



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: SoftBank 931P

To: FCC Part 15.247: 2008 Subpart C

**Test Report Serial No:**  
RFI/RPT1/RP75018JD07A

<b>This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:</b>		
<b>Checked By:</b>	A. HENRIQUES	
<b>Signature:</b>		
<b>Date of Issue:</b>	11 May 2009	

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by RFI Global Services Ltd. is under license. Other trademarks and trade names are those of their respective owners.

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.

This report may not be reproduced other than in full, except with the prior written approval of RFI Global Services Ltd. 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](mailto:info@rfi-global.com) Website: [www.rfi-global.com](http://www.rfi-global.com)

Registered in England and Wales. Company number: 2117901

This page has been left intentionally blank.

**Table of Contents**

**1. Customer Information ..... 4**

**2. Summary of Testing ..... 5**

**3. Equipment Under Test (EUT) ..... 6**

**4. Operation and Monitoring of the EUT during Testing ..... 9**

**5. Measurements, Examinations and Derived Results ..... 10**

**6. Measurement Uncertainty ..... 42**

**Appendix 1. Test Equipment Used ..... 43**

**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) 2008: Part 15 Subpart C (Radio Frequency Devices) - Section 15.247
<b>Specification Reference:</b>	47CFR15.107 and 47CFR15.109
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart B (Radio Frequency Devices) - Sections 15.107 and 15.109
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	28 April 2009 to 01 May 2009

### 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Port Type	Result
Part 15.107(a)	Receiver/Idle Mode AC Conducted Emissions	AC Mains	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	Antenna	✓
Part 15.207	Transmitter AC Conducted Emissions	AC Mains	✓
Part 15.247(a)(1)	Transmitter 20 dB Bandwidth	Antenna	✓
Part 15.247(a)(1)	Transmitter Carrier Frequency Separation	Antenna	✓
Part 15.247(a)(1)(iii)	Transmitter Average Time of Occupancy	Antenna	✓
Part 15.247(b)(3)	Transmitter Maximum Peak Output Power	Antenna	✓
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	Antenna	✓
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	Antenna	✓
<b>Key to Results</b>  = Complied  = Did not comply			

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2003)
<b>Title:</b>	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.
<b>Reference:</b>	DA00-705 (2000)
<b>Title:</b>	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.

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

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

<b>Brand Name:</b>	SoftBank 931P
<b>Model Name or Number:</b>	EB-VS94JZA
<b>Hardware Version:</b>	Rev B
<b>Software Version:</b>	931PVA15
<b>IMEI Number(s):</b>	004401220733253
<b>FCC ID Number:</b>	UCE209017A

<b>Description:</b>	AC charger
<b>Brand Name:</b>	SoftBank
<b>Model Name or Number:</b>	ZTDAA1

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

<b>Description:</b>	USB data cable
<b>Brand Name:</b>	SoftBank
<b>Model Name or Number:</b>	ZTFE01

<b>Description:</b>	Micro-SD Memory Card
<b>Brand Name:</b>	None stated
<b>Model Name or Number:</b>	None stated

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

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

<b>Description:</b>	Battery 3.7V 800 mAh
<b>Brand Name:</b>	SoftBank
<b>Model Name or Number:</b>	PMBAP1

### 3.2. Description of EUT

The equipment under test was a dual mode (W-CDMA FDDI/GSM900/1800/1900MHz) Cellular Mobile Telephone with Bluetooth and RFID.

### 3.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

### 3.4. Additional Information Related to Testing

Tested Technology:	Bluetooth		
Power Supply Requirement:	Nominal	3.7 V	
Type of Unit:	Transceiver		
Channel Spacing:	1 MHz		
Mode:	Basic Rate	Enhanced Data Rate	
Modulation:	GFSK	$\pi/4$ -DQPSK	8DQPSK
Packet Type: (Maximum Payload)	DH5	2DH5	3DH5
Data Rate (Mbit/s):	1	2	3
Maximum Transmit EIRP:	-2.7 dBm		
Transmit Frequency Range:	2402 MHz to 2480 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480
Receive Frequency Range:	2402 MHz to 2480 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480

### **3.5. Support Equipment**

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

<b>Description:</b>	Dummy battery
<b>Model Name or Number:</b>	Not stated
<b>Serial Number:</b>	Not stated

<b>Description:</b>	Laptop PC
<b>Model Name or Number:</b>	Sony VAIO PCG-551N
<b>Serial Number:</b>	283506 2 1208763



## **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:

- Receive/Idle Mode
- Transmit Mode with Basic Rate (DH5 packets) or EDR (2DH5 or 3DH5 packets) as required.

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

The EUT was tested in the following configuration:

- For Transmit tests: Standalone, connected via a radio link to a Bluetooth tester in order to place the EUT into Bluetooth test mode. The laptop PC with the Client's bespoke application was used to place the EUT into Bluetooth test mode.
- For Receive/Idle mode tests: Standalone, with the Bluetooth mode active but not transmitting.
- Both EDR and Basic rate modes were tested in order to identify the mode that presented the worse case result with regards to amplitude and modulation bandwidth. All tests were performed on the mode that exhibited the highest output power and bandwidth except for output power, bandwidth, band edge and channel separation where all modes were tested.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the personal hands-free 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.

## **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****5.3. Receiver/Idle Mode AC Conducted Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.107(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 7 and relevant annexes

**Environmental Conditions:**

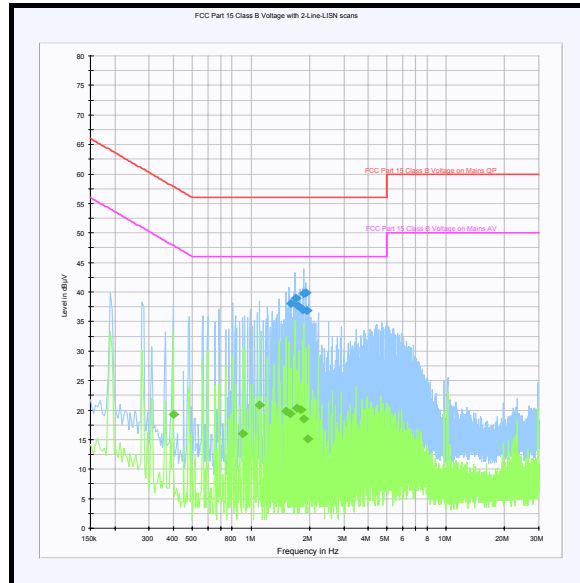
<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	43

**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.608000	Neutral	38.0	56.0	18.0	Complied
1.702500	Neutral	39.0	56.0	17.0	Complied
1.747500	Live	37.6	56.0	18.4	Complied
1.837500	Live	36.9	56.0	19.1	Complied
1.860000	Neutral	39.8	56.0	16.2	Complied
1.914000	Live	39.8	56.0	16.2	Complied
1.936500	Neutral	36.9	56.0	19.1	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.402000	Neutral	19.3	47.8	28.5	Complied
0.906000	Neutral	16.1	46.0	29.9	Complied
1.108500	Neutral	20.9	46.0	25.1	Complied
1.509000	Neutral	19.8	46.0	26.2	Complied
1.590000	Neutral	19.4	46.0	26.6	Complied
1.711500	Neutral	20.3	46.0	25.7	Complied
1.810500	Live	20.1	46.0	25.9	Complied
1.869000	Neutral	18.4	46.0	27.6	Complied
1.950000	Neutral	15.1	46.0	30.9	Complied

**Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**

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

## 5.4. Receiver/Idle Mode Radiated Spurious Emissions

### Test Summary:

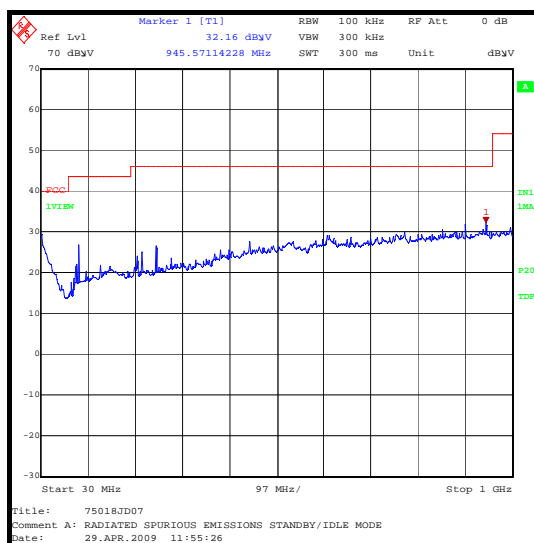
FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	30 MHz to 1000 MHz

### Environmental Conditions:

Temperature(°C):	25
Relative Humidity (%):	30

### Results:

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
229.513	Vertical	25.7	46.0	20.3	Complied
238.484	Horizontal	28.0	46.0	18.0	Complied
268.295	Vertical	28.5	46.0	17.5	Complied
458.795	Vertical	32.3	46.0	13.7	Complied



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

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	30

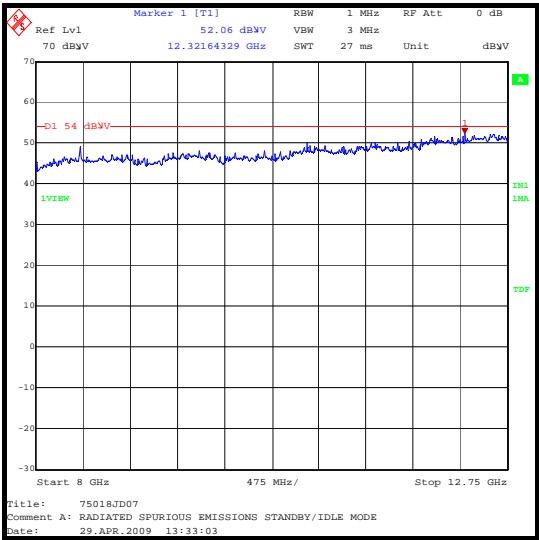
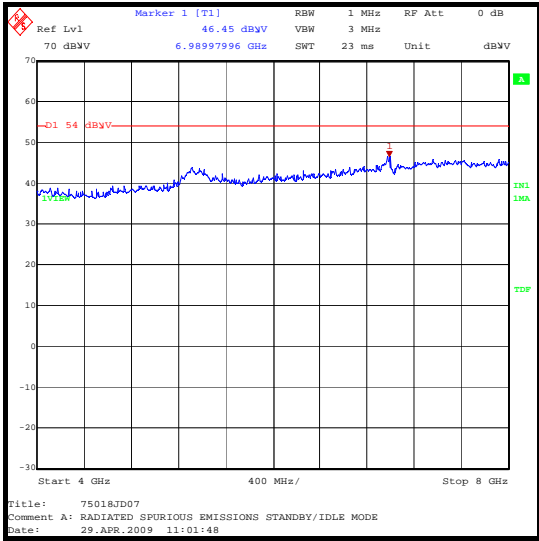
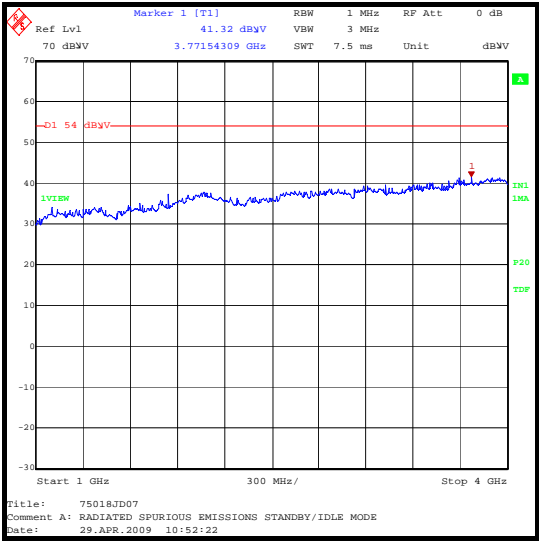
**Results: Electric Field Strength Measurements (Highest Peak Level)**

<b>Frequency (GHz)</b>	<b>Antenna Polarity</b>	<b>Detector Level (dB<math>\mu</math>V)</b>	<b>Transducer Factor (dB)</b>	<b>Peak Level (dB<math>\mu</math>V/m)</b>	<b>Average Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
12322.521	Vertical	40.3	11.8	52.1	54.0	1.9	Complied

**Note(s):**

1. 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)



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

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

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	20
<b>Relative Humidity (%):</b>	30

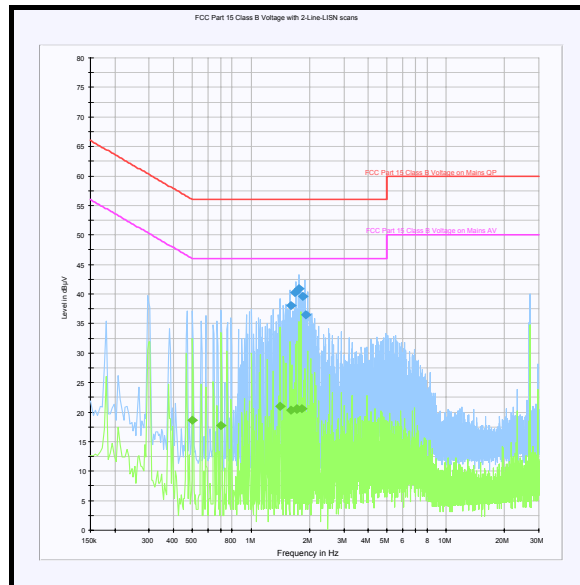
**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.612500	Neutral	38.1	56.0	17.9	Complied
1.684500	Neutral	40.2	56.0	15.8	Complied
1.770000	Neutral	40.9	56.0	15.1	Complied
1.846500	Neutral	39.6	56.0	16.4	Complied
1.900500	Neutral	36.4	56.0	19.6	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.501000	Neutral	18.6	46.0	27.4	Complied
0.703500	Neutral	17.7	46.0	28.3	Complied
1.410000	Neutral	21.0	46.0	25.0	Complied
1.608000	Neutral	20.3	46.0	25.7	Complied
1.711500	Neutral	20.6	46.0	25.4	Complied
1.716000	Neutral	20.5	46.0	25.5	Complied
1.815000	Live	20.6	46.0	25.4	Complied



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

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

**5.6. Transmitter 20 dB Bandwidth****Test Summary:**

<b>FCC Part:</b>	15.247(a)(1)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000) (see note below)

**Environmental Conditions:**

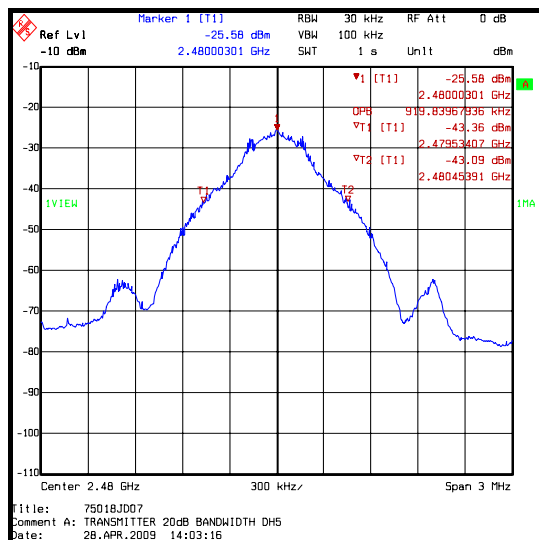
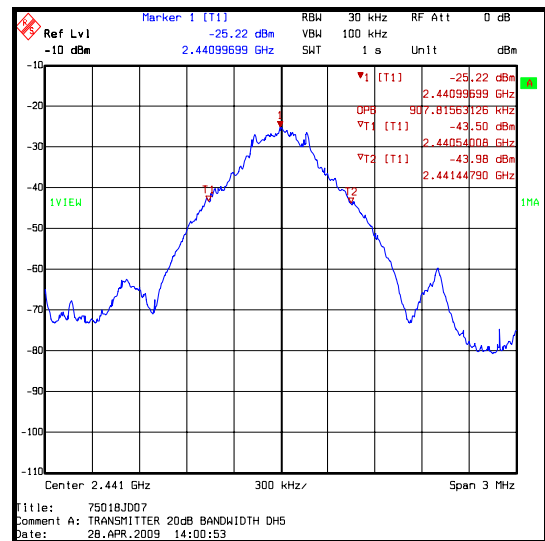
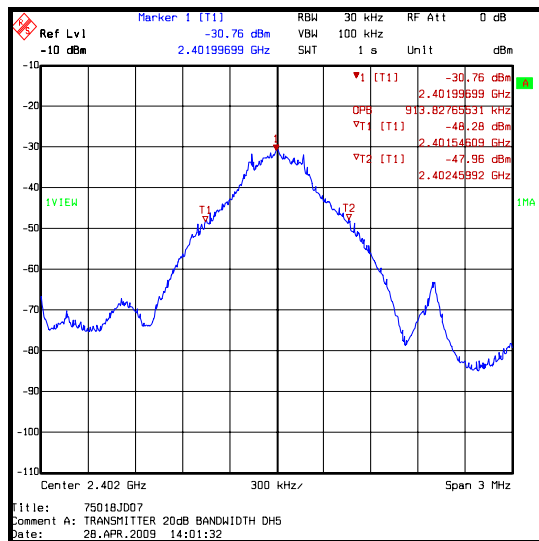
<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	30

**Results: DH5**

<b>Channel</b>	<b>20 dB Bandwidth (kHz)</b>
Bottom	913.828
Middle	907.816
Top	919.840

**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.

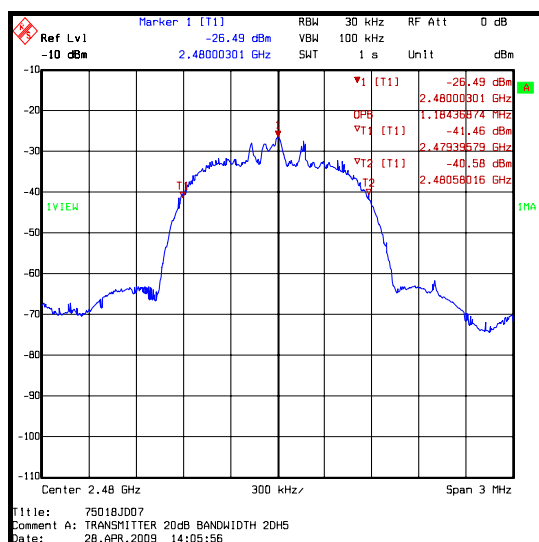
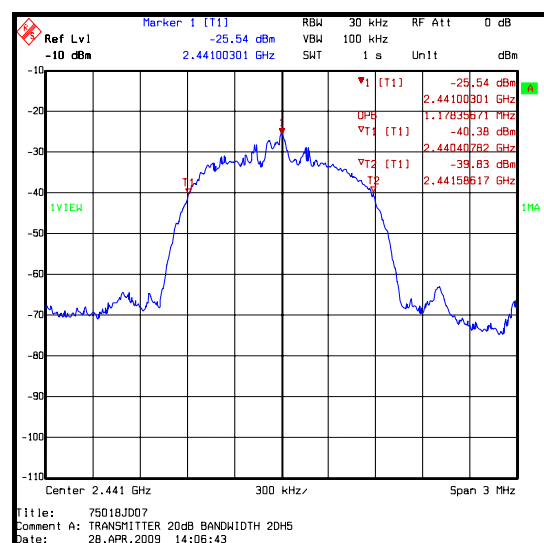
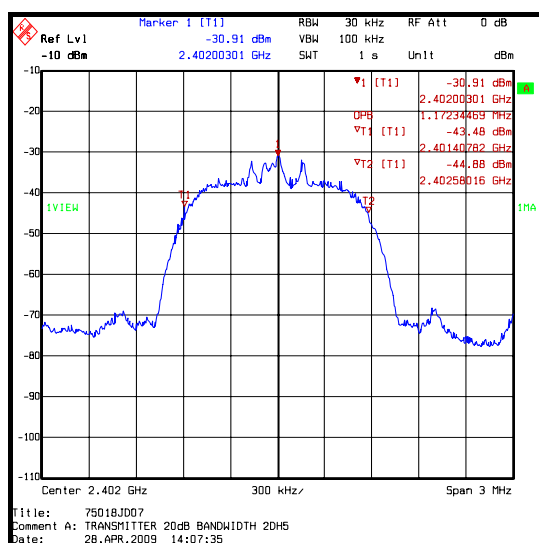
**Transmitter 20 dB Bandwidth (continued)****Results: DH5**

**Transmitter 20 dB Bandwidth (continued)****Results: 2DH5**

Channel	20 dB Bandwidth (kHz)
Bottom	1172.345
Middle	1178.357
Top	1184.369

**Note(s):**

- 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.

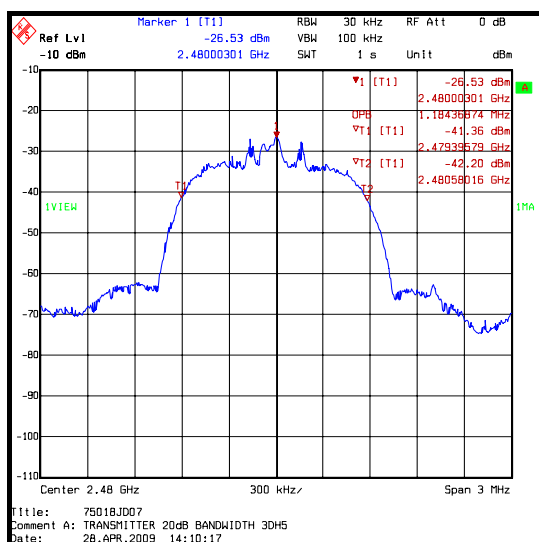
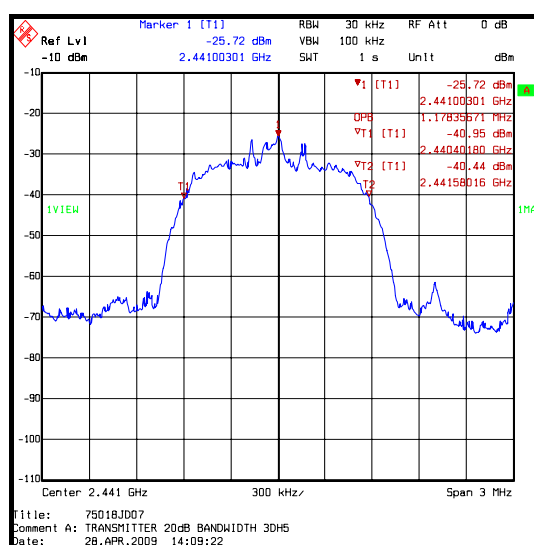
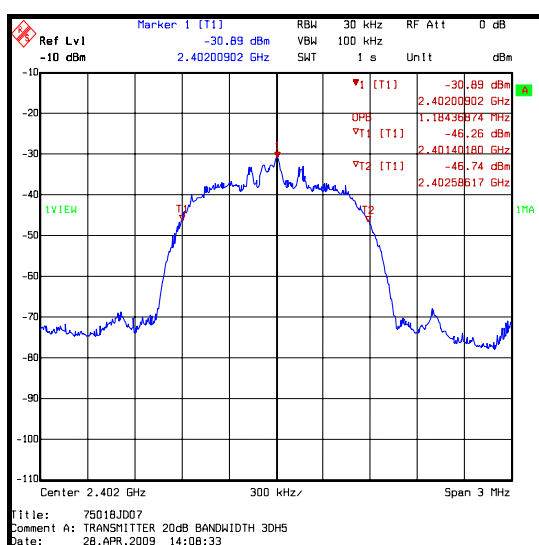


**Transmitter 20 dB Bandwidth (continued)****Results: 3DH5**

Channel	Transmitter 20 dB 3DH5 Bandwidth (kHz)
Bottom	1184.369
Middle	1178.357
Top	1184.369

**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.



## 5.7. Transmitter Carrier Frequency Separation

### Test Summary:

FCC Part:	15.247(a)(1)
Test Method Used:	As detailed in Public Notice DA 00-705 (March 30, 2000)

### Environmental Conditions:

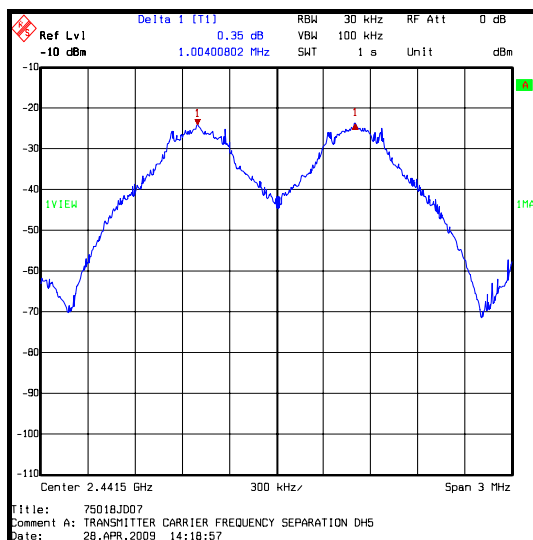
Temperature (°C):	25
Relative Humidity (%):	30

### Results: DH5

Transmitter Carrier Frequency Separation (kHz)	Limit ( $^{2}/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1004.008	605.211	398.797	Complied

### Note(s):

- The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit

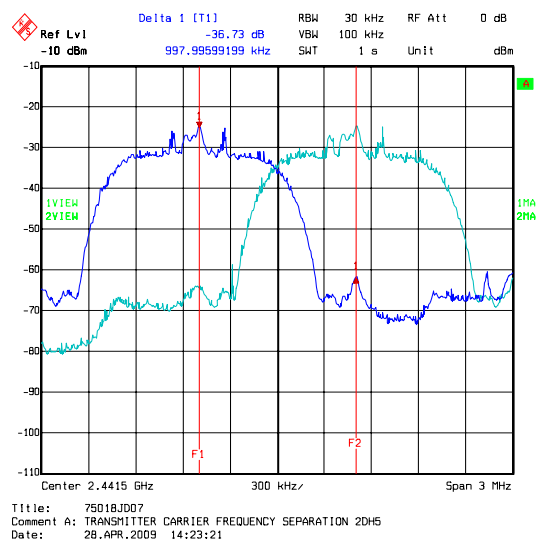


**Transmitter Carrier Frequency Separation (continued)****Results: 2DH5**

Transmitter Carrier Frequency Separation (kHz)	Limit ( $2/3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
997.996	785.571	212.425	Complied

**Note(s):**

1. The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit

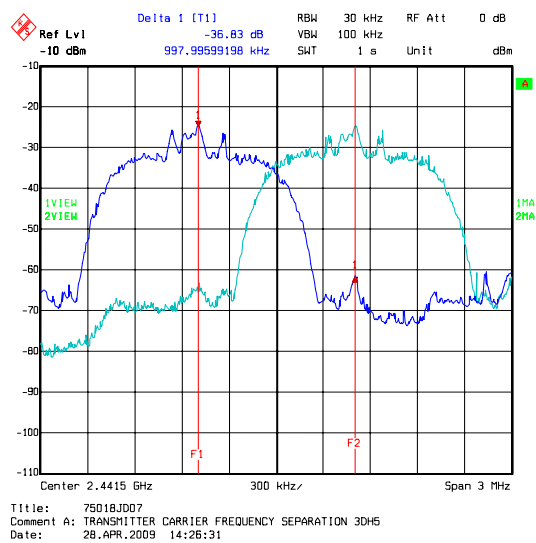


**Transmitter Carrier Frequency Separation (continued)****Results: 3DH5**

Transmitter Carrier Frequency Separation (kHz)	Limit ( $^{2}/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
997.996	785.571	212.425	Complied

**Note(s):**

1. The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit





**5.8. Transmitter Average Time of Occupancy****Test Summary:**

<b>FCC Part:</b>	15.247(a)(1)(iii)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000)

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	30

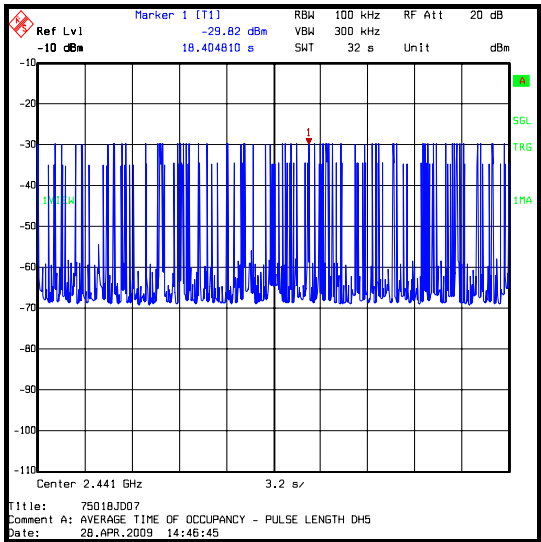
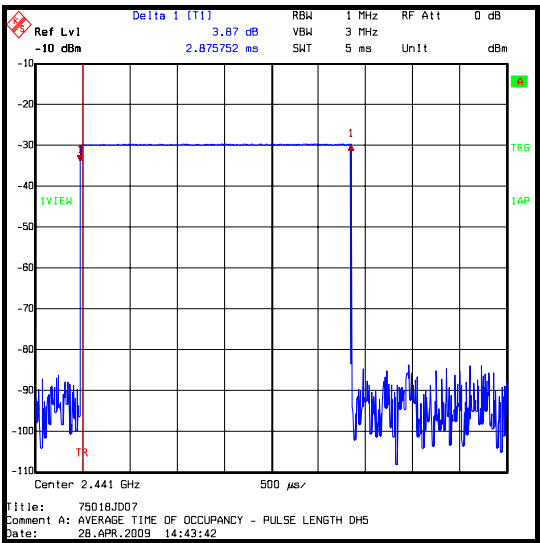
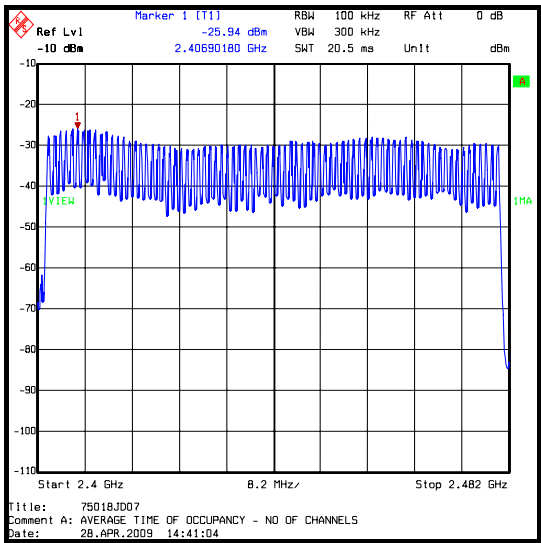
**Results:**

<b>Emission Width (μs)</b>	<b>Number of Hops in 31.6 Seconds</b>	<b>Average Time of Occupancy (s)</b>	<b>Limit (s)</b>	<b>Margin (s)</b>	<b>Result</b>
2875.752	68	0.196	0.4	0.204	Complied

**Note(s):**

1. Tests were performed to identify the average time of occupancy in number of channels (79) x 0.4 seconds. The calculated period is 31.6 seconds.

Transmitter Average Time of Occupancy (continued)



**5.9. Transmitter Maximum Peak Output Power (EIRP)****Test Summary:**

<b>FCC Part:</b>	15.247(b)(3)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000)

**Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	30

**Results: Basic Rate DH5**

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-3.3	30.0	33.3	Complied
Middle	-4.2	30.0	34.2	Complied
Top	-2.7	30.0	32.7	Complied

**Results: EDR 2DH5**

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-3.1	20.0	21.3	Complied
Middle	-4.3	20.0	24.3	Complied
Top	-3.1	20.0	23.1	Complied

**Results: EDR 3DH5**

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-3.1	20.0	23.1	Complied
Middle	-4.3	20.0	24.3	Complied
Top	-2.8	20.0	22.8	Complied

**Note(s):**

1. Measurements were performed with the test antenna in the vertical and horizontal planes and the EUT in the X, Y and Z planes. The highest level was recorded.

## 5.10. 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 1000 MHz

### Environmental Conditions:

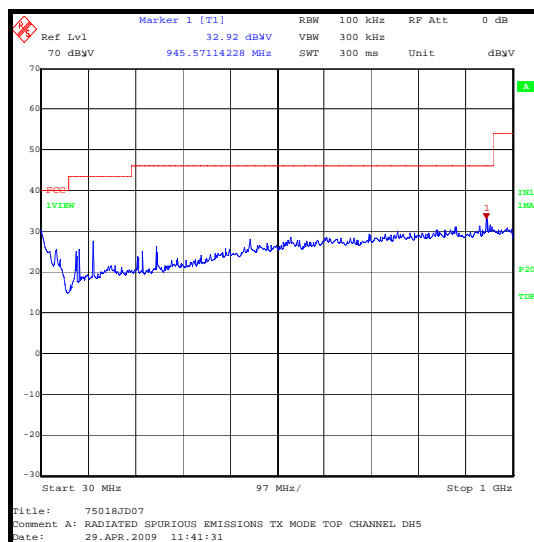
Temperature (°C):	26
Relative Humidity (%):	30

### Results: Electric Field Strength Measurement - Top Channel DH5

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
238.481	Horizontal	28.0	46.0	18.0	Complied
268.288	Horizontal	28.4	46.0	17.6	Complied

### Note(s):

1. The preliminary scans showed similar emission levels below 1 GHz, for each mode of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
2. All other emissions were investigated and found to be ambients and still present with the EUT removed from the test chamber.



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

**5.11. Transmitter Radiated Emissions****Test Summary:**

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	30

**Results: Highest Peak Level**

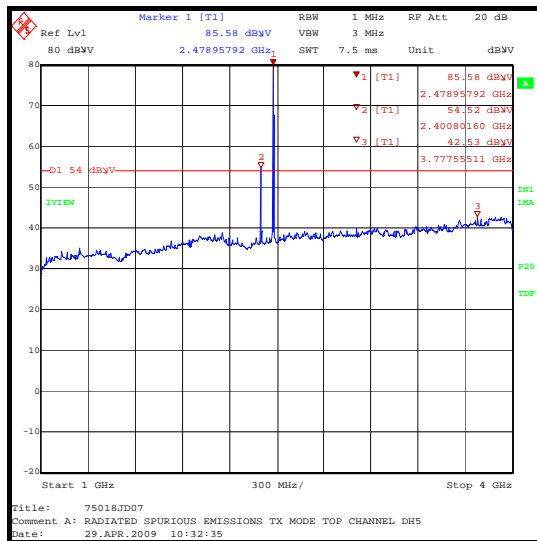
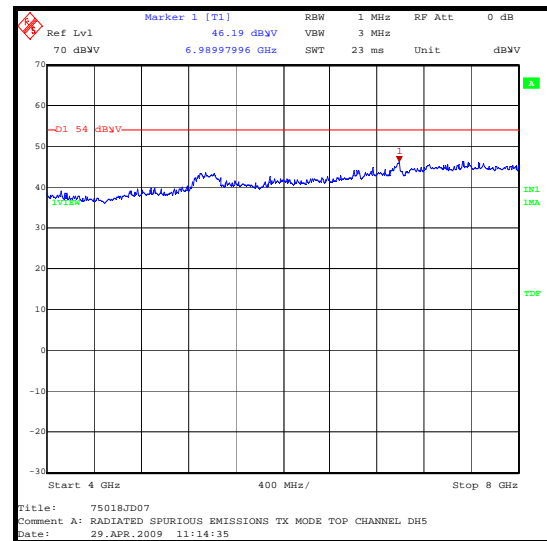
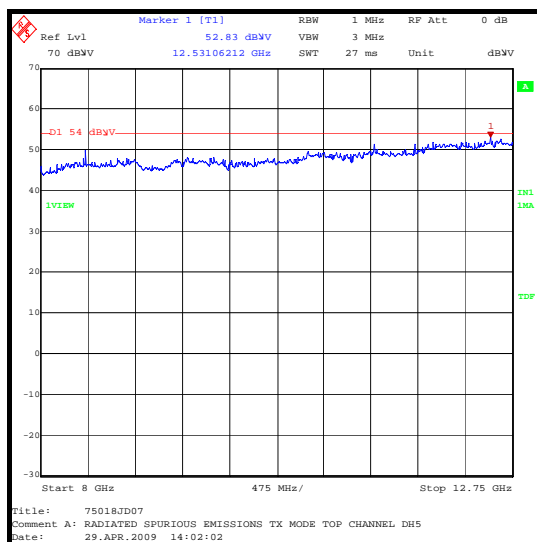
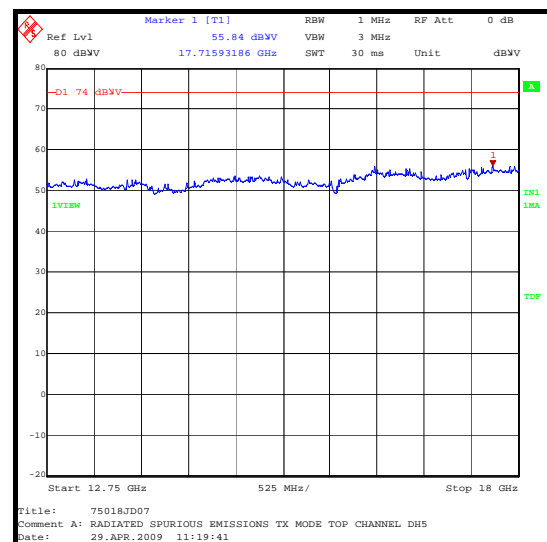
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
17.716	Vertical	39.2	16.6	55.8	74.0	21.2	Complied

**Results: Highest Average Level**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
17.737	Vertical	27.3	16.6	43.9	54.0	10.1	Complied

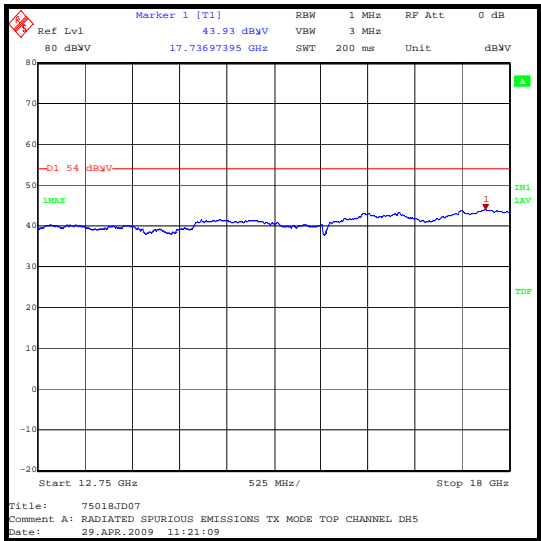
**Note(s):**

1. All pre-scans were performed with a peak detector against average limits apart from measurements made in the range of 12.75 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.
2. No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak and average noise floor readings of the measuring receiver were recorded as shown in the tables above.
3. The emissions shown on the 1 GHz to 4 GHz plots are the EUT carrier at 2480 MHz and receive signal from the support equipment at approximately 2400 MHz

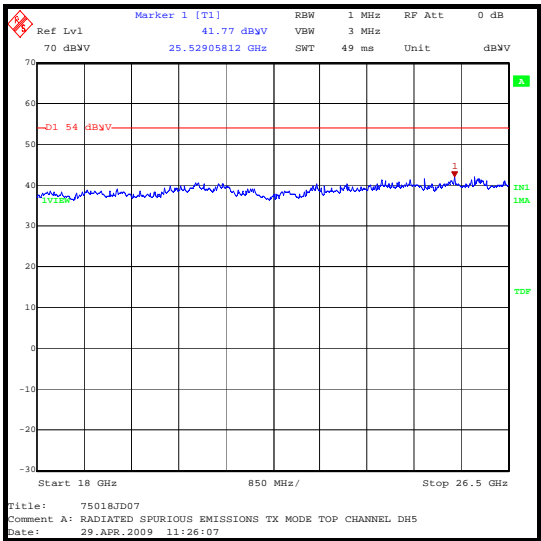
**Transmitter Radiated Emissions (continued)****Peak Measurement****Peak Measurement****Peak Measurement****Peak Measurement**

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

Transmitter Radiated Emissions (continued)



Average Measurement



Peak Measurement

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

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

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	27

**Results: Peak Power Level Hopping Mode DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	55.0	-0.2	54.8	71.8*	17.0	Complied
2.4835	Vertical	52.8	-0.3	52.5	74.0	21.5	Complied

\* -20 dBc limit

**Results: Average Power Level Hopping Mode DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	38.2	-0.3	37.9	54.0	16.1	Complied

**Results: Peak Power Level Hopping Mode 2DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	50.0	-0.2	49.8	72.1*	22.3	Complied
2.4835	Vertical	53.5	-0.3	53.2	74.0	20.8	Complied

\* -20 dBc limit

**Results: Average Power Level Hopping Mode 2DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	38.8	-0.3	38.5	54.0	15.5	Complied



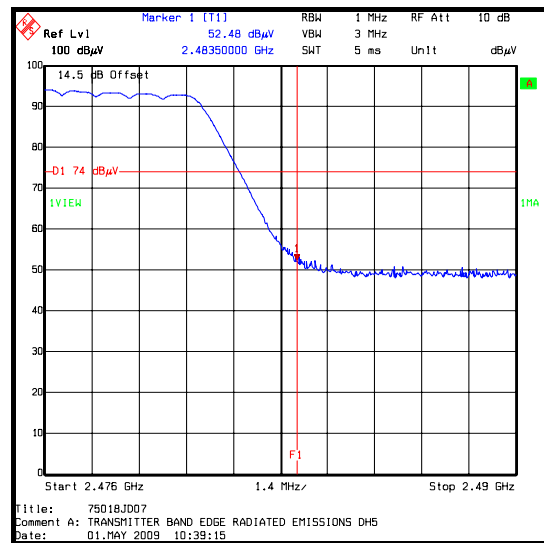
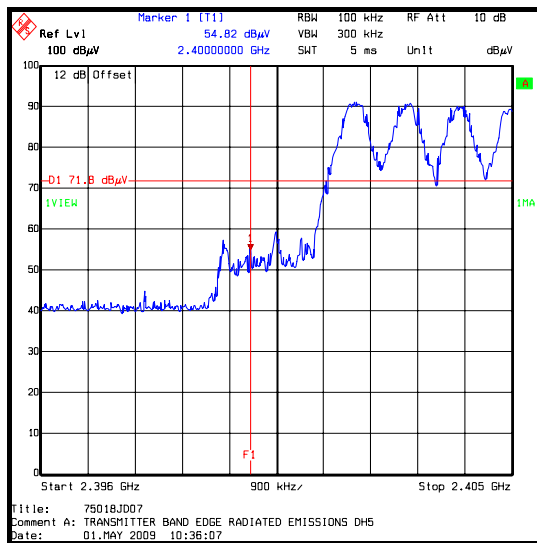
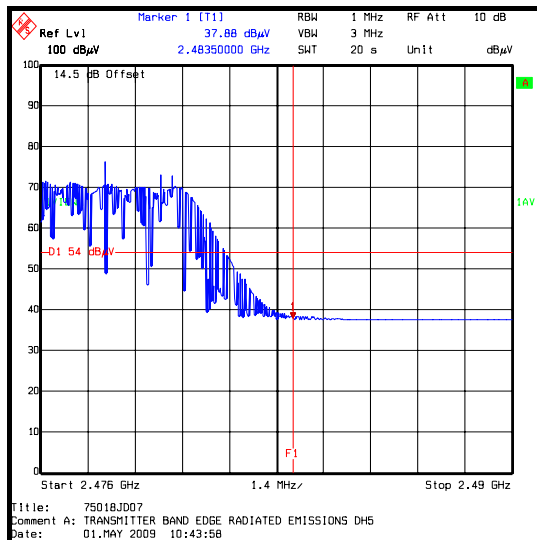
**Transmitter Band Edge Radiated Emissions (continued)****Results: Peak Power Level Hopping Mode 3DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4000	Vertical	41.8	-0.2	41.6	72.2*	30.6	Complied
2.4835	Vertical	54.8	-0.3	54.5	74.0	19.5	Complied

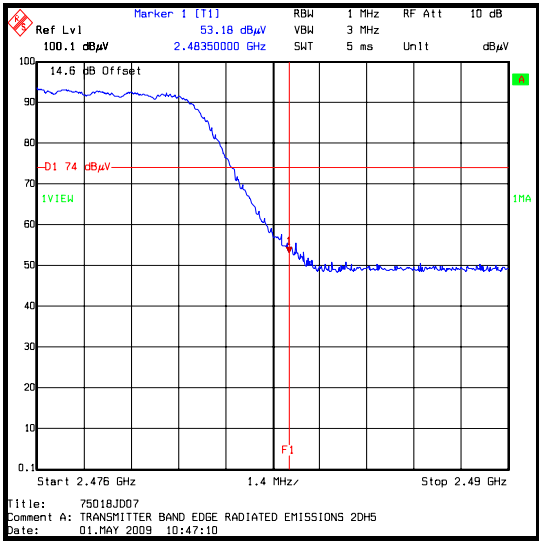
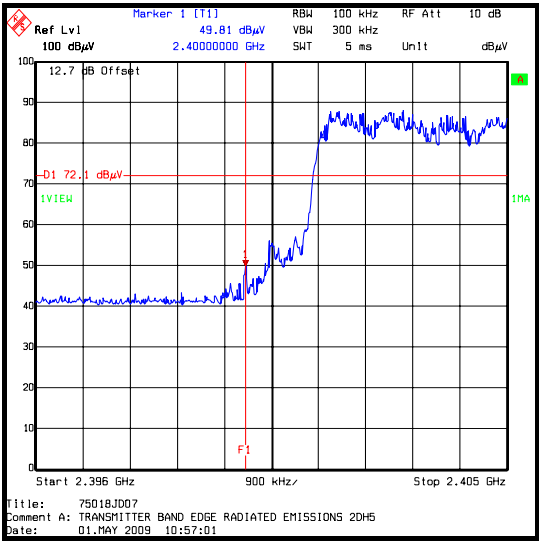
\* -20 dBc limit

**Results: Average Power Level Hopping Mode 3DH5**

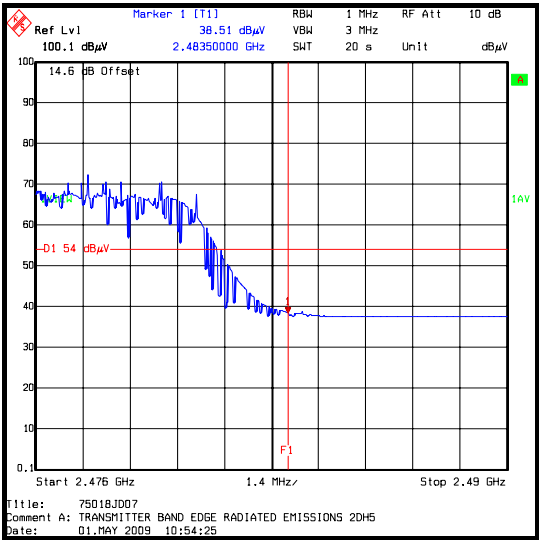
Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4835	Vertical	39.2	-0.3	38.9	54.0	15.1	Complied

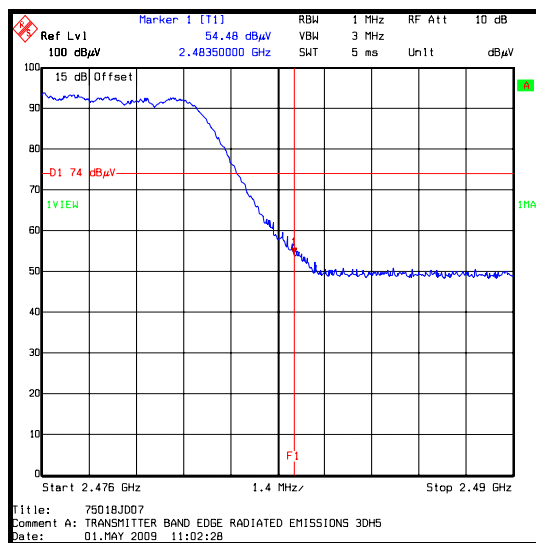
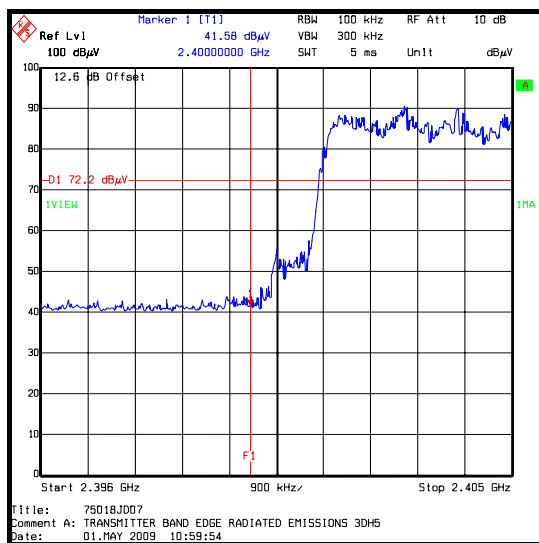
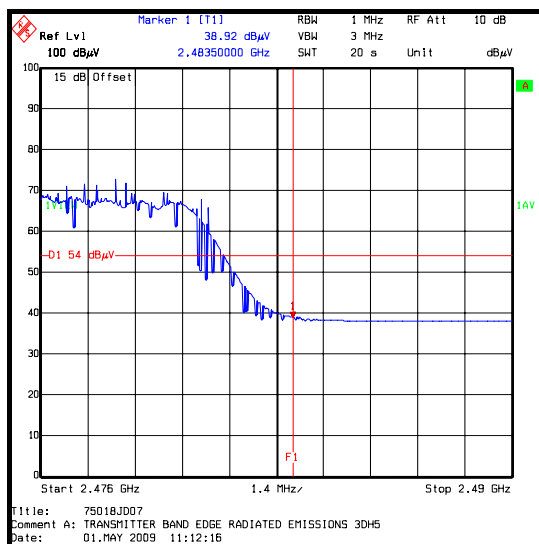
**Transmitter Band Edge Radiated Emissions (continued)****Mode DH5**

Transmitter Band Edge Radiated Emissions (continued)



Mode 2DH5



**Transmitter Band Edge Radiated Emissions (continued)****Mode 3DH5**

**Transmitter Band Edge Radiated Emissions (continued)****Results: Peak Power Level Static Mode DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4000	Vertical	57.3	-0.2	57.1	71.8*	14.7	Complied
2.4835	Vertical	53.7	-0.3	53.4	74.0	20.6	Complied

\* -20 dBc limit

**Results: Average Power Level Static Mode DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4835	Vertical	41.4	-0.3	41.1	54.0	12.9	Complied

**Results: Peak Power Level Static Mode 2DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4000	Vertical	48.6	-0.2	48.4	72.1*	23.7	Complied
2.4835	Vertical	58.0	-0.3	57.7	74.0	16.3	Complied

\* -20 dBc limit

**Results: Average Power Level Static Mode 2DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4835	Vertical	42.2	-0.3	41.9	54.0	12.1	Complied

**Transmitter Band Edge Radiated Emissions (continued)****Results: Peak Power Level Static Mode 3DH5**

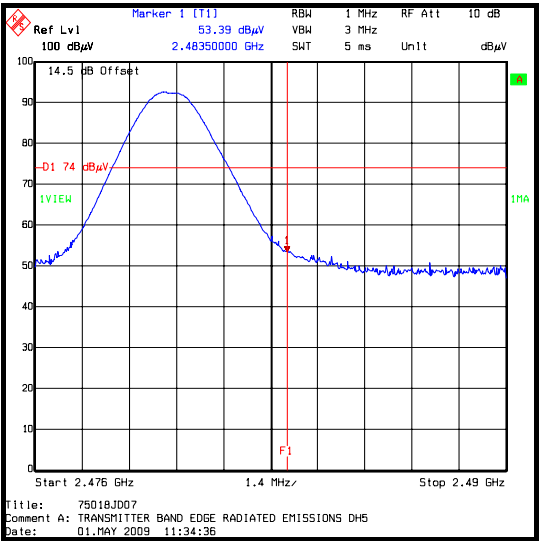
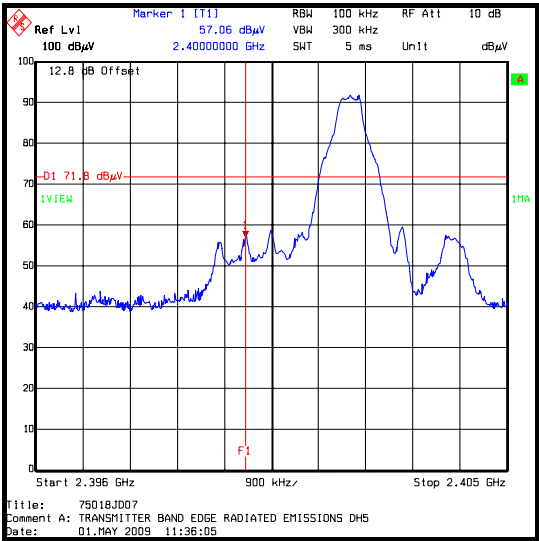
Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4000	Vertical	49.0	-0.2	48.8	72.2*	23.4	Complied
2.4835	Vertical	57.4	-0.3	57.1	74.0	16.9	Complied

\* -20 dBc limit

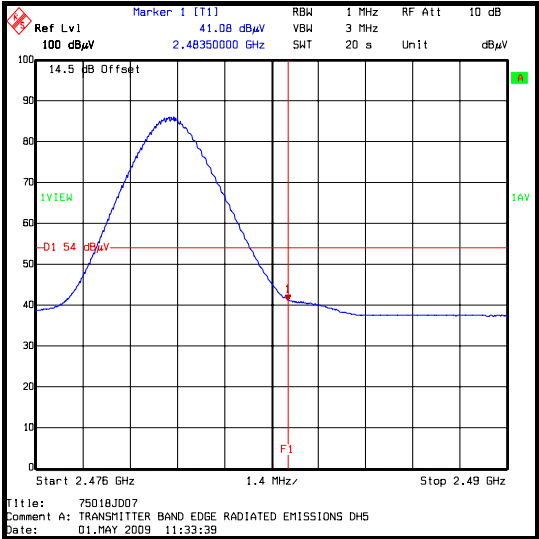
**Results: Average Power Level Static Mode 3DH5**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.4835	Vertical	43.3	-0.3	43.0	54.0	11.0	Complied

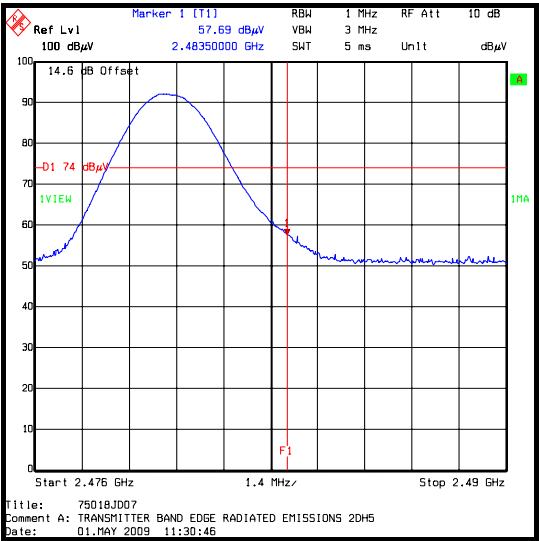
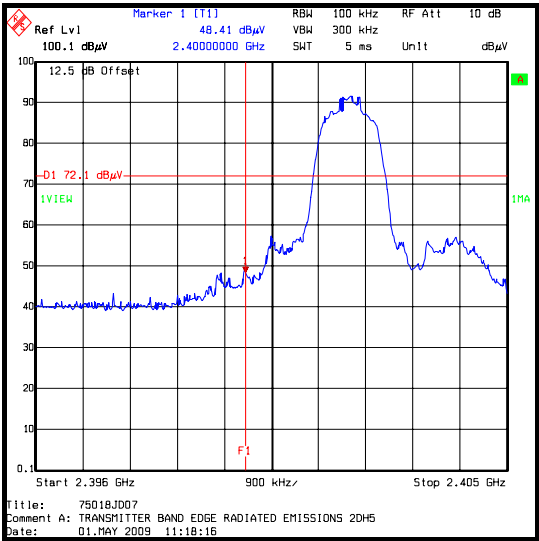
Transmitter Band Edge Radiated Emissions (continued)



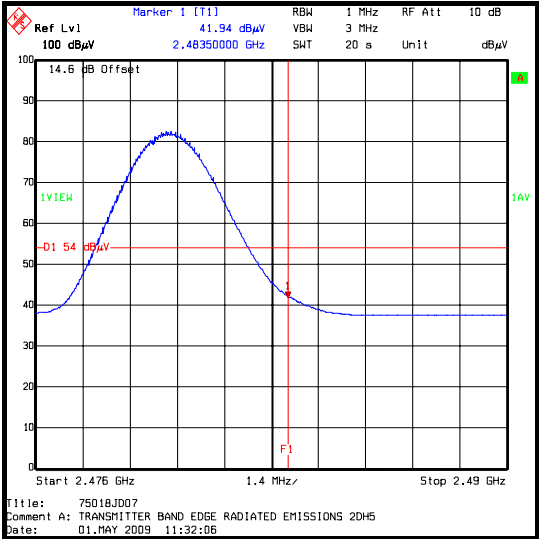
Mode DH5



Transmitter Band Edge Radiated Emissions (continued)

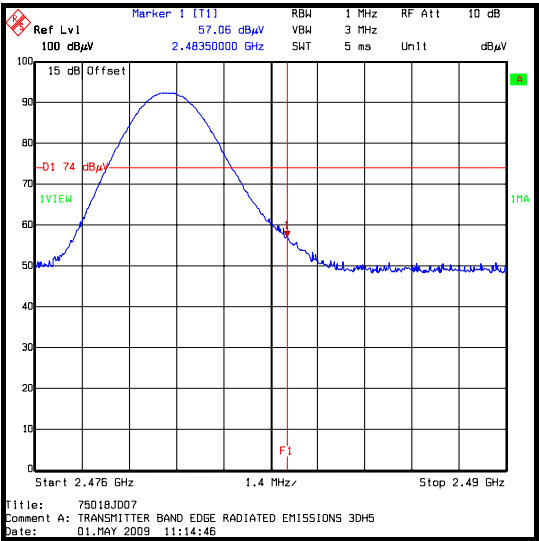
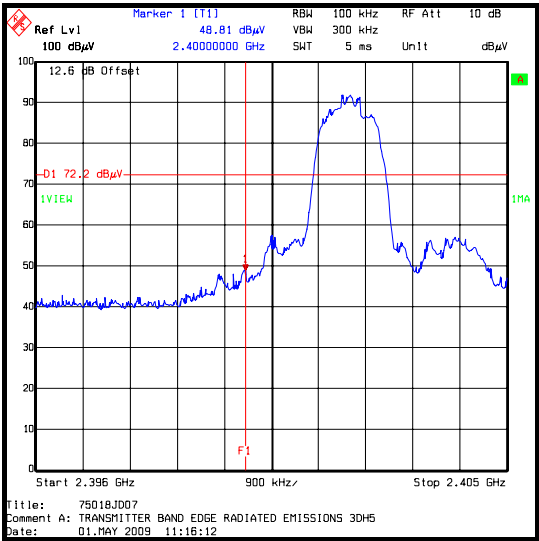


Mode 2DH5

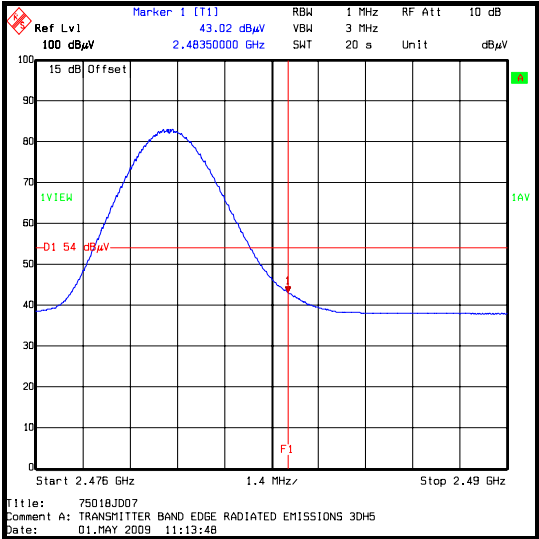




Transmitter Band Edge Radiated Emissions (continued)



Mode 3DH5



## 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
Maximum Peak Output Power	Not Applicable	95%	±2.94 dB
Carrier Frequency Separation	Not Applicable	95%	±0.92 ppm
Average Time of Occupancy	Not Applicable	95%	±0.3 ns
20 dB Bandwidth	Not Applicable	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz 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.

**Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1299	Antenna	Schaffner	CBL6143	5094	28 Jul 2008	12
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	12
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Jan 2009	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	19 Mar 2009	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	26 Aug 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	09 Dec 2008	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	14 Aug 2008	12
M1447	CBT	Rohde & Schwarz	1153.9000.35	100329	19 Jan 2009	12

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