TEST REPORT

Test Report No. : UL-RPT-RP10014948JD15A V2.0

Manufacturer	:	Sony Mobile Communications AB
Type No.	:	PM-0450-BV
FCC ID	:	PY7PM-0450
Technology	:	WLAN
Test Standard(s)	:	FCC Parts 15.207, 15.209(a), 15.403(i) & 15.407

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

Date of Issue: 17 July 2013

Checked by:

Sarah Williams
WiSE Laboratory Engineer

Issued by :

pp
John Newell
Group Quality Manager, WiSE
Basingstoke,
UL VS LTD

0644

This laboratory is accredited by UKAS. The tests reported herein have been performed in accordance with its' terms of accreditation.

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1. Customer Information

Company Name:	Sony Mobile Communications AB
Address:	Nya Vattentornet Lund SE-221 88 Sweden

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407 and 47CFR15.403
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) – Sections 15.403 and 15.407
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Site Registration:	FCC: 209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	26 June 2013 to 11 July 2013

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	✓
Part 15.403(i)	Transmitter 26 dB Emission Bandwidth	✓
Part 15.35(c)	Transmitter Duty Cycle	Note 1
Part 15.407(a)(1)	Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band)	✓
Part 15.407(a)(2)	Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)	✓
Part 15.407(a)(3)	Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band)	✓
Part 15.407(a)(1)	Transmitter Peak Power Spectral Density (5.15-5.25 GHz band)	✓
Part 15.407(a)(2)	Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)	✓
Part 15.407(a)(3)	Transmitter Peak Power Spectral Density (5.725-5.85 GHz band)	✓
Part 15.407(a)(6)	Transmitter Peak Excursion	✓
Part 15.407(b)/ 15.209(a)	Transmitter Out of Band Radiated Emissions	✓
Part 15.407(b)/ 15.209(a)	Transmitter Band Edge Radiated Emissions	✓
Part 15.407(g)	Transmitter Frequency Stability (Temperature & Voltage Variation)	Note 2
Part 15.407(h)(1)	Transmitter Power Control	Note 3
Key to Results ✓ = Complied ✗ = Did not comply		

Note(s):

1. The measurement was performed to assist in the calculation of the level of average output power, power spectral density, peak excursion and emissions as the EUT employs pulsed operation.
2. Frequency stability is better than 20 ppm which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.
3. Transmit Power Control was not tested as the maximum EIRP is less than 500 mW (27 dBm).

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
Reference:	KDB 789033 D01 v01r03 April 8, 2013
Title:	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E
Reference:	KDB 644545 D02 v01 6/7/2012
Title:	Alternative Guidance for IEEE 802.11ac and Pre-ac Device Emissions Testing

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 specifications identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Sony
IMEI Number:	004402451217420 *(Radiated sample #1)*
Serial Number:	CB5124TU17
Hardware Version Number:	AP2
Software Version Number:	14.1.G.184
FCC ID:	PY7PM-0450

Brand Name:	Sony
IMEI Number:	004402451217339 *(Radiated sample #2)*
Serial Number:	CB5124TU2L
Hardware Version Number:	AP2
Software Version Number:	14.1.G.184
FCC ID:	PY7PM-0450

Brand Name:	Sony
IMEI Number:	004402451215499 *(Conducted sample)*
Serial Number:	CB5124TU0Q
Hardware Version Number:	AP2
Software Version Number:	14.1.G.184
FCC ID:	PY7PM-0450

Brand Name:	Sony
Description:	AC Charger
Model Name or Number:	EP880

Brand Name:	Generic
Description:	MHL Cable
Model Name or Number:	Not marked or stated

Brand Name:	Sony
Description:	MHL Adaptor
Model Name or Number:	IM750

Identification of Equipment Under Test (EUT) (continued)

Brand Name:	Sony
Description:	Magnetic Plug
Model Name or Number:	EC21

Brand Name:	Sony
Description:	USB cable
Model Name or Number:	EC801

Brand Name:	Sony
Description:	PHF
Model Name or Number:	MH750

3.2. Description of EUT

The equipment under test (EUT) is a model of GSM/UMTS/LTE mobile phone with integrated antenna and inbuilt Li-Polymer battery.
The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD bands 1/2/4/5/8 and LTE FDD bands 1/2/3/4/5/7/8/20. It also supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33 too. The HSDPA and HSUPA features are also supported. It has MP3, camera, FM radio, USB memory, GPS receiver, NFC, Mobile High-Definition Link (MHL), Bluetooth (EDR and Bluetooth 4.0), WLAN (802.11 a/b/g/n/ac) and Wi-Fi hotspot functions.
The EUT supports DFS as a Client without Radar Detection.

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 802.11a,n,ac) / U-NII		
Type of Unit:	Transceiver		
Modulation:	BPSK, QPSK, 16QAM & 64QAM		
Data rates:	802.11a	6, 9, 12, 18, 24, 36 ,48 & 54 Mbps	
	802.11n HT20	MCS0 to MCS7 (1 spatial stream) GI = 800 ns or 400 ns Greenfield & Mixed modes	
	802.11n HT40	MCS0 to MCS7 (1 spatial stream) GI = 800 ns or 400 ns Greenfield & Mixed modes	
	802.11ac VHT20	MCS0 to MCS7 (1 spatial stream) GI = 800 ns or 400 ns Greenfield & Mixed modes	
	802.11ac VHT40	MCS0 to MCS7 (1 spatial stream) GI = 800 ns or 400 ns Greenfield & Mixed modes	
	802.11ac VHT80	MCS0 to MCS7 (1 spatial stream) GI = 800 ns or 400 ns Greenfield & Mixed modes	
Power Supply Requirement(s):	Nominal	3.8 VDC	
Antenna Gains:	5.15 to 5.35 GHz	-1.2 dBi	
	5.47 to 5.725 GHz	-0.6 dBi	
	5.725 to 5.85 GHz	-2.8 dBi	
Maximum Conducted Output Power:	20 MHz	11.7 dBm	
	40 MHz	9.7 dBm	
	80 MHz	9.0 dBm	
Channel Spacing:	20 MHz		
Transmit Frequency Band:	5150 MHz to 5250 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	36	5180
	Middle	40	5200
	Top	48	5240
Transmit Frequency Band:	5250 MHz to 5350 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	52	5260
	Middle	56	5280
	Top	64	5320

Additional Information Related to Testing (continued)

Transmit Frequency Band:	5470 MHz to 5725 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	100	5500
	Middle	116	5580
	Top	140	5700
Transmit Frequency Band:	5725 MHz to 5850 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	149	5745
	Middle	157	5785
	Top	165	5825
Channel Spacing:	40 MHz		
Transmit Frequency Band:	5150 MHz to 5250 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	38	5190
	Top	46	5230
Transmit Frequency Band:	5250 MHz to 5350 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	54	5270
	Top	62	5310
Transmit Frequency Band:	5470 MHz to 5725 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	102	5510
	Middle	118	5590
	Top	134	5670
Transmit Frequency Band:	5725 MHz to 5850 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	151	5755
	Top	159	5795

Additional Information Related to Testing (continued)

Channel Spacing:	80 MHz		
Transmit Frequency Band:	5150 MHz to 5250 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Single	42	5210
Transmit Frequency Band:	5250 MHz to 5350 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Single	58	5290
Transmit Frequency Band:	5470 MHz to 5725 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Single	106	5530
Transmit Frequency Band:	5725 MHz to 5850 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Single	155	5775

3.5. Support Equipment

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

Description:	Laptop
Brand Name:	Dell
Model Name or Number:	Latitude E5400
Serial Number:	01150

Description:	2 GB Micro SD Card
Brand Name:	Generic
Model Name or Number:	Not marked or stated

Brand Name:	Logik
Description:	22” High Definition Television
Model Name or Number:	L22FE12A
Serial Number:	1309020661

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuously transmitting with a modulated carrier at maximum power on the bottom, middle and top channels as required using the supported data rates/modulation types.

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 Customer. The application was used to enable continuous transmission and receive modes and to select the test channels, data rates and modulation schemes as required.
- All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and widest bandwidth for all bands were:
    - Highest power
        - 802.11a – BPSK / 6 Mbps
        - 802.11n HT20 – 16QAM / 26 Mbps / MCS3 (GI = 800 ns)
        - 802.11n HT40 – QPSK / 40.5 Mbps / MCS2 (GI = 800 ns)
        - 802.11ac VHT20 – BPSK / 6.5 Mbps / MCS0 (GI = 800 ns)
        - 802.11ac VHT40 – BPSK / 13.5 Mbps / MCS0 (GI = 800 ns)
        - 802.11ac VHT80 – BPSK / 29.3 Mbps / MCS0 (GI = 800 ns)
    - Highest power spectral density
        - 802.11a – BPSK / 6 Mbps
        - 802.11n HT20 – 16QAM / 26 Mbps / MCS3 (GI = 800 ns)
        - 802.11n HT40 – QPSK / 40.5 Mbps / MCS2 (GI = 800 ns)
        - 802.11ac VHT20 – 16QAM / 39 Mbps / MCS4 (GI = 800 ns)
        - 802.11ac VHT40 – QPSK / 27 Mbps / MCS1 (GI = 800 ns)
        - 802.11ac VHT80 – BPSK / 29.3 Mbps / MCS0 (GI = 800 ns)
    - Widest bandwidth
        - 802.11a – BPSK / 6 Mbps
        - 802.11n HT20 – 16QAM / 21.7 Mbps / MCS2 (GI = 400 ns)
        - 802.11n HT40 – 16QAM / 60 Mbps / MCS3 (GI = 400 ns)
        - 802.11ac VHT20 – BPSK / 7.2 Mbps / MCS0 (GI = 400 ns)
        - 802.11ac VHT40 – QPSK / 30 Mbps / MCS1 (GI = 400 ns)
        - 802.11ac VHT80 – QPSK / 65 Mbps / MCS1 (GI = 400 ns)

    Pre-scan results for all modes are archived on the Company server and available for inspection if required.
- RF cables and attenuators connecting the test equipment to the EUT were calibrated before use and the calibration data incorporated into the conducted measurement results.

Configuration and Peripherals (continued)

- Transmitter spurious emissions were performed with the EUT transmitting with a data rate of 26 Mbps. This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case.
- Transmitter radiated spurious emission tests were performed with the following configurations, employing all available accessories:
    - Configuration 1 – Handset with the AC charger, USB Cable, MHL cable (terminated in to a television), MHL adaptor and PHF
    - Configuration 2 – Handset with the AC charger, Magnetic plug and PHF
- Pre-scans below 1 GHz were performed in both configurations 1 and 2, with final measurements limited to the configuration which provided worst case results. Pre-scans above 1 GHz were performed in the configuration that employed the most accessories (Configuration 1), with any final measurements being performed in both configurations.
- The conducted sample with IMEI 004402451215499 was used for 26 dB bandwidth, duty cycle, maximum output power, peak power spectral density and peak excursion tests.
- The radiated sample with IMEI 004402451217339 was used for AC conducted emissions.
- The radiated sample with IMEI 004402451217420 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.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Mark Percival	**Test Date:**	02 July 2013
Test Sample IMEI:	004402451217339		

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

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	55

Transmitter AC Conducted Spurious Emissions (continued)

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.150	Live	53.7	66.0	12.3	Complied
0.177	Live	49.5	64.6	15.1	Complied
0.424	Live	39.9	57.4	17.5	Complied
1.428	Live	41.1	56.0	14.9	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.429	Live	28.2	47.3	19.1	Complied
1.459	Live	28.1	46.0	17.9	Complied
3.187	Live	23.9	46.0	22.1	Complied
17.902	Live	28.4	50.0	21.6	Complied

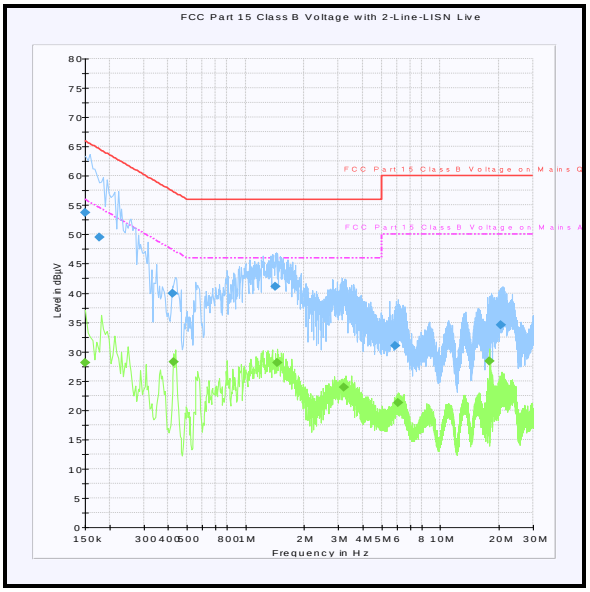
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.154	Neutral	51.9	65.8	13.9	Complied
0.438	Neutral	35.0	57.1	22.1	Complied
1.207	Neutral	36.1	56.0	19.9	Complied
23.095	Neutral	30.8	60.0	29.2	Complied

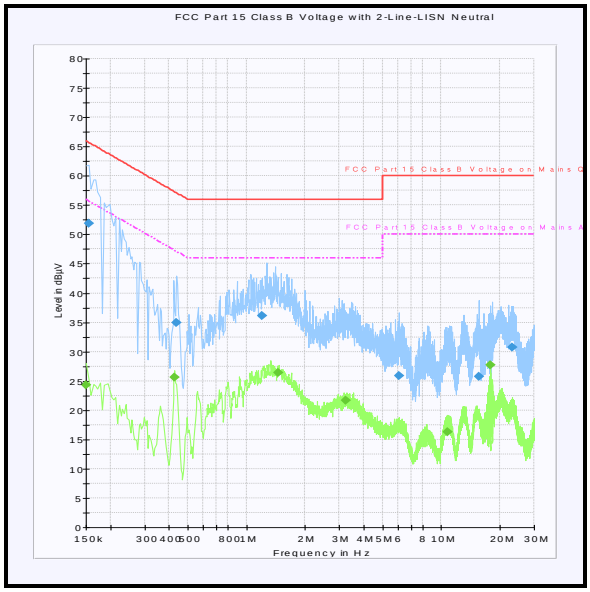
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.429	Neutral	25.6	47.3	21.7	Complied
1.450	Neutral	26.4	46.0	19.6	Complied
3.223	Neutral	21.7	46.0	24.3	Complied
17.839	Neutral	27.7	50.0	22.3	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.

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1625	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	09 Jan 2014	12
A004	LISN	Rohde & Schwarz	ESH3-Z5	890604/027	30 Out 2013	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	19 Feb 2014	12
M1020	Test Receiver	Rohde & Schwarz	SME-03	834617/030	14 Dec 2013	12

5.2.2. Transmitter 26 dB Emission Bandwidth

Test Summary:

Test Engineer:	Nick Steele	**Test Dates:**	23 June 2013 to 11 July 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.403(i)
Test Method Used:	As detailed in FCC KDB 789033 Section C)

Environmental Conditions:

Temperatures (°C):	23 to 26
Relative Humidity (%):	35 to 39

Note(s):

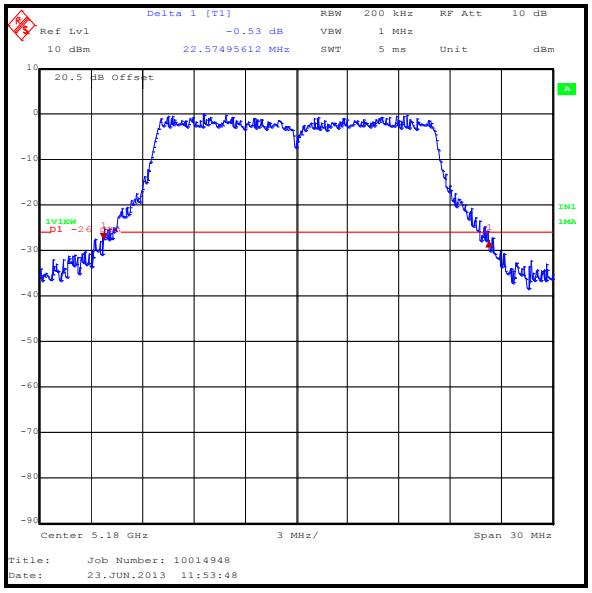
1. All configurations supported by the EUT were investigated on the one channel in accordance with KDB 789033 Section C Emission bandwidth test procedure. The data rates that produced the widest bandwidth and therefore deemed worst case were:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 – QPSK / 21.7 Mbps / MCS2 (GI = 400 ns)
    - 802.11n HT40 – 16QAM / 60 Mbps / MCS3 (GI = 400 ns)
    - 802.11ac VHT20 – BPSK / 7.2 Mbps / MCS0 (GI = 400 ns)
    - 802.11ac VHT40 – QPSK / 30 Mbps / MCS1 (GI = 400 ns)
    - 802.11ac VHT80 – QPSK / 65 Mbps / MCS1 (GI = 400 ns)
2. Final measurements were performed in each supported operating band using the above configurations on the bottom, middle and top or single channels.
3. Plots for all data rates are archived on the Company server and available for inspection upon request.
4. The spectrum analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.
5. For the power measurements in this report, the highest power output level was recorded when the EUT was configured as:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 – 16QAM / 26 Mbps / MCS3 (GI = 800 ns)
    - 802.11n HT40 – QPSK / 40.5 Mbps / MCS2 (GI = 800 ns)
    - 802.11ac VHT20 – BPSK / 6.5 Mbps / MCS0 (GI = 800 ns)
    - 802.11ac VHT40 – BPSK / 13.5 Mbps / MCS0 (GI = 800 ns)
    - 802.11ac VHT80 – BPSK / 29.3 Mbps / MCS0 (GI = 800 ns)

    Emission bandwidth plots in these configurations have been included as ‘Reference plots’ at the end of this Section and the results used for calculations in Section 5.2.4.

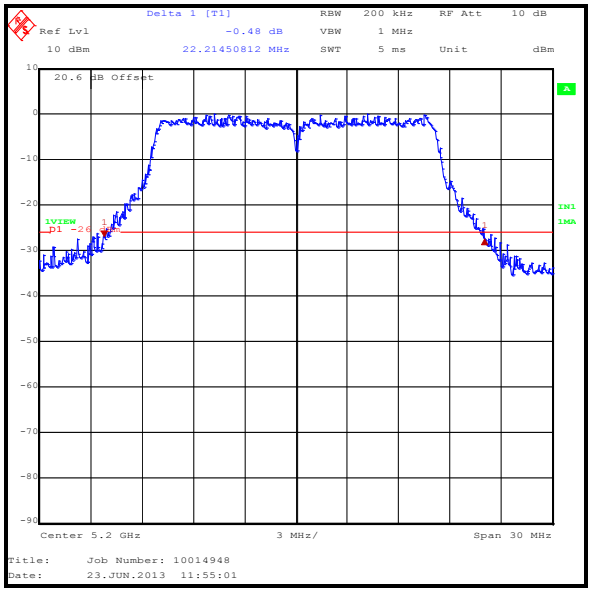
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.15-5.25 GHz band

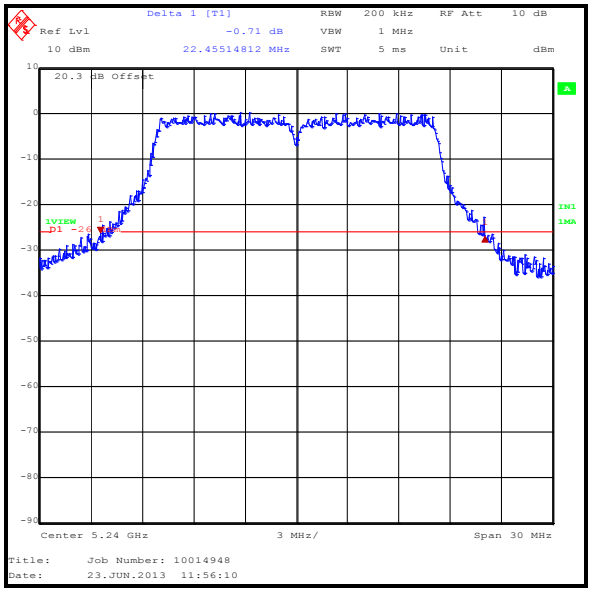
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	6	22.575
Middle	5200	BPSK	6	22.215
Top	5240	BPSK	6	22.455



Bottom Channel



Middle Channel

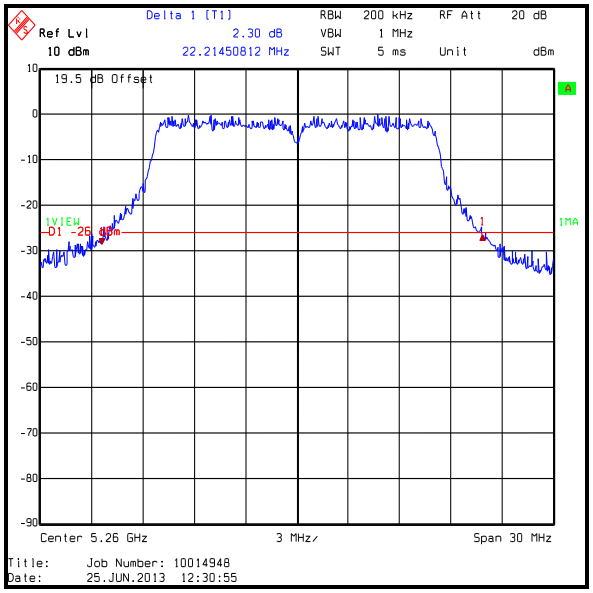


Top Channel

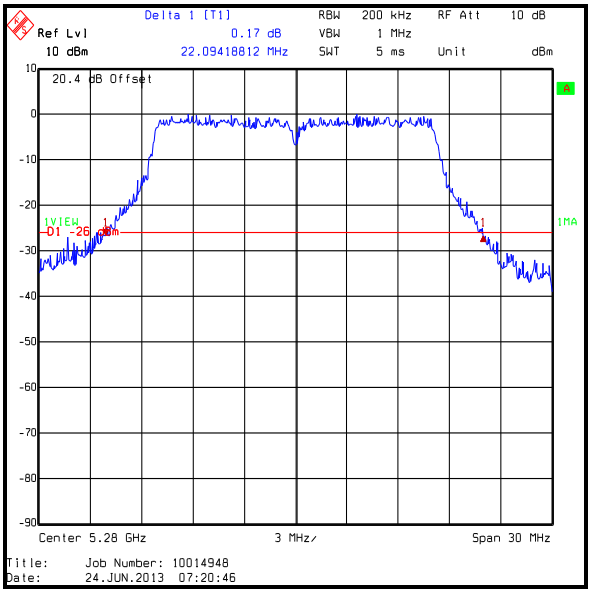
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.25-5.35 GHz band

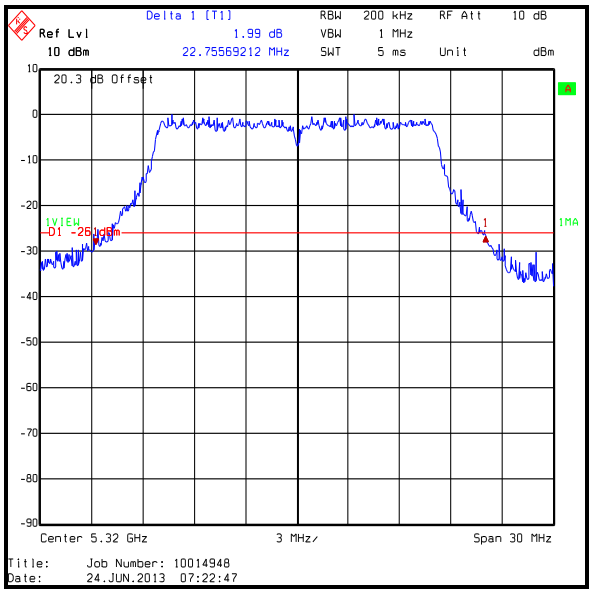
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	6	22.215
Middle	5280	BPSK	6	22.094
Top	5320	BPSK	6	22.756



Bottom Channel



Middle Channel

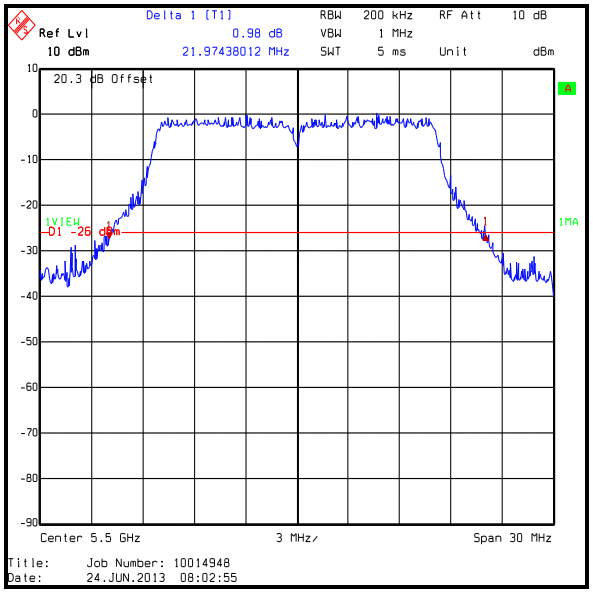


Top Channel

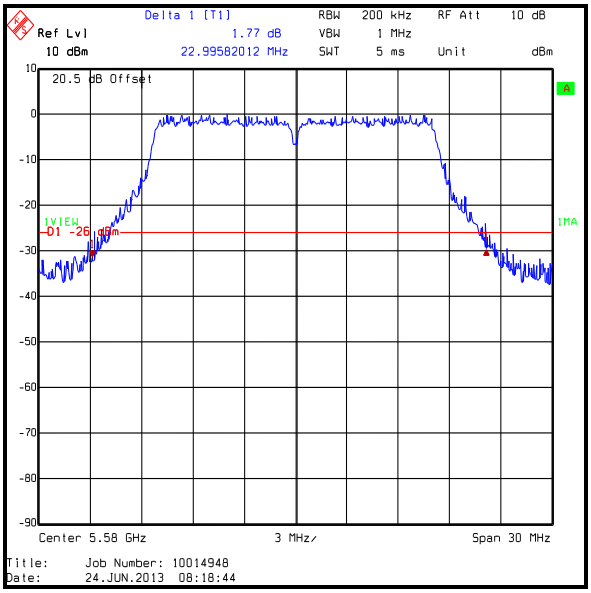
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.47-5.725 GHz band

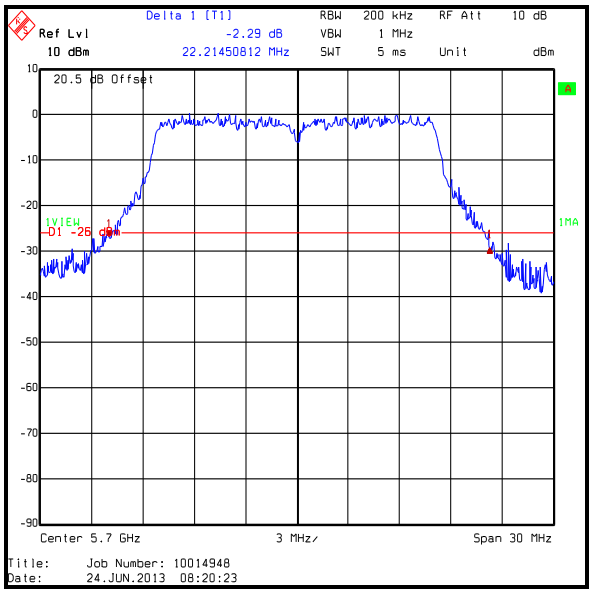
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	6	21.974
Middle	5580	BPSK	6	22.996
Top	5700	BPSK	6	22.215



Bottom Channel



Middle Channel

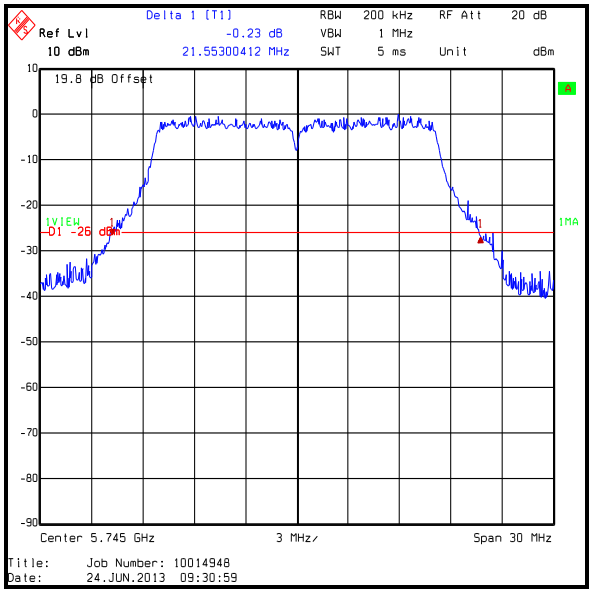


Top Channel

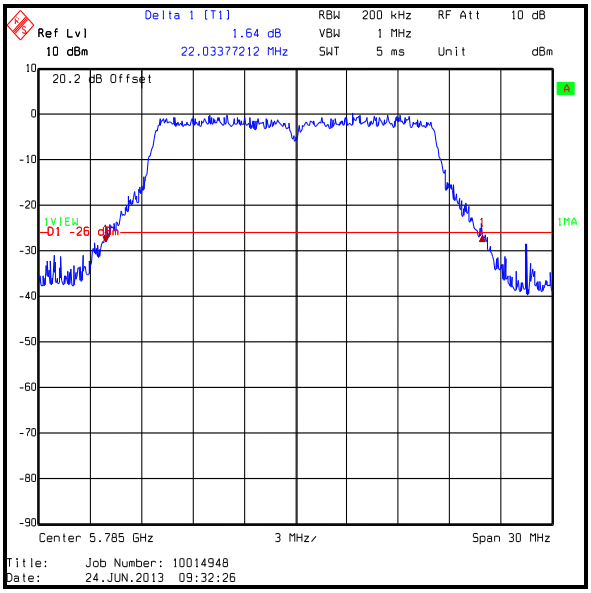
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.725-5.85 GHz band

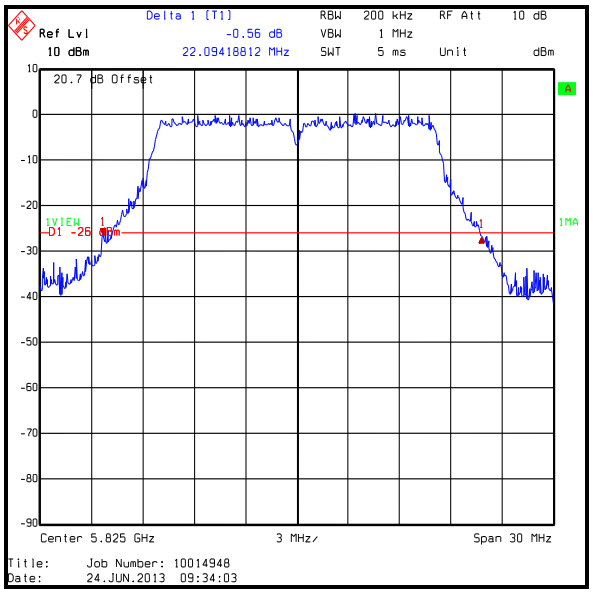
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5745	BPSK	6	21.553
Middle	5785	BPSK	6	22.034
Top	5825	BPSK	6	22.094



Bottom Channel



Middle Channel

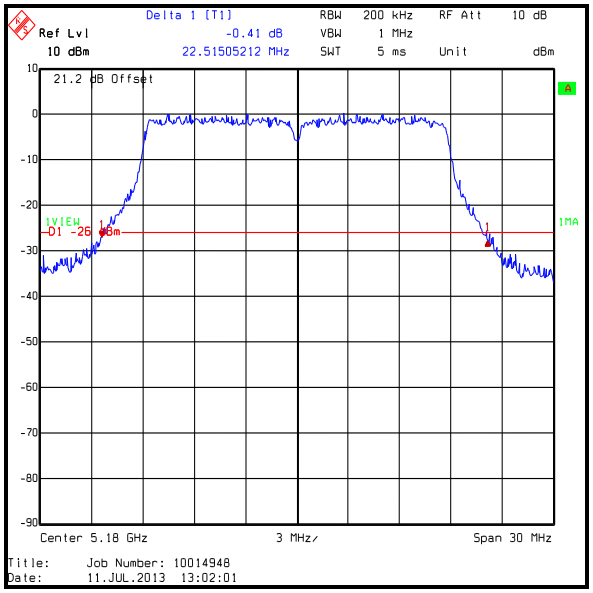


Top Channel

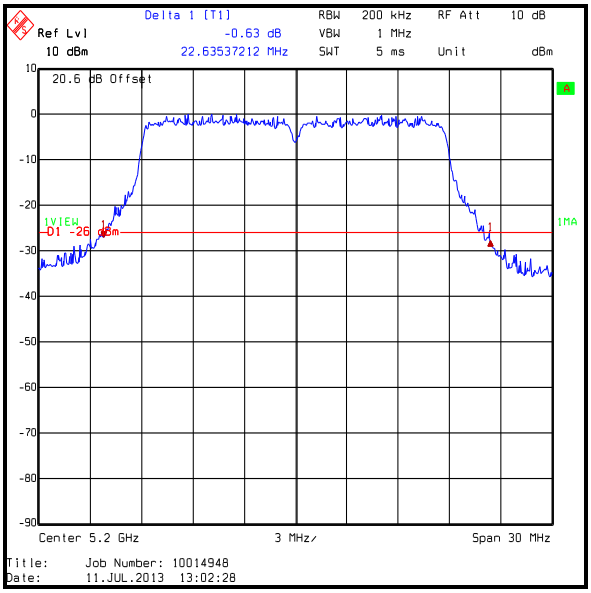
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.15-5.25 GHz band

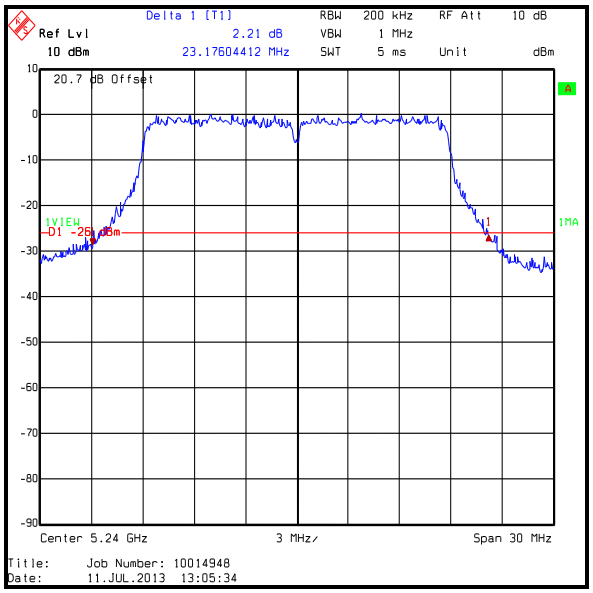
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	QPSK	21.7 / MCS2	22.515
Middle	5200	QPSK	21.7 / MCS2	22.635
Top	5240	QPSK	21.7 / MCS2	23.176



Bottom Channel



Middle Channel

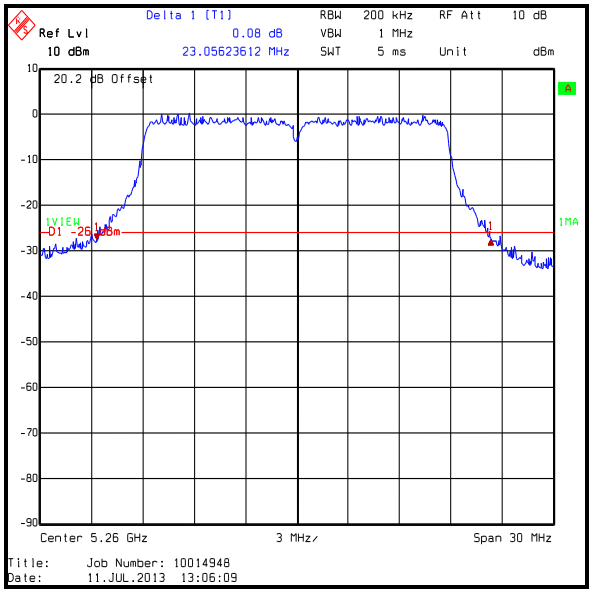


Top Channel

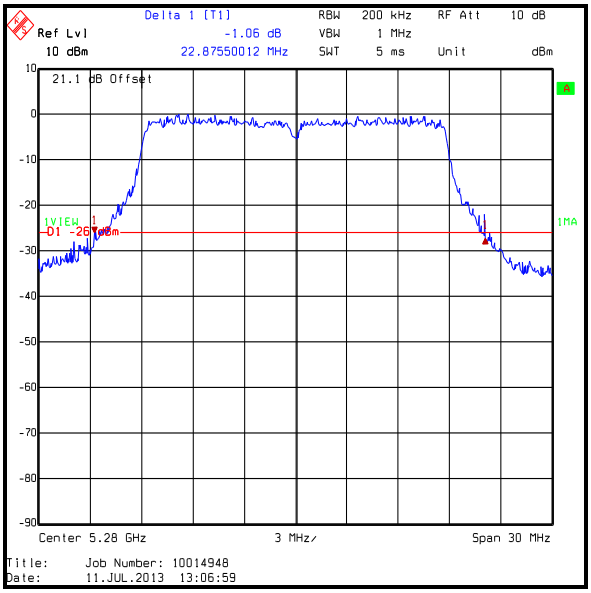
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.25-5.35 GHz band

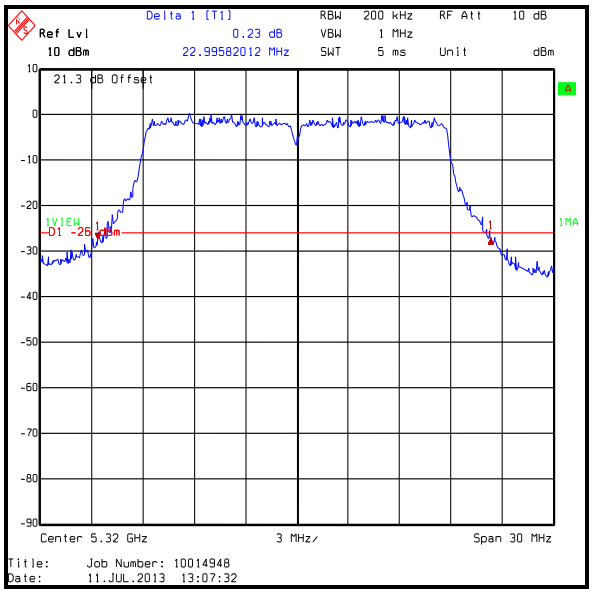
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5260	QPSK	21.7 / MCS2	23.056
Middle	5280	QPSK	21.7 / MCS2	22.876
Top	5320	QPSK	21.7 / MCS2	22.996



Bottom Channel



Middle Channel

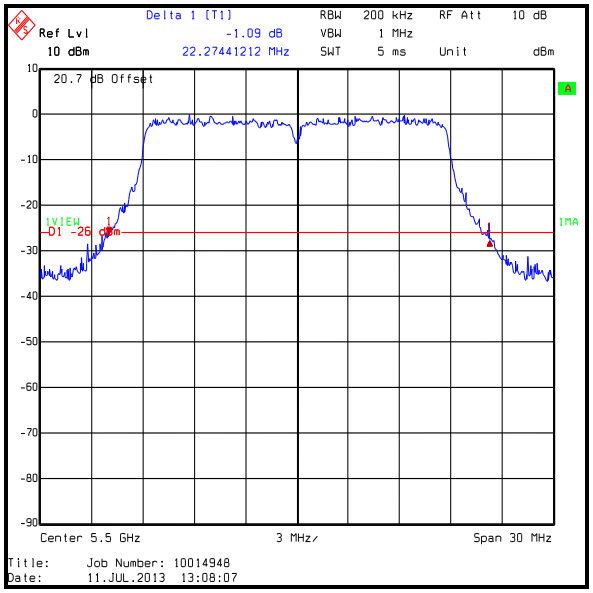


Top Channel

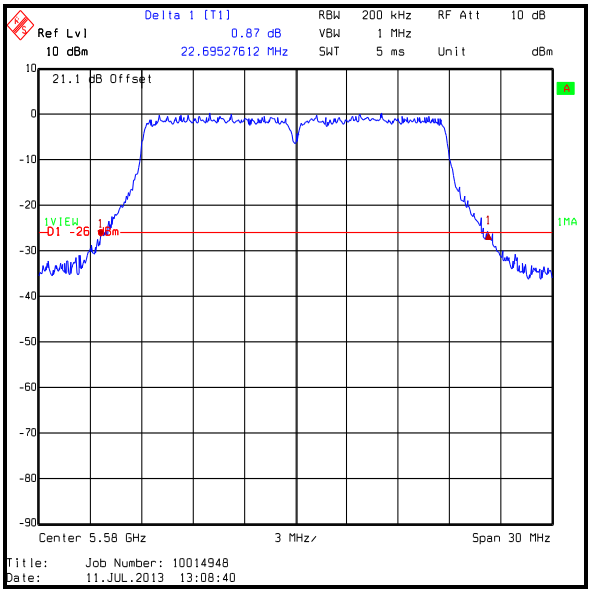
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.47-5.725 GHz band

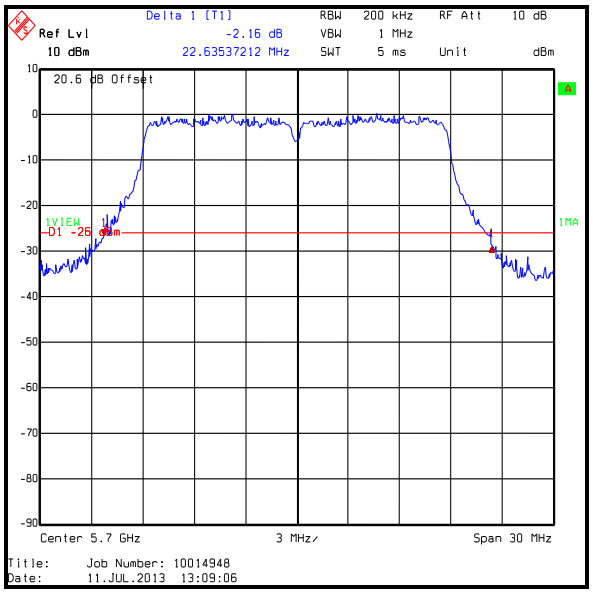
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5500	QPSK	21.7 / MCS2	22.274
Middle	5580	QPSK	21.7 / MCS2	22.695
Top	5700	QPSK	21.7 / MCS2	22.635



Bottom Channel



Middle Channel

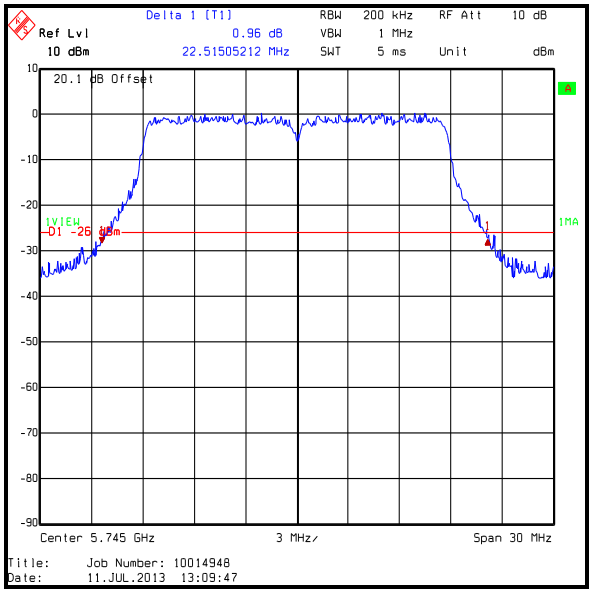


Top Channel

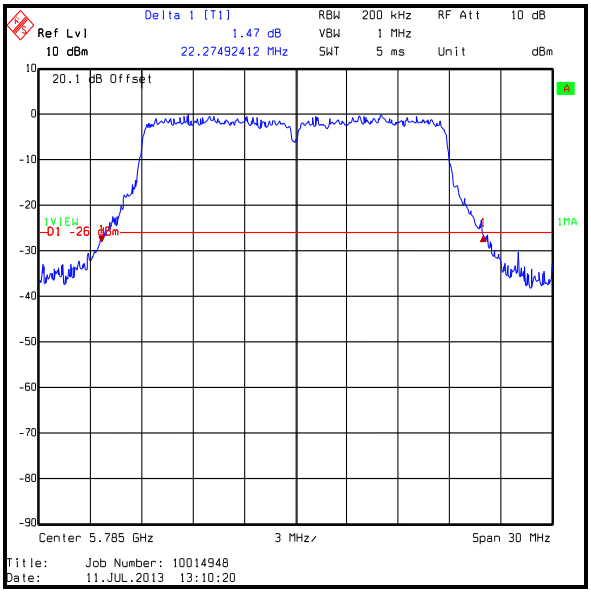
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.725-5.85 GHz band

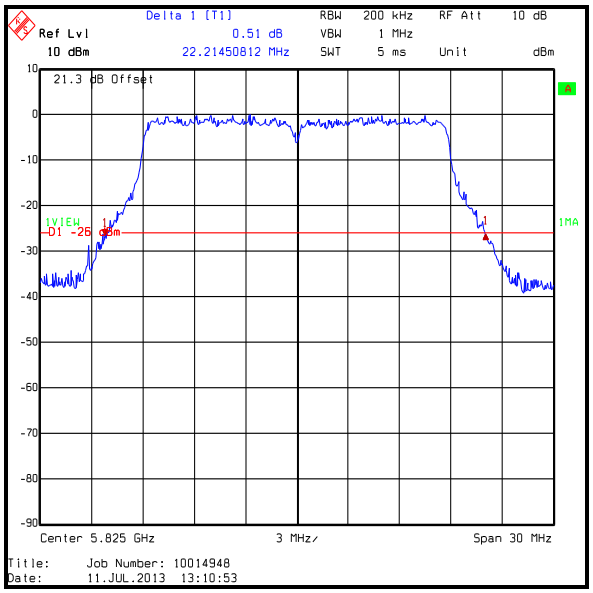
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5745	QPSK	21.7 / MCS2	22.515
Middle	5785	QPSK	21.7 / MCS2	22.275
Top	5825	QPSK	21.7 / MCS2	22.215



Bottom Channel



Middle Channel

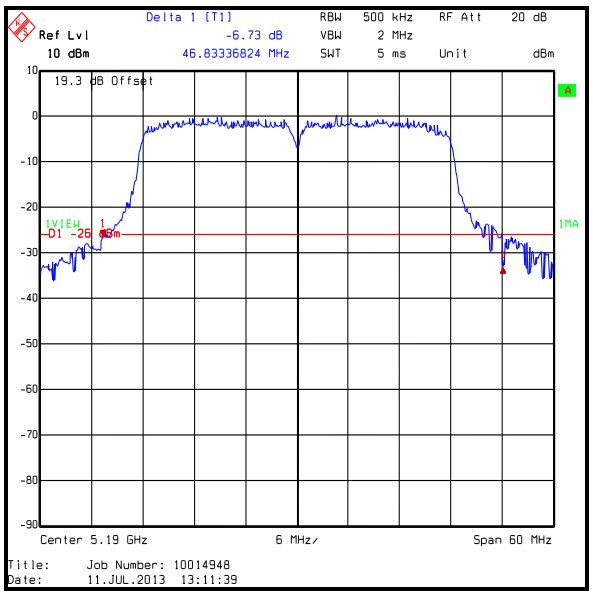


Top Channel

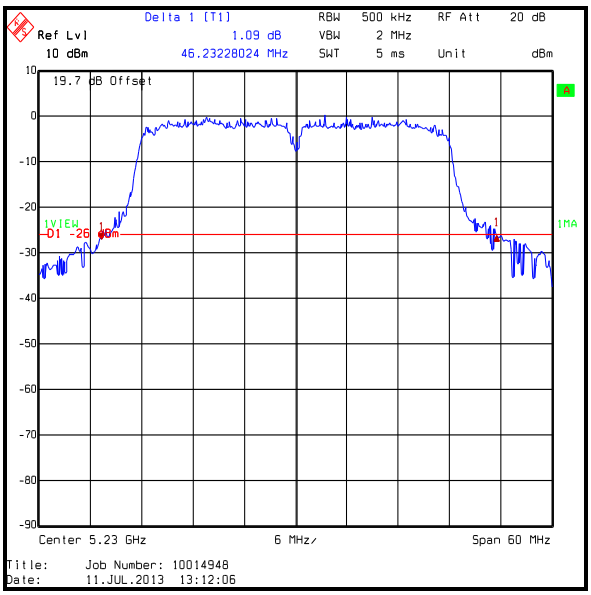
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.15-5.25 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5190	16QAM	60 / MCS3	46.833
Top	5230	16QAM	60 / MCS3	46.232



Bottom Channel

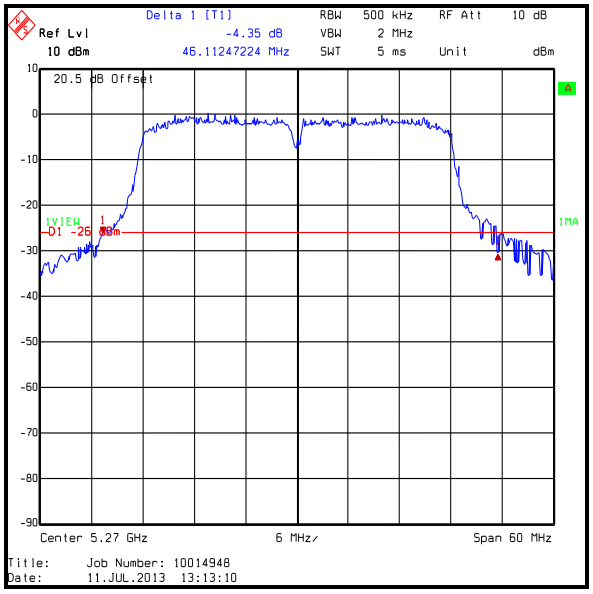


Top Channel

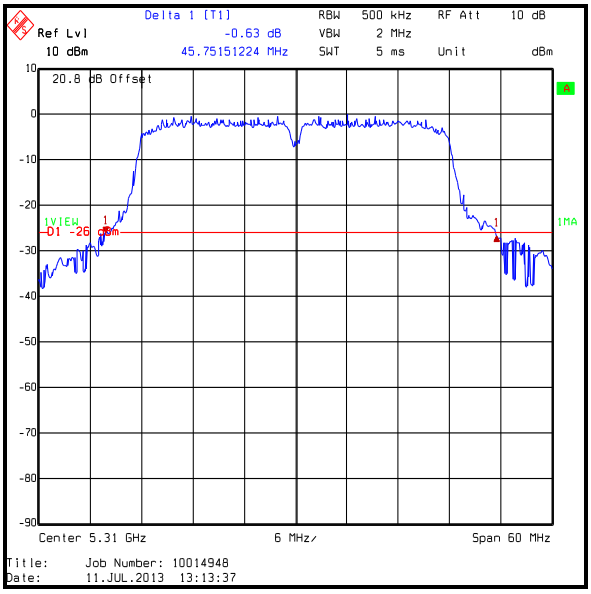
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5270	16QAM	60 / MCS3	46.112
Top	5310	16QAM	60 / MCS3	45.752



Bottom Channel

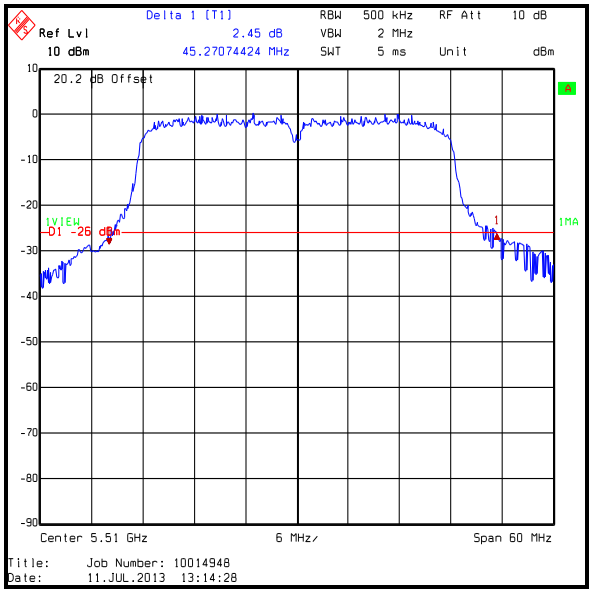


Top Channel

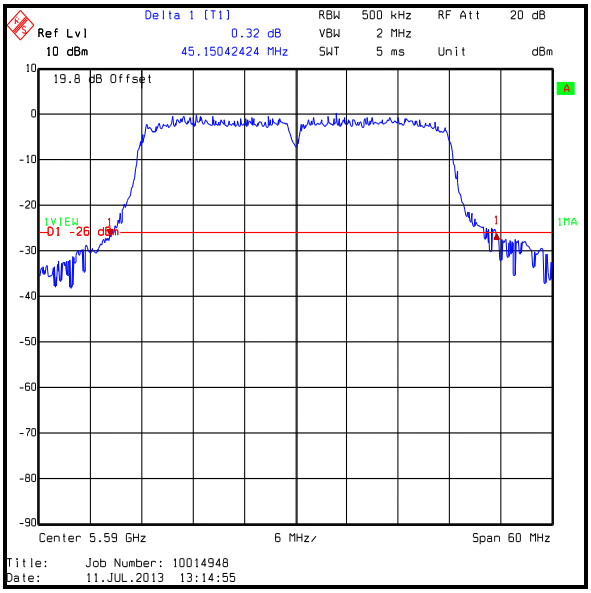
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.47-5.725 GHz band

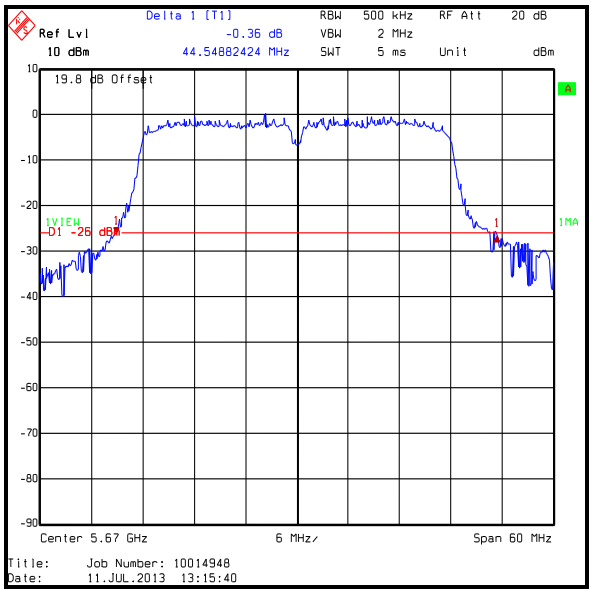
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5510	16QAM	60 / MCS3	45.271
Middle	5590	16QAM	60 / MCS3	45.150
Top	5670	16QAM	60 / MCS3	44.549



Bottom Channel



Middle Channel

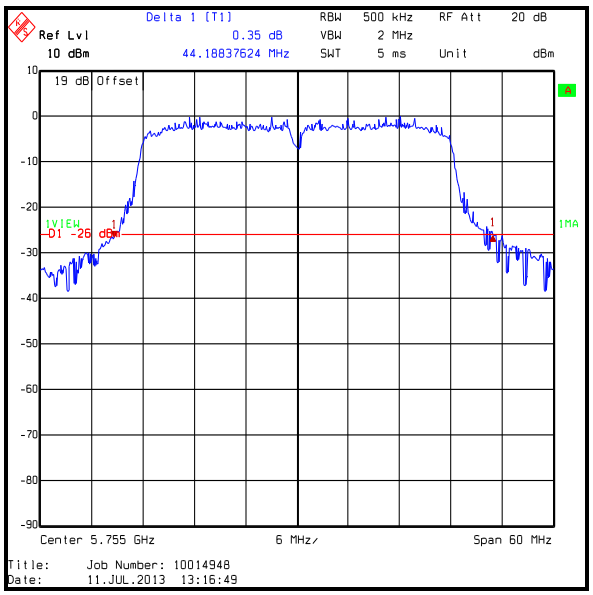


Top Channel

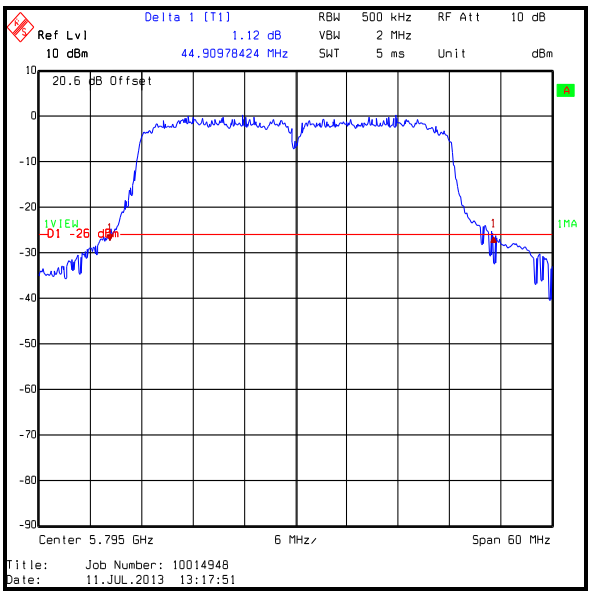
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.725-5.85 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5755	16QAM	60 / MCS3	44.188
Top	5795	16QAM	60 / MCS3	44.910



Bottom Channel

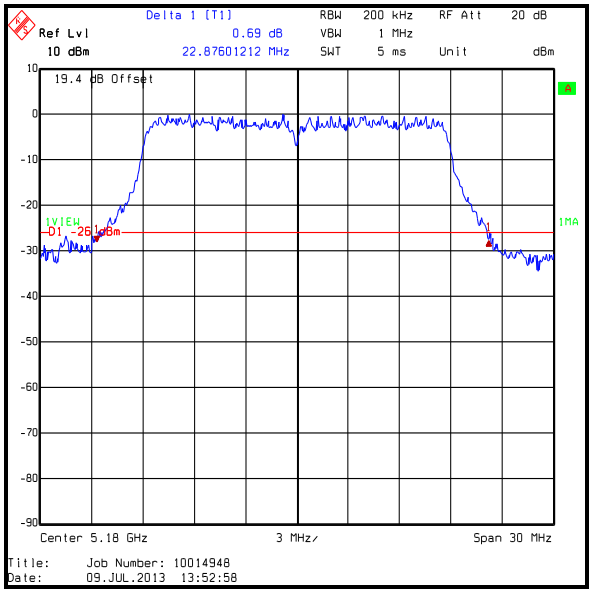


Top Channel

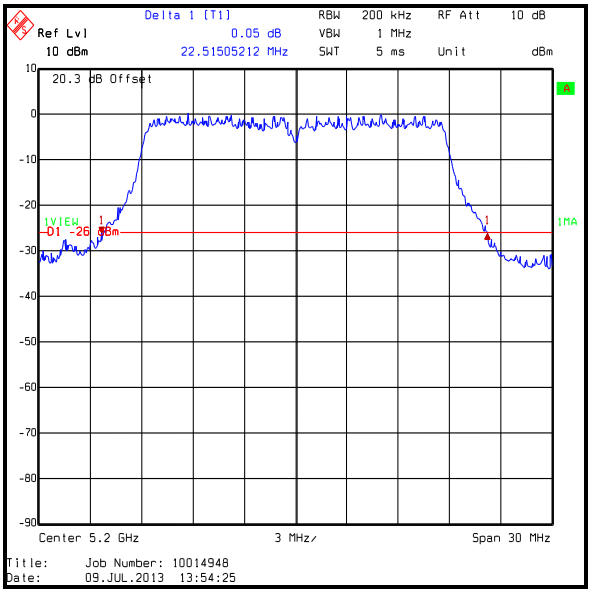
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.15-5.25 GHz band

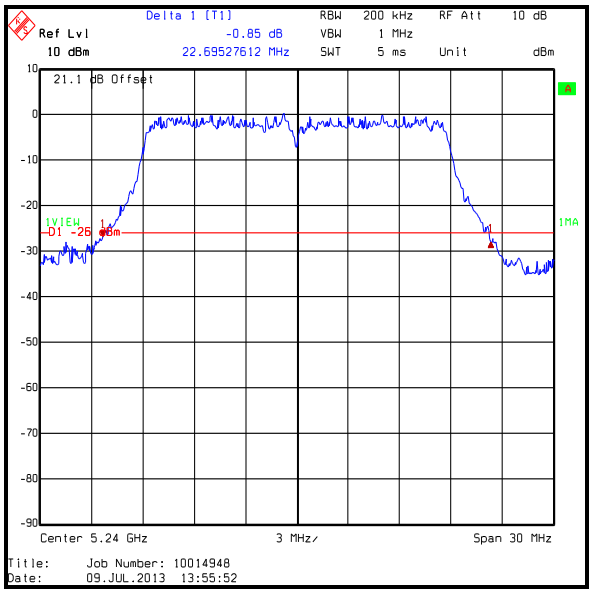
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	7.2 / MCS0	22.876
Middle	5200	BPSK	7.2 / MCS0	22.515
Top	5240	BPSK	7.2 / MCS0	22.695



Bottom Channel



Middle Channel

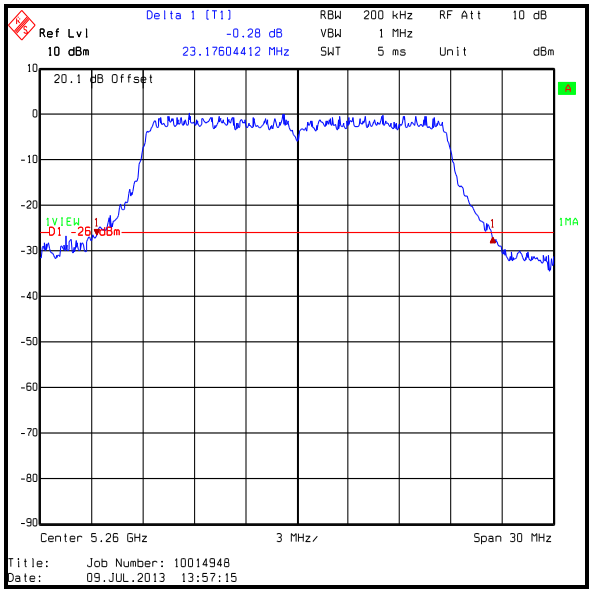


Top Channel

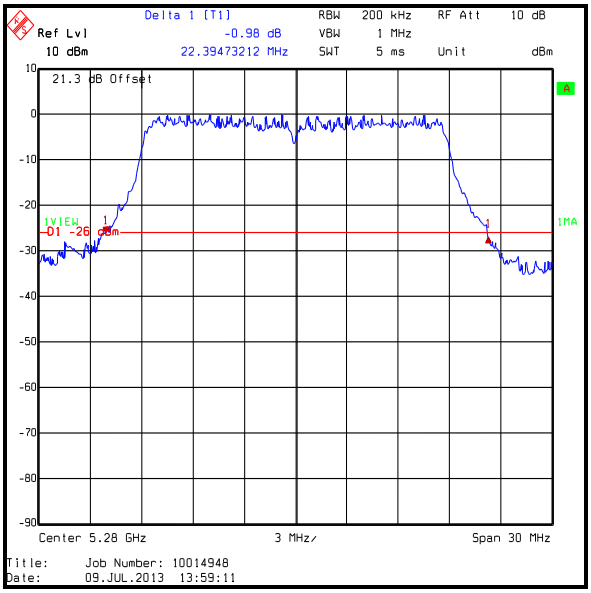
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.25-5.35 GHz band

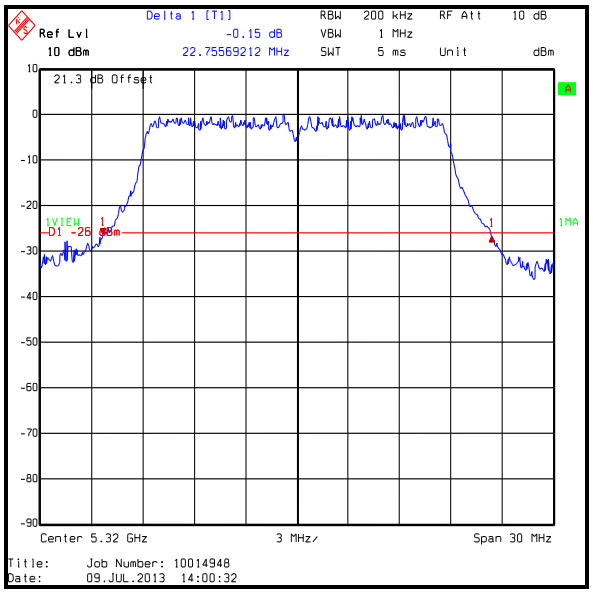
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	7.2 / MCS0	23.176
Middle	5280	BPSK	7.2 / MCS0	22.395
Top	5320	BPSK	7.2 / MCS0	22.756



Bottom Channel



Middle Channel

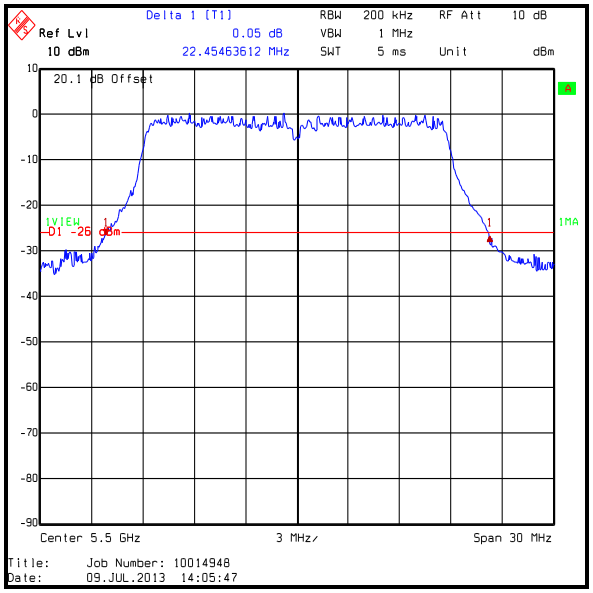


Top Channel

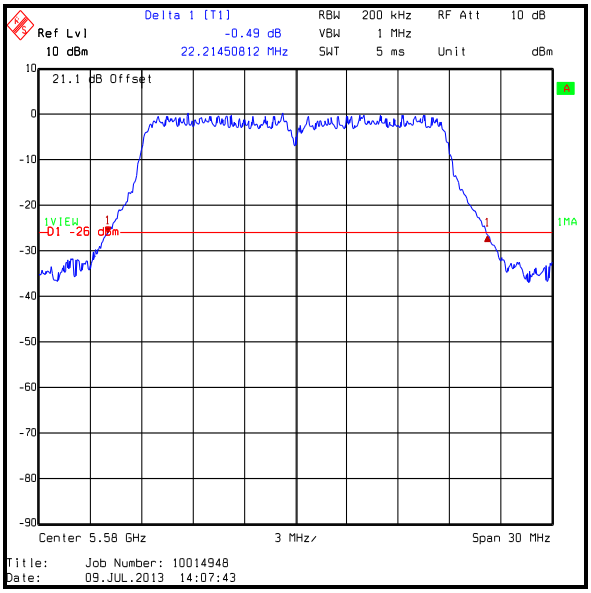
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.47-5.725 GHz band

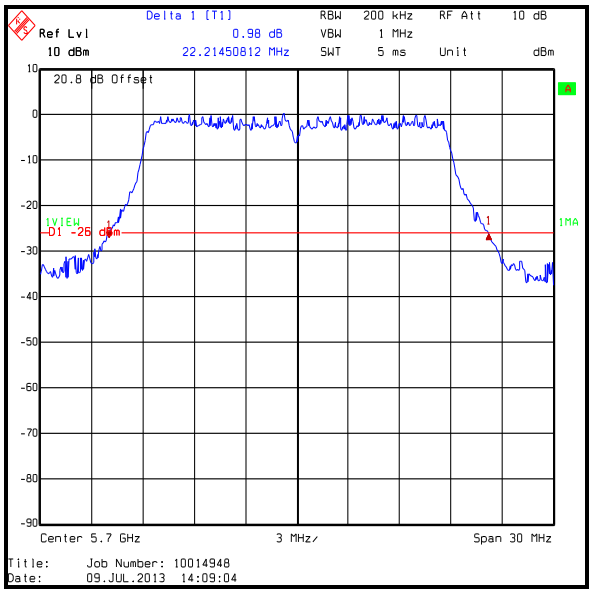
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	7.2 / MCS0	22.455
Middle	5580	BPSK	7.2 / MCS0	22.215
Top	5700	BPSK	7.2 / MCS0	22.215



Bottom Channel



Middle Channel

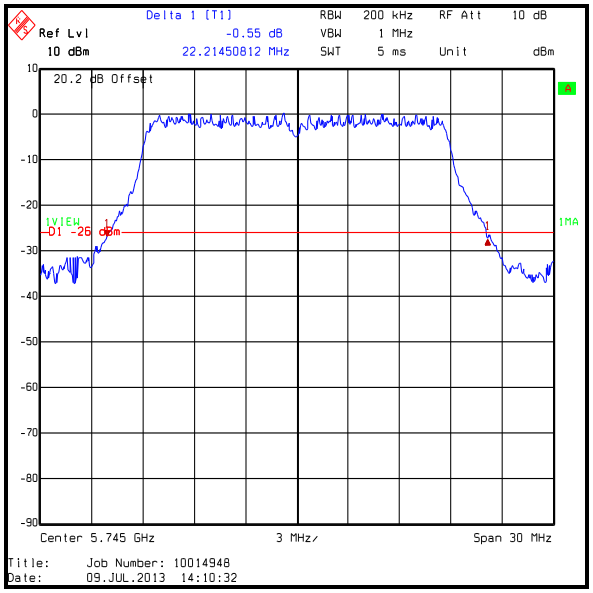


Top Channel

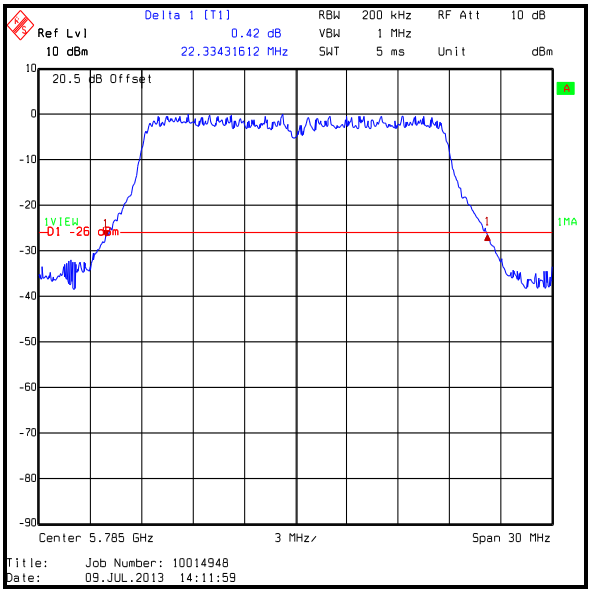
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.725-5.85 GHz band

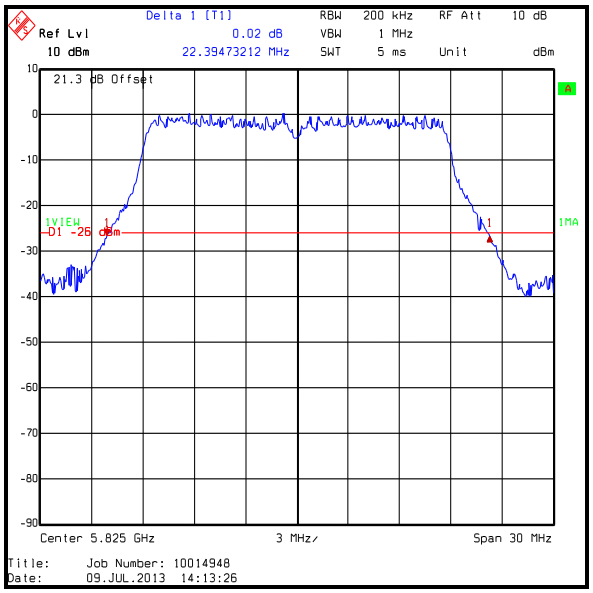
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5745	BPSK	7.2 / MCS0	22.215
Middle	5785	BPSK	7.2 / MCS0	22.334
Top	5825	BPSK	7.2 / MCS0	22.395



Bottom Channel



Middle Channel

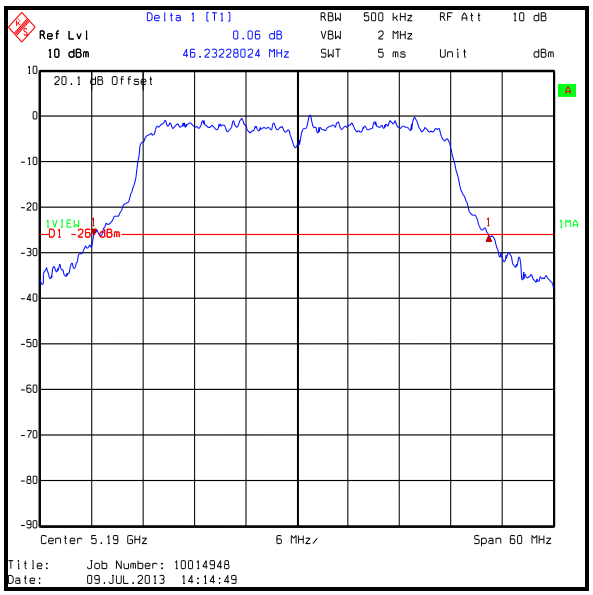


Top Channel

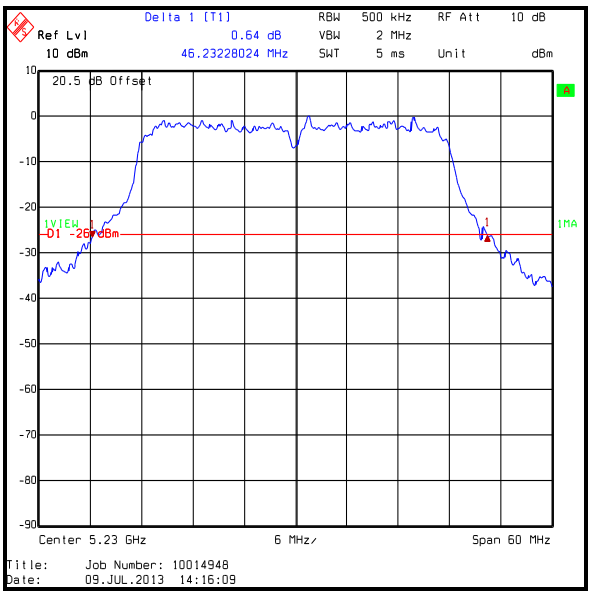
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.15-5.25 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5190	QPSK	30 / MCS1	46.232
Top	5230	QPSK	30 / MCS1	46.232



Bottom Channel

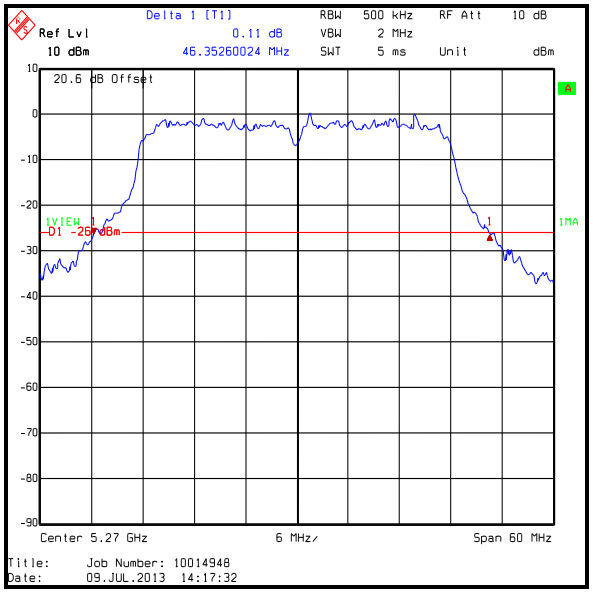


Top Channel

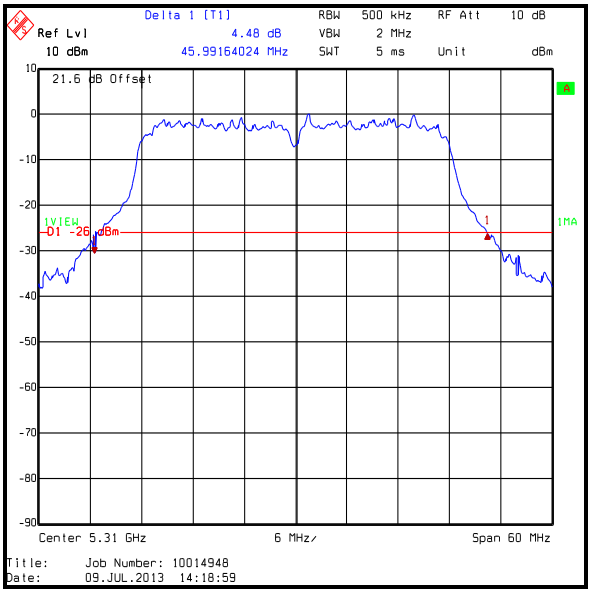
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5270	QPSK	30 / MCS1	46.353
Top	5310	QPSK	30 / MCS1	45.992



Bottom Channel

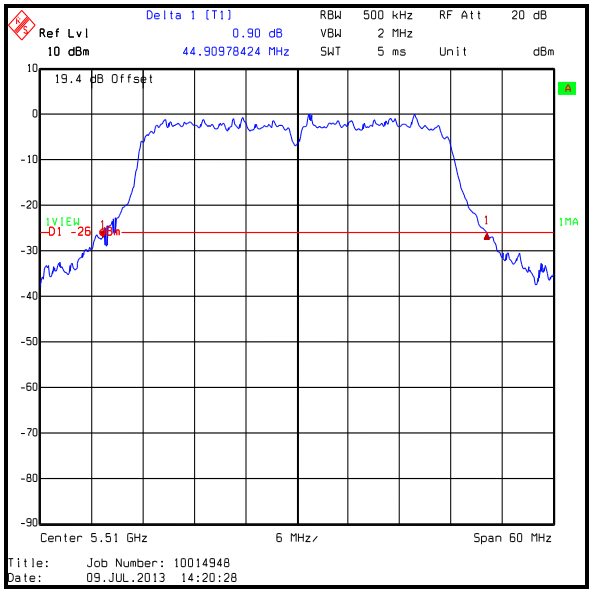


Top Channel

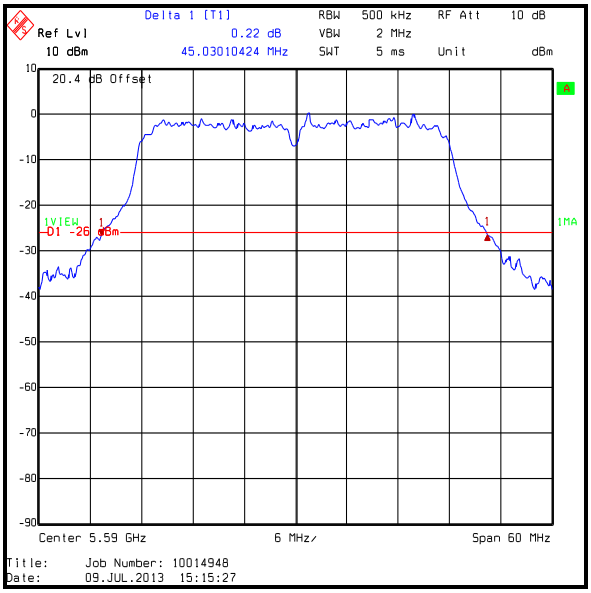
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.47-5.725 GHz band

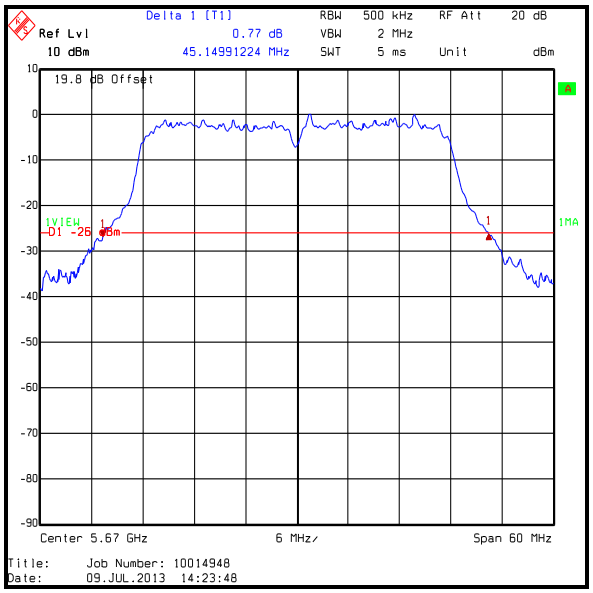
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5510	QPSK	30 / MCS1	44.910
Middle	5590	QPSK	30 / MCS1	45.030
Top	5670	QPSK	30 / MCS1	45.150



Bottom Channel



Middle Channel

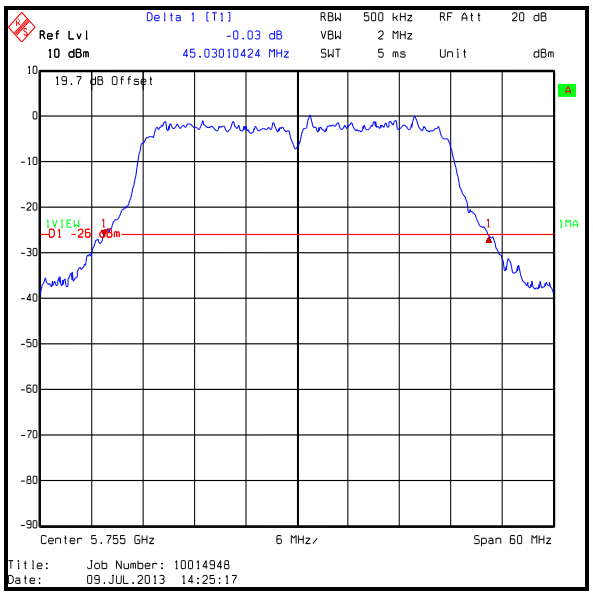


Top Channel

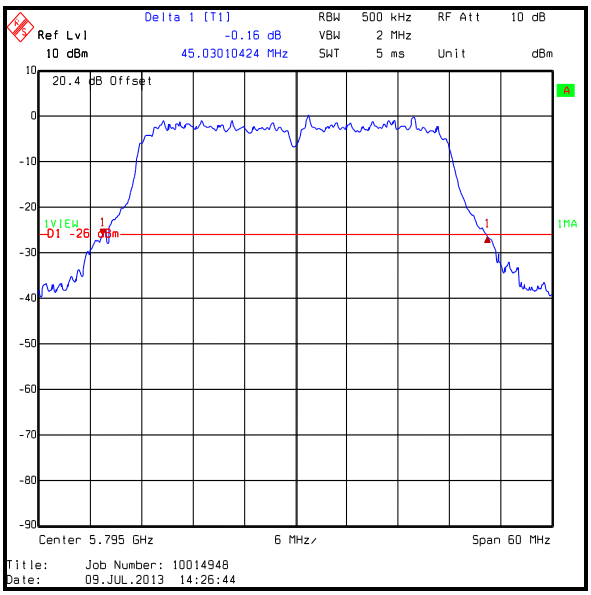
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.725-5.85 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5755	QPSK	30 / MCS1	45.030
Top	5795	QPSK	30 / MCS1	45.030



Bottom Channel

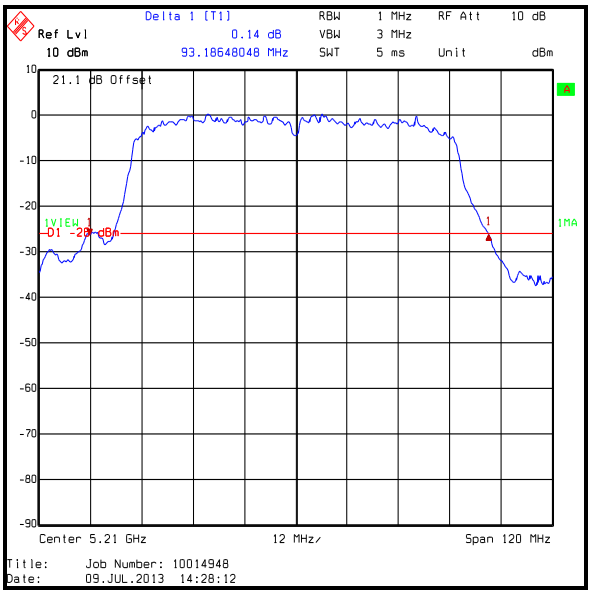


Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.15-5.25 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5210	QPSK	65 / 1	93.186

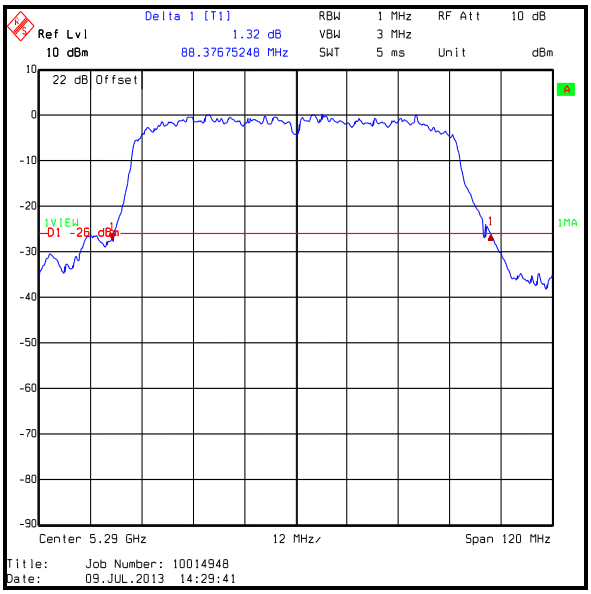


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5290	QPSK	65 / 1	88.377

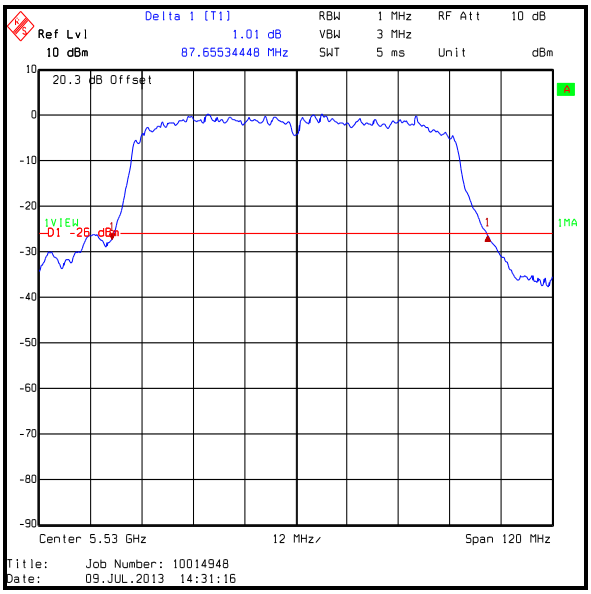


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.47-5.725 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5530	QPSK	65 / 1	87.655

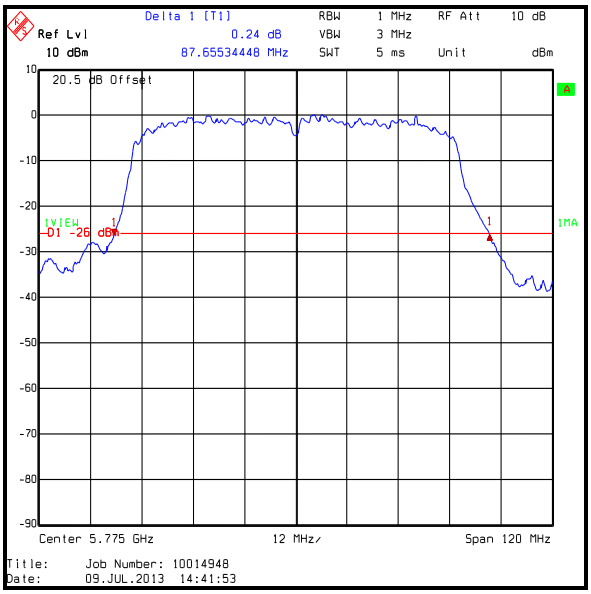


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.725-5.85 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5775	QPSK	65 / 1	87.655

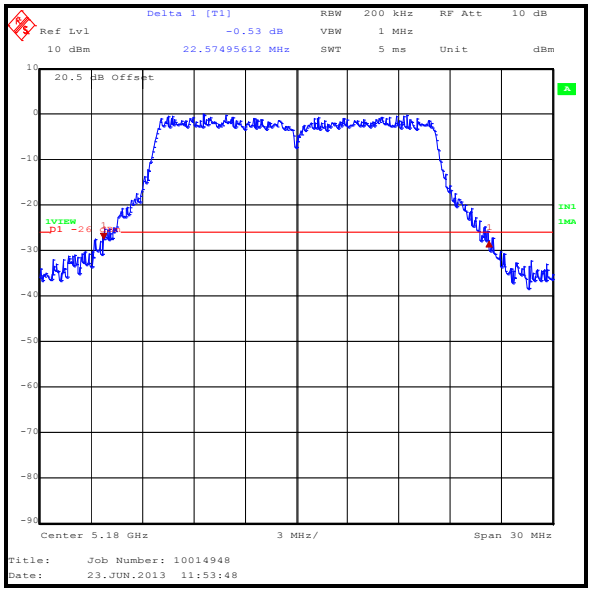


Single Channel

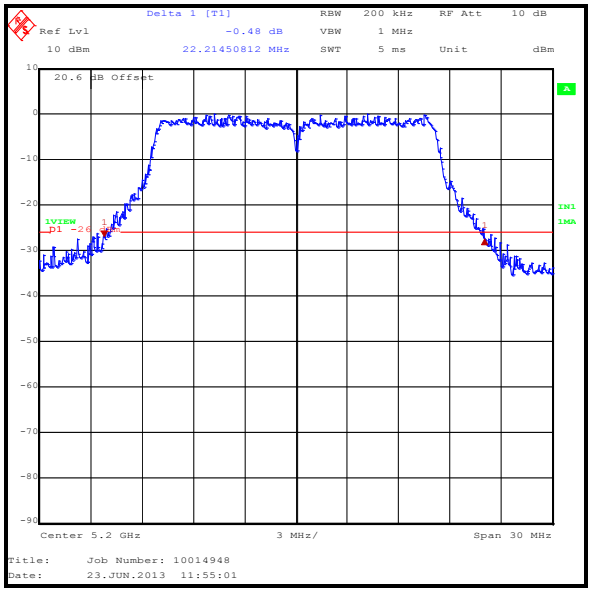
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.15-5.25 GHz band (Reference plots)

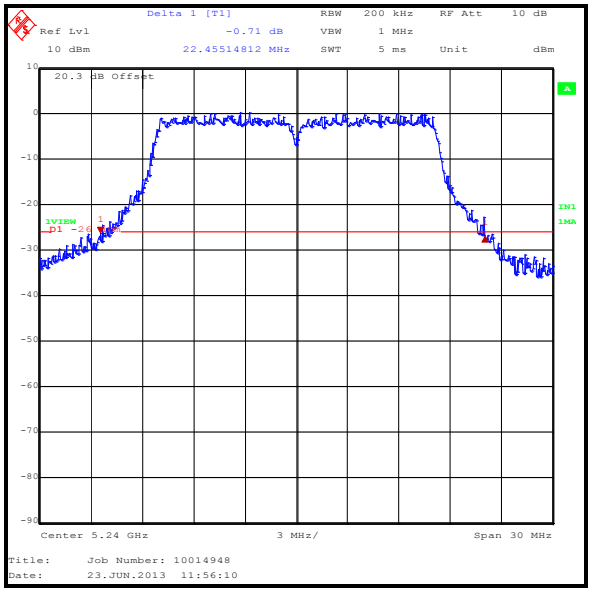
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	6	22.575
Middle	5200	BPSK	6	22.215
Top	5240	BPSK	6	22.455



Bottom Channel



Middle Channel

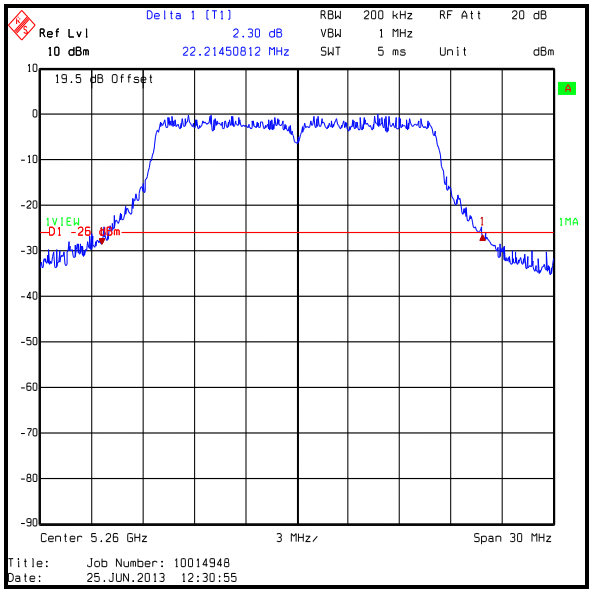


Top Channel

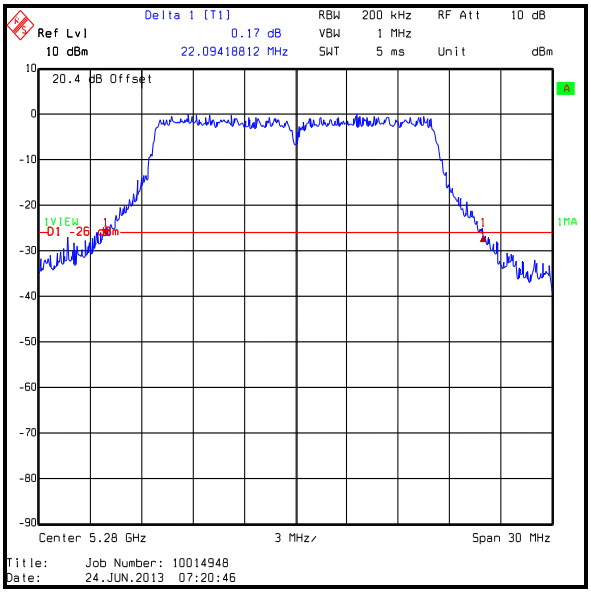
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.25-5.35 GHz band (Reference plots)

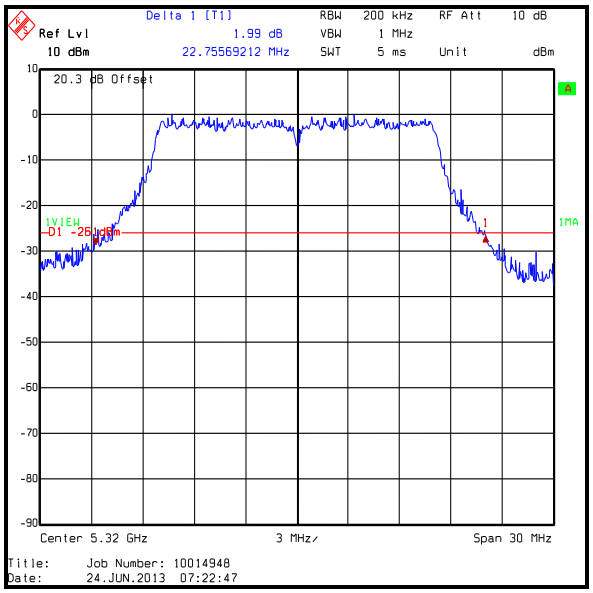
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	6	22.215
Middle	5280	BPSK	6	22.094
Top	5320	BPSK	6	22.756



Bottom Channel



Middle Channel

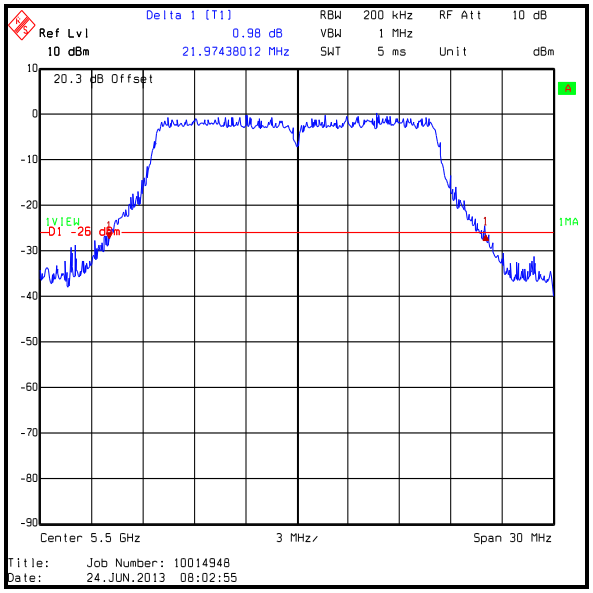


Top Channel

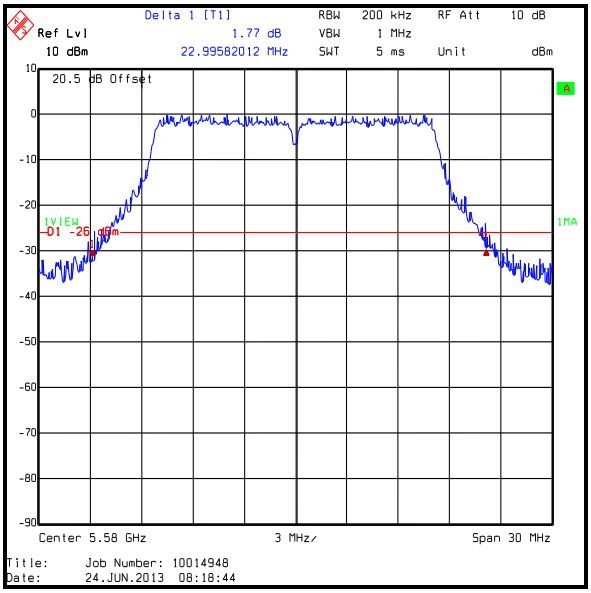
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.47-5.725 GHz band (Reference plots)

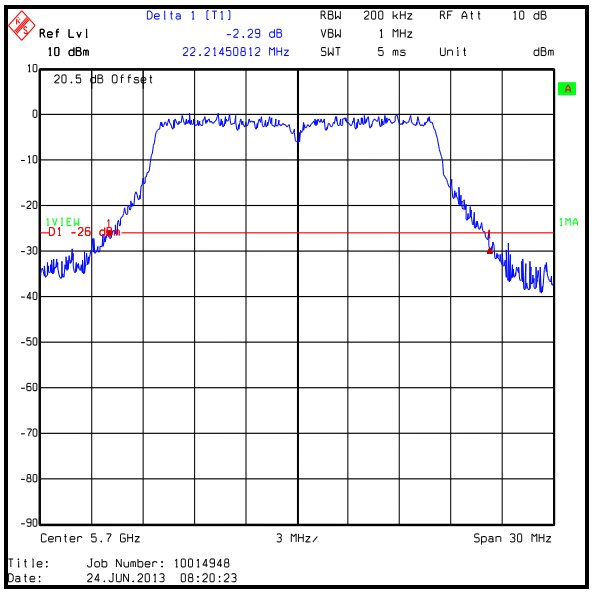
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	6	21.974
Middle	5580	BPSK	6	22.996
Top	5700	BPSK	6	22.215



Bottom Channel



Middle Channel

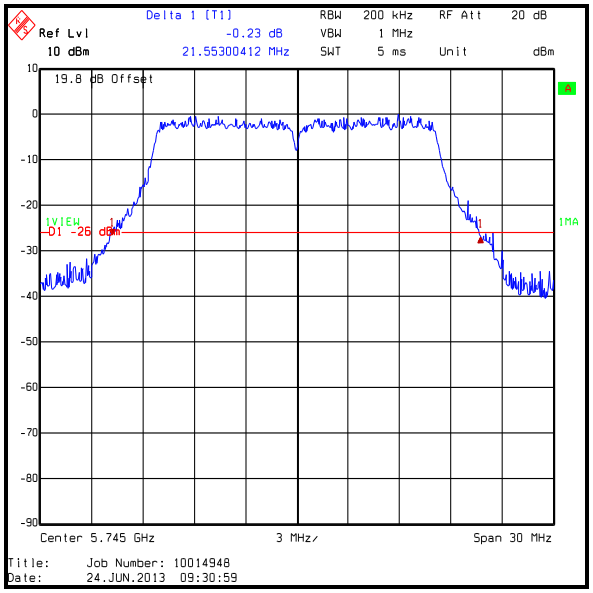


Top Channel

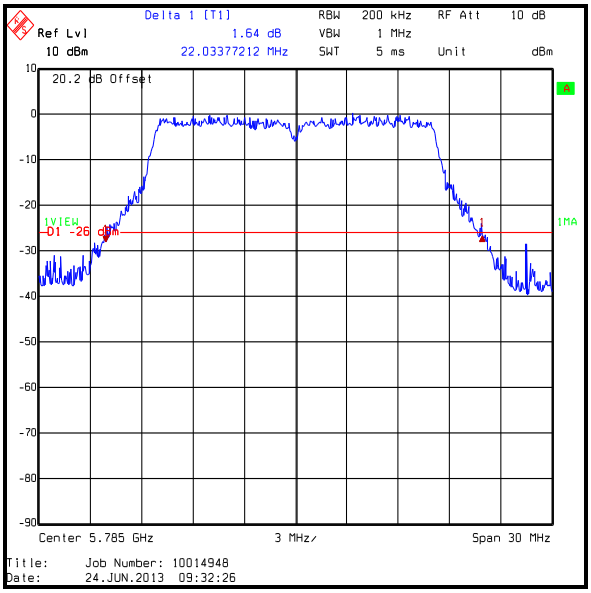
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.725-5.85 GHz band (Reference plots)

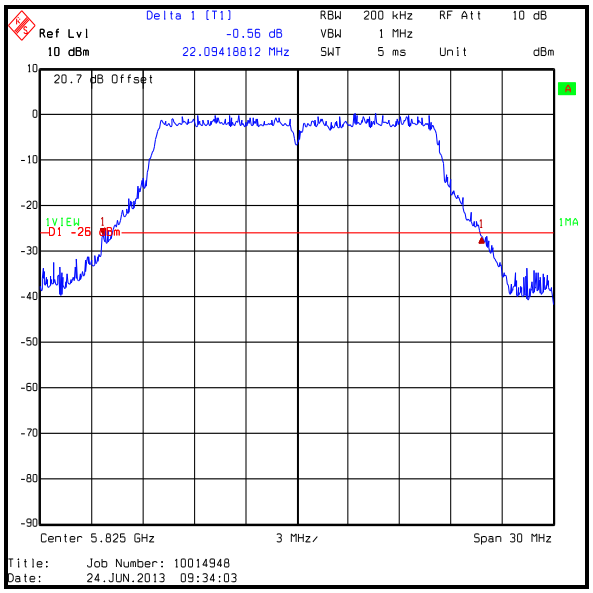
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5745	BPSK	6	21.553
Middle	5785	BPSK	6	22.034
Top	5825	BPSK	6	22.094



Bottom Channel



Middle Channel

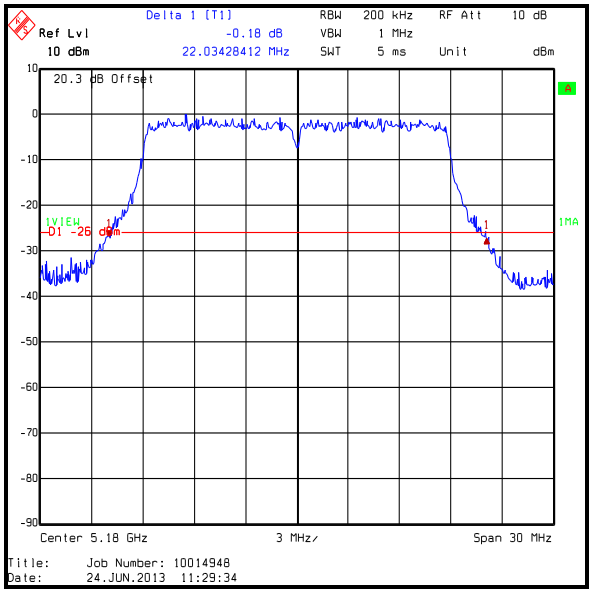


Top Channel

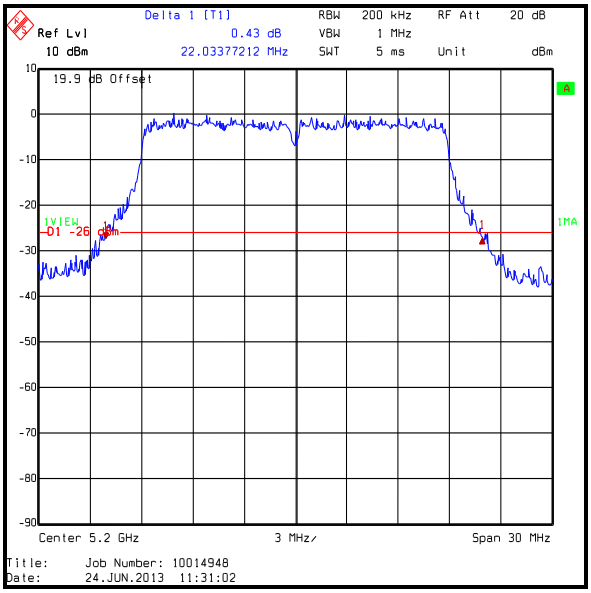
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.15-5.25 GHz band (Reference plots)

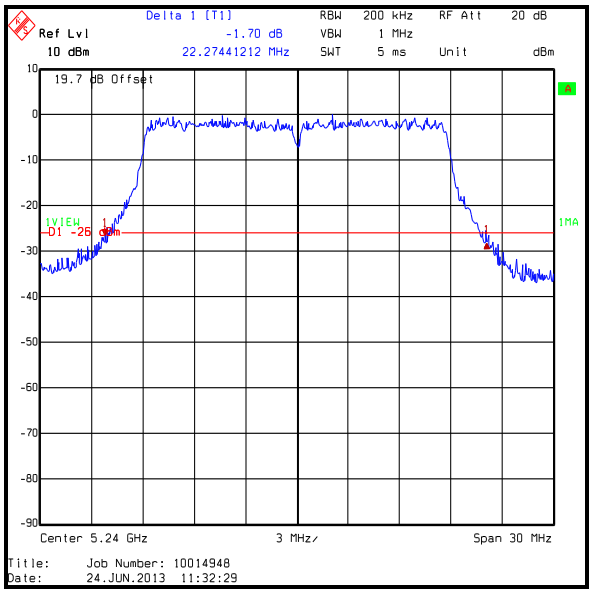
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	16QAM	26 / MCS3	22.034
Middle	5200	16QAM	26 / MCS3	22.034
Top	5240	16QAM	26 / MCS3	22.274



Bottom Channel



Middle Channel

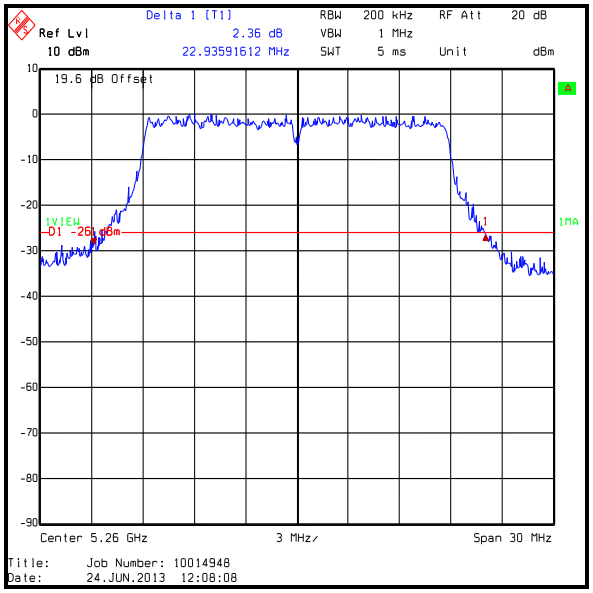


Top Channel

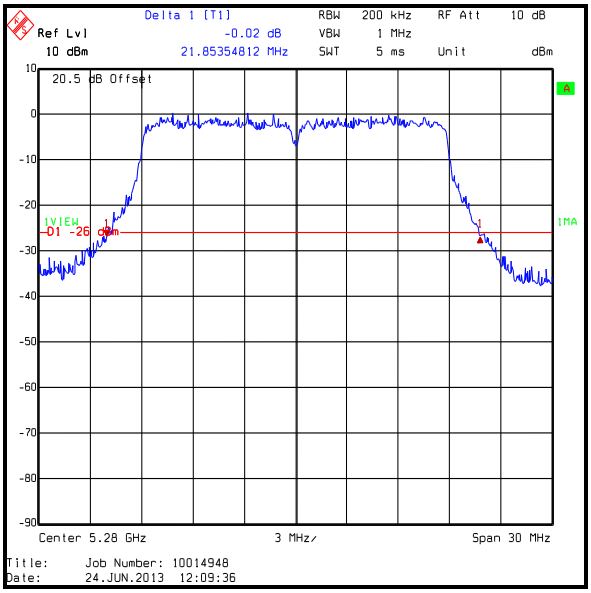
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.25-5.35 GHz band (Reference plots)

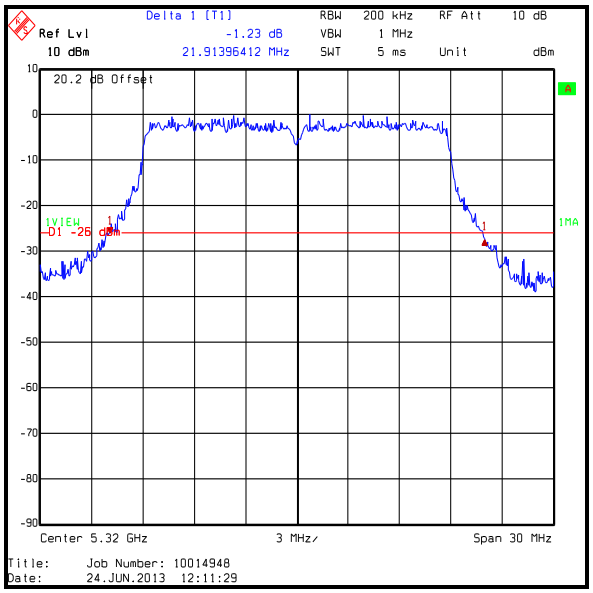
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5260	16QAM	26 / MCS3	22.936
Middle	5280	16QAM	26 / MCS3	21.854
Top	5320	16QAM	26 / MCS3	21.914



Bottom Channel



Middle Channel

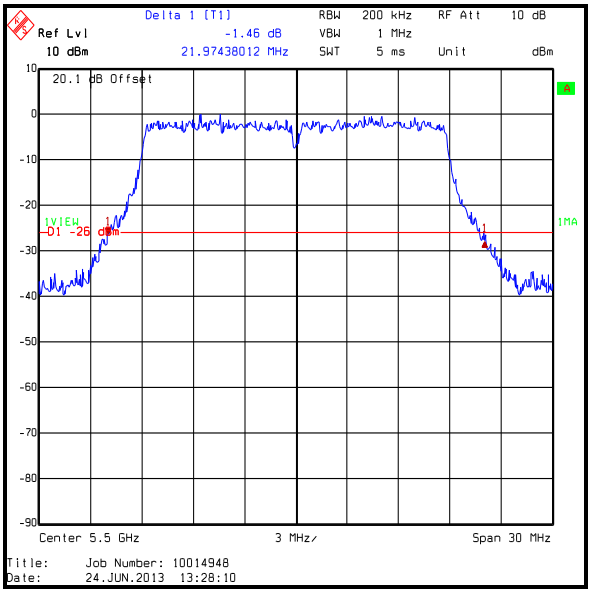


Top Channel

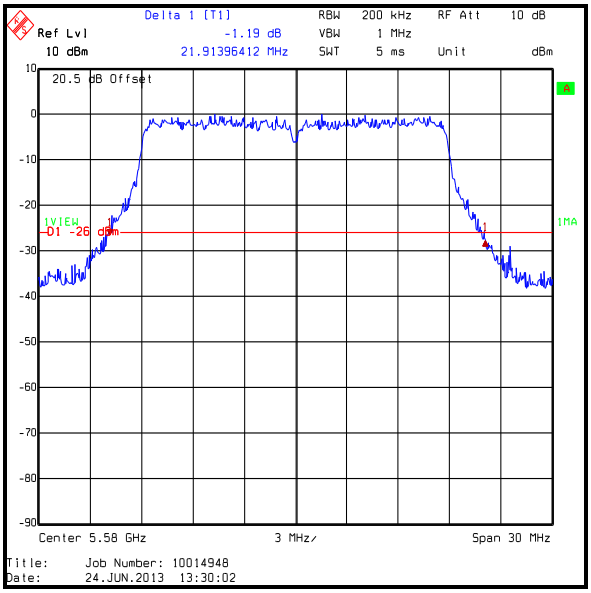
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.47-5.725 GHz band (Reference plots)

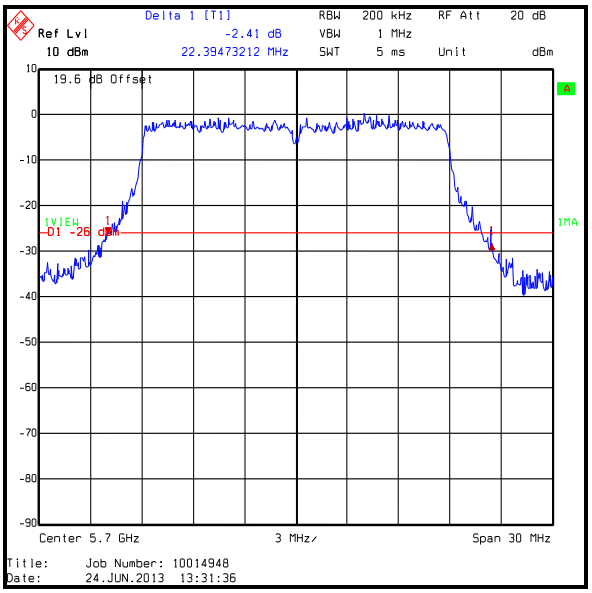
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5500	16QAM	26 / MCS3	21.974
Middle	5580	16QAM	26 / MCS3	21.914
Top	5700	16QAM	26 / MCS3	22.395



Bottom Channel



Middle Channel

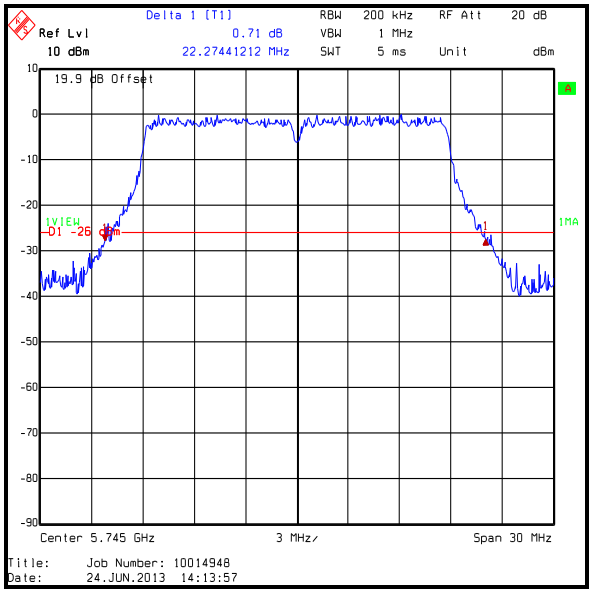


Top Channel

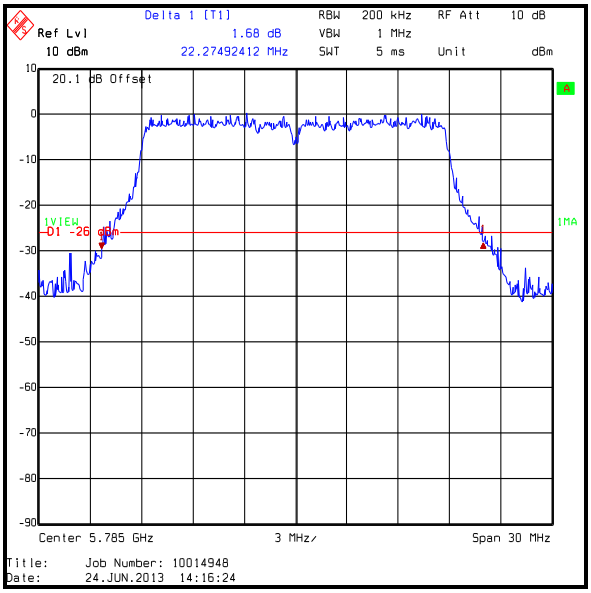
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.725-5.85 GHz band (Reference plots)

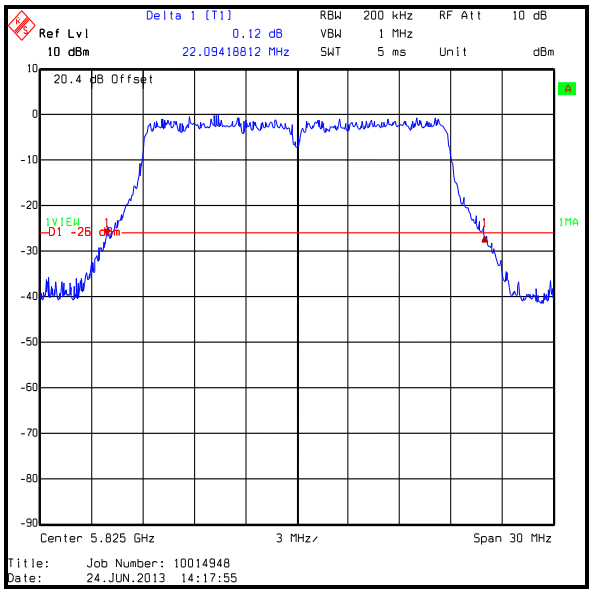
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5745	16QAM	26 / MCS3	22.274
Middle	5785	16QAM	26 / MCS3	22.275
Top	5825	16QAM	26 / MCS3	22.094



Bottom Channel



Middle Channel

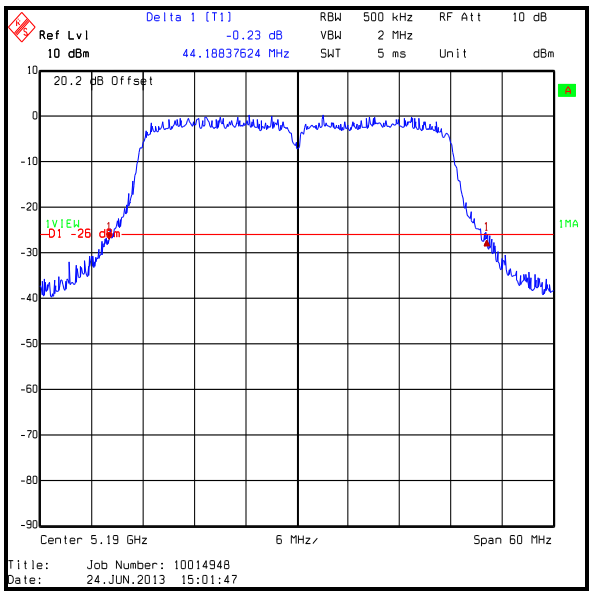


Top Channel

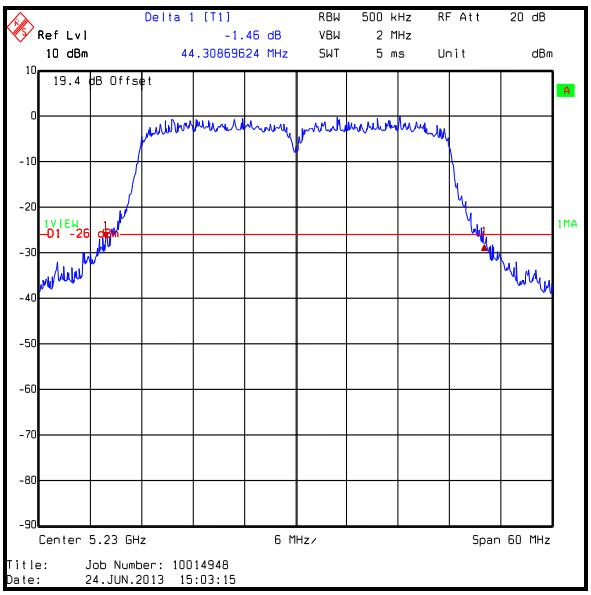
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.15-5.25 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5190	QPSK	40.5 / MCS2	44.188
Top	5230	QPSK	40.5 / MCS2	44.309



Bottom Channel

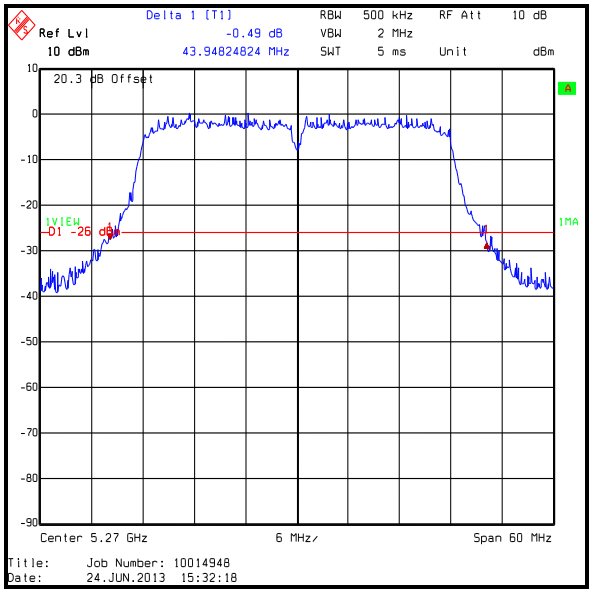


Top Channel

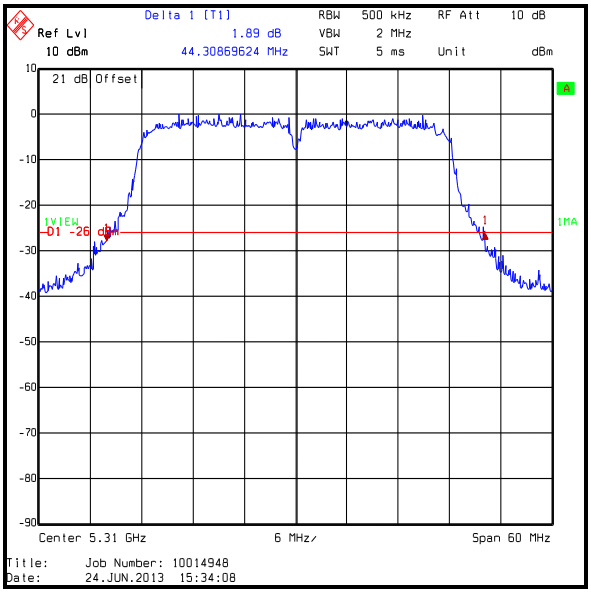
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.25-5.35 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5270	QPSK	40.5 / MCS2	43.948
Top	5310	QPSK	40.5 / MCS2	44.309



Bottom Channel

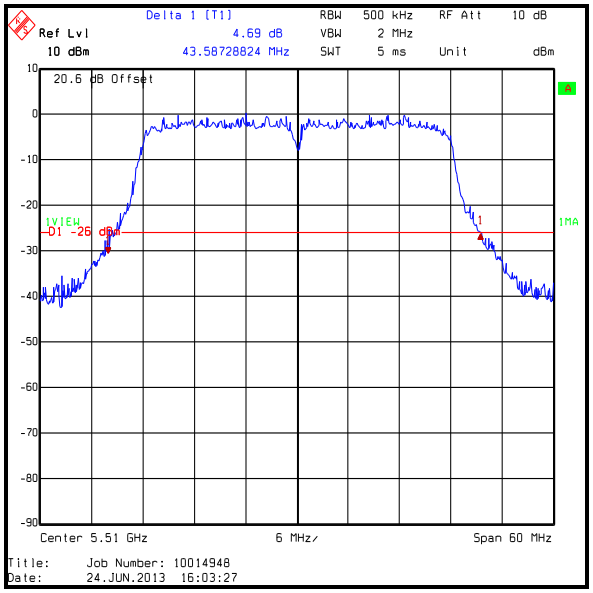


Top Channel

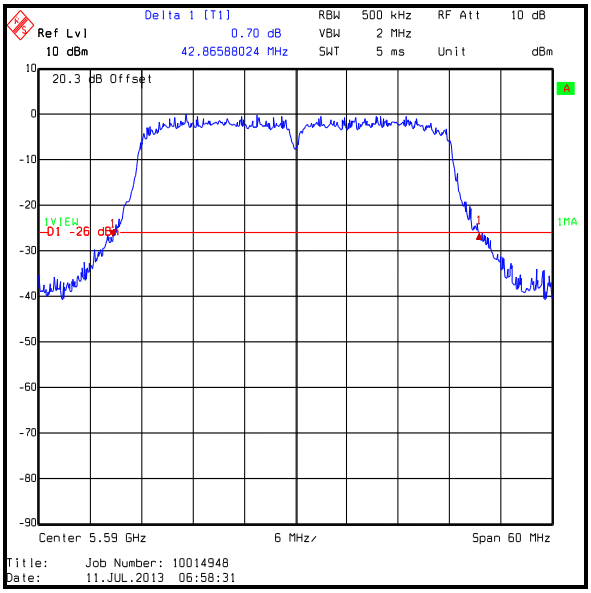
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.47-5.725 GHz band (Reference plots)

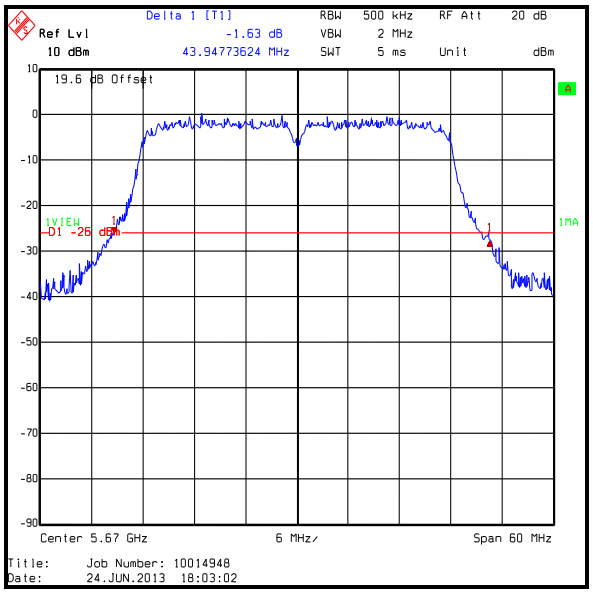
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5510	QPSK	40.5 / MCS2	43.587
Middle	5590	QPSK	40.5 / MCS2	42.866
Top	5670	QPSK	40.5 / MCS2	43.948



Bottom Channel



Middle Channel

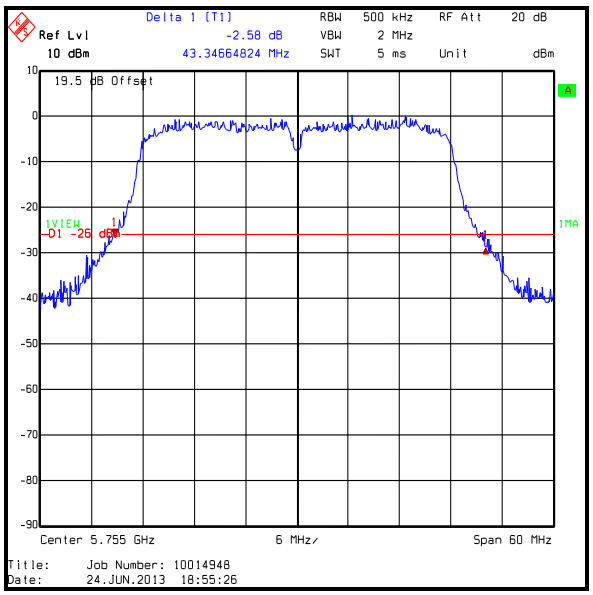


Top Channel

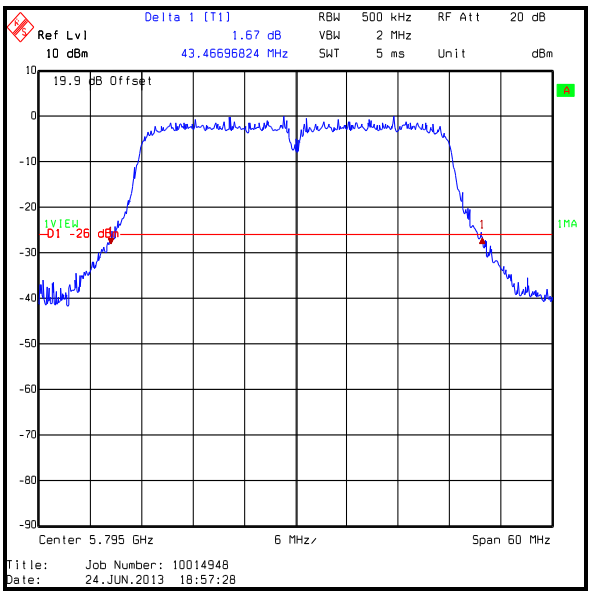
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.725-5.85 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5755	QPSK	40.5 / MCS2	43.347
Top	5795	QPSK	40.5 / MCS2	43.467



Bottom Channel

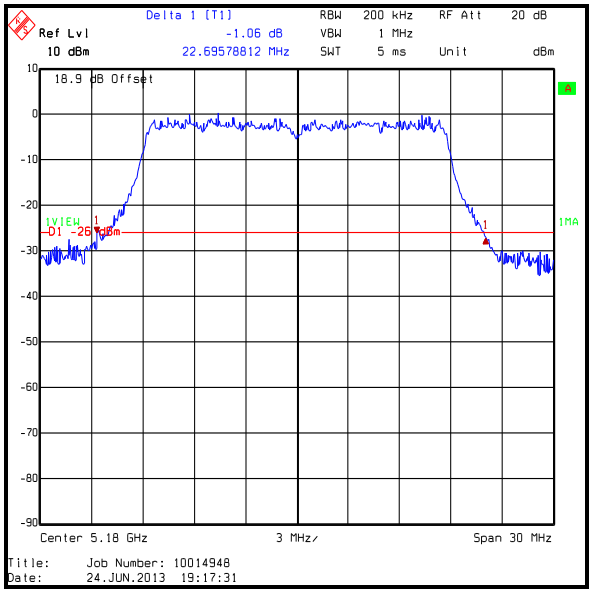


Top Channel

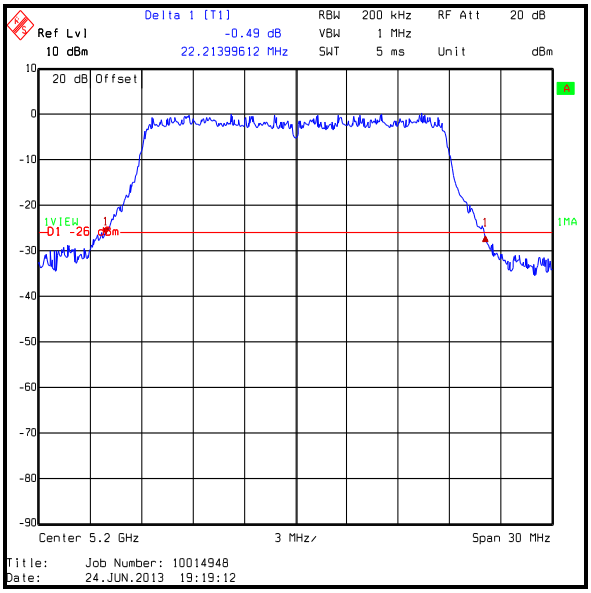
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.15-5.25 GHz band (Reference plots)

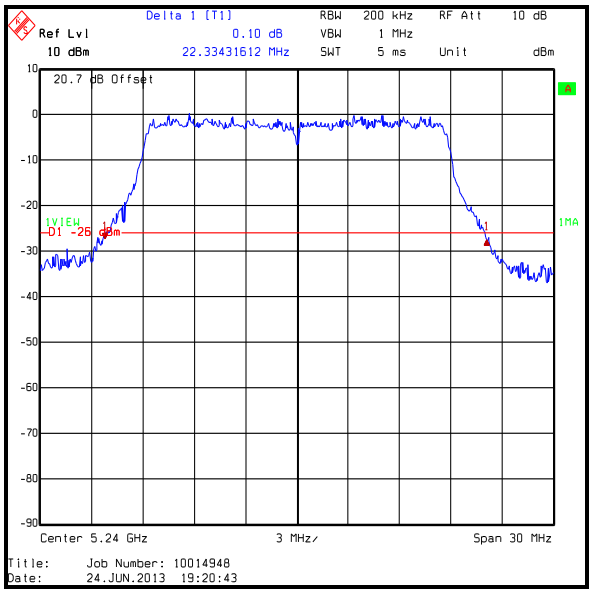
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	6.5 / MCS0	22.696
Middle	5200	BPSK	6.5 / MCS0	22.214
Top	5240	BPSK	6.5 / MCS0	22.334



Bottom Channel



Middle Channel

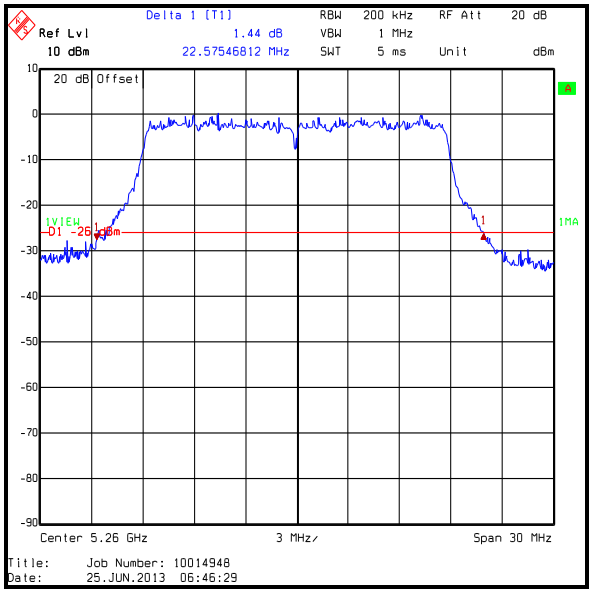


Top Channel

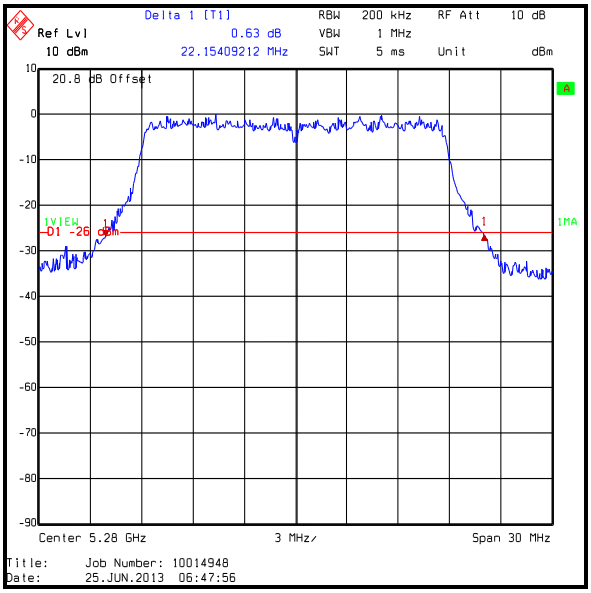
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.25-5.35 GHz band (Reference plots)

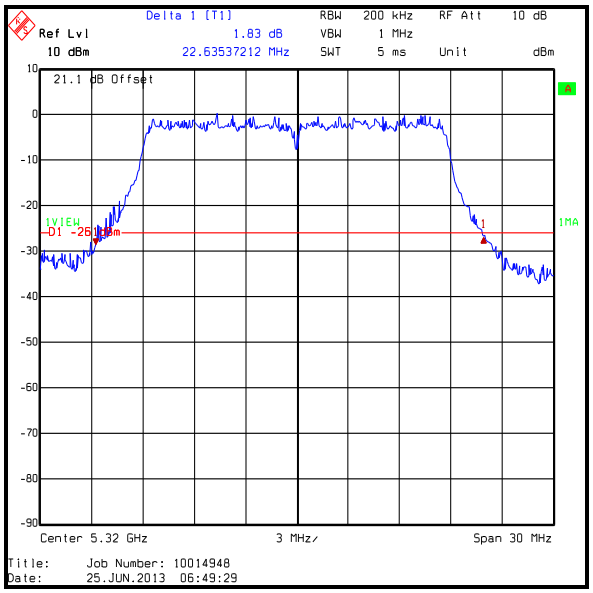
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	6.5 / MCS0	22.575
Middle	5280	BPSK	6.5 / MCS0	22.154
Top	5320	BPSK	6.5 / MCS0	22.635



Bottom Channel



Middle Channel

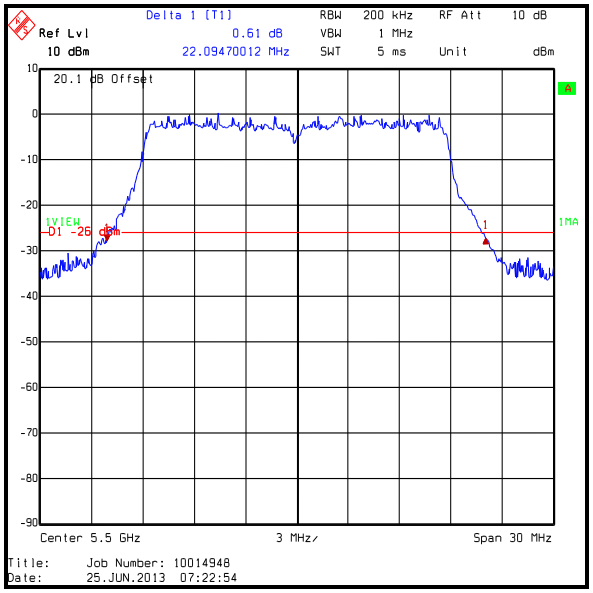


Top Channel

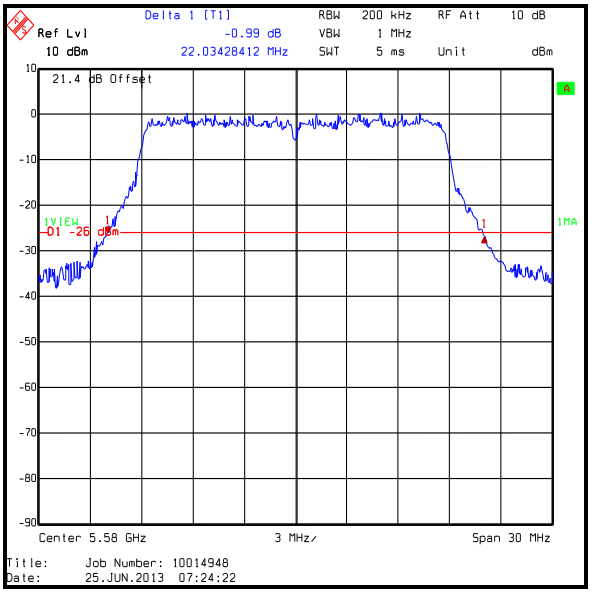
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.47-5.725 GHz band (Reference plots)

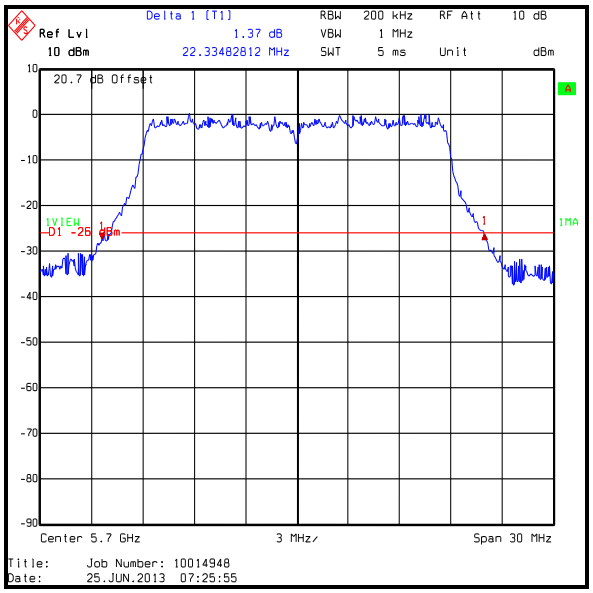
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	6.5 / MCS0	22.095
Middle	5580	BPSK	6.5 / MCS0	22.034
Top	5700	BPSK	6.5 / MCS0	22.335



Bottom Channel



Middle Channel

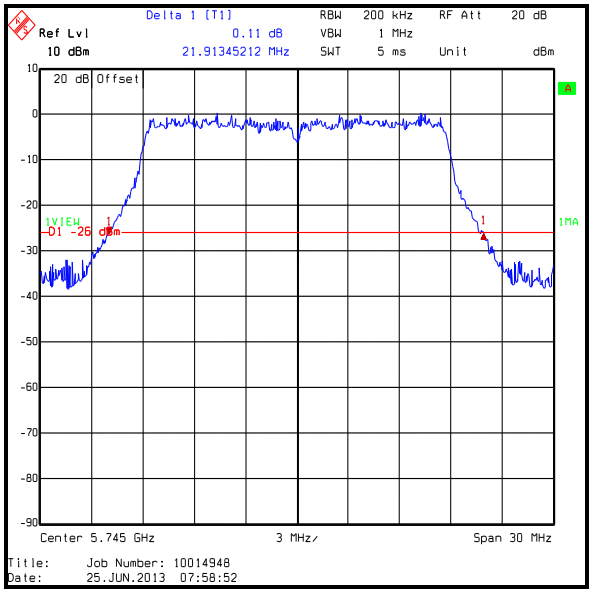


Top Channel

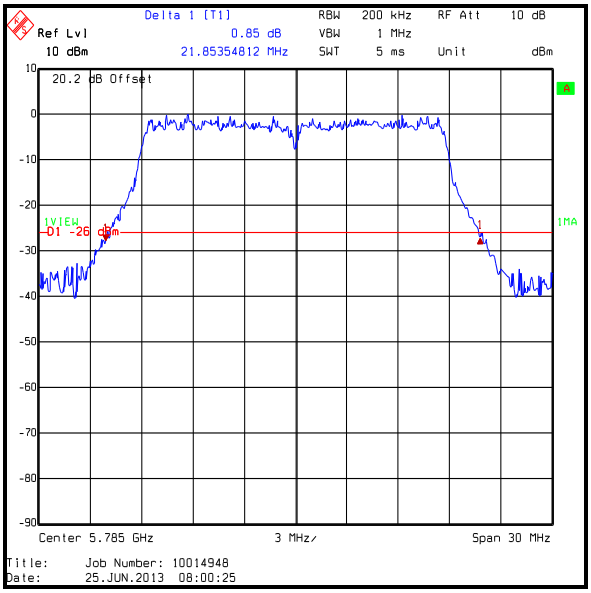
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 20 MHz / 5.725-5.85 GHz band (Reference plots)

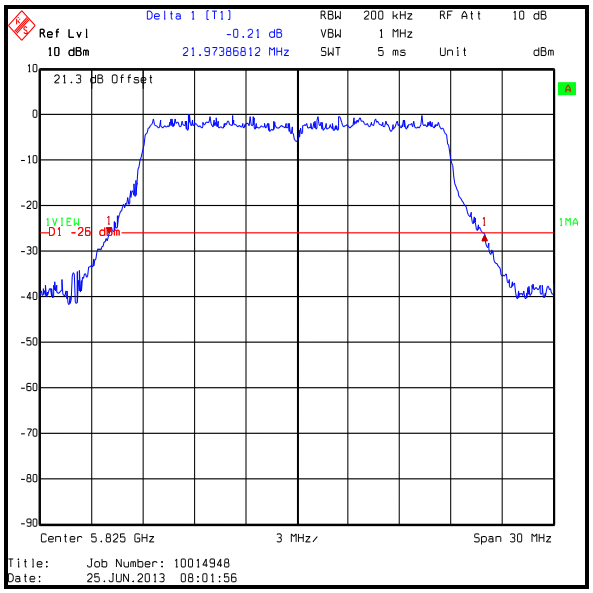
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5745	BPSK	6.5 / MCS0	21.913
Middle	5785	BPSK	6.5 / MCS0	21.854
Top	5825	BPSK	6.5 / MCS0	21.974



Bottom Channel



Middle Channel

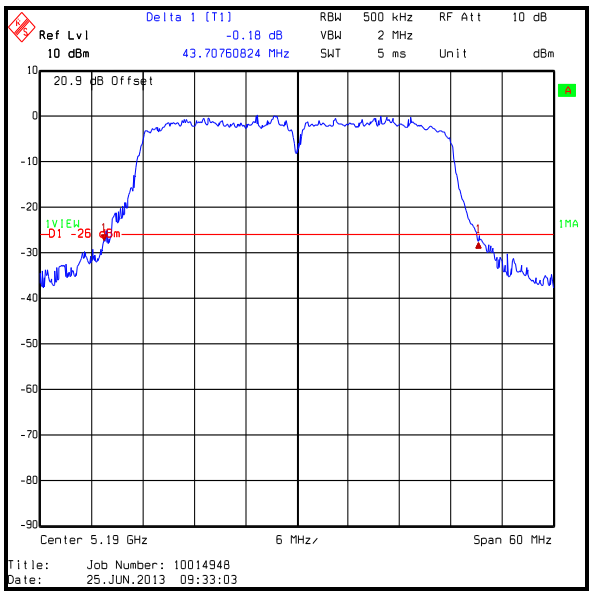


Top Channel

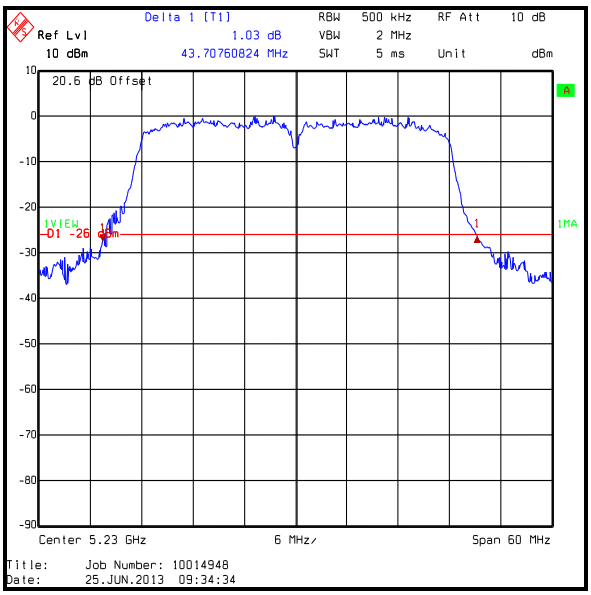
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.15-5.25 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5190	BPSK	13.5 / MCS0	43.708
Top	5230	BPSK	13.5 / MCS0	43.708



Bottom Channel

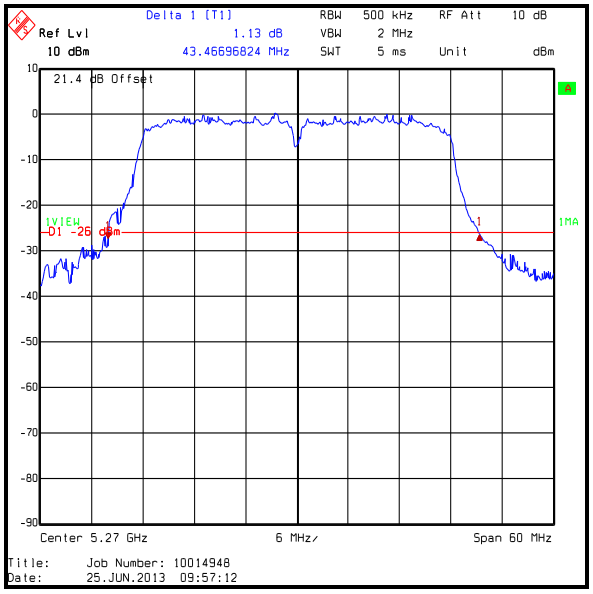


Top Channel

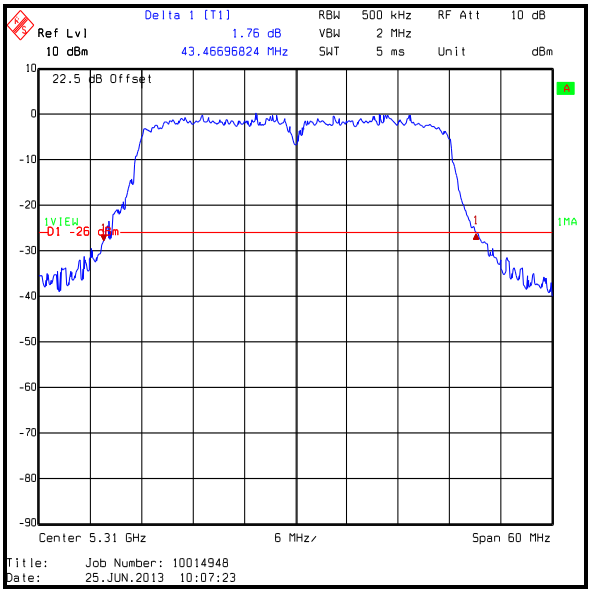
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.25-5.35 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5270	BPSK	13.5 / MCS0	43.467
Top	5310	BPSK	13.5 / MCS0	43.467



Bottom Channel

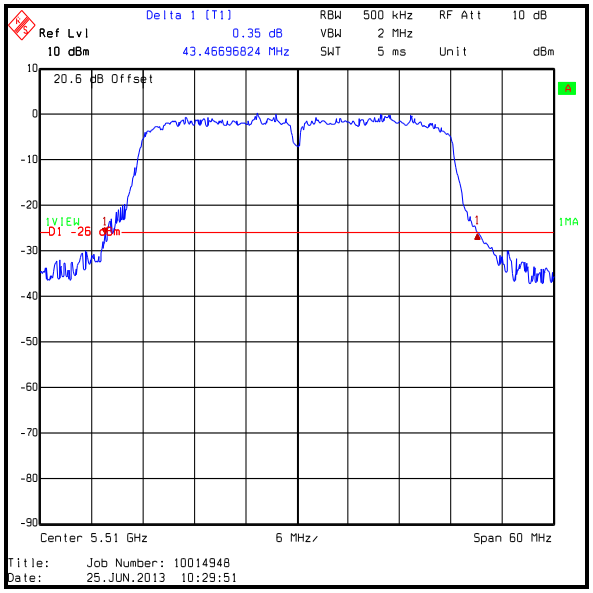


Top Channel

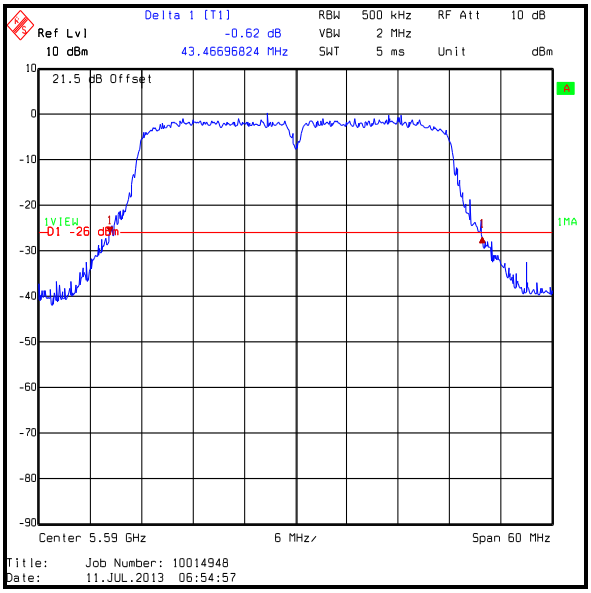
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.47-5.725 GHz band (Reference plots)

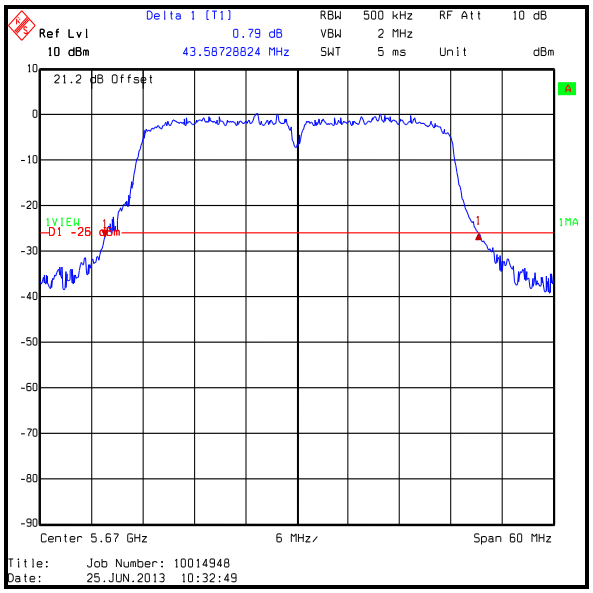
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5510	BPSK	13.5 / MCS0	43.467
Middle	5590	BPSK	13.5 / MCS0	43.467
Top	5670	BPSK	13.5 / MCS0	43.587



Bottom Channel



Middle Channel

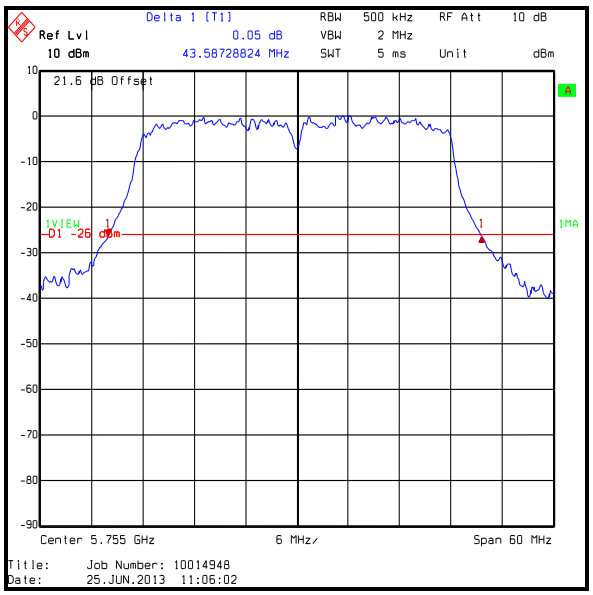


Top Channel

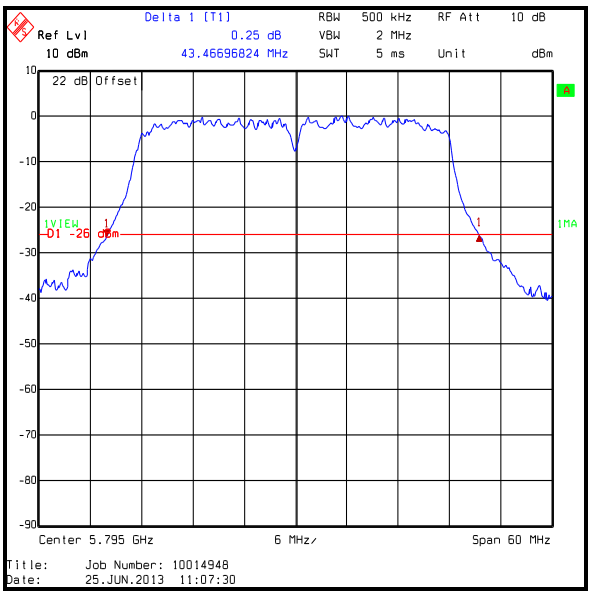
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 40 MHz / 5.725-5.85 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5755	BPSK	13.5 / MCS0	43.587
Top	5795	BPSK	13.5 / MCS0	43.467



Bottom Channel

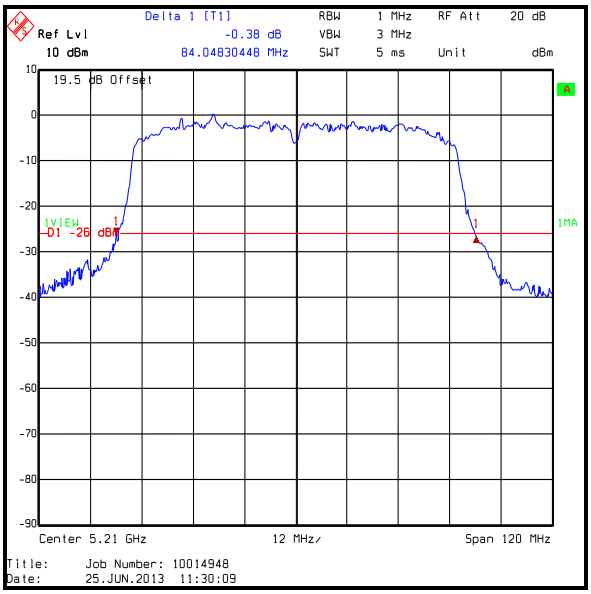


Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.15-5.25 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5210	BPSK	29.3 / MCS0	84.048

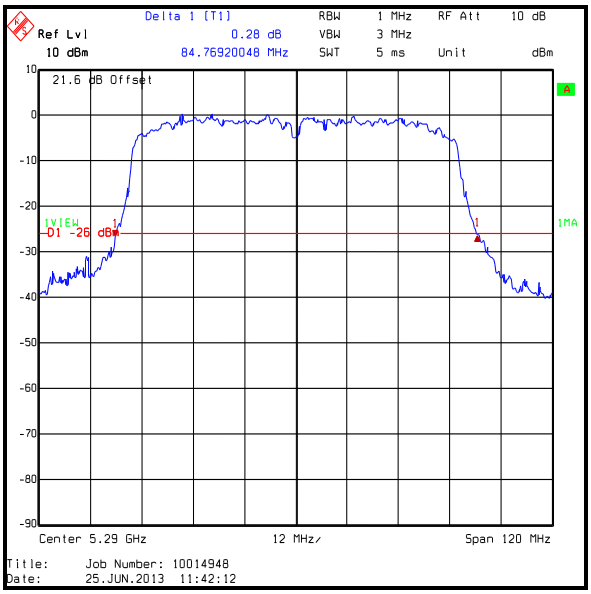


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.25-5.35 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5290	BPSK	29.3 / MCS0	84.769

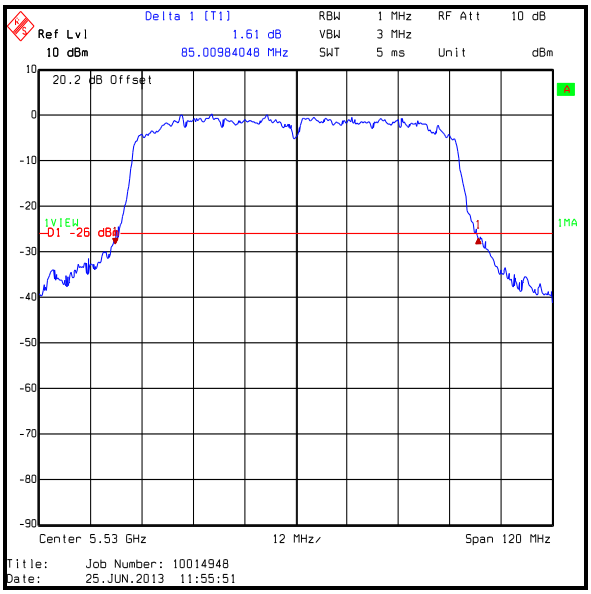


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.47-5.725 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5530	BPSK	29.3 / MCS0	85.010

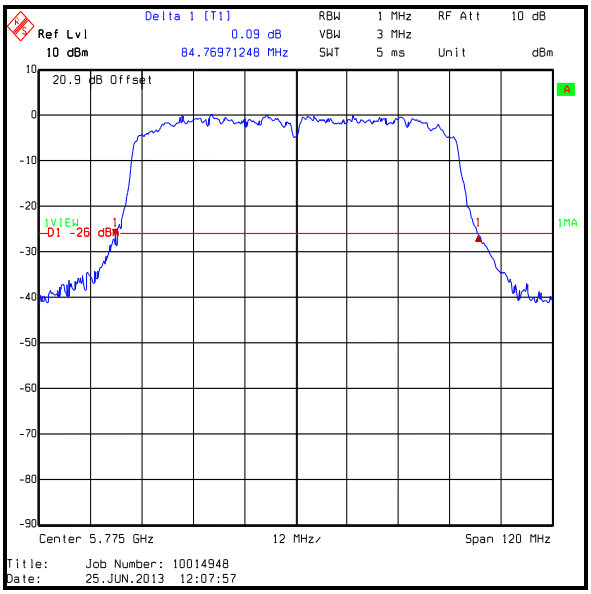


Single Channel

Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11ac / 80 MHz / 5.725-5.85 GHz band (Reference plots)

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Single	5775	BPSK	29.3 / MCS0	84.770



Single Channel

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	13 Aug 2013	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
S0520	DC Power Supply	GW instek	GPC-3030	E835141	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.3.Transmitter Duty Cycle

Test Summary:

Test Engineers:	Ahmed Ali & Nick Steele	**Test Date:**	27 June 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.35I
Test Method Used:	As detailed in FCC KDB 789033 Section B)2)b)

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	35

Note(s):

1. In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter. The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by using the following calculation:

10 log 1 / (On Time / [Period or 100ms whichever is the lesser]).

802.11a / 6 Mbps duty cycle: ≥ 98%

802.11n HT20 / 26 Mbps / MCS3 duty cycle: ≥ 98%

802.11n HT20 / 6.5 Mbps / MCS0 duty cycle: ≥ 98%

802.11n HT20 / 19.5 Mbps / MCS2 duty cycle: ≥ 98%

802.11n HT20 / 39 Mbps / MCS4 duty cycle: ≥ 98%

802.11n HT20 / 65 Mbps / MCS7 duty cycle: ≥ 98%

802.11n HT40 / 40.5 Mbps / MCS2 duty cycle: ≥ 98%

802.11n HT40 / 13.5 Mbps / MCS0 duty cycle: ≥ 98%

802.11n HT40 / 81 Mbps / MCS4 duty cycle: ≥ 98%

802.11n HT40 / 135 Mbps / MCS7 duty cycle: 10 log (1 / (0.274/0.285)) = 0.2

802.11ac VHT20 / 6.5 Mbps / MCS0 duty cycle: ≥ 98%

802.11ac VHT20 / 39 Mbps / MCS4 duty cycle: 10 log (1 / (0.195/0.204)) = 0.2

802.11ac VHT40 / 13.5 Mbps / MCS0 duty cycle: ≥ 98%

802.11ac VHT40 / 27 Mbps / MCS1 duty cycle: 10 log (1 / (0.268/0.279)) = 0.2

802.11ac VHT80 / 29.3 Mbps / MCS0 duty cycle: 10 log (1 / (0.247/0.259)) = 0.2

802.11ac VHT80 / 87.8 Mbps / MCS2 duty cycle: 10 log (1 / (0.111/0.121)) = 0.4

802.11ac VHT80 / 175.5 Mbps / MCS4 duty cycle: 10 log (1 / (0.076/0.086)) = 0.5

802.11ac VHT80 / 292.5 Mbps / MCS7 duty cycle: 10 log (1 / (0.062/0.074)) = 0.8

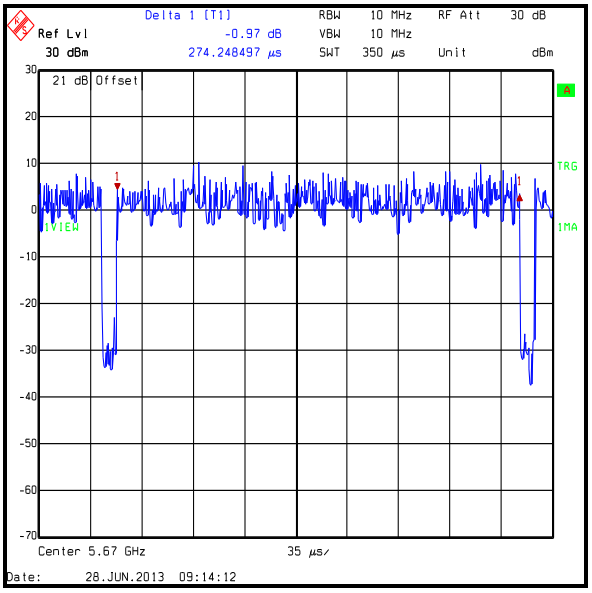
2. Plots below are for data rates with a duty cycle less than 98%. Results for all other modes are archived on the Company server and available for inspection if required.

Transmitter Duty Cycle (continued)

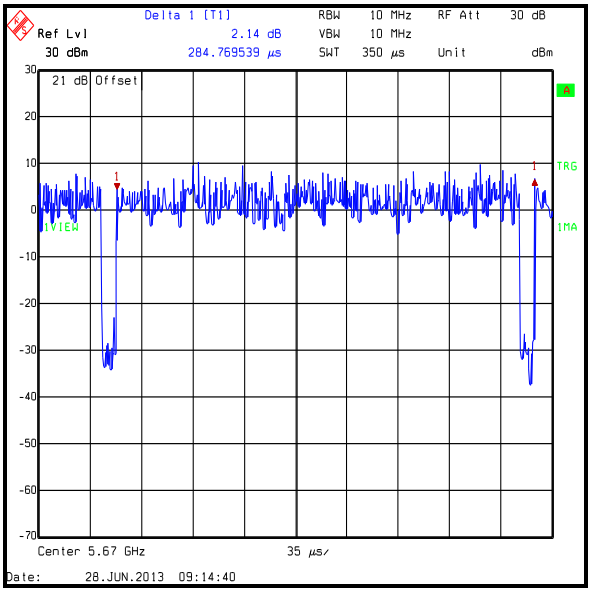
Results: 802.11n / 40 MHz / 135 Mbps / MCS7

Pulse Duration (µs)	Duty Cycle (dB)
0.274	0.2

Period (µs)
0.285



TX on time



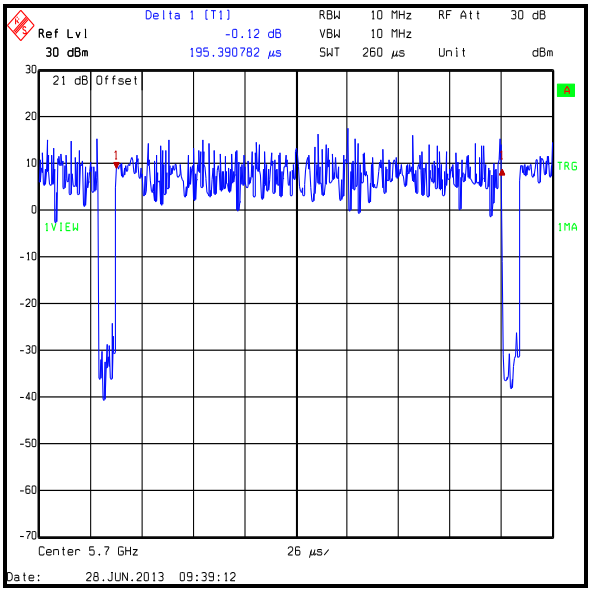
TX on + off time

Transmitter Duty Cycle (continued)

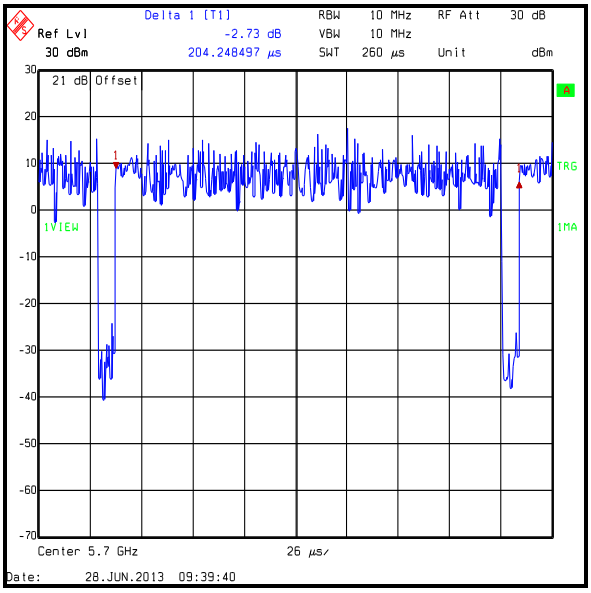
Results: 802.11ac / 20 MHz / 39 Mbps / MCS4

Pulse Duration (ms)	Duty Cycle (dB)
0.195	0.2

Period (ms)
0.204



TX on time



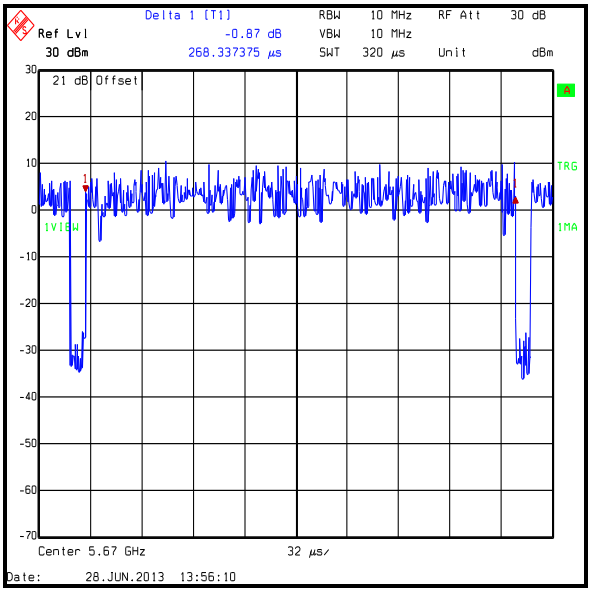
TX on + off time

Transmitter Duty Cycle (continued)

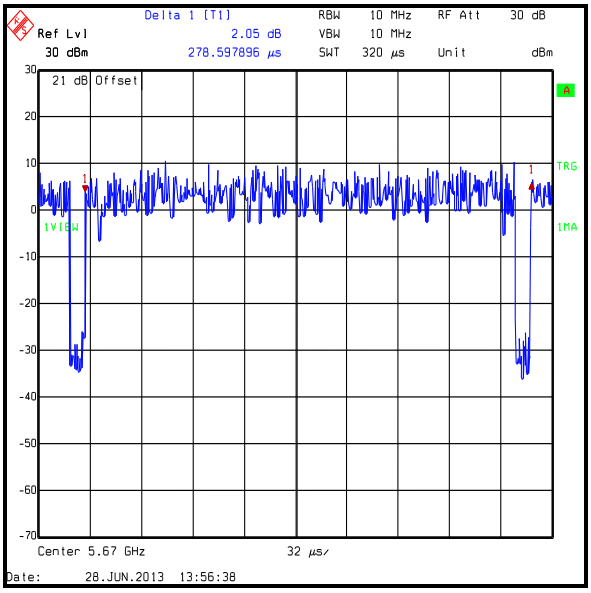
Results: 802.11ac / 40 MHz / 27 Mbps / MCS1

Pulse Duration (ms)	Duty Cycle (dB)
0.268	0.2

Period (ms)
0.279



TX on time



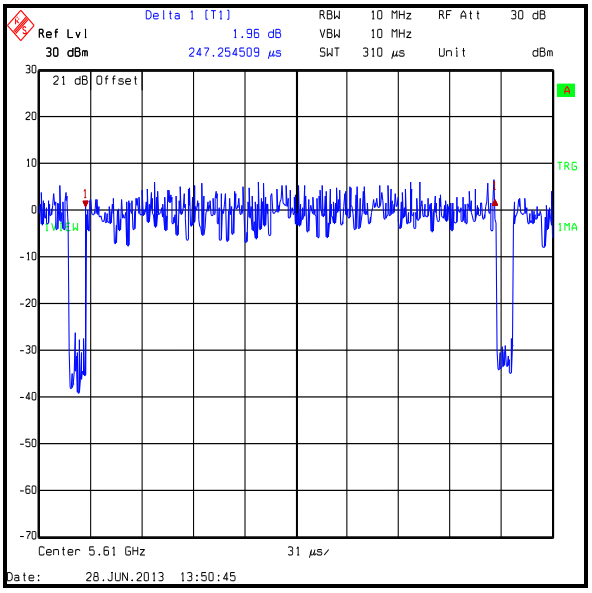
TX on + off time

Transmitter Duty Cycle (continued)

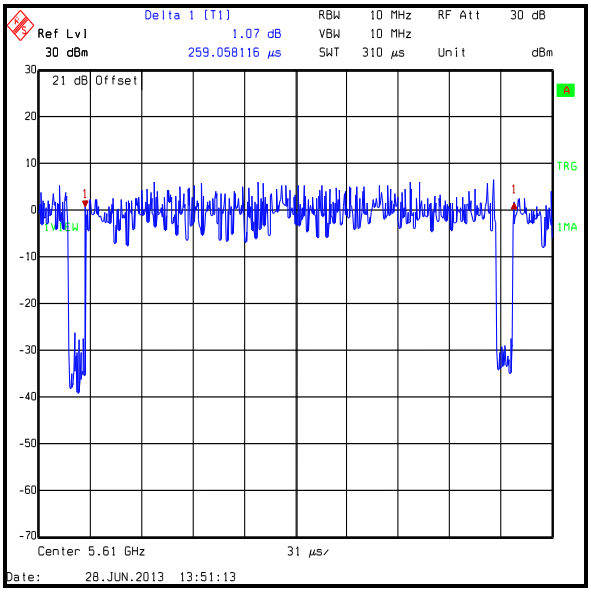
Results: 802.11ac / 80 MHz / 29.3 Mbps / MCS0

Pulse Duration (ms)	Duty Cycle (dB)
0.247	0.2

Period (ms)
0.259



TX on time



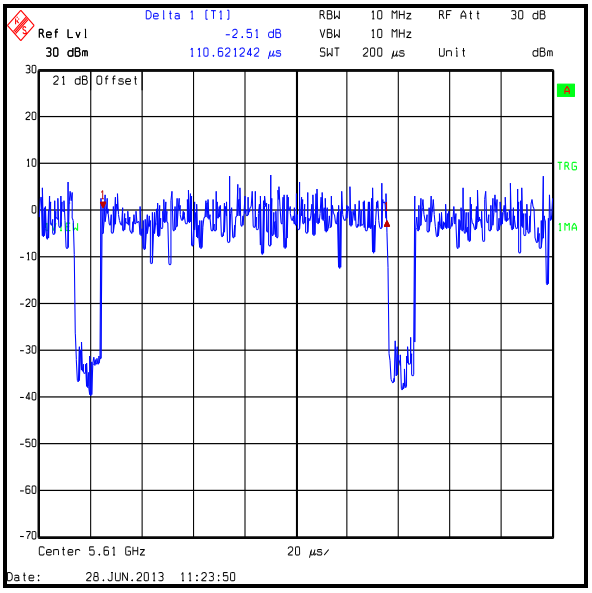
TX on + off time

Transmitter Duty Cycle (continued)

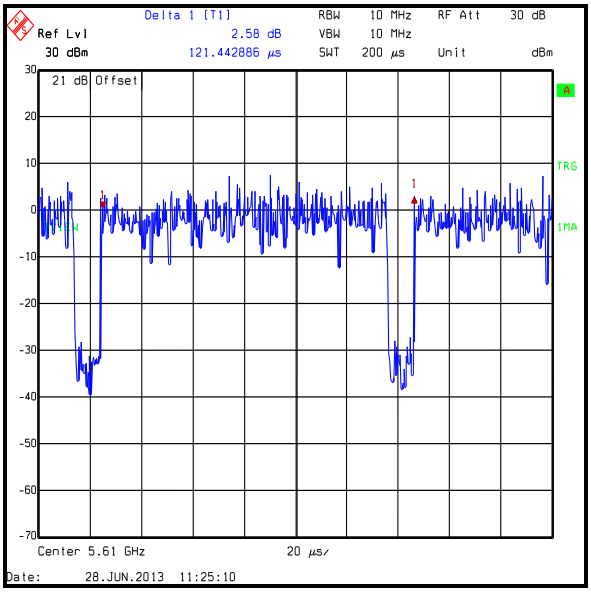
Results: 802.11ac / 80 MHz / 87.8 Mbps / MCS2

Pulse Duration (ms)	Duty Cycle (dB)
0.111	0.4

Period (ms)
0.121



TX on time



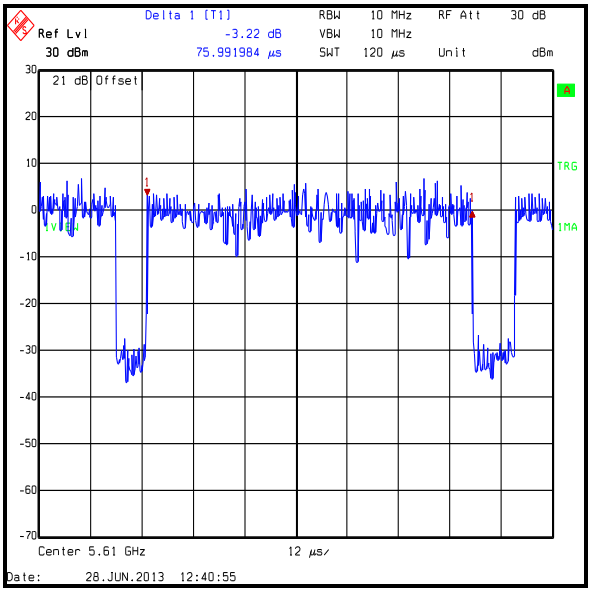
TX on + off time

Transmitter Duty Cycle (continued)

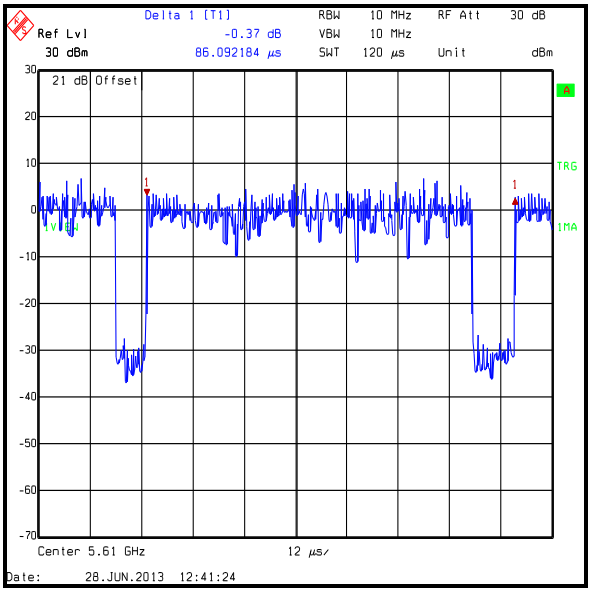
Results: 802.11ac / 80 MHz / 175.5 Mbps / MCS4

Pulse Duration (ms)	Duty Cycle (dB)
0.076	0.5

Period (ms)
0.086



TX on time



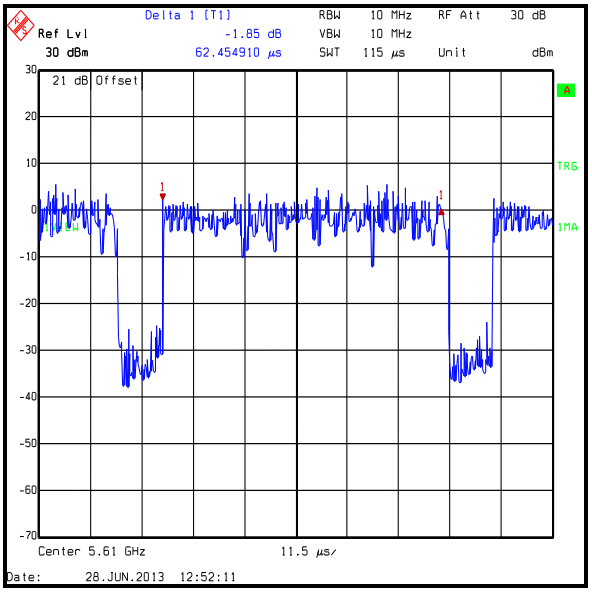
TX on + off time

Transmitter Duty Cycle (continued)

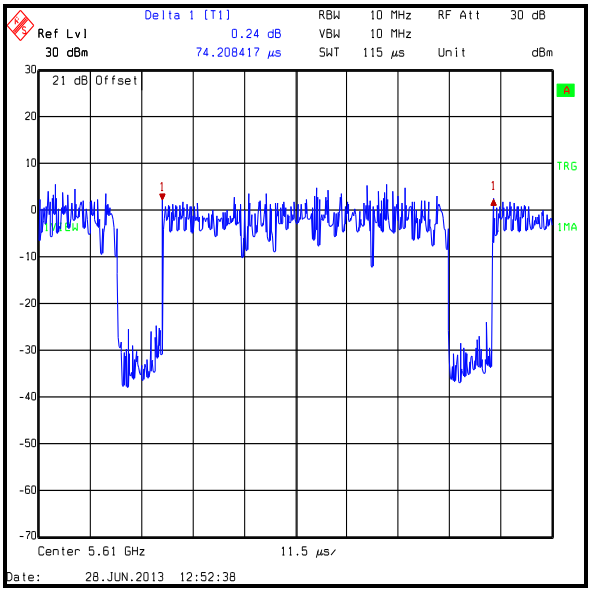
Results: 802.11ac / 80 MHz / 292.5 Mbps / MCS7

Pulse Duration (ms)	Duty Cycle (dB)
0.062	0.8

Period (ms)
0.074



TX on time



TX on + off time

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	13 Aug 2013	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
S0520	DC Power Supply	GW instek	GPC-3030	E835141	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.4. Transmitter Maximum Conducted Output Power

Test Summary:

Test Engineer:	Nick Steele	**Test Dates:**	23 June 2013 to 25 June 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(1)
Test Method Used:	As detailed in FCC KDB 789033 D01 Section E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	35 to 39

Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Note(s):

1. All conducted power tests were performed using a spectrum analyser in accordance with FCC KDB 789033 E)2)e) Method SA-2 Alternative.
2. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 – 16QAM / 26 Mbps / MCS3 (GI = 800 ns)
    - 802.11n HT40 – QPSK / 40.5 Mbps / MCS2 (GI = 800 ns)
    - 802.11ac VHT20 – BPSK / 6.5 Mbps / MCS0 (GI = 800 ns)
    - 802.11ac VHT40 – BPSK / 13.5 Mbps / MCS0 (GI = 800 ns)
    - 802.11ac VHT80 – BPSK / 29.3 Mbps / MCS0 (GI = 800 ns)

    Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
3. For data rates where the EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.3 was added to the measured power in order to compute the average power during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The spectrum analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the spectrum analyser to compensate for the loss of the attenuator and RF cable.
6. The Part 15.407(a)(1) limit is the lesser of 50 mW (17.0 dBm) or 4 dBm + 10 $\log_{10}$ B, where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

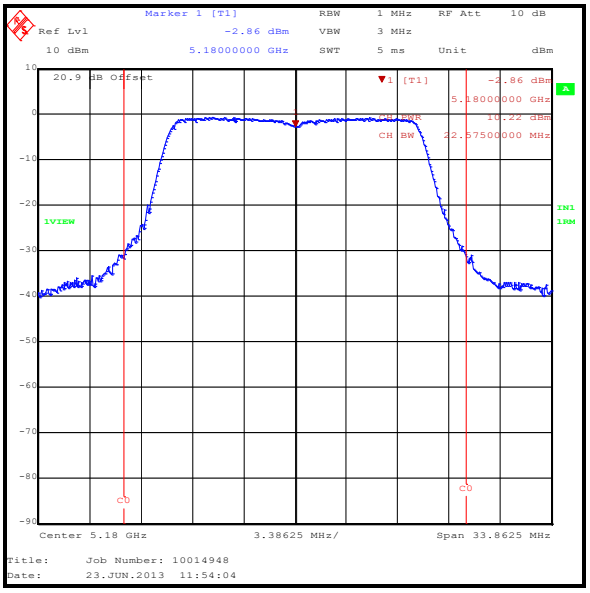
802.11a 20 MHz channel width / Bottom channel = *4 dBm + 10 log_{10} 22.6 = 17.5 dBm*
802.11a 20 MHz channel width / Middle channel = *4 dBm + 10 log_{10} 22.2 = 17.5 dBm*
802.11a 20 MHz channel width / Top channel = *4 dBm + 10 log_{10} 22.5 = 17.5 dBm*
802.11n 20 MHz channel width / Bottom channel = *4 dBm + 10 log_{10} 22.0 = 17.4 dBm*
802.11n 20 MHz channel width / Middle channel = *4 dBm + 10 log_{10} 22.0 = 17.4 dBm*
802.11n 20 MHz channel width / Top channel = *4 dBm + 10 log_{10} 22.3 = 17.5 dBm*
802.11n 40 MHz channel width / Bottom channel = *4 dBm + 10 log_{10} 44.2 = 20.5 dBm*
802.11n 40 MHz channel width / Top channel = *4 dBm + 10 log_{10} 44.3 = 20.5 dBm*
802.11ac 20 MHz channel width / Bottom channel = *4 dBm + 10 log_{10} 22.7 = 17.6 dBm*
802.11ac 20 MHz channel width / Middle channel = *4 dBm + 10 log_{10} 22.2 = 17.5 dBm*
802.11ac 20 MHz channel width / Top channel = *4 dBm + 10 log_{10} 22.3 = 17.5 dBm*
802.11ac 40 MHz channel width / Bottom channel = *4 dBm + 10 log_{10} 43.7 = 20.4 dBm*
802.11ac 40 MHz channel width / Top channel = *4 dBm + 10 log_{10} 43.7 = 20.4 dBm*
802.11ac 80 MHz channel width / Single channel = *4 dBm + 10 log_{10} 84.0 = 23.2 dBm*

Therefore the lesser of the two limits is the fixed limit of 50 mW (17 dBm). This was applied to the results.

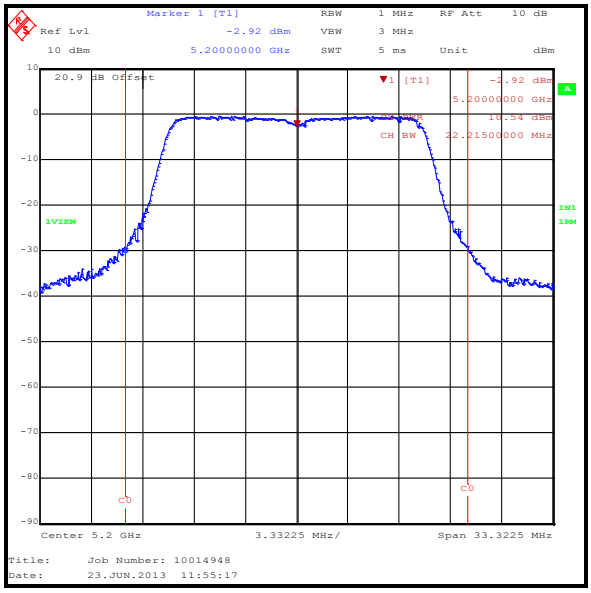
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps

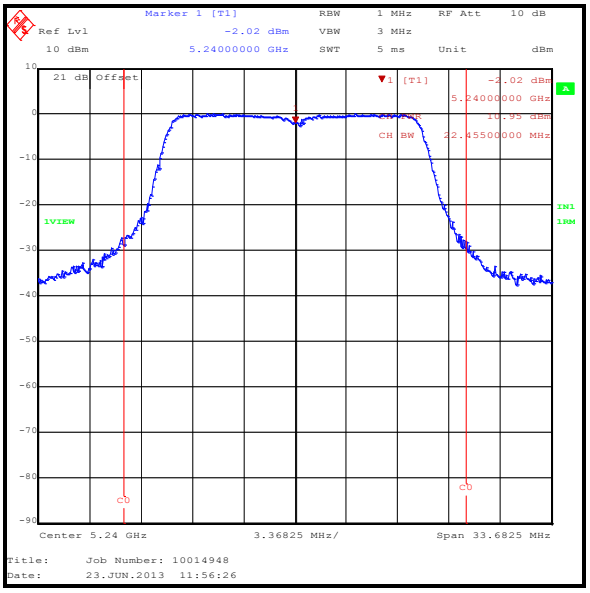
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	10.2	17.0	6.8	Complied
Middle	5200	10.5	17.0	6.5	Complied
Top	5240	11.0	17.0	6.0	Complied



Bottom Channel



Middle Channel

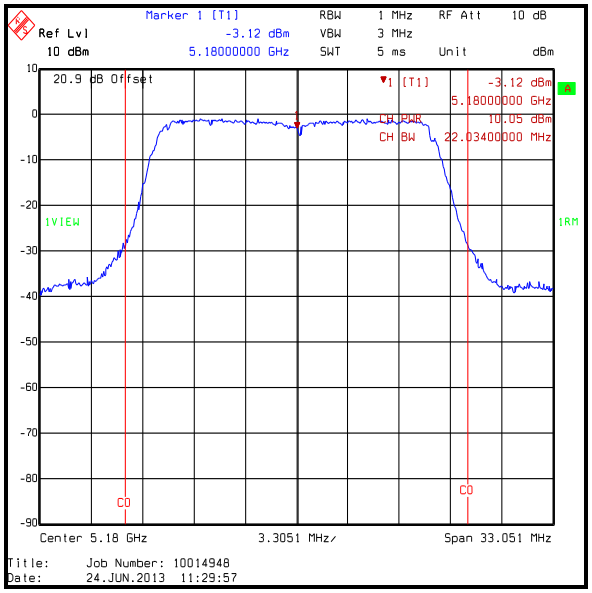


Top Channel

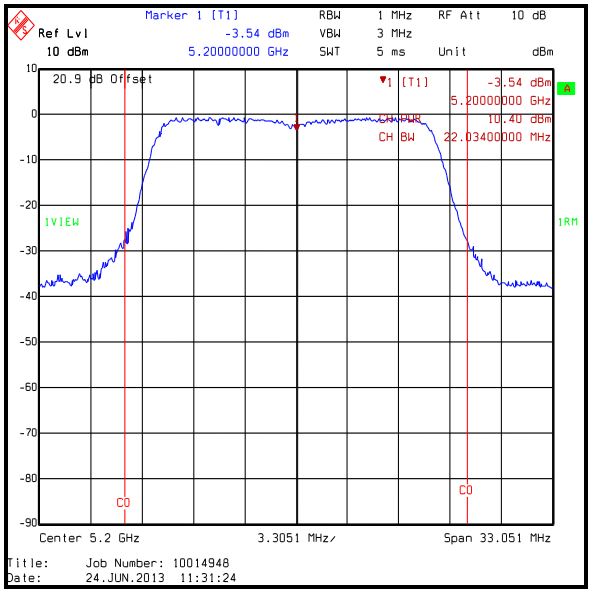
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3

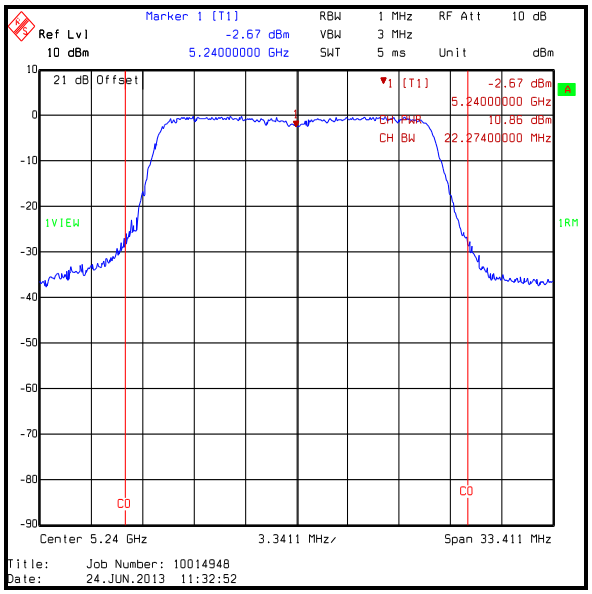
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	10.1	17.0	6.9	Complied
Middle	5200	10.4	17.0	6.6	Complied
Top	5240	10.9	17.0	6.1	Complied



Bottom Channel



Middle Channel

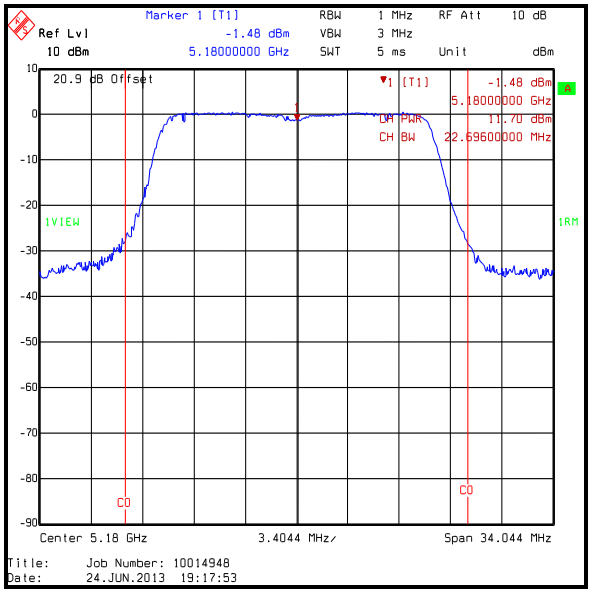


Top Channel

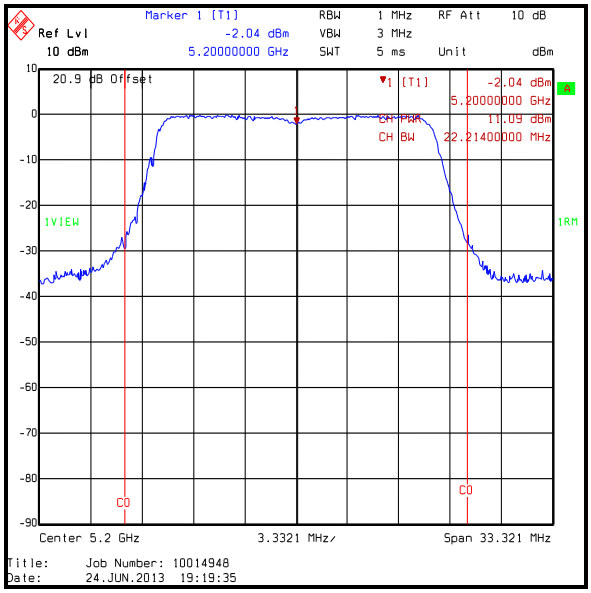
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11ac / 20 MHz / BPSK / 6.5 Mbps / MCS0

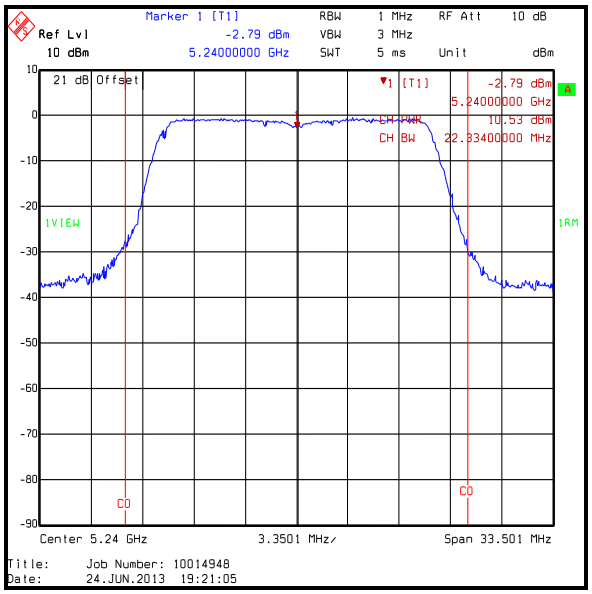
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	11.7	17.0	5.3	Complied
Middle	5200	11.1	17.0	5.9	Complied
Top	5240	10.5	17.0	6.5	Complied



Bottom Channel



Middle Channel

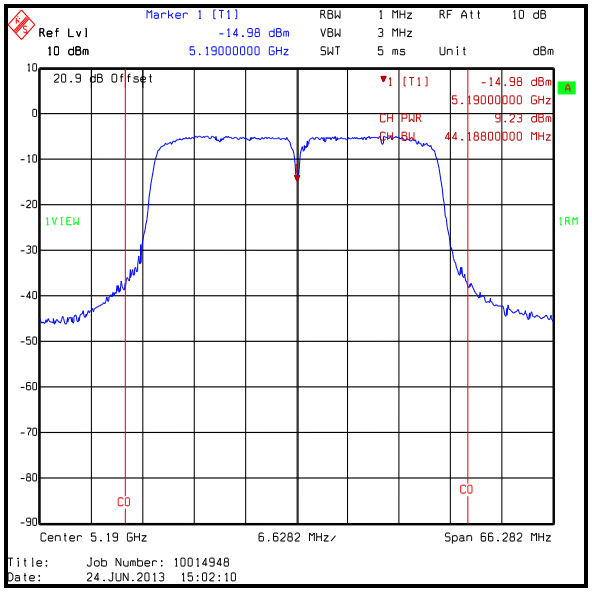


Top Channel

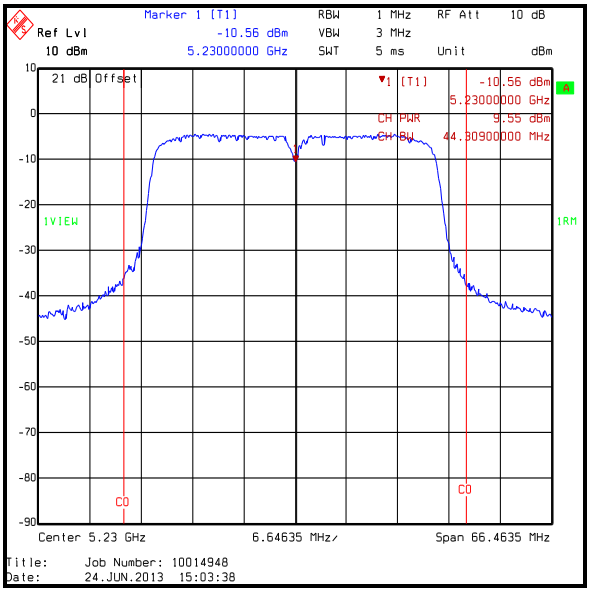
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	9.2	17.0	7.8	Complied
Top	5230	9.6	17.0	7.4	Complied



Bottom Channel

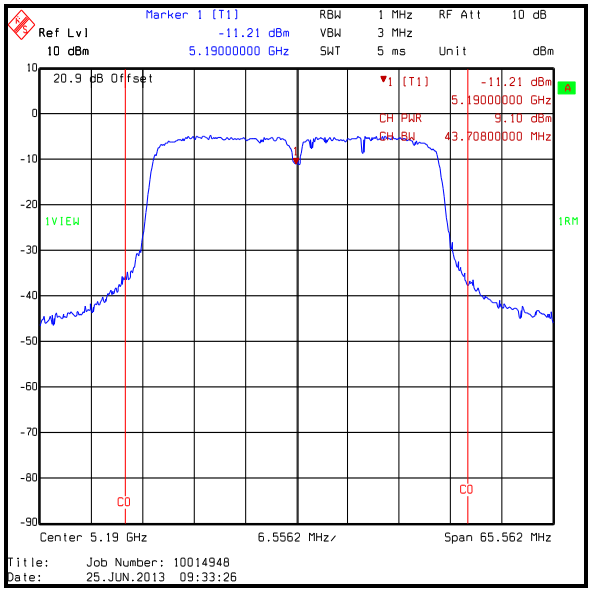


Top Channel

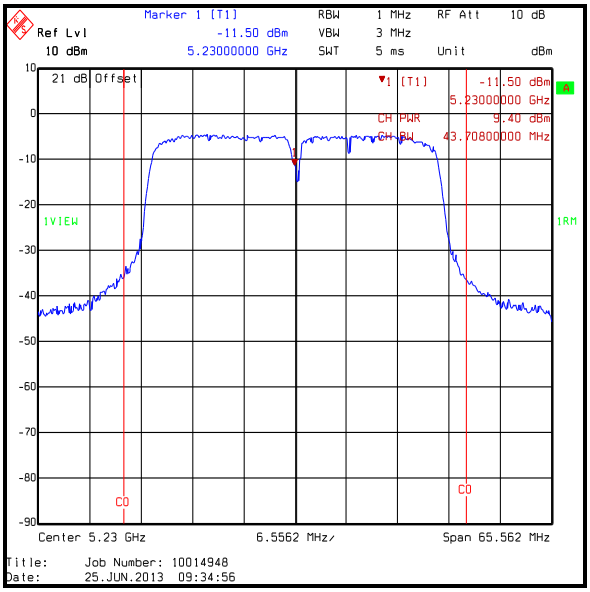
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11ac / 40 MHz / BPSK / 13.5 Mbps / MCS0

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	9.1	17.0	7.9	Complied
Top	5230	9.4	17.0	7.6	Complied



Bottom Channel

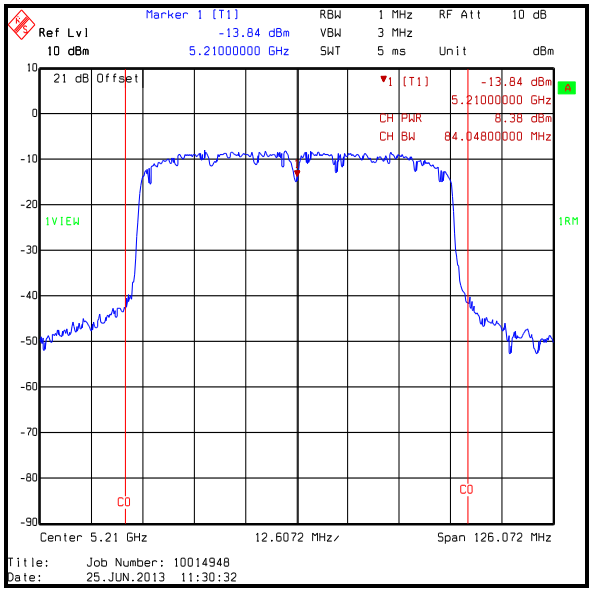


Top Channel

Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (Continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5210	8.4	0.2	8.6	17.0	8.4	Complied



Single Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	24 June 2013 to 11 July 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(2)
Test Method Used:	As detailed in FCC KDB 789033 D01 Section E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	35 to 39

Note(s):

1. The FCC Part 15.407(a)(2) limit is the lesser of 250 mW (24.0 dBm) or 11 dBm + 10 $\log_{10}$ B, where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

5.25-5.35 GHz band

802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.2 = 24.5 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 22.1 = 24.4 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 22.8 = 24.6 dBm*
802.11n 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.9 = 24.6 dBm*
802.11n 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 21.9 = 24.4 dBm*
802.11n 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 21.9 = 24.4 dBm*
802.11n 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 43.9 = 27.4 dBm*
802.11n 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 44.3 = 27.5 dBm*
802.11ac 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.6 = 24.5 dBm*
802.11ac 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 22.2 = 24.5 dBm*
802.11ac 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 22.6 = 24.5 dBm*
802.11ac 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 43.5 = 27.4 dBm*
802.11ac 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 43.5 = 27.4 dBm*
802.11ac 80 MHz channel width / Single channel = *11 dBm + 10 $\log_{10}$ 84.8 = 30.3 dBm*

5.47-5.725 GHz band

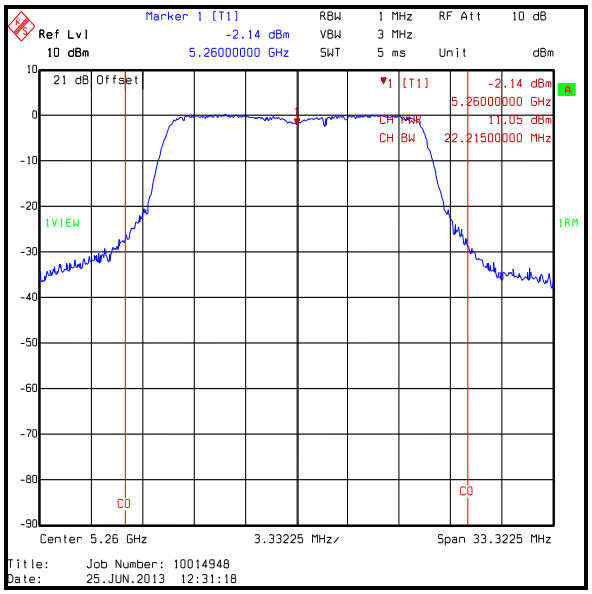
802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.0 = 24.4 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 23.0 = 24.6 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 22.2 = 24.5 dBm*
802.11n 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.0 = 24.4 dBm*
802.11n 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 21.9 = 24.4 dBm*
802.11n 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 22.4 = 24.5 dBm*
802.11n 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 43.6 = 27.4 dBm*
802.11n 40 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 42.9 = 27.3 dBm*
802.11n 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 43.9 = 27.4 dBm*
802.11ac 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 22.1 = 24.4 dBm*
802.11ac 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 22.0 = 24.4 dBm*
802.11ac 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 22.3 = 24.5 dBm*
802.11ac 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 43.5 = 27.4 dBm*
802.11ac 40 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 43.5 = 27.4 dBm*
802.11ac 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 43.6 = 27.4 dBm*
802.11ac 80 MHz channel width / Single channel = *11 dBm + 10 $\log_{10}$ 85.0 = 30.3 dBm*

The lesser of the two limits is the fixed limit of 250 mW (24.0 dBm). This was applied to the results.

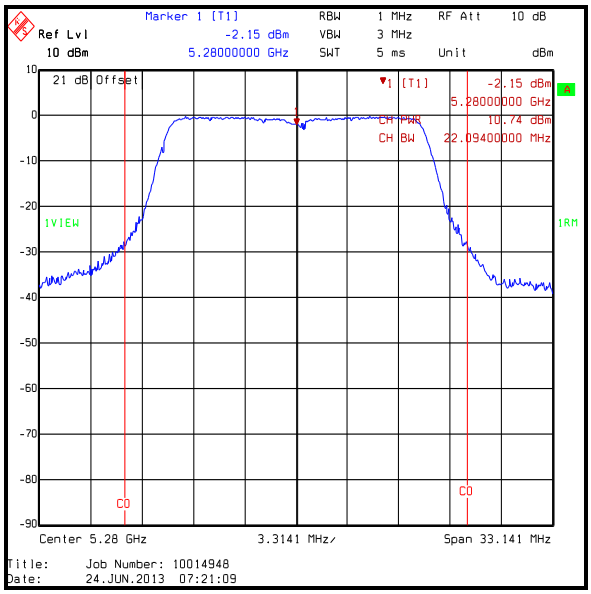
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.25-5.35 GHz band

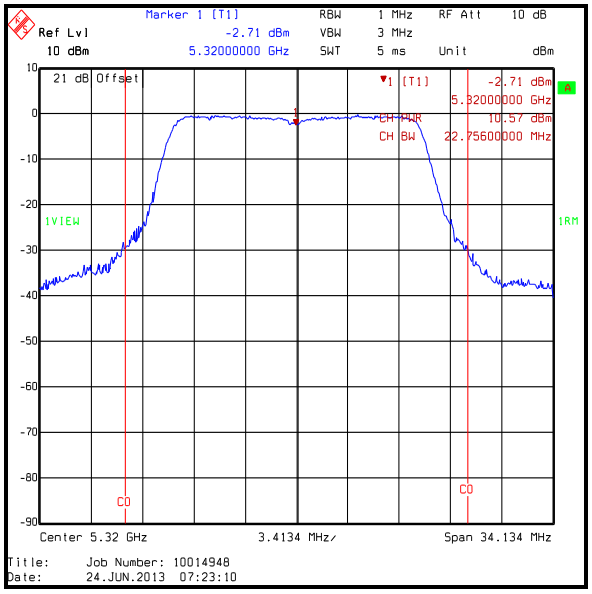
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	11.1	24.0	12.9	Complied
Middle	5280	10.7	24.0	13.3	Complied
Top	5320	10.6	24.0	13.4	Complied



Bottom Channel



Middle Channel

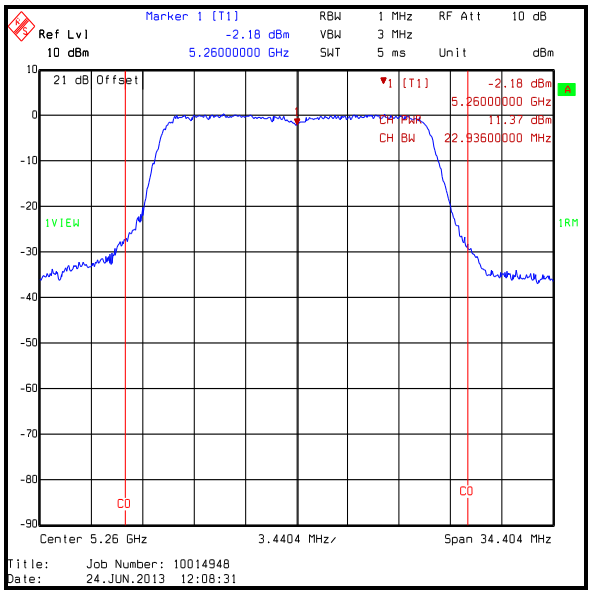


Top Channel

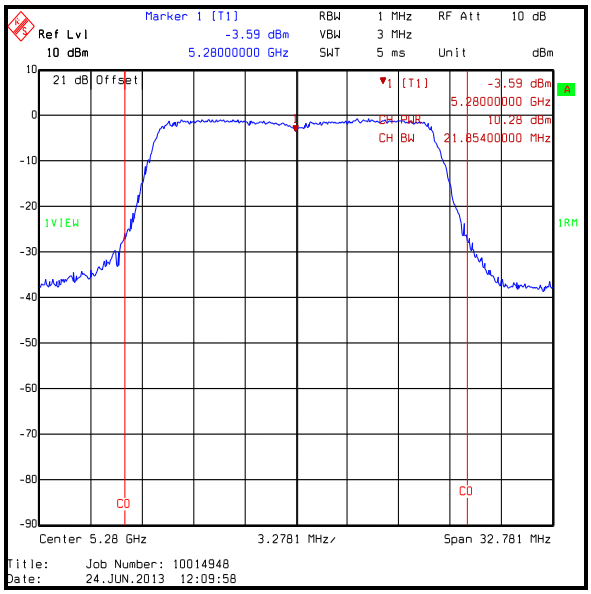
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3 / 5.25-5.35 GHz band

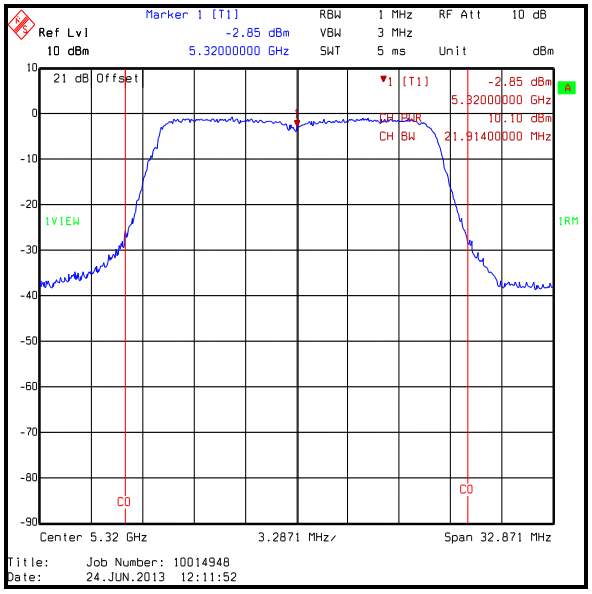
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	11.4	24.0	12.6	Complied
Middle	5280	10.3	24.0	13.7	Complied
Top	5320	10.1	24.0	13.9	Complied



Bottom Channel



Middle Channel

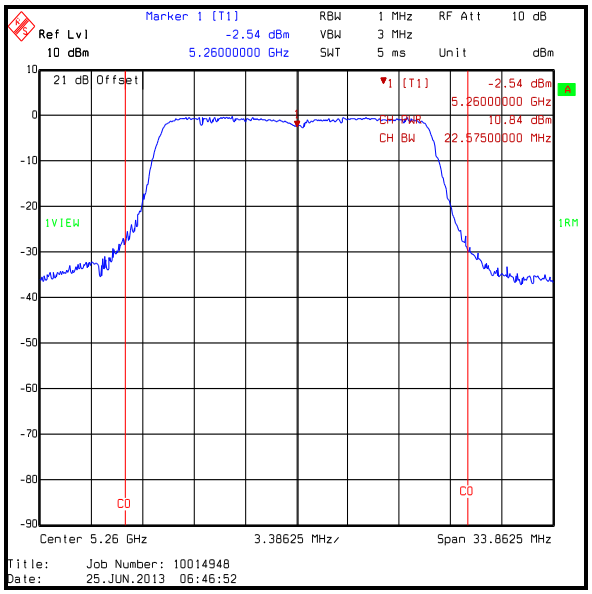


Top Channel

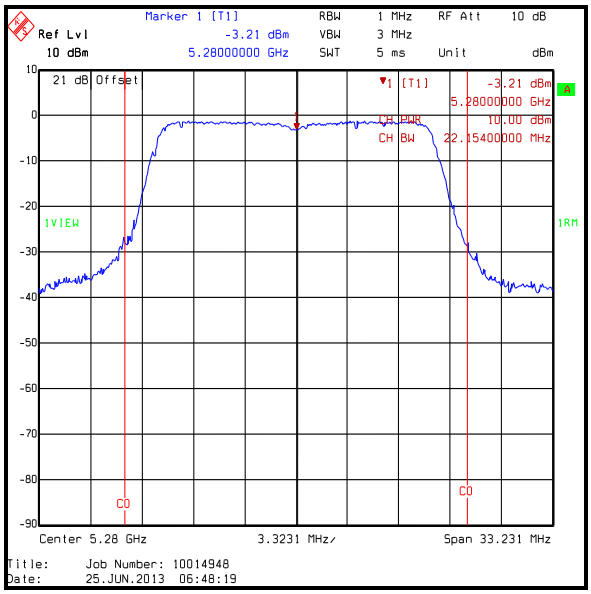
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 20 MHz / BPSK / 6.5 Mbps / MCS0 / 5.25-5.35 GHz band

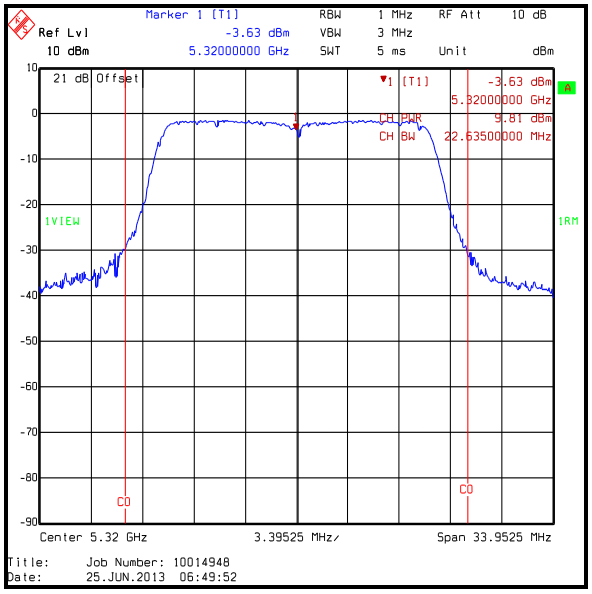
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	10.8	24.0	13.2	Complied
Middle	5280	10.0	24.0	14.0	Complied
Top	5320	9.8	24.0	14.2	Complied



Bottom Channel



Middle Channel

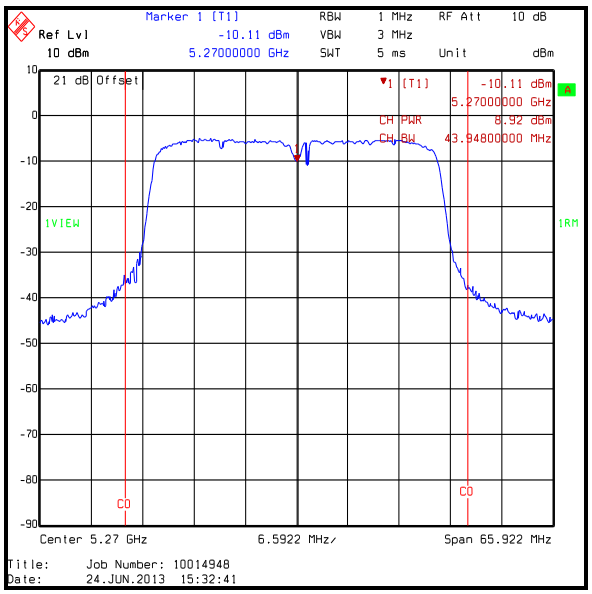


Top Channel

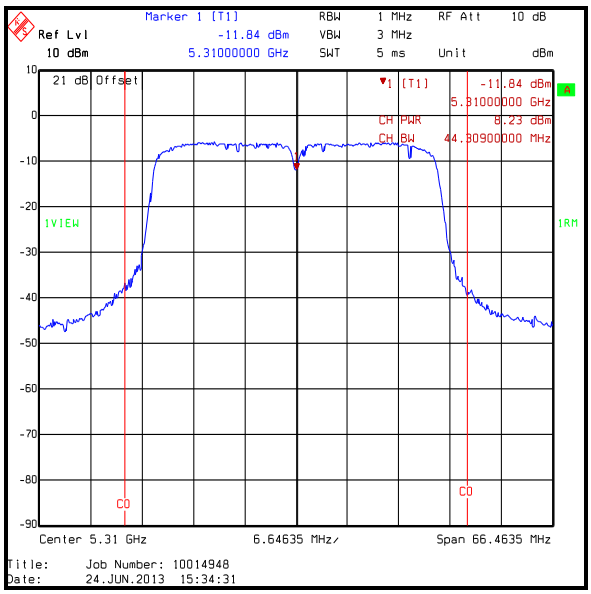
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	8.9	24.0	15.1	Complied
Top	5310	8.2	24.0	15.8	Complied



Bottom Channel

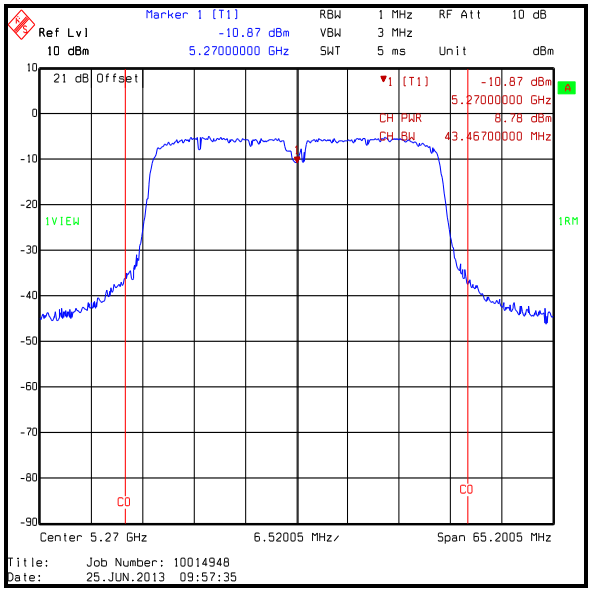


Top Channel

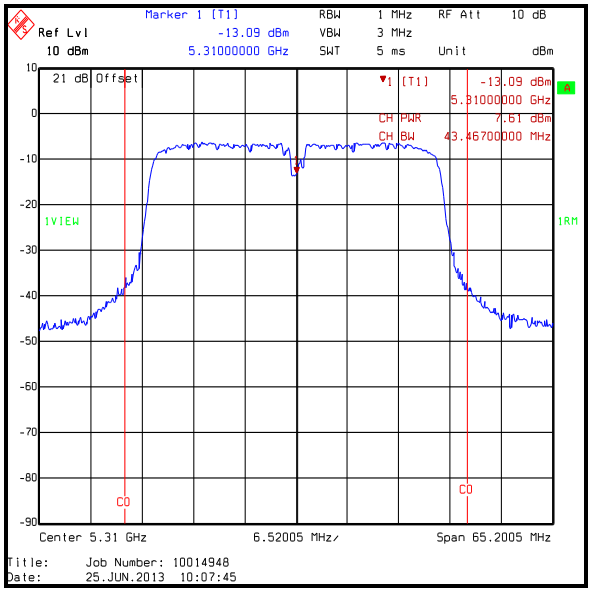
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 40 MHz / BPSK / 13.5 Mbps / MCS0 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	8.8	24.0	15.2	Complied
Top	5310	7.6	24.0	16.4	Complied



Bottom Channel

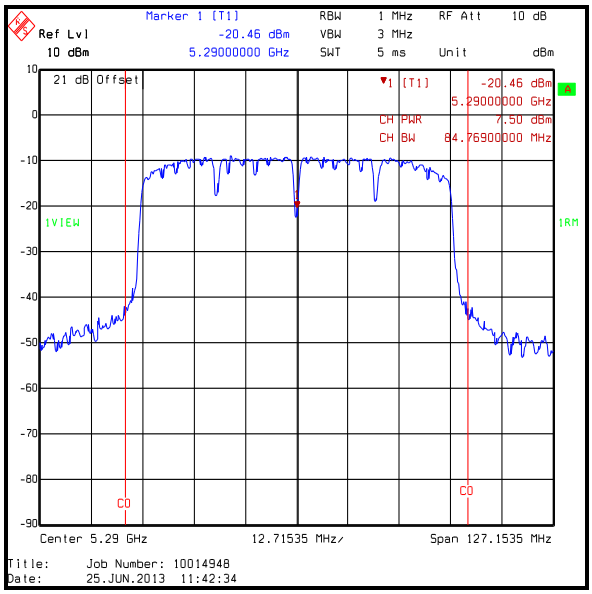


Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5290	7.5	0.2	7.7	24.0	16.3	Complied

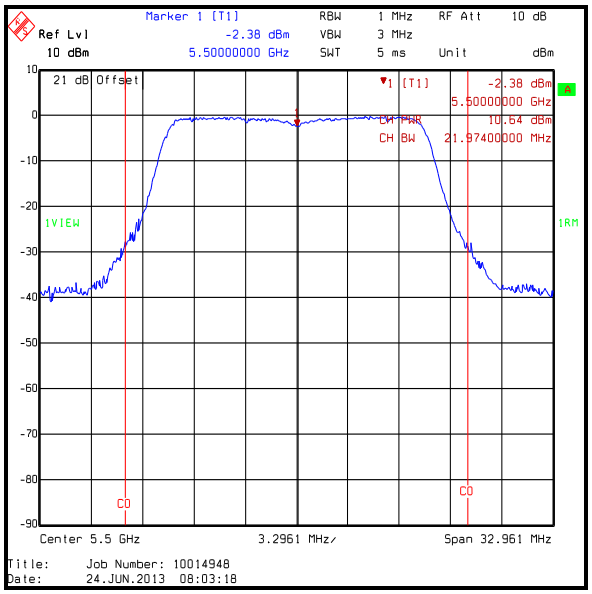


Single Channel

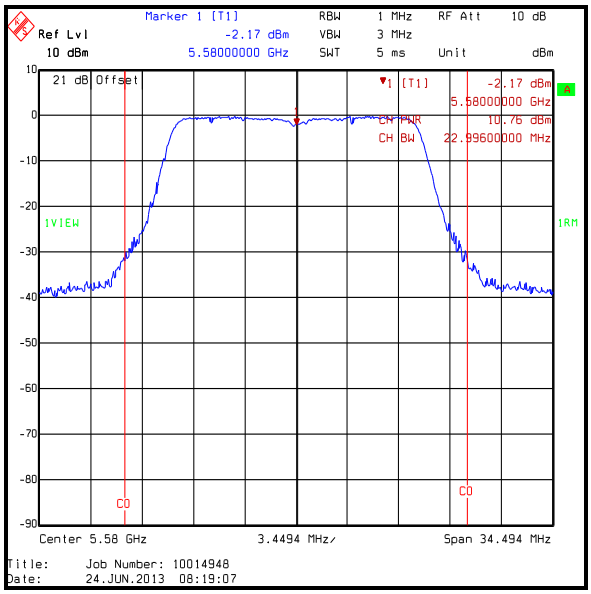
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.47-5.725 GHz band

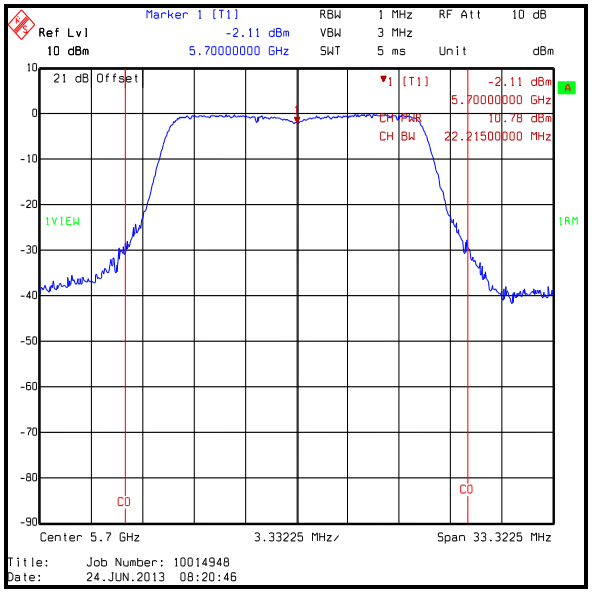
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	10.6	24.0	13.4	Complied
Middle	5580	10.8	24.0	13.2	Complied
Top	5700	10.8	24.0	13.2	Complied



Bottom Channel



Middle Channel

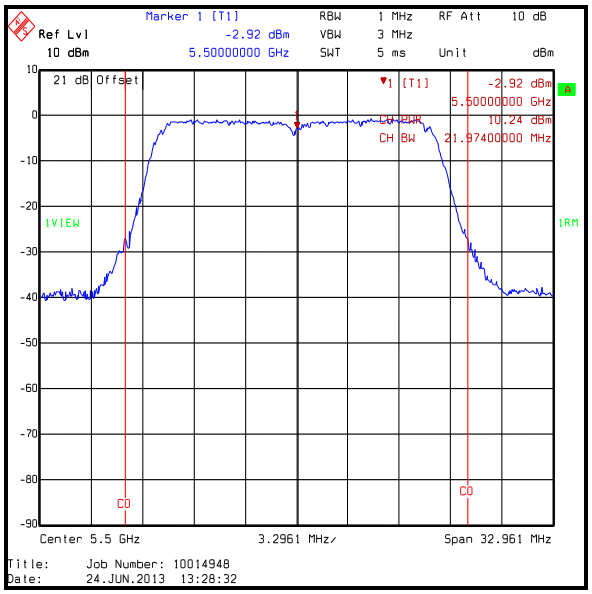


Top Channel

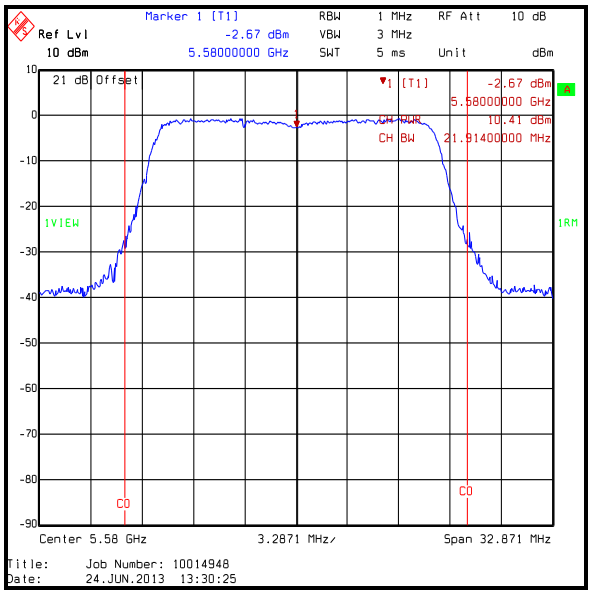
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3 / 5.47-5.725 GHz band

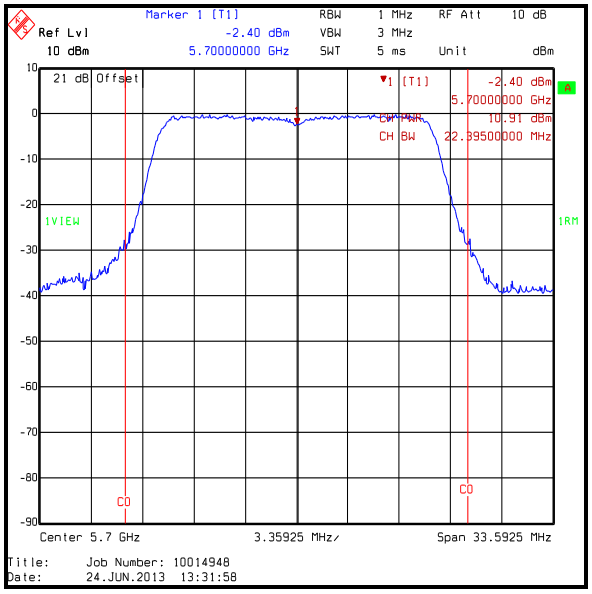
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	10.2	24.0	13.8	Complied
Middle	5580	10.4	24.0	13.6	Complied
Top	5700	10.9	24.0	13.1	Complied



Bottom Channel



Middle Channel

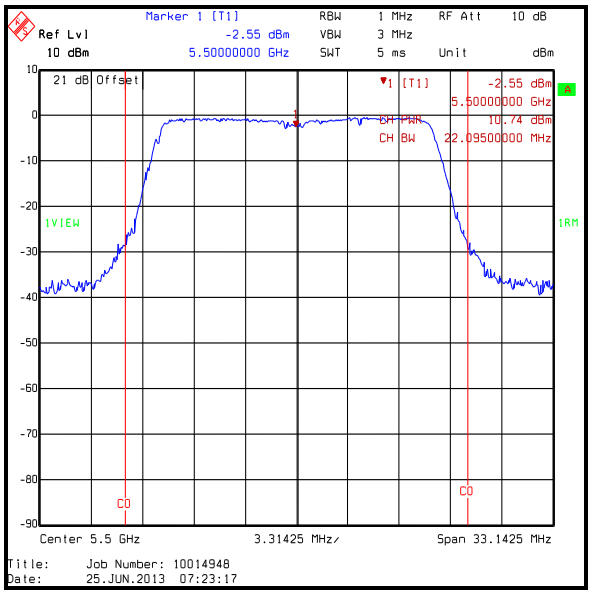


Top Channel

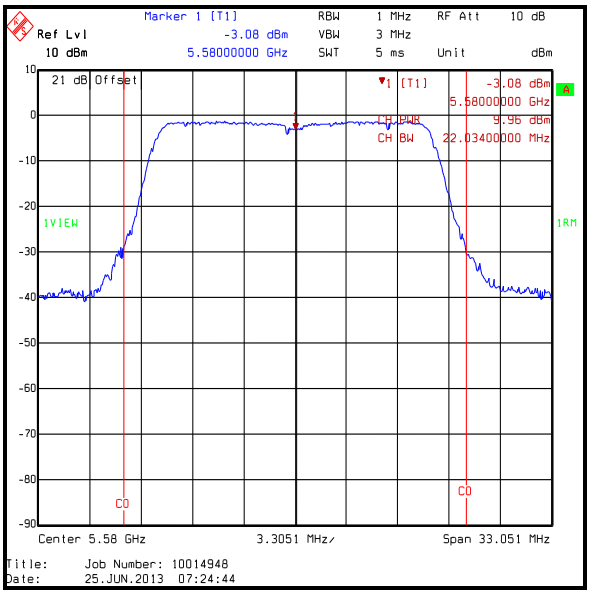
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 20 MHz / BPSK / 6.5 Mbps / MCS0 / 5.47-5.725 GHz band

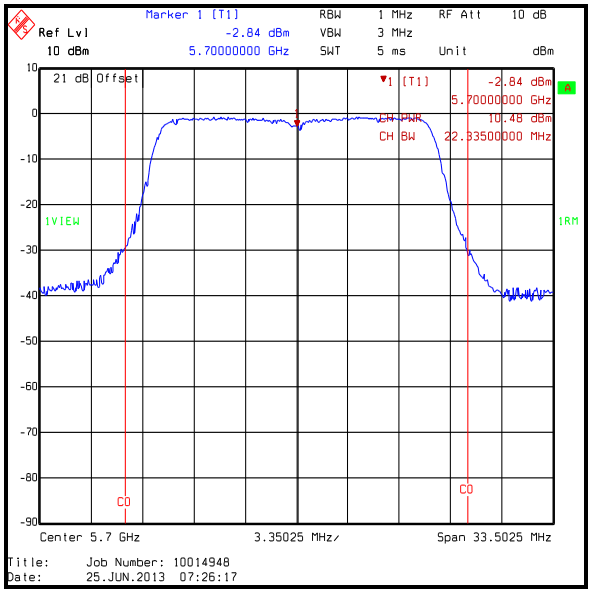
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	10.7	24.0	13.3	Complied
Middle	5580	10.0	24.0	14.0	Complied
Top	5700	10.5	24.0	13.5	Complied



Bottom Channel



Middle Channel

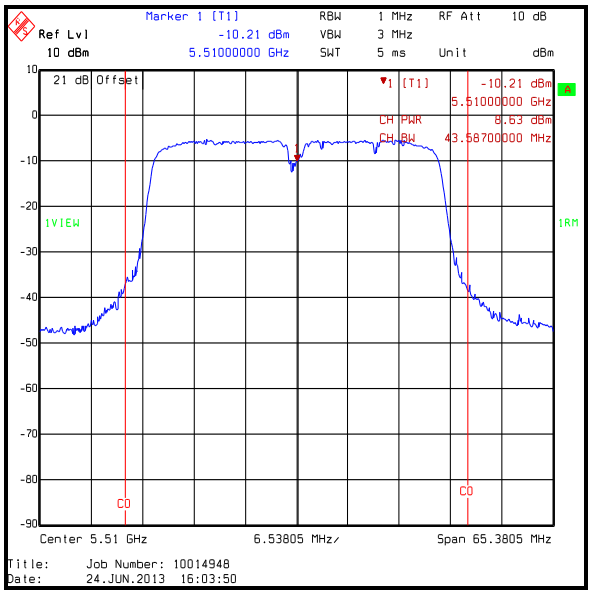


Top Channel

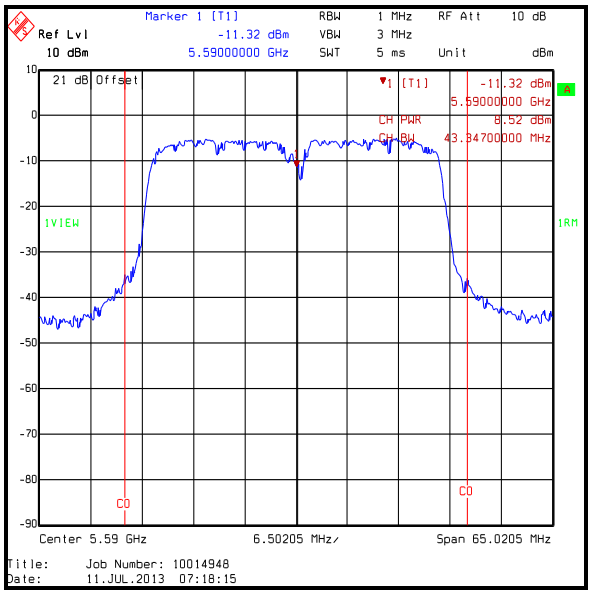
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2 / 5.47-5.725 GHz band

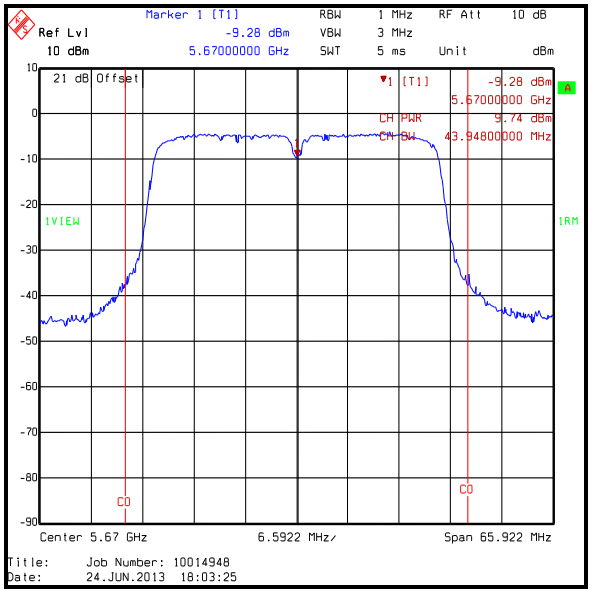
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	8.6	24.0	15.4	Complied
Middle	5590	8.5	24.0	15.5	Complied
Top	5670	9.7	24.0	14.3	Complied



Bottom Channel



Middle Channel

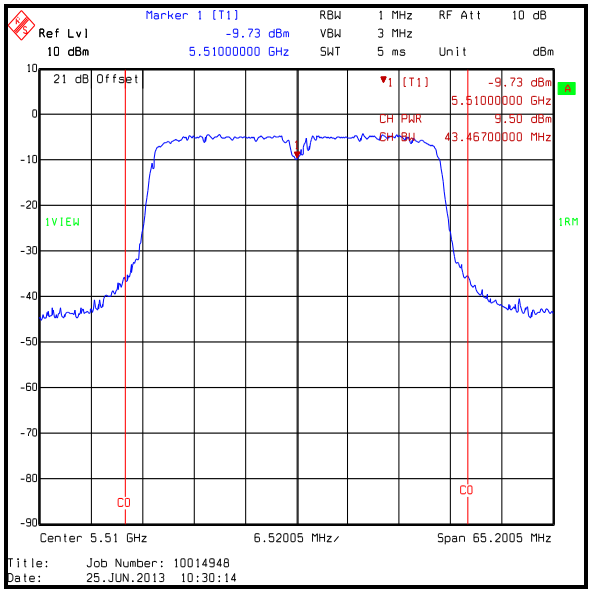


Top Channel

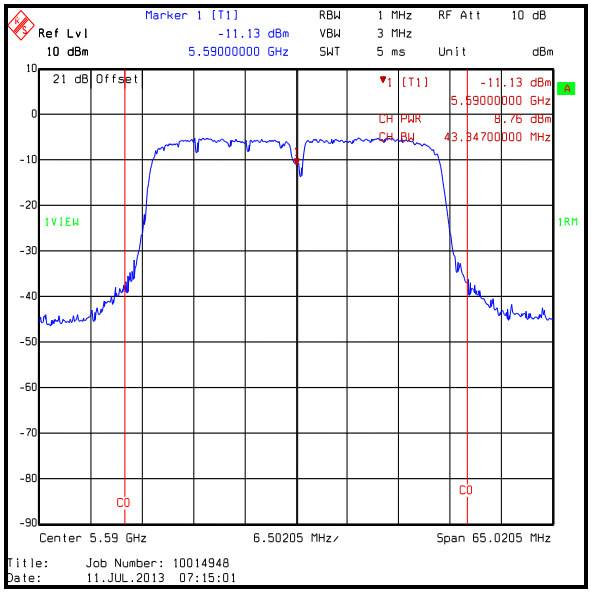
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 40 MHz / BPSK / 13.5 Mbps / MCS0 / 5.47-5.725 GHz band

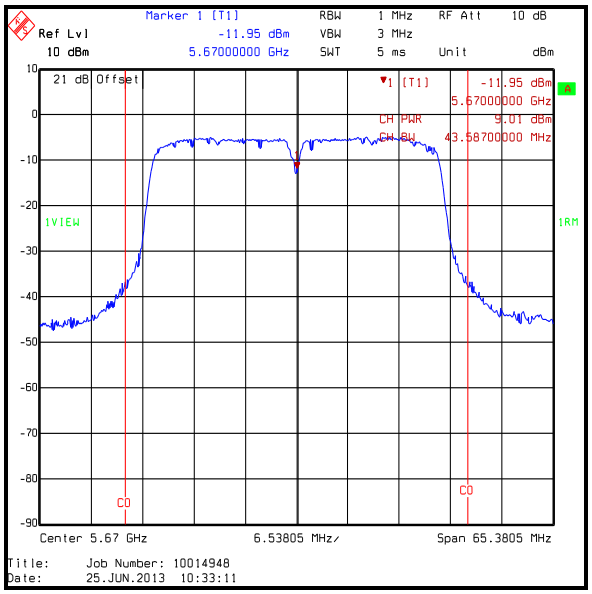
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	9.5	24.0	14.5	Complied
Middle	5590	8.8	24.0	15.2	Complied
Top	5670	9.0	24.0	15.0	Complied



Bottom Channel



Middle Channel

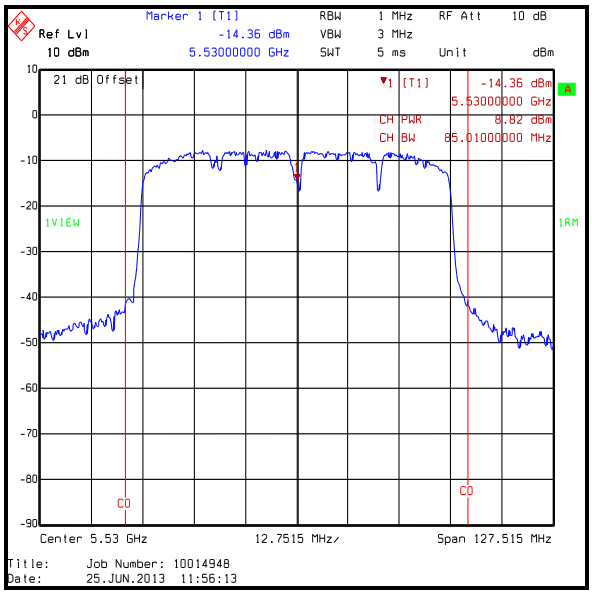


Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0 / 5.47-5.725 GHz band

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5530	8.8	0.2	9.0	24.0	15.0	Complied



Single Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band)

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	24 June 2013 & 25 June 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(3)
Test Method Used:	As detailed in FCC KDB 789033 D01 Section E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	35 to 39

Note(s):

1. The FCC Part 15.407(a)(3) limit is the lesser of 1 W (30.0 dBm) or 17 dBm + 10 $\log_{10}$ B, where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

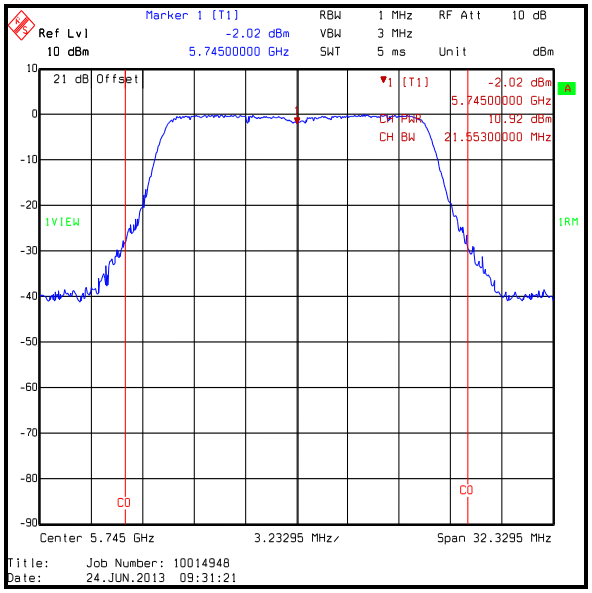
802.11a 20 MHz channel width / Bottom channel = $17\ dBm + 10\ log_{10}\ 21.6 = 30.3\ dBm$
802.11a 20 MHz channel width / Middle channel = $17\ dBm + 10\ log_{10}\ 22.0 = 30.4\ dBm$
802.11a 20 MHz channel width / Top channel = $17\ dBm + 10\ log_{10}\ 22.1 = 30.4\ dBm$
802.11n 20 MHz channel width / Bottom channel = $17\ dBm + 10\ log_{10}\ 22.3 = 30.5\ dBm$
802.11n 20 MHz channel width / Middle channel = $17\ dBm + 10\ log_{10}\ 22.3 = 30.5\ dBm$
802.11n 20 MHz channel width / Top channel = $17\ dBm + 10\ log_{10}\ 22.1 = 30.4\ dBm$
802.11n 40 MHz channel width / Bottom channel = $17\ dBm + 10\ log_{10}\ 43.3 = 33.4\ dBm$
802.11n 40 MHz channel width / Top channel = $17\ dBm + 10\ log_{10}\ 43.5 = 33.4\ dBm$
802.11ac 20 MHz channel width / Bottom channel = $17\ dBm + 10\ log_{10}\ 21.9 = 30.4\ dBm$
802.11ac 20 MHz channel width / Middle channel = $17\ dBm + 10\ log_{10}\ 21.9 = 30.4\ dBm$
802.11ac 20 MHz channel width / Top channel = $17\ dBm + 10\ log_{10}\ 22.0 = 30.4\ dBm$
802.11ac 40 MHz channel width / Bottom channel = $17\ dBm + 10\ log_{10}\ 43.6 = 33.4\ dBm$
802.11ac 40 MHz channel width / Top channel = $17\ dBm + 10\ log_{10}\ 43.5 = 33.4\ dBm$
802.11ac 80 MHz channel width / Single channel = $17\ dBm + 10\ log_{10}\ 84.8 = 36.3\ dBm$

The lesser of the two limits is the fixed limit of 1 W (30.0 dBm). This was applied to the results.

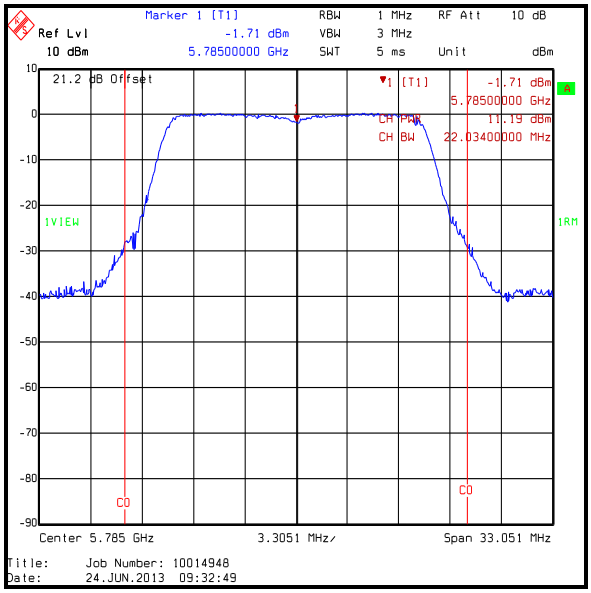
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps

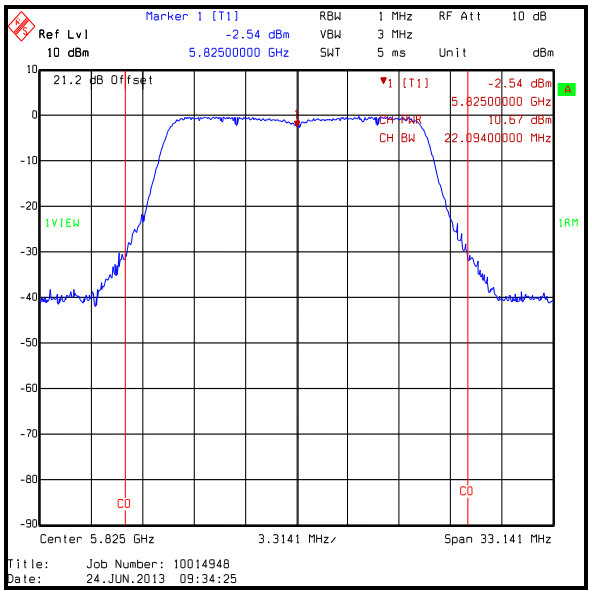
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	10.9	30.0	19.1	Complied
Middle	5785	11.2	30.0	18.8	Complied
Top	5825	10.7	30.0	19.3	Complied



Bottom Channel



Middle Channel

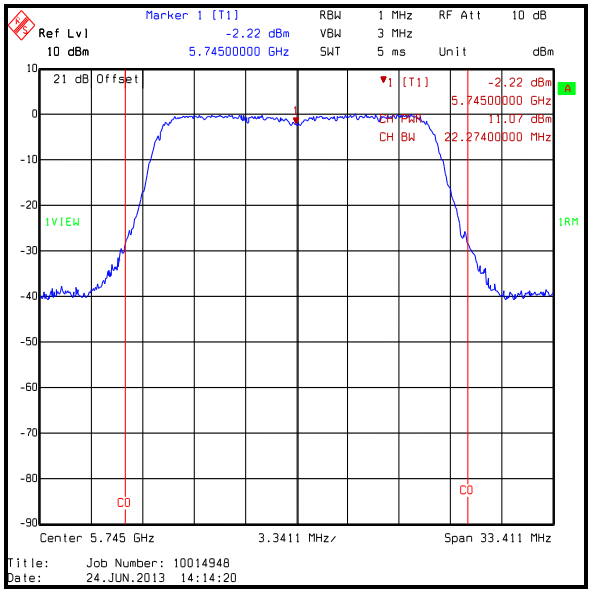


Top Channel

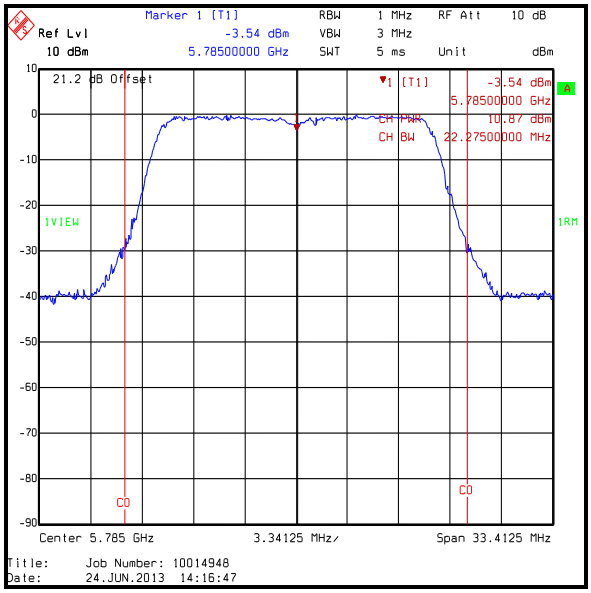
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3

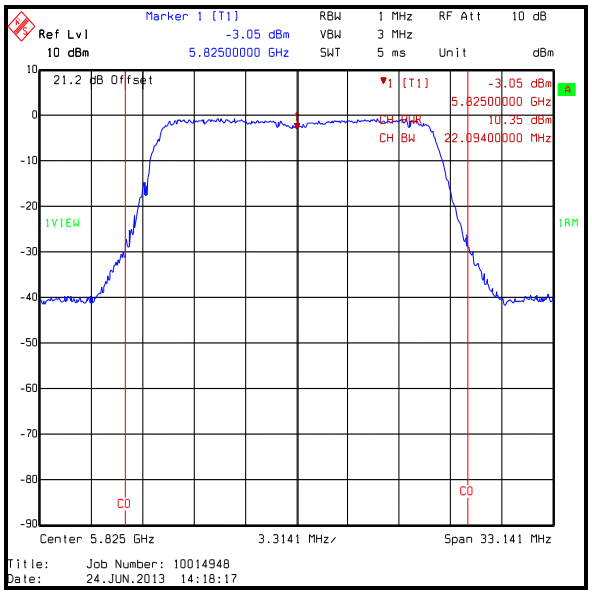
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	11.1	30.0	18.9	Complied
Middle	5785	10.9	30.0	19.1	Complied
Top	5825	10.4	30.0	19.6	Complied



Bottom Channel



Middle Channel

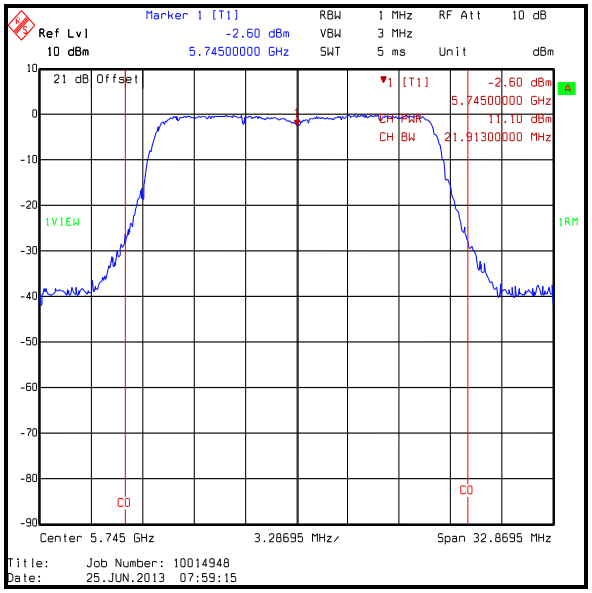


Top Channel

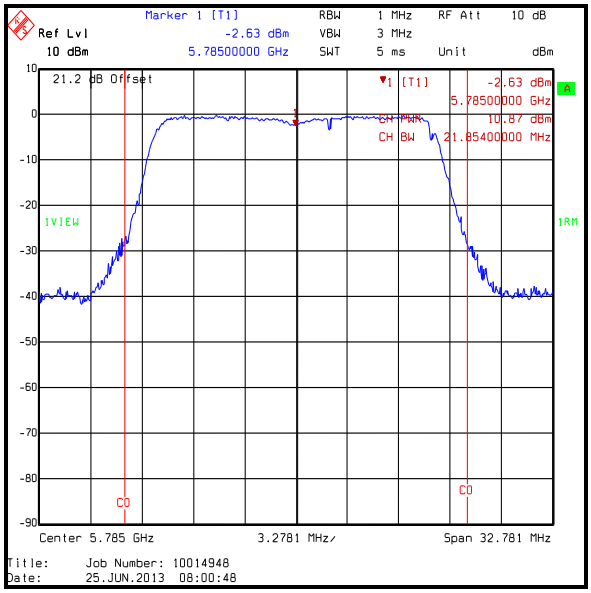
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 20 MHz / BPSK / 6.5 Mbps / MCS0

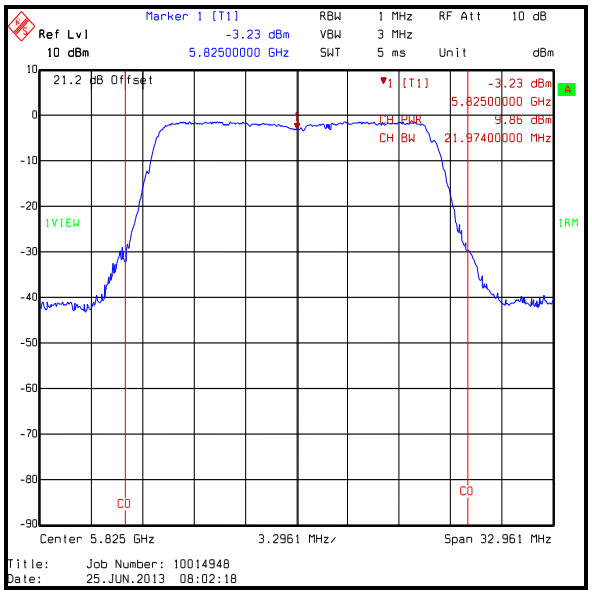
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	11.1	30.0	18.9	Complied
Middle	5785	10.9	30.0	19.1	Complied
Top	5825	9.9	30.0	20.1	Complied



Bottom Channel



Middle Channel

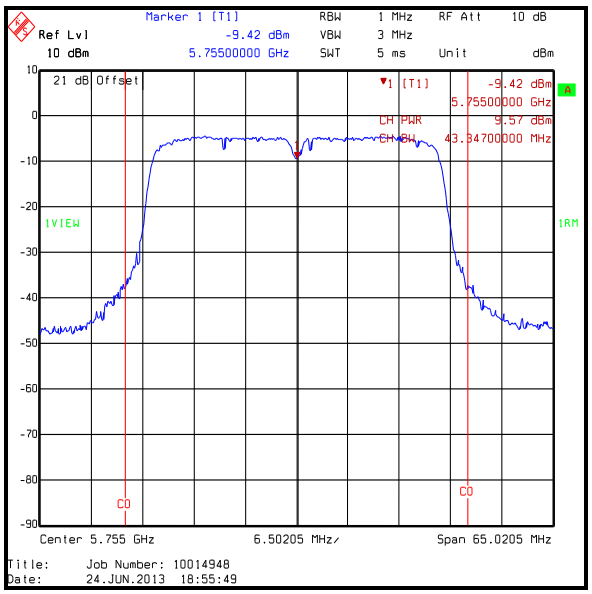


Top Channel

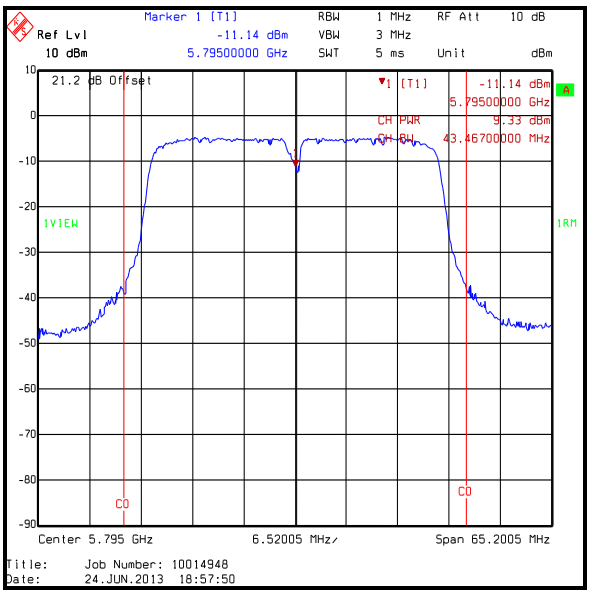
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	9.6	30.0	20.4	Complied
Top	5795	9.3	30.0	20.7	Complied



Bottom Channel

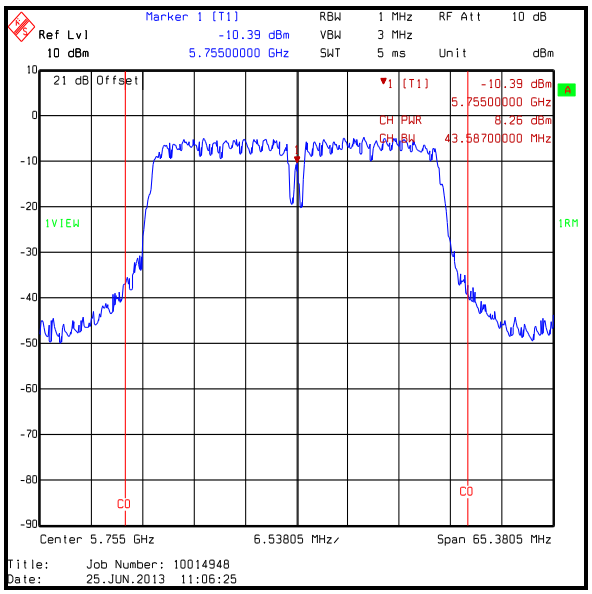


Top Channel

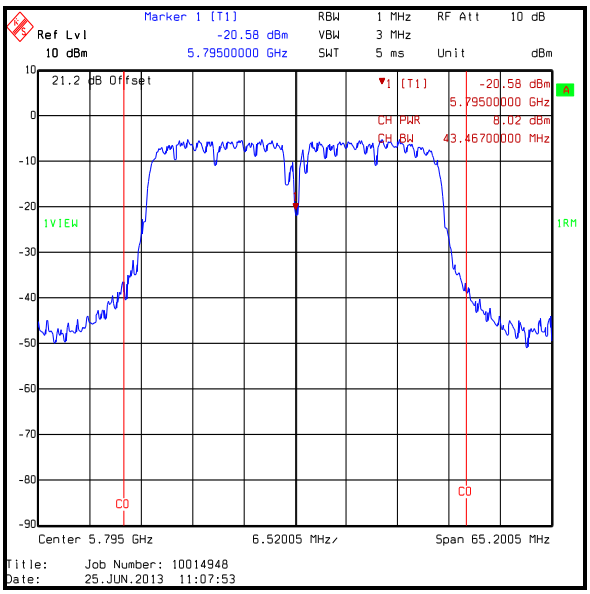
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 40 MHz / BPSK / 13.5 Mbps / MCS0

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	8.3	30.0	21.7	Complied
Top	5795	8.0	30.0	22.0	Complied



Bottom Channel

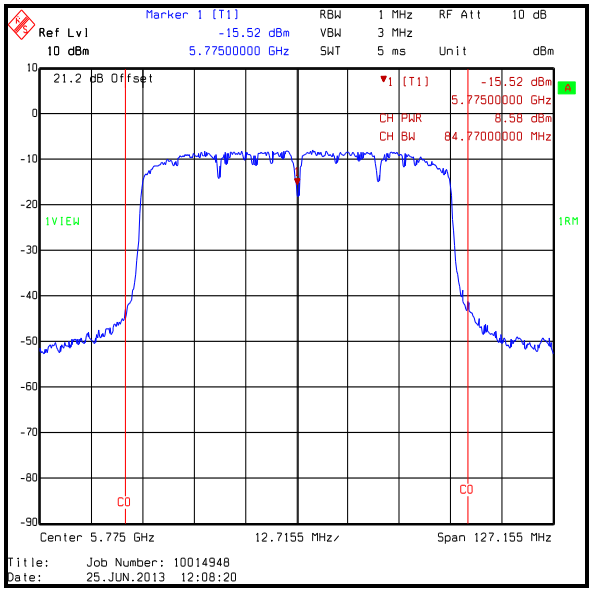


Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5775	8.6	0.2	8.8	30.0	21.2	Complied



Single Channel

Transmitter Maximum Conducted Output Power (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	13 Aug 2013	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
S0520	DC Power Supply	GW instek	GPC-3030	E835141	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12
M1021	Signal Generator	Rohde & Schwarz	SMP-02	833286/004	05 Feb 2014	12

5.2.5. Transmitter Peak Power Spectral Density

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	23 June 2012 to 25 June 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(1)
Test Method Used:	As detailed in FCC KDB 789033 F) referencing KDB 789033 E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	35 to 39

Note(s):

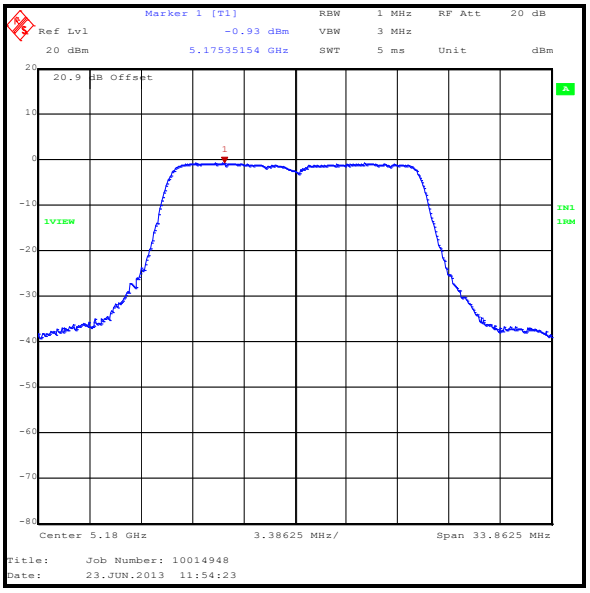
1. Transmitter Peak Power Spectral Density tests in all bands were performed using a test receiver in accordance with FCC KDB 789033 E)2)e) Method SA-2 Alternative.
2. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 – 16QAM / 26 Mbps / MCS3 (GI = 800 ns)
    - 802.11n HT40 – QPSK / 40.5 Mbps / MCS2 (GI = 800 ns)
    - 802.11ac VHT20 – 16QAM / 39 Mbps / MCS4 (GI = 800 ns)
    - 802.11ac VHT40 – QPSK / 27 Mbps / MCS1 (GI = 800 ns)
    - 802.11ac VHT80 – BPSK / 29.3 Mbps / MCS0 (GI = 800 ns)

    Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
3. For data rates where the EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.3 was added to the measured peak power spectral density in order to compute the average peak power spectral density during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The spectrum analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the spectrum analyser to compensate for the loss of the attenuator and RF cable.

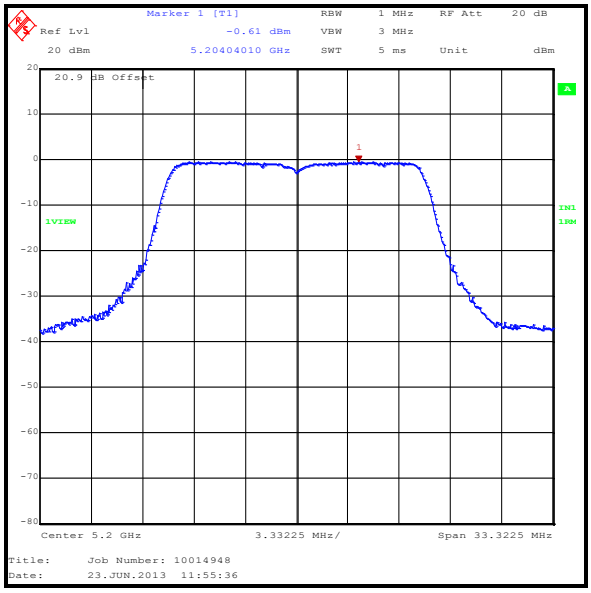
Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps

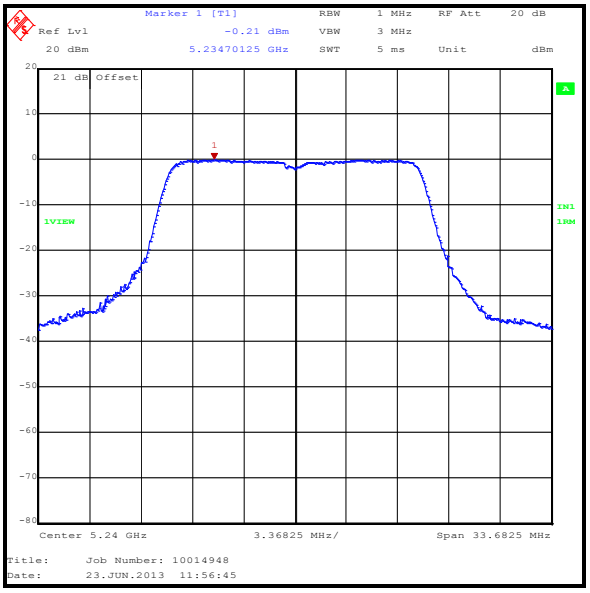
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	-0.9	4.0	4.9	Complied
Middle	5200	-0.6	4.0	4.6	Complied
Top	5240	-0.2	4.0	4.2	Complied



Bottom Channel



Middle Channel

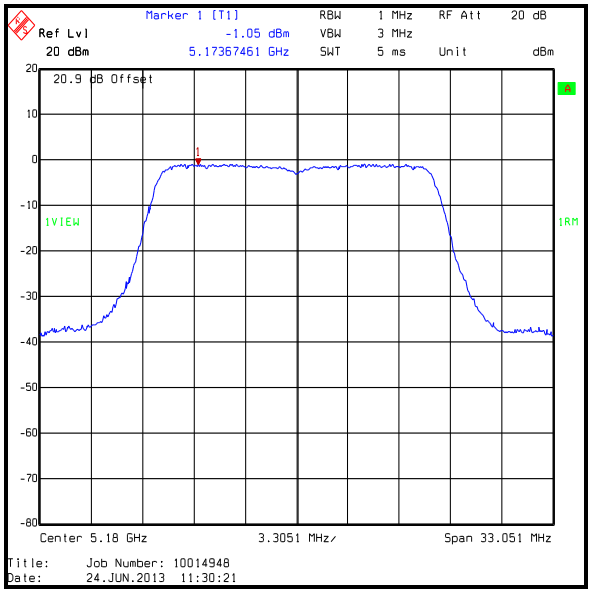


Top Channel

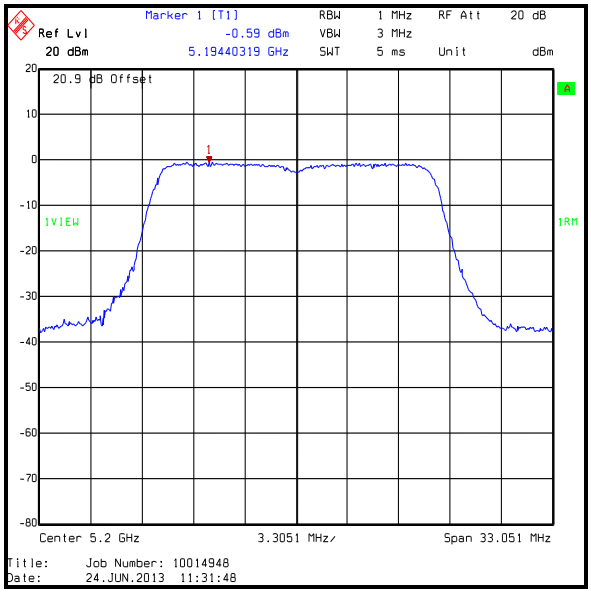
Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3

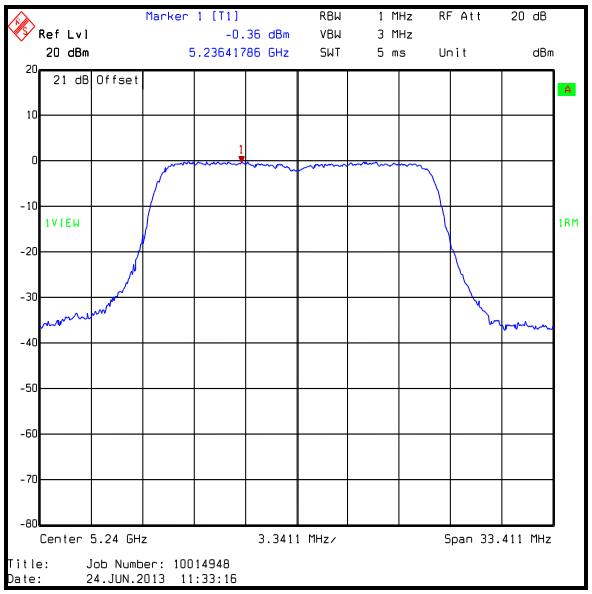
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	-1.1	4.0	5.1	Complied
Middle	5200	-0.6	4.0	4.6	Complied
Top	5240	-0.4	4.0	4.4	Complied



Bottom Channel



Middle Channel

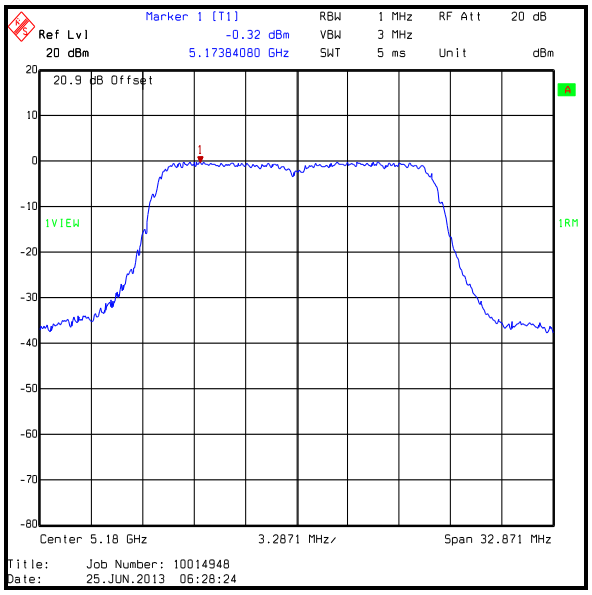


Top Channel

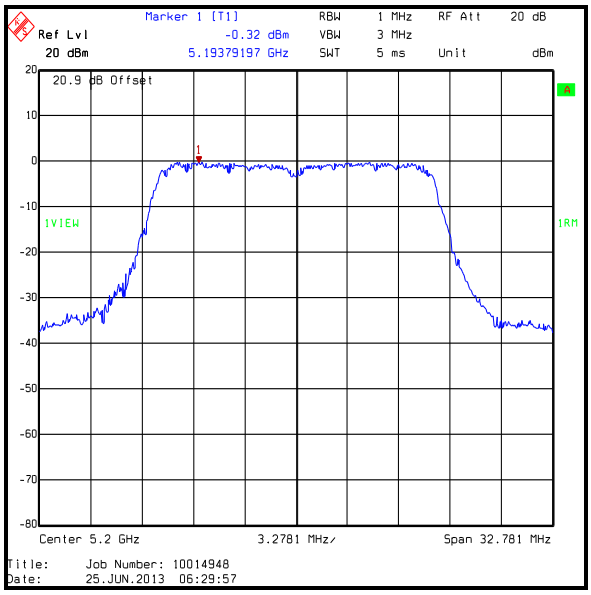
Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11ac / 20 MHz / 16QAM / 39 Mbps / MCS4

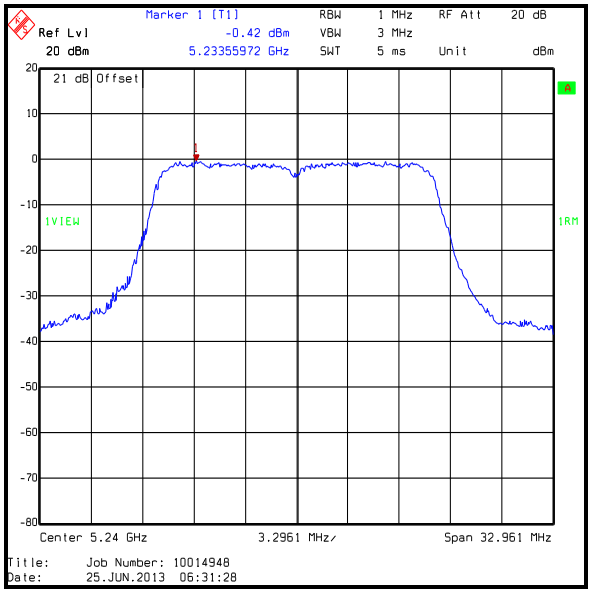
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	-0.3	0.2	-0.1	4.0	4.1	Complied
Middle	5200	-0.3	0.2	-0.1	4.0	4.1	Complied
Top	5240	-0.4	0.2	-0.2	4.0	4.2	Complied



Bottom Channel



Middle Channel

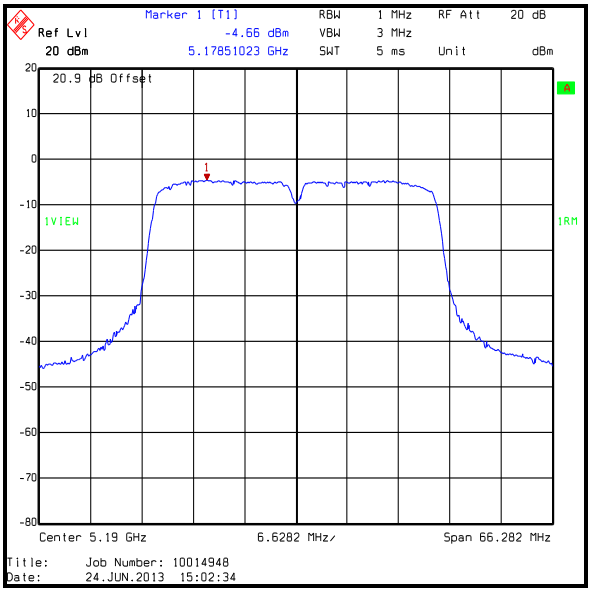


Top Channel

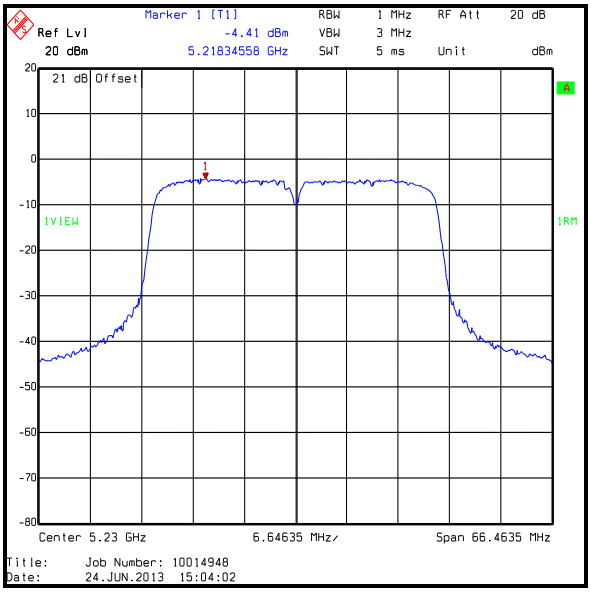
Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5190	-4.7	4.0	8.7	Complied
Top	5230	-4.4	4.0	8.4	Complied



Bottom Channel

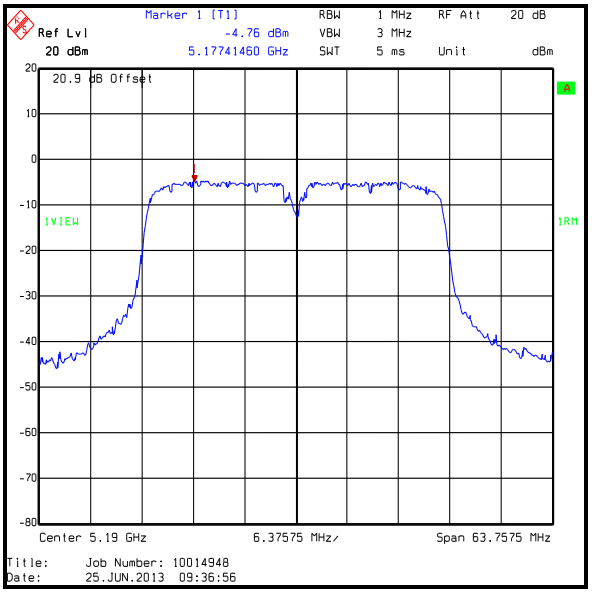


Top Channel

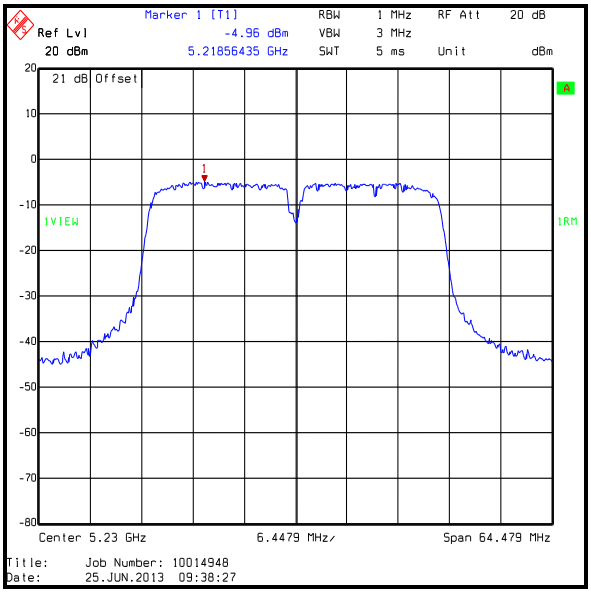
Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11ac / 40 MHz / QPSK / 27 Mbps / MCS1

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5190	-4.8	0.2	-4.6	4.0	8.6	Complied
Top	5230	-5.0	0.2	-4.8	4.0	8.8	Complied



Bottom Channel

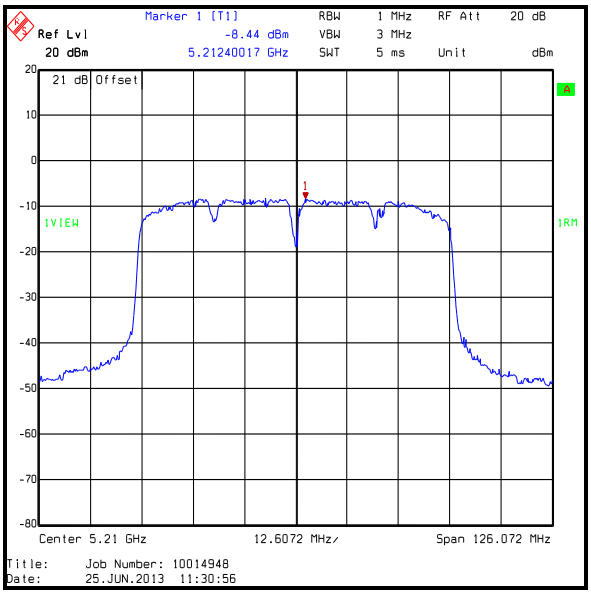


Top Channel

Transmitter Peak Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Single	5210	-8.4	0.2	-8.2	4.0	12.2	Complied



Single Channel

Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	24 June 2013 to 11 July 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(2)
Test Method Used:	As detailed in FCC KDB 789033 F) referencing KDB 789033 E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	35 to 39

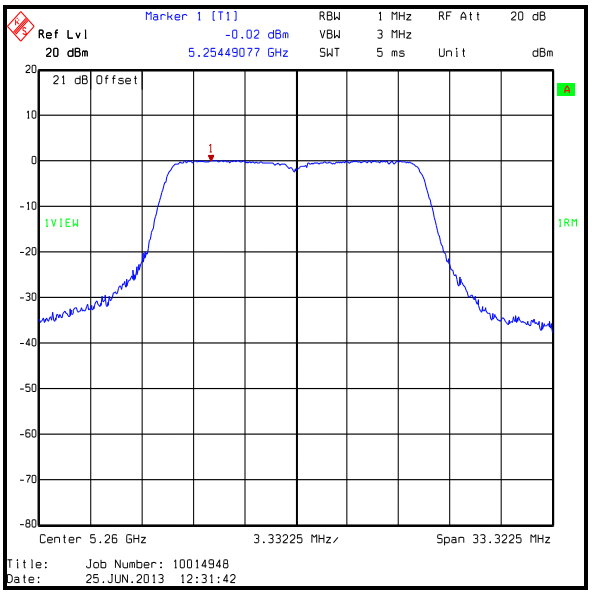
Note(s):

1. FCC Part 15.407(a)(2) limit for PPSD in the 5.25-5.35 GHz and 5.47-5.725 GHz operating bands is <11 dBm/MHz.

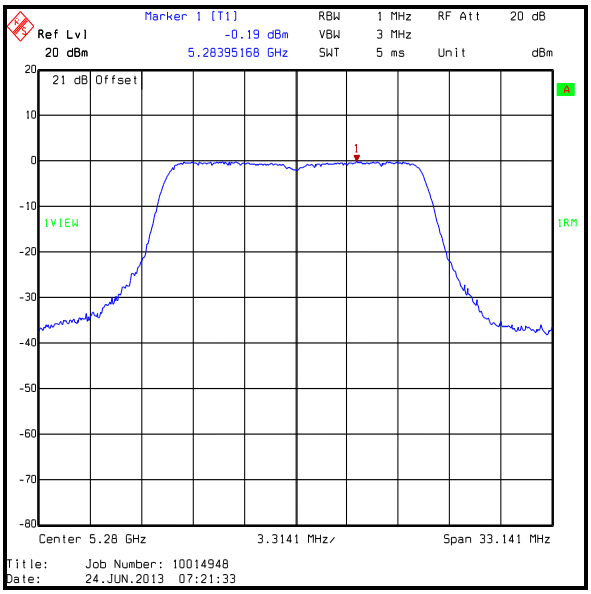
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.25-5.35 GHz band

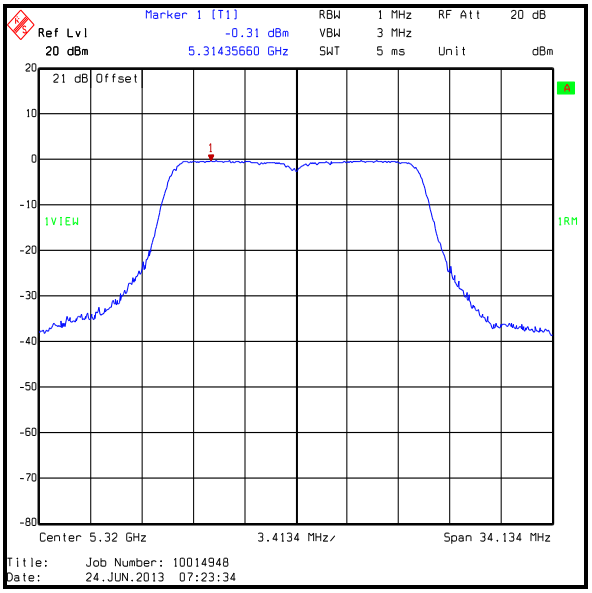
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	0.0	11.0	11.0	Complied
Middle	5280	-0.2	11.0	11.2	Complied
Top	5320	-0.3	11.0	11.3	Complied



Bottom Channel



Middle Channel

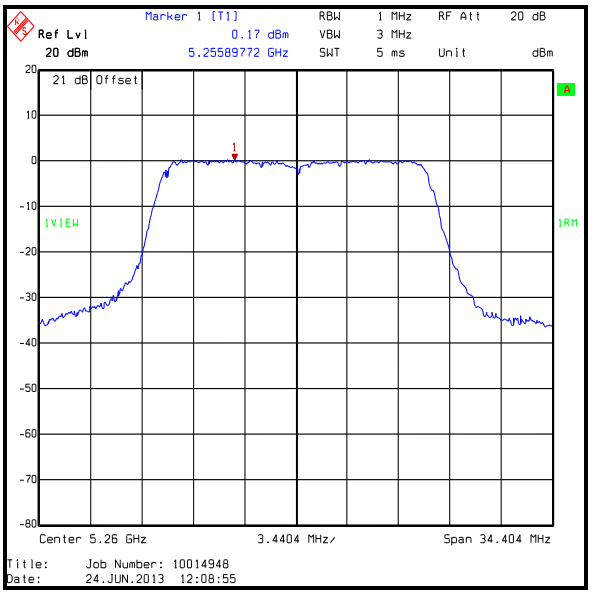


Top Channel

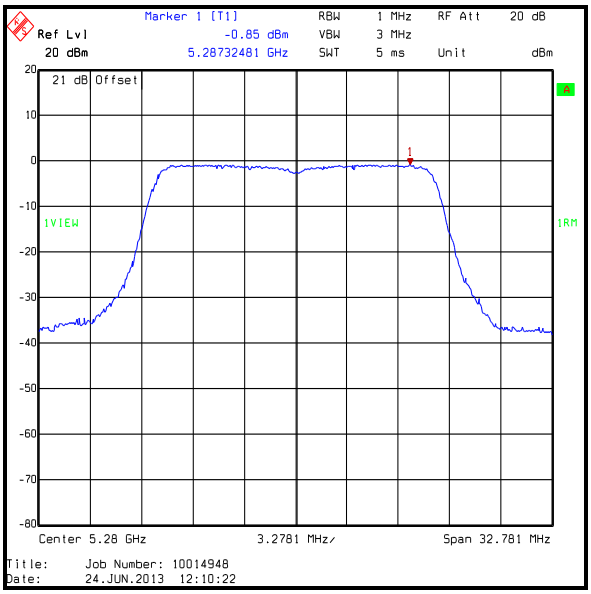
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / QPSK / 26 Mbps / MCS3 / 5.25-5.35 GHz band

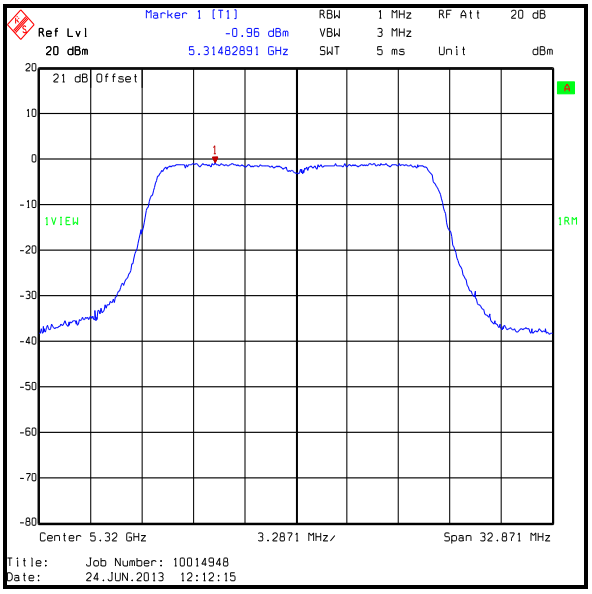
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	0.2	11.0	10.8	Complied
Middle	5280	-0.9	11.0	11.9	Complied
Top	5320	-1.0	11.0	12.0	Complied



Bottom Channel



Middle Channel

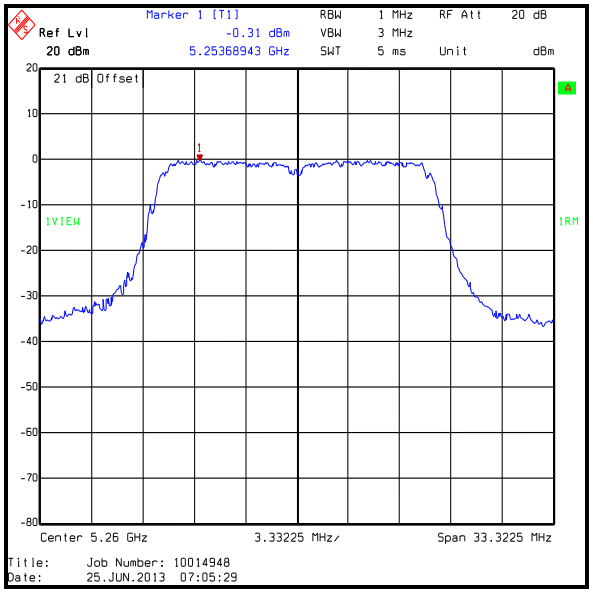


Top Channel

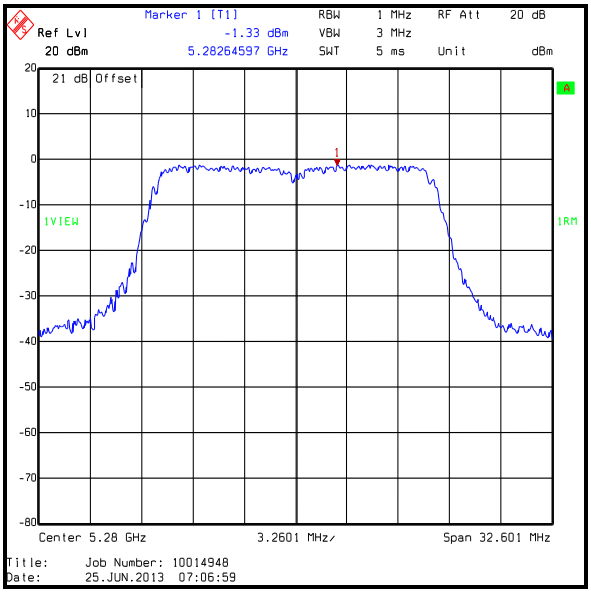
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 20 MHz / 16QAM / 39 Mbps / MCS4 / 5.25-5.35 GHz band

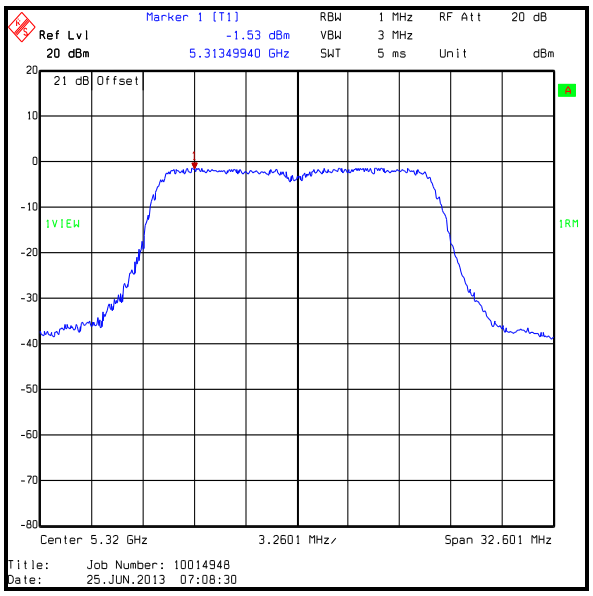
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	-0.3	0.2	-0.1	11.0	11.1	Complied
Middle	5280	-1.3	0.2	-1.1	11.0	12.1	Complied
Top	5320	-1.5	0.2	-1.3	11.0	12.3	Complied



Bottom Channel



Middle Channel

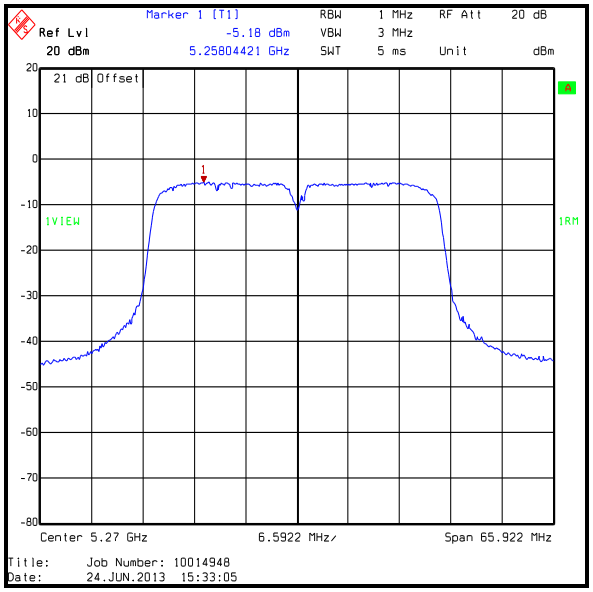


Top Channel

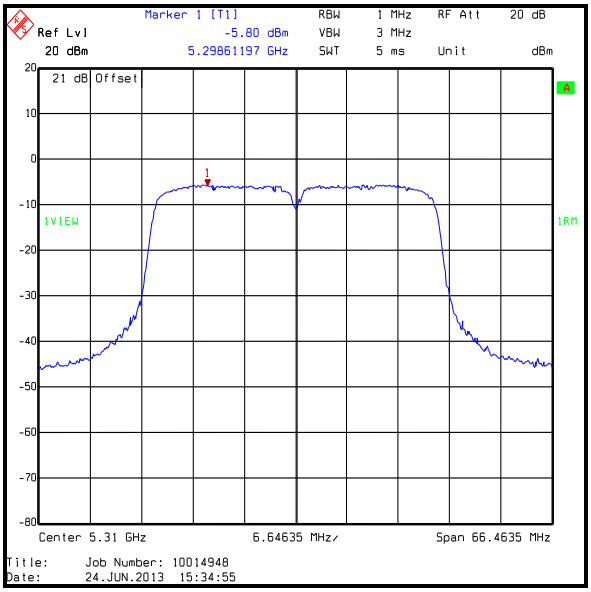
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	-5.2	11.0	16.2	Complied
Top	5310	-5.8	11.0	16.8	Complied



Bottom Channel

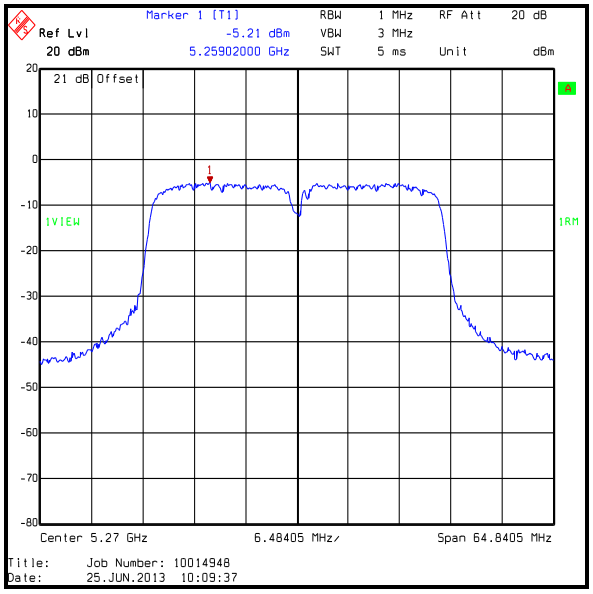


Top Channel

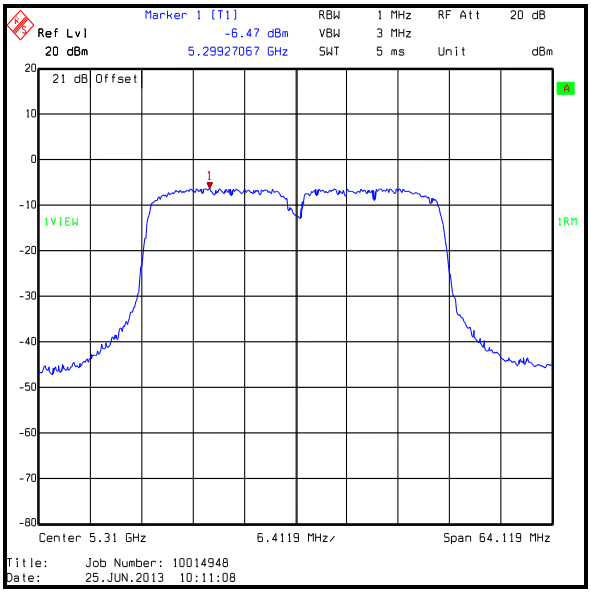
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 40 MHz / QPSK / 27 Mbps / MCS1 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	-5.2	0.2	-5.0	11.0	16.0	Complied
Top	5310	-6.5	0.2	-6.3	11.0	17.3	Complied



Bottom Channel

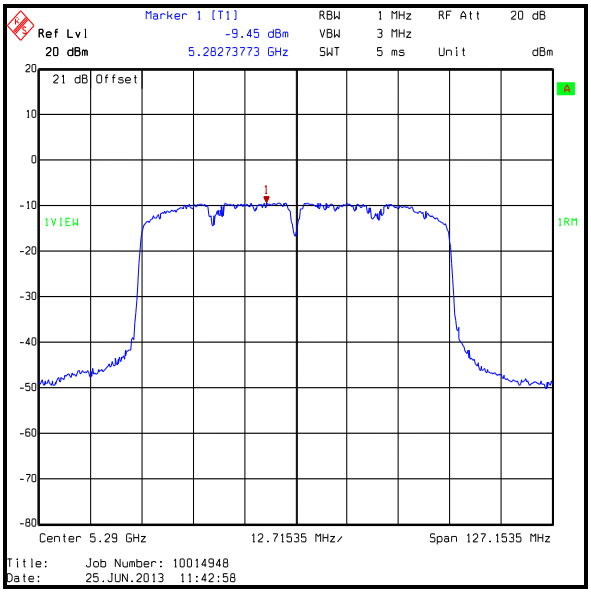


Top Channel

Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0 / 5.25-5.35 GHz band

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Single	5290	-9.5	0.2	-9.3	11.0	20.3	Complied

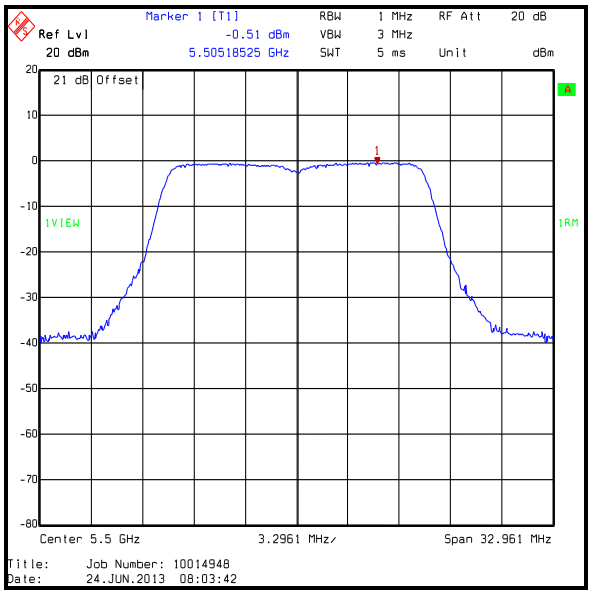


Single Channel

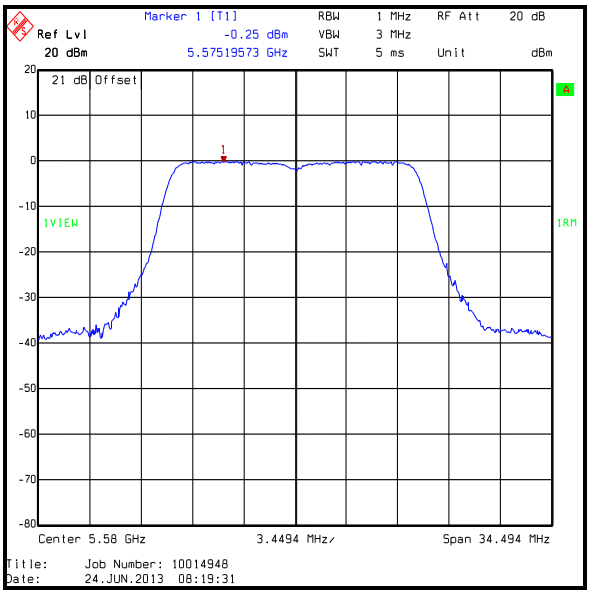
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.47-5.725 GHz band

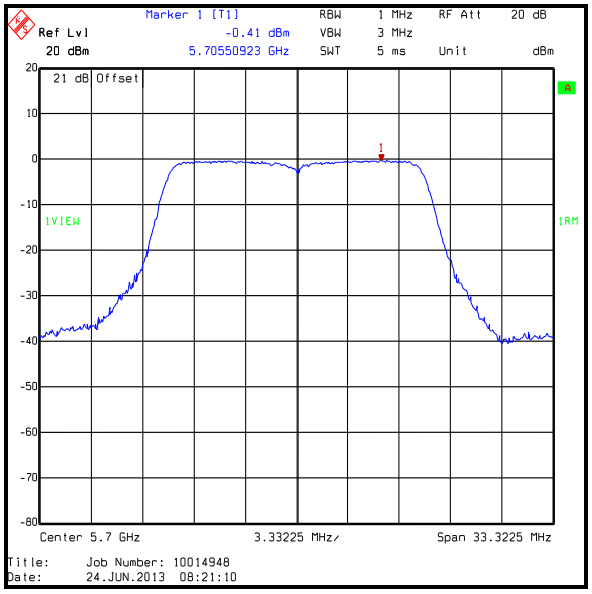
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	-0.5	11.0	11.5	Complied
Middle	5580	-0.3	11.0	11.3	Complied
Top	5700	-0.4	11.0	11.4	Complied



Bottom Channel



Middle Channel

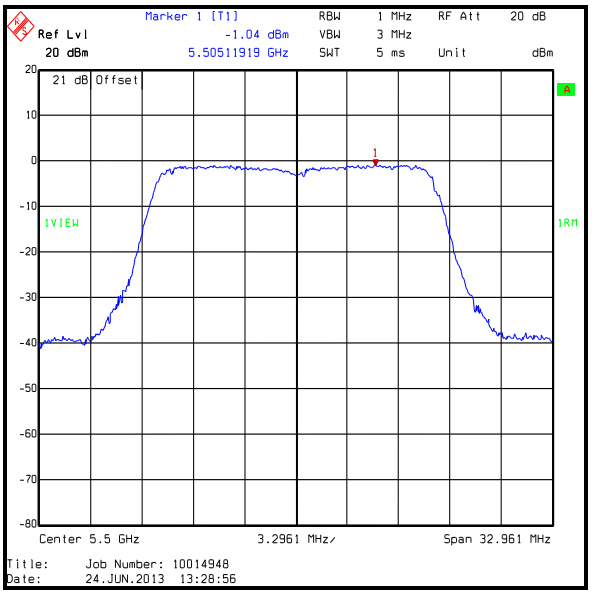


Top Channel

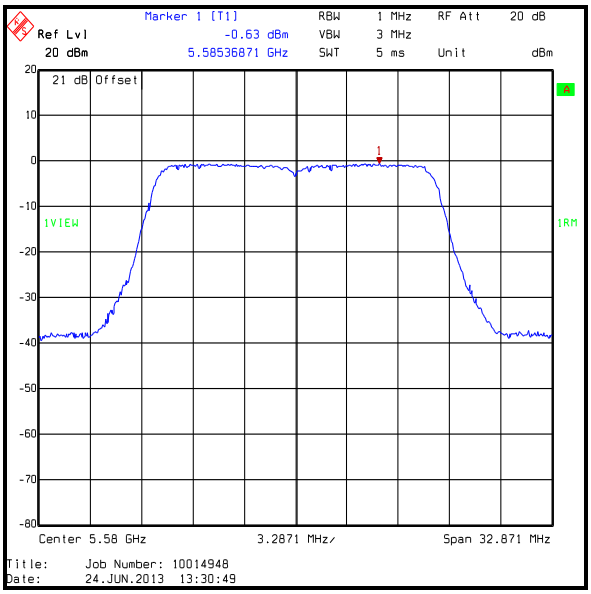
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3 / 5.47-5.725 GHz band

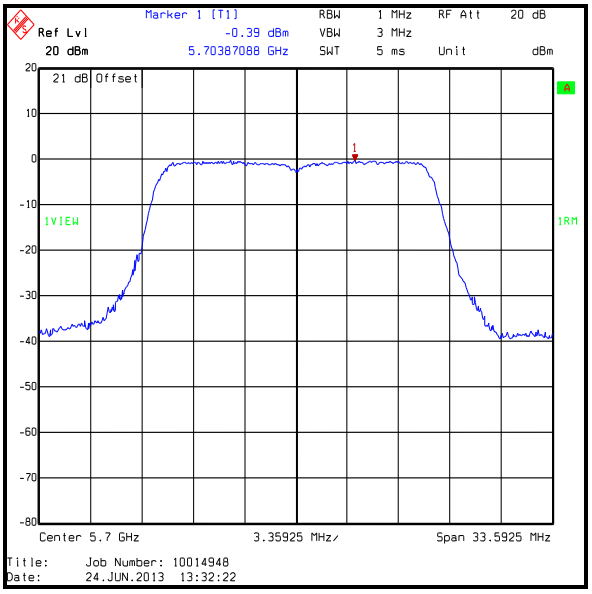
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	-1.0	11.0	12.0	Complied
Middle	5580	-0.6	11.0	11.6	Complied
Top	5700	-0.4	11.0	11.4	Complied



Bottom Channel



Middle Channel

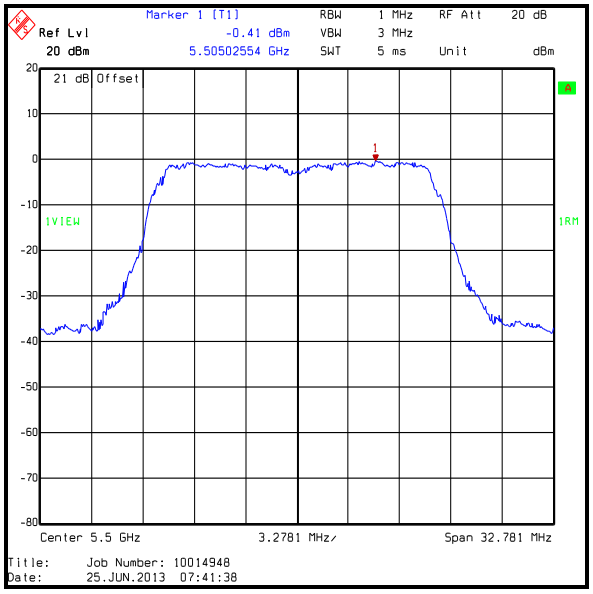


Top Channel

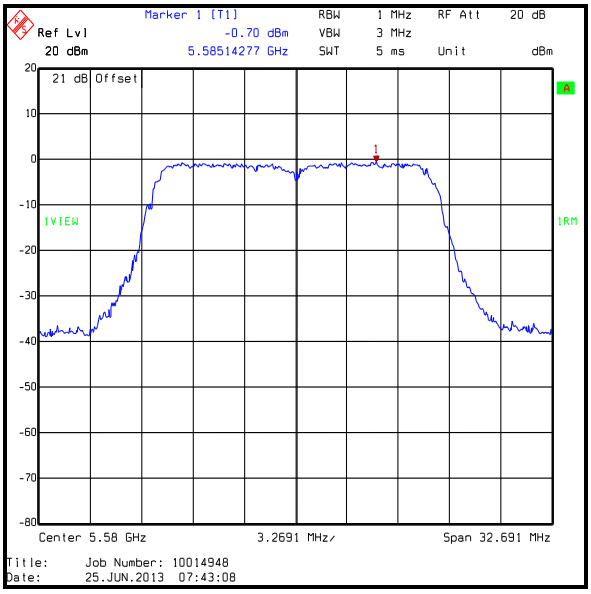
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 20 MHz / 16QAM / 39 Mbps / MCS4 / 5.47-5.725 GHz band

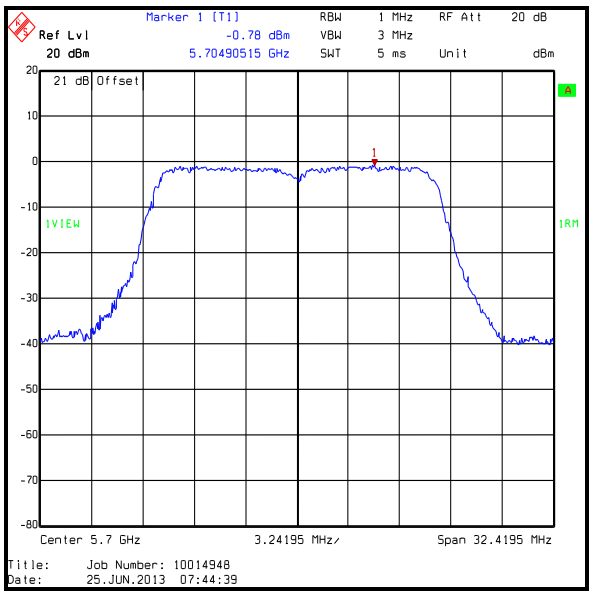
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	-0.4	0.2	-0.2	11.0	11.2	Complied
Middle	5580	-0.7	0.2	-0.5	11.0	11.5	Complied
Top	5700	-0.8	0.2	-0.6	11.0	11.6	Complied



Bottom Channel



Middle Channel

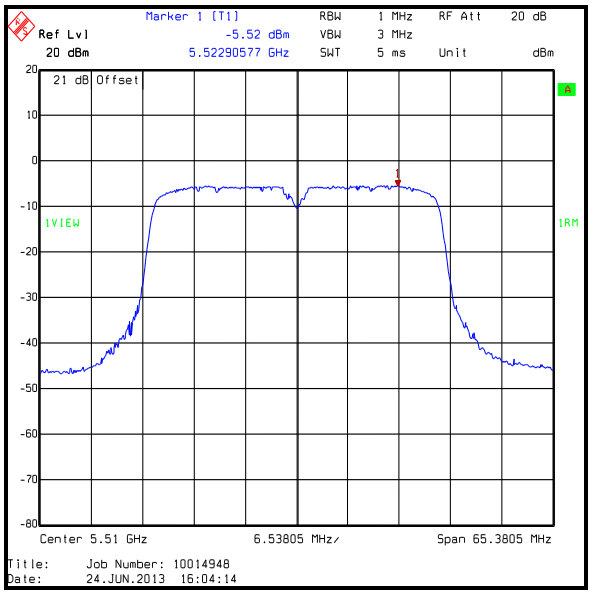


Top Channel

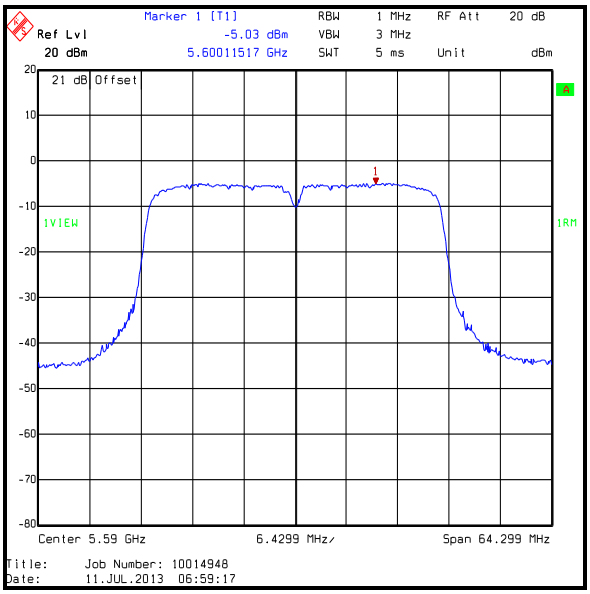
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2 / 5.47-5.725 GHz band

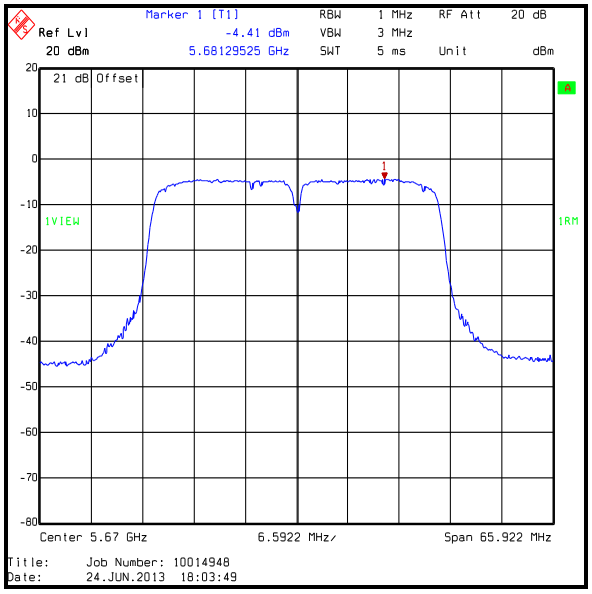
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	-5.5	11.0	16.5	Complied
Middle	5590	-5.0	11.0	16.0	Complied
Top	5670	-4.4	11.0	15.4	Complied



Bottom Channel



Middle Channel

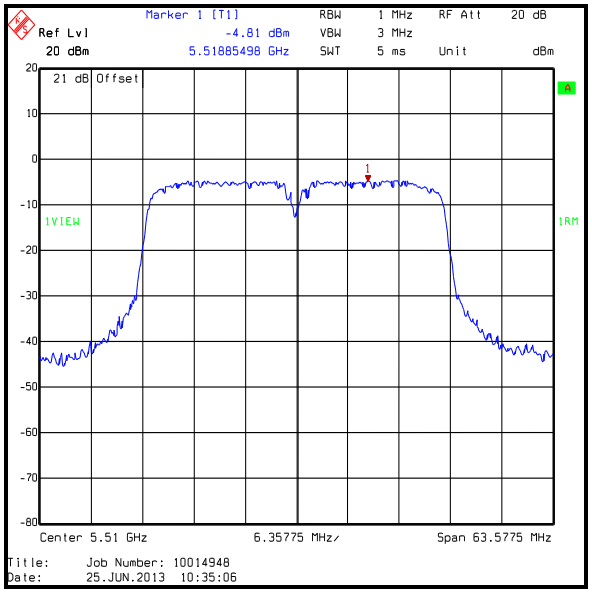


Top Channel

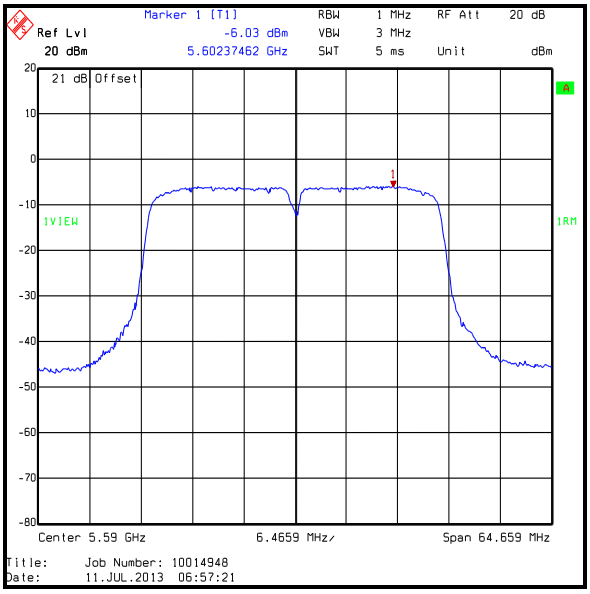
Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 40 MHz / QPSK / 27 Mbps / MCS1 / 5.47-5.725 GHz band

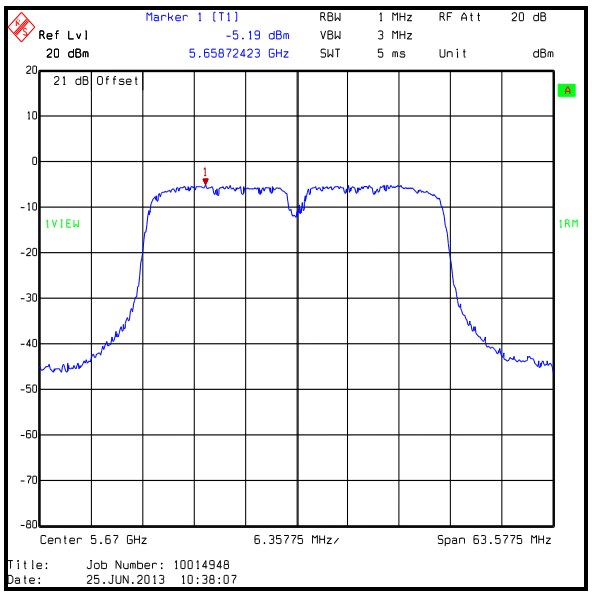
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	-4.8	0.2	-4.6	11.0	15.6	Complied
Middle	5590	-6.0	0.2	-5.8	11.0	16.8	Complied
Top	5670	-5.2	0.2	-5.0	11.0	16.0	Complied



Bottom Channel



Middle Channel

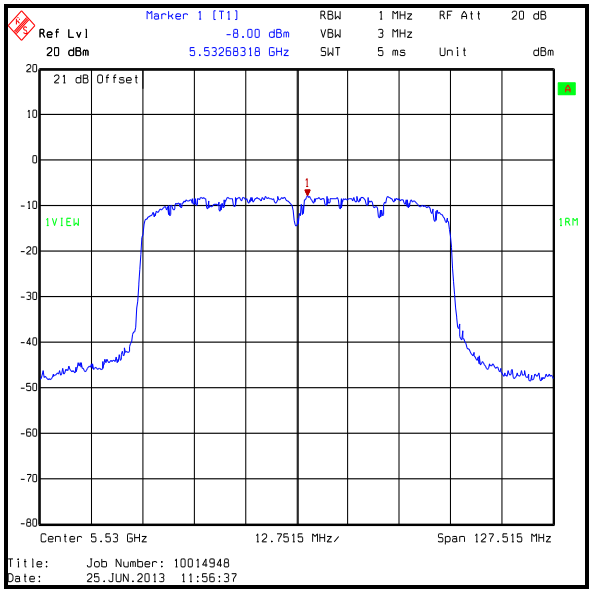


Top Channel

Transmitter Peak Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0 / 5.47-5.725 GHz band

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Single	5530	-8.0	0.2	-7.8	11.0	18.8	Complied



Single Channel

Transmitter Peak Power Spectral Density (5.725-5.85 GHz band)

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	24 June 2013 & 25 June 2013
Test Sample IMEI:	004402451215499		

FCC Reference:	Part 15.407(a)(3)
Test Method Used:	As detailed in FCC KDB 789033 F) referencing KDB 789033 E)2)e)

Environmental Conditions:

Temperature (°C):	23 to 26
Relative Humidity (%):	35 to 39

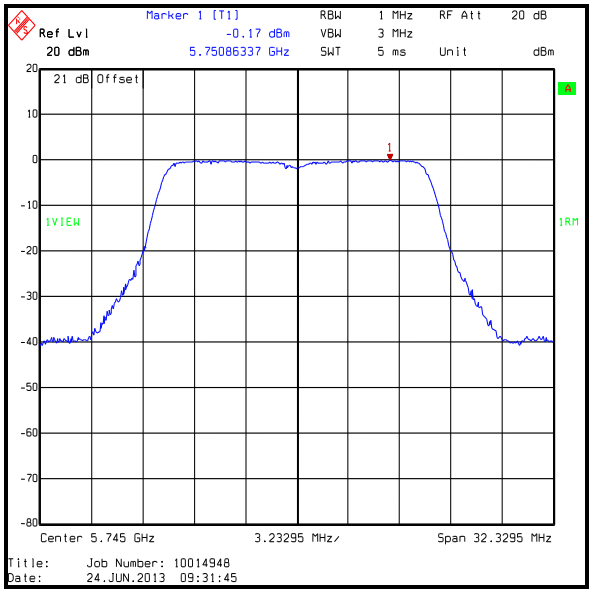
Note(s):

1. FCC Part 15.407(a)(3) limit for PPSD in the 5.725-5.85 GHz operating band is <17 dBm/MHz.

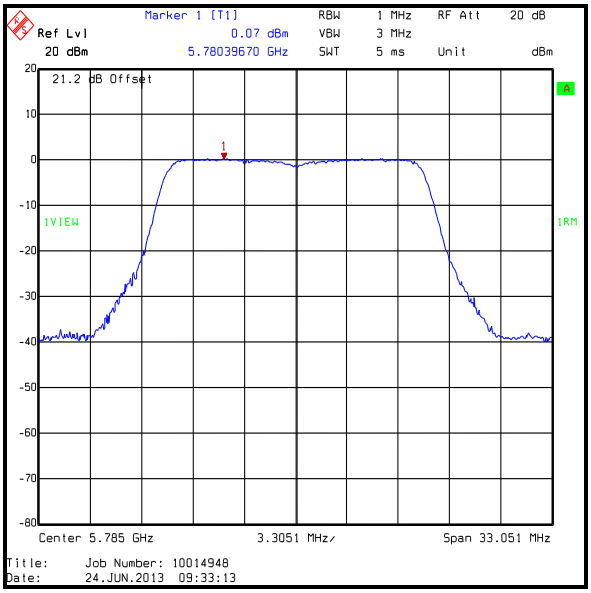
Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps

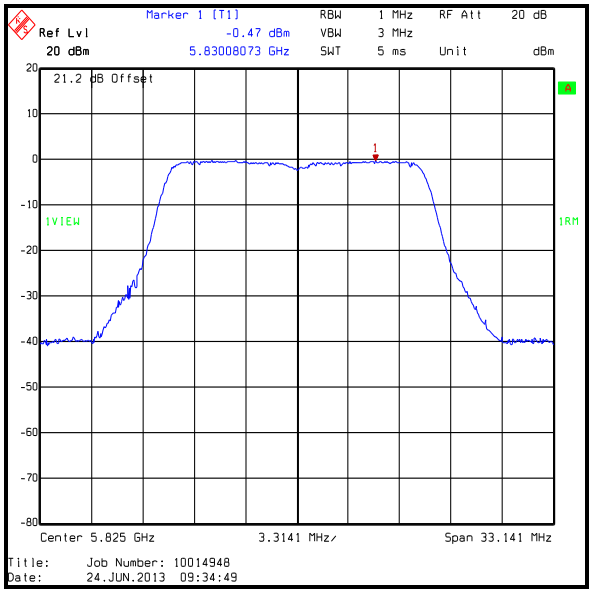
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5745	-0.2	17.0	17.2	Complied
Middle	5785	0.1	17.0	16.9	Complied
Top	5825	-0.5	17.0	17.5	Complied



Bottom Channel



Middle Channel

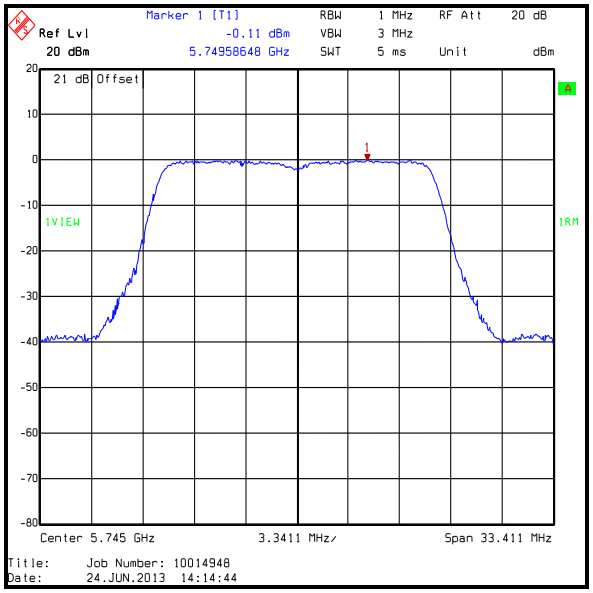


Top Channel

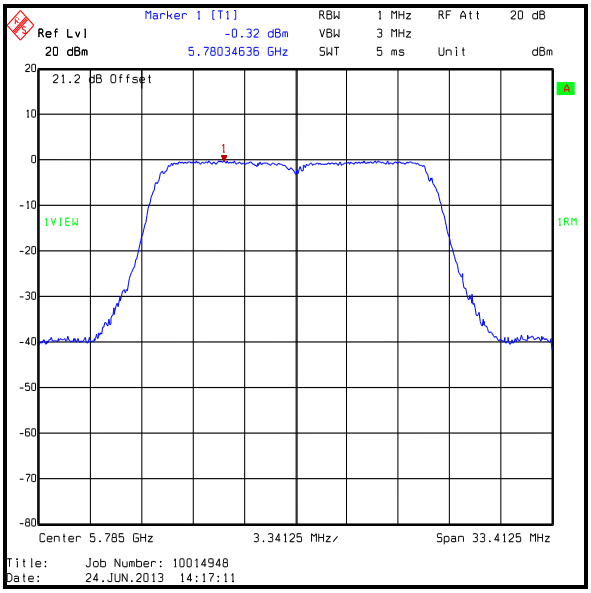
Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11n / 20 MHz / 16QAM / 26 Mbps / MCS3

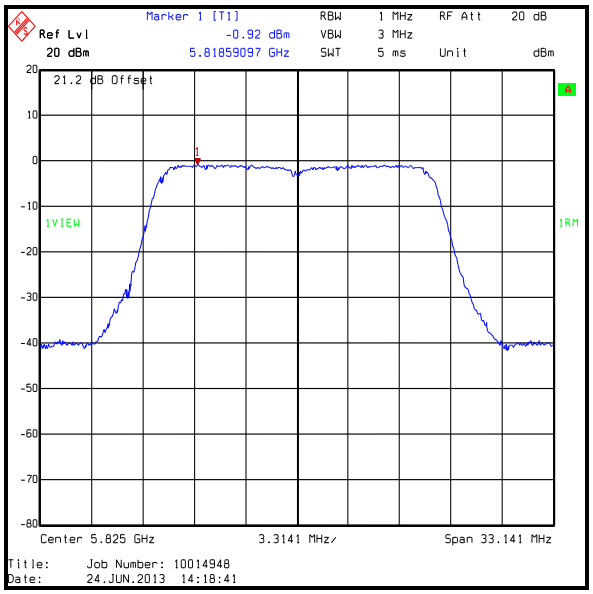
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5745	-0.1	17.0	17.1	Complied
Middle	5785	-0.3	17.0	17.3	Complied
Top	5825	-0.9	17.0	17.9	Complied



Bottom Channel



Middle Channel

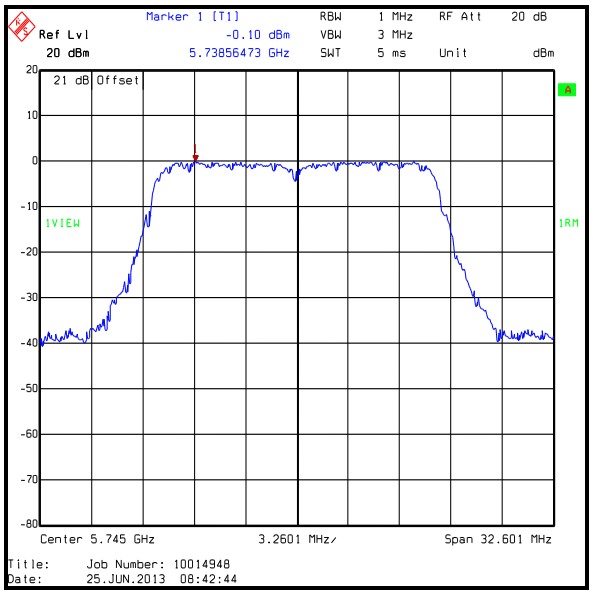


Top Channel

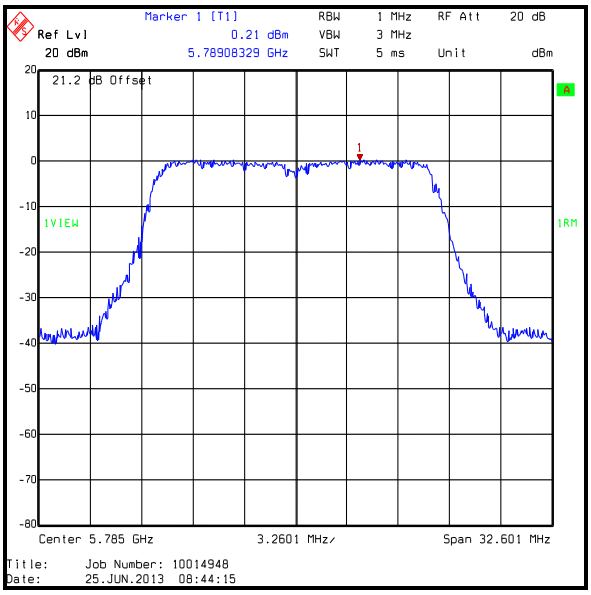
Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 20 MHz / 16QAM / 39 Mbps / MCS4

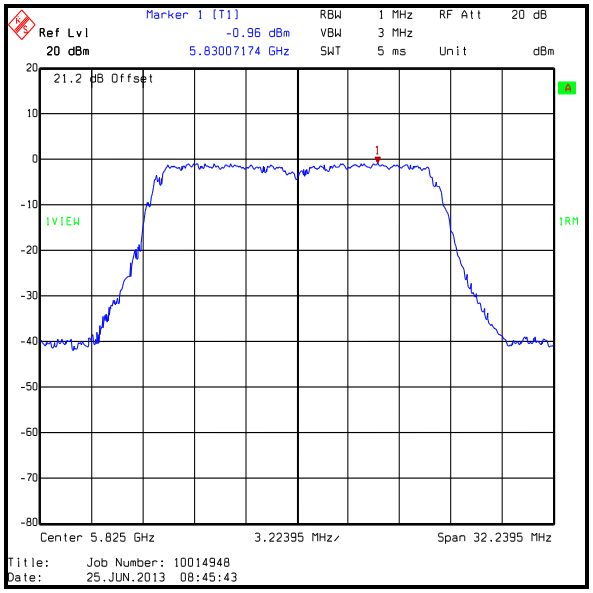
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5745	-0.1	0.2	0.1	17.0	16.9	Complied
Middle	5785	0.2	0.2	0.4	17.0	16.6	Complied
Top	5825	-1.0	0.2	-0.8	17.0	17.8	Complied



Bottom Channel



Middle Channel

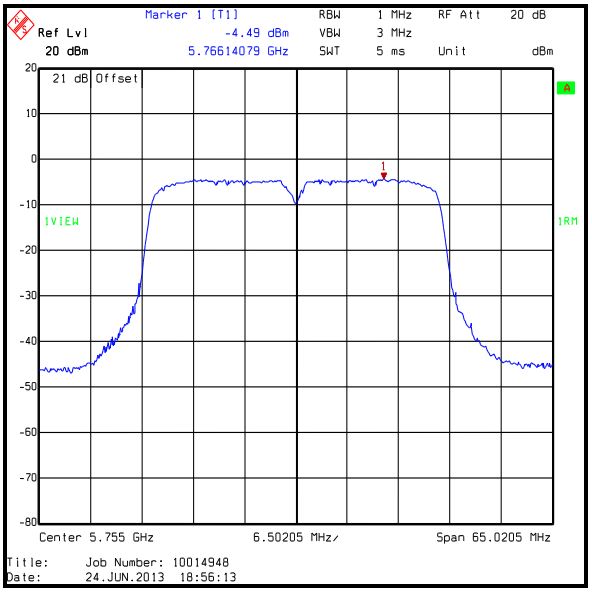


Top Channel

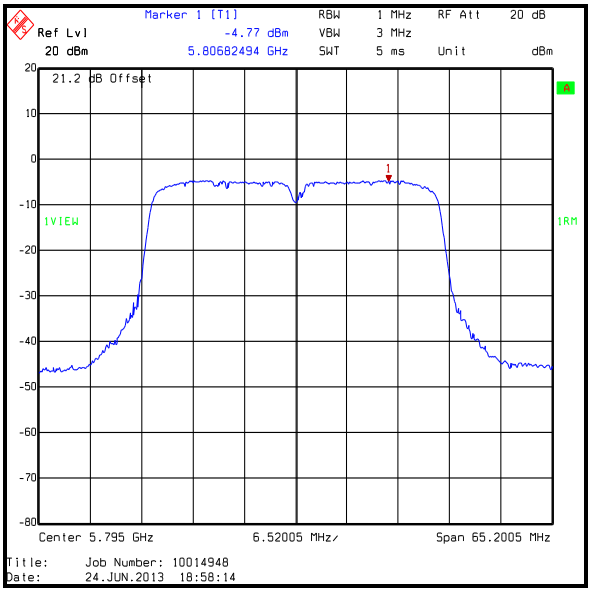
Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11n / 40 MHz / QPSK / 40.5 Mbps / MCS2

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5755	-4.5	17.0	21.5	Complied
Top	5795	-4.8	17.0	21.8	Complied



Bottom Channel

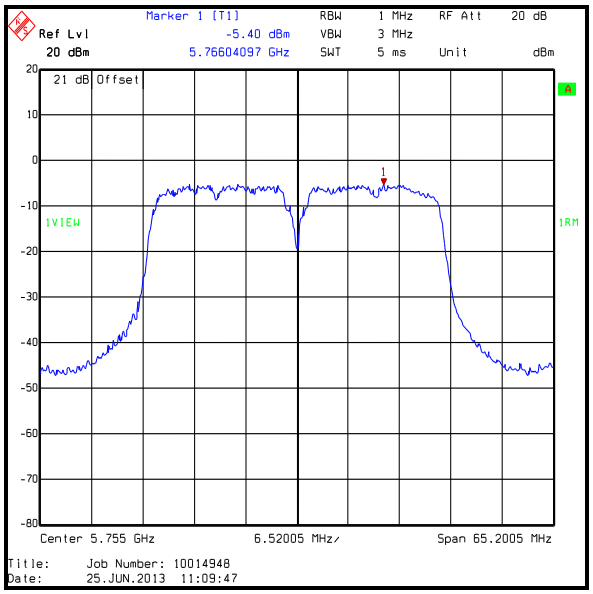


Top Channel

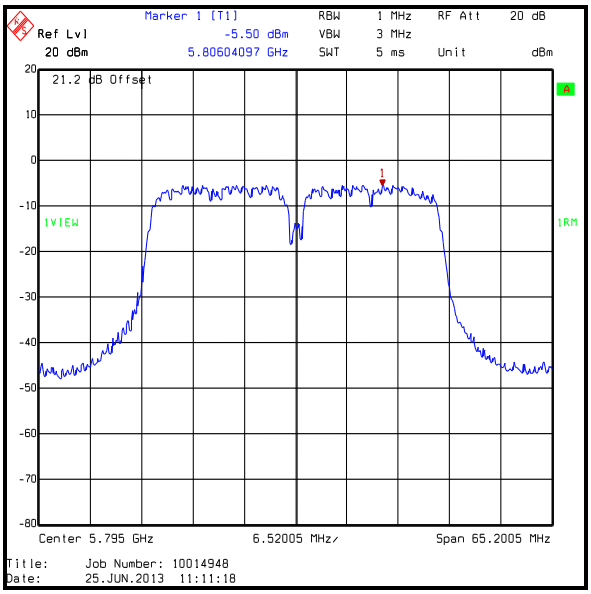
Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 40 MHz / QPSK / 27 Mbps / MCS1

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5755	-5.4	0.2	-5.2	17.0	22.2	Complied
Top	5795	-5.5	0.2	-5.3	17.0	22.3	Complied



Bottom Channel

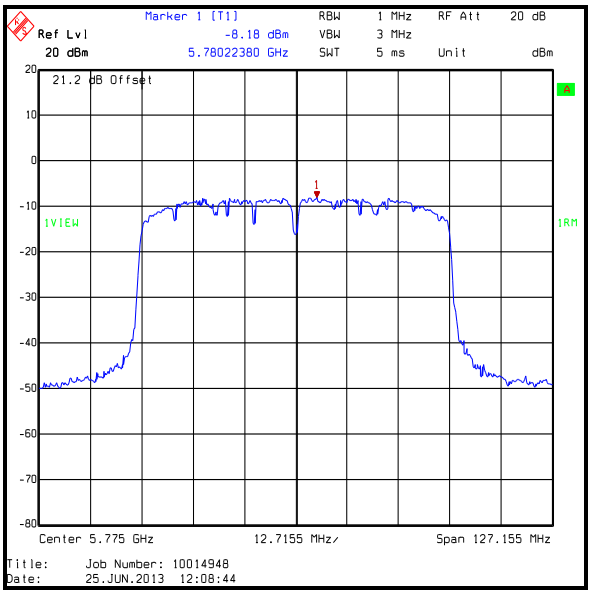


Top Channel

Transmitter Peak Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11ac / 80 MHz / BPSK / 29.3 Mbps / MCS0

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Single	5775	-8.2	0.2	-8.0	17.0	25.0	Complied



Single Channel

Transmitter Peak Power Spectral Density (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	13 Aug 2013	12
A1999	Attenuator	Huber + Suhner	6820.17.B	07101	05 Apr 2014	12
S0520	DC Power Supply	GW instek	GPC-3030	E835141	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12
M1021	Signal Generator	Rohde & Schwarz	SMP-02	833286/004	05 Feb 2014	12