TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-07C

FCC ID: UCE211040A

To: FCC Part 15.247: 2010 Subpart C

Test Report Serial No:
RFI-RPT-RP81533JD02A V2.0

Version 2.0 supersedes all previous versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals: 	
Checked By:	Ian Watch
Signature: 	
Date of Issue:	03 June 2011

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Registered in England and Wales. Company number:2117901

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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

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	10 May 2011 to 26 May 2011

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 Conducted 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	✓
Key to Results ✓ = Complied ✗ = Did not comply		

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

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	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)

Brand Name:	NTT docomo
Model Name or Number:	P-07C *(Radiated sample #1)*
IMEI:	356333040014081
Hardware Version Number:	Rev C
Software Version Number:	laputa-ginger-inc4x-dcm-07-0249 R1E_EC06_005
FCC ID:	UCE211040A

**The customer stated this S/W version is identical to laputa-ginger-inc4x-dcm-07-0312 R1E_EC07 except for the audio speech parameters which do not impact FCC testing.*

Brand Name:	NTT docomo
Model Name or Number:	P-07C *(Radiated sample #2)*
IMEI:	356333040014073
Hardware Version Number:	Rev C
Software Version Number:	laputa-ginger-inc4x-dcm-07-0312 R1E_EC07
FCC ID:	UCE211040A

Brand Name:	NTT docomo
Model Name or Number:	P-07C *(Conducted sample)*
IMEI:	356333040014099
Hardware Version Number:	Rev C
Software Version Number:	laputa-ginger-inc4x-dcm-07-0483 R1E_EC08
FCC ID:	UCE211040A

** The customer stated this S/W version contains a bug fix to prevent the S/W from crashing under certain circumstances. The RF performance is identical to laputa-ginger-inc4x-dcm-07-0312 R1E_EC07 and the change does not impact FCC testing.*

Identification of Equipment Under Test (continued)

Brand Name:	NTT docomo
Description:	Battery
Model Name or Number:	P24

Brand Name:	NTT docomo
Description:	AC Charger and USB cable
Model Name or Number:	P01

Brand Name:	NTT docomo
Description:	Personal Hands-Free
Model Name or Number:	L0ZZ00000027

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM cellular handset with Bluetooth and WLAN.

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 (IEEE 802.11)		
Type of Unit:	Transceiver		
Modulation Type:	BPSK, QPSK, 16 QAM and 64QAM		
Data Rate:	1, 2, 5.5, 11, 6, 9, 12, 18, 24, 36, 48 and 54 Mbps		
Declared Antenna Gain	-2.3 dBi		
Power Supply Requirement(s):	Nominal	3.7 V	
Maximum Conducted Output Power:	22.5 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:

Brand Name:	Panasonic
Description:	Laptop PC
Model Name or Number:	Toughbook CF-74

Brand Name:	Generic
Description:	Micro SD Memory Card
Model Name or Number:	128 MB

Brand Name:	Buffalo
Description:	USB Hub
Model Name or Number:	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 as required using the supported data rates.

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 receive mode and to select the test channels, data rates and modulation schemes as required.
- Receive/Idle tests: The 802.11 mode was active but not transmitting.
- Transmitter spurious emissions were performed with the EUT transmitting with a data rate of 9 Mbps, as this was found to have the highest power level and therefore deemed to be worst case.
- Idle and transmitter radiated spurious emissions tests were performed with the AC charger connected to the EUT as this was found to be the worst case during pre-scans. All the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination.
- The conducted sample with IMEI 356333040014099 was used for maximum output power and power spectral density tests.
- The radiated sample with IMEI 356333040014081 was used for AC conducted emissions and idle mode radiated spurious emissions > 1 GHz tests.
- The radiated sample with IMEI 356333040014073 was used for all other tests.

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:**	16 May 2011
Test Sample Serial No:	356333040014081		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	21

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.433500	Live	38.0	57.2	19.2	Complied
0.469500	Live	38.6	56.5	17.9	Complied
0.595500	Live	36.0	56.0	20.0	Complied
0.757500	Live	36.1	56.0	19.9	Complied
1.135500	Live	36.4	56.0	19.6	Complied
1.446000	Live	37.9	56.0	18.1	Complied
1.504500	Live	40.5	56.0	15.6	Complied
1.527000	Live	39.0	56.0	17.0	Complied
1.540500	Live	39.2	56.0	16.8	Complied
1.648500	Live	43.8	56.0	12.2	Complied
1.689000	Live	49.6	56.0	6.4	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.379500	Live	32.7	48.3	15.6	Complied
0.429000	Live	31.1	47.3	16.2	Complied
0.465000	Live	32.9	46.6	13.7	Complied
0.469500	Live	29.7	46.5	16.8	Complied
1.221000	Live	28.6	46.0	17.4	Complied
1.819500	Live	34.4	46.0	11.6	Complied
2.112000	Live	25.6	46.0	20.4	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)

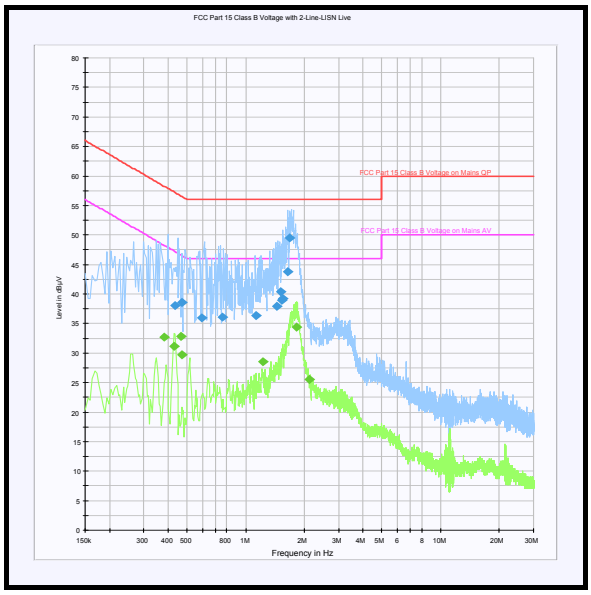
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.429000	Neutral	37.7	57.3	19.6	Complied
0.465000	Neutral	35.9	56.6	20.7	Complied
0.568500	Neutral	38.5	56.0	17.5	Complied
0.874500	Neutral	39.1	56.0	16.9	Complied
0.987000	Neutral	39.0	56.0	17.0	Complied
1.180500	Neutral	39.5	56.0	16.5	Complied
1.482000	Neutral	42.3	56.0	13.7	Complied
1.666500	Neutral	35.4	56.0	20.6	Complied
1.689000	Neutral	45.4	56.0	10.6	Complied

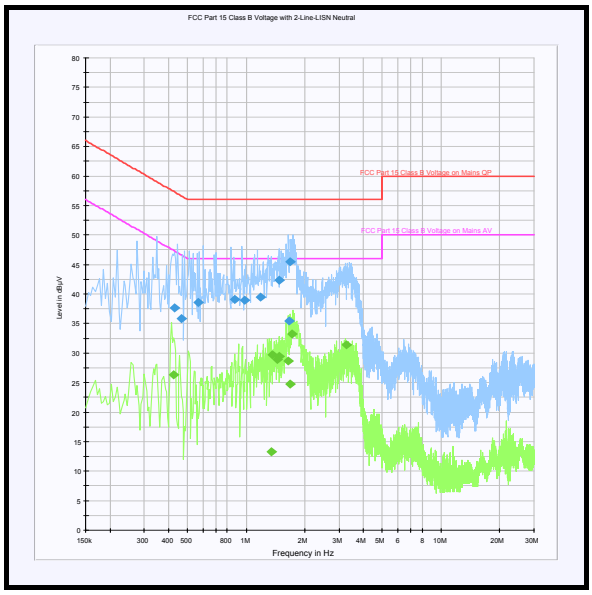
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.424500	Neutral	26.3	47.4	21.1	Complied
1.347000	Neutral	13.3	46.0	32.7	Complied
1.365000	Neutral	29.7	46.0	16.3	Complied
1.441500	Neutral	28.9	46.0	17.1	Complied
1.482000	Neutral	29.4	46.0	16.6	Complied
1.635000	Neutral	28.6	46.0	17.4	Complied
1.689000	Neutral	24.7	46.0	21.3	Complied
1.725000	Neutral	33.2	46.0	12.8	Complied
3.255000	Neutral	31.4	46.0	14.6	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)



Live



Neutral

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

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	18 May 2011
Test Sample IMEI:	356333040014073		

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

Environmental Conditions:

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

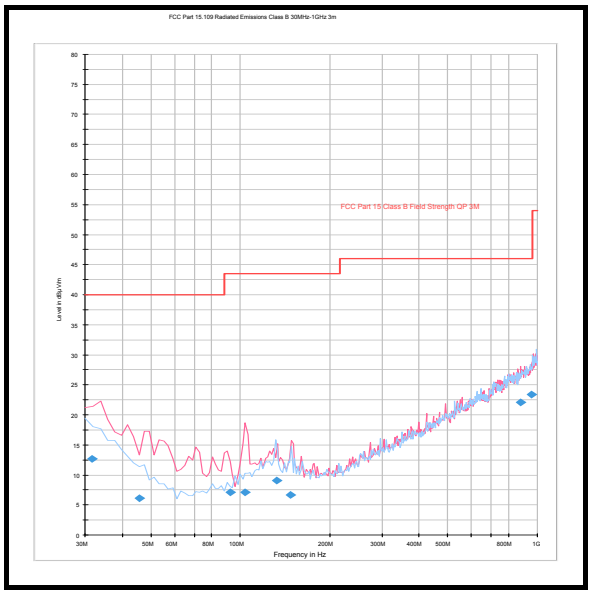
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
31.603	Vertical	12.7	40.0	27.3	Complied
45.701	Vertical	6.1	40.0	33.9	Complied
92.391	Vertical	7.1	43.5	36.4	Complied
103.786	Vertical	7.1	43.5	36.4	Complied
132.425	Vertical	9.1	43.5	34.4	Complied
147.485	Vertical	6.7	43.5	36.8	Complied
879.454	Vertical	22.1	46.0	23.9	Complied
958.298	Vertical	23.4	46.0	22.6	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 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.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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:

Test Engineer:	Tim Stanley	**Test Date:**	11 May 2011
Test Sample IMEI:	356333040014081		

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

Environmental Conditions:

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

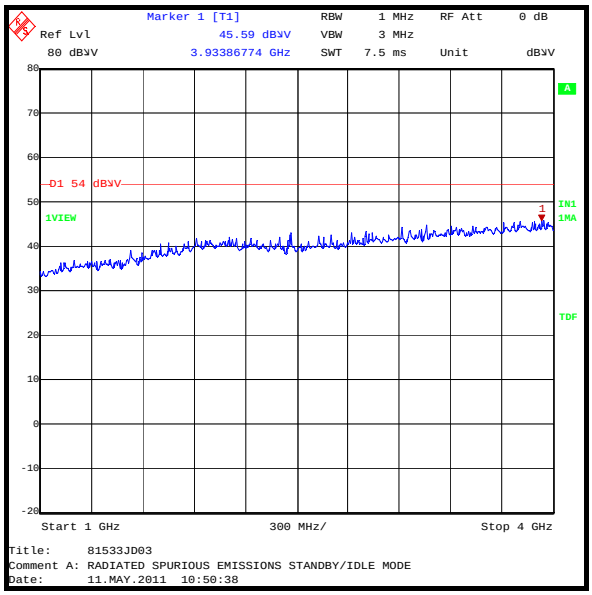
Results:

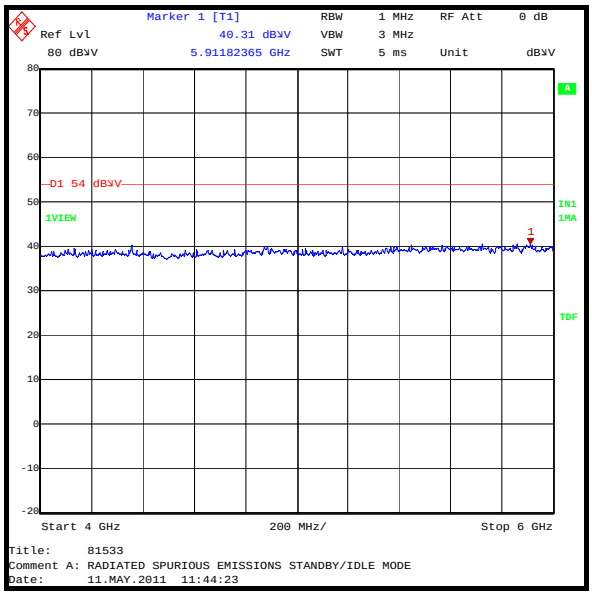
Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3933.868	Vertical	45.6	54.0	8.4	Complied

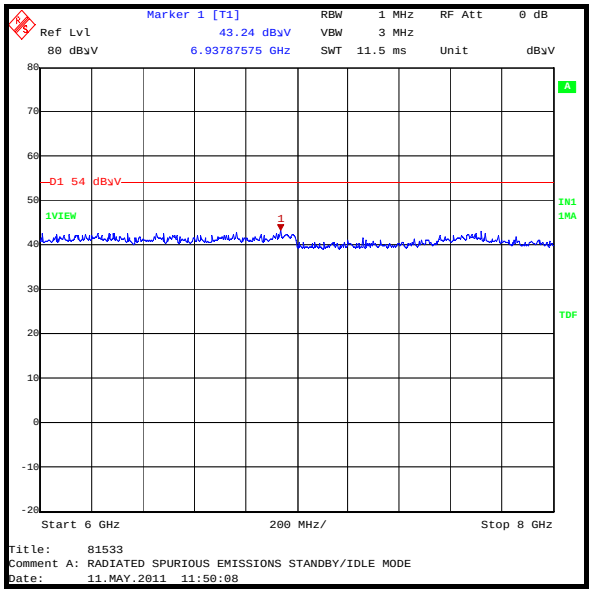
Note(s):

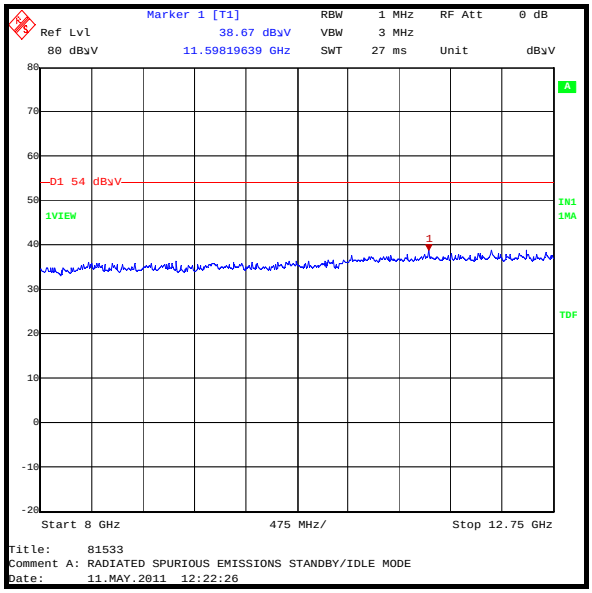
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded 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.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)









5.2.3. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	17 May 2011
Test Sample IMEI:	356333040014073		

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

Environmental Conditions:

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

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.919500	Live	29.8	56.0	26.2	Complied
1.261500	Live	32.5	56.0	23.5	Complied
1.342500	Live	31.5	56.0	24.5	Complied
1.351500	Live	32.3	56.0	23.7	Complied
1.401000	Live	32.6	56.0	23.4	Complied
1.540500	Live	32.9	56.0	23.1	Complied
1.567500	Live	33.4	56.0	22.6	Complied
1.608000	Live	34.4	56.0	21.6	Complied
1.698000	Live	38.0	56.0	18.0	Complied
1.725000	Live	39.1	56.0	16.9	Complied
1.734000	Live	38.3	56.0	17.7	Complied
1.882500	Live	34.6	56.0	21.4	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.438000	Live	29.5	47.1	17.6	Complied
0.874500	Live	21.0	46.0	25.0	Complied
1.671000	Live	24.1	46.0	21.9	Complied
1.725000	Live	26.3	46.0	19.7	Complied
1.819500	Live	26.4	46.0	19.6	Complied
1.873500	Live	26.1	46.0	19.9	Complied
1.968000	Live	24.9	46.0	21.1	Complied

Transmitter AC Conducted Spurious Emissions (continued)

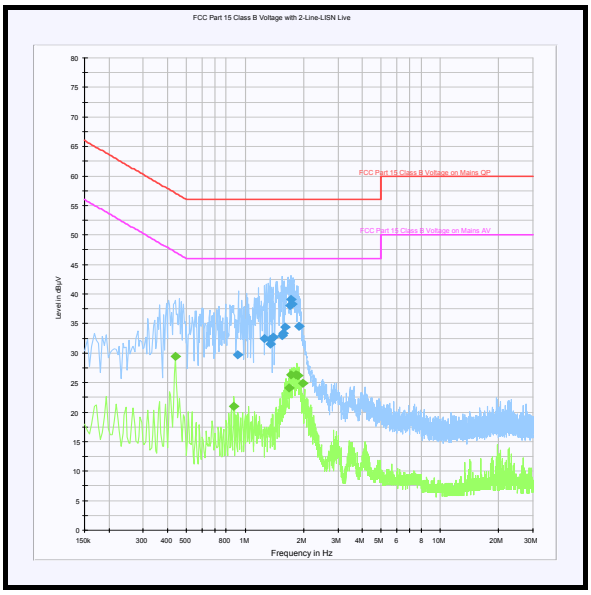
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.438000	Neutral	45.6	57.1	11.5	Complied
0.636000	Neutral	35.9	56.0	20.1	Complied
0.730500	Neutral	37.8	56.0	18.2	Complied
0.843000	Neutral	36.3	56.0	19.7	Complied
1.041000	Neutral	39.4	56.0	16.6	Complied
1.288500	Neutral	39.4	56.0	16.6	Complied
1.342500	Neutral	41.5	56.0	14.5	Complied
1.351500	Neutral	41.7	56.0	14.3	Complied
1.428000	Neutral	42.1	56.0	13.9	Complied
1.563000	Neutral	42.6	56.0	13.4	Complied

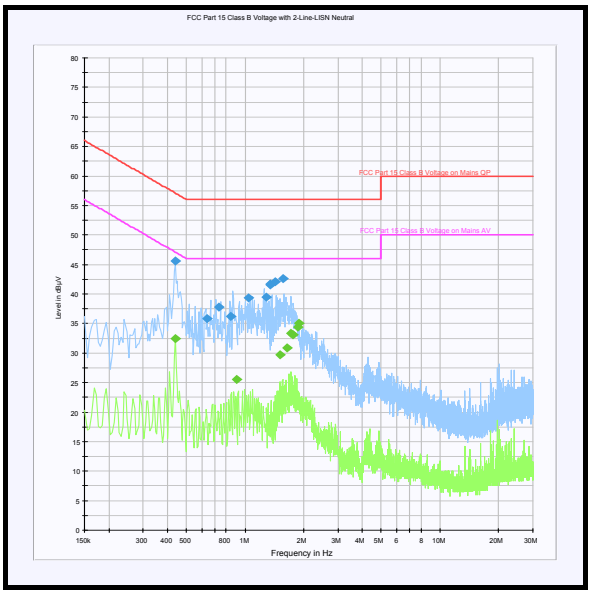
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.438000	Neutral	32.4	47.1	14.7	Complied
0.901500	Neutral	25.5	46.0	20.5	Complied
1.509000	Neutral	29.7	46.0	16.3	Complied
1.648500	Neutral	30.9	46.0	15.1	Complied
1.720500	Neutral	33.3	46.0	12.7	Complied
1.770000	Neutral	33.1	46.0	12.9	Complied
1.855500	Neutral	34.5	46.0	11.5	Complied
1.878000	Neutral	35.0	46.0	11.0	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

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

5.2.4. Transmitter 6 dB Bandwidth

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	23 May 2011
Test Sample IMEI:	356333040014073		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results: 1 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	9.719	≥0.5	9.219	Complied
Middle	9.168	≥0.5	8.668	Complied
Top	9.619	≥0.5	9.119	Complied

Results: 2 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	9.719	≥0.5	9.219	Complied
Middle	8.968	≥0.5	8.468	Complied
Top	9.018	≥0.5	8.518	Complied

Results: 5.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	9.619	≥0.5	9.119	Complied
Middle	9.619	≥0.5	9.119	Complied
Top	9.519	≥0.5	9.019	Complied

Transmitter 6 dB Bandwidth (continued)

Results: 11 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	10.621	≥0.5	10.121	Complied
Middle	10.020	≥0.5	9.520	Complied
Top	9.519	≥0.5	9.019	Complied

Results: 6 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.333	≥0.5	15.833	Complied
Middle	15.832	≥0.5	15.332	Complied
Top	16.232	≥0.5	15.732	Complied

Results: 9 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.333	≥0.5	15.833	Complied
Middle	15.932	≥0.5	15.432	Complied
Top	16.032	≥0.5	15.532	Complied

Results: 12 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	15.932	≥0.5	15.432	Complied
Middle	16.333	≥0.5	15.833	Complied
Top	15.832	≥0.5	15.332	Complied

Results: 18 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.032	≥0.5	15.532	Complied
Middle	16.433	≥0.5	15.933	Complied
Top	16.132	≥0.5	15.632	Complied

Results: 24 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.333	≥0.5	15.833	Complied
Middle	16.032	≥0.5	15.532	Complied
Top	16.132	≥0.5	15.632	Complied

Transmitter 6 dB Bandwidth (continued)

Results: 36 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.433	≥0.5	15.933	Complied
Middle	15.832	≥0.5	15.332	Complied
Top	16.333	≥0.5	15.833	Complied

Results: 48 Mbps

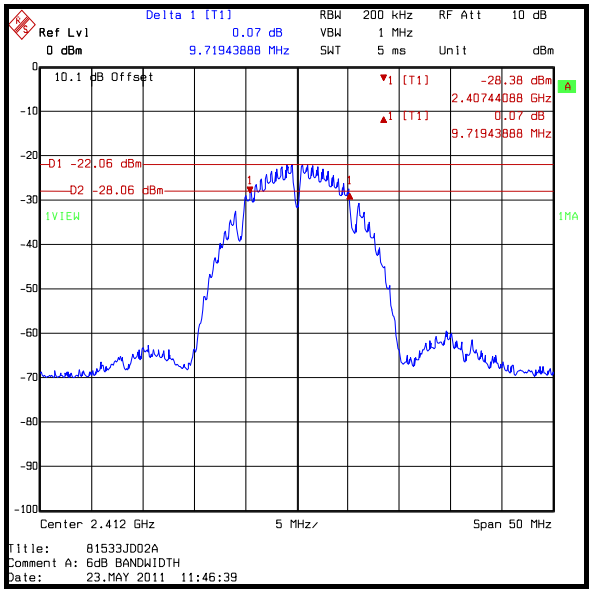
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.333	≥0.5	15.833	Complied
Middle	15.932	≥0.5	15.432	Complied
Top	16.132	≥0.5	15.632	Complied

Results: 54 Mbps

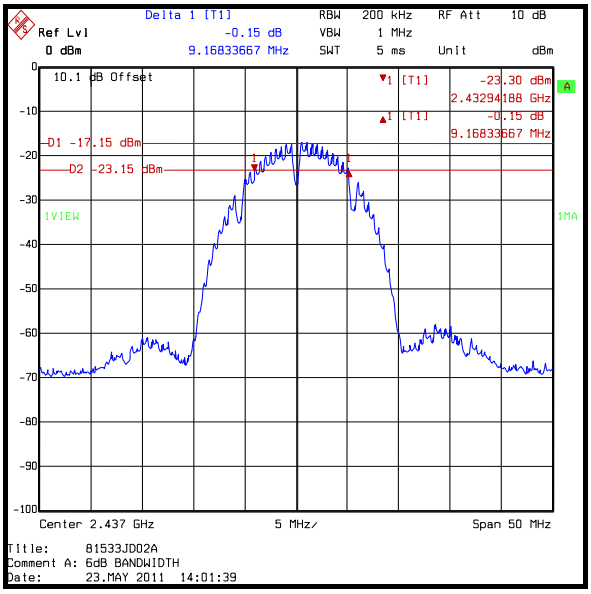
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.433	≥0.5	15.933	Complied
Middle	15.832	≥0.5	15.332	Complied
Top	16.232	≥0.5	15.732	Complied

Transmitter 6 dB Bandwidth (continued)

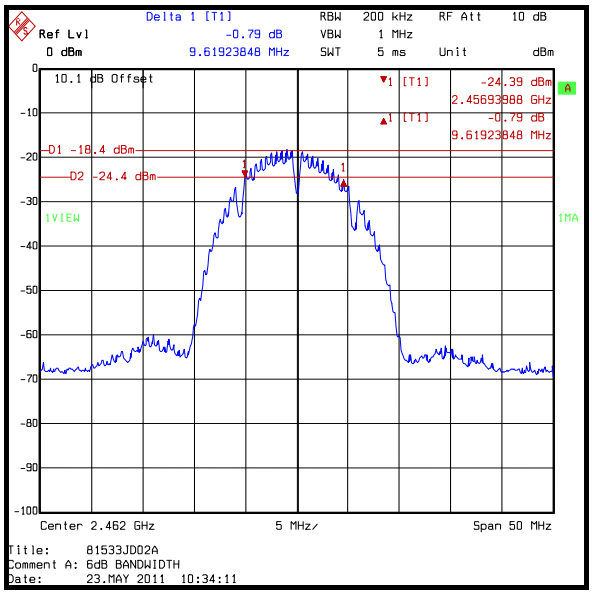
Results: 1 Mbps



Bottom channel



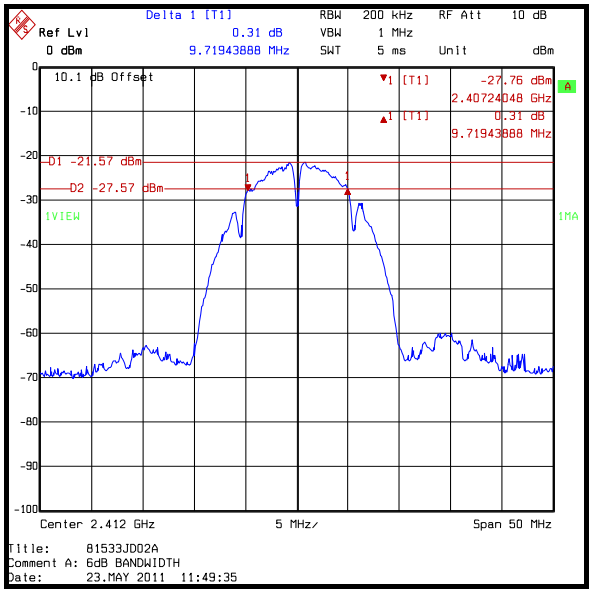
Middle channel



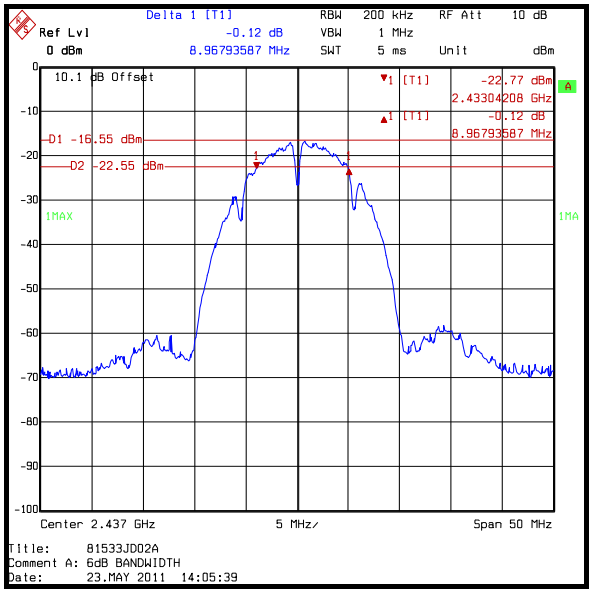
Top channel

Transmitter 6 dB Bandwidth (continued)

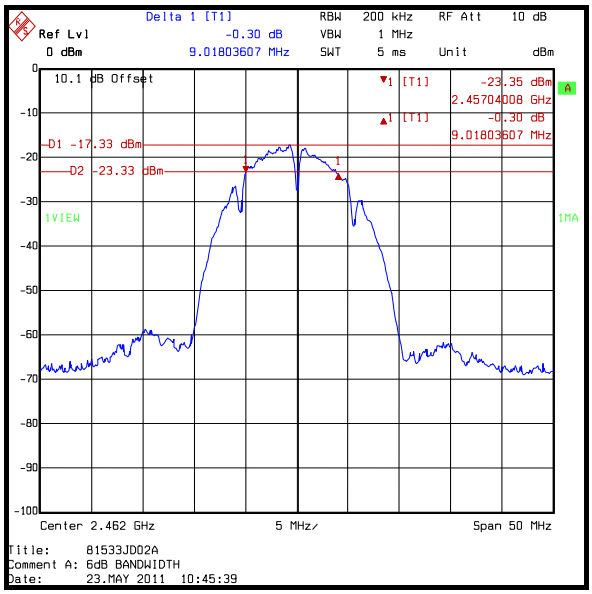
Results: 2 Mbps



Bottom channel



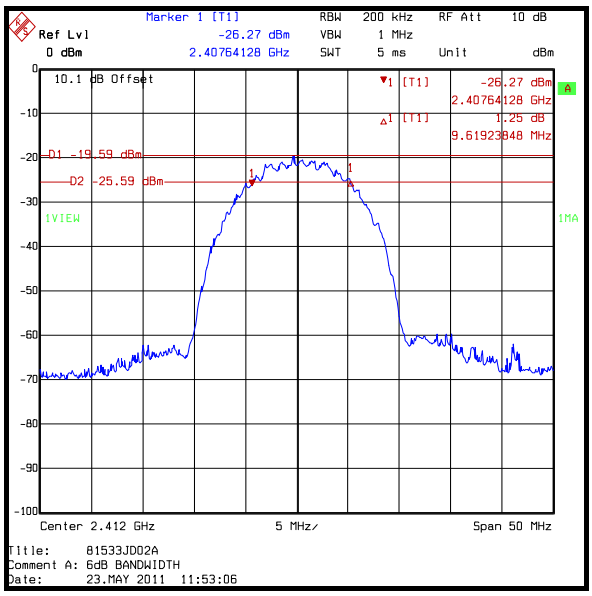
Middle channel



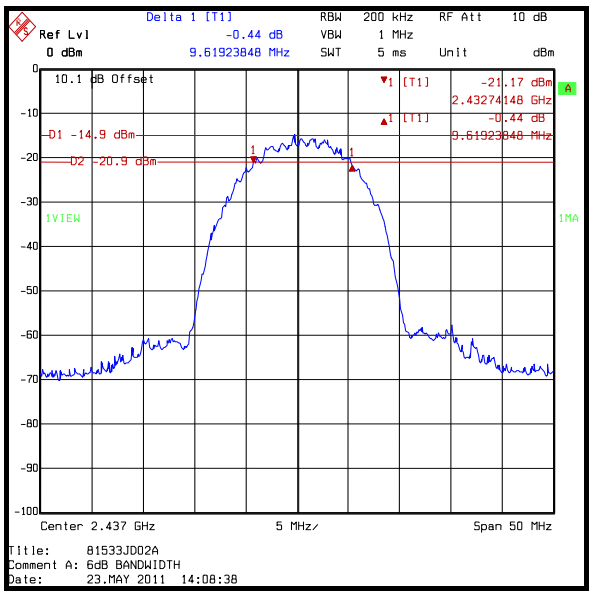
Top channel

Transmitter 6 dB Bandwidth (continued)

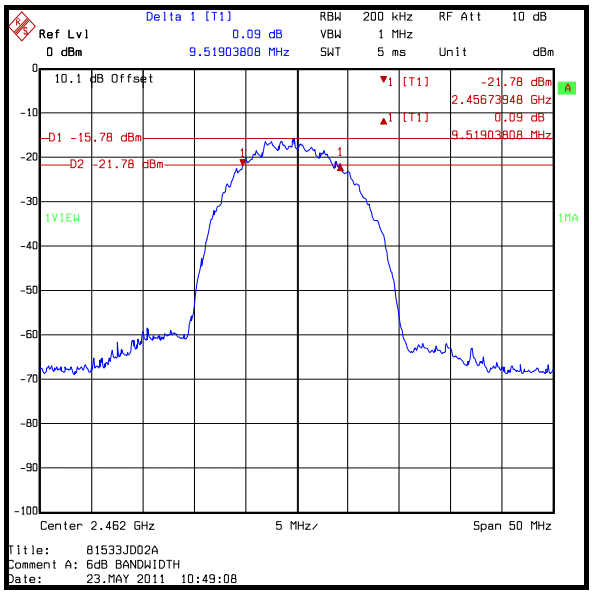
Results: 5.5 Mbps



Bottom channel



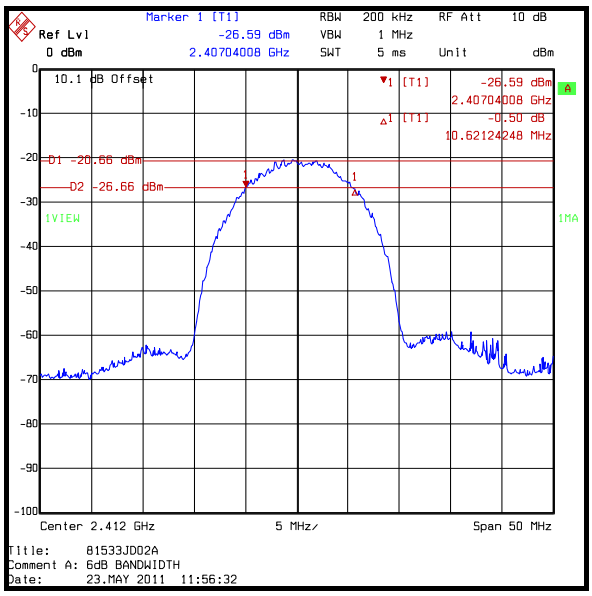
Middle channel



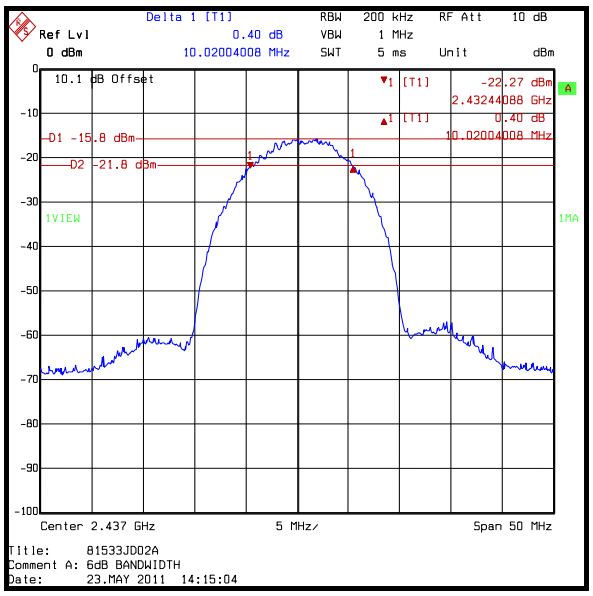
Top channel

Transmitter 6 dB Bandwidth (continued)

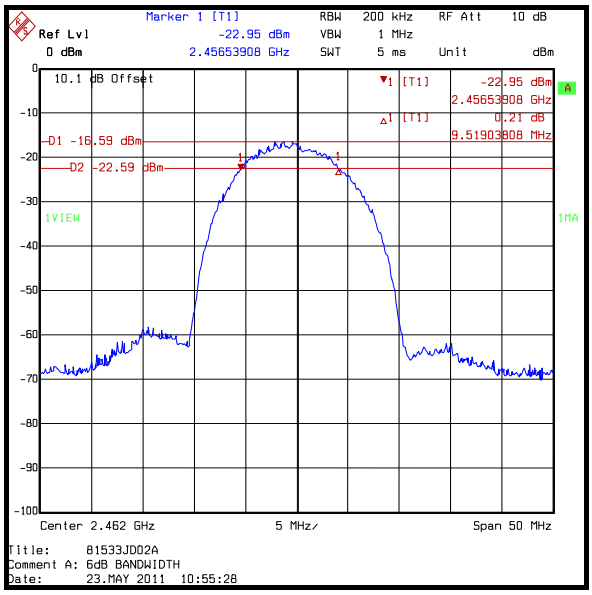
Results: 11 Mbps



Bottom channel



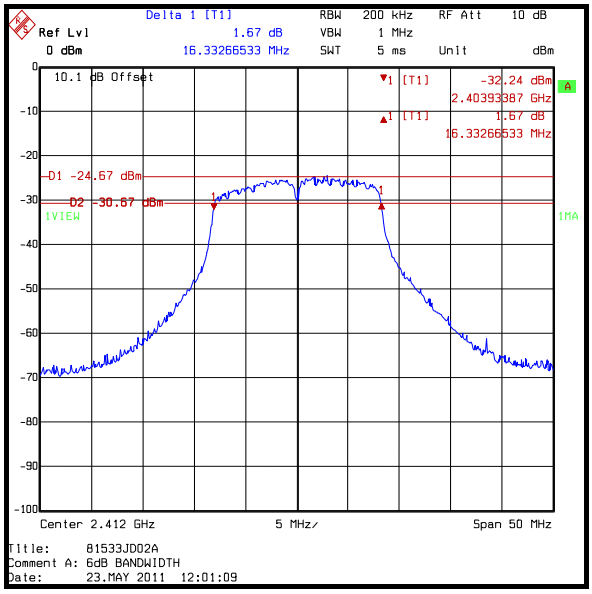
Middle channel



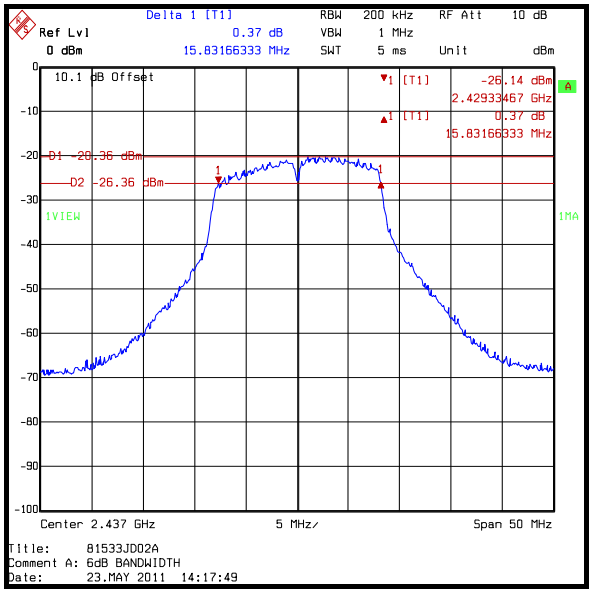
Top channel

Transmitter 6 dB Bandwidth (continued)

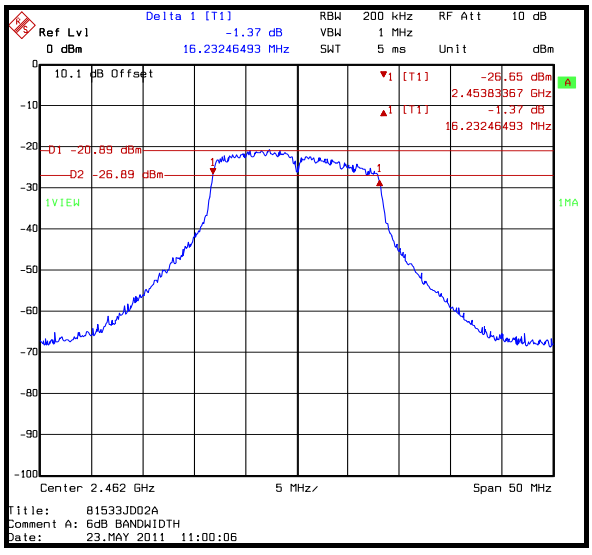
Results: 6 Mbps



Bottom channel



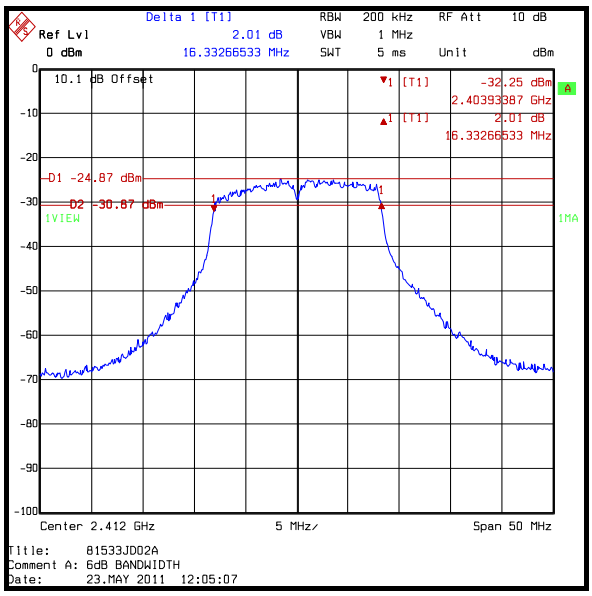
Middle channel



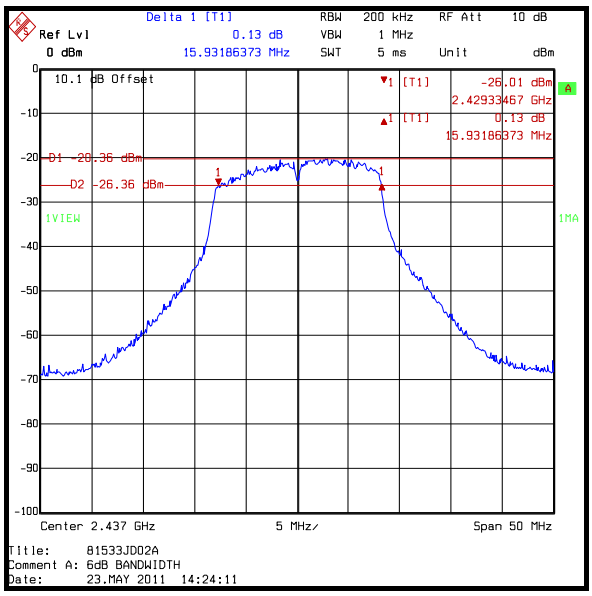
Top channel

Transmitter 6 dB Bandwidth (continued)

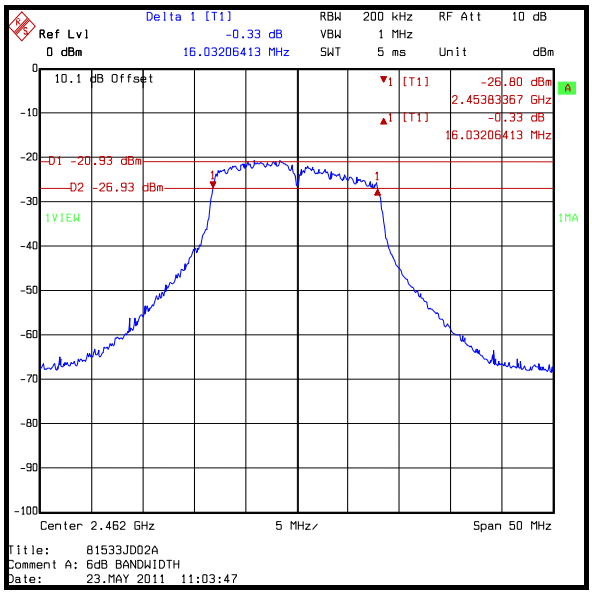
Results: 9 Mbps



Bottom channel



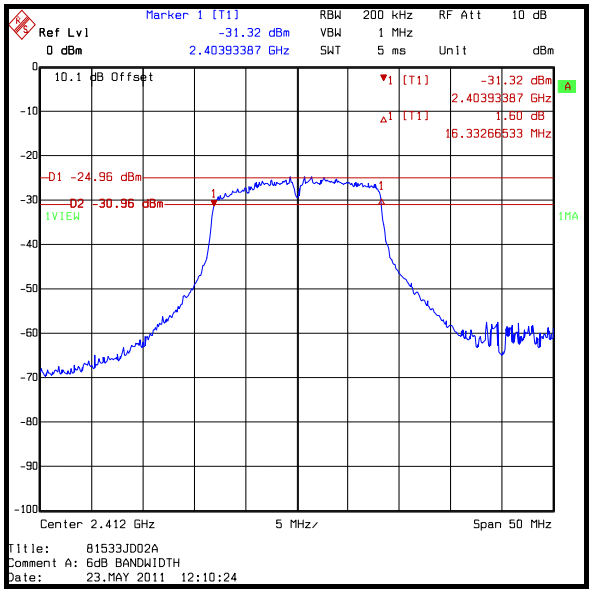
Middle channel



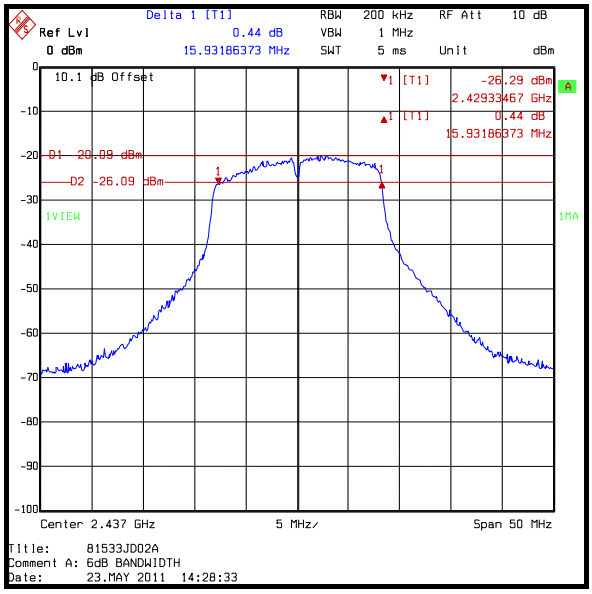
Top channel

Transmitter 6 dB Bandwidth (continued)

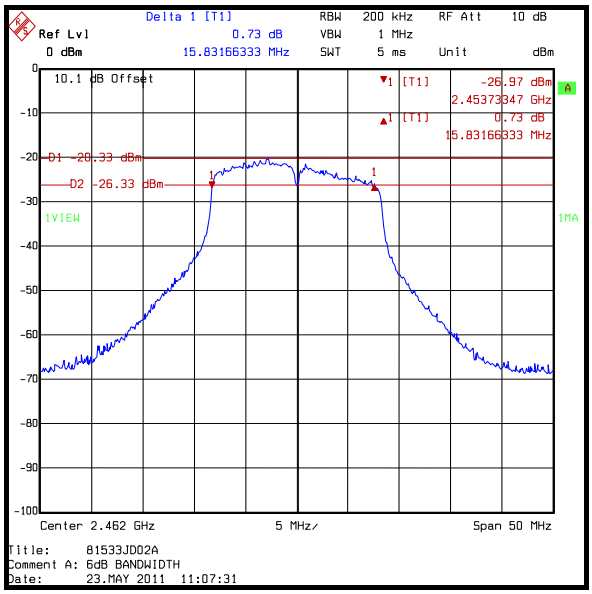
Results: 12 Mbps



Bottom channel



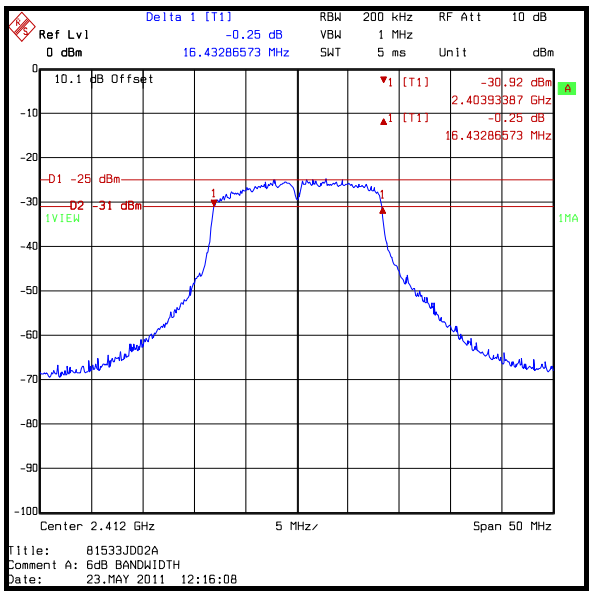
Middle channel



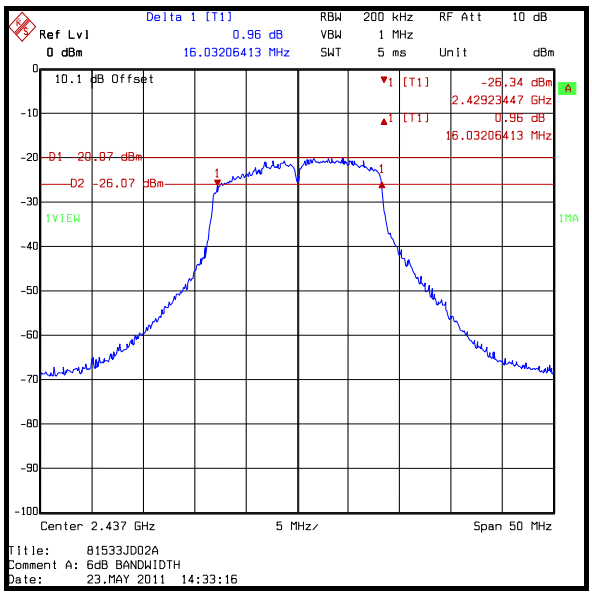
Top channel

Transmitter 6 dB Bandwidth (continued)

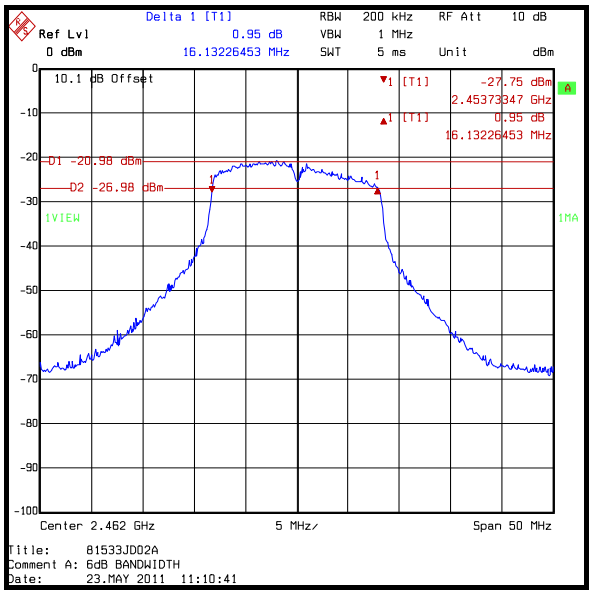
Results: 18 Mbps



Bottom channel



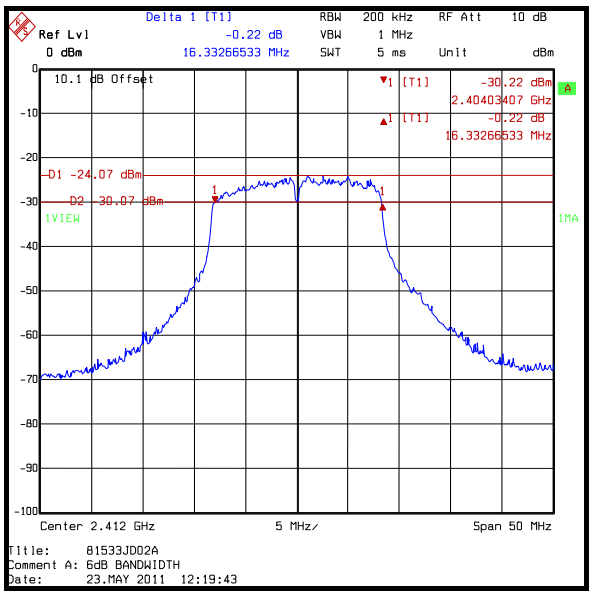
Middle channel



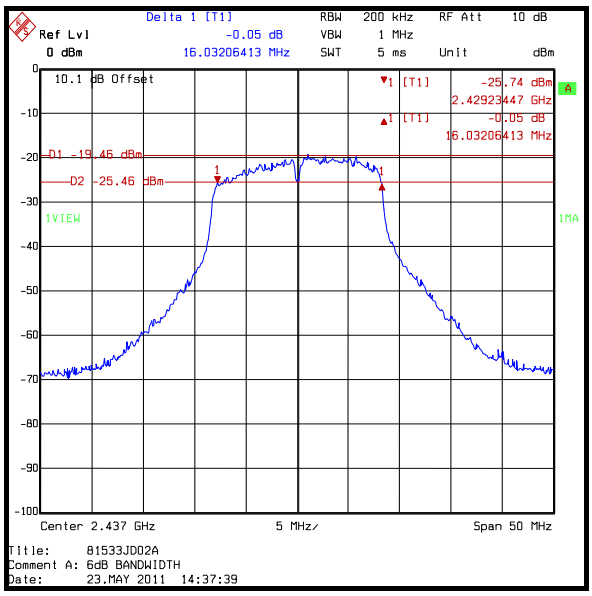
Top channel

Transmitter 6 dB Bandwidth (continued)

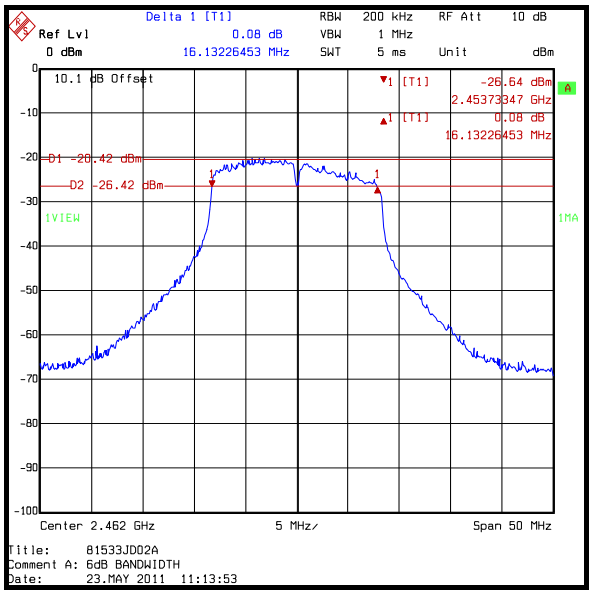
Results: 24 Mbps



Bottom channel



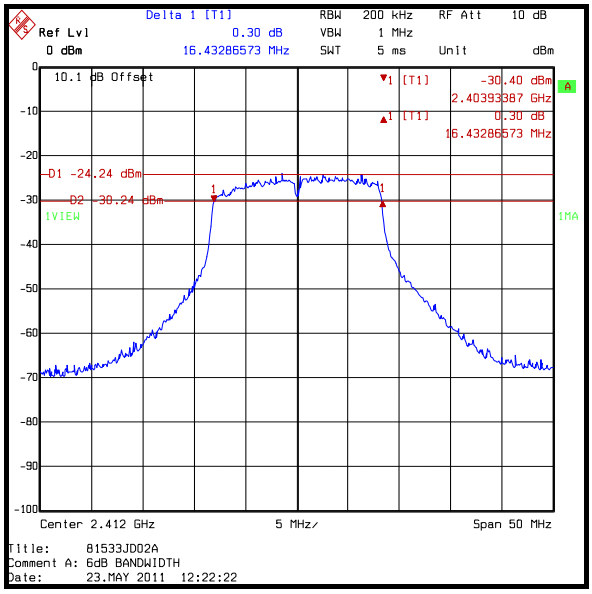
Middle channel



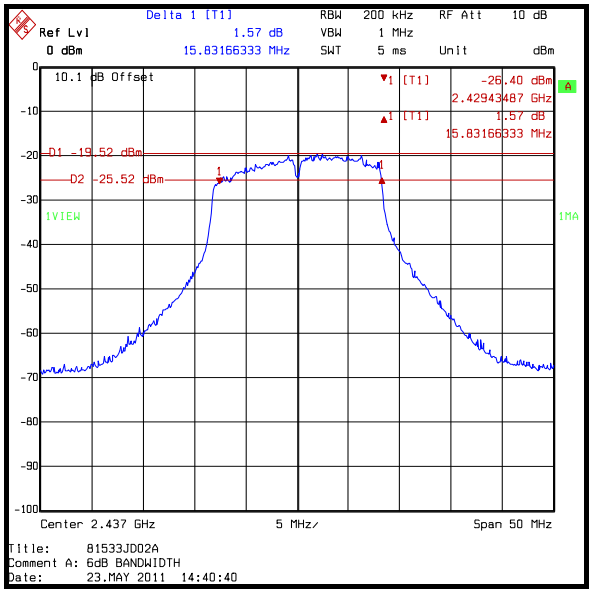
Top channel

Transmitter 6 dB Bandwidth (continued)

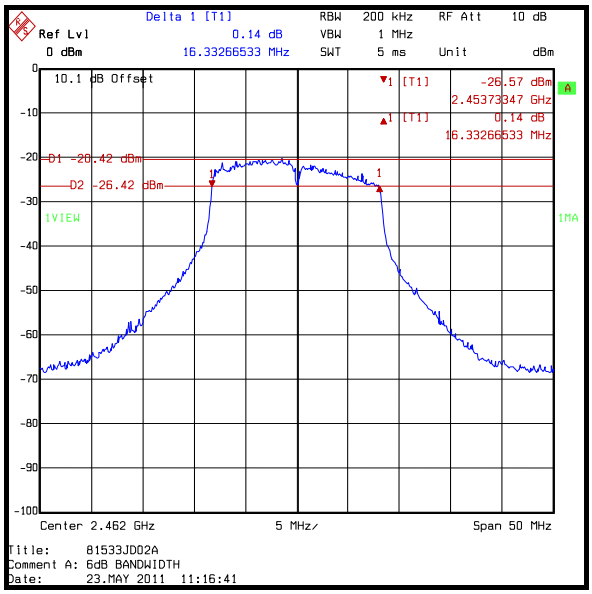
Results: 36 Mbps



Bottom channel



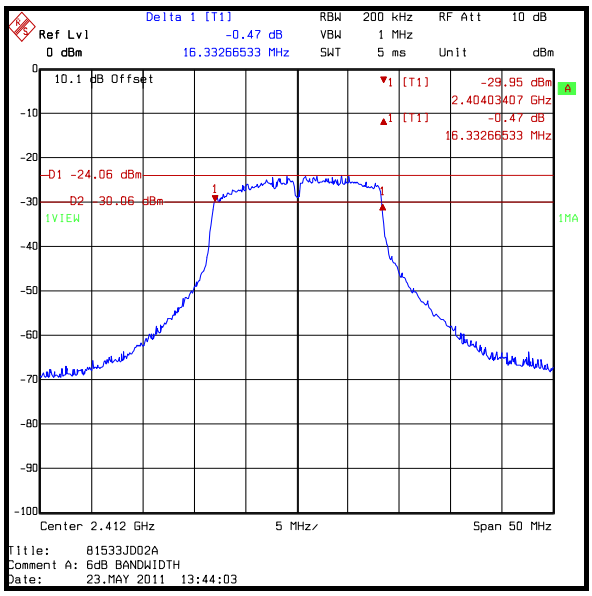
Middle channel



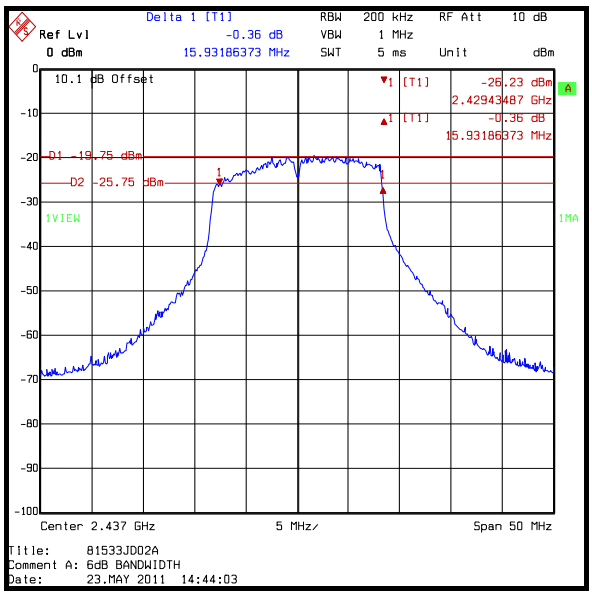
Top channel

Transmitter 6 dB Bandwidth (continued)

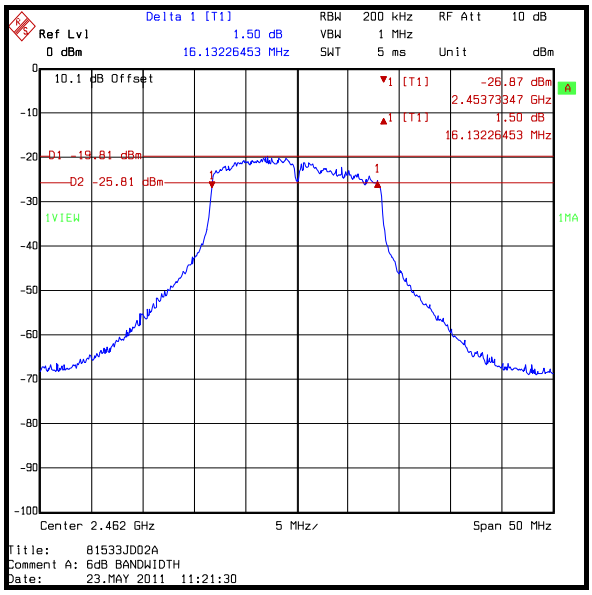
Results: 48 Mbps



Bottom channel



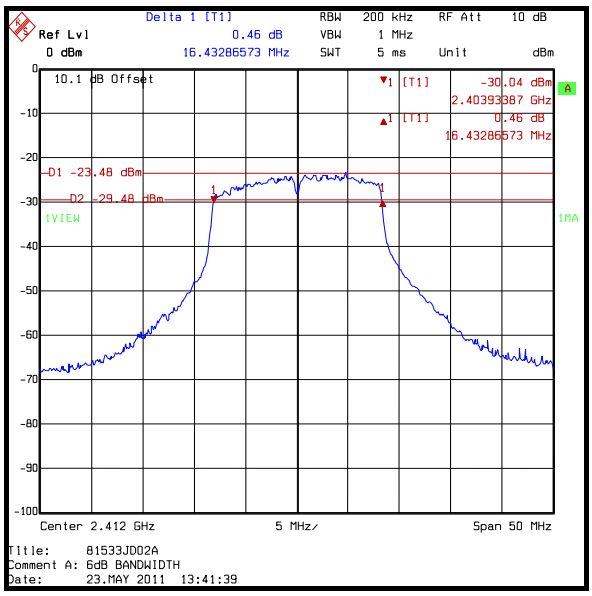
Middle channel



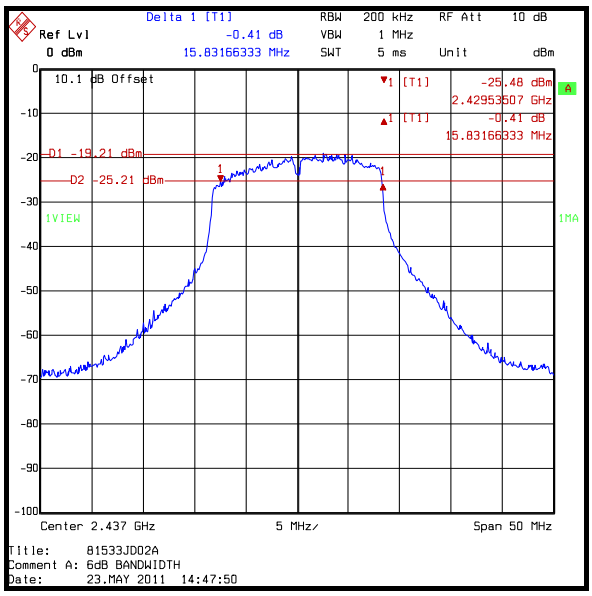
Top channel

Transmitter 6 dB Bandwidth (continued)

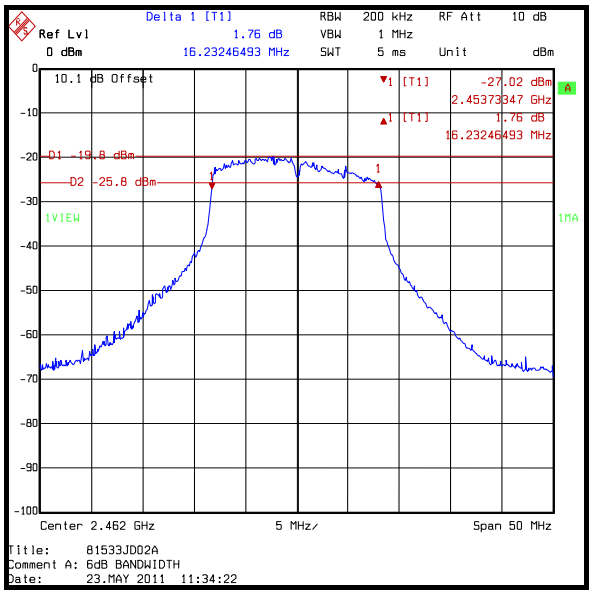
Results: 54 Mbps



Bottom channel



Middle channel



Top channel

5.2.4.1. Transmitter Power Spectral Density

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	26 May 2011
Test Sample IMEI:	356333040014099		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	21

Results: 2 Mbps

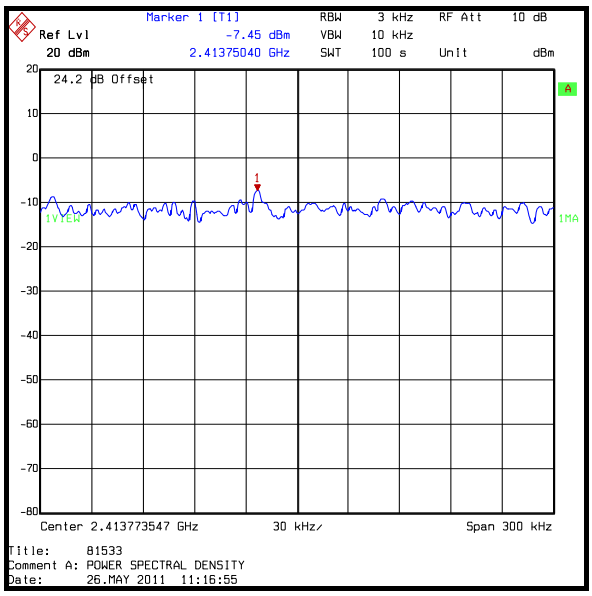
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-7.5	8.0	15.5	Complied
Middle	-6.4	8.0	14.4	Complied
Top	-6.3	8.0	14.3	Complied

Note(s):

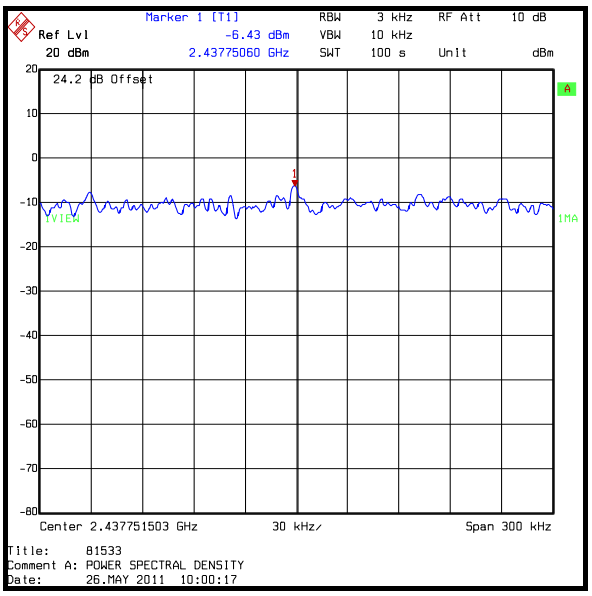
1. All supported modes were tested on the bottom, middle and top channels to determine the worst case configuration. The configuration that produced the highest levels is recorded in the table above.

Transmitter Power Spectral Density (continued)

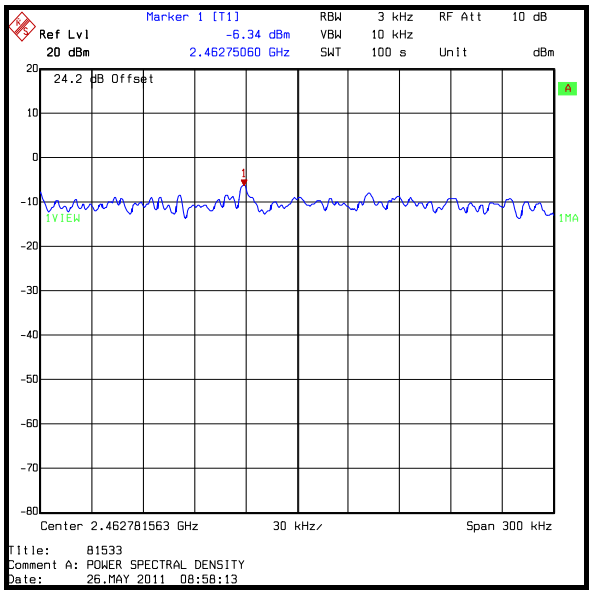
Results: 2 Mbps



Bottom channel



Middle channel



Top channel

5.2.5. Transmitter Maximum Peak Output Power

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	26 May 2011
Test Sample IMEI:	356333040014099		

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):	27
Relative Humidity (%):	21

Results: 1 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	19.3	30.0	10.7	Complied
Middle	19.6	30.0	10.4	Complied
Top	19.5	30.0	10.5	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	19.3	-2.3	17.0	36.0	19.0	Complied
Middle	19.6	-2.3	17.3	36.0	18.7	Complied
Top	19.5	-2.3	17.2	36.0	18.8	Complied

Transmitter Maximum Peak Output Power (continued)

Results: 9 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	22.5	30.0	7.5	Complied
Middle	22.5	30.0	7.5	Complied
Top	22.5	30.0	7.5	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	22.5	-2.3	20.2	36.0	20.2	Complied
Middle	22.5	-2.3	20.2	36.0	20.2	Complied
Top	22.5	-2.3	20.2	36.0	20.2	Complied

Results: 11 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	20.3	30.0	9.7	Complied
Middle	20.4	30.0	9.6	Complied
Top	20.4	30.0	9.6	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	20.3	-2.3	18.0	36.0	18.0	Complied
Middle	20.4	-2.3	18.1	36.0	17.9	Complied
Top	20.4	-2.3	18.1	36.0	17.9	Complied

Transmitter Maximum Peak Output Power (continued)

Results: 18 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	20.4	30.0	9.6	Complied
Middle	20.6	30.0	9.4	Complied
Top	20.6	30.0	9.4	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	20.4	-2.3	18.1	36.0	17.9	Complied
Middle	20.6	-2.3	18.3	36.0	17.7	Complied
Top	20.6	-2.3	18.3	36.0	17.7	Complied

Results: 48 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	21.0	30.0	9.0	Complied
Middle	21.3	30.0	8.7	Complied
Top	21.0	30.0	9.0	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.0	-2.3	18.7	36.0	17.3	Complied
Middle	21.3	-2.3	19.0	36.0	17.6	Complied
Top	21.0	-2.3	18.7	36.0	17.3	Complied

Transmitter Maximum Peak Output Power (continued)

Results: 54 Mbps

Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	20.9	30.0	9.1	Complied
Middle	21.1	30.0	8.9	Complied
Top	21.0	30.0	9.0	Complied

De Facto EIRP Limit Comparison

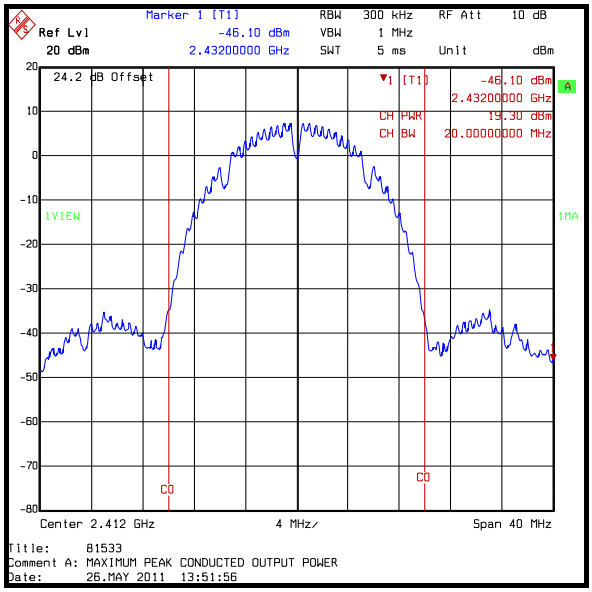
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	20.9	-2.3	18.6	36.0	17.4	Complied
Middle	21.1	-2.3	18.8	36.0	17.2	Complied
Top	21.0	-2.3	18.7	36.0	17.3	Complied

Note(s):

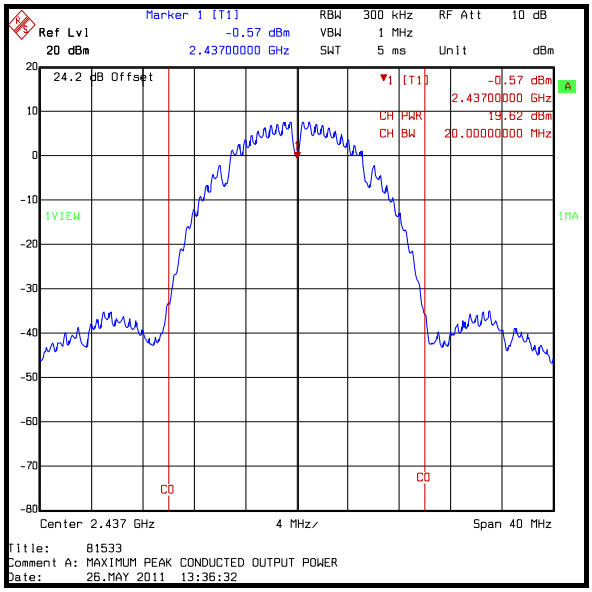
1. Power was measured using the channel power function on a spectrum analyser. The spectrum analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.
2. Each supported modulation type was tested at the highest data rate.

Transmitter Maximum Peak Output Power (continued)

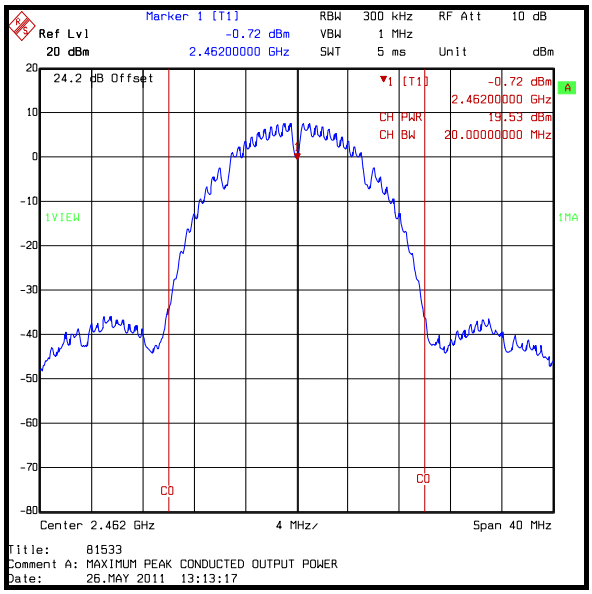
Results: 1 Mbps



Bottom channel



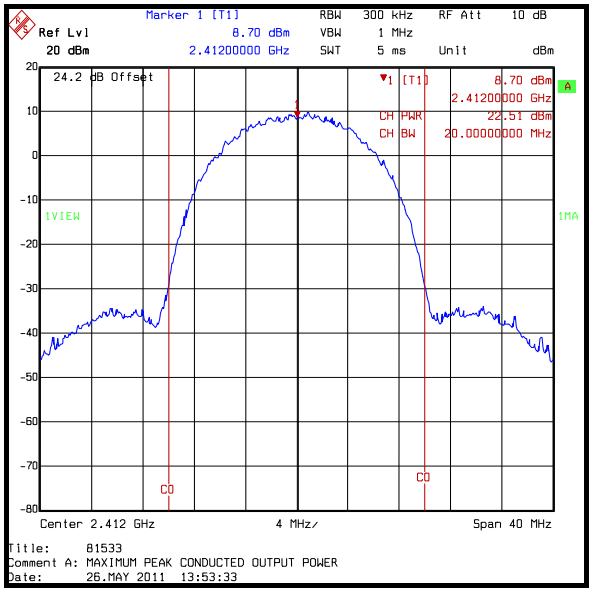
Middle channel



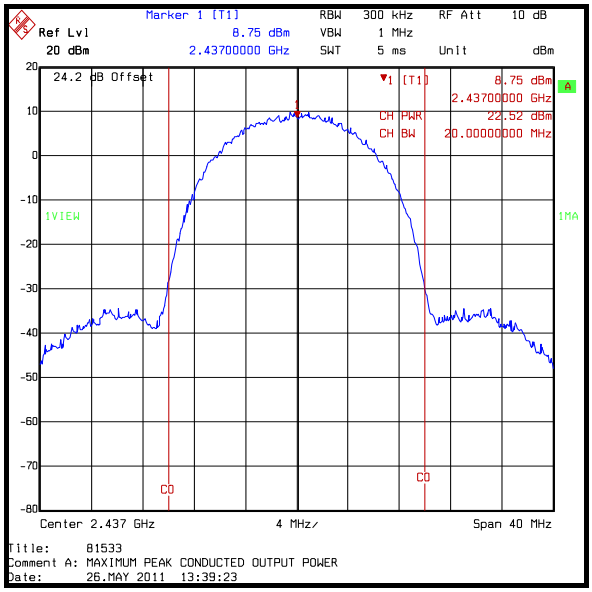
Top channel

Transmitter Maximum Peak Output Power (continued)

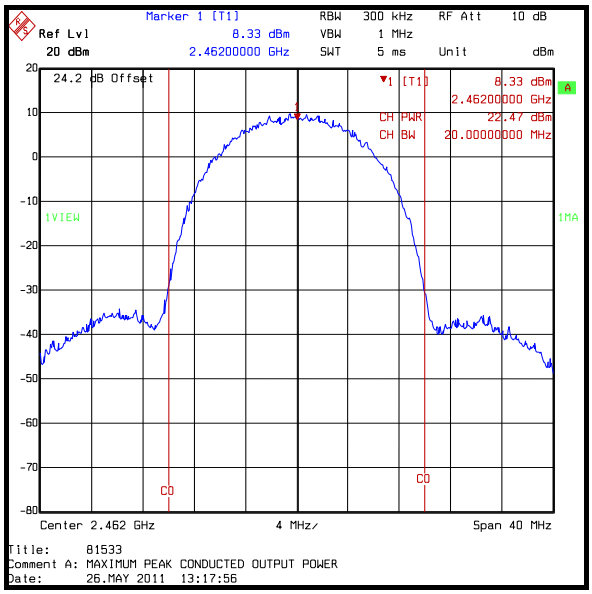
Results: 11 Mbps



Bottom channel



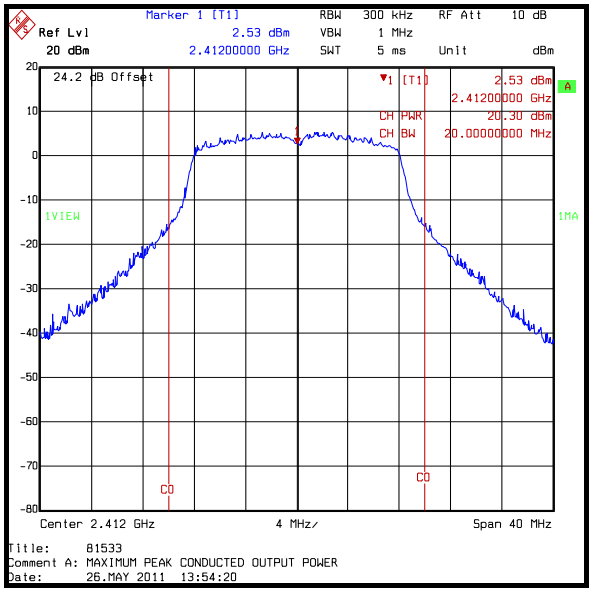
Middle channel



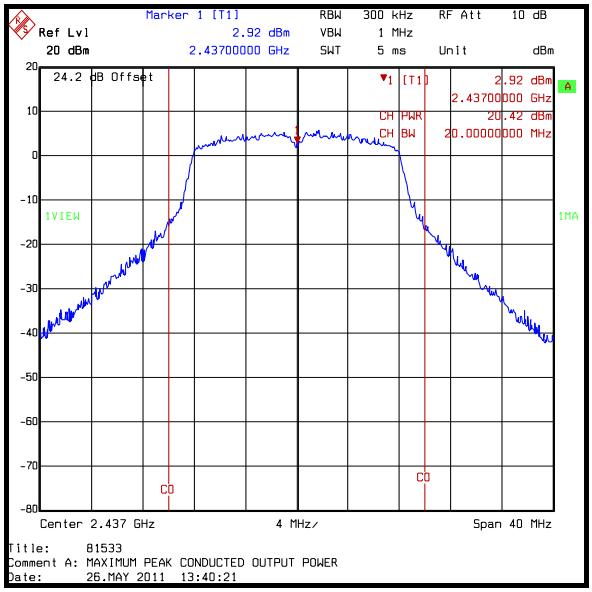
Top channel

Transmitter Maximum Peak Output Power (continued)

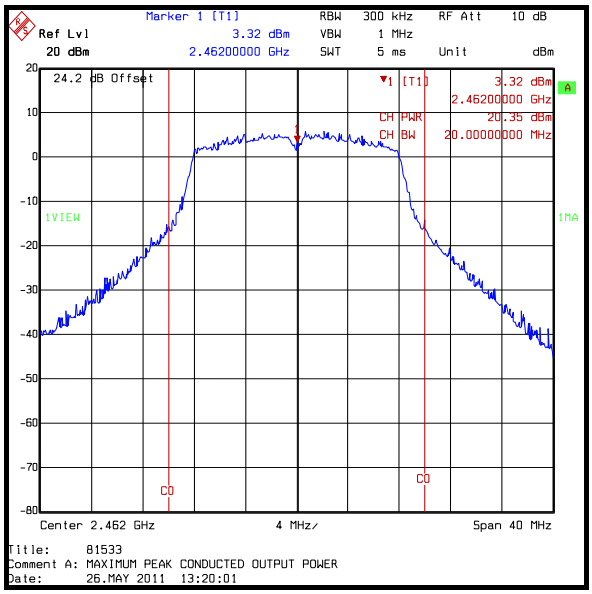
Results: 9 Mbps



Bottom channel



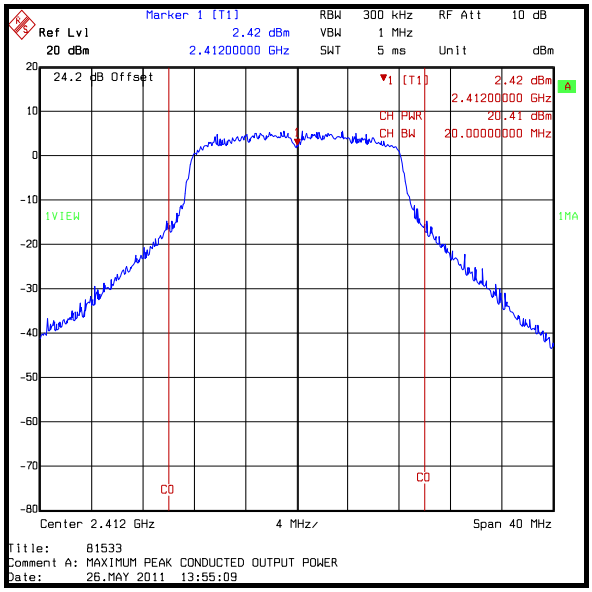
Middle channel



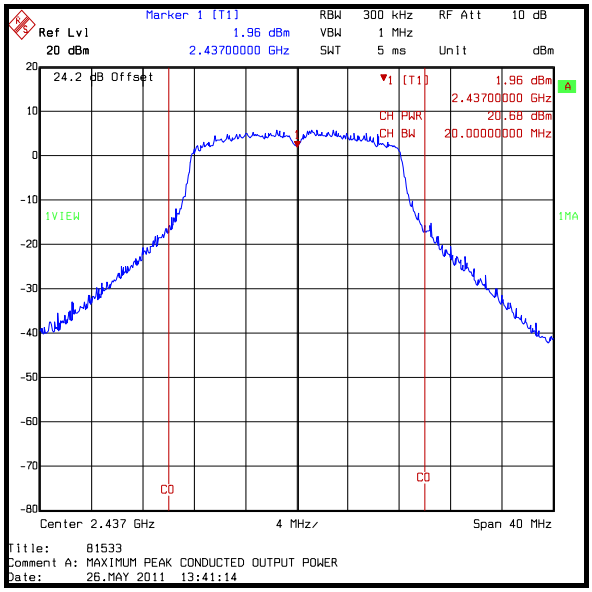
Top channel

Transmitter Maximum Peak Output Power (continued)

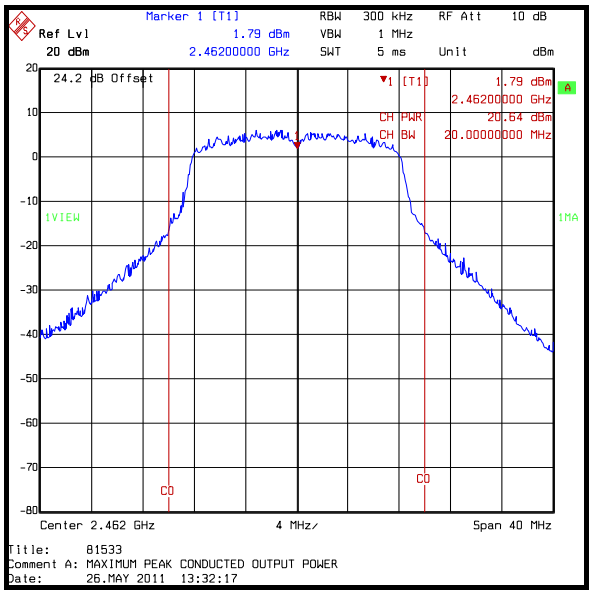
Results: 18 Mbps



Bottom channel



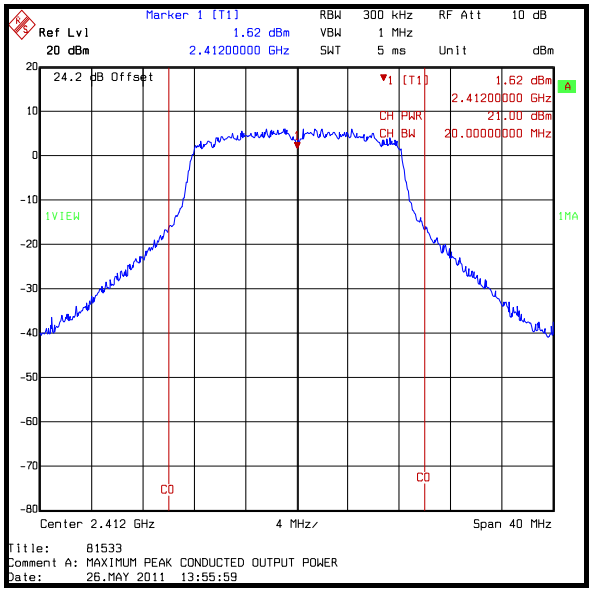
Middle channel



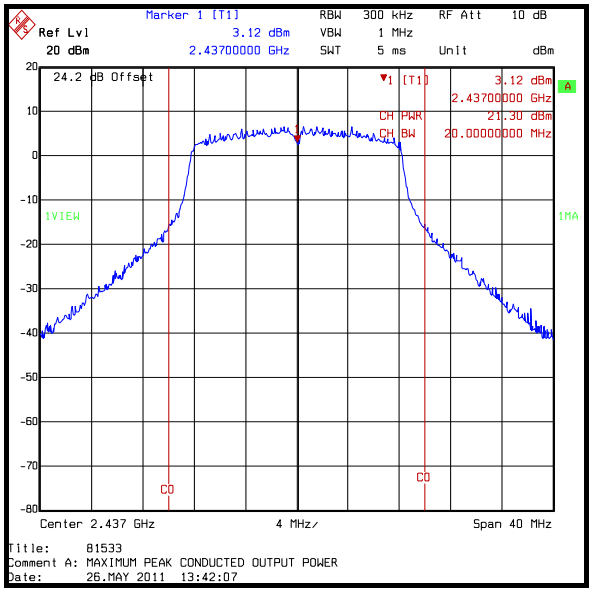
Top channel

Transmitter Maximum Peak Output Power (continued)

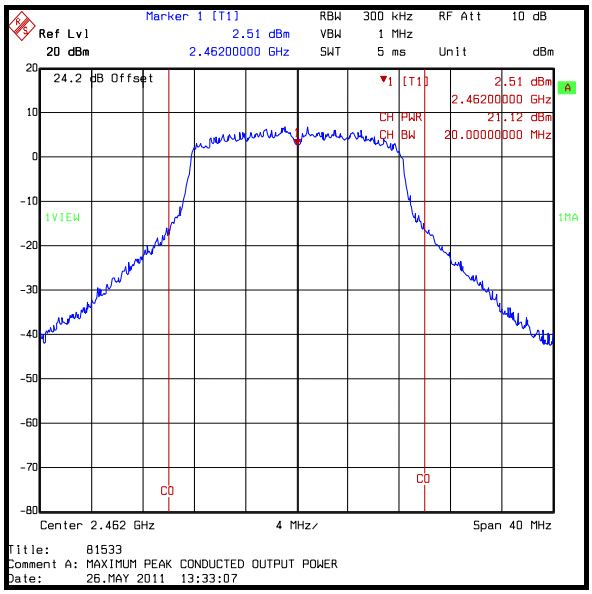
Results: 48 Mbps



Bottom channel



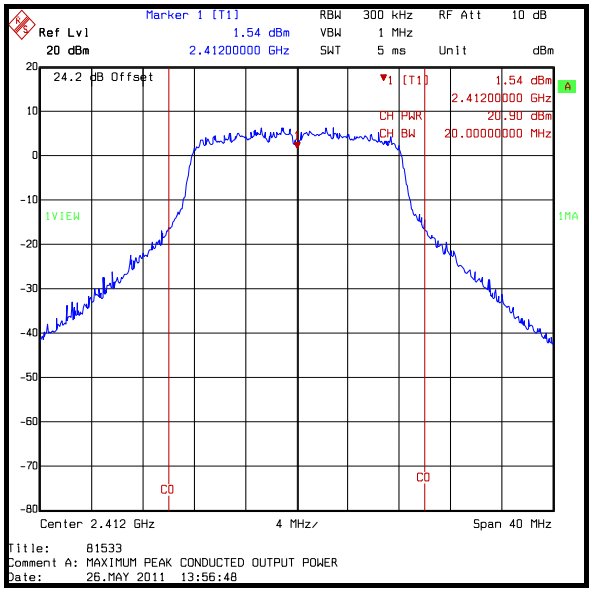
Middle channel



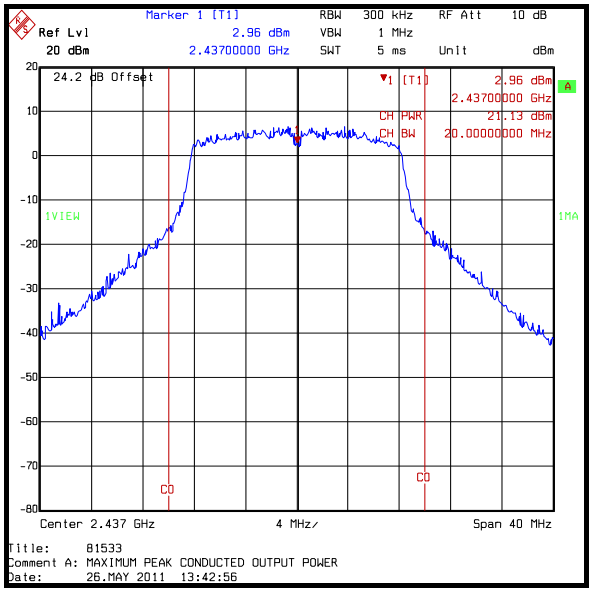
Top channel

Transmitter Maximum Peak Output Power (continued)

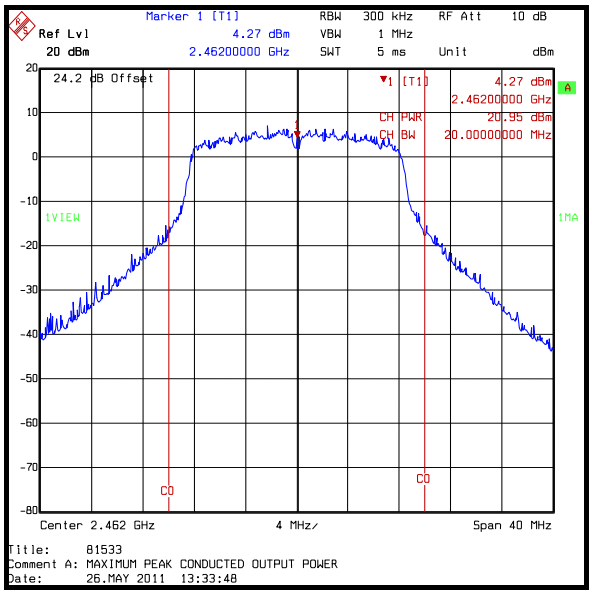
Results: 54 Mbps



Bottom channel



Middle channel



Top channel

5.2.6. Transmitter Average Conducted Output Power

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	24 May 2011
Test Sample IMEI:	356333040014099		

FCC Part:	15.247(b)(3)

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	20

Results:

Channel	Frequency (MHz)	Average Transmit Power (dBm)	Note
1	2412	15.5	802.11b (1 Mbps)
6	2437	15.7	
11	2462	15.6	
1	2412	15.3	802.11b (11 Mbps)
6	2437	15.5	
11	2462	15.5	
1	2412	13.1	802.11g (6 Mbps)
6	2437	13.6	
11	2462	13.6	
1	2412	12.9	802.11g (54 Mbps)
6	2437	13.1	
11	2462	13.1	

Note(s):

1. Conducted power measurements were performed to support SAR tests.

5.2.7. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	18 May 2011
Test Sample IMEI:	356333040014073		

FCC Part:	15.247(d) & 15.209(a)
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):	30
Relative Humidity (%):	27

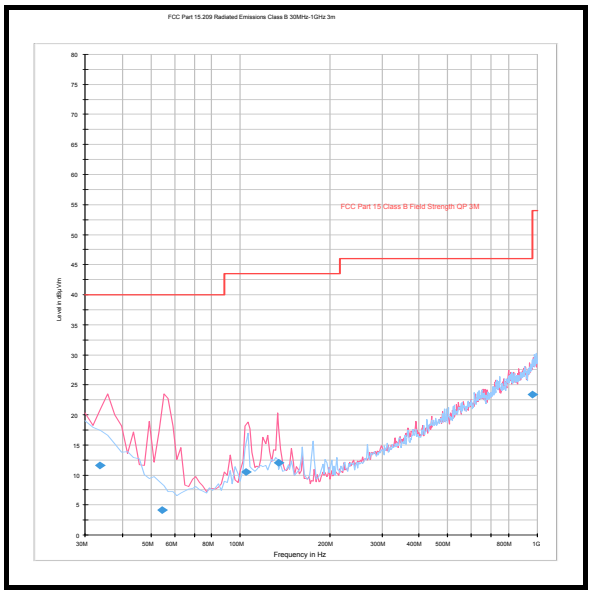
Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
33.605	Vertical	11.6	40.0	28.4	Complied
54.487	Vertical	4.1	40.0	35.9	Complied
104.701	Vertical	10.5	43.5	33.0	Complied
134.310	Vertical	12.0	43.5	31.5	Complied
959.000	Horizontal	23.3	46.0	22.7	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. 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.
3. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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:

Test Engineer:	Patrick Jones	**Test Date:**	13 May 2011 & 16 May 2011
Test Sample IMEI:	356333040014073		

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

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

Results: Peak

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
3873.747	57.0	74.0	17.0	Complied

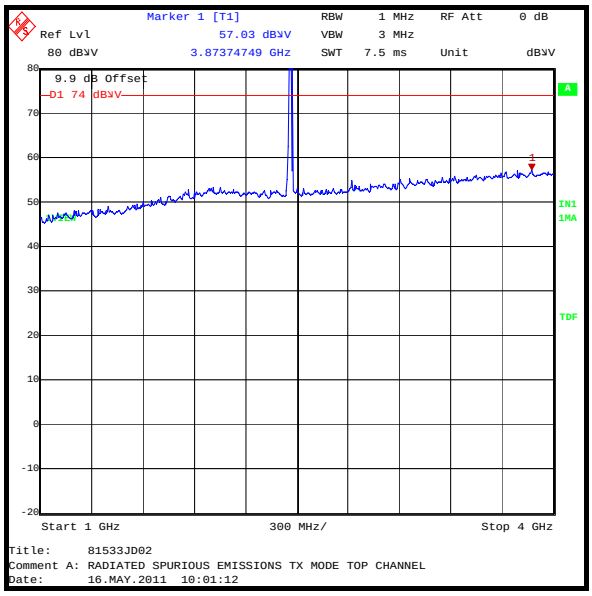
Results: Average

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
3909.820	47.3	54.0	6.7	Complied

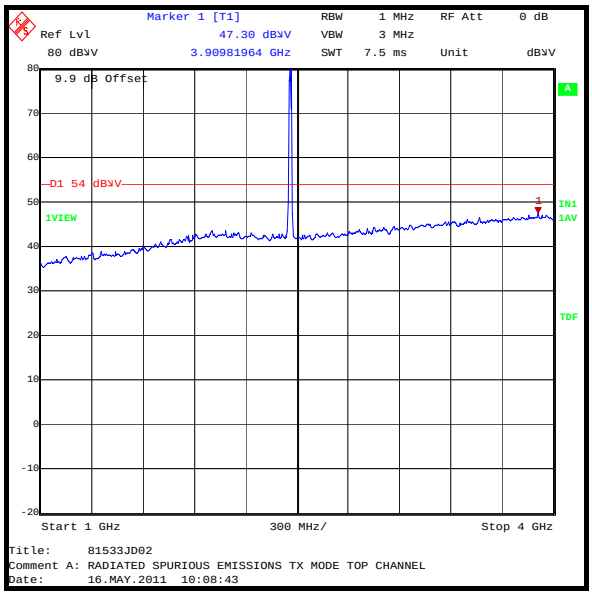
Note(s):

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.
3. 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 table above.
4. The emission shown at 2462 MHz on the 1 GHz to 4 GHz plot is the EUT fundamental.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

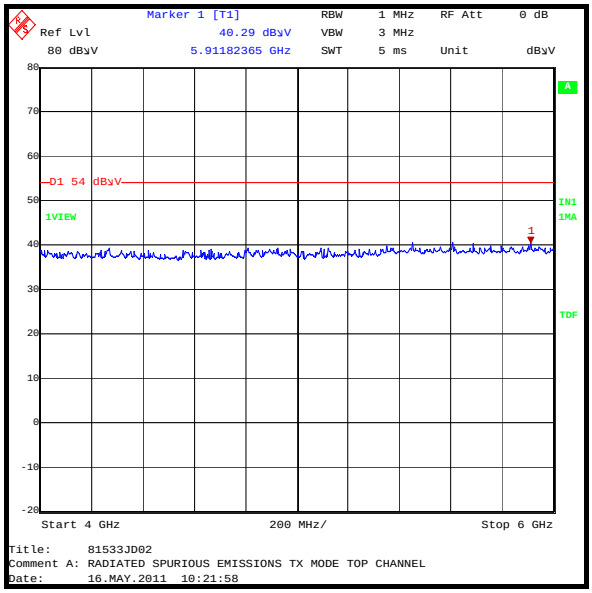
Transmitter Radiated Emissions (continued)

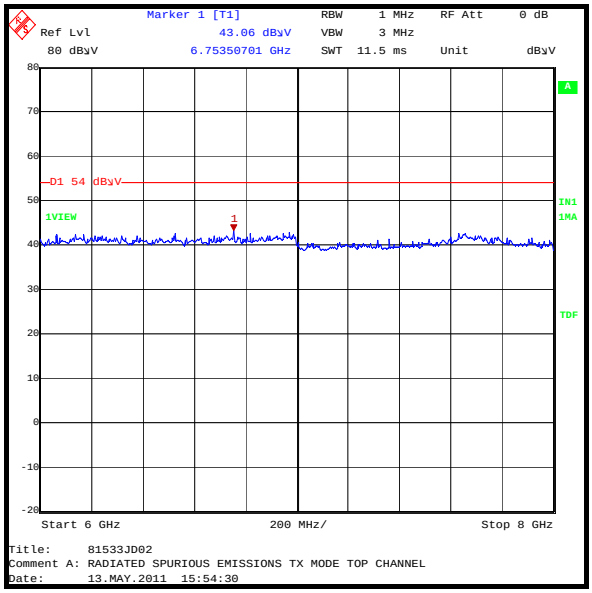


Peak detector

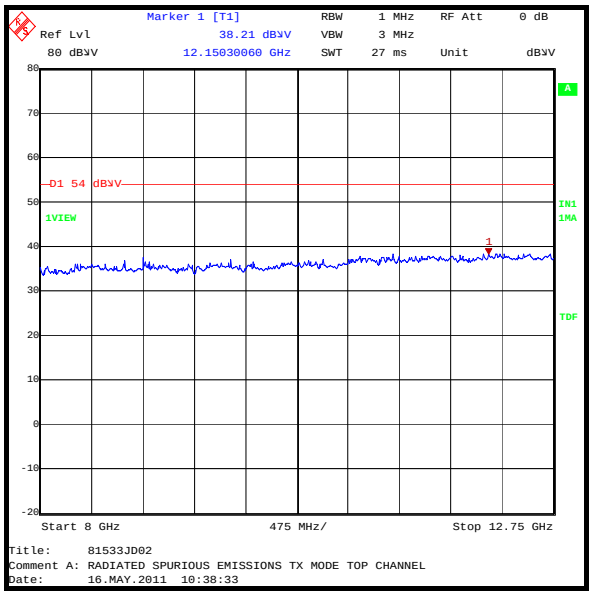


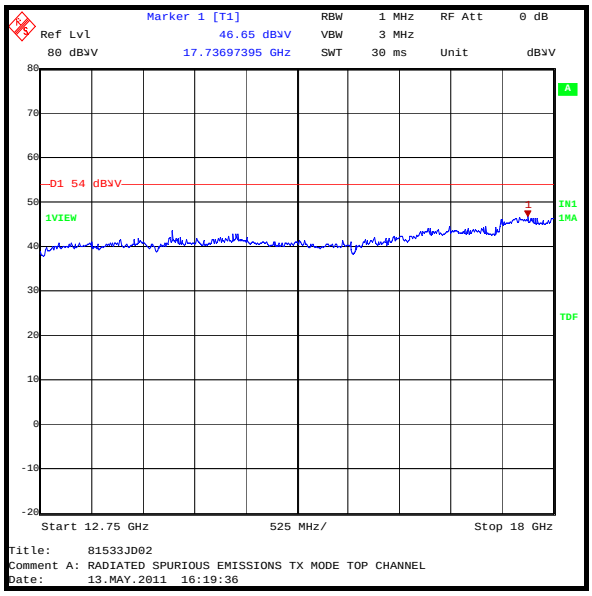
Average detector

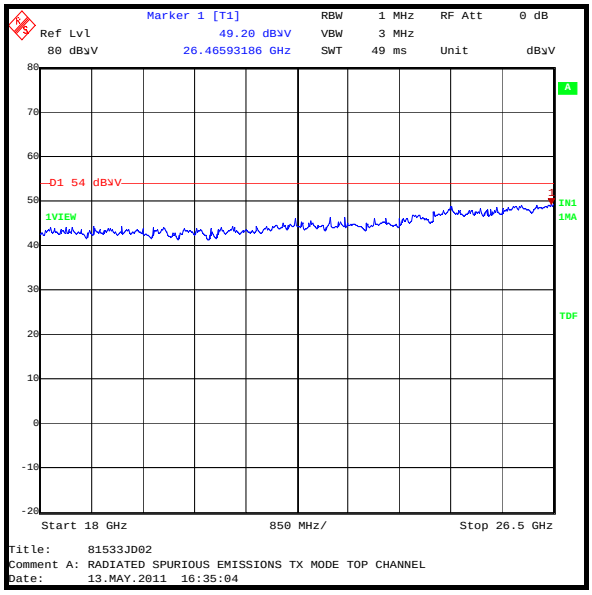




Transmitter Radiated Emissions (continued)







5.2.8. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	20 May 2011
Test Sample IMEI:	356333040014073		

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):	28
Relative Humidity (%):	19

Results – Peak / 1 Mbps:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400	51.2	78.1*	26.9	Complied
2483.5	55.7	74.0	18.3	Complied

Results – Average / 1 Mbps:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	44.3	54.0	9.7	Complied

Results – Peak / 9 Mbps:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400	61.5	74.2*	12.7	Complied
2483.5	58.9	74.0	15.1	Complied

Results – Average / 9 Mbps:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	45.4	54.0	8.6	Complied

Transmitter Band Edge Radiated Emissions (continued)

Results – Peak / 11 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	53.9	77.1*	23.2	Complied
2483.5	57.4	74.0	16.6	Complied

Results – Average / 11 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	44.5	54.0	9.5	Complied

Results – Peak / 18 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	63.6	74.0*	10.4	Complied
2483.5	56.4	74.0	17.6	Complied

Results – Average / 18 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	45.4	54.0	8.8	Complied

Transmitter Band Edge Radiated Emissions (continued)

Results – Peak / 48 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	61.2	74.0*	12.8	Complied
2483.5	58.0	74.0	16.0	Complied

Results – Average / 48 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	45.3	54.0	8.7	Complied

Results – Peak / 54 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	62.1	74.0*	11.9	Complied
2483.5	57.1	74.0	16.9	Complied

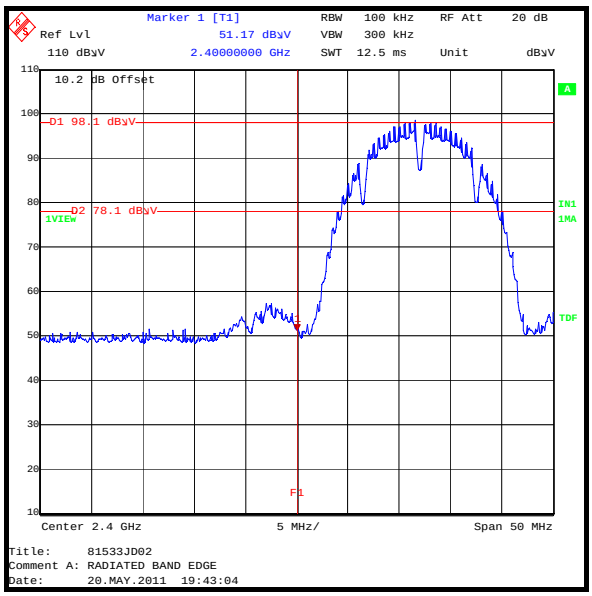
Results – Average / 54 Mbps:

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	45.2	54.0	8.8	Complied

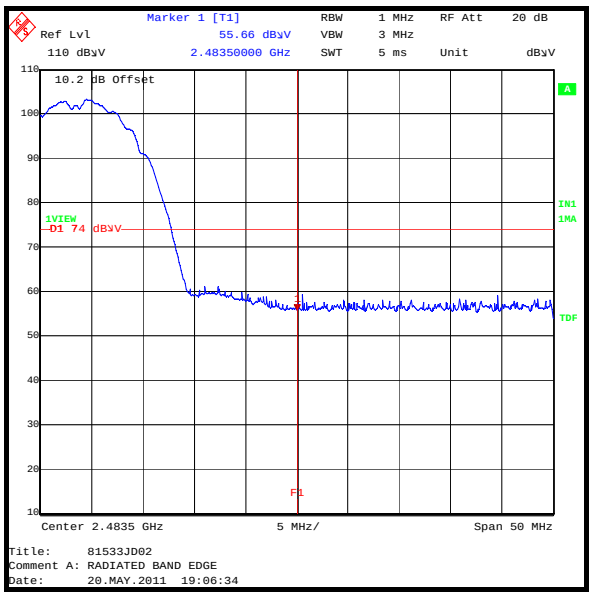
**-20 dBc limit*

Transmitter Band Edge Radiated Emissions (continued)

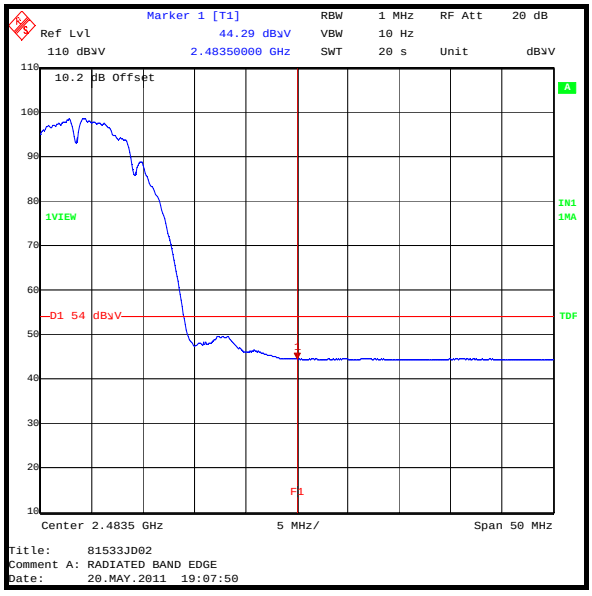
Results – 1 Mbps:



Lower Band Edge Peak Measurement



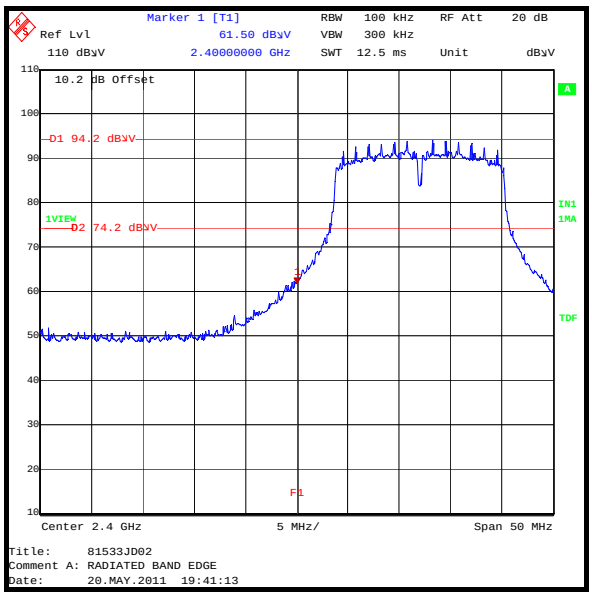
Upper Band Edge Peak Measurement



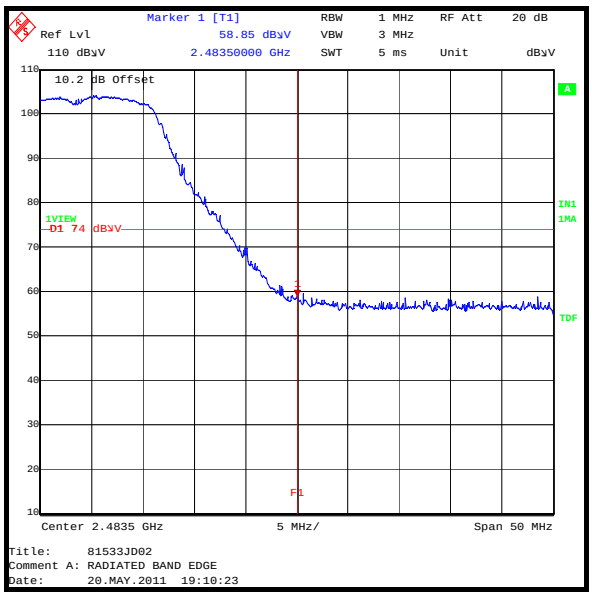
Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

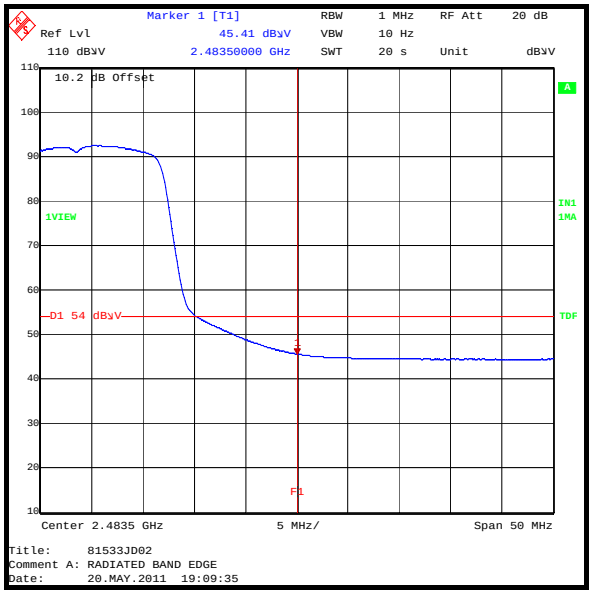
Results – 9 Mbps:



Lower Band Edge Peak Measurement



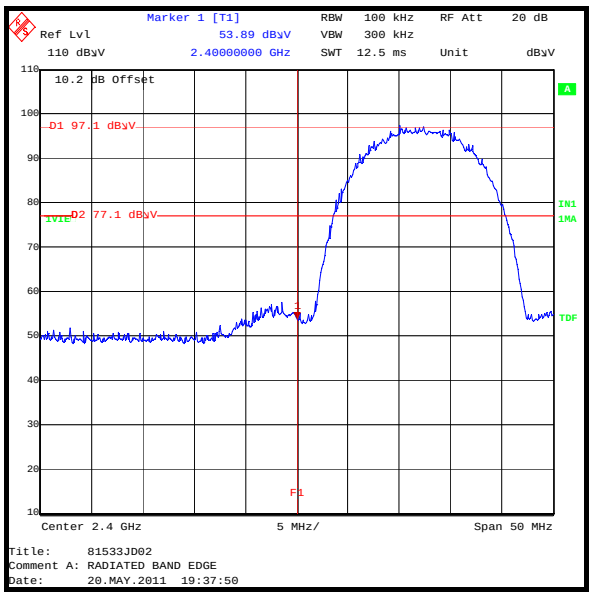
Upper Band Edge Peak Measurement



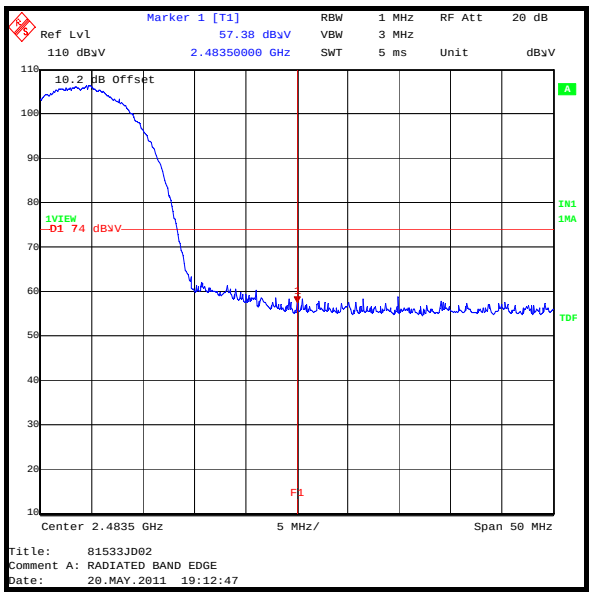
Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

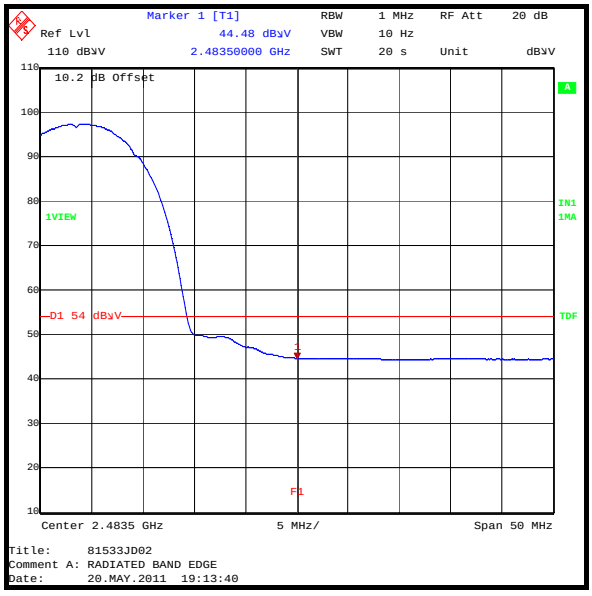
Results – 11 Mbps:



Lower Band Edge Peak Measurement



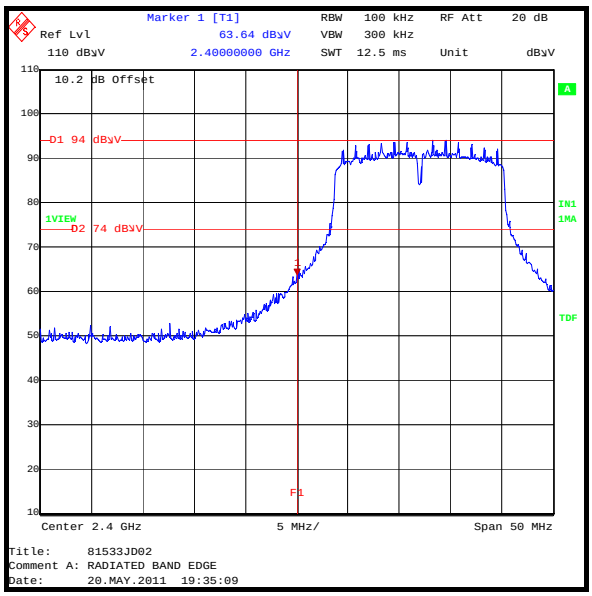
Upper Band Edge Peak Measurement



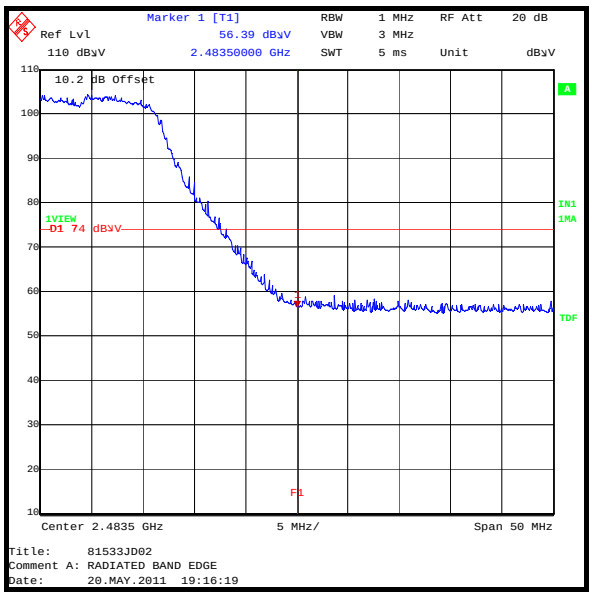
Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

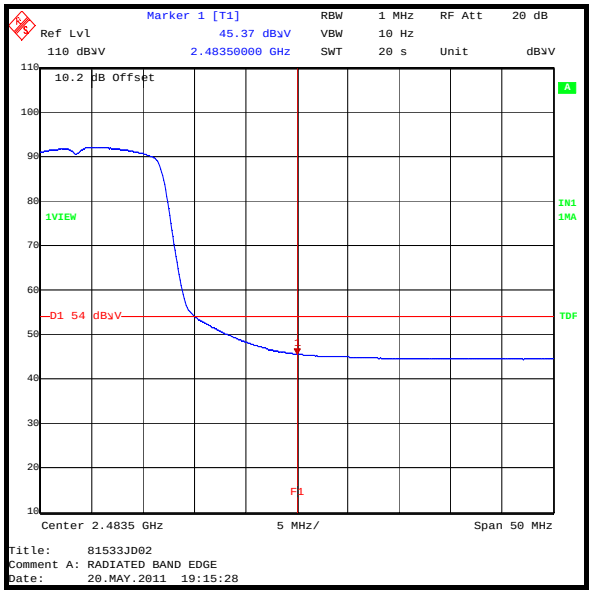
Results – 18 Mbps:



Lower Band Edge Peak Measurement



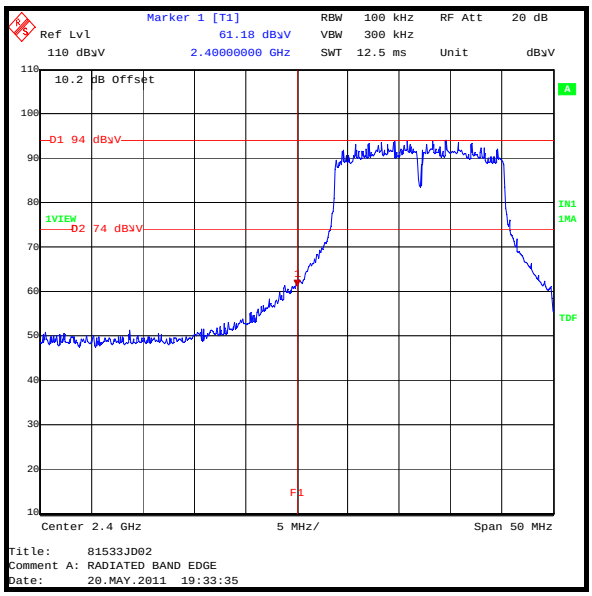
Upper Band Edge Peak Measurement



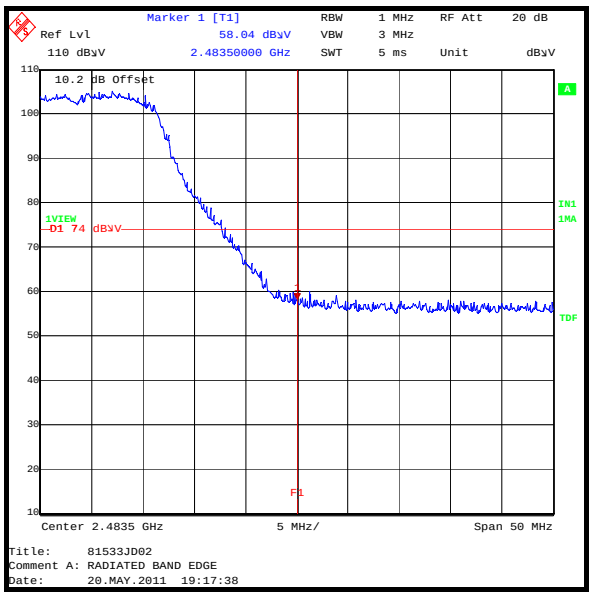
Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

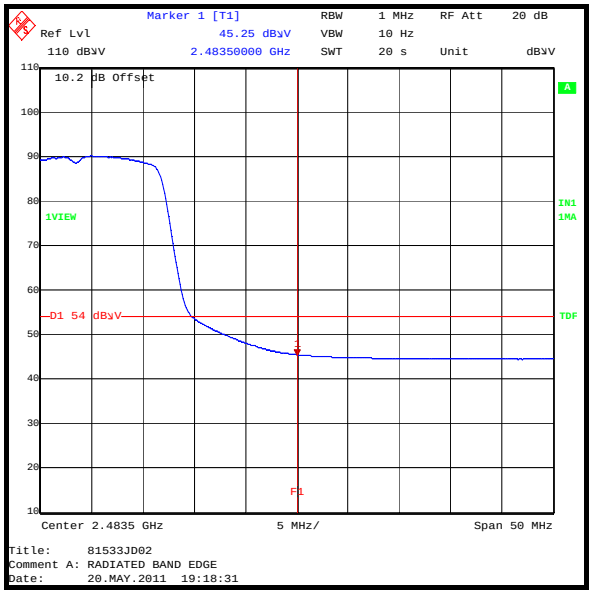
Results – 48 Mbps:



Lower Band Edge Peak Measurement



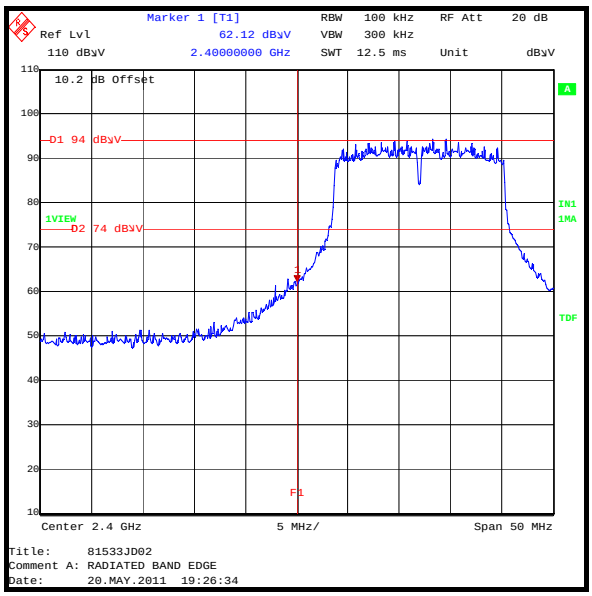
Upper Band Edge Peak Measurement



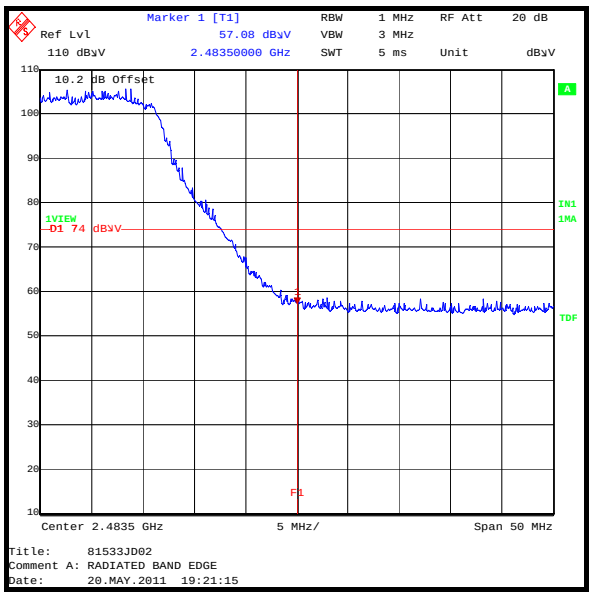
Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

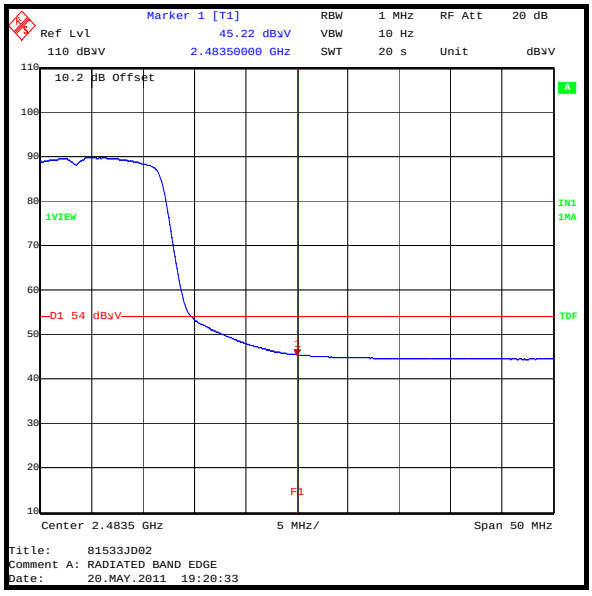
Results – 54 Mbps:



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)
A1391	Attenuator	Huber + Suhner	757987	6810.17.B	09 Feb 2012	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	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A1996	Attenuator	Huber + Suhner	6810.17.B	301749	09 Feb 2012	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	18 Mar 2012	12
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
A427	Antenna	Flann Microwave	14240-20	150	21 Nov 2013	36
A436	Antenna	Flann Microwave	20240-20	330	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Jun 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Jun 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	17 May 2012	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Sep 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 May 2012	12
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	04 May 2012	12

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