

FCC Test Report

Report No.: RF170421C58

FCC ID: UZ7TC200J

Test Model: TC200J

Received Date: Apr. 21, 2017

Test Date: Apr. 24 ~ Jun. 29, 2017

Issued Date: Jul. 04, 2017

Applicant: Zebra Technologies Corporation

Address: 1 Zebra Plaza Holtsville New York United States 11742

Manufacturer: Zebra Technologies Corporation

Address: 1 Zebra Plaza Holtsville New York United States 11742

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



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Release Control Record

Issue No.	Description	Date Issued
RF170421C58	Original release.	Jul. 04, 2017

1 Certificate of Conformity

Product: Touch Computer

Brand: ZEBRA

Test Model: TC200J


Sample Status: Engineering sample

Applicant: Zebra Technologies Corporation

Test Date: Apr. 24 ~ Jun. 29, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

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

Prepared by :  , **Date:** Jul. 04, 2017
Pettie Chen / Senior Specialist

Approved by :  , **Date:** Jul. 04, 2017
Ken Liu / Senior 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 -13.90dB at 0.41035MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 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	No antenna connector is used.

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) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Touch Computer
Brand	ZEBRA
Test Model	TC200J
Status of EUT	Engineering sample
MFD	28MAR17
HW Version	EV
SW Version	90-04-03-N-00-E1
Power Supply Rating	5Vdc from adapter or host equipment 3.85Vdc from battery
Transfer Rate	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 150Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	227.510mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter, Gun Handle, Headset (1.25m non-shielded cable without core), Arm Mount, Holster (Refer to note 5 for more details)
Data Cable Supplied	1.5m shielded USB Type C to Type A cable without core (Refer to note 5 for more details)

Note:

1. The EUT has three types for sale.

Brand	Model	Difference
ZEBRA	TC200J	Scanner SE4710 with camera, with 2pin
		Scanner SE4710 with camera, with 8pin (option)
		Scanner SE2100 without camera, blank

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

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX

3. The EUT consumes power from the following adapter and battery.

Adapter	
Brand	ZEBRA
Model	SAWA-65-20005A
Input Power	100-240Vac, 0.5A, 50-60Hz
Output Power	5Vdc, 2.5A

Battery	
Brand	ZEBRA
Model	BT-000334
Rate capacity(mAh)	3000mAh
Min capacity(mAh)	2800mAh
Rate Voltage	3.85Vdc

4. The following antennas were provided to the EUT.

Type	Connector	Gain (dBi)	
		2.4GHz	5GHz
PIFA	NA	2.25	4.22

5. Accessory devices of EUT are list as below:

Specification of Accessory		
AC Adapter	Brand Name	ZEBRA
	Model Name	SAWA-65-20005A
USB Type C cable	Brand Name	ZEBRA
	P/N Number	CBL-MPM-USB1-01
Ear Headset	Brand Name	ZEBRA
	Model Name	HDST-25MM-PTVP-01
Headset Adapter Cable	Brand Name	ZEBRA
	Model Name	CBL-TC51-HDST35-01
Gun Handle	Brand Name	ZEBRA
	P/N Number	TRG-TC2X-SNP1-01
Arm Mount	Brand Name	ZEBRA
	P/N Number	SG-TC2X-ARMNT-01
Holster	Brand Name	ZEBRA
	P/N Number	SG-TC2X-HLSTR1-01

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
A	√	√	√	√	Scanner SE4710 (2pin), EUT with Headset
B	-	√	√	-	Scanner SE4710 (2pin), EUT with Gun Handle
C	-	√	√	-	Scanner SE4710 (8pin), EUT with Headset
D	-	√	√	-	Scanner SE2100 (2pin), EUT with Headset

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:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. "-": Means no effect.

Radiated Emission Test (Above 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C, D	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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)
A, B, C, D	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	20deg. C, 69%RH	120Vac, 60Hz	Chris Lin
RE<1G	20deg. C, 69%RH	120Vac, 60Hz	Bayu Chen
PLC	25deg. C, 75%RH	120Vac, 60Hz	Chris Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Ted Chang

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor is required.

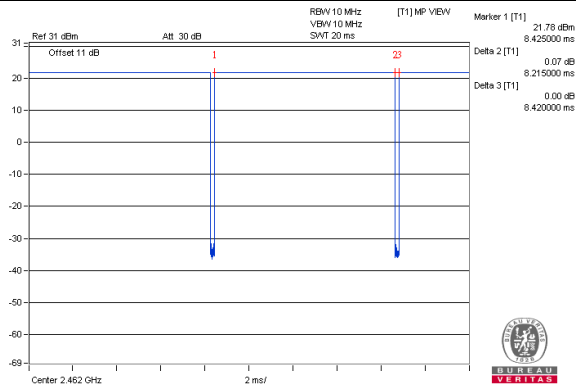
802.11b: Duty cycle = $8.215/8.420 = 0.976$

802.11g: Duty cycle = $1.357/1.559 = 0.87$

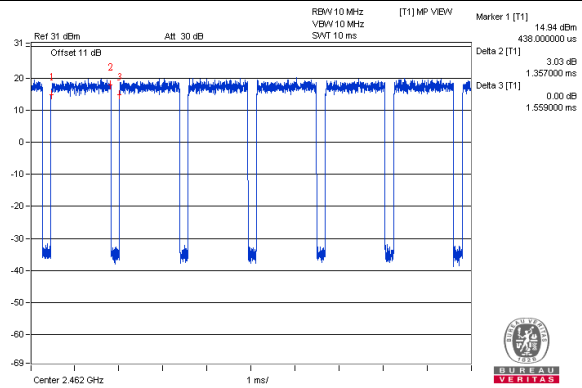
802.11n (HT20): Duty cycle = $1.275/1.495 = 0.853$

802.11n (HT40): Duty cycle = $0.627/0.837 = 0.749$

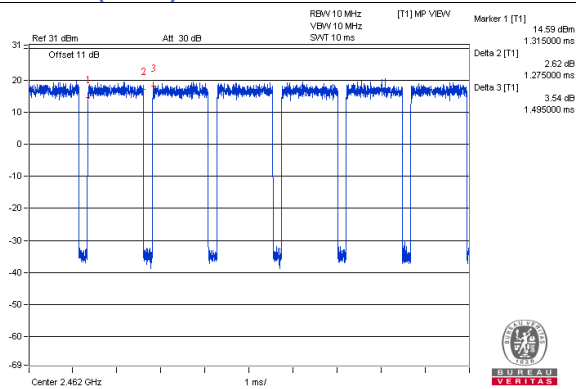
802.11b



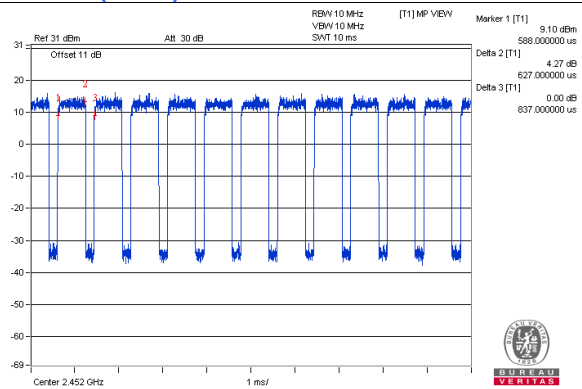
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Conducted Output Power

	802.11b Real Peak Power			
	1Mbps	2Mbps	5.5Mb	11Mbps
Ch1	21.52	-	-	-
Ch6	21.74	21.45	21.6	21.64
Ch11	21.55	-	-	-

	802.11g Real Peak Power							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Ch1	22.50	22.30	22.4	22.28	22.34	22.24	22.28	22.36
Ch6	22.38	-	-	-	-	-	-	-
Ch11	20.90	-	-	-	-	-	-	-

	802.11n(HT20) Real Peak Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch1	22.32	-	-	-	-	-	-	-
Ch6	23.57	23.32	23.33	23.30	23.31	23.35	23.35	23.42
Ch11	21.61	-	-	-	-	-	-	-

	802.11n(HT40) Real Peak Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch3	22.09	-	-	-	-	-	-	-
Ch6	22.40	22.1	22.28	22.17	22.22	22.25	22.23	22.18
Ch9	21.04	-	-	-	-	-	-	-

	802.11b Real Average Power			
	1Mbps	2Mbps	5.5Mb	11Mbps
Ch1	19.60	-	-	-
Ch6	19.69	19.52	19.43	19.51
Ch11	19.58	-	-	-

	802.11g Real Average Power							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Ch1	16.57	-	-	-	-	-	-	-
Ch6	19.60	19.33	19.35	19.32	19.48	19.43	19.31	19.38
Ch11	14.61	-	-	-	-	-	-	-

	802.11n(HT20) Real Average Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch1	15.68	-	-	-	-	-	-	-
Ch6	20.51	20.22	20.39	20.40	20.38	20.32	20.25	20.35
Ch11	14.15	-	-	-	-	-	-	-

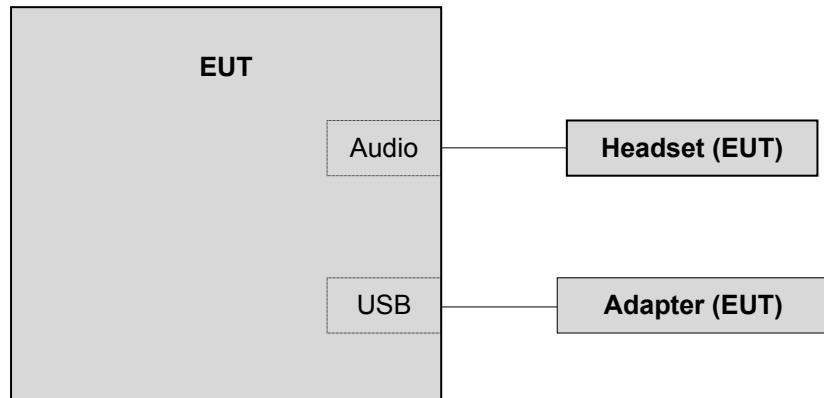
	802.11n(HT40) Real Average Power							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch3	14.65	-	-	-	-	-	-	-
Ch6	15.52	15.24	15.38	15.22	15.37	15.41	15.32	15.23
Ch9	12.75	-	-	-	-	-	-	-

3.5 Description of Support Units

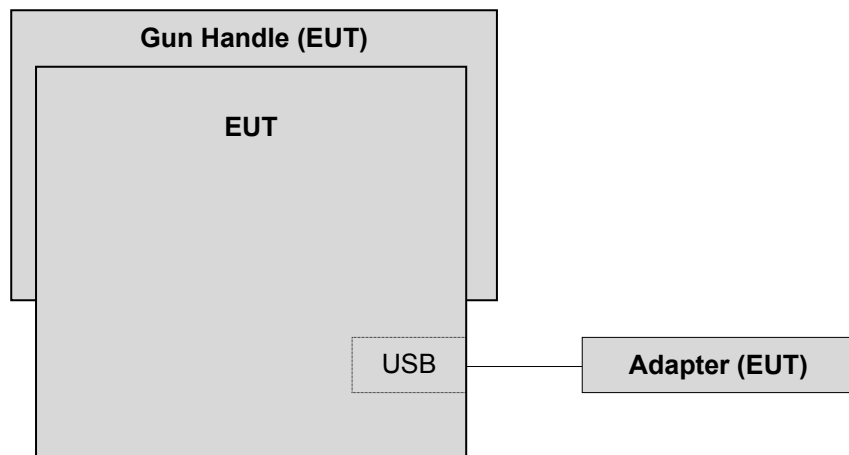
The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.5.1 Configuration of System under Test

Test Mode A, C, D



Test Mode B



3.6 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 DTS Meas Guidance v04
 ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 24, 2016	Oct. 23, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 16, 2016	Aug. 15, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Dec. 15, 2016	Dec. 14, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2016	Aug. 08, 2017
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Aug. 09, 2016	Aug. 08, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824012	Aug. 11, 2016	Aug. 10, 2017
Power Sensor	MA2411B	0738171	Aug. 11, 2016	Aug. 10, 2017

- Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 4.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 460141.
 5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

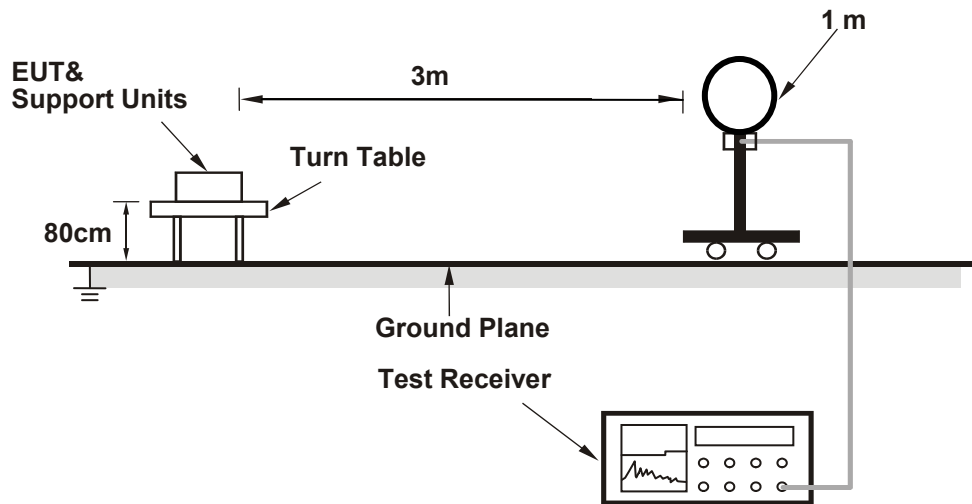
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

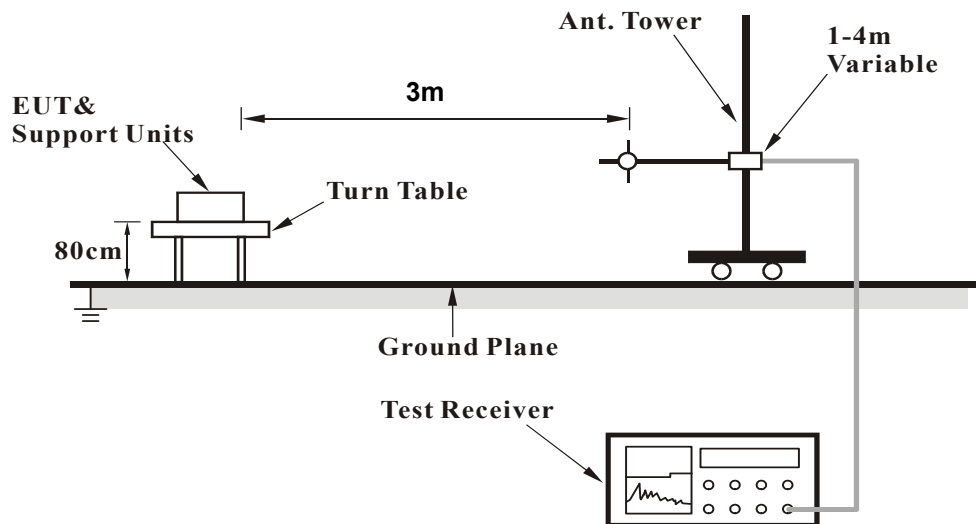
No deviation.

4.1.5 Test Set Up

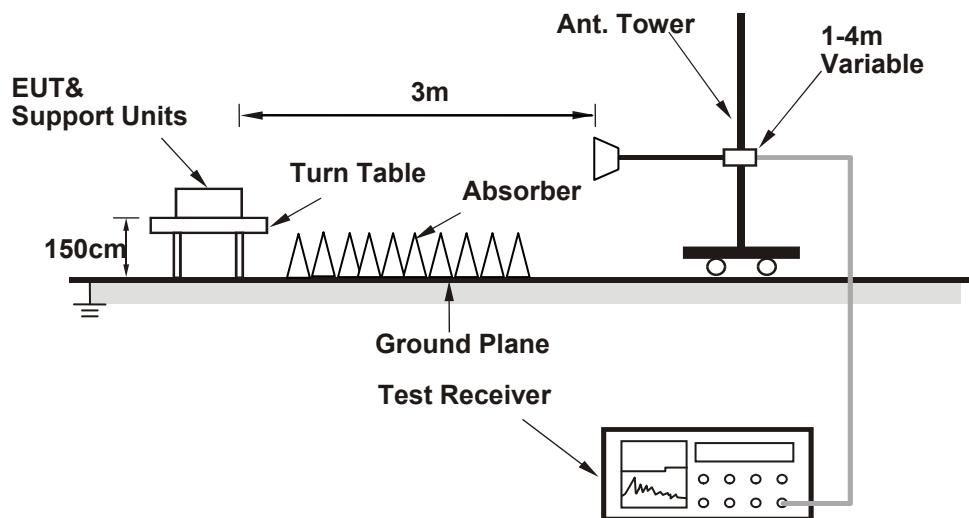
For Radiated emission below 30MHz



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

The EUT has been tested as an independent unit together with other necessary accessories or support units.

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	58.3 PK	74.0	-15.7	3.97 H	162	26.1	32.2
2	2390.00	47.3 AV	54.0	-6.7	3.97 H	162	15.1	32.2
3	*2412.00	108.8 PK			3.97 H	162	76.5	32.3
4	*2412.00	105.0 AV			3.97 H	162	72.7	32.3
5	4824.00	52.5 PK	74.0	-21.5	3.77 H	205	50.5	2.0
6	4824.00	48.8 AV	54.0	-5.2	3.77 H	205	46.8	2.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.4 PK	74.0	-16.6	1.36 V	94	25.2	32.2
2	2390.00	45.3 AV	54.0	-8.7	1.36 V	94	13.1	32.2
3	*2412.00	107.6 PK			1.36 V	94	75.3	32.3
4	*2412.00	103.5 AV			1.36 V	94	71.2	32.3
5	4824.00	49.8 PK	74.0	-24.2	1.18 V	187	47.8	2.0
6	4824.00	46.5 AV	54.0	-7.5	1.18 V	187	44.5	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.6 PK			3.93 H	182	77.2	32.4
2	*2437.00	105.8 AV			3.93 H	182	73.4	32.4
3	2483.50	57.6 PK	74.0	-16.4	3.93 H	182	24.9	32.7
4	2483.50	46.7 AV	54.0	-7.3	3.93 H	182	14.0	32.7
5	4874.00	54.0 PK	74.0	-20.0	3.68 H	202	51.8	2.2
6	4874.00	50.9 AV	54.0	-3.1	3.68 H	202	48.7	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.7 PK			1.27 V	88	76.3	32.4
2	*2437.00	104.4 AV			1.27 V	88	72.0	32.4
3	2483.50	57.3 PK	74.0	-16.7	1.27 V	88	24.6	32.7
4	2483.50	45.5 AV	54.0	-8.5	1.27 V	88	12.8	32.7
5	4874.00	52.5 PK	74.0	-21.5	3.72 V	194	50.3	2.2
6	4874.00	49.7 AV	54.0	-4.3	3.72 V	194	47.5	2.2

REMARKS:

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

CHANNEL	TX Channel 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	109.7 PK			3.81 H	180	77.1	32.6
2	*2462.00	105.7 AV			3.81 H	180	73.1	32.6
3	2483.50	60.8 PK	74.0	-13.2	3.81 H	180	28.1	32.7
4	2483.50	52.8 AV	54.0	-1.2	3.81 H	180	20.1	32.7
5	4924.00	52.5 PK	74.0	-21.5	3.42 H	196	50.3	2.2
6	4924.00	49.0 AV	54.0	-5.0	3.42 H	196	46.8	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.6 PK			1.31 V	91	76.0	32.6
2	*2462.00	104.4 AV			1.31 V	91	71.8	32.6
3	2483.50	59.8 PK	74.0	-14.2	1.31 V	91	27.1	32.7
4	2483.50	50.3 AV	54.0	-3.7	1.31 V	91	17.6	32.7
5	4924.00	49.7 PK	74.0	-24.3	3.65 V	189	47.5	2.2
6	4924.00	46.8 AV	54.0	-7.2	3.65 V	189	44.6	2.2

REMARKS:

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

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	72.8 PK	74.0	-1.2	3.97 H	164	40.6	32.2
2	2390.00	53.0 AV	54.0	-1.0	3.97 H	164	20.8	32.2
3	*2412.00	108.4 PK			3.97 H	164	76.1	32.3
4	*2412.00	97.7 AV			3.97 H	164	65.4	32.3
5	4824.00	49.6 PK	74.0	-24.4	3.51 H	189	47.6	2.0
6	4824.00	35.9 AV	54.0	-18.1	3.51 H	189	33.9	2.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.0 PK	74.0	-3.0	1.43 V	101	38.8	32.2
2	2390.00	52.2 AV	54.0	-1.8	1.43 V	101	20.0	32.2
3	*2412.00	107.9 PK			1.43 V	101	75.6	32.3
4	*2412.00	96.6 AV			1.43 V	101	64.3	32.3
5	4824.00	48.6 PK	74.0	-25.4	1.06 V	191	46.6	2.0
6	4824.00	34.5 AV	54.0	-19.5	1.06 V	191	32.5	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.6 PK			3.18 H	174	79.2	32.4
2	*2437.00	101.5 AV			3.18 H	174	69.1	32.4
3	2483.50	67.0 PK	74.0	-7.0	3.18 H	174	34.3	32.7
4	2483.50	47.9 AV	54.0	-6.1	3.18 H	174	15.2	32.7
5	4874.00	50.2 PK	74.0	-23.8	3.47 H	204	48.0	2.2
6	4874.00	37.2 AV	54.0	-16.8	3.47 H	204	35.0	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.3 PK			1.38 V	93	78.9	32.4
2	*2437.00	100.4 AV			1.38 V	93	68.0	32.4
3	2483.50	64.5 PK	74.0	-9.5	1.38 V	93	31.8	32.7
4	2483.50	47.7 AV	54.0	-6.3	1.38 V	93	15.0	32.7
5	4874.00	47.8 PK	74.0	-26.2	1.14 V	188	45.6	2.2
6	4874.00	34.9 AV	54.0	-19.1	1.14 V	188	32.7	2.2

REMARKS:

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

CHANNEL	TX Channel 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	106.2 PK			3.85 H	154	73.6	32.6
2	*2462.00	95.7 AV			3.85 H	154	63.1	32.6
3	2483.50	72.0 PK	74.0	-2.0	3.85 H	154	39.3	32.7
4	2483.50	52.9 AV	54.0	-1.1	3.85 H	154	20.2	32.7
5	4924.00	48.5 PK	74.0	-25.5	3.46 H	207	46.3	2.2
6	4924.00	34.7 AV	54.0	-19.3	3.46 H	207	32.5	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.7 PK			1.35 V	83	73.1	32.6
2	*2462.00	94.9 AV			1.35 V	83	62.3	32.6
3	2483.50	70.0 PK	74.0	-4.0	1.35 V	83	37.3	32.7
4	2483.50	50.9 AV	54.0	-3.1	1.35 V	83	18.2	32.7
5	4924.00	47.5 PK	74.0	-26.5	1.13 V	184	45.3	2.2
6	4924.00	34.0 AV	54.0	-20.0	1.13 V	184	31.8	2.2

REMARKS:

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

802.11n (HT20)

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	72.9 PK	74.0	-1.1	4.00 H	162	40.7	32.2
2	2390.00	52.0 AV	54.0	-2.0	4.00 H	162	19.8	32.2
3	*2412.00	104.9 PK			4.00 H	162	72.6	32.3
4	*2412.00	93.9 AV			4.00 H	162	61.6	32.3
5	4824.00	48.7 PK	74.0	-25.3	3.49 H	200	46.7	2.0
6	4824.00	34.2 AV	54.0	-19.8	3.49 H	200	32.2	2.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.8 PK	74.0	-4.2	1.23 V	87	37.6	32.2
2	2390.00	50.0 AV	54.0	-4.0	1.23 V	87	17.8	32.2
3	*2412.00	103.5 PK			1.23 V	87	71.2	32.3
4	*2412.00	92.5 AV			1.23 V	87	60.2	32.3
5	4824.00	47.5 PK	74.0	-26.5	1.09 V	192	45.5	2.0
6	4824.00	33.7 AV	54.0	-20.3	1.09 V	192	31.7	2.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.1 PK			3.82 H	161	78.7	32.4
2	*2437.00	100.8 AV			3.82 H	161	68.4	32.4
3	2483.50	63.3 PK	74.0	-10.7	3.82 H	161	30.6	32.7
4	2483.50	48.4 AV	54.0	-5.6	3.82 H	161	15.7	32.7
5	4874.00	49.2 PK	74.0	-24.8	3.58 H	194	47.0	2.2
6	4874.00	34.8 AV	54.0	-19.2	3.58 H	194	32.6	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.9 PK			1.32 V	91	77.5	32.4
2	*2437.00	99.7 AV			1.32 V	91	67.3	32.4
3	2483.50	60.0 PK	74.0	-14.0	1.32 V	91	27.3	32.7
4	2483.50	47.8 AV	54.0	-6.2	1.32 V	91	15.1	32.7
5	4874.00	47.8 PK	74.0	-26.2	1.00 V	174	45.6	2.2
6	4874.00	34.3 AV	54.0	-19.7	1.00 V	174	32.1	2.2

REMARKS:

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

CHANNEL	TX Channel 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	106.6 PK			3.80 H	178	74.0	32.6
2	*2462.00	95.7 AV			3.80 H	178	63.1	32.6
3	2483.50	72.8 PK	74.0	-1.2	3.80 H	178	40.1	32.7
4	2483.50	52.8 AV	54.0	-1.2	3.80 H	178	20.1	32.7
5	4924.00	49.2 PK	74.0	-24.8	3.61 H	200	47.0	2.2
6	4924.00	34.6 AV	54.0	-19.4	3.61 H	200	32.4	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.2 PK			1.24 V	87	72.6	32.6
2	*2462.00	94.5 AV			1.24 V	87	61.9	32.6
3	2483.50	71.3 PK	74.0	-2.7	1.24 V	87	38.6	32.7
4	2483.50	51.4 AV	54.0	-2.6	1.24 V	87	18.7	32.7
5	4924.00	47.5 PK	74.0	-26.5	1.05 V	182	45.3	2.2
6	4924.00	34.0 AV	54.0	-20.0	1.05 V	182	31.8	2.2

REMARKS:

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

802.11n (HT40)

CHANNEL	TX Channel 3	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	69.3 PK	74.0	-4.7	3.89 H	159	37.1	32.2
2	2390.00	53.0 AV	54.0	-1.0	3.89 H	159	20.8	32.2
3	*2422.00	103.7 PK			3.89 H	159	71.3	32.4
4	*2422.00	91.4 AV			3.89 H	159	59.0	32.4
5	4844.00	47.9 PK	74.0	-26.1	3.60 H	183	45.8	2.1
6	4844.00	34.6 AV	54.0	-19.4	3.60 H	183	32.5	2.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.6 PK	74.0	-6.4	1.24 V	107	35.4	32.2
2	2390.00	51.7 AV	54.0	-2.3	1.24 V	107	19.5	32.2
3	*2422.00	102.9 PK			1.24 V	107	70.5	32.4
4	*2422.00	90.2 AV			1.24 V	107	57.8	32.4
5	4844.00	47.5 PK	74.0	-26.5	1.10 V	194	45.4	2.1
6	4844.00	34.4 AV	54.0	-19.6	1.10 V	194	32.3	2.1

REMARKS:

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

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	103.0 PK			3.86 H	155	70.6	32.4
2	*2437.00	93.2 AV			3.86 H	155	60.8	32.4
3	2483.50	68.0 PK	74.0	-6.0	3.86 H	155	35.3	32.7
4	2483.50	52.8 AV	54.0	-1.2	3.86 H	155	20.1	32.7
5	4874.00	48.5 PK	74.0	-25.5	3.57 H	195	46.3	2.2
6	4874.00	35.0 AV	54.0	-19.0	3.57 H	195	32.8	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	101.0 PK			1.18 V	92	68.6	32.4
2	*2437.00	92.3 AV			1.18 V	92	59.9	32.4
3	2483.50	66.5 PK	74.0	-7.5	1.18 V	92	33.8	32.7
4	2483.50	51.9 AV	54.0	-2.1	1.18 V	92	19.2	32.7
5	4874.00	48.0 PK	74.0	-26.0	1.00 V	179	45.8	2.2
6	4874.00	34.5 AV	54.0	-19.5	1.00 V	179	32.3	2.2

REMARKS:

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

CHANNEL	TX Channel 9	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	*2452.00	101.0 PK			3.85 H	156	68.4	32.6
2	*2452.00	90.5 AV			3.85 H	156	57.9	32.6
3	2483.50	67.2 PK	74.0	-6.8	3.85 H	156	34.5	32.7
4	2483.50	52.7 AV	54.0	-1.3	3.85 H	156	20.0	32.7
5	4904.00	47.8 PK	74.0	-26.2	3.51 H	190	45.6	2.2
6	4904.00	34.6 AV	54.0	-19.4	3.51 H	190	32.4	2.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	99.8 PK			1.32 V	84	67.2	32.6
2	*2452.00	88.9 AV			1.32 V	84	56.3	32.6
3	2483.50	66.7 PK	74.0	-7.3	1.32 V	84	34.0	32.7
4	2483.50	51.9 AV	54.0	-2.1	1.32 V	84	19.2	32.7
5	4904.00	47.5 PK	74.0	-26.5	1.04 V	185	45.3	2.2
6	4904.00	34.3 AV	54.0	-19.7	1.04 V	185	32.1	2.2

REMARKS:

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

Below 1GHz Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

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	45.52	28.3 QP	40.0	-11.7	1.01 H	198	42.6	-14.3
2	111.48	29.4 QP	43.5	-14.1	1.51 H	98	46.1	-16.7
3	134.76	27.1 QP	43.5	-16.4	2.00 H	242	41.5	-14.4
4	239.52	30.5 QP	46.0	-15.5	1.51 H	169	44.3	-13.8
5	582.90	33.9 QP	46.0	-12.1	1.26 H	78	38.3	-4.4
6	802.12	39.1 QP	46.0	-6.9	1.26 H	205	38.5	0.6

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	30.00	36.4 QP	40.0	-3.6	1.25 V	201	52.4	-16.0
2	70.74	36.5 QP	40.0	-3.5	1.00 V	339	52.2	-15.7
3	117.30	27.1 QP	43.5	-16.4	1.00 V	122	43.2	-16.1
4	350.10	26.9 QP	46.0	-19.1	1.49 V	354	37.1	-10.2
5	582.90	32.3 QP	46.0	-13.7	1.49 V	242	36.7	-4.4
6	788.54	40.4 QP	46.0	-5.6	1.25 V	244	40.1	0.3

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

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	33.88	28.3 QP	40.0	-11.7	1.24 H	212	43.8	-15.5
2	61.04	22.6 QP	40.0	-17.4	1.24 H	257	37.2	-14.6
3	84.32	20.9 QP	40.0	-19.1	1.99 H	16	39.7	-18.8
4	156.10	20.5 QP	43.5	-23.0	1.01 H	117	33.7	-13.2
5	239.52	26.0 QP	46.0	-20.0	1.49 H	222	39.8	-13.8
6	970.90	36.1 QP	54.0	-17.9	1.01 H	16	31.5	4.6

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	33.88	32.2 QP	40.0	-7.8	1.00 V	343	47.7	-15.5
2	59.10	31.9 QP	40.0	-8.1	1.00 V	241	46.1	-14.2
3	82.38	25.7 QP	40.0	-14.3	1.49 V	217	44.4	-18.7
4	152.22	19.2 QP	43.5	-24.3	1.24 V	15	32.5	-13.3
5	194.90	20.5 QP	43.5	-23.0	1.99 V	111	36.1	-15.6
6	747.80	38.2 QP	46.0	-7.8	1.49 V	15	38.7	-0.5

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	C

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	30.00	30.9 QP	40.0	-9.1	1.26 H	13	46.9	-16.0
2	53.28	26.5 QP	40.0	-13.5	1.50 H	233	40.4	-13.9
3	127.00	24.3 QP	43.5	-19.2	1.50 H	131	39.6	-15.3
4	270.56	25.0 QP	46.0	-21.0	1.26 H	228	37.1	-12.1
5	480.08	26.3 QP	46.0	-19.7	1.50 H	173	33.2	-6.9
6	937.92	38.5 QP	46.0	-7.5	1.50 H	60	34.8	3.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	32.0 QP	40.0	-8.0	1.00 V	162	48.0	-16.0
2	53.28	33.9 QP	40.0	-6.1	1.24 V	10	47.8	-13.9
3	88.20	24.9 QP	43.5	-18.6	1.50 V	257	44.3	-19.4
4	128.94	20.4 QP	43.5	-23.1	1.00 V	14	35.6	-15.2
5	317.12	27.1 QP	46.0	-18.9	1.24 V	188	37.6	-10.5
6	480.08	28.8 QP	46.0	-17.2	1.00 V	204	35.7	-6.9

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	D

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	30.00	30.0 QP	40.0	-10.0	1.00 H	27	46.0	-16.0
2	49.40	33.4 QP	40.0	-6.6	1.00 H	235	47.4	-14.0
3	123.12	25.8 QP	43.5	-17.7	1.24 H	232	41.3	-15.5
4	286.08	20.9 QP	46.0	-25.1	1.24 H	15	32.4	-11.5
5	621.70	29.2 QP	46.0	-16.8	1.00 H	56	32.3	-3.1
6	935.98	37.1 QP	46.0	-8.9	1.24 H	15	33.5	3.6

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	30.00	31.0 QP	40.0	-9.0	1.26 V	19	47.0	-16.0
2	68.80	32.0 QP	40.0	-8.0	1.50 V	264	47.5	-15.5
3	191.02	29.6 QP	43.5	-13.9	1.26 V	315	45.1	-15.5
4	480.08	25.2 QP	46.0	-20.8	1.00 V	123	32.1	-6.9
5	631.40	30.7 QP	46.0	-15.3	1.00 V	282	33.7	-3.0
6	988.36	37.4 QP	54.0	-16.6	1.50 V	28	32.7	4.7

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 28, 2016	Jul. 27, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

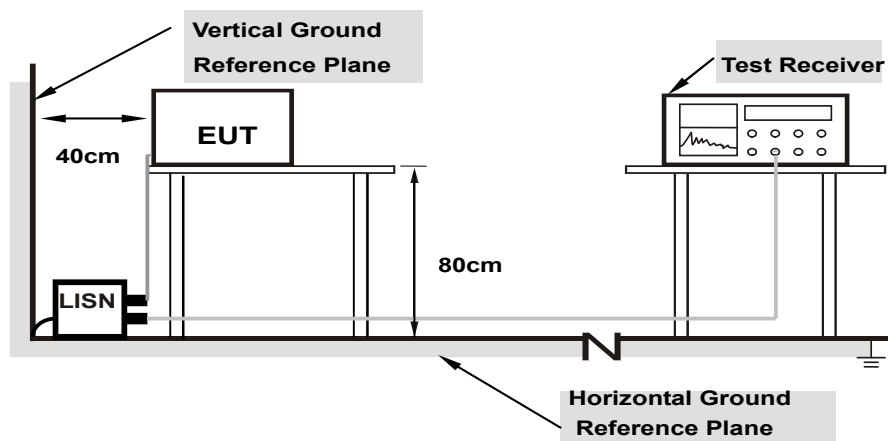
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

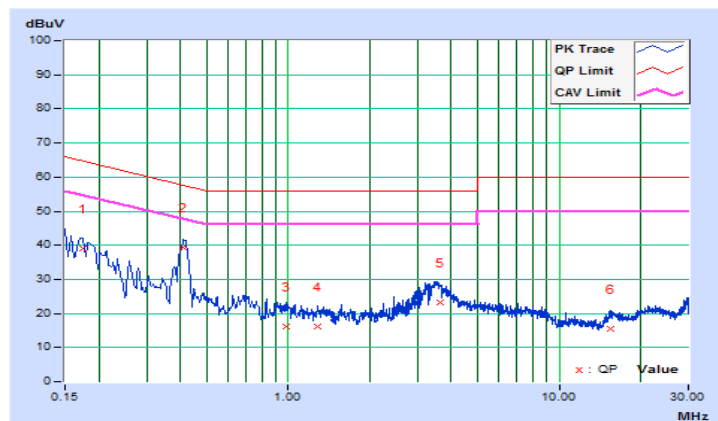
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17400	10.36	28.75	16.34	39.11	26.70	64.77	54.77	-25.66	-28.07
2	0.41035	10.40	29.16	21.38	39.56	31.78	57.64	47.64	-18.08	-15.86
3	0.97800	10.40	5.80	0.05	16.20	10.45	56.00	46.00	-39.80	-35.55
4	1.28600	10.42	5.87	0.68	16.29	11.10	56.00	46.00	-39.71	-34.90
5	3.62575	10.55	12.67	4.04	23.22	14.59	56.00	46.00	-32.78	-31.41
6	15.44600	11.11	4.54	0.24	15.65	11.35	60.00	50.00	-44.35	-38.65

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.

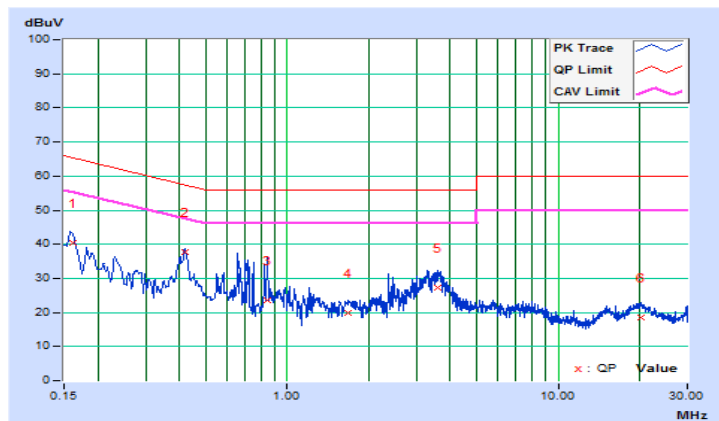


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16200	10.11	30.23	19.46	40.34	29.57	65.36
2	0.41799	10.16	27.63	20.79	37.79	30.95	57.49	47.49	-19.70	-16.54
3	0.84600	10.17	13.29	4.47	23.46	14.64	56.00	46.00	-32.54	-31.36
4	1.68438	10.21	9.69	3.24	19.90	13.45	56.00	46.00	-36.10	-32.55
5	3.58600	10.32	16.99	7.02	27.31	17.34	56.00	46.00	-28.69	-28.66
6	20.11800	10.97	7.59	3.53	18.56	14.50	60.00	50.00	-41.44	-35.50

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.

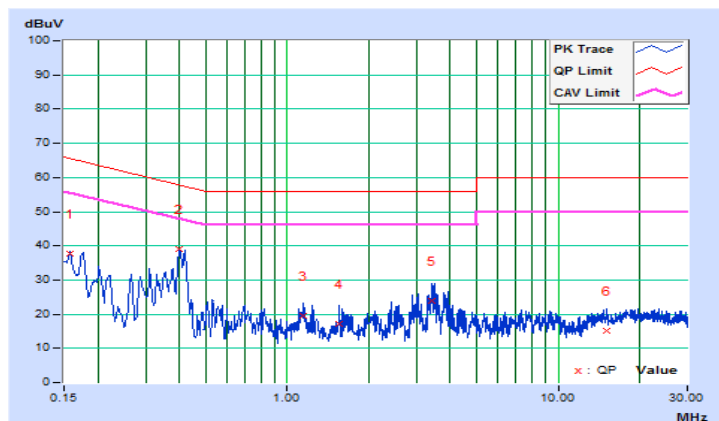


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15811	10.35	27.29	15.33	37.64	25.68	65.56
2	0.39863	10.40	28.74	18.65	39.14	29.05	57.88	47.88	-18.74	-18.83
3	1.14956	10.41	9.17	0.58	19.58	10.99	56.00	46.00	-36.42	-35.01
4	1.55000	10.43	6.66	-1.22	17.09	9.21	56.00	46.00	-38.91	-36.79
5	3.39800	10.54	13.29	1.44	23.83	11.98	56.00	46.00	-32.17	-34.02
6	15.18600	11.10	4.20	-2.80	15.30	8.30	60.00	50.00	-44.70	-41.70

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.

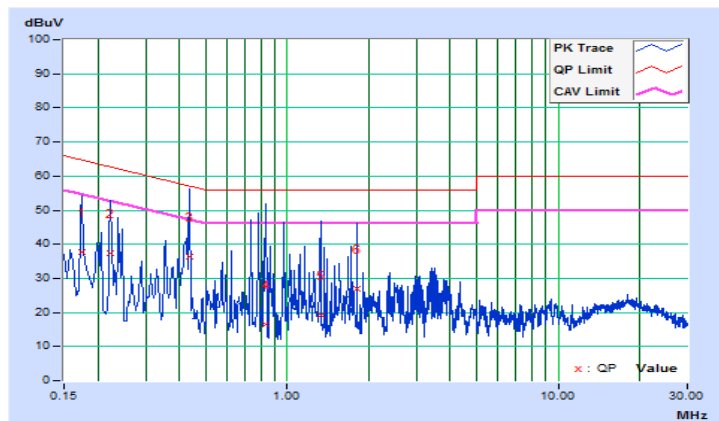


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.17400	10.12	27.62	16.09	37.74	26.21	64.77
2	0.22200	10.14	27.37	12.20	37.51	22.34	62.74	52.74	-25.23	-30.40
3	0.43400	10.16	26.29	2.69	36.45	12.85	57.18	47.18	-20.73	-34.33
4	0.83400	10.17	6.21	-1.77	16.38	8.40	56.00	46.00	-39.62	-37.60
5	1.32600	10.19	9.17	-1.39	19.36	8.80	56.00	46.00	-36.64	-37.20
6	1.81400	10.22	16.85	-1.57	27.07	8.65	56.00	46.00	-28.93	-37.35

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.

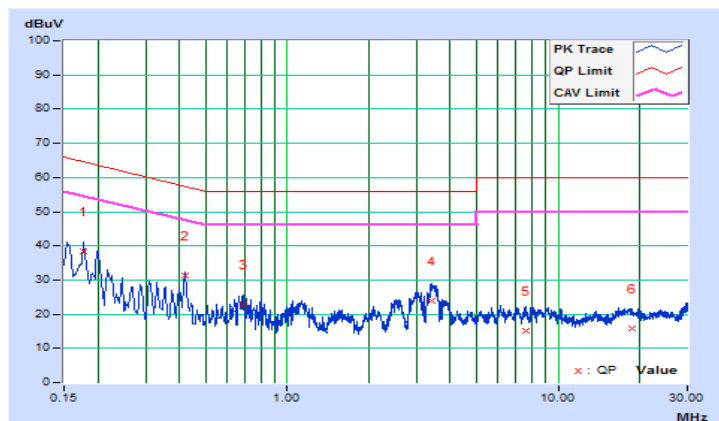


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.17801	10.36	28.00	15.23	38.36	25.59	64.58
2	0.42131	10.40	21.02	11.34	31.42	21.74	57.42	47.42	-26.00	-25.68
3	0.68592	10.40	12.39	2.42	22.79	12.82	56.00	46.00	-33.21	-33.18
4	3.41800	10.54	13.35	0.74	23.89	11.28	56.00	46.00	-32.11	-34.72
5	7.57400	10.72	4.51	-1.62	15.23	9.10	60.00	50.00	-44.77	-40.90
6	18.86200	11.30	4.37	-2.30	15.67	9.00	60.00	50.00	-44.33	-41.00

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.

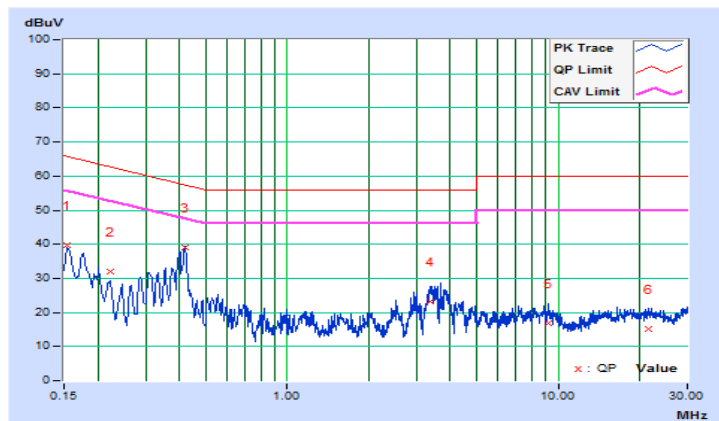


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15400	10.11	29.78	17.64	39.89	27.75	65.78
2	0.22200	10.14	21.85	9.42	31.99	19.56	62.74	52.74	-30.75	-33.18
3	0.42131	10.16	28.96	19.05	39.12	29.21	57.42	47.42	-18.30	-18.21
4	3.37680	10.31	12.98	2.16	23.29	12.47	56.00	46.00	-32.71	-33.53
5	9.21800	10.52	6.46	-0.64	16.98	9.88	60.00	50.00	-43.02	-40.12
6	21.45000	11.00	4.10	-2.75	15.10	8.25	60.00	50.00	-44.90	-41.75

REMARKS:

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

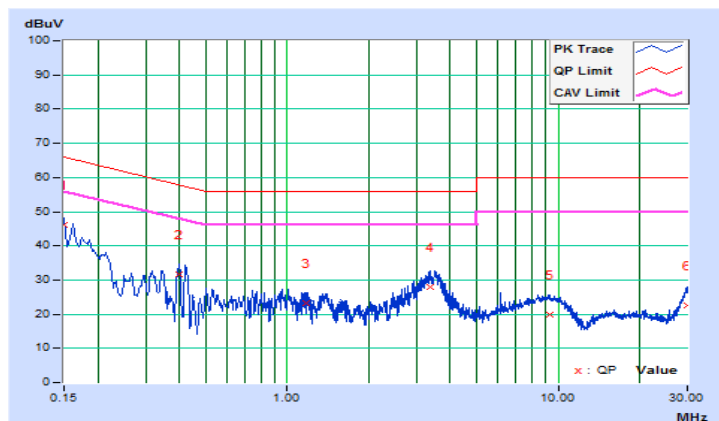


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15000	10.34	35.89	24.38	46.23	34.72	66.00
2	0.39800	10.40	21.15	15.65	31.55	26.05	57.90	47.90	-26.35	-21.85
3	1.16788	10.41	12.90	5.59	23.31	16.00	56.00	46.00	-32.69	-30.00
4	3.35800	10.53	17.31	6.30	27.84	16.83	56.00	46.00	-28.16	-29.17
5	9.32200	10.80	9.21	4.63	20.01	15.43	60.00	50.00	-39.99	-34.57
6	29.82600	11.67	10.99	4.74	22.66	16.41	60.00	50.00	-37.34	-33.59

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.

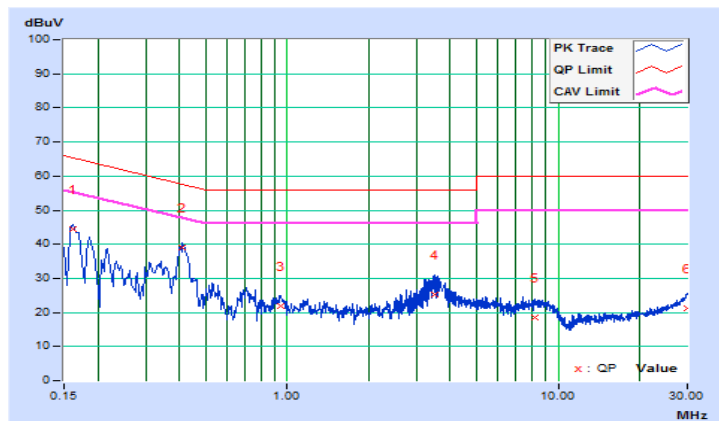


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16105	10.11	34.37	23.43	44.48	33.54	65.41
2	0.41035	10.16	28.94	23.58	39.10	33.74	57.64	47.64	-18.54	-13.90
3	0.94200	10.17	11.80	2.44	21.97	12.61	56.00	46.00	-34.03	-33.39
4	3.50600	10.31	14.96	4.53	25.27	14.84	56.00	46.00	-30.73	-31.16
5	8.25000	10.49	8.19	1.86	18.68	12.35	60.00	50.00	-41.32	-37.65
6	29.95400	11.19	9.92	4.07	21.11	15.26	60.00	50.00	-38.89	-34.74

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.

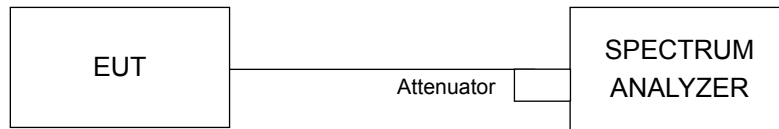


4.3 6dB Bandwidth Measurement

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	9.57	0.5	Pass
6	2437	10.04	0.5	Pass
11	2462	10.07	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.42	0.5	Pass
6	2437	16.38	0.5	Pass
11	2462	16.39	0.5	Pass

802.11n (HT20)

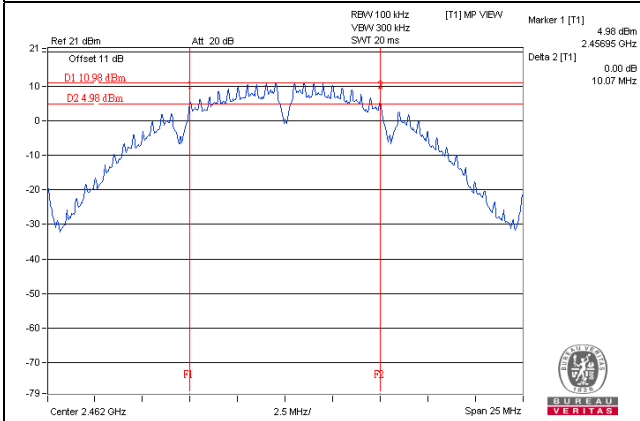
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.56	0.5	Pass
6	2437	17.61	0.5	Pass
11	2462	17.63	0.5	Pass

802.11n (HT40)

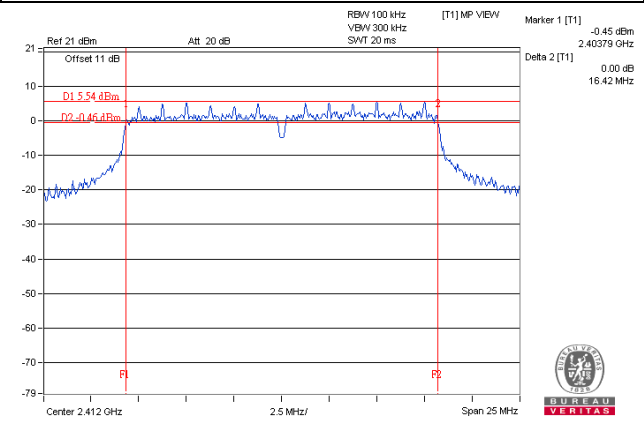
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.57	0.5	Pass
6	2437	35.27	0.5	Pass
9	2452	35.40	0.5	Pass

Spectrum Plot of Worst Value

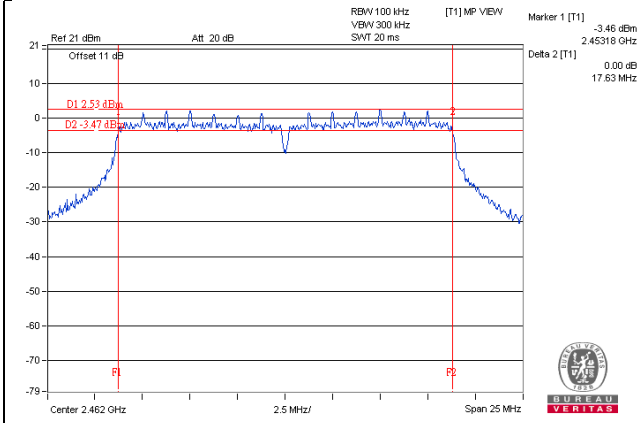
802.11b



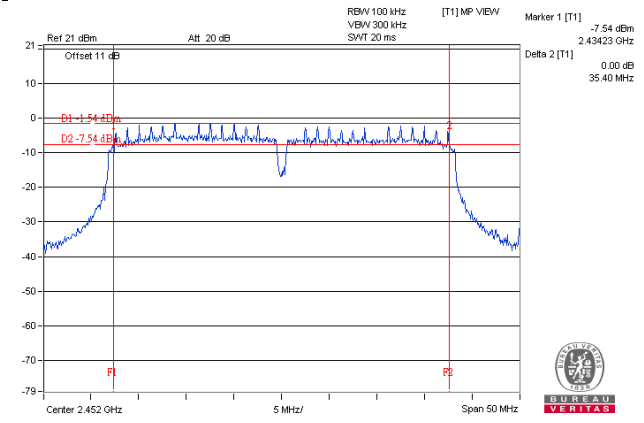
802.11g



802.11n (HT20)



802.11n (HT40)

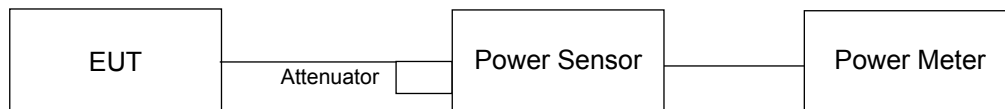


4.4 Conducted Output Power Measurement

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

Peak Power

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	141.906	21.52	30	Pass
6	2437	149.279	21.74	30	Pass
11	2462	142.889	21.55	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	177.828	22.50	30	Pass
6	2437	172.982	22.38	30	Pass
11	2462	123.027	20.90	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	170.608	22.32	30	Pass
6	2437	227.510	23.57	30	Pass
11	2462	144.877	21.61	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	161.808	22.09	30	Pass
6	2437	173.780	22.40	30	Pass
9	2452	127.057	21.04	30	Pass

Average Power

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	91.201	19.60
6	2437	93.111	19.69
11	2462	90.782	19.58

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	45.394	16.57
6	2437	91.201	19.60
11	2462	28.907	14.61

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	36.983	15.68
6	2437	112.460	20.51
11	2462	26.002	14.15

802.11n (HT40)

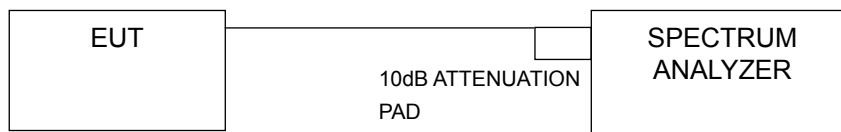
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	29.174	14.65
6	2437	35.645	15.52
9	2452	18.836	12.75

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- 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	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-2.64	8.00	Pass
6	2437	-2.60	8.00	Pass
11	2462	-2.89	8.00	Pass

802.11g

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-9.90	8.00	Pass
6	2437	-6.38	8.00	Pass
11	2462	-10.82	8.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-10.63	8.00	Pass
6	2437	-6.81	8.00	Pass
11	2462	-12.58	8.00	Pass

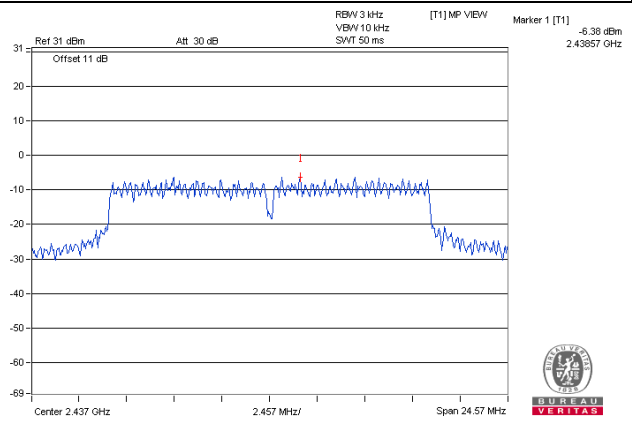
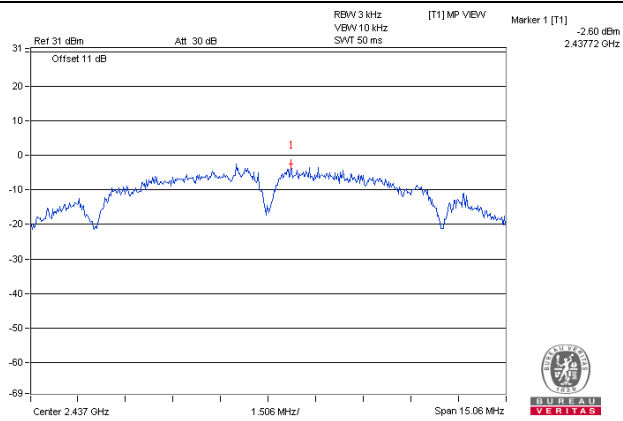
802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
3	2422	-15.82	8.00	Pass
6	2437	-14.36	8.00	Pass
9	2452	-15.76	8.00	Pass

Spectrum Plot of Worst Value

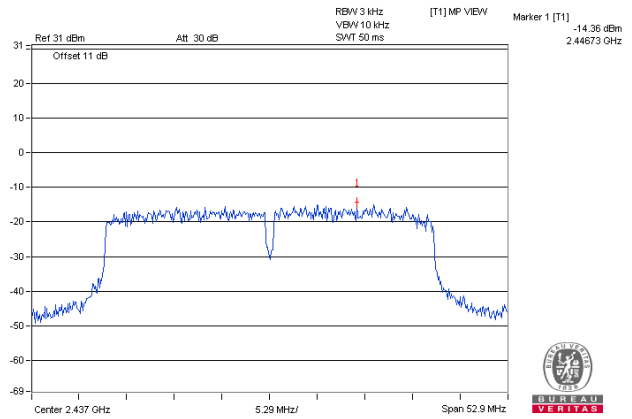
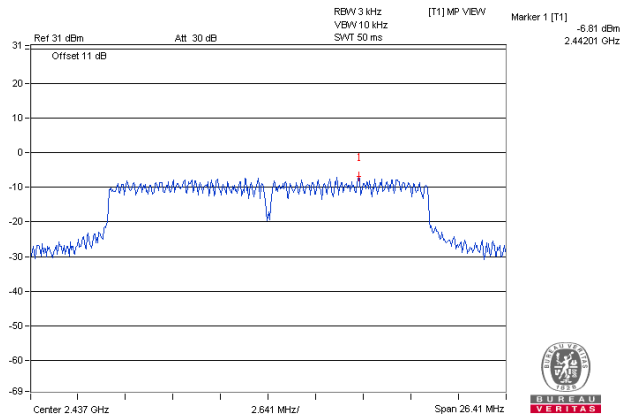
802.11b

802.11g



802.11n (HT20)

802.11n (HT40)

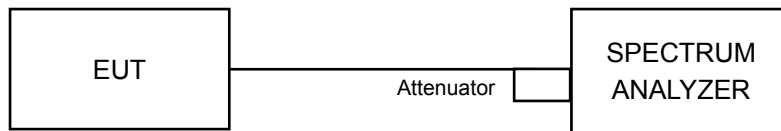


4.6 Conducted Out of Band Emission Measurement

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

- Set the RBW = 100 kHz.
- Set the VBW \geq 300 kHz.
- Detector = average.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW \geq 300 kHz.
- Ensure that the number of measurement points \geq span/RBW
- According to measurement points to set differ measurement span.
- Detector = average.
- Trace Mode = max hold.
- Sweep = auto couple.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

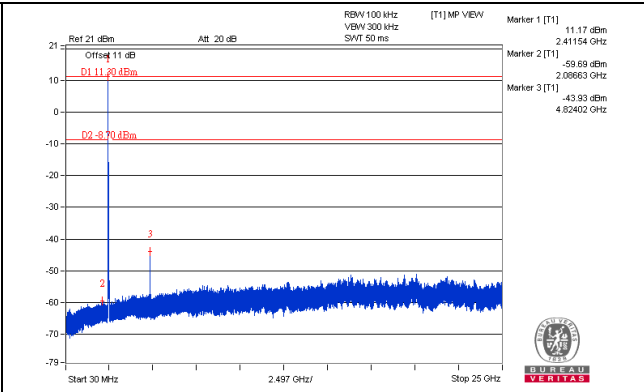
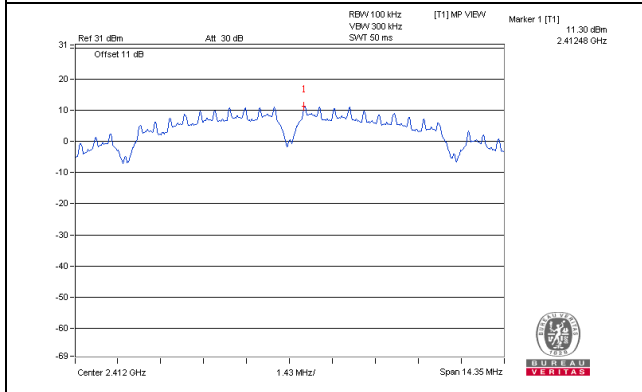
Same as Item 4.3.6

4.6.7 Test Results

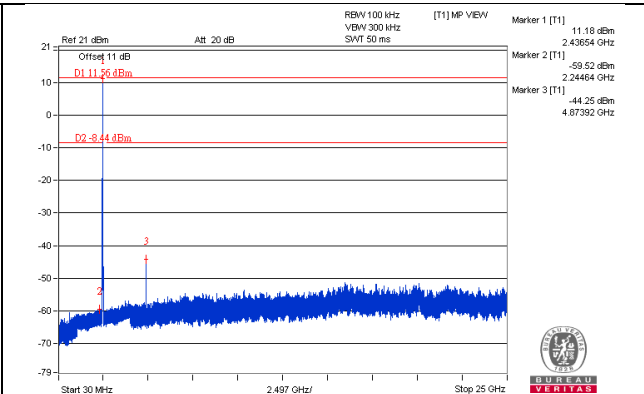
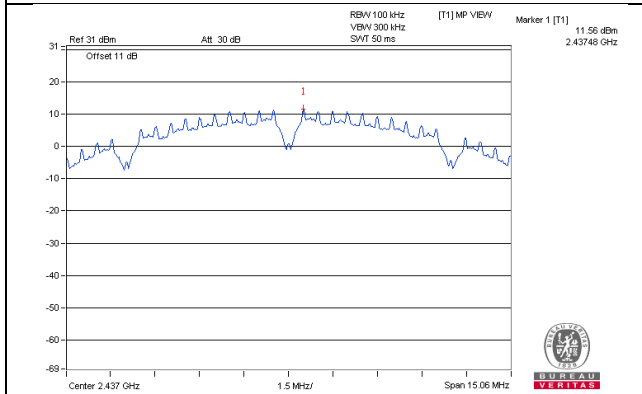
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

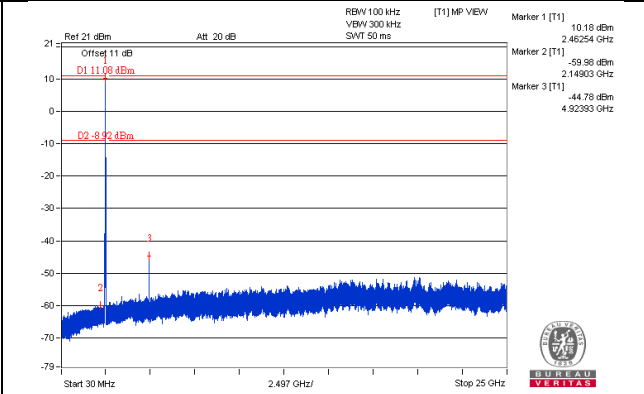
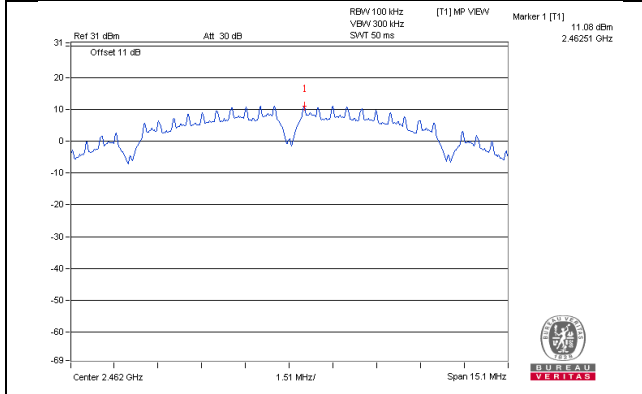
CH 1



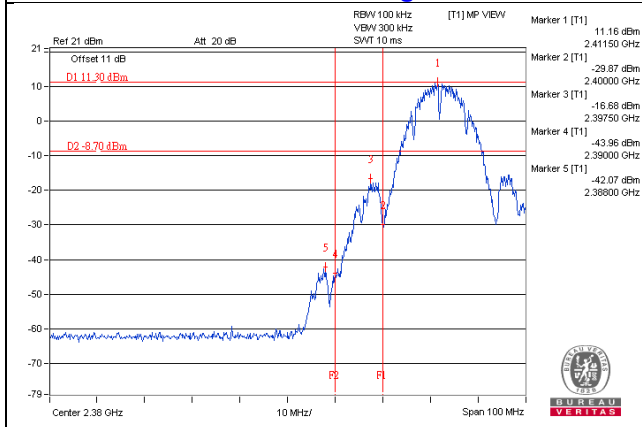
CH 6



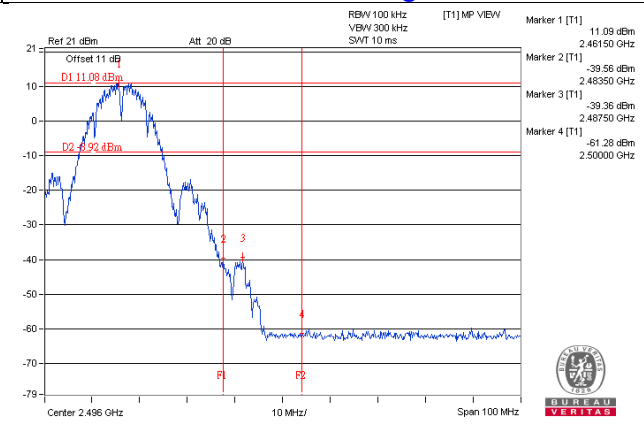
CH 11



CH 1 Band edge

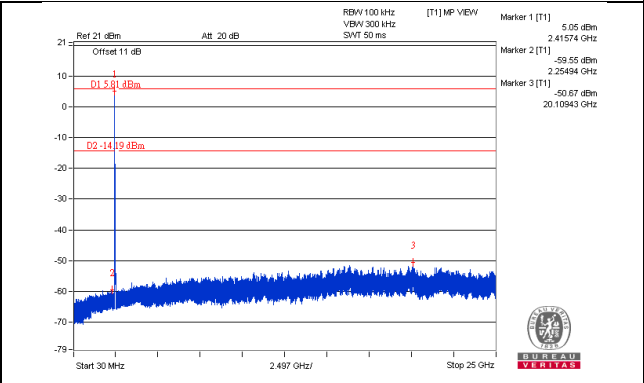
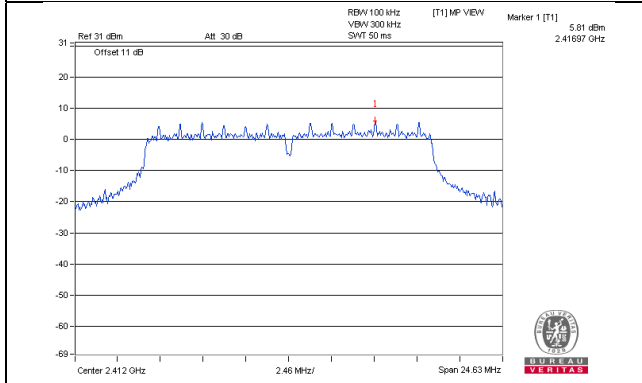


CH 11 Band edge

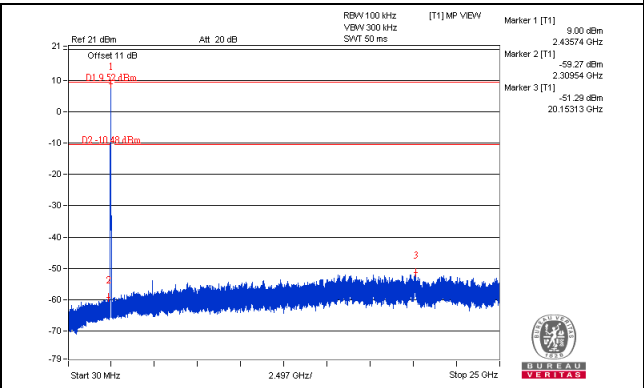
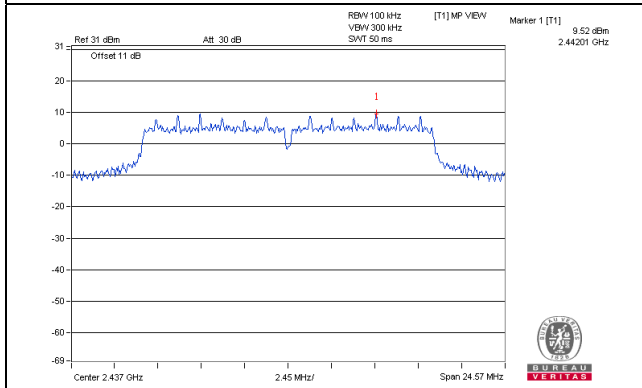


802.11g

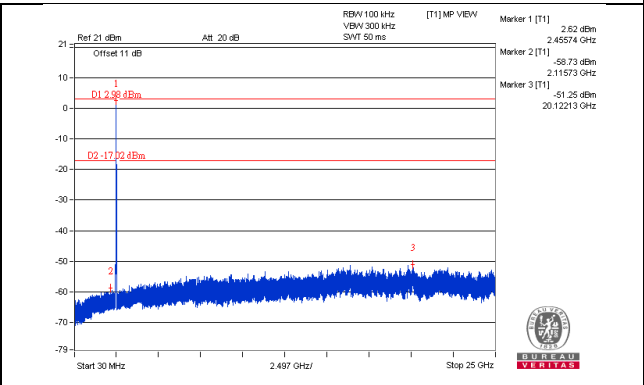
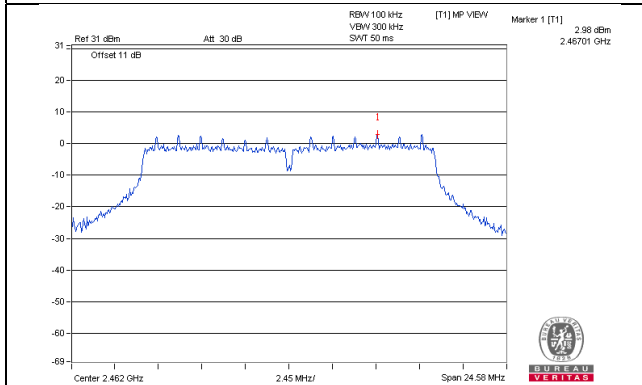
CH 1



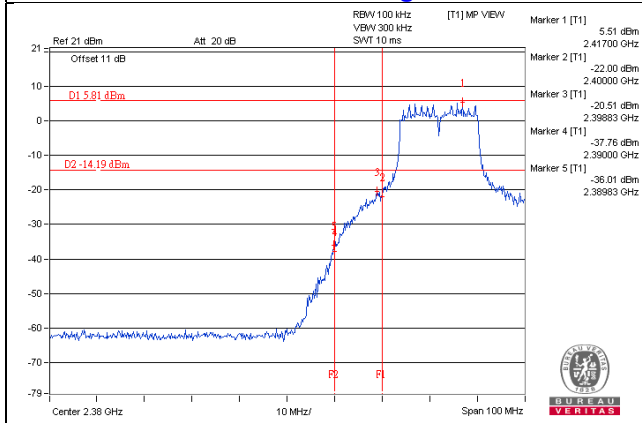
CH 6



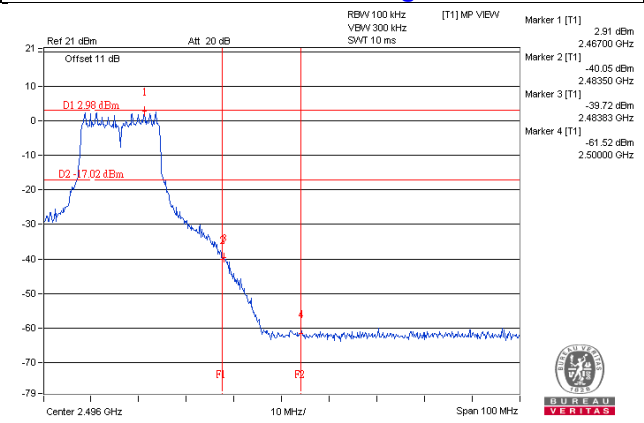
CH 11



CH 1 Band edge

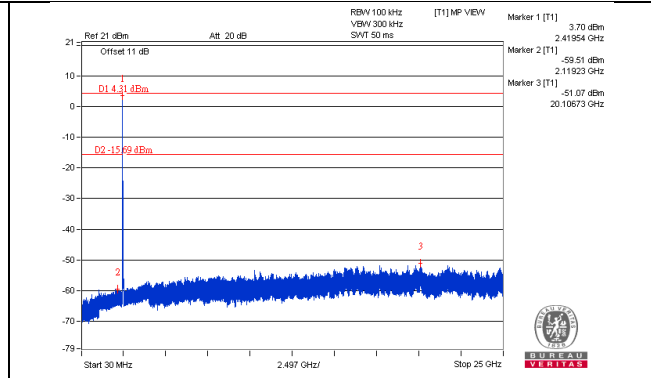
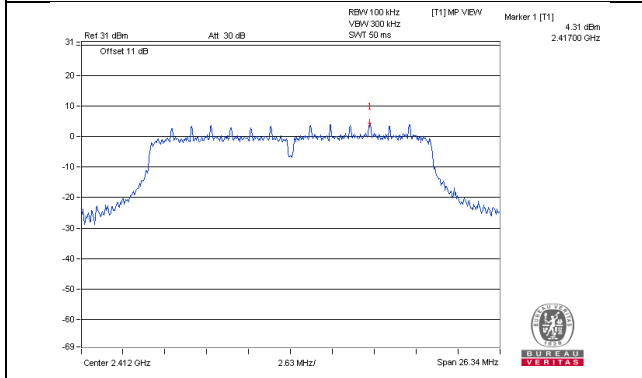


CH 11 Band edge

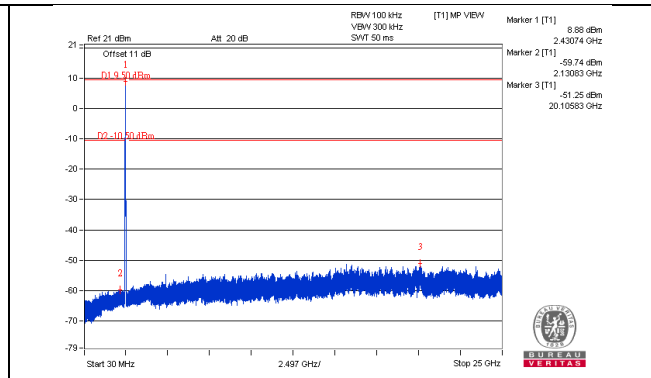
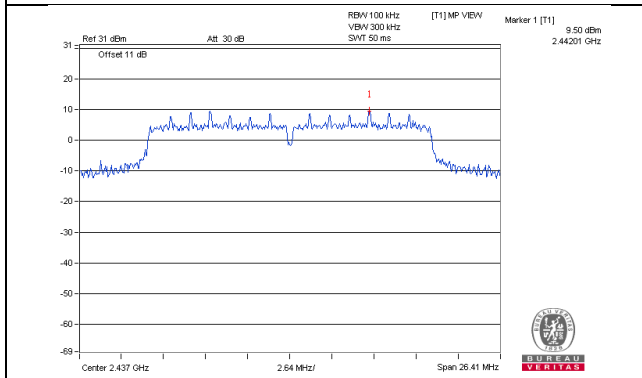


802.11n (HT20)

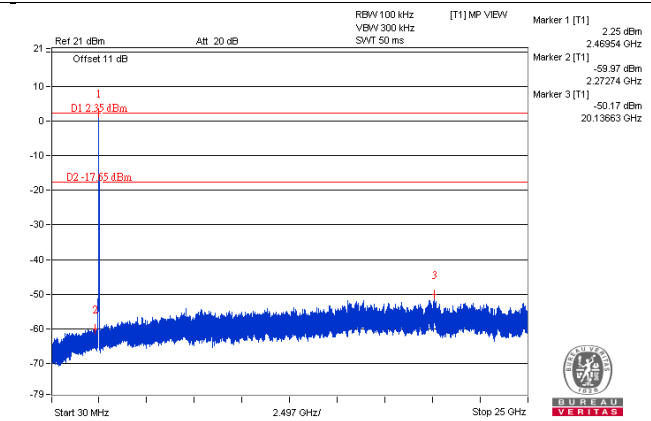
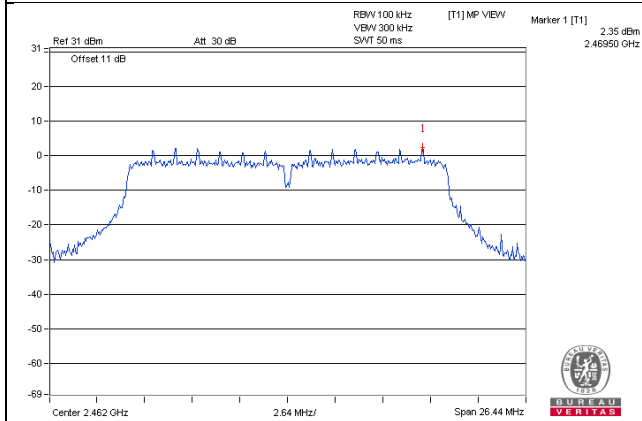
CH 1



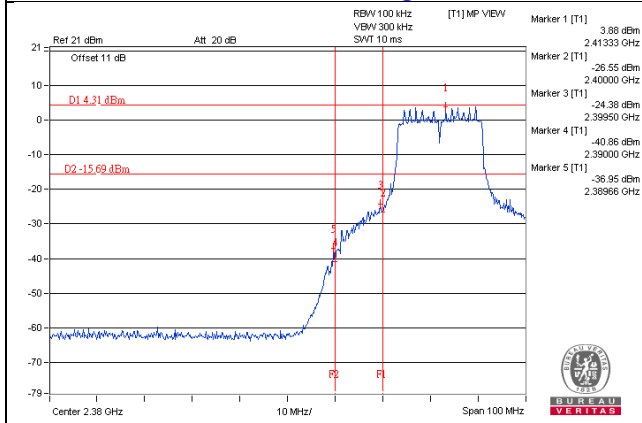
CH 6



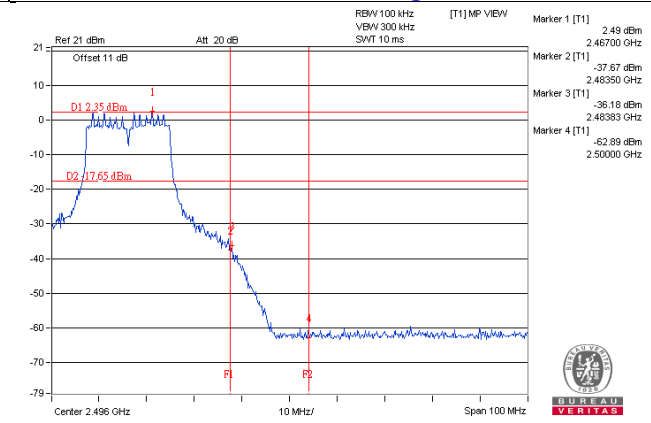
CH 11



CH 1 Band edge

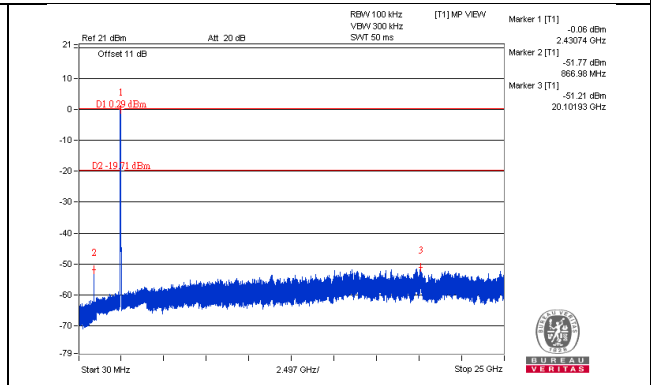
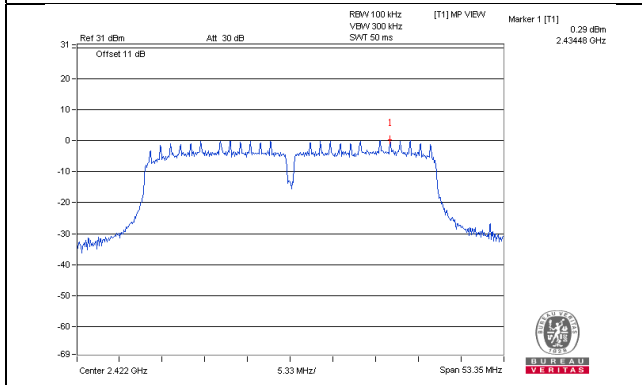


CH 11 Band edge

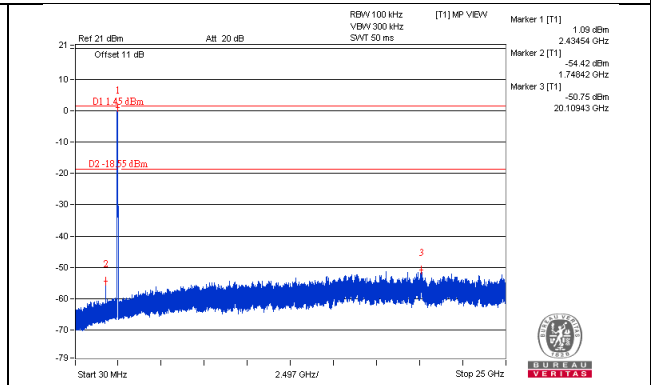
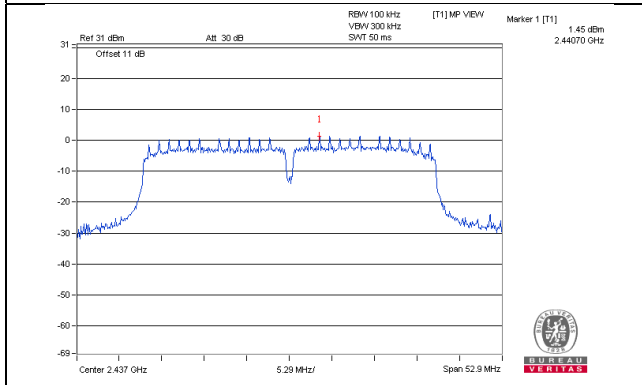


802.11n (HT40)

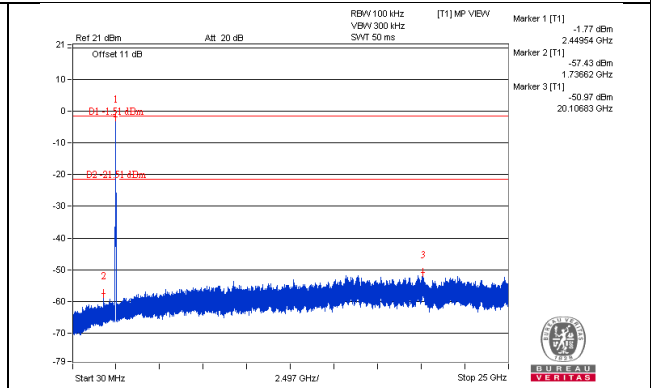
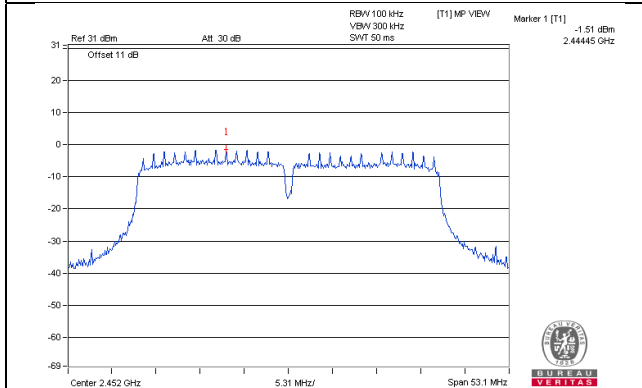
CH 3



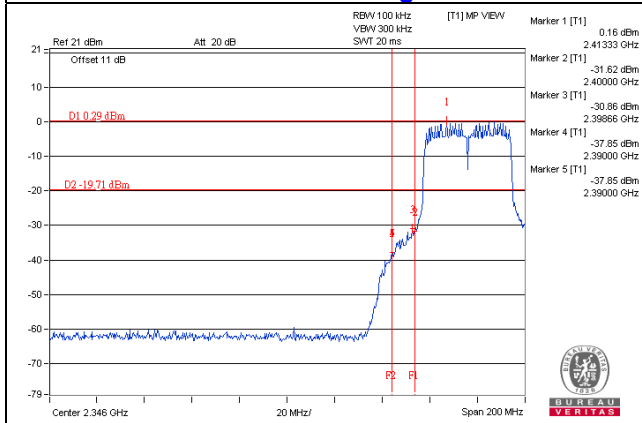
CH 6



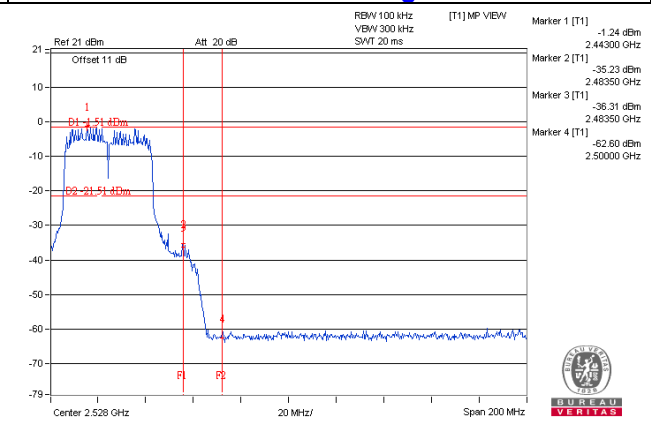
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

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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.

--- END ---