FCC Test Report

Report No.:	RF160525E02
FCC ID:	I88WRE6606
Test Model:	WRE6606
Received Date:	May 25, 2016
Test Date:	Oct. 06 to Nov. 04, 2016
Issued Date:	Nov. 16, 2016
Applicant:	Zyxel Communications Corporation
Address:	No.2, Industry East Road IX, Science Park, Hsinchu, Taiwan
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.

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF160525E02	Original release.	Nov. 16, 2016

1 Certificate of Conformity

Product:	AC1300 MU-MIMO Dual-Band Wireless Range Extender
Brand:	ZYXEL
Test Model:	WRE6606
Sample Status:	ENGINEERING SAMPLE
Applicant:	Zyxel Communications Corporation
Test Date:	Oct. 06 to Nov. 04, 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 : Cindy Hsin , **Date:** Nov. 16, 2016

Cindy Hsin / Specialist

Approved by : , **Date:** Nov. 16, 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 -9.59dB at 0.36875MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 4924.00MHz,2390.00MHz 2483.50MHz, 2487.00MHz
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	5.34 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.41 dB
	6GHz ~ 18GHz	3.49 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

Product	AC1300 MU-MIMO Dual-Band Wireless Range Extender
Brand	ZYXEL
Test Model	WRE6606
FW version	V1.00(ABDU.0)B7
Power Supply Rating	100-240V~0.15A, 50/60Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz and 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 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:** 836.868mW **Beamforming Mode:** 727.986mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 122.309mW **Beamforming Mode:** 110.639mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 128.006mW **Beamforming Mode:** 100.527mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

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

Antenna No	Transmitter Circuit	Brand	Model	Antenna Gain(dBi)	Antenna Type	Connecter Type	Frequency (GHz to GHz)
1	Chain (0) Tx/Rx	Walsin	RFMTA351202IMLB301	3	PIFA	i-pex(MHF)	2.4~2.4835
				3.5	PIFA	i-pex(MHF)	5.15~5.85
2	Chain (1) Tx/Rx	Walsin	RFMTA321204IMLB301	2	PIFA	i-pex(MHF)	2.4~2.4835
				3.5	PIFA	i-pex(MHF)	5.15~5.85
3	Chain (2) 5GHz_RX_0	Walsin	RFMTA161100NN5B001	3	PIFA	i-pex(MHF)	5.15~5.85
4	Chain (3) 5GHz_RX_1	Walsin	RFMTA161100NN5B001	3	PIFA	i-pex(MHF)	5.15~5.85
Note: For 5GHz: TX configuration mode will fix transmission on Chain (0) and Chain (1).							

3. The RF chip information as the following table:

Brand	Model
Qualcomm	IPQ4018

4. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	4RX
802.11n (HT20)	MCS 0~7	2TX	4RX
	MCS 8~15	2TX	4RX
802.11n (HT40)	MCS 0~7	2TX	4RX
	MCS 8~15	2TX	4RX
802.11ac (VHT20)	MCS 0~8, NSS=1	2TX	4RX
	MCS 0~8, NSS=2	2TX	4RX
802.11ac (VHT40)	MCS 0~9, NSS=1	2TX	4RX
	MCS 0~9, NSS=2	2TX	4RX
802.11ac (VHT80)	MCS 0~9, NSS=1	2TX	4RX
	MCS 0~9, NSS=2	2TX	4RX
Note: 1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.			

5. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting	
		CDD Mode	Beamforming Mode
802.11b	2412	15	-
	2437	15	-
	2462	17.5	-
802.11g	2412	16.5	-
	2437	19	-
	2462	16.5	-
802.11n(HT20)	2412	17	17
	2437	17	17
	2462	16	16
802.11n(HT40)	2422	9	9
	2437	13.5	13.5
	2452	9	9

6. For radiated emission evaluation, the EUT has been pre-tested under following test modes, and test mode A was the worst case for final test.

Pre-test Mode	Power
Mode A	**Power from AC Mode**
Mode B	Power from DC Mode (USB adapter)

7. 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):

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):

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 AC Mode
2	--	--	√	--	Power from DC Mode (USB adapter)

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: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
NOTE: "-"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)
802.11g	1 to 11	6	OFDM	BPSK	6

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:

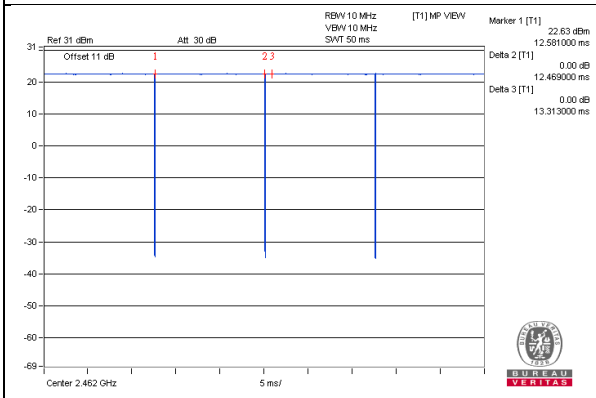
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 69%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	22deg. C, 64%RH	120Vac, 60Hz	Gary Cheng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Barry Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Tim Ho

3.3 Duty Cycle of Test Signal

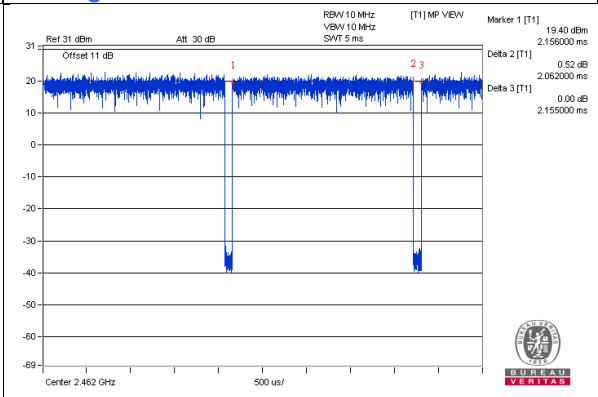
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.469/13.313 = 0.937, Duty factor = 10 * log(1/0.937) = 0.28
802.11g: Duty cycle = 2.062/2.155 = 0.957, Duty factor = 10 * log(1/0.957) = 0.19
802.11n (HT20): Duty cycle = 4.99/5.093 = 0.98
802.11n (HT40): Duty cycle = 2.427/2.52 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

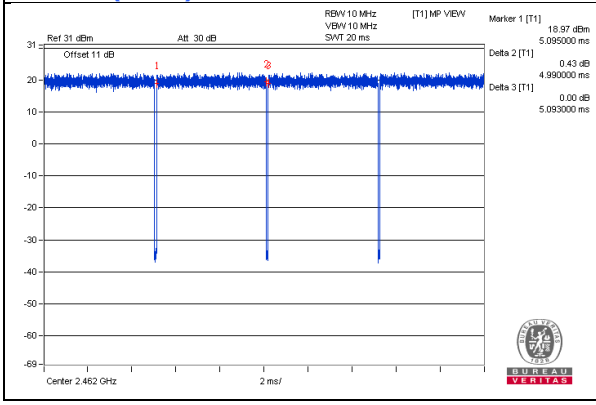
802.11b



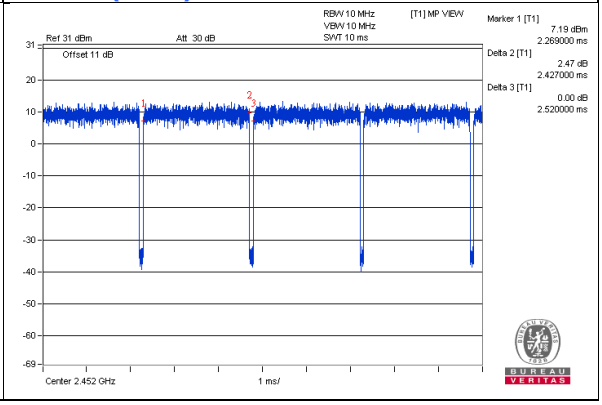
802.11g



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	E6440	F9LYQ32	FCC DoC	Provided by Lab
B.	USB Adapter	ASUS	ADB76320	NA	NA	Supplied by client

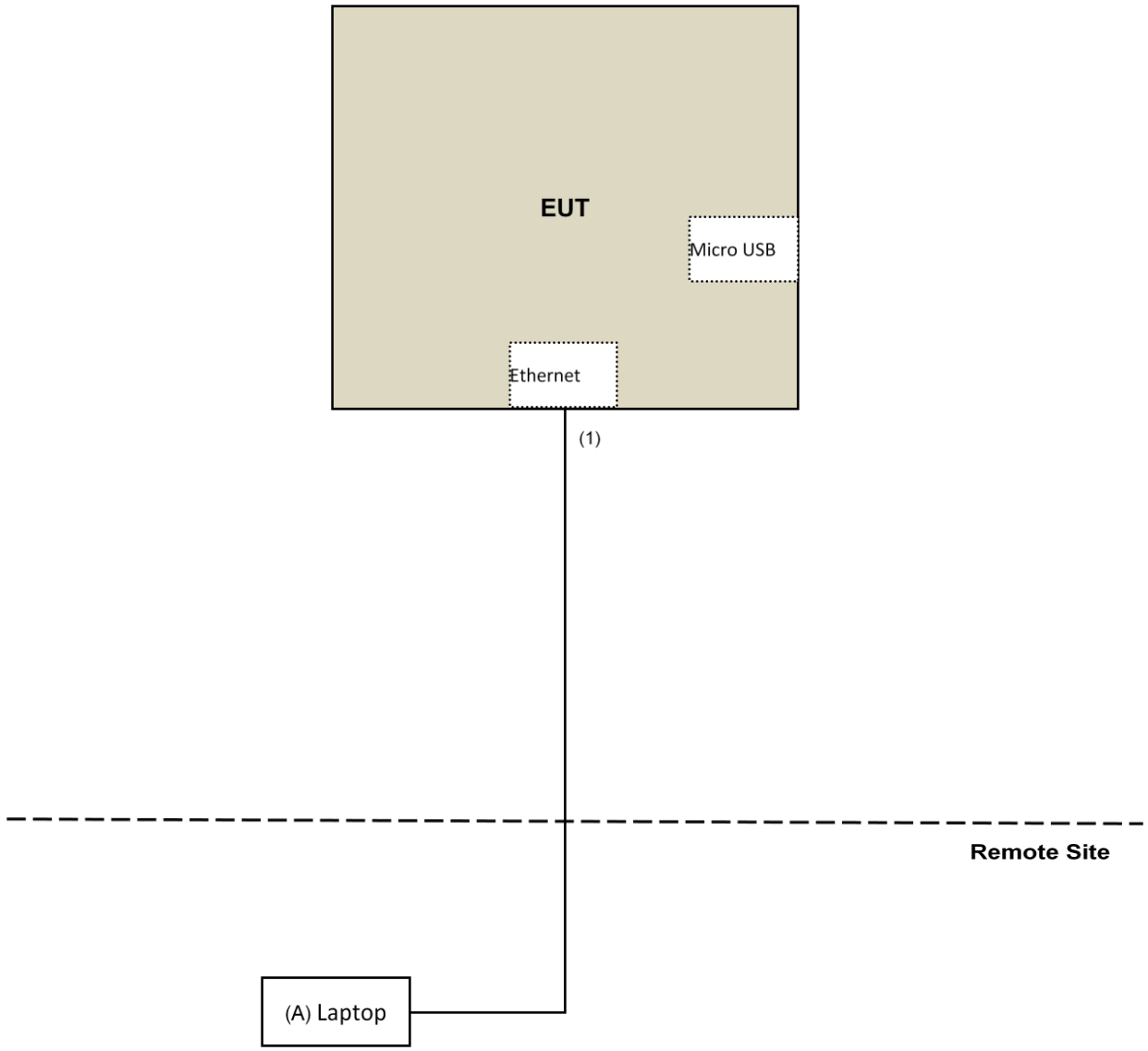
Note:

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

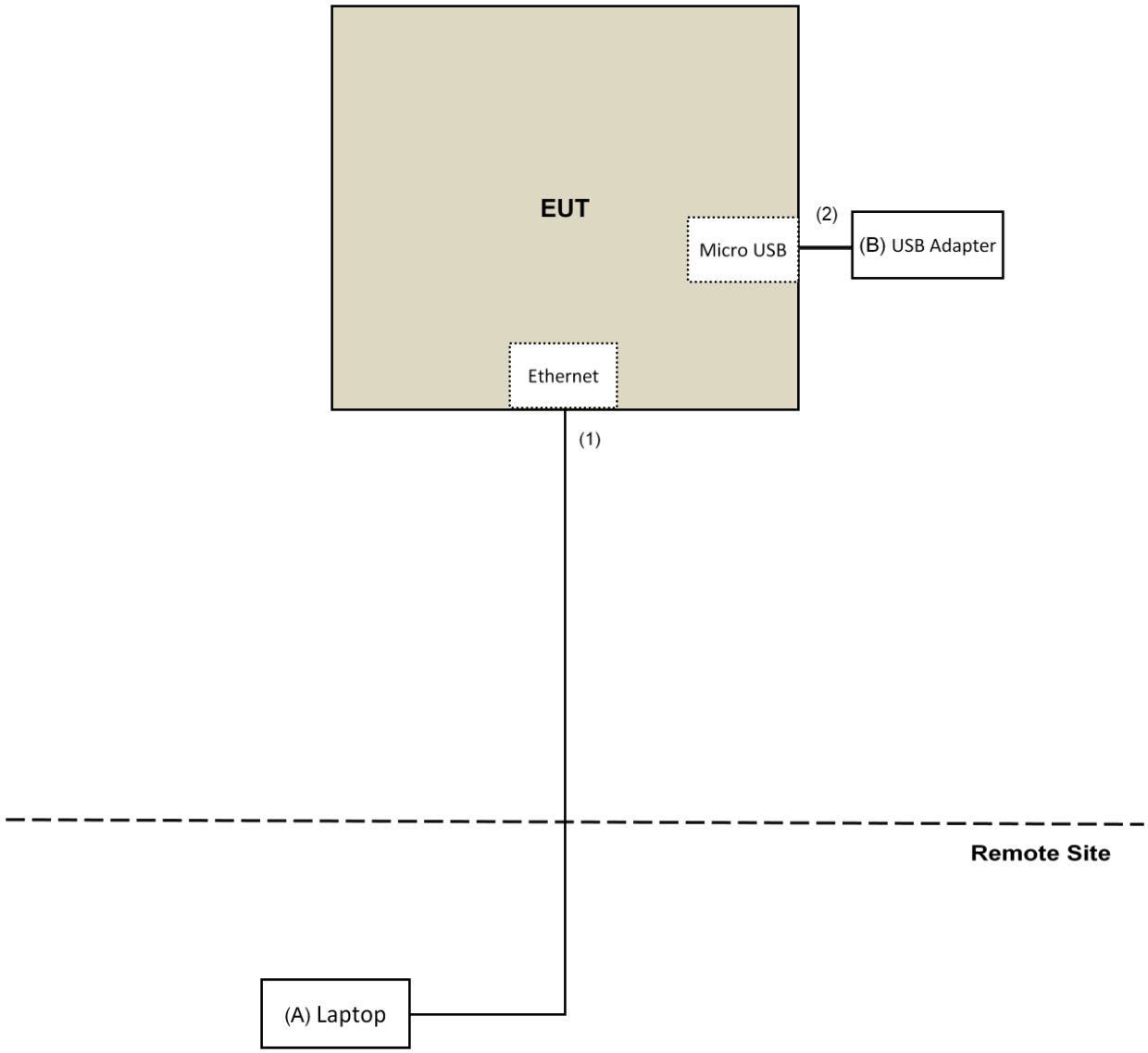
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	USB	1	1	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test

Mode 1



Mode 2



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 20dB or 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

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. 11, 2015	Nov. 10, 2016
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
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
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 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. 04, 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:

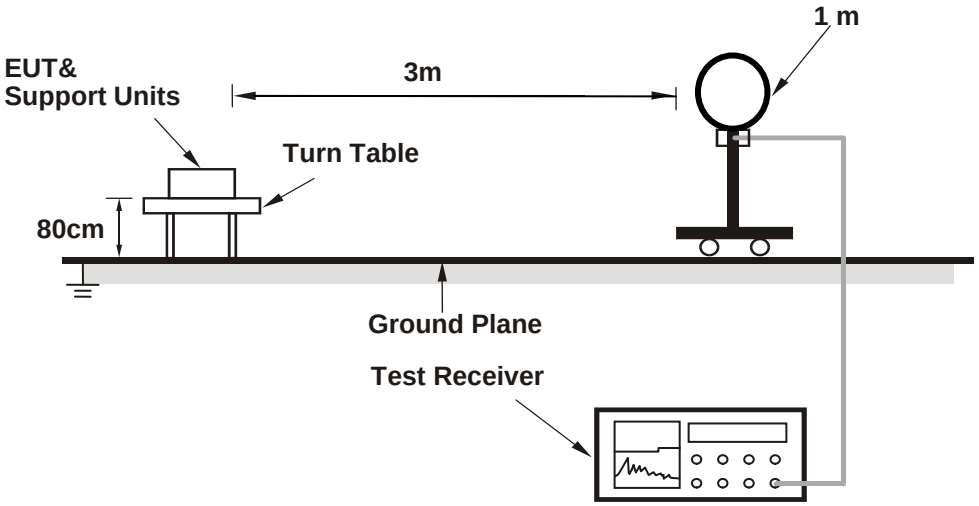
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

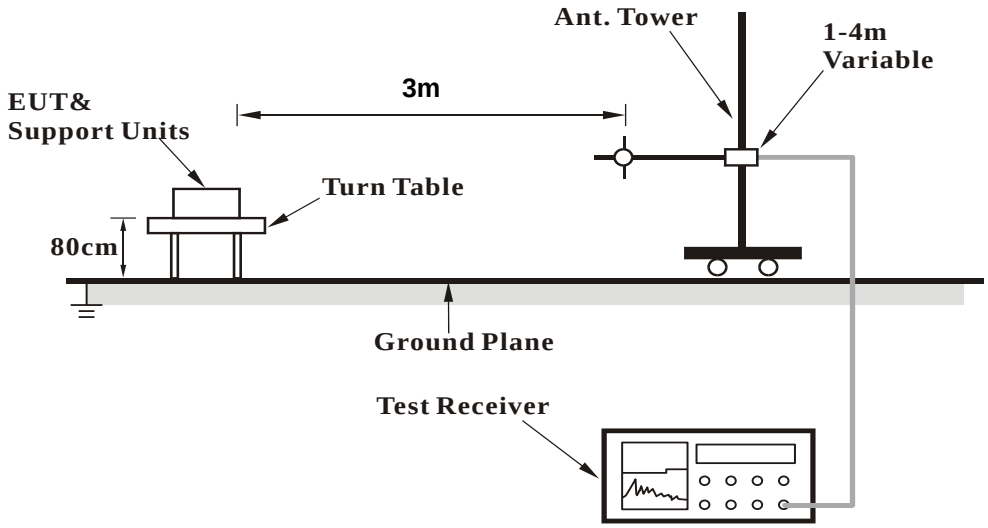
No deviation.

4.1.5 Test Setup

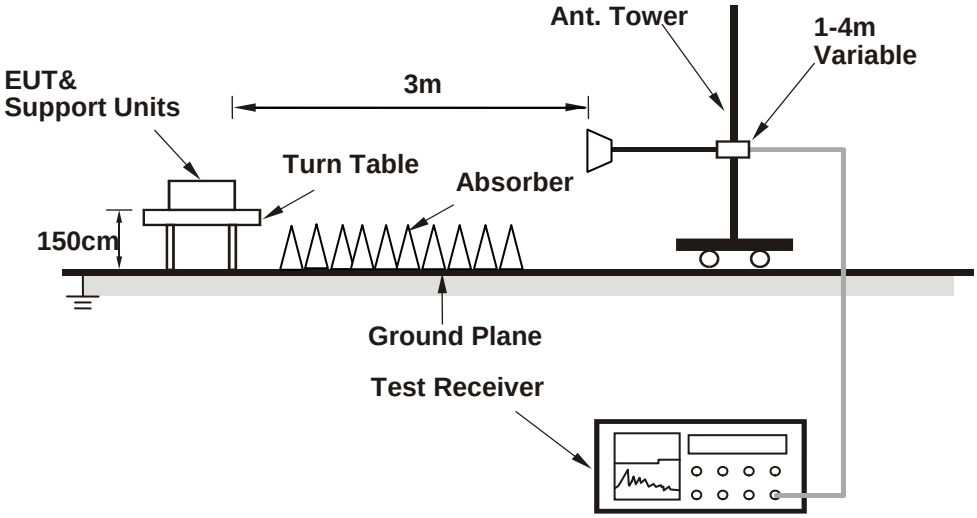
For Radiated emission below 30MHz



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 (QDART CONN.WIN.1.1 Installer-00036.2) 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	2390.00	48.9 PK	74.0	-25.1	1.04 H	360	54.6	-5.7
2	2390.00	35.2 AV	54.0	-18.8	1.04 H	360	40.9	-5.7
3	*2412.00	101.7 PK			1.04 H	360	107.3	-5.6
4	*2412.00	99.3 AV			1.04 H	360	104.9	-5.6
5	4824.00	56.5 PK	74.0	-17.5	1.09 H	337	55.7	0.8
6	4824.00	53.8 AV	54.0	-0.2	1.09 H	337	53.0	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	51.8 PK	74.0	-22.2	1.14 V	268	57.5	-5.7
2	2390.00	38.0 AV	54.0	-16.0	1.14 V	268	43.7	-5.7
3	*2412.00	104.8 PK			1.14 V	268	110.4	-5.6
4	*2412.00	102.7 AV			1.14 V	268	108.3	-5.6
5	4824.00	53.6 PK	74.0	-20.4	1.21 V	6	52.8	0.8
6	4824.00	50.6 AV	54.0	-3.4	1.21 V	6	49.8	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) 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	*2437.00	101.7 PK			1.02 H	352	107.2	-5.5
2	*2437.00	99.4 AV			1.02 H	352	104.9	-5.5
3	4874.00	56.0 PK	74.0	-18.0	1.10 H	337	55.1	0.9
4	4874.00	53.5 AV	54.0	-0.5	1.10 H	337	52.6	0.9
5	7311.00	51.3 PK	74.0	-22.7	2.06 H	306	43.9	7.4
6	7311.00	40.0 AV	54.0	-14.0	2.06 H	306	32.6	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	*2437.00	104.6 PK			1.18 V	268	110.1	-5.5
2	*2437.00	102.5 AV			1.18 V	268	108.0	-5.5
3	4874.00	53.3 PK	74.0	-20.7	1.21 V	20	52.4	0.9
4	4874.00	50.1 AV	54.0	-3.9	1.21 V	20	49.2	0.9
5	7311.00	52.1 PK	74.0	-21.9	2.04 V	334	44.7	7.4
6	7311.00	40.9 AV	54.0	-13.1	2.04 V	334	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	106.3 PK			1.05 H	354	111.7	-5.4
2	*2462.00	102.4 AV			1.05 H	354	107.8	-5.4
3	2487.00	53.4 PK	74.0	-20.6	1.05 H	354	58.8	-5.4
4	2487.00	40.3 AV	54.0	-13.7	1.05 H	354	45.7	-5.4
5	4924.00	56.7 PK	74.0	-17.3	1.09 H	337	55.6	1.1
6	**4924.00**	**53.9 AV**	**54.0**	**-0.1**	**1.09 H**	**337**	**52.8**	**1.1**
7	7386.00	51.5 PK	74.0	-22.5	2.07 H	302	43.9	7.6
8	7386.00	40.0 AV	54.0	-14.0	2.07 H	302	32.4	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	108.7 PK			1.18 V	274	114.1	-5.4
2	*2462.00	105.4 AV			1.18 V	274	110.8	-5.4
3	2487.00	55.0 PK	74.0	-19.0	1.18 V	274	60.4	-5.4
4	2487.00	43.3 AV	54.0	-10.7	1.18 V	274	48.7	-5.4
5	4924.00	53.1 PK	74.0	-20.9	1.17 V	5	52.0	1.1
6	4924.00	50.0 AV	54.0	-4.0	1.17 V	5	48.9	1.1
7	7386.00	52.0 PK	74.0	-22.0	2.03 V	348	44.4	7.6
8	7386.00	41.0 AV	54.0	-13.0	2.03 V	348	33.4	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	66.9 PK	74.0	-7.1	1.00 H	343	72.6	-5.7
2	2390.00	50.2 AV	54.0	-3.8	1.00 H	343	55.9	-5.7
3	*2412.00	108.7 PK			1.00 H	343	114.3	-5.6
4	*2412.00	98.1 AV			1.00 H	343	103.7	-5.6
5	4824.00	65.2 PK	74.0	-8.8	2.29 H	298	64.4	0.8
6	4824.00	44.6 AV	54.0	-9.4	2.29 H	298	43.8	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	70.5 PK	74.0	-3.5	1.14 V	268	76.2	-5.7
2	2390.00	53.7 AV	54.0	-0.3	1.14 V	268	59.4	-5.7
3	*2412.00	112.2 PK			1.14 V	268	117.8	-5.6
4	*2412.00	101.5 AV			1.14 V	268	107.1	-5.6
5	4824.00	45.9 PK	74.0	-28.1	1.16 V	20	45.1	0.8
6	4824.00	41.3 AV	54.0	-12.7	1.16 V	20	40.5	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	67.7 PK	74.0	-6.3	1.02 H	338	73.4	-5.7
2	2390.00	50.4 AV	54.0	-3.6	1.02 H	338	56.1	-5.7
3	*2437.00	113.2 PK			1.02 H	338	118.7	-5.5
4	*2437.00	103.3 AV			1.02 H	338	108.8	-5.5
5	2485.00	64.7 PK	74.0	-9.3	1.02 H	338	70.2	-5.5
6	2485.00	49.5 AV	54.0	-4.5	1.02 H	338	55.0	-5.5
7	4874.00	64.4 PK	74.0	-9.6	2.34 H	314	63.5	0.9
8	4874.00	49.9 AV	54.0	-4.1	2.34 H	314	49.0	0.9
9	7311.00	51.4 PK	74.0	-22.6	2.06 H	312	44.0	7.4
10	7311.00	40.1 AV	54.0	-13.9	2.06 H	312	32.7	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	71.3 PK	74.0	-2.7	1.14 V	265	77.0	-5.7
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.14 V**	**265**	**59.6**	**-5.7**
3	*2437.00	116.1 PK			1.14 V	265	121.6	-5.5
4	*2437.00	106.3 AV			1.14 V	265	111.8	-5.5
5	2485.00	67.9 PK	74.0	-6.1	1.14 V	265	73.4	-5.5
6	2485.00	52.6 AV	54.0	-1.4	1.14 V	265	58.1	-5.5
7	4874.00	50.3 PK	74.0	-23.7	1.15 V	19	49.4	0.9
8	4874.00	46.4 AV	54.0	-7.6	1.15 V	19	45.5	0.9
9	7311.00	52.1 PK	74.0	-21.9	2.03 V	360	44.7	7.4
10	7311.00	41.1 AV	54.0	-12.9	2.03 V	360	33.7	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	109.4 PK			1.02 H	355	114.8	-5.4
2	*2462.00	98.5 AV			1.02 H	355	103.9	-5.4
3	2483.50	67.2 PK	74.0	-6.8	1.02 H	355	72.7	-5.5
4	2483.50	50.6 AV	54.0	-3.4	1.02 H	355	56.1	-5.5
5	4924.00	64.8 PK	74.0	-9.2	2.28 H	312	63.7	1.1
6	4924.00	44.2 AV	54.0	-9.8	2.28 H	312	43.1	1.1
7	7386.00	51.9 PK	74.0	-22.1	2.10 H	319	44.3	7.6
8	7386.00	40.5 AV	54.0	-13.5	2.10 H	319	32.9	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	112.6 PK			1.07 V	267	118.0	-5.4
2	*2462.00	101.8 AV			1.07 V	267	107.2	-5.4
3	2483.50	73.7 PK	74.0	-0.3	1.07 V	267	79.2	-5.5
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.07 V**	**267**	**59.4**	**-5.5**
5	4924.00	46.4 PK	74.0	-27.6	1.12 V	15	45.3	1.1
6	4924.00	41.6 AV	54.0	-12.4	1.12 V	15	40.5	1.1
7	7386.00	51.8 PK	74.0	-22.2	2.07 V	355	44.2	7.6
8	7386.00	40.8 AV	54.0	-13.2	2.07 V	355	33.2	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	67.2 PK	74.0	-6.8	1.04 H	355	72.9	-5.7
2	2390.00	50.2 AV	54.0	-3.8	1.04 H	355	55.9	-5.7
3	*2412.00	109.0 PK			1.04 H	355	114.6	-5.6
4	*2412.00	98.2 AV			1.04 H	355	103.8	-5.6
5	4824.00	65.3 PK	74.0	-8.7	2.25 H	294	64.5	0.8
6	4824.00	44.9 AV	54.0	-9.1	2.25 H	294	44.1	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	71.0 PK	74.0	-3.0	1.14 V	261	76.7	-5.7
2	2390.00	53.6 AV	54.0	-0.4	1.14 V	261	59.3	-5.7
3	*2412.00	113.2 PK			1.14 V	261	118.8	-5.6
4	*2412.00	101.0 AV			1.14 V	261	106.6	-5.6
5	4824.00	45.9 PK	74.0	-28.1	1.19 V	32	45.1	0.8
6	4824.00	41.2 AV	54.0	-12.8	1.19 V	32	40.4	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	71.5 PK	74.0	-2.5	1.07 H	360	77.2	-5.7
2	2390.00	46.5 AV	54.0	-7.5	1.07 H	360	52.2	-5.7
3	*2437.00	109.4 PK			1.07 H	360	114.9	-5.5
4	*2437.00	98.8 AV			1.07 H	360	104.3	-5.5
5	2483.50	66.8 PK	74.0	-7.2	1.07 H	360	72.3	-5.5
6	2483.50	50.1 AV	54.0	-3.9	1.07 H	360	55.6	-5.5
7	4874.00	65.6 PK	74.0	-8.4	2.29 H	303	64.7	0.9
8	4874.00	44.7 AV	54.0	-9.3	2.29 H	303	43.8	0.9
9	7311.00	52.0 PK	74.0	-22.0	2.13 H	319	44.6	7.4
10	7311.00	40.6 AV	54.0	-13.4	2.13 H	319	33.2	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	73.8 PK	74.0	-0.2	1.14 V	266	79.5	-5.7
2	2390.00	50.0 AV	54.0	-4.0	1.14 V	266	55.7	-5.7
3	*2437.00	116.2 PK			1.14 V	266	121.7	-5.5
4	*2437.00	104.0 AV			1.14 V	266	109.5	-5.5
5	2483.50	66.4 PK	74.0	-7.6	1.14 V	266	71.9	-5.5
6	2483.50	48.2 AV	54.0	-5.8	1.14 V	266	53.7	-5.5
7	4874.00	46.1 PK	74.0	-27.9	1.06 V	3	45.2	0.9
8	4874.00	41.1 AV	54.0	-12.9	1.06 V	3	40.2	0.9
9	7311.00	52.1 PK	74.0	-21.9	2.02 V	360	44.7	7.4
10	7311.00	40.8 AV	54.0	-13.2	2.02 V	360	33.4	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	109.2 PK			1.08 H	352	114.6	-5.4
2	*2462.00	98.3 AV			1.08 H	352	103.7	-5.4
3	2483.50	66.8 PK	74.0	-7.2	1.08 H	352	72.3	-5.5
4	2483.50	50.2 AV	54.0	-3.8	1.08 H	352	55.7	-5.5
5	4924.00	65.0 PK	74.0	-9.0	2.27 H	323	63.9	1.1
6	4924.00	44.1 AV	54.0	-9.9	2.27 H	323	43.0	1.1
7	7386.00	51.9 PK	74.0	-22.1	2.12 H	333	44.3	7.6
8	7386.00	40.3 AV	54.0	-13.7	2.12 H	333	32.7	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	112.9 PK			1.14 V	268	118.3	-5.4
2	*2462.00	101.0 AV			1.14 V	268	106.4	-5.4
3	2483.50	72.1 PK	74.0	-1.9	2.68 V	268	77.6	-5.5
4	2483.50	53.8 AV	54.0	-0.2	2.68 V	268	59.3	-5.5
5	4924.00	46.1 PK	74.0	-27.9	1.09 V	13	45.0	1.1
6	4924.00	41.6 AV	54.0	-12.4	1.09 V	13	40.5	1.1
7	7386.00	52.2 PK	74.0	-21.8	2.09 V	344	44.6	7.6
8	7386.00	41.2 AV	54.0	-12.8	2.09 V	344	33.6	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 (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	2386.00	65.4 PK	74.0	-8.6	1.10 H	342	71.1	-5.7
2	2386.00	50.1 AV	54.0	-3.9	1.10 H	342	55.8	-5.7
3	*2422.00	98.2 PK			1.10 H	342	103.7	-5.5
4	*2422.00	87.6 AV			1.10 H	342	93.1	-5.5
5	4844.00	62.6 PK	74.0	-11.4	2.35 H	323	61.8	0.8
6	4844.00	42.1 AV	54.0	-11.9	2.35 H	323	41.3	0.8
7	7266.00	51.7 PK	74.0	-22.3	2.12 H	327	44.2	7.5
8	7266.00	40.2 AV	54.0	-13.8	2.12 H	327	32.7	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	2386.00	68.8 PK	74.0	-5.2	1.14 V	265	74.5	-5.7
2	2386.00	53.5 AV	54.0	-0.5	1.14 V	265	59.2	-5.7
3	*2422.00	101.7 PK			1.14 V	265	107.2	-5.5
4	*2422.00	91.8 AV			1.14 V	265	97.3	-5.5
5	4844.00	43.6 PK	74.0	-30.4	1.01 V	31	42.8	0.8
6	4844.00	39.3 AV	54.0	-14.7	1.01 V	31	38.5	0.8
7	7266.00	51.4 PK	74.0	-22.6	1.99 V	333	43.9	7.5
8	7266.00	40.5 AV	54.0	-13.5	1.99 V	333	33.0	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	67.8 PK	74.0	-6.2	1.06 H	340	73.5	-5.7
2	2390.00	50.4 AV	54.0	-3.6	1.06 H	340	56.1	-5.7
3	*2437.00	102.6 PK			1.06 H	340	108.1	-5.5
4	*2437.00	92.5 AV			1.06 H	340	98.0	-5.5
5	2483.50	67.1 PK	74.0	-6.9	1.06 H	340	72.6	-5.5
6	2483.50	50.4 AV	54.0	-3.6	1.06 H	340	55.9	-5.5
7	4874.00	63.2 PK	74.0	-10.8	2.31 H	324	62.3	0.9
8	4874.00	42.4 AV	54.0	-11.6	2.31 H	324	41.5	0.9
9	7311.00	51.6 PK	74.0	-22.4	2.08 H	327	44.2	7.4
10	7311.00	40.0 AV	54.0	-14.0	2.08 H	327	32.6	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	71.0 PK	74.0	-3.0	1.14 V	266	76.7	-5.7
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.14 V**	**266**	**59.6**	**-5.7**
3	*2437.00	105.5 PK			1.14 V	266	111.0	-5.5
4	*2437.00	95.7 AV			1.14 V	266	101.2	-5.5
5	2483.50	70.6 PK	74.0	-3.4	1.14 V	266	76.1	-5.5
6	2483.50	53.5 AV	54.0	-0.5	1.14 V	266	59.0	-5.5
7	4874.00	43.5 PK	74.0	-30.5	1.07 V	19	42.6	0.9
8	4874.00	39.3 AV	54.0	-14.7	1.07 V	19	38.4	0.9
9	7311.00	51.6 PK	74.0	-22.4	2.04 V	340	44.2	7.4
10	7311.00	40.8 AV	54.0	-13.2	2.04 V	340	33.4	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	98.1 PK			1.03 H	344	103.6	-5.5
2	*2452.00	88.3 AV			1.03 H	344	93.8	-5.5
3	2487.00	65.8 PK	74.0	-8.2	1.03 H	344	71.2	-5.4
4	2487.00	50.2 AV	54.0	-3.8	1.03 H	344	55.6	-5.4
5	4904.00	63.2 PK	74.0	-10.8	2.32 H	339	62.2	1.0
6	4904.00	42.4 AV	54.0	-11.6	2.32 H	339	41.4	1.0
7	7356.00	51.5 PK	74.0	-22.5	2.10 H	311	43.9	7.6
8	7356.00	40.0 AV	54.0	-14.0	2.10 H	311	32.4	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	101.6 PK			1.14 V	266	107.1	-5.5
2	*2452.00	91.9 AV			1.14 V	266	97.4	-5.5
3	2487.00	69.1 PK	74.0	-4.9	1.14 V	266	74.5	-5.4
4	**2487.00**	**53.9 AV**	**54.0**	**-0.1**	**1.14 V**	**266**	**59.3**	**-5.4**
5	4904.00	43.9 PK	74.0	-30.1	1.10 V	32	42.9	1.0
6	4904.00	39.6 AV	54.0	-14.4	1.10 V	32	38.6	1.0
7	7356.00	51.6 PK	74.0	-22.4	2.09 V	350	44.0	7.6
8	7356.00	40.8 AV	54.0	-13.2	2.09 V	350	33.2	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:

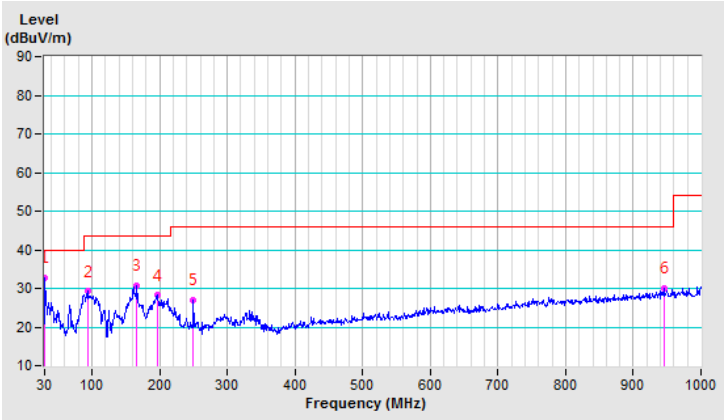
802.11g

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	30.80	32.7 QP	40.0	-7.3	1.00 H	69	42.7	-10.0
2	93.80	29.2 QP	43.5	-14.3	2.00 H	22	43.3	-14.1
3	165.95	30.7 QP	43.5	-12.8	1.50 H	40	39.6	-8.9
4	196.72	28.2 QP	43.5	-15.3	1.00 H	0	40.1	-11.9
5	250.00	27.0 QP	46.0	-19.0	1.00 H	276	37.0	-10.0
6	944.86	30.0 QP	46.0	-16.0	2.50 H	50	25.5	4.5

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

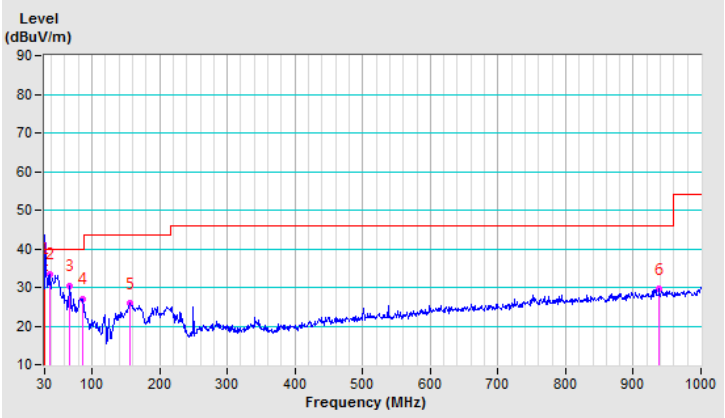


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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**	**35.0 QP**	**40.0**	**-5.0**	**1.00 V**	**131**	**45.0**	**-10.0**
2	37.42	33.5 QP	40.0	-6.5	1.00 V	360	42.8	-9.3
3	67.44	30.4 QP	40.0	-9.6	1.00 V	332	40.9	-10.5
4	86.65	26.9 QP	40.0	-13.1	1.00 V	319	41.5	-14.6
5	155.52	25.8 QP	43.5	-17.7	1.00 V	219	34.3	-8.5
6	938.02	29.5 QP	46.0	-16.5	2.50 V	79	25.0	4.5

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



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	100375	May 09, 2016	May 08, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Aug. 31, 2016	Aug. 30, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-003	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	N/A	EMC-03	Sep. 29, 2016	Sep. 28, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 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. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Oct. 06, 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.

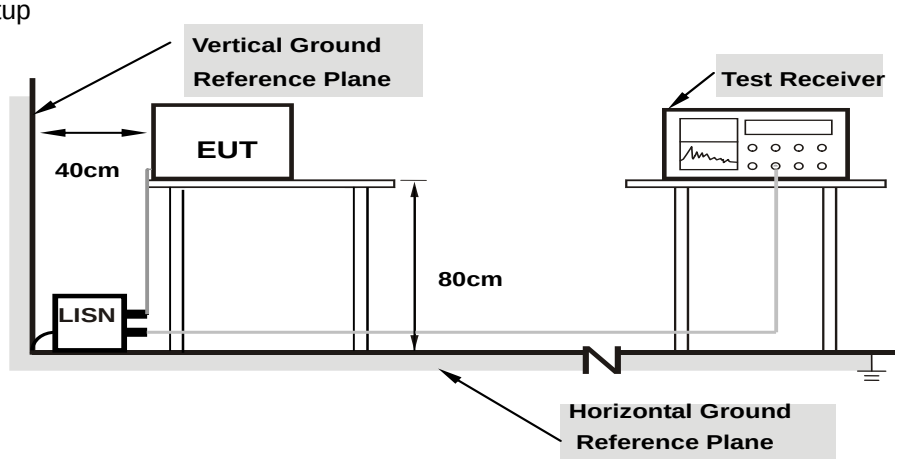
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

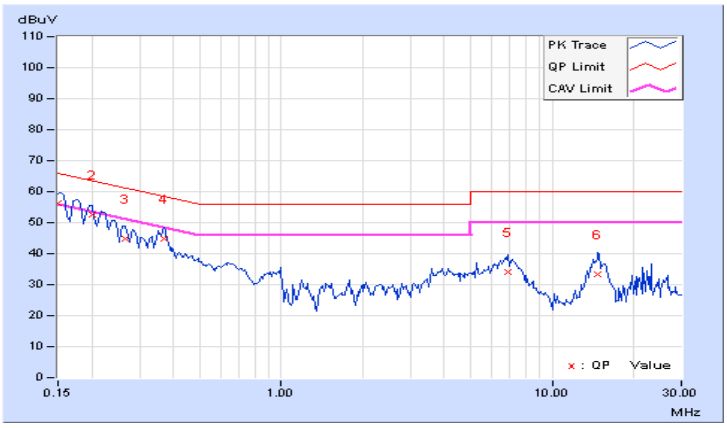
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.14	46.05	33.83	56.19	43.97	66.00	56.00	-9.81	-12.03
2	0.20078	10.12	42.61	32.08	52.73	42.20	63.58	53.58	-10.85	-11.38
3	0.26719	10.12	34.70	24.62	44.82	34.74	61.20	51.20	-16.38	-16.46
4	**0.36875**	**10.11**	**34.52**	**28.83**	**44.63**	**38.94**	**58.53**	**48.53**	**-13.90**	**-9.59**
5	6.85156	10.37	23.71	15.72	34.08	26.09	60.00	50.00	-25.92	-23.91
6	14.76953	10.63	22.64	11.85	33.27	22.48	60.00	50.00	-26.73	-27.52

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.

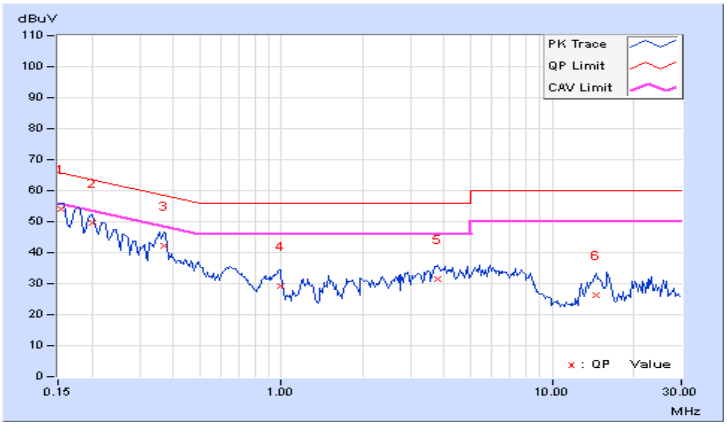


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.18	43.85	33.08	54.03	43.26	65.79	55.79	-11.76	-12.53
2	0.20078	10.07	39.58	29.59	49.65	39.66	63.58	53.58	-13.93	-13.92
3	0.36875	10.09	32.13	26.12	42.22	36.21	58.53	48.53	-16.31	-12.32
4	0.99375	10.21	18.92	13.82	29.13	24.03	56.00	46.00	-26.87	-21.97
5	3.79297	10.30	21.12	13.33	31.42	23.63	56.00	46.00	-24.58	-22.37
6	14.49609	10.66	15.70	6.98	26.36	17.64	60.00	50.00	-33.64	-32.36

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.



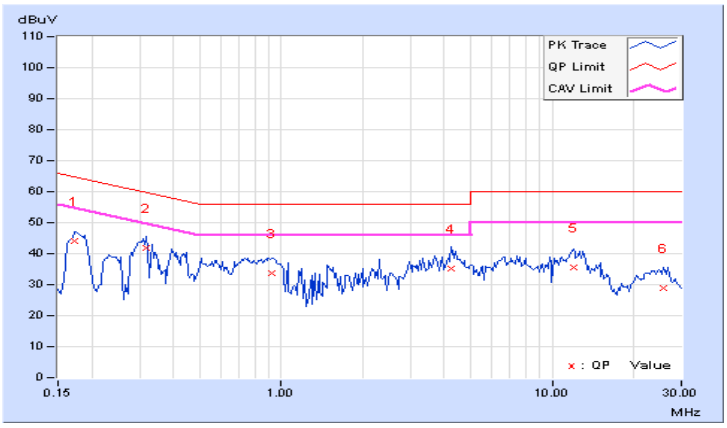
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	10.13	33.81	24.23	43.94	34.36	64.79	54.79	-20.85	-20.43
2	0.31797	10.11	31.72	15.33	41.83	25.44	59.76	49.76	-17.93	-24.32
3	0.92734	10.12	23.47	8.35	33.59	18.47	56.00	46.00	-22.41	-27.53
4	4.24609	10.31	24.99	14.56	35.30	24.87	56.00	46.00	-20.70	-21.13
5	11.95703	10.51	25.13	17.27	35.64	27.78	60.00	50.00	-24.36	-22.22
6	25.86328	11.03	18.03	7.80	29.06	18.83	60.00	50.00	-30.94	-31.17

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.

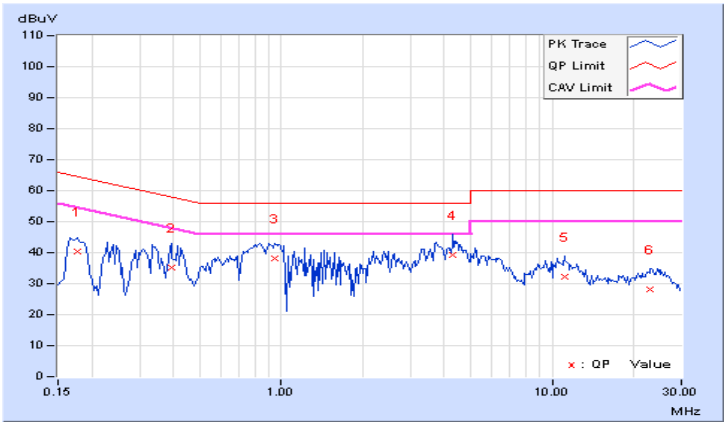


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	10.12	30.26	20.90	40.38	31.02	64.61	54.61	-24.23	-23.59
2	0.39219	10.09	24.94	11.58	35.03	21.67	58.02	48.02	-22.99	-26.35
3	0.95078	10.20	27.82	13.51	38.02	23.71	56.00	46.00	-17.98	-22.29
4	4.29688	10.33	28.77	16.47	39.10	26.80	56.00	46.00	-16.90	-19.20
5	11.07031	10.52	21.77	12.34	32.29	22.86	60.00	50.00	-27.71	-27.14
6	23.06641	10.95	17.16	7.72	28.11	18.67	60.00	50.00	-31.89	-31.33

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.

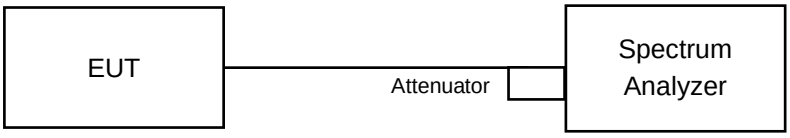


4.3 6dB Bandwidth Measurement

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	8.13	8.13	0.5	PASS
6	2437	8.13	8.11	0.5	PASS
11	2462	8.14	8.12	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.39	16.40	0.5	PASS
6	2437	16.39	16.33	0.5	PASS
11	2462	16.38	16.33	0.5	PASS

802.11n (HT20)

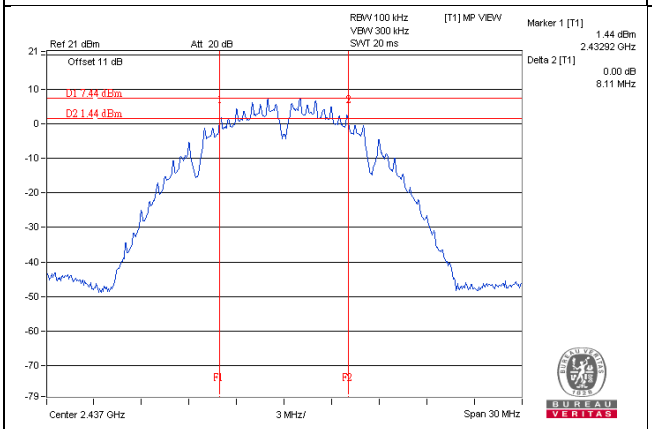
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.59	17.36	0.5	Pass
6	2437	17.61	17.63	0.5	Pass
11	2462	17.27	15.75	0.5	Pass

802.11n (HT40)

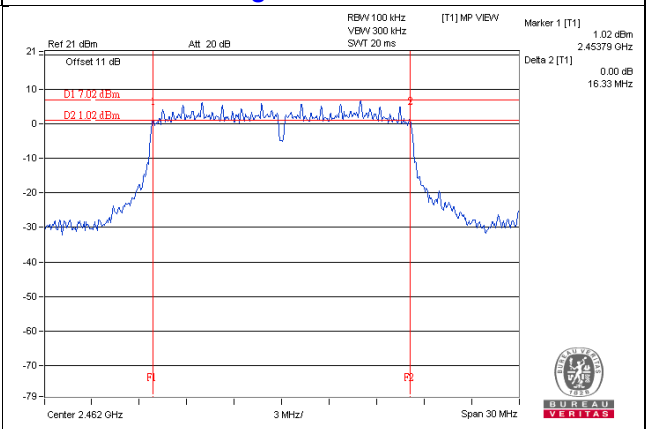
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.20	35.28	0.5	Pass
6	2437	35.19	35.11	0.5	Pass
9	2452	35.36	35.33	0.5	Pass

Spectrum Plot of Worst Value

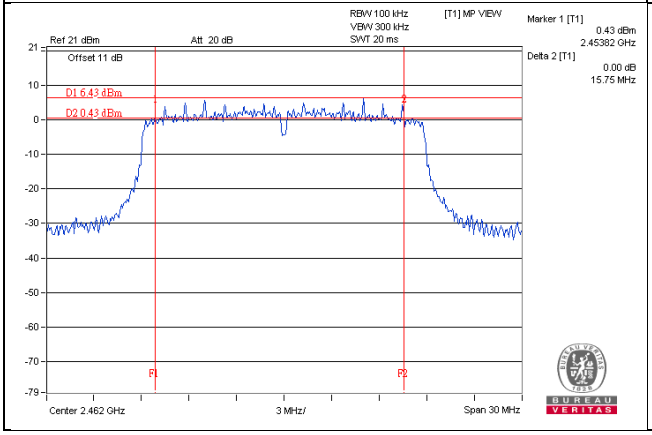
802.11b / Chain 1 : CH6



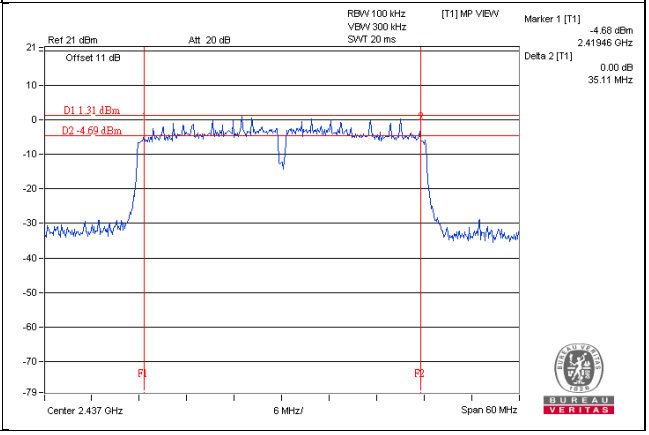
802.11g / Chain 1 : CH11



802.11n (HT20) / Chain 1 : CH11



802.11n (HT40) / Chain 1 : CH6



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

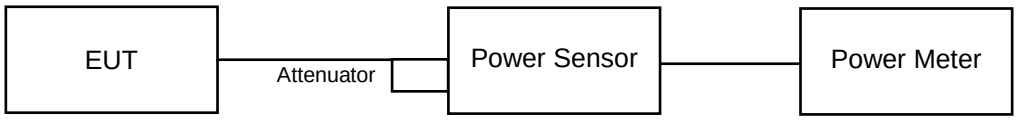
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

A peak / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. 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

FOR PEAK POWER

802.11b

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.60	17.01	107.778	20.33	30	Pass
6	2437	17.76	17.21	112.306	20.50	30	Pass
11	2462	20.44	19.58	201.444	23.04	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.37	25.55	703.272	28.47	30	Pass
6	2437	26.11	26.32	836.868	29.23	30	Pass
11	2462	24.98	25.20	645.906	28.10	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.52	25.70	727.986	28.62	30	Pass
6	2437	25.50	25.66	722.942	28.59	30	Pass
11	2462	24.78	24.74	598.46	27.77	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.88	17.74	120.805	20.82	30	Pass
6	2437	21.98	21.84	310.518	24.92	30	Pass
9	2452	18.24	18.11	131.395	21.19	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	15.26	14.76	63.497	18.03
6	2437	15.43	14.78	64.975	18.13
11	2462	18.14	16.99	115.166	20.61

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.36	17.00	104.569	20.19
6	2437	19.32	19.11	166.977	22.23
11	2462	17.67	16.82	106.563	20.28

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.55	17.70	115.769	20.64
6	2437	17.65	17.80	118.466	20.74
11	2462	17.19	16.43	96.314	19.84

802.11n (HT40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	9.70	9.66	18.58	12.69
6	2437	14.56	13.98	53.579	17.29
9	2452	10.05	9.69	19.427	12.88

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.52	25.70	727.986	28.62	30	Pass
6	2437	25.50	25.66	722.942	28.59	30	Pass
11	2462	24.78	24.74	598.46	27.77	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.88	17.74	120.805	20.82	30	Pass
6	2437	21.98	21.84	310.518	24.92	30	Pass
9	2452	18.24	18.11	131.395	21.19	30	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.55	17.70	115.769	20.64
6	2437	17.65	17.80	118.466	20.74
11	2462	17.19	16.43	96.314	19.84

802.11n (HT40)

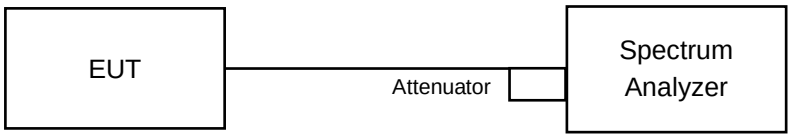
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	9.70	9.66	18.58	12.69
6	2437	14.56	13.98	53.579	17.29
9	2452	10.05	9.69	19.427	12.88

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 analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

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	-9.64	3.01	-6.63	8.00	Pass
	6	2437	-8.73	3.01	-5.72	8.00	Pass
	11	2462	-6.75	3.01	-3.74	8.00	Pass
1	1	2412	-10.97	3.01	-7.96	8.00	Pass
	6	2437	-10.46	3.01	-7.45	8.00	Pass
	11	2462	-6.60	3.01	-3.59	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power density limit shall not be reduced.

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	-10.54	3.01	-7.53	8.00	Pass
	6	2437	-7.23	3.01	-4.22	8.00	Pass
	11	2462	-10.95	3.01	-7.94	8.00	Pass
1	1	2412	-10.20	3.01	-7.19	8.00	Pass
	6	2437	-8.06	3.01	-5.05	8.00	Pass
	11	2462	-9.75	3.01	-6.74	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (HT20)

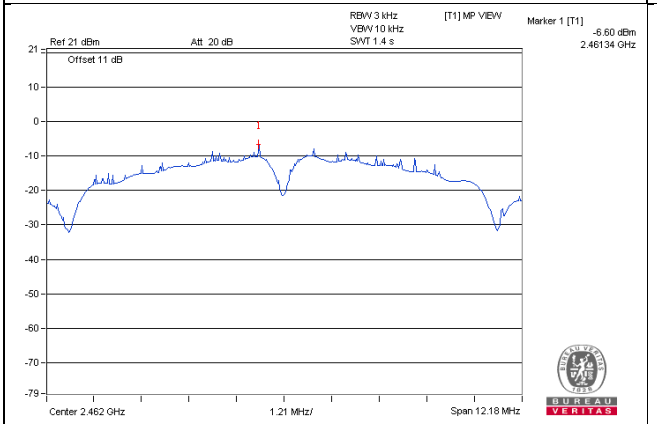
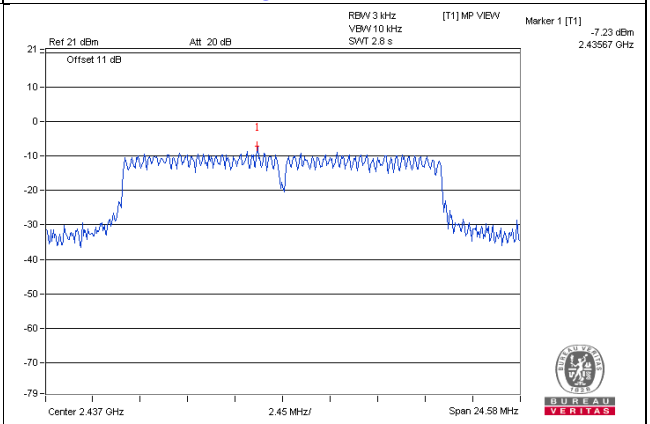
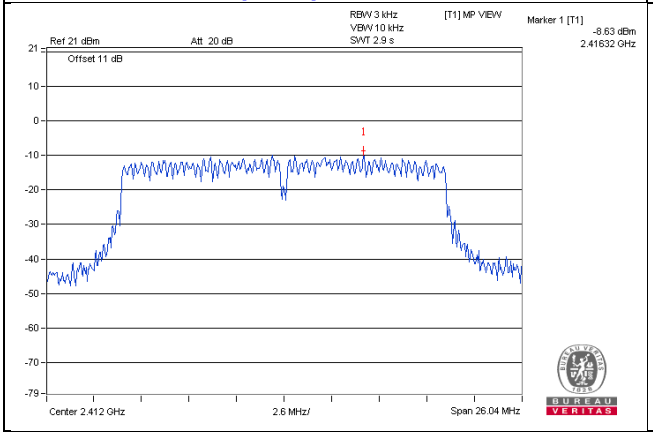
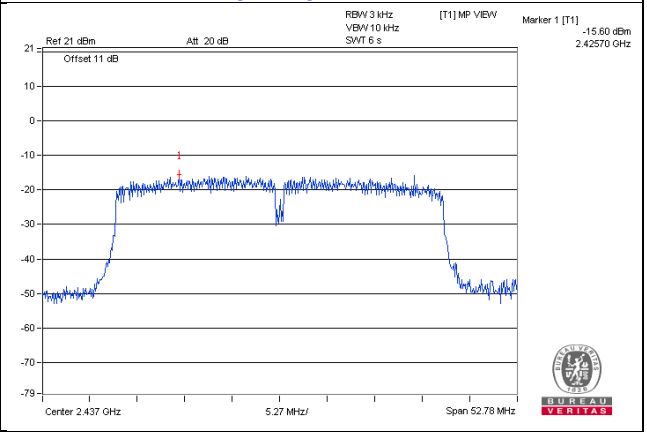
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-10.26	3.01	-7.25	8.00	Pass
	6	2437	-9.68	3.01	-6.67	8.00	Pass
	11	2462	-10.18	3.01	-7.17	8.00	Pass
1	1	2412	-8.63	3.01	-5.62	8.00	Pass
	6	2437	-10.10	3.01	-7.09	8.00	Pass
	11	2462	-10.12	3.01	-7.11	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (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	-18.56	3.01	-15.55	8.00	Pass
	6	2437	-15.60	3.01	-12.59	8.00	Pass
	9	2452	-19.53	3.01	-16.52	8.00	Pass
1	3	2422	-20.00	3.01	-16.99	8.00	Pass
	6	2437	-15.62	3.01	-12.61	8.00	Pass
	9	2452	-19.91	3.01	-16.90	8.00	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.52dBi < 6dBi , so the power density limit shall not be reduced.

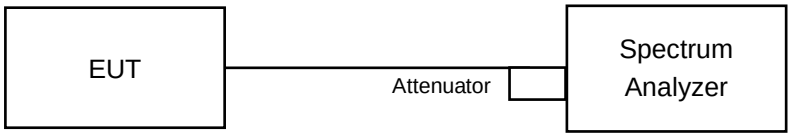
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH11	**802.11g / Chain 0 : CH6**
	
802.11n (HT20) / Chain 1 : CH1	**802.11n (HT40) / Chain 0 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB 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

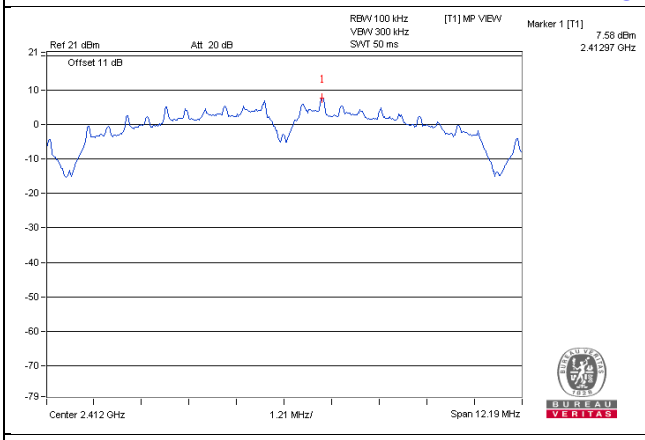
Same as Item 4.3.6

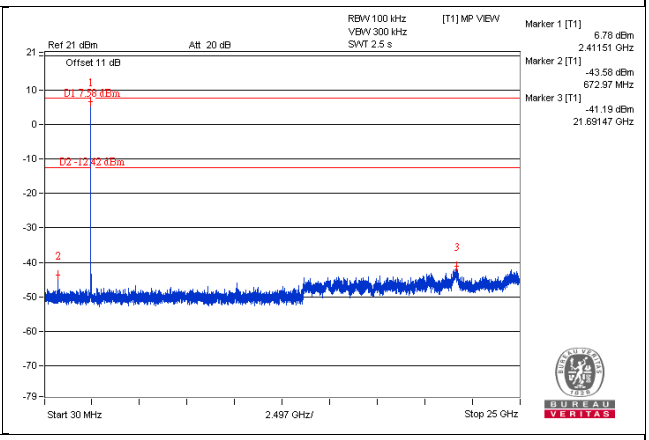
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

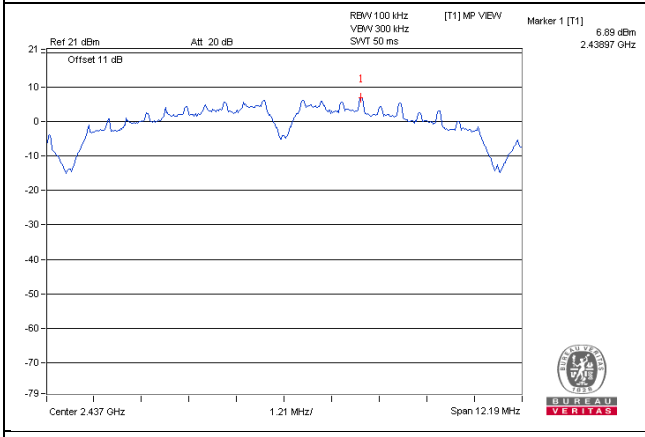
802.11b - CHAIN 0

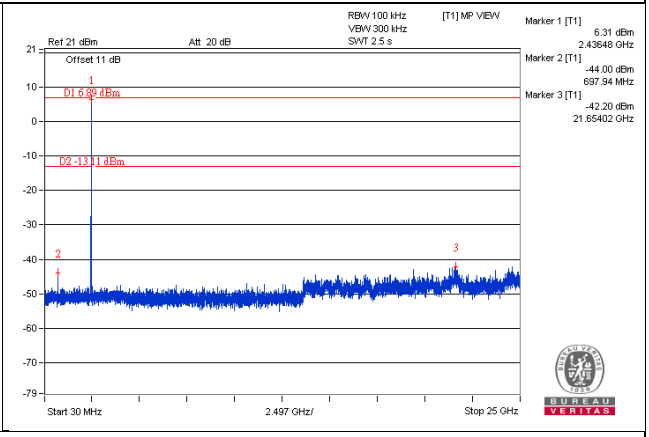
CH 1



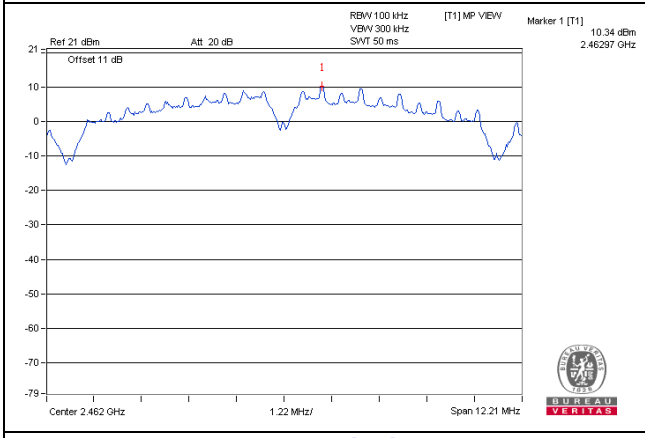


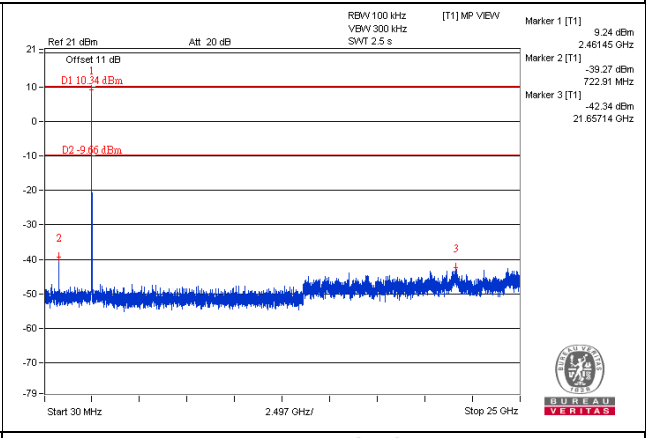
CH 6



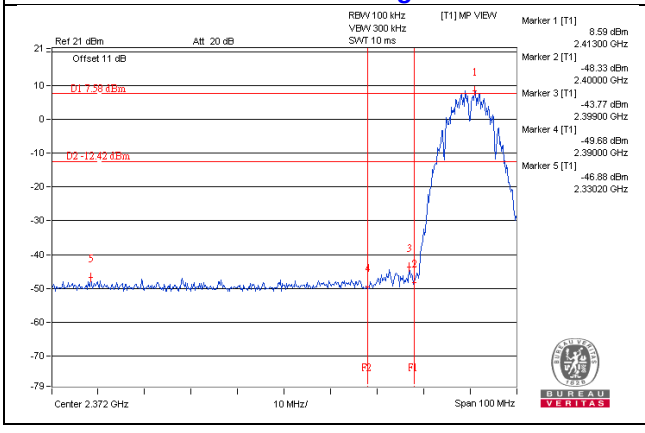


CH 11

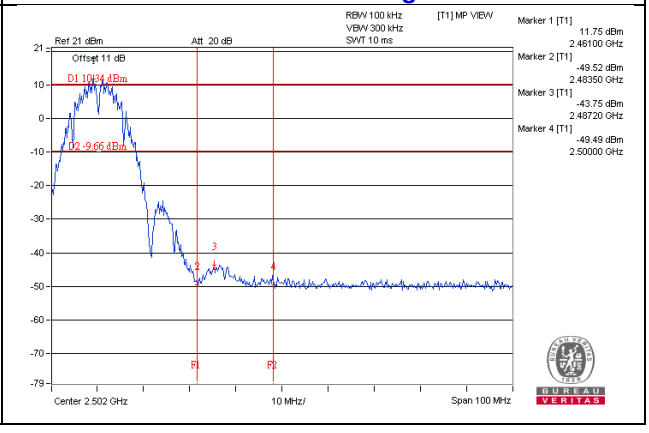




CH 1 Band edge

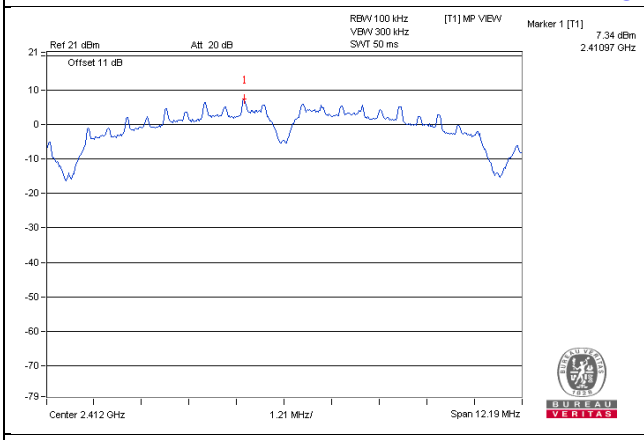


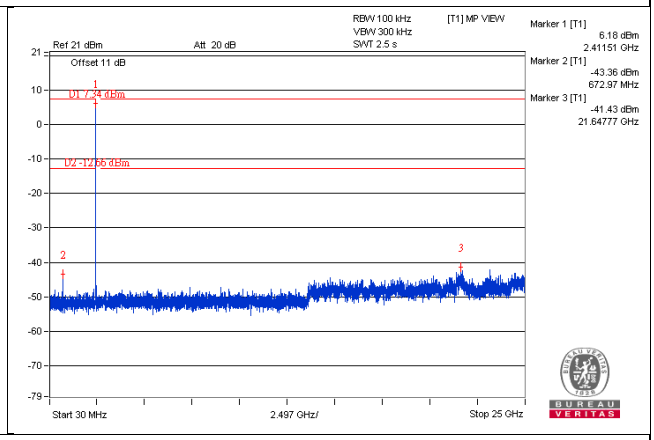
CH 11 Band edge



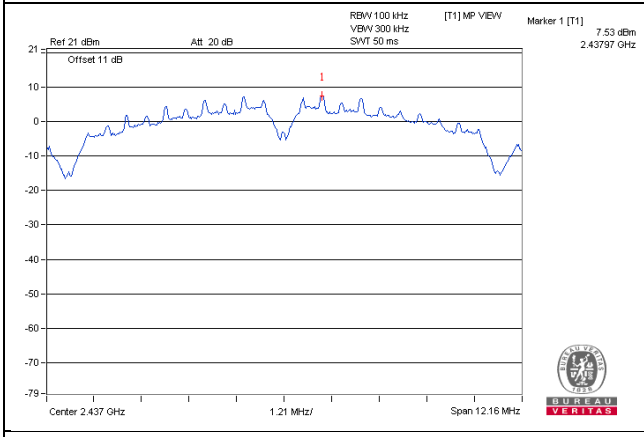
CHAIN 1

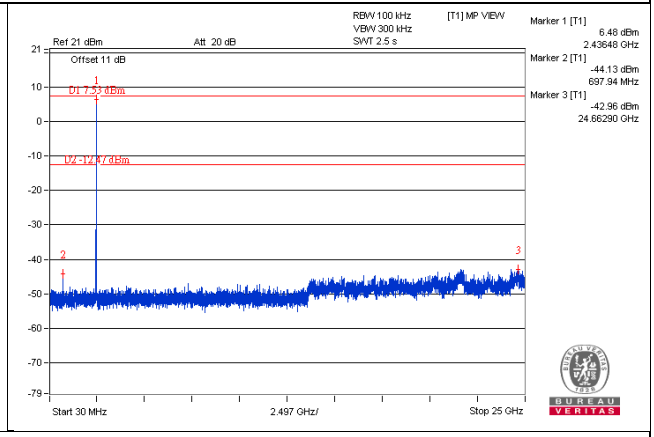
CH 1



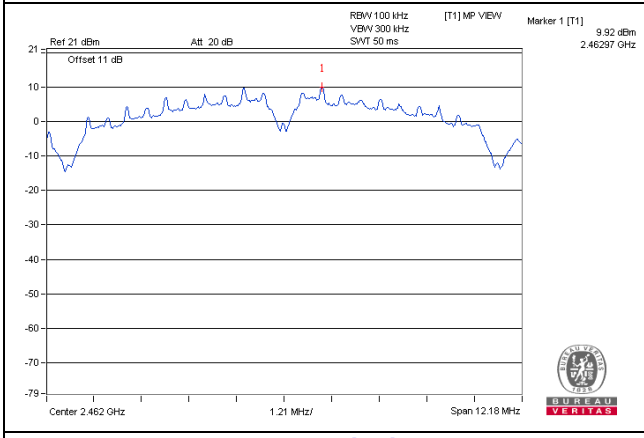


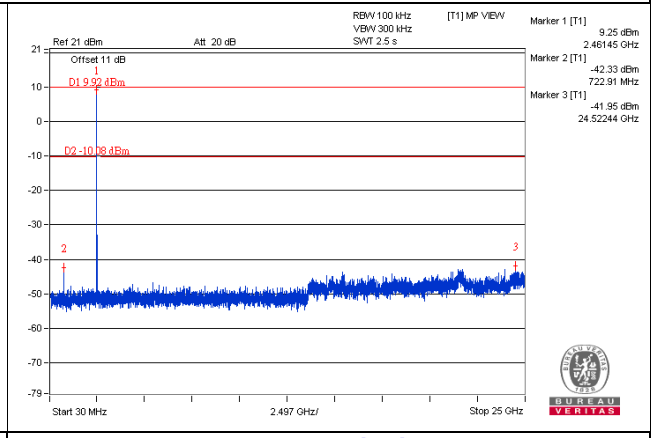
CH 6



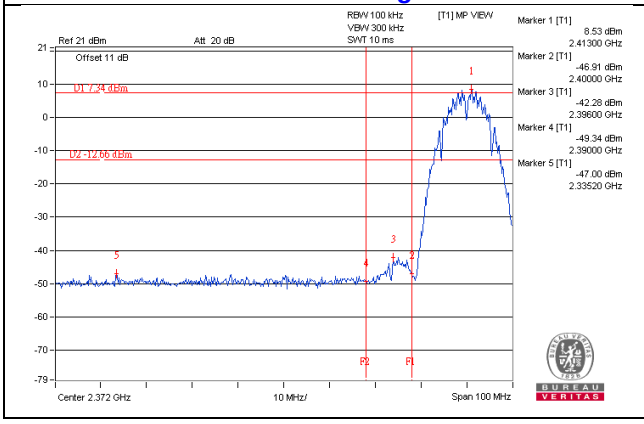


CH 11

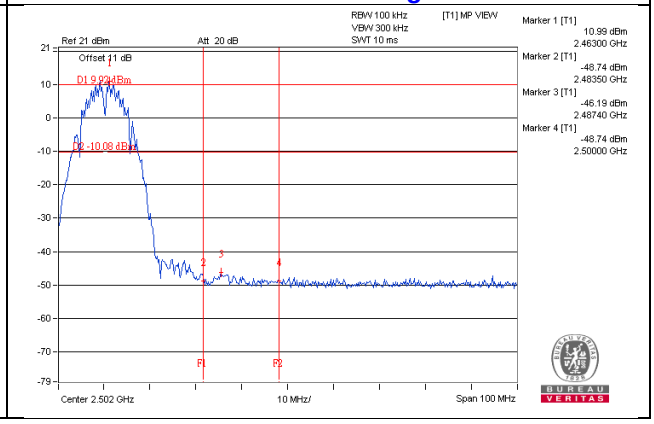




CH 1 Band edge

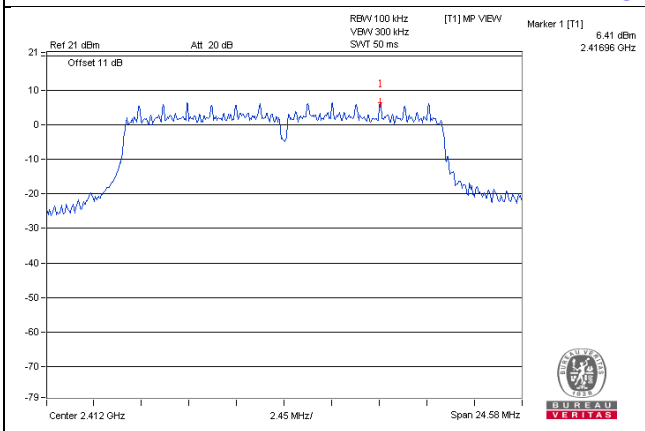


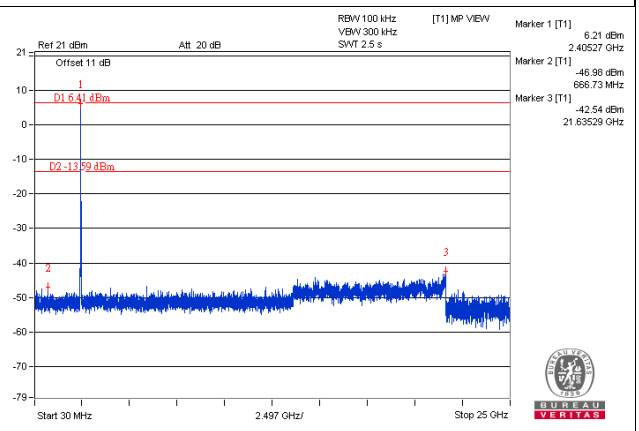
CH 11 Band edge



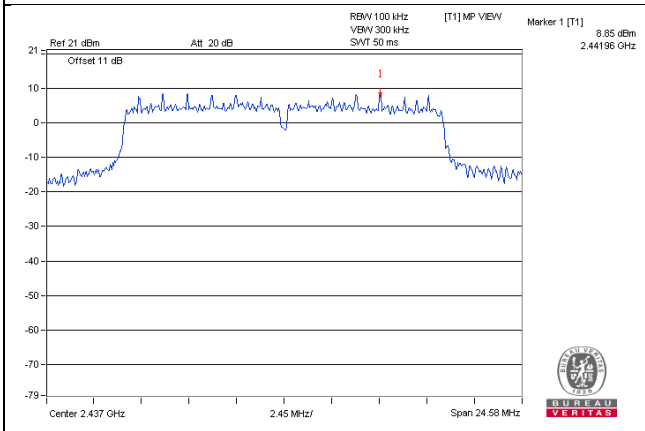
802.11g - CHAIN 0

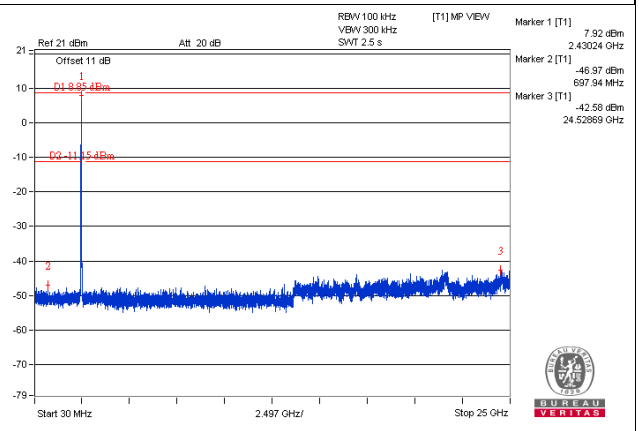
CH 1



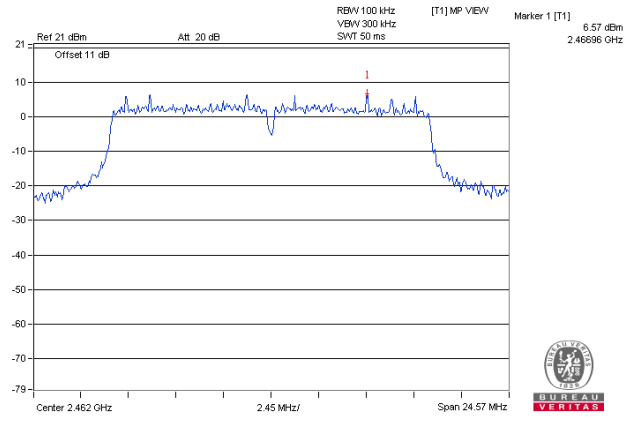


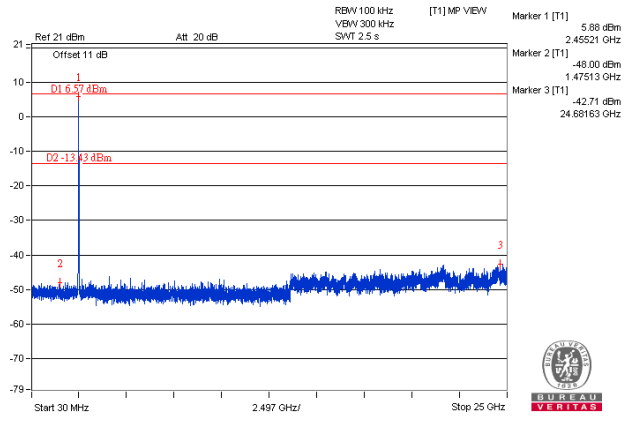
CH 6



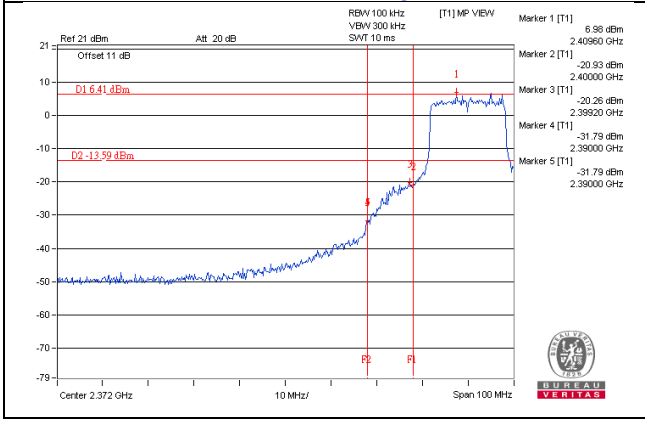


CH 11

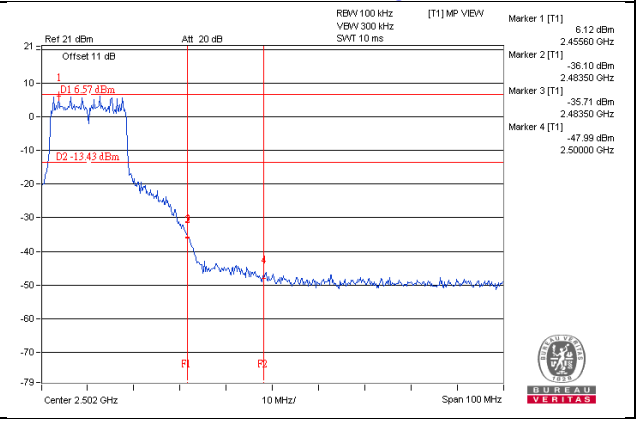




CH 1 Band edge

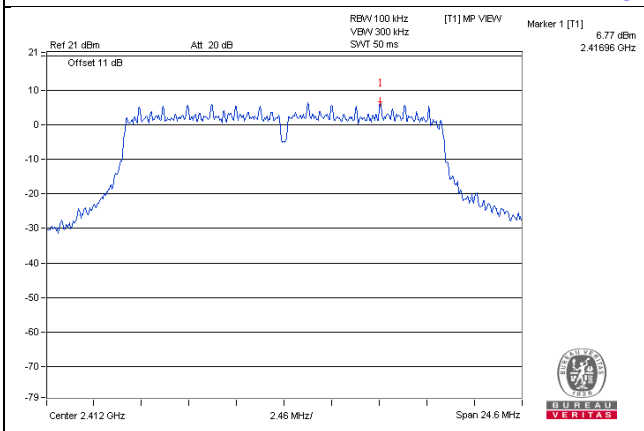


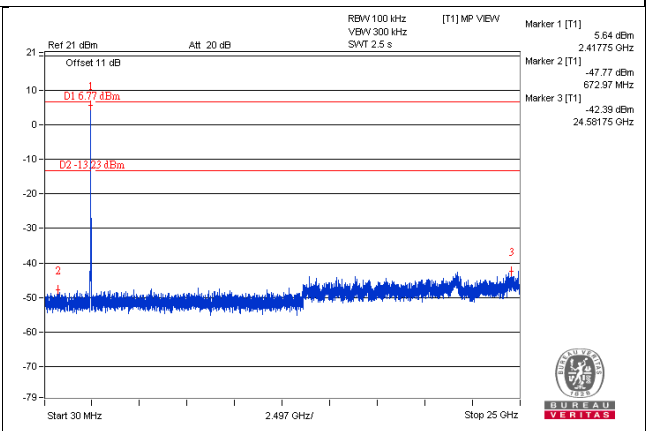
CH 11 Band edge



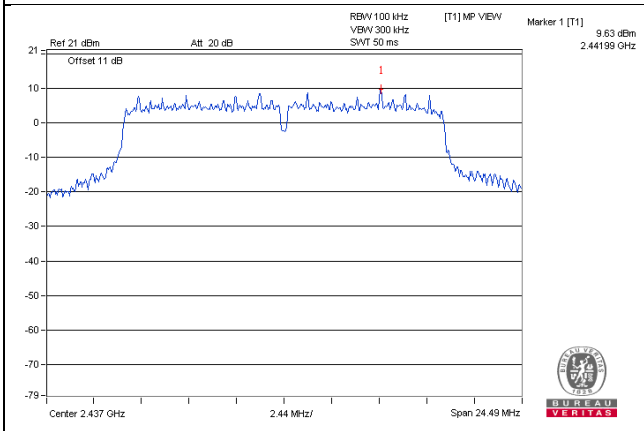
CHAIN 1

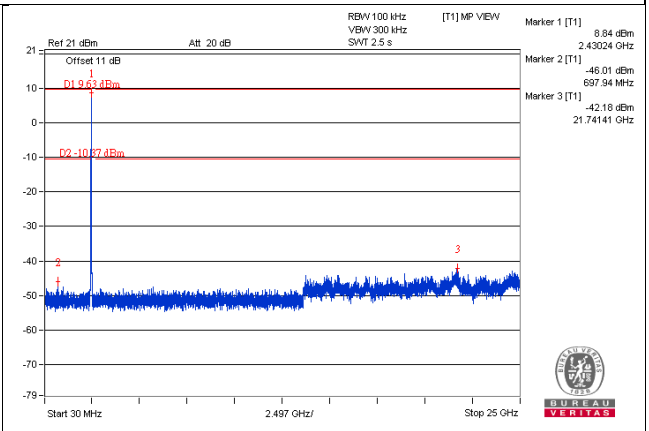
CH 1



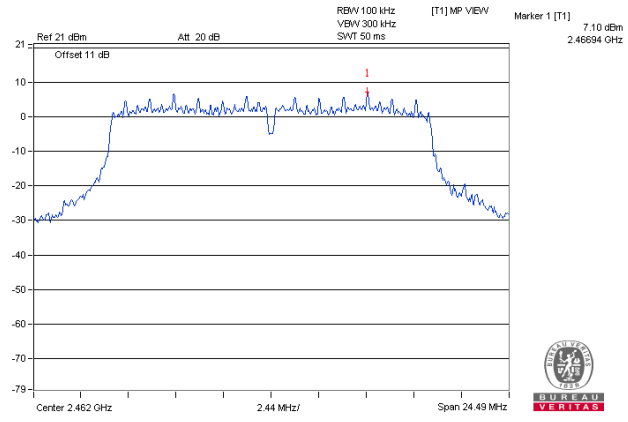


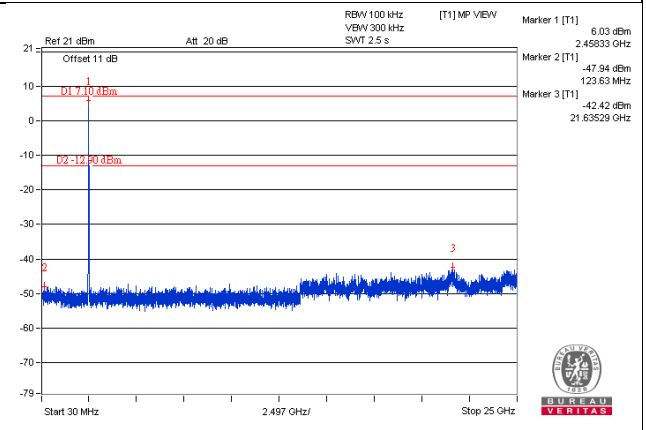
CH 6



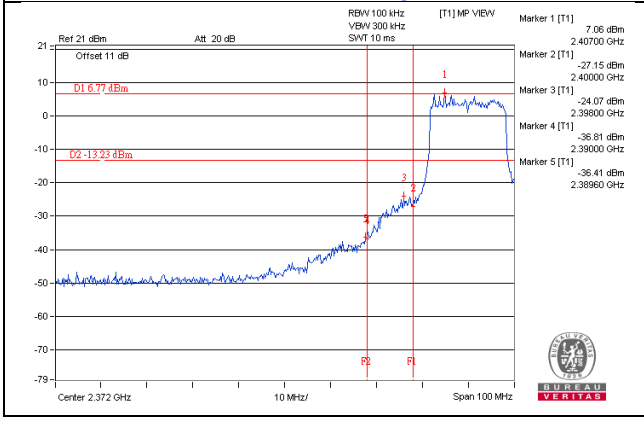


CH 11

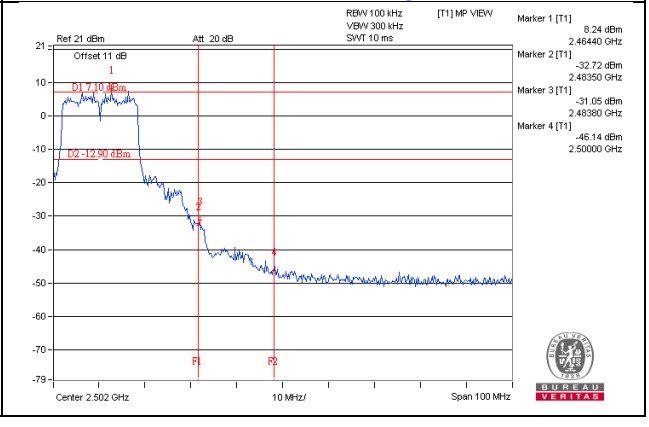




CH 1 Band edge

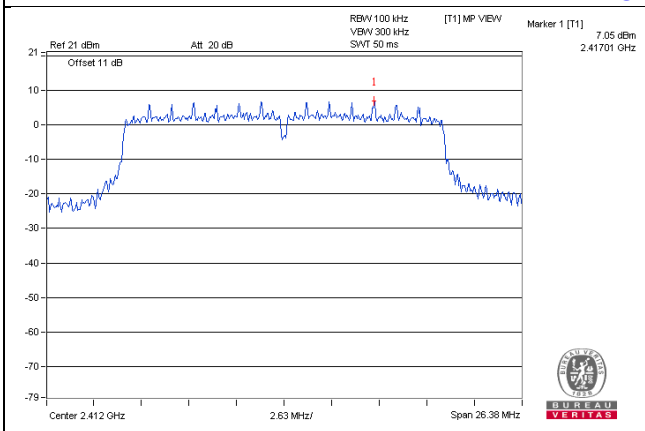


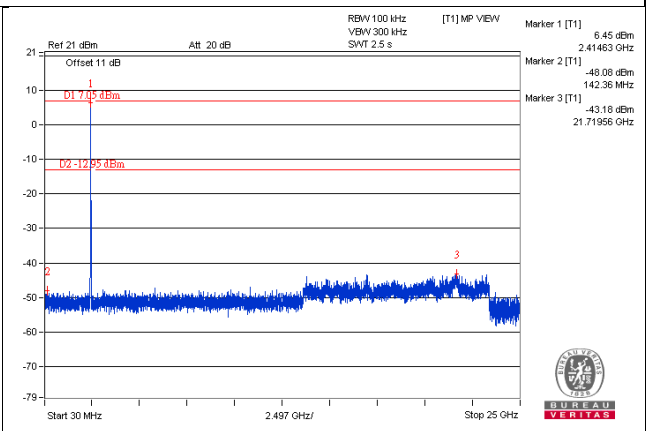
CH 11 Band edge



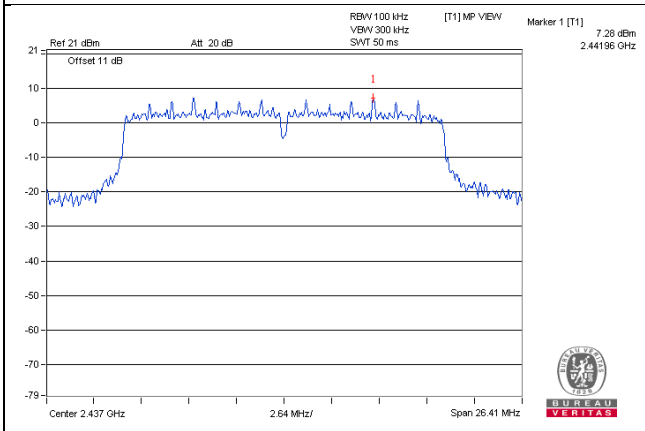
802.11n (HT20) - CHAIN 0

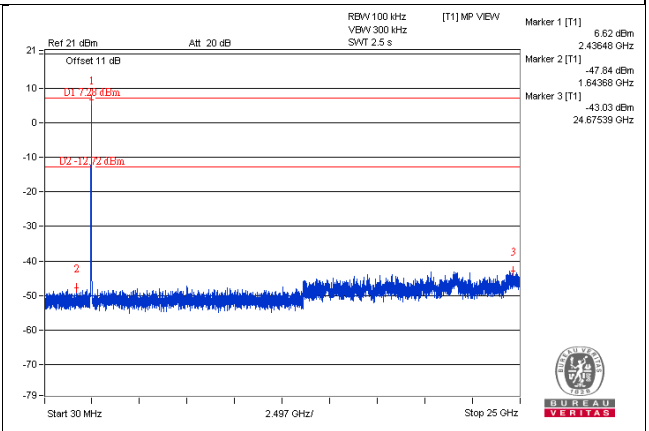
CH 1



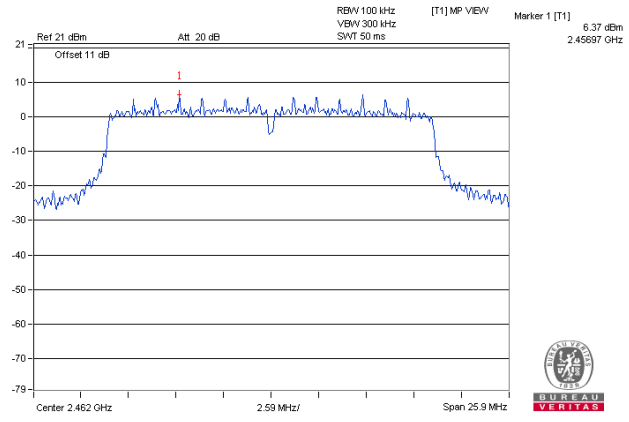


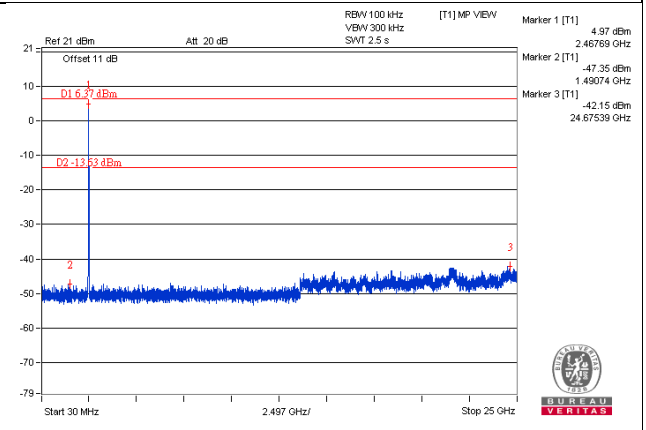
CH 6



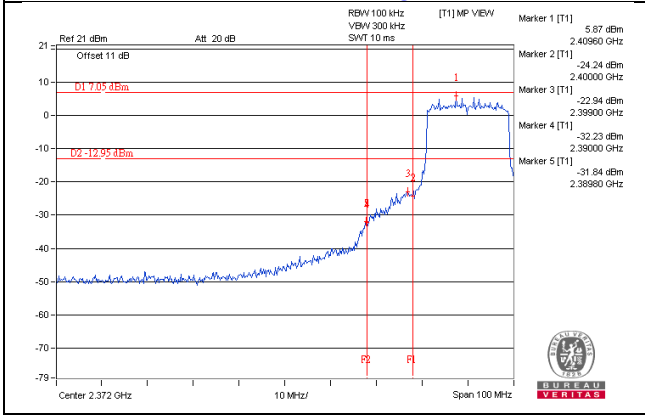


CH 11

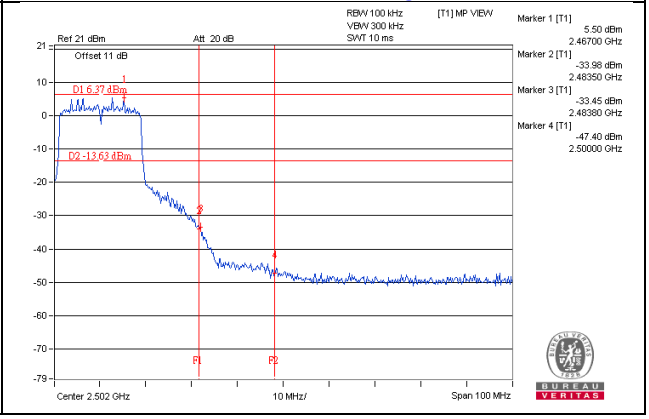




CH 1 Band edge

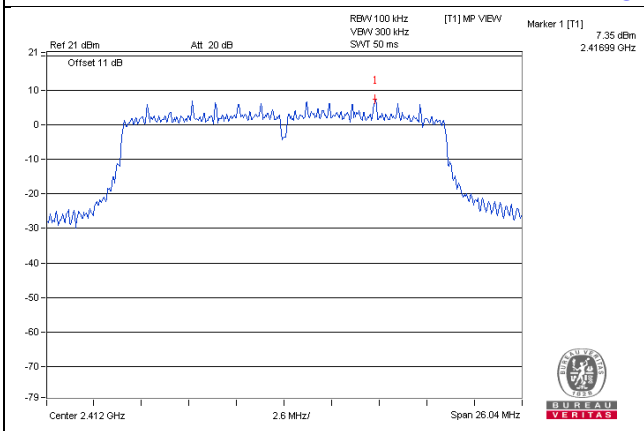


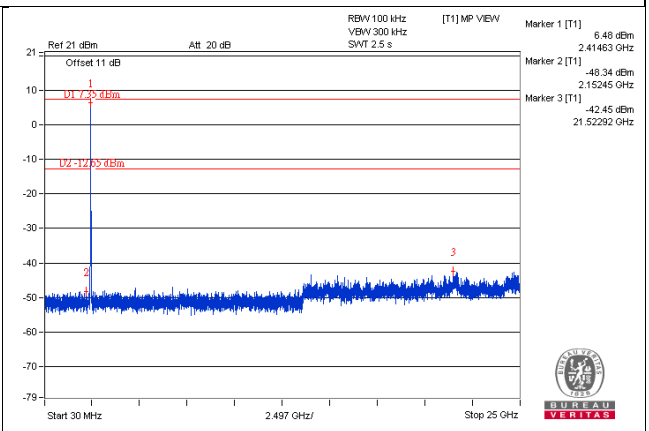
CH 11 Band edge



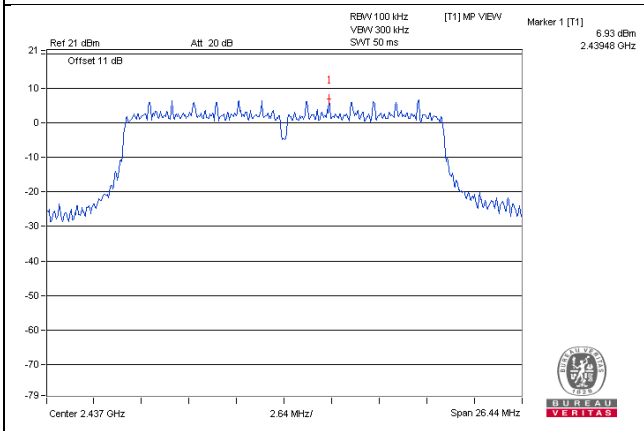
CHAIN 1

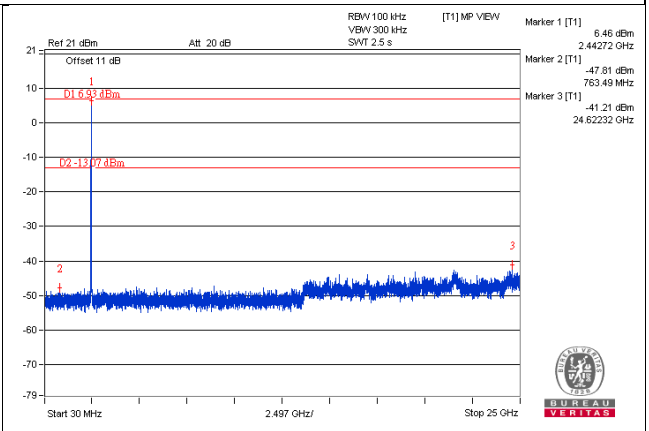
CH 1



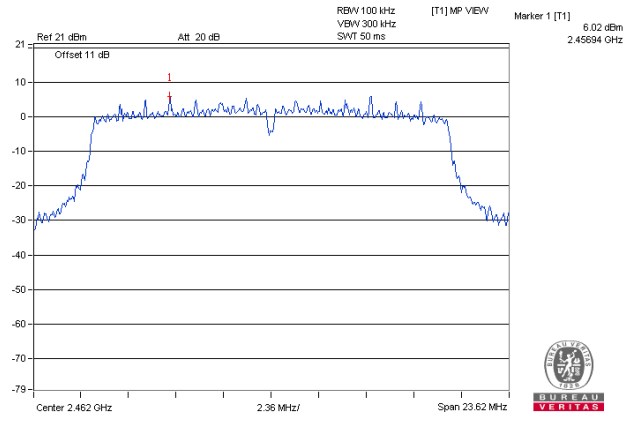


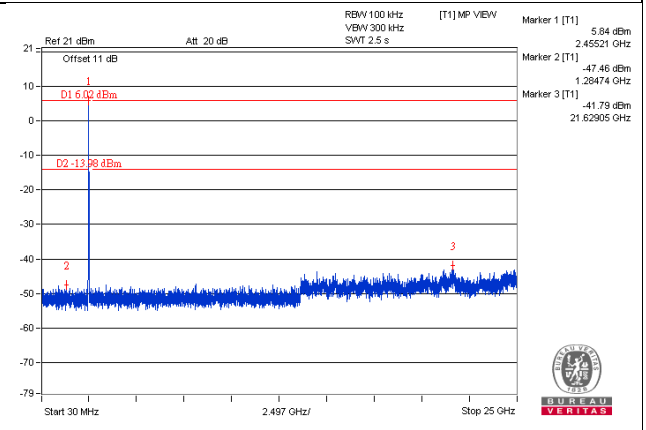
CH 6



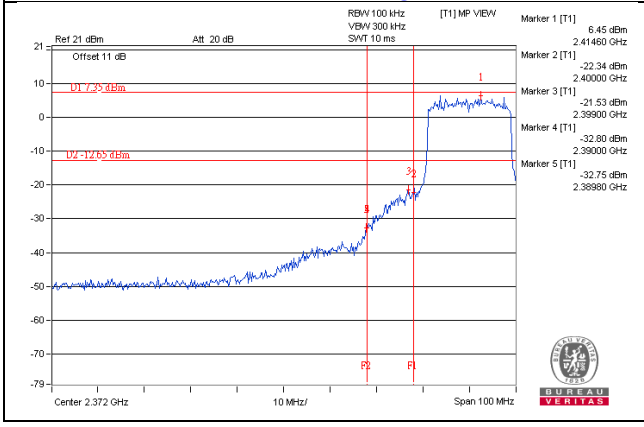


CH 11

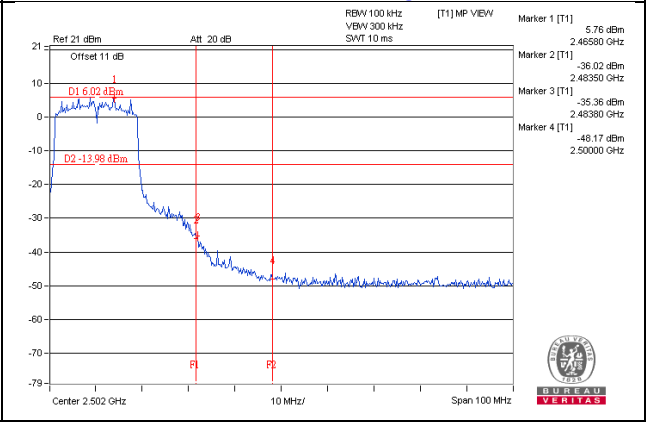




CH 1 Band edge

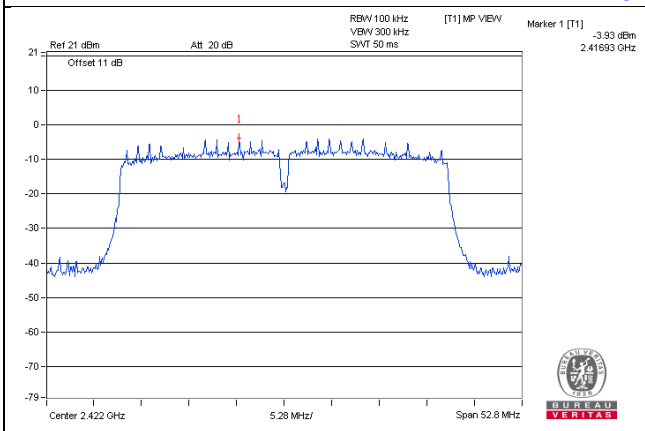


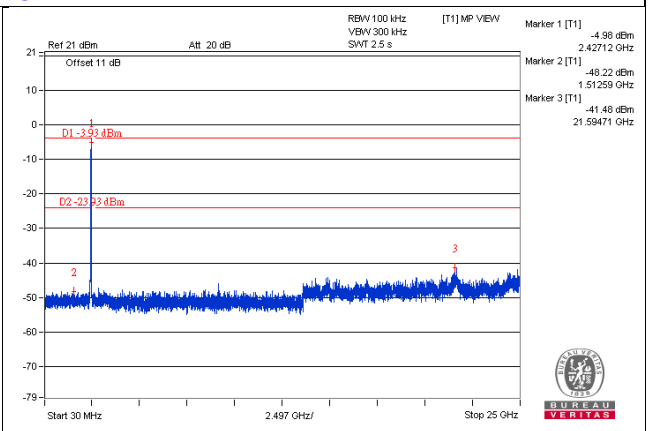
CH 11 Band edge



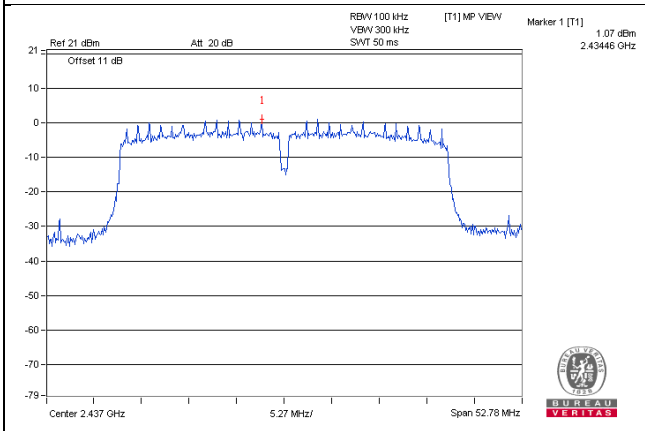
802.11n (HT40) - Chain 0

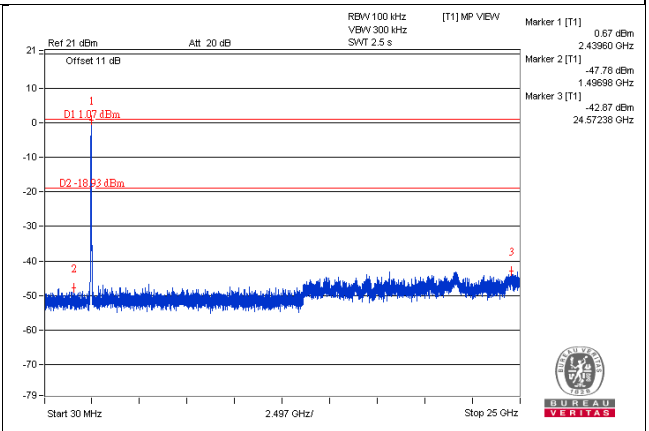
CH 3



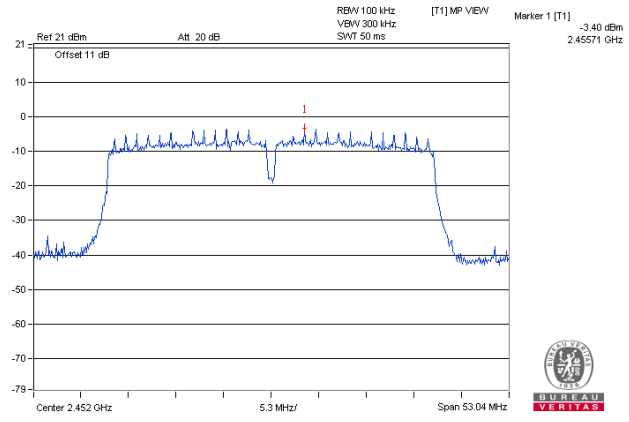


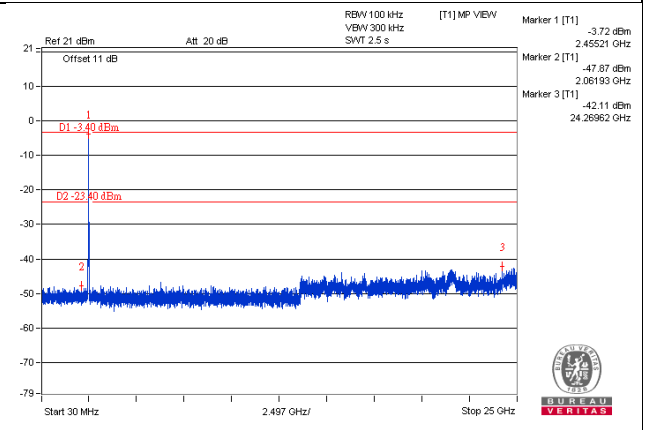
CH 6



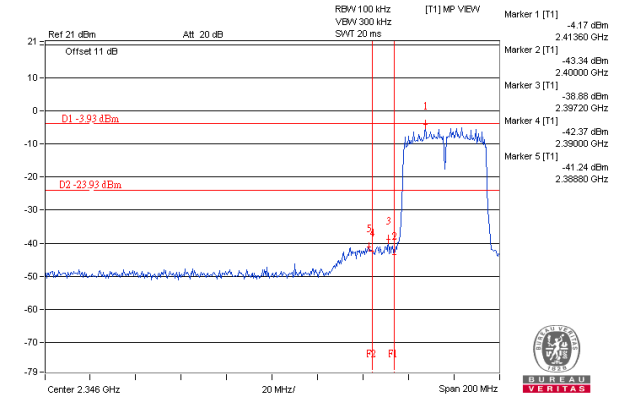


CH 9

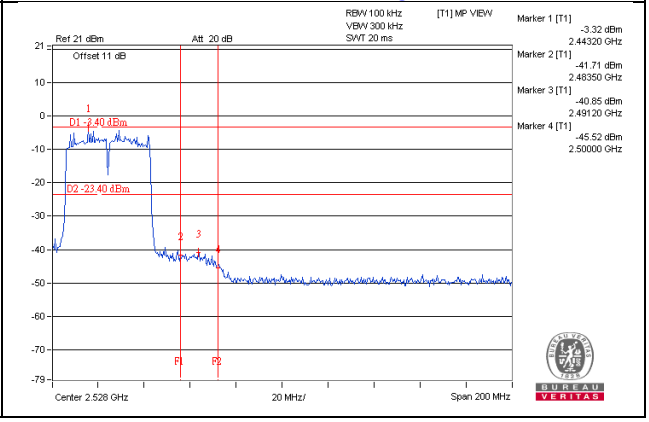




CH 3 Band edge

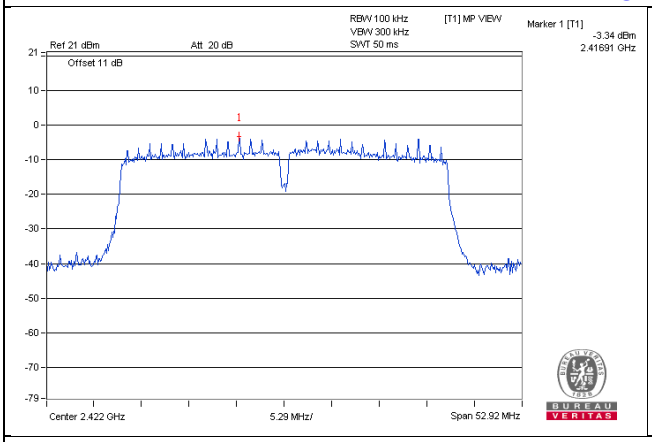


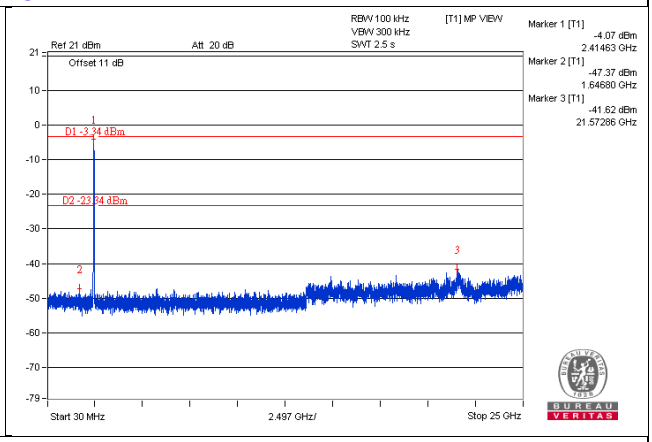
CH 9 Band edge



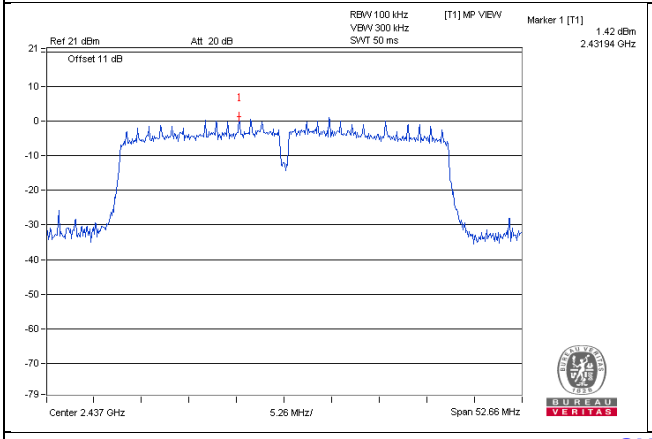
Chain 1

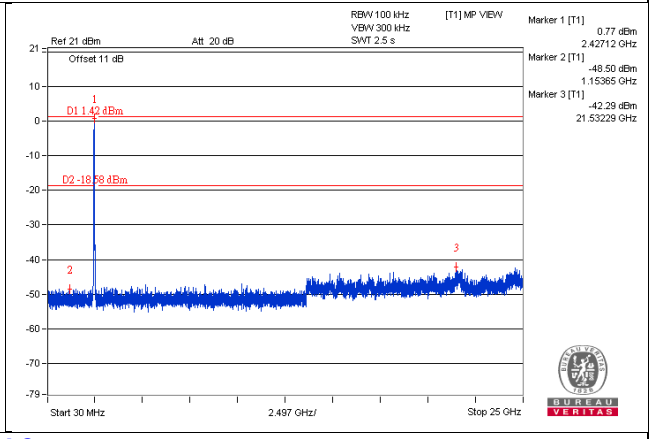
CH 3



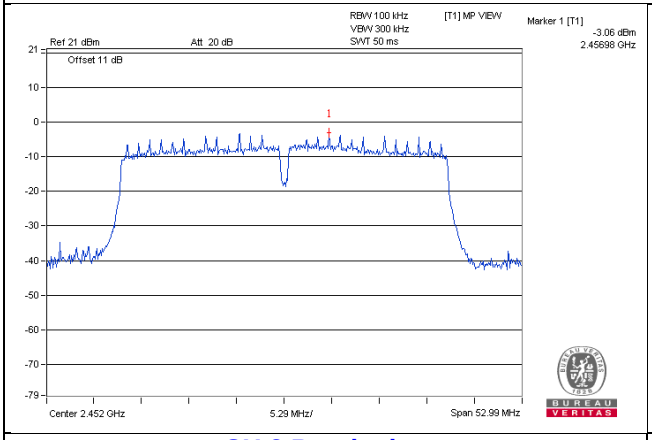


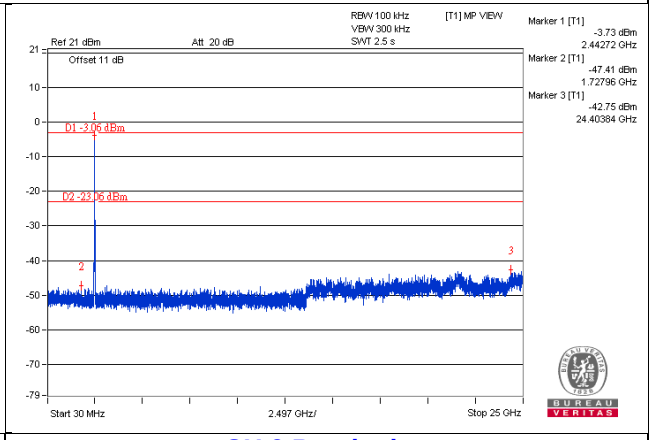
CH 6



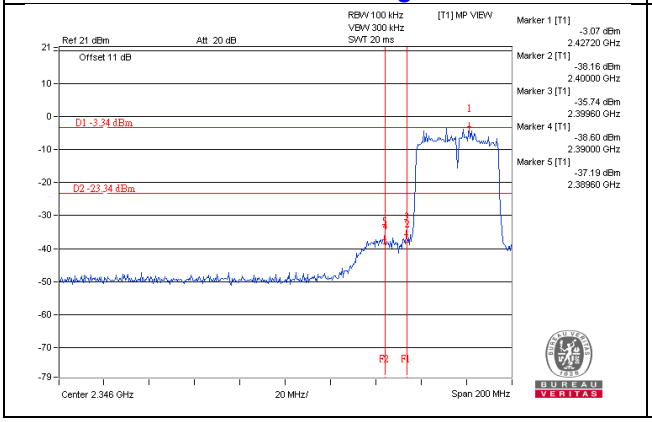


CH 9

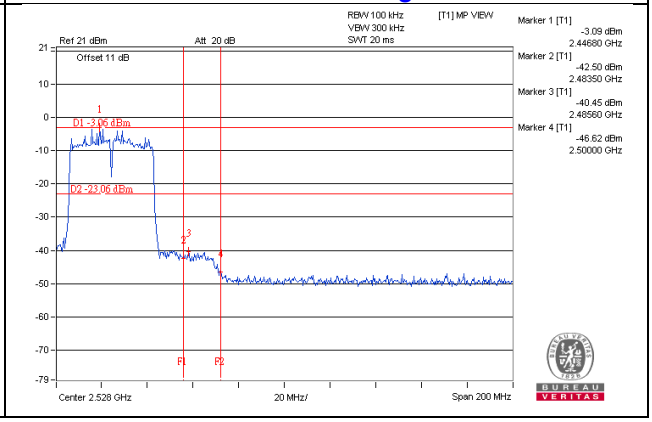




CH 3 Band edge



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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Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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