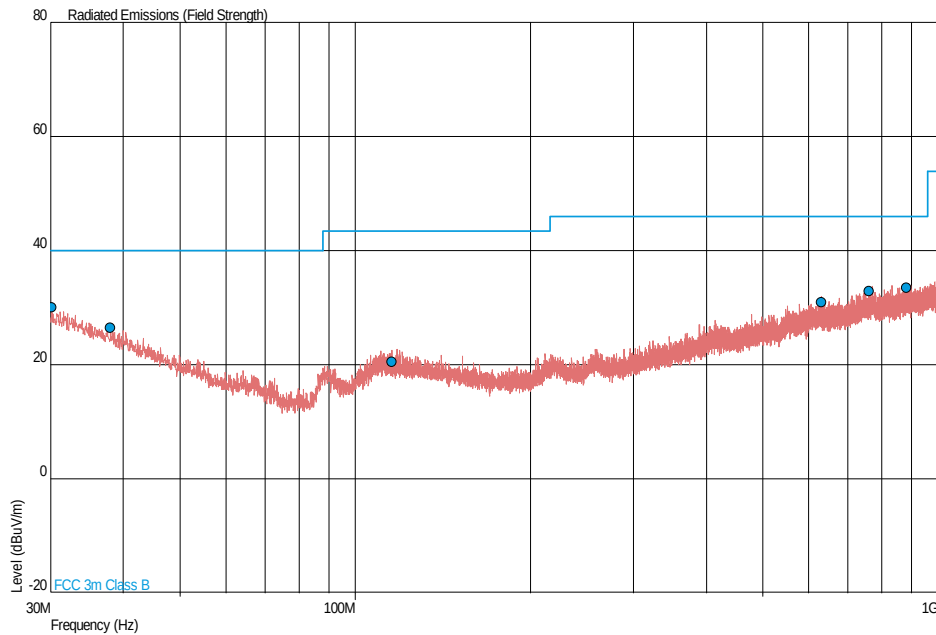


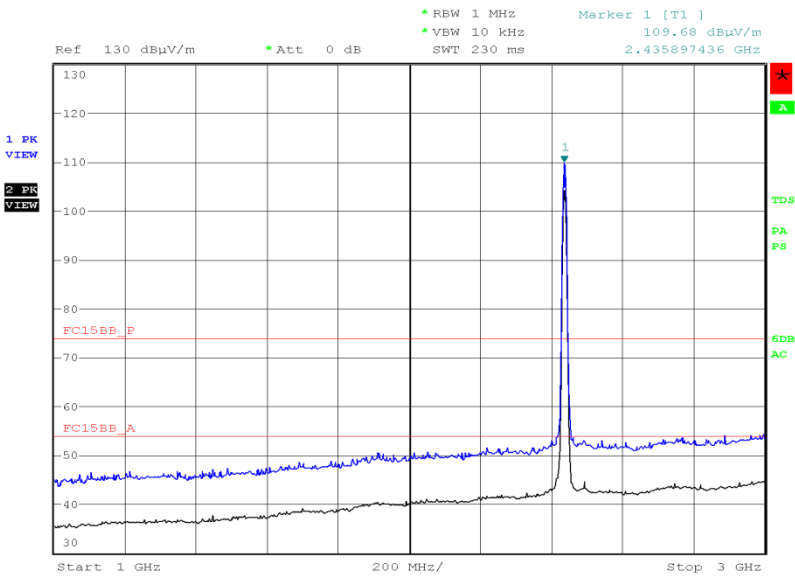
2437 MHz30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.196	30.0	31.6	40.0	100	-10.0	-68.4	168	3.87	Vertical
38.001	26.4	20.9	40.0	100	-13.6	-79.1	105	1.00	Vertical
115.539	20.5	10.6	43.5	150	-23.0	-139.4	188	1.00	Vertical
629.339	31.0	35.5	46.0	200	-15.0	-164.5	296	2.11	Vertical
759.719	32.9	44.2	46.0	200	-13.1	-155.8	0	1.00	Horizontal
881.680	33.5	47.3	46.0	200	-12.5	-152.7	236	4.00	Vertical



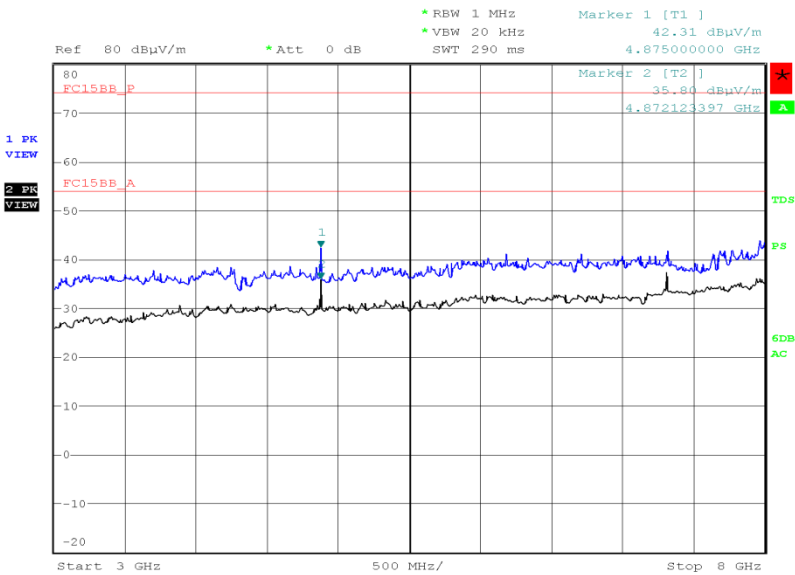
Product Service

1 GHz to 3 GHz



Date: 20.NOV.2014 04:23:39

3 GHz to 8 GHz

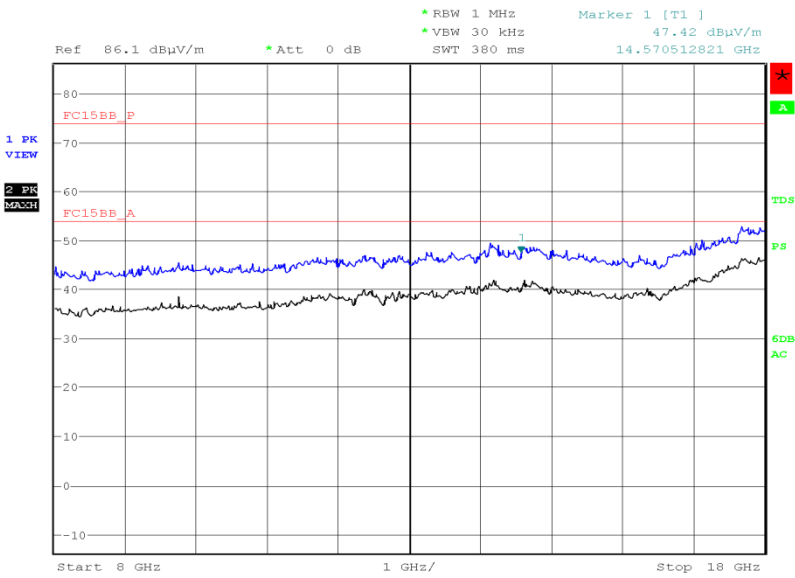


Date: 21.NOV.2014 02:29:23



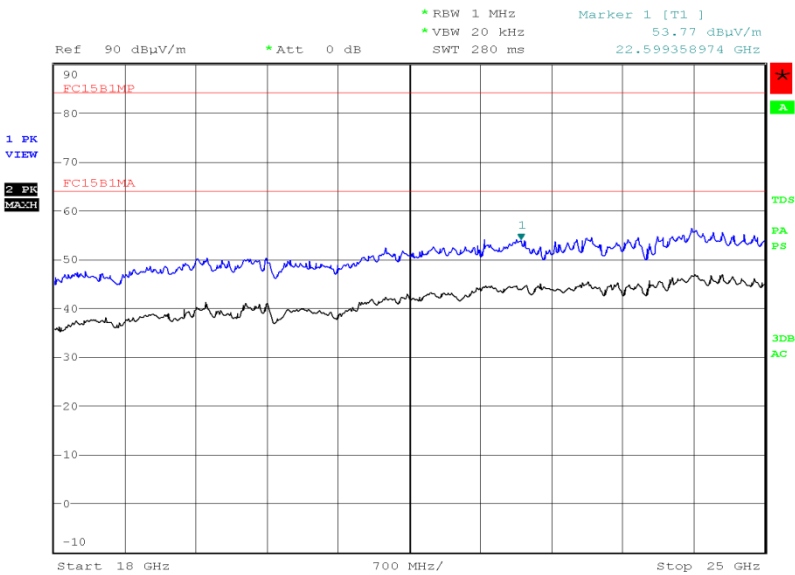
Product Service

8 GHz to 18 GHz



Date: 21.NOV.2014 04:17:34

18 GHz to 25 GHz



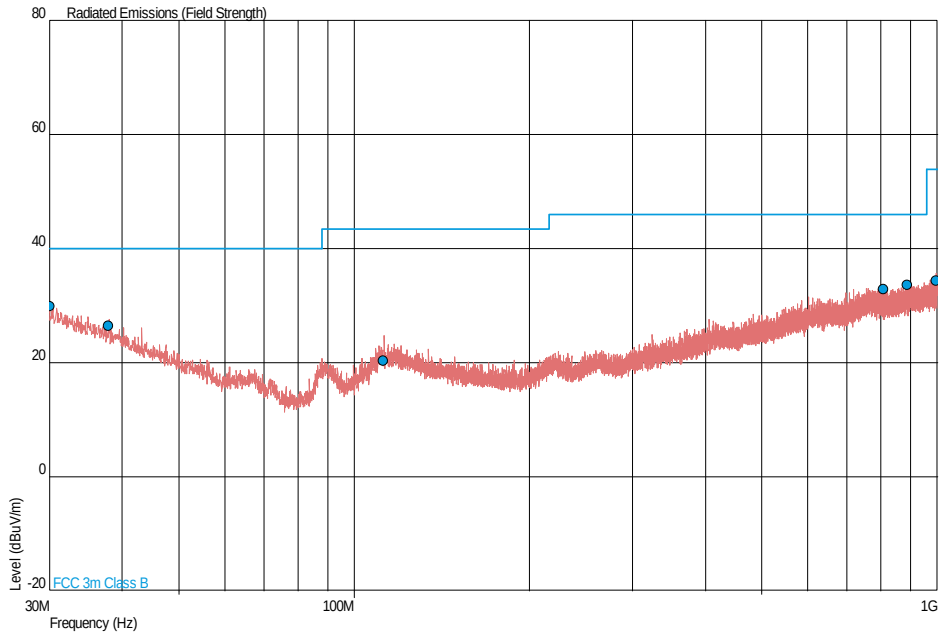
Date: 6.DEC.2014 00:13:36



Product Service

2462 MHz

30 MHz to 1 GHz

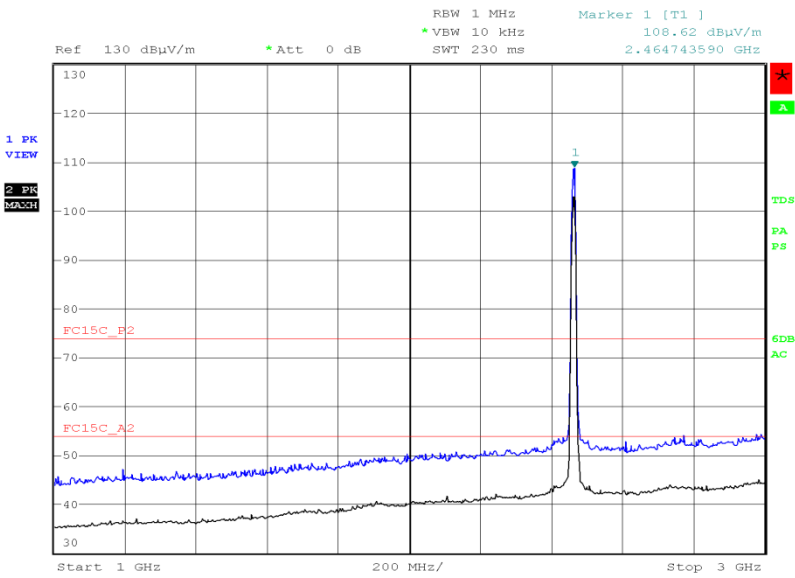


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.058	30.0	31.6	40.0	100	-10.0	-68.4	39	1.00	Horizontal
37.952	26.4	20.9	40.0	100	-13.6	-79.1	218	1.00	Horizontal
111.936	20.3	10.4	43.5	150	-23.2	-139.6	266	1.00	Vertical
807.419	32.9	44.2	46.0	200	-13.1	-155.8	5	1.00	Horizontal
888.173	33.6	47.9	46.0	200	-12.4	-152.1	37	2.13	Horizontal
995.635	34.4	52.5	54.0	501	-19.6	-448.5	167	1.00	Horizontal



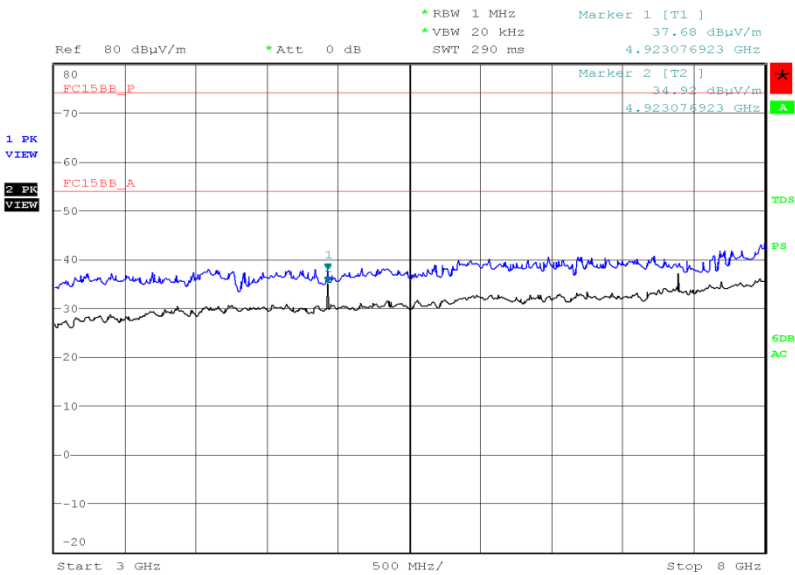
Product Service

1 GHz to 3 GHz



Date: 17.DEC.2014 16:47:20

3 GHz to 8 GHz

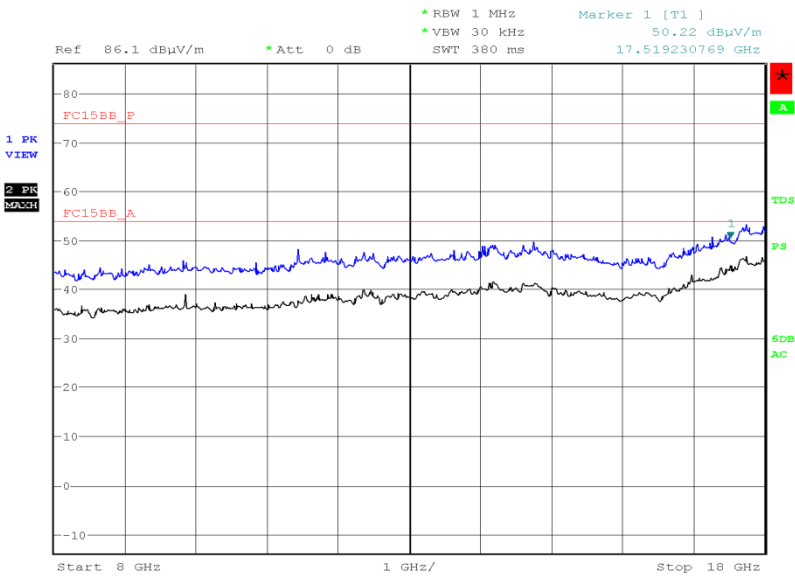


Date: 21.NOV.2014 02:42:48



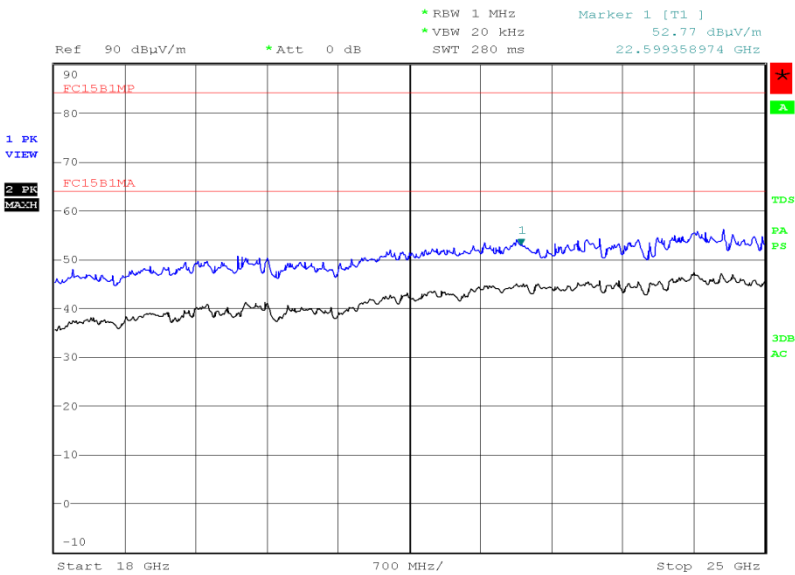
Product Service

8 GHz to 18 GHz



Date: 21.NOV.2014 04:29:55

18 GHz to 25 GHz



Date: 6.DEC.2014 00:24:50

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

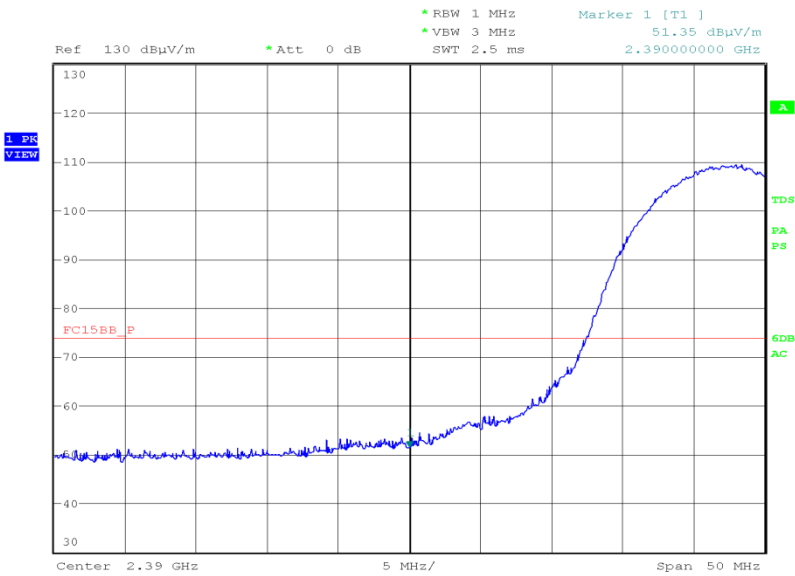
Band Edge Emissions

Modulation/Data Rate: DSSS/11 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	51.35	41.93
2483.50	52.28	42.02

2390.00 MHz

Final Peak

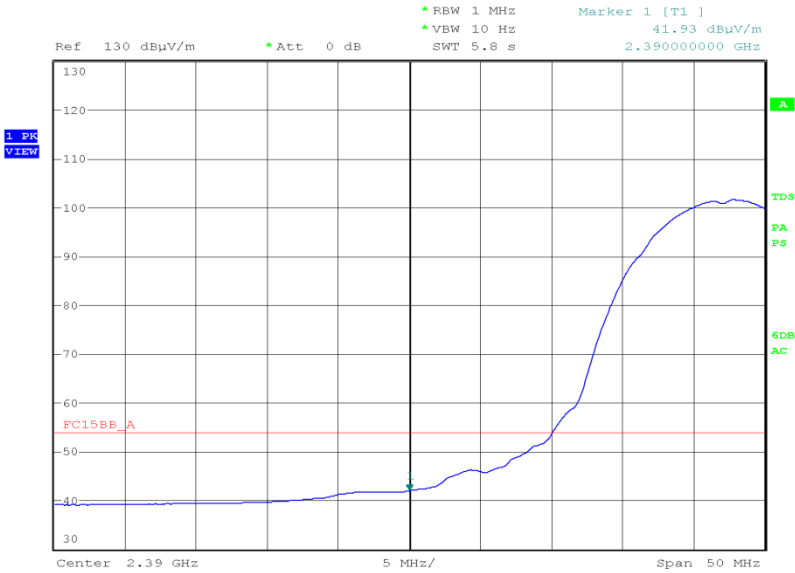


Date: 21.NOV.2014 00:33:30



Product Service

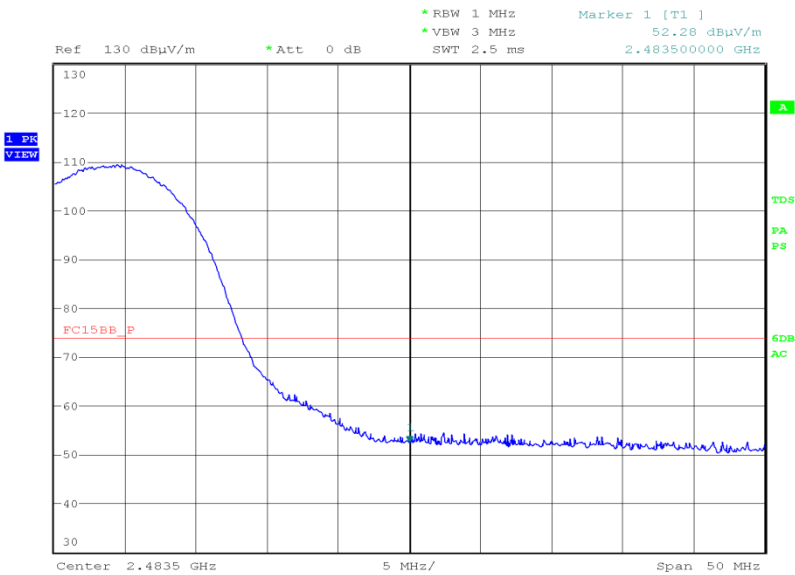
Final Average



Date: 21.NOV.2014 00:32:49

2483.50 MHz

Final Peak

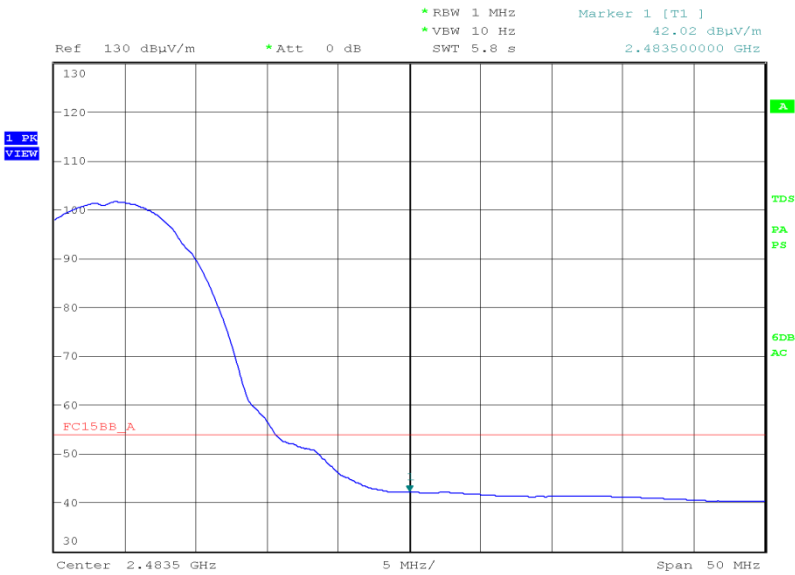


Date: 21.NOV.2014 00:49:17



Product Service

Final Average



Date: 21.NOV.2014 00:48:32

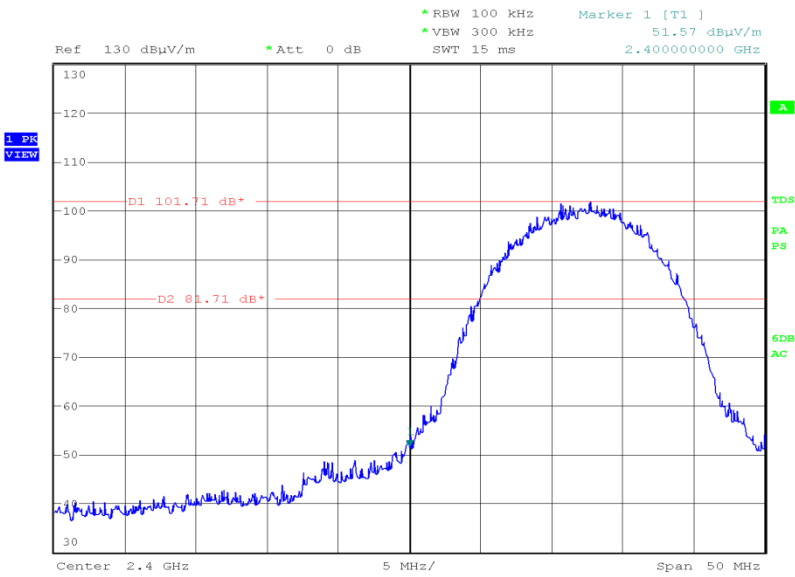


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	51.57
2483.50	40.53

2400.00 MHz

Final Peak



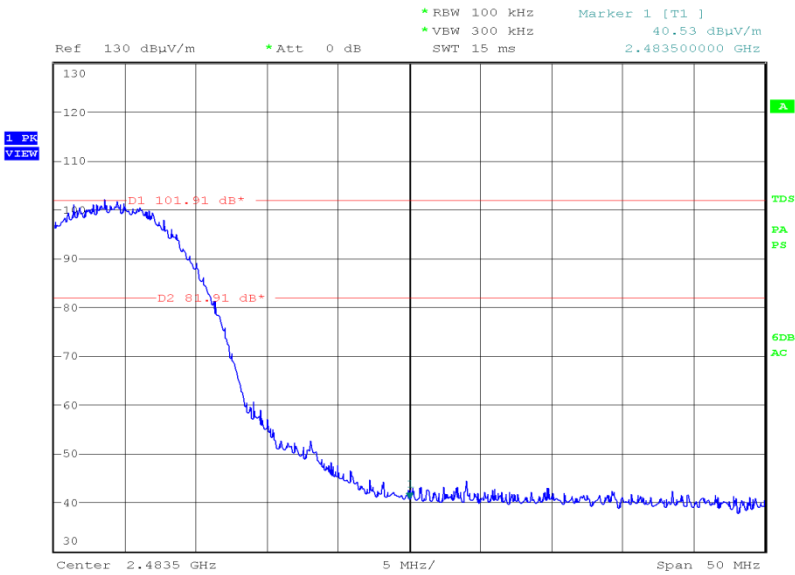
Date: 21.NOV.2014 00:27:46



Product Service

2483.50 MHz

Final Peak



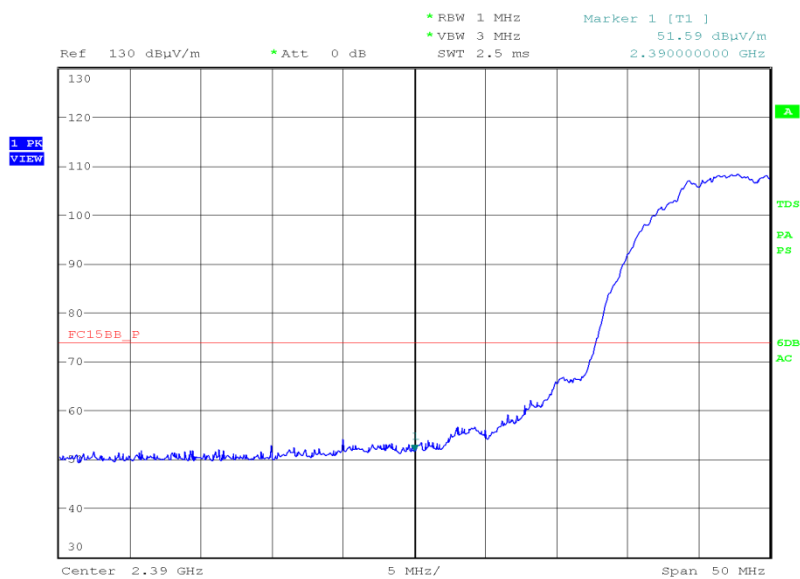
Date: 21.NOV.2014 00:46:57



Product Service

Modulation/Data Rate: DSSS/5.5 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dB μ V/m)	Final Average (dB μ V/m)
2390.00	51.59	41.12
2483.50	53.98	42.62

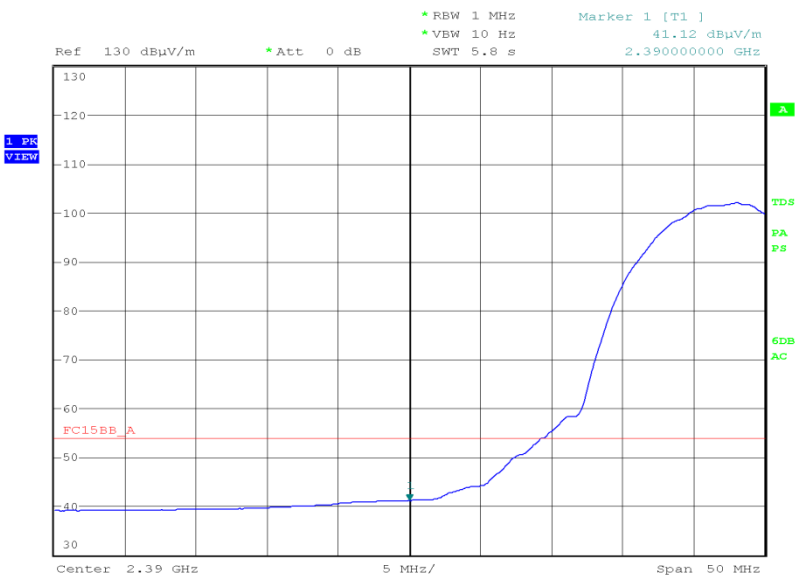
2390.00 MHzFinal Peak

Date: 21.NOV.2014 00:30:37



Product Service

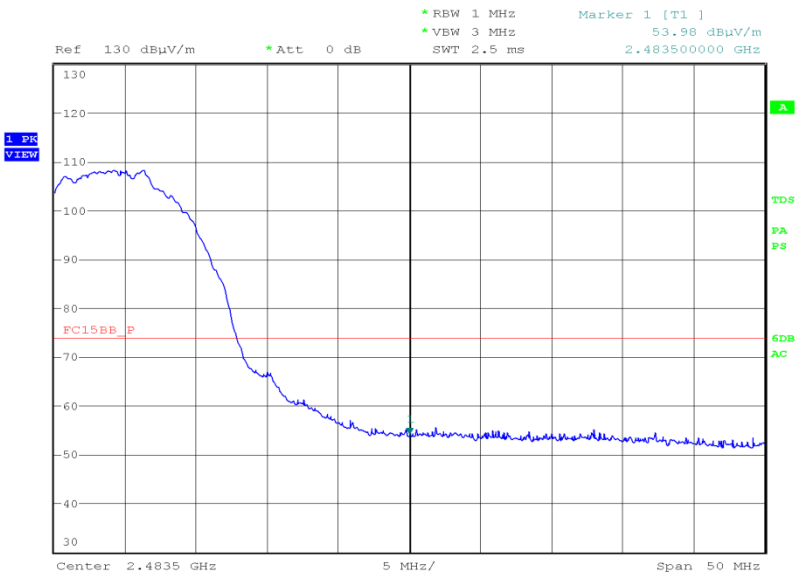
Final Average



Date: 21.NOV.2014 00:31:26

2483.50 MHz

Final Peak

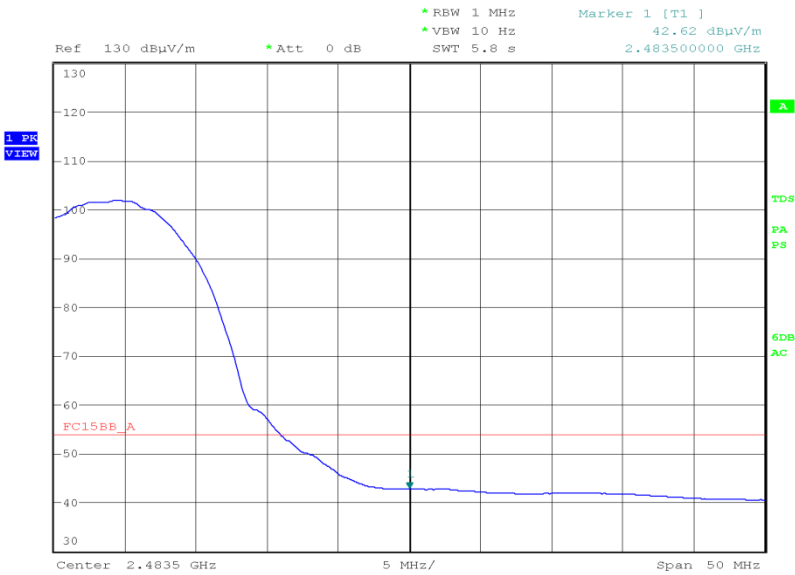


Date: 21.NOV.2014 00:43:05



Product Service

Final Average



Date: 21.NOV.2014 00:44:26

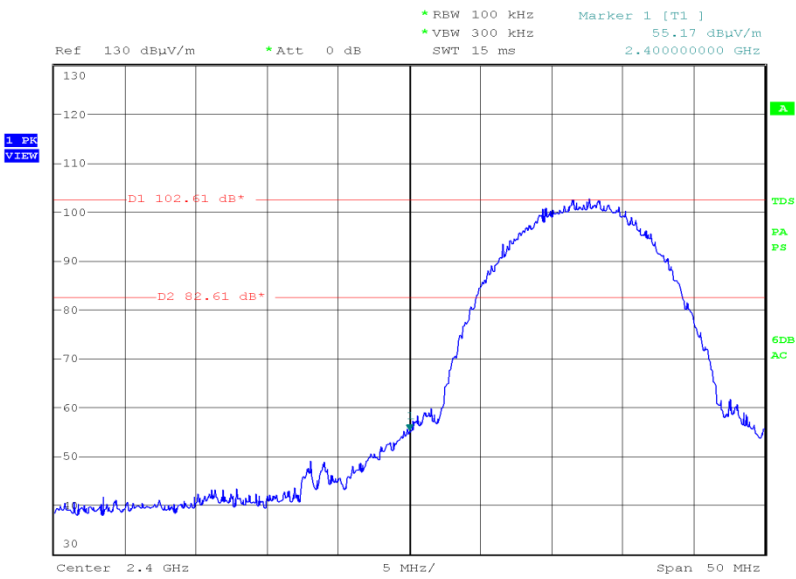


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	55.17
2483.50	41.87

2400.00 MHz

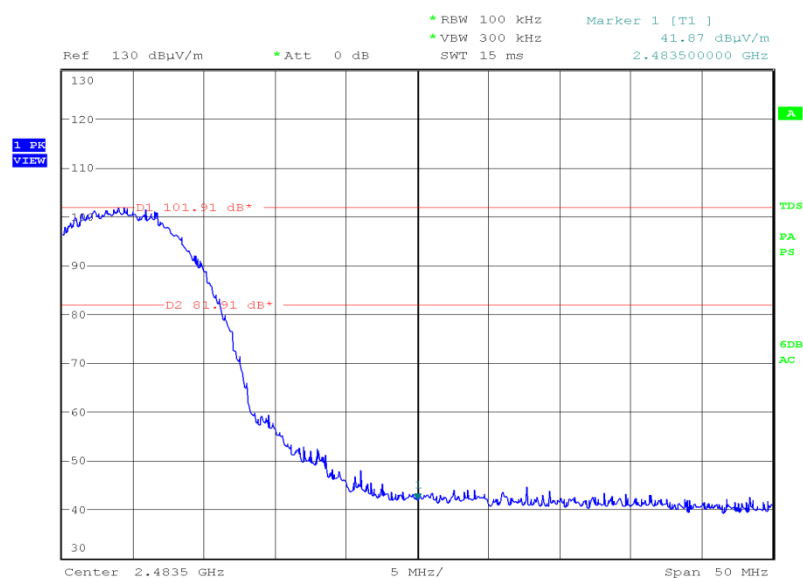
Final Peak



Date: 21.NOV.2014 00:29:21



Product Service

2483.50 MHzFinal Peak

Date: 21.NOV.2014 00:45:26

Remark

The test was performed on 5.5 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

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

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

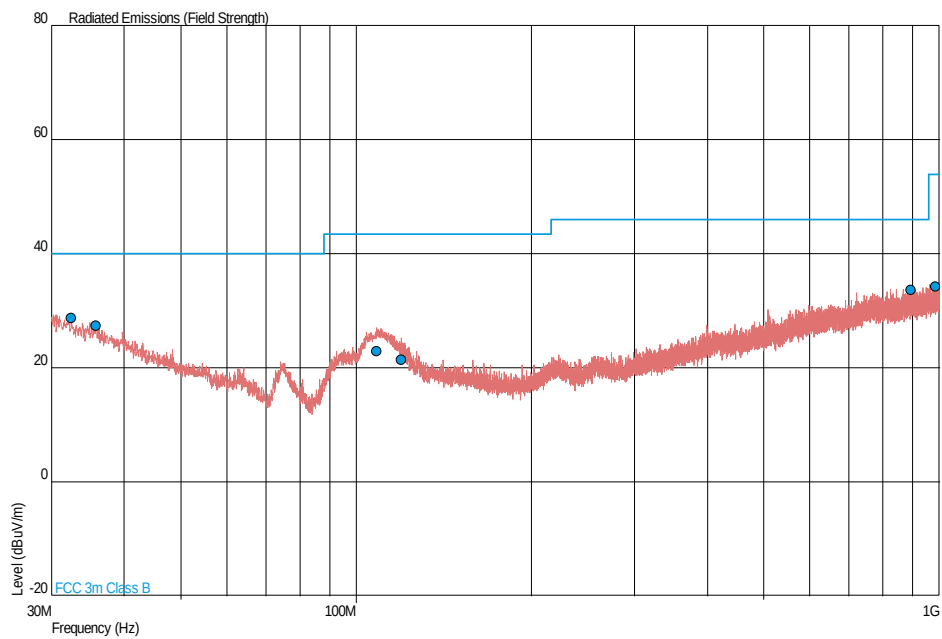
Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These emissions outside the restricted bands shall be 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

802.11(g)

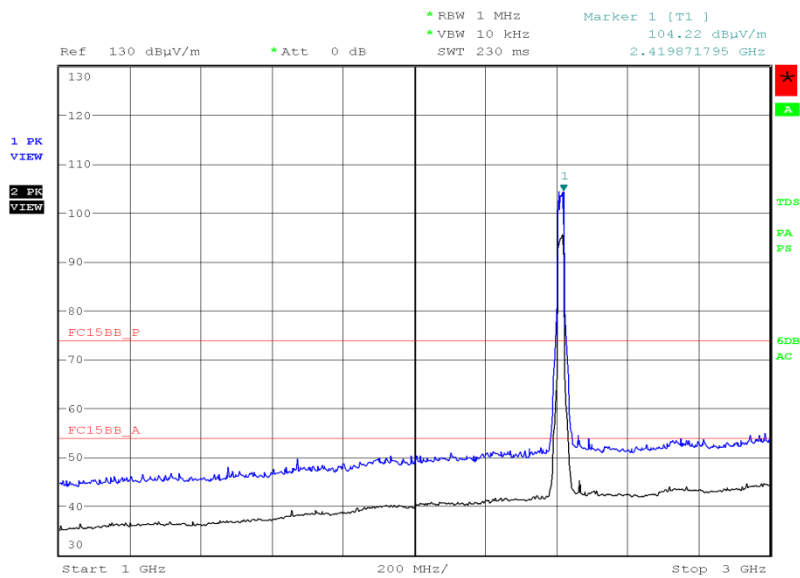
4.0 V DC Supply

Spurious Radiated Emissions2412 MHz30 MHz to 1 GHz

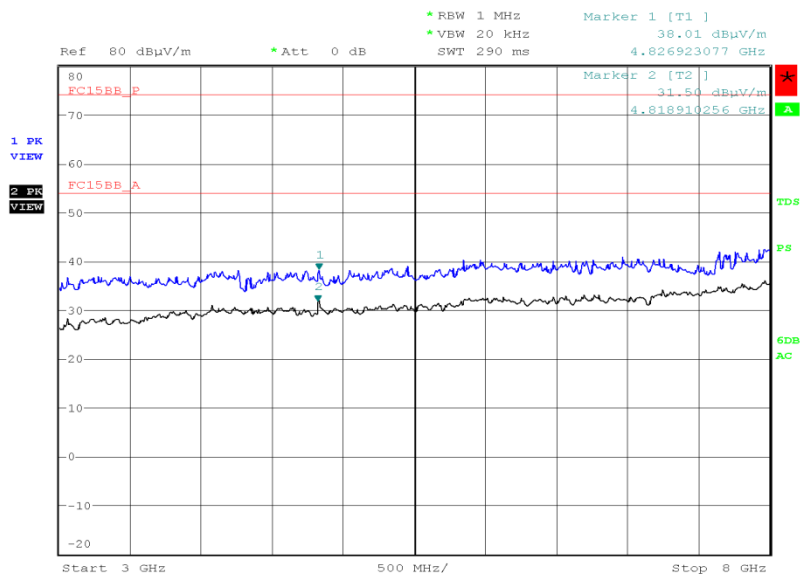
Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
32.477	28.7	27.2	40.0	100	-11.3	-72.8	354	1.00	Horizontal
35.776	27.4	23.4	40.0	100	-12.6	-76.6	191	1.00	Vertical
108.430	22.9	14.0	43.5	150	-20.6	-136.0	134	1.35	Vertical
119.593	21.4	11.7	43.5	150	-22.1	-138.3	268	1.00	Vertical
894.453	33.6	47.9	46.0	200	-12.4	-152.1	129	2.11	Horizontal
985.904	34.2	51.3	54.0	501	-19.8	-449.7	359	1.15	Vertical



Product Service

1 GHz to 3 GHz

Date: 20.NOV.2014 04:08:52

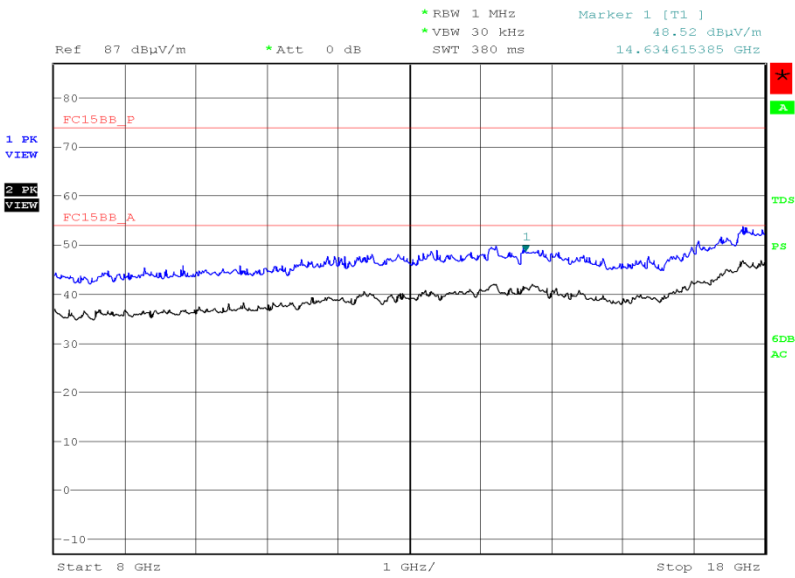
3 GHz to 8 GHz

Date: 21.NOV.2014 02:52:45



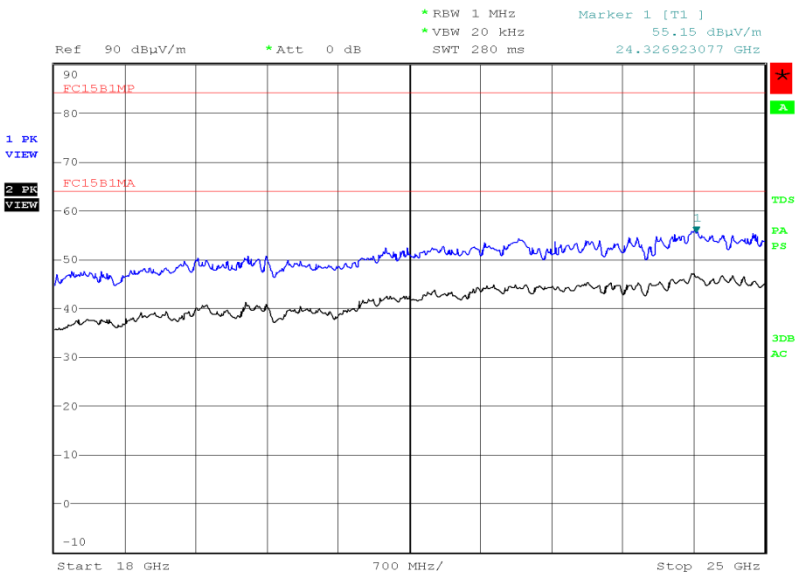
Product Service

8 GHz to 18 GHz

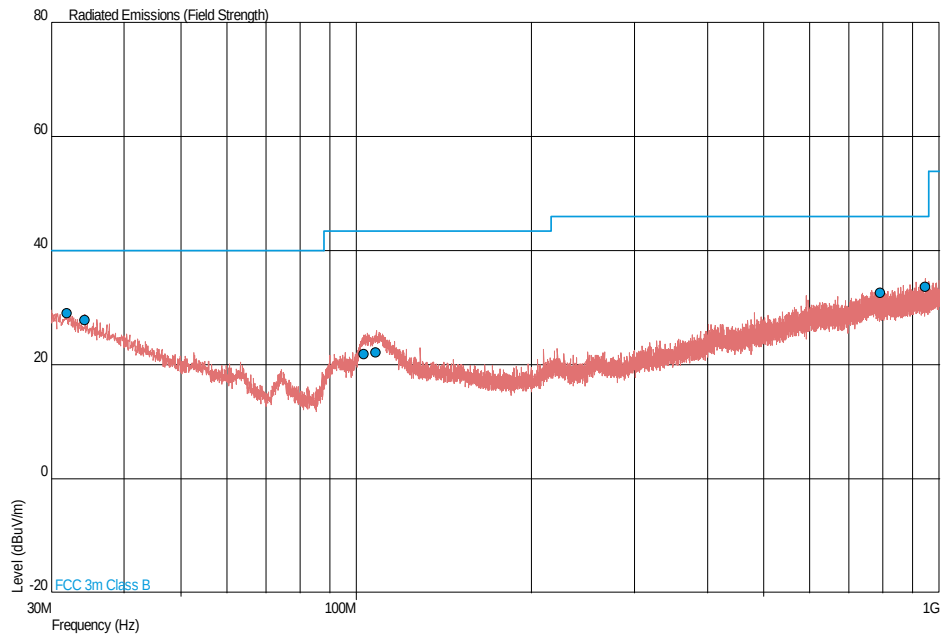


Date: 4.DEC.2014 19:49:44

18 GHz to 25 GHz



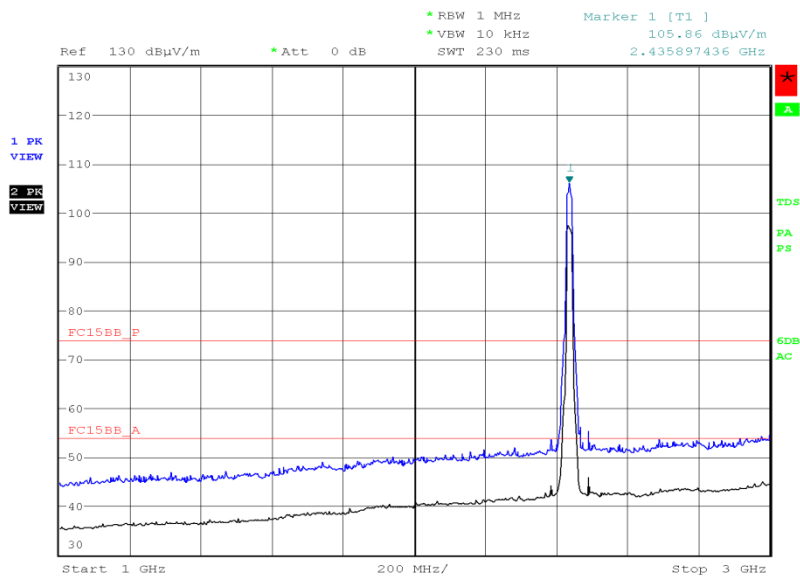
Date: 6.DEC.2014 00:36:56

2437 MHz30 MHz to 1 GHz

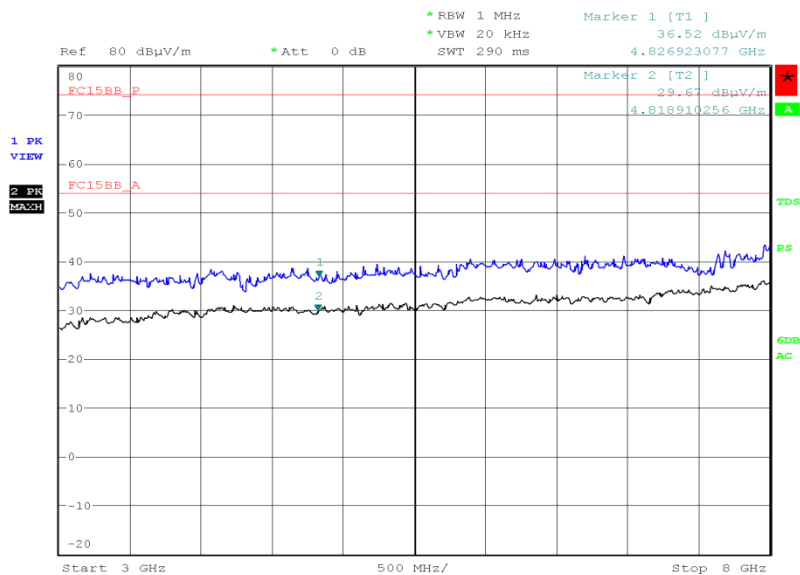
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.890	29.0	28.2	40.0	100	-11.0	-71.8	255	4.00	Vertical
34.271	27.9	24.8	40.0	100	-12.1	-75.2	171	1.46	Horizontal
102.928	21.9	12.4	43.5	150	-21.6	-137.6	133	1.00	Vertical
108.229	22.2	12.9	43.5	150	-21.3	-137.1	119	1.00	Vertical
792.344	32.6	42.7	46.0	200	-13.4	-157.3	360	2.92	Horizontal
945.871	33.7	48.4	46.0	200	-12.3	-452.6	183	1.00	Horizontal



Product Service

1 GHz to 3 GHz

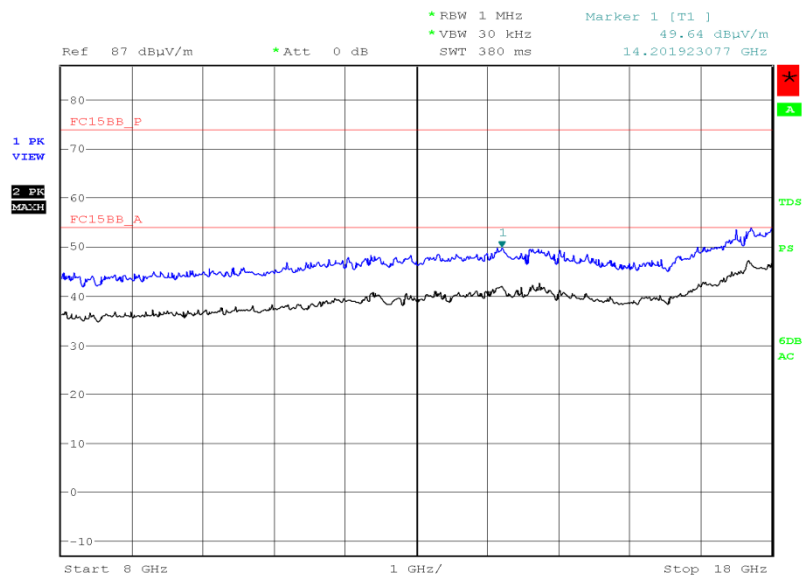
Date: 20.NOV.2014 04:04:19

3 GHz to 8 GHz

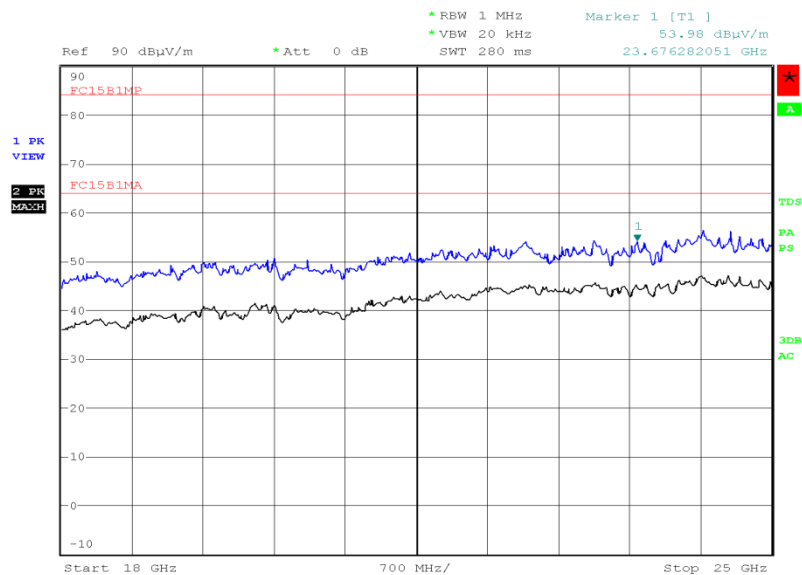
Date: 21.NOV.2014 03:13:26



Product Service

8 GHz to 18 GHz

Date: 4.DEC.2014 20:20:04

18 GHz to 25 GHz

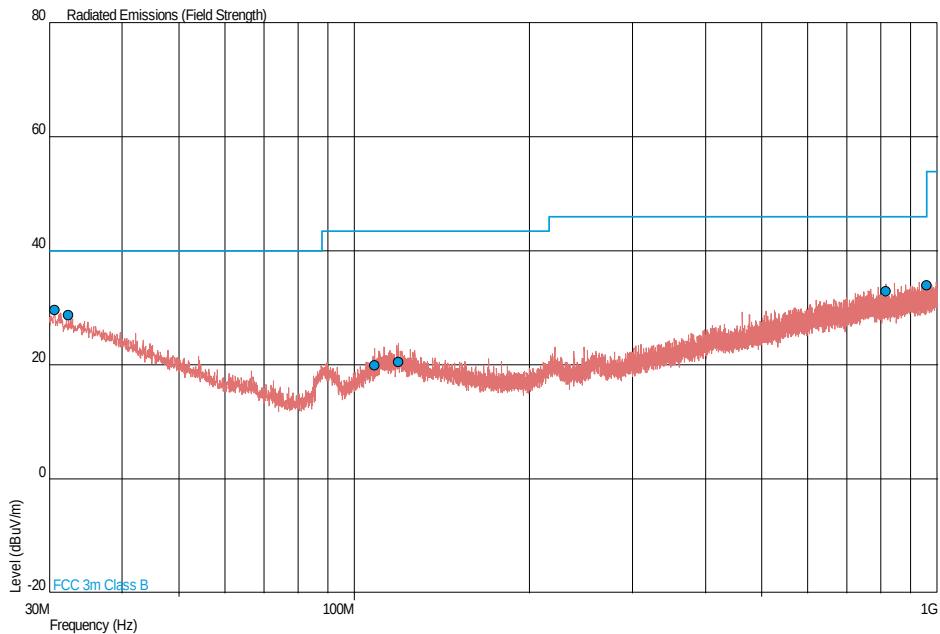
Date: 6.DEC.2014 00:55:09



Product Service

2462 MHz

30 MHz to 1 GHz

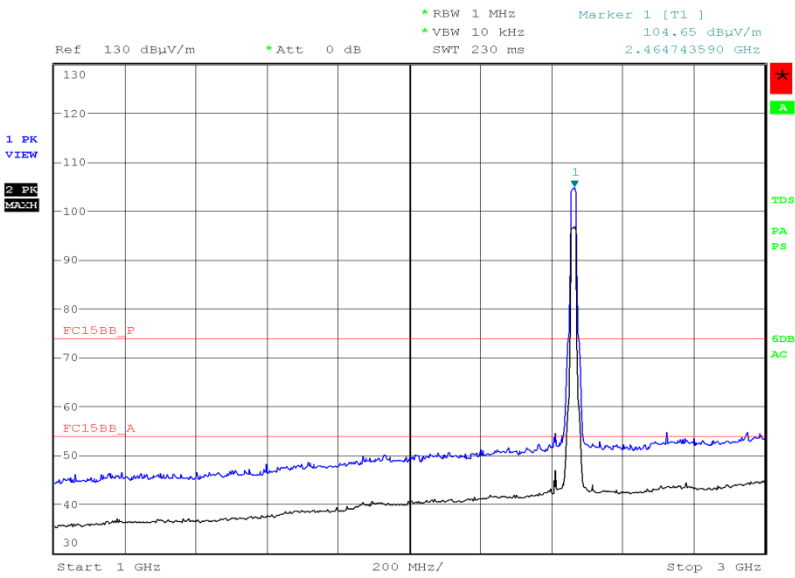


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.625	29.6	30.2	40.0	100	-10.4	-69.8	197	1.00	Vertical
32.374	28.8	27.5	40.0	100	-11.2	-72.5	1	1.00	Horizontal
108.397	20.0	10.0	43.5	150	-23.5	-140.0	131	1.00	Vertical
118.978	20.6	10.7	43.5	150	-22.9	-139.3	177	1.00	Vertical
817.244	32.9	44.2	46.0	200	-13.1	-155.8	8	2.94	Vertical
959.787	34.0	50.1	46.0	200	-12.0	-149.9	42	2.53	Horizontal



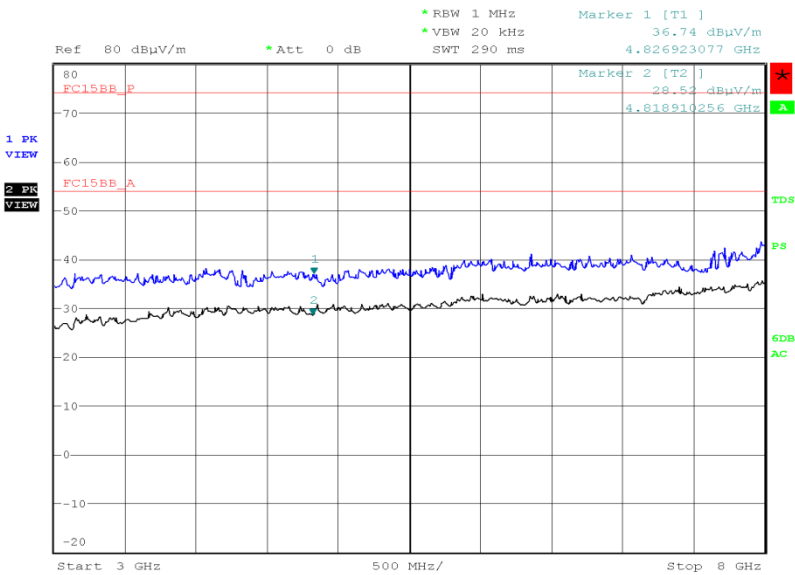
Product Service

1 GHz to 3 GHz



Date: 20.NOV.2014 03:59:29

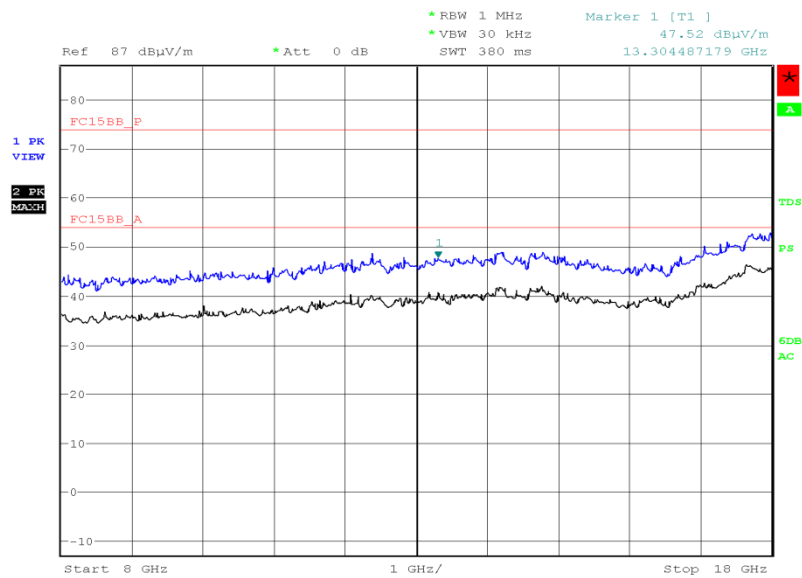
3 GHz to 8 GHz



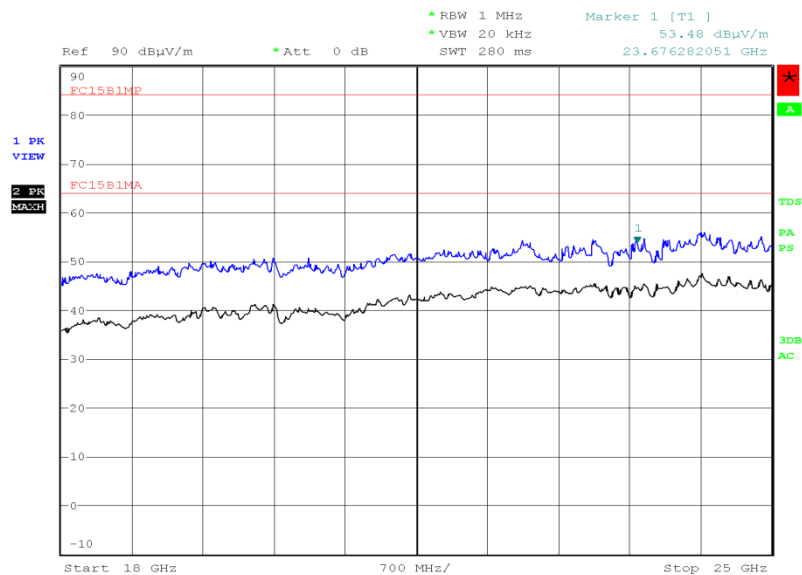
Date: 21.NOV.2014 03:19:04



Product Service

8 GHz to 18 GHz

Date: 4.DEC.2014 20:28:01

18 GHz to 25 GHz

Date: 6.DEC.2014 01:17:01

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.

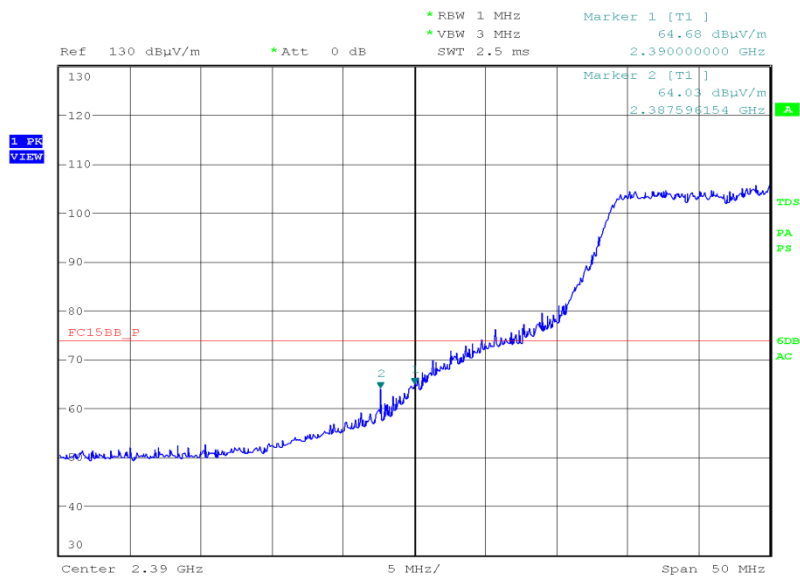


Product Service

Band Edge Emissions

Modulation/Data Rate: OFDM/12 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	64.68	47.94
2483.50	64.12	46.80

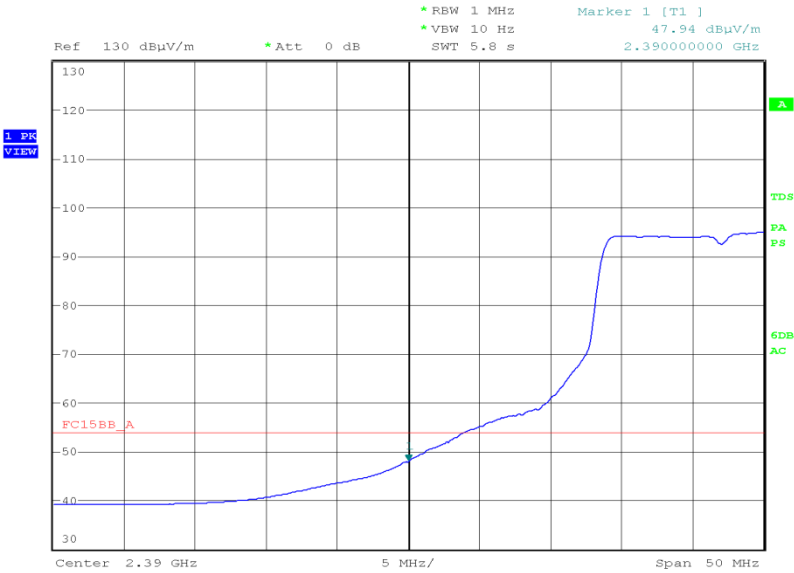
2390.00 MHzFinal Peak

Date: 20.NOV.2014 23:39:12



Product Service

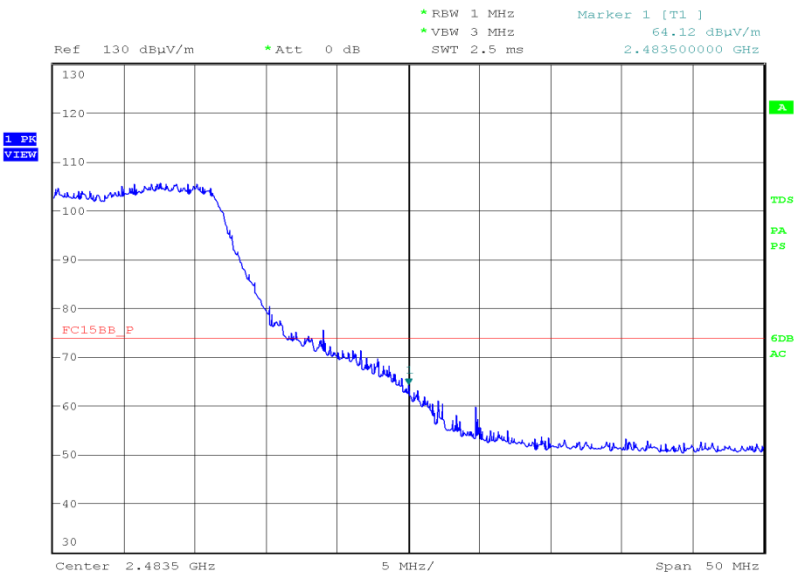
Final Average



Date: 20.NOV.2014 23:38:21

2483.50 MHz

Final Peak

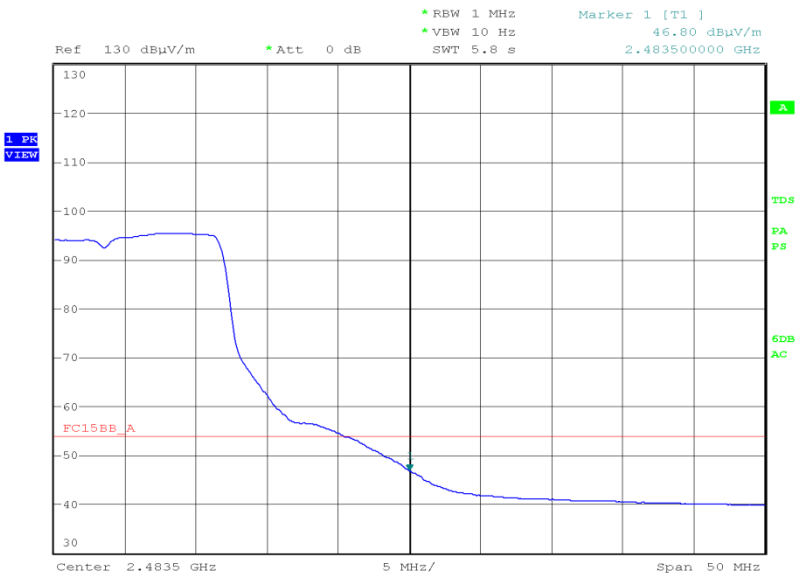


Date: 21.NOV.2014 00:03:10



Product Service

Final Average



Date: 20.NOV.2014 23:11:57

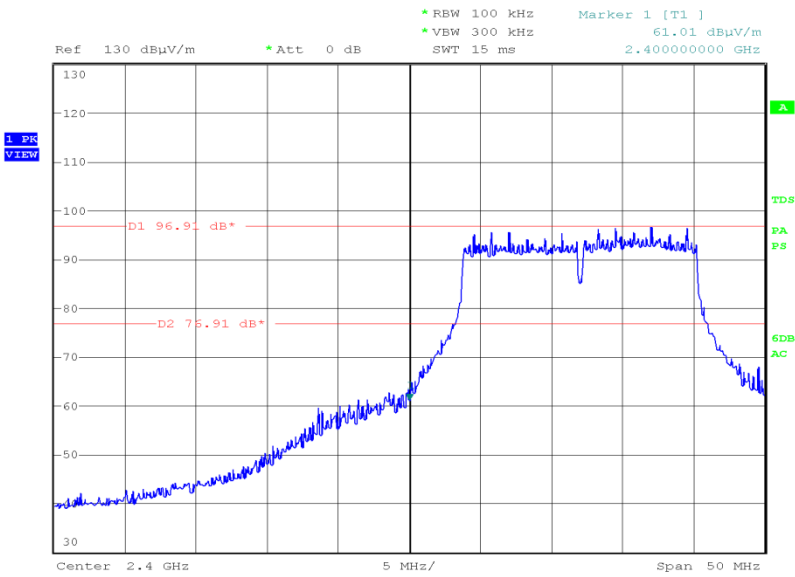


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	61.01
2483.50	47.52

2400.00 MHz

Final Peak



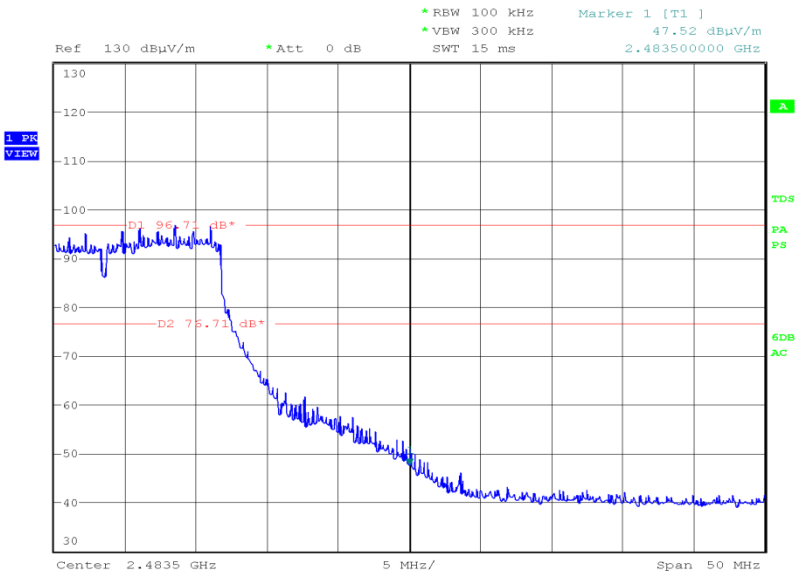
Date: 20.NOV.2014 23:40:40



Product Service

2483.50 MHz

Final Peak

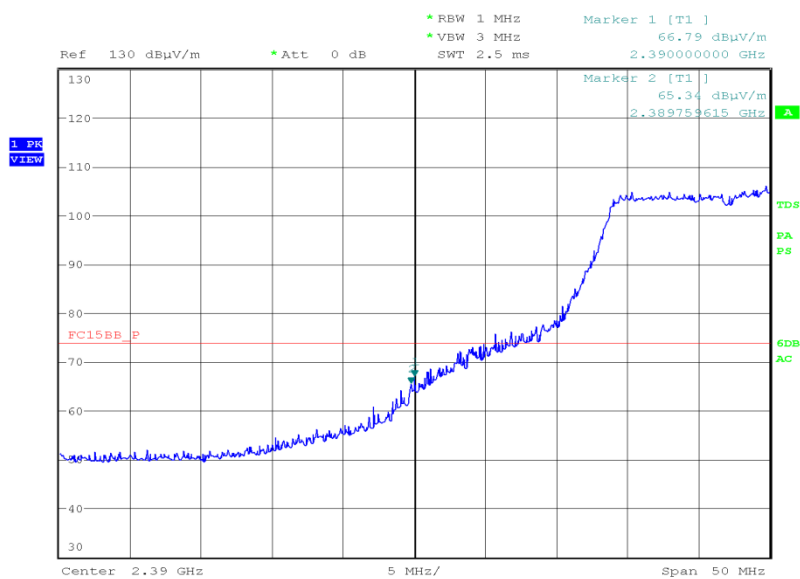


Date: 20.NOV.2014 23:10:37



Modulation/Data Rate: OFDM/54 Mbps

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	66.79	46.96
2483.50	66.59	45.64

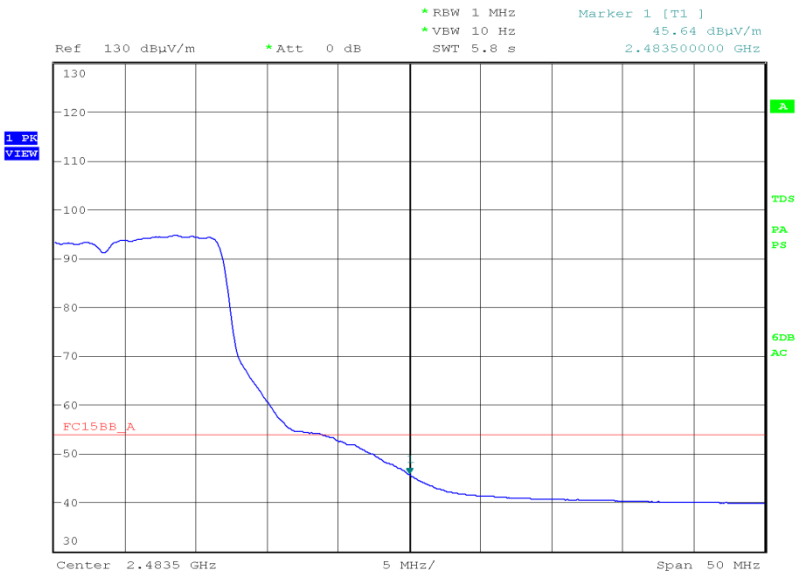
2390.00 MHzFinal Peak

Date: 20.NOV.2014 23:45:00



Product Service

Final Average



Date: 20.NOV.2014 23:26:07

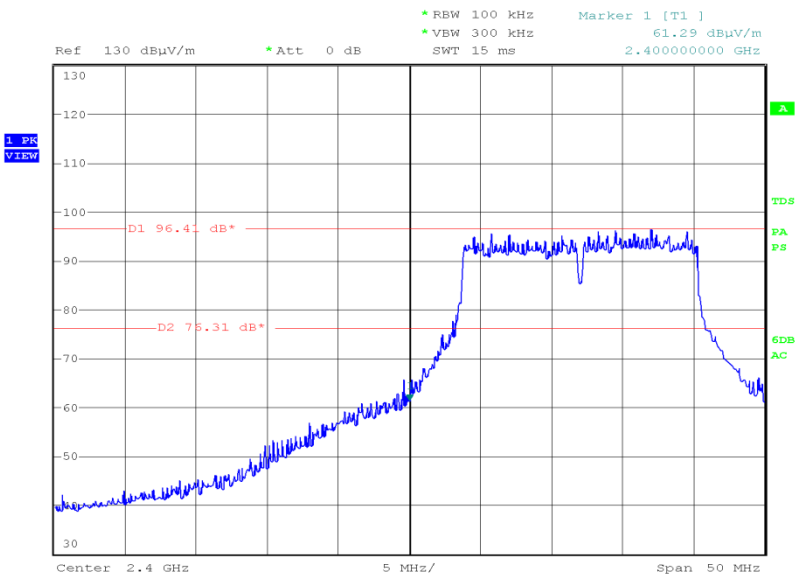


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	61.29
2483.50	47.46

2400.00 MHz

Final Peak



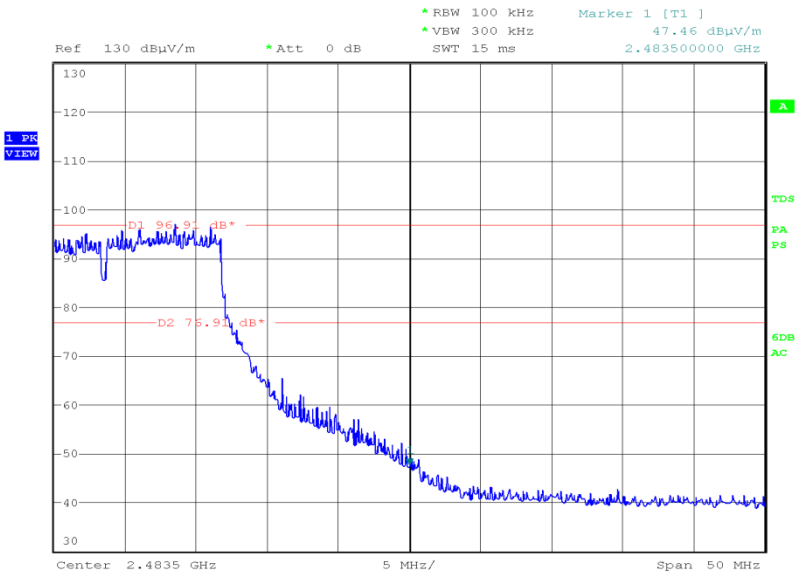
Date: 20.NOV.2014 23:43:04



Product Service

2483.50 MHz

Final Peak



Date: 20.NOV.2014 23:27:40

Remark

The test was performed on 54 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

The test was performed on 12 Mbps because this was deemed the worst case data rate for Conducted Output Power.

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

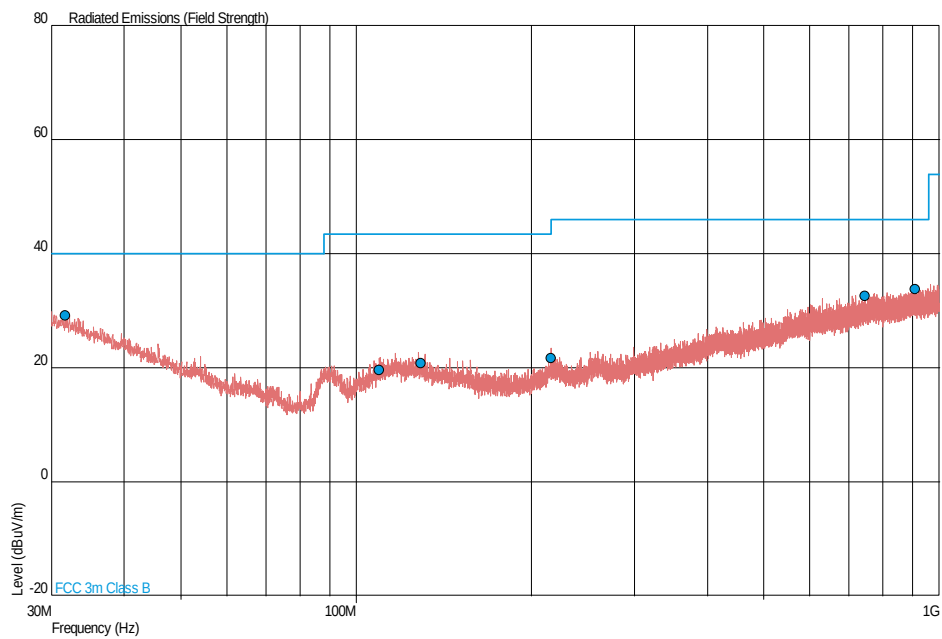
Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These emissions outside the restricted bands shall be 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

802.11(n)

4.0 V DC Supply

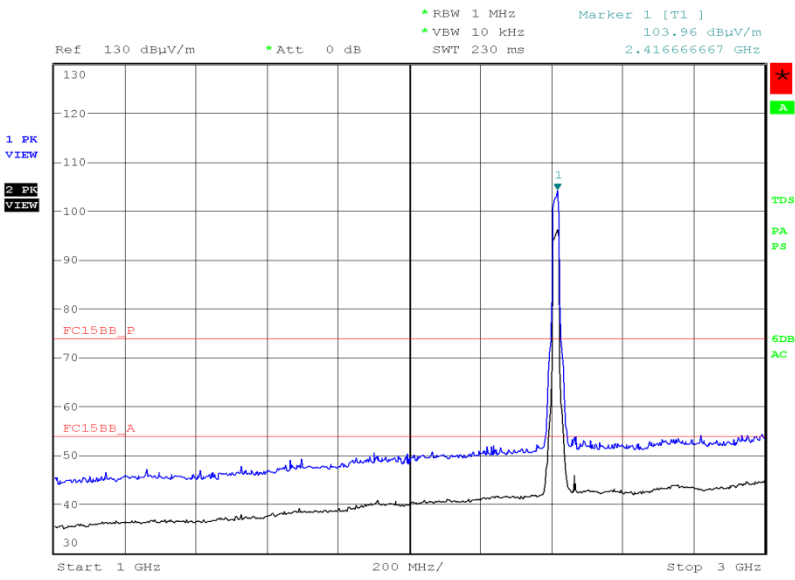
Spurious Radiated Emissions2412 MHz30 MHz to 1 GHz

Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
31.723	29.1	28.5	40.0	100	-10.9	-71.5	49	3.39	Vertical
109.495	19.7	9.7	43.5	150	-23.8	-140.3	264	1.00	Vertical
129.185	20.8	11.0	43.5	150	-22.7	-139.0	10	1.00	Vertical
215.977	21.8	12.3	43.5	150	-21.7	-137.7	66	1.00	Vertical
746.292	32.6	42.7	46.0	200	-13.4	-157.3	195	4.00	Vertical
907.709	33.8	49.0	46.0	200	-12.2	-151.0	270	1.00	Vertical



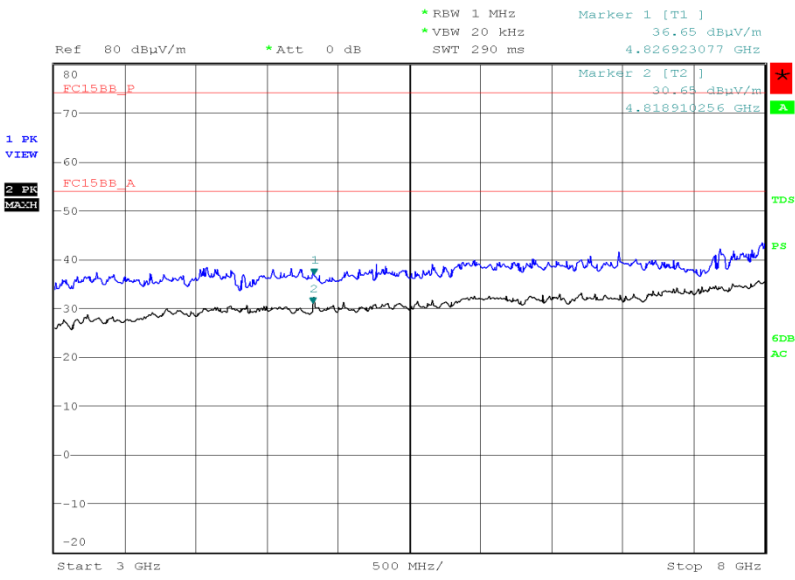
Product Service

1 GHz to 3 GHz



Date: 20.NOV.2014 03:51:23

3 GHz to 8 GHz

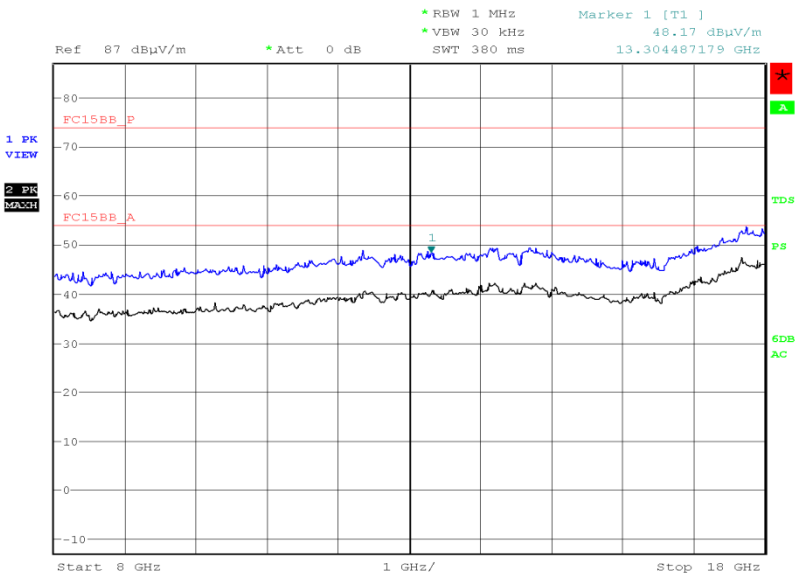


Date: 21.NOV.2014 03:25:52



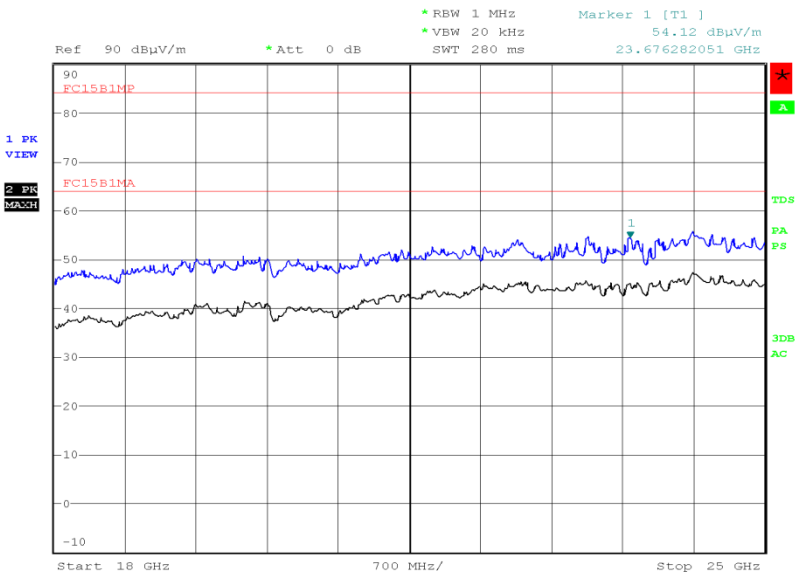
Product Service

8 GHz to 18 GHz



Date: 4.DEC.2014 20:47:21

18 GHz to 25 GHz

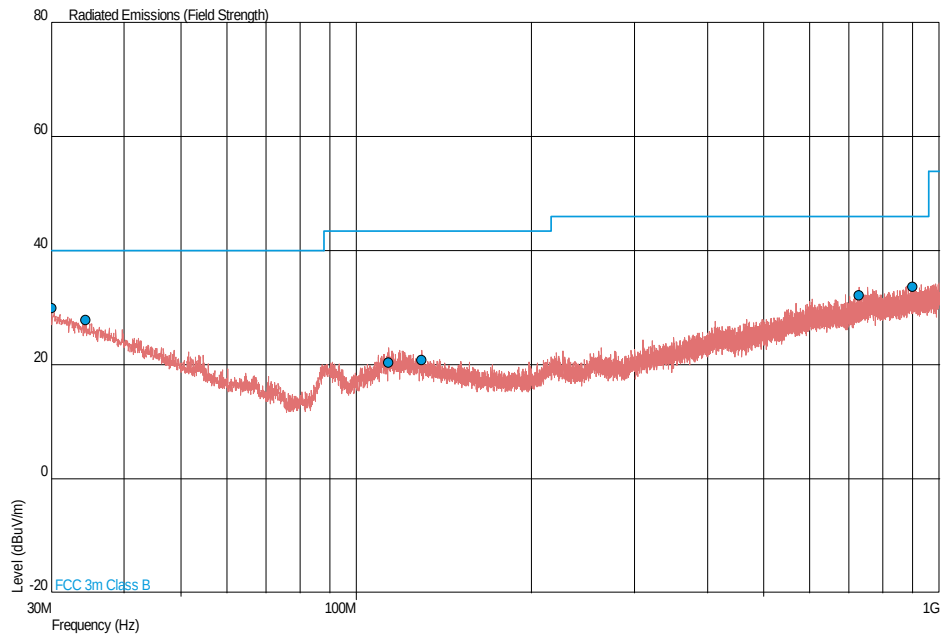


Date: 6.DEC.2014 01:43:50



2437 MHz

30 MHz to 1 GHz

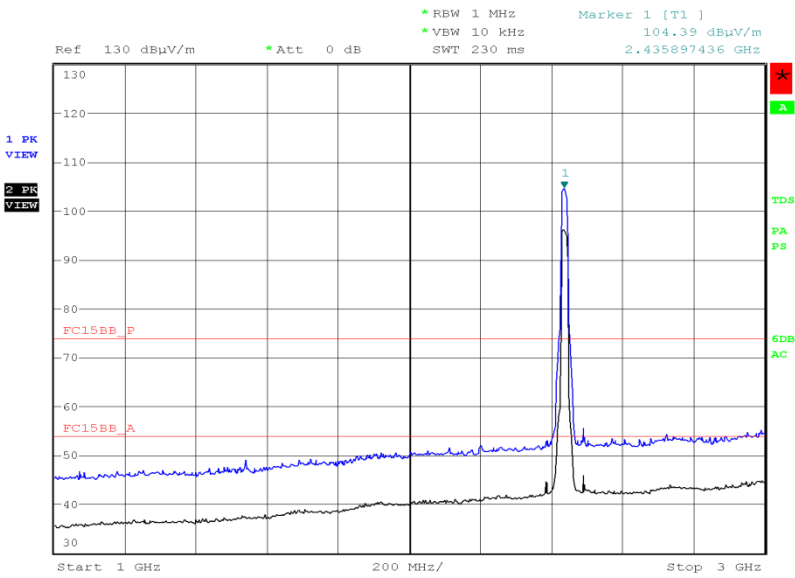


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.048	29.9	31.3	40.0	100	-10.1	-68.7	258	3.82	Horizontal
34.367	27.9	24.8	40.0	100	-12.1	-75.2	265	1.20	Vertical
113.600	20.4	10.5	43.5	150	-23.1	-139.5	337	1.00	Vertical
129.558	20.8	11.0	43.5	150	-22.7	-139.0	235	1.20	Vertical
728.146	32.1	40.3	46.0	200	-13.9	-159.7	174	1.00	Horizontal
900.593	33.7	48.4	46.0	200	-12.3	-151.6	359	2.92	Vertical



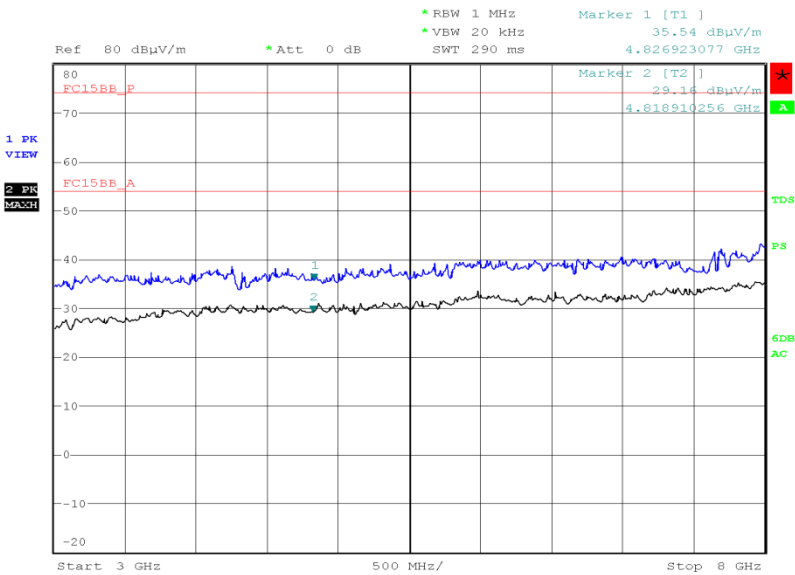
Product Service

1 GHz to 3 GHz



Date: 20.NOV.2014 03:44:28

3 GHz to 8 GHz

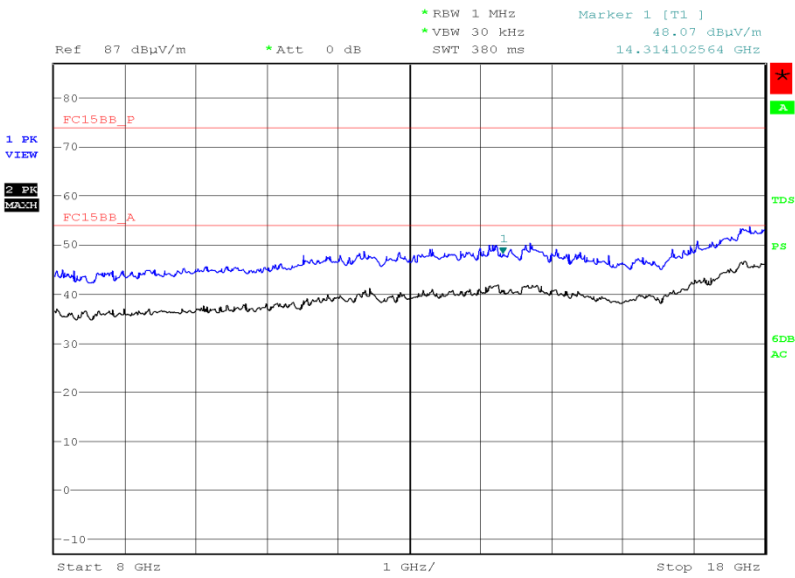


Date: 21.NOV.2014 03:33:51



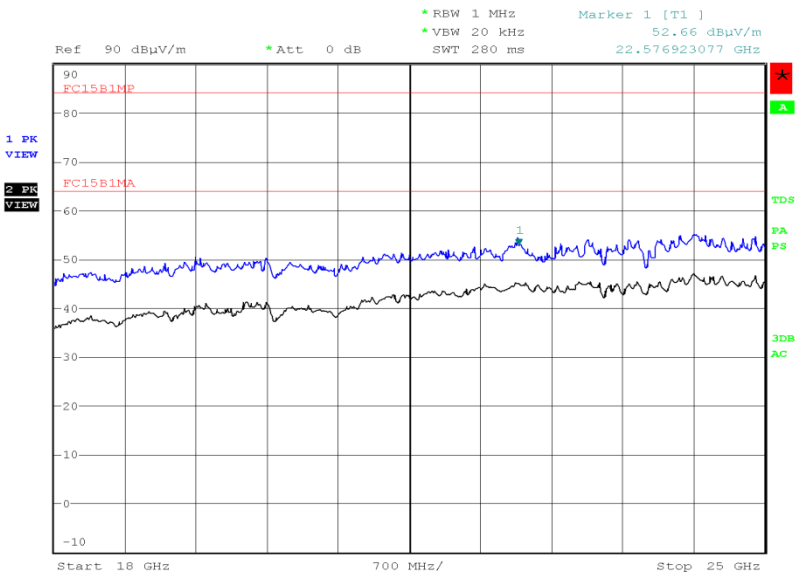
Product Service

8 GHz to 18 GHz



Date: 4.DEC.2014 21:15:25

18 GHz to 25 GHz



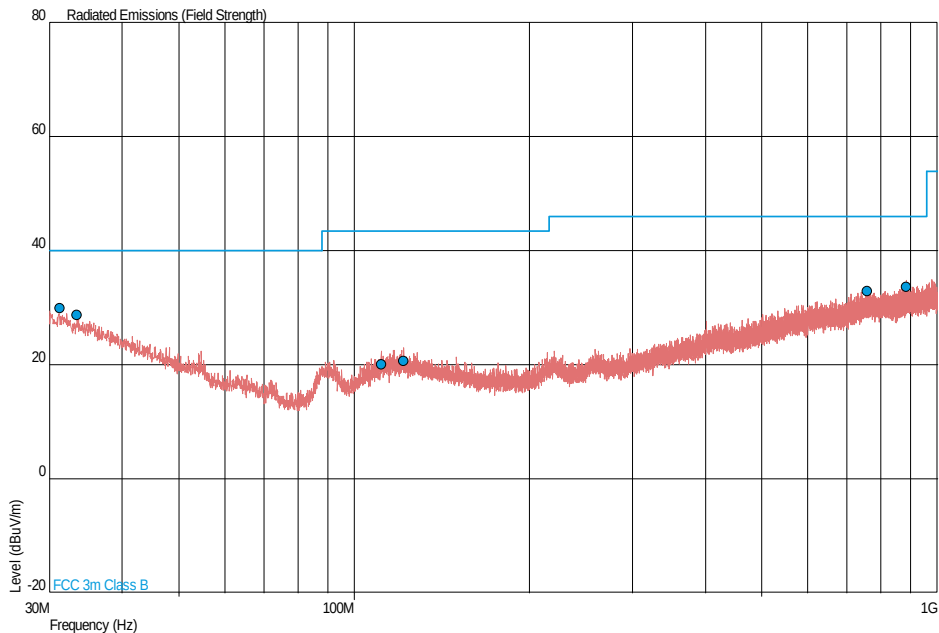
Date: 6.DEC.2014 02:01:38



Product Service

2462 MHz

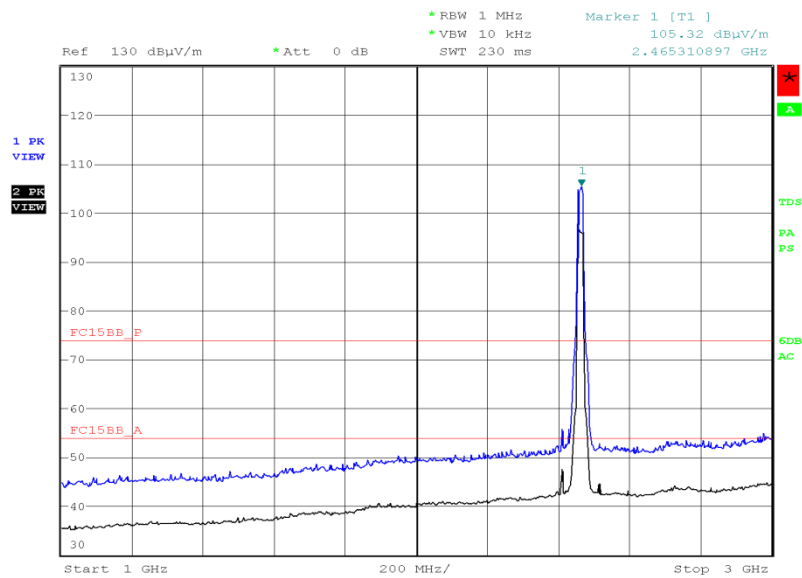
30 MHz to 1 GHz



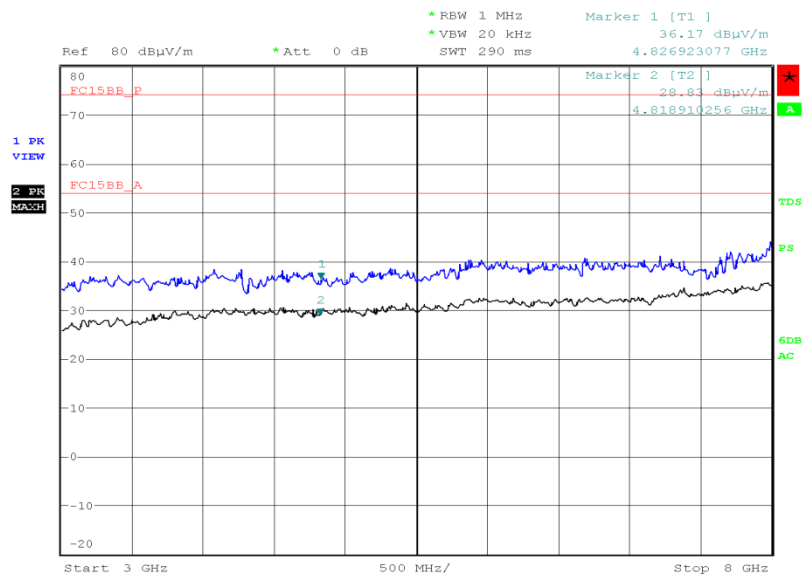
Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
31.234	29.9	31.3	40.0	100	-10.1	-68.7	73	1.00	Vertical
33.436	28.7	27.2	40.0	100	-11.3	-72.8	253	1.00	Horizontal
111.221	20.1	10.1	43.5	150	-23.4	-139.9	281	1.00	Vertical
121.626	20.6	10.7	43.5	150	-22.9	-139.3	0	1.00	Vertical
758.518	32.9	44.2	46.0	200	-13.1	-155.8	341	1.00	Horizontal
883.657	33.6	47.9	46.0	200	-12.4	-152.1	83	1.00	Horizontal



Product Service

1 GHz to 3 GHz

Date: 20.NOV.2014 03:25:30

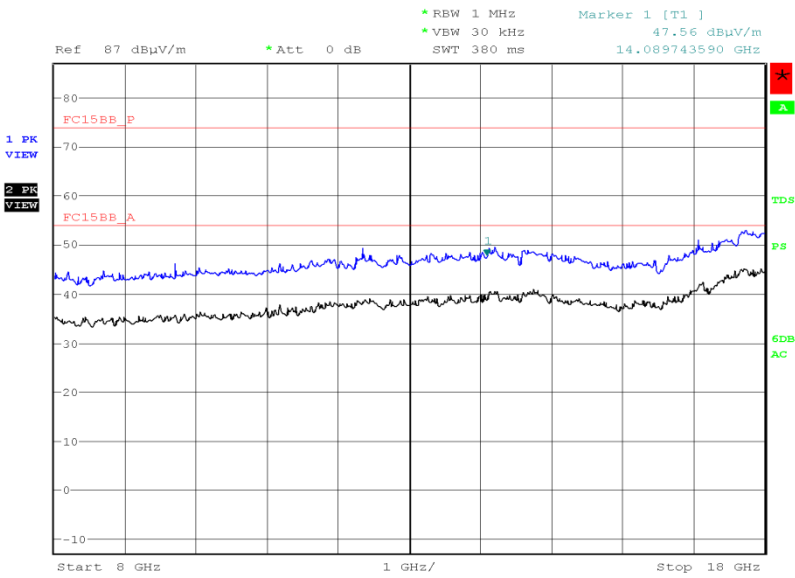
3 GHz to 8 GHz

Date: 21.NOV.2014 03:40:14



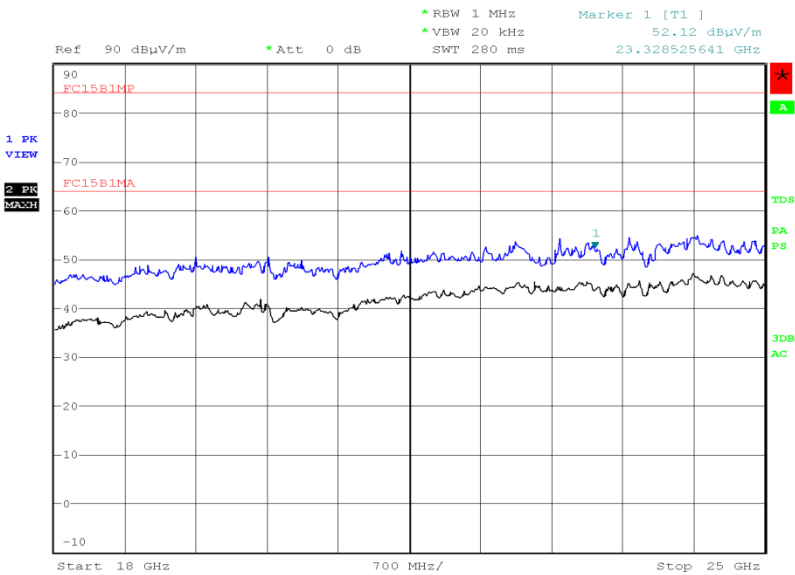
Product Service

8 GHz to 18 GHz



Date: 4.DEC.2014 21:34:12

18 GHz to 25 GHz



Date: 6.DEC.2014 02:11:03

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.



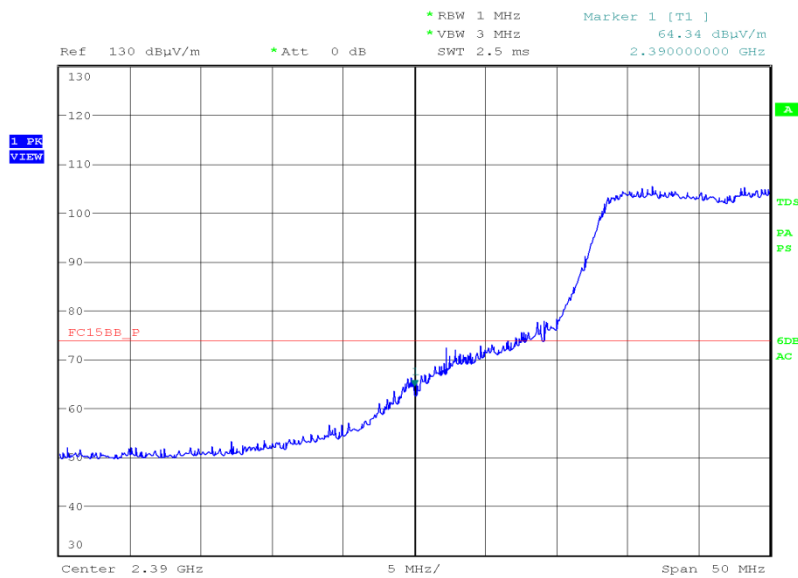
Band Edge Emissions

Modulation/Data Rate: OFDM/MCS2

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	64.34	48.12
2483.50	63.38	47.30

2390.00 MHz

Final Peak

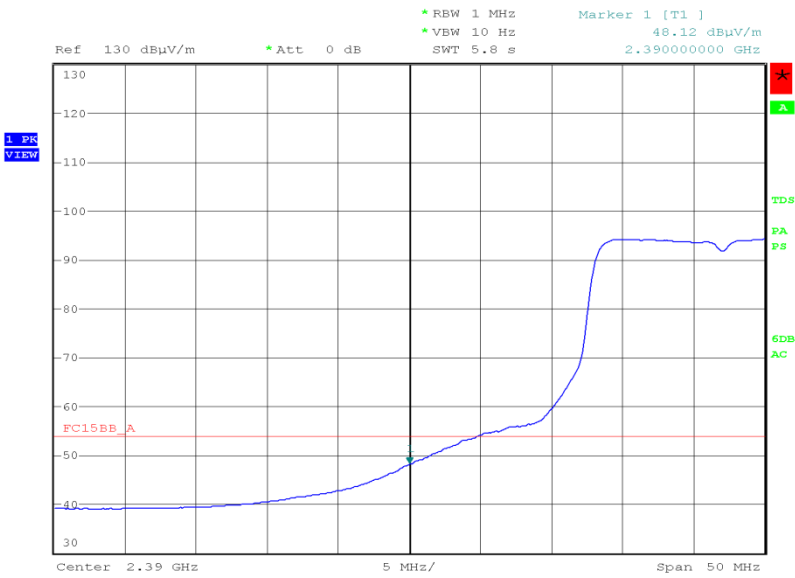


Date: 20.NOV.2014 21:56:26



Product Service

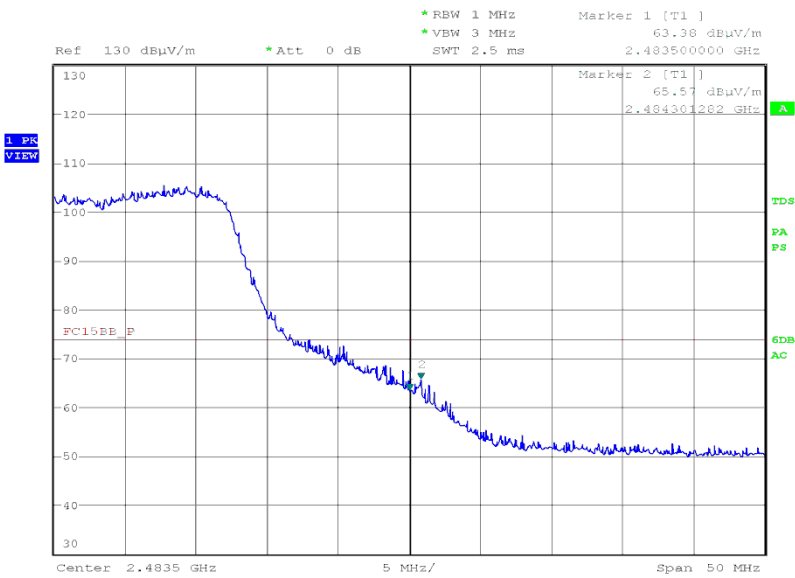
Final Average



Date: 20.NOV.2014 21:57:41

2483.50 MHz

Final Peak

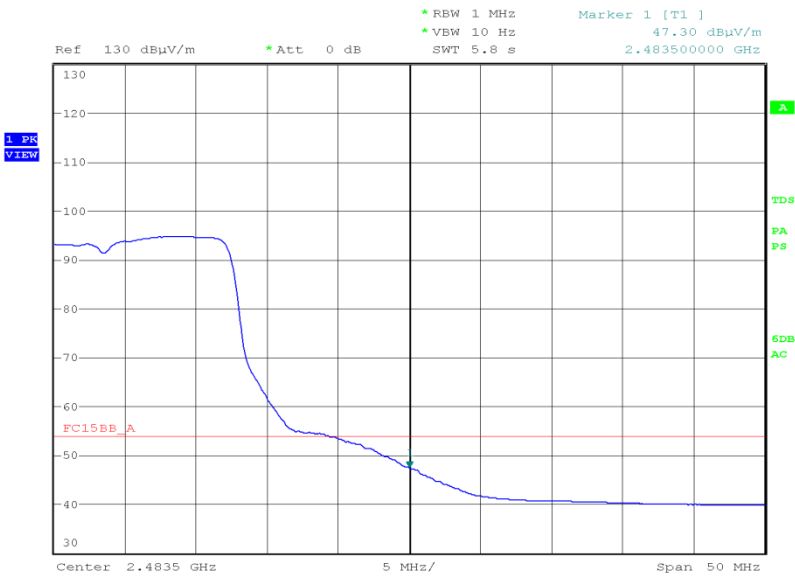


Date: 20.NOV.2014 22:22:08



Product Service

Final Average



Date: 20.NOV.2014 22:52:15

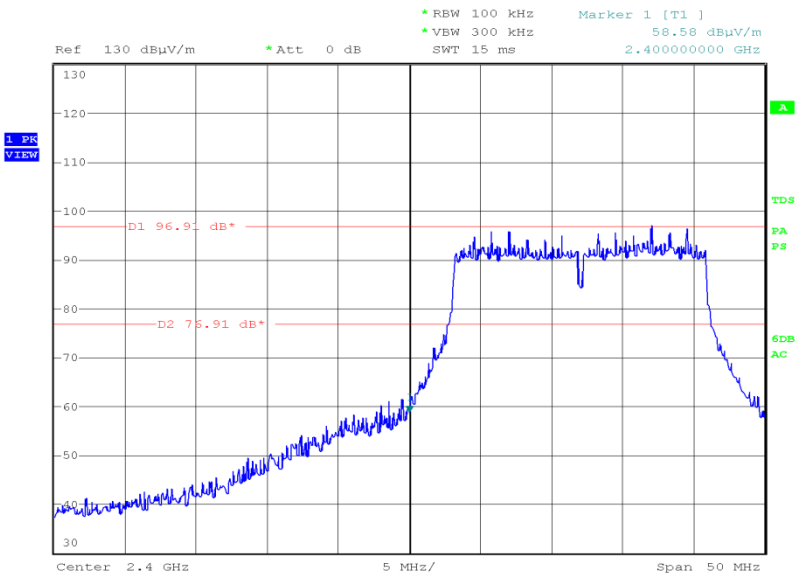


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	58.58
2483.50	47.25

2400.00 MHz

Final Peak



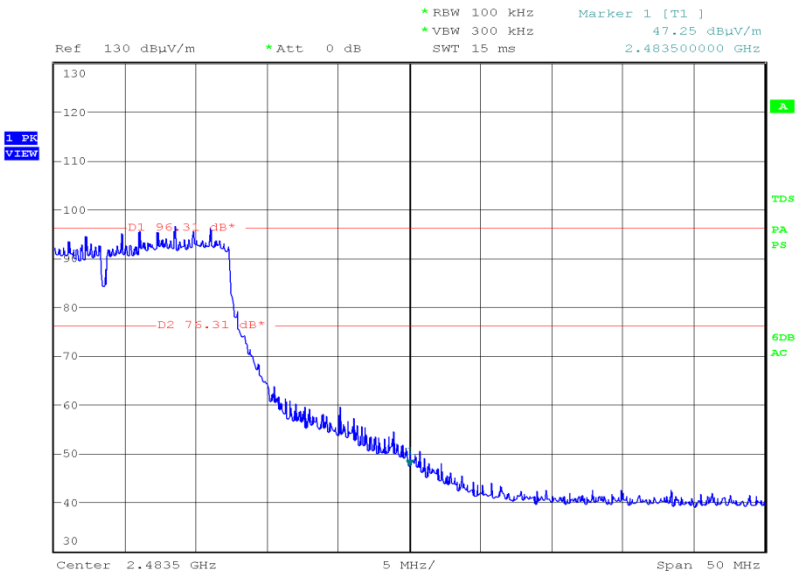
Date: 20.NOV.2014 21:53:53



Product Service

2483.50 MHz

Final Peak



Date: 20.NOV.2014 22:20:56



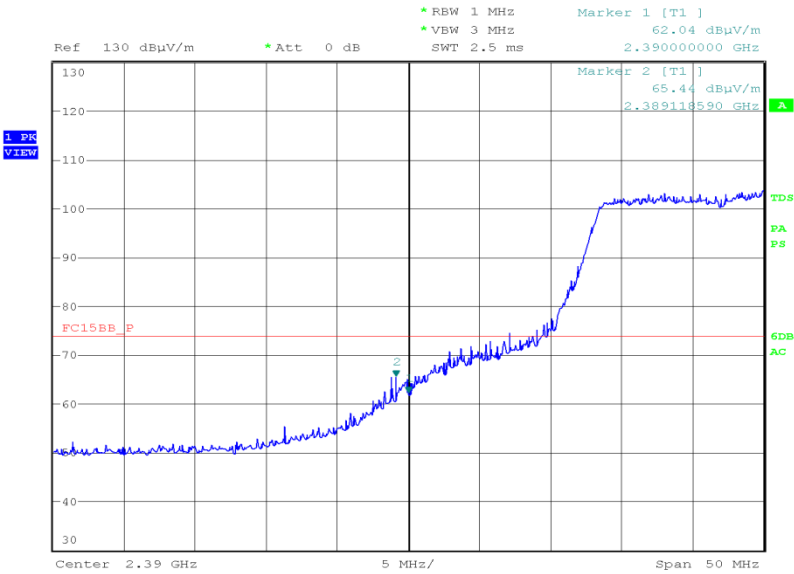
Product Service

Modulation/Data Rate: OFDM/MCS7

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	62.04	47.24
2483.50	64.08	47.18

2390.00 MHz

Final Peak

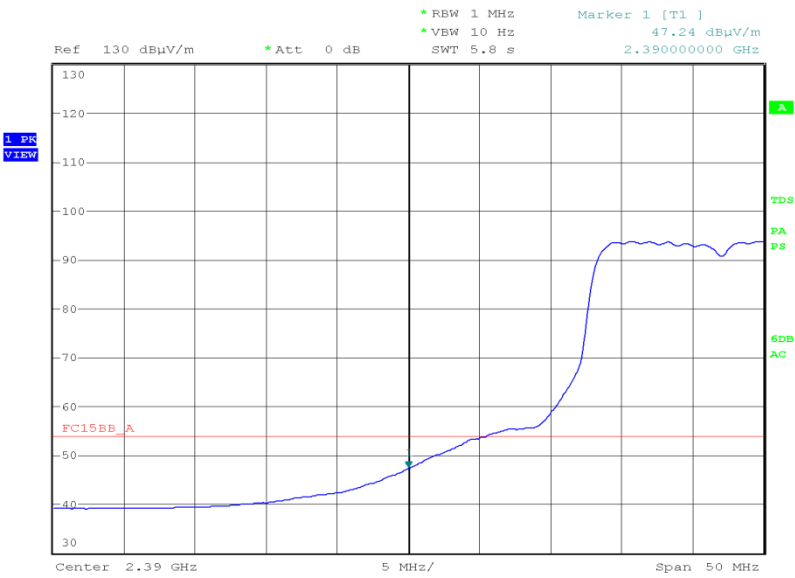


Date: 20.NOV.2014 23:31:38



Product Service

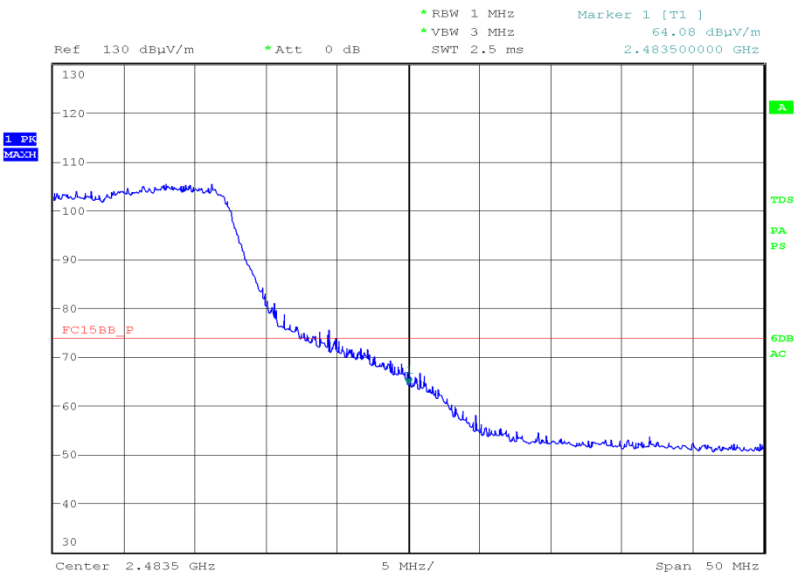
Final Average



Date: 20.NOV.2014 21:59:42

2483.50 MHz

Final Peak

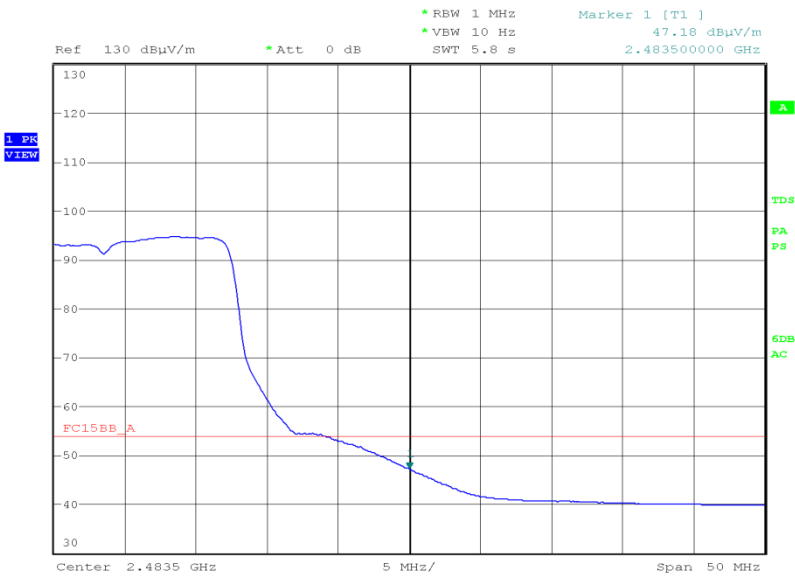


Date: 20.NOV.2014 22:28:07



Product Service

Final Average



Date: 20.NOV.2014 22:27:05

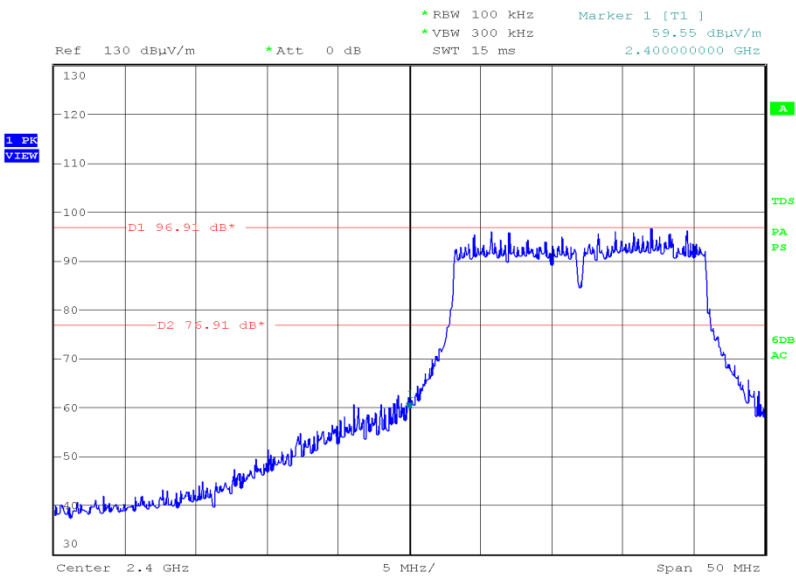


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	59.55
2483.50	48.78

2400.00 MHz

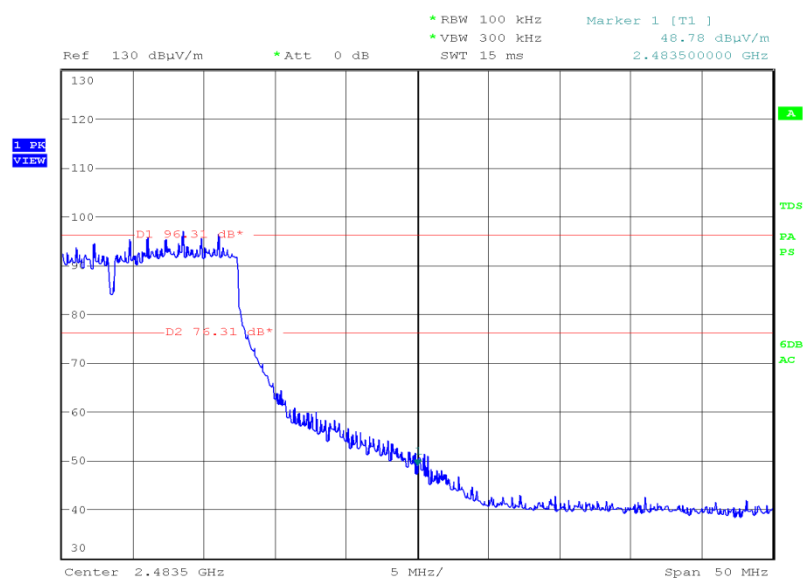
Final Peak



Date: 20.NOV.2014 22:02:58



Product Service

2483.50 MHzFinal Peak

Date: 20.NOV.2014 22:29:14

Remark

The test was performed on MCS7 because this was deemed the worst case data rate for 6 dB Bandwidth.

The test was performed on MCS2 because this was deemed the worst case data rate for Conducted Output Power.

Limit

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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.

Bluetooth Low Energy

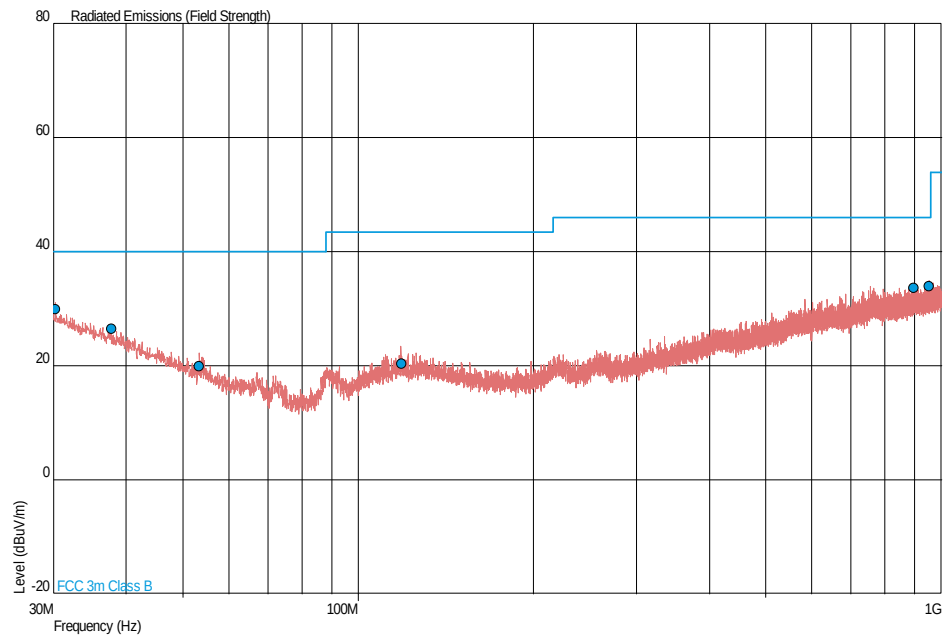
4.0 V DC Supply



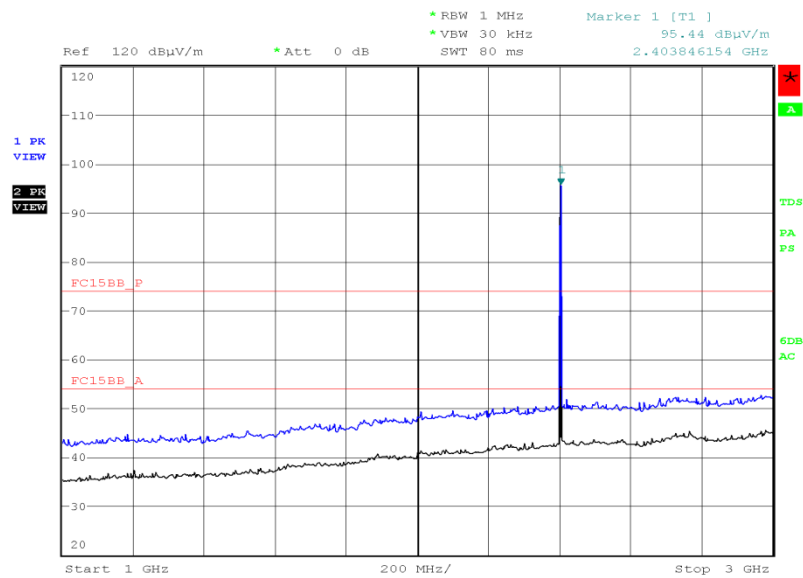
Spurious Radiated Emissions

2402 MHz

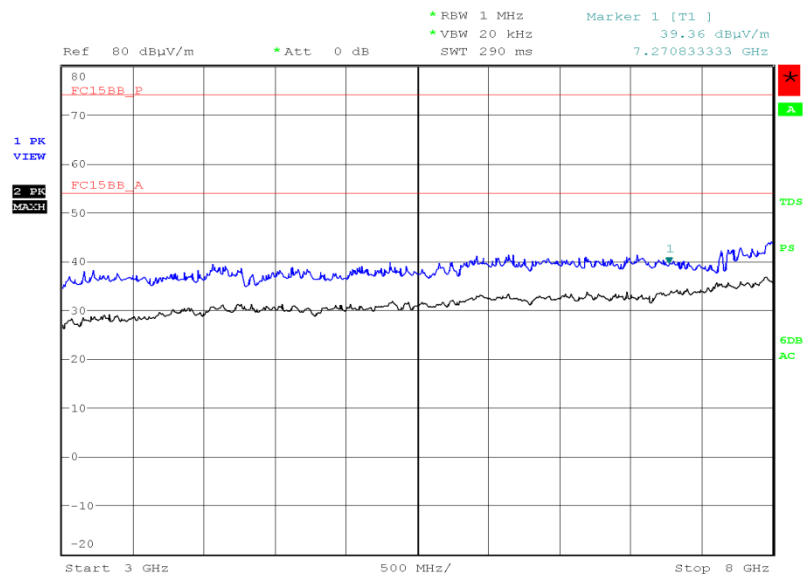
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
30.295	29.9	31.3	40.0	100	-10.1	-68.7	55	1.00	Horizontal
37.751	26.5	21.1	40.0	100	-13.5	-78.9	137	1.00	Horizontal
53.428	19.9	9.9	40.0	100	-20.1	-90.1	83	1.00	Vertical
118.897	20.4	10.5	43.5	150	-23.1	-139.5	235	1.00	Vertical
897.268	33.6	47.9	46.0	200	-12.4	-152.1	170	2.73	Vertical
953.797	34.0	50.1	46.0	200	-12.0	-149.9	31	2.44	Horizontal

1 GHz to 3 GHz

Date: 30.NOV.2014 02:10:52

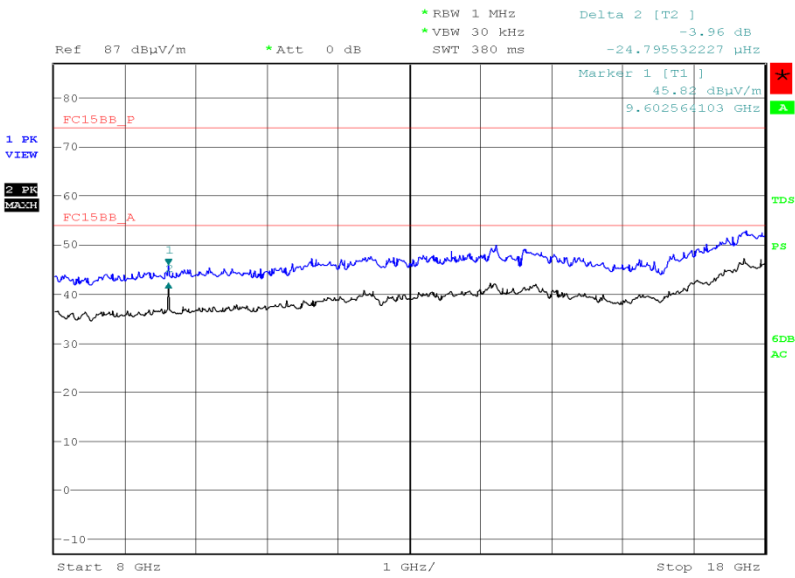
3 GHz to 8 GHz

Date: 4.DEC.2014 22:50:35



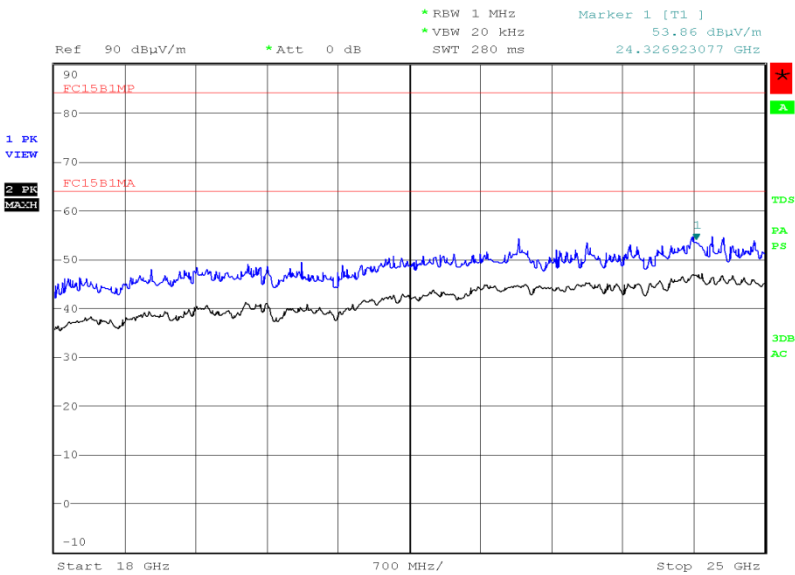
Product Service

8 GHz to 18 GHz



Date: 4.DEC.2014 22:12:30

18 GHz to 25 GHz

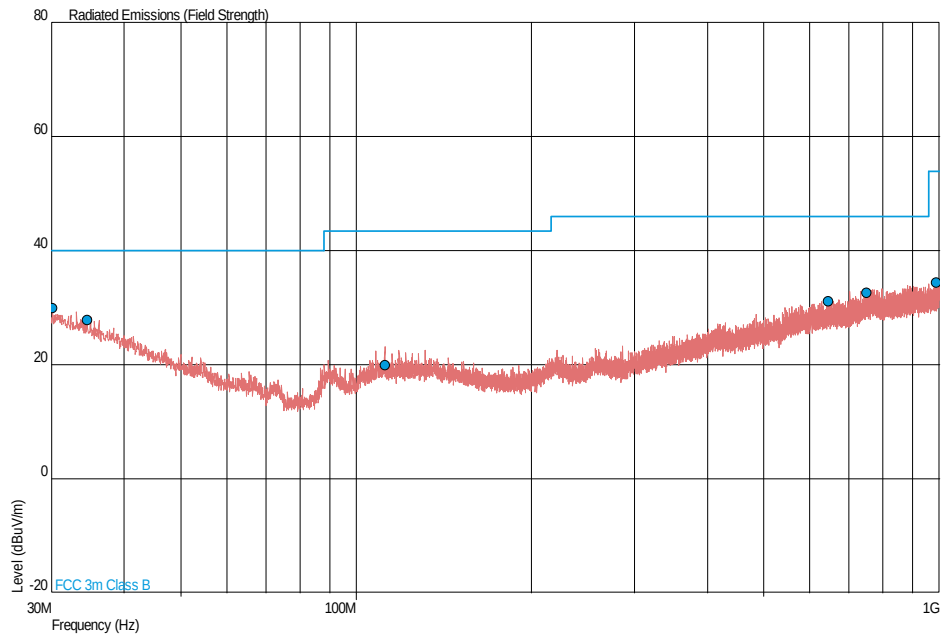


Date: 5.DEC.2014 22:46:08



2441 MHz

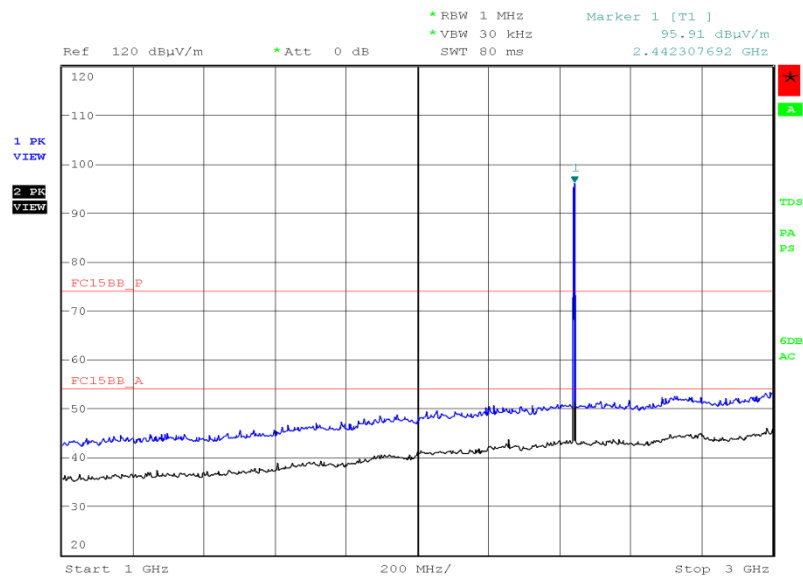
30 MHz to 1 GHz



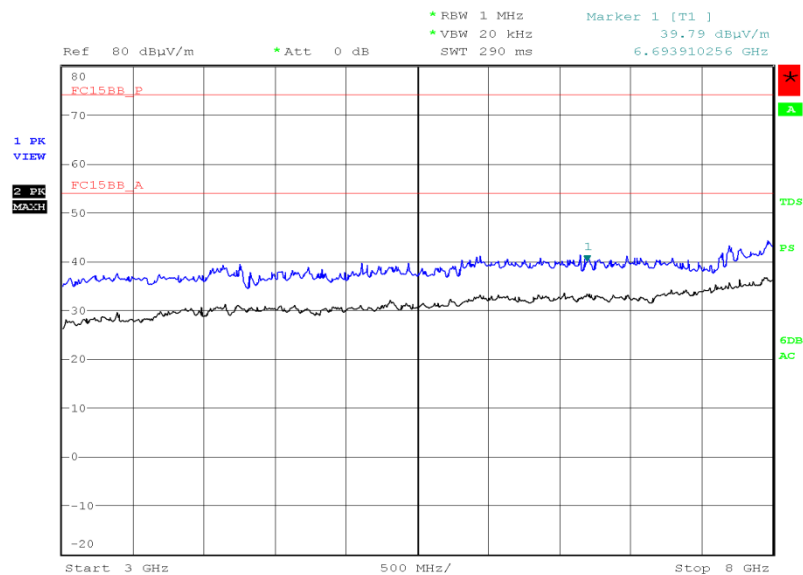
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.146	29.9	31.3	40.0	100	-10.1	-68.7	170	2.96	Horizontal
34.560	27.8	24.5	40.0	100	-12.2	-75.5	360	1.00	Vertical
111.947	20.0	10.0	43.5	150	-23.5	-140.0	62	1.02	Vertical
645.184	31.1	35.9	46.0	200	-14.9	-164.1	226	1.00	Horizontal
751.208	32.7	43.2	46.0	200	-13.3	-156.8	152	3.37	Vertical
988.324	34.4	52.5	54.0	501	-19.6	-448.5	123	1.00	Vertical



Product Service

1 GHz to 3 GHz

Date: 30.NOV.2014 02:16:58

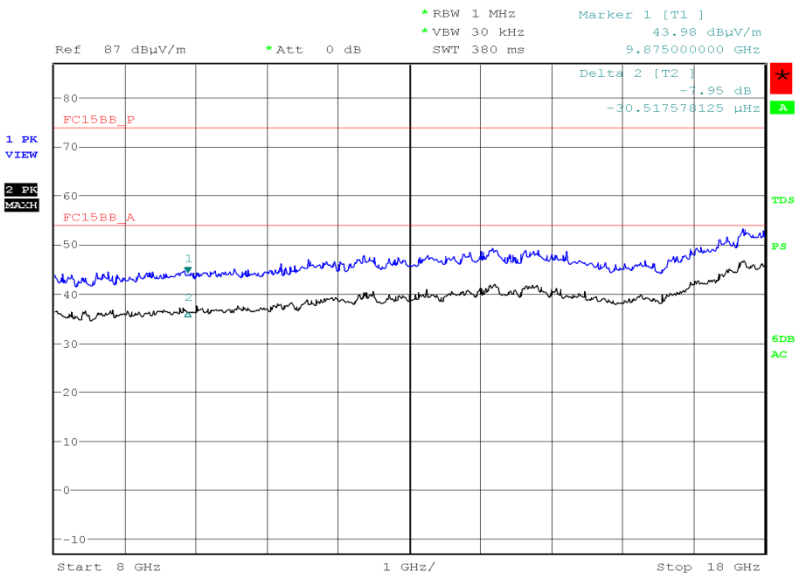
3 GHz to 8 GHz

Date: 4.DEC.2014 22:58:25



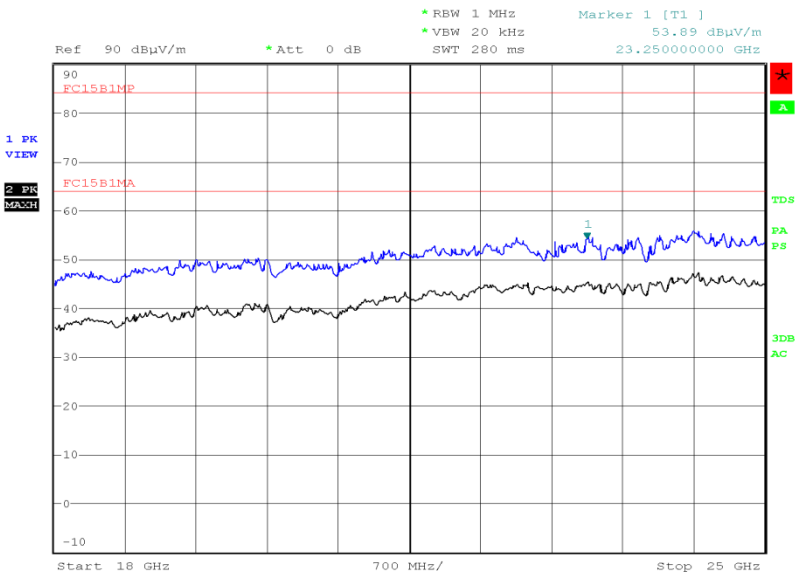
Product Service

8 GHz to 18 GHz

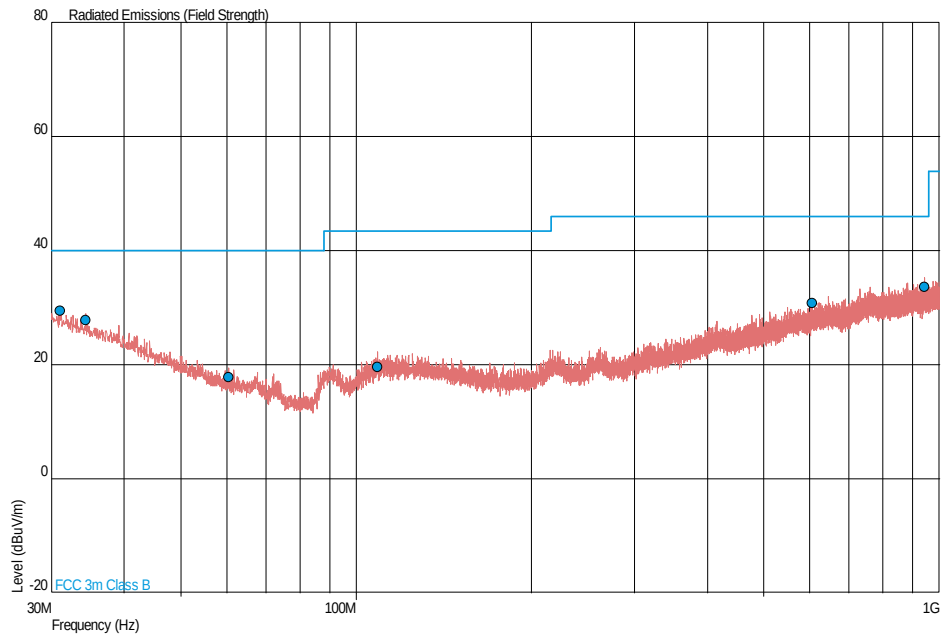


Date: 4.DEC.2014 22:19:20

18 GHz to 25 GHz



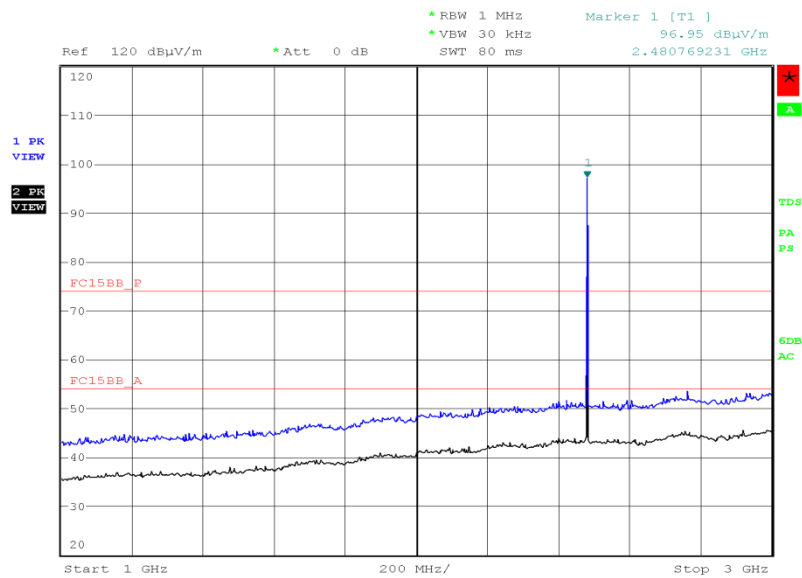
Date: 5.DEC.2014 22:58:58

2480 MHz30 MHz to 1 GHz

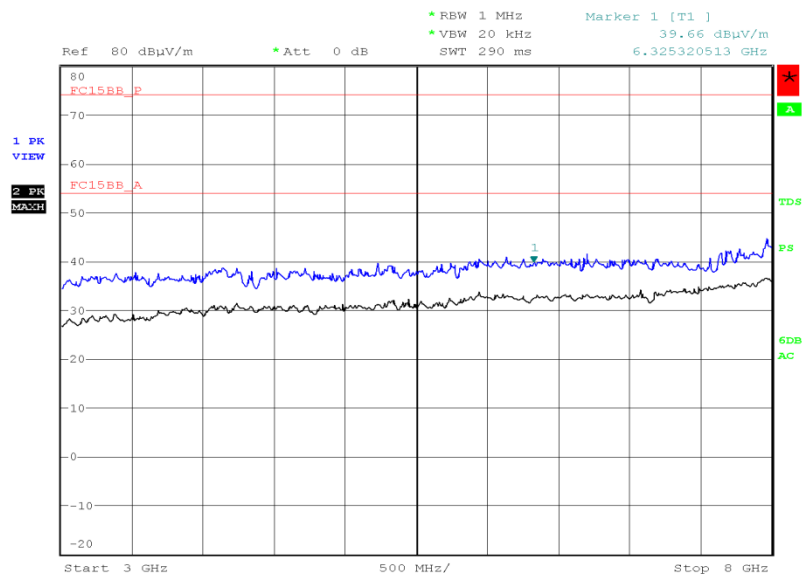
Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
31.079	29.4	29.5	40.0	100	-10.6	-70.5	238	1.16	Horizontal
34.415	27.9	24.8	40.0	100	-12.1	-75.2	33	1.00	Vertical
60.489	17.9	7.9	40.0	100	-22.1	-92.1	360	1.00	Vertical
108.916	19.6	9.5	43.5	150	-23.9	-140.5	129	1.29	Vertical
604.298	30.8	34.7	46.0	200	-15.2	-165.3	360	1.79	Vertical
943.122	33.7	48.4	46.0	200	-12.3	-151.6	234	1.30	Vertical



Product Service

1 GHz to 3 GHz

Date: 30.NOV.2014 02:27:54

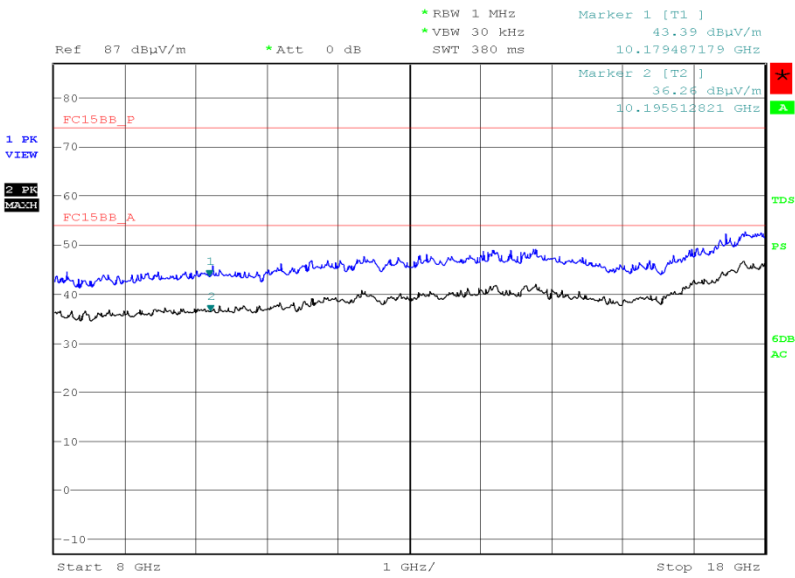
3 GHz to 8 GHz

Date: 4.DEC.2014 23:13:18



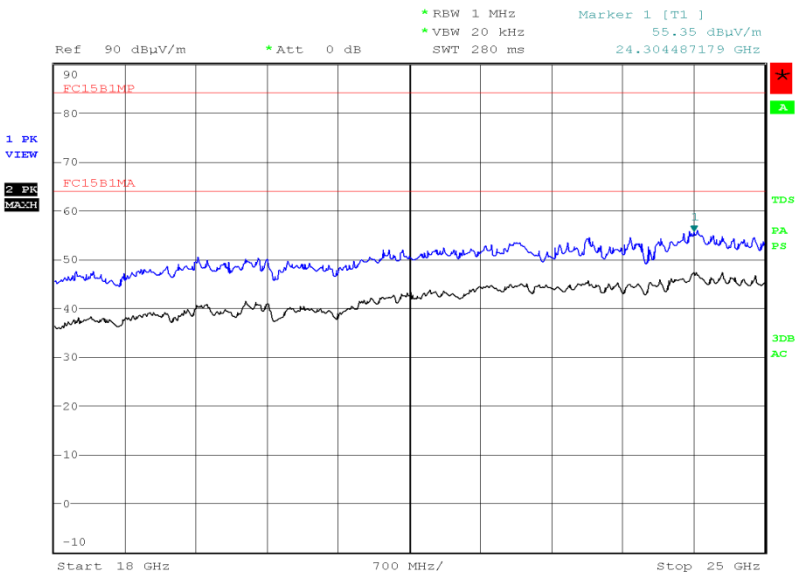
Product Service

8 GHz to 18 GHz



Date: 4.DEC.2014 22:25:29

18 GHz to 25 GHz



Date: 5.DEC.2014 23:11:58

Limit

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(μ V/m)	Average (dB μ V/m)	Peak (dB μ V/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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.

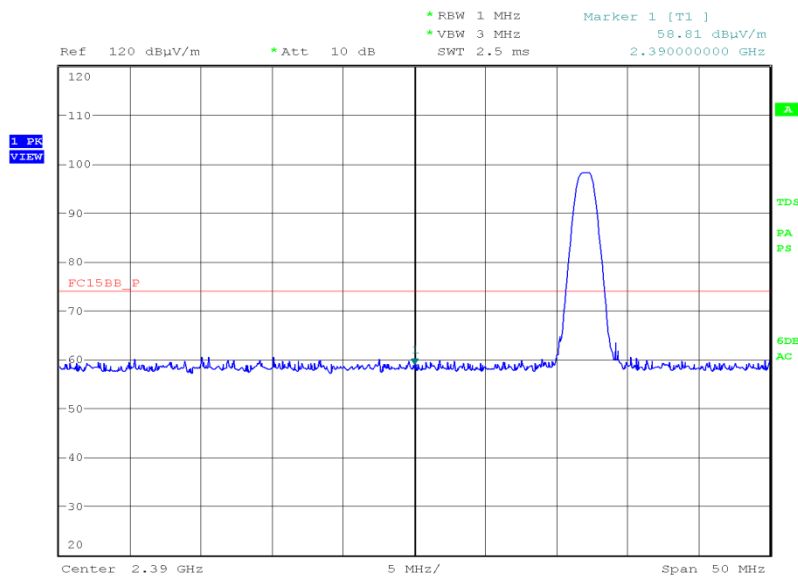


Product Service

Band Edge Emissions

Modulation/Package Type: GFSK/DH1

Restricted Bands of Operation		
Frequency (MHz)	Final Peak (dBμV/m)	Final Average (dBμV/m)
2390.00	58.81	47.79
2483.50	59.45	47.83

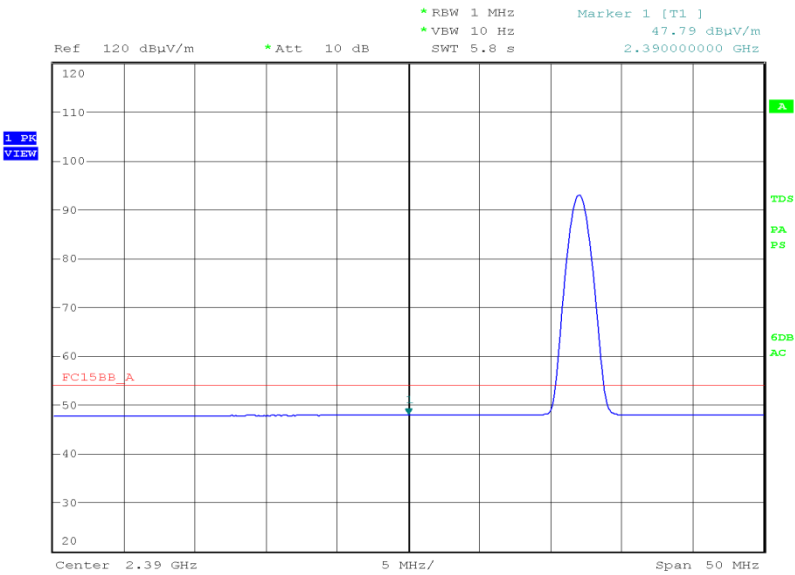
2390.00 MHzFinal Peak

Date: 30.NOV.2014 02:53:57



Product Service

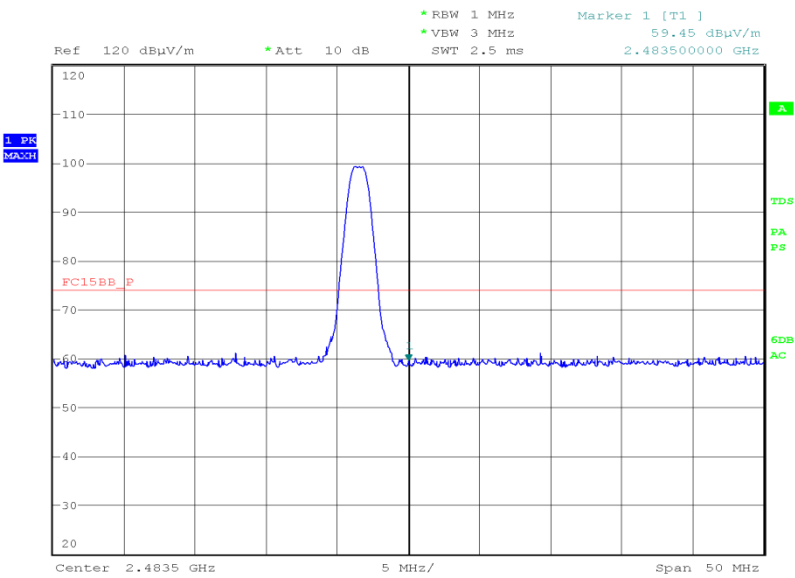
Final Average



Date: 30.NOV.2014 02:56:11

2483.50 MHz

Final Peak

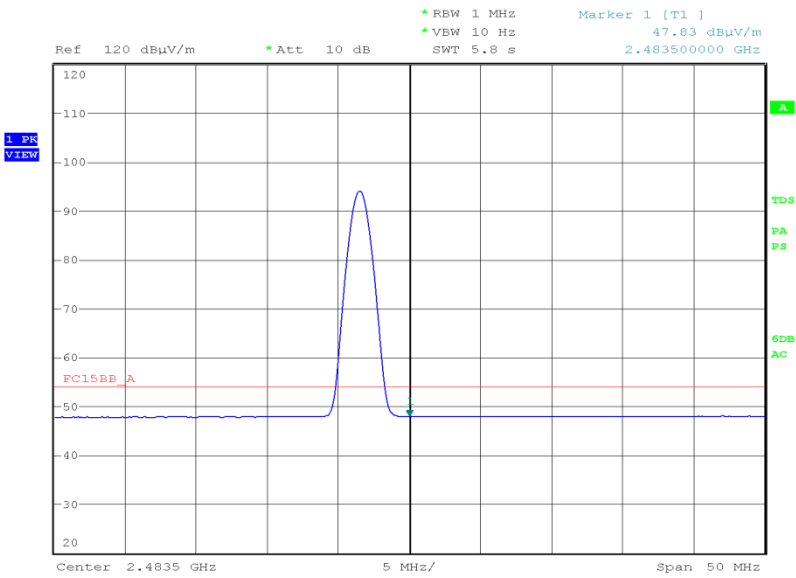


Date: 30.NOV.2014 02:36:49



Product Service

Final Average



Date: 30.NOV.2014 02:37:35

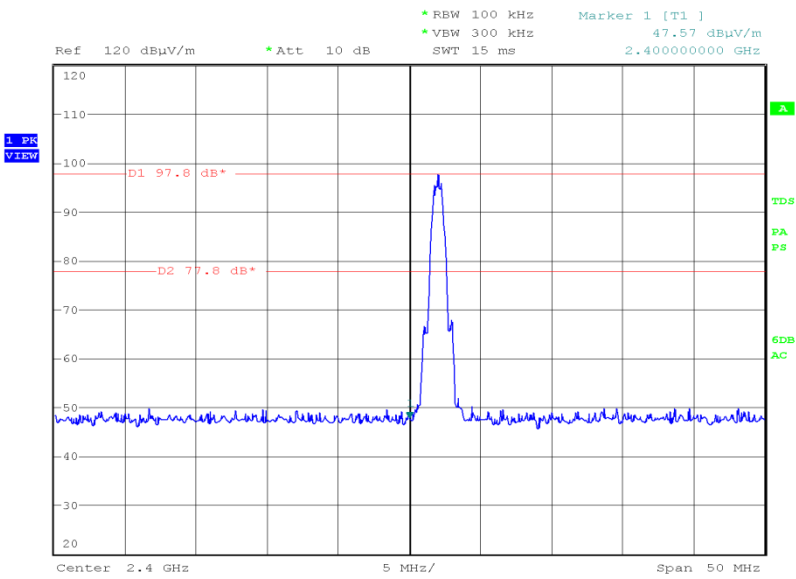


Product Service

Band Edge	
Frequency (MHz)	Final Peak (dBμV/m)
2400.00	47.57
2483.50	46.67

2400.00 MHz

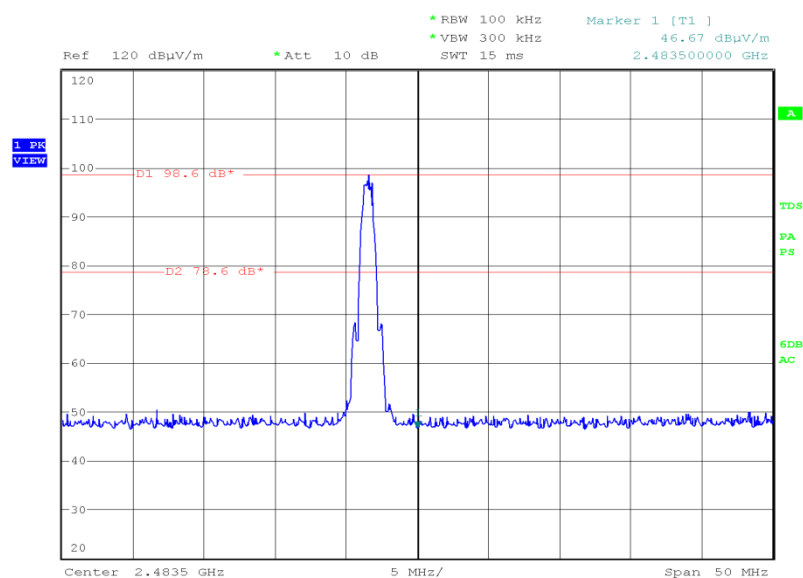
Final Peak



Date: 30.NOV.2014 03:09:26



Product Service

2483.50 MHzFinal Peak

Date: 30.NOV.2014 02:34:59

Limit

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

Radiated Emissions which fall only in the restricted bands as defined in 15.205 must also comply with the limits in the table above. The table above does not apply for Radiated Emissions which fall outside the restricted bands as defined in 15.205. These 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 attenuator required shall be 30 dB below the fundamental instead on 20 dB.



Product Service

2.6 POWER SPECTRAL DENSITY

2.6.1 Specification Reference

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

2.6.2 Equipment Under Test and Modification State

SHV31 S/N: IMEI 004401115315919 - Modification State 0

SHV31 S/N: IMEI 004401115315836 - Modification State 0

2.6.3 Date of Test

10 November 2014 & 27 November 2014

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

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.247 (e) and ANSI C63.10, clause 6.11.2.3.

The EUT was connected to a spectrum analyser via a cable and attenuator. The EUT was transmitting at maximum power, for bottom, middle and top channels on all supported data rates. The path loss was measured between the EUT and the spectrum analyser and entered as a reference level offset. The initial span was set to >1.5 times the OBW and the peak point in a 1 MHz RBW was determined. The span was then reduced to 300 kHz about this point to obtain the measurement point resolution required by ANSI C63.10. The trace was set to max hold and using a peak detector the maximum response was established with the spectrum analyser RBW at 3 kHz and VBW at 10 kHz, the power spectral density in a 3 kHz bandwidth was measured.

2.6.6 Environmental Conditions

Ambient Temperature	22.4 - 22.7°C
Relative Humidity	41.0 - 42.1%



Product Service

2.6.7 Test Results802.11(b)

4.0 V DC Supply

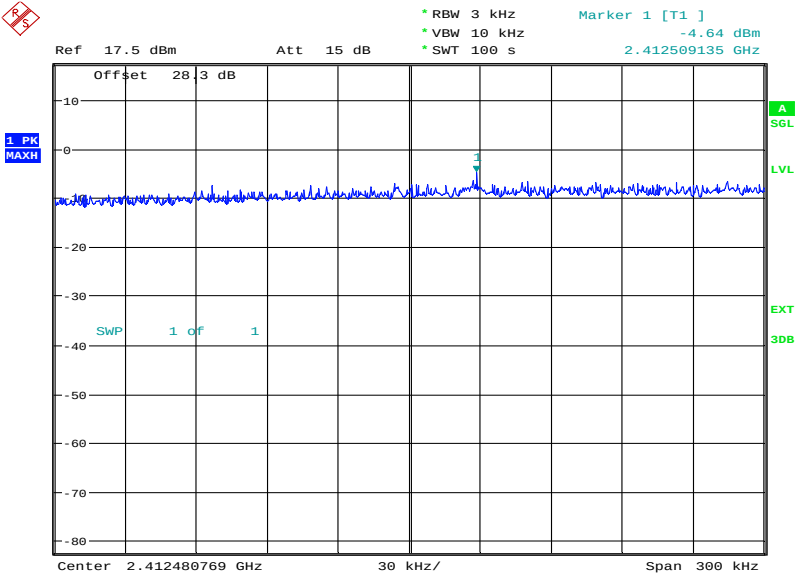
Frequency	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	1	-4.64
	2	-5.64
	5.5	-6.45
	11	-6.81
2437 MHz	1	-5.44
	2	-4.70
	5.5	-6.08
	11	-6.26
2462 MHz	1	-6.62
	2	-5.62
	5.5	-6.30
	11	-6.67



Product Service

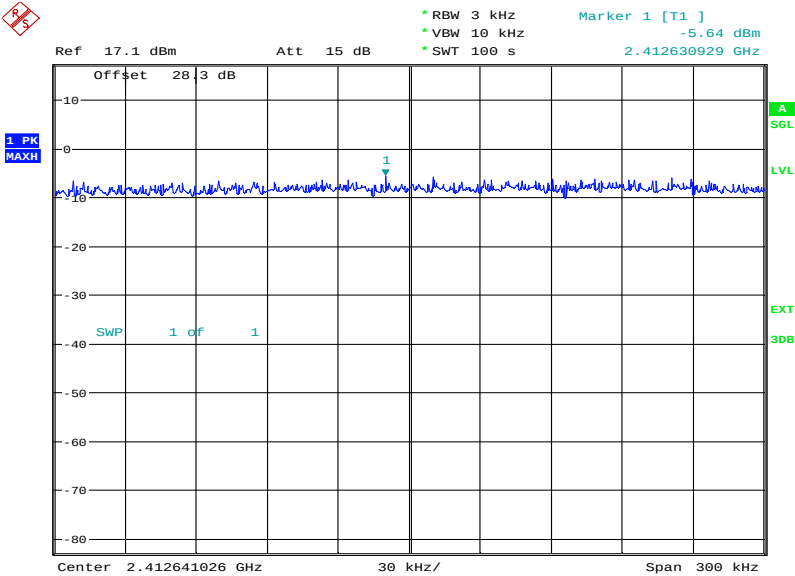
2412 MHz

1 Mbps



Date: 7.NOV.2014 08:28:21

2 Mbps

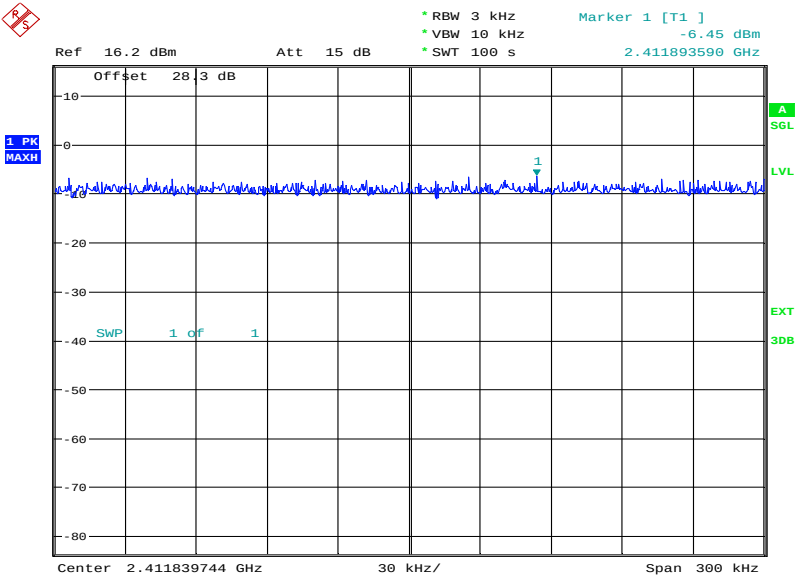


Date: 7.NOV.2014 09:03:12



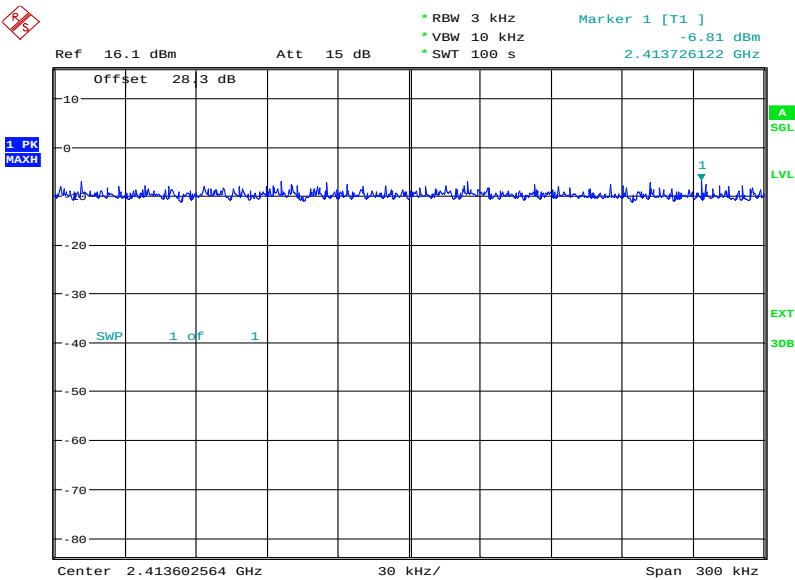
Product Service

5.5 Mbps



Date: 7.NOV.2014 09:22:44

11 Mbps



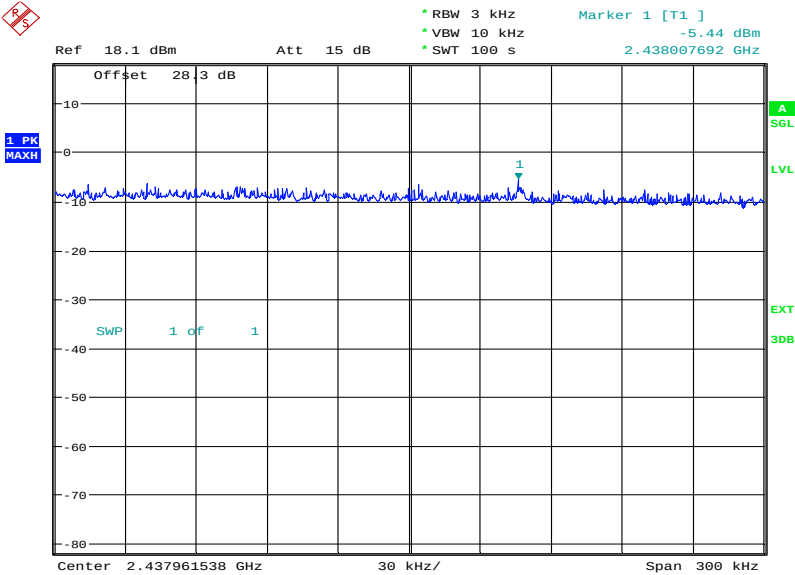
Date: 7.NOV.2014 10:06:56



Product Service

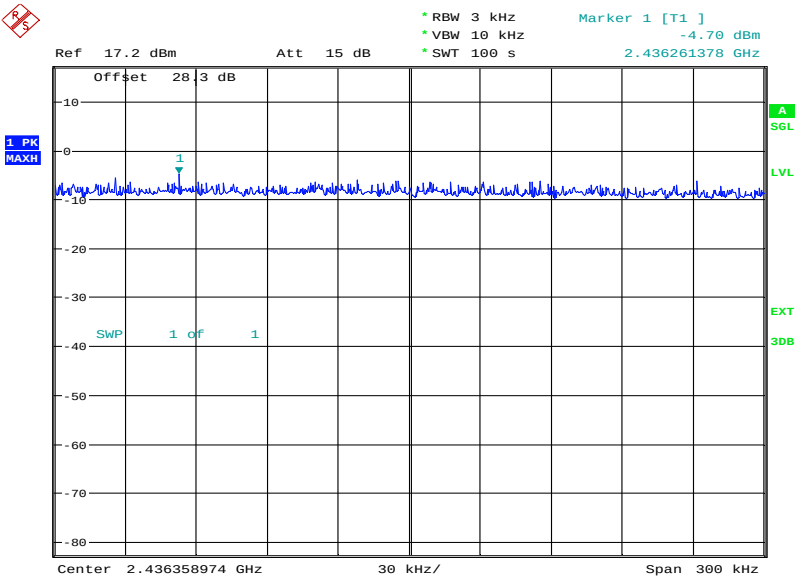
2437 MHz

1 Mbps



Date: 7.NOV.2014 08:44:10

2 Mbps

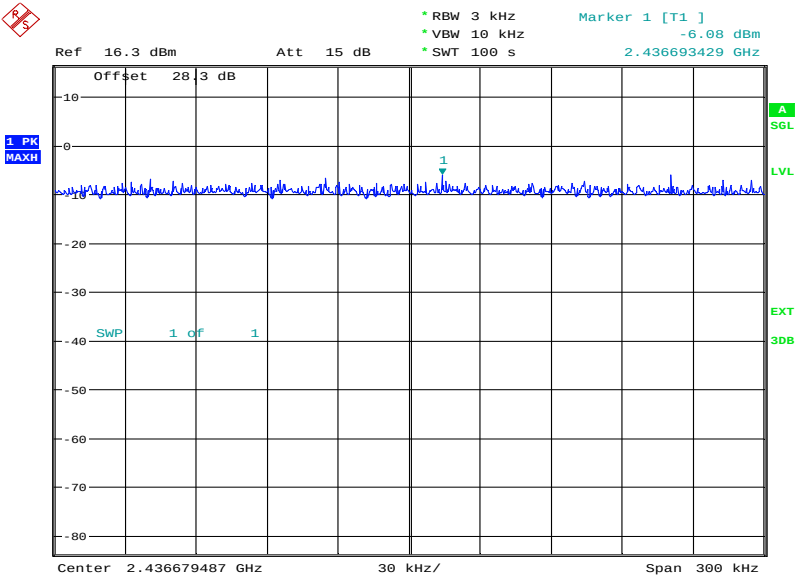


Date: 7.NOV.2014 09:08:00



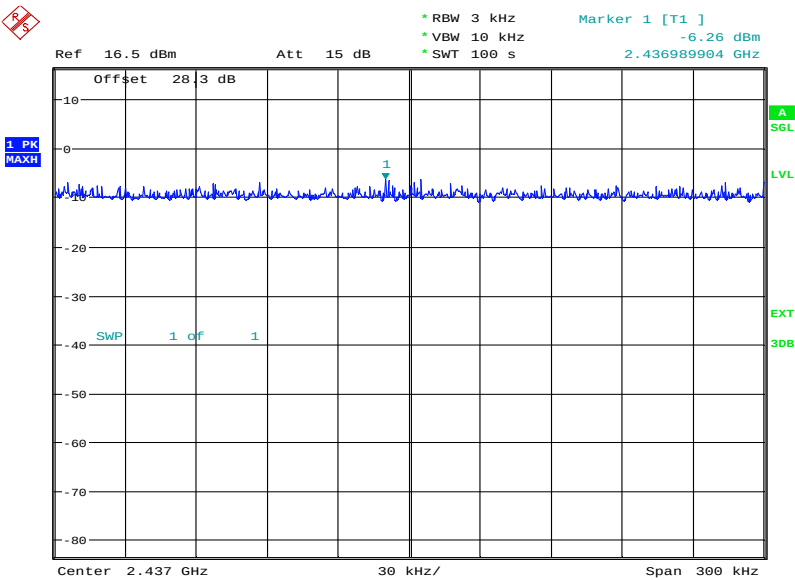
Product Service

5.5 Mbps



Date: 7.NOV.2014 09:33:56

11 Mbps



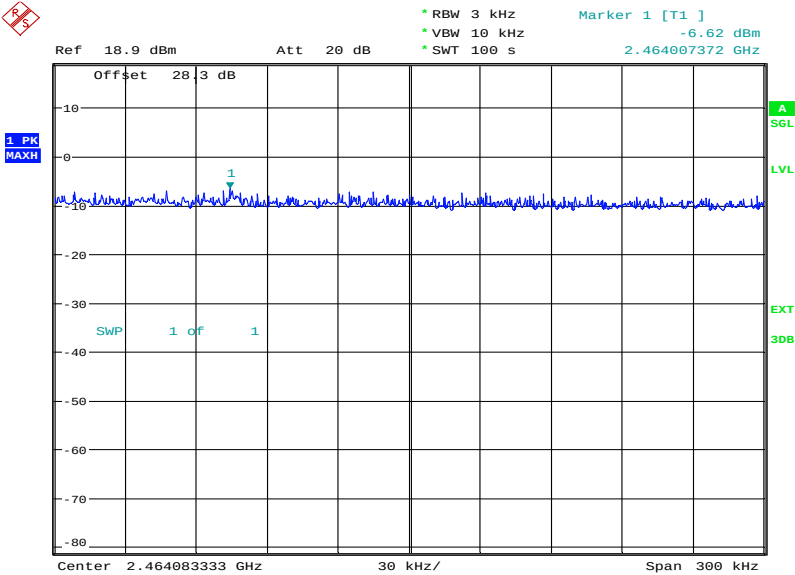
Date: 7.NOV.2014 10:15:27



Product Service

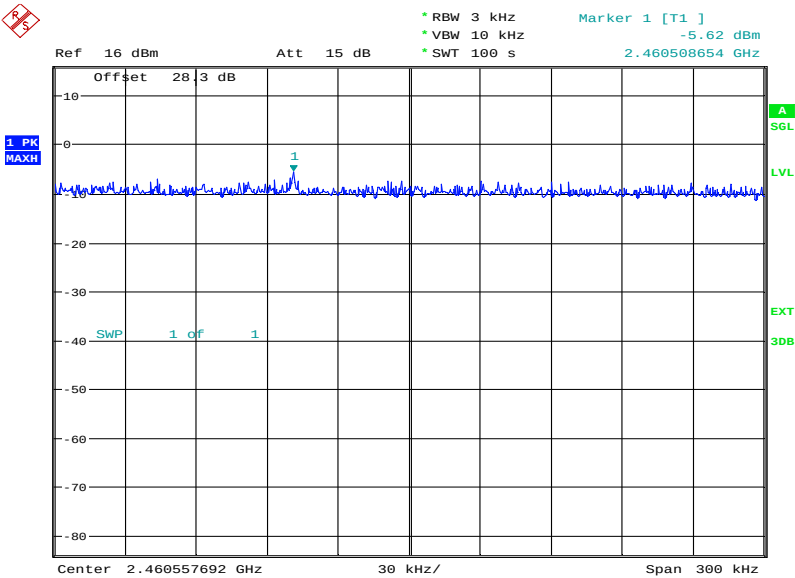
2462 MHz

1 Mbps



Date: 7.NOV.2014 08:48:03

2 Mbps

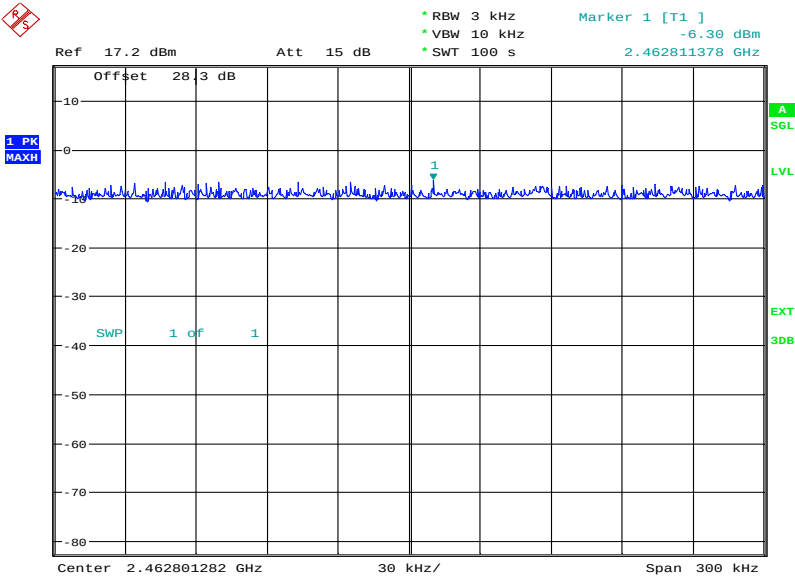


Date: 7.NOV.2014 09:18:01



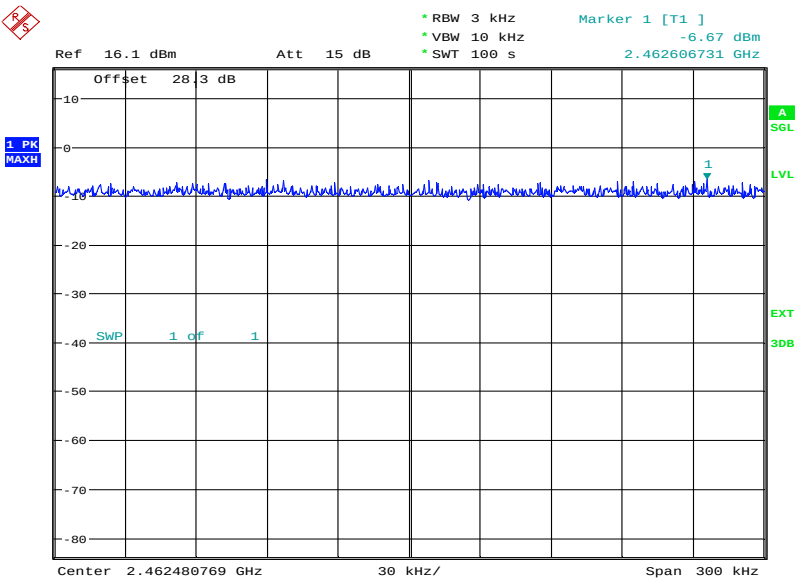
Product Service

5.5 Mbps



Date: 7.NOV.2014 09:39:48

11 Mbps



Date: 7.NOV.2014 10:27:11

Limit Clause

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.

802.11(g)

4.0 V DC Supply

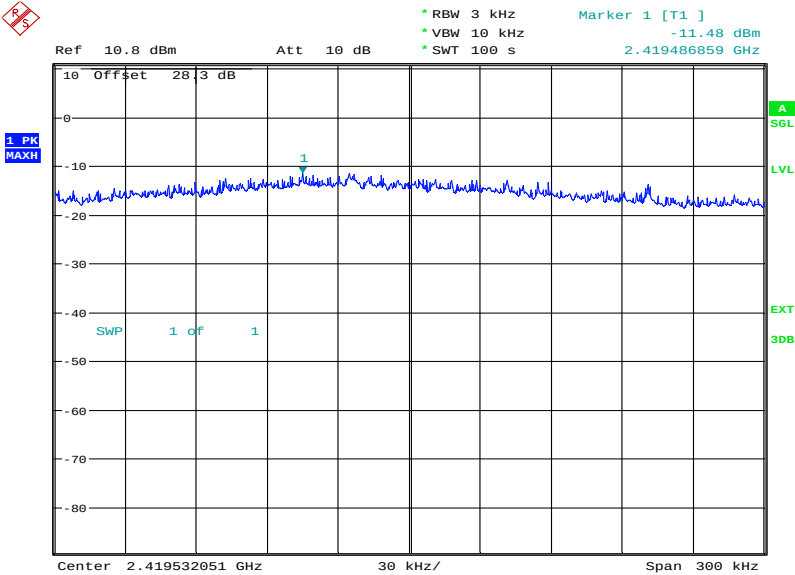
Frequency	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6	-11.48
	9	-11.43
	12	-11.72
	18	-11.03
	24	-11.51
	36	-12.26
	48	-11.15
	54	-10.26
2437 MHz	6	-11.38
	9	-11.11
	12	-11.20
	18	-11.21
	24	-10.89
	36	-10.90
	48	-10.38
	54	-10.43
2462 MHz	6	-11.60
	9	-10.80
	12	-11.05
	18	-11.89
	24	-10.40
	36	-11.59
	48	-11.34
	54	-11.25



Product Service

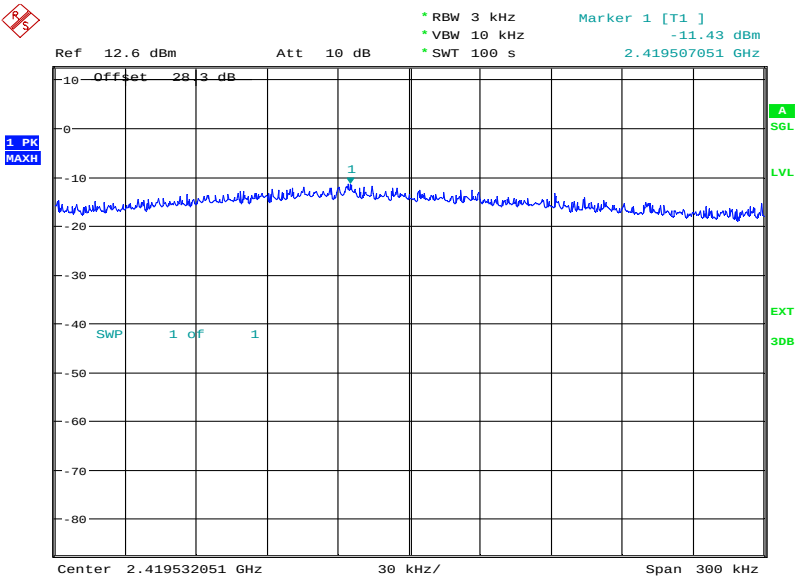
2412 MHz

6 Mbps



Date: 7.NOV.2014 10:43:27

9 Mbps

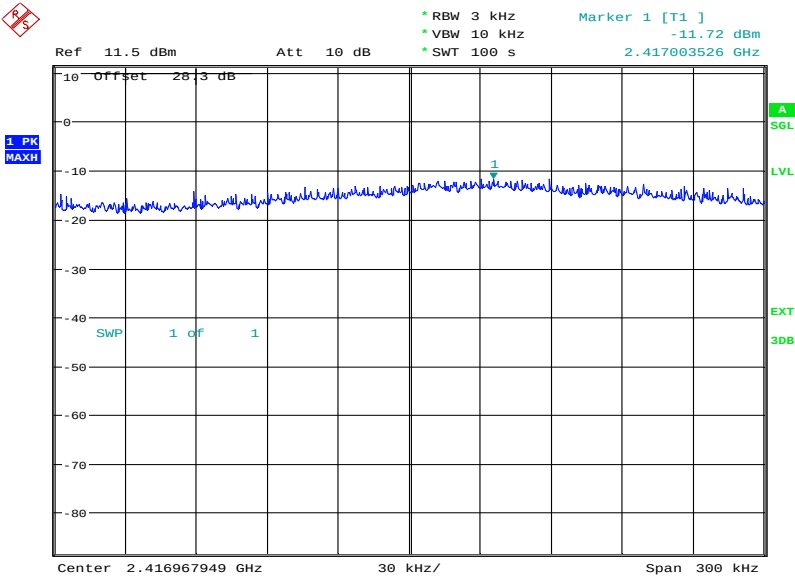


Date: 7.NOV.2014 11:11:27



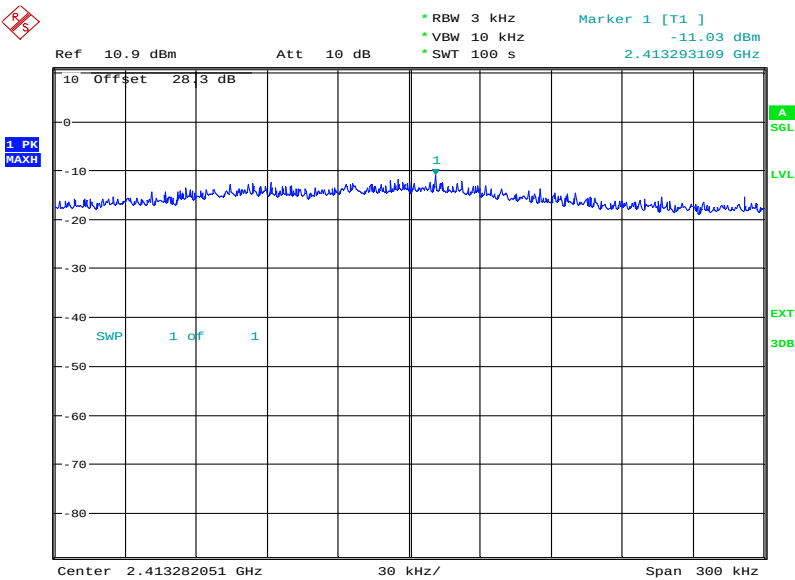
Product Service

12 Mbps



Date: 7.NOV.2014 11:45:42

18 Mbps

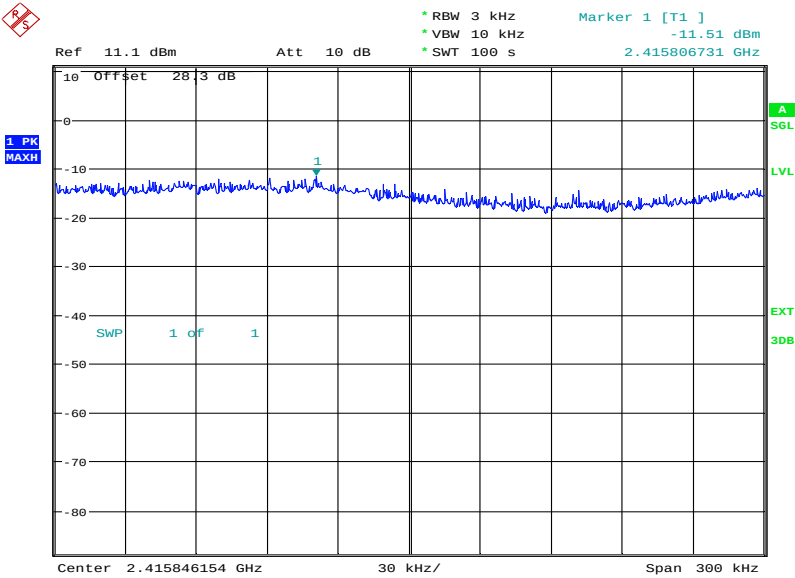


Date: 7.NOV.2014 12:13:26



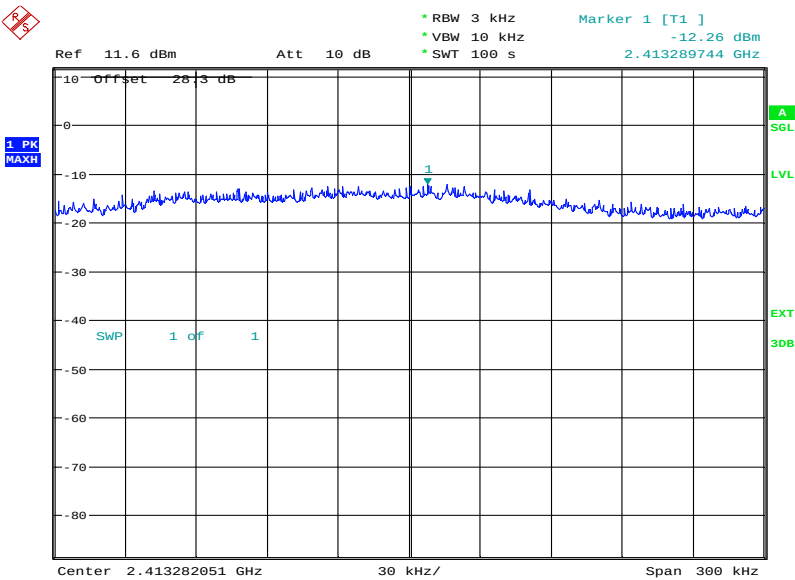
Product Service

24 Mbps



Date: 7.NOV.2014 12:47:10

36 Mbps

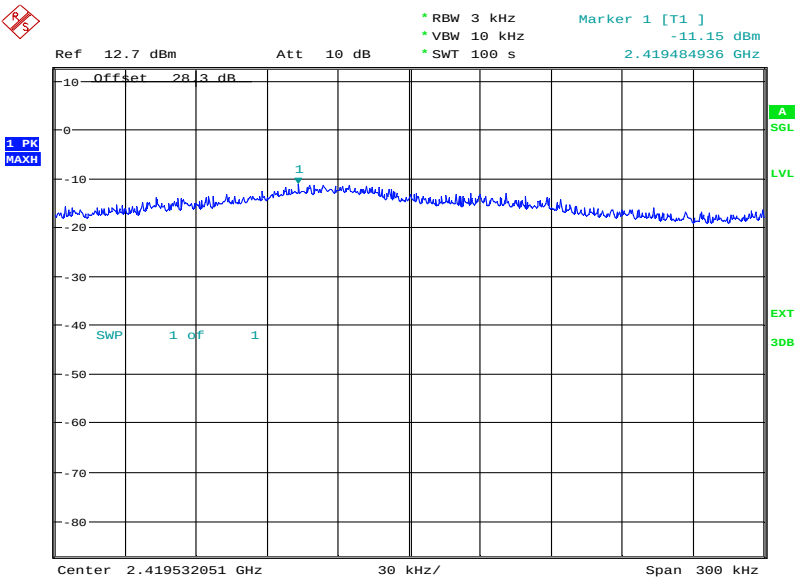


Date: 7.NOV.2014 13:00:16



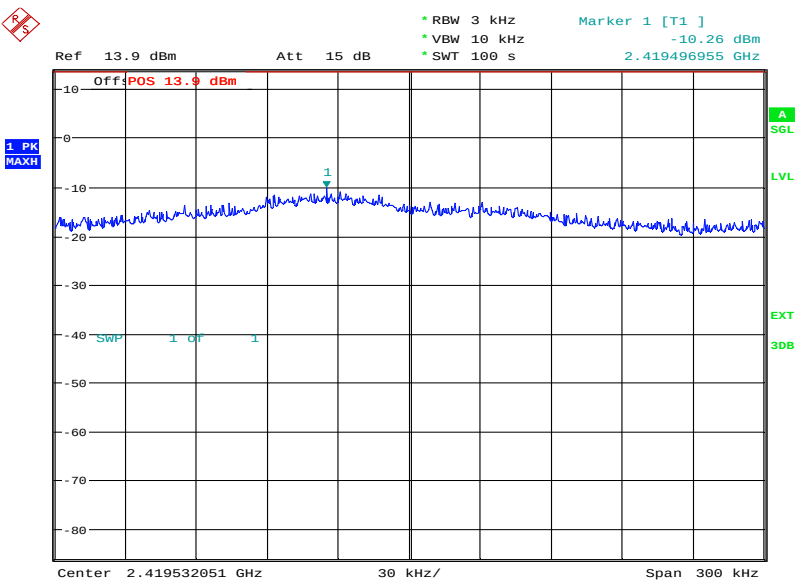
Product Service

48 Mbps



Date: 7.NOV.2014 13:37:03

54 Mbps



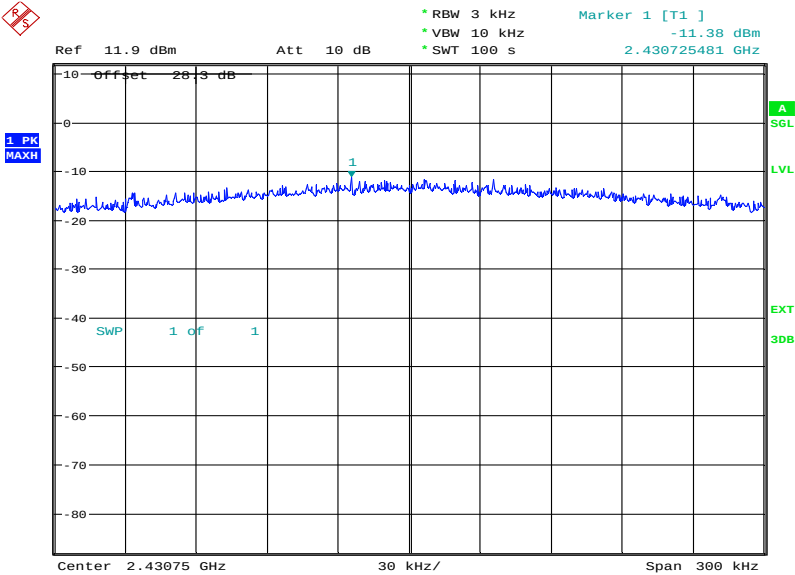
Date: 7.NOV.2014 14:00:14



Product Service

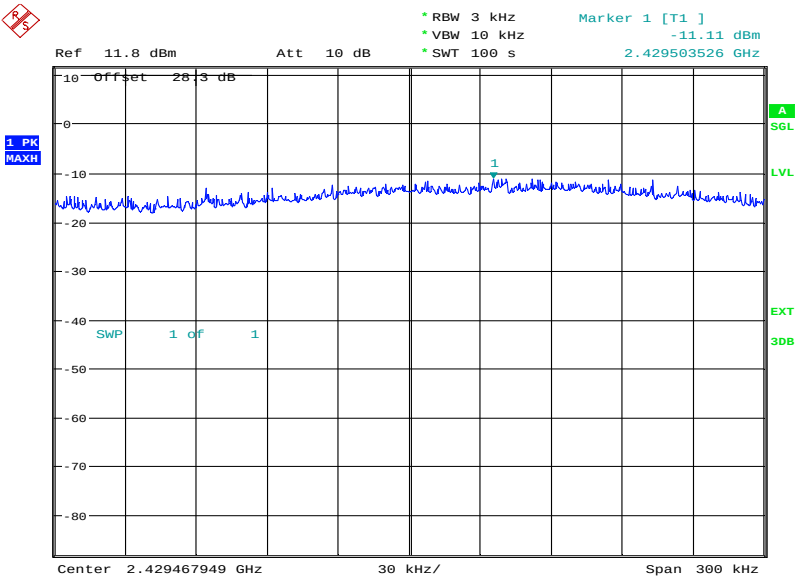
2437 MHz

6 Mbps



Date: 7.NOV.2014 10:54:20

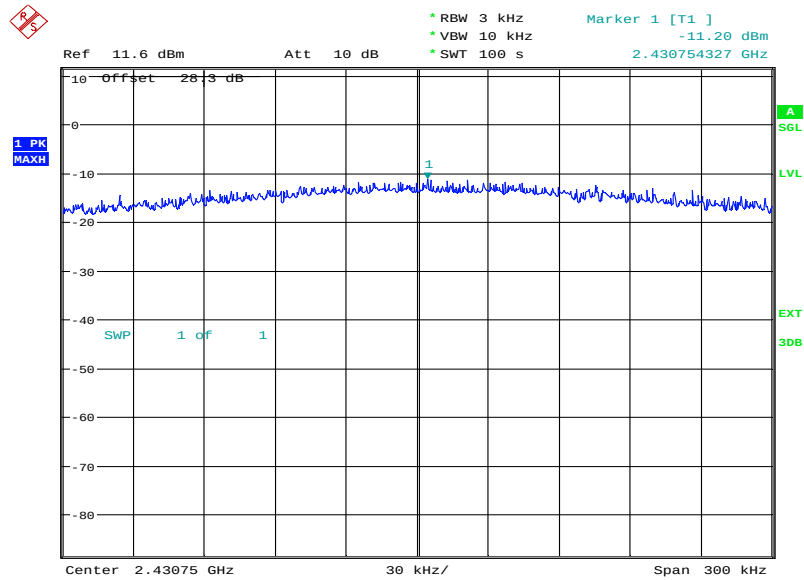
9 Mbps



Date: 7.NOV.2014 11:23:59

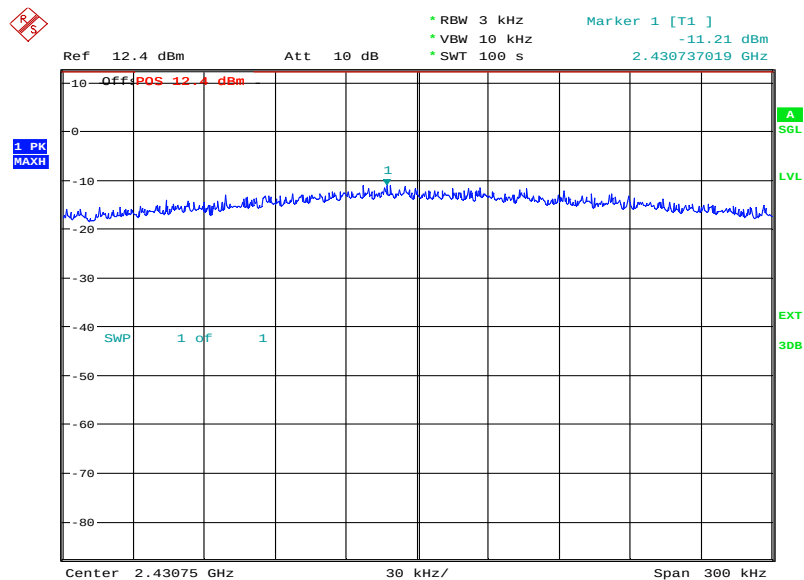


12 Mbps



Date: 7.NOV.2014 11:49:55

18 Mbps

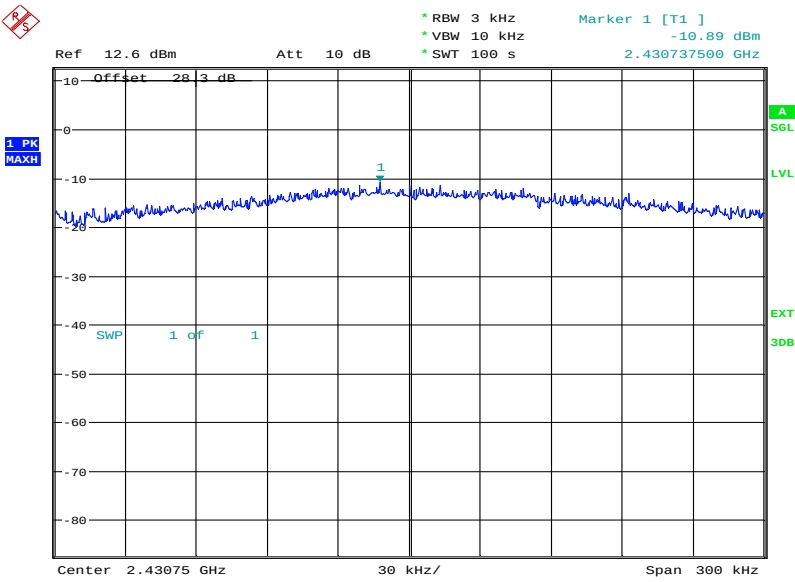


Date: 7.NOV.2014 12:19:27



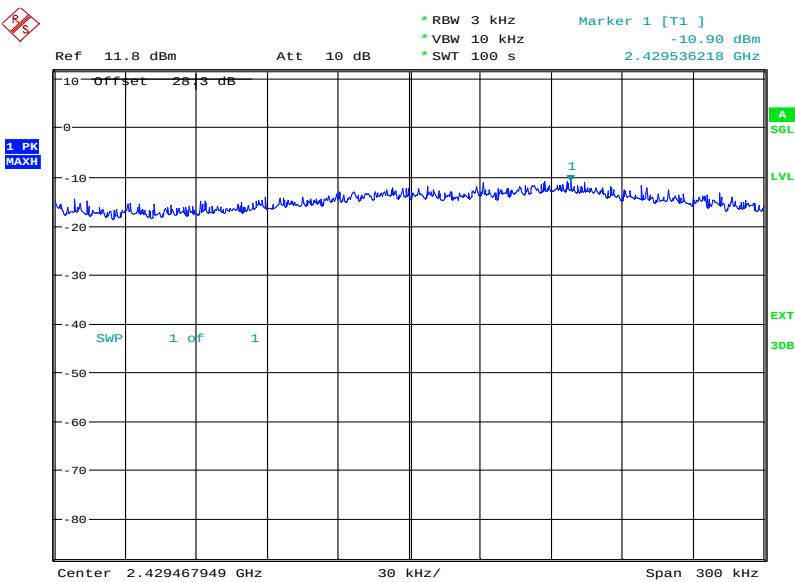
Product Service

24 Mbps



Date: 7.NOV.2014 12:53:14

36 Mbps

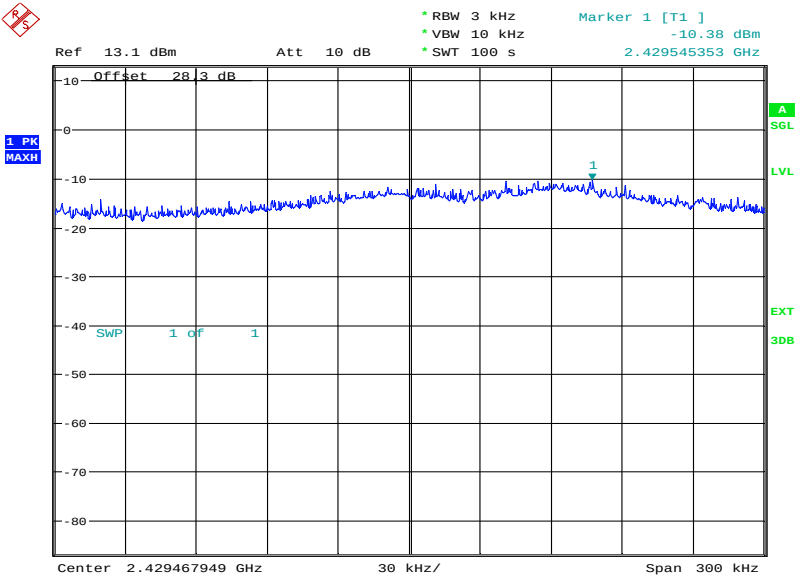


Date: 7.NOV.2014 13:05:25



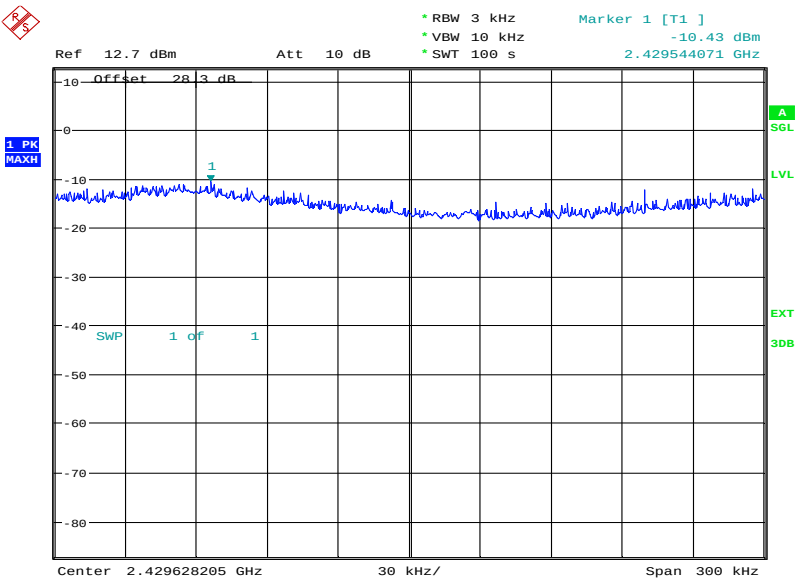
Product Service

48 Mbps



Date: 7.NOV.2014 13:45:14

54 Mbps



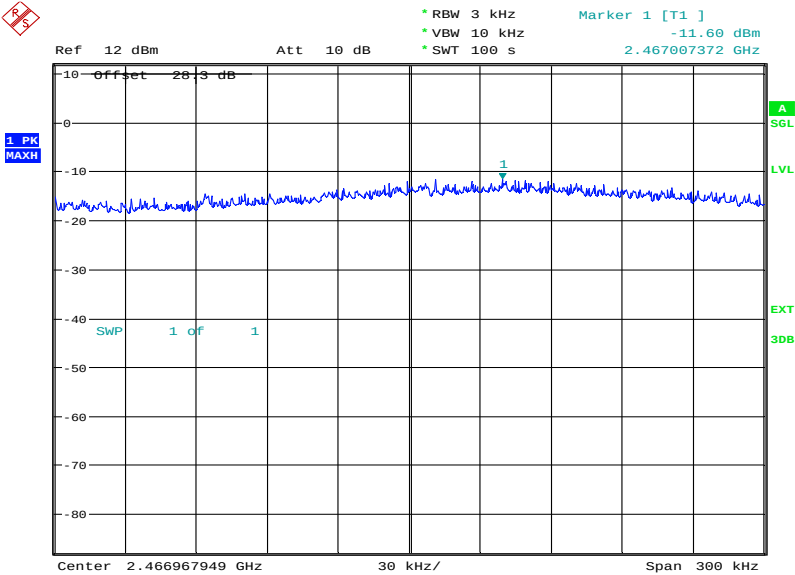
Date: 7.NOV.2014 14:11:18



Product Service

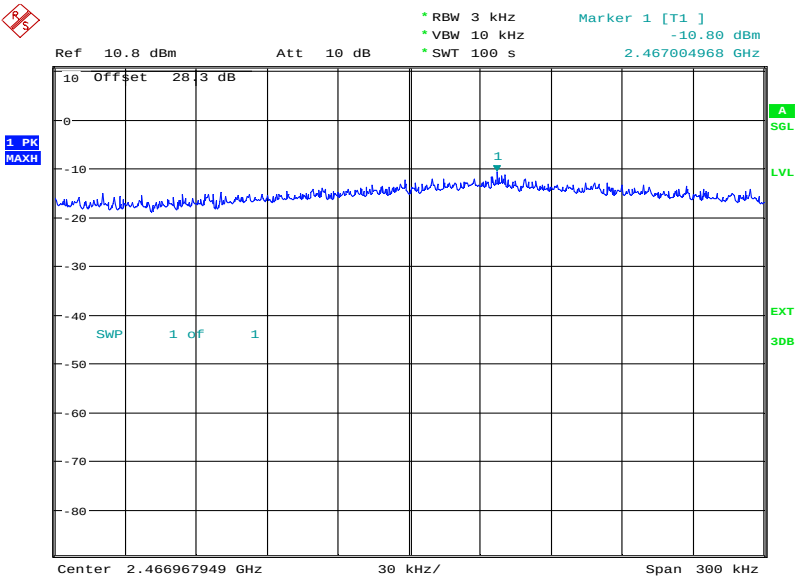
2462 MHz

6 Mbps



Date: 7.NOV.2014 11:05:18

9 Mbps

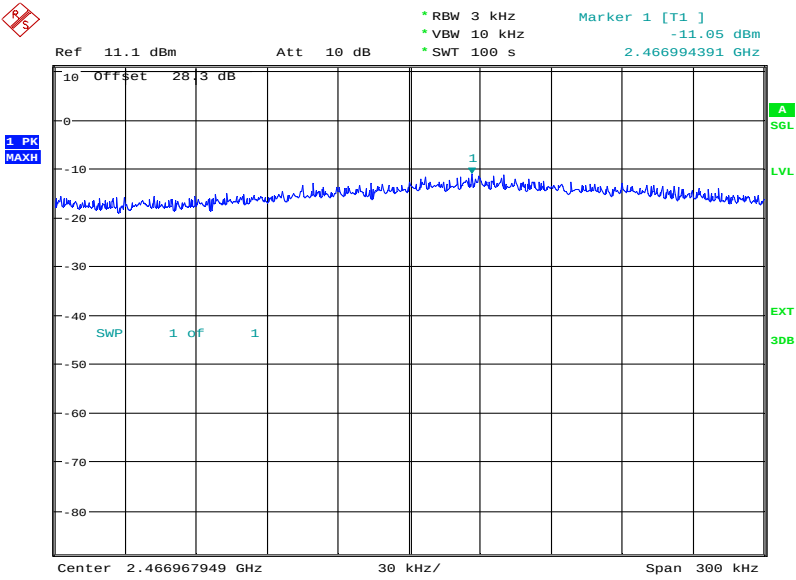


Date: 7.NOV.2014 11:35:03



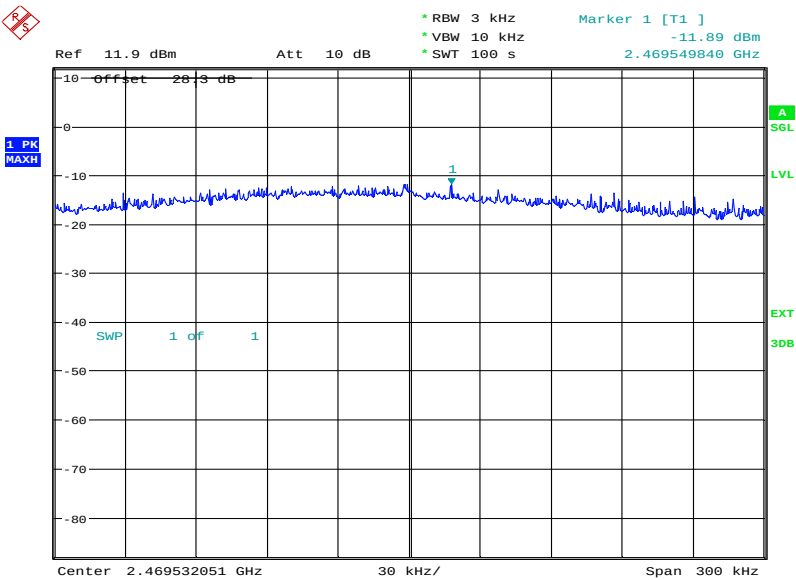
Product Service

12 Mbps



Date: 7.NOV.2014 11:55:39

18 Mbps

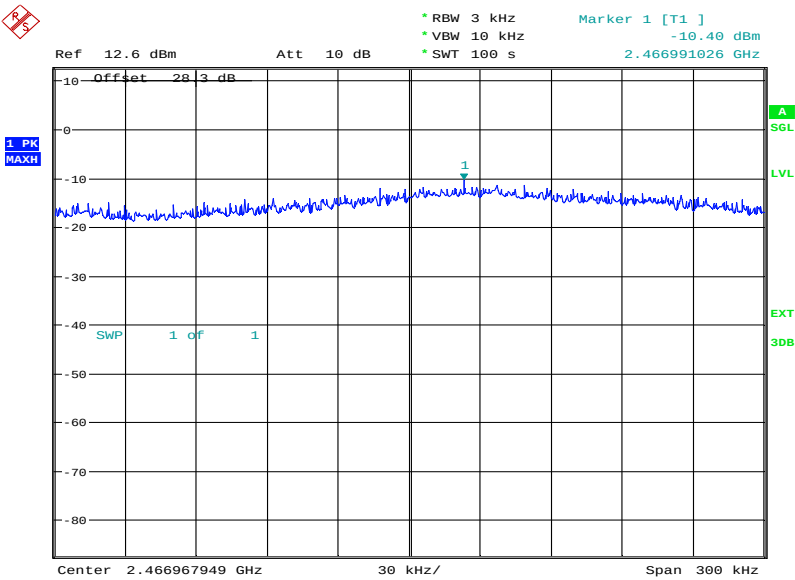


Date: 7.NOV.2014 12:30:44



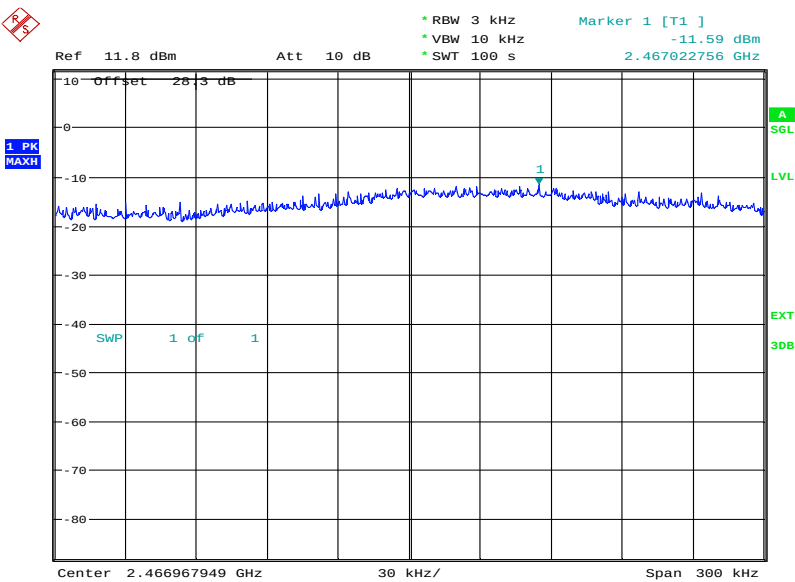
Product Service

24 Mbps



Date: 7.NOV.2014 12:56:40

36 Mbps

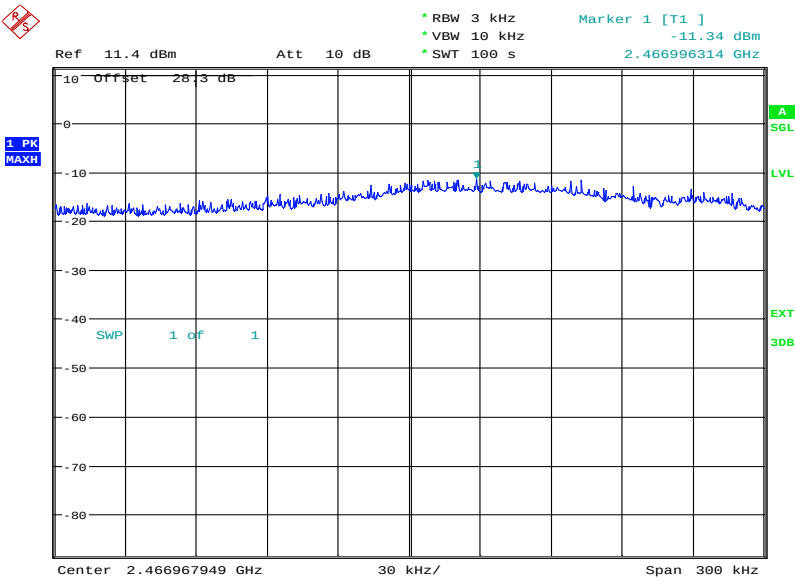


Date: 7.NOV.2014 13:09:14



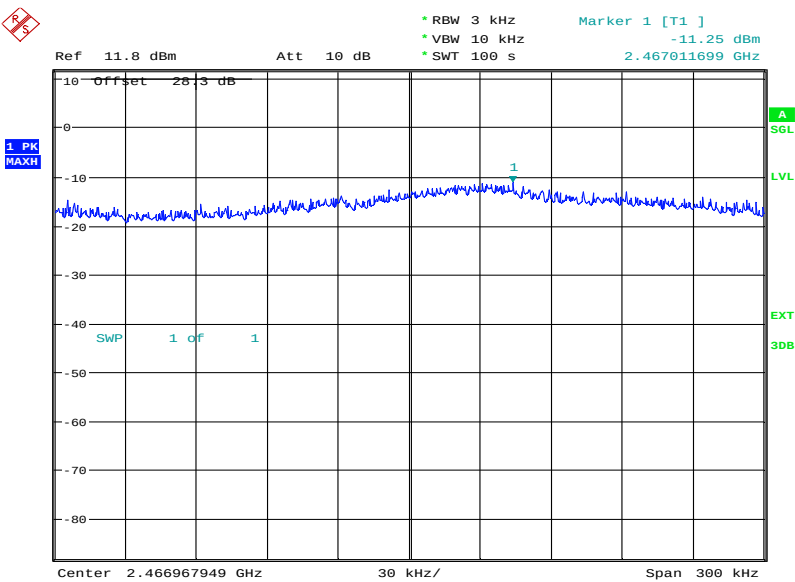
Product Service

48 Mbps



Date: 7.NOV.2014 13:54:03

54 Mbps



Date: 7.NOV.2014 14:27:20

Limit Clause

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.

802.11(n)

4.0 V DC Supply

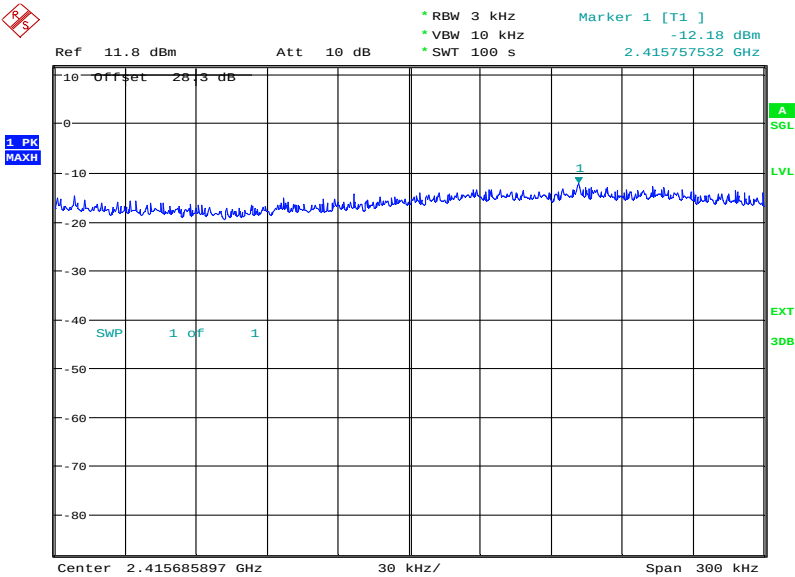
Frequency	Data Rate (Mbps)	Power Spectral Density in 3 kHz Bands (dBm)
2412 MHz	6.5	-12.18
	13	-12.70
	19.5	-12.06
	26	-11.68
	39	-11.60
	52	-12.45
	58.5	-11.28
	65	-11.57
2437 MHz	6.5	-11.96
	13	-12.17
	19.5	-12.23
	26	-11.51
	39	-12.17
	52	-11.56
	58.5	-11.37
	65	-11.09
2462 MHz	6.5	-11.48
	13	-12.15
	19.5	-11.44
	26	-11.17
	39	-13.41
	52	-11.51
	58.5	-10.71
	65	-12.64



Product Service

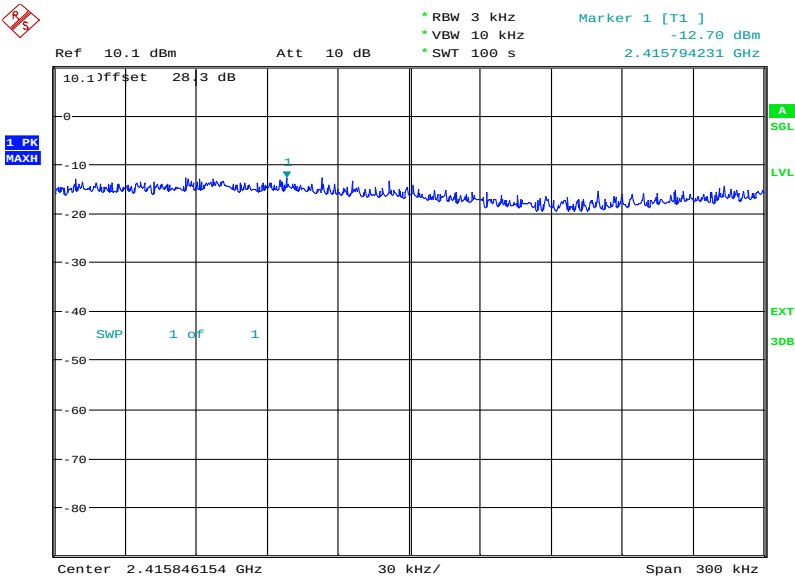
2412 MHz

6.5 Mbps



Date: 7.NOV.2014 14:35:44

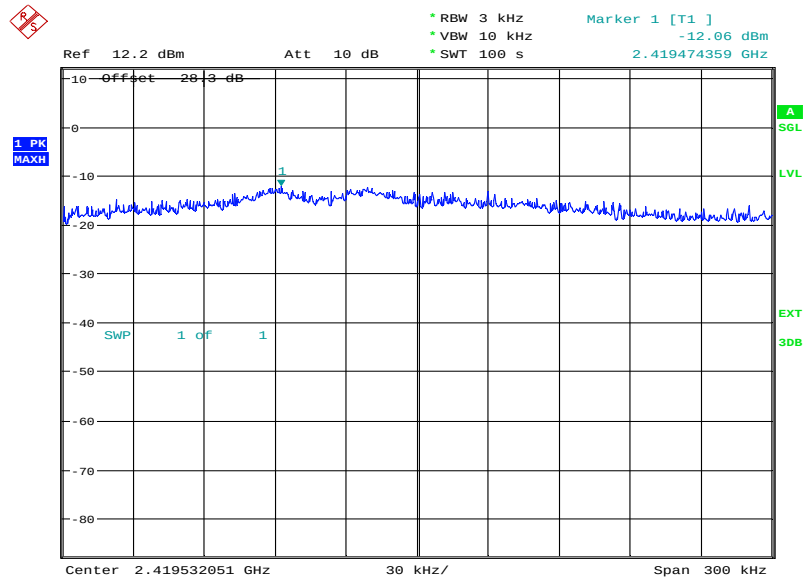
13 Mbps



Date: 7.NOV.2014 15:18:13

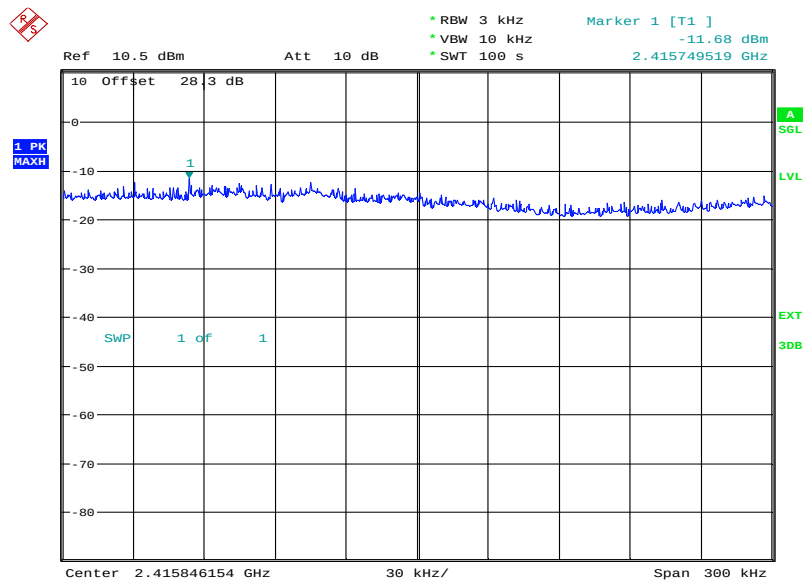


19.5 Mbps



Date: 10.NOV.2014 08:48:24

26 Mbps

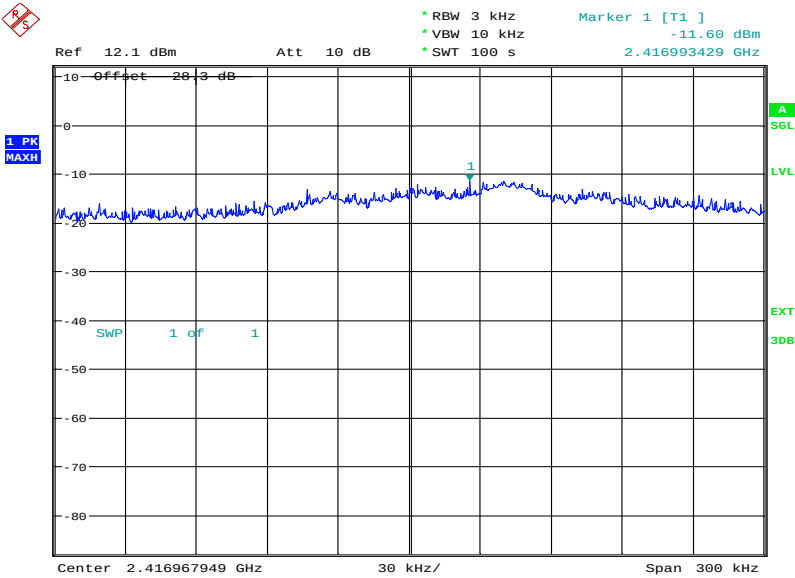


Date: 10.NOV.2014 09:06:47



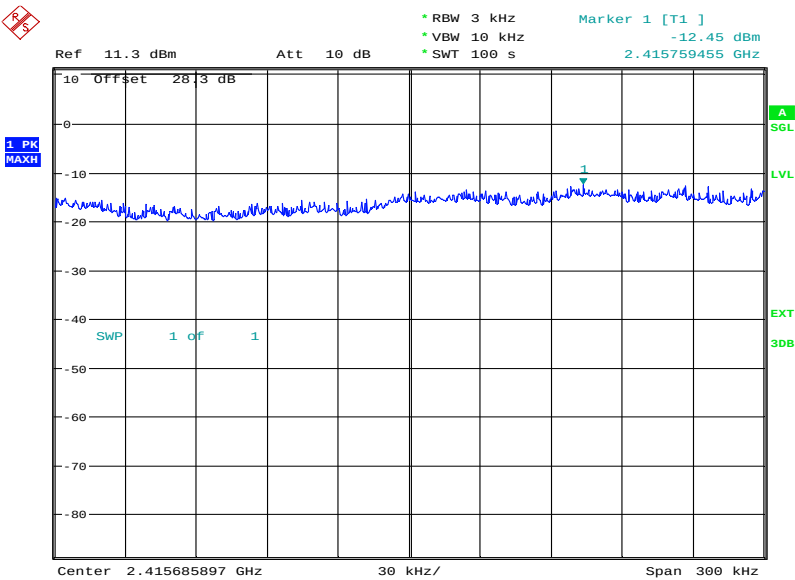
Product Service

39 Mbps



Date: 10.NOV.2014 09:26:05

52 Mbps

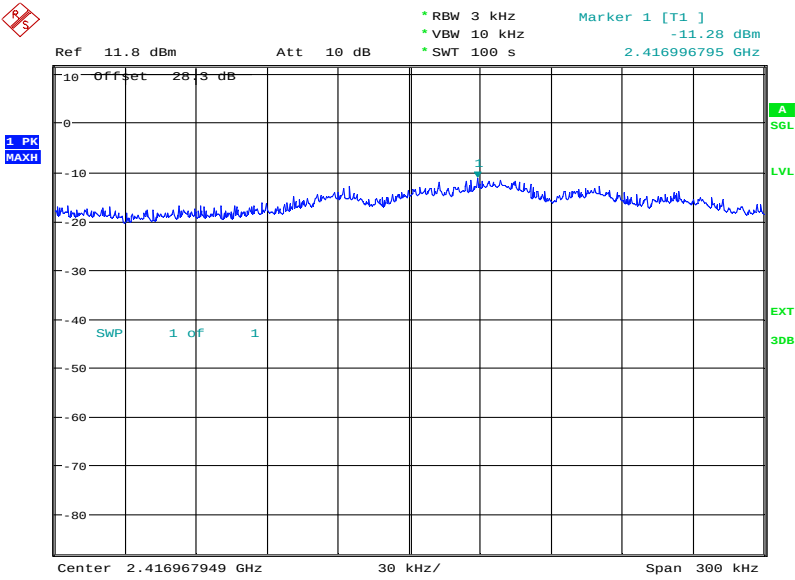


Date: 10.NOV.2014 09:41:04



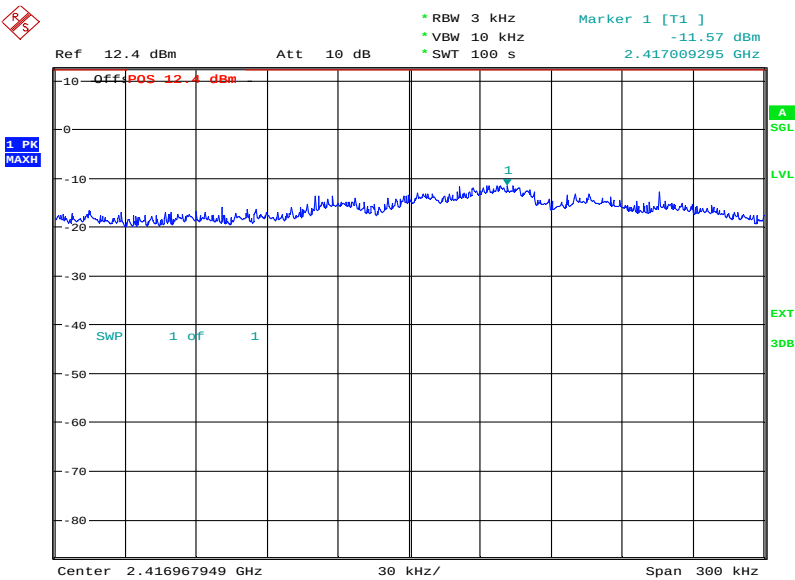
Product Service

58.5 Mbps



Date: 10.NOV.2014 09:56:27

65 Mbps



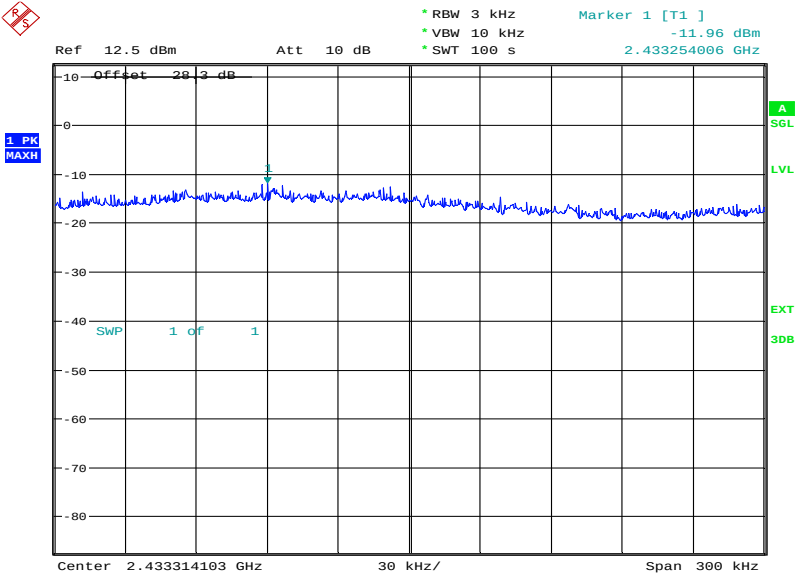
Date: 10.NOV.2014 10:18:39



Product Service

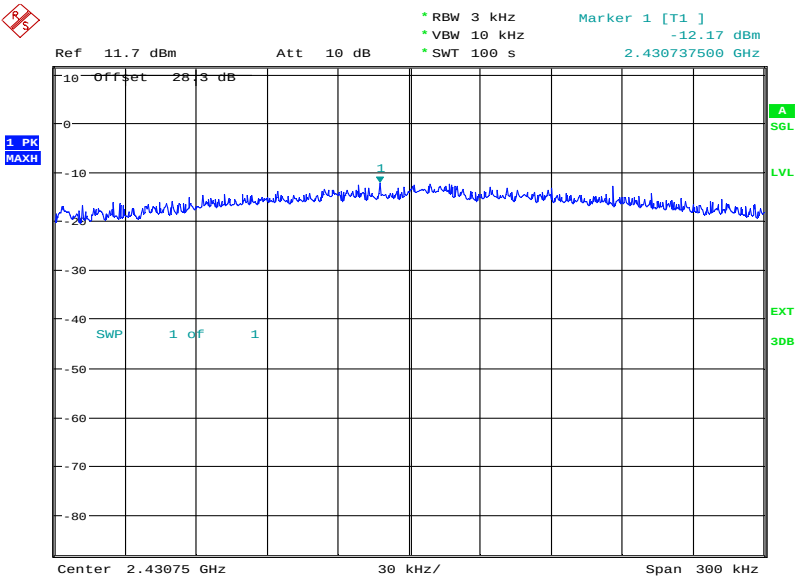
2437 MHz

6.5 Mbps



Date: 7.NOV.2014 14:48:41

13 Mbps

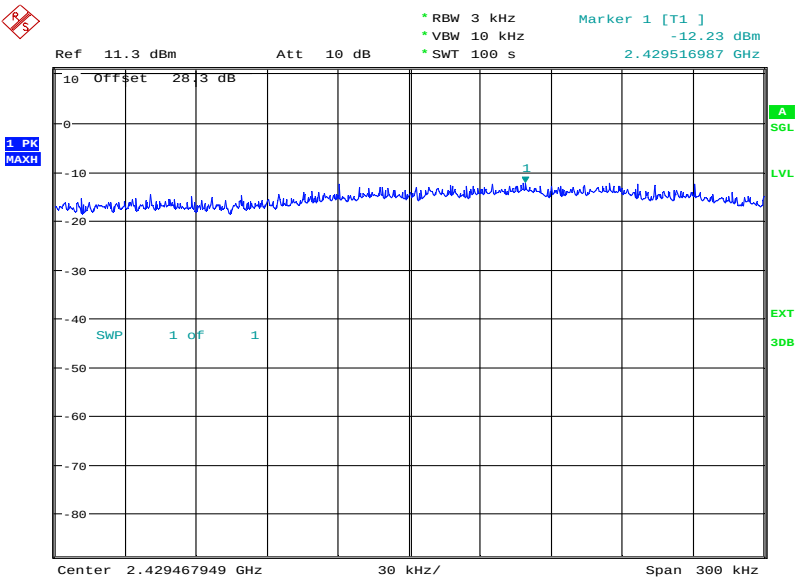


Date: 10.NOV.2014 08:38:18



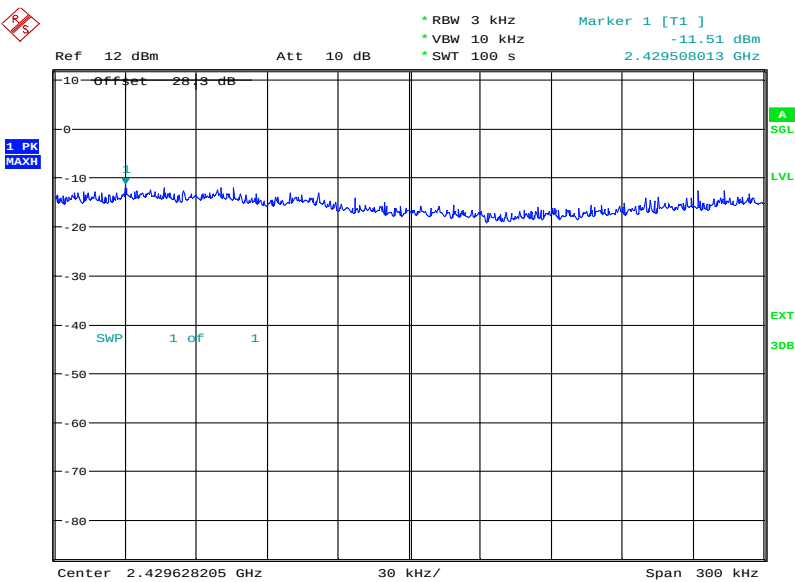
Product Service

19.5 Mbps



Date: 10.NOV.2014 08:55:09

26 Mbps

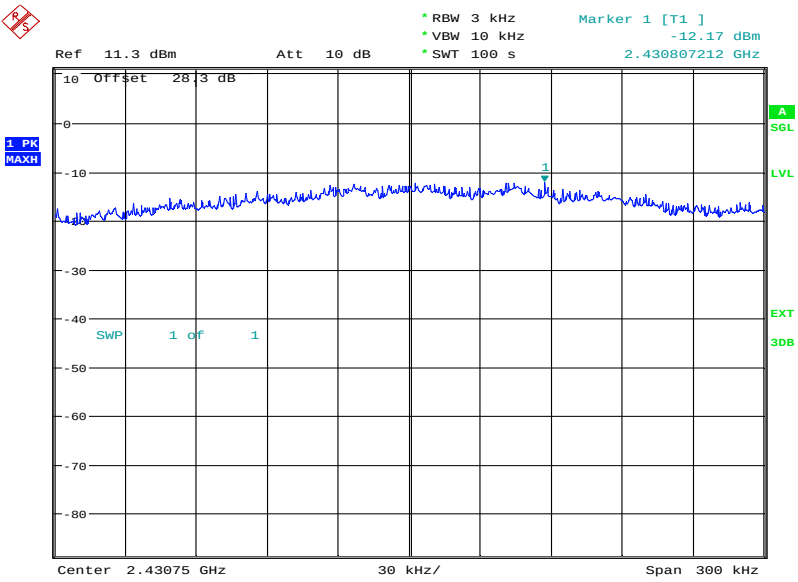


Date: 10.NOV.2014 09:13:29



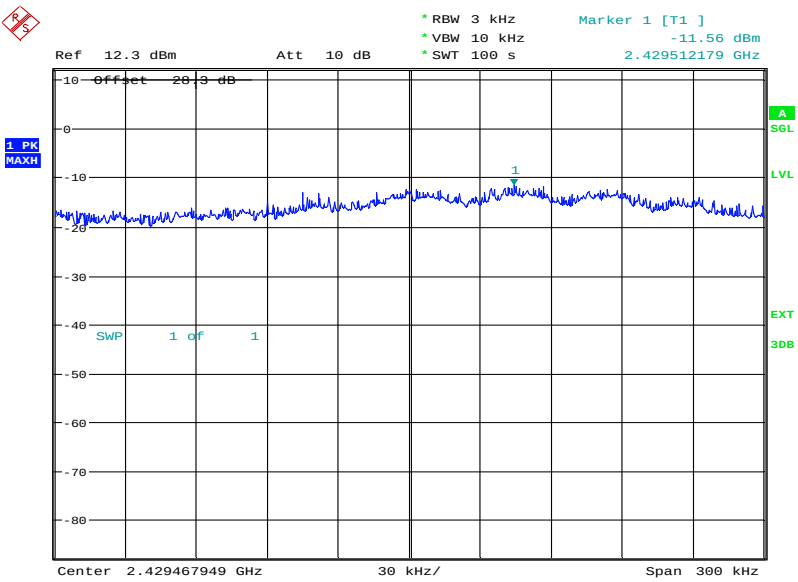
Product Service

39 Mbps



Date: 10.NOV.2014 09:31:48

52 Mbps

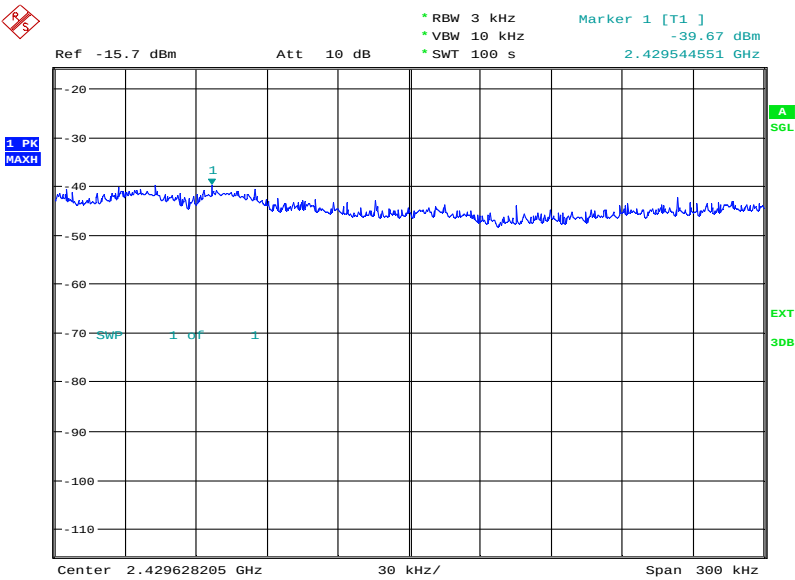


Date: 10.NOV.2014 09:44:37



Product Service

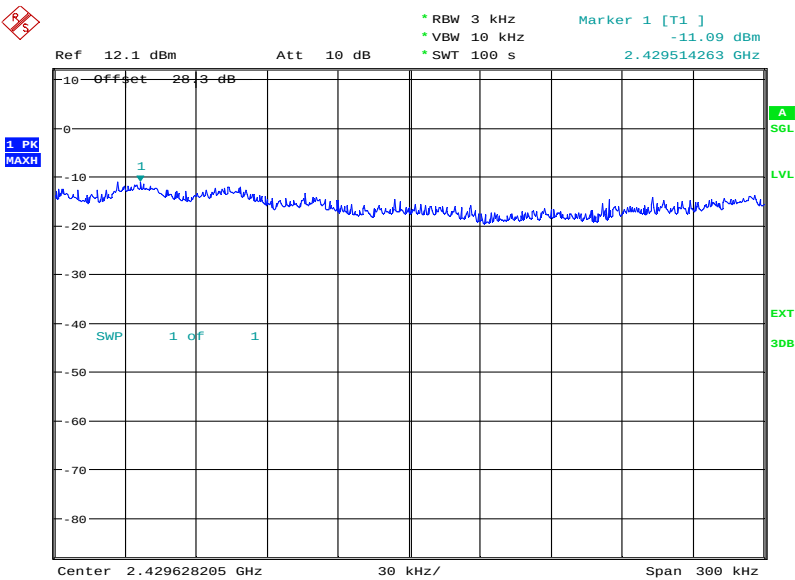
58.5 Mbps



Date: 10.NOV.2014 10:07:26

Note: The offset was applied to the result shown on the plot to obtain the result shown in the table.

65 Mbps



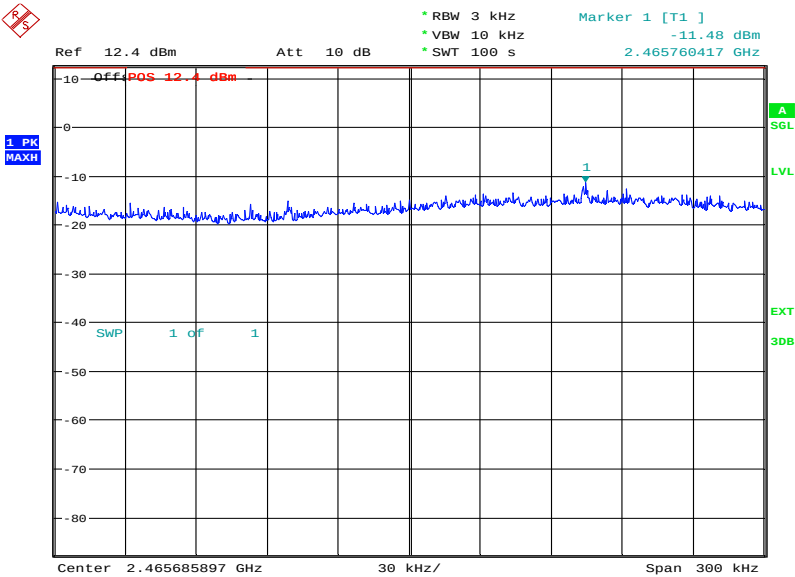
Date: 10.NOV.2014 10:23:19



Product Service

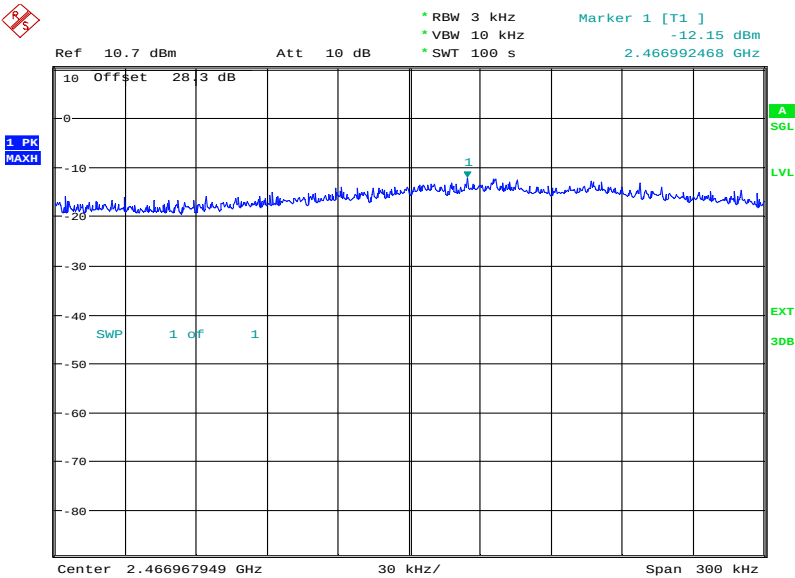
2462 MHz

6.5 Mbps



Date: 10.NOV.2014 13:58:25

13 Mbps

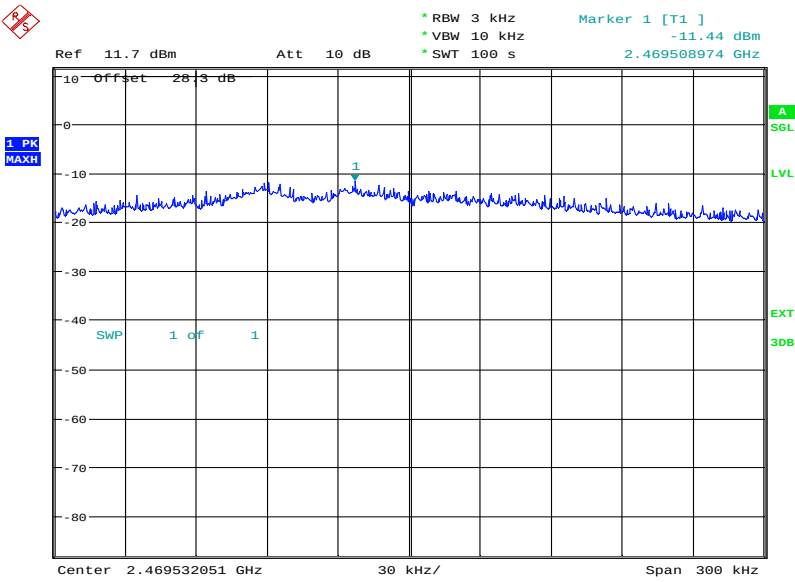


Date: 10.NOV.2014 08:42:35



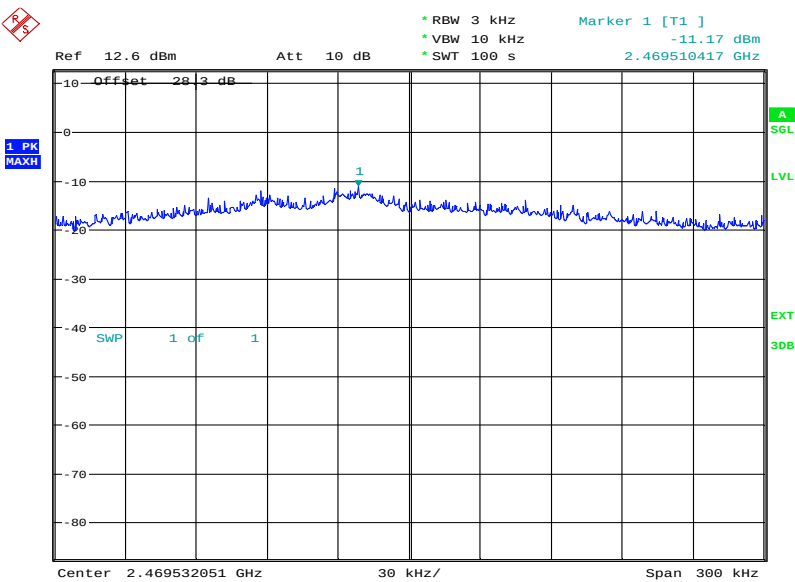
Product Service

19.5 Mbps



Date: 10.NOV.2014 09:00:30

26 Mbps

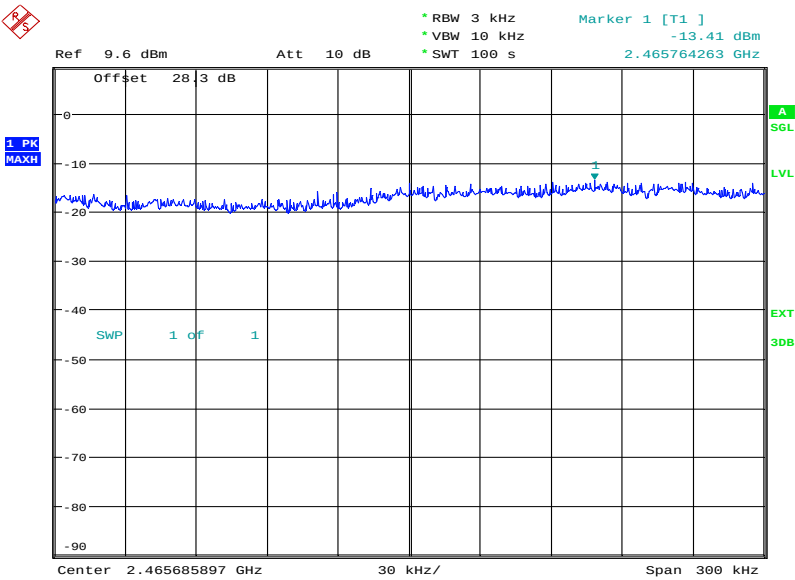


Date: 10.NOV.2014 09:21:33



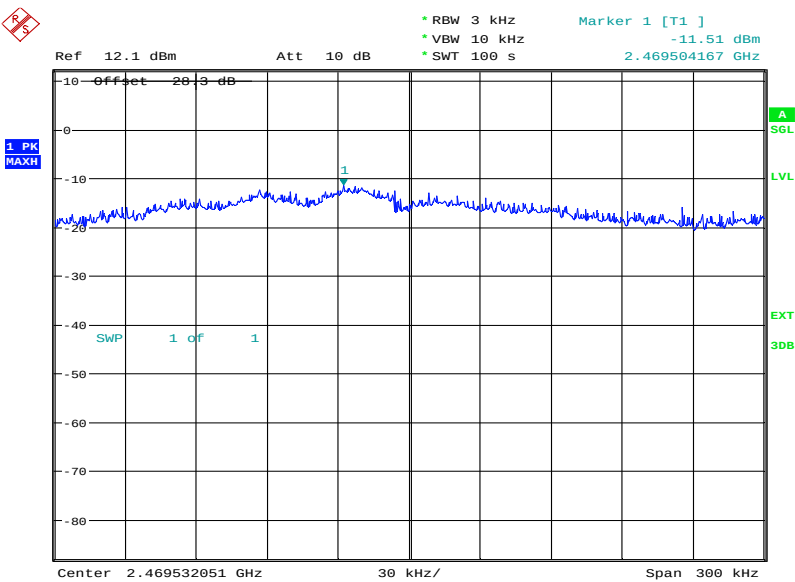
Product Service

39 Mbps



Date: 10.NOV.2014 09:36:41

52 Mbps

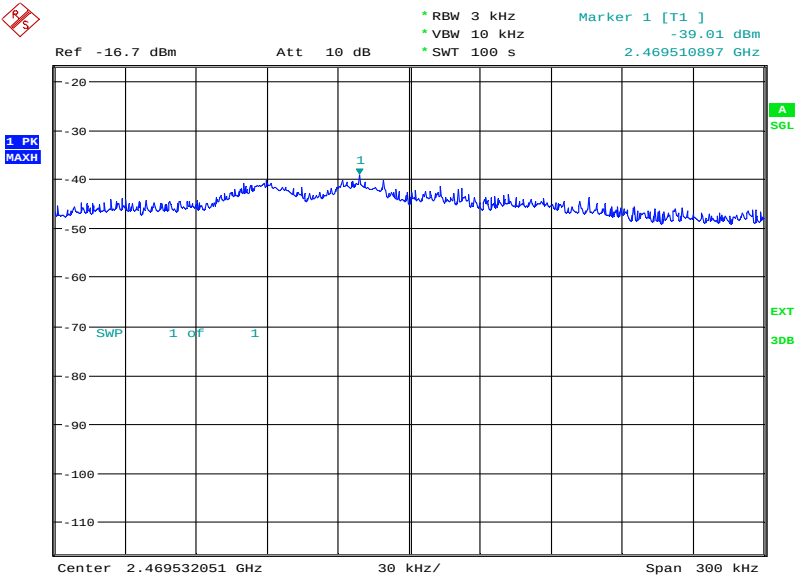


Date: 10.NOV.2014 09:52:13



Product Service

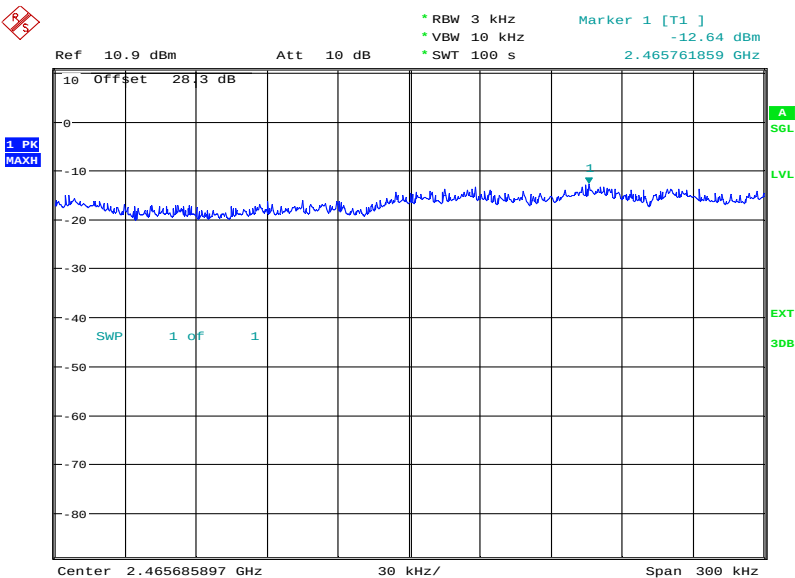
58.5 Mbps



Date: 10.NOV.2014 10:12:56

Note: The offset was applied to the result shown on the plot to obtain the result shown in the table.

65 Mbps



Date: 10.NOV.2014 10:31:36

Limit Clause

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

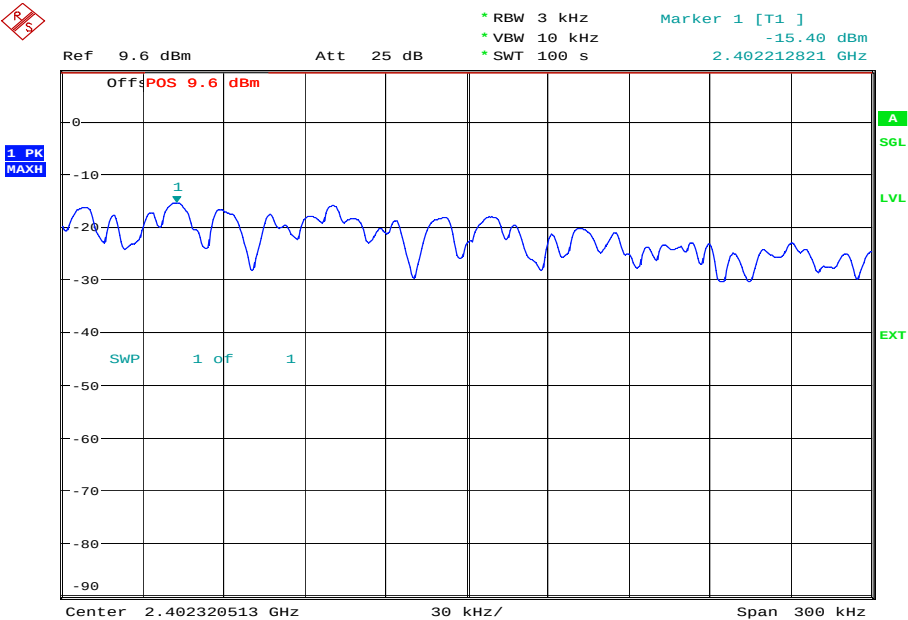
Bluetooth Low Energy

4.0 V DC Supply

Frequency	Packet Type	Power Spectral Density in 3 kHz Bands (dBm)
2402 MHz	DH1	-15.40
2441 MHz	DH1	-12.61
2480 MHz	DH1	-11.75

2402 MHz

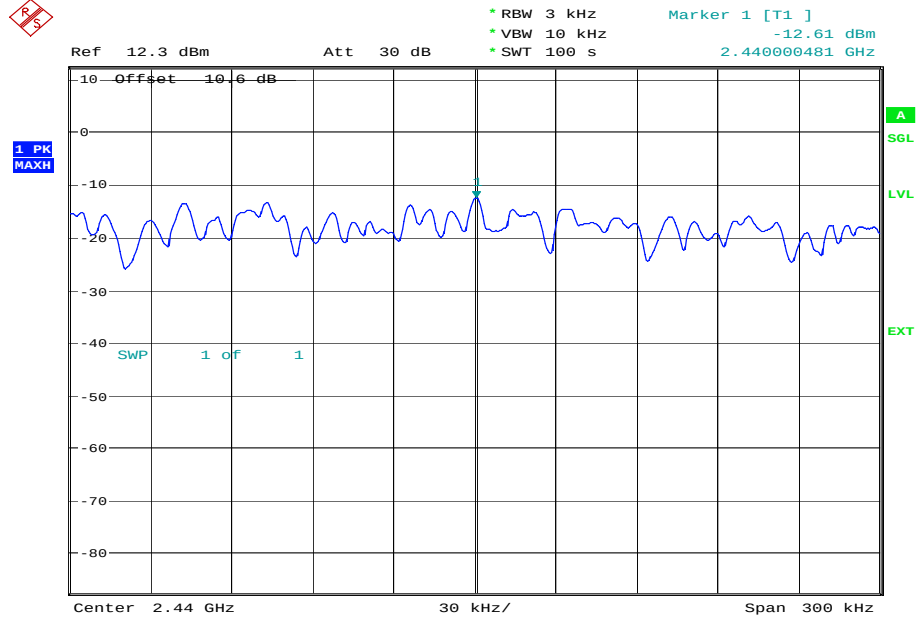
DH1



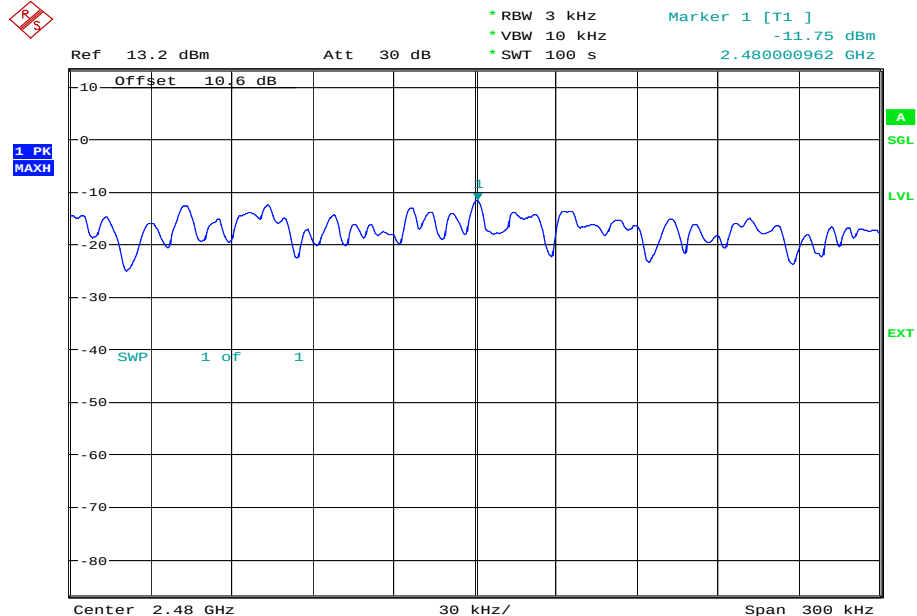
Date: 27.NOV.2014 15:46:21



Product Service

2441 MHzDH1

Date: 27.NOV.2014 15:43:39

2480 MHzDH1

Date: 27.NOV.2014 15:38:20

Limit Clause

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.



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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
Section 2.1 – AC Line Conducted Emissions					
3 phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	16-Jan-2015
Transient Limiter	Hewlett Packard	11947A	2378	12	1-Jul-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Section 2.2 - 6dB Bandwidth					
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	18-Jan-2015
Hygrometer	Rotronic	I-1000	2891	12	16-Jul-2015
Power Supply	Farnell	LT30-2	2903	-	TU
True RMS Multimeter	Fluke	179	4007	12	31-Jul-2015
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4099	12	7-Nov-2015
2 Metre SMA Type Cable	Rhophase	3PS-1801A-2000-3PS	4111	12	7-Nov-2015
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	18-Jan-2015
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	27-Feb-2015
Section 2.3 - Maximum Peak Conducted Output Power					
Power Supply Unit	Farnell	LT30-2	41	-	O/P Mon
Attenuator 10dB/25W	Weinschel	46-10-43	400	12	4-Jun-2015
Power Divider	Weinschel	1506A	603	12	28-May-2015
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Hygrometer	Rotronic	I-1000	3220	12	24-Jul-2015
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	3-Sep-2015
P-Series Power Meter	Agilent Technologies	N1911A	3981	12	22-Sep-2015
50 MHz-18 GHz Wideband Power Sensor	Agilent Technologies	N1921A	3982	12	22-Sep-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	24-Sep-2015
Section 2.4 - EIRP Peak Power					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	19-Sep-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	16-Jul-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU



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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Spurious and Band Edge Emissions					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	26-Nov-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Pre-Amplifier	Phase One	PSO4-0087	1534	12	1-Oct-2015
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	11-Aug-2015
Compliance 5 Emissions	Schaffner	C5e Software V.5.00.00	3275	-	N/A - Software
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Feb-2015
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	1-Oct-2015
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	21-Mar-2015
Section 2.6 - Power Spectral Density					
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
Multimeter	Fluke	79 Series III	611	12	1-Sep-2015
Multimeter	Iso-tech	IDM101	2419	12	7-Oct-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	9-Jan-2015
Attenuator (20dB, 2W)	Pasternack	PE7004-20	2943	12	28-Mar-2015
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	12-Dec-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	6-Aug-2015
2 Metre SMA Type Cable	Rhophase	3PS-1801A-2000-3PS	4111	12	7-Nov-2015

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	± 212.114 kHz
EIRP Peak Power	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Maximum Peak Conducted Output Power	± 0.70 dB
Spurious and Band Edge Emissions	Conducted: ± 3.08 dB Radiated: 30 MHz to 1 GHz: ± 5.1 dB Radiated: 1 GHz to 40 GHz: ± 6.3 dB
Power Spectral Density	± 3.0 dB
AC Line Conducted Emissions	± 3.2 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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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