

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: SoftBank 941P

To: FCC Part 15.247: 2008 Subpart C

Test Report Serial No: RFI/RPT2/RP76421JD13A

Supersedes Test Report Serial No: RFI-RPT1-RP76421JD13A

This Test Report Is Issued Under The Authority Of Chris Guy, Operations Manager - Cellular & Wireless:	C.G
Checked By:	Tony Henriques
Signature:	pp Affinekerby
Date of Issue:	31 December 2009

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RFI Global Services Ltd

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ISSUE DATE: 31 DECEMBER 2009

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# 1. Customer Information

Company Name:	Panasonic Mobile Communications Development of Europe Ltd
Address:	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP United Kingdom

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# 2. Summary of Testing

# 2.1. General Information

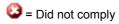
Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart C (Radio Frequency Devices) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart B (Radio Frequency Devices) - Sections 15.107 and 15.109
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	26 November 2009 to 04 December 2009

# 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Port Type	Result
Part 15.107	Idle Mode AC Conducted Emissions	AC Mains	<b>②</b>
Part 15.109	Idle Mode Radiated Spurious Emissions	Enclosure	<b>②</b>
Part 15.207	Transmitter AC Conducted Emissions	AC Mains	<b>②</b>
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	Antenna	<b>②</b>
Part 2.1049	Transmitter 20 dB Bandwidth	Antenna	<b>②</b>
Part 15.247(e)	Transmitter Peak Power Spectral Density	Antenna	<b>②</b>
Part 15.247(b)(3)	Transmitter Maximum Peak Output Power	Antenna	<b>②</b>
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	Antenna	<b>②</b>
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	Antenna	<b>②</b>

# **Key to Results**





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#### 2.3. Methods and Procedures

Reference:	ANSI C63.4 (2003)
Title:	American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
Reference:	DA00-705 (2000)
Title:	Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

#### 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

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# 3. Equipment Under Test (EUT)

# 3.1. Identification of Equipment Under Test (EUT)

3.1. Identification of Equipment officer rest (EOT)				
Brand Name:	SoftBank			
Model Name or Number:	941P			
IMEI Number:	004401220894337			
Hardware Version Number:	Rev C			
Software Version Number:	941PVA16			
FCC ID Number:	UCE209023A			
Description:	AC Charger			
Brand Name:	SoftBank			
Model Name or Number:	ZTDAA1			
Description:	DC Charger			
Brand Name:	SoftBank			
Model Name or Number:	PMJAA1			
Description:	USB Data Cable			
Brand Name:	SoftBank			
Model Name or Number:	ZTFE01			
<u></u>	<u> </u>			
Description:	Personal Hands-free			
Brand Name:	SoftBank			
Model Name or Number:	ZTCK01			
Description:	Personal Hands-free Converter			
Brand Name:	SoftBank			
Model Name or Number:	PMLAJ1			
Description:	Battery			
Brand Name:	SoftBank			
Model Name or Number:	PMBAS1			
Description:	Micro SD memory card			
Brand Name:	Not Stated			
Model Name or Number:	Not Stated			
1				

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#### 3.2. Description of EUT

The Equipment Under Test was a dual mode (W-CDMA FDDI/GSM900/1800/1900MHz) cellular mobile telephone with Bluetooth, WLAN and RFID.

#### 3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

# 3.4. Additional Information Related to Testing

Technology Tested:	WLAN			
Type of Unit:	Transceiver			
Modulation Type:	BPSK; 64QAM			
Data Rate:	802.11b (DSSS): 11 Mbps;	802.11g (OFDM): 5	4 Mbps	
Power Supply Requirement:	Nominal	3.7V		
Maximum Peak Power Output (EIRP)	10.7 dBm			
Transmit Frequency Range:	2412 MHz to 2462 MHz			
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)	
	Bottom	1	2412	
	Middle 6		2437	
	Top 11		2462	
Receive Frequency Range:	2412 MHz to 2462 MHz			
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)	
	Bottom	1	2412	
	Middle 6 2437			
	Top 11 2462			

#### 3.5. Support Equipment

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

Description:	Laptop
Brand Name:	Panasonic
Model Name or Number:	CF-W2
Serial Number:	None Stated

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# 4. Operation and Monitoring of the EUT during Testing

#### 4.1. Operating Modes

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

- Continuously transmitting at maximum power on the bottom, centre and top channels as required using the data rates which exhibited the widest spectral bandwidths and highest power levels i.e.:
  - 802.11b 11 Mbps BPSK
     802.11g 54 Mbps 64QAM
- Idle Mode

#### 4.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- Controlled using a bespoke application on the laptop PC supplied by the client. The
  application was used to enable continuous transmission and the idle mode (enabled but not
  transmitting) and to select the test channels, data rates and modulation schemes as
  required.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the AC charger connected to the EUT, with the TV antenna extended as this was found to be the worst case during prescans. All accessories were individually connected with the TV antenna extended and retracted during prescan measurements to determine the worst case combination.

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# 5. Measurements, Examinations and Derived Results

#### **5.1. General Comments**

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 6. Measurement Uncertainty for details.

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# 5.2. Test Results

# 5.2.1. Idle Mode AC Conducted Spurious Emissions

#### **Test Summary:**

FCC Part:	15.107
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes

#### **Environmental Conditions:**

Temperature (°C):	26
Relative Humidity (%):	27

#### **Results: Quasi Peak Detector Measurements**

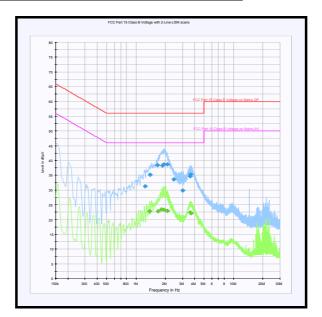
Frequency (MHz)	Line	Quasi Peak Level (dBμV)	Limit (dΒμV)	Margin (dB)	Result
1.239000	Live	31.3	56.0	24.7	Complied
1.401000	Live	35.2	56.0	20.8	Complied
1.653000	Neutral	38.4	56.0	17.6	Complied
1.873500	Neutral	38.3	56.0	17.7	Complied
1.936500	Live	38.7	56.0	17.3	Complied
2.098500	Live	38.8	56.0	17.2	Complied
2.445000	Live	33.6	56.0	22.4	Complied
3.016500	Live	29.8	56.0	26.2	Complied
3.583500	Live	34.6	56.0	21.4	Complied
3.610500	Live	35.4	56.0	20.6	Complied

#### **Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dBμV)	Limit (dB <sub>µ</sub> V)	Margin (dB)	Result
1.383000	Live	22.8	46.0	23.2	Complied
1.671000	Neutral	22.8	46.0	23.2	Complied
1.828500	Neutral	23.4	46.0	22.6	Complied
1.932000	Live	23.4	46.0	22.6	Complied
2.085000	Live	22.9	46.0	23.1	Complied
3.601500	Live	22.3	46.0	23.7	Complied
3.655500	Live	22.1	46.0	23.9	Complied

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# **Idle Mode AC Conducted Spurious Emissions (continued)**



This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

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# 5.2.2. Idle Mode Radiated Spurious Emissions

#### **Test Summary:**

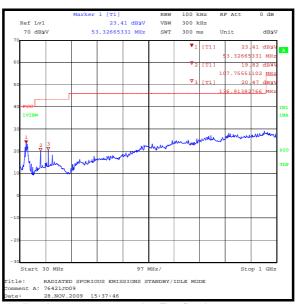
FCC Part:	15.109
Frequency Range:	30 MHz to 1000 MHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

#### **Environmental Conditions:**

Temperature (°C):	22
Relative Humidity (%):	26

#### **Results:**

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
53.326	Horizontal	21.6	40.0	18.4	Complied
107.755	Vertical	24.7	43.5	18.8	Complied
138.001	Horizontal	26.8	43.5	16.7	Complied



This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

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#### **Idle Mode Radiated Spurious Emissions (continued)**

#### **Test Summary:**

FCC Part:	15.109
Frequency Range:	1 GHz to 12.75 GHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

#### **Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	31

#### **Results:**

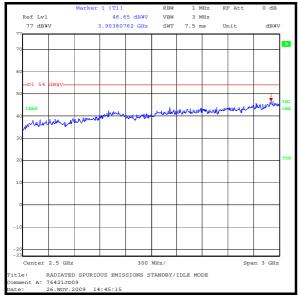
Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dΒμV/m)	Margin (dB)	Result
3903.808	Horizontal	46.7	54.0	7.3	Complied

#### Note(s):

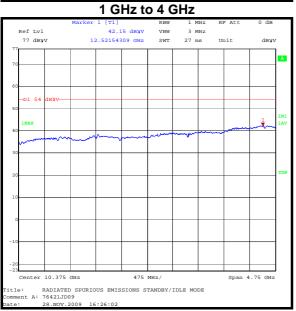
- No spurious emissions were detected above the noise floor of the measuring receiver therefore the
  highest peak noise floor reading of the measuring receiver was recorded as shown in the table above.
  The peak level was compared to the average limit as opposed to being compared to the peak limit
  because this is the more onerous limit.
- 2. All pre-scan were performed with the peak detector against average limits apart from measurement made in the range of 8 GHz to 12.75 GHz where pre-scans were performed with peak and average detector and the applicable limit apply. This was due to the noise floor exceeding the average limit when using the peak detector.

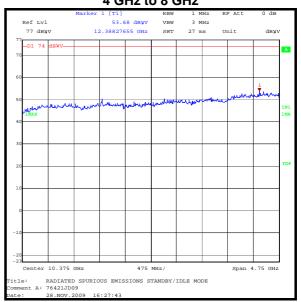
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#### **Idle Mode Radiated Spurious Emissions (continued)**









8 GHz to 12.75 GHz Average

8 GHz to 12.75 GHz Peak

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# 5.2.3. Transmitter AC Conducted Spurious Emissions

#### **Test Summary:**

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes

#### **Environmental Conditions:**

Temperature (°C):	26
Relative Humidity (%):	26

#### **Results: Quasi Peak Detector Measurements**

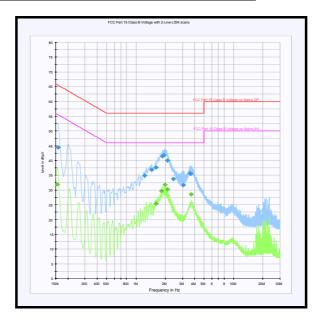
Frequency (MHz)	Line	Quasi Peak Level (dBµV)	Limit (dΒμV)	Margin (dB)	Result
0.159000	Live	44.4	65.5	21.1	Complied
1.230000	Live	34.9	56.0	21.1	Complied
1.446000	Live	36.9	56.0	19.1	Complied
1.608000	Neutral	37.7	56.0	18.3	Complied
1.873500	Neutral	41.5	56.0	14.5	Complied
1.927500	Live	41.8	56.0	14.2	Complied
2.085000	Live	40.1	56.0	15.9	Complied
2.404500	Live	33.7	56.0	22.3	Complied
3.052500	Live	31.7	56.0	24.3	Complied
3.588000	Live	35.7	56.0	20.3	Complied
3.637500	Live	35.4	56.0	20.6	Complied

#### **Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dBμV)	Limit (dBµV)	Margin (dB)	Result
0.154500	Live	31.9	55.8	23.9	Complied
1.603500	Neutral	25.4	46.0	20.6	Complied
1.819500	Neutral	29.8	46.0	16.2	Complied
1.977000	Live	31.8	46.0	14.2	Complied
2.085000	Live	30.2	46.0	15.8	Complied
3.687000	Live	28.5	46.0	17.5	Complied

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# **Transmitter AC Conducted Spurious Emissions (continued)**



This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

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# 5.2.4. Transmitter Minimum 6 dB Bandwidth

#### **Test Summary:**

FCC Part:	15.247(a)(2)
Test Method Used:	As detailed in Public Notice DA 00-705 (March 30, 2000) (see note below)

#### **Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	34

#### Results: 11 Mbps

Channel	Transmitter 6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	8.777	≥0.5	8.277	Complied
Middle	8.537	≥0.5	8.037	Complied
Тор	8.657	≥0.5	8.157	Complied

#### Results: 54 Mbps

Channel	Transmitter 6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.865	≥0.5	12.385	Complied
Middle	12.745	≥0.5	12.245	Complied
Тор	12.745	≥0.5	12.245	Complied

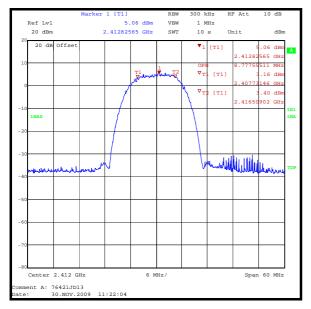
#### Note(s):

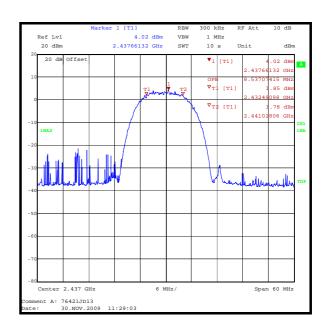
1. In lieu of the test method detailed in Public Notice DA 00-705 the 6 dB (75%) occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

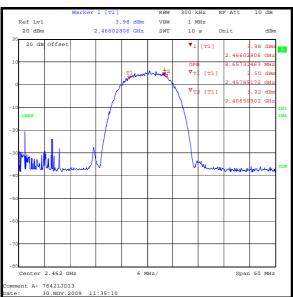
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# **Transmitter Minimum 6 dB Bandwidth (continued)**

#### **11 Mbps**



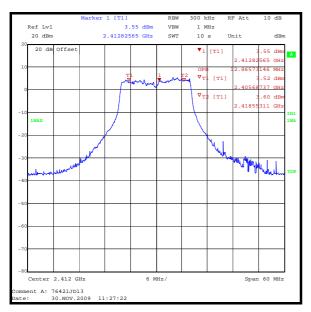


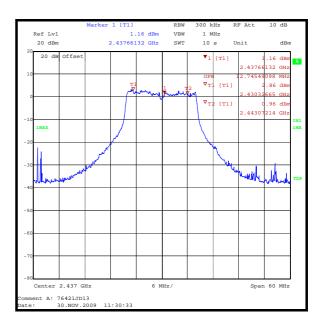


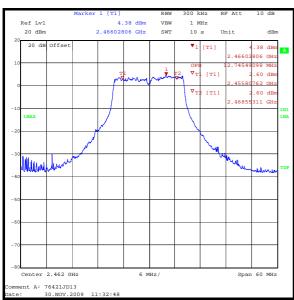
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# **Transmitter Minimum 6 dB Bandwidth (continued)**

#### 54 Mbps







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# 5.2.5. Transmitter 20 dB Bandwidth

#### **Test Summary:**

FCC Part:	2.1049
Test Method Used:	As detailed in Public Notice DA 00-705 (March 30, 2000) (see note below)

#### **Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	34

#### Results: 11 Mbps

Channel	Transmitter 20 dB Bandwidth (MHz)
Bottom	15.752
Middle	15.752
Тор	15.752

#### Results: 54 Mbps

Channel	Transmitter 20 dB Bandwidth (MHz)
Bottom	17.074
Middle	17.315
Тор	17.315

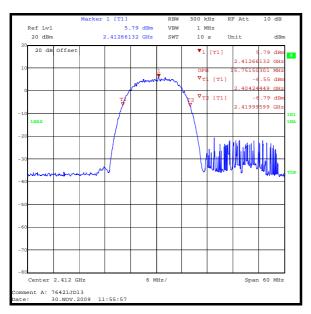
#### Note(s):

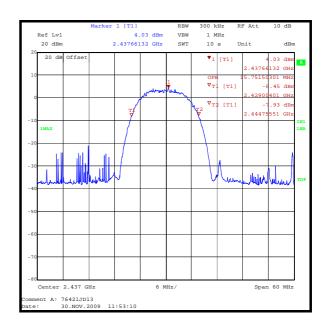
1. In lieu of the test method detailed in Public Notice DA 00-705 the 20 dB bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

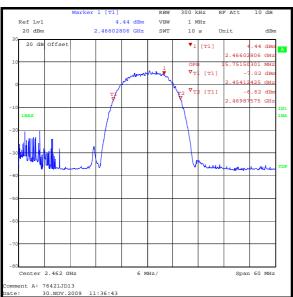
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# **Transmitter 20 dB Bandwidth (continued)**

#### **11 Mbps**

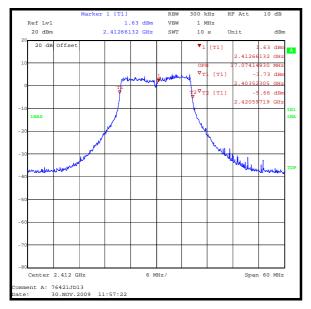


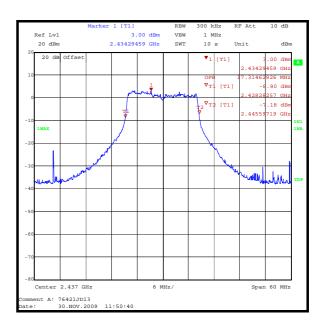


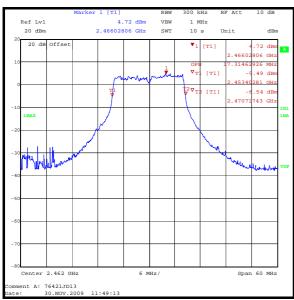


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# <u>Transmitter 20 dB Bandwidth (continued)</u> <u>54 Mbps</u>







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# 5.2.6. Transmitter Peak Power Spectral Density

#### **Test Summary:**

FCC Part:	15.247(e)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 and FCC CFR Part 2

#### **Environmental Conditions:**

Temperature (°C):	22
Relative Humidity (%):	36

# Results: 11 Mbps

Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-13.4	8.0	21.4	Complied
Middle	-14.5	8.0	22.5	Complied
Тор	-13.2	8.0	21.2	Complied

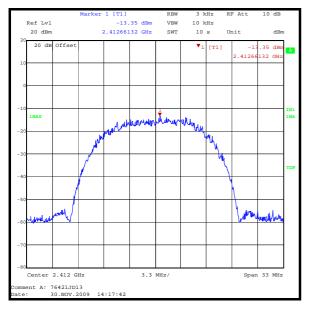
#### Results: 54 Mbps

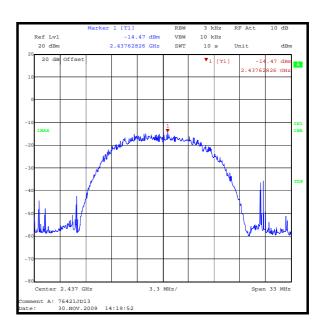
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-14.1	8.0	22.1	Complied
Middle	-15.6	8.0	23.6	Complied
Тор	-15.1	8.0	23.1	Complied

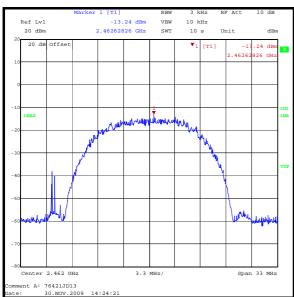
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# **Transmitter Peak Power Spectral Density (continued)**

#### **11 Mbps**

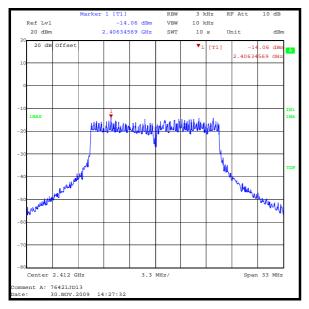


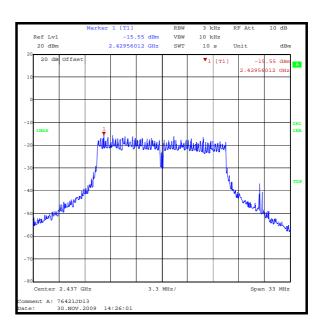


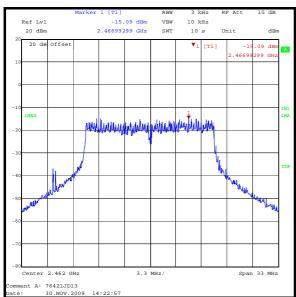


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# <u>Transmitter Peak Power Spectral Density (Continued)</u> <u>54 Mbps</u>







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#### 5.2.7. Transmitter Maximum Peak Output Power (EIRP)

#### **Test Summary:**

FCC Part:	15.247(b)(3)
Test Method Used:	As detailed in Public Notice DA 00-705 (March 30, 2000), ANSI TIA-603-C-2004 and FCC CFR Part 2

#### **Environmental Conditions:**

Temperature (°C):	21
Relative Humidity (%):	32

#### Results: 11 Mbps

Channel	EIRP (dBm)	Limit Margin (dBm) (dB)		Result
Bottom	9.9 30.0		20.1	Complied
Middle	8.6	30.0 21.4		Complied
Тор	10.4	30.0	19.6	Complied

#### Results: 54 Mbps

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	9.8	30.0	20.2	Complied
Middle	Middle 8.2		21.8	Complied
Тор	9.3	30.0	20.7	Complied

#### Note(s):

1. These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.

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#### 5.2.8. Transmitter Radiated Emissions

#### **Test Summary:**

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000)
Frequency Range	30 MHz to 1 GHz

#### **Environmental Conditions:**

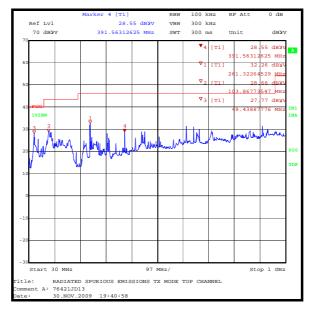
Temperature (°C):	23
Relative Humidity (%):	32

#### **Results: Top Channel**

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
49.438	Horizontal	15.2	40.0	24.8	Complied
103.867	Vertical	16.3	43.5	27.2	Complied
261.322	Vertical	19.2	46.5	27.3	Complied
391.563	Vertical	21.5	54.0	32.5	Complied

#### Note(s):

- 1. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
- 2. All other emissions from the EUT were, at least, 20 dB below the appropriate limit.



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

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#### 5.2.9. Transmitter Radiated Emissions

#### **Test Summary:**

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000)
Frequency Range	1 GHz to 26.5 GHz

#### **Environmental Conditions:**

Temperature (°C):	20
Relative Humidity (%):	27

#### **Results: Highest Peak Level. Bottom Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.065	Horizontal	45.6	-8.5	37.1	74.0	36.9	Complied
4.824	Horizontal	43.2	-1.2	42.0	74.0	32.0	Complied

#### **Results: Highest Average Level. Bottom Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.060	Horizontal	38.6	-8.5	30.1	54.0	23.9	Complied
4.824	Horizontal	39.9	-1.2	38.7	54.0	15.3	Complied

#### **Results: Highest Peak Level. Middle Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.065	Horizontal	45.6	-8.5	37.1	74.0	36.9	1.065
4.874	Horizontal	44.3	-1.2	43.1	74.0	30.9	Complied

#### **Results: Highest Average Level. Middle Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.060	Horizontal	38.6	-8.5	30.1	54.0	23.9	Complied
4.874	Horizontal	41.6	-1.2	40.4	54.0	13.6	Complied

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#### **Transmitter Radiated Emissions (continued)**

#### Results: Highest Peak Level. Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.065	Horizontal	45.6	-8.5	37.1	74.0	36.9	1.065
4.922	Horizontal	45.4	-1.2	44.2	74.0	30.0	Complied

#### **Results: Highest Average Level. Top Channel**

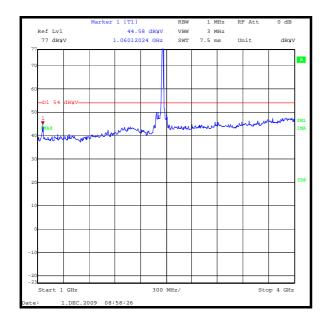
Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.060	Horizontal	38.6	-8.5	30.1	54.0	23.9	Complied
4.922	Horizontal	41.4	-1.2	40.2	54.0	13.8	Complied

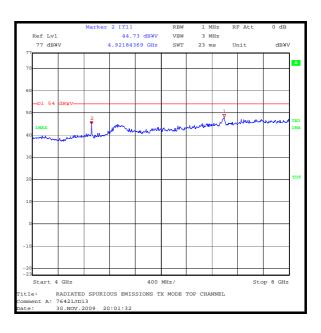
#### Note(s):

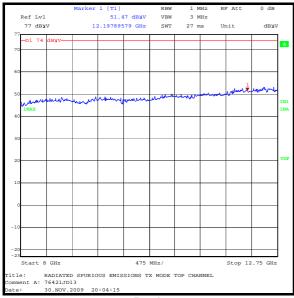
- 1. The transmitter fundamental is shown on the 1 GHz to 4 GHz plot at approximately 2461 MHz.
- 2. All other emissions from the EUT were, at least, 20 dB below the appropriate limit.
- 3. Final measurements were performed using appropriate RF filters and attenuators where required.
- 4. All pre-scans were performed with a peak detector against average limits apart from measurements made in the range of 8 GHz to 18 GHz where pre-scans were performed with peak and average detectors and the applicable limit applied. This was due to the noise floor exceeding the average limit when using a peak detector.

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# **Transmitter Radiated Emissions (continued)**





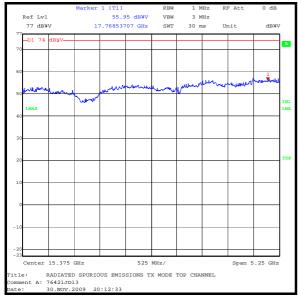




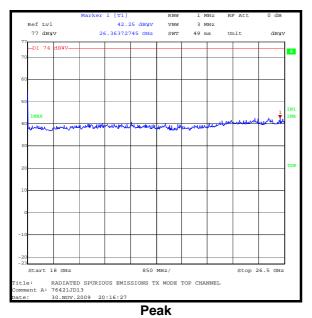
Peak Average

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# **Transmitter Radiated Emissions (continued)**







Marker 1 [T1] RBW 1 MHZ RF Att 0 dB
Ref Lv1 44.99 dBVV VBW 3 MHZ
77 dBVV 17.54759519 GHZ SWT 30 ms Unit dBVV

78 dBVV 17.54759519 GHZ SWT 30 ms Unit dBVV

10 D1 54 dBVV 17.54759519 GHZ SWT 30 ms Unit dBVV

10 D1 54 dBVV 17.54759519 GHZ SWT 30 ms Unit dBVV

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10 D1 54 dBVV 17.5475919 GHZ SWT 30 ms Unit dBVV

10 D1 54 dBVV 17.5475919 GHZ SWT 30 ms Unit dBVV

10 D1

12.75 GHz to 18 GHz Average

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

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#### 5.2.10. Transmitter Band Edge Radiated Emissions

#### **Test Summary:**

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000)

# **Environmental Conditions:**

Temperature (°C):	20
Relative Humidity (%):	27

#### **Results: Peak Power Level: 11 Mbps**

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	56.4	-0.2	56.2	77.0*	20.8	Complied
2.4835	Horizontal	62.6	-0.3	62.4	74.0	11.6	Complied

<sup>\* -20</sup> dBc limit.

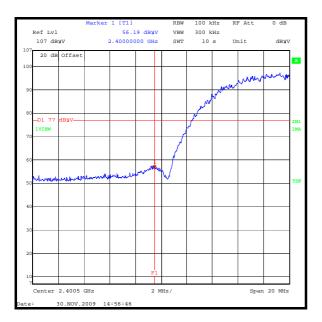
#### Results: Average Power Level: 11 Mbps

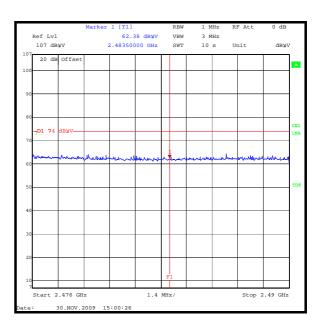
Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	49.8	-0.3	49.5	54.0	5.5	Complied

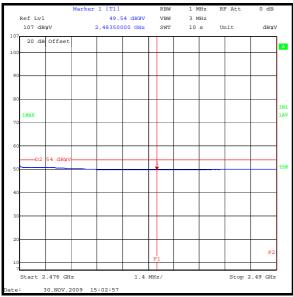
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# **Transmitter Band Edge Radiated Emissions (continued)**

#### **11 Mbps**







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

**Results: Peak Power Level: 54 Mbps** 

Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	66.1	-0.2	65.9	75.0	9.1	Complied
2.4835	Vertical	68.4	-0.3	68.1	74.0	5.9	Complied

<sup>\* -20</sup> dBc limit.

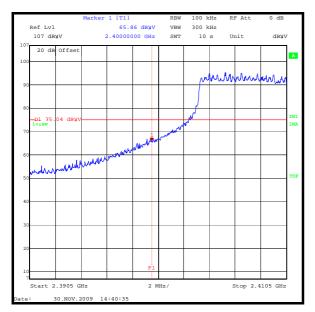
#### Results: Average Power Level: 54 Mbps

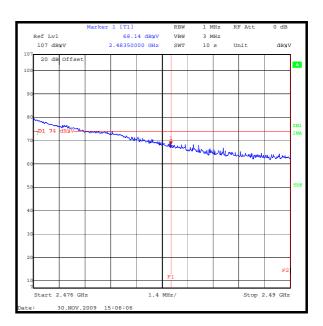
Frequency (GHz)	Antenna Polarity	Detector Level (dB <sub>µ</sub> V)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	51.5	-0.3	51.2	54.0	3.8	Complied

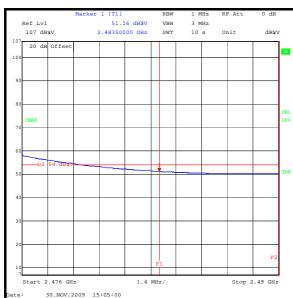
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# **Transmitter Band Edge Radiated Emissions (continued)**

#### 54 Mbps







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# 6. 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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.72 dB
Transmitter Maximum Peak Output Power	Not Applicable	95%	±2.94 dB
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
6 dB / 20 dB Bandwidth	Not Applicable	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	±2.94 dB

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

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# **Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1393	Attenuator	Huber + Suhner	757456	6820.17.B	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A436	Antenna	Flann	20240-20	330	24 Apr 2009	36
A1818	Antenna	EMCO	3115	00075692	27 Nov 2009	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Jan 2009	12
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	19 Mar 2009	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2009	12
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	22 Apr 2009	12

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

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