12.5G_Horn(@1m,3m_cable,A1534)
17/10/2005 15:17:27



Start 12.5 GHz; Stop 18.0 GHz
Ref -10 dBm; Ref Offset 11.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 110.0 mS
Peak 18.0 GHz, -43.0 dBm
Display Line: -13 dBm;
Transducer Factors: 12.5-18G_Horn(@1m,3m_cable,A1534)
17/10/2005 15:13:38

Transmitter Radiated Emissions: 7.68 Mcps Chip Rate; Top Channel (Continued),





Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±5.0 dB
Radiated Spurious Emissions	1 GHz to 27 GHz	95%	±3.03 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

9. Measurement Methods

9.1. Transmitter Radiated Emissions

Radiated emission measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 10 times the highest fundamental frequency. The scans were performed within a screened chamber in order to identify frequencies on which the EUT was generating spurious. This procedure identified the frequencies from the EUT, which required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit by characterising the screen room using a known signal source set at exactly the same location as the EUT. The signal source was derived from either a horn antenna or a dipole dependant on the frequency band under investigation. Any levels within 20 dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a peak detector was used for final measurements at each frequency recorded in the screen room.

The levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the vertical polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the horizontal polarisation.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For EIRP measurements a Horn antenna whose gain was based on an isotropic antenna was used, ERP measurements were done using a dipole. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The EIRP was calculated as:-

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

The limit in the standard states that emissions shall be attenuated by at least 43+10 log (P) dB below the transmitter power (P), where (P) is the maximum measured fundamental power for the channel under test. This limit always reduces to -13 dBm therefore, the limit line presented on the accompanying plots is set to -13 dBm.

Any spurious measured were then compared to the -13 dBm limit. The requirement is for the emission to be less than -13 dBm. The margin between emission and limit is recorded and should always be positive to indicate compliance.

All measurements were performed using broadband horn antennas.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacture	Type No.	Serial No.
A027	Horn Antenna	Eaton	9188-2	301
A029	Frequency Doubler	Hewlett-Packard	11721A	1950 A01794
A031	Horn Antenna	Eaton	91889-2	557
A059	Log Periodic Antenna	EMCO	3146	8902-2378
A1059	WG22 to K-Type Coaxial Adapter	Flann Microwave	22094-KF20	2017
A227	6dB Power Divider	Suhner Electronics Ltd	4901/01/A	none
A253	Horn Antenna	Flann Microwave	12240-20	128
A254	Horn Antenna	Flann Microwave	14240-20	139
A255	Horn Antenna	Flann Microwave	16240-20	519
A256	Horn Antenna	Flann Microwave	18240-20	400
A288	Bilog Antenna	Chase	CBL6111A	1589
A436	Horn Antenna	Flann	20240-20	330
C1082	Cable	Rosenberger	FA210A1020M5050	28463-1
C1088	Cable	Rosenberger	FA210A1050005050	1
C1140	Cable	Suhner	SUCOFLEX 104A	37016 14A
C323	Cable	Rosenberger	UFA 210A-1-0788-50x50	96A0121
M090	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:838494/005 RU:836833/001
M1253	Spectrum Analyser	HP	8564E	3442A00262
S209	Site 9	RFI	9	
*	DC Power Supply	Wayne Kerr	AP7030A	193784
*	20W Attenuator & Load	Narda	768-20	0105
*	20W Attenuator & Load	Narda	766-20	0308

** Supplied by the client*

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

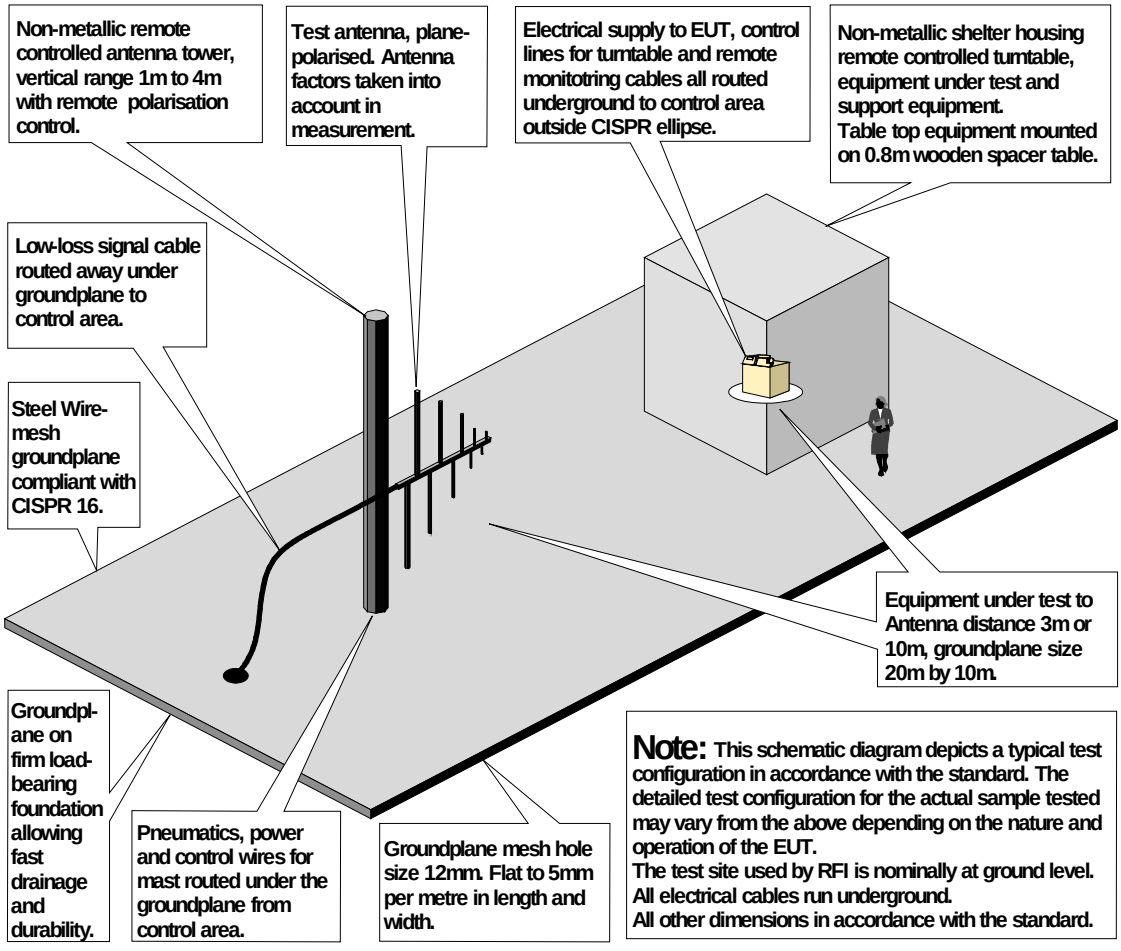
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\47702JD01\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: IPWireless (UK) Ltd.
2.5 GHz V4 Node B Model RK1/RC
To: FCC Part 27

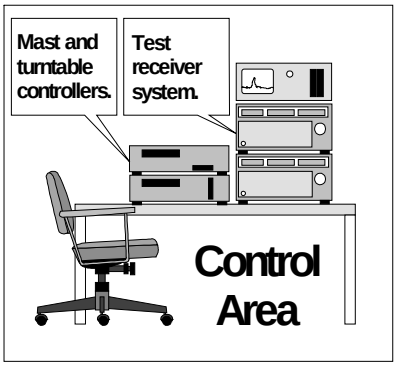
DRG\47702JD01\EMIRAD



Note: This schematic diagram depicts a typical test configuration in accordance with the standard. The detailed test configuration for the actual sample tested may vary from the above depending on the nature and operation of the EUT.
The test site used by RFI is nominally at ground level.
All electrical cables run underground.
All other dimensions in accordance with the standard.

Test Configuration For Radiated Emissions Measurements

Reflection-free area: >60m by 52m (CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse



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