FCC Test Report (WLAN)

Report No.:	RF160922E02
FCC ID:	UZ7AP7602
Test Model:	AP-7602
Received Date:	Sep. 22, 2016
Test Date:	Nov. 05 to 16, 2016
Issued Date:	Dec. 02, 2016
Applicant:	Zebra Technologies Corporation
Address:	One Zebra Plaza, Holtsville, NY,11742, USA
Manufacturer:	Zebra Technologies Corporation
Address:	One Zebra Plaza, Holtsville, NY,11742, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF160922E02	Original release.	Dec. 02, 2016

1 Certificate of Conformity

Product:	Access Point
Brand:	ZEBRA
Test Model:	AP-7602
Sample Status:	ENGINEERING SAMPLE
Applicant:	Zebra Technologies Corporation
Test Date:	Nov. 05 to 16, 2016
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Dec. 02, 2016

Wendy Wu / Specialist

Approved by : _____ , **Date:** Dec. 02, 2016

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.30dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.1dB at 2483.50MHz, 2390.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.41 dB
	6GHz ~ 18GHz	4.49 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	Access Point
Brand	ZEBRA
Test Model	AP-7602
Status of EUT	ENGINEERING SAMPLE
SW Version	esdk 5.0.9.1
HW Version	ZEBRA_ASPEN-W_BCM47452_v21_d2_20160803_Sandy.brd
Power Supply Rating	12Vdc from power adapter or 55Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 mode in 2.4GHz band
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** **CDD Mode:** 183.039mW **Beamforming Mode:** 105.547mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 194.249mW **Beamforming Mode:** 189.641mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 260.394mW **Beamforming Mode:** 260.394mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. There are WLAN, BT technology used for the EUT.
2. Simultaneously transmission condition.

Condition	Technology		
1	WLAN (2.4GHz-Chain0)	WLAN (5GHz-Chain1)	BT
2	WLAN (2.4GHz-Chain1)	WLAN (5GHz-Chain0)	BT
3	WLAN (2.4GHz-Chain0)	WLAN (2.4GHz-Chain1)	BT
4	WLAN (5GHz-Chain0)	WLAN (5GHz-Chain1)	BT
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

3. The EUT must be supplied with a power adapter and POE as following table:

Adapter (Only for test not for sale)		
Brand	Model No.	Spec.
HIPRO	HP-A0502R3D	Input: 100-240Vac, 50-60Hz, 2.4A Output: 12Vdc, 4.16A DC output cable (Unshielded, 1.8m with one core)
POE(Only for test not for sale)		
Brand	Model No.	Spec.
Symbol	PD-9001GR/AT/AC	Input: 100-240Vac, 50/60Hz, 0.67A Output: 55Vdc, 0.6A P/N : AP-PSBIAS-2P3-ATR
From above adapters and POE, the radiated emission worst case was found in **POE**. Therefore only the test data of the modes were recorded in this report individually.		

4. The antennas provided to the EUT, please refer to the following table:

No.	PCB Chain No	Brand	Model	Antenna Gain(dBi) Including cable loss	Frequency range	Antenna Type	Connector type	Cable Length (mm)
1	Chain 0	NA	NA	2.61	2.4~2.4835GHz	Dipole	i-pex(MHF)	155
				4.39	5.15~5.25GHz			
				4.2	5.25~5.35GHz			
				4.28	5.47~5.725GHz			
				5.61	5.725~5.85GHz			
2	Chain 1	NA	NA	3.76	2.4~2.4835GHz	Dipole	i-pex(MHF)	182
				5.18	5.15~5.25GHz			
				5.22	5.25~5.35GHz			
				4.44	5.47~5.725GHz			
				5.95	5.725~5.85GHz			
3	BT	NA	NA	1.8	2.4~2.483GHz	Dipole	i-pex(MHF)	88

5. The EUT incorporates a MIMO function:

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX/1TX diversity	2RX
802.11g	6 ~ 54Mbps	2TX/1TX diversity	2RX
802.11n (HT20)	MCS 0~7	2TX/1TX diversity	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX/1TX diversity	2RX
	MCS 8~15	2TX	2RX
VHT20	MCS 0~8, Nss=1	2TX/1TX diversity	2RX
	MCS 0~8, Nss=2	2TX	2RX
VHT40	MCS 0~9, Nss=1	2TX/1TX diversity	2RX
	MCS 0~9, Nss=2	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX/1TX diversity	2RX
802.11n (HT20)	MCS 0~7	2TX/1TX diversity	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX/1TX diversity	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, Nss=1	2TX/1TX diversity	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, Nss=1	2TX/1TX diversity	2RX
	MCS 0~9, Nss=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, Nss=1	2TX/1TX diversity	2RX
	MCS 0~9, Nss=2	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
3. The EUT support diversity parameter for 1TX mode, the 1TX output power will remain the same as per chain of 2TX parameter, and all test items were performed by 2TX mode.

6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20), VHT20:

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40), VHT40:

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	Power from adapter
2	-	-	√	-	Power from POE

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: 1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane**.
2. "-"means no effect.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (Output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

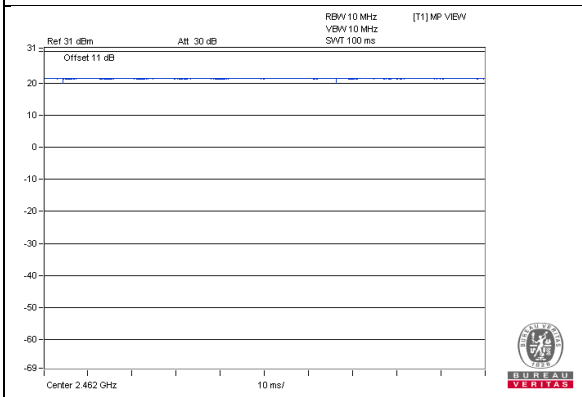
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 67%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	24deg. C, 66%RH	120Vac, 60Hz	Jyunchun Lin
PLC	25deg. C, 60%RH	120Vac, 60Hz	Eagle Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

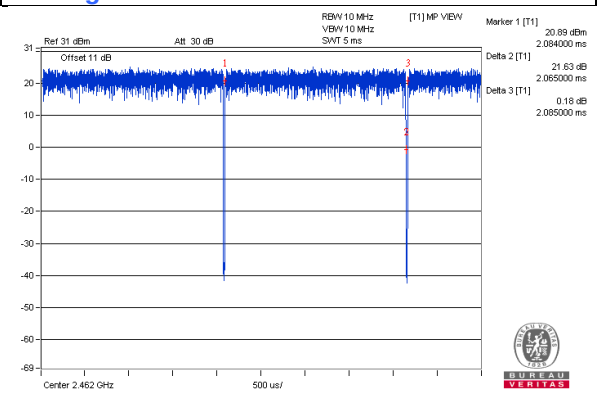
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is 100 %, duty factor is not required.
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
802.11b: Duty cycle of test signal is 100 %
802.11g: Duty cycle = 2.065/2.085 = 0.990
802.11n (HT20): Duty cycle = 1.921/1.94 = 0.990
802.11n (HT40): Duty cycle = 0.945/0.962 = 0.982

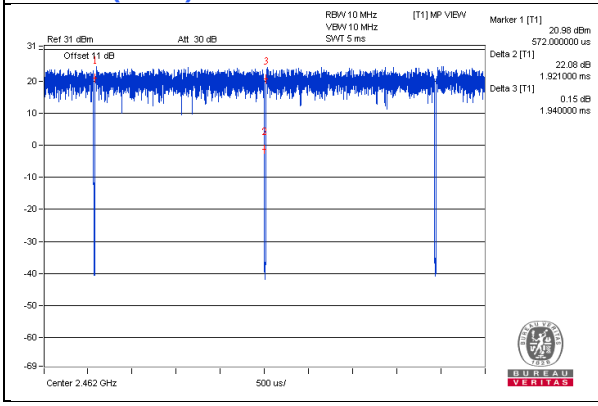
802.11b



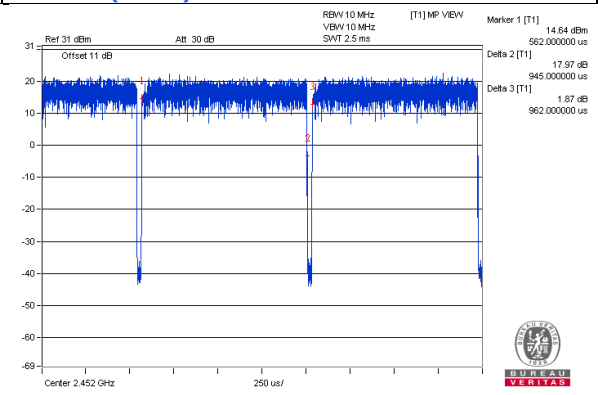
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	POE	Symbol	PD-9001GR/AT/AC	NA	NA	Supplied by client
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	Adapter	HIPRO	HP-A0502R3D	NA	NA	Supplied by client

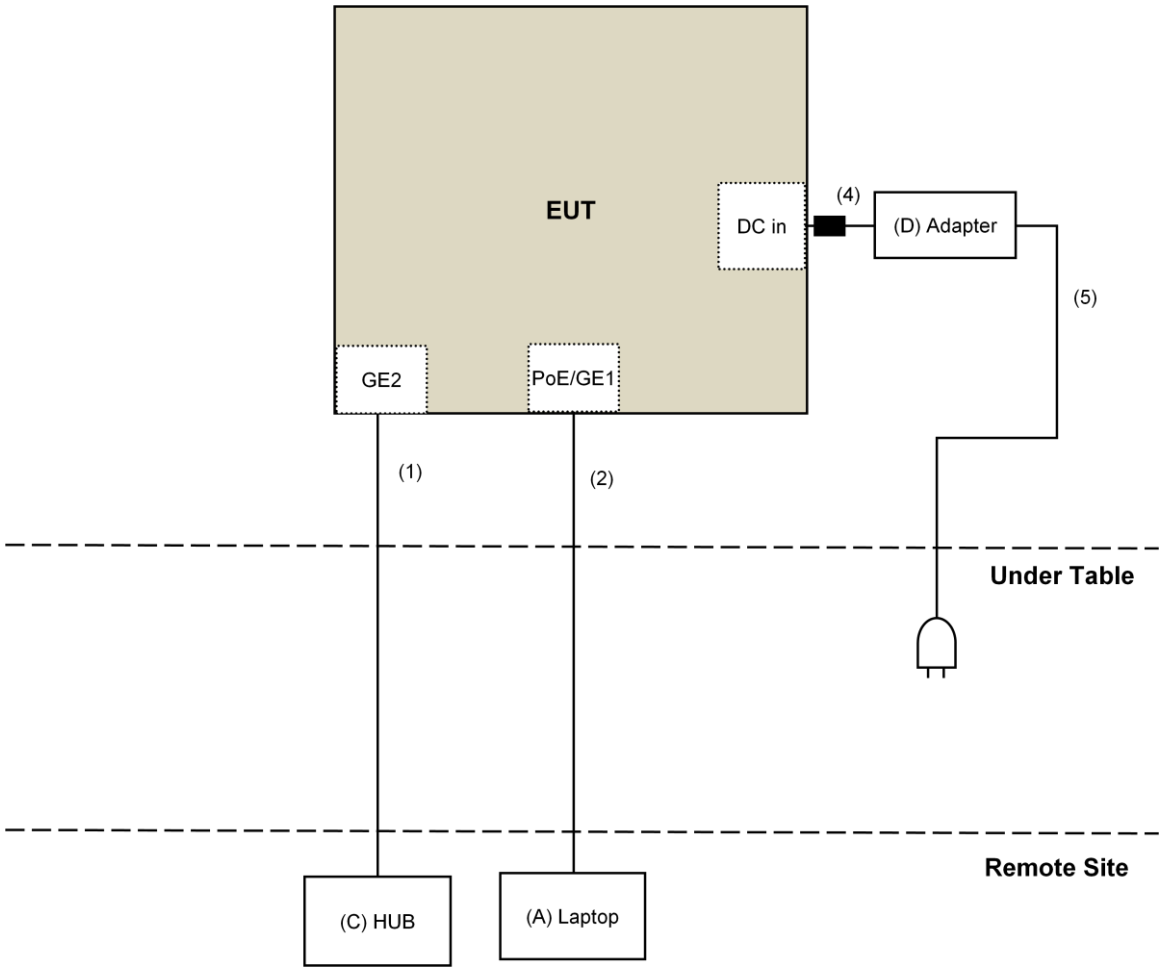
Note:
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	1	No	0	Provided by Lab
4.	DC Cable	1	1.8	No	1	Supplied by client
5.	AC Cable	1	1.8	No	0	Provided by Lab

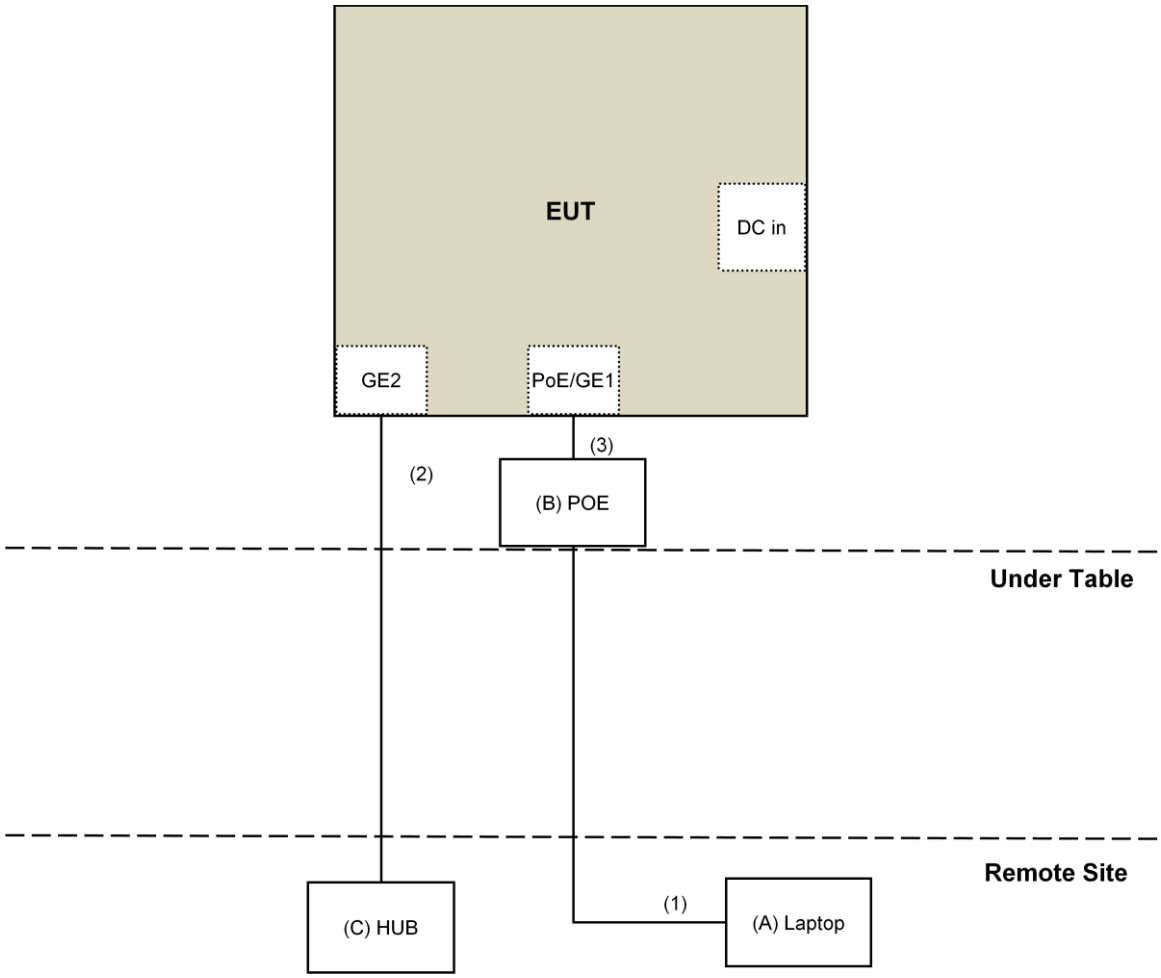
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

Adapter Mode:



POE Mode


EUT
DC in
GE2
PoE/GE1
(3)
(2)
(B) POE
Under Table
Remote Site
(1)
(C) HUB
(A) Laptop

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 DTS Meas Guidance v03r05
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

For Radiated Emission above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6. Tested Date: Nov. 05, 2016

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Nov. 12 to 16, 2016

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

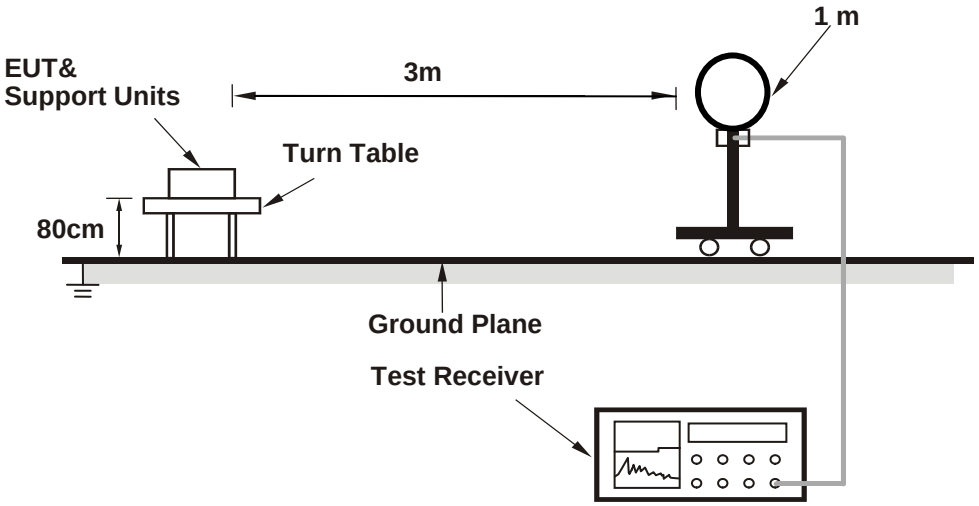
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

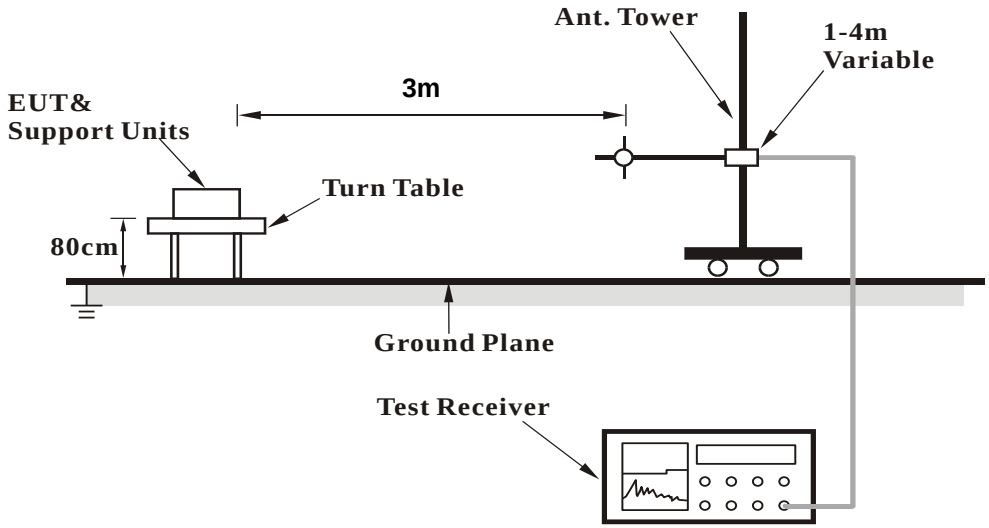
No deviation.

4.1.5 Test Setup

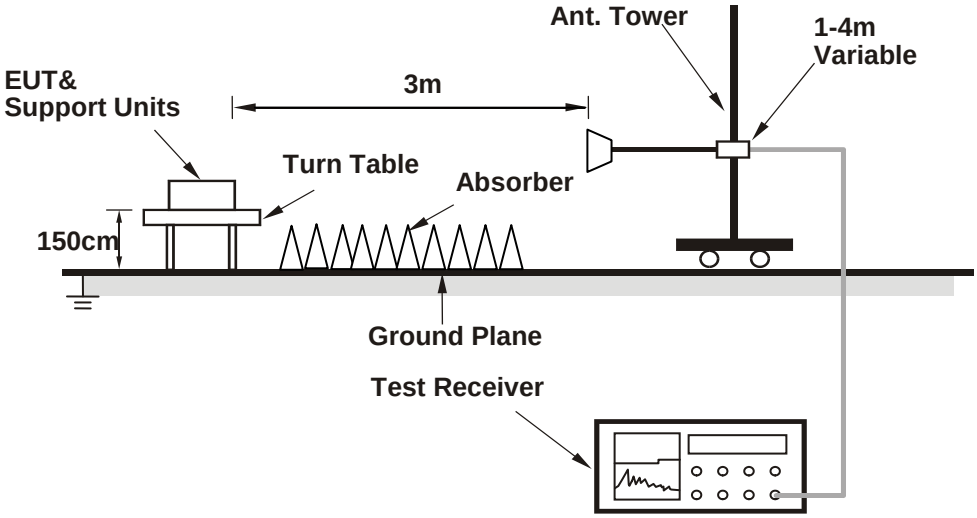
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.

b. Contorlling software (MTool.exe Ver.2.0.2.7) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.60	51.1 PK	74.0	-22.9	1.51 H	314	56.8	-5.7
2	2387.60	43.6 AV	54.0	-10.4	1.51 H	314	49.3	-5.7
3	*2412.00	103.0 PK			1.51 H	314	108.6	-5.6
4	*2412.00	100.0 AV			1.51 H	314	105.6	-5.6
5	4824.00	44.6 PK	74.0	-29.4	1.05 H	62	43.8	0.8
6	4824.00	40.4 AV	54.0	-13.6	1.05 H	62	39.6	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.60	60.3 PK	74.0	-13.7	2.20 V	350	66.0	-5.7
2	2387.60	52.8 AV	54.0	-1.2	2.20 V	350	58.5	-5.7
3	*2412.00	112.3 PK			2.20 V	350	117.9	-5.6
4	*2412.00	109.2 AV			2.20 V	350	114.8	-5.6
5	4824.00	50.4 PK	74.0	-23.6	3.05 V	360	49.6	0.8
6	4824.00	49.1 AV	54.0	-4.9	3.05 V	360	48.3	0.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.4 PK	74.0	-23.6	1.48 H	286	56.1	-5.7
2	2390.00	38.6 AV	54.0	-15.4	1.48 H	286	44.3	-5.7
3	*2437.00	104.0 PK			1.48 H	286	109.5	-5.5
4	*2437.00	101.3 AV			1.48 H	286	106.8	-5.5
5	2483.50	50.0 PK	74.0	-24.0	1.48 H	286	55.5	-5.5
6	2483.50	37.5 AV	54.0	-16.5	1.48 H	286	43.0	-5.5
7	4874.00	47.8 PK	74.0	-26.2	1.15 H	64	46.9	0.9
8	4874.00	43.3 AV	54.0	-10.7	1.15 H	64	42.4	0.9
9	7311.00	48.2 PK	74.0	-25.8	1.50 H	264	40.8	7.4
10	7311.00	37.1 AV	54.0	-16.9	1.50 H	264	29.7	7.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.1 PK	74.0	-22.9	2.73 V	346	56.8	-5.7
2	2390.00	39.0 AV	54.0	-15.0	2.73 V	346	44.7	-5.7
3	*2437.00	113.3 PK			2.73 V	346	118.8	-5.5
4	*2437.00	110.6 AV			2.73 V	346	116.1	-5.5
5	2483.50	50.2 PK	74.0	-23.8	2.73 V	346	55.7	-5.5
6	2483.50	37.9 AV	54.0	-16.1	2.73 V	346	43.4	-5.5
7	4874.00	53.3 PK	74.0	-20.7	3.05 V	360	52.4	0.9
8	4874.00	51.0 AV	54.0	-3.0	3.05 V	360	50.1	0.9
9	7311.00	49.2 PK	74.0	-24.8	1.57 V	343	41.8	7.4
10	7311.00	40.1 AV	54.0	-13.9	1.57 V	343	32.7	7.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.7 PK			1.49 H	299	108.1	-5.4
2	*2462.00	100.1 AV			1.49 H	299	105.5	-5.4
3	2483.50	51.3 PK	74.0	-22.7	1.49 H	299	56.8	-5.5
4	2483.50	43.1 AV	54.0	-10.9	1.49 H	299	48.6	-5.5
5	4924.00	45.6 PK	74.0	-28.4	1.15 H	69	44.5	1.1
6	4924.00	40.1 AV	54.0	-13.9	1.15 H	69	39.0	1.1
7	7386.00	47.4 PK	74.0	-26.6	1.50 H	265	39.8	7.6
8	7386.00	36.4 AV	54.0	-17.6	1.50 H	265	28.8	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.1 PK			1.50 V	27	117.5	-5.4
2	*2462.00	109.7 AV			1.50 V	27	115.1	-5.4
3	2483.50	58.4 PK	74.0	-15.6	1.50 V	27	63.9	-5.5
4	2483.50	52.6 AV	54.0	-1.4	1.50 V	27	58.1	-5.5
5	4924.00	51.1 PK	74.0	-22.9	3.05 V	360	50.0	1.1
6	4924.00	48.6 AV	54.0	-5.4	3.05 V	360	47.5	1.1
7	7386.00	48.9 PK	74.0	-25.1	1.57 V	338	41.3	7.6
8	7386.00	39.6 AV	54.0	-14.4	1.57 V	338	32.0	7.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	1.50 H	299	68.9	-5.7
2	2390.00	40.5 AV	54.0	-13.5	1.50 H	299	46.2	-5.7
3	*2412.00	104.4 PK			1.50 H	299	110.0	-5.6
4	*2412.00	93.6 AV			1.50 H	299	99.2	-5.6
5	4824.00	44.4 PK	74.0	-29.6	1.05 H	77	43.6	0.8
6	4824.00	39.6 AV	54.0	-14.4	1.05 H	77	38.8	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.6 PK	74.0	-1.4	2.07 V	8	78.3	-5.7
2	2390.00	49.3 AV	54.0	-4.7	2.07 V	8	55.0	-5.7
3	*2412.00	113.5 PK			2.07 V	8	119.1	-5.6
4	*2412.00	103.1 AV			2.07 V	8	108.7	-5.6
5	4824.00	49.6 PK	74.0	-24.4	3.10 V	360	48.8	0.8
6	4824.00	45.2 AV	54.0	-8.8	3.10 V	360	44.4	0.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.4 PK	74.0	-14.6	1.45 H	285	65.1	-5.7
2	2390.00	43.2 AV	54.0	-10.8	1.45 H	285	48.9	-5.7
3	*2437.00	106.9 PK			1.45 H	285	112.4	-5.5
4	*2437.00	95.2 AV			1.45 H	285	100.7	-5.5
5	2483.50	55.7 PK	74.0	-18.3	1.45 H	285	61.2	-5.5
6	2483.50	40.4 AV	54.0	-13.6	1.45 H	285	45.9	-5.5
7	4874.00	44.3 PK	74.0	-29.7	1.10 H	84	43.4	0.9
8	4874.00	39.4 AV	54.0	-14.6	1.10 H	84	38.5	0.9
9	7311.00	47.4 PK	74.0	-26.6	1.54 H	255	40.0	7.4
10	7311.00	36.5 AV	54.0	-17.5	1.54 H	255	29.1	7.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.8 PK	74.0	-5.2	2.25 V	1	74.5	-5.7
2	2390.00	52.6 AV	54.0	-1.4	2.25 V	1	58.3	-5.7
3	*2437.00	116.0 PK			2.25 V	1	121.5	-5.5
4	*2437.00	104.6 AV			2.25 V	1	110.1	-5.5
5	2483.50	64.9 PK	74.0	-9.1	2.25 V	1	70.4	-5.5
6	2483.50	48.8 AV	54.0	-5.2	2.25 V	1	54.3	-5.5
7	4874.00	51.4 PK	74.0	-22.6	3.06 V	360	50.5	0.9
8	4874.00	49.6 AV	54.0	-4.4	3.06 V	360	48.7	0.9
9	7311.00	49.6 PK	74.0	-24.4	1.53 V	338	42.2	7.4
10	7311.00	40.6 AV	54.0	-13.4	1.53 V	338	33.2	7.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.9 PK			1.52 H	300	110.3	-5.4
2	*2462.00	94.2 AV			1.52 H	300	99.6	-5.4
3	2483.50	63.6 PK	74.0	-10.4	1.52 H	300	69.1	-5.5
4	2483.50	43.1 AV	54.0	-10.9	1.52 H	300	48.6	-5.5
5	4924.00	44.6 PK	74.0	-29.4	1.04 H	79	43.5	1.1
6	4924.00	39.5 AV	54.0	-14.5	1.04 H	79	38.4	1.1
7	7386.00	46.8 PK	74.0	-27.2	1.55 H	240	39.2	7.6
8	7386.00	36.1 AV	54.0	-17.9	1.55 H	240	28.5	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.5 PK			2.15 V	1	119.9	-5.4
2	*2462.00	103.0 AV			2.15 V	1	108.4	-5.4
3	**2483.50**	**72.9 PK**	**74.0**	**-1.1**	**2.15 V**	**1**	**78.4**	**-5.5**
4	2483.50	52.6 AV	54.0	-1.4	2.15 V	1	58.1	-5.5
5	4924.00	51.0 PK	74.0	-23.0	3.03 V	360	49.9	1.1
6	4924.00	47.7 AV	54.0	-6.3	3.03 V	360	46.6	1.1
7	7386.00	49.2 PK	74.0	-24.8	1.50 V	341	41.6	7.6
8	7386.00	40.2 AV	54.0	-13.8	1.50 V	341	32.6	7.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	1.56 H	286	69.1	-5.7
2	2390.00	38.4 AV	54.0	-15.6	1.56 H	286	44.1	-5.7
3	*2412.00	102.4 PK			1.56 H	286	108.0	-5.6
4	*2412.00	92.6 AV			1.56 H	286	98.2	-5.6
5	4824.00	44.3 PK	74.0	-29.7	1.09 H	68	43.5	0.8
6	4824.00	39.5 AV	54.0	-14.5	1.09 H	68	38.7	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.8 PK	74.0	-1.2	2.25 V	341	78.5	-5.7
2	2390.00	47.5 AV	54.0	-6.5	2.25 V	341	53.2	-5.7
3	*2412.00	112.0 PK			2.25 V	341	117.6	-5.6
4	*2412.00	101.8 AV			2.25 V	341	107.4	-5.6
5	4824.00	49.9 PK	74.0	-24.1	3.15 V	351	49.1	0.8
6	4824.00	45.6 AV	54.0	-8.4	3.15 V	351	44.8	0.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.6 PK	74.0	-14.4	1.57 H	284	65.3	-5.7
2	2390.00	43.4 AV	54.0	-10.6	1.57 H	284	49.1	-5.7
3	*2437.00	106.7 PK			1.57 H	284	112.2	-5.5
4	*2437.00	94.8 AV			1.57 H	284	100.3	-5.5
5	2483.50	55.6 PK	74.0	-18.4	1.57 H	284	61.1	-5.5
6	2483.50	40.4 AV	54.0	-13.6	1.57 H	284	45.9	-5.5
7	4874.00	43.6 PK	74.0	-30.4	1.10 H	79	42.7	0.9
8	4874.00	39.0 AV	54.0	-15.0	1.10 H	79	38.1	0.9
9	7311.00	47.1 PK	74.0	-26.9	1.59 H	241	39.7	7.4
10	7311.00	36.4 AV	54.0	-17.6	1.59 H	241	29.0	7.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.6 PK	74.0	-1.4	2.25 V	341	78.3	-5.7
2	2390.00	52.4 AV	54.0	-1.6	2.25 V	341	58.1	-5.7
3	*2437.00	115.0 PK			2.25 V	341	120.5	-5.5
4	*2437.00	104.1 AV			2.25 V	341	109.6	-5.5
5	2483.50	69.0 PK	74.0	-5.0	2.25 V	341	74.5	-5.5
6	2483.50	48.6 AV	54.0	-5.4	2.25 V	341	54.1	-5.5
7	4874.00	51.4 PK	74.0	-22.6	3.05 V	360	50.5	0.9
8	4874.00	49.6 AV	54.0	-4.4	3.05 V	360	48.7	0.9
9	7311.00	50.1 PK	74.0	-23.9	1.52 V	341	42.7	7.4
10	7311.00	40.9 AV	54.0	-13.1	1.52 V	341	33.5	7.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.9 PK			1.46 H	295	110.3	-5.4
2	*2462.00	94.1 AV			1.46 H	295	99.5	-5.4
3	2483.50	63.0 PK	74.0	-11.0	1.46 H	295	68.5	-5.5
4	2483.50	42.7 AV	54.0	-11.3	1.46 H	295	48.2	-5.5
5	4924.00	44.8 PK	74.0	-29.2	1.04 H	67	43.7	1.1
6	4924.00	39.7 AV	54.0	-14.3	1.04 H	67	38.6	1.1
7	7386.00	46.6 PK	74.0	-27.4	1.50 H	234	39.0	7.6
8	7386.00	35.9 AV	54.0	-18.1	1.50 H	234	28.3	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.3 PK			2.25 V	4	118.7	-5.4
2	*2462.00	103.0 AV			2.25 V	4	108.4	-5.4
3	2483.50	72.6 PK	74.0	-1.4	2.25 V	4	78.1	-5.5
4	2483.50	52.1 AV	54.0	-1.9	2.25 V	4	57.6	-5.5
5	4924.00	51.5 PK	74.0	-22.5	3.09 V	360	50.4	1.1
6	4924.00	48.2 AV	54.0	-5.8	3.09 V	360	47.1	1.1
7	7386.00	49.6 PK	74.0	-24.4	1.54 V	354	42.0	7.6
8	7386.00	40.6 AV	54.0	-13.4	1.54 V	354	33.0	7.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.4 PK	74.0	-11.6	1.42 H	300	68.1	-5.7
2	2390.00	41.6 AV	54.0	-12.4	1.42 H	300	47.3	-5.7
3	*2422.00	100.6 PK			1.42 H	300	106.1	-5.5
4	*2422.00	88.4 AV			1.42 H	300	93.9	-5.5
5	4844.00	44.2 PK	74.0	-29.8	1.00 H	81	43.4	0.8
6	4844.00	38.1 AV	54.0	-15.9	1.00 H	81	37.3	0.8
7	7266.00	46.6 PK	74.0	-27.4	1.42 H	224	39.1	7.5
8	7266.00	36.3 AV	54.0	-17.7	1.42 H	224	28.8	7.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.3 PK	74.0	-1.7	2.25 V	340	78.0	-5.7
2	2390.00	51.3 AV	54.0	-2.7	2.25 V	340	57.0	-5.7
3	*2422.00	110.0 PK			2.25 V	340	115.5	-5.5
4	*2422.00	98.5 AV			2.25 V	340	104.0	-5.5
5	4844.00	49.7 PK	74.0	-24.3	3.15 V	360	48.9	0.8
6	4844.00	45.3 AV	54.0	-8.7	3.15 V	360	44.5	0.8
7	7266.00	49.2 PK	74.0	-24.8	1.62 V	360	41.7	7.5
8	7266.00	40.4 AV	54.0	-13.6	1.62 V	360	32.9	7.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.5 PK	74.0	-11.5	1.43 H	315	68.2	-5.7
2	2390.00	43.1 AV	54.0	-10.9	1.43 H	315	48.8	-5.7
3	*2437.00	101.4 PK			1.43 H	315	106.9	-5.5
4	*2437.00	90.2 AV			1.43 H	315	95.7	-5.5
5	2483.50	62.4 PK	74.0	-11.6	1.43 H	315	67.9	-5.5
6	2483.50	41.6 AV	54.0	-12.4	1.43 H	315	47.1	-5.5
7	4874.00	44.4 PK	74.0	-29.6	1.00 H	67	43.5	0.9
8	4874.00	38.5 AV	54.0	-15.5	1.00 H	67	37.6	0.9
9	7311.00	46.3 PK	74.0	-27.7	1.46 H	220	38.9	7.4
10	7311.00	35.9 AV	54.0	-18.1	1.46 H	220	28.5	7.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**2390.00**	**72.9 PK**	**74.0**	**-1.1**	**2.25 V**	**343**	**78.6**	**-5.7**
2	2390.00	52.5 AV	54.0	-1.5	2.25 V	343	58.2	-5.7
3	*2437.00	111.1 PK			2.25 V	343	116.6	-5.5
4	*2437.00	99.5 AV			2.25 V	343	105.0	-5.5
5	2483.50	72.1 PK	74.0	-1.9	2.25 V	343	77.6	-5.5
6	2483.50	51.6 AV	54.0	-2.4	2.25 V	343	57.1	-5.5
7	4874.00	49.4 PK	74.0	-24.6	3.14 V	360	48.5	0.9
8	4874.00	45.2 AV	54.0	-8.8	3.14 V	360	44.3	0.9
9	7311.00	49.4 PK	74.0	-24.6	1.60 V	356	42.0	7.4
10	7311.00	40.3 AV	54.0	-13.7	1.60 V	356	32.9	7.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	98.5 PK			1.44 H	294	104.0	-5.5
2	*2452.00	86.4 AV			1.44 H	294	91.9	-5.5
3	2483.50	63.6 PK	74.0	-10.4	1.44 H	294	69.1	-5.5
4	2483.50	42.4 AV	54.0	-11.6	1.44 H	294	47.9	-5.5
5	4904.00	44.4 PK	74.0	-29.6	1.00 H	78	43.4	1.0
6	4904.00	38.6 AV	54.0	-15.4	1.00 H	78	37.6	1.0
7	7356.00	46.0 PK	74.0	-28.0	1.48 H	212	38.4	7.6
8	7356.00	35.4 AV	54.0	-18.6	1.48 H	212	27.8	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	107.9 PK			2.25 V	339	113.4	-5.5
2	*2452.00	96.5 AV			2.25 V	339	102.0	-5.5
3	**2483.50**	**72.9 PK**	**74.0**	**-1.1**	**2.25 V**	**339**	**78.4**	**-5.5**
4	2483.50	51.0 AV	54.0	-3.0	2.25 V	339	56.5	-5.5
5	4904.00	50.0 PK	74.0	-24.0	3.08 V	360	49.0	1.0
6	4904.00	45.6 AV	54.0	-8.4	3.08 V	360	44.6	1.0
7	7356.00	49.4 PK	74.0	-24.6	1.62 V	360	41.8	7.6
8	7356.00	40.5 AV	54.0	-13.5	1.62 V	360	32.9	7.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.82	30.9 QP	40.0	-9.1	1.98 H	262	40.9	-10.0
2	114.09	25.9 QP	43.5	-17.6	1.45 H	58	37.0	-11.1
3	249.96	34.3 QP	46.0	-11.7	1.00 H	69	44.3	-10.0
4	320.80	34.0 QP	46.0	-12.0	1.00 H	42	41.4	-7.4
5	497.48	27.4 QP	46.0	-18.6	1.53 H	51	30.2	-2.8
6	920.61	30.7 QP	46.0	-15.3	2.50 H	87	26.5	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.52	32.8 QP	40.0	-7.2	1.94 V	319	42.7	-9.9
2	42.60	30.1 QP	40.0	-9.9	1.00 V	360	39.0	-8.9
3	249.94	27.4 QP	46.0	-18.6	1.52 V	357	37.4	-10.0
4	320.49	26.6 QP	46.0	-19.4	1.51 V	360	34.0	-7.4
5	497.41	26.4 QP	46.0	-19.6	1.00 V	304	29.2	-2.8
6	926.01	30.0 QP	46.0	-16.0	2.55 V	63	25.7	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.47	30.6 QP	40.0	-9.4	1.99 H	268	40.5	-9.9
2	114.07	25.5 QP	43.5	-18.0	1.50 H	82	36.6	-11.1
3	250.00	34.3 QP	46.0	-11.7	1.00 H	61	44.3	-10.0
4	320.89	33.7 QP	46.0	-12.3	1.00 H	56	41.1	-7.4
5	497.50	27.5 QP	46.0	-18.5	1.55 H	55	30.3	-2.8
6	920.61	30.6 QP	46.0	-15.4	2.45 H	89	26.4	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.91	32.6 QP	40.0	-7.4	2.02 V	316	42.6	-10.0
2	42.72	29.7 QP	40.0	-10.3	1.00 V	357	38.5	-8.8
3	249.80	27.6 QP	46.0	-18.4	1.53 V	345	37.6	-10.0
4	320.90	26.7 QP	46.0	-19.3	1.50 V	360	34.1	-7.4
5	497.21	26.3 QP	46.0	-19.7	1.00 V	305	29.1	-2.8
6	926.01	30.0 QP	46.0	-16.0	2.52 V	51	25.7	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.42	30.6 QP	40.0	-9.4	1.97 H	253	40.5	-9.9
2	114.28	25.5 QP	43.5	-18.0	1.48 H	65	36.6	-11.1
3	249.94	33.8 QP	46.0	-12.2	1.04 H	80	43.8	-10.0
4	320.87	33.8 QP	46.0	-12.2	1.02 H	62	41.2	-7.4
5	497.45	27.8 QP	46.0	-18.2	1.54 H	37	30.6	-2.8
6	920.61	30.6 QP	46.0	-15.4	2.50 H	99	26.4	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.53	32.8 QP	40.0	-7.2	1.99 V	310	42.7	-9.9
2	42.45	30.1 QP	40.0	-9.9	1.00 V	360	39.0	-8.9
3	250.16	27.6 QP	46.0	-18.4	1.53 V	360	37.6	-10.0
4	320.41	26.8 QP	46.0	-19.2	1.45 V	350	34.2	-7.4
5	497.04	26.2 QP	46.0	-19.8	1.00 V	302	29.0	-2.8
6	926.01	29.6 QP	46.0	-16.4	2.47 V	68	25.3	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.77	31.0 QP	40.0	-9.0	2.05 H	268	41.0	-10.0
2	114.04	25.3 QP	43.5	-18.2	1.54 H	74	36.4	-11.1
3	250.15	33.9 QP	46.0	-12.1	1.00 H	89	43.9	-10.0
4	320.67	33.4 QP	46.0	-12.6	1.00 H	38	40.8	-7.4
5	497.65	27.6 QP	46.0	-18.4	1.56 H	60	30.4	-2.8
6	920.61	31.0 QP	46.0	-15.0	2.49 H	84	26.8	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.78	32.6 QP	40.0	-7.4	1.94 V	311	42.6	-10.0
2	42.58	29.7 QP	40.0	-10.3	1.00 V	359	38.6	-8.9
3	249.83	27.4 QP	46.0	-18.6	1.48 V	350	37.4	-10.0
4	320.77	26.8 QP	46.0	-19.2	1.52 V	360	34.2	-7.4
5	497.20	26.4 QP	46.0	-19.6	1.00 V	298	29.2	-2.8
6	926.01	29.9 QP	46.0	-16.1	2.45 V	74	25.6	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.87	30.8 QP	40.0	-9.2	1.99 H	261	40.8	-10.0
2	114.18	25.7 QP	43.5	-17.8	1.46 H	76	36.8	-11.1
3	249.79	34.0 QP	46.0	-12.0	1.00 H	83	44.0	-10.0
4	320.82	34.0 QP	46.0	-12.0	1.00 H	54	41.4	-7.4
5	497.44	27.7 QP	46.0	-18.3	1.46 H	52	30.5	-2.8
6	920.61	30.7 QP	46.0	-15.3	2.52 H	83	26.5	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.38	32.9 QP	40.0	-7.1	2.04 V	313	42.8	-9.9
2	42.45	29.7 QP	40.0	-10.3	1.03 V	355	38.6	-8.9
3	249.82	27.7 QP	46.0	-18.3	1.47 V	354	37.7	-10.0
4	320.77	26.4 QP	46.0	-19.6	1.48 V	360	33.8	-7.4
5	497.38	25.9 QP	46.0	-20.1	1.02 V	304	28.7	-2.8
6	926.01	30.0 QP	46.0	-16.0	2.51 V	49	25.7	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.52	30.9 QP	40.0	-9.1	1.95 H	269	40.8	-9.9
2	114.52	25.6 QP	43.5	-17.9	1.55 H	56	36.7	-11.1
3	249.97	34.1 QP	46.0	-11.9	1.02 H	61	44.1	-10.0
4	320.66	33.6 QP	46.0	-12.4	1.00 H	32	41.0	-7.4
5	497.74	27.8 QP	46.0	-18.2	1.45 H	53	30.6	-2.8
6	920.61	30.9 QP	46.0	-15.1	2.50 H	77	26.7	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.49	32.5 QP	40.0	-7.5	2.02 V	335	42.4	-9.9
2	42.39	30.0 QP	40.0	-10.0	1.05 V	352	38.9	-8.9
3	249.89	27.8 QP	46.0	-18.2	1.48 V	360	37.8	-10.0
4	320.44	26.4 QP	46.0	-19.6	1.51 V	356	33.8	-7.4
5	497.05	25.9 QP	46.0	-20.1	1.00 V	291	28.7	-2.8
6	926.01	29.8 QP	46.0	-16.2	2.54 V	68	25.5	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.42	30.6 QP	40.0	-9.4	1.98 H	266	40.5	-9.9
2	114.16	25.6 QP	43.5	-17.9	1.50 H	80	36.7	-11.1
3	249.83	34.2 QP	46.0	-11.8	1.00 H	61	44.2	-10.0
4	320.70	33.9 QP	46.0	-12.1	1.02 H	53	41.3	-7.4
5	497.75	27.9 QP	46.0	-18.1	1.44 H	55	30.7	-2.8
6	920.61	31.0 QP	46.0	-15.0	2.51 H	80	26.8	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.39	33.0 QP	40.0	-7.0	1.95 V	324	42.9	-9.9
2	42.41	30.1 QP	40.0	-9.9	1.00 V	356	39.0	-8.9
3	250.08	27.6 QP	46.0	-18.4	1.54 V	360	37.6	-10.0
4	320.53	26.7 QP	46.0	-19.3	1.51 V	356	34.1	-7.4
5	497.08	26.2 QP	46.0	-19.8	1.02 V	280	29.0	-2.8
6	926.01	29.7 QP	46.0	-16.3	2.50 V	59	25.4	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.61	30.6 QP	40.0	-9.4	2.02 H	259	40.6	-10.0
2	114.44	25.4 QP	43.5	-18.1	1.44 H	64	36.5	-11.1
3	250.14	34.4 QP	46.0	-11.6	1.00 H	87	44.4	-10.0
4	320.62	33.8 QP	46.0	-12.2	1.00 H	62	41.2	-7.4
5	497.81	27.6 QP	46.0	-18.4	1.47 H	56	30.4	-2.8
6	920.61	31.0 QP	46.0	-15.0	2.47 H	109	26.8	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.91	32.9 QP	40.0	-7.1	1.98 V	326	42.9	-10.0
2	42.87	29.6 QP	40.0	-10.4	1.00 V	355	38.4	-8.8
3	250.11	27.7 QP	46.0	-18.3	1.54 V	349	37.7	-10.0
4	320.80	26.5 QP	46.0	-19.5	1.50 V	351	33.9	-7.4
5	497.38	26.3 QP	46.0	-19.7	1.00 V	280	29.1	-2.8
6	926.01	29.8 QP	46.0	-16.2	2.53 V	50	25.5	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.91	31.1 QP	40.0	-8.9	2.02 H	261	41.1	-10.0
2	114.47	25.5 QP	43.5	-18.0	1.45 H	81	36.6	-11.1
3	250.12	34.0 QP	46.0	-12.0	1.00 H	74	44.0	-10.0
4	320.66	33.5 QP	46.0	-12.5	1.00 H	49	40.9	-7.4
5	498.01	27.9 QP	46.0	-18.1	1.51 H	42	30.7	-2.8
6	920.61	30.9 QP	46.0	-15.1	2.48 H	89	26.7	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.78	33.0 QP	40.0	-7.0	1.99 V	314	43.0	-10.0
2	42.76	29.6 QP	40.0	-10.4	1.00 V	360	38.4	-8.8
3	249.99	27.7 QP	46.0	-18.3	1.45 V	360	37.7	-10.0
4	320.49	26.3 QP	46.0	-19.7	1.55 V	346	33.7	-7.4
5	497.16	26.2 QP	46.0	-19.8	1.00 V	303	29.0	-2.8
6	926.01	30.0 QP	46.0	-16.0	2.48 V	72	25.7	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.97	30.5 QP	40.0	-9.5	1.98 H	264	40.5	-10.0
2	114.34	25.8 QP	43.5	-17.7	1.53 H	68	36.9	-11.1
3	250.17	34.4 QP	46.0	-11.6	1.03 H	69	44.4	-10.0
4	320.52	33.5 QP	46.0	-12.5	1.00 H	47	40.9	-7.4
5	497.67	27.5 QP	46.0	-18.5	1.45 H	49	30.3	-2.8
6	920.61	30.9 QP	46.0	-15.1	2.53 H	88	26.7	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.38	33.0 QP	40.0	-7.0	2.05 V	341	42.9	-9.9
2	42.70	30.0 QP	40.0	-10.0	1.00 V	360	38.9	-8.9
3	249.86	27.4 QP	46.0	-18.6	1.55 V	360	37.4	-10.0
4	320.54	26.7 QP	46.0	-19.3	1.46 V	360	34.1	-7.4
5	497.26	25.9 QP	46.0	-20.1	1.00 V	284	28.7	-2.8
6	926.01	30.1 QP	46.0	-15.9	2.51 V	48	25.8	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.89	30.6 QP	40.0	-9.4	2.05 H	254	40.6	-10.0
2	114.32	25.5 QP	43.5	-18.0	1.47 H	69	36.6	-11.1
3	250.21	33.9 QP	46.0	-12.1	1.00 H	74	43.9	-10.0
4	320.93	33.4 QP	46.0	-12.6	1.00 H	37	40.8	-7.4
5	497.79	27.4 QP	46.0	-18.6	1.54 H	41	30.2	-2.8
6	920.61	30.8 QP	46.0	-15.2	2.49 H	100	26.6	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.72	32.5 QP	40.0	-7.5	2.03 V	318	42.5	-10.0
2	42.67	30.1 QP	40.0	-9.9	1.03 V	360	39.0	-8.9
3	249.76	27.9 QP	46.0	-18.1	1.47 V	360	37.9	-10.0
4	320.42	26.7 QP	46.0	-19.3	1.47 V	359	34.1	-7.4
5	497.20	26.3 QP	46.0	-19.7	1.02 V	284	29.1	-2.8
6	926.01	30.1 QP	46.0	-15.9	2.48 V	69	25.8	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.78	30.6 QP	40.0	-9.4	2.00 H	250	40.6	-10.0
2	114.41	25.5 QP	43.5	-18.0	1.49 H	60	36.6	-11.1
3	250.22	33.9 QP	46.0	-12.1	1.00 H	75	43.9	-10.0
4	320.78	33.6 QP	46.0	-12.4	1.00 H	57	41.0	-7.4
5	497.44	27.7 QP	46.0	-18.3	1.47 H	60	30.5	-2.8
6	920.61	30.9 QP	46.0	-15.1	2.54 H	106	26.7	4.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.79	32.7 QP	40.0	-7.3	1.95 V	314	42.7	-10.0
2	42.43	29.5 QP	40.0	-10.5	1.00 V	360	38.4	-8.9
3	250.24	27.8 QP	46.0	-18.2	1.56 V	360	37.8	-10.0
4	320.87	26.5 QP	46.0	-19.5	1.47 V	348	33.9	-7.4
5	497.50	26.3 QP	46.0	-19.7	1.00 V	298	29.1	-2.8
6	926.01	29.7 QP	46.0	-16.3	2.52 V	54	25.4	4.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2016	Apr. 15, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-523	Oct. 11, 2016	Oct. 10, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
RF Cable	5D-FB	COACAB-001	May 24, 2016	May 23, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-001	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	50	3	Oct. 26, 2016	Oct. 25, 2017
50 ohms Terminator	N/A	EMC-04	Nov. 02, 2016	Nov. 01, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. Tested Date: Nov. 09, 2016

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

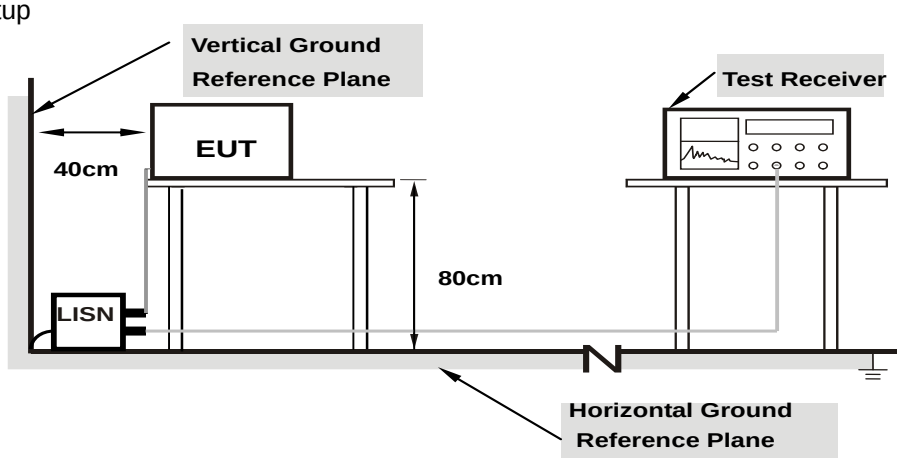
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

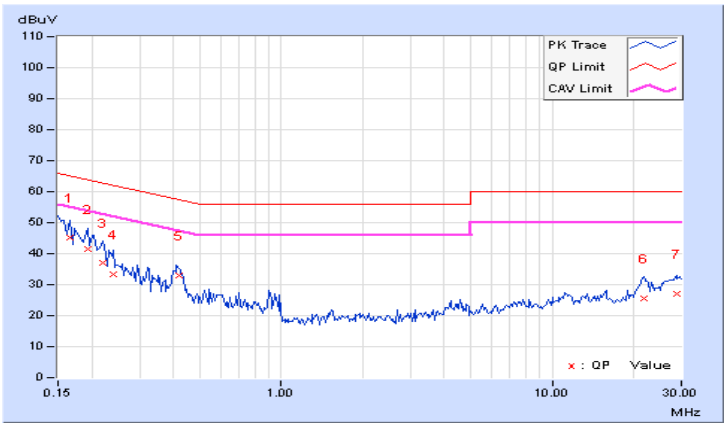
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	10.13	34.93	17.73	45.06	27.86	65.18	55.18	-20.12	-27.32
2	0.19297	10.12	31.39	15.91	41.51	26.03	63.91	53.91	-22.40	-27.88
3	0.22031	10.12	27.10	10.00	37.22	20.12	62.81	52.81	-25.59	-32.69
4	0.23984	10.12	23.34	7.58	33.46	17.70	62.10	52.10	-28.64	-34.40
5	0.41953	10.11	22.92	17.64	33.03	27.75	57.46	47.46	-24.43	-19.71
6	21.77734	10.88	14.85	9.90	25.73	20.78	60.00	50.00	-34.27	-29.22
7	28.74219	11.13	15.85	10.77	26.98	21.90	60.00	50.00	-33.02	-28.10

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

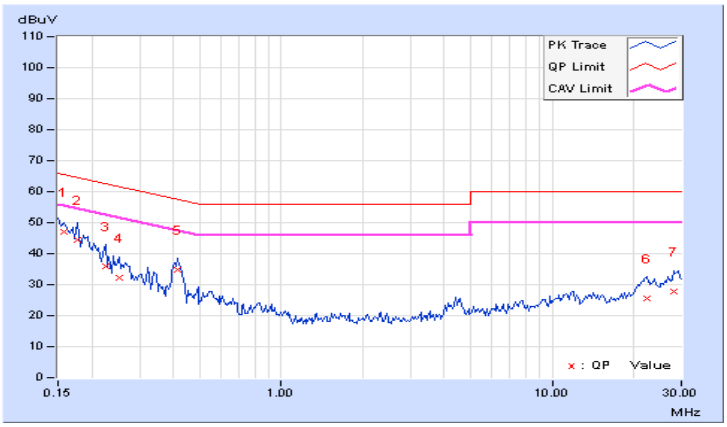


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.17	36.71	21.03	46.88	31.20	65.58	55.58	-18.70	-24.38
2	0.17734	10.12	34.20	19.39	44.32	29.51	64.61	54.61	-20.29	-25.10
3	0.22422	10.07	25.74	8.97	35.81	19.04	62.66	52.66	-26.85	-33.62
4	0.25156	10.08	22.29	6.31	32.37	16.39	61.71	51.71	-29.34	-35.32
5	0.41563	10.09	24.71	18.71	34.80	28.80	57.54	47.54	-22.74	-18.74
6	22.35547	10.92	14.80	9.89	25.72	20.81	60.00	50.00	-34.28	-29.19
7	28.16406	11.12	16.61	11.47	27.73	22.59	60.00	50.00	-32.27	-27.41

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



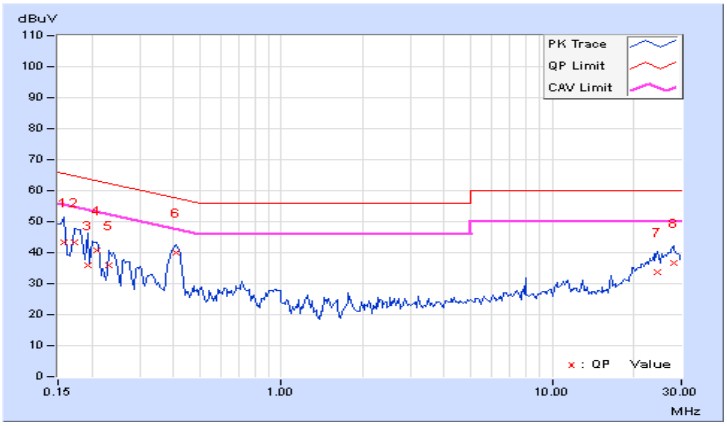
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.14	33.28	15.67	43.42	25.81	65.58	55.58	-22.16	-29.77
2	0.17344	10.13	33.34	21.13	43.47	31.26	64.79	54.79	-21.32	-23.53
3	0.19297	10.12	25.88	5.80	36.00	15.92	63.91	53.91	-27.91	-37.99
4	0.20859	10.12	30.48	22.72	40.60	32.84	63.26	53.26	-22.66	-20.42
5	0.23203	10.12	25.95	15.38	36.07	25.50	62.38	52.38	-26.31	-26.88
6	0.40781	10.11	29.99	21.92	40.10	32.03	57.69	47.69	-17.59	-15.66
7	24.35547	10.97	22.59	17.77	33.56	28.74	60.00	50.00	-26.44	-21.26
8	28.07031	11.10	25.48	20.52	36.58	31.62	60.00	50.00	-23.42	-18.38

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

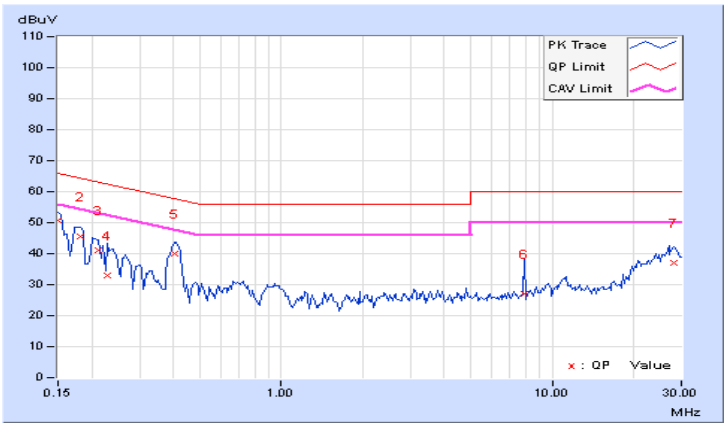


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	**0.15000**	**10.19**	**40.46**	**31.51**	**50.65**	**41.70**	**66.00**	**56.00**	**-15.35**	**-14.30**
2	0.18125	10.12	35.29	25.53	45.41	35.65	64.43	54.43	-19.02	-18.78
3	0.21250	10.07	30.87	21.15	40.94	31.22	63.11	53.11	-22.17	-21.89
4	0.22812	10.07	22.82	10.03	32.89	20.10	62.52	52.52	-29.63	-32.42
5	0.40391	10.09	29.91	18.83	40.00	28.92	57.77	47.77	-17.77	-18.85
6	7.89844	10.42	16.44	6.73	26.86	17.15	60.00	50.00	-33.14	-32.85
7	28.10156	11.12	26.06	21.06	37.18	32.18	60.00	50.00	-22.82	-17.82

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

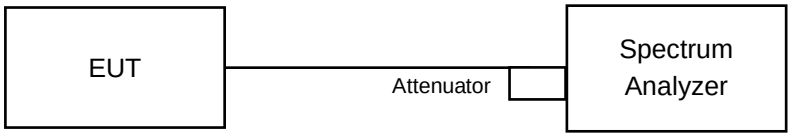


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.12	7.11	0.5	Pass
6	2437	7.58	7.14	0.5	Pass
11	2462	7.61	7.59	0.5	Pass

802.11g

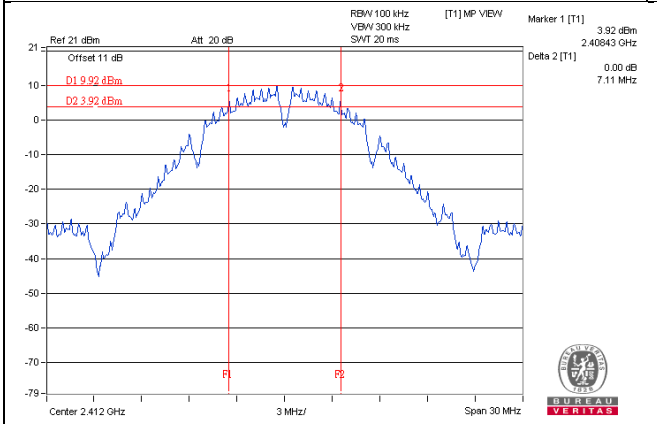
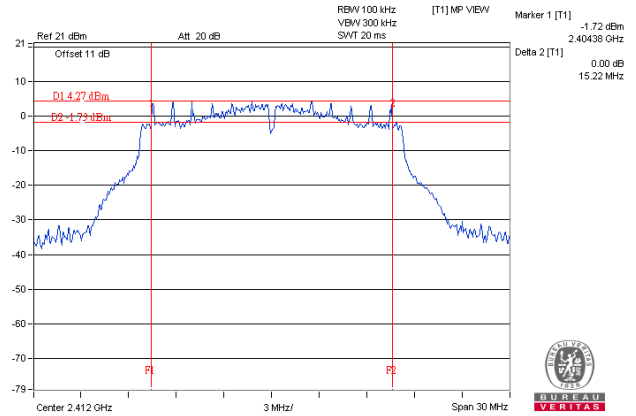
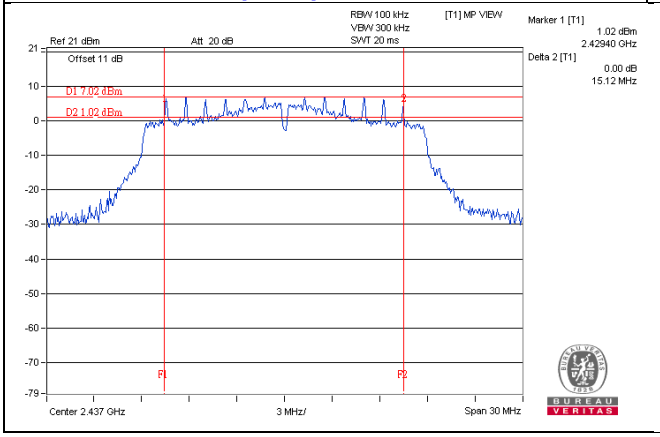
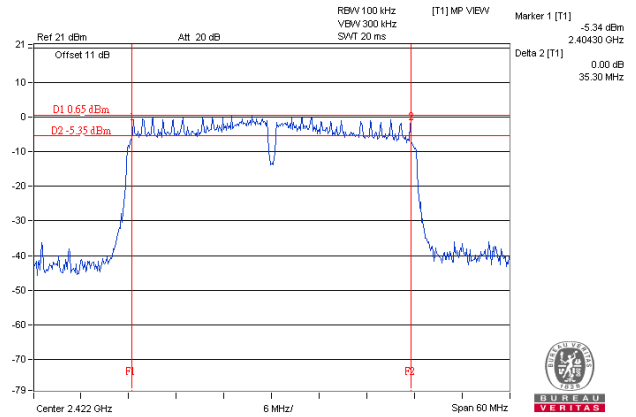
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.22	15.79	0.5	Pass
6	2437	15.30	15.81	0.5	Pass
11	2462	15.26	15.78	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.23	15.51	0.5	Pass
6	2437	15.12	15.52	0.5	Pass
11	2462	15.25	15.77	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.40	35.30	0.5	Pass
6	2437	35.45	35.41	0.5	Pass
9	2452	35.41	35.32	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH1	**802.11g / Chain 0 : CH1**
	
802.11n (HT20) / Chain 0 : CH6	**802.11n (HT40) / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

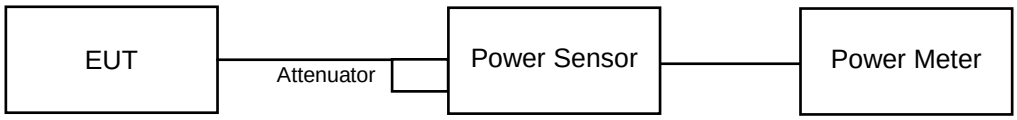
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE. Record the power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.89	17.90	123.178	20.91	30.00	Pass
6	2437	19.65	19.58	183.039	22.63	30.00	Pass
11	2462	18.43	18.47	139.97	21.46	30.00	Pass

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	15.76	15.56	73.645	18.67	30.00	Pass
6	2437	18.52	18.25	137.955	21.40	30.00	Pass
11	2462	17.04	16.85	98.999	19.96	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.04	13.44	47.431	16.76	30.00	Pass
6	2437	17.41	17.03	105.547	20.23	30.00	Pass
11	2462	16.00	15.66	76.624	18.84	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.12	13.98	50.826	17.06	30.00	Pass
6	2437	16.61	16.12	86.74	19.38	30.00	Pass
9	2452	13.78	13.49	46.214	16.65	30.00	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.04	13.44	47.431	16.76	29.79	Pass
6	2437	17.41	17.03	105.547	20.23	29.79	Pass
11	2462	16.00	15.66	76.624	18.84	29.79	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power limit shall be reduced to 30-(6.21-6) = 29.79dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.12	13.98	50.826	17.06	29.79	Pass
6	2437	16.61	16.12	86.74	19.38	29.79	Pass
9	2452	13.78	13.49	46.214	16.65	29.79	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power limit shall be reduced to 30-(6.21-6) = 29.79dBm.

※Add test for each data rate output power (require by manufacturer):

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			
		Data rate			
		1Mbps	2Mbps	5.5Mbps	11Mbps
1	2412	20.91	20.90	20.75	20.86
6	2437	22.63	22.52	22.46	22.58
11	2462	21.46	21.30	21.43	21.22

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)							
		Data rate							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	2412	18.67	18.57	18.36	18.52	18.63	18.61	18.55	18.43
6	2437	21.40	21.22	21.08	21.17	21.25	21.20	21.36	21.31
11	2462	19.96	19.76	19.55	19.64	19.71	19.52	19.50	19.30

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)							
		Data rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	2412	16.76	16.69	16.56	16.44	16.29	16.30	16.27	16.23
6	2437	20.23	20.12	20.14	20.22	20.10	20.08	20.13	20.06
11	2462	18.84	18.66	18.69	18.59	18.73	18.67	18.70	18.50

Chan.	Chan. Freq. (MHz)	Average Power (dBm)							
		Data rate							
		MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
1	2412	16.72	16.66	16.68	16.68	16.59	16.46	16.26	16.21
6	2437	20.20	20.03	19.95	19.94	19.94	20.05	19.84	19.72
11	2462	18.68	18.64	18.55	18.40	18.21	18.20	18.37	18.19

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)							
		Data rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
3	2422	17.06	16.97	17.03	17.02	16.93	16.87	16.95	16.94
6	2437	19.38	19.22	19.36	19.34	19.32	19.30	19.27	19.08
9	2452	16.65	16.54	16.48	16.27	16.40	16.30	16.38	16.31

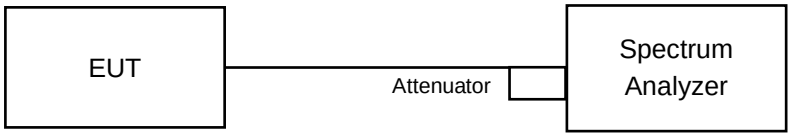
Chan.	Chan. Freq. (MHz)	Average Power (dBm)							
		Data rate							
		MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
3	2422	17.05	17.04	16.83	16.70	16.66	16.52	16.61	16.72
6	2437	19.24	19.28	19.19	19.12	18.95	18.94	18.77	18.97
9	2452	16.53	16.62	16.57	16.35	16.44	16.30	16.26	16.17

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.78	3.01	-9.77	7.79	Pass
	6	2437	-10.35	3.01	-7.34	7.79	Pass
	11	2462	-11.40	3.01	-8.39	7.79	Pass
1	1	2412	-13.14	3.01	-10.13	7.79	Pass
	6	2437	-10.39	3.01	-7.38	7.79	Pass
	11	2462	-11.48	3.01	-8.47	7.79	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 8-(6.21-6) = 7.79dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-14.33	3.01	-11.32	7.79	Pass
	6	2437	-10.31	3.01	-7.30	7.79	Pass
	11	2462	-12.50	3.01	-9.49	7.79	Pass
1	1	2412	-13.35	3.01	-10.34	7.79	Pass
	6	2437	-10.45	3.01	-7.44	7.79	Pass
	11	2462	-12.70	3.01	-9.69	7.79	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 8-(6.21-6) = 7.79dBm.

802.11n (HT20)

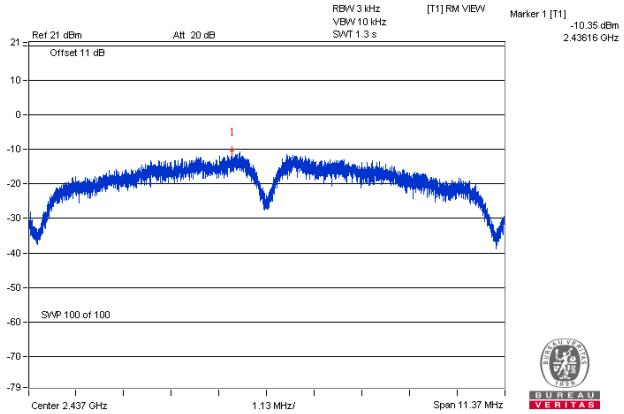
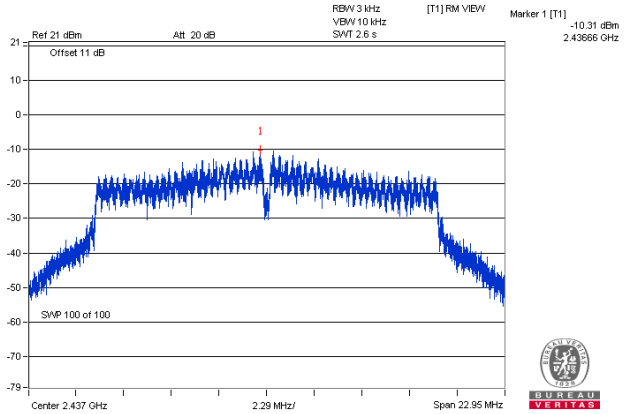
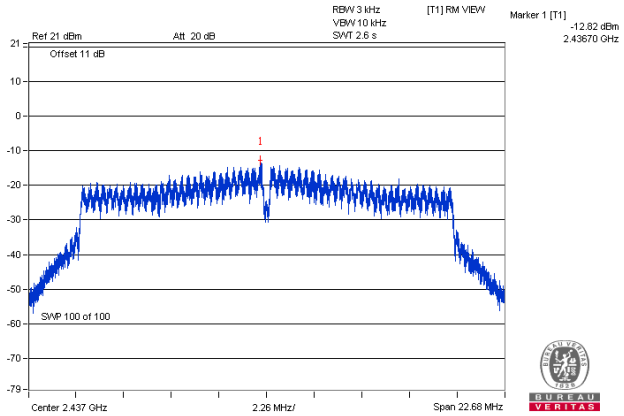
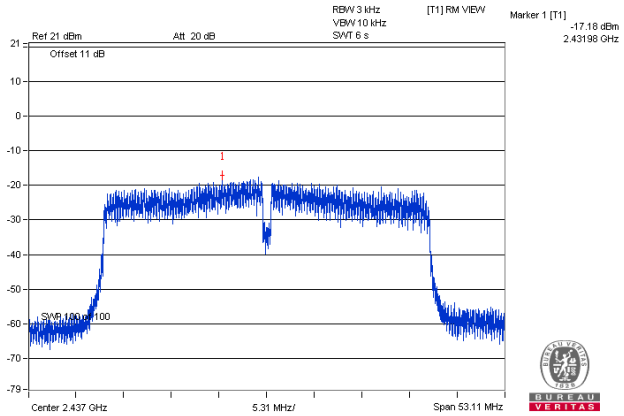
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-17.56	3.01	-14.55	7.79	Pass
	6	2437	-12.82	3.01	-9.81	7.79	Pass
	11	2462	-14.24	3.01	-11.23	7.79	Pass
1	1	2412	-16.56	3.01	-13.55	7.79	Pass
	6	2437	-13.42	3.01	-10.41	7.79	Pass
	11	2462	-15.41	3.01	-12.40	7.79	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 8-(6.21-6) = 7.79dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-20.18	3.01	-17.17	7.79	Pass
	6	2437	-18.39	3.01	-15.38	7.79	Pass
	9	2452	-19.05	3.01	-16.04	7.79	Pass
1	3	2422	-20.20	3.01	-17.19	7.79	Pass
	6	2437	-17.18	3.01	-14.17	7.79	Pass
	9	2452	-20.33	3.01	-17.32	7.79	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.21dBi > 6dBi , so the power density limit shall be reduced to 8-(6.21-6) = 7.79dBm.

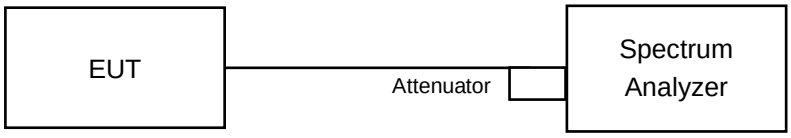
Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH6	**802.11g / Chain 0 : CH6**
	
802.11n (HT20) / Chain 0 : CH6	**802.11n (HT40) / Chain 1 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

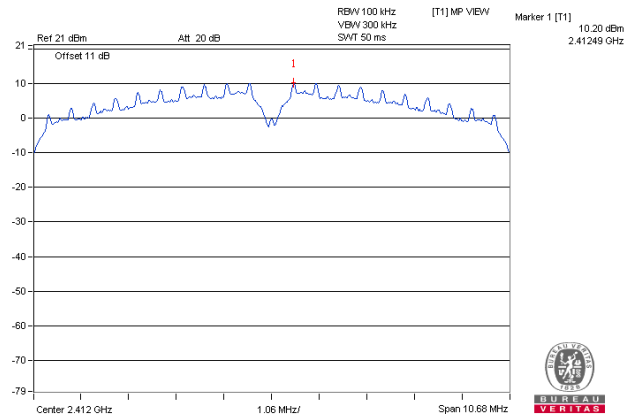
Same as Item 4.3.6

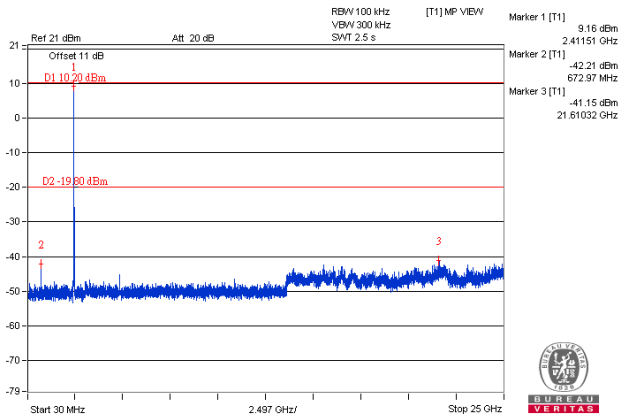
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dBoffset below D1. It shows compliance with the requirement.

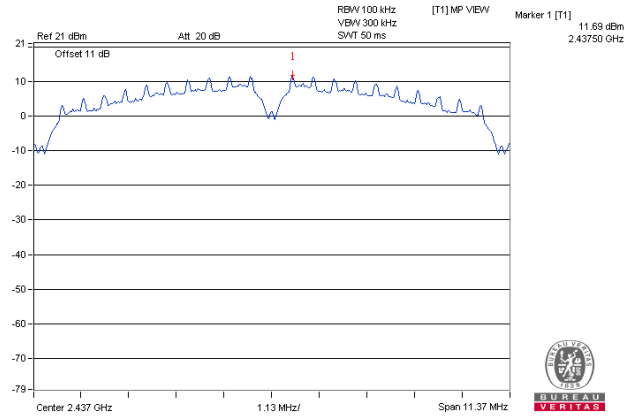
802.11b / Chain 0

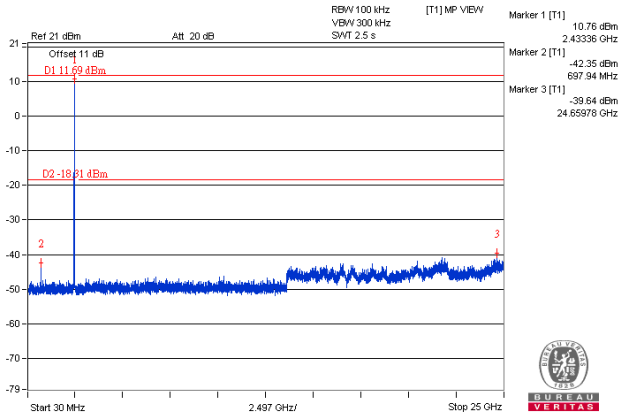
CH 1



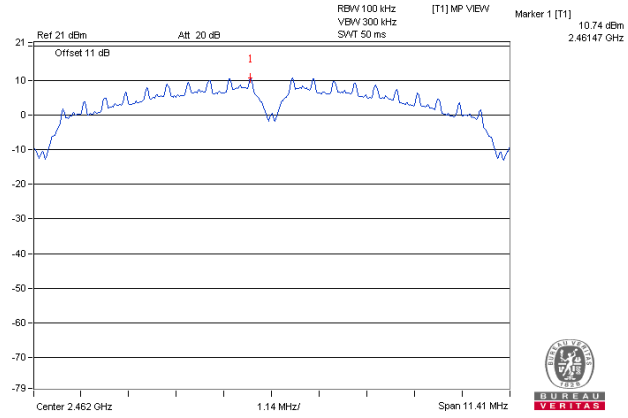


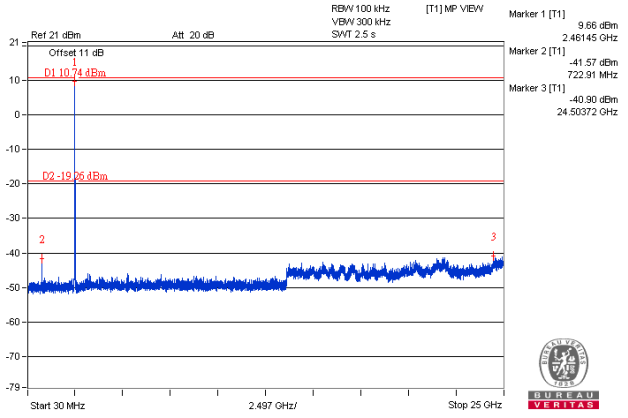
CH 6



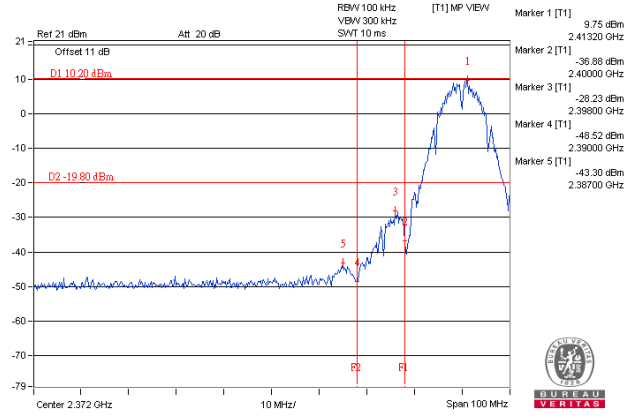


CH 11

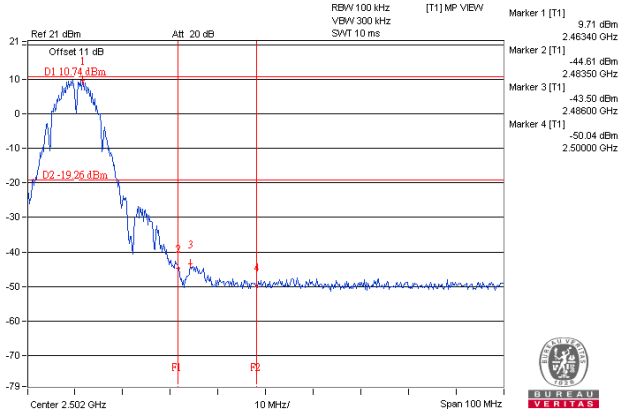




CH 1 Band edge

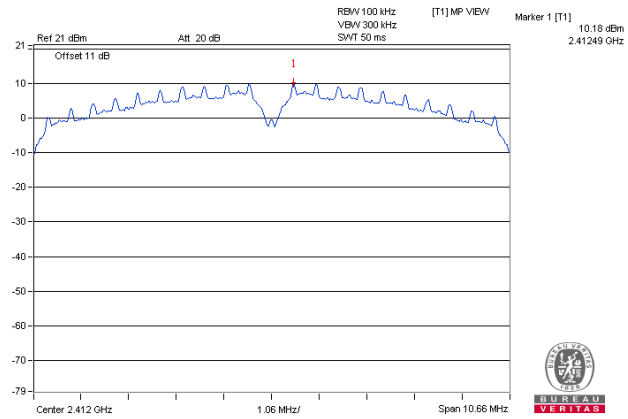


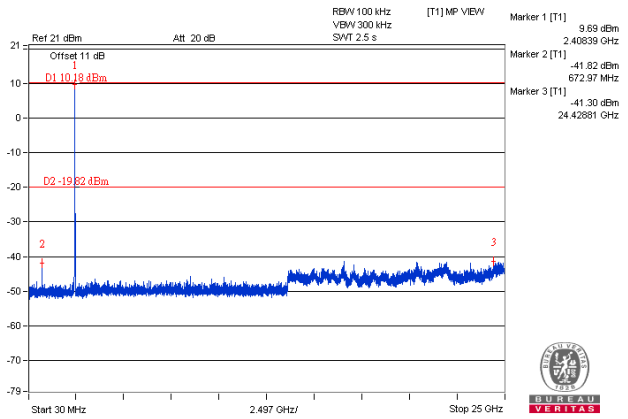
CH 11 Band edge



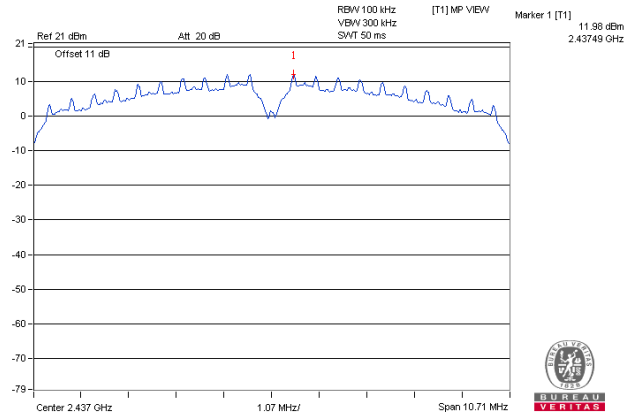
802.11b / Chain 1

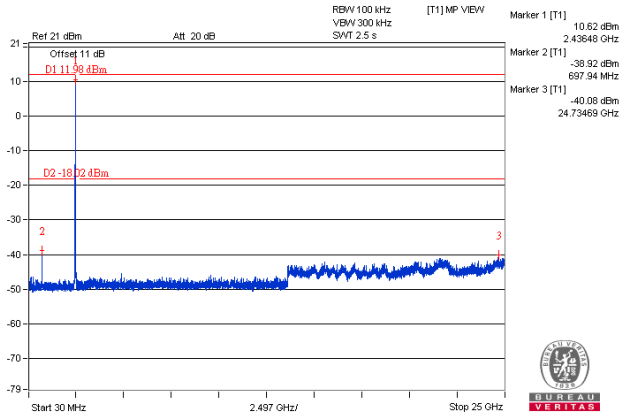
CH 1



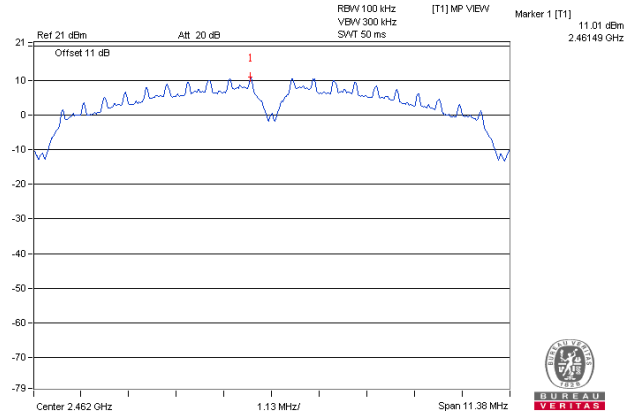


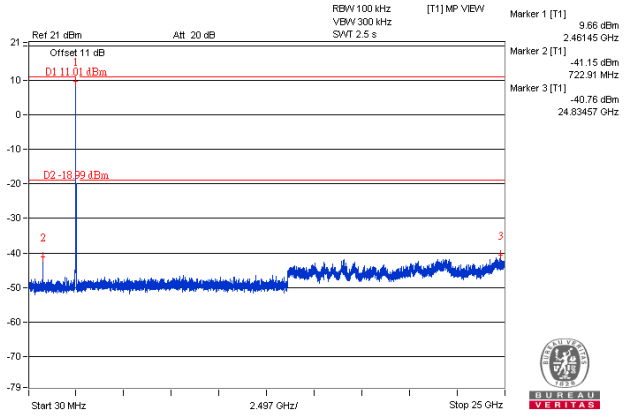
CH 6



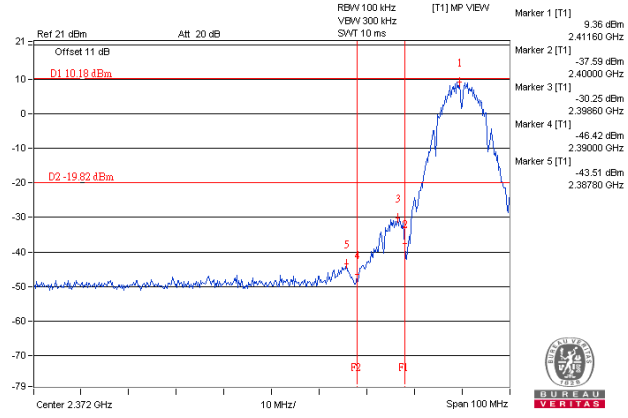


CH 11

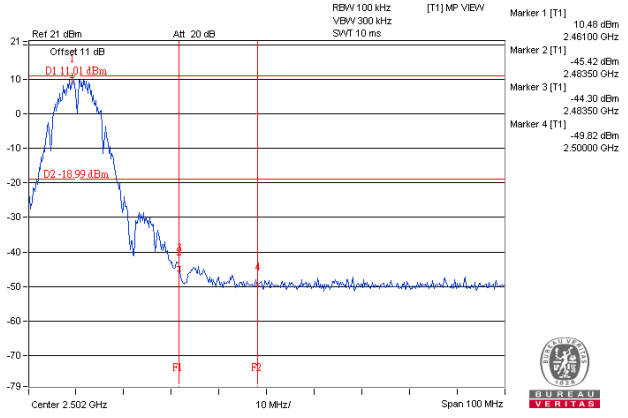




CH 1 Band edge

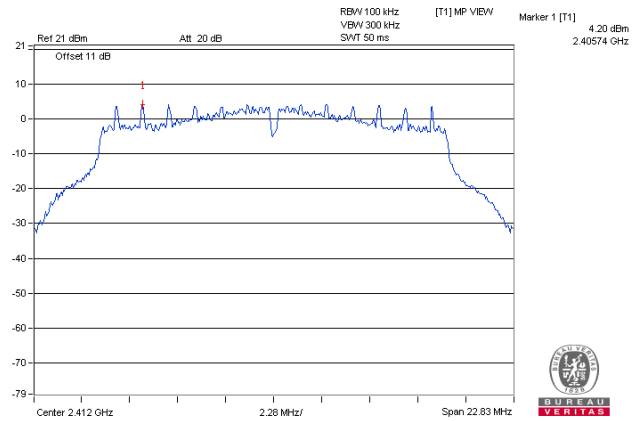


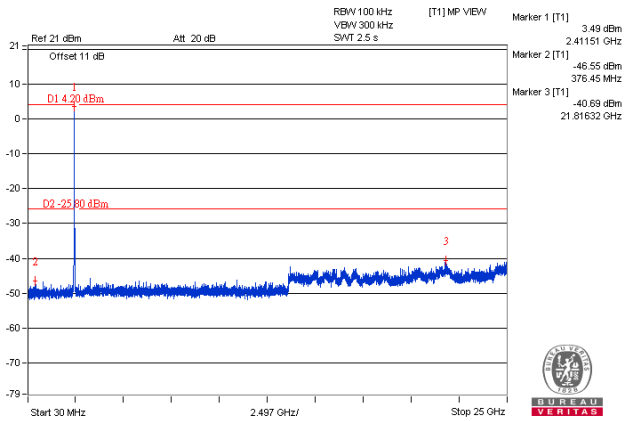
CH 11 Band edge



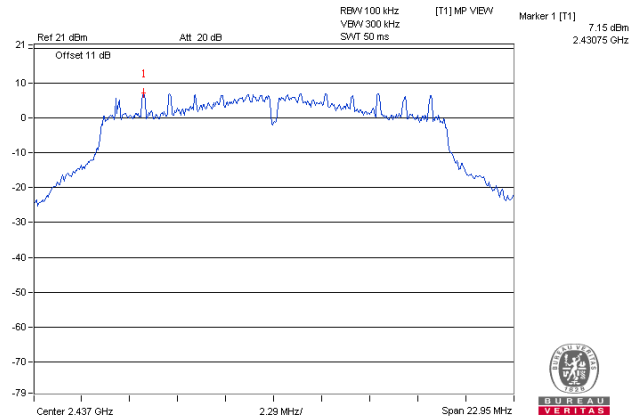
802.11g / Chain 0

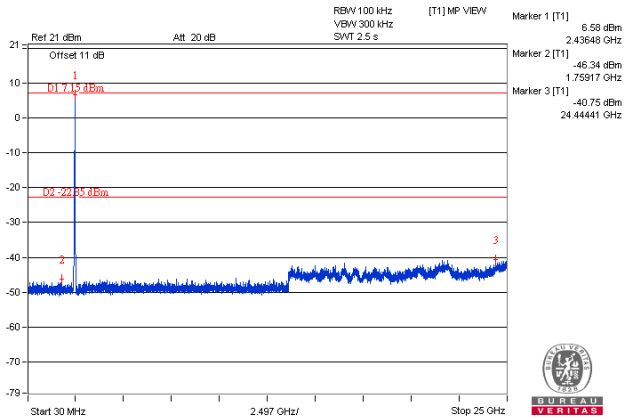
CH 1



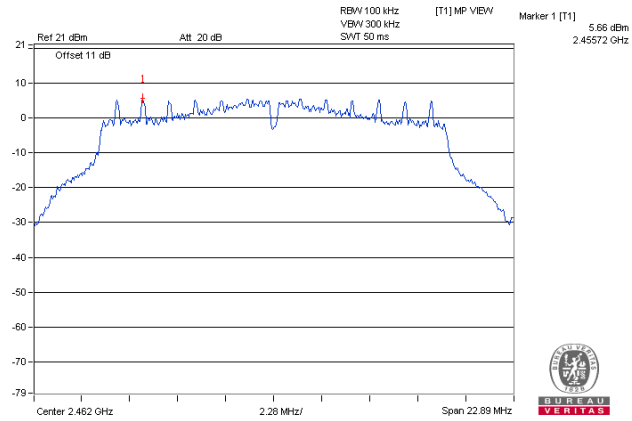


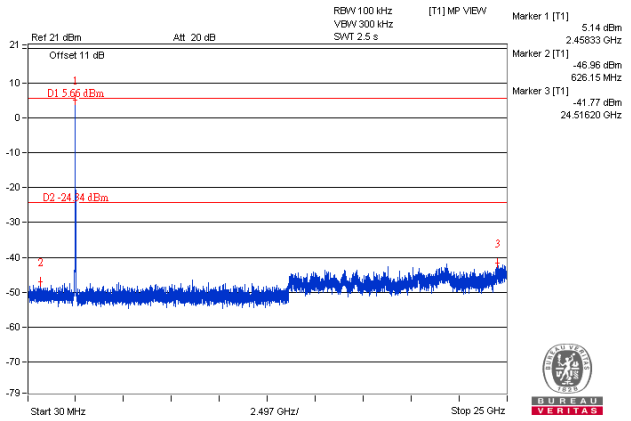
CH 6



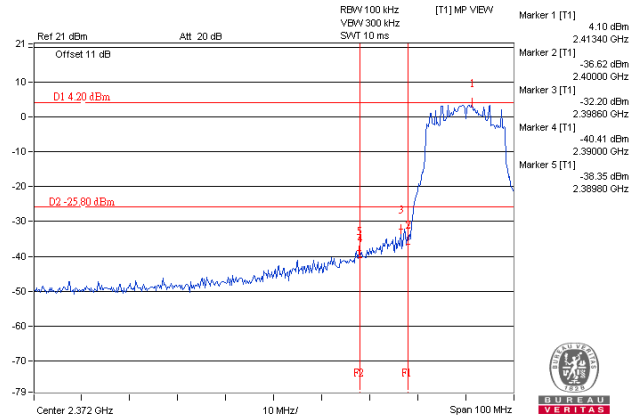


CH 11

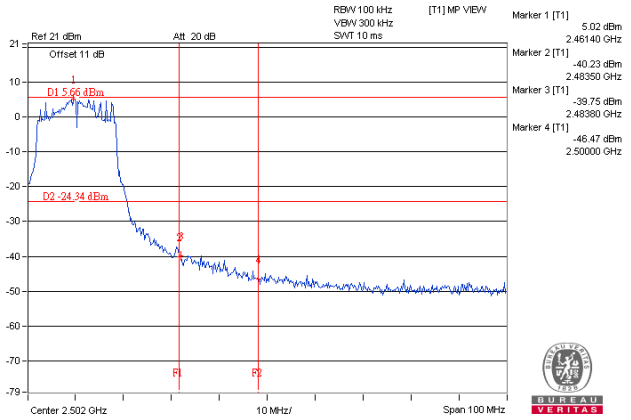




CH 1 Band edge

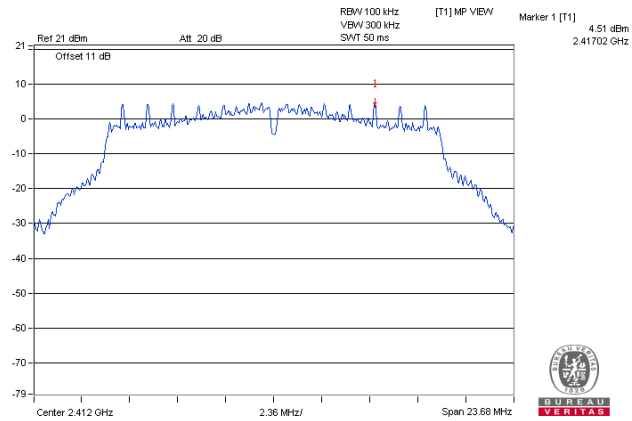


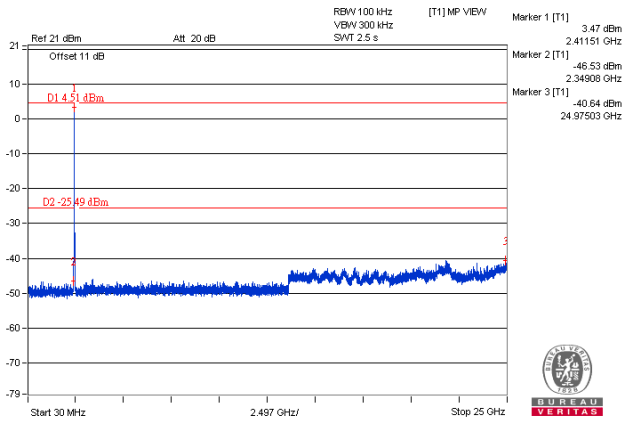
CH 11 Band edge



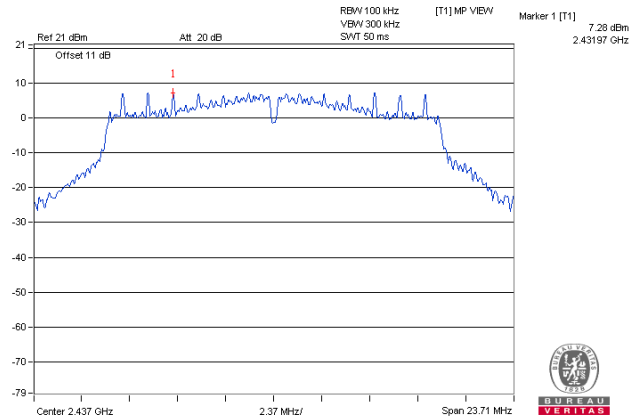
802.11g / Chain 1

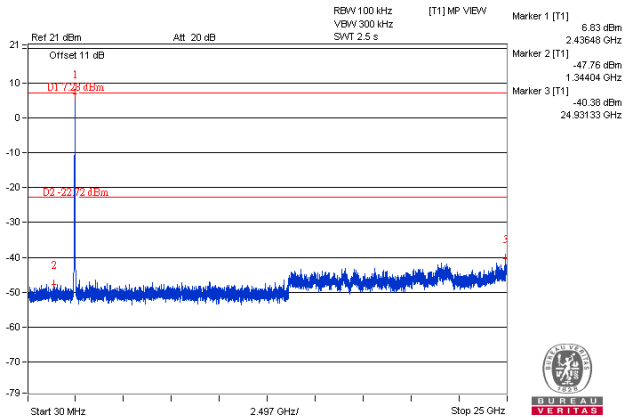
CH 1



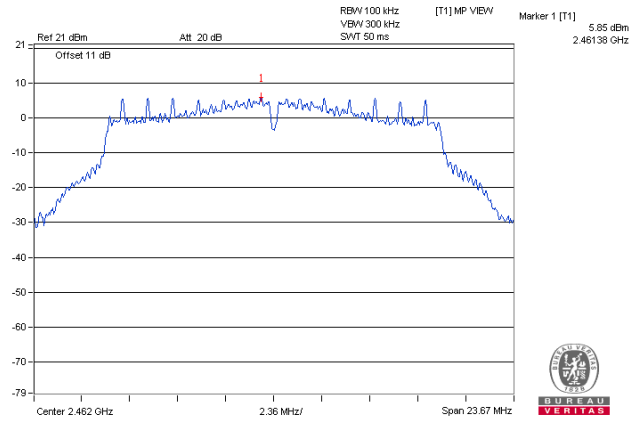


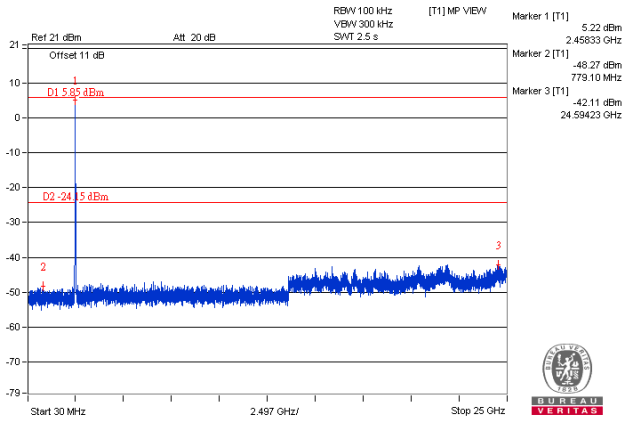
CH 6



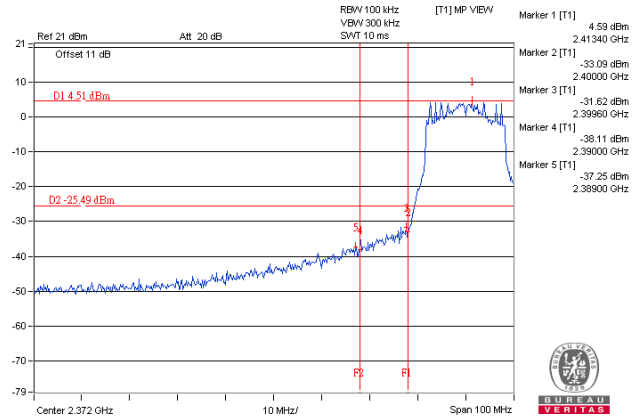


CH 11

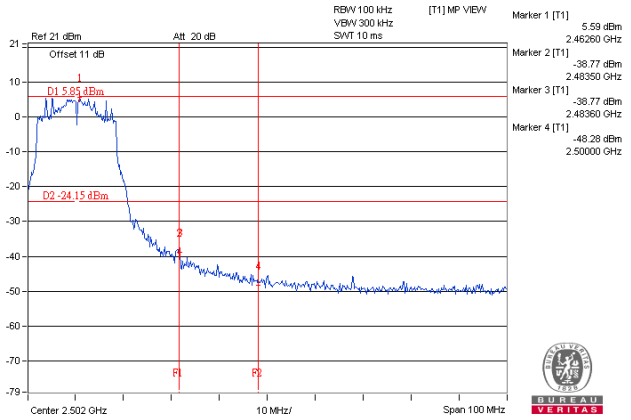




CH 1 Band edge

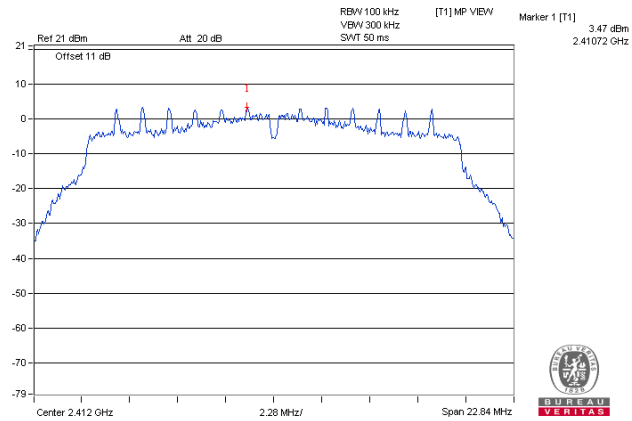


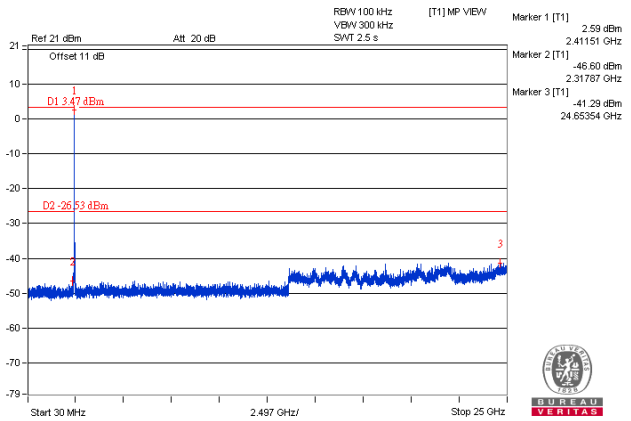
CH 11 Band edge



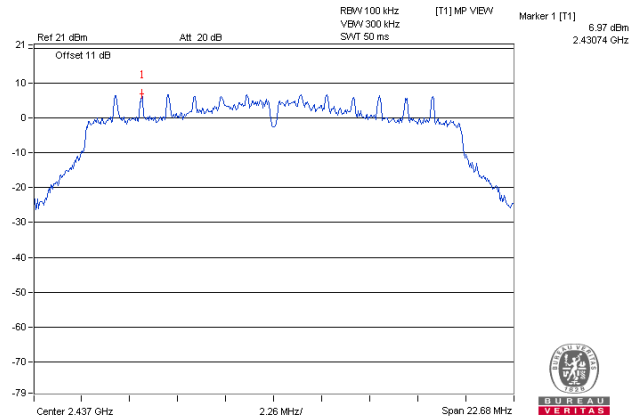
802.11n (HT20) / Chain 0

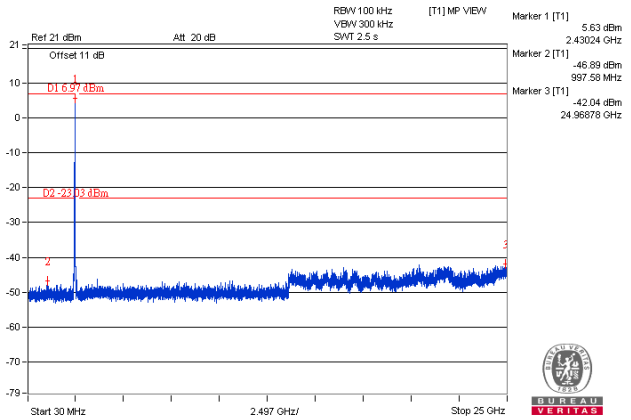
CH 1



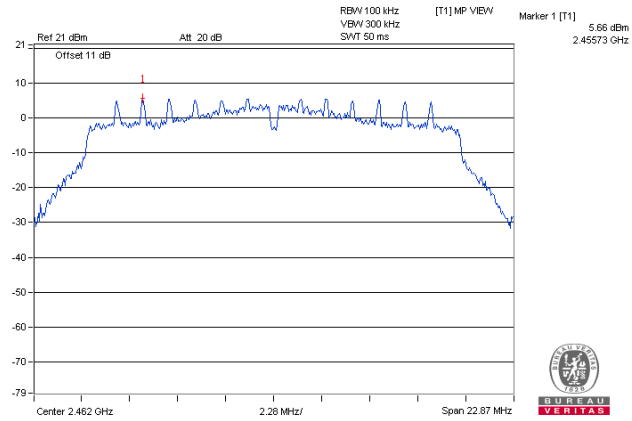


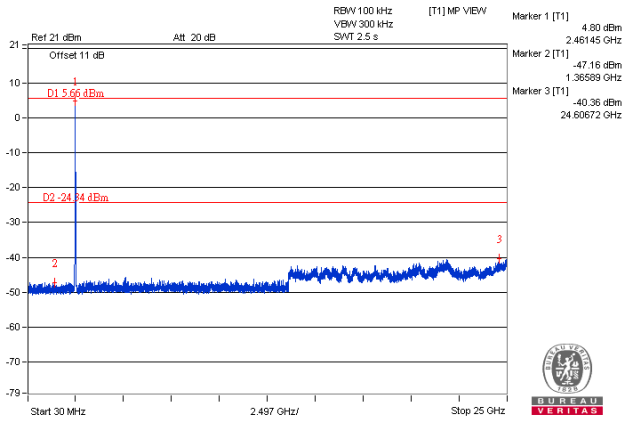
CH 6



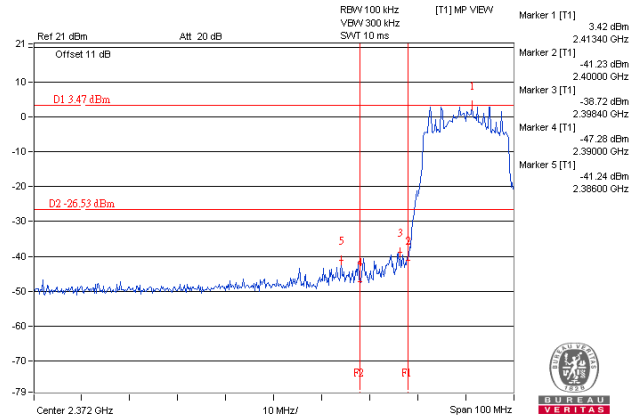


CH 11

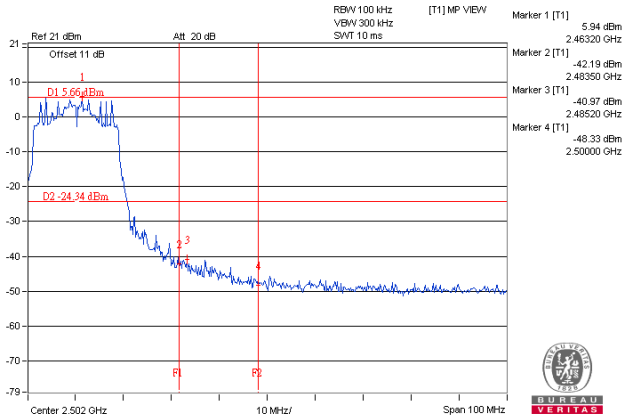




CH 1 Band edge

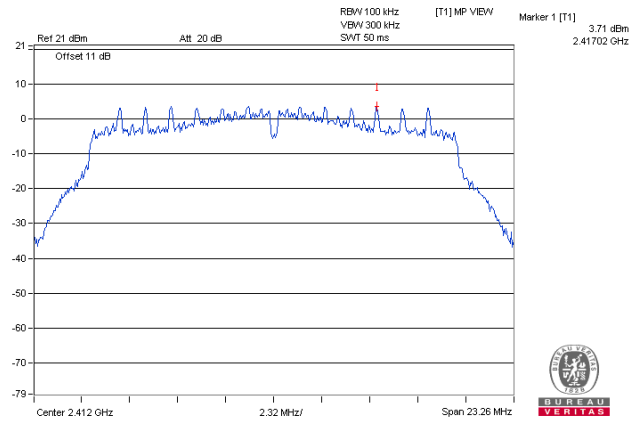


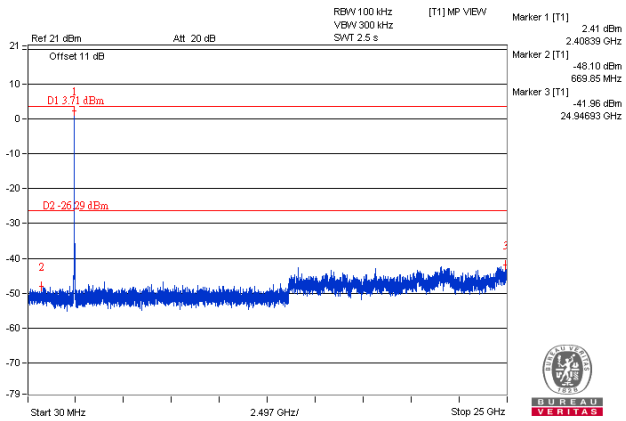
CH 11 Band edge



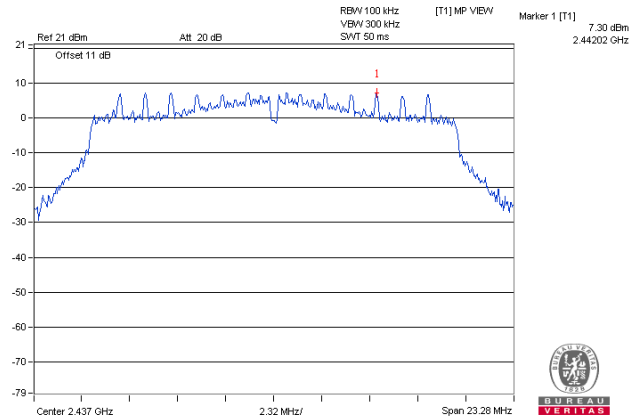
802.11n (HT20) / Chain 1

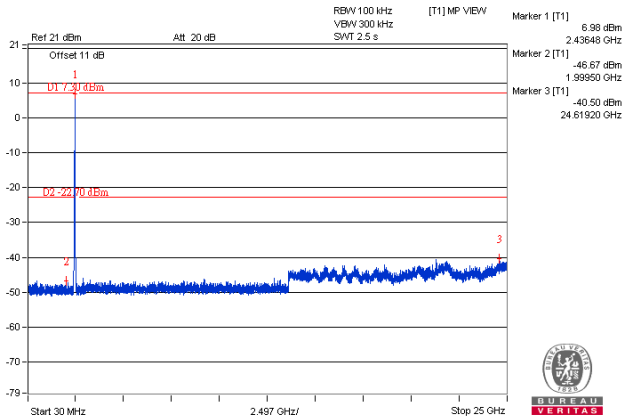
CH 1



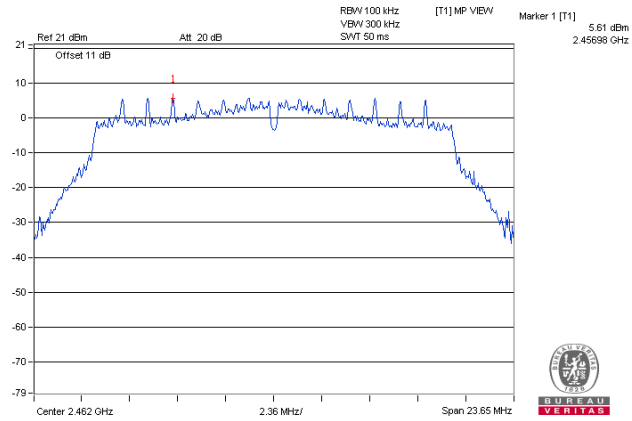


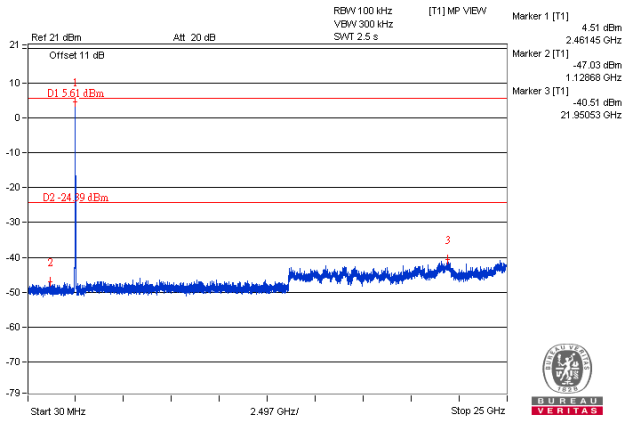
CH 6



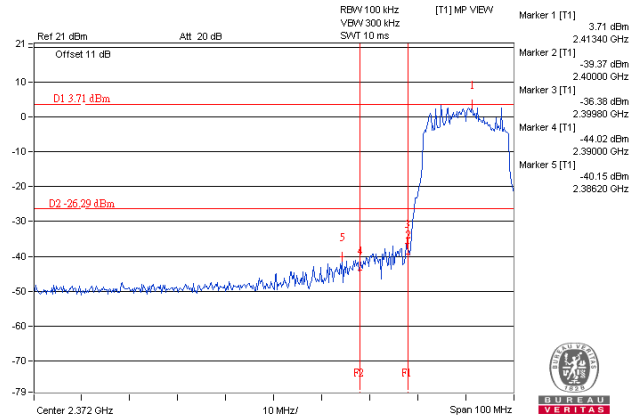


CH 11

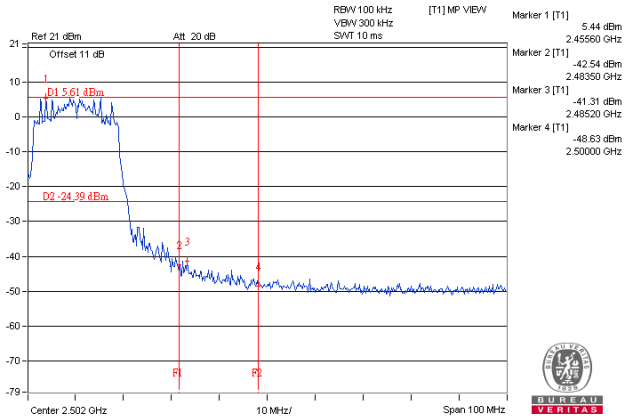




CH 1 Band edge

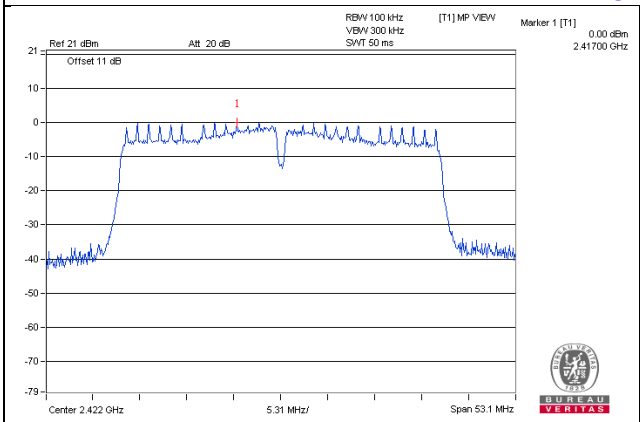


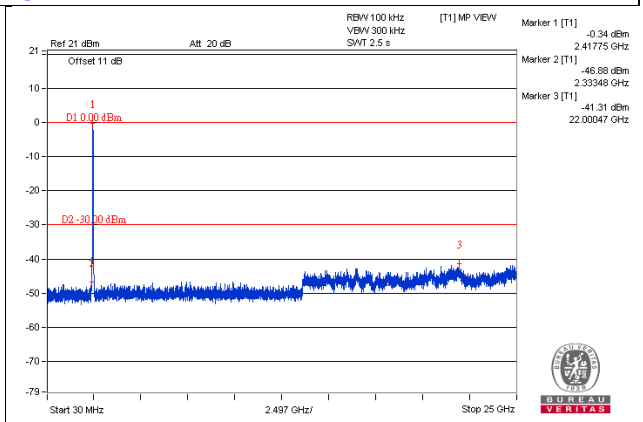
CH 11 Band edge



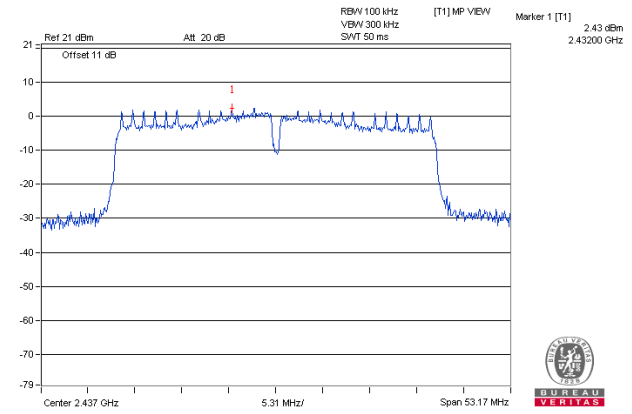
802.11n (HT40) / Chain 0

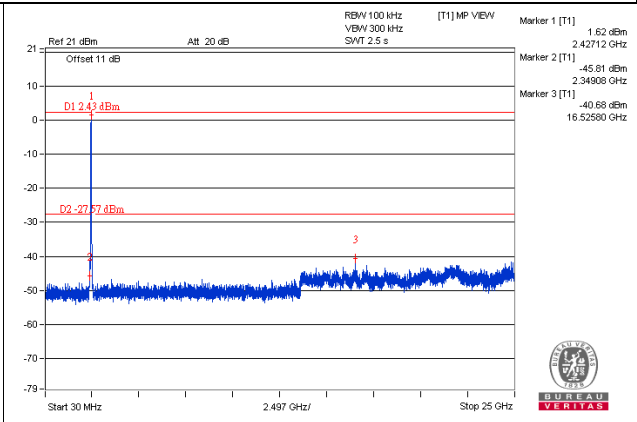
CH 3



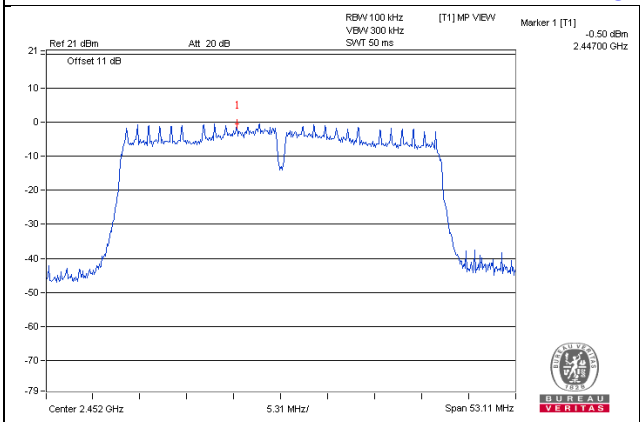


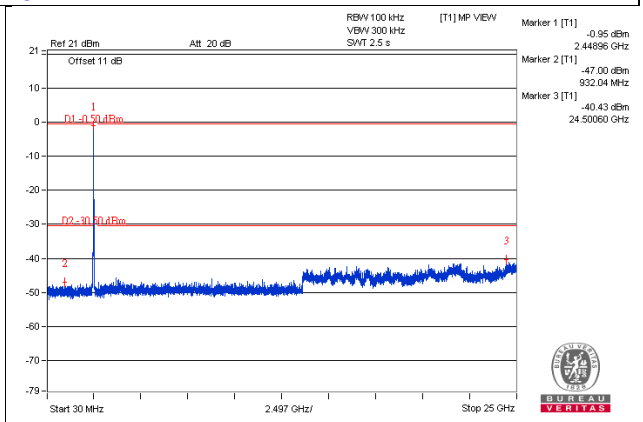
CH 6



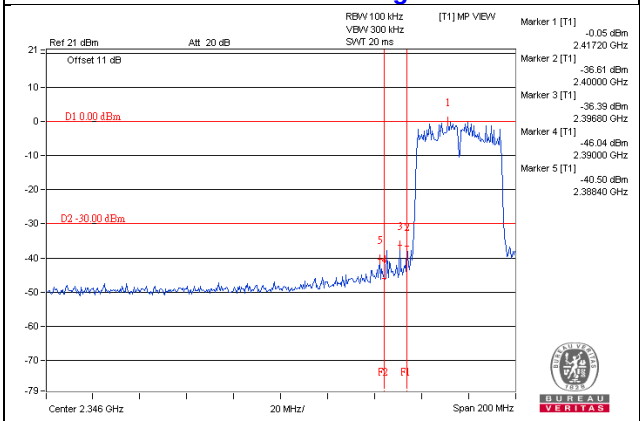


CH 9

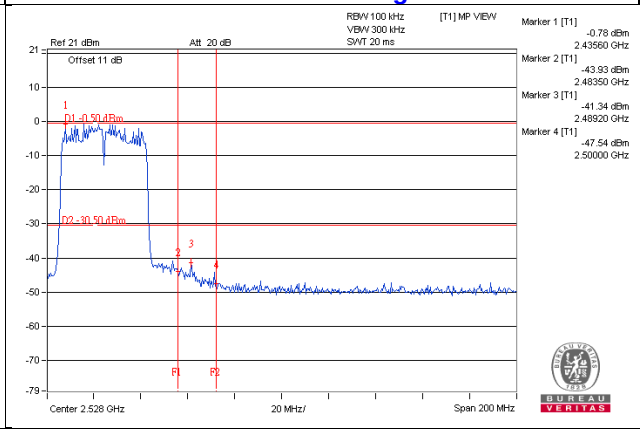




CH 3 Band edge

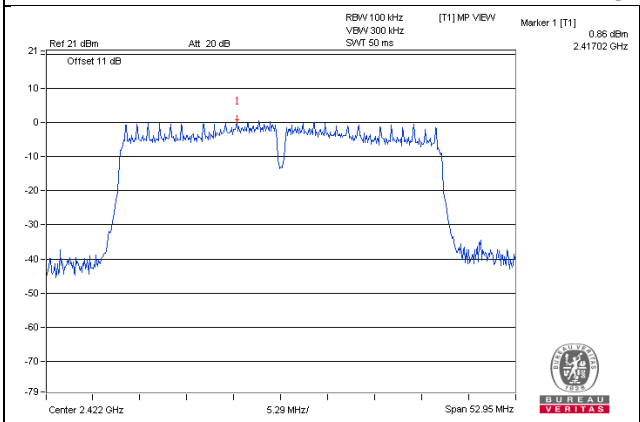


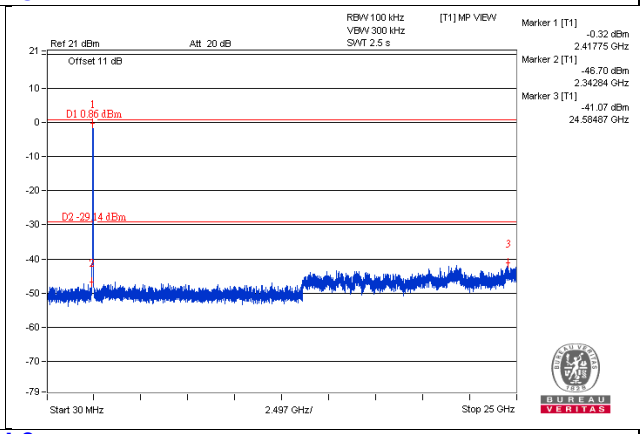
CH 9 Band edge



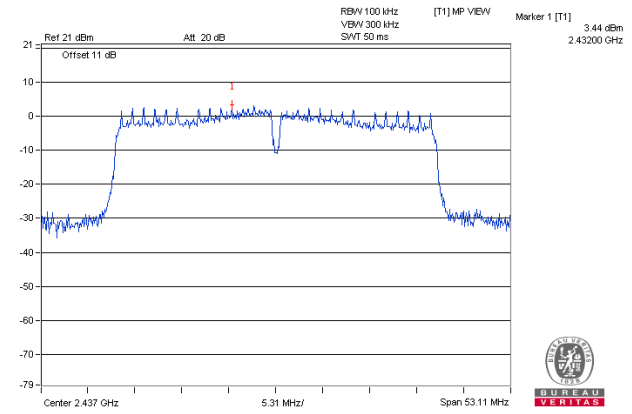
802.11n (HT40) / Chain 1

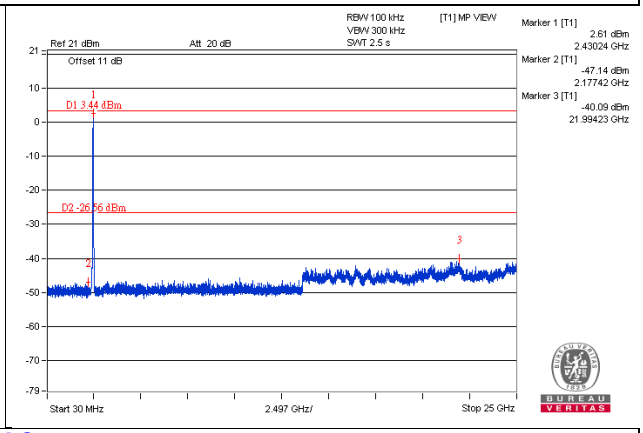
CH 3



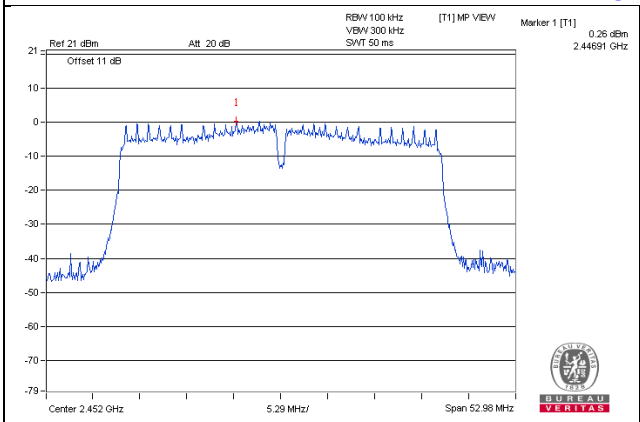


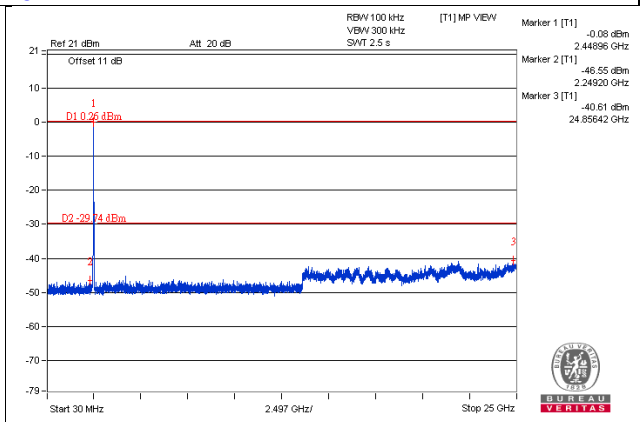
CH 6



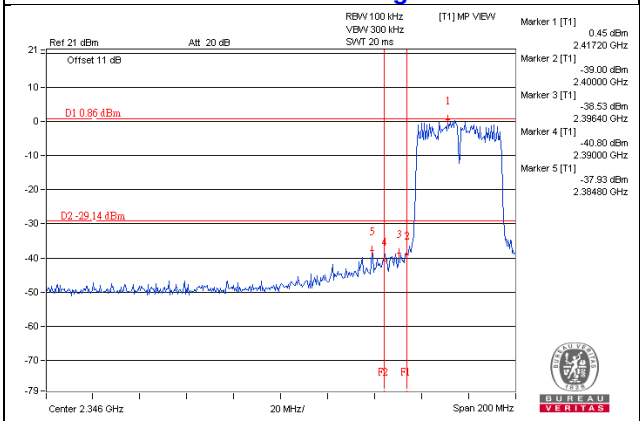


CH 9

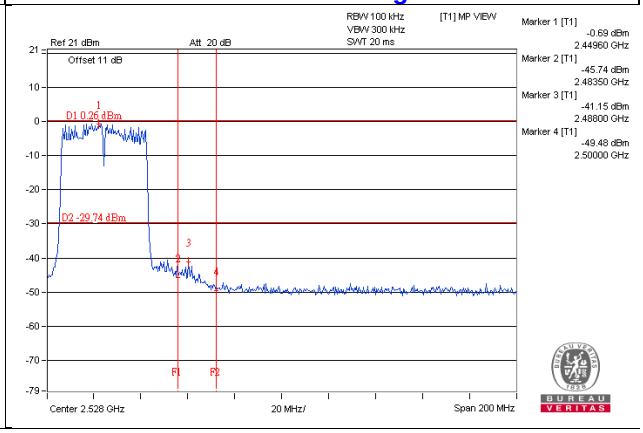




CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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