FCC Test Report

Report No.: RF170913E07

FCC ID: I88EMG2881-T20A

Test Model: EMG2881-T20A

Received Date: Sep. 13, 2017

Test Date: Oct. 02 to 06, 2017

Issued Date: Jan. 09, 2018

Applicant: Zyxel Communications Corporation

Address: No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, 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 : E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

FCC Registration / Designation Number: 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF170913E07	Original release.	Jan. 09, 2018

1 Certificate of Conformity

Product: Dual Band Wireless AC1300 Gigabit Ethernet Gateway

Brand: ZYXEL

Test Model: EMG2881-T20A

Sample Status: ENGINEERING SAMPLE

Applicant: Zyxel Communications Corporation

Test Date: Oct. 02 to 06, 2017

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:** Jan. 09, 2018

Cindy Hsin / Specialist

Approved by : , **Date:** Jan. 09, 2018

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 -15.06dB at 0.88438MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.14 dB
	6GHz ~ 18GHz	5.04 dB
	18GHz ~ 40GHz	5.25 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Dual Band Wireless AC1300 Gigabit Ethernet Gateway
Brand	ZYXEL
Test Model	EMG2881-T20A
RF CPU Model No.	MT7621
RF Chip Model No.	**2.4GHz:** MT7615D **5GHz:** MT7615D
FW	V3.10(ABKX.0)b1
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from Adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode.
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:** 5.18GHz ~ 5.24GHz, 5.745GHz ~ 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:** 579.966mW **5.18 ~ 5.24GHz** **CDD Mode:** 880.11mW **Beamforming Mode:** 773.666mW **5.745 ~ 5.825GHz** **CDD Mode:** 684.156mW **Beamforming Mode:** 684.156mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	Ethernet cable x 1 (Unshielded, 1.5m)

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 EUT power needs to be supplied from power adapters, the information is as below table:

Brand	Model No.	Spec.
Frecom	F18L10-120150SPAU	Input: 100-240V, 0.6A, 50/60Hz Output: 12V, 1.5A DC Cable (unshielded, 1.5m)

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

Transmitter Circuit.	Brand	Model	Antenna Gain(dBi) Including cable loss	Frequency range	Antenna Type	Connecter Type	Cable Length
Chain 0	CINGXIN	A176-17042802	2.97	2.4~2.4835GHz	PCB	i-pex(MHF)	60mm
			2.99	5.15~5.85GHz			
Chain 1	CINGXIN	A176-17042801	2.75	2.4~2.4835GHz	PCB	i-pex(MHF)	150mm
			2.97	5.15~5.85GHz			

4. The EUT incorporates a MIMO function:

For 2.4GHz					
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**		**NON-TXBF Mode**	**TXBF Mode**
802.11b	1 ~ 11Mbps	2TX	2RX	v	-
802.11g	6 ~ 54Mbps	2TX	2RX	v	-
802.11n (HT20)	MCS 0~7	2TX	2RX	v	-
	MCS 8~15	2TX	2RX	v	-
802.11n (HT40)	MCS 0~7	2TX	2RX	v	-
	MCS 8~15	2TX	2RX	v	-
For 5GHz					
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**		**NON-TXBF Mode**	**TXBF Mode**
802.11a	6 ~ 54Mbps	2TX	2RX	v	-
802.11n (HT20)	MCS 0~7	2TX	2RX	v	v
	MCS 8~15	2TX	2RX	v	v
802.11n (HT40)	MCS 0~7	2TX	2RX	v	v
	MCS 8~15	2TX	2RX	v	v
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX	v	v
	MCS0~8 Nss=2	2TX	2RX	v	v
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX	v	v
	MCS0~9 Nss=2	2TX	2RX	v	v
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX	v	v
	MCS0~9 Nss=2	2TX	2RX	v	v

Note:
1. All of modulation mode support beamforming function except 2.4GHz and 802.11a modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

5. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting
802.11b	2412	29
	2437	29
	2462	29
802.11g	2412	21
	2437	2E
	2462	21
802.11n(HT20)	2412	21
	2437	2E
	2462	21
802.11n(HT40)	2422	1C
	2437	20
	2452	1C

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):

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	
-	√	√	√	√	-

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

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.

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.

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.

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.

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

Test Condition:

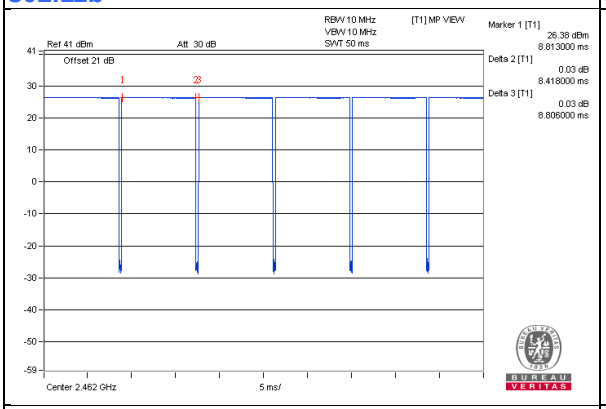
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 67%RH	120Vac, 60Hz	Rey Chen
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

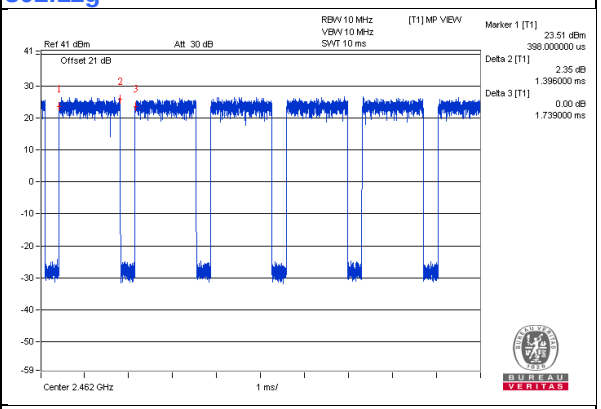
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 8.418/8.806 = 0.956, Duty factor = 10 * log(1/0.956) = 0.2
802.11g: Duty cycle = 1.396/1.739 = 0.803, Duty factor = 10 * log(1/0.803) = 0.95
802.11n (HT20): Duty cycle = 1.307/1.643 = 0.795, Duty factor = 10 * log(1/0.795) = 0.99
802.11n (HT40): Duty cycle = 0.646/0.998 = 0.647, Duty factor = 10 * log(1/0.647) = 1.89

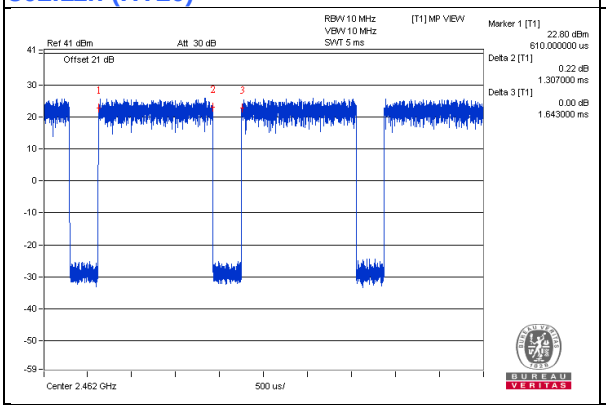
802.11b



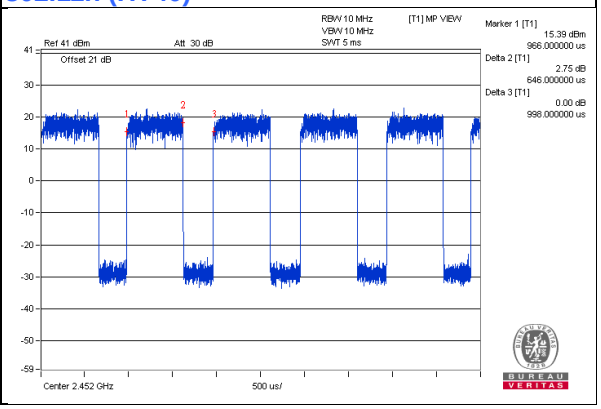
802.11g



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.

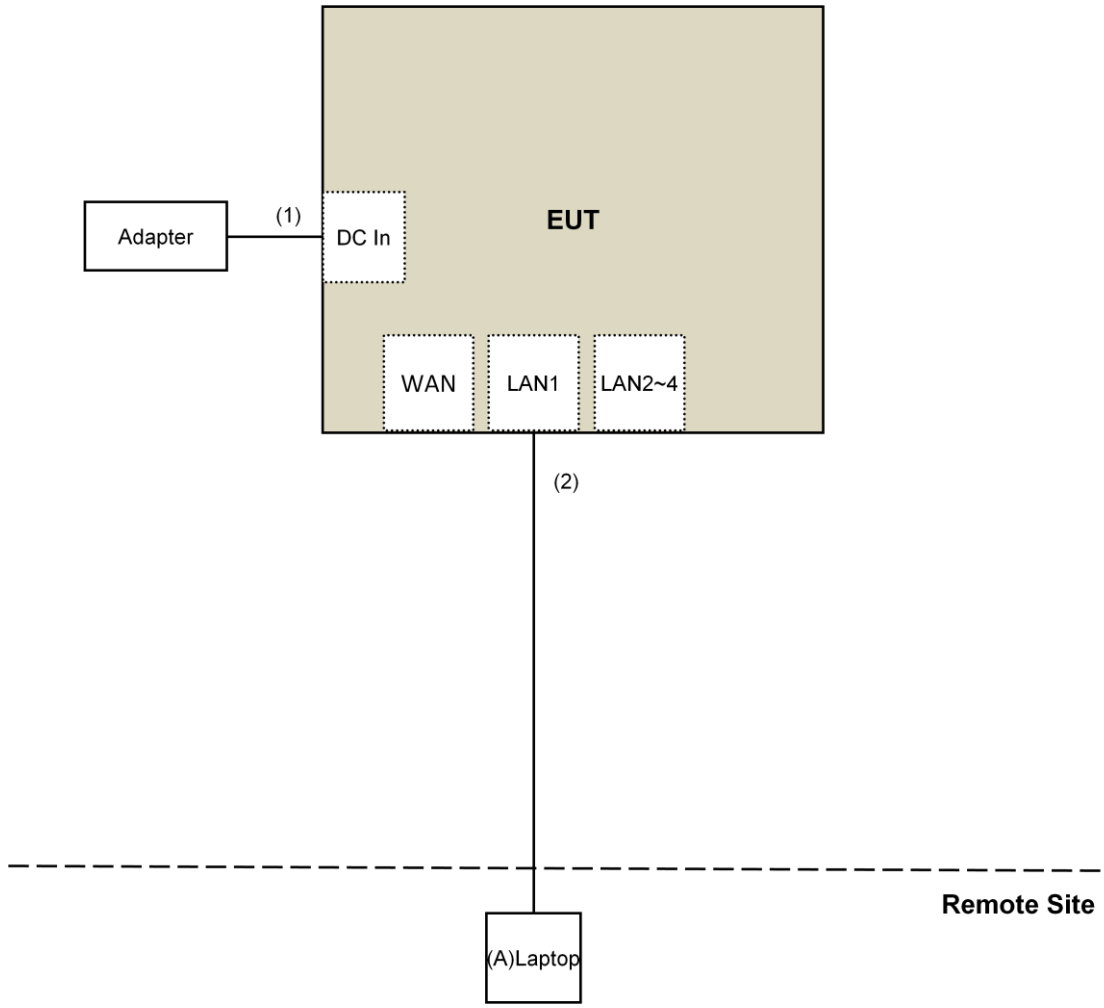
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

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.	DC Cable	1	1.5	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



Note: The test configuration was defined by the client requirement.

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 v04
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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSv40	100964	July 01, 2017	June 30, 2018
Power meter Anritsu	ML2495A	0824006	June 26, 2017	June 25, 2018
Power sensor Anritsu	MA2411B	0738172	June 26, 2017	June 25, 2018

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. 3.
4. Loop antenna was used for all emissions below 30 MHz.
5 The CANADA Site Registration No. is 20331-1
6. Tested Date: Oct. 05, 2017

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:

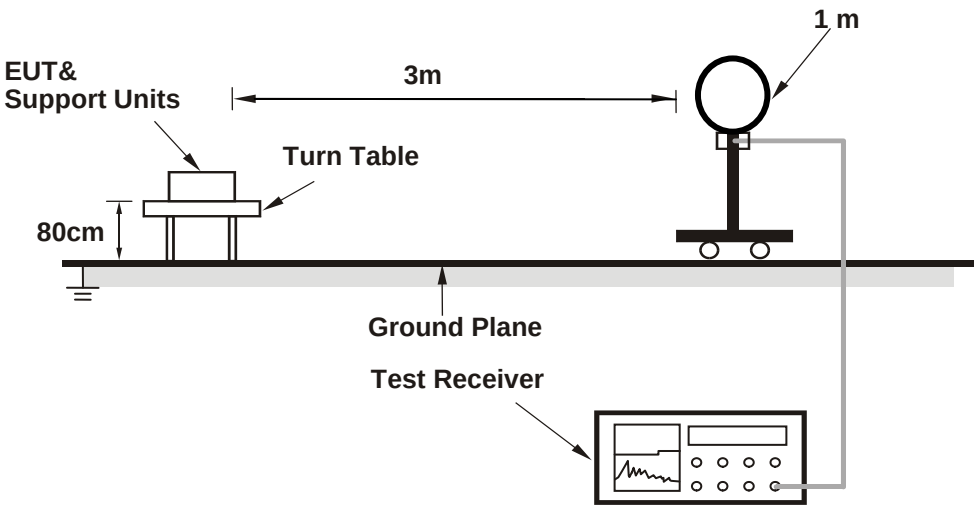
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

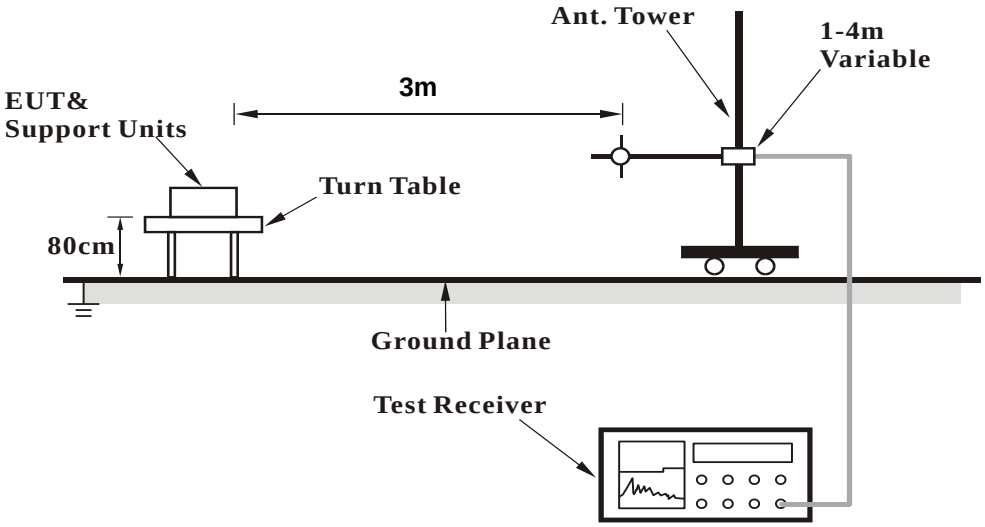
No deviation.

4.1.5 Test Setup

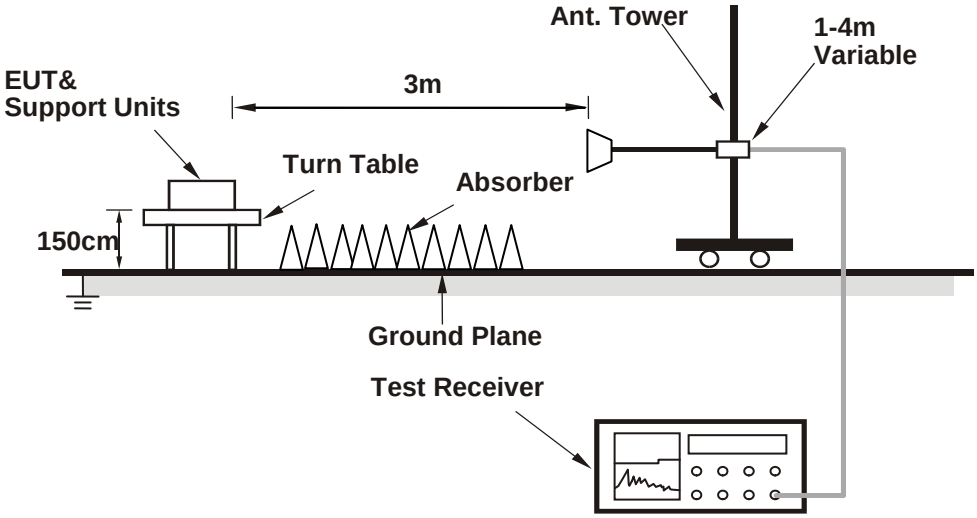
For Radiated emission below 30MHz



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. Controlling software (MT7615 QA 0.0.1.71) 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	62.9 PK	74.0	-11.1	2.06 H	353	64.5	-1.6
2	2390.00	53.2 AV	54.0	-0.8	2.06 H	353	54.8	-1.6
3	*2412.00	114.3 PK			2.06 H	353	115.8	-1.5
4	*2412.00	112.2 AV			2.06 H	353	113.7	-1.5
5	4824.00	40.5 PK	74.0	-33.5	1.48 H	9	37.5	3.0
6	4824.00	30.4 AV	54.0	-23.6	1.48 H	9	27.4	3.0
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	57.2 PK	74.0	-16.8	1.25 V	117	58.8	-1.6
2	2390.00	43.8 AV	54.0	-10.2	1.25 V	117	45.4	-1.6
3	*2412.00	108.0 PK			1.25 V	117	109.5	-1.5
4	*2412.00	105.2 AV			1.25 V	117	106.7	-1.5
5	4824.00	42.0 PK	74.0	-32.0	3.03 V	325	39.0	3.0
6	4824.00	31.2 AV	54.0	-22.8	3.03 V	325	28.2	3.0

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	2390.00	60.8 PK	74.0	-13.2	2.23 H	360	62.4	-1.6
2	2390.00	53.3 AV	54.0	-0.7	2.23 H	360	54.9	-1.6
3	*2437.00	114.4 PK			2.23 H	360	115.9	-1.5
4	*2437.00	112.1 AV			2.23 H	360	113.6	-1.5
5	2483.50	60.5 PK	74.0	-13.5	2.23 H	360	61.9	-1.4
6	2483.50	48.9 AV	54.0	-5.1	2.23 H	360	50.3	-1.4
7	4874.00	40.6 PK	74.0	-33.4	1.43 H	25	37.4	3.2
8	4874.00	30.9 AV	54.0	-23.1	1.43 H	25	27.7	3.2
9	7311.00	46.7 PK	74.0	-27.3	2.54 H	353	37.8	8.9
10	7311.00	37.7 AV	54.0	-16.3	2.54 H	353	28.8	8.9
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	57.3 PK	74.0	-16.7	1.18 V	119	58.9	-1.6
2	2390.00	43.9 AV	54.0	-10.1	1.18 V	119	45.5	-1.6
3	*2437.00	107.8 PK			1.18 V	119	109.3	-1.5
4	*2437.00	105.1 AV			1.18 V	119	106.6	-1.5
5	2483.50	56.2 PK	74.0	-17.8	1.18 V	119	57.6	-1.4
6	2483.50	43.3 AV	54.0	-10.7	1.18 V	119	44.7	-1.4
7	4874.00	41.8 PK	74.0	-32.2	3.02 V	331	38.6	3.2
8	4874.00	31.5 AV	54.0	-22.5	3.02 V	331	28.3	3.2
9	7311.00	48.2 PK	74.0	-25.8	3.33 V	120	39.3	8.9
10	7311.00	42.6 AV	54.0	-11.4	3.33 V	120	33.7	8.9

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	114.5 PK			2.19 H	360	115.9	-1.4
2	*2462.00	112.2 AV			2.19 H	360	113.6	-1.4
3	2483.50	61.7 PK	74.0	-12.3	2.19 H	360	63.1	-1.4
4	2483.50	53.1 AV	54.0	-0.9	2.19 H	360	54.5	-1.4
5	4924.00	40.2 PK	74.0	-33.8	1.47 H	40	36.9	3.3
6	4924.00	30.5 AV	54.0	-23.5	1.47 H	40	27.2	3.3
7	7386.00	46.3 PK	74.0	-27.7	2.53 H	358	37.2	9.1
8	7386.00	37.4 AV	54.0	-16.6	2.53 H	358	28.3	9.1
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	107.4 PK			1.19 V	133	108.8	-1.4
2	*2462.00	104.9 AV			1.19 V	133	106.3	-1.4
3	2483.50	55.9 PK	74.0	-18.1	1.19 V	133	57.3	-1.4
4	2483.50	43.6 AV	54.0	-10.4	1.19 V	133	45.0	-1.4
5	4924.00	41.6 PK	74.0	-32.4	3.05 V	336	38.3	3.3
6	4924.00	31.1 AV	54.0	-22.9	3.05 V	336	27.8	3.3
7	7386.00	48.9 PK	74.0	-25.1	3.38 V	10	39.8	9.1
8	7386.00	43.1 AV	54.0	-10.9	3.38 V	10	34.0	9.1

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	68.0 PK	74.0	-6.0	2.60 H	360	69.6	-1.6
2	2390.00	53.1 AV	54.0	-0.9	2.60 H	360	54.7	-1.6
3	*2412.00	114.2 PK			2.60 H	360	115.7	-1.5
4	*2412.00	104.8 AV			2.60 H	360	106.3	-1.5
5	4824.00	40.5 PK	74.0	-33.5	1.49 H	12	37.5	3.0
6	4824.00	30.7 AV	54.0	-23.3	1.49 H	12	27.7	3.0
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	60.3 PK	74.0	-13.7	1.20 V	125	61.9	-1.6
2	2390.00	44.5 AV	54.0	-9.5	1.20 V	125	46.1	-1.6
3	*2412.00	107.1 PK			1.20 V	125	108.6	-1.5
4	*2412.00	97.5 AV			1.20 V	125	99.0	-1.5
5	4824.00	41.9 PK	74.0	-32.1	2.98 V	334	38.9	3.0
6	4824.00	31.4 AV	54.0	-22.6	2.98 V	334	28.4	3.0

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	2390.00	63.6 PK	74.0	-10.4	2.57 H	360	65.2	-1.6
2	2390.00	53.3 AV	54.0	-0.7	2.57 H	360	54.9	-1.6
3	*2437.00	119.2 PK			2.57 H	360	120.7	-1.5
4	*2437.00	109.7 AV			2.57 H	360	111.2	-1.5
5	2483.50	63.1 PK	74.0	-10.9	2.57 H	360	64.5	-1.4
6	2483.50	50.6 AV	54.0	-3.4	2.57 H	360	52.0	-1.4
7	4874.00	40.4 PK	74.0	-33.6	1.53 H	9	37.2	3.2
8	4874.00	30.6 AV	54.0	-23.4	1.53 H	9	27.4	3.2
9	7311.00	50.2 PK	74.0	-23.8	2.58 H	360	41.3	8.9
10	7311.00	35.6 AV	54.0	-18.4	2.58 H	360	26.7	8.9
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	50.2 PK	74.0	-23.8	1.25 V	122	51.8	-1.6
2	2390.00	43.3 AV	54.0	-10.7	1.25 V	122	44.9	-1.6
3	*2437.00	112.0 PK			1.25 V	122	113.5	-1.5
4	*2437.00	102.3 AV			1.25 V	122	103.8	-1.5
5	2483.50	56.1 PK	74.0	-17.9	1.25 V	122	57.5	-1.4
6	2483.50	43.0 AV	54.0	-11.0	1.25 V	122	44.4	-1.4
7	4874.00	42.2 PK	74.0	-31.8	2.97 V	335	39.0	3.2
8	4874.00	31.5 AV	54.0	-22.5	2.97 V	335	28.3	3.2
9	7311.00	56.8 PK	74.0	-17.2	3.39 V	5	47.9	8.9
10	7311.00	41.1 AV	54.0	-12.9	3.39 V	5	32.2	8.9

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	114.0 PK			2.49 H	360	115.4	-1.4
2	*2462.00	105.2 AV			2.49 H	360	106.6	-1.4
3	2483.50	70.1 PK	74.0	-3.9	2.49 H	360	71.5	-1.4
4	2483.50	53.4 AV	54.0	-0.6	2.49 H	360	54.8	-1.4
5	4924.00	41.1 PK	74.0	-32.9	1.52 H	24	37.8	3.3
6	4924.00	30.5 AV	54.0	-23.5	1.52 H	24	27.2	3.3
7	7386.00	44.8 PK	74.0	-29.2	2.55 H	359	35.7	9.1
8	7386.00	32.1 AV	54.0	-21.9	2.55 H	359	23.0	9.1
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	107.5 PK			1.16 V	121	108.9	-1.4
2	*2462.00	97.9 AV			1.16 V	121	99.3	-1.4
3	2483.50	62.9 PK	74.0	-11.1	1.16 V	121	64.3	-1.4
4	2483.50	44.8 AV	54.0	-9.2	1.16 V	121	46.2	-1.4
5	4924.00	42.5 PK	74.0	-31.5	2.98 V	337	39.2	3.3
6	4924.00	31.7 AV	54.0	-22.3	2.98 V	337	28.4	3.3
7	7386.00	51.3 PK	74.0	-22.7	3.43 V	5	42.2	9.1
8	7386.00	36.8 AV	54.0	-17.2	3.43 V	5	27.7	9.1

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	69.3 PK	74.0	-4.7	2.66 H	360	70.9	-1.6
2	2390.00	53.4 AV	54.0	-0.6	2.66 H	360	55.0	-1.6
3	*2412.00	111.8 PK			2.66 H	360	113.3	-1.5
4	*2412.00	103.6 AV			2.66 H	360	105.1	-1.5
5	4824.00	41.4 PK	74.0	-32.6	1.52 H	4	38.4	3.0
6	4824.00	31.2 AV	54.0	-22.8	1.52 H	4	28.2	3.0
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	61.5 PK	74.0	-12.5	1.16 V	115	63.1	-1.6
2	2390.00	44.8 AV	54.0	-9.2	1.16 V	115	46.4	-1.6
3	*2412.00	105.6 PK			1.16 V	115	107.1	-1.5
4	*2412.00	96.3 AV			1.16 V	115	97.8	-1.5
5	4824.00	42.1 PK	74.0	-31.9	2.99 V	324	39.1	3.0
6	4824.00	31.7 AV	54.0	-22.3	2.99 V	324	28.7	3.0

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	2390.00	66.1 PK	74.0	-7.9	2.72 H	360	67.7	-1.6
2	**2390.00**	**53.5 AV**	**54.0**	**-0.5**	**2.72 H**	**360**	**55.1**	**-1.6**
3	*2437.00	116.6 PK			2.72 H	360	118.1	-1.5
4	*2437.00	107.7 AV			2.72 H	360	109.2	-1.5
5	2483.50	65.4 PK	74.0	-8.6	2.72 H	360	66.8	-1.4
6	2483.50	50.6 AV	54.0	-3.4	2.72 H	360	52.0	-1.4
7	4874.00	41.0 PK	74.0	-33.0	1.56 H	17	37.8	3.2
8	4874.00	30.7 AV	54.0	-23.3	1.56 H	17	27.5	3.2
9	7311.00	50.1 PK	74.0	-23.9	2.55 H	355	41.2	8.9
10	7311.00	35.3 AV	54.0	-18.7	2.55 H	355	26.4	8.9
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	50.1 PK	74.0	-23.9	1.11 V	123	51.7	-1.6
2	2390.00	43.2 AV	54.0	-10.8	1.11 V	123	44.8	-1.6
3	*2437.00	110.4 PK			1.11 V	123	111.9	-1.5
4	*2437.00	100.4 AV			1.11 V	123	101.9	-1.5
5	2483.50	50.6 PK	74.0	-23.4	1.11 V	123	52.0	-1.4
6	2483.50	43.5 AV	54.0	-10.5	1.11 V	123	44.9	-1.4
7	4874.00	41.7 PK	74.0	-32.3	2.94 V	346	38.5	3.2
8	4874.00	31.3 AV	54.0	-22.7	2.94 V	346	28.1	3.2
9	7311.00	56.8 PK	74.0	-17.2	3.37 V	2	47.9	8.9
10	7311.00	41.3 AV	54.0	-12.7	3.37 V	2	32.4	8.9

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	112.9 PK			2.72 H	360	114.3	-1.4
2	*2462.00	104.3 AV			2.72 H	360	105.7	-1.4
3	2483.50	69.8 PK	74.0	-4.2	2.72 H	360	71.2	-1.4
4	2483.50	53.4 AV	54.0	-0.6	2.72 H	360	54.8	-1.4
5	4924.00	40.8 PK	74.0	-33.2	1.48 H	9	37.5	3.3
6	4924.00	30.2 AV	54.0	-23.8	1.48 H	9	26.9	3.3
7	7386.00	44.7 PK	74.0	-29.3	2.55 H	347	35.6	9.1
8	7386.00	31.9 AV	54.0	-22.1	2.55 H	347	22.8	9.1
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	106.6 PK			1.10 V	126	108.0	-1.4
2	*2462.00	97.1 AV			1.10 V	126	98.5	-1.4
3	2483.50	62.5 PK	74.0	-11.5	1.10 V	126	63.9	-1.4
4	2483.50	44.6 AV	54.0	-9.4	1.10 V	126	46.0	-1.4
5	4924.00	42.1 PK	74.0	-31.9	2.95 V	347	38.8	3.3
6	4924.00	31.3 AV	54.0	-22.7	2.95 V	347	28.0	3.3
7	7386.00	51.5 PK	74.0	-22.5	3.40 V	9	42.4	9.1
8	7386.00	37.2 AV	54.0	-16.8	3.40 V	9	28.1	9.1

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	70.4 PK	74.0	-3.6	2.34 H	342	72.0	-1.6
2	2390.00	53.4 AV	54.0	-0.6	2.34 H	342	55.0	-1.6
3	*2422.00	108.4 PK			2.34 H	342	110.0	-1.6
4	*2422.00	100.0 AV			2.34 H	342	101.6	-1.6
5	4844.00	41.3 PK	74.0	-32.7	1.48 H	3	38.2	3.1
6	4844.00	30.9 AV	54.0	-23.1	1.48 H	3	27.8	3.1
7	7266.00	44.8 PK	74.0	-29.2	2.54 H	345	35.9	8.9
8	7266.00	31.8 AV	54.0	-22.2	2.54 H	345	22.9	8.9
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	62.1 PK	74.0	-11.9	1.14 V	141	63.7	-1.6
2	2390.00	44.7 AV	54.0	-9.3	1.14 V	141	46.3	-1.6
3	*2422.00	102.1 PK			1.14 V	141	103.7	-1.6
4	*2422.00	92.8 AV			1.14 V	141	94.4	-1.6
5	4844.00	42.0 PK	74.0	-32.0	2.90 V	356	38.9	3.1
6	4844.00	31.7 AV	54.0	-22.3	2.90 V	356	28.6	3.1
7	7266.00	45.2 PK	74.0	-28.8	3.42 V	10	36.3	8.9
8	7266.00	32.5 AV	54.0	-21.5	3.42 V	10	23.6	8.9

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	2390.00	65.2 PK	74.0	-8.8	2.36 H	342	66.8	-1.6
2	2390.00	53.4 AV	54.0	-0.6	2.36 H	342	55.0	-1.6
3	*2437.00	110.1 PK			2.36 H	342	111.6	-1.5
4	*2437.00	102.1 AV			2.36 H	342	103.6	-1.5
5	2483.50	64.9 PK	74.0	-9.1	2.36 H	342	66.3	-1.4
6	2483.50	49.8 AV	54.0	-4.2	2.36 H	342	51.2	-1.4
7	4874.00	41.6 PK	74.0	-32.4	1.44 H	0	38.4	3.2
8	4874.00	31.2 AV	54.0	-22.8	1.44 H	0	28.0	3.2
9	7311.00	44.3 PK	74.0	-29.7	2.56 H	334	35.4	8.9
10	7311.00	31.3 AV	54.0	-22.7	2.56 H	334	22.4	8.9
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	50.5 PK	74.0	-23.5	1.11 V	148	52.1	-1.6
2	2390.00	43.4 AV	54.0	-10.6	1.11 V	148	45.0	-1.6
3	*2437.00	103.9 PK			1.11 V	148	105.4	-1.5
4	*2437.00	94.9 AV			1.11 V	148	96.4	-1.5
5	2483.50	50.4 PK	74.0	-23.6	1.11 V	148	51.8	-1.4
6	2483.50	43.5 AV	54.0	-10.5	1.11 V	148	44.9	-1.4
7	4874.00	42.0 PK	74.0	-32.0	2.88 V	357	38.8	3.2
8	4874.00	32.0 AV	54.0	-22.0	2.88 V	357	28.8	3.2
9	7311.00	47.6 PK	74.0	-26.4	3.46 V	4	38.7	8.9
10	7311.00	34.8 AV	54.0	-19.2	3.46 V	4	25.9	8.9

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	107.0 PK			2.36 H	348	108.5	-1.5
2	*2452.00	99.5 AV			2.36 H	348	101.0	-1.5
3	2483.50	69.8 PK	74.0	-4.2	2.36 H	348	71.2	-1.4
4	2483.50	53.3 AV	54.0	-0.7	2.36 H	348	54.7	-1.4
5	4904.00	41.2 PK	74.0	-32.8	1.48 H	19	38.0	3.2
6	4904.00	31.0 AV	54.0	-23.0	1.48 H	19	27.8	3.2
7	7356.00	44.8 PK	74.0	-29.2	2.52 H	355	35.7	9.1
8	7356.00	32.1 AV	54.0	-21.9	2.52 H	355	23.0	9.1
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	100.8 PK			1.17 V	143	102.3	-1.5
2	*2452.00	92.3 AV			1.17 V	143	93.8	-1.5
3	2483.50	62.7 PK	74.0	-11.3	1.17 V	143	64.1	-1.4
4	2483.50	44.7 AV	54.0	-9.3	1.17 V	143	46.1	-1.4
5	4904.00	42.3 PK	74.0	-31.7	2.88 V	350	39.1	3.2
6	4904.00	31.9 AV	54.0	-22.1	2.88 V	350	28.7	3.2
7	7356.00	44.8 PK	74.0	-29.2	3.46 V	17	35.7	9.1
8	7356.00	32.0 AV	54.0	-22.0	3.46 V	17	22.9	9.1

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:

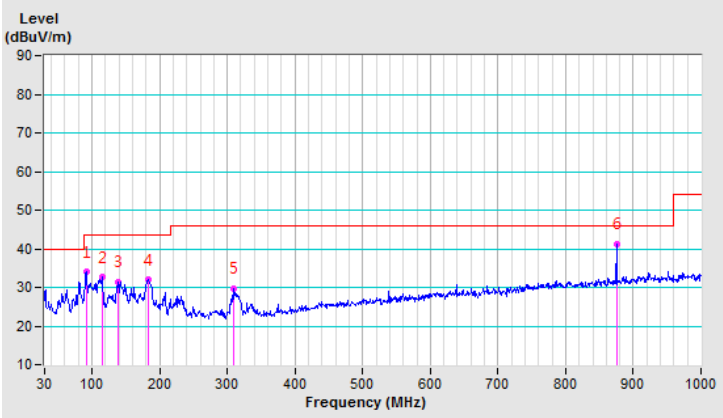
802.11g

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	91.45	33.9 QP	43.5	-9.6	2.00 H	304	47.7	-13.8
2	114.61	32.6 QP	43.5	-10.9	2.50 H	91	43.3	-10.7
3	139.34	31.3 QP	43.5	-12.2	2.00 H	271	39.9	-8.6
4	182.73	31.9 QP	43.5	-11.6	1.50 H	194	41.9	-10.0
5	310.11	29.6 QP	46.0	-16.4	1.00 H	140	36.7	-7.1
6	874.99	41.2 QP	46.0	-4.8	1.00 H	142	38.6	2.6

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

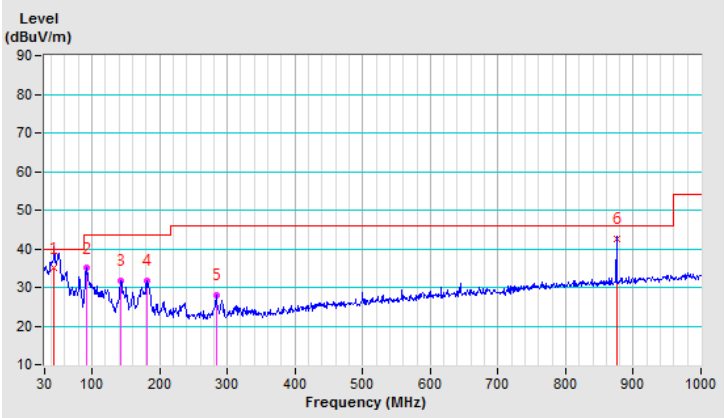


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	44.11	35.0 QP	40.0	-5.0	1.00 V	360	43.2	-8.2
2	91.64	35.0 QP	43.5	-8.5	2.00 V	336	48.8	-13.8
3	142.71	31.7 QP	43.5	-11.8	1.00 V	79	40.0	-8.3
4	181.15	31.8 QP	43.5	-11.7	1.00 V	315	41.7	-9.9
5	283.53	28.0 QP	46.0	-18.0	1.50 V	210	36.0	-8.0
6	874.99	42.6 QP	46.0	-3.4	1.50 V	356	40.0	2.6

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



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	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
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. 1.
3 Tested Date: Oct. 06, 2017

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.

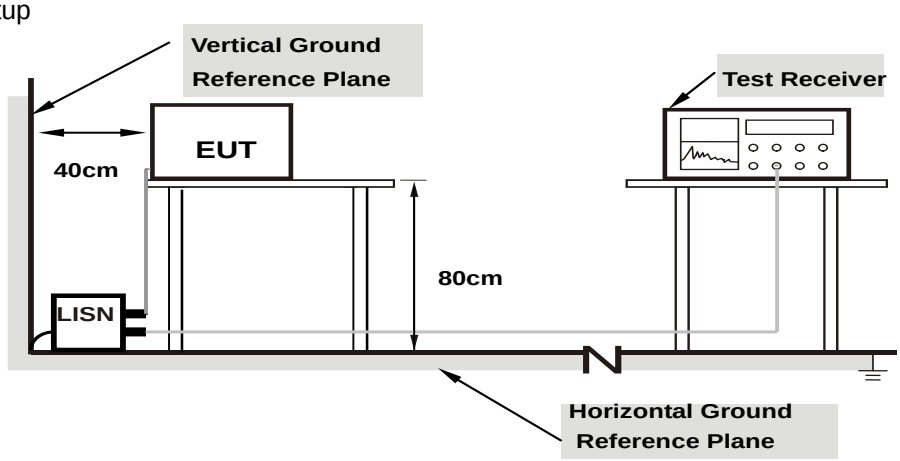
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

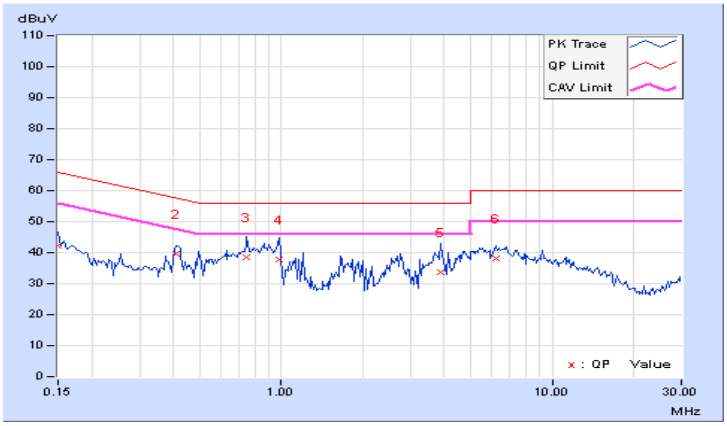
4.2.7 Test Results

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	10.08	32.18	20.68	42.26	30.76	66.00	56.00	-23.74	-25.24
2	0.41172	10.12	29.37	21.35	39.49	31.47	57.61	47.61	-18.12	-16.14
3	0.74766	10.14	28.22	19.67	38.36	29.81	56.00	46.00	-17.64	-16.19
4	0.97813	10.16	27.47	19.20	37.63	29.36	56.00	46.00	-18.37	-16.64
5	3.89844	10.36	23.51	17.76	33.87	28.12	56.00	46.00	-22.13	-17.88
6	6.21094	10.52	27.76	20.83	38.28	31.35	60.00	50.00	-21.72	-18.65

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.

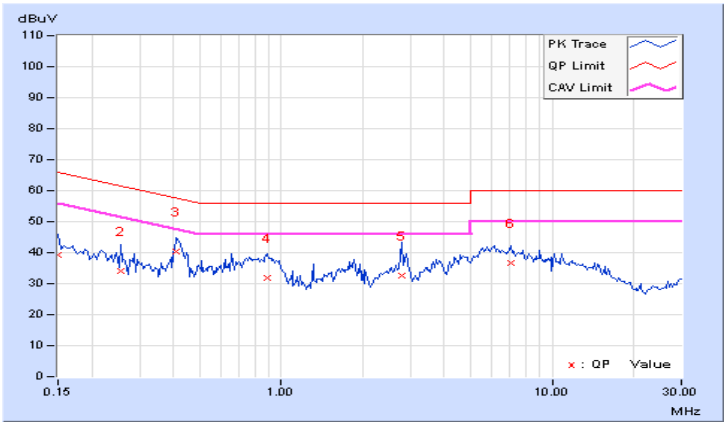


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.07	29.32	20.81	39.39	30.88	66.00	56.00	-26.61	-25.12
2	0.25547	10.06	23.96	18.33	34.02	28.39	61.58	51.58	-27.56	-23.19
3	0.41172	10.12	30.33	21.47	40.45	31.59	57.61	47.61	-17.16	-16.02
4	**0.88438**	**10.12**	**21.66**	**20.82**	**31.78**	**30.94**	**56.00**	**46.00**	**-24.22**	**-15.06**
5	2.79688	10.23	22.33	14.04	32.56	24.27	56.00	46.00	-23.44	-21.73
6	7.05859	10.49	26.10	20.19	36.59	30.68	60.00	50.00	-23.41	-19.32

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.

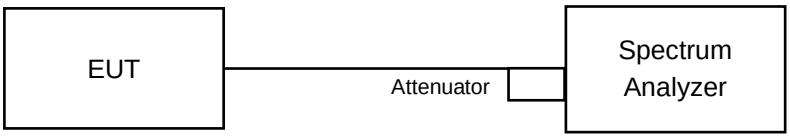


4.3 6dB Bandwidth Measurement

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 from Test 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	9.03	9.02	0.5	PASS
6	2437	9.07	9.09	0.5	PASS
11	2462	9.14	9.09	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.06	15.17	0.5	PASS
6	2437	15.17	15.15	0.5	PASS
11	2462	15.17	15.17	0.5	PASS

802.11n (HT20)

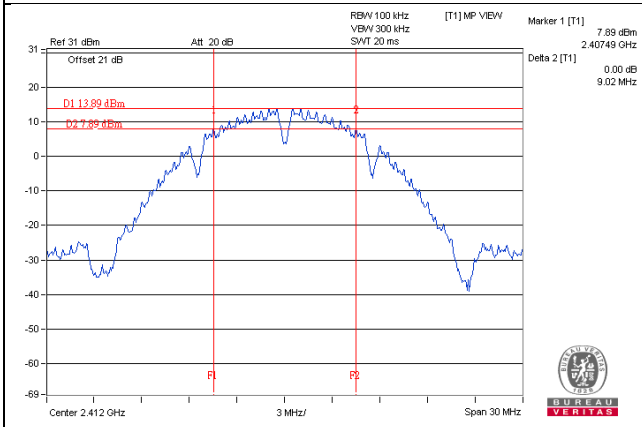
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.17	15.17	0.5	Pass
6	2437	15.16	15.14	0.5	Pass
11	2462	15.14	15.16	0.5	Pass

802.11n (HT40)

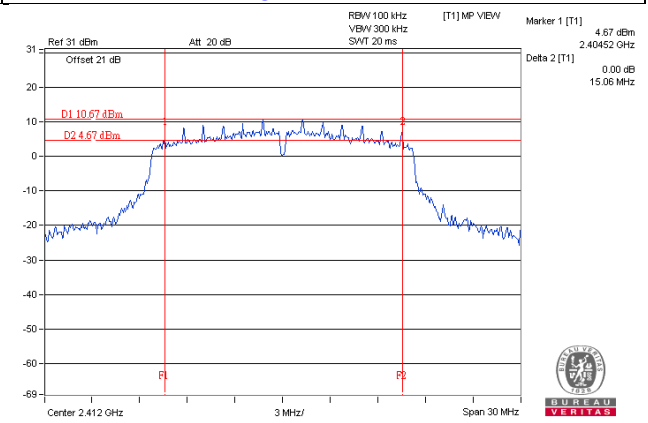
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.15	35.15	0.5	Pass
6	2437	35.18	35.22	0.5	Pass
9	2452	35.16	35.26	0.5	Pass

Spectrum Plot of Worst Value

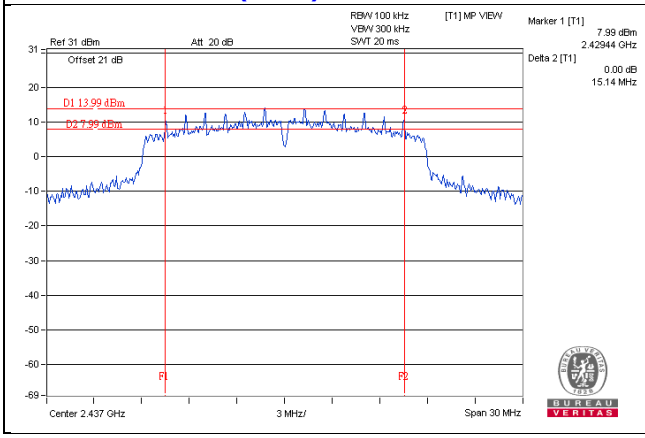
802.11b / Chain 1 : CH1



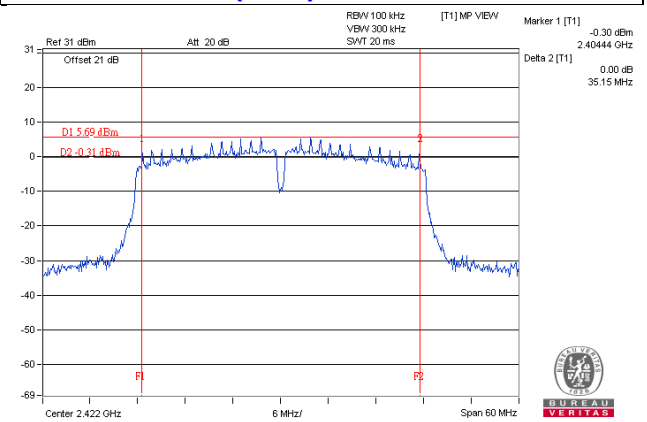
802.11g / Chain 0 : CH1



802.11n (HT20) / Chain 1 : CH6



802.11n (HT40) / Chain 0 : CH3



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

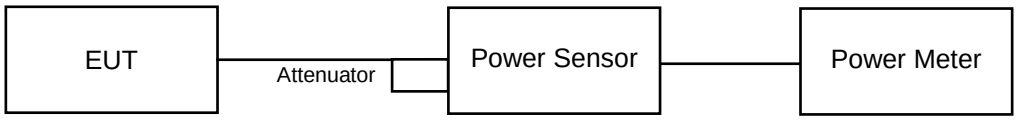
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 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

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.06	23.47	477.014	26.79	30.00	Pass
6	2437	23.93	23.33	462.45	26.65	30.00	Pass
11	2462	24.14	23.40	478.194	26.80	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	20.48	20.03	212.379	23.27	30.00	Pass
6	2437	24.80	24.44	579.966	27.63	30.00	Pass
11	2462	20.94	20.32	231.812	23.65	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	19.56	19.27	174.893	22.43	30.00	Pass
6	2437	24.04	23.93	500.685	27.00	30.00	Pass
11	2462	19.84	19.47	184.895	22.67	30.00	Pass

802.11n (HT40)

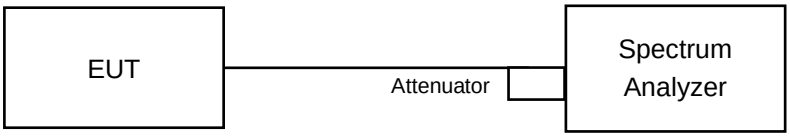
Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.48	16.90	104.954	20.21	30.00	Pass
6	2437	19.01	18.92	157.599	21.98	30.00	Pass
9	2452	17.58	16.92	106.484	20.27	30.00	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

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) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

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 W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-7.07	3.01	0.20	-3.86	8.00	Pass
	6	2437	-7.32	3.01	0.20	-4.11	8.00	Pass
	11	2462	-6.94	3.01	0.20	-3.73	8.00	Pass
1	1	2412	-7.69	3.01	0.20	-4.48	8.00	Pass
	6	2437	-7.01	3.01	0.20	-3.80	8.00	Pass
	11	2462	-7.51	3.01	0.20	-4.30	8.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.87dBi < 6dBi , so the power density limit shall not be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.40	3.01	0.95	-7.44	8.00	Pass
	6	2437	-7.49	3.01	0.95	-3.53	8.00	Pass
	11	2462	-10.31	3.01	0.95	-6.35	8.00	Pass
1	1	2412	-11.41	3.01	0.95	-7.45	8.00	Pass
	6	2437	-7.19	3.01	0.95	-3.23	8.00	Pass
	11	2462	-10.54	3.01	0.95	-6.58	8.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.87dBi < 6dBi , so the power density limit shall not be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.06	3.01	0.99	-8.06	8.00	Pass
	6	2437	-7.87	3.01	0.99	-3.87	8.00	Pass
	11	2462	-12.01	3.01	0.99	-8.01	8.00	Pass
1	1	2412	-12.45	3.01	0.99	-8.45	8.00	Pass
	6	2437	-8.17	3.01	0.99	-4.17	8.00	Pass
	11	2462	-12.40	3.01	0.99	-8.40	8.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.87dBi < 6dBi , so the power density limit shall not be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

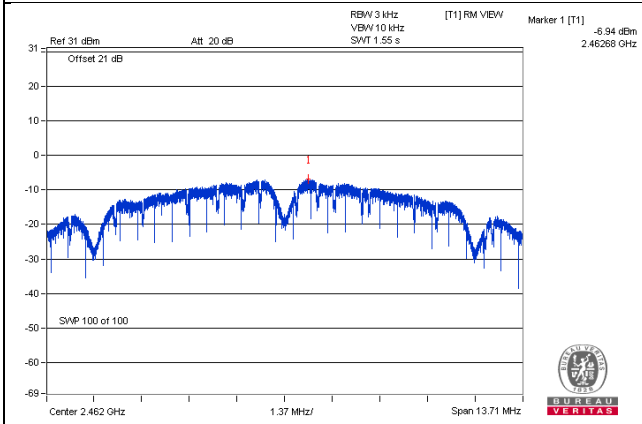
TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-16.94	3.01	1.89	-12.04	8.00	Pass
	6	2437	-15.53	3.01	1.89	-10.63	8.00	Pass
	9	2452	-16.76	3.01	1.89	-11.86	8.00	Pass
1	3	2422	-17.80	3.01	1.89	-12.90	8.00	Pass
	6	2437	-13.18	3.01	1.89	-8.28	8.00	Pass
	9	2452	-17.57	3.01	1.89	-12.67	8.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.87dBi < 6dBi , so the power density limit shall not be reduced.

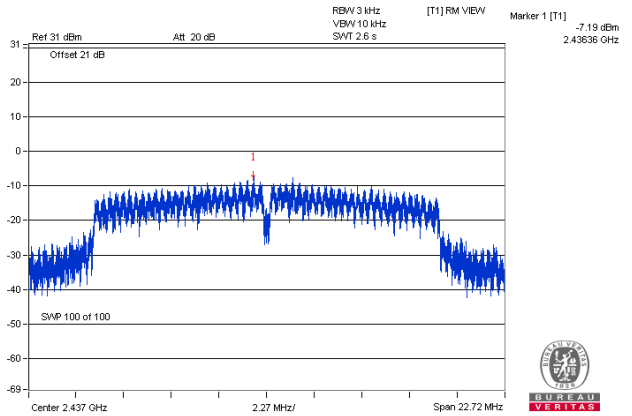
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

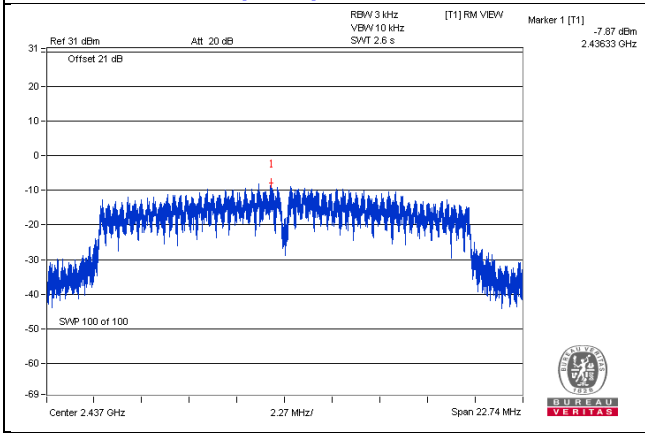
802.11b / Chain 0 : CH11



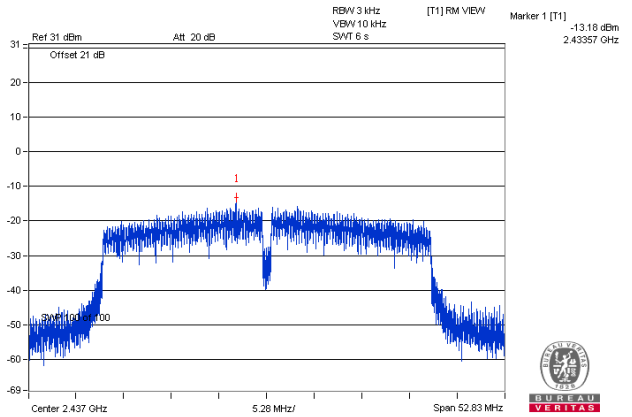
802.11g / Chain 1 : CH6



802.11n (HT20) / Chain 0 : CH6



802.11n (HT40) / Chain 1 : CH6

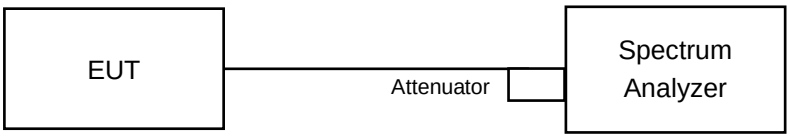


4.6 Conducted Out of Band Emission Measurement

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

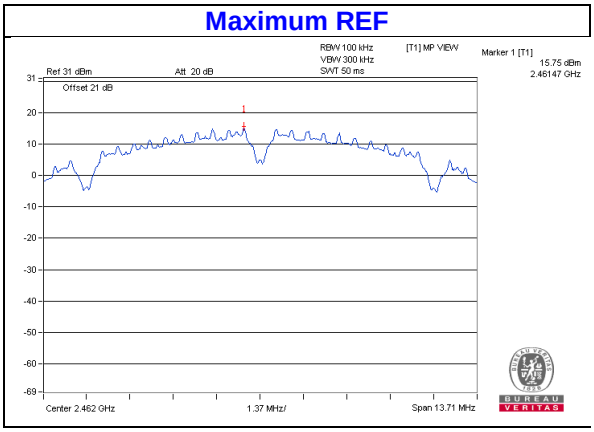
Same as Item 4.3.6

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 30dB offset below D1. It shows compliance with the requirement.

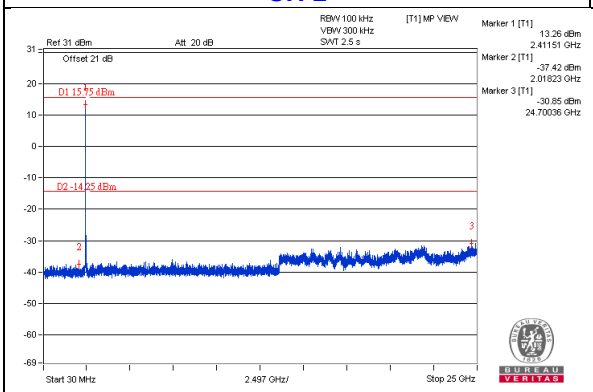
802.11b

Maximum REF

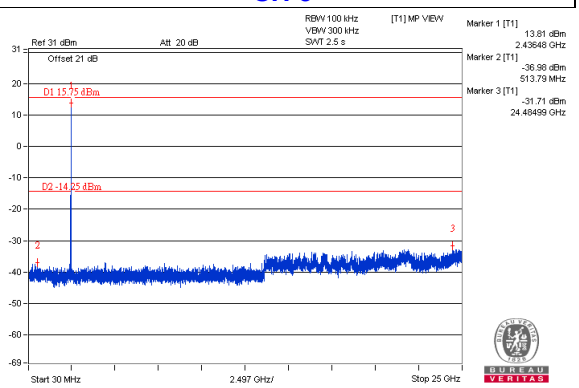


CHAIN 0

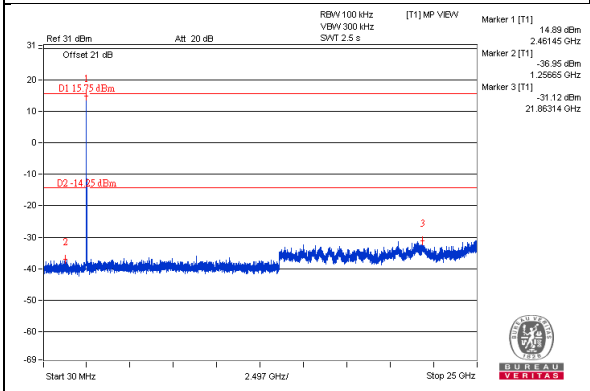
CH 1



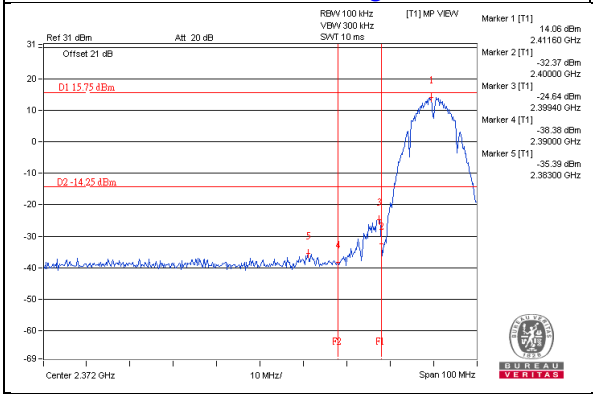
CH 6



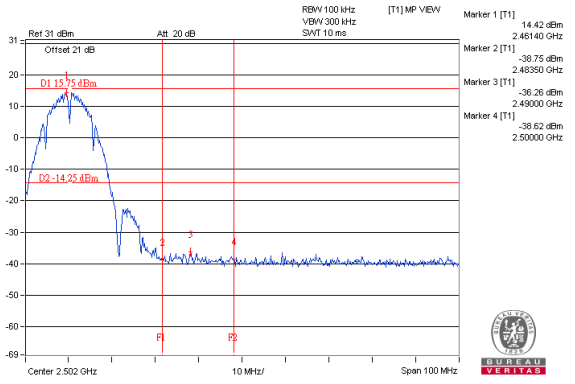
CH 11



CH 1 Band edge

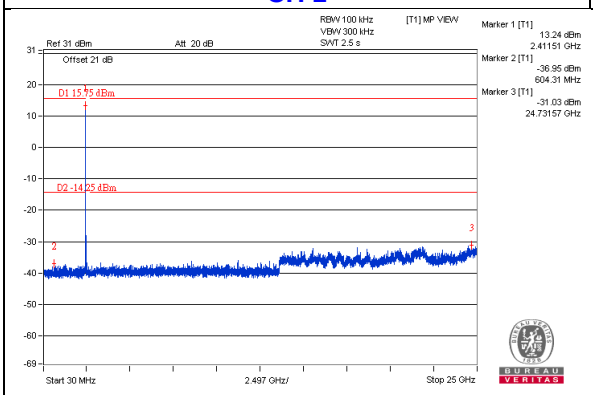


CH 11 Band edge

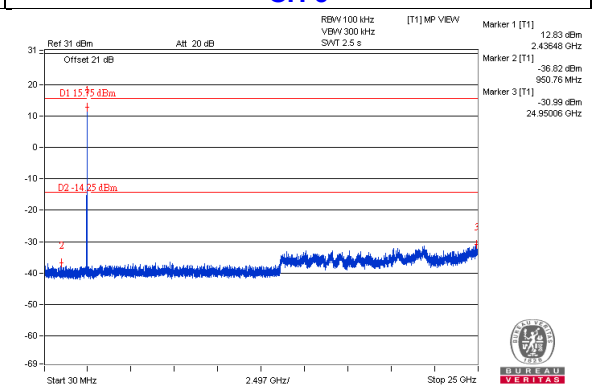


CHAIN 1

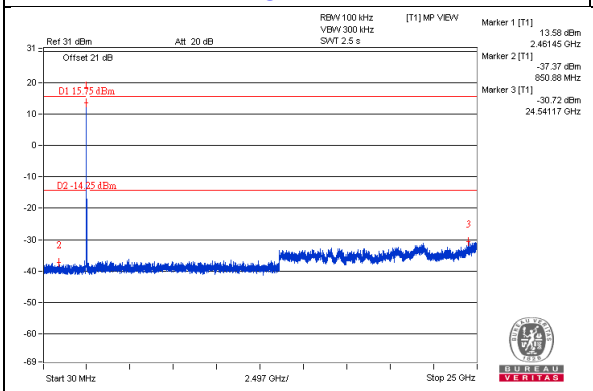
CH 1



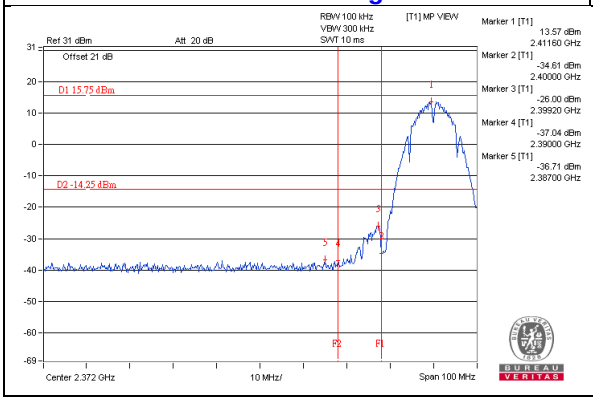
CH 6



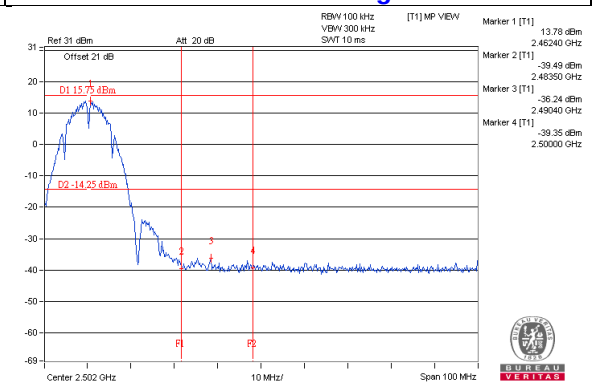
CH 11



CH 1 Band edge

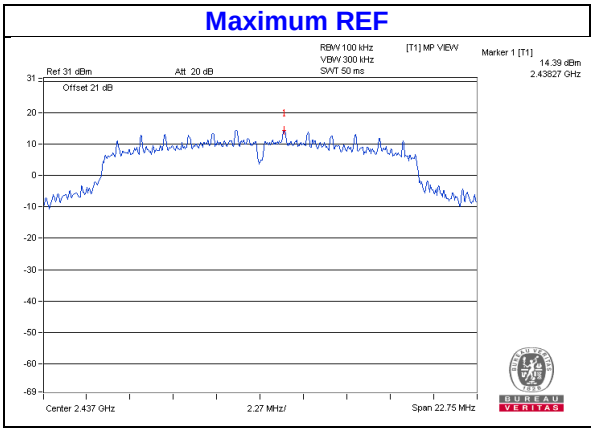


CH 11 Band edge



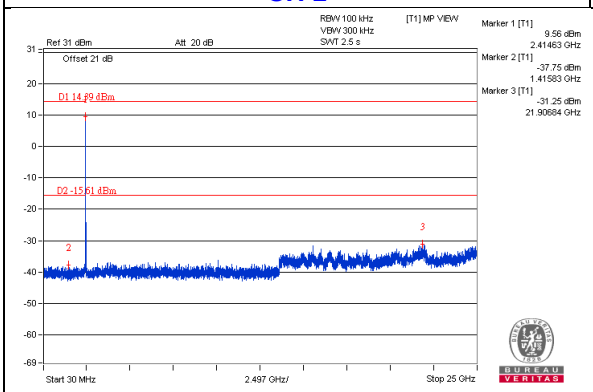
802.11g

Maximum REF

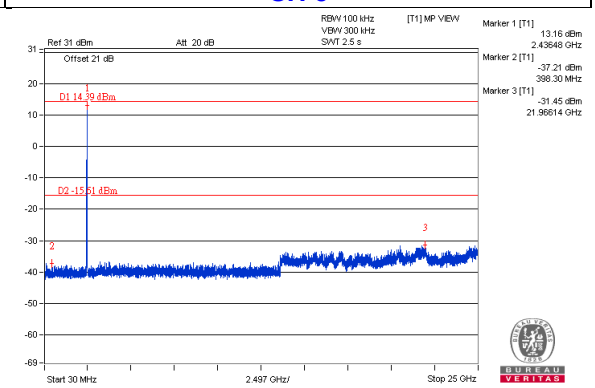


CHAIN 0

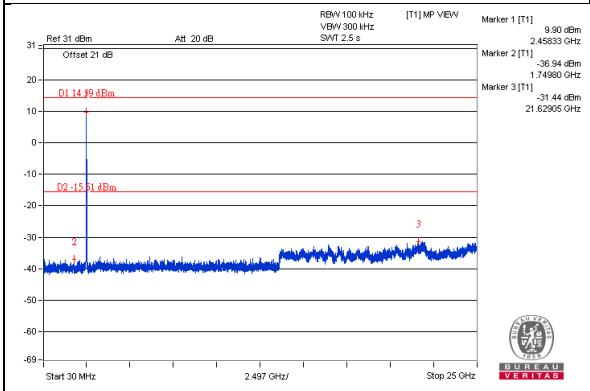
CH 1



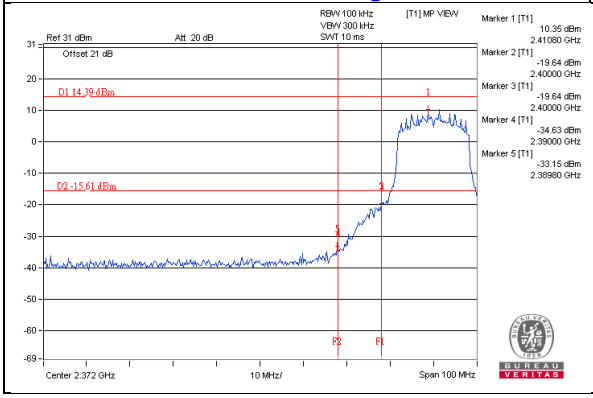
CH 6



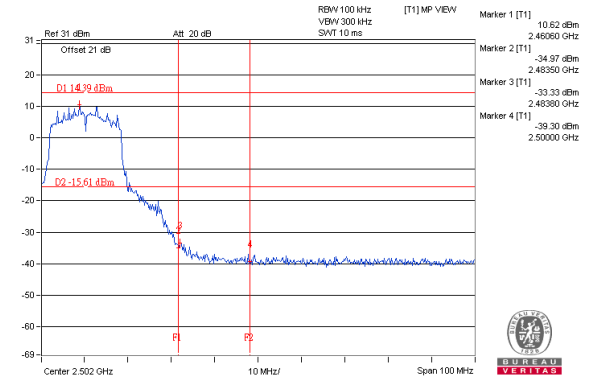
CH 11



CH 1 Band edge

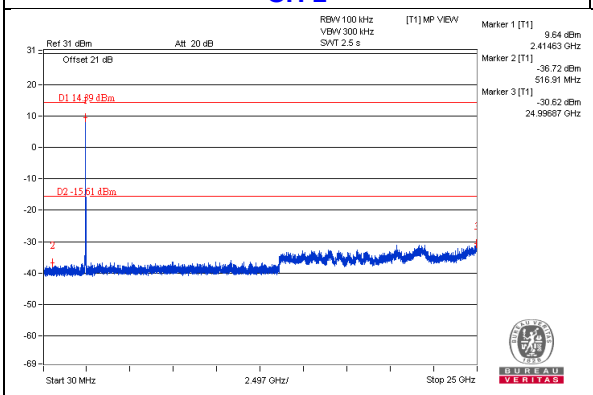


CH 11 Band edge

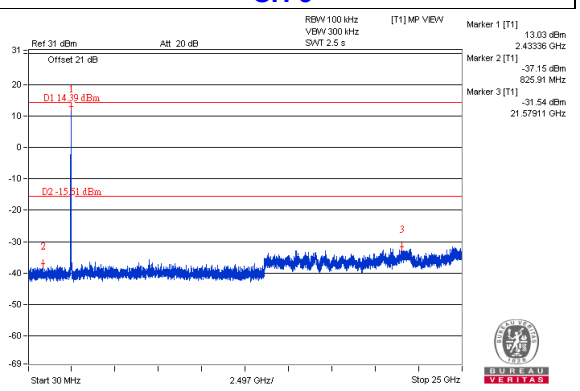


CHAIN 1

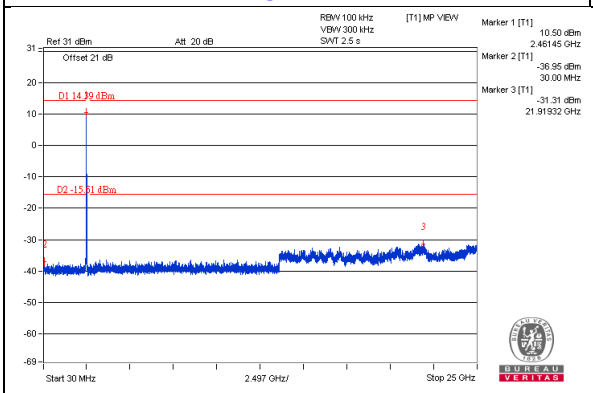
CH 1



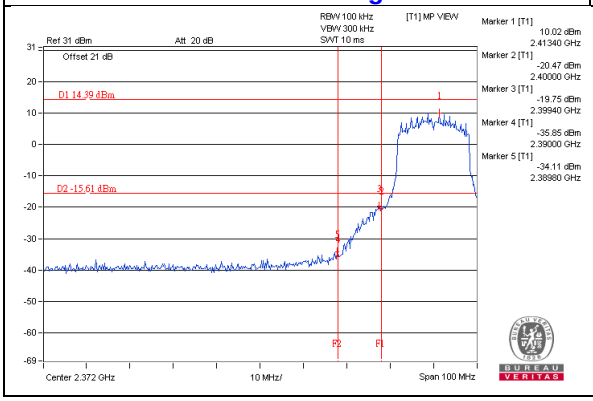
CH 6



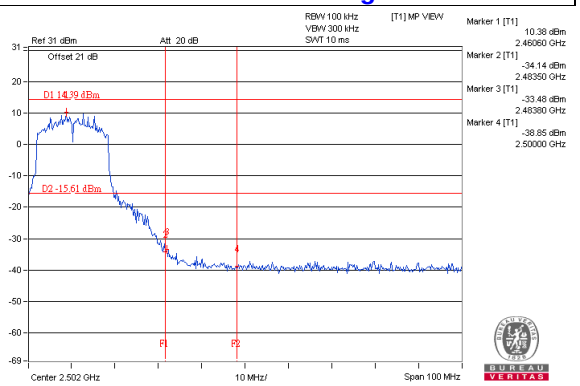
CH 11



CH 1 Band edge

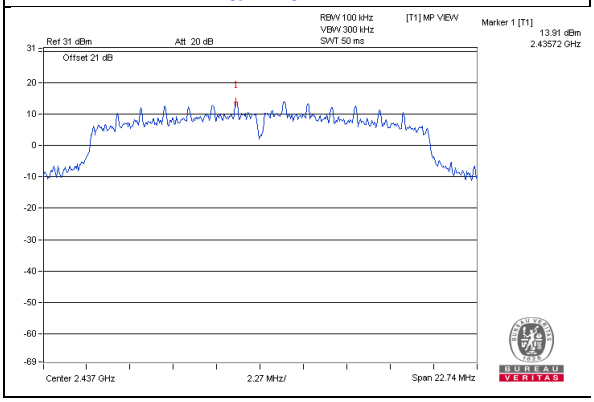


CH 11 Band edge



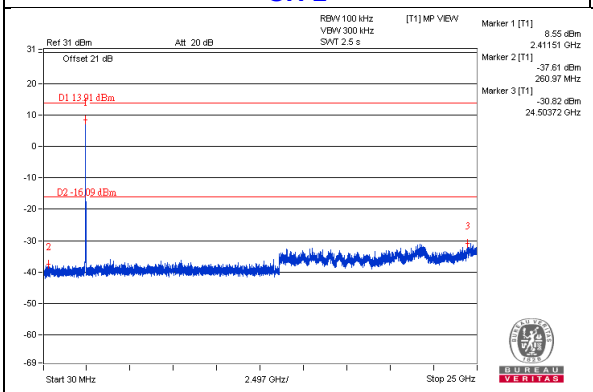
802.11n (HT20)

Maximum REF

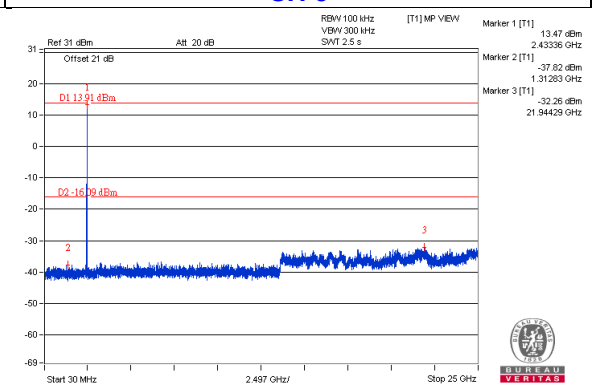


CHAIN 0

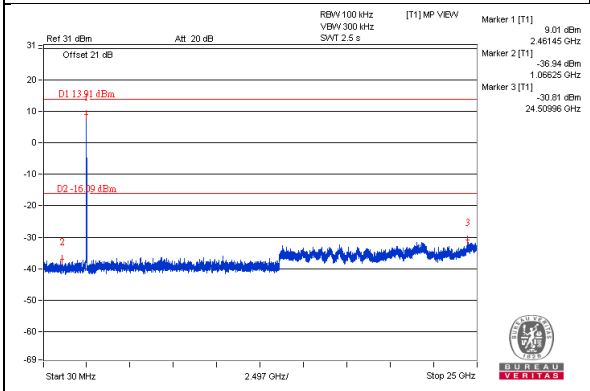
CH 1



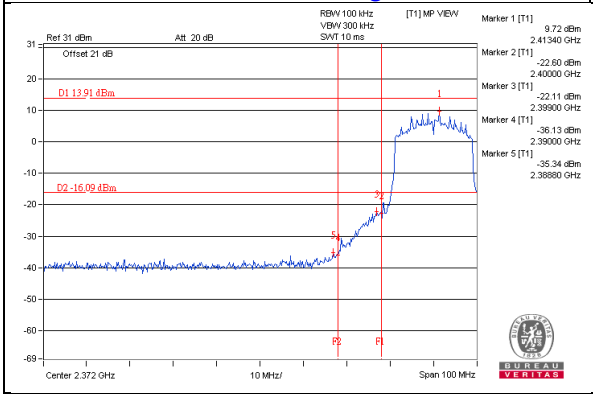
CH 6



CH 11



CH 1 Band edge



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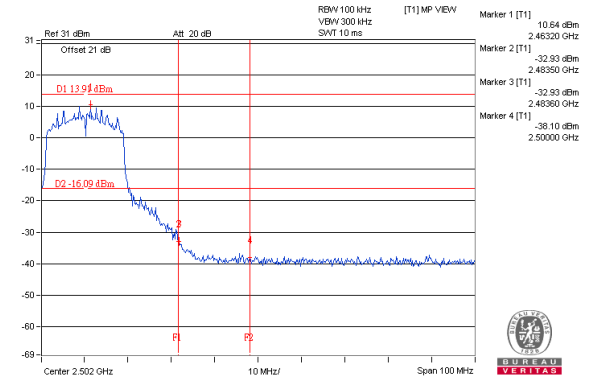
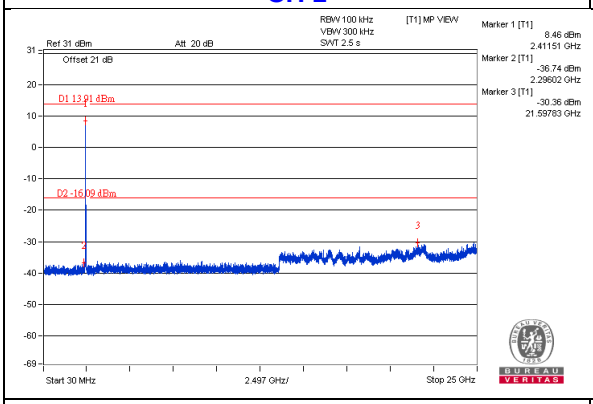


CHAIN 1

CH 1



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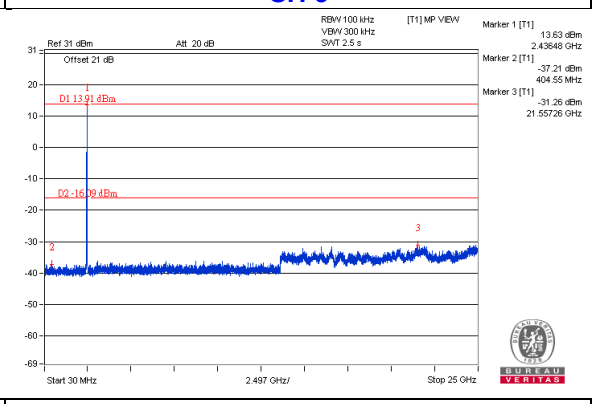

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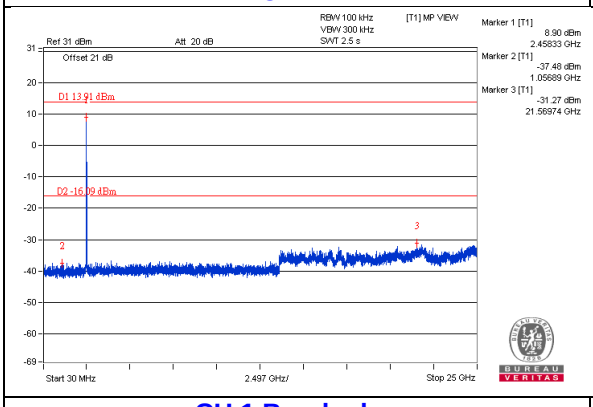

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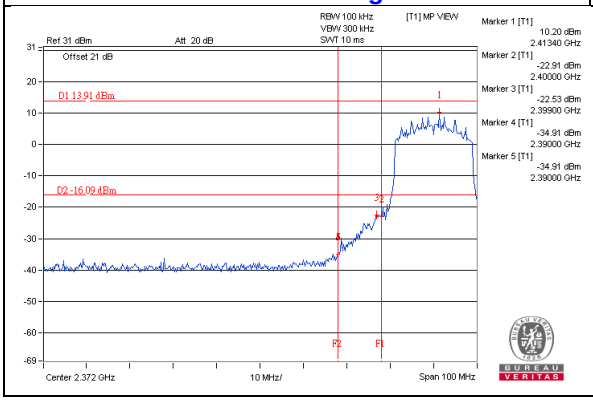

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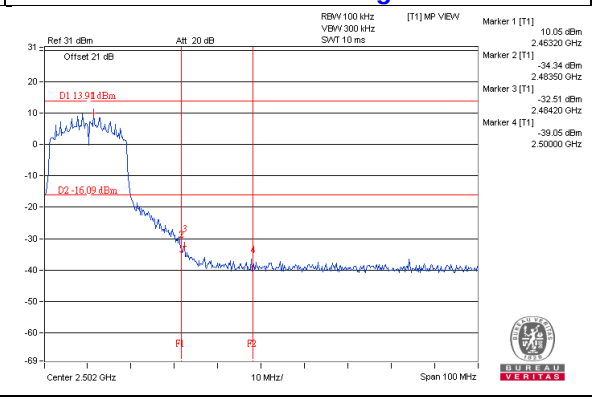
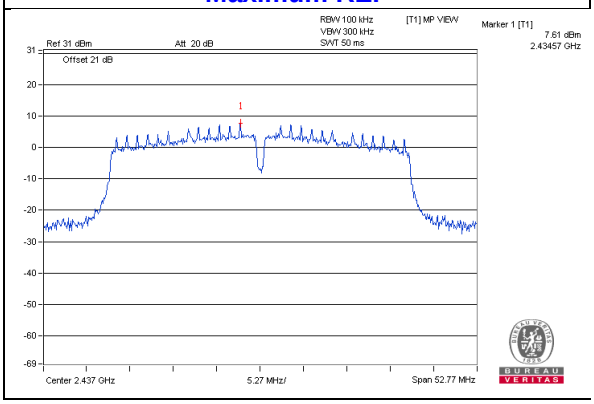


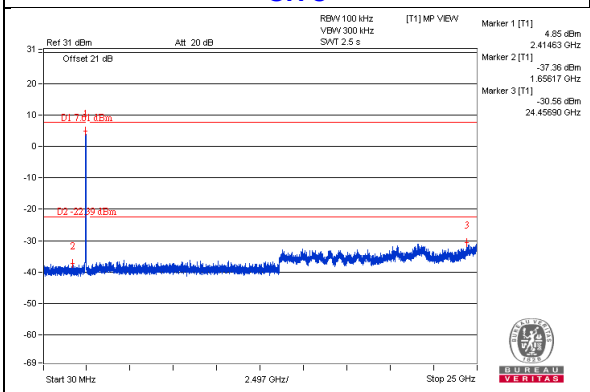
802.11n (HT40)

Maximum REF

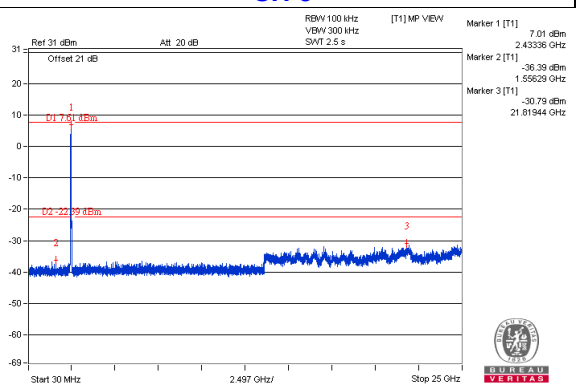


CHAIN 0

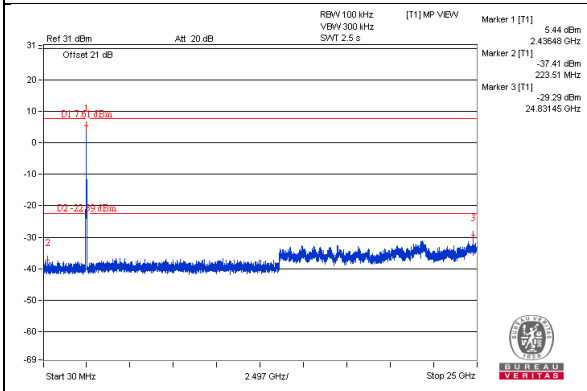
CH 3



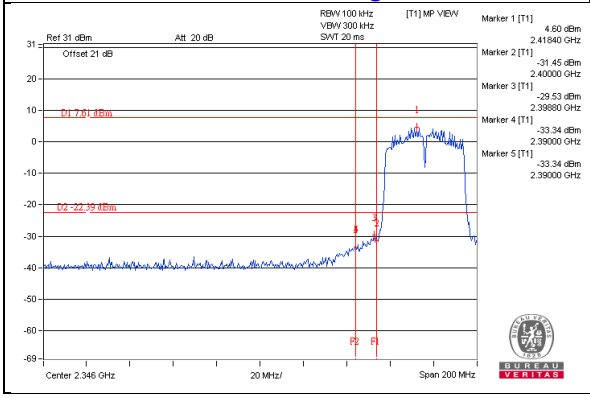
CH 6



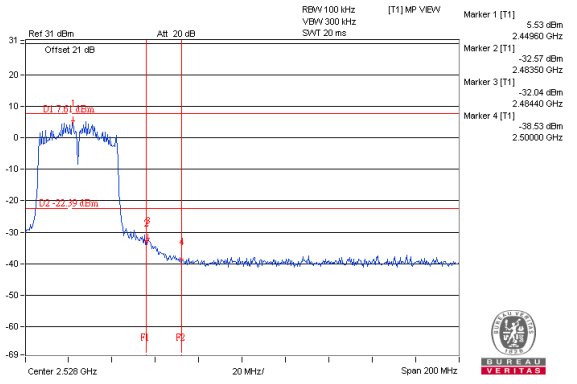
CH 9



CH 3 Band edge

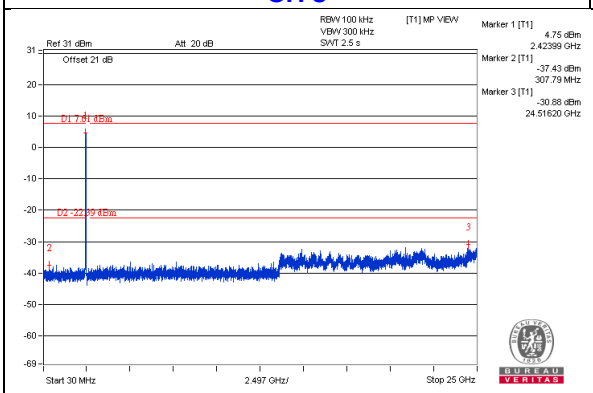


CH 9 Band edge



CHAIN 1

CH 3



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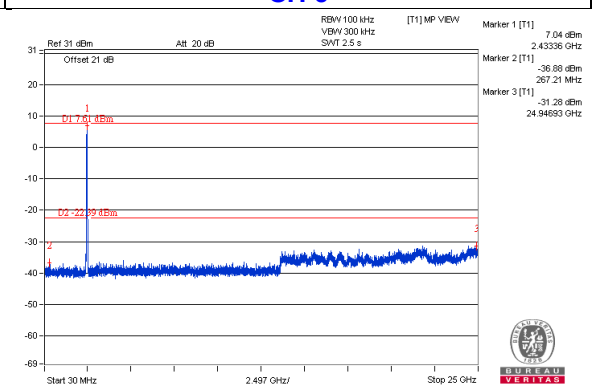

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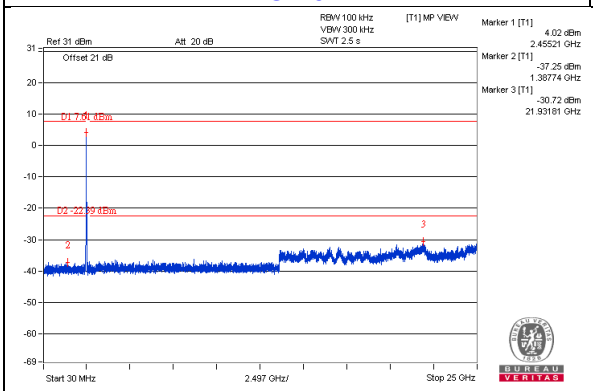
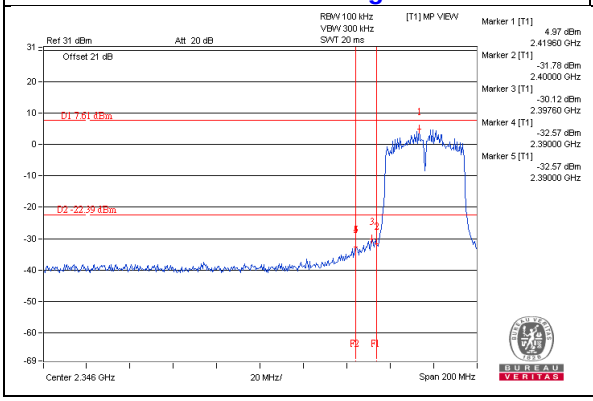


CH 3 Band edge



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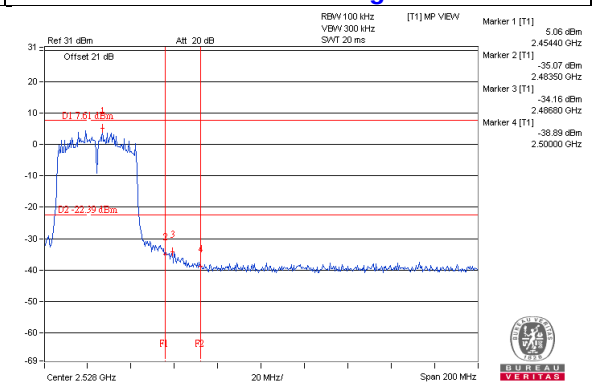

5 Pictures of Test Arrangements

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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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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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