

FCC Test Report

Report No.: RF150708C18

FCC ID: PZWDWWB005

Test Model: DWWB005

Received Date: Jul. 08, 2015

Test Date: Jul. 19 ~ Aug. 04, 2015

Issued Date: Aug. 06, 2015

Applicant: DENSO WAVE INCORPORATED

Address: 1, Yoshiike, Kusagi, Agui-cho, Chita-gun, Aichi, 470-2297 Japan

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

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
RF150708C18	Original release.	Aug. 06, 2015

1 Certificate of Conformity

Product: BHT-1400 -CE main board

Brand: DENSO

Test Model: DWWB005

Sample Status: Engineering sample

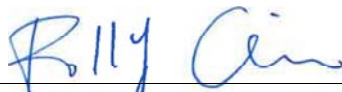
Applicant: DENSO WAVE INCORPORATED

Test Date: Jul. 19 ~ Aug. 04, 2015

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 :



Polly Chien / Specialist

Date:

Aug. 06, 2015

Approved by :



Ken Liu / Senior Manager

Date:

Aug. 06, 2015

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 -12.31dB at 0.19832MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.6dB at 722.07MHz.
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	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 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	BHT-1400 -CE main board
Brand	DENSO
Test Model	DWWB005
Status of EUT	Engineering sample
Power Supply Rating	3.3Vdc (host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
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 72.2Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	218.776mW
Antenna Type	2D barcode scanner: Monopole antenna with -3.3dBi gain 1D barcode scanner: Monopole antenna with -4.0dBi gain
Antenna Connector	NA
Accessory Device	NA
Data Cable Supplied	NA

Note:

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

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

2. The EUT is authorized for use in following specific End-product (Handy Terminal).

Brand	Model	Difference
DENSO	BHT-1461BWB-CE	1D barcode scanner with WLAN & BT
	BHT-1461QWB-CE	2D barcode scanner with WLAN & BT

3. The following devices are support units only.

Device	Brand Name	Model No.	Remark
Rechargeable Li-ion battery	DENSO WAVE	BT-110LA (BP06-00028C)	Rating: 3.7Vdc, 2300mA, 8.5Wh
Cradle	DENSO	CU-AL1	-
AC adapter for cradle	JQA	AWW0515NE	I/P: 100-240Vac, 50/60Hz, 0.2A, 13W O/P: 5Vdc, 1.5A AC 1.8m power cable without core DC 1.25m power cable with 1 core

4. 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		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE $<$ 1G	PLC	APCM	
A	√	√	-	√	With 2D scanner Handy Terminal, Battery mode
B	-	√	√	-	With 2D scanner Handy Terminal, Cradle mode
C	√	√	-	-	With 1D scanner Handy Terminal, Battery mode
D	-	√	√	-	With 1D scanner Handy Terminal, Cradle mode

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 **Z-plane**.
- "-" 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, C	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A, C	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, C	802.11n (HT20)	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)
A, B, C, D	802.11g	1 to 11	11	OFDM	BPSK	6.0

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)
B, D	802.11g	1 to 11	11	OFDM	BPSK	6.0

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	18deg. C, 70%RH	3.7Vdc (Battery)	Nick Hsu
RE<1G	18deg. C, 70%RH	120Vac, 60Hz (System) 3.7Vdc (Battery)	Nick Hsu
PLC	25deg. C, 65%RH	120Vac, 60Hz (System)	Tank Wu
APCM	25deg. C, 60%RH	3.7Vdc (Battery)	Leo Tsai

3.3 Duty Cycle of Test Signal

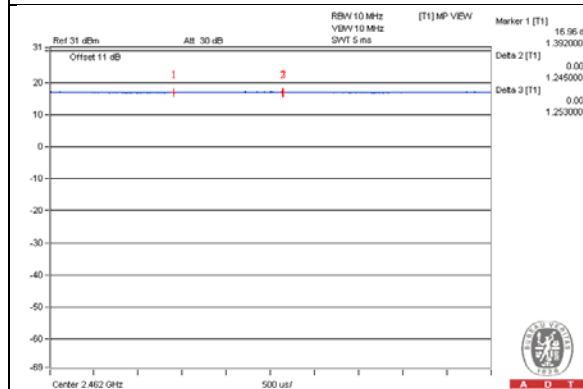
802.11b: Duty cycle of test signal is 100 %

Duty cycle of test signal is < 98%.

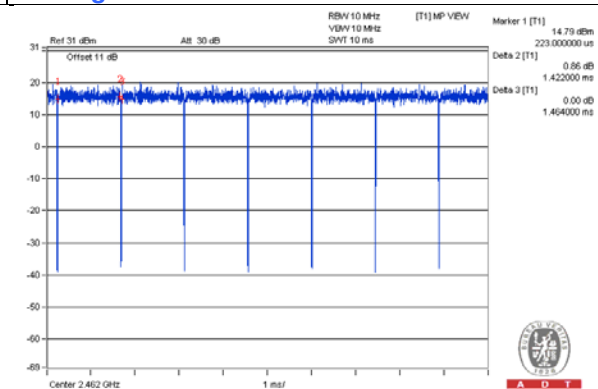
802.11g: Duty cycle = $1.422/1.464 = 0.971$, Duty factor = $10 * \log(1/0.971) = 0.13$

802.11n (HT20): Duty cycle = $1.334/1.371 = 0.973$, Duty factor = $10 * \log(1/0.973) = 0.12$

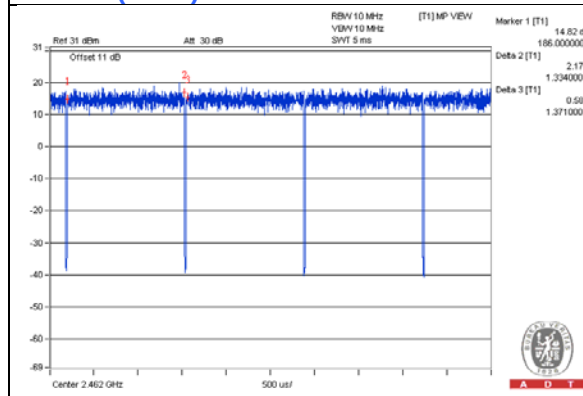
802.11b



802.11g



802.11n (HT20)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Handy Terminal	DENSO	BHT-1461QWB-CE	NA	NA	Provided by client.
	Handy Terminal	DENSO	BHT-1461BWB-CE	NA	NA	Provided by client.
B.	Cradle	DENSO	CU-AL1	NA	NA	Provided by client.
C.	Load	NA	NA	NA	NA	-
D.	AC adapter for cradle	JQA	AWW0515NE	NA	NA	Provided by client.

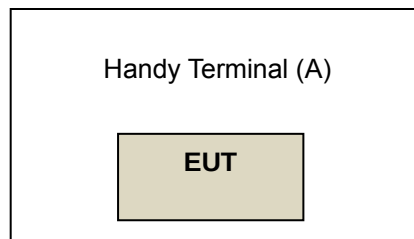
Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	1.8	N	0	-
2.	Power cable	1	1.25	-	1	-

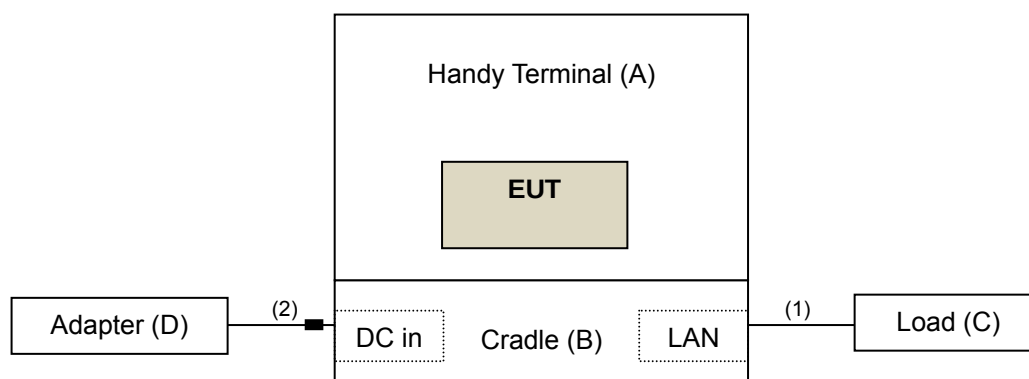
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

Test mode A, C



Test mode B, D



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)
558074 D01 DTS Meas Guidance v03r02
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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Aug. 29, 2014	Aug. 28, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	9120D	209	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016

- 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 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

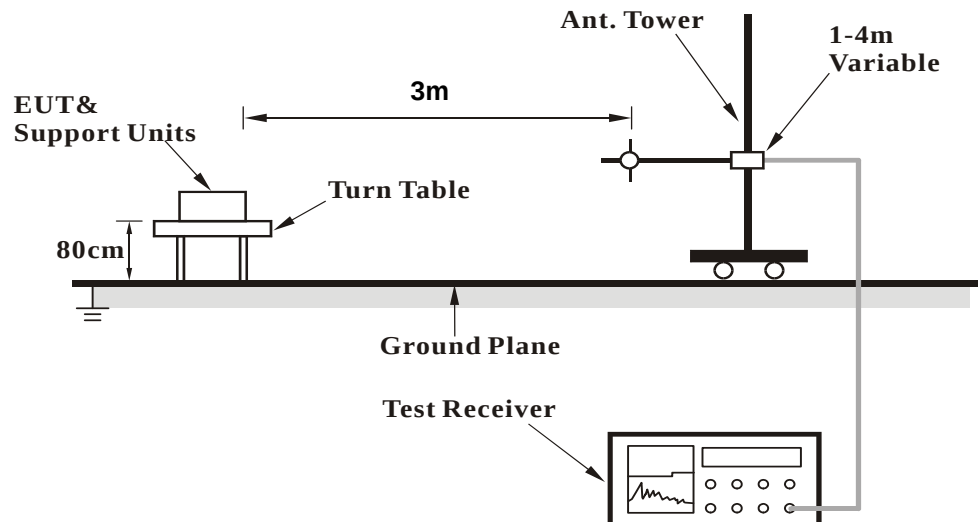
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

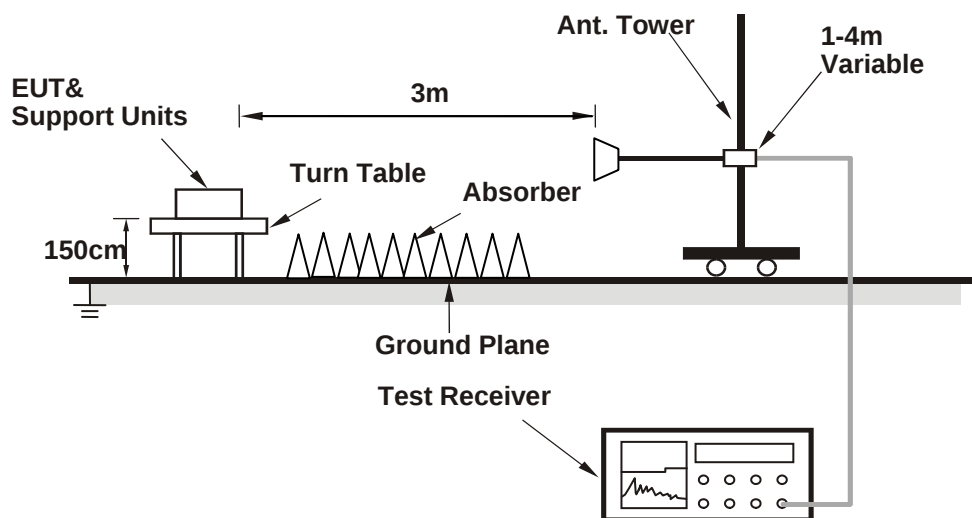
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range 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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.2 PK	74.0	-17.8	1.76 H	212	23.70	32.50
2	2390.00	44.8 AV	54.0	-9.2	1.76 H	212	12.30	32.50
3	*2412.00	102.0 PK			1.92 H	191	69.40	32.60
4	*2412.00	98.2 AV			1.92 H	191	65.60	32.60
5	4824.00	46.3 PK	74.0	-27.7	1.59 H	244	40.40	5.90
6	4824.00	34.0 AV	54.0	-20.0	1.59 H	244	28.10	5.90
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	55.8 PK	74.0	-18.2	1.34 V	229	23.30	32.50
2	2390.00	44.7 AV	54.0	-9.3	1.34 V	229	12.20	32.50
3	*2412.00	95.9 PK			1.49 V	219	63.30	32.60
4	*2412.00	92.2 AV			1.49 V	219	59.60	32.60
5	4824.00	46.8 PK	74.0	-27.2	1.21 V	213	40.90	5.90
6	4824.00	34.2 AV	54.0	-19.8	1.21 V	213	28.30	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	104.3 PK			1.73 H	202	71.60	32.70
2	*2437.00	100.7 AV			1.73 H	202	68.00	32.70
3	4874.00	46.9 PK	74.0	-27.1	1.44 H	216	41.00	5.90
4	4874.00	34.4 AV	54.0	-19.6	1.44 H	216	28.50	5.90
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	98.2 PK			1.82 V	198	65.50	32.70
2	*2437.00	94.9 AV			1.82 V	198	62.20	32.70
3	4874.00	47.0 PK	74.0	-27.0	1.65 V	215	41.10	5.90
4	4874.00	34.0 AV	54.0	-20.0	1.65 V	215	28.10	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	105.3 PK			2.06 H	199	72.70	32.60
2	*2462.00	101.5 AV			2.06 H	199	68.90	32.60
3	2483.50	56.1 PK	74.0	-17.9	2.03 H	186	23.40	32.70
4	2483.50	45.6 AV	54.0	-8.4	2.03 H	186	12.90	32.70
5	4924.00	47.6 PK	74.0	-26.4	1.93 H	214	41.60	6.00
6	4924.00	34.6 AV	54.0	-19.4	1.93 H	214	28.60	6.00
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	98.7 PK			1.94 V	237	66.10	32.60
2	*2462.00	94.5 AV			1.94 V	237	61.90	32.60
3	2483.50	56.6 PK	74.0	-17.4	1.76 V	244	23.90	32.70
4	2483.50	44.7 AV	54.0	-9.3	1.76 V	244	12.00	32.70
5	4924.00	47.2 PK	74.0	-26.8	1.61 V	262	41.20	6.00
6	4924.00	34.3 AV	54.0	-19.7	1.61 V	262	28.30	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.7 PK	74.0	-17.3	1.40 H	11	24.20	32.50
2	2390.00	45.4 AV	54.0	-8.6	1.40 H	11	12.90	32.50
3	*2412.00	102.8 PK			1.41 H	196	70.20	32.60
4	*2412.00	92.5 AV			1.41 H	196	59.90	32.60
5	4824.00	48.2 PK	74.0	-25.8	1.50 H	211	42.30	5.90
6	4824.00	35.1 AV	54.0	-18.9	1.50 H	211	29.20	5.90
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	55.5 PK	74.0	-18.5	1.71 V	219	23.00	32.50
2	2390.00	44.8 AV	54.0	-9.2	1.71 V	219	12.30	32.50
3	*2412.00	96.2 PK			1.47 V	221	63.60	32.60
4	*2412.00	85.6 AV			1.47 V	221	53.00	32.60
5	4824.00	46.9 PK	74.0	-27.1	1.58 V	204	41.00	5.90
6	4824.00	34.2 AV	54.0	-19.8	1.58 V	204	28.30	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	103.4 PK			1.41 H	199	70.70	32.70
2	*2437.00	93.4 AV			1.41 H	199	60.70	32.70
3	4874.00	48.0 PK	74.0	-26.0	1.39 H	66	42.10	5.90
4	4874.00	35.0 AV	54.0	-19.0	1.39 H	66	29.10	5.90
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	97.0 PK			1.82 V	199	64.30	32.70
2	*2437.00	87.5 AV			1.82 V	199	54.80	32.70
3	4874.00	47.9 PK	74.0	-26.1	1.60 V	78	42.00	5.90
4	4874.00	34.9 AV	54.0	-19.1	1.60 V	78	29.00	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	103.5 PK			1.39 H	193	70.90	32.60
2	*2462.00	94.3 AV			1.39 H	193	61.70	32.60
3	2483.50	60.1 PK	74.0	-13.9	1.41 H	189	27.40	32.70
4	2483.50	47.3 AV	54.0	-6.7	1.41 H	189	14.60	32.70
5	4924.00	47.9 PK	74.0	-26.1	1.23 H	155	41.90	6.00
6	4924.00	34.6 AV	54.0	-19.4	1.23 H	155	28.60	6.00
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	97.9 PK			1.78 V	203	65.30	32.60
2	*2462.00	87.7 AV			1.78 V	203	55.10	32.60
3	2483.50	57.7 PK	74.0	-16.3	1.78 V	200	25.00	32.70
4	2483.50	45.7 AV	54.0	-8.3	1.78 V	200	13.00	32.70
5	4924.00	48.0 PK	74.0	-26.0	1.50 V	152	42.00	6.00
6	4924.00	34.8 AV	54.0	-19.2	1.50 V	152	28.80	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.2 PK	74.0	-17.8	1.40 H	190	23.70	32.50
2	2390.00	45.6 AV	54.0	-8.4	1.40 H	190	13.10	32.50
3	*2412.00	100.4 PK			1.43 H	198	67.80	32.60
4	*2412.00	91.1 AV			1.43 H	198	58.50	32.60
5	4824.00	47.1 PK	74.0	-26.9	1.23 H	88	41.20	5.90
6	4824.00	33.8 AV	54.0	-20.2	1.23 H	88	27.90	5.90
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	55.1 PK	74.0	-18.9	1.76 V	190	22.60	32.50
2	2390.00	44.9 AV	54.0	-9.1	1.76 V	190	12.40	32.50
3	*2412.00	94.5 PK			2.04 V	202	61.90	32.60
4	*2412.00	84.9 AV			2.04 V	202	52.30	32.60
5	4824.00	46.6 PK	74.0	-27.4	1.50 V	69	40.70	5.90
6	4824.00	33.5 AV	54.0	-20.5	1.50 V	69	27.60	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	101.8 PK			1.40 H	191	69.10	32.70
2	*2437.00	92.8 AV			1.40 H	191	60.10	32.70
3	4874.00	46.8 PK	74.0	-27.2	1.52 H	177	40.90	5.90
4	4874.00	34.1 AV	54.0	-19.9	1.52 H	177	28.20	5.90
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	95.4 PK			2.00 V	201	62.70	32.70
2	*2437.00	86.0 AV			2.00 V	201	53.30	32.70
3	4874.00	47.2 PK	74.0	-26.8	1.68 V	135	41.30	5.90
4	4874.00	34.3 AV	54.0	-19.7	1.68 V	135	28.40	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	103.2 PK			1.38 H	196	70.60	32.60
2	*2462.00	94.2 AV			1.38 H	196	61.60	32.60
3	2483.50	62.9 PK	74.0	-11.1	1.38 H	196	30.20	32.70
4	2483.50	49.0 AV	54.0	-5.0	1.38 H	196	16.30	32.70
5	4924.00	47.3 PK	74.0	-26.7	1.61 H	162	41.30	6.00
6	4924.00	34.0 AV	54.0	-20.0	1.61 H	162	28.00	6.00
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	98.5 PK			1.98 V	204	65.90	32.60
2	*2462.00	89.0 AV			1.98 V	204	56.40	32.60
3	2483.50	58.4 PK	74.0	-15.6	1.77 V	199	25.70	32.70
4	2483.50	46.3 AV	54.0	-7.7	1.77 V	199	13.60	32.70
5	4924.00	47.4 PK	74.0	-26.6	1.47 V	19	41.40	6.00
6	4924.00	34.1 AV	54.0	-19.9	1.47 V	19	28.10	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.2 PK	74.0	-17.8	1.61 H	164	23.70	32.50
2	2390.00	44.9 AV	54.0	-9.1	1.61 H	164	12.40	32.50
3	*2412.00	101.8 PK			1.92 H	182	69.20	32.60
4	*2412.00	97.9 AV			1.92 H	182	65.30	32.60
5	4824.00	47.1 PK	74.0	-26.9	1.35 H	36	41.20	5.90
6	4824.00	34.2 AV	54.0	-19.8	1.35 H	36	28.30	5.90
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	55.5 PK	74.0	-18.5	1.80 V	266	23.00	32.50
2	2390.00	44.7 AV	54.0	-9.3	1.80 V	266	12.20	32.50
3	*2412.00	91.7 PK			1.92 V	249	59.10	32.60
4	*2412.00	87.6 AV			1.92 V	249	55.00	32.60
5	4824.00	47.8 PK	74.0	-26.2	1.24 V	213	41.90	5.90
6	4824.00	34.3 AV	54.0	-19.7	1.24 V	213	28.40	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	103.3 PK			1.72 H	188	70.60	32.70
2	*2437.00	99.4 AV			1.72 H	188	66.70	32.70
3	4874.00	46.9 PK	74.0	-27.1	1.15 H	97	41.00	5.90
4	4874.00	34.3 AV	54.0	-19.7	1.15 H	97	28.40	5.90
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	93.1 PK			1.01 V	245	60.40	32.70
2	*2437.00	89.3 AV			1.01 V	245	56.60	32.70
3	4874.00	47.1 PK	74.0	-26.9	1.42 V	348	41.20	5.90
4	4874.00	34.0 AV	54.0	-20.0	1.42 V	348	28.10	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	104.6 PK			2.06 H	180	72.00	32.60
2	*2462.00	100.7 AV			2.06 H	180	68.10	32.60
3	2483.50	57.1 PK	74.0	-16.9	2.02 H	188	24.40	32.70
4	2483.50	46.1 AV	54.0	-7.9	2.02 H	188	13.40	32.70
5	4924.00	47.1 PK	74.0	-26.9	1.58 H	13	41.10	6.00
6	4924.00	34.5 AV	54.0	-19.5	1.58 H	13	28.50	6.00
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	93.8 PK			2.26 V	266	61.20	32.60
2	*2462.00	90.0 AV			2.26 V	266	57.40	32.60
3	2483.50	55.9 PK	74.0	-18.1	2.14 V	274	23.20	32.70
4	2483.50	44.6 AV	54.0	-9.4	2.14 V	274	11.90	32.70
5	4924.00	46.6 PK	74.0	-27.4	1.37 V	245	40.60	6.00
6	4924.00	34.4 AV	54.0	-19.6	1.37 V	245	28.40	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.0 PK	74.0	-18.0	1.71 H	224	23.50	32.50
2	2390.00	45.3 AV	54.0	-8.7	1.71 H	224	12.80	32.50
3	*2412.00	102.4 PK			1.93 H	184	69.80	32.60
4	*2412.00	92.0 AV			1.93 H	184	59.40	32.60
5	4824.00	46.3 PK	74.0	-27.7	1.55 H	164	40.40	5.90
6	4824.00	34.2 AV	54.0	-19.8	1.55 H	164	28.30	5.90
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	56.1 PK	74.0	-17.9	1.78 V	259	23.60	32.50
2	2390.00	44.6 AV	54.0	-9.4	1.78 V	259	12.10	32.50
3	*2412.00	91.8 PK			1.94 V	246	59.20	32.60
4	*2412.00	81.7 AV			1.94 V	246	49.10	32.60
5	4824.00	47.0 PK	74.0	-27.0	1.41 V	97	41.10	5.90
6	4824.00	34.0 AV	54.0	-20.0	1.41 V	97	28.10	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	103.5 PK			1.74 H	181	70.80	32.70
2	*2437.00	93.0 AV			1.74 H	181	60.30	32.70
3	4874.00	45.7 PK	74.0	-28.3	1.49 H	205	39.80	5.90
4	4874.00	33.9 AV	54.0	-20.1	1.49 H	205	28.00	5.90
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	93.1 PK			1.00 V	245	60.40	32.70
2	*2437.00	83.9 AV			1.00 V	245	51.20	32.70
3	4874.00	47.0 PK	74.0	-27.0	1.09 V	185	41.10	5.90
4	4874.00	33.9 AV	54.0	-20.1	1.09 V	185	28.00	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	104.0 PK			1.71 H	171	71.40	32.60
2	*2462.00	94.7 AV			1.71 H	171	62.10	32.60
3	2483.50	62.6 PK	74.0	-11.4	1.69 H	179	29.90	32.70
4	2483.50	47.8 AV	54.0	-6.2	1.69 H	179	15.10	32.70
5	4924.00	47.7 PK	74.0	-26.3	1.51 H	54	41.70	6.00
6	4924.00	34.0 AV	54.0	-20.0	1.51 H	54	28.00	6.00
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	93.5 PK			1.92 V	244	60.90	32.60
2	*2462.00	83.8 AV			1.92 V	244	51.20	32.60
3	2483.50	56.2 PK	74.0	-17.8	1.78 V	235	23.50	32.70
4	2483.50	44.8 AV	54.0	-9.2	1.78 V	235	12.10	32.70
5	4924.00	46.8 PK	74.0	-27.2	1.11 V	89	40.80	6.00
6	4924.00	34.0 AV	54.0	-20.0	1.11 V	89	28.00	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	2390.00	56.0 PK	74.0	-18.0	1.35 H	201	23.50	32.50
2	2390.00	45.6 AV	54.0	-8.4	1.35 H	201	13.10	32.50
3	*2412.00	101.3 PK			1.41 H	193	68.70	32.60
4	*2412.00	91.4 AV			1.41 H	193	58.80	32.60
5	4824.00	46.2 PK	74.0	-27.8	1.35 H	284	40.30	5.90
6	4824.00	34.0 AV	54.0	-20.0	1.35 H	284	28.10	5.90
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	55.8 PK	74.0	-18.2	1.79 V	280	23.30	32.50
2	2390.00	44.8 AV	54.0	-9.2	1.79 V	280	12.30	32.50
3	*2412.00	92.3 PK			1.94 V	262	59.70	32.60
4	*2412.00	82.6 AV			1.94 V	262	50.00	32.60
5	4824.00	46.7 PK	74.0	-27.3	1.54 V	299	40.80	5.90
6	4824.00	34.0 AV	54.0	-20.0	1.54 V	299	28.10	5.90

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2437.00	102.4 PK			1.73 H	192	69.70	32.70
2	*2437.00	92.6 AV			1.73 H	192	59.90	32.70
3	4874.00	46.6 PK	74.0	-27.4	1.60 H	241	40.70	5.90
4	4874.00	33.8 AV	54.0	-20.2	1.60 H	241	27.90	5.90
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	92.0 PK			2.13 V	246	59.30	32.70
2	*2437.00	82.6 AV			2.13 V	246	49.90	32.70
3	4874.00	46.4 PK	74.0	-27.6	1.42 V	312	40.50	5.90
4	4874.00	33.8 AV	54.0	-20.2	1.42 V	312	27.90	5.90

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	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	*2462.00	103.5 PK			2.08 H	170	70.90	32.60
2	*2462.00	94.2 AV			2.08 H	170	61.60	32.60
3	2483.50	62.6 PK	74.0	-11.4	2.20 H	192	29.90	32.70
4	2483.50	47.8 AV	54.0	-6.2	2.20 H	192	15.10	32.70
5	4924.00	46.8 PK	74.0	-27.2	1.38 H	184	40.80	6.00
6	4924.00	33.9 AV	54.0	-20.1	1.38 H	184	27.90	6.00
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	92.4 PK			1.91 V	265	59.80	32.60
2	*2462.00	82.3 AV			1.91 V	265	49.70	32.60
3	2483.50	56.3 PK	74.0	-17.7	1.69 V	284	23.60	32.70
4	2483.50	44.8 AV	54.0	-9.2	1.69 V	284	12.10	32.70
5	4924.00	46.9 PK	74.0	-27.1	1.21 V	301	40.90	6.00
6	4924.00	34.0 AV	54.0	-20.0	1.21 V	301	28.00	6.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 11	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	57.12	29.3 QP	40.0	-10.7	1.99 H	243	44.10	-14.80
2	154.33	28.4 QP	43.5	-15.1	1.99 H	272	42.30	-13.90
3	185.44	25.6 QP	43.5	-17.9	1.99 H	294	41.30	-15.70
4	216.55	24.9 QP	46.0	-21.1	1.99 H	285	41.50	-16.60
5	463.48	31.3 QP	46.0	-14.7	1.99 H	78	40.30	-9.00
6	714.29	33.4 QP	46.0	-12.6	1.00 H	349	37.50	-4.10
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	57.12	24.5 QP	40.0	-15.5	1.01 V	47	39.30	-14.80
2	154.33	30.0 QP	43.5	-13.5	1.01 V	167	43.90	-13.90
3	185.44	26.7 QP	43.5	-16.8	1.01 V	191	42.40	-15.70
4	216.55	25.0 QP	46.0	-21.0	2.00 V	169	41.60	-16.60
5	463.48	32.9 QP	46.0	-13.1	1.01 V	190	41.90	-9.00
6	716.23	37.9 QP	46.0	-8.1	1.01 V	16	42.00	-4.10

REMARKS:

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

CHANNEL	TX Channel 11	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	154.33	34.9 QP	43.5	-8.6	2.00 H	106	48.80	-13.90
2	185.44	34.2 QP	43.5	-9.3	1.50 H	72	49.90	-15.70
3	216.55	33.7 QP	46.0	-12.3	1.01 H	111	50.30	-16.60
4	249.60	42.0 QP	46.0	-4.0	1.01 H	231	56.40	-14.40
5	624.85	35.9 QP	46.0	-10.1	1.50 H	321	41.30	-5.40
6	722.07	42.4 QP	46.0	-3.6	1.01 H	2	46.40	-4.00
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	31.84	31.1 QP	40.0	-8.9	1.00 V	242	47.20	-16.10
2	154.33	36.3 QP	43.5	-7.2	1.00 V	157	50.20	-13.90
3	185.44	32.0 QP	43.5	-11.5	1.00 V	169	47.70	-15.70
4	249.60	37.6 QP	46.0	-8.4	1.49 V	195	52.00	-14.40
5	463.48	37.5 QP	46.0	-8.5	1.00 V	188	46.50	-9.00
6	722.07	39.8 QP	46.0	-6.2	1.49 V	239	43.80	-4.00

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. 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	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	57.12	27.8 QP	40.0	-12.2	2.00 H	136	42.60	-14.80
2	154.33	28.6 QP	43.5	-14.9	2.00 H	245	42.50	-13.90
3	185.44	25.3 QP	43.5	-18.2	2.00 H	290	41.00	-15.70
4	216.55	25.3 QP	46.0	-20.7	1.51 H	93	41.90	-16.60
5	463.48	32.5 QP	46.0	-13.5	1.51 H	100	41.50	-9.00
6	714.29	42.2 QP	46.0	-3.8	2.00 H	58	46.30	-4.10
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	154.33	30.2 QP	43.5	-13.3	1.00 V	162	44.10	-13.90
2	185.44	26.9 QP	43.5	-16.6	1.00 V	162	42.60	-15.70
3	278.77	26.4 QP	46.0	-19.6	1.99 V	9	39.40	-13.00
4	463.48	31.4 QP	46.0	-14.6	1.00 V	216	40.40	-9.00
5	585.97	32.1 QP	46.0	-13.9	1.00 V	20	38.50	-6.40
6	714.29	40.4 QP	46.0	-5.6	1.99 V	151	44.50	-4.10

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	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	57.12	29.2 QP	40.0	-10.8	1.99 H	3	44.00	-14.80
2	154.33	33.6 QP	43.5	-9.9	1.00 H	243	47.50	-13.90
3	234.05	31.4 QP	46.0	-14.6	1.00 H	141	46.90	-15.50
4	286.55	33.8 QP	46.0	-12.2	1.00 H	250	46.60	-12.80
5	463.48	32.2 QP	46.0	-13.8	1.99 H	248	41.20	-9.00
6	714.29	35.6 QP	46.0	-10.4	1.49 H	242	39.70	-4.10
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	41.57	28.4 QP	40.0	-11.6	2.00 V	183	43.40	-15.00
2	154.33	35.4 QP	43.5	-8.1	1.01 V	150	49.30	-13.90
3	169.89	32.1 QP	43.5	-11.4	1.01 V	162	46.40	-14.30
4	216.55	29.3 QP	46.0	-16.7	1.01 V	185	45.90	-16.60
5	463.48	39.2 QP	46.0	-6.8	1.01 V	115	48.20	-9.00
6	722.07	36.4 QP	46.0	-9.6	1.01 V	314	40.40	-4.00

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 21, 2015	Jul. 20, 2016
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

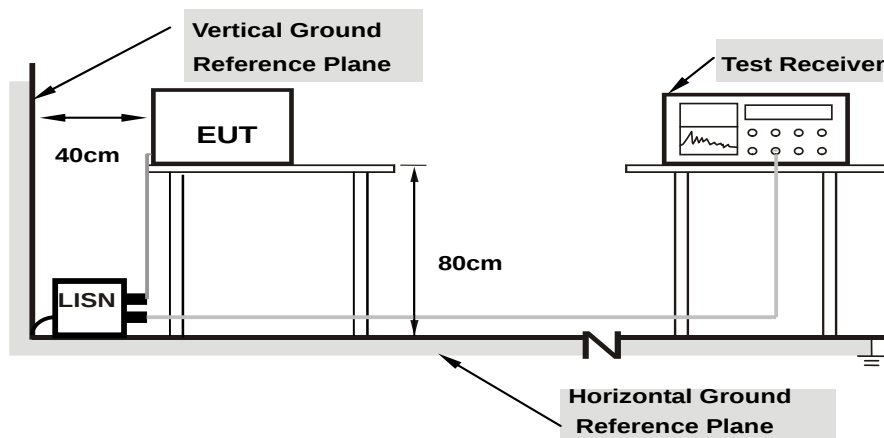
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

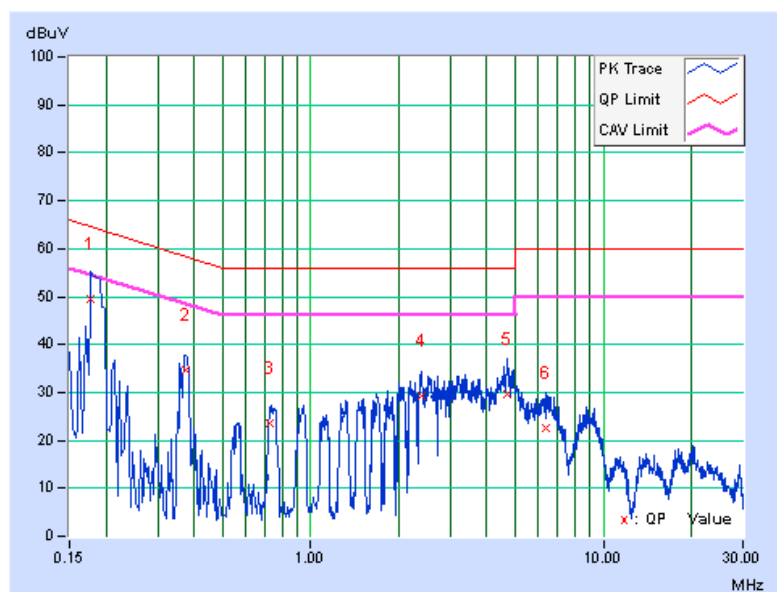
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	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	0.17801	0.06	49.57	32.60	49.63	32.66	64.58	54.58	-14.95	-21.92
2	0.37224	0.06	34.54	25.58	34.60	25.64	58.45	48.45	-23.85	-22.81
3	0.72303	0.07	23.55	9.74	23.62	9.81	56.00	46.00	-32.38	-36.19
4	2.38200	0.13	29.11	16.25	29.24	16.38	56.00	46.00	-26.76	-29.62
5	4.69000	0.22	29.26	19.29	29.48	19.51	56.00	46.00	-26.52	-26.49
6	6.39400	0.29	22.31	14.13	22.60	14.42	60.00	50.00	-37.40	-35.58

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.

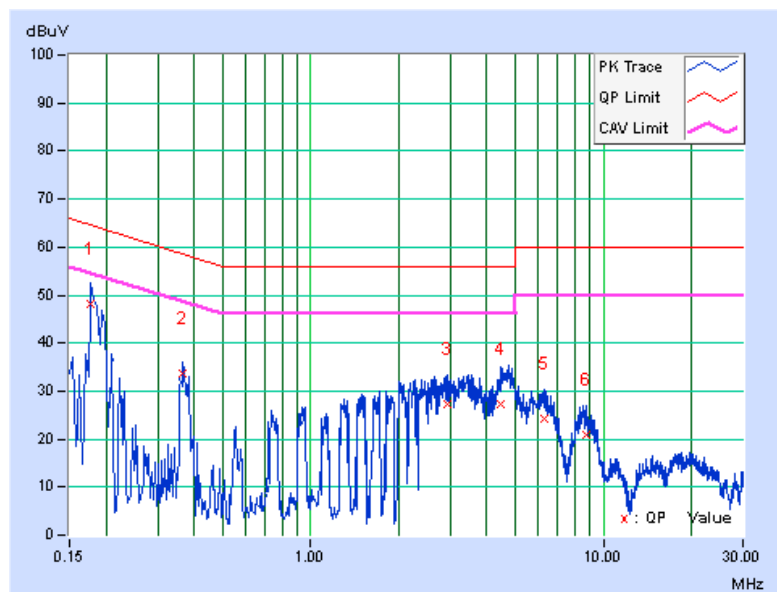


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17801	0.05	48.14	31.79	48.19	31.84	64.58	54.58	-16.39	-22.74
2	0.36640	0.06	33.62	22.29	33.68	22.35	58.58	48.58	-24.90	-26.23
3	2.94200	0.15	27.16	15.01	27.31	15.16	56.00	46.00	-28.69	-30.84
4	4.44200	0.21	27.23	16.00	27.44	16.21	56.00	46.00	-28.56	-29.79
5	6.27000	0.28	24.01	15.78	24.29	16.06	60.00	50.00	-35.71	-33.94
6	8.74200	0.37	20.35	13.19	20.72	13.56	60.00	50.00	-39.28	-36.44

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.

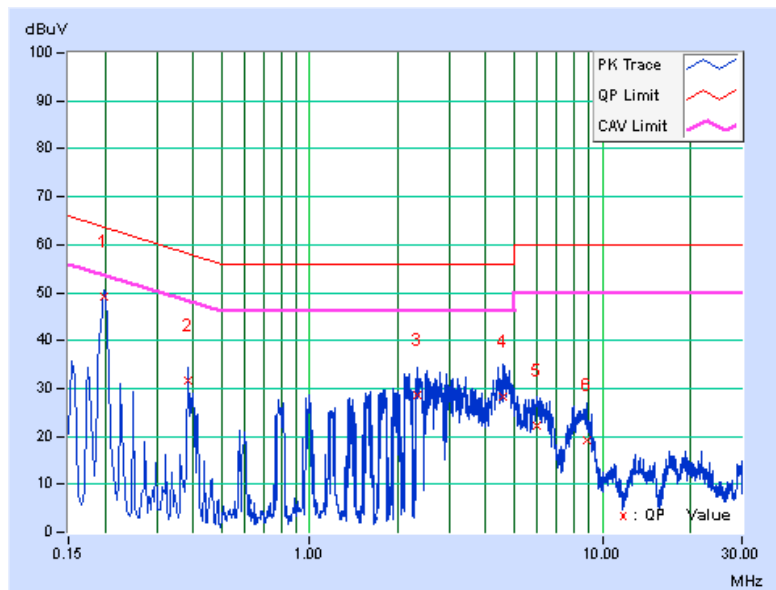


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

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	0.19832	0.06	48.97	41.31	49.03	41.37	63.68	53.68	-14.65	-12.31
2	0.38600	0.06	31.63	21.05	31.69	21.11	58.15	48.15	-26.46	-27.04
3	2.33000	0.13	28.64	16.49	28.77	16.62	56.00	46.00	-27.23	-29.38
4	4.56200	0.21	28.08	18.89	28.29	19.10	56.00	46.00	-27.71	-26.90
5	5.94200	0.27	21.88	13.55	22.15	13.82	60.00	50.00	-37.85	-36.18
6	8.85400	0.40	18.87	12.46	19.27	12.86	60.00	50.00	-40.73	-37.14

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.

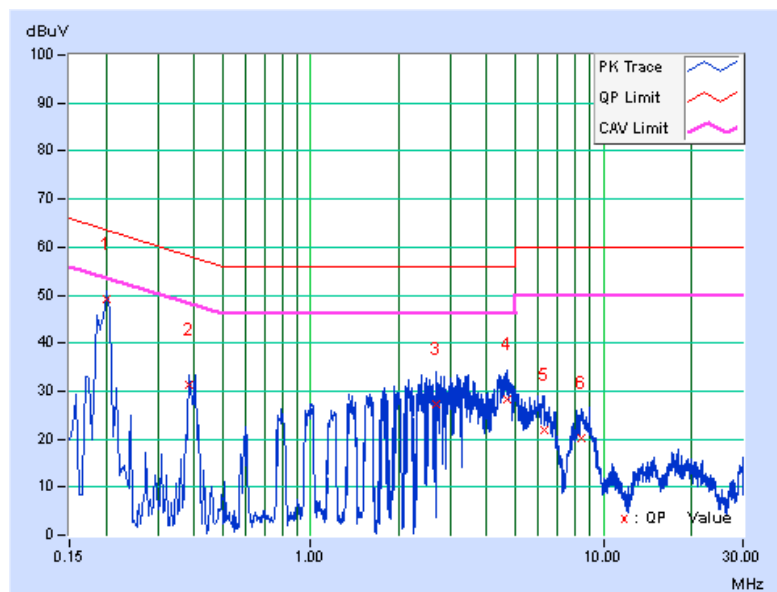


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	D		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20201	0.05	49.24	38.81	49.29	38.86	63.53	53.53	-14.24	-14.67
2	0.38623	0.06	31.22	20.07	31.28	20.13	58.14	48.14	-26.87	-28.02
3	2.68600	0.14	27.08	9.58	27.22	9.72	56.00	46.00	-28.78	-36.28
4	4.70600	0.22	28.05	17.89	28.27	18.11	56.00	46.00	-27.73	-27.89
5	6.31400	0.28	21.60	13.56	21.88	13.84	60.00	50.00	-38.12	-36.16
6	8.38600	0.36	19.73	12.98	20.09	13.34	60.00	50.00	-39.91	-36.66

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.

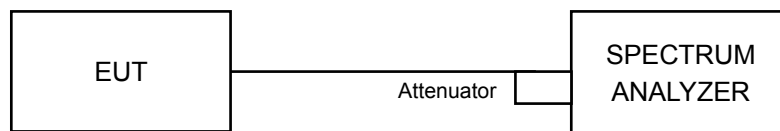


4.3 6dB Bandwidth Measurement

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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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	9.08	0.5	PASS
6	2437	9.10	0.5	PASS
11	2462	9.09	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.71	0.5	PASS
6	2437	15.69	0.5	PASS
11	2462	15.40	0.5	PASS

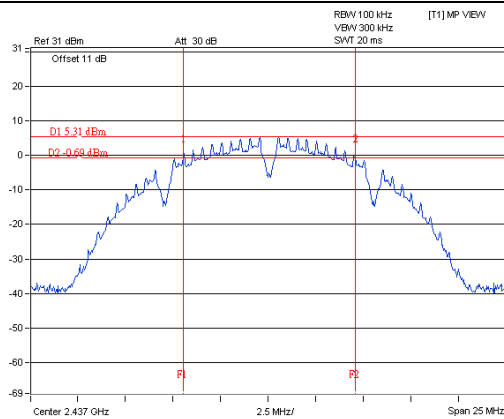
802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.40	0.5	PASS
6	2437	15.37	0.5	PASS
11	2462	15.23	0.5	PASS

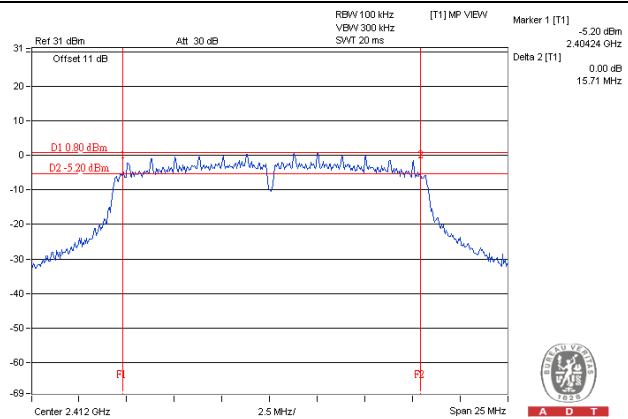
Spectrum Plot of Worst Value

802.11b

802.11g

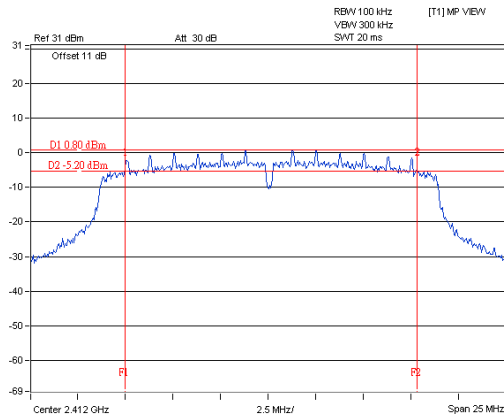


A D T



A D T

802.11n (HT20)



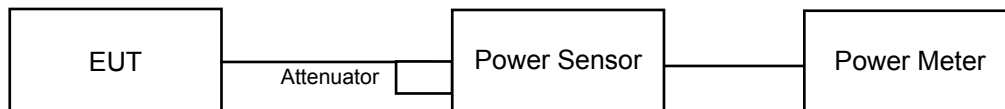
A D T

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

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	60.256	17.80	30	Pass
6	2437	66.069	18.20	30	Pass
11	2462	69.183	18.40	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	208.930	23.20	30	Pass
6	2437	213.796	23.30	30	Pass
11	2462	218.776	23.40	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	131.826	21.20	30	Pass
6	2437	173.780	22.40	30	Pass
11	2462	173.780	22.40	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	34.674	15.40
6	2437	38.905	15.90
11	2462	40.738	16.10

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	20.417	13.10
6	2437	22.387	13.50
11	2462	23.988	13.80

802.11n (HT20)

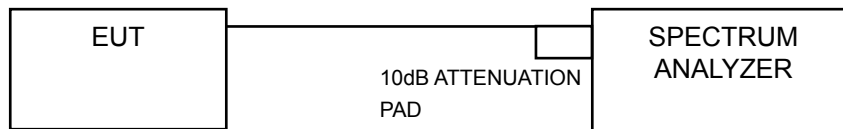
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	19.498	12.90
6	2437	21.878	13.40
11	2462	23.442	13.70

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	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-8.98	8	Pass
6	2437	-9.78	8	Pass
11	2462	-7.71	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-14.54	8	Pass
6	2437	-14.45	8	Pass
11	2462	-12.79	8	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-13.58	8	Pass
6	2437	-13.23	8	Pass
11	2462	-12.91	8	Pass

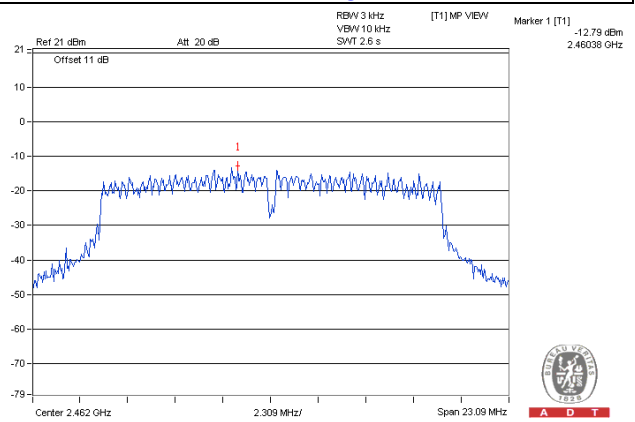
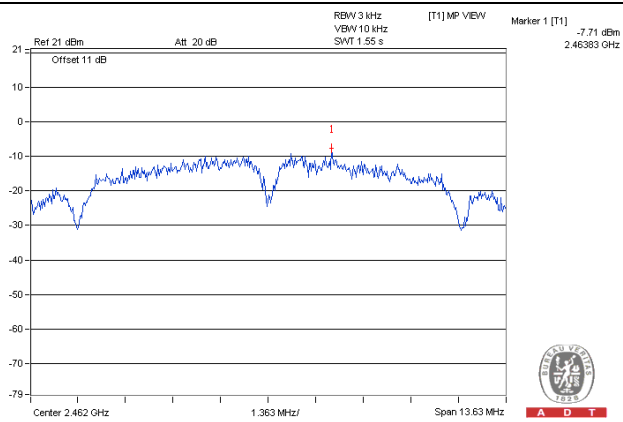


A D T

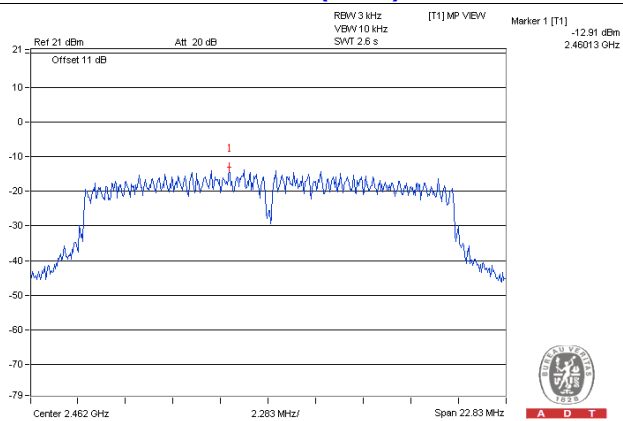
Spectrum Plot of Worst Value

802.11b

802.11g



802.11n (HT20)

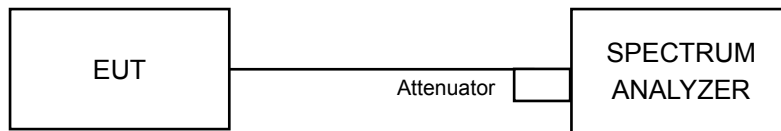


4.6 Conducted Out of Band Emission Measurement

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 OOB

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

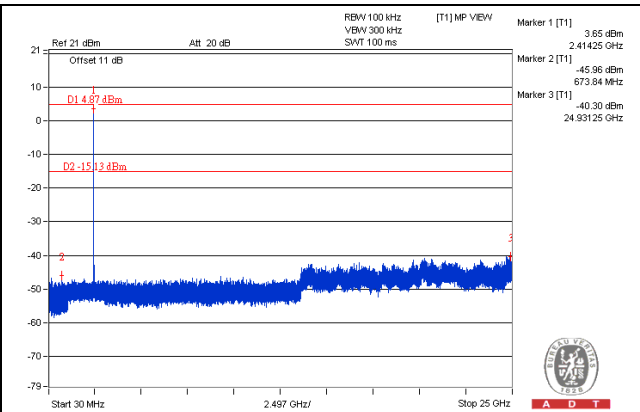
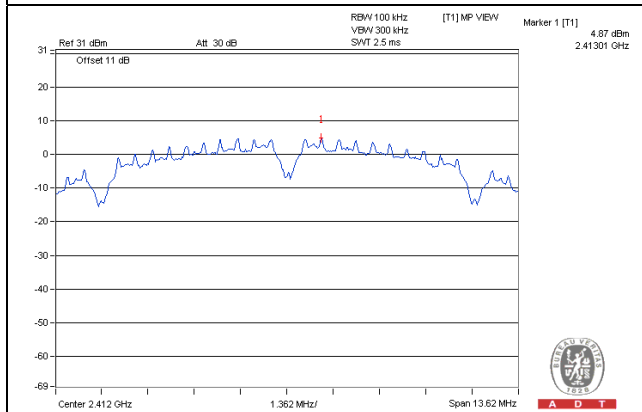
Same as Item 4.3.6

4.6.7 Test Results

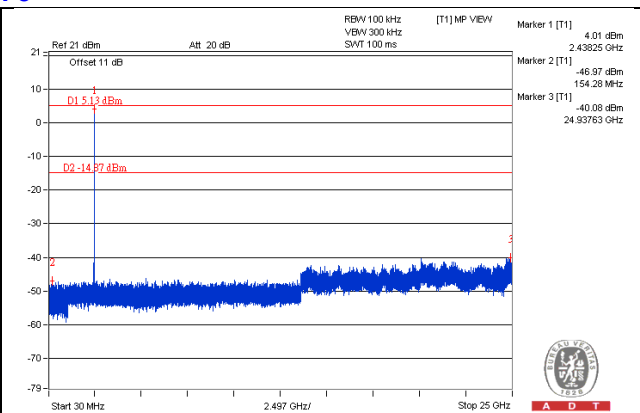
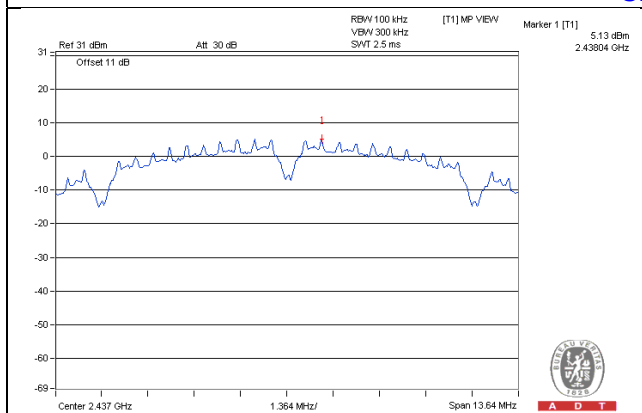
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

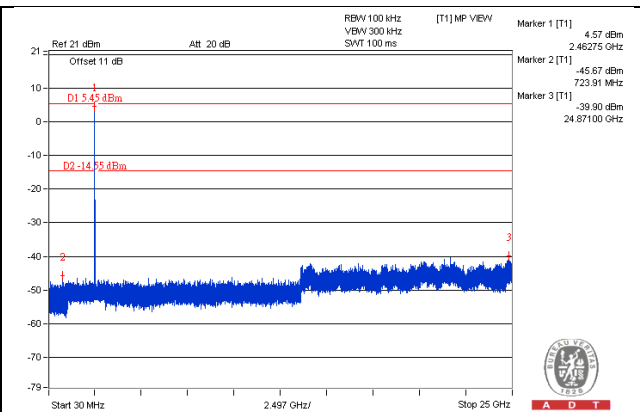
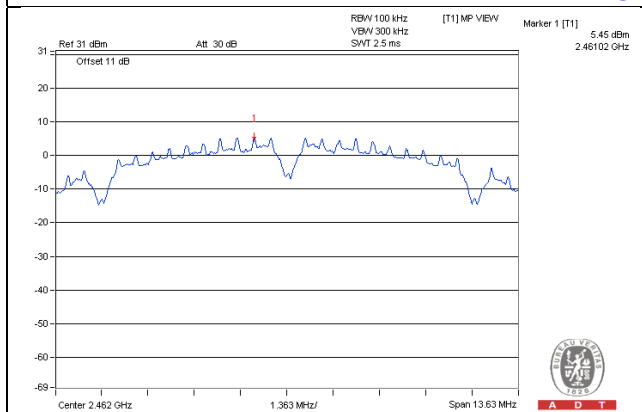
CH 1



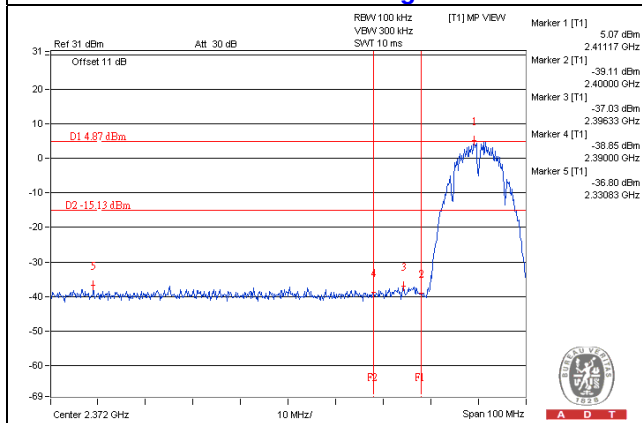
CH 6



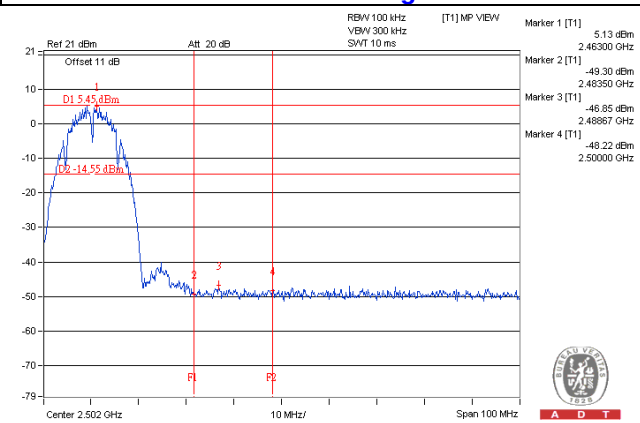
CH 11



CH 1 Band edge

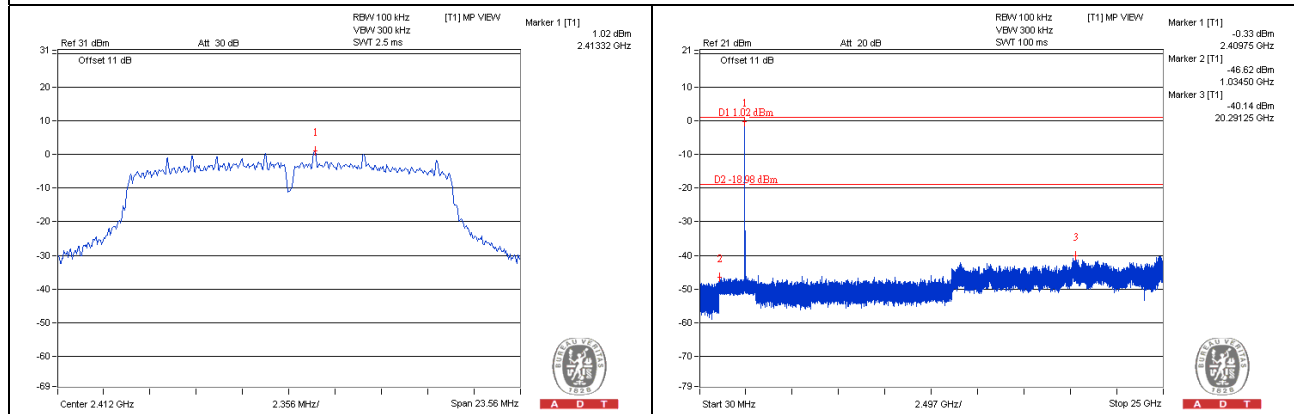


CH 11 Band edge

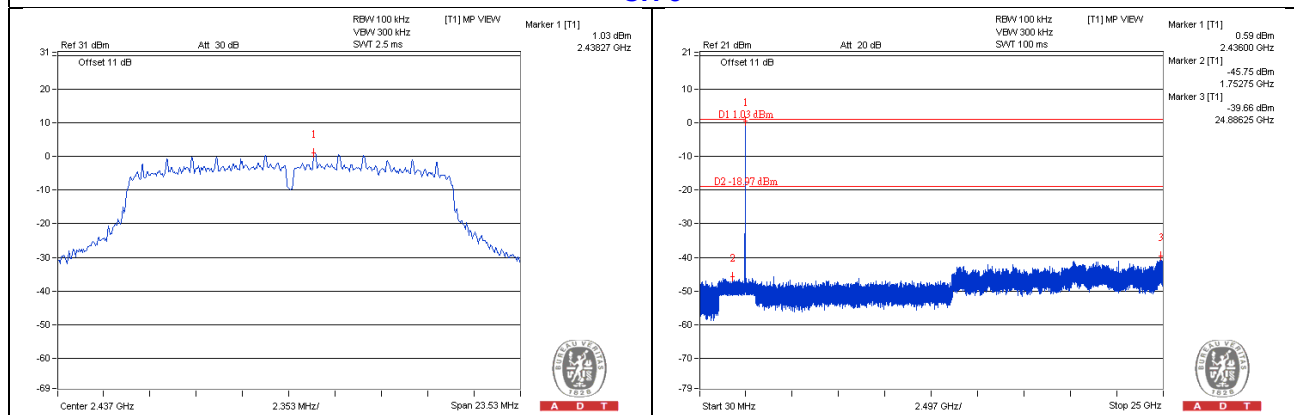


802.11g

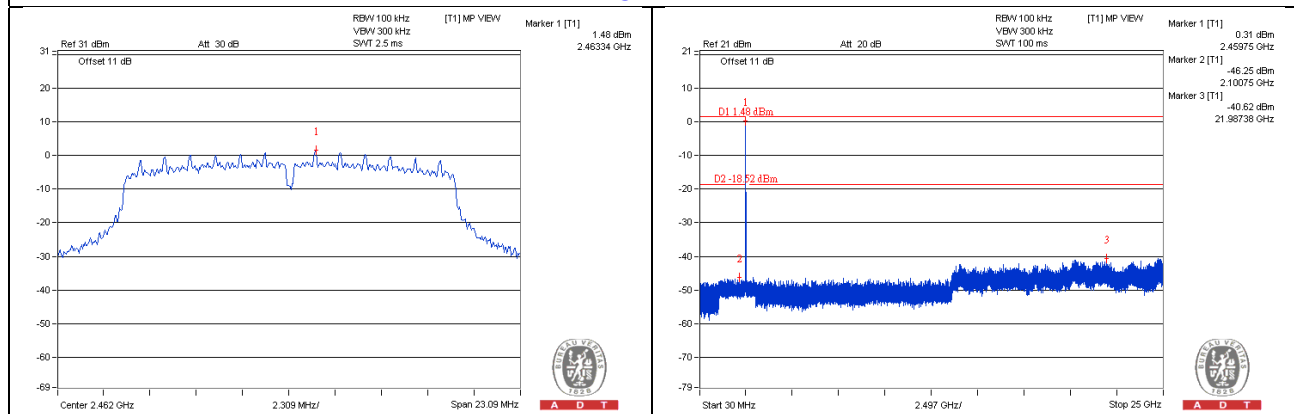
CH 1



CH 6

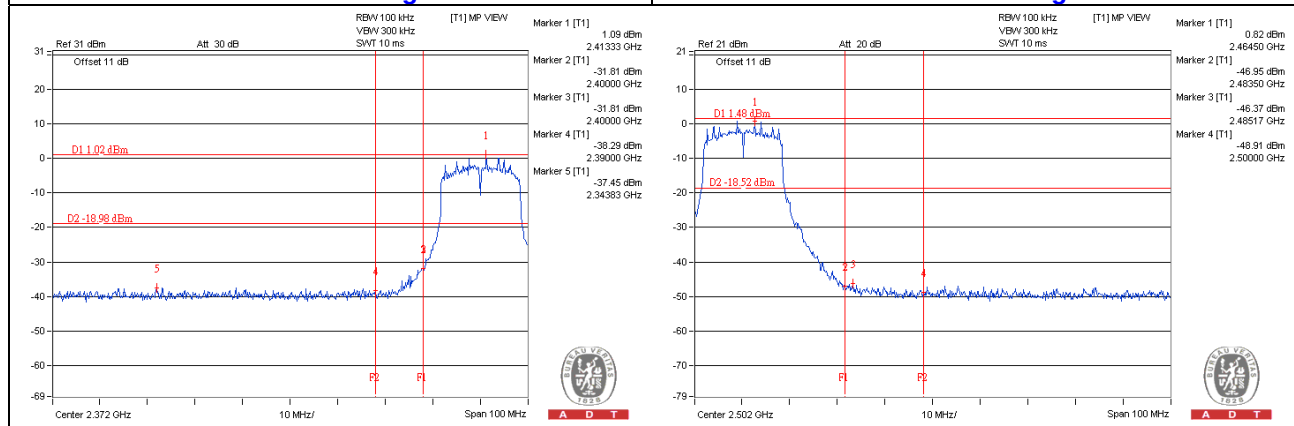


CH 11



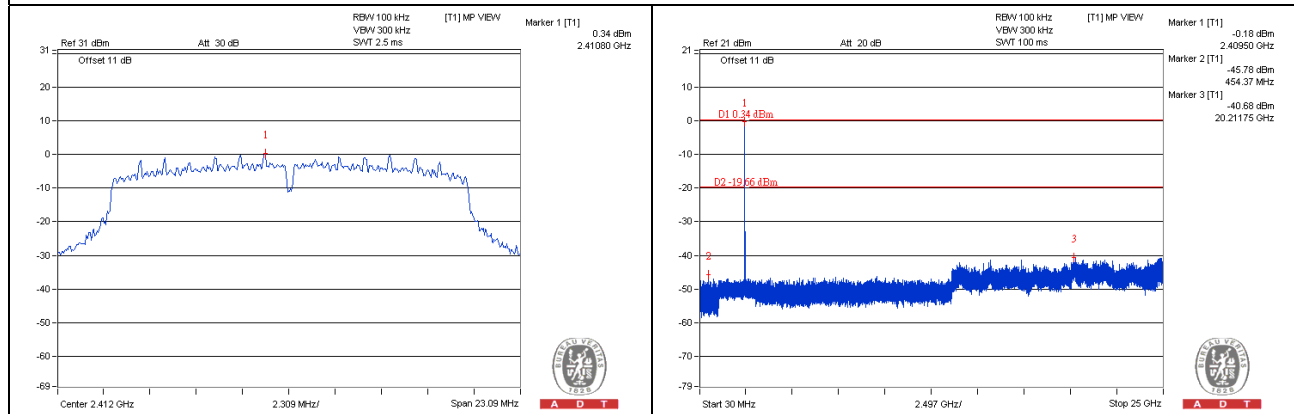
CH 1 Band edge

CH 11 Band edge

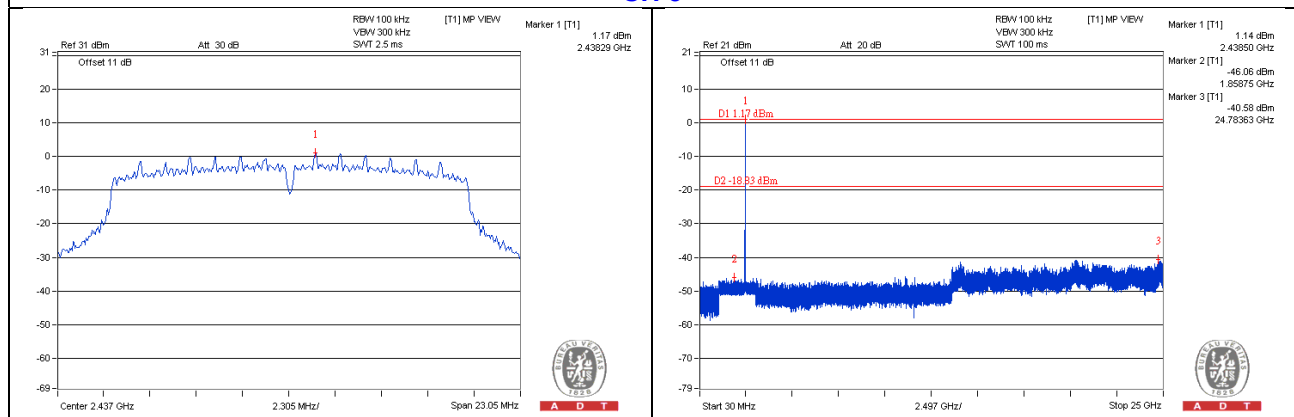


802.11n (HT20)

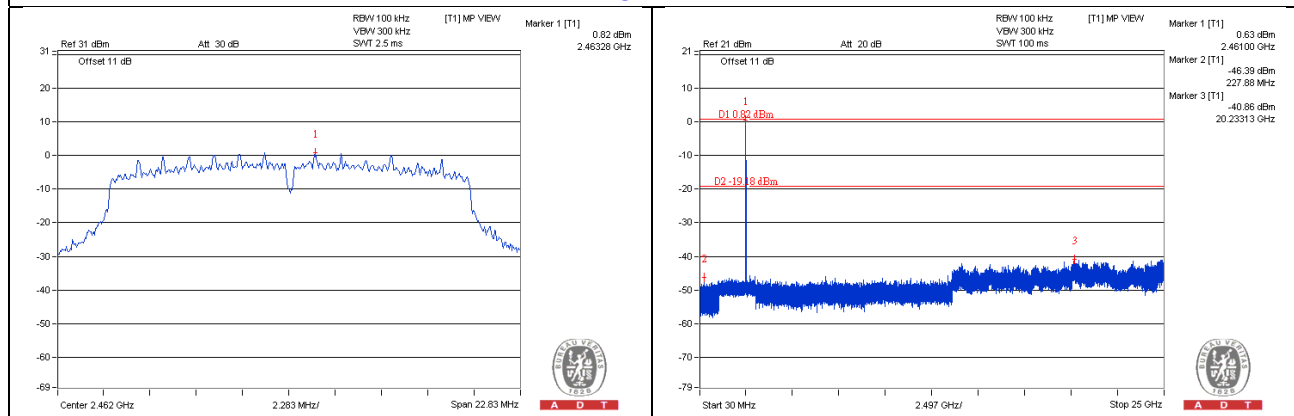
CH 1



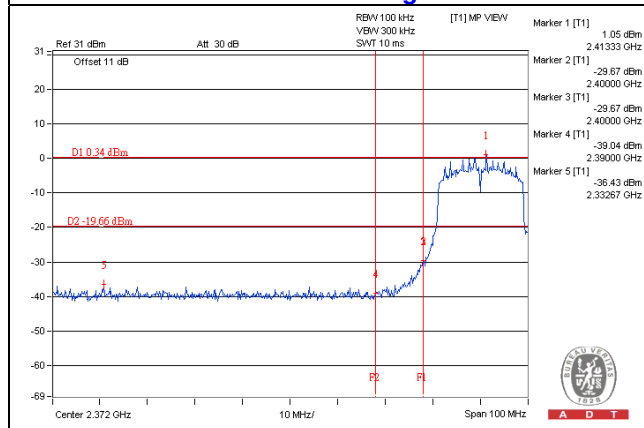
CH 6



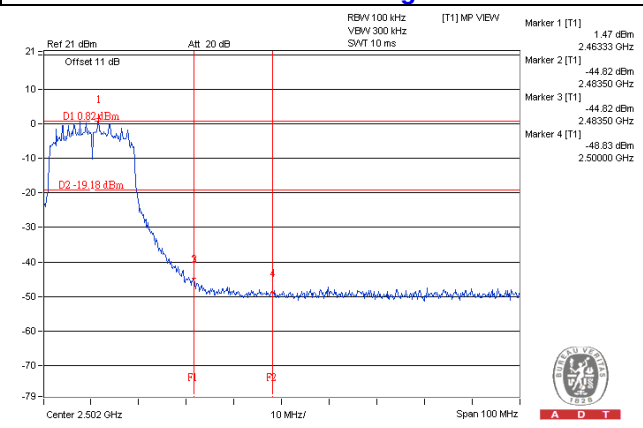
CH 11



CH 1 Band edge



CH 11 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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