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Report On

FCC Testing of the Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM (850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and GPS in accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)

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FCC ID: APYHRO00238

Document 75934711 Report 18 Issue 1

June 2016



Product Service

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COMMERCIAL-IN-CONFIDENCE

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FCC Testing of the Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM (850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and GPS in accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)

Document 75934711 Report 18 Issue 1

June 2016

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DATED

24 June 2016

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler

M Choudhury



M Toubella

J Tuckwell



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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM
(850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and
GPS

In accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM (850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and GPS to the requirements of FCC 47 CFR Part 15C.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation
Serial Number(s)	IMEI 004401115813590 IMEI 004401115813376
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C (2015)
Disposal	Held Pending Disposal
Reference Number	Not Applicable
Date	Not Applicable
Order Number	10829
Date	31 May 2016
Start of Test	3 June 2016
Finish of Test	20 June 2016
Name of Engineer(s)	G Lawler M Choudhury M Toubella J Tuckwell
Related Document(s)	ANSI C63.10 (2013)



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
802.11b				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Conducted Output Power	Pass	
2.4	15.247 (d), 15.205 and 15.209	Spurious Radiated Emissions	Pass	
2.5	15.205	Restricted Band Edges	Pass	
2.6	15.247 (d)	Authorised Band Edges	Pass	
2.7	15.247 (e)	Power Spectral Density	Pass	
802.11g				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Conducted Output Power	Pass	
2.4	15.247 (d), 15.205 and 15.209	Spurious Radiated Emissions	Pass	
2.5	15.205	Restricted Band Edges	Pass	
2.6	15.247 (d)	Authorised Band Edges	Pass	
2.7	15.247 (e)	Power Spectral Density	Pass	



Section	Specification Clause	Test Description	Result	Comments/Base Standard
802.11n				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Conducted Output Power	Pass	
2.4	15.247 (d), 15.205 and 15.209	Spurious Radiated Emissions	Pass	
2.5	15.205	Restricted Band Edges	Pass	
2.6	15.247 (d)	Authorised Band Edges	Pass	
2.7	15.247 (e)	Power Spectral Density	Pass	
Bluetooth Low Energy				
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(3)	Maximum Conducted Output Power	Pass	
2.4	15.247 (d), 15.205 and 15.209	Spurious Radiated Emissions	Pass	
2.5	15.205	Restricted Band Edges	Pass	
2.6	15.247 (d)	Authorised Band Edges	Pass	
2.7	15.247 (e)	Power Spectral Density	Pass	



1.3 PRODUCT TECHNICAL DESCRIPTION

Refer to Model Description APYHRO00238 Rev 4.0 document.

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM (850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and GPS. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 4.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard or test plan were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Sharp Quad-band LTE (B1/B3/B17/B26), Dual-band WCDMA (FDD I / V), Quad-band GSM
(850/900/1800/1900) & WiMAX2+ (TDD41) multi mode Smart phone with Bluetooth, WLAN, and
GPS

In accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)



Product Service

2.1 AC LINE CONDUCTED EMISSIONS**2.1.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.207

2.1.2 Equipment Under Test and Modification State

S/N: IMEI 004401115813590 - Modification State 0

2.1.3 Date of Test

14 June 2016

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.10, Clause 6.2.

Remarks

A mains supply cable of 1 m length was used to supply mains power to the EUT from the LISN.

All final measurements were assessed against the Class B emission limits in FCC 47 CFR Part 15, Clause 15.109.

2.1.6 Environmental Conditions

Ambient Temperature	19.9°C
Relative Humidity	64.0%

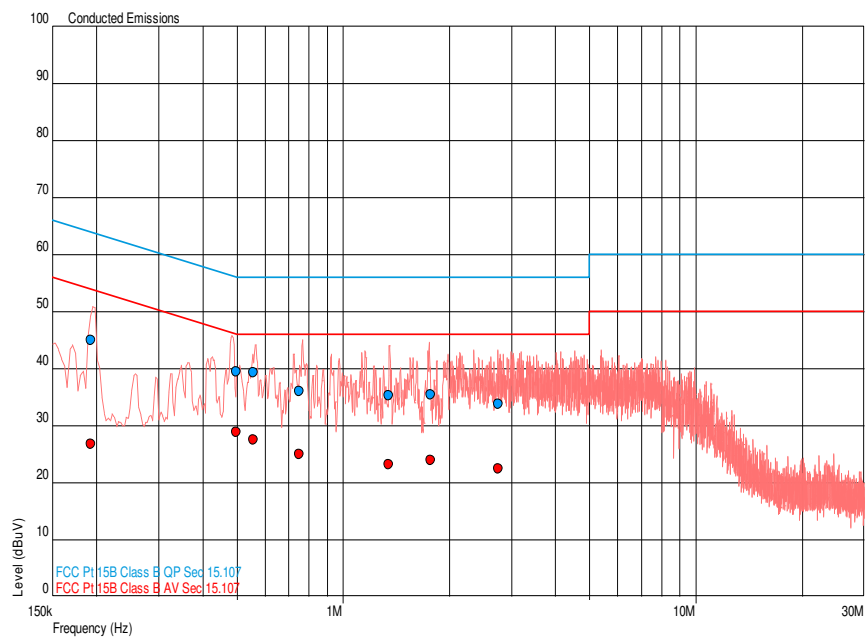


2.1.7 Test Results

802.11b, Live Line, AC Line Conducted Emissions Result

Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.193	45.0	63.9	-18.9	26.7	53.9	-27.2
0.499	39.5	56.0	-16.5	28.8	46.0	-17.2
0.556	39.4	56.0	-16.6	27.6	46.0	-18.4
0.751	36.1	56.0	-19.9	25.1	46.0	-20.9
1.344	35.3	56.0	-20.7	23.2	46.0	-22.8
1.772	35.4	56.0	-20.6	24.0	46.0	-22.0
2.751	33.8	56.0	-22.2	22.5	46.0	-23.5

802.11b, Live Line, AC Line Conducted Emissions Plot

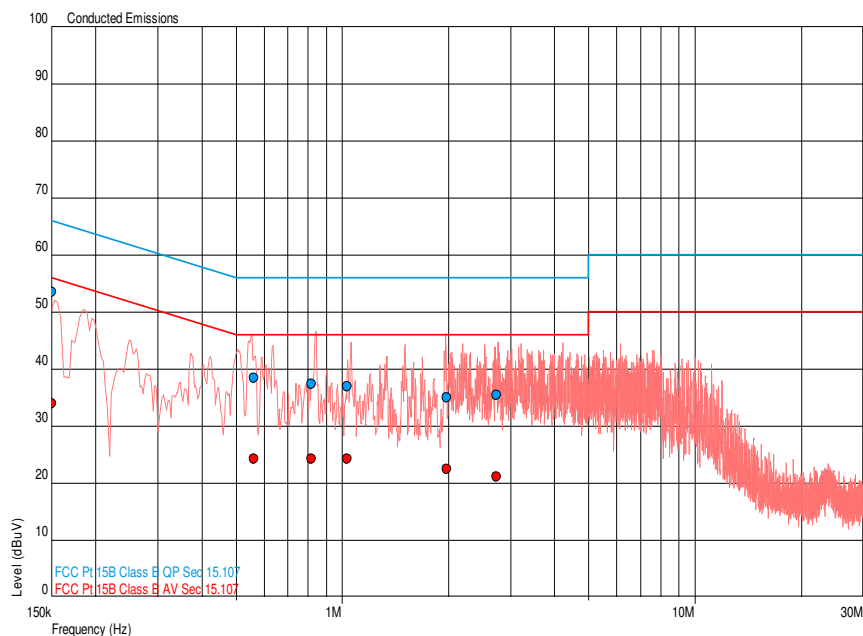




802.11b, Neutral Line, AC Line Conducted Emissions Result

Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.150	53.4	66.0	-12.5	34.0	56.0	-22.0
0.563	38.5	56.0	-17.5	24.3	46.0	-21.7
0.818	37.3	56.0	-18.7	24.2	46.0	-21.8
1.035	36.9	56.0	-19.1	24.2	46.0	-21.8
1.980	35.1	56.0	-20.9	22.4	46.0	-23.6
2.736	35.5	56.0	-20.5	21.1	46.0	-24.9

802.11b, Neutral Line, AC Line Conducted Emissions Plot



FCC 47 CFR Part 15, Limit Clause 15.207

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.



Product Service

2.2 6 dB BANDWIDTH**2.2.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)

2.2.2 Equipment Under Test and Modification State

S/N: IMEI 004401115813376 - Modification State 0

2.2.3 Date of Test

3 June 2016 & 9 June 2016

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

The test was performed in accordance with ANSI C63.10, clause 11.8.

Remarks

Preliminary checks were performed to determine the data rate with the widest bandwidth.

2.2.6 Environmental Conditions

Ambient Temperature	22.2 - 22.9°C
Relative Humidity	39.2 - 42.8%



Product Service

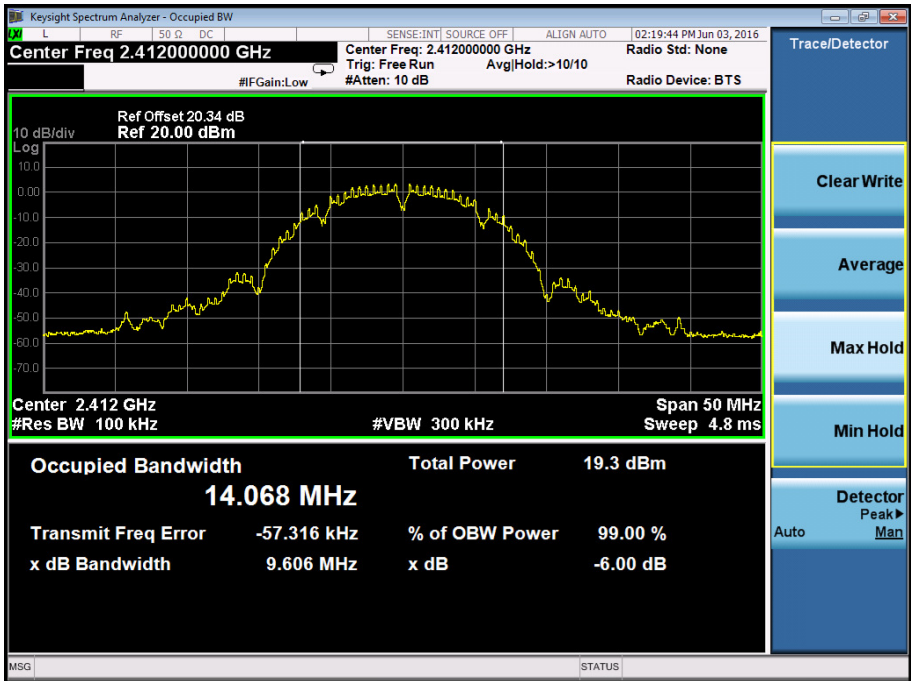
2.2.7 Test Results

4.0 V DC Supply

802.11b, OFDM, 1 Mbps, 6 dB Bandwidth Results

2412 MHz	2437 MHz	2462 MHz
kHz	kHz	kHz
9606	10060	9594

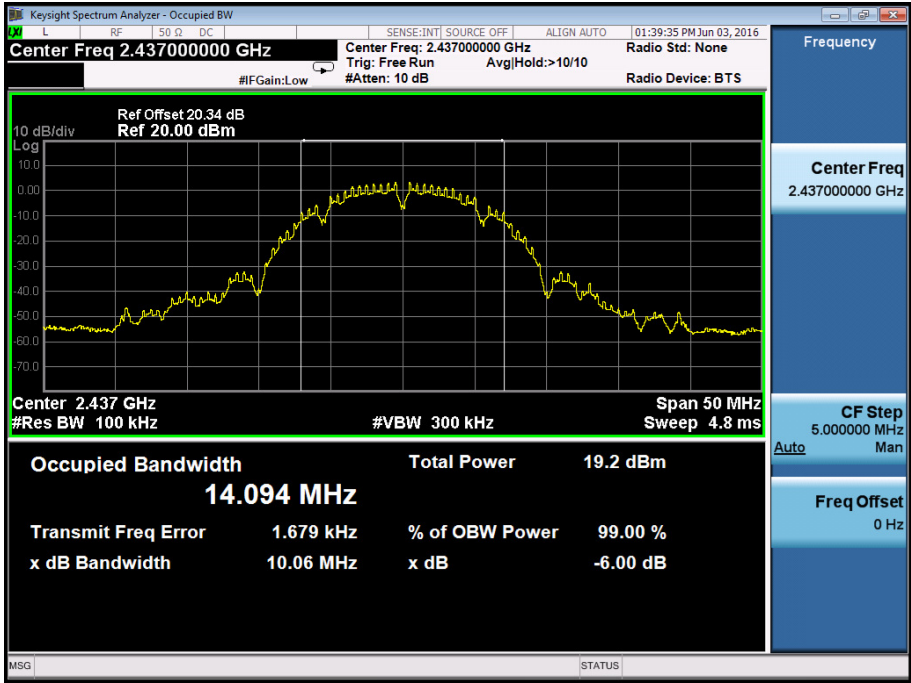
802.11b, 2412 MHz, OFDM, 1 Mbps, 6 dB Bandwidth Plot





Product Service

802.11b, 2437 MHz, OFDM, 1 Mbps, 6 dB Bandwidth Plot



802.11b, 2462 MHz, OFDM, 1 Mbps, 6 dB Bandwidth Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.



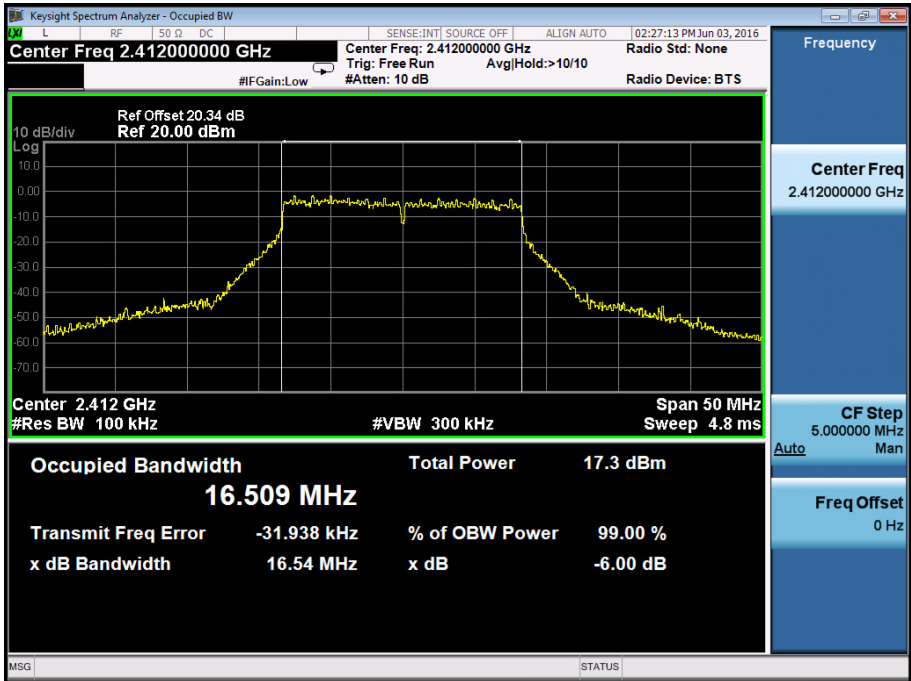
Product Service

4.0 V DC Supply

802.11g, OFDM, 54 Mbps, 6 dB Bandwidth Results

2412 MHz	2437 MHz	2462 MHz
kHz	kHz	kHz
16540	16560	16540

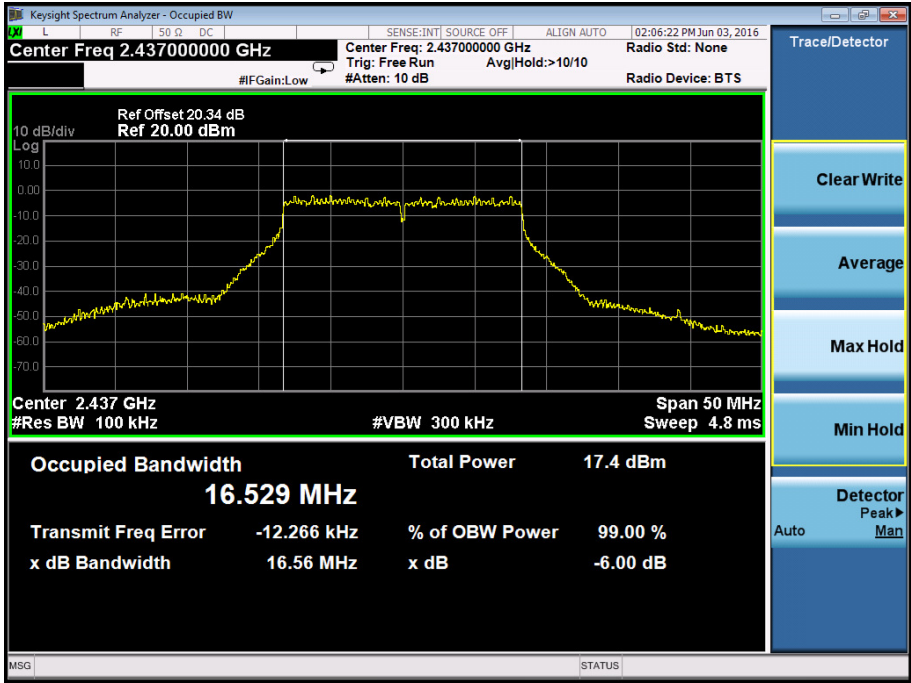
802.11g, 2412 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot



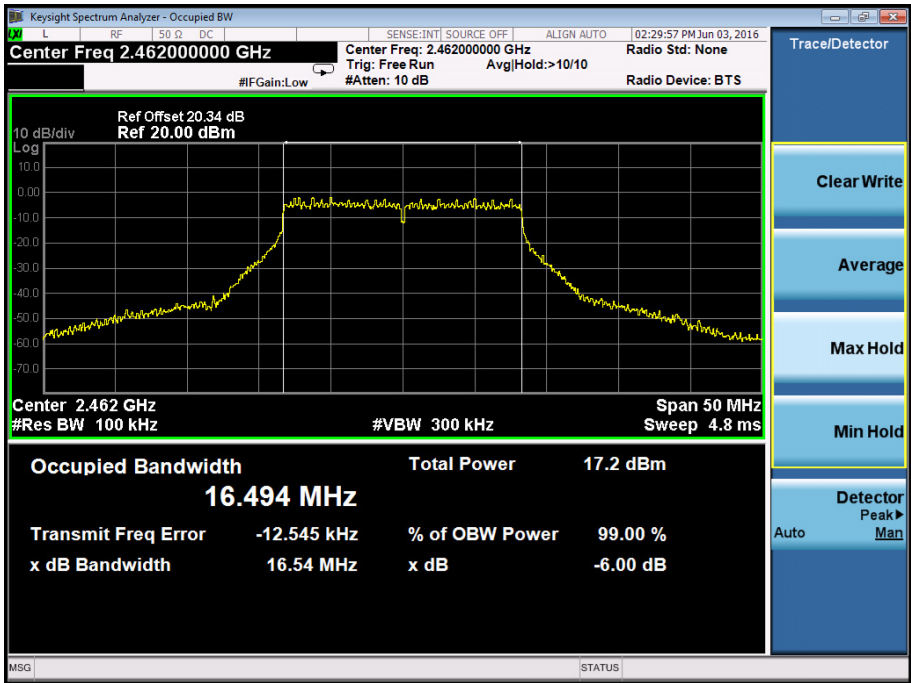


Product Service

802.11g, 2437 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot



802.11g, 2462 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

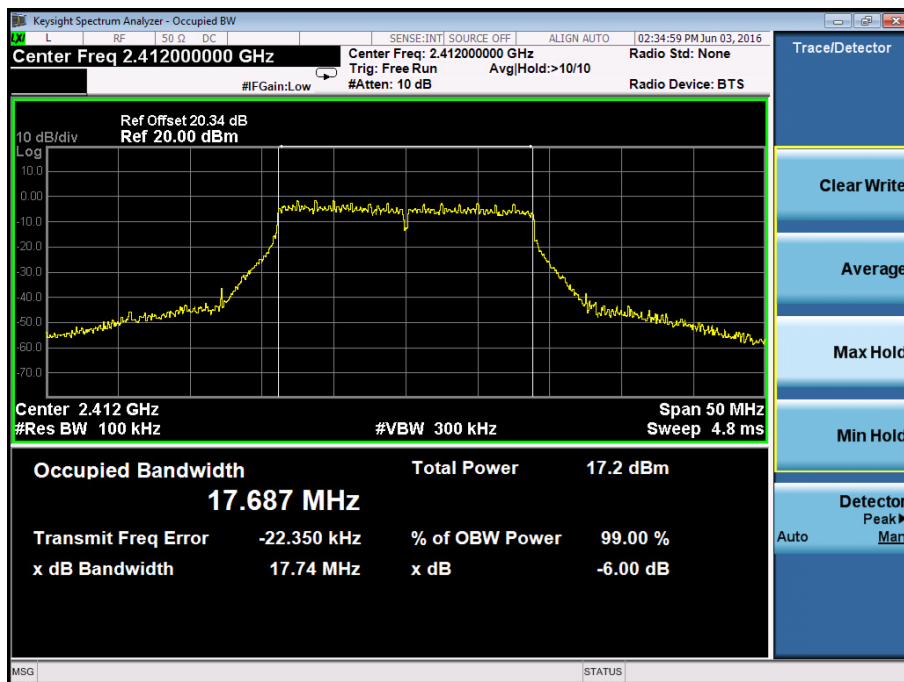


Product Service

4.0 V DC Supply

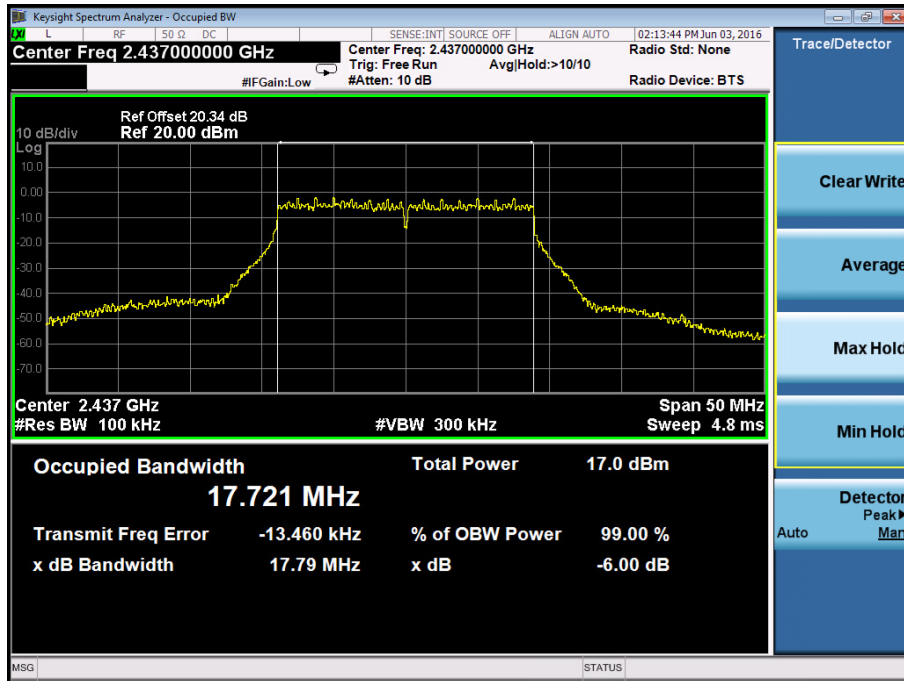
802.11n, OFDM, MCS7, 6 dB Bandwidth Results

2412 MHz	2437 MHz	2462 MHz
kHz	kHz	kHz
17740	17790	17730

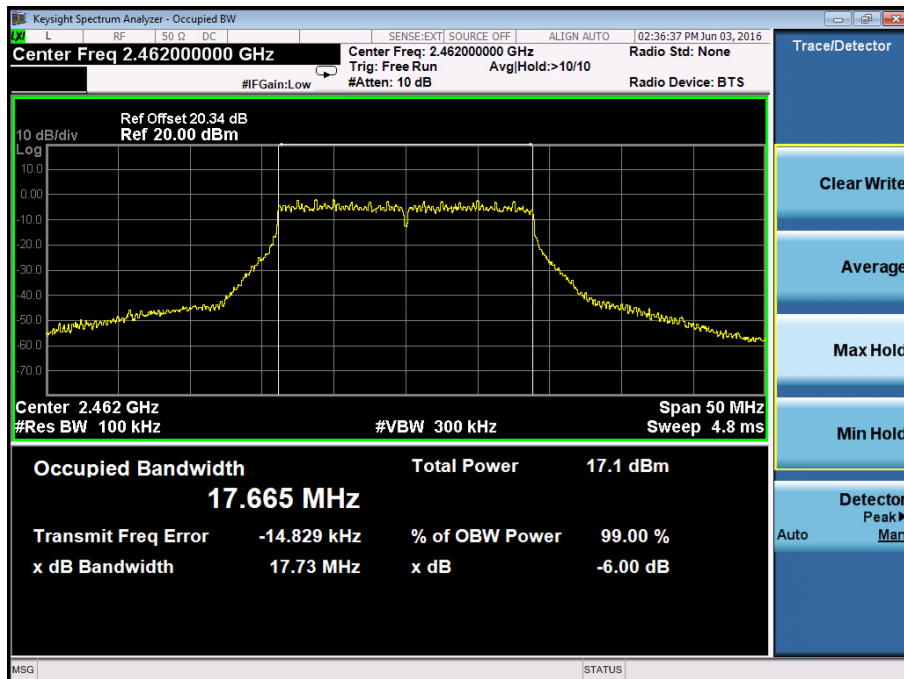
802.11n, 2412 MHz, OFDM, MCS7, 6 dB Bandwidth Plot



802.11n, 2437 MHz, OFDM, MCS7, 6 dB Bandwidth Plot



802.11n, 2462 MHz, OFDM, MCS7, 6 dB Bandwidth Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.



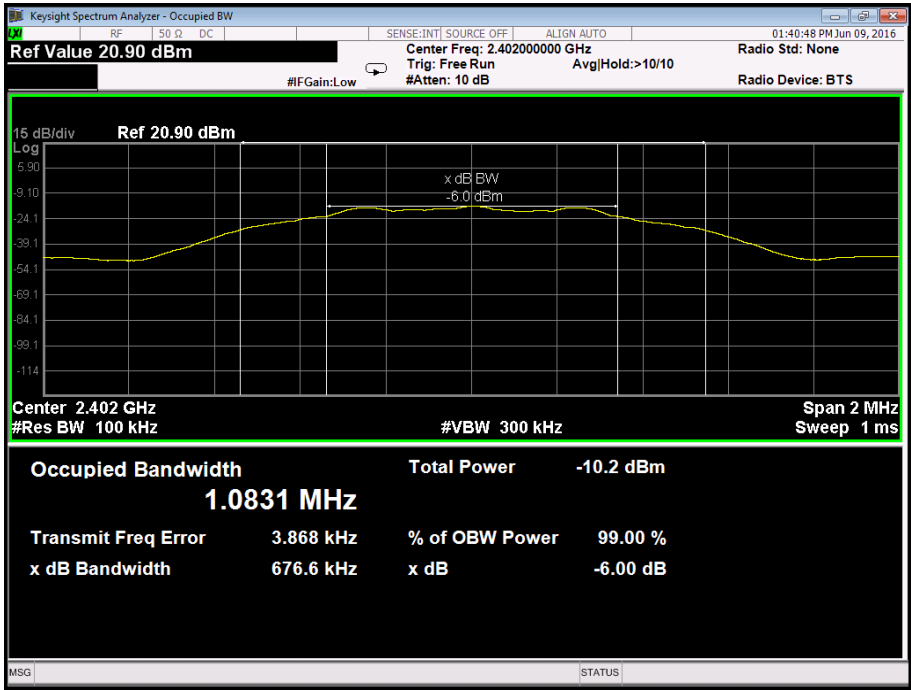
Product Service

4.0 V DC Supply

Bluetooth Low Energy, GFSK, 6 dB Bandwidth Results

2402 MHz	2441 MHz	2480 MHz
kHz	kHz	kHz
676.60	670.90	671.50

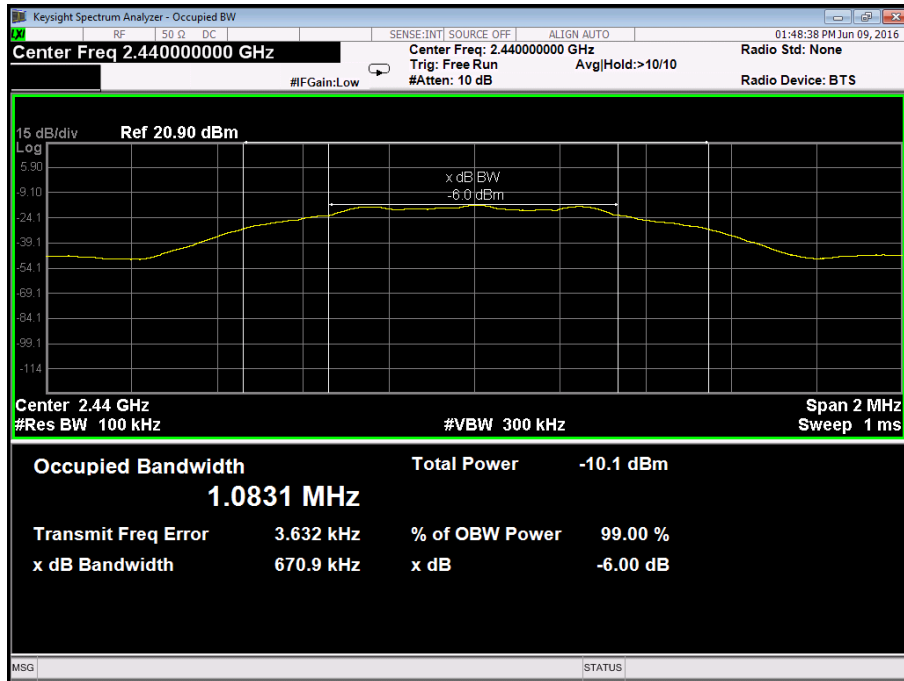
Bluetooth Low Energy, 2402 MHz, GFSK, 6 dB Bandwidth Plot



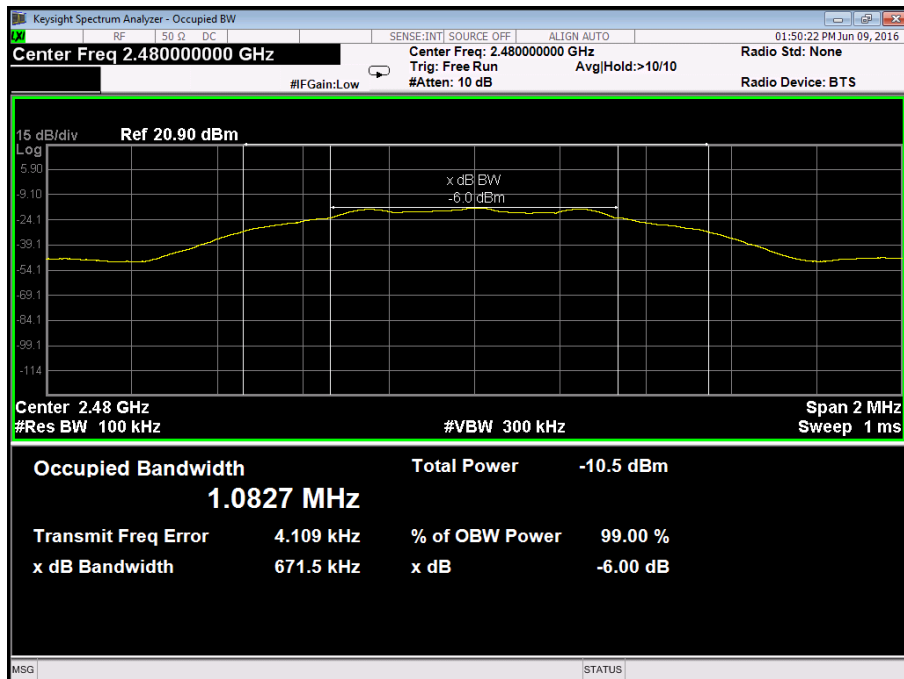


Product Service

Bluetooth Low Energy, 2441 MHz, GFSK, 6 dB Bandwidth Plot



Bluetooth Low Energy, 2480 MHz, GFSK, 6 dB Bandwidth Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.



Product Service

2.3 MAXIMUM CONDUCTED OUTPUT POWER

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)(3)

2.3.2 Equipment Under Test and Modification State

S/N: IMEI 004401115813376 - Modification State 0

2.3.3 Date of Test

3 June 2016, 6 June 2016 & 10 June 2016

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

The test was performed in accordance with ANSI C63.10, clause 11.9.1.3.

2.3.6 Environmental Conditions

Ambient Temperature 22.9 - 25.0°C
Relative Humidity 41.7 - 45.6%

2.3.7 Test Results

4.0 V DC Supply

802.11b, 1 Mbps, Maximum Conducted Output Power Results

2412 MHz		2437 MHz		2462 MHz	
dBm	mW	dBm	mW	dBm	mW
16.70	46.77	16.14	41.11	16.18	41.50

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.



Product Service

4.0 V DC Supply

802.11g, 9 Mbps, Maximum Conducted Output Power Results

2412 MHz		2437 MHz		2462 MHz	
dBm	mW	dBm	mW	dBm	mW
21.1	128.82	21.56	143.22	21.31	135.21

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

4.0 V DC Supply

802.11n, MCS0, Maximum Conducted Output Power Results

2412 MHz		2437 MHz		2462 MHz	
dBm	mW	dBm	mW	dBm	mW
21.15	130.32	21.29	134.59	21.23	132.74

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

4.0 V DC Supply

Bluetooth Low Energy, Maximum Conducted Output Power Results

2402 MHz		2441 MHz		2480 MHz	
dBm	mW	dBm	mW	dBm	mW
4.120	2.582	4.416	2.764	3.986	2.504

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



Product Service

2.4 SPURIOUS RADIATED EMISSIONS**2.4.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (d), 15.205 and 15.209

2.4.2 Equipment Under Test and Modification State

S/N: IMEI 004401115813590 - Modification State 0

2.4.3 Date of Test

8 June 2016, 12 June 2016, 13 June 2016 & 14 June 2016

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

Testing was performed in accordance with ANSI C63.10, clause 11.11, 11.12.1 and 11.12.2.7.

Remarks

Plots for average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.3
Final average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.2

2.4.6 Environmental Conditions

Ambient Temperature	18.8 - 19.6°C
Relative Humidity	62.0 - 66.0%



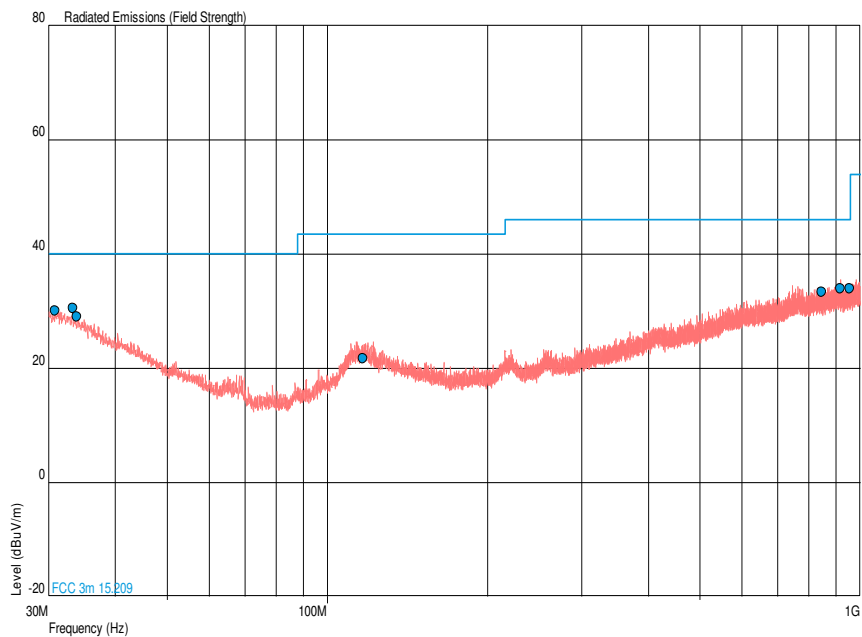
2.4.7 Test Results

4.0 V DC Supply

802.11b, 2412 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (°)	Height (m)	Polarisation
30.817	30.0	-10.0	31.6	-68.4	342	1.00	Vertical
33.348	30.5	-9.5	33.5	-66.5	328	1.00	Horizontal
33.902	29.0	-11.0	28.2	-71.8	187	1.00	Vertical
116.602	21.7	-21.8	12.2	-137.8	348	1.00	Horizontal
847.892	33.3	-12.7	46.2	-153.8	2	1.00	Vertical
917.132	33.9	-12.1	49.5	-150.5	85	1.00	Vertical
956.000	34.0	-12.0	50.1	-149.9	99	1.00	Vertical

802.11b, 2412 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





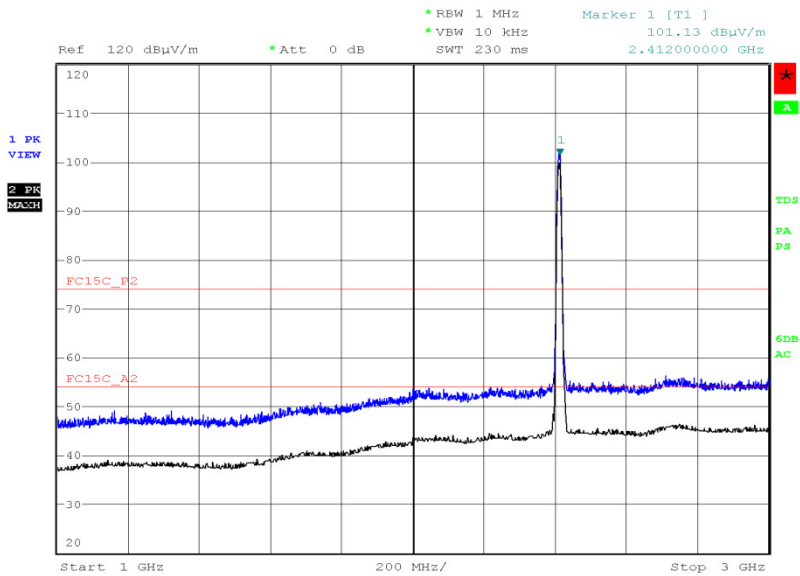
Product Service

802.11b, 2412 MHz, 1 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

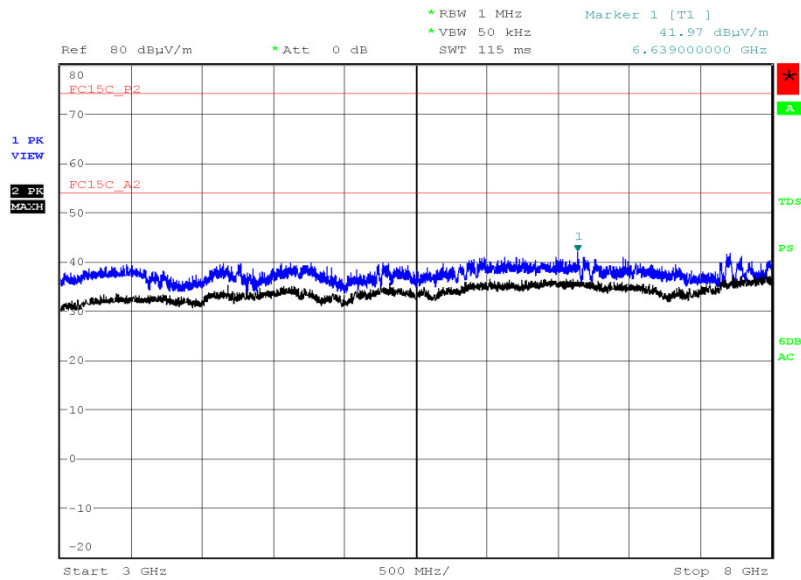
802.11b, 2412 MHz, 1 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 8.JUN.2016 20:38:38

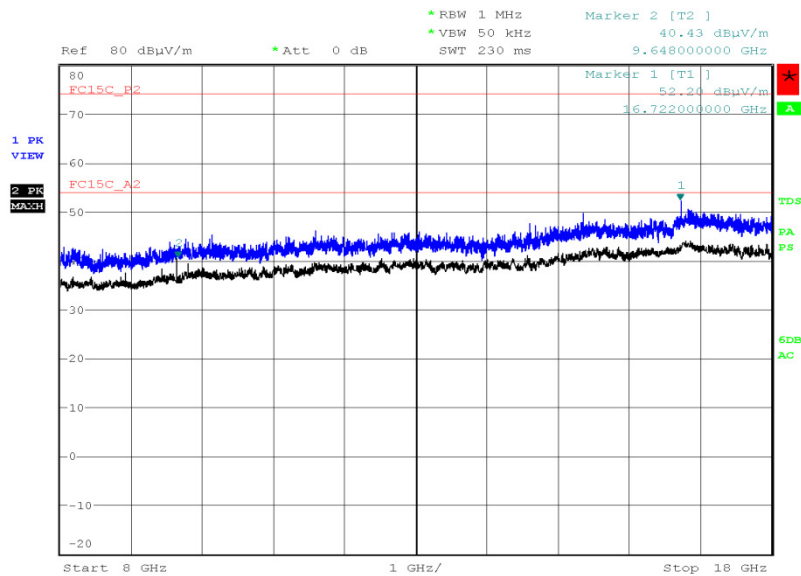


802.11b, 2412 MHz, 1 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 18:33:37

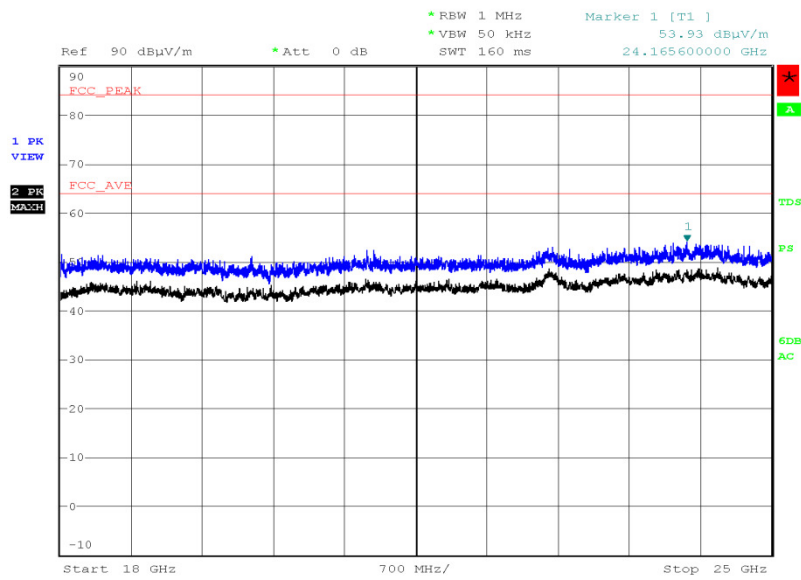
802.11b, 2412 MHz, 1 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 19:54:18



Product Service

802.11b, 2412 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot

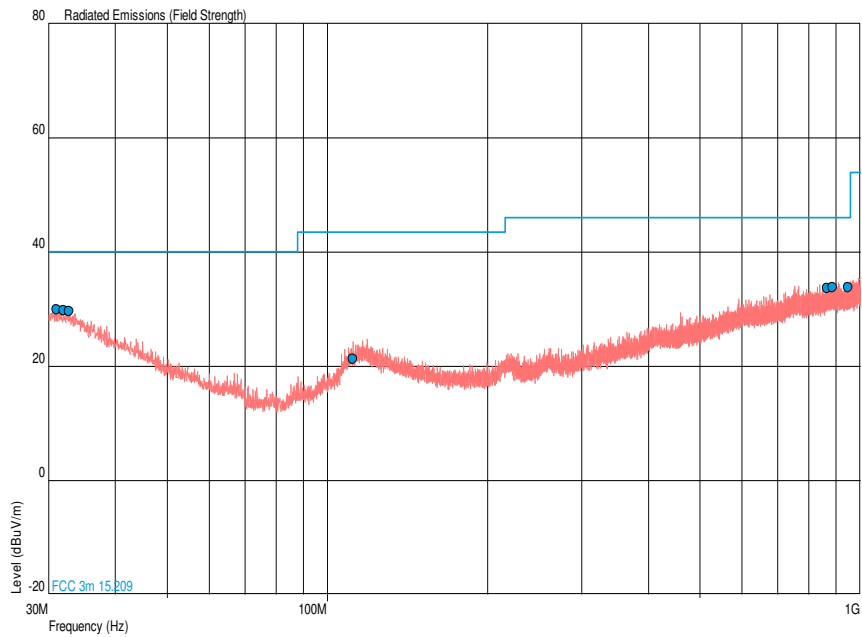
Date: 13.JUN.2016 23:30:41



802.11b, 2437 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (°)	Height (m)	Polarisation
31.067	29.9	-10.1	31.3	-68.7	180	1.00	Vertical
31.989	29.8	-10.2	30.9	-69.1	180	1.00	Horizontal
32.813	29.6	-10.4	30.2	-69.8	0	1.00	Horizontal
111.674	21.3	-22.2	11.6	-138.4	180	1.00	Horizontal
866.625	33.7	-12.3	48.4	-151.6	180	1.00	Horizontal
887.383	33.8	-12.2	49.0	-151.0	180	1.00	Vertical
950.274	33.8	-12.2	49.0	-151.0	180	1.00	Vertical

802.11b, 2437 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





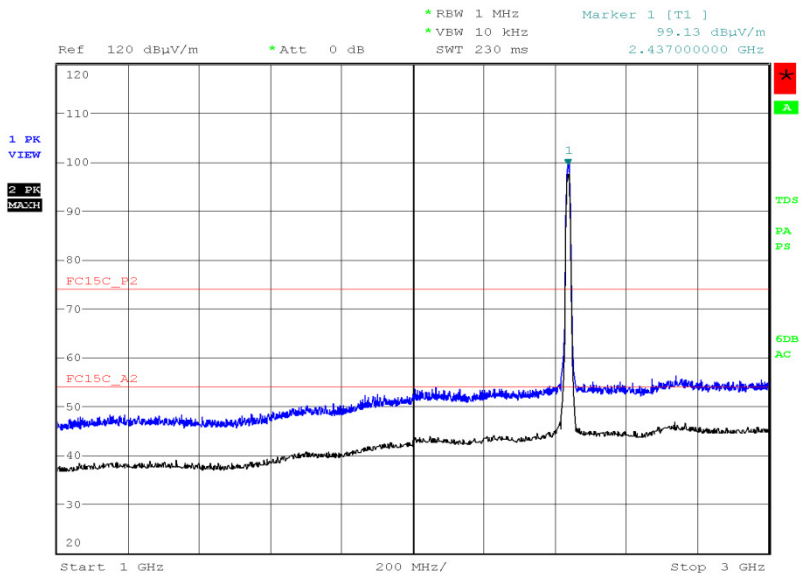
Product Service

802.11b, 2437 MHz, 1 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

802.11b, 2437 MHz, 1 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

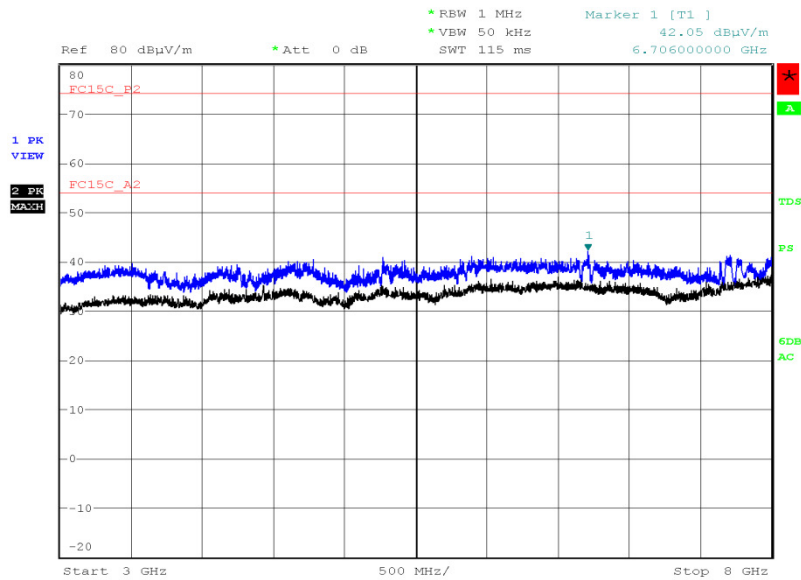


Date: 8.JUN.2016 20:33:34



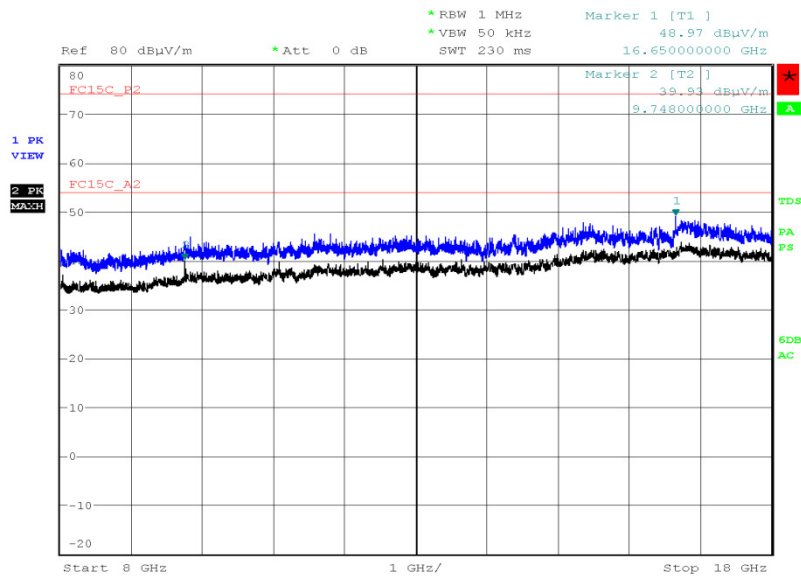
Product Service

802.11b, 2437 MHz, 1 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 18:37:16

802.11b, 2437 MHz, 1 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot

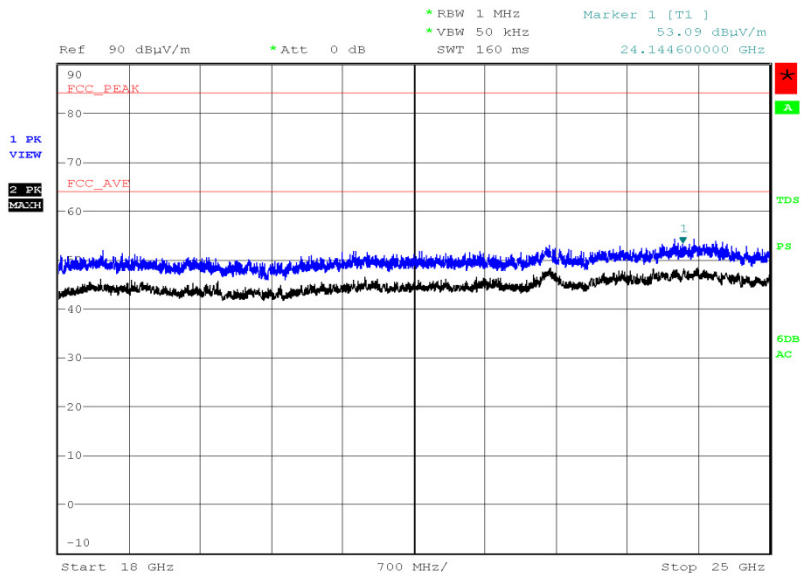


Date: 13.JUN.2016 20:06:17



Product Service

802.11b, 2437 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



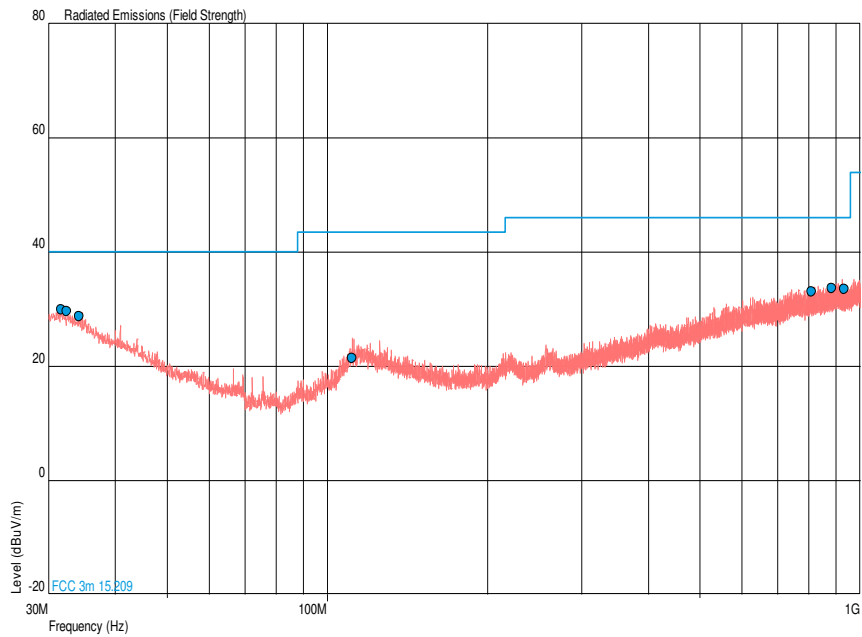
Date: 13.JUN.2016 23:32:43



802.11b, 2462 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

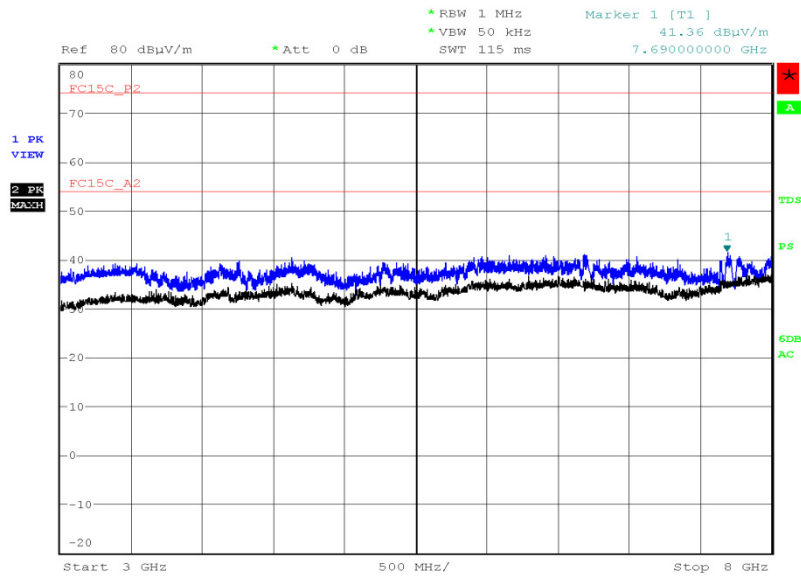
Frequency (MHz)	QP Level (dBμV/m)	QP Margin (dBμV/m)	QP Level (μV/m)	QP Margin (μV/m)	Angle (°)	Height (m)	Polarisation
31.698	29.9	-10.1	31.3	-68.7	0	1.00	Vertical
32.474	29.6	-10.4	30.2	-69.8	0	1.00	Vertical
34.220	28.8	-11.2	27.5	-72.5	0	1.00	Vertical
111.238	21.3	-22.2	11.6	-138.4	0	1.00	Horizontal
810.265	33.1	-12.9	45.2	-154.8	0	1.00	Horizontal
884.570	33.7	-12.3	48.4	-151.6	0	1.00	Horizontal
932.272	33.6	-12.4	47.9	-154.1	0	1.00	Horizontal

802.11b, 2462 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

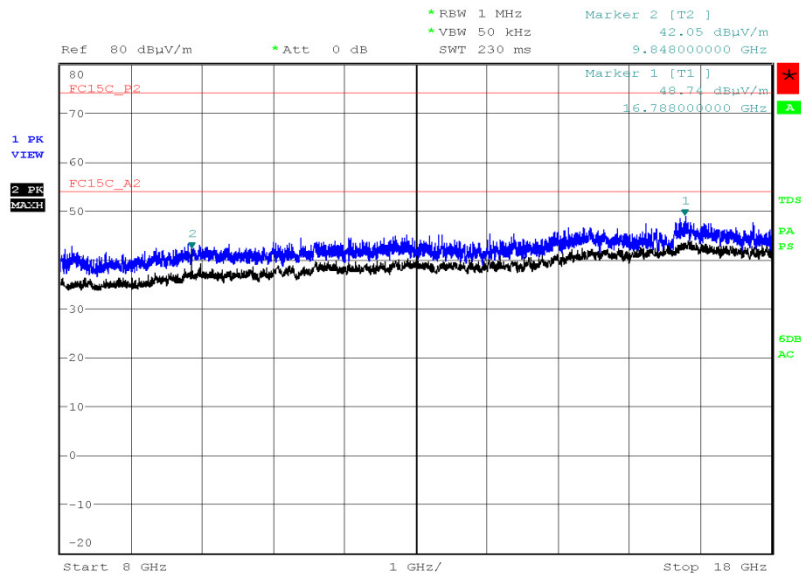




Product Service

802.11b, 2462 MHz, 1 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot

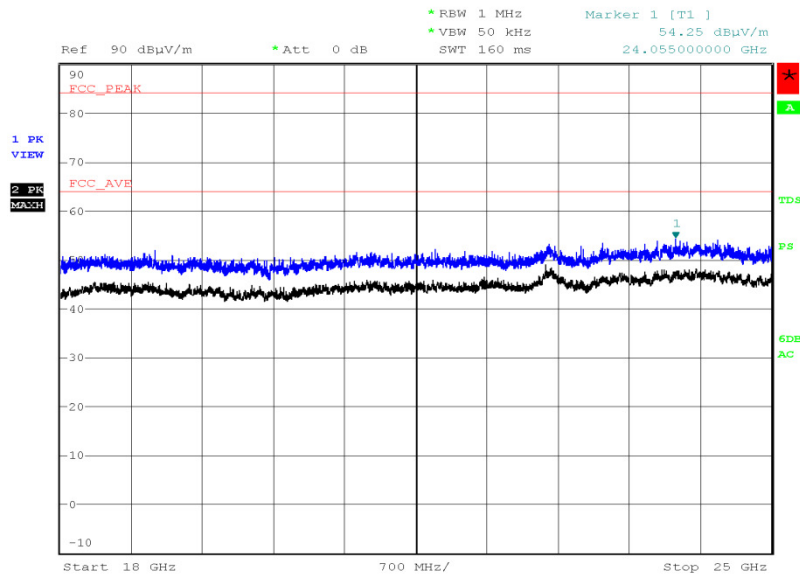
Date: 13.JUN.2016 18:39:50

802.11b, 2462 MHz, 1 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot

Date: 13.JUN.2016 20:17:40



802.11b, 2462 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 23:34:49

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	As per 15.209	As per 15.209

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μV/m)	Average (dBμV/m)	Peak (dBμV/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3

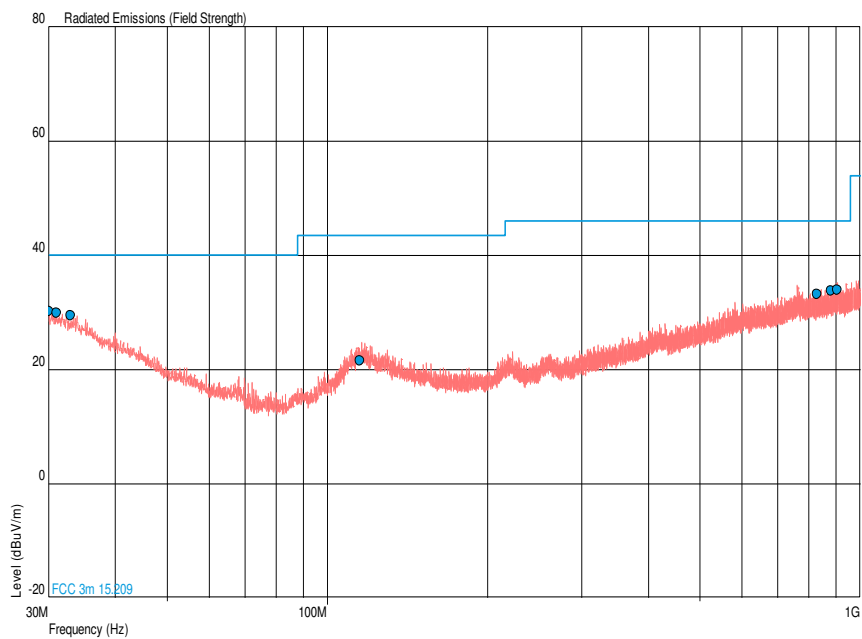


4.0 V DC Supply

802.11g, 2412 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (°)	Height (m)	Polarisation
30.049	30.2	-9.8	32.4	-67.6	180	1.00	Vertical
31.067	30.0	-10.0	31.6	-68.4	0	1.00	Horizontal
33.056	29.5	-10.5	29.9	-70.1	180	1.00	Horizontal
115.263	21.6	-21.9	12.0	-138.0	0	1.00	Horizontal
828.601	33.3	-12.7	46.2	-153.8	0	1.00	Horizontal
881.418	33.8	-12.2	49.0	-151.0	0	1.00	Vertical
905.862	34.0	-12.0	50.1	-149.9	0	1.00	Vertical

802.11g, 2412 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





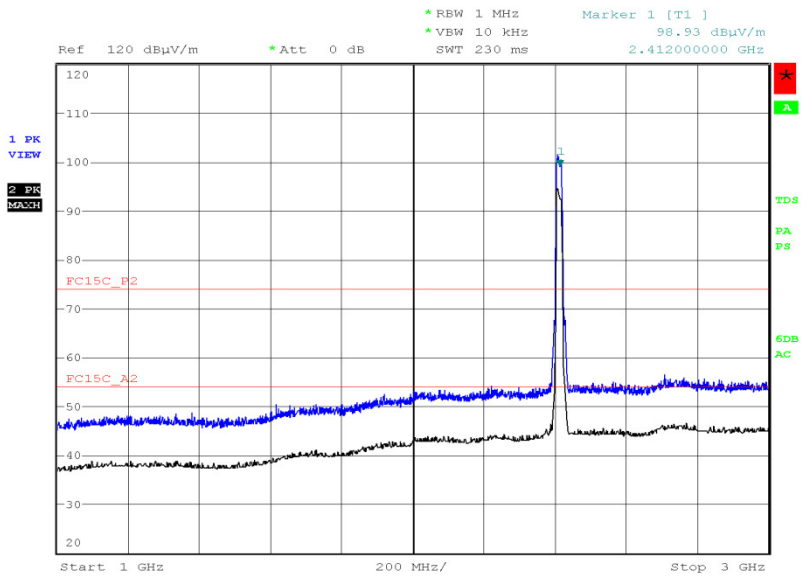
Product Service

802.11g, 2412 MHz, 9 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

802.11g, 2412 MHz, 9 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

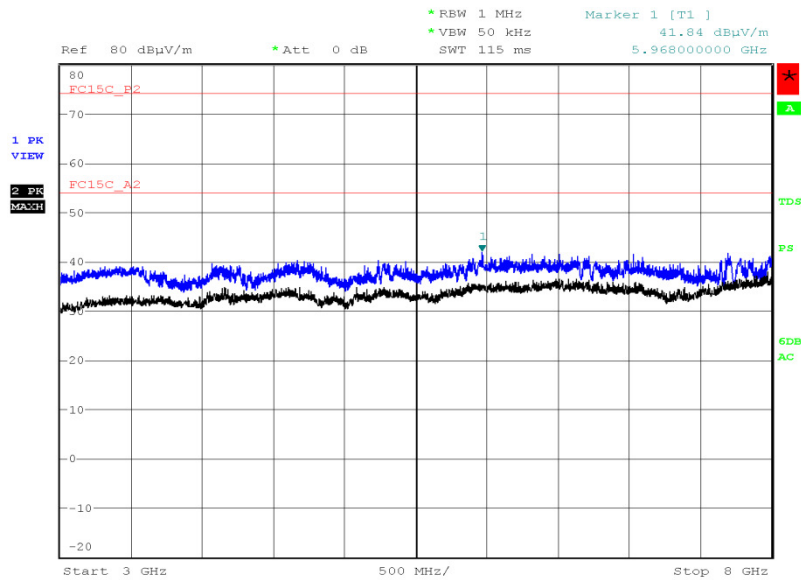


Date: 8.JUN.2016 20:43:41



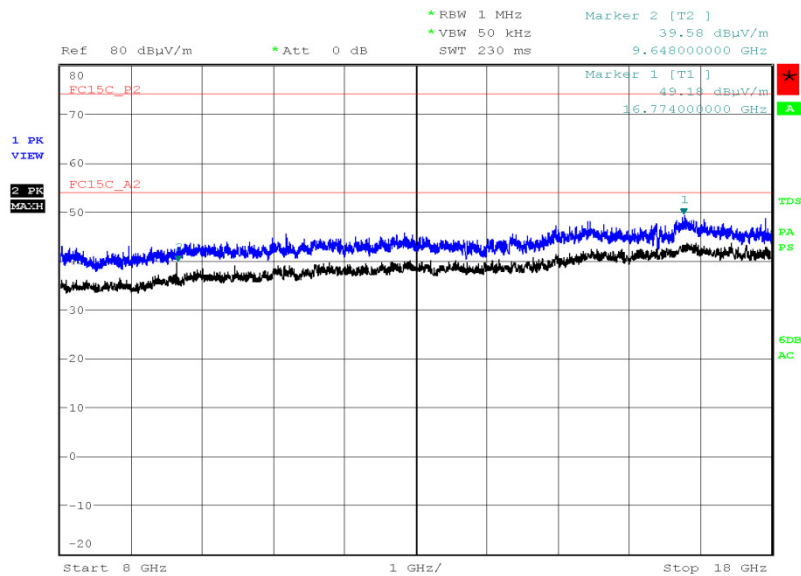
Product Service

802.11g, 2412 MHz, 9 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 18:44:26

802.11g, 2412 MHz, 9 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot

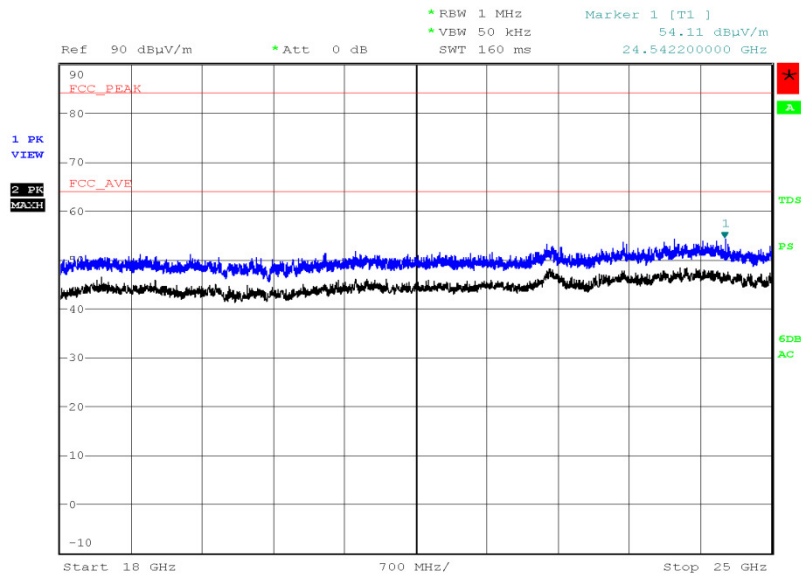


Date: 13.JUN.2016 20:28:48



Product Service

802.11g, 2412 MHz, 9 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



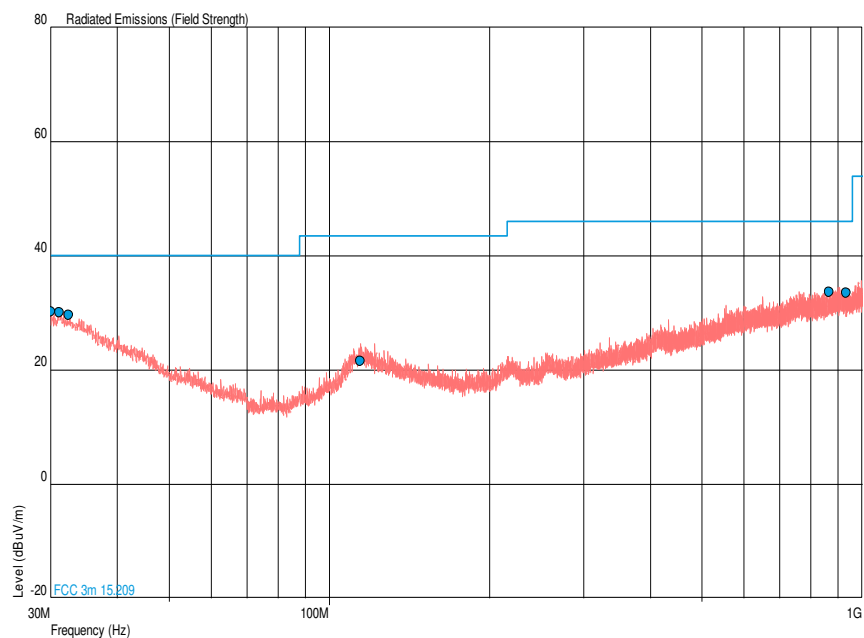
Date: 13.JUN.2016 23:36:38



802.11g, 2437 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBμV/m)	QP Margin (dBμV/m)	QP Level (μV/m)	QP Margin (μV/m)	Angle (°)	Height (m)	Polarisation
30.049	30.2	-9.8	32.4	-67.6	0	1.00	Horizontal
31.164	30.1	-9.9	32.0	-68.0	0	1.00	Vertical
32.425	29.6	-10.4	30.2	-69.8	0	1.00	Horizontal
114.439	21.5	-22.0	11.9	-138.1	0	1.00	Horizontal
868.177	33.6	-12.4	47.9	-152.1	0	1.00	Horizontal
932.272	33.6	-12.4	47.9	-152.1	0	1.00	Horizontal

802.11g, 2437 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





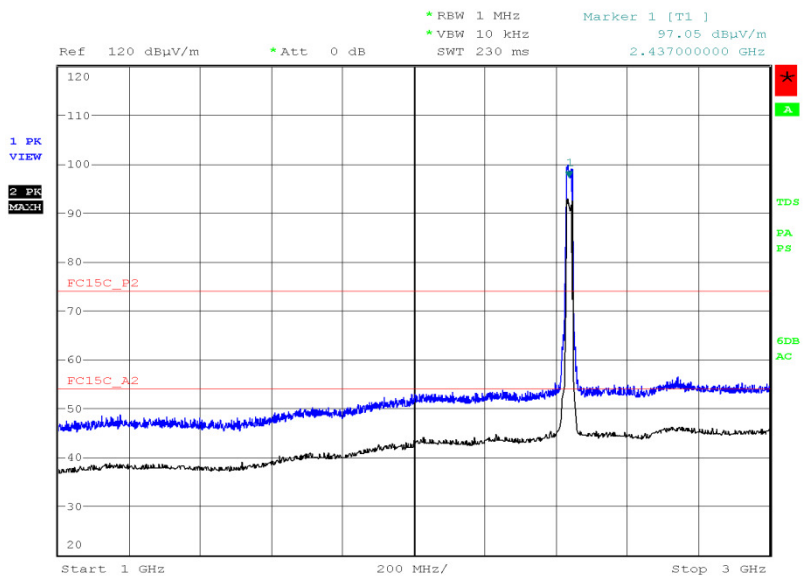
Product Service

802.11g, 2437 MHz, 9 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

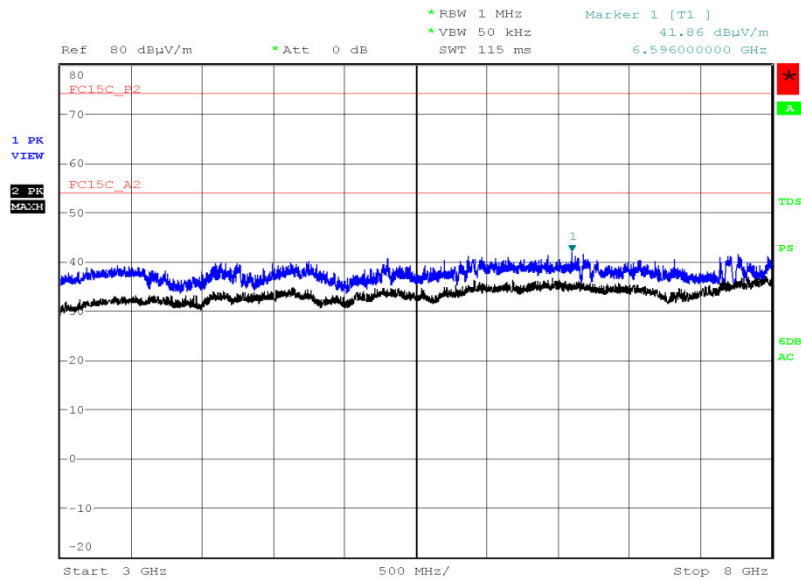
802.11g, 2437 MHz, 9 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



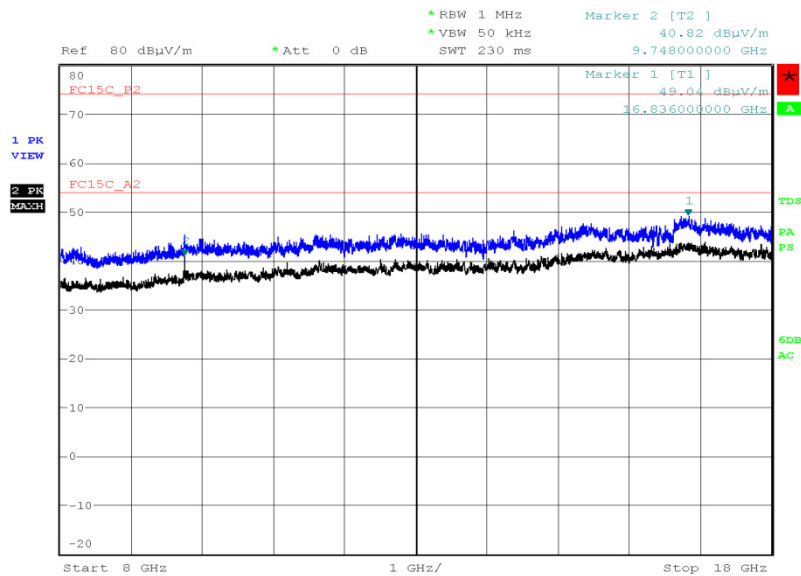
Date: 8.JUN.2016 20:47:10



Product Service

802.11g, 2437 MHz, 9 Mbps, 3 GHz to 8 GHz , Spurious Radiated Emissions Plot

Date: 13.JUN.2016 18:47:44

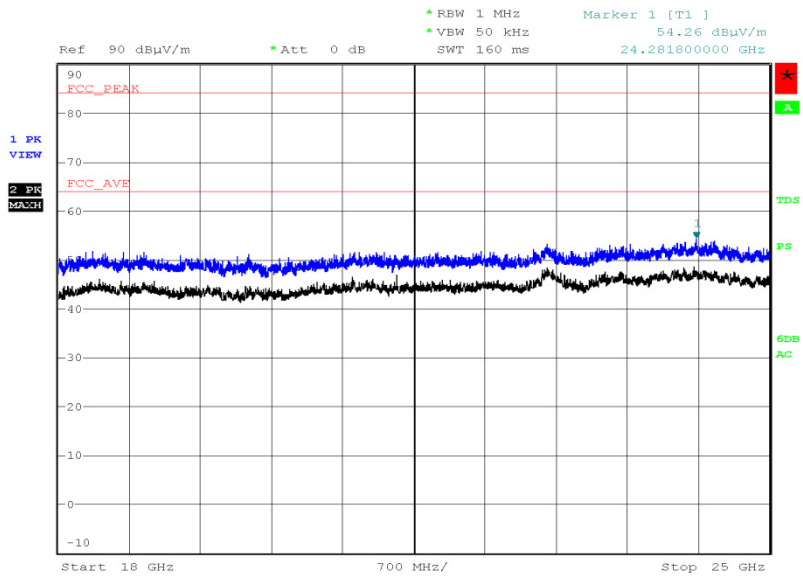
802.11g, 2437 MHz, 9 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot

Date: 13.JUN.2016 20:41:30



Product Service

802.11g, 2437 MHz, 9 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



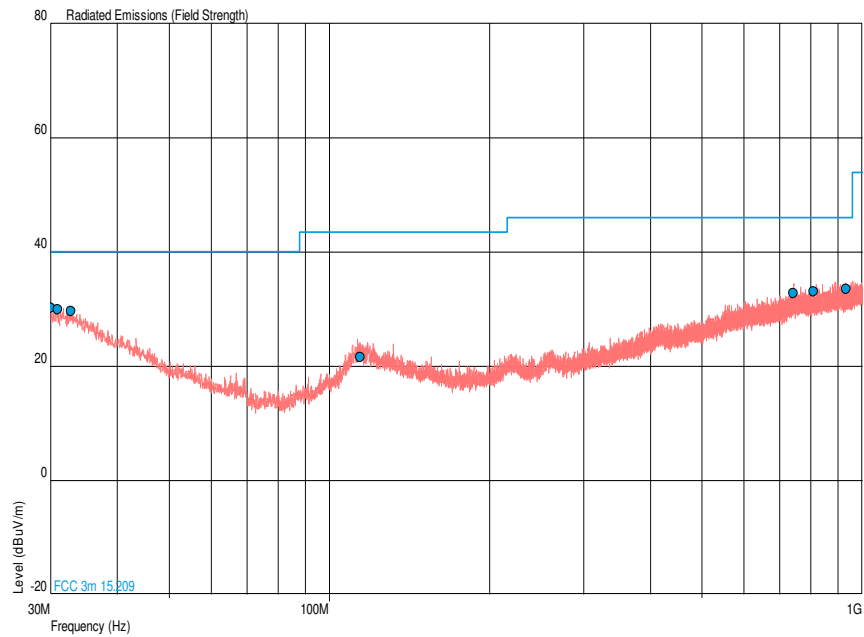
Date: 13.JUN.2016 23:38:42



802.11g, 2462 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBμV/m)	QP Margin (dBμV/m)	QP Level (μV/m)	QP Margin (μV/m)	Angle (°)	Height (m)	Polarisation
30.049	30.2	-9.8	32.4	-67.6	0	1.00	Horizontal
31.019	30.0	-10.0	31.6	-68.4	0	1.00	Vertical
32.813	29.6	-10.4	30.2	-69.8	0	1.00	Horizontal
114.584	21.5	-22.0	11.9	-138.1	180	1.00	Horizontal
741.932	32.8	-13.2	43.7	-156.3	180	1.00	Horizontal
810.365	33.1	-12.9	45.2	-154.8	180	1.00	Horizontal
932.272	33.5	-12.5	47.3	-152.7	180	1.00	Horizontal

802.11g, 2462 MHz, 9 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





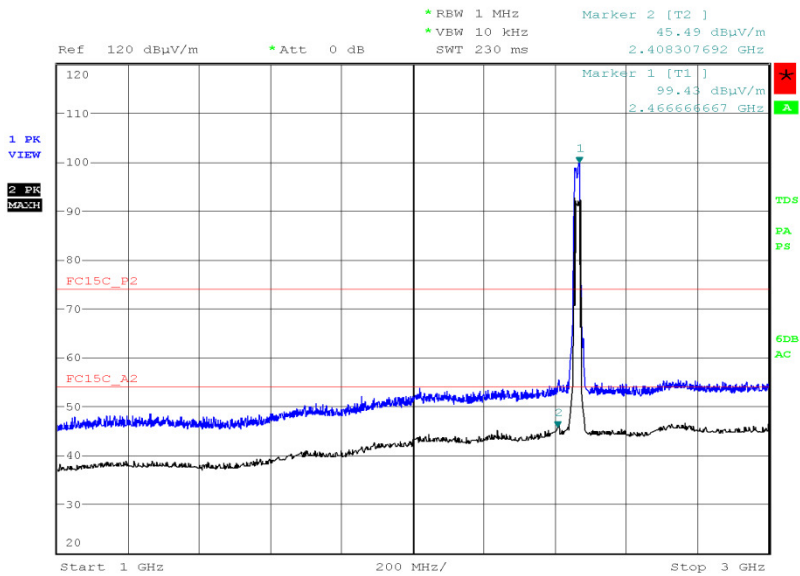
Product Service

802.11g, 2462 MHz, 9 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

802.11g, 2462 MHz, 9 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

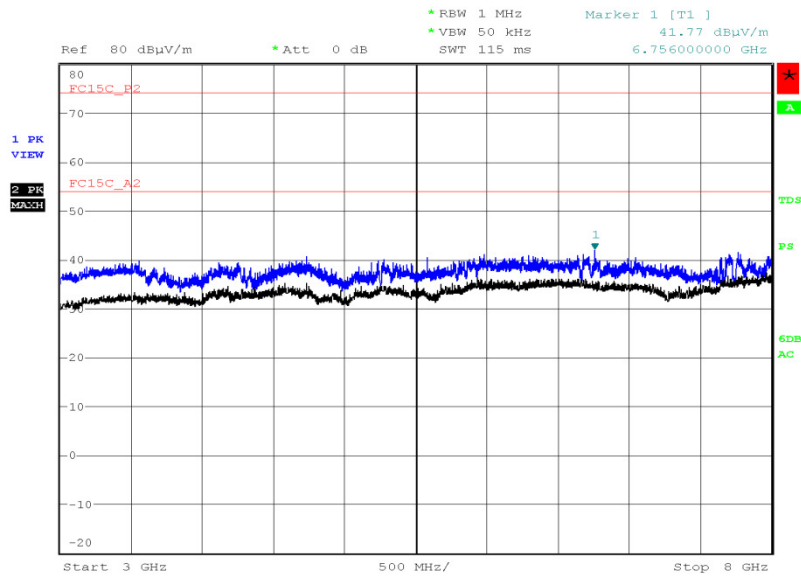


Date: 8.JUN.2016 20:50:26



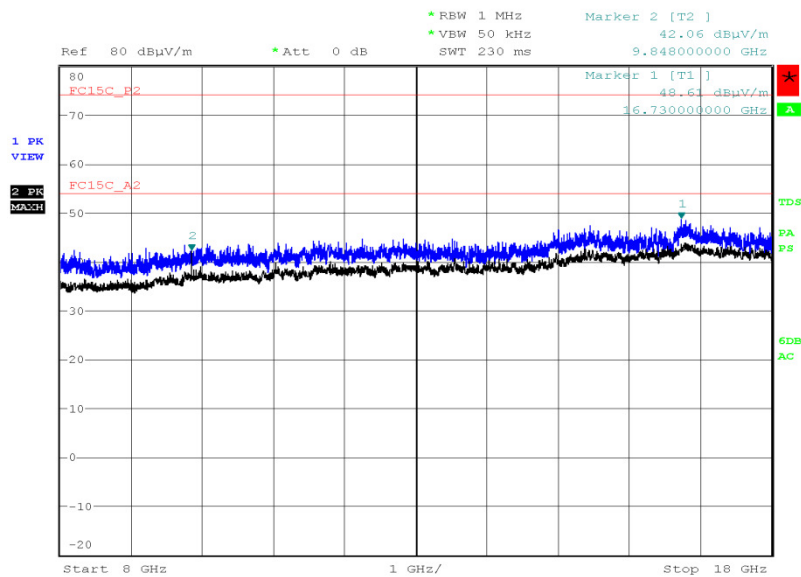
Product Service

802.11g, 2462 MHz, 9 Mbps, 3 GHz to 8 GHz , Spurious Radiated Emissions Plot



Date: 13.JUN.2016 18:51:21

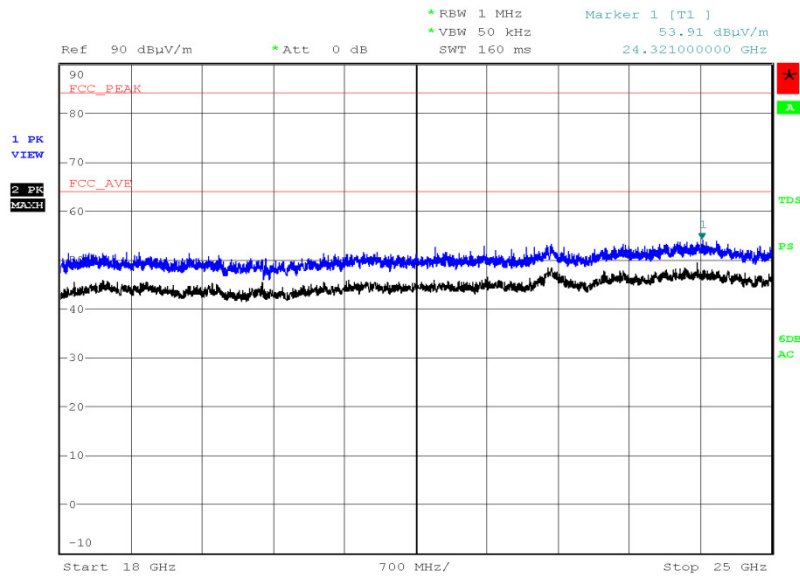
802.11g, 2462 MHz, 9 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 20:50:03



802.11g, 2462 MHz, 9 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 23:41:11

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	As per 15.209	As per 15.209

FCC 47 CFR Part 15, Limit Clause 15.209

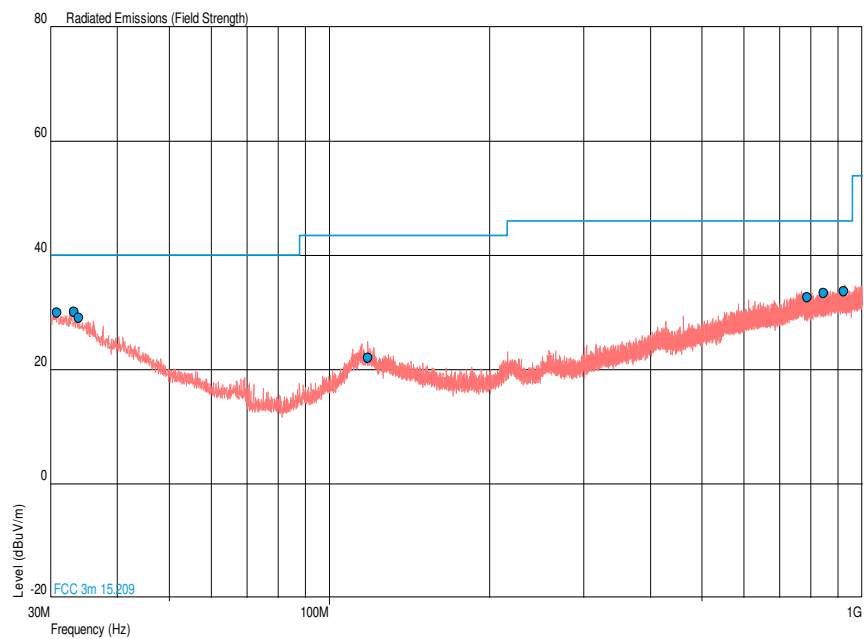
Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μV/m)	Average (dBμV/m)	Peak (dBμV/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3



4.0 V DC Supply

802.11n, 2412 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBμV/m)	QP Margin (dBμV/m)	QP Level (μV/m)	QP Margin (μV/m)	Angle (°)	Height (m)	Polarisation
30.873	30.0	-10.0	31.6	-68.4	0	1.00	Vertical
33.250	30.1	-9.9	32.0	-68.0	0	1.00	Horizontal
33.929	29.0	-11.0	28.2	-71.8	180	1.00	Vertical
118.222	22.0	-21.5	12.6	-137.4	0	1.00	Horizontal
789.863	32.6	-13.4	42.7	-157.3	0	1.00	Horizontal
848.244	33.4	-12.6	46.8	-153.2	180	1.00	Horizontal
923.079	33.7	-12.3	48.4	-151.6	180	1.00	Vertical

802.11n, 2412 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot



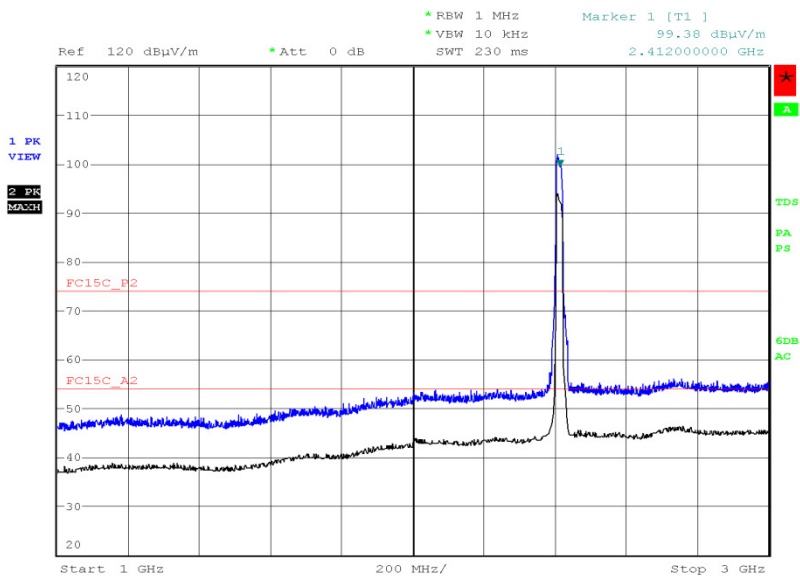
Product Service

802.11n, 2412 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

802.11n, 2412 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

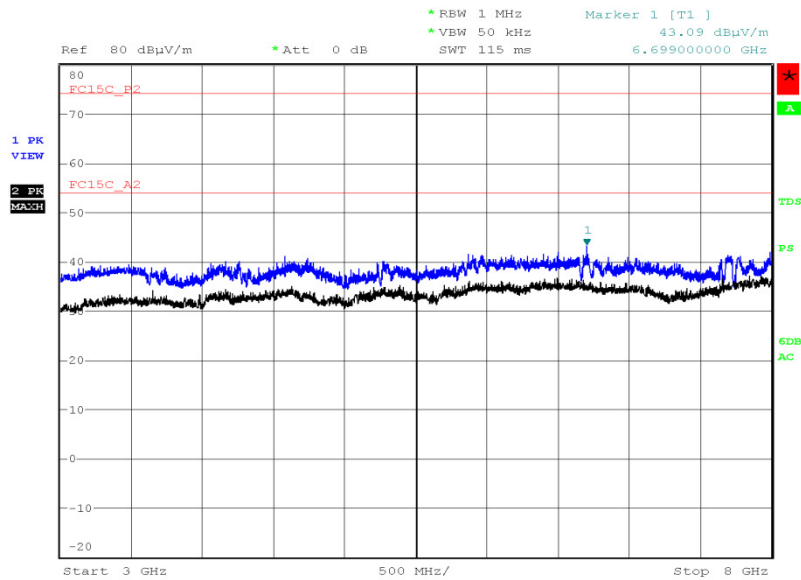


Date: 8.JUN.2016 22:48:13



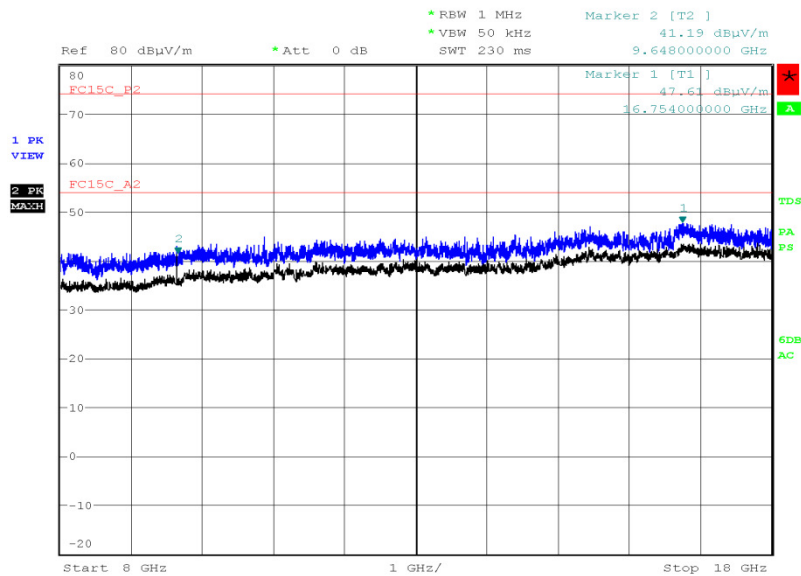
Product Service

802.11n, 2412 MHz,MCS0, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 18:57:30

802.11n, 2412 MHz,MCS0, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot

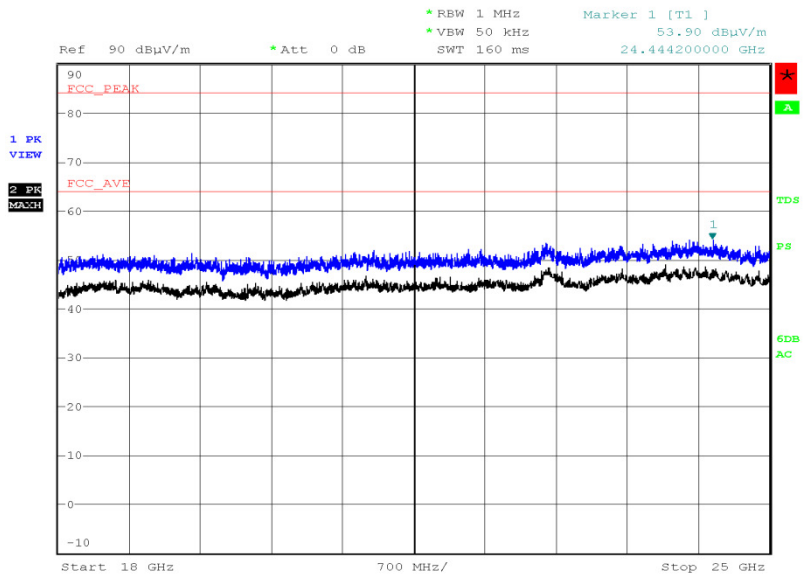


Date: 13.JUN.2016 21:05:53



Product Service

802.11n, 2412 MHz, MCS0, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



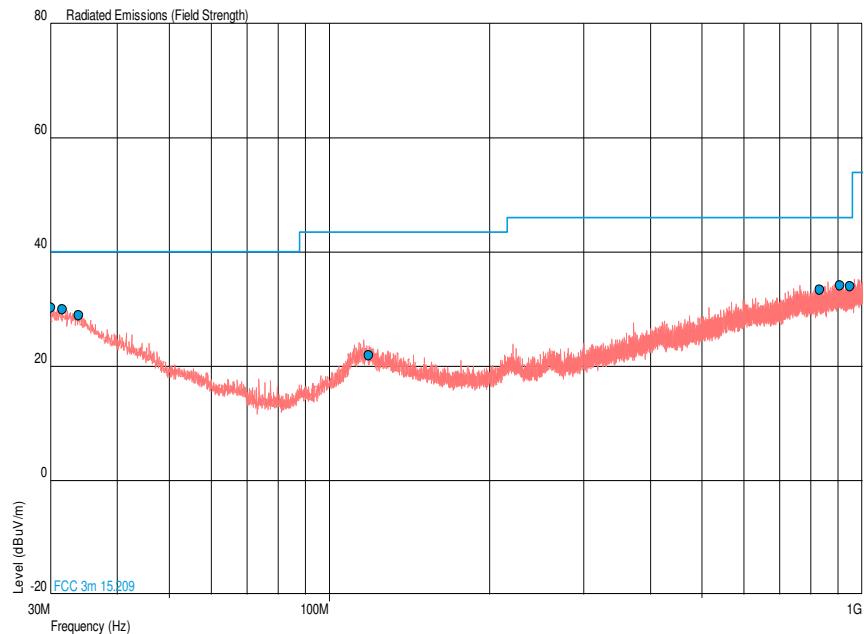
Date: 13.JUN.2016 23:43:57



802.11n, 2437 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (°)	Height (m)	Polarisation
30.049	30.2	-9.8	32.4	-67.6	180	1.00	Vertical
31.601	29.9	-10.1	31.3	-68.7	0	1.00	Vertical
33.880	29.0	-11.0	28.2	-71.8	0	1.00	Horizontal
118.658	21.9	-21.6	12.4	-137.6	0	1.00	Horizontal
831.657	33.3	-12.7	46.2	-153.8	0	1.00	Vertical
909.160	34.1	-11.9	50.7	-149.3	180	1.00	Horizontal
949.269	33.9	-12.1	49.5	-150.5	180	1.00	Vertical

802.11n, 2437 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





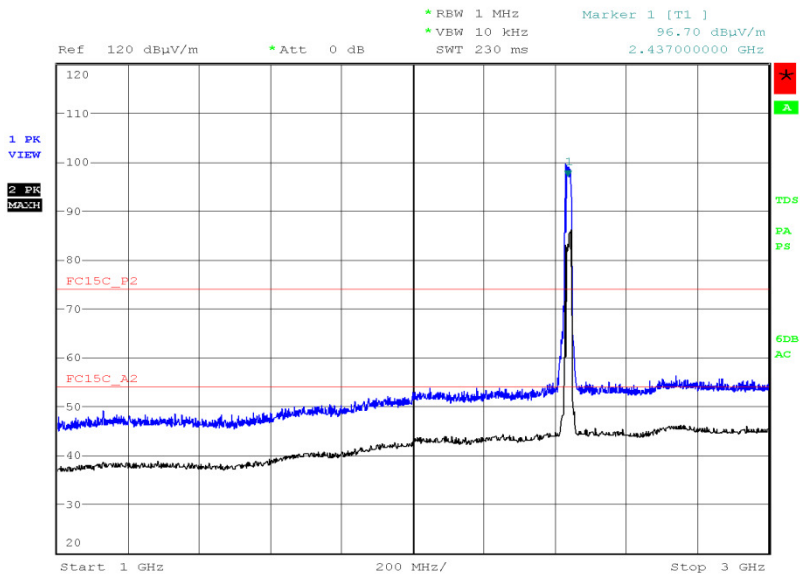
Product Service

802.11n, 2437 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)	Final Peak (μV/m)	Final Average (μV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

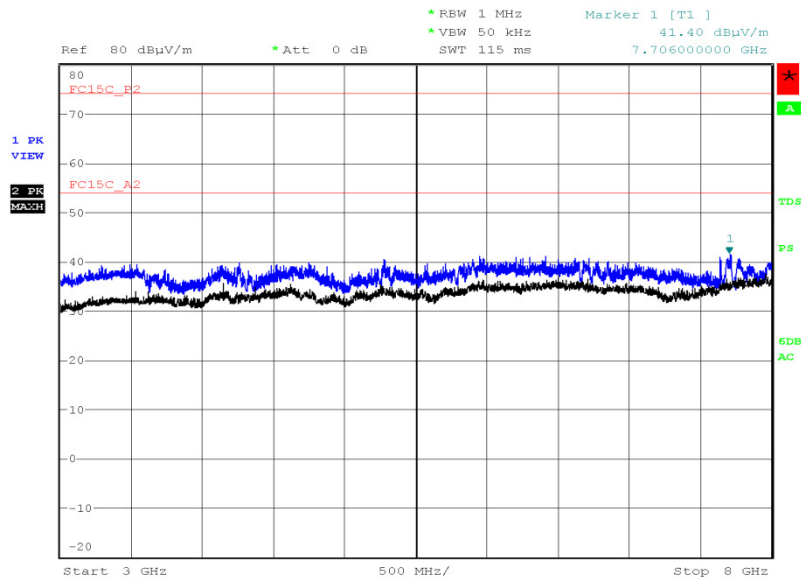
802.11n, 2437 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 8.JUN.2016 22:50:49

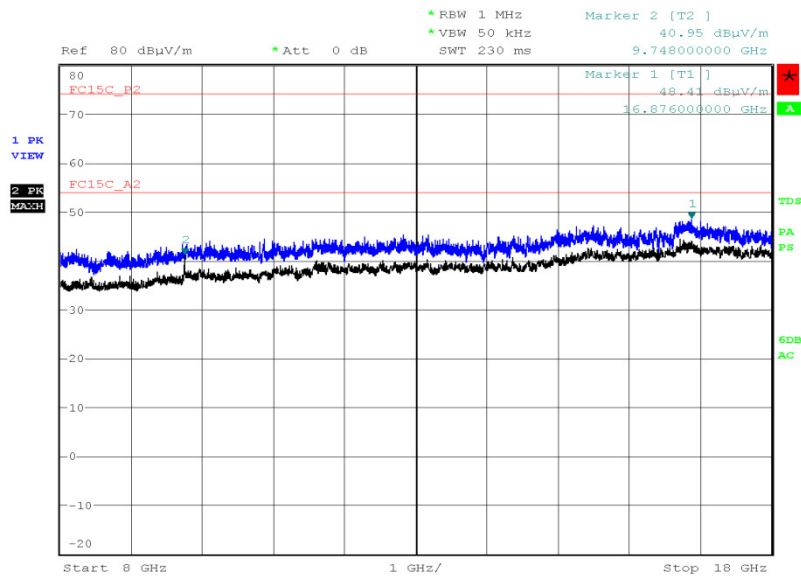


802.11n, 2437 MHz, MCS0, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 19:00:59

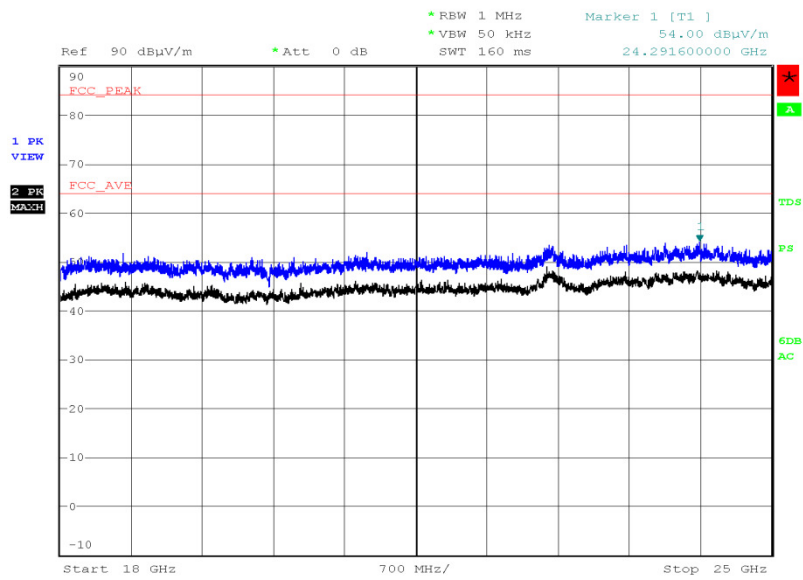
802.11n, 2437 MHz, MCS0, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot



Date: 13.JUN.2016 21:15:41



Product Service

802.11n, 2437 MHz, MCS0, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot

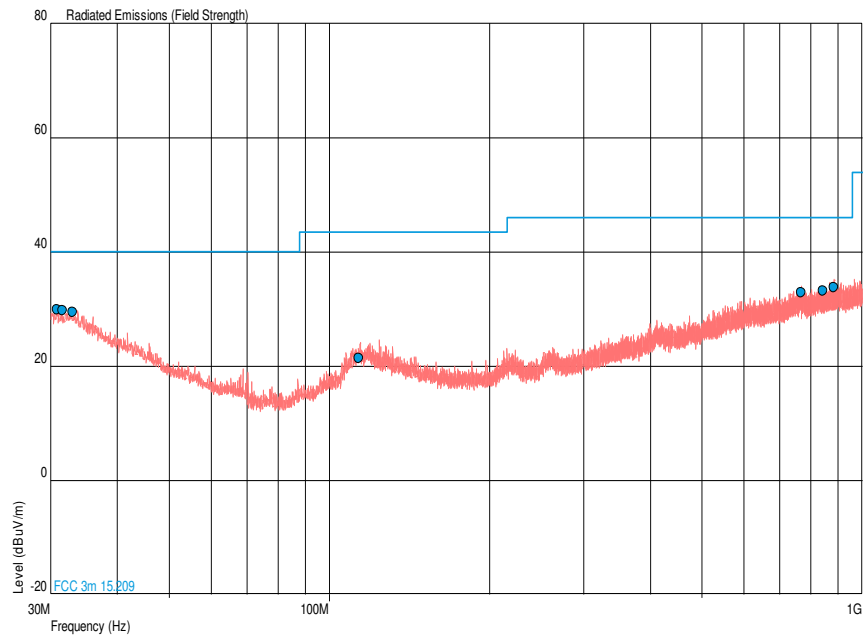
Date: 13.JUN.2016 23:45:43



802.11n, 2462 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (°)	Height (m)	Polarisation
30.873	29.9	-10.1	31.3	-68.7	180	1.00	Vertical
31.649	29.8	-10.2	30.9	-69.1	0	1.00	Horizontal
33.056	29.4	-10.6	29.5	-70.5	180	1.00	Vertical
113.808	21.4	-22.1	11.7	-138.3	0	1.00	Horizontal
768.995	32.9	-13.1	44.2	-155.8	180	1.00	Vertical
844.170	33.1	-12.9	45.2	-154.8	180	1.00	Vertical
883.164	33.8	-12.2	49.0	-151.0	180	1.00	Horizontal

802.11n, 2462 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





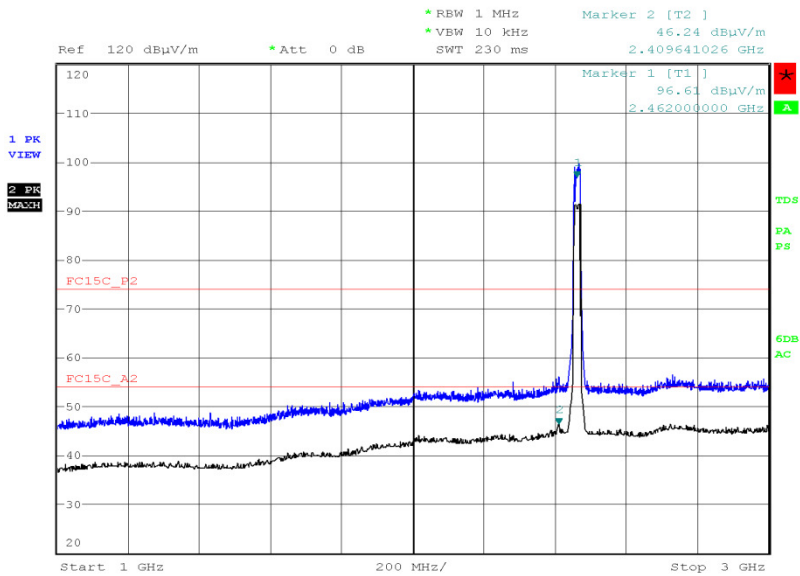
Product Service

802.11n, 2462 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

802.11n, 2462 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 8.JUN.2016 22:55:27