TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test Of: IPWireless UK Ltd
UE PCMCIA Card Model: FD

To: FCC Part 27

Test Report Serial No:
RFI/MPTE3/RP47147JD02A

Supersedes Test Report Serial No.:
RFI/MPTE2/RP47147JD02A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Steven Wong 	**Checked By: Tony Henriques** 
Report Copy No: PDF01	
Issue Date: 19 July 2005	**Test Dates: 26 January 2004 to 10 February 2004, 25 May 2004, 08 April 2005 and 01 July 2005**

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

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This report may be copied in full. The results in this report apply only to the sample(s) tested.

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

Registered in England and Wales. Company number:2117901

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1. Client Information

Company Name:	IPWireless UK Ltd.
Address:	Unit 7 Greenways Business Park Bellinger Close Chippenham Wilts SN15 1BN
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 Modem
Model Name or Number:	UE PCMCIA V1
Unique Type Identification:	FD
Serial Number:	FD5D34100F213* FD7D50201K831
Country of Manufacture:	UK
FCC ID Number:	PKTPCMCIAFD1

**Note: Original sample used to perform testing against Part 21 and 74.*

2.2. Accessories

The following accessory was supplied with the EUT:

Description:	External Stick Antenna (for connection to external antenna port)
Part Number:	WSI-3025
Serial Number:	None
Country of Manufacture:	Sweden

2.3. Description of EUT

The equipment under test is a wireless broadband modem PCMCIA card intended for use in notebook and desktop PCs. It is fitted with an integral antenna and an external antenna port, which allows the attachment of an external stick antenna. On attachment of this external stick antenna the integral antenna is disabled.

2.4. Modifications Incorporated In EUT

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

2.5. Additional Information Related To Testing

Power Supply Requirement:	3.3 VDC supplied via PCMCIA interface of host PC		
Power Supply Requirement: (Host Notebook PC)	Nominal 110 V 60 Hz AC Mains supply		
Intended Operating Environment:	Residential, Commercial, Light Industry		
Equipment Category:	Miscellaneous Wireless Communications Services		
Type of Unit:	Wireless Broadband Modem		
Interface Ports:	PCMCIA interface		
Chip Rate:	High: 7.68 Mcps; Low: 3.84 Mcps		
Channel Spacing:	High: 11 MHz; Low: 5.5 MHz		
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 (EIRP)	High Chip Rate: 26.9 dBm Low Chip Rate: 24.0 dBm		

2.6. Support Equipment

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

Description:	Notebook PC
Brand Name:	Sony Vaio
Model Name or Number:	PCG-5201
Serial Number:	28308530 3101633
Cable Length and Type	Direct Connection
Connected to Port:	PCMCIA Connector of EUT

Description:	Notebook PC
Brand Name:	UMAX
Model Name or Number:	2000
Serial Number:	PD0402096
Cable Length and Type	Direct Connection
Connected to Port:	PCMCIA Connector of EUT

Description:	Notebook PC
Brand Name:	ACER
Model Name or Number:	BY25
Serial Number:	LXT180A03224616447EB00
Cable Length and Type	Direct Connection
Connected to Port:	PCMCIA Connector of EUT

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	FCC Part 27: 2004: Sections 27.50, 27.53 and 27.54
Title:	Code of Federal Regulations, Part 27 (47CFR) Subpart C Miscellaneous Wireless Communications Services
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-2003
Land Mobile Communications Equipment, Measurements and performance Standards.

ANSI C63.2 (1996)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

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

ANSI C63.5 (1998)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

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

CISPR 16-1 (1999)
Title: Specification for radio disturbance and immunity measuring apparatus and methods. Part 1. Radio disturbance and immunity measuring apparatus.

DA00-705 (2000)
Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

3.3. Definition of Measurement Equipment

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

4. Deviations From The Test Specification

None

5. Operation of The EUT During Testing

5.1. Operating Conditions

The EUT was tested in a normal laboratory environment.

During testing, the EUT was powered by a host laptop PC which was powered by a nominal 110 V, 60 Hz AC Mains power supply (13 Amp max)

5.2. Operating Modes

The EUT was tested in the following operating modes:

Preliminary radiated emissions scans up to 4 GHz of both chip rates were performed on the EUT fitted and operating in each of the three host notebook PCs stated in section 2.5 of this report. The combination that exhibited the worse case mode of operation was then used to perform final measurements. This was found to be with the EUT fitted and operating in the ACER BY25 notebook PC.

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, the EUT was transmitting on bottom, middle and top channels on all 15 timeslots.

For radiated tests, the EUT was transmitting on bottom, middle and top channels on 5 timeslots and receiving on 10 timeslots, i.e. typical of normal operation.

Tests of EIRP were performed with the EUT transmitting via its integral antenna and via the fitted external stick antenna (integral antenna is disabled).

Tests of radiated emissions were performed with the EUT transmitting via its integral antenna i.e. the worst case.

All other transmit mode tests were performed at the external antenna port of the EUT.

Receive/Idle Modes:

Testing was performed with the EUT in idle mode without the external antenna fitted i.e. the integral antenna being the active antenna (the worst case).

5.3. Configuration and Peripherals

The EUT was tested in the following configuration:

Plugged into the PCMCIA port of the established worst case host notebook PC (ACER BY25).

6. Summary Of Test Results

Transmit Mode

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Effective Isotropic Radiated Power (EIRP)	CFR 47: 2004 FCC Part 2.1046, Part 27.50	Integral & External Antenna	Complied
Transmitter Carrier Output Power and EIRP	CFR 47: 2004 FCC Part 2.1046, Part 27.50	Antenna Terminals	Not Applicable*
Frequency Stability (Temperature Variation)	CFR 47: 2004 FCC Part 2.1055, Part 27.54	Antenna Terminals	Complied
Frequency Stability (Voltage Variation)	CFR 47: 2004 FCC Part 2.1055, Part 27.54	Antenna Terminals	Complied
Occupied Bandwidth	CFR 47: 2004 FCC Part 2.1049	Antenna Terminals	Complied
Conducted Spurious Emissions at Band Edges	CFR 47: 2004 FCC Part 2.1051, Part 27.53	Antenna Terminals	Complied
Conducted Spurious Emissions	CFR 47: 2004 FCC Part 2.1051, Part 27.53	Antenna Terminals	Complied
Radiated Spurious Emissions	CFR 47: 2004 FCC Part 2.1053, Part 27.53	Integral Antenna	Complied
Radiated Spurious Emissions at Band Edges	CFR 47: 2004 FCC Part 2.1053, Part 27.53	Integral Antenna	Complied

*Note: For information only.

Receive/ Idle Mode

Range of Measurements	Specification Reference	Port Type	Compliancy Status
AC Conducted Spurious Emissions (150 kHz to 30 MHz)	CFR 47: 2003 FCC Part 15 Section 15.107	AC Mains	Complied
Idle Mode Spurious Emissions	CFR 47: 2003 FCC Part 15 Section 15.109	Enclosure	Complied

6.1. Location Of Tests

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

7. Measurements, Examinations and Derived Results

7.1. General Comments

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.

7.1.3. Additional testing was performed, as necessary, on 8th April 2005 to allow the EUT to demonstrate compliance with the requirements of Part 27.53 *Emission limits* subsection (l) (4) (4) which states: *For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB* (≡ -13 dBm) *at the channel edge and 55 + 10 log (P) dB* (≡ -25 dBm) *at 5.5 MHz from the channel edges*. The spurious emissions limit greater than 5.5 MHz away from the channel edge (-25 dBm) is tougher than the original requirement in Parts 21 and 74 therefore some additional testing was necessary in order to demonstrated compliance against Part 27.53.

7.1.4. The customer has requested to perform additional testing for the transmitter carrier conducted output power and add these results to this test report. The EUT was returned for testing and the transmitter carrier conducted output power test was performed on 01 July 2005, with the same test sample that was tested previously (Serial number: FD7D50201K831).

7.2. Effective Isotropic Radiated Power (EIRP): Part 2.1046 and Part 27.50

7.2.1. The EUT was configured as for Effective Isotropic Radiated Power (EIRP) as described in Appendix 2 of this report.

Results (High Chip Rate with Integral Antenna)

Channel	Measured Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2506	24.9	33.0	8.1	Complied
Middle	2596	25.7	33.0	7.3	Complied
Top	2680	26.6	33.0	6.4	Complied

Results (Low Chip Rate with Integral Antenna)

Channel	Measured Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2503	22.0	33.0	11.0	Complied
Middle	2596	22.9	33.0	10.1	Complied
Top	2683	23.7	33.0	9.3	Complied

Results (High Chip Rate with External Stick Antenna)

Channel	Measured Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2506	26.6	33.0	6.4	Complied
Middle	2596	26.9	33.0	6.1	Complied
Top	2680	26.4	33.0	6.6	Complied

Results (Low Chip Rate with External Stick Antenna)

Channel	Measured Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2503	24.0	33.0	9.0	Complied
Middle	2596	22.9	33.0	10.1	Complied
Top	2683	23.5	33.0	9.5	Complied

7.3. Transmitter Carrier Output Power: Part 2.1046 and Part 27.50

7.3.1. The EUT was configured as for conducted RF output power as described in section 9 of this report.

Results (Low Chip Rate at RF External Antenna Port)

Channel	Measured Frequency (MHz)	Conducted RF O/P Power (dBm)
Bottom	2503.00	23.4
Middle	2596.00	23.4
Top	2683.00	23.4

Results (High Chip Rate at RF External Antenna Port)

Channel	Measured Frequency (MHz)	Conducted RF O/P Power (dBm)
Bottom	2506.00	23.4
Middle	2596.00	23.4
Top	2680.00	23.4

Note(s):

1. *The above output power results are only recorded for information only, as requested by the manufacturer. Therefore, these measurements have no bearing with the 33.0 dBm limit of the Effective Isotropic Radiated Power test.*

7.4. Transmitter Frequency Stability: (Temperature Variation): Parts 2.1055 and Part 27.54

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 ambient temperature.

Results Bottom Channel (2506 MHz) – High Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2505.99986	-0.14
-20	2506.00010	0.10
-10	2506.00007	0.07
0	2506.00049	0.49
10	2506.00042	0.42
20	2506.00022	0.22
30	2506.00046	0.46
40	2506.00132	1.32
50	2506.00170	1.70

Results Bottom Channel (2503 MHz) – Low Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2502.99937	-0.63
-20	2503.00011	0.11
-10	2503.00004	0.04
0	2503.00046	0.46
10	2503.00041	0.41
20	2503.00021	0.21
30	2503.00046	0.46
40	2503.00135	1.35
50	2503.00170	1.70

Transmitter Frequency Stability: (Temperature Variation) - Continued

Results Middle Channel (2596 MHz) – High Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2595.99983	-0.17
-20	2596.00008	0.08
-10	2596.00006	0.06
0	2596.00050	0.50
10	2596.00044	0.44
20	2596.00021	0.21
30	2596.00045	0.45
40	2596.00140	1.40
50	2596.00175	1.75

Results Middle Channel (2596 MHz) – Low Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2595.99966	-0.37
-20	2596.00012	0.12
-10	2596.00007	0.07
0	2596.00048	0.48
10	2596.00042	0.42
20	2596.00023	0.23
30	2596.00050	0.50
40	2596.00137	1.37
50	2596.00176	1.76

Transmitter Frequency Stability: (Temperature Variation) - Continued

Results Top Channel (2680 MHz) – High Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2679.99976	-0.24
-20	2680.00007	0.07
-10	2680.00003	0.03
0	2680.00051	0.51
10	2680.00039	0.39
20	2680.00020	0.20
30	2680.00036	0.36
40	2680.00145	1.45
50	2680.00171	1.71

Results Top Channel (2683 MHz) – Low Chip Rate

Temperature (ºC)	Measured Frequency (MHz)	Frequency Error (kHz)
-30	2682.99979	-0.21
-20	2683.00013	0.13
-10	2683.00009	0.09
0	2683.00047	0.47
10	2683.00041	0.41
20	2683.00021	0.21
30	2683.00053	0.53
40	2683.00132	1.32
50	2683.00176	1.76

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

7.5. Transmitter Frequency Stability: (Voltage Variation): Parts 2.1055 and Part 27.54

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

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

Results Bottom Channel (2506 MHz) - High Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2506.00184	1.84
126.5	2506.00168	1.68

Results Middle Channel (2596 MHz) – High Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2596.000154	1.54
126.5	2596.000129	1.59

Results Top Channel (2680 MHz) – High Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2680.00192	1.92
126.5	2680.00172	1.72

Transmitter Frequency Stability: (Voltage Variation) - Continued

Results Bottom Channel (2503 MHz) – Low Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2503.00197	1.97
126.5	2503.00178	1.78

Results Middle Channel (2596 MHz) – Low Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2596.00169	1.69
126.5	2596.00184	1.84

Results Top Channel (2683 MHz) – Low Chip Rate

Supply Voltage (VAC)	Measured Frequency (MHz)	Frequency Error (kHz)
93.5	2683.00205	2.05
126.5	2683.00198	1.98

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

7.6. Transmitter Occupied Bandwidth: Part 2.1049

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

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

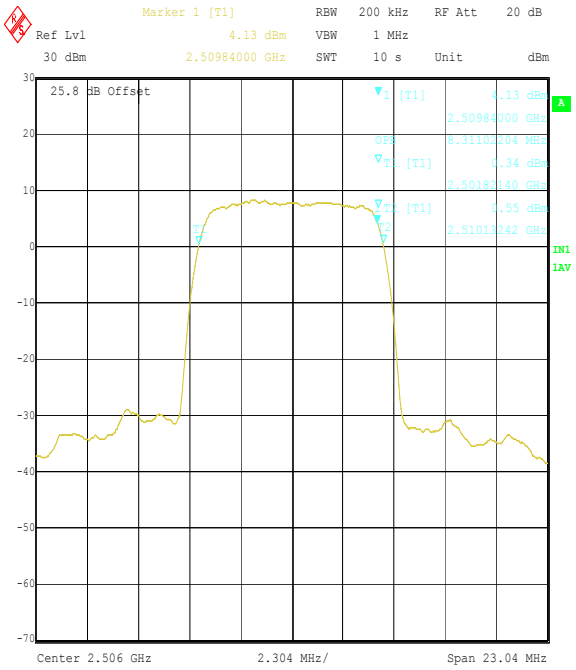
Results: (High Chip Rate)

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	2506	200	1000	8.311
Middle	2596	200	1000	8.357
Top	2680	200	1000	8.357

Results: (Low Chip Rate)

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	2503	100	300	4.168
Middle	2596	100	300	4.168
Top	2683	100	300	4.168

Transmitter Occupied Bandwidth (High Chip Rate) - Continued



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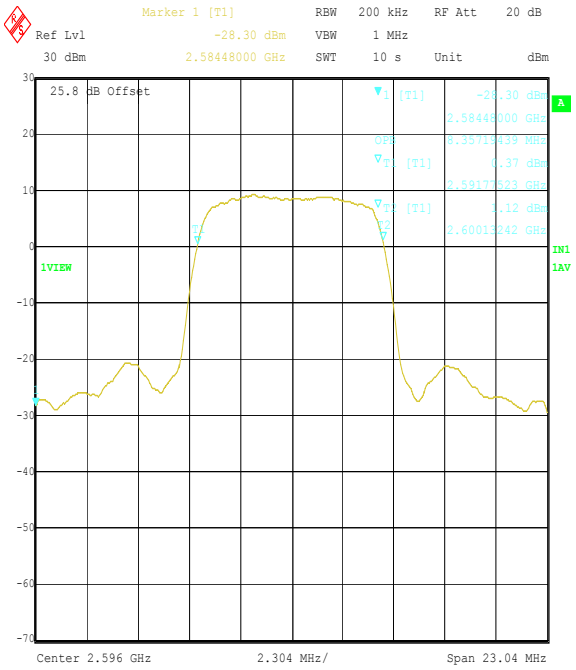
Date: 5.FEB.2004 14:13:20



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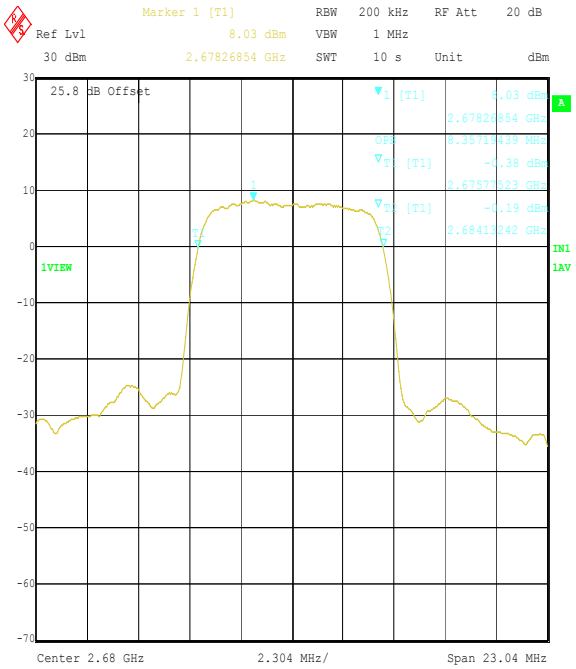
Date: 5.FEB.2004 14:14:38



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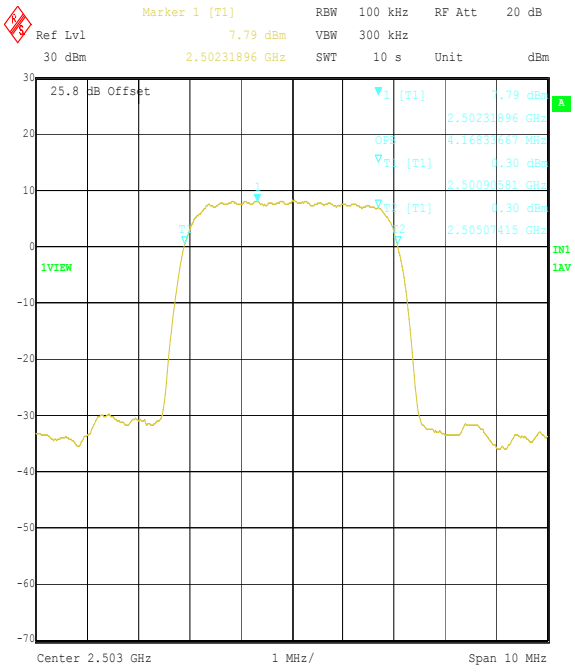
Comment A: 45219JD01 Top Channel 7.68 Mcps.
Date: 5.FEB.2004 14:15:41

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.

Transmitter Occupied Bandwidth (Low Chip Rate) - Continued



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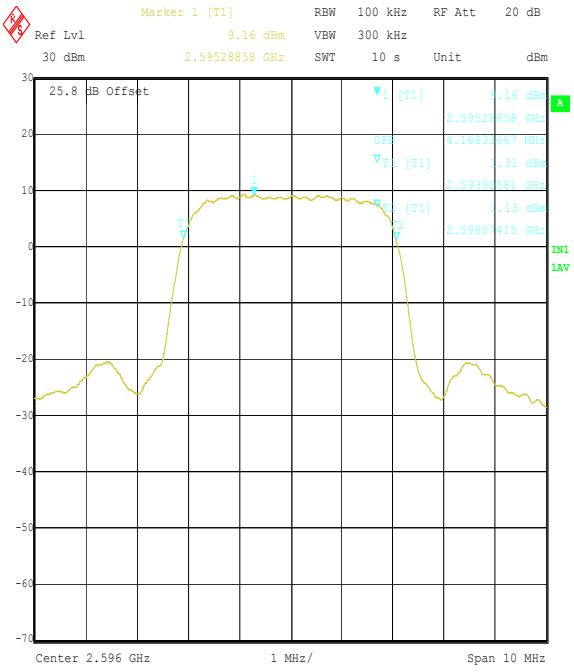

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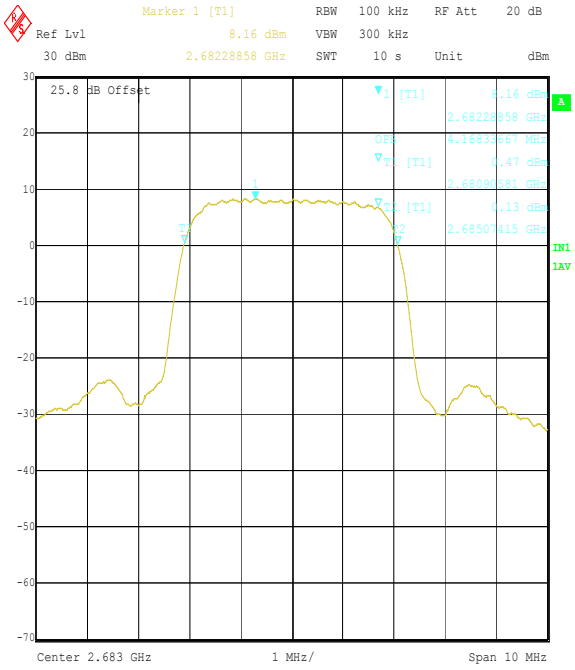

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Comment A: 45219JD01 Top Channel 3.84 Mcps.
Date: 5.FEB.2004 12:13:05

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.

7.7. Transmitter Conducted Emissions (Channel Edge): Part 2.1051 & Part 27.53

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

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

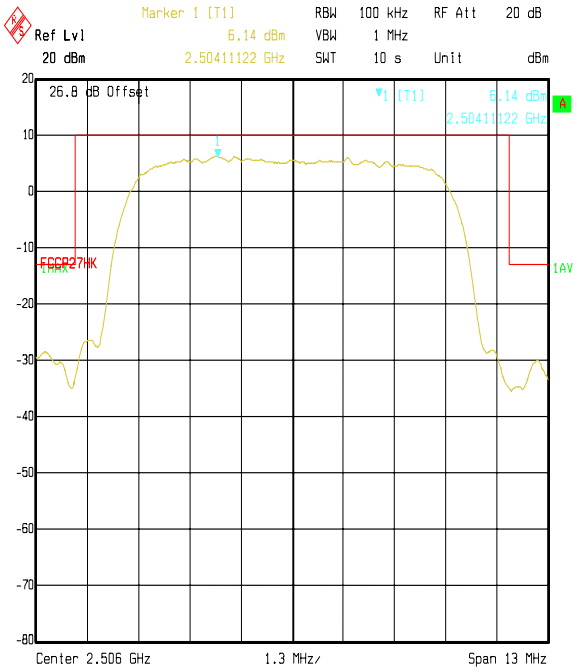
Results:

Results are presented graphically in the following graphs. As can be seen from the plots the EUT complies with the requirements of relevant part of the regulations when operating in high chip rate mode (7.68Mcps).

It can be seen from the low chip rate mode (3.84Mcps) plots that there was an incursion from the power envelope through the mask measured using a 1 MHz resolution bandwidth.

Therefore, the integration method as stated in Part 27.53(l)(6) was used to measure the emission of the 2nd 1 MHz block immediately outside adjacent frequency block with a 100 kHz resolution bandwidth i.e. 10 linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were then integrated to give the emission level in an equivalent 1 MHz bandwidth.

Transmitter Conducted Emissions (Channel Edge): High Chip Rate – Continued



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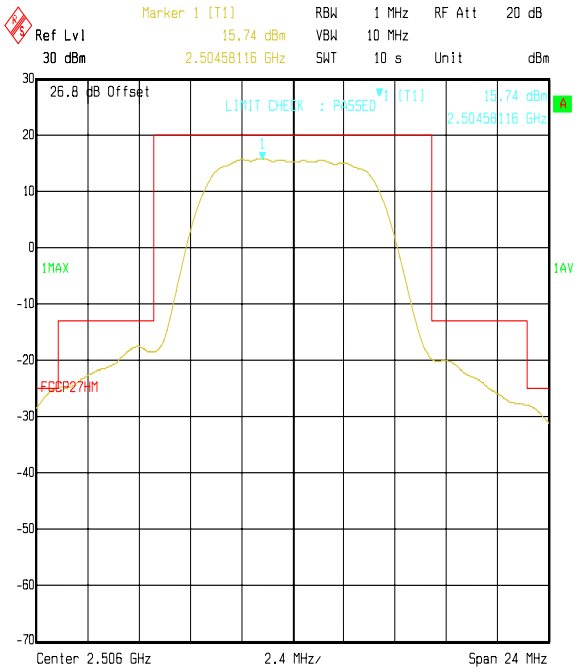
Comment A: 47147JD02 Bottom Channel High Chip Rate.
Date: 08.APR.2005 14:24:09



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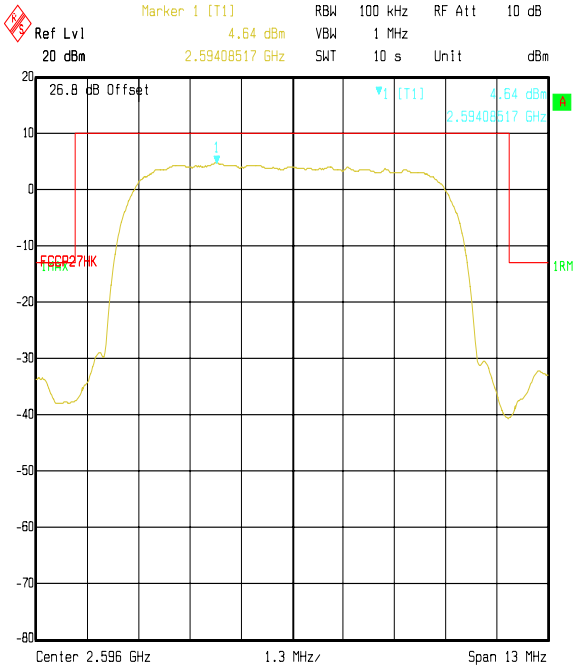

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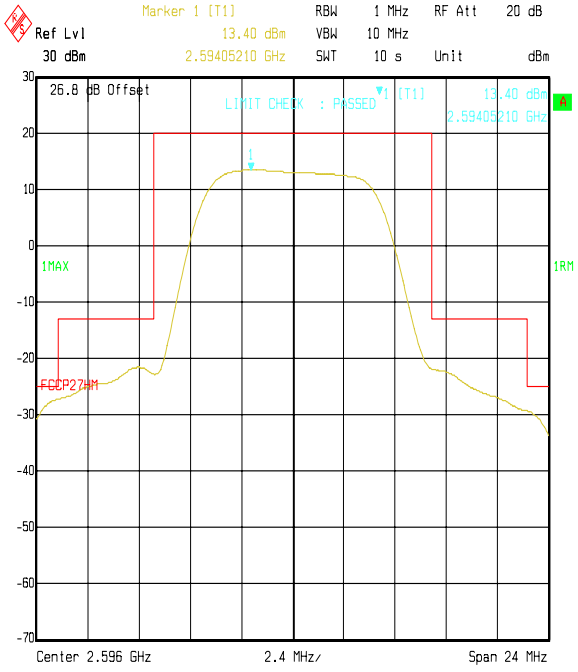
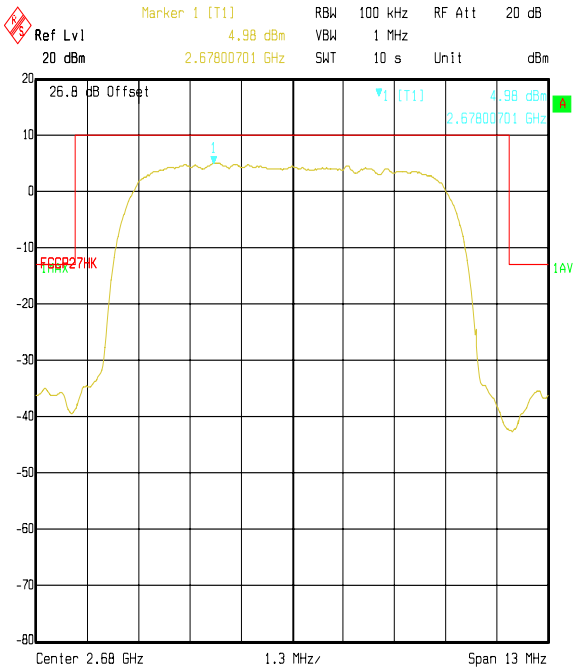


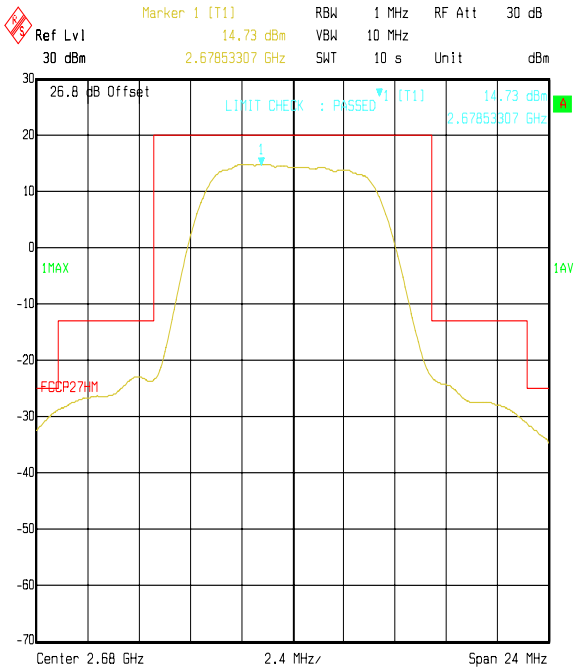
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Middle Channel High Chip Rate.
Date: 08.APR.2005 14:38:20

Note: The frequency lines shown closest to the centre frequency in the above plots that demonstrate measurements in a 1 MHz RBW were the channel edge frequencies plus 1 MHz. They were placed at these frequencies to demonstrate compliance with the requirement that emissions greater than 1 MHz away from the channel edge be measured in a 1 MHz bandwidth.

Transmitter Conducted Emissions (Channel Edge): High Chip Rate – Continued



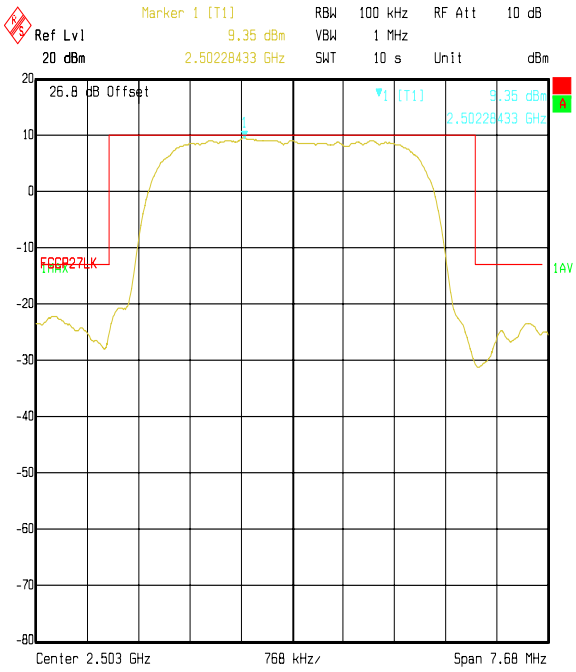
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel High Chip Rate.
Date: 08.APR.2005 14:43:51



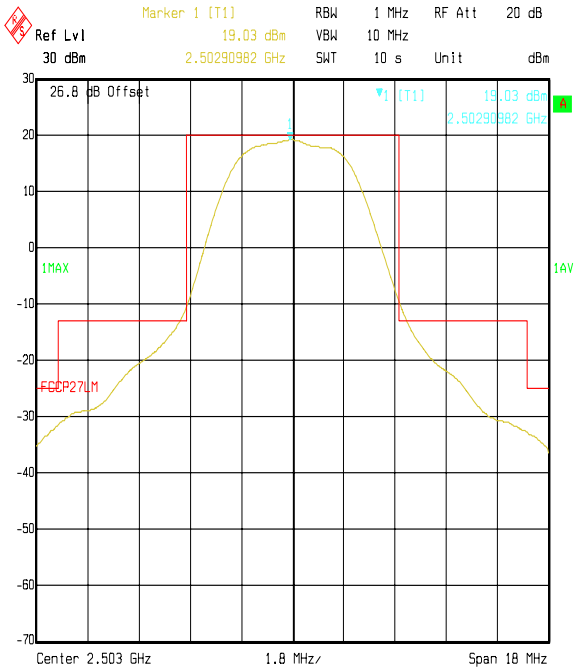
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel High Chip Rate.
Date: 08.APR.2005 14:45:56

Note: The frequency lines shown closest to the centre frequency in the above plots that demonstrate measurements in a 1 MHz RBW were the channel edge frequencies plus 1 MHz. They were placed at these frequencies to demonstrate compliance with the requirement that emissions greater than 1 MHz away from the channel edge be measured in a 1 MHz bandwidth.

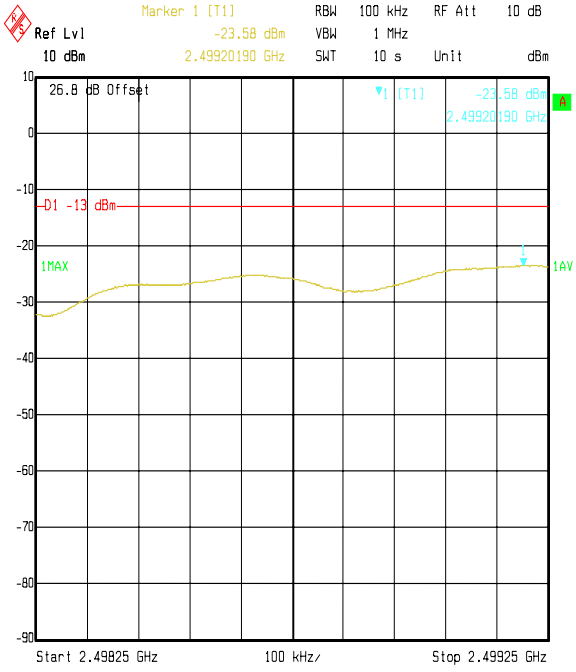
Transmitter Conducted Emissions (Channel Edge): Low Chip Rate – Continued



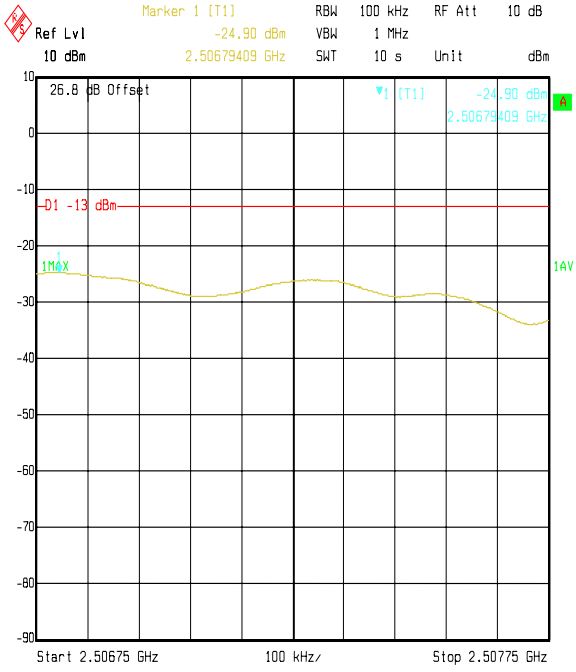
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Bottom Channel Low Chip Rate
Date: 08.APR.2005 13:47:37



Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Bottom Channel Low Chip Rate
Date: 08.APR.2005 13:48:48



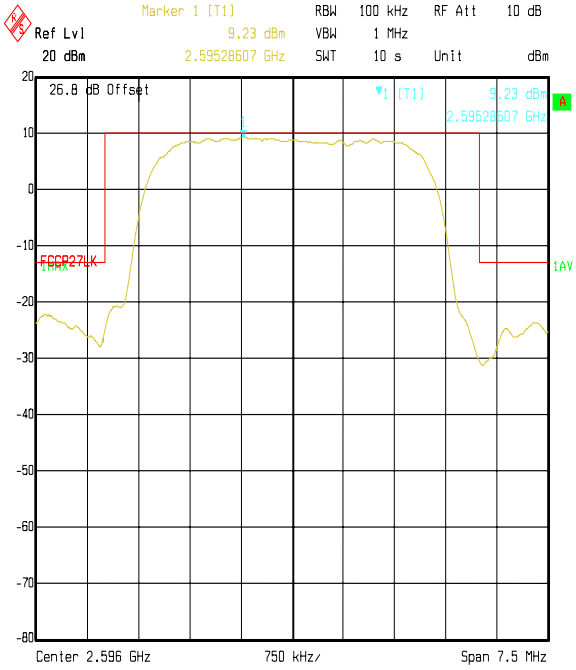
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Bottom Channel Low Chip Rate, Integration Methods
Date: 08.APR.2005 13:52:23



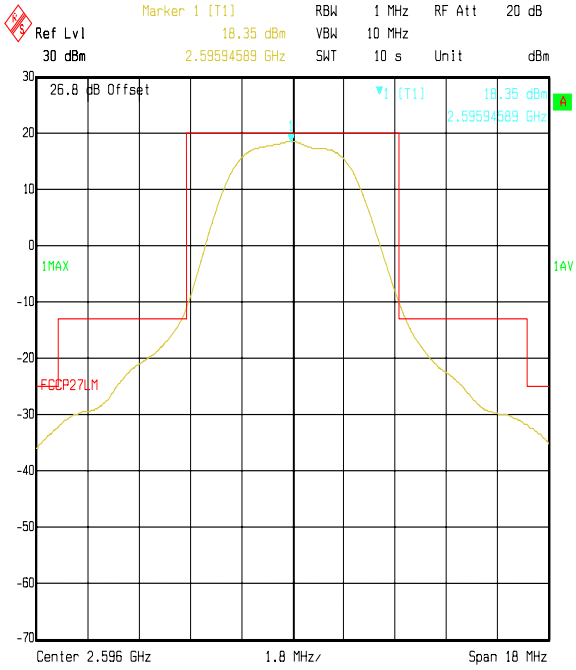
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Bottom Channel Low Chip Rate, Integration Methods
Date: 08.APR.2005 13:57:57

Note: The frequency lines shown closest to the centre frequency in the above plots that demonstrate measurements in a 1 MHz RBW were the channel edge frequencies plus 1 MHz. They were placed at these frequencies to demonstrate compliance with the requirement that emissions greater than 1 MHz away from the channel edge be measured in a 1 MHz bandwidth.

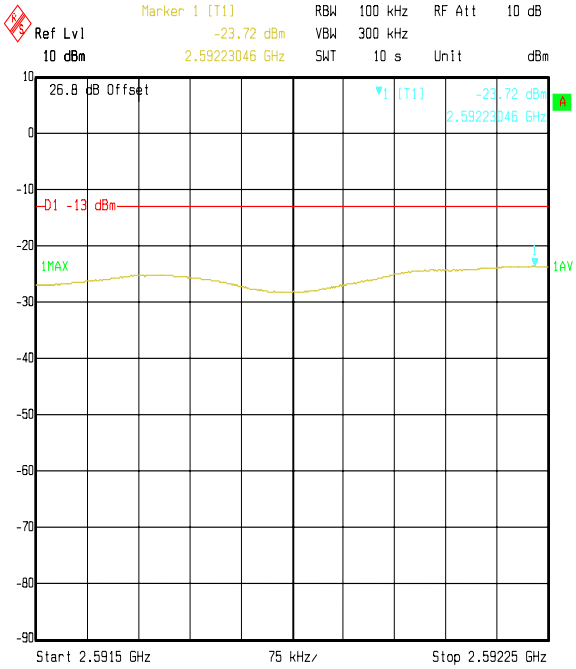
Transmitter Conducted Emissions (Channel Edge): Low Chip Rate – Continued



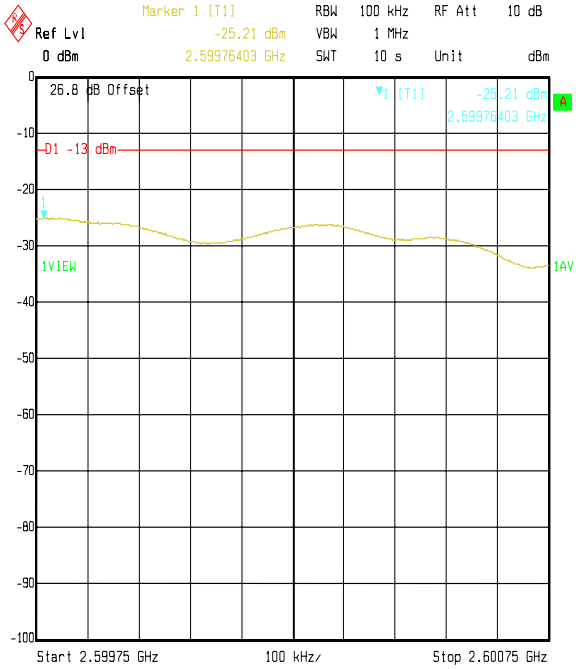
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Middle Channel Low Chip Rate, Integration Method
Date: 08.APR.2005 11:43:58



Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Middle Channel Low Chip Rate, Integration Method
Date: 08.APR.2005 11:42:27



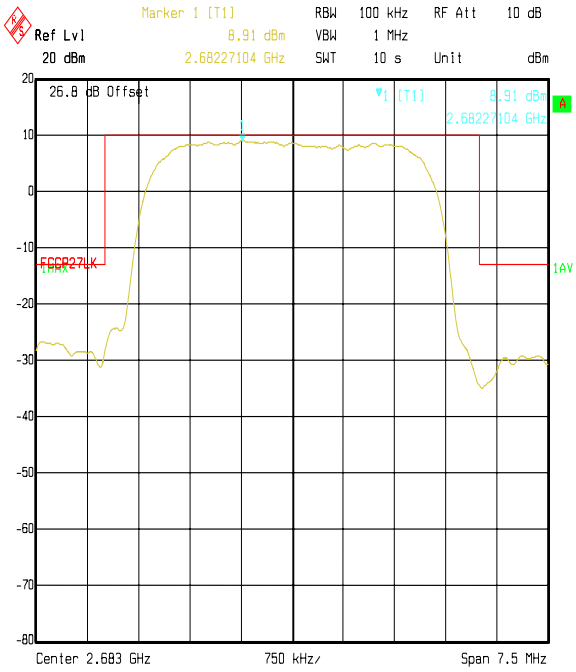
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Middle Channel Low Chip Rate. Integration Methods
Date: 08.APR.2005 14:16:29



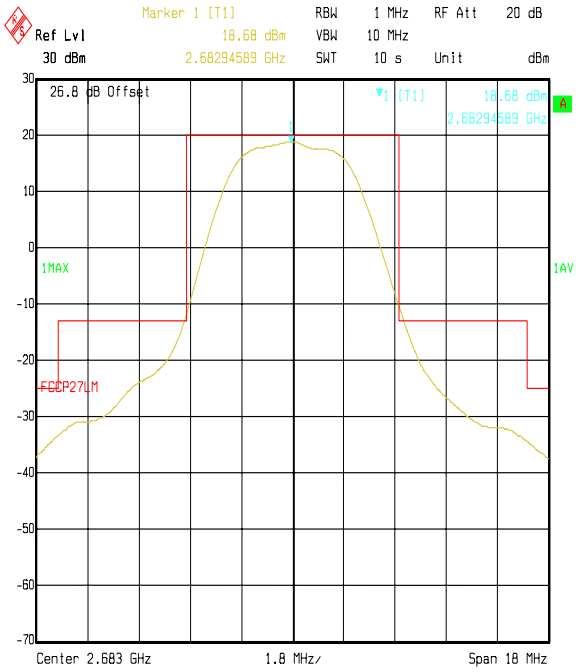
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Middle Channel Low Chip Rate, Integration Method
Date: 08.APR.2005 11:37:12

Note: The frequency lines shown closest to the centre frequency in the above plots that demonstrate measurements in a 1 MHz RBW were the channel edge frequencies plus 1 MHz. They were placed at these frequencies to demonstrate compliance with the requirement that emissions greater than 1 MHz away from the channel edge be measured in a 1 MHz bandwidth.

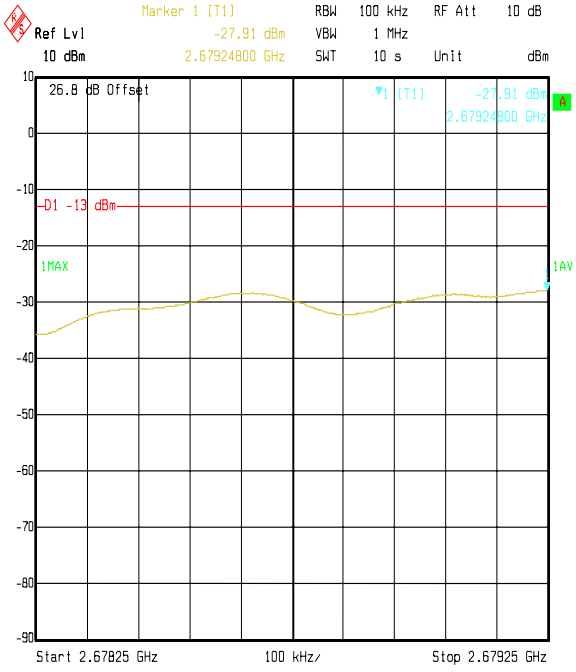
Transmitter Conducted Emissions (Channel Edge): Low Chip Rate – Continued



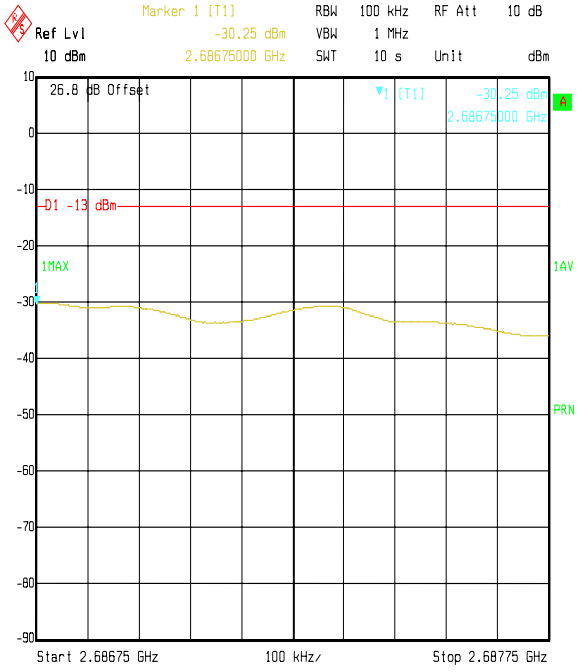
Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel Low Chip Rate
Date: 08.APR.2005 11:54:04



Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel Low Chip Rate
Date: 08.APR.2005 11:55:08



Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel Low Chip Rate, Integration Method
Date: 08.APR.2005 12:06:30



Title: IPWireless EUT:FD, FCC P27 Channel Edge Conducted Emissions
Comment A: 47147JD02 Top Channel Low Chip Rate, Integration Method
Date: 08.APR.2005 12:02:57

Note: The frequency lines shown closest to the centre frequency in the above plots that demonstrate measurements in a 1 MHz RBW were the channel edge frequencies plus 1 MHz. They were placed at these frequencies to demonstrate compliance with the requirement that emissions greater than 1 MHz away from the channel edge be measured in a 1 MHz bandwidth.

Transmitter Conducted Emissions (Channel Edge): Part 2.1051 & Part 27.53 (Continued)

Results for Bottom Channel:

Integrated Power Over 1 MHz Strip Band: 2498.25 to 2499.25 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	1.123	6	2.406
2	2.011	7	1.894
3	2.030	8	3.433
4	2.911	9	3.781
5	2.894	10	4.387
Total Peak Power:	26.870 nW/MHz		

Integrated Power Over 1 MHz Strip Band: 2506.75 to 2507.75 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	3.238	6	2.422
2	2.832	7	2.130
3	2.116	8	1.353
4	1.459	9	1.291
5	2.239	10	0.634
Total Peak Power:	19.714 nW/MHz		

Results for Bottom Channel:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
2498.25 to 2499.25	26.870	-15.7	-13.0	2.7	Complied
2506.75 to 2507.75	19.714	-17.1	-13.0	4.1	Complied

Transmitter Conducted Emissions (Channel Edge): Part 2.1051 & Part 27.53 (Continued)

Results for Middle Channel:

Integrated Power Over 1 MHz Strip Band: 2591.25 to 2592.25 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	2.254	6	1.885
2	2.860	7	2.888
3	2.923	8	3.583
4	2.607	9	3.951
5	1.871	10	4.241
Total Peak Power:	29.063 nW/MHz		

Integrated Power Over 1 MHz Strip Band: 2599.75 to 2600.75 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	3.011	6	2.250
2	2.512	7	2.090
3	2.077	8	1.341
4	1.264	9	1.301
5	2.007	10	0.644
Total Peak Power:	18.497 nW/MHz		

Results for Middle Channel:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
2591.25 to 2592.25	29.063	-15.4	-13.0	2.4	Complied
2599.75 to 2600.75	18.497	-17.3	-13.0	4.3	Complied

Transmitter Conducted Emissions (Channel Edge): Part 2.1051 & Part 27.53 (Continued)

Results for Top Channel:

Integrated Power Over 1 MHz Strip Band: 2678.25 to 2679.25 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	0.485	6	0.893
2	0.678	7	0.754
3	0.846	8	1.141
4	1.239	9	1.191
5	1.288	10	1.467
Total Peak Power:	9.982 nW/MHz		

Integrated Power Over 1 MHz Strip Band: 2686.75 to 2687.75 MHz

2nd 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	0.944	6	0.828
2	0.813	7	0.783
3	0.751	8	0.433
4	0.460	9	0.409
5	0.694	10	0.293
Total Peak Power:	6.408 nW/MHz		

Results for Top Channel:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
2678.25 to 2679.25	9.982	-20.0	-13.0	7.0	Complied
2686.75 to 2687.75	6.408	-21.9	-13.0	8.9	Complied

7.8. Transmitter Conducted Emissions at Band Edges: Parts 2.1051 and 27.53

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

7.8.2. Tests were performed to identify the maximum emissions level at the edges of the frequency band 2500 MHz to 2686 MHz that the EUT will operate over.

Results: (High Chip Rate)

Bottom Band Edge

Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2500	-44.1	-13.0	31.1	Complied

Top Band Edge

Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2686	-44.4	-13.0	31.4	Complied

Results: (Low Chip Rate)

Bottom Band Edge

Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2500	-36.1	-13.0	23.1	Complied

Top Band Edge

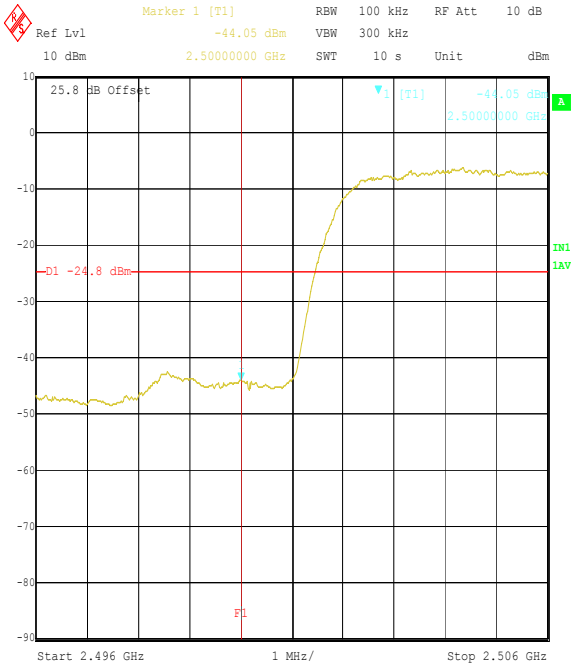
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2686	-40.0	-13.0	27.0	Complied

Note(s):

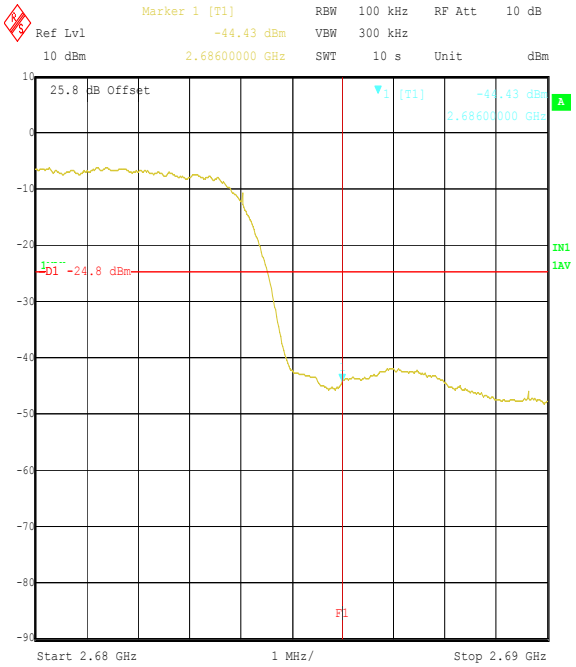
2. *The limit is calculated according to FCC Section 27.53(l)(4) as follows: 55 + 10log(P) where P is the transmitter power in Watts.*

3. *The 55 + 10log(P) limit applies because the test frequencies closest to the lower and upper band edges are 2506 MHz and 2680 MHz for high chip rate mode and 2503 MHz and 2683 MHz for low chip rate mode respectively. The respective band edges of 2500 MHz and 2686 MHz are less than 5.5 MHz from the edges of these channels in both high and low chip rates.*

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



Title: IPWireless EUT: FD. FCC P15/21/74. Lower BandEdge
Comment A: 45219JD01 Bottom Channel 7.68 Mcps.
Date: 5.FEB.2004 15:10:18



Title: IPWireless EUT: FD. FCC P15/21/74. Upper BandEdge
Comment A: 45219JD01 Top Channel 7.68 Mcps.
Date: 5.FEB.2004 15:08:20

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

Transmitter Conducted Emissions at Band Edges (Low Chip Rate)

Title: IPWireless EUT: FD. FCC P15/21/74. Lower Band Edge
Comment A: 45219JD01 Bottom Channel 3.84 Mcps.
Date: 5.FEB.2004 11:26:17

Title: IPWireless EUT: FD. FCC P15/21/74. Upper Band Edge
Comment A: 45219JD01 Top Channel 3.84 Mcps.
Date: 5.FEB.2004 11:24:52

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

7.9. Transmitter Conducted Emissions: Parts 2.1051 and 27.53

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

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

Result: Bottom Channel (High Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2497	-26.9	-13.0	13.9	Complied (Note 1)
2515	-27.3	-13.0	14.3	Complied (Note 1)
5012	-46.1	-25.0	21.1	Complied

Result: Middle Channel (High Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2587	-27.2	-13.0	14.2	Complied (Note 2)
2605	-32.4	-13.0	19.4	Complied (Note 2)
5192	-44.5	-25.0	19.5	Complied

Result: Top Channel (High Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2669	-29.0	-25.0	4.0	Complied
2671	-24.7	-13.0	11.7	Complied
2689	-25.0	-13.0	12.0	Complied
2691	-31.4	-25.0	6.4	Complied
5360	-46.5	-25.0	21.5	Complied

Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2495.0 MHz & 2517.0 MHz were unnecessary.*

2. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2585.0 MHz & 2607.0 MHz were unnecessary.*

Transmitter Conducted Emissions (Continued)

Result: Bottom Channel (Low Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2497	-28.0	-13.0	5.0	Complied (Note 1)
2509	-27.4	-13.0	4.4	Complied (Note 1)
5006	-42.9	-25.0	17.9	Complied

Result: Middle Channel (Low Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2590	-25.8	-13.0	12.8	Complied (Note 2)
2602	-21.2	-13.0	8.2	Complied
2604.25	-32.7	-25.0	7.7	Complied
5192	-41.0	-25.0	16.0	Complied

Result: Top Channel (Low Chip Rate)

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2677	-28.3	-13.0	15.3	Complied (Note 3)
2689	-23.7	-13.0	10.7	Complied
2691.25	-34.7	-25.0	9.7	Complied
5366	-38.6	-25.0	13.6	Complied

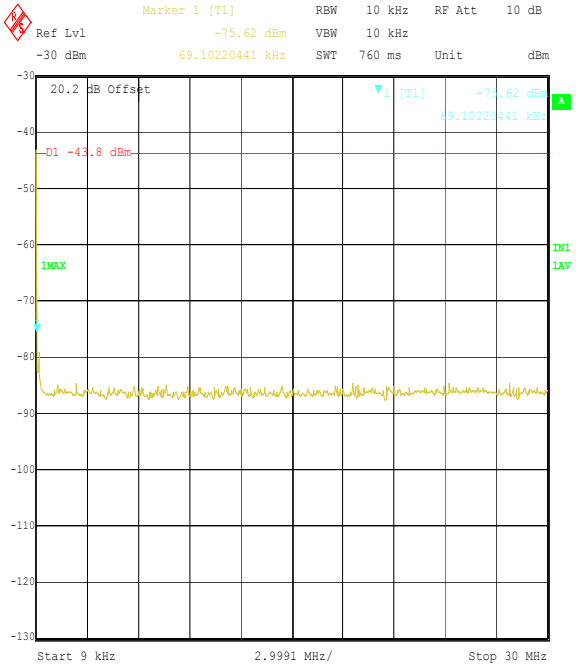
Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2494.75 MHz & 2511.25 MHz were unnecessary.*

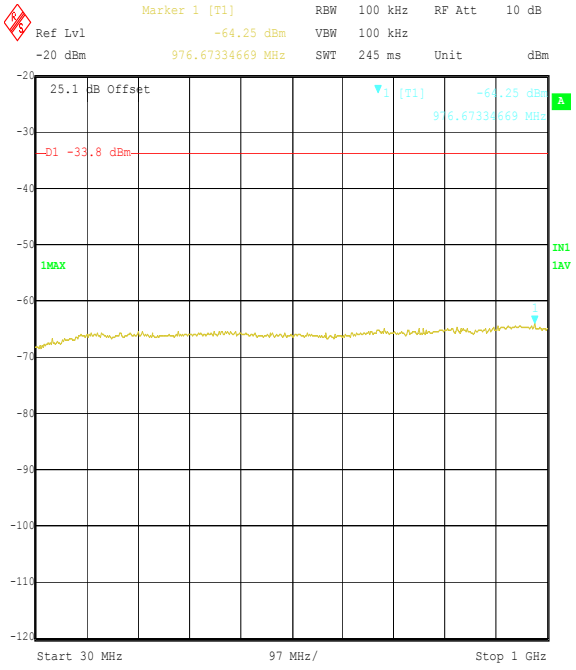
2. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (this frequency lies within 5.5 MHz of the channel edge), a further measurement at the spot frequency 5.5 MHz away from the channel edge i.e. 2587.75 MHz was unnecessary.*

3. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (this frequency lies within 5.5 MHz of the channel edge), a further measurement at the spot frequency 5.5 MHz away from the channel edge i.e. 2674.75 MHz was unnecessary*

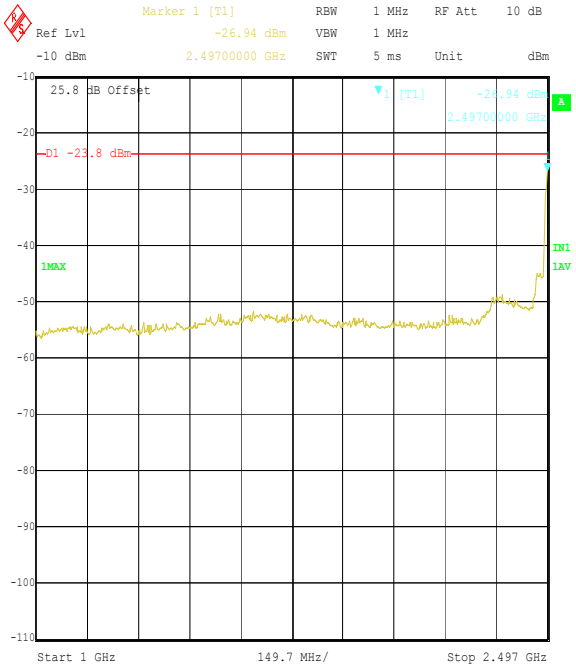
Transmitter Conducted Emissions Bottom Channel (High Chip Rate) – Continued



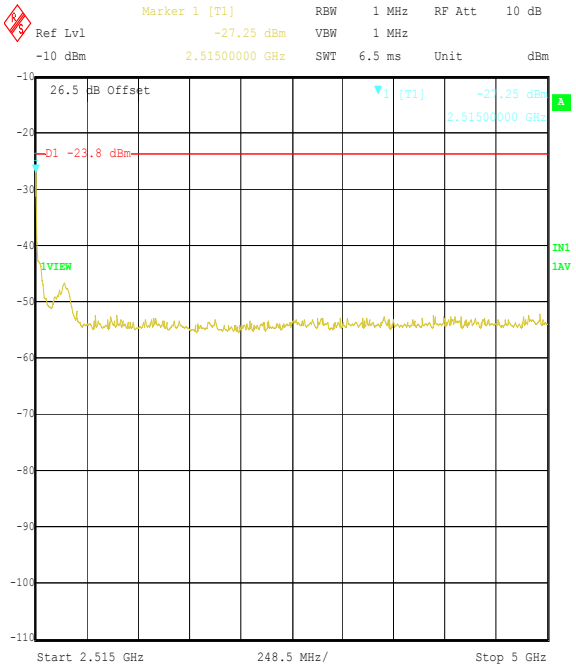
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 001
Date: 5.FEB.2004 14:35:18



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 002
Date: 5.FEB.2004 14:38:09



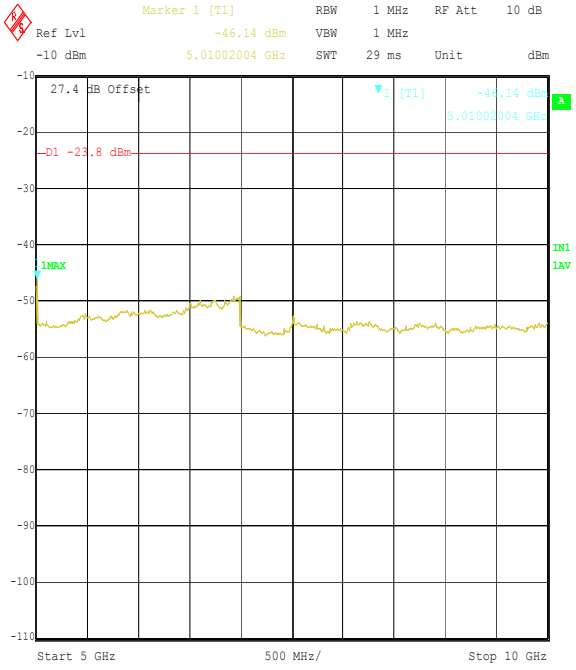
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 003
Date: 5.FEB.2004 14:38:55



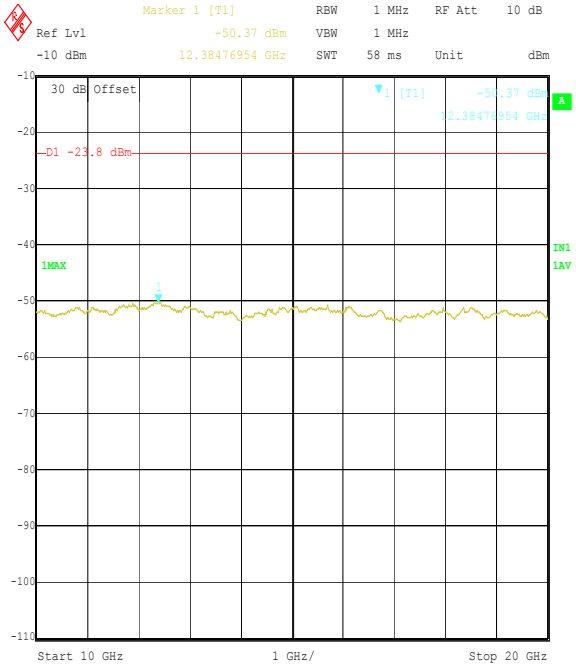
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 004
Date: 5.FEB.2004 14:50:00

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

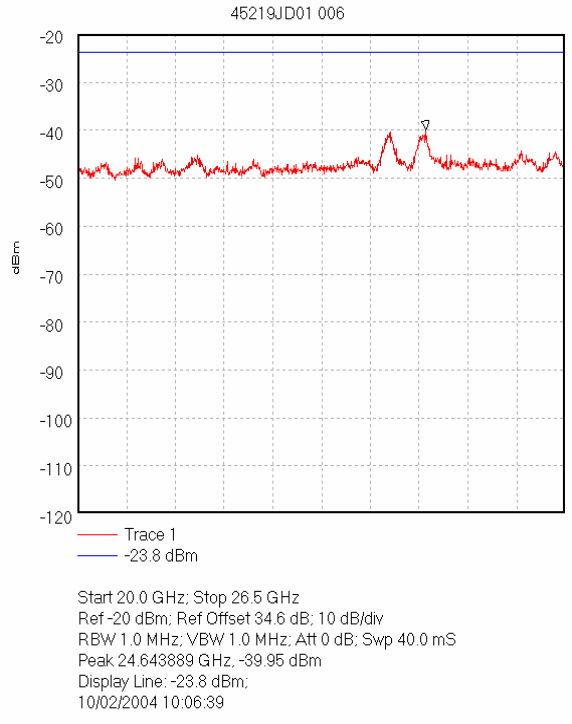
Transmitter Conducted Emissions Bottom Channel (High Chip Rate) – Continued

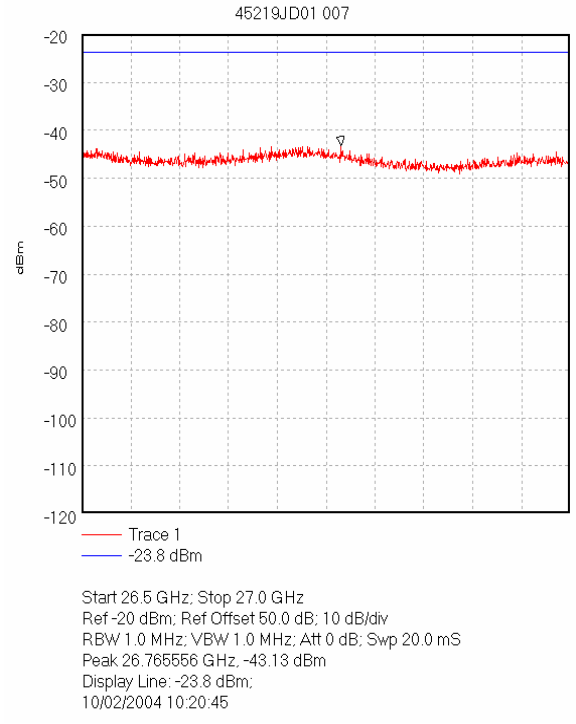


Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 005
Date: 5.FEB.2004 14:50:54



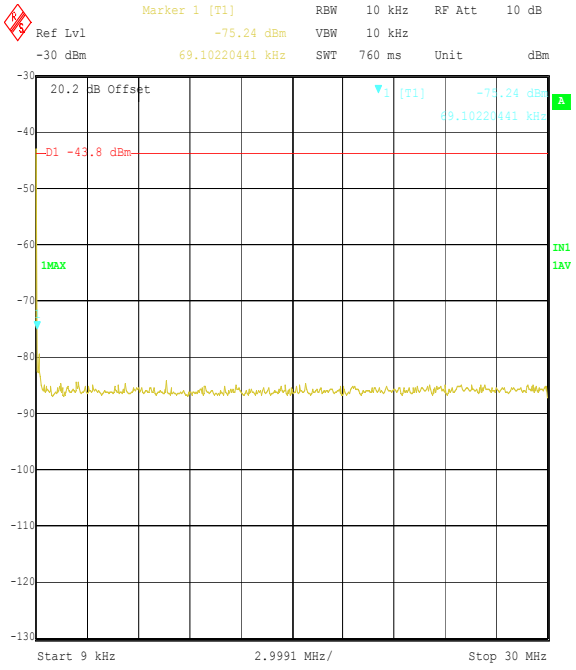
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 006
Date: 5.FEB.2004 14:54:04



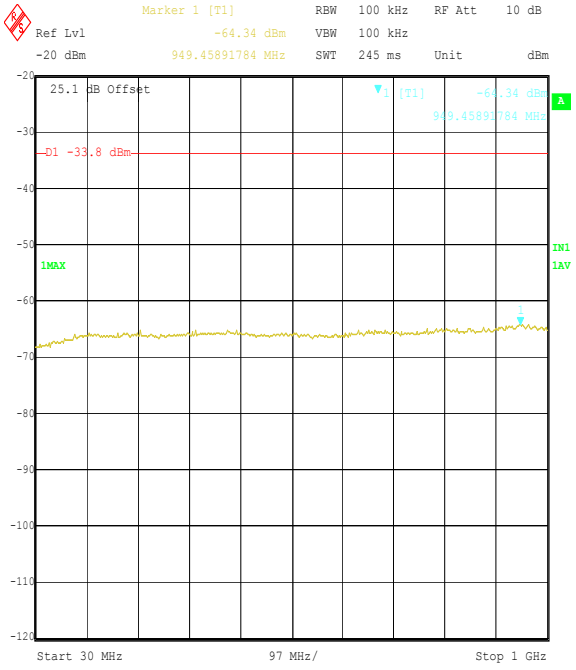


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

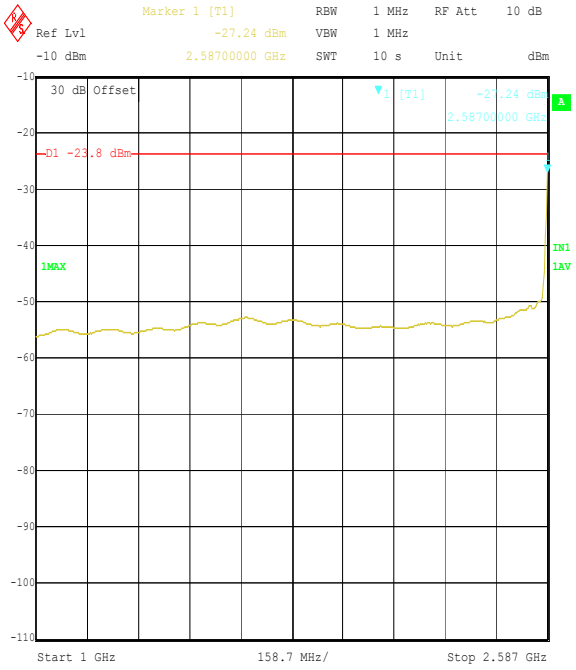
Transmitter Conducted Emissions Middle Channel (High Chip Rate) – Continued



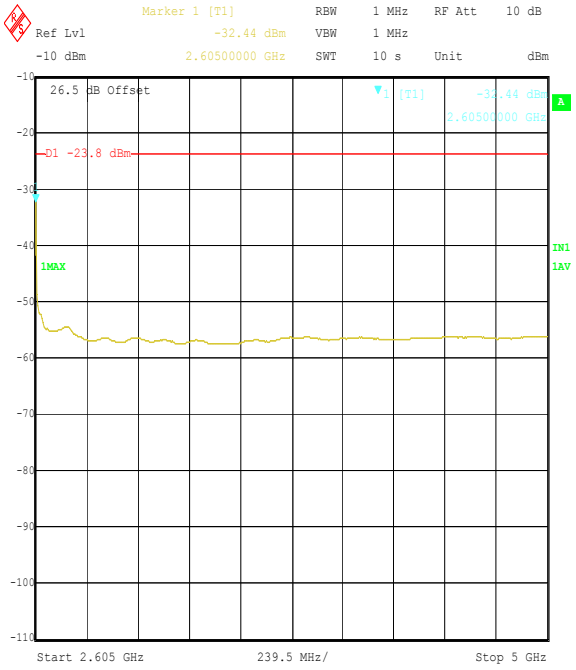
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 001
Date: 5.FEB.2004 14:34:48



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 002
Date: 5.FEB.2004 14:37:15



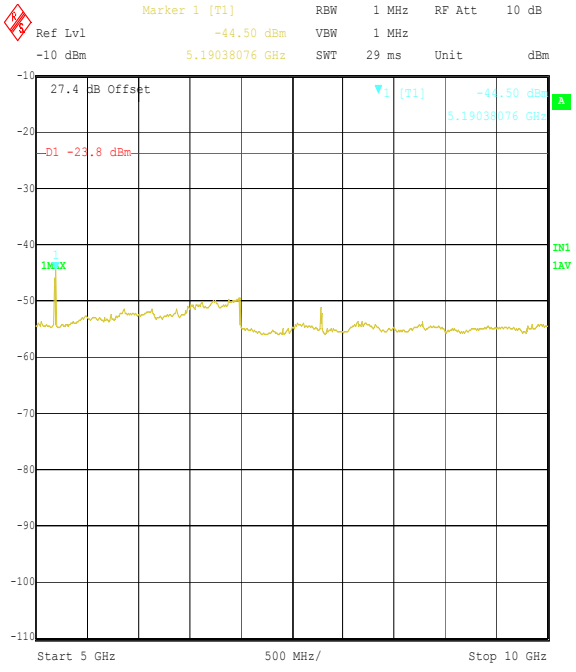
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 003
Date: 5.FEB.2004 14:57:47



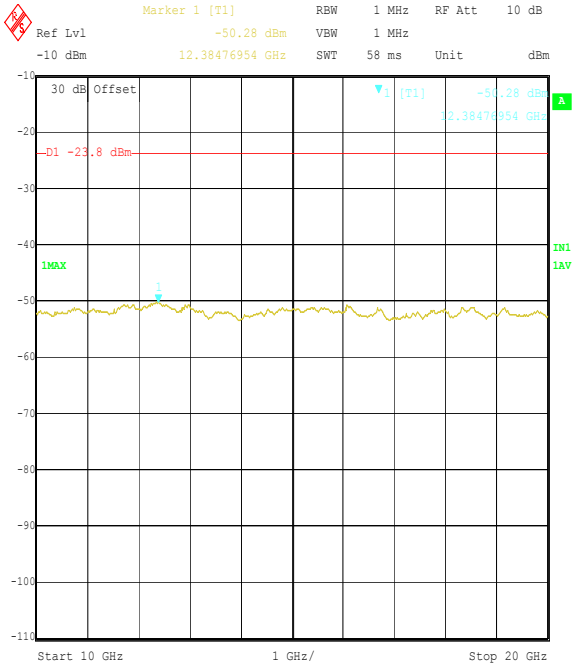
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 004
Date: 5.FEB.2004 14:59:13

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

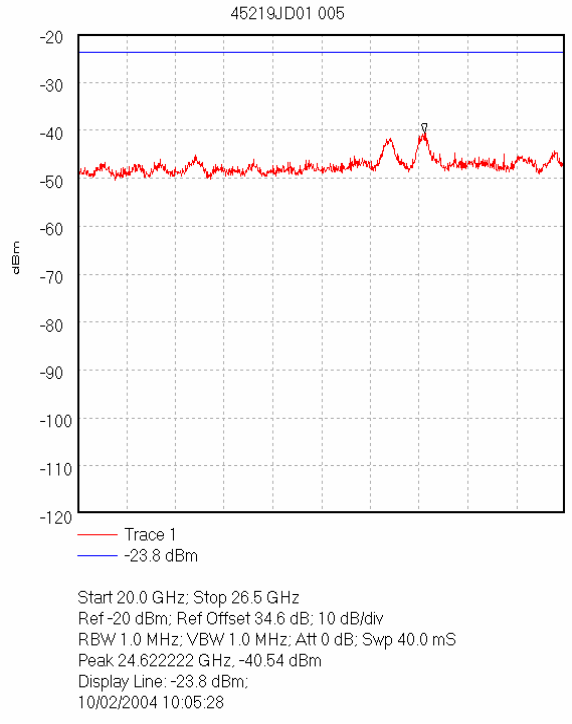
Transmitter Conducted Emissions Middle Channel (High Chip Rate) – Continued

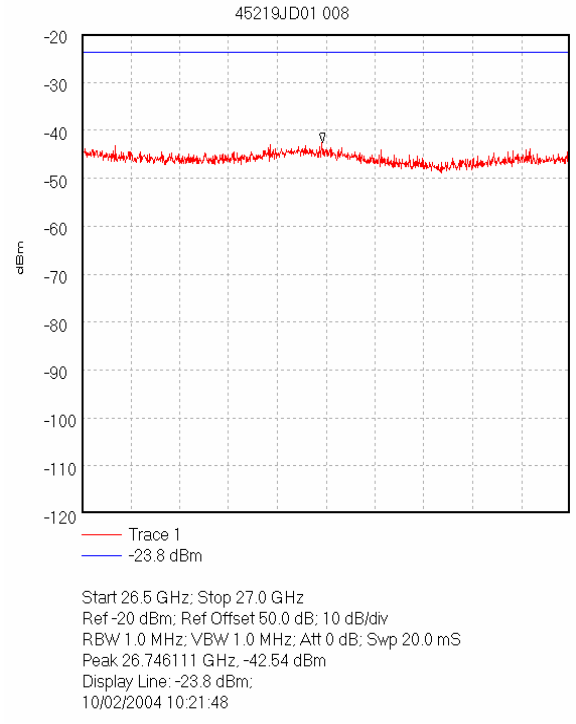


Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 005
Date: 5.FEB.2004 14:51:36



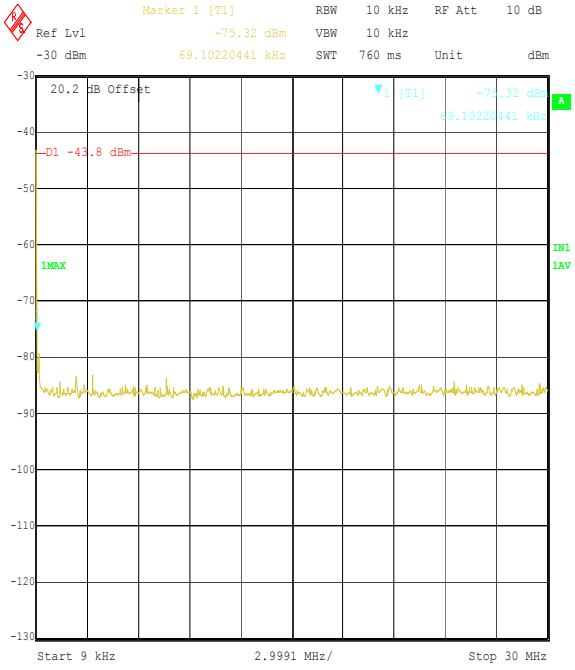
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 006
Date: 5.FEB.2004 14:53:37



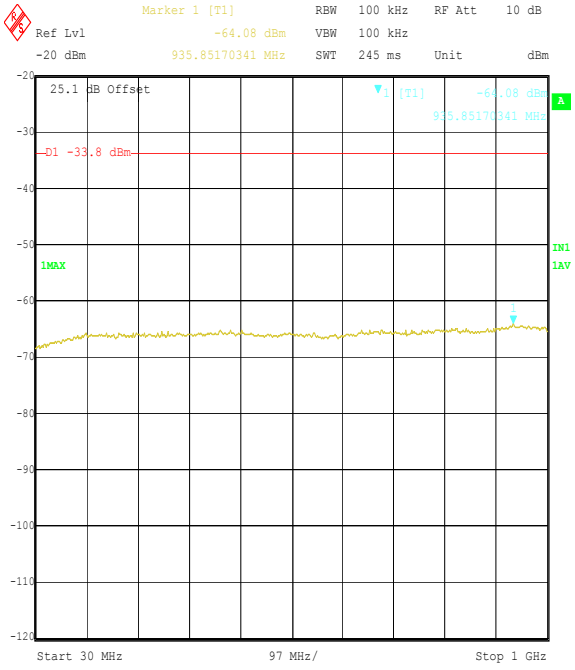


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

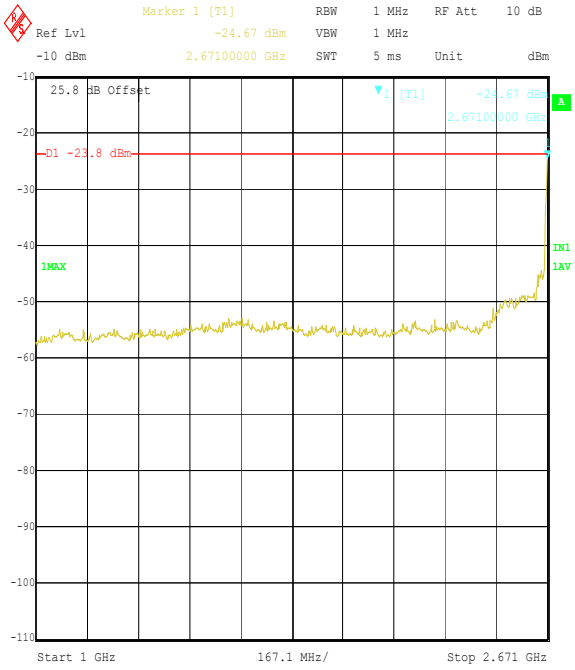
Transmitter Conducted Emissions Top Channel (High Chip Rate) – Continued



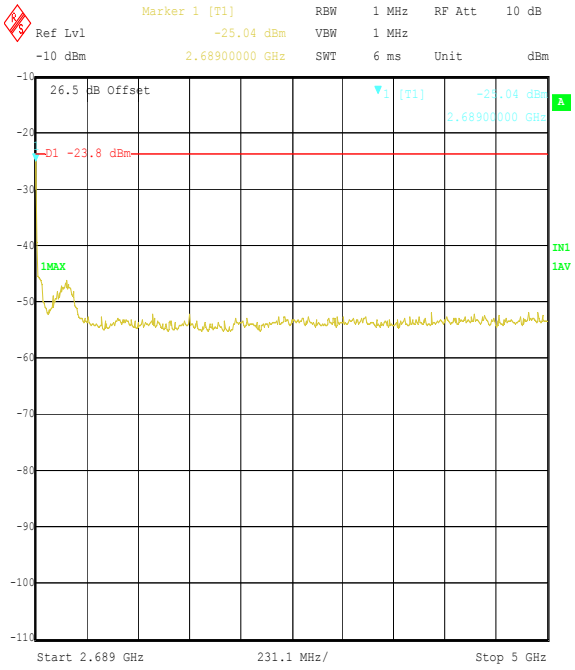
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 001
Date: 5.FEB.2004 14:35:50



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 002
Date: 5.FEB.2004 14:36:30



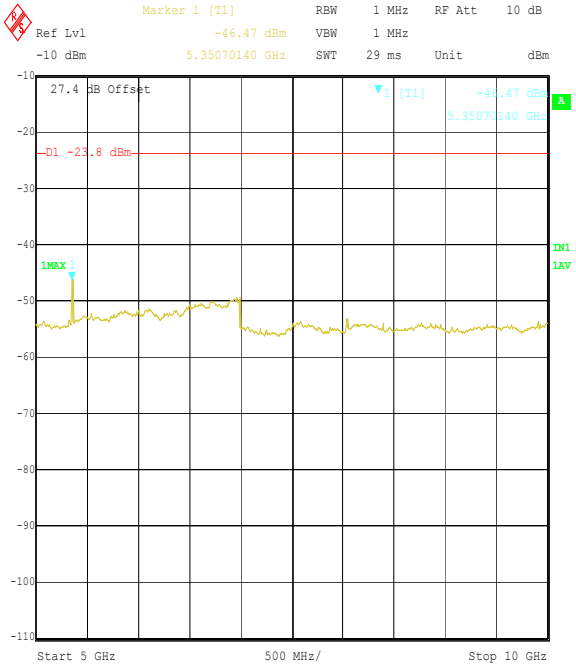
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 003
Date: 5.FEB.2004 14:47:58



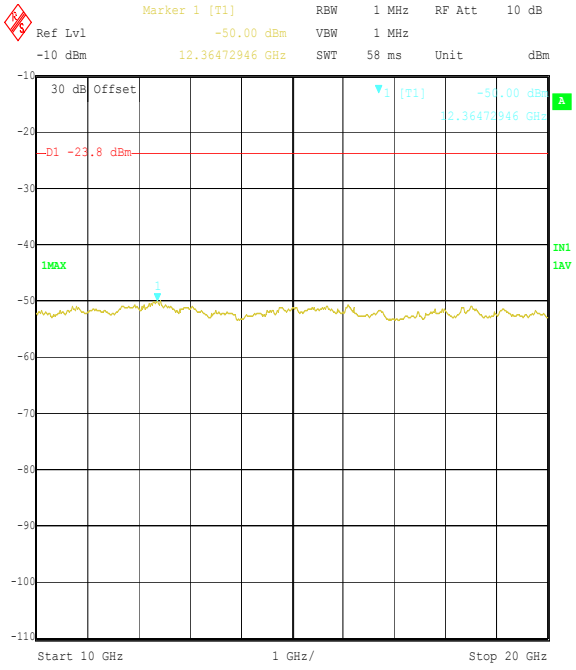
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 004
Date: 5.FEB.2004 14:48:32

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

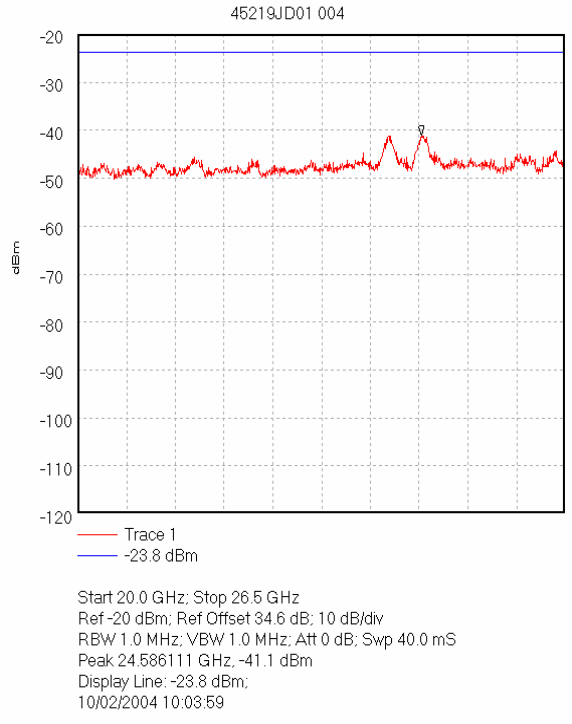
Transmitter Conducted Emissions Top Channel (High Chip Rate) – Continued



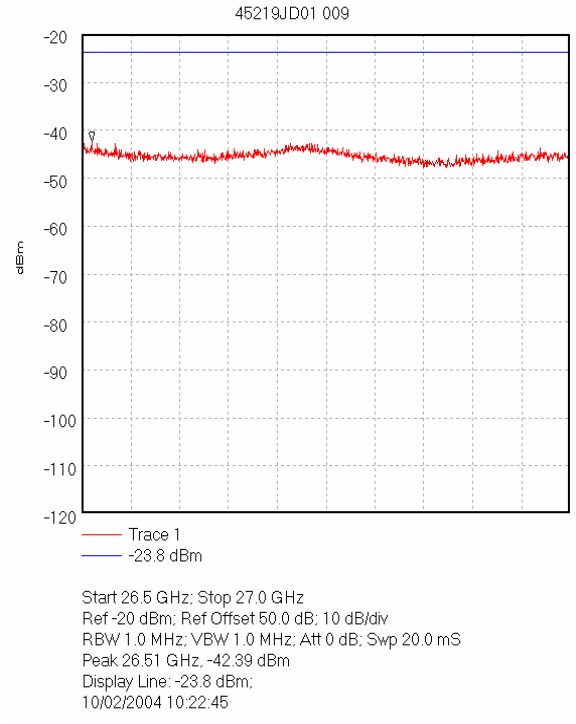
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 005
Date: 5.FEB.2004 14:52:20



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 7.68 Mcps. 006
Date: 5.FEB.2004 14:53:10



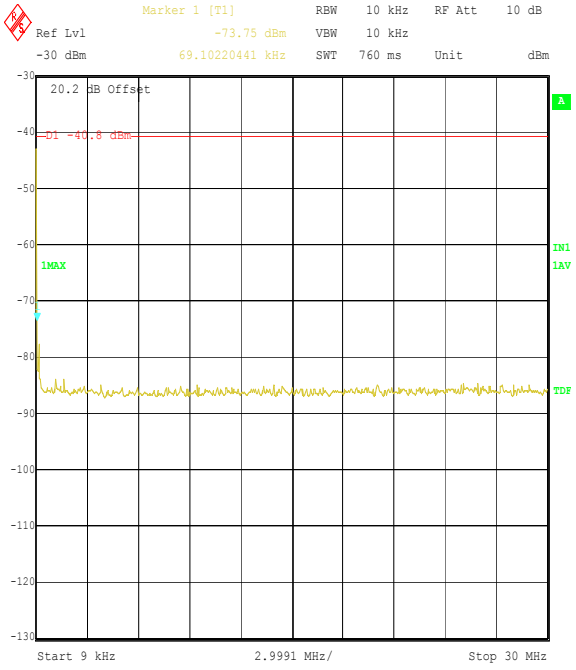
Start 20.0 GHz; Stop 26.5 GHz
Ref -20 dBm; Ref Offset 34.6 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 24.586111 GHz, -41.1 dBm
Display Line: -23.8 dBm;
10/02/2004 10:03:59



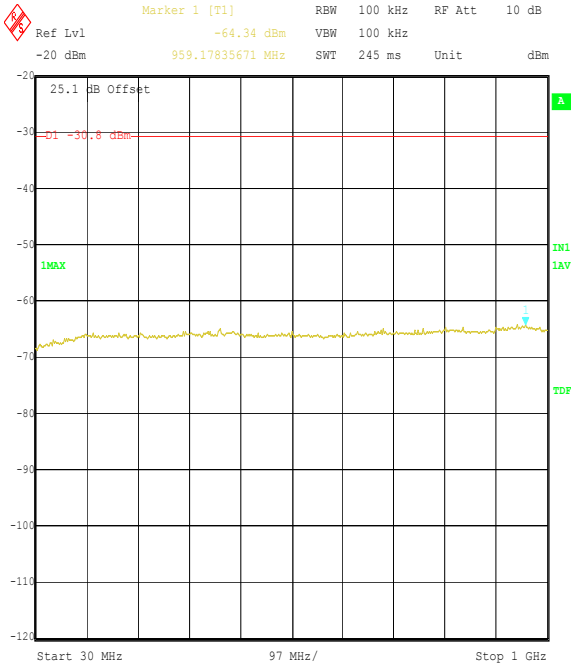
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 50.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.51 GHz, -42.39 dBm
Display Line: -23.8 dBm;
10/02/2004 10:22:45

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

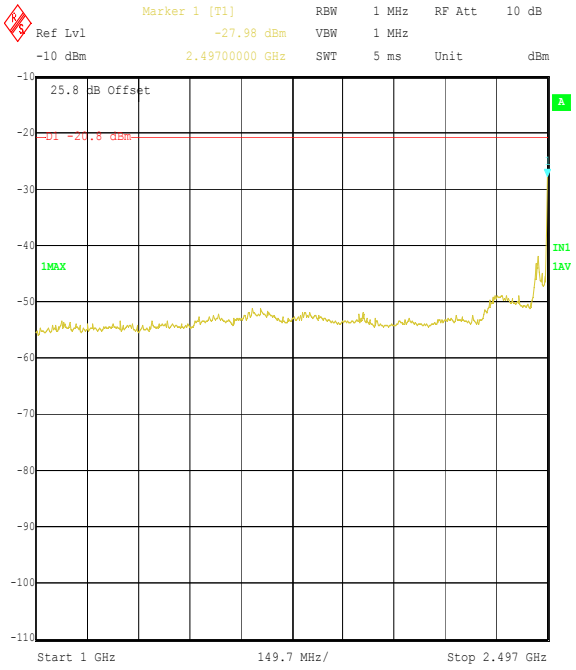
Transmitter Conducted Emissions Bottom Channel (Low Chip Rate) – Continued



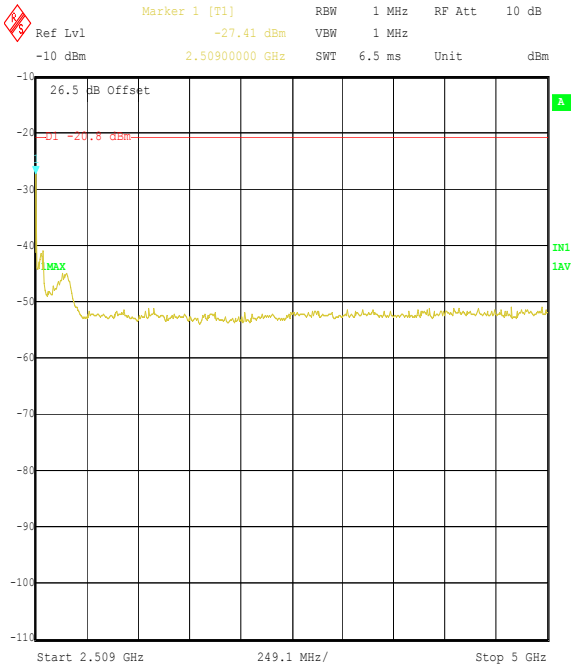
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 001
Date: 5.FEB.2004 10:27:21



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 002
Date: 5.FEB.2004 10:30:13



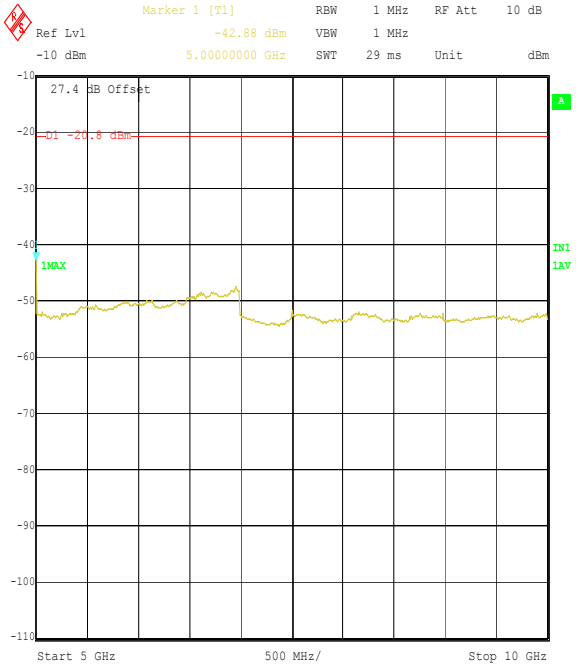
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 003
Date: 5.FEB.2004 10:41:20



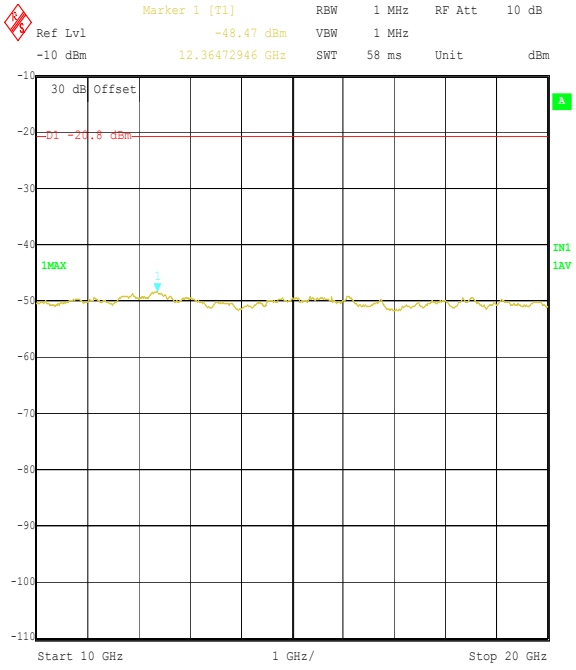
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 004
Date: 5.FEB.2004 10:47:00

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

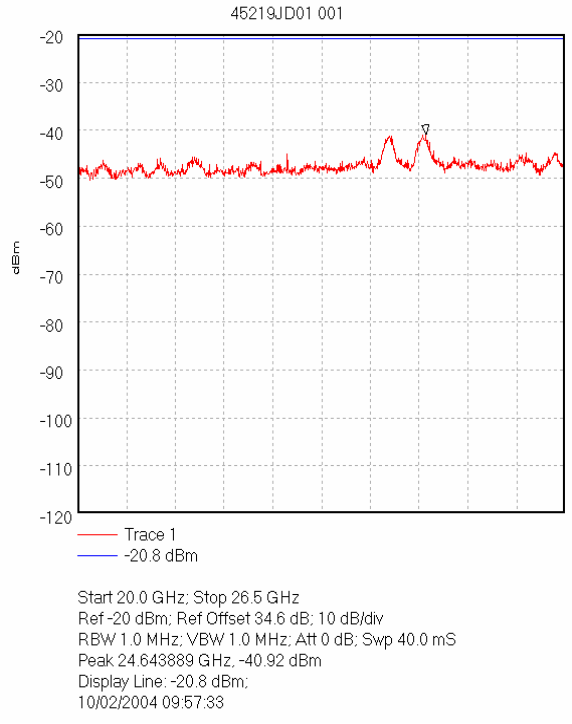
Transmitter Conducted Emissions Bottom Channel (Low Chip Rate) – Continued



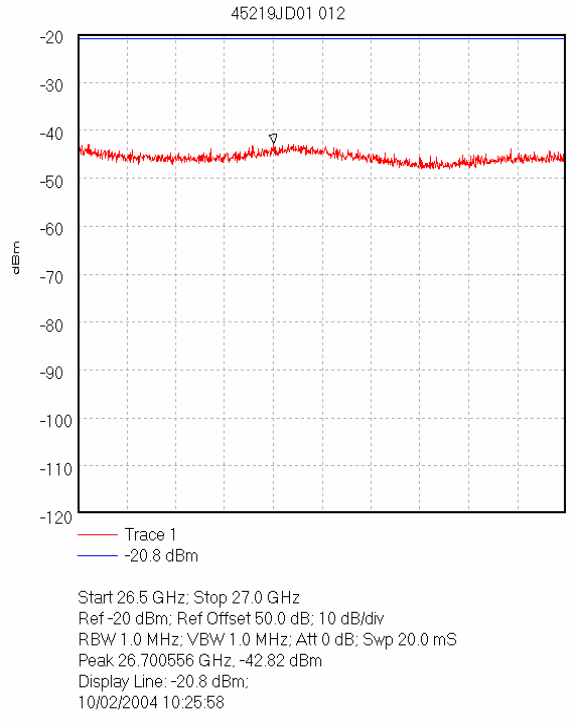
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 005
Date: 5.FEB.2004 10:48:04



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 006
Date: 5.FEB.2004 10:56:24



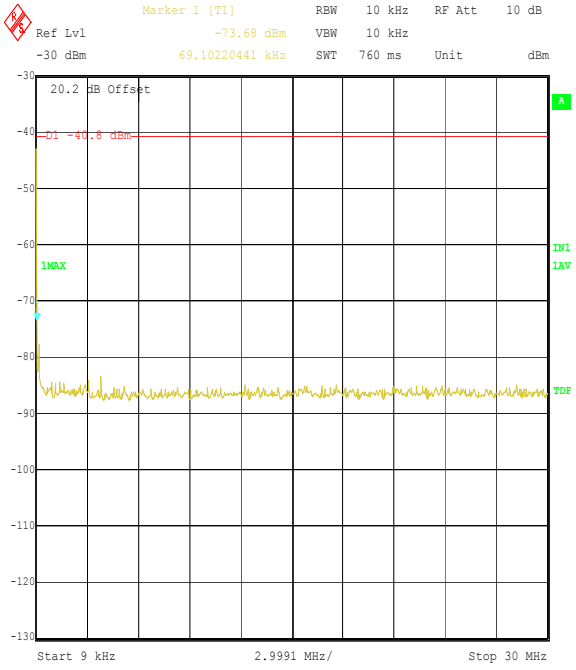
Start 20.0 GHz; Stop 26.5 GHz
Ref -20 dBm; Ref Offset 34.6 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 24.643889 GHz, -40.92 dBm
Display Line: -20.8 dBm;
10/02/2004 09:57:33



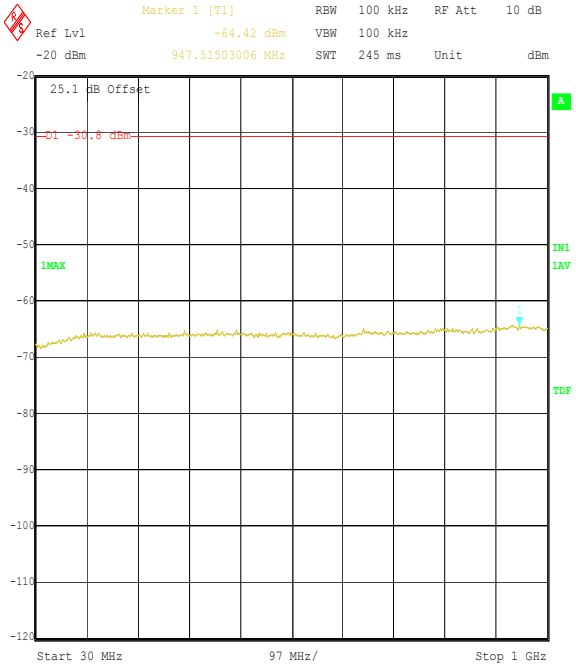
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 50.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.700556 GHz, -42.82 dBm
Display Line: -20.8 dBm;
10/02/2004 10:25:58

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

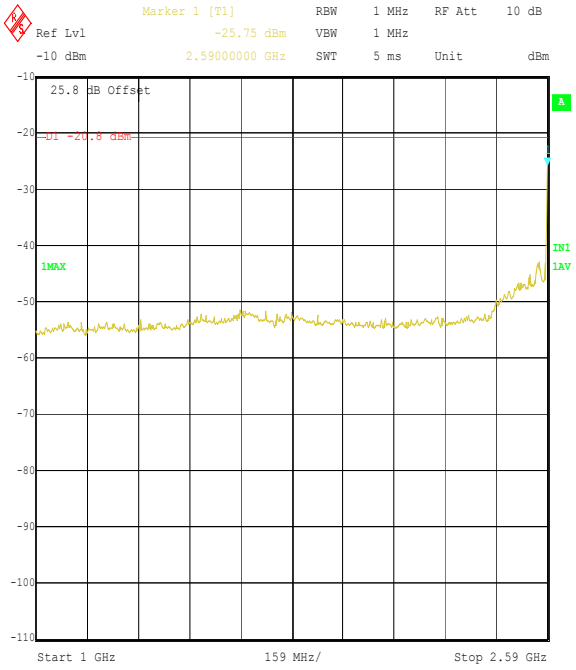
Transmitter Conducted Emissions Middle Channel (Low Chip Rate) – Continued



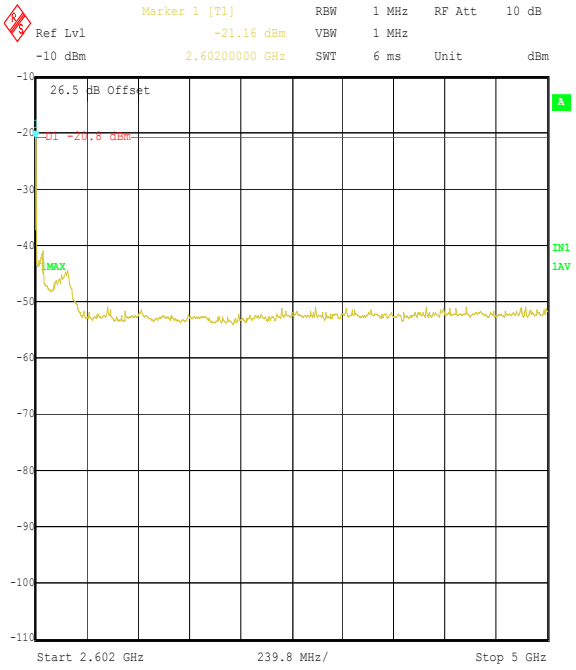
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 001
Date: 5.FEB.2004 10:27:49



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 002
Date: 5.FEB.2004 10:29:40



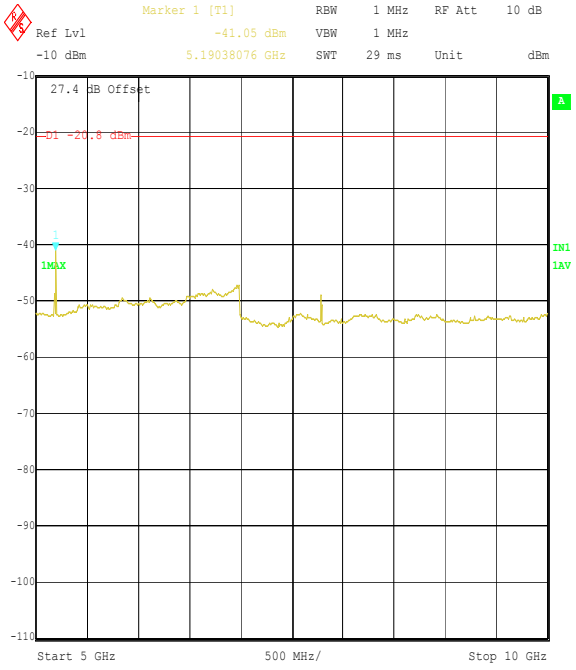
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 003
Date: 5.FEB.2004 10:43:08



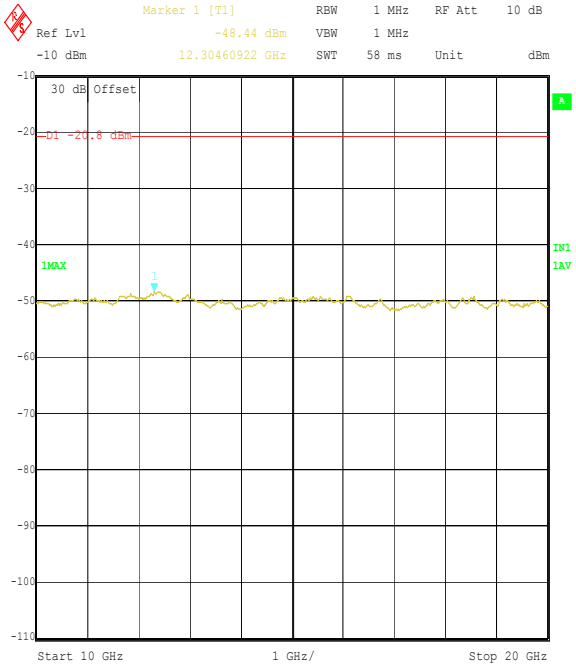
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 004
Date: 5.FEB.2004 10:45:55

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

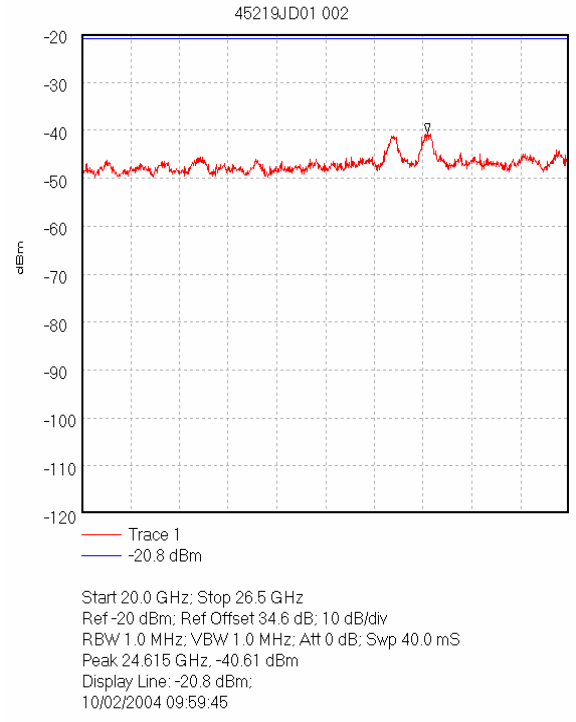
Transmitter Conducted Emissions Middle Channel (Low Chip Rate) – Continued



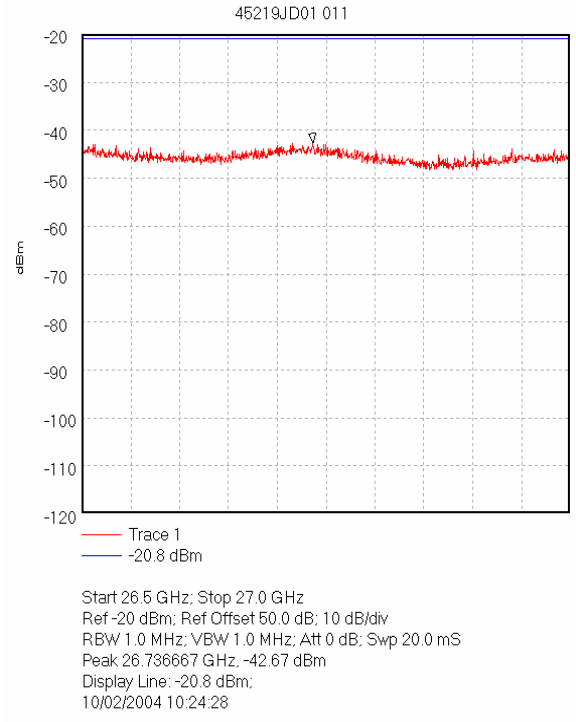
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 005
Date: 5.FEB.2004 10:48:39



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 006
Date: 5.FEB.2004 10:55:05

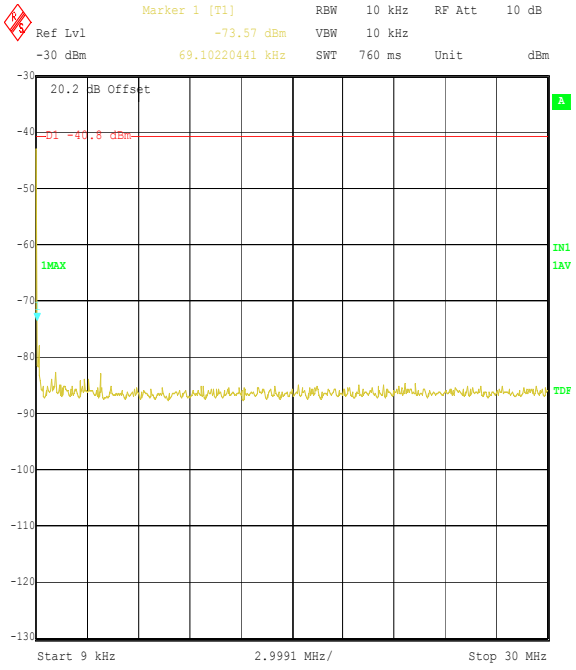


Start 20.0 GHz; Stop 26.5 GHz
Ref -20 dBm; Ref Offset 34.6 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 24.615 GHz, -40.61 dBm
Display Line: -20.8 dBm;
10/02/2004 09:59:45

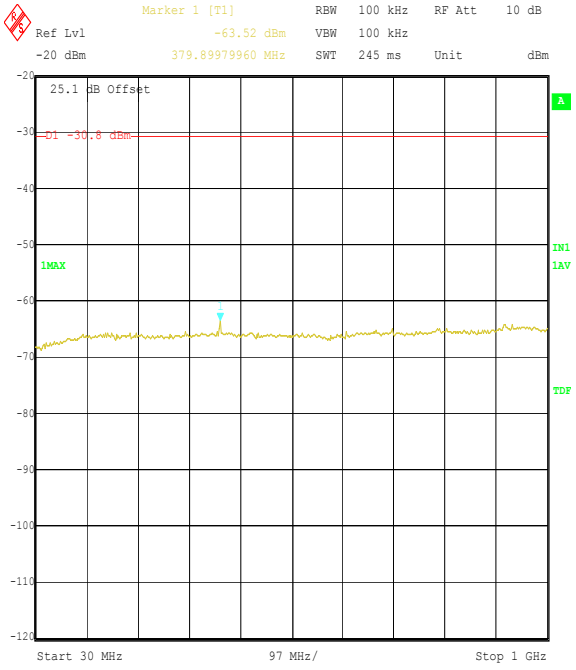


Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 50.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.736667 GHz, -42.67 dBm
Display Line: -20.8 dBm;
10/02/2004 10:24:28

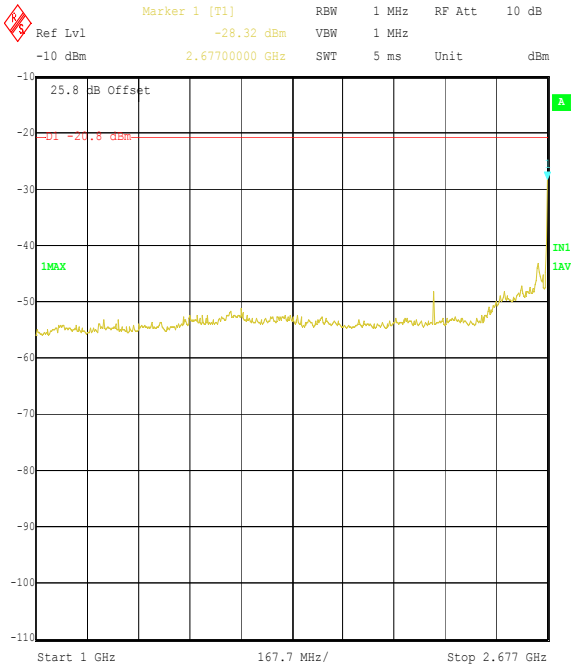
Transmitter Conducted Emissions Top Channel (Low Chip Rate) – Continued



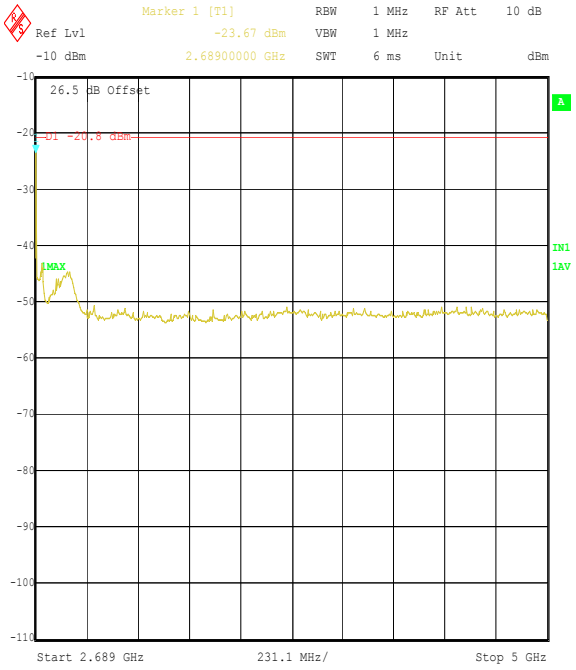
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 001
Date: 5.FEB.2004 10:28:17



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 002
Date: 5.FEB.2004 10:28:55



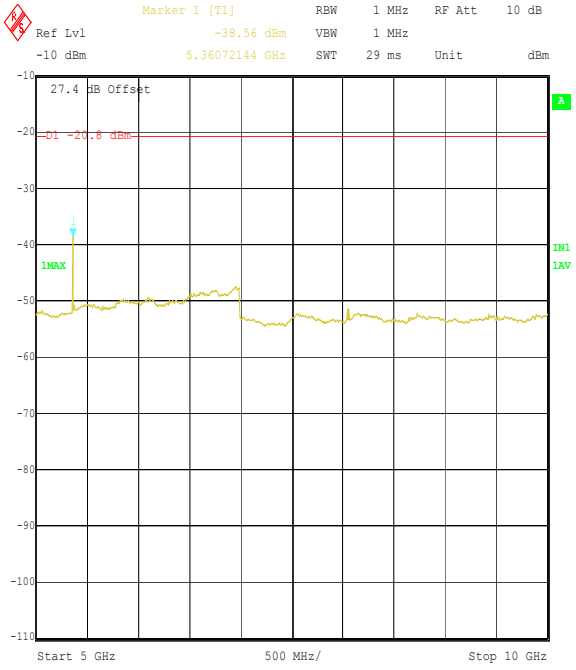
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 003
Date: 5.FEB.2004 10:44:09



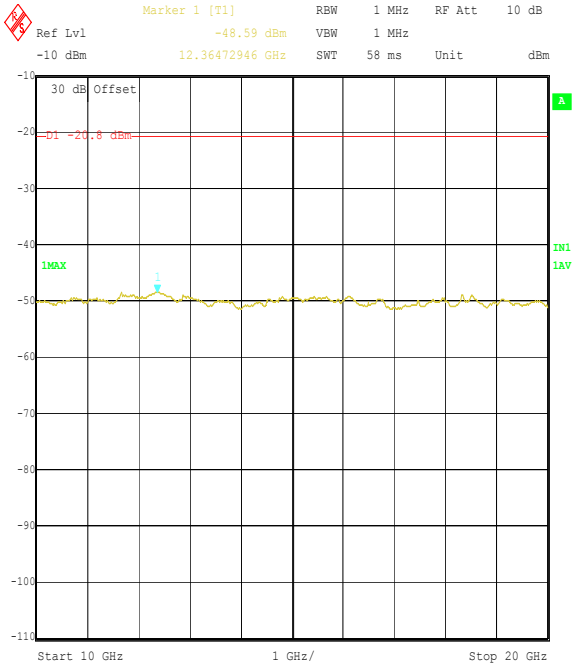
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 004
Date: 5.FEB.2004 10:45:00

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

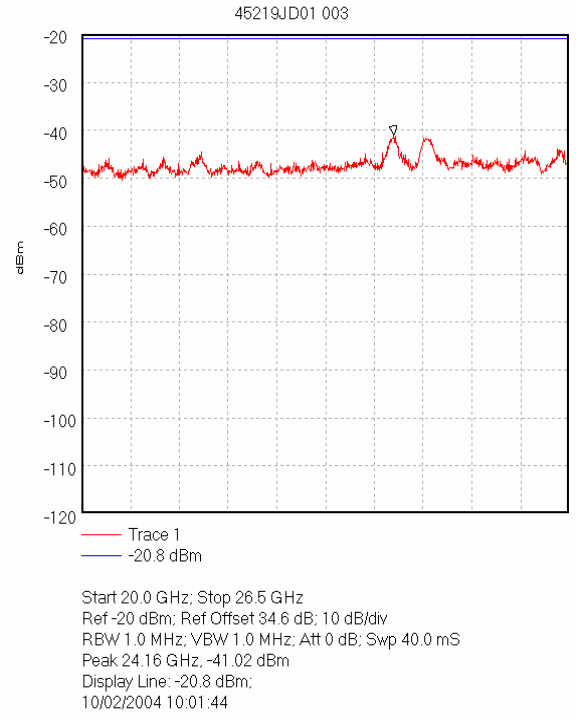
Transmitter Conducted Emissions Top Channel (Low Chip Rate) – Continued



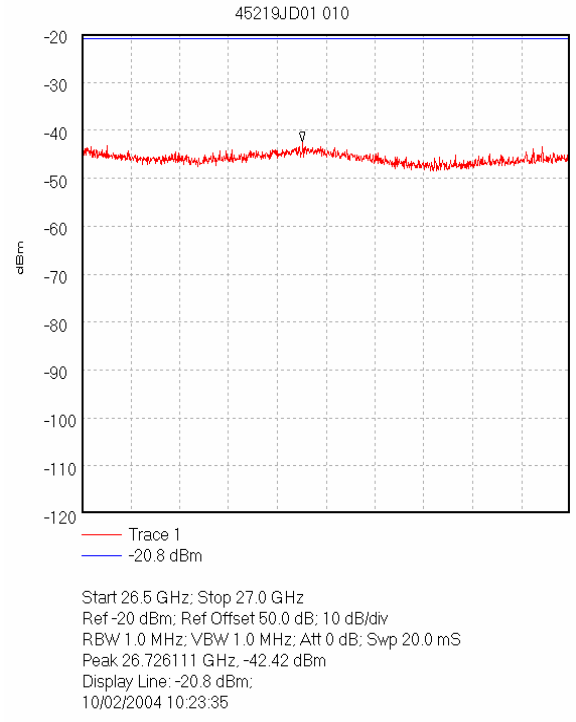
Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 005
Date: 5.FEB.2004 10:49:18



Title: IPWireless EUT: FD. FCC P15/21/74. Conducted Spurious
Comment A: 45219JD01 Top Channel 3.84 Mcps. 006
Date: 5.FEB.2004 10:54:19



Start 20.0 GHz; Stop 26.5 GHz
Ref -20 dBm; Ref Offset 34.6 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 40.0 mS
Peak 24.16 GHz, -41.02 dBm
Display Line: -20.8 dBm;
10/02/2004 10:01:44



Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 50.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 26.726111 GHz, -42.42 dBm
Display Line: -20.8 dBm;
10/02/2004 10:23:35

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

7.10. Transmitter Radiated Emissions

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

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

Results:- Bottom Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.874	-64.2	-25.0	39.2	Complied
132.423	-52.0	-25.0	27.0	Complied
111.208	-67.1	-25.0	42.1	Complied
163.033	-62.2	-25.0	37.2	Complied
195.409	-57.9	-25.0	32.9	Complied
260.557	-49.1	-25.0	24.1	Complied
325.707	-49.2	-25.0	24.2	Complied
390.836	-58.4	-25.0	33.4	Complied
458.265	-53.2	-25.0	28.2	Complied
716.565	-50.2	-25.0	25.2	Complied
911.977	-52.6	-25.0	27.6	Complied
977.156	-51.7	-25.0	26.7	Complied
1042.249	-52.9	-25.0	27.9	Complied
1060.837	-44.8	-25.0	19.8	Complied
1107.817	-47.2	-25.0	22.2	Complied
1172.600	-55.7	-25.0	30.7	Complied
1197.831	-64.0	-25.0	39.0	Complied
1592.651	-61.8	-25.0	36.8	Complied
1133.352	-54.6	-25.0	29.6	Complied
2493.100	-36.6	-25.0	11.6	Complied
2497.000	-31.8	-13.0	18.8	Complied (Note 1)
2515.000	-33.9	-13.0	20.9	Complied (Note 1)

Transmitter Radiated Emissions (Continued)

Results:- Bottom Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
2662.535	-46.6	-25.0	21.6	Complied
5008.297	-39.5	-25.0	14.5	Complied
7510.335	-52.5	-25.0	27.5	Complied
12246.824	-47.9	-25.0	22.9	Complied
14529.349	-44.8	-25.0	19.8	Complied
25546.994	-35.7	-25.0	10.7	Complied
26534.070	-48.5	-25.0	23.5	Complied

Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2495.0 MHz & 2517.0 MHz were unnecessary.*

Transmitter Radiated Emissions (Continued)

Results:- Middle Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.843	-65.5	-25.0	40.5	Complied
111.731	-69.5	-25.0	44.5	Complied
132.403	-51.8	-25.0	26.8	Complied
163.346	-61.4	-25.0	36.4	Complied
195.403	-57.7	-25.0	32.7	Complied
260.575	-49.2	-25.0	24.2	Complied
390.845	-57.5	-25.0	32.5	Complied
325.705	-49.0	-25.0	24.0	Complied
458.245	-53.7	-25.0	28.7	Complied
716.565	-48.8	-25.0	23.8	Complied
911.973	-52.5	-25.0	27.5	Complied
977.126	-51.7	-25.0	26.7	Complied
1042.730	-53.4	-25.0	28.4	Complied
1059.650	-44.1	-25.0	19.1	Complied
1107.135	-47.3	-25.0	22.3	Complied
1133.076	-48.7	-25.0	23.7	Complied
1172.665	-55.3	-25.0	30.3	Complied
1195.667	-63.2	-25.0	38.2	Complied
1590.927	-62.9	-25.0	37.9	Complied
2475.872	-49.5	-25.0	24.5	Complied
2587.000	-29.6	-13.0	16.6	Complied (Note 1)
2605.000	-29.6	-13.0	16.6	Complied (Note 1)
3776.740	-58.5	-25.0	33.5	Complied
5188.096	-33.8	-25.0	8.8	Complied
6998.046	-54.1	-25.0	29.1	Complied

Transmitter Radiated Emissions (Continued)

Results:- Middle Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
12389.494	-47.3	-25.0	22.3	Complied
12980.752	-41.6	-25.0	16.6	Complied
25554.008	-35.5	-25.0	10.5	Complied
26504.650	-49.0	-25.0	24.0	Complied

Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2585.0 MHz & 2607.0 MHz were unnecessary.*

Transmitter Radiated Emissions (Continued) - High Chip Rate

Results:- Top Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.873	-64.8	-25.0	39.8	Complied
111.269	-67.8	-25.0	42.8	Complied
132.425	-53.0	-25.0	28.0	Complied
162.846	-64.5	-25.0	39.5	Complied
195.423	-58.1	-25.0	33.1	Complied
260.557	-49.5	-25.0	24.5	Complied
390.855	-57.6	-25.0	32.6	Complied
325.707	-49.2	-25.0	24.2	Complied
458.247	-53.6	-25.0	28.6	Complied
716.559	-50.6	-25.0	25.6	Complied
911.987	-51.5	-25.0	26.5	Complied
977.140	-50.6	-25.0	25.6	Complied
1043.136	-51.2	-25.0	26.2	Complied
1059.670	-45.1	-25.0	20.1	Complied
1107.411	-50.5	-25.0	25.5	Complied
1133.131	-54.1	-25.0	29.1	Complied
1172.520	-55.7	-25.0	30.7	Complied
1196.874	-63.6	-25.0	38.6	Complied
1590.752	-62.0	-25.0	37.0	Complied
2669.000	-35.5	-25.0	10.5	Complied
2671.000	-23.9	-13.0	10.9	Complied
2689.000	-23.9	-13.0	10.9	Complied
2691.000	-36.8	-25.0	11.8	Complied
2830.618	-52.2	-25.0	27.2	Complied

Transmitter Radiated Emissions (Continued)

Results:- Top Channel (High Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
5356.052	-41.3	-25.0	16.3	Complied
6723.497	-49.3	-25.0	24.3	Complied
12351.804	-47.3	-25.0	22.3	Complied
12997.064	-44.2	-25.0	19.2	Complied
25545.792	-35.5	-25.0	10.5	Complied
26518.720	-48.5	-25.0	23.5	Complied

Transmitter Radiated Emissions (Continued) - Low Chip Rate

Results:- Bottom Channel (Low Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.839	-63.1	-25.0	38.1	Complied
132.164	-57.0	-25.0	32	Complied
195.417	-57.3	-25.0	32.3	Complied
260.572	-48.9	-25.0	23.9	Complied
325.692	-48.2	-25.0	23.2	Complied
458.236	-53.5	-25.0	28.5	Complied
716.585	-53.3	-25.0	28.3	Complied
911.962	-50.7	-25.0	25.7	Complied
977.136	-51.2	-25.0	26.2	Complied
1059.068	-49.0	-25.0	24	Complied
2493.434	-36.6	-25.0	11.6	Complied
2497.000	-34.0	-13.0	21.0	Complied (Note 1)
2509.000	-34.7	-13.0	21.7	Complied (Note 1)
2646.600	-47.2	-25.0	22.2	Complied
5007.786	-41.7	-25.0	16.7	Complied
12294.899	-46.9	-25.0	21.9	Complied
16161.573	-44.9	-25.0	19.9	Complied
25516.693	-36.6	-25.0	11.6	Complied
26526.570	-48.8	-25.0	23.8	Complied

Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2494.75 MHz & 2511.25 MHz were unnecessary.*

Transmitter Radiated Emissions (Continued) - Low Chip Rate

Results:- Middle Channel (Low Chip Rate)

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.892	-64.6	-25.0	39.6	Complied
132.432	-51.6	-25.0	26.6	Complied
195.402	-57.4	-25.0	32.4	Complied
260.556	-49.6	-25.0	24.6	Complied
325.692	-48.2	-25.0	23.2	Complied
458.245	-53.4	-25.0	28.4	Complied
716.537	-53.5	-25.0	28.5	Complied
911.982	-50.7	-25.0	25.7	Complied
977.136	-51.1	-25.0	26.1	Complied
1059.188	-45.4	-25.0	20.4	Complied
2479.759	-49.0	-25.0	24	Complied
2590.000	-33.8	-13.0	20.8	Complied (Note 1)
2602.000	-33.0	-13.0	20.0	Complied (Note 1)
3776.439	-58.5	-25.0	33.5	Complied
5189.960	-36.1	-25.0	11.1	Complied
12398.682	-47.9	-25.0	22.9	Complied
12974.599	-39.2	-25.0	14.2	Complied
25555.491	-35.7	-25.0	10.7	Complied
26502.500	-48.6	-25.0	23.6	Complied

Note(s):

1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2587.75 MHz & 2604.25 MHz were unnecessary.*

Transmitter Radiated Emissions (Continued) - Low Chip Rate

Results:- Top Channel (Low Chip Rate)

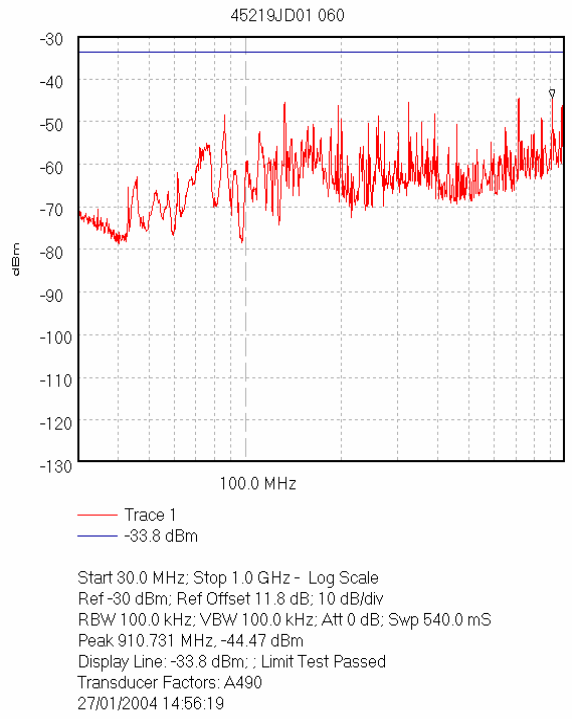
Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
85.861	-64.6	-25.0	39.6	Complied
132.932	-54.9	-25.0	29.9	Complied
195.421	-57.6	-25.0	32.6	Complied
260.586	-47.6	-25.0	22.6	Complied
325.690	-47.3	-25.0	22.3	Complied
458.260	-53.6	-25.0	28.6	Complied
716.558	-52.8	-25.0	27.8	Complied
912.016	-51.3	-25.0	26.3	Complied
977.139	-51.4	-25.0	26.4	Complied
1058.888	-44.7	-25.0	19.7	Complied
2677.000	-27.4	-13.0	14.4	Complied (Note 1)
2689.000	-28.4	-13.0	15.4	Complied (Note 1)
2782.578	-51.7	-25.0	26.7	Complied
5363.868	-38.8	-25.0	13.8	Complied
6946.603	-48.8	-25.0	23.8	Complied
12314.479	-46.8	-25.0	21.8	Complied
13420.391	-37.9	-25.0	12.9	Complied
25545.631	-35.5	-25.0	10.5	Complied
26568.830	-49.0	-25.0	24.0	Complied

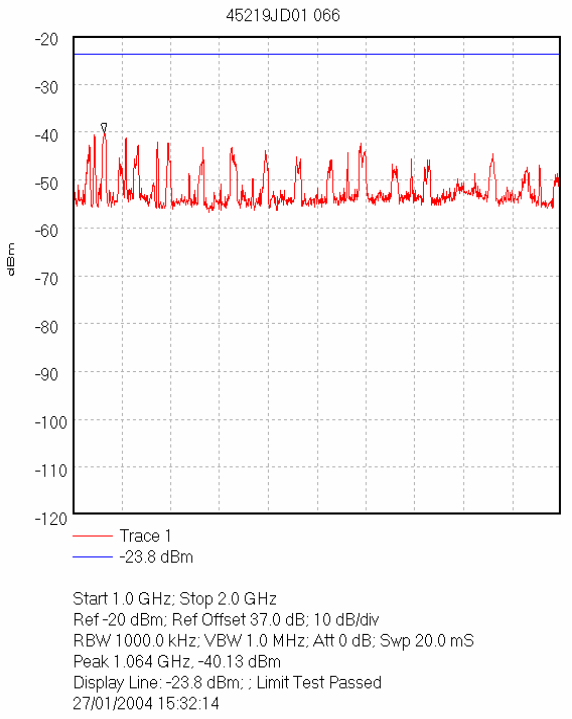
Note(s):

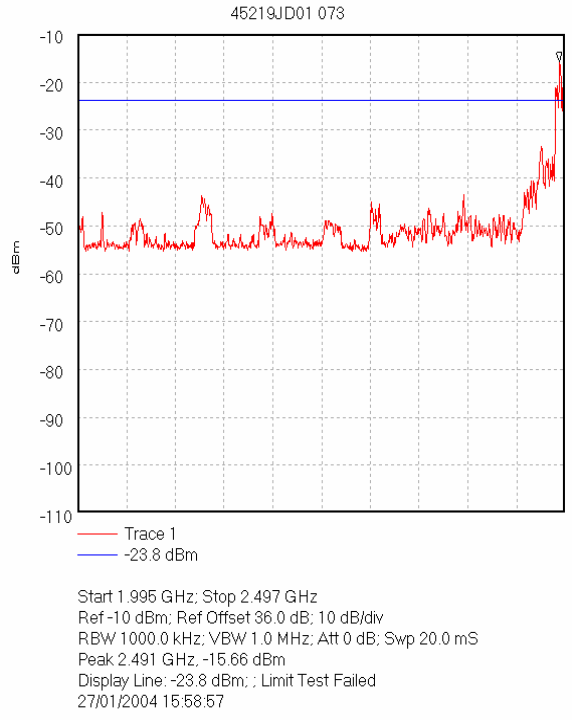
1. *As compliance is also demonstrated against the 55 + 10log(P) i.e. -25 dBm limit that applies 5.5 MHz away from the channel edge (these frequencies lie within 5.5 MHz of the respective channel edge), further measurements at the spot frequencies 5.5 MHz away from the channel edge i.e. 2674.75 MHz & 2691.25 MHz were unnecessary.*

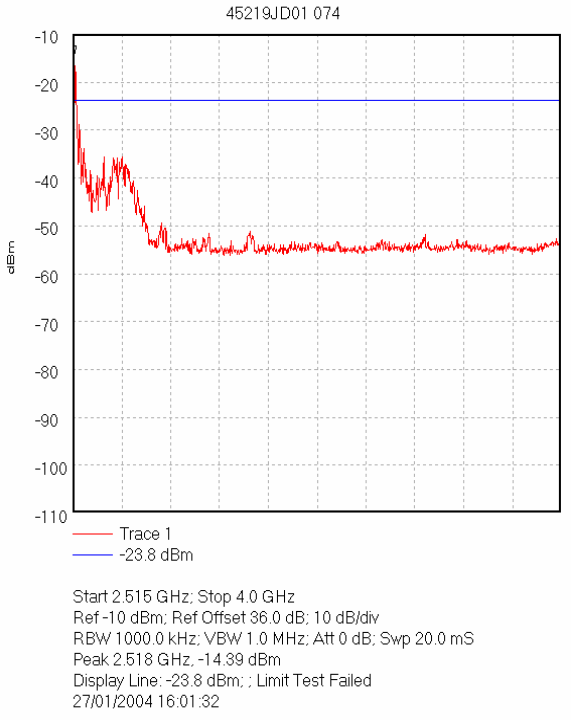
Note: the following plots are pre-scans and for indication purposes only. For final measurements, see the corresponding tables.

Transmitter Radiated Emissions, Bottom Channel - High Chip Rate



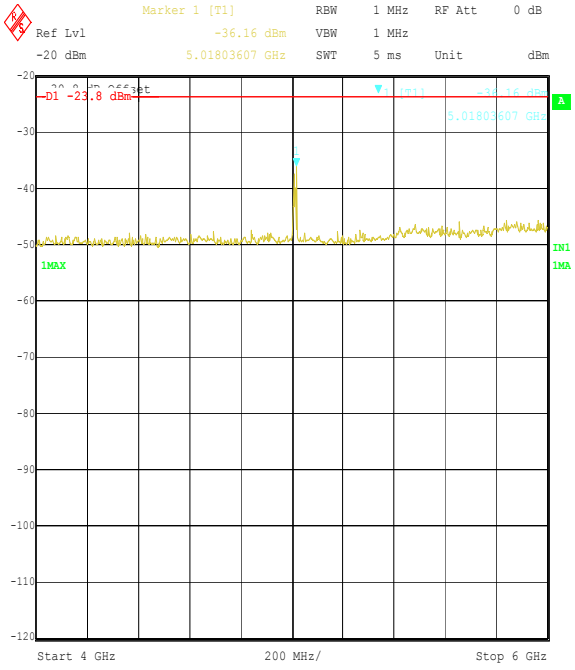




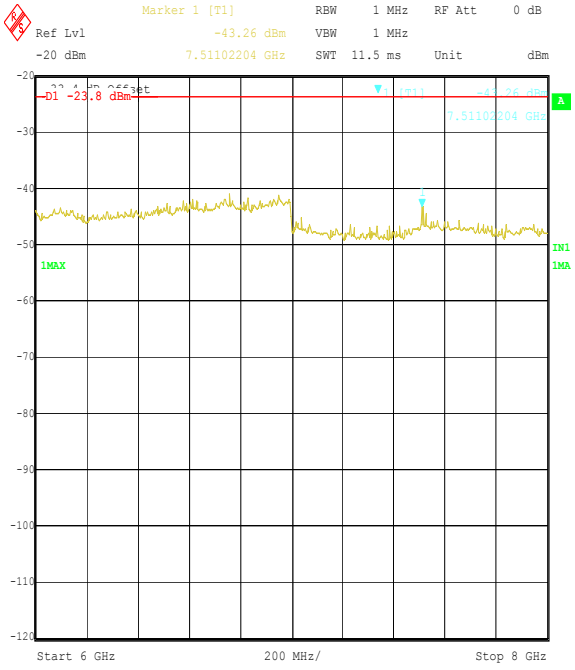


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

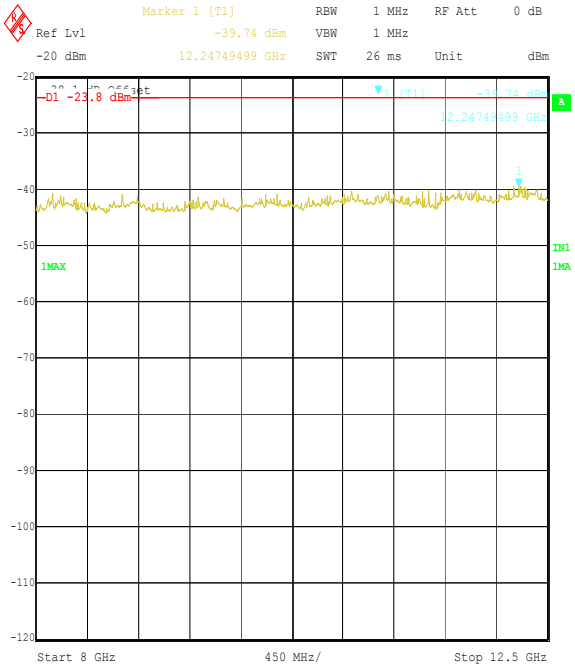
Transmitter Radiated Emissions, Bottom Channel - High Chip Rate



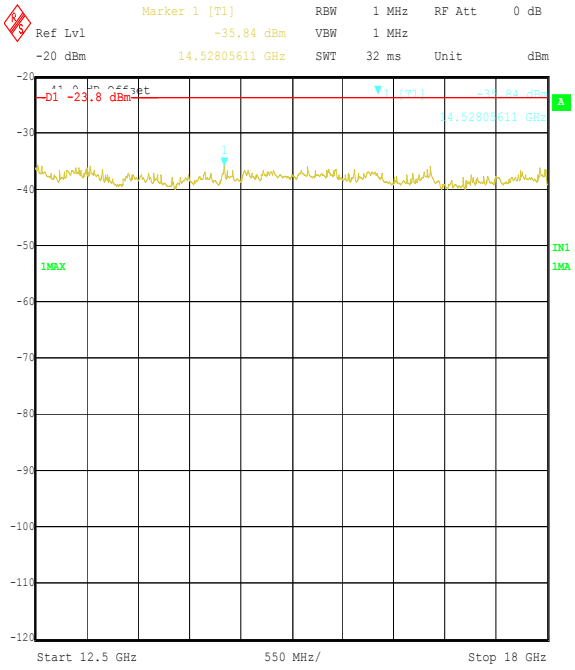
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 4-6 GHz
Date: 4.FEB.2004 12:30:55



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 6-8 GHz
Date: 4.FEB.2004 12:34:59



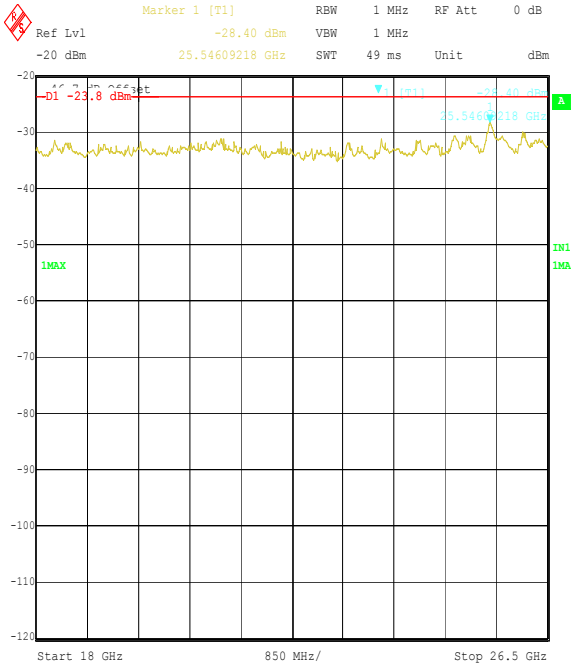
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 12:47:36

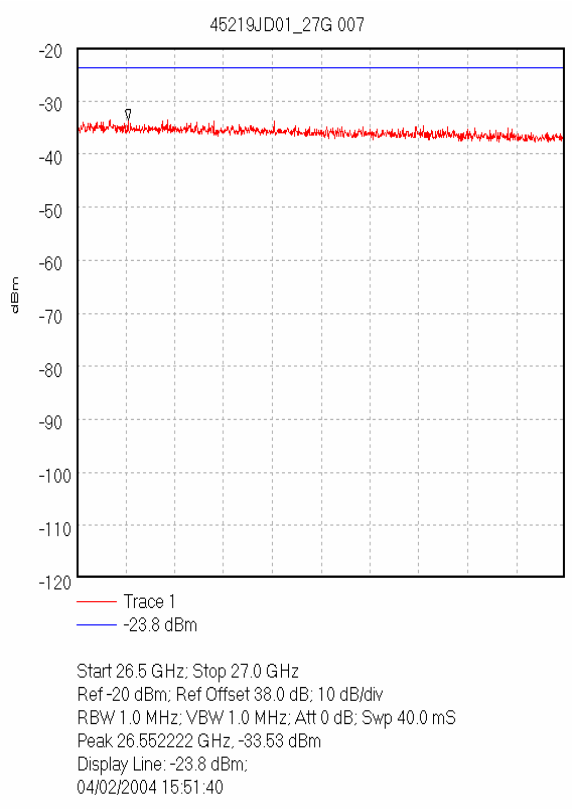


Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 7.68 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 13:47:36

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

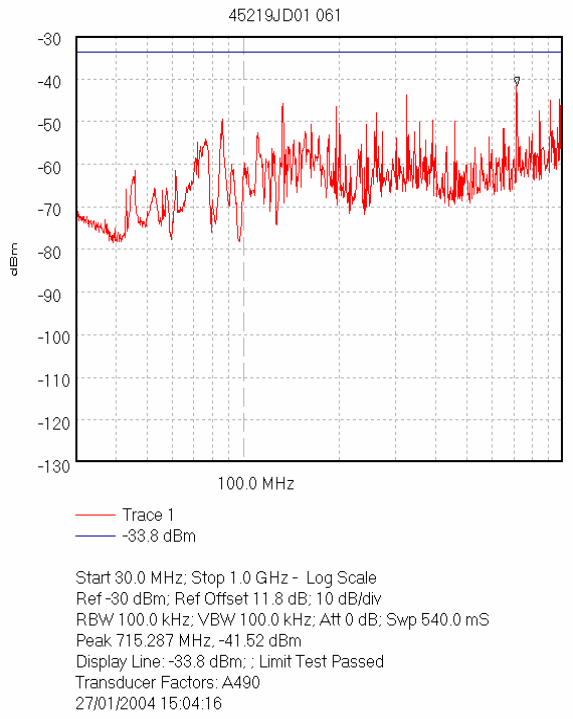
Transmitter Radiated Emissions, Bottom Channel - High Chip Rate

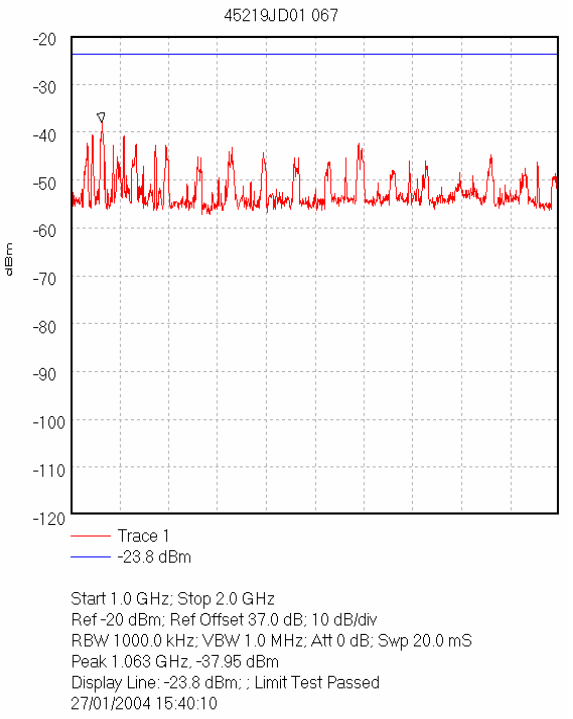


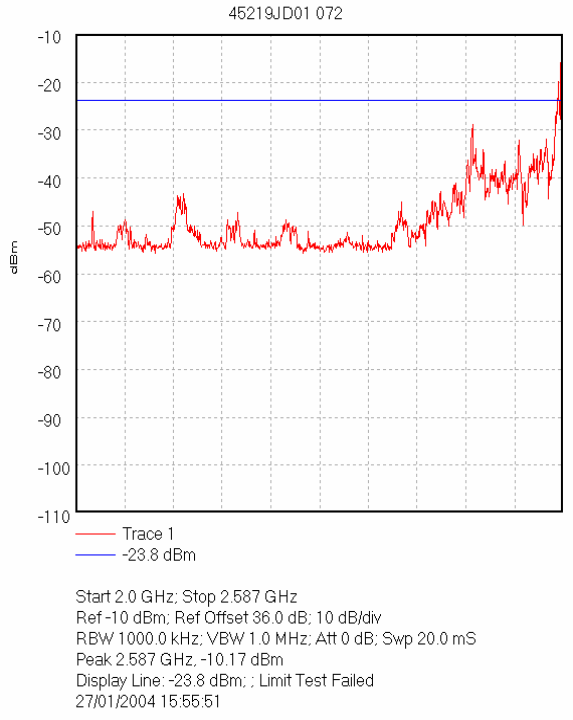


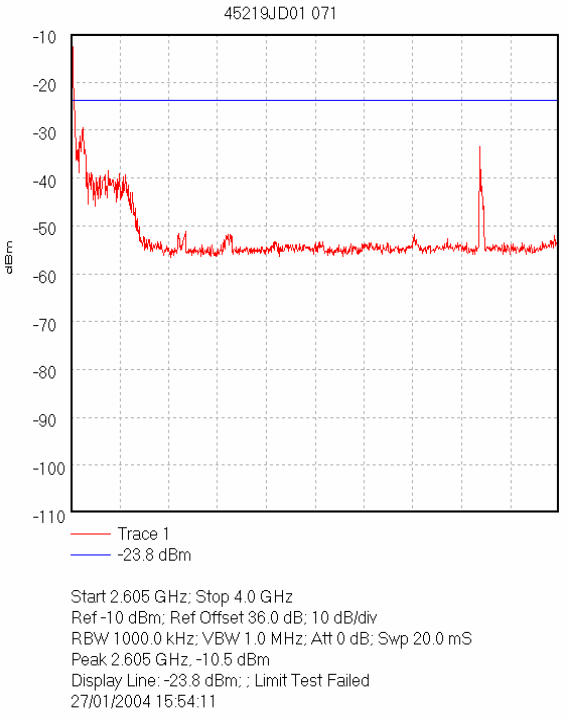
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Middle Channel - High Chip Rate



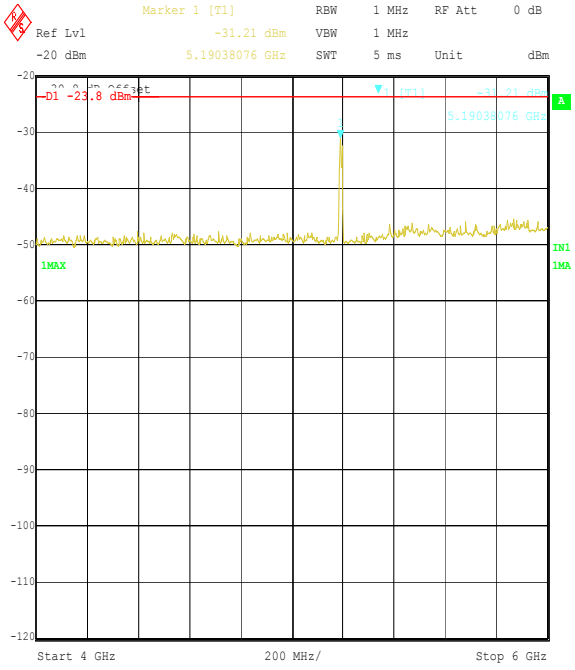




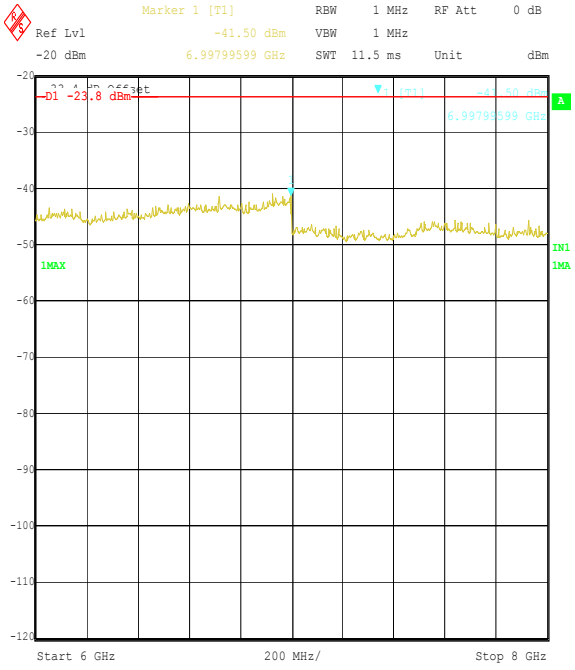


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

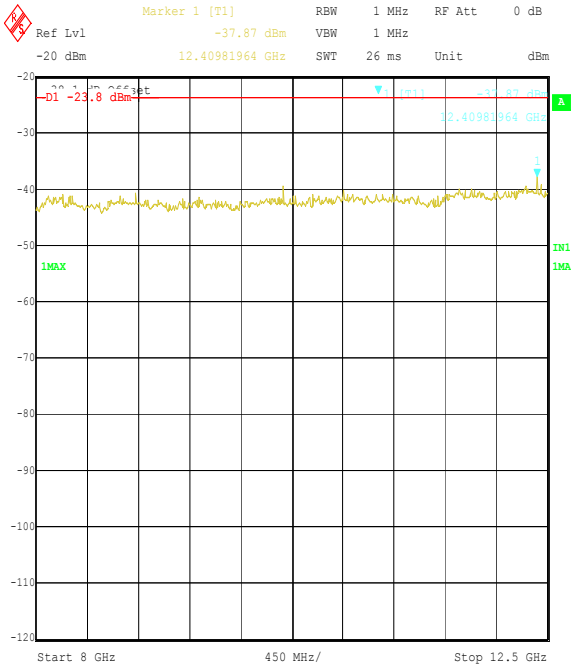
Transmitter Radiated Emissions, Middle Channel - High Chip Rate



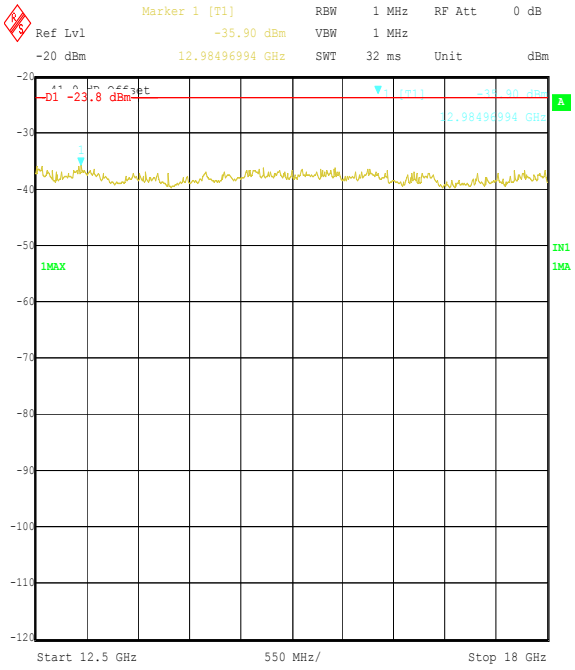
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 4-6 GHz
Date: 4.FEB.2004 12:29:46



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 6-8 GHz
Date: 4.FEB.2004 12:38:05



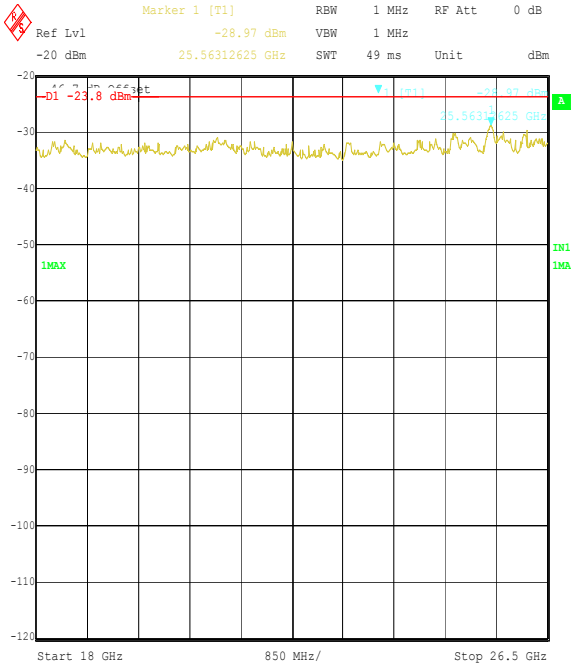
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 12:47:03



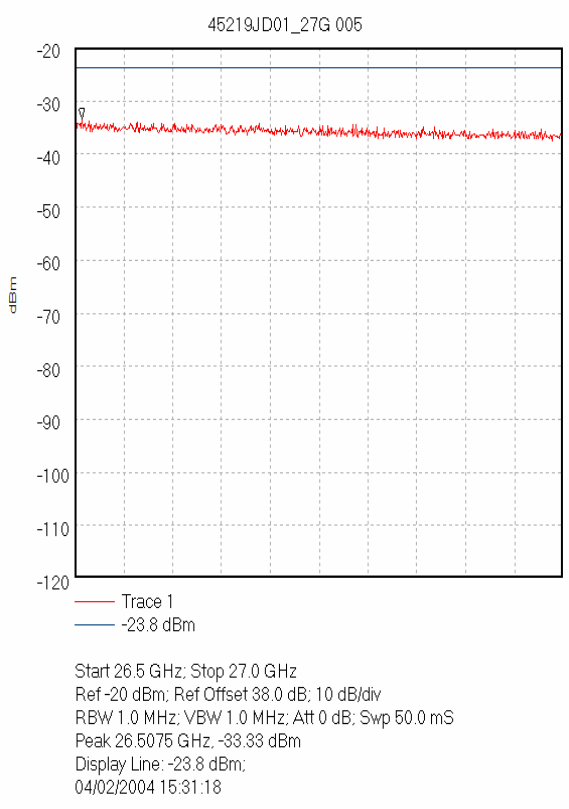
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 13:49:37

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Middle Channel - High Chip Rate



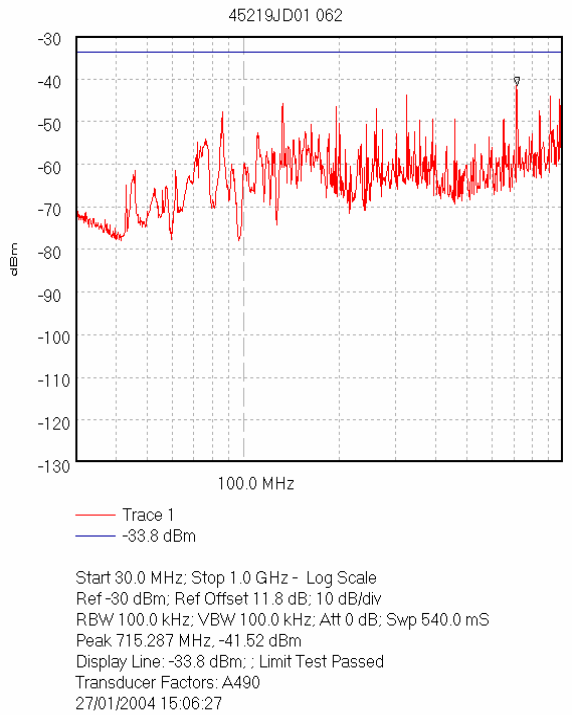
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 7.68 Mcps. 18-26.5 GHz
Date: 4.FEB.2004 13:55:59

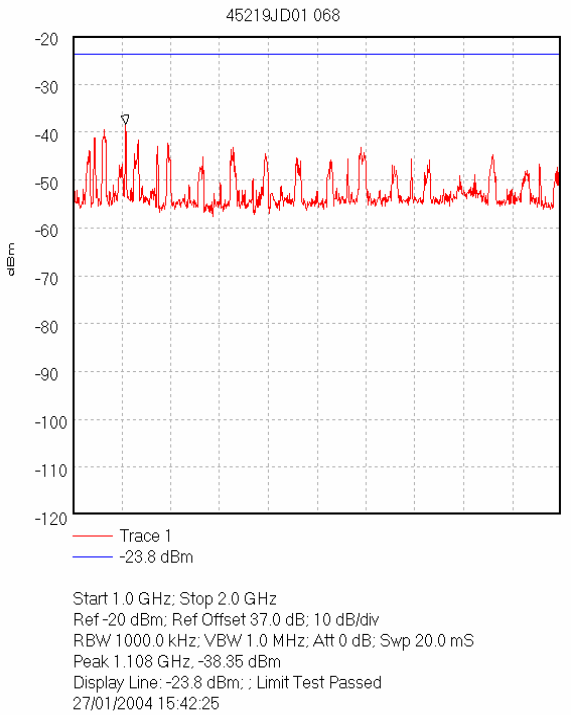


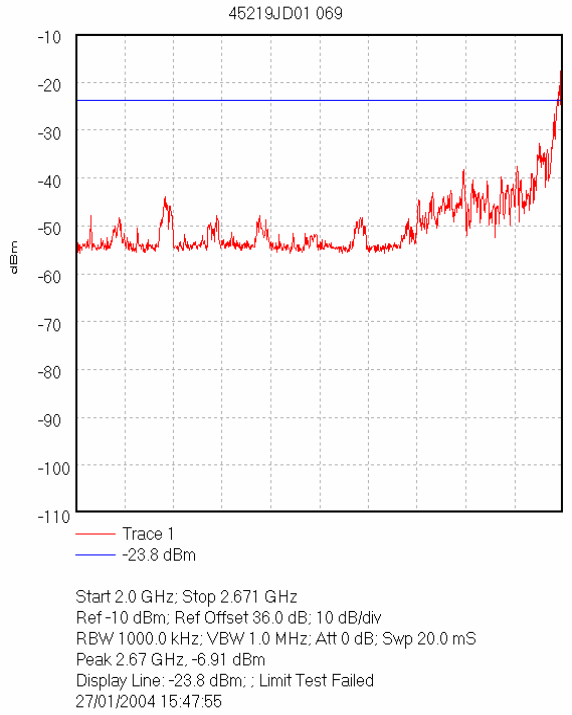
Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 38.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 26.5075 GHz, -33.33 dBm
Display Line: -23.8 dBm;
04/02/2004 15:31:18

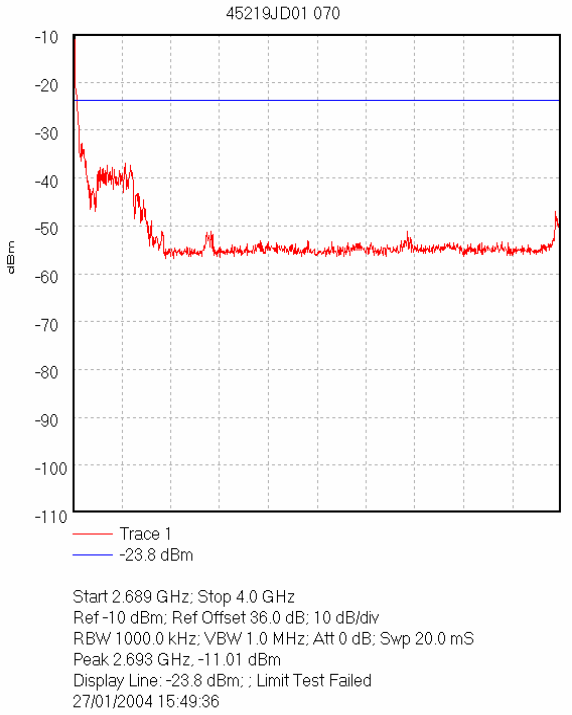
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Top Channel - High Chip Rate



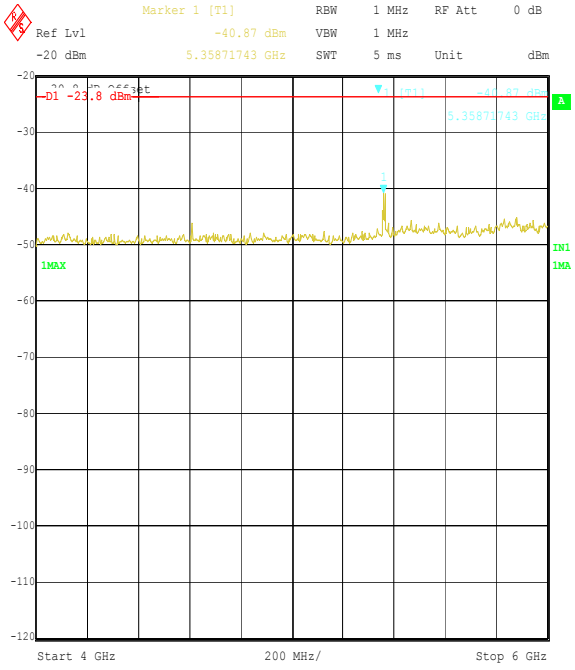




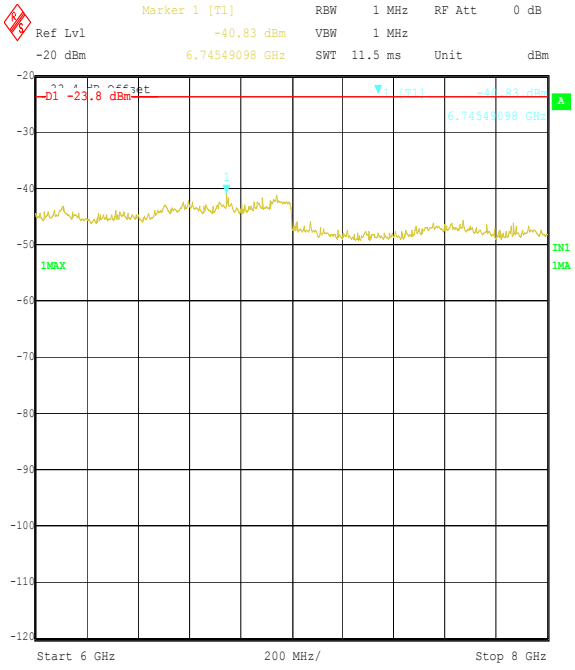


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

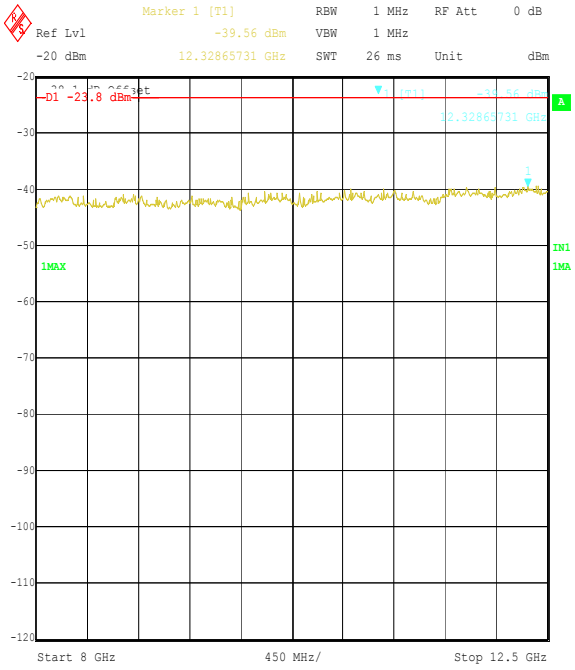
Transmitter Radiated Emissions, Top Channel - High Chip Rate



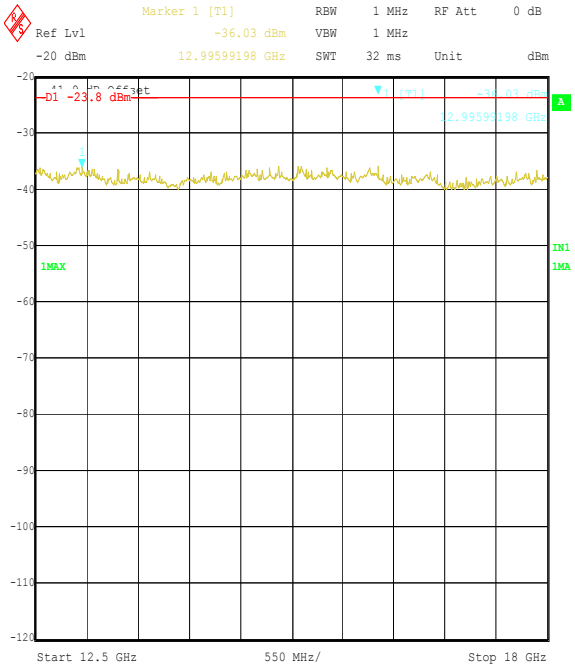
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 7.68 Mcps. 4-6 GHz
Date: 4.FEB.2004 12:28:39



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 7.68 Mcps. 6-8 GHz
Date: 4.FEB.2004 12:40:30



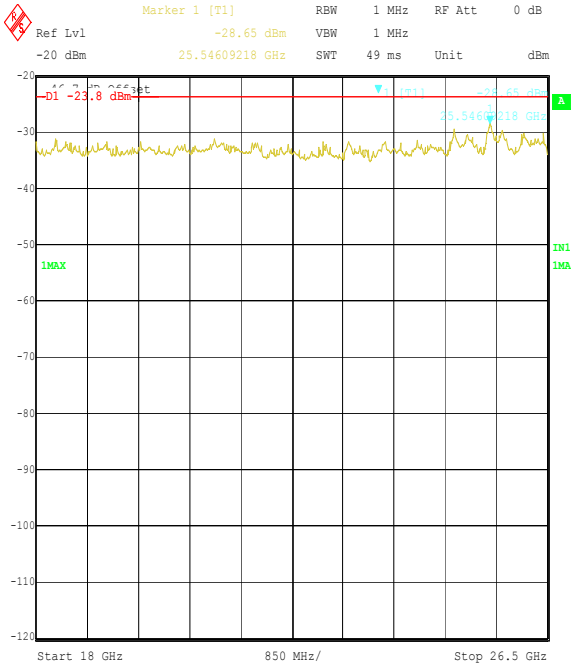
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 7.68 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 12:43:55

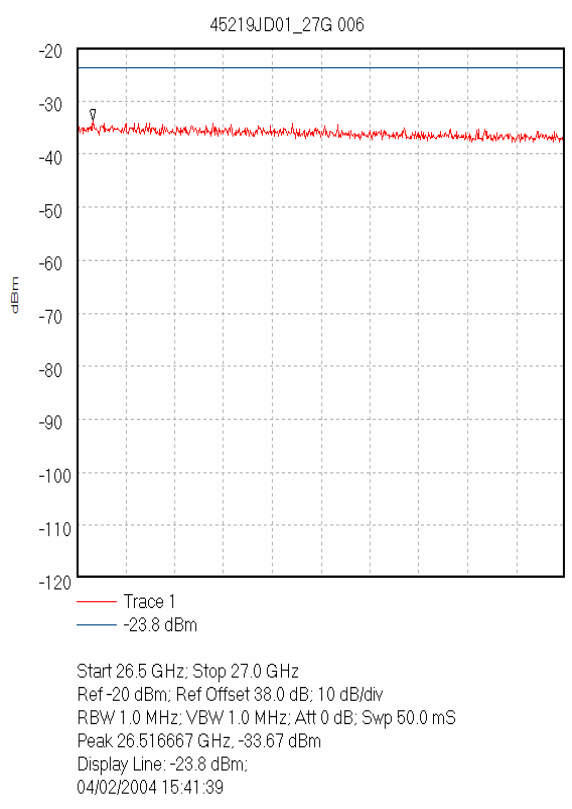


Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 7.68 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 13:51:19

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

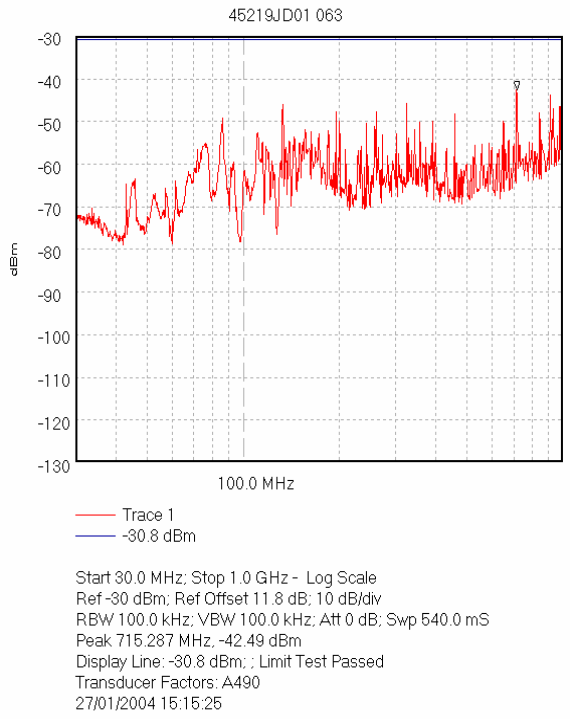
Transmitter Radiated Emissions, Top Channel - High Chip Rate

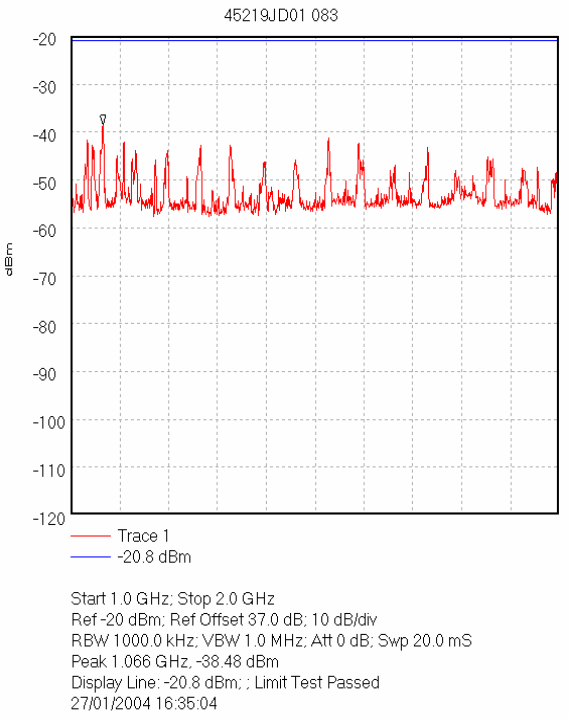


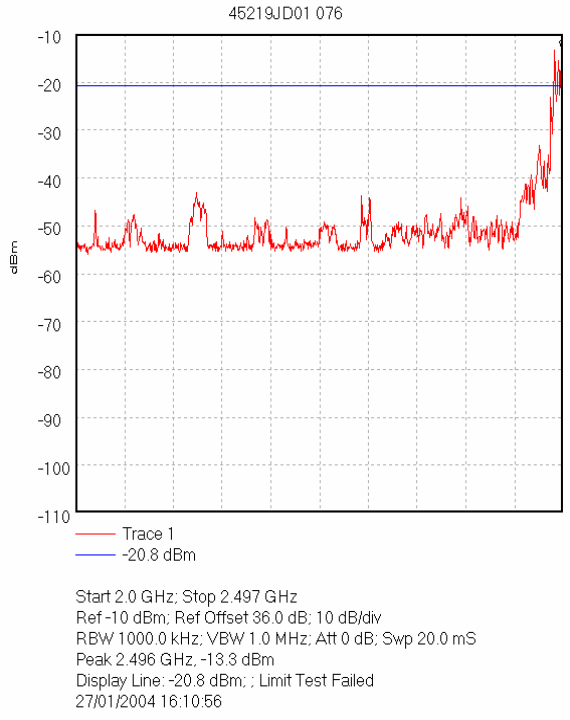


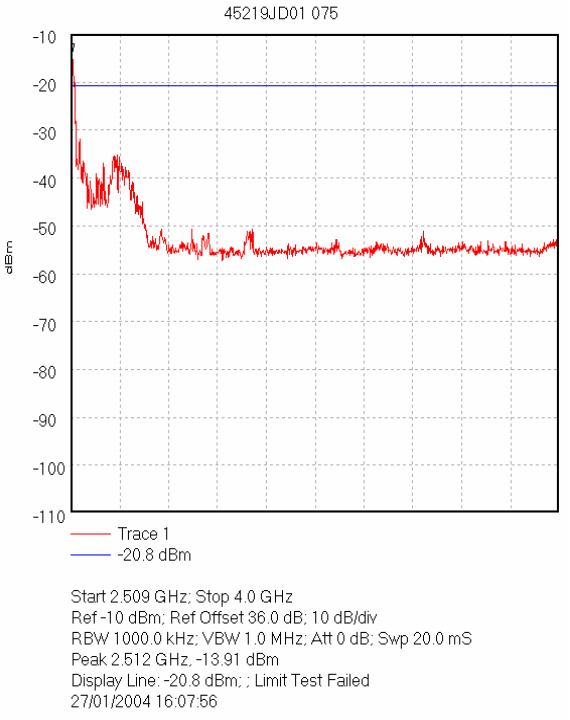
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Bottom Channel - Low Chip Rate



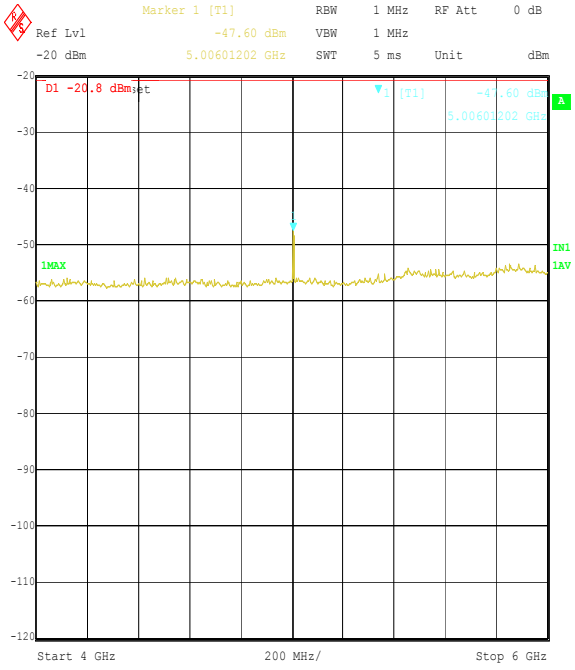




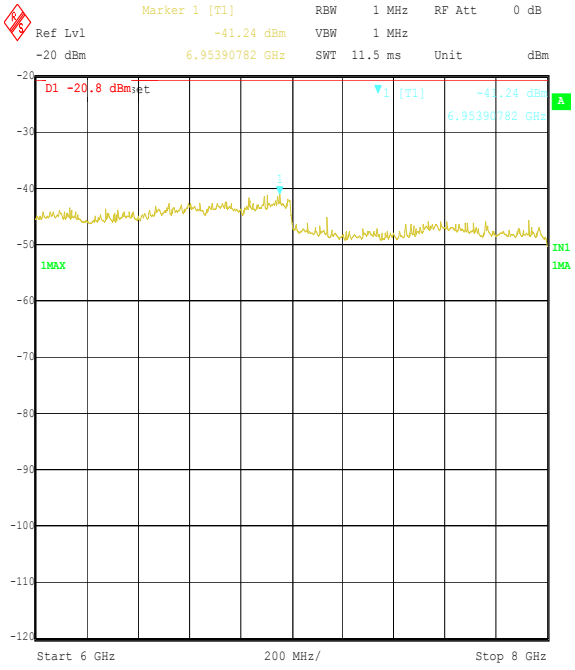


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

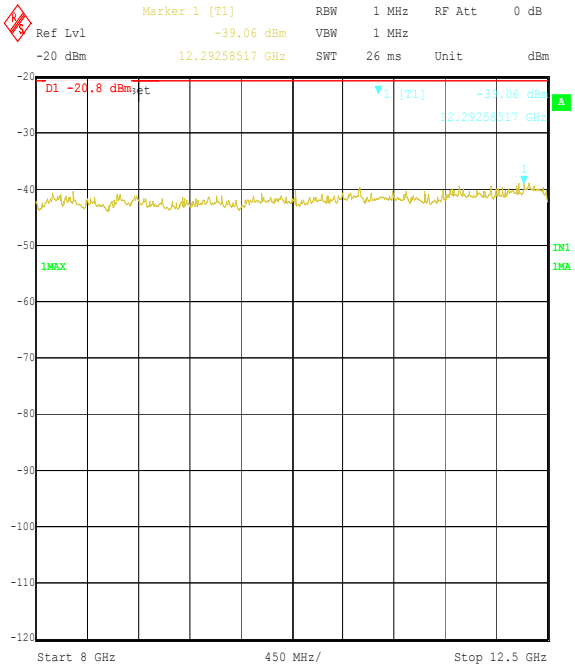
Transmitter Radiated Emissions, Bottom Channel - Low Chip Rate



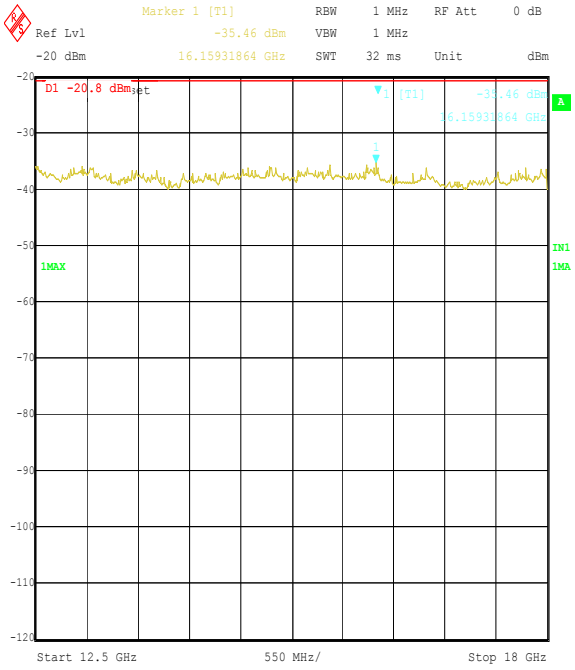
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 4-6 GHz
Date: 4.FEB.2004 14:32:48



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 6-8 GHz
Date: 4.FEB.2004 14:29:24



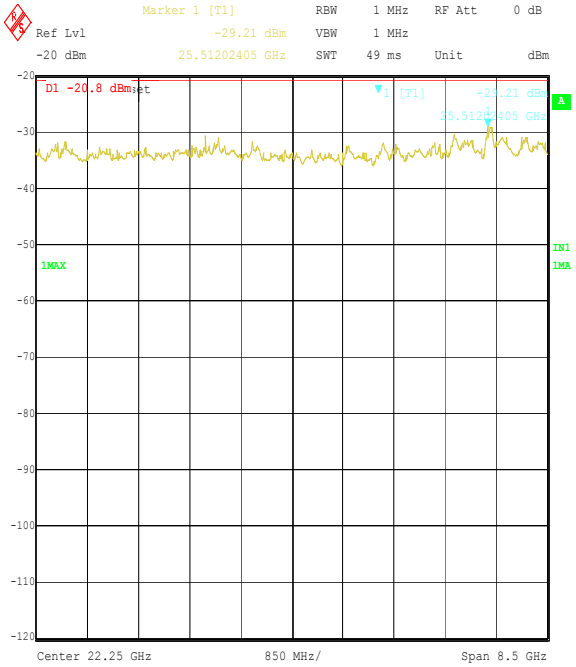
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 14:20:25

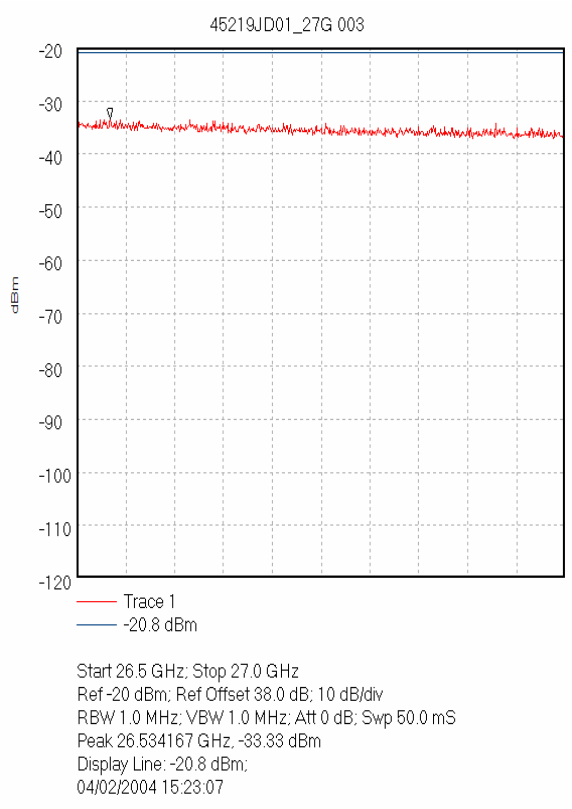


Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Bottom Channel 3.84 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 14:17:47

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

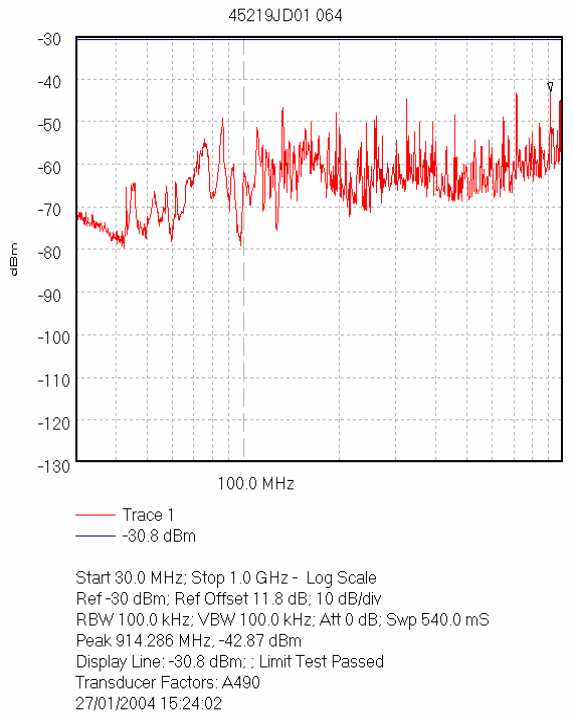
Transmitter Radiated Emissions, Bottom Channel - Low Chip Rate

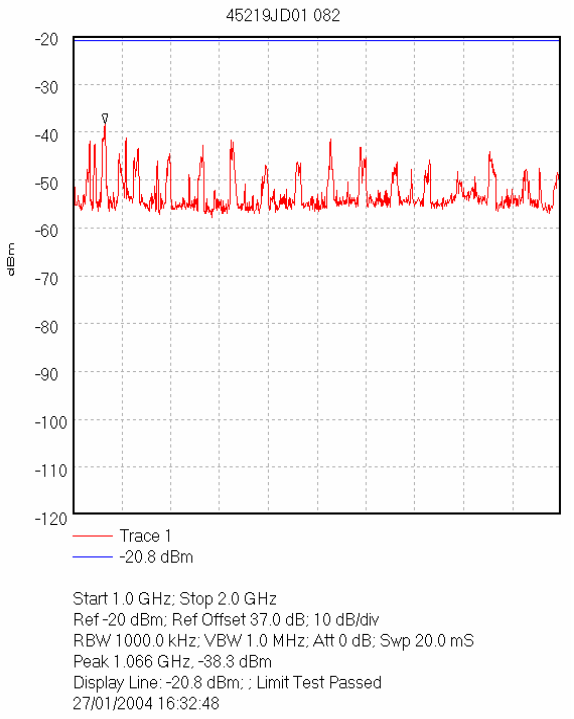


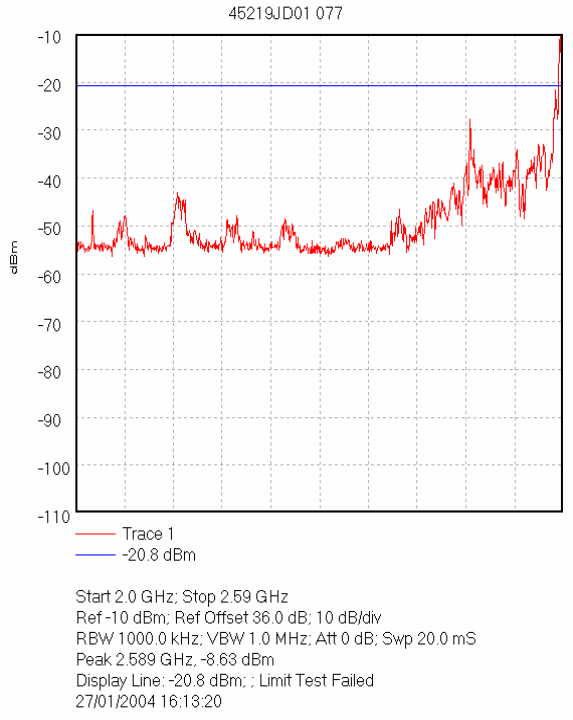


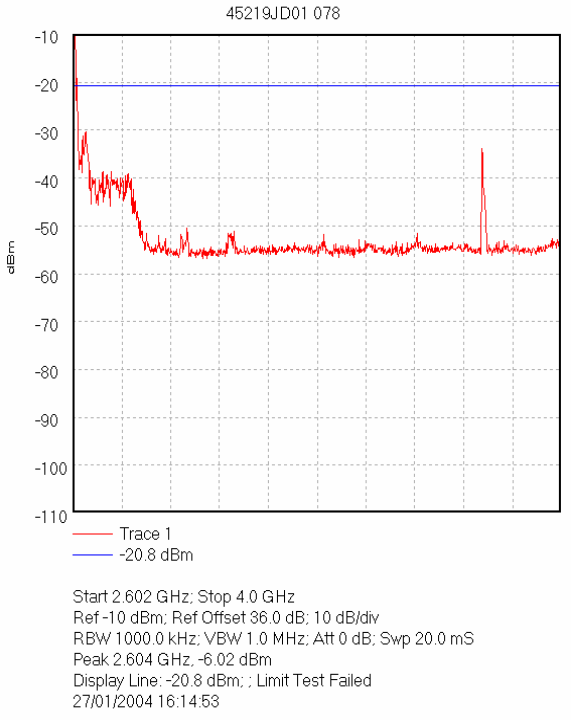
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Middle Channel - Low Chip Rate



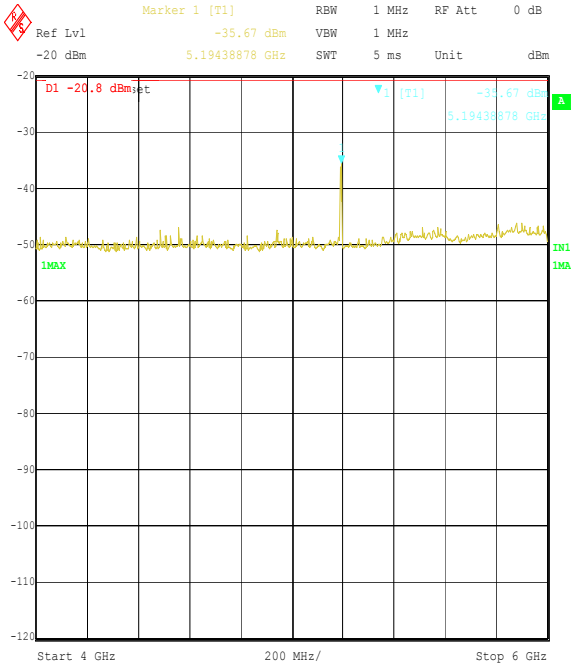




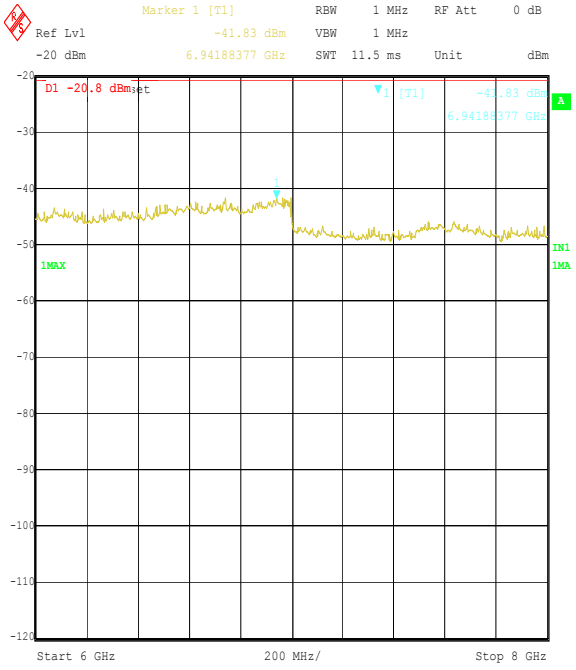


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

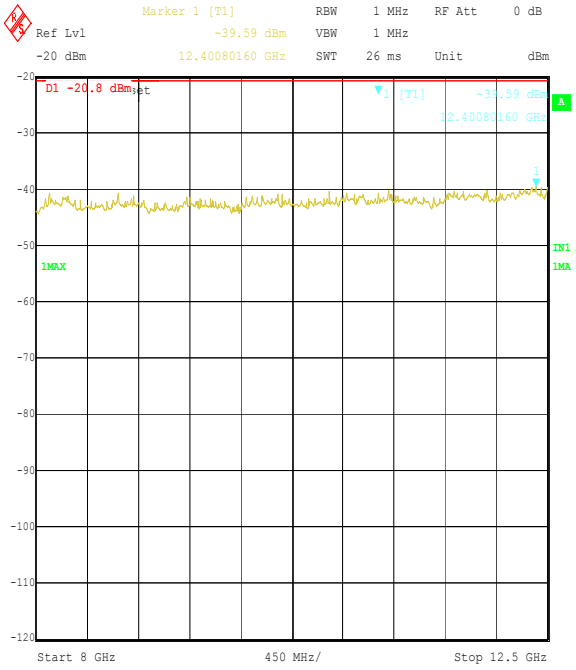
Transmitter Radiated Emissions, Middle Channel - Low Chip Rate



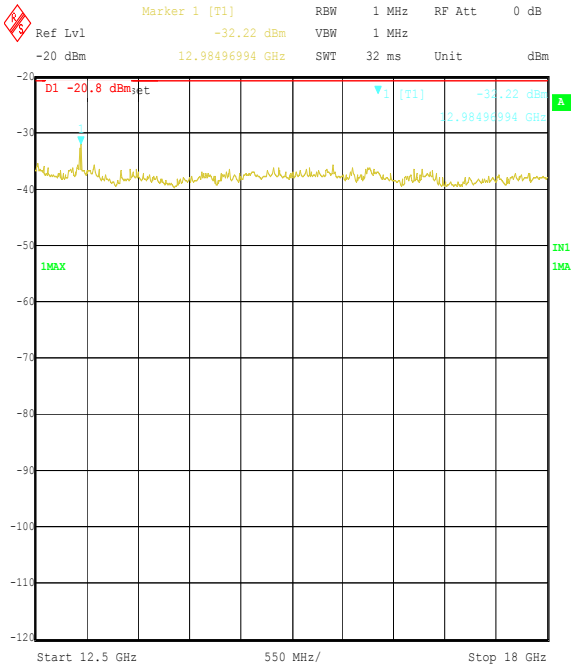
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 4-6 GHz
Date: 4.FEB.2004 14:34:29



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 6-8 GHz
Date: 4.FEB.2004 14:28:12



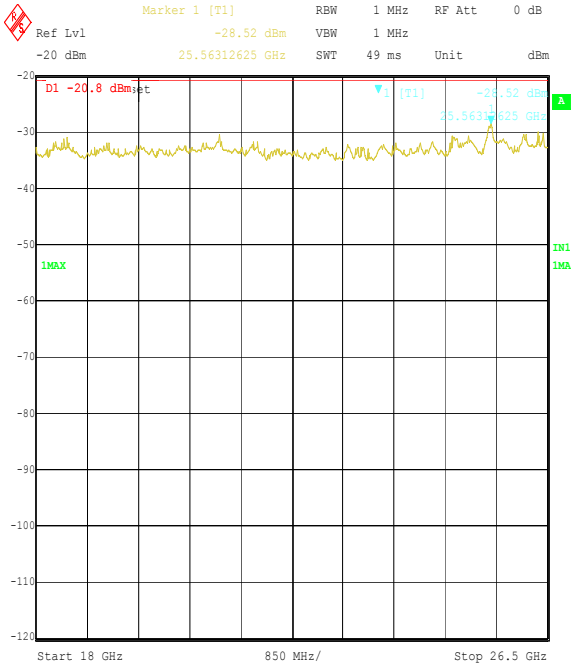
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 14:22:07

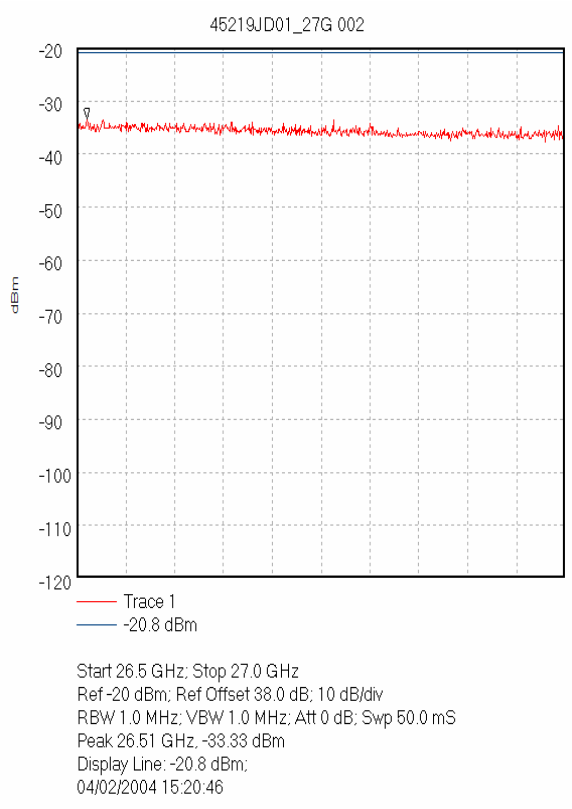


Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Middle Channel 3.84 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 14:15:47

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

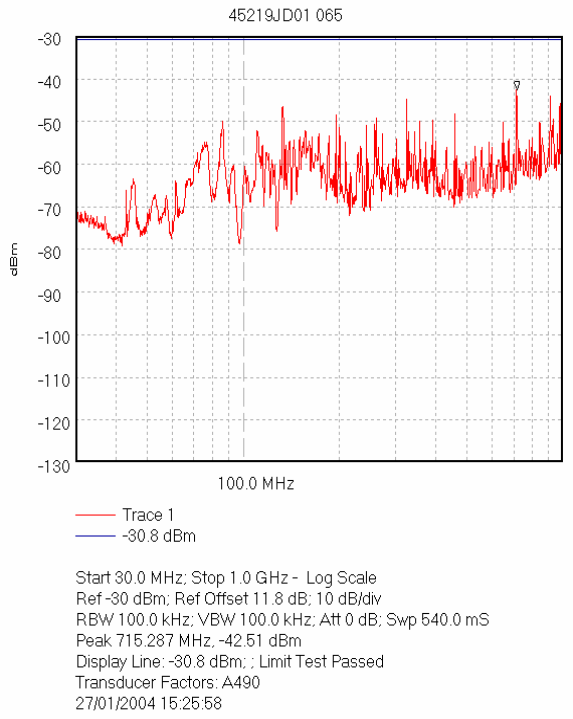
Transmitter Radiated Emissions, Middle Channel - Low Chip Rate

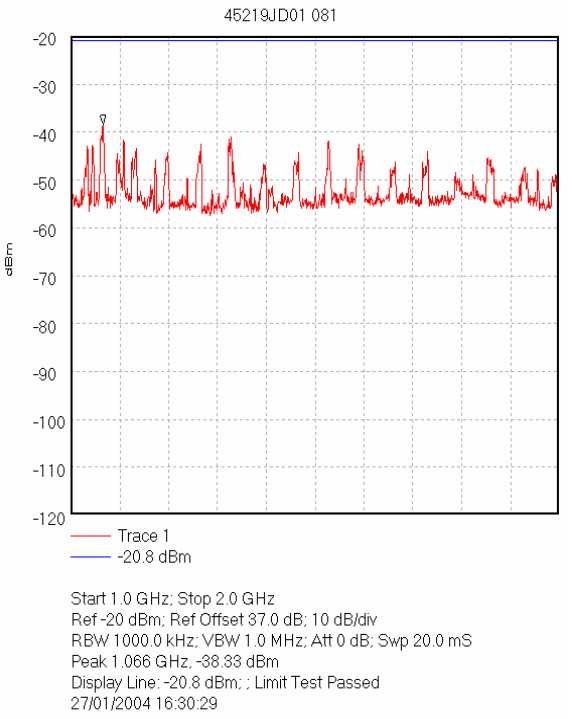


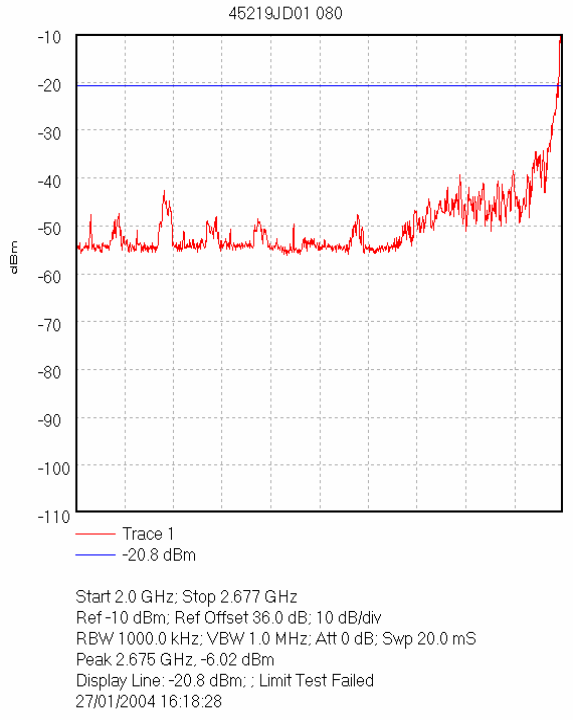


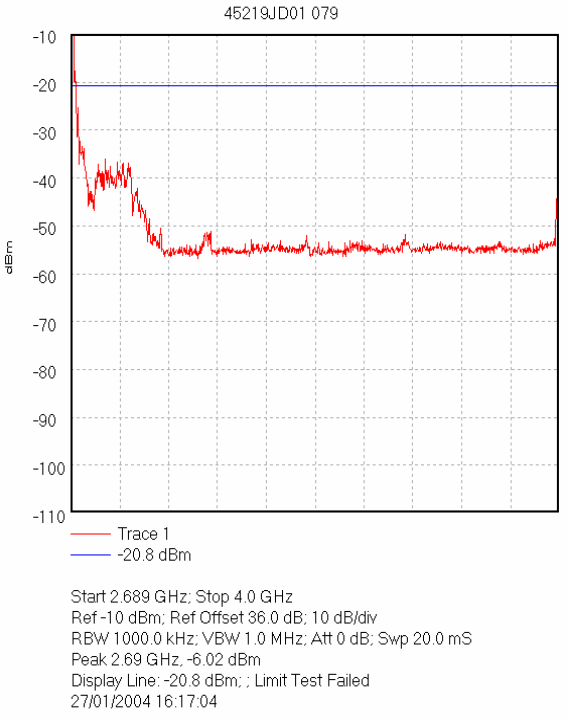
Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Top Channel - Low Chip Rate



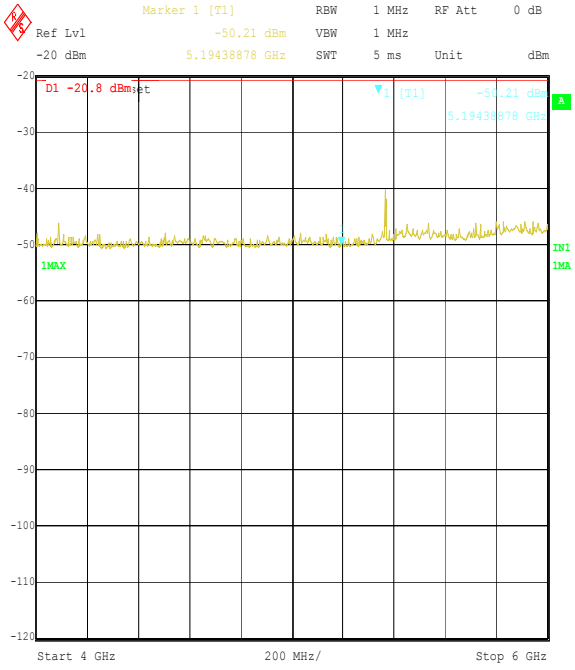




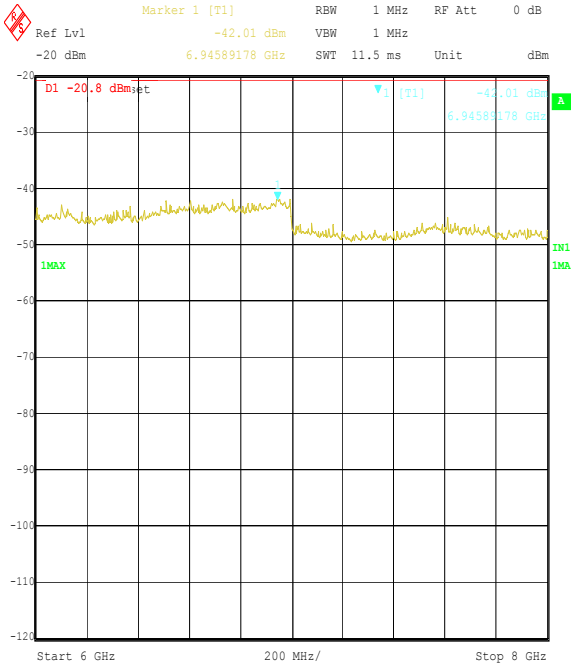


Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

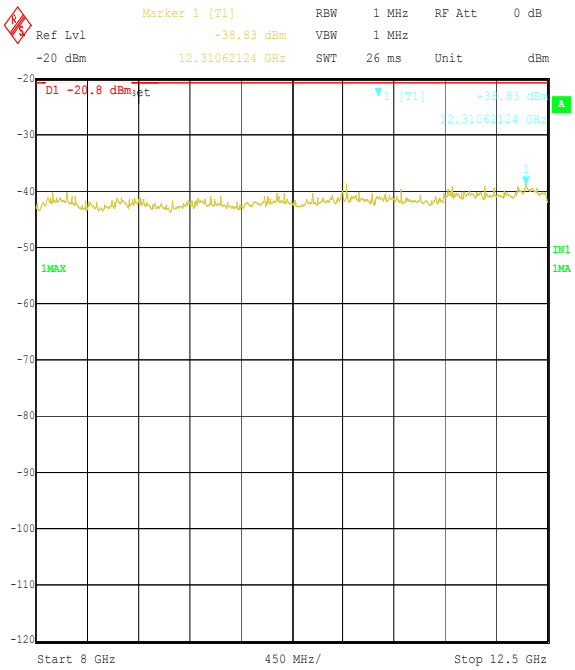
Transmitter Radiated Emissions, Top Channel - Low Chip Rate



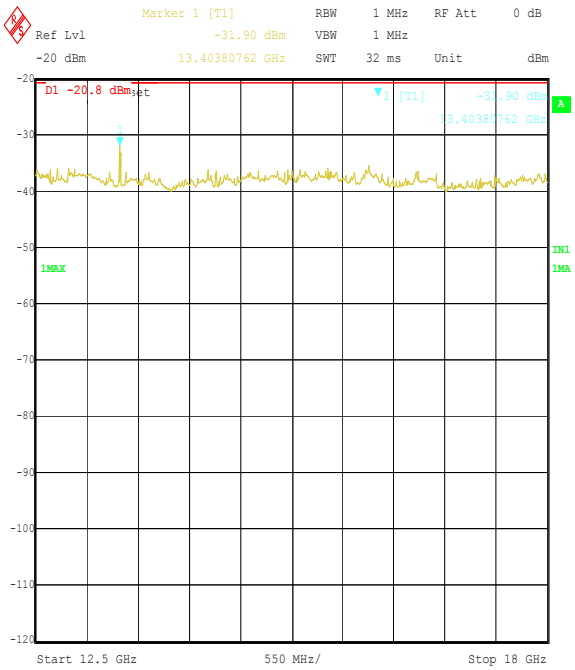
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 3.84 Mcps. 4-6 GHz
Date: 4.FEB.2004 14:35:15



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 3.84 Mcps. 6-8 GHz
Date: 4.FEB.2004 14:26:20



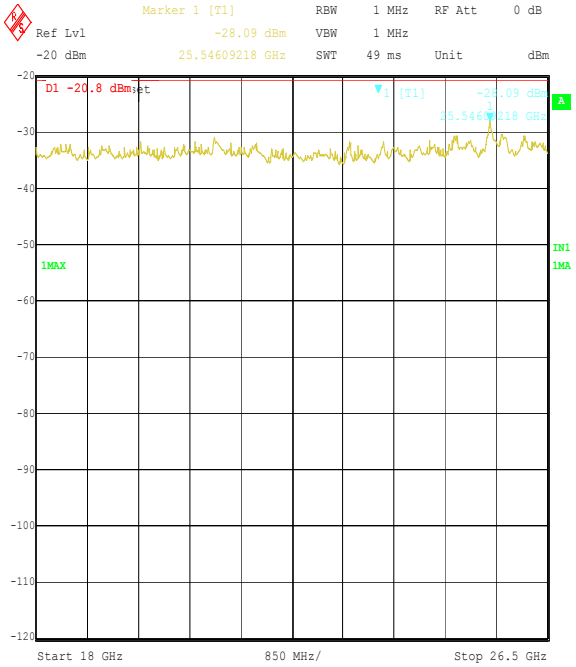
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 3.84 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 14:24:02



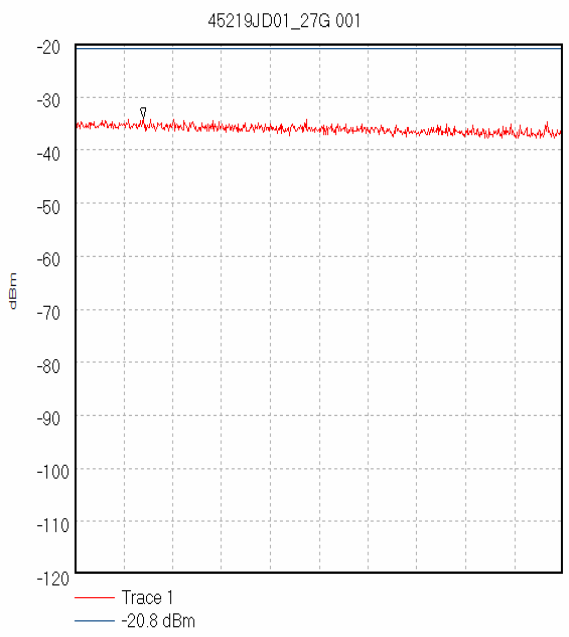
Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 3.84 Mcps. 12.5-18 GHz
Date: 4.FEB.2004 14:13:05

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

Transmitter Radiated Emissions, Top Channel - Low Chip Rate



Title: IPWireles EUT: UE PCMCIA FD. FCC P15/21/74. Rad Spurious.
Comment A: 45219JD01 Top Channel 3.84 Mcps. 18-26.5 GHz
Date: 4.FEB.2004 14:10:40



Start 26.5 GHz; Stop 27.0 GHz
Ref -20 dBm; Ref Offset 38.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 50.0 mS
Peak 26.57 GHz, -34.0 dBm
Display Line: -20.8 dBm;
04/02/2004 15:16:29

Note: The limit shown in the above plots was the derived limit for testing according to Part 21.908, the limit for Part 27.53 is -25 dBm except for the emissions up to 5.5 MHz from the respective channel edge where the limit is -13 dBm. It is confirmed that the position of the limit line on the plot has no bearing on the measurement result.

7.11. Transmitter Radiated Emissions at Band Edges

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

7.11.2. 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)	Limit (dBm)	Margin (dB)	Result
2500	-42.1	-13.0	29.1	Complied

Top Band Edge

Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2686	-37.0	-13.0	24.0	Complied

Results: (Low Chip Rate)

Bottom Band Edge

Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2500	-39.0	-13.0	26.0	Complied

Top Band Edge

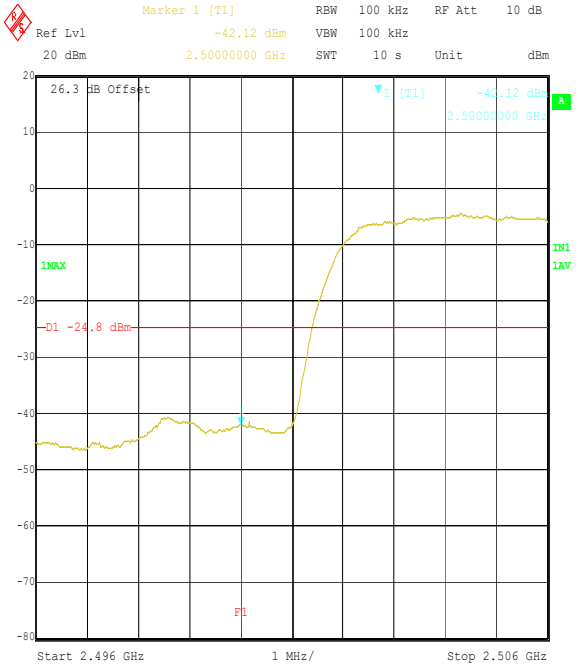
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2686	-36.2	-13.0	23.2	Complied

Note(s):

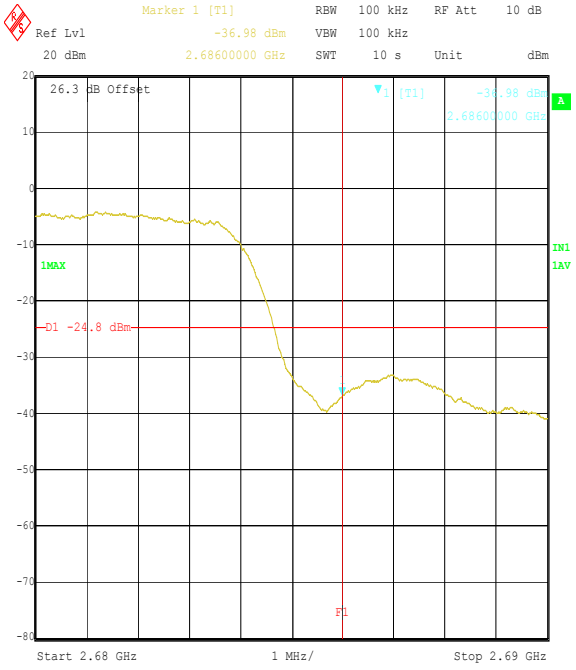
1. *The limit is calculated according to FCC Section 27.53(l)(2) as follows: 43 + 10log(P) where P is the transmitter power in Watts.*

2. *The 43 + 10log(P) limit applies because the test frequencies closest to the lower and upper band edges are 2506 MHz and 2680 MHz in high chip rate mode and 2503 MHz and 2683 MHz in low chip rate mode respectively. In both modes the respective band edges of 2500 MHz and 2686 MHz are less than 5.5 MHz from the edges of these channels.*

Transmitter Radiated Emissions at Band Edges - High Chip Rate



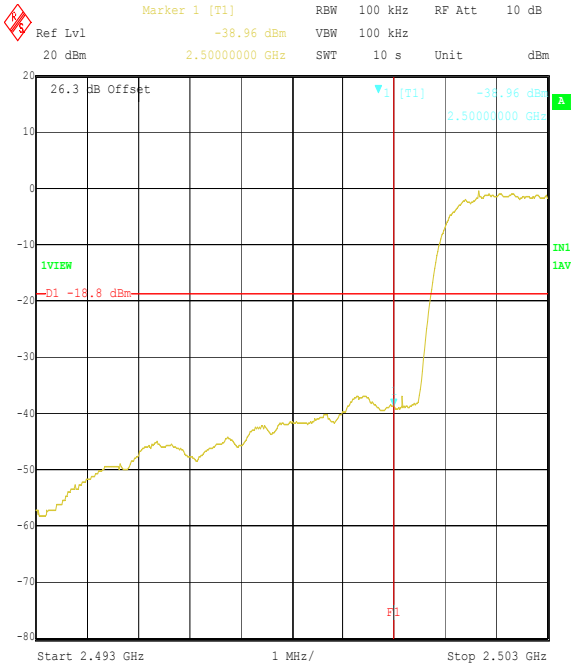
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated BandEdge
Comment A: 45219JD01 Bottom Channel 7.68 Mcps.
Date: 4.FEB.2004 14:55:29



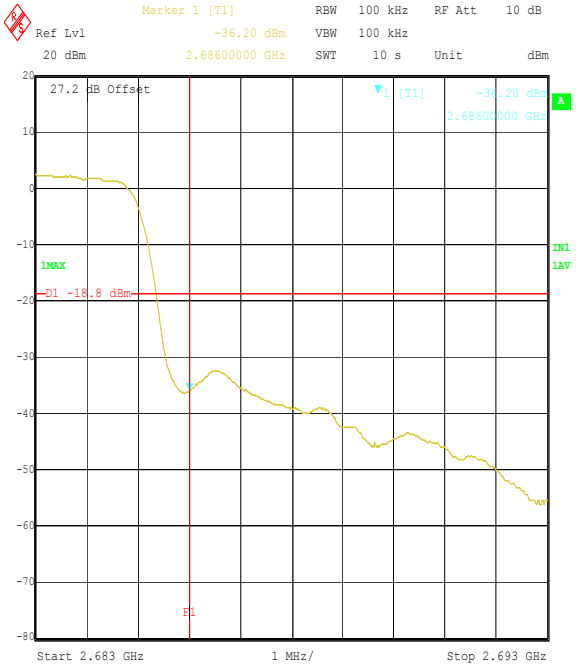
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated BandEdge
Comment A: 45219JD01 Top Channel 7.68 Mcps.
Date: 4.FEB.2004 14:56:28

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

Transmitter Radiated Emissions at Band Edges - Low Chip Rate



Title: IPWireless EUT: FD. FCC P15/21/74. Radiated BandEdge
Comment A: 45219JD01 Bottom Channel 3.84 Mcps.
Date: 4.FEB.2004 14:52:02



Title: IPWireless EUT: FD. FCC P15/21/74. Radiated BandEdge
Comment A: 45219JD01 Top Channel 3.84 Mcps.
Date: 4.FEB.2004 14:49:40

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

7.12. Idle Mode AC Conducted Spurious Emissions

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

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

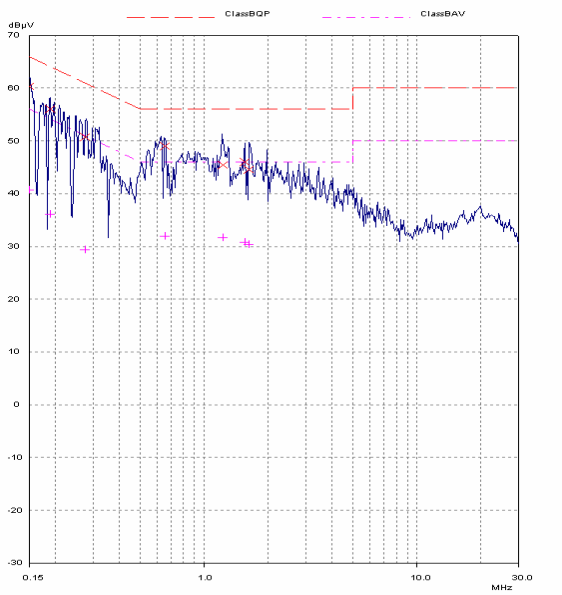
Results: Quasi-Peak Detector Measurements on Live and Neutral Lines (High Chip Rate)

Frequency (MHz)	Line	Q-P Level (dBμV)	Q-P Limit (dBμV)	Margin (dB)	Result
0.1502	Live	60.35	65.99	5.64	Complied
0.18762	Live	56.10	64.14	8.04	Complied
0.27598	Live	50.79	60.94	10.15	Complied
0.65495	Live	48.99	56.00	7.01	Complied
1.22208	Neutral	45.36	56.00	10.64	Complied
1.54583	Neutral	46.07	56.00	9.93	Complied
1.62621	Neutral	44.57	56.00	11.43	Complied

Results: Average Detector Measurements on Live and Neutral Lines (High Chip Rate)

Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
0.1502	Live	40.72	55.99	15.27	Complied
0.18762	Live	36.07	54.14	18.07	Complied
0.27598	Live	29.36	50.94	21.58	Complied
0.65495	Neutral	31.93	46.00	14.07	Complied
1.22208	Neutral	31.72	46.00	14.28	Complied
1.54583	Neutral	30.81	46.00	15.19	Complied
1.62621	Neutral	30.40	46.00	15.60	Complied

Idle Mode 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.

Idle Mode AC Conducted Spurious Emissions (Continued)

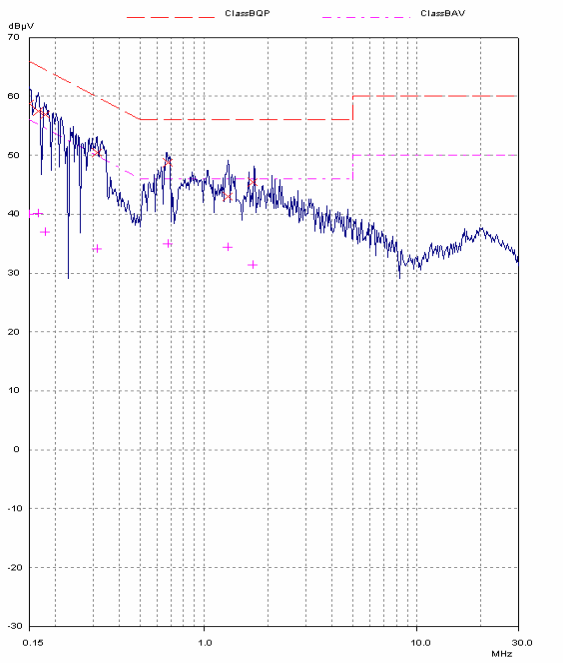
Results: Quasi-Peak Detector Measurements on Live and Neutral Lines (Low Chip Rate)

Frequency (MHz)	Line	Q-P Level (dBμV)	Q-P Limit (dBμV)	Margin (dB)	Result
0.1508	Live	58.76	65.96	7.20	Complied
0.16539	Live	-57.42	65.19	7.77	Complied
0.17825	Live	56.86	64.57	7.71	Complied
0.31442	Live	50.46	59.85	9.39	Complied
0.67612	Live	48.79	56.00	7.21	Complied
1.28867	Neutral	42.97	56.00	13.03	Complied
1.68882	Neutral	45.46	56.00	10.54	Complied

Results: Average Detector Measurements on Live and Neutral Lines (Low Chip Rate)

Frequency (MHz)	Line	Av. Level (dBμV)	Av. Limit (dBμV)	Margin (dB)	Result
0.1508	Live	40.00	55.96	15.96	Complied
0.16539	Live	40.10	55.19	15.09	Complied
0.17825	Live	36.97	54.57	17.60	Complied
0.31442	Live	34.06	49.85	15.79	Complied
0.67612	Neutral	34.95	46.00	11.05	Complied
1.28867	Neutral	34.36	46.00	11.64	Complied
1.68882	Neutral	31.44	46.00	14.56	Complied

Idle Mode AC Conducted Spurious Emissions (Continued) (Low Chip Rate)



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

7.13. Idle Mode Radiated Emissions – 30 MHz to 1 GHz

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

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

Results: (High Chip Rate)

Frequency (MHz)	Ant. Pol.	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
75.563	Vert.	18.3	40.0	21.7	Complied
85.901	Horiz.	29.8	40.0	10.2	Complied
111.491	Vert.	29.0	43.5	14.5	Complied
132.698	Vert.	37.0	43.5	6.5	Complied
162.850	Vert.	33.7	43.5	9.8	Complied
195.429	Vert.	34.6	43.5	8.9	Complied
260.575	Horiz.	36.0	46.0	10.0	Complied
325.718	Horiz.	33.4	46.0	12.6	Complied
390.861	Vert.	28.9	46.0	17.1	Complied
456.004	Vert.	37.0	46.0	9.0	Complied
651.438	Vert.	45.0	46.0	1.0	Complied
716.577	Horiz.	45.8	46.0	0.2	Complied
846.864	Vert.	40.5	46.0	5.5	Complied
912.008	Vert.	42.6	46.0	3.4	Complied
977.154	Vert.	44.0	54.0	10.0	Complied

Preliminary radiated scans up to 4 GHz of both chip rates were performed on the EUT fitted and operating in each of the three host notebook PCs stated in section 2.5 of this report. The combination that exhibited the worse case mode of operation was then used to perform the final measurements detailed in the above results table. This was found to be with the EUT fitted and operating in the ACER BY25 notebook PC.

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

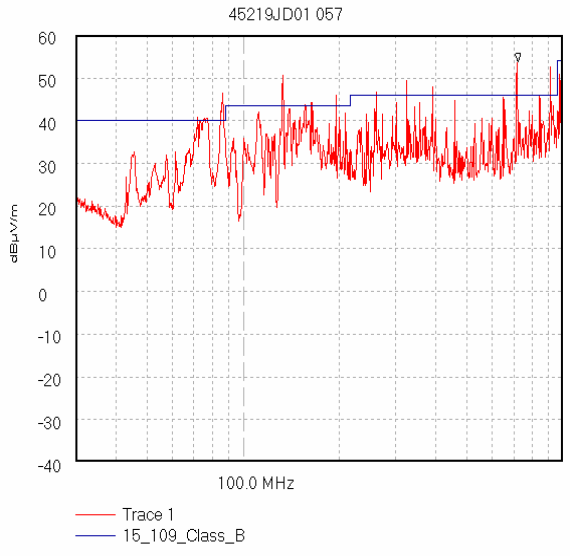
Results: (Low Chip Rate)

Frequency (MHz)	Ant. Pol.	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
75.562	Vert.	18.0	40.0	22.0	Complied
85.903	Horiz.	30.6	40.0	9.4	Complied
111.513	Vert.	29.6	43.5	13.9	Complied
132.749	Vert.	37.3	43.5	6.2	Complied
162.847	Vert.	33.4	43.5	10.1	Complied
195.431	Vert.	34.6	43.5	8.9	Complied
260.574	Horiz.	35.6	46.0	10.4	Complied
325.718	Horiz.	36.1	46.0	9.9	Complied
390.861	Vert.	27.3	46.0	18.7	Complied
465.006	Vert.	37.3	46.0	8.7	Complied
651.438	Vert.	45.0	46.0	1.0	Complied
716.579	Horiz.	45.5	46.0	0.5	Complied
846.867	Vert.	42.7	46.0	3.3	Complied
912.012	Vert.	43.4	46.0	2.6	Complied
977.153	Vert.	40.8	54.0	13.2	Complied

Preliminary radiated scans up to 4 GHz of both chip rates were performed on the EUT fitted and operating in each of the three host notebook PCs stated in section 2.5 of this report. The combination that exhibited the worse case mode of operation was then used to perform the final measurements detailed in the above results table. This was found to be with the EUT fitted and operating in the ACER BY25 notebook PC.

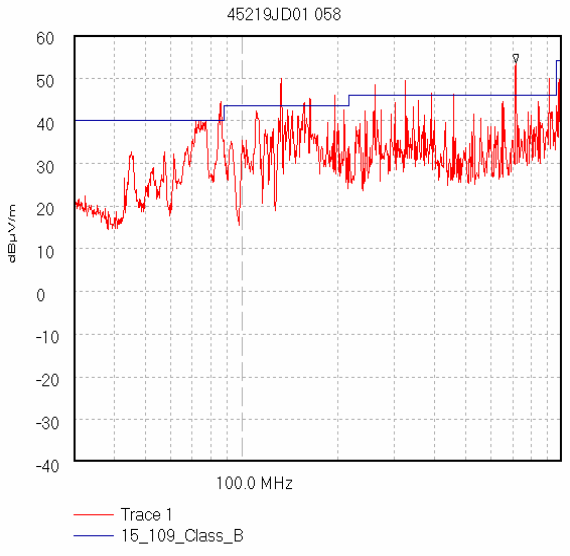
Idle Mode Radiated Emissions – 30 MHz to 1 GHz - Continued

Idle Mode, High Chip Rate, Acer PC



Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 380.0 mS
Peak 720.883 MHz, 53.73 dBµV/m
Limit/Mask: 15_109_Class_B; ; Limit Test Failed
Transducer Factors: A490
27/01/2004 14:44:10

Idle Mode, Low Chip Rate, Acer PC



Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 0 dB; Swp 380.0 mS
Peak 718.08 MHz, 53.5 dBµV/m
Limit/Mask: 15_109_Class_B; ; Limit Test Failed
Transducer Factors: A490
27/01/2004 14:45:52

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

7.14. Idle Mode Radiated Emissions – 1 GHz to 14 GHz

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

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

Results: (High Chip Rate)

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
1107.450	Vert.	21.4	21.5	0.8	43.7	54.0	10.3	Complied
1326.518	Vert.	8.4	21.5	0.9	30.8	54.0	23.2	Complied
1563.445	Vert.	16.0	21.6	1.0	38.6	54.0	15.4	Complied
1597.150	Vert.	9.6	21.6	1.0	32.2	54.0	21.8	Complied
1995.664	Vert.	8.6	21.6	1.2	31.4	54.0	22.6	Complied
2019.425	Vert.	17.6	20.7	1.2	39.5	54.0	14.5	Complied
2122.496	Vert.	8.2	20.9	1.2	30.3	54.0	23.7	Complied
2394.536	Vert.	9.7	21.2	1.3	32.2	54.0	21.8	Complied
2523.799	Vert.	8.6	21.4	1.3	31.3	54.0	22.7	Complied
2660.045	Vert.	8.2	21.6	1.3	31.1	54.0	22.5	Complied
2781.715	Vert.	7.6	21.8	1.4	30.8	54.0	23.2	Complied

Idle Mode Radiated Emissions – 1 GHz to 14 GHz (Continued)

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
1107.450	Vert.	30.5	21.5	0.8	52.8	74.0	21.2	Complied
1326.518	Vert.	22.0	21.5	0.9	44.4	74.0	29.6	Complied
1563.445	Vert.	21.9	21.6	1.0	44.5	74.0	29.5	Complied
1597.150	Vert.	24.5	21.6	1.0	47.1	74.0	26.9	Complied
1995.664	Vert.	21.8	21.6	1.2	44.6	74.0	29.4	Complied
2019.425	Vert.	22.2	20.7	1.2	44.1	74.0	29.9	Complied
2122.496	Vert.	21.3	20.9	1.2	43.4	74.0	30.6	Complied
2394.536	Vert.	25.3	21.2	1.3	47.8	74.0	26.2	Complied
2523.799	Vert.	22.1	21.4	1.3	44.8	74.0	29.2	Complied
2660.045	Vert.	21.3	21.6	1.3	44.2	74.0	29.8	Complied
2781.715	Vert.	19.7	21.8	1.4	42.9	74.0	31.1	Complied

Preliminary radiated scans up to 4 GHz of both chip rates were performed on the EUT fitted and operating in each of the three host notebook PCs stated in section 2.5 of this report. The combination that exhibited the worse case mode of operation was then used to perform the final measurements detailed in the above results table. This was found to be with the EUT fitted and operating in the ACER BY25 notebook PC.

Idle Mode Radiated Emissions – 1 GHz to 14 GHz (Continued)

Results: (Low Chip Rate)

Highest Average Level:

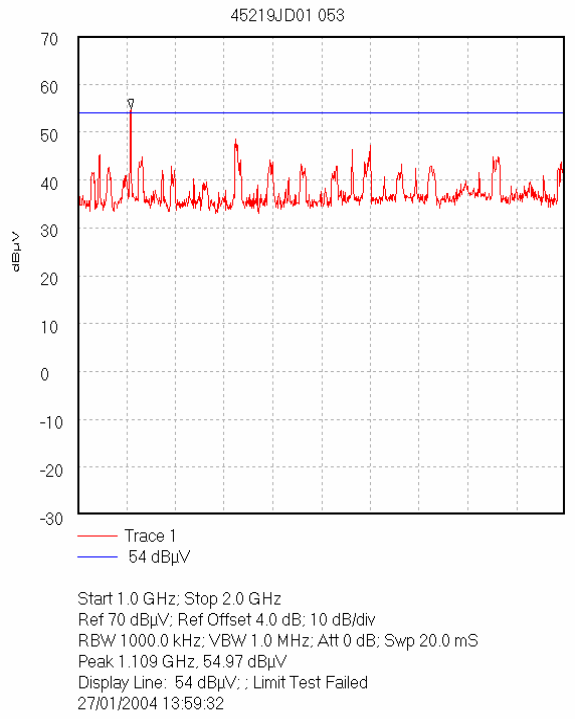
Frequency (MHz)	Antenna Polarity (H/V)	Average Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Result
1107.490	Vert.	20.5	21.5	0.8	42.8	54.0	11.2	Complied
1327.976	Vert.	8.9	21.5	0.9	31.3	54.0	22.7	Complied
1563.440	Vert.	19.0	21.6	1.0	41.6	54.0	12.4	Complied
1597.336	Vert.	9.7	21.6	1.0	32.3	54.0	21.7	Complied
1994.432	Vert.	8.5	21.6	1.2	31.3	54.0	22.7	Complied
2019.450	Vert.	17.8	20.7	1.2	39.7	54.0	14.3	Complied
2124.846	Vert.	8.0	20.9	1.2	30.1	54.0	13.9	Complied
2392.978	Vert.	10.1	21.2	1.3	32.6	54.0	11.4	Complied
2525.618	Vert.	8.4	21.4	1.3	31.1	54.0	12.9	Complied
2661.681	Vert.	8.4	21.6	1.3	31.3	54.0	12.7	Complied
2782.492	Vert.	7.4	21.8	1.4	30.6	54.0	13.4	Complied

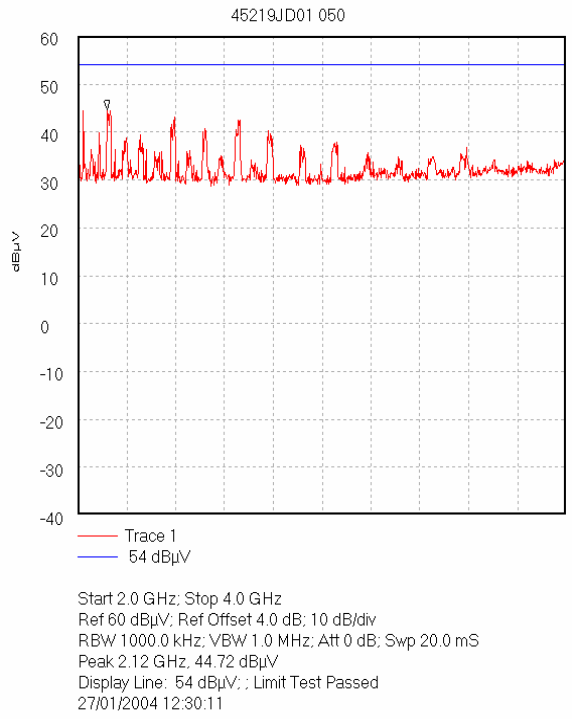
Highest Peak Level:

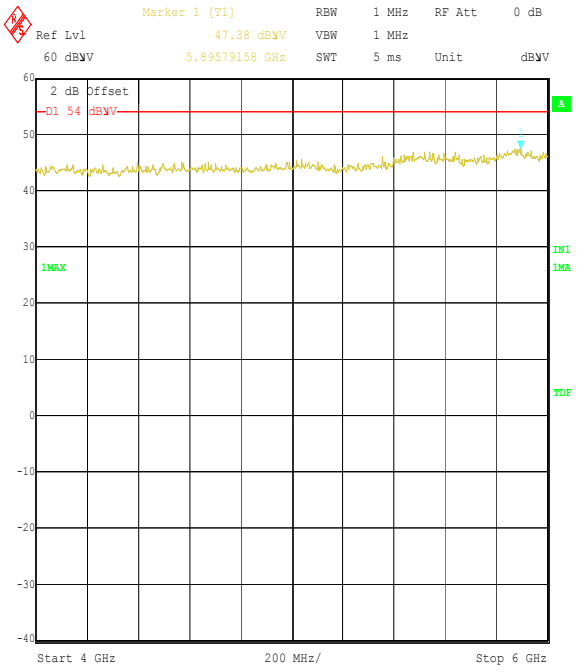
Frequency (MHz)	Antenna Polarity (H/V)	Peak Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Result
1107.490	Vert.	24.3	21.5	0.8	46.6	74.0	27.4	Complied
1327.976	Vert.	23.6	21.5	0.9	46.0	74.0	28.0	Complied
1563.440	Vert.	23.0	21.6	1.0	45.6	74.0	28.4	Complied
1597.336	Vert.	24.6	21.6	1.0	47.2	74.0	26.8	Complied
1994.432	Vert.	19.2	21.6	1.2	42.0	74.0	32.0	Complied
2019.450	Vert.	22.3	20.7	1.2	44.2	74.0	29.8	Complied
2124.846	Vert.	20.5	20.9	1.2	42.6	74.0	31.4	Complied
2392.978	Vert.	26.4	21.2	1.3	49.0	74.0	25.0	Complied
2525.618	Vert.	21.7	21.4	1.3	44.4	74.0	29.6	Complied
2661.681	Vert.	21.1	21.6	1.3	44.0	74.0	30.0	Complied
2782.492	Vert.	19.7	21.8	1.4	42.9	74.0	31.1	Complied

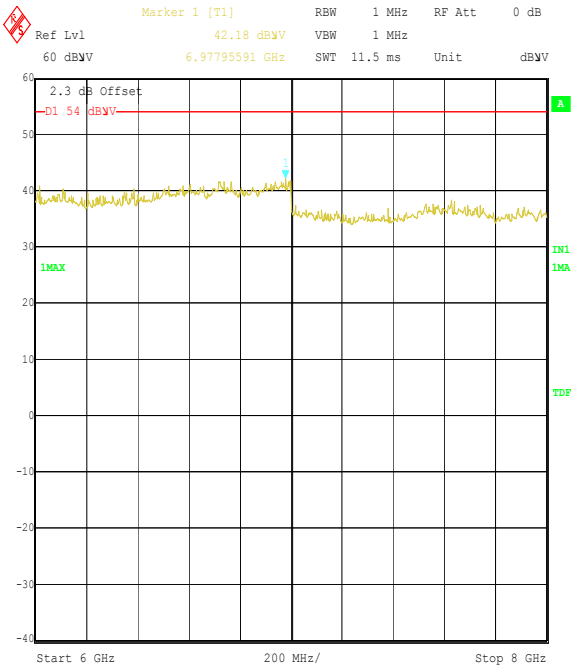
Preliminary radiated scans up to 4 GHz of both chip rates were performed on the EUT fitted and operating in each of the three host notebook PCs stated in section 2.5 of this report. The combination that exhibited the worse case mode of operation was then used to perform the final measurements detailed in the above results table. This was found to be with the EUT fitted and operating in the ACER BY25 notebook PC.

Idle Mode Radiated Emissions – 1 GHz to 14 GHz (High Chip Rate) ACER PC- Continued



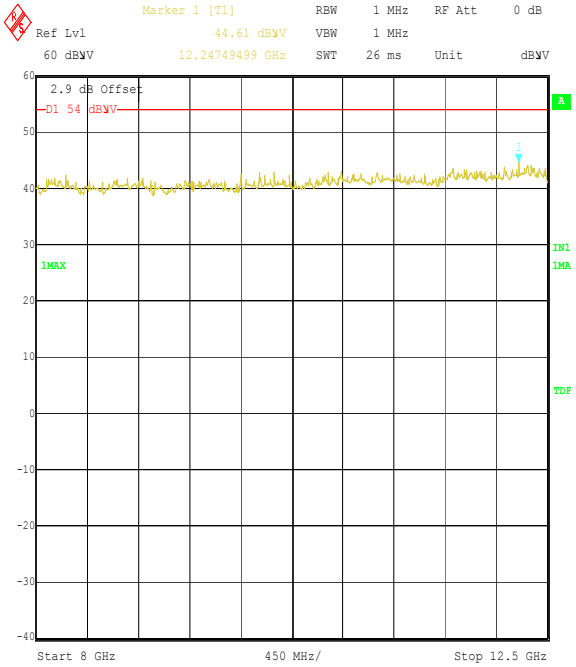




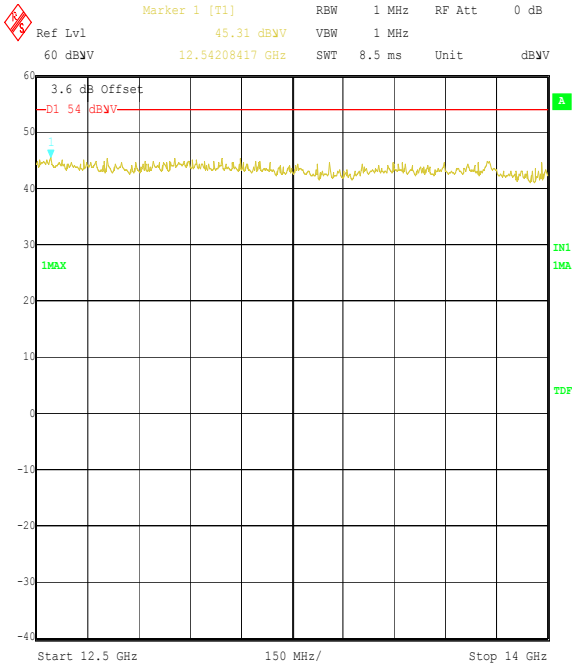


Note: these plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Idle Mode Radiated Emissions – 1 GHz to 14 GHz (High Chip Rate) ACER PC- Continued



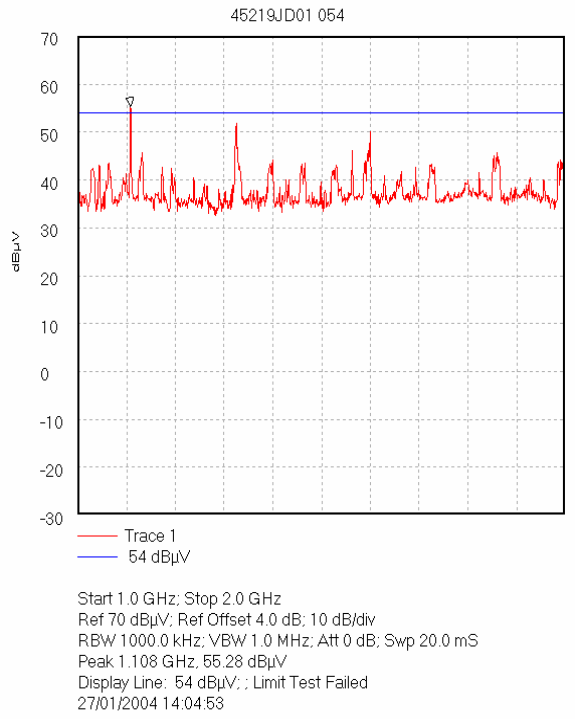
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 7.68 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 16:14:24



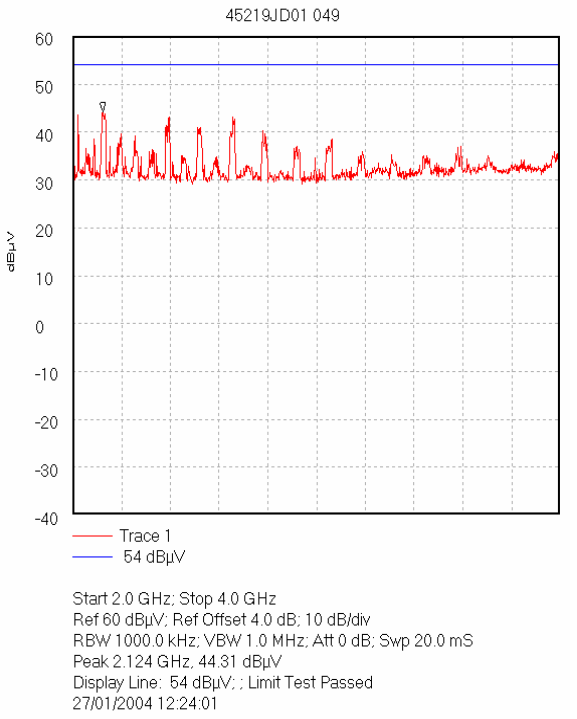
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 7.68 Mcps. 12.5-14 GHz
Date: 4.FEB.2004 16:21:23

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

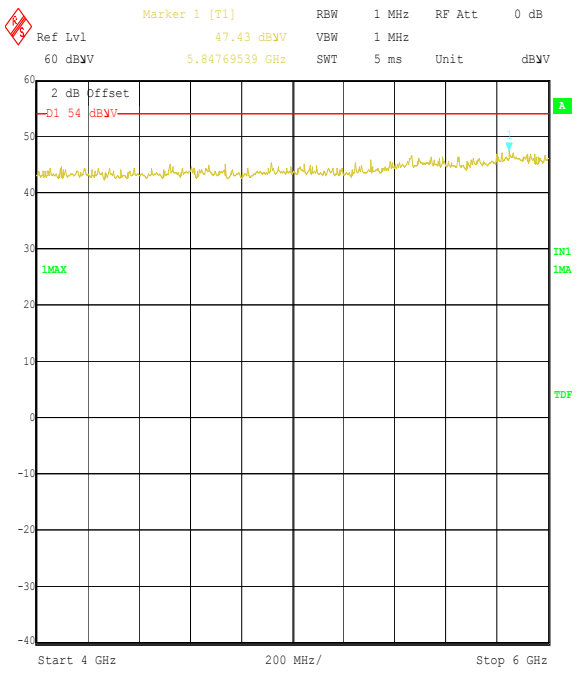
Idle Mode Radiated Emissions – 1 GHz to 14 GHz (Low Chip Rate) ACER PC- Continued



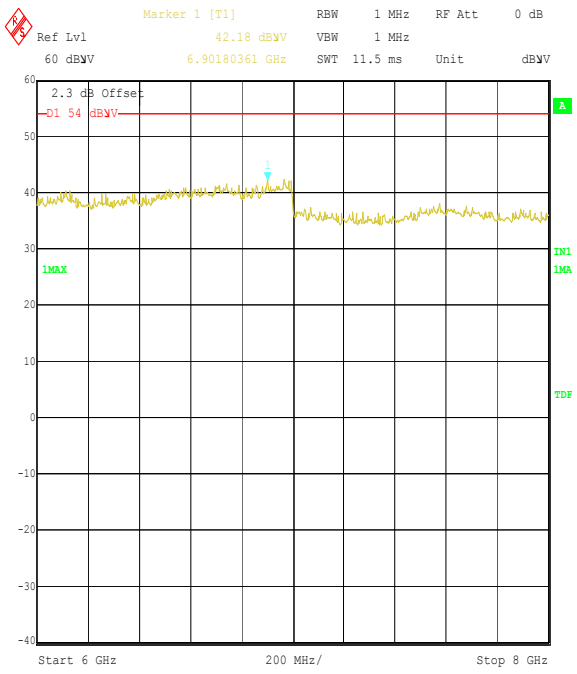
Start 1.0 GHz; Stop 2.0 GHz
Ref 70 dBµV; Ref Offset 4.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.108 GHz, 55.28 dBµV
Display Line: 54 dBµV; ; Limit Test Failed
27/01/2004 14:04:53



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 2.124 GHz, 44.31 dBµV
Display Line: 54 dBµV; ; Limit Test Passed
27/01/2004 12:24:01



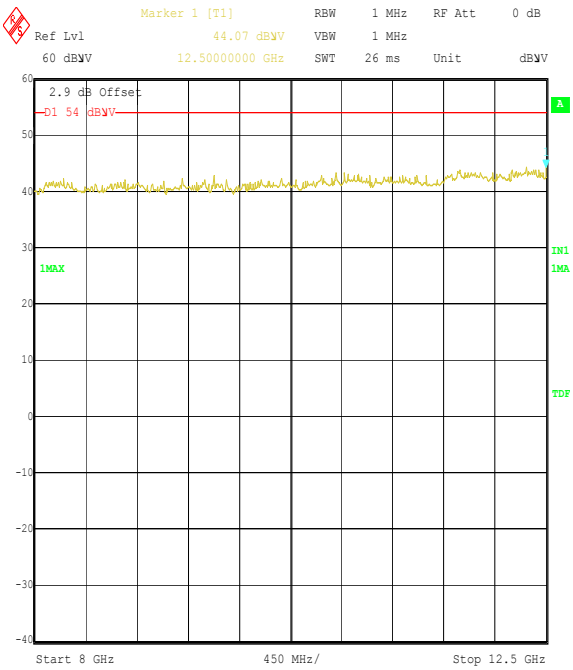
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 3.84 Mcps. 4-6 GHz
Date: 4.FEB.2004 16:05:10



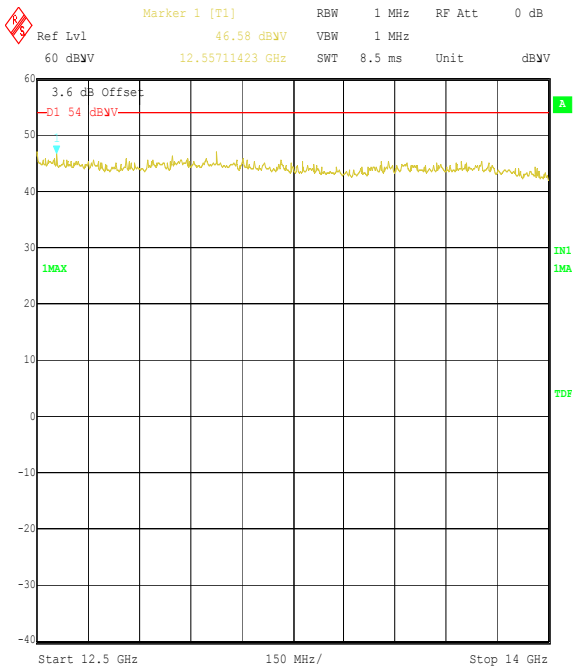
Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 3.84 Mcps. 6-8 GHz
Date: 4.FEB.2004 16:08:30

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

Idle Mode Radiated Emissions – 1 GHz to 14 GHz (Low Chip Rate) ACER PC- Continued



Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 3.84 Mcps. 8-12.5 GHz
Date: 4.FEB.2004 16:15:58



Title: IPWireless EUT: FD. FCC P15/21/74. Radiated Spurious
Comment A: 45219JD01 Idle Mode, 3.84 Mcps. 12.5-14 GHz
Date: 4.FEB.2004 16:19:11

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

8. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Carrier Output Power (Conducted)	Not applicable	95%	+/- 0.46 dB
Carrier Output Power (Radiated)	Not applicable	95%	+/- 1.78 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.
A027	Horn Antenna	Eaton	9188-2	301
A030	Step Attenuator	Narda	745-69	01544
A031	Horn Antenna	Eaton	91889-2	557
A047	High Pass Filter	Aerial Facilities	HP-470-5N	4015B
A059	Log Periodic Antenna	EMCO	3146	8902-2378
A091	Biconical Antenna	EMCO	3110	9008-1182
A203	Horn Antenna	Flann	22240-20	343
A259	Bilog Antenna	Chase	CBL6111	1513
A336	Attenuator	Flann	20081-30	75
A366	Isolator	MRI	FRR-400	169
A392	Attenuator	Suhner	6803.17.B	None
A427	Horn Antenna	Flann	14240-20	150
A428	Horn Antenna	Flann	12240-20	134
A429	Horn Antenna	Flann	16240-20	561
A430	Horn Antenna	Flann	18240-20	425
A436	Horn Antenna	Flann	20240-20	330
A559	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	357881052
C1065	Cable	Rosenberger	UFA210-1-7872	0985
C1078	Cable	Rosenberger	FA210A1030 M5050	28464-2
C1080	Cable	Rosenberger	FA210A1030 M5050	28464-1
C178	Cable	Rosenberger	UFA210A-1-1181-70x70	None
C436	Cable	Hewlett Packard	5061-5458	5061-5458-C436
C453	Cable	Rosenberger	RG142XX-001-RFIB	C453-10081998

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
C468	Cable	Rosenberger	UFA210A-1-3937-504504	98L0440
C499	Cable	Rosenberger	FA210A1020 M30309	001
E009	Environmental Chamber	Thermotron Corporation	S-8-E Mini Max	25-2407-0
None	Lo-Amp	Rohde & Schwarz	FNR5717	1021.0741.02
G085	Generator	Hewlett Packard	83650L	3614A00104
M003	Spectrum Monitor	Rohde & Schwarz	EZM	883 580/008
M023	Test Receiver	Rohde & Schwarz	ESVP	872 991/027
M069	Spectrum Analyser / Receiver	Rohde & Schwarz	ESMI	829 808/007 (DU) / 827 063/008 (RU)
M088	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:835862/018 RU:835387/006
M1122	Peak Power Sensor	Boonton Electronics	57340	3297
M1123	RF Power Meter	Boonton	4531	138201
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K
M114	Temperature/Humidity Meter	RS Components	212-146	None
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016
M152	Mixer	Rohde & Schwarz	FS-Z16	None
M281	Power Meter	Hewlett Packard	E4418A (EPM441A)	GB37170210-01
M283	Power Sensor	Hewlett Packard	8487A	3318A03241
M287	Transmission Analyser	Hewlett Packard	37717C	GB00003727
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. Measurement Methods

A2.1 AC Mains Conducted Emissions

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

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

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

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

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

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

A2.2 Conducted Output Power

The EUT was connected to a wideband power meter via suitable cables, RF attenuators and combiners.

The connection was made to the EUT either via an antenna port or by antenna terminals made available by the client.

The total loss of the cables, attenuators and combiner were measured and entered as a reference level offset into the measuring receiver to correct for the losses.

The EUT was set to the required frequency and the transmitter set to operate at full power.

The conducted power was recorded from the LCD display of the wideband power meter.

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

A2.3 Effective Isotropic Radiated Power (EIRP)

EIRP measurements were performed in accordance with the standard, against appropriate limits.

The EIRP was measured with the EUT arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4. The transmitter transmitting either via its integral antenna or via an external stick antenna (when fitted).

The level of the EIRP was measured using the channel power function of the spectrum analyser, having its level referenced to a wideband power meter.

The test antenna was positioned in the horizontal plane. The EUT was oriented in the X plane. The test antenna was then raised and lowered until a maximum peak was observed. The turntable was then rotated through 360 degrees and the maximum peak reading obtained. The height search was then repeated to take into consideration the new angular position of the turntable. The maximum reading observed was then recorded. This procedure was then repeated with the EUT oriented in the Y and Z planes. The highest reading taken in all 3 planes was recorded. The entire procedure was then repeated with the test antenna set in the Vertical polarity.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution horn antenna. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution horn antenna was set to the horizontal polarity. The substitution horn antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

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

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

All measurements were performed using broadband Horn antennas.

Circumstances where the signal generator could not produce the desired power substitution was performed with the signal generator set to 0 dBm. The radiated signal was maximised as previously described. The level indicated on the measuring receiver was noted. The delta between this level and the maximum level for the EUT was calculated and also noted. The EIRP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated EIRP to obtain the substituted EUT EIRP.

Delta (dB) = EUT – SG

where :

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual EIRP is calculated as:

EIRP SG= Signal Generator Level - Cable Loss + Antenna Gain

The EUT EIRP is calculated as:

EIRP EUT = EIRP SG + Delta.

Effective Isotropic Radiated Power (EIRP) (Continued)

The test equipment settings for EIRP measurements were as follows:

Receiver Function	Setting
Detector Type:	Average
Mode:	Channel Power Function
Resolution Bandwidth:	100 kHz (automatically set by the spectrum analyser when using the channel power function)
Video Bandwidth:	300 kHz (automatically set by the spectrum analyser when using the channel power function)
Amplitude Range:	100 dB
Sweep Time:	10s

A2.4 Frequency Stability

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

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

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

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

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

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

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

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

A2.5 Occupied Bandwidth

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 automatically configures the measurement bandwidths to make an accurate measurement based on the channel bandwidth and channel spacing of the EUT. A value of 200 kHz was used was used for the high chip rate whilst a value of 100 kHz was used was used for the low chip rate.

A2.6 Conducted Emissions

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

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

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

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

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

The limit in the standard states that, for mobile digital stations, emissions shall be attenuated by at least 43 + 10 log (P) dB at the channel edge and by at least 55+10 log (P)dB at frequencies greater than 5.5 MHz from the channel edge below the transmitter power (P), where (P) is the maximum measured fundamental power in Watts for the channel under test. These calculations always give absolute levels of -13 dBm and -25 dBm respectively and, therefore, the limit is either
-13 dBm or -25 dBm. The frequency band described above was investigated with the transmitter operating at full power. Any spurious observed were then recorded and compared to the appropriate limit.

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

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

The measurements in the 2nd 1 MHz blocks away from the channel edges of bottom, middle and top channel at low chip rate were carried out using an analyser span of 1 MHz and a 100 kHz receiver resolution bandwidth (RBW). 10 linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were integrated to give the emission level in an equivalent 1 MHz bandwidth.

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

Receiver Function	**Settings**
Detector Type:	Average
Mode:	Max Hold
Bandwidth:	As shown in the plots
Amplitude Range:	100 dB
Sweep Time:	Coupled

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 were performed in order to identify frequencies on which the EUT was generating spurious emissions. This determined the frequencies from the EUT that required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m, below 4 GHz; above 4 GHz a 1 m measurement distance was used. A limit line was set to the specification limit. Levels within 20 dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and spectrum analyser with an average detector was used for final measurements.

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

Once the final amplitude (maximised) had been obtained and noted, the EUT was replaced by a substitution antenna, and a substitution method applied. The substitution antennas used were a horn antenna for measurements greater 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 matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

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

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

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

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

Transmitter Radiated Emissions (Continued)

The limit in the standard states that, for mobile digital stations, emissions shall be attenuated by at least 43 + 10 log (P) dB at the channel edge and by at least 55+10 log (P)dB at frequencies greater than 5.5 MHz from the channel edge below the transmitter power (P), where (P) is the maximum measured fundamental power in Watts for the channel under test. These calculations always give absolute levels of -13 dBm and -25 dBm respectively and, therefore, the limit is either
-13 dBm or -25 dBm. The frequency band described above was investigated with the transmitter operating at full power. Any spurious observed were then recorded and compared to the appropriate limit.

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

For the measurements of emissions at the channel edge, plots of the spectral distribution including the fundamental frequency were recorded using a spectrum analyser for the EUT transmitting on bottom, middle and top channels. The method is in accordance with the measurement method detailed in Part 27.53 for measurements in the 1 MHz bands immediately outside and adjacent to the channel edge. A resolution bandwidth of 100 kHz was used. Ten linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were integrated to give the emission level in an equivalent 1 MHz bandwidth.

A2.8 Receiver Radiated Emissions

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

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 5 times the highest unintentionally generated frequency were performed within a screened chamber in order to identify frequencies on which the EUT was generating interference. This determined the frequencies from the EUT which required further examination. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit. Levels within 20 dB of this limit were measured where possible, on occasion, the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a Quasi-Peak detector was used for measurements below 1000 MHz, for measurements above 1000 MHz average and peak detectors were used.

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

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

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

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

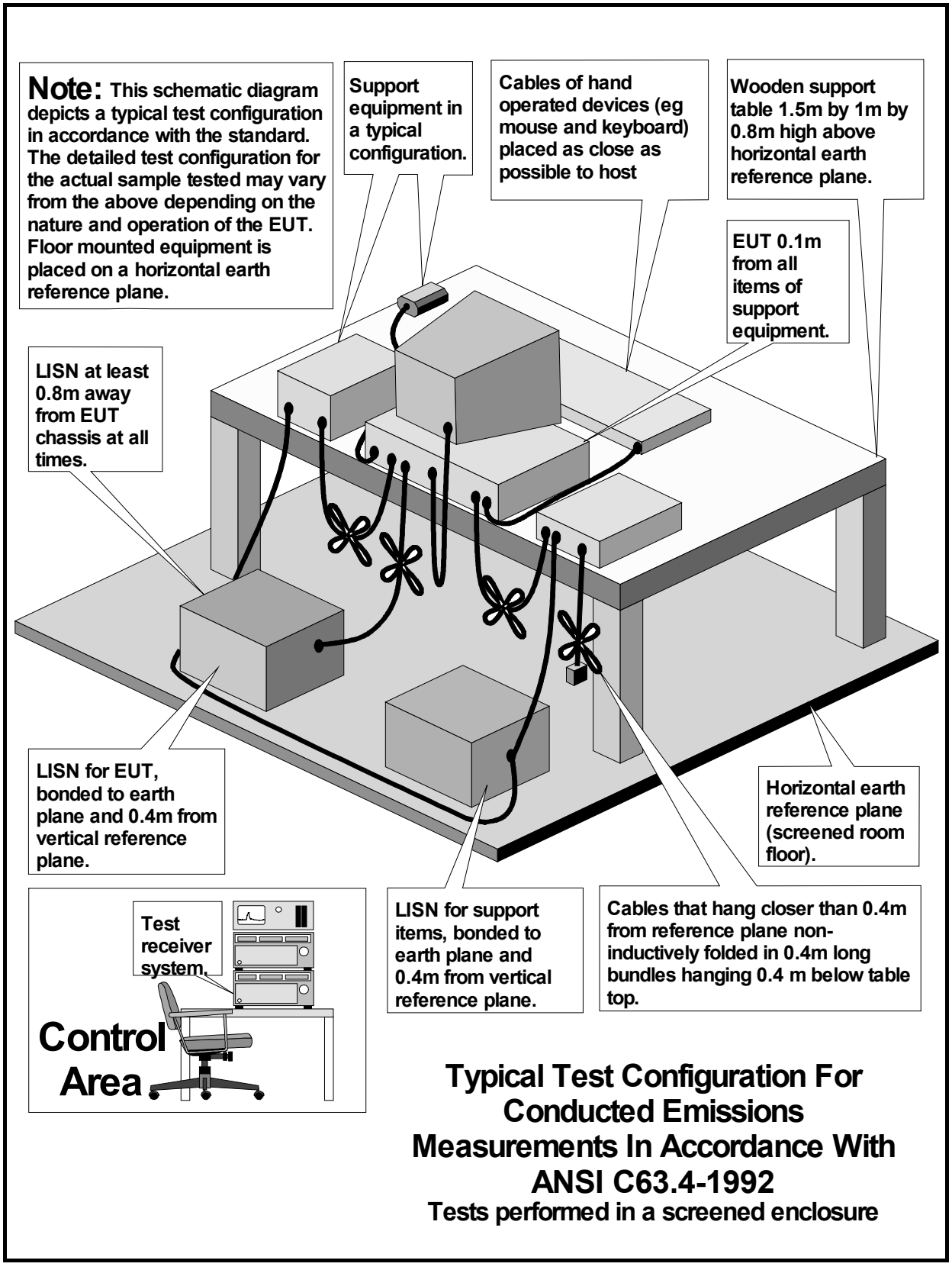
Receiver Function	**Initial Scan**	**Final Measurements Below 1 GHz**	**Final Measurements Above 1 GHz**
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	(120 kHz < 1 GHz) (1 MHz > 1 GHz)	120 kHz	1 MHz (If Applicable)
Amplitude Range:	60 dB	20 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\47147JD02\EMICON	Test configuration for measurement of conducted emissions
DRG\47147JD02\EMIRAD	Test configuration for measurement of radiated emissions

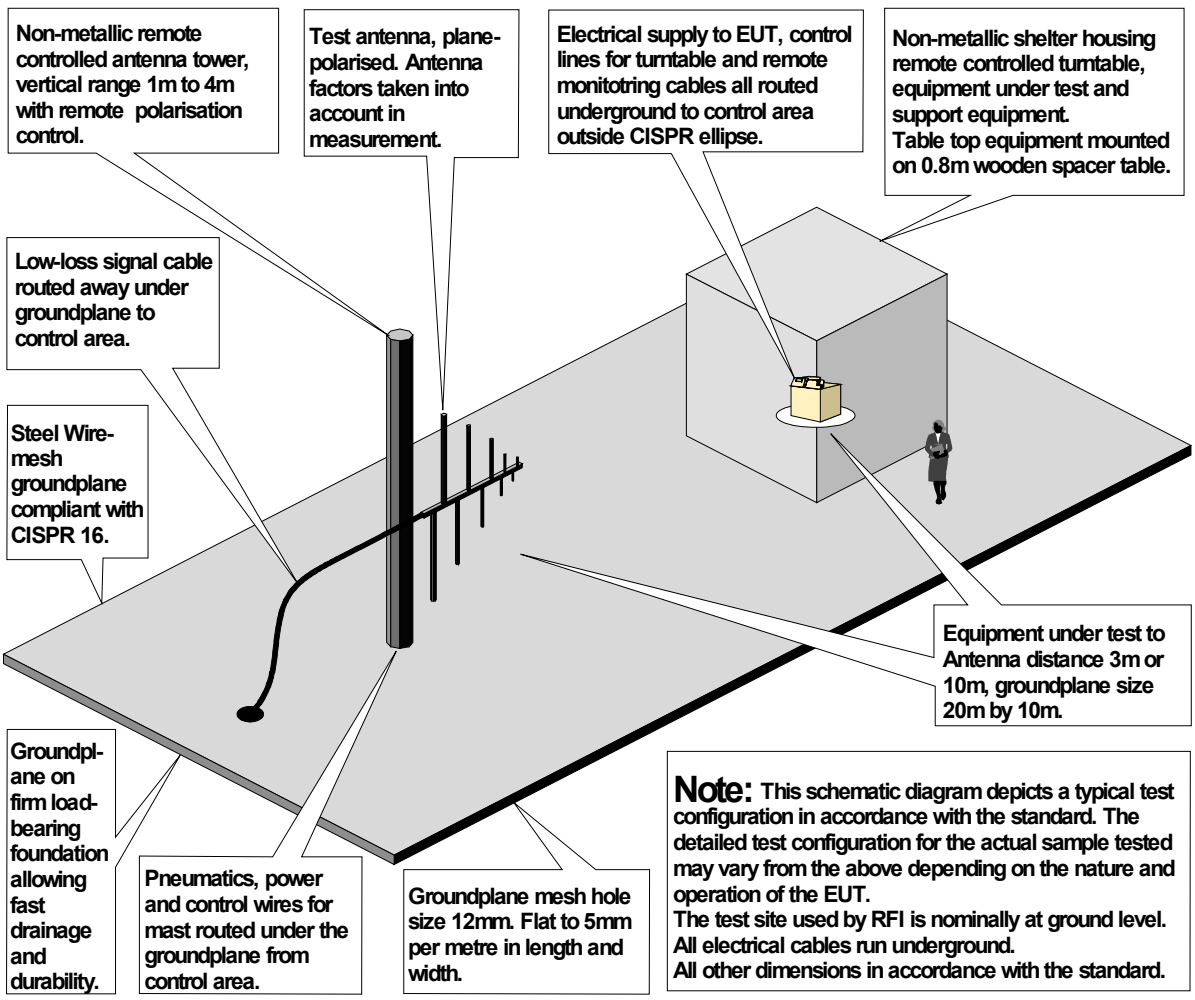
DRG\47147JD02\EMICON



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

Tests performed in a screened enclosure

DRG\47147JD02\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