

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: SoftBank 001P

FCC ID: UCE210035A

To: FCC Part 15.247: 2010 Subpart C

**Test Report Serial No:**  
RFI-RPT-RP79566JD09A

**This Test Report Is Issued Under The Authority  
Of Chris Guy, Head of Global Approvals:**



<b>Checked By:</b>	A. Henriques
<b>Signature:</b>	
<b>Date of Issue:</b>	25 November 2010

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## **1. Customer Information**

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

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.247
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.247
<b>Specification Reference:</b>	47CFR15.107 and 47CFR15.109
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
<b>Specification Reference:</b>	47CFR15.207 and 47CFR15.209
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	13 November 2010 to 22 November 2010

### 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107(a)	Receiver/Idle Mode AC Conducted Emissions	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 15.207	Transmitter AC Conducted Emissions	✓
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	✓
Part 15.247(e)	Transmitter Power Spectral Density	✓
Part 15.247(b)(3)	Transmitter Maximum Peak Output Power	✓
Part 15.247(b)(3)	Transmitter Average Output Power	Note 1
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	✓
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	✓
<b>Key to Results</b>		
✓ = Complied	✗ = Did not comply	

Note 1: The measurement was performed to support SAR tests.

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	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
<b>Reference:</b>	ANSI C63.10 (2009)
<b>Title:</b>	American National Standard for Testing Unlicensed Wireless Devices

### **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.

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

#### **3.1. Identification of Equipment Under Test (EUT)**

<b>Brand Name:</b>	SoftBank
<b>Model Name or Number:</b>	001P
<b>IMEI:</b>	004401221005610 ( <i>Radiated sample</i> )
<b>Hardware Version Number:</b>	Rev C
<b>Software Version Number:</b>	001PVA13
<b>FCC ID:</b>	UCE210035A

<b>Brand Name:</b>	SoftBank
<b>Model Name or Number:</b>	001P
<b>IMEI:</b>	004401221005552 ( <i>Conducted RF port sample</i> )
<b>Hardware Version Number:</b>	Rev C
<b>Software Version Number:</b>	001PVA13
<b>FCC ID:</b>	UCE210035A

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	Battery
<b>Model Name or Number:</b>	PMBAS1

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	AC Charger
<b>Model Name or Number:</b>	ZTDA1

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	DC Charger
<b>Model Name or Number:</b>	PMJAA1

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	USB Data cable
<b>Model Name or Number:</b>	ZTAE01

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	Personal Hands-free
<b>Model Name or Number:</b>	ZTCK01

<b>Brand Name:</b>	SoftBank
<b>Description:</b>	Personal Hands-free Converter
<b>Model Name or Number:</b>	PMLAJ1

### **3.2. Description of EUT**

The equipment under test was a dual mode 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**

<b>Technology Tested:</b>	WLAN				
<b>Type of Unit:</b>	Transceiver				
<b>Modulation Type:</b>	BPSK and 64QAM				
<b>Data Rate:</b>	802.11b (DSSS): 1, 2, 5.5, 11 Mbps 802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps				
<b>Power Supply Requirement(s):</b>	Nominal	3.7 V			
<b>Maximum Peak Power Output (EIRP)</b>	21.3 dBm				
<b>Transmit Frequency Range:</b>	2412 MHz to 2462 MHz				
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>		
	Bottom	1	2412		
	Middle	6	2437		
	Top	11	2462		
<b>Receive Frequency Range:</b>	2412 MHz to 2462 MHz				
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>		
	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:

<b>Brand Name:</b>	Sony
<b>Description:</b>	Laptop PC
<b>Model Name or Number:</b>	Vaio PCG-551N

<b>Brand Name:</b>	Not marked or stated
<b>Description:</b>	Micro SD Memory Card
<b>Model Name or Number:</b>	128 MB

<b>Brand Name:</b>	Buffalo
<b>Description:</b>	USB Hub
<b>Model Name or Number:</b>	BSH3U01

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

The EUT was tested in the following operating mode(s):

- Receiver/Idle mode.
- Continuously transmitting at maximum power on the bottom, centre and top channels, using 802.11b and 802.11g data rates at the bandwidths required for testing.

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- Controlled using a bespoke application on the laptop PC supplied by the client. The application was used to enable continuous transmission and idle mode (enabled but not transmitting) and to select the test channels, data rates and modulation schemes as required.
- The sample with IMEI 004401221005610 was used for AC conducted emissions, output power and radiated spurious emissions tests. The sample with IMEI 004401221005552 was used for all other measurements.
- The SDRAM card was present in the EUT during all testing.
- Transmitter spurious emissions were performed with the EUT transmitting in 802.11b 11 Mbps mode, as this was found to have the highest power level and therefore deemed to be worst case.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the AC charger connected to the EUT and with the TV antenna extended as this was found to be the worst case during pre-scans. All accessories were individually connected with the TV antenna extended and retracted during pre-scan measurements to determine the worst case combination.

## **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.

## **5.2. Test Results**

### **5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions**

#### **Test Summary:**

Test Engineer:	Ian Watch	Test Date:	13 November 2010
Test Sample IMEI:	004401221005610		

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

#### **Environmental Conditions:**

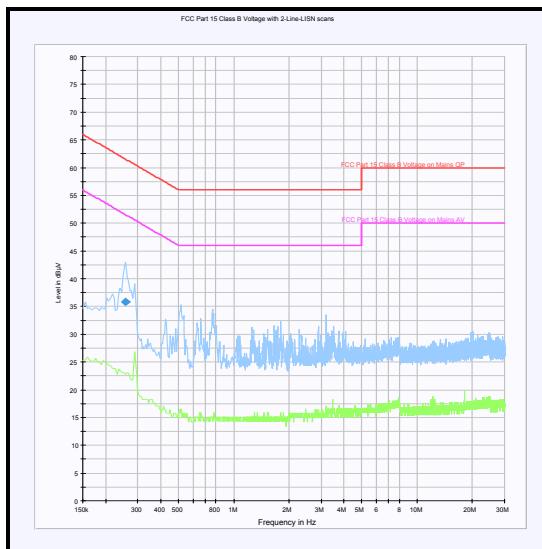
Temperature (°C):	25
Relative Humidity (%):	25

#### **Results: Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.258000	Neutral	35.8	61.5	25.7	Complied

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

1. All other emissions were >30 dB below the applicable limits.
2. All average emissions were >20 dB below the applicable limits



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

**5.2.2. Receiver/Idle Mode Radiated Spurious Emissions****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	14 November 2010
Test Sample IMEI:	004401221005610		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

**Environmental Conditions:**

Temperature (°C):	27
Relative Humidity (%):	24

**Results: Quasi Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
50.369	Vertical	26.1	40.0	13.9	Complied
107.592	Vertical	24.5	43.5	19.0	Complied
458.795	Vertical	28.1	46.0	17.9	Complied

**Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.

### Receiver/Idle Mode Radiated Spurious Emissions (continued)



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

**Receiver/Idle Mode Radiated Spurious Emissions (continued)****Test Summary:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	14 November 2010
<b>Test Sample IMEI:</b>	004401221005610		

<b>FCC Part:</b>	15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
<b>Frequency Range:</b>	1 GHz to 12.5 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	25

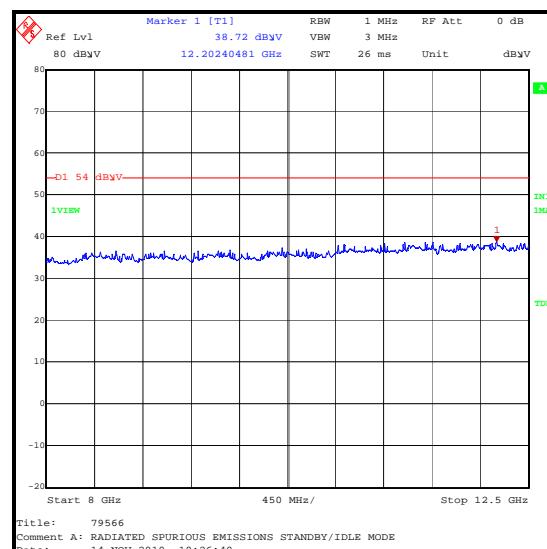
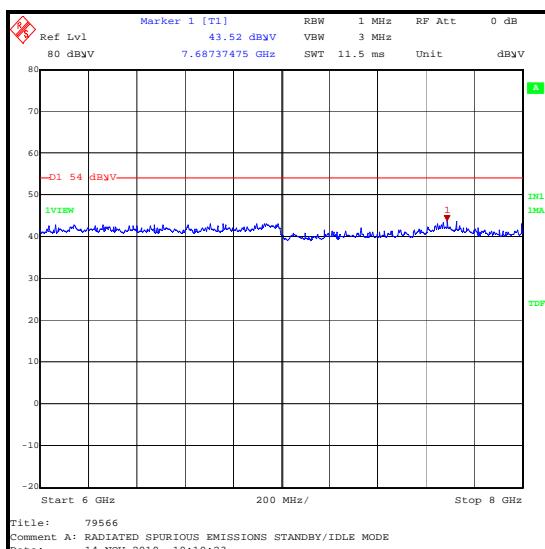
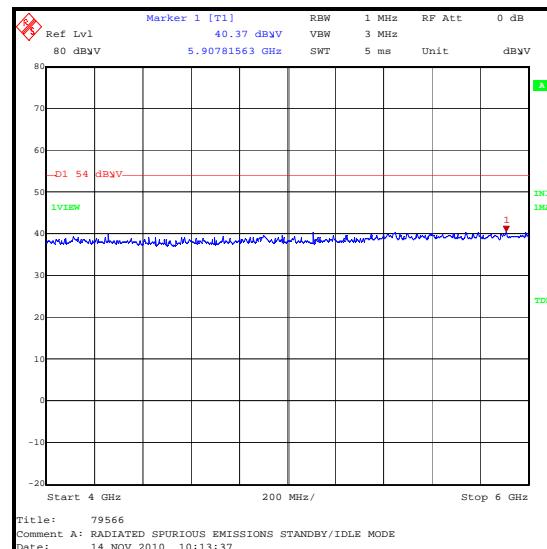
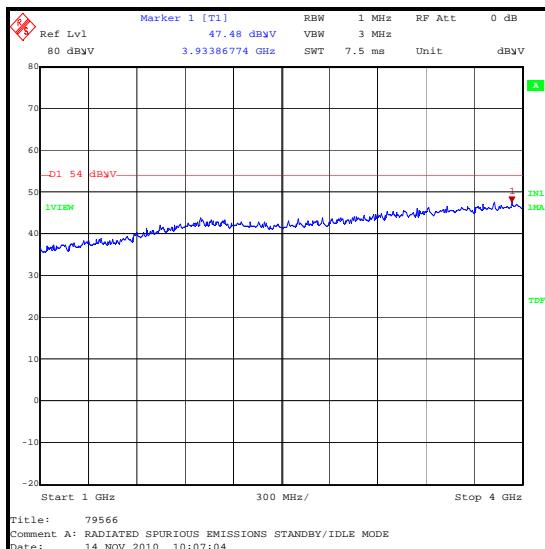
**Results:**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
3933.868	Vertical	47.5	54.0	6.5	Complied

**Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. 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.

## Receiver/Idle Mode Radiated Spurious Emissions (continued)



**5.2.3. Transmitter AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	13 November 2010
Test Sample IMEI:	004401221005610		

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

**Environmental Conditions:**

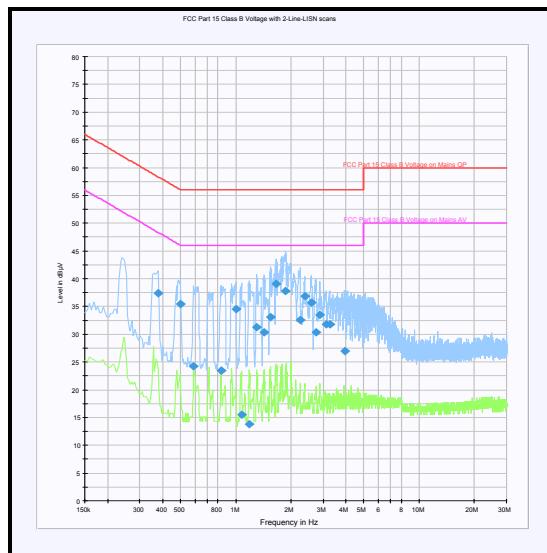
Temperature (°C):	25
Relative Humidity (%):	25

**Results: Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.375000	Live	37.3	58.4	21.1	Complied
0.496500	Live	35.4	56.1	20.7	Complied
1.000500	Live	34.6	56.0	21.4	Complied
1.306500	Neutral	31.3	56.0	24.7	Complied
1.428000	Neutral	30.4	56.0	25.6	Complied
1.540500	Neutral	33.1	56.0	22.9	Complied
1.662000	Neutral	39.1	56.0	16.9	Complied
1.873500	Neutral	37.7	56.0	18.3	Complied
2.251500	Neutral	32.6	56.0	23.4	Complied
2.373000	Neutral	36.9	56.0	19.1	Complied
2.575500	Neutral	35.6	56.0	20.4	Complied
2.751000	Neutral	30.4	56.0	25.6	Complied
2.877000	Neutral	33.4	56.0	22.6	Complied
3.124500	Neutral	31.8	56.0	24.2	Complied
3.255000	Neutral	31.8	56.0	24.2	Complied
3.916500	Neutral	26.9	56.0	29.1	Complied

**Note(s):**

1. All average emissions were >20 dB below the applicable limits and therefore not recorded.

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

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

**5.2.4. Transmitter 6 dB Bandwidth****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	19 November 2010
Test Sample IMEI:	004401221005552		

FCC Part:	15.247(a)(2)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

**Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	33

**Results: 802.11b - 5.5Mbps**

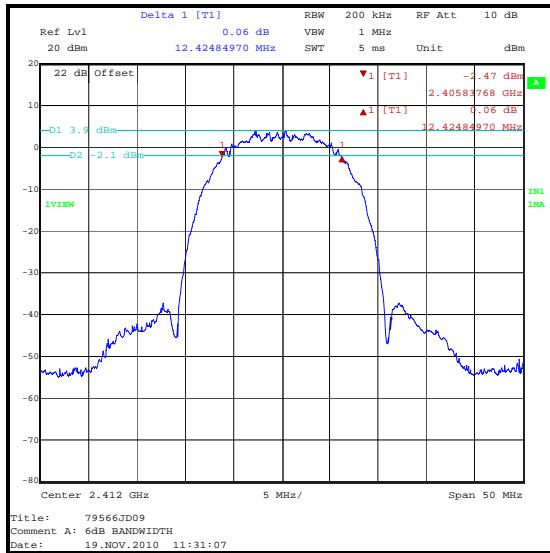
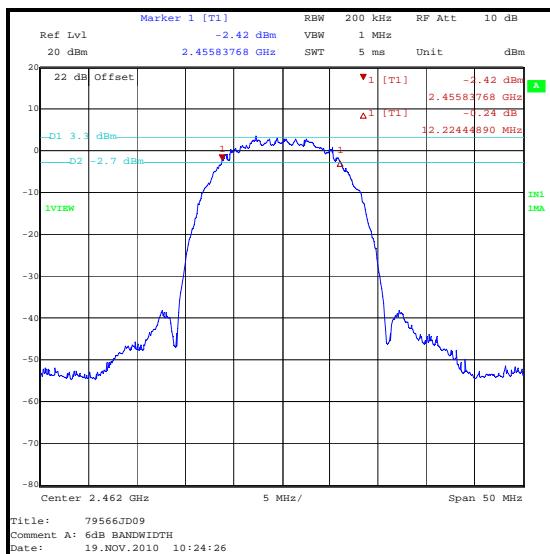
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.425	≥0.5	11.925	Complied
Middle	12.275	≥0.5	11.775	Complied
Top	12.224	≥0.5	11.724	Complied

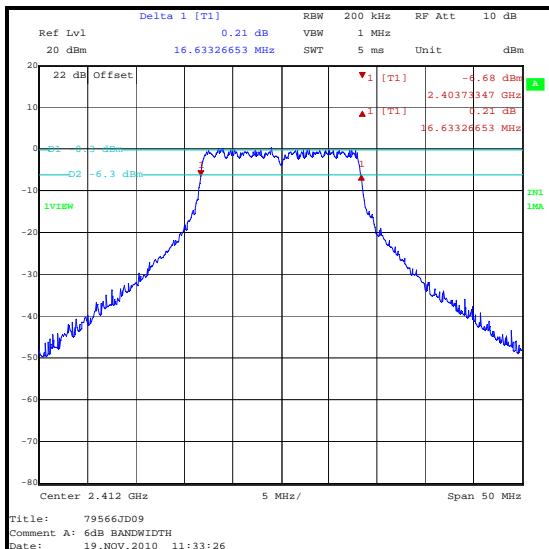
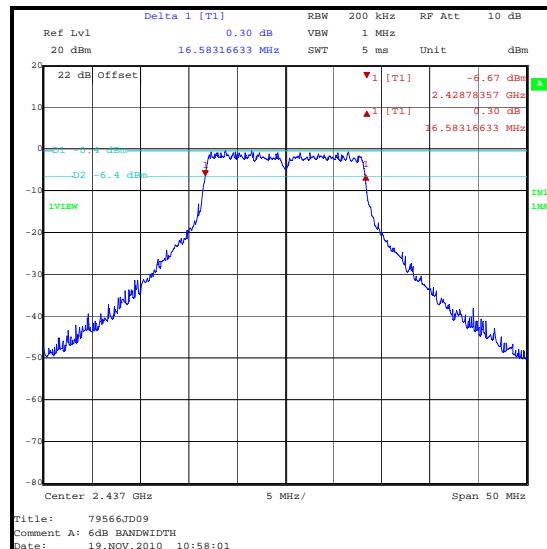
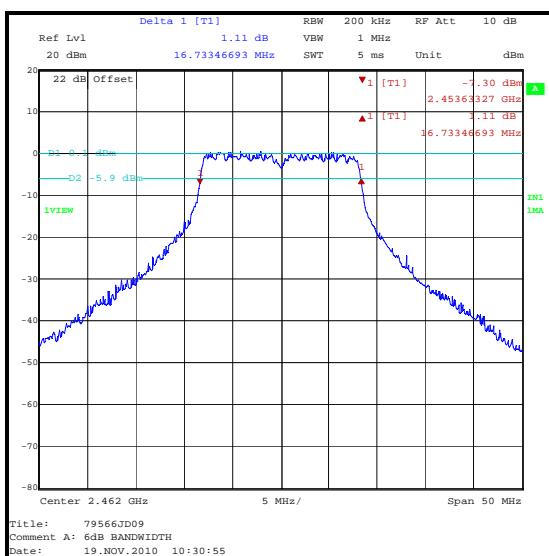
**Results: 802.11g - 6 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.583	≥0.5	16.083	Complied
Top	16.733	≥0.5	16.233	Complied

**Note(s):**

1. Testing was performed on the data rates in each mode that exhibited the narrowest 6 dB bandwidths and therefore, closest to the limit. It should be noted that the 6 dB bandwidths for all data rates in each specific mode, i.e. 802.11b or 802.11g were very similar.

**Transmitter 6 dB Bandwidth (continued)****Results: 802.11b – 5.5 Mbps****Bottom channel****Middle channel****Top channel**

**Transmitter 6 dB Bandwidth (continued)****Results: 802.11g - 6 Mbps****Bottom channel****Middle channel****Top channel**

**5.2.5. Transmitter Power Spectral Density****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	22 November 2010
Test Sample IMEI:	004401221005552		

FCC Part:	15.247(e)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.2

**Environmental Conditions:**

Temperature (°C):	20
Relative Humidity (%):	36

**Results: 802.11b - 11Mbps**

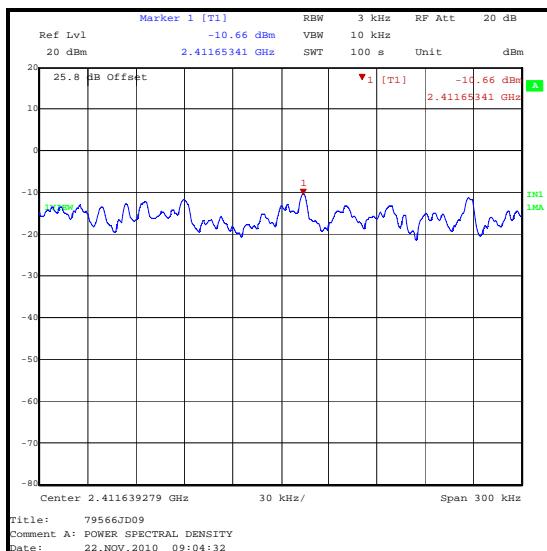
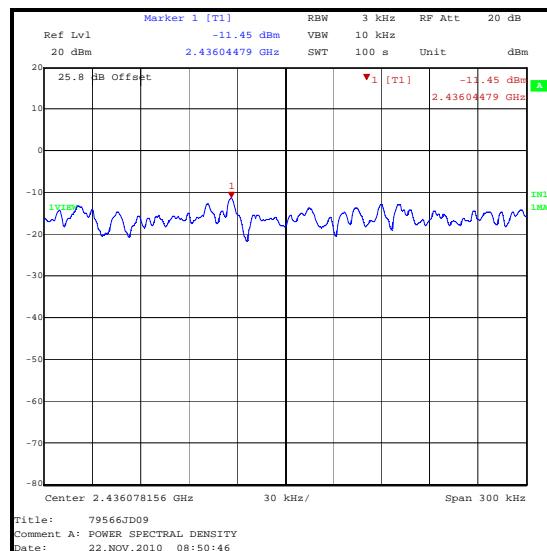
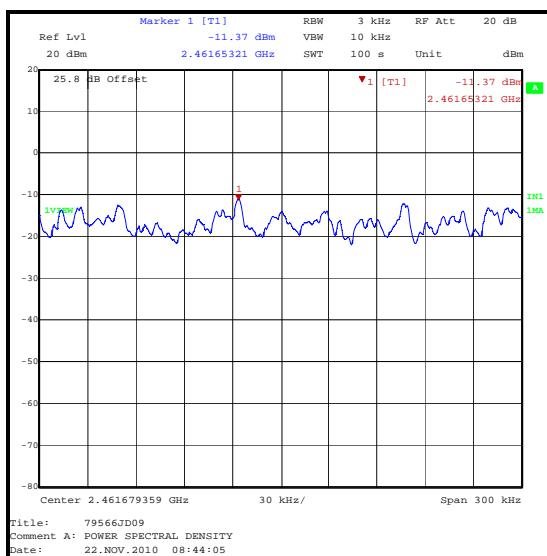
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-10.7	8.0	18.7	Complied
Middle	-11.5	8.0	19.5	Complied
Top	-11.4	8.0	19.4	Complied

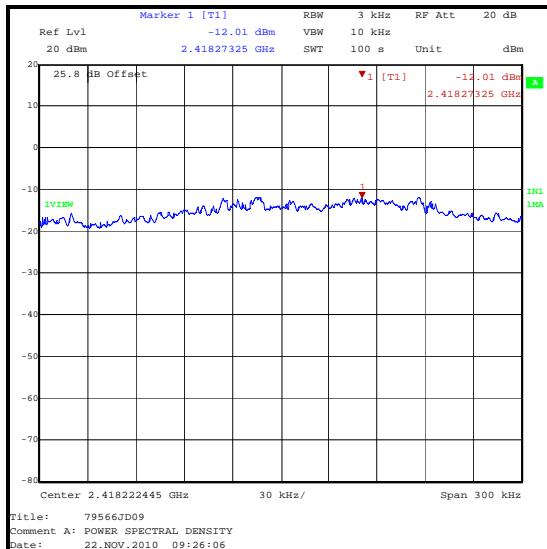
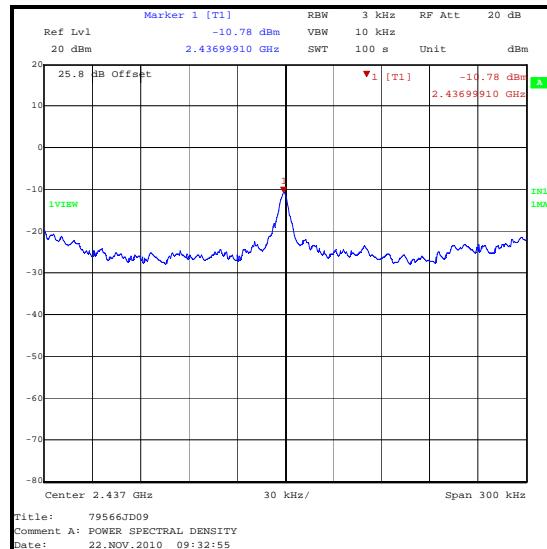
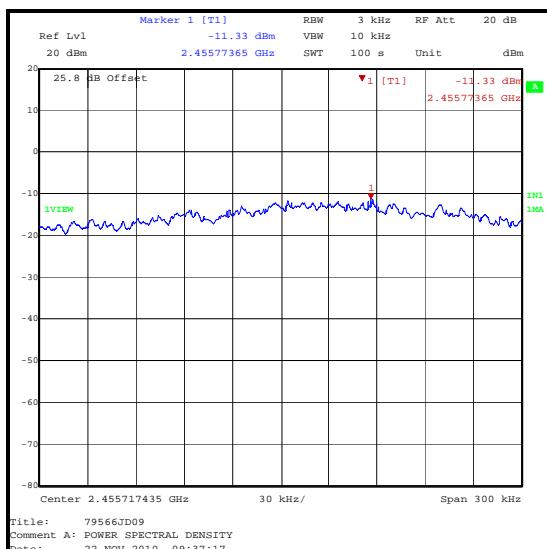
**Results: 802.11g - 24Mbps**

Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-12.0	8.0	20.0	Complied
Middle	-10.8	8.0	18.8	Complied
Top	-11.3	8.0	19.3	Complied

**Note(s):**

1. This test was performed as a conducted measurement on a EUT modified by the client to incorporate an antenna port. A 25.8 dB offset was used on the spectrum analyser to compensate for the 20 dB attenuator and cable losses between the EUT and spectrum analyser. The RF level offset also includes correction for EIRP measurement as the EUT does not normally have an external RF port.
2. The worst case modes for 802.11b and 802.11g were tested. These modes produced the highest EIRP.

**Transmitter Power Spectral Density (continued)****Results: 802.11b - 11Mbps****Bottom channel****Middle channel****Top channel**

**Transmitter Power Spectral Density (continued)****Results: 802.11g – 24 Mbps****Bottom channel****Middle channel****Top channel**

**5.2.6. Transmitter Maximum Peak Output Power****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	21 November 2010
Test Sample IMEI:	004401221005610		

FCC Part:	15.247(b)(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.2 and Sections 6.3 and 6.6 referencing ANSI C63.4 (see note below)

**Environmental Conditions:**

Temperature (°C):	22
Relative Humidity (%):	24

**Results: 802.11b - 11Mbps**

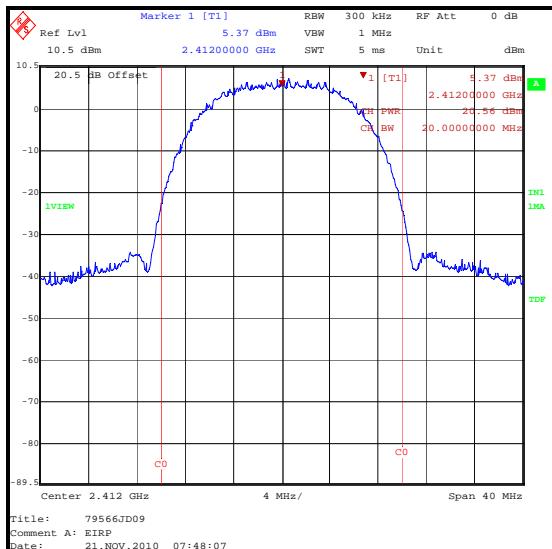
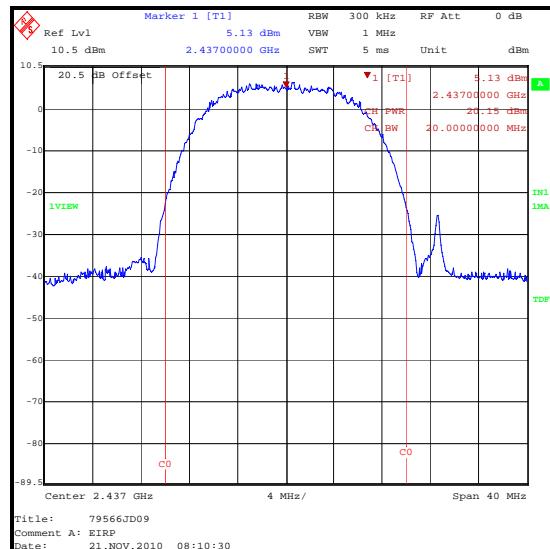
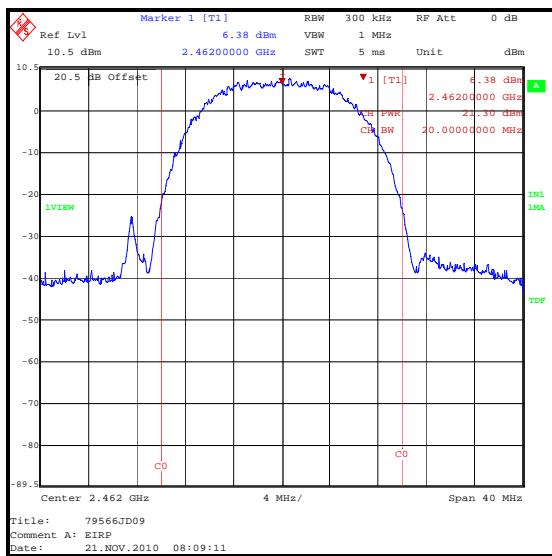
Channel	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	20.6	36.0	15.4	Complied
Middle	20.2	36.0	15.8	Complied
Top	21.3	36.0	14.7	Complied

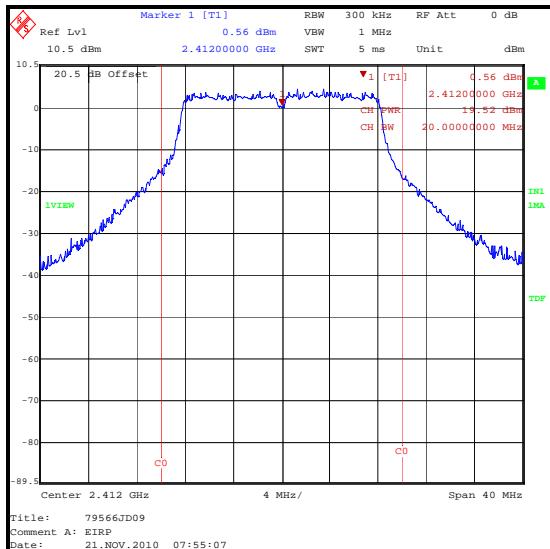
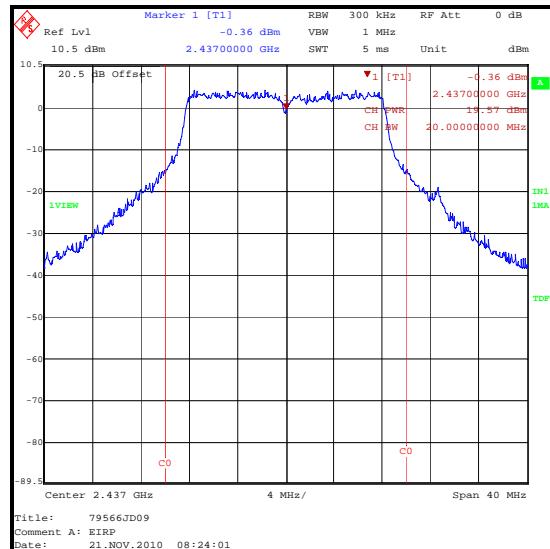
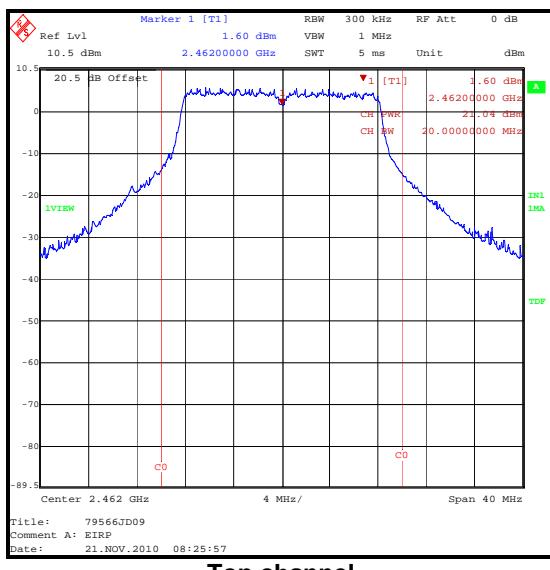
**Results: 802.11g - 24Mbps**

Channel	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	19.5	36.0	16.5	Complied
Middle	19.6	36.0	16.4	Complied
Top	21.0	36.0	15.0	Complied

**Note(s):**

1. Tests were performed using a combination of the conducted test method described in ANSI C63.10 Section 6.10.2 and the test methods for radiated emissions measurements described in Sections 6.3 and 6.6. The reason for this being that the measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.
2. Power was measured in all modes and all data rates using the channel power function of a spectrum analyser. The highest power in 802.11b and 802.11g modes were recorded.

**Transmitter Maximum Peak Output Power (continued)****Results: 802.11b - 11Mbps****Bottom channel****Middle channel****Top channel**

**Transmitter Maximum Peak Output Power (continued)****Results: 802.11g - 24Mbps****Bottom channel****Middle channel****Top channel**

**5.2.7. Transmitter Average Output Power (EIRP)****Test Summary:**

Test Engineer:	Naseer Mirza	Test Date:	16 November 2010
Test Sample IMEI:	004401221005552		

FCC Part:	15.247(b)(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.2 and Sections 6.3 and 6.6 referencing ANSI C63.4 (see note below)

**Environmental Conditions:**

Temperature (°C):	25
Relative Humidity (%):	25

**Results:**

Channel Number	Frequency (GHz)	Average TX Power (dBm)	Note
1	2.412	13.5	2.4GHz 802.11b (1Mbps)
6	2.437	12.8	
11	2.462	13.1	
1	2.412	13.3	2.4GHz 802.11b (11Mbps)
6	2.437	12.4	
11	2.462	12.7	
1	2.412	13.3	2.4GHz 802.11g (6Mbps)
6	2.437	12.7	
11	2.462	13.2	
1	2.412	13.0	2.4GHz 802.11g (54Mbps)
6	2.437	12.5	
11	2.462	12.9	

**Note(s):**

- Conducted power measurements were performed to support SAR tests.

### **5.2.8. Transmitter Radiated Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	21 November 2010
<b>Test Sample IMEI:</b>	004401221005610		

<b>FCC Part:</b>	15.247(d) & 15.209(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range</b>	30 MHz to 1000 MHz

#### **Environmental Conditions:**

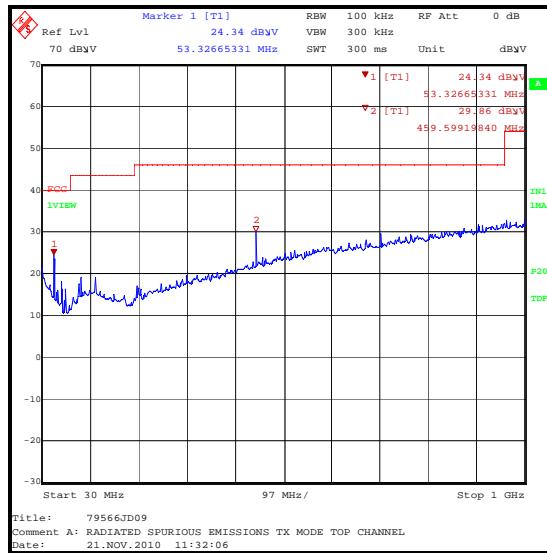
<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	24

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

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
53.771	Vertical	21.2	40.0	18.8	Complied
458.784	Vertical	29.6	46.0	16.4	Complied

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

1. Pre-scans were performed with the EUT transmitting at maximum power on the top channel in 802.11b 11 Mbps mode as this combination produced the highest EIRP.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. 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.
4. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
5. Tests were performed with the AC charger connected to the EUT as this was found to be the worst case during pre-scans. All accessories were individually connected and measurements made during pre-scans to determine the worst case combination.

**Transmitter Radiated Emissions (continued)**

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

**Transmitter Radiated Emissions (continued)****Test Summary:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	17 November 2010 / 21 November 2010
<b>Test Sample IMEI:</b>	004401221005610		

<b>FCC Part:</b>	15.247(d) & 15.209(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
<b>Frequency Range</b>	1 GHz to 25 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	22

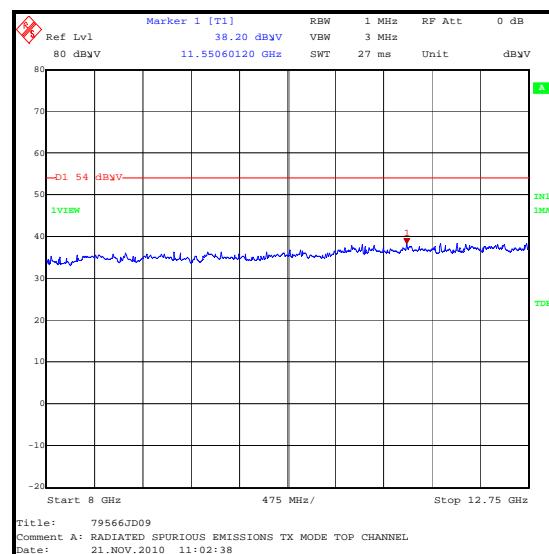
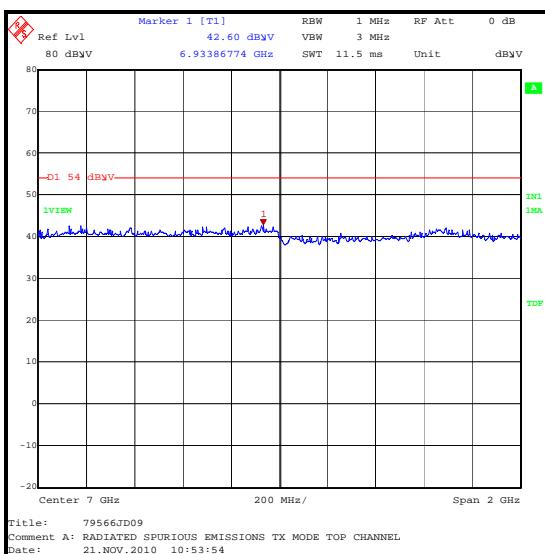
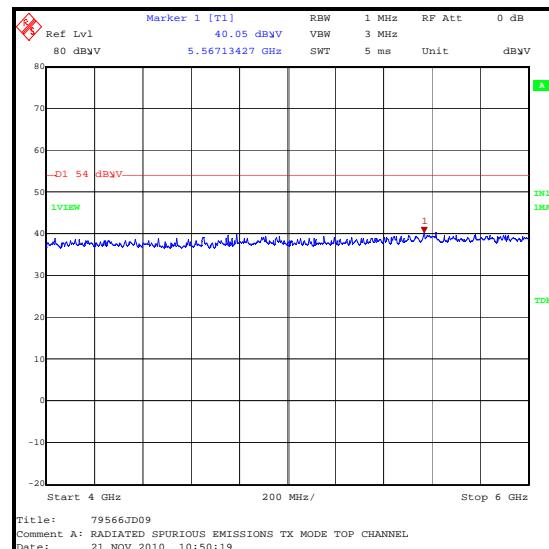
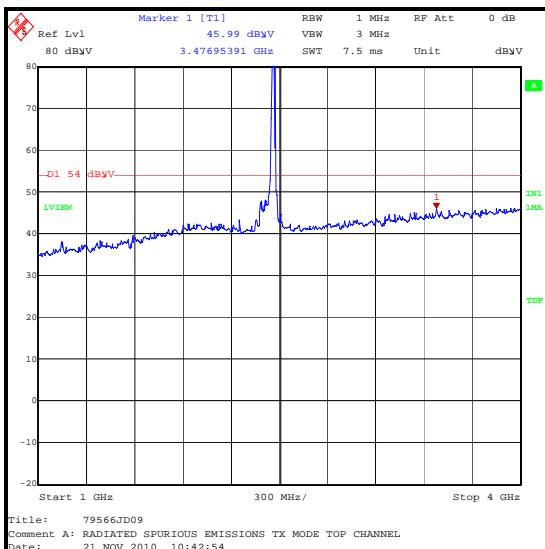
**Results:**

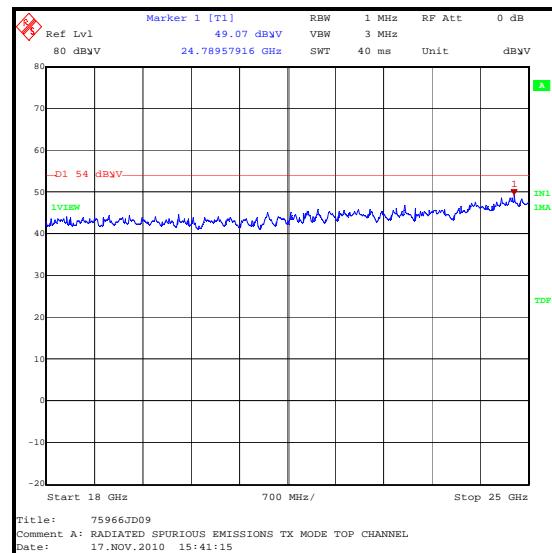
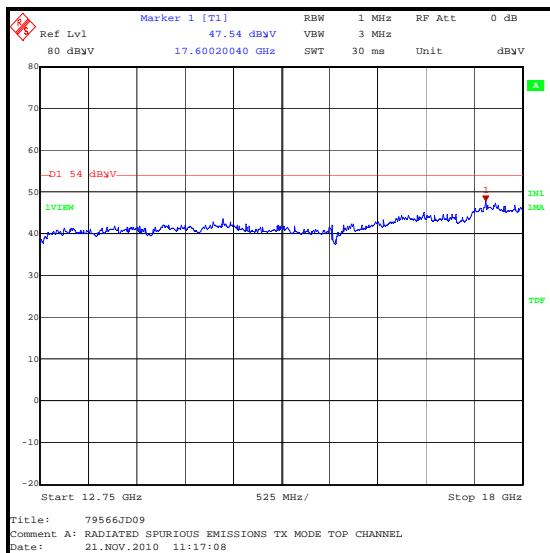
Frequency (GHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
25.789579	Vertical	49.1	54.0	4.9	Complied

**Note(s):**

1. Pre-scans were performed with the EUT transmitting at maximum power on the top channel in 802.11b 11 Mbps mode as this combination produced the highest EIRP.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. 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.
4. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental.

## Transmitter Radiated Emissions (continued)



**Transmitter Radiated Emissions (continued)**

**5.2.9. Transmitter Band Edge Radiated Emissions****Test Summary:**

Test Engineer:	Ian Watch	Test Date:	21 November 2010
Test Sample IMEI:	004401221005610		

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

**Environmental Conditions:**

Temperature (°C):	22
Relative Humidity (%):	24

**Results: 802.11b 1 Mbps - Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	57.6	80.0*	22.4	Complied
2483.5	61.1	74.0	12.9	Complied

**Results: 802.11b 1 Mbps - Average**

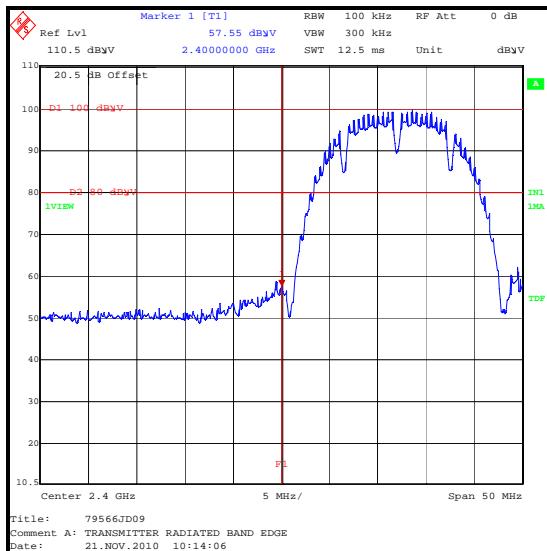
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	48.0	54.0	6.0	Complied

**Note(s):**

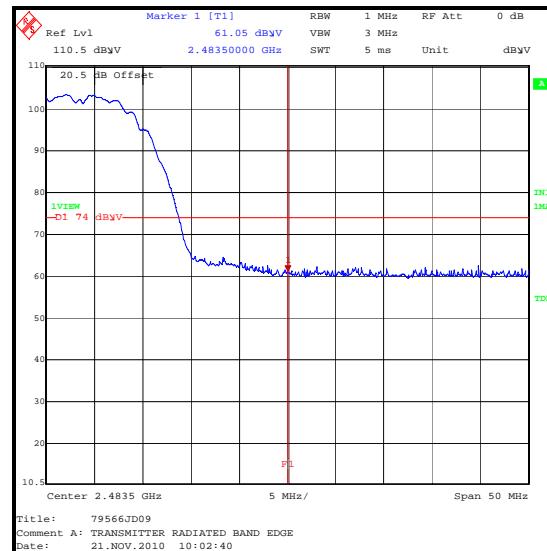
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. \* -20 dBc limit.
3. Tests were performed with the EUT transmitting in 802.11b and 802.11g modes at the highest and lowest data rates supported in both modes.

### Transmitter Band Edge Radiated Emissions (continued)

## Results: 802.11b 1 Mbps - Peak



## Lower Band Edge Peak Measurement



## Upper Band Edge Peak Measurement



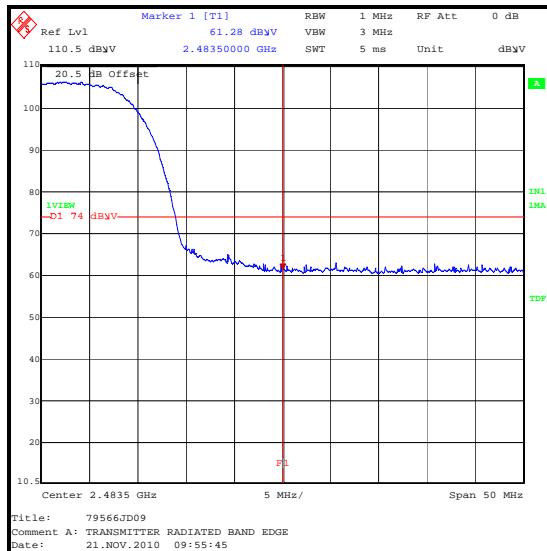
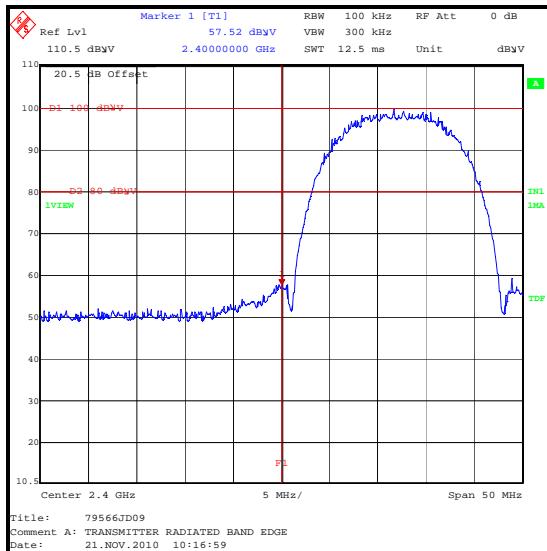
## Upper Band Edge Average Measurement

**Transmitter Band Edge Radiated Emissions (continued)****Results: 802.11b 11 Mbps - Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	57.5	80.0*	22.5	Complied
2483.5	61.3	74.0	12.7	Complied

**Results: 802.11b 11 Mbps - Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	48.0	54.0	6.0	Complied

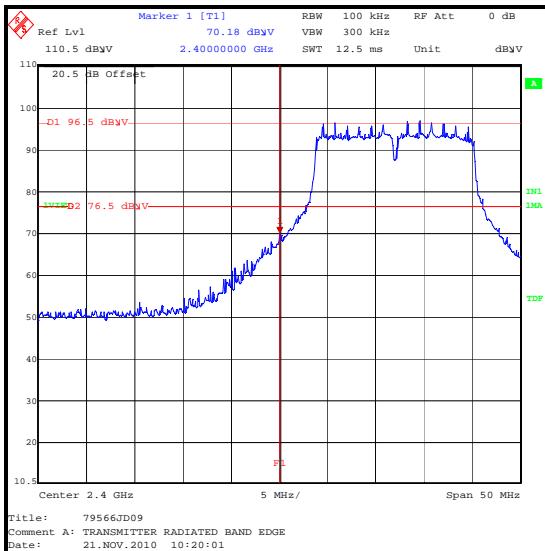
**Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (continued)****Results: 802.11g 6 Mbps - Peak**

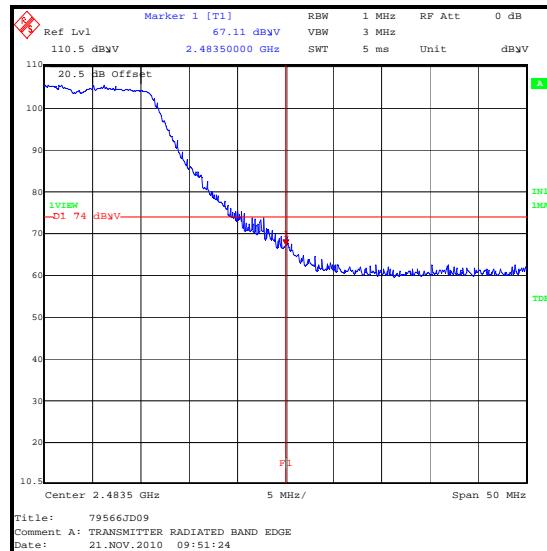
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	70.2	76.5*	6.3	Complied
2483.5	67.1	74.0	6.9	Complied

**Results: 802.11g 6 Mbps - Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	49.4	54.0	4.6	Complied



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



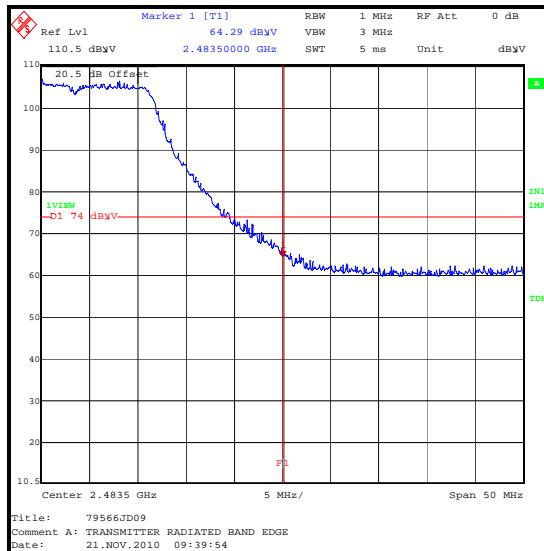
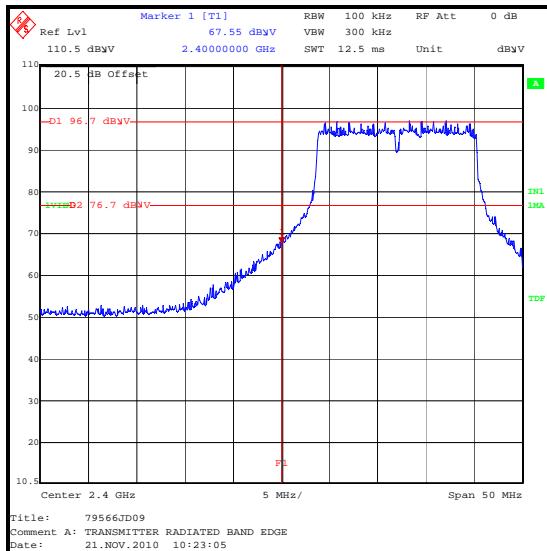
Upper Band Edge Average Measurement

**Transmitter Band Edge Radiated Emissions (continued)****Results: 802.11g 54 Mbps - Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	67.6	76.7*	9.1	Complied
2483.5	64.3	74.0	9.7	Complied

**Results: 802.11g 54 Mbps - Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	49.4	54.0	4.6	Complied

**Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

## **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%	±3.25 dB
Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 25 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.

## **Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months )
A1069	LISN	Rohde & Schwarz	ESH3-Z5	837469/012	13 Apr 2011	12
A1393	Attenuator	Huber + Suhner	757456	6820.17.B	06 Jul 2011	12
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	06 Jul 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 2011	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	01 Mar 2011	12
A244	Attenuator	Schaffner	6820-17-B	None	Calibrated before use	-
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann Microwave	18240-20	400	05 Sep 2011	12
A288	Antenna	Chase	CBL6111A	1589	05 Sep 2011	12
A436	Antenna	Flann	20240-20	330	05 Sep 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
M1123	Power Meter	Boonton	4531	138201	02 Dec 2010	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	26 Aug 2011	12

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