FCC Test Report (WLAN)

Report No.:	RF170417E09
FCC ID:	KA2SHG200A1
Test Model:	DSH-G200
Received Date:	Apr. 17, 2017
Test Date:	May 02 to 08, 2017
Issued Date:	May 22, 2017
Applicant:	D-Link Corporation
Address:	No.289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF170417E09	Original release.	May 22, 2017

1 Certificate of Conformity

Product:	Omna Bridge
Brand:	D-Link
Test Model:	DSH-G200
Sample Status:	ENGINEERING SAMPLE
Applicant:	D-Link Corporation
Test Date:	May 02 to 08, 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:** May 22, 2017

Midoli Peng / Specialist

Approved by : _____ , **Date:** May 22, 2017

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.12dB at 0.48594MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz & 2483.50MHz
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.14 dB
	6GHz ~ 18GHz	5.04 dB
	18GHz ~ 40GHz	5.25 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	Omna Bridge
Brand	D-Link
Test Model	DSH-G200
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	5Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 300Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	550.23mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	LAN cable(white) (unshielded, 0.2m)

Note:

1. Simultaneously transmission condition.

Condition	Technology	
1	WLAN	Z-wave
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

2. The EUT must be supplied with a power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	Spec.
1	D-Link	F05L5-050100SPAU	Input: 100-240V, 0.2A, 50/60Hz Output: 5V, 1A DC power cable (unshielded, 1.2m)
2	D-Link	2AAU005B US	Input: 100-240V, 0.2A, 50/60Hz Output: 5V, 1A DC power cable (unshielded, 1.5m)
3	Frecom	F06W-050120SPACP	Input: 100-240V, 0.2A, 50/60Hz Output: 5V, 1.2A DC power cable (unshielded, 1.5m)
NOTE: For Radiated emission, the adapter 1 ~ 3, the worst case was found in adapter 2. Therefore only the test data of the adapter was recorded in this report.			

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

WLAN Antenna						
No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)
1	PSA	RFFPA291003IMAB301	4.56	FPC	IPEX	2.4~2.4835
2	PSA	RFFPA291007IMAB301	4.44	FPC	IPEX	2.4~2.4835
Z-Wave Antenna						
No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (MHz to MHz)
1	PSA	RFMTA010504NNRB001	1.64	Metal	NA	863~872
			2.05			902~928

4. The EUT incorporates a MIMO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX

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

3.2 Description of Test Modes

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

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≥1G	RE<1G	PLC	APCM	
1	-	-	√	-	With adapter 1
2	√	√	√	√	With adapter 2
3	-	-	√	-	With adapter 3

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

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

NOTE: 1.The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-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.

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	11	DSSS	DBPSK	1

Power Line Conducted Emission Test:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	11	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

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

Test Condition:

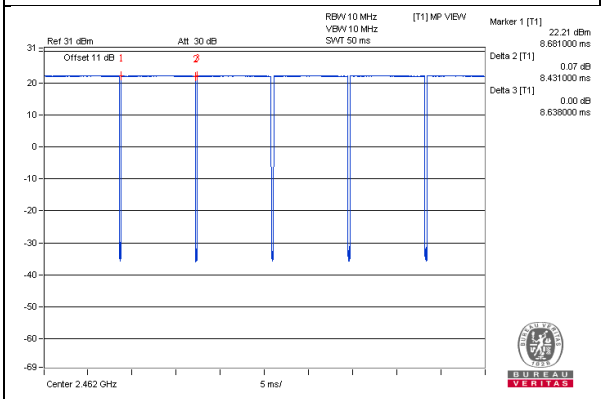
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 64%RH	120Vac, 60Hz	Rey Chen
RE<1G	24deg. C, 67%RH	120Vac, 60Hz	Rey Chen
PLC	26deg. C, 67%RH	120Vac, 60Hz	Eagle Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

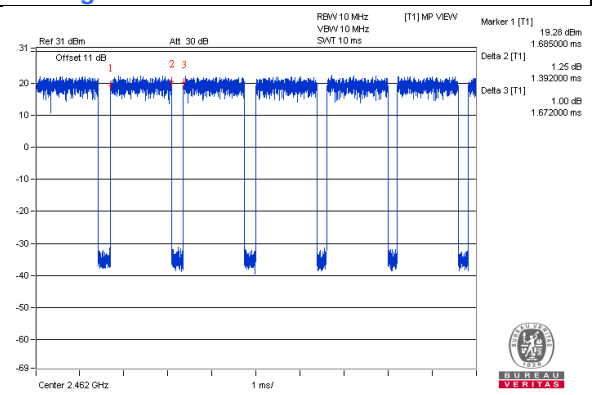
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 8.431/8.638 = 0.976, Duty factor = 10 * log(1/0.976) = 0.11
802.11g: Duty cycle = 1.392/1.672 = 0.833, Duty factor = 10 * log(1/0.833) = 0.8
802.11n (HT20): Duty cycle = 1.306/1.558 = 0.838, Duty factor = 10 * log(1/0.838) = 0.77
802.11n (HT40): Duty cycle = 0.647/0.862 = 0.751, Duty factor = 10 * log(1/0.751) = 1.25

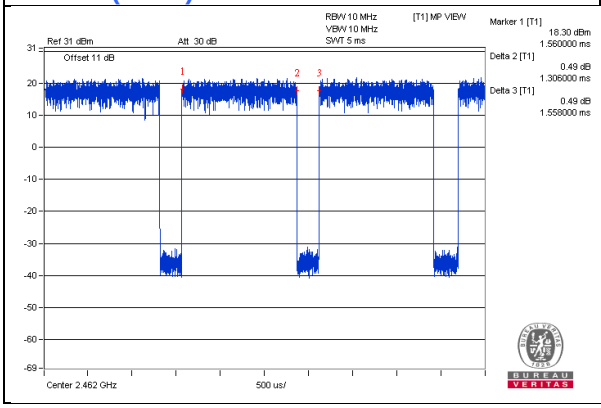
802.11b



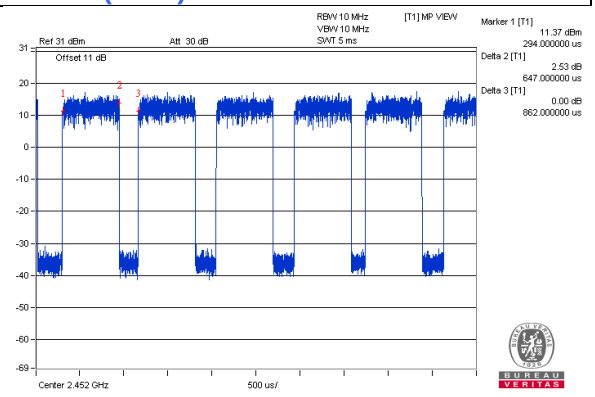
802.11g



802.11n (HT20)



802.11n (HT40)



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.

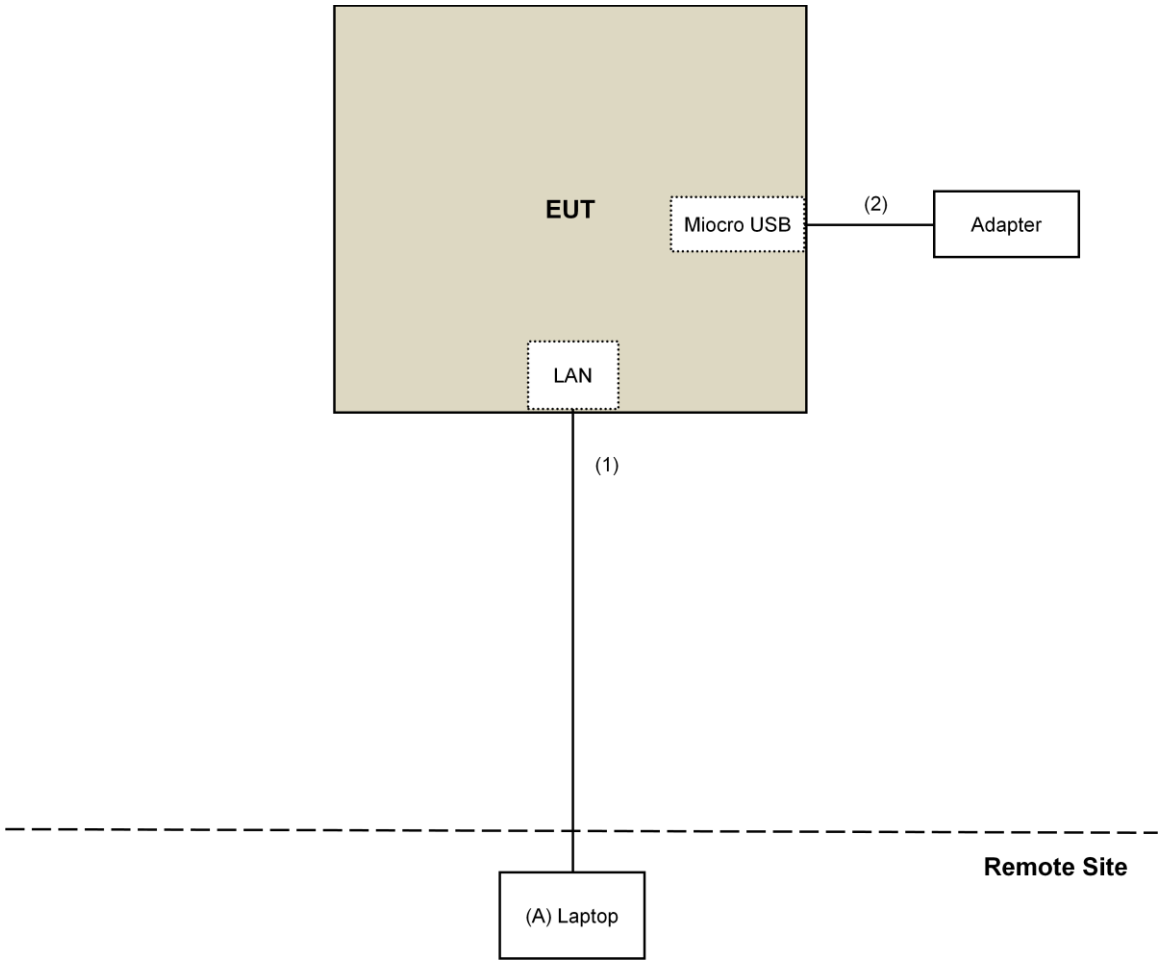
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	DC Cable	1	1.5	No	0	Supplied by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 DTS Meas Guidance v04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSv40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 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 966 Chamber No. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
6. Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: May 02 to 03, 2017

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

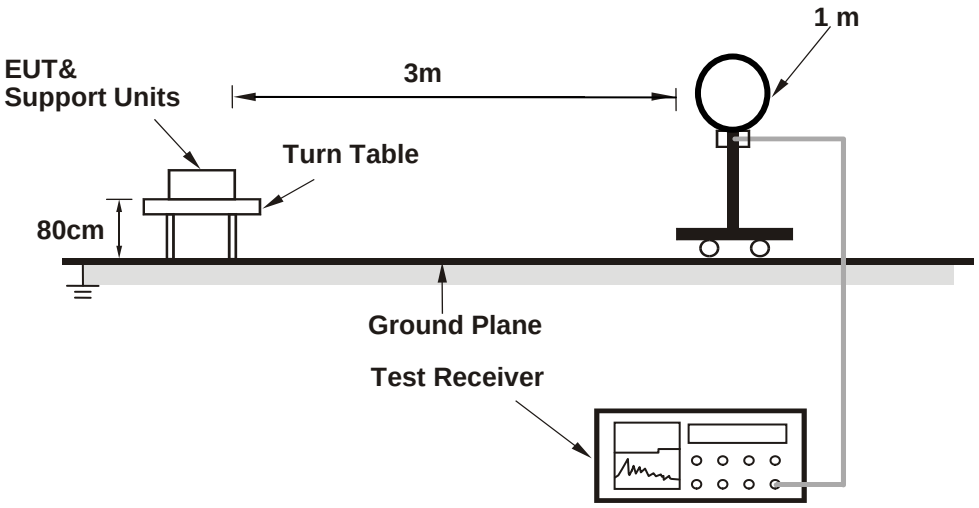
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

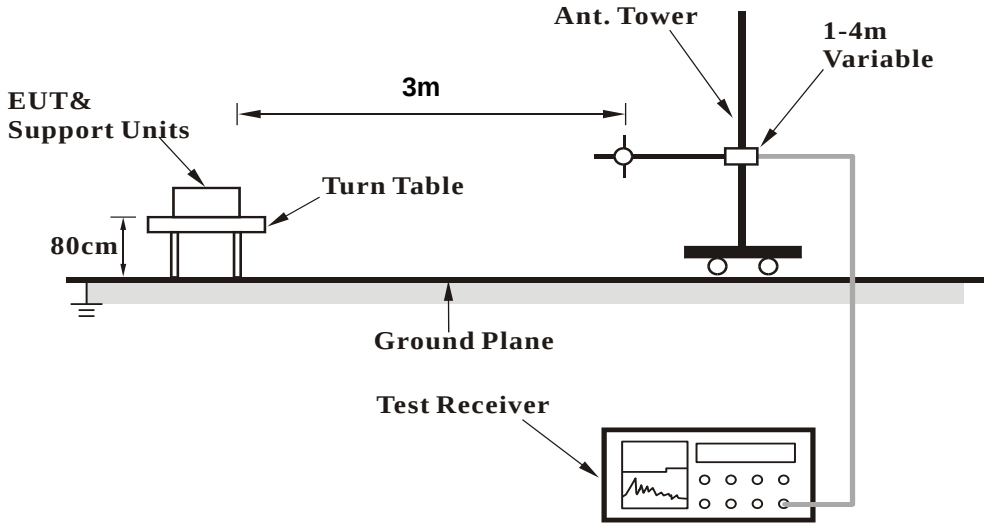
No deviation.

4.1.5 Test Setup

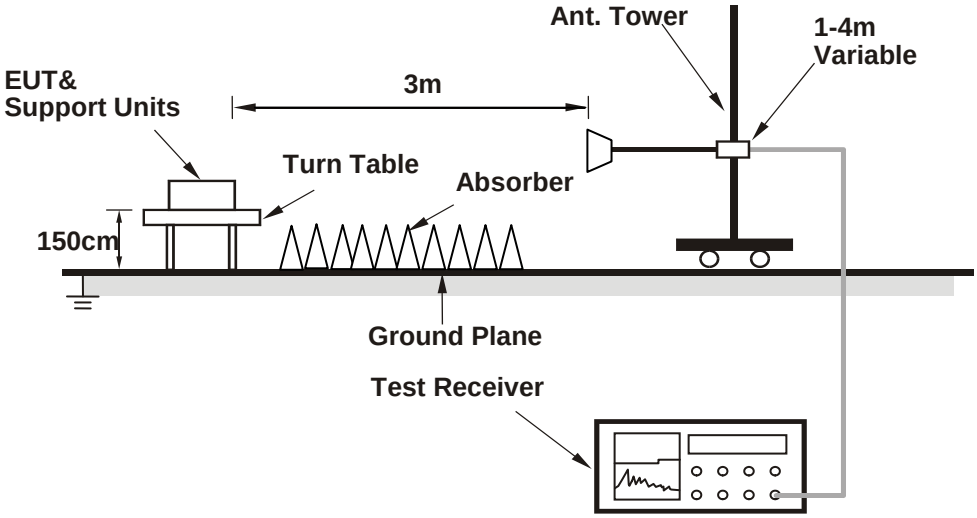
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Contorlling software (MT7628 QA 0.0.096) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data：

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.8 PK	74.0	-14.2	1.03 H	110	61.4	-1.6
2	2390.00	52.7 AV	54.0	-1.3	1.03 H	110	54.3	-1.6
3	*2412.00	114.9 PK			1.03 H	110	116.4	-1.5
4	*2412.00	111.7 AV			1.03 H	110	113.2	-1.5
5	4824.00	52.3 PK	74.0	-21.7	3.19 H	346	49.3	3.0
6	4824.00	50.7 AV	54.0	-3.3	3.19 H	346	47.7	3.0
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	55.7 PK	74.0	-18.3	3.51 V	345	57.3	-1.6
2	2390.00	48.5 AV	54.0	-5.5	3.51 V	345	50.1	-1.6
3	*2412.00	110.7 PK			3.51 V	345	112.2	-1.5
4	*2412.00	107.7 AV			3.51 V	345	109.2	-1.5
5	4824.00	50.7 PK	74.0	-23.3	2.54 V	220	47.7	3.0
6	4824.00	49.2 AV	54.0	-4.8	2.54 V	220	46.2	3.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.2 PK	74.0	-17.8	1.02 H	109	57.8	-1.6
2	2390.00	44.3 AV	54.0	-9.7	1.02 H	109	45.9	-1.6
3	*2437.00	115.9 PK			1.02 H	109	117.4	-1.5
4	*2437.00	112.5 AV			1.02 H	109	114.0	-1.5
5	2483.50	56.5 PK	74.0	-17.5	1.02 H	109	57.9	-1.4
6	2483.50	44.6 AV	54.0	-9.4	1.02 H	109	46.0	-1.4
7	4874.00	52.7 PK	74.0	-21.3	3.21 H	344	49.5	3.2
8	4874.00	50.5 AV	54.0	-3.5	3.21 H	344	47.3	3.2
9	7311.00	51.2 PK	74.0	-22.8	1.07 H	154	42.3	8.9
10	7311.00	46.2 AV	54.0	-7.8	1.07 H	154	37.3	8.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.2 PK	74.0	-21.8	3.47 V	333	53.8	-1.6
2	2390.00	40.2 AV	54.0	-13.8	3.47 V	333	41.8	-1.6
3	*2437.00	111.5 PK			3.47 V	333	113.0	-1.5
4	*2437.00	108.2 AV			3.47 V	333	109.7	-1.5
5	2483.50	52.4 PK	74.0	-21.6	3.47 V	333	53.8	-1.4
6	2483.50	40.9 AV	54.0	-13.1	3.47 V	333	42.3	-1.4
7	4874.00	50.8 PK	74.0	-23.2	2.56 V	214	47.6	3.2
8	4874.00	49.4 AV	54.0	-4.6	2.56 V	214	46.2	3.2
9	7311.00	54.0 PK	74.0	-20.0	3.03 V	217	45.1	8.9
10	7311.00	50.1 AV	54.0	-3.9	3.03 V	217	41.2	8.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.3 PK			1.02 H	108	116.7	-1.4
2	*2462.00	111.7 AV			1.02 H	108	113.1	-1.4
3	2483.50	60.2 PK	74.0	-13.8	1.02 H	108	61.6	-1.4
4	2483.50	52.4 AV	54.0	-1.6	1.02 H	108	53.8	-1.4
5	4924.00	50.0 PK	74.0	-24.0	3.15 H	344	46.7	3.3
6	4924.00	48.1 AV	54.0	-5.9	3.15 H	344	44.8	3.3
7	7386.00	49.9 PK	74.0	-24.1	1.08 H	155	40.8	9.1
8	7386.00	45.9 AV	54.0	-8.1	1.08 H	155	36.8	9.1
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	*2462.00	111.1 PK			3.47 V	335	112.5	-1.4
2	*2462.00	107.8 AV			3.47 V	335	109.2	-1.4
3	2483.50	56.8 PK	74.0	-17.2	3.47 V	335	58.2	-1.4
4	2483.50	47.3 AV	54.0	-6.7	3.47 V	335	48.7	-1.4
5	4924.00	51.3 PK	74.0	-22.7	2.57 V	207	48.0	3.3
6	4924.00	49.7 AV	54.0	-4.3	2.57 V	207	46.4	3.3
7	7386.00	54.4 PK	74.0	-19.6	3.04 V	218	45.3	9.1
8	7386.00	50.6 AV	54.0	-3.4	3.04 V	218	41.5	9.1

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.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.3 PK	74.0	-6.7	2.60 H	115	68.9	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.60 H**	**115**	**55.5**	**-1.6**
3	*2412.00	113.9 PK			2.60 H	115	115.4	-1.5
4	*2412.00	104.4 AV			2.60 H	115	105.9	-1.5
5	4824.00	51.2 PK	74.0	-22.8	3.18 H	357	48.2	3.0
6	4824.00	39.2 AV	54.0	-14.8	3.18 H	357	36.2	3.0
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	65.2 PK	74.0	-8.8	3.14 V	214	66.8	-1.6
2	2390.00	48.7 AV	54.0	-5.3	3.14 V	214	50.3	-1.6
3	*2412.00	106.0 PK			3.14 V	214	107.5	-1.5
4	*2412.00	96.9 AV			3.14 V	214	98.4	-1.5
5	4824.00	50.1 PK	74.0	-23.9	2.18 V	209	47.1	3.0
6	4824.00	38.4 AV	54.0	-15.6	2.18 V	209	35.4	3.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.9 PK	74.0	-16.1	2.61 H	110	59.5	-1.6
2	2390.00	45.4 AV	54.0	-8.6	2.61 H	110	47.0	-1.6
3	*2437.00	116.9 PK			2.61 H	110	118.4	-1.5
4	*2437.00	107.3 AV			2.61 H	110	108.8	-1.5
5	2483.50	56.7 PK	74.0	-17.3	2.61 H	110	58.1	-1.4
6	2483.50	44.7 AV	54.0	-9.3	2.61 H	110	46.1	-1.4
7	4874.00	51.5 PK	74.0	-22.5	3.15 H	354	48.3	3.2
8	4874.00	39.6 AV	54.0	-14.4	3.15 H	354	36.4	3.2
9	7311.00	54.5 PK	74.0	-19.5	1.22 H	52	45.6	8.9
10	7311.00	41.1 AV	54.0	-12.9	1.22 H	52	32.2	8.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.3 PK	74.0	-18.7	3.17 V	208	56.9	-1.6
2	2390.00	41.2 AV	54.0	-12.8	3.17 V	208	42.8	-1.6
3	*2437.00	107.3 PK			3.02 V	217	108.8	-1.5
4	*2437.00	100.1 AV			3.02 V	217	101.6	-1.5
5	2483.50	54.3 PK	74.0	-19.7	3.02 V	217	55.7	-1.4
6	2483.50	40.1 AV	54.0	-13.9	3.02 V	217	41.5	-1.4
7	4874.00	50.1 PK	74.0	-23.9	2.19 V	224	46.9	3.2
8	4874.00	38.4 AV	54.0	-15.6	2.19 V	224	35.2	3.2
9	7311.00	61.1 PK	74.0	-12.9	3.92 V	133	52.2	8.9
10	7311.00	47.8 AV	54.0	-6.2	3.92 V	133	38.9	8.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.3 PK			2.55 H	111	115.7	-1.4
2	*2462.00	104.8 AV			2.55 H	111	106.2	-1.4
3	2483.50	64.3 PK	74.0	-9.7	2.55 H	111	65.7	-1.4
4	2483.50	53.7 AV	54.0	-0.3	2.55 H	111	55.1	-1.4
5	4924.00	51.1 PK	74.0	-22.9	3.17 H	349	47.8	3.3
6	4924.00	39.1 AV	54.0	-14.9	3.17 H	349	35.8	3.3
7	7386.00	53.8 PK	74.0	-20.2	1.27 H	55	44.7	9.1
8	7386.00	40.9 AV	54.0	-13.1	1.27 H	55	31.8	9.1
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	*2462.00	105.5 PK			3.00 V	216	106.9	-1.4
2	*2462.00	96.5 AV			3.00 V	216	97.9	-1.4
3	2483.50	62.4 PK	74.0	-11.6	3.00 V	216	63.8	-1.4
4	2483.50	47.6 AV	54.0	-6.4	3.00 V	216	49.0	-1.4
5	4924.00	50.3 PK	74.0	-23.7	2.17 V	230	47.0	3.3
6	4924.00	38.2 AV	54.0	-15.8	2.17 V	230	34.9	3.3
7	7386.00	52.7 PK	74.0	-21.3	3.90 V	143	43.6	9.1
8	7386.00	39.8 AV	54.0	-14.2	3.90 V	143	30.7	9.1

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.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.6 PK	74.0	-5.4	2.55 H	113	70.2	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.55 H**	**113**	**55.5**	**-1.6**
3	*2412.00	111.3 PK			2.55 H	113	112.8	-1.5
4	*2412.00	101.7 AV			2.55 H	113	103.2	-1.5
5	4824.00	51.4 PK	74.0	-22.6	3.13 H	358	48.4	3.0
6	4824.00	39.4 AV	54.0	-14.6	3.13 H	358	36.4	3.0
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	66.4 PK	74.0	-7.6	2.98 V	207	68.0	-1.6
2	2390.00	48.3 AV	54.0	-5.7	2.98 V	207	49.9	-1.6
3	*2412.00	105.1 PK			2.98 V	207	106.6	-1.5
4	*2412.00	95.2 AV			2.98 V	207	96.7	-1.5
5	4824.00	50.4 PK	74.0	-23.6	2.17 V	209	47.4	3.0
6	4824.00	38.7 AV	54.0	-15.3	2.17 V	209	35.7	3.0

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	2.54 H	115	58.8	-1.6
2	2390.00	44.9 AV	54.0	-9.1	2.54 H	115	46.5	-1.6
3	*2437.00	115.4 PK			2.54 H	115	116.9	-1.5
4	*2437.00	106.1 AV			2.54 H	115	107.6	-1.5
5	2483.50	57.3 PK	74.0	-16.7	2.54 H	115	58.7	-1.4
6	2483.50	45.8 AV	54.0	-8.2	2.54 H	115	47.2	-1.4
7	4874.00	51.1 PK	74.0	-22.9	3.11 H	338	47.9	3.2
8	4874.00	39.3 AV	54.0	-14.7	3.11 H	338	36.1	3.2
9	7311.00	54.8 PK	74.0	-19.2	1.17 H	56	45.9	8.9
10	7311.00	41.1 AV	54.0	-12.9	1.17 H	56	32.2	8.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.8 PK	74.0	-18.2	3.01 V	213	57.4	-1.6
2	2390.00	40.1 AV	54.0	-13.9	3.01 V	213	41.7	-1.6
3	*2437.00	106.9 PK			3.01 V	213	108.4	-1.5
4	*2437.00	99.8 AV			3.01 V	213	101.3	-1.5
5	2483.50	55.2 PK	74.0	-18.8	3.01 V	213	56.6	-1.4
6	2483.50	40.1 AV	54.0	-13.9	3.01 V	213	41.5	-1.4
7	4874.00	50.1 PK	74.0	-23.9	2.24 V	223	46.9	3.2
8	4874.00	38.1 AV	54.0	-15.9	2.24 V	223	34.9	3.2
9	7311.00	61.6 PK	74.0	-12.4	3.92 V	134	52.7	8.9
10	7311.00	48.3 AV	54.0	-5.7	3.92 V	134	39.4	8.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.4 PK			2.53 H	119	112.8	-1.4
2	*2462.00	102.1 AV			2.53 H	119	103.5	-1.4
3	2483.50	70.0 PK	74.0	-4.0	2.53 H	119	71.4	-1.4
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.53 H**	**119**	**55.3**	**-1.4**
5	4924.00	50.3 PK	74.0	-23.7	3.13 H	348	47.0	3.3
6	4924.00	38.1 AV	54.0	-15.9	3.13 H	348	34.8	3.3
7	7386.00	53.5 PK	74.0	-20.5	1.20 H	56	44.4	9.1
8	7386.00	40.2 AV	54.0	-13.8	1.20 H	56	31.1	9.1
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	*2462.00	102.6 PK			2.96 V	206	104.0	-1.4
2	*2462.00	93.8 AV			2.96 V	206	95.2	-1.4
3	2483.50	68.1 PK	74.0	-5.9	2.96 V	206	69.5	-1.4
4	2483.50	47.8 AV	54.0	-6.2	2.96 V	206	49.2	-1.4
5	4924.00	49.2 PK	74.0	-24.8	2.25 V	231	45.9	3.3
6	4924.00	36.9 AV	54.0	-17.1	2.25 V	231	33.6	3.3
7	7386.00	52.4 PK	74.0	-21.6	3.94 V	125	43.3	9.1
8	7386.00	39.1 AV	54.0	-14.9	3.94 V	125	30.0	9.1

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.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	2.59 H	103	69.1	-1.6
2	2390.00	53.7 AV	54.0	-0.3	2.59 H	103	55.3	-1.6
3	*2422.00	105.5 PK			2.59 H	103	107.1	-1.6
4	*2422.00	96.8 AV			2.59 H	103	98.4	-1.6
5	4844.00	51.3 PK	74.0	-22.7	3.16 H	344	48.2	3.1
6	4844.00	39.4 AV	54.0	-14.6	3.16 H	344	36.3	3.1
7	7266.00	54.7 PK	74.0	-19.3	1.20 H	68	45.8	8.9
8	7266.00	41.3 AV	54.0	-12.7	1.20 H	68	32.4	8.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.9 PK	74.0	-15.1	2.96 V	20	60.5	-1.6
2	2390.00	47.5 AV	54.0	-6.5	2.96 V	20	49.1	-1.6
3	*2422.00	100.6 PK			2.96 V	20	102.2	-1.6
4	*2422.00	92.8 AV			2.96 V	20	94.4	-1.6
5	4844.00	49.6 PK	74.0	-24.4	2.29 V	216	46.5	3.1
6	4844.00	37.6 AV	54.0	-16.4	2.29 V	216	34.5	3.1
7	7266.00	61.4 PK	74.0	-12.6	3.90 V	148	52.5	8.9
8	7266.00	47.8 AV	54.0	-6.2	3.90 V	148	38.9	8.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.1 PK	74.0	-6.9	2.58 H	105	68.7	-1.6
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.58 H**	**105**	**55.5**	**-1.6**
3	*2437.00	110.2 PK			2.58 H	105	111.7	-1.5
4	*2437.00	101.3 AV			2.58 H	105	102.8	-1.5
5	2483.50	66.0 PK	74.0	-8.0	2.58 H	105	67.4	-1.4
6	2483.50	52.6 AV	54.0	-1.4	2.58 H	105	54.0	-1.4
7	4874.00	51.6 PK	74.0	-22.4	3.15 H	326	48.4	3.2
8	4874.00	39.7 AV	54.0	-14.3	3.15 H	326	36.5	3.2
9	7311.00	54.5 PK	74.0	-19.5	1.12 H	67	45.6	8.9
10	7311.00	40.8 AV	54.0	-13.2	1.12 H	67	31.9	8.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.1 PK	74.0	-14.9	3.00 V	25	60.7	-1.6
2	2390.00	47.8 AV	54.0	-6.2	3.00 V	25	49.4	-1.6
3	*2437.00	105.3 PK			3.00 V	25	106.8	-1.5
4	*2437.00	97.5 AV			3.00 V	25	99.0	-1.5
5	2483.50	58.1 PK	74.0	-15.9	3.00 V	25	59.5	-1.4
6	2483.50	46.3 AV	54.0	-7.7	3.00 V	25	47.7	-1.4
7	4874.00	50.3 PK	74.0	-23.7	2.24 V	208	47.1	3.2
8	4874.00	38.3 AV	54.0	-15.7	2.24 V	208	35.1	3.2
9	7311.00	61.4 PK	74.0	-12.6	3.98 V	137	52.5	8.9
10	7311.00	48.1 AV	54.0	-5.9	3.98 V	137	39.2	8.9

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	105.4 PK			2.54 H	105	106.9	-1.5
2	*2452.00	96.9 AV			2.54 H	105	98.4	-1.5
3	2483.50	69.0 PK	74.0	-5.0	2.54 H	105	70.4	-1.4
4	2483.50	53.8 AV	54.0	-0.2	2.54 H	105	55.2	-1.4
5	4904.00	51.3 PK	74.0	-22.7	3.12 H	353	48.1	3.2
6	4904.00	39.5 AV	54.0	-14.5	3.12 H	353	36.3	3.2
7	7356.00	55.2 PK	74.0	-18.8	1.13 H	69	46.1	9.1
8	7356.00	41.3 AV	54.0	-12.7	1.13 H	69	32.2	9.1
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	*2452.00	100.2 PK			3.01 V	27	101.7	-1.5
2	*2452.00	92.6 AV			3.01 V	27	94.1	-1.5
3	2483.50	57.8 PK	74.0	-16.2	3.01 V	27	59.2	-1.4
4	2483.50	46.1 AV	54.0	-7.9	3.01 V	27	47.5	-1.4
5	4904.00	49.8 PK	74.0	-24.2	2.25 V	220	46.6	3.2
6	4904.00	37.8 AV	54.0	-16.2	2.25 V	220	34.6	3.2
7	7356.00	61.3 PK	74.0	-12.7	3.93 V	119	52.2	9.1
8	7356.00	47.8 AV	54.0	-6.2	3.93 V	119	38.7	9.1

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.

Below 1GHz Data:

802.11b

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	88.64	26.0 QP	43.5	-17.5	2.00 H	104	40.3	-14.3
2	143.34	25.6 QP	43.5	-17.9	2.00 H	297	33.9	-8.3
3	191.65	26.6 QP	43.5	-16.9	1.00 H	266	37.6	-11.0
4	209.81	23.9 QP	43.5	-19.6	1.00 H	262	35.4	-11.5
5	547.35	34.8 QP	46.0	-11.2	2.00 H	36	36.6	-1.8
6	574.99	36.0 QP	46.0	-10.0	1.00 H	360	37.0	-1.0
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	49.40	30.7 QP	40.0	-9.3	1.00 V	0	39.1	-8.4
2	88.88	30.8 QP	43.5	-12.7	2.00 V	360	45.1	-14.3
3	99.04	31.6 QP	43.5	-11.9	2.00 V	360	44.5	-12.9
4	191.67	24.2 QP	43.5	-19.3	1.00 V	268	35.2	-11.0
5	544.29	33.7 QP	46.0	-12.3	2.00 V	360	35.7	-2.0
6	574.99	40.2 QP	46.0	-5.8	1.00 V	194	41.2	-1.0

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 10, 2016	Oct. 09, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Aug. 31, 2016	Aug. 30, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
RF Cable	5D-FB	COACAB-002	Mar. 03, 2017	Mar. 02, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-003	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	N/A	EMC-03	Sep. 29, 2016	Sep. 28, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: May 08, 2017

4.2.3 Test Procedures

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

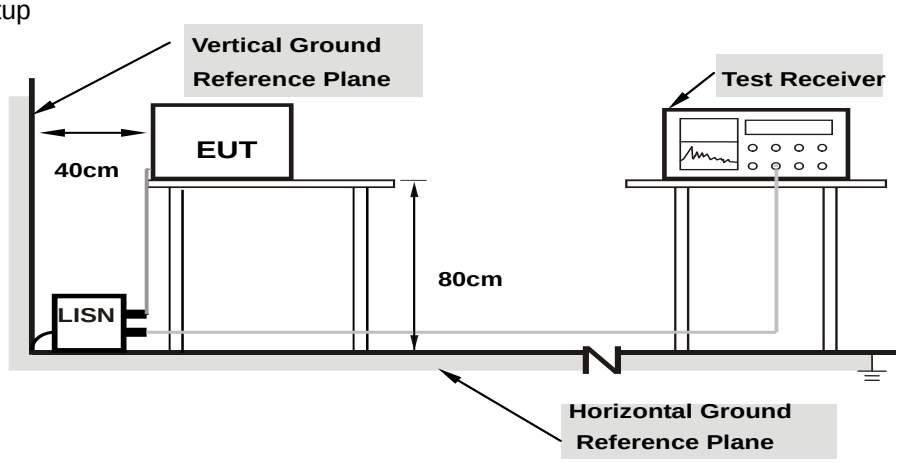
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

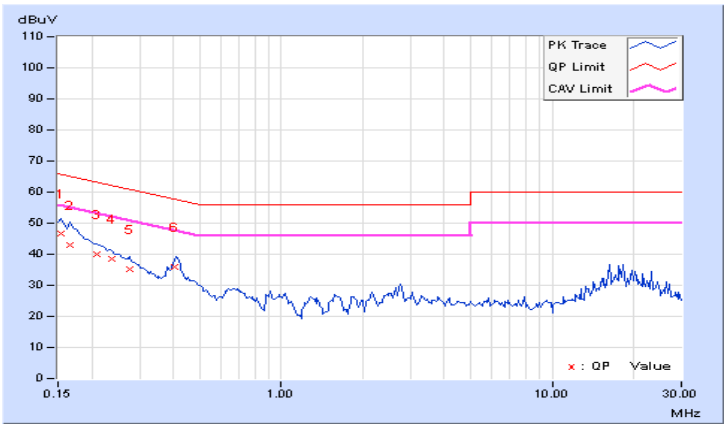
4.2.7 Test Results (Mode 1)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.13	36.71	23.84	46.84	33.97	65.79	55.79	-18.95	-21.82
2	0.16562	10.13	32.88	17.49	43.01	27.62	65.18	55.18	-22.17	-27.56
3	0.20859	10.12	30.04	16.86	40.16	26.98	63.26	53.26	-23.10	-26.28
4	0.23594	10.12	28.54	16.71	38.66	26.83	62.24	52.24	-23.58	-25.41
5	0.27500	10.12	25.10	11.66	35.22	21.78	60.97	50.97	-25.75	-29.19
6	0.40391	10.12	25.95	19.72	36.07	29.84	57.77	47.77	-21.70	-17.93

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

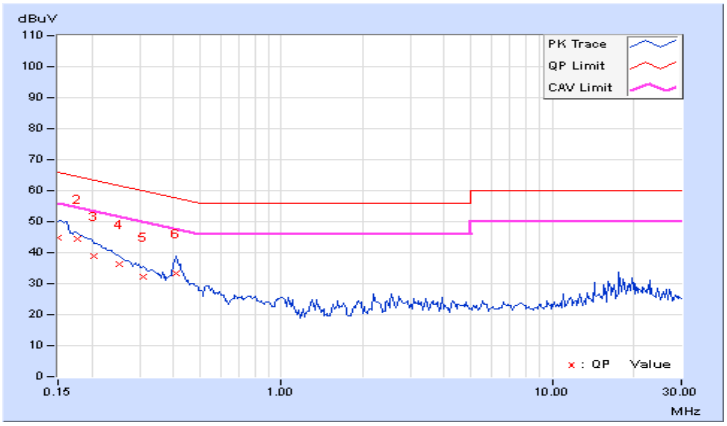


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	34.57	19.62	44.76	29.81	66.00	56.00	-21.24	-26.19
2	0.17734	10.12	34.17	21.26	44.29	31.38	64.61	54.61	-20.32	-23.23
3	0.20469	10.07	28.95	14.52	39.02	24.59	63.42	53.42	-24.40	-28.83
4	0.25156	10.08	26.26	13.26	36.34	23.34	61.71	51.71	-25.37	-28.37
5	0.31016	10.09	22.16	8.78	32.25	18.87	59.97	49.97	-27.72	-31.10
6	0.41172	10.10	23.13	13.20	33.23	23.30	57.61	47.61	-24.38	-24.31

Remarks:

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



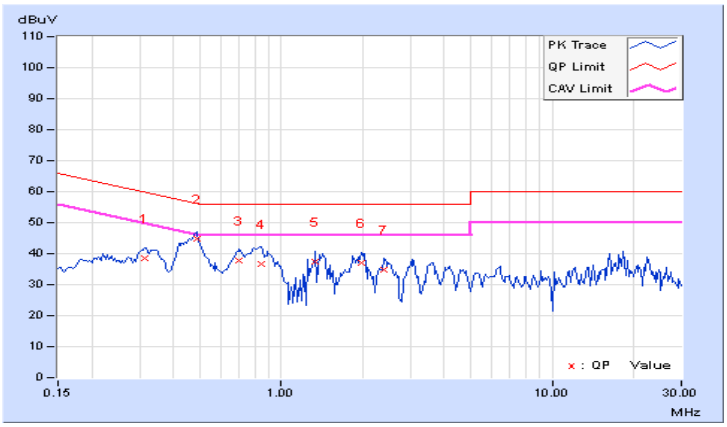
4.2.8 Test Results (Mode 2)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.31406	10.12	28.36	20.15	38.48	30.27	59.86	49.86	-21.38	-19.59
2	**0.48594**	**10.12**	**34.58**	**27.00**	**44.70**	**37.12**	**56.24**	**46.24**	**-11.54**	**-9.12**
3	0.70078	10.13	27.71	19.94	37.84	30.07	56.00	46.00	-18.16	-15.93
4	0.84141	10.13	26.44	18.25	36.57	28.38	56.00	46.00	-19.43	-17.62
5	1.33984	10.18	27.33	19.36	37.51	29.54	56.00	46.00	-18.49	-16.46
6	1.97656	10.27	26.73	17.94	37.00	28.21	56.00	46.00	-19.00	-17.79
7	2.38672	10.28	24.67	16.38	34.95	26.66	56.00	46.00	-21.05	-19.34

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

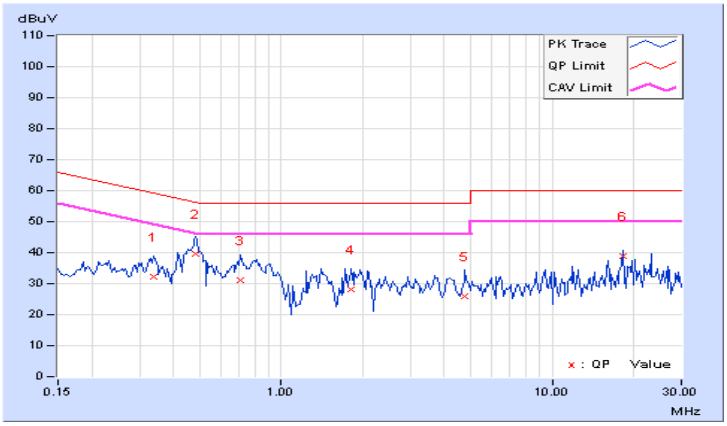


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.33750	10.09	22.04	16.64	32.13	26.73	59.26	49.26	-27.13	-22.53
2	0.48203	10.12	29.42	23.37	39.54	33.49	56.30	46.30	-16.76	-12.81
3	0.70859	10.17	21.07	15.08	31.24	25.25	56.00	46.00	-24.76	-20.75
4	1.81250	10.19	17.97	12.04	28.16	22.23	56.00	46.00	-27.84	-23.77
5	4.77734	10.35	15.47	11.99	25.82	22.34	56.00	46.00	-30.18	-23.66
6	18.24219	10.78	28.19	20.84	38.97	31.62	60.00	50.00	-21.03	-18.38

Remarks:

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



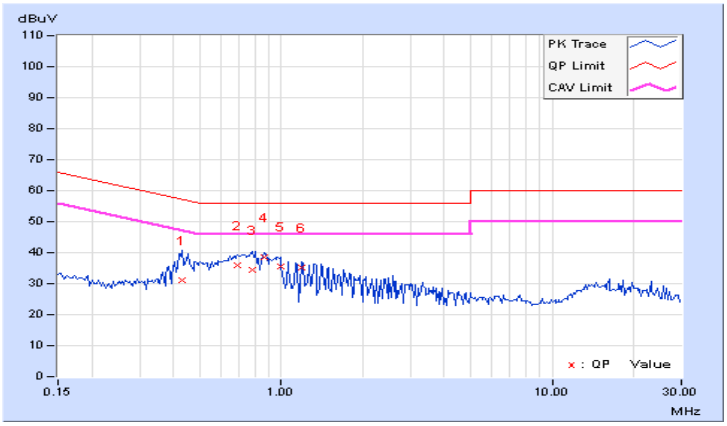
4.2.9 Test Results (Mode 3)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.43125	10.12	20.94	5.25	31.06	15.37	57.23	47.23	-26.17	-31.86
2	0.68906	10.13	25.69	15.44	35.82	25.57	56.00	46.00	-20.18	-20.43
3	0.77891	10.13	24.34	13.50	34.47	23.63	56.00	46.00	-21.53	-22.37
4	0.86094	10.14	28.39	20.12	38.53	30.26	56.00	46.00	-17.47	-15.74
5	0.99766	10.14	25.52	15.13	35.66	25.27	56.00	46.00	-20.34	-20.73
6	1.19141	10.16	25.19	14.83	35.35	24.99	56.00	46.00	-20.65	-21.01

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

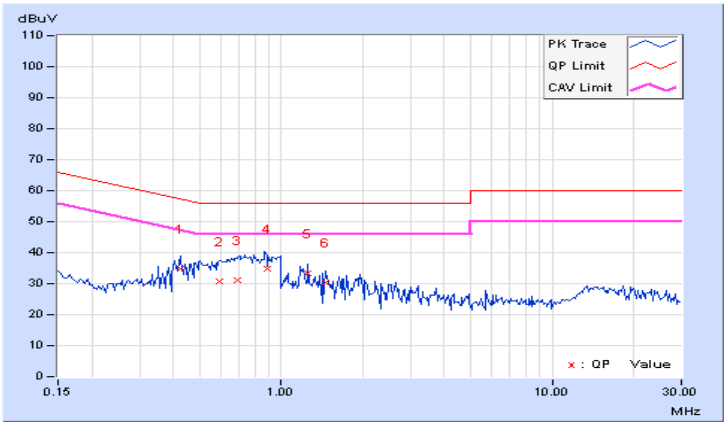


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.42344	10.11	24.89	19.73	35.00	29.84	57.38	47.38	-22.38	-17.54
2	0.59531	10.14	20.50	10.88	30.64	21.02	56.00	46.00	-25.36	-24.98
3	0.68516	10.16	20.92	12.10	31.08	22.26	56.00	46.00	-24.92	-23.74
4	0.88438	10.20	24.61	15.68	34.81	25.88	56.00	46.00	-21.19	-20.12
5	1.25000	10.22	23.00	12.41	33.22	22.63	56.00	46.00	-22.78	-23.37
6	1.46094	10.21	20.29	7.44	30.50	17.65	56.00	46.00	-25.50	-28.35

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

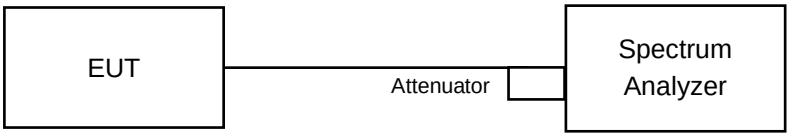


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	9.58	9.61	0.5	PASS
6	2437	9.62	9.54	0.5	PASS
11	2462	9.58	10.07	0.5	PASS

802.11g

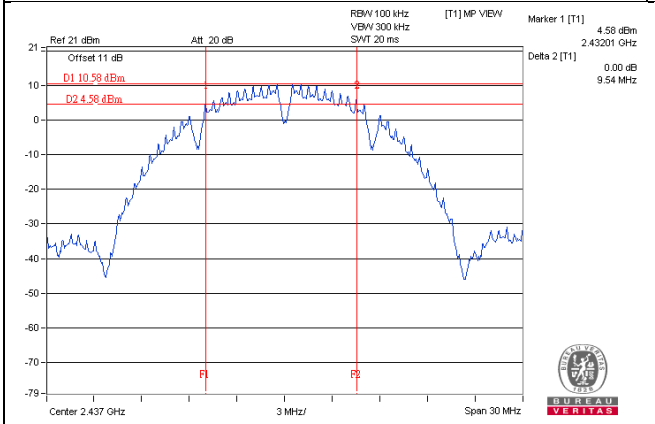
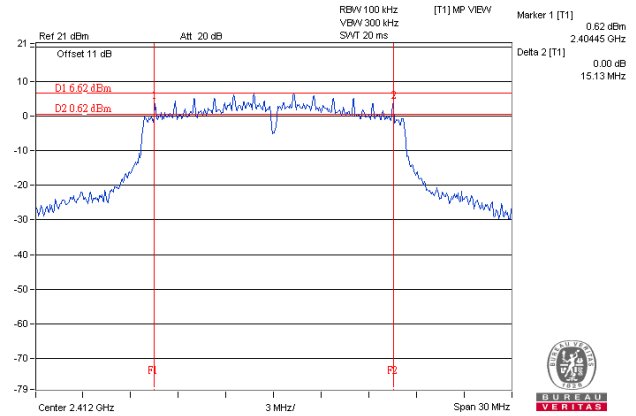
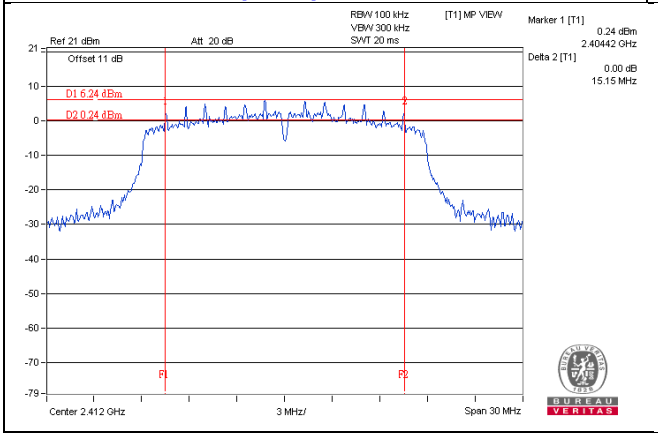
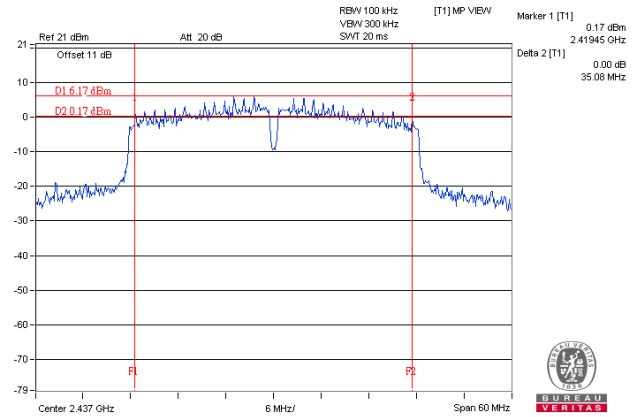
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.13	15.16	0.5	PASS
6	2437	15.19	15.18	0.5	PASS
11	2462	15.17	15.17	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.17	15.15	0.5	Pass
6	2437	15.76	15.16	0.5	Pass
11	2462	15.74	15.16	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.15	35.10	0.5	Pass
6	2437	35.08	35.13	0.5	Pass
9	2452	35.18	35.16	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 0 : CH1**
	
802.11n (HT20) / Chain 1 : CH1	**802.11n (HT40) / Chain 0 : CH6**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

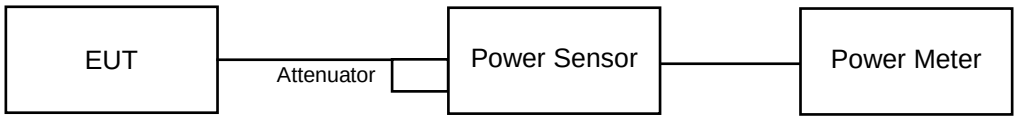
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

A peak / 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

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.63	21.40	283.584	24.53	30	Pass
6	2437	21.60	21.38	281.948	24.50	30	Pass
11	2462	21.65	21.38	283.622	24.53	30	Pass

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.97	23.49	421.51	26.25	30	Pass
6	2437	24.36	24.43	550.23	27.41	30	Pass
11	2462	23.12	23.12	410.232	26.13	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.72	22.43	362.053	25.59	30	Pass
6	2437	24.13	24.38	532.978	27.27	30	Pass
11	2462	23.26	22.56	392.138	25.93	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	20.44	20.06	212.053	23.26	30	Pass
6	2437	23.62	23.44	450.944	26.54	30	Pass
9	2452	20.68	20.97	241.976	23.84	30	Pass

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.97	19.70	192.637	22.85
6	2437	19.95	19.69	191.966	22.83
11	2462	20.01	19.69	193.342	22.86

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	16.83	16.39	91.746	19.63
6	2437	19.68	19.48	181.613	22.59
11	2462	16.87	16.25	90.811	19.58

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	15.70	15.42	71.988	18.57
6	2437	19.42	19.65	179.755	22.55
11	2462	15.68	15.52	72.628	18.61

802.11n (HT40)

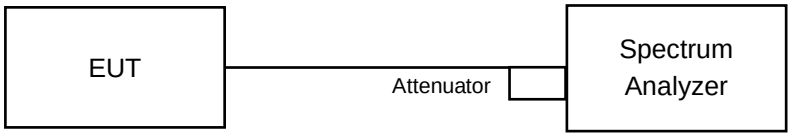
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	12.75	12.38	36.134	15.58
6	2437	17.71	17.51	115.384	20.62
9	2452	12.72	12.30	35.689	15.53

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-4.24	3.01	-1.23	6.49	Pass
	6	2437	-3.76	3.01	-0.75	6.49	Pass
	11	2462	-5.23	3.01	-2.22	6.49	Pass
1	1	2412	-4.17	3.01	-1.16	6.49	Pass
	6	2437	-3.53	3.01	-0.52	6.49	Pass
	11	2462	-4.07	3.01	-1.06	6.49	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7.51> 6dBi , so the power density limit shall be reduced to 8-(7.51-6) = 6.49dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-10.84	3.01	-7.83	6.49	Pass
	6	2437	-7.09	3.01	-4.08	6.49	Pass
	11	2462	-10.78	3.01	-7.77	6.49	Pass
1	1	2412	-10.32	3.01	-7.31	6.49	Pass
	6	2437	-7.01	3.01	-4.00	6.49	Pass
	11	2462	-10.16	3.01	-7.15	6.49	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7.51> 6dBi , so the power density limit shall be reduced to 8-(7.51-6) = 6.49dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.24	3.01	-8.23	6.49	Pass
	6	2437	-7.21	3.01	-4.20	6.49	Pass
	11	2462	-10.17	3.01	-7.16	6.49	Pass
1	1	2412	-10.66	3.01	-7.65	6.49	Pass
	6	2437	-7.27	3.01	-4.26	6.49	Pass
	11	2462	-10.88	3.01	-7.87	6.49	Pass

Note: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7.51> 6dBi , so the power density limit shall be reduced to 8-(7.51-6) = 6.49dBm.

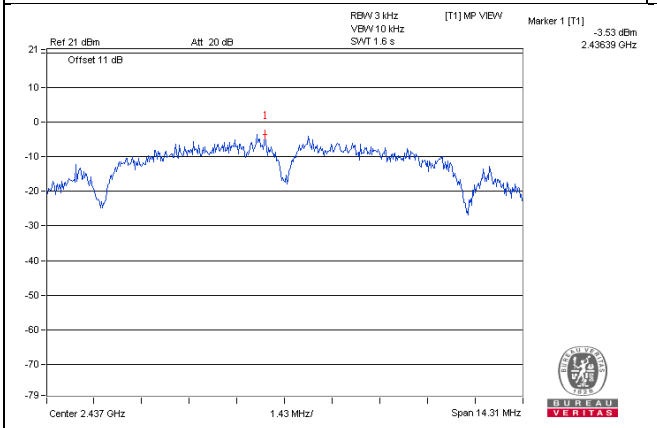
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-16.15	3.01	-13.14	6.49	Pass
	6	2437	-9.32	3.01	-6.31	6.49	Pass
	9	2452	-16.22	3.01	-13.21	6.49	Pass
1	3	2422	-15.92	3.01	-12.91	6.49	Pass
	6	2437	-9.61	3.01	-6.60	6.49	Pass
	9	2452	-16.28	3.01	-13.27	6.49	Pass

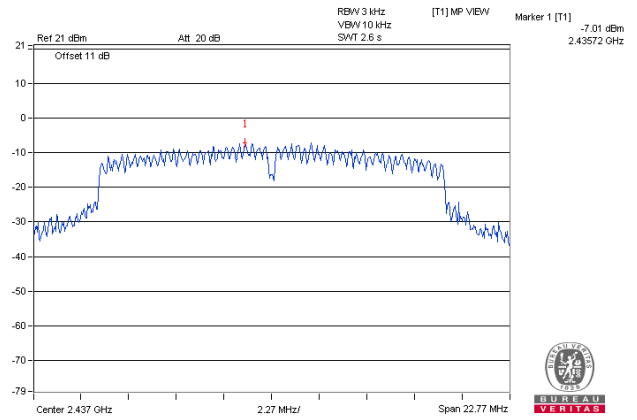
Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2] = 7.51> 6dBi , so the power density limit shall be reduced to 8-(7.51-6) = 6.49dBm.

Spectrum Plot of Worst Value

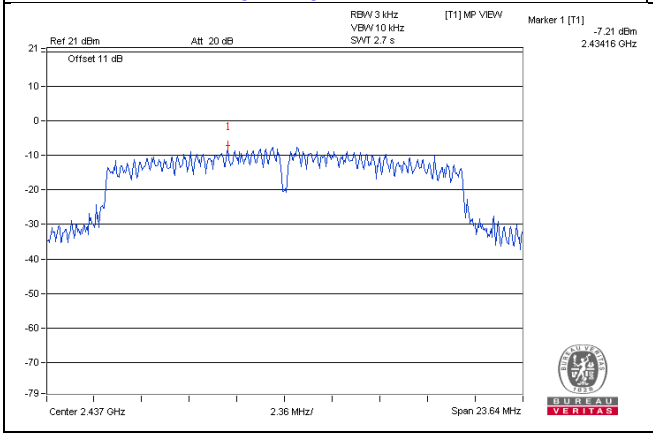
802.11b / Chain 1 : CH6



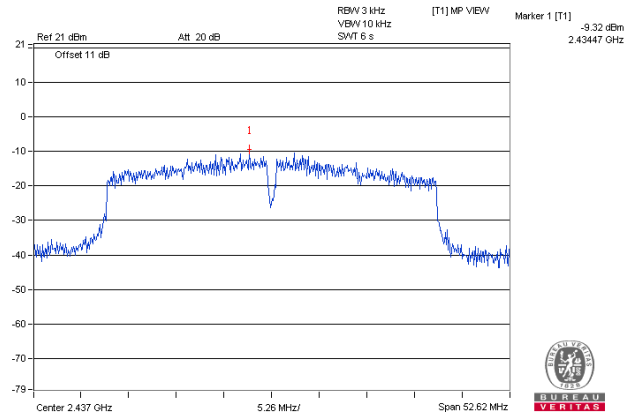
802.11g / Chain 1 : CH6



802.11n (HT20) / Chain 0 : CH6



802.11n (HT40) / Chain 0 : CH6

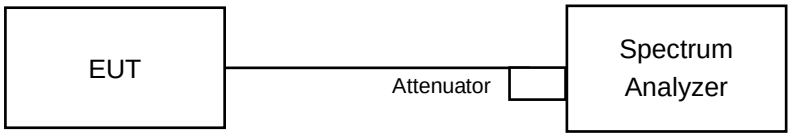


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

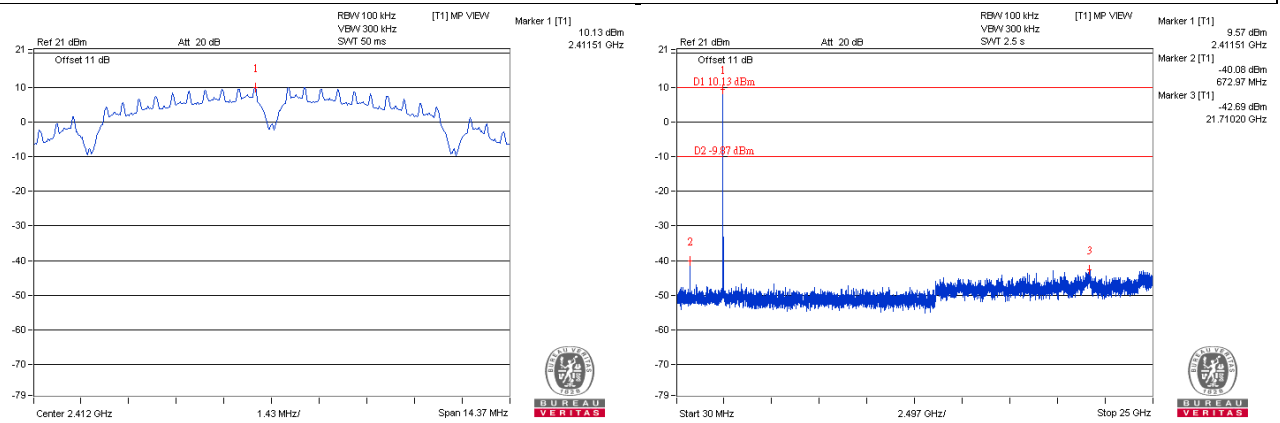
Same as Item 4.3.6

4.6.7 Test Results

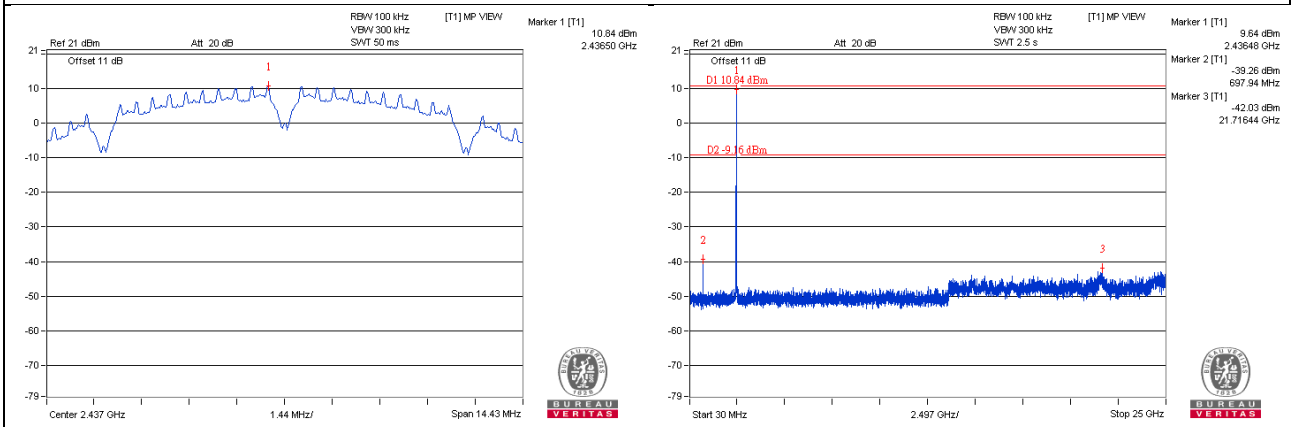
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b – chain 0

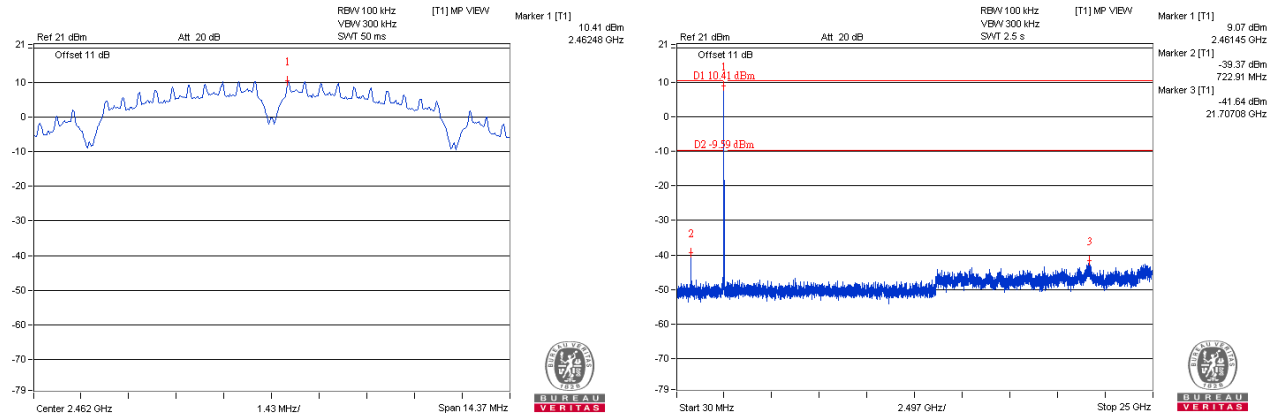
CH 1



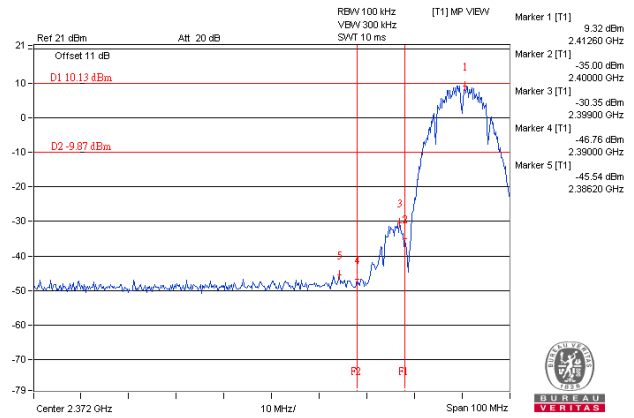
CH 6



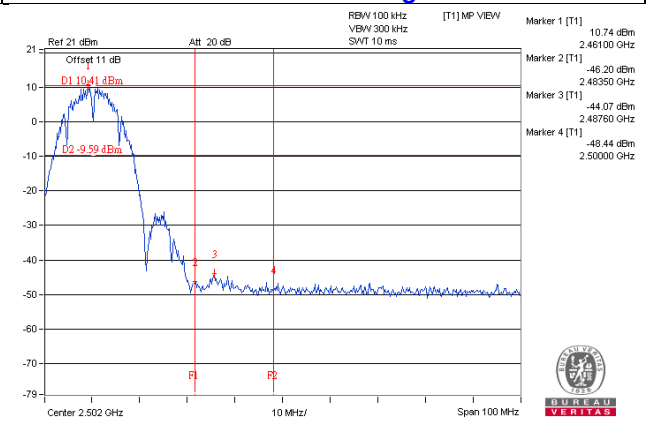
CH 11



CH 1 Band edge

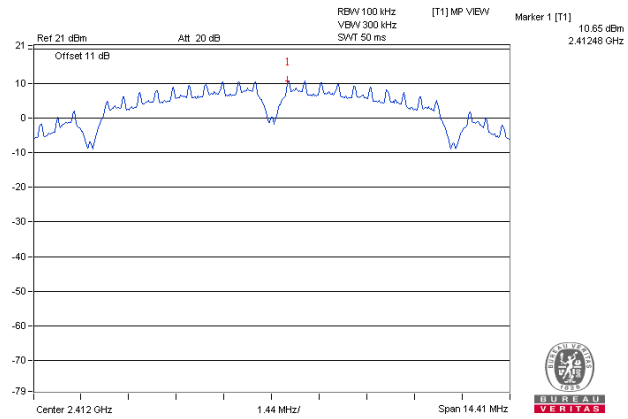


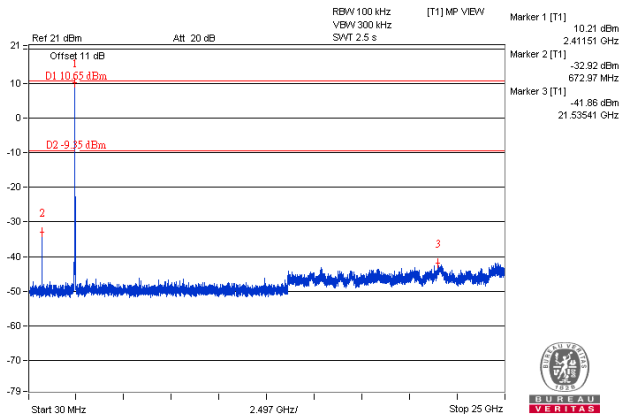
CH 11 Band edge



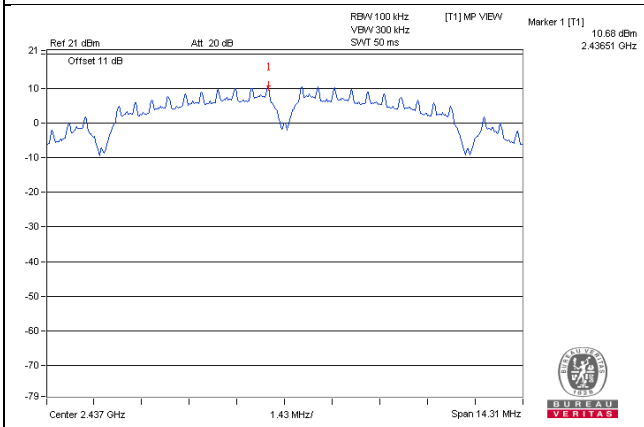
802.11b – chain 1

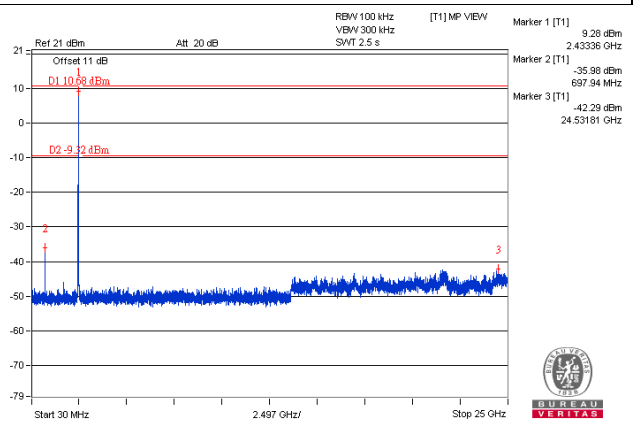
CH 1



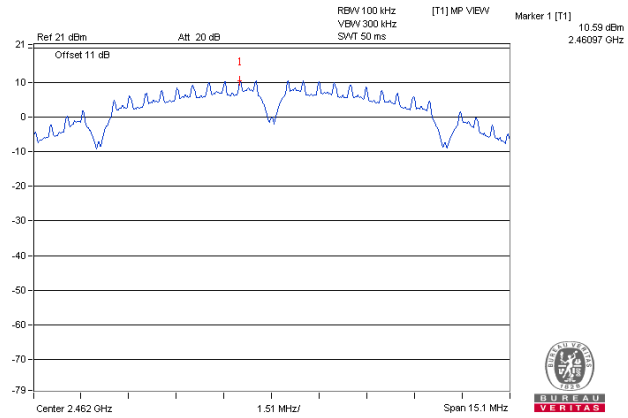


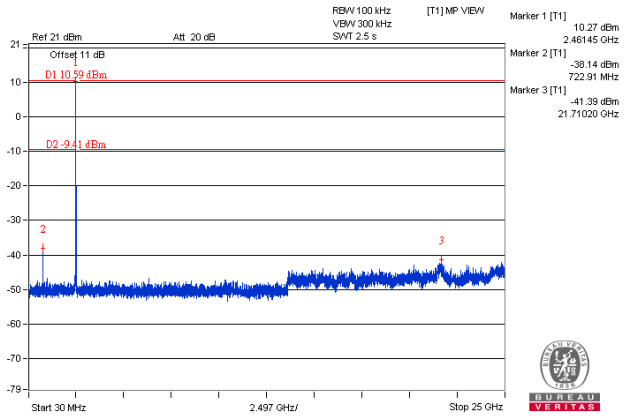
CH 6



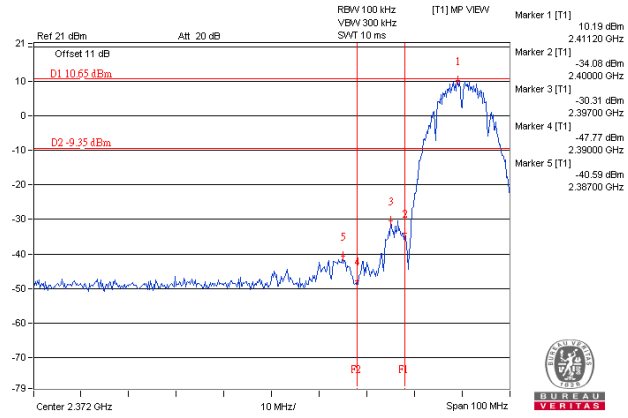


CH 11

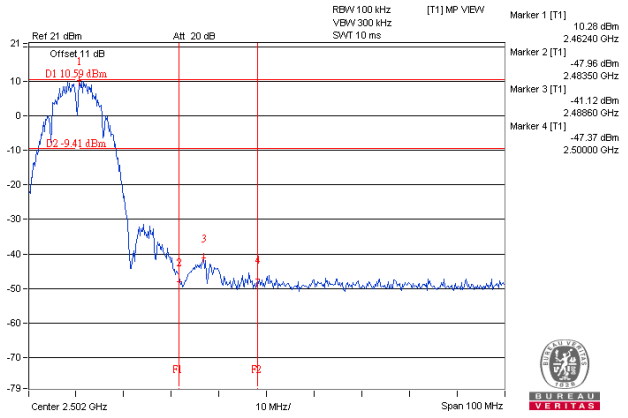




CH 1 Band edge

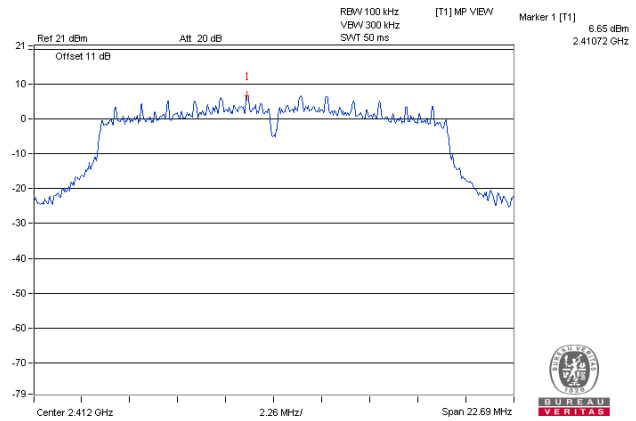


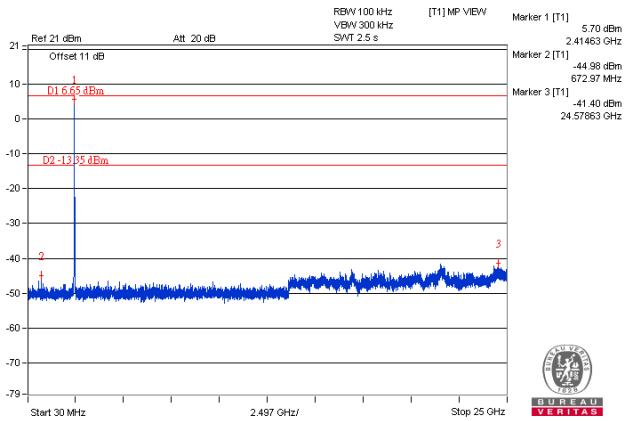
CH 11 Band edge



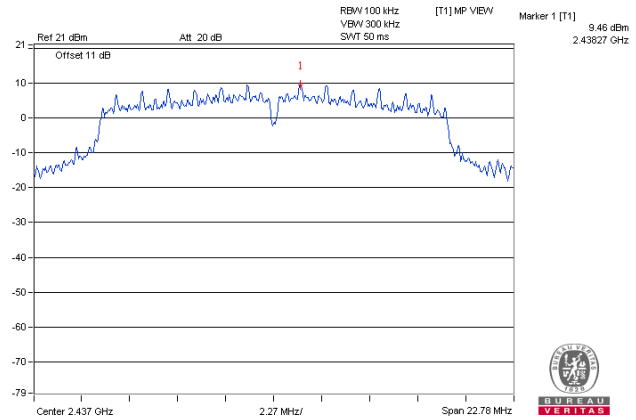
802.11g – chain 0

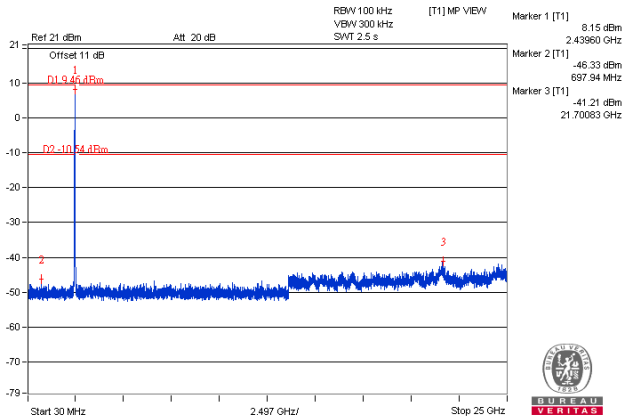
CH 1



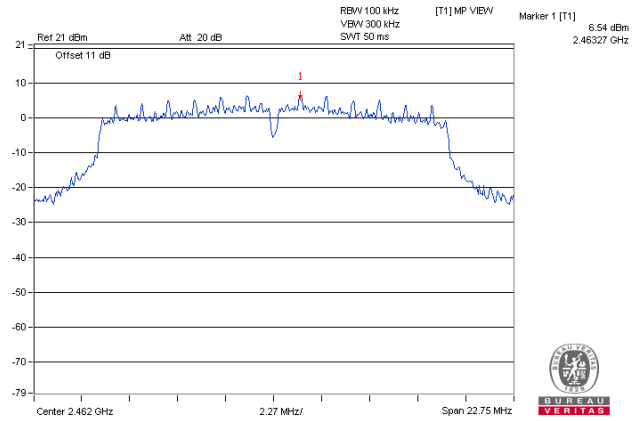


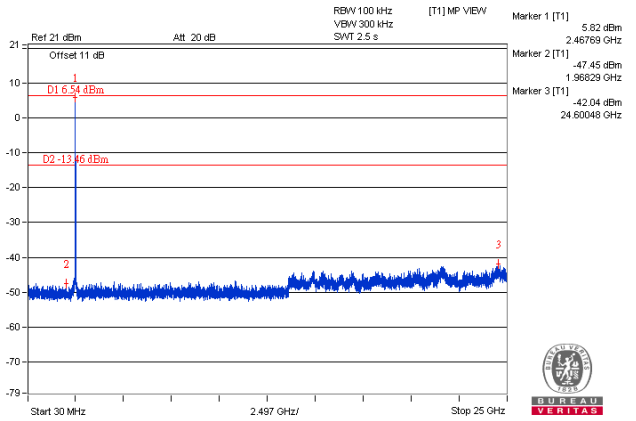
CH 6



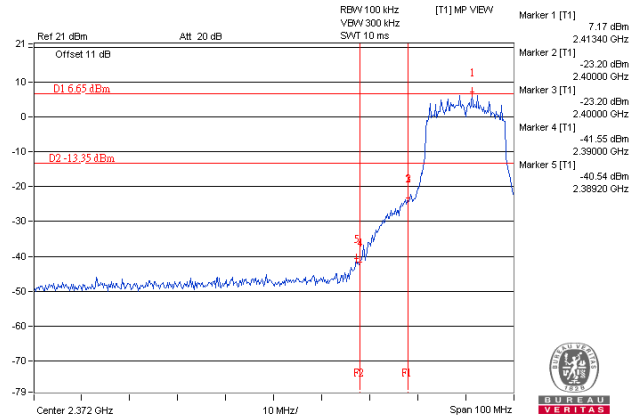


CH 11

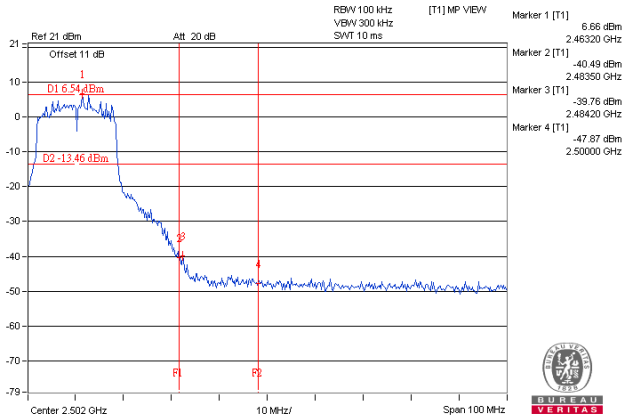




CH 1 Band edge

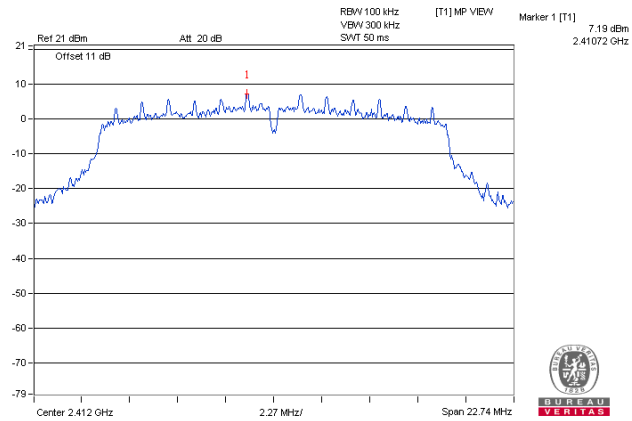


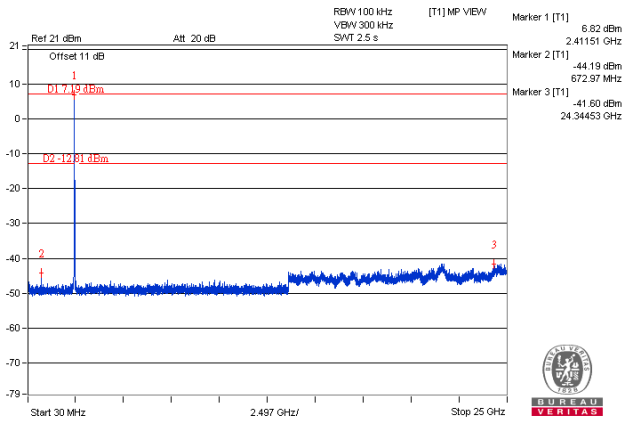
CH 11 Band edge



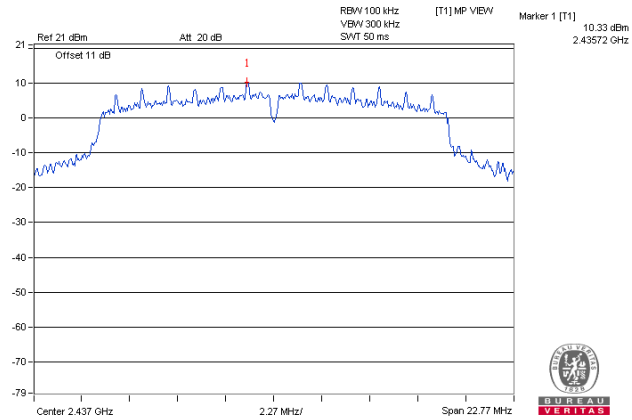
802.11g – chain 1

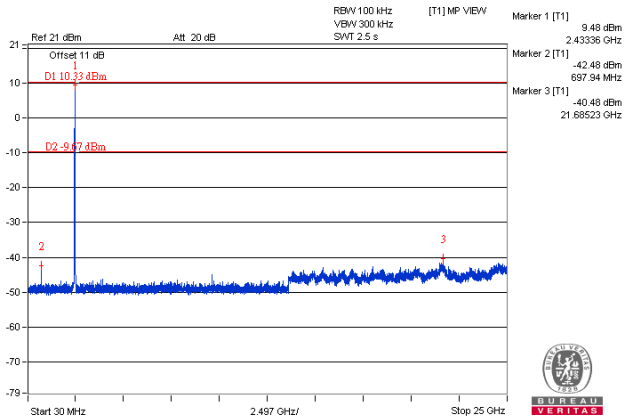
CH 1



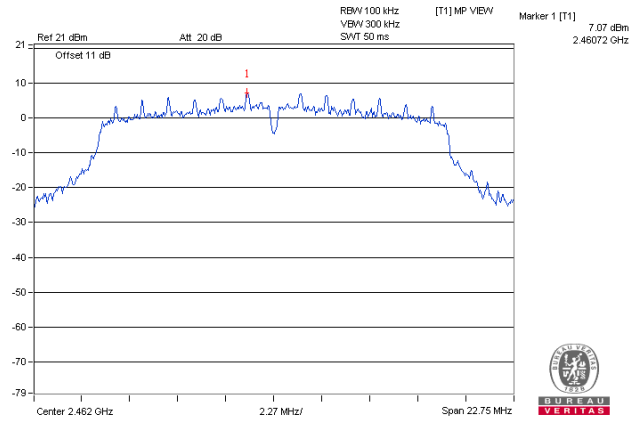


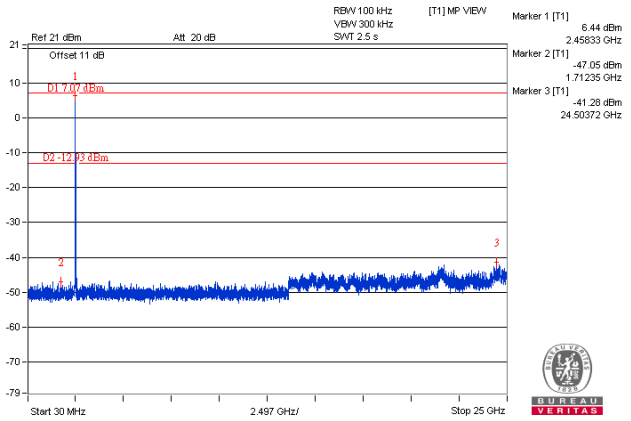
CH 6



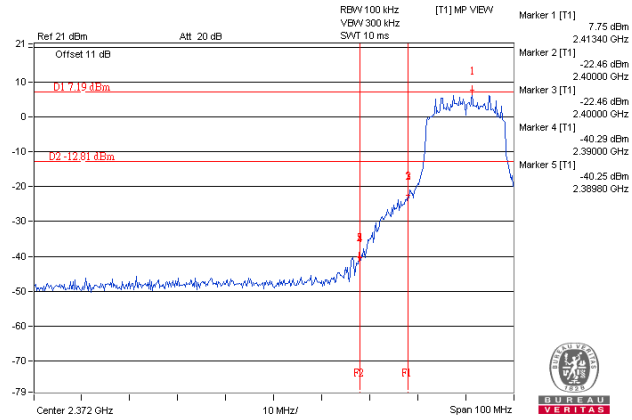


CH 11

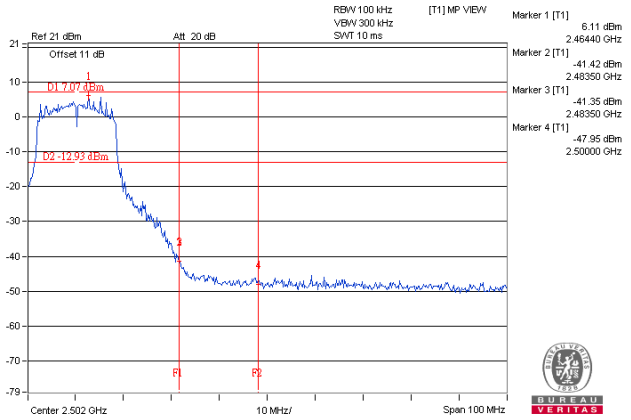




CH 1 Band edge

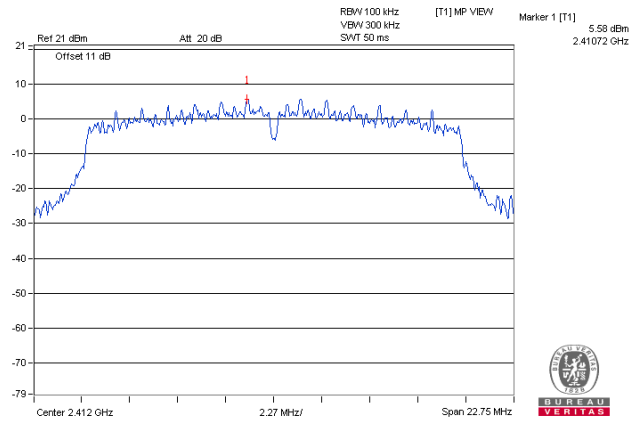


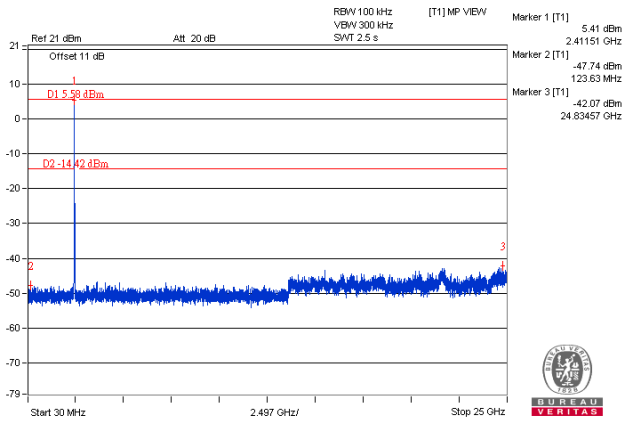
CH 11 Band edge



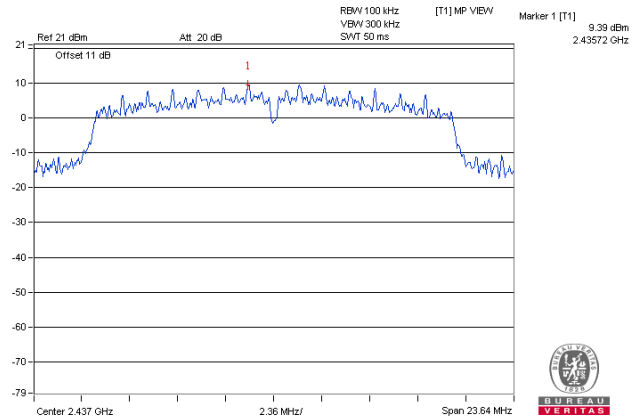
802.11n (HT20) – chain 0

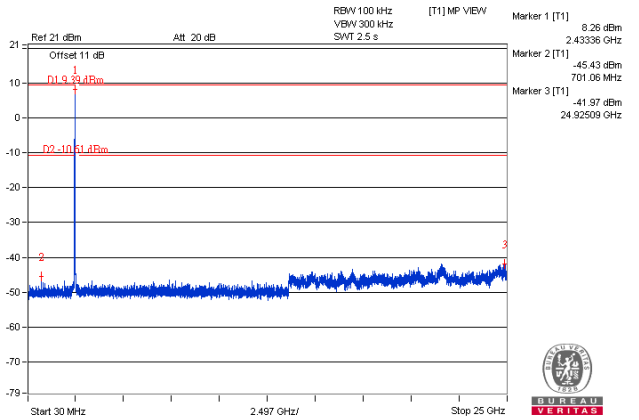
CH 1



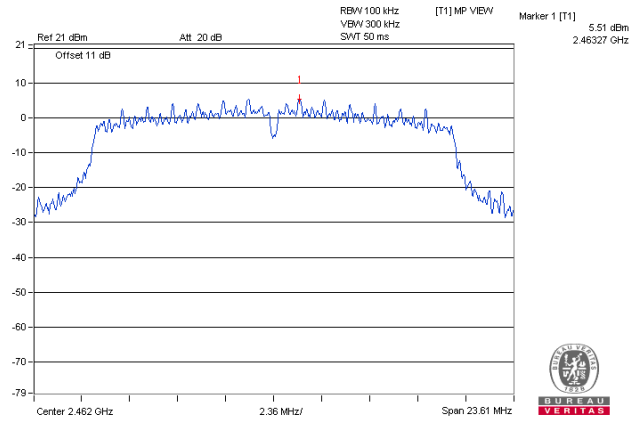


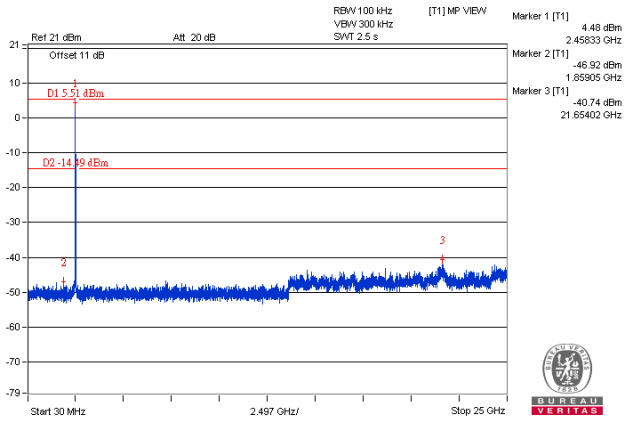
CH 6



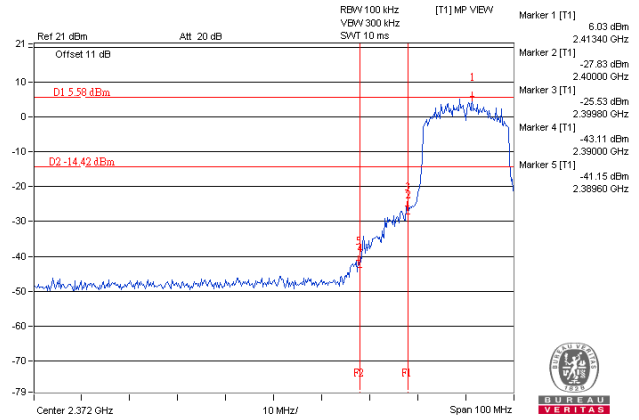


CH 11

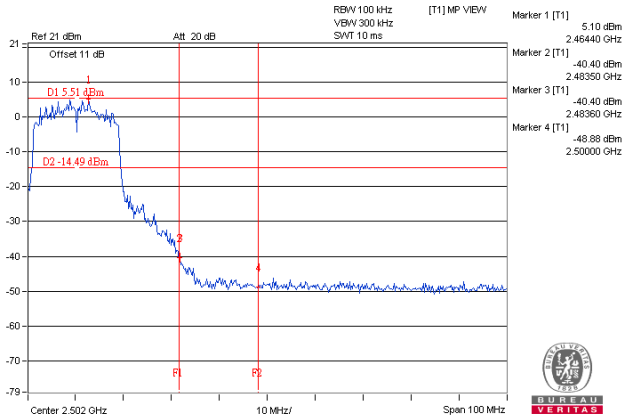




CH 1 Band edge

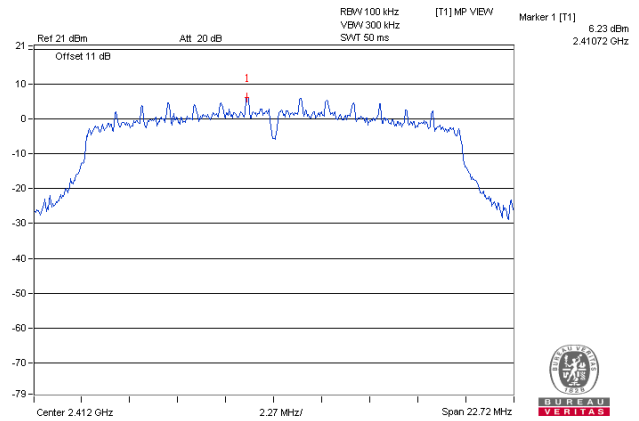


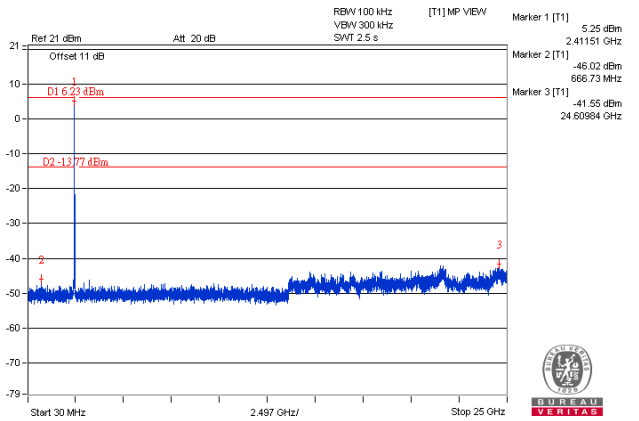
CH 11 Band edge



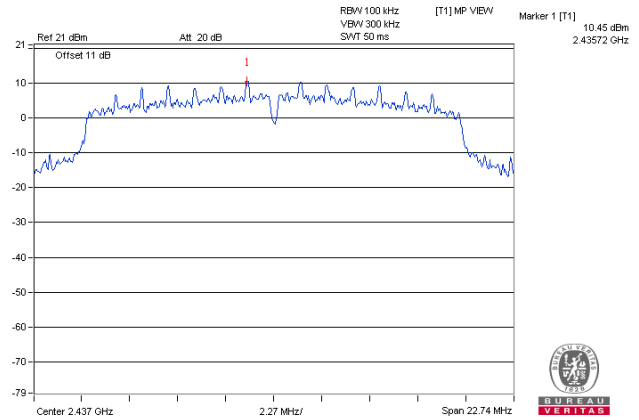
802.11n (HT20) – chain 1

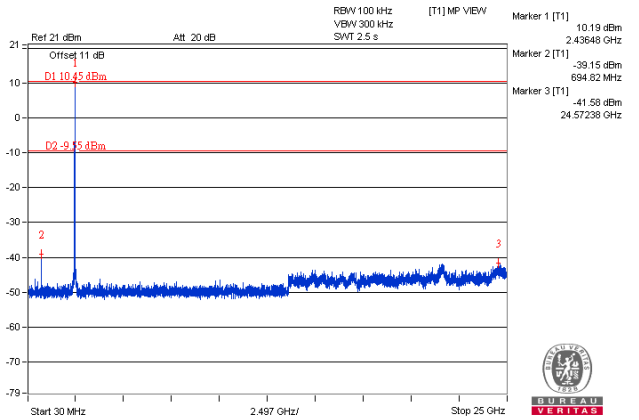
CH 1



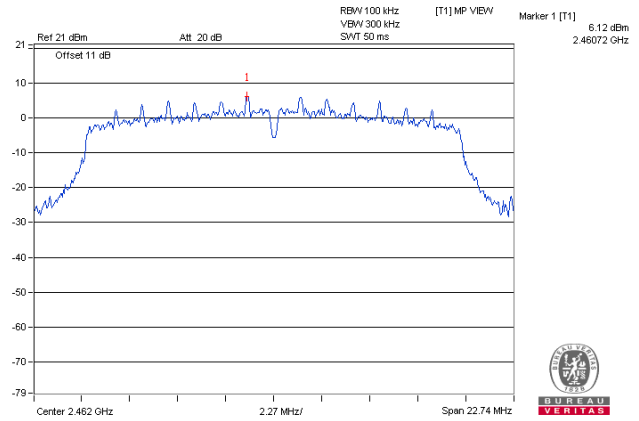


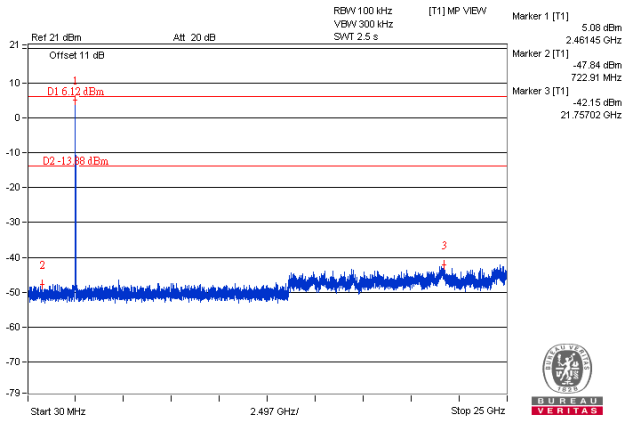
CH 6



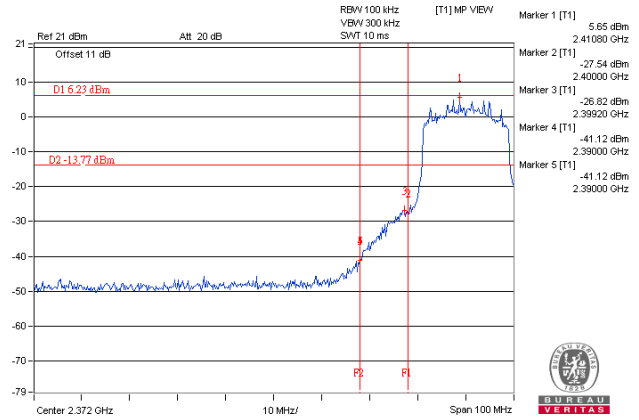


CH 11

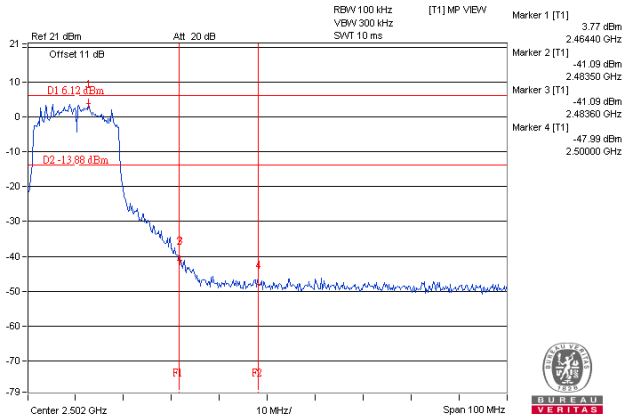




CH 1 Band edge

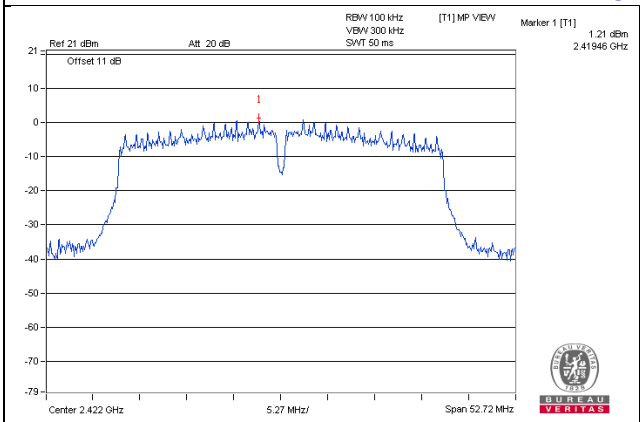


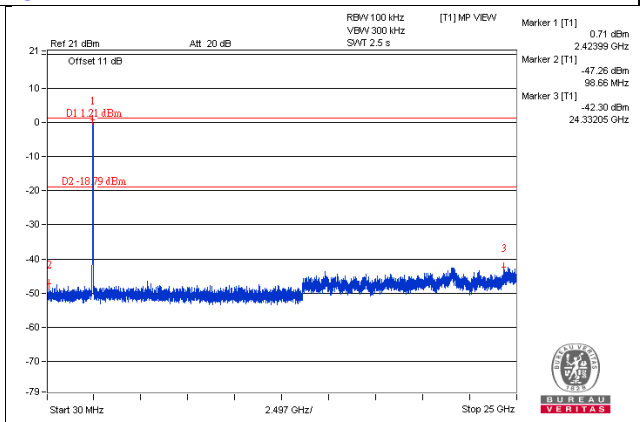
CH 11 Band edge



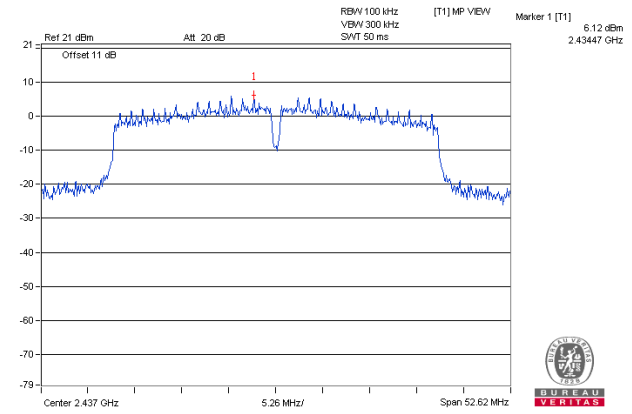
802.11n (HT40) – chain 0

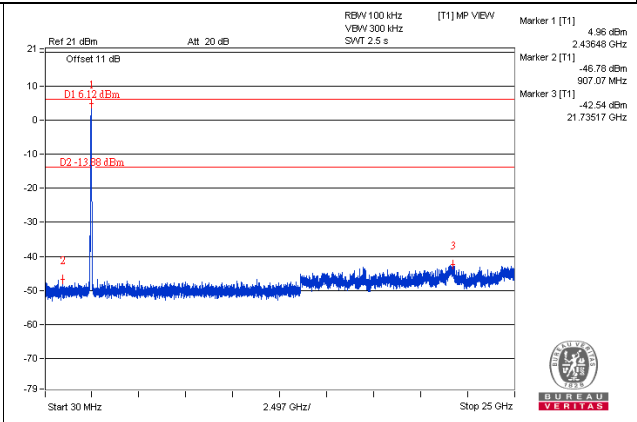
CH 3



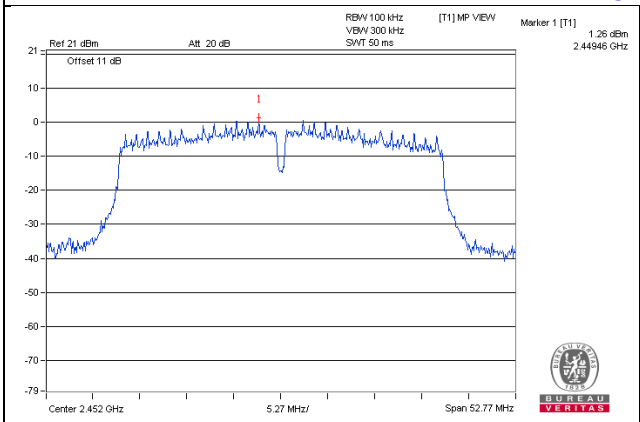


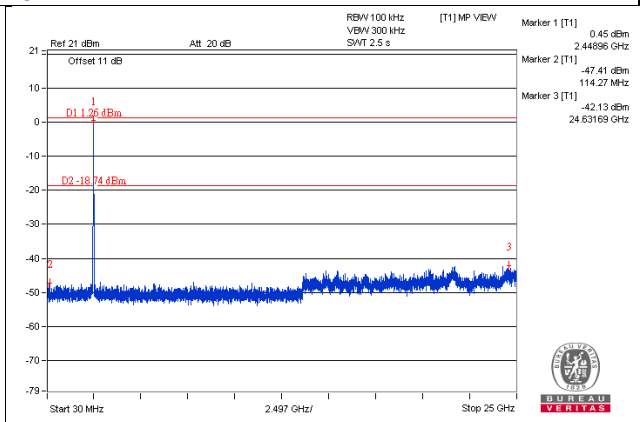
CH 6



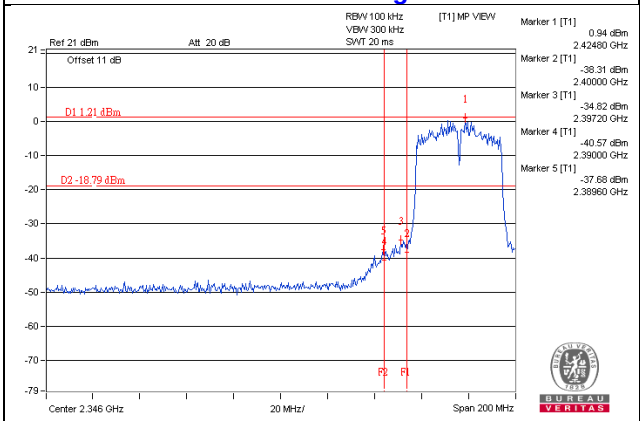


CH 9

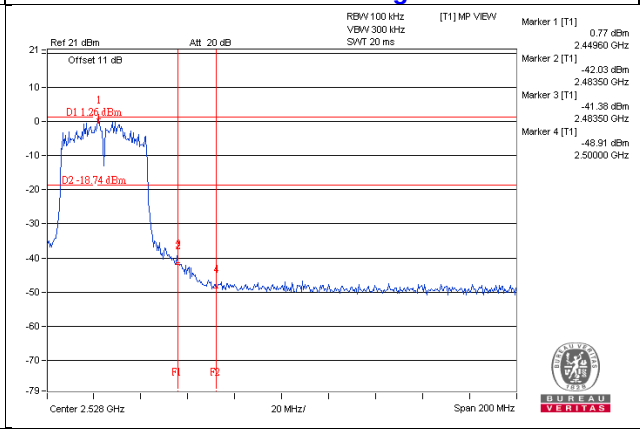




CH 3 Band edge

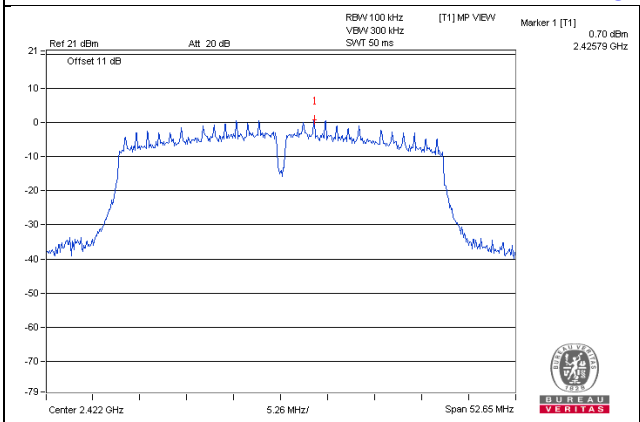


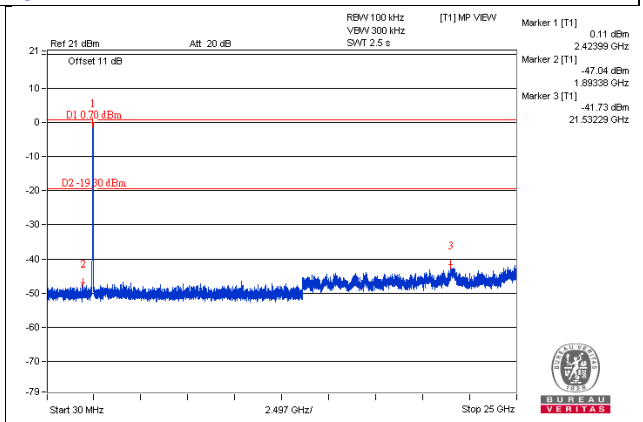
CH 9 Band edge



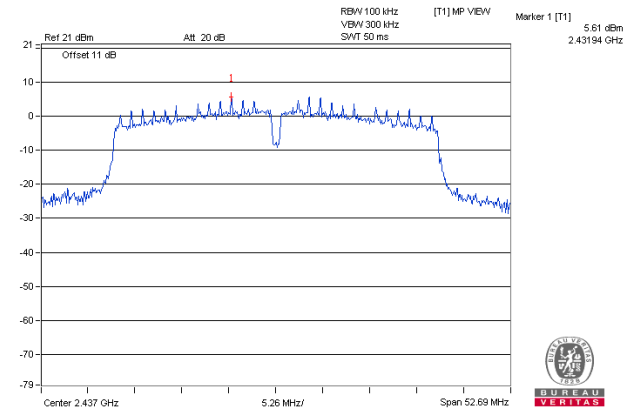
802.11n (HT40) – chain 1

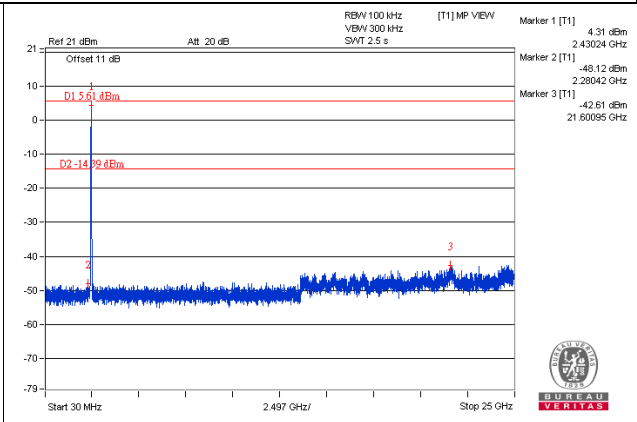
CH 3



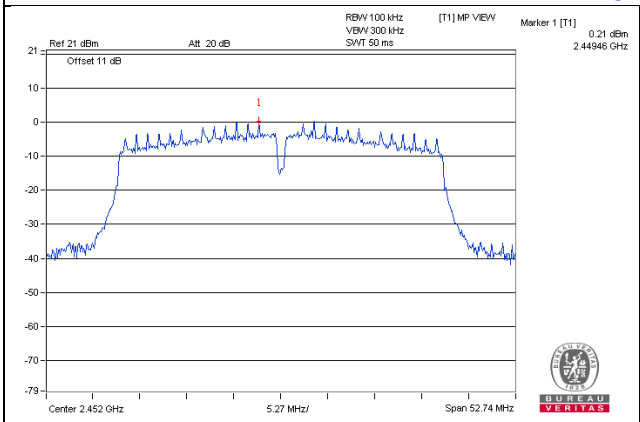


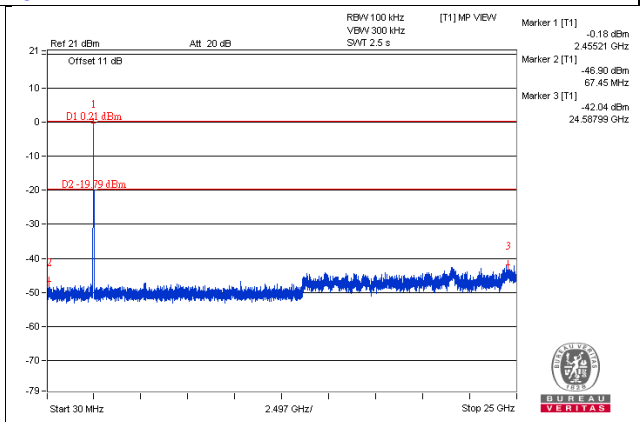
CH 6



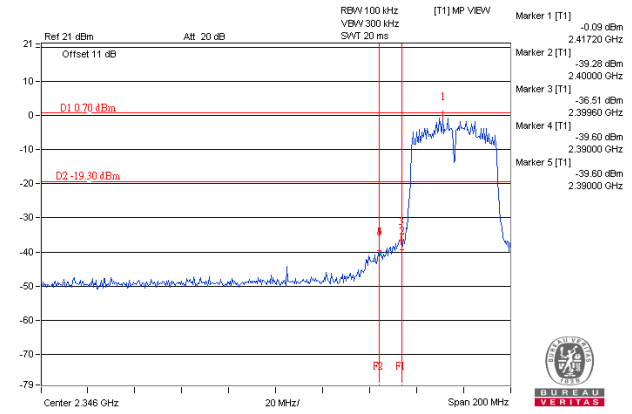


CH 9

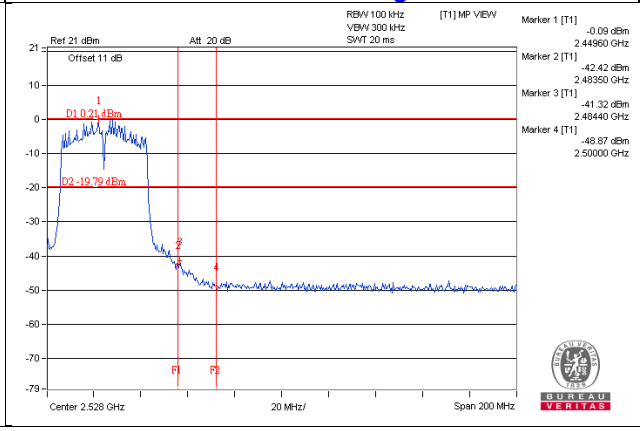




CH 3 Band edge



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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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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