Kenxen Electronic (SZ) Limited.

Application
For
Certification

FCC ID: 2AEBDBU4001

IP-Cam

Model: BU4001

2.4GHz WiFi Transceiver

Report No.: 141222017SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:

Sign on file

Sunny Zhou
Engineer

Approved by:

Digitally signed by Andy Yan
Location: Intertek Testing Services

Andy Yan
Senior Project Engineer
Date: April 09, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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TRF no.: FCC 15C_Tx_b

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MEASUREMENT/TECHNICAL REPORT

IP-Cam

Model: BU4001

FCC ID: 2AEBDBU4001

This report concerns (check one) Original Grant ___X___ Class II Change ____

Equipment Type: DTS - Part 15 Digital Transmission Systems (WiFi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___ X_____

If yes, defer until : _____ date

Company Name agrees to notify the Commission by: _____ date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-13] Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1

SUMMARY OF TEST RESULTS

1.0 Summary of Test results

IP-Cam

Model: BU4001

FCC ID: 2AEBDBU4001

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a IP-Cam with WiFi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 2422-2452MHz for 802.11n-HT40, 9 channels with 5MHz channel spacing. The EUT was powered by AC120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM. CCK, DQPSK, DBPSK for DSSS.

Antenna Type: Integral Antenna.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:
DTS- Part 15 Digital Transmission Systems (WiFi transmitter portion)

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC120V/ 60Hz during the testing. All the data rate of 802.11b/g/n was tested and only the worst case data was reported.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

The rear of unit shall be flushed with the rear of the table.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

3.3 Special Accessories

N/A

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Kenxen Electronic (SZ) Limited. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
USB Cable	Kenxen	Unshielded, Length 360cm
Adapter	Shenzhen Huoniu Technology Co Ltd	Model No.:HNBM050150UX Rating: Input 100-240Vac, 50/60Hz, 0.35A Max. output: 5Vdc, 1.5A

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	18.10	64.57
Middle Channel: 2437	17.80	60.26
High Channel: 2462	18.10	64.57

IEEE 802.11g (Antenna Gain = 2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	23.20	208.93
Middle Channel: 2437	23.10	204.17
High Channel: 2462	23.40	218.78

IEEE 802.11n-HT20 (Antenna Gain = 2dBi) (16QAM, 6.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	22.60	181.97
Middle Channel: 2437	22.50	177.83
High Channel: 2462	22.90	194.98

IEEE 802.11n-HT40 (Antenna Gain = 2.0dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2422	21.40	138.04
Middle Channel: 2437	21.30	134.90
High Channel: 2452	21.50	141.25

Cable loss: 1.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max output level = 23.40dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.465
2437	9.508
2462	10.637

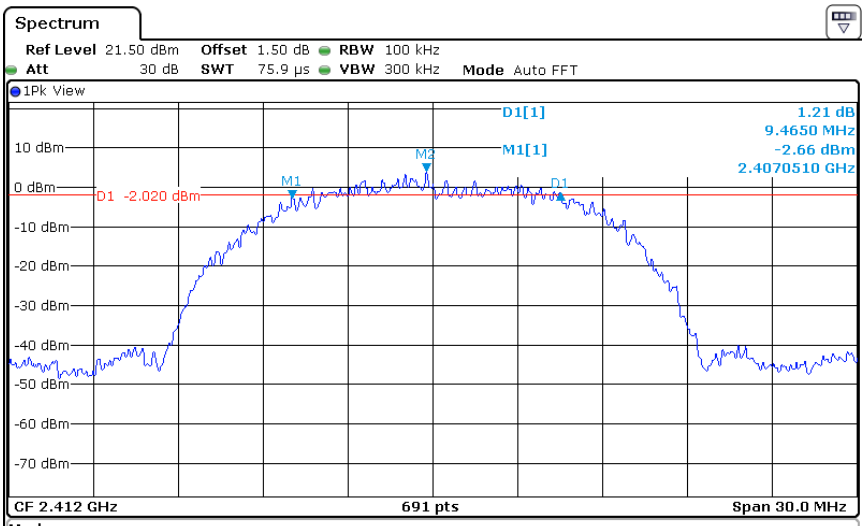
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.541
2437	17.062
2462	16.411

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.757
2437	17.757
2462	17.627

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	36.57
2437	36.52
2452	36.44

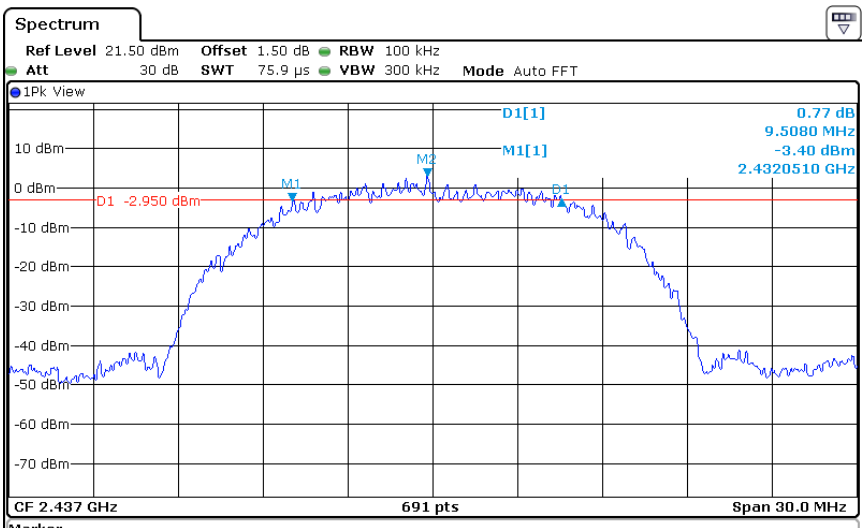
The test plots are attached as below.

802.11b



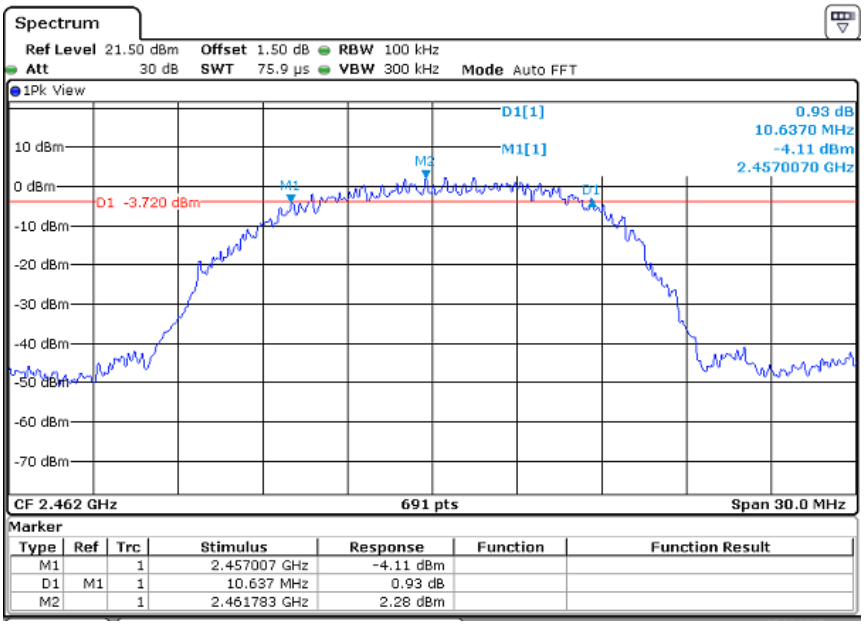
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.407051 GHz	-2.66 dBm		
D1	M1	1	9.465 MHz	1.21 dB		
M2		1	2.411783 GHz	3.98 dBm		

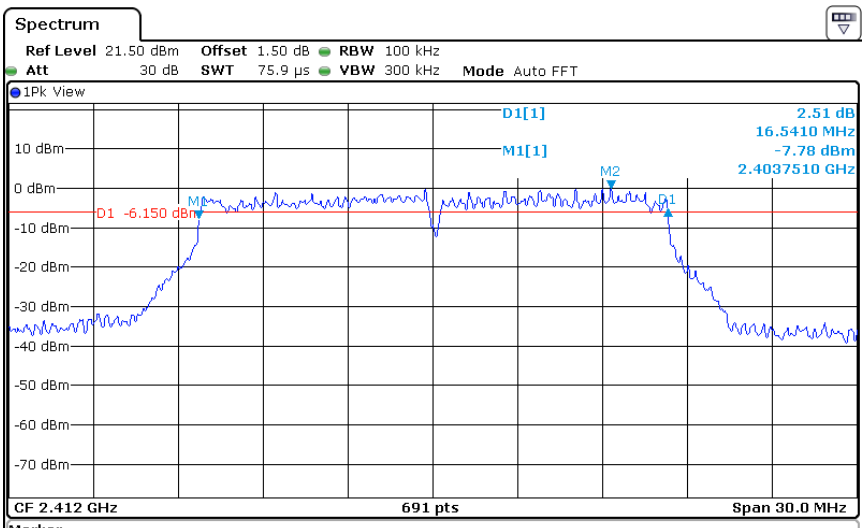


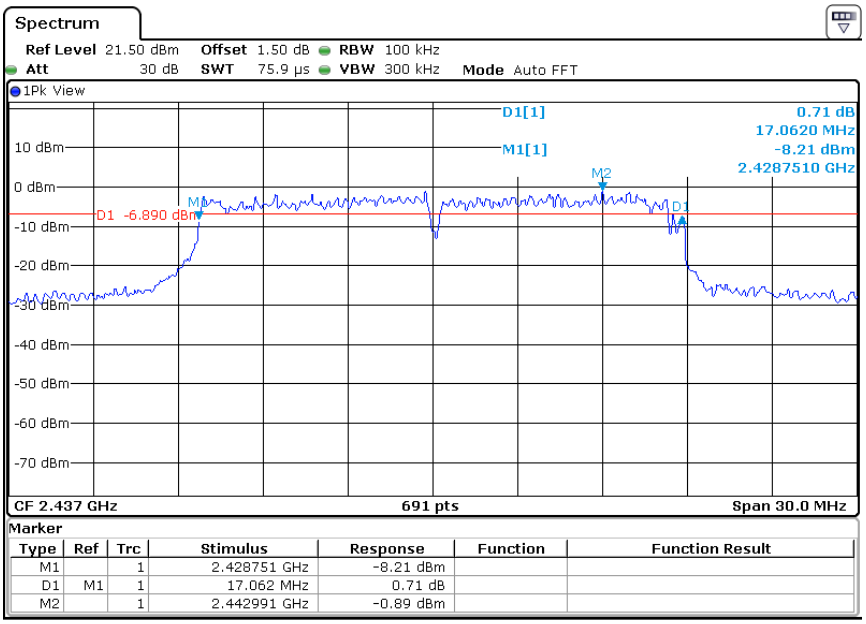
Marker

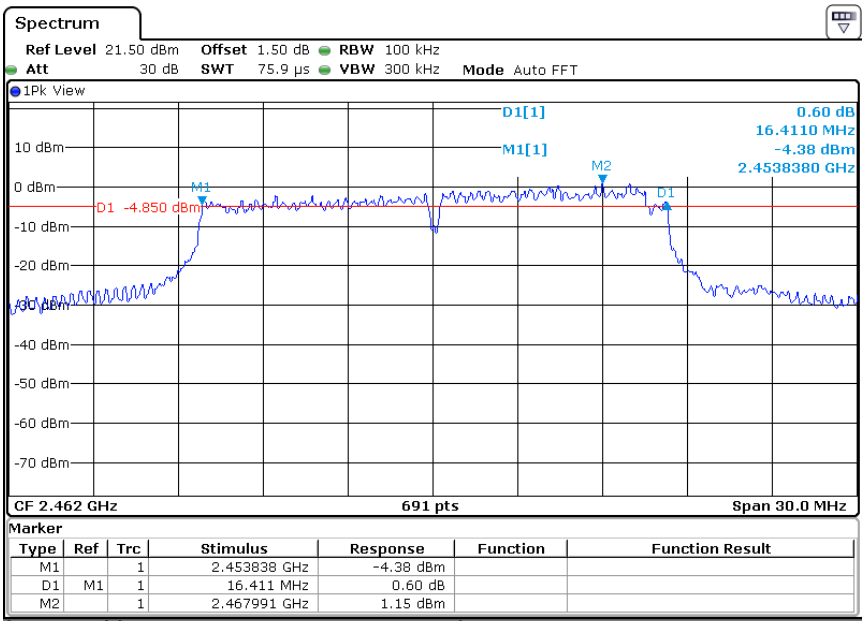
Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.432051 GHz	-3.40 dBm		
D1	M1	1	9.508 MHz	0.77 dB		
M2		1	2.436826 GHz	3.05 dBm		


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1]
0.93 dB
10.6370 MHz
M1[1]
-4.11 dBm
2.4570070 GHz
M2
M1
D1 -3.720 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.457007 GHz -4.11 dBm
D1 M1 1 10.637 MHz 0.93 dB
M2 1 2.461783 GHz 2.28 dBm

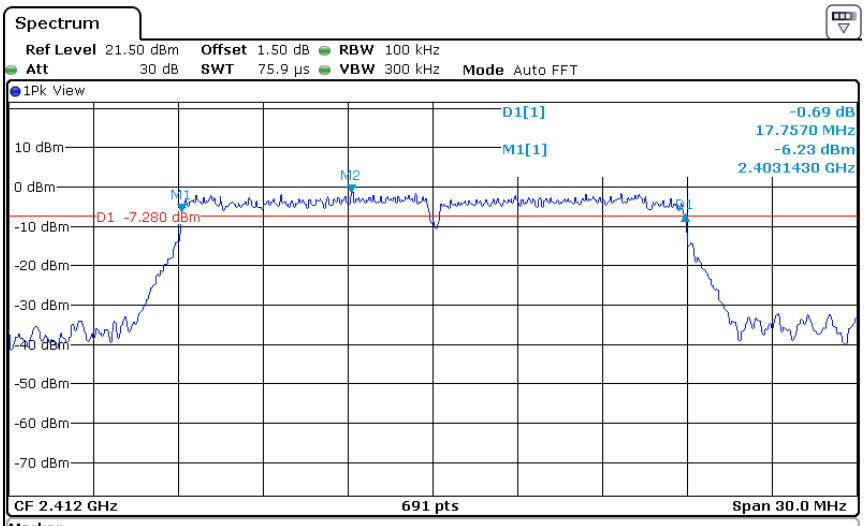
802.11g

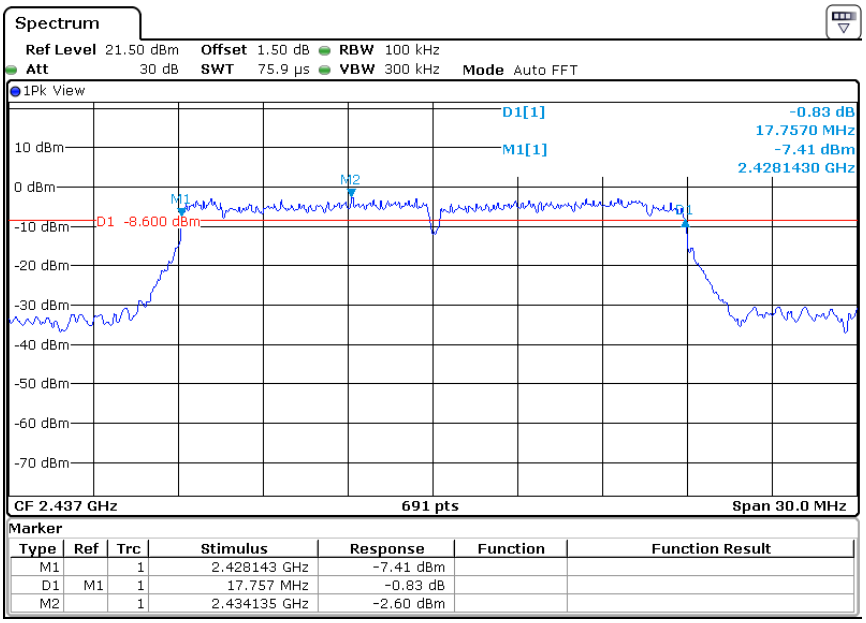

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1]
2.51 dB
16.5410 MHz
M1[1]
-7.78 dBm
2.4037510 GHz
M2
D1 -6.150 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.403751 GHz -7.78 dBm
D1 M1 1 16.541 MHz 2.51 dB
M2 1 2.418295 GHz -0.15 dBm

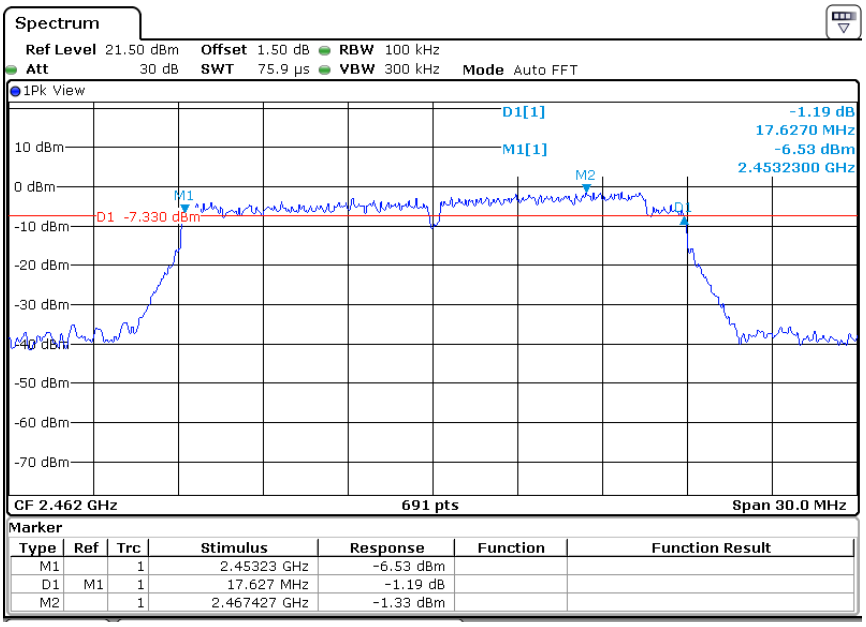

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1]
0.71 dB
17.0620 MHz
M1[1]
-8.21 dBm
2.4287510 GHz
M2
D1 -6.890 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.428751 GHz -8.21 dBm
D1 M1 1 17.062 MHz 0.71 dB
M2 1 2.442991 GHz -0.89 dBm


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] 0.60 dB
16.4110 MHz
M1[1] -4.38 dBm
2.4538380 GHz
M2
M1
D1 -4.850 dBm
D1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.453838 GHz -4.38 dBm
D1 M1 1 16.411 MHz 0.60 dB
M2 1 2.467991 GHz 1.15 dBm

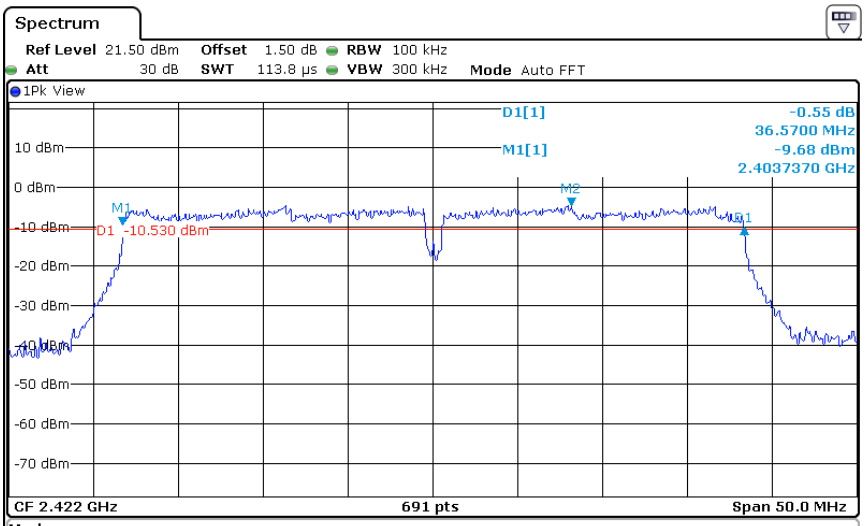
802.11 n-HT20

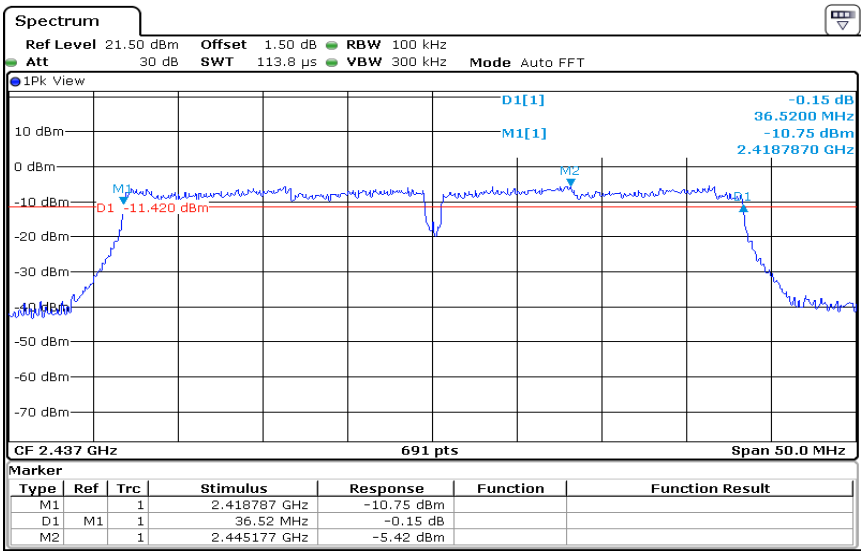

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -0.69 dB
17.7570 MHz
M1[1] -6.23 dBm
2.4031430 GHz
D1 -7.280 dBm
CF 2.412 GHz 691 pts Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.403143 GHz -6.23 dBm
D1 M1 1 17.757 MHz -0.69 dB
M2 1 2.409135 GHz -1.28 dBm

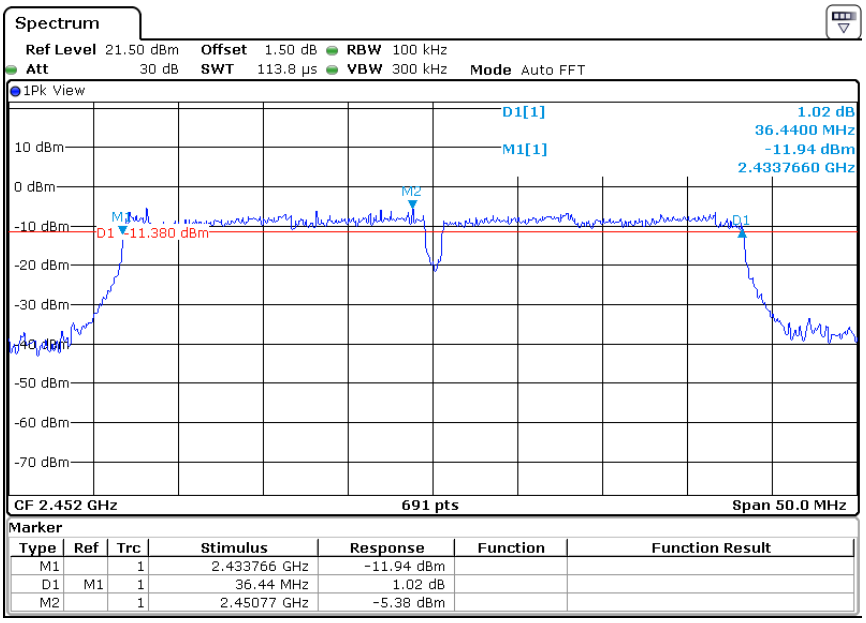

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -0.83 dB
17.7570 MHz
M1[1] -7.41 dBm
2.4281430 GHz
D1 -8.600 dBm
CF 2.437 GHz 691 pts Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.428143 GHz -7.41 dBm
D1 M1 1 17.757 MHz -0.83 dB
M2 1 2.434135 GHz -2.60 dBm


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -1.19 dB
17.6270 MHz
M1[1] -6.53 dBm
2.4532300 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
D1 -7.330 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.45323 GHz -6.53 dBm
D1 M1 1 17.627 MHz -1.19 dB
M2 1 2.467427 GHz -1.33 dBm

802.11 n-HT40


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -0.55 dB
36.5700 MHz
M1[1] -9.68 dBm
2.4037370 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1 -10.530 dBm
M2
D1
CF 2.422 GHz
691 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.403737 GHz -9.68 dBm
D1 M1 1 36.57 MHz -0.55 dB
M2 1 2.430177 GHz -4.53 dBm


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -0.15 dB
36.5200 MHz
M1[1] -10.75 dBm
2.4187870 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1 -11.420 dBm
M2
D1
CF 2.437 GHz
691 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.418787 GHz -10.75 dBm
D1 M1 1 36.52 MHz -0.15 dB
M2 1 2.445177 GHz -5.42 dBm


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1]
1.02 dB
36.4400 MHz
M1[1]
-11.94 dBm
2.4337660 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
-11.380 dBm
M2
D1
CF 2.452 GHz
691 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.433766 GHz -11.94 dBm
D1 M1 1 36.44 MHz 1.02 dB
M2 1 2.45077 GHz -5.38 dBm

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	4.00
2437	3.45
2462	3.51

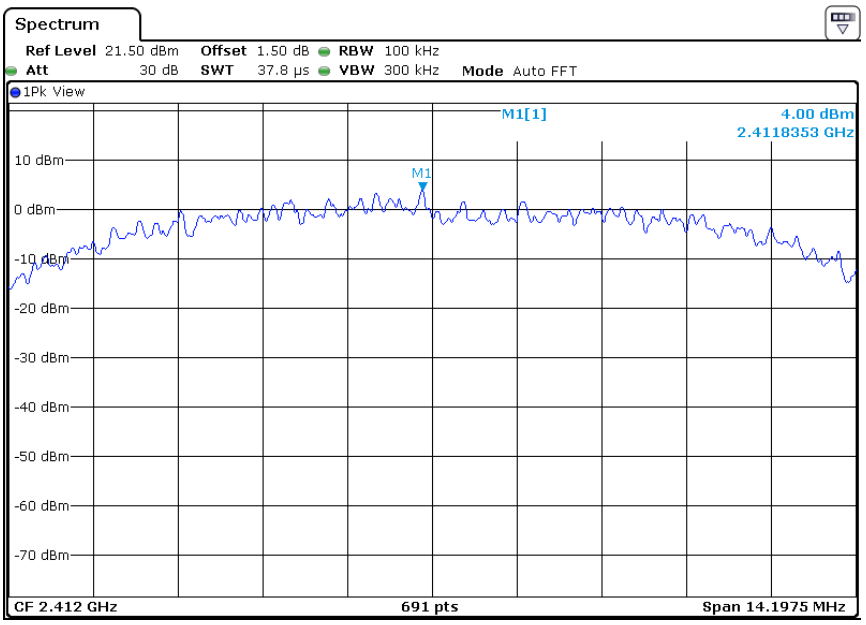
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	0.53
2437	-0.54
2462	-1.11

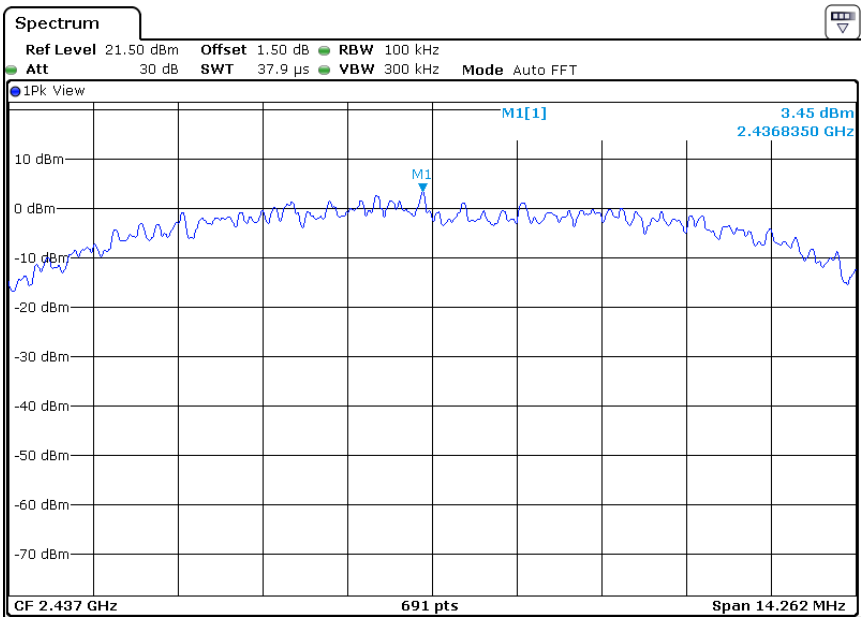
IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-1.08
2437	-2.69
2462	-3.45

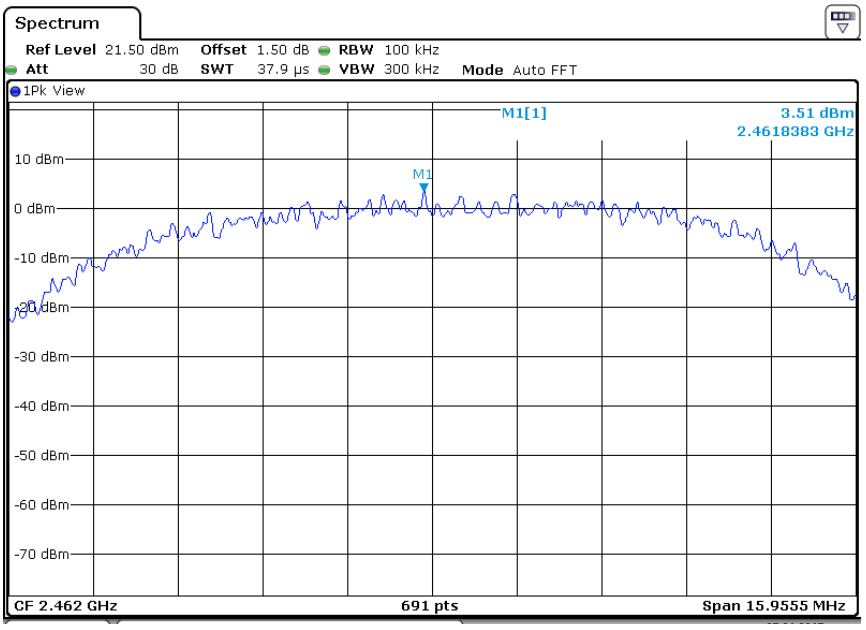
IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2422	-4.78
2437	-5.65
2452	-4.61

The test plots are attached as below.

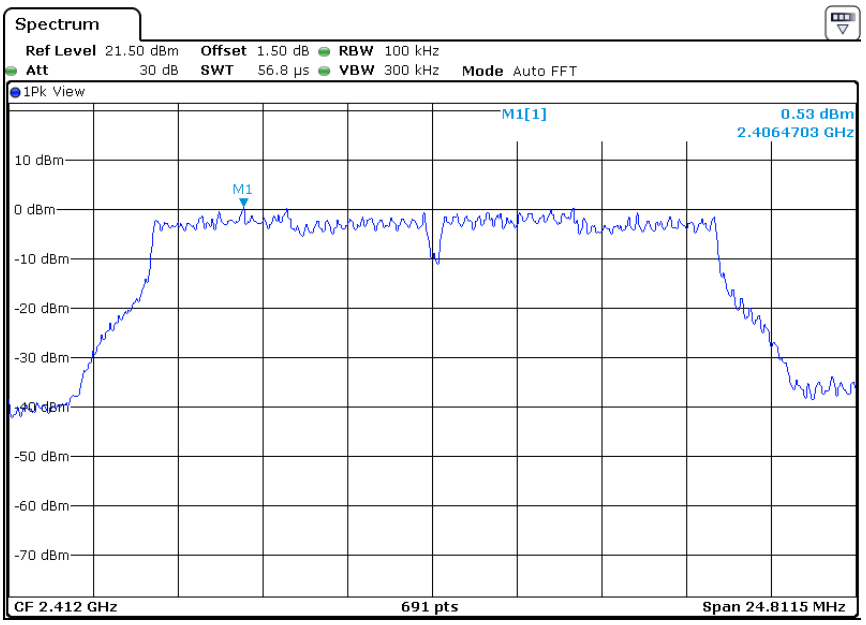
802.11b

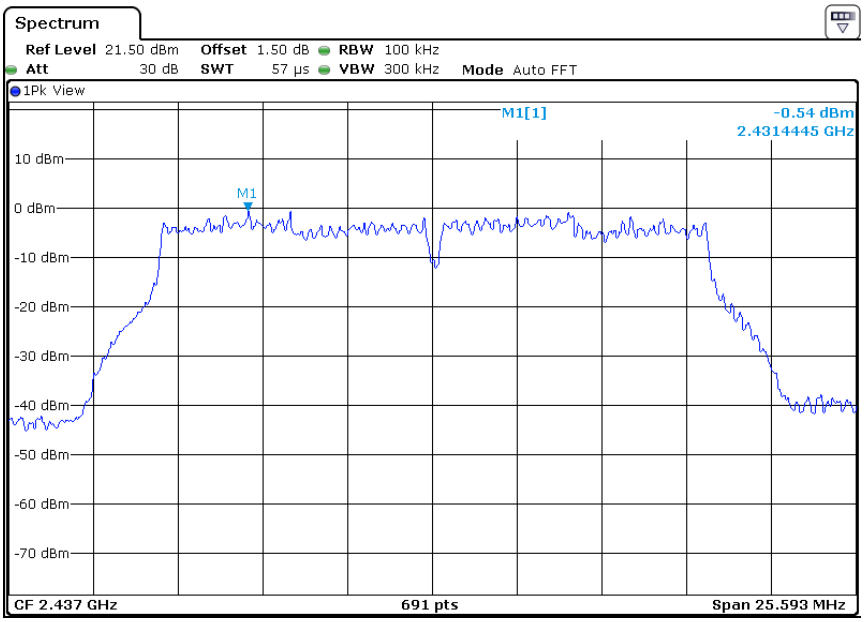

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 37.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 4.00 dBm
2.4118353 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 14.1975 MHz

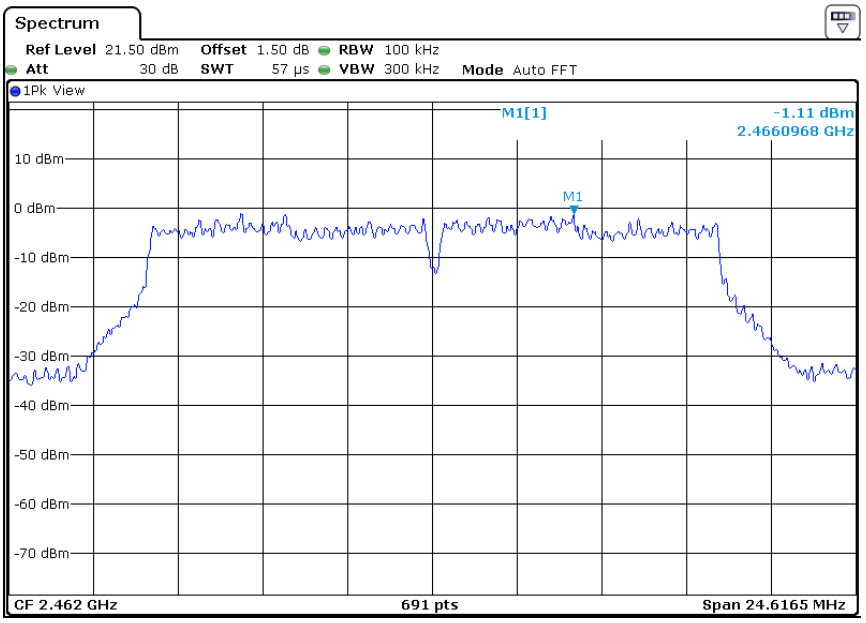

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 3.45 dBm
2.4368350 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.437 GHz
691 pts
Span 14.262 MHz


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 3.51 dBm
2.4618383 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 15.9555 MHz

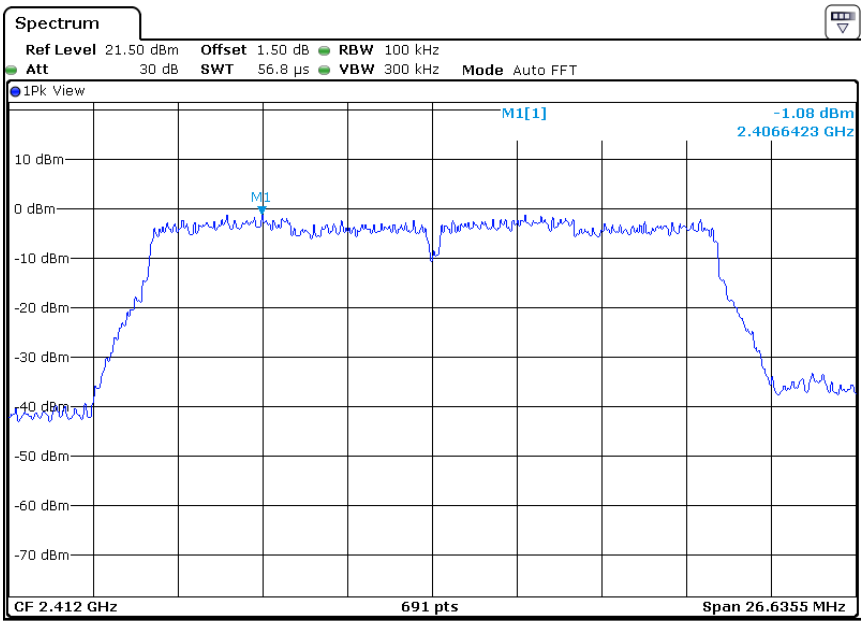
802.11g

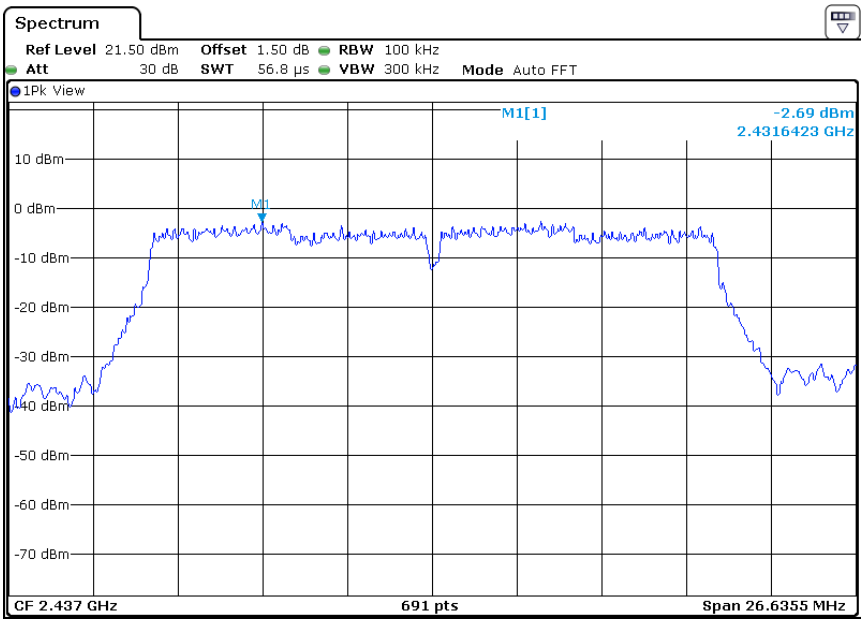

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 0.53 dBm
2.4064703 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 24.8115 MHz

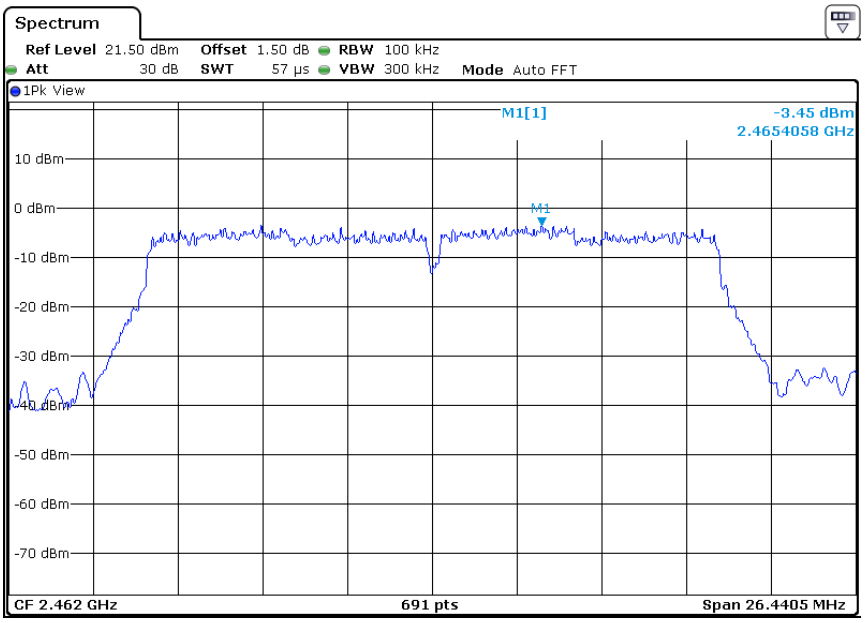

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -0.54 dBm
2.4314445 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.437 GHz
691 pts
Span 25.593 MHz


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1]
-1.11 dBm
2.4660968 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 24.6165 MHz

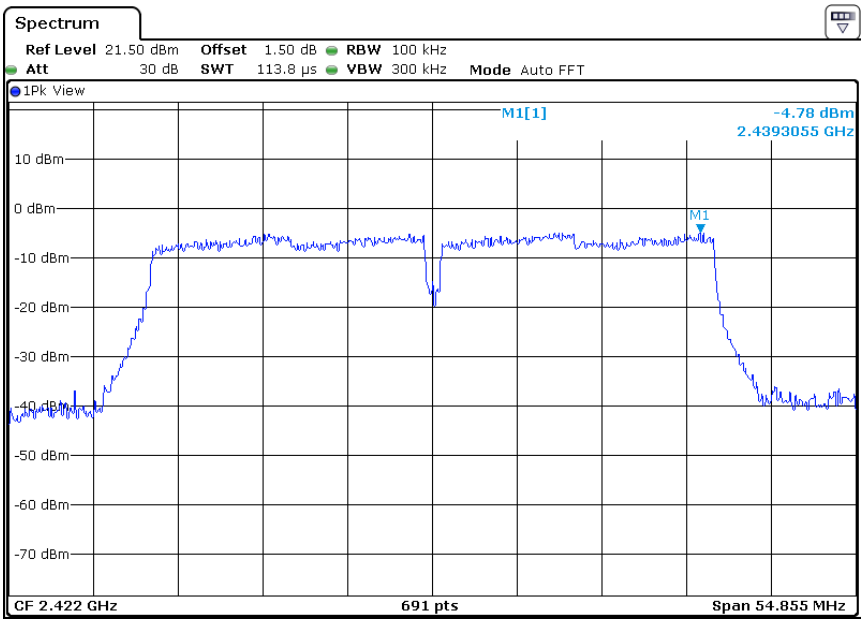
802.11 n-HT20

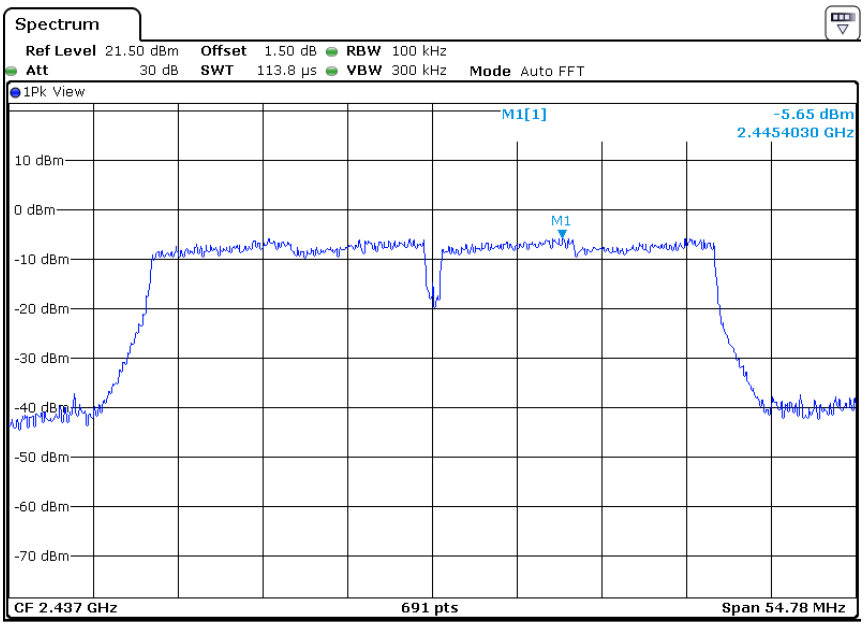

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -1.08 dBm
2.4066423 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 26.6355 MHz

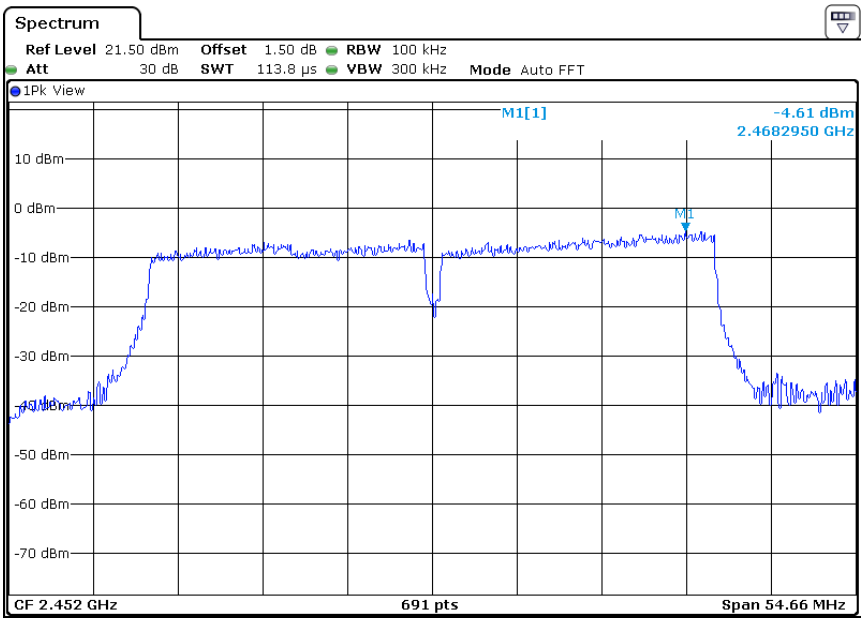

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 56.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -2.69 dBm
2.4316423 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.437 GHz
691 pts
Span 26.6355 MHz


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -3.45 dBm
2.4654058 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 26.4405 MHz

802.11 n-HT40


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -4.78 dBm
2.4393055 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.422 GHz
691 pts
Span 54.855 MHz


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -5.65 dBm
2.4454030 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.437 GHz
691 pts
Span 54.78 MHz


Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1]
-4.61 dBm
2.4682950 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.452 GHz
691 pts
Span 54.66 MHz

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074.

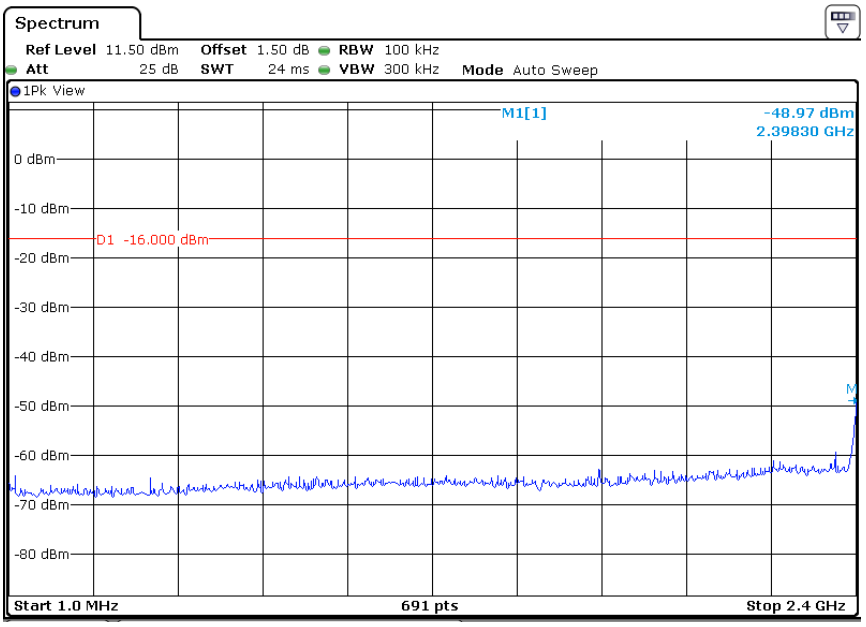
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

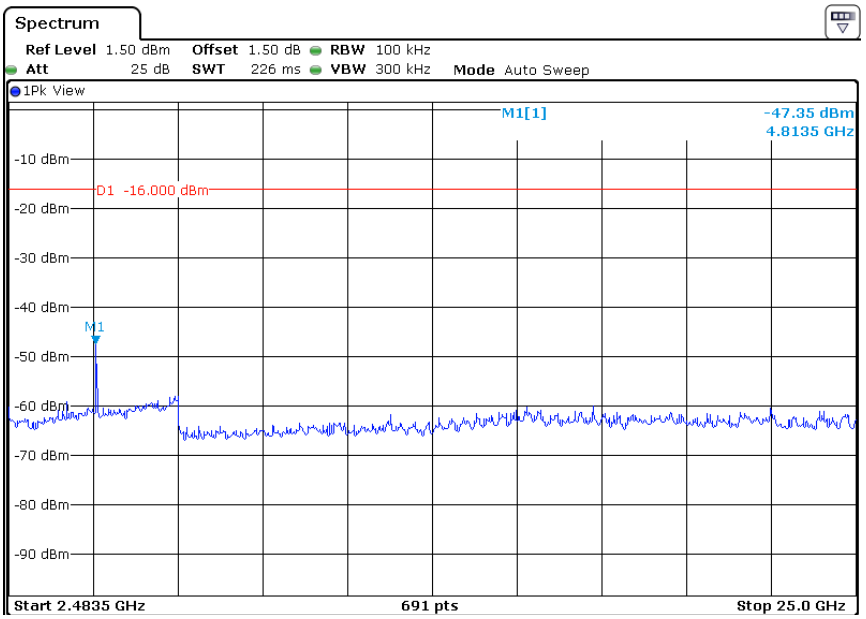
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

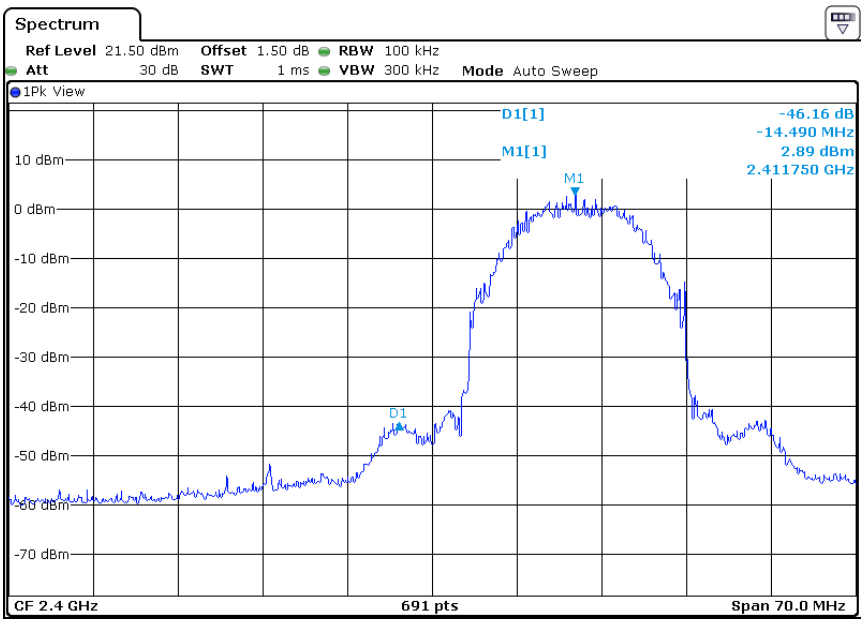
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

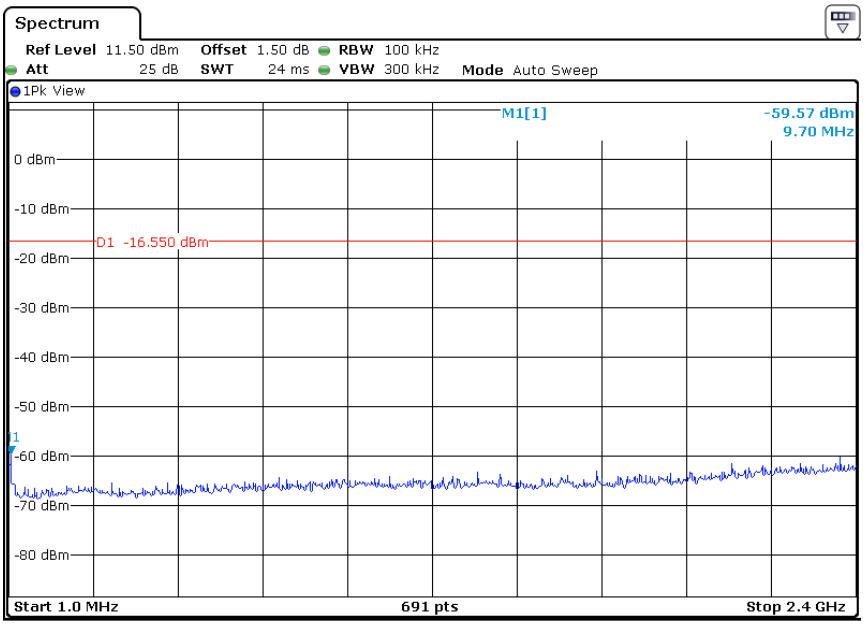
802.11b
Channel 01 (2412MHz) Reference Level: 4.00dBm

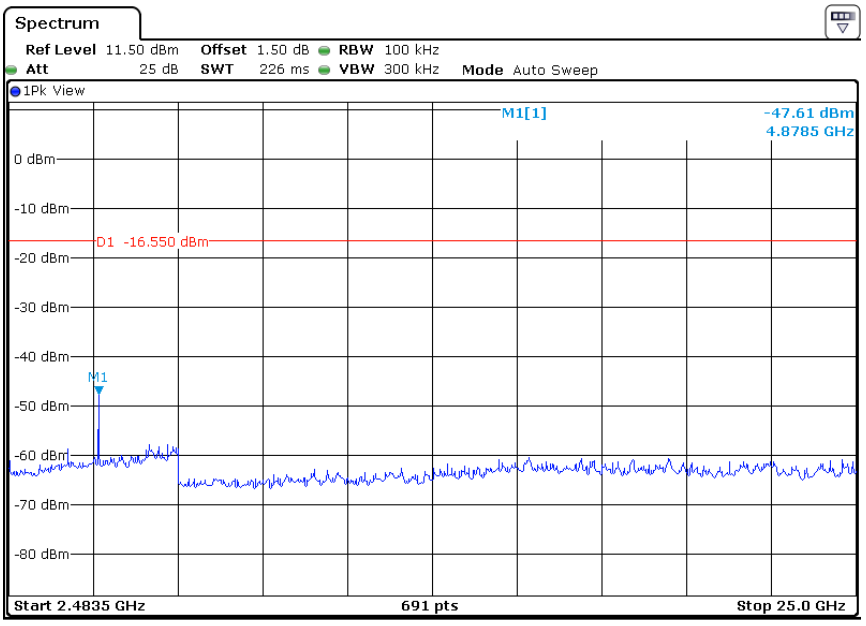




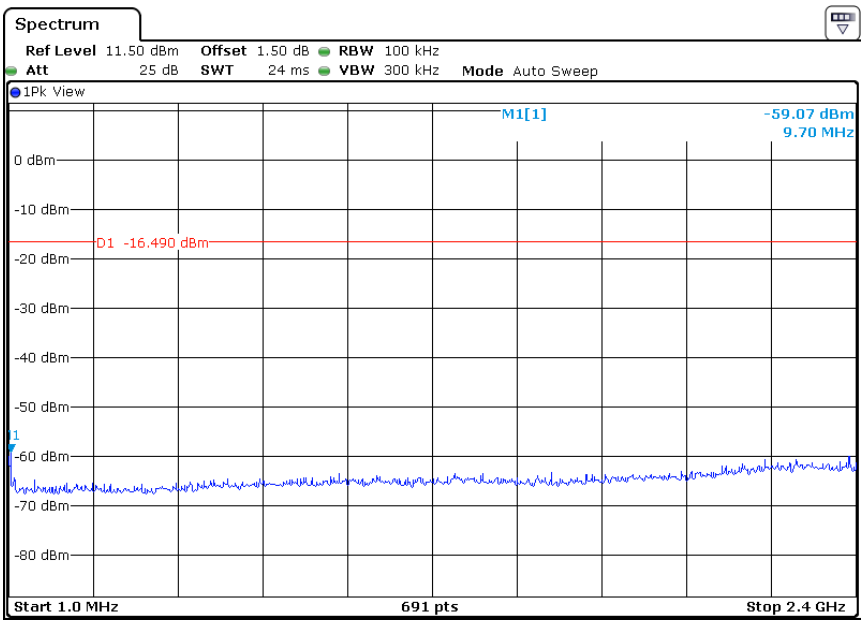

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1] -46.16 dB
-14.490 MHz
M1[1] 2.89 dBm
2.411750 GHz
M1
D1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.4 GHz
691 pts
Span 70.0 MHz

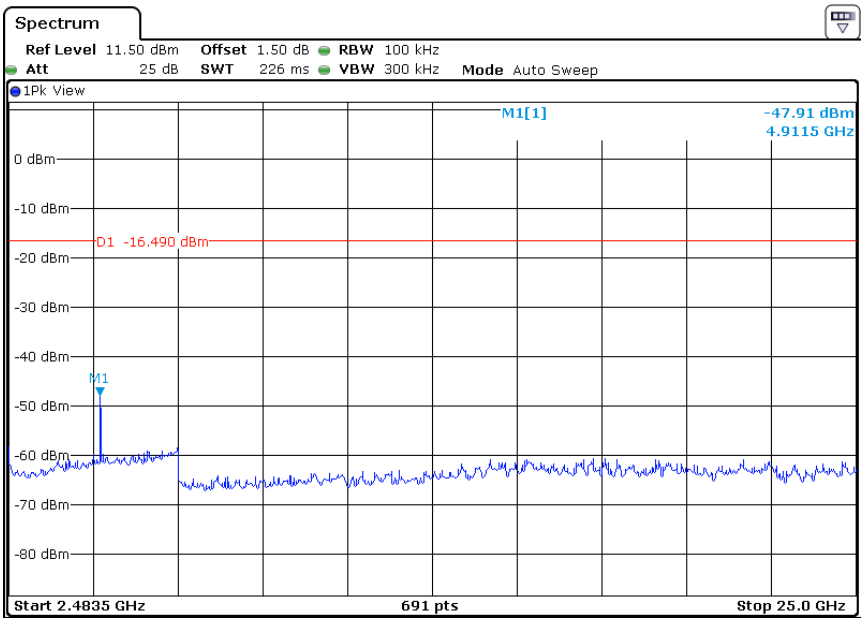
Channel 06 (2437MHz) Reference Level: 3.45dBm

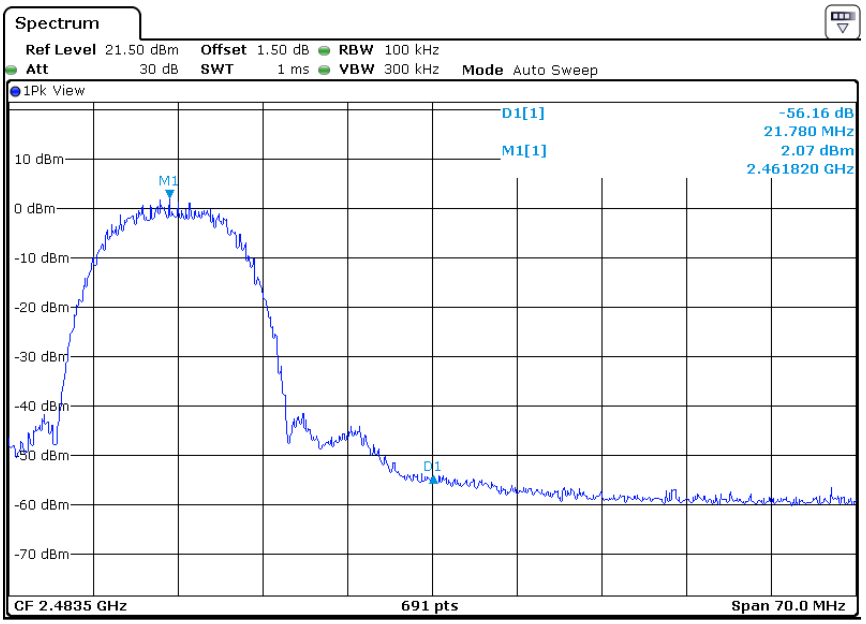




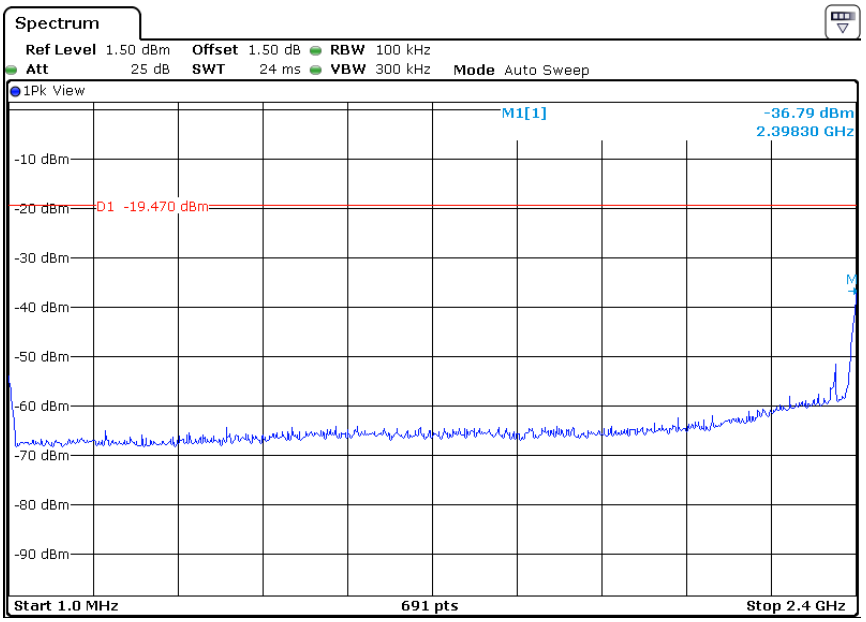
Channel 11 (2462MHz) Reference Level: 3.51dBm

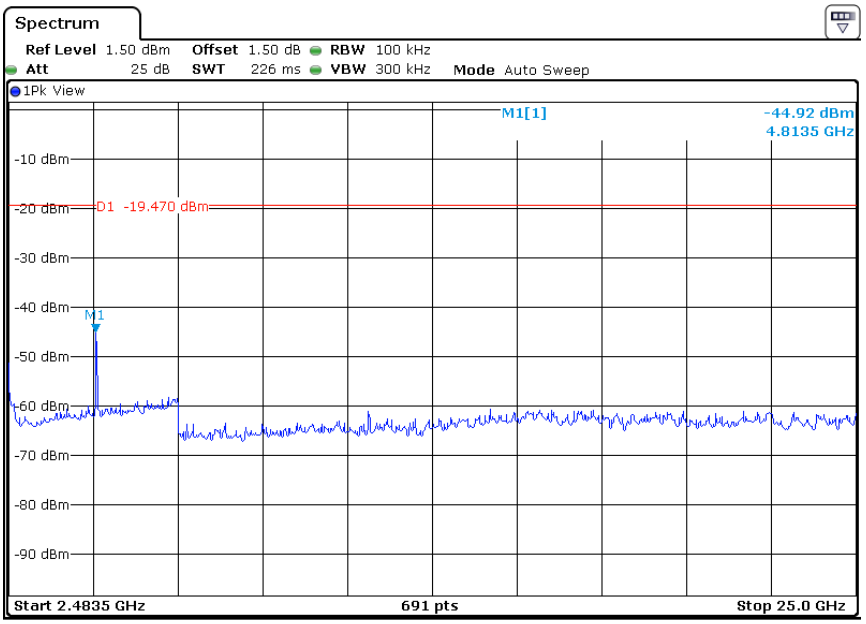


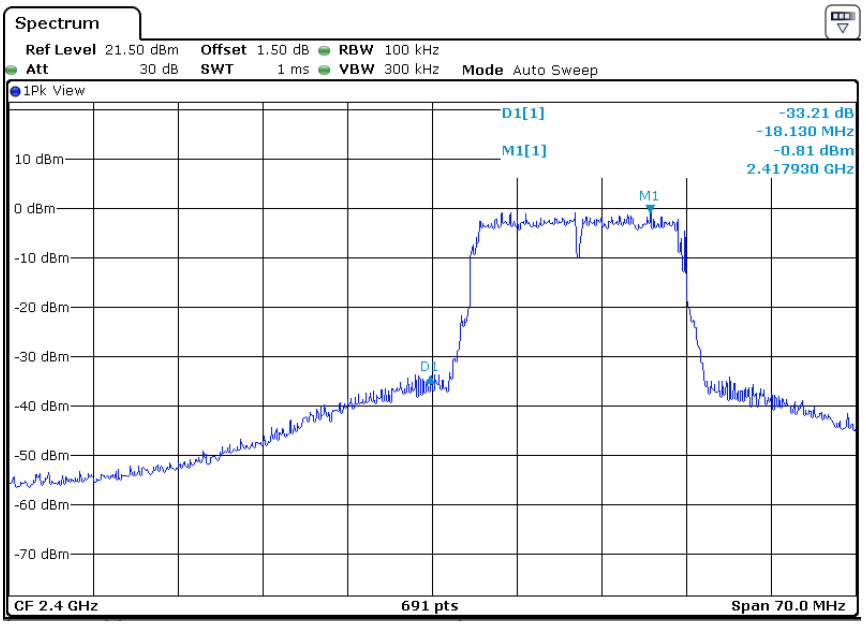



Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1] -56.16 dB
21.780 MHz
M1[1] 2.07 dBm
2.461820 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 70.0 MHz

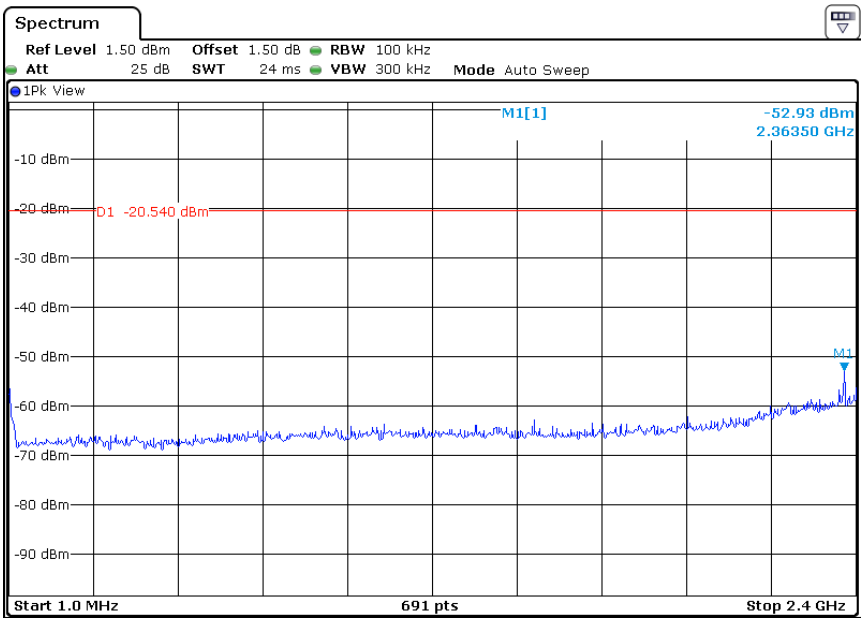
802.11g
Channel 01 (2412MHz) Reference Level: 0.53dBm

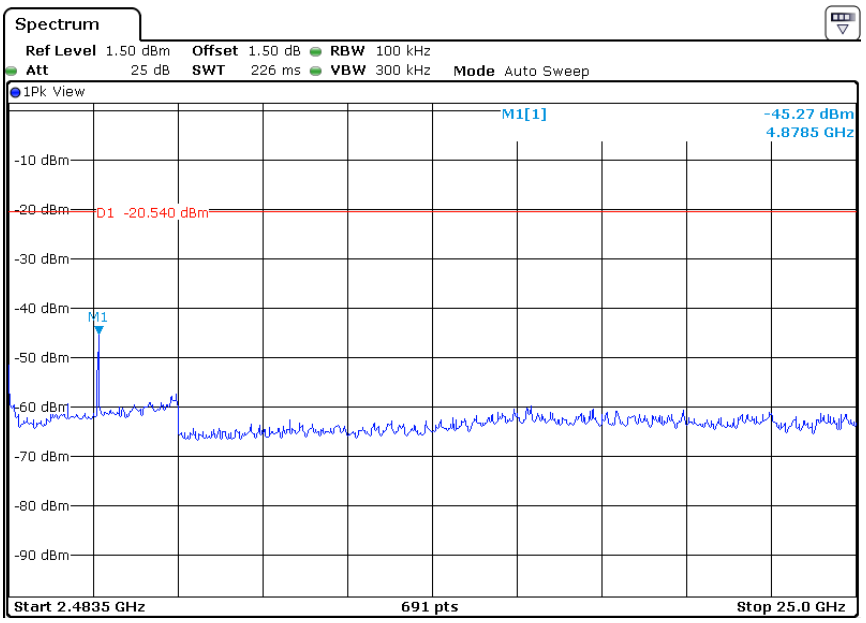




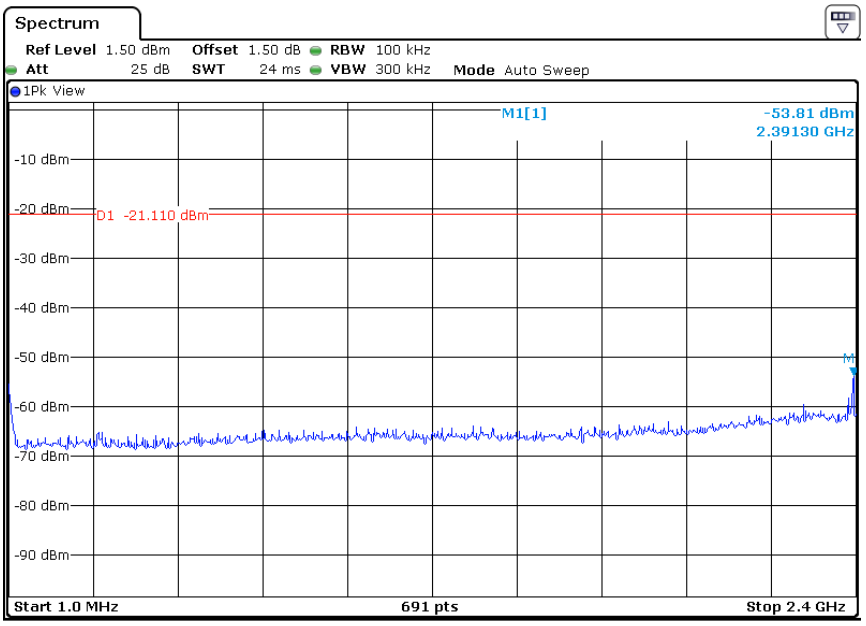

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1]
-33.21 dB
-18.130 MHz
M1[1]
-0.81 dBm
2.417930 GHz
M1
D1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.4 GHz
691 pts
Span 70.0 MHz

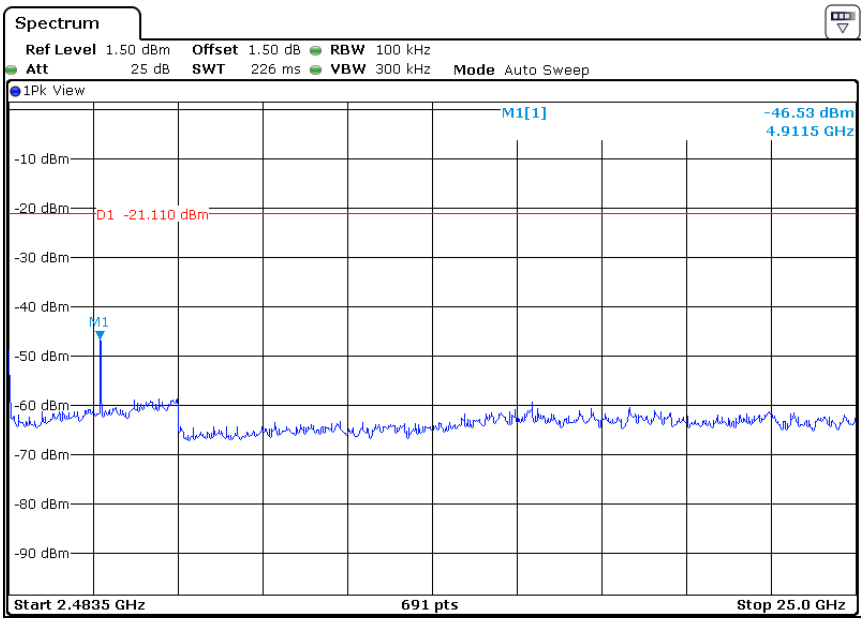
Channel 06 (2437MHz) Reference Level: -0.54dBm

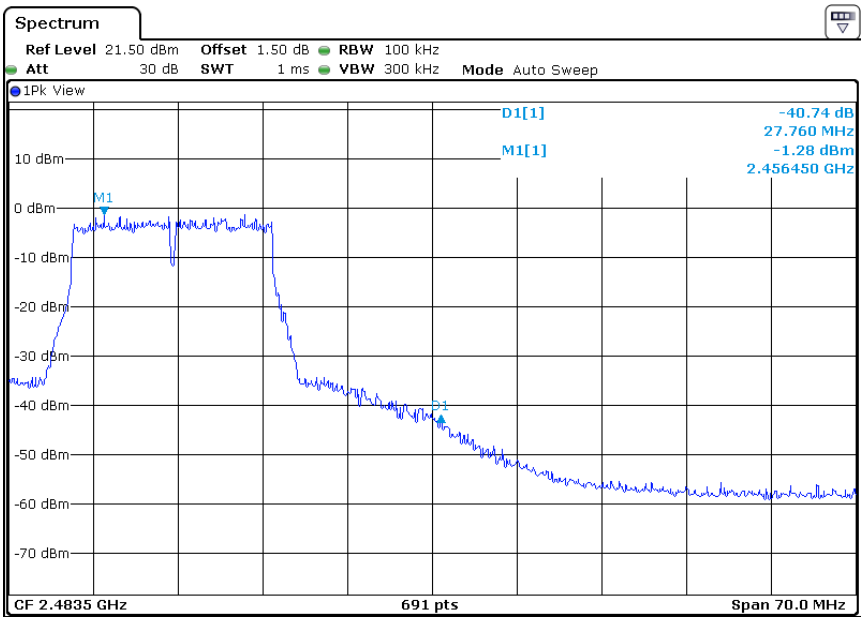




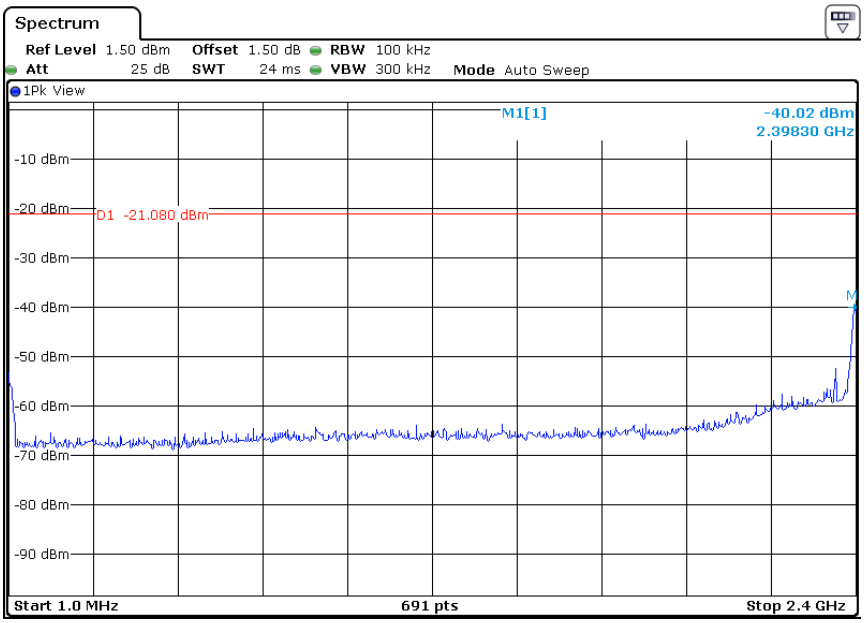
Channel 11 (2462MHz) Reference Level: -1.11dBm

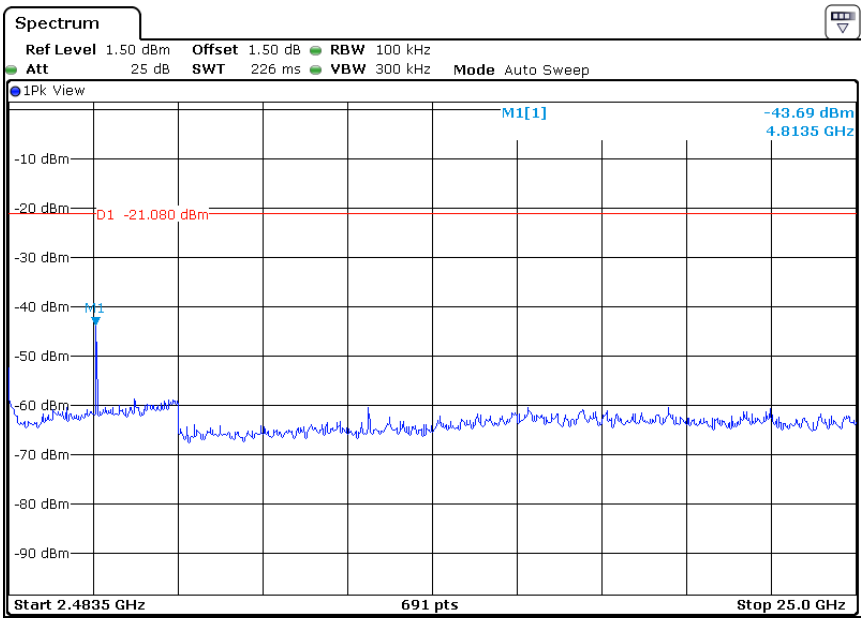


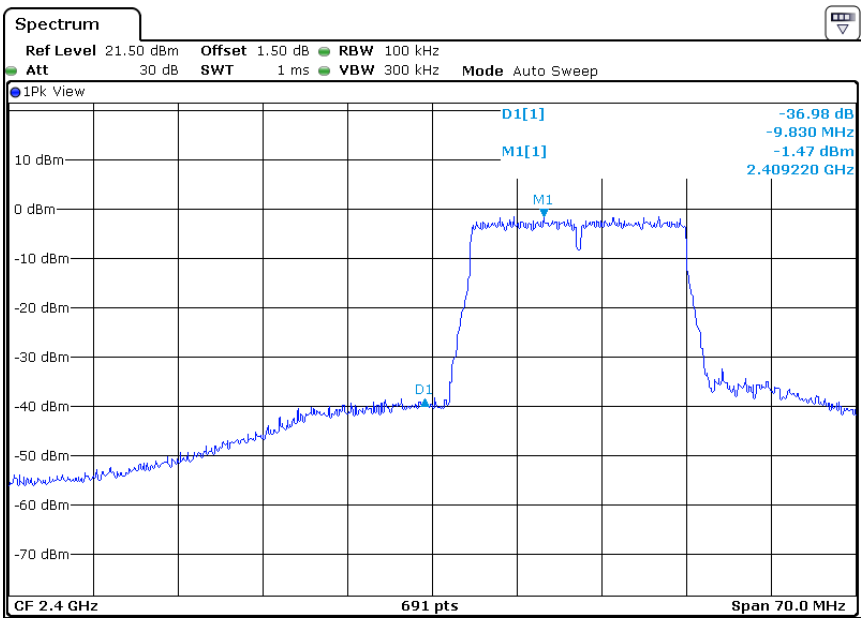



Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1] -40.74 dB
27.760 MHz
M1[1] -1.28 dBm
2.456450 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 70.0 MHz

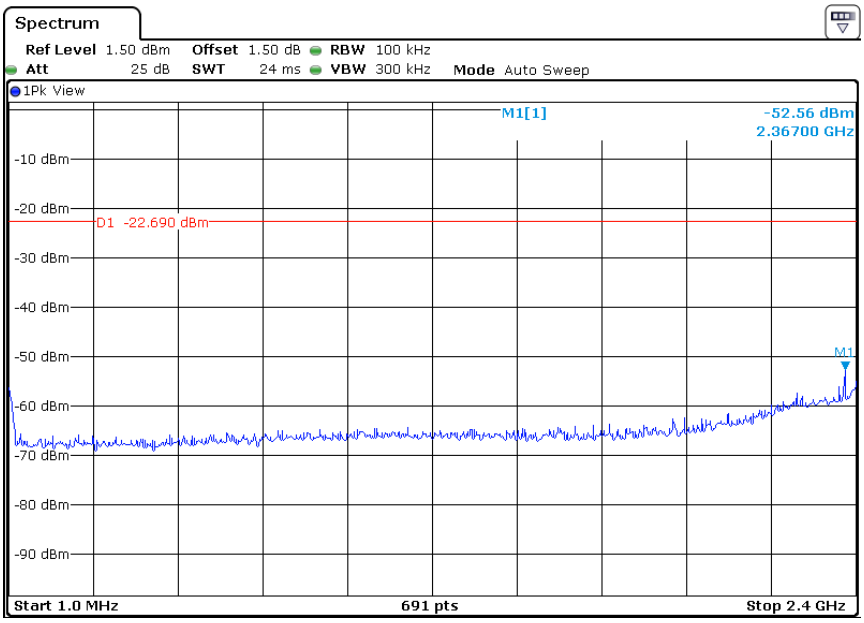
802.11 n-HT20
Channel 01 (2412MHz) Reference Level: -1.08dBm

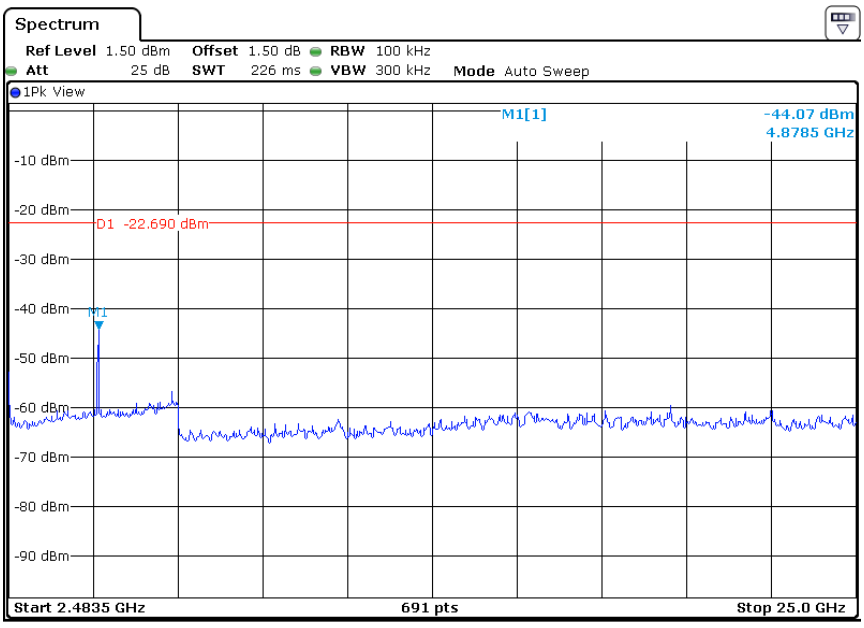




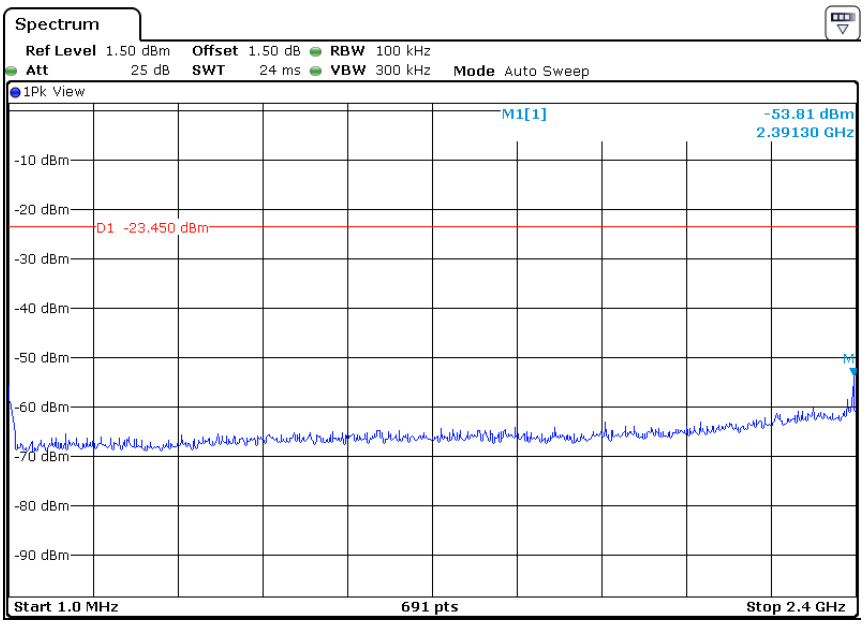

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1] -36.98 dB
-9.830 MHz
M1[1] -1.47 dBm
2.409220 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 70.0 MHz

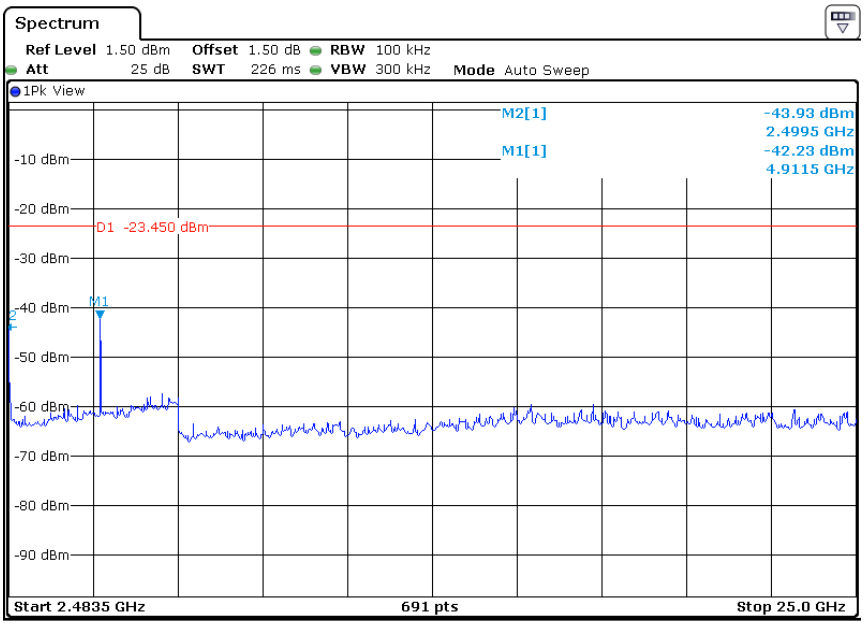
Channel 06 (2437MHz) Reference Level: -2.69dBm

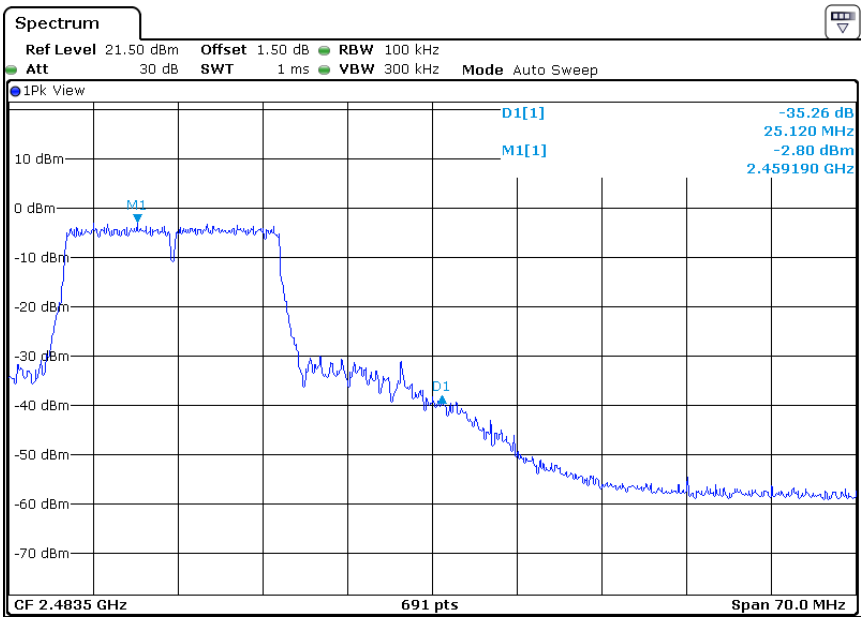




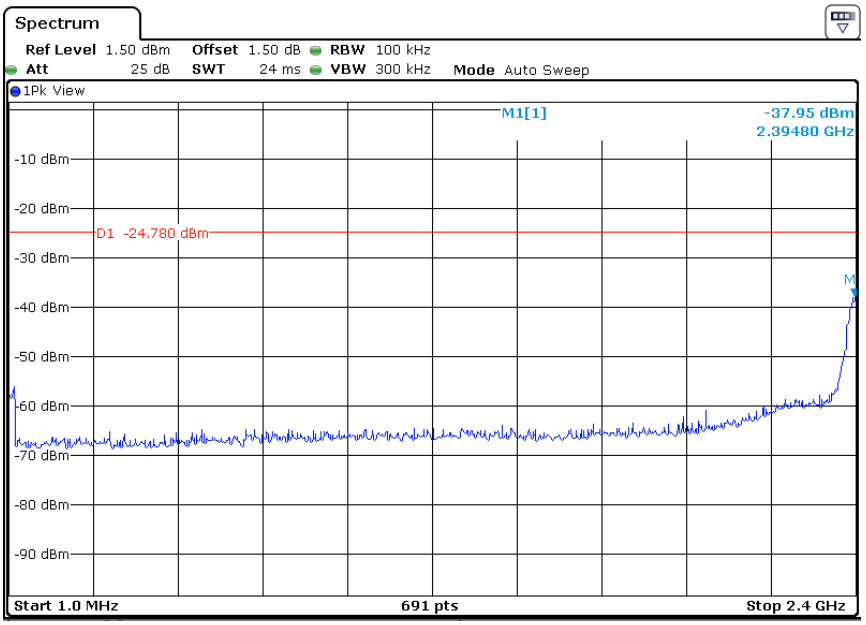
Channel 11 (2462MHz) Reference Level: -3.45dBm

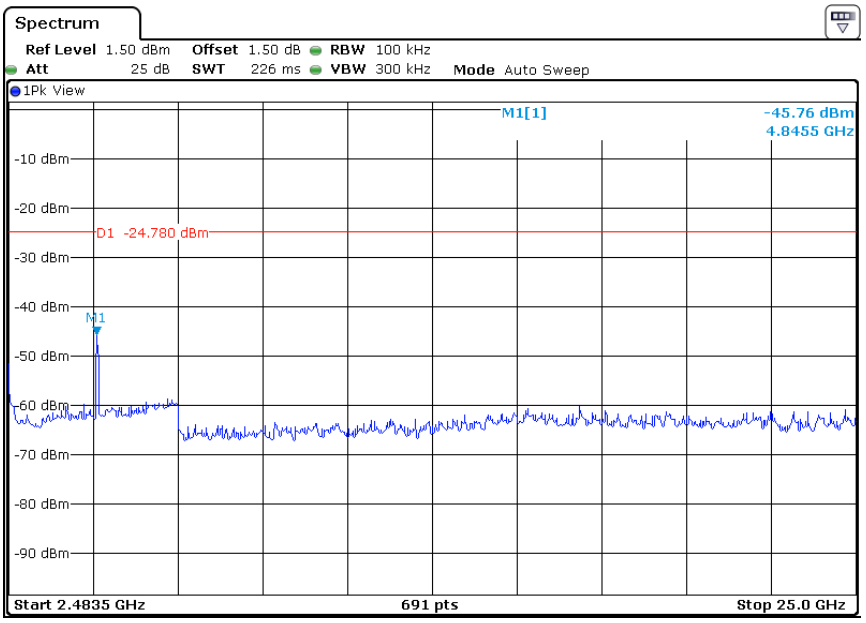


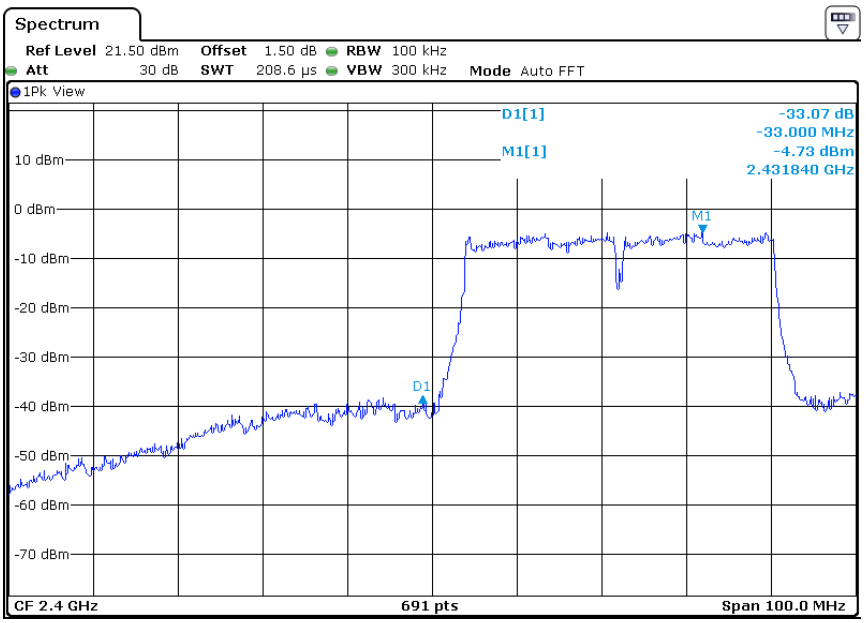



Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
1Pk View
D1[1] -35.26 dB
25.120 MHz
M1[1] -2.80 dBm
2.459190 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 70.0 MHz

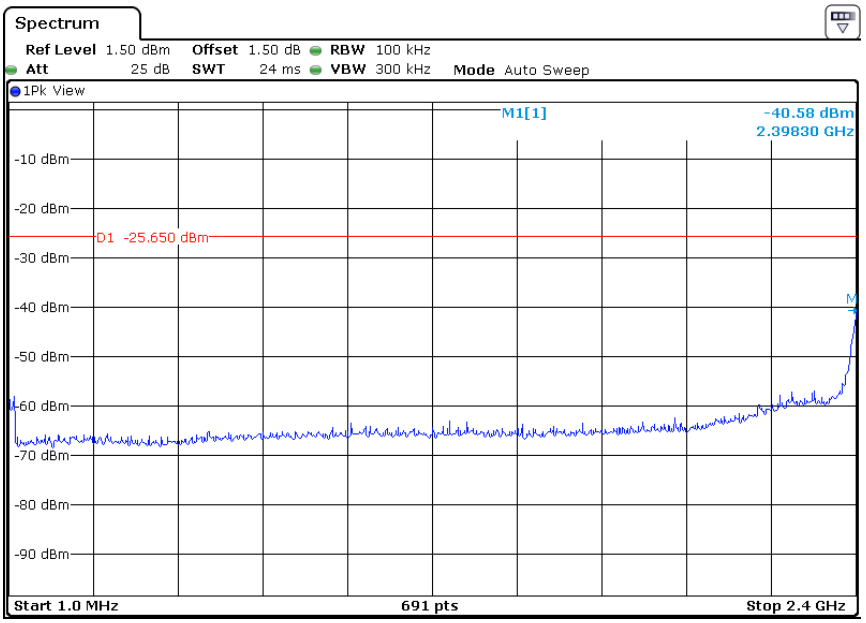
802.11 n-HT40
Channel 03 (2422MHz) Reference Level: -4.78dBm

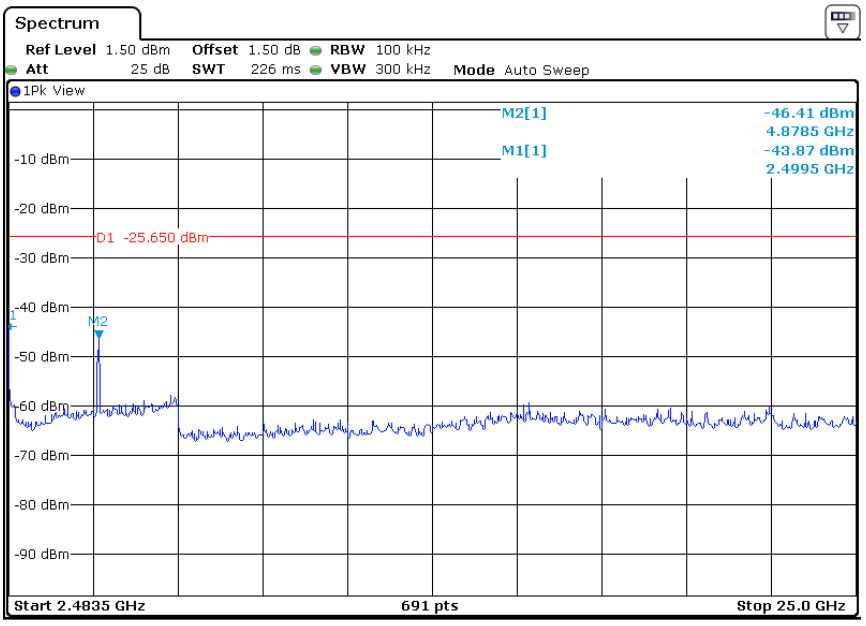




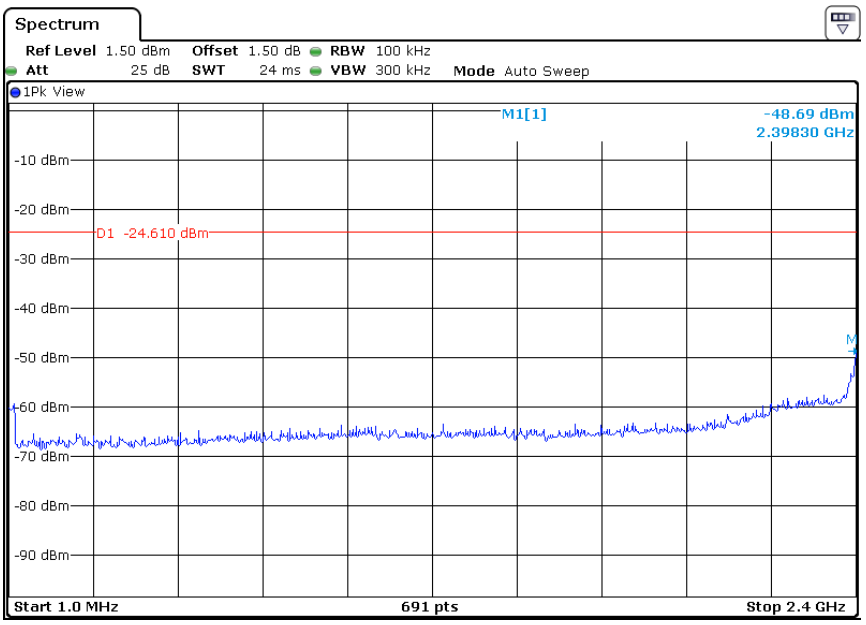

Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 208.6 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -33.07 dB
-33.000 MHz
M1[1] -4.73 dBm
2.431840 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 100.0 MHz

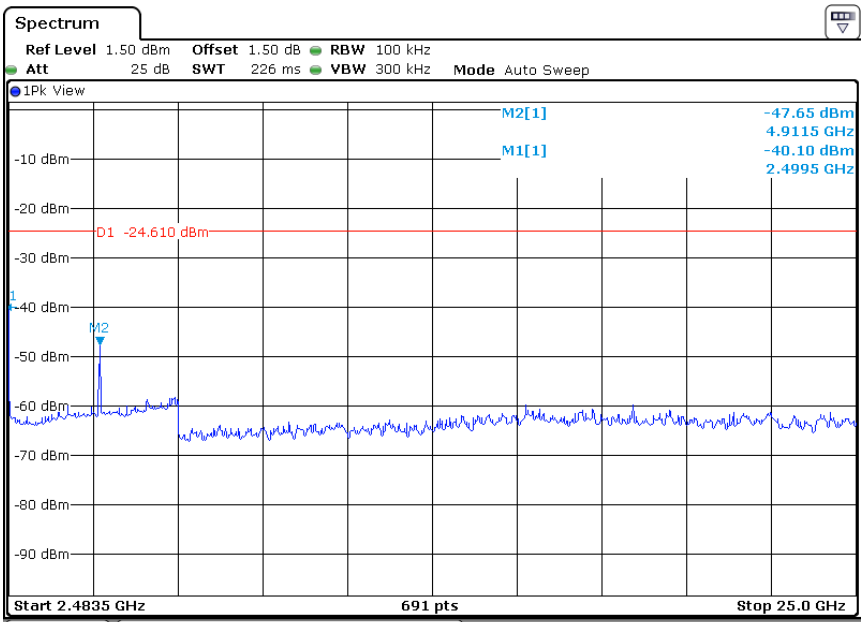
Channel 06 (2437MHz) Reference Level: -5.65dBm

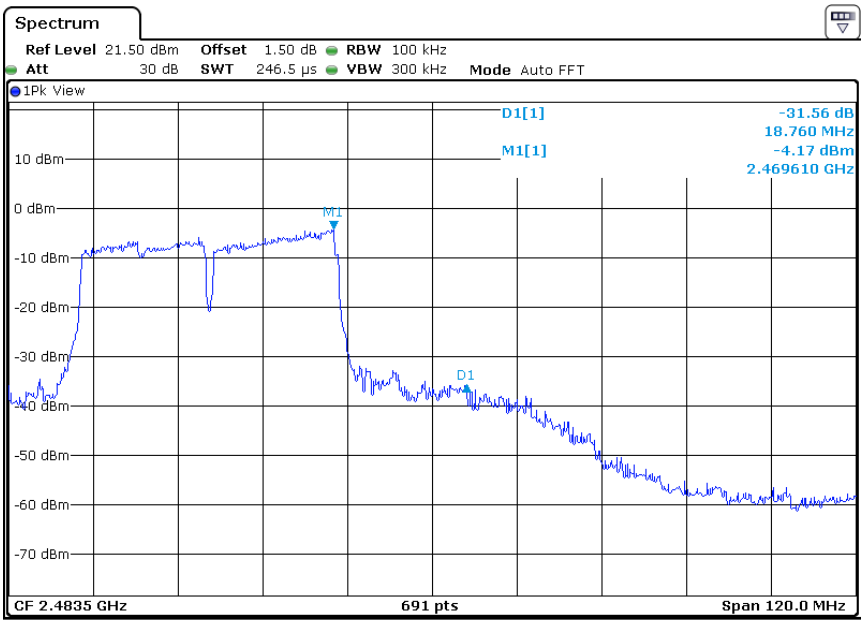




Channel 09 (2452MHz) Reference Level: -4.61dBm






Spectrum
Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 246.5 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1]
-31.56 dB
18.760 MHz
M1[1]
-4.17 dBm
2.469610 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 120.0 MHz

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Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11 n-HT20) at 2483.750MHz is passed by 2.0dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	214.330	43.9	20.0	6.1	30.0	43.5	-13.5
Horizontal	242.915	51.2	20.0	10.3	41.5	46.0	-4.5
Horizontal	351.070	41.3	20.0	13.9	35.2	46.0	-10.8
Vertical	57.645	37.5	20.0	9.8	27.3	40.0	-12.7
Vertical	143.005	43.4	20.0	6.8	30.2	43.5	-13.3
Vertical	258.300	44.4	20.0	16.3	40.7	46.0	-5.3

NOTES: 1. Quasi-Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. All emissions are below the QP limit.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11b (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	52.9	36.1	34.2	51.0	74.0	-23.0
Horizontal	*7236.000	55.5	36.8	36.9	55.6	74.0	-18.4
Horizontal	*9648.000	61.0	36.2	36.2	61.0	74.0	-13.0
Horizontal	*2389.071	47.1	20.0	28.2	55.3	74.0	-18.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	40.3	36.1	34.2	38.4	54.0	-15.6
Horizontal	*7236.000	43.1	36.8	36.9	43.2	54.0	-10.8
Horizontal	*9648.000	47.2	36.2	36.2	47.2	54.0	-6.8
Horizontal	*2389.071	40.1	20.0	28.2	48.3	54.0	-5.7

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11b (TX-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.9	36.1	34.6	51.4	74.0	-22.6
Horizontal	*7311.000	55.3	35.6	37.1	56.8	74.0	-17.2
Horizontal	*9748.000	59.3	36.3	38.5	61.5	74.0	-12.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	39.8	36.1	34.6	38.3	54.0	-15.7
Horizontal	*7311.000	42.3	35.6	37.1	43.8	54.0	-10.2
Horizontal	*9748.000	45.0	36.3	38.5	47.2	54.0	-6.8

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11b (TX-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	53.0	36.1	34.6	51.5	74.0	-22.5
Horizontal	*7386.000	54.7	35.6	37.2	56.3	74.0	-17.7
Horizontal	*9848.000	58.7	36.3	38.6	61.0	74.0	-13.0
Horizontal	*2485.300	44.0	20.0	28.0	52.0	74.0	-22.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	39.9	36.1	34.6	38.4	54.0	-15.6
Horizontal	*7386.000	41.6	35.6	37.2	43.2	54.0	-10.8
Horizontal	*9848.000	45.7	36.3	38.6	48.0	54.0	-6.0
Horizontal	*2485.300	38.5	20.0	28.0	46.5	54.0	-7.5

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11g (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	52.2	36.1	34.2	50.3	74.0	-23.7
Horizontal	*7236.000	55.8	36.8	36.9	55.9	74.0	-18.1
Horizontal	*9648.000	60.7	35.6	36.2	61.3	74.0	-12.7
Horizontal	*2388.690	52.0	20.0	28.2	60.2	74.0	-13.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	39.4	36.1	34.2	37.5	54.0	-16.5
Horizontal	*7236.000	42.9	36.8	36.9	43.0	54.0	-11.0
Horizontal	*9648.000	44.7	35.6	36.2	45.3	54.0	-8.7
Horizontal	*2388.690	39.8	20.0	28.2	48.0	54.0	-6.0

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11g (TX-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.0	36.1	34.6	50.5	74.0	-23.5
Horizontal	*7311.000	55.0	35.6	37.1	56.5	74.0	-17.5
Horizontal	*9748.000	59.3	36.8	38.5	61.0	74.0	-13.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	38.4	36.1	34.6	36.9	54.0	-17.1
Horizontal	*7311.000	41.3	35.6	37.1	42.8	54.0	-11.2
Horizontal	*9748.000	44.6	36.8	38.5	46.3	54.0	-7.7

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11g (TX-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.8	36.1	34.6	50.3	74.0	-23.7
Horizontal	*7386.000	54.6	35.6	37.2	56.2	74.0	-17.8
Horizontal	*9848.000	58.5	35.6	38.6	61.5	74.0	-12.5
Horizontal	*2484.660	54.0	20.0	28.0	62.0	74.0	-12.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	39.0	36.1	34.6	37.5	54.0	-16.5
Horizontal	*7386.000	41.4	35.6	37.2	43.0	54.0	-11.0
Horizontal	*9848.000	44.3	35.6	38.6	47.3	54.0	-6.7
Horizontal	*2484.660	41.2	20.0	28.0	49.2	54.0	-4.8

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	52.7	36.1	34.2	50.8	74.0	-23.2
Horizontal	*7236.000	56.8	36.8	36.9	56.9	74.0	-17.1
Horizontal	*9648.000	60.7	35.6	36.2	61.3	74.0	-12.7
Horizontal	*2389.860	53.8	20.0	28.2	62.0	74.0	-12.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	39.7	36.1	34.2	37.8	54.0	-16.2
Horizontal	*7236.000	43.6	36.8	36.9	43.7	54.0	-10.3
Horizontal	*9648.000	47.0	35.6	36.2	47.6	54.0	-6.4
Horizontal	*2389.860	43.5	20.0	28.2	51.7	54.0	-2.3

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	53.0	36.1	34.2	51.1	74.0	-22.9
Horizontal	*7311.000	54.8	35.6	37.1	56.3	74.0	-17.7
Horizontal	*9748.000	59.9	36.8	38.5	61.6	74.0	-12.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	39.7	36.1	34.2	37.8	54.0	-16.2
Horizontal	*7311.000	41.7	35.6	37.1	43.2	54.0	-10.8
Horizontal	*9748.000	45.8	36.8	38.5	47.5	54.0	-6.5

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4924.000	52.5	36.1	34.6	51.0	74.0	-23.0
Horizontal	*7386.000	54.9	35.6	37.2	56.5	74.0	-17.5
Horizontal	*9848.000	58.0	35.6	38.6	61.0	74.0	-13.0
Horizontal	*2483.750	55.2	20.0	28.0	63.2	74.0	-10.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4924.000	39.5	36.1	34.6	38.0	54.0	-16.0
Horizontal	*7386.000	43.7	35.6	37.2	45.3	54.0	-8.7
Horizontal	*9848.000	45.0	35.6	38.6	48.0	54.0	-6.0
Horizontal	*2483.750	44.0	20.0	28.0	52.0	54.0	-2.0

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 03)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4844.000	52.4	36.1	34.2	50.5	74.0	-23.5
Horizontal	*7266.000	60.2	36.8	36.9	60.3	74.0	-13.7
Horizontal	*9688.000	59.6	35.6	36.2	60.2	74.0	-13.8
Horizontal	*2389.460	54.7	20.0	28.2	62.9	74.0	-11.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4844.000	39.9	36.1	34.2	38.0	54.0	-16.0
Horizontal	*7266.000	42.0	36.8	36.9	42.1	54.0	-11.9
Horizontal	*9688.000	45.7	35.6	36.2	46.3	54.0	-7.7
Horizontal	*2389.460	42.4	20.0	28.2	50.6	54.0	-3.4

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4874.000	52.0	36.1	34.2	50.1	74.0	-23.9
Horizontal	*7311.000	54.3	35.6	37.1	55.8	74.0	-18.2
Horizontal	*9748.000	59.7	36.8	38.5	61.4	74.0	-12.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4874.000	39.7	36.1	34.2	37.8	54.0	-16.2
Horizontal	*7311.000	41.7	35.6	37.1	43.2	54.0	-10.8
Horizontal	*9748.000	44.3	36.8	38.5	46.0	54.0	-8.0

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 09)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4904.000	51.7	36.1	34.6	50.2	74.0	-23.8
Horizontal	*7356.000	54.7	35.6	37.2	56.3	74.0	-17.7
Horizontal	*9808.000	58.0	35.6	38.6	61.0	74.0	-13.0
Horizontal	*2483.850	56.0	20.0	28.0	64.0	74.0	-10.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4904.000	39.0	36.1	34.6	37.5	54.0	-16.5
Horizontal	*7356.000	41.6	35.6	37.2	43.2	54.0	-10.8
Horizontal	*9808.000	43.2	35.6	38.6	46.2	54.0	-7.8
Horizontal	*2483.850	42.3	20.0	28.0	50.3	54.0	-3.7

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

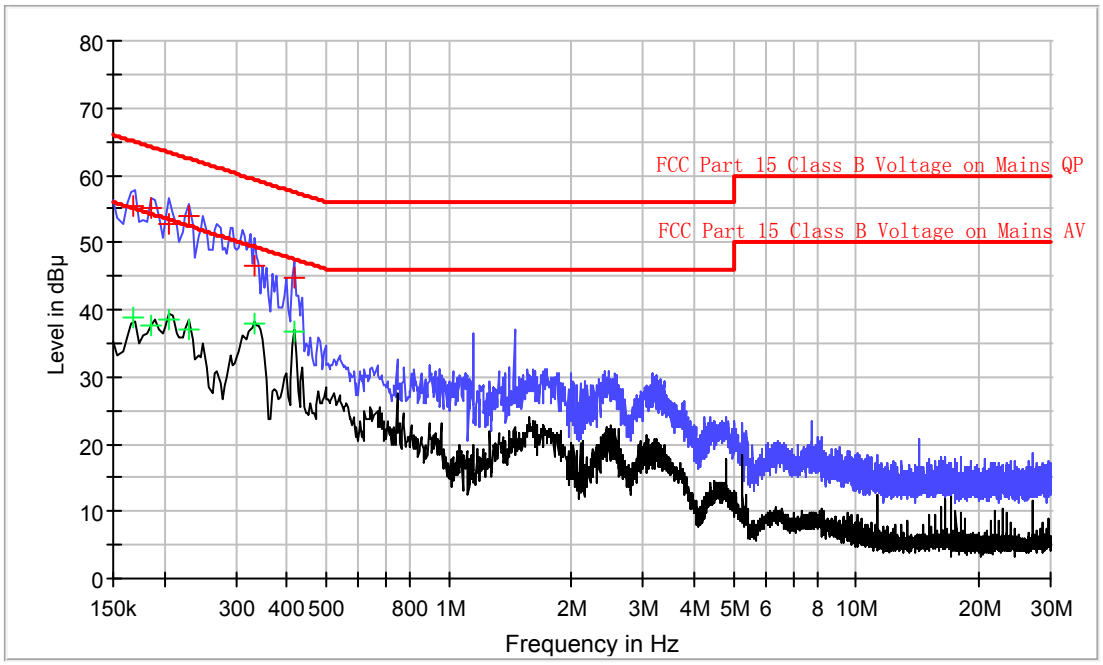
* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

4.9 Conducted Emission

Worst Case Conducted emission at 0.230MHz is Passed by 8.5dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)
Line: Live
Conducted Emission Test - FCC



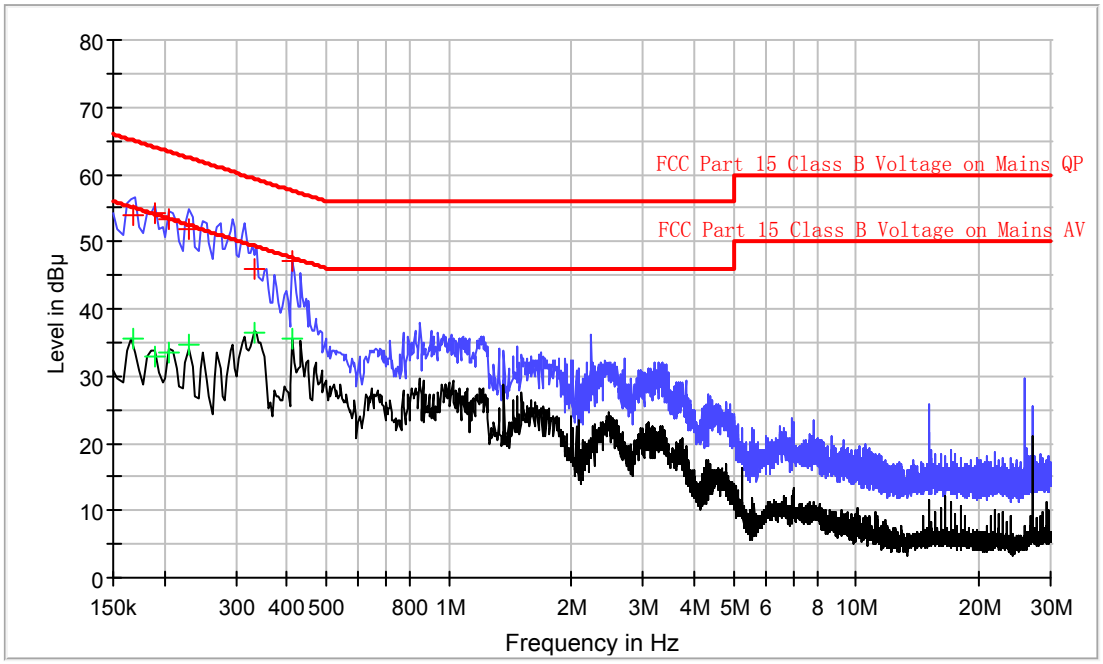
Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.168	55.4	L1	9.8	9.7	65.1
0.186	55.1	L1	9.8	9.1	64.2
0.206	52.7	L1	9.8	10.7	63.4
0.230	53.9	L1	9.8	8.5	62.4
0.334	46.6	L1	9.8	12.8	59.4
0.418	44.7	L1	9.8	12.8	57.5

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.168	38.7	L1	9.8	16.4	55.1
0.186	37.6	L1	9.8	16.6	54.2
0.206	38.5	L1	9.8	14.9	53.4
0.230	37.0	L1	9.8	15.4	52.4
0.334	38.0	L1	9.8	11.4	49.4
0.418	36.8	L1	9.8	10.7	47.5

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001
Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)
Line: Neutral
Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.168	54.0	N	10.0	11.1	65.1
0.190	54.2	N	10.0	9.8	64.0
0.206	53.2	N	10.1	10.2	63.4
0.230	51.9	N	10.1	10.5	62.4
0.334	45.9	N	10.1	13.5	59.4
0.414	47.2	N	10.1	10.4	57.6

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.168	35.5	N	10.0	19.6	55.1
0.190	32.8	N	10.0	21.2	54.0
0.206	33.6	N	10.1	19.8	53.4
0.230	34.6	N	10.1	17.8	52.4
0.334	36.4	N	10.1	13.0	49.4
0.414	35.6	N	10.1	12.0	47.6

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part

[ ] Test results are attached

[x] Included in the separated report.

Applicant: Kenxen Electronic (SZ) Limited.
Date of Test: March 27, 2015
Model: BU4001

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9

CONFIDENTIALITY REQUEST

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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EXHIBIT 10

MISCELLANEOUS INFORMATION

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11

TEST EQUIPMENT LIST

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	21-May-2014	21-May-2015
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	21-May-2014	21-May-2015
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	28-Jun-2014	28-Jun-2015
SZ185-01	EMI Receiver	R&S	ESCI	100547	10-Mar-2015	10-Mar-2016
SZ061-09	Horn Antenna	ETS	3115	00092346	01-Nov-2014	01-Nov-2015
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	03-Sep-2014	03-Sep-2015
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2014	29-Apr-2015
EM031-03	EXA Spectrum Analyzer	R&S	FSV40	101506	09-Jun-2014	09-Jun-2015
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	10-Mar-2015	10-Mar-2016
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2014	19-Apr-2015
SZ062-02	RF Cable	RADIALL	RG 213U	--	09-Oct-2014	09-Apr-2015
SZ062-05	RF Cable	RADIALL	0.04-26.5 GHz	--	09-Oct-2014	09-Apr-2015
SZ062-12	RF Cable	RADIALL	0.04-26.5 GHz	--	09-Oct-2014	09-Apr-2015
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	21-May-2014	21-May-2015
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	01-Nov-2014	01-Nov-2015
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	01-Nov-2014	01-Nov-2015
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	16-Jun-2014	16-Jun-2015
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2015