

FCC Test Report

Report No.: RF181220D19

FCC ID: 2AGPT-HGW2

Test Model: WiFi-GW

Received Date: Dec. 21, 2018

Test Date: Jan. 4 to Apr. 17, 2019

Issued Date: Apr. 22, 2019

Applicant: SolarEdge Technologies Ltd.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**FCC Registration /
Designation Number:** 198487 / TW2021



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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
3 General Information	7
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal.....	11
3.4 Description of Support Units.....	12
3.4.1 Configuration of System under Test.....	12
3.5 General Description of Applied Standards.....	13
4 Test Types and Results	14
4.1 Radiated Emission and Bandedge Measurement.....	14
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	14
4.1.2 Test Instruments.....	15
4.1.3 Test Procedures.....	16
4.1.4 Deviation from Test Standard.....	16
4.1.5 Test Setup.....	17
4.1.6 EUT Operating Conditions.....	18
4.1.7 Test Results.....	19
4.2 Conducted Emission Measurement.....	30
4.2.1 Limits of Conducted Emission Measurement.....	30
4.2.2 Test Instruments.....	30
4.2.3 Test Procedures.....	31
4.2.4 Deviation from Test Standard.....	31
4.2.5 Test Setup.....	31
4.2.6 EUT Operating Conditions.....	31
4.2.7 Test Results.....	32
4.3 6dB Bandwidth Measurement.....	34
4.3.1 Limits of 6dB Bandwidth Measurement.....	34
4.3.2 Test Setup.....	34
4.3.3 Test Instruments.....	34
4.3.4 Test Procedure.....	34
4.3.5 Deviation from Test Standard.....	34
4.3.6 EUT Operating Conditions.....	34
4.3.7 Test Result.....	35
4.4 Conducted Output Power Measurement.....	37
4.4.1 Limits of Conducted Output Power Measurement.....	37
4.4.2 Test Setup.....	37
4.4.3 Test Instruments.....	37
4.4.4 Test Procedures.....	37
4.4.5 Deviation from Test Standard.....	37
4.4.6 EUT Operating Conditions.....	37
4.4.7 Test Results.....	38
4.5 Power Spectral Density Measurement.....	40
4.5.1 Limits of Power Spectral Density Measurement.....	40
4.5.2 Test Setup.....	40
4.5.3 Test Instruments.....	40
4.5.4 Test Procedure.....	40
4.5.5 Deviation from Test Standard.....	40

4.5.6 EUT Operating Condition	40
4.5.7 Test Results	41
4.6 Conducted Out of Band Emission Measurement.....	43
4.6.1 Limits of Conducted Out of Band Emission Measurement	43
4.6.2 Test Setup.....	43
4.6.3 Test Instruments	43
4.6.4 Test Procedure	43
4.6.5 Deviation from Test Standard	43
4.6.6 EUT Operating Condition	43
4.6.7 Test Results	43
5 Pictures of Test Arrangements.....	47
Appendix – Information of the Testing Laboratories	48

Release Control Record

Issue No.	Description	Date Issued
RF181220D19	Original release.	Apr. 22, 2019

1 Certificate of Conformity

Product: Wi-Fi Gateway, Wi-Fi Repeater
Brand: SolarEdge
Test Model: WiFi-GW
Sample Status: Mass Production
Applicant: SolarEdge Technologies Ltd.
Test Date: Jan. 4 to Apr. 17, 2019
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 RF characteristics under the conditions specified in this report.

Prepared by : Annie Chang, **Date:** Apr. 22, 2019
Annie Chang / Senior Specialist

Approved by : Rex Lai, **Date:** Apr. 22, 2019
Rex Lai / Associate Technical 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 -0.96 dB at 0.68377 MHz
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.10dB at 2483.50MHz.
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 R-SMA not a standard connector.

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.54 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.48 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wi-Fi Gateway, Wi-Fi Repeater
Brand	SolarEdge
Test Model	WiFi-GW
Status of EUT	Mass Production
Power Supply Rating	Input: 100-240Vac, 50/60Hz, 50mA
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 72.2Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11
Output Power	251.189mW
Antenna Type	Dipole antenna with 5dBi gain
Antenna Connector	R-SMA
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX

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

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

Where RE \geq 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**.

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
-	802.11n (20MHz)	1 to 11	1, 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 70%RH	120Vac, 60Hz	Ian Chang
RE<1G	24deg. C, 77%RH	120Vac, 60Hz	Dalen Dai
PLC	23deg. C, 76%RH	120Vac, 60Hz	Chin-Wen Wang
APCM	25deg. C, 76%RH	120Vac, 60Hz	Saxon Lee

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.



3.4 Description of Support Units

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook PC	ASUS	PU401L	E9NXBC002007372	FCC DoC Approved	Provided by Lab
B.	PERSONAL COMPUTER	DELL	VOSTRO 470	5VBJYBX	FCC DoC Approved	Provided by Lab
C.	Wireless Broadband Router	D-LINK	DIR-815	N/A	KA2IR518B1	Provided by Lab
D.	Notebook PC	SONY	SVS151A12P	275548477001024	N/A	Provided by Lab

Note:

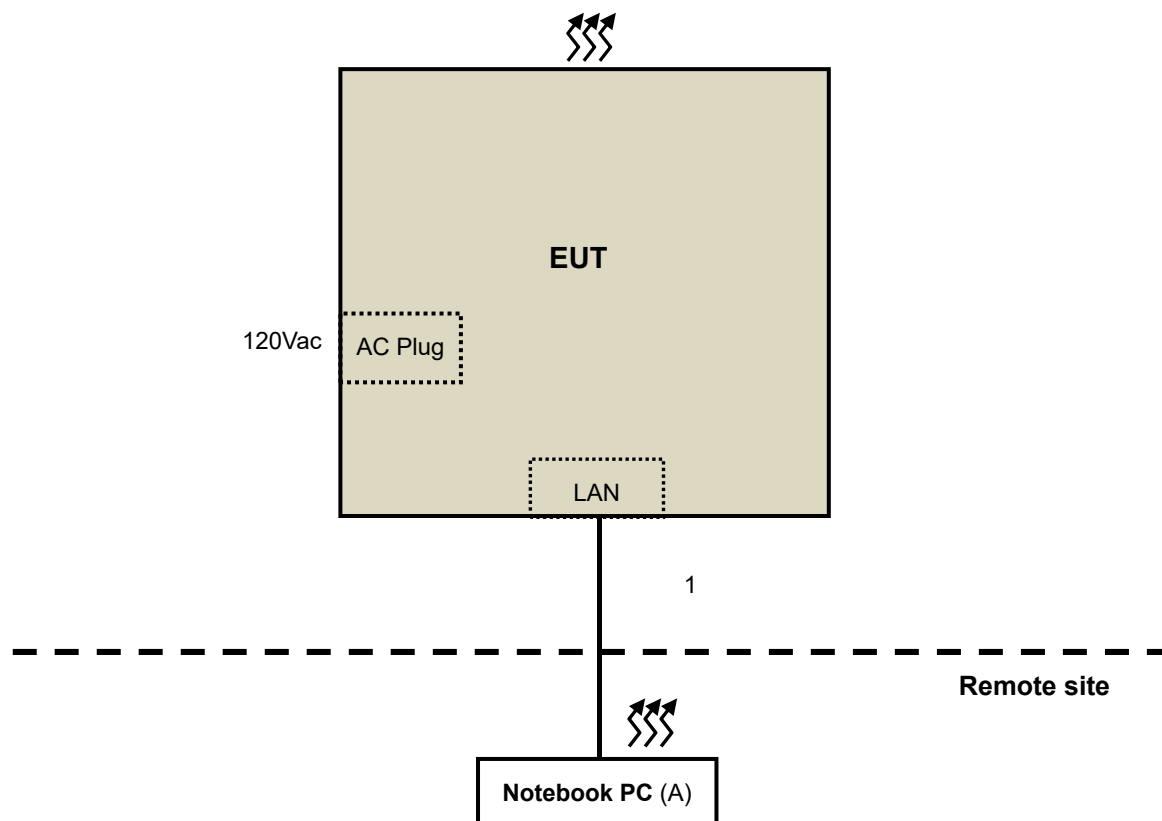
1. All power cords of the above support units are non-shielded (1.8m).
2. Items A-D acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable (Cat.5e)	1	10	N	0	Provided by Lab
2.	LAN cable (Cat.5e)	1	1	N	0	Provided by Lab

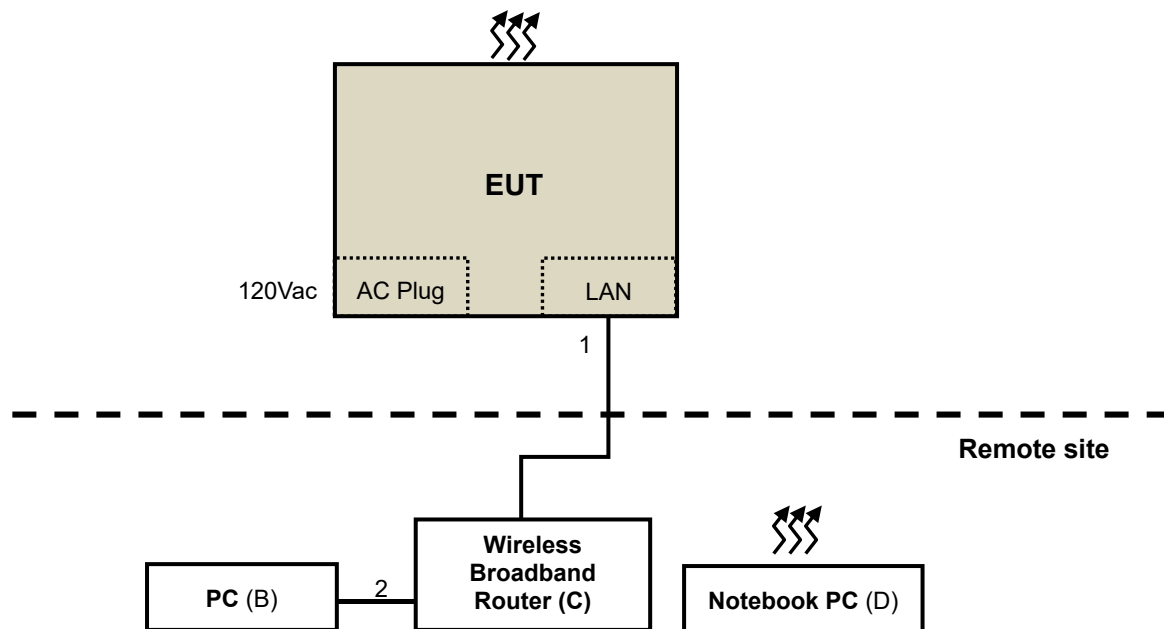
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

Radiated emission test



For Conducted emission 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 v05r02**
- 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
HP Preamplifier	8447D	2432A03504	Feb. 21, 2018	Feb. 20, 2019
			Feb. 20, 2019	Feb. 19, 2020
HP Preamplifier	8449B	3008A01201	Feb. 22, 2018	Feb. 21, 2019
			Feb. 21, 2019	Feb. 20, 2020
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2018	Feb. 20, 2019
			Feb. 20, 2019	Feb. 19, 2020
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 6, 2018	Feb. 5, 2019
			Mar. 05, 2019	Mar. 04, 2020
Schwarzbeck Antenna	VULB 9168	139	Nov. 26, 2018	Nov. 25, 2019
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 25, 2018	Nov. 24, 2019
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 25, 2018	Nov. 24, 2019
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Aug. 13, 2018	Aug. 12, 2019
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Aug. 13, 2018	Aug. 12, 2019
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 4, 2018	Jun. 3, 2019
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Aug. 3, 2018	Aug. 2, 2019
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
EMCO Horn Antenna	3115	00028257	Nov. 25, 2018	Nov. 24, 2019
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 27, 2018	Sep. 26, 2019
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2018	Apr. 25, 2019
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2018	Apr. 25, 2019

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. Tested Date: Jan. 4 to Apr. 17, 2019

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:

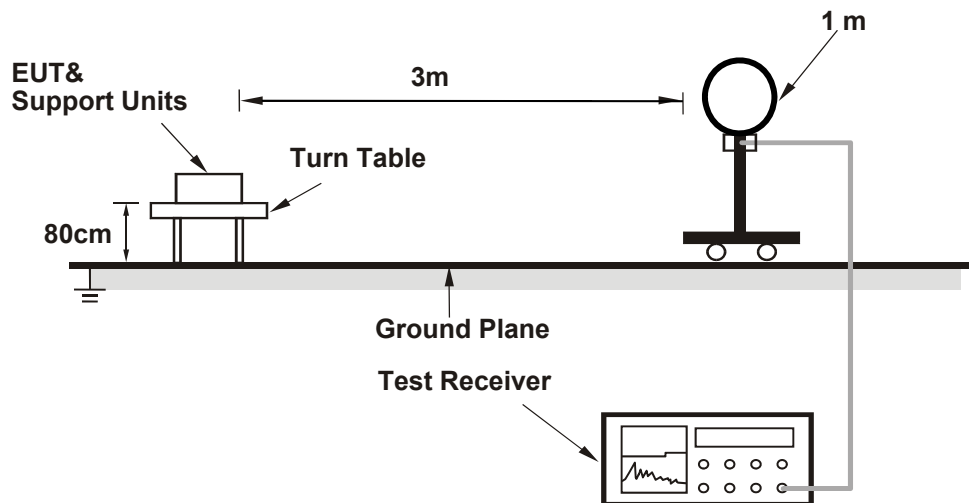
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

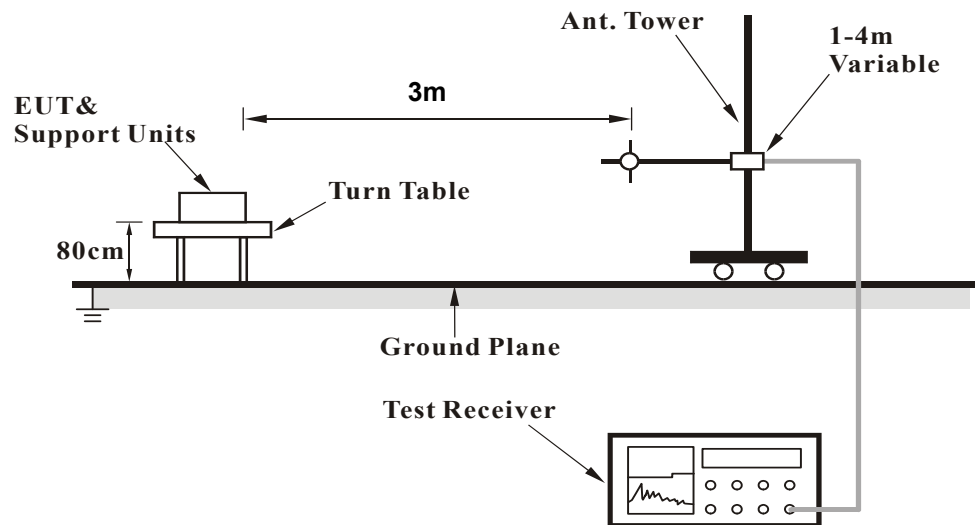
No deviation.

4.1.5 Test Setup

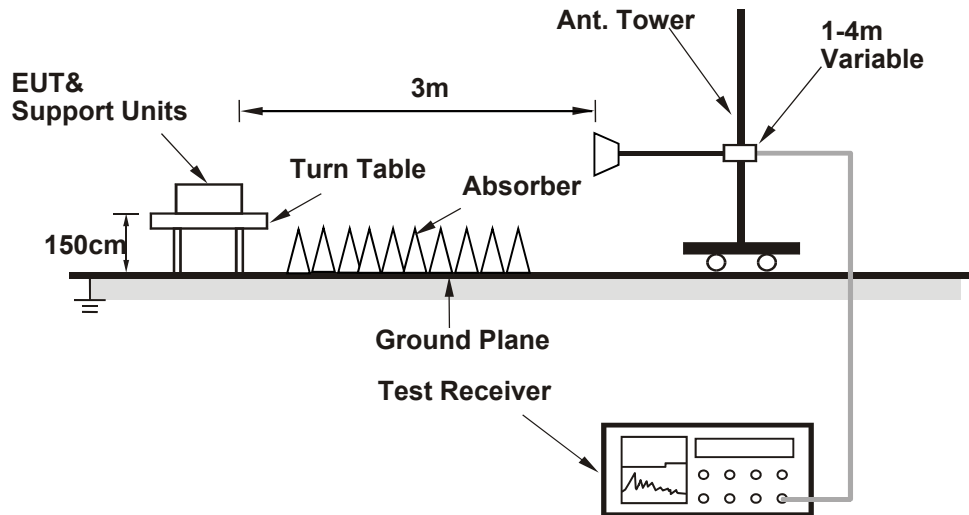
For Radiated emission below 30MHz



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

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data :

802.11b

CHANNEL	TX Channel 1	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	54.07 PK	74.00	-19.93	2.38 H	16	55.22	-1.15
2	2390.00	39.78 AV	54.00	-14.22	2.38 H	16	40.93	-1.15
3	*2412.00	96.65 PK			2.38 H	16	97.77	-1.12
4	*2412.00	93.70 AV			2.38 H	16	94.82	-1.12
5	4824.00	54.85 PK	74.00	-19.15	1.02 H	131	49.60	5.25
6	4824.00	51.52 AV	54.00	-2.48	1.02 H	131	46.27	5.25
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	56.50 PK	74.00	-17.50	1.53 V	270	57.65	-1.15
2	2390.00	45.76 AV	54.00	-8.24	1.53 V	270	46.91	-1.15
3	*2412.00	105.61 PK			1.53 V	270	106.73	-1.12
4	*2412.00	102.72 AV			1.53 V	270	103.84	-1.12
5	4824.00	55.35 PK	74.00	-18.65	1.66 V	185	50.10	5.25
6	4824.00	52.89 AV	54.00	-1.11	1.66 V	185	47.64	5.25

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 other emission levels were very low against the limit.
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	*2437.00	98.81 PK			2.41 H	20	99.89	-1.08
2	*2437.00	95.70 AV			2.41 H	20	96.78	-1.08
3	4874.00	54.07 PK	74.00	-19.93	1.52 H	140	49.00	5.07
4	4874.00	51.89 AV	54.00	-2.11	1.52 H	140	46.82	5.07

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	107.37 PK			1.68 V	267	108.45	-1.08
2	*2437.00	104.47 AV			1.68 V	267	105.55	-1.08
3	4874.00	55.09 PK	74.00	-18.91	2.94 V	147	50.02	5.07
4	4874.00	52.84 AV	54.00	-1.16	2.94 V	147	47.77	5.07

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	97.74 PK			2.48 H	52	98.76	-1.02
2	*2462.00	94.61 AV			2.48 H	52	95.63	-1.02
3	2483.50	55.86 PK	74.00	-18.14	2.48 H	52	56.84	-0.98
4	2483.50	43.31 AV	54.00	-10.69	2.48 H	52	44.29	-0.98
5	4924.00	54.52 PK	74.00	-19.48	1.15 H	163	49.52	5.00
6	4924.00	51.88 AV	54.00	-2.12	1.15 H	163	46.88	5.00

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	106.60 PK			1.47 V	181	107.62	-1.02
2	*2462.00	103.72 AV			1.47 V	181	104.74	-1.02
3	2483.50	57.25 PK	74.00	-16.75	1.47 V	181	58.23	-0.98
4	2483.50	46.45 AV	54.00	-7.55	1.47 V	181	47.43	-0.98
5	4924.00	55.61 PK	74.00	-18.39	2.13 V	86	50.61	5.00
6	4924.00	52.87 AV	54.00	-1.13	2.13 V	86	47.87	5.00

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	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	57.97 PK	74.00	-16.03	1.76 H	245	59.12	-1.15
2	2390.00	40.34 AV	54.00	-13.66	1.76 H	245	41.49	-1.15
3	*2412.00	97.13 PK			1.76 H	245	98.25	-1.12
4	*2412.00	85.37 AV			1.76 H	245	86.49	-1.12
5	4824.00	51.59 PK	74.00	-22.41	1.11 H	134	46.34	5.25
6	4824.00	40.22 AV	54.00	-13.78	1.11 H	134	34.97	5.25

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	72.76 PK	74.00	-1.24	1.55 V	258	73.91	-1.15
2	2390.00	49.88 AV	54.00	-4.12	1.55 V	258	51.03	-1.15
3	*2412.00	109.82 PK			1.55 V	258	110.94	-1.12
4	*2412.00	98.41 AV			1.55 V	258	99.53	-1.12
5	4824.00	54.04 PK	74.00	-19.96	1.26 V	172	48.79	5.25
6	4824.00	44.23 AV	54.00	-9.77	1.26 V	172	38.98	5.25

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 other emission levels were very low against the limit.
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	*2437.00	103.79 PK			1.82 H	238	104.87	-1.08
2	*2437.00	92.55 AV			1.82 H	238	93.63	-1.08
3	4874.00	53.86 PK	74.00	-20.14	1.18 H	145	48.79	5.07
4	4874.00	43.63 AV	54.00	-10.37	1.18 H	145	38.56	5.07

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	115.04 PK			1.68 V	262	116.12	-1.08
2	*2437.00	103.25 AV			1.68 V	262	104.33	-1.08
3	4874.00	55.31 PK	74.00	-18.69	1.68 V	262	50.24	5.07
4	4874.00	45.95 AV	54.00	-8.05	1.68 V	262	40.88	5.07

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	98.84 PK			1.80 H	241	99.86	-1.02
2	*2462.00	85.87 AV			1.80 H	241	86.89	-1.02
3	2483.50	67.61 PK	74.00	-6.39	1.80 H	241	68.59	-0.98
4	2483.50	47.28 AV	54.00	-6.72	1.80 H	241	48.26	-0.98
5	4924.00	51.84 PK	74.00	-22.16	1.23 H	140	46.84	5.00
6	4924.00	40.16 AV	54.00	-13.84	1.23 H	140	35.16	5.00

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	109.22 PK			1.50 V	262	110.31	-1.09
2	*2462.00	97.35 AV			1.50 V	262	98.44	-1.09
3	2483.50	72.90 PK	74.00	-1.10	1.50 V	262	73.88	-0.98
4	2483.50	51.29 AV	54.00	-2.71	1.50 V	262	52.27	-0.98
5	4924.00	53.99 PK	74.00	-20.01	1.36 V	189	48.99	5.00
6	4924.00	44.28 AV	54.00	-9.72	1.36 V	189	39.28	5.00

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.73 PK	74.00	-15.27	1.82 H	236	59.88	-1.15
2	2390.00	40.29 AV	54.00	-13.71	1.82 H	236	41.44	-1.15
3	*2412.00	99.41 PK			1.82 H	236	100.53	-1.12
4	*2412.00	87.14 AV			1.82 H	236	88.26	-1.12
5	4824.00	54.02 PK	74.00	-19.98	1.47 H	126	48.77	5.25
6	4824.00	43.51 AV	54.00	-10.49	1.47 H	126	38.26	5.25

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	72.88 PK	74.00	-1.12	1.10 V	262	74.03	-1.15
2	2390.00	52.31 AV	54.00	-1.69	1.10 V	262	53.46	-1.15
3	*2412.00	110.89 PK			1.10 V	262	112.01	-1.12
4	*2412.00	98.65 AV			1.10 V	262	99.77	-1.12
5	4824.00	54.60 PK	74.00	-19.40	1.26 V	182	49.35	5.25
6	4824.00	44.81 AV	54.00	-9.19	1.26 V	182	39.56	5.25

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 other emission levels were very low against the limit.
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	*2437.00	103.47 PK			1.88 H	240	104.55	-1.08
2	*2437.00	91.55 AV			1.88 H	240	92.63	-1.08
3	4874.00	54.77 PK	74.00	-19.23	1.56 H	133	49.70	5.07
4	4874.00	44.33 AV	54.00	-9.67	1.56 H	133	39.26	5.07

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	115.68 PK			1.23 V	262	116.76	-1.08
2	*2437.00	103.34 AV			1.23 V	262	104.42	-1.08
3	4874.00	55.51 PK	74.00	-18.49	1.34 V	191	50.44	5.07
4	4874.00	45.92 AV	54.00	-8.08	1.34 V	191	40.85	5.07

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	97.77 PK			1.90 H	246	98.79	-1.02
2	*2462.00	85.86 AV			1.90 H	246	86.88	-1.02
3	2483.50	66.51 PK	74.00	-7.49	1.90 H	246	67.49	-0.98
4	2483.50	46.02 AV	54.00	-7.98	1.90 H	246	47.00	-0.98
5	4924.00	53.78 PK	74.00	-20.22	1.52 H	137	48.78	5.00
6	4924.00	43.26 AV	54.00	-10.74	1.52 H	137	38.26	5.00

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	109.87 PK			1.09 V	288	110.89	-1.02
2	*2462.00	97.98 AV			1.09 V	288	99.00	-1.02
3	2483.50	72.86 PK	74.00	-1.14	1.09 V	288	73.84	-0.98
4	2483.50	51.39 AV	54.00	-2.61	1.09 V	288	52.37	-0.98
5	4924.00	54.86 PK	74.00	-19.14	1.36 V	197	49.86	5.00
6	4924.00	44.67 AV	54.00	-9.33	1.36 V	197	39.67	5.00

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 other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Below 1GHz Data:

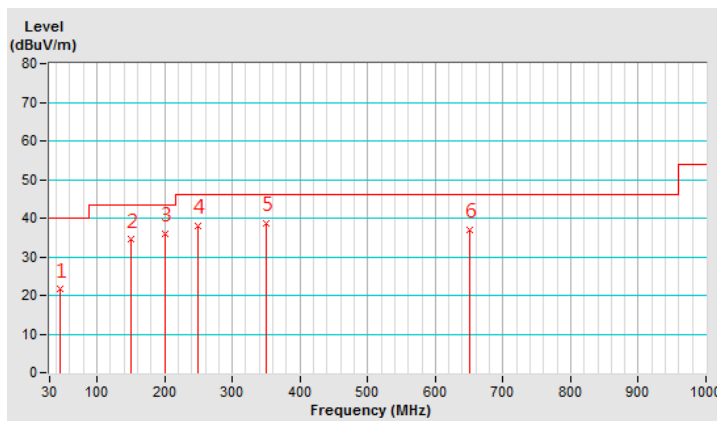
802.11n (20MHz)

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	45.57	21.58 QP	40.00	-18.42	1.83 H	128	28.81	-7.23
2	149.99	34.45 QP	43.50	-9.05	1.55 H	266	41.30	-6.85
3	199.99	35.98 QP	43.50	-7.52	1.71 H	240	45.06	-9.08
4	250.00	38.01 QP	46.00	-7.99	1.64 H	235	44.96	-6.95
5	350.00	38.81 QP	46.00	-7.19	2.08 H	219	43.10	-4.29
6	650.02	36.96 QP	46.00	-9.04	1.95 H	212	35.07	1.89

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 other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. 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.



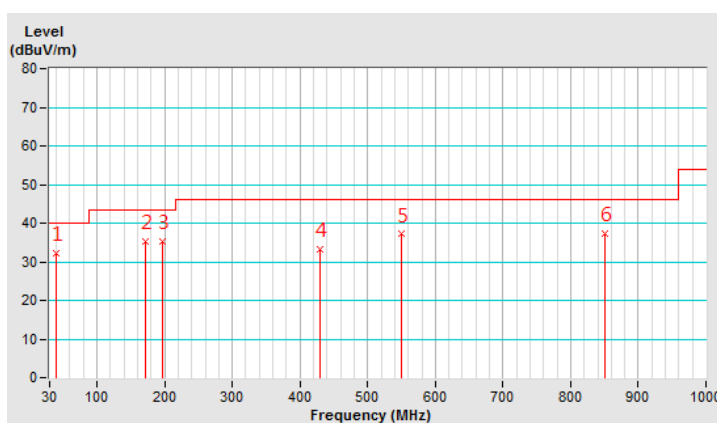
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	40.62	32.27 QP	40.00	-7.73	1.57 V	345	39.92	-7.65
2	171.43	35.31 QP	43.50	-8.19	1.84 V	168	42.53	-7.22
3	197.18	35.40 QP	43.50	-8.10	1.29 V	152	44.49	-9.09
4	428.91	33.21 QP	46.00	-12.79	1.93 V	76	35.66	-2.45
5	550.02	37.15 QP	46.00	-8.85	1.66 V	235	37.66	-0.51
6	849.99	37.37 QP	46.00	-8.63	2.05 V	164	32.01	5.36

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 other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. 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.



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.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESR3	102413	Feb. 18, 2019	Feb. 17, 2020
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 18, 2018	Dec. 17, 2019
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 18, 2018	Dec. 17, 2019
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Nov. 5, 2018	Nov. 4, 2019
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 3, 2018	May 2, 2019
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK 8121	8121-808	Mar. 15, 2019	Mar. 14, 2020
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Feb. 20, 2019	Feb. 19, 2020
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 8, 2018	May 7, 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 test was performed in Shielded Room No. 9.

3. Tested Date: Apr. 15, 2019

4.2.3 Test Procedures

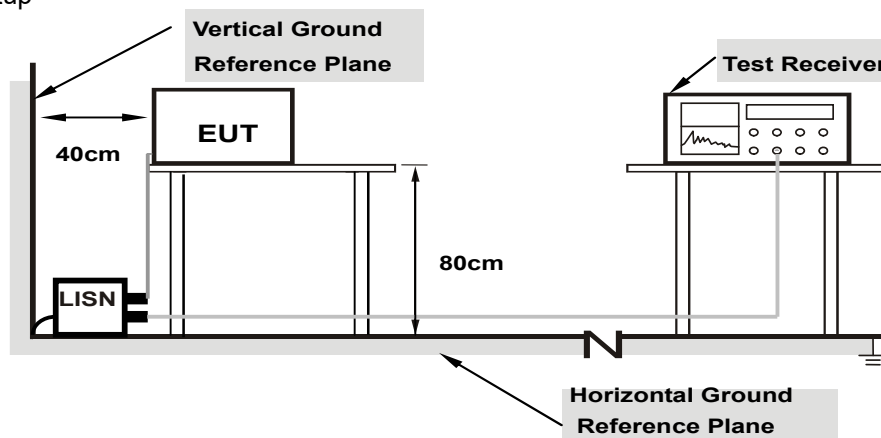
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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.

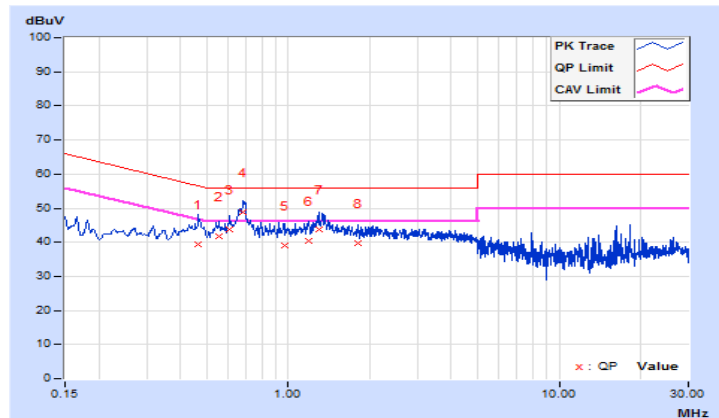
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.
1	0.46668	10.32	29.03	19.19	39.35	29.51	56.57	46.57	-17.22	-17.06
2	0.55865	10.34	31.49	22.01	41.83	32.35	56.00	46.00	-14.17	-13.65
3	0.60948	10.34	33.31	24.52	43.65	34.86	56.00	46.00	-12.35	-11.14
4	0.68377	10.36	38.37	28.28	48.73	38.64	56.00	46.00	-7.27	-7.36
5	0.96529	10.40	28.71	19.75	39.11	30.15	56.00	46.00	-16.89	-15.85
6	1.18816	10.45	29.79	20.60	40.24	31.05	56.00	46.00	-15.76	-14.95
7	1.30155	10.47	33.35	22.28	43.82	32.75	56.00	46.00	-12.18	-13.25
8	1.81376	10.57	29.17	19.55	39.74	30.12	56.00	46.00	-16.26	-15.88

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.

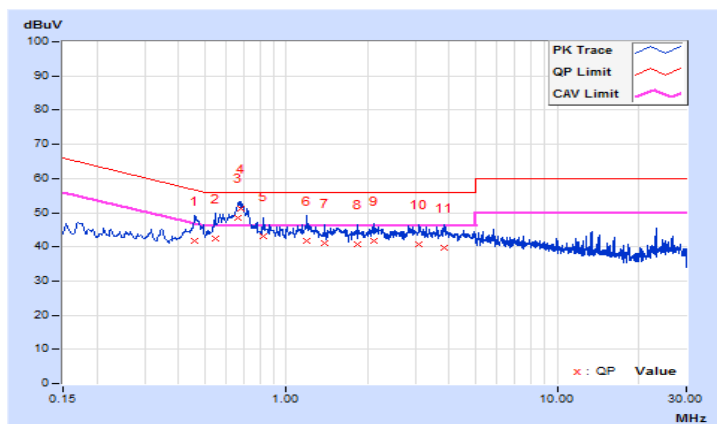


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.45889	10.33	31.40	23.98	41.73	34.31	56.71	46.71	-14.98	-12.40
2	0.54692	10.34	32.17	25.52	42.51	35.86	56.00	46.00	-13.49	-10.14
3	0.66292	10.36	38.28	32.37	48.64	42.73	56.00	46.00	-7.36	-3.27
4	0.68377	10.37	40.92	34.67	51.29	45.04	56.00	46.00	-4.71	-0.96
5	0.82844	10.39	32.86	26.94	43.25	37.33	56.00	46.00	-12.75	-8.67
6	1.19546	10.46	31.16	25.66	41.62	36.12	56.00	46.00	-14.38	-9.88
7	1.37975	10.50	30.60	24.61	41.10	35.11	56.00	46.00	-14.90	-10.89
8	1.83722	10.60	30.26	23.88	40.86	34.48	56.00	46.00	-15.14	-11.52
9	2.09528	10.64	31.15	23.99	41.79	34.63	56.00	46.00	-14.21	-11.37
10	3.07669	10.74	29.96	24.32	40.70	35.06	56.00	46.00	-15.30	-10.94
11	3.84696	10.82	28.87	22.56	39.69	33.38	56.00	46.00	-16.31	-12.62

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.

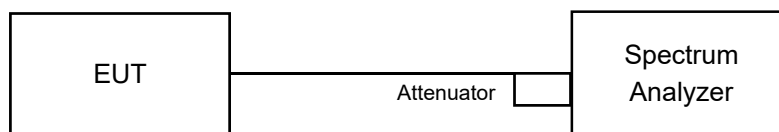


4.3 6dB Bandwidth Measurement

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) $\geq 3 \times$ 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
1	2412	12.15	0.5	PASS
6	2437	12.15	0.5	PASS
11	2462	12.15	0.5	PASS

802.11g

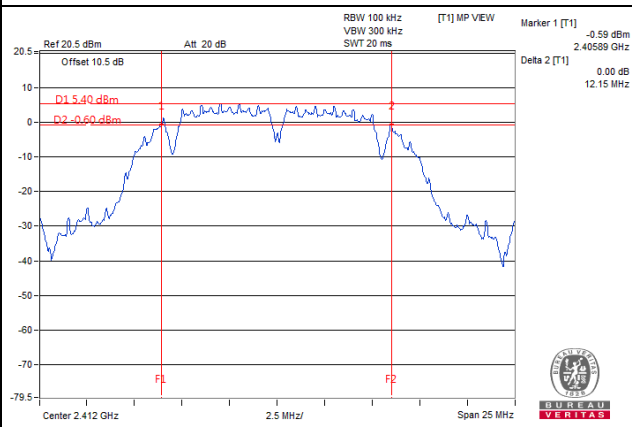
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.55	0.5	PASS
6	2437	16.53	0.5	PASS
11	2462	16.51	0.5	PASS

802.11n (20MHz)

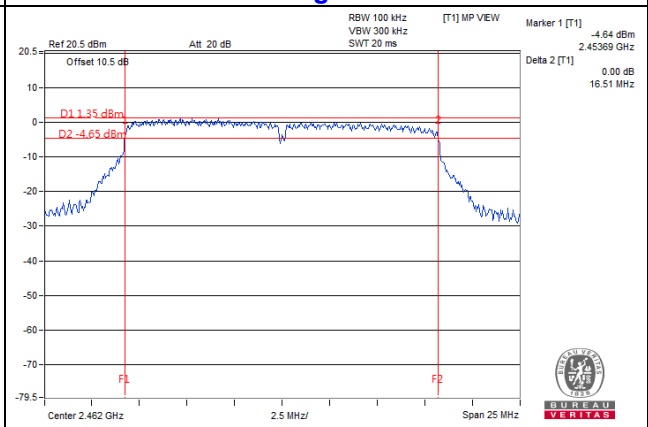
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.78	0.5	PASS
6	2437	17.82	0.5	PASS
11	2462	17.81	0.5	PASS

Spectrum Plot of Worst Value

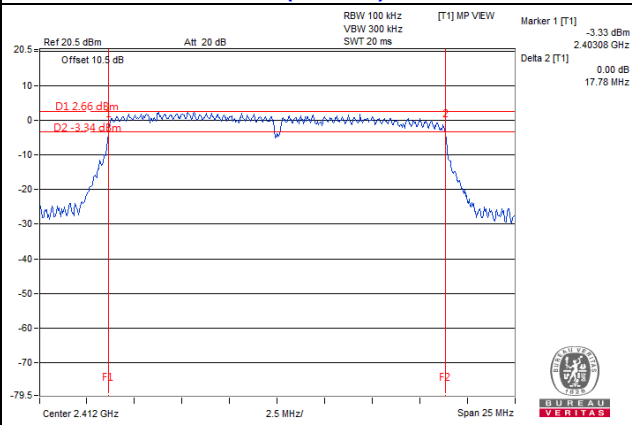
802.11b : CH1



802.11g : CH11



802.11n (20MHz) : CH1

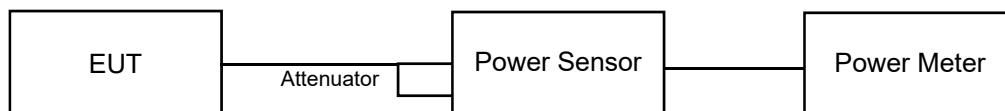


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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.	Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	121.619	20.85	30	Pass
6	2437	111.944	20.49	30	Pass
11	2462	98.628	19.94	30	Pass

802.11g

Chan.	Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	210.378	23.23	30	Pass
6	2437	251.189	24.00	30	Pass
11	2462	165.959	22.20	30	Pass

802.11n (20MHz)

Chan.	Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	179.887	22.55	30	Pass
6	2437	250.611	23.99	30	Pass
11	2462	144.544	21.60	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	70.958	18.51
6	2437	64.121	18.07
11	2462	55.335	17.43

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	44.566	16.49
6	2437	112.72	20.52
11	2462	33.884	15.30

802.11n (20MHz)

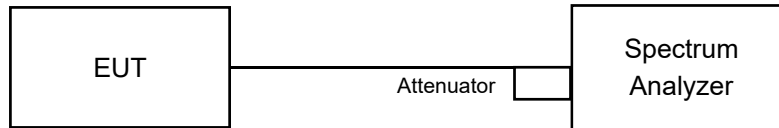
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	39.719	15.99
6	2437	111.173	20.46
11	2462	30.549	14.85

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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq 3 \times \text{RBW}$.
- 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

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-9.87	8	Pass
6	2437	-10.38	8	Pass
11	2462	-10.74	8	Pass

802.11g

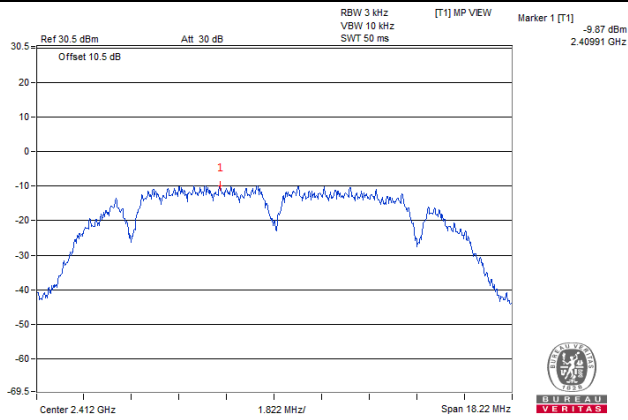
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-9.74	8	Pass
6	2437	-5.29	8	Pass
11	2462	-10.56	8	Pass

802.11n (20MHz)

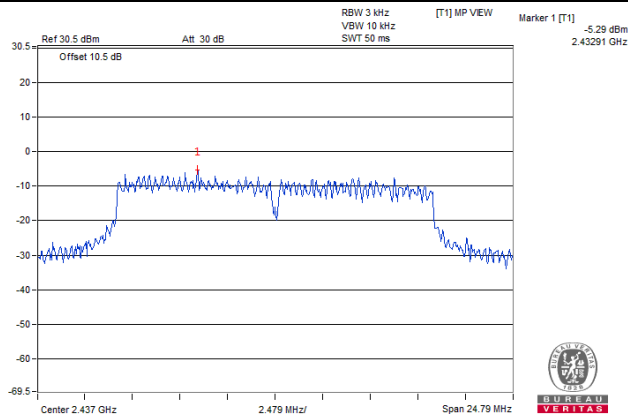
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-10.13	8	Pass
6	2437	-5.13	8	Pass
11	2462	-10.82	8	Pass

Spectrum Plot of Worst Value

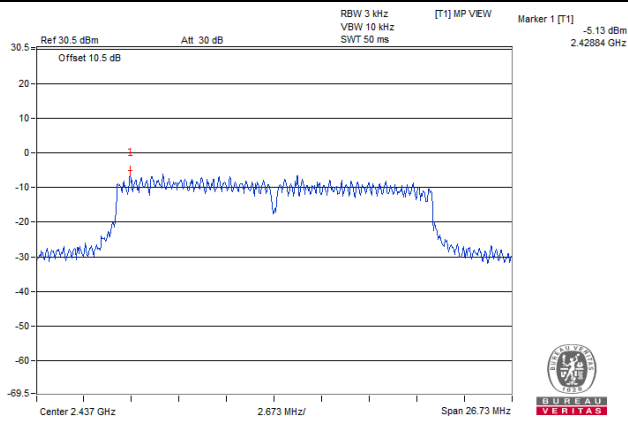
802.11b : CH1



802.11g : CH6



802.11n (20MHz) : CH6

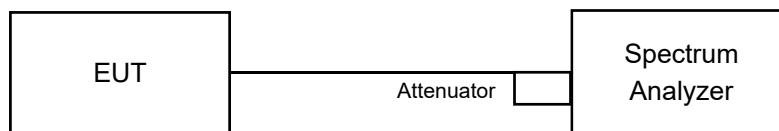


4.6 Conducted Out of Band Emission Measurement

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 \geq 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 \geq 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

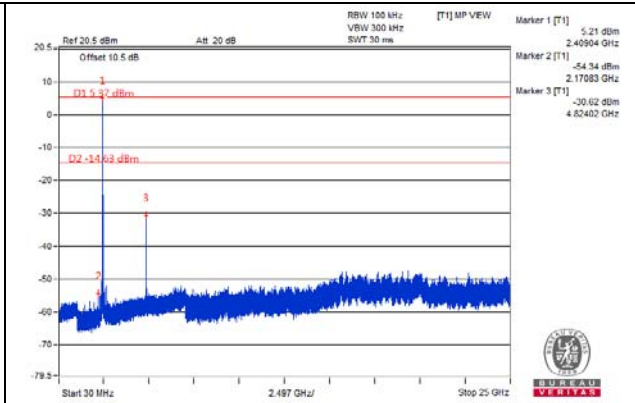
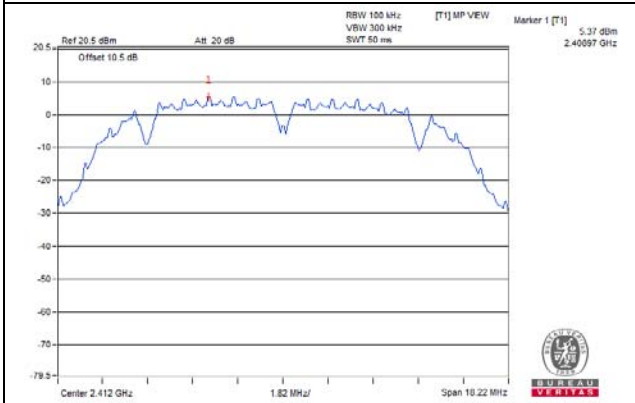
Same as Item 4.3.6

4.6.7 Test Results

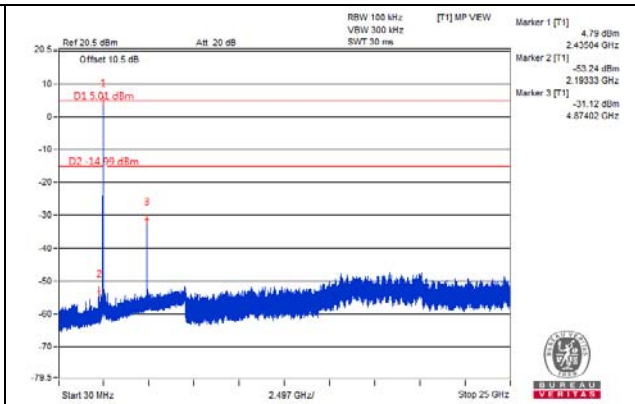
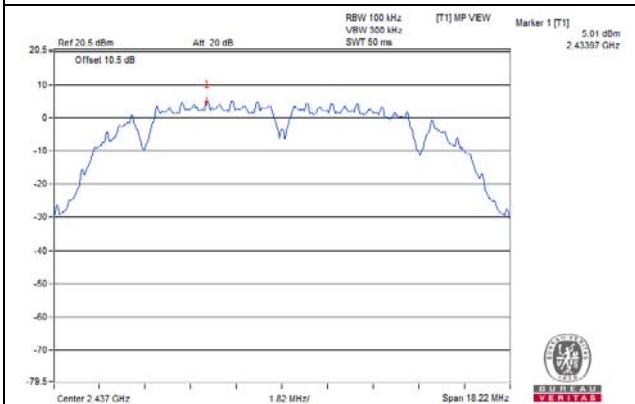
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b:

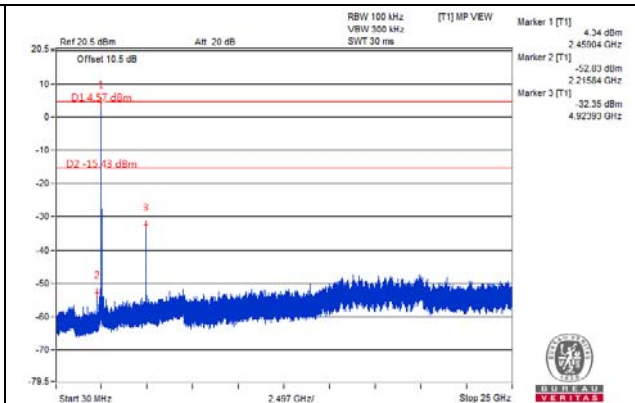
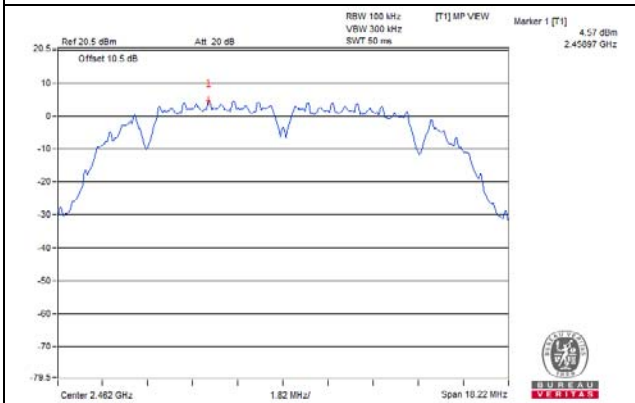
CH 1



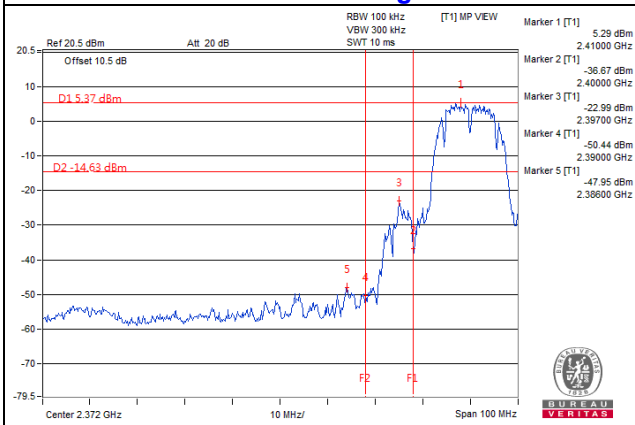
CH 6



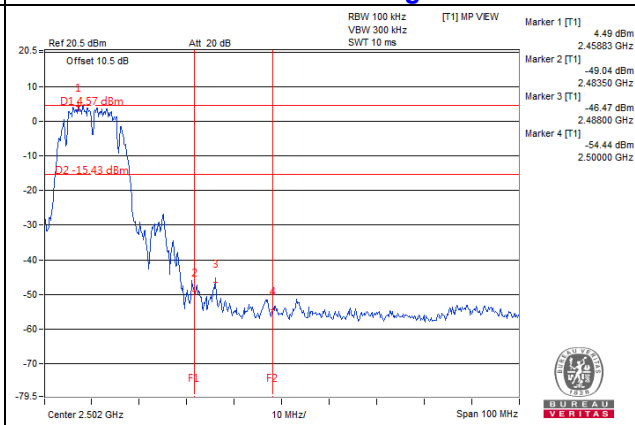
CH 11



CH 1 Band edge

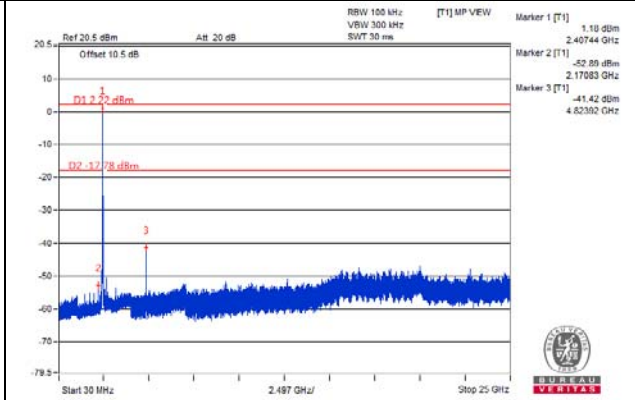
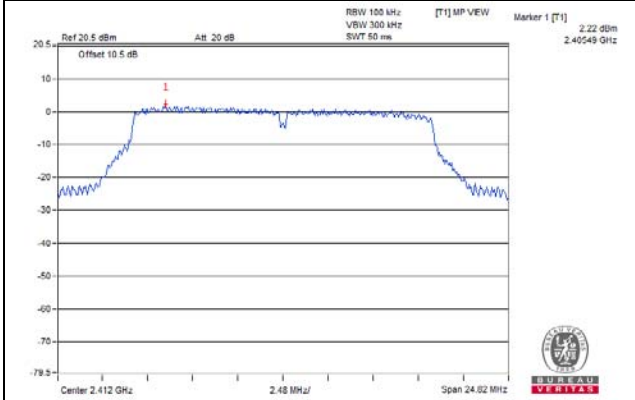


CH 11 Band edge

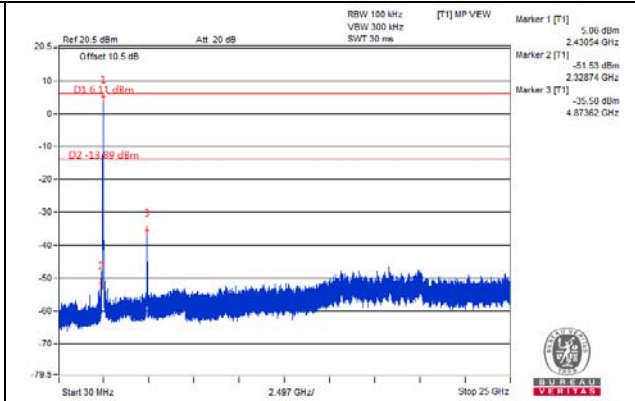
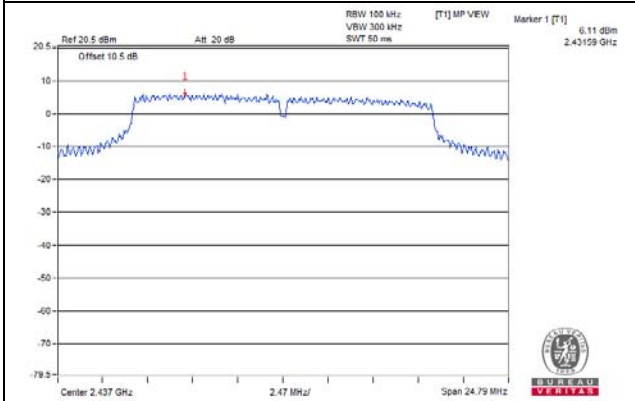


802.11g:

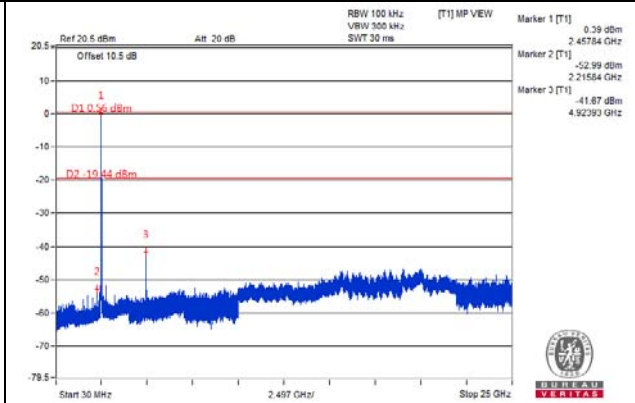
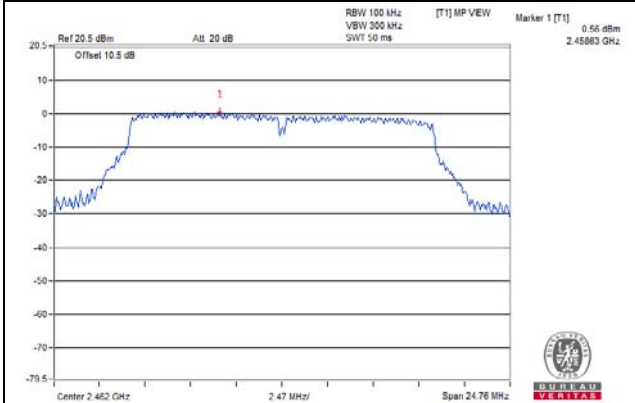
CH 1



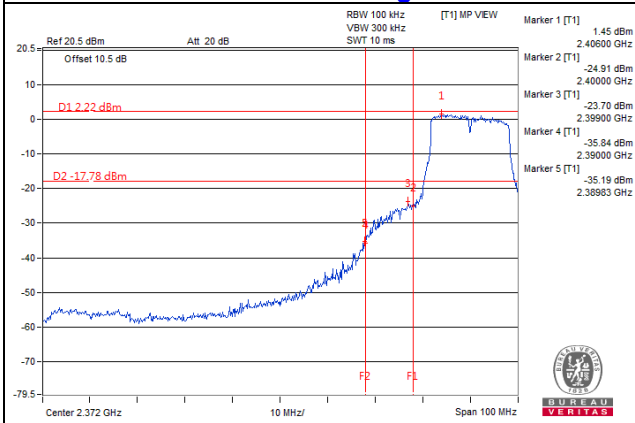
CH 6



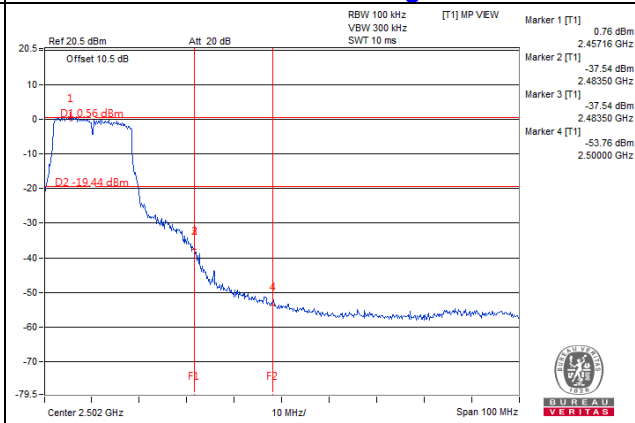
CH 11



CH 1 Band edge

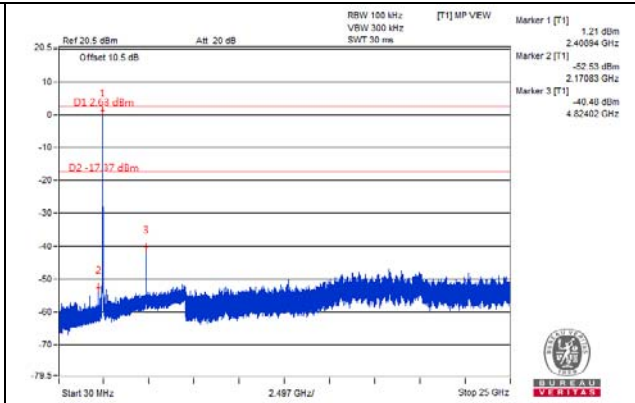
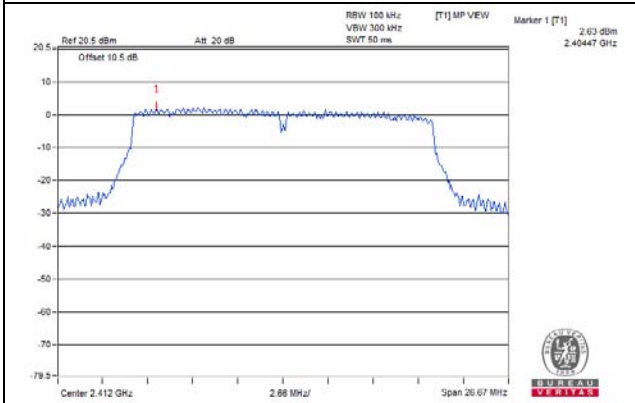


CH 11 Band edge

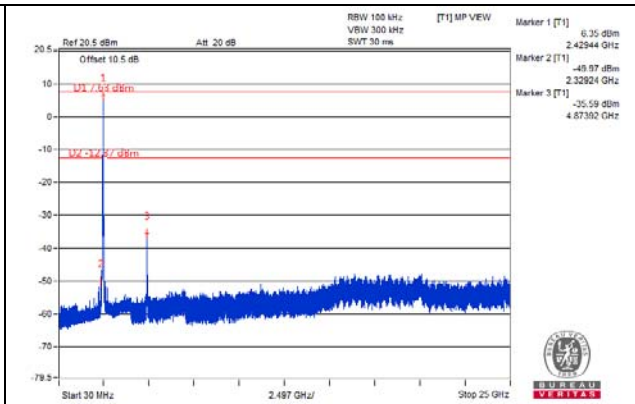
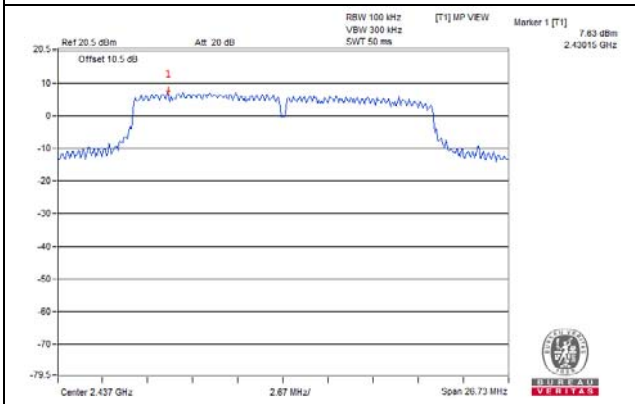


802.11n (20MHz):

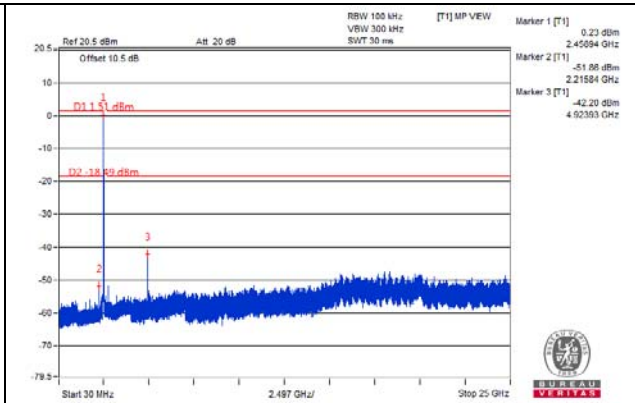
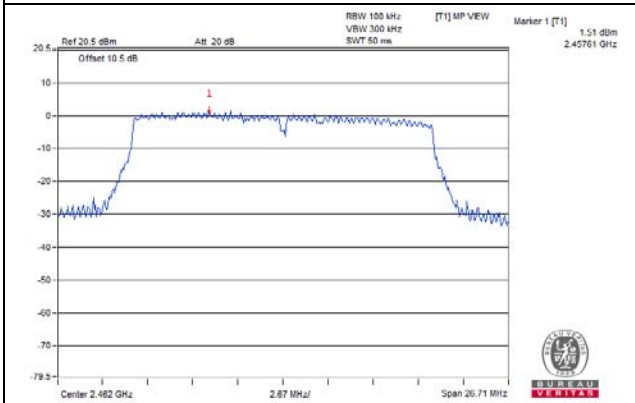
CH 1



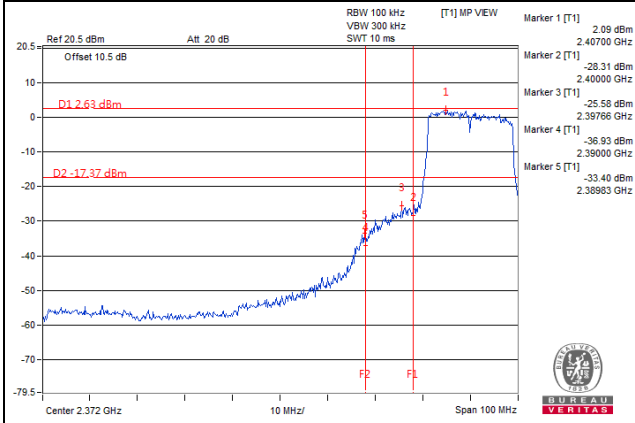
CH 6



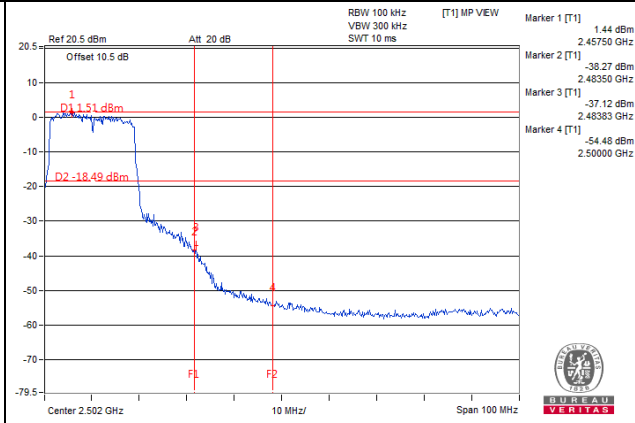
CH 11



CH 1 Band edge



CH 11 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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

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