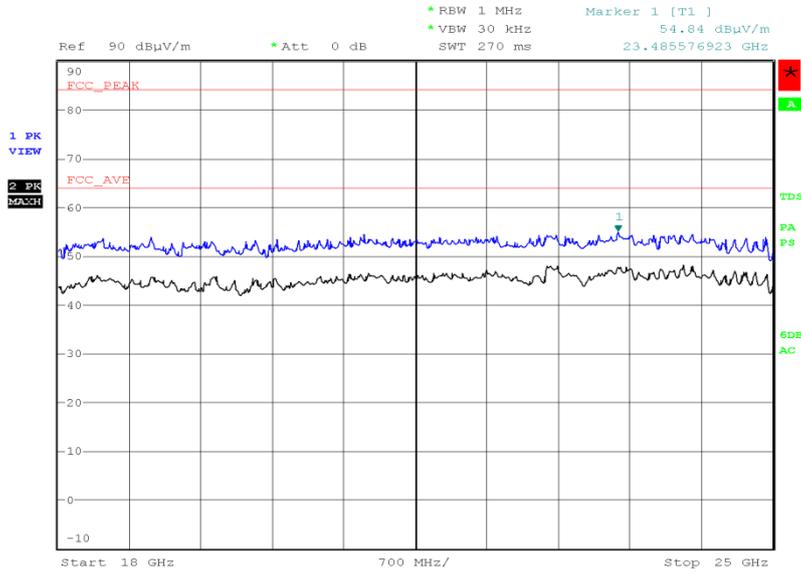




Bluetooth Low Energy, 2441 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



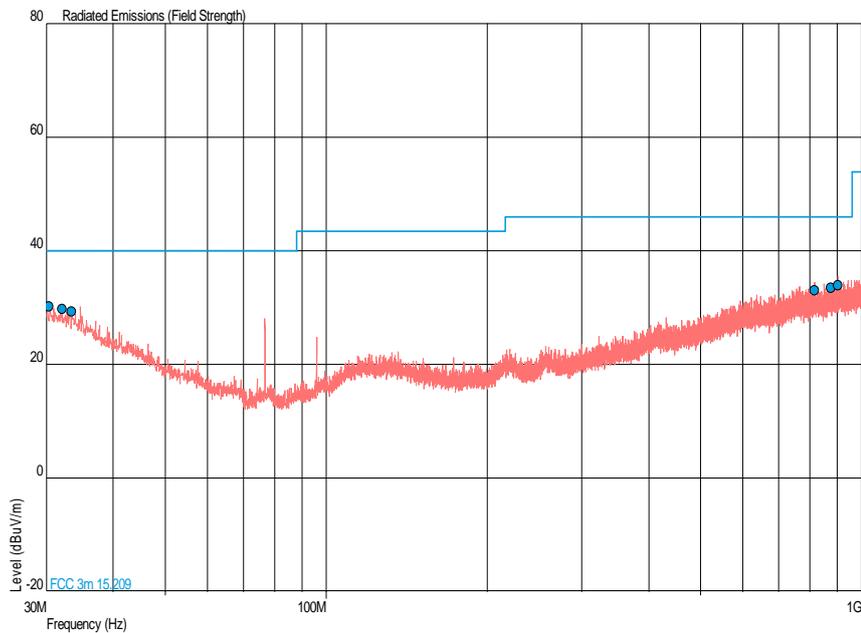
Date: 17.APR.2016 15:26:09



Bluetooth Low Energy, 2480 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dB $\mu$ V/m)	QP Margin (dB $\mu$ V/m)	QP Level ( $\mu$ V/m)	QP Margin ( $\mu$ V/m)	Angle (°)	Height (m)	Polarisation
30.388	30.2	-9.8	32.4	-67.6	0	1.00	Vertical
32.183	29.8	-10.2	30.9	-69.1	180	1.00	Vertical
33.492	29.3	-10.7	29.2	-70.8	180	1.00	Vertical
817.155	33.1	-12.9	45.2	-154.8	180	1.00	Vertical
876.859	33.6	-12.4	47.9	-152.1	180	1.00	Vertical
901.933	34.0	-12.0	50.1	-149.9	0	1.00	Vertical

Bluetooth Low Energy, 2480 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot





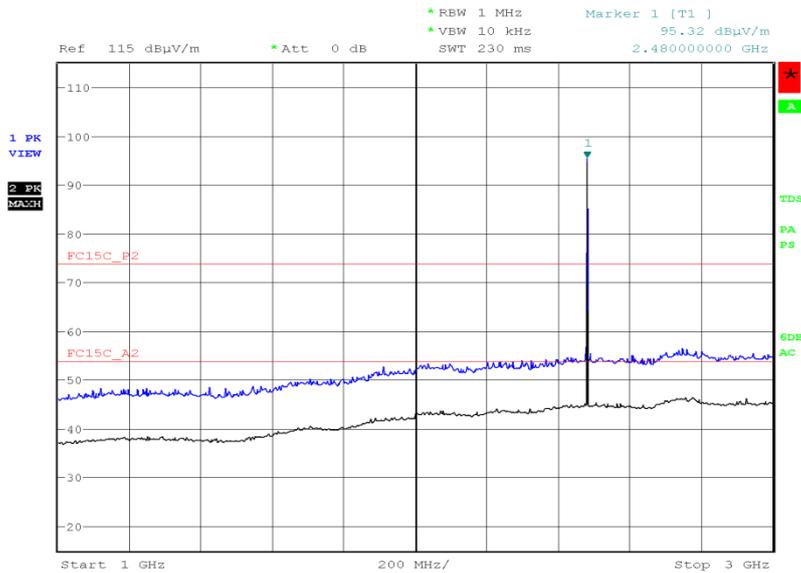
Product Service

Bluetooth Low Energy, 2480 MHz, 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.

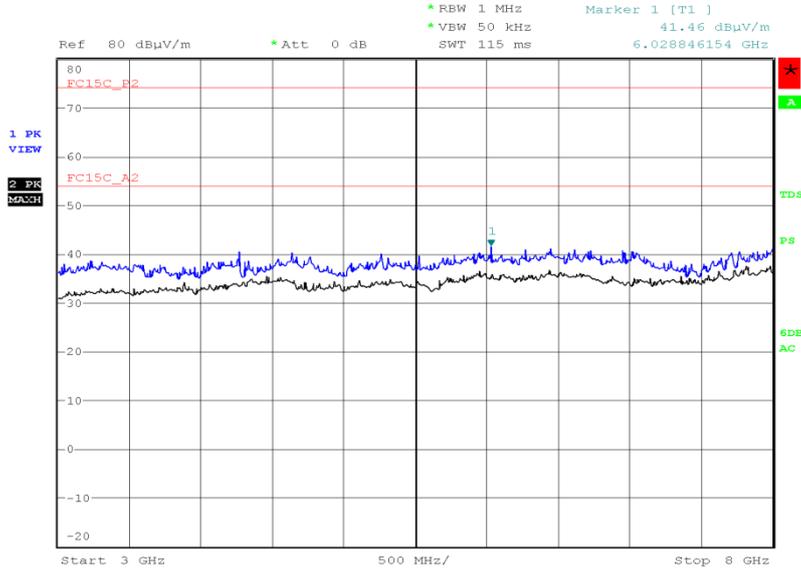
Bluetooth Low Energy, 2480 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 12.APR.2016 20:49:47

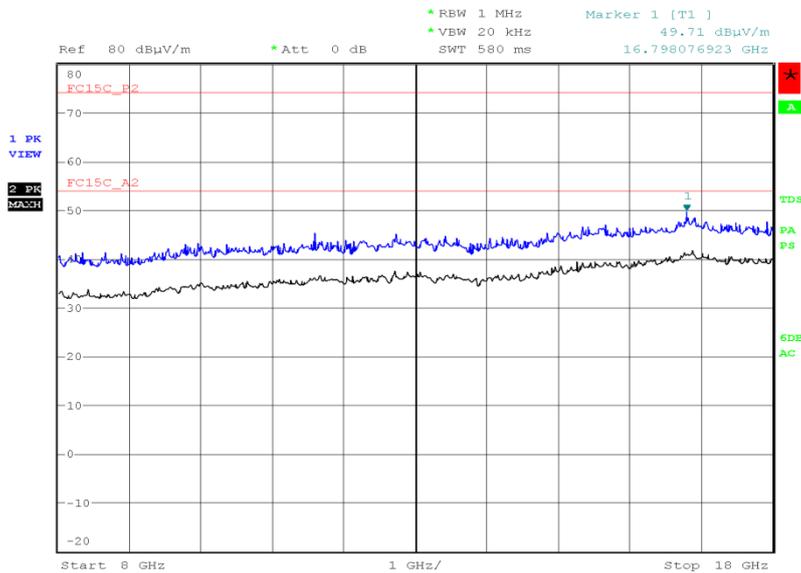


**Bluetooth Low Energy, 2480 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot**



Date: 17.APR.2016 09:10:45

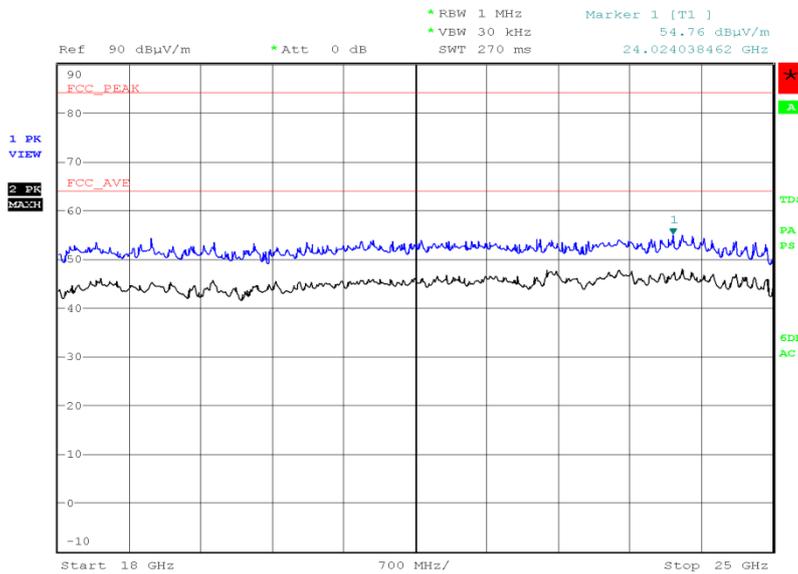
**Bluetooth Low Energy, 2480 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot**



Date: 17.APR.2016 12:55:31



Bluetooth Low Energy, 2480 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



Date: 17.APR.2016 15:27:58

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	74	54

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



Product Service

**2.5 RESTRICTED BAND EDGES****2.5.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.205

**2.5.2 Equipment Under Test and Modification State**

S/N: IMEI 004401115723948 - Modification State 0

**2.5.3 Date of Test**

11 April 2016 &amp; 12 April 2016

**2.5.4 Test Equipment Used**

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

**2.5.5 Test Procedure**

Testing was performed in accordance with ANSI C63.10, Clause 11.13.

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.

**2.5.6 Environmental Conditions**

Ambient Temperature	20.3°C
Relative Humidity	34.0 - 36.0%



Product Service

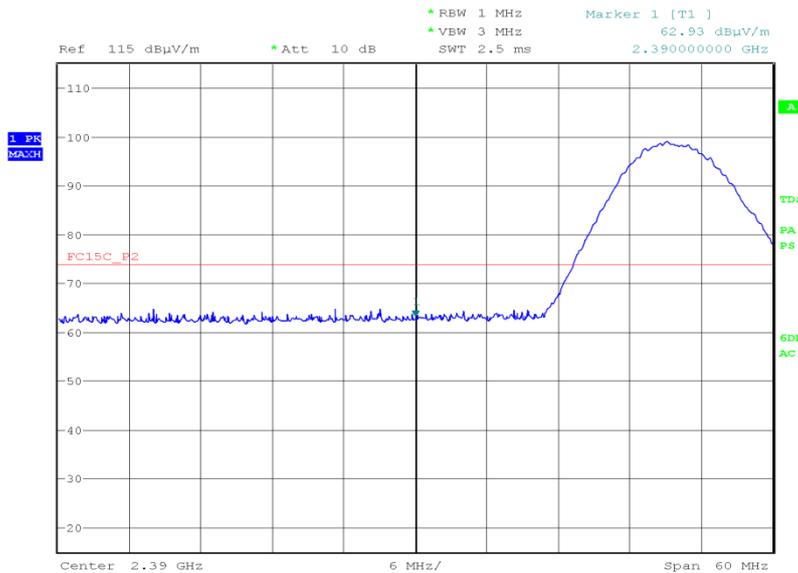
**2.5.7 Test Results**

4.0 V DC Supply

802.11b, 1 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
62.93	46.37	62.57	46.64

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 1 Mbps, Final Peak, Restricted Band Edges Plot

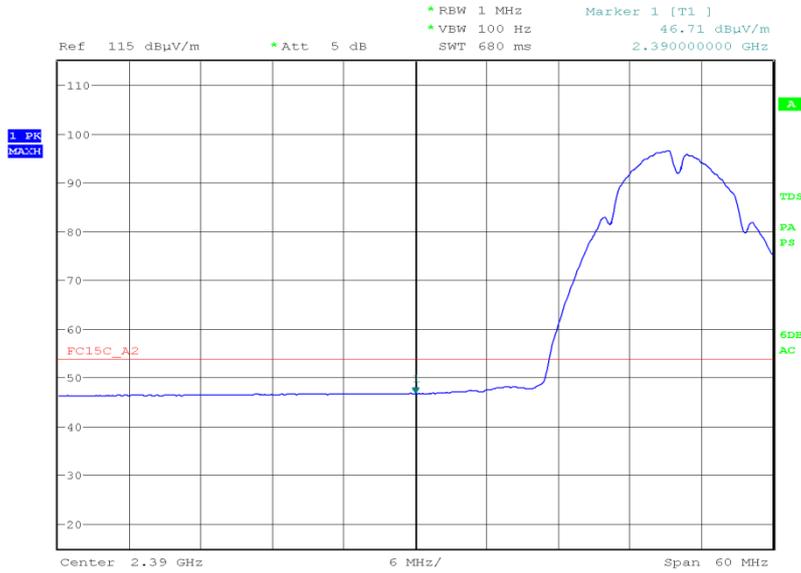


Date: 11.APR.2016 21:03:26



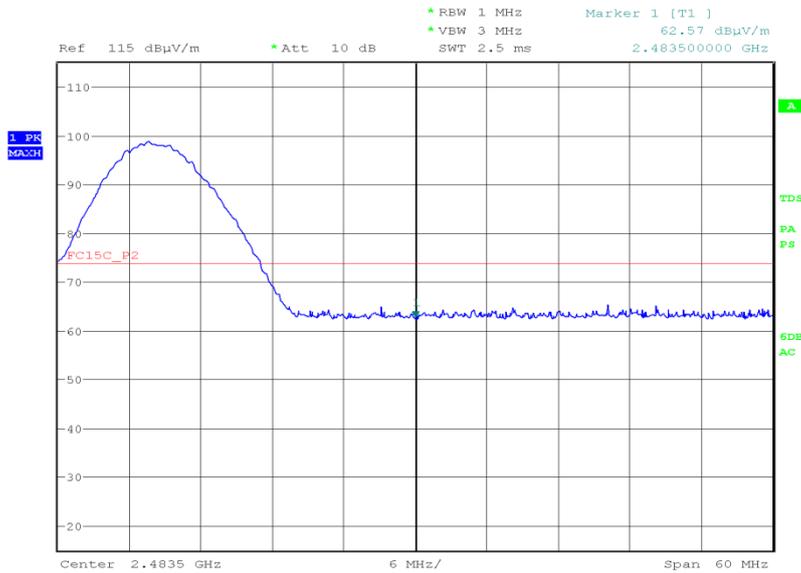
Product Service

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 1 Mbps, Final Average, Restricted Band Edges Plot



Date: 11.APR.2016 21:04:04

802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 1 Mbps, Final Peak, Restricted Band Edges Plot

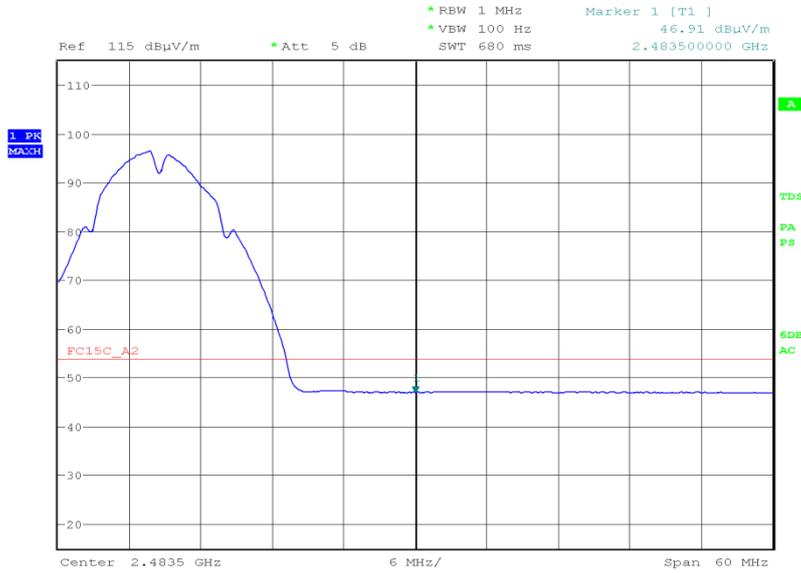


Date: 11.APR.2016 21:06:24



Product Service

802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 1 Mbps, Final Average, Restricted Band Edges Plot



Date: 11.APR.2016 21:05:19

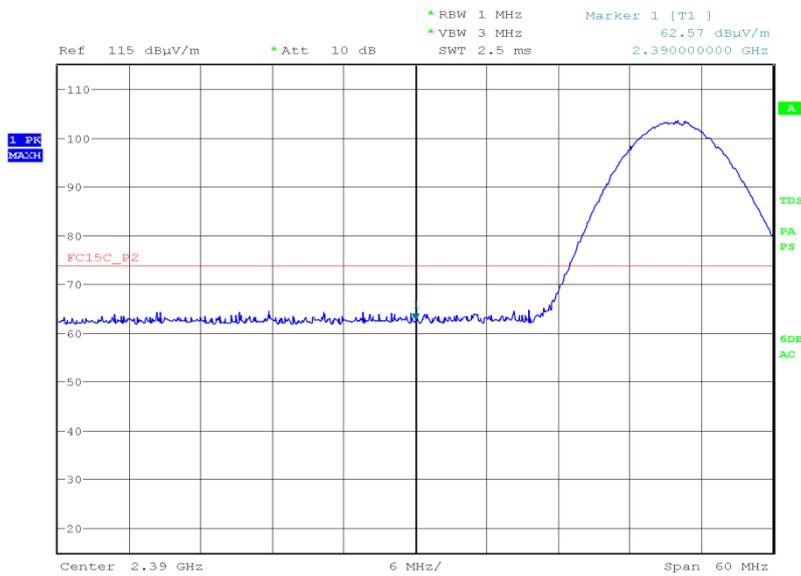


Product Service

802.11b, 11 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
62.57	46.78	63.20	47.02

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 11 Mbps, Final Peak, Restricted Band Edges Plot

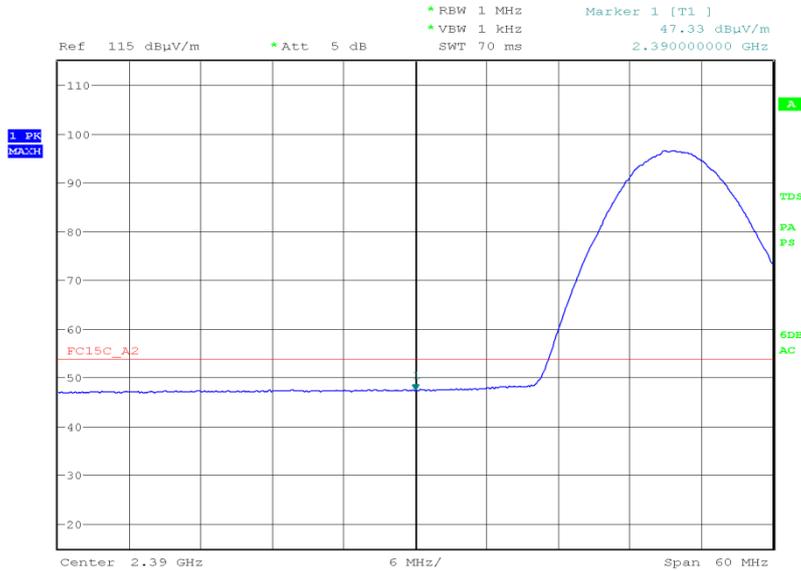


Date: 11.APR.2016 21:16:28



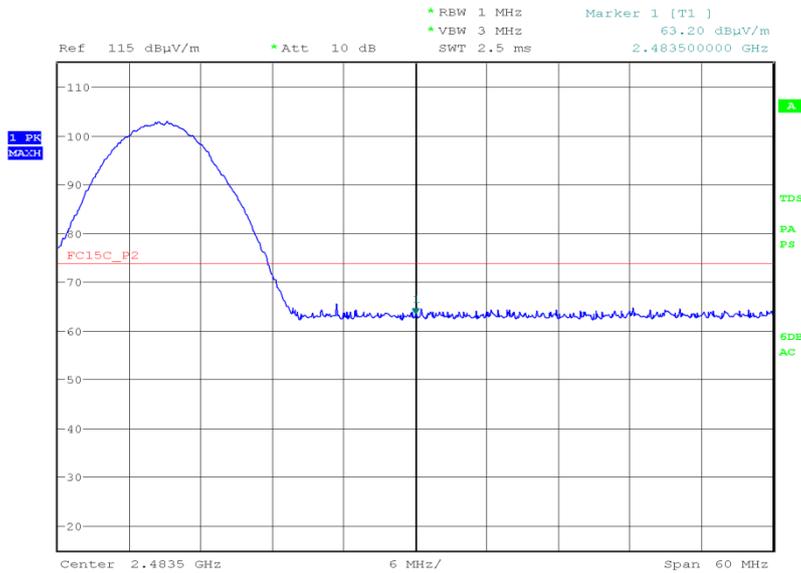
Product Service

**802.11b, 2412 MHz, Measured Frequency 2390 MHz, 11 Mbps, Final Average, Restricted Band Edges Plot**



Date: 11.APR.2016 21:15:46

**802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 11 Mbps, Final Peak, Restricted Band Edges Plot**

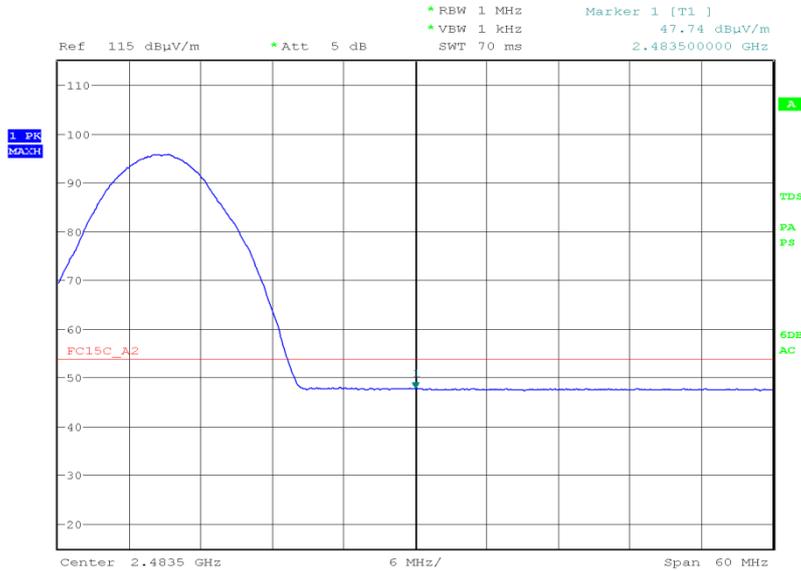


Date: 11.APR.2016 21:12:51



Product Service

**802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 11 Mbps, Final Average, Restricted Band Edges Plot**



Date: 11.APR.2016 21:13:40

**Remark**

The test was performed on 1 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 11 Mbps because this was deemed the worst case data rate for Bandwidth.

Final average results shown in the tables above were recorded using a CISPR average detector as described in ANSI C63.10 clause 4.1.2. In order to determine the maximum emissions with the restricted band near the band edge, the method described in ANSI C63.10 clause 6.10.5.2 has been used and these plots are included in the report.

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54



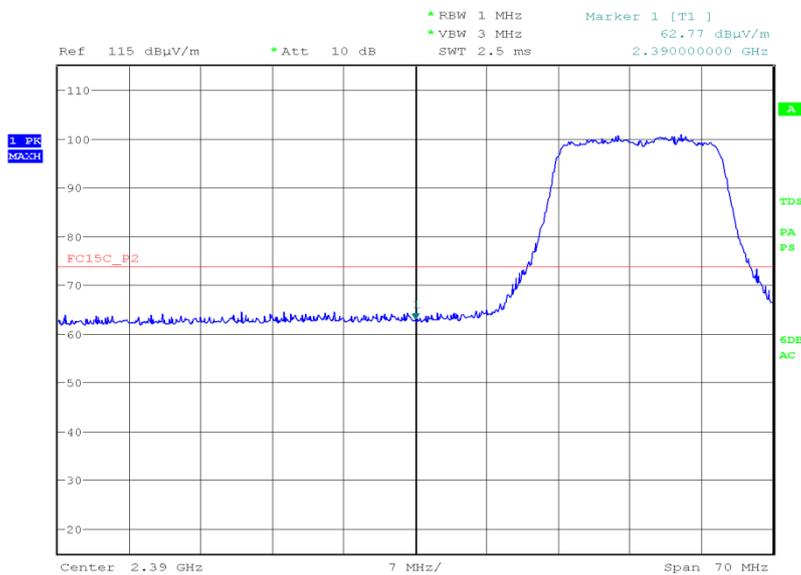
Product Service

4.0 V DC Supply

802.11g, 6 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
62.77	47.24	62.62	46.80

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 6 Mbps, Final Peak, Restricted Band Edges Plot

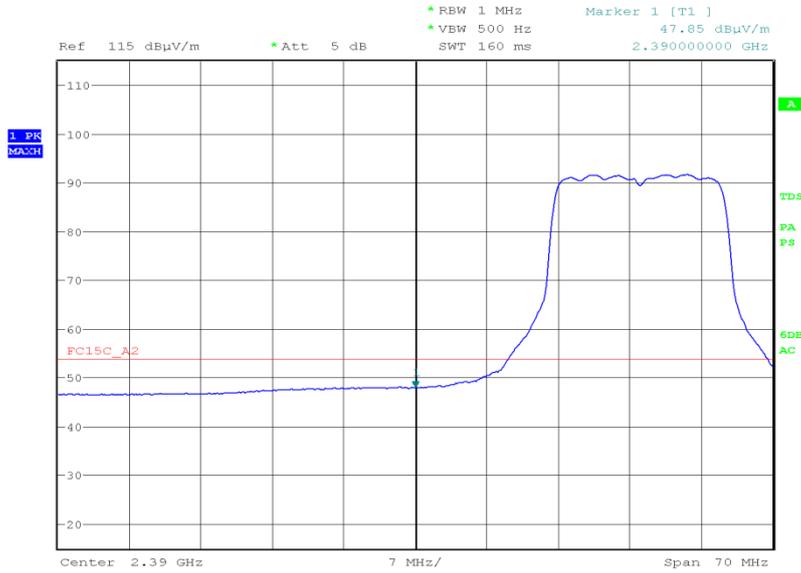


Date: 11.APR.2016 21:55:54



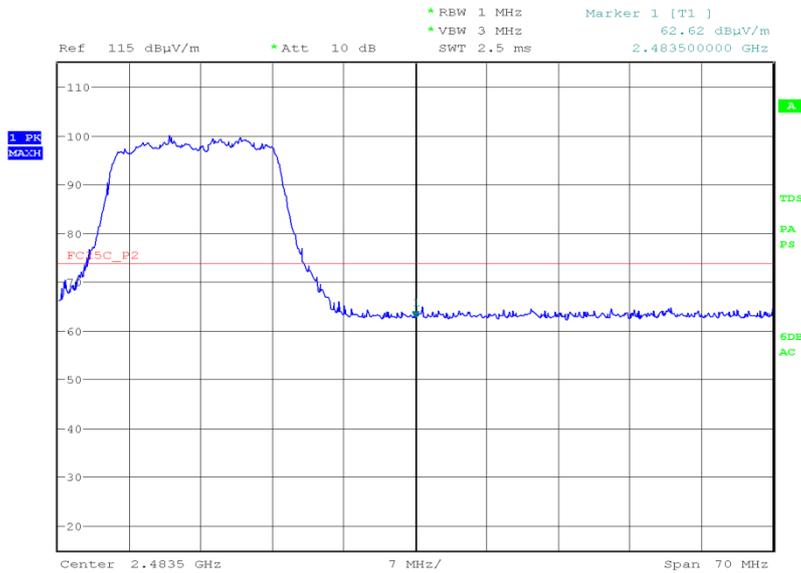
Product Service

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 6 Mbps, Final Average, Restricted Band Edges Plot



Date: 11.APR.2016 22:00:18

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 6 Mbps, Final Peak, Restricted Band Edges Plot

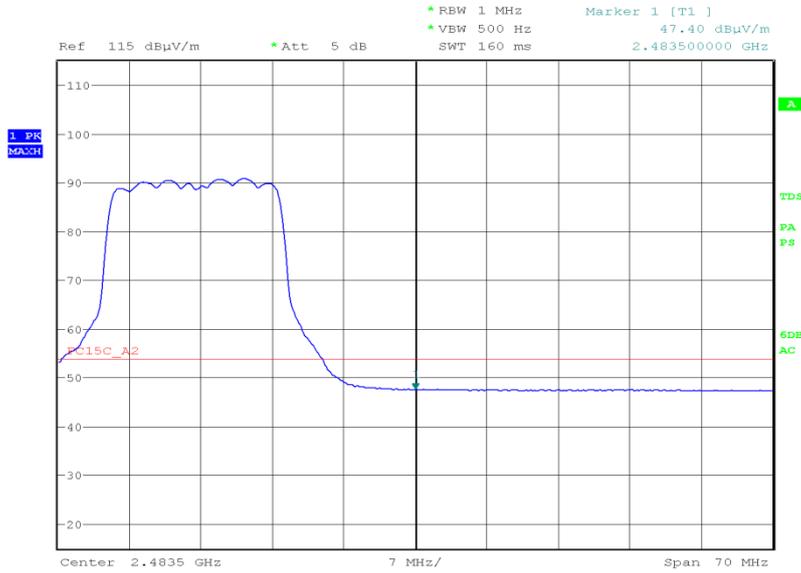


Date: 11.APR.2016 22:13:34



Product Service

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 6 Mbps, Final Average, Restricted Band Edges Plot



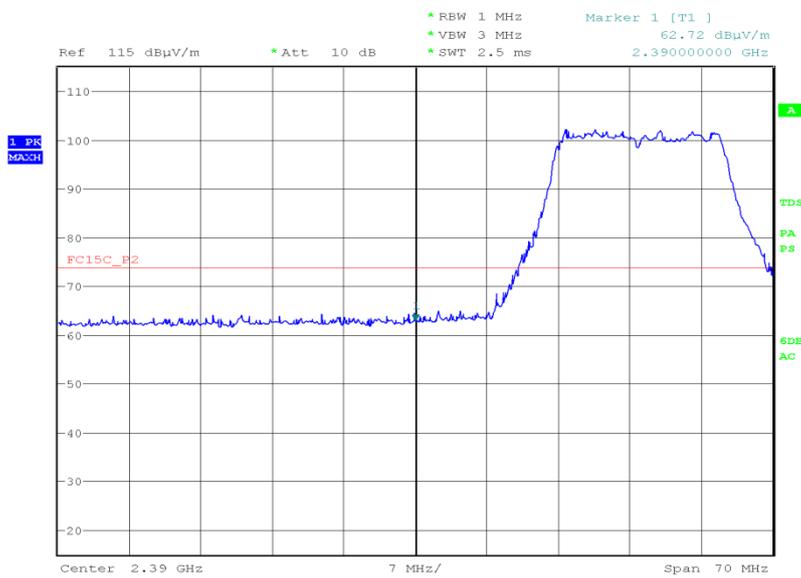
Date: 11.APR.2016 22:14:28



802.11g, 48 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
62.72	46.73	63.47	47.00

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 48 Mbps, Final Peak, Restricted Band Edges Plot

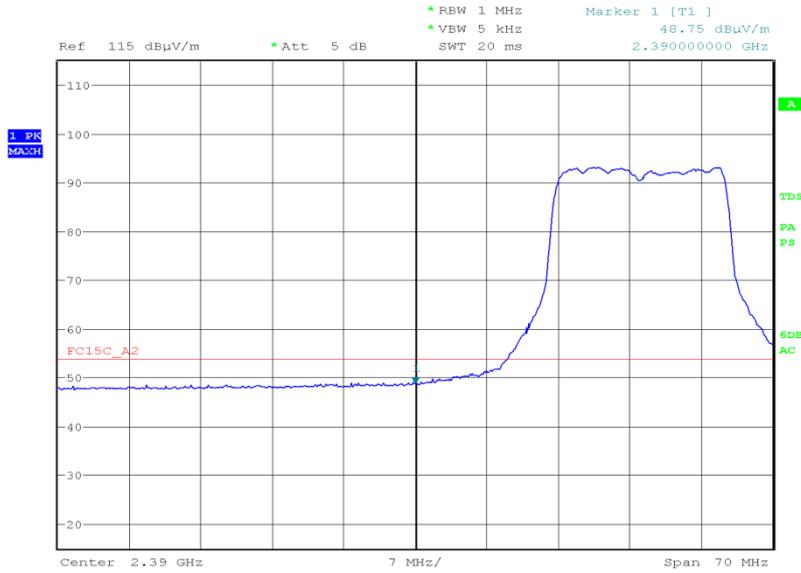


Date: 11.APR.2016 22:37:54



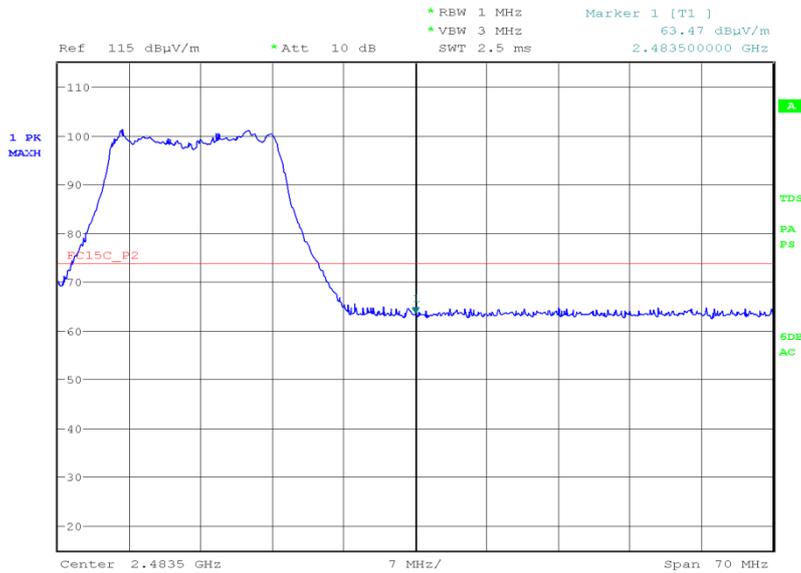
Product Service

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 48 Mbps, Final Average, Restricted Band Edges Plot



Date: 11.APR.2016 22:39:48

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 48 Mbps, Final Peak, Restricted Band Edges Plot

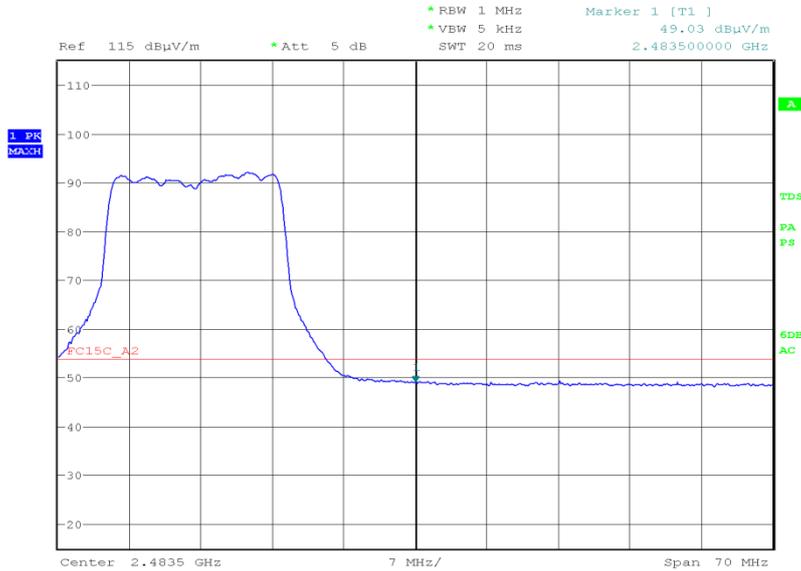


Date: 11.APR.2016 22:47:34



Product Service

**802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 48 Mbps, Final Average, Restricted Band Edges Plot**



Date: 11.APR.2016 22:48:13

**Remark**

The test was performed on 6 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 48 Mbps because this was deemed the worst case data rate for Bandwidth.

Final average results shown in the tables above were recorded using a CISPR average detector as described in ANSI C63.10 clause 4.1.2. In order to determine the maximum emissions with the restricted band near the band edge, the method described in ANSI C63.10 clause 6.10.5.2 has been used and these plots are included in the report.

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54



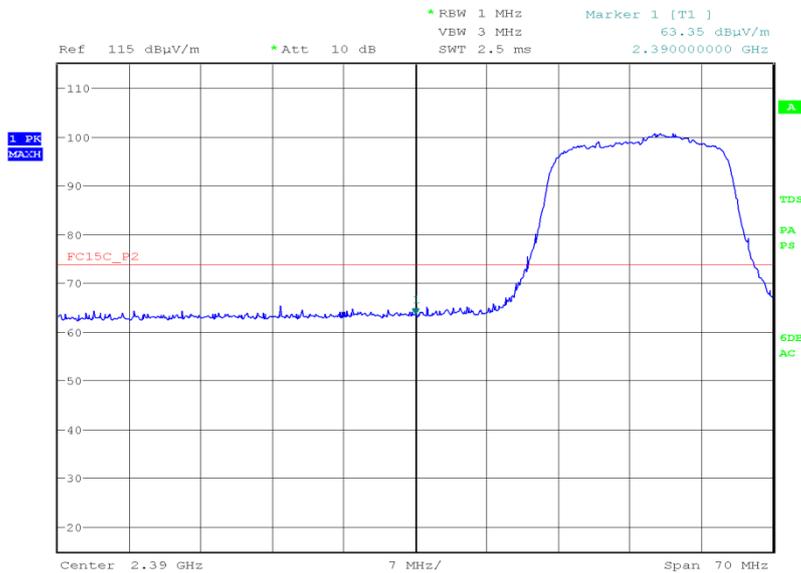
Product Service

4.0 V DC Supply

802.11n, 6.5 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
63.35	47.39	62.41	46.57

802.11n, 2412 MHz, Measured Frequency 2390 MHz, 6.5 Mbps, Final Peak, Restricted Band Edges Plot

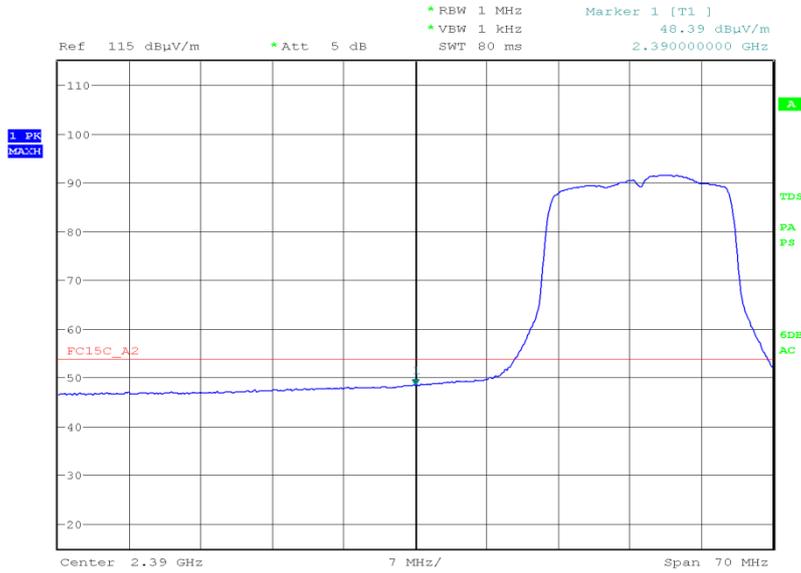


Date: 12.APR.2016 18:21:56



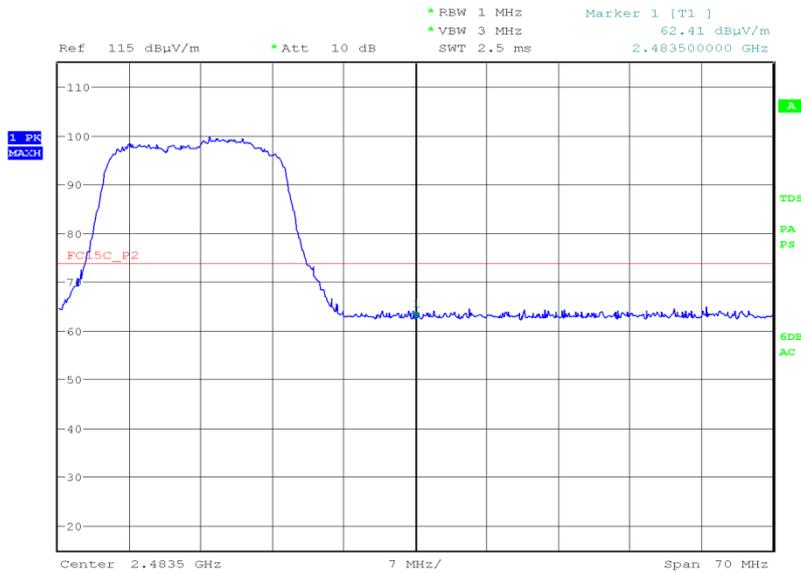
Product Service

802.11n, 2412 MHz, Measured Frequency 2390 MHz, 6.5 Mbps, Final Average, Restricted Band Edges Plot



Date: 12.APR.2016 18:22:50

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, 6.5 Mbps, Final Peak, Restricted Band Edges Plot

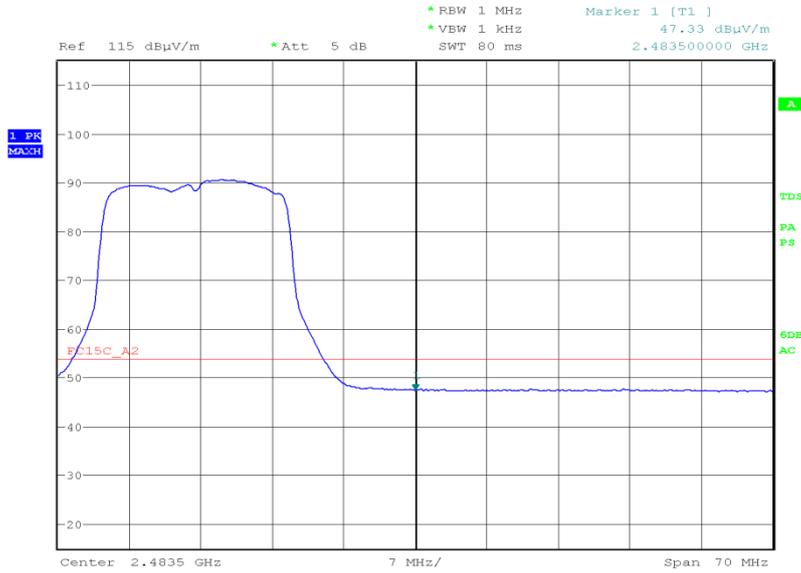


Date: 12.APR.2016 18:42:15



Product Service

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, 6.5 Mbps, Final Average, Restricted Band Edges Plot



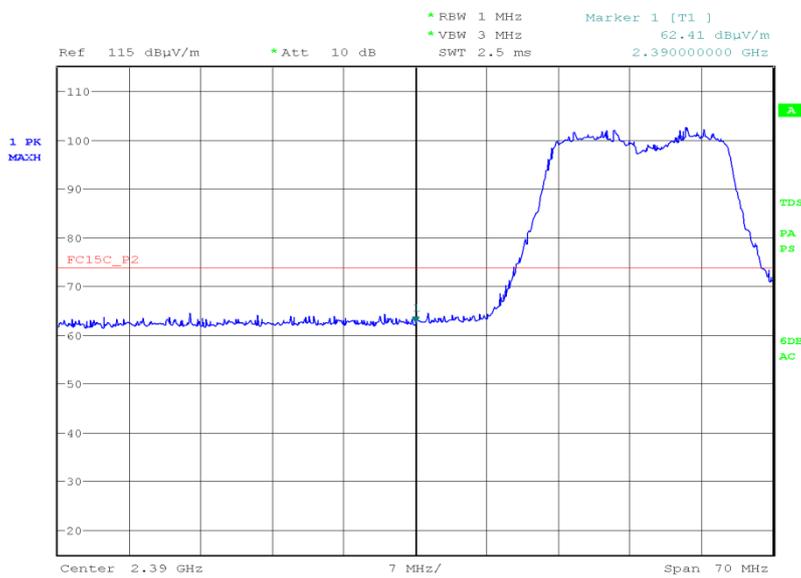
Date: 12.APR.2016 18:43:02



802.11n, 65 Mbps, Restricted Band Edges Results

2412 MHz		2462 MHz	
Measured Frequency 2390.00 MHz		Measured Frequency 2483.50 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
62.41	46.67	63.14	46.71

802.11n, 2412 MHz, Measured Frequency 2390 MHz, 65 Mbps, Final Peak, Restricted Band Edges Plot

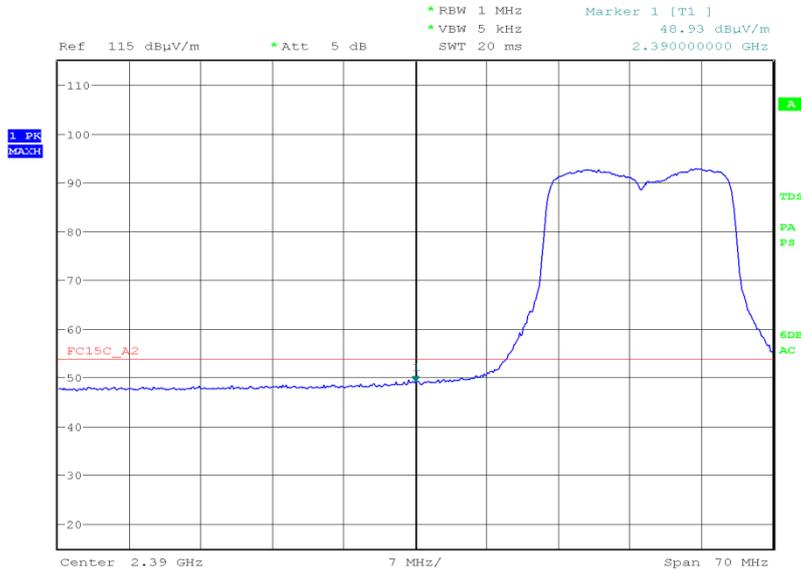


Date: 12.APR.2016 19:12:12



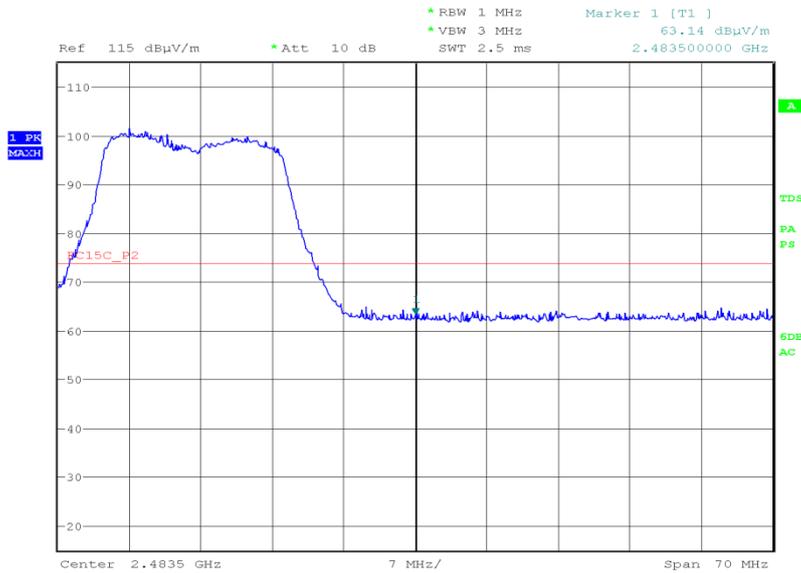
Product Service

802.11n, 2412 MHz, Measured Frequency 2390 MHz, 65 Mbps, Final Average, Restricted Band Edges Plot



Date: 12.APR.2016 19:13:03

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, 65 Mbps, Final Peak, Restricted Band Edges Plot

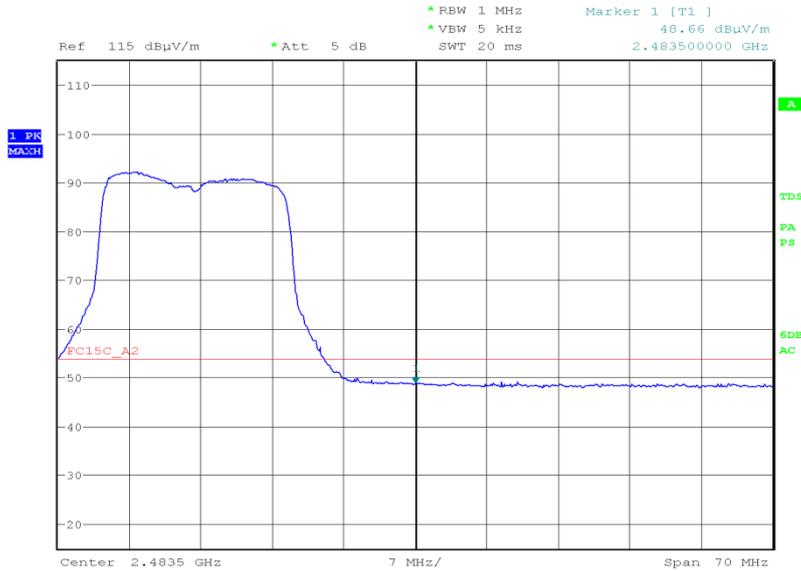


Date: 12.APR.2016 19:23:23



Product Service

**802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, 65 Mbps, Final Average, Restricted Band Edges Plot**



Date: 12.APR.2016 19:23:59

**Remark**

The test was performed on 6.5 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 65 Mbps because this was deemed the worst case data rate for Bandwidth.

Final average results shown in the tables above were recorded using a CISPR average detector as described in ANSI C63.10 clause 4.1.2. In order to determine the maximum emissions with the restricted band near the band edge, the method described in ANSI C63.10 clause 6.10.5.2 has been used and these plots are included in the report.

**FCC 47 CFR Part 15, Limit Clause 15.205**

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54



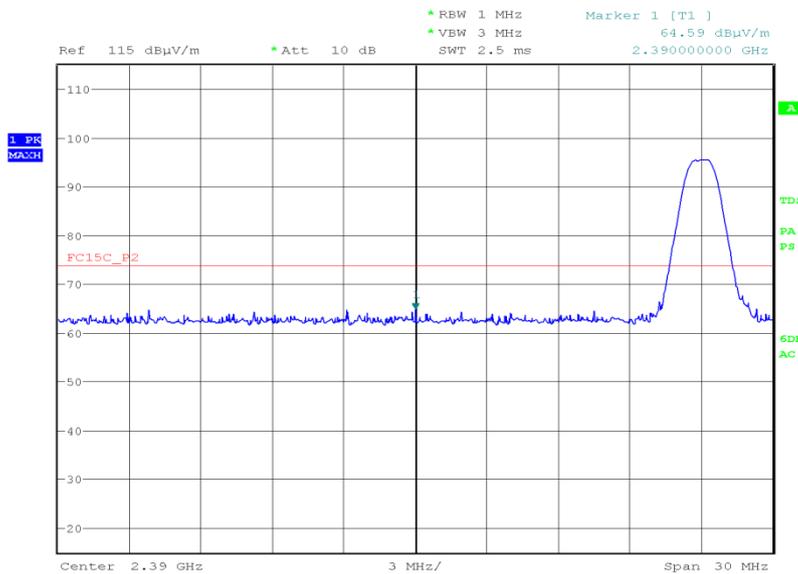
Product Service

4.0 V DC Supply

Bluetooth Low Energy, GFSK, Restricted Band Edges Results

2402 MHz		2480 MHz	
Measured Frequency 2390 MHz		Measured Frequency 2483.5 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
64.59	46.14	62.92	46.30

Bluetooth Low Energy, 2402 MHz, Measured Frequency 2390 MHz, GFSK, Final Peak, Restricted Band Edges Plot

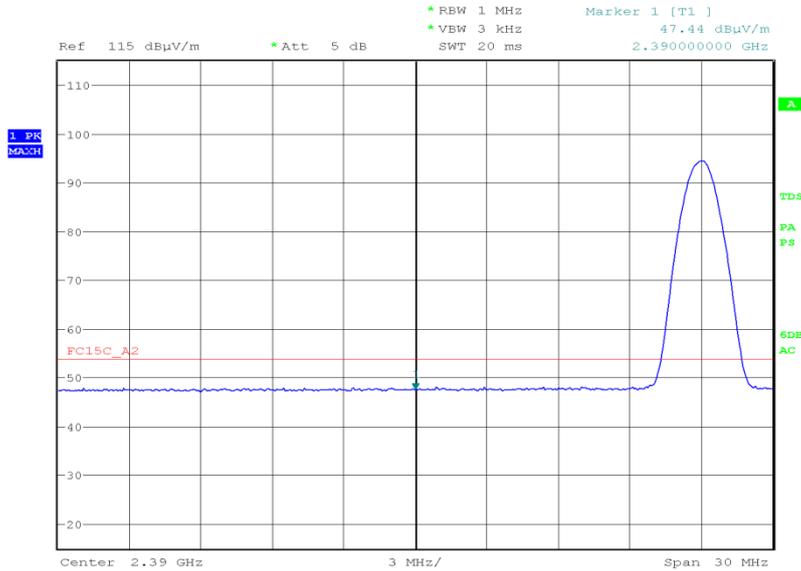


Date: 12.APR.2016 20:36:17



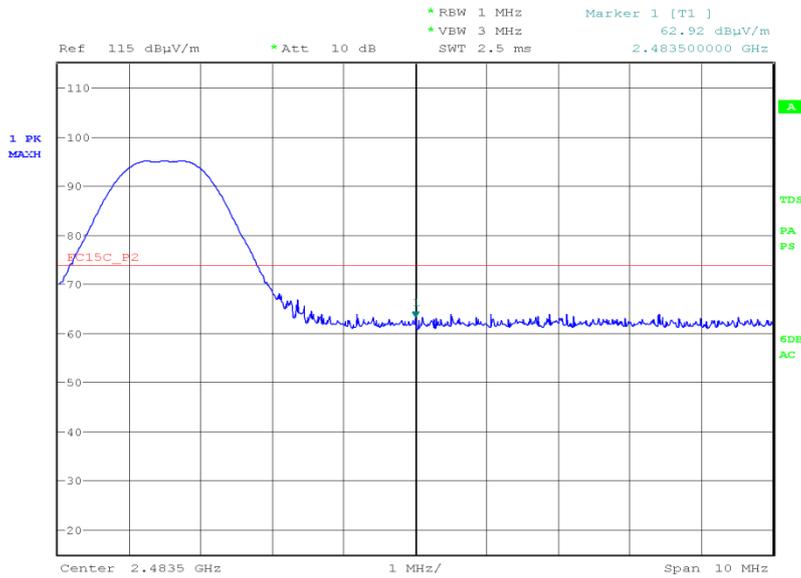
Product Service

**Bluetooth Low Energy, 2402 MHz, Measured Frequency 2390 MHz, GFSK, Final Average, Restricted Band Edges Plot**



Date: 12.APR.2016 20:36:55

**Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.5 MHz, GFSK, Final Peak, Restricted Band Edges Plot**

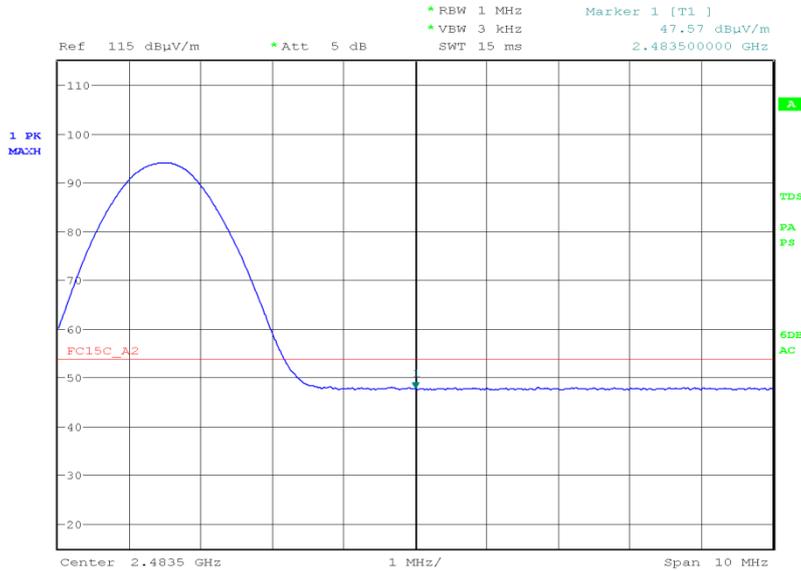


Date: 12.APR.2016 20:42:54



Product Service

Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.5 MHz, GFSK, Final Average, Restricted Band Edges Plot



Date: 12.APR.2016 20:41:44

Remarks

Final average results shown in the tables above were recorded using a CISPR average detector as described in ANSI C63.10 clause 4.1.2. In order to determine the maximum emissions with the restricted band near the band edge, the method described in ANSI C63.10 clause 6.10.5.2 has been used and these plots are included in the report.

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBuV/m)	Average (dBuV/m)
Restricted Bands of Operation	74	54



Product Service

## **2.6 AUTHORIZED BAND EDGES**

### **2.6.1 Specification Reference**

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

### **2.6.2 Equipment Under Test and Modification State**

S/N: IMEI 004401115723948 - Modification State 0

### **2.6.3 Date of Test**

11 April 2016 & 12 April 2016

### **2.6.4 Test Equipment Used**

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

### **2.6.5 Test Procedure**

Testing was performed in accordance with ANSI C63.10, Clause 11.13.

### **2.6.6 Environmental Conditions**

Ambient Temperature	20.3°C
Relative Humidity	34.0 - 36.0%



Product Service

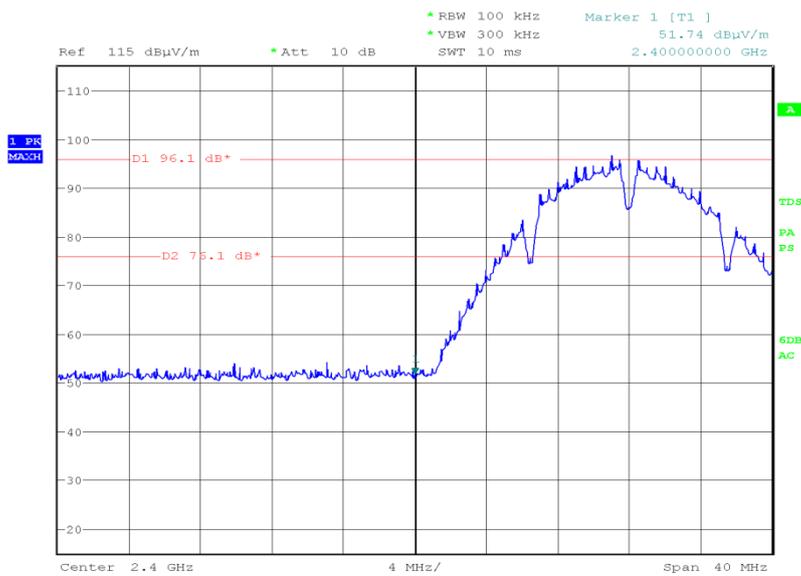
**2.6.7 Test Results**

4.0 V DC Supply

802.11b, 1 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
51.74	51.96

802.11b, 2412 MHz, Measured Frequency 2400.00 MHz, 1 Mbps, Final Peak, Authorised Band Edges Plot

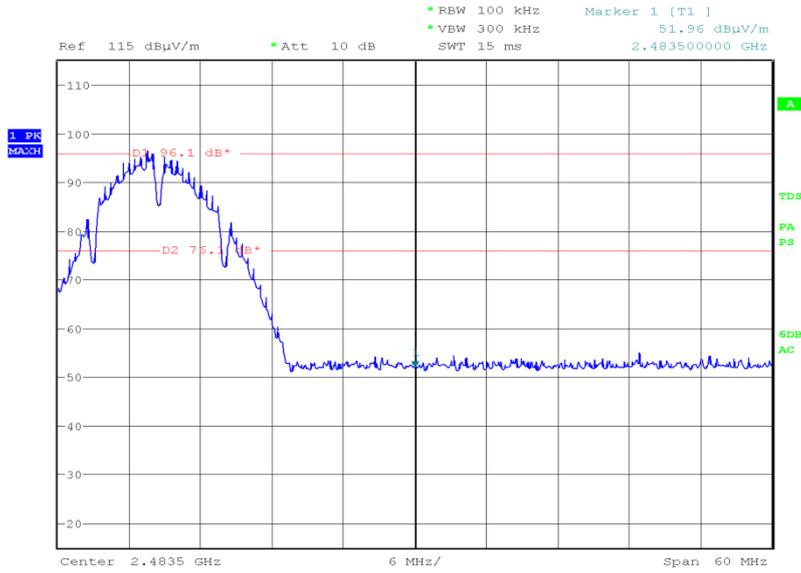


Date: 11.APR.2016 21:01:12



Product Service

802.11b, 2462 MHz, Measured Frequency 2483.50 MHz, 1 Mbps, Final Peak, Authorised Band Edges Plot



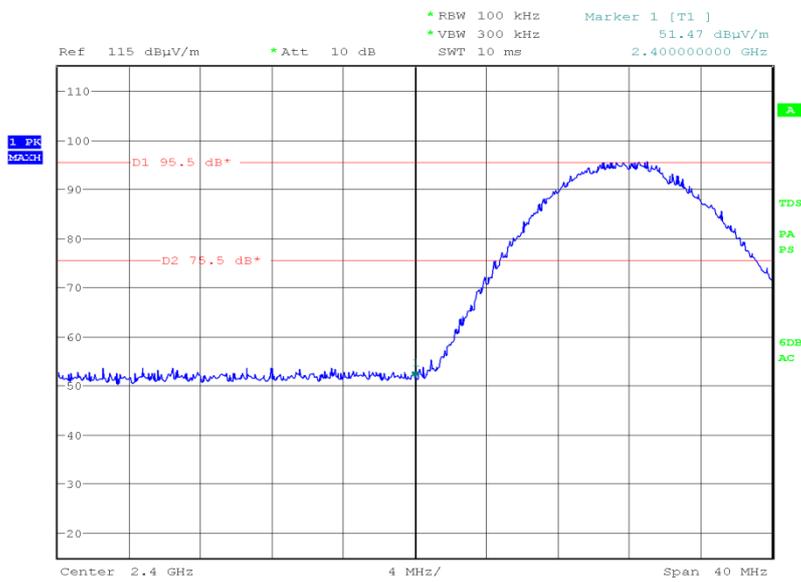
Date: 11.APR.2016 21:07:23



802.11b, 11 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
51.47	52.49

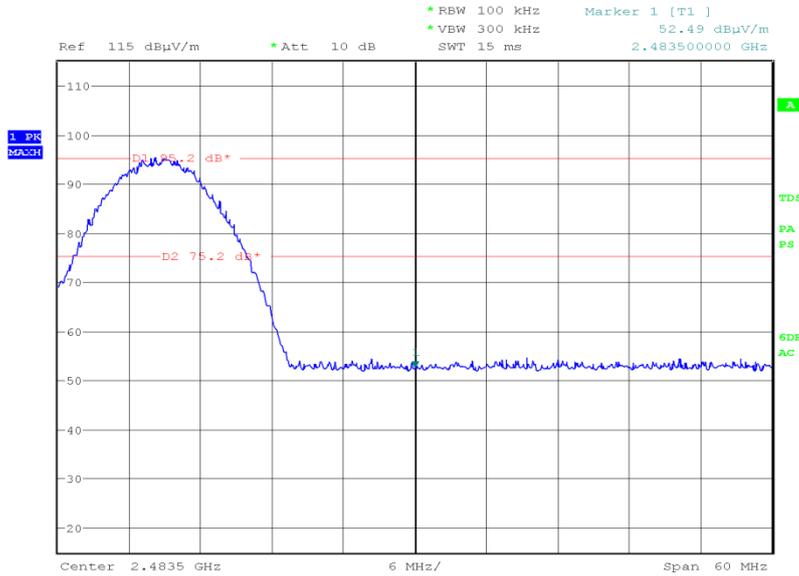
802.11b, 2412 MHz, Measured Frequency 2400.00 MHz, 11 Mbps, Final Peak, Authorised Band Edges Plot



Date: 11.APR.2016 21:17:44



802.11b, 2462 MHz, Measured Frequency 2483.50 MHz, 11 Mbps, Final Peak, Authorised Band Edges Plot



Date: 11.APR.2016 21:11:47

Remark

The test was performed on 1 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 11 Mbps because this was deemed the worst case data rate for Bandwidth.

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

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.



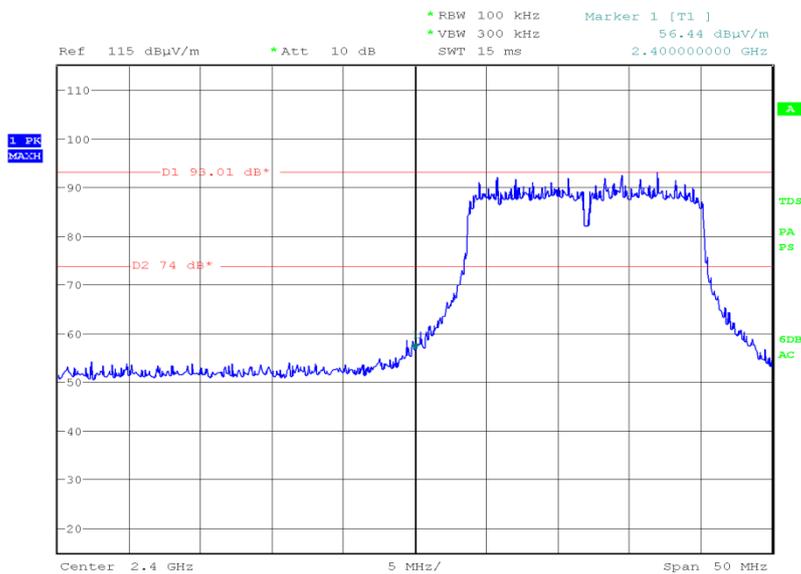
Product Service

4.0 V DC Supply

802.11g, 6 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
56.44	53.26

802.11g, 2412 MHz, Measured Frequency 2400.00 MHz, 6 Mbps, Final Peak, Authorised Band Edges Plot

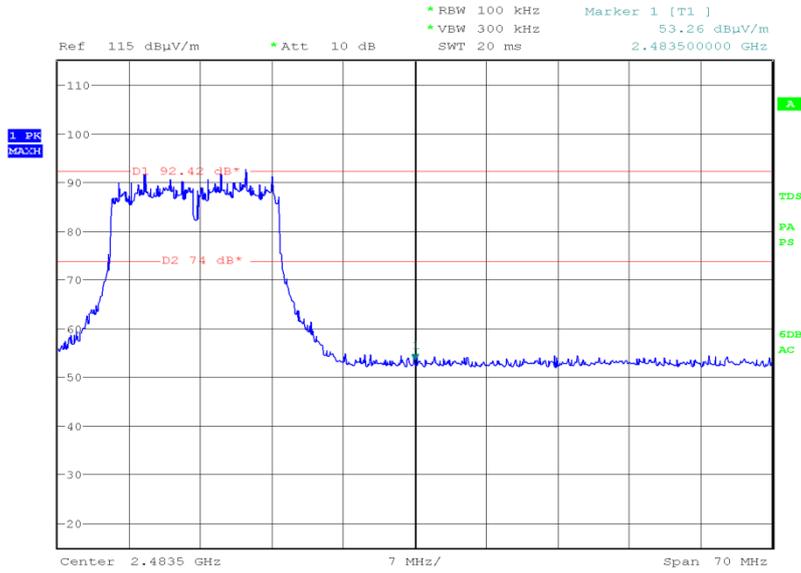


Date: 11.APR.2016 21:54:54



Product Service

802.11g, 2462 MHz, Measured Frequency 2483.50 MHz, 6 Mbps, Final Peak, Authorised Band Edges Plot



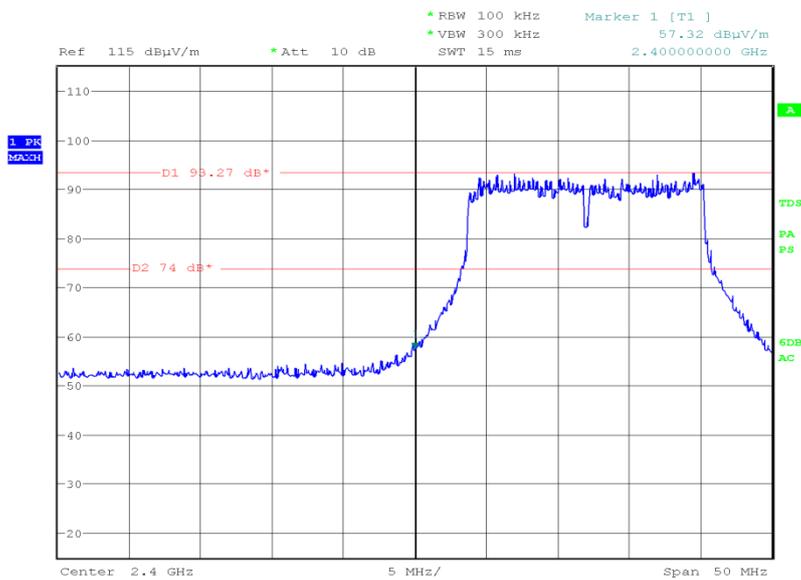
Date: 11.APR.2016 22:12:39



802.11g, 48 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
57.32	53.63

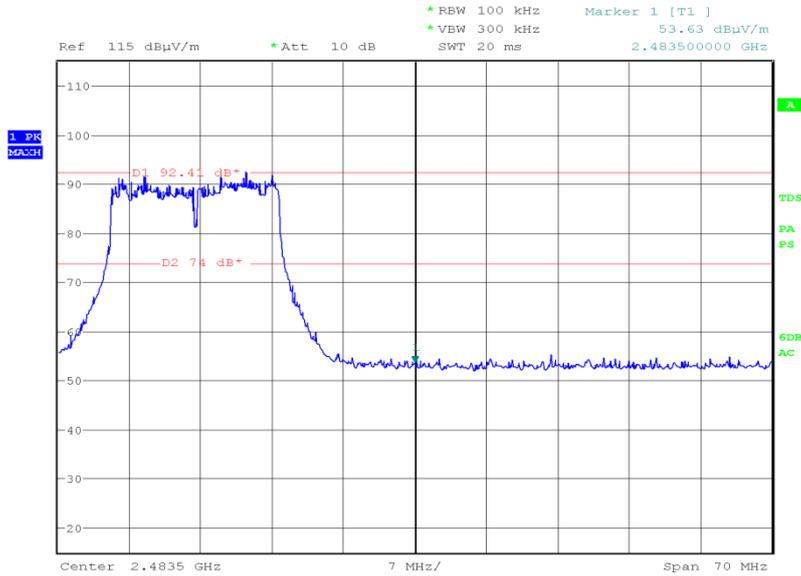
802.11g, 2412 MHz, Measured Frequency 2400.00 MHz, 48 Mbps, Final Peak, Authorised Band Edges Plot



Date: 11.APR.2016 22:37:02



802.11g, 2462 MHz, Measured Frequency 2483.50 MHz, 48 Mbps, Final Peak, Authorised Band Edges Plot



Date: 11.APR.2016 22:50:08

Remark

The test was performed on 6 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 48 Mbps because this was deemed the worst case data rate for Bandwidth.

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

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.



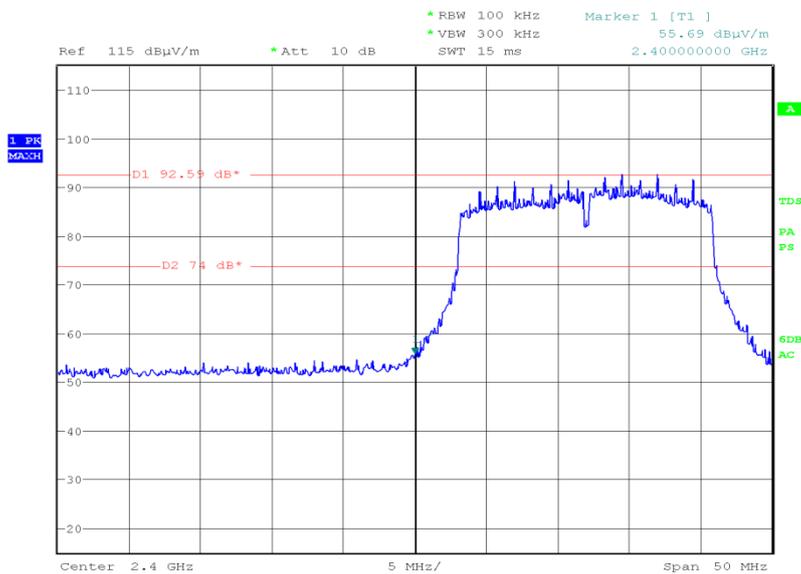
Product Service

4.0 V DC Supply

802.11n, 6.5 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
55.69	52.40

802.11n, 2412 MHz, Measured Frequency 2400.00 MHz, 6.5 Mbps, Final Peak, Authorised Band Edges Plot

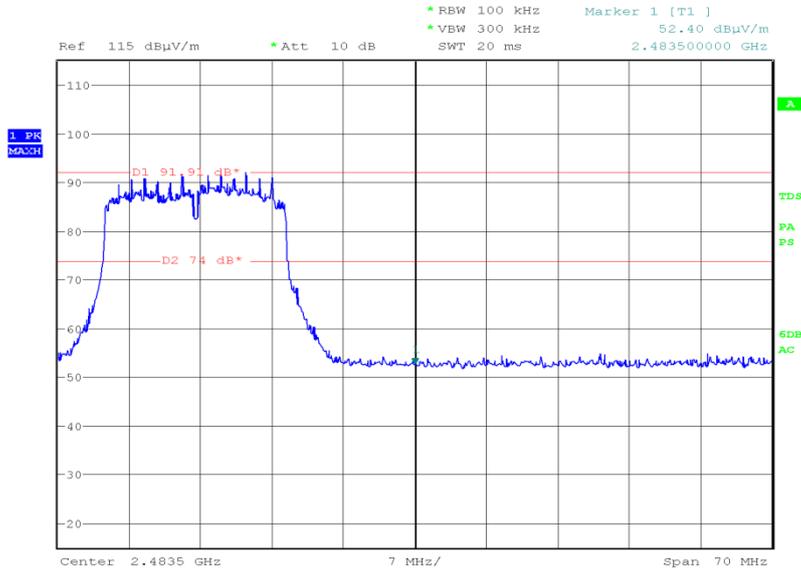


Date: 12.APR.2016 18:27:14



Product Service

802.11n, 2462 MHz, Measured Frequency 2483.50 MHz, 6.5 Mbps, Final Peak, Authorised Band Edges Plot



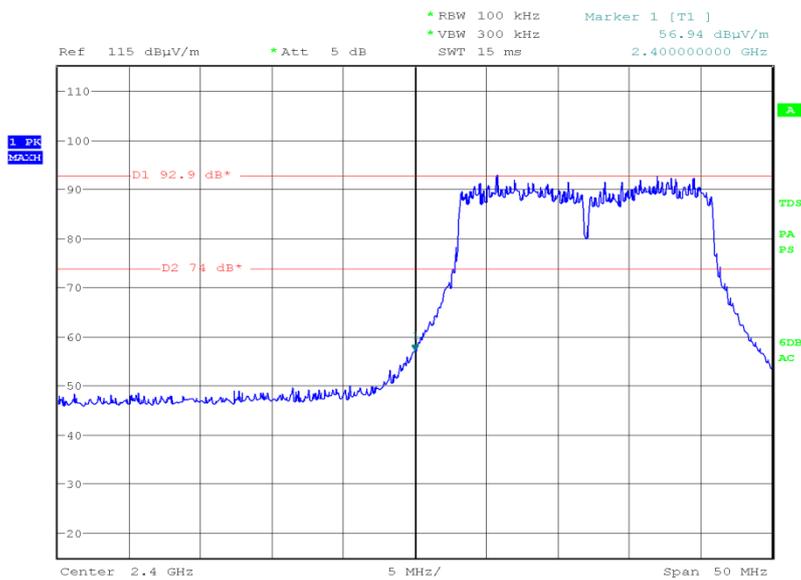
Date: 12.APR.2016 18:40:04



802.11n, 65 Mbps, Authorised Band Edges Results

2412 MHz	2462 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
56.94	52.69

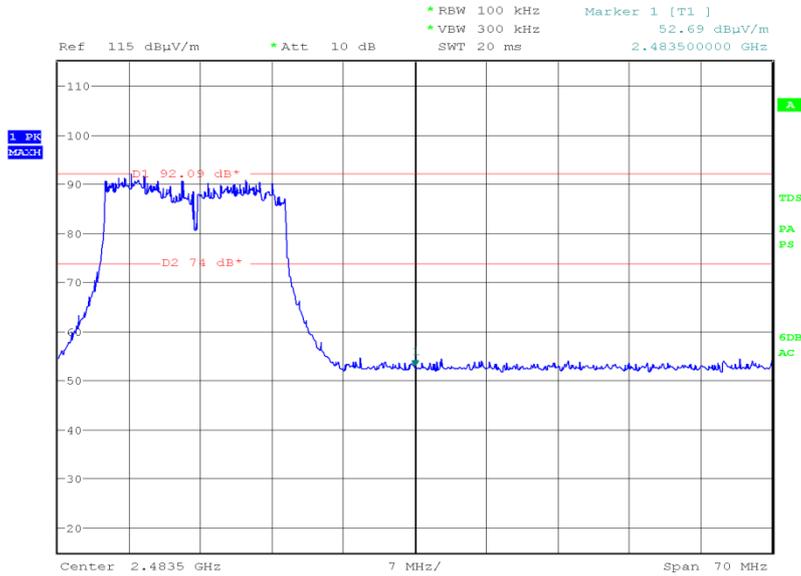
802.11n, 2412 MHz, Measured Frequency 2400.00 MHz, 65 Mbps, Final Peak, Authorised Band Edges Plot



Date: 12.APR.2016 19:16:11



802.11n, 2462 MHz, Measured Frequency 2483.50 MHz, 65 Mbps, Final Peak, Authorised Band Edges Plot



Date: 12.APR.2016 19:22:46

Remark

The test was performed on 6.5 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 65 Mbps because this was deemed the worst case data rate for Bandwidth.

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

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.



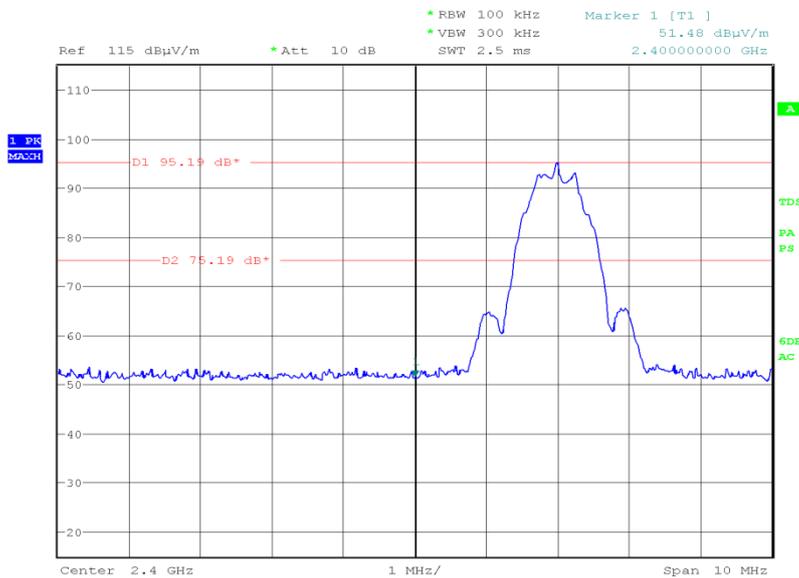
Product Service

4.0 V DC Supply

Bluetooth Low Energy, GFSK, Authorised Band Edges Results

2402 MHz	2480 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
51.48	51.16

Bluetooth Low Energy, 2402 MHz, Measured Frequency 2400.00 MHz, GFSK, Final Peak, Authorised Band Edges Plot

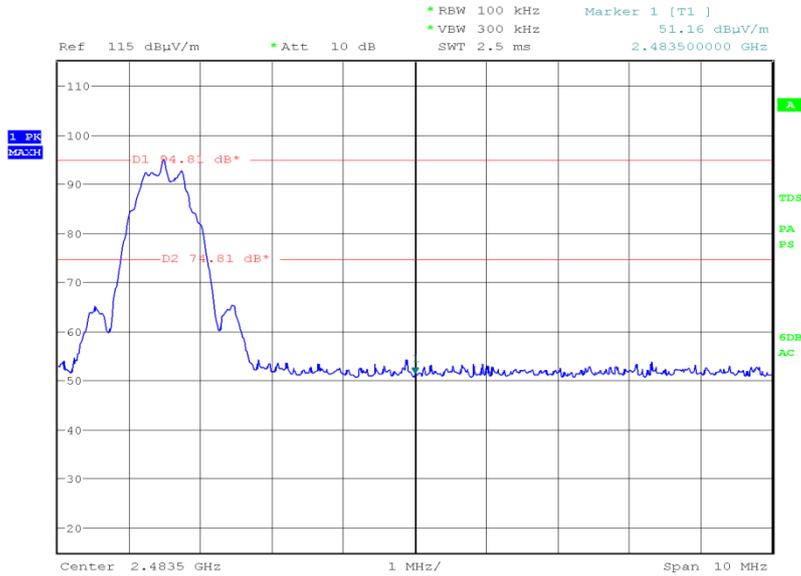


Date: 12.APR.2016 20:34:46



Product Service

Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.50 MHz, GFSK, Final Peak, Authorised Band Edges Plot



Date: 12.APR.2016 20:44:36

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

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.



Product Service

**2.7 POWER SPECTRAL DENSITY****2.7.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (e)

**2.7.2 Equipment Under Test and Modification State**

S/N: IMEI 004401115723419 - Modification State 0

**2.7.3 Date of Test**

7 April 2016

**2.7.4 Test Equipment Used**

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

**2.7.5 Test Procedure**

The test was performed in accordance with KDB 558074 D01 V03r02, clause 10.2.

Remarks

Total power calculated using method in KDB 662911 D01 V02r01 Section E, 2c.

**2.7.6 Environmental Conditions**

Ambient Temperature	22.1°C
Relative Humidity	28.2%



Product Service

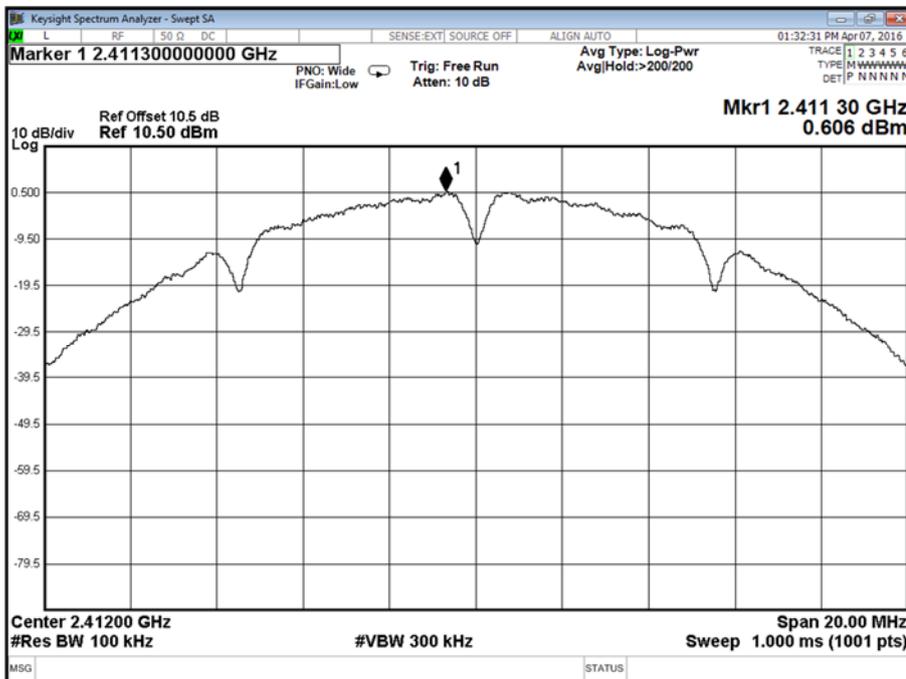
**2.7.7 Test Results**

4.0 V DC Supply

802.11b, DSSS, 1 Mbps, Power Spectral Density Results

2412 MHz		
dBm		
Port A	Port B	Total Power
0.606	0.187	3.606

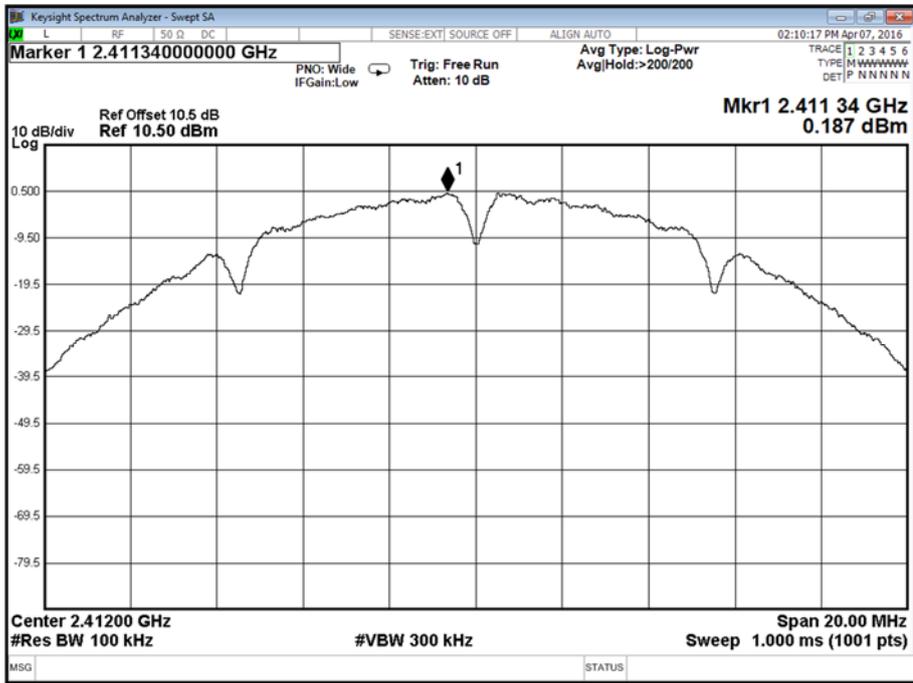
802.11b, 2412 MHz, DSSS, 1 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11b, 2412 MHz, DSSS, 1 Mbps, Port B, Power Spectral Density Plot

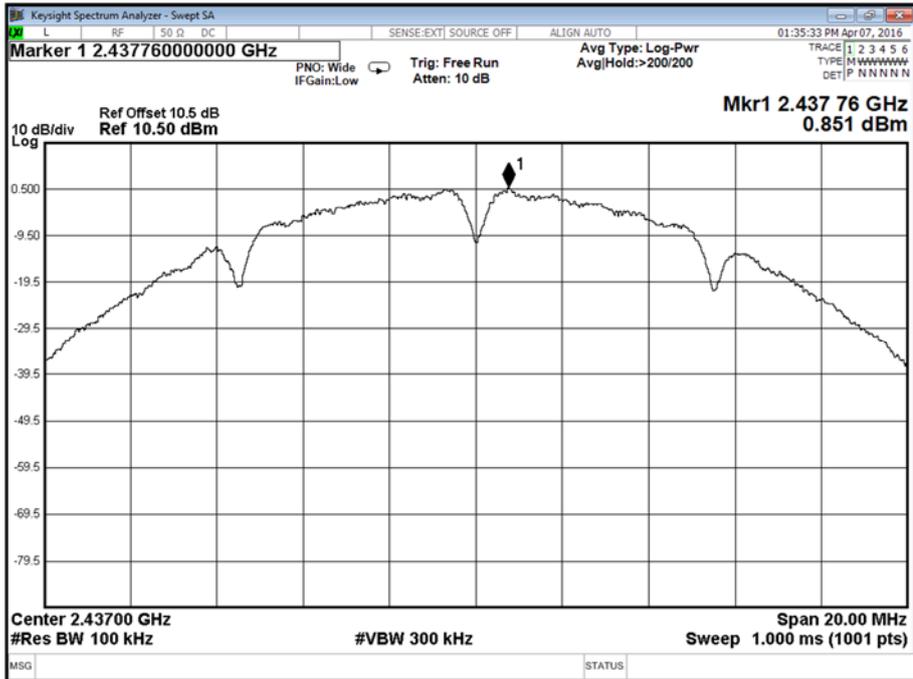




Product Service

2437 MHz		
dBm		
Port A	Port B	Total Power
0.851	0.033	3.851

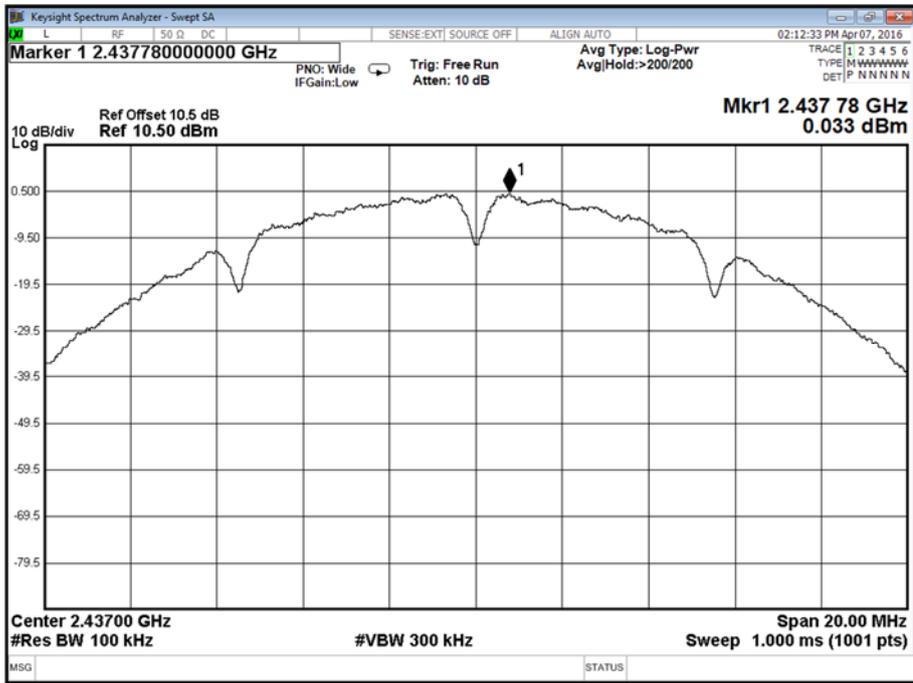
802.11b, 2437 MHz, DSSS, 1 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11b, 2437 MHz, DSSS, 1 Mbps, Port B, Power Spectral Density Plot

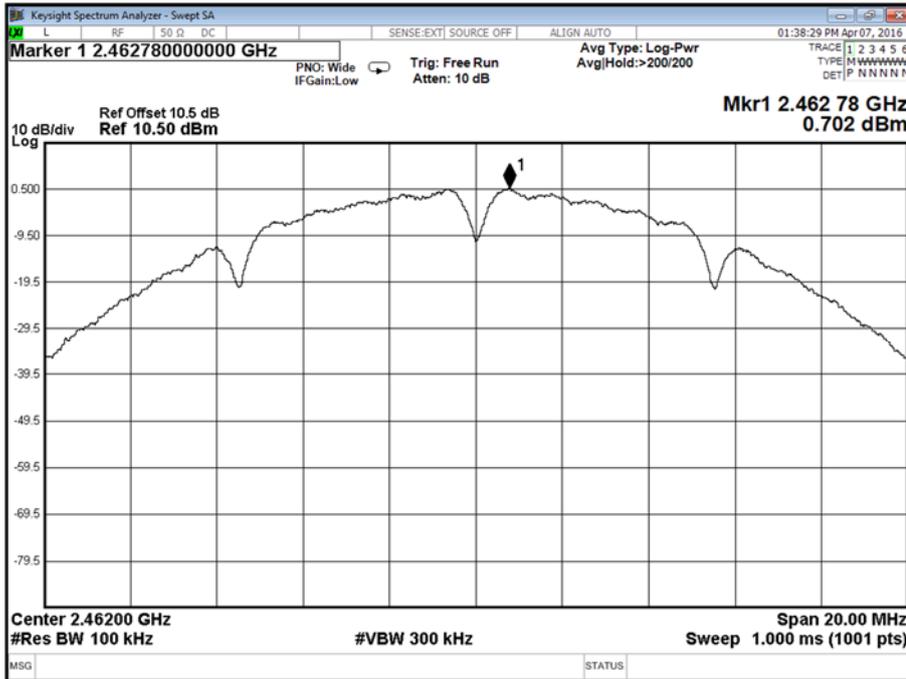




Product Service

2462 MHz		
dBm		
Port A	Port B	Total Power
0.702	-0.006	3.702

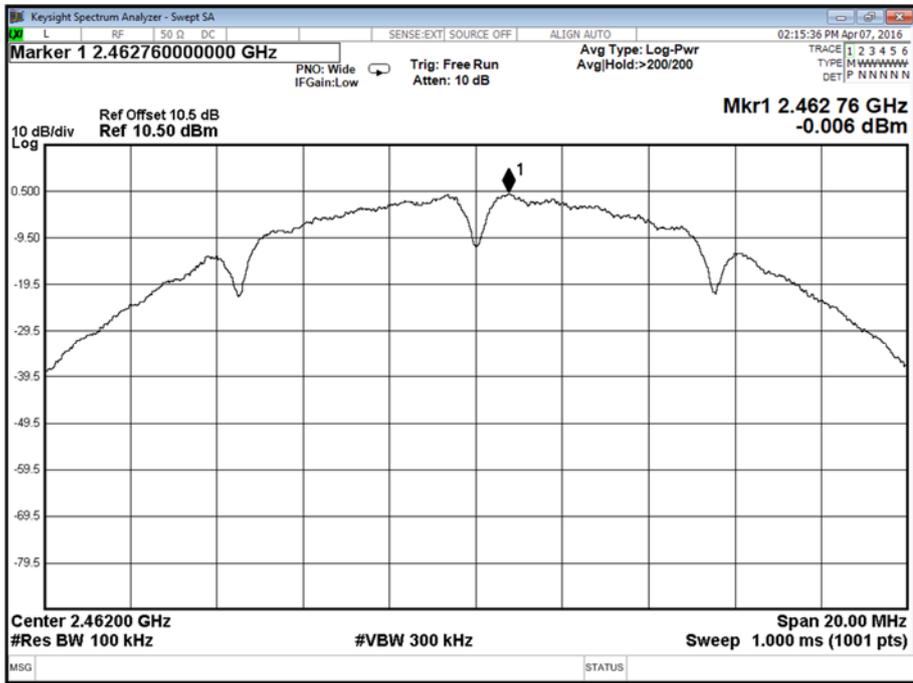
802.11b, 2462 MHz, DSSS, 1 Mbps, Port A Power Spectral Density Plot





Product Service

802.11b, 2462 MHz, DSSS, 1 Mbps, Port A Power Spectral Density Plot



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

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.



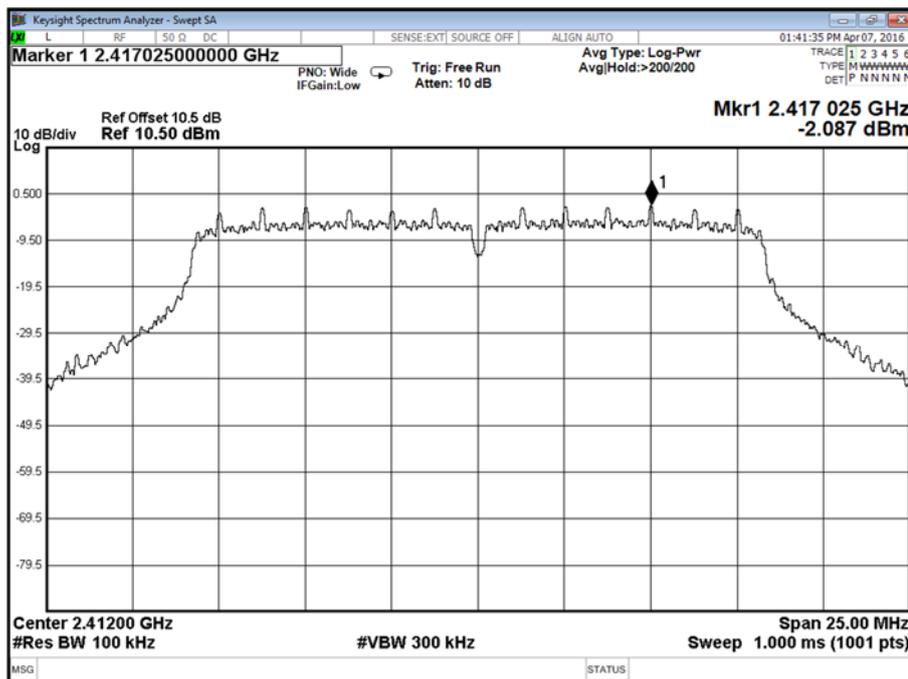
Product Service

4.0 V DC Supply

802.11g, OFDM, 6 Mbps, Power Spectral Density Results

2412 MHz		
dBm		
Port A	Port B	Total Power
-2.087	-2.673	0.913

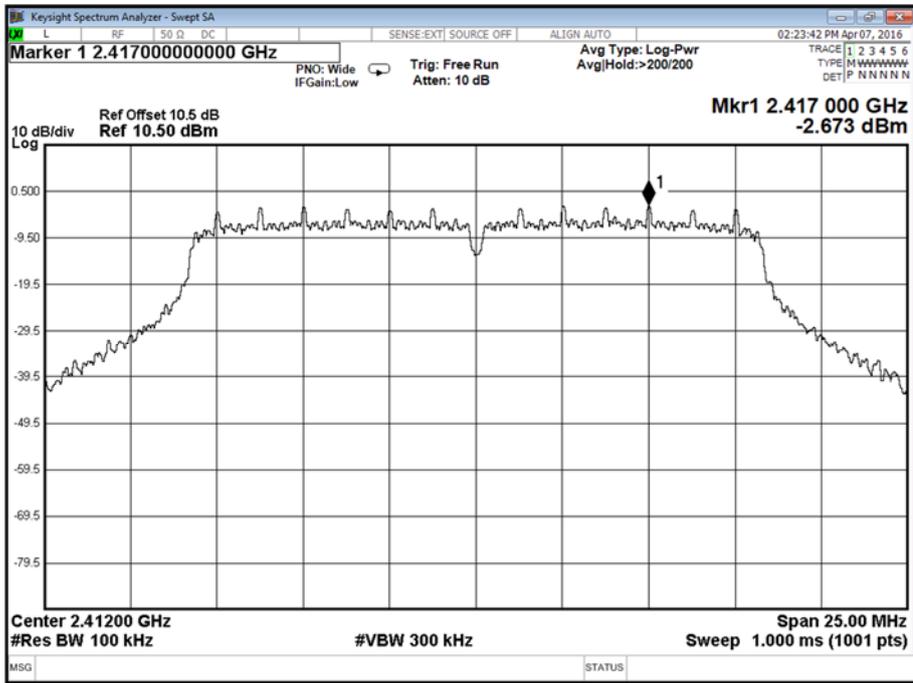
802.11g, 2412 MHz, OFDM, 6 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11g, 2412 MHz, OFDM, 6 Mbps, Port B, Power Spectral Density Plot

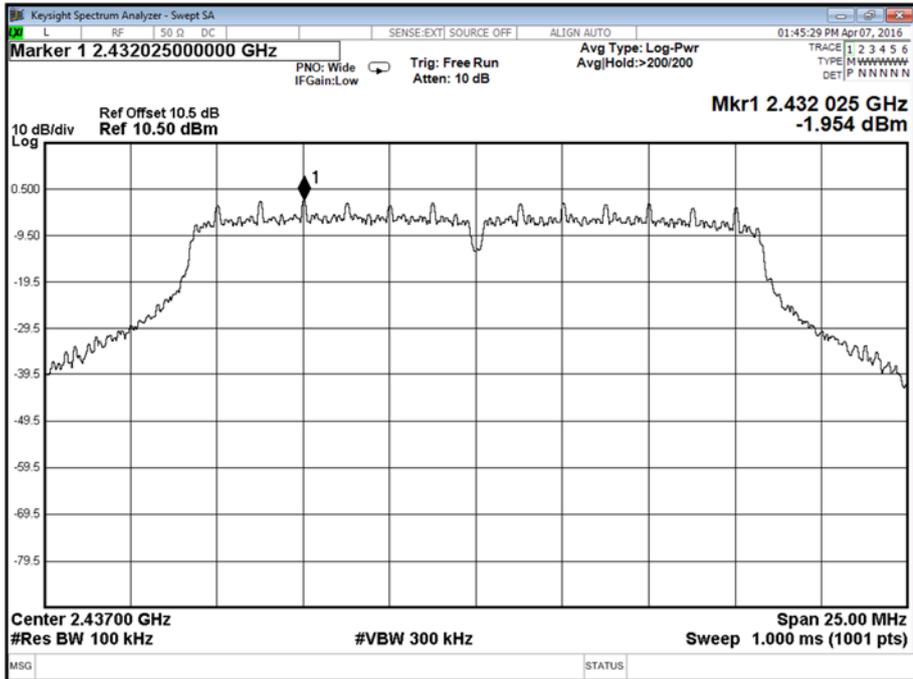




Product Service

2437 MHz		
dBm		
Port A	Port B	Total Power
-1.954	-2.222	1.046

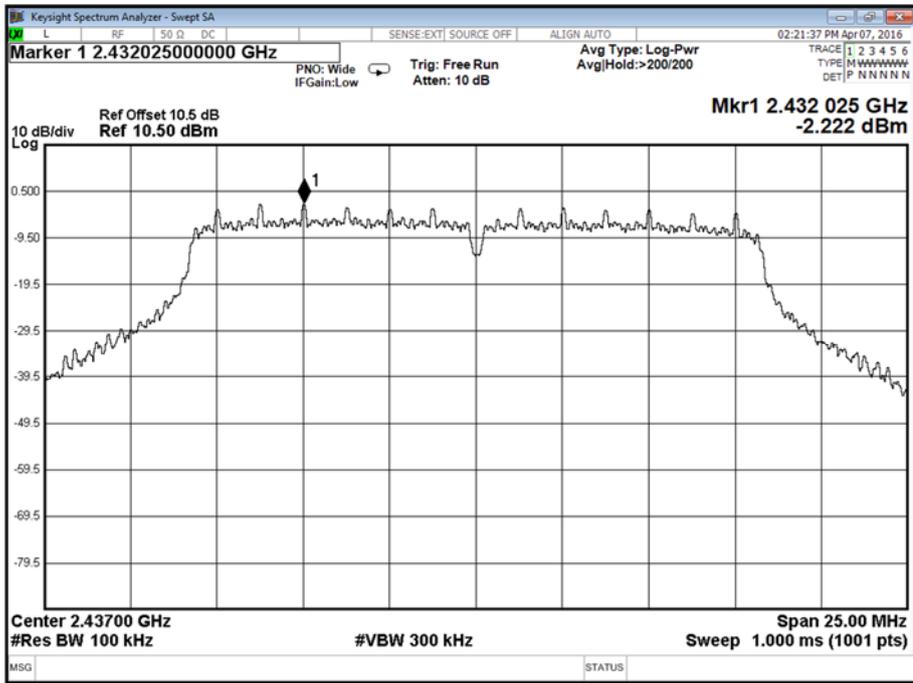
802.11g, 2437 MHz, OFDM, 6 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11g, 2437 MHz, OFDM, 6 Mbps, Port B, Power Spectral Density Plot

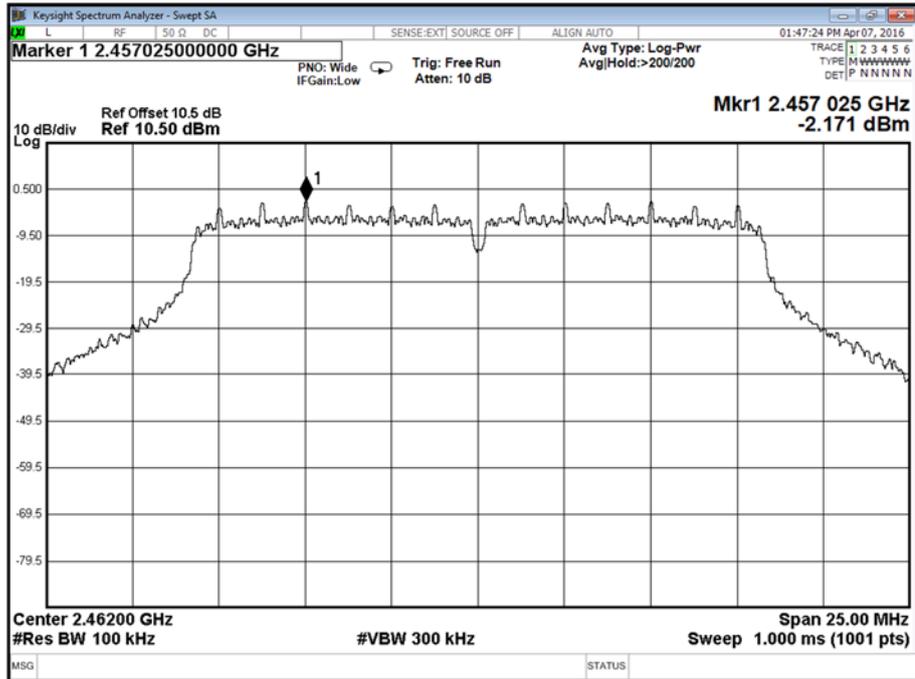




Product Service

2462 MHz		
dBm		
Port A	Port B	Total Power
-2.171	-2.770	0.829

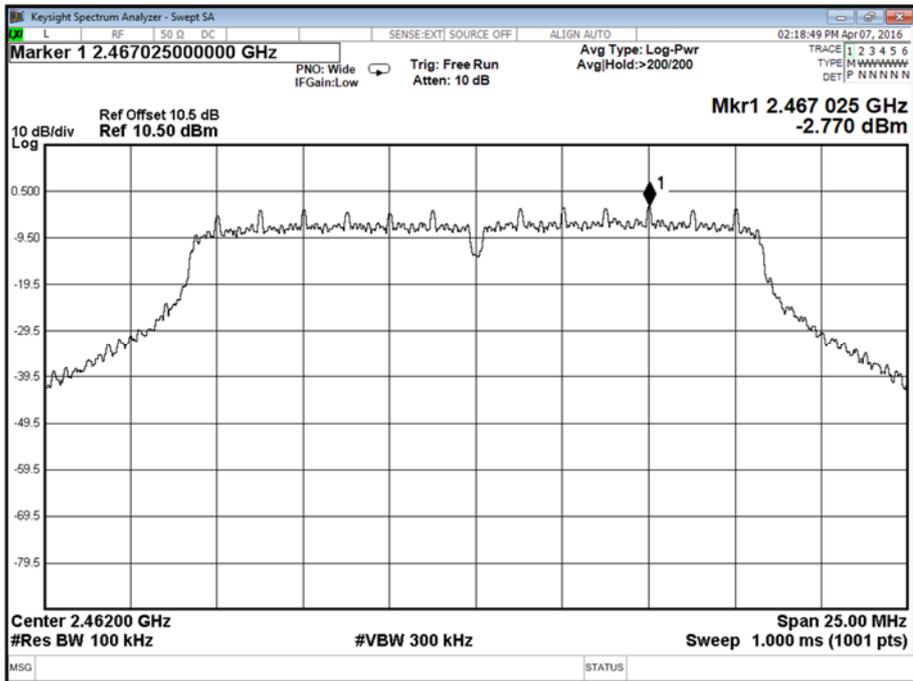
802.11g, 2462 MHz, OFDM, 6 Mbps, Port A Power Spectral Density Plot





Product Service

802.11g, 2462 MHz, OFDM, 6 Mbps, Port A Power Spectral Density Plot



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

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.



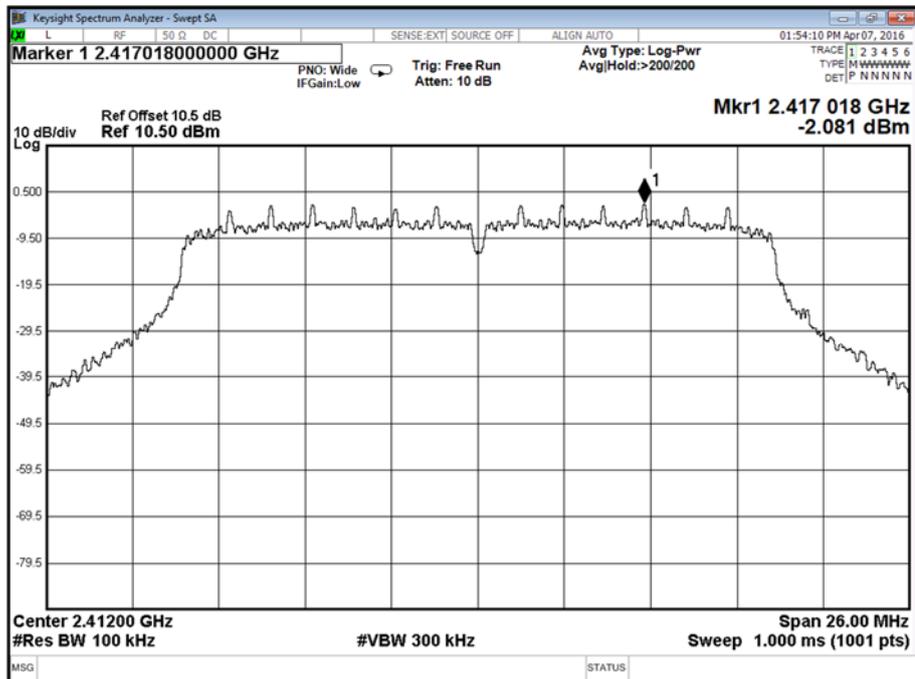
Product Service

4.0 V DC Supply

802.11n, OFDM, 6.5 Mbps, Power Spectral Density Results

2412 MHz		
dBm		
Port A	Port B	Total Power
-2.081	-2.666	0.919

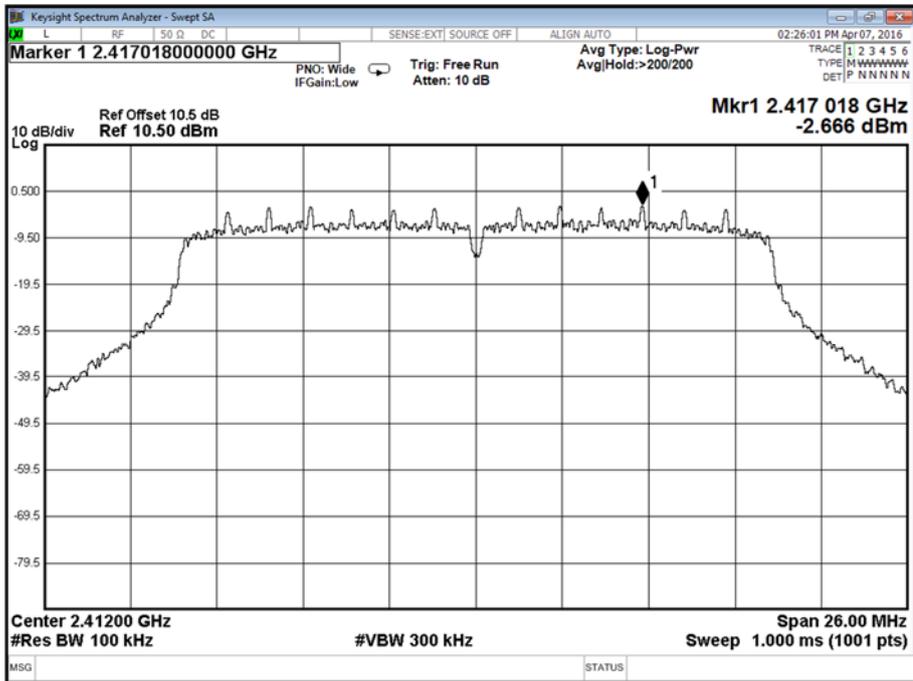
802.11n, 2412 MHz, OFDM, 6.5 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11n, 2412 MHz, OFDM, 6.5 Mbps, Port B, Power Spectral Density Plot

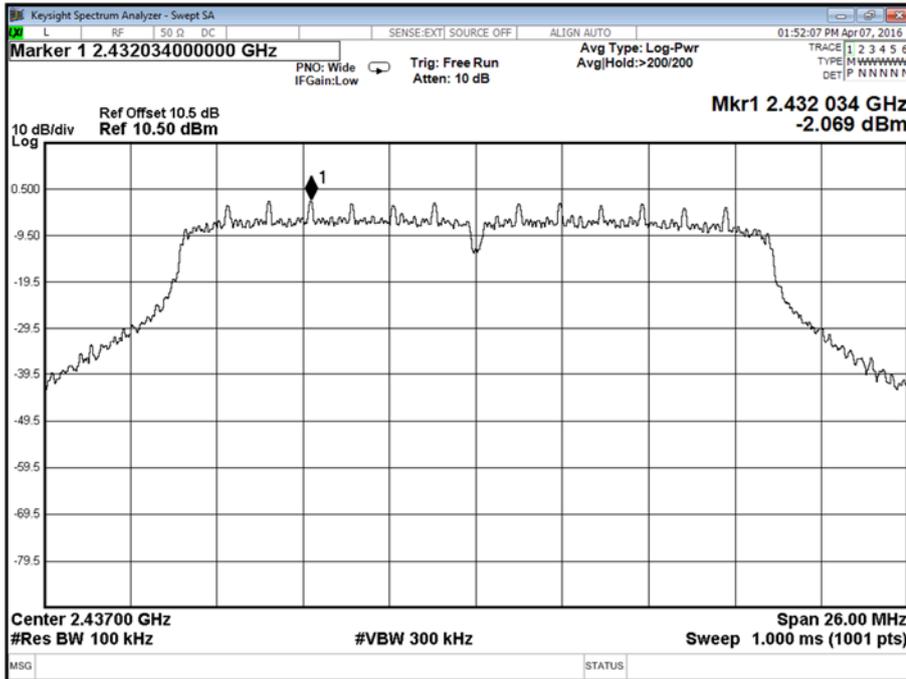




Product Service

2437 MHz		
dBm		
Port A	Port B	Total Power
-2.069	-2.290	0.931

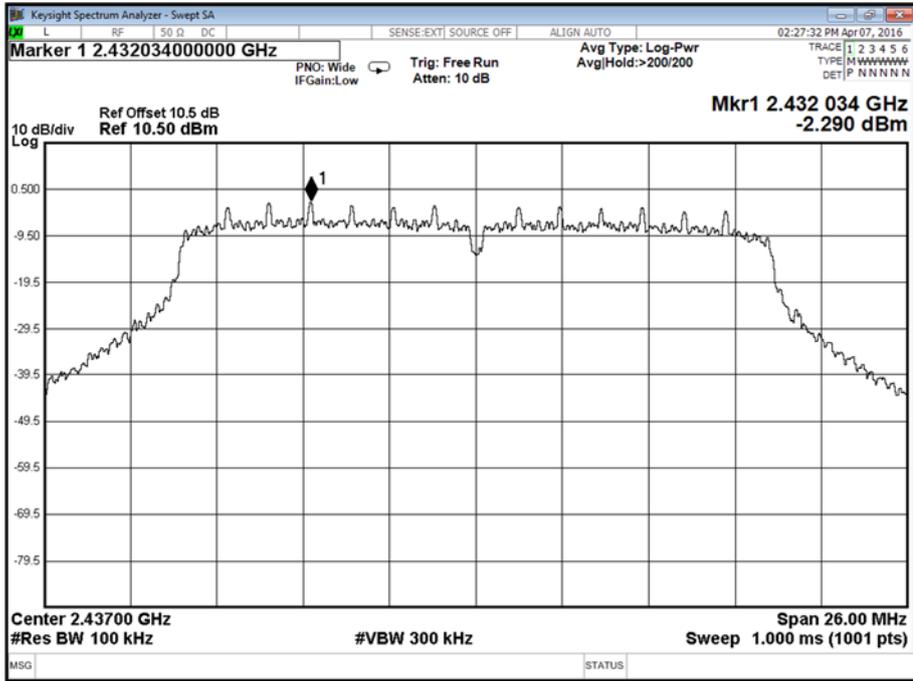
802.11n, 2437 MHz, OFDM, 6.5 Mbps, Port A, Power Spectral Density Plot





Product Service

802.11n, 2437 MHz, OFDM, 6.5 Mbps, Port B, Power Spectral Density Plot

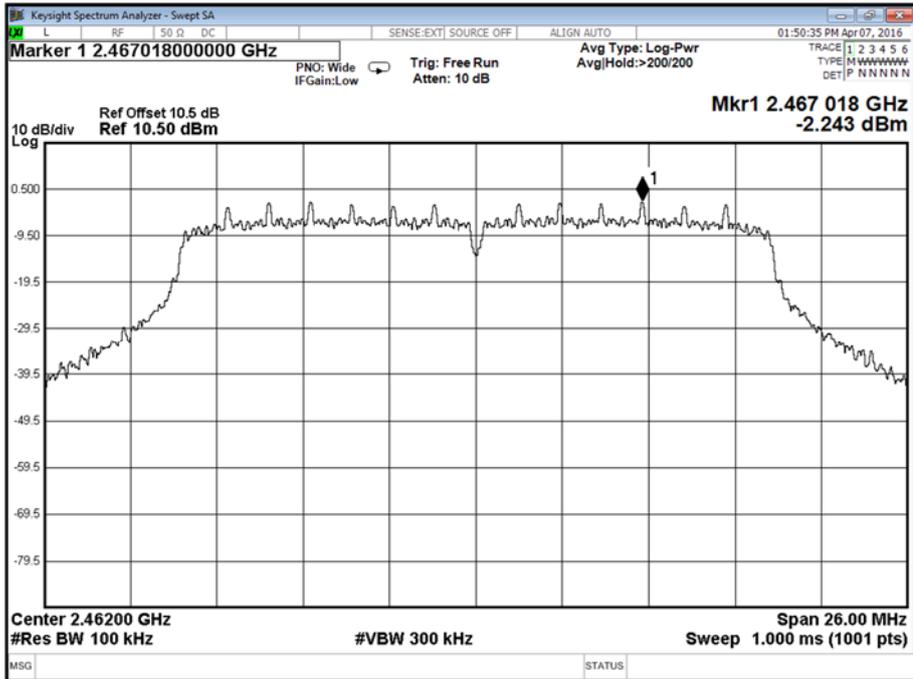




Product Service

2462 MHz		
dBm		
Port A	Port B	Total Power
-2.243	-2.743	0.757

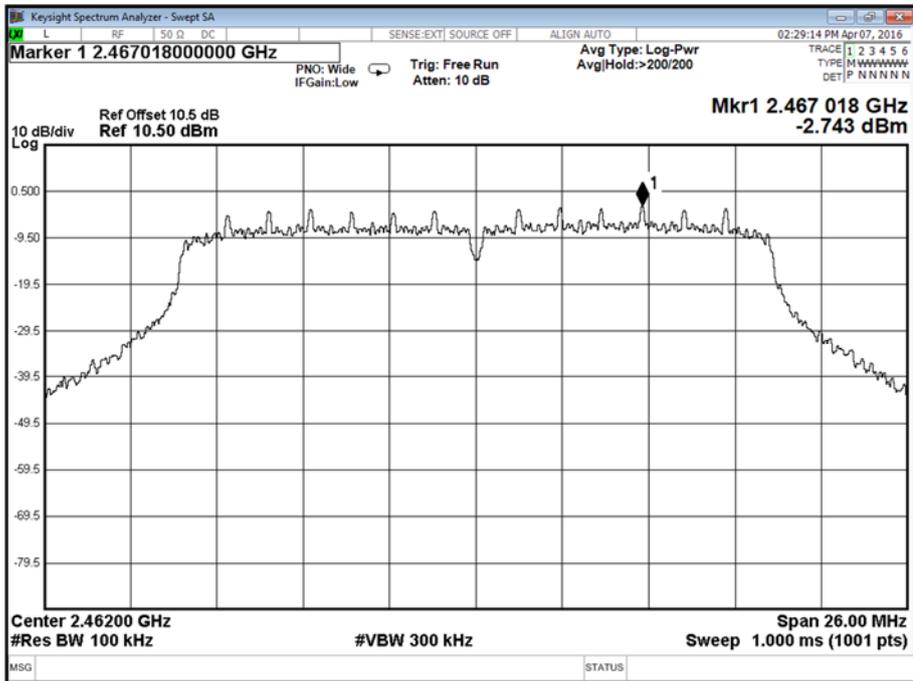
802.11n, 2462 MHz, OFDM, 6.5 Mbps, Port A Power Spectral Density Plot





Product Service

802.11n, 2462 MHz, OFDM, 6.5 Mbps, Port A Power Spectral Density Plot



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

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.



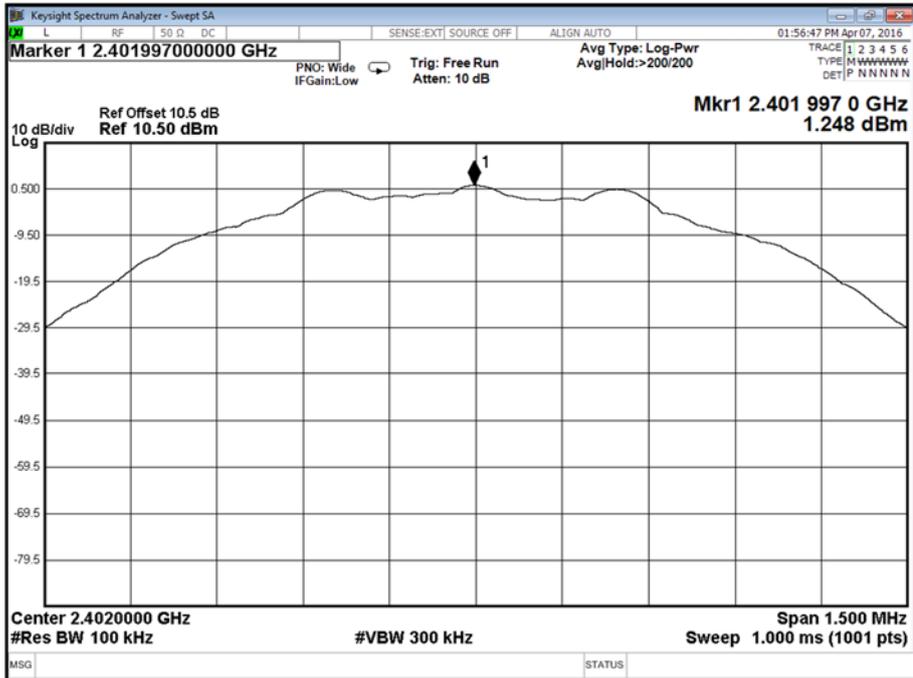
Product Service

4.0 V DC Supply

Bluetooth Low Energy, GFSK, Power Spectral Density Results

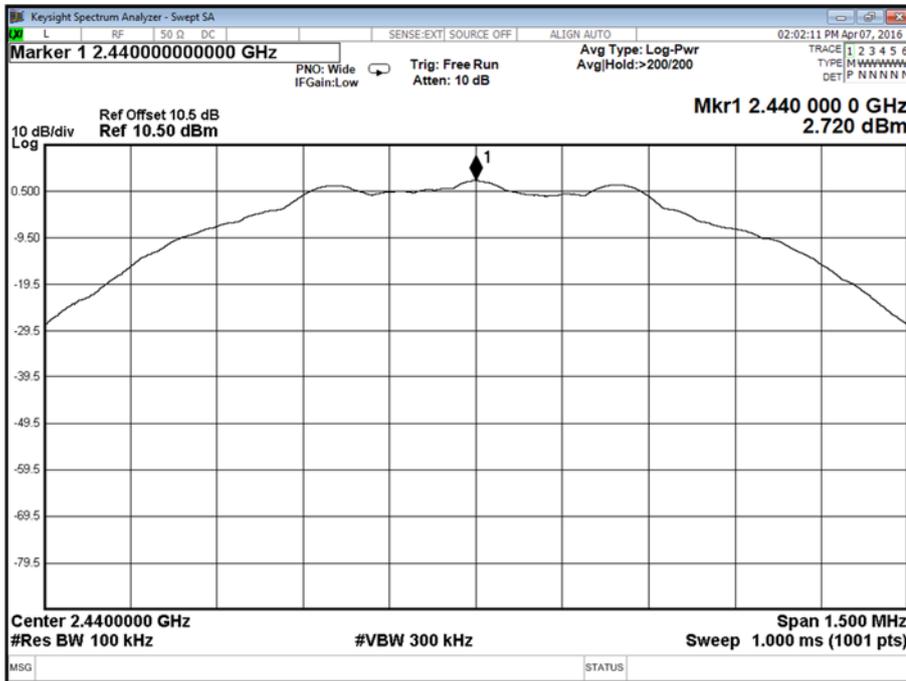
2402 MHz	2441 MHz	2480 MHz
dBm	dBm	dBm
1.248	2.720	2.037

Bluetooth Low Energy, 2402 MHz, GFSK, Power Spectral Density Plot

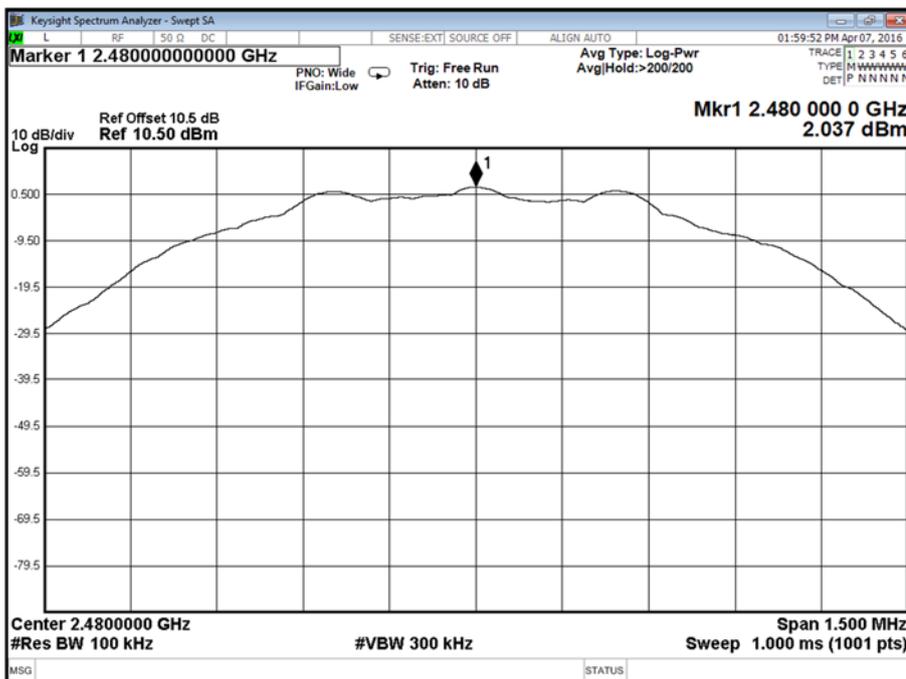




Bluetooth Low Energy, 2441 MHz, GFSK, Power Spectral Density Plot



Bluetooth Low Energy, 2480 MHz, GFSK, Power Spectral Density Plot



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

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.



Product Service

### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.1 – AC Line Conducted Emissions</b>					
LISN	Rohde & Schwarz	ESH2-Z5	17	12	11-Feb-2017
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Transient Limiter	Hewlett Packard	11947A	2377	12	16-Feb-2017
Multimeter	Iso-tech	IDM101	2417	12	29-Sep-2016
Hygrometer	Rotronic	A1	2677	12	11-Jun-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
<b>Section 2.2 - 6dB Bandwidth</b>					
Multimeter	Iso-tech	IDM-101	466	12	11-Sep-2016
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Programmable Power Supply	Iso-tech	IPS 2010	2435	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394- 3PS	4662	12	6-Nov-2016
<b>Section 2.3 - Maximum Conducted Output Power</b>					
Radio Communications Test Set	Rohde & Schwarz	CMU 200	442	12	18-Jan-2017
Multimeter	Fluke	75 Mk3	455	12	10-Sep-2016
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	30-Oct-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	2-Sep-2016
Combiner/Splitter	Weinschel	1506A	3878	12	2-Jun-2016
P-Series Power Meter	Agilent Technologies	N1911A	3981	12	25-Sep-2016
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3983	12	25-Sep-2016
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	7-Sep-2016
1 metre N-Type Cable	Florida Labs	NMS-235SP-39.4- NMS	4511	12	2-Mar-2017
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4- SMS	4512	12	29-Jan-2017
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	3-Feb-2017
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.4 - Spurious Radiated Emissions</b>					
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	23-Feb-2017
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	27-Nov-2016
Pre-Amplifier	Phase One	PS04-0086	1533	12	30-Jul-2016
18GHz - 40GHz Pre-Amplifier	Phase One	PSO4-0087	1534	12	23-Dec-2016
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Cable (2m)	Rosenberger	FA147A2020002020	2195	12	19-Aug-2016
Hygromer	Rotronic	A1	2677	12	11-Jun-2016
Antenna (Bilog)	Chase	CBL6143	2904	24	11-Jun-2017
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	28-Sep-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Cable 1503 2M 2.92(P)m 2.92(P)m	Rhophase	KPS-1503A-2000-KPS	4293	12	9-Jun-2016
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	6-Oct-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	23-Mar-2017
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
Cable (Rx, SMAM-SMAM 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	-	TU
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	29-Dec-2016
<b>Section 2.5 - Restricted Band Edges</b>					
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2677	12	11-Jun-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
10mohm Resistor	Cropico	RS3	3616	48	12-Mar-2017
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
Cable (Rx, SMAM-SMAM 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	-	TU
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	29-Dec-2016



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.6 - Authorised Band Edges</b>					
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2677	12	11-Jun-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	-	TU
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	29-Dec-2016
<b>Section 2.7 - Power Spectral Density</b>					
Power Supply Unit	Farnell	LB30-4	158	-	O/P Mon
20dB/2W Attenuator	Narda	4772-20	462	-	TU
Multimeter	Iso-tech	IDM-101	466	12	11-Sep-2016
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Multimeter	Iso-tech	IDM101	2424	12	29-Sep-2016
Programmable Power Supply	Iso-tech	IPS 2010	2435	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	2-Sep-2016
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	7-Sep-2016
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	3-Sep-2016
EMI Receiver	Keysight Technologies	N9038A MXE	4628	12	3-Sep-2016
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	8-Oct-2016
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016
2 metre SMA Cable	IW Microwave	3PS-1806LC-788-3PS	4661	12	6-Nov-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4662	12	6-Nov-2016

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
6 dB Bandwidth	$\pm 212.114$ kHz
AC Line Conducted Emissions	$\pm 3.2$ dB
Maximum Conducted Output Power	$\pm 0.70$ dB
Power Spectral Density	$\pm 3.0$ dB
Authorised Band Edges	Radiated: 30 MHz to 1 GHz: $\pm 5.1$ dB Radiated: 1 GHz to 40 GHz: $\pm 6.3$ dB
Restricted Band Edges	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB
Spurious Radiated Emissions	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB



Product Service

## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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