FCC Test Report (WLAN)

Report No.:	RF180803E05A
FCC ID:	YAW529027
Test Model:	PVS6
Received Date:	Oct. 04, 2018
Test Date:	Oct. 25 to 30, 2018
Issued Date:	Dec. 10, 2018
Applicant:	SunPower Corporation
Address:	1414 Harbour Way South Suite 1901, Richmond, CA 94804, USA
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
RF180803E05A	Original release.	Dec. 10, 2018

1 Certificate of Conformity

Product:	SunPower Monitoring System with PVS6
Brand:	SUNPOWER
Test Model:	PVS6
Sample Status:	ENGINEERING SAMPLE
Applicant:	SunPower Corporation
Test Date:	Oct. 25 to 30, 2018
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:** Dec. 10, 2018

Claire Kuan / Specialist

Approved by : _____ , **Date:** Dec. 10, 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 -4.05dB at 0.49375MHz.
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 2383.50MHz & 2390.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX 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	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.08 dB
	6GHz ~ 18GHz	4.98 dB
	18GHz ~ 40GHz	5.19 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	SunPower Monitoring System with PVS6
Brand	SUNPOWER
Test Model	PVS6
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	AC100-240V, 0.75A , 50/60Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz**: 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 **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**: 762.15mW **5GHz:** **5.18 ~ 5.24GHz:** 199.38mW **5.745 ~ 5.825GHz:** 268.355mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Hole Plugs x 2 Bracket
Data Cable Supplied	Ethernet cable (Unshielded, 1.5m)

Note:

1. There are WLAN, Bluetooth, Zigbee and WWAN technology used for the EUT. The EUT has three radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
WLAN (2.4GHz+5GHz)	Zigbee	BT	WWAN (LTE+GSM)

2. Simultaneously transmission condition.

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

3. The EUT needs to be supplied from an Internal power supply, the information is as below table:

Brand	Model No.	Spec.
WLAN WELL	IRM-30-12	AC Input: 100-240V, 0.75A , 50/60Hz DC Output: 12V, 2.5A

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

WLAN							
Ant No.	Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
1	Chain 0 (Including BT)	airgain	65-031-212002B	2.2	2.4~2.4835	PCB	I-PEX
				3.8	5.15~5.25		
				4.2	5.725~5.85		
2	Chain 1 (WLAN use only)	airgain	65-031-212003B	4.2	2.4~2.4835	PCB	I-PEX
				4.1	5.15~5.25		
				4.8	5.725~5.85		

Zigbee						
Ant No.	Brand	Model	Antenna Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
3	airgain	65-031-212004B	4.8	2.4~2.4835	PCB	I-PEX

LTE						
Ant No.	Brand	Model	Antenna Gain (dBi)	Frequency rang (MHz)	Antenna type	Connector type
4	airgain	65-031-212001B	2.7	1920~1980	PCB	I-PEX
				1850~1910		
				1710~1785		
				1710~1755		
				824 ~ 849		
				880~915		
				698~716		
				777~787		
				815 ~ 830		
				830 ~ 845		
				832 ~ 862		
				814 ~ 849		
				703 ~ 748		
				1880 ~ 1920		

5. The EUT incorporates a MIMO function.

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

6. This device can support different category application which switched by access point mode and client mode by software.
7. The power setting are list as below:

Modulation Mode	Frequency (MHz)	Power Setting
802.11b	2412	78
	2417	81
	2437	88
	2462	81
802.11g	2412	69
	2417	72
	2437	84
	2457	74
	2462	71
802.11n(HT20)	2412	65
	2417	68
	2437	79
	2462	67

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

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, 2, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 2, 6, 11	OFDM	BPSK	6.5

Radiated Emission Test (Below 1GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

Power Line Conducted Emission Test:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 2, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 2, 6, 11	OFDM	BPSK	6.5

Test Condition:

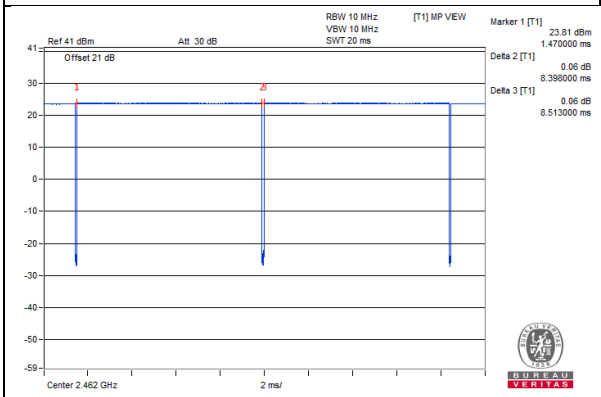
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 66%RH	120Vac, 60Hz	Frank Chuang
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Frank Chuang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

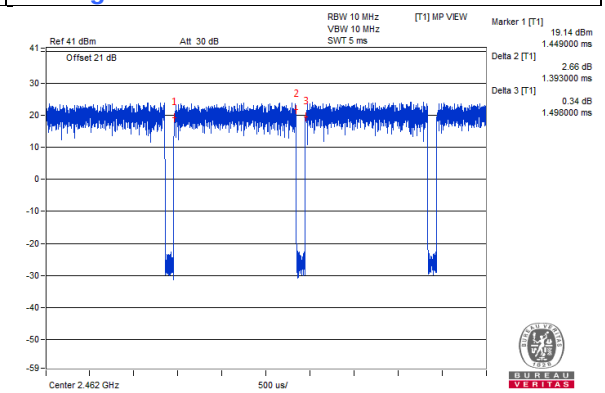
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 8.398 ms/8.513 ms = 0.986
802.11g: Duty cycle = 1.393 ms/1.498 ms = 0.93, Duty factor = 10 * log (1/0.93) = 0.32
802.11n (HT20): Duty cycle = 1.306 ms/1.411 ms = 0.926, Duty factor = 10 * log (1/0.926) = 0.34

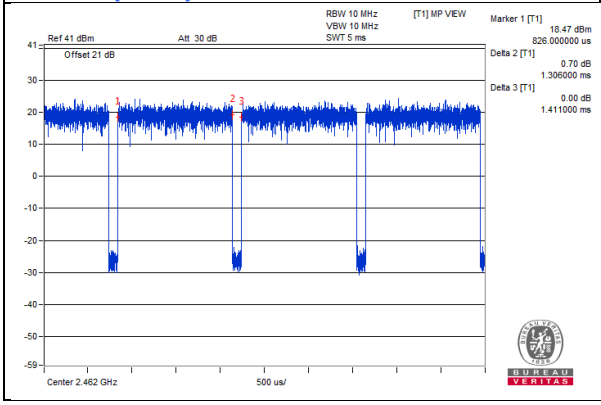
802.11b



802.11g



802.11n (HT20)



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	CC4DMFJUDFDM	NA	Provided by Lab
B.	Laptop	Lenovo	81A4	YD02YN22	NA	Provided by Lab

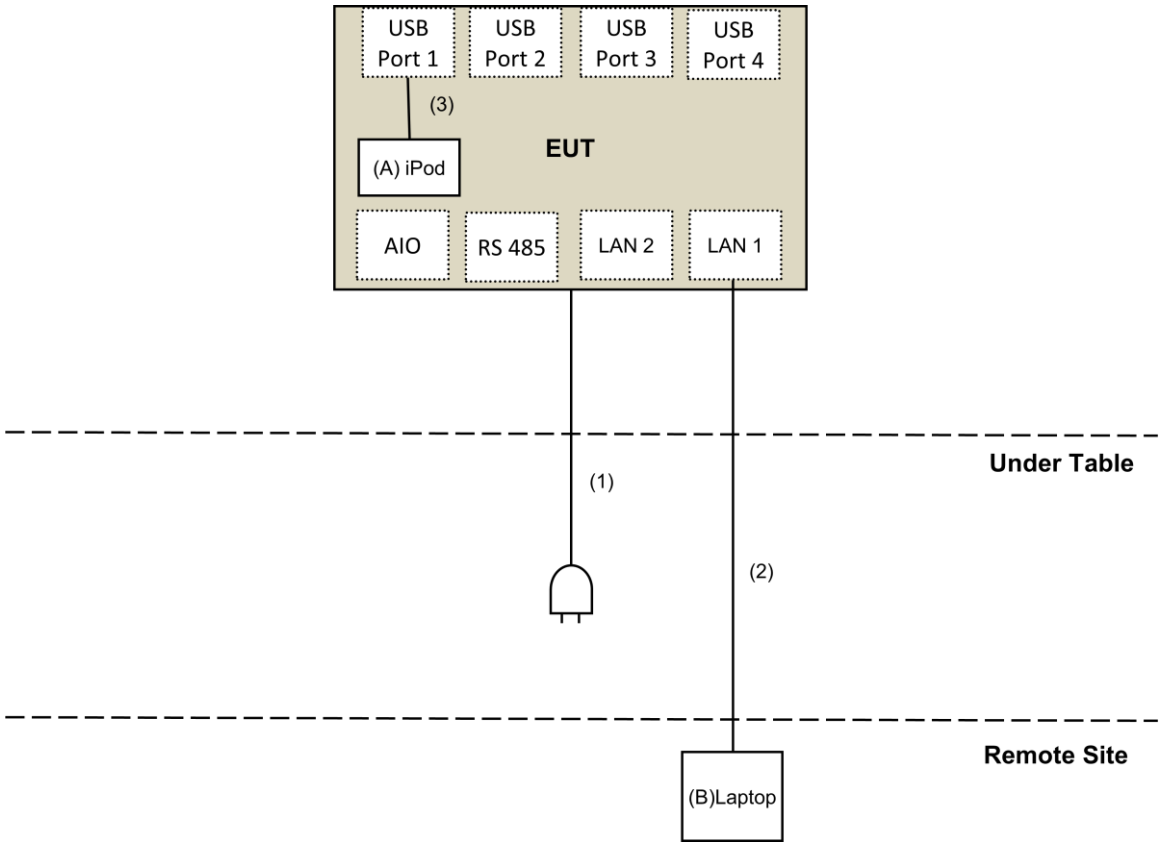
Note:

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

Note: The core(s) is(are) originally attached to the cable(s).

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 15.247 Meas Guidance v05
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB 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, 2018	July 11, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 05, 2018	May 04, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-2	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-3	Mar. 20, 2018	Mar. 19, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200	160922	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150317	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 23, 2018	July 22, 2019
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 2019
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	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

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 CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Oct. 25 to 30, 2018

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. Parallel, perpendicular, and ground-parallel orientations 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 detects 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:

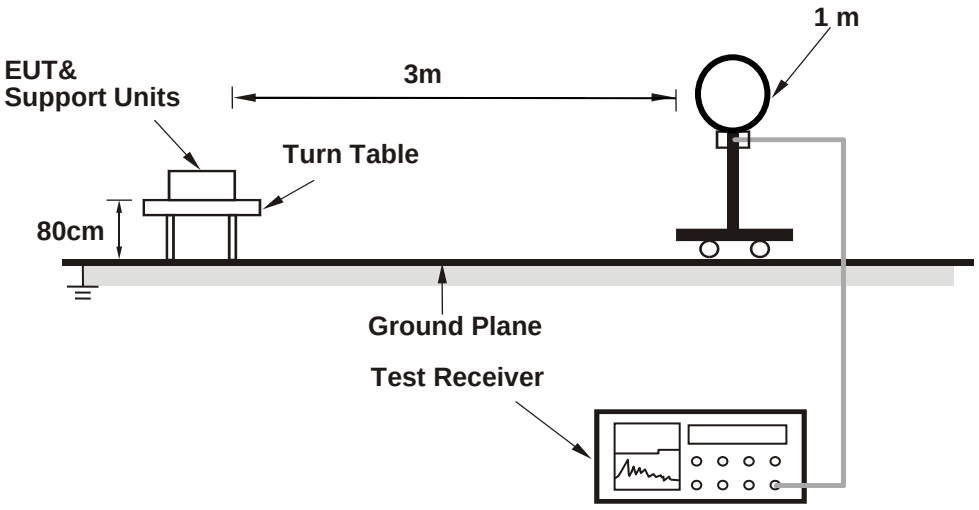
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

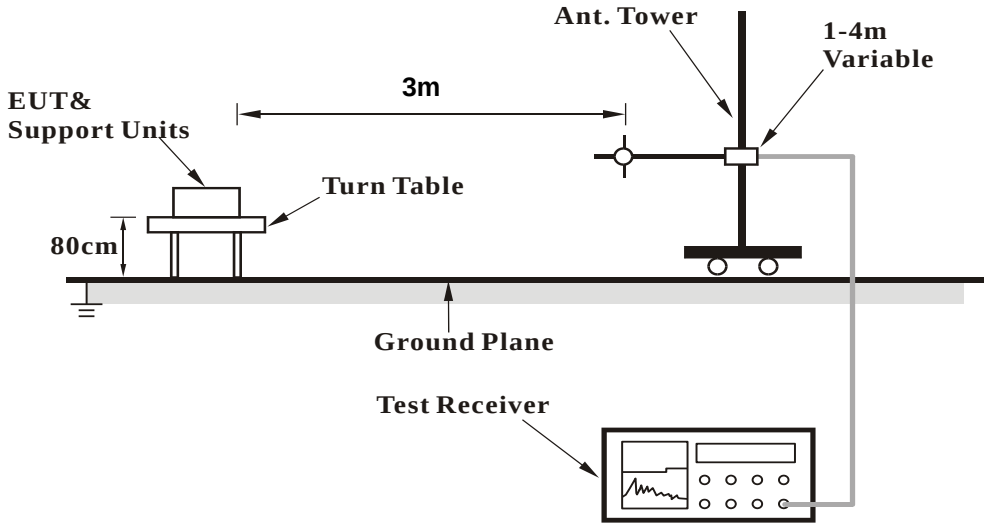
No deviation.

4.1.5 Test Setup

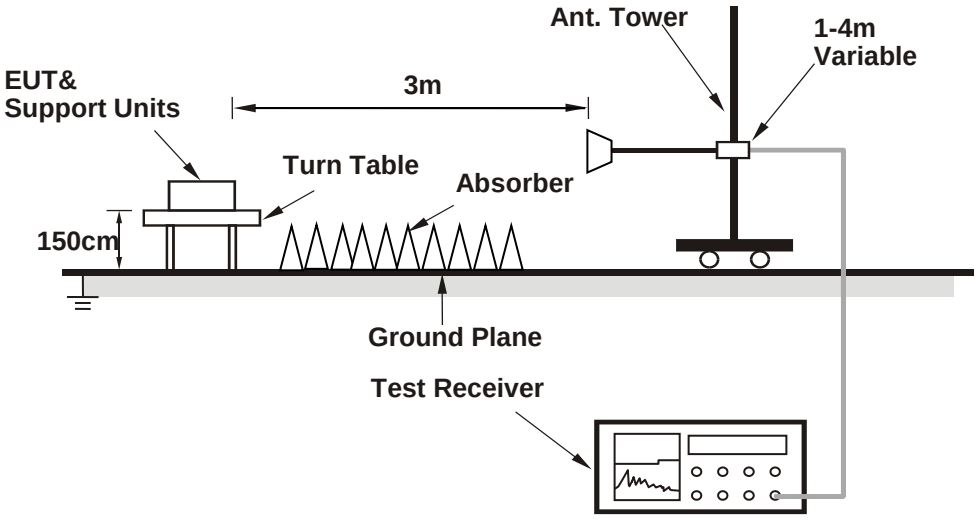
For Radiated emission below 30MHz



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. Placed the EUT on the testing table.
b. Controlling software (SSH paste PVS6_WiFi+Zigbee+BT+BLE+RB SOP.docx Command) 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	60.3 PK	74.0	-13.7	1.41 H	61	63.0	-2.7
2	2390.00	53.3 AV	54.0	-0.7	1.41 H	61	56.0	-2.7
3	*2412.00	111.2 PK			1.41 H	61	113.9	-2.7
4	*2412.00	108.4 AV			1.41 H	61	111.1	-2.7
5	4824.00	41.6 PK	74.0	-32.4	1.48 H	264	40.0	1.6
6	4824.00	38.6 AV	54.0	-15.4	1.48 H	264	37.0	1.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.5 PK	74.0	-13.5	1.30 V	252	63.2	-2.7
2	2390.00	53.5 AV	54.0	-0.5	1.30 V	252	56.2	-2.7
3	*2412.00	111.2 PK			1.30 V	252	113.9	-2.7
4	*2412.00	108.3 AV			1.30 V	252	111.0	-2.7
5	4824.00	38.5 PK	74.0	-35.5	2.28 V	185	36.9	1.6
6	4824.00	32.4 AV	54.0	-21.6	2.28 V	185	30.8	1.6

REMARKS:

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

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.0 PK	74.0	-14.0	1.45 H	64	62.7	-2.7
2	2390.00	53.2 AV	54.0	-0.8	1.45 H	64	55.9	-2.7
3	*2417.00	112.0 PK			1.45 H	64	114.8	-2.8
4	*2417.00	109.1 AV			1.45 H	64	111.9	-2.8
5	4834.00	42.6 PK	74.0	-31.4	1.39 H	266	41.0	1.6
6	4834.00	39.9 AV	54.0	-14.1	1.39 H	266	38.3	1.6
7	7251.00	54.1 PK	74.0	-19.9	2.33 H	211	46.3	7.8
8	7251.00	51.1 AV	54.0	-2.9	2.33 H	211	43.3	7.8
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	60.3 PK	74.0	-13.7	1.31 V	250	63.0	-2.7
2	2390.00	53.5 AV	54.0	-0.5	1.31 V	250	56.2	-2.7
3	*2417.00	112.1 PK			1.31 V	250	114.9	-2.8
4	*2417.00	109.3 AV			1.31 V	250	112.1	-2.8
5	4834.00	39.1 PK	74.0	-34.9	2.36 V	186	37.5	1.6
6	4834.00	32.9 AV	54.0	-21.1	2.36 V	186	31.3	1.6
7	7251.00	52.6 PK	74.0	-21.4	1.19 V	193	44.8	7.8
8	7251.00	50.2 AV	54.0	-3.8	1.19 V	193	42.4	7.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.0 PK	74.0	-16.0	1.38 H	49	60.7	-2.7
2	2390.00	49.7 AV	54.0	-4.3	1.38 H	49	52.4	-2.7
3	*2437.00	114.0 PK			1.38 H	49	117.0	-3.0
4	*2437.00	112.2 AV			1.38 H	49	115.2	-3.0
5	2483.50	57.5 PK	74.0	-16.5	1.38 H	49	60.5	-3.0
6	2483.50	48.0 AV	54.0	-6.0	1.38 H	49	51.0	-3.0
7	4874.00	44.2 PK	74.0	-29.8	1.43 H	261	42.6	1.6
8	4874.00	41.5 AV	54.0	-12.5	1.43 H	261	39.9	1.6
9	7311.00	55.5 PK	74.0	-18.5	2.34 H	218	47.8	7.7
10	7311.00	52.5 AV	54.0	-1.5	2.34 H	218	44.8	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	1.29 V	251	60.8	-2.7
2	2390.00	49.9 AV	54.0	-4.1	1.29 V	251	52.6	-2.7
3	*2437.00	114.1 PK			1.29 V	251	117.1	-3.0
4	*2437.00	112.3 AV			1.29 V	251	115.3	-3.0
5	2483.50	57.7 PK	74.0	-16.3	1.29 V	251	60.7	-3.0
6	2483.50	48.2 AV	54.0	-5.8	1.29 V	251	51.2	-3.0
7	4874.00	40.8 PK	74.0	-33.2	2.33 V	181	39.2	1.6
8	4874.00	34.7 AV	54.0	-19.3	2.33 V	181	33.1	1.6
9	7311.00	55.4 PK	74.0	-18.6	1.21 V	193	47.7	7.7
10	7311.00	52.6 AV	54.0	-1.4	1.21 V	193	44.9	7.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.1 PK			1.41 H	59	115.1	-3.0
2	*2462.00	109.7 AV			1.41 H	59	112.7	-3.0
3	2483.50	60.6 PK	74.0	-13.4	1.41 H	59	63.6	-3.0
4	2483.50	53.8 AV	54.0	-0.2	1.41 H	59	56.8	-3.0
5	4924.00	42.6 PK	74.0	-31.4	1.42 H	280	40.9	1.7
6	4924.00	39.6 AV	54.0	-14.4	1.42 H	280	37.9	1.7
7	7386.00	54.4 PK	74.0	-19.6	2.37 H	224	46.5	7.9
8	7386.00	51.5 AV	54.0	-2.5	2.37 H	224	43.6	7.9
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	112.2 PK			1.40 V	244	115.2	-3.0
2	*2462.00	109.9 AV			1.40 V	244	112.9	-3.0
3	2483.50	60.8 PK	74.0	-13.2	1.40 V	244	63.8	-3.0
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.40 V**	**244**	**56.9**	**-3.0**
5	4924.00	38.7 PK	74.0	-35.3	2.33 V	181	37.0	1.7
6	4924.00	32.5 AV	54.0	-21.5	2.33 V	181	30.8	1.7
7	7386.00	52.1 PK	74.0	-21.9	1.25 V	199	44.2	7.9
8	7386.00	49.8 AV	54.0	-4.2	1.25 V	199	41.9	7.9

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.

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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	73.8 PK	74.0	-0.2	1.67 H	257	76.5	-2.7
2	2390.00	53.0 AV	54.0	-1.0	1.67 H	257	55.7	-2.7
3	*2412.00	111.7 PK			1.67 H	257	114.4	-2.7
4	*2412.00	102.9 AV			1.67 H	257	105.6	-2.7
5	4824.00	37.8 PK	74.0	-36.2	1.52 H	273	36.2	1.6
6	4824.00	33.8 AV	54.0	-20.2	1.52 H	273	32.2	1.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	73.5 PK	74.0	-0.5	1.87 V	136	76.2	-2.7
2	2390.00	52.3 AV	54.0	-1.7	1.87 V	136	55.0	-2.7
3	*2412.00	111.3 PK			1.87 V	136	114.0	-2.7
4	*2412.00	102.8 AV			1.87 V	136	105.5	-2.7
5	4824.00	36.7 PK	74.0	-37.3	2.42 V	196	35.1	1.6
6	4824.00	30.0 AV	54.0	-24.0	2.42 V	196	28.4	1.6

REMARKS:

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

CHANNEL	TX Channel 2	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	73.8 PK	74.0	-0.2	1.66 H	255	76.5	-2.7
2	2390.00	53.2 AV	54.0	-0.8	1.66 H	255	55.9	-2.7
3	*2417.00	112.7 PK			1.66 H	255	115.5	-2.8
4	*2417.00	103.9 AV			1.66 H	255	106.7	-2.8
5	4834.00	39.5 PK	74.0	-34.5	1.49 H	263	37.9	1.6
6	4834.00	35.3 AV	54.0	-18.7	1.49 H	263	33.7	1.6
7	7251.00	50.4 PK	74.0	-23.6	2.33 H	244	42.6	7.8
8	7251.00	47.1 AV	54.0	-6.9	2.33 H	244	39.3	7.8
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	73.5 PK	74.0	-0.5	1.84 V	135	76.2	-2.7
2	2390.00	53.0 AV	54.0	-1.0	1.84 V	135	55.7	-2.7
3	*2417.00	112.5 PK			1.84 V	135	115.3	-2.8
4	*2417.00	103.7 AV			1.84 V	135	106.5	-2.8
5	4834.00	37.2 PK	74.0	-36.8	2.32 V	179	35.6	1.6
6	4834.00	30.6 AV	54.0	-23.4	2.32 V	179	29.0	1.6
7	7251.00	47.8 PK	74.0	-26.2	1.22 V	189	40.0	7.8
8	7251.00	45.4 AV	54.0	-8.6	1.22 V	189	37.6	7.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.6 PK	74.0	-6.4	1.64 H	261	70.3	-2.7
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.64 H**	**261**	**56.6**	**-2.7**
3	*2437.00	115.2 PK			1.64 H	261	118.2	-3.0
4	*2437.00	106.1 AV			1.64 H	261	109.1	-3.0
5	2483.50	66.9 PK	74.0	-7.1	1.64 H	261	69.9	-3.0
6	2483.50	51.2 AV	54.0	-2.8	1.64 H	261	54.2	-3.0
7	4874.00	42.8 PK	74.0	-31.2	1.44 H	258	41.2	1.6
8	4874.00	38.6 AV	54.0	-15.4	1.44 H	258	37.0	1.6
9	7311.00	53.2 PK	74.0	-20.8	2.34 H	229	45.5	7.7
10	7311.00	50.0 AV	54.0	-4.0	2.34 H	229	42.3	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.7 PK	74.0	-6.3	1.86 V	141	70.4	-2.7
2	2390.00	53.6 AV	54.0	-0.4	1.86 V	141	56.3	-2.7
3	*2437.00	115.0 PK			1.86 V	141	118.0	-3.0
4	*2437.00	105.8 AV			1.86 V	141	108.8	-3.0
5	2483.50	66.7 PK	74.0	-7.3	1.86 V	141	69.7	-3.0
6	2483.50	51.0 AV	54.0	-3.0	1.86 V	141	54.0	-3.0
7	4874.00	40.0 PK	74.0	-34.0	2.36 V	185	38.4	1.6
8	4874.00	33.6 AV	54.0	-20.4	2.36 V	185	32.0	1.6
9	7311.00	51.2 PK	74.0	-22.8	1.23 V	193	43.5	7.7
10	7311.00	49.0 AV	54.0	-5.0	1.23 V	193	41.3	7.7

REMARKS:

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

CHANNEL	TX Channel 10	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	*2457.00	113.3 PK			1.23 H	258	116.3	-3.0
2	*2457.00	104.0 AV			1.23 H	258	107.0	-3.0
3	2483.50	73.6 PK	74.0	-0.4	1.23 H	258	76.6	-3.0
4	2483.50	52.3 AV	54.0	-1.7	1.23 H	258	55.3	-3.0
5	4914.00	40.8 PK	74.0	-33.2	1.45 H	265	39.1	1.7
6	4914.00	36.5 AV	54.0	-17.5	1.45 H	265	34.8	1.7
7	7371.00	50.4 PK	74.0	-23.6	2.32 H	230	42.6	7.8
8	7371.00	47.4 AV	54.0	-6.6	2.32 H	230	39.6	7.8
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	*2457.00	113.0 PK			1.86 V	122	116.0	-3.0
2	*2457.00	103.8 AV			1.86 V	122	106.8	-3.0
3	2483.50	73.5 PK	74.0	-0.5	1.86 V	122	76.5	-3.0
4	2483.50	52.0 AV	54.0	-2.0	1.86 V	122	55.0	-3.0
5	4914.00	38.6 PK	74.0	-35.4	2.28 V	183	36.9	1.7
6	4914.00	31.6 AV	54.0	-22.4	2.28 V	183	29.9	1.7
7	7371.00	49.1 PK	74.0	-24.9	1.24 V	194	41.3	7.8
8	7371.00	46.5 AV	54.0	-7.5	1.24 V	194	38.7	7.8

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	112.2 PK			1.25 H	260	115.2	-3.0
2	*2462.00	103.1 AV			1.25 H	260	106.1	-3.0
3	2483.50	73.5 PK	74.0	-0.5	1.25 H	260	76.5	-3.0
4	2483.50	52.0 AV	54.0	-2.0	1.25 H	260	55.0	-3.0
5	4924.00	39.5 PK	74.0	-34.5	1.47 H	266	37.8	1.7
6	4924.00	35.2 AV	54.0	-18.8	1.47 H	266	33.5	1.7
7	7386.00	50.3 PK	74.0	-23.7	2.38 H	240	42.4	7.9
8	7386.00	46.8 AV	54.0	-7.2	2.38 H	240	38.9	7.9
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	112.0 PK			1.86 V	151	115.0	-3.0
2	*2462.00	103.0 AV			1.86 V	151	106.0	-3.0
3	2483.50	73.4 PK	74.0	-0.6	1.86 V	151	76.4	-3.0
4	2483.50	51.9 AV	54.0	-2.1	1.86 V	151	54.9	-3.0
5	4924.00	37.7 PK	74.0	-36.3	2.30 V	168	36.0	1.7
6	4924.00	30.7 AV	54.0	-23.3	2.30 V	168	29.0	1.7
7	7386.00	47.9 PK	74.0	-26.1	1.18 V	203	40.0	7.9
8	7386.00	45.5 AV	54.0	-8.5	1.18 V	203	37.6	7.9

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**	**73.9 PK**	**74.0**	**-0.1**	**1.49 H**	**67**	**76.6**	**-2.7**
2	2390.00	52.5 AV	54.0	-1.5	1.49 H	67	55.2	-2.7
3	*2412.00	112.9 PK			1.49 H	67	115.6	-2.7
4	*2412.00	101.8 AV			1.49 H	67	104.5	-2.7
5	4824.00	37.8 PK	74.0	-36.2	1.48 H	279	36.2	1.6
6	4824.00	34.1 AV	54.0	-19.9	1.48 H	279	32.5	1.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.6 PK	74.0	-0.4	1.86 V	142	76.3	-2.7
2	2390.00	52.4 AV	54.0	-1.6	1.86 V	142	55.1	-2.7
3	*2412.00	112.8 PK			1.86 V	142	115.5	-2.7
4	*2412.00	101.7 AV			1.86 V	142	104.4	-2.7
5	4824.00	36.3 PK	74.0	-37.7	2.39 V	184	34.7	1.6
6	4824.00	29.5 AV	54.0	-24.5	2.39 V	184	27.9	1.6

REMARKS:

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

CHANNEL	TX Channel 2	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**	**73.9 PK**	**74.0**	**-0.1**	**1.47 H**	**66**	**76.6**	**-2.7**
2	2390.00	52.6 AV	54.0	-1.4	1.47 H	66	55.3	-2.7
3	*2417.00	113.4 PK			1.47 H	66	116.2	-2.8
4	*2417.00	102.6 AV			1.47 H	66	105.4	-2.8
5	4834.00	39.9 PK	74.0	-34.1	1.44 H	274	38.3	1.6
6	4834.00	35.1 AV	54.0	-18.9	1.44 H	274	33.5	1.6
7	7251.00	49.0 PK	74.0	-25.0	2.37 H	225	41.2	7.8
8	7251.00	46.0 AV	54.0	-8.0	2.37 H	225	38.2	7.8
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	73.8 PK	74.0	-0.2	1.88 V	129	76.5	-2.7
2	2390.00	52.5 AV	54.0	-1.5	1.88 V	129	55.2	-2.7
3	*2417.00	113.3 PK			1.88 V	129	116.1	-2.8
4	*2417.00	102.4 AV			1.88 V	129	105.2	-2.8
5	4834.00	36.8 PK	74.0	-37.2	2.40 V	189	35.2	1.6
6	4834.00	30.4 AV	54.0	-23.6	2.40 V	189	28.8	1.6
7	7251.00	47.6 PK	74.0	-26.4	1.30 V	197	39.8	7.8
8	7251.00	45.1 AV	54.0	-8.9	1.30 V	197	37.3	7.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.8 PK	74.0	-6.2	1.48 H	59	70.5	-2.7
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.48 H**	**59**	**56.6**	**-2.7**
3	*2437.00	115.4 PK			1.48 H	59	118.4	-3.0
4	*2437.00	104.5 AV			1.48 H	59	107.5	-3.0
5	2483.50	67.7 PK	74.0	-6.3	1.48 H	59	70.7	-3.0
6	2483.50	51.0 AV	54.0	-3.0	1.48 H	59	54.0	-3.0
7	4874.00	42.3 PK	74.0	-31.7	1.46 H	261	40.7	1.6
8	4874.00	37.9 AV	54.0	-16.1	1.46 H	261	36.3	1.6
9	7311.00	52.0 PK	74.0	-22.0	2.39 H	233	44.3	7.7
10	7311.00	48.7 AV	54.0	-5.3	2.39 H	233	41.0	7.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.83 V	129	70.2	-2.7
2	2390.00	53.8 AV	54.0	-0.2	1.83 V	129	56.5	-2.7
3	*2437.00	115.2 PK			1.83 V	129	118.2	-3.0
4	*2437.00	104.3 AV			1.83 V	129	107.3	-3.0
5	2483.50	67.6 PK	74.0	-6.4	1.83 V	129	70.6	-3.0
6	2483.50	50.8 AV	54.0	-3.2	1.83 V	129	53.8	-3.0
7	4874.00	39.2 PK	74.0	-34.8	2.35 V	177	37.6	1.6
8	4874.00	32.5 AV	54.0	-21.5	2.35 V	177	30.9	1.6
9	7311.00	50.2 PK	74.0	-23.8	1.27 V	182	42.5	7.7
10	7311.00	47.8 AV	54.0	-6.2	1.27 V	182	40.1	7.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.5 PK			1.46 H	60	115.5	-3.0
2	*2462.00	101.9 AV			1.46 H	60	104.9	-3.0
3	2483.50	73.8 PK	74.0	-0.2	1.46 H	60	76.8	-3.0
4	2483.50	51.1 AV	54.0	-2.9	1.46 H	60	54.1	-3.0
5	4924.00	39.0 PK	74.0	-35.0	1.47 H	266	37.3	1.7
6	4924.00	34.5 AV	54.0	-19.5	1.47 H	266	32.8	1.7
7	7386.00	48.9 PK	74.0	-25.1	2.33 H	219	41.0	7.9
8	7386.00	46.2 AV	54.0	-7.8	2.33 H	219	38.3	7.9
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	112.3 PK			1.87 V	150	115.3	-3.0
2	*2462.00	101.8 AV			1.87 V	150	104.8	-3.0
3	2483.50	73.7 PK	74.0	-0.3	1.87 V	150	76.7	-3.0
4	2483.50	51.0 AV	54.0	-3.0	1.87 V	150	54.0	-3.0
5	4924.00	36.0 PK	74.0	-38.0	2.43 V	199	34.3	1.7
6	4924.00	30.0 AV	54.0	-24.0	2.43 V	199	28.3	1.7
7	7386.00	47.5 PK	74.0	-26.5	1.32 V	192	39.6	7.9
8	7386.00	44.8 AV	54.0	-9.2	1.32 V	192	36.9	7.9

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:

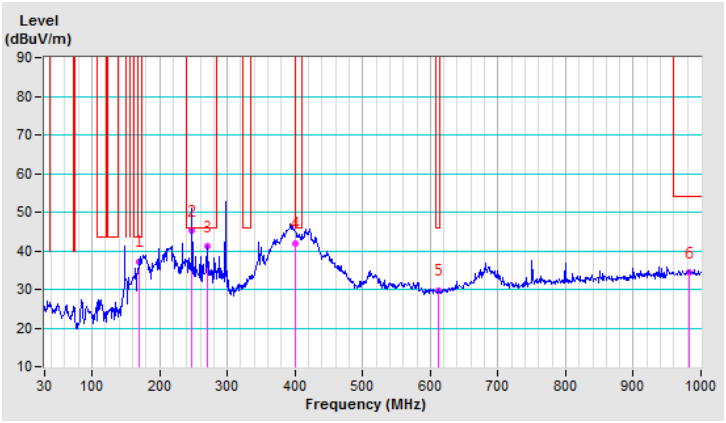
802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	170.16	37.1 QP	43.5	-6.4	1.50 H	315	45.4	-8.3
2	247.52	45.1 QP	46.0	-0.9	1.50 H	131	54.2	-9.1
3	270.63	41.1 QP	46.0	-4.9	1.00 H	221	49.1	-8.0
4	400.37	42.0 QP	46.0	-4.0	1.50 H	353	46.5	-4.5
5	612.41	29.8 QP	46.0	-16.2	1.00 H	144	29.2	0.6
6	983.29	34.3 QP	54.0	-19.7	1.00 H	341	28.4	5.9

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. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.
5. Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must also comply with the radiated emission limits specified in FCC 15.209(a), the otheremission shall be at least 20 dB below fundamental.

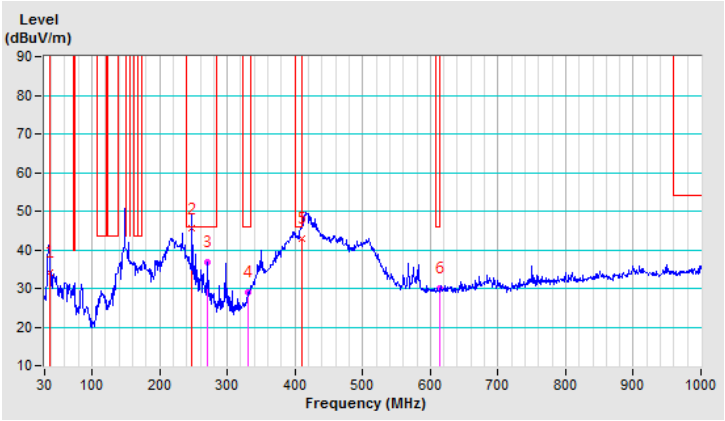


CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	37.50	34.1 QP	40.0	-5.9	1.00 V	3	42.8	-8.7
2	247.52	45.5 QP	46.0	-0.5	1.50 V	70	54.6	-9.1
3	270.61	36.7 QP	46.0	-9.3	1.00 V	28	44.7	-8.0
4	330.53	29.1 QP	46.0	-16.9	1.00 V	244	34.9	-5.8
5	409.70	42.8 QP	46.0	-3.2	1.50 V	175	47.0	-4.2
6	613.09	30.1 QP	46.0	-15.9	1.50 V	168	29.5	0.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.
5. Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must also comply with the radiated emission limits specified in FCC 15.209(a), the otheremission shall be at least 20 dB below fundamental.



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, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-04	Nov. 01, 2017	Oct. 31, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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 Conduction 1.
3. Tested Date: Oct. 26, 2018

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.

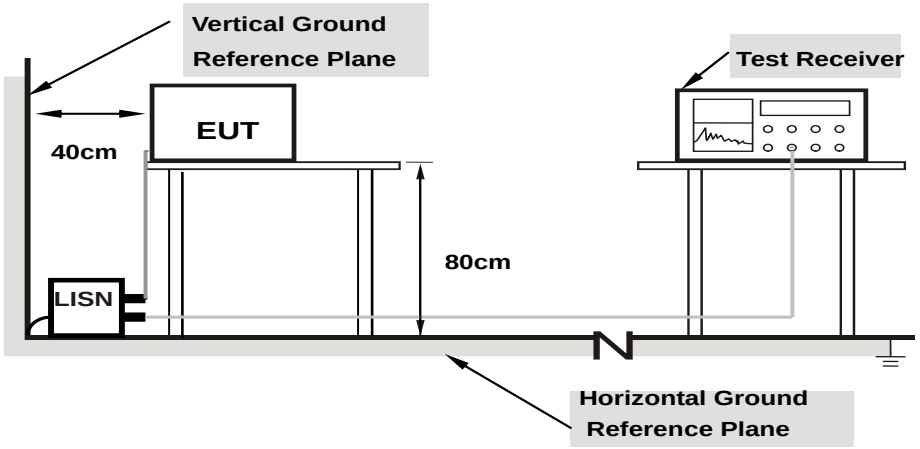
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

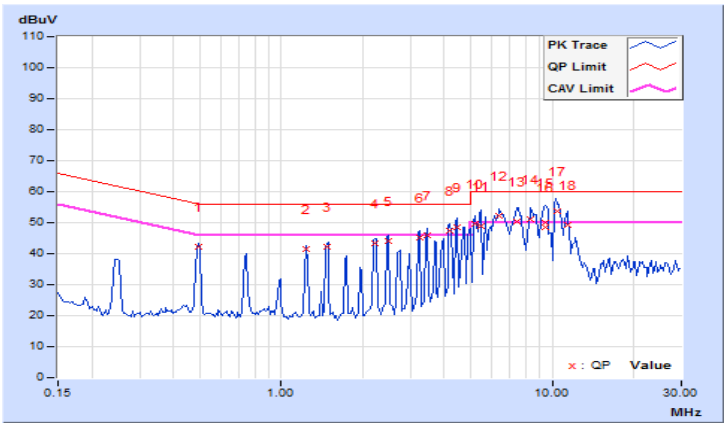
4.2.7 Test Results

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	0.49375	10.08	32.19	31.18	42.27	41.26	56.10	46.10	-13.83	-4.84
2	1.23047	10.12	31.26	25.79	41.38	35.91	56.00	46.00	-14.62	-10.09
3	1.47266	10.13	31.95	25.00	42.08	35.13	56.00	46.00	-13.92	-10.87
4	2.21094	10.17	33.11	25.07	43.28	35.24	56.00	46.00	-12.72	-10.76
5	2.47266	10.18	33.99	26.29	44.17	36.47	56.00	46.00	-11.83	-9.53
6	3.23828	10.22	35.13	22.92	45.35	33.14	56.00	46.00	-10.65	-12.86
7	3.46094	10.23	35.58	27.84	45.81	38.07	56.00	46.00	-10.19	-7.93
8	4.18359	10.26	37.33	27.59	47.59	37.85	56.00	46.00	-8.41	-8.15
9	4.44922	10.27	38.18	29.52	48.45	39.79	56.00	46.00	-7.55	-6.21
10	5.19922	10.31	39.29	30.86	49.60	41.17	60.00	50.00	-10.40	-8.83
11	5.46875	10.32	38.61	25.53	48.93	35.85	60.00	50.00	-11.07	-14.15
12	6.39453	10.36	41.83	31.71	52.19	42.07	60.00	50.00	-7.81	-7.93
13	7.41406	10.41	40.14	30.88	50.55	41.29	60.00	50.00	-9.45	-8.71
14	8.35938	10.45	40.58	29.88	51.03	40.33	60.00	50.00	-8.97	-9.67
15	9.38281	10.50	39.35	29.48	49.85	39.98	60.00	50.00	-10.15	-10.02
16	9.38281	10.50	38.14	28.59	48.64	39.09	60.00	50.00	-11.36	-10.91
17	10.38466	10.55	43.19	33.92	53.74	44.47	60.00	50.00	-6.26	-5.53
18	11.38672	10.60	38.68	29.12	49.28	39.72	60.00	50.00	-10.72	-10.28

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.

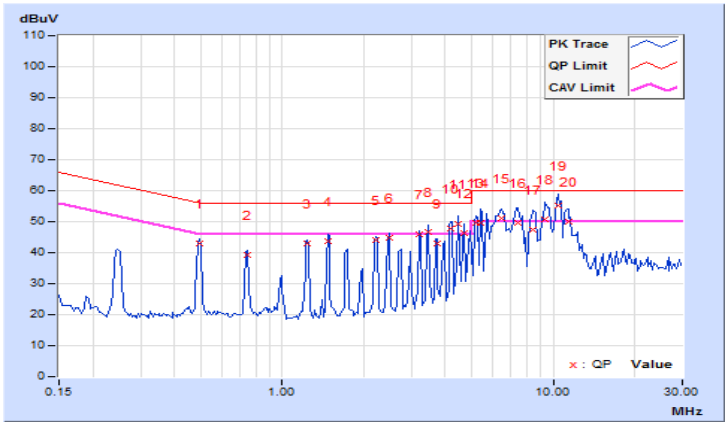


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	**0.49375**	**9.96**	**33.11**	**32.09**	**43.07**	**42.05**	**56.10**	**46.10**	**-13.03**	**-4.05**
2	0.74375	9.98	29.16	25.29	39.14	35.27	56.00	46.00	-16.86	-10.73
3	1.23438	10.00	32.92	28.04	42.92	38.04	56.00	46.00	-13.08	-7.96
4	1.48047	10.01	33.84	28.93	43.85	38.94	56.00	46.00	-12.15	-7.06
5	2.22656	10.05	33.85	26.41	43.90	36.46	56.00	46.00	-12.10	-9.54
6	2.47656	10.06	34.86	26.89	44.92	36.95	56.00	46.00	-11.08	-9.05
7	3.19531	10.09	35.70	27.15	45.79	37.24	56.00	46.00	-10.21	-8.76
8	3.46875	10.10	36.48	28.26	46.58	38.36	56.00	46.00	-9.42	-7.64
9	3.71484	10.11	32.72	24.59	42.83	34.70	56.00	46.00	-13.17	-11.30
10	4.20313	10.13	37.76	29.39	47.89	39.52	56.00	46.00	-8.11	-6.48
11	4.45313	10.14	39.00	31.04	49.14	41.18	56.00	46.00	-6.86	-4.82
12	4.69922	10.15	36.32	28.02	46.47	38.17	56.00	46.00	-9.53	-7.83
13	5.19922	10.17	39.51	31.08	49.68	41.25	60.00	50.00	-10.32	-8.75
14	5.41797	10.18	39.45	30.92	49.63	41.10	60.00	50.00	-10.37	-8.90
15	6.48047	10.23	40.86	27.13	51.09	37.36	60.00	50.00	-8.91	-12.64
16	7.43359	10.27	39.23	30.64	49.50	40.91	60.00	50.00	-10.50	-9.09
17	8.39453	10.31	37.17	26.70	47.48	37.01	60.00	50.00	-12.52	-12.99
18	9.26953	10.35	40.34	27.86	50.69	38.21	60.00	50.00	-9.31	-11.79
19	10.39453	10.40	44.76	35.53	55.16	45.93	60.00	50.00	-4.84	-4.07
20	11.39453	10.45	39.71	30.32	50.16	40.77	60.00	50.00	-9.84	-9.23

REMARKS:

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

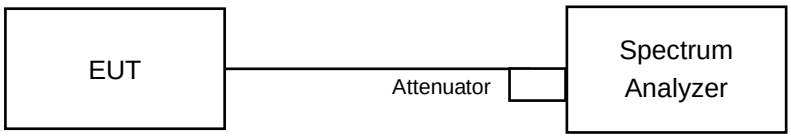


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

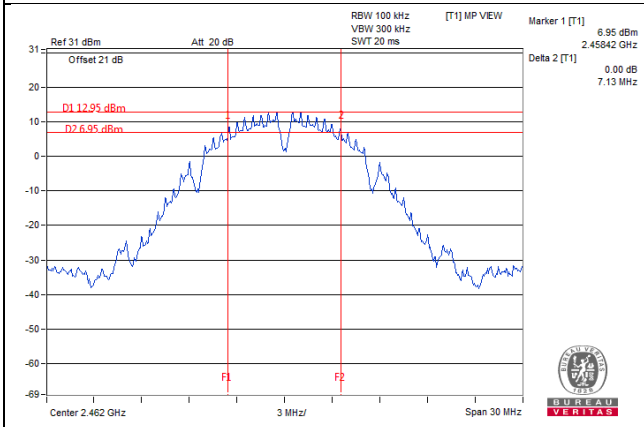
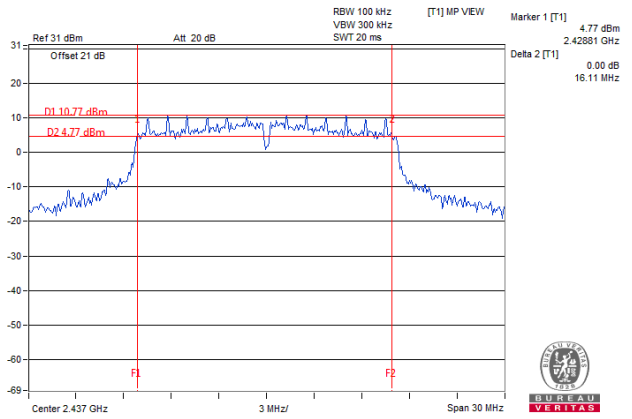
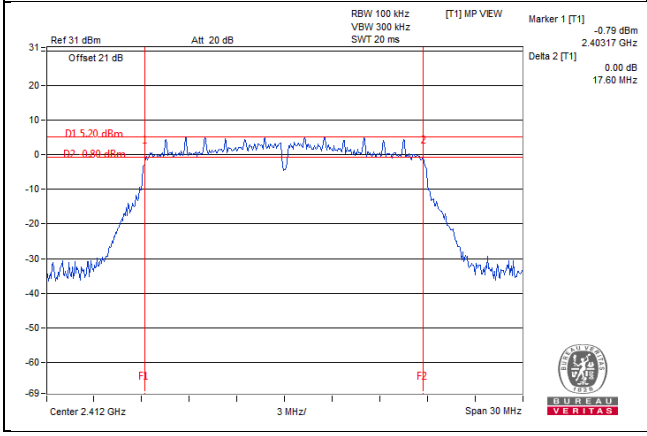
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.58	7.13	0.5	Pass
2	2417	7.59	7.58	0.5	Pass
6	2437	8.55	8.55	0.5	Pass
11	2462	7.13	7.58	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	16.43	0.5	Pass
2	2417	16.38	16.42	0.5	Pass
6	2437	16.11	16.37	0.5	Pass
10	2457	16.37	16.38	0.5	Pass
11	2462	16.36	16.40	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.60	17.65	0.5	Pass
2	2417	17.61	17.63	0.5	Pass
6	2437	17.60	17.65	0.5	Pass
11	2462	17.60	17.67	0.5	Pass

Spectrum Plot of Worst Value	
802.11b_Chain 0 / CH11	**802.11g_Chain 0 / CH6**
	
802.11n (HT20)_Chain 0 / CH1	
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

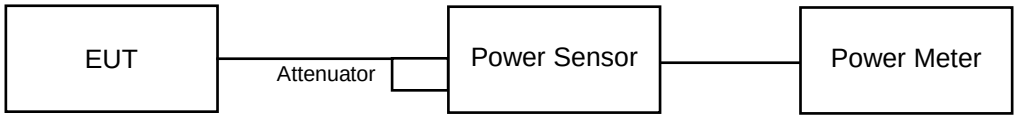
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

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

FOR PEAK POWER

802.11b

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.22	22.25	334.605	25.25	30	Pass
2	2417	23.31	23.08	417.525	26.21	30	Pass
6	2437	25.54	25.05	677.986	28.31	30	Pass
11	2462	23.25	23.02	411.796	26.15	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.06	25.11	644.967	28.10	30	Pass
2	2417	25.16	25.18	657.705	28.18	30	Pass
6	2437	25.84	25.78	762.15	28.82	30	Pass
10	2457	25.15	25.22	660.001	28.20	30	Pass
11	2462	25.06	24.98	635.402	28.03	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.70	24.48	575.664	27.60	30	Pass
2	2417	24.81	24.69	597.133	27.76	30	Pass
6	2437	25.84	25.74	758.68	28.80	30	Pass
11	2462	24.41	24.68	569.823	27.56	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.26	19.36	170.631	22.32
2	2417	20.38	20.35	217.537	23.38
6	2437	23.32	23.12	419.899	26.23
11	2462	20.40	20.32	217.295	23.37

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.45	17.62	113.4	20.55
2	2417	18.03	17.88	124.909	20.97
6	2437	21.45	21.75	289.261	24.61
10	2457	18.75	18.32	142.909	21.55
11	2462	17.95	17.69	121.122	20.83

802.11n (HT20)

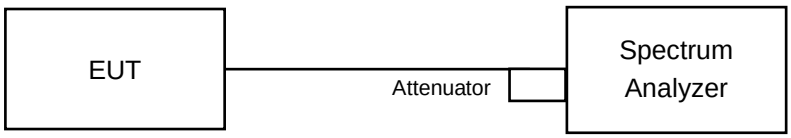
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	16.45	16.36	87.408	19.42
2	2417	17.32	17.50	110.185	20.42
6	2437	20.01	19.84	196.614	22.94
11	2462	17.09	16.78	98.811	19.95

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-2.72	3.01	0.29	7.73	Pass
	2	2417	-2.10	3.01	0.91	7.73	Pass
	6	2437	1.59	3.01	4.60	7.73	Pass
	11	2462	-2.21	3.01	0.80	7.73	Pass
1	1	2412	-3.07	3.01	-0.06	7.73	Pass
	2	2417	-2.89	3.01	0.12	7.73	Pass
	6	2437	-0.28	3.01	2.73	7.73	Pass
	11	2462	-2.80	3.01	0.21	7.73	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.27dBi > 6dBi , so the power density limit shall be reduced to 8-(6.27-6) = 7.73dBm.

802.11g

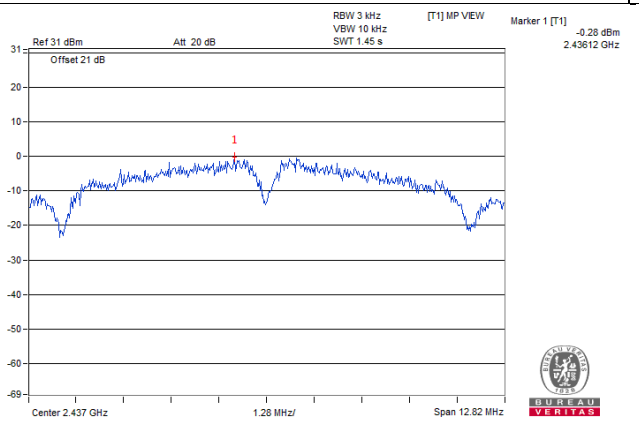
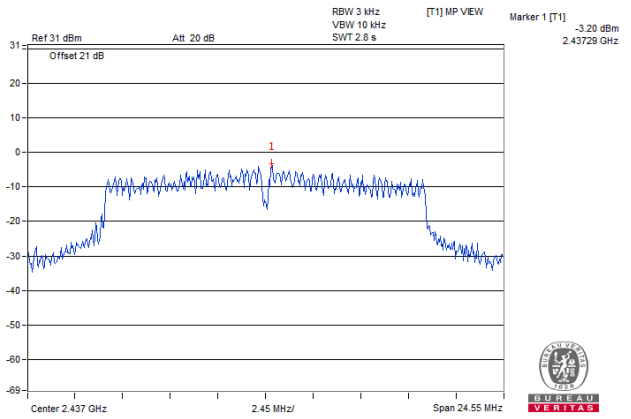
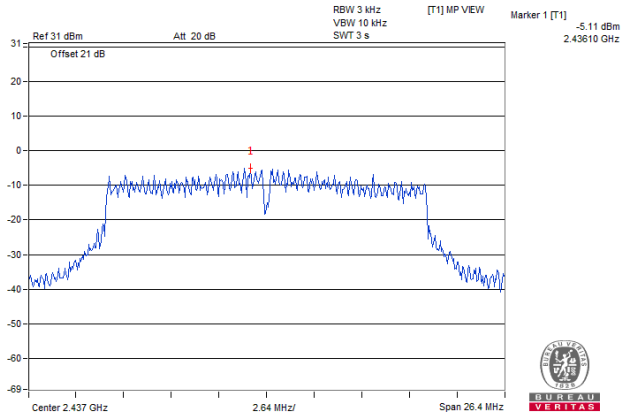
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-7.46	3.01	-4.45	7.73	Pass
	2	2417	-6.81	3.01	-3.80	7.73	Pass
	6	2437	-3.73	3.01	-0.72	7.73	Pass
	10	2457	-6.50	3.01	-3.49	7.73	Pass
	11	2462	-6.10	3.01	-3.09	7.73	Pass
1	1	2412	-7.75	3.01	-4.74	7.73	Pass
	2	2417	-7.74	3.01	-4.73	7.73	Pass
	6	2437	-3.20	3.01	-0.19	7.73	Pass
	10	2457	-6.91	3.01	-3.90	7.73	Pass
	11	2462	-7.14	3.01	-4.13	7.73	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.27dBi > 6dBi , so the power density limit shall be reduced to 8-(6.27-6) = 7.73dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.62	3.01	-5.61	7.73	Pass
	2	2417	-8.23	3.01	-5.22	7.73	Pass
	6	2437	-5.11	3.01	-2.10	7.73	Pass
	11	2462	-7.65	3.01	-4.64	7.73	Pass
1	1	2412	-9.05	3.01	-6.04	7.73	Pass
	2	2417	-6.94	3.01	-3.93	7.73	Pass
	6	2437	-5.98	3.01	-2.97	7.73	Pass
	11	2462	-8.04	3.01	-5.03	7.73	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.27dBi > 6dBi , so the power density limit shall be reduced to 8-(6.27-6) = 7.73dBm.

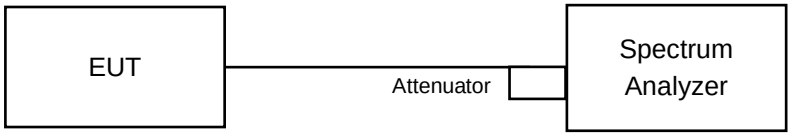
Spectrum Plot of Worst Value	
802.11b_Chain 1 / CH6	**802.11g_Chain 1 / CH6**
	
802.11n (HT20)_Chain 0 / CH6	
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

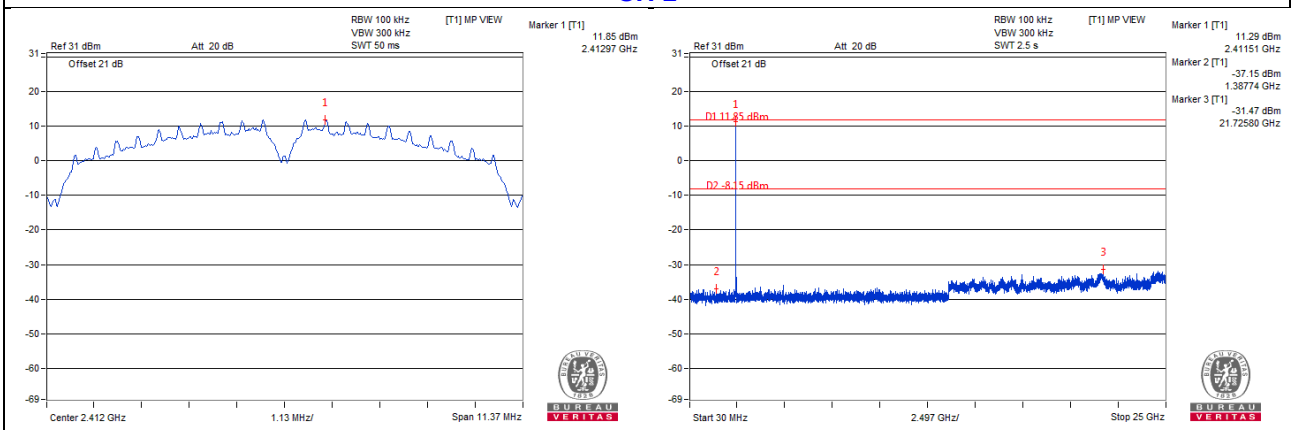
4.6.7 Test Results

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

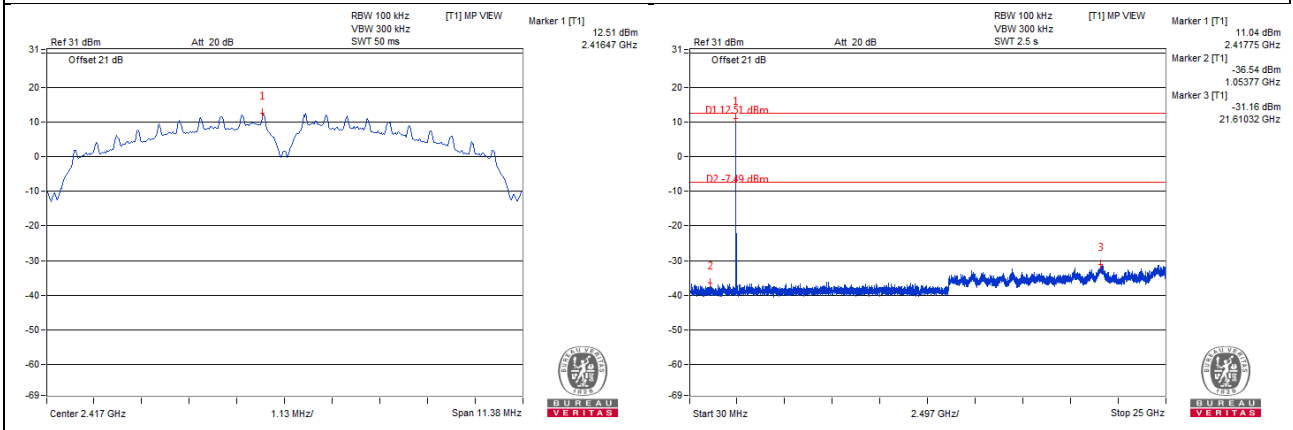
802.11b

Chain 0

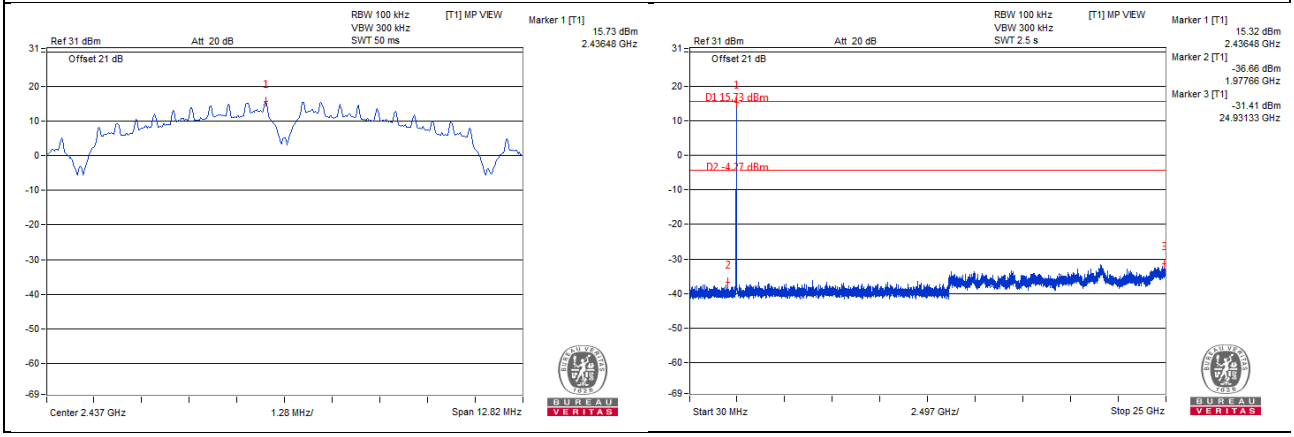
CH 1



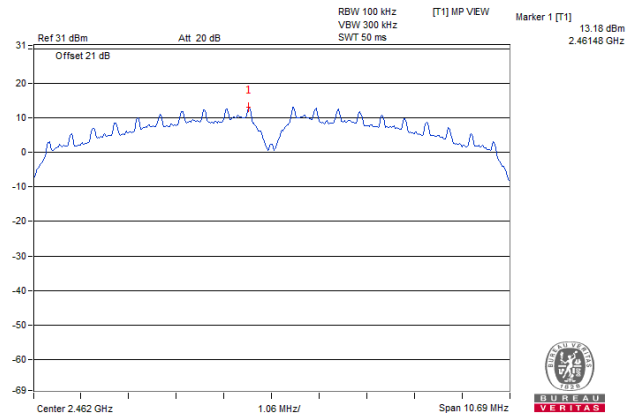
CH 2

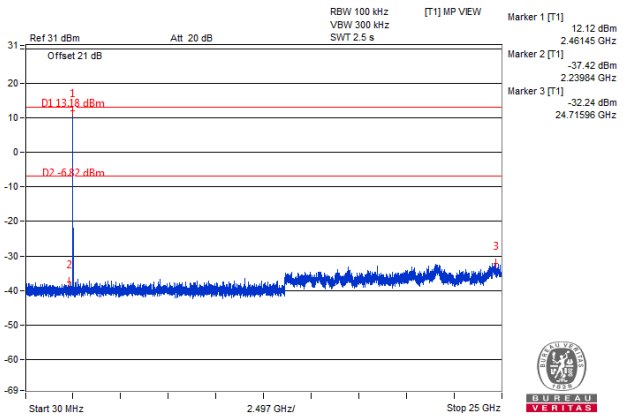


CH 6

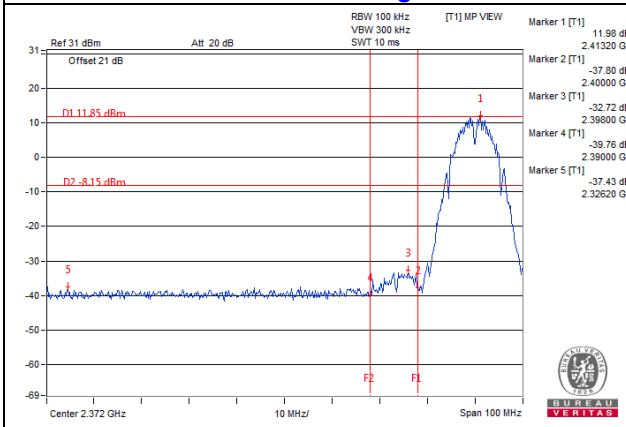


CH 11

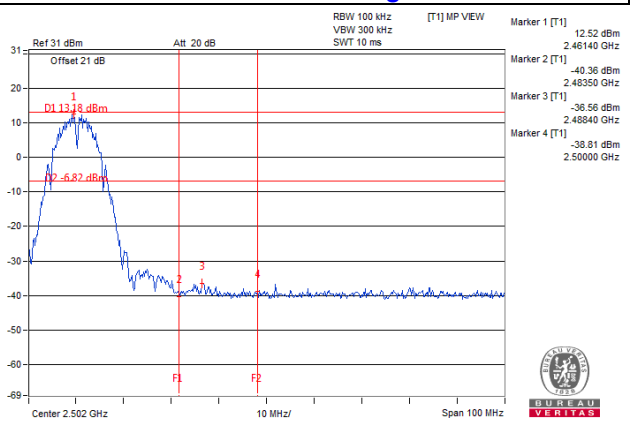




CH 1 Band edge

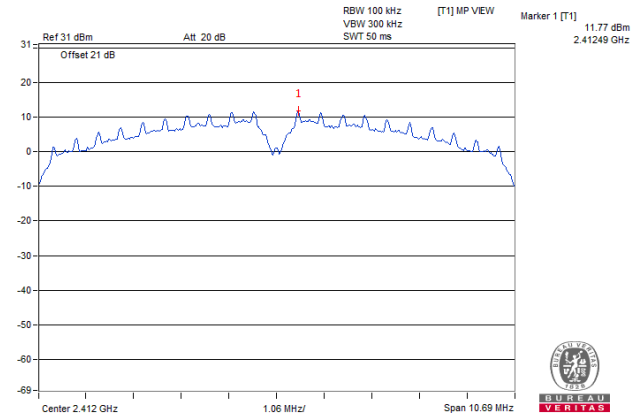


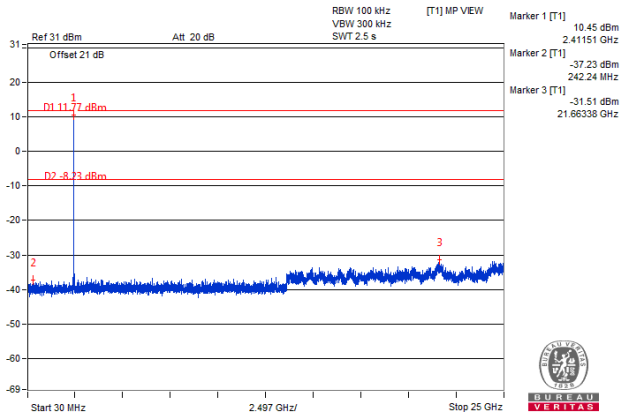
CH 11 Band edge



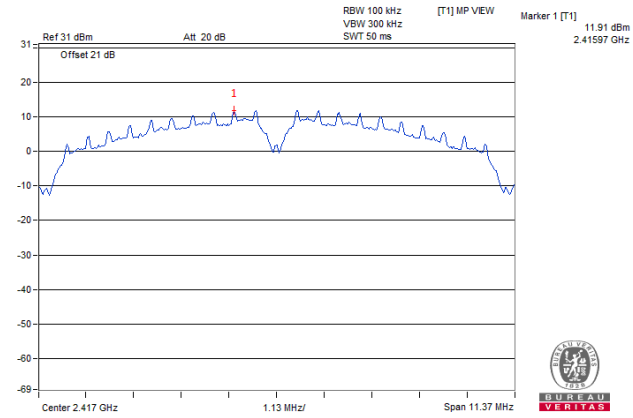
Chain 1

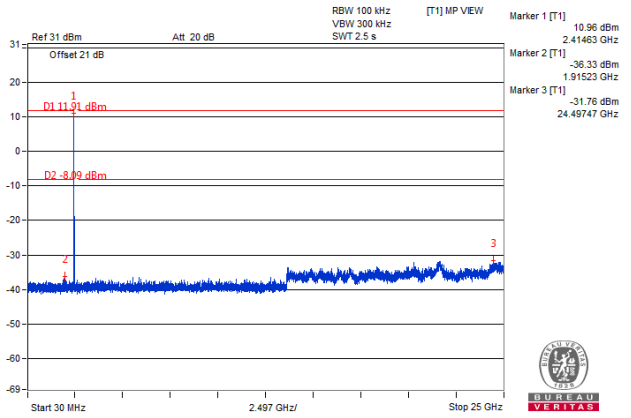
CH 1



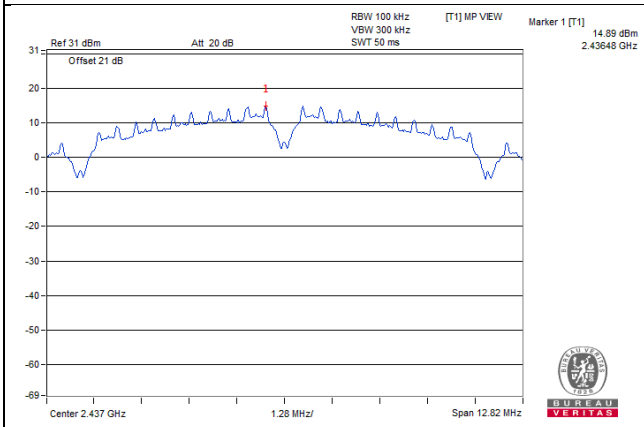


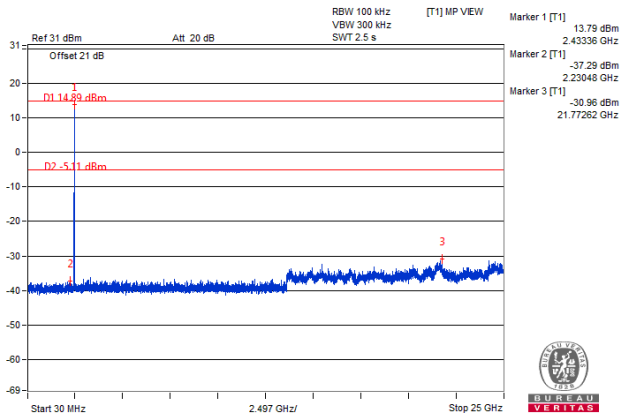
CH 2



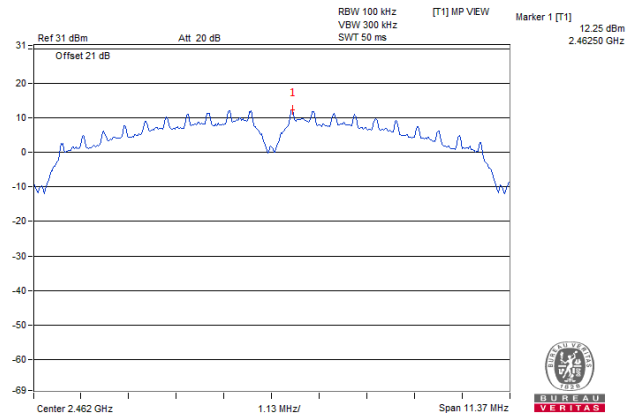


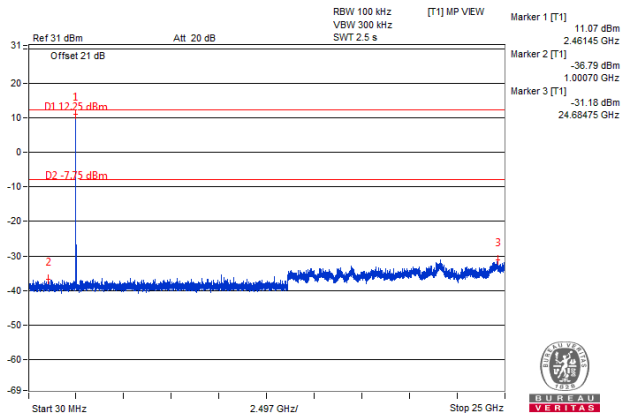
CH 6



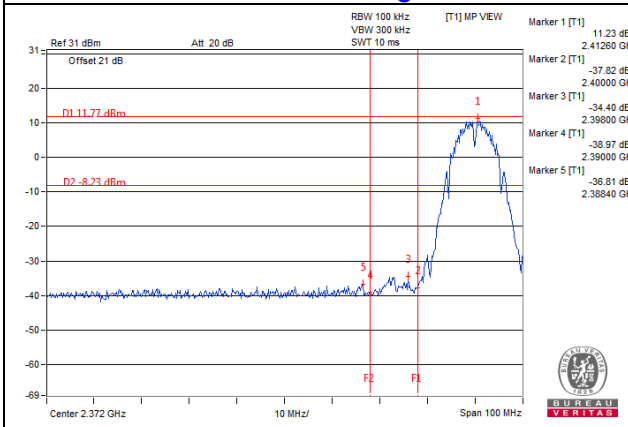


CH 11

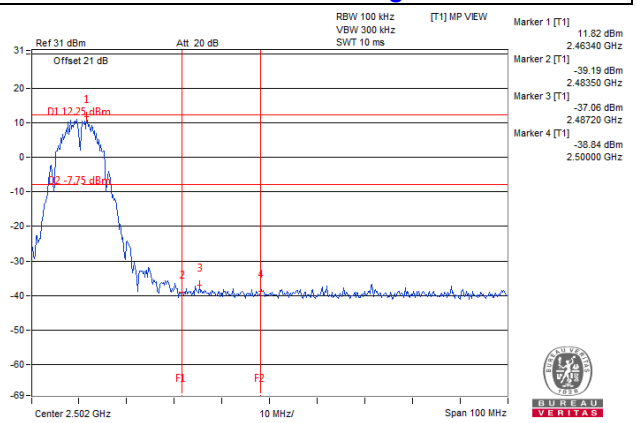




CH 1 Band edge



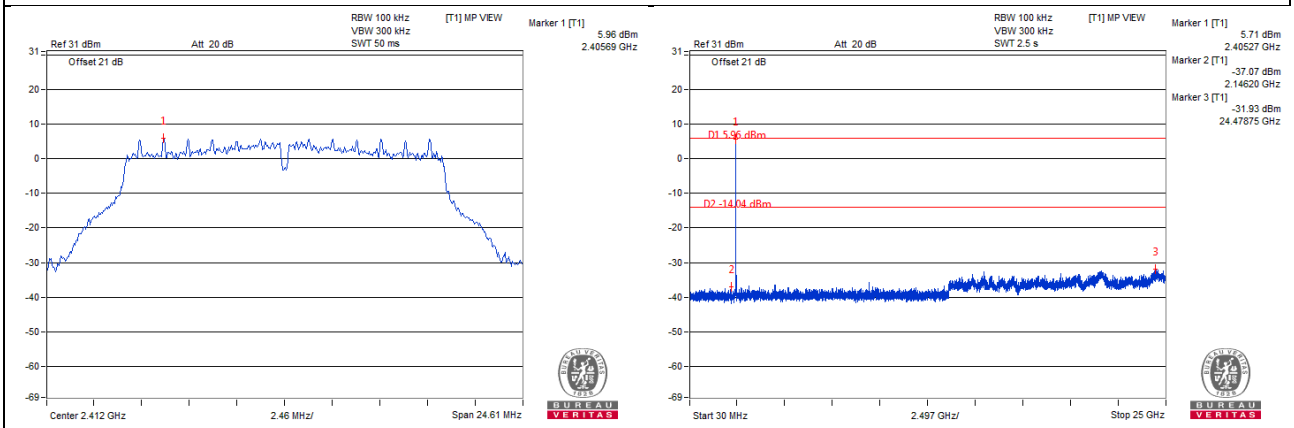
CH 11 Band edge



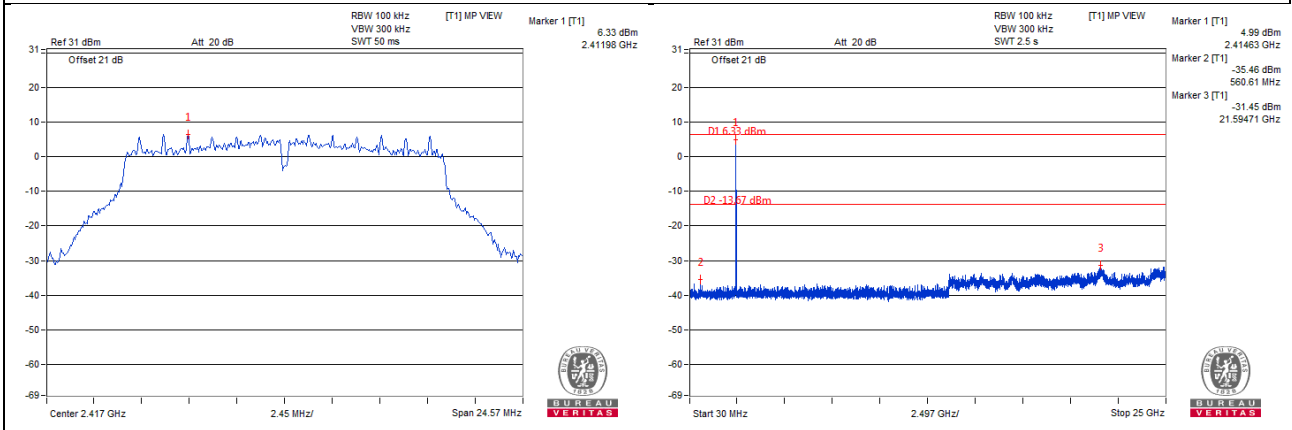
802.11g

Chain 0

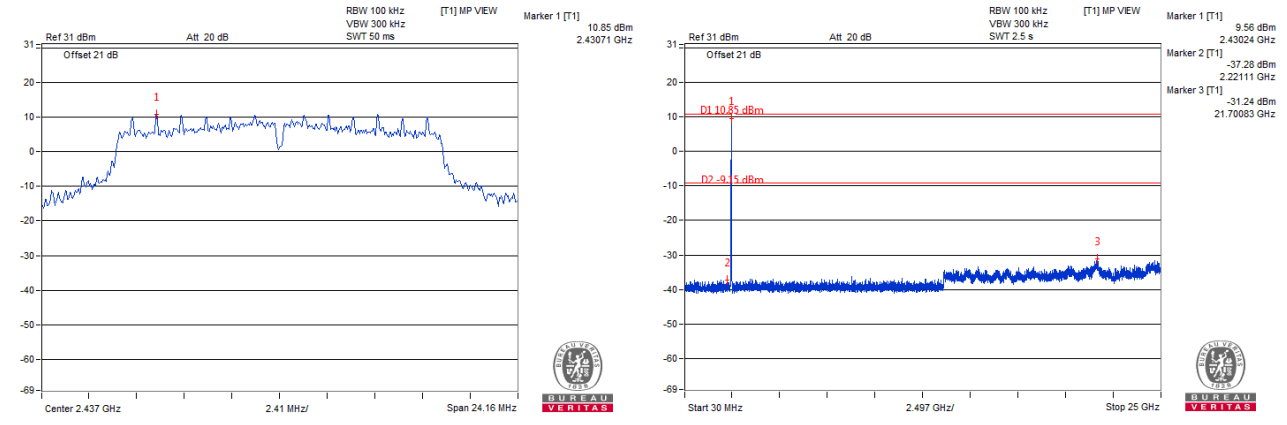
CH 1



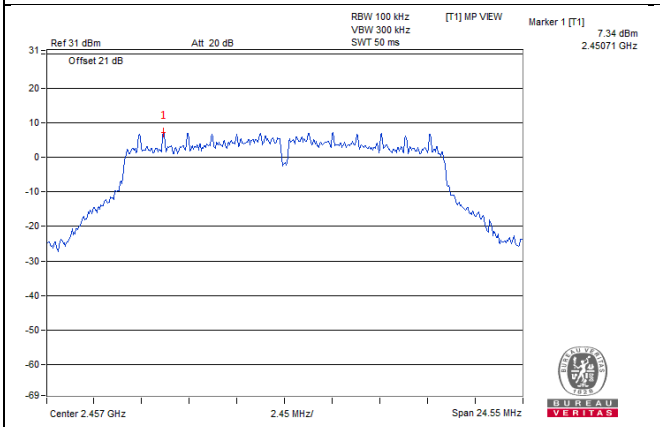
CH 2

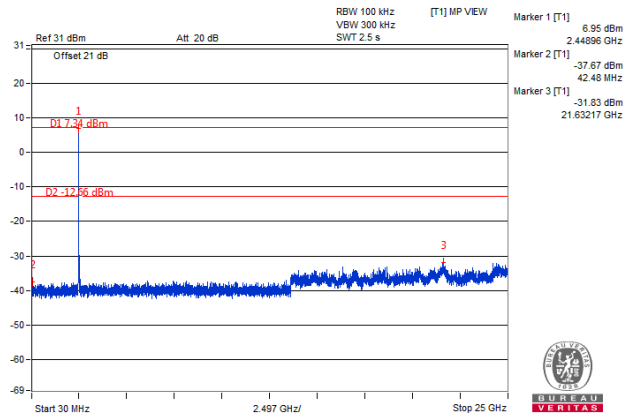


CH 6

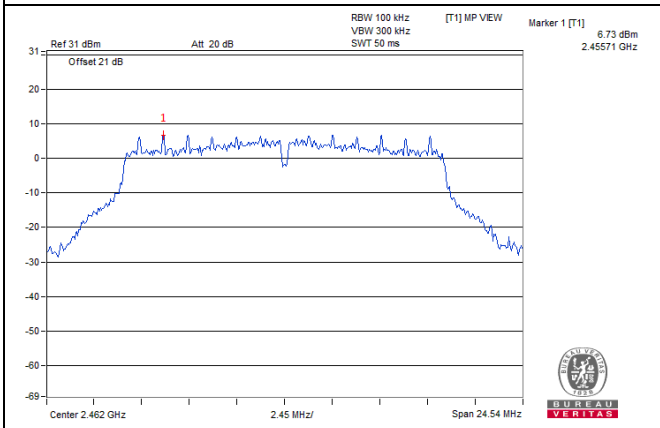


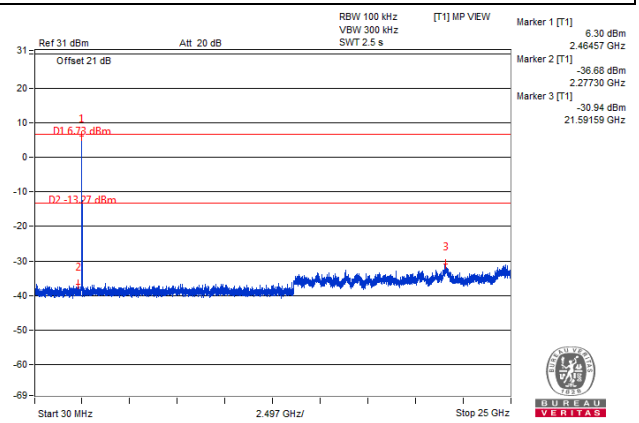
CH 10



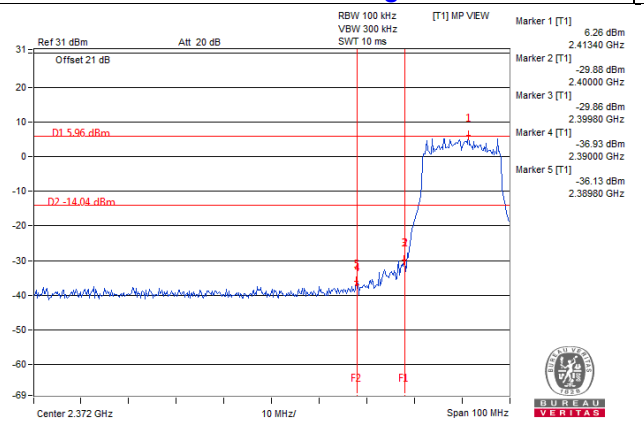


CH 11

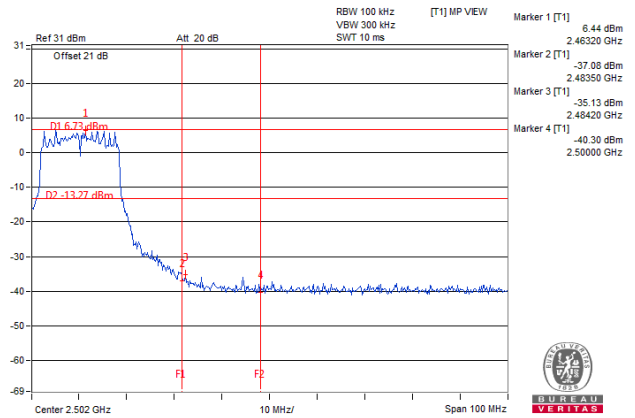




CH 1 Band edge

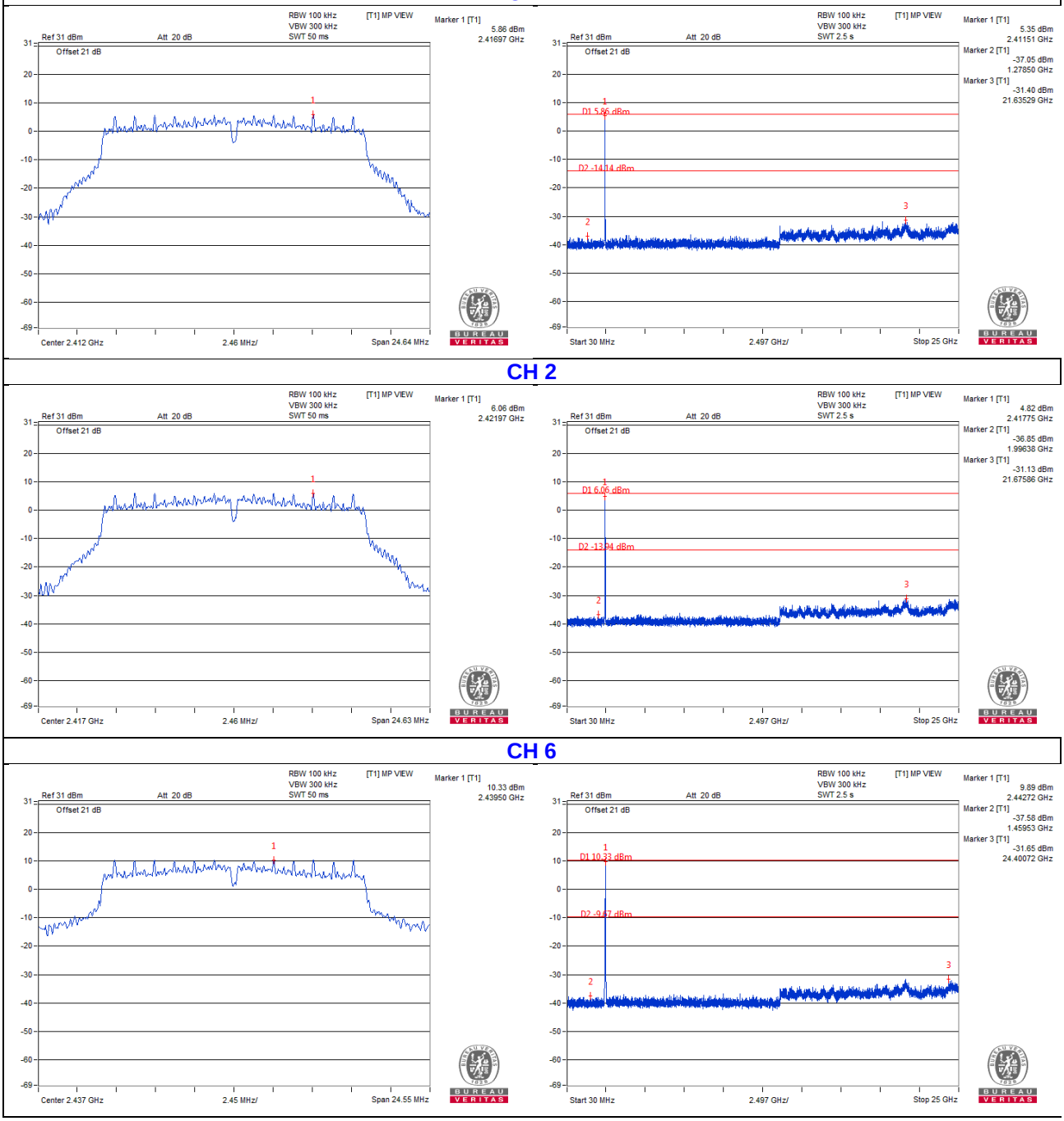


CH 11 Band edge



Chain 1

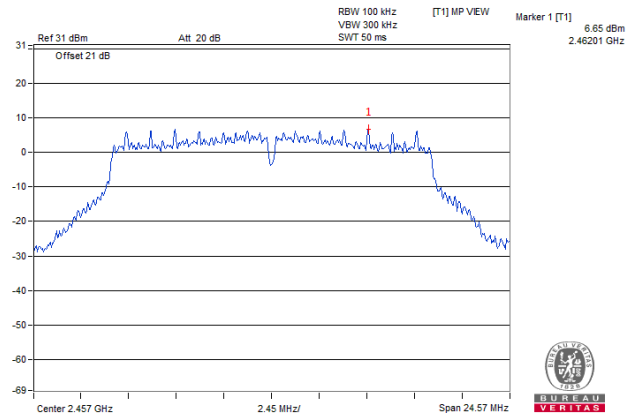
CH 1

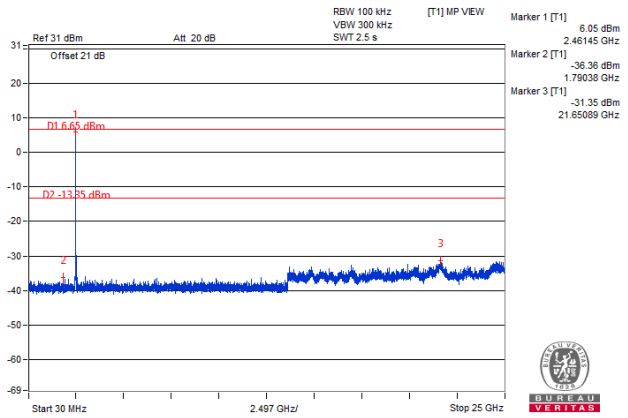


CH 2

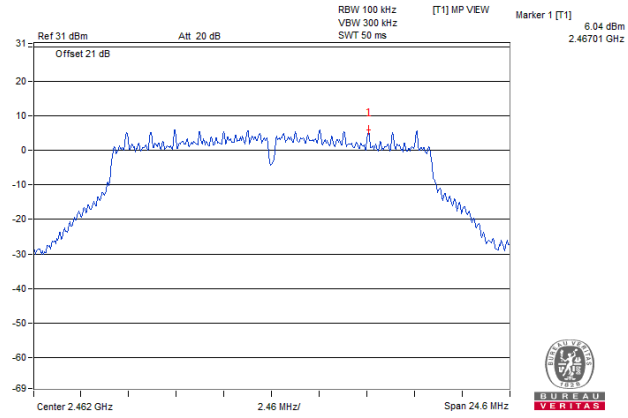
CH 6

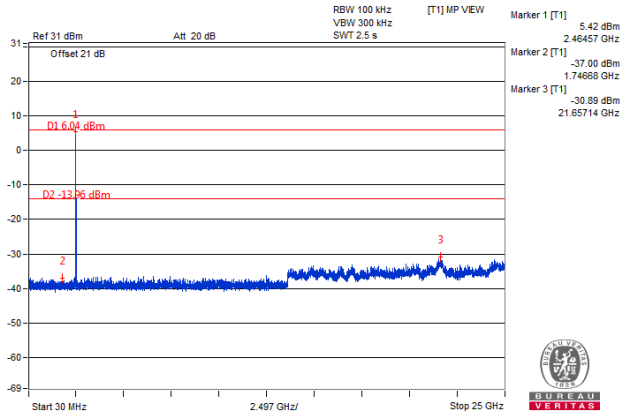
CH 10



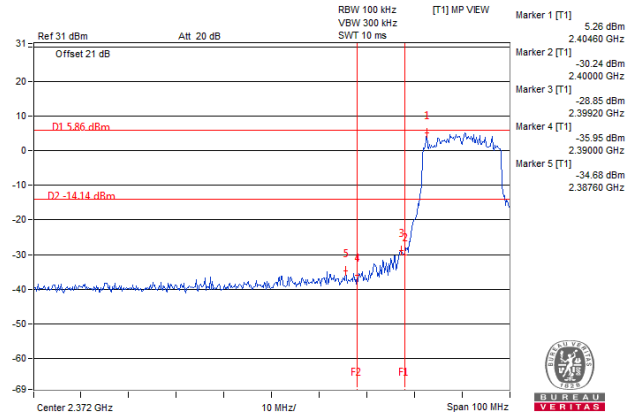


CH 11

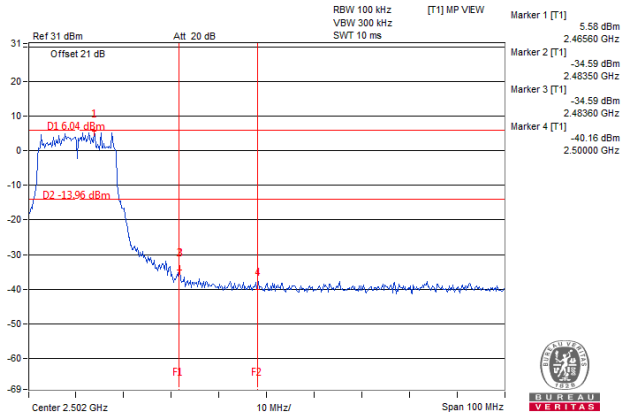




CH 1 Band edge



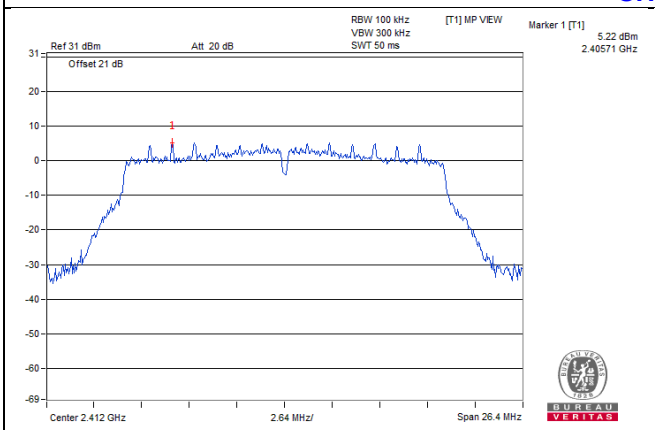
CH 11 Band edge

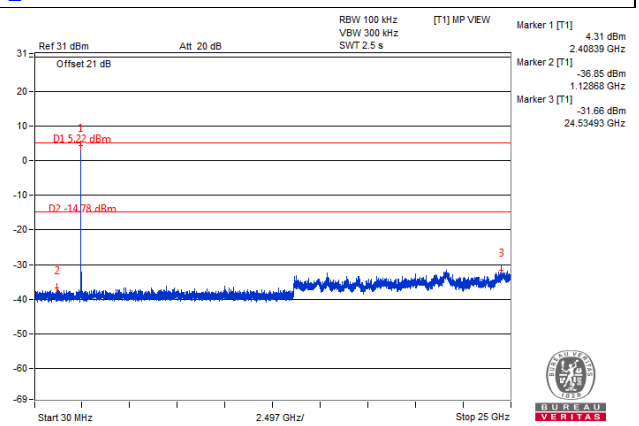


802.11n (HT20)

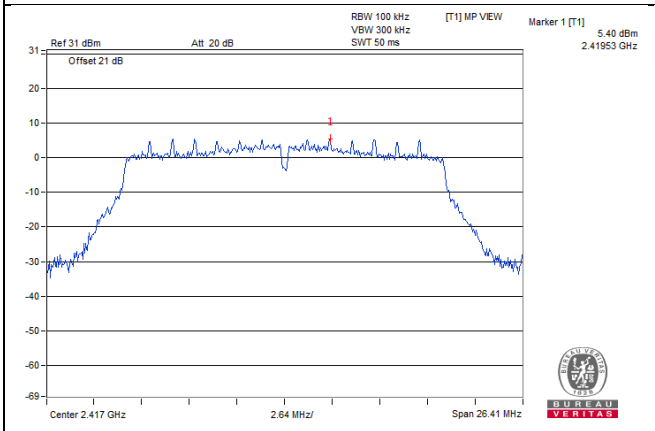
Chain 0

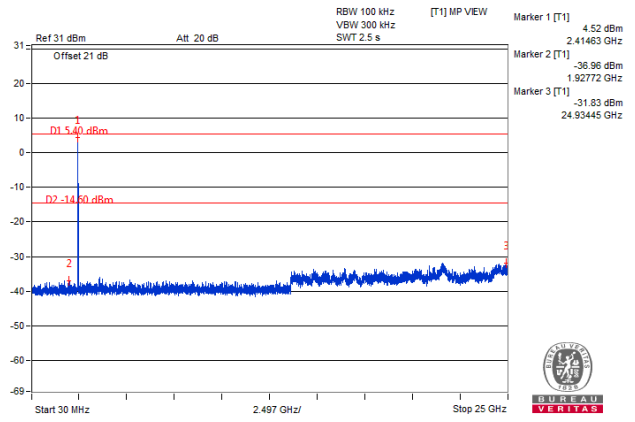
CH 1



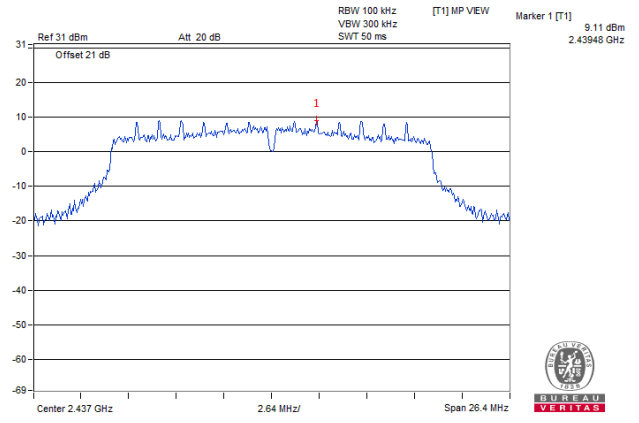


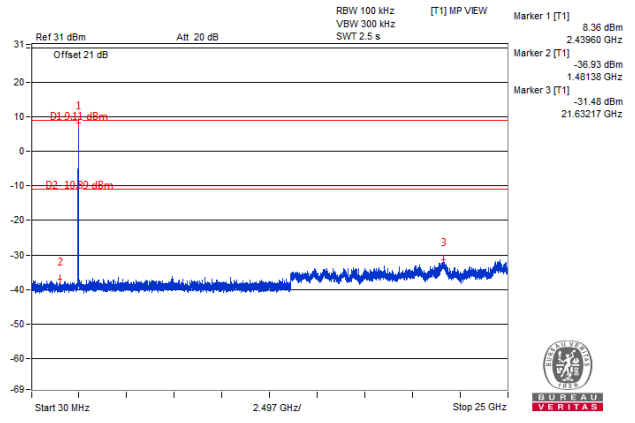
CH 2



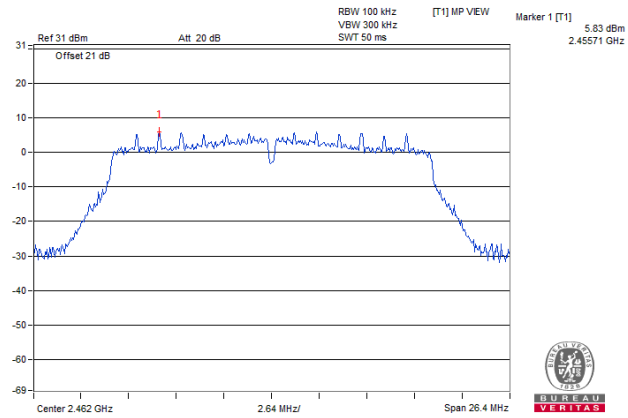


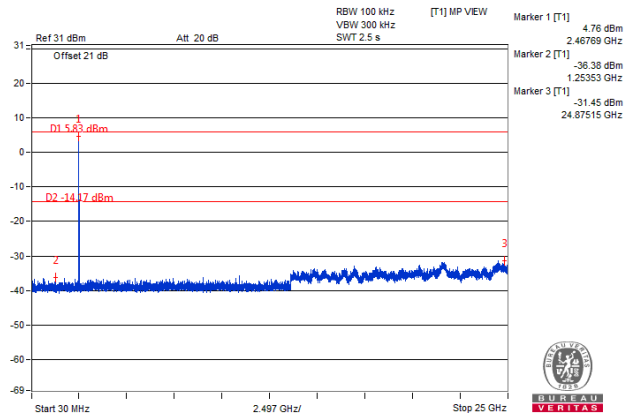
CH 6



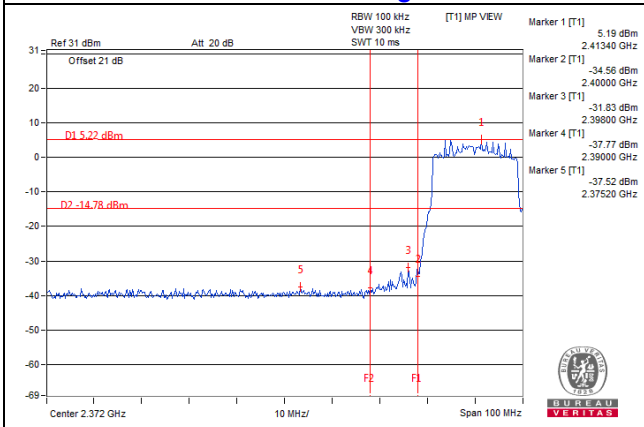


CH 11

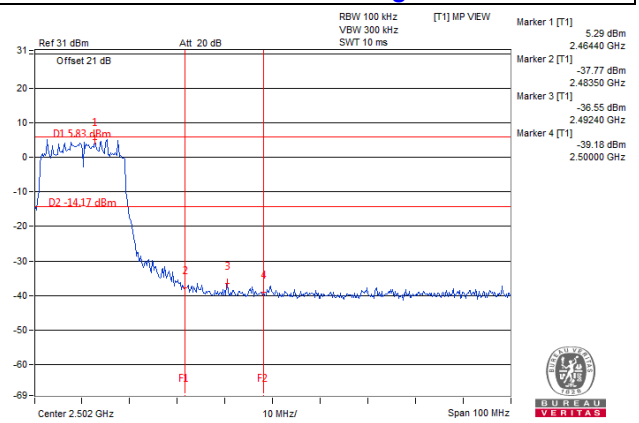




CH 1 Band edge

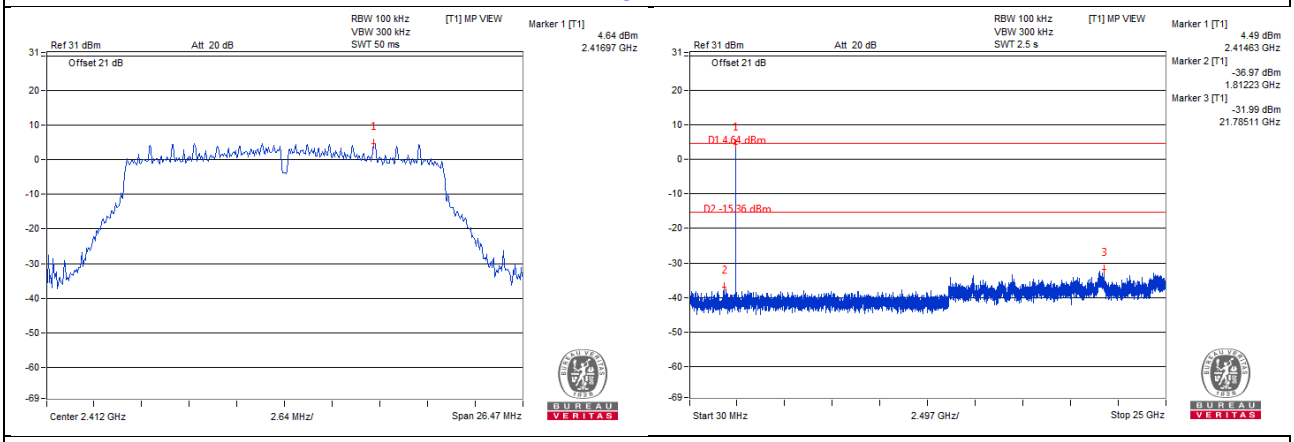


CH 11 Band edge



Chain 1

CH 1



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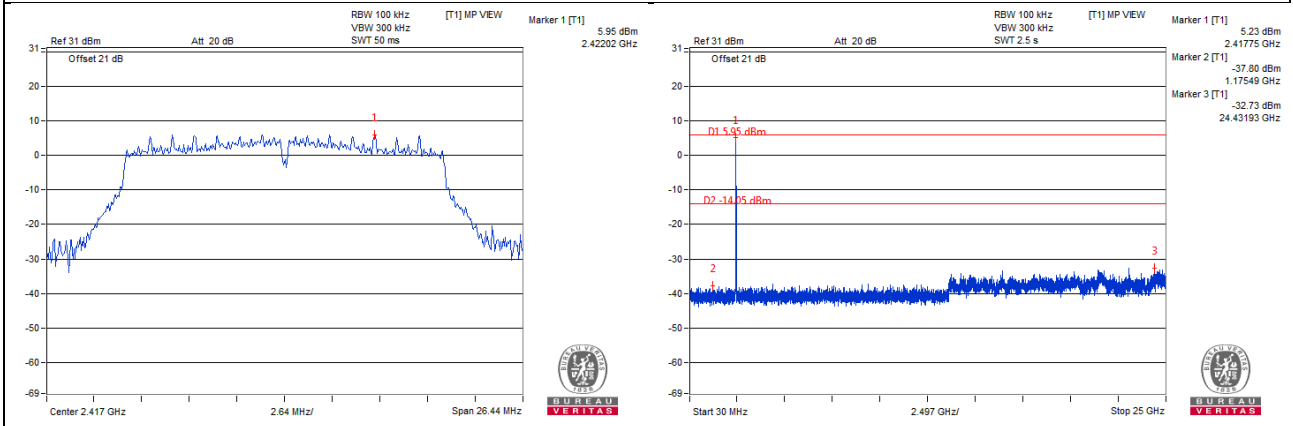
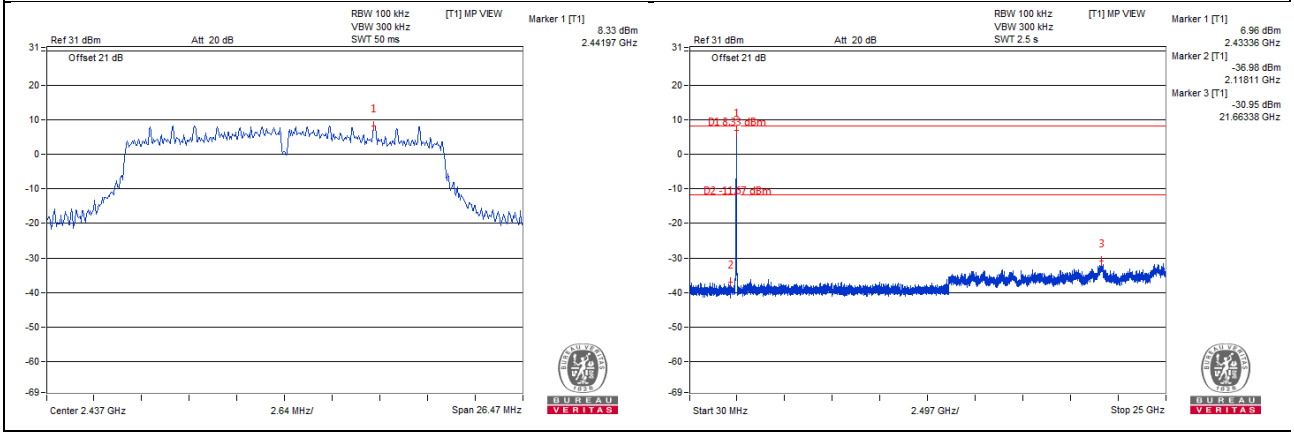
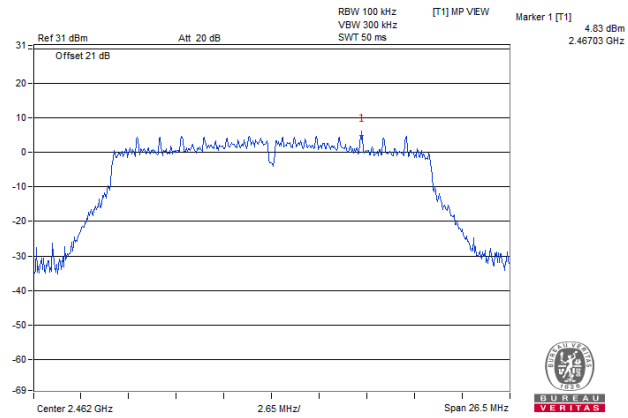
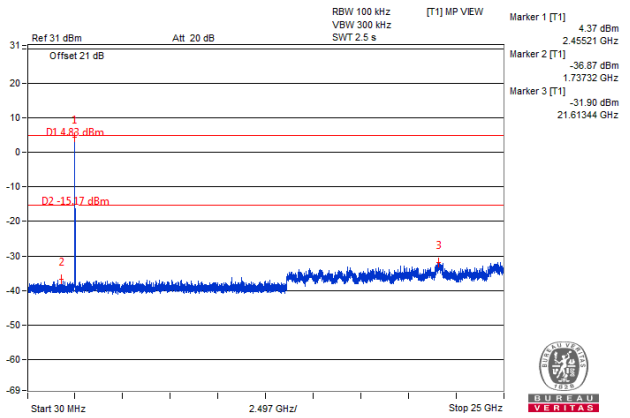


CH 6

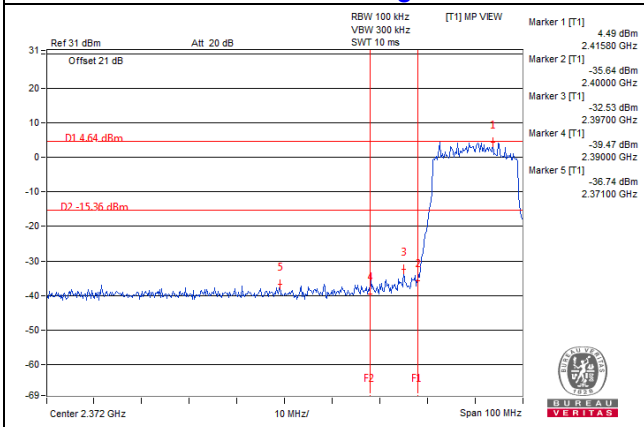


CH 11





CH 1 Band edge



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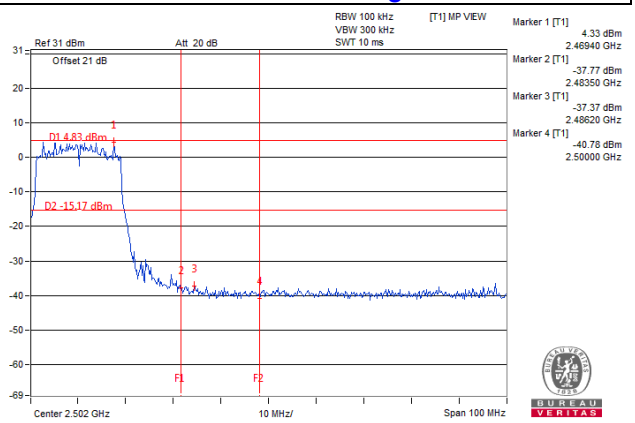

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linkou 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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