FCC Test Report
(Class II Permissive Change)

Product Name	Logistic Monitoring Gateway
Model No	GWS-CSCG
FCC ID.	WL6GWS-CSCG

Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan

Date of Receipt	Sep. 29, 2017
Issue Date	Nov. 20, 2017
Report No.	1790405R-RFUSP02V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issue Date: Nov. 20, 2017
Report No.: 1790405R-RFUSP02V00

Product Name	Logistic Monitoring Gateway
Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Manufacturer	Golden Elite Technology (SHENZHEN) CO., LTD.
Model No.	GWS-CSCG
FCC ID.	WL6GWS-CSCG
EUT Rated Voltage	DC 5V by USB
EUT Test Voltage	DC 5V by USB
Trade Name	ECS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By : Joanne Lin

(Senior Adm. Specialist / Joanne Lin)

Tested By : Bill Lin

(Engineer / Bill Lin)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Logistic Monitoring Gateway
Trade Name	ECS
Model No.	GWS-CSCG
FCC ID.	WL6GWS-CSCG
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW
Number of Channels	802.11b/g/n-20MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 72.2Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	Chip Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	ECS	IOT	Chip Antenna	0.09dBi for 2.4 GHz

Note: The antenna of EUT conforms to FCC 15.203.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

Note:

1. The EUT is a Logistic Monitoring Gateway with a built-in WLAN, Zigbee and NFC transceiver, this report for WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report.
4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps、802.11g is 6Mbps、802.11n(20M-BW) is 7.2Mbps)
5. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
6. This is to request a Class II permissive change for FCC ID: WL6GWS-CSCG, originally granted on 06/13/2017.

   The major change filed under this application is:

   Change #1:

   Add load switch to turn on/off power of UBLOX M8C GNSS module. A GPIO is to control the load switch.

   Change #2:

   GPS: To unpopulated the unused GPS level shifter (U2B2).

   Change #3:

   Add boost after charger to stabilize system power while battery going low.

   Change #4:

   Remove redundant 0R resistors (keep those for RF tuning, stuff option, and VR output)

   Change #5:

   Remove C2C16 and C2C15 100uF large capacitor since boost is added.

   Change #6:

   Remove USB switch (SoFIA - MCU) and rout MCU USB to charger connector.

   Change #7:

   Change OTG 5V boost from TPS61170 to TPS61236 to fix voltage ripple issue.

   Change #8:

   Use Telink MCU A1 sample. (DVT is using A0)

Change #9:

At pull-up 3.3V add a resistor R2E1 (165K), C1E4 (47picker) on I2C1 to tune the frequency and slew rate.

Change #10:

Add 2 MOSFETs between OLED and 12V boost to fix OLED residual issue.

Change #11:

Change Zigbee and Wifi antenna from PCB antenna to Chip Antenna

(1) Original antenna: JEM IAHA20170411 (Zigbee), IAH20170410 (Wifi & GPS) PIFA antenna.

(2) New antenna: Walsin RGFRA1903041A1T chip antenna

(3) Schematic & Layout change: remove IPEX connector and change antenna to chip/SMT type.

Change #12:

Change GNSS antenna to active patch antenna

(1) Original antenna: IAH20170410 (Wifi &GPS) PIFA antenna.

(2) New antenna: INPAQ customized active antenna (patch antenna + LNA + co-axial cable), P/N: TBD

(3) Schematic & Layout change: remove LNA on PCB and add 3V LDO for active antenna. Antenna will be installed on top of device.

(4) Chassis is increase for patch antenna.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

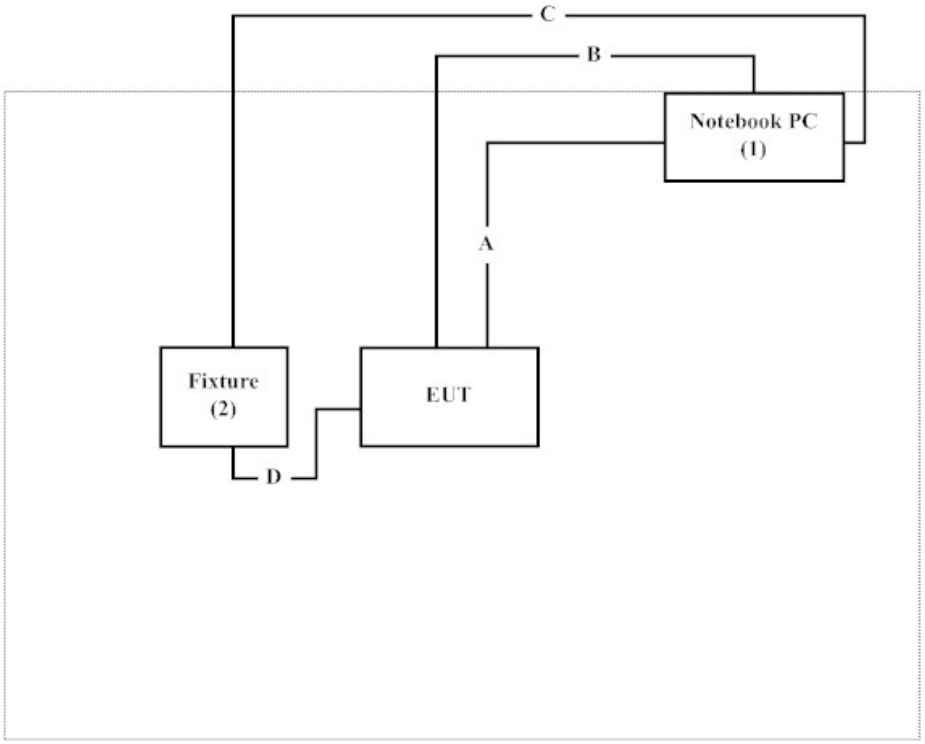
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	P62G	229FJC2	N/A
2	Fixture	N/A	CI53A20_V2.0	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB 2.0 Cable	Shielded, 0.75m
B	USB 2.0 Cable	Shielded, 1.0m
C	USB 2.0 Cable	Shielded, 1.8m
D	Signal Cable	Non-Shielded, 0.25m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Raltek MP Tool” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd.
Site Address: No.159, Sec. 2, Wenhua 1st Rd., Linkou Dist.,
New Taipei City 24457, Taiwan.
TEL: 886-2-2602-7968 / FAX : 866-2-2602-3286
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW1014

1.7. List of Test Item and Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	161601	2017.01.06	2018.01.05
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.25	2018.05.24

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2017.01.09	2018.01.08
X	Power Meter	Anritsu	ML2496A	1548003	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531024	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531025	2016.12.15	2017.12.14
	Bluetooth Tester	R&S	CBT	101238	2017.01.03	2018.01.02

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek Conduction Test System V8.0.110

For Radiated measurements /ACB1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	A.H.	SAS-562B	272	2017.07.21	2018.07.20
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.09	2018.02.08
X	Horn Antenna	ETS-Lindgren	3117	00203800	2017.10.13	2018.10.12
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.03	2018.05.02
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.14	2018.05.15
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.15	2018.05.16
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.15	2018.05.16
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.18
X	Filter	MICRO TRONICS	BRM50702	G251	2017.08.11	2018.08.10
	Filter	MICRO TRONICS	BRM50716	G188	2017.08.11	2018.08.10
X	EMI Test Receiver	R&S	ESR7	101602	2016.12.15	2017.12.14
X	Spectrum Analyzer	R&S	FSV40	101149	2017.01.24	2018.01.23
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2017.08.11	2018.08.10

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Peak Power Output

2.1. Test Setup

2.2. Limits

The maximum peak power shall be less 1 Watt.

2.3. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

2.4. Uncertainty

±0.86 dB

2.5. Test Result of Peak Power Output

Product : Logistic Monitoring Gateway
Test Item : Peak Power Output Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)
Test Date : 2017/11/10

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	17.85	--	--	--	19.69	<30dBm	Pass
06	2437	17.54	17.42	17.33	17.25	19.45	<30dBm	Pass
11	2462	17.19	--	--	--	19.24	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Logistic Monitoring Gateway
Test Item : Peak Power Output Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)
Test Date : 2017/11/10

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	11.25	--	--	--	--	--	--	--	17.23	<30dBm	Pass
06	2437	10.88	10.76	10.61	10.54	10.43	10.34	10.28	10.11	16.93	<30dBm	Pass
11	2462	10.47	--	--	--	--	--	--	--	16.02	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Logistic Monitoring Gateway
Test Item : Peak Power Output Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
Test Date : 2017/11/10

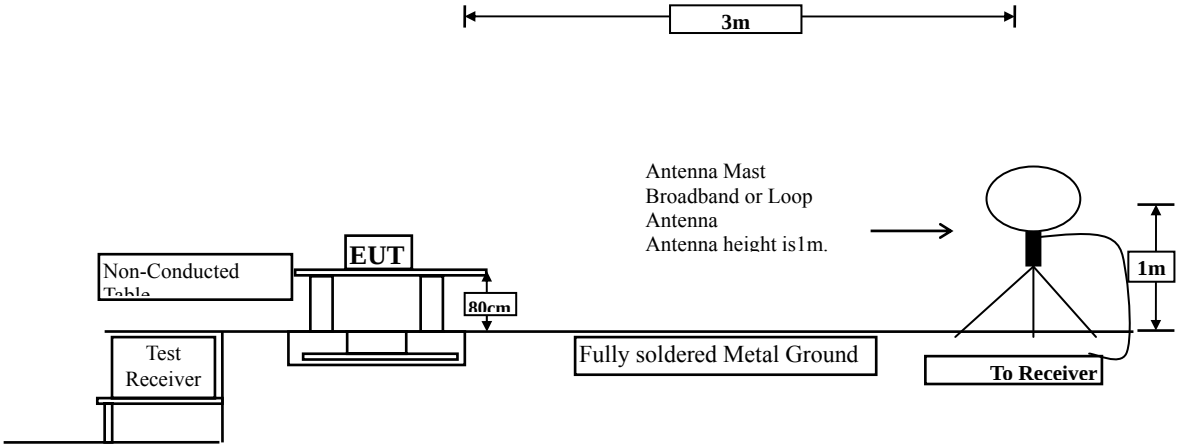
Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2		
		Measurement Level (dBm)										
01	2412	10.08	--	--	--	--	--	--	--	16.11	<30dBm	Pass
06	2437	9.88	9.74	9.62	9.51	9.42	9.33	9.27	9.15	16.03	<30dBm	Pass
11	2462	9.51	--	--	--	--	--	--	--	15.18	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

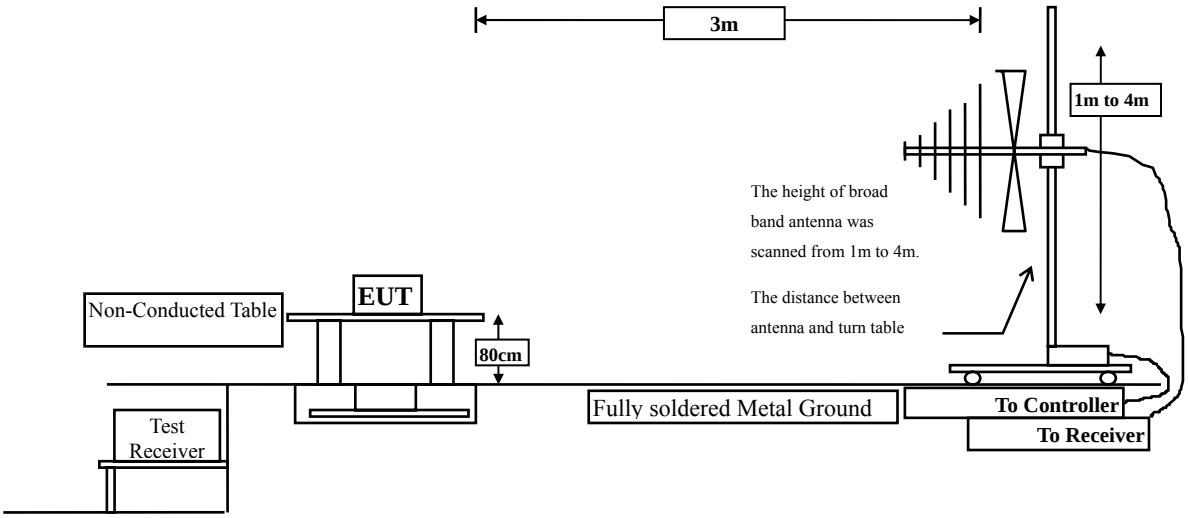
3. Radiated Emission

3.1. Test Setup

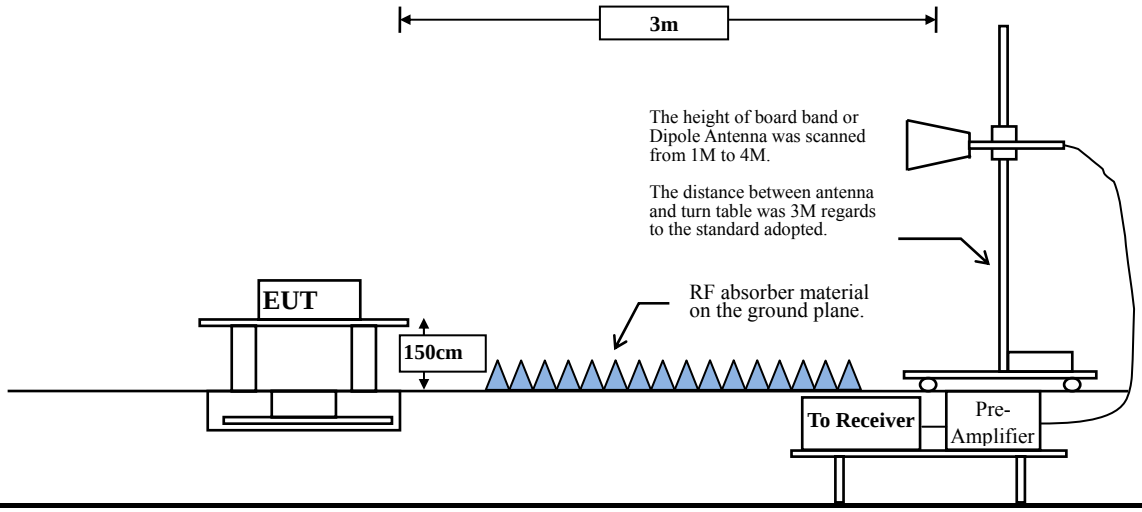
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

3.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.
The turn table is rotated 360 degrees to determine the position of the maximum emission level.
The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.
The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.
Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.
The measurement is divided into the Preliminary Measurement and the Final Measurement.
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.
The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Uncertainty

Horizontal：
30-300MHz: ±4.08dB；300M-1GHz: ±3.86dB；1-18GHz: ±3.77dB；18-40GHz: ±3.98dB。
Vertical：
30-300MHz: ±4.81dB；300M-1GHz: ±3.87dB；1-18GHz: ±3.83dB；18-40GHz: ±3.98dB。

3.5. Test Result of Radiated Emission

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/11/14

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-2.866	46.460	43.594	-30.406	74.000
7236.000	0.381	45.190	45.571	-28.429	74.000
9648.000	2.391	42.990	45.381	-28.619	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-2.866	47.320	44.454	-29.546	74.000
7236.000	0.381	46.180	46.561	-27.439	74.000
9648.000	2.391	44.920	47.311	-26.689	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)
Test Date : 2017/11/13

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-2.835	45.780	42.944	-31.056	74.000
7311.000	0.465	44.900	45.365	-28.635	74.000
9748.000	2.590	44.330	46.919	-27.081	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4874.000	-2.835	47.710	44.874	-29.126	74.000
7311.000	0.465	45.490	45.955	-28.045	74.000
9748.000	2.590	47.020	49.609	-24.391	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)
Test Date : 2017/11/13

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
4924.000	-2.796	46.740	43.944	-30.056	74.000
7386.000	0.489	44.170	44.659	-29.341	74.000
9848.000	2.729	43.380	46.110	-27.890	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4924.000	-2.796	47.900	45.104	-28.896	74.000
7386.000	0.489	44.270	44.759	-29.241	74.000
9848.000	2.729	45.240	47.970	-26.030	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/11/13

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-2.866	46.070	43.204	-30.796	74.000
7236.000	0.381	44.970	45.351	-28.649	74.000
9648.000	2.391	43.090	45.481	-28.519	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-2.866	45.890	43.024	-30.976	74.000
7236.000	0.381	45.170	45.551	-28.449	74.000
9648.000	2.391	43.580	45.971	-28.029	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)
Test Date : 2017/11/13

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-2.835	45.580	42.744	-31.256	74.000
7311.000	0.465	45.460	45.925	-28.075	74.000
9748.000	2.590	44.640	47.229	-26.771	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4874.000	-2.835	45.940	43.104	-30.896	74.000
7311.000	0.465	45.090	45.555	-28.445	74.000
9748.000	2.590	44.280	46.869	-27.131	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)
Test Date : 2017/11/13

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
4924.000	-2.796	45.570	42.774	-31.226	74.000
7386.000	0.489	44.140	44.629	-29.371	74.000
9848.000	2.729	43.040	45.770	-28.230	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4924.000	-2.796	46.100	43.304	-30.696	74.000
7386.000	0.489	43.910	44.399	-29.601	74.000
9848.000	2.729	43.480	46.210	-27.790	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)
Test Date : 2017/11/15

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-2.866	46.130	43.264	-30.736	74.000
7236.000	0.381	44.330	44.711	-29.289	74.000
9648.000	2.391	43.390	45.781	-28.219	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-2.866	46.010	43.144	-30.856	74.000
7236.000	0.381	45.090	45.471	-28.529	74.000
9648.000	2.391	42.960	45.351	-28.649	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)
Test Date : 2017/11/15

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-2.835	45.940	43.104	-30.896	74.000
7311.000	0.465	44.730	45.195	-28.805	74.000
9748.000	2.590	44.000	46.589	-27.411	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4874.000	-2.835	46.160	43.324	-30.676	74.000
7311.000	0.465	45.180	45.645	-28.355	74.000
9748.000	2.590	44.320	46.909	-27.091	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)
Test Date : 2017/11/14

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	-2.796	45.840	43.044	-30.956	74.000
7386.000	0.489	44.860	45.349	-28.651	74.000
9848.000	2.729	42.970	45.700	-28.300	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4924.000	-2.796	45.430	42.634	-31.366	74.000
7386.000	0.489	44.840	45.329	-28.671	74.000
9848.000	2.729	43.480	46.210	-27.790	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Logistic Monitoring Gateway
Test Item : General Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)
Test Date : 2017/11/14

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
200.101	-13.473	40.979	27.505	-15.995	43.500
239.464	-11.898	43.773	31.874	-14.126	46.000
333.652	-9.133	41.316	32.183	-13.817	46.000
600.754	-3.062	33.150	30.088	-15.912	46.000
800.377	-0.321	33.843	33.523	-12.477	46.000
919.870	1.133	33.420	34.553	-11.447	46.000
Vertical					
32.812	-11.890	39.419	27.529	-12.471	40.000
200.101	-13.473	46.593	33.119	-10.381	43.500
232.435	-12.337	51.796	39.459	-6.541	46.000
266.174	-11.074	46.744	35.670	-10.330	46.000
399.725	-7.349	38.948	31.599	-14.401	46.000
600.754	-3.062	33.923	30.861	-15.139	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Logistic Monitoring Gateway
Test Item : General Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)
Test Date : 2017/11/14

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
166.362	-10.704	36.155	25.451	-18.049	43.500
240.870	-11.846	43.035	31.189	-14.811	46.000
333.652	-9.133	41.191	32.058	-13.942	46.000
467.203	-5.871	35.460	29.589	-16.411	46.000
600.754	-3.062	32.074	29.012	-16.988	46.000
800.377	-0.321	37.004	36.684	-9.316	46.000
Vertical					
31.406	-12.007	42.342	30.335	-9.665	40.000
166.362	-10.704	40.687	29.983	-13.517	43.500
200.101	-13.473	47.708	34.234	-9.266	43.500
232.435	-12.337	51.336	38.999	-7.001	46.000
266.174	-11.074	47.598	36.524	-9.476	46.000
399.725	-7.349	39.256	31.907	-14.093	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Logistic Monitoring Gateway
Test Item : General Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)
Test Date : 2017/11/14

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
232.435	-12.337	43.777	31.440	-14.560	46.000
266.174	-11.074	41.561	30.487	-15.513	46.000
333.652	-9.133	40.736	31.603	-14.397	46.000
467.203	-5.871	33.992	28.121	-17.879	46.000
600.754	-3.062	32.170	29.108	-16.892	46.000
800.377	-0.321	33.541	33.221	-12.779	46.000
Vertical					
31.406	-12.007	42.454	30.447	-9.553	40.000
200.101	-13.473	46.031	32.557	-10.943	43.500
232.435	-12.337	51.465	39.128	-6.872	46.000
266.174	-11.074	46.862	35.788	-10.212	46.000
739.928	-1.031	40.660	39.629	-6.371	46.000
886.130	0.764	36.954	37.718	-8.282	46.000

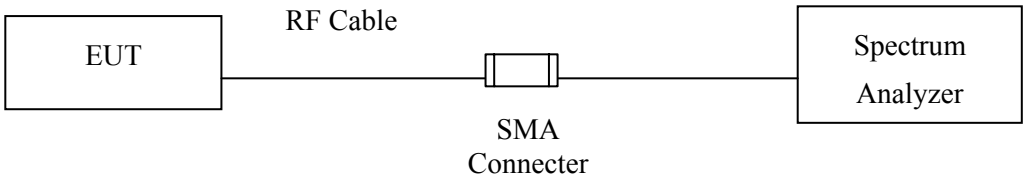
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

4. Band Edge

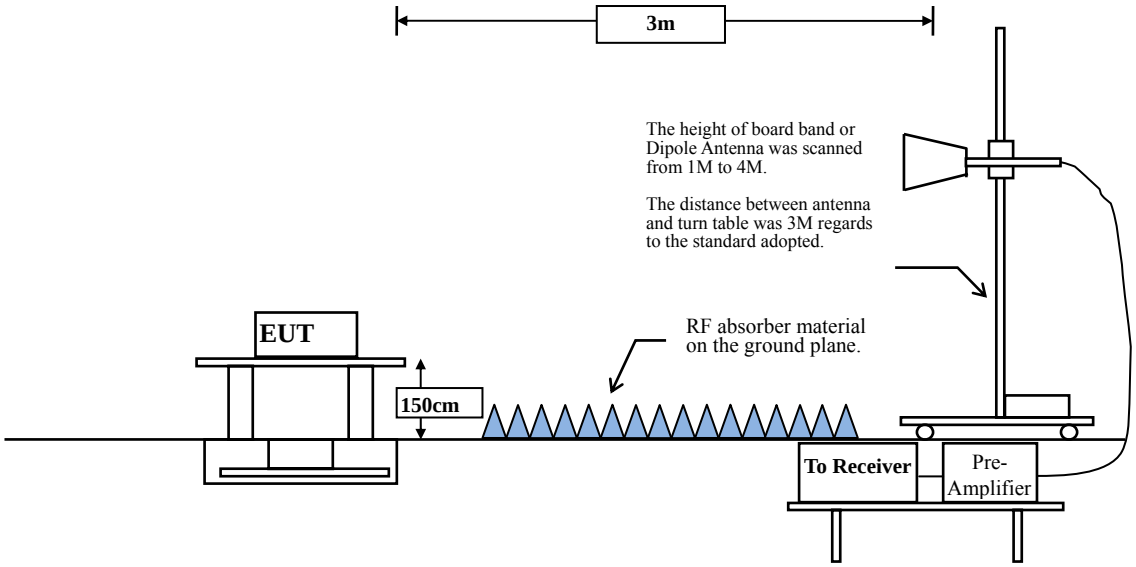
4.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

4.4. Uncertainty

Conducted: ±1.23dB
Radiated:
Horizontal polarization：1-18GHz: ±3.77dB
Vertical polarization：1-18GHz : ±3.83dB

4.5. Test Result of Band Edge

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2385.652	12.136	50.225	62.361	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	46.553	58.701	74.00	54.00	Pass
01 (Peak)	2397.681	12.169	64.348	76.517	--	--	--
01 (Peak)	2400.000	12.176	61.853	74.029	--	--	--
01 (Peak)	2413.478	12.206	93.230	105.437	--	--	--
01 (Average)	2385.217	12.135	40.548	52.683	74.00	54.00	Pass
01 (Average)	2390.000	12.148	34.477	46.625	74.00	54.00	Pass
01 (Average)	2398.116	12.171	59.856	72.027	--	--	--
01 (Average)	2400.000	12.176	55.837	68.013	--	--	--
01 (Average)	2412.754	12.205	88.735	100.940	--	--	--

Figure Channel 01: Horizontal (Peak)

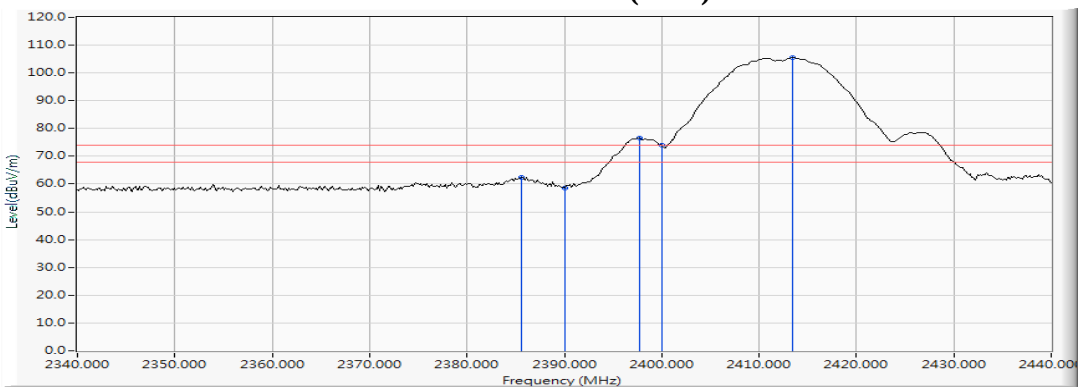
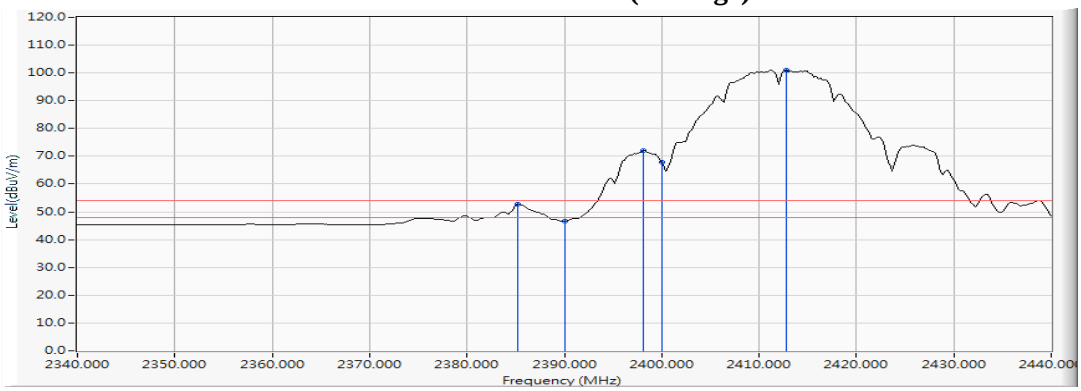


Figure Channel 01: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
01 (Peak)	2385.942	12.137	50.447	62.584	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	46.747	58.895	74.00	54.00	Pass
01 (Peak)	2397.681	12.169	65.103	77.272	--	--	--
01 (Peak)	2400.000	12.176	61.966	74.142	--	--	--
01 (Peak)	2413.478	12.206	92.725	104.932	--	--	--
01 (Average)	2385.217	12.135	41.310	53.445	74.00	54.00	Pass
01 (Average)	2390.000	12.148	34.876	47.024	74.00	54.00	Pass
01 (Average)	2398.261	12.172	60.488	72.659	--	--	--
01 (Average)	2400.000	12.176	56.256	68.432	--	--	--
01 (Average)	2411.304	12.201	88.317	100.519	--	--	--

Figure Channel 01: VERTICAL (Peak)

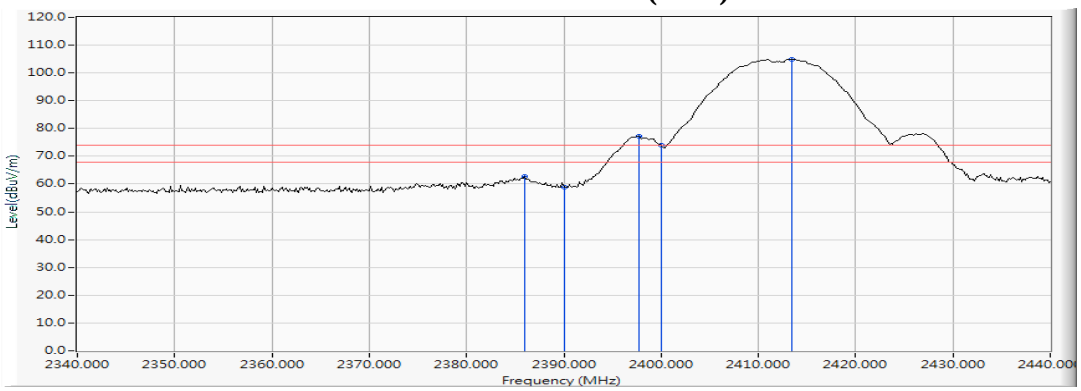
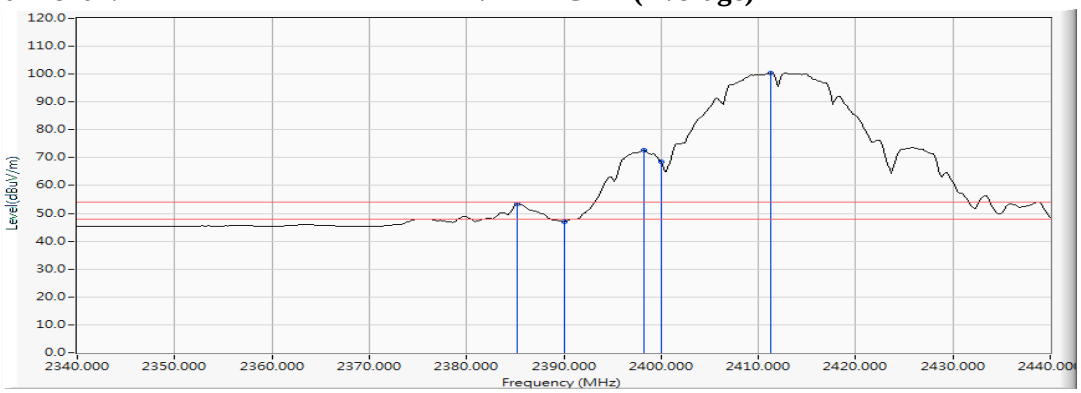


Figure Channel 01: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2463.500	12.345	92.069	104.415	--	--	--
11 (Peak)	2483.500	12.403	49.080	61.483	74.00	54.00	Pass
11 (Average)	2462.775	12.344	87.779	100.123	--	--	--
11 (Average)	2483.500	12.403	38.479	50.882	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

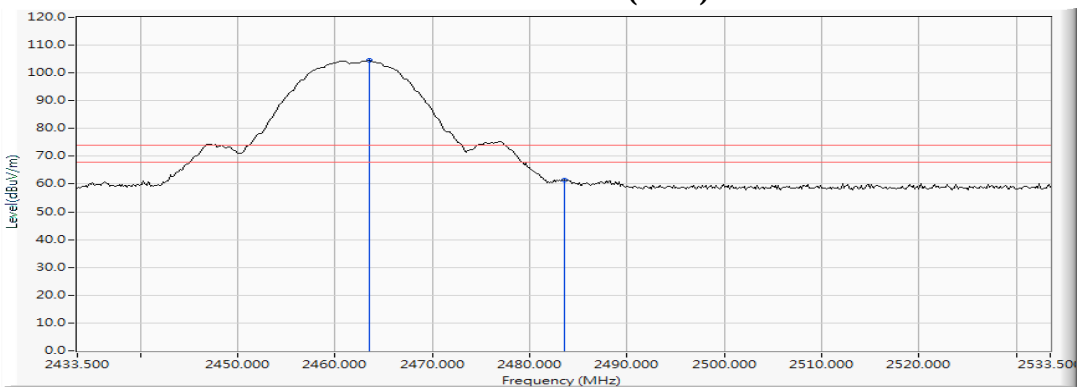
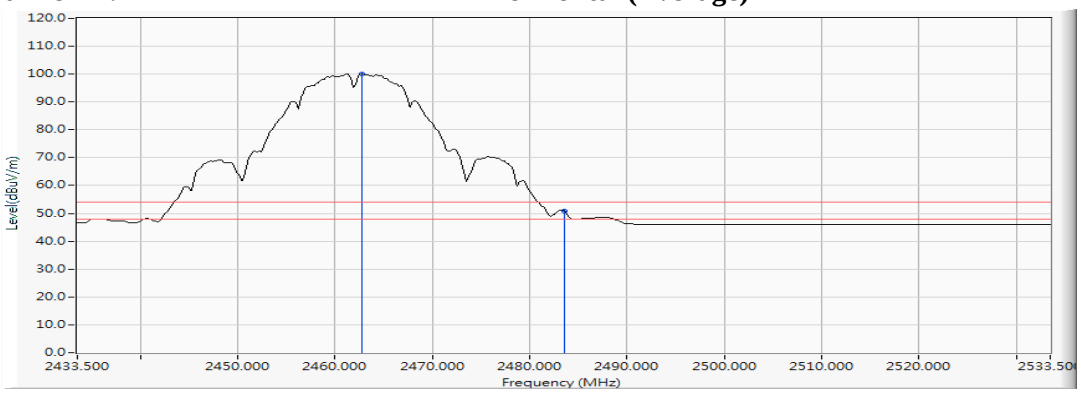


Figure Channel 11: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2463.355	12.345	91.053	103.398	--	--	--
11 (Peak)	2483.500	12.403	47.196	59.599	74.00	54.00	Pass
11 (Peak)	2484.370	12.405	49.133	61.538	74.00	54.00	Pass
11 (Average)	2462.775	12.344	86.710	99.054	--	--	--
11 (Average)	2483.500	12.403	36.689	49.092	74.00	54.00	Pass

Figure Channel 11: VERTICAL (Peak)

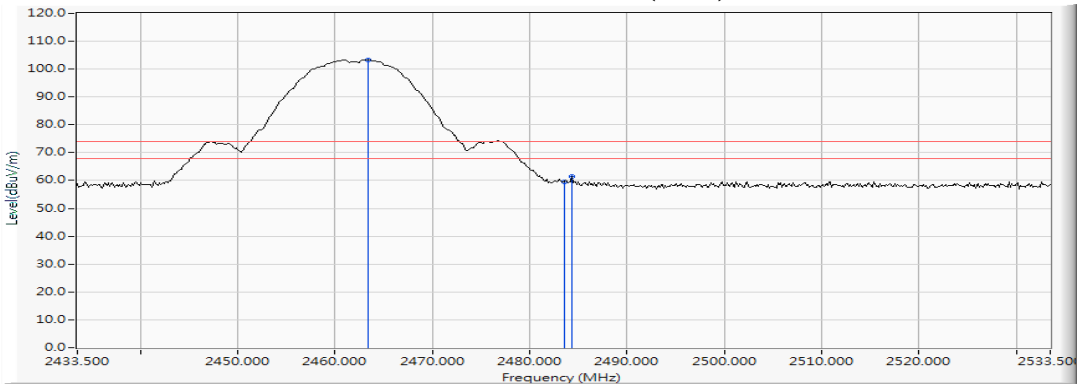
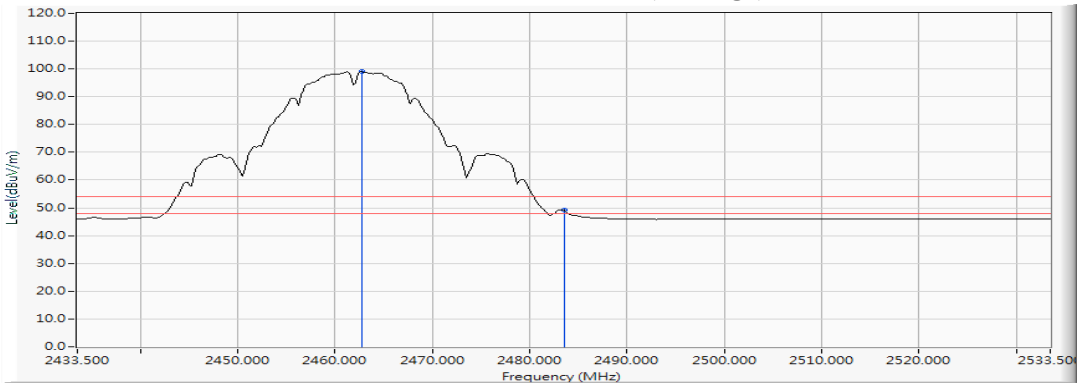


Figure Channel 11: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2384.058	12.131	52.337	64.468	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	50.535	62.683	74.00	54.00	Pass
01 (Peak)	2400.000	12.176	67.238	79.414	--	--	--
01 (Peak)	2416.522	12.214	91.311	103.525	--	--	--
01 (Average)	2390.000	12.148	39.843	51.991	74.00	54.00	Pass
01 (Average)	2400.000	12.176	50.330	62.506	--	--	--
01 (Average)	2416.522	12.214	82.194	94.408	--	--	--

Figure Channel 01: Horizontal (Peak)

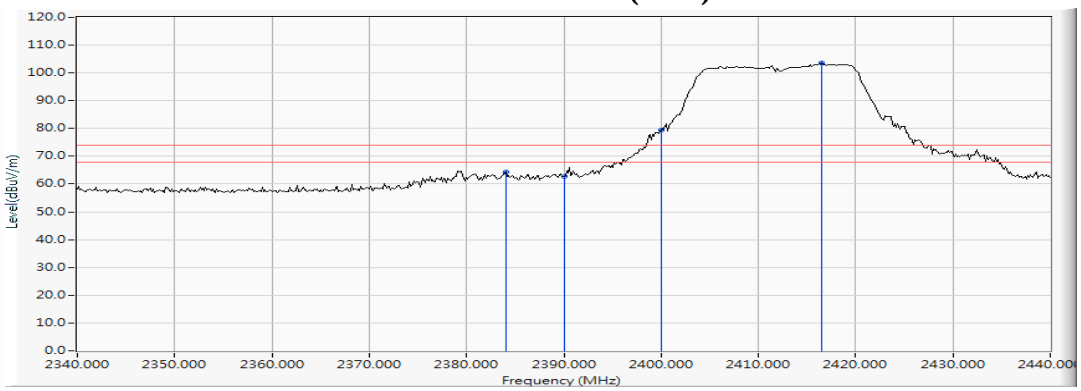
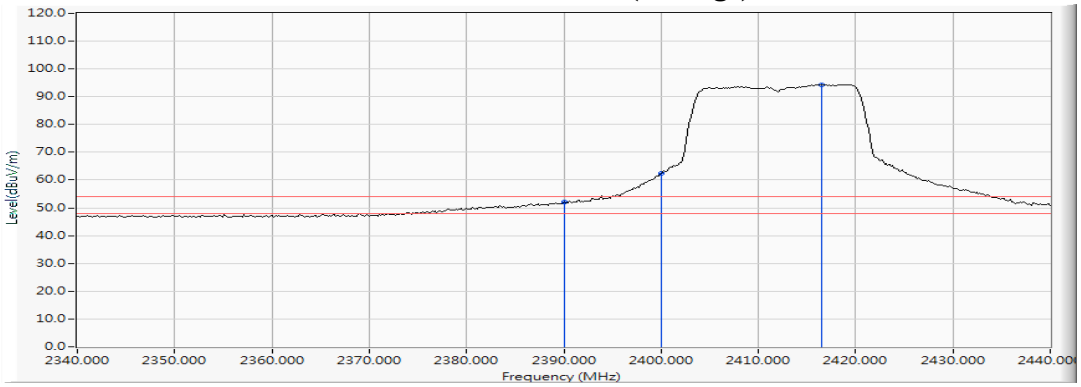


Figure Channel 01: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
01 (Peak)	2378.551	12.115	52.919	65.034	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	50.555	62.703	74.00	54.00	Pass
01 (Peak)	2400.000	12.176	66.846	79.022	--	--	--
01 (Peak)	2417.971	12.218	90.672	102.889	--	--	--
01 (Average)	2390.000	12.148	40.263	52.411	74.00	54.00	Pass
01 (Average)	2400.000	12.176	50.407	62.583	--	--	--
01 (Average)	2419.420	12.221	81.659	93.880	--	--	--

Figure Channel 01: VERTICAL (Peak)

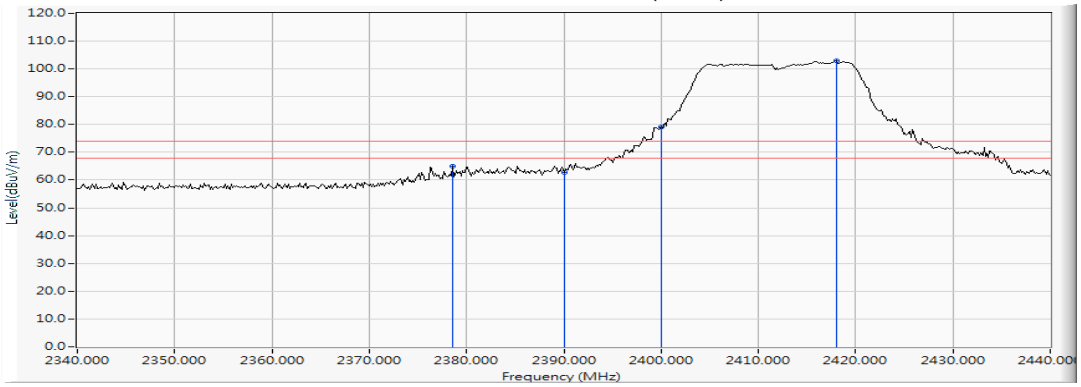
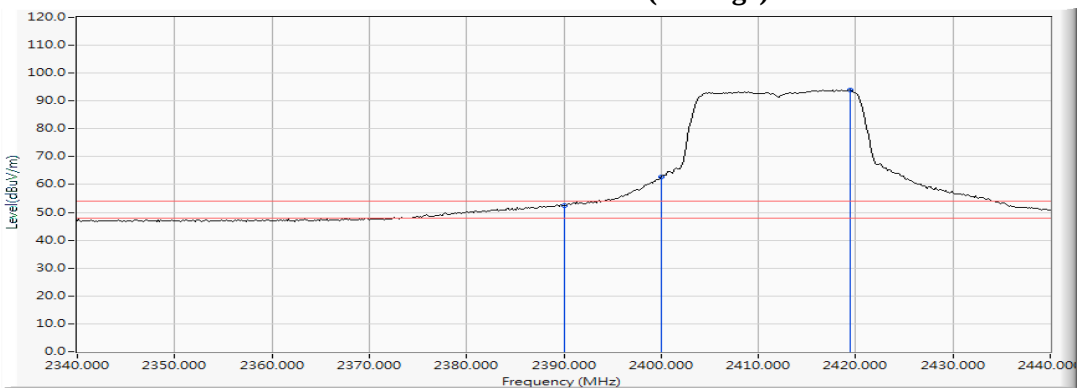


Figure Channel 01: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2466.254	12.353	90.013	102.366	--	--	--
11 (Peak)	2483.500	12.403	54.640	67.043	74.00	54.00	Pass
11 (Average)	2468.572	12.360	80.943	93.303	--	--	--
11 (Average)	2483.500	12.403	39.965	52.368	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

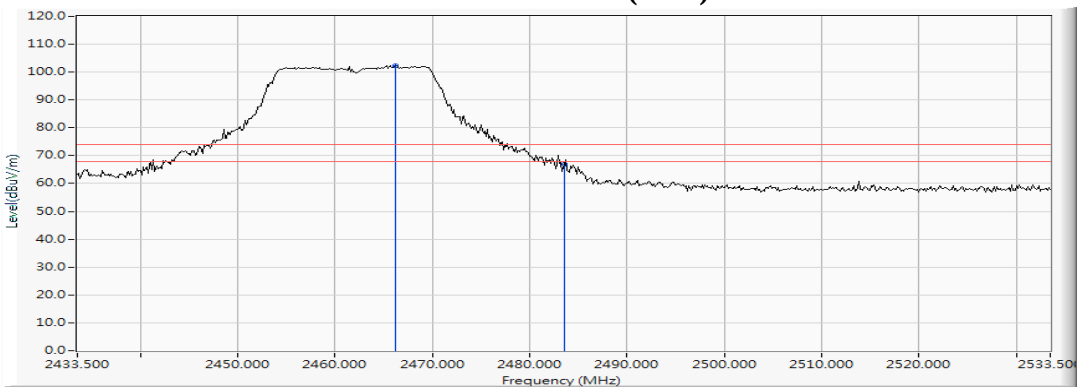
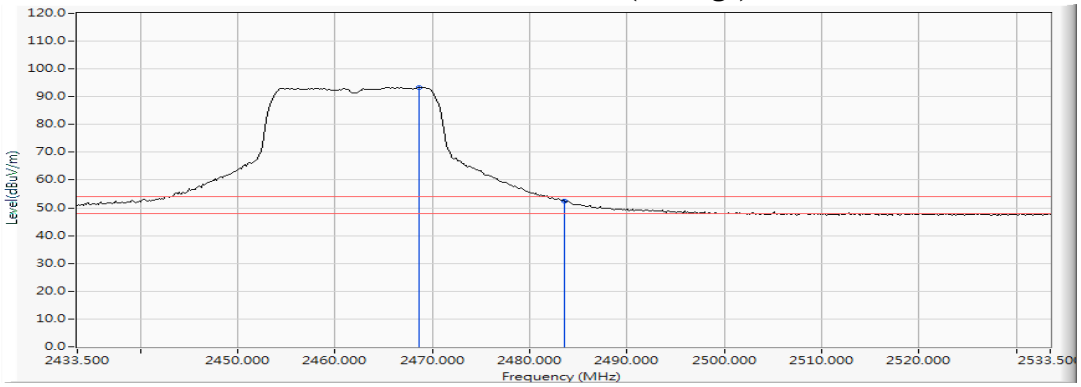


Figure Channel 11: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2465.674	12.352	89.371	101.723	--	--	--
11 (Peak)	2483.500	12.403	55.323	67.726	74.00	54.00	Pass
11 (Peak)	2483.935	12.404	57.964	70.368	74.00	54.00	Pass
11 (Average)	2466.688	12.355	80.176	92.531	--	--	--
11 (Average)	2483.500	12.403	41.065	53.468	74.00	54.00	Pass

Figure Channel 11: VERTICAL (Peak)

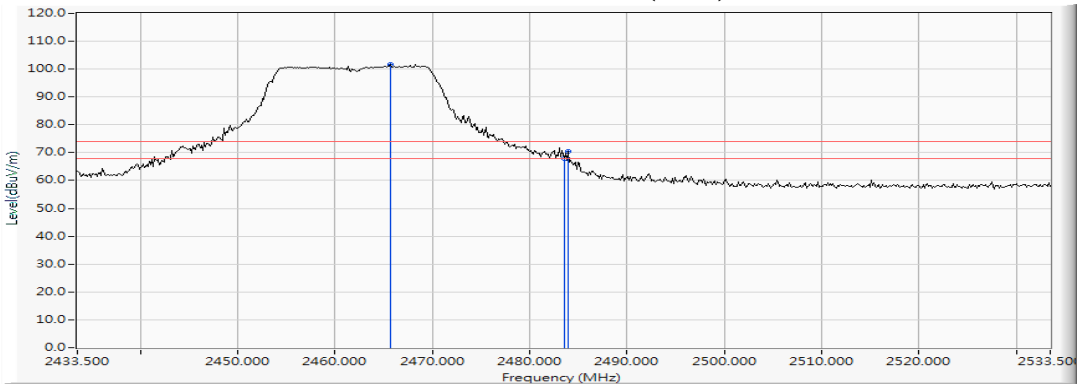
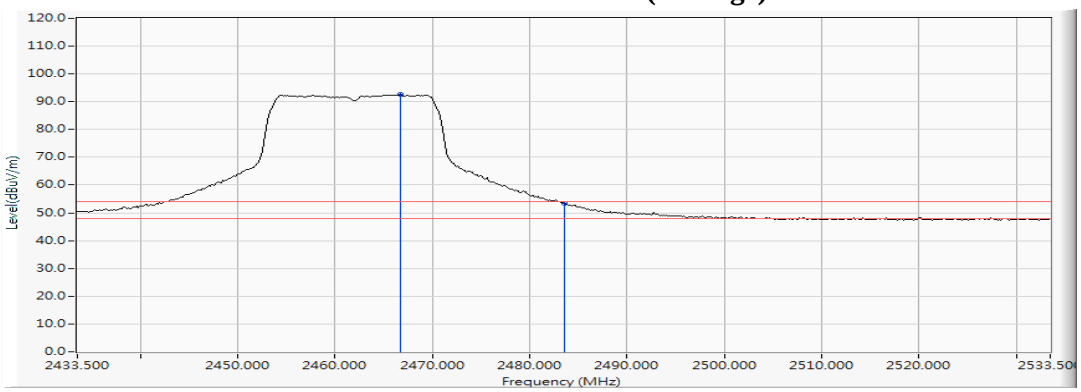


Figure Channel 11: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
01 (Peak)	2386.957	12.139	52.340	64.480	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	50.551	62.699	74.00	54.00	Pass
01 (Peak)	2400.000	12.176	66.232	78.408	--	--	--
01 (Peak)	2416.087	12.213	89.304	101.517	--	--	--
01 (Average)	2388.406	12.144	39.133	51.277	74.00	54.00	Pass
01 (Average)	2390.000	12.148	39.096	51.244	74.00	54.00	Pass
01 (Average)	2400.000	12.176	48.328	60.504	--	--	--
01 (Average)	2419.275	12.221	80.089	92.310	--	--	--

Figure Channel 01: Horizontal (Peak)

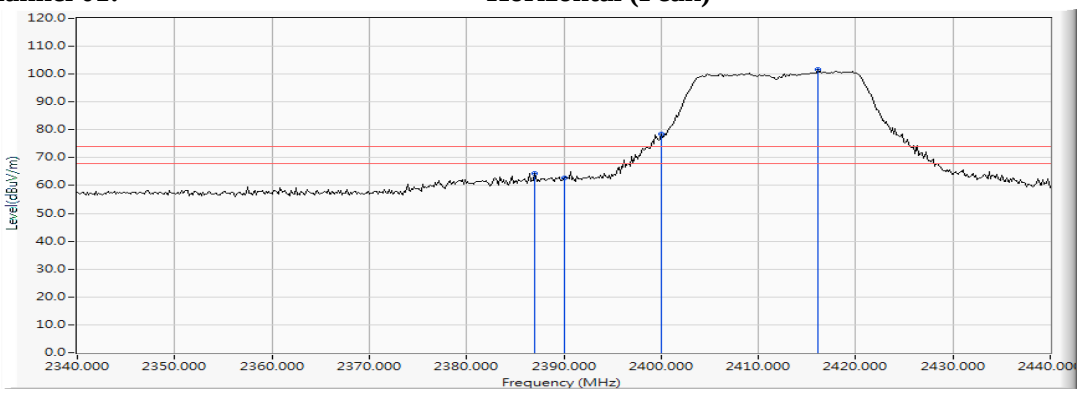
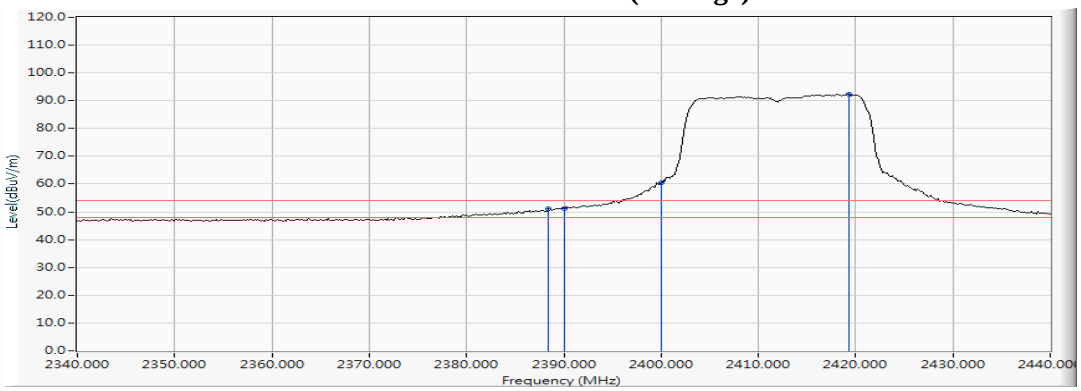


Figure Channel 01: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
01 (Peak)	2386.377	12.138	52.707	64.845	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	51.676	63.824	74.00	54.00	Pass
01 (Peak)	2399.275	12.174	65.609	77.783	--	--	--
01 (Peak)	2400.000	12.176	65.547	77.723	--	--	--
01 (Peak)	2416.087	12.213	88.718	100.931	--	--	--
01 (Average)	2390.000	12.148	39.738	51.886	74.00	54.00	Pass
01 (Average)	2400.000	12.176	48.857	61.033	--	--	--
01 (Average)	2418.986	12.219	79.521	91.741	--	--	--

Figure Channel 01: VERTICAL (Peak)

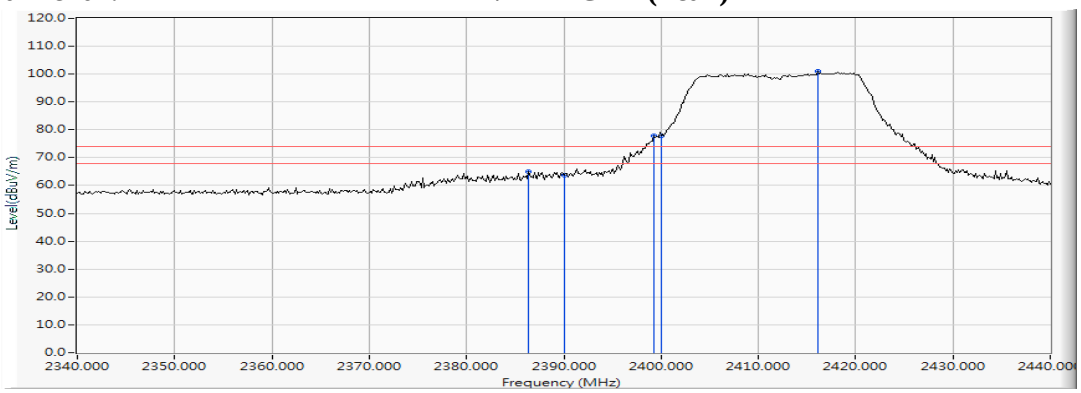
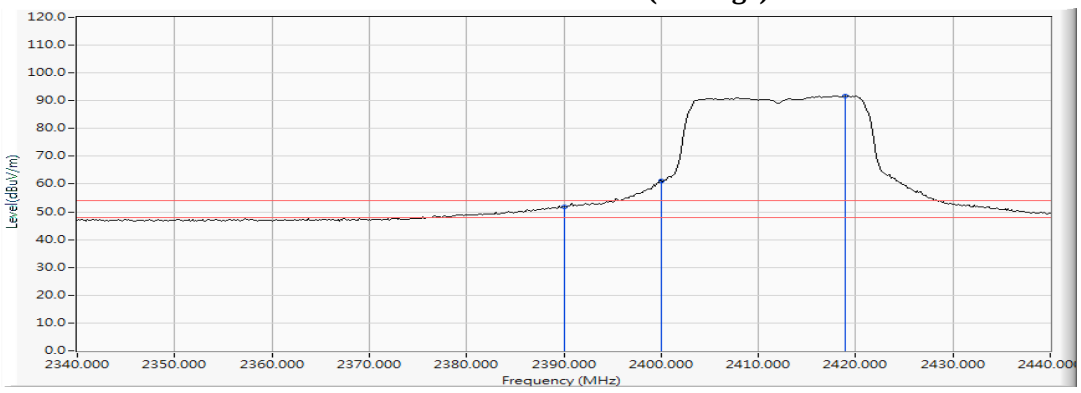


Figure Channel 01: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2466.109	12.353	89.024	101.377	--	--	--
11 (Peak)	2483.500	12.403	54.427	66.830	74.00	54.00	Pass
11 (Average)	2466.109	12.353	79.916	92.269	--	--	--
11 (Average)	2483.500	12.403	39.028	51.431	74.00	54.00	Pass
11 (Average)	2484.370	12.405	39.583	51.988	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

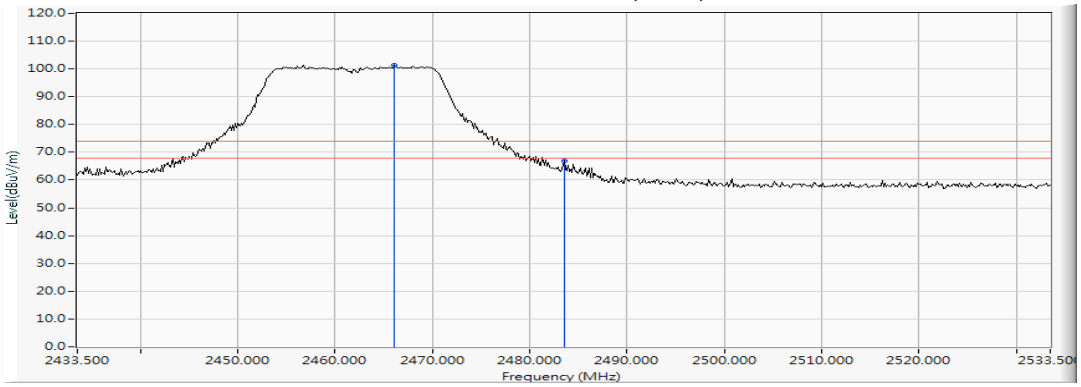
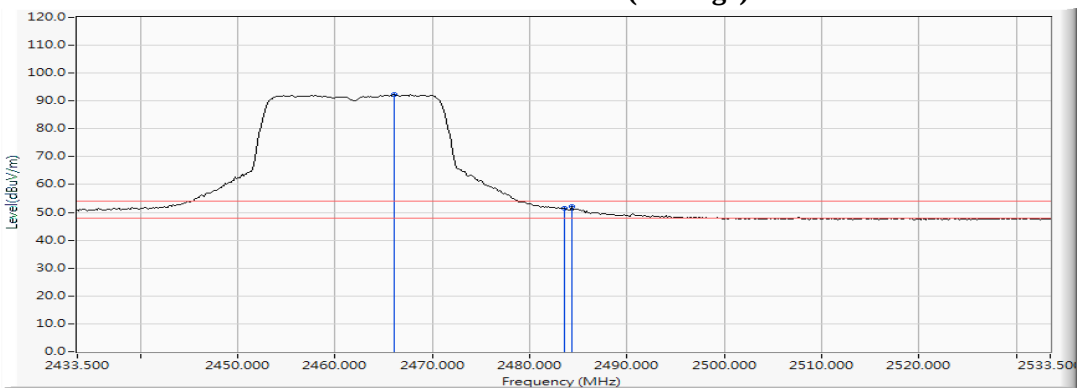


Figure Channel 11: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Logistic Monitoring Gateway
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
Test Date : 2017/11/13

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2465.819	12.352	87.829	100.181	--	--	--
11 (Peak)	2483.500	12.403	51.261	63.664	74.00	54.00	Pass
11 (Peak)	2483.935	12.404	54.636	67.040	74.00	54.00	Pass
11 (Average)	2466.399	12.354	78.643	90.997	--	--	--
11 (Average)	2483.500	12.403	40.393	52.796	74.00	54.00	Pass

Figure Channel 11: VERTICAL (Peak)

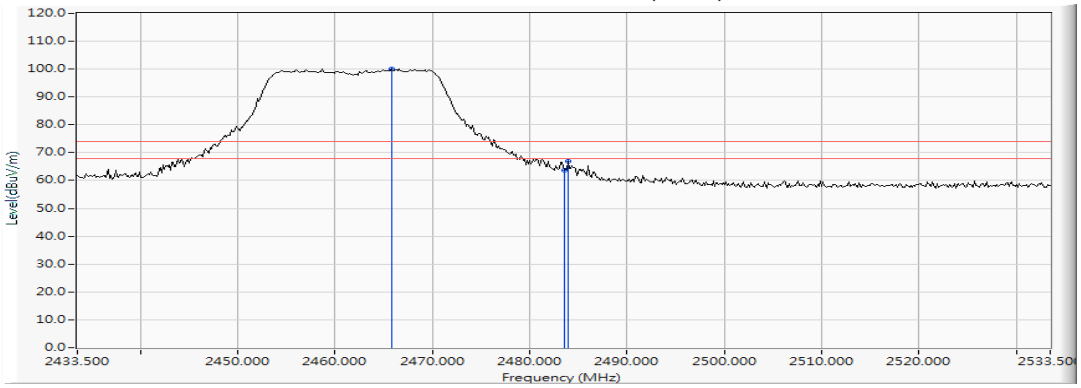
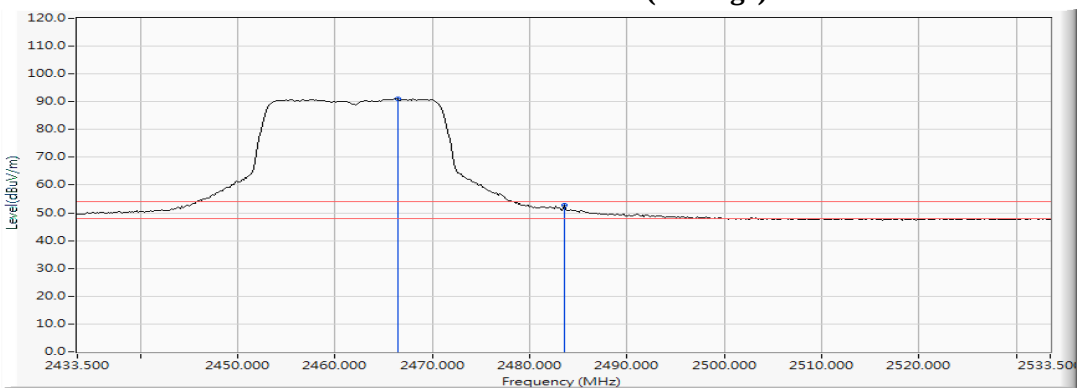


Figure Channel 11: VERTICAL (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.