FCC Test Report

Report No.:	RF170706C25
FCC ID:	PY317100376
Test Model:	C7500
Received Date:	July 06, 2017
Test Date:	Aug. 08 to 15, 2017
Issued Date:	Sep. 06, 2017
Applicant:	NETGEAR INC.
Address:	350 East Plumeria Drive San Jose, CA 95134
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.

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Release Control Record

Issue No.	Description	Date Issued
RF170706C25	Original release.	Sep. 06, 2017

1 Certificate of Conformity

Product:	AC3200 WiFi Cable Modem Router
Brand:	NETGEAR
Test Model:	C7500
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR INC.
Test Date:	Aug. 08 to 15, 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 : _____ , **Date:** Sep. 06, 2017

Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 06, 2017

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 -10.64dB at 29.23438MHz.
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, 7311.00MHz.
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	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC3200 WiFi Cable Modem Router
Brand	NETGEAR
Test Model	C7500
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 19V 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 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, 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:** 984.906mW **Beamforming Mode (Nss=1):** 558.355mW **Beamforming Mode (Nss=2):** 799.826mW **5GHz:** **CDD Mode:** **5.18 ~ 5.24GHz:** 836.579mW **5.745 ~ 5.825GHz:** 992.311mW **Beamforming Mode (Nss=1):** **5.18 ~ 5.24GHz:** 608.681mW **5.745 ~ 5.825GHz:** 755.931mW **Beamforming Mode (Nss=2):** **5.18 ~ 5.24GHz:** 990.45mW **5.745 ~ 5.825GHz:** 991.062mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	Ethernet Cable x 1

Note:

1. 2.4GHz & 5GHz technology can not transmit at same time.
2. The EUT must be supplied with a power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	AD2003F10	PN:332-10631-01	AC Input: 100-120Vac, 1.5A, 50/60Hz DC Output: 19V, 3.16A DC Output cable: Unshielded, 1.8m
2	NETGEAR	2ABS060K 1 NA	PN:332-10788-01	AC Input: 100-120Vac, 1.7A, 50/60Hz DC Output: 19V, 3.16A DC Output cable: Unshielded, 1.8m
Note: 1. From the above adapters, the worse case was found in Adapter 2. Therefore only the test data of the mode was recorded in this report.				

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

2.4GHz					
Antenna No.	Transmitter Circuit	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	Chain (0)	2.47	2.4~2.4835	Dipole	i-pex(MHF)
2	Chain (1)	2.47			
3	Chain (2)	2.47			
4	Chain (3)	2.47			
5GHz					
Antenna No.	Transmitter Circuit	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	Chain (0)	2.13	5.15~5.25	Dipole	i-pex(MHF)
		1.19	5.725~5.85		
2	Chain (1)	2.13	5.15~5.25	Dipole	i-pex(MHF)
		1.19	5.725~5.85		
3	Chain (2)	2.13	5.15~5.25	Dipole	i-pex(MHF)
		1.19	5.725~5.85		
4	Chain (3)	2.13	5.15~5.25	Dipole	i-pex(MHF)
		1.19	5.725~5.85		

4. 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	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
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

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

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

3.2 Description of Test Modes

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

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
NOTE: "-"means no effect.

Radiated Emission Test (Above 1GHz):

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

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	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.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	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.

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
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (Nss1) (output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (Nss2) (output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	13
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	27

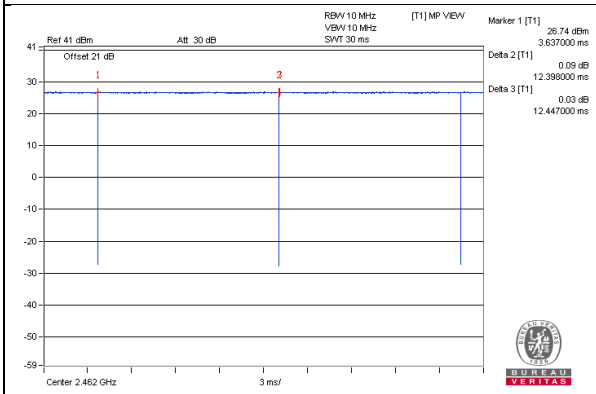
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 63%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	23deg. C, 64%RH	120Vac, 60Hz	Jyunchun Lin
PLC	25deg. C, 75%RH 25deg. C, 75%RH	120Vac, 60Hz	Andy Ho Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

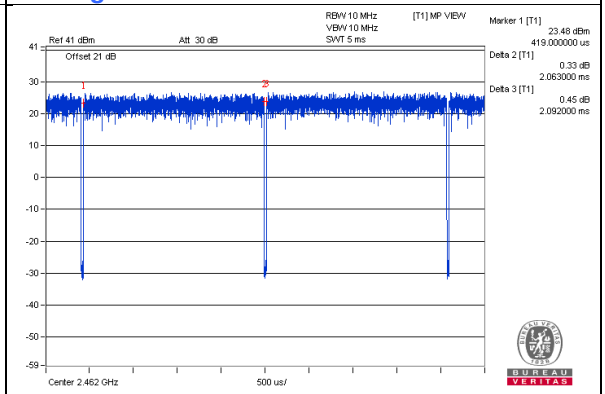
3.3 Duty Cycle of Test Signal

802.11b: Duty cycle = 12.398/12.447 = 0.996
802.11g: Duty cycle = 2.063/2.092 = 0.986
VHT20: Duty cycle = 1.927/1.958 = 0.984
VHT40: Duty cycle = 0.951/0.981 = 0.969, Duty factor = 10 * log(1/0.969) = 0.13

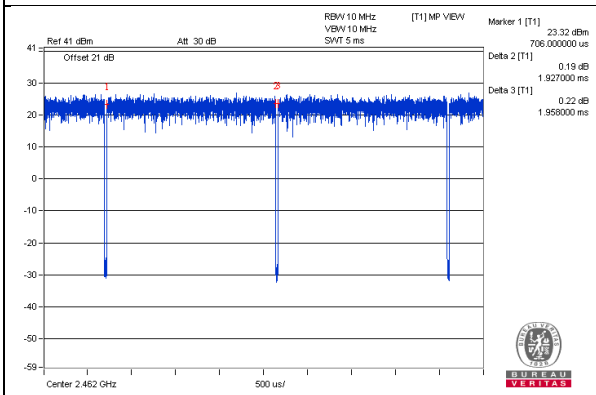
802.11b



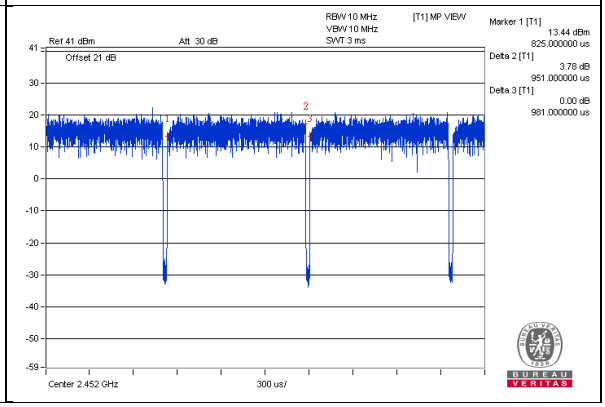
802.11g



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.

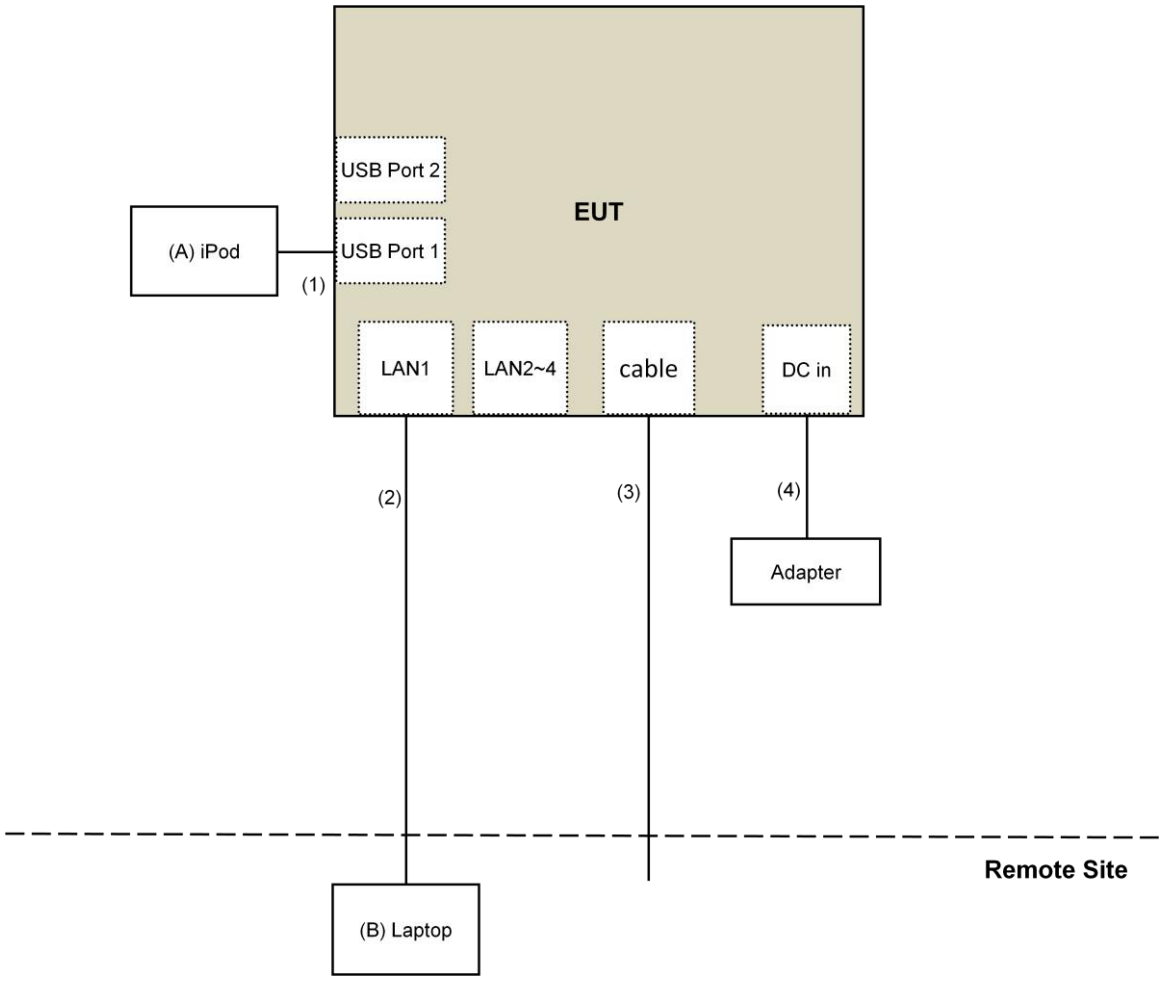
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab
B.	Laptop	HP	Pavilion 14-ab023TU	5CD5340WXZ	NA	Provided by Lab

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.	USB Cable	1	0.1	Yes	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	Coaxial Cable	1	10	Yes	0	Provided by Lab
4.	DC Cable	1	1.8	No	0	Supplied by client

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 Keysight	N9038A	MY54450088	July 08, 2017	July 07, 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-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Dec. 13, 2016	Dec. 12, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	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	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	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. 4.
4. The CANADA Site Registration No. is 20331-2
5 Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Aug. 08 to 10, 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:

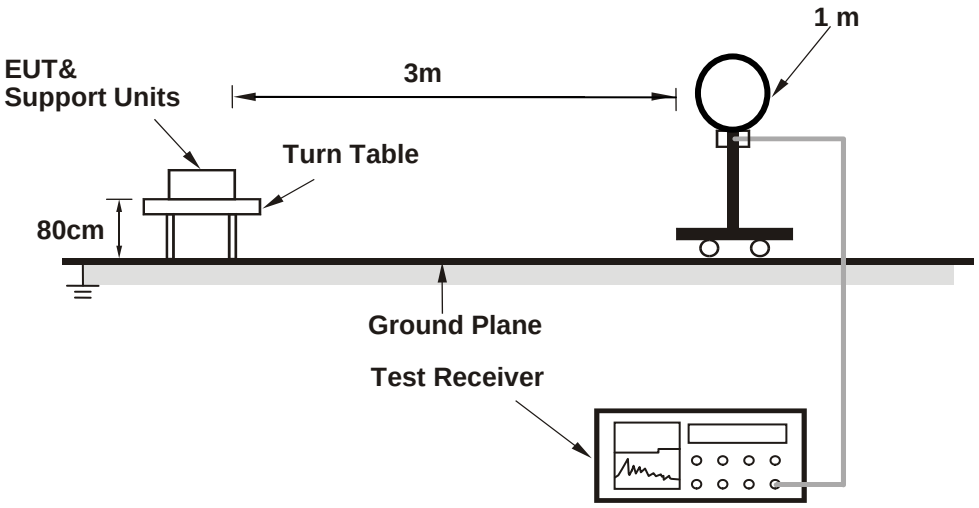
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

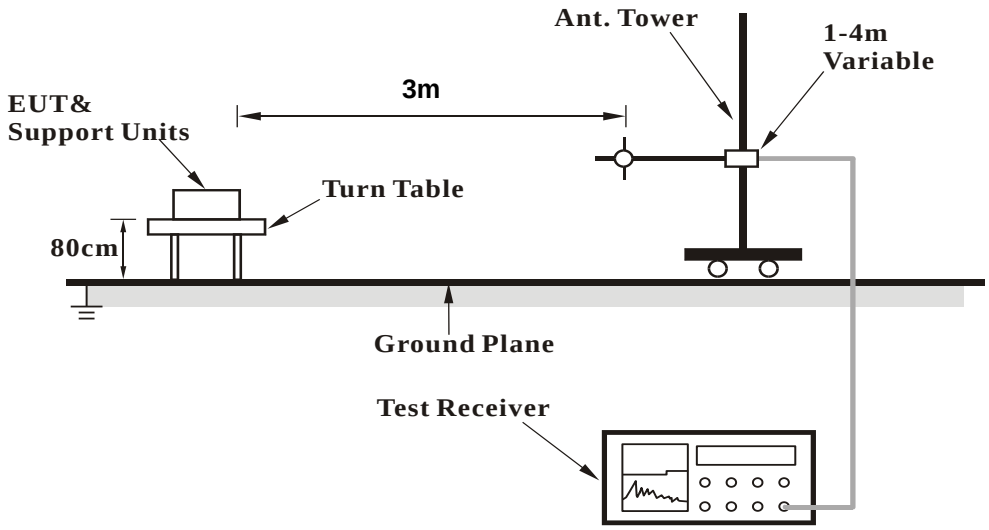
No deviation.

4.1.5 Test Setup

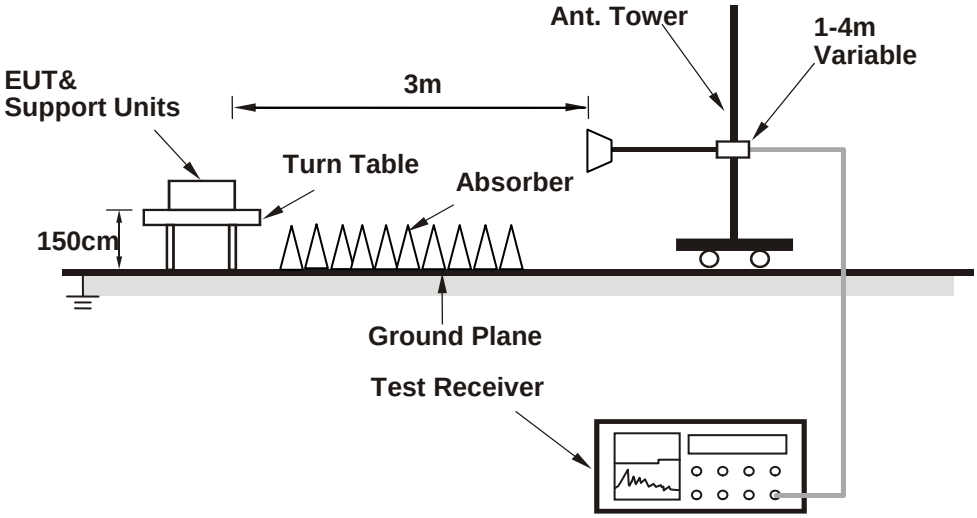
For Radiated emission below 30MHz



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 (MTool [V2.0.2.7]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	56.9 PK	74.0	-17.1	2.76 H	200	58.2	-1.3
2	2390.00	43.2 AV	54.0	-10.8	2.76 H	200	44.5	-1.3
3	*2412.00	103.9 PK			2.76 H	200	105.0	-1.1
4	*2412.00	101.6 AV			2.76 H	200	102.7	-1.1
5	4824.00	48.4 PK	74.0	-25.6	3.61 H	345	45.2	3.2
6	4824.00	45.1 AV	54.0	-8.9	3.61 H	345	41.9	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	58.8 PK	74.0	-15.2	2.55 V	207	60.1	-1.3
2	2390.00	47.6 AV	54.0	-6.4	2.55 V	207	48.9	-1.3
3	*2412.00	106.5 PK			2.55 V	207	107.6	-1.1
4	*2412.00	104.2 AV			2.55 V	207	105.3	-1.1
5	4824.00	52.8 PK	74.0	-21.2	3.78 V	247	49.6	3.2
6	4824.00	50.5 AV	54.0	-3.5	3.78 V	247	47.3	3.2

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	102.4 PK			2.82 H	192	103.6	-1.2
2	*2437.00	100.1 AV			2.82 H	192	101.3	-1.2
3	4874.00	48.4 PK	74.0	-25.6	3.63 H	349	45.1	3.3
4	4874.00	44.9 AV	54.0	-9.1	3.63 H	349	41.6	3.3
5	7311.00	54.6 PK	74.0	-19.4	1.18 H	299	44.8	9.8
6	7311.00	50.9 AV	54.0	-3.1	1.18 H	299	41.1	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.3 PK			2.19 V	205	106.5	-1.2
2	*2437.00	103.0 AV			2.19 V	205	104.2	-1.2
3	4874.00	51.4 PK	74.0	-22.6	4.00 V	191	48.1	3.3
4	4874.00	49.6 AV	54.0	-4.4	4.00 V	191	46.3	3.3
5	7311.00	59.8 PK	74.0	-14.2	1.15 V	241	50.0	9.8
6	**7311.00**	**53.9 AV**	**54.0**	**-0.1**	**1.15 V**	**241**	**44.1**	**9.8**

REMARKS:

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

CHANNEL	TX Channel 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	103.8 PK			2.70 H	213	104.9	-1.1
2	*2462.00	101.4 AV			2.70 H	213	102.5	-1.1
3	2483.50	52.2 PK	74.0	-21.8	2.70 H	213	53.2	-1.0
4	2483.50	40.9 AV	54.0	-13.1	2.70 H	213	41.9	-1.0
5	4924.00	47.3 PK	74.0	-26.7	3.61 H	360	43.8	3.5
6	4924.00	43.8 AV	54.0	-10.2	3.61 H	360	40.3	3.5
7	7386.00	54.4 PK	74.0	-19.6	1.21 H	312	44.5	9.9
8	7386.00	50.7 AV	54.0	-3.3	1.21 H	312	40.8	9.9
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	*2462.00	106.5 PK			2.33 V	207	107.6	-1.1
2	*2462.00	104.2 AV			2.33 V	207	105.3	-1.1
3	2483.50	59.1 PK	74.0	-14.9	2.33 V	207	60.1	-1.0
4	2483.50	45.1 AV	54.0	-8.9	2.33 V	207	46.1	-1.0
5	4924.00	50.5 PK	74.0	-23.5	3.71 V	190	47.0	3.5
6	4924.00	47.9 AV	54.0	-6.1	3.71 V	190	44.4	3.5
7	7386.00	59.7 PK	74.0	-14.3	1.13 V	247	49.8	9.9
8	7386.00	53.7 AV	54.0	-0.3	1.13 V	247	43.8	9.9

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.

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	65.5 PK	74.0	-8.5	2.71 H	220	66.8	-1.3
2	2390.00	48.6 AV	54.0	-5.4	2.71 H	220	49.9	-1.3
3	*2412.00	103.1 PK			2.71 H	220	104.2	-1.1
4	*2412.00	92.9 AV			2.71 H	220	94.0	-1.1
5	4824.00	45.2 PK	74.0	-28.8	3.66 H	344	42.0	3.2
6	4824.00	32.5 AV	54.0	-21.5	3.66 H	344	29.3	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.7 PK	74.0	-3.3	2.59 V	206	72.0	-1.3
2	2390.00	53.8 AV	54.0	-0.2	2.59 V	206	55.1	-1.3
3	*2412.00	105.8 PK			2.59 V	206	106.9	-1.1
4	*2412.00	95.7 AV			2.59 V	206	96.8	-1.1
5	4824.00	49.1 PK	74.0	-24.9	2.05 V	151	45.9	3.2
6	4824.00	36.4 AV	54.0	-17.6	2.05 V	151	33.2	3.2

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	57.0 PK	74.0	-17.0	2.66 H	217	58.3	-1.3
2	2390.00	43.0 AV	54.0	-11.0	2.66 H	217	44.3	-1.3
3	*2437.00	106.2 PK			2.66 H	217	107.4	-1.2
4	*2437.00	96.0 AV			2.66 H	217	97.2	-1.2
5	2483.50	57.3 PK	74.0	-16.7	2.66 H	217	58.3	-1.0
6	2483.50	43.7 AV	54.0	-10.3	2.66 H	217	44.7	-1.0
7	4874.00	48.1 PK	74.0	-25.9	3.72 H	329	44.8	3.3
8	4874.00	34.8 AV	54.0	-19.2	3.72 H	329	31.5	3.3
9	7311.00	70.7 PK	74.0	-3.3	1.26 H	313	60.9	9.8
10	7311.00	50.7 AV	54.0	-3.3	1.26 H	313	40.9	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.3 PK	74.0	-16.7	2.59 V	200	58.6	-1.3
2	2390.00	44.4 AV	54.0	-9.6	2.59 V	200	45.7	-1.3
3	*2437.00	108.9 PK			2.59 V	200	110.1	-1.2
4	*2437.00	98.8 AV			2.59 V	200	100.0	-1.2
5	2483.50	58.5 PK	74.0	-15.5	2.59 V	200	59.5	-1.0
6	2483.50	44.7 AV	54.0	-9.3	2.59 V	200	45.7	-1.0
7	4874.00	51.9 PK	74.0	-22.1	2.07 V	160	48.6	3.3
8	4874.00	38.9 AV	54.0	-15.1	2.07 V	160	35.6	3.3
9	**7311.00**	**73.9 PK**	**74.0**	**-0.1**	**1.13 V**	**352**	**64.1**	**9.8**
10	7311.00	53.8 AV	54.0	-0.2	1.13 V	352	44.0	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.2 PK			2.62 H	213	105.3	-1.1
2	*2462.00	93.5 AV			2.62 H	213	94.6	-1.1
3	2483.50	66.2 PK	74.0	-7.8	2.62 H	213	67.2	-1.0
4	2483.50	48.8 AV	54.0	-5.2	2.62 H	213	49.8	-1.0
5	4924.00	46.6 PK	74.0	-27.4	3.68 H	320	43.1	3.5
6	4924.00	33.4 AV	54.0	-20.6	3.68 H	320	29.9	3.5
7	7386.00	70.5 PK	74.0	-3.5	1.32 H	319	60.6	9.9
8	7386.00	50.6 AV	54.0	-3.4	1.32 H	319	40.7	9.9
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	*2462.00	106.7 PK			2.59 V	201	107.8	-1.1
2	*2462.00	96.4 AV			2.59 V	201	97.5	-1.1
3	2483.50	71.3 PK	74.0	-2.7	2.59 V	201	72.3	-1.0
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.59 V**	**201**	**54.9**	**-1.0**
5	4924.00	50.7 PK	74.0	-23.3	2.03 V	158	47.2	3.5
6	4924.00	37.5 AV	54.0	-16.5	2.03 V	158	34.0	3.5
7	7386.00	73.8 PK	74.0	-0.2	2.23 V	152	63.9	9.9
8	7386.00	53.6 AV	54.0	-0.4	2.23 V	152	43.7	9.9

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.

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	68.6 PK	74.0	-5.4	2.76 H	220	69.9	-1.3
2	2390.00	48.7 AV	54.0	-5.3	2.76 H	220	50.0	-1.3
3	*2412.00	103.6 PK			2.76 H	220	104.7	-1.1
4	*2412.00	93.3 AV			2.76 H	220	94.4	-1.1
5	4824.00	45.1 PK	74.0	-28.9	3.71 H	336	41.9	3.2
6	4824.00	32.2 AV	54.0	-21.8	3.71 H	336	29.0	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**2390.00**	**73.9 PK**	**74.0**	**-0.1**	**2.66 V**	**183**	**75.2**	**-1.3**
2	2390.00	53.5 AV	54.0	-0.5	2.66 V	183	54.8	-1.3
3	*2412.00	105.7 PK			2.66 V	183	106.8	-1.1
4	*2412.00	95.6 AV			2.66 V	183	96.7	-1.1
5	4824.00	49.3 PK	74.0	-24.7	2.05 V	202	46.1	3.2
6	4824.00	36.2 AV	54.0	-17.8	2.05 V	202	33.0	3.2

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			2.70 H	207	107.1	-1.2
2	*2437.00	95.8 AV			2.70 H	207	97.0	-1.2
3	4874.00	48.6 PK	74.0	-25.4	3.74 H	336	45.3	3.3
4	4874.00	35.1 AV	54.0	-18.9	3.74 H	336	31.8	3.3
5	7311.00	70.7 PK	74.0	-3.3	1.26 H	310	60.9	9.8
6	7311.00	50.8 AV	54.0	-3.2	1.26 H	310	41.0	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.6 PK			2.66 V	182	110.8	-1.2
2	*2437.00	99.4 AV			2.66 V	182	100.6	-1.2
3	4874.00	51.7 PK	74.0	-22.3	2.03 V	149	48.4	3.3
4	4874.00	38.7 AV	54.0	-15.3	2.03 V	149	35.4	3.3
5	7311.00	69.9 PK	74.0	-4.1	2.32 V	78	60.1	9.8
6	**7311.00**	**53.9 AV**	**54.0**	**-0.1**	**2.32 V**	**78**	**44.1**	**9.8**

REMARKS:

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

CHANNEL	TX Channel 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	103.4 PK			2.76 H	226	104.5	-1.1
2	*2462.00	93.0 AV			2.76 H	226	94.1	-1.1
3	2483.50	69.2 PK	74.0	-4.8	2.76 H	226	70.2	-1.0
4	2483.50	47.6 AV	54.0	-6.4	2.76 H	226	48.6	-1.0
5	4924.00	46.8 PK	74.0	-27.2	3.69 H	334	43.3	3.5
6	4924.00	33.8 AV	54.0	-20.2	3.69 H	334	30.3	3.5
7	7386.00	66.8 PK	74.0	-7.2	1.34 H	323	56.9	9.9
8	7386.00	48.9 AV	54.0	-5.1	1.34 H	323	39.0	9.9
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	*2462.00	106.5 PK			2.66 V	174	107.6	-1.1
2	*2462.00	96.4 AV			2.66 V	174	97.5	-1.1
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**2.66 V**	**174**	**74.9**	**-1.0**
4	2483.50	52.1 AV	54.0	-1.9	2.66 V	174	53.1	-1.0
5	4924.00	50.3 PK	74.0	-23.7	2.01 V	172	46.8	3.5
6	4924.00	37.0 AV	54.0	-17.0	2.01 V	172	33.5	3.5
7	7386.00	70.1 PK	74.0	-3.9	2.24 V	176	60.2	9.9
8	7386.00	52.0 AV	54.0	-2.0	2.24 V	176	42.1	9.9

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.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	2.73 H	237	69.7	-1.3
2	2390.00	48.9 AV	54.0	-5.1	2.73 H	237	50.2	-1.3
3	*2422.00	93.4 PK			2.73 H	237	94.7	-1.3
4	*2422.00	82.2 AV			2.73 H	237	83.5	-1.3
5	4844.00	44.2 PK	74.0	-29.8	3.73 H	344	40.9	3.3
6	4844.00	30.5 AV	54.0	-23.5	3.73 H	344	27.2	3.3
7	7266.00	63.8 PK	74.0	-10.2	1.30 H	323	54.0	9.8
8	7266.00	47.7 AV	54.0	-6.3	1.30 H	323	37.9	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.3 PK	74.0	-0.7	2.62 V	181	74.6	-1.3
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.62 V**	**181**	**55.2**	**-1.3**
3	*2422.00	100.2 PK			2.62 V	181	101.5	-1.3
4	*2422.00	89.6 AV			2.62 V	181	90.9	-1.3
5	4844.00	48.1 PK	74.0	-25.9	2.05 V	187	44.8	3.3
6	4844.00	34.6 AV	54.0	-19.4	2.05 V	187	31.3	3.3
7	7266.00	67.9 PK	74.0	-6.1	1.53 V	324	58.1	9.8
8	7266.00	51.8 AV	54.0	-2.2	1.53 V	324	42.0	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.3 PK	74.0	-8.7	2.75 H	231	66.6	-1.3
2	2390.00	45.1 AV	54.0	-8.9	2.75 H	231	46.4	-1.3
3	*2437.00	97.7 PK			2.75 H	231	98.9	-1.2
4	*2437.00	86.3 AV			2.75 H	231	87.5	-1.2
5	2483.50	69.1 PK	74.0	-4.9	2.75 H	231	70.1	-1.0
6	2483.50	48.6 AV	54.0	-5.4	2.75 H	231	49.6	-1.0
7	4874.00	44.8 PK	74.0	-29.2	3.73 H	350	41.5	3.3
8	4874.00	31.7 AV	54.0	-22.3	3.73 H	350	28.4	3.3
9	7311.00	68.1 PK	74.0	-5.9	1.33 H	319	58.3	9.8
10	7311.00	46.5 AV	54.0	-7.5	1.33 H	319	36.7	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.6 PK	74.0	-3.4	2.62 V	180	71.9	-1.3
2	2390.00	49.9 AV	54.0	-4.1	2.62 V	180	51.2	-1.3
3	*2437.00	104.5 PK			2.62 V	180	105.7	-1.2
4	*2437.00	93.7 AV			2.62 V	180	94.9	-1.2
5	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**2.62 V**	**180**	**74.9**	**-1.0**
6	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.62 V**	**180**	**54.9**	**-1.0**
7	4874.00	48.6 PK	74.0	-25.4	2.09 V	216	45.3	3.3
8	4874.00	35.8 AV	54.0	-18.2	2.09 V	216	32.5	3.3
9	7311.00	72.2 PK	74.0	-1.8	1.53 V	204	62.4	9.8
10	7311.00	50.7 AV	54.0	-3.3	1.53 V	204	40.9	9.8

REMARKS:

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

CHANNEL	TX Channel 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	96.5 PK			2.79 H	232	97.6	-1.1
2	*2452.00	85.4 AV			2.79 H	232	86.5	-1.1
3	2483.50	67.9 PK	74.0	-6.1	2.79 H	232	68.9	-1.0
4	2483.50	48.8 AV	54.0	-5.2	2.79 H	232	49.8	-1.0
5	4904.00	43.7 PK	74.0	-30.3	3.78 H	336	40.2	3.5
6	4904.00	30.8 AV	54.0	-23.2	3.78 H	336	27.3	3.5
7	7356.00	67.8 PK	74.0	-6.2	1.38 H	304	57.9	9.9
8	7356.00	46.6 AV	54.0	-7.4	1.38 H	304	36.7	9.9
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	*2452.00	103.3 PK			2.62 V	177	104.4	-1.1
2	*2452.00	92.7 AV			2.62 V	177	93.8	-1.1
3	2483.50	72.7 PK	74.0	-1.3	1.74 V	171	73.7	-1.0
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.74 V**	**171**	**54.9**	**-1.0**
5	4904.00	48.6 PK	74.0	-25.4	2.11 V	215	45.1	3.5
6	4904.00	35.1 AV	54.0	-18.9	2.11 V	215	31.6	3.5
7	7356.00	71.9 PK	74.0	-2.1	1.54 V	217	62.0	9.9
8	7356.00	50.5 AV	54.0	-3.5	1.54 V	217	40.6	9.9

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.

Below 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	92.40	36.5 QP	43.5	-7.0	2.00 H	136	50.4	-13.9
2	104.71	36.1 QP	43.5	-7.4	2.00 H	277	48.0	-11.9
3	242.62	35.6 QP	46.0	-10.4	1.00 H	210	45.4	-9.8
4	320.01	37.3 QP	46.0	-8.7	1.00 H	262	44.4	-7.1
5	418.70	36.2 QP	46.0	-9.8	1.00 H	9	40.8	-4.6
6	448.68	37.3 QP	46.0	-8.7	2.00 H	360	41.0	-3.7
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	91.84	34.2 QP	43.5	-9.3	1.00 V	45	48.2	-14.0
2	244.32	33.1 QP	46.0	-12.9	1.00 V	360	42.8	-9.7
3	320.01	33.6 QP	46.0	-12.4	1.50 V	187	40.7	-7.1
4	424.11	32.2 QP	46.0	-13.8	2.50 V	199	36.6	-4.4
5	448.26	34.5 QP	46.0	-11.5	1.50 V	77	38.2	-3.7
6	480.01	37.3 QP	46.0	-8.7	1.00 V	151	40.3	-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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
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: Aug. 11 to 15, 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.

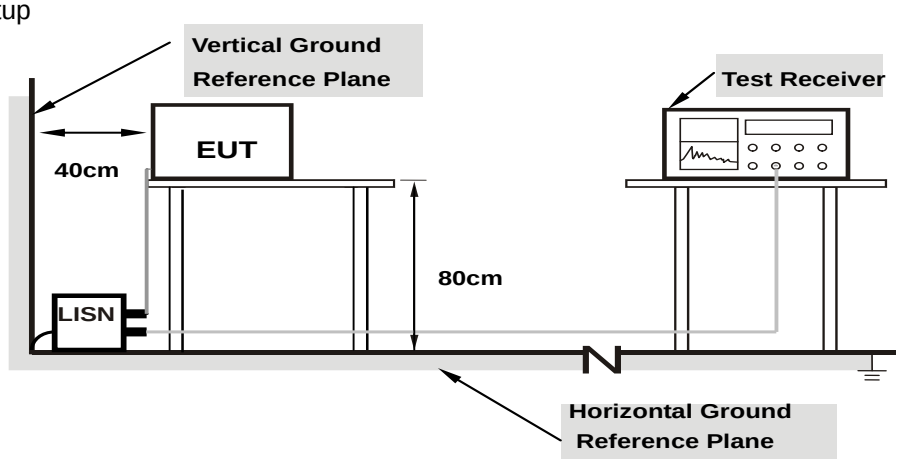
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

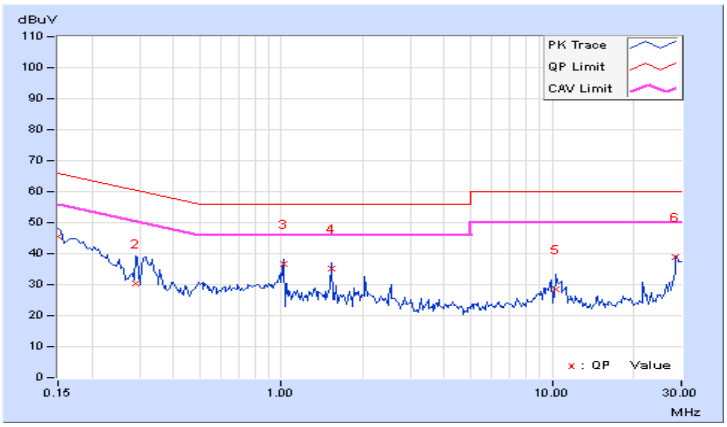
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.08	35.62	22.40	45.70	32.48	66.00	56.00	-20.30	-23.52
2	0.29063	10.09	20.11	8.14	30.20	18.23	60.51	50.51	-30.31	-32.28
3	1.01563	10.16	26.36	22.67	36.52	32.83	56.00	46.00	-19.48	-13.17
4	1.53516	10.17	25.06	19.76	35.23	29.93	56.00	46.00	-20.77	-16.07
5	10.36719	10.81	17.89	9.53	28.70	20.34	60.00	50.00	-31.30	-29.66
6	28.68750	11.73	27.06	24.52	38.79	36.25	60.00	50.00	-21.21	-13.75

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.

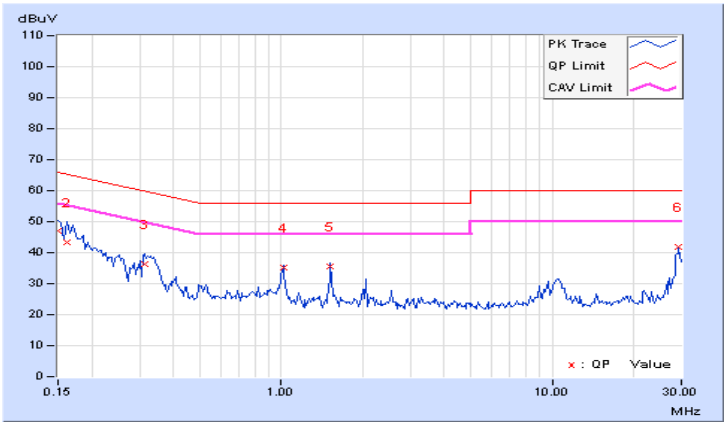


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15000	10.07	37.15	23.31	47.22	33.38	66.00	56.00	-18.78	-22.62
2	0.16172	10.06	33.45	18.70	43.51	28.76	65.38	55.38	-21.87	-26.62
3	0.31406	10.09	26.25	18.07	36.34	28.16	59.86	49.86	-23.52	-21.70
4	1.01953	10.12	24.93	23.34	35.05	33.46	56.00	46.00	-20.95	-12.54
5	1.52344	10.17	25.52	22.59	35.69	32.76	56.00	46.00	-20.31	-13.24
6	**29.23438**	**11.29**	**30.70**	**28.07**	**41.99**	**39.36**	**60.00**	**50.00**	**-18.01**	**-10.64**

REMARKS:

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



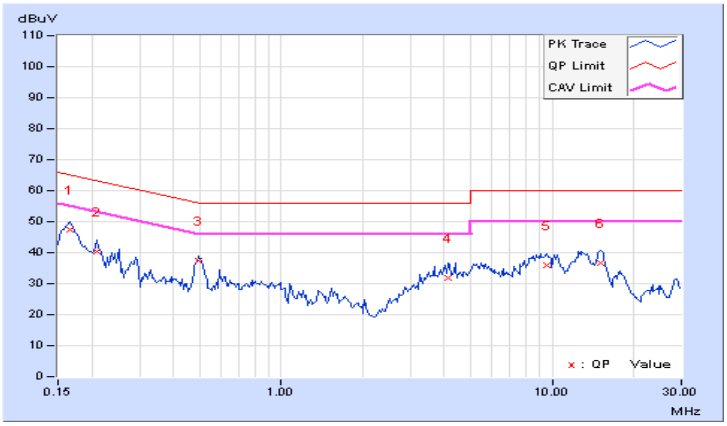
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	10.07	37.47	28.67	47.54	38.74	65.18	55.18	-17.64	-16.44
2	0.20859	10.06	30.43	23.54	40.49	33.60	63.26	53.26	-22.77	-19.66
3	0.49375	10.11	27.23	24.93	37.34	35.04	56.10	46.10	-18.76	-11.06
4	4.13672	10.31	21.52	13.87	31.83	24.18	56.00	46.00	-24.17	-21.82
5	9.52734	10.59	25.35	20.10	35.94	30.69	60.00	50.00	-24.06	-19.31
6	15.17188	10.97	25.71	19.95	36.68	30.92	60.00	50.00	-23.32	-19.08

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.

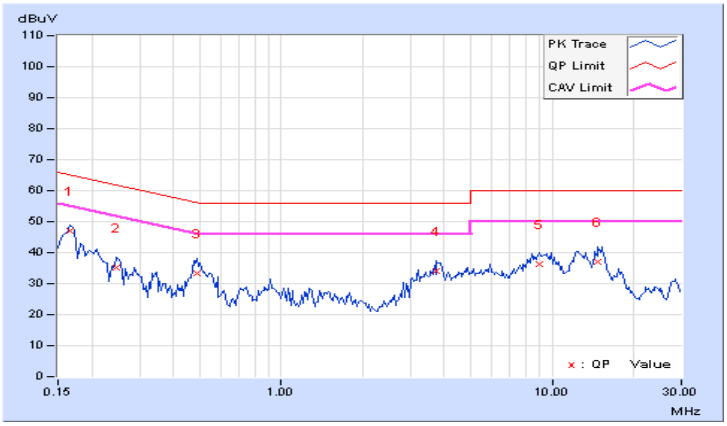


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16562	10.05	37.03	26.45	47.08	36.50	65.18	55.18	-18.10	-18.68
2	0.24766	10.05	25.08	16.57	35.13	26.62	61.84	51.84	-26.71	-25.22
3	0.48594	10.10	23.14	17.04	33.24	27.14	56.24	46.24	-23.00	-19.10
4	3.75391	10.22	23.75	14.21	33.97	24.43	56.00	46.00	-22.03	-21.57
5	8.95313	10.49	25.88	20.52	36.37	31.01	60.00	50.00	-23.63	-18.99
6	14.74609	10.78	26.19	19.89	36.97	30.67	60.00	50.00	-23.03	-19.33

REMARKS:

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

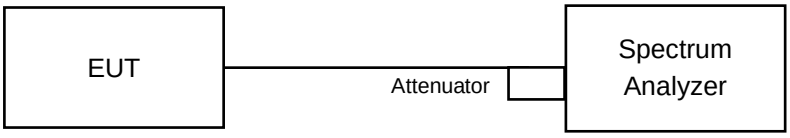


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.07	8.08	8.11	8.12	0.5	PASS
6	2437	8.09	8.02	8.10	7.59	0.5	PASS
11	2462	8.12	8.12	8.11	8.12	0.5	PASS

802.11g

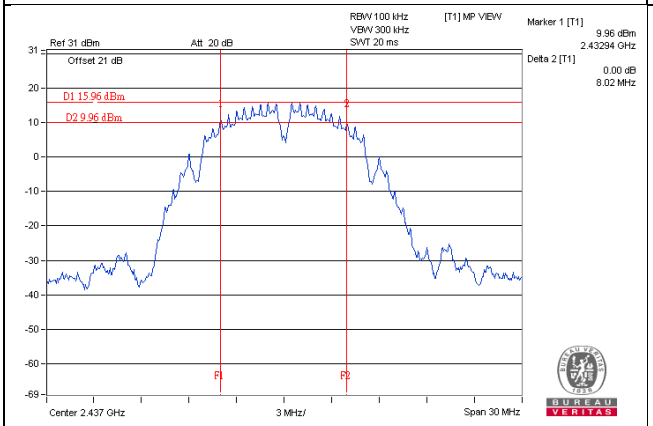
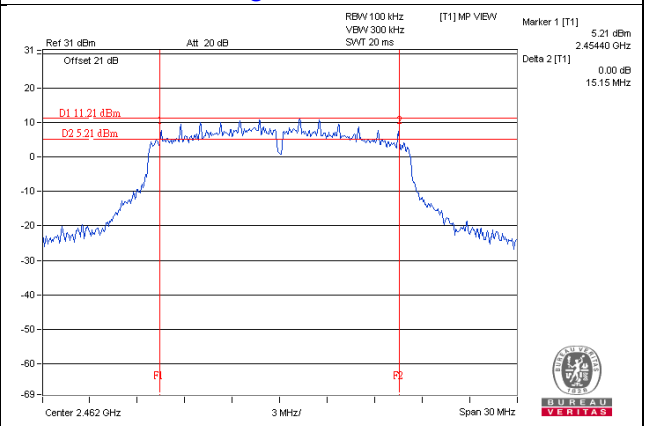
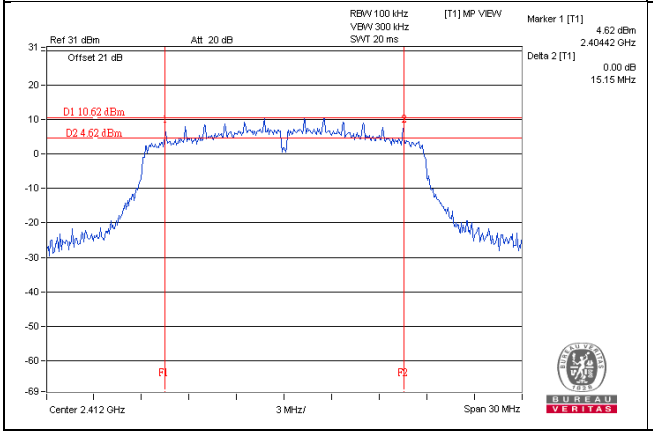
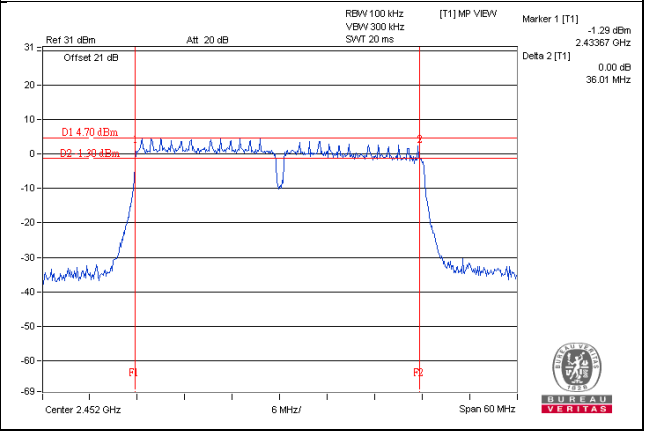
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.19	15.20	15.18	15.17	0.5	PASS
6	2437	15.46	15.18	15.20	15.16	0.5	PASS
11	2462	15.18	15.18	15.15	15.20	0.5	PASS

VHT20

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	15.15	15.19	15.18	15.21	0.5	PASS
6	2437	15.46	15.22	15.23	15.23	0.5	PASS
11	2462	15.18	15.19	15.18	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	36.03	36.51	36.45	36.18	0.5	Pass
6	2437	36.03	36.29	36.20	36.10	0.5	Pass
9	2452	36.47	36.23	36.01	36.09	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 2 : CH11**
	
VHT20 / Chain 0 : CH1	**VHT40 / Chain 2 : CH9**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

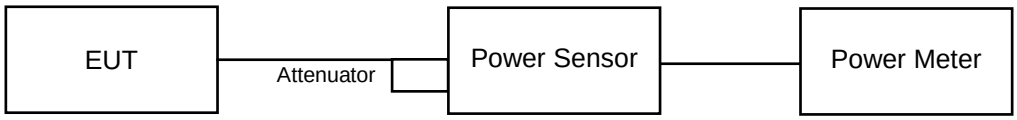
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	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	24.53	24.27	23.96	22.67	984.906	29.93	30.00	Pass
6	2437	24.28	24.01	23.88	22.47	940.632	29.73	30.00	Pass
11	2462	23.95	24.00	23.90	22.52	923.622	29.65	30.00	Pass

802.11g

Chan.	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	21.30	21.21	21.01	19.74	487.398	26.88	30.00	Pass
6	2437	23.59	23.54	23.45	22.14	839.495	29.24	30.00	Pass
11	2462	21.57	21.51	21.56	20.05	529.505	27.24	30.00	Pass

VHT20

Chan.	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	21.13	20.90	20.41	19.35	448.745	26.52	30.00	Pass
6	2437	23.50	23.34	22.90	22.18	799.826	29.03	30.00	Pass
11	2462	21.39	21.14	21.13	19.84	493.839	26.94	30.00	Pass

VHT40

Chan.	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	18.33	18.42	18.03	18.63	274.058	24.38	30.00	Pass
6	2437	21.49	21.50	21.21	21.87	568.128	27.54	30.00	Pass
9	2452	19.03	18.75	18.79	19.55	320.812	25.06	30.00	Pass

Beamforming Mode (Nss=1)

VHT20

Chan.	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	21.13	20.90	20.41	19.35	448.745	26.52	27.51	Pass
6	2437	21.93	21.83	21.24	20.68	558.355	27.47	27.51	Pass
11	2462	21.39	21.14	21.13	19.84	493.839	26.94	27.51	Pass

Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power limit shall be reduced to 30-(8.49-6) = 27.51dBm.

VHT40

Chan.	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	18.33	18.42	18.03	18.63	274.058	24.38	27.51	Pass
6	2437	21.16	21.20	20.98	21.58	531.637	27.26	27.51	Pass
9	2452	19.03	18.75	18.79	19.55	320.812	25.06	27.51	Pass

Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power limit shall be reduced to 30-(8.49-6) = 27.51dBm.

Beamforming Mode (Nss=2)

VHT20

Chan.	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	21.13	20.90	20.41	19.35	448.745	26.52	30.00	Pass
6	2437	23.50	23.34	22.90	22.18	799.826	29.03	30.00	Pass
11	2462	21.39	21.14	21.13	19.84	493.839	26.94	30.00	Pass

Note: 1. Directional gain = 2.47dBi + 10log(2) = 5.48dBi < 6dBi , so the power limit shall not be reduced.

VHT40

Chan.	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	18.33	18.42	18.03	18.63	274.058	24.38	30.00	Pass
6	2437	21.49	21.50	21.21	21.87	568.128	27.54	30.00	Pass
9	2452	19.03	18.75	18.79	19.55	320.812	25.06	30.00	Pass

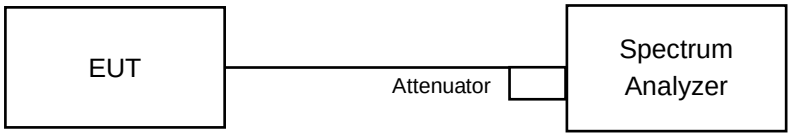
Note: 1. Directional gain = 2.47dBi + 10log(2) = 5.48dBi < 6dBi , so the power limit shall not be reduced.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

802.11b, 802.11g, VHT20

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.

VHT40

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=4) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-3.25	6.02	2.77	5.51	Pass
	6	2437	-5.20	6.02	0.82	5.51	Pass
	11	2462	-5.34	6.02	0.68	5.51	Pass
1	1	2412	-6.13	6.02	-0.11	5.51	Pass
	6	2437	-6.42	6.02	-0.40	5.51	Pass
	11	2462	-6.10	6.02	-0.08	5.51	Pass
2	1	2412	-6.44	6.02	-0.42	5.51	Pass
	6	2437	-6.28	6.02	-0.26	5.51	Pass
	11	2462	-6.46	6.02	-0.44	5.51	Pass
3	1	2412	-7.94	6.02	-1.92	5.51	Pass
	6	2437	-8.01	6.02	-1.99	5.51	Pass
	11	2462	-7.04	6.02	-1.02	5.51	Pass

Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power density limit shall be reduced to 8-(8.49-6) = 5.51dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=4) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.86	6.02	-2.84	5.51	Pass
	6	2437	-5.06	6.02	0.96	5.51	Pass
	11	2462	-9.09	6.02	-3.07	5.51	Pass
1	1	2412	-8.83	6.02	-2.81	5.51	Pass
	6	2437	-6.88	6.02	-0.86	5.51	Pass
	11	2462	-9.12	6.02	-3.10	5.51	Pass
2	1	2412	-9.36	6.02	-3.34	5.51	Pass
	6	2437	-7.78	6.02	-1.76	5.51	Pass
	11	2462	-8.97	6.02	-2.95	5.51	Pass
3	1	2412	-10.53	6.02	-4.51	5.51	Pass
	6	2437	-8.02	6.02	-2.00	5.51	Pass
	11	2462	-10.59	6.02	-4.57	5.51	Pass

Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power density limit shall be reduced to 8-(8.49-6) = 5.51dBm.

VHT20

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=4) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.93	6.02	-5.91	5.51	Pass
	6	2437	-4.46	6.02	1.56	5.51	Pass
	11	2462	-10.10	6.02	-4.08	5.51	Pass
1	1	2412	-11.08	6.02	-5.06	5.51	Pass
	6	2437	-8.88	6.02	-2.86	5.51	Pass
	11	2462	-10.29	6.02	-4.27	5.51	Pass
2	1	2412	-11.30	6.02	-5.28	5.51	Pass
	6	2437	-8.82	6.02	-2.80	5.51	Pass
	11	2462	-10.91	6.02	-4.89	5.51	Pass
3	1	2412	-12.10	6.02	-6.08	5.51	Pass
	6	2437	-9.75	6.02	-3.73	5.51	Pass
	11	2462	-12.19	6.02	-6.17	5.51	Pass

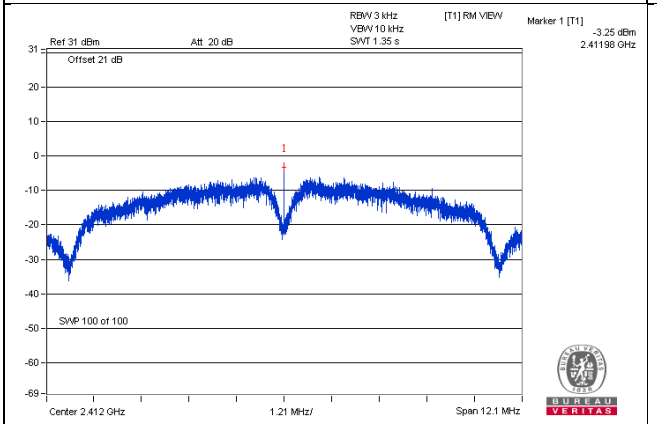
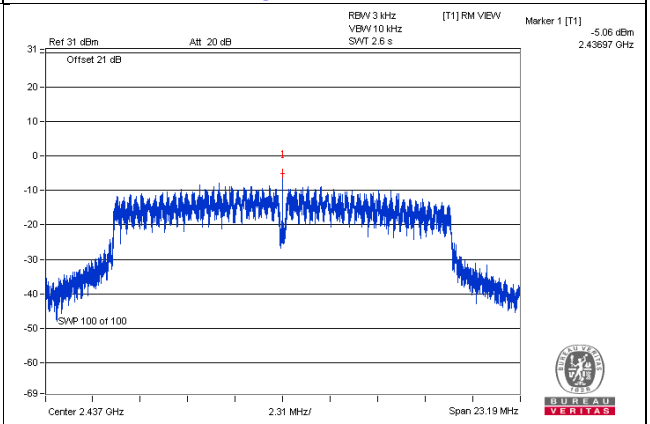
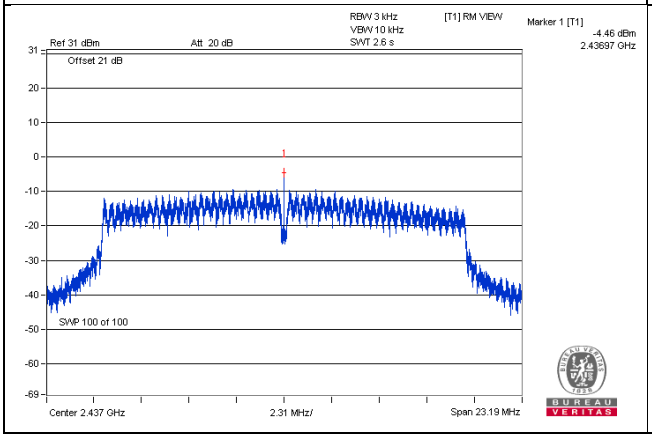
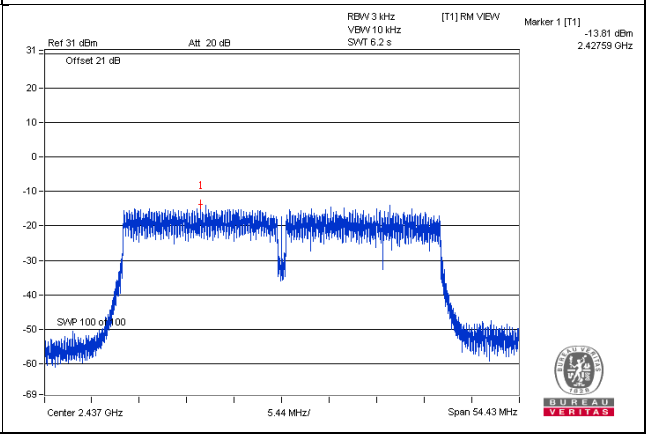
Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power density limit shall be reduced to 8-(8.49-6) = 5.51dBm.

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	-17.44	6.02	0.13	-11.29	5.51	Pass
	6	2437	-14.21	6.02	0.13	-8.06	5.51	Pass
	9	2452	-16.73	6.02	0.13	-10.58	5.51	Pass
1	3	2422	-17.64	6.02	0.13	-11.49	5.51	Pass
	6	2437	-13.81	6.02	0.13	-7.66	5.51	Pass
	9	2452	-15.77	6.02	0.13	-9.62	5.51	Pass
2	3	2422	-17.36	6.02	0.13	-11.21	5.51	Pass
	6	2437	-14.06	6.02	0.13	-7.91	5.51	Pass
	9	2452	-16.70	6.02	0.13	-10.55	5.51	Pass
3	3	2422	-16.36	6.02	0.13	-10.21	5.51	Pass
	6	2437	-13.97	6.02	0.13	-7.82	5.51	Pass
	9	2452	-15.75	6.02	0.13	-9.60	5.51	Pass

Note: 1. Directional gain = 2.47dBi + 10log(4) = 8.49dBi > 6dBi , so the power density limit shall be reduced to 8-(8.49-6) = 5.51dBm.

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

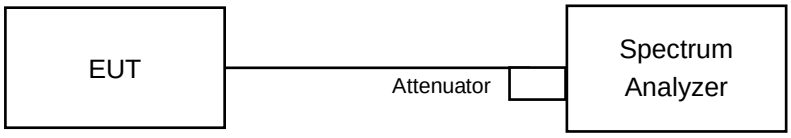
Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH1	**802.11g / Chain 0 : CH6**
	
VHT20 / Chain 0 : CH6	**VHT40 / Chain 1 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

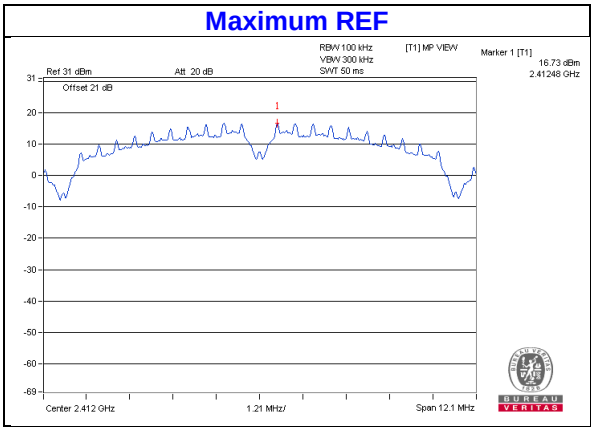
Same as Item 4.3.6

4.6.7 Test Results

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

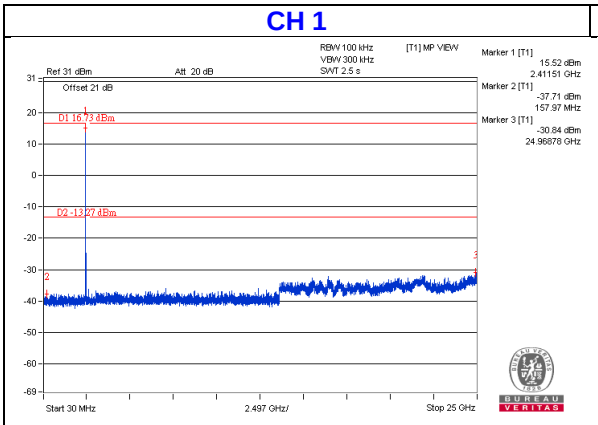
802.11b

Maximum REF

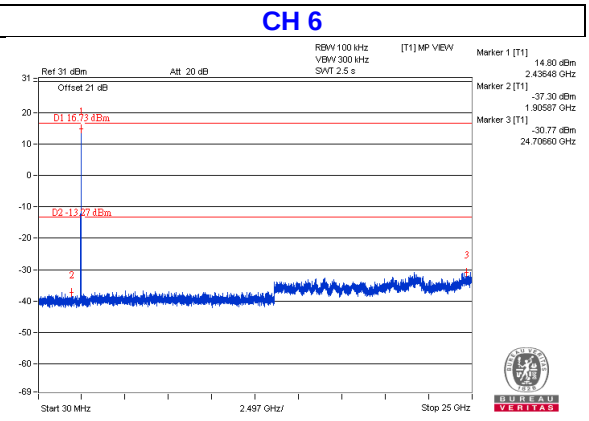


Chain 0

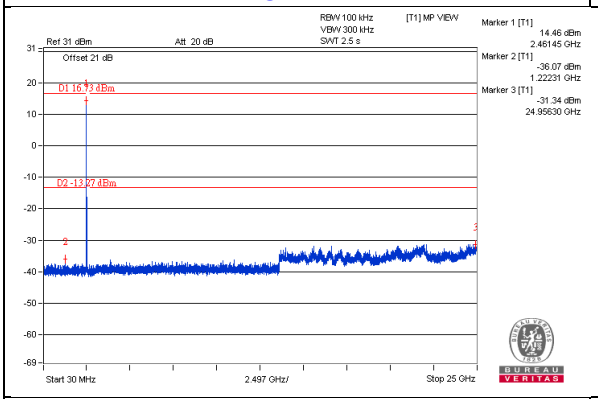
CH 1



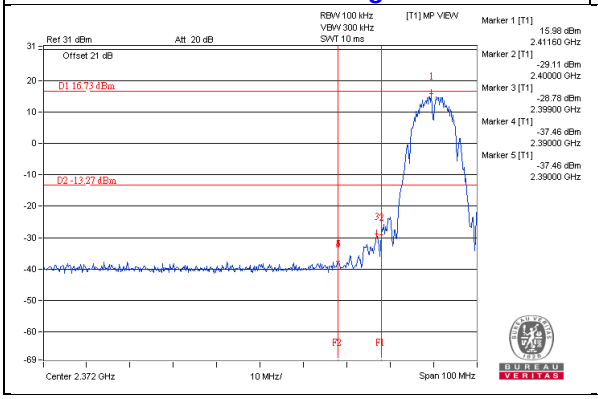
CH 6



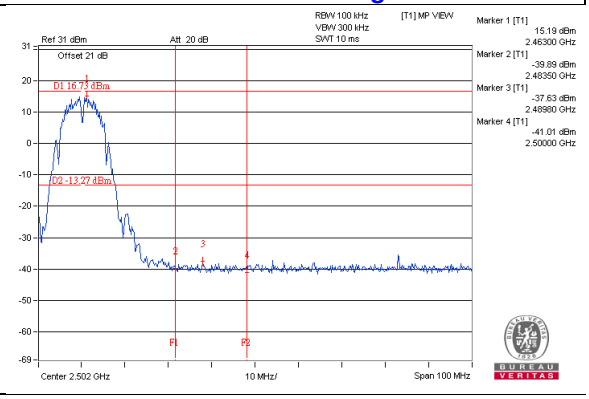
CH 11



CH 1 Band edge

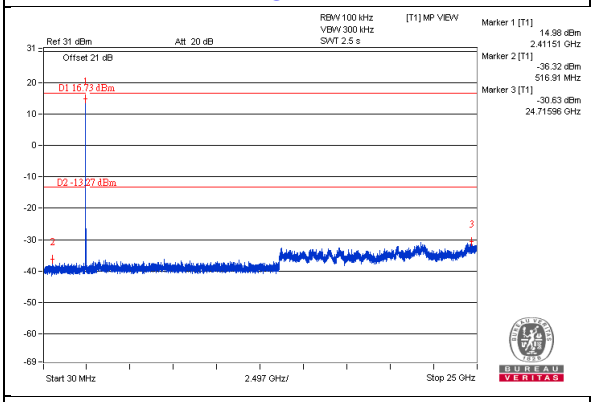


CH 11 Band edge

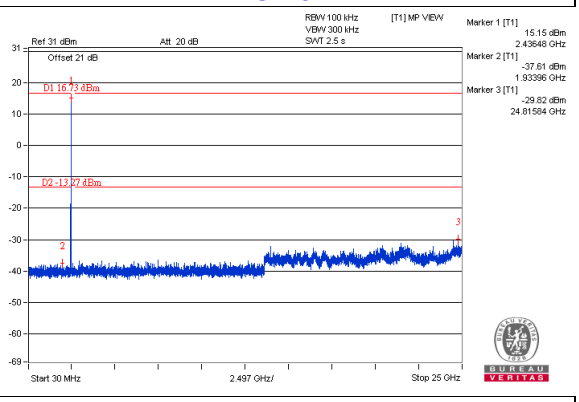


Chain 1

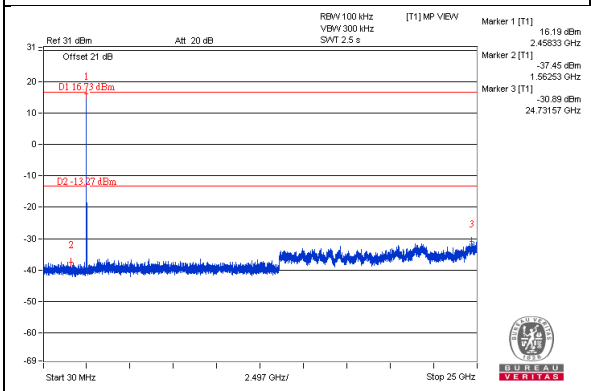
CH 1



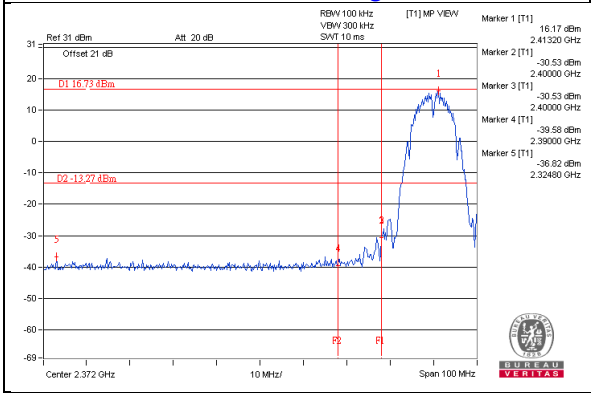
CH 6



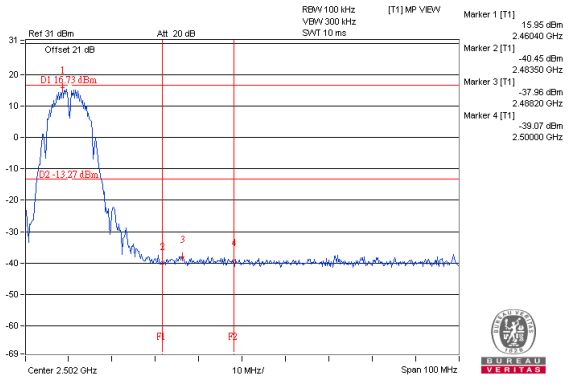
CH 11



CH 1 Band edge

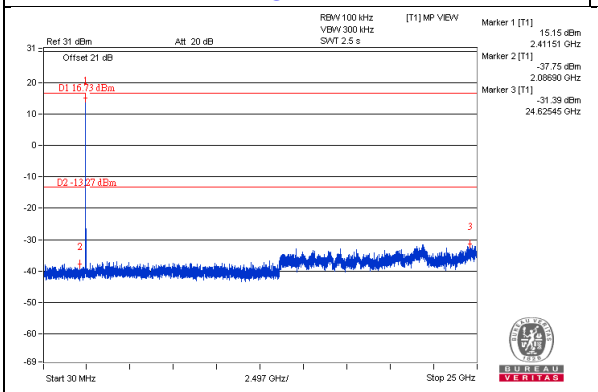


CH 11 Band edge

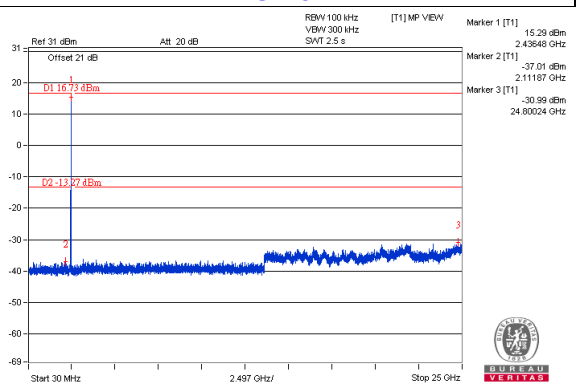


Chain 2

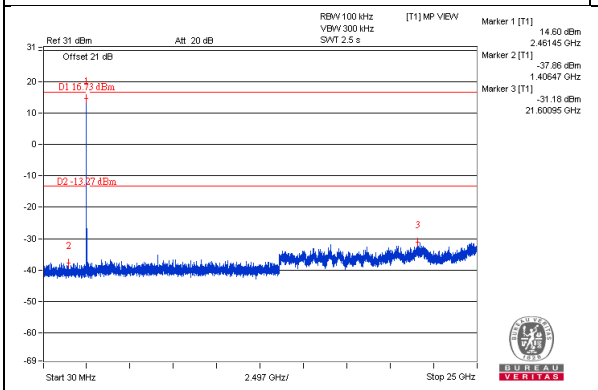
CH 1



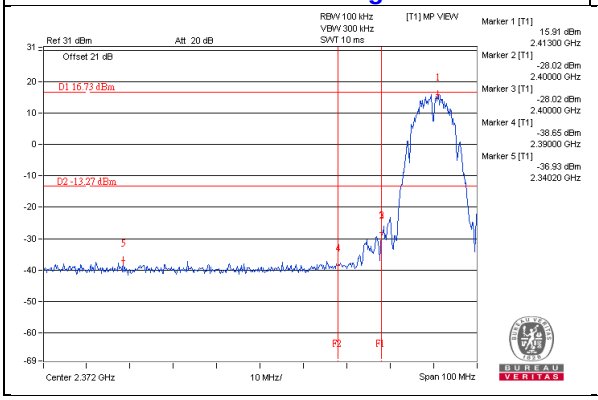
CH 6



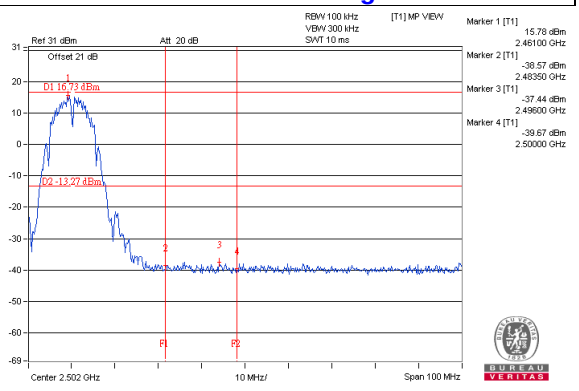
CH 11



CH 1 Band edge

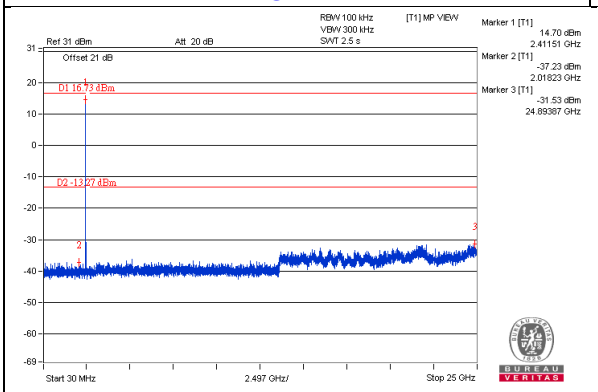


CH 11 Band edge

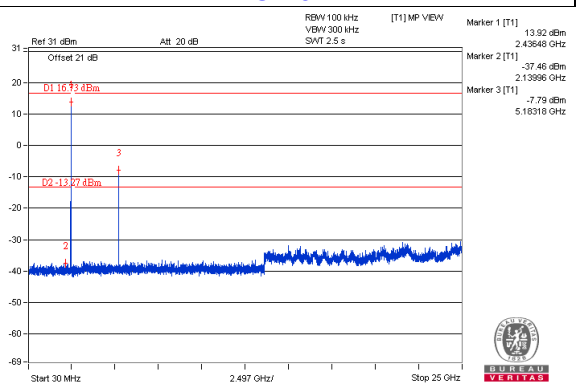


Chain 3

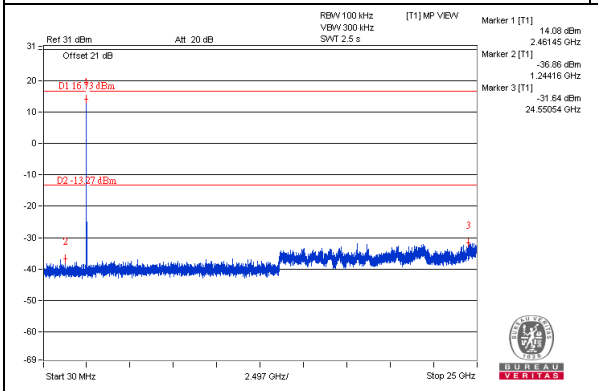
CH 1



CH 6



CH 11



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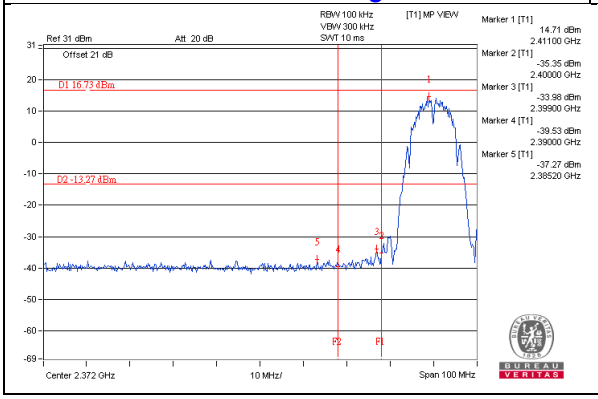
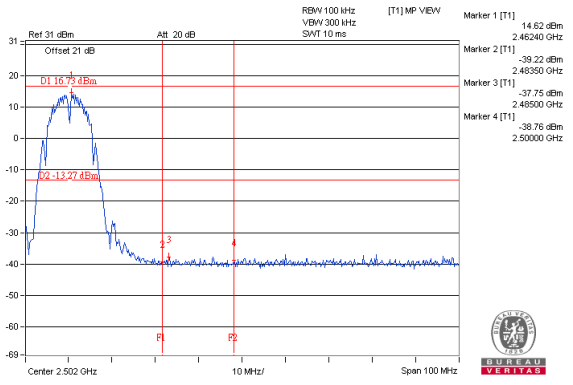
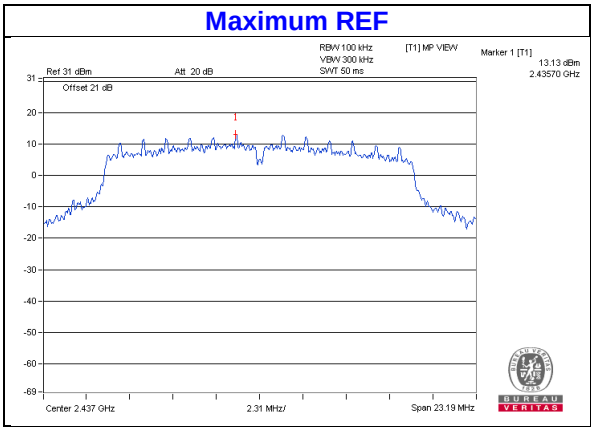


CH 11 Band edge



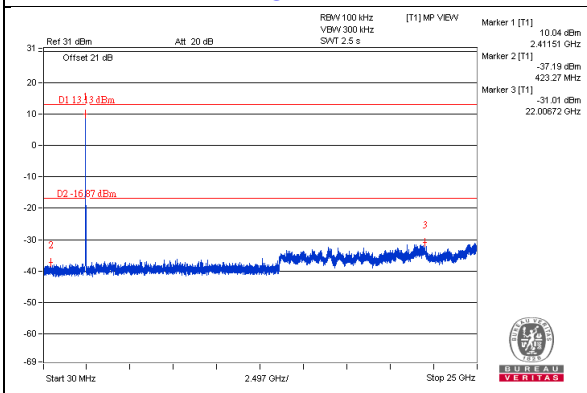
802.11g

Maximum REF

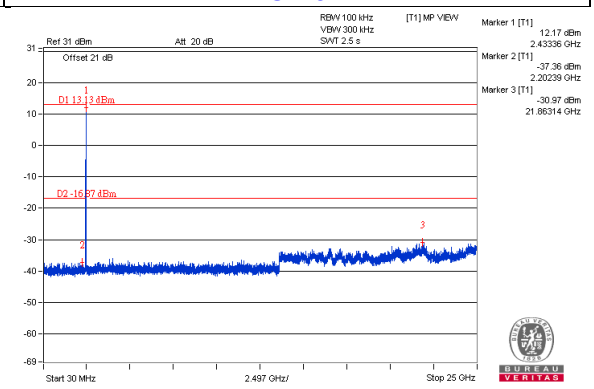


Chain 0

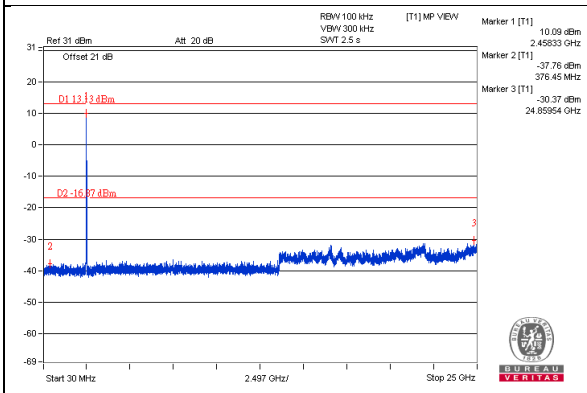
CH 1



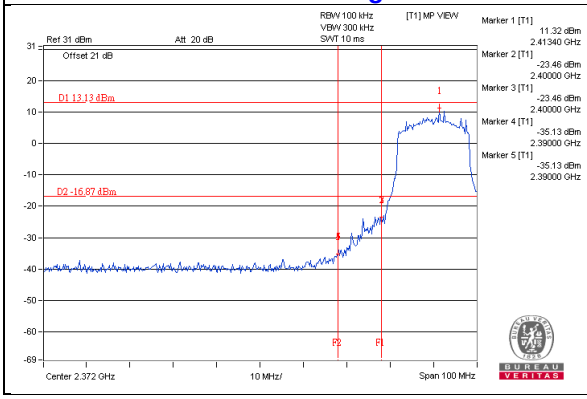
CH 6



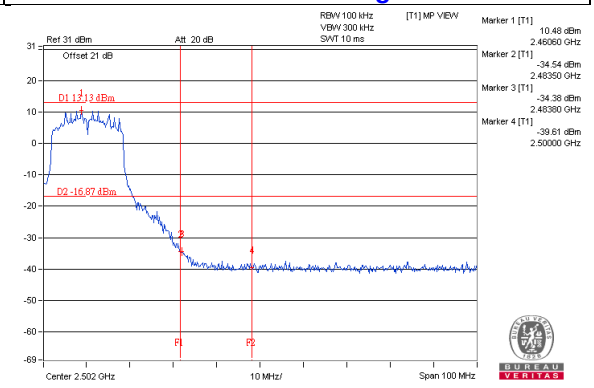
CH 11



CH 1 Band edge

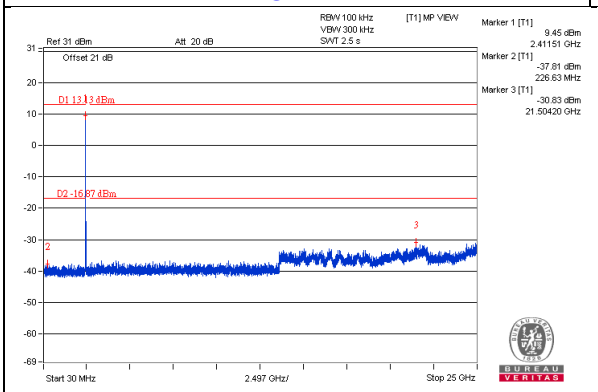


CH 11 Band edge

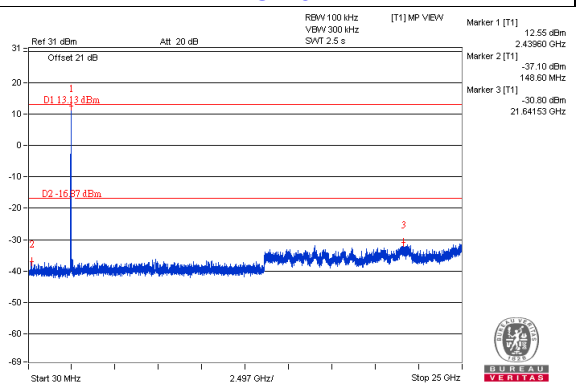


Chain 1

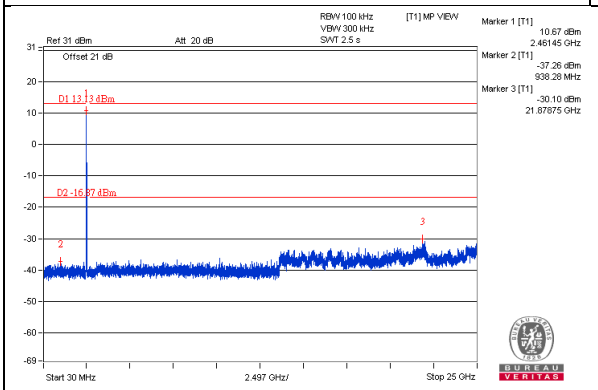
CH 1



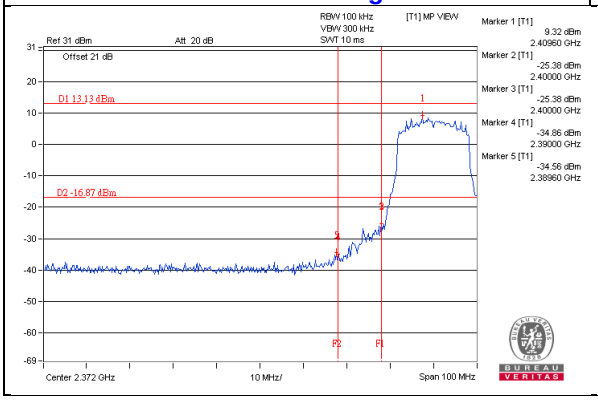
CH 6



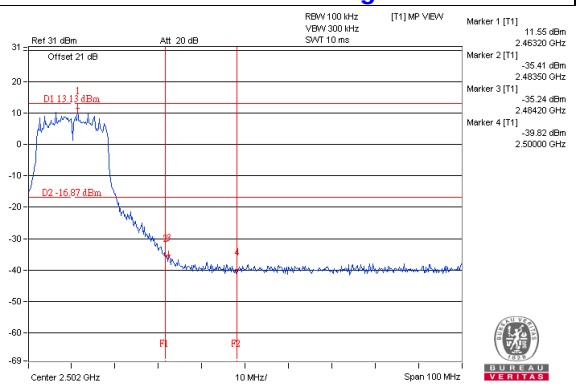
CH 11



CH 1 Band edge

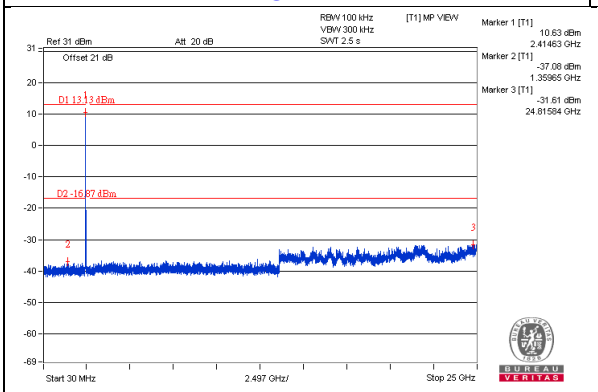


CH 11 Band edge

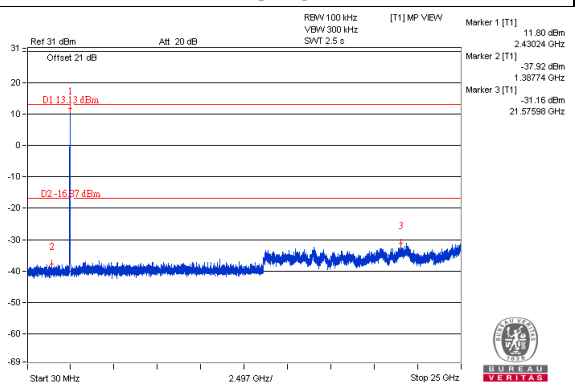


Chain 2

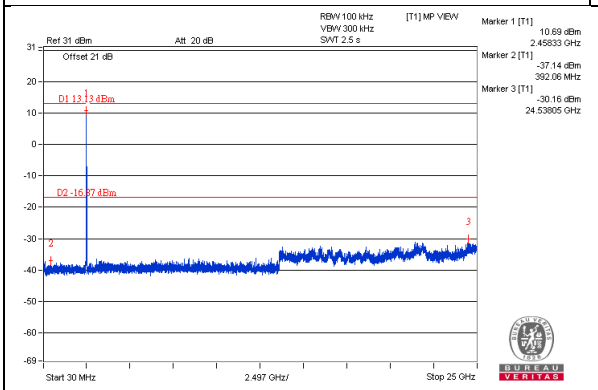
CH 1



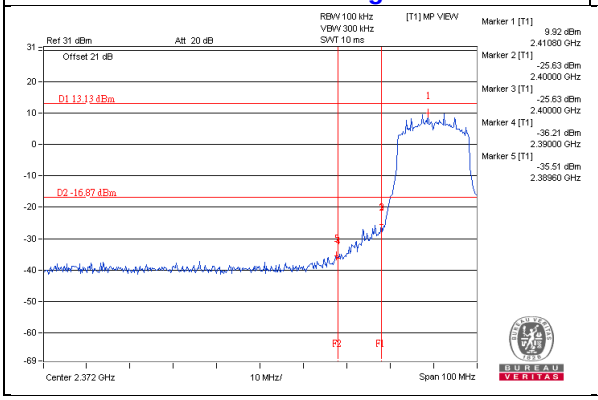
CH 6



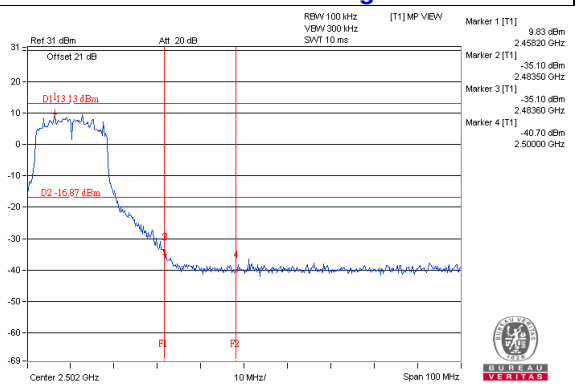
CH 11



CH 1 Band edge

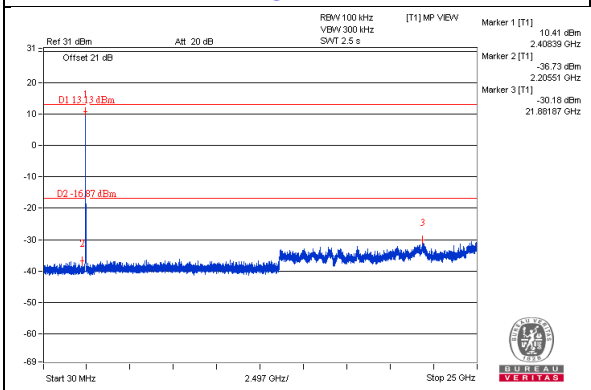


CH 11 Band edge

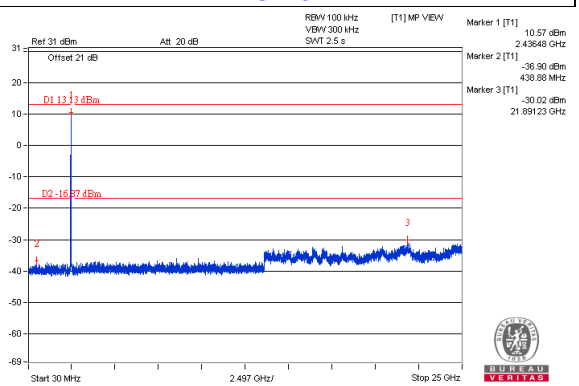


Chain 3

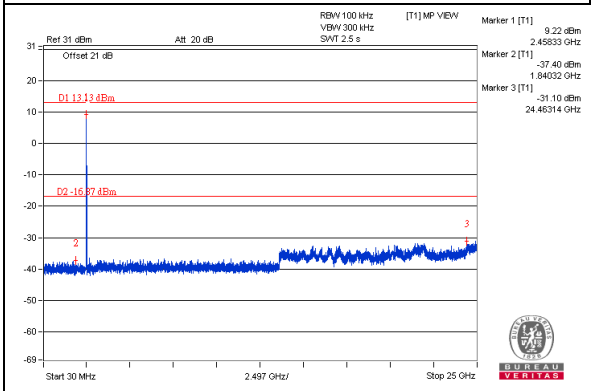
CH 1



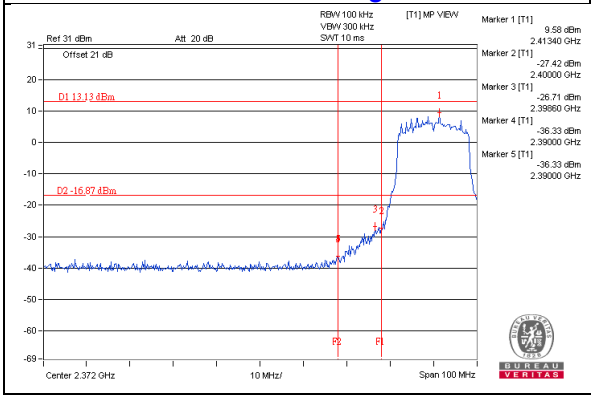
CH 6



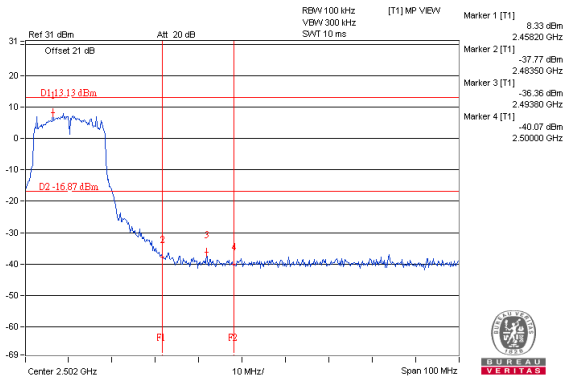
CH 11



CH 1 Band edge

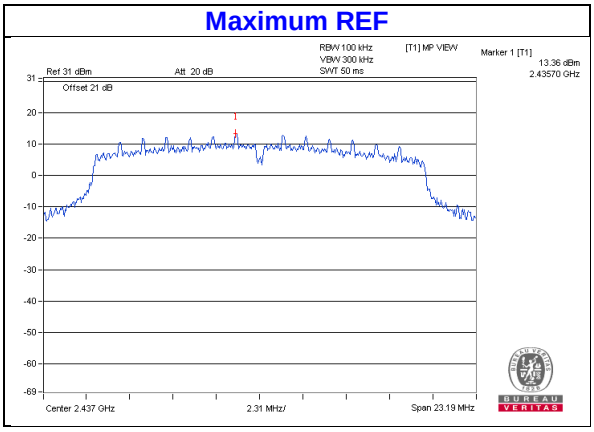


CH 11 Band edge



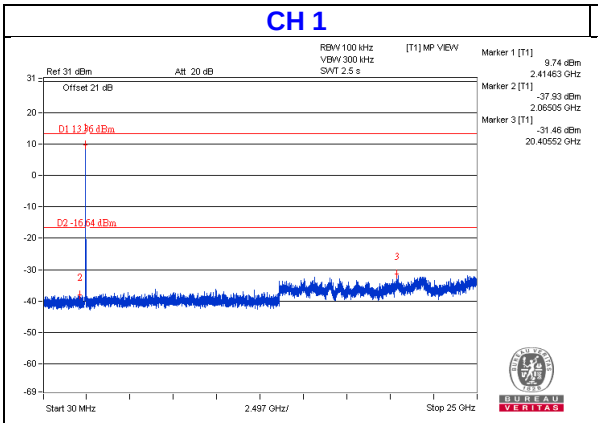
VHT20

Maximum REF

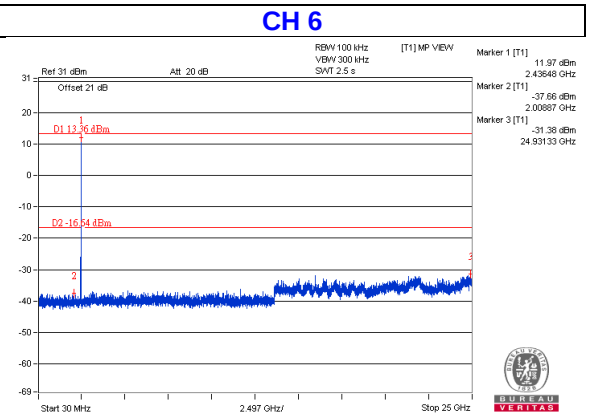


Chain 0

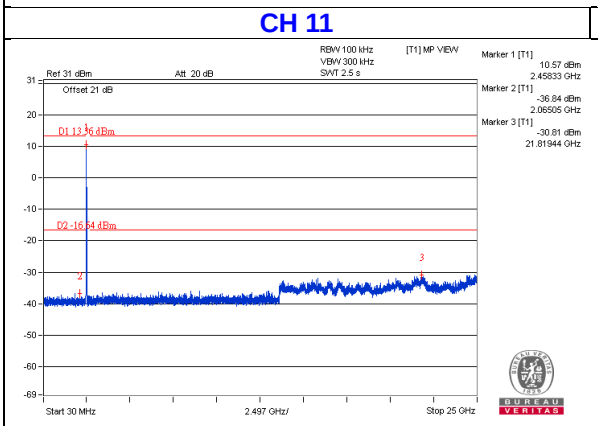
CH 1



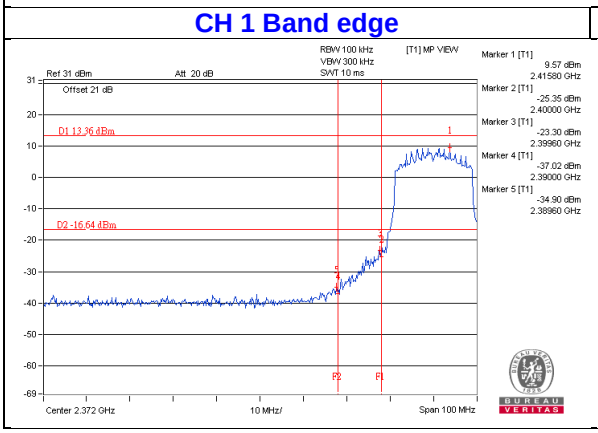
CH 6



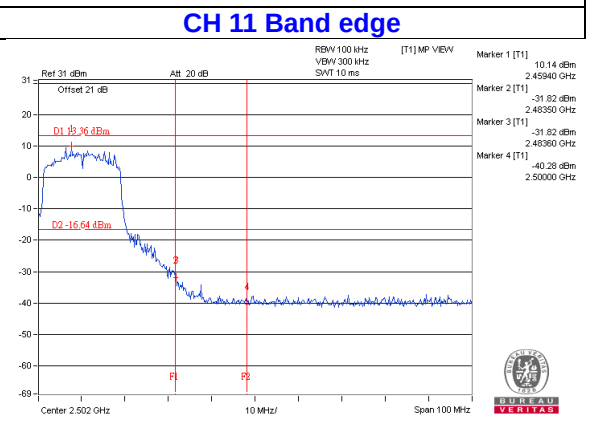
CH 11



CH 1 Band edge

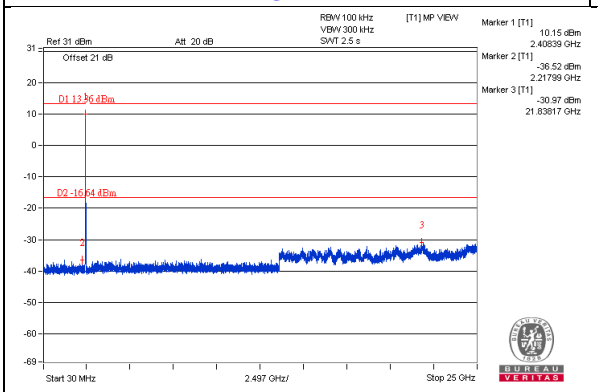


CH 11 Band edge

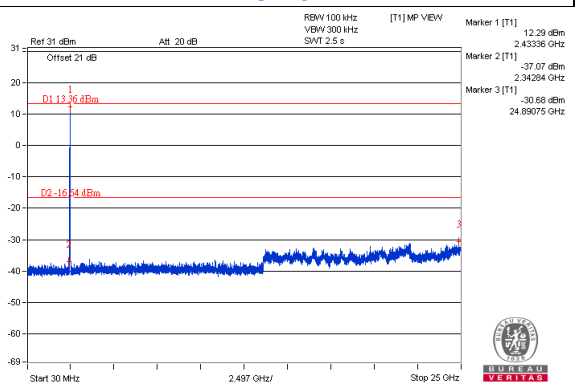


Chain 1

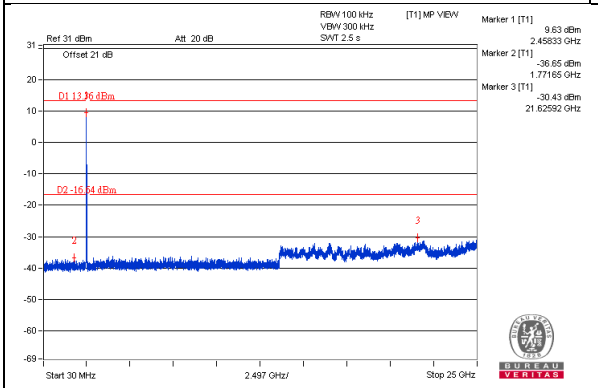
CH 1



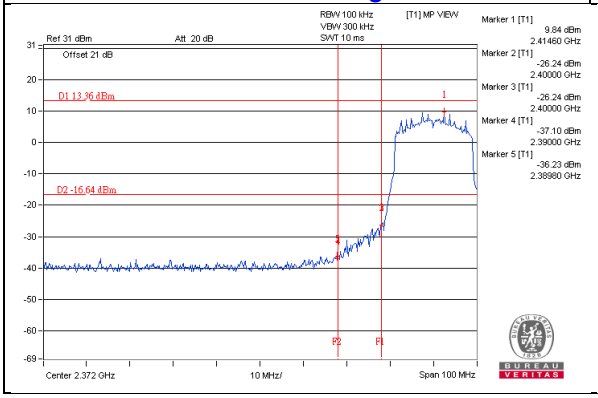
CH 6



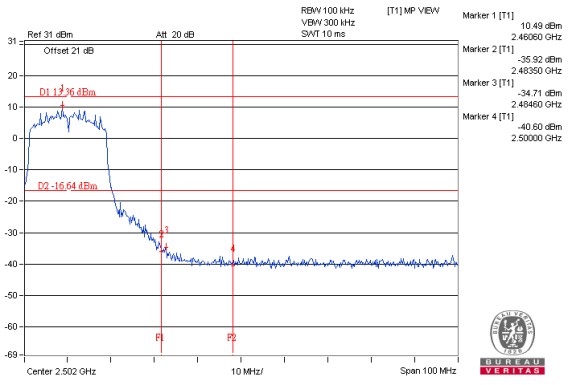
CH 11



CH 1 Band edge

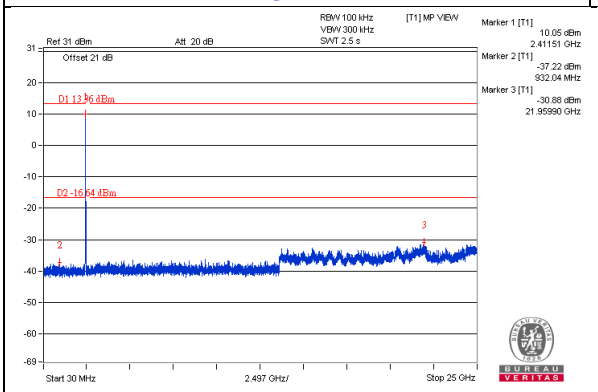


CH 11 Band edge

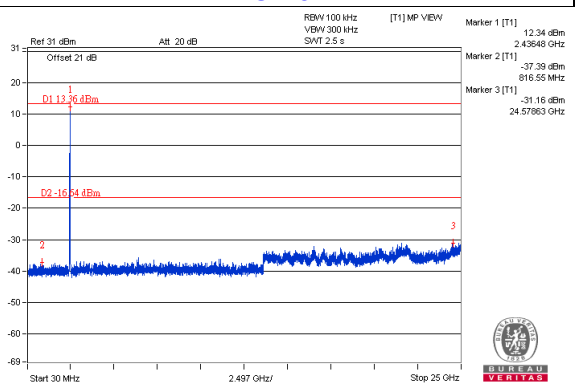


Chain 2

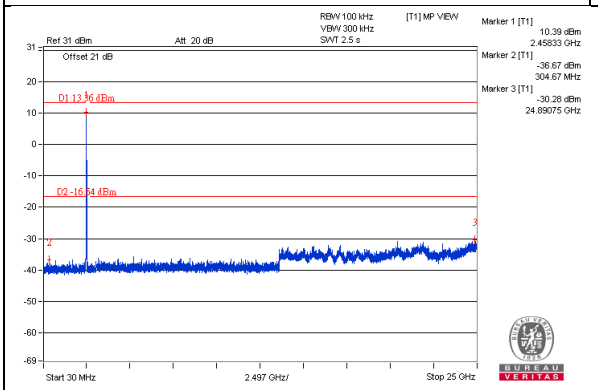
CH 1



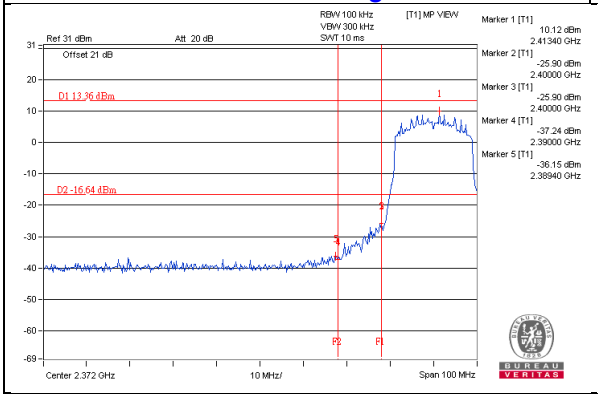
CH 6



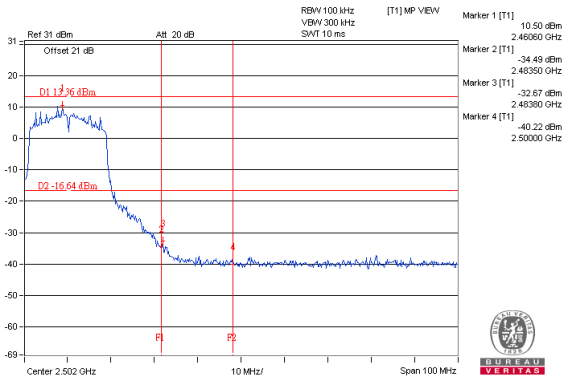
CH 11



CH 1 Band edge

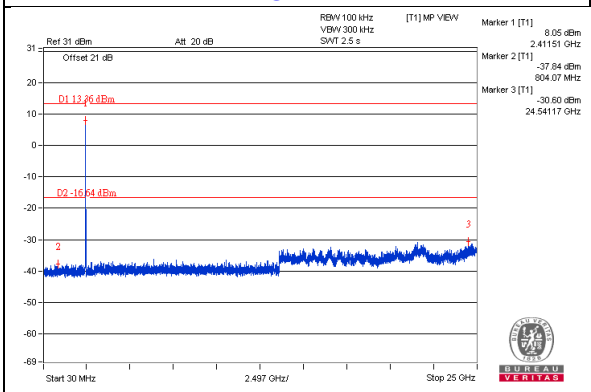


CH 11 Band edge

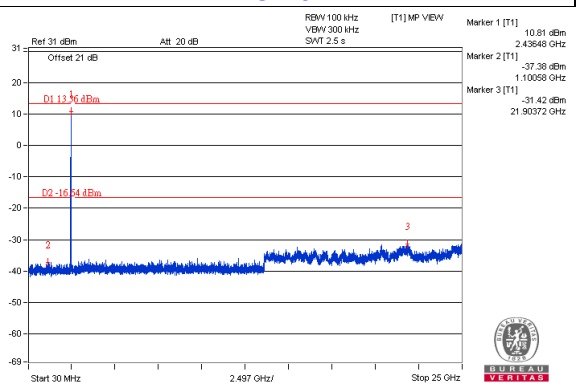


Chain 3

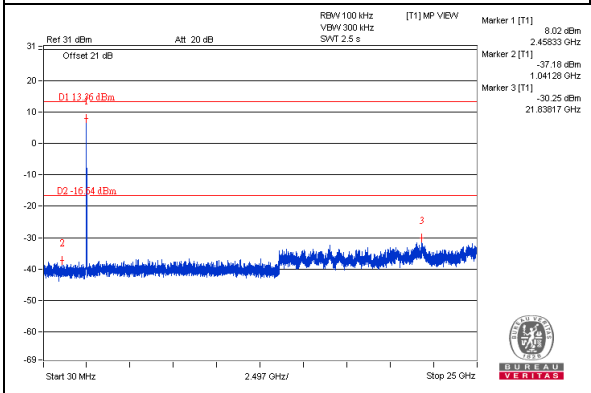
CH 1



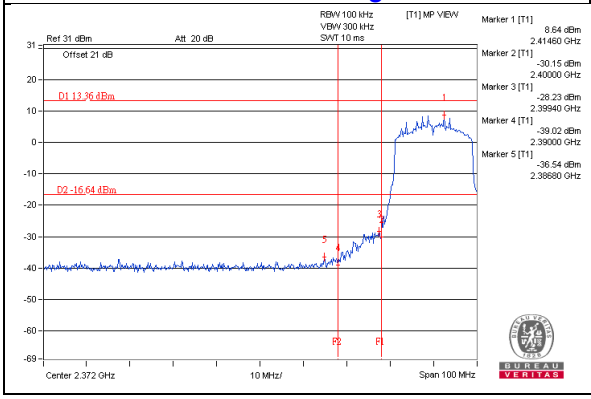
CH 6



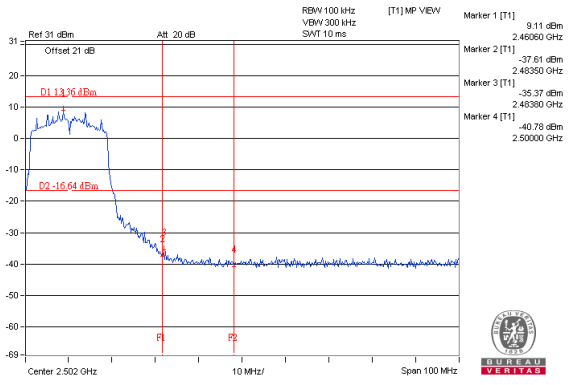
CH 11



CH 1 Band edge

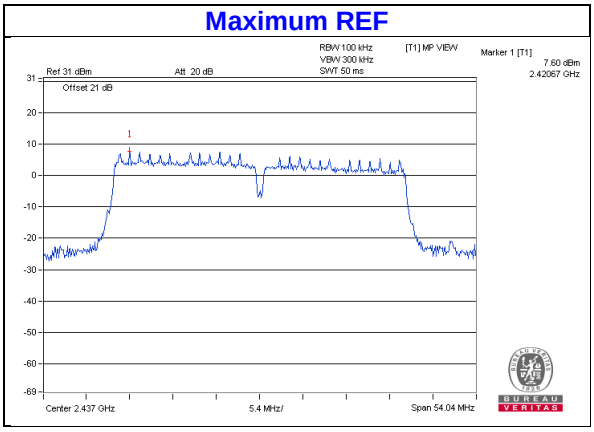


CH 11 Band edge



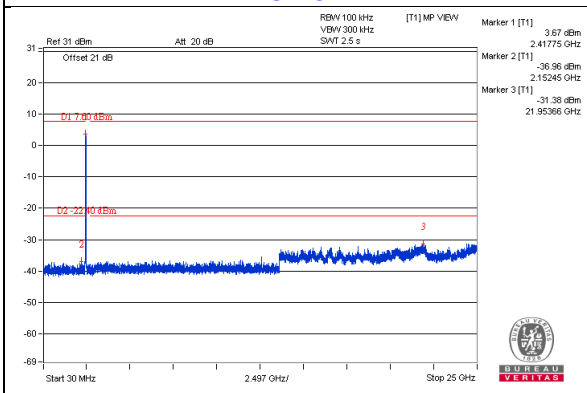
VHT40

Maximum REF

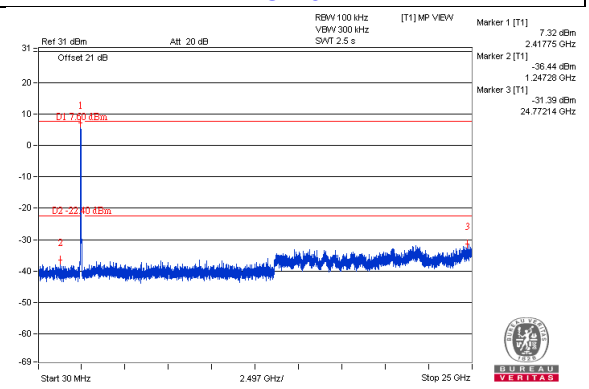


Chain 0

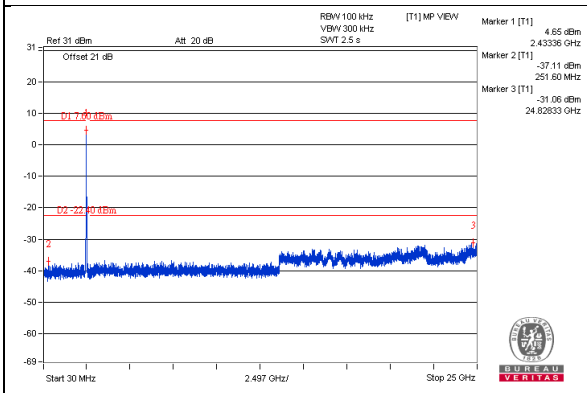
CH 3



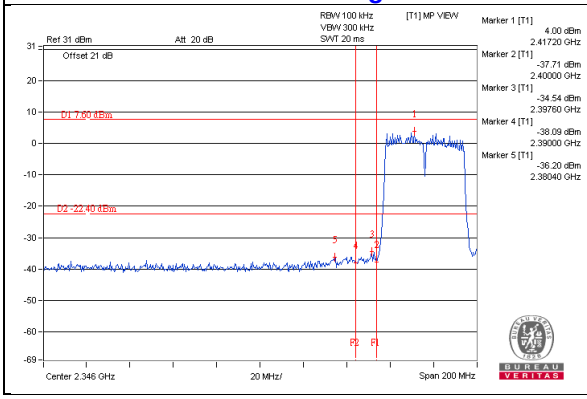
CH 6



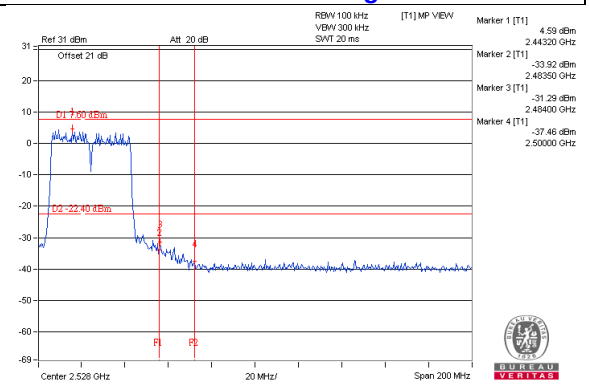
CH 9



CH 3 Band edge

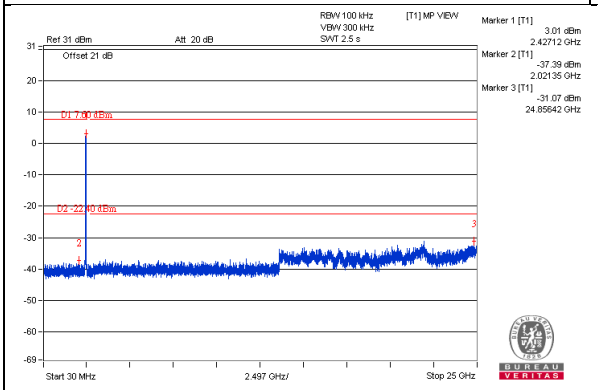


CH 9 Band edge

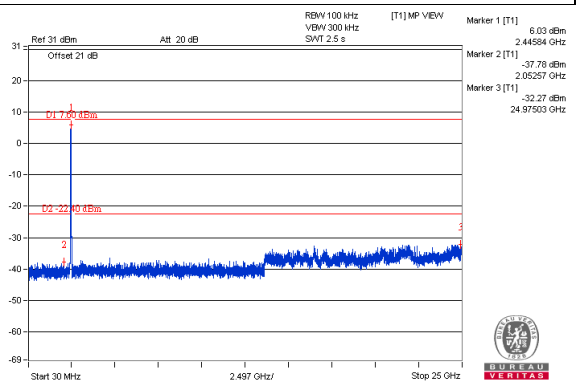


Chain 1

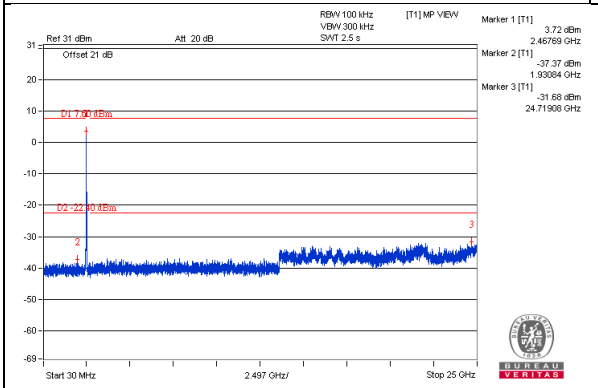
CH 3



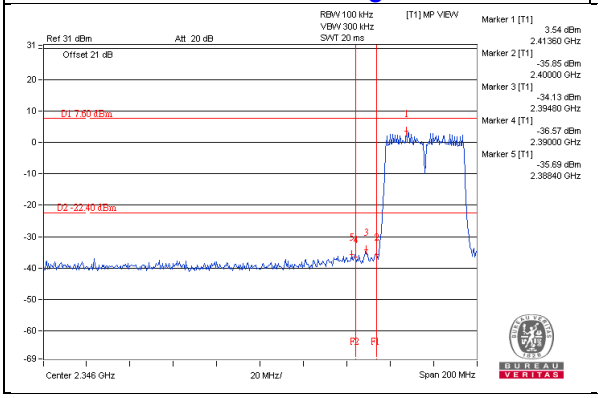
CH 6



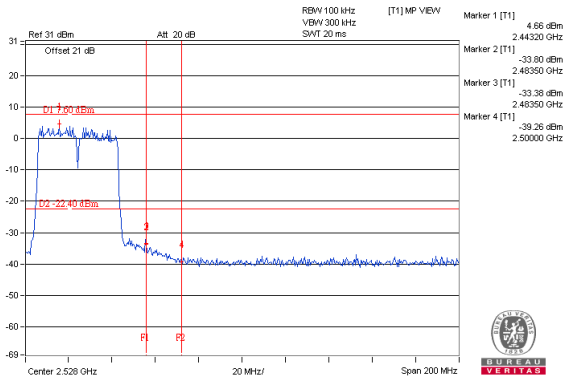
CH 9



CH 3 Band edge

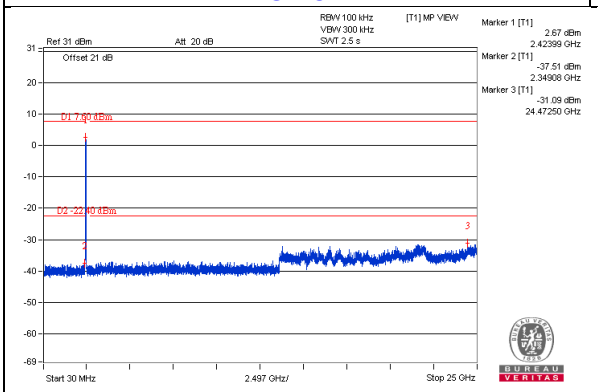


CH 9 Band edge

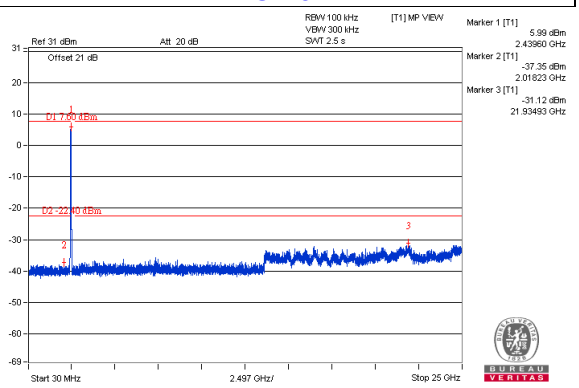


Chain 2

CH 3



CH 6



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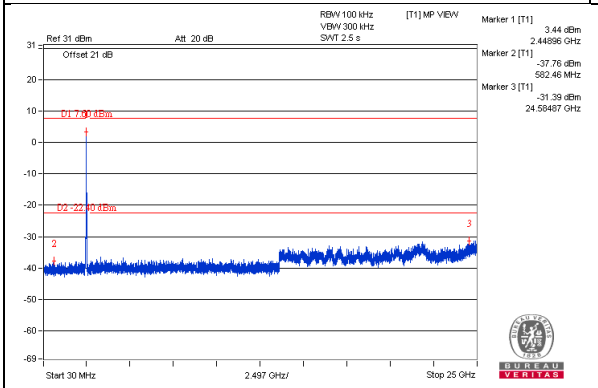

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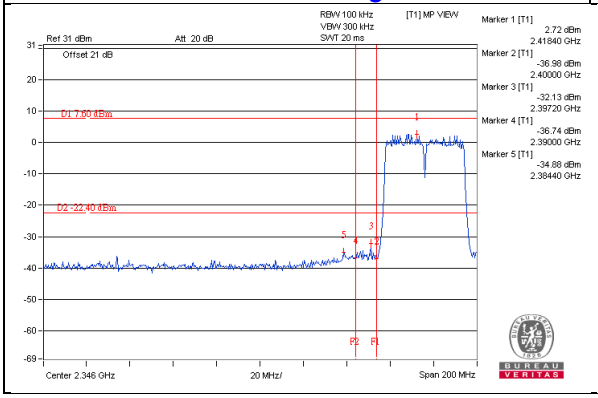
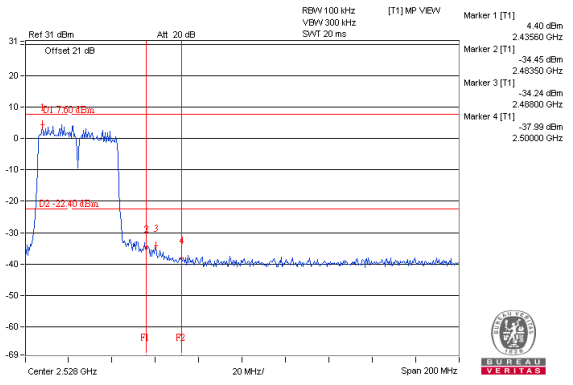
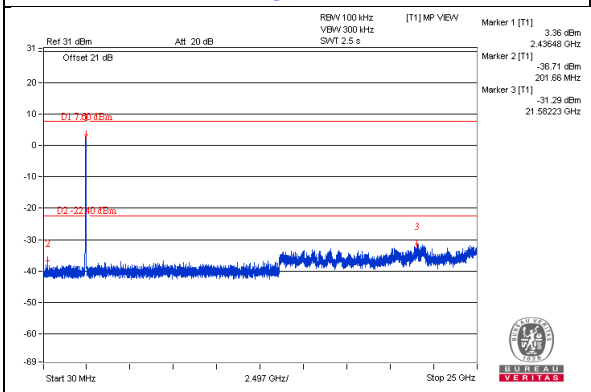


CH 9 Band edge

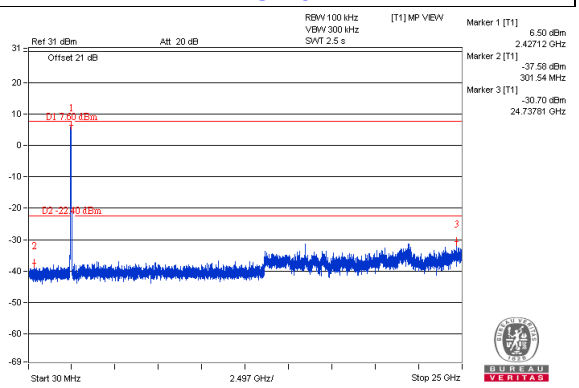


Chain 3

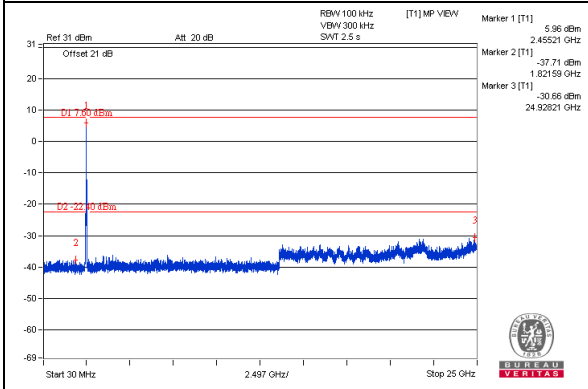
CH 1



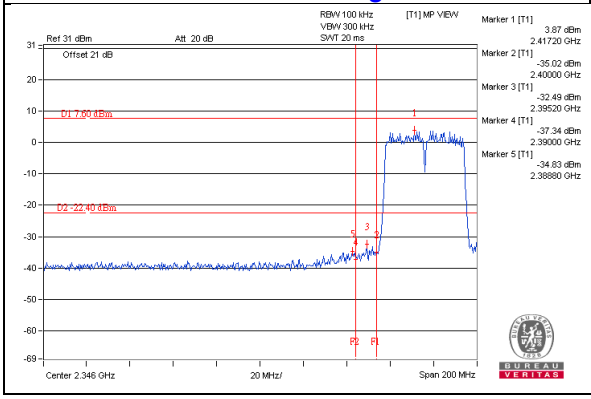
CH 6



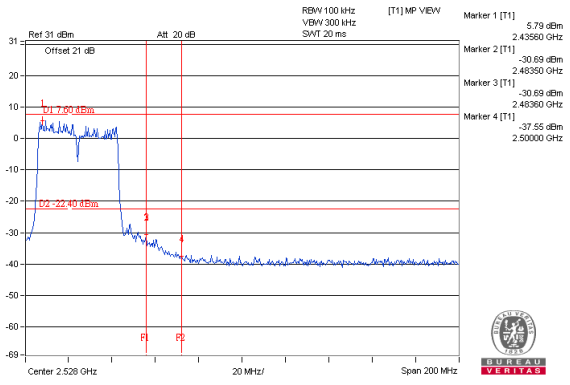
CH 11



CH 1 Band edge



CH 11 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:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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