FCC Test Report (WLAN)

Report No.:	RF171027E03
FCC ID:	2AF5PMR2600
Test Model:	MR2600
Series Model:	MR2600XY (where X can be A, B, C, D or blank, and Y can be A, B, C, D, or blank, for identical hardware models for marketing purposes only)
Received Date:	Oct. 27, 2017
Test Date:	Nov. 30 to Dec. 13, 2017
Issued Date:	Jan. 04, 2018
Applicant:	MTRLC LLC
Address:	PO Box 121147 Boston, MA 02112-1147, United States.
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
RF171027E03	Original release.	Jan. 04, 2018

1 Certificate of Conformity

Product:	AC2600 WiFi Gigabit Router
Brand:	Motorola
Test Model:	MR2600
Series Model:	MR2600XY (where X can be A, B, C, D or blank, and Y can be A, B, C, D, or blank, for identical hardware models for marketing purposes only)
Sample Status:	ENGINEERING SAMPLE
Applicant:	MTRLC LLC
Test Date:	Nov. 30 to Dec. 13, 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 : Mary Ko , **Date:** Jan. 04, 2018

Mary Ko / Specialist

Approved by : , **Date:** Jan. 04, 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 -14.38dB at 0.41563MHz.
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, 2483.50MHz, 2486.00MHz.
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 (WLAN)

Product	AC2600 WiFi Gigabit Router
Brand	Motorola
Test Model	MR2600
Series Model	MR2600XY (where X can be A, B, C, D or blank, and Y can be A, B, C, D, or blank, for identical hardware models for marketing purposes only)
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 mode in 2.4GHz band
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps 802.11ac (80+80): up to 1733.3Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b/g, 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): 2 802.11ac (VHT80+80): 1 set
Output Power	**2.4GHz:** 906.761mW **5.18 ~ 5.24GHz:** **CDD Mode:** 389.192mW **Beamforming Mode:** 382.231mW **5.745 ~ 5.825GHz:** **CDD Mode:** 994.756mW **Beamforming Mode:** 407.669mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT has below model names, which are identical to each other in all aspects except for the following:

Brand	Model	Product name	Different
Motorola	MR2600	AC2600 WiFi Gigabit Router	For identical hardware models and for marketing purposes only
	MR2600XY (where X can be A, B, C, D or blank, and Y can be A, B, C, D, or blank, for identical hardware models for marketing purposes only)		

From the above models, model: **MR2600** was selected as representative model for the test and its data was recorded in this report.

2. 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.		

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

Brand	Model No.	Spec.
Shenzhen Gongjin Electronics Co., Ltd	S24B72-120A200-C4	AC Input: 100-240Vac, 0.8A, 50/60Hz DC Output: 12V, 2A DC Output cable: Unshielded, 1.4m

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

Antenna NO.	Ant. Gain (dBi)	Ant. Net Gain (dBi)	Frequency range (GHz to GHz)	Antenna Type	Connecter Type	Cable Loss(dB)	Cable Length (mm)
1	5	4.42	2.4~2.4835GHz	Dipole	i-pex(MHF)	0.58	150
	5	4.04	5.15~5.85GHz	Dipole	i-pex(MHF)	0.96	150
2	5	4.27	2.4~2.4835GHz	Dipole	i-pex(MHF)	0.73	180
	5	3.7	5.15~5.85GHz	Dipole	i-pex(MHF)	1.3	180
3	5	4.27	2.4~2.4835GHz	Dipole	i-pex(MHF)	0.73	180
	5	3.7	5.15~5.85GHz	Dipole	i-pex(MHF)	1.3	180
4	5	4.42	2.4~2.4835GHz	Dipole	i-pex(MHF)	0.58	150
	5	4.04	5.15~5.85GHz	Dipole	i-pex(MHF)	0.96	150

5. 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
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
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
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
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	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
802.11ac (VHT80+VHT80) noncontigurus	MCS 0~9, Nss=1	2TX+2TX	2RX +2RX
	MCS 0~9, Nss=2	2TX+2TX	2RX +2RX

Note:
1. All of modulation mode support beamforming function except 2.4GHz and 802.11a modulation mode.

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

3.2 Description of Test Modes

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

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	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)
802.11b	1 to 11	6	DSSS	DBPSK	1

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)
802.11b	1 to 11	6	DSSS	DBPSK	1

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
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

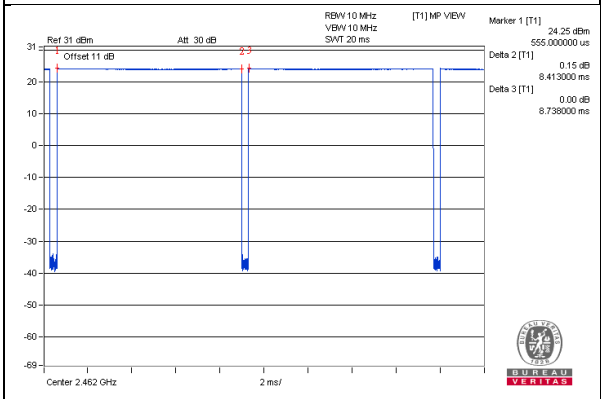
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Eason Tseng
RE<1G	24deg. C, 68%RH	120Vac, 60Hz	Eason Tseng
PLC	24deg. C, 76%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

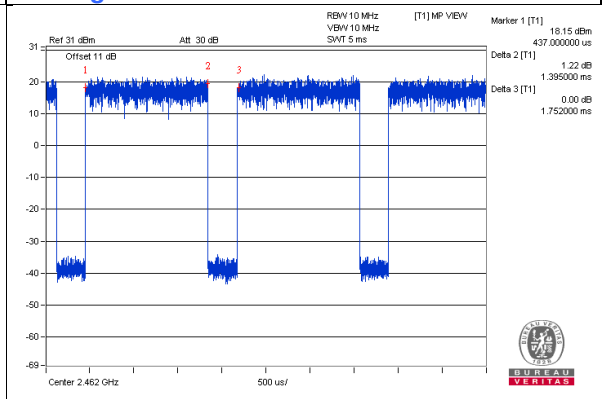
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 8.413/8.738 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16
802.11g: Duty cycle = 1.395/1.752 = 0.796, Duty factor = 10 * log(1/0.796) = 0.99
VHT20: Duty cycle = 1.315/1.655 = 0.795, Duty factor = 10 * log(1/0.795) = 1
VHT40: Duty cycle = 0.655/1.005 = 0.652, Duty factor = 10 * log(1/0.652) = 1.86

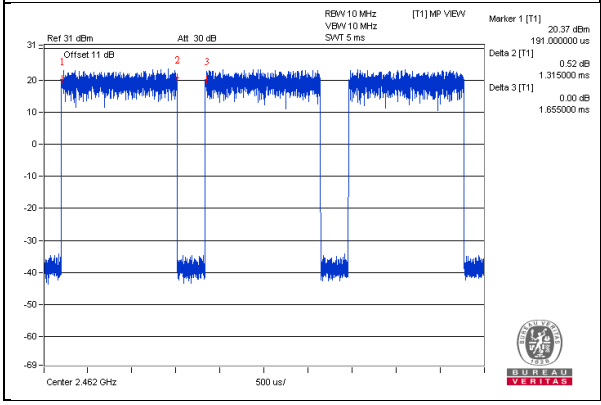
802.11b



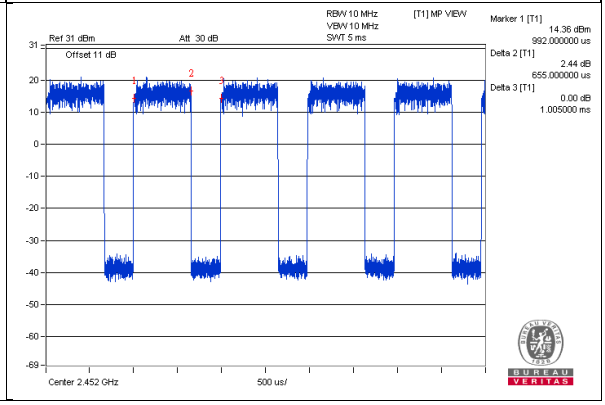
802.11g



VHT20



VHT40



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.

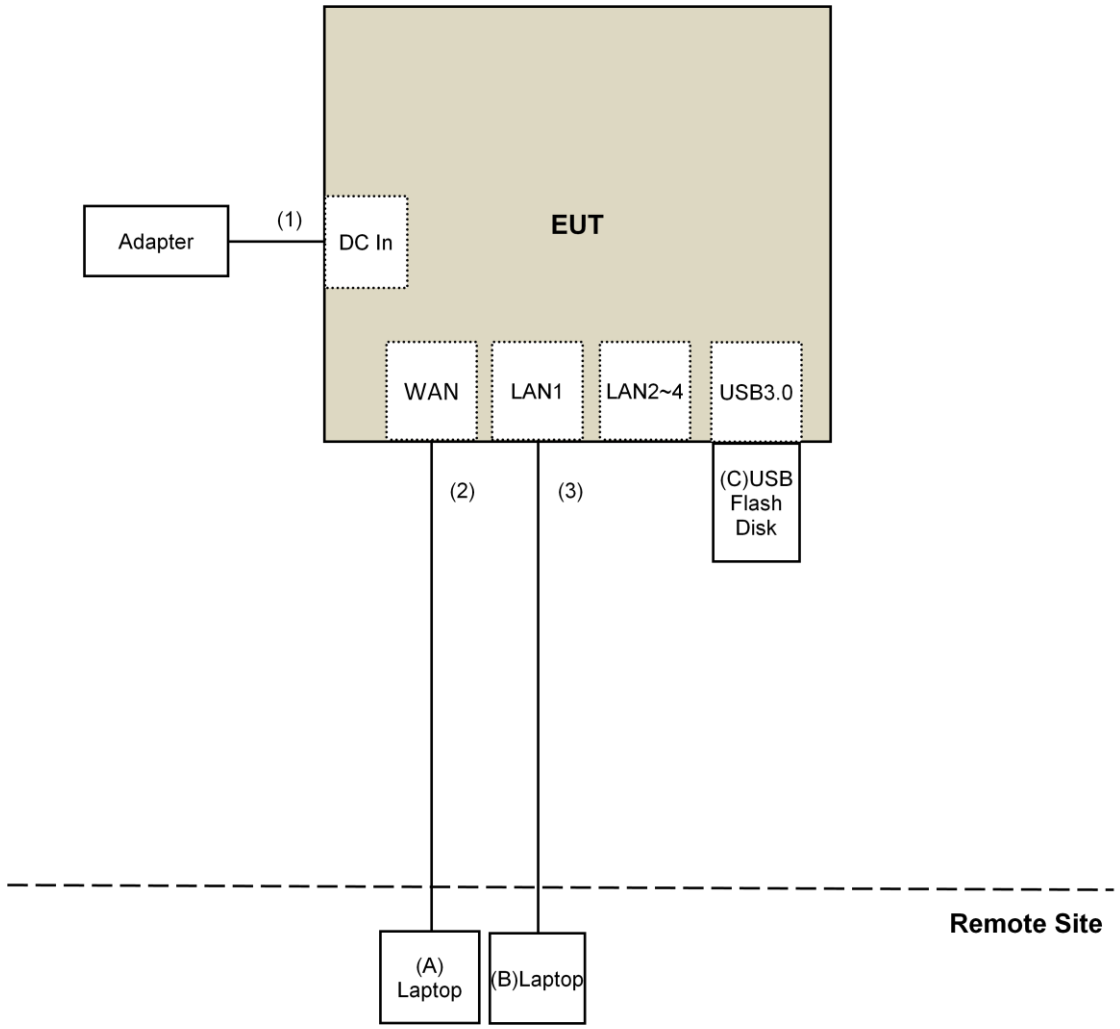
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab
C.	USB Disk	Transcend	16GB	NA	NA	Provided by Lab

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	1.4	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 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 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-3-01	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 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 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. The FCC Designation Number is TW2022.
5 Loop antenna was used for all emissions below 30 MHz.
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: Dec. 12 to 13, 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:

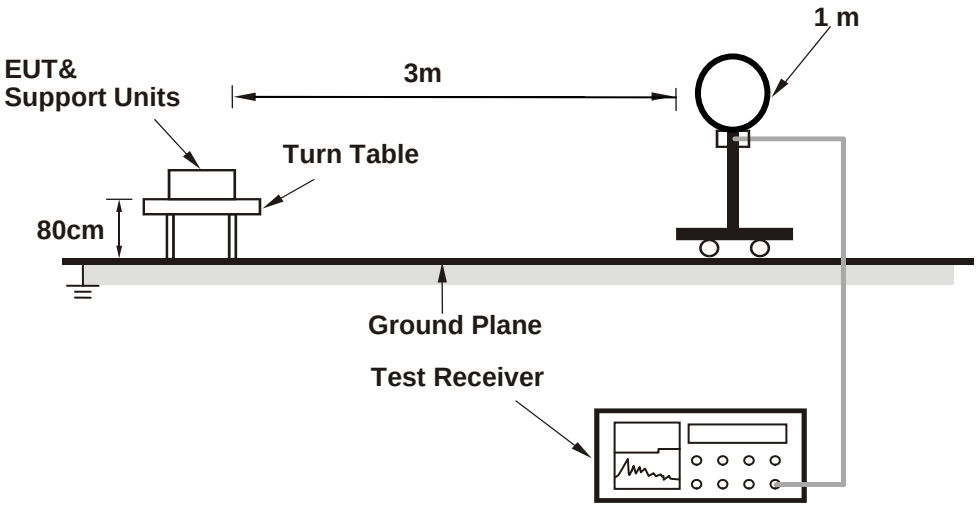
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

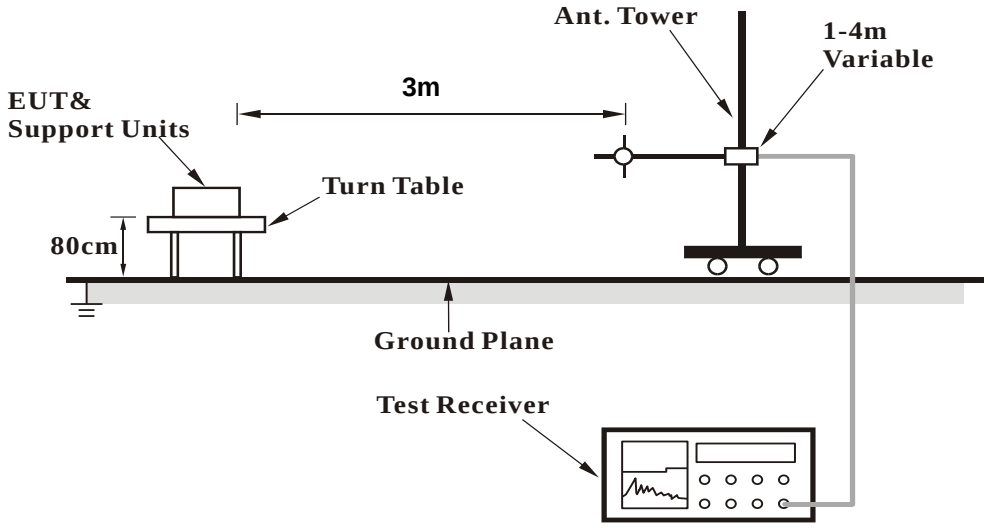
No deviation.

4.1.5 Test Setup

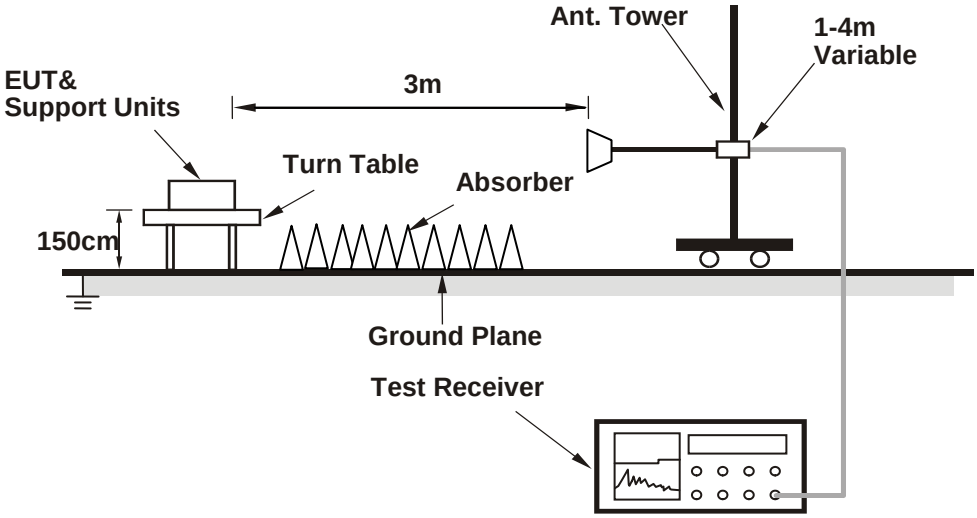
For Radiated emission below 30MHz



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 (QATool_Dbg.exe Ver 0.0.1.73) 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	59.9 PK	74.0	-14.1	1.65 H	330	61.5	-1.6
2	2390.00	49.2 AV	54.0	-4.8	1.65 H	330	50.8	-1.6
3	*2412.00	108.6 PK			1.65 H	330	110.1	-1.5
4	*2412.00	106.5 AV			1.65 H	330	108.0	-1.5
5	4824.00	41.0 PK	74.0	-33.0	1.48 H	3	38.0	3.0
6	4824.00	34.1 AV	54.0	-19.9	1.48 H	3	31.1	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	60.8 PK	74.0	-13.2	1.04 V	185	62.4	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.04 V**	**185**	**55.5**	**-1.6**
3	*2412.00	120.3 PK			1.04 V	185	121.8	-1.5
4	*2412.00	118.6 AV			1.04 V	185	120.1	-1.5
5	4824.00	49.7 PK	74.0	-24.3	1.00 V	314	46.7	3.0
6	4824.00	42.9 AV	54.0	-11.1	1.00 V	314	39.9	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)
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	2358.00	57.1 PK	74.0	-16.9	1.64 H	318	58.8	-1.7
2	2358.00	46.2 AV	54.0	-7.8	1.64 H	318	47.9	-1.7
3	*2437.00	110.5 PK			1.64 H	318	112.0	-1.5
4	*2437.00	108.2 AV			1.64 H	318	109.7	-1.5
5	2483.50	54.5 PK	74.0	-19.5	1.64 H	318	55.9	-1.4
6	2483.50	43.1 AV	54.0	-10.9	1.64 H	318	44.5	-1.4
7	4874.00	40.8 PK	74.0	-33.2	1.51 H	0	37.6	3.2
8	4874.00	34.0 AV	54.0	-20.0	1.51 H	0	30.8	3.2
9	7311.00	38.7 PK	74.0	-35.3	1.04 H	9	29.8	8.9
10	7311.00	29.0 AV	54.0	-25.0	1.04 H	9	20.1	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	2358.00	61.4 PK	74.0	-12.6	1.39 V	184	63.1	-1.7
2	2358.00	50.6 AV	54.0	-3.4	1.39 V	184	52.3	-1.7
3	*2437.00	121.5 PK			1.39 V	184	123.0	-1.5
4	*2437.00	119.8 AV			1.39 V	184	121.3	-1.5
5	2483.50	58.4 PK	74.0	-15.6	1.39 V	184	59.8	-1.4
6	2483.50	47.7 AV	54.0	-6.3	1.39 V	184	49.1	-1.4
7	4874.00	50.2 PK	74.0	-23.8	1.00 V	309	47.0	3.2
8	4874.00	43.1 AV	54.0	-10.9	1.00 V	309	39.9	3.2
9	7311.00	45.2 PK	74.0	-28.8	1.05 V	69	36.3	8.9
10	7311.00	34.1 AV	54.0	-19.9	1.05 V	69	25.2	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	107.3 PK			1.65 H	319	108.7	-1.4
2	*2462.00	105.4 AV			1.65 H	319	106.8	-1.4
3	2487.00	59.7 PK	74.0	-14.3	1.65 H	319	61.1	-1.4
4	2487.00	48.9 AV	54.0	-5.1	1.65 H	319	50.3	-1.4
5	4924.00	41.3 PK	74.0	-32.7	1.53 H	1	38.0	3.3
6	4924.00	34.3 AV	54.0	-19.7	1.53 H	1	31.0	3.3
7	7386.00	38.7 PK	74.0	-35.3	1.00 H	7	29.6	9.1
8	7386.00	28.7 AV	54.0	-25.3	1.00 H	7	19.6	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	119.7 PK			1.10 V	187	121.1	-1.4
2	*2462.00	117.7 AV			1.10 V	187	119.1	-1.4
3	2487.00	61.9 PK	74.0	-12.1	1.10 V	187	63.3	-1.4
4	2487.00	53.8 AV	54.0	-0.2	1.10 V	187	55.2	-1.4
5	4924.00	49.9 PK	74.0	-24.1	1.00 V	297	46.6	3.3
6	4924.00	42.8 AV	54.0	-11.2	1.00 V	297	39.5	3.3
7	7386.00	45.1 PK	74.0	-28.9	1.11 V	63	36.0	9.1
8	7386.00	34.3 AV	54.0	-19.7	1.11 V	63	25.2	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.3 PK	74.0	-7.7	1.65 H	321	67.9	-1.6
2	2390.00	49.9 AV	54.0	-4.1	1.65 H	321	51.5	-1.6
3	*2412.00	109.4 PK			1.65 H	321	110.9	-1.5
4	*2412.00	99.2 AV			1.65 H	321	100.7	-1.5
5	4824.00	41.0 PK	74.0	-33.0	1.47 H	11	38.0	3.0
6	4824.00	34.0 AV	54.0	-20.0	1.47 H	11	31.0	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	70.5 PK	74.0	-3.5	1.19 V	184	72.1	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.19 V**	**184**	**55.5**	**-1.6**
3	*2412.00	119.1 PK			1.19 V	184	120.6	-1.5
4	*2412.00	109.3 AV			1.19 V	184	110.8	-1.5
5	4824.00	49.7 PK	74.0	-24.3	1.00 V	321	46.7	3.0
6	4824.00	42.9 AV	54.0	-11.1	1.00 V	321	39.9	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)
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	56.8 PK	74.0	-17.2	1.69 H	321	58.4	-1.6
2	2390.00	43.1 AV	54.0	-10.9	1.69 H	321	44.7	-1.6
3	*2437.00	114.3 PK			1.69 H	321	115.8	-1.5
4	*2437.00	104.2 AV			1.69 H	321	105.7	-1.5
5	2483.50	63.6 PK	74.0	-10.4	1.69 H	321	65.0	-1.4
6	2483.50	46.1 AV	54.0	-7.9	1.69 H	321	47.5	-1.4
7	4874.00	41.0 PK	74.0	-33.0	1.47 H	11	37.8	3.2
8	4874.00	34.0 AV	54.0	-20.0	1.47 H	11	30.8	3.2
9	7311.00	38.2 PK	74.0	-35.8	1.00 H	18	29.3	8.9
10	7311.00	28.7 AV	54.0	-25.3	1.00 H	18	19.8	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	60.1 PK	74.0	-13.9	1.10 V	125	61.7	-1.6
2	2390.00	47.2 AV	54.0	-6.8	1.10 V	125	48.8	-1.6
3	*2437.00	124.1 PK			1.10 V	125	125.6	-1.5
4	*2437.00	114.2 AV			1.10 V	125	115.7	-1.5
5	2483.50	67.8 PK	74.0	-6.2	1.10 V	125	69.2	-1.4
6	2483.50	50.3 AV	54.0	-3.7	1.10 V	125	51.7	-1.4
7	4874.00	50.2 PK	74.0	-23.8	1.06 V	315	47.0	3.2
8	4874.00	42.9 AV	54.0	-11.1	1.06 V	315	39.7	3.2
9	7311.00	45.2 PK	74.0	-28.8	1.05 V	82	36.3	8.9
10	7311.00	33.9 AV	54.0	-20.1	1.05 V	82	25.0	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	108.2 PK			1.65 H	321	109.6	-1.4
2	*2462.00	98.1 AV			1.65 H	321	99.5	-1.4
3	2483.50	65.2 PK	74.0	-8.8	1.65 H	321	66.6	-1.4
4	2483.50	49.1 AV	54.0	-4.9	1.65 H	321	50.5	-1.4
5	4924.00	41.0 PK	74.0	-33.0	1.47 H	11	37.7	3.3
6	4924.00	34.0 AV	54.0	-20.0	1.47 H	11	30.7	3.3
7	7386.00	38.2 PK	74.0	-35.8	1.00 H	18	29.1	9.1
8	7386.00	28.7 AV	54.0	-25.3	1.00 H	18	19.6	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	117.7 PK			1.86 V	339	119.1	-1.4
2	*2462.00	108.5 AV			1.86 V	339	109.9	-1.4
3	2483.50	69.3 PK	74.0	-4.7	1.86 V	339	70.7	-1.4
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.86 V**	**339**	**55.3**	**-1.4**
5	4924.00	50.0 PK	74.0	-24.0	1.00 V	314	46.7	3.3
6	4924.00	42.8 AV	54.0	-11.2	1.00 V	314	39.5	3.3
7	7386.00	45.1 PK	74.0	-28.9	1.08 V	84	36.0	9.1
8	7386.00	34.2 AV	54.0	-19.8	1.08 V	84	25.1	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.

VHT20

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	64.9 PK	74.0	-9.1	1.66 H	320	66.5	-1.6
2	2390.00	48.7 AV	54.0	-5.3	1.66 H	320	50.3	-1.6
3	*2412.00	108.3 PK			1.64 H	329	109.8	-1.5
4	*2412.00	98.4 AV			1.64 H	329	99.9	-1.5
5	4824.00	41.5 PK	74.0	-32.5	1.42 H	21	38.5	3.0
6	4824.00	34.4 AV	54.0	-19.6	1.42 H	21	31.4	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	69.5 PK	74.0	-4.5	1.57 V	40	71.1	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.57 V**	**40**	**55.5**	**-1.6**
3	*2412.00	118.3 PK			1.57 V	40	119.8	-1.5
4	*2412.00	108.2 AV			1.57 V	40	109.7	-1.5
5	4824.00	49.9 PK	74.0	-24.1	1.03 V	330	46.9	3.0
6	4824.00	42.7 AV	54.0	-11.3	1.03 V	330	39.7	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)
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	58.6 PK	74.0	-15.4	1.70 H	350	60.2	-1.6
2	2390.00	43.1 AV	54.0	-10.9	1.70 H	350	44.7	-1.6
3	*2437.00	114.8 PK			1.70 H	324	116.3	-1.5
4	*2437.00	104.9 AV			1.70 H	324	106.4	-1.5
5	2483.50	63.2 PK	74.0	-10.8	1.70 H	350	64.6	-1.4
6	2483.50	48.2 AV	54.0	-5.8	1.70 H	350	49.6	-1.4
7	4874.00	40.5 PK	74.0	-33.5	1.50 H	20	37.3	3.2
8	4874.00	33.7 AV	54.0	-20.3	1.50 H	20	30.5	3.2
9	7311.00	38.1 PK	74.0	-35.9	1.05 H	15	29.2	8.9
10	7311.00	28.4 AV	54.0	-25.6	1.05 H	15	19.5	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	62.8 PK	74.0	-11.2	1.53 V	41	64.4	-1.6
2	2390.00	47.8 AV	54.0	-6.2	1.53 V	41	49.4	-1.6
3	*2437.00	124.3 PK			1.53 V	41	125.8	-1.5
4	*2437.00	114.1 AV			1.53 V	41	115.6	-1.5
5	2483.50	70.6 PK	74.0	-3.4	1.53 V	41	72.0	-1.4
6	2483.50	52.9 AV	54.0	-1.1	1.53 V	41	54.3	-1.4
7	4874.00	50.2 PK	74.0	-23.8	1.01 V	318	47.0	3.2
8	4874.00	42.9 AV	54.0	-11.1	1.01 V	318	39.7	3.2
9	7311.00	45.9 PK	74.0	-28.1	1.08 V	98	37.0	8.9
10	7311.00	34.4 AV	54.0	-19.6	1.08 V	98	25.5	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	108.6 PK			1.67 H	335	110.0	-1.4
2	*2462.00	98.7 AV			1.67 H	335	100.1	-1.4
3	2483.50	65.7 PK	74.0	-8.3	1.67 H	335	67.1	-1.4
4	2483.50	49.1 AV	54.0	-4.9	1.67 H	335	50.5	-1.4
5	4924.00	40.6 PK	74.0	-33.4	1.42 H	27	37.3	3.3
6	4924.00	33.8 AV	54.0	-20.2	1.42 H	27	30.5	3.3
7	7386.00	38.7 PK	74.0	-35.3	1.01 H	3	29.6	9.1
8	7386.00	28.9 AV	54.0	-25.1	1.01 H	3	19.8	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	118.4 PK			1.57 V	38	119.8	-1.4
2	*2462.00	108.3 AV			1.57 V	38	109.7	-1.4
3	2483.50	69.6 PK	74.0	-4.4	1.57 V	38	71.0	-1.4
4	2483.50	53.8 AV	54.0	-0.2	1.57 V	38	55.2	-1.4
5	4924.00	50.1 PK	74.0	-23.9	1.00 V	313	46.8	3.3
6	4924.00	43.0 AV	54.0	-11.0	1.00 V	313	39.7	3.3
7	7386.00	45.8 PK	74.0	-28.2	1.06 V	110	36.7	9.1
8	7386.00	34.5 AV	54.0	-19.5	1.06 V	110	25.4	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.

VHT40

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	63.8 PK	74.0	-10.2	1.66 H	328	65.4	-1.6
2	2390.00	49.1 AV	54.0	-4.9	1.66 H	328	50.7	-1.6
3	*2422.00	102.6 PK			1.66 H	328	104.2	-1.6
4	*2422.00	92.4 AV			1.66 H	328	94.0	-1.6
5	4844.00	40.7 PK	74.0	-33.3	1.47 H	4	37.6	3.1
6	4844.00	33.9 AV	54.0	-20.1	1.47 H	4	30.8	3.1
7	7266.00	38.3 PK	74.0	-35.7	1.10 H	32	29.4	8.9
8	7266.00	29.0 AV	54.0	-25.0	1.10 H	32	20.1	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	66.7 PK	74.0	-7.3	1.28 V	192	68.3	-1.6
2	2390.00	53.8 AV	54.0	-0.2	1.28 V	192	55.4	-1.6
3	*2422.00	111.6 PK			1.28 V	192	113.2	-1.6
4	*2422.00	101.7 AV			1.28 V	192	103.3	-1.6
5	4844.00	50.5 PK	74.0	-23.5	1.00 V	327	47.4	3.1
6	4844.00	43.0 AV	54.0	-11.0	1.00 V	327	39.9	3.1
7	7266.00	46.4 PK	74.0	-27.6	1.14 V	95	37.5	8.9
8	7266.00	34.4 AV	54.0	-19.6	1.14 V	95	25.5	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)
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	64.3 PK	74.0	-9.7	1.68 H	315	65.9	-1.6
2	2390.00	49.4 AV	54.0	-4.6	1.68 H	315	51.0	-1.6
3	*2437.00	108.2 PK			1.66 H	320	109.7	-1.5
4	*2437.00	98.2 AV			1.66 H	320	99.7	-1.5
5	2483.50	63.8 PK	74.0	-10.2	1.68 H	315	65.2	-1.4
6	2483.50	49.1 AV	54.0	-4.9	1.68 H	315	50.5	-1.4
7	4874.00	40.8 PK	74.0	-33.2	1.50 H	7	37.6	3.2
8	4874.00	34.1 AV	54.0	-19.9	1.50 H	7	30.9	3.2
9	7311.00	38.4 PK	74.0	-35.6	1.08 H	24	29.5	8.9
10	7311.00	28.9 AV	54.0	-25.1	1.08 H	24	20.0	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	68.9 PK	74.0	-5.1	1.24 V	198	70.5	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.24 V**	**198**	**55.5**	**-1.6**
3	*2437.00	117.2 PK			1.24 V	198	118.7	-1.5
4	*2437.00	107.2 AV			1.24 V	198	108.7	-1.5
5	2483.50	68.3 PK	74.0	-5.7	1.24 V	198	69.7	-1.4
6	2483.50	53.3 AV	54.0	-0.7	1.24 V	198	54.7	-1.4
7	4874.00	50.2 PK	74.0	-23.8	1.00 V	314	47.0	3.2
8	4874.00	42.9 AV	54.0	-11.1	1.00 V	314	39.7	3.2
9	7311.00	45.8 PK	74.0	-28.2	1.08 V	91	36.9	8.9
10	7311.00	34.0 AV	54.0	-20.0	1.08 V	91	25.1	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	106.7 PK			1.65 H	319	108.2	-1.5
2	*2452.00	96.8 AV			1.65 H	319	98.3	-1.5
3	2486.00	64.2 PK	74.0	-9.8	1.63 H	319	65.6	-1.4
4	2486.00	49.5 AV	54.0	-4.5	1.63 H	319	50.9	-1.4
5	4904.00	40.6 PK	74.0	-33.4	1.49 H	7	37.4	3.2
6	4904.00	34.1 AV	54.0	-19.9	1.49 H	7	30.9	3.2
7	7356.00	38.4 PK	74.0	-35.6	1.08 H	21	29.3	9.1
8	7356.00	28.7 AV	54.0	-25.3	1.08 H	21	19.6	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	115.8 PK			1.34 V	193	117.3	-1.5
2	*2452.00	105.9 AV			1.34 V	193	107.4	-1.5
3	2486.00	68.3 PK	74.0	-5.7	1.34 V	193	69.7	-1.4
4	**2486.00**	**53.9 AV**	**54.0**	**-0.1**	**1.34 V**	**193**	**55.3**	**-1.4**
5	4904.00	50.6 PK	74.0	-23.4	1.00 V	319	47.4	3.2
6	4904.00	43.2 AV	54.0	-10.8	1.00 V	319	40.0	3.2
7	7356.00	45.7 PK	74.0	-28.3	1.11 V	107	36.6	9.1
8	7356.00	34.0 AV	54.0	-20.0	1.11 V	107	24.9	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:

802.11b

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	121.51	32.3 QP	43.5	-11.2	3.00 H	211	42.3	-10.0
2	283.63	31.5 QP	46.0	-14.5	3.00 H	104	39.5	-8.0
3	508.21	39.1 QP	46.0	-6.9	1.00 H	226	41.9	-2.8
4	574.93	30.2 QP	46.0	-15.8	2.00 H	13	31.7	-1.5
5	754.96	33.6 QP	46.0	-12.4	2.50 H	321	31.9	1.7
6	877.62	34.0 QP	46.0	-12.0	1.50 H	241	31.3	2.7
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	110.17	31.8 QP	43.5	-11.7	3.00 V	154	42.9	-11.1
2	250.00	30.5 QP	46.0	-15.5	2.50 V	214	40.0	-9.5
3	500.01	39.6 QP	46.0	-6.4	1.00 V	21	42.6	-3.0
4	750.90	33.9 QP	46.0	-12.1	2.50 V	131	32.3	1.6
5	814.71	36.6 QP	46.0	-9.4	2.50 V	121	34.5	2.1
6	880.91	38.2 QP	46.0	-7.8	1.50 V	42	35.5	2.7

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

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	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 20167	Nov. 14, 2018
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: Nov. 30 ,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.

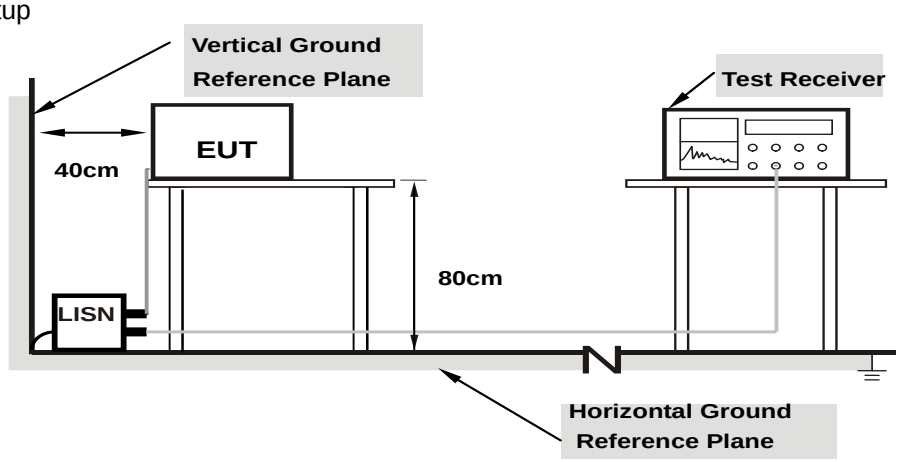
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

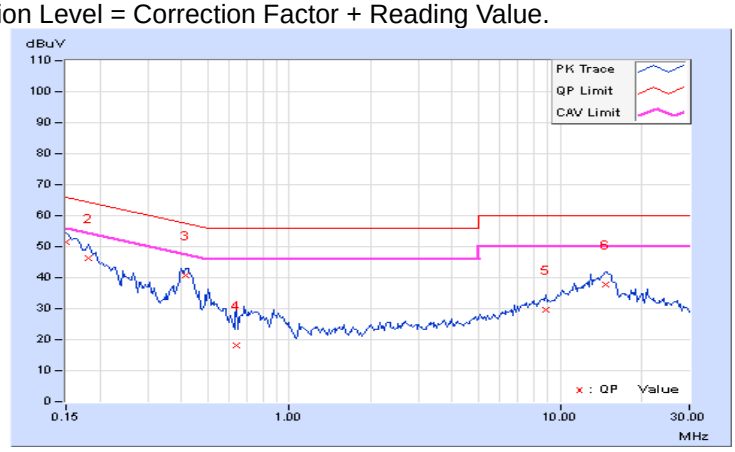
4.2.7 Test Results

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	10.09	41.50	24.97	51.59	35.06	66.00	56.00	-14.41	-20.94
2	0.18125	10.08	36.07	18.40	46.15	28.48	64.43	54.43	-18.28	-25.95
3	**0.41563**	**10.12**	**30.70**	**23.04**	**40.82**	**33.16**	**57.54**	**47.54**	**-16.72**	**-14.38**
4	0.64219	10.14	7.96	1.94	18.10	12.08	56.00	46.00	-37.90	-33.92
5	8.84766	10.71	18.90	12.51	29.61	23.22	60.00	50.00	-30.39	-26.78
6	14.76563	11.18	26.70	21.25	37.88	32.43	60.00	50.00	-22.12	-17.57

REMARKS:

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

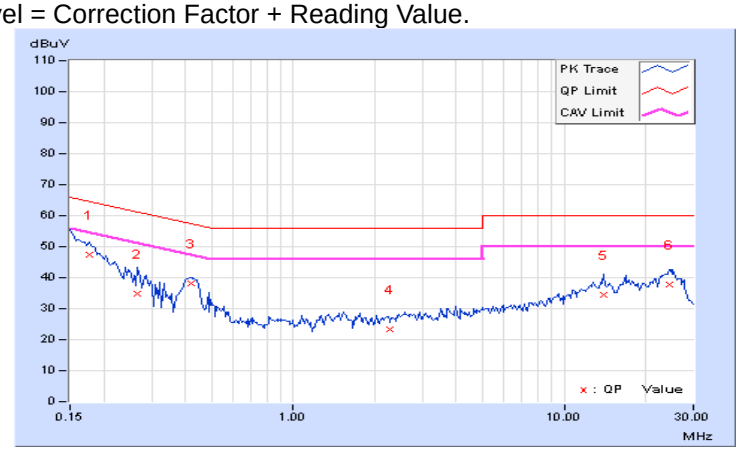


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	10.06	37.20	19.63	47.26	29.69	64.61	54.61	-17.35	-24.92
2	0.26719	10.07	24.89	10.47	34.96	20.54	61.20	51.20	-26.24	-30.66
3	0.41953	10.12	27.96	20.20	38.08	30.32	57.46	47.46	-19.38	-17.14
4	2.26953	10.22	13.25	6.77	23.47	16.99	56.00	46.00	-32.53	-29.01
5	14.05078	10.95	23.53	17.73	34.48	28.68	60.00	50.00	-25.52	-21.32
6	24.47656	11.28	26.35	20.78	37.63	32.06	60.00	50.00	-22.37	-17.94

REMARKS:

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

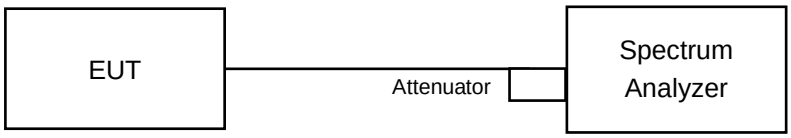


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	9.16	9.17	9.16	9.14	0.5	PASS
6	2437	10.13	10.11	10.11	10.11	0.5	PASS
11	2462	9.17	9.14	9.15	9.14	0.5	PASS

802.11g

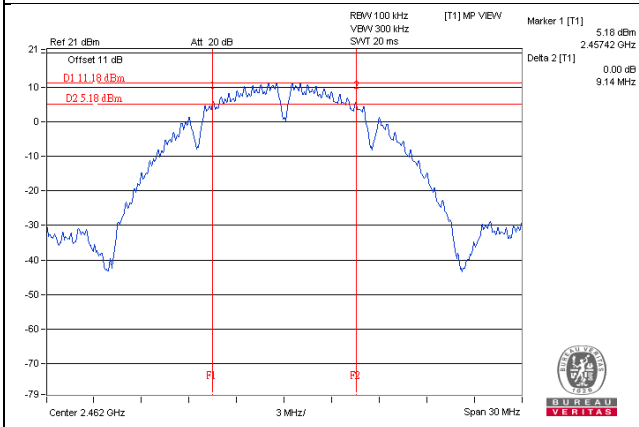
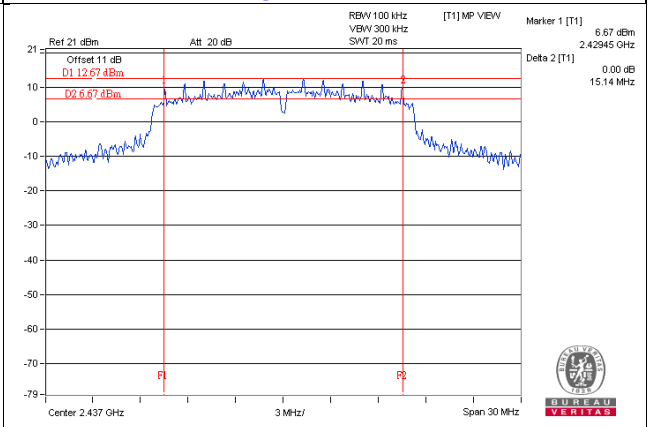
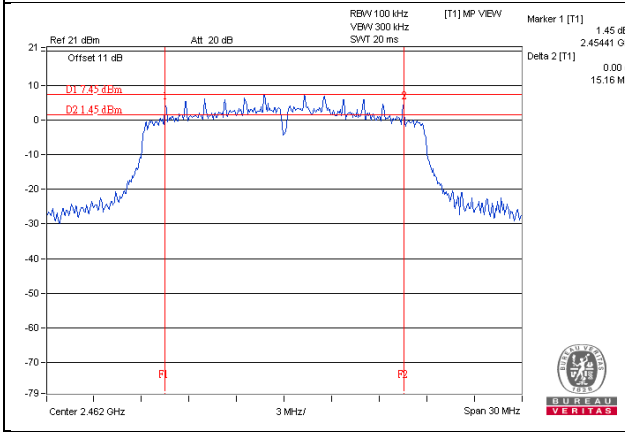
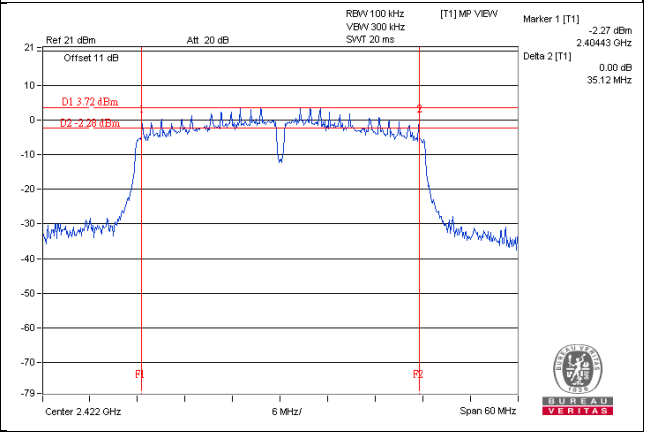
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.15	15.18	15.17	15.18	0.5	PASS
6	2437	15.14	15.20	15.19	15.19	0.5	PASS
11	2462	15.18	15.19	15.19	15.18	0.5	PASS

VHT20

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.18	15.17	15.17	15.18	0.5	PASS
6	2437	15.18	15.19	15.19	15.19	0.5	PASS
11	2462	15.16	15.18	15.17	15.17	0.5	PASS

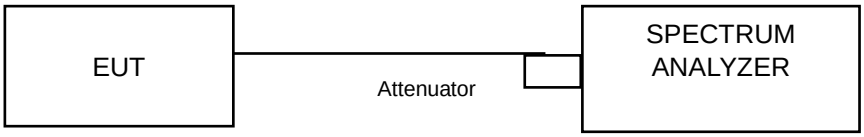
VHT40

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.12	35.16	35.18	35.15	0.5	PASS
6	2437	35.12	35.18	35.22	35.18	0.5	PASS
9	2452	35.23	35.20	35.25	35.24	0.5	PASS

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH11	**802.11g / Chain 0 : CH6**
	
VHT20 / Chain 0 : CH11	**VHT40 / Chain 0 : CH3**
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

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

4.4.6 Test Results

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
1	2412	14.40	14.16	14.28	14.52
6	2437	16.44	16.08	15.96	15.60
11	2462	14.04	14.04	13.92	14.40

802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
1	2412	16.68	16.68	16.56	16.68
6	2437	23.16	21.60	17.76	23.28
11	2462	16.68	16.80	16.56	16.56

VHT20

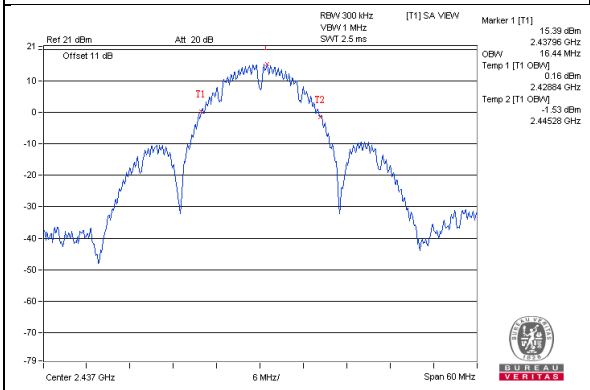
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
1	2412	17.76	17.76	17.76	17.88
6	2437	24.36	22.56	25.44	23.76
11	2462	17.76	17.64	17.76	17.88

VHT40

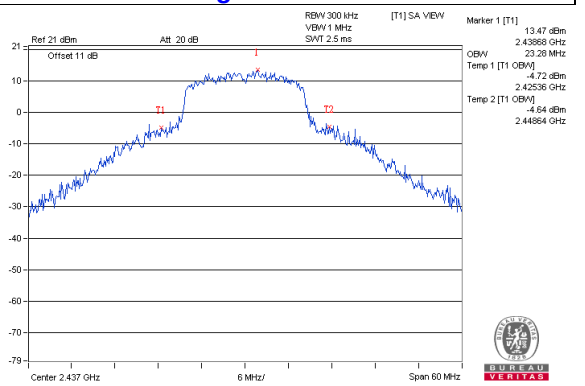
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
3	2422	36.24	36.24	36.24	36.24
6	2437	36.24	36.24	36.72	36.24
9	2452	36.24	36.24	36.48	36.72

Spectrum Plot of Worst Value

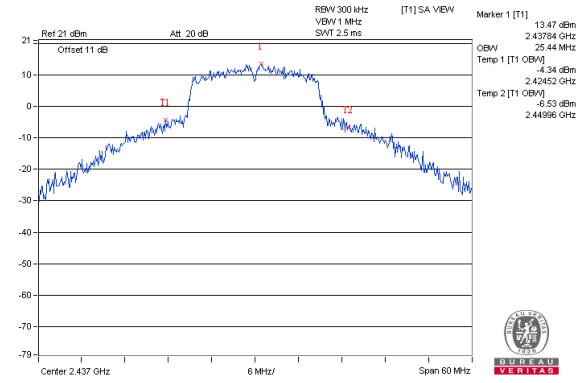
802.11b / Chain 0 : CH6



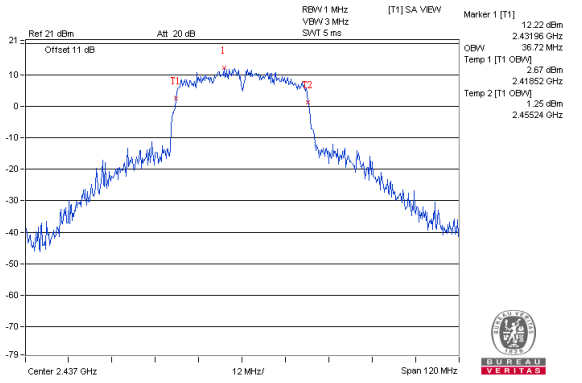
802.11g / Chain 3 : CH6



VHT20 / Chain 2: CH6



VHT40 / Chain 2 : CH6



4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

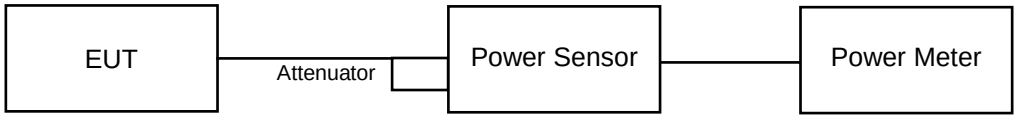
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	22.46	21.91	21.77	22.39	655.131	28.16	30.00	Pass
6	2437	24.04	23.39	23.08	23.65	906.761	29.57	30.00	Pass
11	2462	21.12	20.89	20.12	21.56	498.185	26.97	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	Chain 2	Chain 3				
1	2412	17.21	16.43	16.42	17.35	194.734	22.89	30.00	Pass
6	2437	22.21	21.90	19.84	21.91	572.845	27.58	30.00	Pass
11	2462	15.02	14.46	15.02	15.95	130.818	21.17	30.00	Pass

VHT20

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	17.37	17.11	16.75	17.72	212.451	23.27	30.00	Pass
6	2437	21.78	21.85	20.45	21.87	568.502	27.55	30.00	Pass
11	2462	16.98	17.03	17.22	17.75	212.643	23.28	30.00	Pass

VHT40

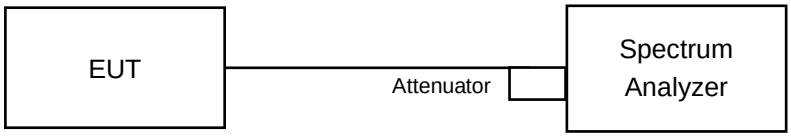
Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	15.23	15.29	15.55	15.65	139.769	21.45	30.00	Pass
6	2437	17.39	17.77	17.60	17.44	227.676	23.57	30.00	Pass
9	2452	16.36	16.12	16.46	17.11	179.84	22.55	30.00	Pass

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

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

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

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.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

4.6.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.67	6.02	0.16	-2.49	3.63	Pass
	6	2437	-7.27	6.02	0.16	-1.09	3.63	Pass
	11	2462	-9.79	6.02	0.16	-3.61	3.63	Pass
1	1	2412	-9.11	6.02	0.16	-2.93	3.63	Pass
	6	2437	-7.94	6.02	0.16	-1.76	3.63	Pass
	11	2462	-10.40	6.02	0.16	-4.22	3.63	Pass
2	1	2412	-9.73	6.02	0.16	-3.55	3.63	Pass
	6	2437	-8.07	6.02	0.16	-1.89	3.63	Pass
	11	2462	-10.93	6.02	0.16	-4.75	3.63	Pass
3	1	2412	-8.85	6.02	0.16	-2.67	3.63	Pass
	6	2437	-8.74	6.02	0.16	-2.56	3.63	Pass
	11	2462	-9.46	6.02	0.16	-3.28	3.63	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$+ $10^{G2/20}$+ $10^{G3/20}$)^2 / 4] = 10.37dBi > 6dBi , so the power density limit shall be reduced to 8-(10.37-6) = 3.63dBm

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=4) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-14.68	6.02	0.99	-7.67	3.63	Pass
	6	2437	-9.76	6.02	0.99	-2.75	3.63	Pass
	11	2462	-16.38	6.02	0.99	-9.37	3.63	Pass
1	1	2412	-14.91	6.02	0.99	-7.90	3.63	Pass
	6	2437	-9.29	6.02	0.99	-2.28	3.63	Pass
	11	2462	-17.30	6.02	0.99	-10.29	3.63	Pass
2	1	2412	-14.16	6.02	0.99	-7.15	3.63	Pass
	6	2437	-12.21	6.02	0.99	-5.20	3.63	Pass
	11	2462	-15.72	6.02	0.99	-8.71	3.63	Pass
3	1	2412	-15.01	6.02	0.99	-8.00	3.63	Pass
	6	2437	-8.94	6.02	0.99	-1.93	3.63	Pass
	11	2462	-15.51	6.02	0.99	-8.50	3.63	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$+ $10^{G2/20}$+ $10^{G3/20}$)^2 / 4] = 10.37dBi > 6dBi , so the power density limit shall be reduced to 8-(10.37-6) = 3.63dBm

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

VHT20

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-13.05	6.02	1	-6.03	3.63	Pass
	6	2437	-9.47	6.02	1	-2.45	3.63	Pass
	11	2462	-13.83	6.02	1	-6.81	3.63	Pass
1	1	2412	-15.71	6.02	1	-8.69	3.63	Pass
	6	2437	-10.24	6.02	1	-3.22	3.63	Pass
	11	2462	-14.67	6.02	1	-7.65	3.63	Pass
2	1	2412	-15.16	6.02	1	-8.14	3.63	Pass
	6	2437	-9.89	6.02	1	-2.87	3.63	Pass
	11	2462	-13.78	6.02	1	-6.76	3.63	Pass
3	1	2412	-13.61	6.02	1	-6.59	3.63	Pass
	6	2437	-10.59	6.02	1	-3.57	3.63	Pass
	11	2462	-15.00	6.02	1	-7.98	3.63	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.37dBi > 6dBi , so the power density limit shall be reduced to 8-(10.37-6) = 3.63dBm

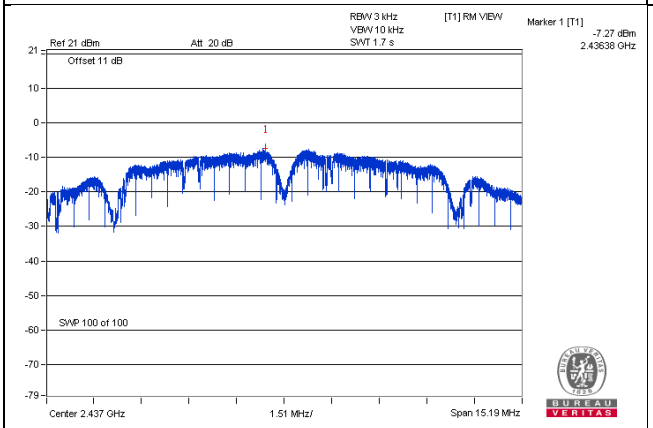
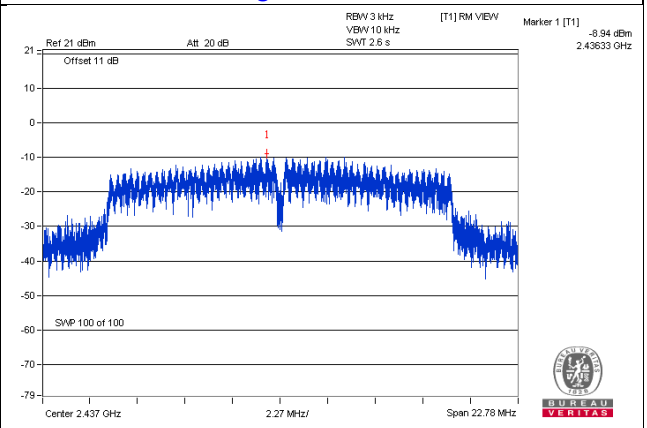
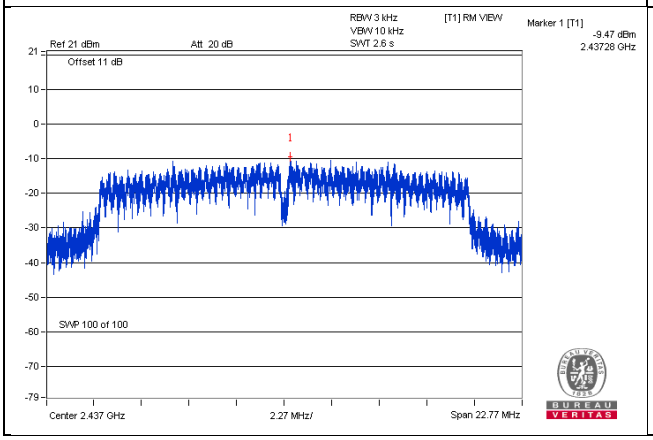
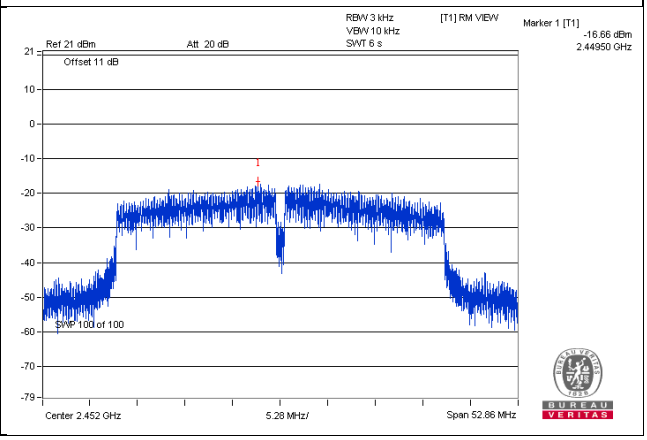
2. Refer to section 3.3 for duty cycle spectrum plot.

VHT40

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-19.09	6.02	1.86	-11.21	3.63	Pass
	6	2437	-17.10	6.02	1.86	-9.22	3.63	Pass
	9	2452	-18.12	6.02	1.86	-10.24	3.63	Pass
1	3	2422	-19.37	6.02	1.86	-11.49	3.63	Pass
	6	2437	-17.26	6.02	1.86	-9.38	3.63	Pass
	9	2452	-18.80	6.02	1.86	-10.92	3.63	Pass
2	3	2422	-18.37	6.02	1.86	-10.49	3.63	Pass
	6	2437	-17.22	6.02	1.86	-9.34	3.63	Pass
	9	2452	-18.50	6.02	1.86	-10.62	3.63	Pass
3	3	2422	-19.03	6.02	1.86	-11.15	3.63	Pass
	6	2437	-17.38	6.02	1.86	-9.50	3.63	Pass
	9	2452	-16.66	6.02	1.86	-8.78	3.63	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 10.37dBi > 6dBi , so the power density limit shall be reduced to 8-(10.37-6) = 3.63dBm

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

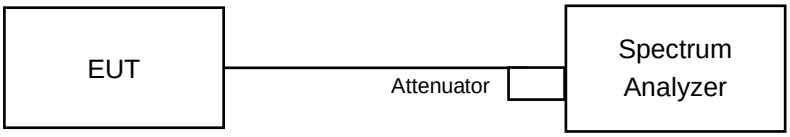
Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH6	**802.11g / Chain 3 : CH6**
	
VHT20 / Chain 0 : CH6	**VHT40 / Chain 3 : CH9**
	

4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

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

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 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.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

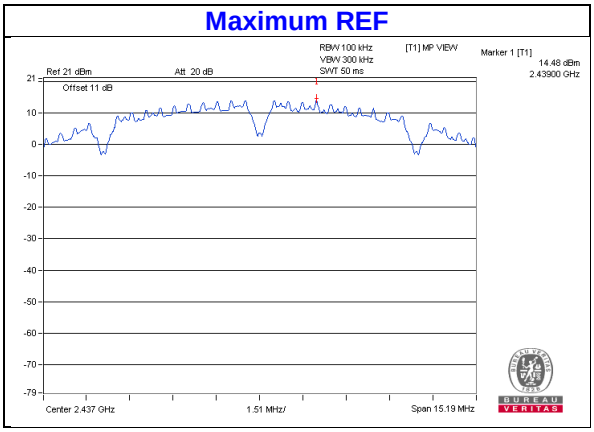
Same as Item 4.3.6

4.7.7 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.

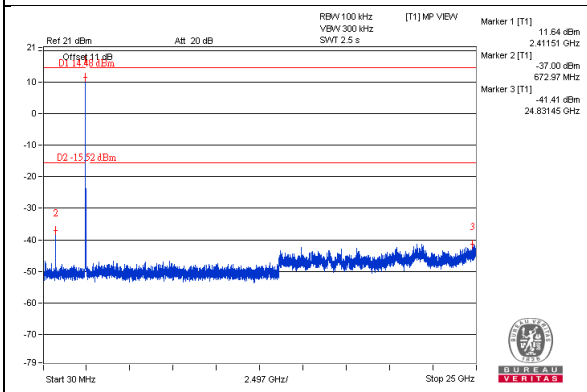
802.11b

Maximum REF

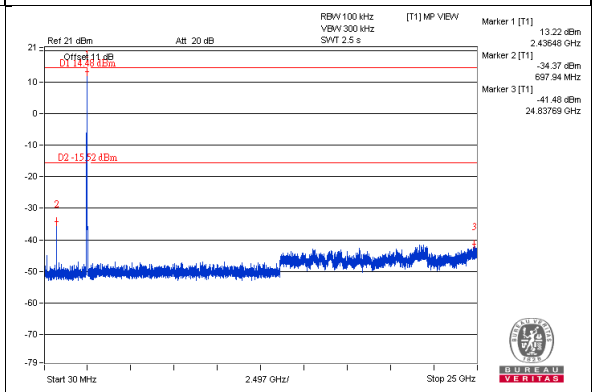


Chain 0

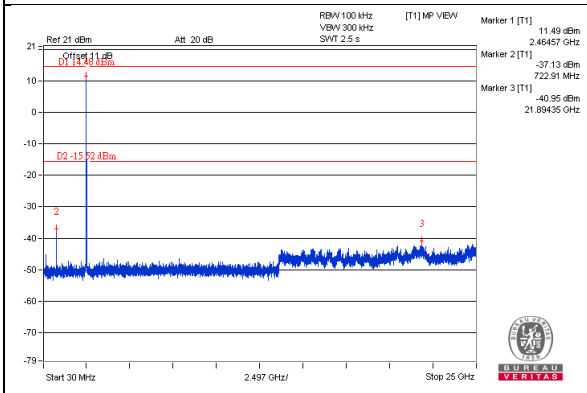
CH 1



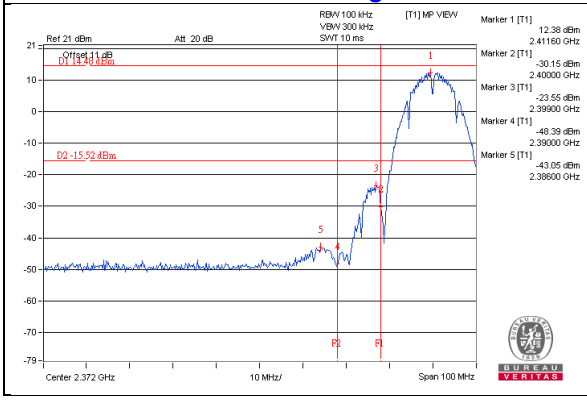
CH 6



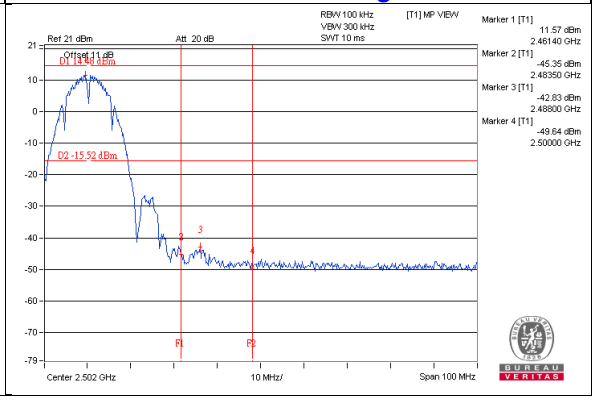
CH 11



CH 1 Band edge

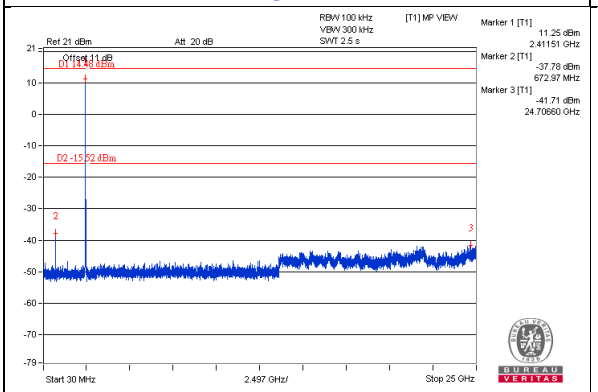


CH 11 Band edge

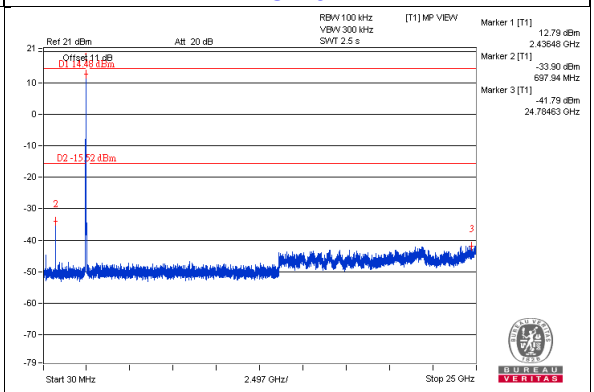


Chain 1

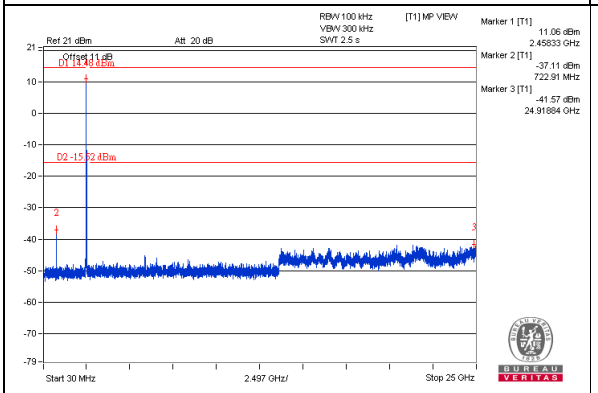
CH 1



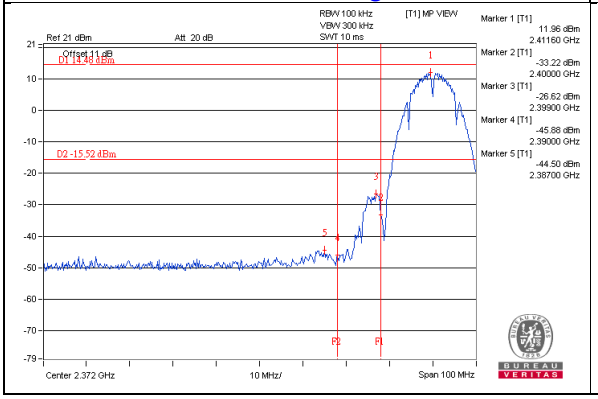
CH 6



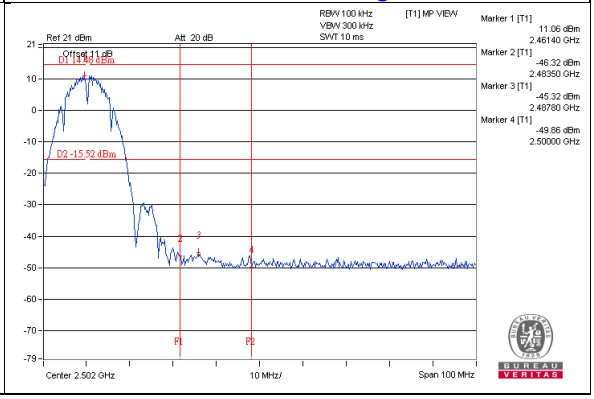
CH 11



CH 1 Band edge

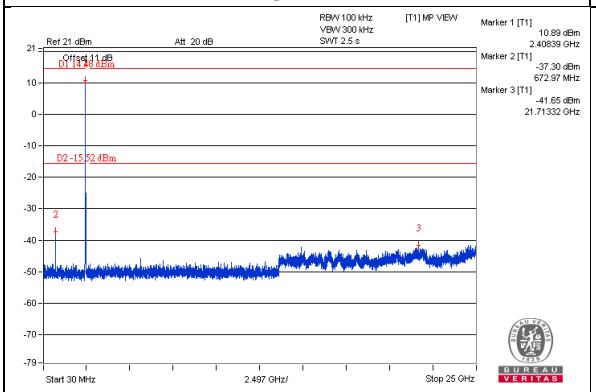


CH 11 Band edge

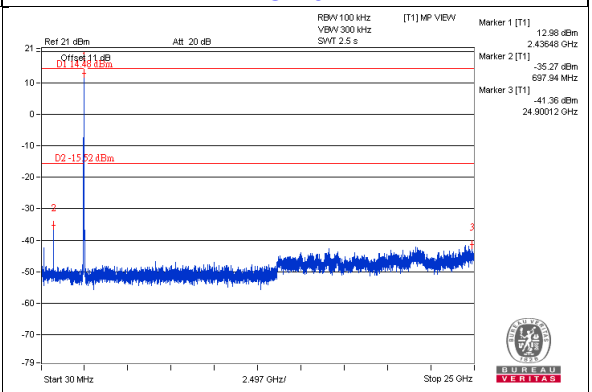


Chain 2

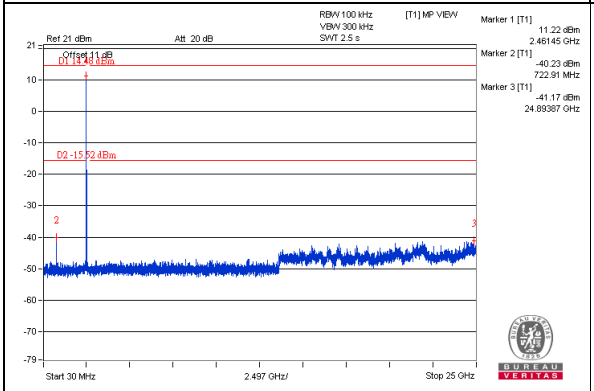
CH 1



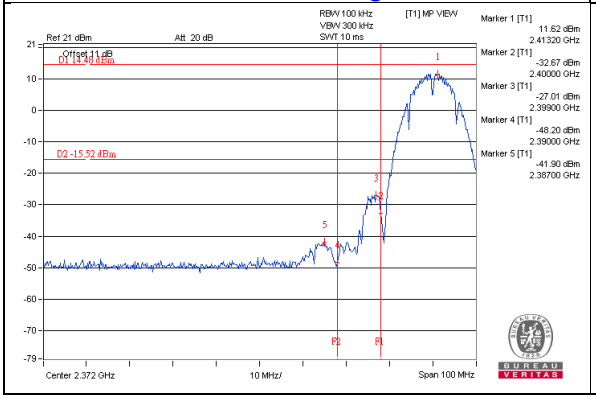
CH 6



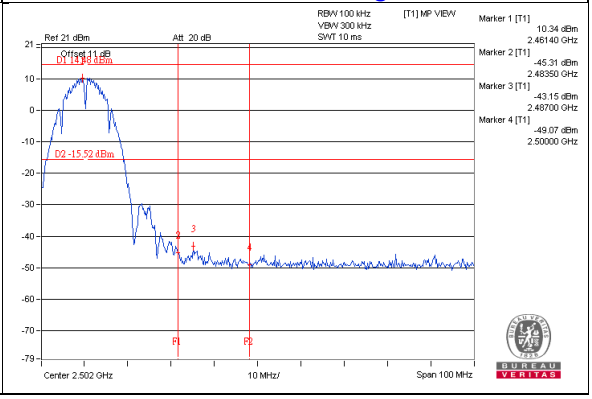
CH 11



CH 1 Band edge

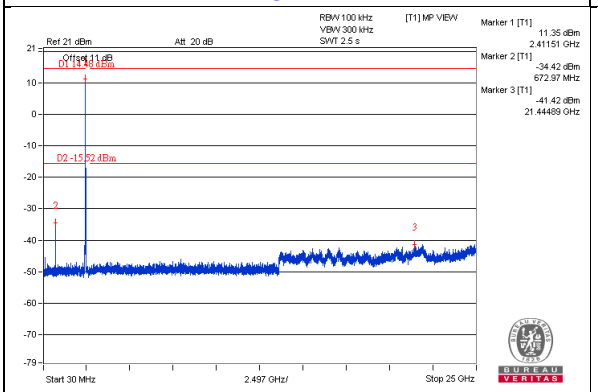


CH 11 Band edge

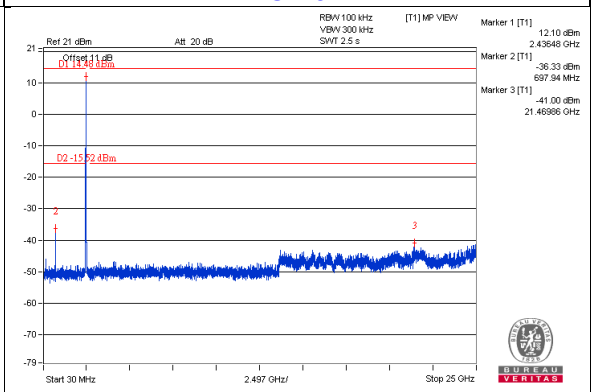


Chain 3

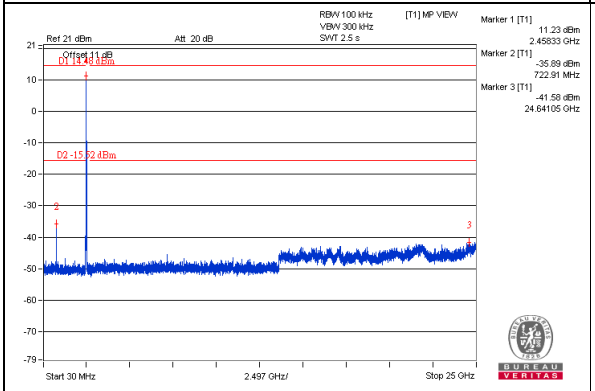
CH 1



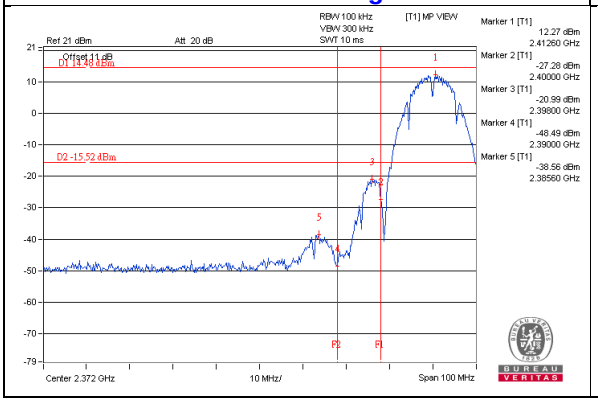
CH 6



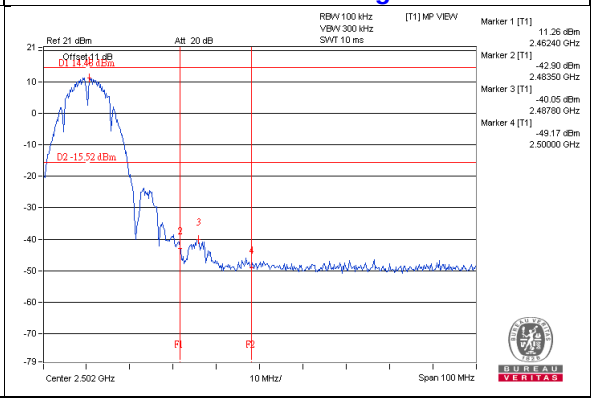
CH 11



CH 1 Band edge

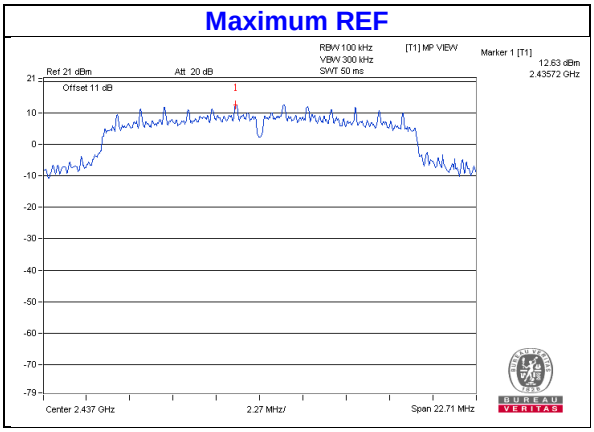


CH 11 Band edge



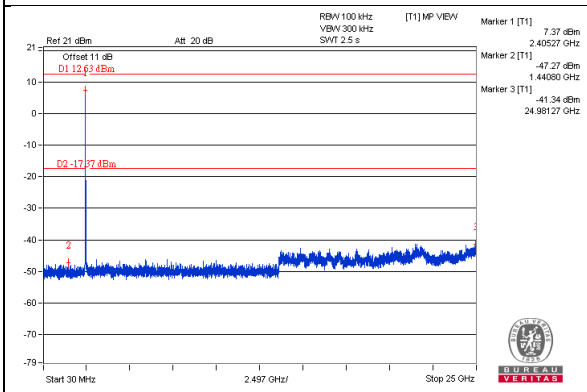
802.11g

Maximum REF

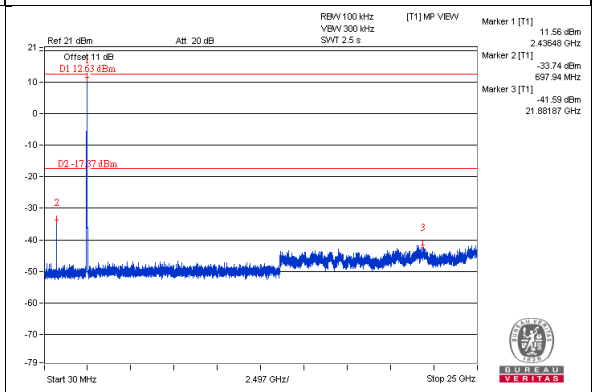


Chain 0

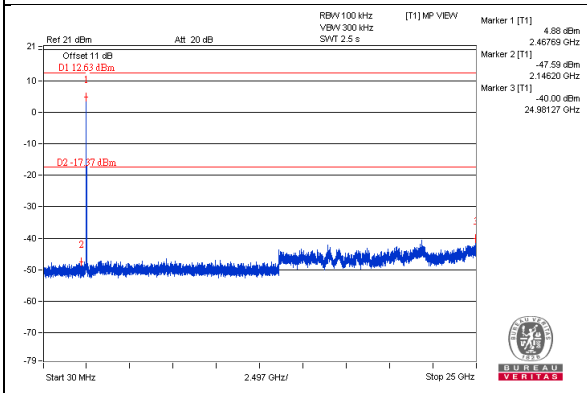
CH 1



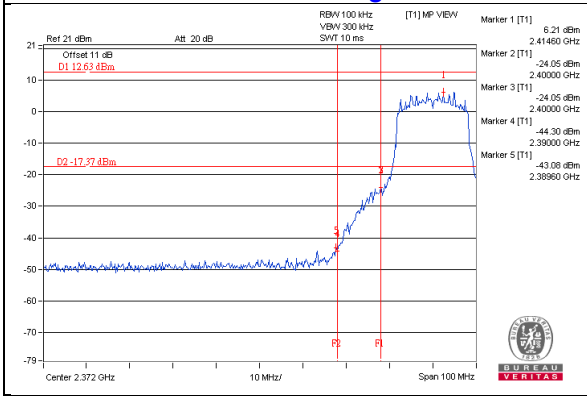
CH 6



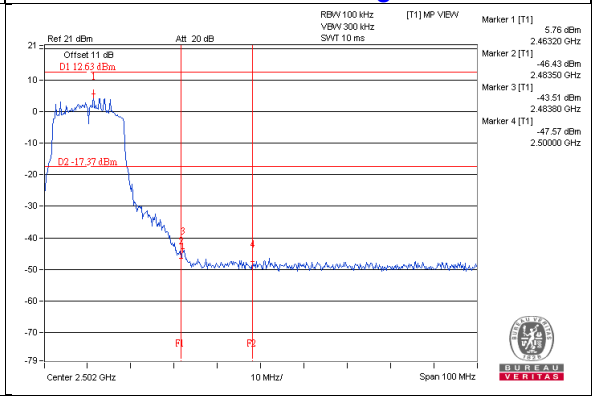
CH 11



CH 1 Band edge

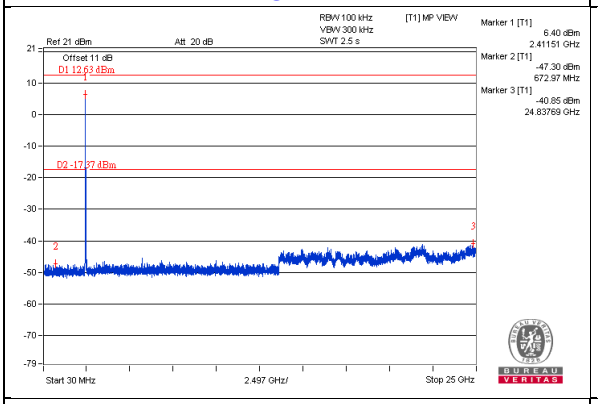


CH 11 Band edge

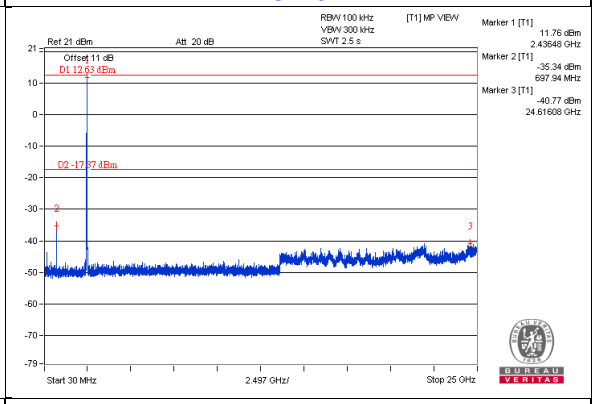


Chain 1

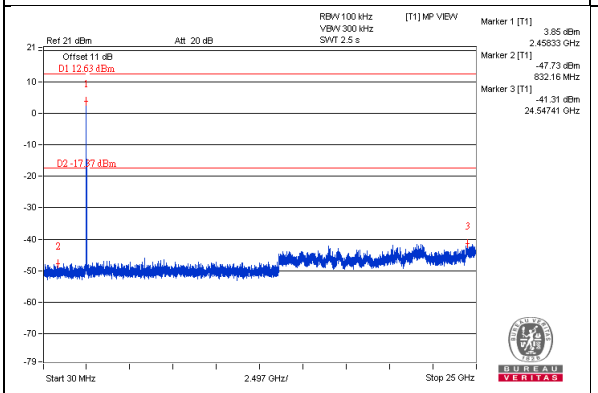
CH 1



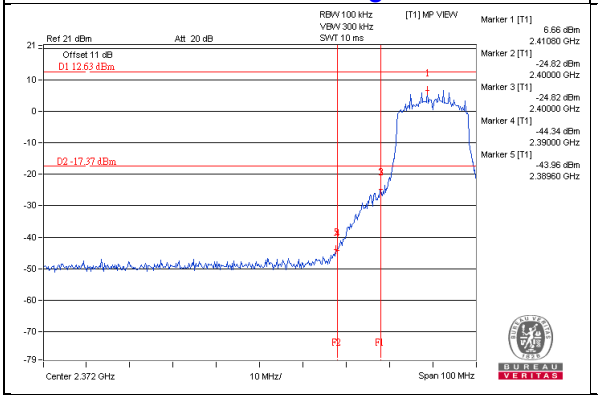
CH 6



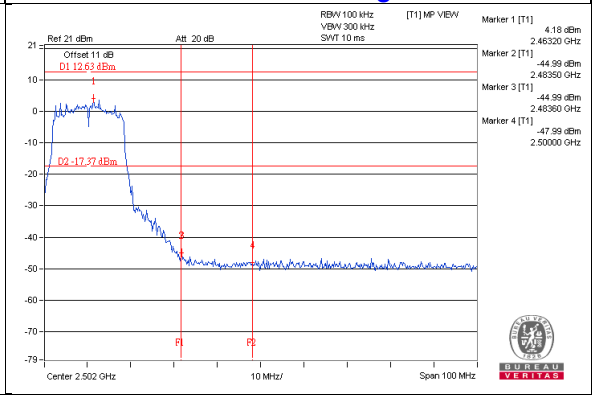
CH 11



CH 1 Band edge

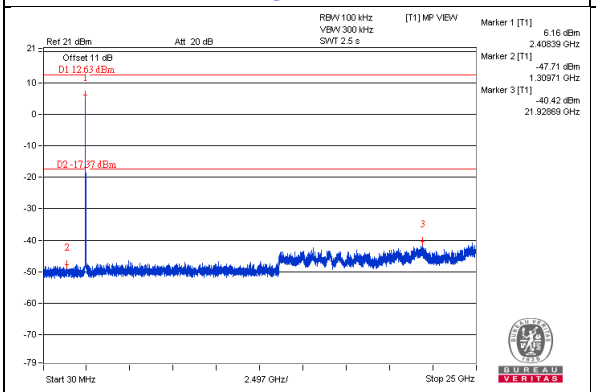


CH 11 Band edge

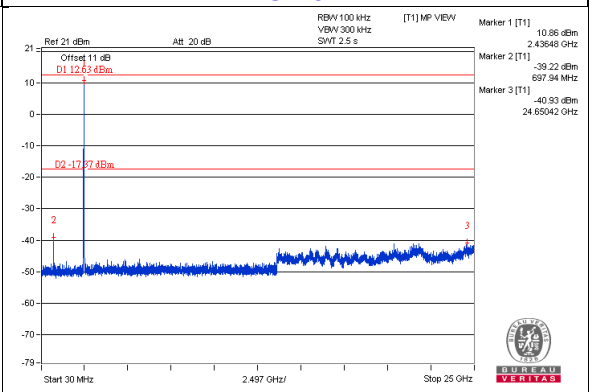


Chain 2

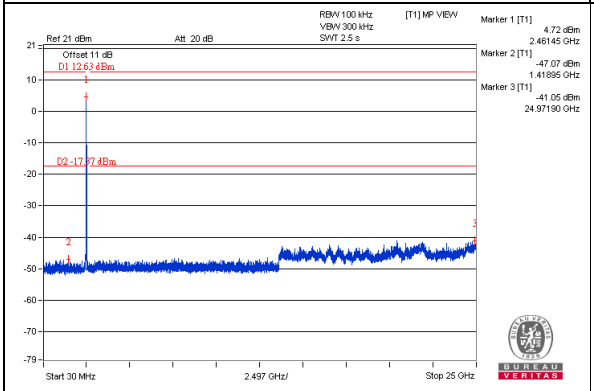
CH 1



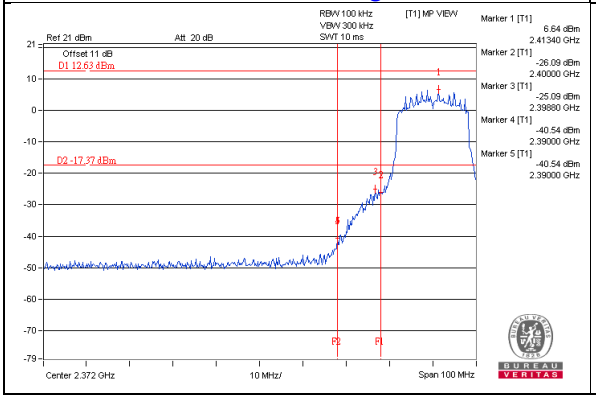
CH 6



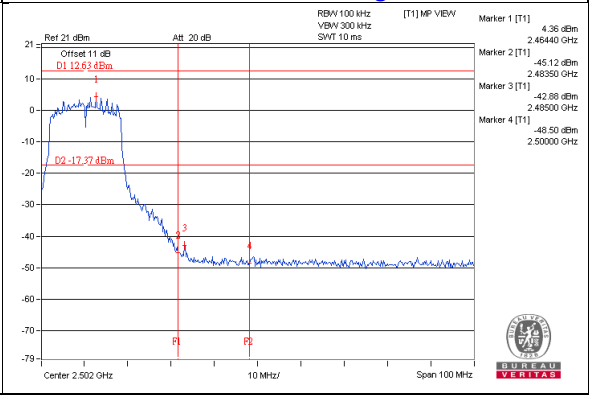
CH 11



CH 1 Band edge

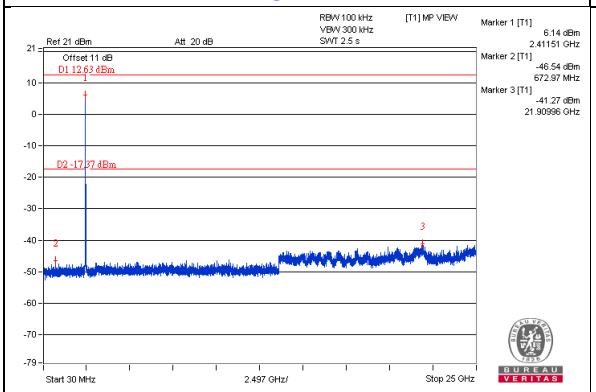


CH 11 Band edge

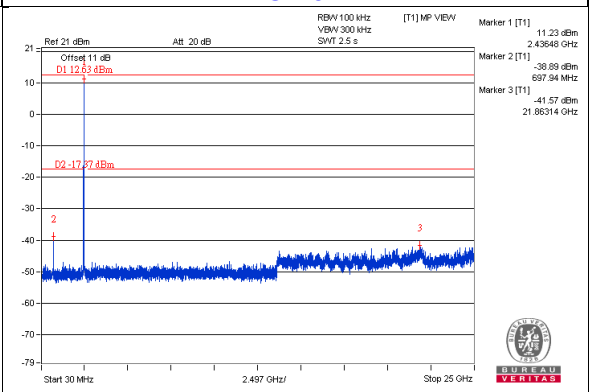


Chain 3

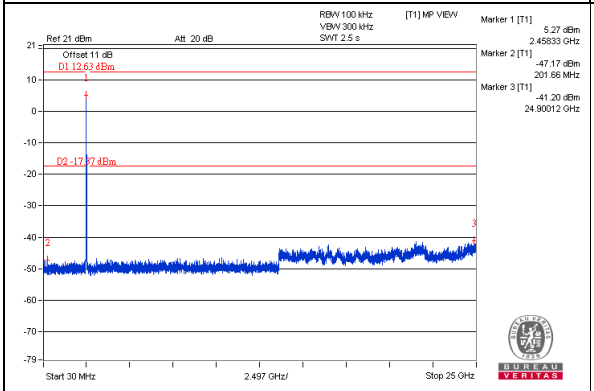
CH 1



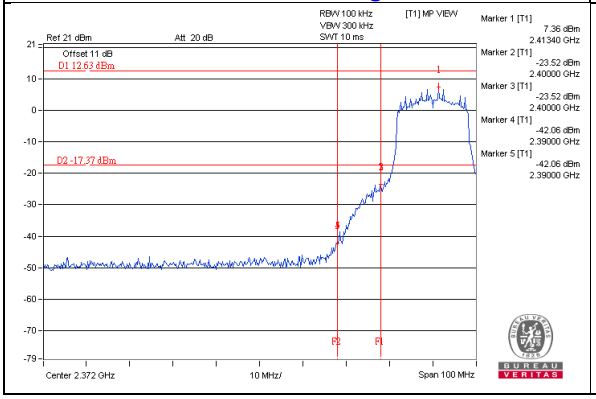
CH 6



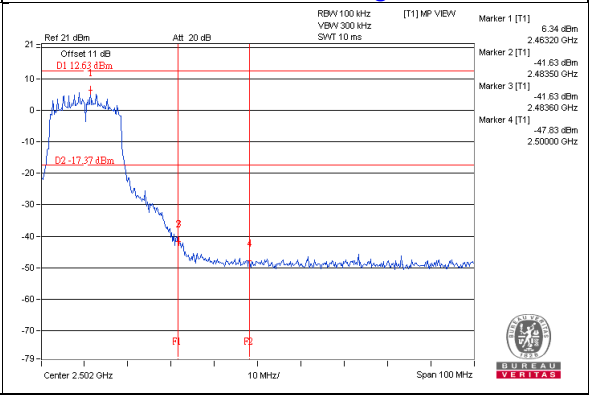
CH 11



CH 1 Band edge

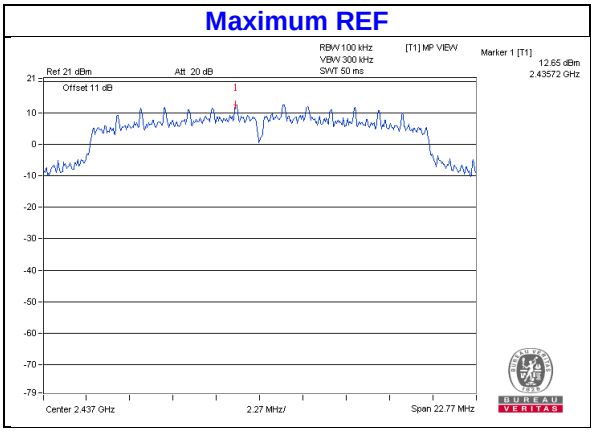


CH 11 Band edge



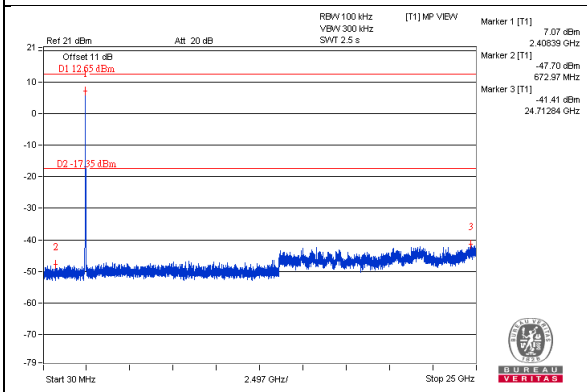
VHT20

Maximum REF

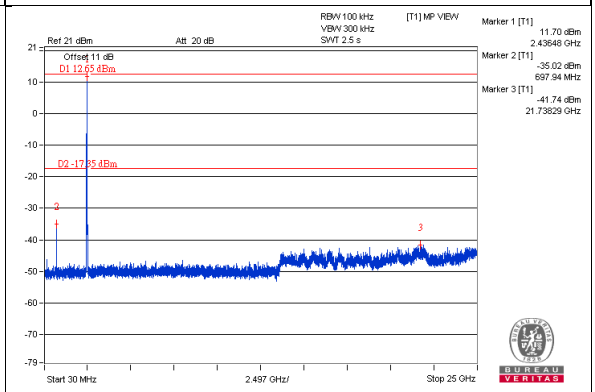


Chain 0

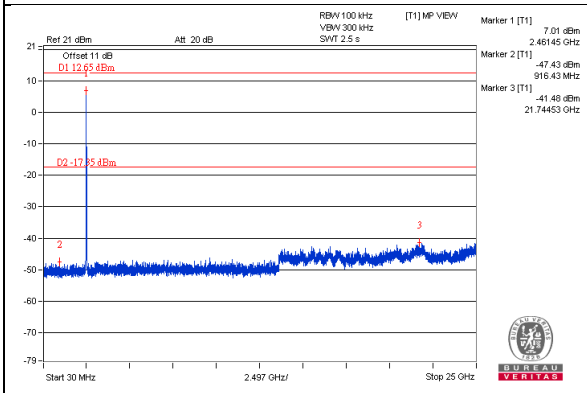
CH 1



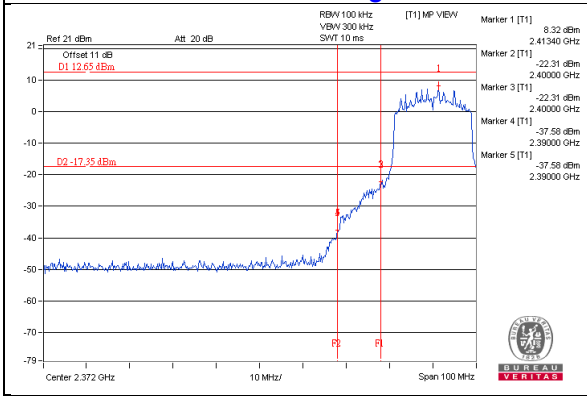
CH 6



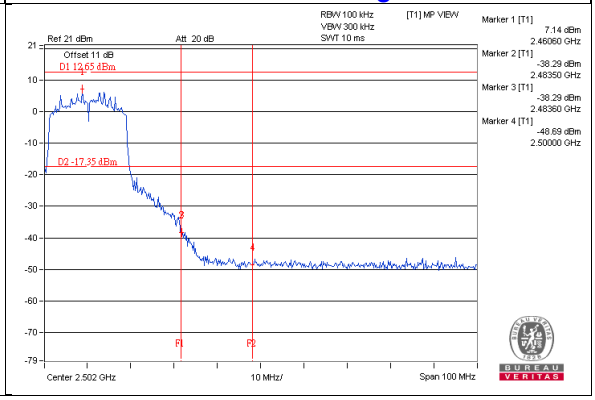
CH 11



CH 1 Band edge

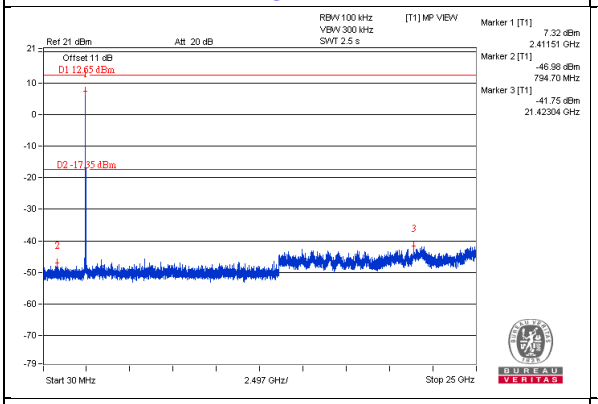


CH 11 Band edge

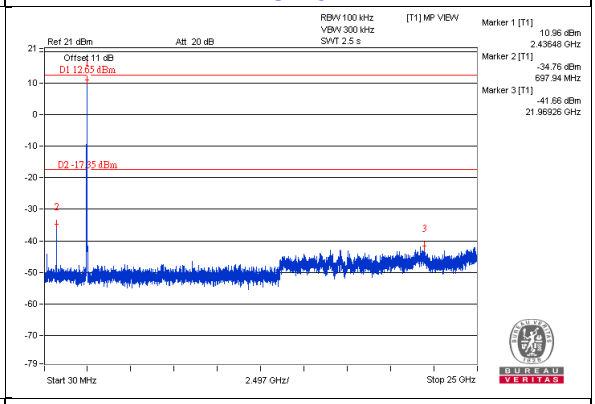


Chain 1

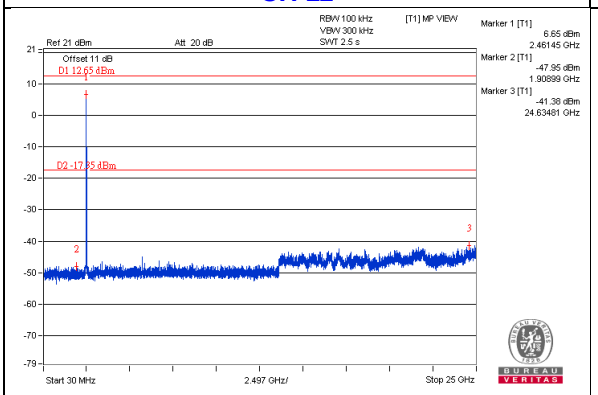
CH 1



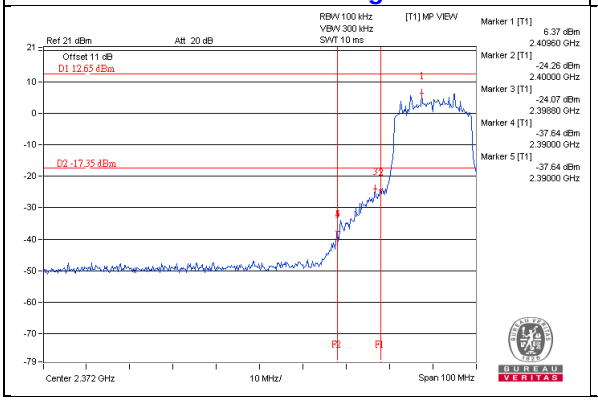
CH 6



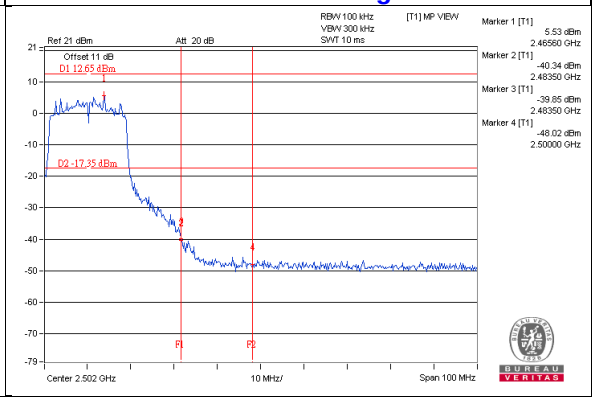
CH 11



CH 1 Band edge

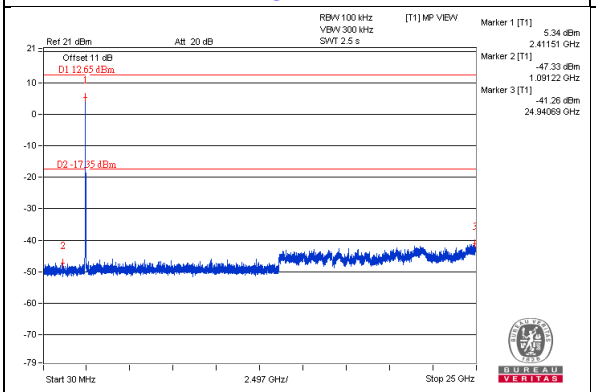


CH 11 Band edge

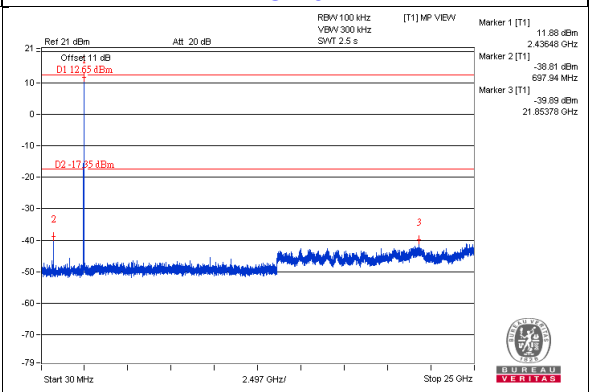


Chain 2

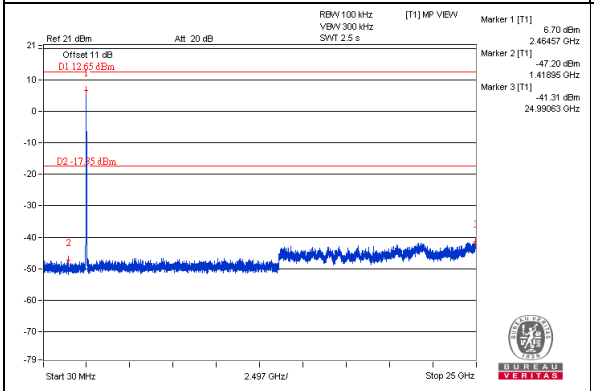
CH 1



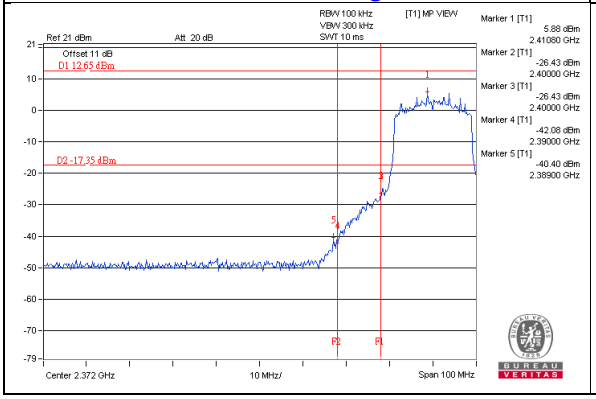
CH 6



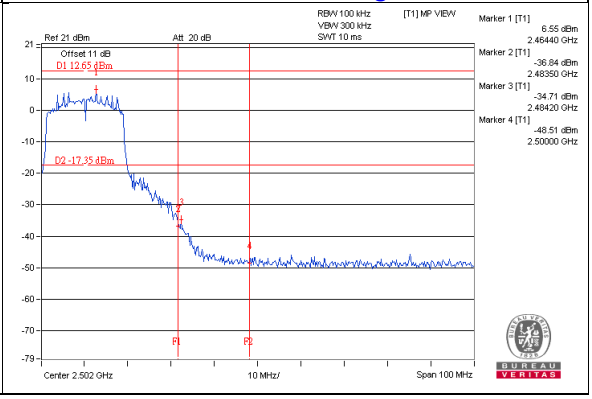
CH 11



CH 1 Band edge

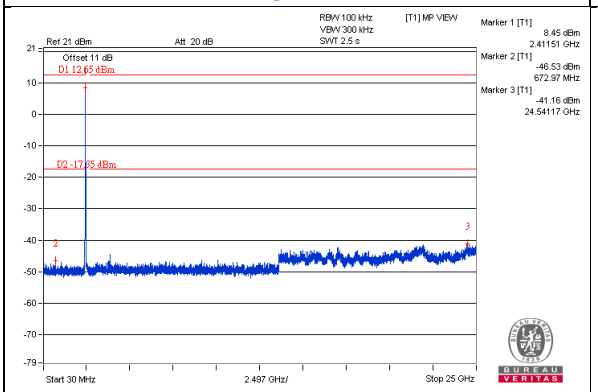


CH 11 Band edge

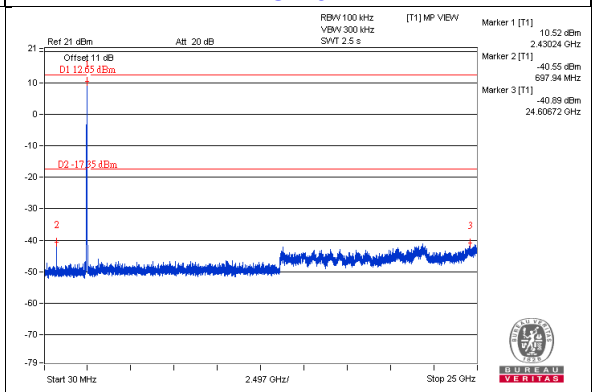


Chain 3

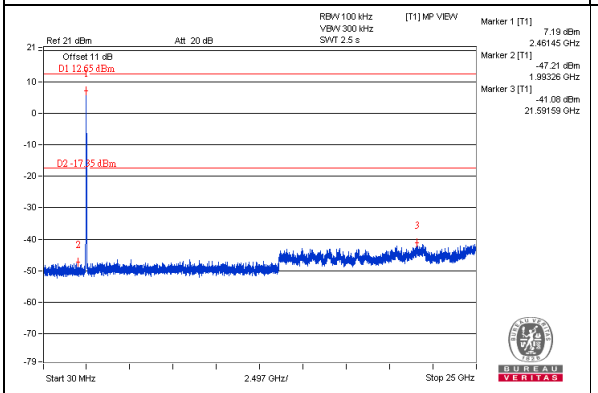
CH 1



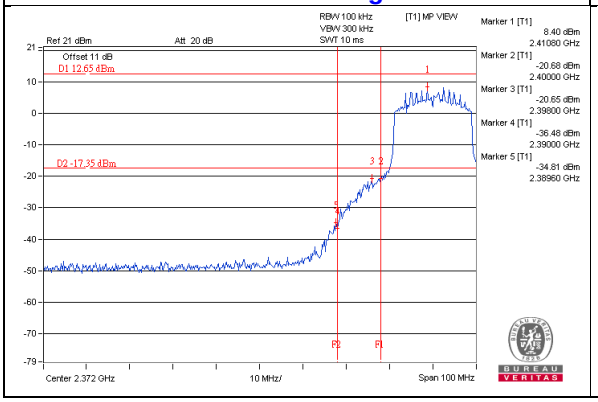
CH 6



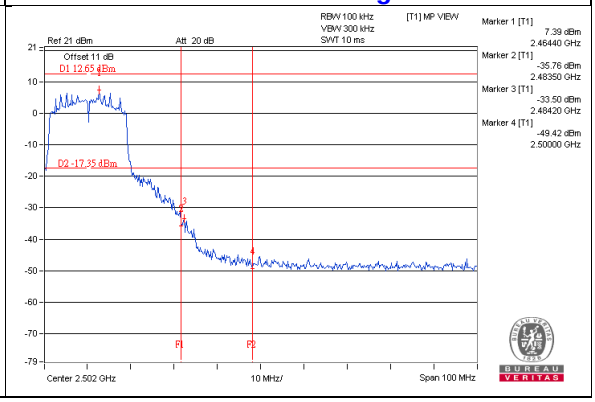
CH 11



CH 1 Band edge

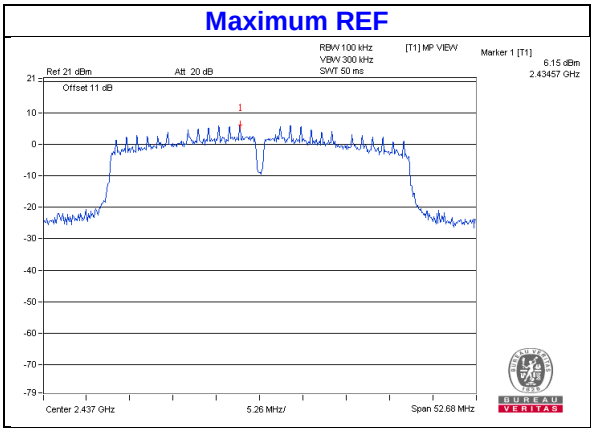


CH 11 Band edge



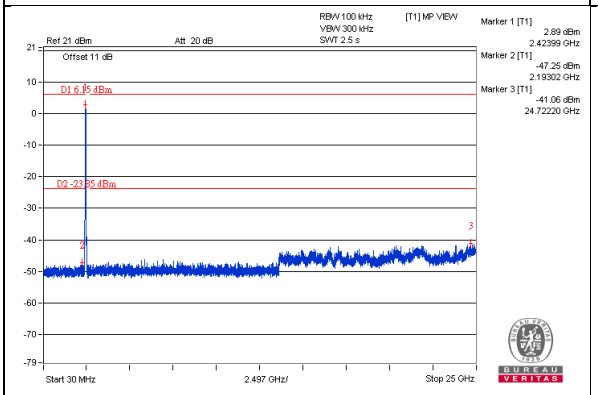
VHT40

Maximum REF

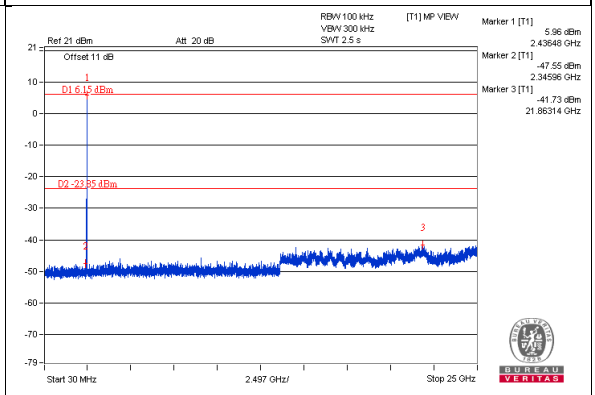


Chain 0

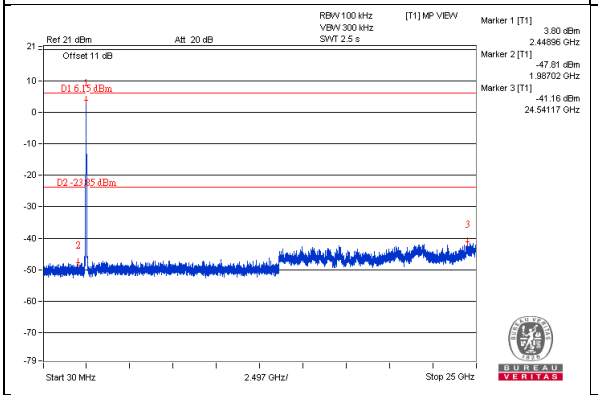
CH 3



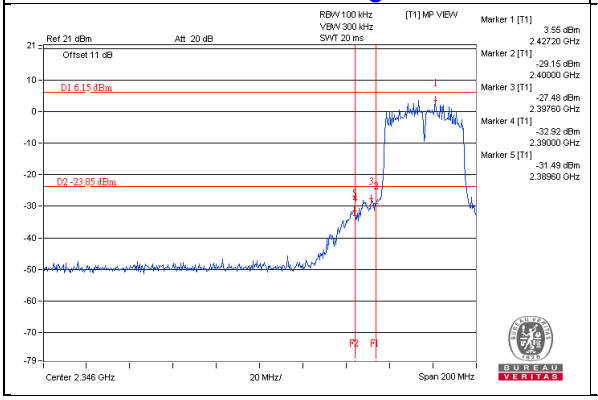
CH 6



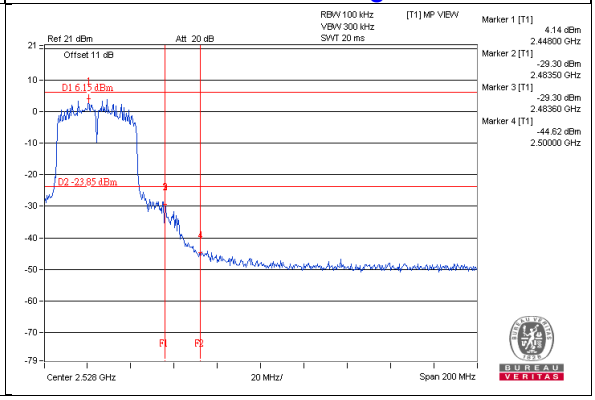
CH 9



CH 3 Band edge

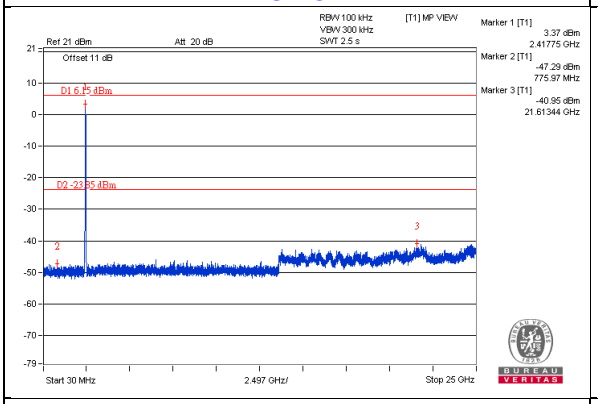


CH 9 Band edge

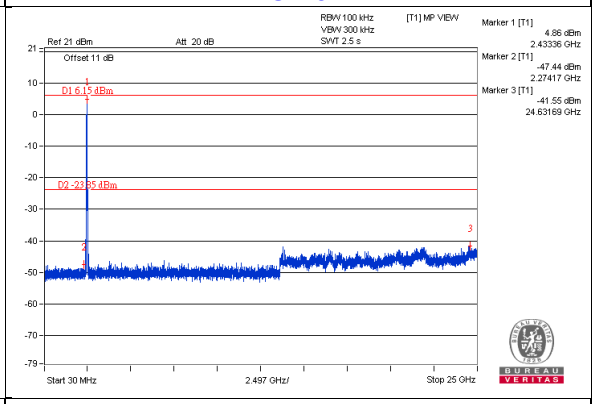


Chain 1

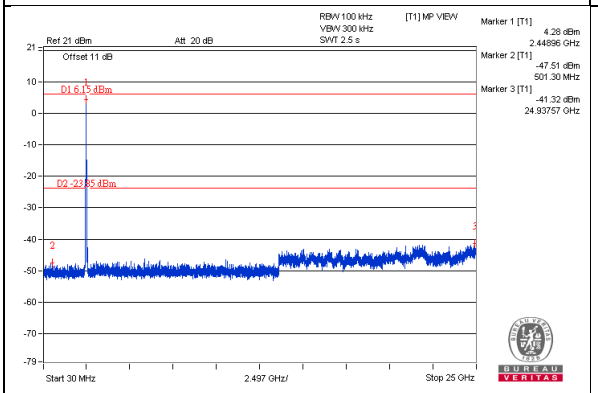
CH 3



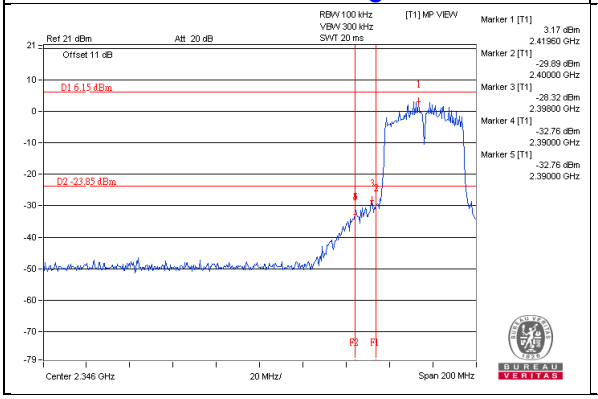
CH 6



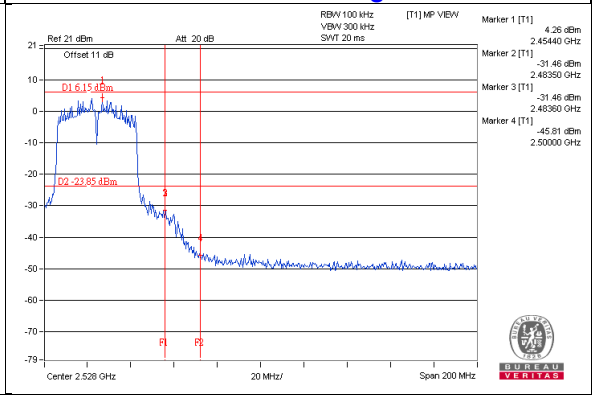
CH 9



CH 3 Band edge

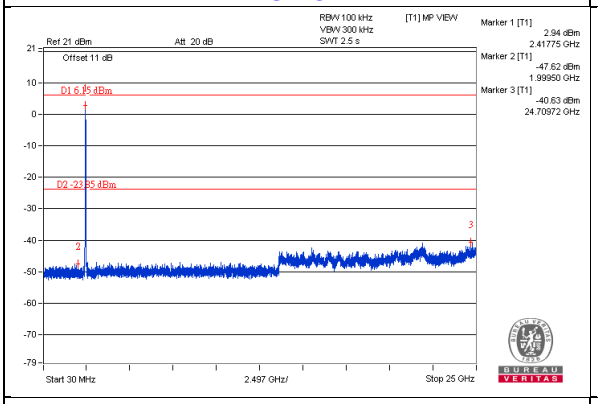


CH 9 Band edge

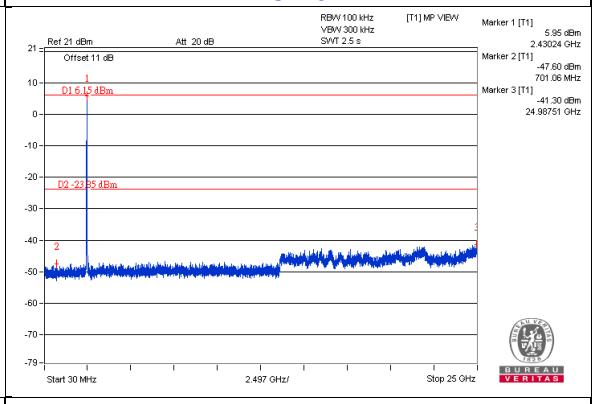


Chain 2

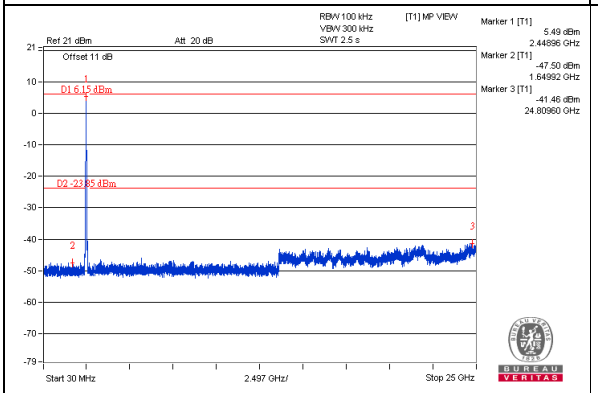
CH 3



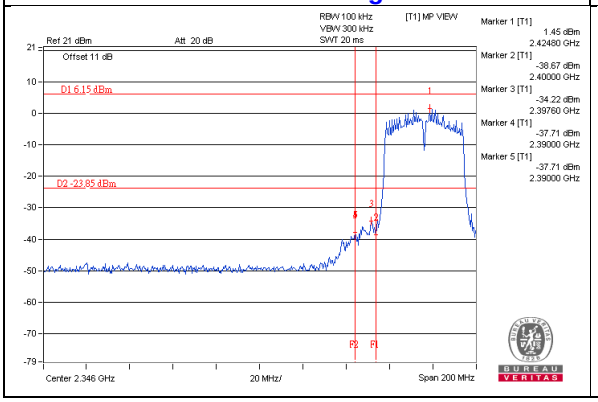
CH 6



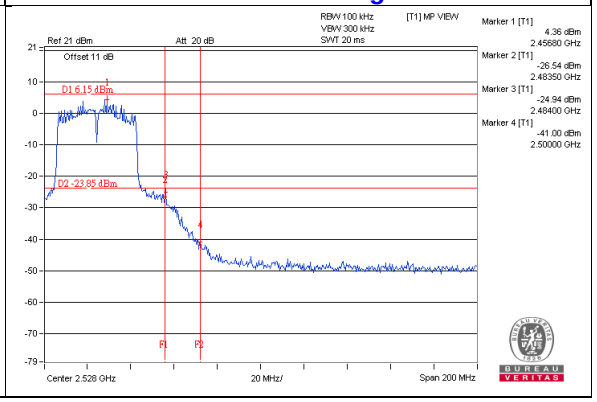
CH 9



CH 3 Band edge

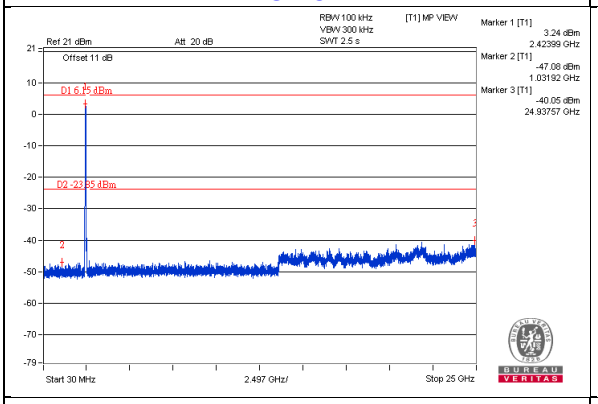


CH 9 Band edge

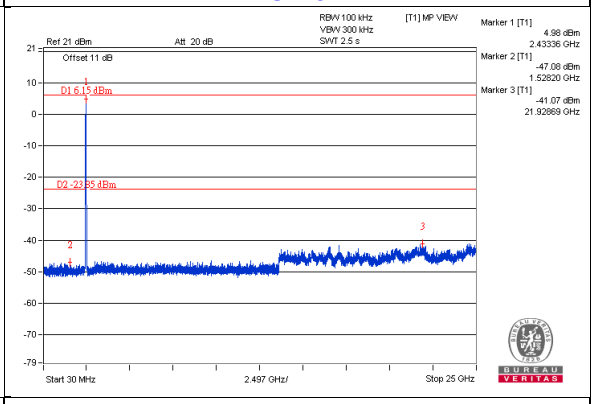


Chain 3

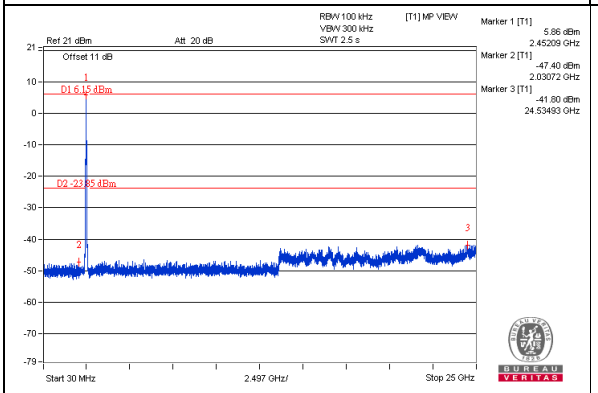
CH 3



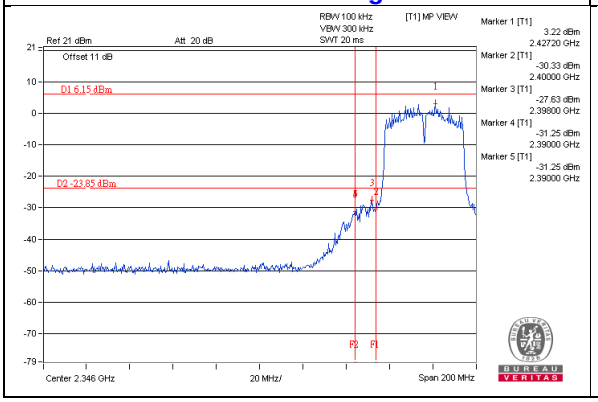
CH 6



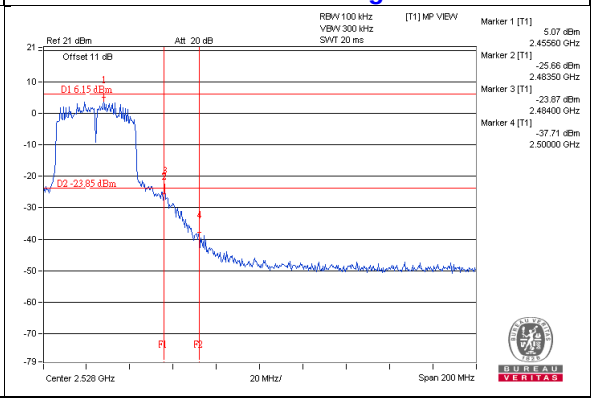
CH 9



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 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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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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