TEST REPORT
FROM
RADIO FREQUENCY
INVESTIGATION LTD.

Test Of: IPWireless (UK) Ltd.
Node B V2 Model: HZ

To: FCC Part 15: 2001,
Part 21: 2002 & Part 74: 2002

Test Report Serial No:
RFI/MPTB3/RP44493JD13A

Superseded Test Report Serial No:
RFI/MPTB1/RP44493JD13A & RFI/MPTB2/RP44493JD13A

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: 	**Checked By:** 
Tested By: 	**Release Version No:** **PDF01**
Issue Date: 04 September 2003	**Test Dates: 12 July 2003 to 18 July 2003**

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The results in this report apply only to the sample(s) tested.

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1. Client Information

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

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:	Node B V2
Unique Type Identification:	HZ
Serial Number:	HZ1F3B-0000001 1:1
Country of Manufacture:	United Kingdom
FCC ID Number:	PKTNODEBHZ
Date of Receipt:	02 July 2003

2.2. Description Of EUT

The equipment under test is a base station.

2.3. Modifications Incorporated In EUT

The EUT has not been modified from what is described by the Model Number and Unique Type Identification stated above.

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		
Weight:	25kg		
Dimensions:	566mm (H), 380mm (W), 202mm (D)		
Interface Ports:	Ethernet Port Mains -48V Input Antenna Receiver Port Antenna Receiver/Transmitter Port		
Transmit Frequency Range	2.506 GHz to 2.680 GHz		
Transmit Channels Tested	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	N/A	2506
	Middle	N/A	2596
	Top	N/A	2680
Receive Frequency Range	2.506 GHz to 2.680 GHz		
Receive Channels Tested	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	N/A	2506
	Middle	N/A	2596
	Top	N/A	2680
Highest Fundamental Frequency	2680 MHz		
Highest Oscillator Frequency	2300 MHz		
Maximum Power Output	34.0 dBm		

2.5. Support Equipment

The following support equipment was supplied by the applicant and used to exercise the EUT during testing:

Description:	Laptop PC	
Brand Name:	Intel/CompUSA PC	
Model Name or Number:	Ameri Note RL366C	
Serial Number:	3882A452	
Cable Length and Type	10 m Cat-5e	
Connected to Port:	Ethernet	

Description:	AC Power Adaptor	
Brand Name:	LSE Li Shin International Enterprise Corp.	
Model Name or Number:	LSE9802A2050	
Serial Number:	993206426	
Cable Length and Type	2 m Mains Cable	2 m 3 Core
Connected to Port:	AC I/P	AC O/P

3. Test Specification, Methods And Procedures

3.1. Test Specification

Reference:	FCC Part 74: 2002: 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: 2002 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: 2002 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: 2002 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.

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:

Transmitter Modes:

For all conducted antenna port tests, the EUT was transmitting at full power on bottom, middle and top channels on all 15 timeslots.

For radiated tests, the EUT was transmitting at full power on bottom, middle and top channels on all 15 timeslots, i.e. worst-case configuration.

Receiver Modes:

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 an external AC adaptor connected to 110 VAC, 60 Hz, AC Mains supply, and the ethernet port connected to a laptop PC

Appendix 3 contains a schematic diagram of the test configuration.

6. Summary Of Test Results

Transmit Mode

Range Of Measurements	Specification Reference	Mode of Operation	Port Type	Compliancy Status
RF Output Power (EIRP Limitations)	Part 2.1046, Part 21.904 Part 74.935 of CFR 47: 2001	Transmit	Antenna Terminals	Complied
Frequency Stability (Temperature Variation)	Part 2.1055, Part 21.101 Part 74.961 of CFR 47: 2001	Transmit	Antenna Terminals	Complied
Frequency Stability (Voltage Variation)	Part 2.1055, Part 21.101 Part 74.961 of CFR 47: 2001	Transmit	Antenna Terminals	Complied
Occupied Bandwidth	Part 2.1049, Part 21.908 Part 74.936 of CFR 47: 2001	Transmit	Antenna Terminals	Complied
Conducted Emissions	Part 2.1051, Part 21.908 Part 74.936 of CFR 47: 2001	Transmit	Antenna Terminals	Complied
Radiated Spurious Emissions	Part 2.1053, Part 21.908 Part 74.936 of CFR 47: 2001	Transmit	Enclosure	Complied

Receive Mode

Range Of Measurements	Specification Reference	Mode of Operation	Port Type	Compliancy Status
AC Conducted Spurious Emissions (150 kHz to 30 MHz)	Part 15 of CFR 47: 2001, Section 15.107	Receive	AC Mains Input	Complied
Radiated Spurious Emissions (30 MHz to 1 GHz)	Part 15 of CFR 47: 2001, Section 15.109	Receive	Enclosure	Complied
Radiated Spurious Emissions (1 GHz to 20 GHz)	Part 15 of CFR 47: 2001, Section 15.109	Receive	Enclosure	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 Appendix 2 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.

7.2. Transmitter Output Power and (EIRP Limitations)

7.2.1. The EUT was configured as for conducted RF output power as described in Appendix 2 of this report.

7.2.2. 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.

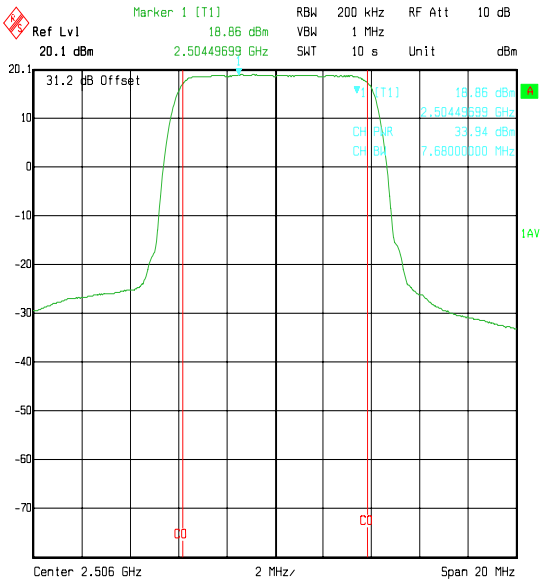
Channel	Measured Frequency (MHz)	Conducted RF O/P Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (dBW)	Limit EIRP (dBW)	Margin (dB)	Result
Bottom	2506.00	33.94	20.0	53.94	23.94	35.218	11.278	Complied
Middle	2596.00	34.00	20.0	54.00	24.00	35.218	11.218	Complied
Top	2680.00	33.96	20.0	53.96	23.96	35.218	11.258	Complied

Note 1: *The limit is calculated as 33+10 Log (10/6). The emission bandwidth being equal to 10 MHz.*

Note 2: *The antenna gain is typically 20 dBi 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.*

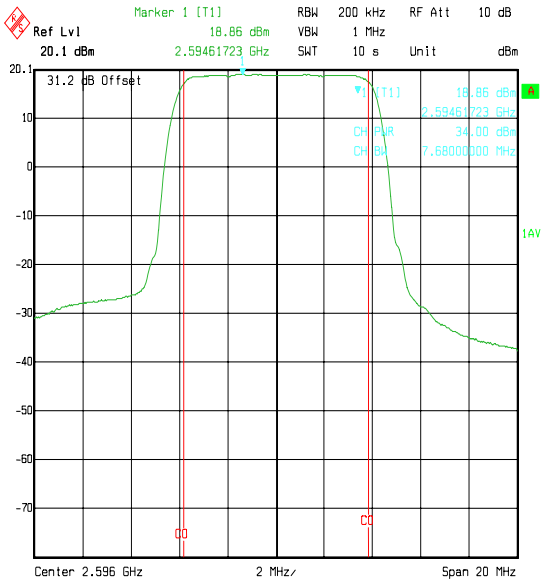
Transmitter Output Power and (EIRP Limitations) (Continued)

Bottom Channel



Title: IP Wireless EUT: Node B V2. FCC Part 21.
Comment A: 44493JD13_FCC_RFOP_001
Date: 9.JUL.2003 12:55:21

Middle Channel



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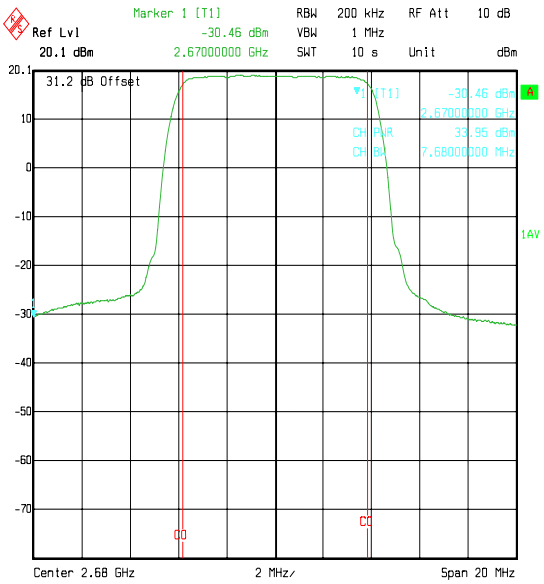
Top Channel



Title: IP Wireless EUT: Node B V2. FCC Part 21.
Comment A: 44493JD13_FCC_RFOP_003
Date: 9.JUL.2003 12:57:28

7.3. Transmitter Frequency Stability: (Temperature Variation)

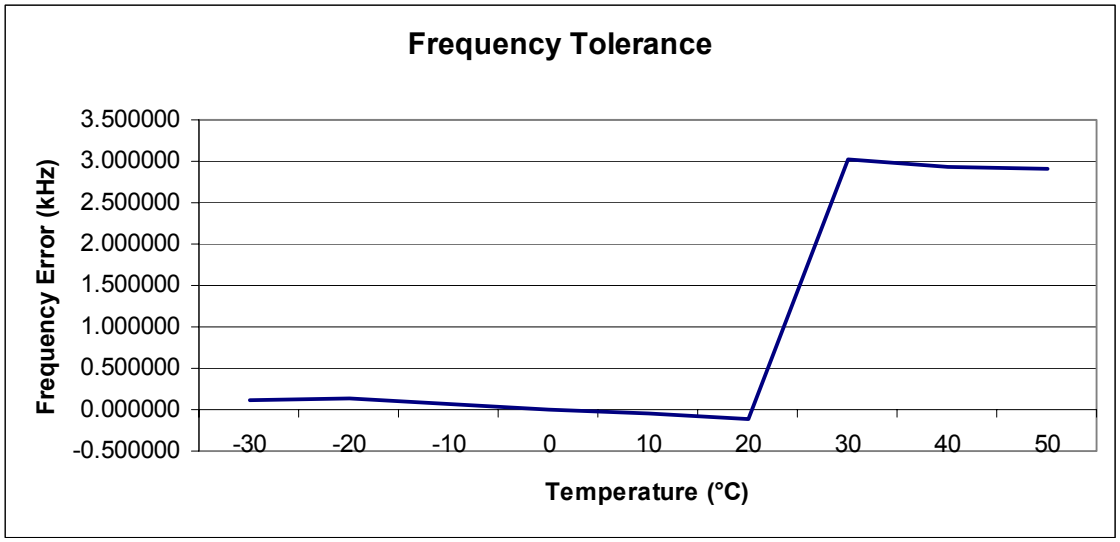
7.3.1. The EUT was configured as for frequency stability measurements as described in Appendix 2 of this report.

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

Results Bottom Channel (2506.00 MHz)

Temp (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
-30	2506.00012	0.12	25.06	24.94	Complied
-20	2506.00013	0.13	25.06	24.93	Complied
-10	2506.00007	0.07	25.06	24.99	Complied
0	2506.00001	0.01	25.06	25.05	Complied
10	2505.99995	0.05	25.06	25.01	Complied
20	2505.99989	0.11	25.06	24.95	Complied
30	2506.00302	3.02	25.06	22.04	Complied
40	2506.00294	2.94	25.06	22.12	Complied
50	2506.00292	2.92	25.06	22.14	Complied

Frequency Variation From 2506.00 MHz

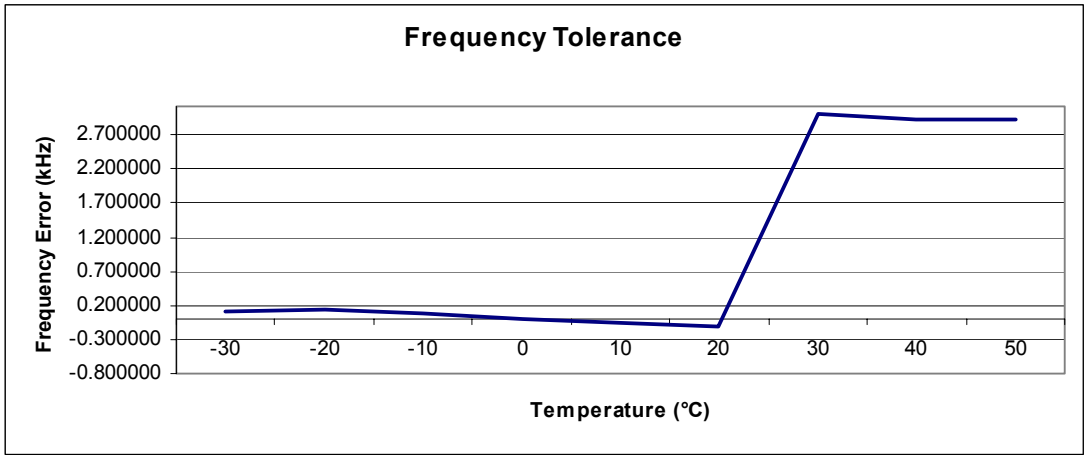


Transmitter Frequency Stability: (Temperature Variation) (continued)

Results Middle Channel (2596.00 MHz)

Temp (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
-30	2596.00013	0.130000	25.96	25.830	Complied
-20	2596.00013	0.050000	25.96	25.910	Complied
-10	2596.00005	0.010000	25.96	25.950	Complied
0	2596.00001	-0.030000	25.96	25.990	Complied
10	2595.99997	-0.080000	25.96	26.040	Complied
20	2595.99992	3.120000	25.96	22.840	Complied
30	2596.00312	3.040000	25.96	22.920	Complied
40	2596.00304	3.020000	25.96	22.940	Complied
50	2596.00302	0.130000	25.96	25.830	Complied

Frequency Variation From 2596.00 MHz

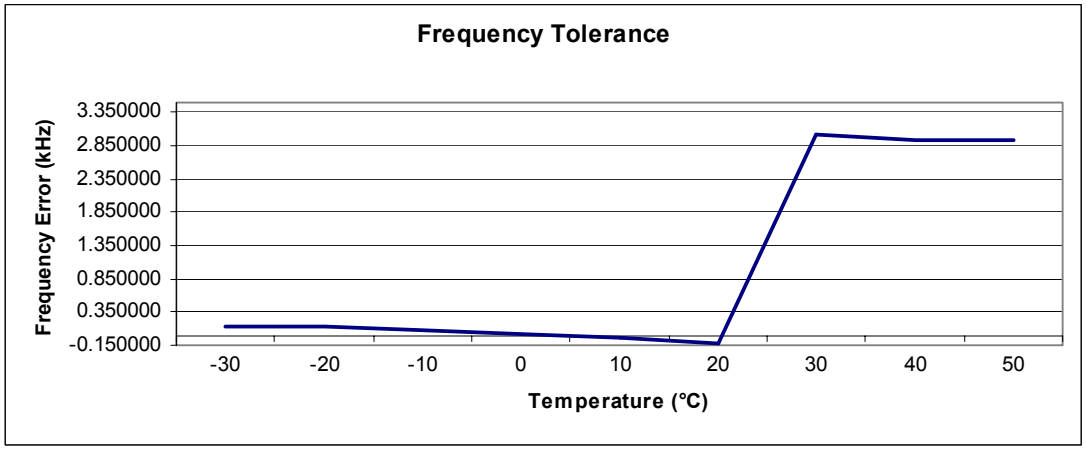


Transmitter Frequency Stability: (Temperature Variation) (continued)

Results Top Channel (2680.00 MHz)

Temp (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
-30	2680.00016	0.150000	26.80	26.650	Complied
-20	2680.00015	0.090000	26.80	26.710	Complied
-10	2680.00009	0.010000	26.80	26.790	Complied
0	2680.00001	-0.030000	26.80	26.830	Complied
10	2679.99997	-0.090000	26.80	26.890	Complied
20	2679.99991	3.180000	26.80	23.620	Complied
30	2680.00318	3.140000	26.80	23.660	Complied
40	2680.00314	3.120000	26.80	23.680	Complied
50	2680.00312	0.160000	26.80	26.640	Complied

Frequency Variation From 2680.00 MHz



7.4. Transmitter Frequency Stability: (Voltage Variation)

7.4.1. The EUT was configured as for frequency stability measurements as described in Appendix 2 of this report.

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

Results Bottom Channel (2506.00 MHz)

Supply Voltage (V AC 60 Hz)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
102	2505.999890	1.10	25.06	23.96	Complied
120	2505.999890	1.10	25.06	23.96	Complied
138	2505.999890	1.10	25.06	23.96	Complied

Results Middle Channel (2596.00 MHz)

Supply Voltage (V AC 60 Hz)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
102	2595.999920	0.80	25.96	25.16	Complied
120	2595.999920	0.80	25.96	25.16	Complied
138	2595.999920	0.80	25.96	25.16	Complied

Results Top Channel (2680.00 MHz)

Supply Voltage (V AC 60 Hz)	Measured Frequency (MHz)	Frequency Error (kHz)	Limit 0.001% (kHz)	Margin (kHz)	Result
102	2679.999910	0.90	26.80	25.10	Complied
120	2679.999910	0.90	26.80	25.10	Complied
138	2679.999910	0.90	26.80	25.10	Complied

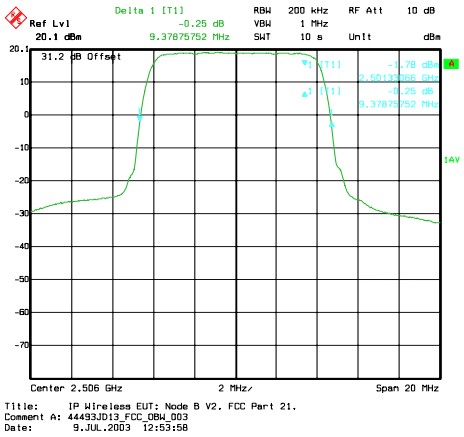
7.5. Transmitter Occupied Bandwidth

7.5.1. The EUT was configured as for Occupied Bandwidth measurements as described in Appendix 2 of this report.

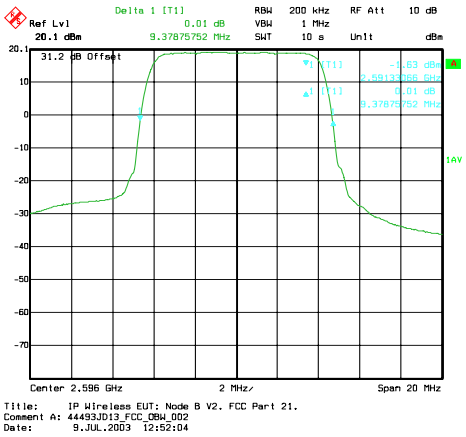
7.5.2. Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

Results:

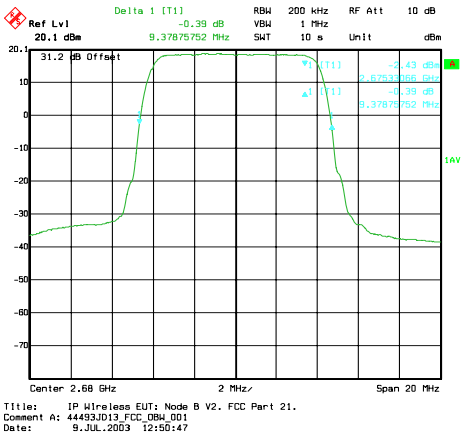
Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	2506.00	200	1000	9.37875752
Middle	2596.00	200	1000	9.37875752
Top	2680.00	200	1000	9.37875752



Bottom Channel



Middle Channel



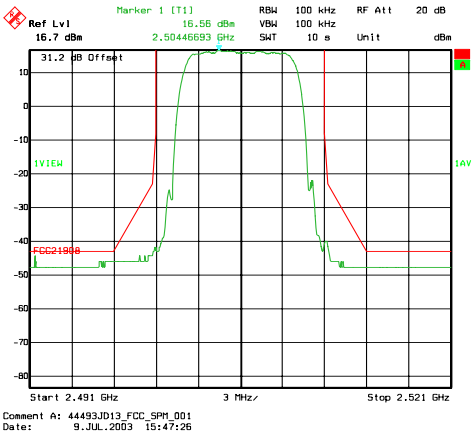
Top channel

7.6. Transmitter Emission Mask Part: 21.908(a)

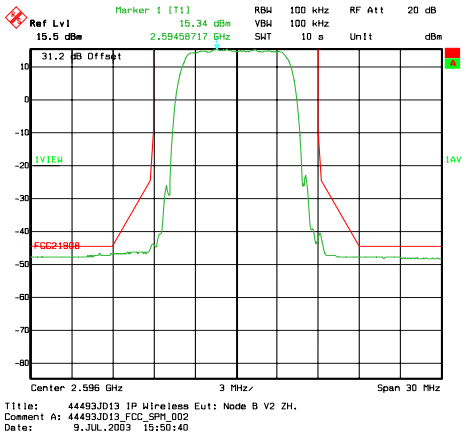
7.6.1. The EUT was configured as for conducted emissions and spectral mask measurements as described in Appendix 2 of this report.

7.6.2. 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.

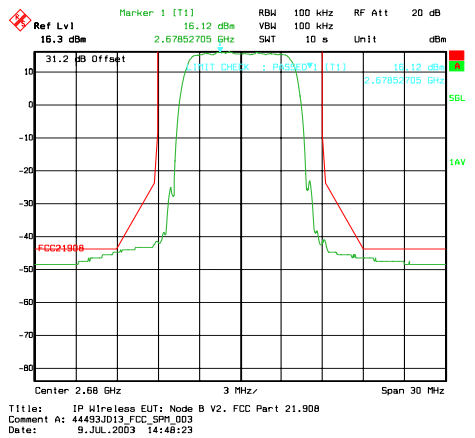
Results:
Results are presented graphically below, The graphs indicate compliance with the out-of band power requirements within the frequency bands defined by the nominal channel frequency +/- 15 MHz.



Bottom Channel



Middle channel



Top Channel

7.7. Transmitter Conducted Emissions

7.7.1. The EUT was configured as for conducted emissions measurements as described in Appendix 2 of this report.

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

Result: Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
0.332	-79.05	31.43	110.48	90.0	20.5	Complied
2491.000	-40.81	31.43	72.24	70.0	2.2	Complied
2521.000	-39.64	31.43	71.07	70.0	1.1	Complied
5016.667	-52.70	31.43	84.13	70.0	14.1	Complied

Result: Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
1.000	-74.54	31.08	105.62	90.0	15.6	Complied
2574.663	-39.74	31.08	70.82	70.0	0.8	Complied
2665.687	-39.35	31.08	70.43	70.0	0.4	Complied
5193.333	-53.33	31.08	84.41	70.0	14.4	Complied

Result: Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Carrier Level (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
1.000	-77.28	30.8	108.08	90.0	18.1	Complied
2661.663	-39.97	30.8	70.77	70.0	0.8	Complied
2695.000	-40.34	30.8	71.14	70.0	1.1	Complied
5363.333	-53.94	30.8	129.04	70.0	59.0	Complied

Note: *The limit is calculated according to FCC Section 21.908(e) for relative power measurements (A + 10log(RBW1/RBW2) where RBW1 = 10 MHz and RBW2= 1 MHz for frequencies above 1 GHz, 120 kHz in the frequency range 30 MHz to 1 GHz and 10 kHz for frequencies below 30 MHz.*

7.8. Transmitter Radiated Emissions

7.8.1. The EUT was configured as for transmitter radiated emissions testing as described in Appendix 2 of this report.

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

Results:-

Frequency (MHz)	Spurious Emission (dBm)	Carrier EIRP (dBm)	Spurious Emission (dBc)	Limit (dBc)	Margin (dB)	Result
61.439	-68.4	50.8	79.2	-31.4	37.0	Complied
99.620	-55.2	50.8	79.2	-31.4	23.8	Complied
122.890	-73.0	50.8	79.2	-31.4	41.6	Complied
250.016	-67.1	50.8	79.2	--31.4	35.7	Complied
307.196	-62.2	50.8	79.2	-31.4	30.8	Complied
368.642	-48.6	50.8	79.2	-31.4	17.2	Complied
396.309	-49.9	50.8	79.2	-31.4	18.5	Complied
430.086	-50.4	50.8	79.2	-31.4	17.0	Complied
491.499	-57.6	50.8	79.2	--31.4	26.2	Complied
921.600	-57.6	50.8	79.2	-31.4	26.2	Complied
1043.2223	-52.7	50.8	70.0	--22.2	30.5	Complied
1229.297	-52.2	50.8	70.0	-22.2	30.0	Complied

Note 1: *The limit is calculated according to FCC Section 21.908(e) for relative power measurements (A + 10log(RBW1/RBW2) where RBW1 = 10 MHz and RBW2= 1 MHz for frequencies above 1 GHz, 120 kHz in the frequency range 30 MHz to 1 GHz and 10 kHz for frequencies below 30 MHz.*

Note 2: *All channels exhibited similar responses, as such, results for middle channel only are shown.*

7.9. Receive AC Conducted Spurious Emissions

7.9.1. The EUT was configured as for AC conducted emissions measurements as described in Appendix 2 of this report.

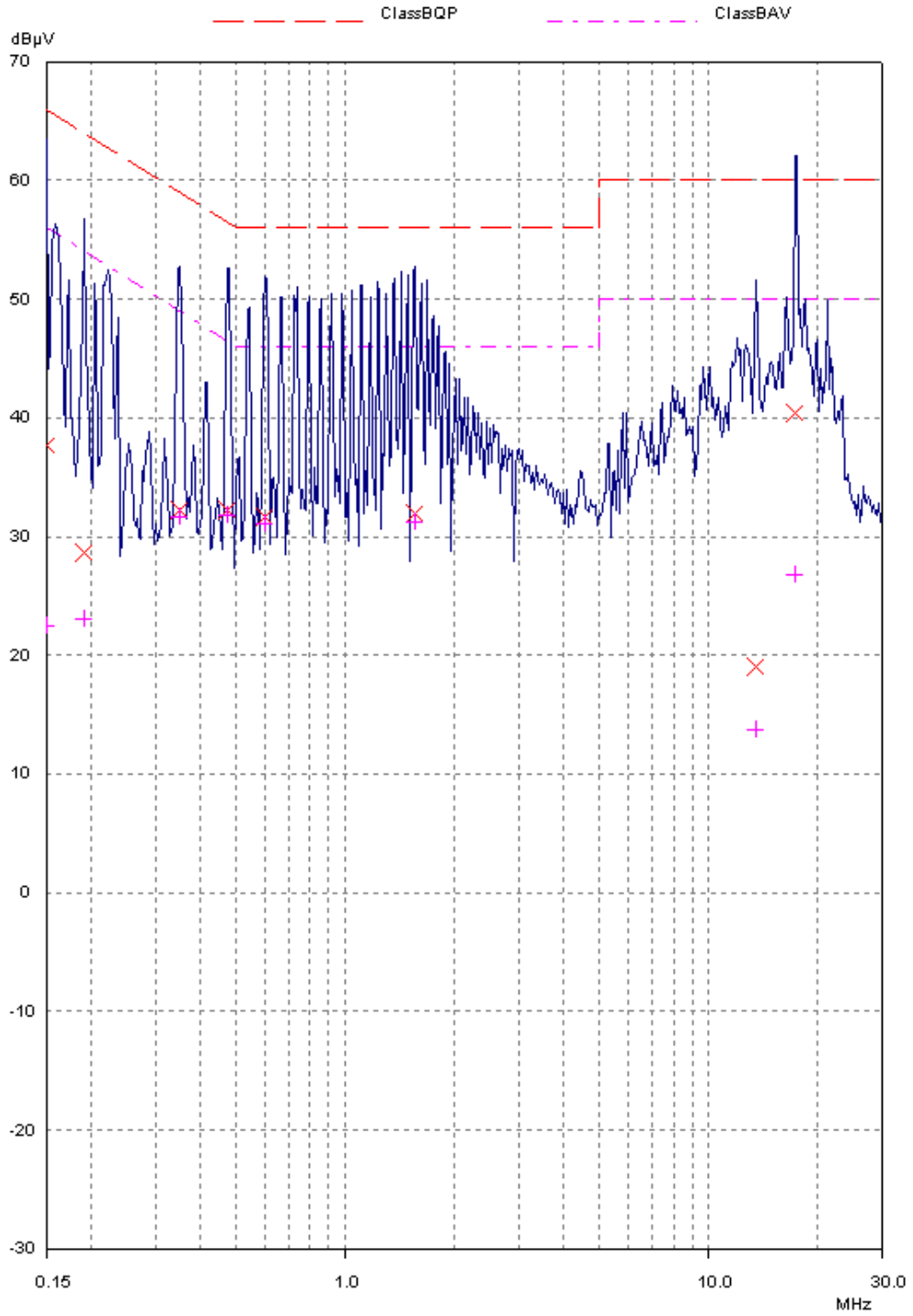
7.9.2. Tests were performed to identify the maximum emissions levels on the AC mains line of the EUT.

Results: Quasi-Peak Detector Measurements On Live And Neutral Lines

Frequency (MHz)	Line	Q-P Level (dBμV)	Q-P Limit (dBμV)	Margin (dB)	Result
0.15000	Live	37.75	66.00	28.25	Complied
0.19017	Live	28.60	64.03	35.43	Complied
0.34811	Neutral	32.19	59.01	26.82	Complied
0.47446	Neutral	32.19	56.44	24.25	Complied
0.60055	Neutral	31.60	56.00	24.40	Complied
1.54743	Live	31.91	56.00	24.09	Complied
13.51183	Neutral	19.01	60.00	40.99	Complied
17.28245	Live	40.41	60.00	19.59	Complied

Results: Average Detector Measurements On Live And Neutral Lines

Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
0.15000	Live	22.41	56.00	33.59	Complied
0.19017	Neutral	23.04	54.03	30.99	Complied
0.34811	Live	31.70	49.01	17.31	Complied
0.47446	Neutral	31.75	46.44	14.69	Complied
0.60055	Neutral	31.02	46.00	14.98	Complied
1.54743	Live	31.20	46.00	14.80	Complied
13.51183	Live	13.70	50.00	36.30	Complied
17.28245	Live	26.78	50.00	23.22	Complied


ClassBQP
ClassBAV
dBµV
70
60
50
40
30
20
10
0
-10
-20
-30
0.15
1.0
10.0
30.0
MHz

7.10. Radiated Emissions (Idle Mode)- 30 MHz to 1.0 GHz

7.10.1. The EUT was configured as for receiver-radiated emissions testing as described in Appendix 2 of this report.

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

Results:

Frequency (MHz)	Ant. Pol.	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
61.406	Vertical	13.0	40.0	27.0	Complied
99.51	Vertical	30.5	43.5	13.0	Complied
122.8	Vertical	28.9	43.5	14.6	Complied
250.00	Horizontal	25.9	46.0	20.1	Complied
307.0201	Horizontal	26.8	46.0	19.2	Complied
368.640	Horizontal	28.3	46.0	17.7	Complied
398.096	Horizontal	27.0	46.0	19.0	Complied
430.08	Horizontal	30.8	46.0	15.2	Complied
491.521	Vertical	43.0	46.0	3.0	Complied
921.601	Vertical	37.0	46.0	9.0	Complied

7.11. Receiver Radiated Emission (Idle Mode) – 1 GHz to 20 GHz

7.11.1. The EUT was configured as for receiver radiated emissions testing as described in Appendix 2 of this report.

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

Results:

Highest Average Level:

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
1044.513	V	2.11	22	0.8	24.91	54	29.09	Complied
1228.847	H	0.91	22	0.8	23.71	54	30.29	Complied
1351.462	V	0.31	22	0.8	23.11	54	30.89	Complied

Highest Peak Level:

Frequency (MHz)	Antenna Polarity (H/V)	Peak Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Result
1044.513	V	18.44	22	0.8	41.24	74	32.76	Complied
1228.847	H	19.95	22	0.8	40.75	74	33.25	Complied
1351.462	V	17.70	22	0.8	40.50	74	33.50	Complied

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 26 GHz	95%	+/- 1.2 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 26 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.

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
A028	Horn Antenna	Eaton	91888-2	304
A031	2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	557
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002
A075	High Power Attenuator 20 dB 150W	Narda	769-20	02878
A090	Narda Step Attenuator 0-60 dB	Narda	743-60	01057
A1037	Chase Bilog Antenna	Chase EMC Ltd	CBL6112B	2413
A145	10 dB Attenuator	Narda	NONE	NONE
A197	Site 2 Controller SC144	Unknown	SC144	150720
A256	WG 18 Microwave Horn	Flann Microwave	18240-20	400
A258	Zenith Variable Power Supply	Zenith Electric	SVA 10	None
A276	OATS Positioning Controller	Rohde & Schwarz	HCC	
A427	WG 14 horn	Flann	14240-20	150
A428	WG 12 horn	Flann	12240-20	134
A429	WG 16 horn	Flann	16240-20	561
A436	WG 20 horn	Flann	20240-20	330
A490	Bilog Antenna	Chase	CBL6111A	1590
A532	RHT & Barometer	RS Components	216-935	N/A
C1078	Rosenberger 3 m Cable	Rosenberger	FA210A1030M5050	28464-2
C1079	Rosenberger 1 m Cable	Rosenberger	FA210A1010M5050	28462-1
C1082	Rosenberger Cable 2 m	Rosenberger	FA210A1020M5050	28463-1
C160	Cables	Rosenberger	UFA210A-1-1181-70x70	None
C202	Rosenberger cable	Rosenberger	UFA 210A-1-1180-70X70	1543
C342	Cable	Andrews	None	None
C344	Cable	Rosenberger	UFA210A-1-1181-70x70	1934
C363	BNC Cable	Rosenberger	RG142	None

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
C457	Cable	Rosenberger	RG142XX-002-RFIB	C457-10081998
C461	Cable	Rosenberger	UFA210A-1-1182-704704	98H0305
E009	Environmental Chamber	Thermotron Corporation	S-8-E Mini Max	25-2407-0
G013	SMHU Signal Generator	Rohde & Schwarz	SMHU	894 055/003
G046	Signal Generator	Gigatronics	7100/.01-20	749474
L0670	EMI Test Receiver – 20 Hz to 26.5 GHz.	Rohde and Schwarz	ESI	100046
M072	FSM Spectrum Analyser	Rohde & Schwarz	FSM	862 967/010 (RF) & 863 912/048 (Display)
M084	NRVS Power Meter	Rohde & Schwarz	NRVS	864268/006
M088	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:835862/018 RU:835387/006
M090	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:838494/005 RU:836833/001
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
M173	Turntable Controller	R.H.Electrical Services	RH351	3510020
M198	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	827 191/003
S201	Site 1	RFI	1	-
S202	Site 2	RFI	2	-
S209	Site 9	RFI	9	-
S212	Site 12	RFI	12	-
S216	Site 16	RFI	16	None

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

Appendix 2. Measurement Methods

A2.1 Conducted Output Power

The conducted power was measured on top, middle and bottom channels using the channel power function of an R&S FSEB spectrum analyser. The analyser was set up to measure the channel power in the client specified channel bandwidths. This value was recorded, converted to dBW and recorded again so that the level in dBm and dBW may be shown.

All system losses were measured an entered into the spectrum analyser as an offset so that the correct output power may be established.

The client specified antenna gain was then added to the conducted power in order that the defacto EIRP may be determined.

The limit is calculated as described in FCC Part 21.904 for EIRP limitations as 10Log(X/6) where X is the actual emission bandwidth.

A2.2 Effective Isotropic Radiated Power (EIRP)

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

A2.3 Frequency Stability

The test was performed in a laboratory environment.

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 Deg 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, middle 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 within the frequency tolerance stated in the results table for this test.

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

A2.4 Occupied Bandwidth

The test was performed in a laboratory environment.

The EUT was connected to a spectrum analyser at its antenna port.

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

The EUT is a Broadband Wireless Modem; therefore no modulation input port was available. The occupied bandwidth was measured with the EUT transmitting on all timeslots and using normal modulation.

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 settings were set as per those outlined in the ESI user manual for this measurement, i.e., RBW <= 1/20 of occupied bandwidth. A value of 200 kHz was used.

A2.5 Conducted Emissions Measurements and Emission Mask

The test was performed in a laboratory environment.

Spurious emission measurements at the antenna port were performed from the lowest declared frequency to 10 times the highest EUT fundamental frequency as shown in Section 2.4 of this report, rounded up for convenience.

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.

$$dB = A+10 \log_{10} \left(\frac{RBW1}{RBW2}\right) (dB)$$

Where,

A = Spurious Attenuation Limit (60 dB)
RBW1 = Resolution Bandwidth of Flat Top Measurement.
RBW2 = Resolution Bandwidth of Spectral Point Measured.

The tabulated results in the results section of this report show the carrier power and the associated spurious limit relative to the carrier in dBc

.

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. Plots can be found at Appendix 4. 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.

A2.6 FCC Part 15: AC Mains Conducted Emissions

The test was performed in a laboratory environment.

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

A2.7 Transmitter Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 10 times the highest fundamental frequency stated in Section 2.5 of this report (rounded up for convenience) 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 through the use of substitution. A known level was transmitted in place of the EUT set to the EUT carrier frequency. 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 then 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.

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:-

EIRP = Signal Generator Level - Cable Loss + 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. This attenuation was then taken from the limit to give a margin.

A2.8 Standby Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 5 times the highest clock frequency stated in section 2.5 of this report (rounded up for convenience) were performed within a screened chamber below 4 GHz and on an open area test site above 4 GHz generating interference. This determined the frequencies from the EUT that required further examination. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m, 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 measuring receiver with a Quasi-Peak detector was used for measurements below 1000 MHz, for measurements above 1000 MHz average and peak detectors were used.

For the final measurements the EUT was arranged on a non-conducting turntable on a standard test site compliant with ANSI C63.4 – 2001 Clause 5.4.

On the open area test site, at each frequency where a signal was found, the levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the horizontal polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the vertical polarisation. Final measurements were taken at a 10 m measurement distance.

Standby Radiated Emissions (Continued)

The final field strength was determined as the indicated level in dBuV plus cable loss and antenna factor.

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

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

Appendix 3. Test Configuration Drawings

This Appendix contains the following drawings:

Drawing Reference Number	Title
DRG\44493JD13\EMICON	Test configuration for measurement of conducted emissions
DRG\44493JD13\EMIRAD	Test configuration for measurement of radiated emissions
DRG\44493JD13\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

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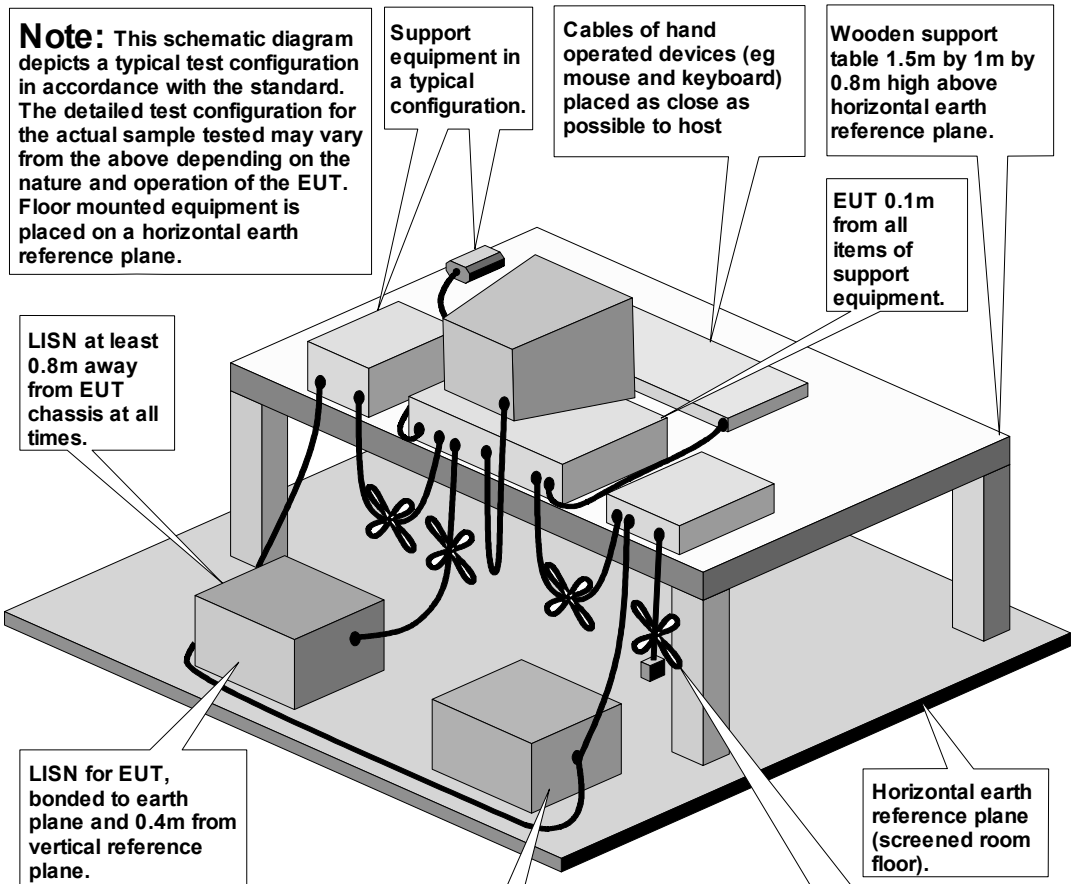
DRG\44493JD13\EMICON

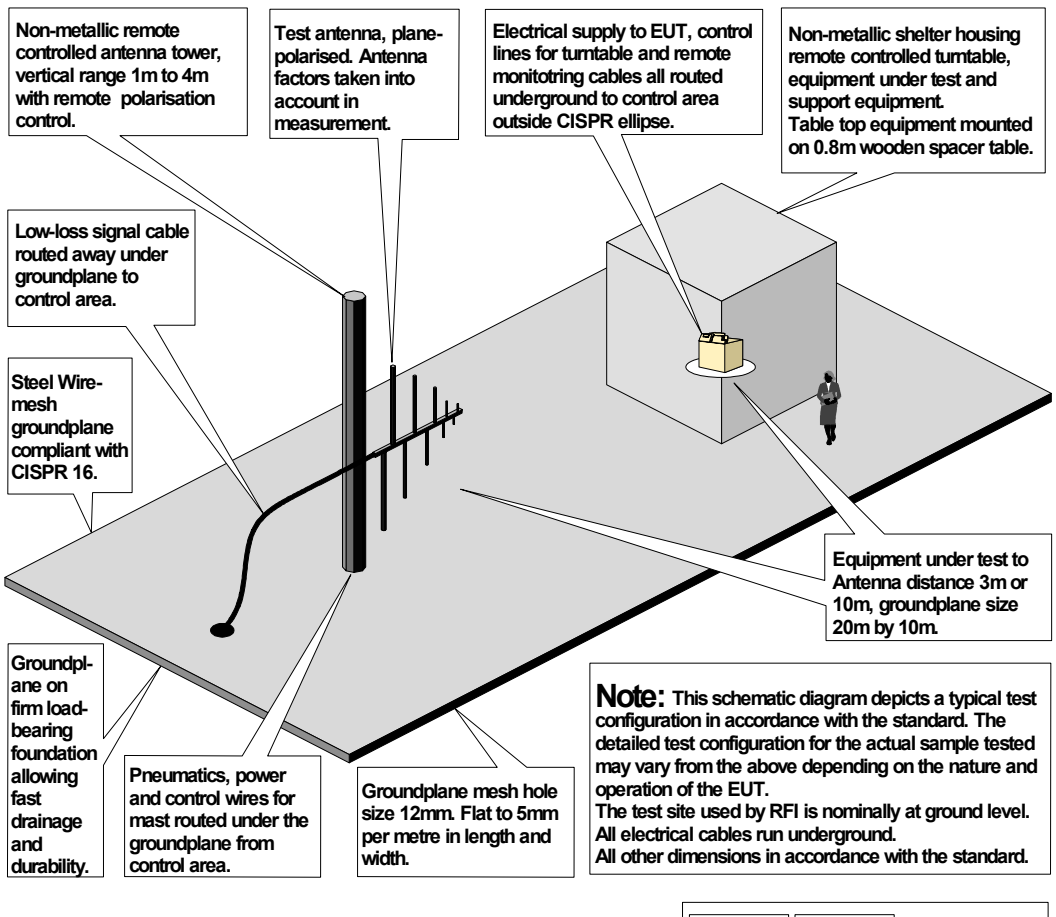


Typical Test Configuration For Conducted Emissions Measurements In Accordance With ANSI C63.4-1992

Tests performed in a screened enclosure

Test Of: IPWireless (UK) Ltd.
Node B V2 Model: HZ
To: FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002

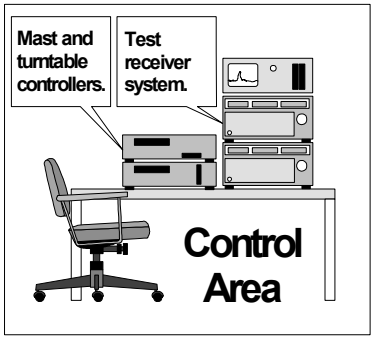
DRG\44493JD13\EMIRAD



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

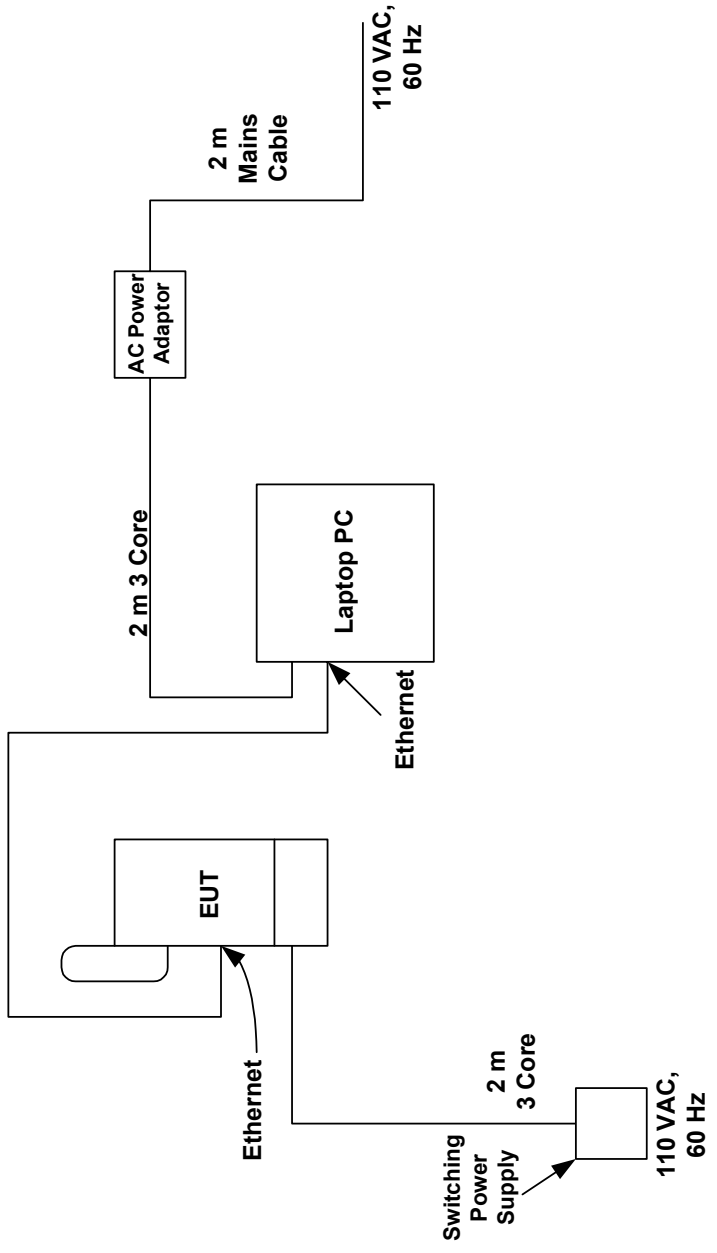
Test Configuration For Radiated Emissions Measurements

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



DRG\44493JD13\001

Configuration of EUT and Local Support Equipment



Appendix 4. Graphical Test Results

This Appendix contains the following graphs:

Graph Reference Number	Title
GPH\44493JD13_FCC_CE_002	Conducted Emissions, Bottom Channel (1 MHz to 30 MHz)
GPH\44493JD13_FCC_CE_007	Conducted Emissions, Bottom Channel (30 MHz to 1 GHz)
GPH\44493JD13_FCC_CE_010	Conducted Emissions, Bottom Channel (1 GHz to 2.491 GHz)
GPH\44493JD13_FCC_CE_016	Conducted Emissions, Bottom Channel (2.521 GHz to 5 GHz)
GPH\44493-JD13-CE\006	Conducted Emissions. Bottom Channel (5 GHz to 8 GHz)
GPH\44493-JD13-CE\010	Conducted Emissions. Bottom Channel (8 GHz to 10 GHz)
GPH\44493-JD13-CE\015	Conducted Emissions. Bottom Channel (10 GHz to 18 GHz)
GPH\44493-JD13-CE\020	Conducted Emissions. Bottom Channel (18 GHz to 25.5 GHz)
GPH\44493-JD13-CE\023	Conducted Emissions. Bottom Channel (25.5 GHz to 26.5 GHz)
GPH\44493-JD13-CE\029	Conducted Emissions. Bottom Channel (26.5 GHz to 27.0 GHz)
GPH\44493JD13_FCC_CE_003	Conducted Emissions, Middle Channel (1 MHz to 30 MHz)
GPH\44493JD13_FCC_CE_006	Conducted Emissions, Middle Channel (30 MHz to 1 GHz)
GPH\44493JD13_FCC_CE_011	Conducted Emissions, Middle Channel (1 GHz to 2.581 GHz)
GPH\44493JD13_FCC_CE_013	Conducted Emissions, Middle Channel (2.661 GHz to 5 GHz)
GPH\44493-JD13-CE\005	Conducted Emissions. Middle Channel (5 GHz to 8 GHz)
GPH\44493-JD13-CE\009	Conducted Emissions. Middle Channel (8 GHz to 10 GHz)
GPH\44493-JD13-CE\014	Conducted Emissions. Middle Channel (10 GHz to 18 GHz)
GPH\44493-JD13-CE\018	Conducted Emissions. Middle Channel (18 GHz to 25.5 GHz)
GPH\44493-JD13-CE\025	Conducted Emissions. Middle Channel (25.5 GHz to 26.5 GHz)

Graphical Test Results (continued)

Graph Reference Number	Title
GPH\44493-JD13-CE\028	Conducted Emissions. Middle Channel (26.5 GHz to 27.0 GHz)
GPH\44493JD13_FCC_CE_001	Conducted Emissions, Top Channel (1 MHz to 30 MHz)
GPH\44493JD13_FCC_CE_008	Conducted Emissions, Top Channel (30 MHz to 1 GHz)
GPH\44493JD13_FCC_CE_009	Conducted Emissions, Top Channel (1 GHz to 2.665 GHz)
GPH\44493JD13_FCC_CE_014	Conducted Emissions, Top Channel (2.695 GHz to 5 GHz)
GPH\44493-JD13-CE\004	Conducted Emissions. Top Channel (5 GHz to 8 GHz)
GPH\44493-JD13-CE\011	Conducted Emissions. Top Channel (8 GHz to 10 GHz)
GPH\44493-JD13-CE\013	Conducted Emissions. Top Channel (10 GHz to 18 GHz)
GPH\44493-JD13-CE\021	Conducted Emissions. Top Channel (18 GHz to 25.5 GHz)
GPH\44493-JD13-CE\022	Conducted Emissions. Top Channel (25.5 GHz to 26.5 GHz)
GPH\44493-JD13-CE\027	Conducted Emissions. Top Channel (26.5 GHz to 27.0 GHz)
GPH\44493JD13_FCC_CE_004	Conducted Emissions, Receive Mode (1 MHz to 30 MHz)
GPH\44493JD13_FCC_CE_005	Conducted Emissions, Receive Mode (30 MHz to 1 GHz)
GPH\44493JD13_FCC_CE_012	Conducted Emissions, Receive Mode (1 GHz to 5 GHz)
GPH\44493-JD13-CE\007	Conducted Emissions. Receive Middle Channel (5 GHz to 8 GHz)
GPH\44493-JD13-CE\008	Conducted Emissions. Receive Middle Channel (8 GHz to 10 GHz)
GPH\44493-JD13-CE\016	Conducted Emissions. Receive Middle Channel (10 GHz to 18 GHz)

Graphical Test Results (continued)

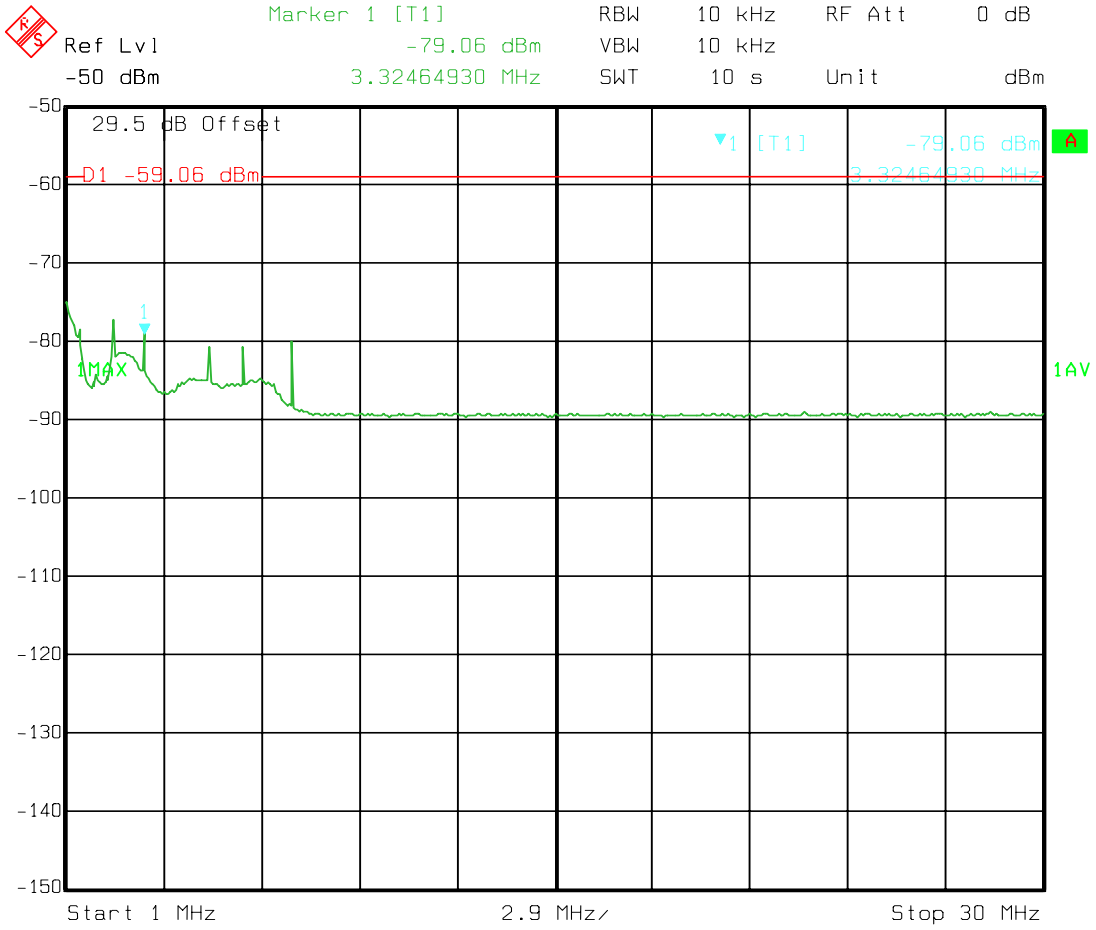
Graph Reference Number	Title
GPH\44493-JD13_FCC_RE\002	Radiated Emissions. Middle Channel (30 MHz to 1 GHz)
GPH\44493-JD13_FCC_RE\006	Radiated Emissions. Middle Channel (1 GHz to 2 GHz)
GPH\44493-JD13_FCC_RE\007	Radiated Emissions. Middle Channel (2 GHz to 4 GHz)
GPH\44493-JD13_RE\006	Radiated Emissions. Middle Channel (4 GHz to 6 GHz)
GPH\44493-JD13_RE\007	Radiated Emissions. Middle Channel (6 GHz to 8 GHz)
GPH\44493-JD13_RE\008	Radiated Emissions. Middle Channel (8 GHz to 12.5 GHz)
GPH\44493-JD13_RE\009	Radiated Emissions. Middle Channel (12.5 GHz to 18.0 GHz)
GPH\44493-JD13_RE\010	Radiated Emissions. Middle Channel (18.0 GHz to 26.5 GHz)
GPH\44493-JD13_RE\011	Radiated Emissions. Middle Channel (26.5 GHz to 27.0 GHz)
GPH\44493-JD13_RE\017	Radiated Emissions. Receive Middle Channel (25.0 MHz to 200 MHz)
GPH\44493-JD13_RE\018	Radiated Emissions. Receive Middle Channel (200 MHz to 1 GHz)

Graphical Test Results (continued)

Graph Reference Number	Title
GPH\44493-JD13_RE\019	Radiated Emissions. Receive Middle Channel (1 GHz to 2 GHz)
GPH\44493-JD13_RE\021	Radiated Emissions. Receive Middle Channel (2 GHz to 4 GHz)
GPH\44493-JD13_RE\001	Radiated Emissions. Receive Mode (4 GHz to 6 GHz)
GPH\44493-JD13_RE\003	Radiated Emissions. Receive Mode (6 GHz to 8 GHz)
GPH\44493-JD13_RE\004	Radiated Emissions. Receive Mode (8 GHz to 12.5 GHz)
GPH\44493-JD13_RE\005	Radiated Emissions. Receive Mode (12.5 GHz to 18.0 GHz)
GPH\44493-JD13_RE\014	Radiated Emissions. Bottom Channel, Lower Band Edge (2.491 GHz to 2.506 GHz)
GPH\44493-JD13_RE\013	Radiated Emissions. Top Channel, Upper Band Edge (2.68 GHz to 2.695 GHz)

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

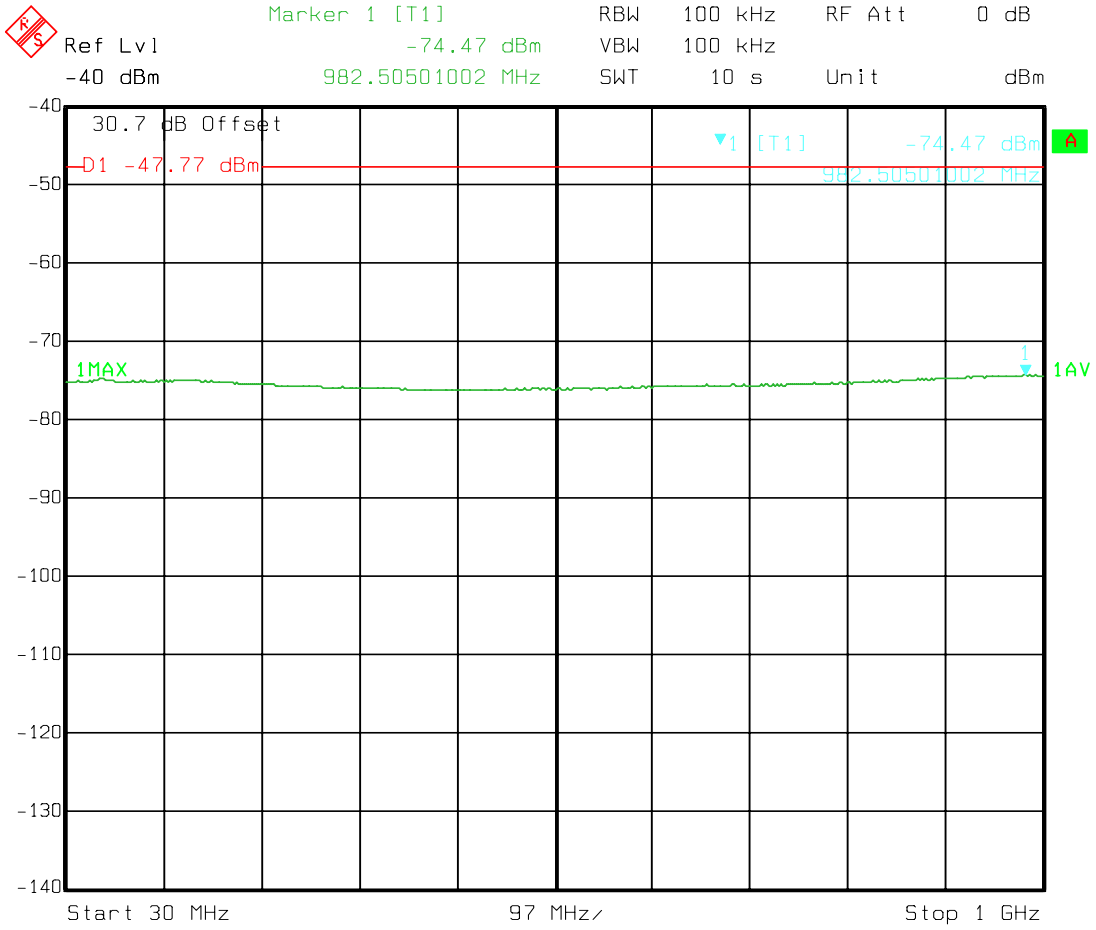
GPH\44493JD13_FCC_CE_002
Conducted Emissions, Bottom Channel (1 MHz to 30 MHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_002
Date: 9.JUL.2003 13:28:00

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

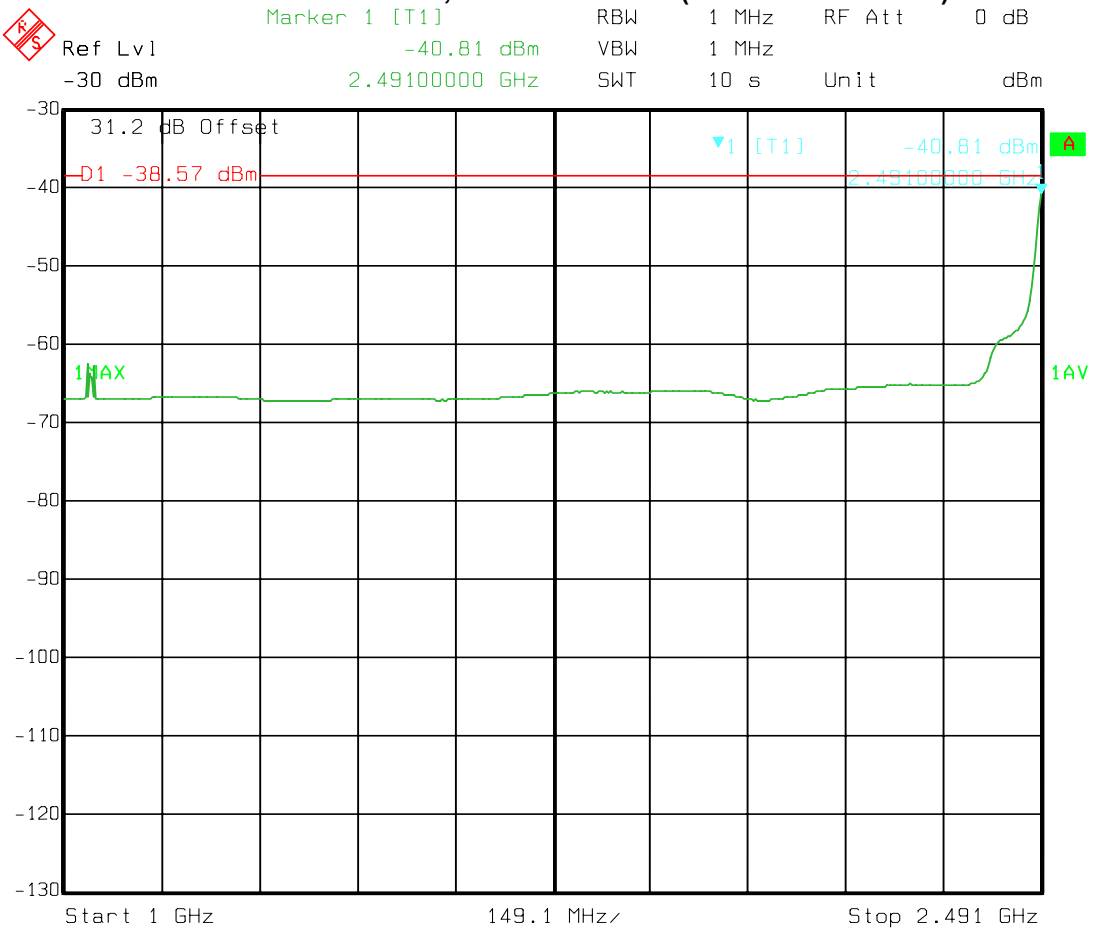
GPH\44493JD13_FCC_CE_007
Conducted Emissions, Bottom Channel (30 MHz to 1 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_007
Date: 9.JUL.2003 13:21:01

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

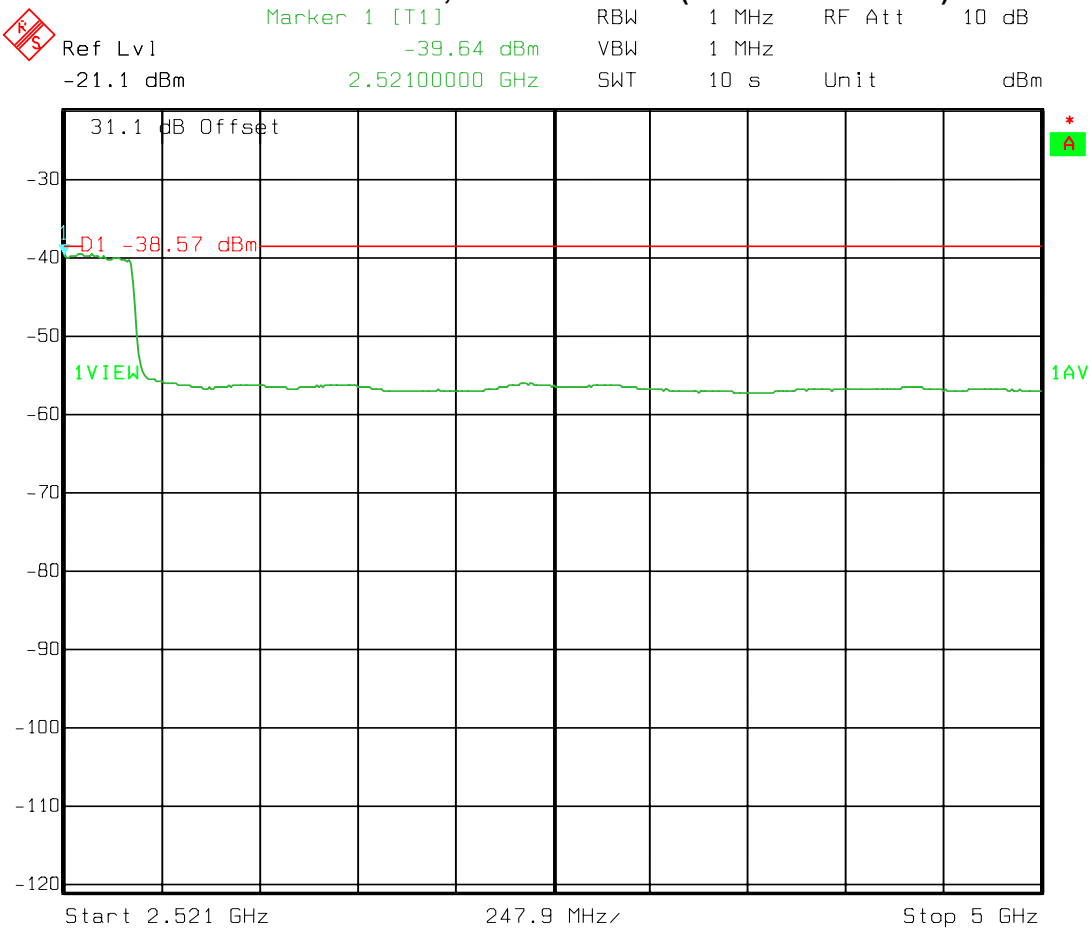
GPH\44493JD13_FCC_CE_010
Conducted Emissions, Bottom Channel (1 GHz to 2.491 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_010
Date: 9.JUL.2003 13:37:51

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

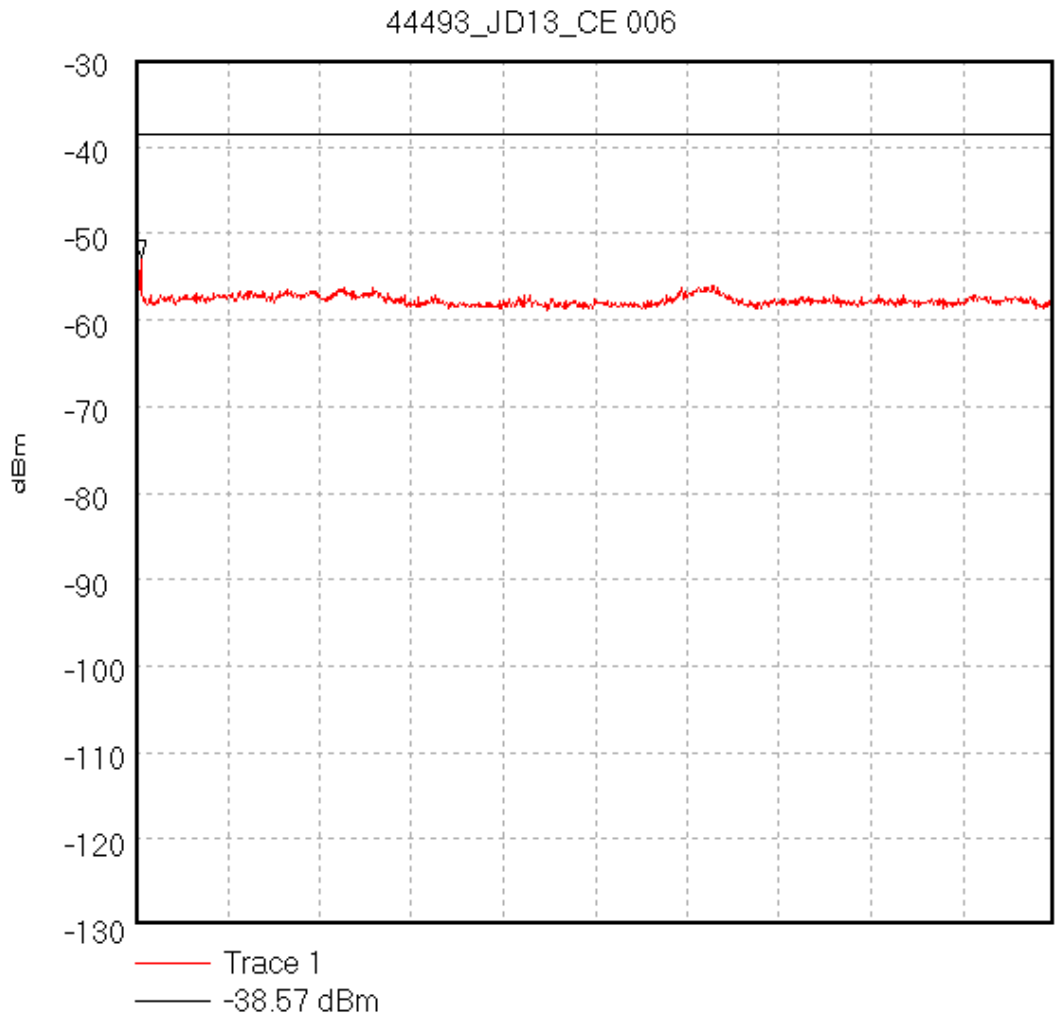
GPH\44493JD13_FCC_CE_016
Conducted Emissions, Bottom Channel (2.521 GHz to 5 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_016
Date: 9.JUL.2003 13:59:14

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

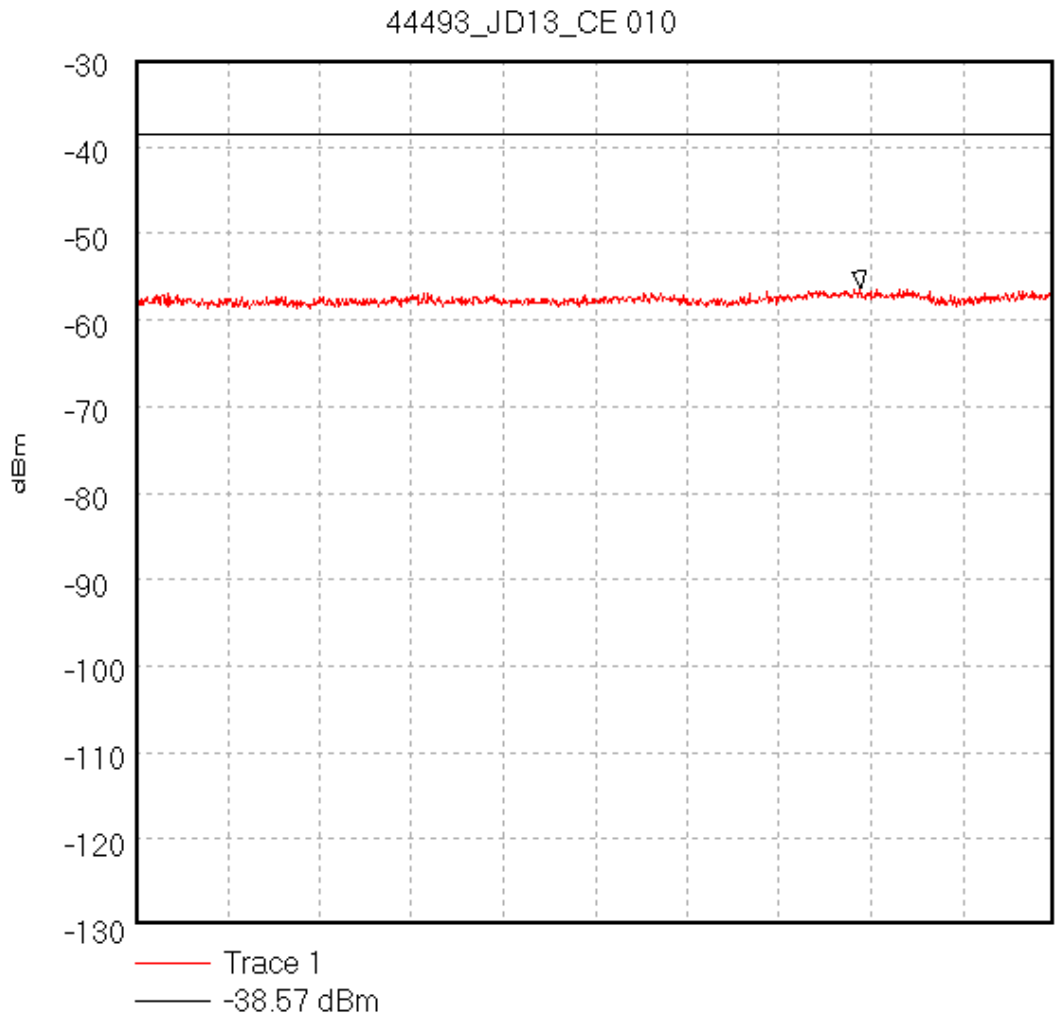
GPH\44493_JD13_CE\006
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 5.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 1.32 S
Peak 5.016667 GHz, -52.7 dBm
Display Line: -38.57 dBm;
08/07/2003 14:21:31

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

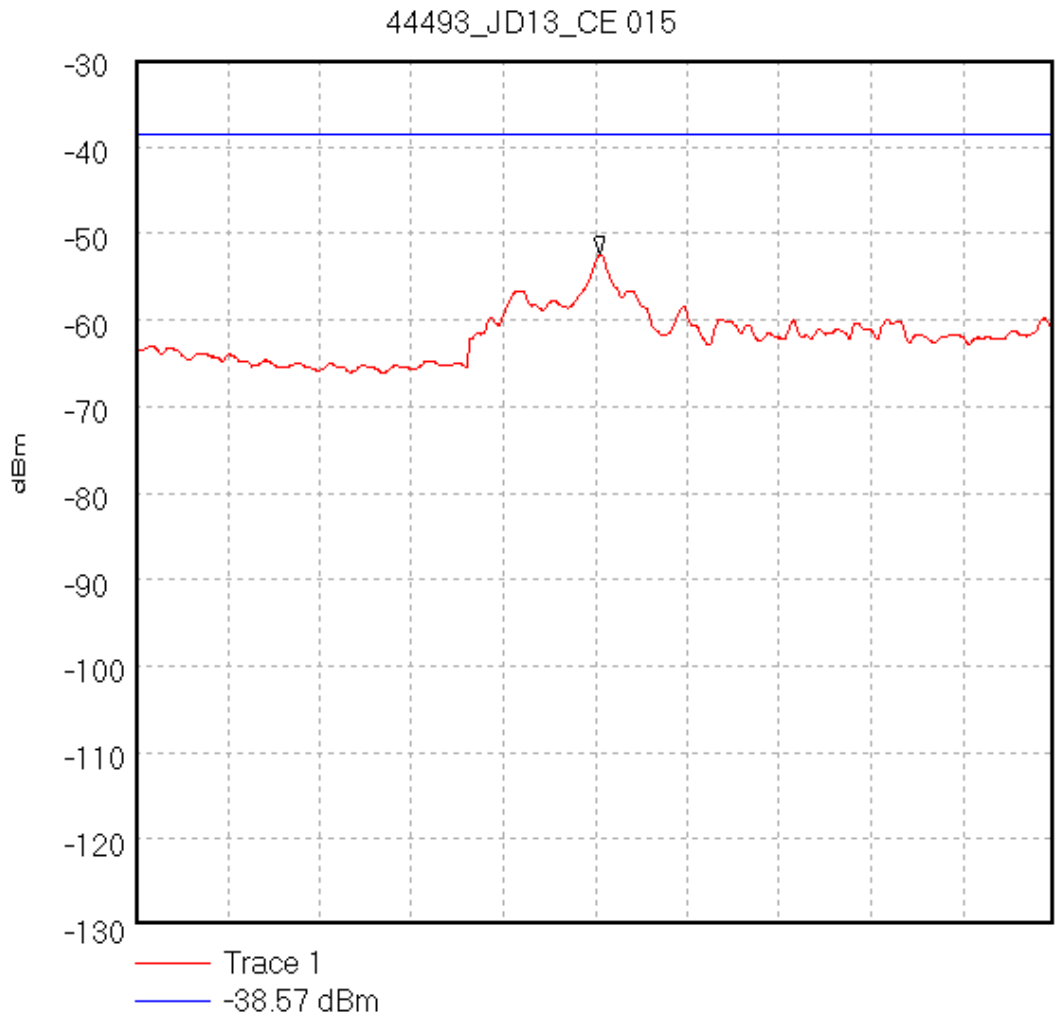
GPH\44493_JD13_CE\010
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 8.0 GHz; Stop 10.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 880.0 mS
Peak 9.577778 GHz, -56.35 dBm
Display Line: -38.57 dBm;
08/07/2003 14:26:34

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

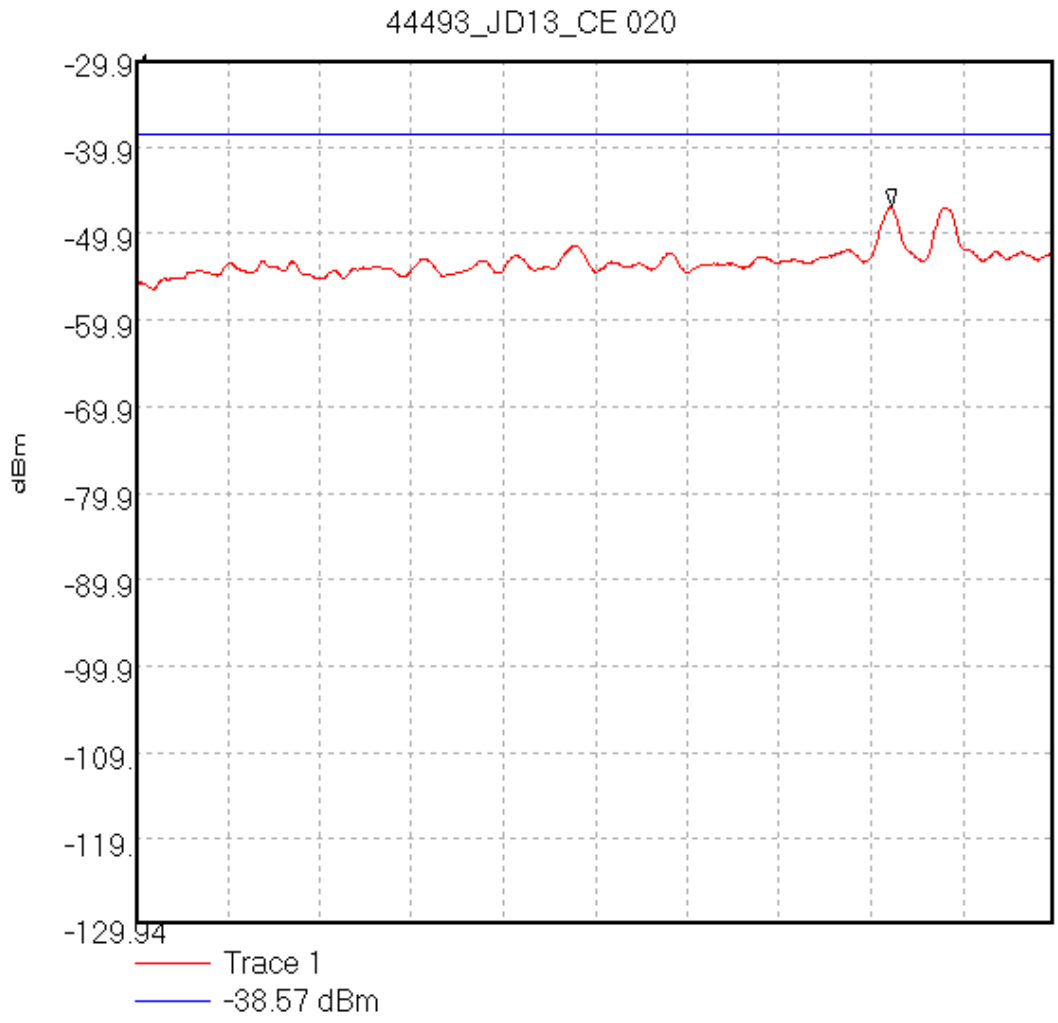
GPH\44493_JD13_CE\015
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 10.0 GHz; Stop 18.0 GHz
Ref -30 dBm; Ref Offset 35.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 14.044444 GHz, -52.42 dBm
Display Line: -38.57 dBm;
08/07/2003 19:43:22

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

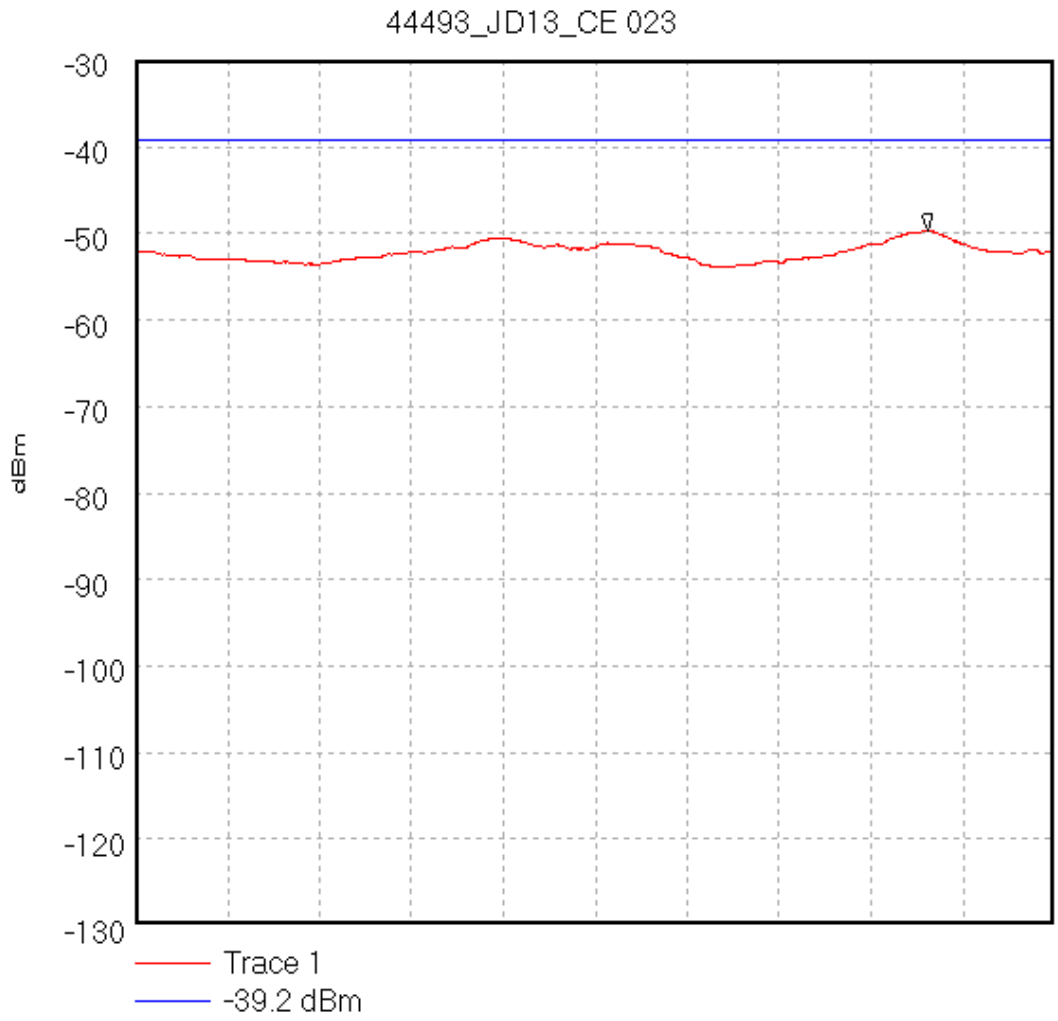
GPH\44493_JD13_CE\020
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 18.0 GHz; Stop 25.5 GHz
Ref -29.94 dBm; Ref Offset 41.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 24.166667 GHz, -46.8 dBm
Display Line: -38.57 dBm;
08/07/2003 19:48:12

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

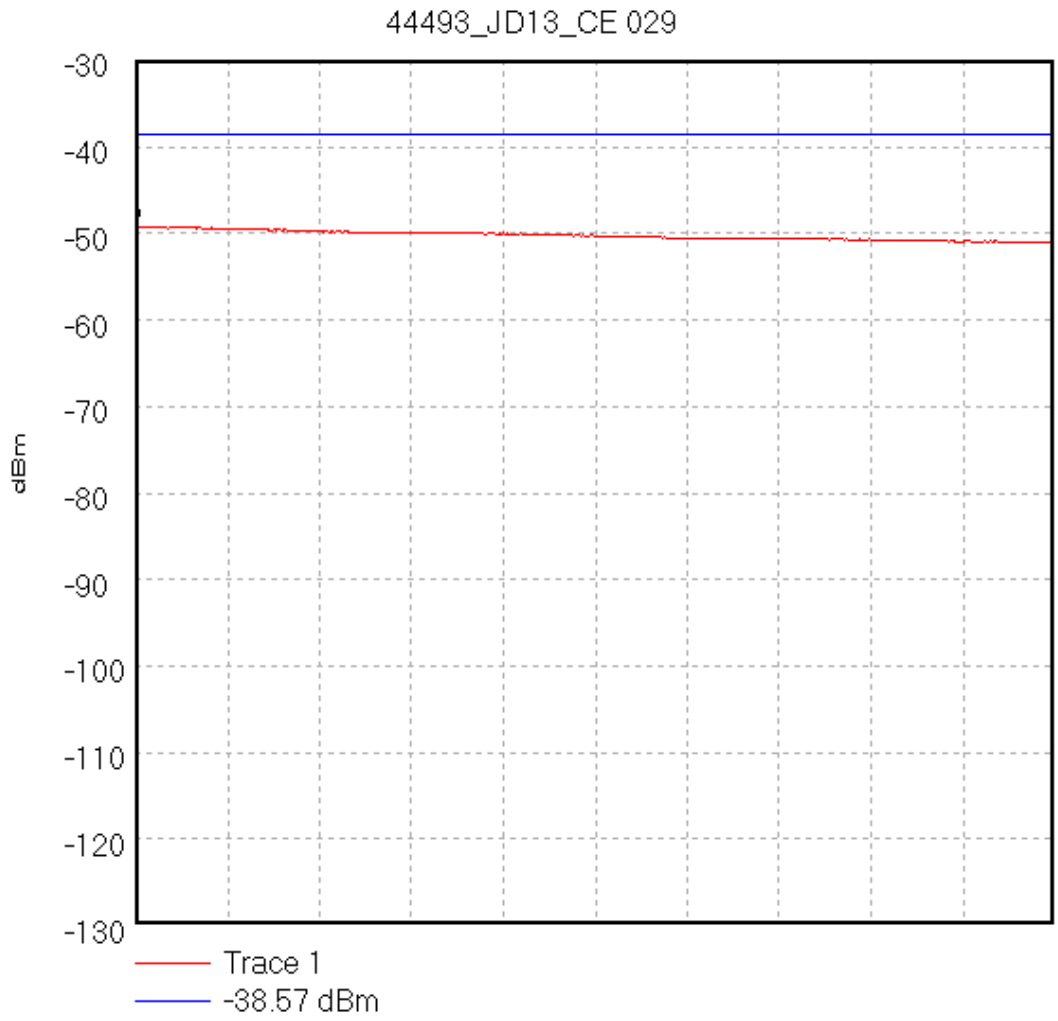
GPH\44493_JD13_CE\023
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 25.5 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 40.9 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 26.362222 GHz, -49.68 dBm
Display Line: -39.2 dBm;
08/07/2003 19:53:17

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

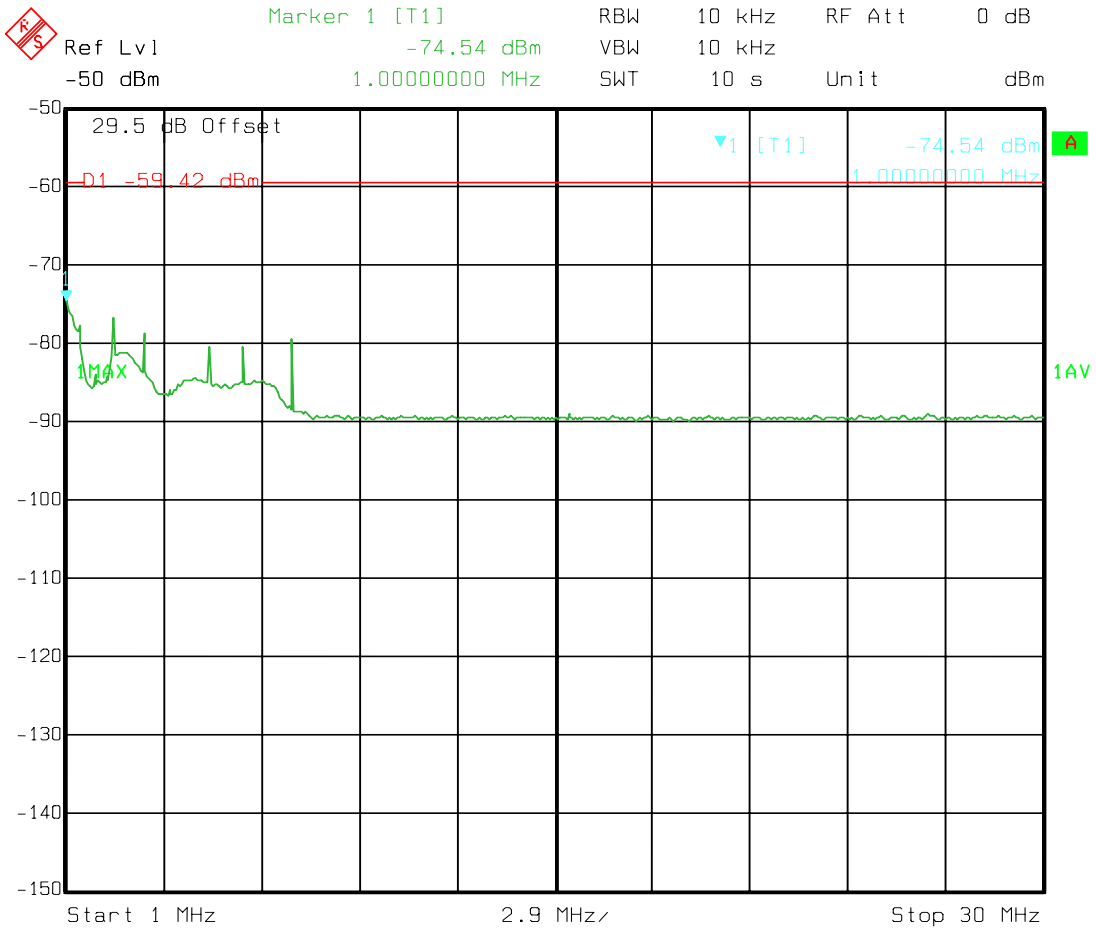
GPH\44493_JD13_CE\029
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Bottom Channel.



Start 26.5 GHz; Stop 27.0 GHz
Ref -30 dBm; Ref Offset 35.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 130.0 S
Peak 26.5 GHz, -49.33 dBm
Display Line: -38.57 dBm;
09/07/2003 10:14:57

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

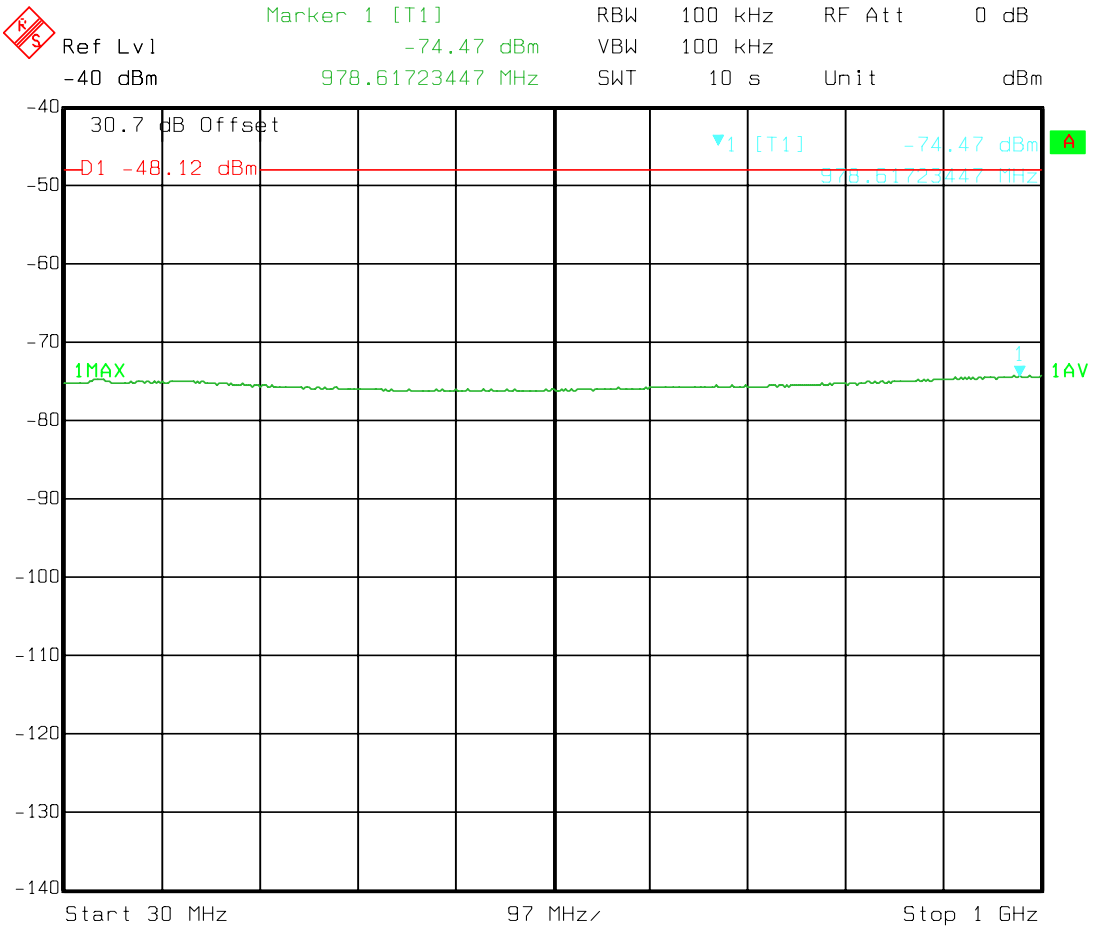
GPH\44493JD13_FCC_CE_003
Conducted Emissions, Middle Channel (1 MHz to 30 MHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_003
Date: 9.JUL.2003 13:26:01

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

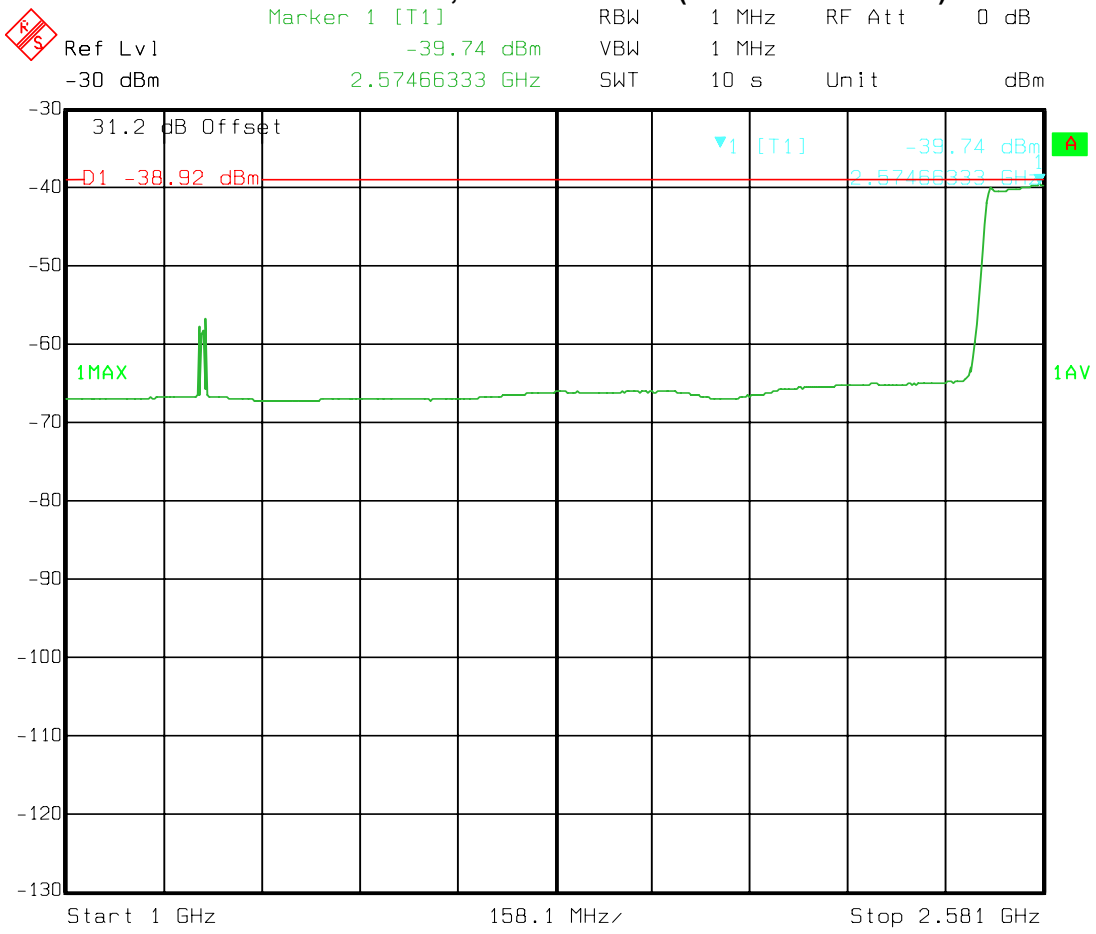
GPH\44493JD13_FCC_CE_006
Conducted Emissions, Middle Channel (30 MHz to 1 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_006
Date: 9.JUL.2003 13:21:45

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

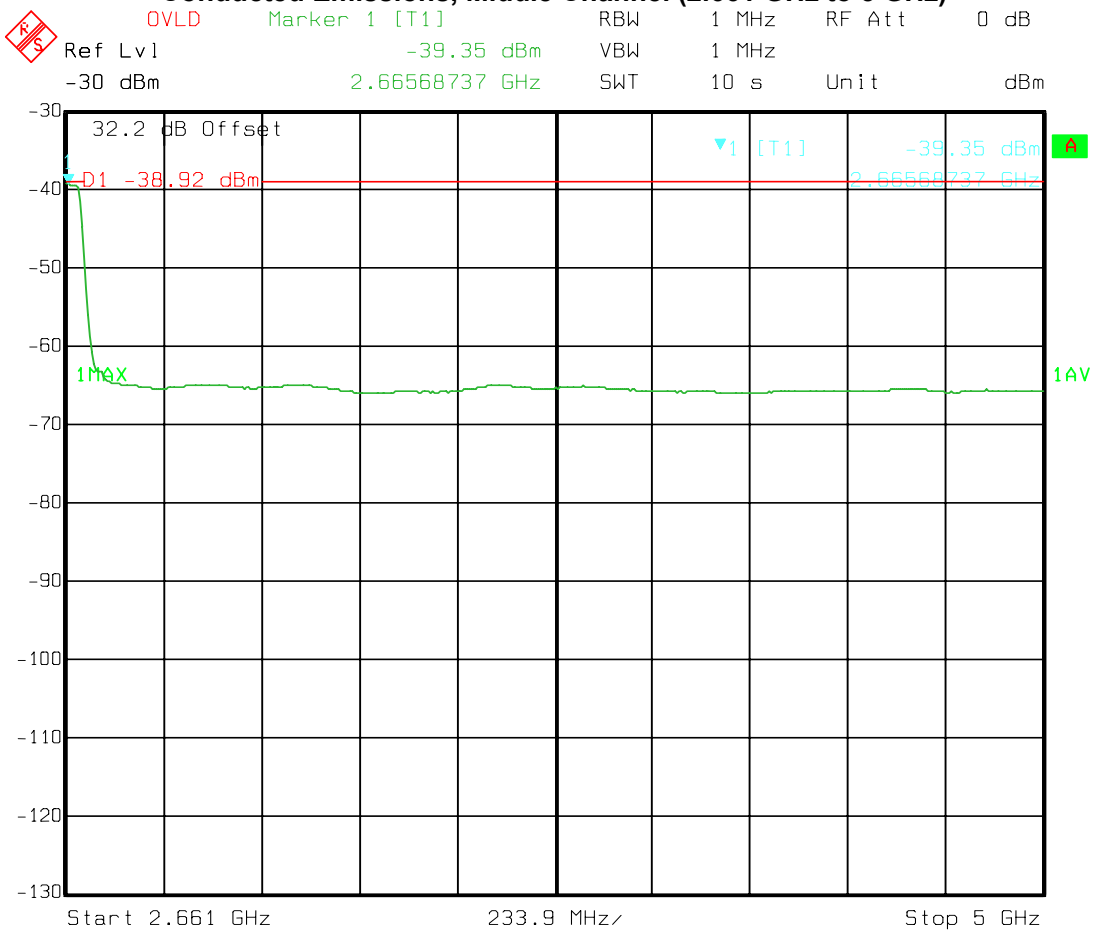
GPH\44493JD13_FCC_CE_011
Conducted Emissions, Middle Channel (1 GHz to 2.581 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_011
Date: 9.JUL.2003 13:39:27

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

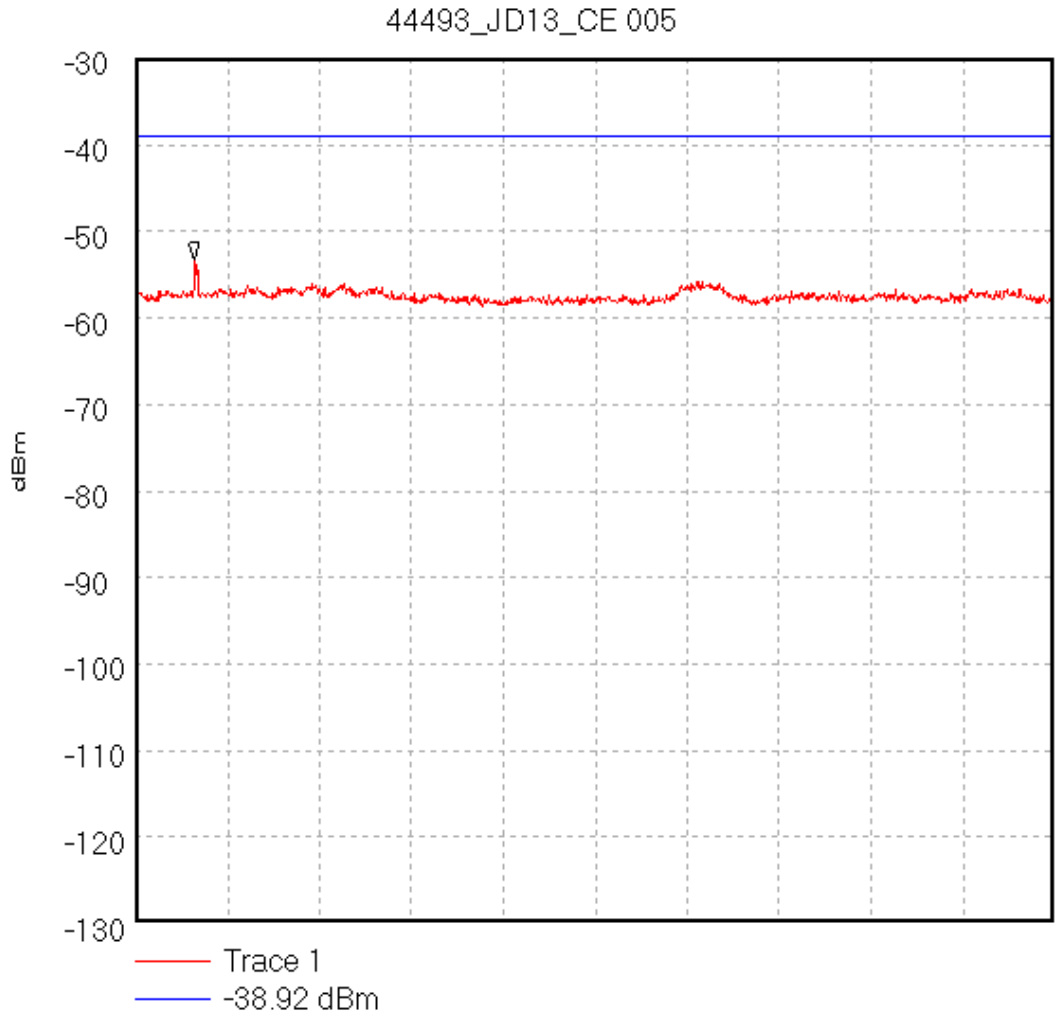
GPH\44493JD13_FCC_CE_013
Conducted Emissions, Middle Channel (2.661 GHz to 5 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_013
Date: 9.JUL.2003 13:45:04

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

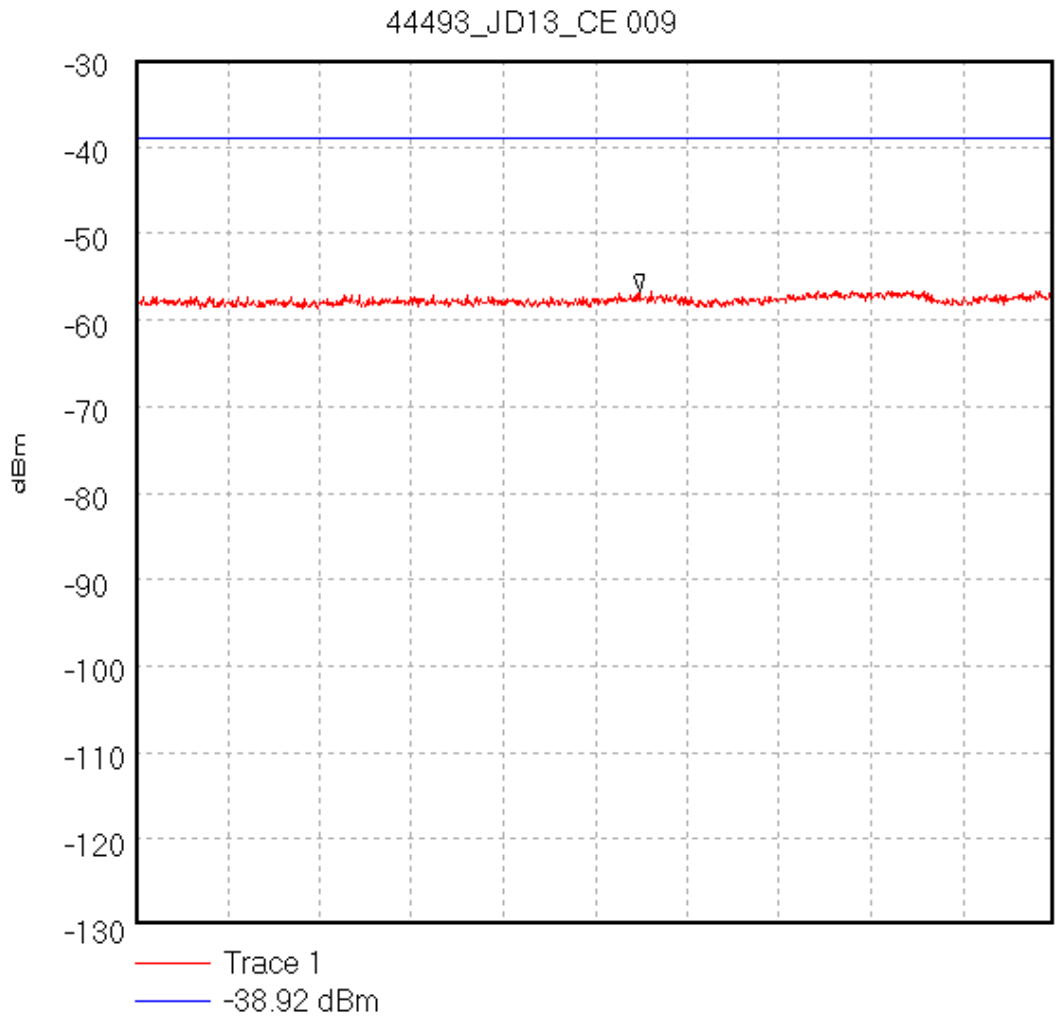
GPH\44493_JD13_CE\005
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 5.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 10.8 S
Peak 5.193333 GHz, -53.33 dBm
Display Line: -38.92 dBm;
08/07/2003 14:19:33

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

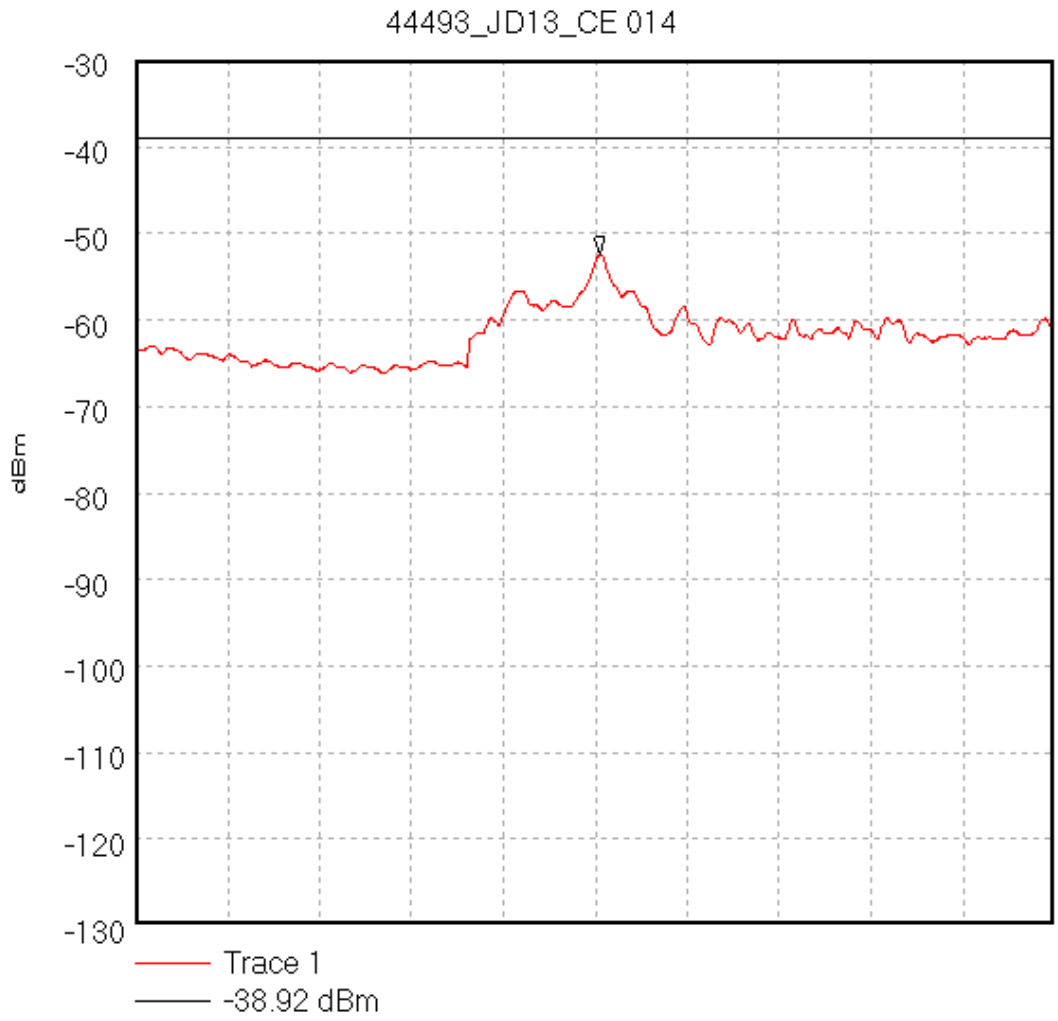
GPH\44493_JD13_CE\009
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 8.0 GHz; Stop 10.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 880.0 mS
Peak 9.097778 GHz, -56.63 dBm
Display Line: -38.92 dBm;
08/07/2003 14:26:06

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

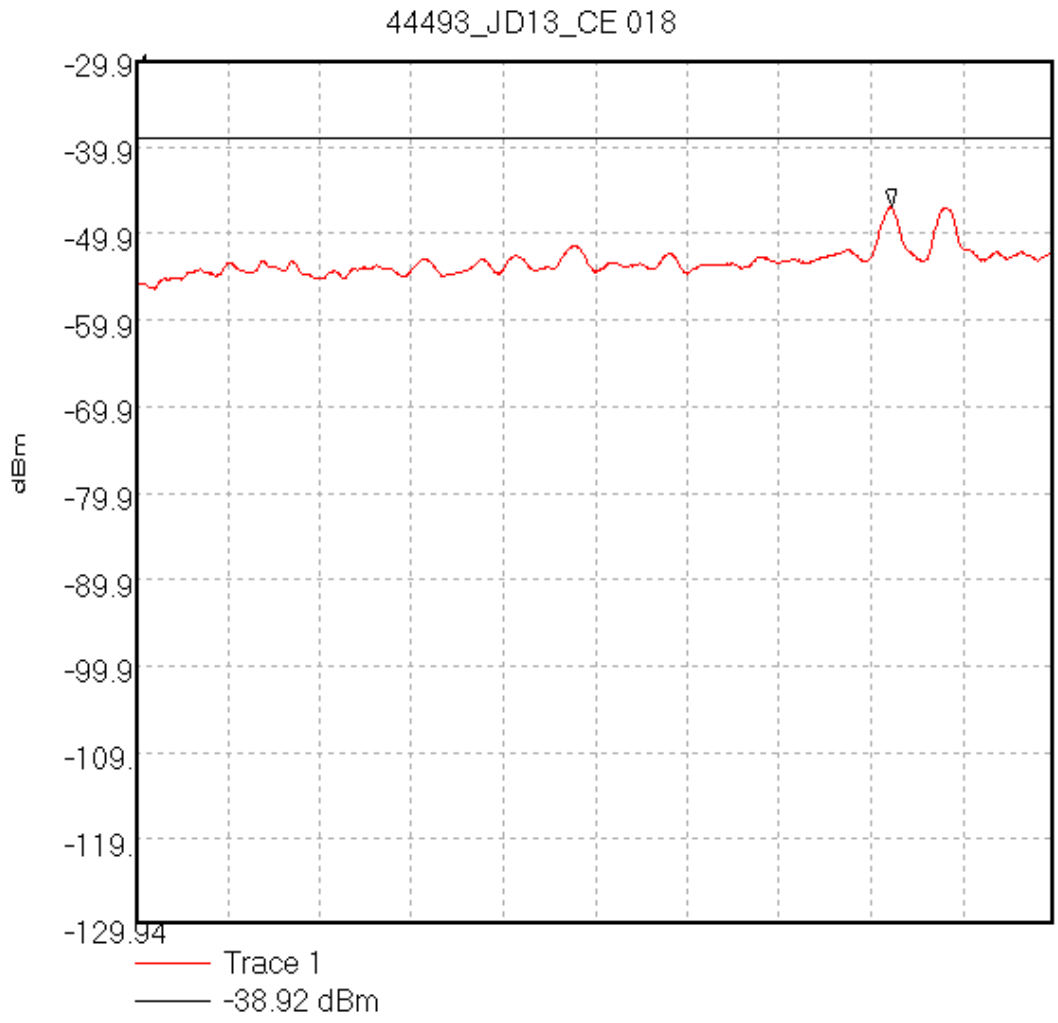
GPH\44493_JD13_CE\014
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 10.0 GHz; Stop 18.0 GHz
Ref -30 dBm; Ref Offset 35.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 14.044444 GHz, -52.42 dBm
Display Line: -38.92 dBm;
08/07/2003 19:42:01

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

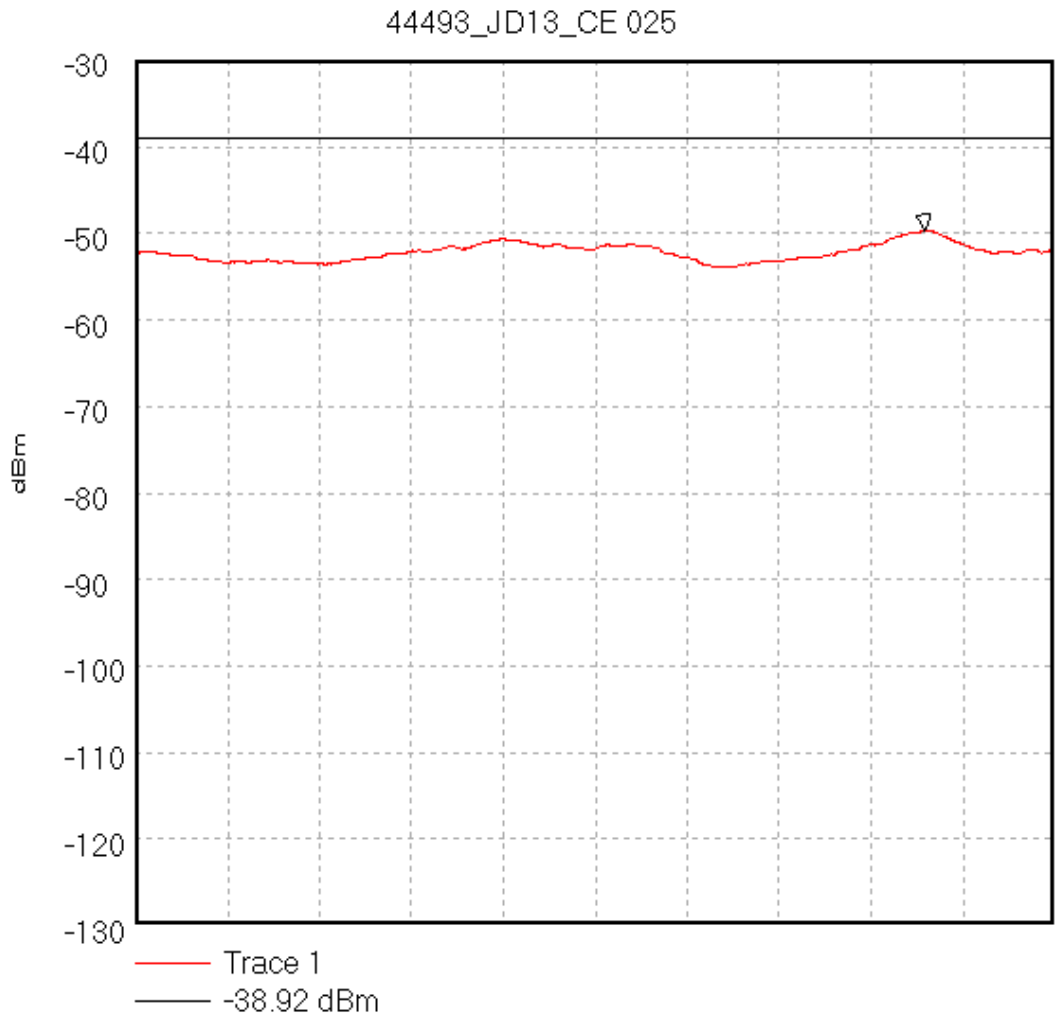
GPH\44493_JD13_CE\018
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 18.0 GHz; Stop 25.5 GHz
Ref -29.94 dBm; Ref Offset 41.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 24.166667 GHz, -46.82 dBm
Display Line: -38.92 dBm;
08/07/2003 19:47:15

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

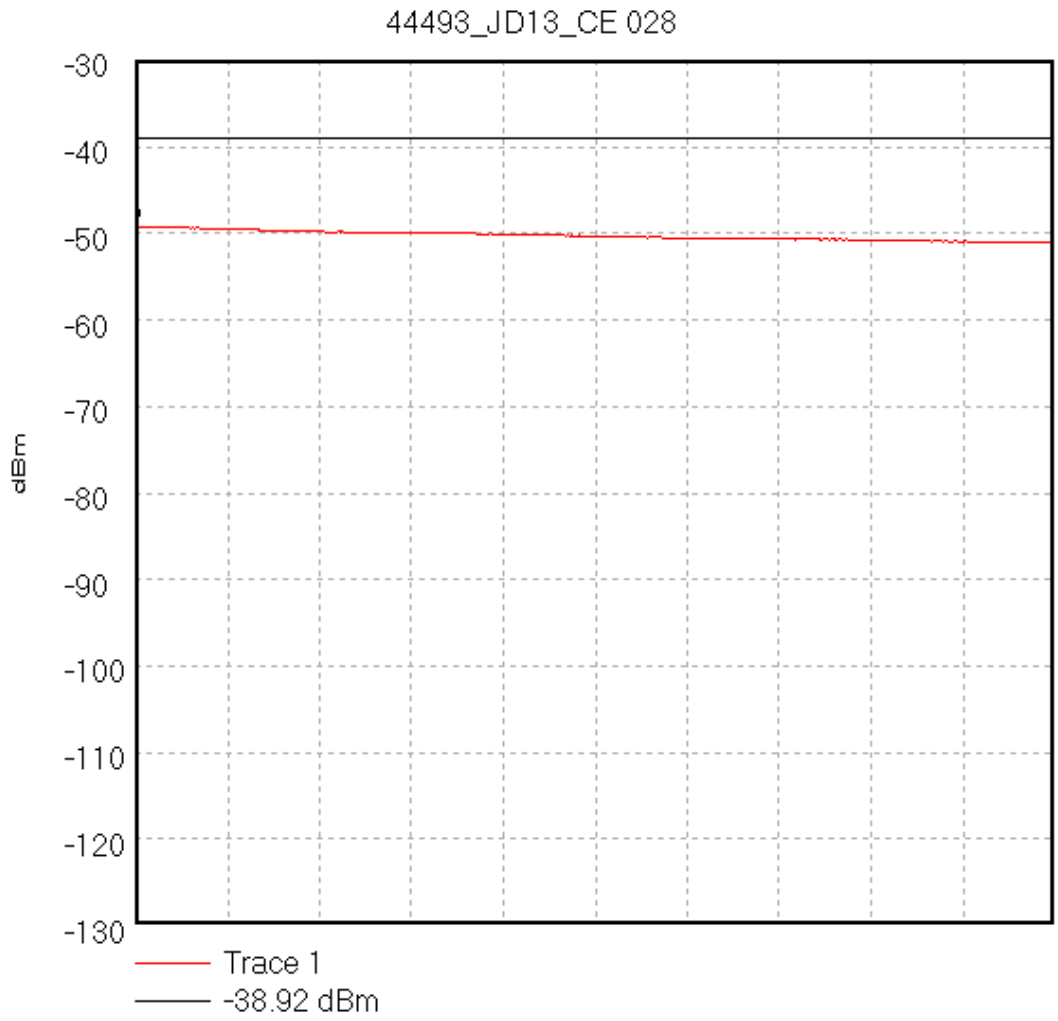
GPH\44493_JD13_CE\025
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 25.5 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 40.9 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 26.358889 GHz, -49.7 dBm
Display Line: -38.92 dBm;
08/07/2003 19:54:18

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

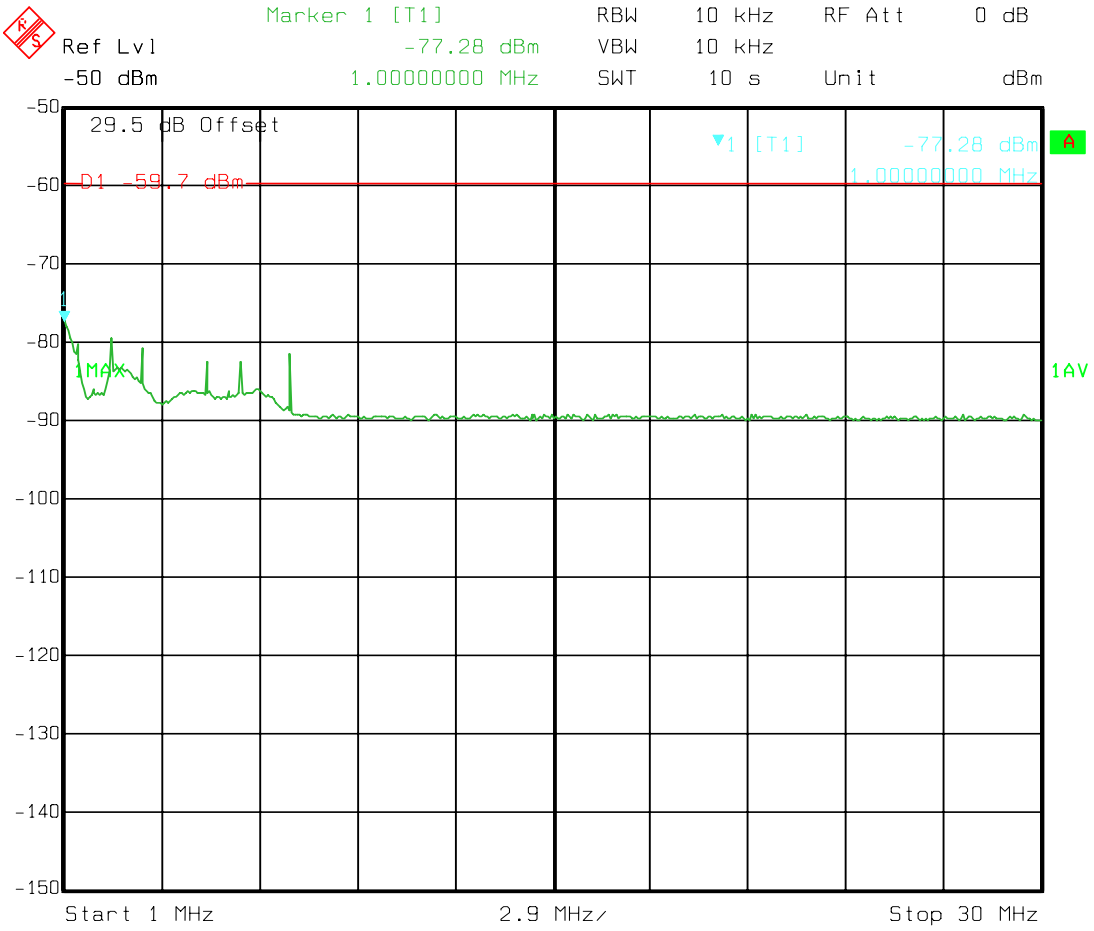
GPH\44493_JD13_CE\028
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Middle Channel.



Start 26.5 GHz; Stop 27.0 GHz
Ref -30 dBm; Ref Offset 35.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 130.0 S
Peak 26.5 GHz, -49.33 dBm
Display Line: -38.92 dBm;
09/07/2003 10:11:44

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

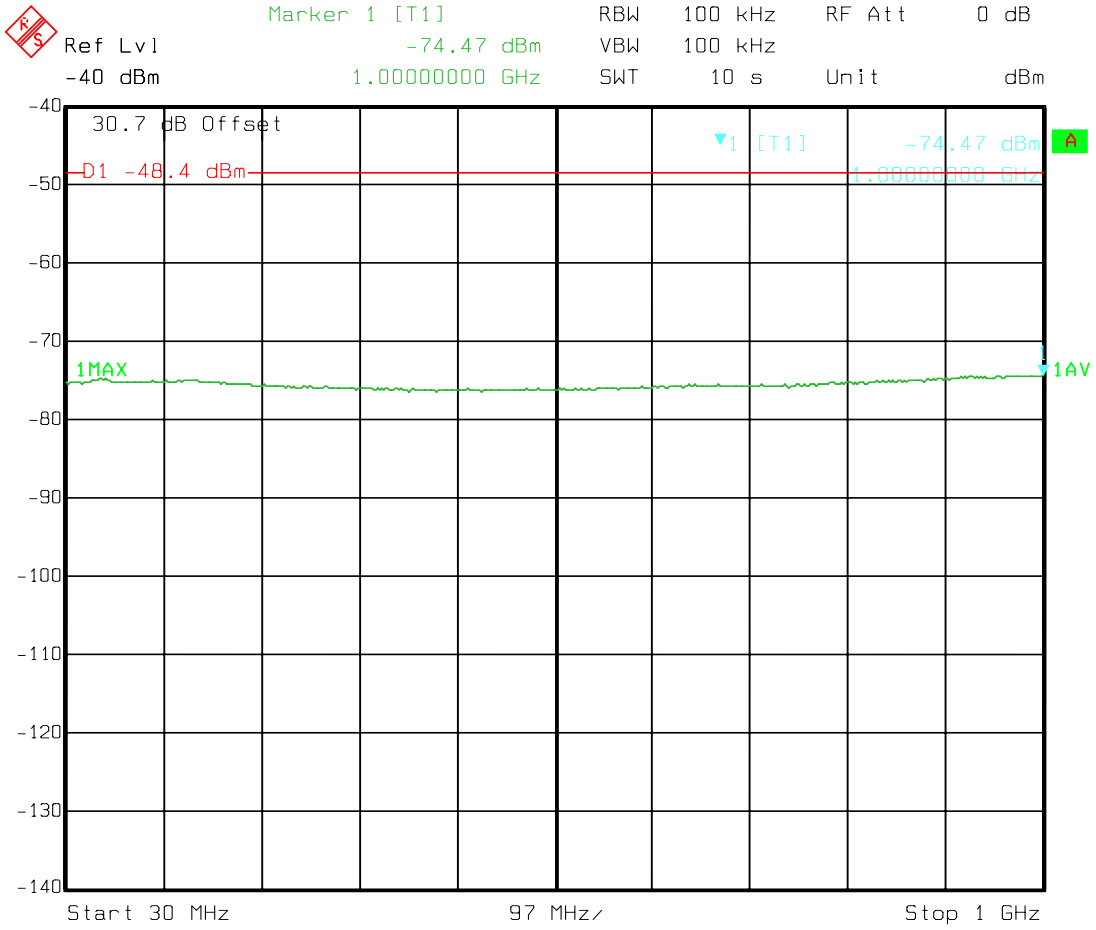
GPH\44493JD13_FCC_CE_001
Conducted Emissions, Top Channel (1 MHz to 30 MHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_001
Date: 9.JUL.2003 13:28:47

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

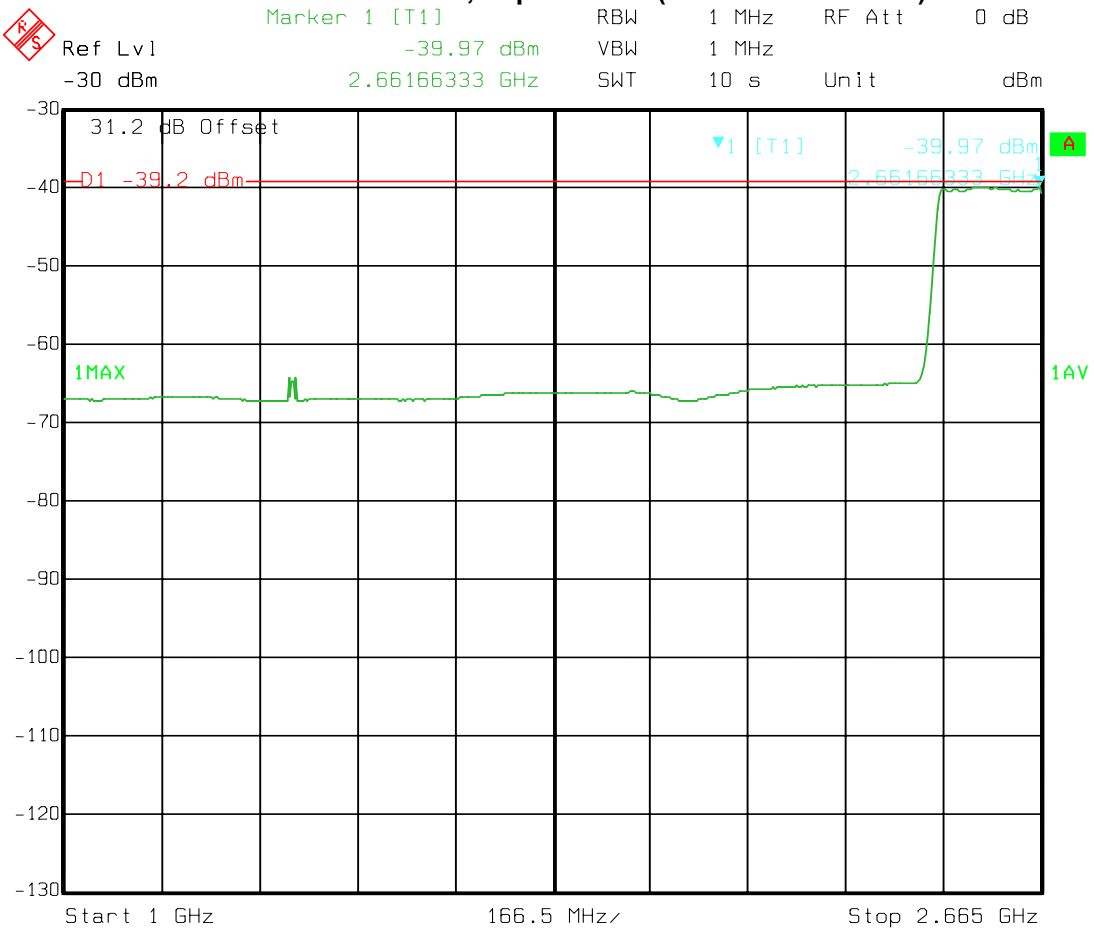
GPH\44493JD13_FCC_CE_008
Conducted Emissions, Top Channel (30 MHz to 1 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_008
Date: 9.JUL.2003 13:19:16

Test Of: IPWireless (UK) Ltd.
Node B V2 Model: HZ
To: FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002

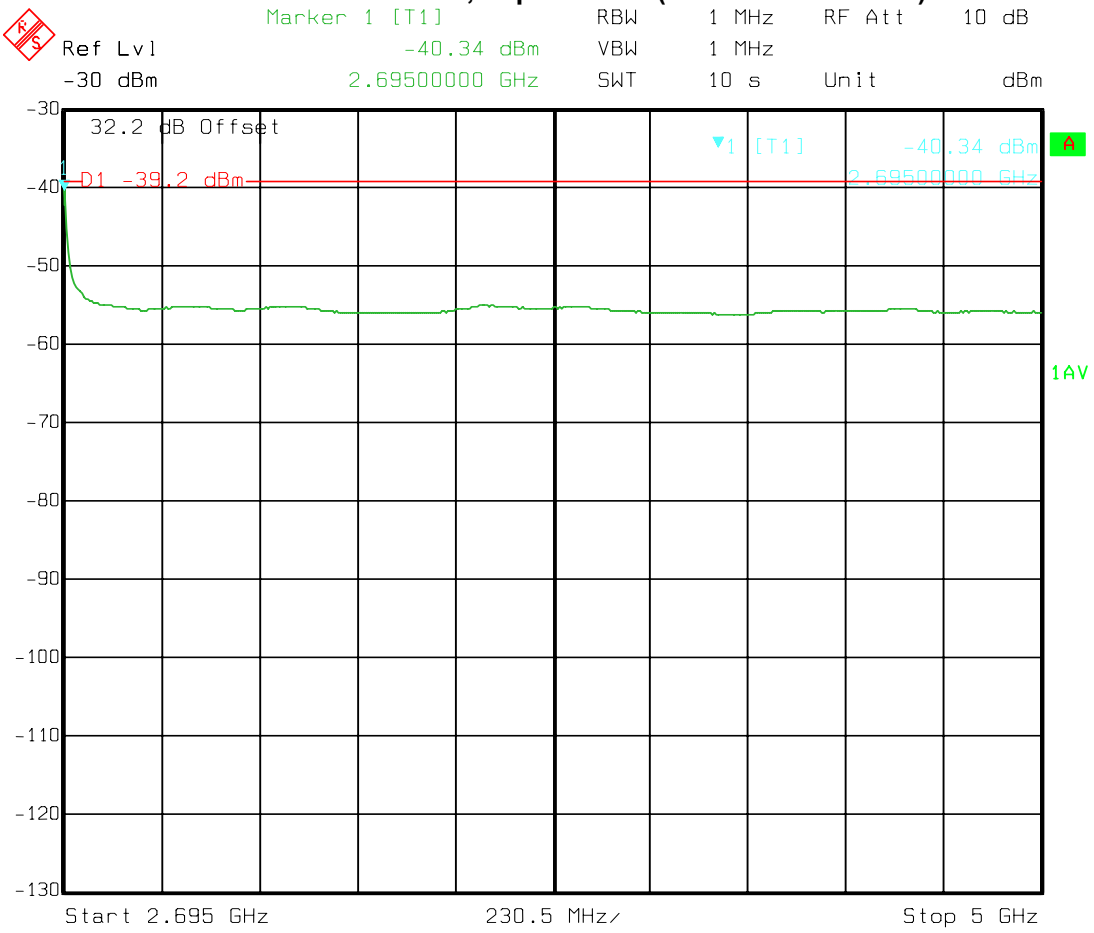
GPH\44493JD13_FCC_CE_009
Conducted Emissions, Top Channel (1 GHz to 2.665 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_009
Date: 9.JUL.2003 13:36:34

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

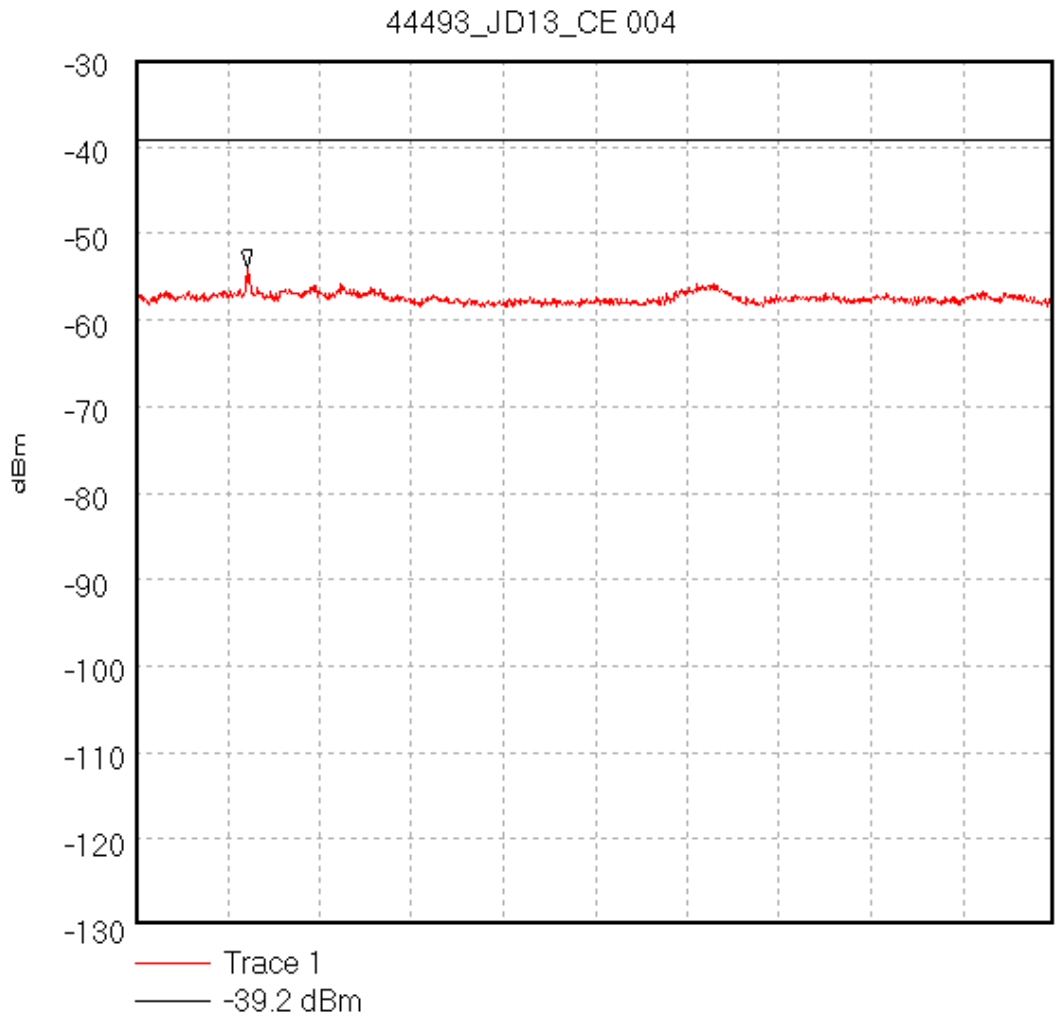
GPH\44493JD13_FCC_CE_014
Conducted Emissions, Top Channel (2.695 GHz to 5 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 21.908
Comment A: 44493JD13_FCC_CE_014
Date: 9.JUL.2003 13:49:44

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

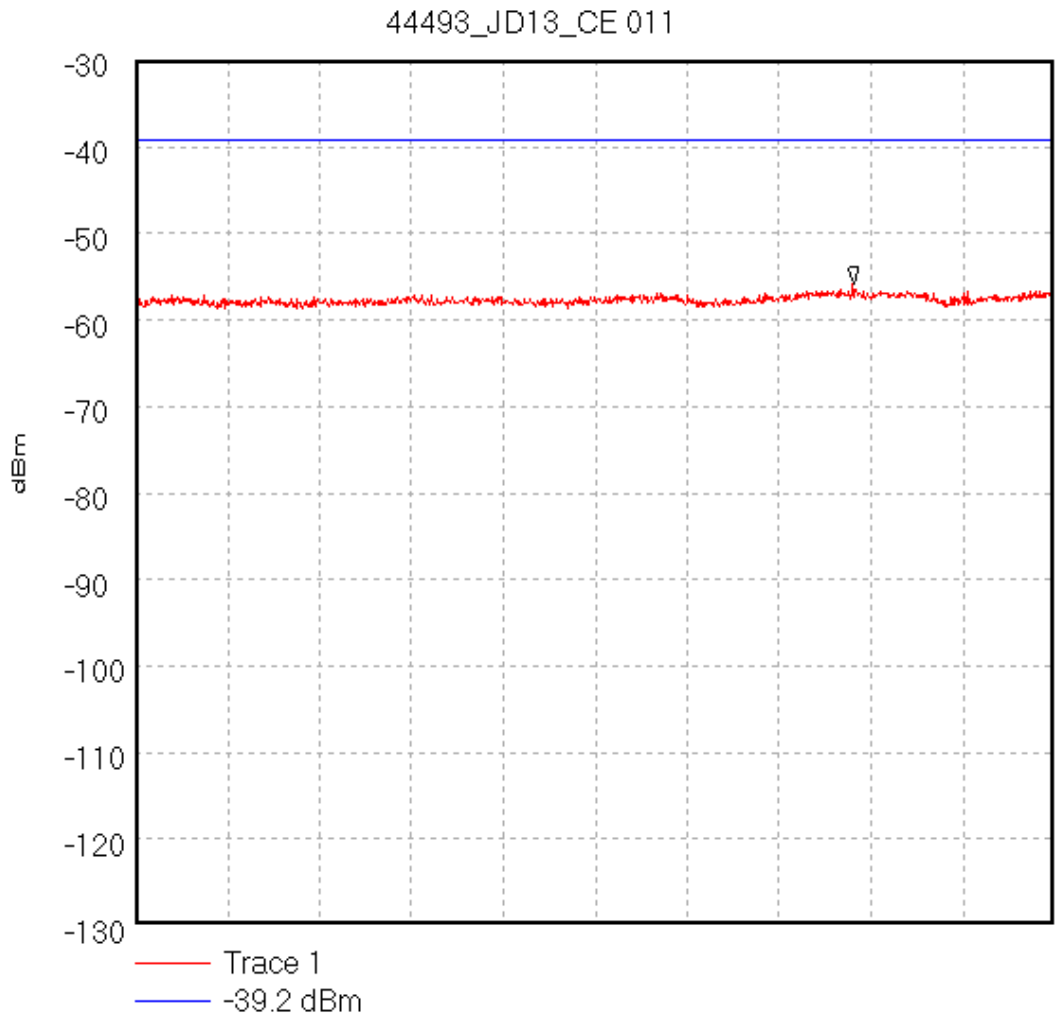
GPH\44493_JD13_CE\004
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 5.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 10.8 S
Peak 5.363333 GHz, -53.94 dBm
Display Line: -39.2 dBm;
08/07/2003 14:18:35

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

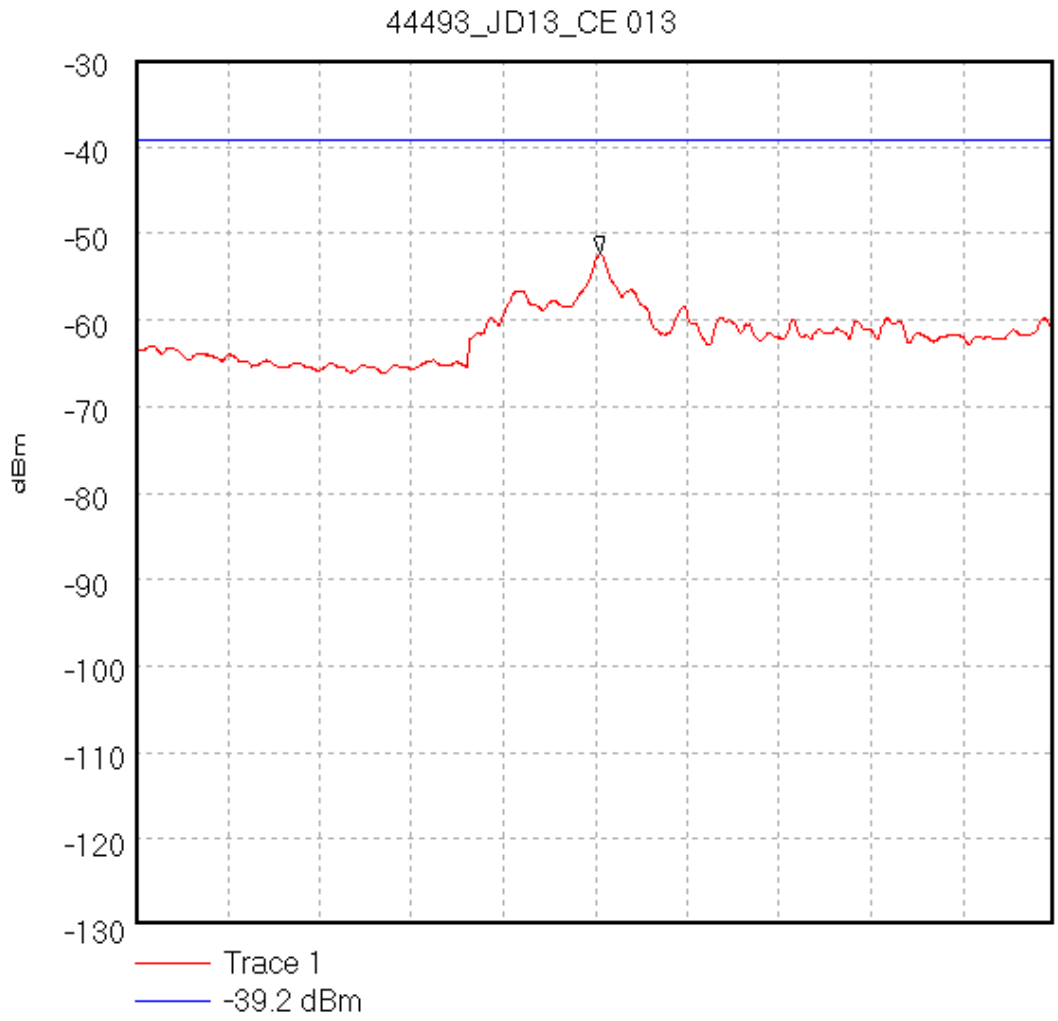
GPH\44493_JD13_CE\011
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 8.0 GHz; Stop 10.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 880.0 mS
Peak 9.562222 GHz, -55.87 dBm
Display Line: -39.2 dBm;
08/07/2003 14:27:28

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

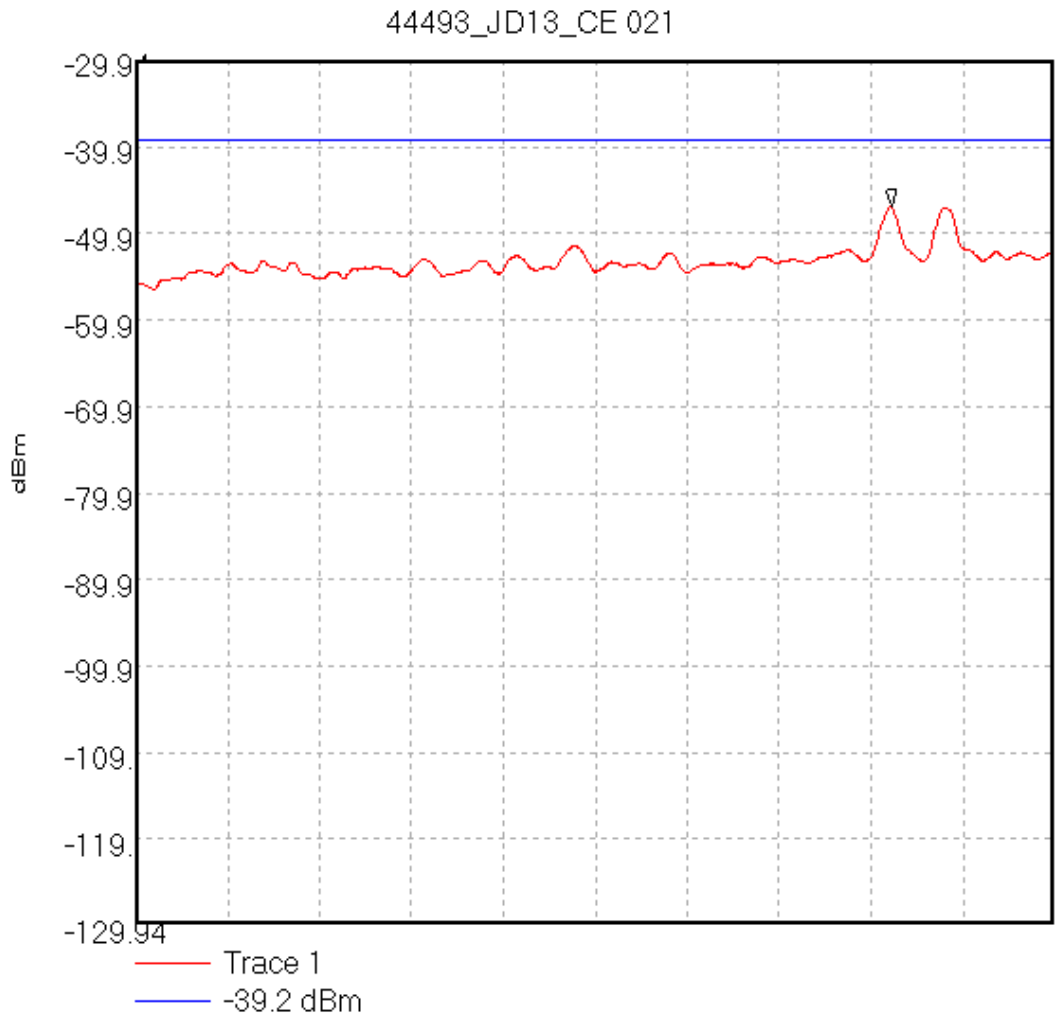
GPH\44493_JD13_CE\013
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 10.0 GHz; Stop 18.0 GHz
Ref -30 dBm; Ref Offset 35.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 14.044444 GHz, -52.37 dBm
Display Line: -39.2 dBm;
08/07/2003 19:40:47

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

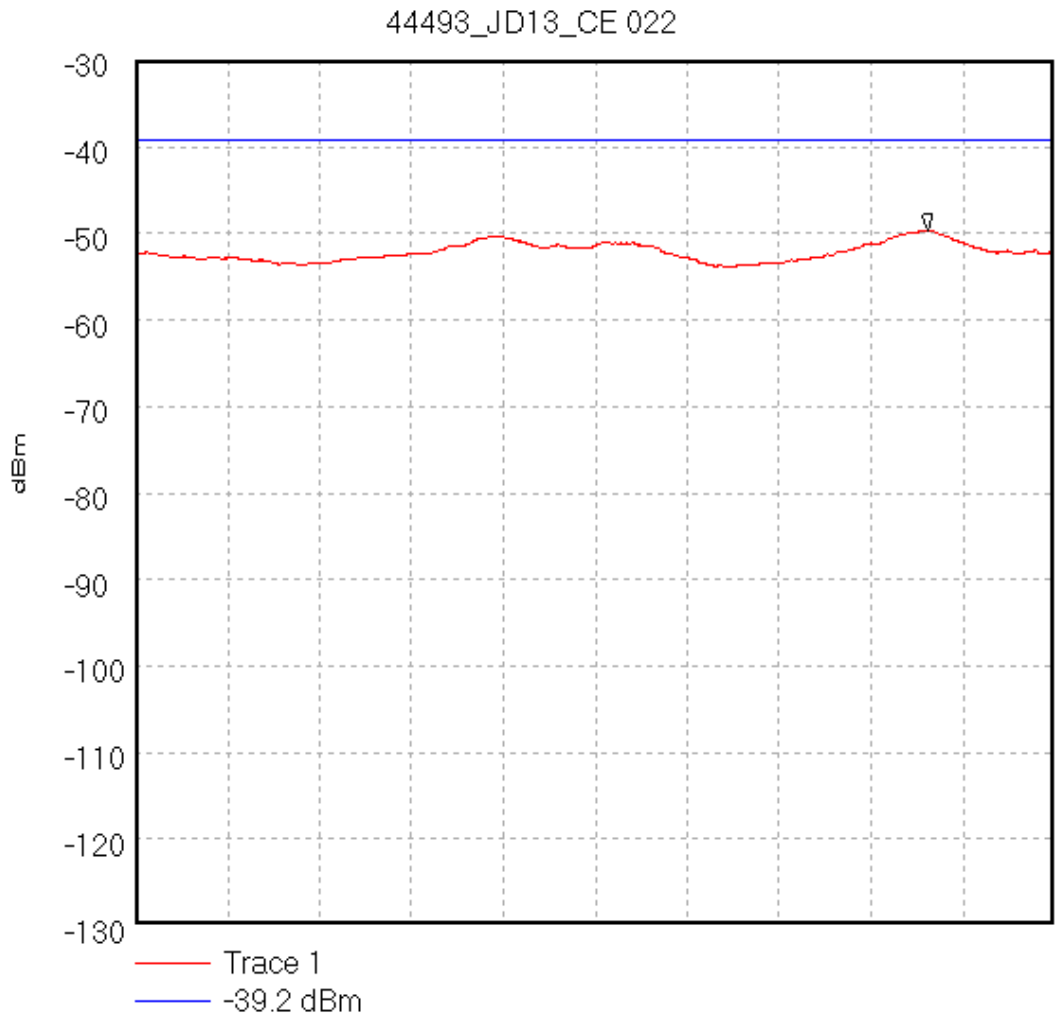
GPH\44493_JD13_CE\021
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 18.0 GHz; Stop 25.5 GHz
Ref -29.94 dBm; Ref Offset 41.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 24.175 GHz, -46.82 dBm
Display Line: -39.2 dBm;
08/07/2003 19:49:27

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

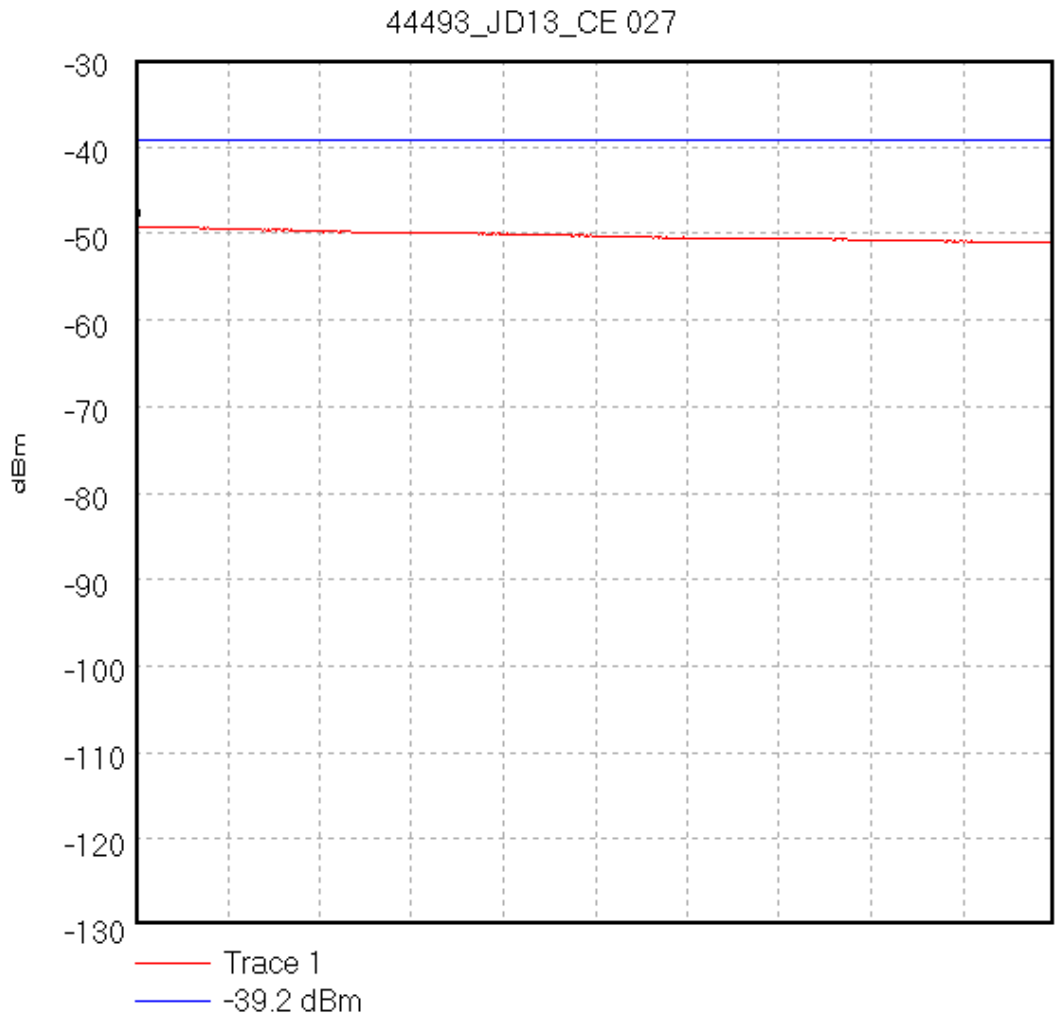
GPH\44493_JD13_CE\022
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 25.5 GHz; Stop 26.5 GHz
Ref -30 dBm; Ref Offset 40.9 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 26.362222 GHz, -49.68 dBm
Display Line: -39.2 dBm;
08/07/2003 19:52:34

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

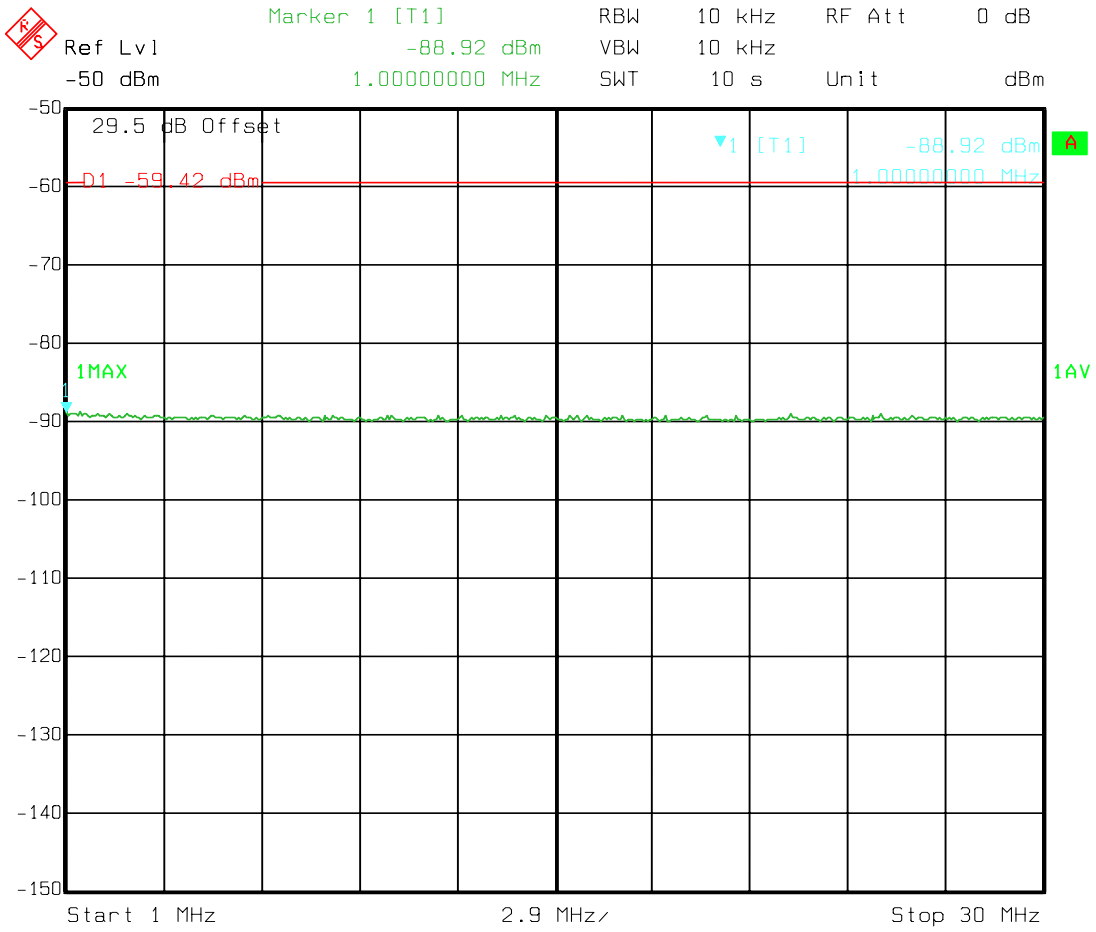
GPH\44493_JD13_CE\027
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Top Channel.



Start 26.5 GHz; Stop 27.0 GHz
Ref -30 dBm; Ref Offset 35.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 130.0 S
Peak 26.5 GHz, -49.33 dBm
Display Line: -39.2 dBm;
09/07/2003 10:08:45

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

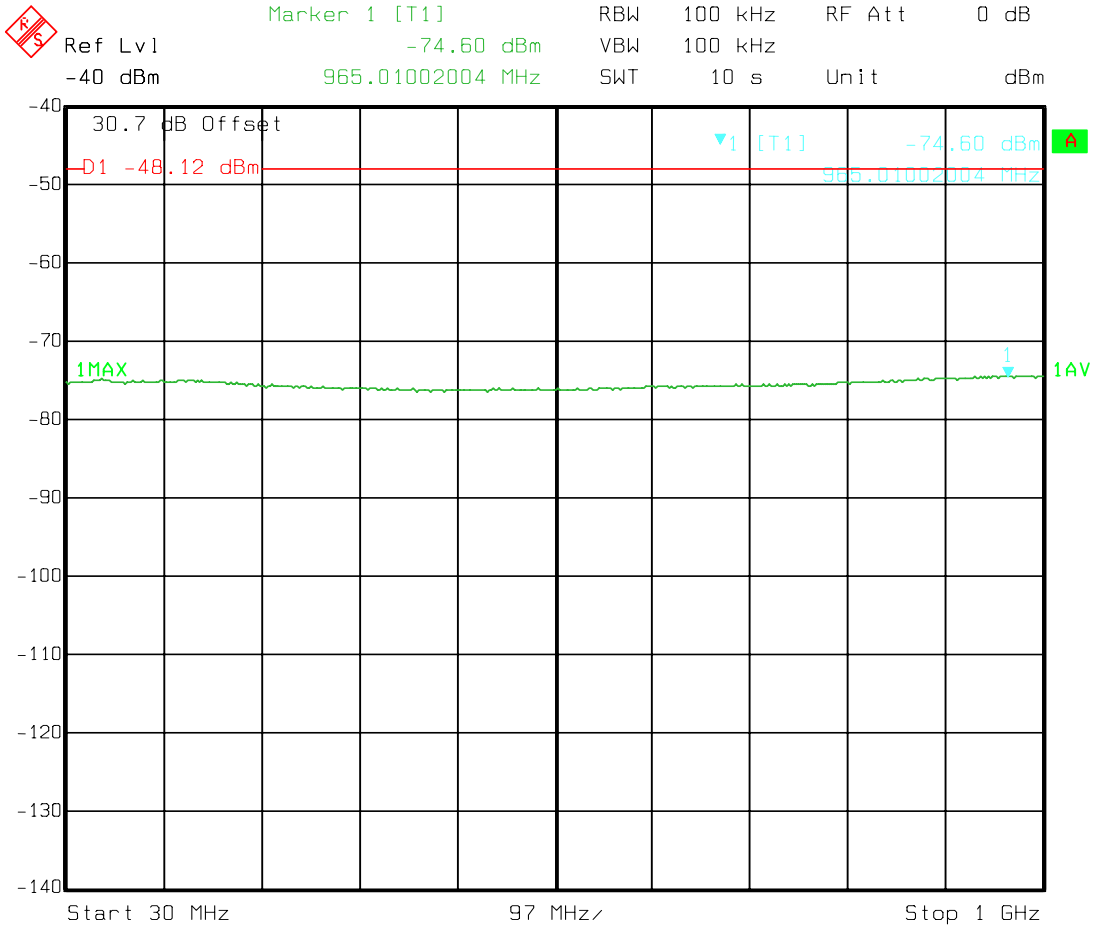
GPH\44493JD13_FCC_CE_004
Conducted Emissions, Receive Mode (1 MHz to 30 MHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_004
Date: 9.JUL.2003 13:24:05

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

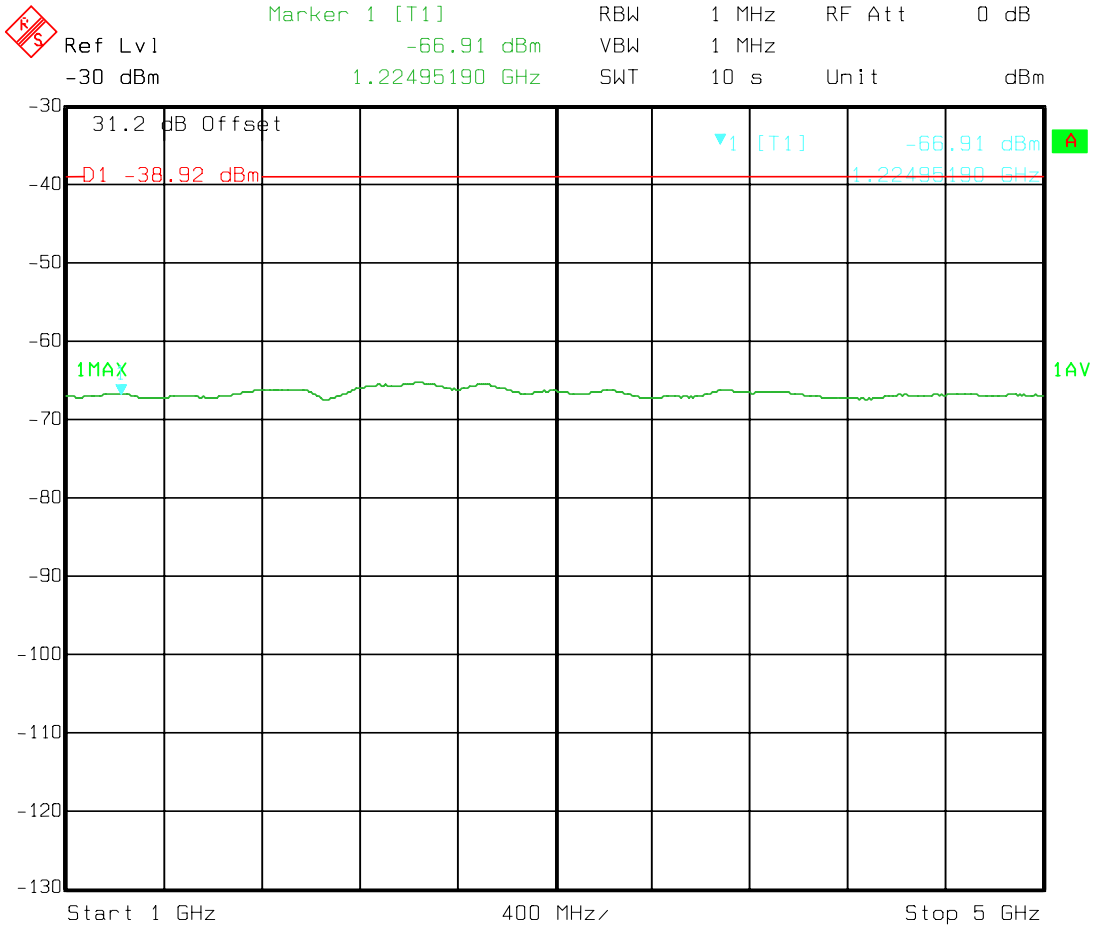
GPH\44493JD13_FCC_CE_005
Conducted Emissions, Receive Mode (30 MHz to 1 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_005
Date: 9.JUL.2003 13:22:43

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

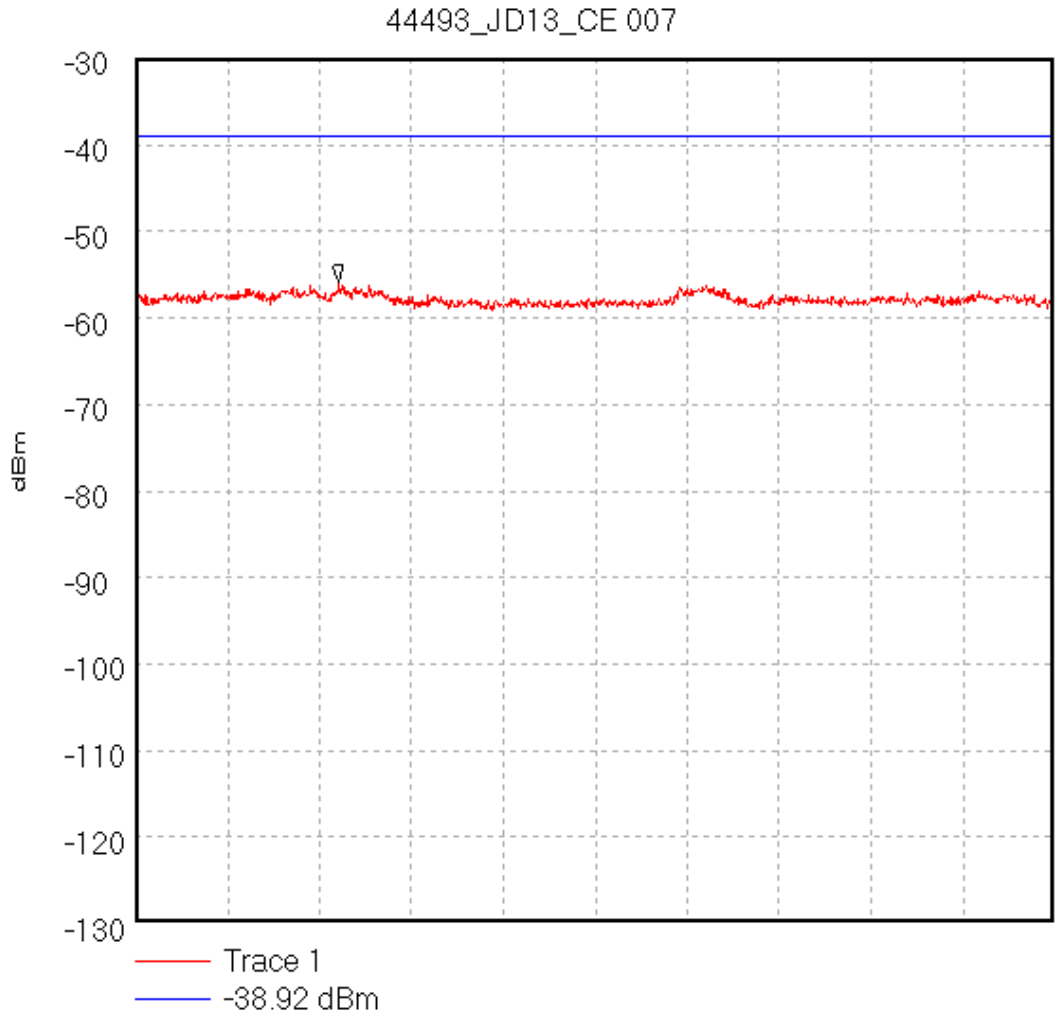
GPH\44493JD13_FCC_CE_012
Conducted Emissions, Receive Mode (1 GHz to 5 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_012
Date: 9.JUL.2003 13:41:29

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

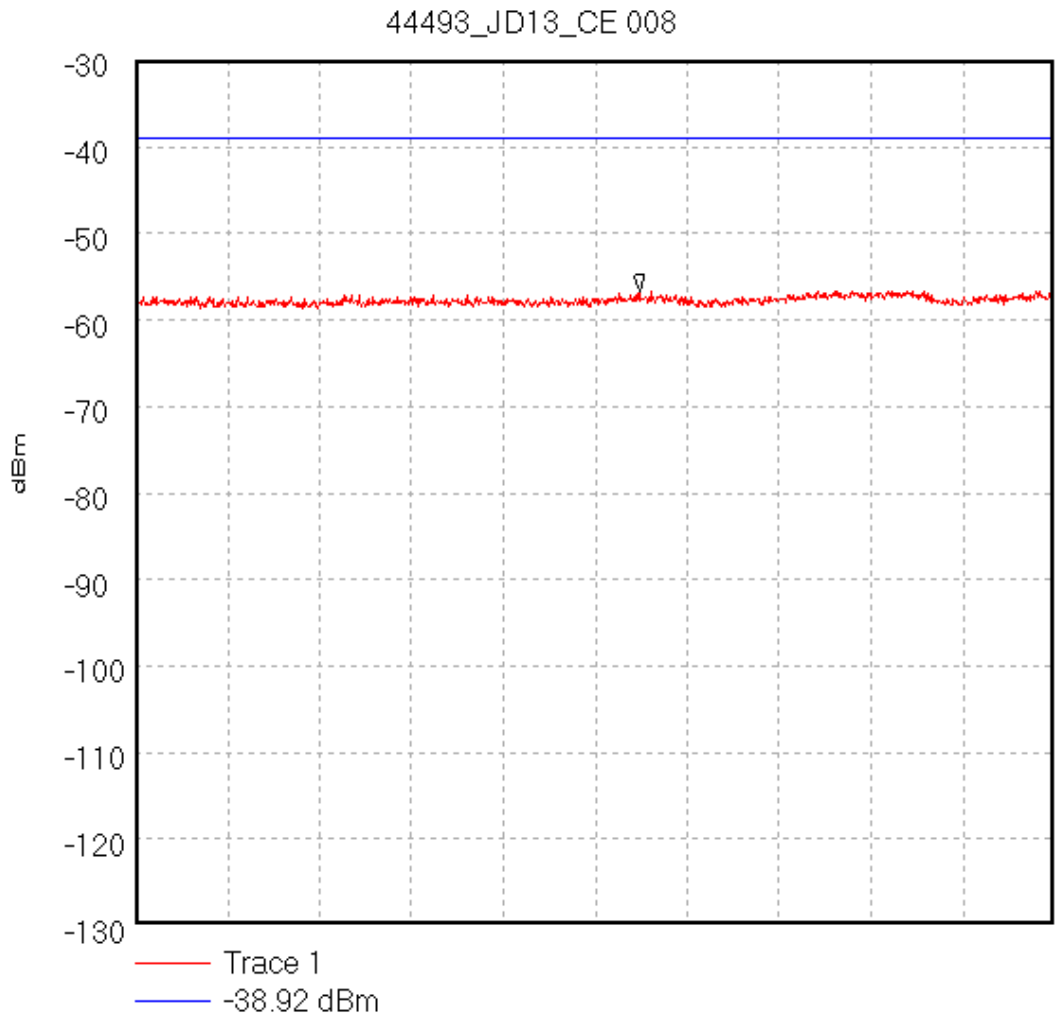
GPH\44493_JD13_CE\007
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Receive Middle Channel.



Start 5.0 GHz; Stop 8.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 1.32 S
Peak 5.663333 GHz, -55.87 dBm
Display Line: -38.92 dBm;
08/07/2003 14:22:44

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

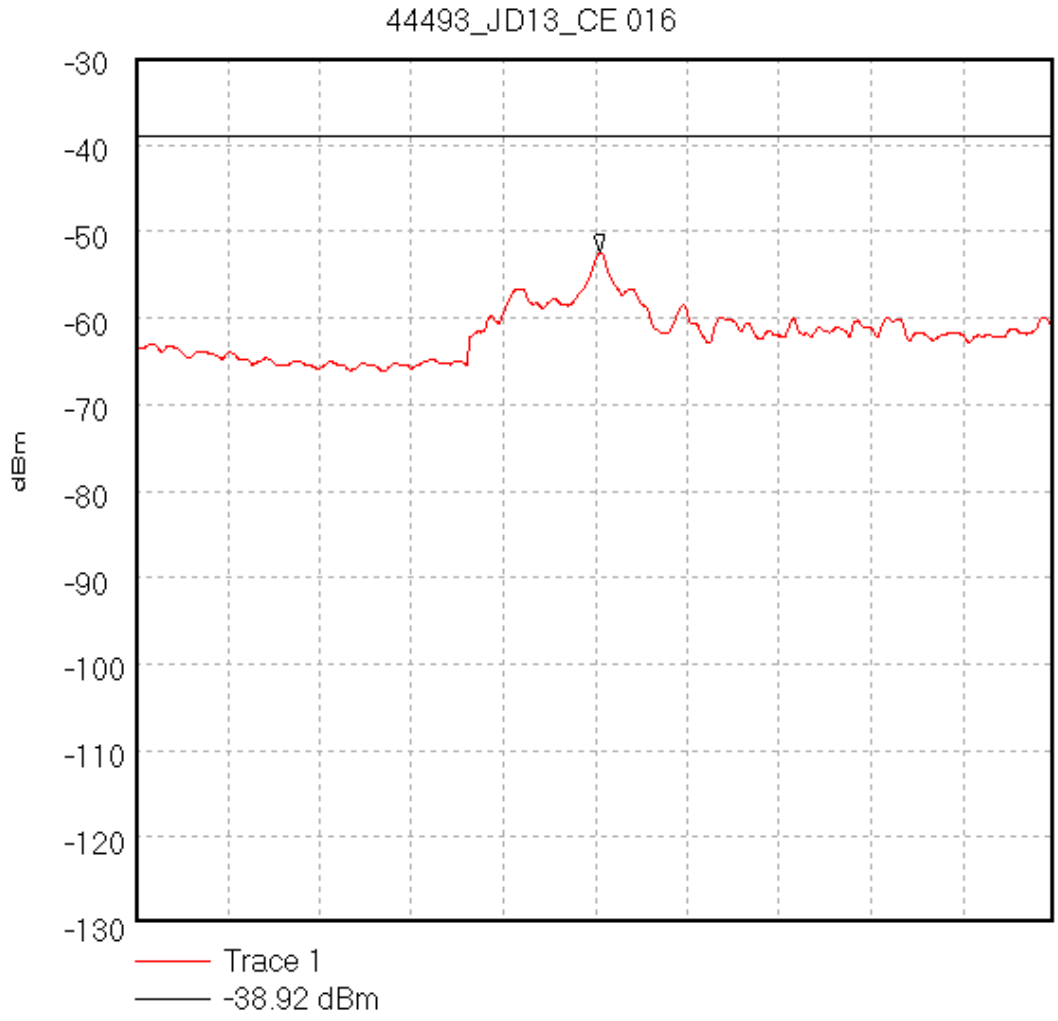
GPH\44493_JD13_CE\008
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Conducted Emissions. Operating at Receive Middle Channel.



Start 8.0 GHz; Stop 10.0 GHz
Ref -30 dBm; Ref Offset 44.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 10.0 kHz; Att 5 dB; Swp 880.0 mS
Peak 9.097778 GHz, -56.63 dBm
Display Line: -38.92 dBm;
08/07/2003 14:25:01

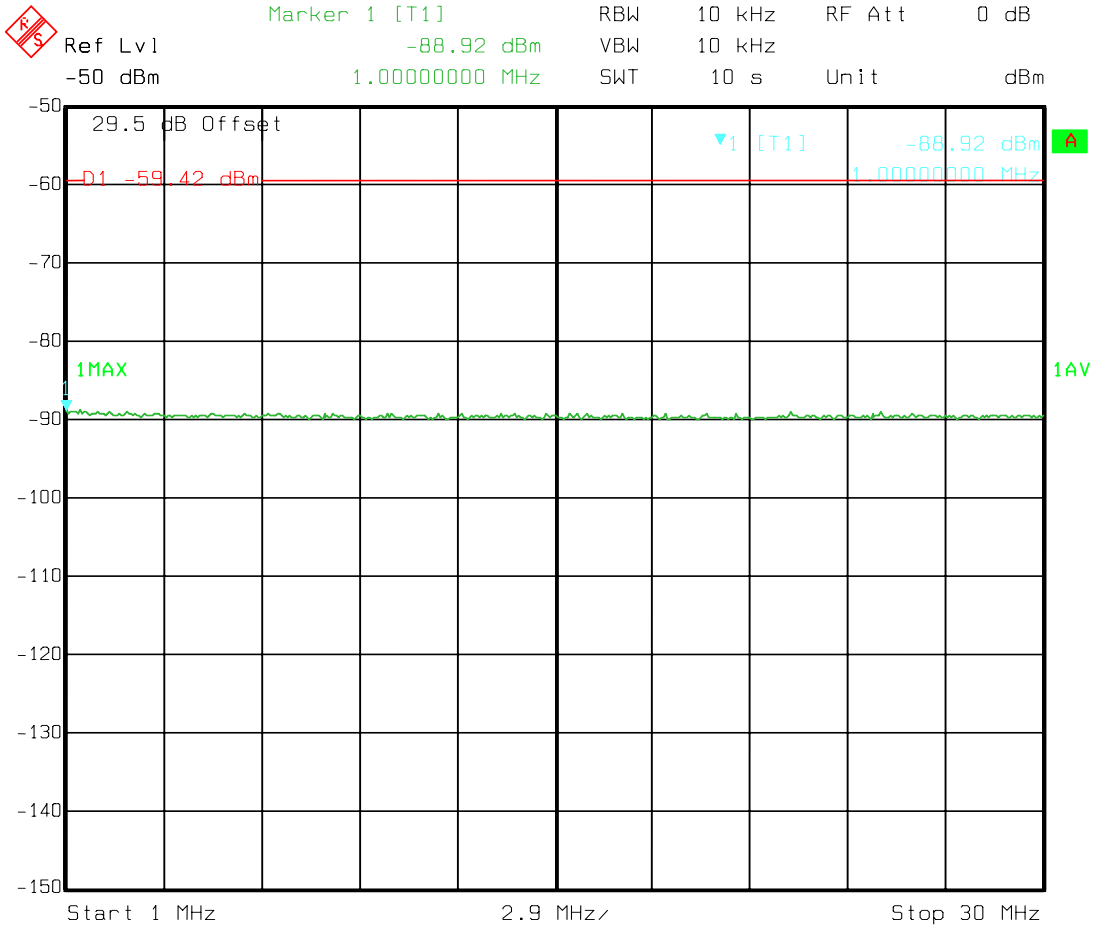
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_CE\016
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 21.908.
Conducted Emissions. Operating at Receive Middle Channel.



Start 10.0 GHz; Stop 18.0 GHz
Ref -30 dBm; Ref Offset 35.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 10.0 Hz; Att 0 dB; Swp 10.0 S
Peak 14.044444 GHz, -52.44 dBm
Display Line: -38.92 dBm;
08/07/2003 19:44:21

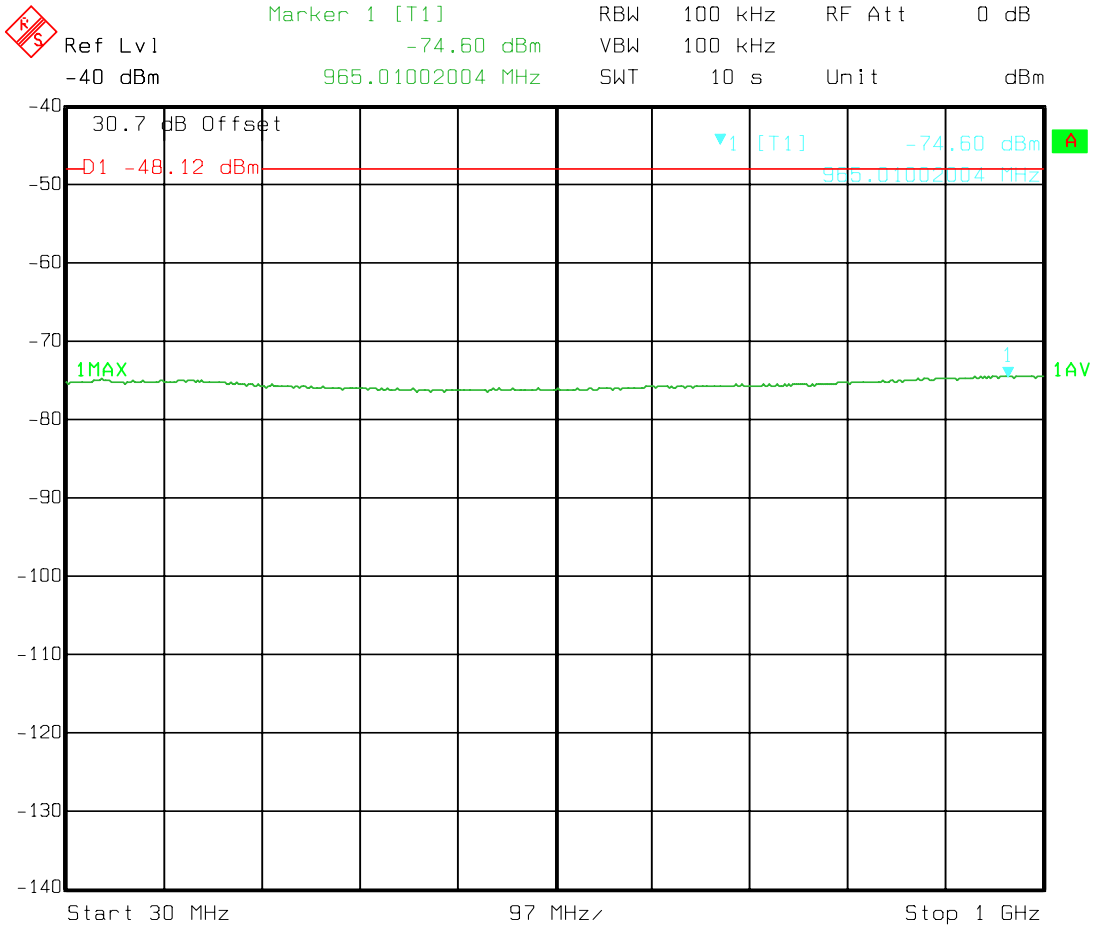
GPH\44493JD13_FCC_CE_004
Conducted Emissions, Receive Mode (1 MHz to 30 MHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_004
Date: 9.JUL.2003 13:24:05

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

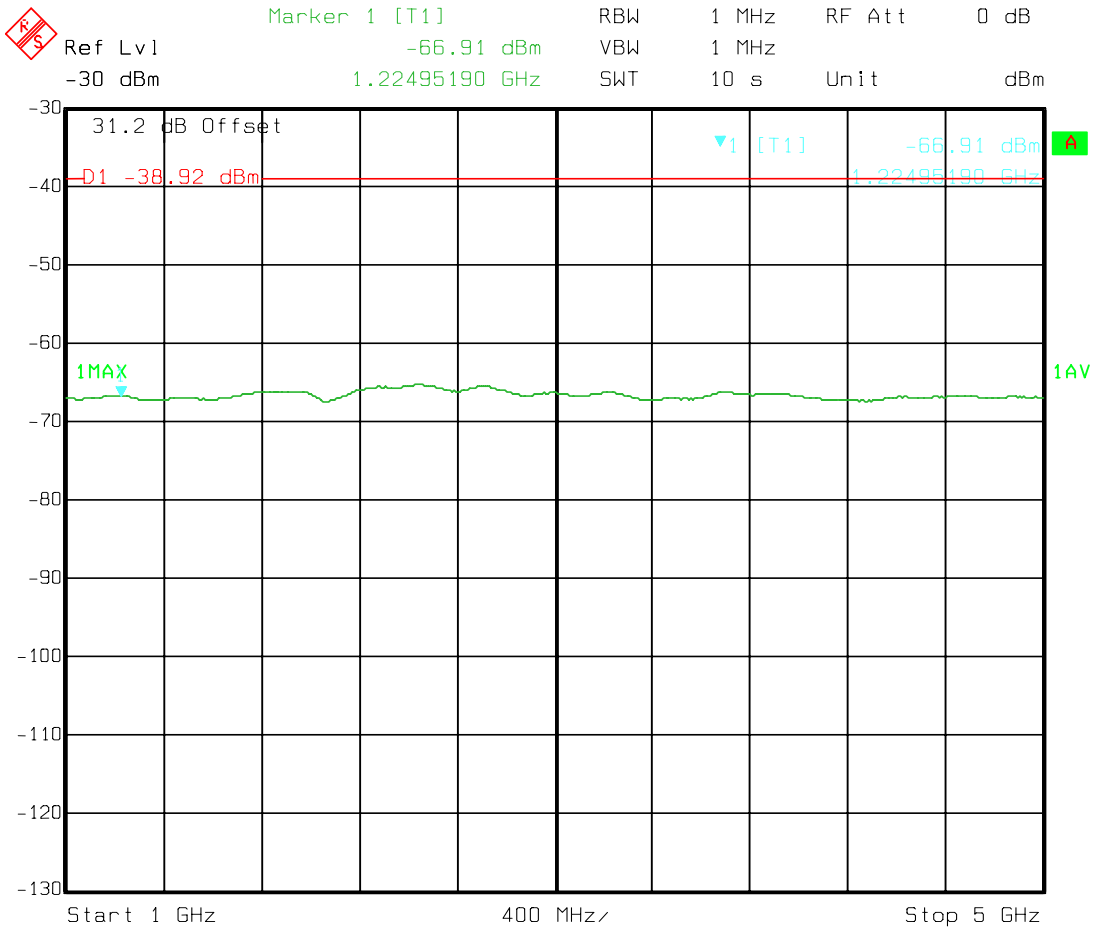
GPH\44493JD13_FCC_CE_005
Conducted Emissions, Receive Mode (30 MHz to 1 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_005
Date: 9.JUL.2003 13:22:43

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

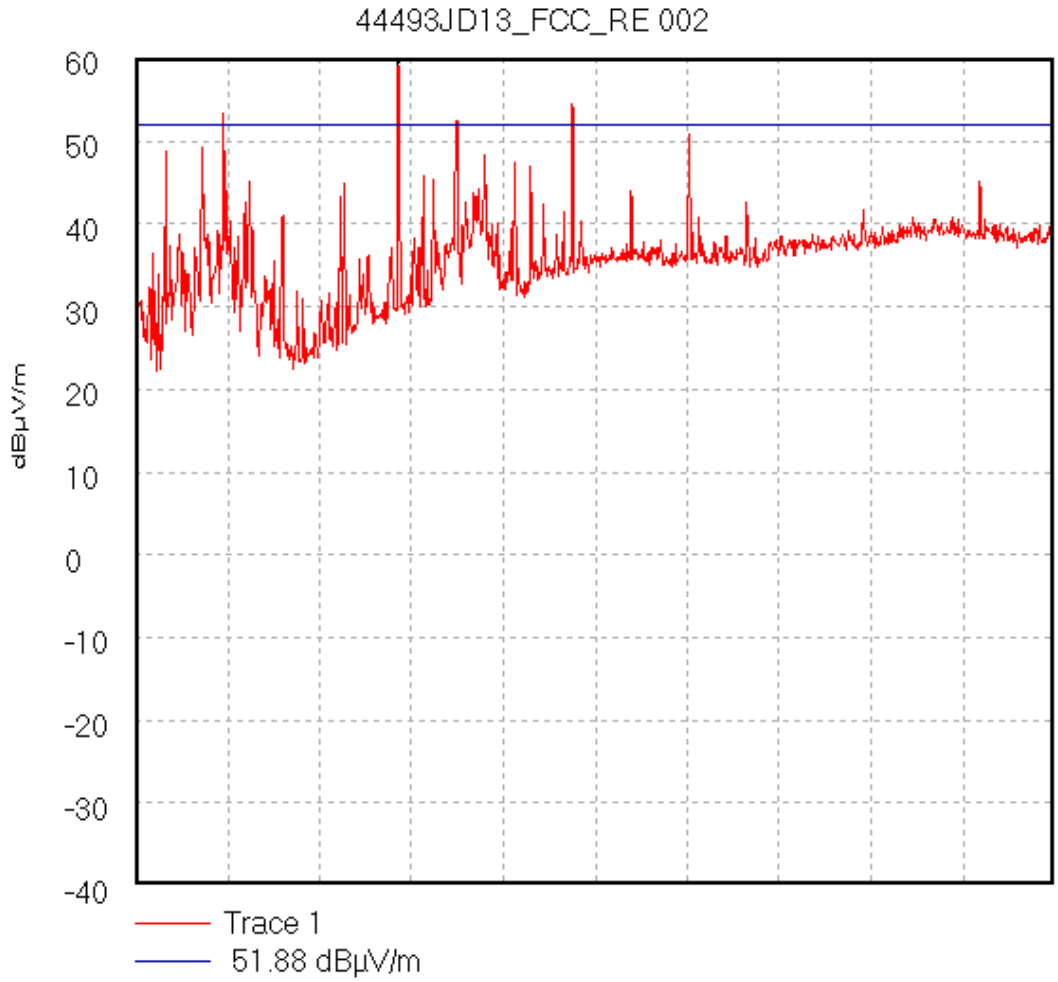
GPH\44493JD13_FCC_CE_012
Conducted Emissions, Receive Mode (1 GHz to 5 GHz)



Title: IP Wireless EUT: Node B V2. FCC Part 15.109
Comment A: 44493JD13_FCC_CE_012
Date: 9.JUL.2003 13:41:29

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

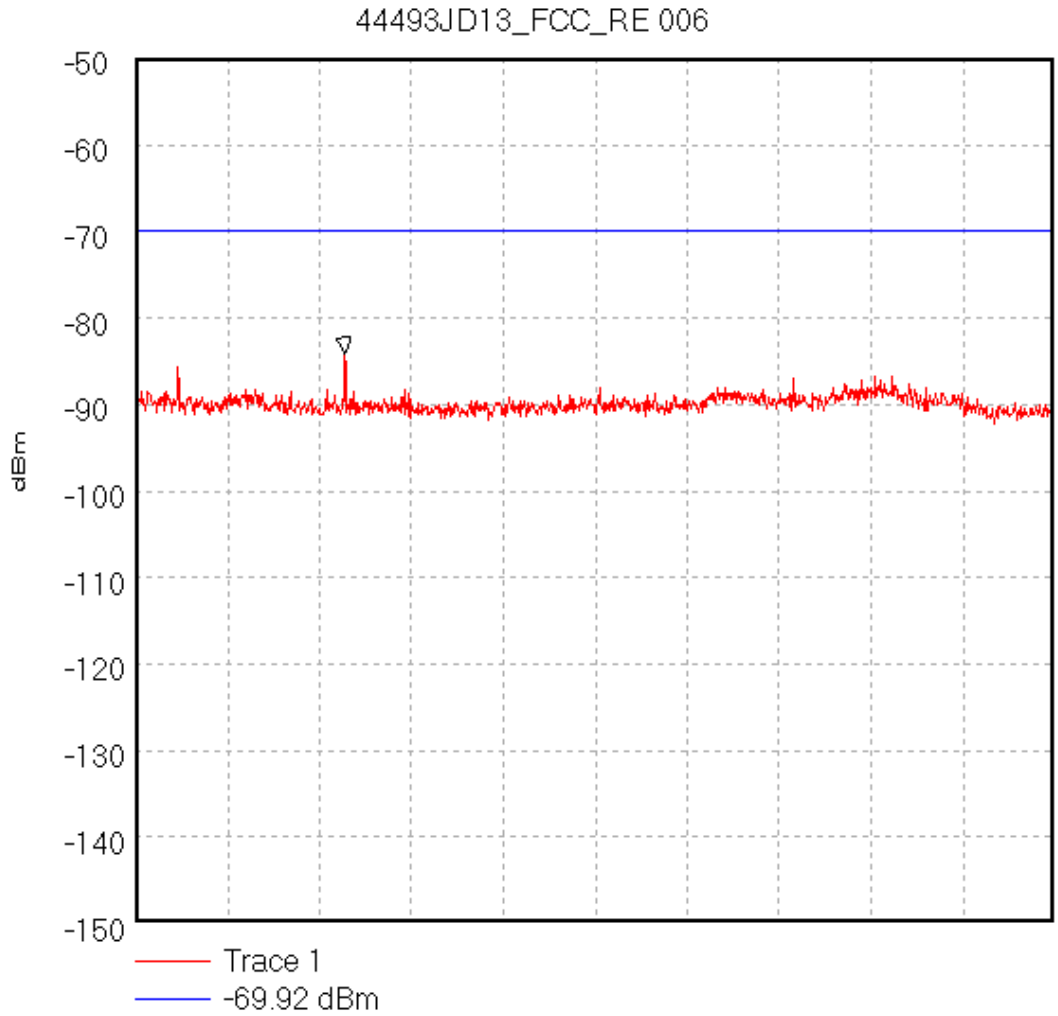
GPH\44493JD13_FCC_RE\002
Radiated Emissions. FCC Part 15.209. PreScan @ 3m.
44493JD13 IP Wireless EUT: Node B V2.
Radiated Emissions for FCC Part 21.908(d). Operating at Middle Channel.



Start 30.0 MHz; Stop 1.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 300.0 kHz; Att 10 dB; Swp 440.0 mS
Peak 306.989 MHz, 59.34 dBµV/m
Display Line: 51.88 dBµV/m; ; Limit Test Failed
Transducer Factors: A1037
04/07/2003 11:03:22

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

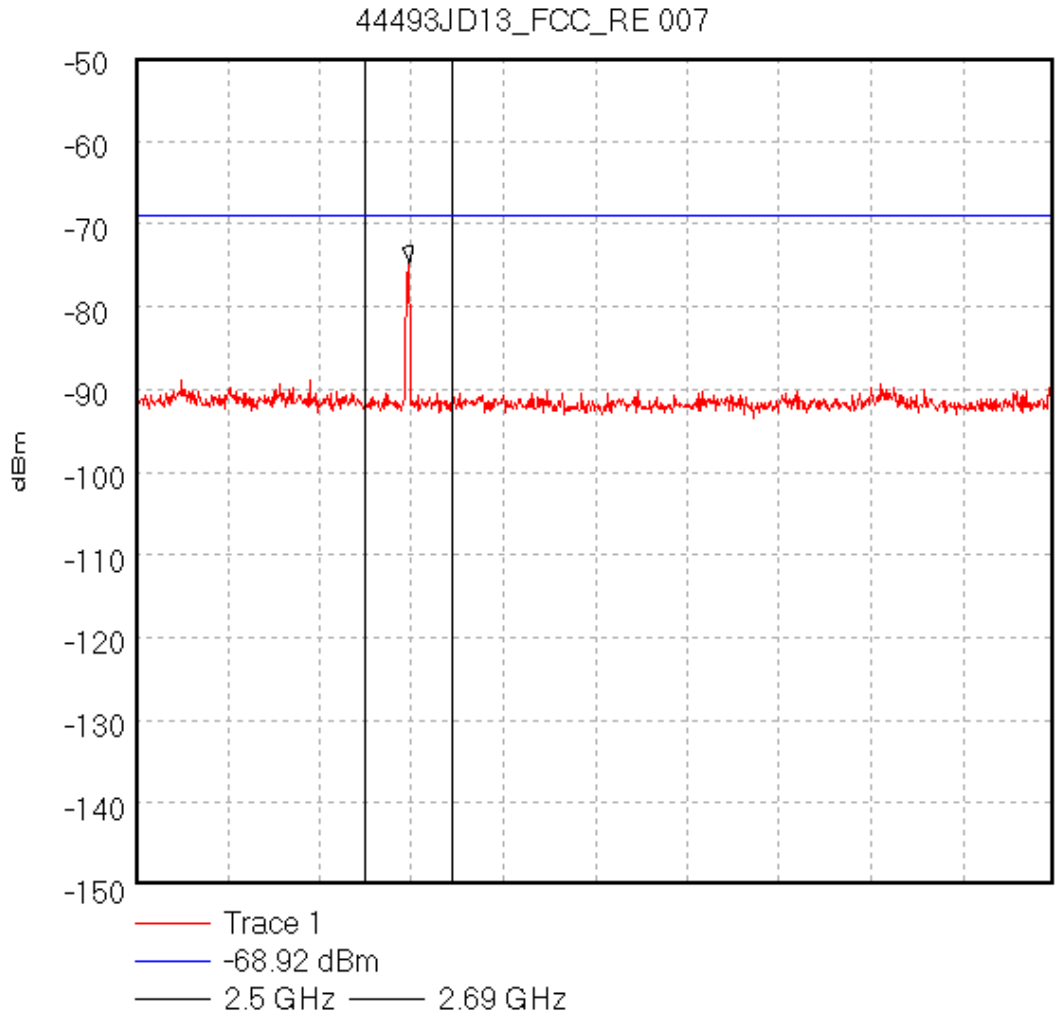
GPH\44493JD13_FCC_RE\006
Transmitter Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2.
Radiated Emissions for FCC 21.908(d). Operating at Middle Channel.



Start 1.0 GHz; Stop 2.0 GHz
Ref -50 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.228 GHz, -84.17 dBm
Display Line: -69.92 dBm; ; Limit Test Passed
04/07/2003 12:01:10

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

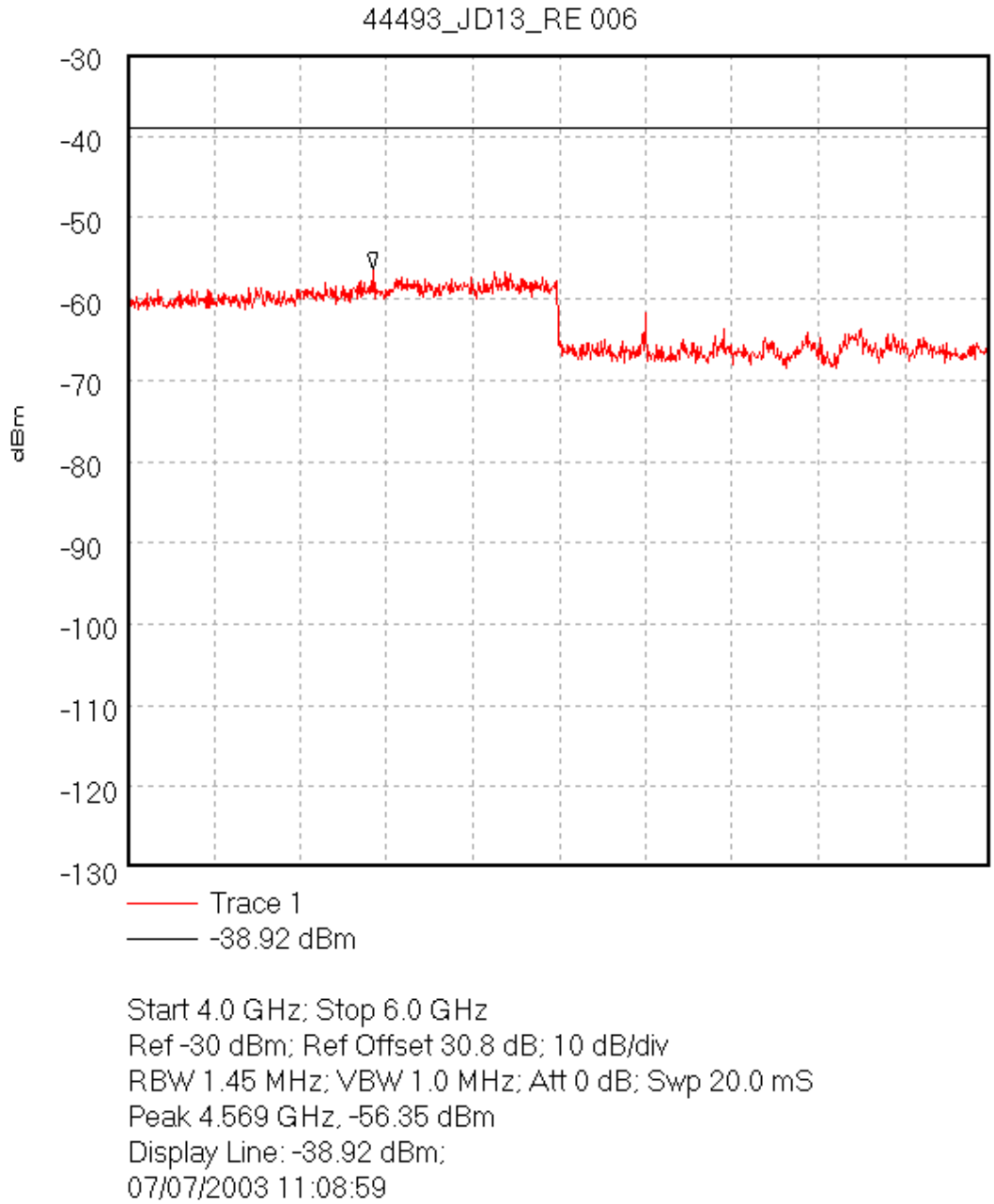
GPH\44493JD13_FCC_RE\007
Transmitter Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2.
Radiated Emissions for FCC 21.908(d). Operating at Middle Channel.



Start 2.0 GHz; Stop 4.0 GHz
Ref -50 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.596 GHz, -74.7 dBm
Display Line: -68.92 dBm; ; Limit Test Passed
04/07/2003 12:06:24

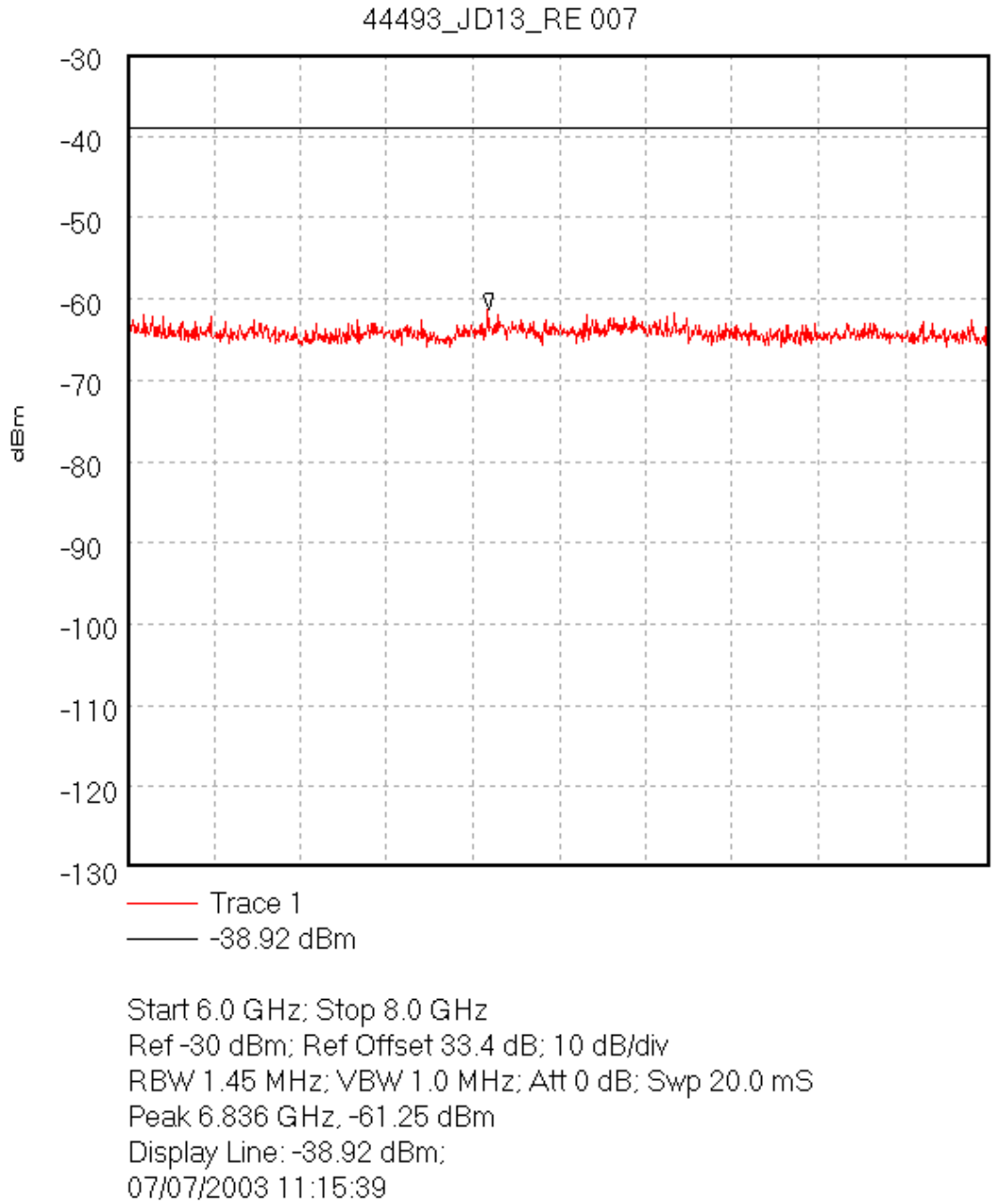
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\006
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908(d).
Operating at Middle Channel.



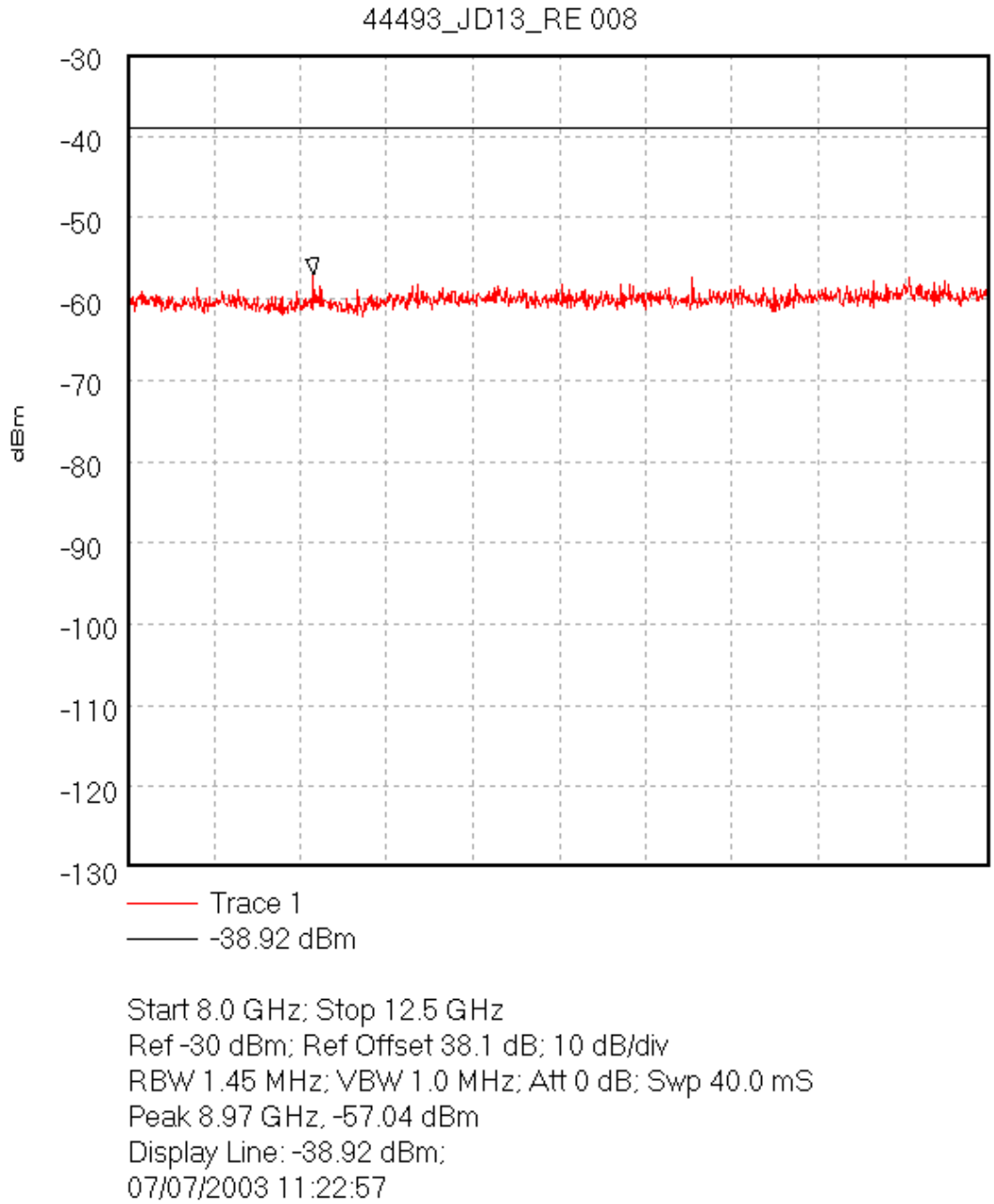
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\007
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908(d).
Operating at Middle Channel.



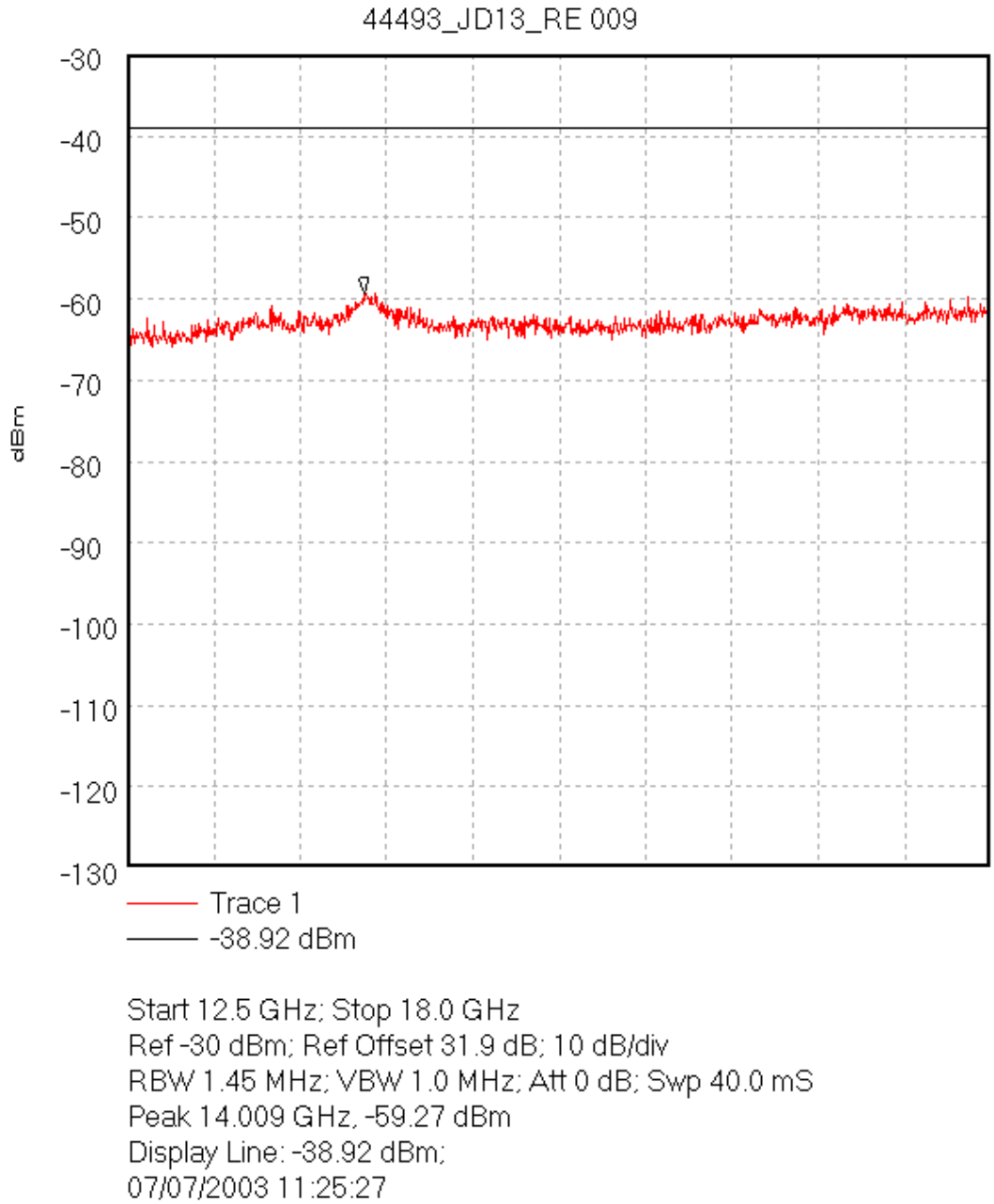
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\008
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908(d).
Operating at Middle Channel.



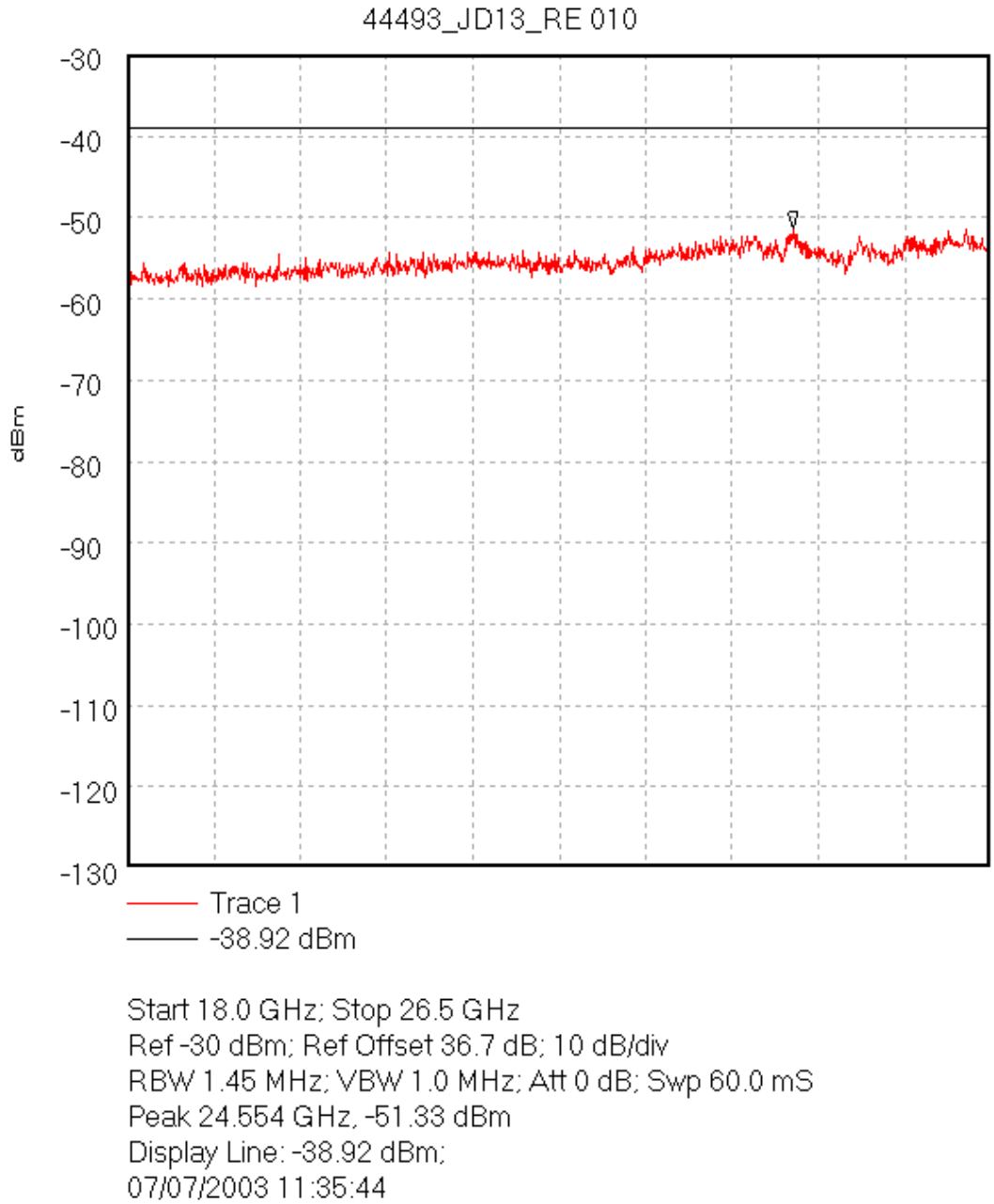
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\009
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908(d).
Operating at Middle Channel.



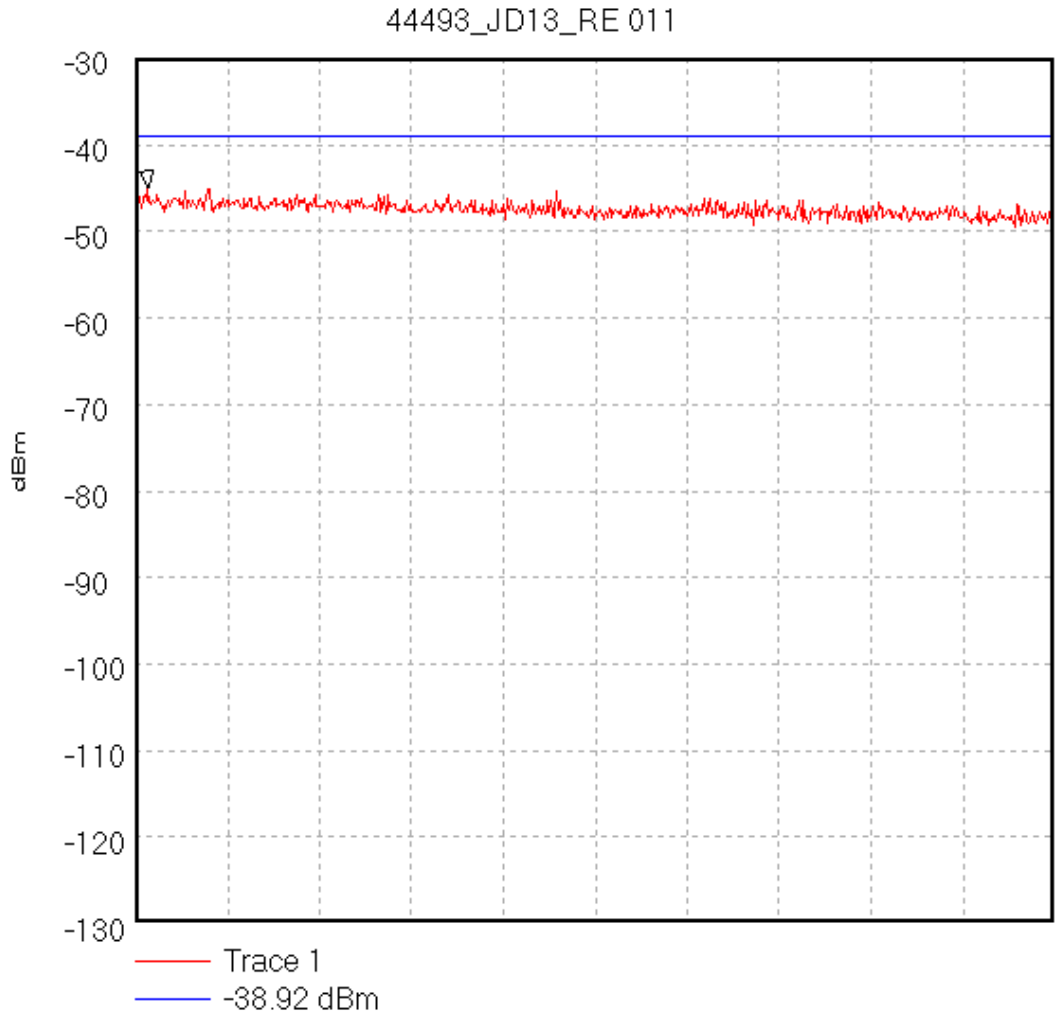
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\010
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908(d).
Operating at Middle Channel.



Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

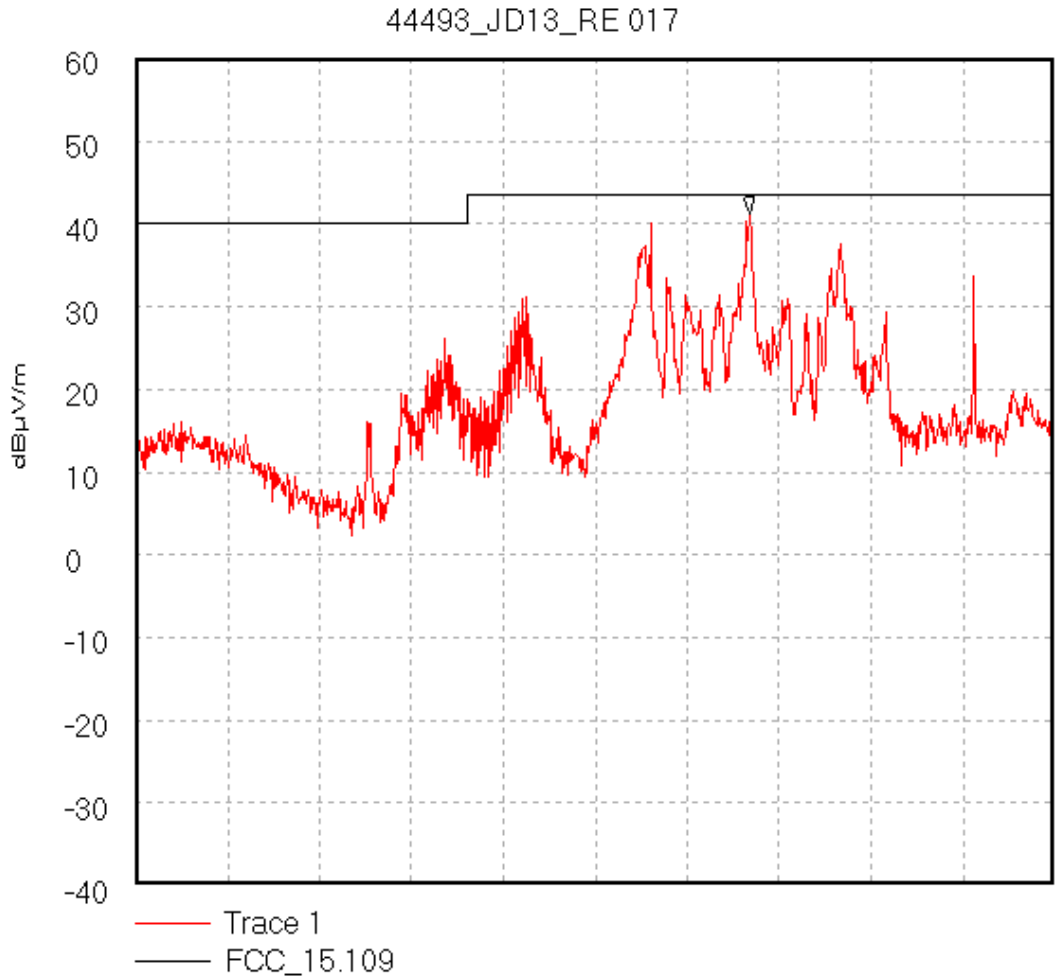
GPH\44493_JD13_RE\011
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Operating at Middle Channel.



Start 26.5 GHz; Stop 27.0 GHz
Ref -30 dBm; Ref Offset 37.0 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 130.0 mS
Peak 26.506667 GHz, -45.0 dBm
Display Line: -38.92 dBm;
07/07/2003 12:10:48

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

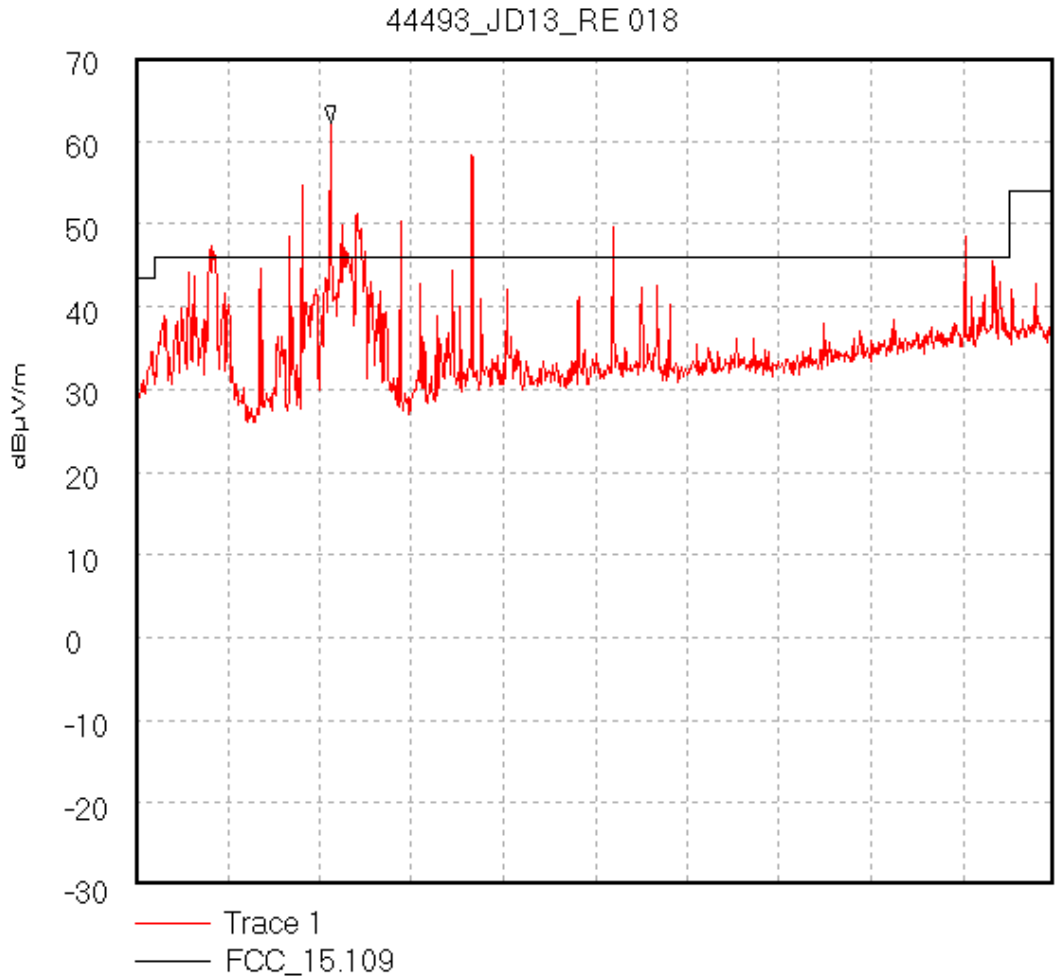
GPH\44493_JD13_RE\017
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 15.109.
Radiated Emissions. Operating at Receive Middle Channel.



Start 25.0 MHz; Stop 200.0 MHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 118.47 kHz; VBW 100.0 kHz; Att 0 dB; Swp 10.0 S
Peak 141.861 MHz, 41.19 dBµV/m
Limit/Mask: FCC_15.109;
Transducer Factors: Radio_Bicon
09/07/2003 11:15:56

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

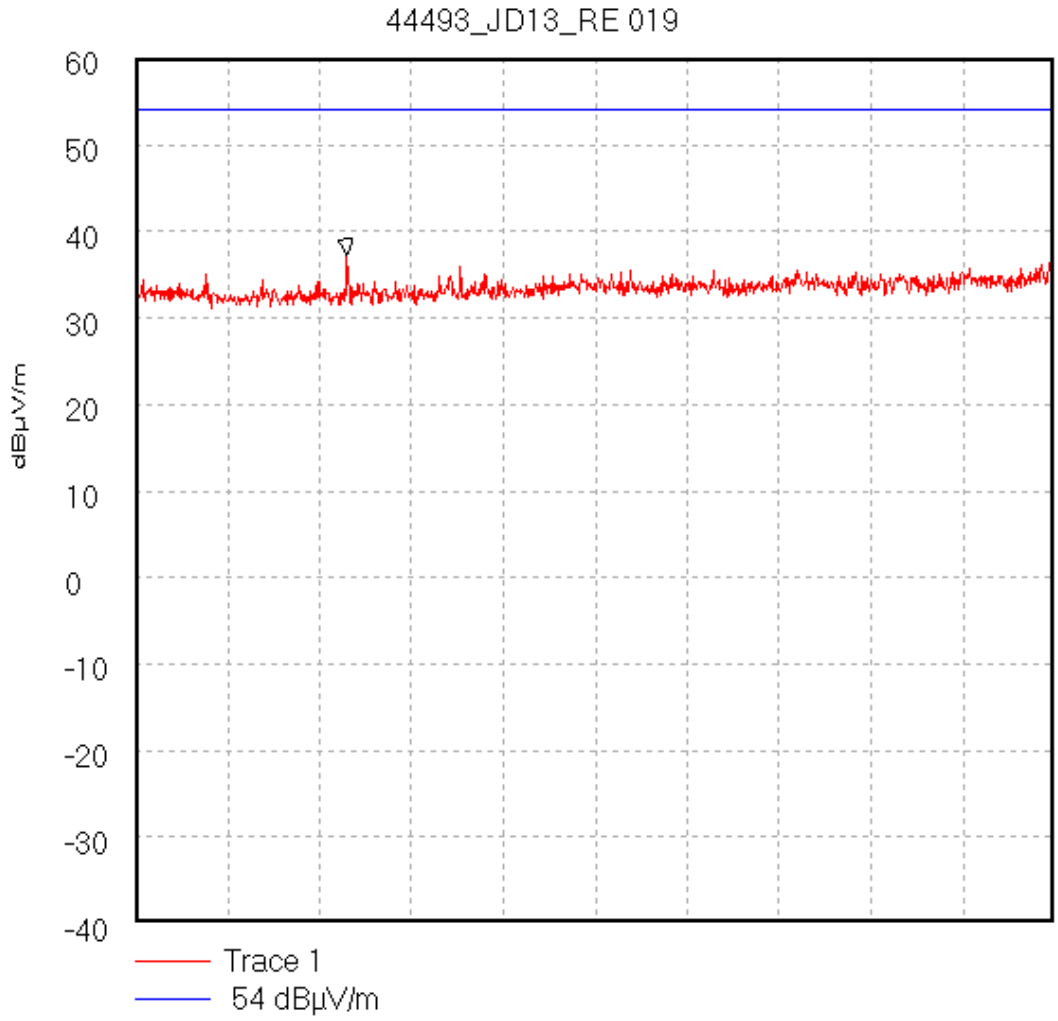
GPH\44493_JD13_RE\018
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 15.109.
Radiated Emissions. Operating at Receive Middle Channel.



Start 200.0 MHz; Stop 1.0 GHz
Ref 70 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 100.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 240.0 mS
Peak 369.778 MHz, 62.18 dBµV/m
Limit/Mask: FCC_15.109;
Transducer Factors: Radio_Log_Spiral
09/07/2003 11:28:38

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

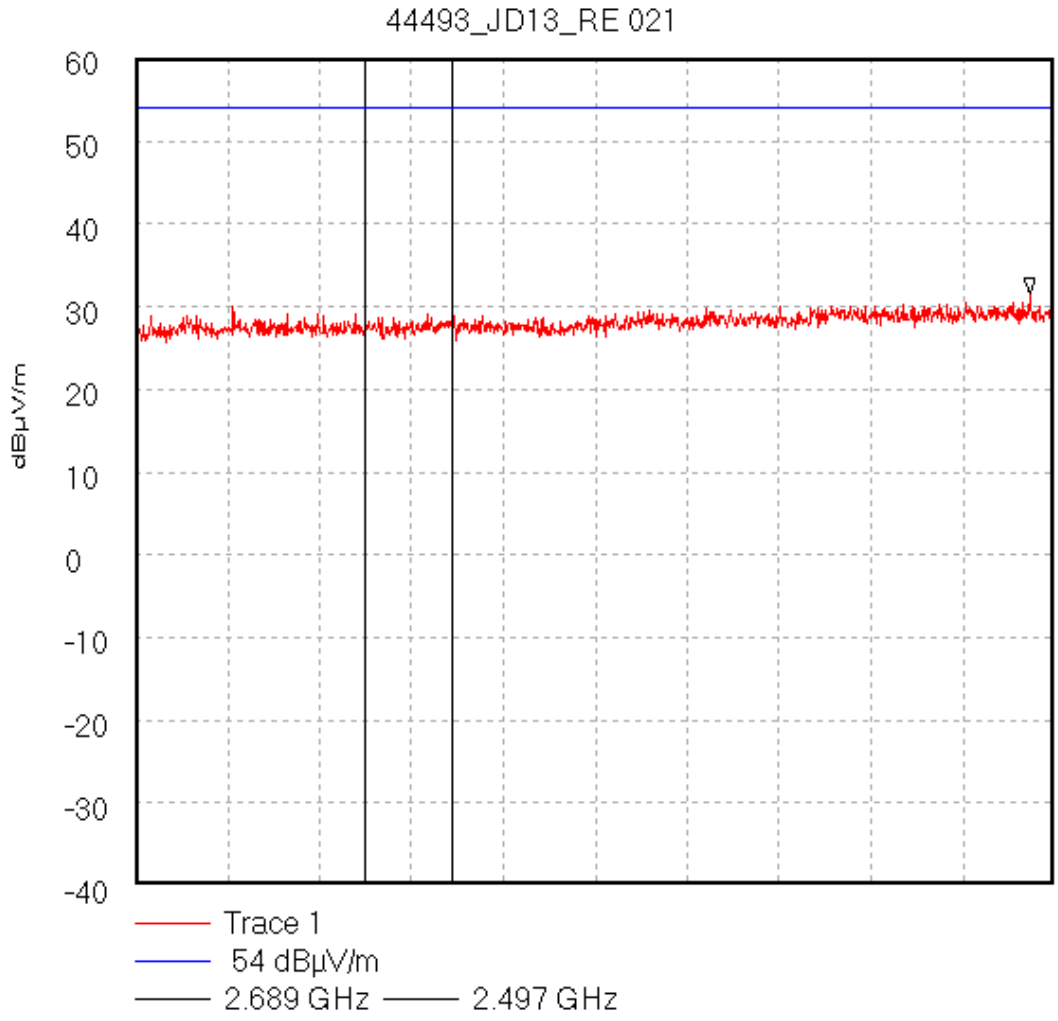
GPH\44493_JD13_RE\019
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 15.109.
Radiated Emissions. Operating at Receive Middle Channel.



Start 1.0 GHz; Stop 2.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.23 GHz, 37.3 dBµV/m
Display Line: 54 dBµV/m;
09/07/2003 11:37:21

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

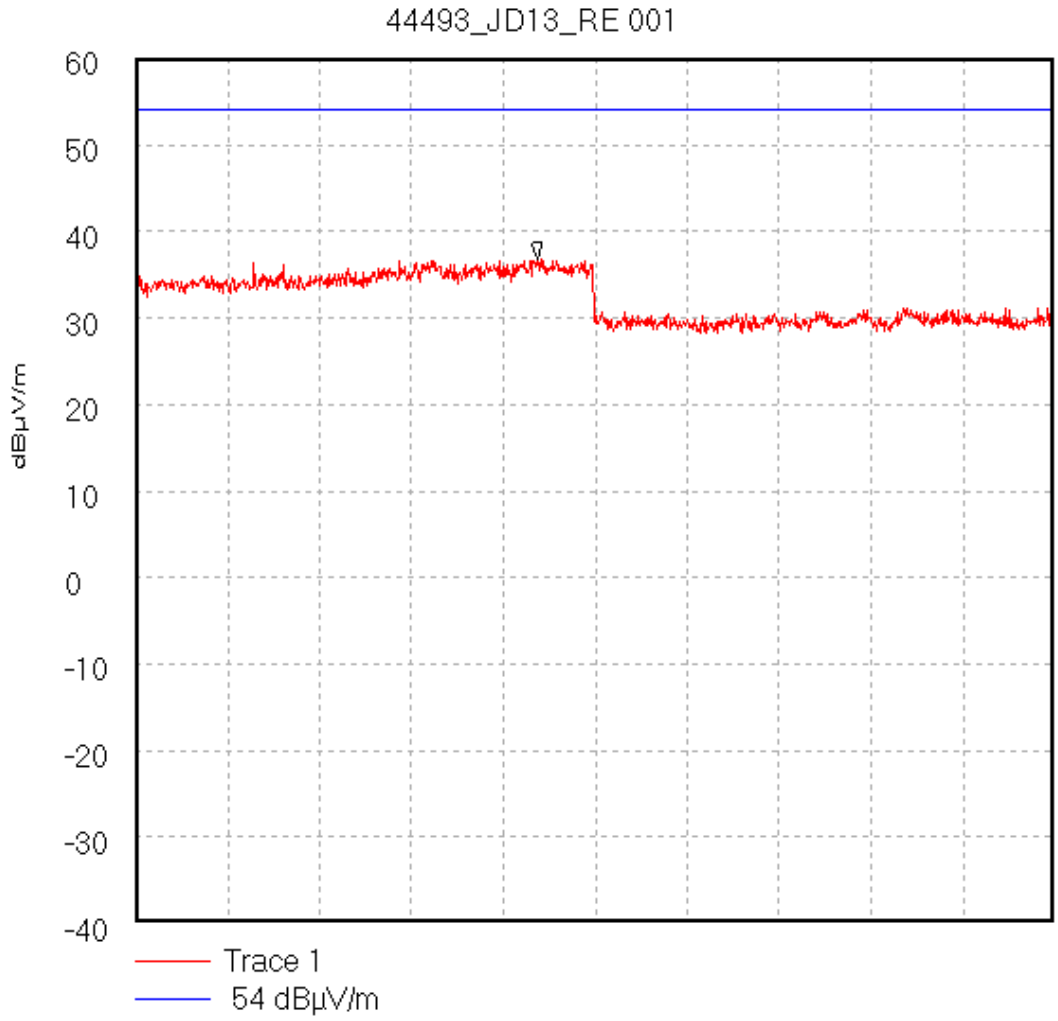
GPH\44493_JD13_RE\021
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2 ZH. FCC Part 15.109.
Radiated Emissions. Operating at Receive Middle Channel.



Start 2.0 GHz; Stop 4.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1.45 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.947 GHz, 31.56 dBµV/m
Display Line: 54 dBµV/m;
09/07/2003 11:43:00

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

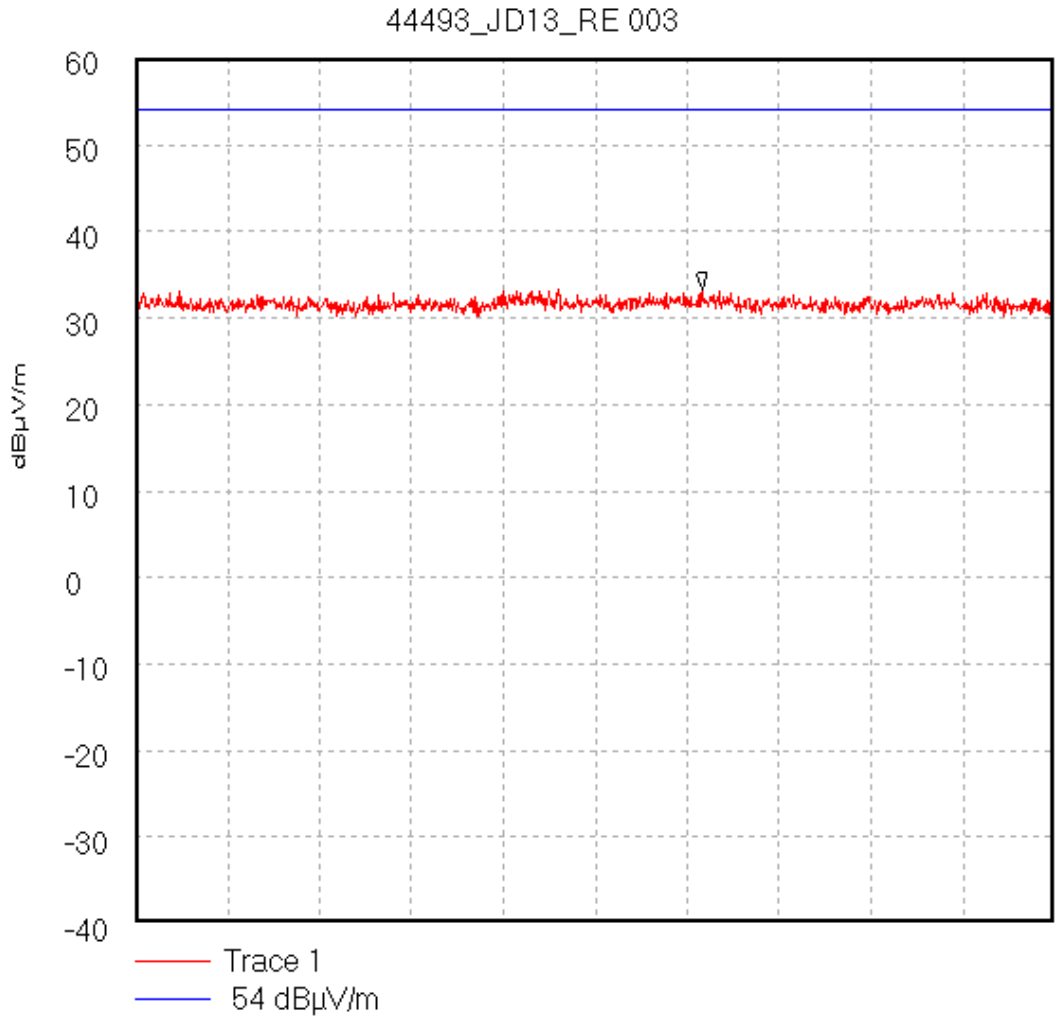
GPH\44493_JD13_RE\001
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 15.109 Class B.
Operating at Receive Mode.



Start 4.0 GHz; Stop 6.0 GHz
Ref 60 dBµV/m; Ref Offset 2.0 dB; 10 dB/div
RBW 1.45 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 4.873 GHz, 36.85 dBµV/m
Display Line: 54 dBµV/m;
07/07/2003 10:44:33

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

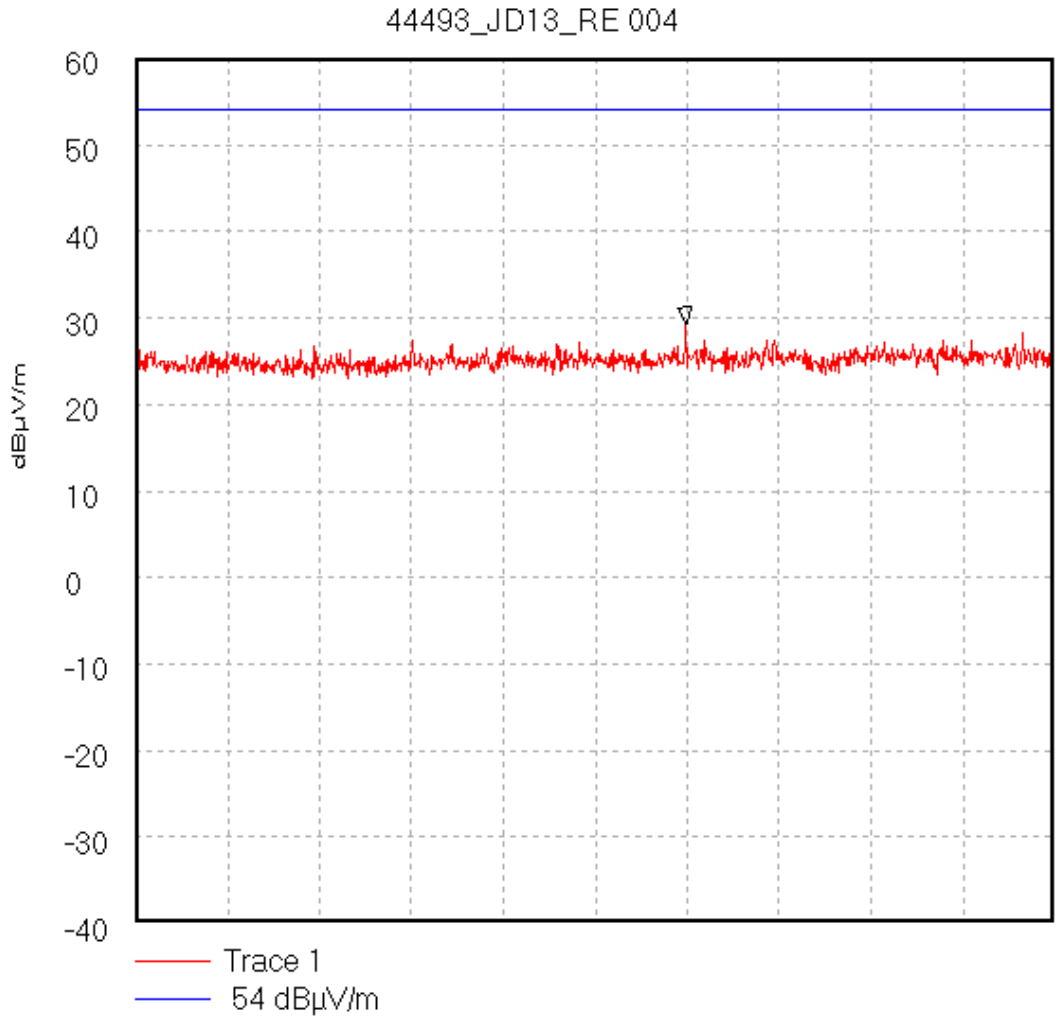
GPH\44493_JD13_RE\003
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 15.109 Class B.
Operating at Receive Mode.



Start 6.0 GHz; Stop 8.0 GHz
Ref 60 dBµV/m; Ref Offset 2.3 dB; 10 dB/div
RBW 1.45 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 7.233 GHz, 33.34 dBµV/m
Display Line: 54 dBµV/m;
07/07/2003 10:50:30

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

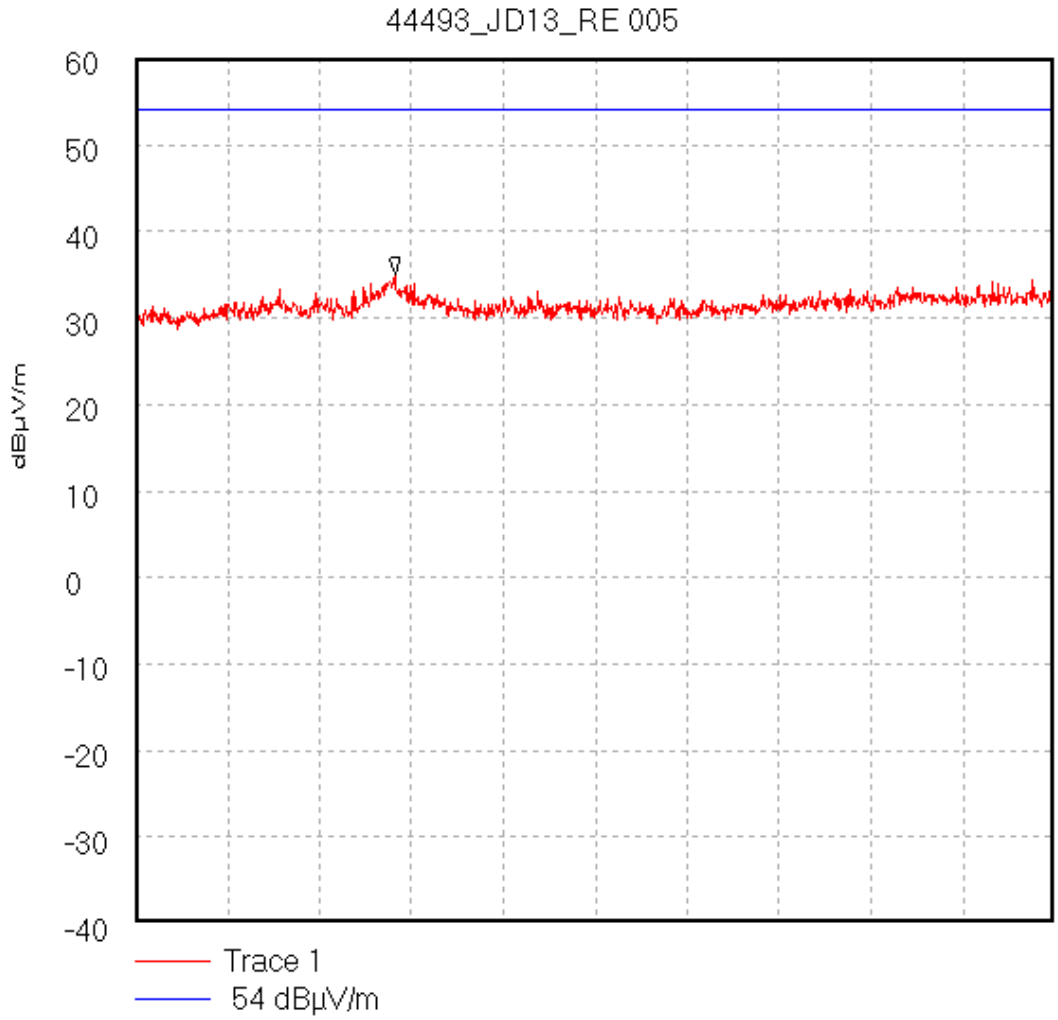
GPH\44493_JD13_RE\004
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 15.109 Class B.
Operating at Receive Mode.



Start 8.0 GHz; Stop 12.5 GHz
Ref 60 dBµV/m; Ref Offset 2.9 dB; 10 dB/div
RBW 1.45 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 10.695 GHz, 29.25 dBµV/m
Display Line: 54 dBµV/m;
07/07/2003 10:55:50

Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

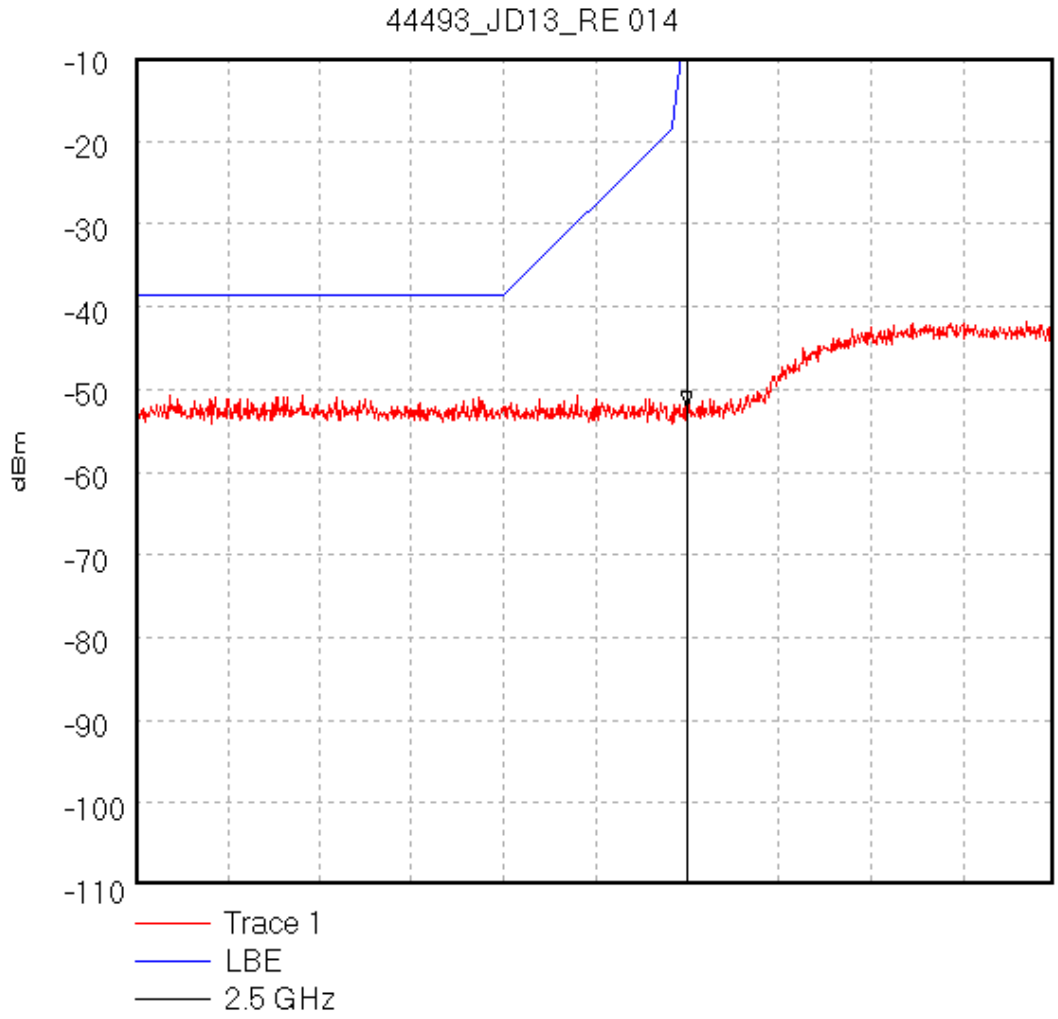
GPH\44493_JD13_RE\005
Radiated Emissions.
44493JD13 IP Wireless EUT: Node B V2. FCC Part 15.109 Class B.
Operating at Receive Mode.



Start 12.5 GHz; Stop 18.0 GHz
Ref 60 dBµV/m; Ref Offset 3.6 dB; 10 dB/div
RBW 1.45 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 14.052 GHz, 35.07 dBµV/m
Display Line: 54 dBµV/m;
07/07/2003 10:59:42

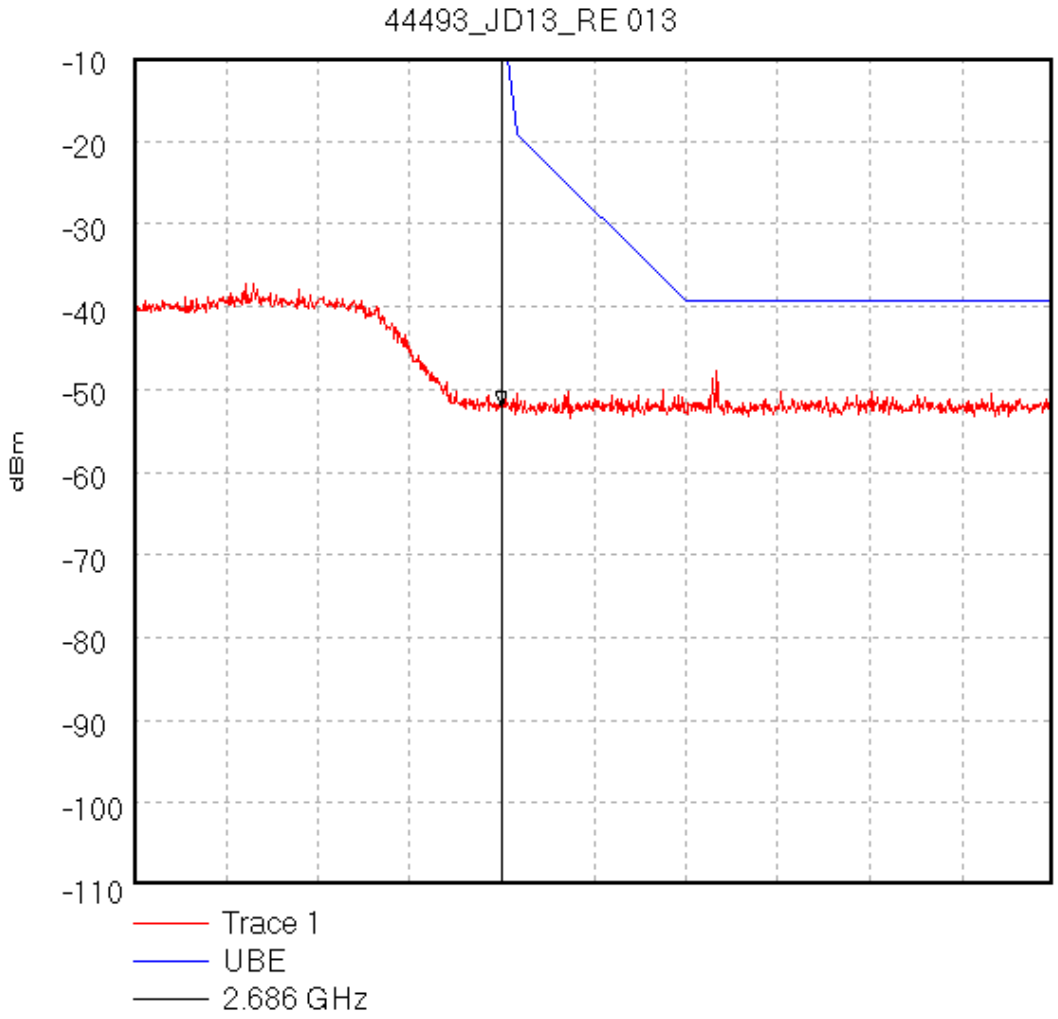
Test Of: **IPWireless (UK) Ltd.**
Node B V2 Model: HZ
To: **FCC Part 15: 2002, Part 21: 2002 & Part 74: 2002**

GPH\44493_JD13_RE\014
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Lower Band Edge. Operating at Bottom Channel.



Start 2.491 GHz; Stop 2.506 GHz
Ref -10 dBm; Ref Offset 30.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Marker 2.5 GHz, -52.25 dBm
Limit/Mask: LBE;
07/07/2003 12:52:19

GPH\44493_JD13_RE\013
44493JD13 IP Wireless EUT: Node B V2. FCC Part 21.908.
Upper Band Edge. Operating at Top Channel.



Start 2.68 GHz; Stop 2.695 GHz
Ref -10 dBm; Ref Offset 30.1 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Marker 2.686 GHz, -52.25 dBm
Limit/Mask: UBE;
07/07/2003 12:47:44