




# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN

To: FCC Part 27

**Test Report Serial No:**  
RFI/MPTB4/RP45361JD05A

**Supersedes Test Report Serial No:**  
RFI/MPTB3/RP45361JD05A

<p><b>This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager:</b></p> <div style="text-align: right; margin-top: 20px;">  pp         </div>	
<p><b>Tested By: Steven Wong</b></p> <div style="text-align: right; margin-top: 10px;">  </div>	<p><b>Checked By: Tony Henriques</b></p> <div style="text-align: right; margin-top: 10px;">  </div>
<p><b>Report Copy No:</b></p> <p>PDF01</p>	
<p><b>Issue Date: 04 May 2005</b></p>	<p><b>Test Dates: 05 December 2003 to 12 February 2004</b></p>

**This test report was produced at the request of the client to demonstrate compliance with the requirements of FCC Part 27 and supersedes the original test report that was issued against the requirements of FCC Parts 21 and 74.**

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**RFI GLOBAL SERVICES LTD**

**TEST REPORT**

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## 1. Client Information

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

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## **2. Equipment Under Test (EUT)**

The following information has been supplied by the client:

### **2.1. Identification Of Equipment Under Test (EUT)**

<b>Brand Name:</b>	IPWireless Broadband Base Station
<b>Model Name or Number:</b>	2.5 GHz Rack Mount Node B Radio Shelf
<b>Unique Type Identification:</b>	DZ
<b>Serial Number:</b>	DZ1A344000211
<b>Country of Manufacture:</b>	UK
<b>FCC ID Number:</b>	PKTNODEBDZ1
<b>Date of Receipt:</b>	05 December 2003

<b>Brand Name:</b>	IPWireless Broadband Base Station
<b>Model Name or Number:</b>	2.5 GHz Rack Mount Node B Digital Shelf
<b>Unique Type Identification:</b>	DN
<b>Serial Number:</b>	DN1A344000211
<b>Country of Manufacture:</b>	UK
<b>FCC ID Number:</b>	PKTNODEBDZ1
<b>Date of Receipt:</b>	05 December 2003

### **2.2. Description Of EUT**

The equipment under test is a wireless broadband base station; the base station provides high-speed internet access network.

### **2.3. Modifications Incorporated In EUT**

During the course of testing the EUT has not been modified.

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## 2.4. Additional Information Related To Testing

<b>Power Supply Requirement:</b>	-48V DC		
<b>Intended Operating Environment:</b>	Residential, Commercial, Light Industry		
<b>Equipment Category:</b>	Miscellaneous Wireless Communications Services		
<b>Type of Unit:</b>	Wireless Broadband Base Station		
<b>Interface Ports:</b>	Ethernet Ports x 8 -48VDC input (one per shelf) Antenna Receiver/Transmitter Port x 2 I/O & Clock interface (one per shelf) CTRL & CPLD interface (one per shelf) Debug interface Alarms interface x 2 GPS interface		
<b>Chip Rate:</b>	High: 7.68 Mcps; Low : 3.84 Mcps		
<b>Transmit &amp; Receive Frequency Ranges</b>	High Chip Rate: 2506 MHz to 2680 MHz Low Chip Rate: 2503 MHz to 2683 MHz		
<b>Transmit/Receive Channels Tested (High Chip Rate: 7.68 Mcps):</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	N/A	2506
	Middle	N/A	2596
	Top	N/A	2680
<b>Transmit/Receive Channels Tested (Low Chip Rate: 3.84 Mcps):</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	N/A	2503
	Middle	N/A	2596
	Top	N/A	2683
<b>Highest Fundamental Frequency</b>	2683 MHz		
<b>Highest Unintentionally Generated Frequency</b>	2303 MHz		
<b>Maximum Power Output</b>	High Chip Rate: 37.7 dBm per 12 MHz channel Low Chip Rate: 39.7 dBm per 6 MHz channel		

## 2.5. Support Equipment

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

<b>Description:</b>	Notebook PC
<b>Brand Name:</b>	Sony Vaio
<b>Model Name or Number:</b>	PCG-Z505HSK
<b>Serial Number:</b>	28305733 3350053
<b>Cable Length and Type</b>	2 m Ethernet
<b>Connected to Port:</b>	EUT Ethernet

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### **3. Test Specification, Methods And Procedures**

#### **3.1. Test Specification**

<b>Reference:</b>	FCC Part 27: 2004: Sections 27.50, 27.53 and 27.54
<b>Title:</b>	Code of Federal Regulations, Part 27 (47CFR) Subpart C Miscellaneous Wireless Communications Services
<b>Purpose of Test:</b>	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

<b>Reference:</b>	FCC Part 15: 2004 Class B, Sections: 15.107 and 15.109
<b>Title:</b>	Code of Federal Regulations, Part 15 (47CFR) Radio Frequency Devices: Digital Devices.
<b>Comments:</b>	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.

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### **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 (1996)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)

Title: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1998)

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.

DA00-705 (2000)

Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

### **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.



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#### **4. Deviations From The Test Specification**

None

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## **5. Operation Of The EUT During Testing**

### **5.1. Operating Modes**

The EUT was tested in the following operating modes:

Full tests were performed on both the high and low chip rates on the bottom, middle and top channels of each associated frequency range.

#### **Transmitter Modes:**

For all conducted antenna port tests, except the spurious emissions at the band edges, the EUT was transmitting at full power on bottom, middle and top channels on all 15 timeslots. For tests of spurious emissions at the band edges the transmitter was operating at full power for 10 of the 15 time slots which is 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.

For radiated tests, the EUT was transmitting at full power for 10 of the 15 time slots on bottom, middle and top channels.

#### **Receiver Modes:**

Preliminary radiated emissions and AC conducted emissions scans of both high and low chip rates were performed on the EUT. The chip rate that exhibited the worse case mode of operation was then used to perform final measurements. This was found to be with the EUT operating in high chip rate mode.

Testing was performed with the EUT receiving on all timeslots.

### **5.2. Configuration and Peripherals**

The EUT was tested in the following configuration:

All tests were performed with the EUT powered by a -48VDC nominal supply, and connected to a support notebook PC via an ethernet connection.

Appendix 2 contains a schematic diagram of the test configuration.

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## 6. Summary of Test Results

### Receive Mode

Range Of Measurements	Specification Reference	Port Type	Compliance Status
AC Conducted Spurious Emissions (150 kHz to 30 MHz)	CFR 47: 2004 FCC Part 15 Section 15.107	AC Mains	Complied
Receive Mode Spurious Emissions	CFR 47: 2004 FCC Part 15 Section 15.109	Enclosure	Complied

### Transmit Mode

Range Of Measurements	Specification Reference	Port Type	Compliance Status
Effective Isotropic Radiated Power (EIRP)	CFR 47: 2004 FCC Part 2.1046, Part 27.50	Antenna Terminals	Complied
Frequency Stability (Temperature Variation)	CFR 47: 2004 FCC Part 2.1055, Part 27.54	Antenna Terminals	Complied
Frequency Stability (Voltage Variation)	CFR 47: 2004 FCC Part 2.1055, Part 27.54	Antenna Terminals	Complied
Occupied Bandwidth	CFR 47: 2004 FCC Part 2.1049	Antenna Terminals	Complied
Conducted Spurious Emissions at Band Edges	CFR 47: 2004 FCC Part 2.1051, Part 27.53	Antenna Terminals	Complied
Conducted Spurious Emissions	CFR 47: 2004 FCC Part 2.1051, Part 27.53	Antenna Terminals	Complied
Radiated Spurious Emissions	CFR 47: 2004 FCC Part 2.1053, Part 27.53	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.

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## **7. Measurements, Examinations And Derived Results**

### **7.1. General Comments**

7.1.1. This section contains test results only. Details of the test methods and procedures can be found in Section 3 of this report.

7.1.2. 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.

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## **7.2. Receive Mode AC Conducted Spurious Emissions**

7.2.1. The EUT was configured as for AC conducted emissions measurements as described in section 9 of this report.

7.2.2. Tests were performed to identify the maximum emissions levels on the AC mains line of the EUT.

### **Results: Quasi-Peak Detector Measurements On Live And Neutral Lines (High Chip Rate)**

Frequency (MHz)	Line	Q-P Level (dB $\mu$ V)	Q-P Limit (dB $\mu$ V)	Margin (dB)	Result
0.19592	Live	32.10	63.78	31.68	Complied
0.33815	Neutral	30.88	59.25	28.37	Complied
0.53095	Neutral	29.69	56.00	26.31	Complied
1.54343	Neutral	34.74	56.00	21.26	Complied
4.29005	Neutral	30.45	56.00	25.55	Complied
13.87929	Neutral	38.81	60.00	21.19	Complied
28.19217	Neutral	43.20	60.00	16.80	Complied

### **Results: Average Detector Measurements On Live And Neutral Lines (High Chip Rate)**

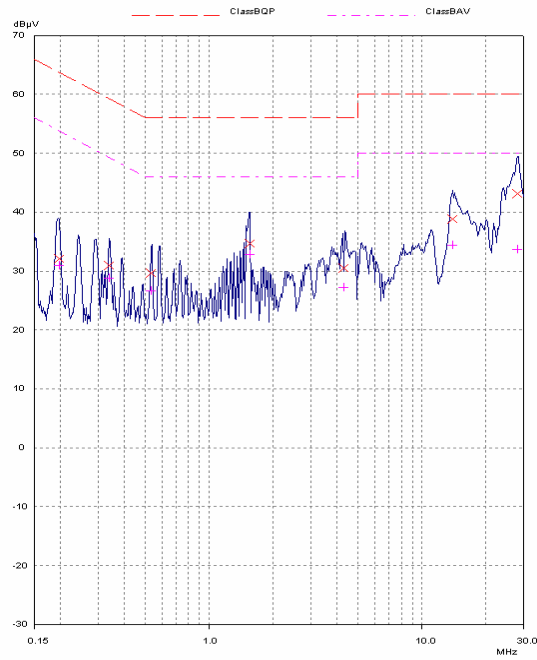
Frequency (MHz)	Line	Av. Level (dB $\mu$ V)	Av. Limit (dB $\mu$ V)	Margin (dB)	Result
0.19592	Neutral	30.91	53.78	22.87	Complied
0.33815	Neutral	28.78	49.25	20.47	Complied
0.53095	Neutral	26.69	46.00	19.31	Complied
1.54343	Neutral	32.81	46.00	13.19	Complied
4.29005	Neutral	27.23	46.00	18.77	Complied
13.87929	Neutral	34.41	50.00	15.59	Complied
28.19217	Neutral	33.73	50.00	16.27	Complied

**Note:** The results detailed in the above table and the graph on the following page are for the determined worst case mode of operation i.e. with the EUT operating in high chip rate mode.

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**Receive AC Conducted Spurious Emissions (Continued)**

**High Chip Rate**



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

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### 7.3. Receive Mode Radiated Emissions – 30 MHz to 1 GHz

7.3.1. The EUT was configured as for receiver radiated emissions testing as described in section 9 of this report.

7.3.2. Tests were performed to identify the maximum receiver or standby radiated emissions levels.

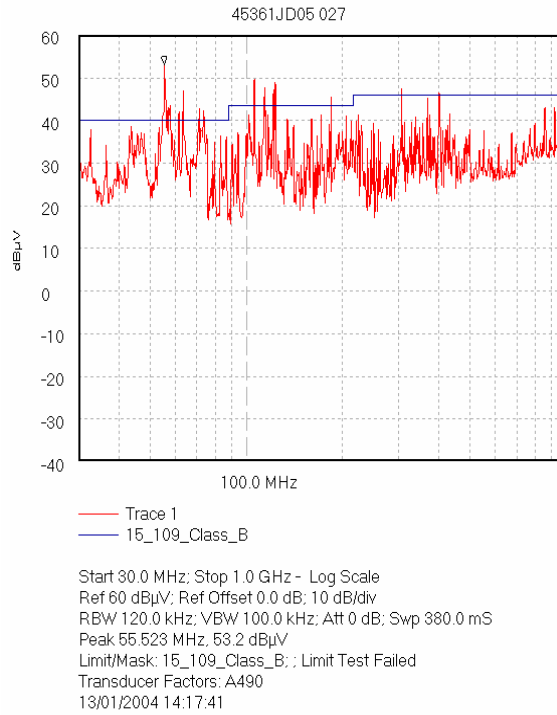
#### **Results: (High Chip Rate)**

Frequency (MHz)	Ant. Pol.	Q-P Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
32.635	Vert.	26.0	40.0	14.0	Complied
43.508	Vert.	28.2	40.0	11.8	Complied
55.675	Vert.	33.3	40.0	6.7	Complied
57.375	Vert.	25.5	40.0	14.5	Complied
61.892	Vert.	25.2	40.0	14.8	Complied
63.369	Vert.	26.8	40.0	13.2	Complied
70.912	Vert.	33.1	40.0	6.9	Complied
73.477	Vert.	23.7	40.0	16.3	Complied
101.712	Vert.	35.3	43.5	8.2	Complied
105.999	Vert.	24.0	43.5	19.5	Complied
113.280	Vert.	36.2	43.5	7.3	Complied
122.879	Vert.	31.7	43.5	11.8	Complied
134.209	Vert.	34.8	43.5	8.7	Complied
159.999	Vert.	34.6	43.5	8.9	Complied
184.318	Vert.	38.6	43.5	4.9	Complied
224.627	Vert.	36.0	46.0	10.0	Complied
307.198	Horiz.	39.8	46.0	6.2	Complied
368.638	Horiz.	39.6	46.0	6.4	Complied
402.626	Horiz.	36.3	46.0	9.7	Complied
430.078	Horiz.	38.3	46.0	7.7	Complied
777.622	Horiz.	30.2	46.0	15.8	Complied
860.158	Vert.	38.7	46.0	7.3	Complied
921.598	Vert.	41.2	46.0	4.8	Complied
983.036	Vert.	46.7	54.0	7.3	Complied

**Note:** The results detailed in the above table and the graph on the following page are for the determined worst case mode of operation i.e. with the EUT operating in high chip rate mode.

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**Receive Mode Radiated Emissions – 30 MHz to 1 GHz (Continued)**



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



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#### **7.4. Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz**

7.4.1. The EUT was configured as for receiver radiated emissions testing as described in section 9 of this report.

7.4.2. Tests were performed to identify the maximum receiver or standby radiated emissions levels.

#### **Results:**

##### **Highest Average Level: (High Chip Rate)**

Frequency (MHz)	Antenna Polarity (H/V)	Average Detector level (dB $\mu$ V)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Average Margin (dB)	Result
1043.567	Vert.	28.0	21.5	0.8	50.3	54.0	3.7	Complied
1104.710	Vert.	29.7	21.5	0.8	52.0	54.0	2.0	Complied
1228.968	Vert.	11.8	21.5	0.9	34.2	54.0	19.8	Complied
1290.809	Vert.	12.0	21.5	0.9	34.4	54.0	19.6	Complied
1535.898	Horiz.	14.0	21.6	1.0	36.6	54.0	17.4	Complied
1781.960	Horiz.	13.0	21.6	1.1	35.7	54.0	18.3	Complied
2126.026	Vert.	8.6	20.9	1.2	30.7	54.0	23.3	Complied
2150.274	Vert.	9.5	20.9	1.2	31.6	54.0	22.4	Complied
2216.219	Horiz.	14.5	21.0	1.2	36.7	54.0	17.3	Complied
2299.686	Horiz.	12.5	21.1	1.3	34.9	54.0	19.1	Complied
4245.860	Vert.	22.2	24.1	1.6	47.9	54.0	6.1	Complied
9211.910	Horiz.	6.3	30.4	2.5	39.2	54.0	14.8	Complied
13328.460	Horiz.	-15.4	33.6	3.0	21.2	54.0	32.8	Complied

**Note:** The results detailed in the above table and the graphs on the following pages are for the determined worst case mode of operation i.e. with the EUT operating in high chip rate mode.

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**Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz (Continued)**

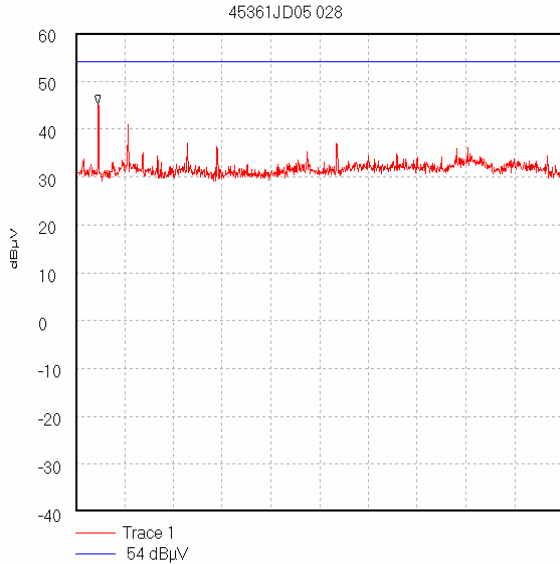
**Highest Peak Level: (High Chip Rate)**

Frequency (MHz)	Antenna Polarity (H/V)	Peak Detector level (dB $\mu$ V)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Peak Margin (dB)	Result
1043.567	Vert.	37.3	21.5	0.8	59.6	74.0	14.4	Complied
1104.710	Vert.	38.1	21.5	0.8	60.4	74.0	13.6	Complied
1228.968	Vert.	17.2	21.5	0.9	39.6	74.0	34.4	Complied
1290.809	Vert.	19.7	21.5	0.9	42.1	74.0	31.9	Complied
1535.898	Horiz.	19.5	21.6	1.0	42.1	74.0	31.9	Complied
1781.960	Horiz.	18.8	21.6	1.1	41.5	74.0	32.5	Complied
2126.026	Vert.	18.1	20.9	1.2	40.0	74.0	34.0	Complied
2150.274	Vert.	17.4	20.9	1.2	39.5	74.0	34.5	Complied
2216.219	Horiz.	19.5	21.0	1.2	41.7	74.0	32.3	Complied
2299.686	Horiz.	19.1	21.1	1.3	41.5	74.0	32.5	Complied
4245.860	Vert.	23.5	24.1	1.6	49.2	74.0	24.8	Complied
9211.910	Horiz.	11.0	30.4	2.5	43.9	74.0	30.1	Complied
13328.460	Horiz.	-1.4	33.6	3.0	35.2	74.0	38.8	Complied

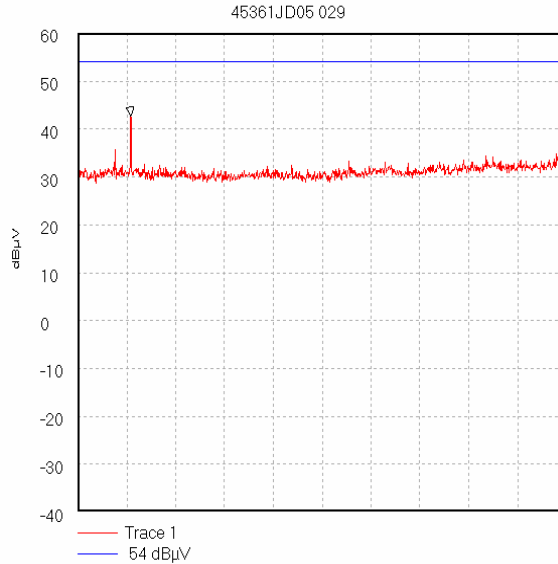
**Note:** The results detailed in the above table and the graphs on the following pages are for the determined worst case mode of operation i.e. with the EUT operating in high chip rate mode.

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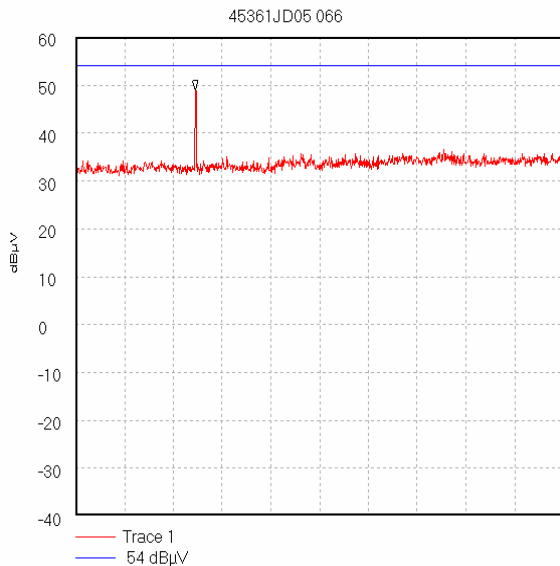
**Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz (Continued)**



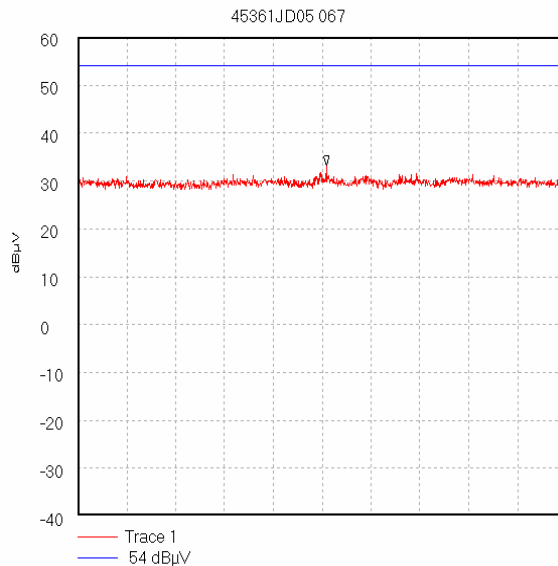
Start 1.0 GHz; Stop 2.0 GHz  
 Ref 60 dBµV; Ref Offset 4.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz; 45.1 dBµV  
 Display Line: 54 dBµV; : Limit Test Failed  
 13/01/2004 14:41:40



Start 2.0 GHz; Stop 4.0 GHz  
 Ref 60 dBµV; Ref Offset 4.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.216 GHz; 42.76 dBµV  
 Display Line: 54 dBµV; : Limit Test Passed  
 13/01/2004 14:47:05



Start 4.0 GHz; Stop 5.0 GHz  
 Ref 60 dBµV; Ref Offset 2.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.246 GHz; 48.96 dBµV  
 Display Line: 54 dBµV; : Limit Test Failed  
 16/01/2004 14:05:32

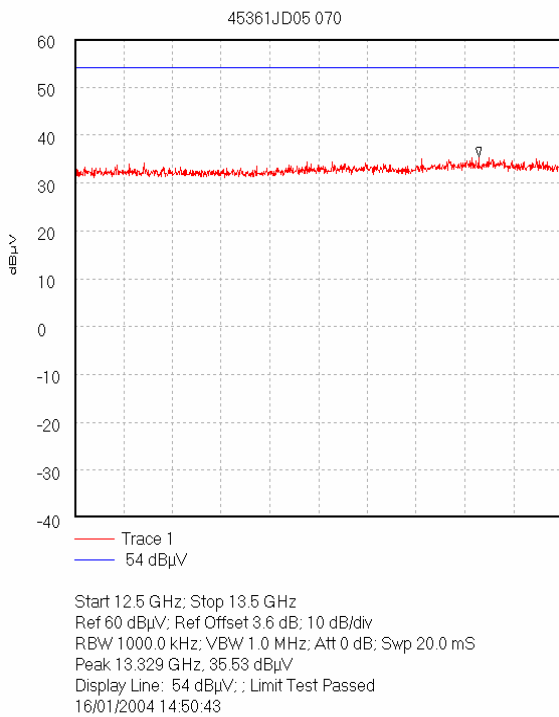
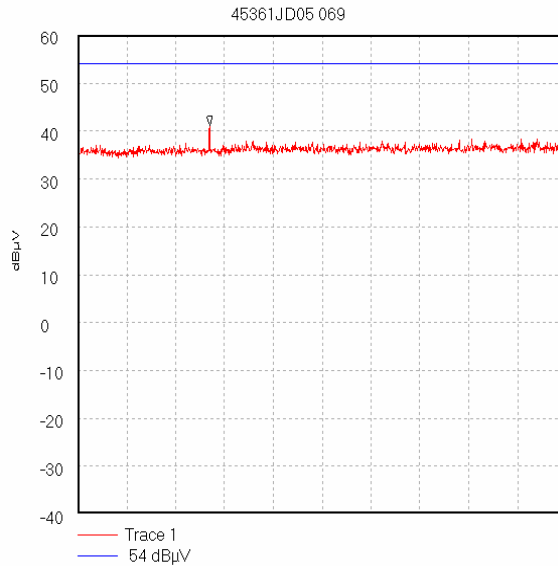
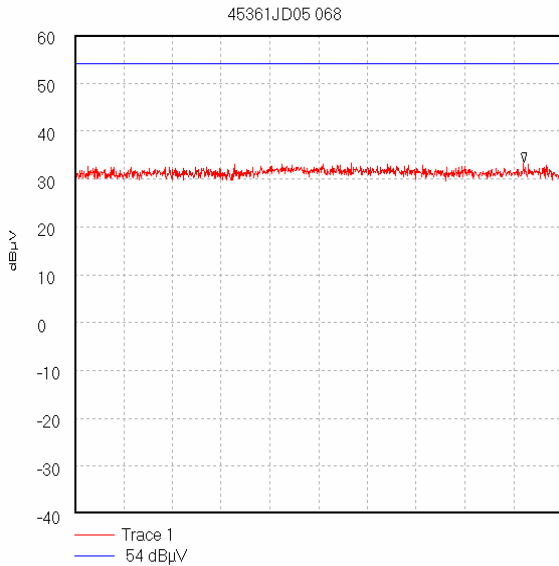


Start 5.0 GHz; Stop 6.0 GHz  
 Ref 60 dBµV; Ref Offset 2.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.509 GHz; 33.19 dBµV  
 Display Line: 54 dBµV; : Limit Test Passed  
 16/01/2004 14:08:48

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

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**Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz (Continued)**



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

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### **7.5. Transmitter Carrier Output Power and Effective Isotropic Radiated Power (EIRP): Part 2.1046 & Part 27.50**

7.5.1. The EUT was configured as for conducted RF output power and Effective Isotropic Radiated Power (EIRP) as described in section 9 of this report.

7.5.2. The effective isotropic radiated power (EIRP) was calculated by adding the manufacturer's declared antenna gain to the figure measured for conducted RF output power.

#### **Results EIRP. (High Chip Rate)**

Channel	Measured Frequency (MHz)	Conducted RF O/P Power (dBm)*	Antenna Gain (dBi)	EIRP (dBm)	EIRP (dBW)	Limit EIRP (dBW)	Margin (dB)	Result
Bottom	2506	36.8	20.0	56.8	26.8	36.4	9.2	Complied
Middle	2596	36.3	20.0	56.3	26.3	36.0	9.7	Complied
Top	2680	37.7	20.0	57.7	27.7	36.4	8.3	Complied

\*per 12 MHz channel

Note: The limit is calculated as  $33+10 \log (X/Y)$  where X is the actual channel width i.e. 12 MHz and Y is 6 MHz for channels in the MBS and 5.5 MHz for channels in the LBS and UBS.

#### **Results EIRP. (Low Chip Rate)**

Channel	Measured Frequency (MHz)	Conducted RF O/P Power (dBm)**	Antenna Gain (dBi)	EIRP (dBm)	EIRP (dBW)	Limit EIRP (dBW)	Margin (dB)	Result
Bottom	2503	39.7	20.0	59.7	29.7	33.4	3.3	Complied
Middle	2596	39.3	20.0	59.3	29.3	33.0	3.7	Complied
Top	2683	39.1	20.0	59.1	29.1	33.4	3.9	Complied

\*\*per 6 MHz channel

Note: The limit is calculated as  $33+10 \log (X/Y)$  where X is the actual channel width i.e. 12 MHz and Y is 6 MHz for channels in the MBS and 5.5 MHz for channels in the LBS and UBS.

#### **Note(s):**

1. The antenna gain is typically a maximum of 20 dBi and, hence, is the figure used in the above tables. IP Wireless do not supply the antenna, the MDS licensee supplies this. IP Wireless will, in their user information, inform all MDS licensees of the device, that the combination of measured conducted RF output power and antenna gain must not, under any circumstances whatsoever, exceed the maximum allowable EIRP limit as detailed in the tables above.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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### **7.6. Transmitter Frequency Stability: (Temperature Variation): Part 2.1055 & Part 27.54**

7.6.1. The EUT was configured as for frequency stability measurements as described in Section 9 of this report.

7.6.2. Tests were performed to identify the maximum frequency error of the EUT with variations in ambient temperature.

#### **Results Bottom Channel (2506 MHz) (High Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2505.995840	4.160
-20	2505.995648	4.352
-10	2505.995526	4.474
0	2505.995208	4.792
10	2505.995296	4.704
20	2505.995164	4.836
30	2505.995068	4.932
40	2505.994952	5.048
50	2505.994837	5.163

#### **Results Bottom Channel (2503 MHz) (Low Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2502.995814	4.186
-20	2502.995647	4.353
-10	2502.995536	4.464
0	2502.995203	4.797
10	2502.995301	4.699
20	2502.995164	4.836
30	2502.995078	4.922
40	2502.994957	5.043
50	2502.994847	5.153

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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**Transmitter Frequency Stability: (Temperature Variation) (Continued)****Results Middle Channel (2596 MHz) (High Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2595.995678	4.322
-20	2595.995491	4.509
-10	2595.995369	4.631
0	2595.995046	4.954
10	2595.995120	4.880
20	2595.994988	5.012
30	2595.994892	5.108
40	2595.994767	5.233
50	2595.994652	5.348

**Results Middle Channel (2596 MHz) (Low Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2595.995663	4.337
-20	2595.995494	4.506
-10	2595.995379	4.621
0	2595.995034	4.966
10	2595.995120	4.880
20	2595.994988	5.012
30	2595.994887	5.113
40	2595.994767	5.233
50	2595.994652	5.348

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Frequency Stability: (Temperature Variation) (Continued)**

**Results Top Channel (2680 MHz) (High Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2679.995536	4.464
-20	2679.995350	4.650
-10	2679.995222	4.778
0	2679.994914	5.086
10	2679.994963	5.037
20	2679.994831	5.169
30	2679.994729	5.271
40	2679.994602	5.398
50	2679.994481	5.519

**Results Top Channel (2683 MHz) (Low Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2682.995518	4.482
-20	2682.995342	4.658
-10	2682.995222	4.782
0	2682.994855	4.145
10	2682.994968	5.032
20	2682.994811	5.189
30	2682.994722	5.278
40	2682.994587	5.413
50	2682.994471	5.529

As can be seen from the frequency stability results above, the fundamental emissions at the highest and lowest operating frequencies of the EUT (in addition to the fundamental emission at the centre of the operating band) stay, under all test conditions, within the authorised bands of operation i.e. 2496 MHz to 2690 MHz. The EUT is, therefore, compliant.



Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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### **7.7. Transmitter Frequency Stability: (Voltage Variation):** **Part 2.1055 & Part 27.54**

7.7.1. The EUT was configured as for frequency stability measurements as described in section 9 of this report.

7.7.2. Tests were performed to identify the maximum frequency error of the EUT with variations in nominal operating voltage.

#### **Results Bottom Channel (2506 MHz) - High Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2505.995100	4.900
126.5	2505.995070	4.930

#### **Results Middle Channel (2596 MHz) – High Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2595.994920	5.080
126.5	2595.994920	5.080

#### **Results Top Channel (2680 MHz) – High Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2679.994730	5.270
126.5	2679.994730	5.270

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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**Transmitter Frequency Stability: (Voltage Variation) (Continued)**

**Results Bottom Channel (2503 MHz) – Low Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2502.995260	4.740
126.5	2502.995070	4.930

**Results Middle Channel (2596 MHz) – Low Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2595.994920	5.080
126.5	2595.994920	5.080

**Results Top Channel (2683 MHz) – Low Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2682.994710	5.290
126.5	2682.994730	5.270

As can be seen from the frequency stability results above, the fundamental emissions at the highest and lowest operating frequencies of the EUT (in addition to the fundamental emission at the centre of the operating band) stay, under all test conditions, within the authorised bands of operation i.e. 2496 MHz to 2690 MHz. The EUT is, therefore, compliant.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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### **7.8. Transmitter Occupied Bandwidth: Part 2.1049**

7.8.1. The EUT was configured as for Occupied Bandwidth measurements as described in section 9 of this report.

7.8.2. Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

#### **Results: (High Chip Rate)**

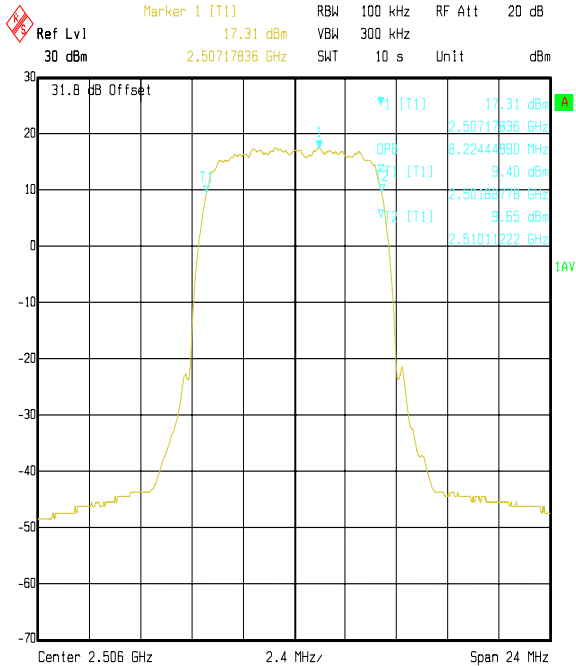
Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	2506	100	300	8.224
Middle	2596	100	300	8.224
Top	2680	100	300	8.224

#### **Results: (Low Chip Rate)**

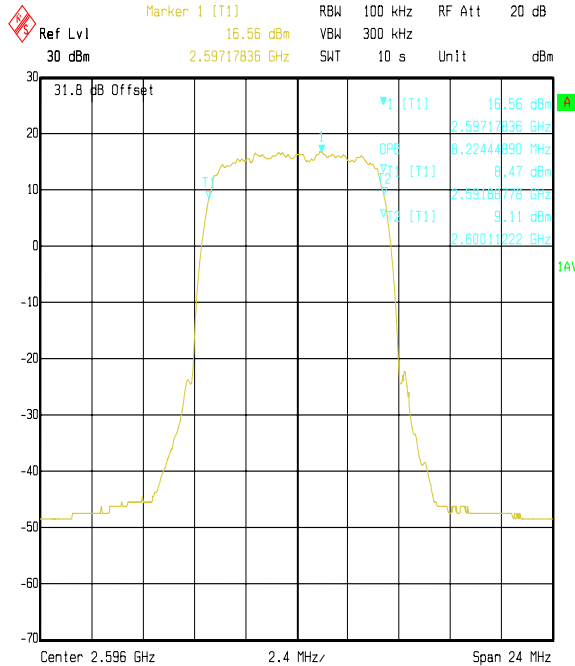
Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	2503	100	300	4.160
Middle	2596	100	300	4.160
Top	2683	100	300	4.160

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

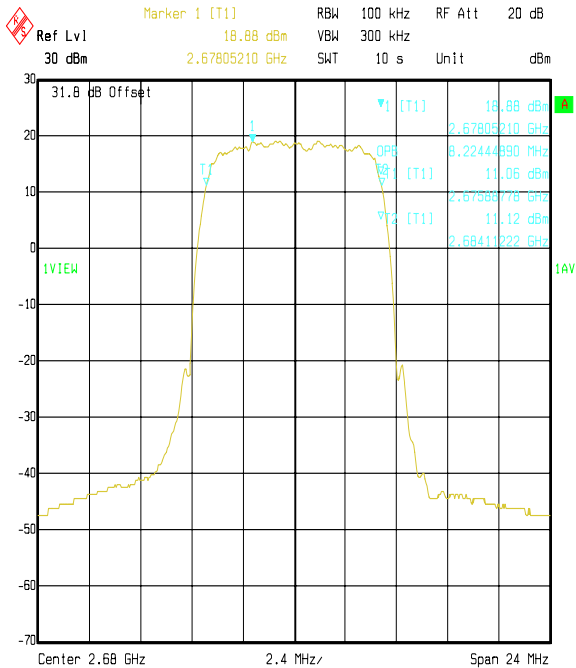
**Transmitter Occupied Bandwidth (High Chip Rate) - Continued**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps  
 Date: 10.FEB.2004 14:05:40



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Middle Channel 7.68 Mcps  
 Date: 10.FEB.2004 14:04:56

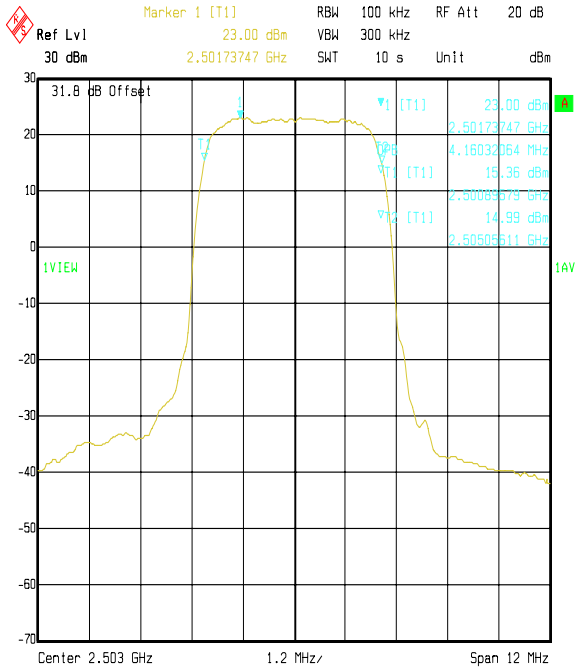


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Top Channel 7.68 Mcps  
 Date: 10.FEB.2004 14:04:13

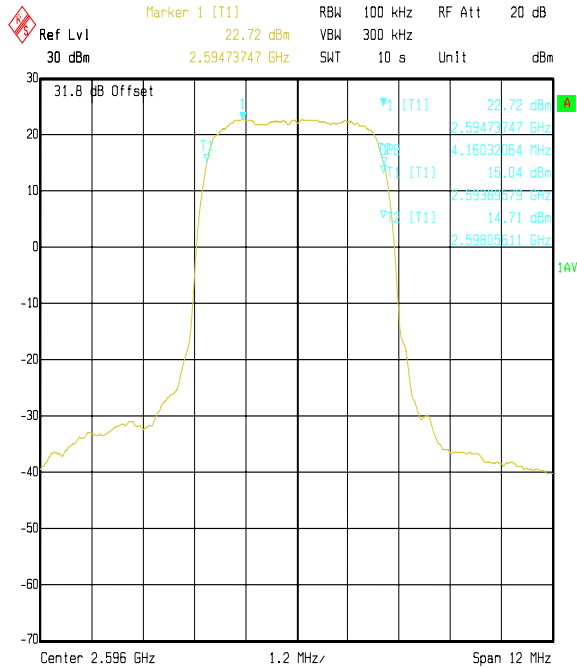
*Note: The occupied bandwidth is measured using the internal OBW function of the measurement analyser. The analyser automatically configures the measurement bandwidths to make an accurate measurement.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

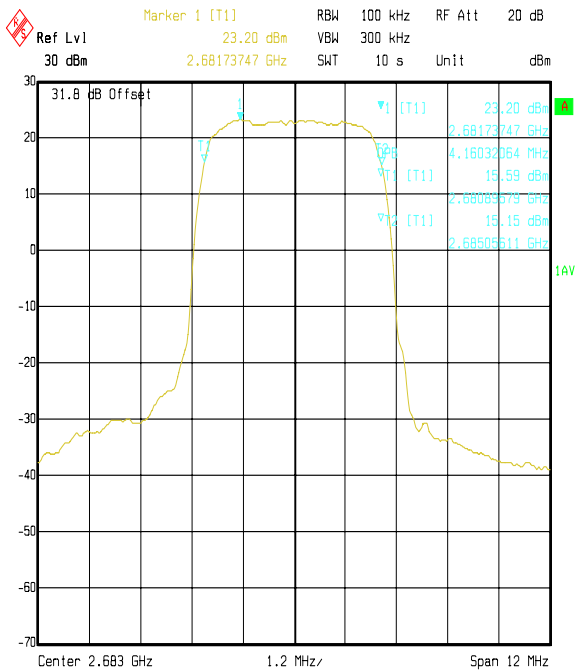
**Transmitter Occupied Bandwidth (Low Chip Rate) - Continued**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps  
 Date: 10.FEB.2004 14:02:23



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Middle Channel 3.84 Mcps  
 Date: 10.FEB.2004 14:01:26



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Occupied BW  
 Comment A: 45361JD05 Top Channel 3.84 Mcps  
 Date: 10.FEB.2004 14:03:10

*Note: The occupied bandwidth is measured using the internal OBW function of the measurement analyser. The analyser automatically configures the measurement bandwidths to make an accurate measurement.*

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

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## **7.9. Transmitter Conducted Emissions (Channel Edge): Part 2.1051 & Part 27.53**

7.9.1. The EUT was configured as for conducted emissions measurements as described in Section 9 of this report.

7.9.2. Tests were performed to determine compliance with the out of band power requirements at frequencies adjacent to the channel occupied by the fundamental frequency of the EUT.

### **Results:**

Results are presented graphically in the following graphs. As can be seen from the plots the EUT complies with the requirements of relevant part of the regulations.

### **Note(s):**

- 1. The following plots of the EUT operating in High and Low Chip Rate Modes were set with a 0 dB reference point as testing was originally performed to FCC Parts 21 and 74. This 0 dB reference point equates to the power level of each fundamental emission measured in a 100 kHz Resolution Bandwidth which, for High Chip Rate mode, is 20.8 dB below the actual power measured in a 12 MHz channel bandwidth ( $C_{BW}$ ) and, for Low Chip Rate mode, is 17.8 dB below the actual power measured in a 6 MHz channel bandwidth. N.B. 20.8 dB and 17.8 dB are derived from  $10\log(C_{BW}/R_{BW})$  where  $C_{BW} = 12$  MHz or 6 MHz respectively and  $R_{BW} = 100$  kHz. The actual power measured in a 100 kHz Resolution Bandwidth is detailed in the right hand corner of each plot.*
- 2. A revised spectrum mask has been added to each plot to indicate the absolute -13 dBm limit which was derived from the  $43 + 10\log(P)$  where  $P$  is the measured transmitter power in Watts (in a 12 MHz channel for High Chip Rate mode or in a 6 MHz channel for Low Chip Rate mode).*
- 3. Measurements in the 2 MHz strip greater than 1 MHz away from the channel edge were performed using a 100 kHz Resolution Bandwidth (in line with the original requirements of to FCC Parts 21 and 74). Part 27 requires that these measurements be performed using a 1 MHz Resolution Bandwidth. In order to correct for this bandwidth change 10 dB shall be added to the levels shown in each plots in these 2 MHz strips. Therefore a pass margin of at least 10 dB in High Chip Rate mode and 8 dB in Low Chip Rate mode exists at the highest point of the fundamental emission in these 2 MHz strips.*

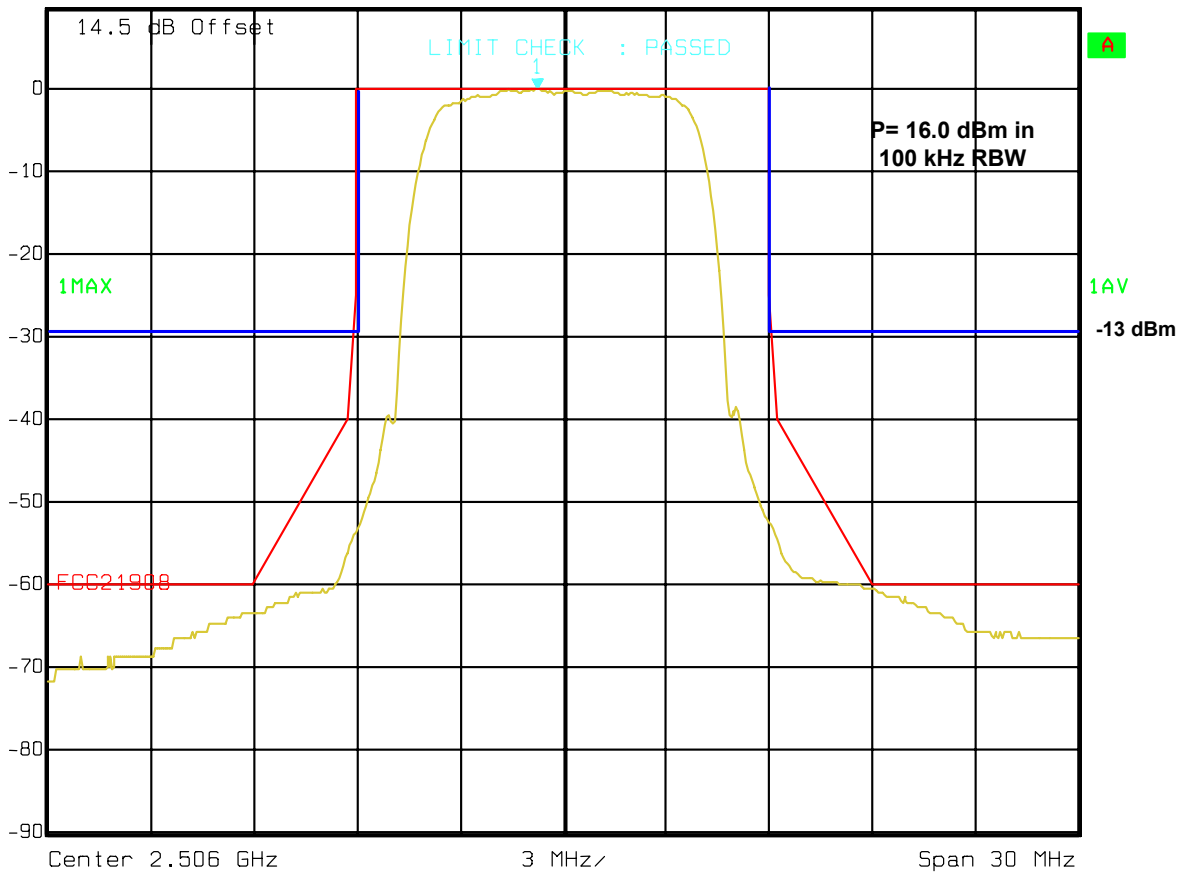
Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - High Chip Rate (Continued)**

**Bottom Channel**



Marker 1 [T1] RBW 100 kHz RF Att 10 dB  
Ref Lvl -0.01 dBm VBW 100 kHz  
9.8 dBm 2.50524850 GHz SWT 10 s Unit dBm

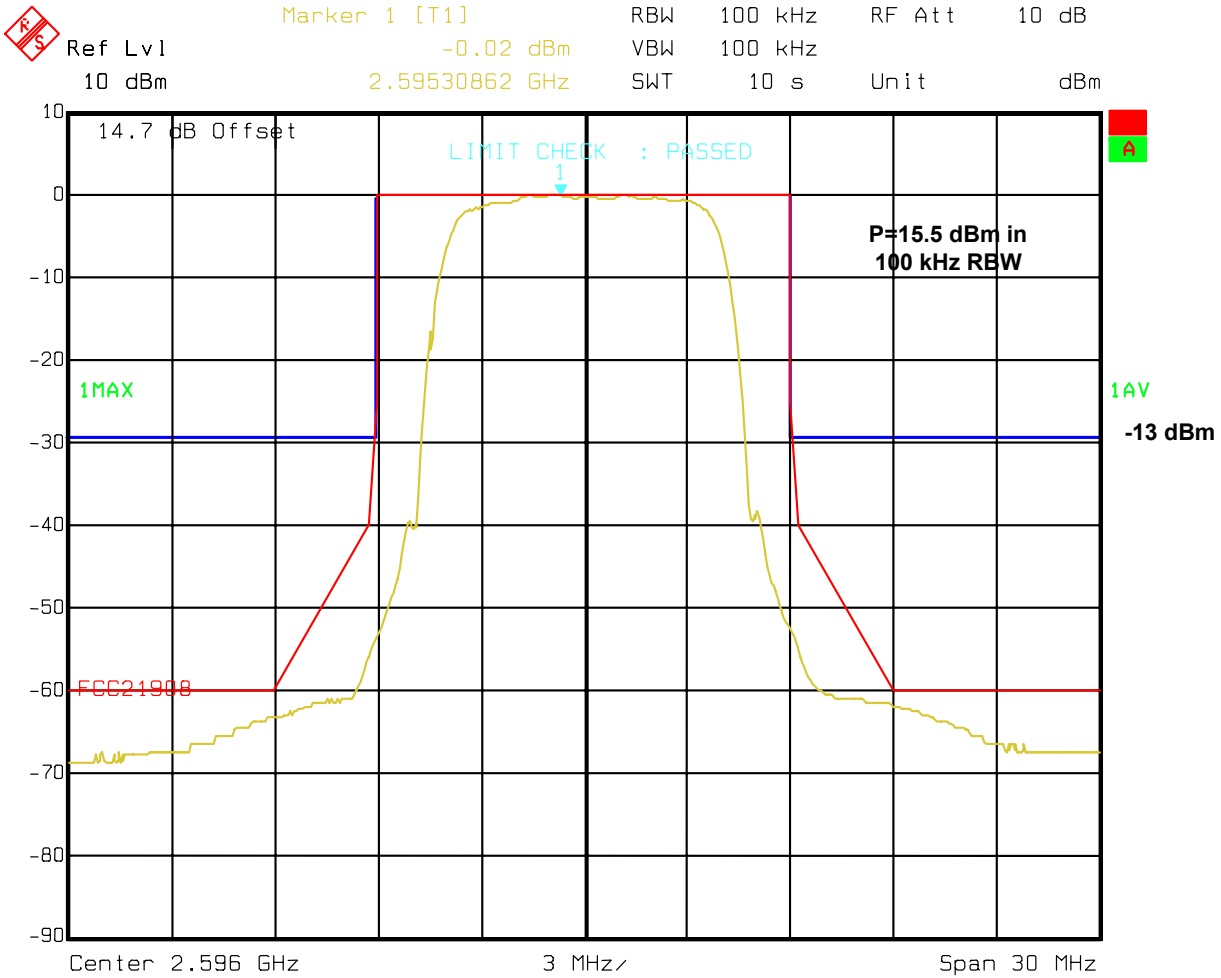


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask  
Comment A: 45361JD05 Bottom Channel 7.68 Mcps  
Date: 10.FEB.2004 12:20:12

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - High Chip Rate (Continued)**

**Middle Channel**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask  
Comment A: 45361JD05 Middle Channel 7.68 Mcps  
Date: 10.FEB.2004 12:18:52



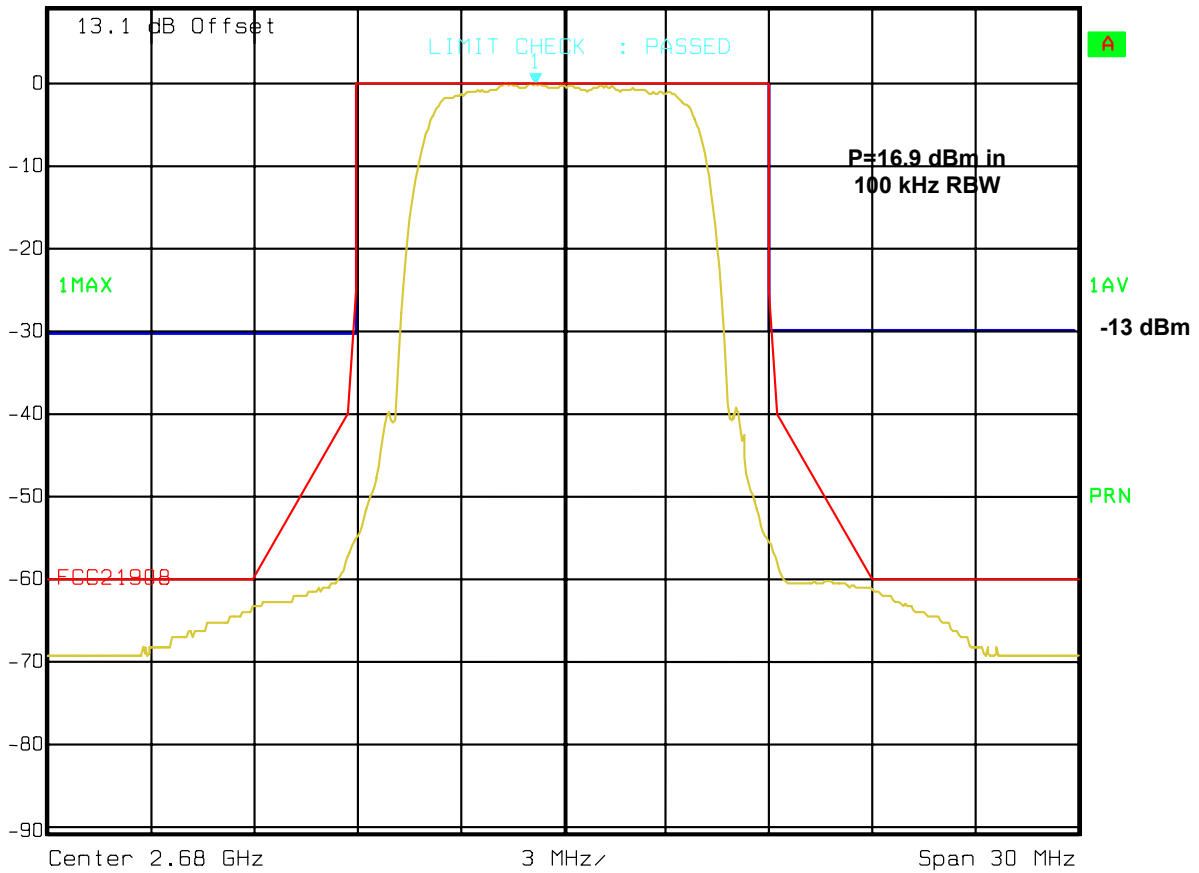
Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - High Chip Rate (Continued)**

**Top Channel**



Ref Lvl	Marker 1 [T1]	RBW	100 kHz	RF Att	10 dB
9.3 dBm	-0.02 dBm	VBW	100 kHz		
	2.67918838 GHz	SWT	10 s	Unit	dBm

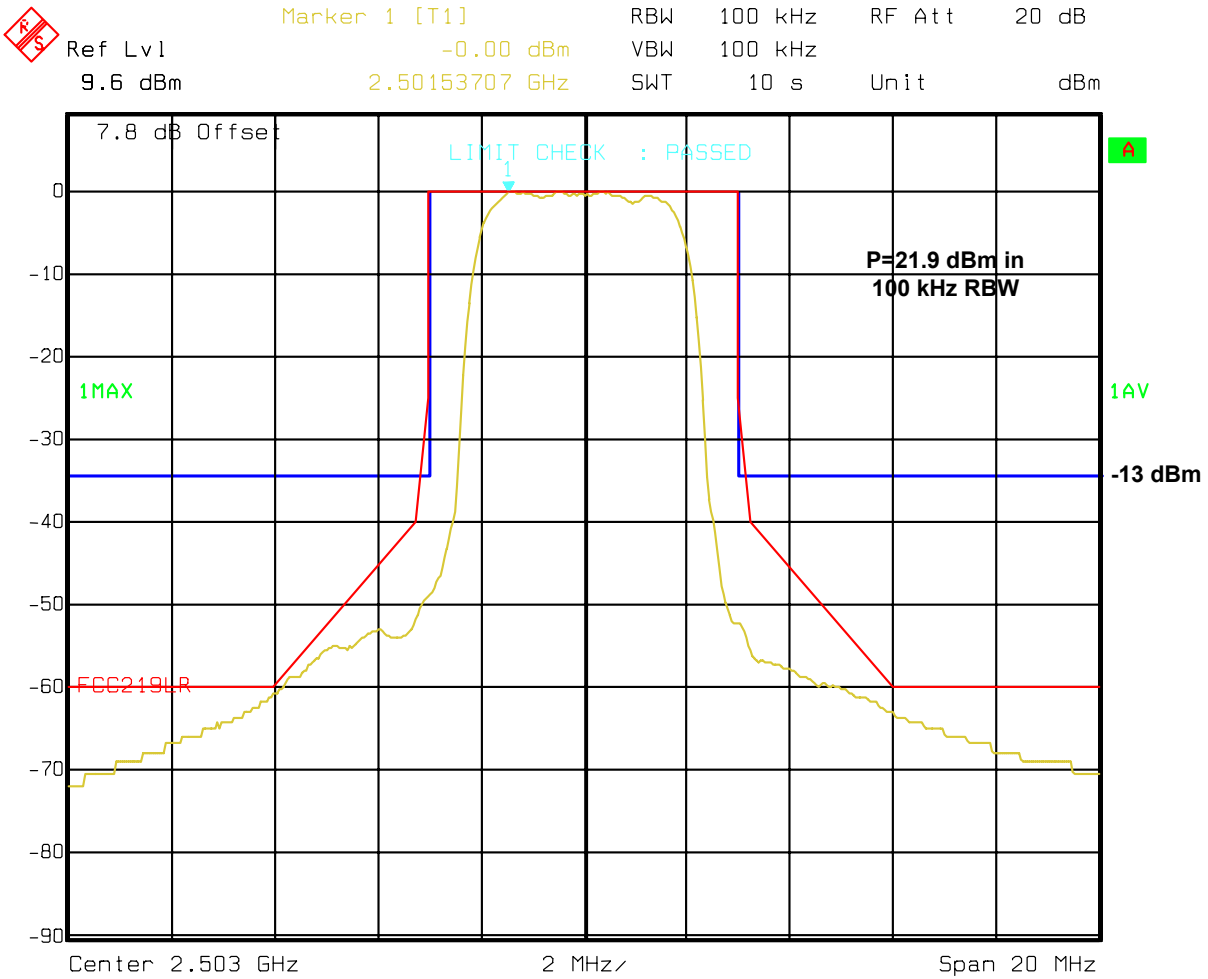


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask  
Comment A: 45361JD05 Top Channel 7.68 Mcps  
Date: 10.FEB.2004 12:15:30

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - Low Chip Rate (Continued)**

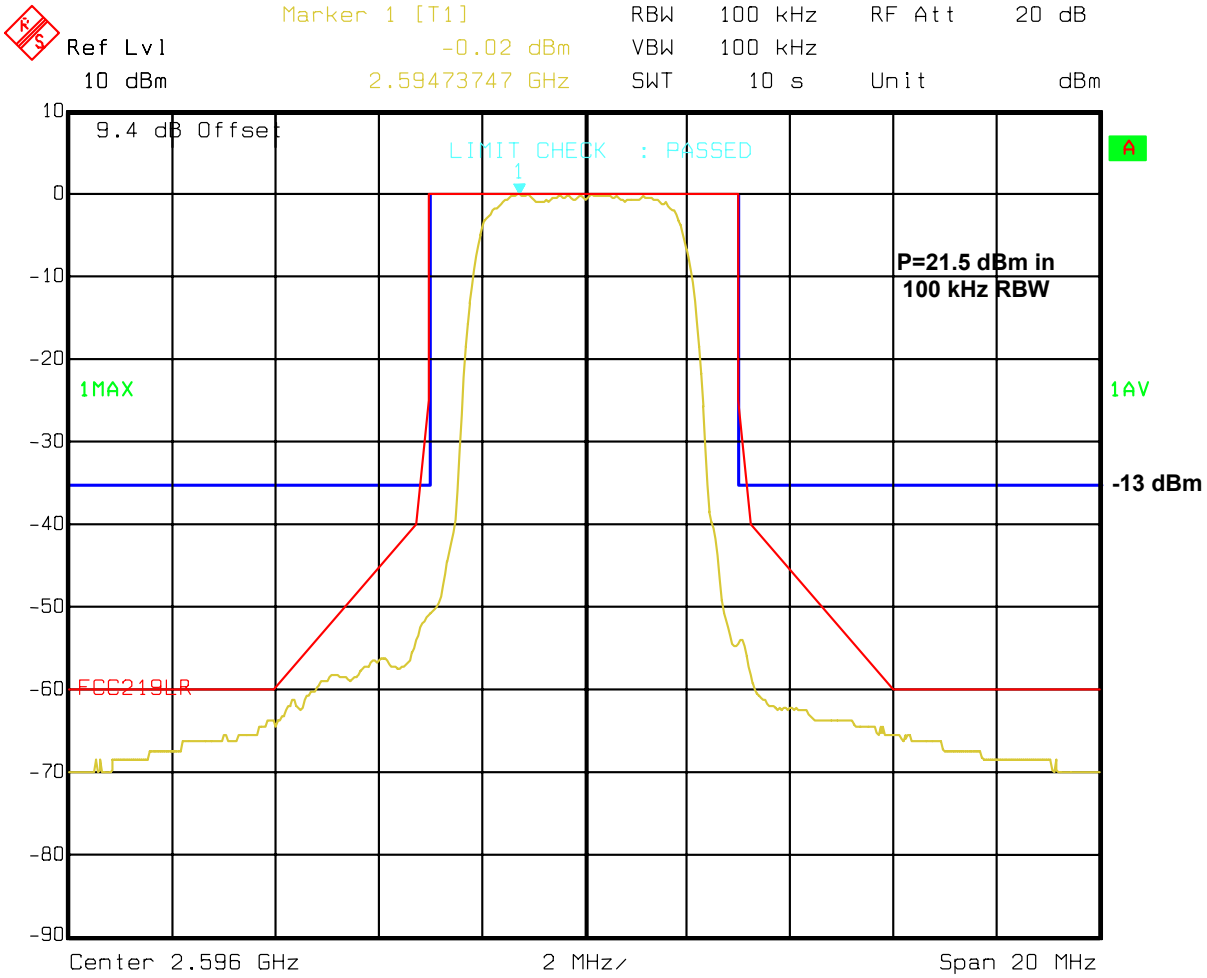
**Bottom Channel**



Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - Low Chip Rate (Continued)**

**Middle Channel**

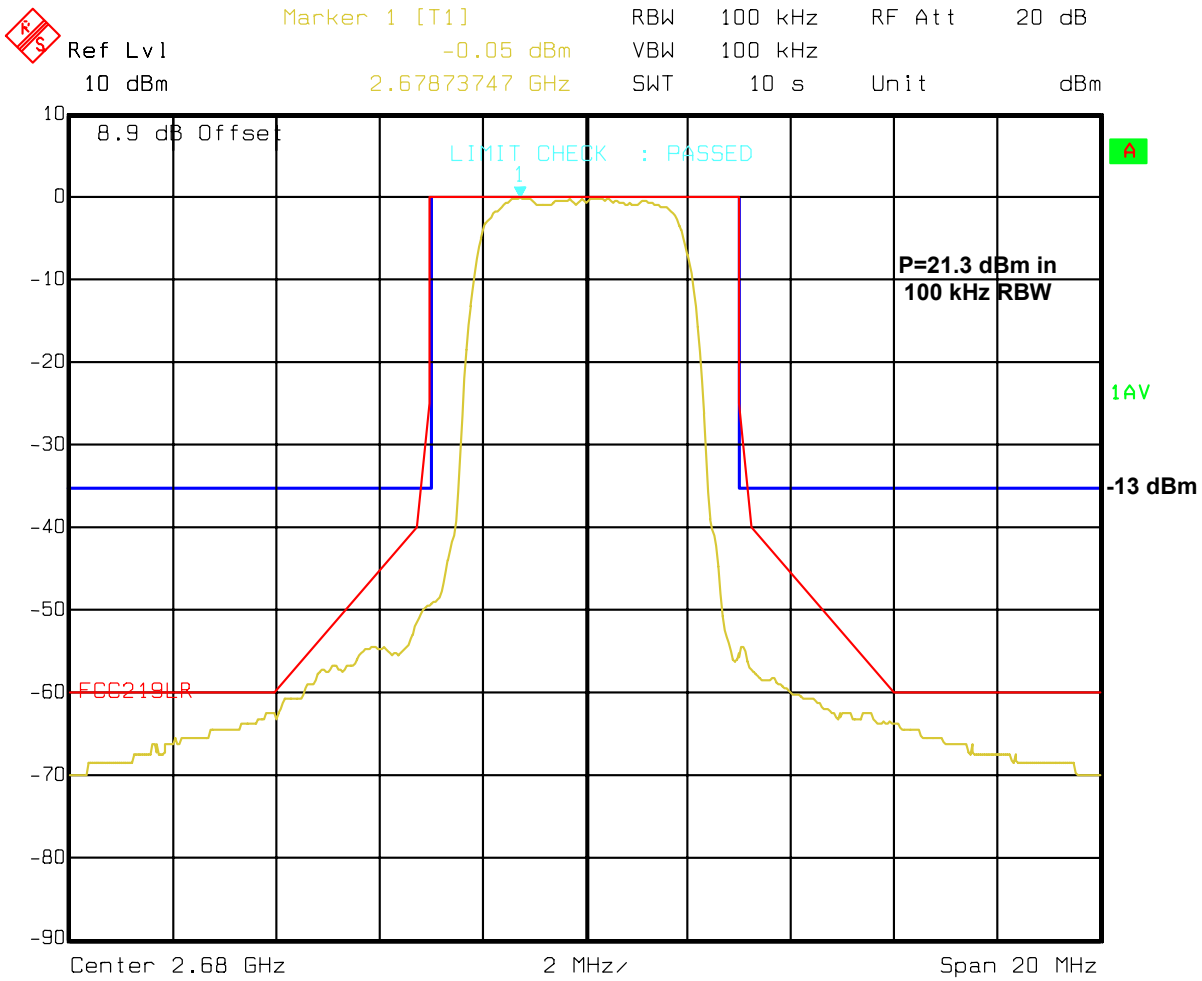


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask  
Comment A: 45361JD05 Middle Channel 3.84 Mcps  
Date: 10.FEB.2004 12:32:44

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Conducted Emissions (Channel Edge) - Low Chip Rate (Continued)**

**Top Channel**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask  
Comment A: 45361JD05 Top Channel 3.84 Mcps  
Date: 10.FEB.2004 12:37:14

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

### **7.10. Transmitter Conducted Emissions at Band Edges: Part 2.1051 & Part 27.53**

7.10.1. The EUT was configured as for conducted emissions measurements as described in section 9 of this report.

7.10.2. Tests were performed to identify the maximum emissions level at the edges of the frequency band that the EUT will operate over.

#### **Results: (High Chip Rate)**

##### **Bottom Band Edge**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2500	-36.5	36.8	-73.3	-49.8	23.5	Complied

##### **Top Band Edge**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2686	-32.6	37.7	-70.3	-50.7	19.6	Complied

#### **Results: (Low Chip Rate)**

##### **Bottom Band Edge**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2500	-25.5	39.7	-65.2	-52.7	12.5	Complied

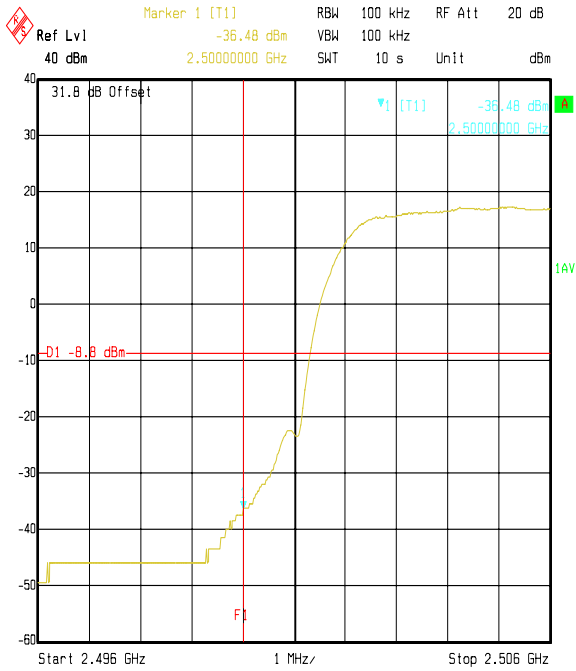
##### **Top Band Edge**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2686	-26.9	39.1	-66.0	-52.1	13.9	Complied

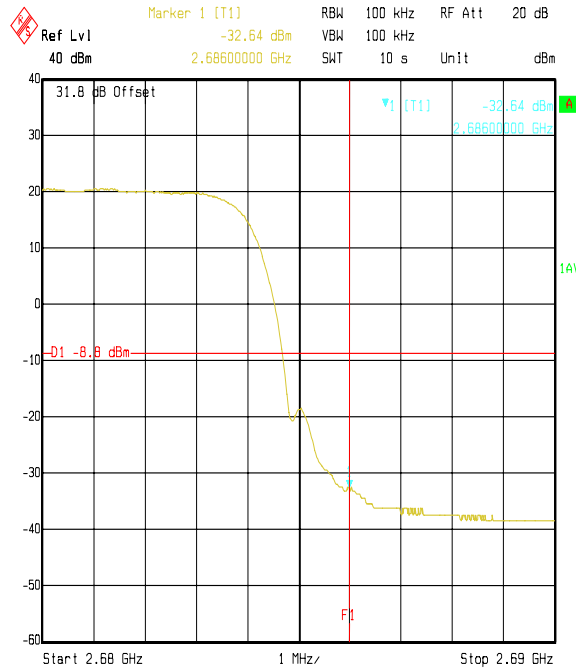
Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

**Transmitter Conducted Emissions at Band Edges (High Chip Rate) - Continued**

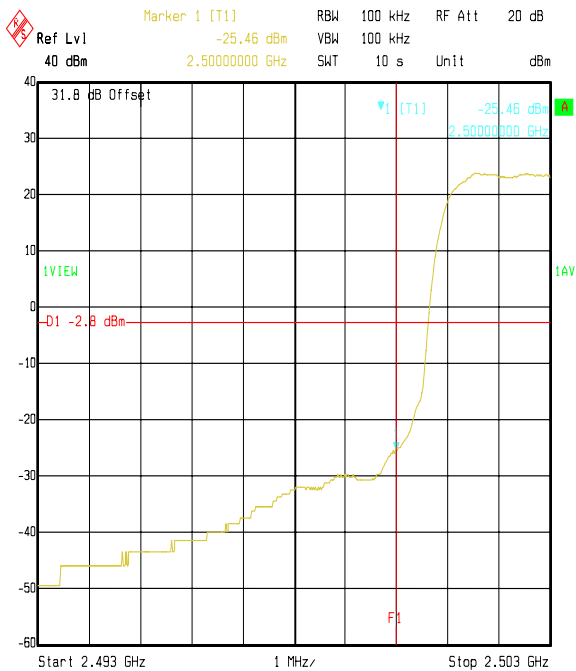


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Lower BandEdge.  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps Avg Dectector  
 Date: 10.FEB.2004 15:31:07

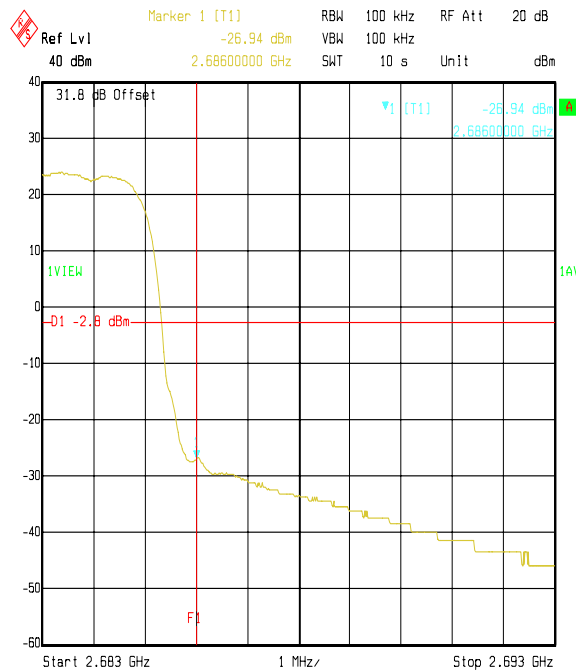


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Upper BandEdge.  
 Comment A: 45361JD05 Top Channel 7.68 Mcps Avg Dectector  
 Date: 10.FEB.2004 15:33:00

**Transmitter Conducted Emissions at Band Edges (Low Chip Rate)- Continued**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Lower BandEdge.  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps Avg Dectector  
 Date: 10.FEB.2004 15:27:52



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Upper BandEdge.  
 Comment A: 45361JD05 Top Channel 3.84 Mcps Avg Dectector  
 Date: 10.FEB.2004 15:26:36

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

### **7.11. Transmitter Conducted Emissions: Part 2.1051 & Part 27.53**

7.11.1. The EUT was configured as for conducted emissions measurements as described in section 9 of this report.

7.11.2. Tests were performed to identify the maximum transmitter conducted emission levels.

#### **Result: Bottom Channel (High Chip Rate)**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2497.000	-35.7	36.8	-72.5	-49.8	22.7	Complied
2515.000	-34.1	36.8	-70.9	-49.8	21.1	Complied
5363.380	-38.8	36.8	-75.6	-49.8	25.8	Complied

#### **Result: Middle Channel (High Chip Rate)**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2587.000	-35.8	36.3	-72.1	-49.3	22.8	Complied
2605.000	-35.2	36.3	-71.5	-49.3	22.2	Complied
5188.770	-37.1	36.3	-73.4	-49.3	24.1	Complied

#### **Result: Top Channel (High Chip Rate)**

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
51.383	-47.7	37.7	-85.4	-50.7	34.7	Complied
2671.000	-34.3	37.7	-72.0	-50.7	21.3	Complied
2689.000	-34.2	37.7	-71.9	-50.7	21.2	Complied
5356.720	-36.2	37.7	-73.9	-50.7	23.2	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

### Transmitter Conducted Emissions - Continued

#### Result: Bottom Channel (Low Chip Rate)

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2497.000	-28.8	39.7	-68.5	-52.7	15.8	Complied
2509.000	-33.5	39.7	-73.2	-52.7	20.5	Complied
5004.490	-32.0	39.7	-71.7	-52.7	19.0	Complied

#### Result: Middle Channel (Low Chip Rate)

Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2590.000	-31.1	39.3	-70.4	-52.3	18.1	Complied
2602.000	-33.0	39.3	-72.3	-52.3	20.0	Complied
5190.530	-29.0	39.3	-68.3	-52.3	16.0	Complied

#### Result: Top Channel (Low Chip Rate)

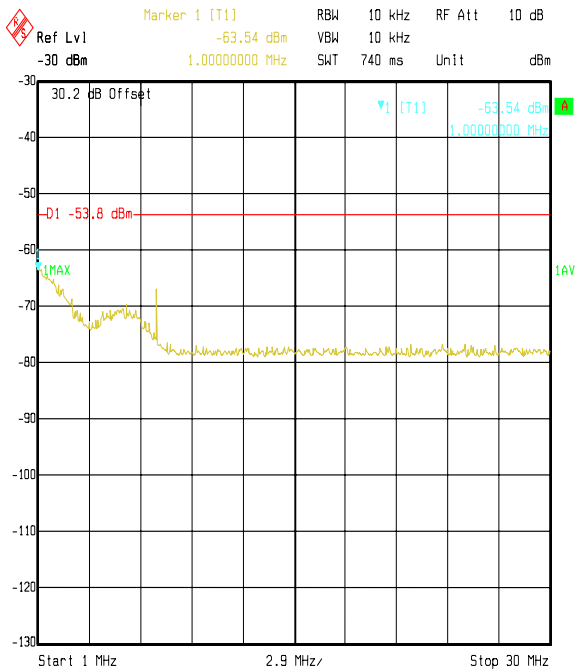
Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
51.383	-39.9	39.1	-79.0	-52.1	26.9	Complied
2677.000	-31.9	39.1	-71.0	-52.1	18.9	Complied
2689.000	-31.9	39.1	-71.0	-52.1	18.9	Complied
5367.660	-30.6	39.1	-69.7	-52.1	17.6	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

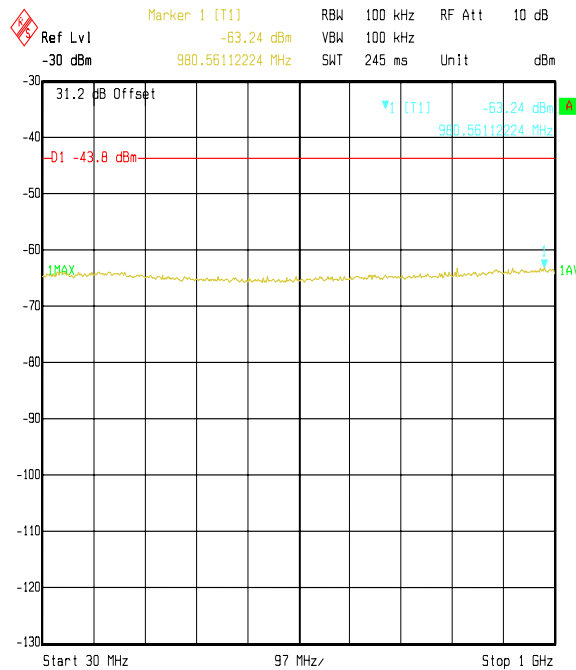


Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

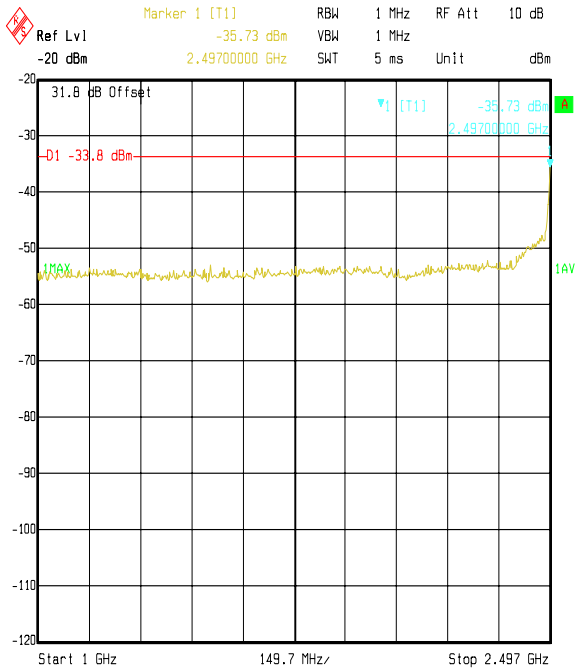
**Transmitter Conducted Emissions Bottom Channel (High Chip Rate)- Continued**



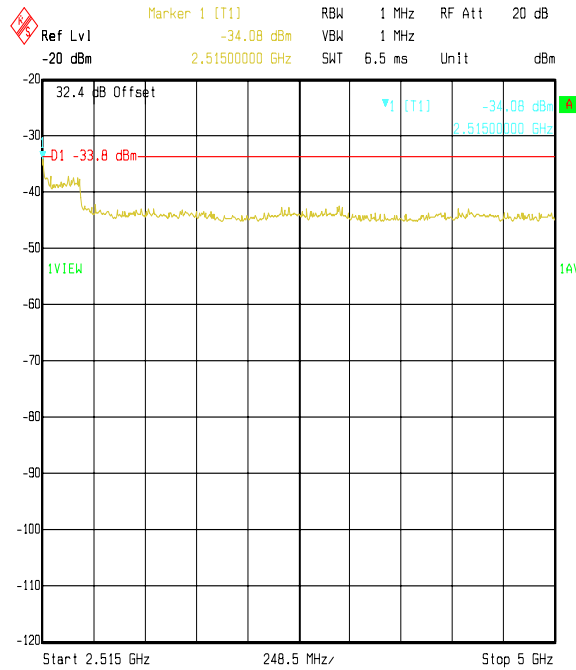
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 14:19:19



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 14:39:04



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps 1-2.497 GHz Avg Detector  
 Date: 10.FEB.2004 14:31:33

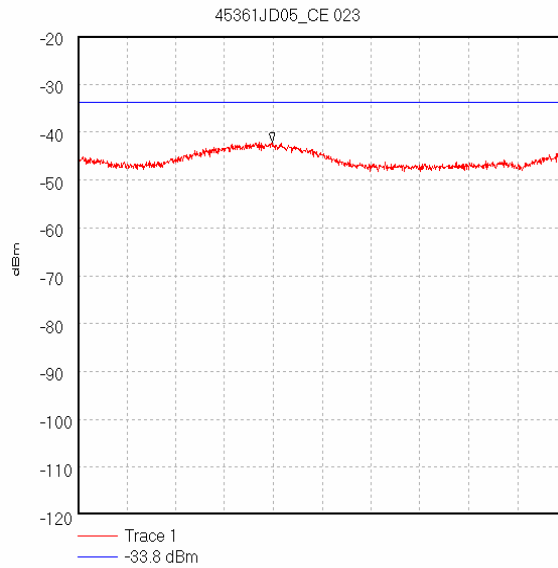
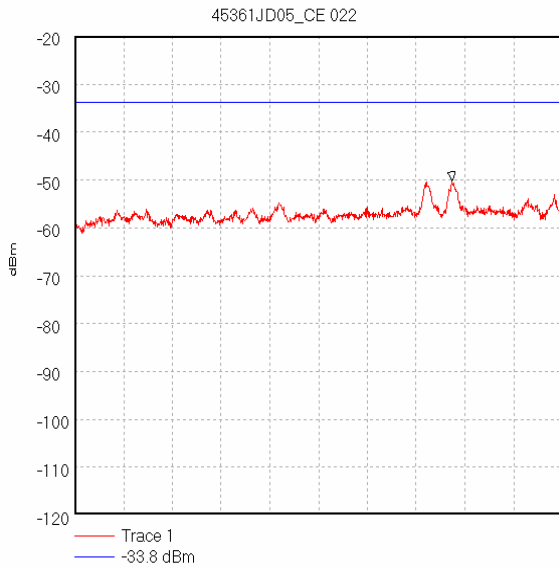
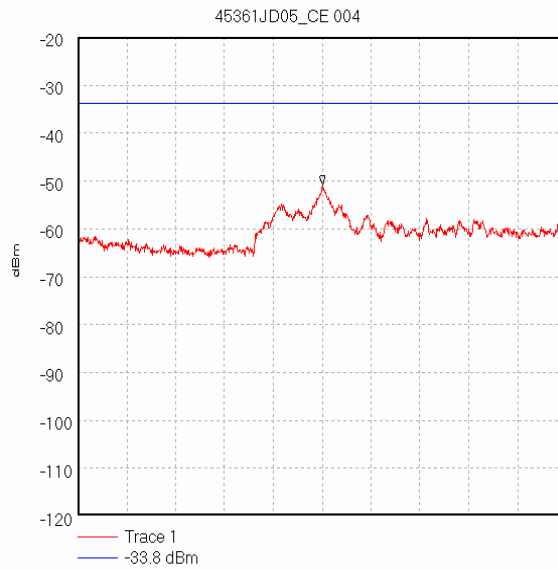
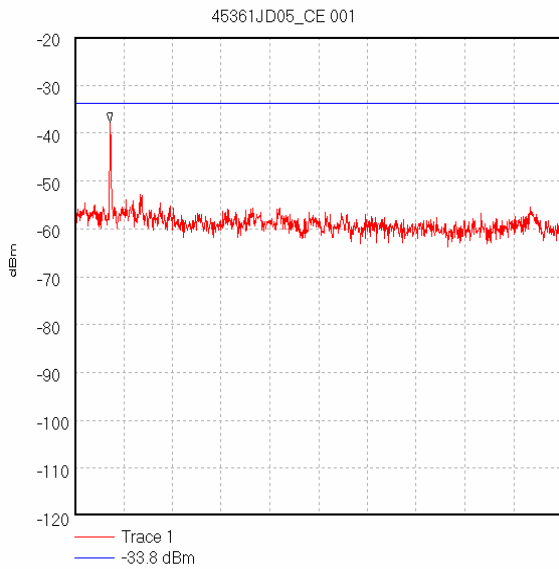


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 7.68 Mcps 2.515-5 GHz Avg Detector  
 Date: 10.FEB.2004 14:30:19

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

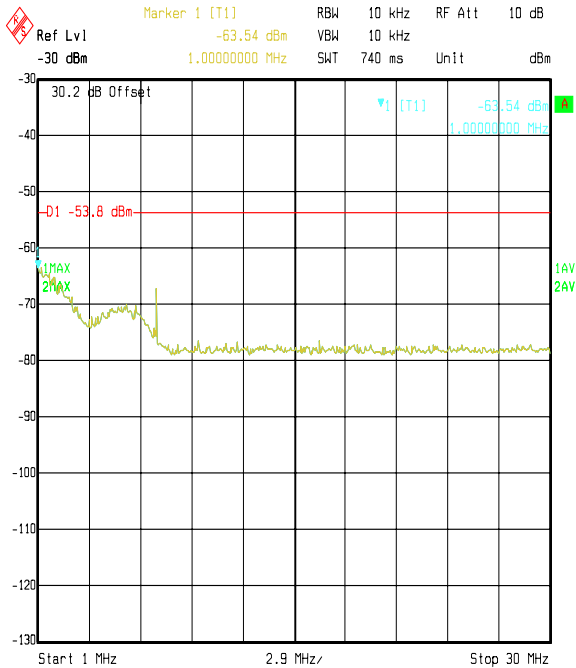
**Transmitter Conducted Emissions Bottom Channel (High Chip Rate)- Continued**



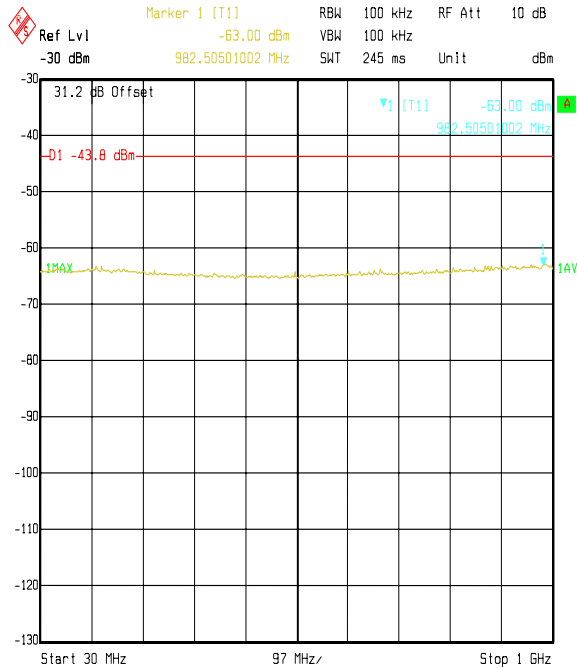
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

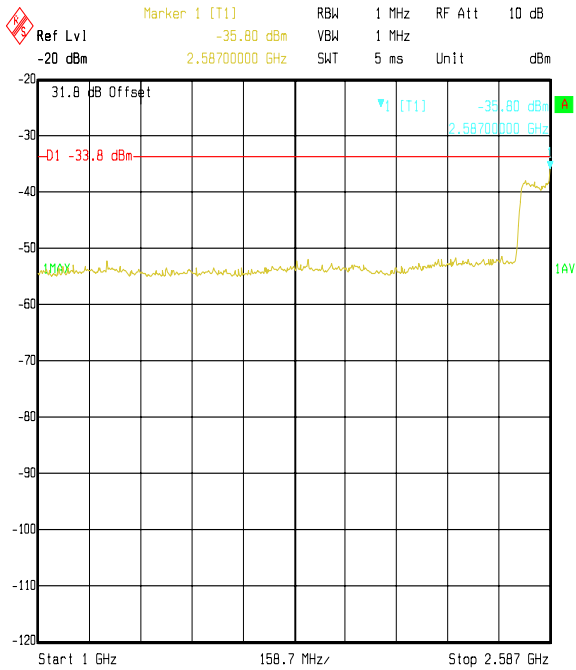
**Transmitter Conducted Emissions Middle Channel (High Chip Rate) - Continued**



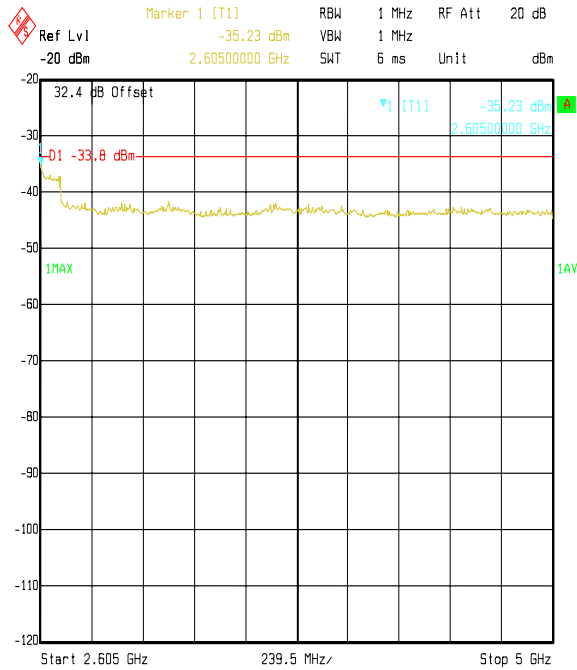
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 7.68 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 14:18:45



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 7.68 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 14:23:15



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 7.68 Mcps 1-2.587 GHz Avg Detector  
 Date: 10.FEB.2004 14:26:28

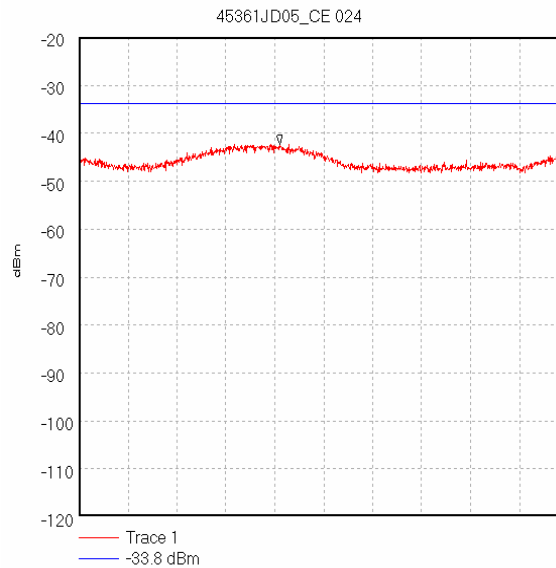
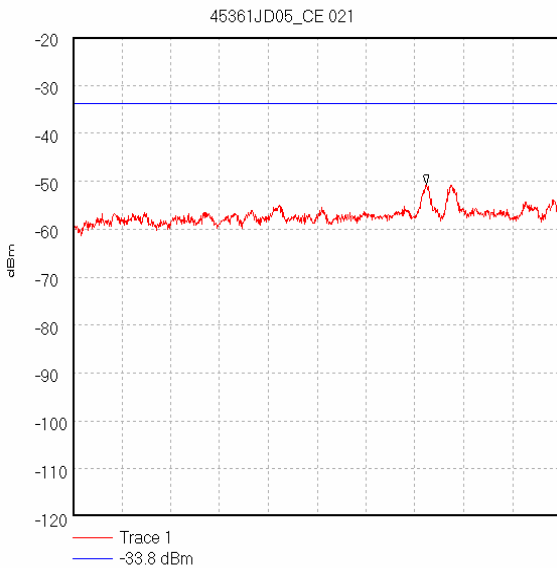
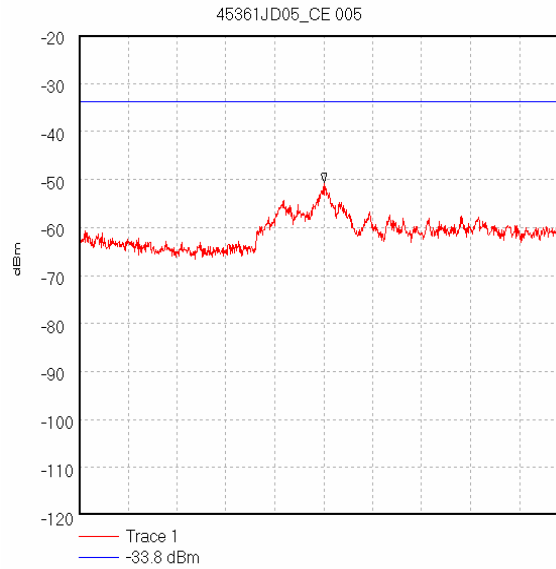
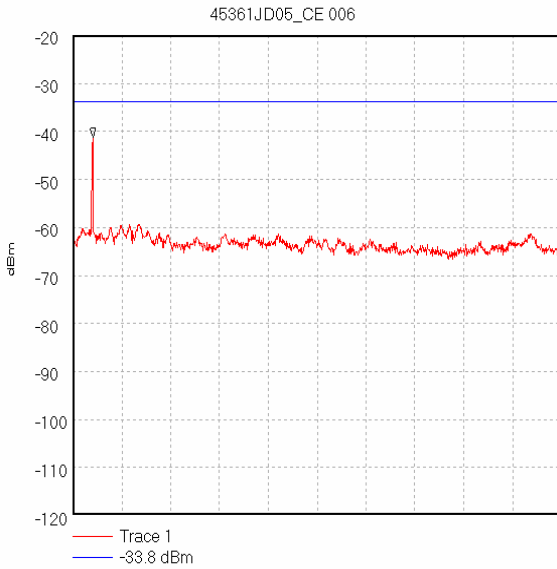


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 7.68 Mcps 2.605-5 GHz Avg Detector  
 Date: 10.FEB.2004 14:28:09

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

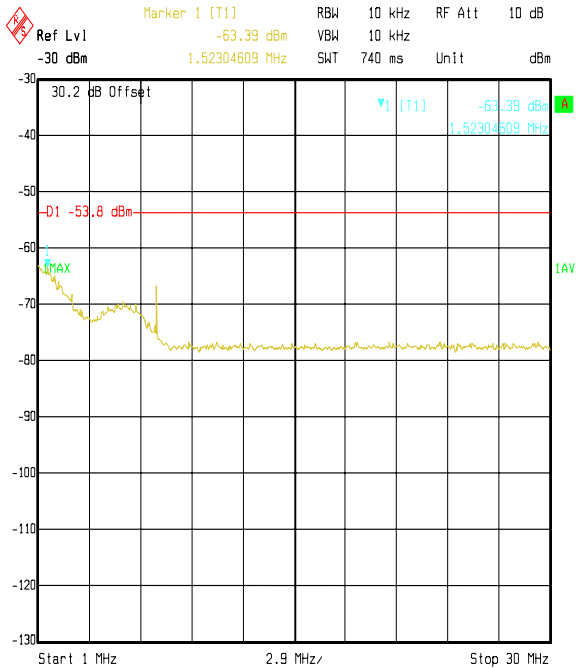
**Transmitter Conducted Emissions Middle Channel (High Chip Rate) - Continued**



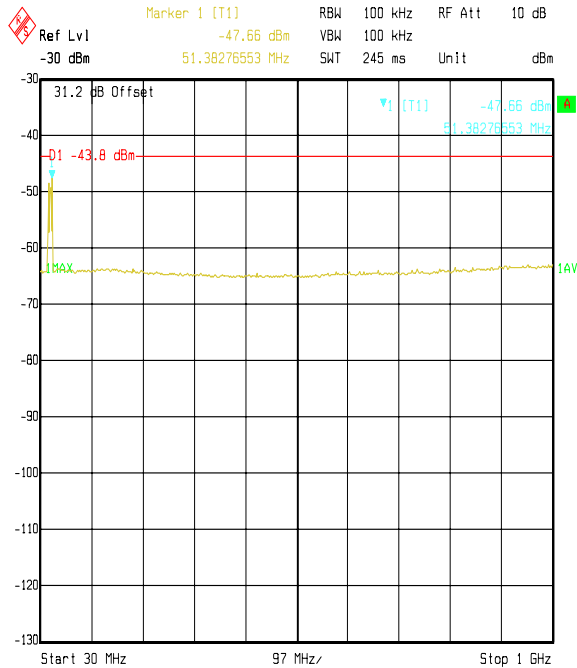
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

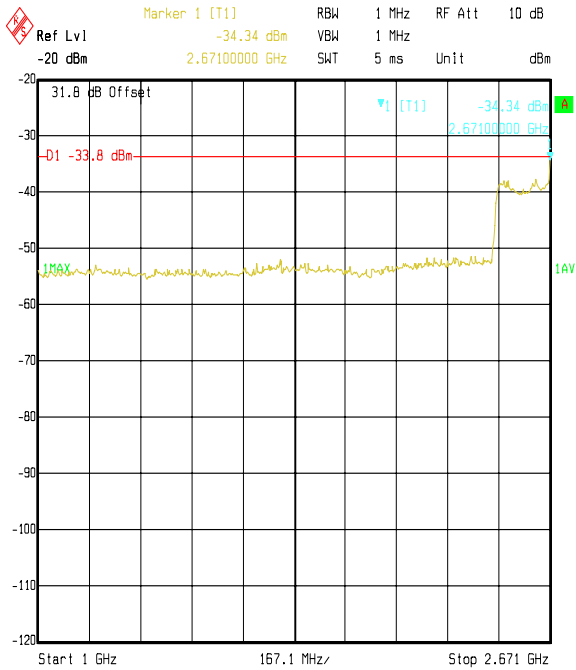
**Transmitter Conducted Emissions Top Channel (High Chip Rate) - Continued**



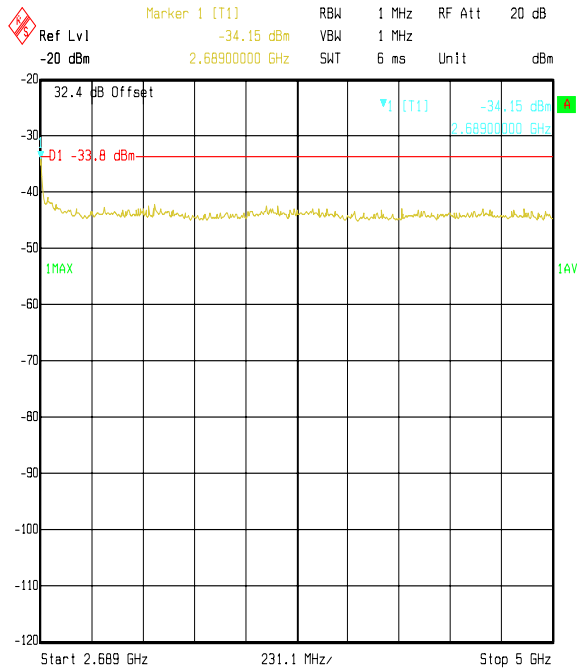
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 7.68 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 14:18:07



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 7.68 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 14:37:51



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 7.68 Mcps 1-2.671 GHz Avg Detector  
 Date: 10.FEB.2004 14:35:03

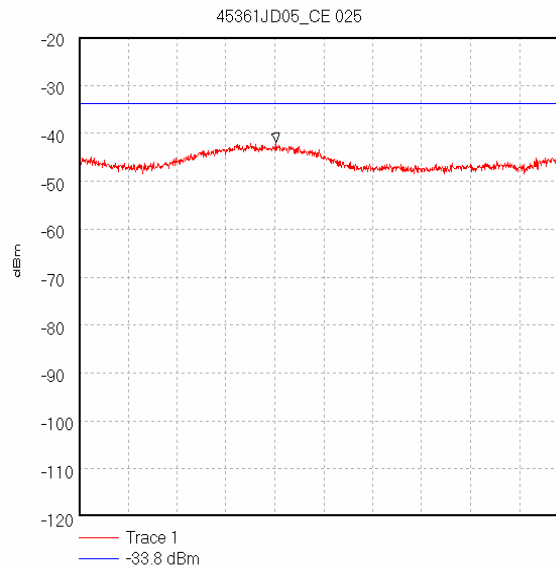
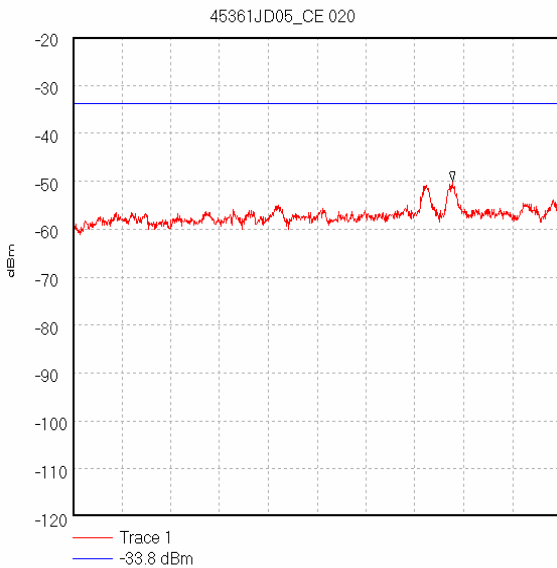
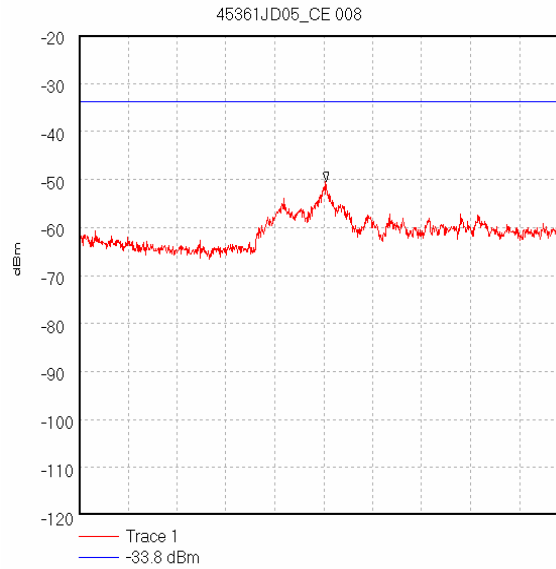
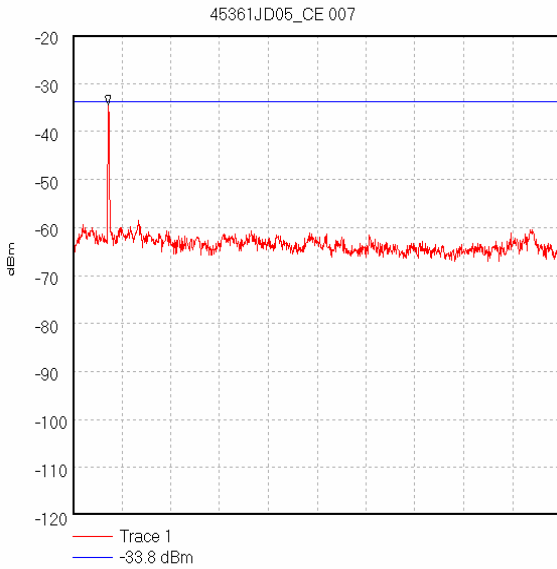


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 7.68 Mcps 2.689-5 GHz Avg Detector  
 Date: 10.FEB.2004 14:36:24

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

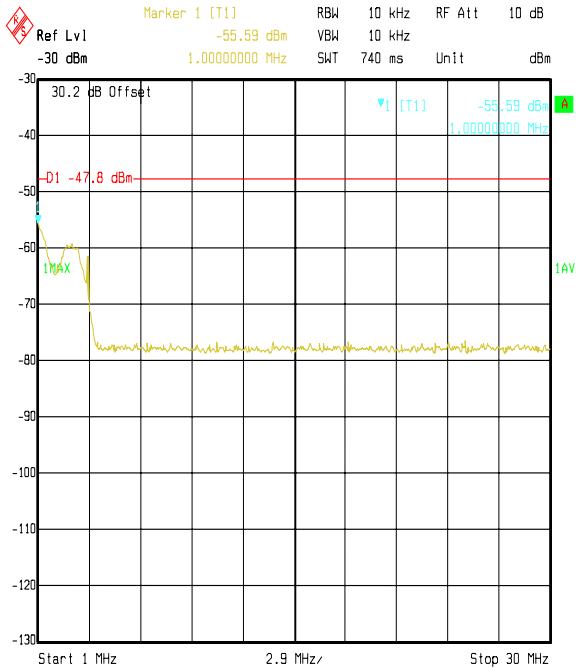
**Transmitter Conducted Emissions Top Channel (High Chip Rate) - Continued**



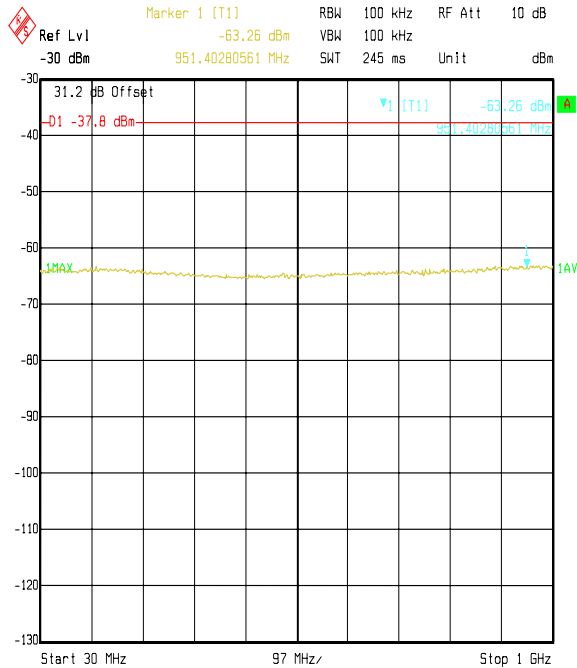
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

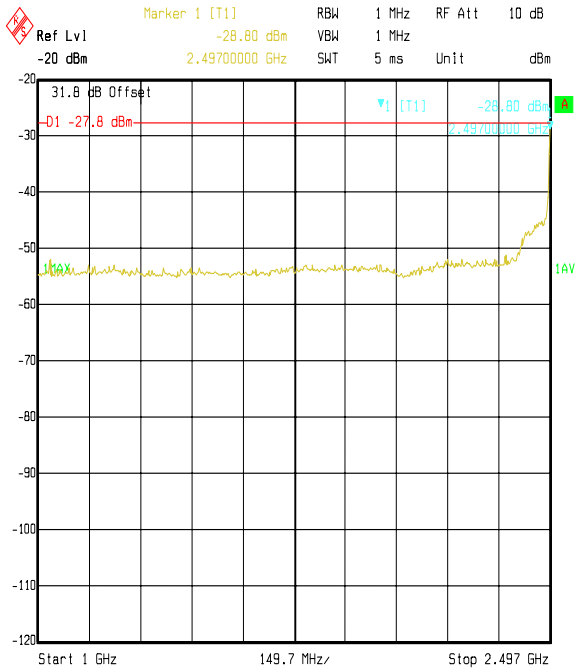
**Transmitter Conducted Emissions Bottom Channel (Low Chip Rate) - Continued**



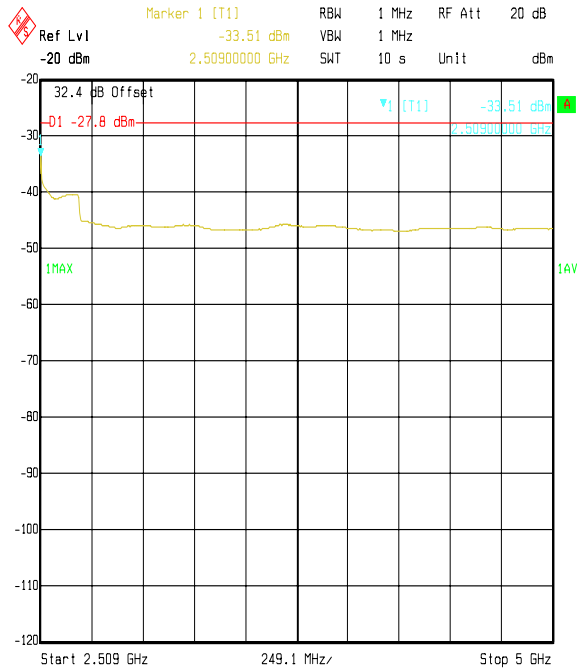
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 14:42:14



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 14:43:15



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps 1-2.497 GHz Avg Detector  
 Date: 10.FEB.2004 14:44:25

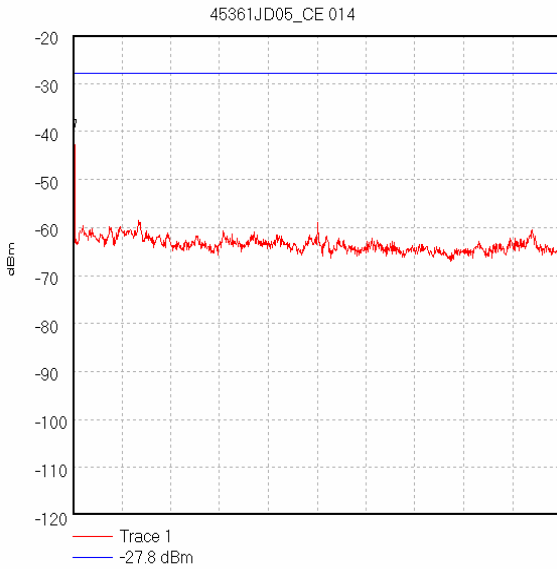


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Bottom Channel 3.84 Mcps 2.509-5 GHz Avg Detector  
 Date: 10.FEB.2004 14:46:06

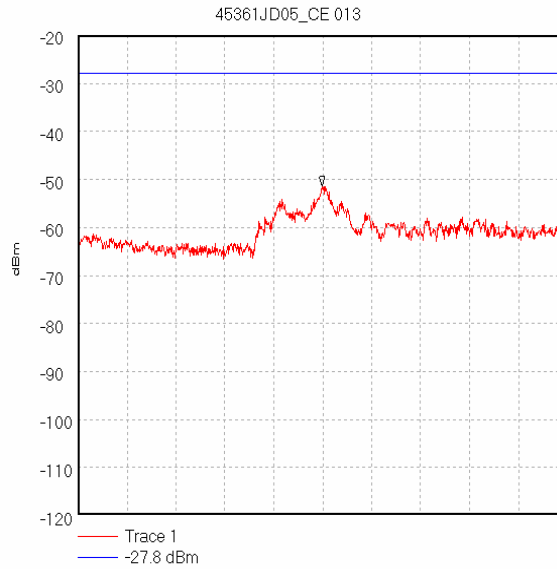
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

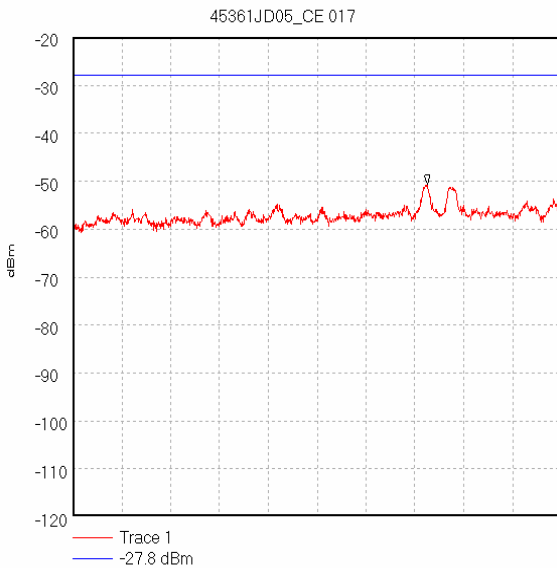
**Transmitter Conducted Emissions Bottom Channel (Low Chip Rate) - Continued**



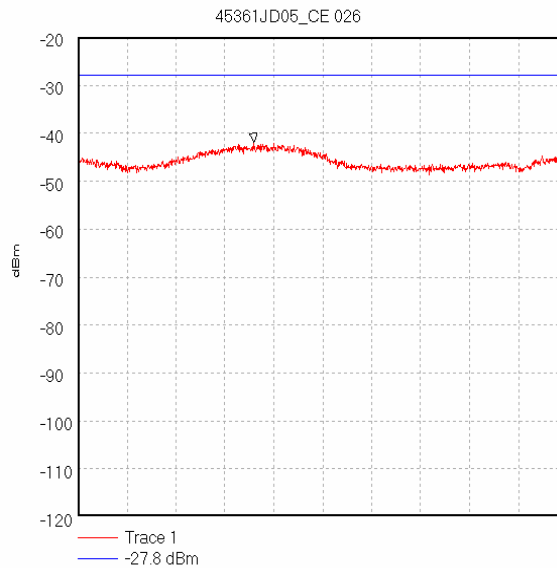
Start 5.0 GHz; Stop 10.0 GHz  
Ref -20 dBm; Ref Offset 33.7 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 5.011111 GHz, -39.47 dBm  
Display Line: -27.8 dBm;  
10/02/2004 16:32:04



Start 10.0 GHz; Stop 18.0 GHz  
Ref -20 dBm; Ref Offset 35.7 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 13.991111 GHz, -51.41 dBm  
Display Line: -27.8 dBm;  
10/02/2004 16:31:08



Start 18.0 GHz; Stop 26.5 GHz  
Ref -20 dBm; Ref Offset 36.5 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 24.167222 GHz, -50.7 dBm  
Display Line: -27.8 dBm;  
10/02/2004 16:39:07



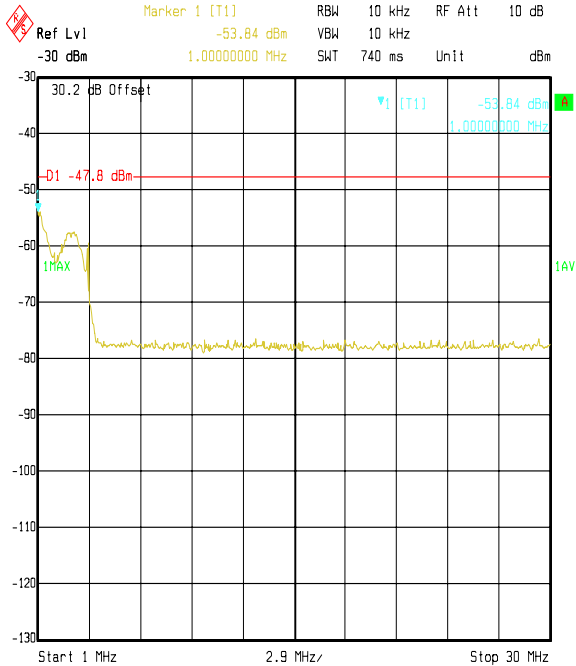
Start 26.5 GHz; Stop 27.0 GHz  
Ref -20 dBm; Ref Offset 60.9 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.68 GHz, -41.81 dBm  
Display Line: -27.8 dBm;  
12/02/2004 10:16:57

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

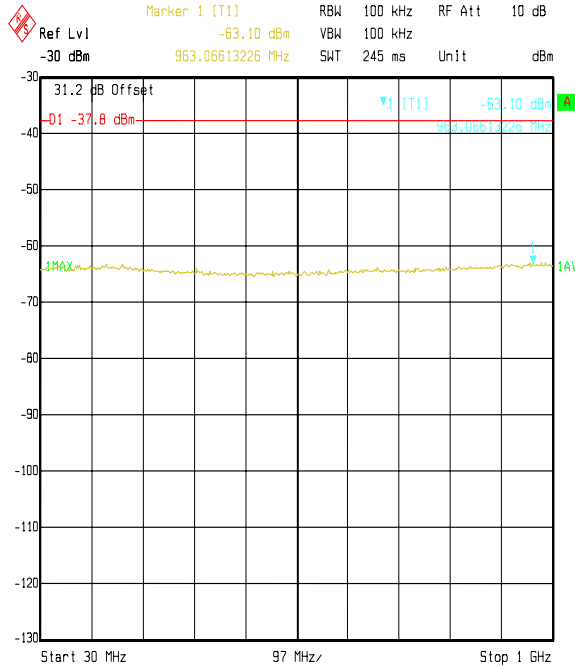


Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

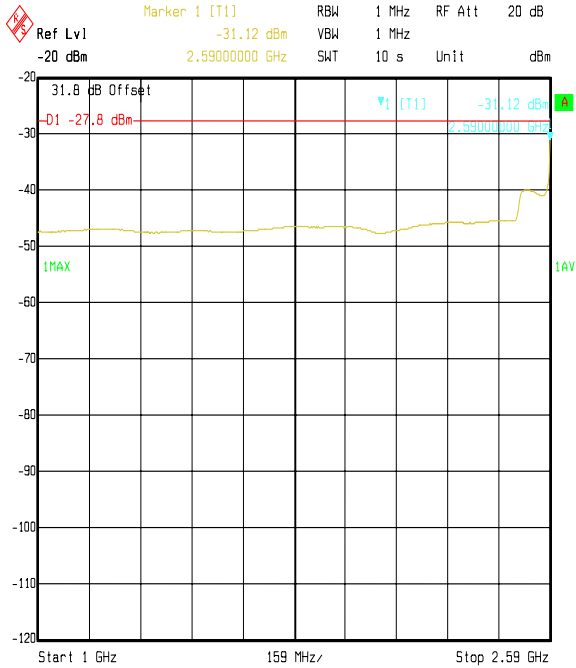
**Transmitter Conducted Emissions Middle Channel (Low Chip Rate) - Continued**



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 3.84 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 15:01:26



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 3.84 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 15:00:16



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 3.84 Mcps 1-2.59 GHz Avg Detector  
 Date: 10.FEB.2004 14:58:59

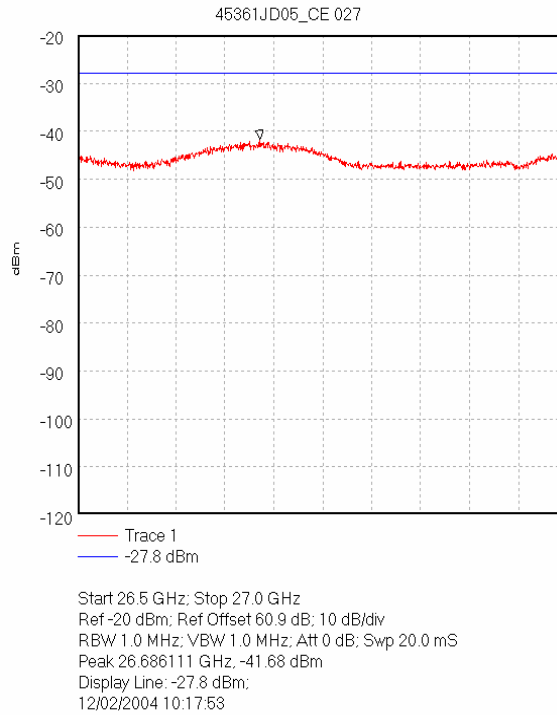
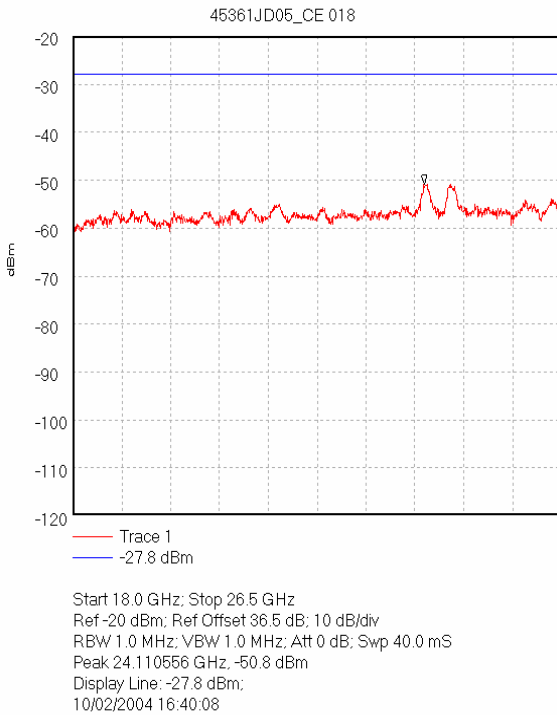
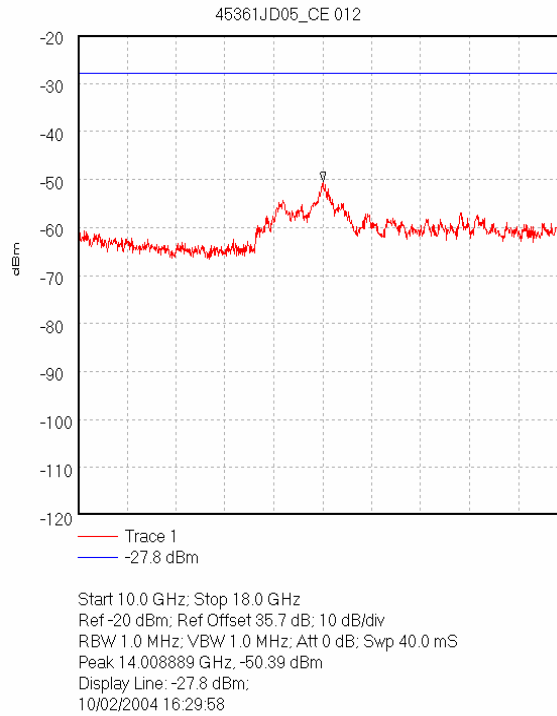
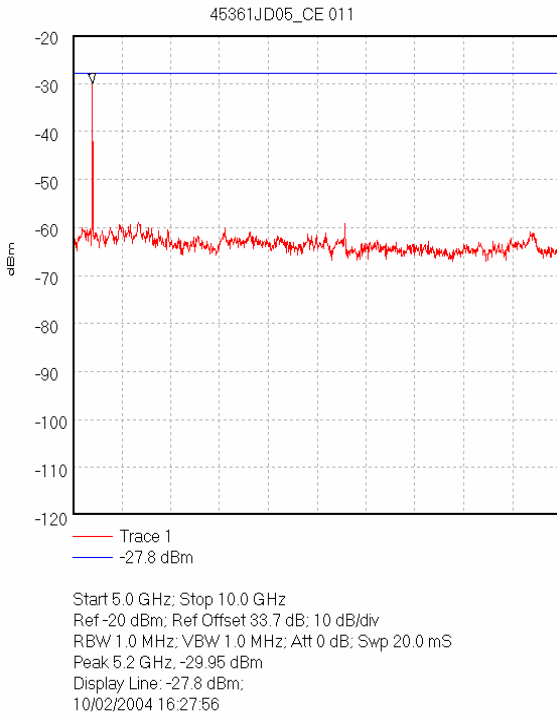


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Middle Channel 3.84 Mcps 2.602-5 GHz Avg Detector  
 Date: 10.FEB.2004 14:57:45

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

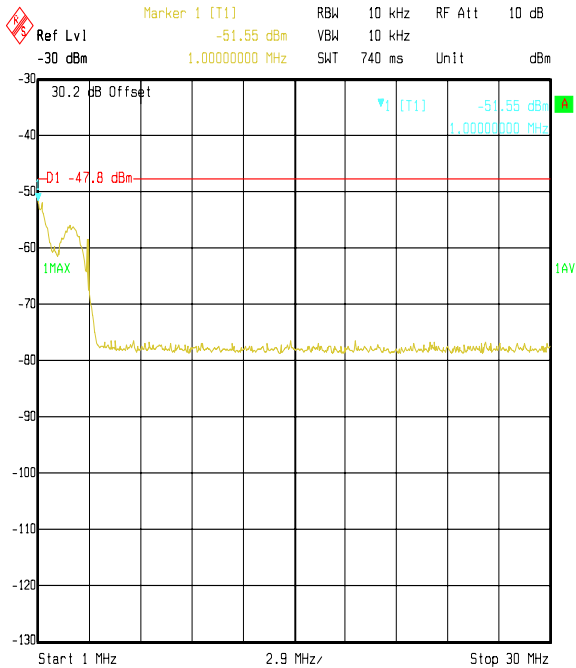
**Transmitter Conducted Emissions Middle Channel (Low Chip Rate) - Continued**



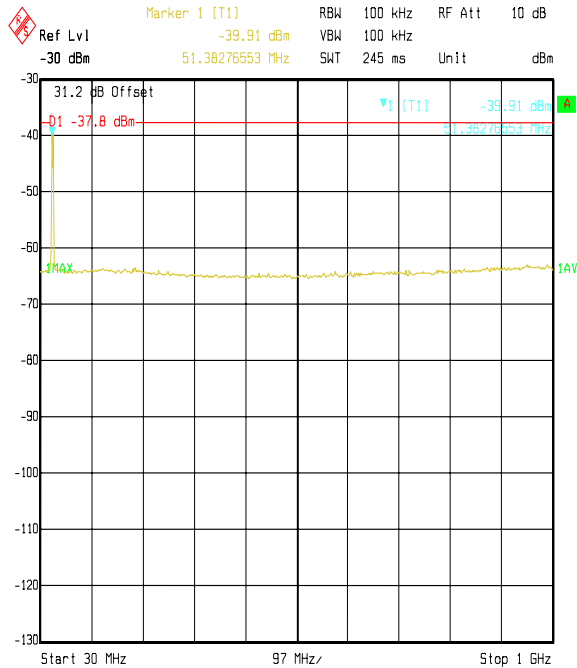
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

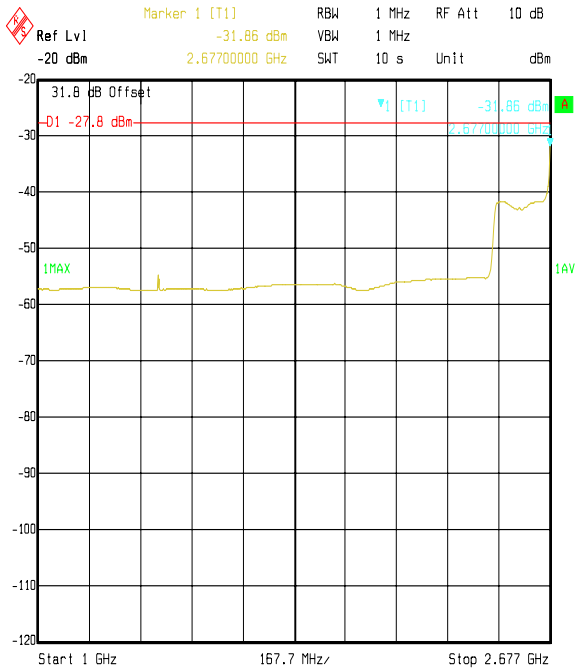
**Transmitter Conducted Emissions Top Channel (Low Chip Rate) - Continued**



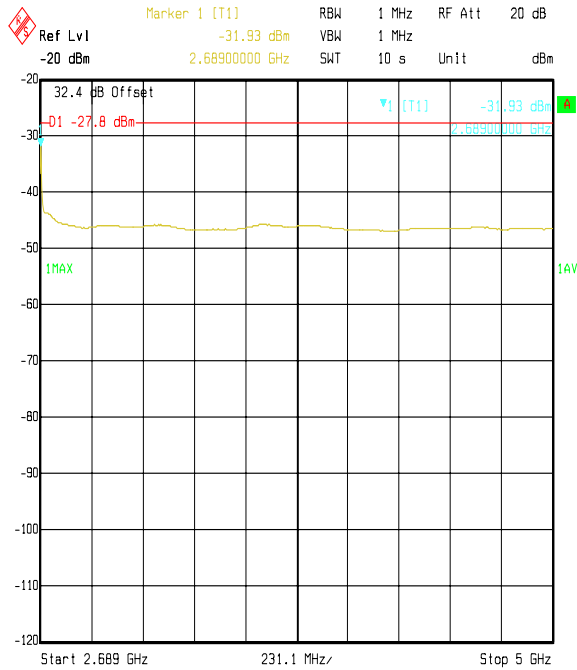
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 3.84 Mcps 1-30 MHz Avg Detector  
 Date: 10.FEB.2004 15:02:10



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 3.84 Mcps 30-1 GHz Avg Detector  
 Date: 10.FEB.2004 15:03:48



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 3.84 Mcps 1-2.677 GHz Avg Detector  
 Date: 10.FEB.2004 15:05:15

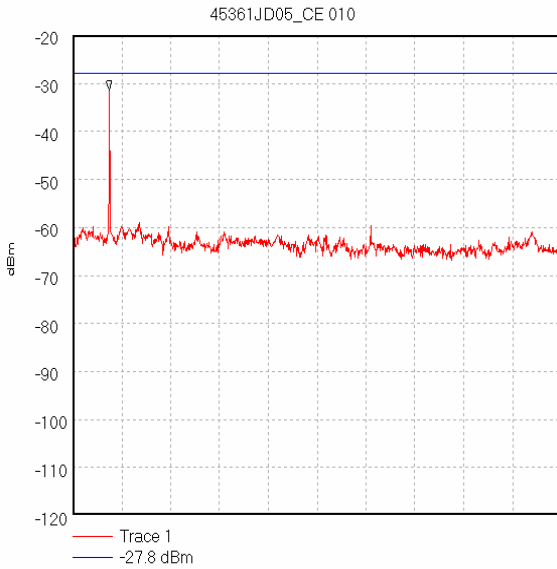


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious  
 Comment A: 45361JD05 Top Channel 3.84 Mcps 2.689-5 GHz Avg Detector  
 Date: 10.FEB.2004 15:06:34

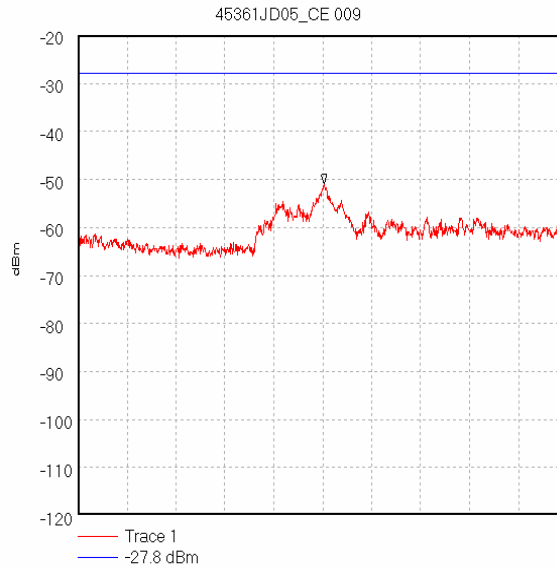
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

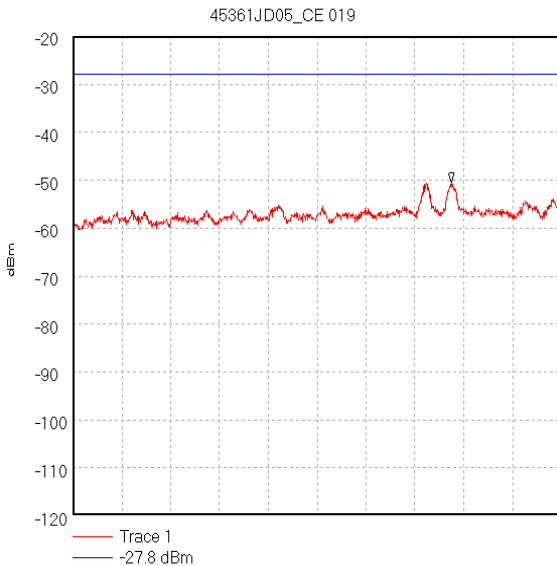
**Transmitter Conducted Emissions Top Channel (Low Chip Rate) - Continued**



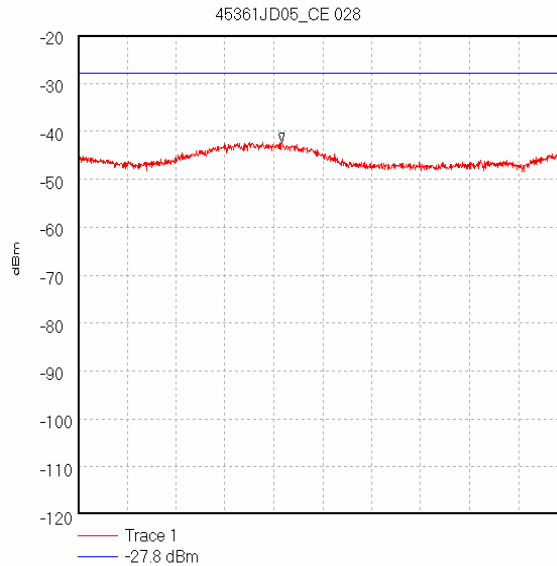
Start 5.0 GHz; Stop 10.0 GHz  
Ref -20 dBm; Ref Offset 33.7 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 5.372222 GHz, -31.32 dBm  
Display Line: -27.8 dBm;  
10/02/2004 16:25:35



Start 10.0 GHz; Stop 18.0 GHz  
Ref -20 dBm; Ref Offset 35.7 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.026667 GHz, -50.95 dBm  
Display Line: -27.8 dBm;  
10/02/2004 16:24:30



Start 18.0 GHz; Stop 26.5 GHz  
Ref -20 dBm; Ref Offset 36.5 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 24.592222 GHz, -50.52 dBm  
Display Line: -27.8 dBm;  
10/02/2004 17:00:08



Start 26.5 GHz; Stop 27.0 GHz  
Ref -20 dBm; Ref Offset 60.9 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.708333 GHz, -42.32 dBm  
Display Line: -27.8 dBm;  
12/02/2004 10:18:41

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

## **7.12. Transmitter Radiated Emissions: Part 2.1053 & Part 27.53**

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

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

### **Results:- Bottom Channel (High Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	36.8	-95.8	-49.8	46.0	Complied
59.529	-65.5	36.8	-102.3	-49.8	52.5	Complied
105.999	-60.9	36.8	-97.7	-49.8	47.9	Complied
113.265	-61.4	36.8	-98.2	-49.8	48.4	Complied
122.862	-64.7	36.8	-101.5	-49.8	51.7	Complied
159.990	-61.2	36.8	-98.0	-49.8	48.2	Complied
184.310	-60.1	36.8	-96.9	-49.8	47.1	Complied
307.191	-59.6	36.8	-96.4	-49.8	46.6	Complied
332.132	-68.7	36.8	-105.5	-49.8	55.7	Complied
402.612	-68.5	36.8	-105.3	-49.8	55.5	Complied
552.950	-62.0	36.8	-98.8	-49.8	49.0	Complied
777.591	-72.0	36.8	-108.8	-49.8	59.0	Complied
1043.567	-45.7	36.8	-82.5	-49.8	32.7	Complied
1106.550	-43.1	36.8	-79.9	-49.8	30.1	Complied
1167.462	-56.2	36.8	-93.0	-49.8	43.2	Complied
1228.820	-62.0	36.8	-98.8	-49.8	49.0	Complied
1290.328	-61.2	36.8	-98.0	-49.8	48.2	Complied
1658.924	-55.3	36.8	-92.1	-49.8	42.3	Complied
2126.495	-60.9	36.8	-97.7	-49.8	47.9	Complied
4251.860	-48.4	36.8	-85.2	-49.8	35.4	Complied
14027.760	-60.8	36.8	-97.6	-49.8	47.8	Complied
24552.820	-61.1	36.8	-97.9	-49.8	48.1	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Radiated Emissions (Continued)****Results:- Middle Channel (High Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	36.3	-95.3	-49.3	46.0	Complied
59.529	-65.5	36.3	-101.8	-49.3	52.5	Complied
105.999	-60.9	36.3	-97.2	-49.3	47.9	Complied
113.265	-61.4	36.3	-97.7	-49.3	48.4	Complied
122.862	-64.7	36.3	-101.0	-49.3	51.7	Complied
134.199	-66.9	36.3	-103.2	-49.3	53.9	Complied
159.990	-61.2	36.3	-97.5	-49.3	48.2	Complied
184.310	-60.1	36.3	-96.4	-49.3	47.1	Complied
307.191	-62.7	36.3	-99.0	-49.3	49.7	Complied
347.522	-60.3	36.3	-96.6	-49.3	47.3	Complied
402.612	-68.5	36.3	-104.8	-49.3	55.5	Complied
552.950	-62.0	36.3	-98.3	-49.3	49.0	Complied
798.720	-57.4	36.3	-93.7	-49.3	44.4	Complied
1043.567	-45.7	36.3	-82.0	-49.3	32.7	Complied
1106.550	-43.1	36.3	-79.4	-49.3	30.1	Complied
1167.462	-56.2	36.3	-92.5	-49.3	43.2	Complied
1228.820	-62.0	36.3	-98.3	-49.3	49.0	Complied
1290.328	-61.2	36.3	-97.5	-49.3	48.2	Complied
1658.924	-55.3	36.3	-91.6	-49.3	42.2	Complied
2216.070	-58.3	36.3	-94.6	-49.3	45.3	Complied
14023.880	-60.8	36.3	-97.1	-49.3	47.8	Complied
24129.800	-61.5	36.3	-97.8	-49.3	48.5	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Radiated Emissions (Continued)****Results:- Top Channel (High Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	37.7	-96.7	-50.7	46.0	Complied
70.984	-72.1	37.7	-109.8	-50.7	59.1	Complied
105.999	-60.9	37.7	-98.6	-50.7	47.9	Complied
113.265	-61.4	37.7	-99.1	-50.7	48.4	Complied
122.862	-64.7	37.7	-102.4	-50.7	51.7	Complied
159.990	-61.2	37.7	-98.9	-50.7	48.2	Complied
184.310	-60.1	37.7	-97.8	-50.7	47.1	Complied
224.627	-55.1	37.7	-92.8	-50.7	42.1	Complied
307.185	-59.6	37.7	-97.3	-50.7	46.6	Complied
347.522	-60.3	37.7	-98.0	-50.7	47.3	Complied
402.612	-68.5	37.7	-106.2	-50.7	55.5	Complied
430.063	-56.3	37.7	-94.0	-50.7	43.3	Complied
552.950	-62.0	37.7	-99.7	-50.7	49.0	Complied
921.586	-62.2	37.7	-99.9	-50.7	49.2	Complied
1043.567	-45.7	37.7	-83.4	-50.7	32.7	Complied
1106.550	-43.1	37.7	-80.8	-50.7	30.1	Complied
1167.462	-56.2	37.7	-93.9	-50.7	43.2	Complied
1228.820	-62.0	37.7	-99.7	-50.7	49.0	Complied
1290.328	-61.2	37.7	-98.9	-50.7	48.2	Complied
1658.924	-55.3	37.7	-93.0	-50.7	42.3	Complied
2300.042	-59.8	37.7	-97.5	-50.7	46.8	Complied
9199.920	-52.8	37.7	-90.5	-50.7	39.8	Complied
14031.670	-60.8	37.7	-98.5	-50.7	47.8	Complied
24116.620	-61.0	37.7	-98.7	-50.7	48.0	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Radiated Emissions (Continued)****Results:- Bottom Channel (Low Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	39.7	-98.7	-52.7	46.0	Complied
63.329	-68.8	39.7	-108.5	-52.7	55.8	Complied
105.999	-60.9	39.7	-100.6	-52.7	47.9	Complied
122.862	-64.7	39.7	-104.4	-52.7	51.7	Complied
184.310	-60.1	39.7	-99.8	-52.7	47.1	Complied
224.627	-55.1	39.7	-94.8	-52.7	42.1	Complied
307.185	-59.6	39.7	-99.3	-52.7	46.6	Complied
430.063	-56.3	39.7	-96.0	-52.7	43.3	Complied
552.950	-62.0	39.7	-101.7	-52.7	49.0	Complied
983.028	-58.1	39.7	-97.8	-52.7	45.1	Complied
113.265	-61.4	39.7	-101.1	-52.7	48.4	Complied
402.612	-68.5	39.7	-108.2	-52.7	55.5	Complied
777.591	-72.0	39.7	-111.7	-52.7	59.0	Complied
1043.567	-45.7	39.7	-85.4	-52.7	32.7	Complied
1106.550	-43.1	39.7	-82.8	-52.7	30.1	Complied
1167.462	-56.2	39.7	-95.9	-52.7	43.2	Complied
4245.880	-45.2	39.7	-84.9	-52.7	32.2	Complied
24171.21	-60.6	39.7	-100.3	-52.7	47.6	Complied

*Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.*



Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Radiated Emissions (Continued)****Results:- Middle Channel (Low Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	39.3	-98.3	-52.3	46.0	Complied
59.529	-65.5	39.3	-104.8	-52.3	52.5	Complied
105.999	-60.9	39.3	-100.2	-52.3	47.9	Complied
113.265	-61.4	39.3	-100.7	-52.3	48.4	Complied
122.862	-64.7	39.3	-104.0	-52.3	51.7	Complied
184.310	-60.1	39.3	-99.4	-52.3	47.1	Complied
307.185	-59.6	39.3	-98.9	-52.3	46.6	Complied
347.522	-60.3	39.3	-99.6	-52.3	47.3	Complied
430.063	-56.3	39.3	-95.6	-52.3	43.3	Complied
552.950	-62.0	39.3	-101.3	-52.3	49.0	Complied
983.028	-58.1	39.3	-97.4	-52.3	45.1	Complied
1043.567	-45.7	39.3	-85.0	-52.3	32.7	Complied
1106.550	-43.1	39.3	-82.4	-52.3	30.1	Complied
1167.462	-56.2	39.3	-95.5	-52.3	43.2	Complied
24594.340	-60.5	39.3	-99.8	-52.3	47.5	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

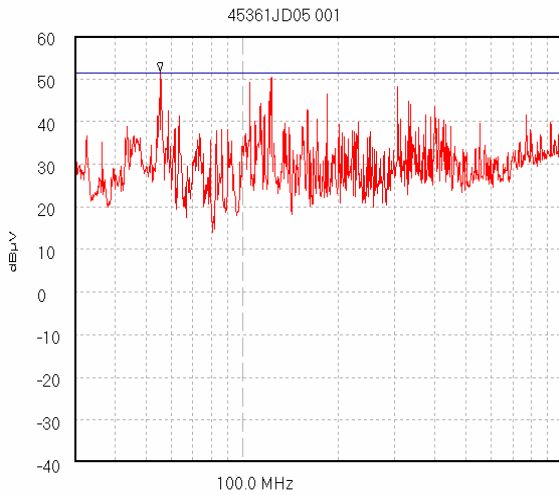
**Transmitter Radiated Emissions (Continued)****Results:- Top Channel (Low Chip Rate)**

Frequency (MHz)	Spurious Emission (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
55.656	-59.0	39.1	-98.1	-52.1	46.0	Complied
63.329	-68.8	39.1	-107.9	-52.1	55.8	Complied
70.984	-72.1	39.1	-111.2	-52.1	59.1	Complied
105.999	-60.9	39.1	-100.0	-52.1	47.9	Complied
122.862	-64.7	39.1	-103.8	-52.1	51.7	Complied
159.990	-61.2	39.1	-100.3	-52.1	48.2	Complied
184.310	-60.1	39.1	-99.2	-52.1	47.1	Complied
224.627	-55.1	39.1	-94.2	-52.1	42.1	Complied
307.185	-59.6	39.1	-98.7	-52.1	46.6	Complied
368.629	-61.8	39.1	-100.9	-52.1	-48.8	Complied
430.063	-56.3	39.1	-95.4	-52.1	43.3	Complied
552.950	-62.0	39.1	-101.1	-52.1	49.0	Complied
983.028	-58.1	39.1	-97.2	-52.1	45.1	Complied
1043.567	-45.7	39.1	-84.8	-52.1	32.7	Complied
1106.550	-43.1	39.1	-82.2	-52.1	30.1	Complied
1167.462	-56.2	39.1	-95.3	-52.1	43.2	Complied

Note: The limit is calculated according to FCC Section 27.53(l)(2) as follows:  $43 + 10\log(P)$  where  $P$  is the transmitter power in Watts.

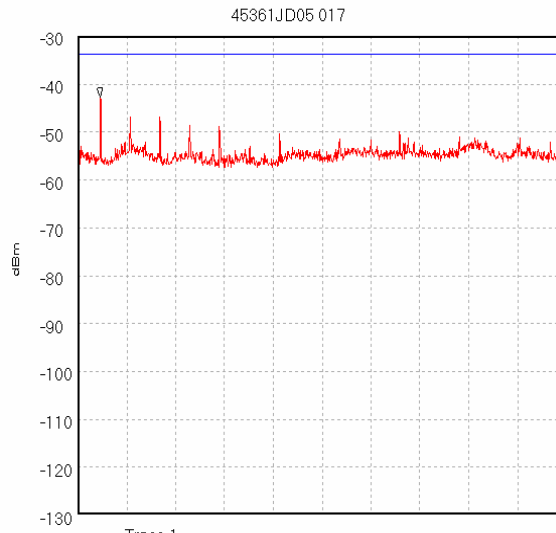
Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

**Transmitter Radiated Emissions Bottom Channel (High Chip Rate) - Continued**



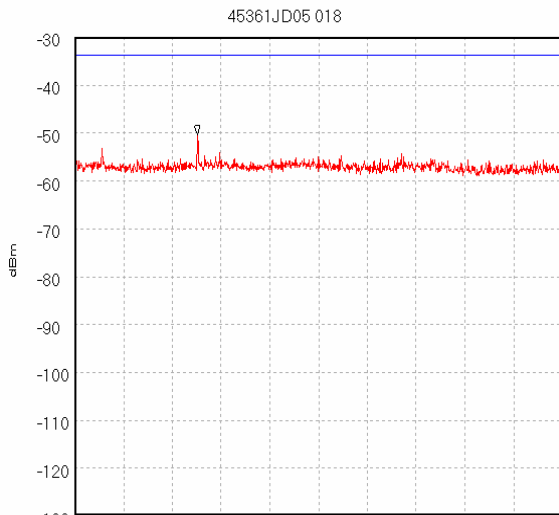
Trace 1  
 51.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
 Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 540.0 mS  
 Peak 55.523 MHz; 51.75 dBµV  
 Display Line: 51.4 dBµV; ; Limit Test Failed  
 Transducer Factors: A490  
 13/01/2004 10:10:51



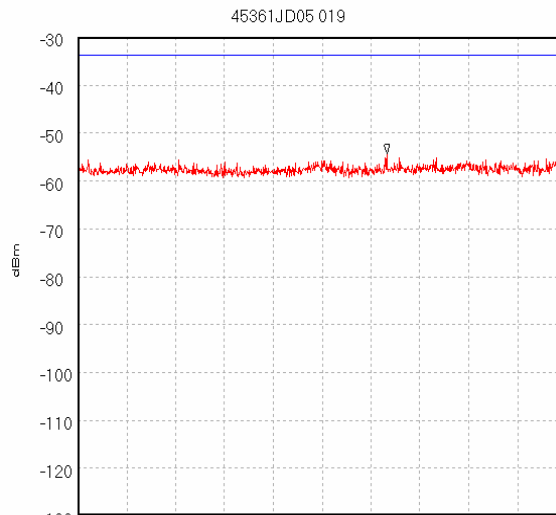
Trace 1  
 -33.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
 Ref -30 dBm; Ref Offset 37.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz; -42.72 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 13/01/2004 13:22:40



Trace 1  
 -33.8 dBm

Start 2.0 GHz; Stop 2.5 GHz  
 Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.126 GHz; -50.41 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 13/01/2004 13:27:57



Trace 1  
 -33.8 dBm

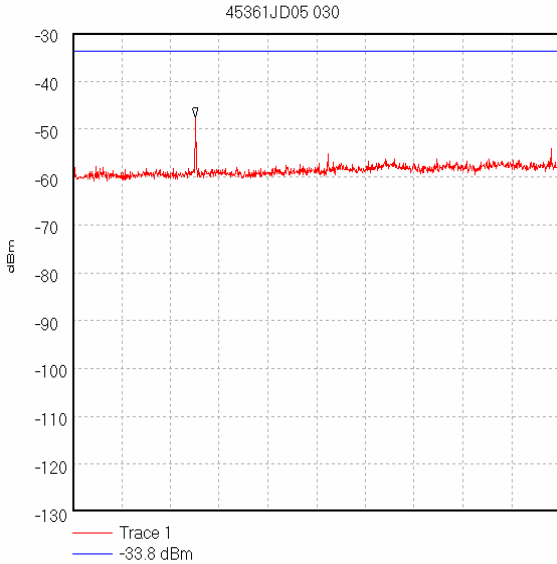
Start 2.512 GHz; Stop 4.0 GHz  
 Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 3.454 GHz; -54.3 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 13/01/2004 13:30:37

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

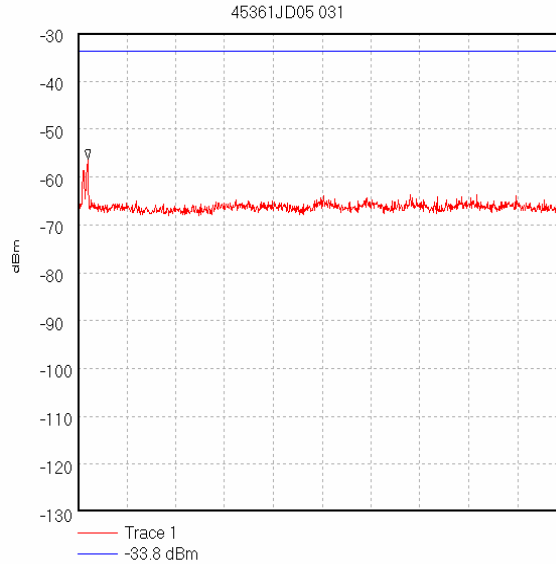
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

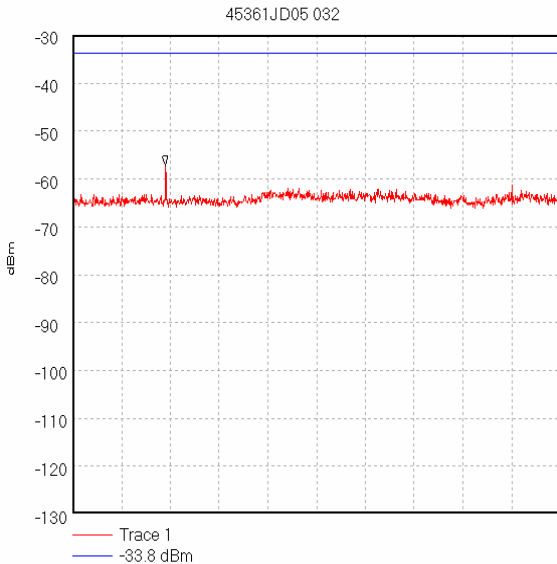
**Transmitter Radiated Emissions Bottom Channel (High Chip Rate)- Continued**



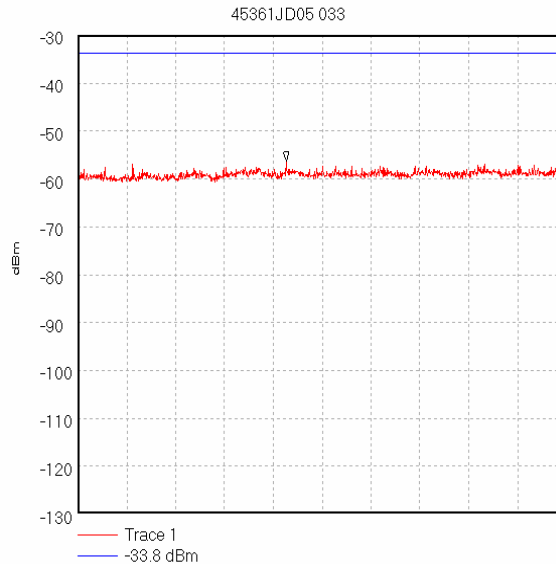
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.252 GHz, -47.59 dBm  
 Display Line: -33.8 dBm; ; Limit Test Failed  
 16/01/2004 09:42:35



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.02 GHz, -56.2 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 09:50:41



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -30 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 6.38 GHz, -57.09 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 09:55:13



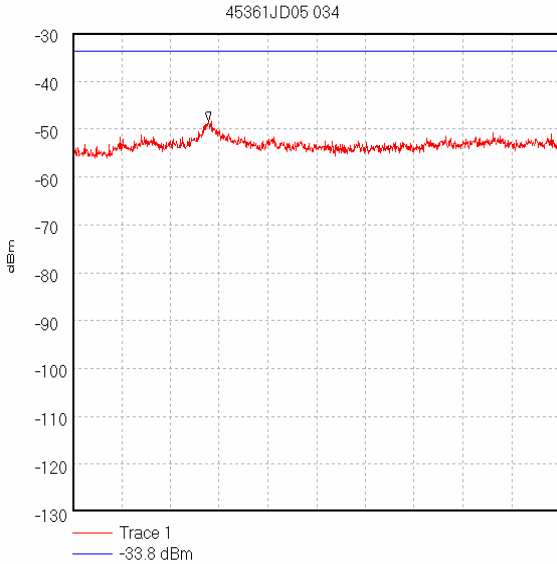
Start 8.0 GHz; Stop 12.5 GHz  
 Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 9.92 GHz, -56.28 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 10:00:35

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

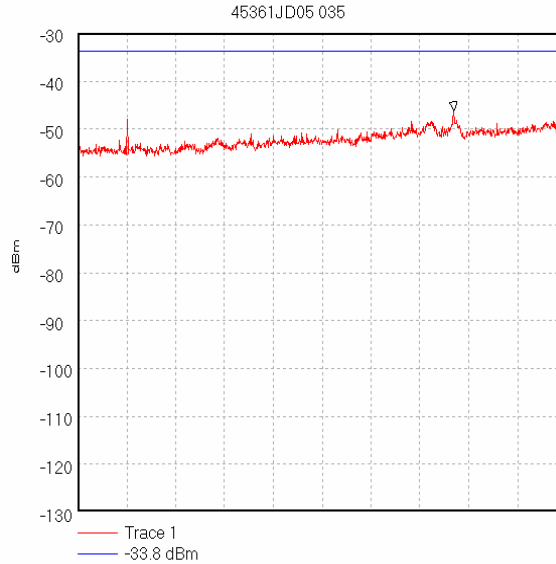
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

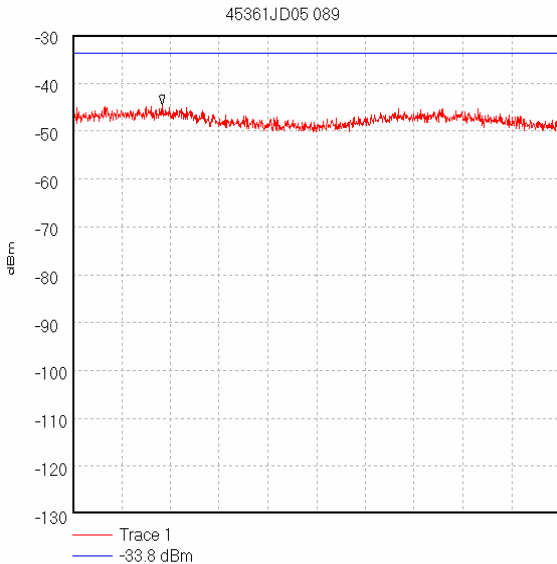
**Transmitter Radiated Emissions Bottom Channel (High Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
 Ref -30 dBm; Ref Offset 41.9 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 14.028 GHz, -48.35 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 10:08:54



Start 18.0 GHz; Stop 26.5 GHz  
 Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
 Peak 24.545 GHz, -46.15 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 10:18:09



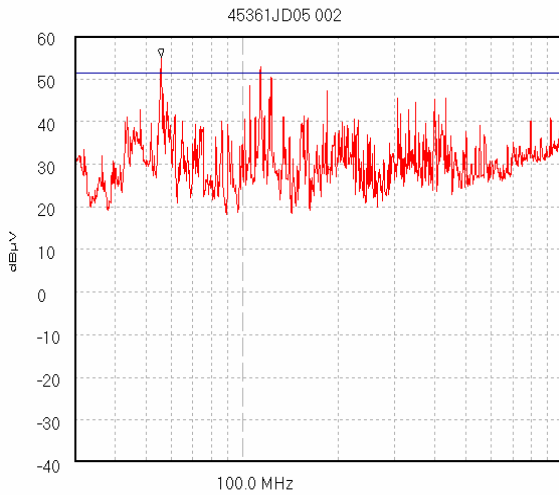
Start 26.5 GHz; Stop 27.0 GHz  
 Ref -30 dBm; Ref Offset 57.8 dB; 10 dB/div  
 RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 26.591667 GHz, -44.57 dBm  
 Display Line: -33.8 dBm;  
 16/01/2004 16:30:18

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

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

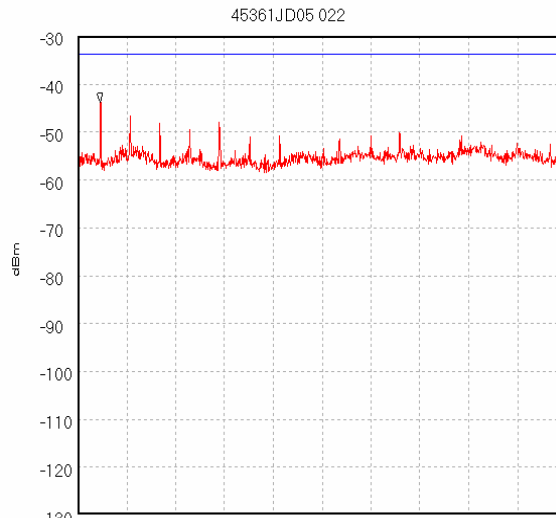
Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

**Transmitter Radiated Emissions Middle Channel (High Chip Rate) - Continued**



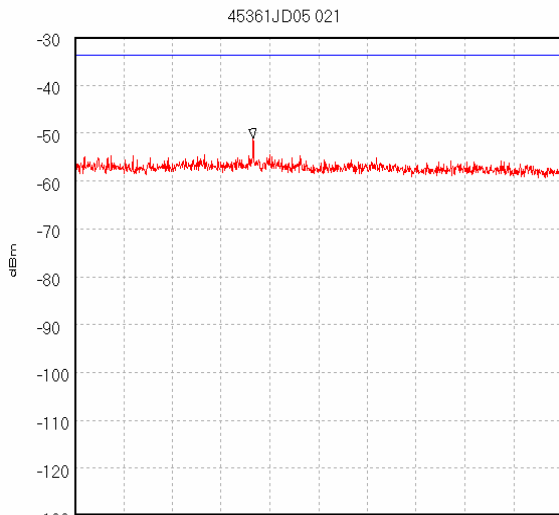
Trace 1  
51.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 100.0 mS  
Peak 55.957 MHz; 55.1 dBµV  
Display Line: 51.4 dBµV; : Limit Test Failed  
Transducer Factors: A490  
13/01/2004 10:35:35



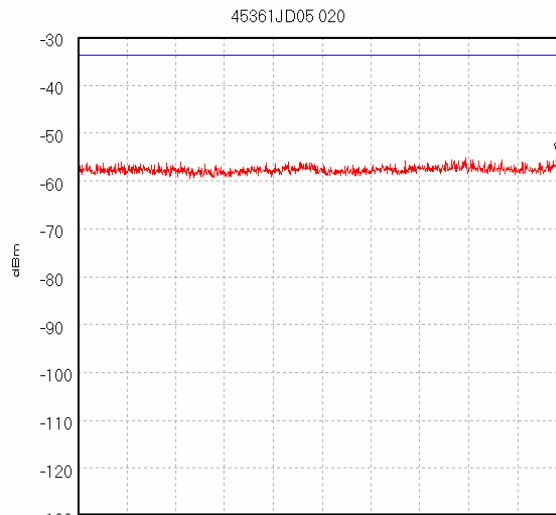
Trace 1  
-33.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
Ref -30 dBm; Ref Offset 37.0 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 1.046 GHz; -43.78 dBm  
Display Line: -33.8 dBm; : Limit Test Passed  
13/01/2004 13:39:06



Trace 1  
-33.8 dBm

Start 2.0 GHz; Stop 2.59 GHz  
Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 2.216 GHz; -51.12 dBm  
Display Line: -33.8 dBm; : Limit Test Passed  
13/01/2004 13:35:23



Trace 1  
-33.8 dBm

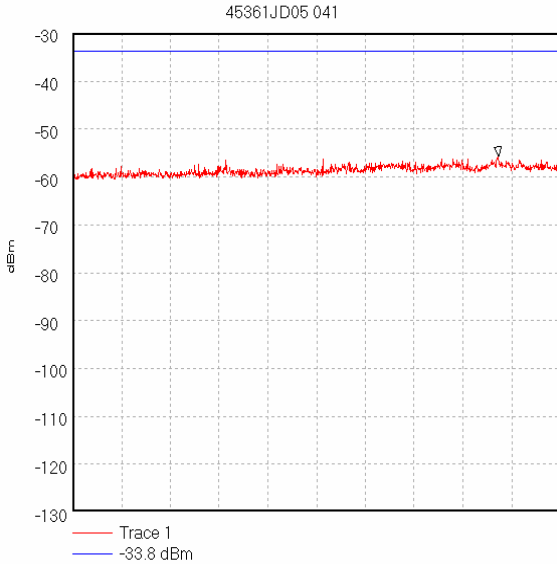
Start 2.602 GHz; Stop 4.0 GHz  
Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 3.975 GHz; -53.99 dBm  
Display Line: -33.8 dBm; : Limit Test Passed  
13/01/2004 13:34:08

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

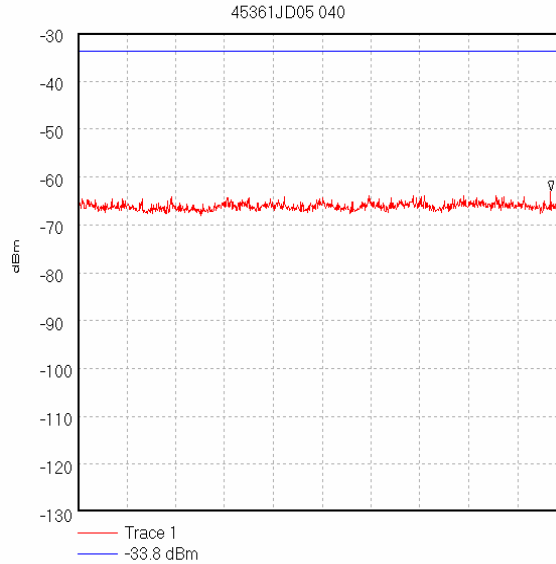
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

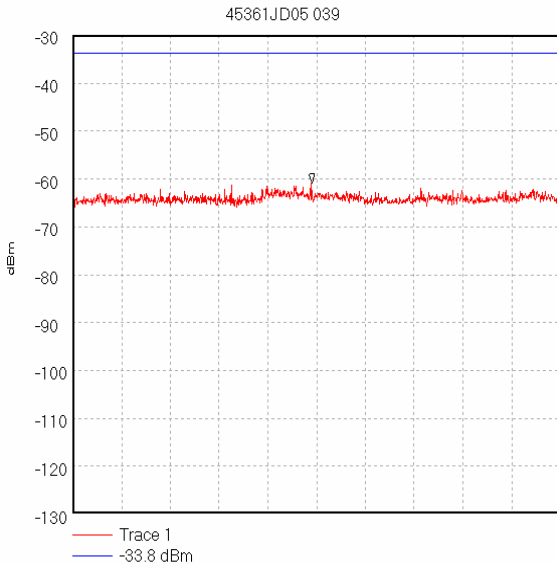
**Transmitter Radiated Emissions Middle Channel (High Chip Rate) - Continued**



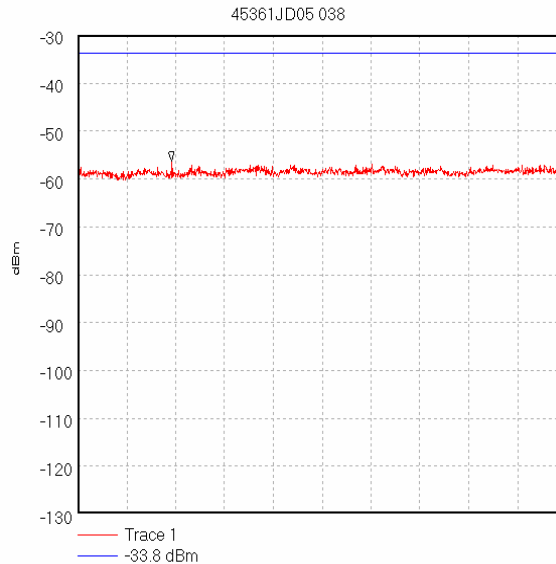
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.873 GHz, -55.69 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 16/01/2004 10:51:50



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.969 GHz, -62.93 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 16/01/2004 10:48:38



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -30 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 6.98 GHz, -60.9 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 16/01/2004 10:44:56



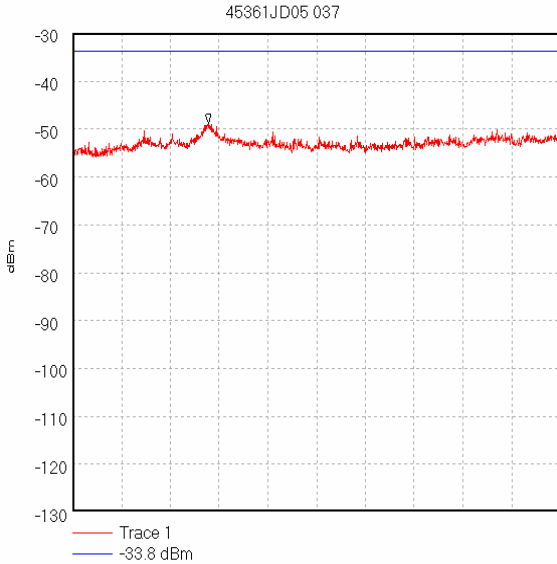
Start 8.0 GHz; Stop 12.5 GHz  
 Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 8.865 GHz, -56.3 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 16/01/2004 10:41:40

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

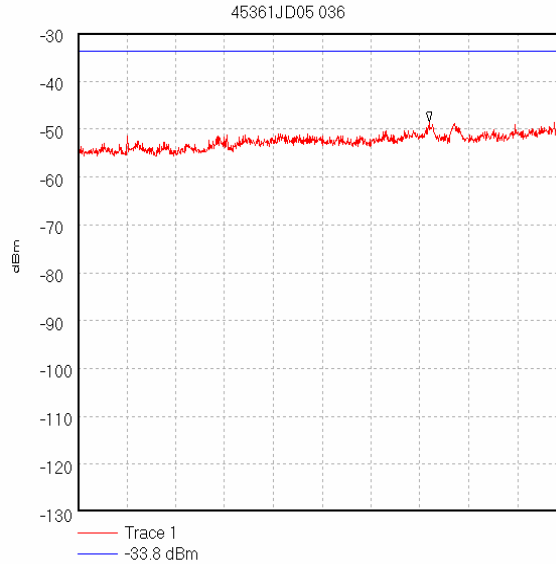
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

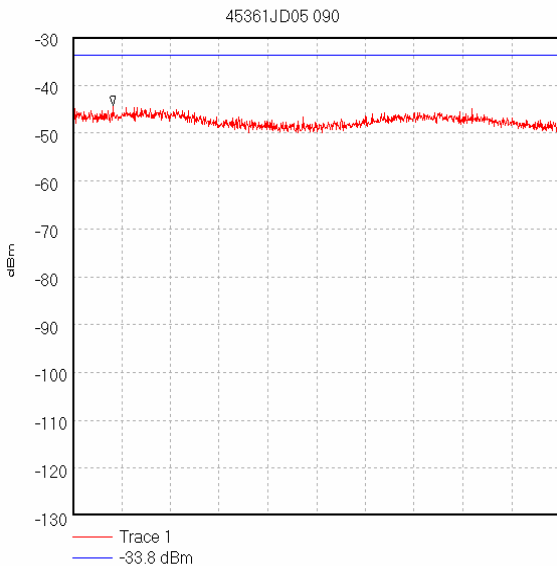
**Transmitter Radiated Emissions Middle Channel (High Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
Ref -30 dBm; Ref Offset 41.9 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.034 GHz, -48.74 dBm  
Display Line: -33.8 dBm; ; Limit Test Passed  
16/01/2004 10:37:03



Start 18.0 GHz; Stop 26.5 GHz  
Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
Peak 24.12 GHz, -48.51 dBm  
Display Line: -33.8 dBm; ; Limit Test Passed  
16/01/2004 10:32:13



Start 26.5 GHz; Stop 27.0 GHz  
Ref -30 dBm; Ref Offset 57.8 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.541111 GHz, -44.16 dBm  
Display Line: -33.8 dBm;  
16/01/2004 16:32:51

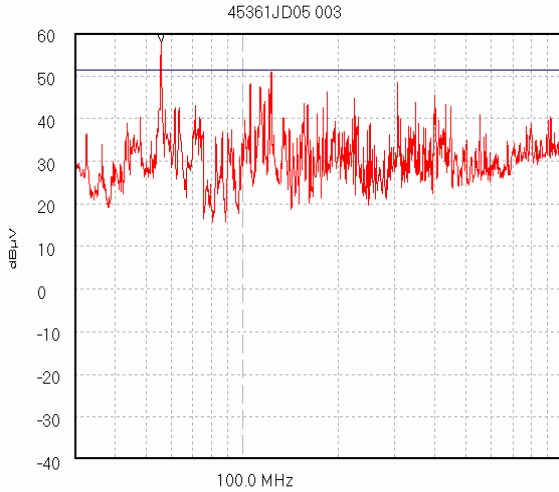
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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



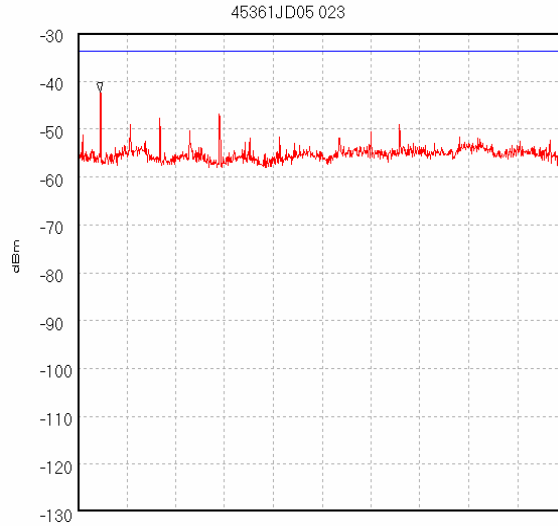
Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

**Transmitter Radiated Emissions Top Channel (High Chip Rate) - Continued**



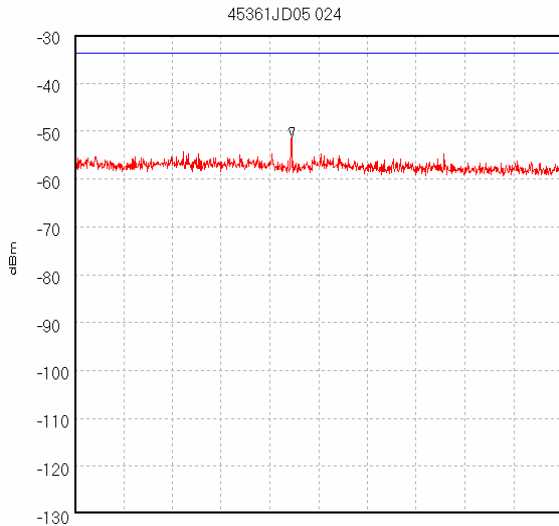
Trace 1  
 51.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
 Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 100.0 mS  
 Peak 55.74 MHz, 57.85 dBµV  
 Display Line: 51.4 dBµV; : Limit Test Failed  
 Transducer Factors: A490  
 13/01/2004 10:58:46



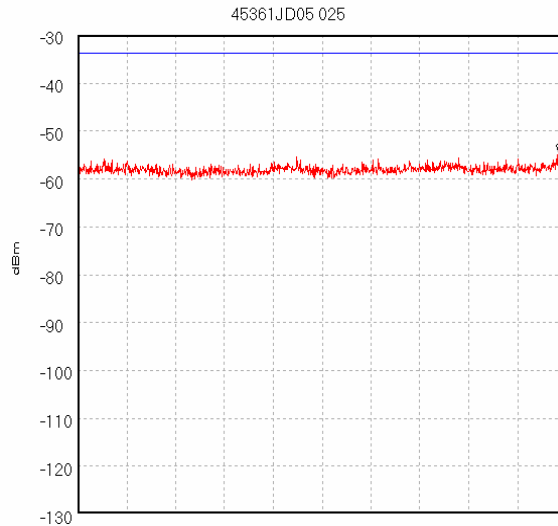
Trace 1  
 -33.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
 Ref -30 dBm; Ref Offset 37.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz, -42.29 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 13/01/2004 13:42:17



Trace 1  
 -33.8 dBm

Start 2.0 GHz; Stop 2.674 GHz  
 Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.3 GHz, -51.15 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 13/01/2004 13:44:43



Trace 1  
 -33.8 dBm

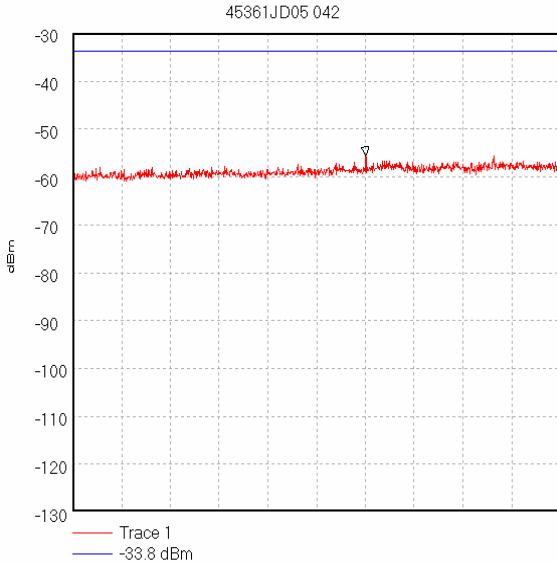
Start 2.686 GHz; Stop 4.0 GHz  
 Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 3.982 GHz, -54.75 dBm  
 Display Line: -33.8 dBm; : Limit Test Passed  
 13/01/2004 13:46:47

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

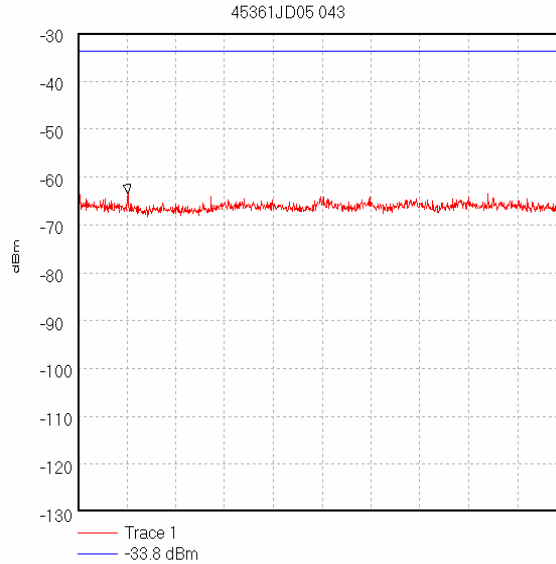
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

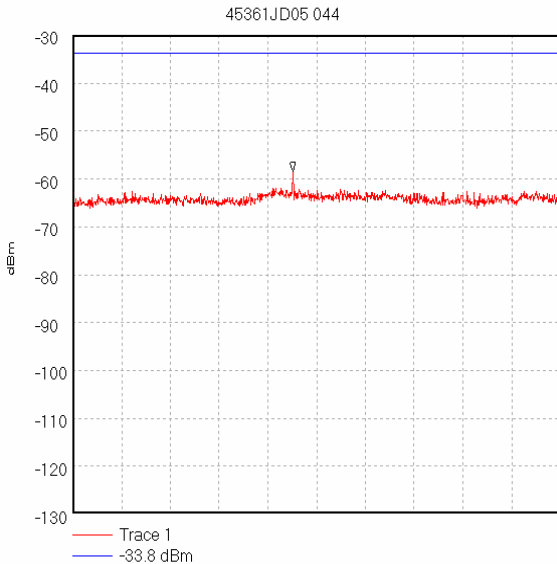
**Transmitter Radiated Emissions Top Channel (High Chip Rate) - Continued**



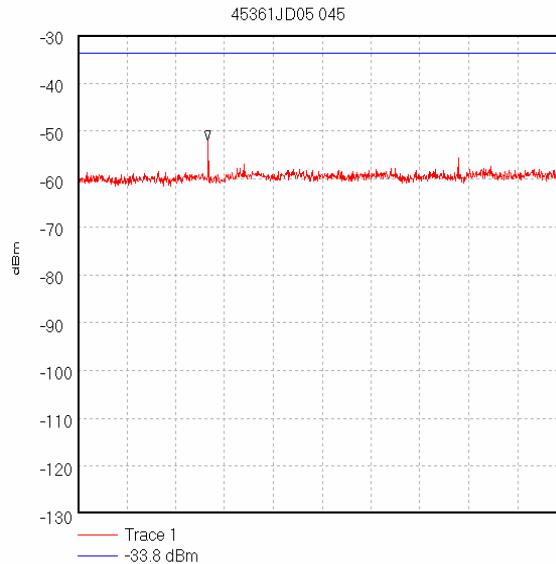
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.601 GHz; -55.57 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 11:01:48



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.102 GHz; -63.49 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 11:03:38



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -30 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 6.902 GHz; -58.39 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 11:07:09



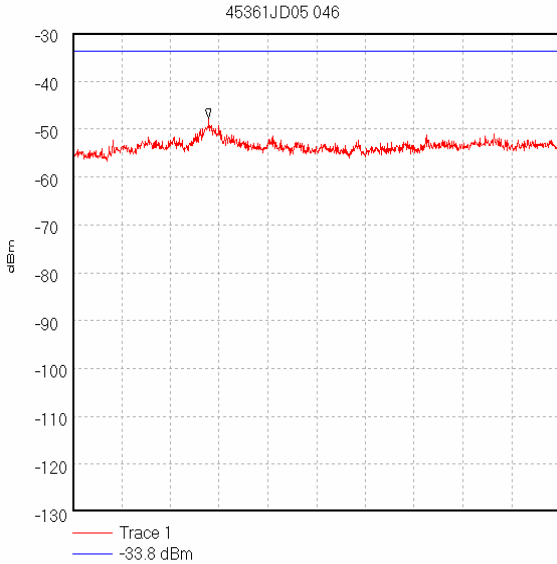
Start 8.0 GHz; Stop 12.5 GHz  
 Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 9.2 GHz; -51.99 dBm  
 Display Line: -33.8 dBm; ; Limit Test Passed  
 16/01/2004 11:10:01

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

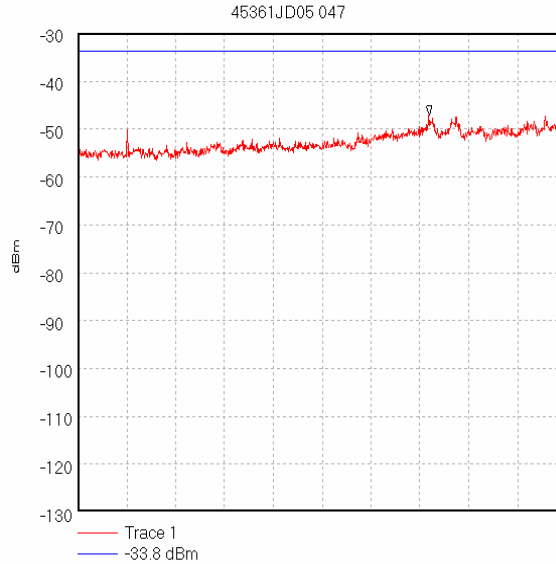
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

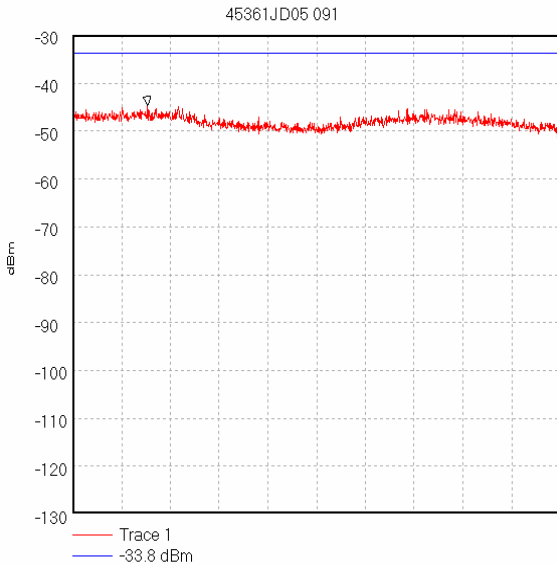
**Transmitter Radiated Emissions Top Channel (High Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
Ref -30 dBm; Ref Offset 41.9 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.034 GHz, -47.69 dBm  
Display Line: -33.8 dBm; Limit Test Passed  
16/01/2004 11:18:31



Start 18.0 GHz; Stop 26.5 GHz  
Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
Peak 24.111 GHz, -47.01 dBm  
Display Line: -33.8 dBm; Limit Test Passed  
16/01/2004 11:21:49



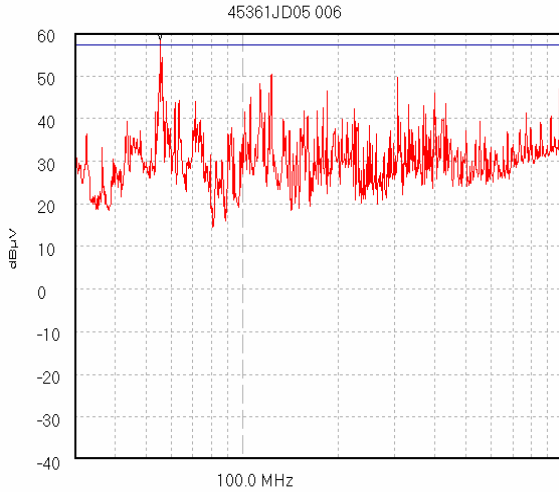
Start 26.5 GHz; Stop 27.0 GHz  
Ref -30 dBm; Ref Offset 57.8 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.576667 GHz, -44.67 dBm  
Display Line: -33.8 dBm;  
16/01/2004 16:37:30

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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

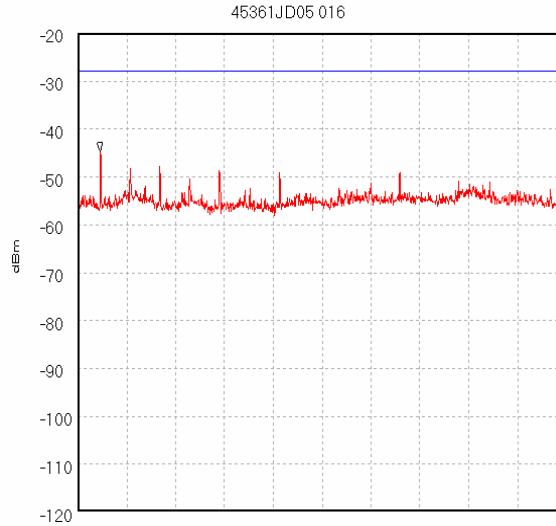
Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

**Transmitter Radiated Emissions Bottom Channel (Low Chip Rate) - Continued**



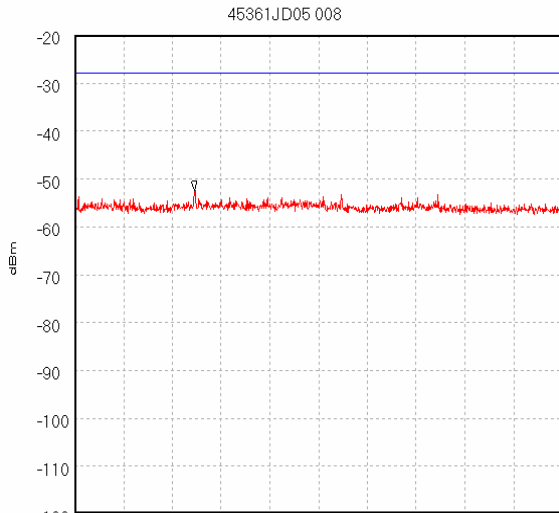
Trace 1  
 57.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
 Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 100.0 mS  
 Peak 55.523 MHz; 58.38 dBµV  
 Display Line: 57.4 dBµV; : Limit Test Failed  
 Transducer Factors: A490  
 13/01/2004 11:33:29



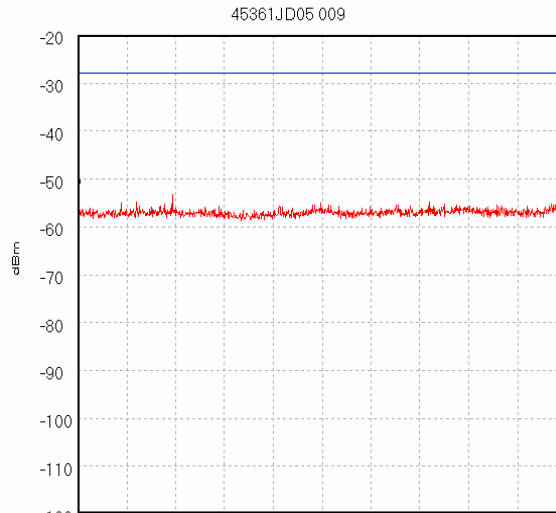
Trace 1  
 -27.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
 Ref -20 dBm; Ref Offset 37.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz; -44.8 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:16:50



Trace 1  
 -27.8 dBm

Start 2.0 GHz; Stop 2.5 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.123 GHz; -52.4 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 11:51:23



Trace 1  
 -27.8 dBm

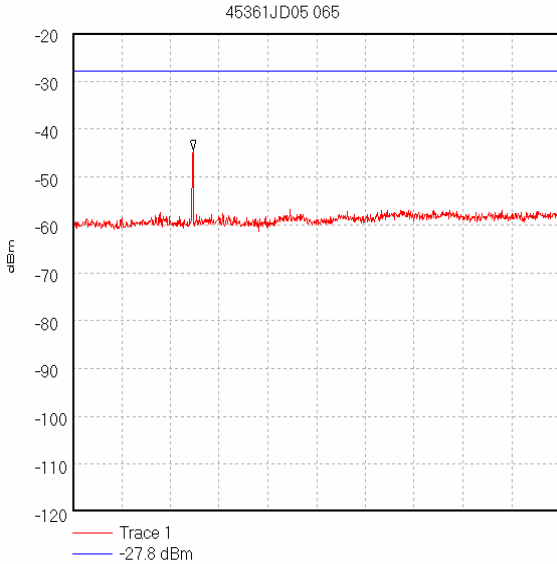
Start 2.506 GHz; Stop 4.0 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.506 GHz; -52.09 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 11:53:09

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

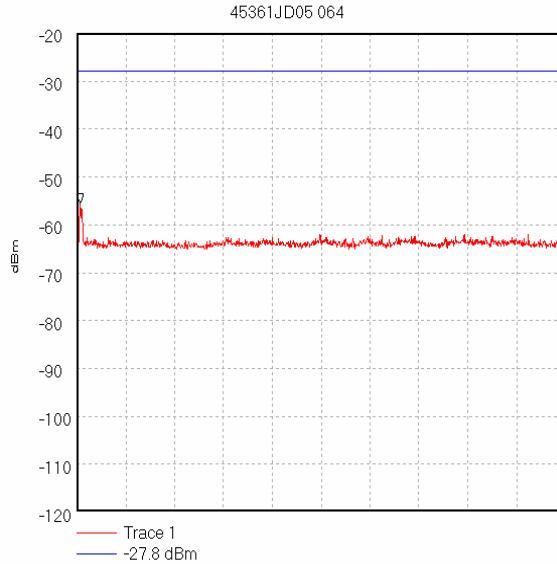
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

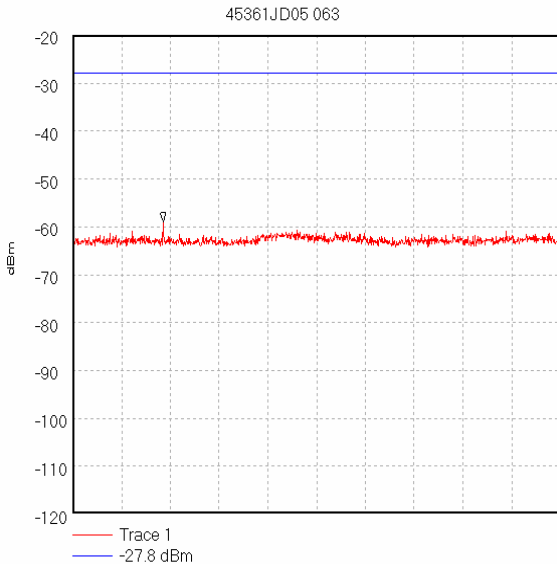
**Transmitter Radiated Emissions Bottom Channel (Low Chip Rate) - Continued**



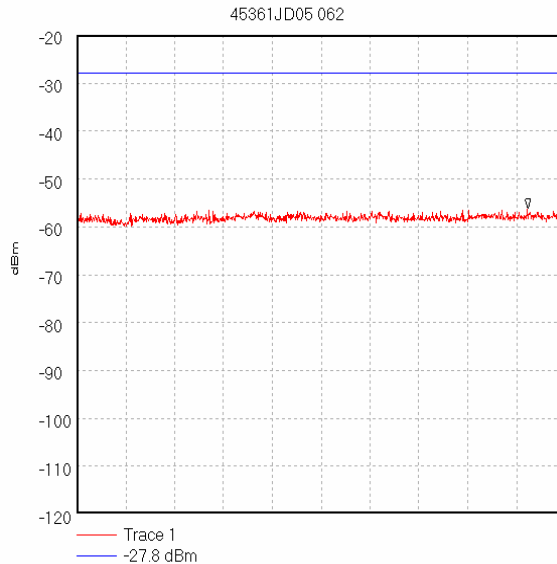
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.247 GHz, -44.37 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:52:45



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.007 GHz, -55.37 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:51:12



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -20 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 6.371 GHz, -59.0 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:47:33



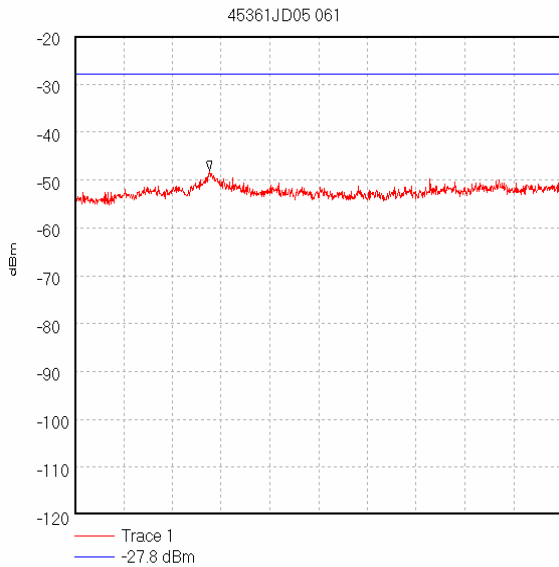
Start 8.0 GHz; Stop 12.5 GHz  
 Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 12.155 GHz, -56.23 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:45:08

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

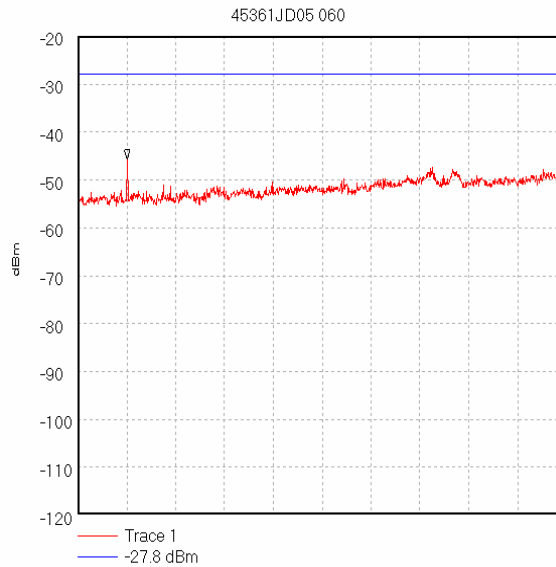
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
Node B Rack Mount Model: DZ/DN  
To: FCC Part 27

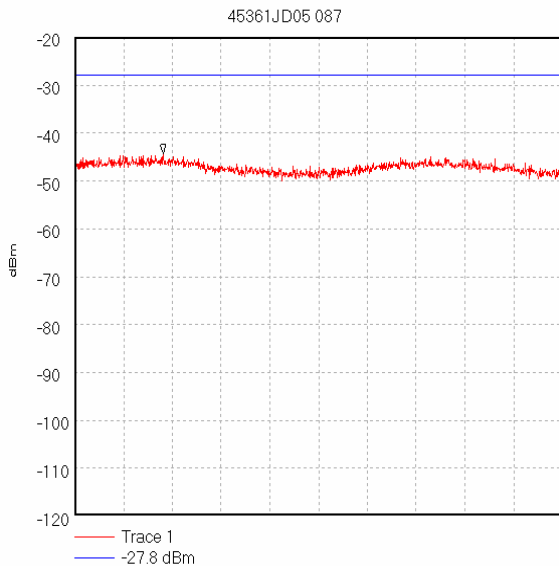
**Transmitter Radiated Emissions Bottom Channel (Low Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
Ref -20 dBm; Ref Offset 41.9 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.022 GHz, -48.03 dBm  
Display Line: -27.8 dBm; ; Limit Test Passed  
16/01/2004 13:42:10



Start 18.0 GHz; Stop 26.5 GHz  
Ref -20 dBm; Ref Offset 38.7 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
Peak 18.859 GHz, -45.72 dBm  
Display Line: -27.8 dBm; ; Limit Test Passed  
16/01/2004 13:36:35



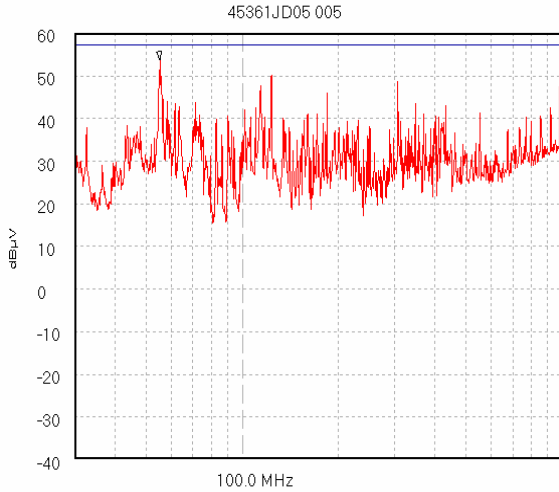
Start 26.5 GHz; Stop 27.0 GHz  
Ref -20 dBm; Ref Offset 57.8 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.590566 GHz, -44.22 dBm  
Display Line: -27.8 dBm;  
16/01/2004 16:28:03

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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

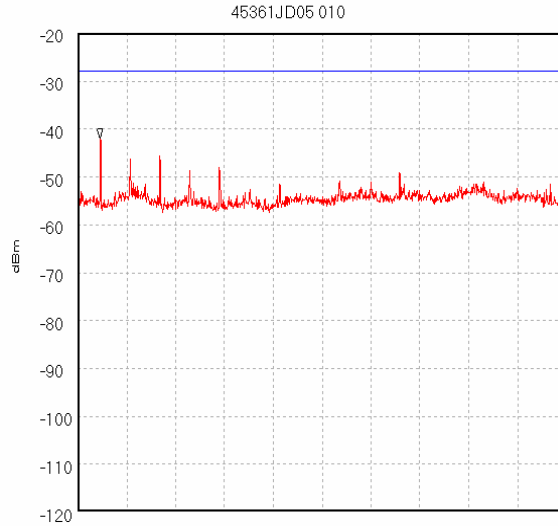
Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

**Transmitter Radiated Emissions Middle Channel (Low Chip Rate) - Continued**



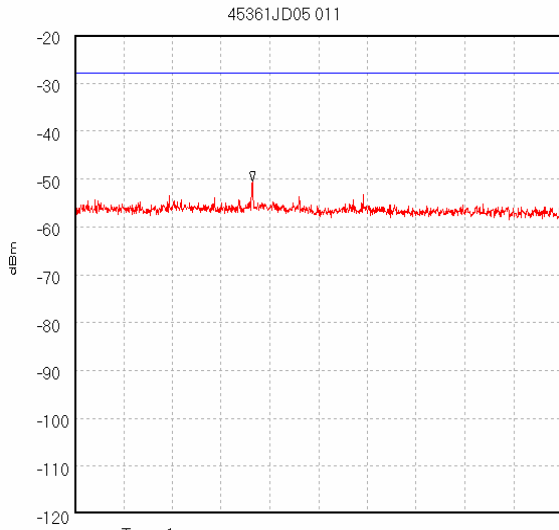
Trace 1  
 57.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
 Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 540.0 mS  
 Peak 55.307 MHz; 53.73 dBµV  
 Display Line: 57.4 dBµV; : Limit Test Passed  
 Transducer Factors: A490  
 13/01/2004 11:26:21



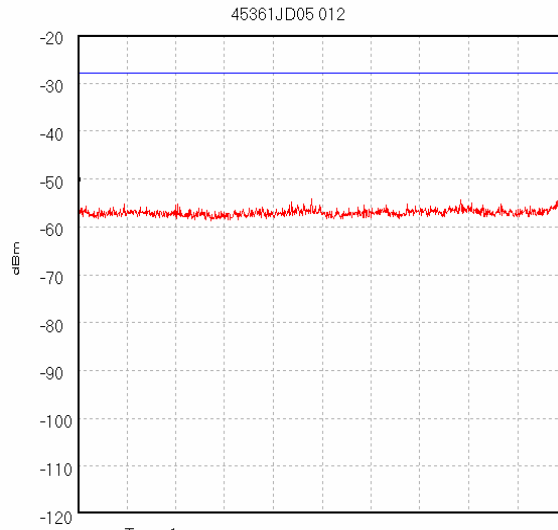
Trace 1  
 -27.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
 Ref -20 dBm; Ref Offset 37.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz; -42.01 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 11:56:33



Trace 1  
 -27.8 dBm

Start 2.0 GHz; Stop 2.593 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.216 GHz; -50.54 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:05:12



Trace 1  
 -27.8 dBm

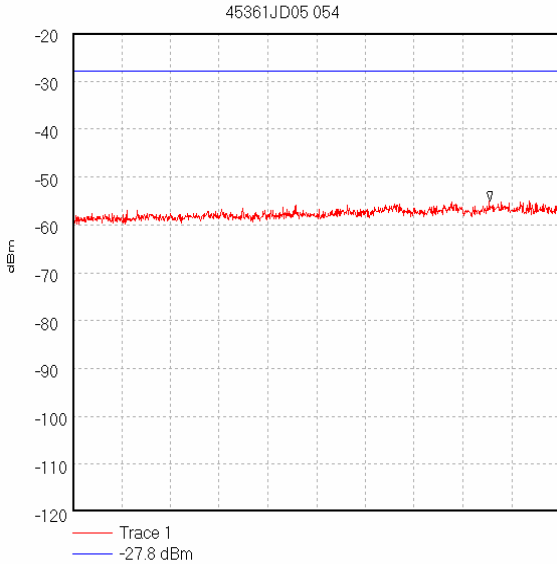
Start 2.599 GHz; Stop 4.0 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.599 GHz; -51.74 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:06:26

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

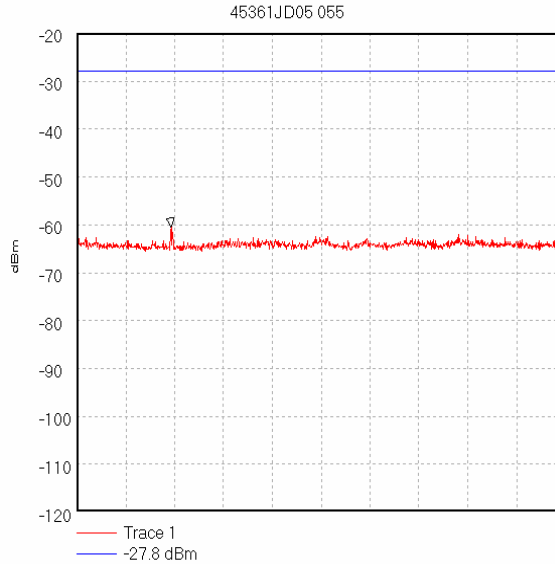
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Test Of: IPWireless (UK) Ltd.  
 Node B Rack Mount Model: DZ/DN  
 To: FCC Part 27

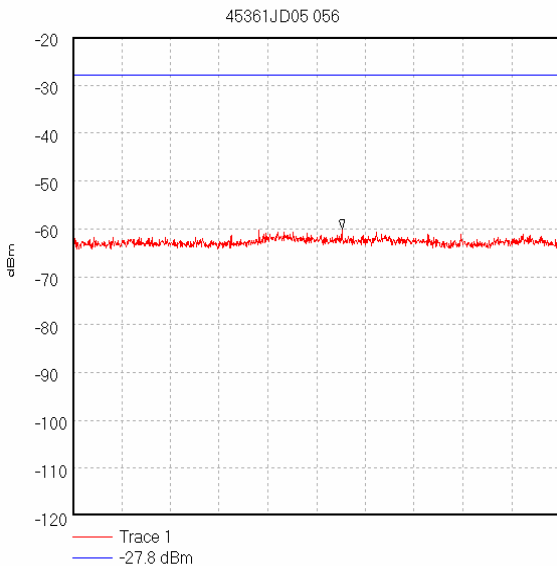
**Transmitter Radiated Emissions Middle Channel (Low Chip Rate) - Continued**



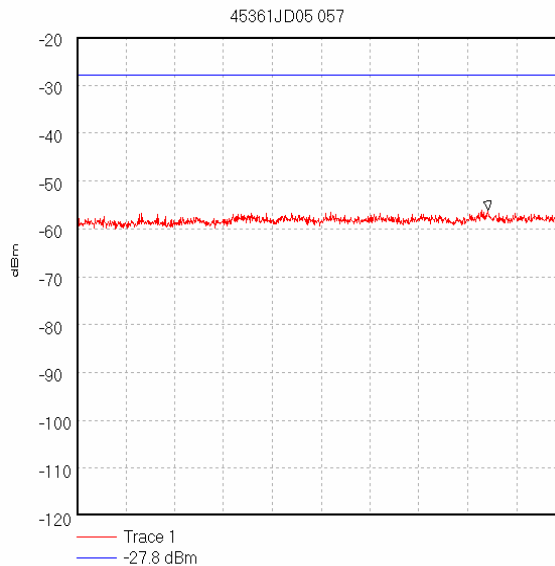
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.856 GHz, -55.06 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 12:04:14



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.193 GHz, -60.42 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 12:05:54



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -20 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 7.104 GHz, -60.07 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:11:40



Start 8.0 GHz; Stop 12.5 GHz  
 Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 11.79 GHz, -56.05 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 13:24:56

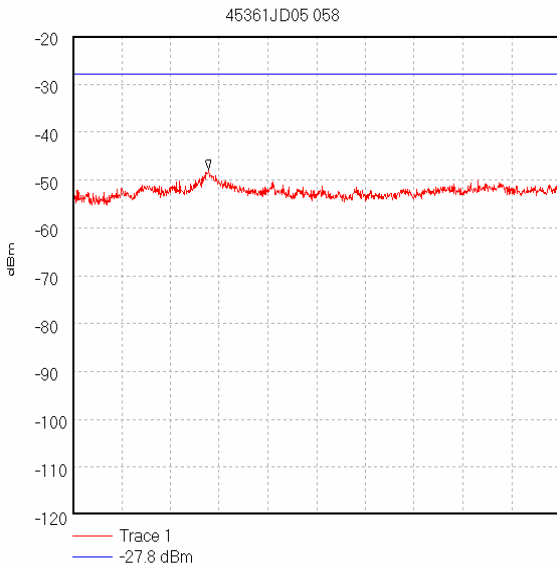
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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

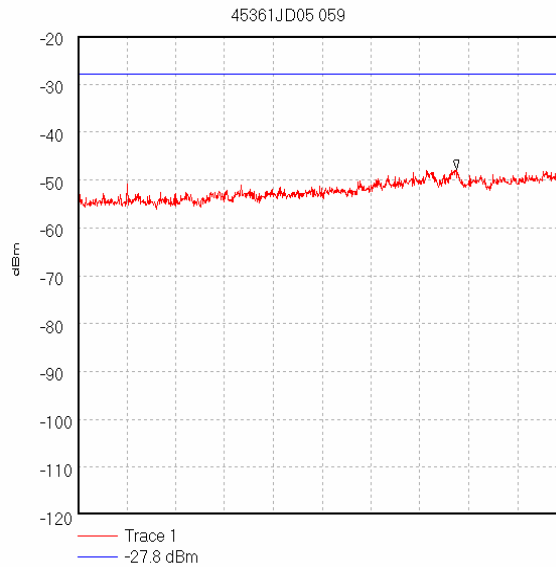


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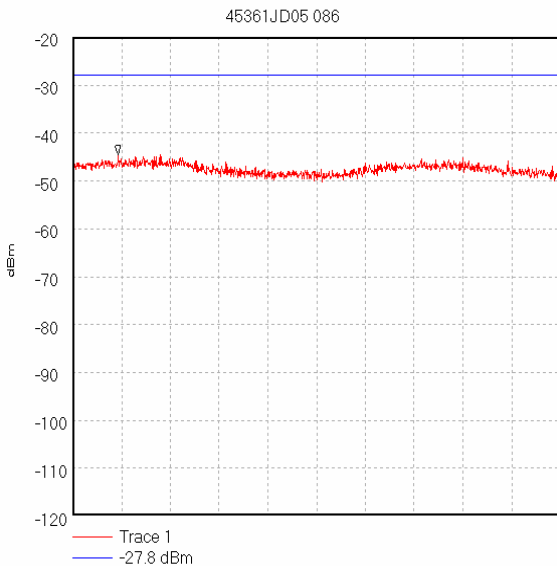
**Transmitter Radiated Emissions Middle Channel (Low Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
Ref -20 dBm; Ref Offset 41.9 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.034 GHz, -47.85 dBm  
Display Line: -27.8 dBm; Limit Test Passed  
16/01/2004 13:28:49



Start 18.0 GHz; Stop 26.5 GHz  
Ref -20 dBm; Ref Offset 38.7 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
Peak 24.592 GHz, -47.75 dBm  
Display Line: -27.8 dBm; Limit Test Passed  
16/01/2004 13:32:41



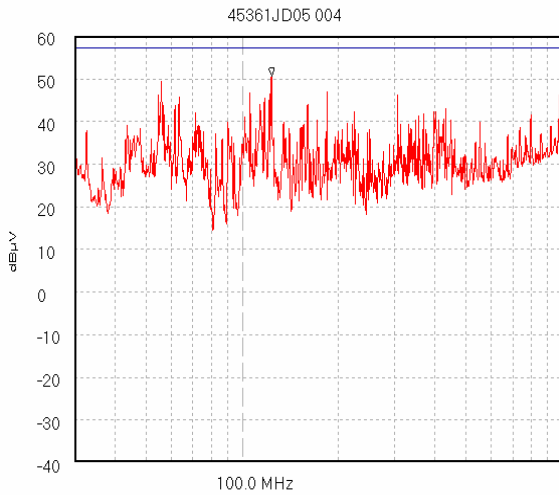
Start 26.5 GHz; Stop 27.0 GHz  
Ref -20 dBm; Ref Offset 57.8 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.546667 GHz, -44.5 dBm  
Display Line: -27.8 dBm;  
16/01/2004 16:25:36

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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

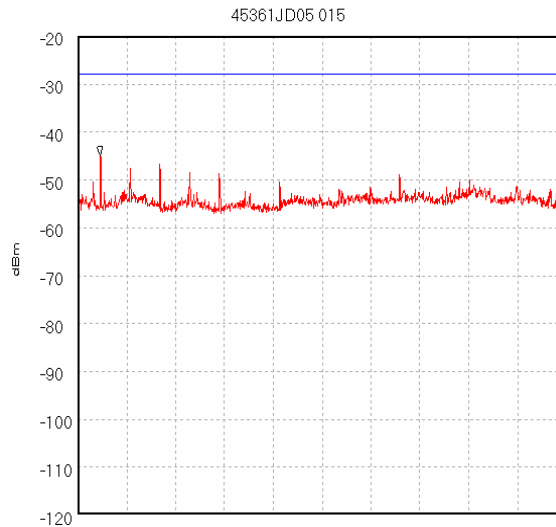
Test Of: IPWireless (UK) Ltd.  
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**Transmitter Radiated Emissions Top Channel (Low Chip Rate) - Continued**



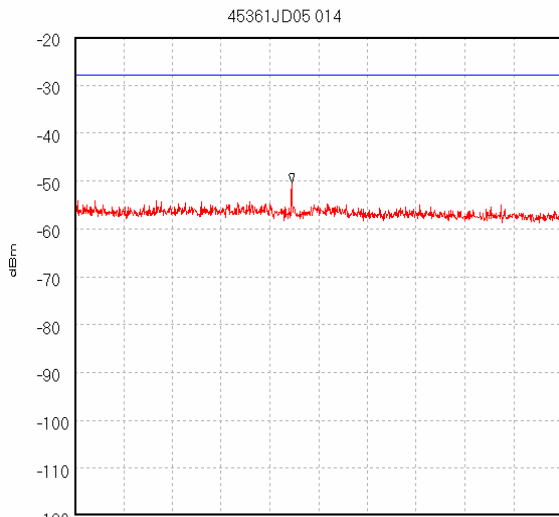
Trace 1  
 57.4 dBµV

Start 30.0 MHz; Stop 1.0 GHz - Log Scale  
 Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div  
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 540.0 mS  
 Peak 123.891 MHz, 50.71 dBµV  
 Display Line: 57.4 dBµV; : Limit Test Passed  
 Transducer Factors: A490  
 13/01/2004 11:16:08



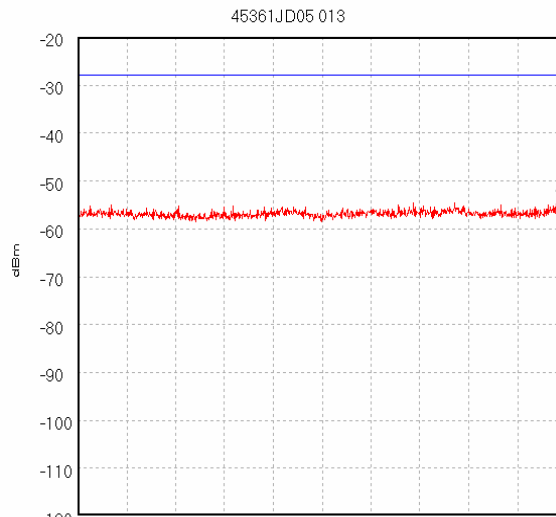
Trace 1  
 -27.8 dBm

Start 1.0 GHz; Stop 2.0 GHz  
 Ref -20 dBm; Ref Offset 37.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 1.046 GHz, -44.88 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:13:35



Trace 1  
 -27.8 dBm

Start 2.0 GHz; Stop 2.68 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 2.303 GHz, -50.47 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:10:50



Trace 1  
 -27.8 dBm

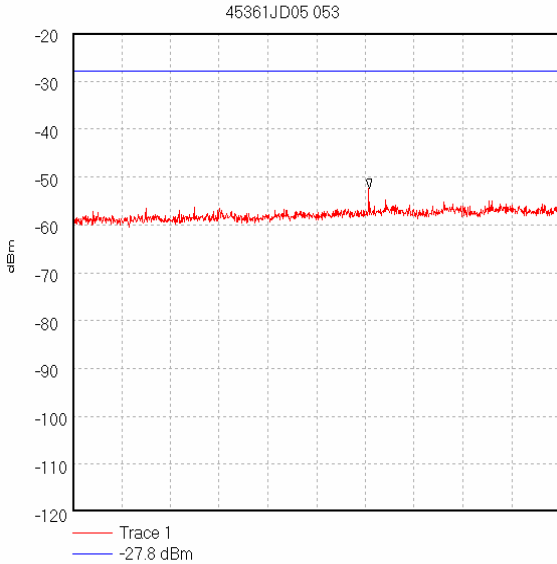
Start 2.686 GHz; Stop 4.0 GHz  
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 3.982 GHz, -53.62 dBm  
 Display Line: -27.8 dBm; : Limit Test Passed  
 13/01/2004 12:09:39

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

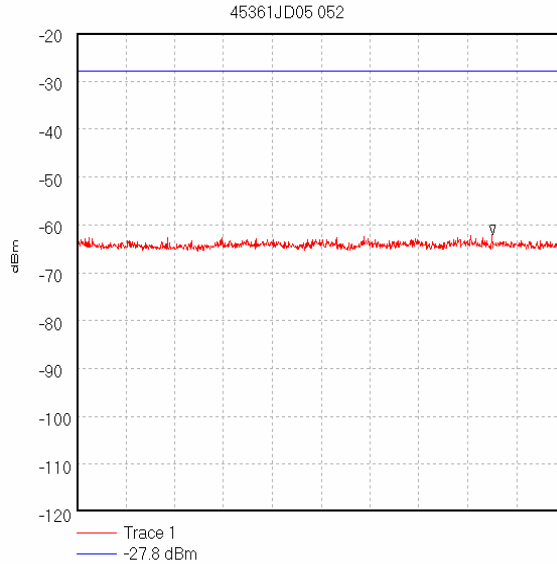
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

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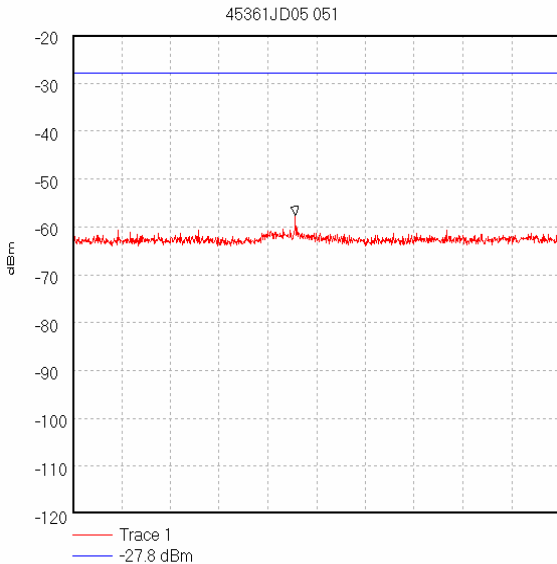
**Transmitter Radiated Emissions Top Channel (Low Chip Rate) - Continued**



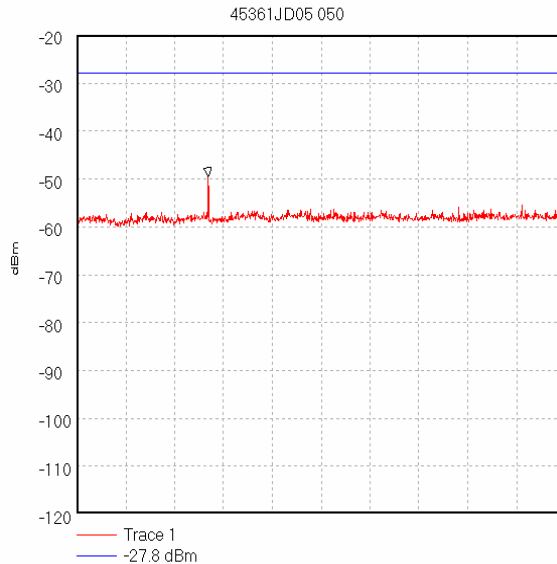
Start 4.0 GHz; Stop 5.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 4.608 GHz, -52.37 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 11:53:24



Start 5.0 GHz; Stop 6.0 GHz  
 Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 5.851 GHz, -61.95 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 11:52:07



Start 6.0 GHz; Stop 8.0 GHz  
 Ref -20 dBm; Ref Offset 33.4 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
 Peak 6.913 GHz, -57.7 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 11:49:25



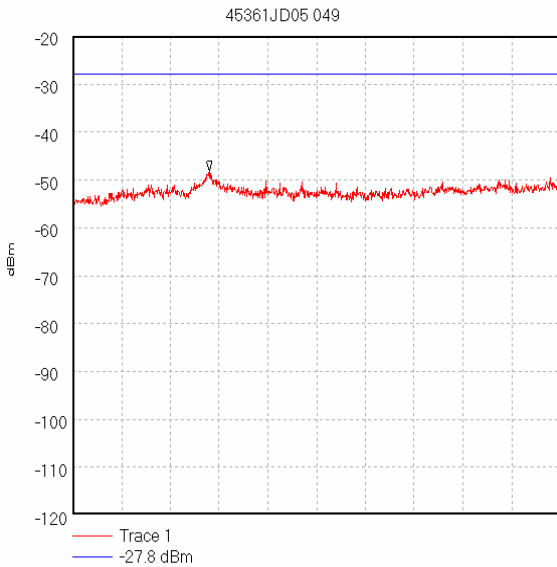
Start 8.0 GHz; Stop 12.5 GHz  
 Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div  
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
 Peak 9.21 GHz, -49.55 dBm  
 Display Line: -27.8 dBm; ; Limit Test Passed  
 16/01/2004 11:46:49

*Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.*

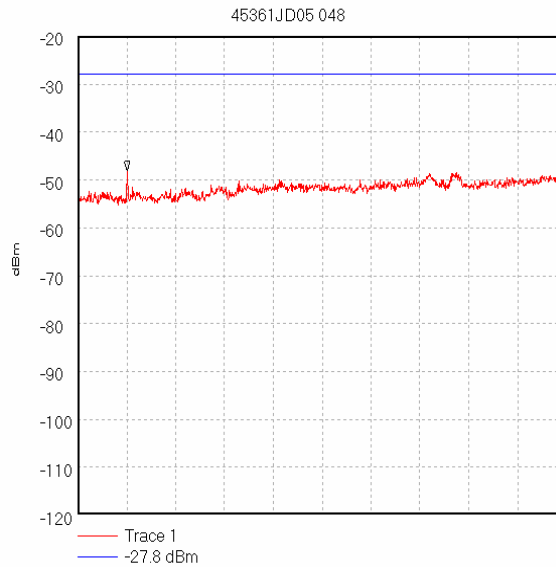
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

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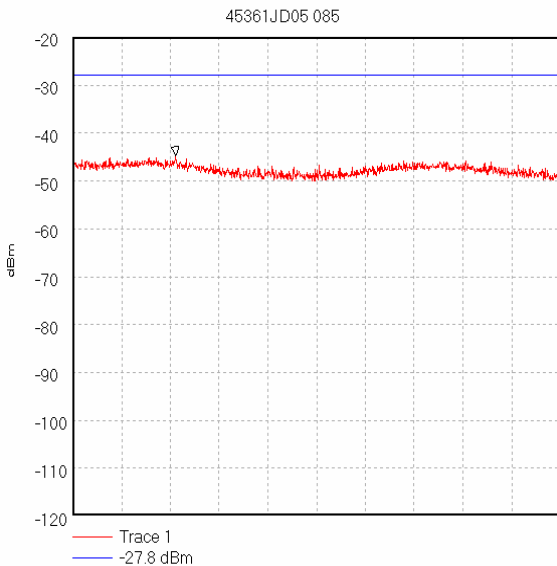
**Transmitter Radiated Emissions Top Channel (Low Chip Rate) - Continued**



Start 12.5 GHz; Stop 18.0 GHz  
Ref -20 dBm; Ref Offset 41.9 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS  
Peak 14.046 GHz, -48.11 dBm  
Display Line: -27.8 dBm; ; Limit Test Passed  
16/01/2004 11:44:09



Start 18.0 GHz; Stop 26.5 GHz  
Ref -20 dBm; Ref Offset 38.7 dB; 10 dB/div  
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS  
Peak 18.859 GHz, -48.13 dBm  
Display Line: -27.8 dBm; ; Limit Test Passed  
16/01/2004 11:36:49



Start 26.5 GHz; Stop 27.0 GHz  
Ref -20 dBm; Ref Offset 57.8 dB; 10 dB/div  
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS  
Peak 26.605566 GHz, -44.65 dBm  
Display Line: -27.8 dBm;  
16/01/2004 16:23:12

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

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

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## **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”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level</b>	<b>Calculated Uncertainty</b>
Carrier Output Power	Not applicable	95%	+/- 0.46 dB
Frequency Stability	Not applicable	95%	+/- 20 Hz
Occupied Bandwidth	Not applicable	95%	+/- 0.12 %
Conducted Emissions	9 kHz to 27 GHz	95%	+/- 1.2 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 27 GHz	95%	+/- 1.78 dB
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	+/- 3.25 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.

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## **9. Measurement Methods**

### **9.1. AC Mains Conducted Emissions**

AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane. The EUT was powered with 110V 60 Hz AC mains supplied via a Line Impedance Stabilisation Network (LISN).

Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

The test equipment settings for conducted emissions measurements were as follows:

<b>Receiver Function</b>	<b>Initial Scan</b>	<b>Final Measurements</b>
Detector Type:	Peak	Quasi-Peak (CISPR)/Average
Mode:	Max Hold	Not applicable
Bandwidth:	10 kHz	9 kHz
Amplitude Range:	60 dB	20 dB
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

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## **9.2. Receiver Radiated Emissions**

Radiated emissions 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 5 times the highest unintentionally generated frequency were performed within a screened chamber in order to identify frequencies on which the EUT was generating interference. This determined the frequencies from the EUT which required further examination. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector measuring bandwidth (see table below). 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. 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 Quasi-Peak detector was used for measurements below 1000 MHz, for measurements above 1000 MHz average and peak detectors were used.

For the final measurements the EUT was arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4.

On the open area test site, at each frequency where a signal was found, 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 horizontal 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 vertical polarisation.

The final field strength was determined as the indicated level in dB $\mu$ V plus cable loss and antenna factor.

The test equipment settings for radiated emissions measurements were as follows:

<b>Receiver Function</b>	<b>Initial Scan</b>	<b>Final Measurements Below 1 GHz</b>	<b>Final Measurements Above 1 GHz</b>
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	(120 kHz < 1 GHz) (1 MHz > 1 GHz)	120 kHz	1 MHz (If Applicable)
Amplitude Range:	60 dB	20 dB	20 dB (typical)
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

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### **9.3. Conducted RF Output Power & Effective Isotropic Radiated Power (EIRP)**

There are no conducted power limits specified in Part 27, therefore measurements were performed as a requirement of Part 2.1046.

The levels obtained were also used in conjunction with spurious attenuation measurements where the results are based on the conducted carrier power (P).

The EUT's antenna port was connected to a wideband power meter with an average power head via suitable attenuation.

The total loss of the cables & attenuators were measured and entered as a reference level offset into the power meter to correct for these losses.

The EUT was set to a specified channel and the transmitter set to operate at full power.

This test was carried out on the bottom, middle and top channels.

In order to obtain an EIRP measurement the manufacturer's declared antenna gain was added to the measured conducted RF output power.



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#### **9.4. Frequency Stability**

The EUT was situated within an environmental test chamber and its antenna port was connected to a spectrum analyser via suitable cables and RF attenuators.

Measurements were performed with the EUT operating under extremes of temperature in 10 degree increments within the range -30 to 50°C.

Measurements were also performed at voltage extremes by varying the primary supply voltage from 85% to 115% of the nominal value.

The requirement was to determine the frequency stability of the device under specified environmental operating conditions and ensure they remained within specified operating parameters.

Measurements were made on the top, middle and bottom channels.

The EUT was switched off for a minimum of 30 minutes between each stage of testing while the environmental chamber stabilised at the next temperature within the stated temperature range.

Once the environmental chamber had reached thermal equilibrium, the nominal frequency of the EUT was measured and recorded.

The reported data shows the nominal frequency drift and its margin from the declared frequency.

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### **9.5. Occupied Bandwidth**

The EUT was connected to a spectrum analyser enabled with an occupied bandwidth function via its antenna port.

Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom, middle and top channels.

The occupied bandwidth was measured using the built in occupied bandwidth function of the Rohde and Schwarz FSEB or ESIB spectrum analyser. It was set to measure the bandwidth where 99% of the signal power was contained. The analyser automatically configures the measurement bandwidths to make an accurate measurement based on the channel bandwidth and channel spacing of the EUT.

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## 9.6. Conducted Emissions

Spurious emission measurements at the antenna port were performed from the lowest declared frequency to 10 times the highest EUT fundamental frequency.

A spectrum analyser was connected to the antenna port of the EUT via a suitable cable and RF attenuator. The total loss of both the cable and the attenuator were measured and entered as a reference level offset into the measuring receiver to correct for the losses.

The frequency band described above was investigated with the transmitter operating at full power on the bottom, middle and top channels. Any spurious emissions noted were then measured.

The recorded emission level was then calculated as a spurious attenuation level using the following formula as described in TIA-EIA-603B.

$$\text{dB} = 10 \log_{10} \left( \frac{\text{TX power in watts}}{0.001} \right) - \text{spurious level (dBm)}$$

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 in Watts for the channel under test. This calculation always gives an absolute level of -13 dBm therefore the limit is -13 dBm, however the results have been presented as decibels relative to the carrier i.e. the tabulated results in the results section of this report show the spurious emission in dBm and as attenuation relative to the carrier in dBc.

The frequency band described above was investigated with the transmitter operating at full power. Any spurious observed were then recorded and 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.

It should be noted that FCC Part 27.53 states that in the 1 MHz bands immediately outside and adjacent to the applicants declared frequency block may be measured using a resolution bandwidth of at least 1% of the emission bandwidth. The resolution bandwidth used was 100 kHz which exceeded the 1% value for both the 3.84 Mcps and 7.68 Mcps chip rates.

For the measurements of emissions at the channel edge, plots of the spectral distribution including the fundamental frequency were recorded using a spectrum analyser for the EUT transmitting on bottom, middle and top channels. The method is in accordance with the measurement method detailed in Part 27.53 for measurements in the 1 MHz bands immediately outside and adjacent to the channel edge. A resolution bandwidth of 100 kHz was used.

.The test equipment settings for conducted antenna port measurements were as follows:

Receiver Function	Settings
Detector Type:	Average
Mode:	Max Hold
Bandwidth:	1 MHz >1 GHz
Bandwidth:	100 kHz <1 GHz
Bandwidth:	10 kHz <30 MHz
Amplitude Range:	100 dB
Sweep Time:	Coupled

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## **9.7. Transmitter Radiated Emissions**

Radiated emissions 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 were performed in order to identify frequencies on which the EUT was generating spurious emissions. This determined the frequencies from the EUT that 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, below 4 GHz; above 4 GHz a 1 m measurement distance was used. A limit line was set to the specification limit. 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 spectrum analyser with an average detector was used for final measurements.

On the open area test site, at each frequency where a signal was found, 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 horizontal 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 vertical polarisation.

Once the final amplitude (maximised) had been obtained and noted, the EUT was replaced by a substitution antenna, and a substitution method applied. The substitution antennas used were a horn antenna for measurements greater than or equal to 1 GHz and a dipole for measurements below 1 GHz. 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:-

$$\text{EIRP} = \text{Signal Generator Level} - \text{Cable Loss} + \text{Antenna Gain}$$

Once the EIRP was obtained, the difference between it and the level of the fundamental emission for the EIRP of the channel under test was noted at the spurious attenuation level in dBc. The following formula was used as described in TIA\_EIA\_603B

$$\text{dB} = 10 \log_{10} \left( \frac{\text{TX power in watts}}{0.001} \right) - \text{spurious level (dBm)}$$

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### **Transmitter Radiated Emissions (Continued)**

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 in Watts for the channel under test. This calculation always gives an absolute level of -13 dBm therefore the limit is -13 dBm, however the results have been presented as decibels relative to the carrier i.e. the tabulated results in the results section of this report show the spurious emission in dBm and as attenuation relative to the carrier in dBc.

The frequency band described above was investigated with the transmitter operating at full power. Any spurious observed were then recorded and 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.

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### Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
A003	ESH3-Z2 Pulse Limiter	Rohde & Schwarz	ESH3-Z2	357 881/052
A027	Horn Antenna	Eaton	9188-2	301
A031	2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	557
A075	High Power Attenuator 20dB 150W	Narda	769-20	02878
A090	Narda Step Attenuator 0-60dB	Narda	743-60	01057
A1009	WG14 to SMA adapter	Flann	14094-SF40	40
A1037	Chase Bilog Antenna	Chase EMC Ltd	CBL6112B	2413
A145	10 dB Attenuator	Narda	NONE	NONE
A201	WG 20 Horn Antenna	Flann Microwave Ltd	20240-20	266
A203	WG 22 Horn Antenna	Flann Microwave Ltd	22240-20	343
A253	WG 12 Microwave Horn	Flann Microwave	12240-20	128
A254	WG 14 Microwave Horn	Flann Microwave	14240-20	139
A255	WG 16 Microwave Horn	Flann Microwave	16240-20	519
A256	WG 18 Microwave Horn	Flann Microwave	18240-20	400
A259	Bilog Antenna	Chase	CBL6111	1513
A392	3 dB attenuator	Suhner	6803.17.B	None
A435	WG 22 horn	Flann	22240-20	400
A490	Bilog Antenna	Chase	CBL6111A	1590
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008
C1068	Cable	Rosenberger	001	001
C1078	Cable	Rosenberger	FA210A1030 M5050	28464-2

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**Test Equipment Used (Continued)**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
C1079	Cable	Rosenberger	FA210A1010 M5050	28462-1
C1082	Cable	Rosenberger	FA210A1020 M5050	28463-1
C160	Cable	Rosenberger	UFA210A-1- 1181-70x70	None
C172	Cable	Rosenberger	UFA210A-1- 1181-70x70	None
C202	Cable	Rosenberger	UFA 210A-1- 1180-70X70	1543
C341	Cable	Andrews	None	None
C342	Cable	Andrews	None	None
C344	Cable	Rosenberger	UFA210A-1- 1181-70x70	1934
C363	BNC Cable	Rosenberger	RG142	None
C364	BNC Cable	Rosenberger	RG142	None
C457	Cable	Rosenberger	RG142XX- 002-RFIB	C457-10081998
C461	Cable	Rosenberger	UFA210A-1- 1182-704704	98H0305
C468	Cable	Rosenberger	UFA210A-1- 3937-504504	98L0440
E011	Environmental Chamber	Design Environmental	WIR3-40	11-96-A2103
G013	SMHU Signal Generator	Rohde & Schwarz	SMHU	894 055/003
G020	Rack Power Amplifier	Spitzenberger Spies	EP4500/B	5233
G085	Generator	Hewlett Packard	83650L	3614A00104
M023	ESVP Receiver	Rohde & Schwarz	ESVP	872 991/027
M072	FSM Spectrum Analyser	Rohde & Schwarz	FSM	862 967/010 (RF) & 863 912/048 (Display)
M084	NRVS Power Meter	Rohde & Schwarz	NRVS	864268/006
M090	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:838494/005 RU:836833/001

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**Test Equipment Used (Continued)**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016
M134	Temperature/Humidity/Pressure Meter	RS Components	None	None
M139	Digital Multimeter	Fluke	11	65830028
M212	Digital Thermometer	RS Components	RS 206-3738	70319456
M245	Thermo/hygrometer	Oregon Scientific	M245	M245
M281	Power Meter	Hewlett Packard	E4418A (EPM441A)	GB37170210-01
M283	Power Sensor	Hewlett Packard	8487A	3318A03241
S201	Site 1	RFI	1	
S202	Site 2	RFI	2	S202-15011990

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



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## **Appendix 2. Test Configuration Drawings**

This Appendix contains the following drawings:

<b>Drawing Reference Number</b>	<b>Title</b>
DRG\45361JD05\EMICON	Test configuration for measurement of conducted emissions
DRG\45361JD05\EMIRAD	Test configuration for measurement of radiated emissions

**RFI GLOBAL SERVICES LTD**

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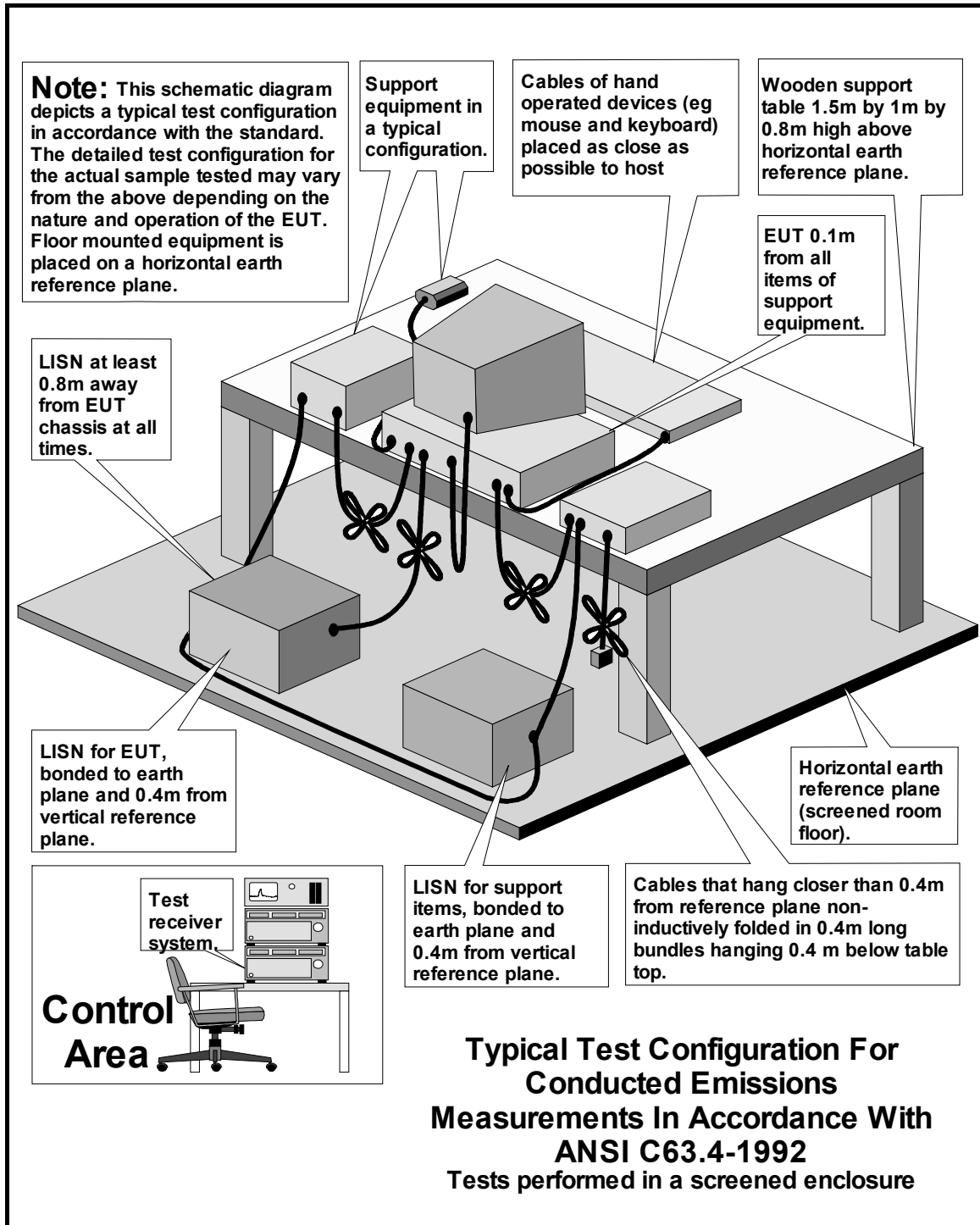
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DRG\45361JD05\EMICON



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