



TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

Test Report Serial No:
RFI/MPTB2/RP45361JD05A

Supersedes Test Report Serial No:
RFI/MPTB1/RP45361JD05A

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: 	Checked By: Tony Henriques 
Tested By: Steven Wong 	Release Version No: PDF01
Issue Date: 19 April 2004	Test Dates: 5 December 2003 to 12 February 2004

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RADIO FREQUENCY INVESTIGATION LTD.

Operations Department

**Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74**

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1. Client Information

Company Name:	IPWireless UK Ltd.
Address:	Units 3-6 Charlton Business Park Crudwell Road Malmesbury SN16 9RU
Contact Name:	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)

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

Brand Name:	IPWireless Broadband Base Station
Model Name or Number:	2.5 GHz Rack Mount Node B Digital Shelf
Unique Type Identification:	DN
Serial Number:	DN1A344000211
Country of Manufacture:	UK
FCC ID Number:	PKTNODEBDZ
Date of Receipt:	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

Power Supply Requirement:	-48V DC		
Intended Operating Environment:	Residential, Commercial, Light Industry		
Equipment Category:	Multipoint Distribution Service / Instructional Television Fixed Service		
Type of Unit:	Wireless Broadband Base Station		
Interface Ports:	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		
Chip Rate:	High: 7.68 Mcps; Low : 3.84 Mcps		
Transmit & Receive Frequency Ranges	High Chip Rate: 2506 MHz to 2680 MHz Low Chip Rate: 2503 MHz to 2683 MHz		
Transmit/Receive Channels Tested (High Chip Rate: 7.68 Mcps):	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	N/A	2506
	Middle	N/A	2596
	Top	N/A	2680
Transmit/Receive Channels Tested (Low Chip Rate: 3.84 Mcps):	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	N/A	2503
	Middle	N/A	2596
	Top	N/A	2683
Highest Fundamental Frequency	2683 MHz		
Highest Unintentionally Generated Frequency	2303 MHz		
Maximum Power Output	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:

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

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3. Test Specification, Methods And Procedures

3.1. Test Specification

Reference:	FCC Part 74: 2003: Sections 74.935, 74.936 and 74.961
Title:	Code of Federal Regulations, Part 74 (47CFR) Subpart I Instructional Television Fixed Service
Comments:	None.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

Reference:	FCC Part 21: 2003 Sections 21.101, 21.904 and 21.908,
Title:	Code of Federal Regulations, Part 21 (47CFR) Subpart K Multipoint Distribution Service
Comments:	None.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

Reference:	FCC Part 15: 2003 Class B, Sections: 15.107 and 15.109
Title:	Code of Federal Regulations, Part 15 (47CFR) Radio Frequency Devices: Digital Devices.
Comments:	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.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

Reference:	FCC Part 2: 2003 Sections 2.1046, 2.1049, 2.1051, 2.1053 and 2.1055
Title:	Code of Federal Regulations, Part 2 (47CFR) Frequency allocations and radio treaty matters; General Rules and Regulations
Comments:	None.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2002

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 (2001)

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

ANSI C63.5 (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.

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

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: 2003 FCC Part 15 Section 15.107	AC Mains Input	Complied
Receive Mode Spurious Emissions	CFR 47: 2003 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: 2003 FCC Part 2.1046, Part 21.904, Part 74.935	Antenna Terminals	Complied
Frequency Stability (Temperature Variation)	CFR 47: 2003 FCC Part 2.1055, Part 21.101, Part 74.961	Antenna Terminals	Complied
Frequency Stability (Voltage Variation)	CFR 47: 2003 FCC Part 2.1055, Part 21.101, Part 74.961	Antenna Terminals	Complied
Occupied Bandwidth	CFR 47: 2003 FCC Part 2.1049, Part 21.908, Part 74.936	Antenna Terminals	Complied
Conducted Spurious Emissions at Band Edges	CFR 47: 2003 FCC Part 2.1051, Part 21.908, Part 74.936	Antenna Terminals	Complied
Conducted Spurious Emissions	CFR 47: 2003 FCC Part 2.1051, Part 21.908, Part 74.936	Antenna Terminals	Complied
Radiated Spurious Emissions	CFR 47: 2003 FCC Part 2.1053, Part 21.908, Part 74.936	Antenna	Complied

6.1. Location Of Tests

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

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 μ V)	Q-P Limit (dB μ 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 μ V)	Av. Limit (dB μ 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.

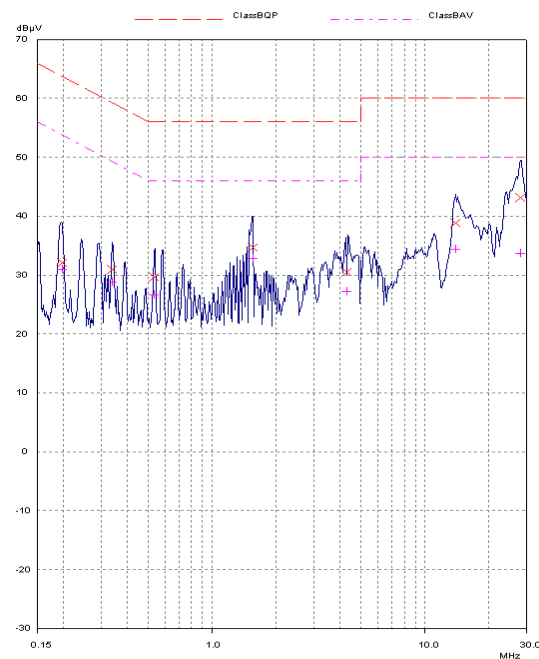
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Receive AC Conducted Spurious Emissions (Continued)

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)

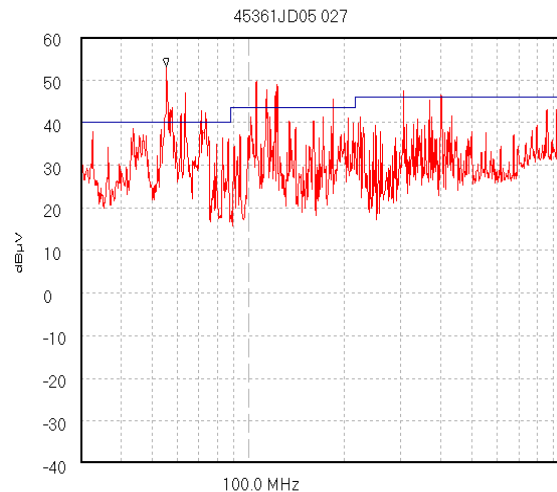
Frequency (MHz)	Ant. Pol.	Q-P Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
32.635	Vert.	26.0	40.0	14.0	Complied
43.508	Vert.	28.2	40.0	11.8	Complied
55.675	Vert.	33.3	40.0	6.7	Complied
57.375	Vert.	25.5	40.0	14.5	Complied
61.892	Vert.	25.2	40.0	14.8	Complied
63.369	Vert.	26.8	40.0	13.2	Complied
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)

Trace 1
15_109_Class_B

Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref 60 dBµV; Ref Offset 0.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 380.0 mS
Peak 55.523 MHz; 53.2 dBµV
Limit/Mask: 15_109_Class_B; ; Limit Test Failed
Transducer Factors: A490
13/01/2004 14:17:41

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 (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBμV/m)	Average Limit (dBμV/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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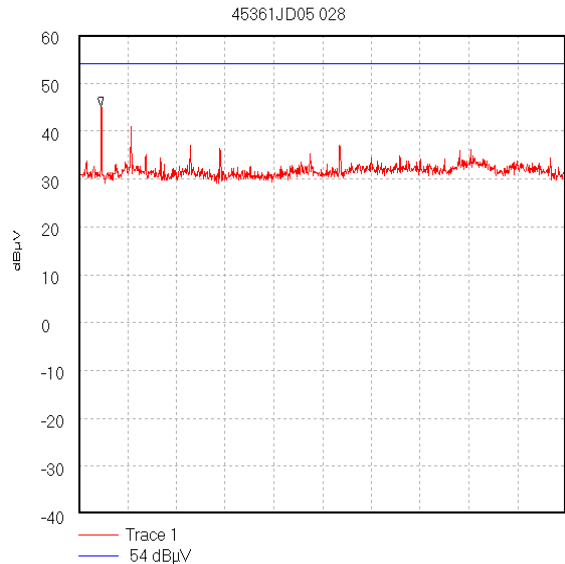
Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz (Continued)**Highest Peak Level: (High Chip Rate)**

Frequency (MHz)	Antenna Polarity (H/V)	Peak Detector level (dB μ V)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dB μ V/m)	Peak Limit (dB μ 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

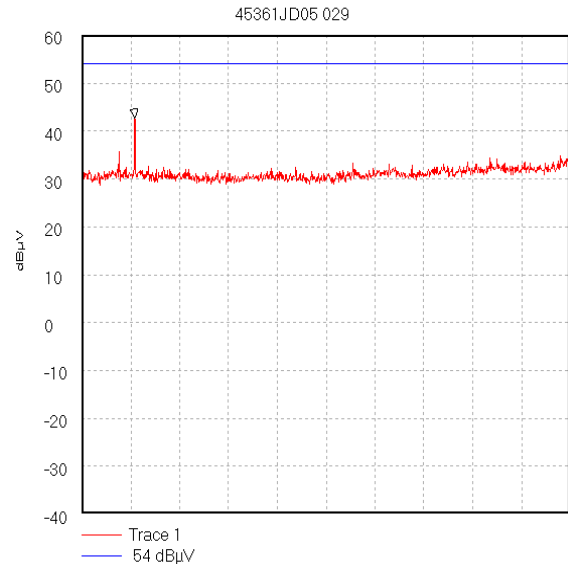
Note: The results detailed in the above table and the graphs on the following pages are for the determined worst case mode of operation i.e. with the EUT operating in high chip rate mode.

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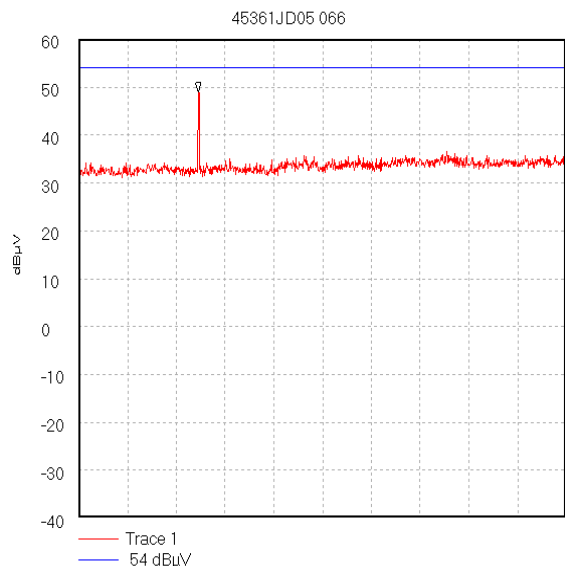
Receive Mode Radiated Emissions – 1 GHz to 13.5 GHz (Continued)



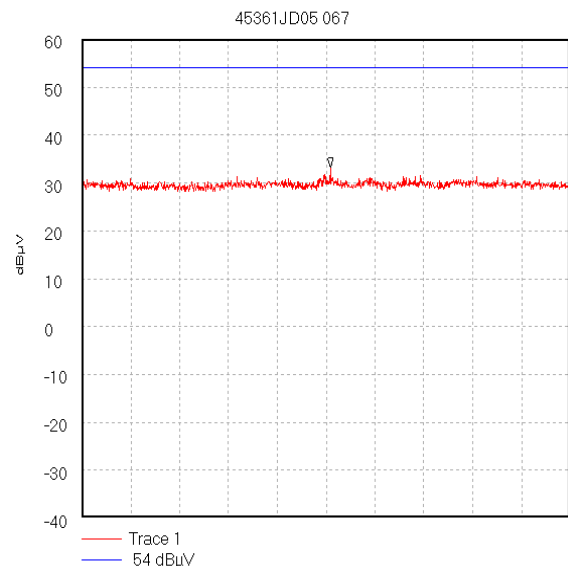
Start 1.0 GHz; Stop 2.0 GHz
Ref 60 dBμV; Ref Offset 4.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.046 GHz; 45.1 dBμV
Display Line: 54 dBμV; ; Limit Test Failed
13/01/2004 14:41:40



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



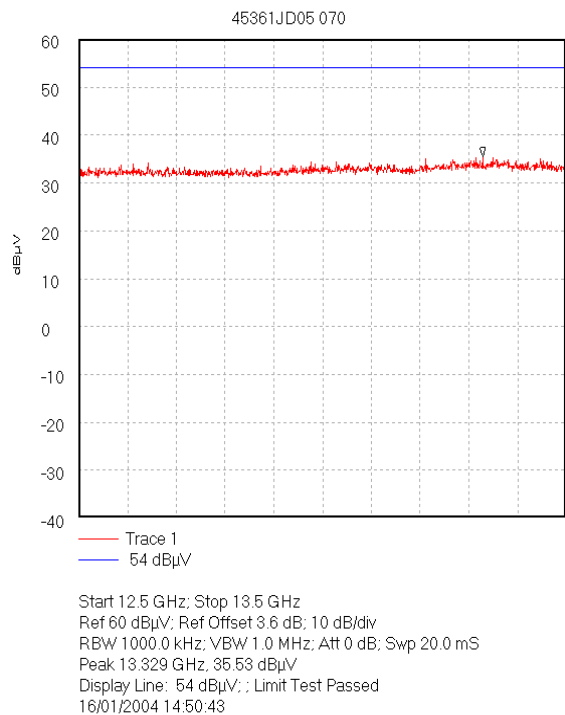
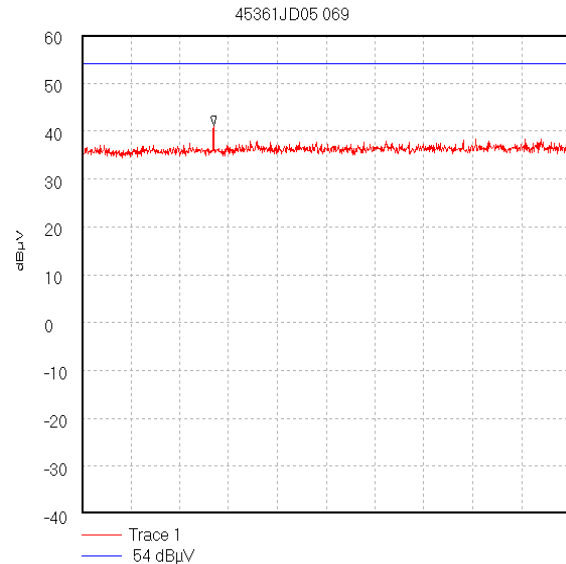
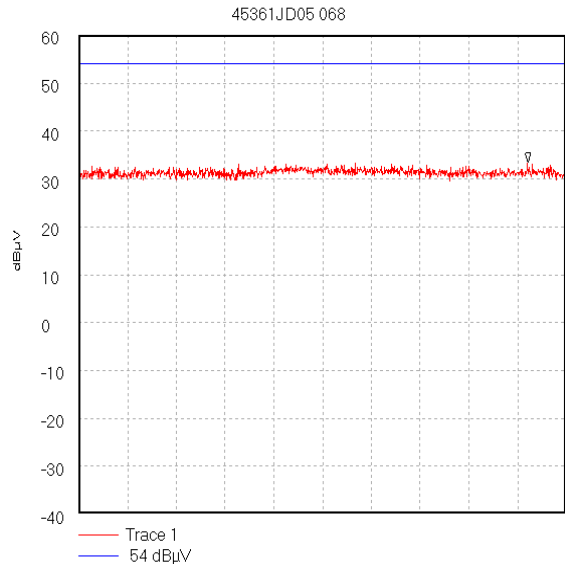
Start 4.0 GHz; Stop 5.0 GHz
Ref 60 dBμV; Ref Offset 2.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.246 GHz; 48.96 dBμV
Display Line: 54 dBμV; ; Limit Test Failed
16/01/2004 14:05:32



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.

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)

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	36.0	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	36.0	8.3	Complied

*per 12 MHz channel

Note : The limit is calculated as $33+10 \log (12/6)$. The channel bandwidth being equal to 12 MHz.

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	33.0	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	33.0	3.9	Complied

**per 6 MHz channel

Note : The limit is calculated as $33+10 \log (6/6)$. The channel bandwidth being equal to 6 MHz.

Note 1: The antenna gain is typically a maximum of 20dBi and, hence, is the figure used in the above table. 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 of 35.218 dBW.

Note 2: These results determine that the EUT conducted output power exceeds the “-9dBW per 6MHz channel” category of FCC Parts 21.908(a) and 74.936(c) with regard to out of band power.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

7.6. Transmitter Frequency Stability: (Temperature Variation)

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)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2505.995840	4.160	25.060	20.900	Complied
-20	2505.995648	4.352	25.060	20.708	Complied
-10	2505.995526	4.474	25.060	20.586	Complied
0	2505.995208	4.792	25.060	20.268	Complied
10	2505.995296	4.704	25.060	20.356	Complied
20	2505.995164	4.836	25.060	20.224	Complied
30	2505.995068	4.932	25.060	20.128	Complied
40	2505.994952	5.048	25.060	20.012	Complied
50	2505.994837	5.163	25.060	19.897	Complied

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

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2502.995814	4.186	25.030	20.844	Complied
-20	2502.995647	4.353	25.030	20.677	Complied
-10	2502.995536	4.464	25.030	20.566	Complied
0	2502.995203	4.797	25.030	20.233	Complied
10	2502.995301	4.699	25.030	20.331	Complied
20	2502.995164	4.836	25.030	20.194	Complied
30	2502.995078	4.922	25.030	20.108	Complied
40	2502.994957	5.043	25.030	19.987	Complied
50	2502.994847	5.153	25.030	19.877	Complied

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2595.995678	4.322	25.960	21.638	Complied
-20	2595.995491	4.509	25.960	21.451	Complied
-10	2595.995369	4.631	25.960	21.529	Complied
0	2595.995046	4.954	25.960	21.006	Complied
10	2595.995120	4.880	25.960	21.08	Complied
20	2595.994988	5.012	25.960	20.948	Complied
30	2595.994892	5.108	25.960	20.852	Complied
40	2595.994767	5.233	25.960	20.727	Complied
50	2595.994652	5.348	25.960	20.612	Complied

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

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2595.995663	4.337	25.960	21.623	Complied
-20	2595.995494	4.506	25.960	21.454	Complied
-10	2595.995379	4.621	25.960	21.339	Complied
0	2595.995034	4.966	25.960	20.994	Complied
10	2595.995120	4.880	25.960	21.08	Complied
20	2595.994988	5.012	25.960	20.948	Complied
30	2595.994887	5.113	25.960	20.847	Complied
40	2595.994767	5.233	25.960	20.727	Complied
50	2595.994652	5.348	25.960	20.612	Complied

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

Transmitter Frequency Stability: (Temperature Variation)**Results Top Channel (2680 MHz) (High Chip Rate)**

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2679.995536	4.464	26.800	22.336	Complied
-20	2679.995350	4.650	26.800	22.150	Complied
-10	2679.995222	4.778	26.800	22.022	Complied
0	2679.994914	5.086	26.800	21.714	Complied
10	2679.994963	5.037	26.800	21.763	Complied
20	2679.994831	5.169	26.800	21.631	Complied
30	2679.994729	5.271	26.800	21.529	Complied
40	2679.994602	5.398	26.800	21.402	Complied
50	2679.994481	5.519	26.800	21.281	Complied

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

Temp (°C)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
-30	2682.995518	4.482	26.830	22.348	Complied
-20	2682.995342	4.658	26.830	22.172	Complied
-10	2682.995222	4.782	26.830	22.048	Complied
0	2682.994855	4.145	26.830	22.685	Complied
10	2682.994968	5.032	26.830	21.798	Complied
20	2682.994811	5.189	26.830	21.641	Complied
30	2682.994722	5.278	26.830	21.552	Complied
40	2682.994587	5.413	26.830	21.417	Complied
50	2682.994471	5.529	26.830	21.301	Complied

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

7.7. Transmitter Frequency Stability: (Voltage Variation)

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)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2505.995100	4.900	25.060	20.160	Complied
126.5	2505.995070	4.930	25.060	20.130	Complied

Results Middle Channel (2596 MHz) – High Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2595.994920	5.080	25.960	20.880	Complied
126.5	2595.994920	5.080	25.960	20.880	Complied

Results Top Channel (2680 MHz) – High Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2679.994730	5.270	26.800	21.530	Complied
126.5	2679.994730	5.270	26.800	21.530	Complied

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

Transmitter Frequency Stability: (Voltage Variation)**Results Bottom Channel (2503 MHz) – Low Chip Rate**

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2502.995260	4.740	25.030	20.290	Complied
126.5	2502.995070	4.930	25.030	20.100	Complied

Results Middle Channel (2596 MHz) – Low Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2595.994920	5.080	25.960	20.880	Complied
126.5	2595.994920	5.080	25.960	20.880	Complied

Results Top Channel (2683 MHz) – Low Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)	0.001% Limit (kHz)	Margin (kHz)	Result
93.5	2682.994710	5.290	26.830	21.540	Complied
126.5	2682.994730	5.270	26.830	21.560	Complied

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

7.8. Transmitter Occupied Bandwidth

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

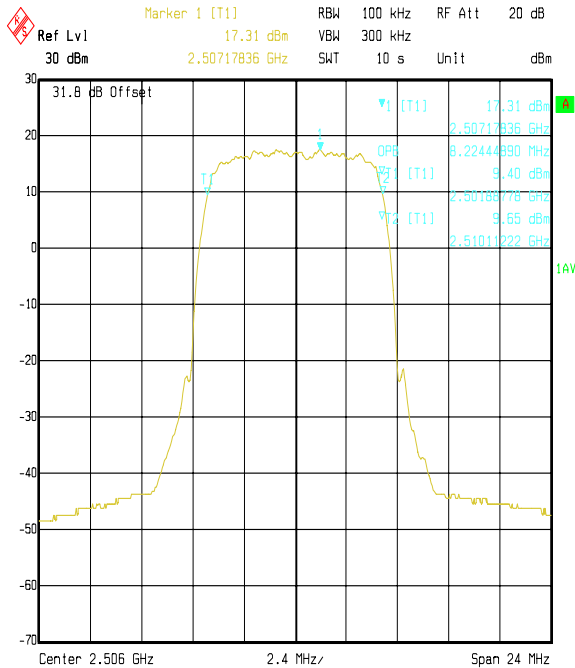
Results: (Low Chip Rate)

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

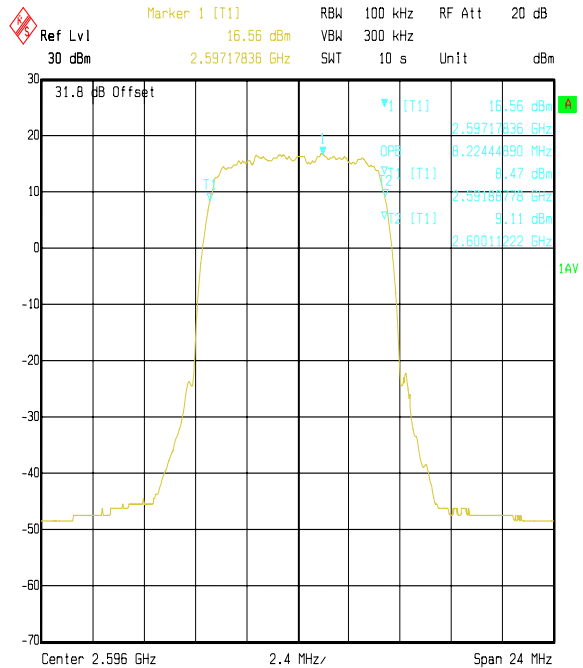
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

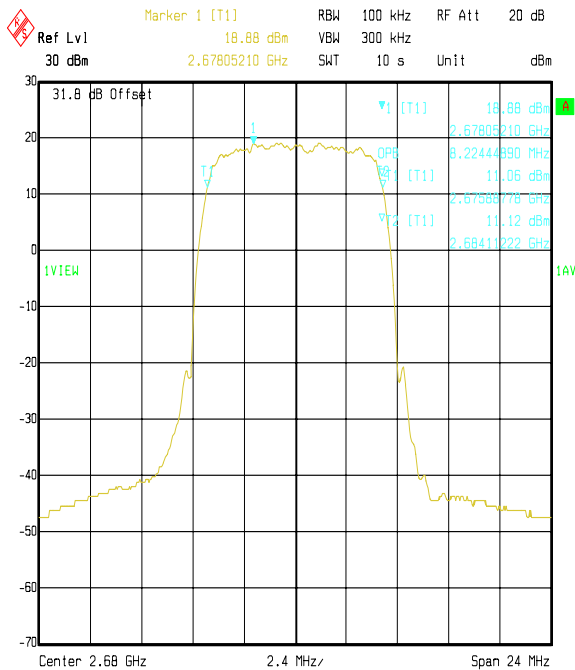
Transmitter Occupied Bandwidth (High Chip Rate) - Continued

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

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.

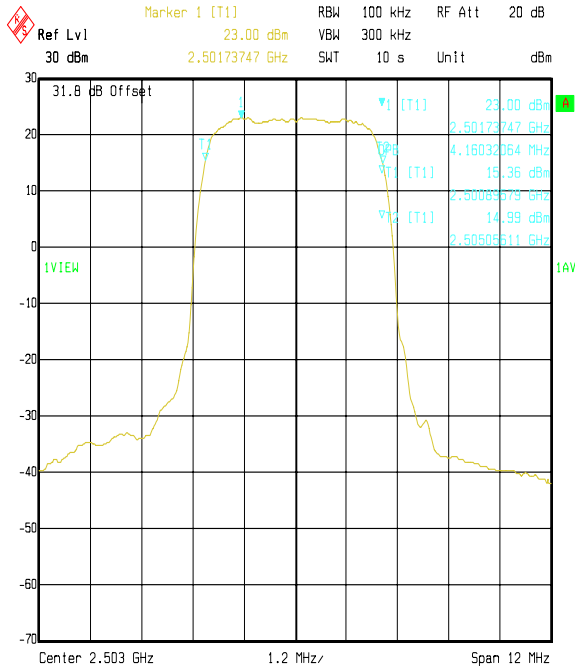


Operations Department

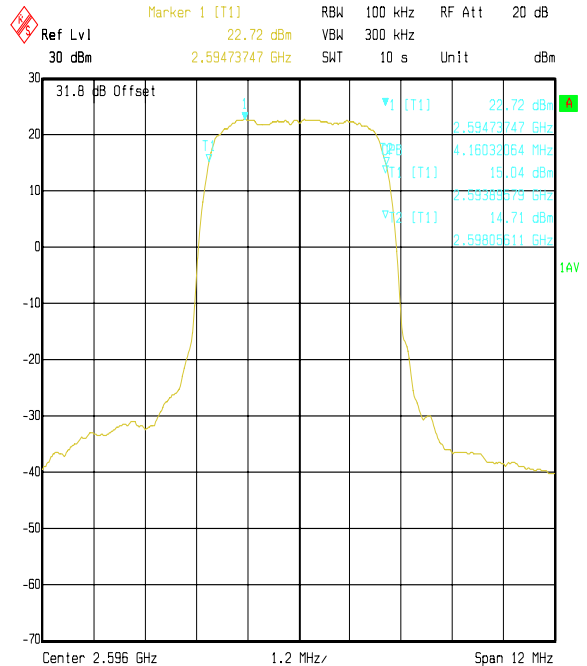
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

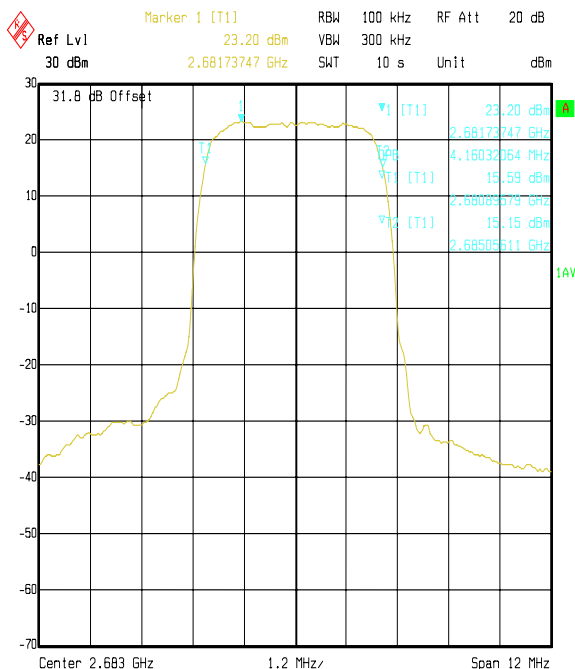
Transmitter Occupied Bandwidth (Low Chip Rate) - Continued

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

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.



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

7.9. Transmitter Conducted Emissions (Spectrum Mask)

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 parts of the regulations.

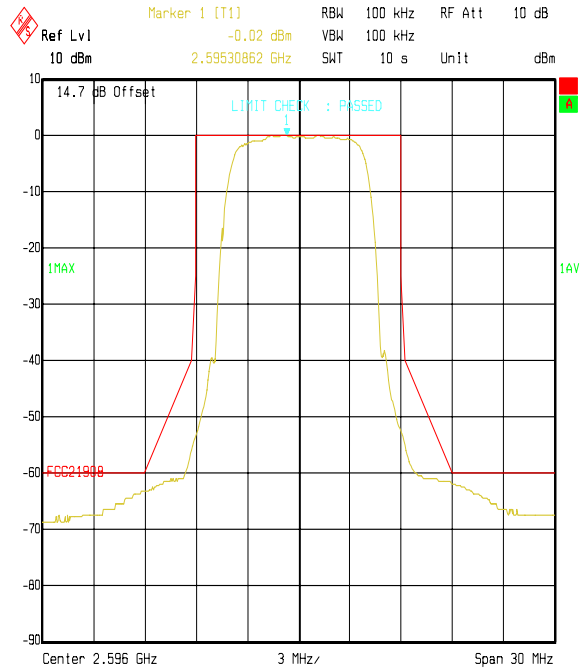
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

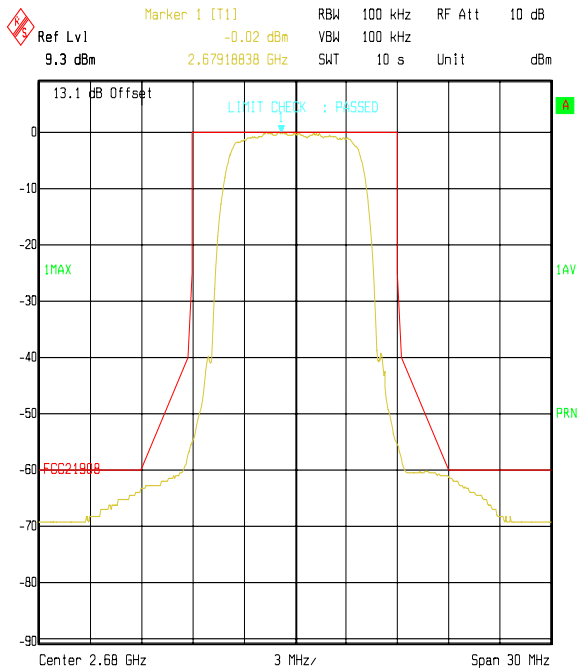
To: FCC Part 15, Part 21 & Part 74

Transmitter Conducted Emissions (Spectrum Mask): High Chip Rate – Continued

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



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

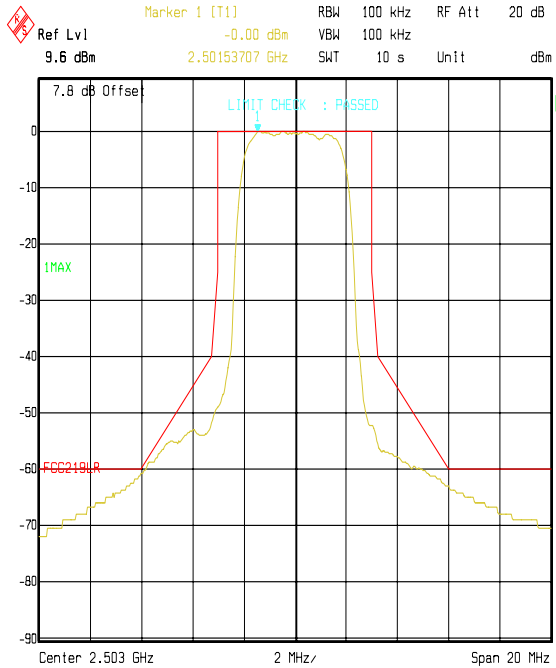


Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask
Comment A: 45361JD05 Top Channel 7.68 Mcps
Date: 10.FEB.2004 12:15:30

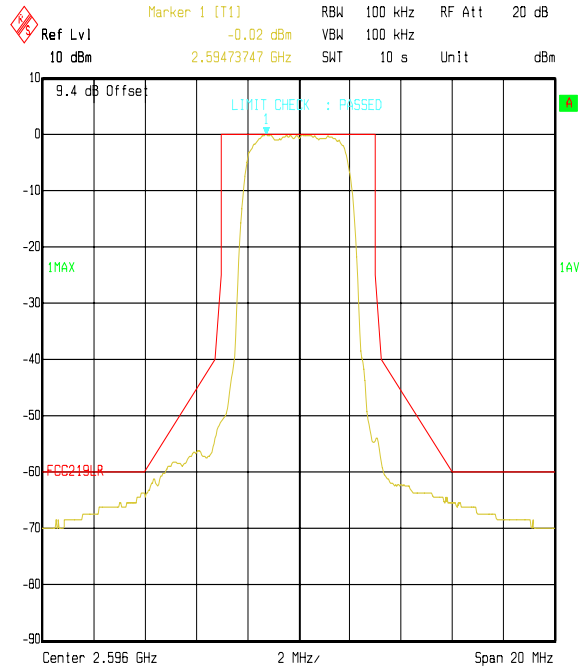
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

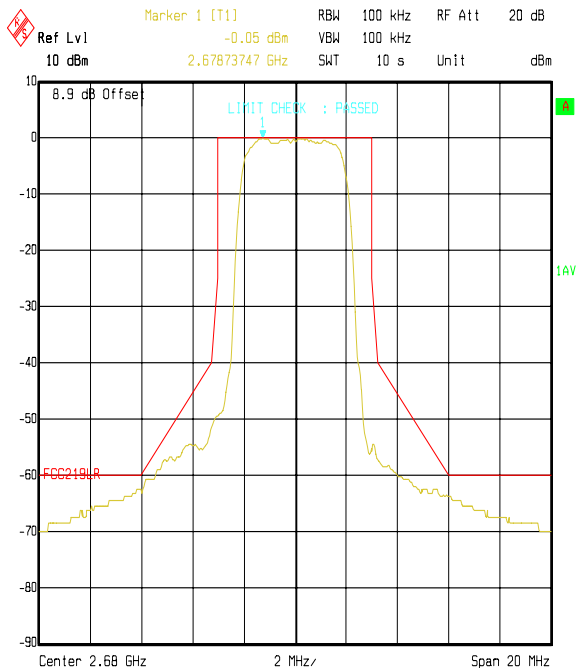
To: FCC Part 15, Part 21 & Part 74

Transmitter Spectrum Mask (Low Chip Rate) - Continued

Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Spectrum Mask
Comment A: 45361JD05 Bottom Channel 3.84 Mcps
Date: 10.FEB.2004 12:22:58



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



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 U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

7.10. Transmitter Conducted Emissions at Band Edges

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 2500 to 2686 MHz 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	-45.8	27.5	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	-45.8	24.5	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 12$ MHz and $R_{BW} = 100$ kHz.

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	-42.8	22.4	Complied

Top Band Edge

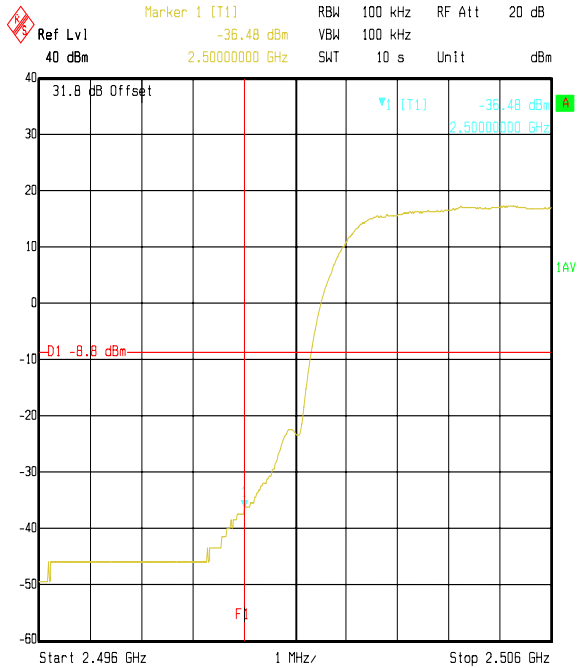
Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
2686	-26.9	39.1	-66.0	-42.8	23.2	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 6$ MHz and $R_{BW} = 100$ kHz.

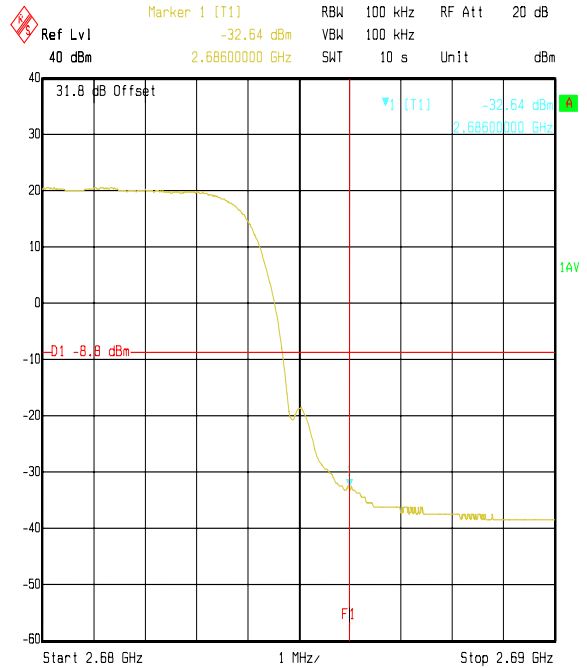
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

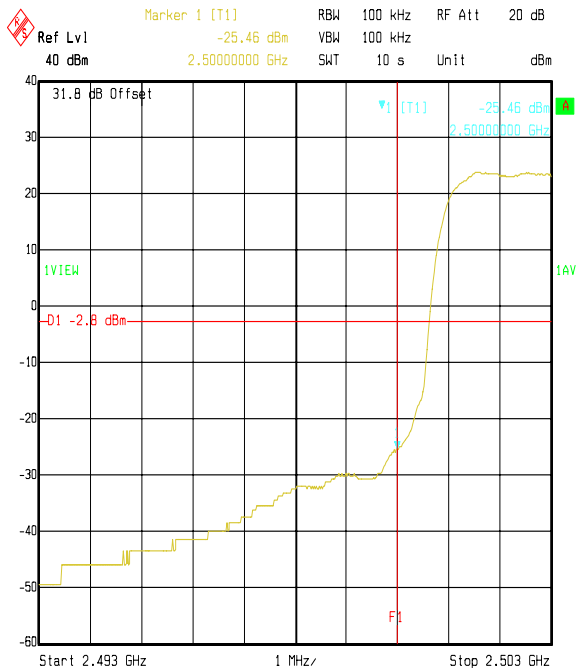
To: FCC Part 15, Part 21 & Part 74

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

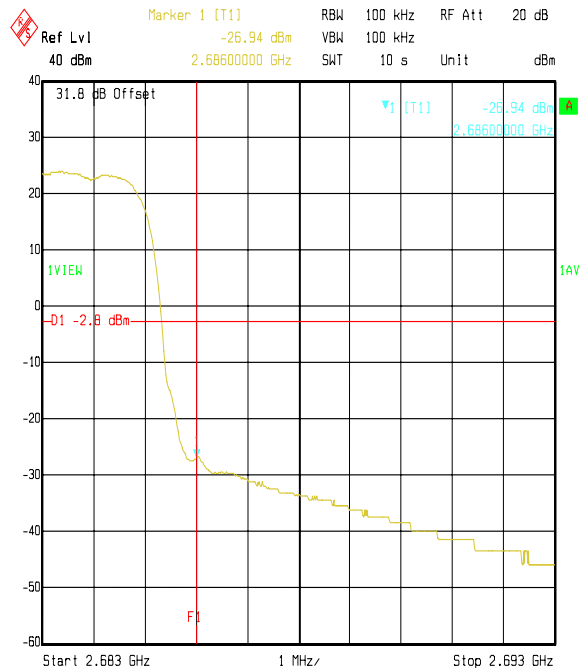
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Lower BandEdge.
Comment A: 45361JD05 Bottom Channel 7.68 Mcps Avg Detector
Date: 10.FEB.2004 15:31:07



Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Upper BandEdge.
Comment A: 45361JD05 Top Channel 7.68 Mcps Avg Detector
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 Detector
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 Detector
Date: 10.FEB.2004 15:26:36

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

7.11. Transmitter Conducted Emissions

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	-70.8	1.3	Complied
2515.000	-34.1	36.8	-70.9	-70.8	0.1	Complied
5363.380	-38.8	36.8	-75.6	-70.8	4.8	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	-70.8	1.3	Complied
2605.000	-35.2	36.3	-71.5	-70.8	0.7	Complied
5188.770	-37.1	36.3	-73.4	-70.8	2.6	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	-80.8	4.6	Complied
2671.000	-34.3	37.7	-72.0	-70.8	1.2	Complied
2689.000	-34.2	37.7	-71.9	-70.8	1.1	Complied
5356.720	-36.2	37.7	-73.9	-70.8	3.1	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 12$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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	-67.8	0.7	Complied
2509.000	-33.5	39.7	-73.2	-67.8	5.4	Complied
5004.490	-32.0	39.7	-71.7	-67.8	3.9	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	-67.8	2.6	Complied
2602.000	-33.0	39.3	-72.3	-67.8	4.5	Complied
5190.530	-29.0	39.3	-68.3	-67.8	0.5	Complied

Result: Top Channel (Low Chip Rate)

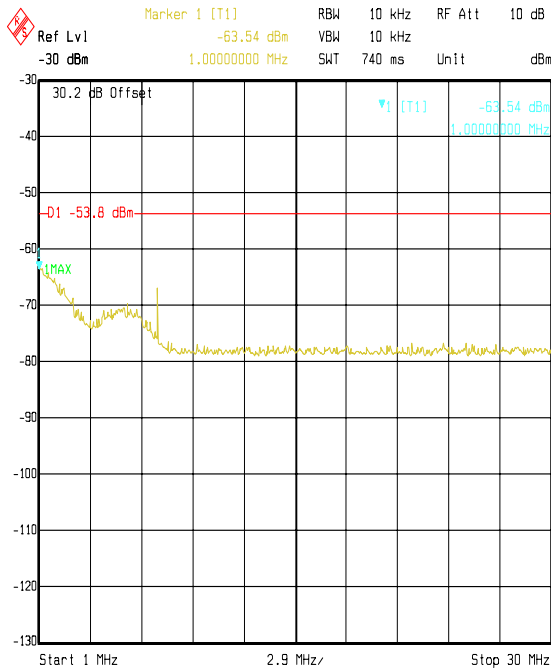
Frequency (MHz)	Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
51.383	-39.9	39.1	-79.0	-77.8	1.2	Complied
2677.000	-31.9	39.1	-71.0	-67.8	3.2	Complied
2689.000	-31.9	39.1	-71.0	-67.8	3.2	Complied
5367.660	-30.6	39.1	-69.7	-67.8	1.9	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 6$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

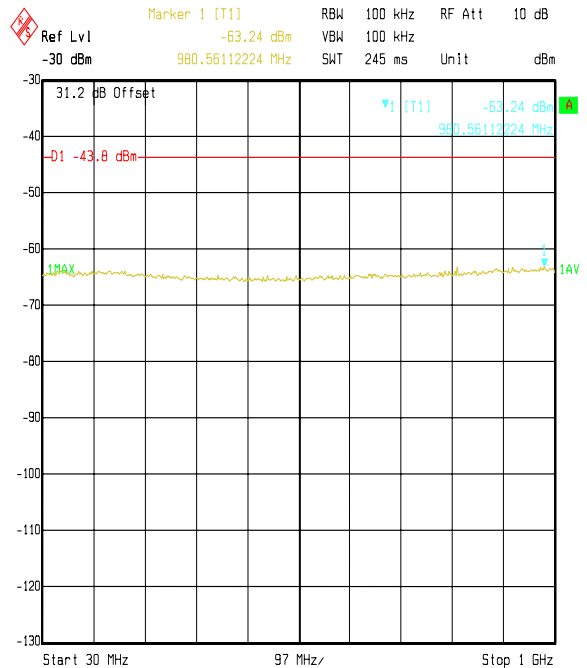
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

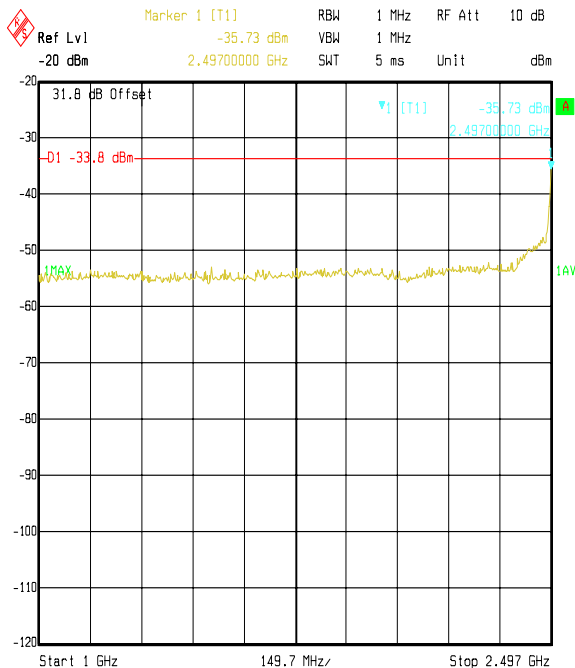
To: FCC Part 15, Part 21 & Part 74

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

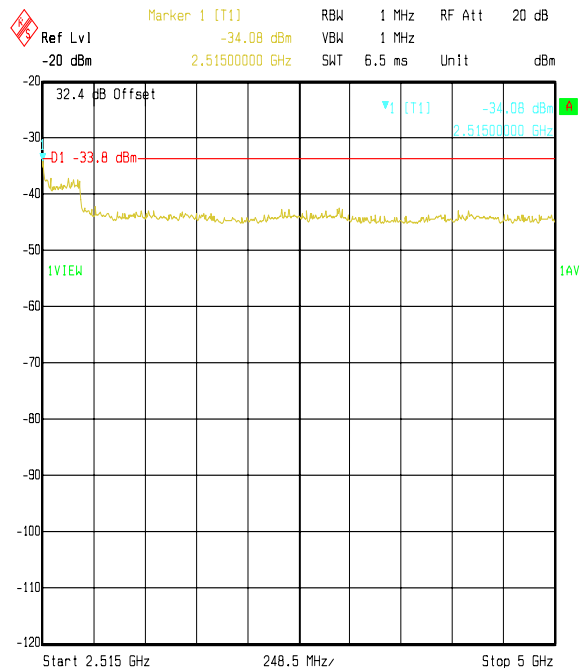
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Bottom Channel 7.68 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 14:19:19



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



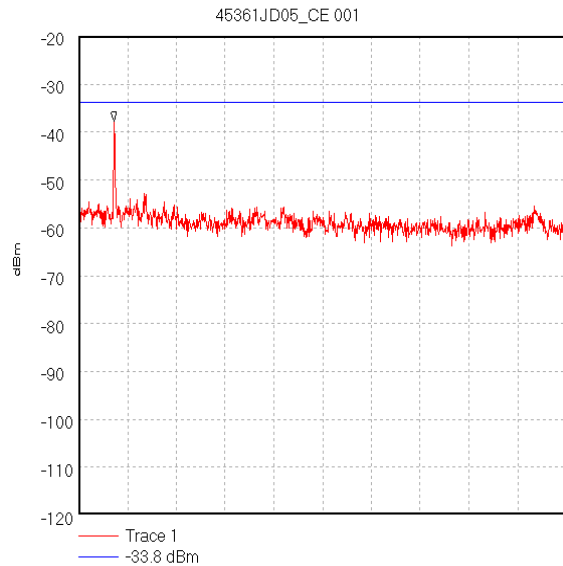
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Bottom Channel 7.68 Mcps 1-2.497 GHz Avg Detector
Date: 10.FEB.2004 14:31:33



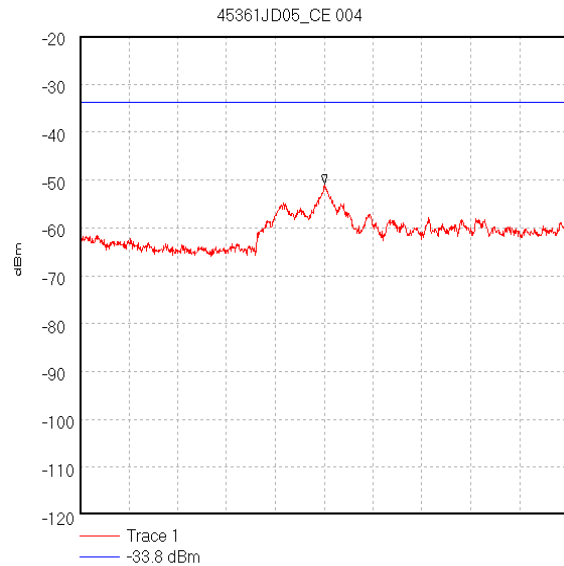
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Bottom Channel 7.68 Mcps 2.515-5 GHz Avg Detector
Date: 10.FEB.2004 14:30:19

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

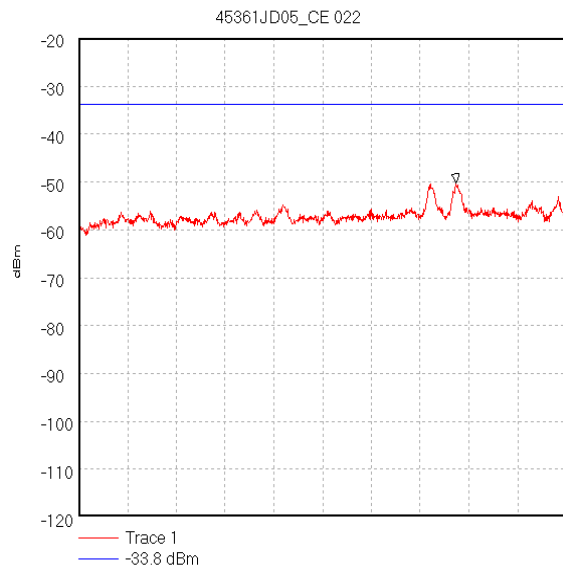
Transmitter Conducted Emissions Bottom Channel (High Chip Rate)- Continued



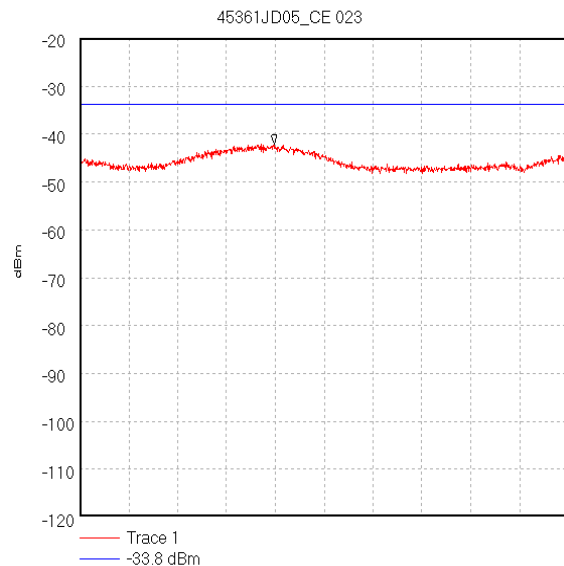
Start 5.0 GHz; Stop 10.0 GHz
Ref -20 dBm; Ref Offset 33.7 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 5 dB; Swp 20.0 mS
Peak 5.361111 GHz, -37.67 dBm
Display Line: -33.8 dBm;
10/02/2004 15:46:32



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 14.008889 GHz, -50.87 dBm
Display Line: -33.8 dBm;
10/02/2004 16:03:08



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 24.582778 GHz, -50.26 dBm
Display Line: -33.8 dBm;
10/02/2004 17:04:07



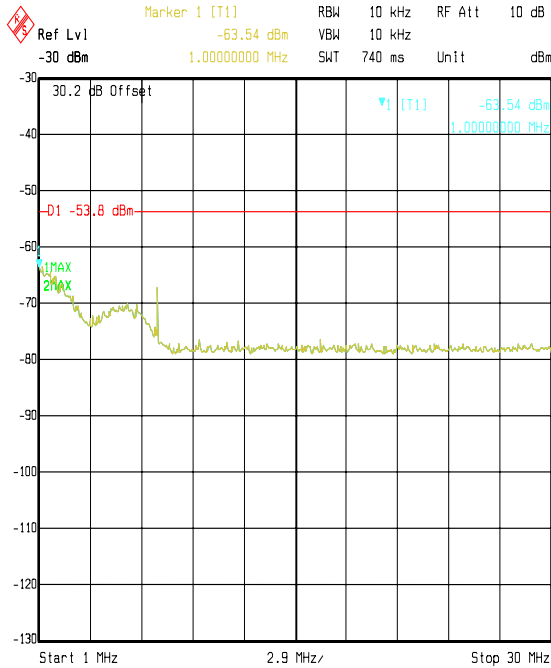
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 60.9 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.698889 GHz, -42.04 dBm
Display Line: -33.8 dBm;
12/02/2004 10:13:50

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

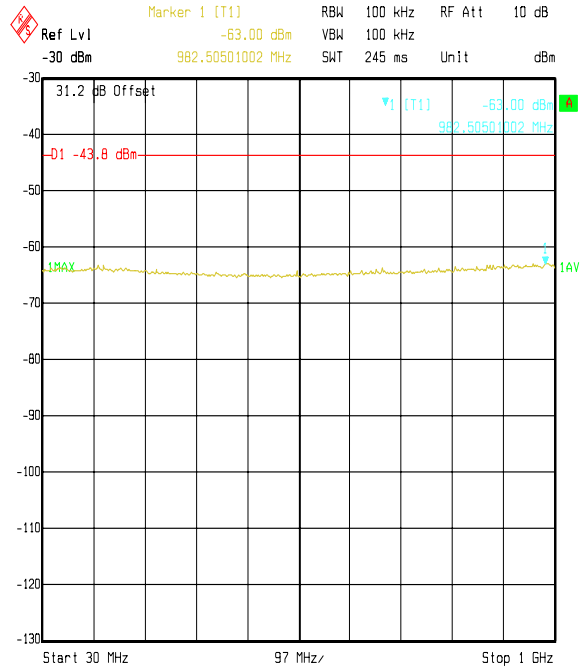
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

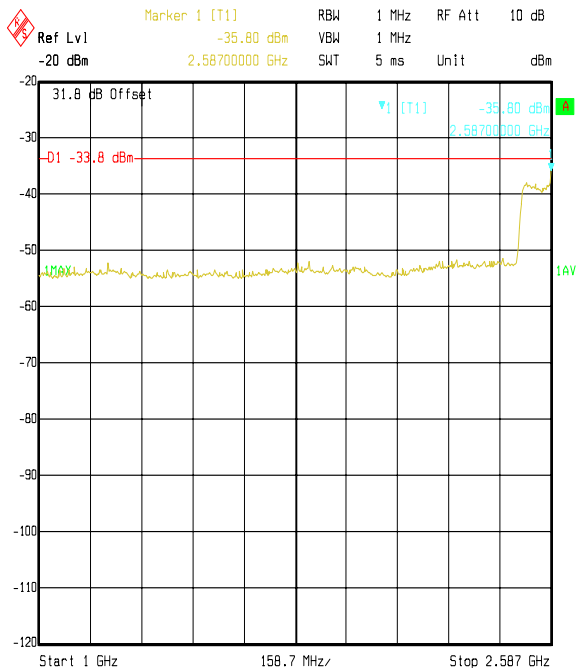
To: FCC Part 15, Part 21 & Part 74

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

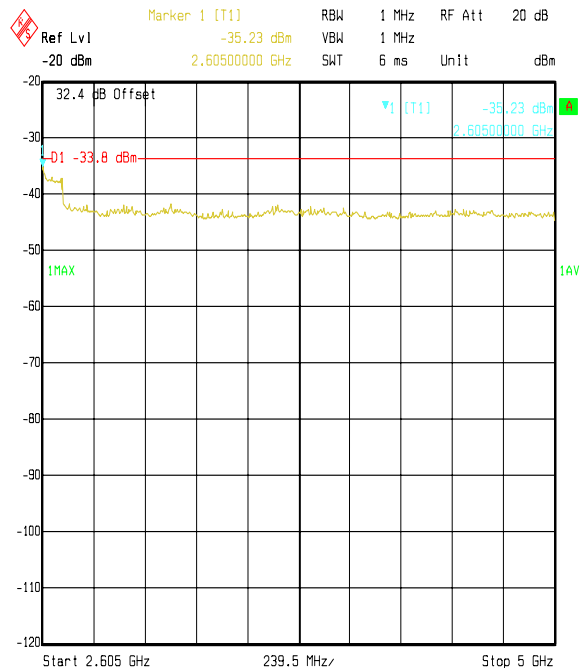
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Middle Channel 7.68 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 14:18:45



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



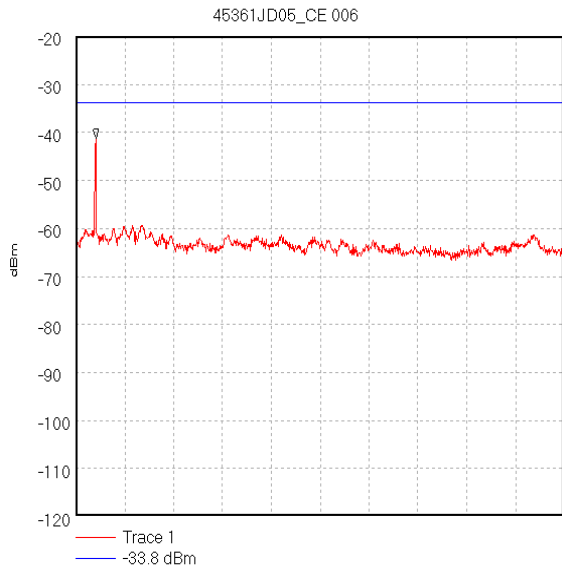
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Middle Channel 7.68 Mcps 1-2.587 GHz Avg Detector
Date: 10.FEB.2004 14:26:28



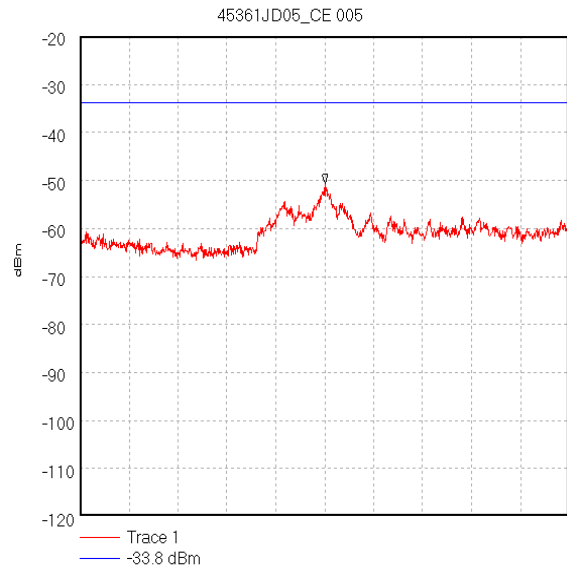
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Middle Channel 7.68 Mcps 2.605-5 GHz Avg Detector
Date: 10.FEB.2004 14:28:09

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

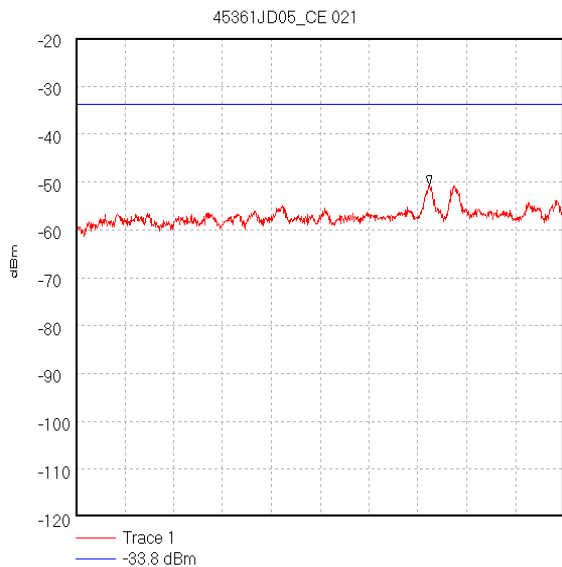
Transmitter Conducted Emissions Middle Channel (High Chip Rate) - Continued



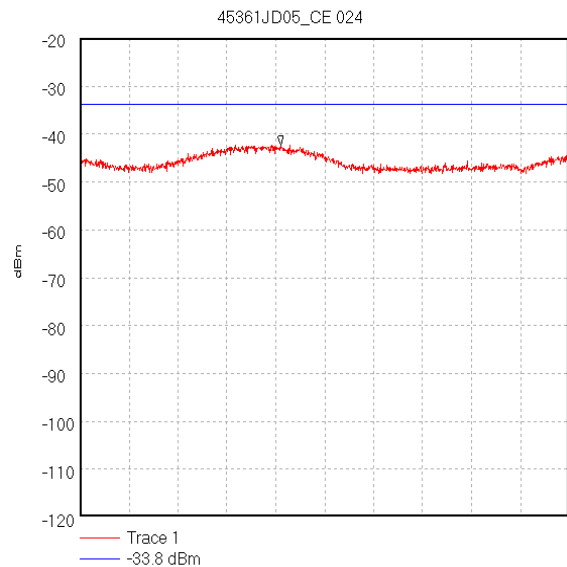
Start 5.0 GHz; Stop 10.0 GHz
Ref -20 dBm; Ref Offset 33.7 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 5.205556 GHz, -41.25 dBm
Display Line: -33.8 dBm;
10/02/2004 16:14:21



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 14.008889 GHz, -50.7 dBm
Display Line: -33.8 dBm;
10/02/2004 16:12:30



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 24.157778 GHz, -50.65 dBm
Display Line: -33.8 dBm;
10/02/2004 17:02:33



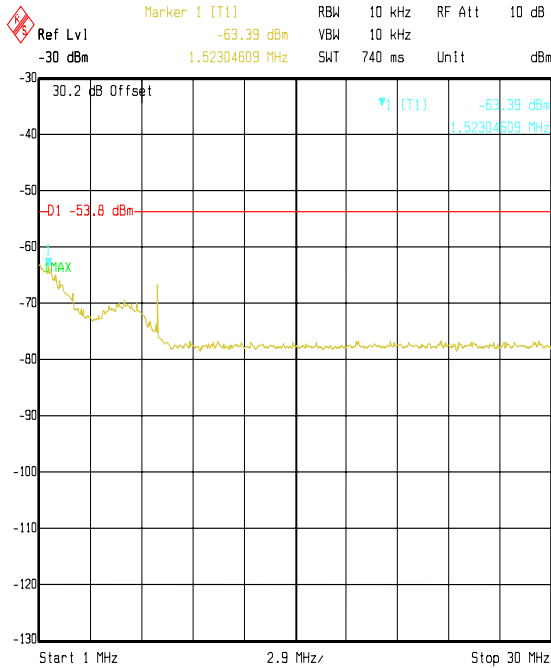
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 60.9 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.705 GHz, -42.32 dBm
Display Line: -33.8 dBm;
12/02/2004 10:14:57

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

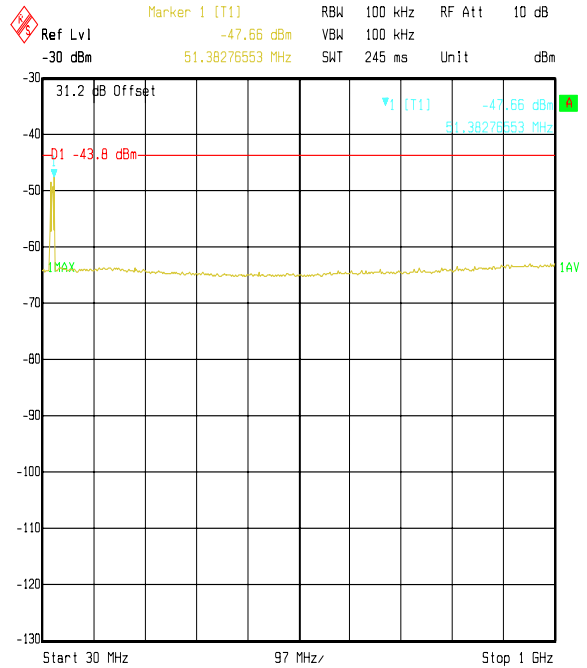
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

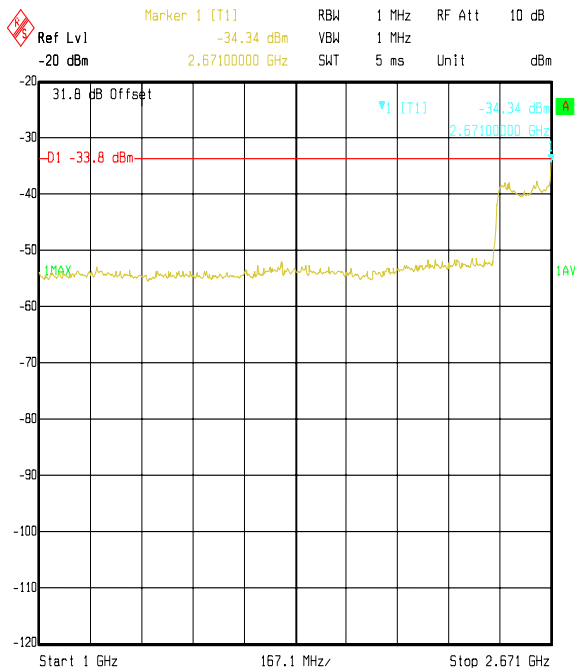
To: FCC Part 15, Part 21 & Part 74

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

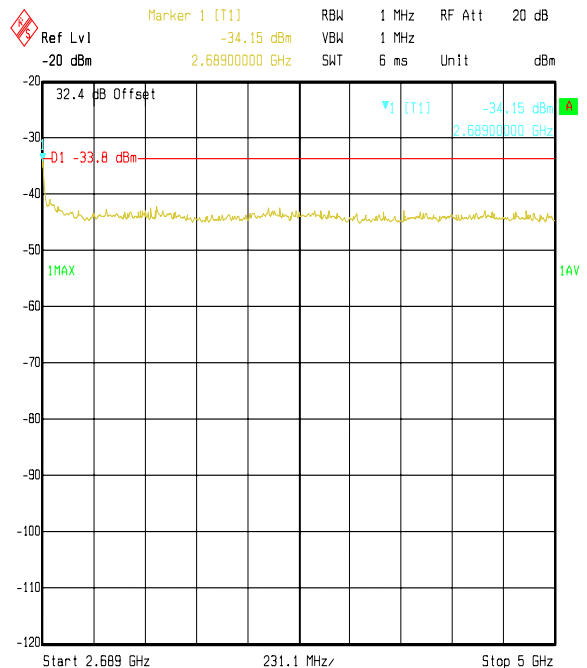
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Top Channel 7.68 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 14:18:07



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



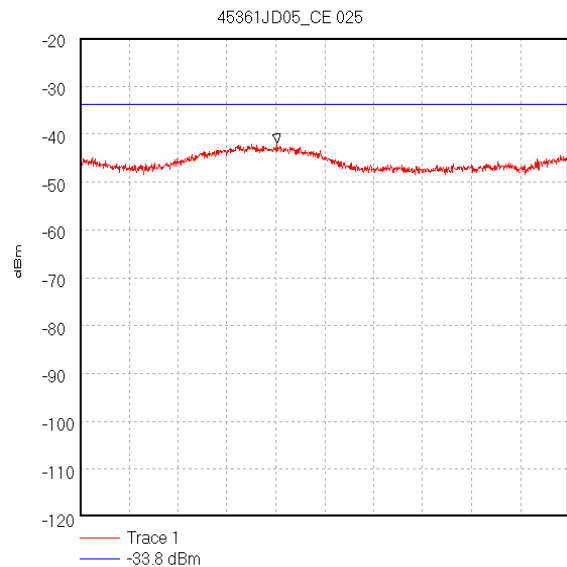
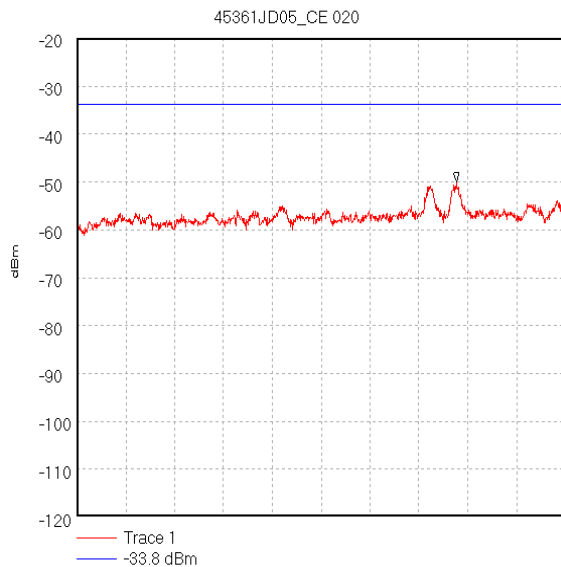
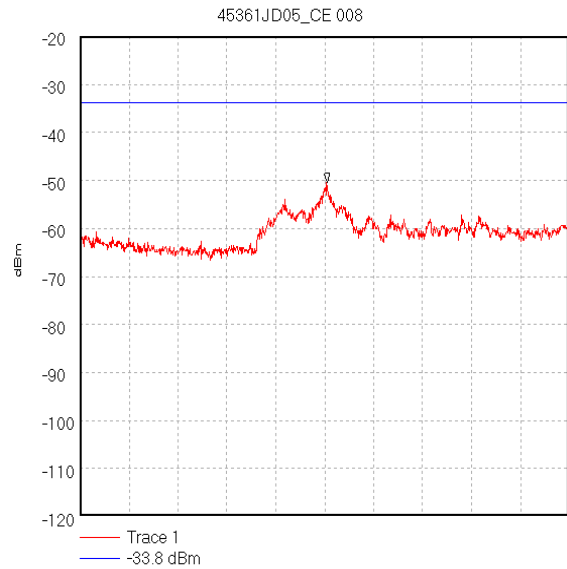
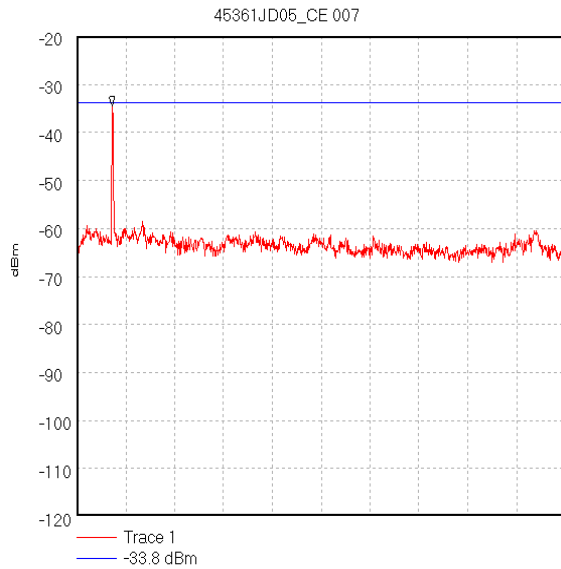
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Top Channel 7.68 Mcps 2.689-5 GHz Avg Detector
Date: 10.FEB.2004 14:36:24

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

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

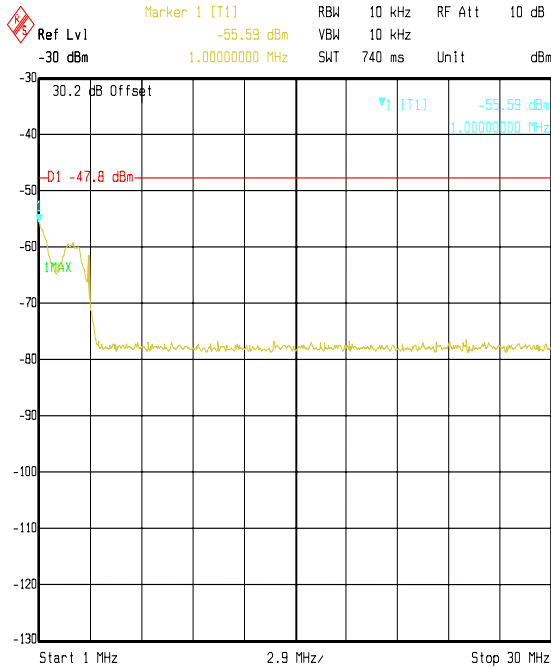
Transmitter Conducted Emissions Top Channel (High Chip Rate) - Continued

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

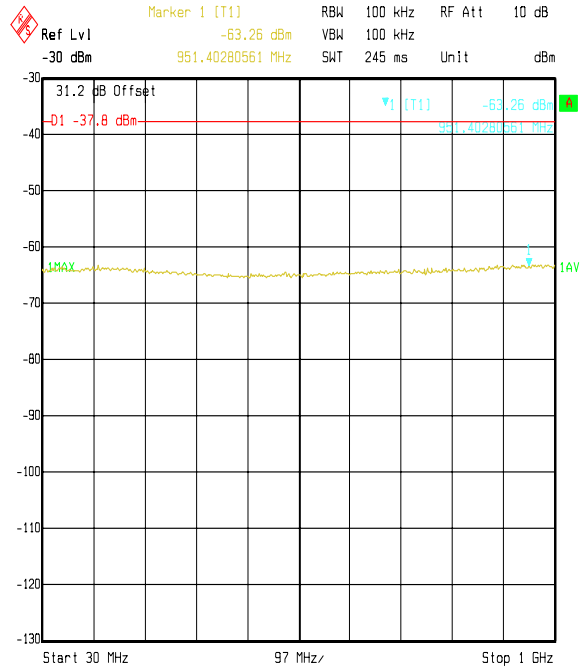
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

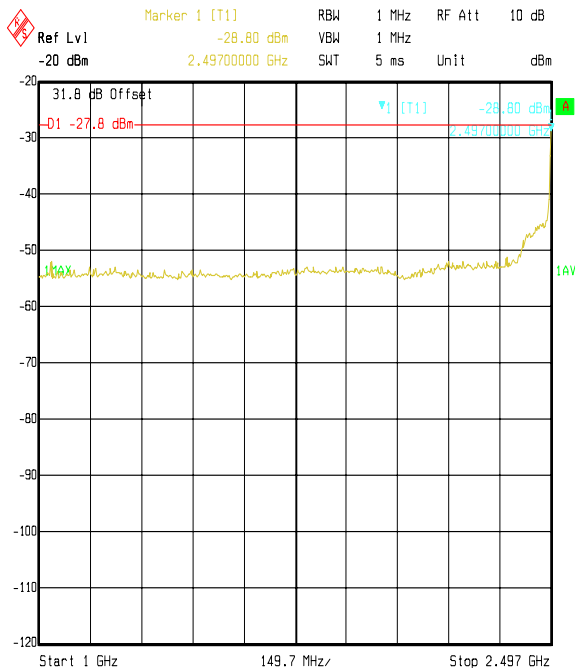
To: FCC Part 15, Part 21 & Part 74

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

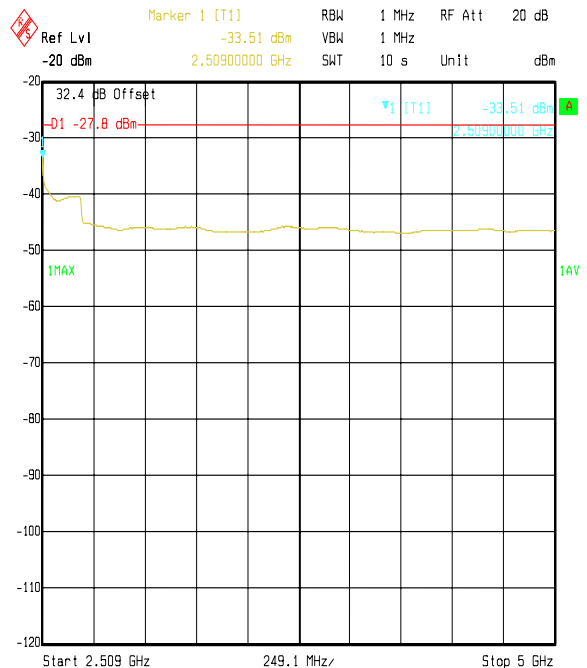
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Bottom Channel 3.84 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 14:42:14



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



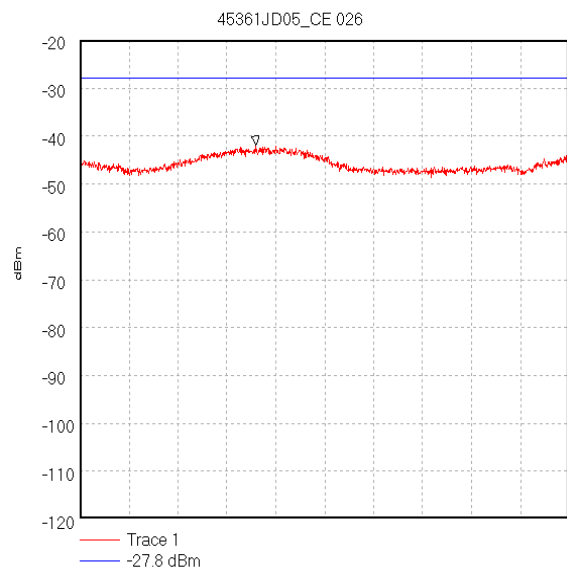
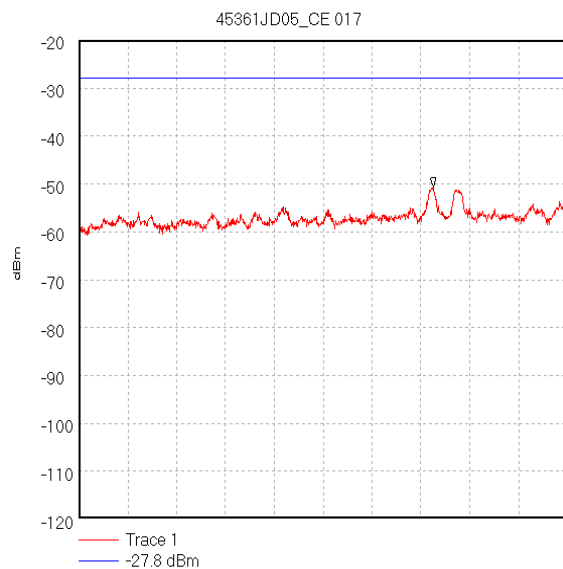
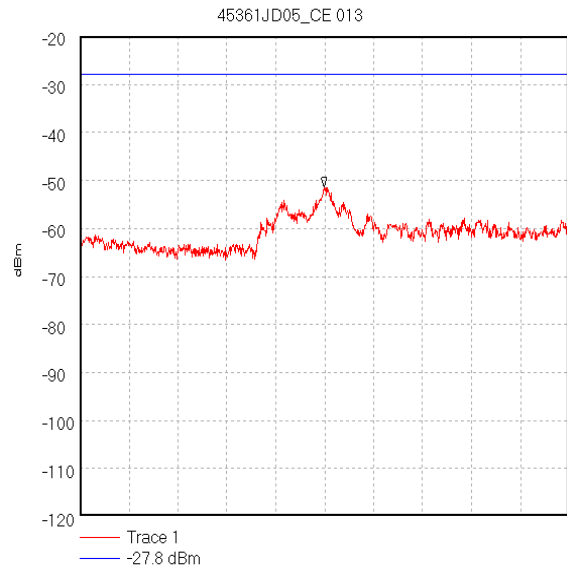
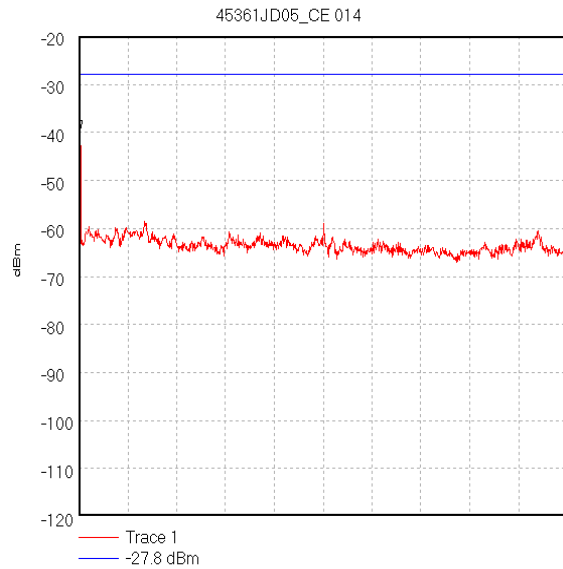
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Bottom Channel 3.84 Mcps 2.509-5 GHz Avg Detector
Date: 10.FEB.2004 14:46:06

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

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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

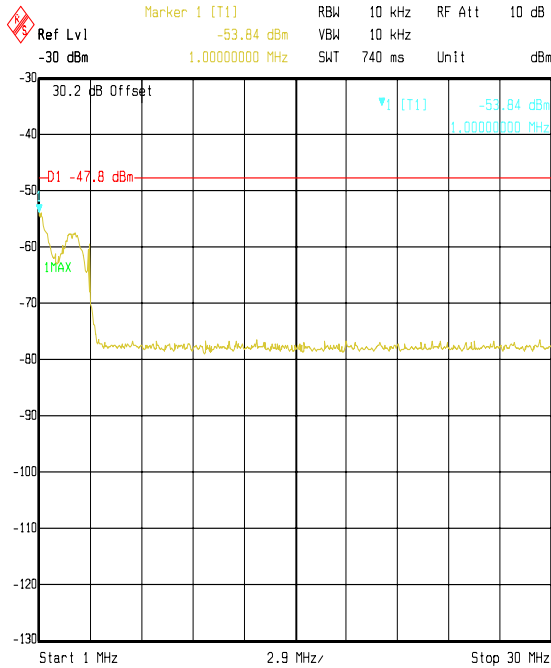
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Of: IPWireless U.K. Ltd.

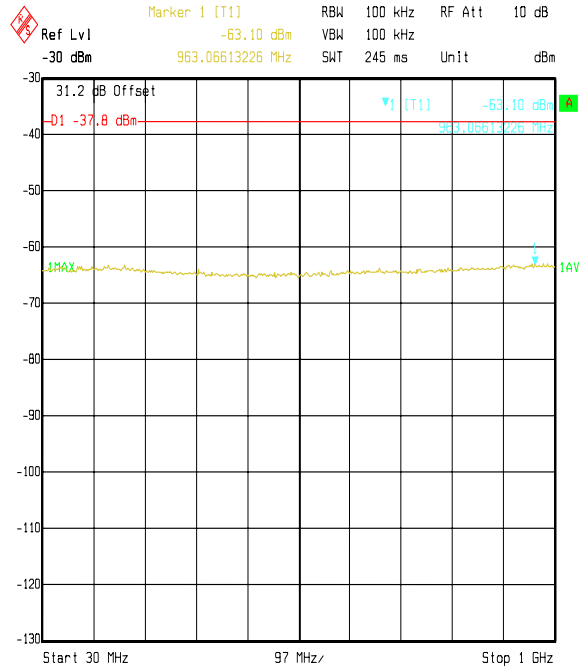
Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

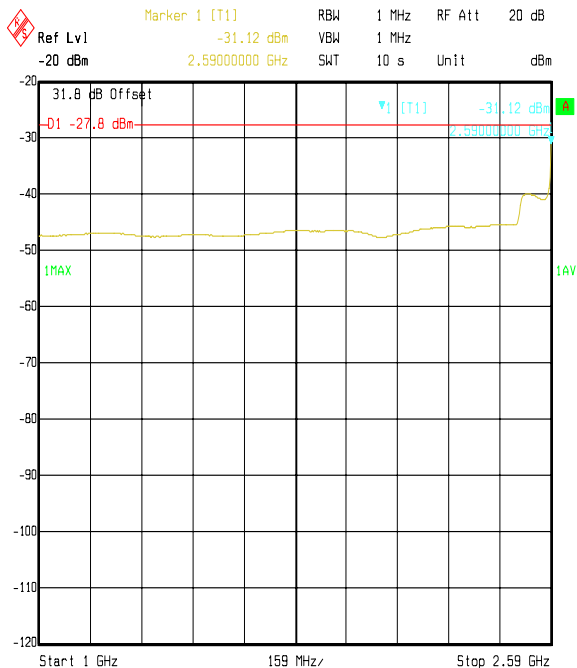
Issue Date: 19 April 2004

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

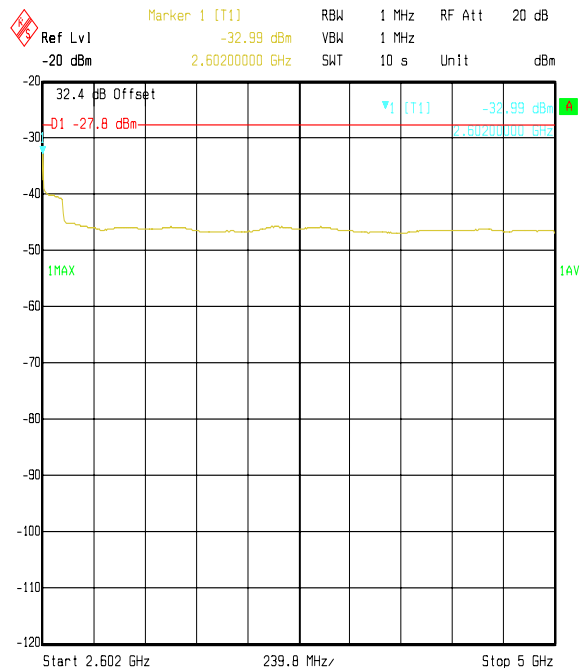
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Middle Channel 3.84 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 15:01:26



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 15:00:18



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



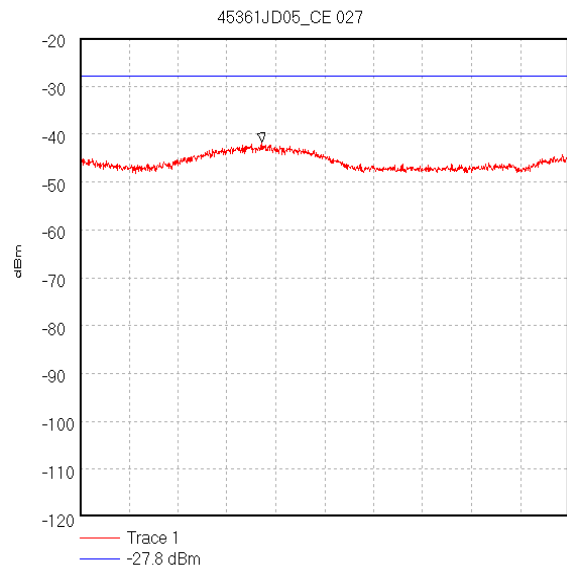
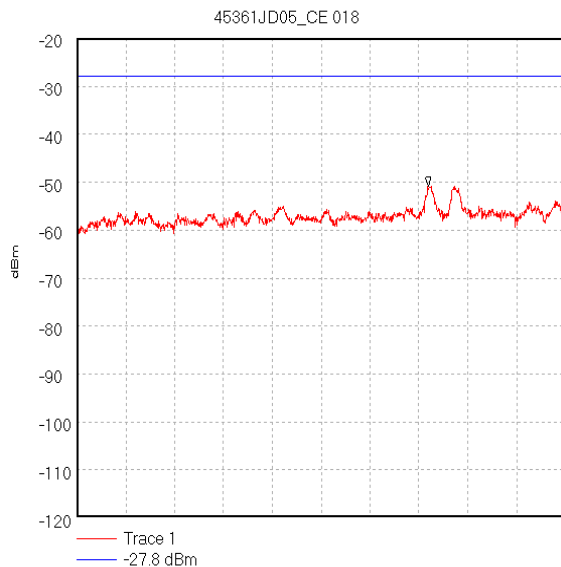
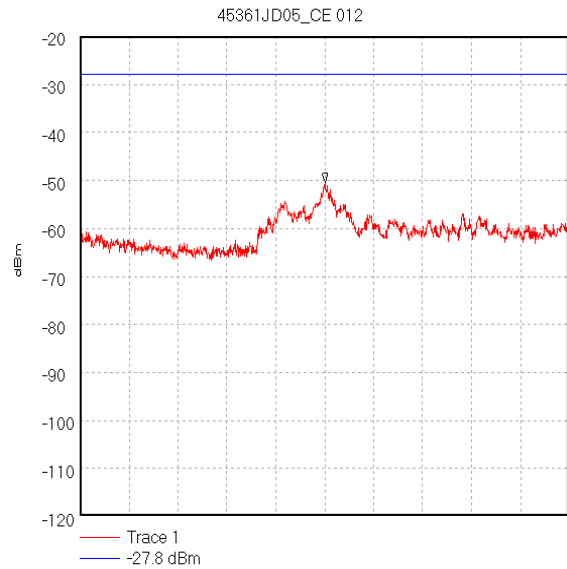
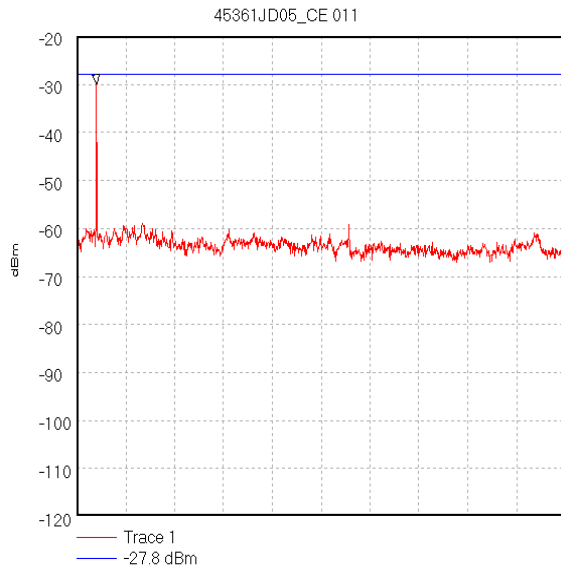
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Middle Channel 3.84 Mcps 2.602-5 GHz Avg Detector
Date: 10.FEB.2004 14:57:45

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

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

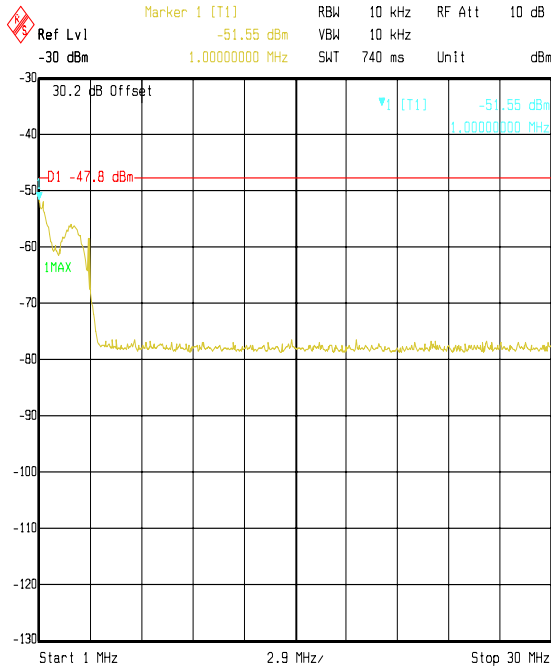
Transmitter Conducted Emissions Middle Channel (Low Chip Rate) - Continued

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

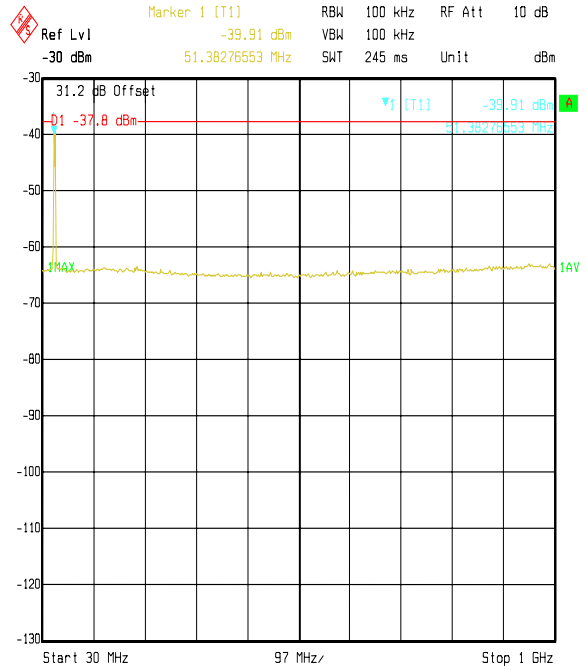
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

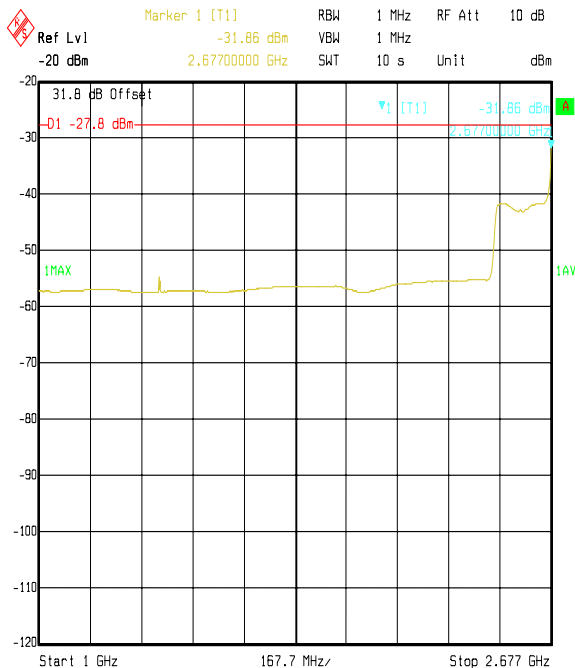
To: FCC Part 15, Part 21 & Part 74

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

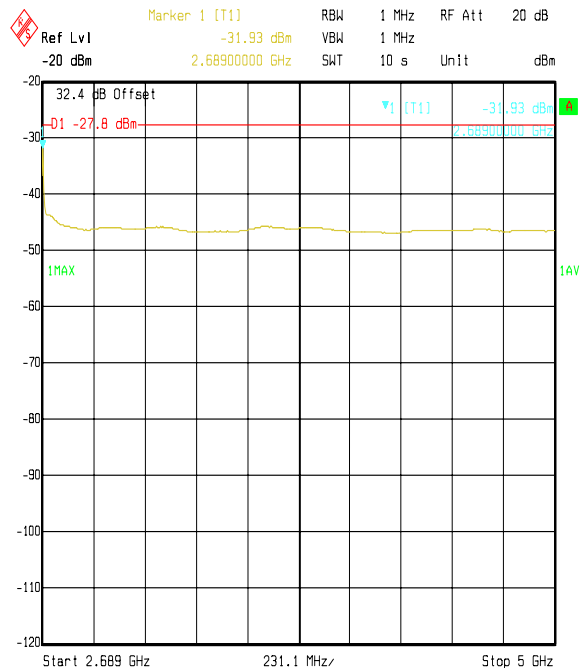
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Top Channel 3.84 Mcps 1-30 MHz Avg Detector
Date: 10.FEB.2004 15:02:10



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



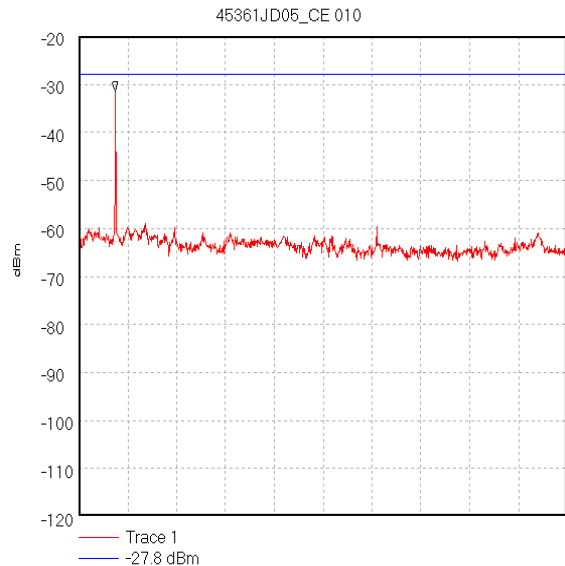
Title: IPWireless EUT: 2.5GHz DN/DZ FCC P15/21/74. Cond. Spurious
Comment A: 45361JD05 Top Channel 3.84 Mcps 2.689-5 GHz Avg Detector
Date: 10.FEB.2004 15:06:34

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

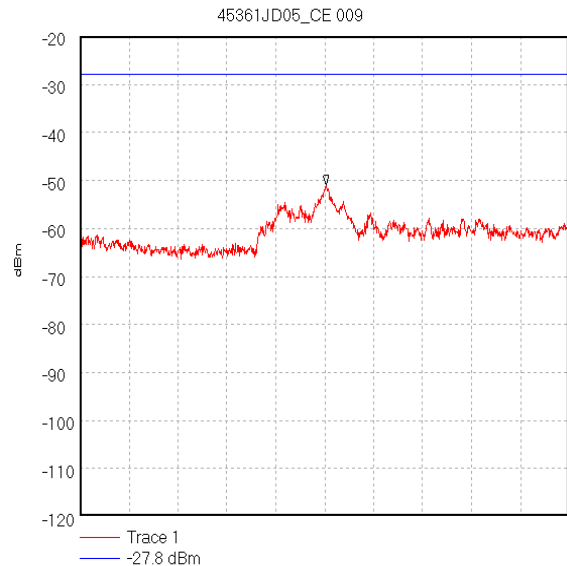
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

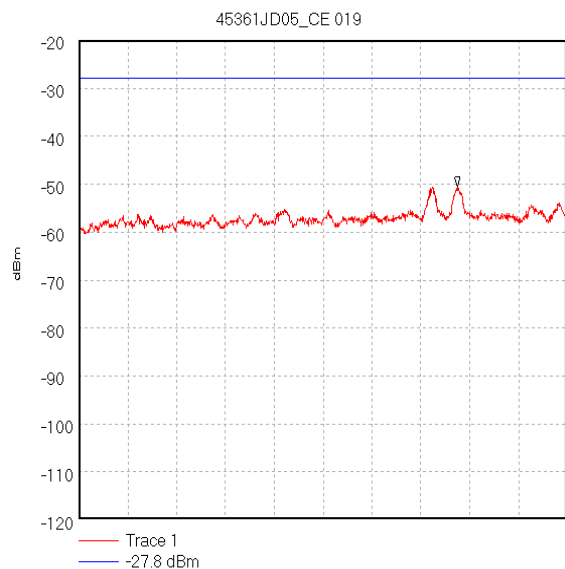
To: FCC Part 15, Part 21 & Part 74

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

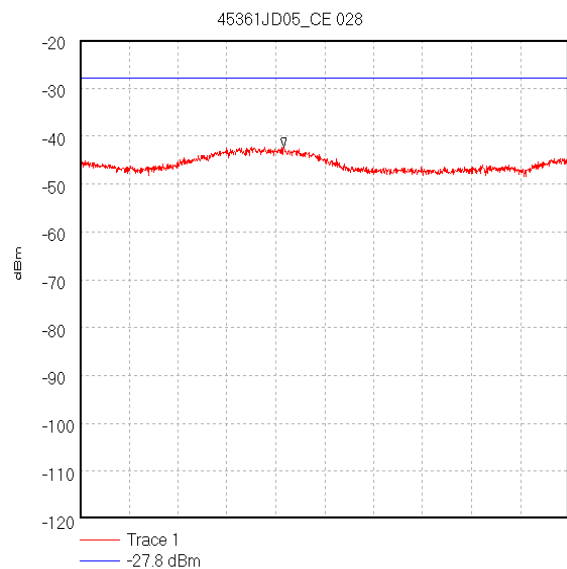
Start 5.0 GHz; Stop 10.0 GHz
 Ref -20 dBm; Ref Offset 33.7 dB; 10 dB/div
 RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
 Peak 5.372222 GHz, -31.32 dBm
 Display Line: -27.8 dBm;
 10/02/2004 16:25:35



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

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

7.12. Transmitter Radiated Emissions

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	-80.8	15.0	Complied
59.529	-65.5	36.8	-102.3	-80.8	21.5	Complied
105.999	-60.9	36.8	-97.7	-80.8	16.9	Complied
113.265	-61.4	36.8	-98.2	-80.8	17.4	Complied
122.862	-64.7	36.8	-101.5	-80.8	20.7	Complied
159.990	-61.2	36.8	-98.0	-80.8	17.2	Complied
184.310	-60.1	36.8	-96.9	-80.8	16.1	Complied
307.191	-59.6	36.8	-96.4	-80.8	15.6	Complied
332.132	-68.7	36.8	-105.5	-80.8	24.7	Complied
402.612	-68.5	36.8	-105.3	-80.8	24.5	Complied
552.950	-62.0	36.8	-98.8	-80.8	18.0	Complied
777.591	-72.0	36.8	-108.8	-80.8	28.0	Complied
1043.567	-45.7	36.8	-82.5	-70.8	11.7	Complied
1106.550	-43.1	36.8	-79.9	-70.8	9.1	Complied
1167.462	-56.2	36.8	-93.0	-70.8	22.2	Complied
1228.820	-62.0	36.8	-98.8	-70.8	28.0	Complied
1290.328	-61.2	36.8	-98.0	-70.8	27.2	Complied
1658.924	-55.3	36.8	-92.1	-70.8	21.3	Complied
2126.495	-60.9	36.8	-97.7	-70.8	26.9	Complied
4251.860	-48.4	36.8	-85.2	-70.8	14.4	Complied
14027.760	-60.8	36.8	-97.6	-70.8	26.8	Complied
24552.820	-61.1	36.8	-97.9	-70.8	27.1	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 12$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

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	-80.8	14.5	Complied
59.529	-65.5	36.3	-101.8	-80.8	21.0	Complied
105.999	-60.9	36.3	-97.2	-80.8	16.4	Complied
113.265	-61.4	36.3	-97.7	-80.8	16.9	Complied
122.862	-64.7	36.3	-101.0	-80.8	20.2	Complied
134.199	-66.9	36.3	-103.2	-80.8	22.4	Complied
159.990	-61.2	36.3	-97.5	-80.8	16.7	Complied
184.310	-60.1	36.3	-96.4	-80.8	15.6	Complied
307.191	-62.7	36.3	-99.0	-80.8	18.2	Complied
347.522	-60.3	36.3	-96.6	-80.8	15.8	Complied
402.612	-68.5	36.3	-104.8	-80.8	24.0	Complied
552.950	-62.0	36.3	-98.3	-80.8	17.5	Complied
798.720	-57.4	36.3	-93.7	-80.8	12.9	Complied
1043.567	-45.7	36.3	-82.0	-70.8	11.2	Complied
1106.550	-43.1	36.3	-79.4	-70.8	8.6	Complied
1167.462	-56.2	36.3	-92.5	-70.8	21.7	Complied
1228.820	-62.0	36.3	-98.3	-70.8	27.5	Complied
1290.328	-61.2	36.3	-97.5	-70.8	26.7	Complied
1658.924	-55.3	36.3	-91.6	-70.8	20.8	Complied
2216.070	-58.3	36.3	-94.6	-70.8	23.8	Complied
14023.880	-60.8	36.3	-97.1	-70.8	26.3	Complied
24129.800	-61.5	36.3	-97.8	-70.8	27.0	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 12$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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	-80.8	15.9	Complied
70.984	-72.1	37.7	-109.8	-80.8	29.0	Complied
105.999	-60.9	37.7	-98.6	-80.8	17.8	Complied
113.265	-61.4	37.7	-99.1	-80.8	18.3	Complied
122.862	-64.7	37.7	-102.4	-80.8	21.6	Complied
159.990	-61.2	37.7	-98.9	-80.8	18.1	Complied
184.310	-60.1	37.7	-97.8	-80.8	17.0	Complied
224.627	-55.1	37.7	-92.8	-80.8	12.0	Complied
307.185	-59.6	37.7	-97.3	-80.8	16.5	Complied
347.522	-60.3	37.7	-98.0	-80.8	17.2	Complied
402.612	-68.5	37.7	-106.2	-80.8	25.4	Complied
430.063	-56.3	37.7	-94.0	-80.8	13.2	Complied
552.950	-62.0	37.7	-99.7	-80.8	18.9	Complied
921.586	-62.2	37.7	-99.9	-80.8	19.1	Complied
1043.567	-45.7	37.7	-83.4	-70.8	12.6	Complied
1106.550	-43.1	37.7	-80.8	-70.8	10.0	Complied
1167.462	-56.2	37.7	-93.9	-70.8	23.1	Complied
1228.820	-62.0	37.7	-99.7	-70.8	28.9	Complied
1290.328	-61.2	37.7	-98.9	-70.8	28.1	Complied
1658.924	-55.3	37.7	-93.0	-70.8	22.2	Complied
2300.042	-59.8	37.7	-97.5	-70.8	26.7	Complied
9199.920	-52.8	37.7	-90.5	-70.8	19.7	Complied
14031.670	-60.8	37.7	-98.5	-70.8	27.7	Complied
24116.620	-61.0	37.7	-98.7	-70.8	27.9	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 12$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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	-77.8	20.9	Complied
63.329	-68.8	39.7	-108.5	-77.8	30.7	Complied
105.999	-60.9	39.7	-100.6	-77.8	22.8	Complied
122.862	-64.7	39.7	-104.4	-77.8	33.6	Complied
184.310	-60.1	39.7	-99.8	-77.8	22.0	Complied
224.627	-55.1	39.7	-94.8	-77.8	17.0	Complied
307.185	-59.6	39.7	-99.3	-77.8	21.5	Complied
430.063	-56.3	39.7	-96.0	-77.8	18.2	Complied
552.950	-62.0	39.7	-101.7	-77.8	23.9	Complied
983.028	-58.1	39.7	-97.8	-77.8	20.0	Complied
113.265	-61.4	39.7	-101.1	-77.8	23.3	Complied
402.612	-68.5	39.7	-108.2	-77.8	30.4	Complied
777.591	-72.0	39.7	-111.7	-77.8	33.9	Complied
1043.567	-45.7	39.7	-85.4	-67.8	17.6	Complied
1106.550	-43.1	39.7	-82.8	-67.8	15.0	Complied
1167.462	-56.2	39.7	-95.9	-67.8	28.1	Complied
4245.880	-45.2	39.7	-84.9	-67.8	17.1	Complied
24171.21	-60.6	39.7	-100.3	-67.8	32.5	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 6$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

To: FCC Part 15, Part 21 & Part 74

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	-77.8	20.5	Complied
59.529	-65.5	39.3	-104.8	-77.8	27.0	Complied
105.999	-60.9	39.3	-100.2	-77.8	22.4	Complied
113.265	-61.4	39.3	-100.7	-77.8	22.9	Complied
122.862	-64.7	39.3	-104.0	-77.8	26.2	Complied
184.310	-60.1	39.3	-99.4	-77.8	21.6	Complied
307.185	-59.6	39.3	-98.9	-77.8	21.1	Complied
347.522	-60.3	39.3	-99.6	-77.8	21.8	Complied
430.063	-56.3	39.3	-95.6	-77.8	17.8	Complied
552.950	-62.0	39.3	-101.3	-77.8	23.5	Complied
983.028	-58.1	39.3	-97.4	-77.8	19.6	Complied
1043.567	-45.7	39.3	-85.0	-67.8	17.2	Complied
1106.550	-43.1	39.3	-82.4	-67.8	14.6	Complied
1167.462	-56.2	39.3	-95.5	-67.8	27.7	Complied
24594.340	-60.5	39.3	-99.8	-67.8	32.0	Complied

Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 6$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

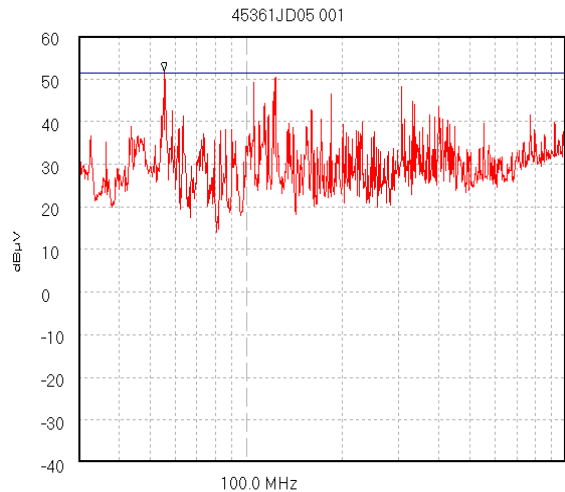
To: FCC Part 15, Part 21 & Part 74

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	-77.8	20.3	Complied
63.329	-68.8	39.1	-107.9	-77.8	30.1	Complied
70.984	-72.1	39.1	-111.2	-77.8	33.4	Complied
105.999	-60.9	39.1	-100.0	-77.8	22.2	Complied
122.862	-64.7	39.1	-103.8	-77.8	26.0	Complied
159.990	-61.2	39.1	-100.3	-77.8	22.5	Complied
184.310	-60.1	39.1	-99.2	-77.8	21.4	Complied
224.627	-55.1	39.1	-94.2	-77.8	16.4	Complied
307.185	-59.6	39.1	-98.7	-77.8	20.9	Complied
368.629	-61.8	39.1	-100.9	-77.8	23.1	Complied
430.063	-56.3	39.1	-95.4	-77.8	17.6	Complied
552.950	-62.0	39.1	-101.1	-77.8	23.3	Complied
983.028	-58.1	39.1	-97.2	-77.8	19.4	Complied
1043.567	-45.7	39.1	-84.8	-67.8	17.0	Complied
1106.550	-43.1	39.1	-82.2	-67.8	14.4	Complied
1167.462	-56.2	39.1	-95.3	-67.8	27.5	Complied

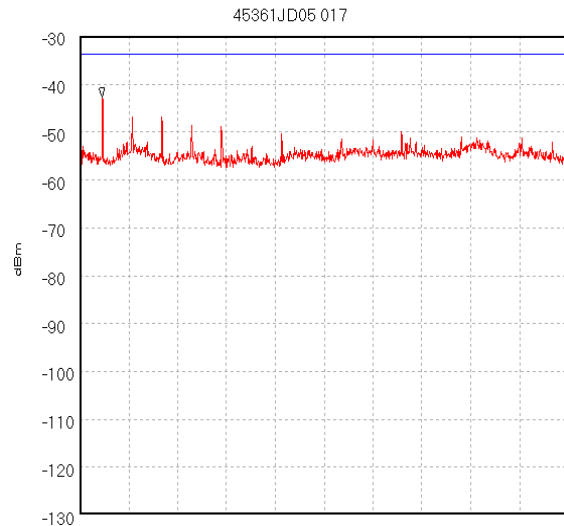
Note: The limit is calculated according to FCC Section 21.908(e) for absolute power measurements as follows: $A + 10\log(C_{BW}/R_{BW})$ where $C_{BW} = 6$ MHz and $R_{BW} = 1$ MHz above 1 GHz & 100 kHz below 1 GHz.

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



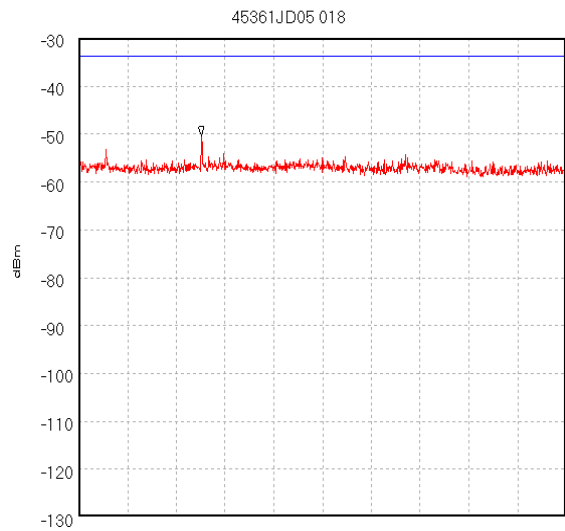
Trace 1
51.4 dBµV

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



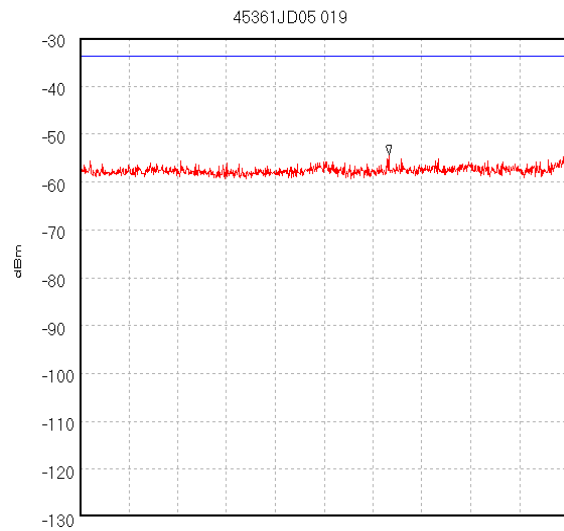
Trace 1
-33.8 dBm

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



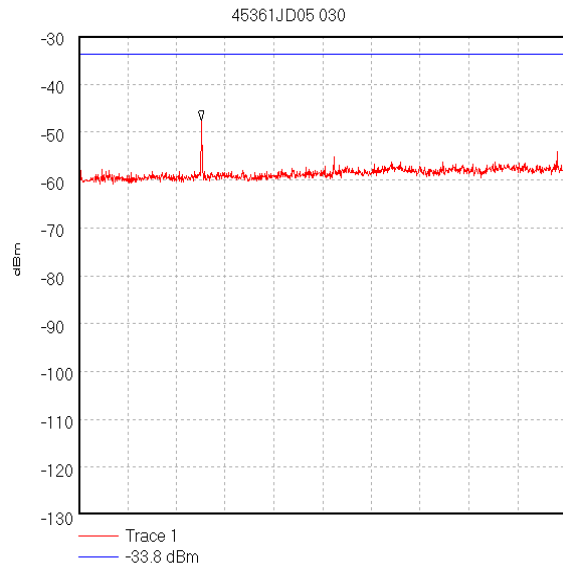
Trace 1
-33.8 dBm

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

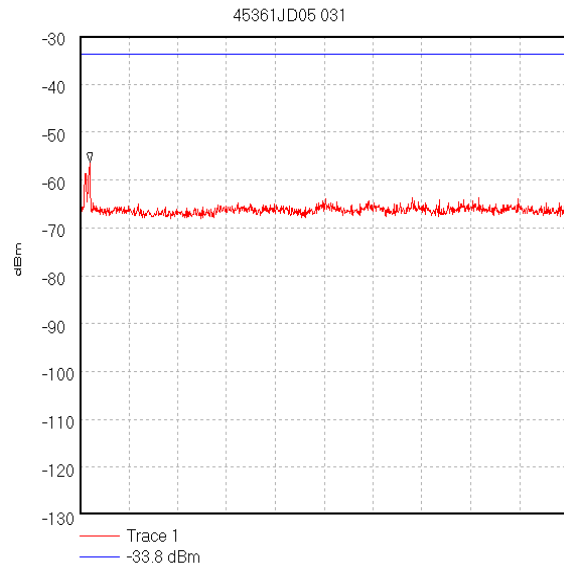
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

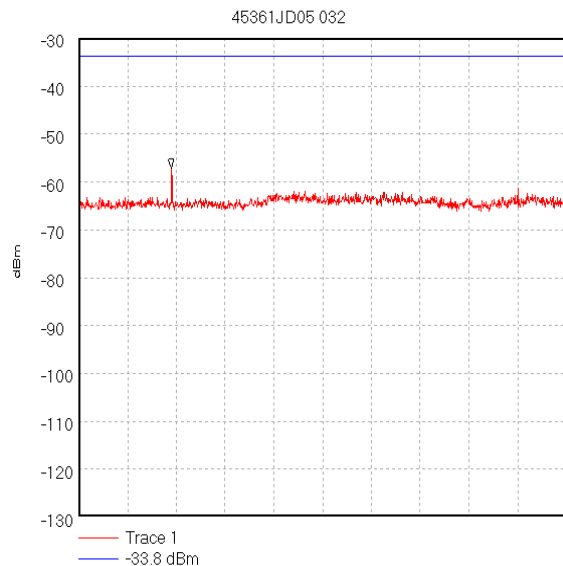
Transmitter Radiated Emissions Bottom Channel (High Chip Rate)- Continued



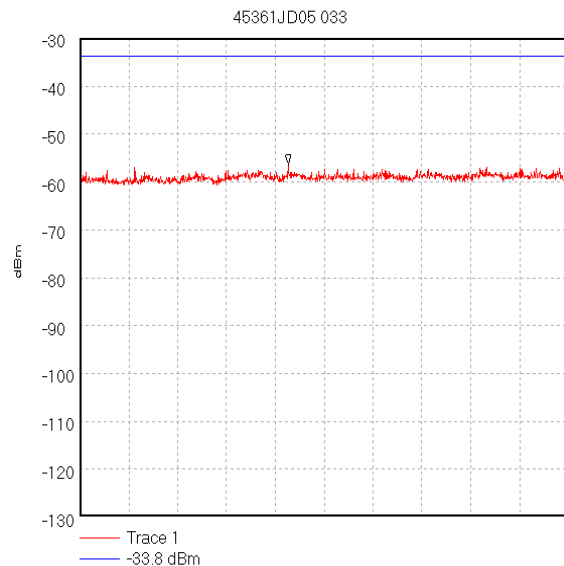
Start 4.0 GHz; Stop 5.0 GHz
Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.252 GHz, -47.59 dBm
Display Line: -33.8 dBm; ; Limit Test Failed
16/01/2004 09:42:35



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



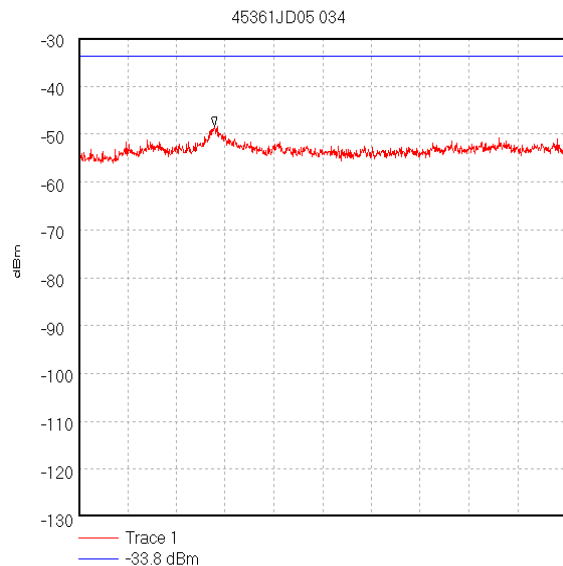
Start 6.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 33.4 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 6.38 GHz, -57.09 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
16/01/2004 09:55:13



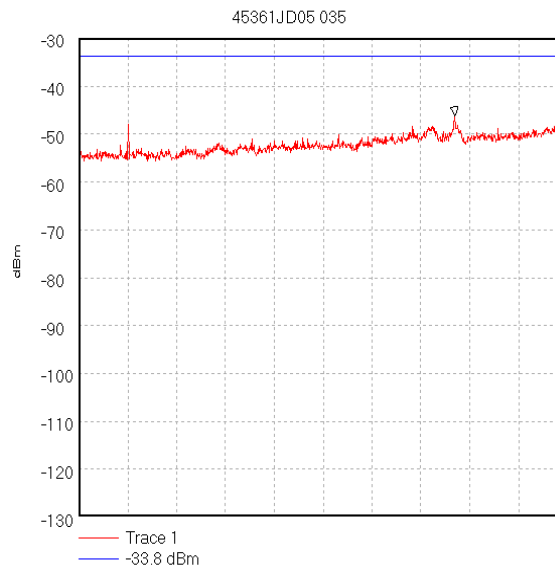
Start 8.0 GHz; Stop 12.5 GHz
Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 9.92 GHz, -56.28 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
16/01/2004 10:00:35

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

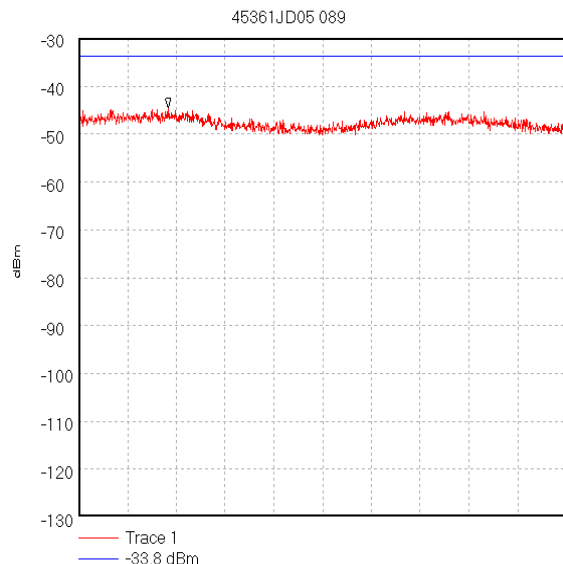
Transmitter Radiated Emissions Bottom Channel (High Chip Rate) - Continued



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



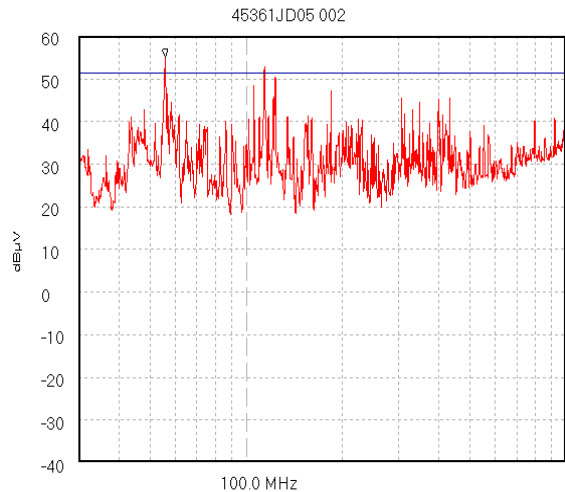
Start 18.0 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS
Peak 24.545 GHz, -46.15 dBm
Display Line: -33.8 dBm; Limit Test Passed
16/01/2004 10:18:09



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

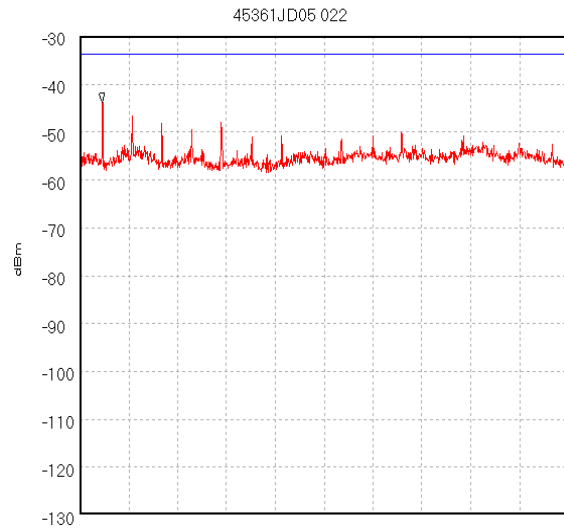
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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



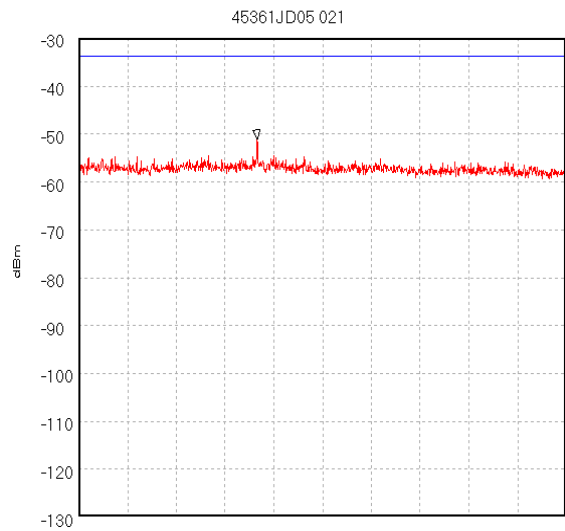
Trace 1
51.4 dBμV

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



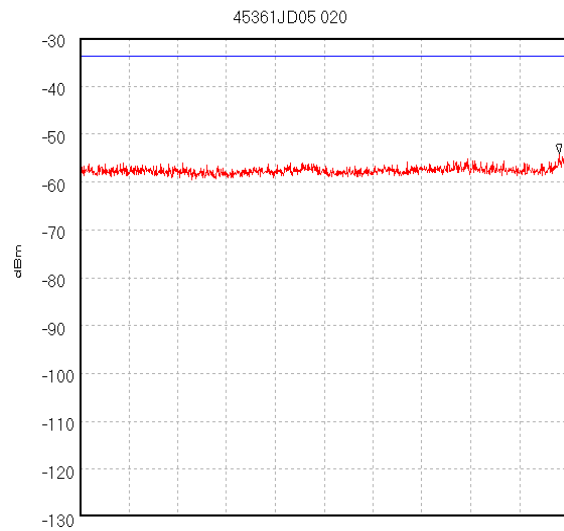
Trace 1
-33.8 dBm

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

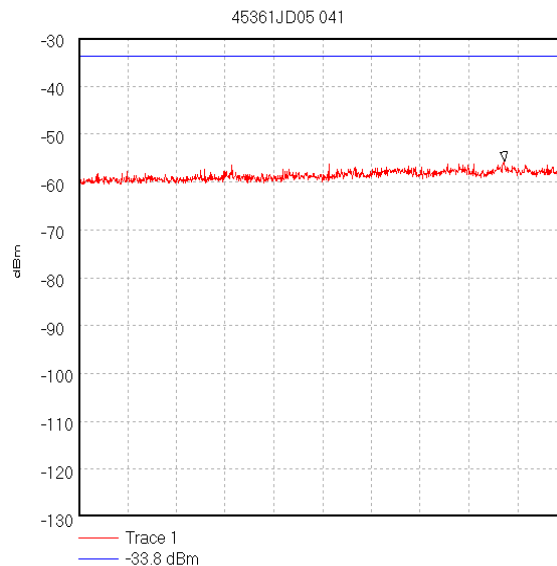
Start 2.602 GHz; Stop 4.0 GHz
Ref -30 dBm; Ref Offset 36.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.975 GHz, -53.99 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
13/01/2004 13:34:08

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

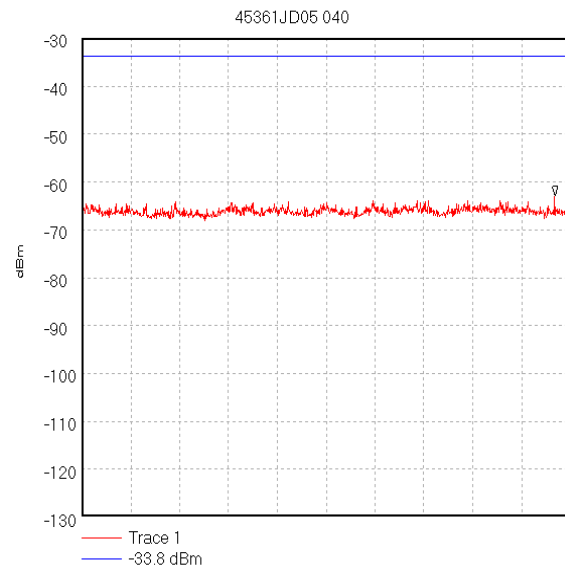
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

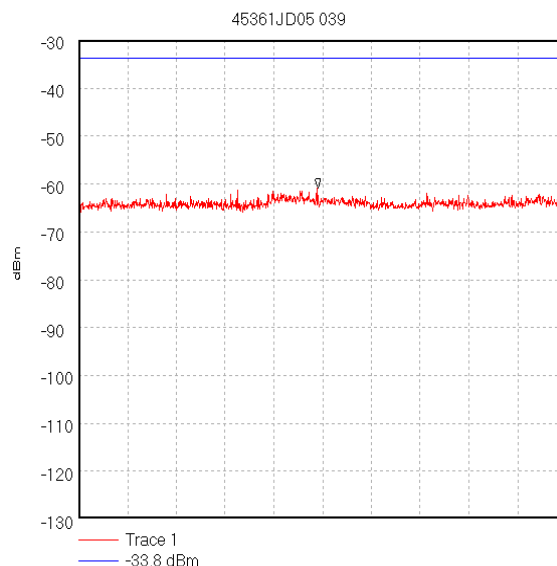
To: FCC Part 15, Part 21 & Part 74

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

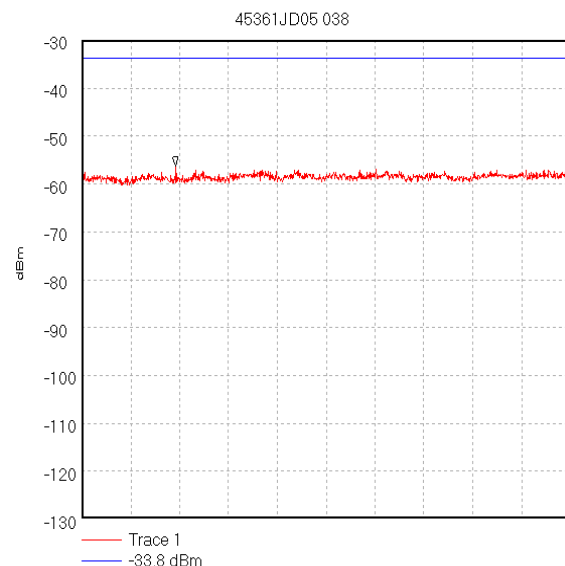
Start 4.0 GHz; Stop 5.0 GHz
 Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
 Peak 4.873 GHz, -55.69 dBm
 Display Line: -33.8 dBm; ; Limit Test Passed
 16/01/2004 10:51:50



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

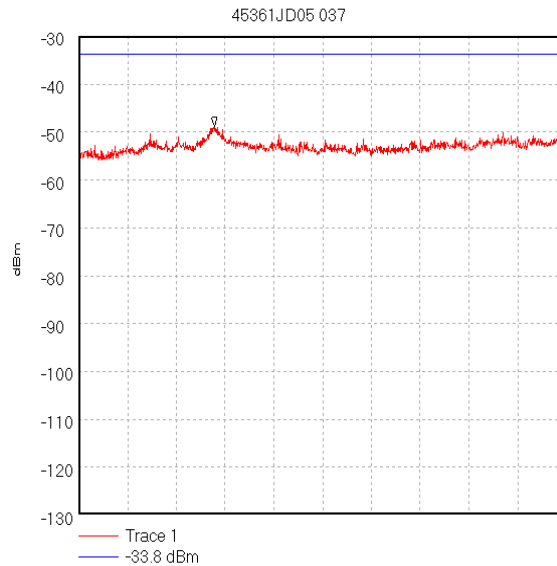


Start 8.0 GHz; Stop 12.5 GHz
 Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
 Peak 8.865 GHz, -56.3 dBm
 Display Line: -33.8 dBm; ; Limit Test Passed
 16/01/2004 10:41:40

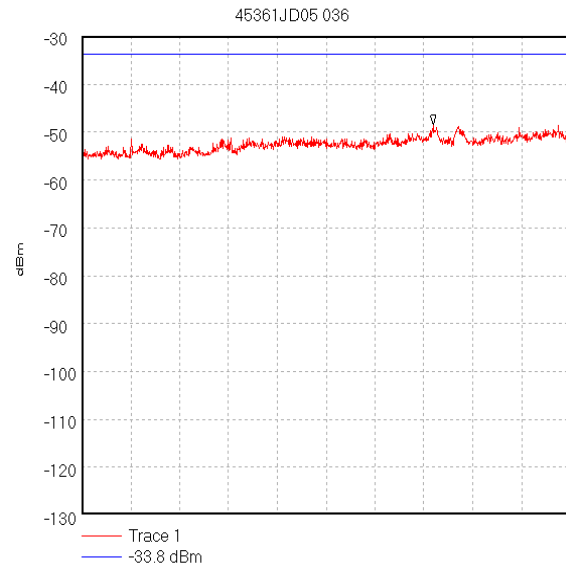
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

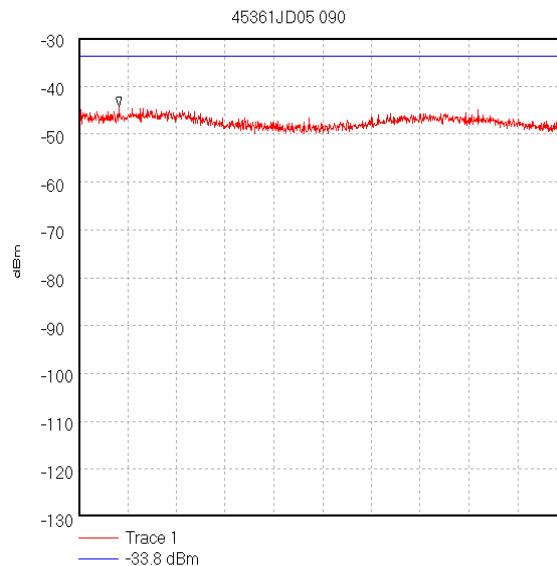
Transmitter Radiated Emissions Middle Channel (High Chip Rate) - Continued



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



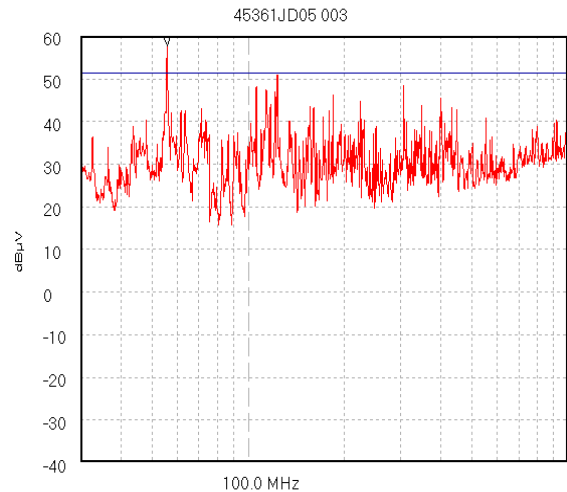
Start 18.0 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS
Peak 24.12 GHz, -48.51 dBm
Display Line: -33.8 dBm; Limit Test Passed
16/01/2004 10:32:13



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

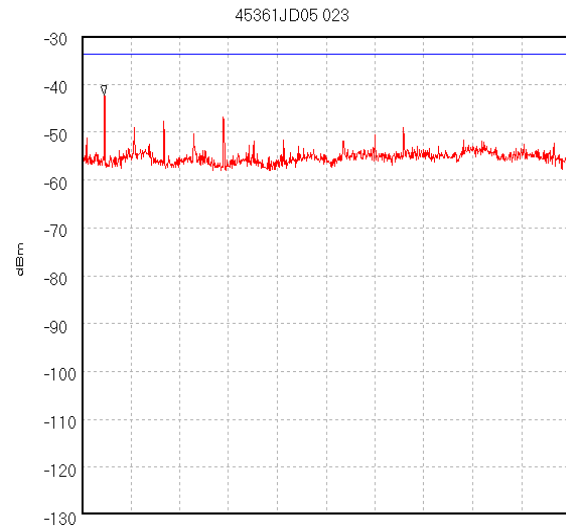
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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



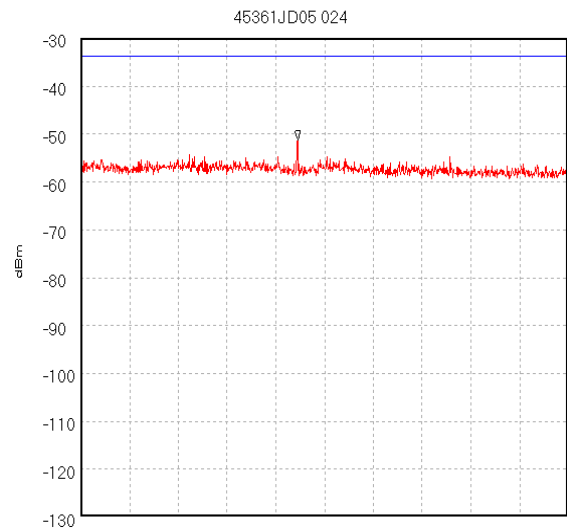
Trace 1
51.4 dBµV

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



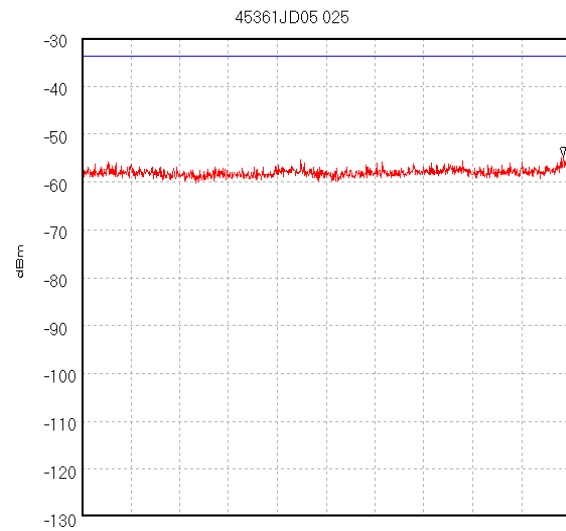
Trace 1
-33.8 dBm

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



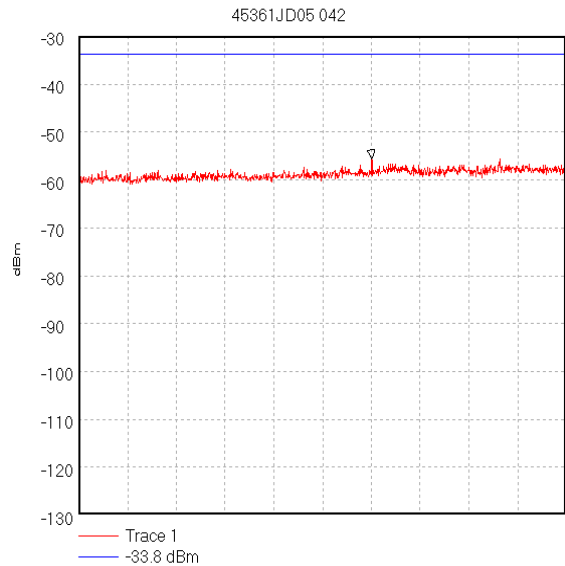
Trace 1
-33.8 dBm

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

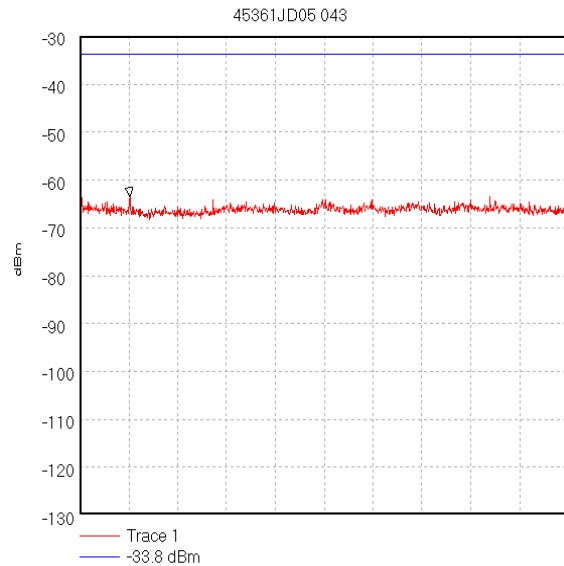
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

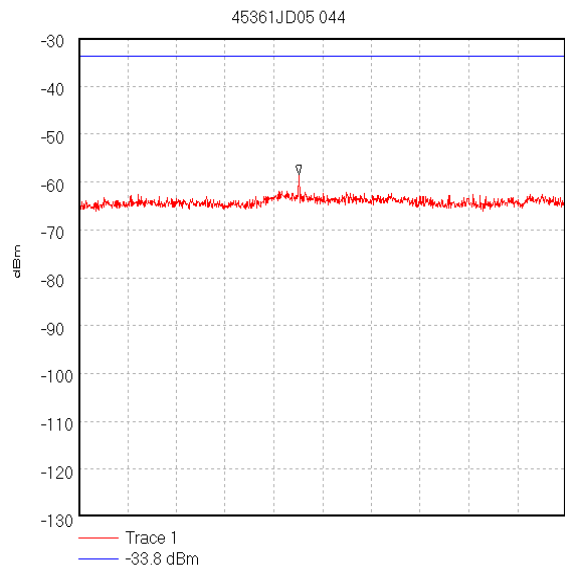
Transmitter Radiated Emissions Top Channel (High Chip Rate) - Continued



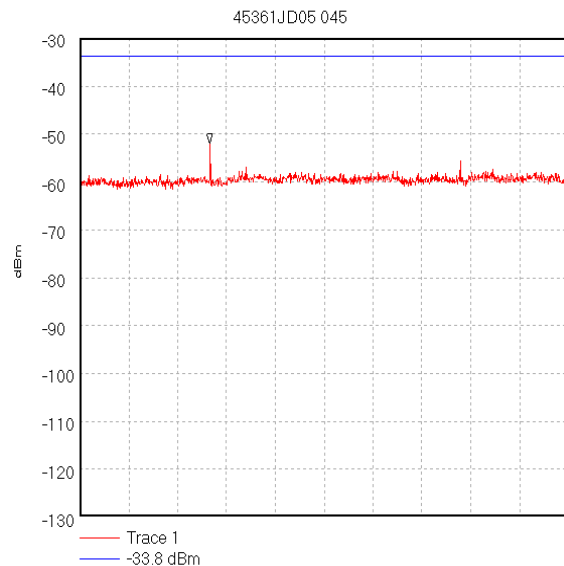
Start 4.0 GHz; Stop 5.0 GHz
Ref -30 dBm; Ref Offset 30.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.601 GHz, -55.57 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
16/01/2004 11:01:48



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



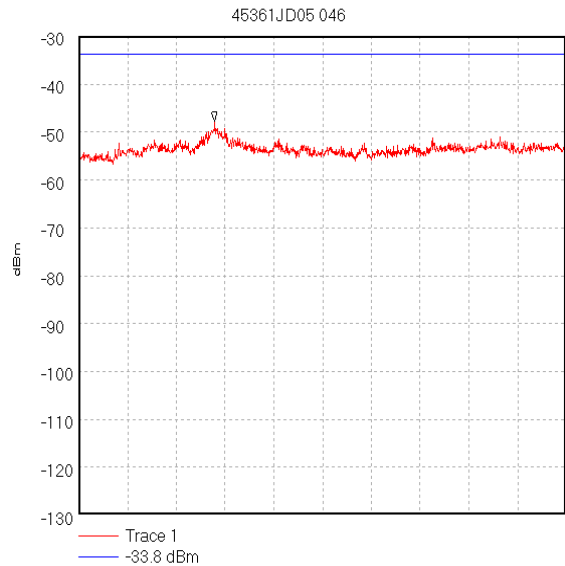
Start 6.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 33.4 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 6.902 GHz, -58.39 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
16/01/2004 11:07:09



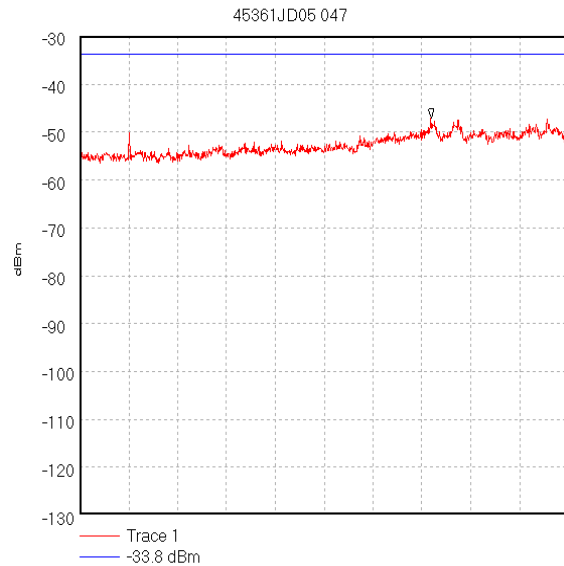
Start 8.0 GHz; Stop 12.5 GHz
Ref -30 dBm; Ref Offset 38.1 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 9.2 GHz, -51.99 dBm
Display Line: -33.8 dBm; ; Limit Test Passed
16/01/2004 11:10:01

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

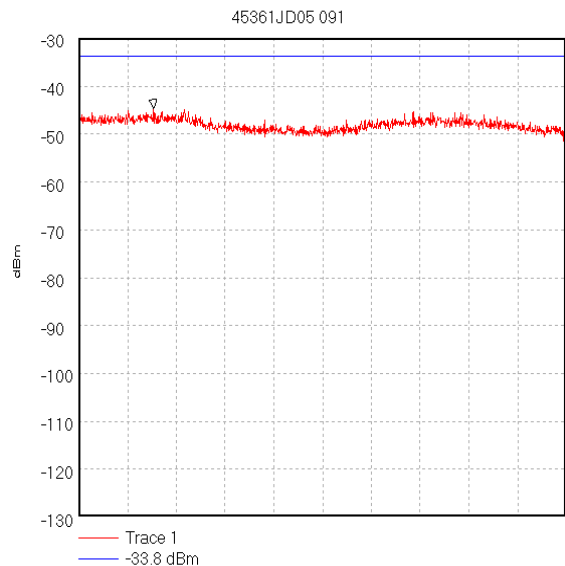
Transmitter Radiated Emissions Top Channel (High Chip Rate) - Continued



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



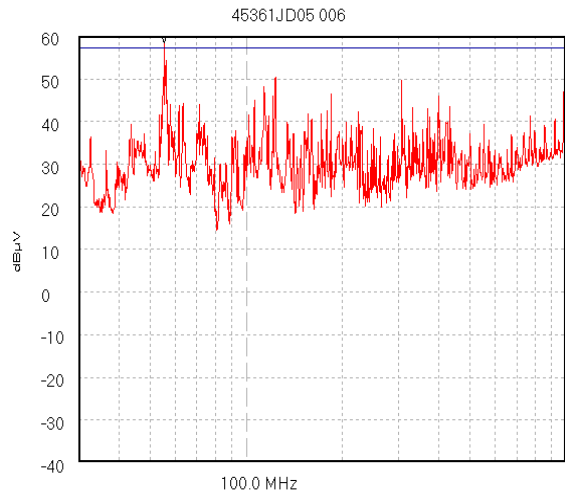
Start 18.0 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 38.7 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS
Peak 24.111 GHz, -47.01 dBm
Display Line: -33.8 dBm; Limit Test Passed
16/01/2004 11:21:49



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

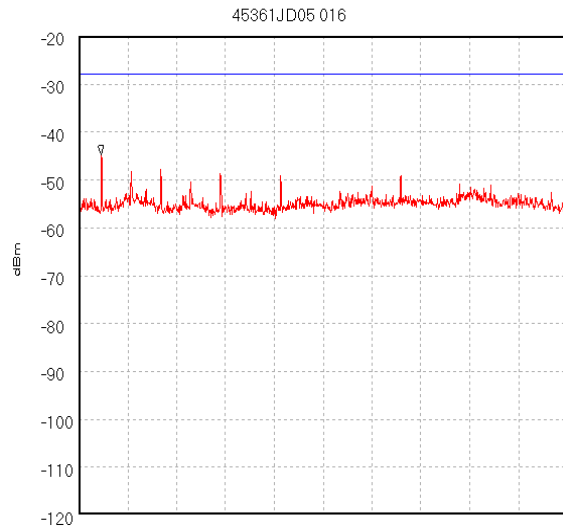
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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



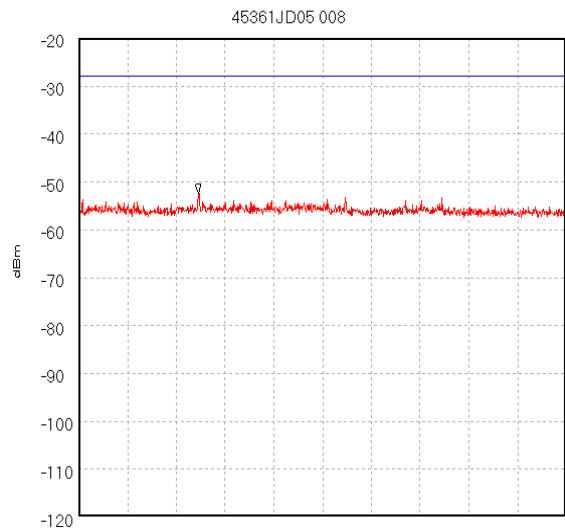
Trace 1
57.4 dBµV

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



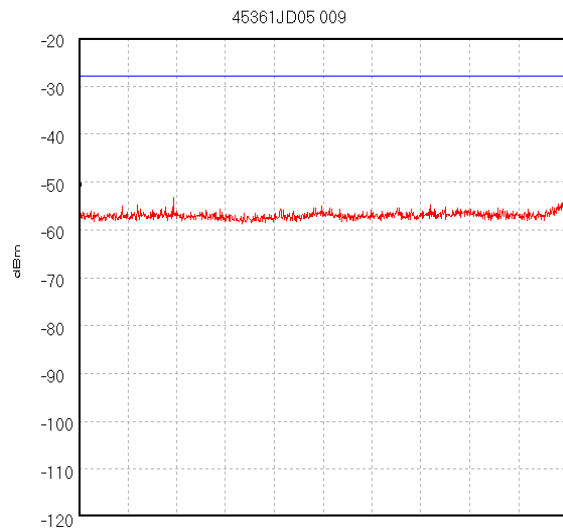
Trace 1
-27.8 dBm

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

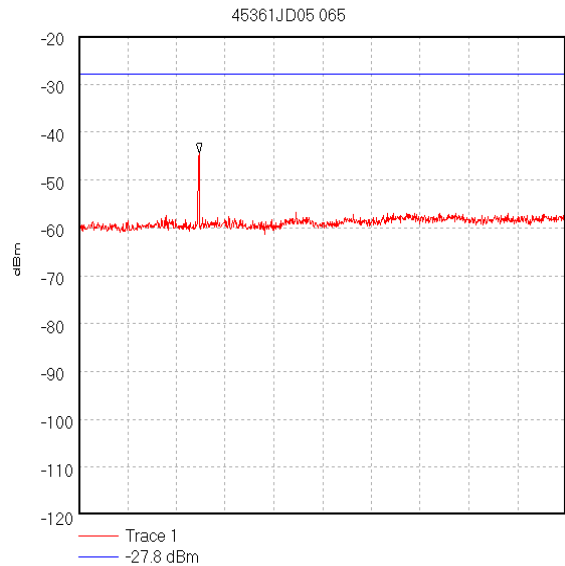


Trace 1
-27.8 dBm

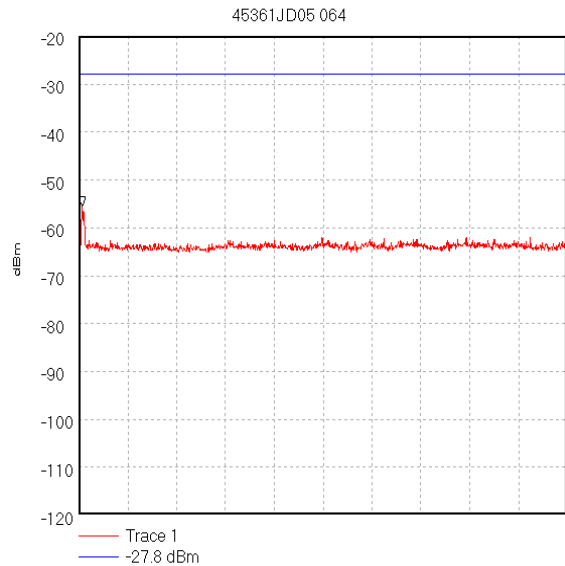
Start 2.506 GHz; Stop 4.0 GHz
Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.506 GHz, -52.09 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
13/01/2004 11:53:09

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

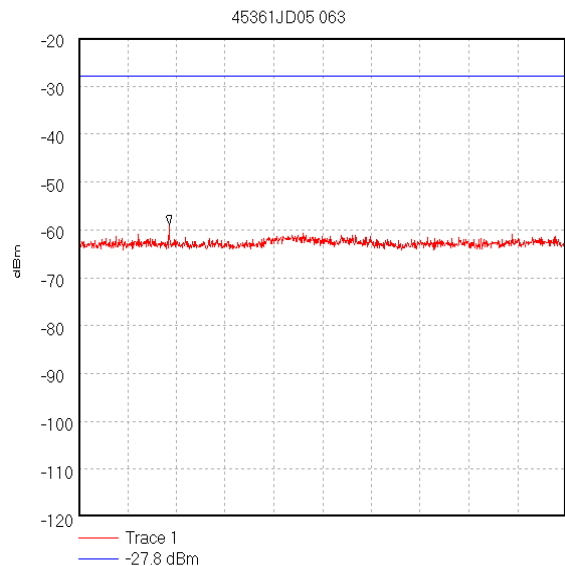
Transmitter Radiated Emissions Bottom Channel (Low Chip Rate) - Continued



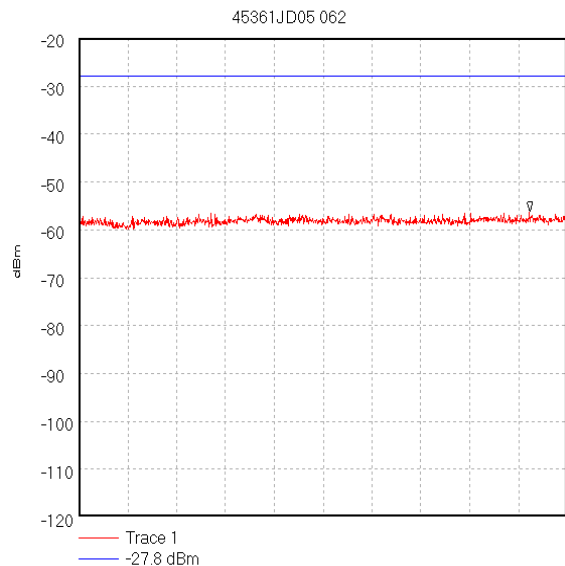
Start 4.0 GHz; Stop 5.0 GHz
Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.247 GHz; -44.37 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 13:52:45



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



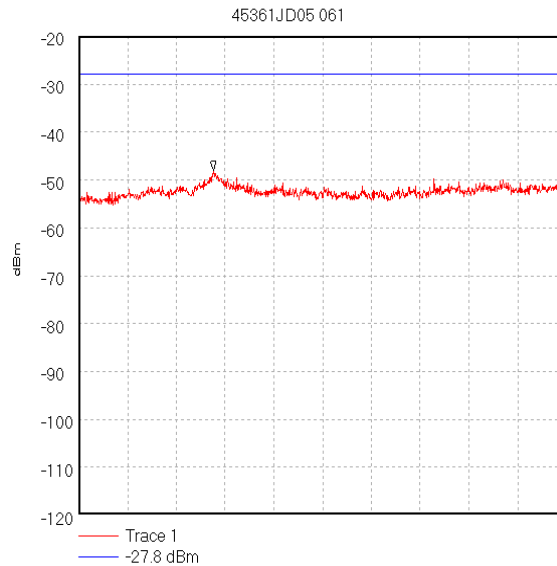
Start 6.0 GHz; Stop 8.0 GHz
Ref -20 dBm; Ref Offset 33.4 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 6.371 GHz; -59.0 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 13:47:33



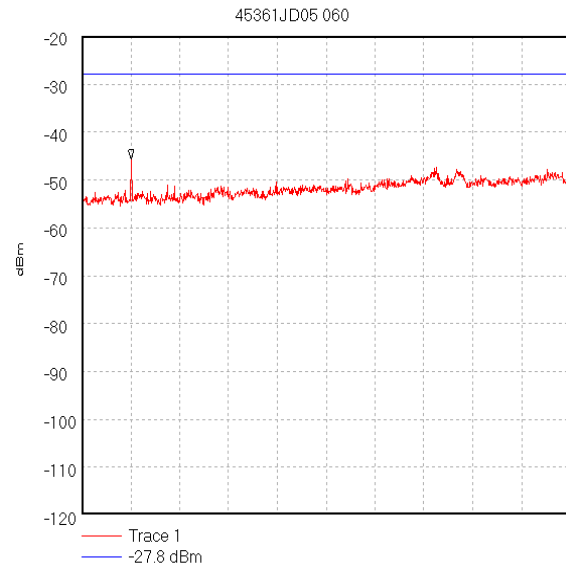
Start 8.0 GHz; Stop 12.5 GHz
Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 12.155 GHz; -56.23 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 13:45:08

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

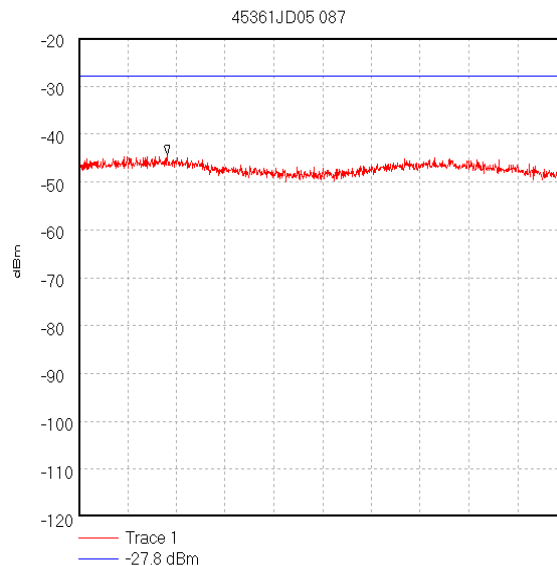
Transmitter Radiated Emissions Bottom Channel (Low Chip Rate) - Continued



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



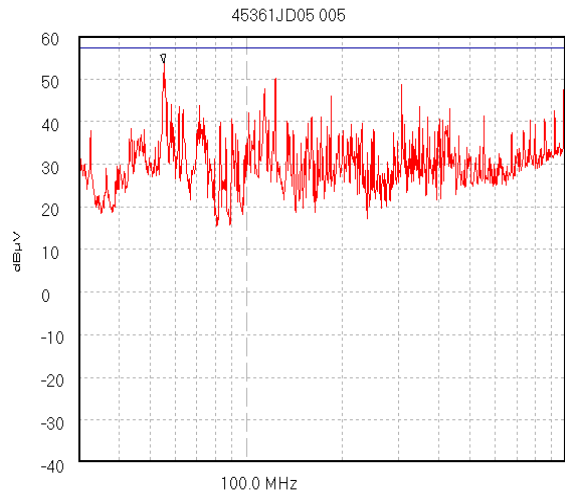
Start 18.0 GHz; Stop 26.5 GHz
Ref -20 dBm; Ref Offset 38.7 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 60.0 mS
Peak 18.859 GHz, -45.72 dBm
Display Line: -27.8 dBm; Limit Test Passed
16/01/2004 13:36:35



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 26.590556 GHz, -44.22 dBm
Display Line: -27.8 dBm;
16/01/2004 16:28:03

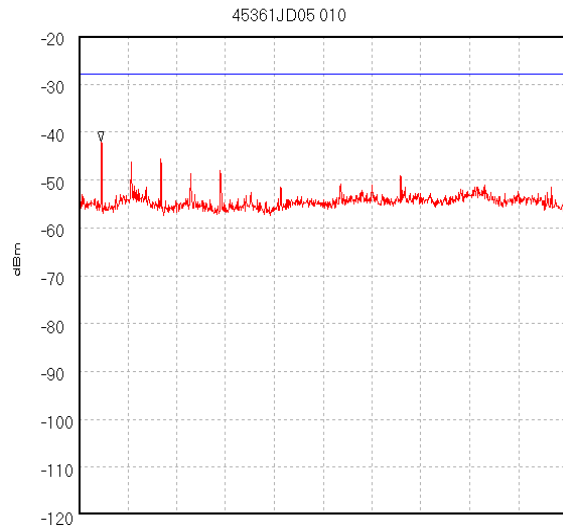
Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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



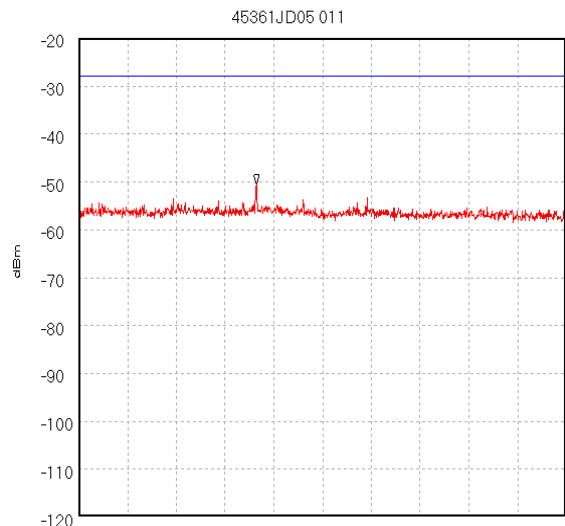
Trace 1
57.4 dBμV

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



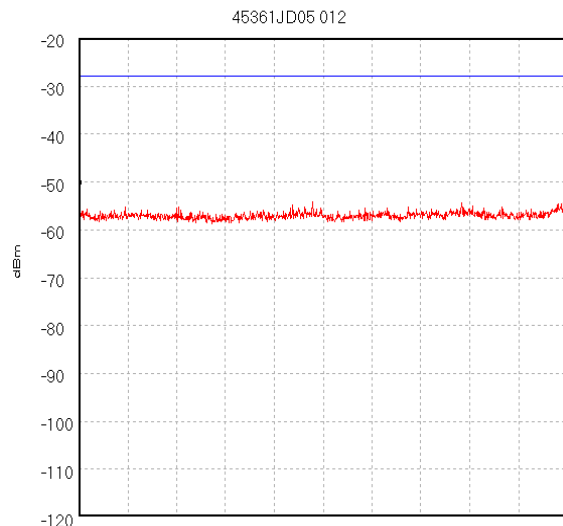
Trace 1
-27.8 dBm

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

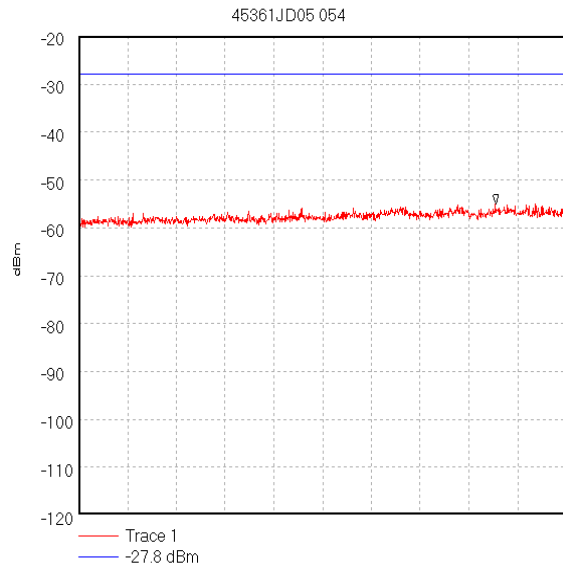


Trace 1
-27.8 dBm

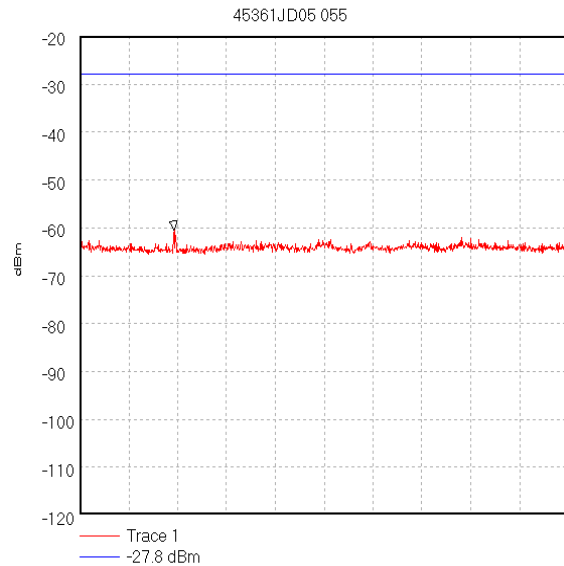
Start 2.599 GHz; Stop 4.0 GHz
Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.599 GHz; -51.74 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
13/01/2004 12:06:26

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

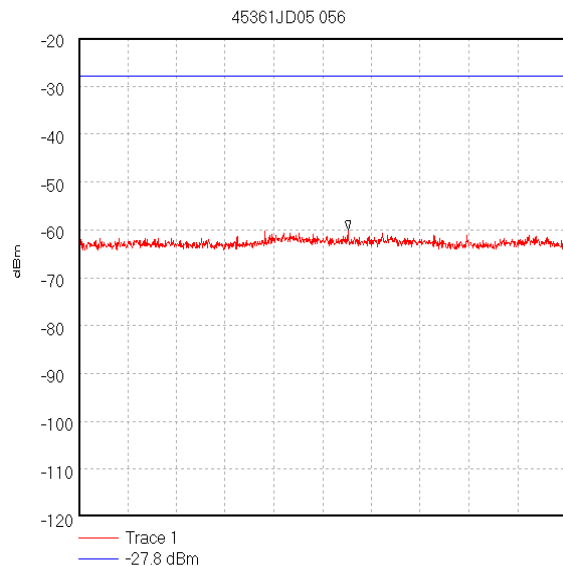
Transmitter Radiated Emissions Middle Channel (Low Chip Rate) - Continued



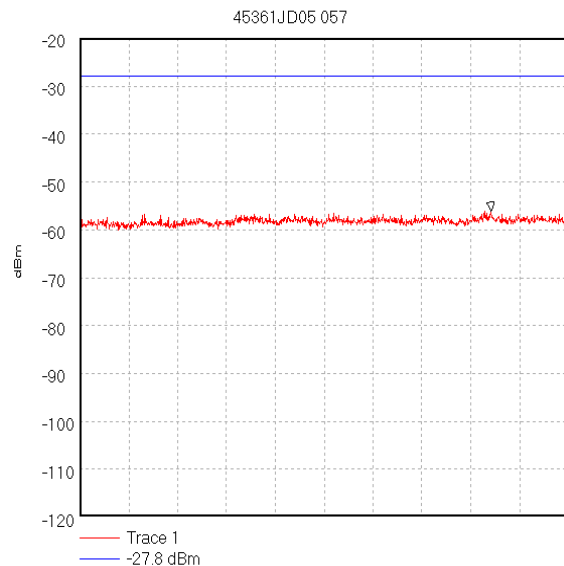
Start 4.0 GHz; Stop 5.0 GHz
Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.856 GHz, -55.06 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 12:04:14



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



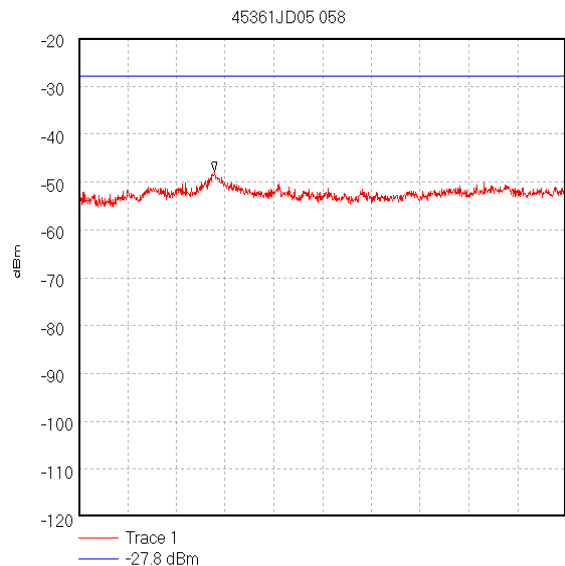
Start 6.0 GHz; Stop 8.0 GHz
Ref -20 dBm; Ref Offset 33.4 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 7.104 GHz, -60.07 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 13:11:40



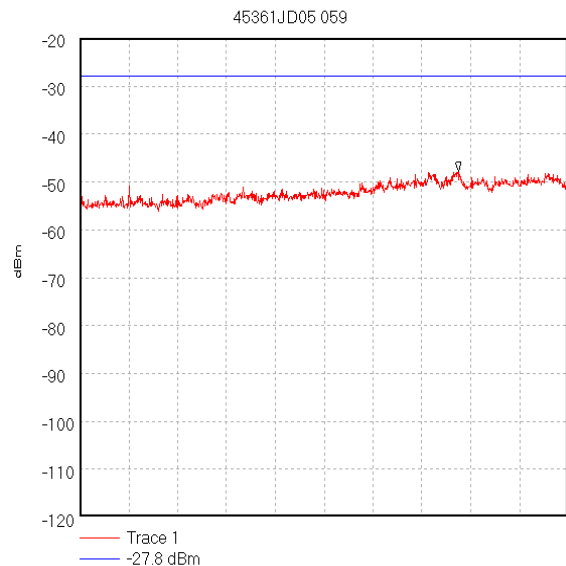
Start 8.0 GHz; Stop 12.5 GHz
Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 11.79 GHz, -56.05 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 13:24:56

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

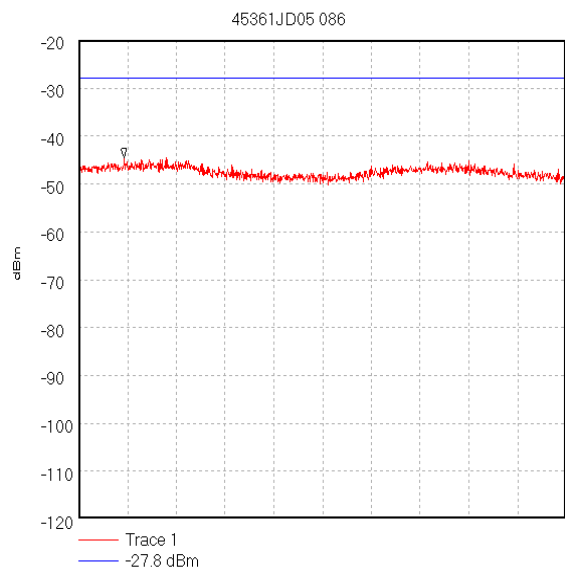
Transmitter Radiated Emissions Middle Channel (Low Chip Rate) - Continued



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



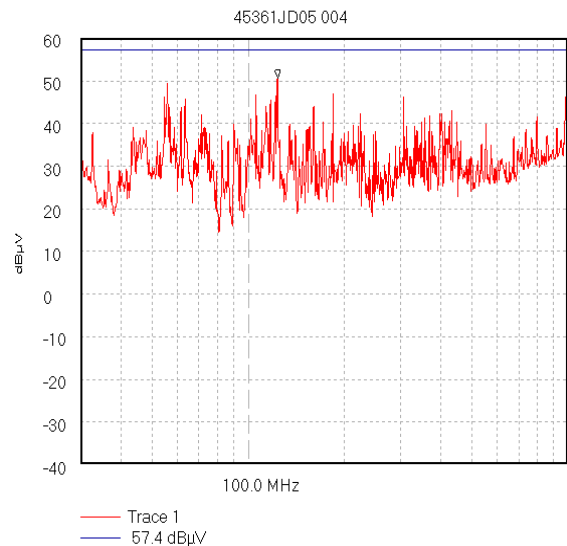
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 57.8 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.546667 GHz, -44.5 dBm
Display Line: -27.8 dBm;
16/01/2004 16:25:36

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

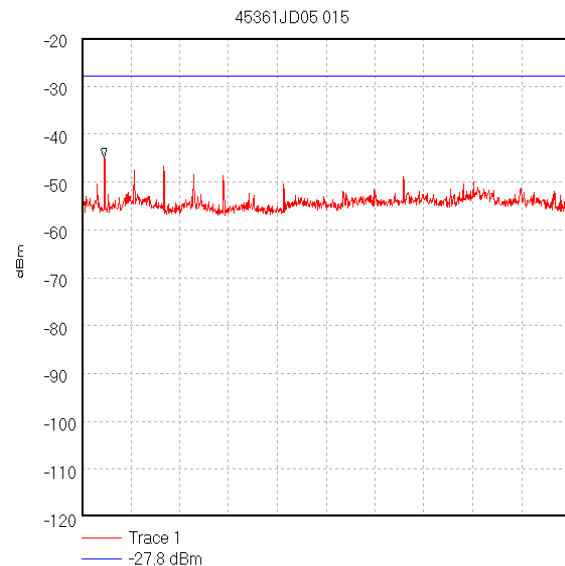
Test Of: IPWireless U.K. Ltd.

Node B Rack Mount Model: DZ/DN

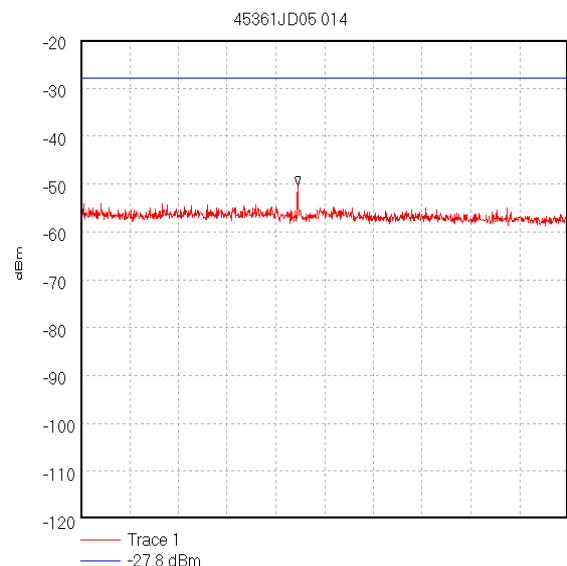
To: FCC Part 15, Part 21 & Part 74

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

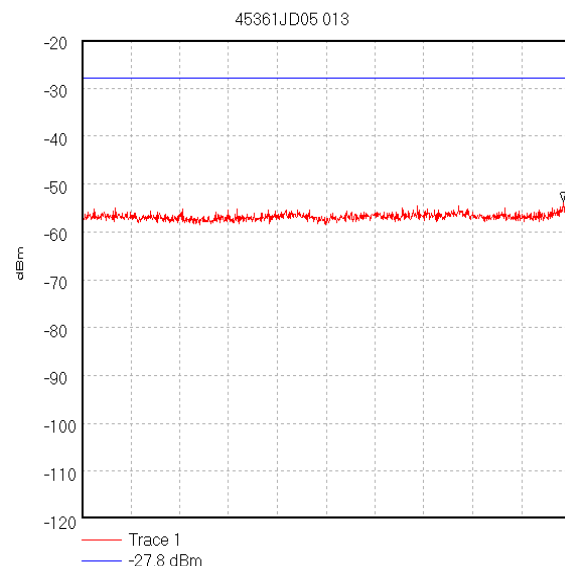
Start 30.0 MHz; Stop 1.0 GHz - Log Scale
 Ref 60 dBμV; Ref Offset 0.0 dB; 10 dB/div
 RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 540.0 mS
 Peak 123.891 MHz, 50.71 dBμV
 Display Line: 57.4 dBμV; ; Limit Test Passed
 Transducer Factors: A490
 13/01/2004 11:16:08



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



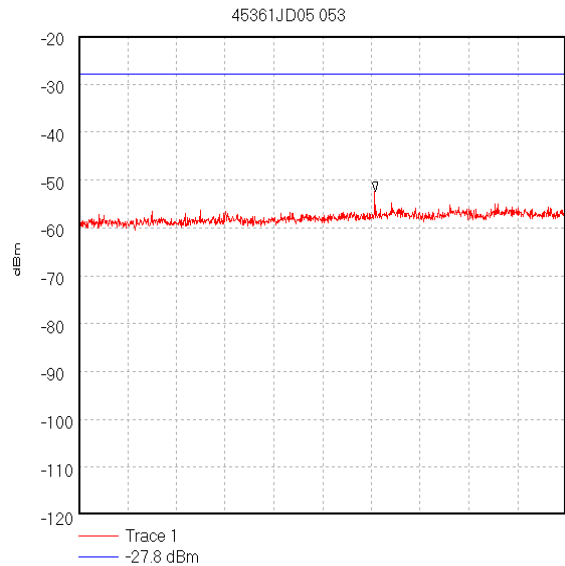
Start 2.0 GHz; Stop 2.68 GHz
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
 Peak 2.303 GHz, -50.47 dBm
 Display Line: -27.8 dBm; ; Limit Test Passed
 13/01/2004 12:10:50



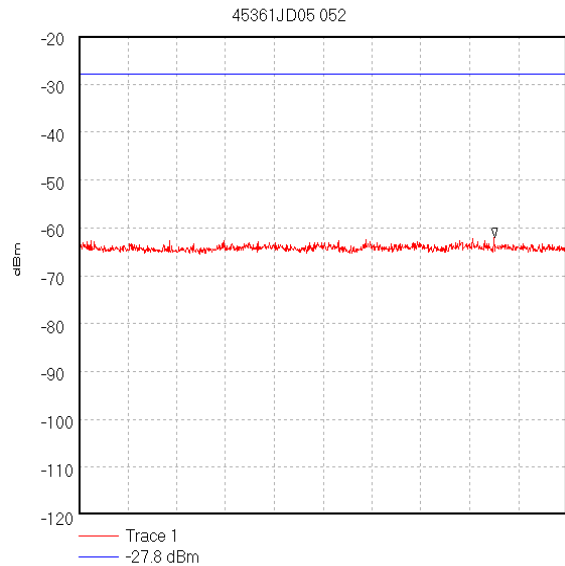
Start 2.686 GHz; Stop 4.0 GHz
 Ref -20 dBm; Ref Offset 36.0 dB; 10 dB/div
 RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
 Peak 3.982 GHz, -53.62 dBm
 Display Line: -27.8 dBm; ; Limit Test Passed
 13/01/2004 12:09:39

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

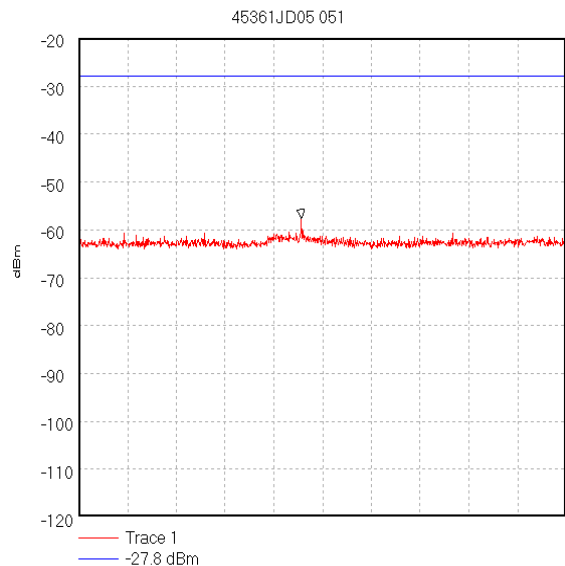
Transmitter Radiated Emissions Top Channel (Low Chip Rate) - Continued



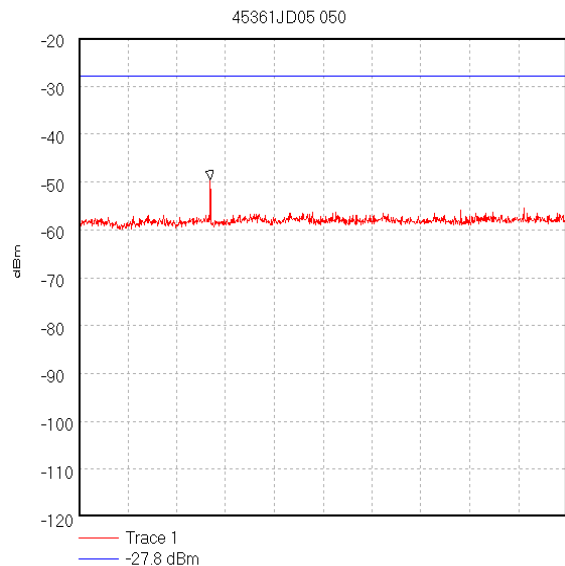
Start 4.0 GHz; Stop 5.0 GHz
Ref -20 dBm; Ref Offset 30.8 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.608 GHz, -52.37 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 11:53:24



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



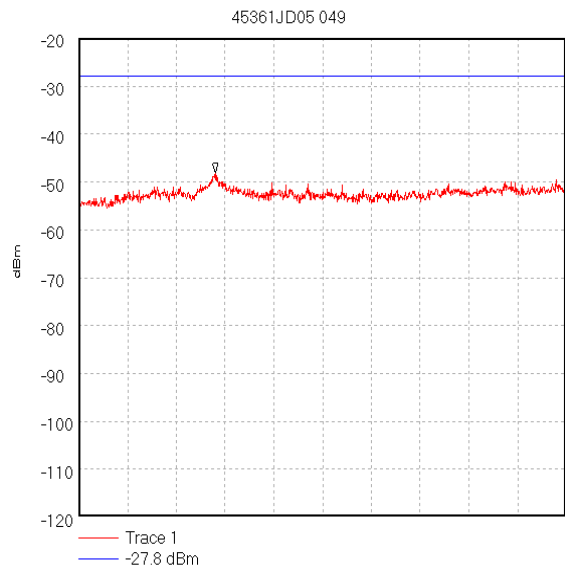
Start 8.0 GHz; Stop 12.5 GHz
Ref -20 dBm; Ref Offset 38.1 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 9.21 GHz, -49.55 dBm
Display Line: -27.8 dBm; ; Limit Test Passed
16/01/2004 11:46:49

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

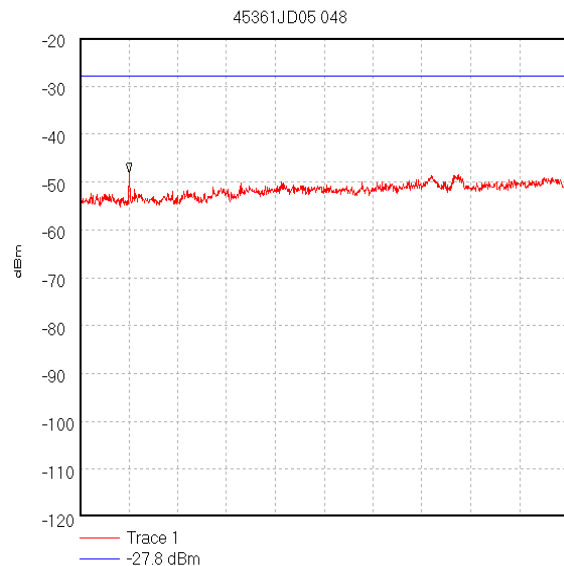
Test Of: IPWireless U.K. Ltd.

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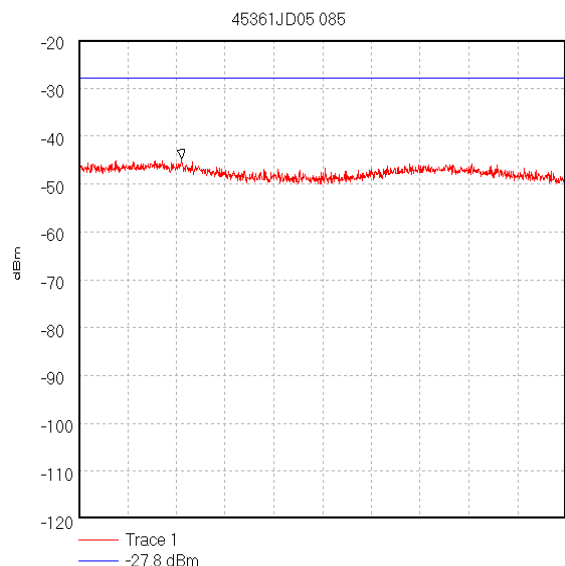
To: FCC Part 15, Part 21 & Part 74

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 26.60556 GHz, -44.65 dBm
 Display Line: -27.8 dBm;
 16/01/2004 16:23:12

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

Test Of: IPWireless U.K. Ltd.
Node B Rack Mount Model: DZ/DN
To: FCC Part 15, Part 21 & Part 74

8. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level	Calculated Uncertainty
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.

9. Measurement Methods

9.1. Conducted

Output Power

There is no conducted power limit specified in FCC Parts 21 and 74 for this test, it has been recorded as a requirement of FCC Part 2.1046, therefore, no compliancy statement has been made for this test.

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

The EUT was connected to a wideband power meter with an average power head, cable, and RF attenuators.

The connection was made to the EUT antenna port.

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

9.2. Frequency Stability

The EUT was situated within an environmental test chamber and connected via cables and attenuator(s) to the spectrum analyser.

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

Measurements were also performed at voltage extremes as stated in the specification.

The requirement was to determine the frequency stability of the device under specified environmental operating conditions.

Measurements were made on the top and bottom channels using the spectrum analyser.

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 recorded frequency was compared to the requirements of the specification.

In order to show compliance, the EUT must remain maintain a frequency tolerance not exceeding 0.005% according to Section 21.101 and 0.001% according to Section 74.961.

The reported data shows the nominal frequency drift and its margin from the declared frequency. If this margin is positive, the result is compliant. If it is negative, the result is non-compliant. There is also a frequency chart presented offering the frequency variation around nominal.

9.3. Occupied Bandwidth

The EUT was connected to a spectrum analyser enabled with an occupied bandwidth function.

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 ESI 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.

9.4. 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.

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.

During the swept measurements (and also during subsequent final measurements on single frequencies) 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.

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:

Receiver Function	Initial Scan	Final Measurements
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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9.5. Conducted Emissions Measurements

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_603A.

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

For frequencies further than 3MHz from the applicable channel edge the emissions shall be attenuated by at least 60 dBc relative to the transmitter output power level measured for the channel under test. Since the transmitter output power was measured as an absolute level using a power meter the attenuation limit was adjusted according to FCC Section 21.908(e) for absolute power measurements ($A + 10\log(C_{BW}/R_{BW})$) where $C_{BW} = 12$ MHz (for high chip rate mode) or $C_{BW} = 6$ MHz (for low chip rate mode) whilst R_{BW} = the resolution bandwidth for the emissions measurement i.e. 100 kHz below 1 GHz and 1 MHz above 1 GHz.

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.

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Conducted Emissions Measurements (Continued)

For the frequency ranges close to and including the fundamental frequency, plots of the spectral distribution were recorded using a spectrum analyser for the EUT transmitting on bottom, middle & top channels. The method is in accordance with the relative power measurement method from FCC Part 21.908(e). A resolution bandwidth of 100 kHz was used throughout thus no bandwidth adjustment was required to the limits.

FCC Part 21.908(a) states that the maximum out-of-band power of an MDS station transmits, or where adjacent channel licensees jointly transmit, a single signal over more than one contiguous 6 MHz channel, employing digital modulation and transmitting with an EIRP in excess of -9 dBW channel (or, when subchannels or superchannels are used, the appropriately adjusted value based upon the ratio of 6 MHz to the subchannel or superchannel bandwidth), shall be attenuated at the channel edges of those combined channels at least 25 dB relative to the power level of each channel, then attenuated along a linear slope from that level to at least 40 dB at 250 kHz above or below the channel edges of those combined channels, then attenuated along a linear slope from that level to at least 60 dB at 3 MHz above the upper and below the lower edges of those combined channels, and attenuated at least 60 dB at all other frequencies.

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

Receiver Function	Settings
Detector Type:	Average
Mode:	Max Hold
Bandwidth:	As shown on plots
Amplitude Range:	100 dB
Step Size:	Continuous sweep
Sweep Time:	Coupled

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9.6. 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 within a screened chamber below 4 GHz and on an open area test site above 4 GHz in order to identify frequencies on which the EUT was generating interference. 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 then connected to and fed by a signal generator tuned to the EUT's frequency under test.

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Transmitter Radiated Emissions (Continued)

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 previously recorded maximum level for this set of conditions was obtained. This procedure was repeated with both antennas vertically polarised. The EIRP was then taken 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

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

The limit is calculated according to FCC Section 21.908(e) for absolute power measurements ($A + 10\log(C_{BW}/R_{BW})$) where $C_{BW} = 12$ MHz (for high chip rate mode) or $C_{BW} = 6$ MHz (for low chip rate mode) whilst R_{BW} = the resolution bandwidth for the emissions measurement i.e. 100 kHz below 1 GHz and 1 MHz above 1 GHz.

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

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.

Appendix 2. Test Configuration Drawings

This Appendix contains the following drawings:

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

RADIO FREQUENCY INVESTIGATION LTD.

Operations Department

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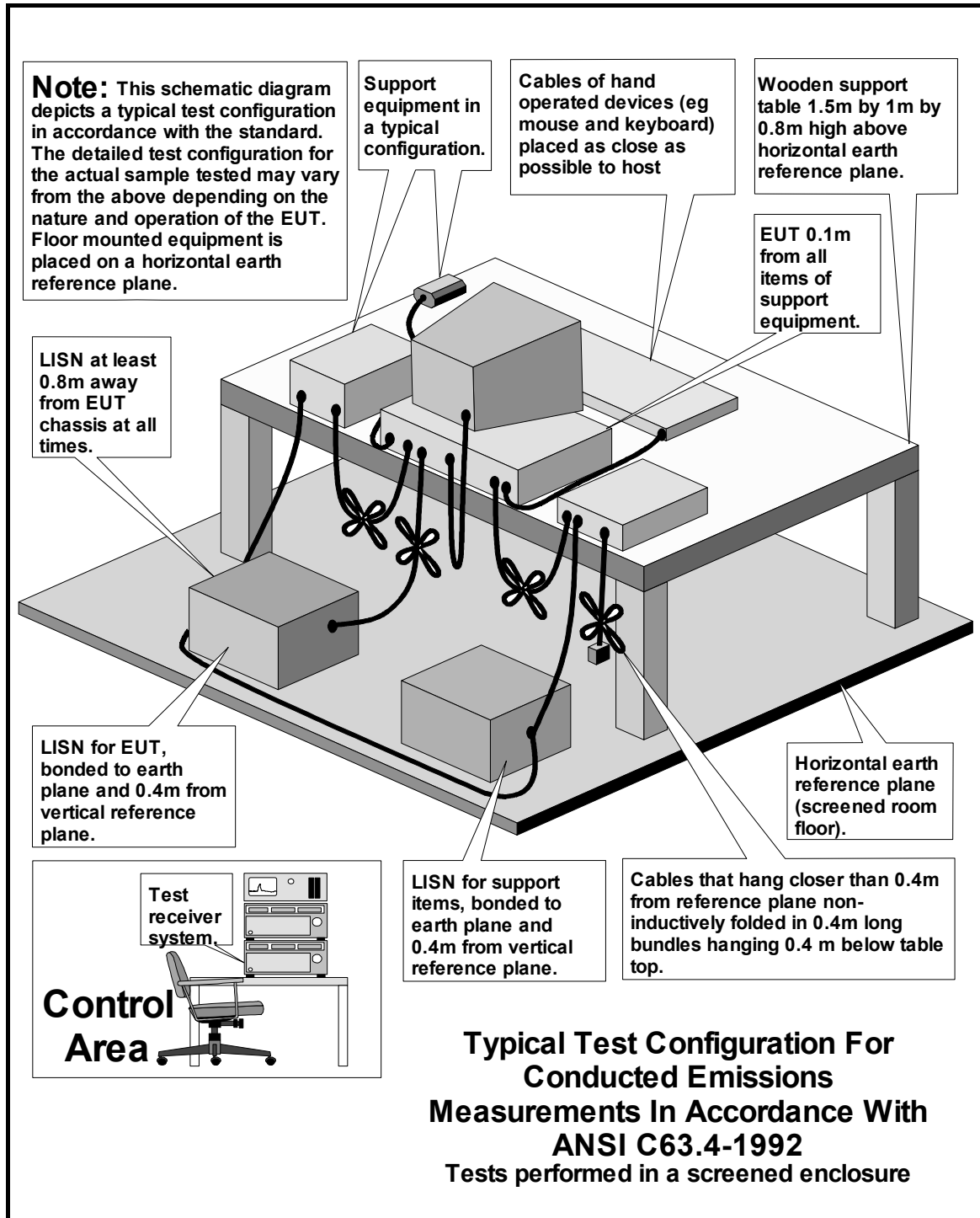
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DRG\45361JD05\EMICON



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DRG\45361JD05\EMIRAD

