FCC Test Report

Report No.:	RF160601C24
FCC ID:	XCNUBC1301
Test Model:	UBC1301
Received Date:	June 01, 2016
Test Date:	June 22 to July 26, 2016
Issued Date:	Aug. 25, 2016
Applicant:	Ubee Interactive Corp.
Address:	10F-1, No. 5, Taiyuan 1st St. Jhubei City, Hsinchu County 302, Taiwan, R.O.C.
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.

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Release Control Record

Issue No.	Description	Date Issued
RF160601C24	Original release.	Aug. 25, 2016

1 Certificate of Conformity

Product:	Wireless eMTA
Brand:	Ubee
Test Model:	UBC1301
Sample Status:	ENGINEERING SAMPLE
Applicant:	Ubee Interactive Corp.
Test Date:	June 22 to July 26, 2016
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Aug. 25, 2016

Midoli Peng / Specialist

Approved by : _____ , **Date:** Aug. 25, 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 -5.92dB at 24.00000MHz.
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 2390.00MHz, 7311.00MHz, 2483.50MHz & 2389.00MHz
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 not a standard connector.

NOTE: 1. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25 GHz and 5.725~5.85GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5.15~5.25GHz and 5.725~5.85GHz RF parameters was recorded in another test report.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless eMTA
Brand	Ubee
Test Model	UBC1301
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	100-120Vac, 1.2A, 60Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
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), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** **CDD Mode:** 346.172mW **Beamforming Mode:** 312.876mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 474.593mW **Beamforming Mode:** 316.252mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 558.098mW **Beamforming Mode:** 328.25mW
Antenna Type	PCB
Antenna Connector	I-PEX
Accessory Device	Power cord (unshielded, 1.5m)
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:

Frequency (MHz)	Ant 1 2.4GHz (Chain 0) / 5GHz (Chain 3)		Ant 2 2.4GHz (Chain 1) / 5GHz (Chain 2)	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400	3.1	69.4	4.0	65.5
2450	3.5	68.0	4.0	65.0
2500	3.9	63.5	3.5	69.9
5050	4.5	73.3	4.9	63.1
5150	4.8	71.7	4.9	64.7
5350	4.4	70.8	4.2	72.5
5725	4.7	67.0	4.6	67.6
5825	4.3	67.1	4.3	69.6

Frequency (MHz)	Ant 3 2.4GHz (Chain 2) / 5GHz (Chain 1)		Ant 4 2.4GHz (Chain 3) / 5GHz (Chain 0)	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400	3.9	66.1	3.9	63.0
2450	3.4	66.8	3.8	65.3
2500	3.8	67.0	3.8	65.2
5050	4.8	67.5	4.9	62.4
5150	4.8	69.1	4.7	70.2
5350	4.7	69.4	4.9	63.4
5725	4.9	64.9	4.9	62.1
5825	4.9	63.9	4.9	64.2

1. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	4TX	4RX
802.11g	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS16~23	4TX	4RX
	MCS 24~31	4TX	4RX
VHT20	MCS0~8, Nss=1	4TX	4RX
	MCS0~8, Nss=2	4TX	4RX
	MCS0~9, Nss=3	4TX	4RX
	MCS0~8, Nss=4	4TX	4RX
VHT40	MCS0~9, Nss=1	4TX	4RX
	MCS0~9, Nss=2	4TX	4RX
	MCS0~9, Nss=3	4TX	4RX
	MCS0~9, Nss=4	4TX	4RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. 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, 802.11n (HT20) and VHT20:

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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.

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:

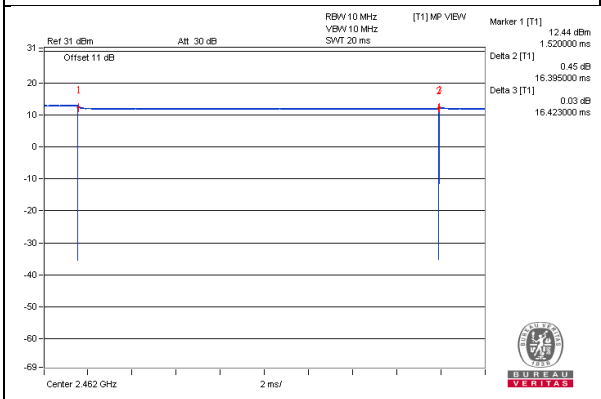
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Robert Cheng
RE<1G	24deg. C, 68%RH	120Vac, 60Hz	Robert Cheng
PLC	24deg. C, 61%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

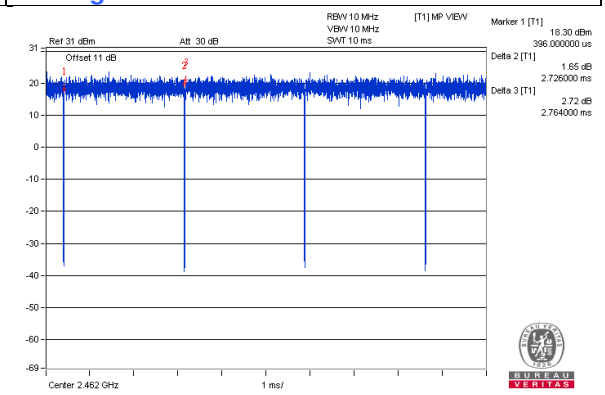
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 16.395/16.423 = 0.998
802.11g: Duty cycle = 2.726/2.764 = 0.986
802.11n (HT20): Duty cycle = 2.531/2.561 = 0.988
802.11n (HT40): Duty cycle = 1.237/1.261 = 0.981

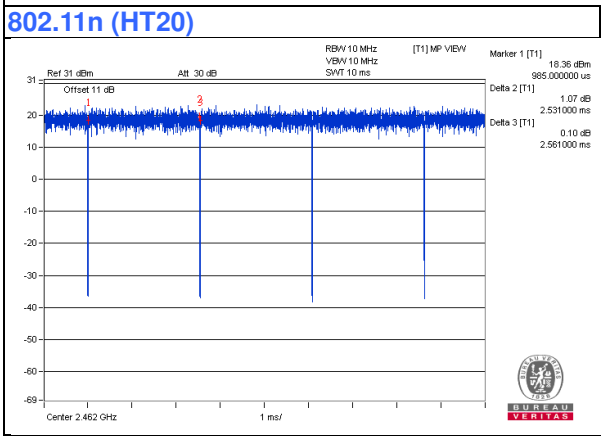
802.11b



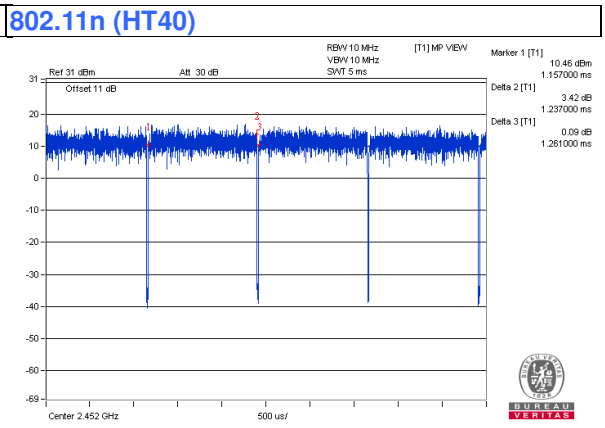
802.11g



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.

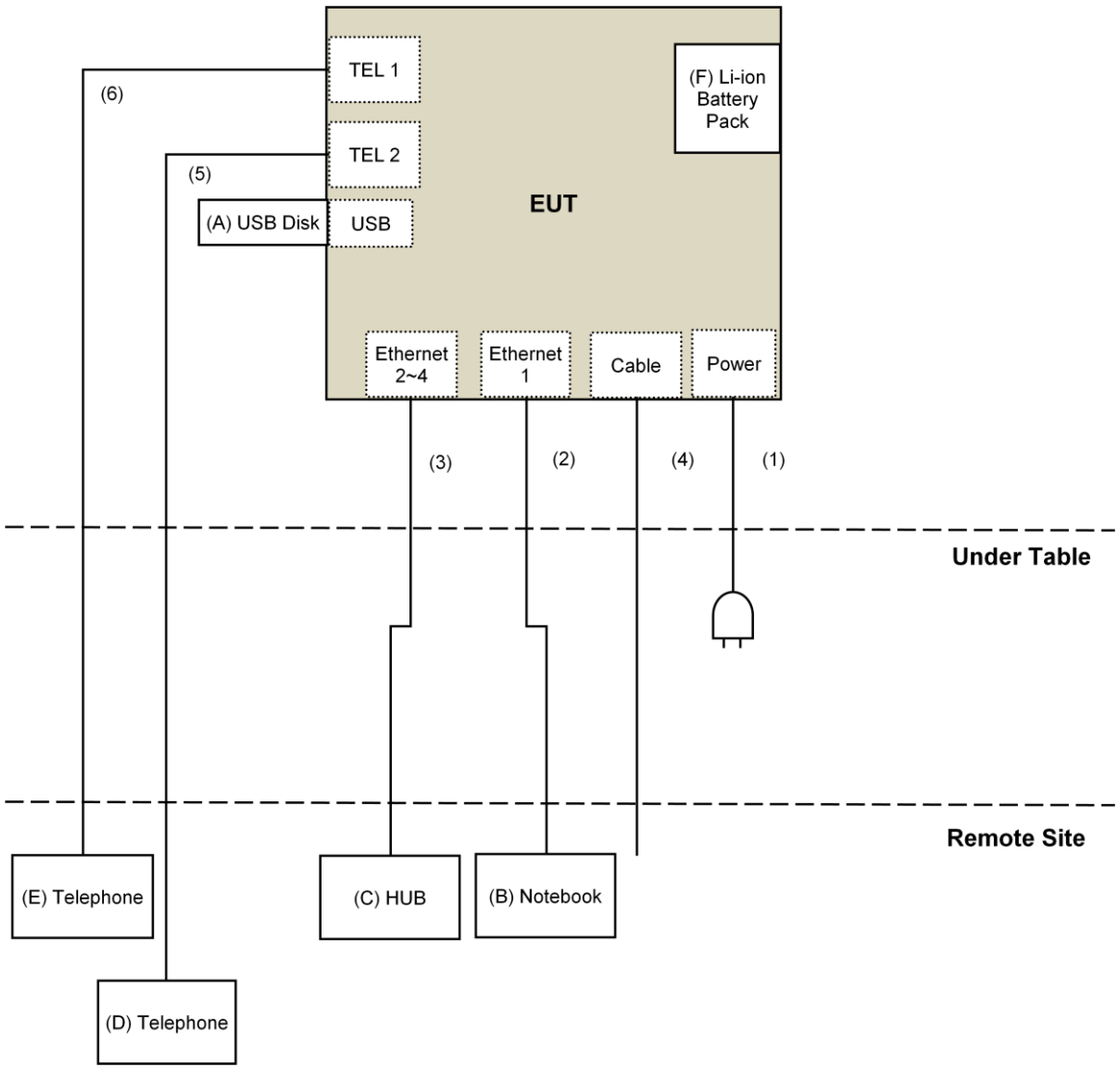
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB Disk	Transcend	USB 3.0 16G	NA	NA	Provided by Lab
B.	HUB	ZyXEL	ES-116P	S060H02000215	FCC Doc	Provided by Lab
C.	TELEPHONE	DAISHO	DS-03	N/A	NA	Provided by Lab
D.	TELEPHONE	Romeo	TE-812	97280903	NA	Provided by Lab
E.	Li-ion Battery Pack	SMP	UBC1301 2S2P LGC-3000D2	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.	AC Cable	1	1.5	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	3	10	No	0	Provided by Lab
4.	Coaxial Cable	1	10	Yes	0	Provided by Lab
5.	RJ-11 Cable	1	10	No	0	Provided by Lab
6.	RJ-11 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



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.

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 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-1000VH2 B	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
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
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_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3 Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: July 26, 2016

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

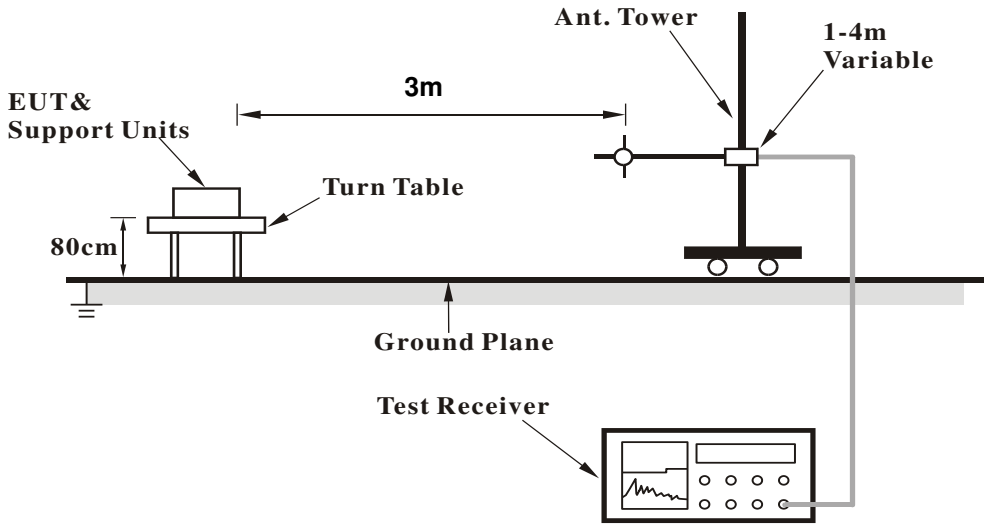
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

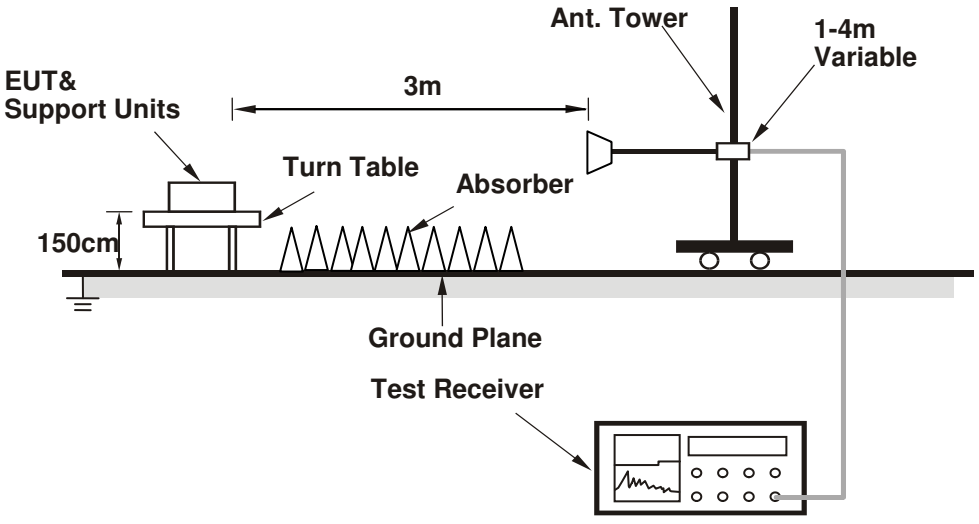
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

a. Connect the EUT with the support unit B (Notebook Computer) which is placed outside of testing area.
b. The communication partner run test program “Mtool. exe[ver 2.0.3.2]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

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	50.0 PK	74.0	-24.0	2.79 H	273	55.6	-5.6
2	2390.00	37.6 AV	54.0	-16.4	2.79 H	273	43.2	-5.6
3	*2412.00	106.1 PK			2.79 H	273	111.6	-5.5
4	*2412.00	103.5 AV			2.79 H	273	109.0	-5.5
5	4824.00	53.9 PK	74.0	-20.1	2.82 H	118	53.0	0.9
6	4824.00	52.1 AV	54.0	-1.9	2.82 H	118	51.2	0.9
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	51.3 PK	74.0	-22.7	2.17 V	171	56.9	-5.6
2	2390.00	38.4 AV	54.0	-15.6	2.17 V	171	44.0	-5.6
3	*2412.00	106.9 PK			2.17 V	171	112.4	-5.5
4	*2412.00	104.1 AV			2.17 V	171	109.6	-5.5
5	4824.00	56.1 PK	74.0	-17.9	3.68 V	118	55.2	0.9
6	4824.00	53.8 AV	54.0	-0.2	3.68 V	118	52.9	0.9

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	*2437.00	105.9 PK			2.76 H	257	111.3	-5.4
2	*2437.00	103.3 AV			2.76 H	257	108.7	-5.4
3	4874.00	54.3 PK	74.0	-19.7	2.78 H	131	53.3	1.0
4	4874.00	52.3 AV	54.0	-1.7	2.78 H	131	51.3	1.0
5	7311.00	53.5 PK	74.0	-20.5	3.52 H	144	45.9	7.6
6	7311.00	46.8 AV	54.0	-7.2	3.52 H	144	39.2	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	*2437.00	106.4 PK			2.11 V	189	111.8	-5.4
2	*2437.00	103.8 AV			2.11 V	189	109.2	-5.4
3	4874.00	55.8 PK	74.0	-18.2	3.17 V	115	54.8	1.0
4	4874.00	53.8 AV	54.0	-0.2	3.17 V	115	52.8	1.0
5	7311.00	52.3 PK	74.0	-21.7	3.76 V	106	44.7	7.6
6	7311.00	44.7 AV	54.0	-9.3	3.76 V	106	37.1	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.

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	106.4 PK			2.69 H	270	111.7	-5.3
2	*2462.00	103.9 AV			2.69 H	270	109.2	-5.3
3	2483.50	50.1 PK	74.0	-23.9	2.69 H	270	55.4	-5.3
4	2483.50	37.5 AV	54.0	-16.5	2.69 H	270	42.8	-5.3
5	4924.00	54.1 PK	74.0	-19.9	2.74 H	115	52.8	1.3
6	4924.00	52.1 AV	54.0	-1.9	2.74 H	115	50.8	1.3
7	7386.00	53.6 PK	74.0	-20.4	3.58 H	140	45.9	7.7
8	7386.00	47.0 AV	54.0	-7.0	3.58 H	140	39.3	7.7
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	106.2 PK			2.13 V	186	111.5	-5.3
2	*2462.00	103.4 AV			2.13 V	186	108.7	-5.3
3	2483.50	50.7 PK	74.0	-23.3	2.13 V	186	56.0	-5.3
4	2483.50	38.0 AV	54.0	-16.0	2.13 V	186	43.3	-5.3
5	4924.00	55.6 PK	74.0	-18.4	1.73 V	110	54.3	1.3
6	4924.00	53.8 AV	54.0	-0.2	1.73 V	110	52.5	1.3
7	7386.00	53.1 PK	74.0	-20.9	1.30 V	129	45.4	7.7
8	7386.00	45.2 AV	54.0	-8.8	1.30 V	129	37.5	7.7

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	68.1 PK	74.0	-5.9	2.74 H	270	73.7	-5.6
2	2390.00	53.1 AV	54.0	-0.9	2.74 H	270	58.7	-5.6
3	*2412.00	113.6 PK			2.74 H	265	119.1	-5.5
4	*2412.00	103.1 AV			2.74 H	265	108.6	-5.5
5	4824.00	54.1 PK	74.0	-19.9	2.78 H	115	53.2	0.9
6	4824.00	42.1 AV	54.0	-11.9	2.78 H	115	41.2	0.9
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	68.2 PK	74.0	-5.8	2.00 V	180	73.8	-5.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.00 V**	**180**	**59.5**	**-5.6**
3	*2412.00	113.8 PK			2.00 V	180	119.3	-5.5
4	*2412.00	103.3 AV			2.00 V	180	108.8	-5.5
5	4824.00	57.1 PK	74.0	-16.9	3.17 V	116	56.2	0.9
6	4824.00	47.3 AV	54.0	-6.7	3.17 V	116	46.4	0.9

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)
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	68.3 PK	74.0	-5.7	2.73 H	249	73.9	-5.6
2	2390.00	52.7 AV	54.0	-1.3	2.73 H	249	58.3	-5.6
3	*2437.00	120.6 PK			2.73 H	249	126.0	-5.4
4	*2437.00	109.9 AV			2.73 H	249	115.3	-5.4
5	2483.50	65.1 PK	74.0	-8.9	2.73 H	249	70.4	-5.3
6	2483.50	48.2 AV	54.0	-5.8	2.73 H	249	53.5	-5.3
7	4874.00	60.4 PK	74.0	-13.6	2.78 H	117	59.4	1.0
8	4874.00	48.3 AV	54.0	-5.7	2.78 H	117	47.3	1.0
9	7311.00	65.2 PK	74.0	-8.8	3.54 H	131	57.6	7.6
10	7311.00	53.4 AV	54.0	-0.6	3.54 H	131	45.8	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.4 PK	74.0	-4.6	2.39 V	183	75.0	-5.6
2	2390.00	52.8 AV	54.0	-1.2	2.39 V	183	58.4	-5.6
3	*2437.00	121.0 PK			2.39 V	183	126.4	-5.4
4	*2437.00	110.0 AV			2.39 V	183	115.4	-5.4
5	2483.50	66.2 PK	74.0	-7.8	2.39 V	183	71.5	-5.3
6	2483.50	49.4 AV	54.0	-4.6	2.39 V	183	54.7	-5.3
7	4874.00	63.3 PK	74.0	-10.7	3.19 V	115	62.3	1.0
8	4874.00	53.1 AV	54.0	-0.9	3.19 V	115	52.1	1.0
9	7311.00	66.8 PK	74.0	-7.2	3.79 V	99	59.2	7.6
10	**7311.00**	**53.9 AV**	**54.0**	**-0.1**	**3.79 V**	**99**	**46.3**	**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.

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	116.3 PK			3.53 H	269	121.6	-5.3
2	*2462.00	105.1 AV			3.53 H	269	110.4	-5.3
3	2483.50	69.8 PK	74.0	-4.2	3.53 H	269	75.1	-5.3
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**3.53 H**	**269**	**59.2**	**-5.3**
5	4924.00	56.1 PK	74.0	-17.9	2.79 H	123	54.8	1.3
6	4924.00	44.4 AV	54.0	-9.6	2.79 H	123	43.1	1.3
7	7386.00	59.2 PK	74.0	-14.8	3.55 H	138	51.5	7.7
8	7386.00	47.7 AV	54.0	-6.3	3.55 H	138	40.0	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.7 PK			2.34 V	176	120.0	-5.3
2	*2462.00	104.6 AV			2.34 V	176	109.9	-5.3
3	2483.50	69.4 PK	74.0	-4.6	2.34 V	176	74.7	-5.3
4	2483.50	52.4 AV	54.0	-1.6	2.34 V	176	57.7	-5.3
5	4924.00	59.2 PK	74.0	-14.8	3.22 V	124	57.9	1.3
6	4924.00	49.4 AV	54.0	-4.6	3.22 V	124	48.1	1.3
7	7386.00	61.1 PK	74.0	-12.9	3.79 V	95	53.4	7.7
8	7386.00	48.1 AV	54.0	-5.9	3.79 V	95	40.4	7.7

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	67.7 PK	74.0	-6.3	2.69 H	264	73.3	-5.6
2	2390.00	52.7 AV	54.0	-1.3	2.69 H	264	58.3	-5.6
3	*2412.00	112.7 PK			2.69 H	264	118.2	-5.5
4	*2412.00	101.9 AV			2.69 H	264	107.4	-5.5
5	4824.00	53.8 PK	74.0	-20.2	2.77 H	105	52.9	0.9
6	4824.00	41.8 AV	54.0	-12.2	2.77 H	105	40.9	0.9
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	70.1 PK	74.0	-3.9	2.17 V	244	75.7	-5.6
2	2390.00	53.5 AV	54.0	-0.5	2.17 V	244	59.1	-5.6
3	*2412.00	113.0 PK			2.17 V	244	118.5	-5.5
4	*2412.00	102.2 AV			2.17 V	244	107.7	-5.5
5	4824.00	57.2 PK	74.0	-16.8	3.23 V	106	56.3	0.9
6	4824.00	47.3 AV	54.0	-6.7	3.23 V	106	46.4	0.9

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)
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	68.7 PK	74.0	-5.3	2.76 H	256	74.3	-5.6
2	2390.00	52.8 AV	54.0	-1.2	2.76 H	256	58.4	-5.6
3	*2437.00	118.8 PK			2.76 H	256	124.2	-5.4
4	*2437.00	108.9 AV			2.76 H	256	114.3	-5.4
5	2483.50	67.1 PK	74.0	-6.9	2.76 H	256	72.4	-5.3
6	2483.50	49.6 AV	54.0	-4.4	2.76 H	256	54.9	-5.3
7	4874.00	60.8 PK	74.0	-13.2	2.82 H	128	59.8	1.0
8	4874.00	48.7 AV	54.0	-5.3	2.82 H	128	47.7	1.0
9	7311.00	65.0 PK	74.0	-9.0	3.60 H	123	57.4	7.6
10	7311.00	52.9 AV	54.0	-1.1	3.60 H	123	45.3	7.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.4 PK	74.0	-4.6	2.46 V	195	75.0	-5.6
2	2390.00	53.2 AV	54.0	-0.8	2.46 V	195	58.8	-5.6
3	*2437.00	119.2 PK			2.46 V	195	124.6	-5.4
4	*2437.00	109.2 AV			2.46 V	195	114.6	-5.4
5	2483.50	67.7 PK	74.0	-6.3	2.46 V	195	73.0	-5.3
6	2483.50	50.1 AV	54.0	-3.9	2.46 V	195	55.4	-5.3
7	4874.00	63.1 PK	74.0	-10.9	3.14 V	119	62.1	1.0
8	4874.00	52.9 AV	54.0	-1.1	3.14 V	119	51.9	1.0
9	7311.00	66.8 PK	74.0	-7.2	3.79 V	92	59.2	7.6
10	7311.00	53.7 AV	54.0	-0.3	3.79 V	92	46.1	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.

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	115.2 PK			3.53 H	277	120.5	-5.3
2	*2462.00	104.5 AV			3.53 H	277	109.8	-5.3
3	2483.50	73.1 PK	74.0	-0.9	3.53 H	277	78.4	-5.3
4	2483.50	53.8 AV	54.0	-0.2	3.53 H	277	59.1	-5.3
5	4924.00	55.7 PK	74.0	-18.3	2.80 H	101	54.4	1.3
6	4924.00	43.9 AV	54.0	-10.1	2.80 H	101	42.6	1.3
7	7386.00	59.0 PK	74.0	-15.0	3.49 H	123	51.3	7.7
8	7386.00	46.8 AV	54.0	-7.2	3.49 H	123	39.1	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.1 PK			2.10 V	218	119.4	-5.3
2	*2462.00	103.3 AV			2.10 V	218	108.6	-5.3
3	2483.50	73.1 PK	74.0	-0.9	2.10 V	218	78.4	-5.3
4	2483.50	53.2 AV	54.0	-0.8	2.10 V	218	58.5	-5.3
5	4924.00	59.2 PK	74.0	-14.8	3.23 V	122	57.9	1.3
6	4924.00	49.2 AV	54.0	-4.8	3.23 V	122	47.9	1.3
7	7386.00	60.9 PK	74.0	-13.1	3.81 V	91	53.2	7.7
8	7386.00	47.7 AV	54.0	-6.3	3.81 V	91	40.0	7.7

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	2389.00	68.6 PK	74.0	-5.4	2.79 H	267	74.2	-5.6
2	2389.00	53.5 AV	54.0	-0.5	2.79 H	267	59.1	-5.6
3	*2422.00	105.1 PK			2.79 H	267	110.5	-5.4
4	*2422.00	93.8 AV			2.79 H	267	99.2	-5.4
5	4844.00	51.0 PK	74.0	-23.0	2.81 H	113	50.1	0.9
6	4844.00	39.0 AV	54.0	-15.0	2.81 H	113	38.1	0.9
7	7266.00	51.2 PK	74.0	-22.8	3.57 H	132	43.5	7.7
8	7266.00	39.2 AV	54.0	-14.8	3.57 H	132	31.5	7.7
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	2389.00	69.3 PK	74.0	-4.7	2.04 V	183	74.9	-5.6
2	**2389.00**	**53.9 AV**	**54.0**	**-0.1**	**2.04 V**	**183**	**59.5**	**-5.6**
3	*2422.00	105.6 PK			2.04 V	183	111.0	-5.4
4	*2422.00	94.2 AV			2.04 V	183	99.6	-5.4
5	4844.00	51.3 PK	74.0	-22.7	3.20 V	123	50.4	0.9
6	4844.00	39.2 AV	54.0	-14.8	3.20 V	123	38.3	0.9
7	7266.00	51.5 PK	74.0	-22.5	3.84 V	84	43.8	7.7
8	7266.00	39.3 AV	54.0	-14.7	3.84 V	84	31.6	7.7

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	71.7 PK	74.0	-2.3	3.59 H	276	77.3	-5.6
2	2390.00	53.3 AV	54.0	-0.7	3.59 H	276	58.9	-5.6
3	*2437.00	108.4 PK			3.59 H	276	113.8	-5.4
4	*2437.00	96.6 AV			3.59 H	276	102.0	-5.4
5	2483.50	64.3 PK	74.0	-9.7	3.59 H	276	69.6	-5.3
6	2483.50	48.1 AV	54.0	-5.9	3.59 H	276	53.4	-5.3
7	4874.00	51.5 PK	74.0	-22.5	2.73 H	130	50.5	1.0
8	4874.00	39.4 AV	54.0	-14.6	2.73 H	130	38.4	1.0
9	7311.00	53.7 PK	74.0	-20.3	3.57 H	144	46.1	7.6
10	7311.00	40.6 AV	54.0	-13.4	3.57 H	144	33.0	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	2390.00	70.3 PK	74.0	-3.7	2.01 V	182	75.9	-5.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.01 V**	**182**	**59.5**	**-5.6**
3	*2437.00	107.5 PK			2.01 V	182	112.9	-5.4
4	*2437.00	96.5 AV			2.01 V	182	101.9	-5.4
5	2483.50	62.5 PK	74.0	-11.5	2.01 V	182	67.8	-5.3
6	2483.50	45.7 AV	54.0	-8.3	2.01 V	182	51.0	-5.3
7	4874.00	51.8 PK	74.0	-22.2	3.23 V	124	50.8	1.0
8	4874.00	40.0 AV	54.0	-14.0	3.23 V	124	39.0	1.0
9	7311.00	54.5 PK	74.0	-19.5	3.84 V	101	46.9	7.6
10	7311.00	41.3 AV	54.0	-12.7	3.84 V	101	33.7	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.

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	109.4 PK			3.52 H	280	114.8	-5.4
2	*2452.00	97.5 AV			3.52 H	280	102.9	-5.4
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**3.52 H**	**280**	**79.2**	**-5.3**
4	2483.50	53.2 AV	54.0	-0.8	3.52 H	280	58.5	-5.3
5	4904.00	51.4 PK	74.0	-22.6	2.76 H	119	50.2	1.2
6	4904.00	39.3 AV	54.0	-14.7	2.76 H	119	38.1	1.2
7	7356.00	53.2 PK	74.0	-20.8	3.58 H	140	45.5	7.7
8	7356.00	40.1 AV	54.0	-13.9	3.58 H	140	32.4	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	107.8 PK			2.31 V	195	113.2	-5.4
2	*2452.00	96.5 AV			2.31 V	195	101.9	-5.4
3	2483.50	73.1 PK	74.0	-0.9	2.31 V	195	78.4	-5.3
4	2483.50	51.7 AV	54.0	-2.3	2.31 V	195	57.0	-5.3
5	4904.00	52.1 PK	74.0	-21.9	3.13 V	120	50.9	1.2
6	4904.00	40.2 AV	54.0	-13.8	3.13 V	120	39.0	1.2
7	7356.00	54.1 PK	74.0	-19.9	3.84 V	98	46.4	7.7
8	7356.00	40.8 AV	54.0	-13.2	3.84 V	98	33.1	7.7

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	Below 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	179.82	33.78 QP	43.50	-9.72	1.50 H	265	44.06	-10.28
2	299.71	42.20 QP	46.00	-3.80	1.10 H	296	50.20	-8.00
3	419.65	40.13 QP	46.00	-5.87	2.00 H	274	44.96	-4.83
4	539.52	35.50 QP	46.00	-10.50	1.10 H	344	37.74	-2.24
5	659.43	36.80 QP	46.00	-9.20	1.10 H	125	36.65	0.15
6	779.33	37.08 QP	46.00	-8.92	1.50 H	139	34.81	2.27
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	43.53	33.25 QP	40.00	-6.75	1.10 V	23	42.01	-8.76
2	59.95	34.91 QP	40.00	-5.09	1.10 V	0	43.92	-9.01
3	84.10	34.79 QP	40.00	-5.21	1.10 V	346	49.05	-14.26
4	299.76	41.64 QP	46.00	-4.36	1.50 V	21	49.64	-8.00
5	419.65	39.35 QP	46.00	-6.65	1.10 V	350	44.18	-4.83
6	539.54	37.62 QP	46.00	-8.38	2.00 V	0	39.86	-2.24

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. 23, 2015	Oct. 22, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 28, 2015	Oct. 27, 2016
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	Jun. 20, 2016	Jun. 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.3	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: June 22, 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.

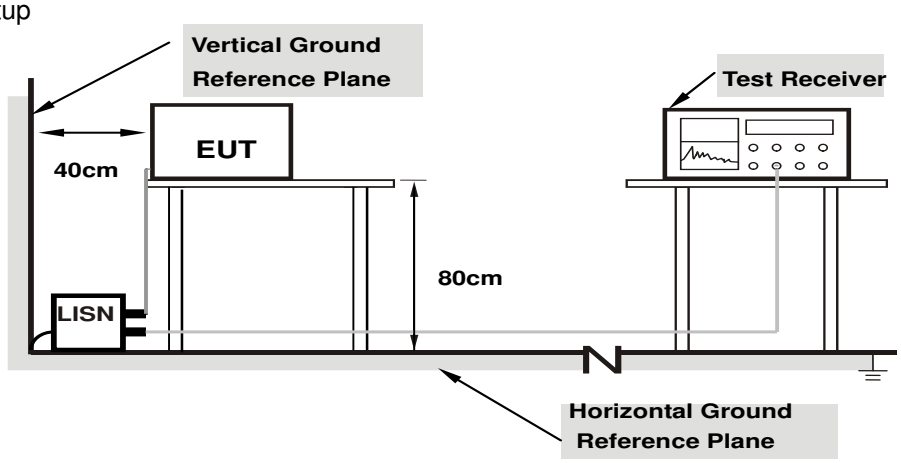
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

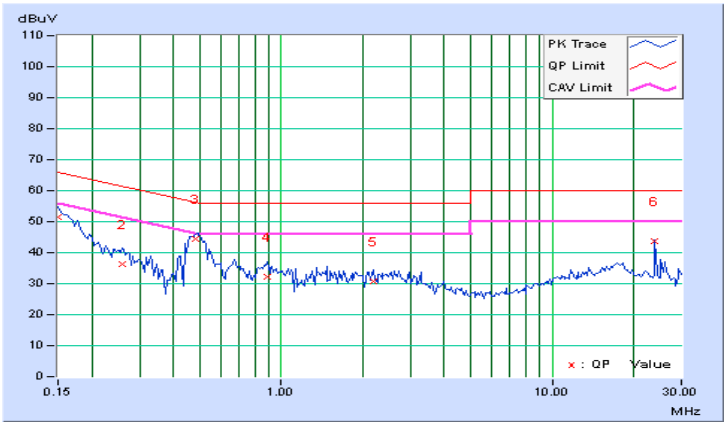
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.21	41.19	27.55	51.40	37.76	66.00	56.00	-14.60	-18.24
2	0.25938	10.22	25.93	16.81	36.15	27.03	61.45	51.45	-25.30	-24.42
3	0.48203	10.23	34.03	28.02	44.26	38.25	56.30	46.30	-12.05	-8.06
4	0.89219	10.25	22.01	14.15	32.26	24.40	56.00	46.00	-23.74	-21.60
5	2.19141	10.31	20.42	13.70	30.73	24.01	56.00	46.00	-25.27	-21.99
6	24.00000	11.43	32.27	31.89	43.70	43.32	60.00	50.00	-16.30	-6.68

Remarks:

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

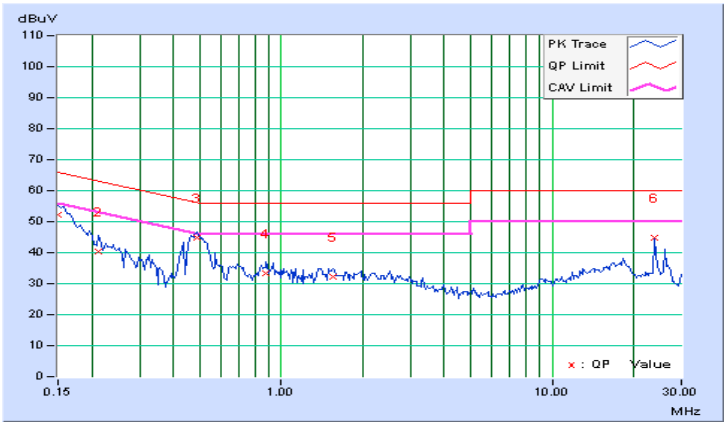


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	42.04	27.89	52.23	38.08	66.00	56.00	-13.77	-17.92
2	0.21250	10.21	30.28	14.80	40.49	25.01	63.11	53.11	-22.62	-28.10
3	0.48594	10.21	34.49	28.49	44.70	38.70	56.24	46.24	-11.54	-7.54
4	0.88047	10.23	23.03	16.79	33.26	27.02	56.00	46.00	-22.74	-18.98
5	1.55078	10.27	21.86	13.34	32.13	23.61	56.00	46.00	-23.87	-22.39
6	**24.00000**	**11.13**	**33.59**	**32.95**	**44.72**	**44.08**	**60.00**	**50.00**	**-15.28**	**-5.92**

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

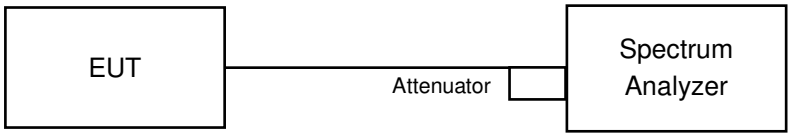


4.3 6dB Bandwidth Measurement

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100036	Jan. 27, 2016	Jan. 26, 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. Tested Date: July 19, 2016

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	Chain 2	Chain 3		
1	2412	7.63	8.10	8.11	8.12	0.5	PASS
6	2437	8.04	7.61	8.05	8.10	0.5	PASS
11	2462	7.61	8.11	7.61	8.10	0.5	PASS

802.11g

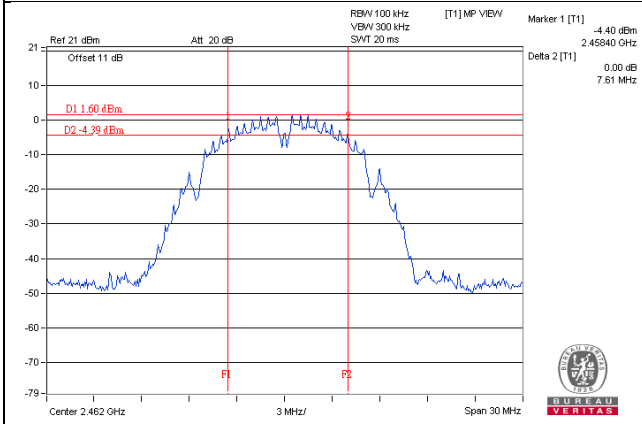
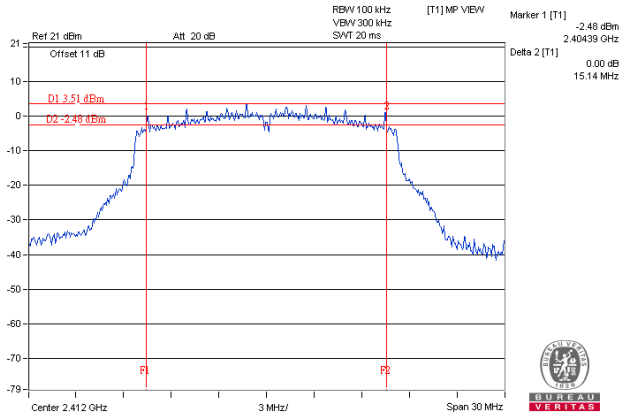
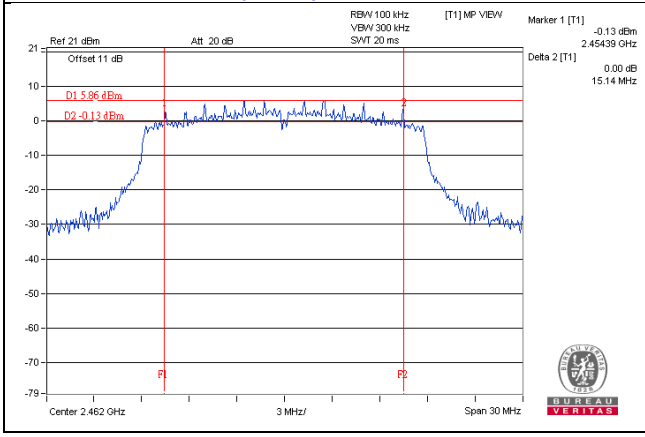
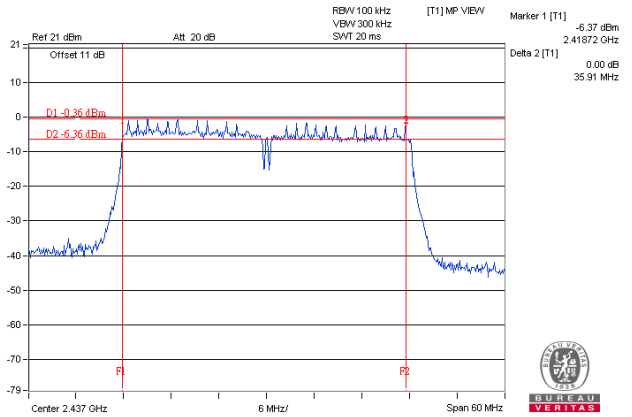
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.16	15.19	15.14	15.15	0.5	PASS
6	2437	15.19	15.24	15.17	15.16	0.5	PASS
11	2462	15.20	15.21	15.15	15.19	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.17	15.75	15.18	15.17	0.5	PASS
6	2437	15.16	15.22	15.74	15.74	0.5	PASS
11	2462	15.21	15.14	15.20	15.17	0.5	PASS

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.98	36.40	36.36	36.38	0.5	PASS
6	2437	35.91	36.49	36.49	36.47	0.5	PASS
9	2452	36.49	36.55	36.48	36.46	0.5	PASS

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH11	**802.11g / Chain 2 : CH1**
	
802.11n (HT20) / Chain 1 : CH1	**802.11n (HT40) / Chain 0 : CH6**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

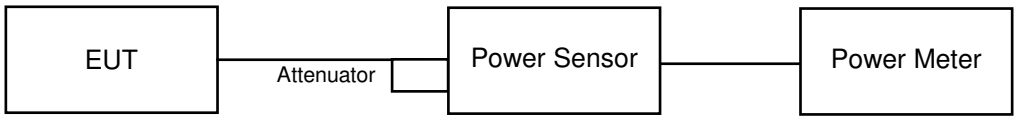
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested Date: July 19, 2016

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

CDD Mode

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	10.93	11.37	10.57	11.14	50.501	17.03	30	Pass
6	2437	10.64	11.11	10.37	10.96	47.863	16.80	30	Pass
11	2462	9.77	10.11	9.93	10.25	40.174	16.04	30	Pass

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	14.77	15.37	14.95	14.69	125.132	20.97	30	Pass
6	2437	18.69	20.16	19.45	19.05	346.172	25.39	30	Pass
11	2462	16.31	17.12	16.63	16.42	184.158	22.65	30	Pass

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	14.56	15.11	14.35	14.48	116.291	20.66	30	Pass
6	2437	18.36	19.77	19.03	18.42	312.876	24.95	30	Pass
11	2462	16.22	17.19	16.47	16.48	183.063	22.63	30	Pass

802.11n (HT40)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	10.56	11.19	10.57	11.02	48.577	16.86	30	Pass
6	2437	13.58	14.05	13.23	13.74	92.91	19.68	30	Pass
9	2452	14.37	14.86	14.57	14.62	115.588	20.63	30	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	14.56	15.11	14.35	14.48	116.291	20.66	26.05	Pass
6	2437	18.36	19.77	19.03	18.42	312.876	24.95	26.05	Pass
11	2462	16.22	17.19	16.47	16.48	183.063	22.63	26.05	Pass

Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$+ $10^{G3/20}$+ $10^{G4/20}$)^2 / 4] = 9.95dBi > 6dBi , so the power limit shall be reduced to 30-(9.95-6) = 26.05dBm.

802.11n (HT40)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	10.56	11.19	10.57	11.02	48.577	16.86	26.05	Pass
6	2437	13.58	14.05	13.23	13.74	92.91	19.68	26.05	Pass
9	2452	14.37	14.86	14.57	14.62	115.588	20.63	26.05	Pass

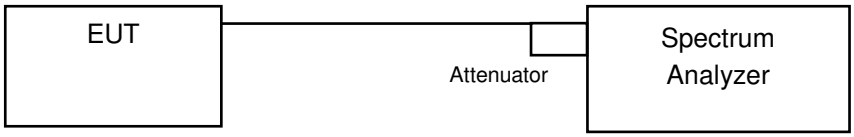
Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$+ $10^{G3/20}$+ $10^{G4/20}$)^2 / 4] = 9.95dBi > 6dBi , so the power limit shall be reduced to 30-(9.95-6) = 26.05dBm.

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100036	Jan. 27, 2016	Jan. 26, 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. Tested Date: July 19, 2016

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.66	6.02	-2.64	4.05	Pass
	6	2437	-8.42	6.02	-2.40	4.05	Pass
	11	2462	-9.55	6.02	-3.53	4.05	Pass
1	1	2412	-8.34	6.02	-2.32	4.05	Pass
	6	2437	-8.64	6.02	-2.62	4.05	Pass
	11	2462	-9.76	6.02	-3.74	4.05	Pass
2	1	2412	-13.25	6.02	-7.23	4.05	Pass
	6	2437	-13.42	6.02	-7.40	4.05	Pass
	11	2462	-14.38	6.02	-8.36	4.05	Pass
3	1	2412	-15.53	6.02	-9.51	4.05	Pass
	6	2437	-15.56	6.02	-9.54	4.05	Pass
	11	2462	-15.77	6.02	-9.75	4.05	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.95dBi > 6dBi , so the power density limit shall be reduced to 8-(9.95-6) = 4.05dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-3.85	6.02	2.17	4.05	Pass
	6	2437	-2.44	6.02	3.58	4.05	Pass
	11	2462	-3.27	6.02	2.75	4.05	Pass
1	1	2412	-3.57	6.02	2.45	4.05	Pass
	6	2437	-9.82	6.02	-3.80	4.05	Pass
	11	2462	-5.26	6.02	0.76	4.05	Pass
2	1	2412	-7.90	6.02	-1.88	4.05	Pass
	6	2437	-5.23	6.02	0.79	4.05	Pass
	11	2462	-4.76	6.02	1.26	4.05	Pass
3	1	2412	-9.24	6.02	-3.22	4.05	Pass
	6	2437	-11.08	6.02	-5.06	4.05	Pass
	11	2462	-5.22	6.02	0.80	4.05	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.95dBi > 6dBi , so the power density limit shall be reduced to 8-(9.95-6) = 4.05dBm.

802.11n (HT20)

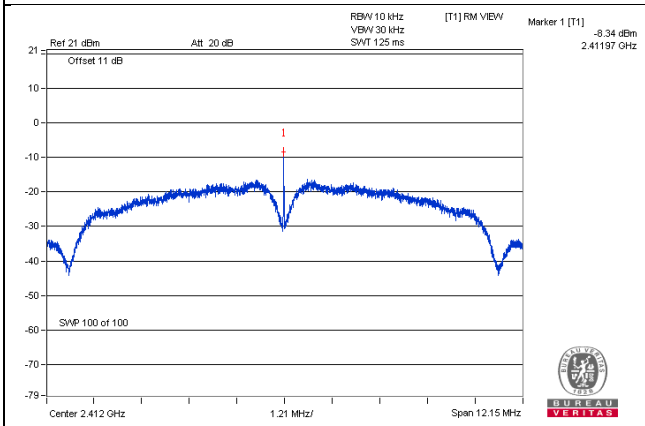
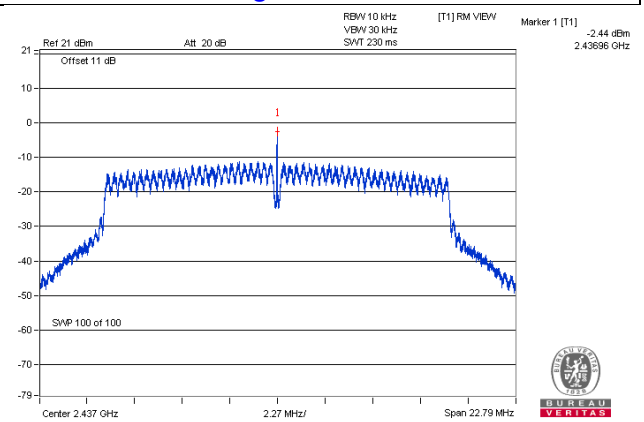
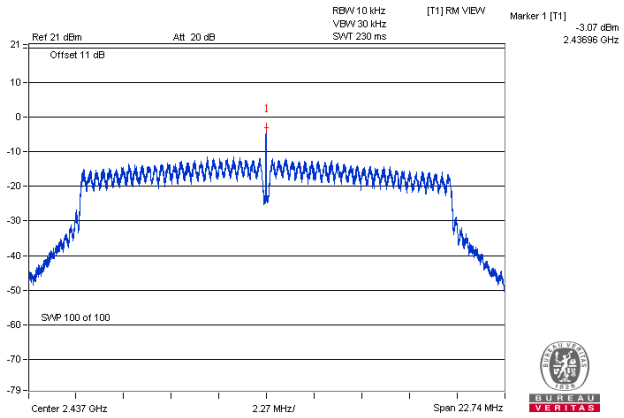
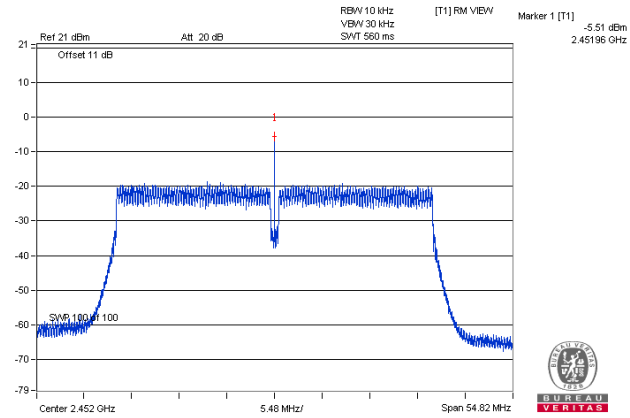
TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-4.44	6.02	1.58	4.05	Pass
	6	2437	-3.07	6.02	2.95	4.05	Pass
	11	2462	-4.12	6.02	1.90	4.05	Pass
1	1	2412	-3.42	6.02	2.60	4.05	Pass
	6	2437	-5.05	6.02	0.97	4.05	Pass
	11	2462	-4.77	6.02	1.25	4.05	Pass
2	1	2412	-8.69	6.02	-2.67	4.05	Pass
	6	2437	-4.60	6.02	1.42	4.05	Pass
	11	2462	-5.07	6.02	0.95	4.05	Pass
3	1	2412	-9.84	6.02	-3.82	4.05	Pass
	6	2437	-5.79	6.02	0.23	4.05	Pass
	11	2462	-4.87	6.02	1.15	4.05	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.95dBi > 6dBi , so the power density limit shall be reduced to 8-(9.95-6) = 4.05dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=4) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-8.13	6.02	-2.11	4.05	Pass
	6	2437	-8.31	6.02	-2.29	4.05	Pass
	9	2452	-7.88	6.02	-1.86	4.05	Pass
1	3	2422	-7.94	6.02	-1.92	4.05	Pass
	6	2437	-6.32	6.02	-0.30	4.05	Pass
	9	2452	-5.51	6.02	0.51	4.05	Pass
2	3	2422	-13.72	6.02	-7.70	4.05	Pass
	6	2437	-11.14	6.02	-5.12	4.05	Pass
	9	2452	-9.59	6.02	-3.57	4.05	Pass
3	3	2422	-15.52	6.02	-9.50	4.05	Pass
	6	2437	-13.06	6.02	-7.04	4.05	Pass
	9	2452	-12.50	6.02	-6.48	4.05	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.95dBi > 6dBi , so the power density limit shall be reduced to 8-(9.95-6) = 4.05dBm.

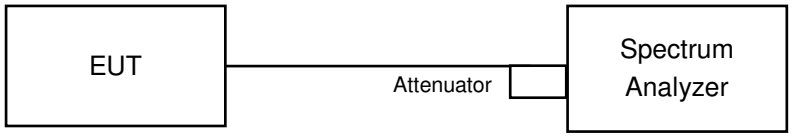
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH1	**802.11g / Chain 0 : CH6**
	
802.11n (HT20) / Chain 0 : CH6	**802.11n (HT40) / Chain 1 : CH9**
	

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP40	100036	Jan. 27, 2016	Jan. 26, 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. Tested Date: July 19, 2016

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

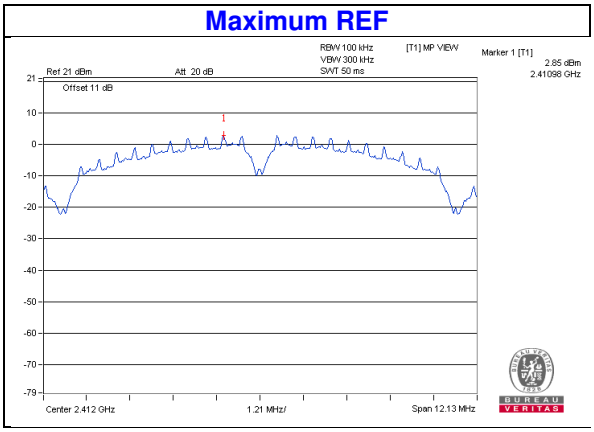
Same as Item 4.3.6

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.

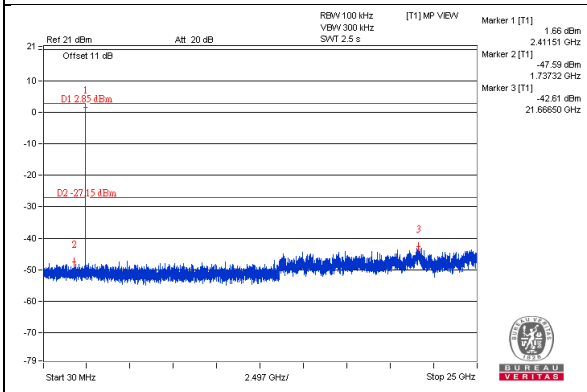
802.11b

Maximum REF

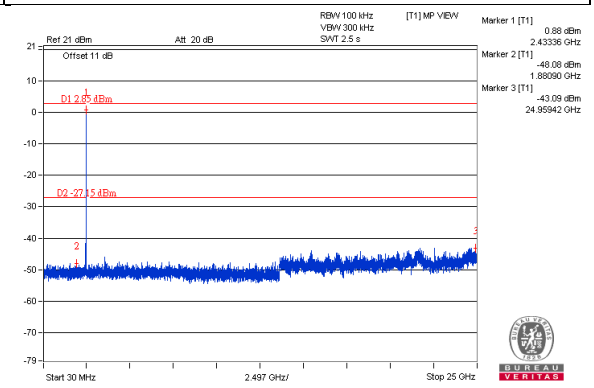


Chain 0

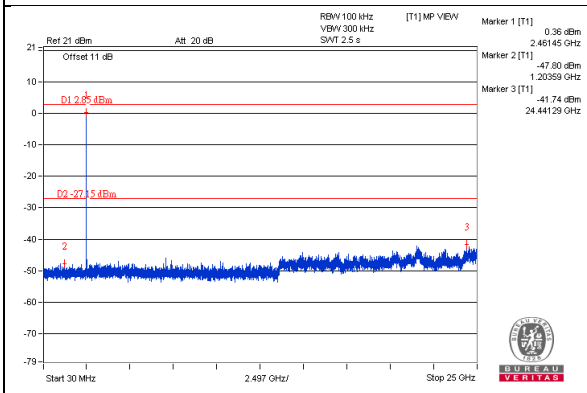
CH 1



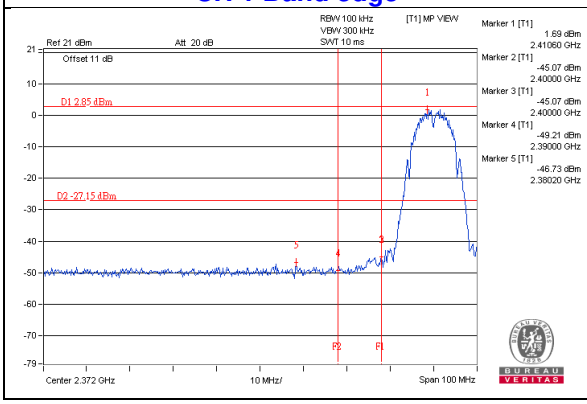
CH 6



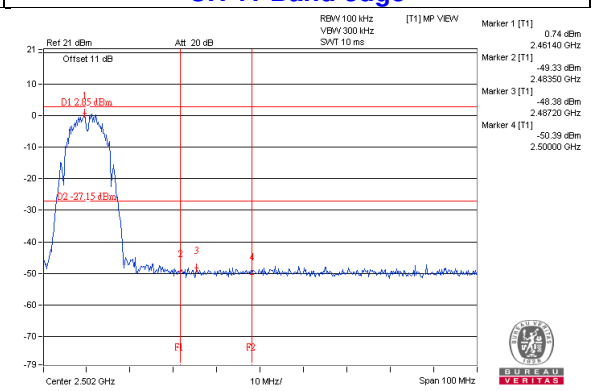
CH 11



CH 1 Band edge

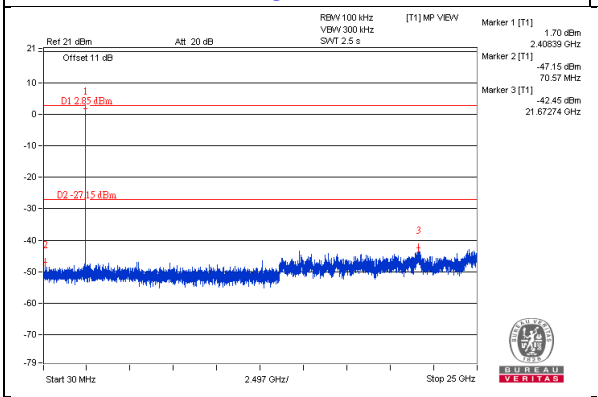


CH 11 Band edge

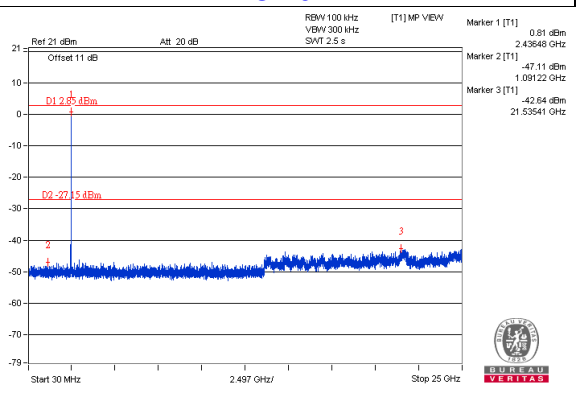


Chain 1

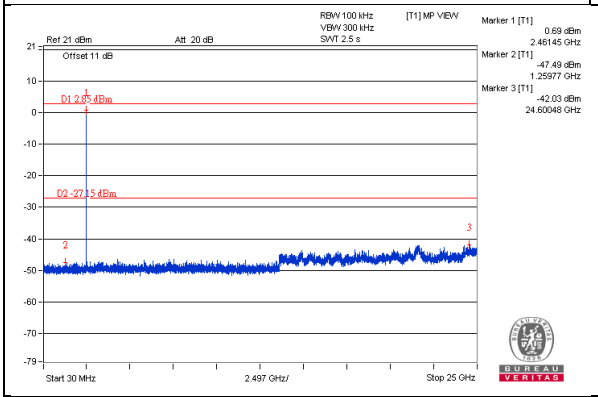
CH 1



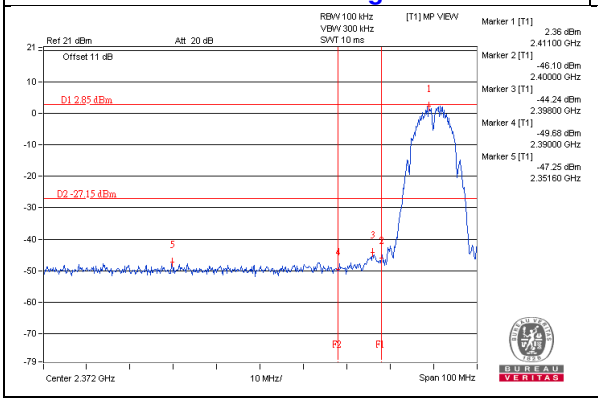
CH 6



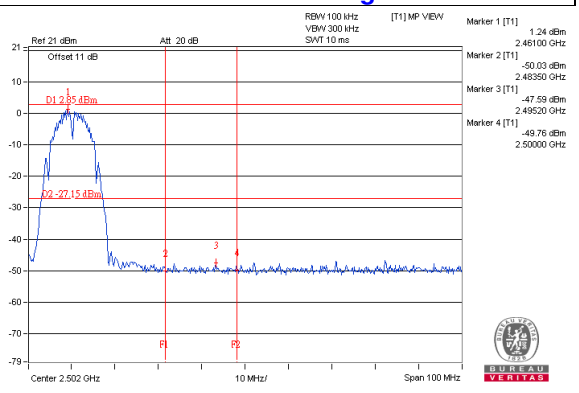
CH 11



CH 1 Band edge

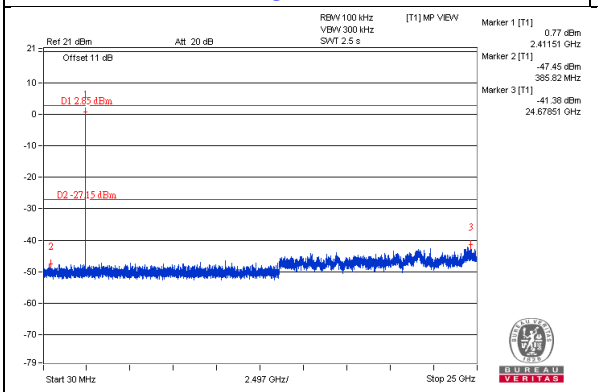


CH 11 Band edge

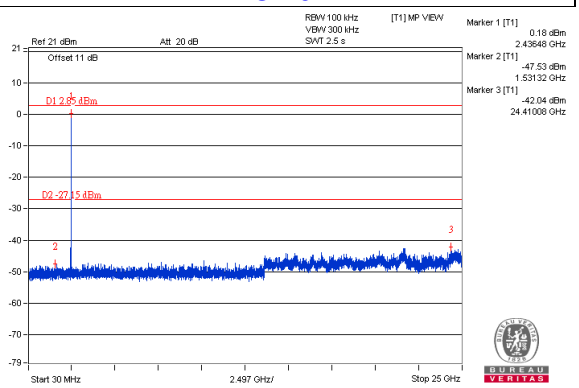


Chain 2

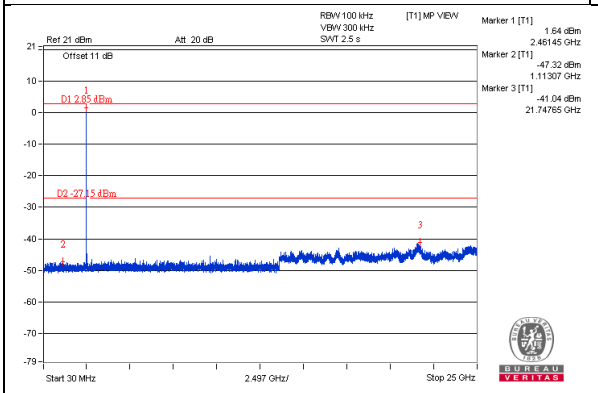
CH 1



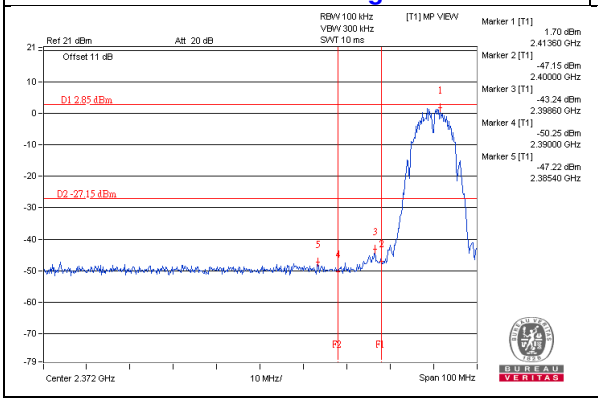
CH 6



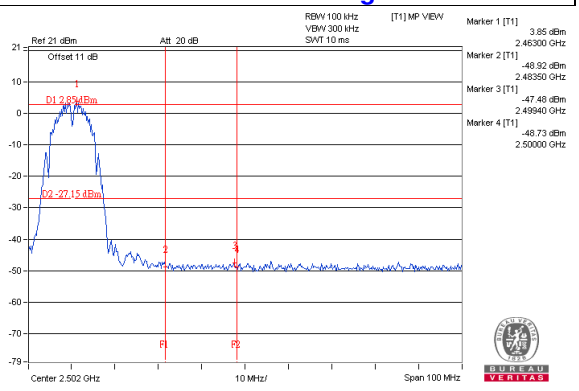
CH 11



CH 1 Band edge

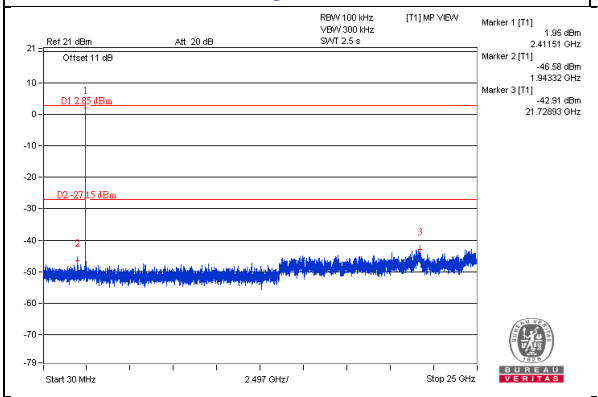


CH 11 Band edge

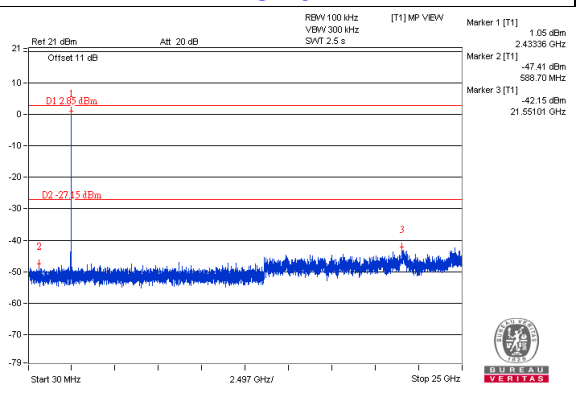


Chain 3

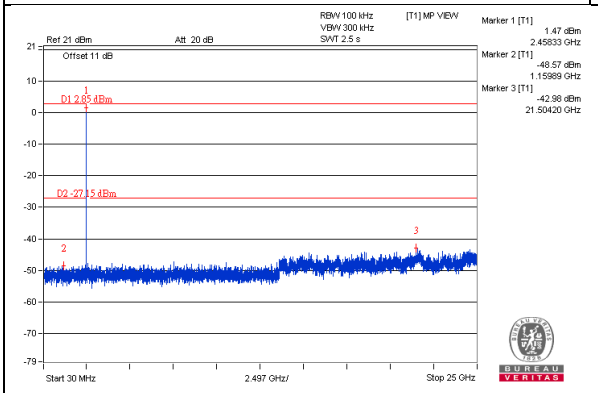
CH 1



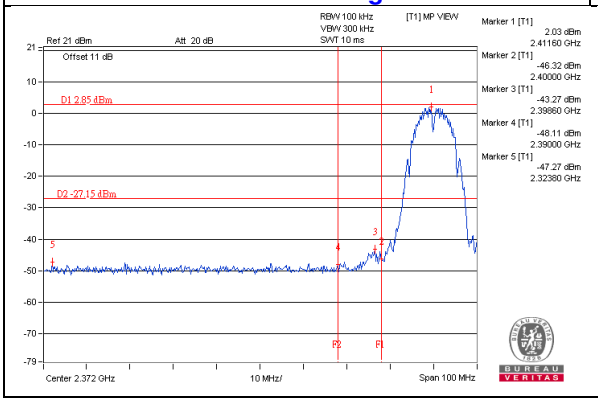
CH 6



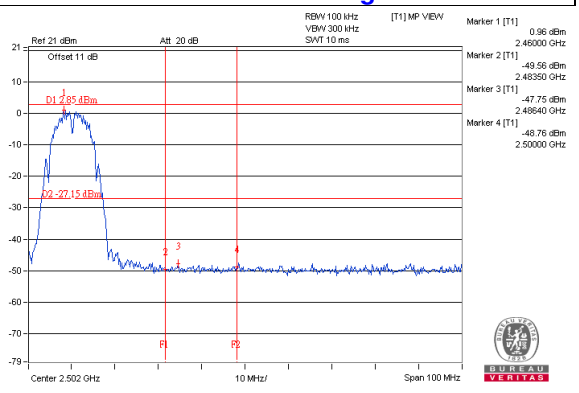
CH 11



CH 1 Band edge

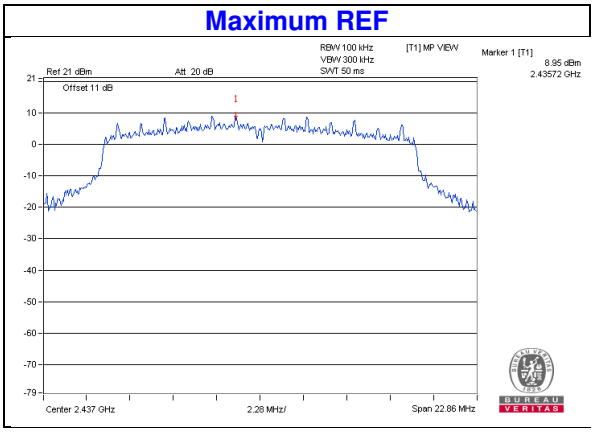


CH 11 Band edge



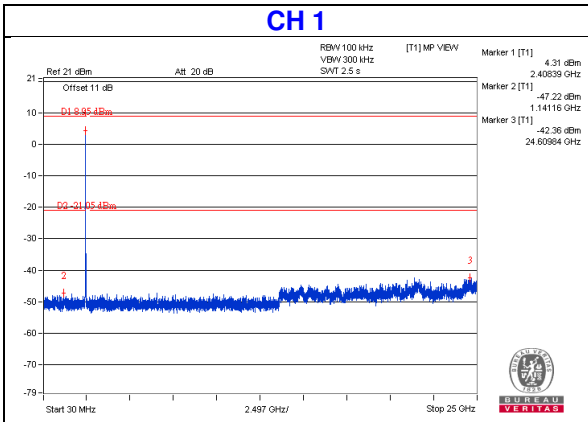
802.11g

Maximum REF

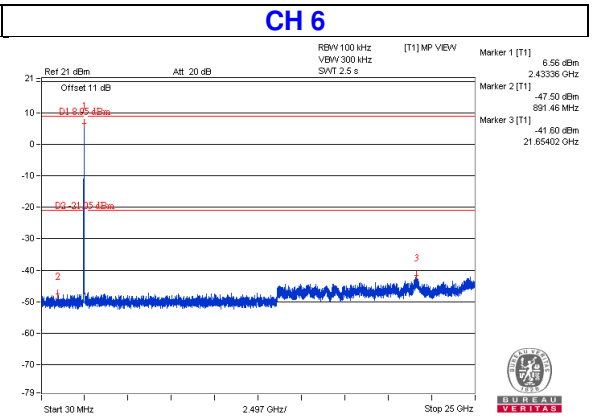


Chain 0

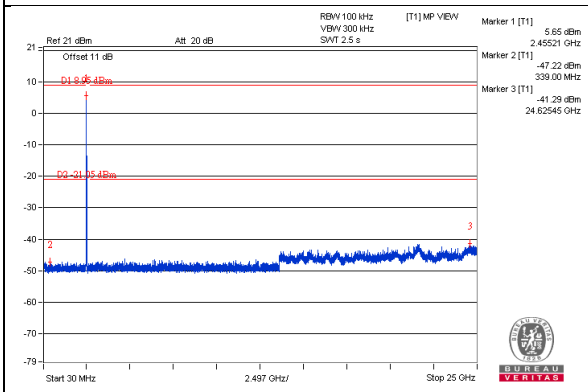
CH 1



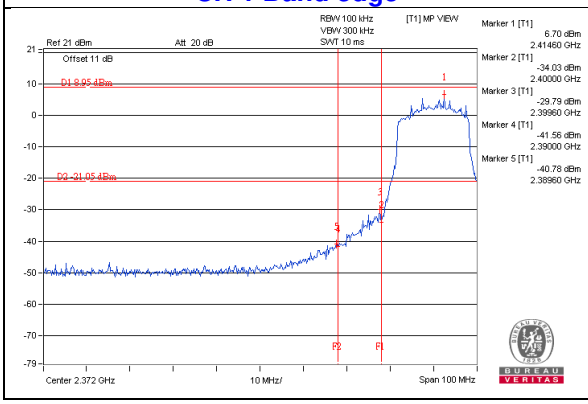
CH 6



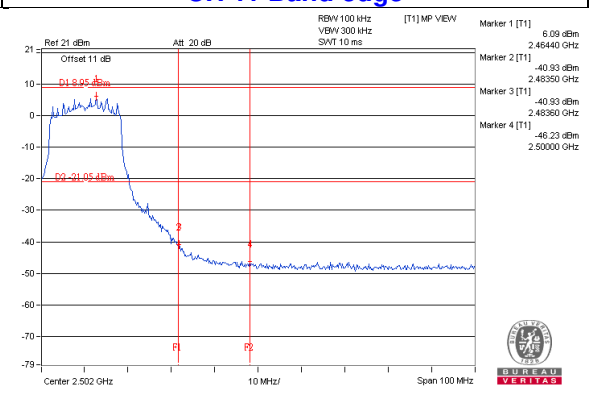
CH 11



CH 1 Band edge

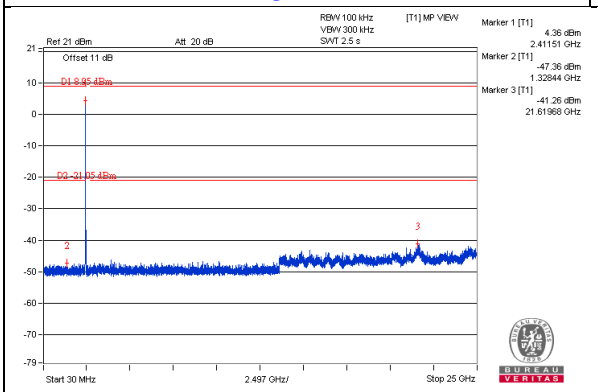


CH 11 Band edge

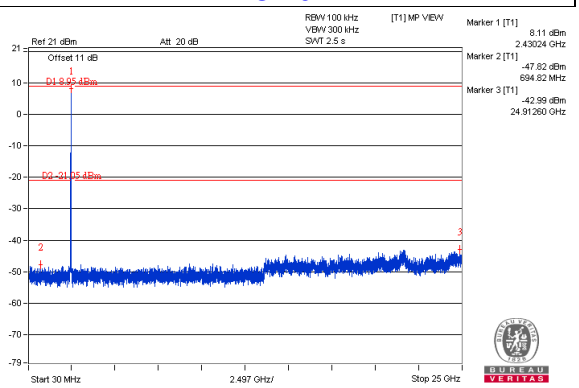


Chain 1

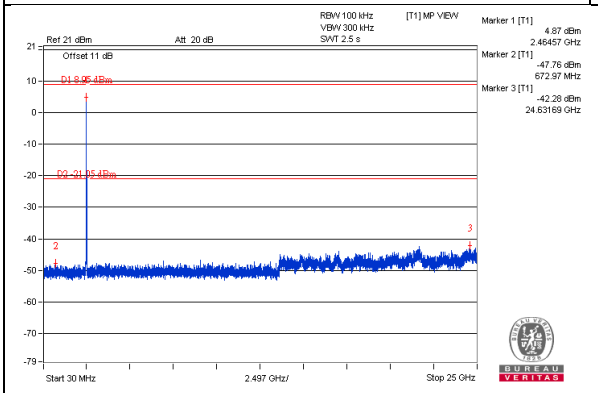
CH 1



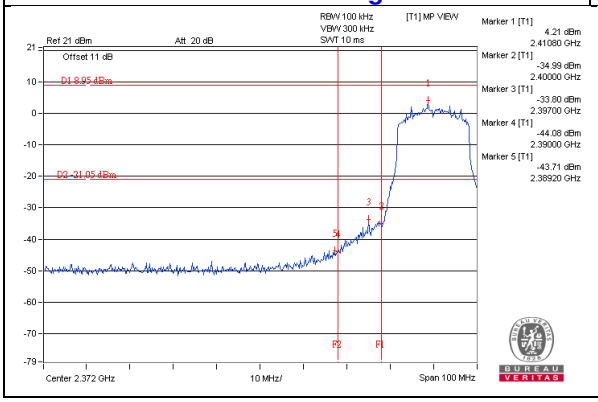
CH 6



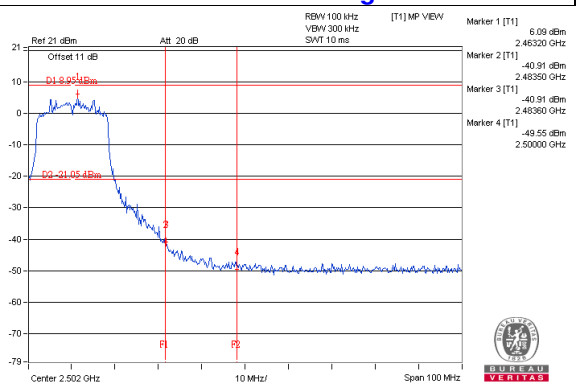
CH 11



CH 1 Band edge

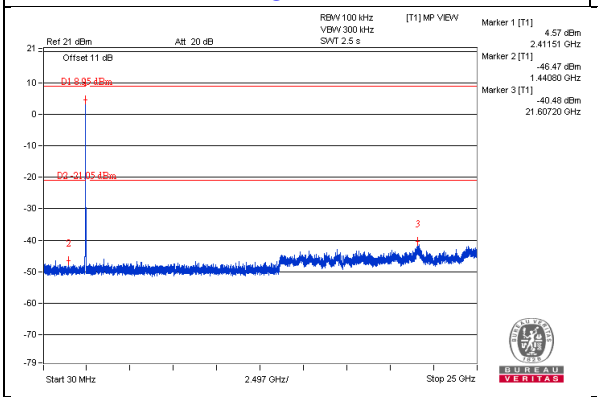


CH 11 Band edge

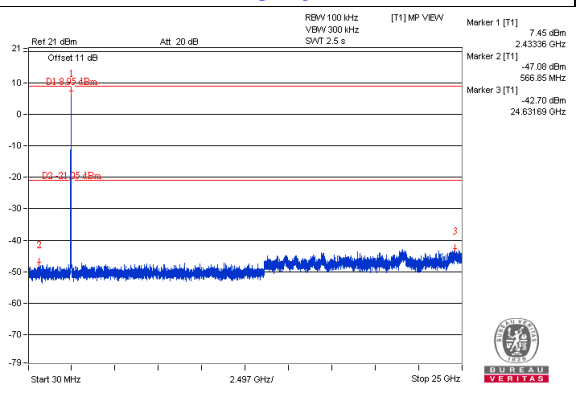


Chain 2

CH 1



CH 6



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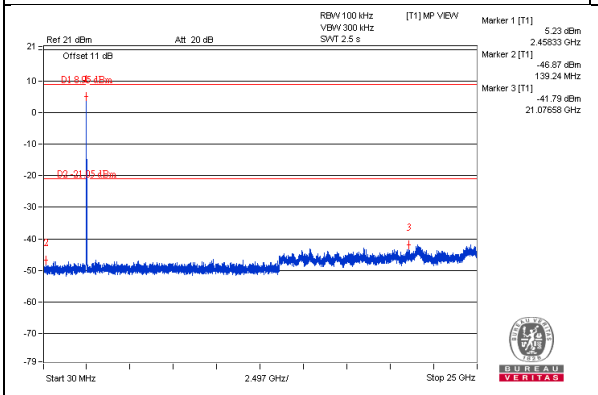
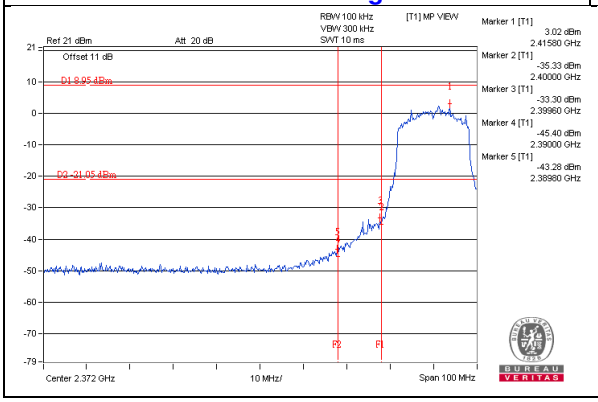
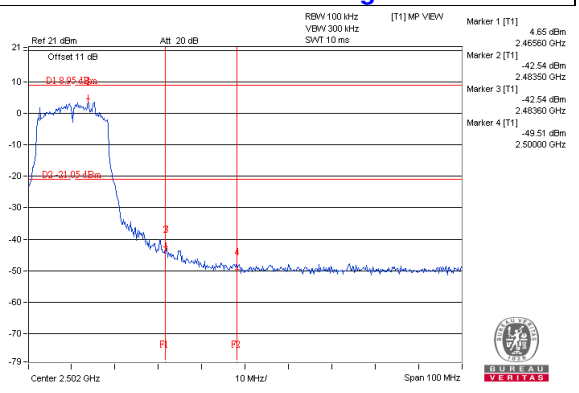


CH 1 Band edge

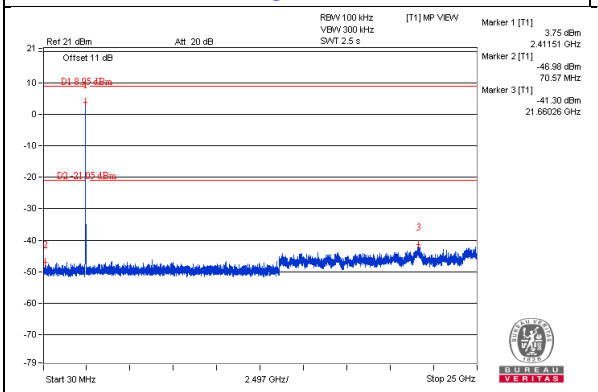


CH 11 Band edge

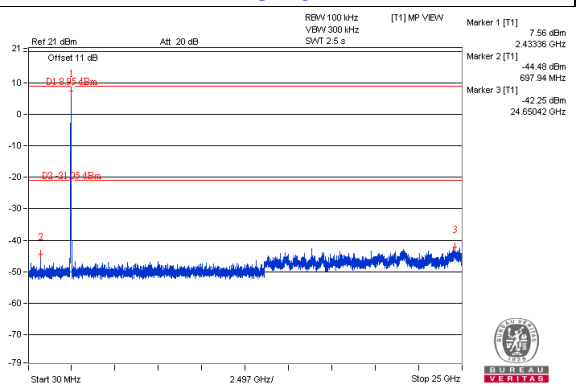


Chain 3

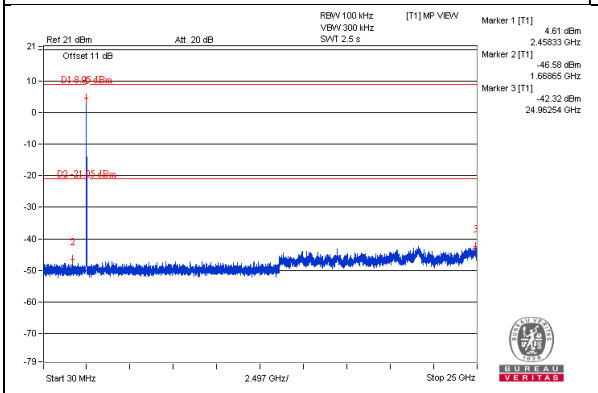
CH 1



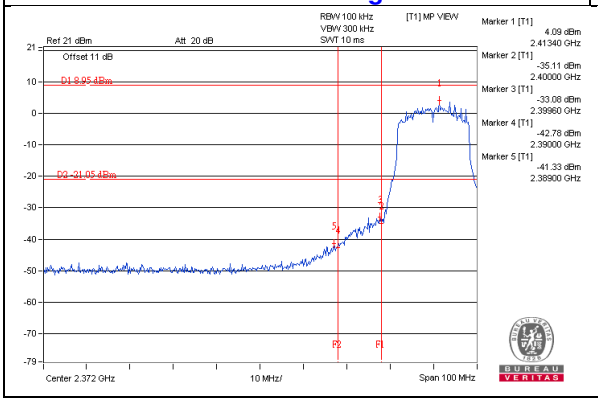
CH 6



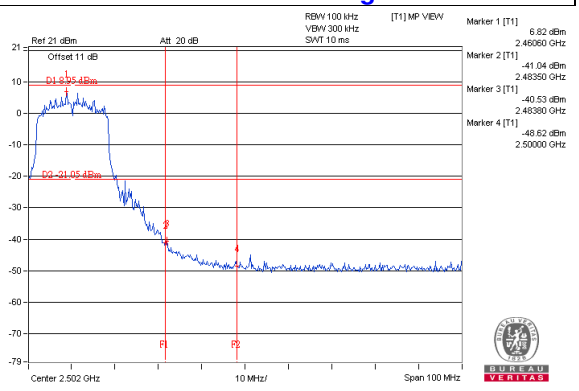
CH 11



CH 1 Band edge

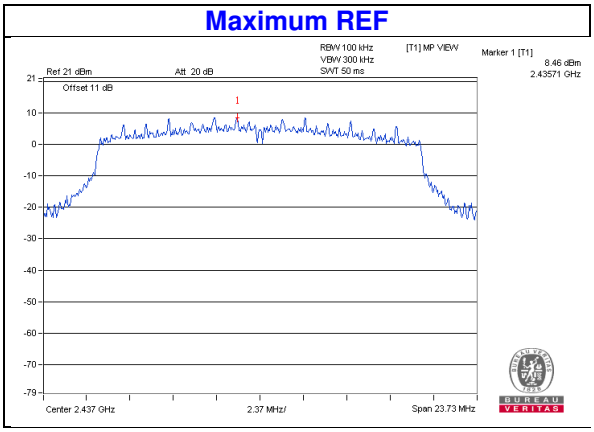


CH 11 Band edge



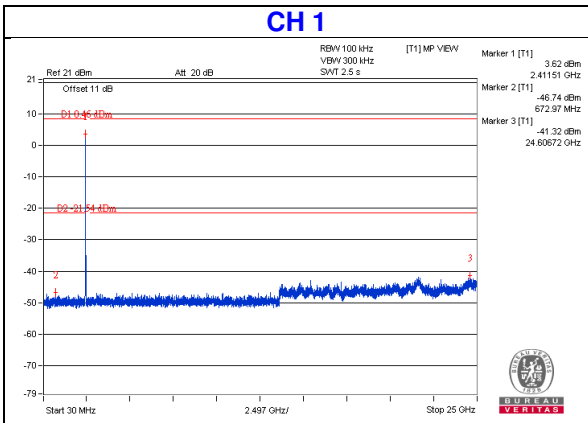
802.11n (HT20)

Maximum REF

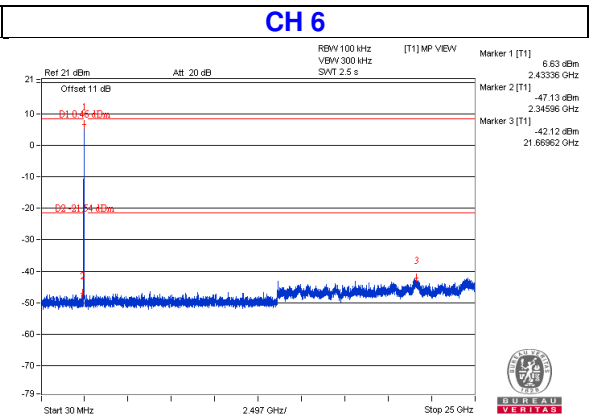


Chain 0

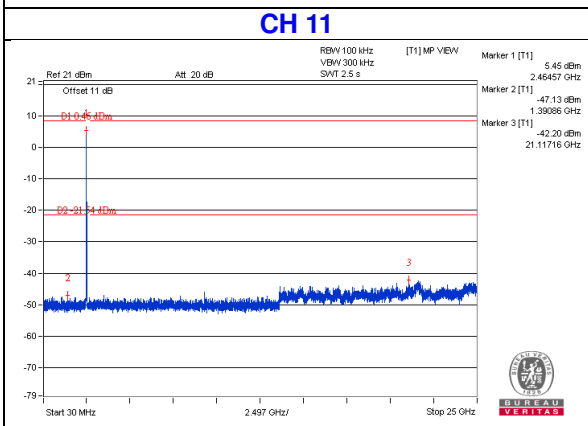
CH 1



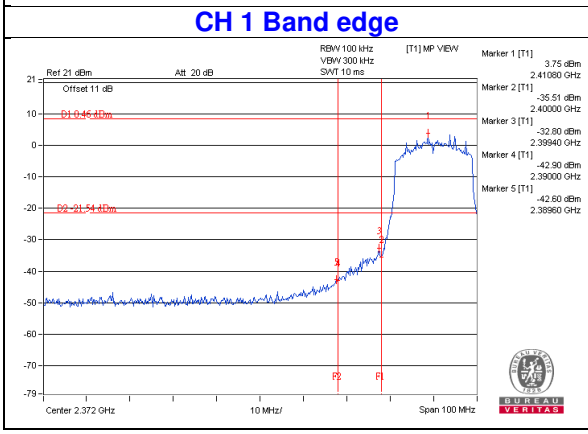
CH 6



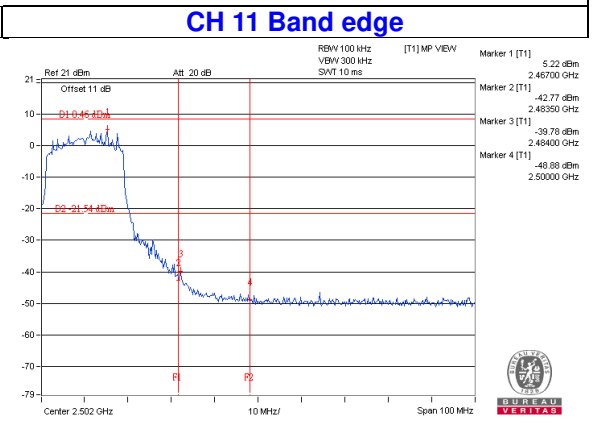
CH 11



CH 1 Band edge

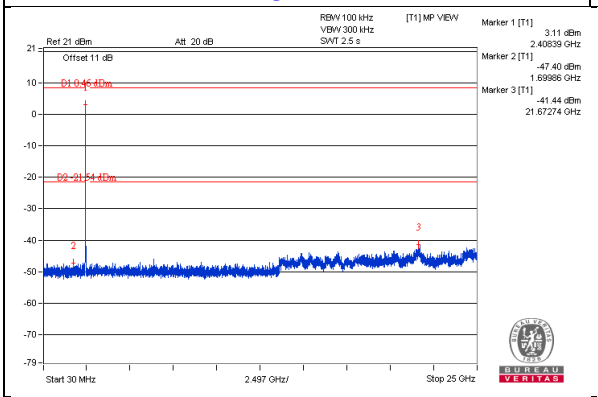


CH 11 Band edge

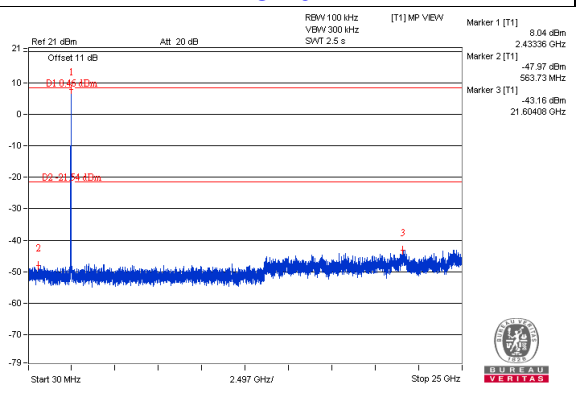


Chain 1

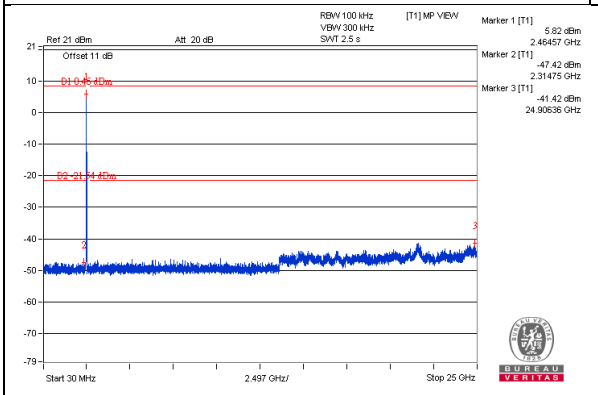
CH 1



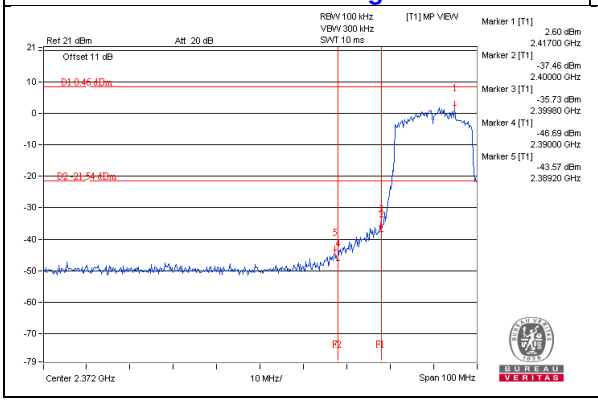
CH 6



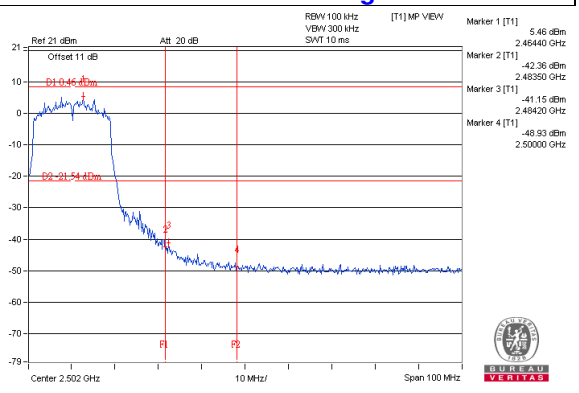
CH 11



CH 1 Band edge

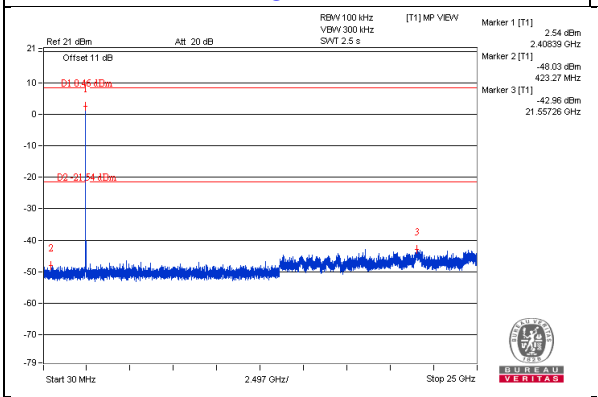


CH 11 Band edge

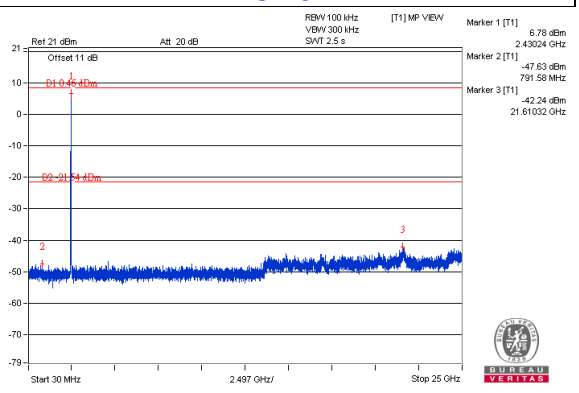


Chain 2

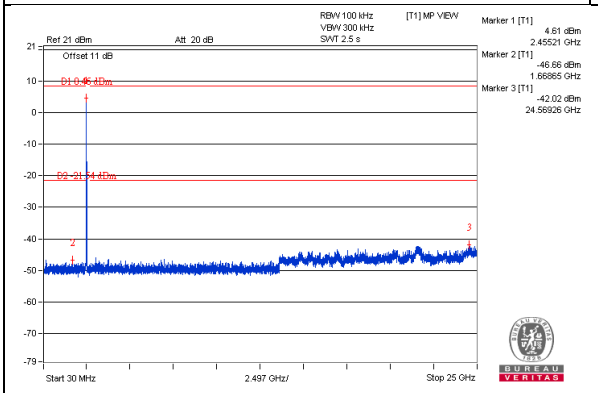
CH 1



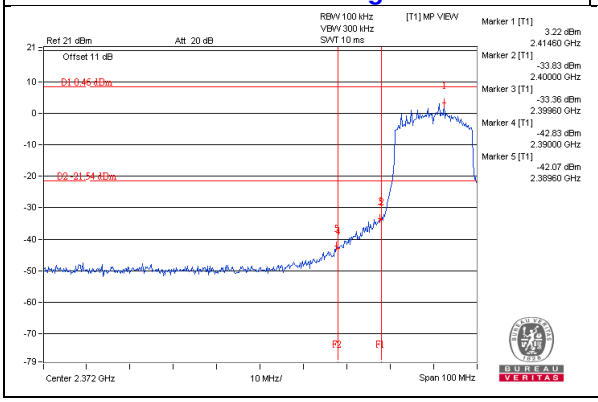
CH 6



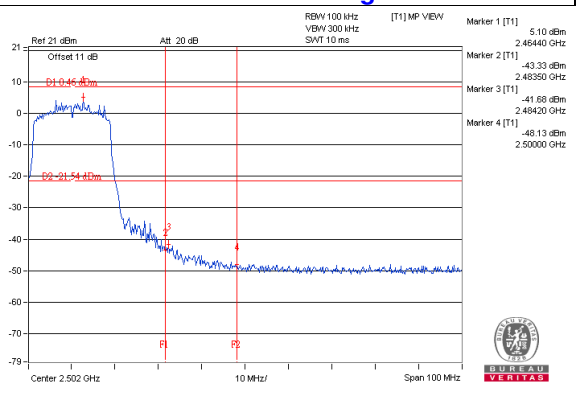
CH 11



CH 1 Band edge

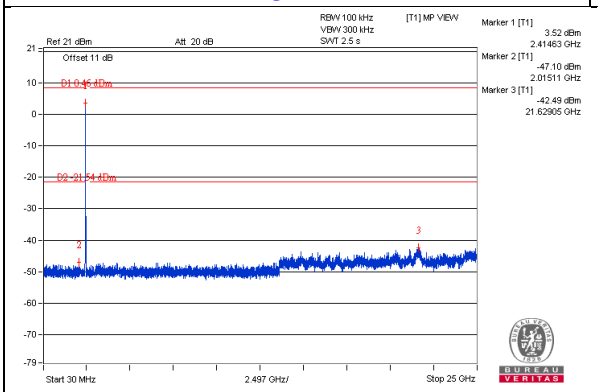


CH 11 Band edge

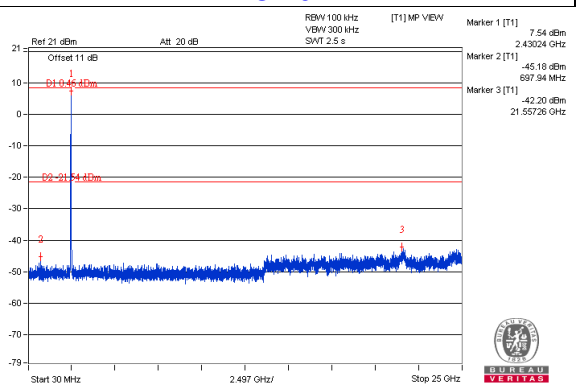


Chain 3

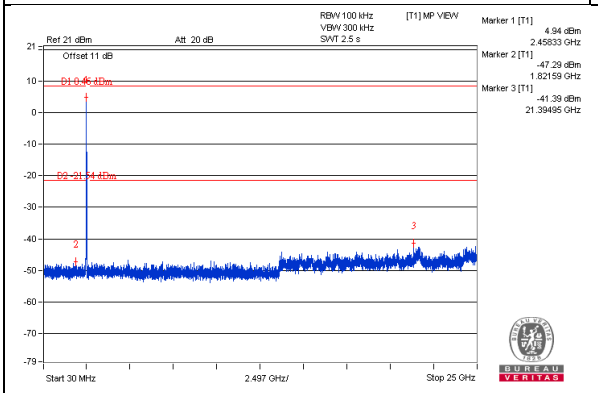
CH 1



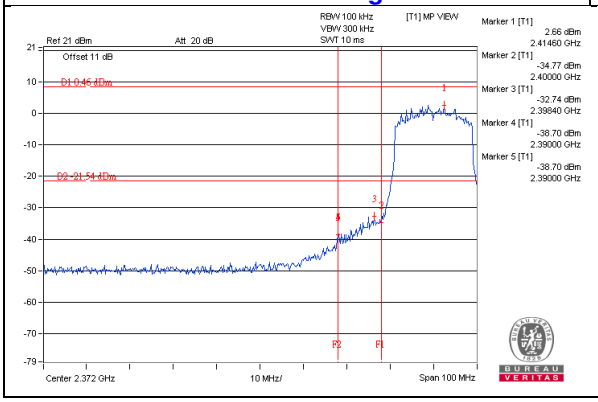
CH 6



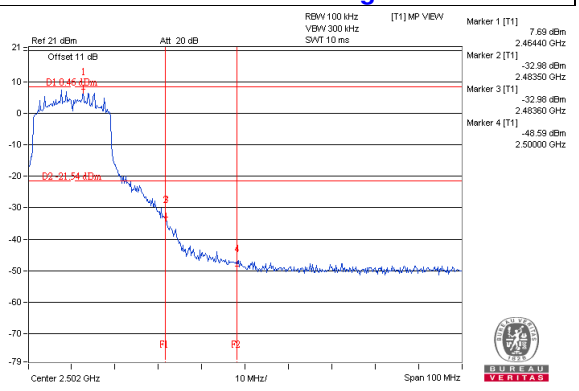
CH 11



CH 1 Band edge

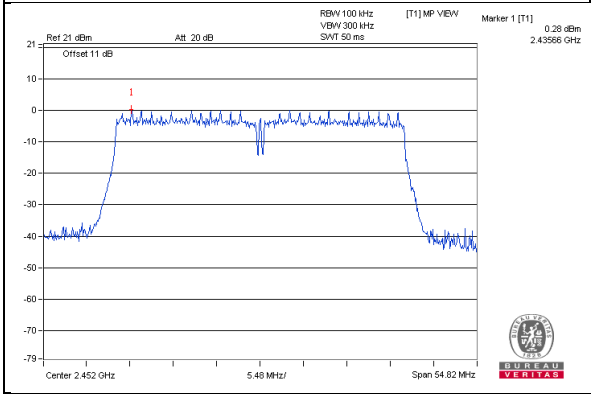


CH 11 Band edge



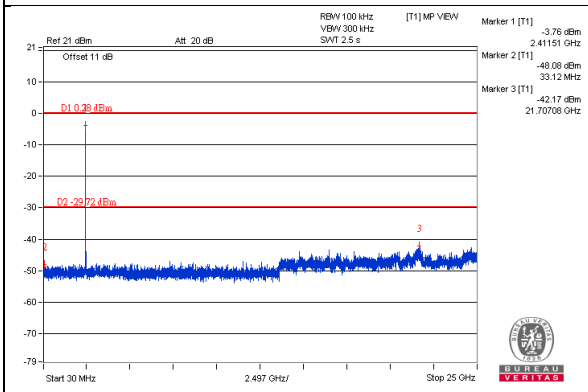
802.11n (HT40)

Maximum REF

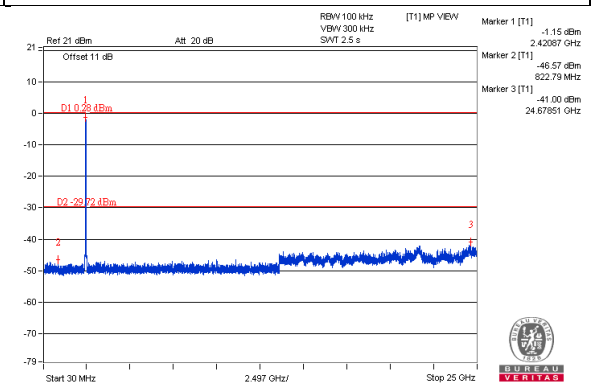


Chain 0

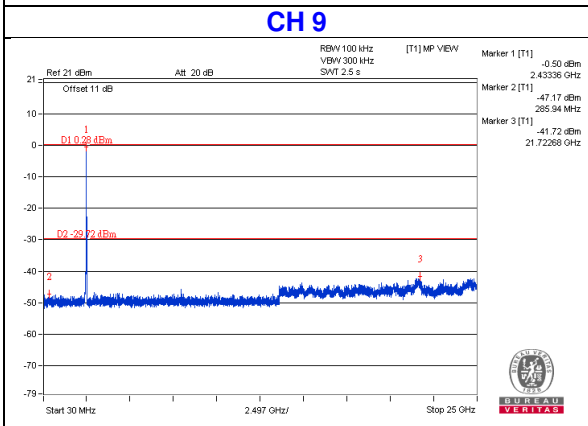
CH 3



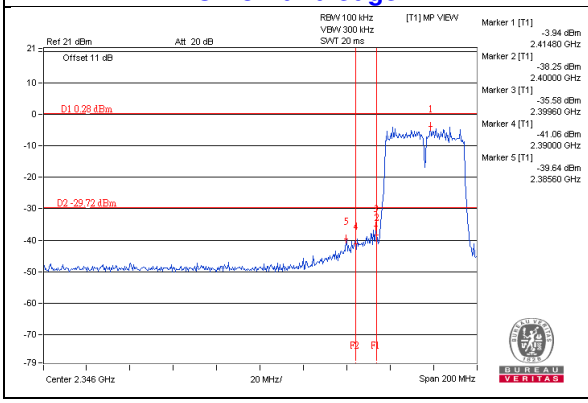
CH 6



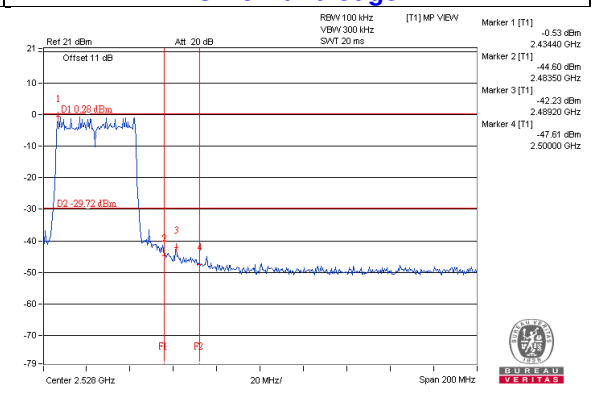
CH 9



CH 3 Band edge

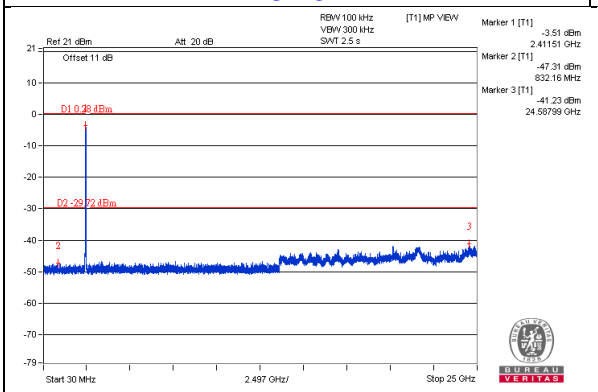


CH 9 Band edge

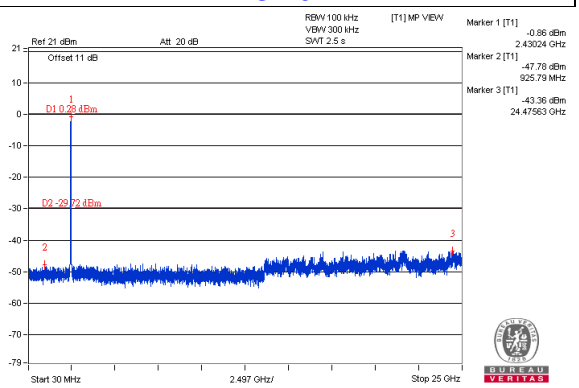


Chain 1

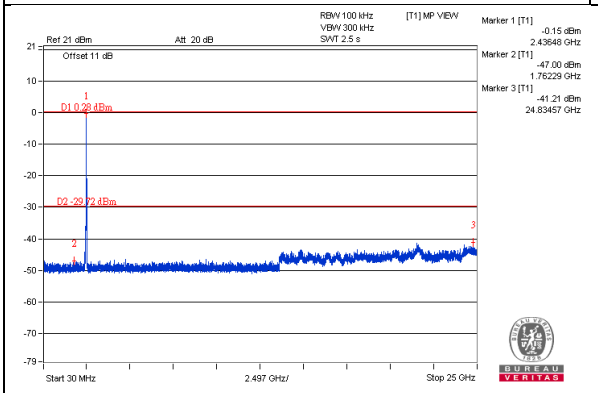
CH 3



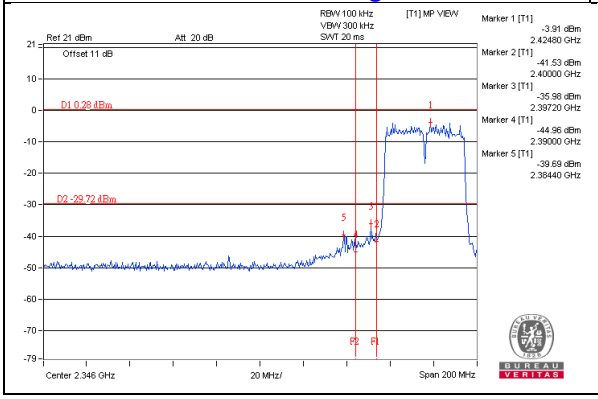
CH 6



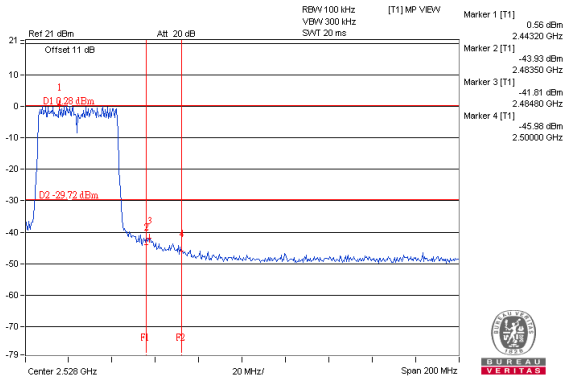
CH 9



CH 3 Band edge

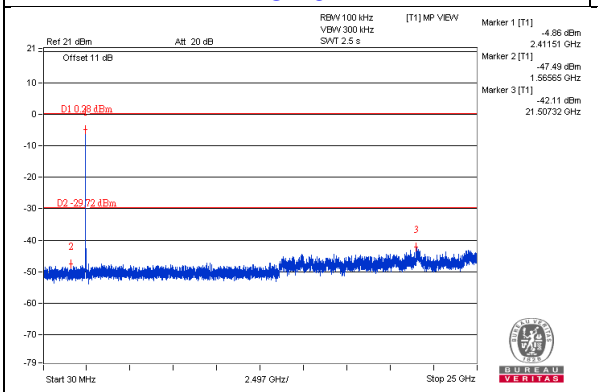


CH 9 Band edge

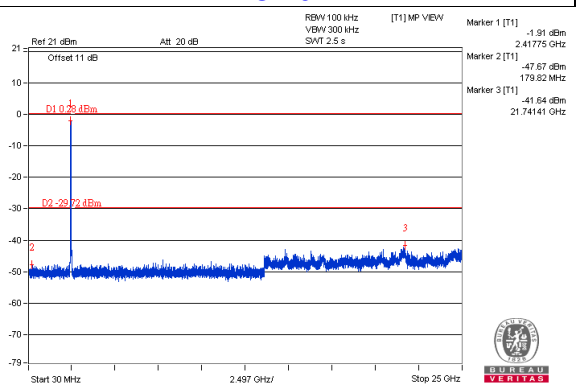


Chain 2

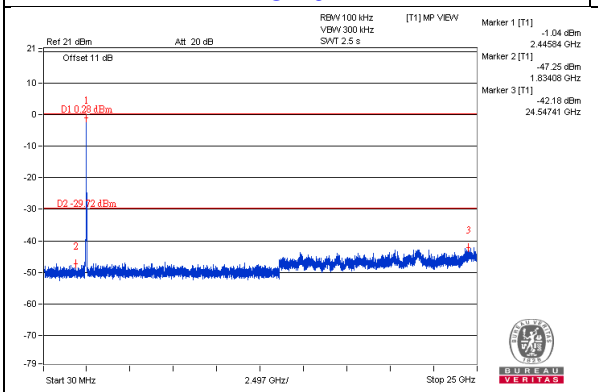
CH 3



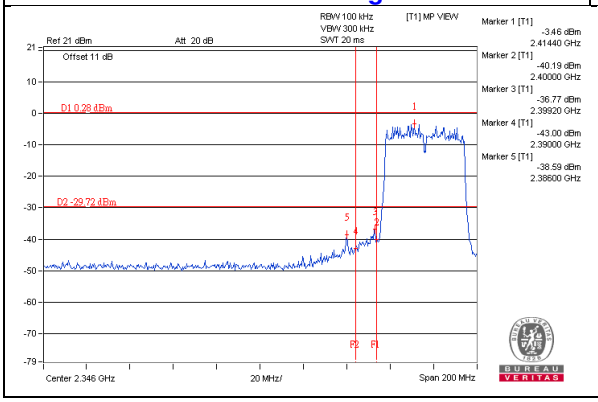
CH 6



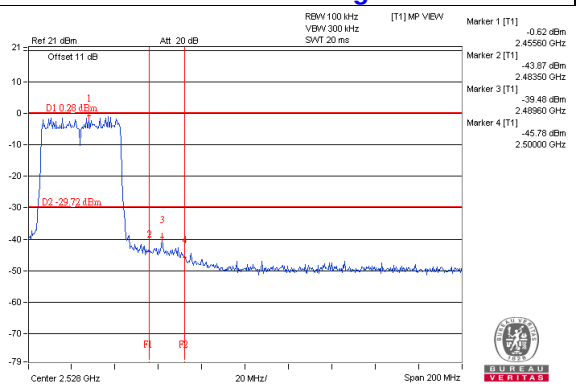
CH 9



CH 3 Band edge

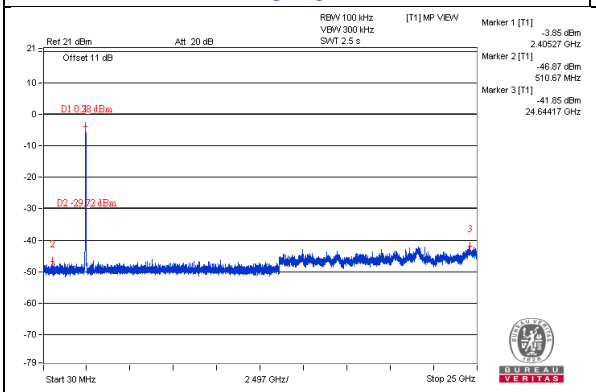


CH 9 Band edge

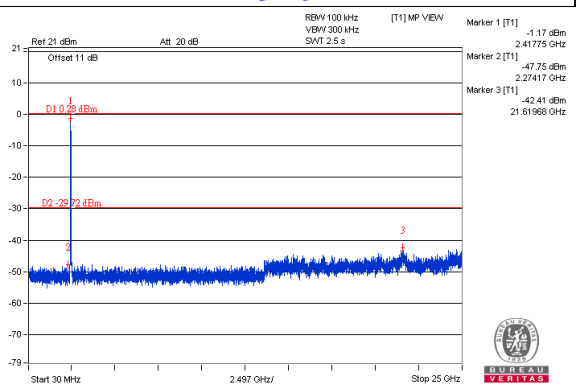


Chain 3

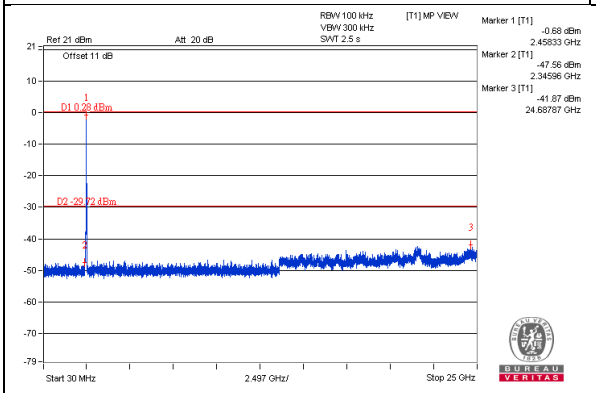
CH 3



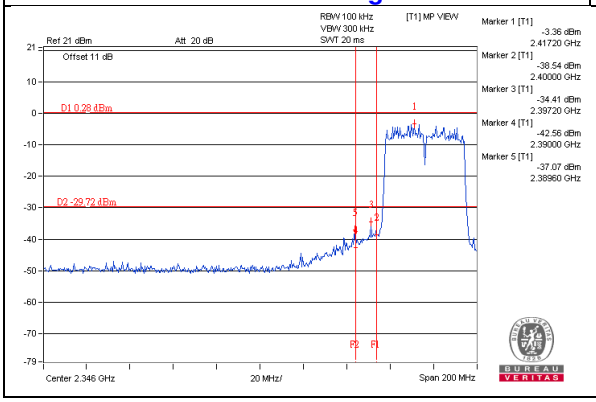
CH 6



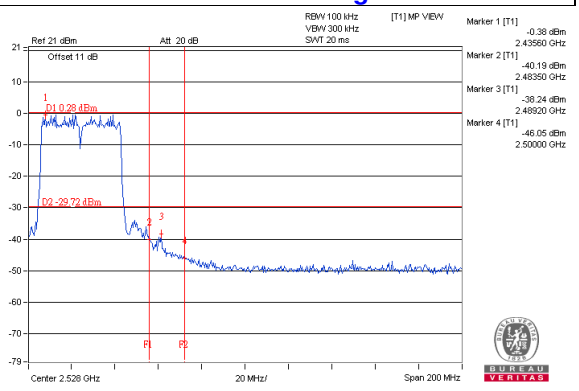
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

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