

FCC Test Report

Report No.: RF170320E01B

FCC ID: H8NTCG310

Test Model: TCG310

Series Model: TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z," -" , " ." or blank for marketing)

Received Date: Aug. 07, 2017

Test Date: Aug. 15 to Sep. 06, 2017

Issued Date: Sep. 14, 2017

Applicant: ASKEY COMPUTER CORP.

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

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Release Control Record

Issue No.	Description	Date Issued
RF170320E01B	Original release.	Sep. 14, 2017

1 Certificate of Conformity

Product: Cable Modem

Brand: ASKEY

Test Model: TCG310

Series Model: TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z," ","."or blank for marketing)

Sample Status: ENGINEERING SAMPLE

Applicant: ASKEY COMPUTER CORP.

Test Date: Aug. 15 to Sep. 06, 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.

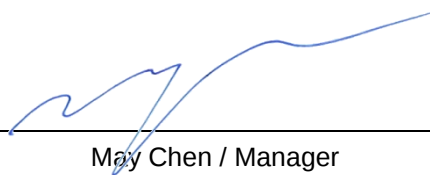
Prepared by :



Date: Sep. 14, 2017

Wendy Wu / Specialist

Approved by :



Date: Sep. 14, 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 -11.78dB at 0.36875MHz.
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 2387.3MHz, 2388MHz, 2390MHz, 2483.5MHz, 7311MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) 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) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Cable Modem
Brand	ASKEY
Test Model	TCG310
Series Model	TCG310,TCG310XXXXXX (X=0~9,A-Z,a-z," -" ," ." or blank for marketing)
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.4GHz: CDD Mode: 409.643mW Beamforming Mode: 290.116mW 5.18 ~ 5.24GHz: CDD Mode: 431.54mW Beamforming Mode: 330.994mW 5.745 ~ 5.825GHz: CDD Mode: 715.803mW Beamforming Mode: 343.532mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT has below model names, which are identical to each other in all aspects except for the following:

Brand	Model No.	Different
ASKEY	TCG310	For Marketing request,"XXXXXX" just for used to ship to different customers to do the difference, Not related to the hardware, RF features, institutions.
	TCG310XXXXXX	
	(X=0~9,A-Z,a-z," -" ," ." or blank for marketing)	

From the above models, model: **TCG310** was selected as representative model for the test and its data was recorded in this report.

2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	WLAN 5GHz

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

No	Brand Name	Model No.	Spec.
1	LEI	MU42-3120350-A1	Input: 100-240Vac, 50/60Hz, 1.5A Output: 12Vdc, 3.5A DC output cable: 1.5m, unshielded
2	Sunny	SYS1570-4212-W2	Input: 100-240Vac, 50-60Hz, 1.5A Output: 12Vdc, 3.5A DC output cable: 1.5m, unshielded

Note: From the above adapters, the worst radiated test was found in **Adapter 1**. Therefore only the test data of the modes were recorded in this report.

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

Set 1							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1	HONGBO	3.89	5.15~5.35	Dipole	i-pex(MHF)	95
			4.16	5.47~5.725			
			4.04	5.725~5.85			
3	2.4G-chain 1		3.99	2.4~2.4835	Dipole	i-pex(MHF)	75
	5G-chain 2		3.89	5.15~5.35			
			3.66	5.47~5.725			
			3.83	5.725~5.85			
4	2.4G-chain 0		3.26	2.4~2.4835	Dipole	i-pex(MHF)	295
	5G-chain 3		3.9	5.15~5.35			
			3.92	5.47~5.725			
			4.49	5.725~5.85			

Set 2

Set 2							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1		2.93	5.15~5.35	PIFA	i-pex(MHF)	93
			2.69	5.47~5.725			
			2.76	5.725~5.85			
3	2.4G-chain 1	TSKY	3.2	2.4~2.4835	PIFA	i-pex(MHF)	71
	5G-chain 2		3.48	5.15~5.35			
			3.23	5.47~5.725			
			3.34	5.725~5.85			
4	2.4G-chain 0		2.12	2.4~2.4835	Dipole	i-pex(MHF)	290
	5G-chain 3		2.61	5.15~5.35			
			2.36	5.47~5.725			
			2.52	5.725~5.85			

Set 3

Set 3							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1	Master Wave	5.96	5.15~5.35	Dipole	i-pex(MHF)	95
			7.51	5.47~5.725			
			7.39	5.725~5.85			
3	2.4G-chain 1		4.52	2.4~2.4835	Dipole	i-pex(MHF)	58
	5G-chain 2		4.9	5.15~5.35			
			3.95	5.47~5.725			
			3.38	5.725~5.85			
4	2.4G-chain 0		3.41	2.4~2.4835	Dipole	i-pex(MHF)	285
	5G-chain 3		4.23	5.15~5.35			
			4.57	5.47~5.725			
		3.76	5.725~5.85				

5. The EUT incorporates a MIMO function.

For 2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX Fixed Chain 0	1RX Fixed Chain 0
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
	MCS 0~7	4TX	4RX
802.11n (HT40)	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
	MCS 0~7	4TX	4RX
802.11ac (VHT20)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX

Note:

1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	√	√	Antenna Set 3 with Adapter 1
2	√	√	-	-	Antenna Set 2 with Adapter 1
3	-	-	√	-	Antenna Set 3 with Adapter 2

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

NOTE: “-” 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.

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

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

Power Line Conducted Emission Test:

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

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

Antenna Port Conducted Measurement:

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
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 $\geq$ 1G	23deg. C, 69%RH	120Vac, 60Hz	Andy Ho
RE<1G	23deg. C, 64%RH	120Vac, 60Hz	Jyunchun Lin
PLC	23deg. C, 66%RH	120Vac, 60Hz	Bear Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng Eason Tseng

3.3 Duty Cycle of Test Signal

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

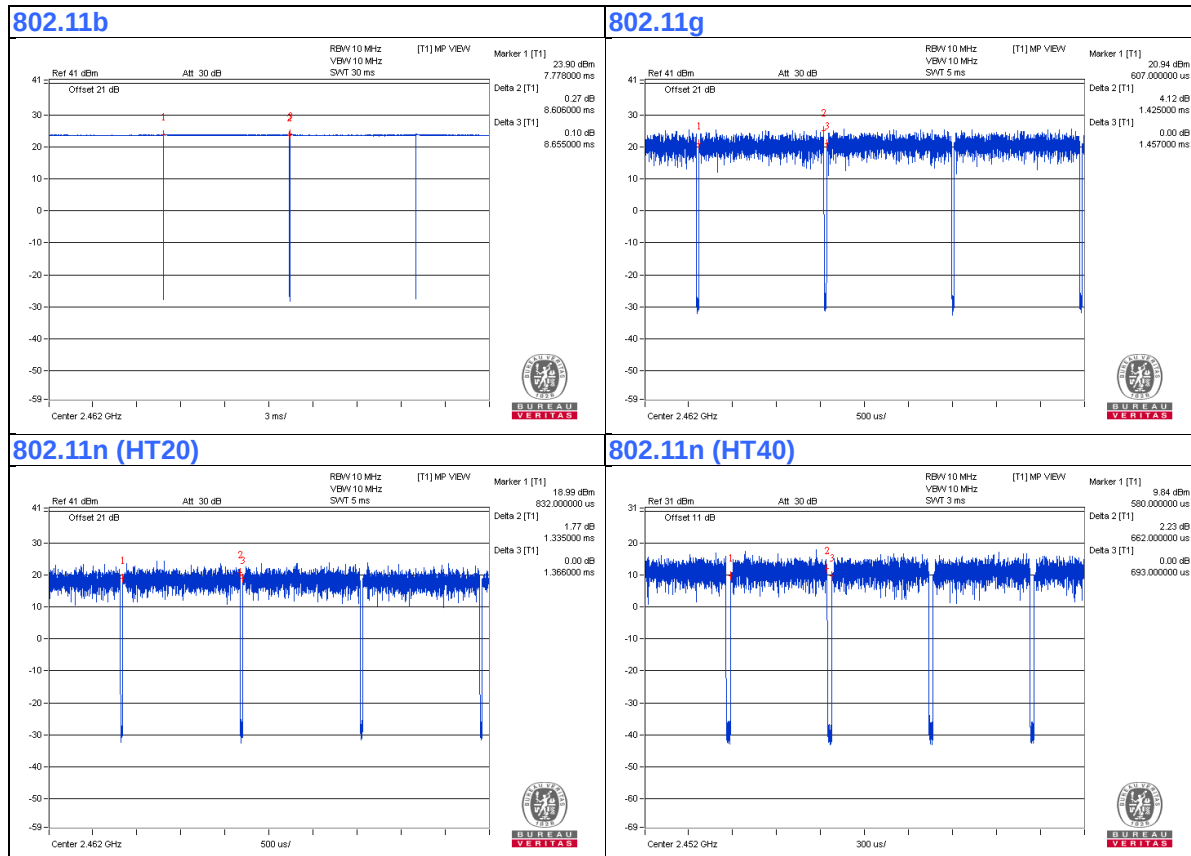
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $8.606/8.655 = 0.994$

802.11g: Duty cycle = $1.425/1.457 = 0.978$, Duty factor = $10 * \log(1/0.978) = 0.1$

802.11n (HT20): Duty cycle = $1.335/1.366 = 0.977$, Duty factor = $10 * \log(1/0.977) = 0.1$

802.11n (HT40): Duty cycle = $0.662/0.693 = 0.955$, Duty factor = $10 * \log(1/0.955) = 0.2$



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.

For Conducted Emission Test:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	CMTS	CASA system	C220	NA	NA	Supplied by client
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	USB Disk	Nmicro	16G	N/A	N/A	Supplied by client
E.	Telephone	DAISHO	DS-03	N/A	N/A	Provided by Lab
F.	Telephone	Romeo	TE-812	97280903	N/A	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.	DC Cable	1	1.5	No	0	Supplied by client
2.	Coaxial Cable	1	10	Yes	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	3	10	No	0	Provided by Lab
5.	RJ-11 Cable	1	1.8	No	0	Provided by Lab
6.	RJ-11 Cable	1	1.8	No	0	Provided by Lab

For Radiated Emission Test:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	N/A	Provided by Lab
B.	Laptop	HP	Pavilion 14-ab023TU	5CD5340WXZ	N/A	Provided by Lab
C.	USB 3.0 Disk	Nmicro	16G	N/A	N/A	Supplied by client

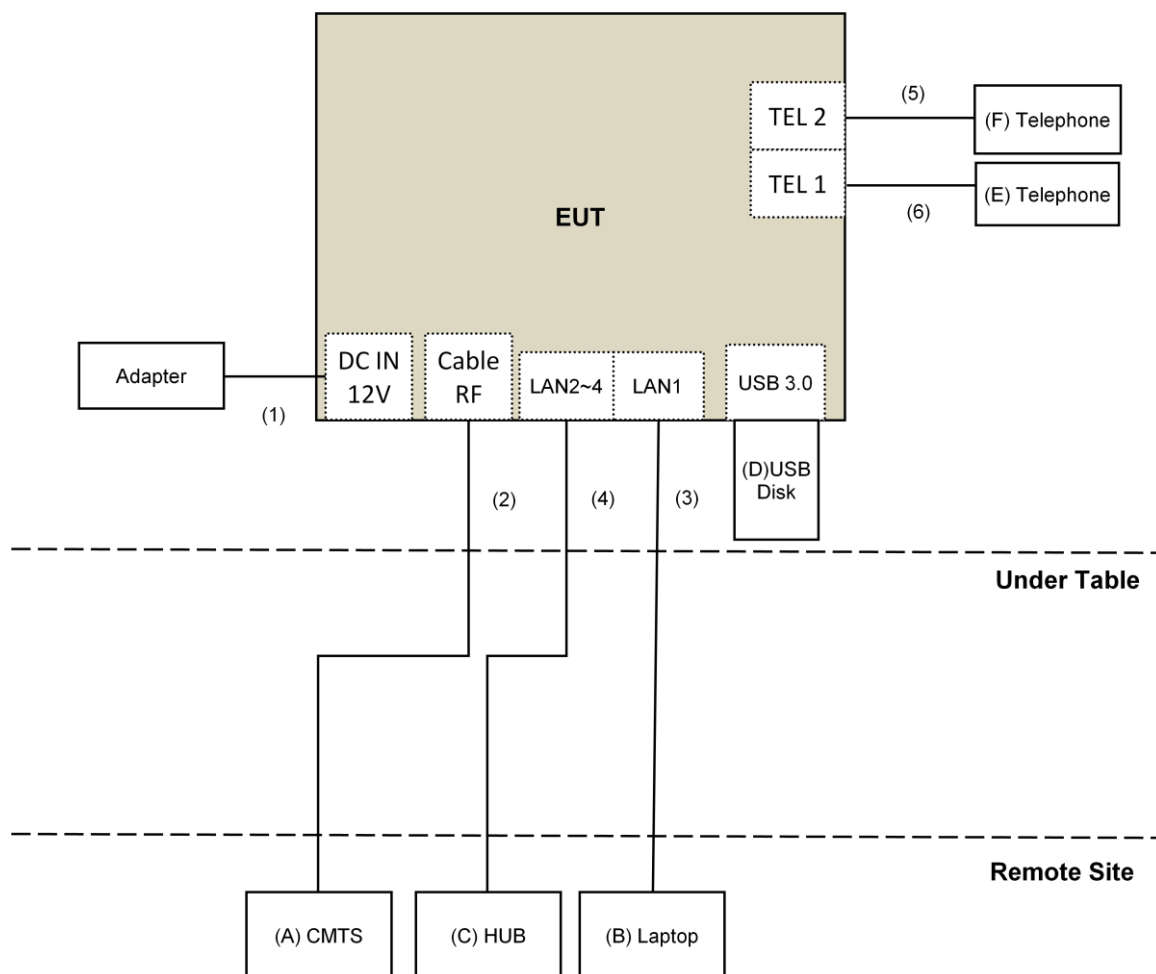
Note:

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

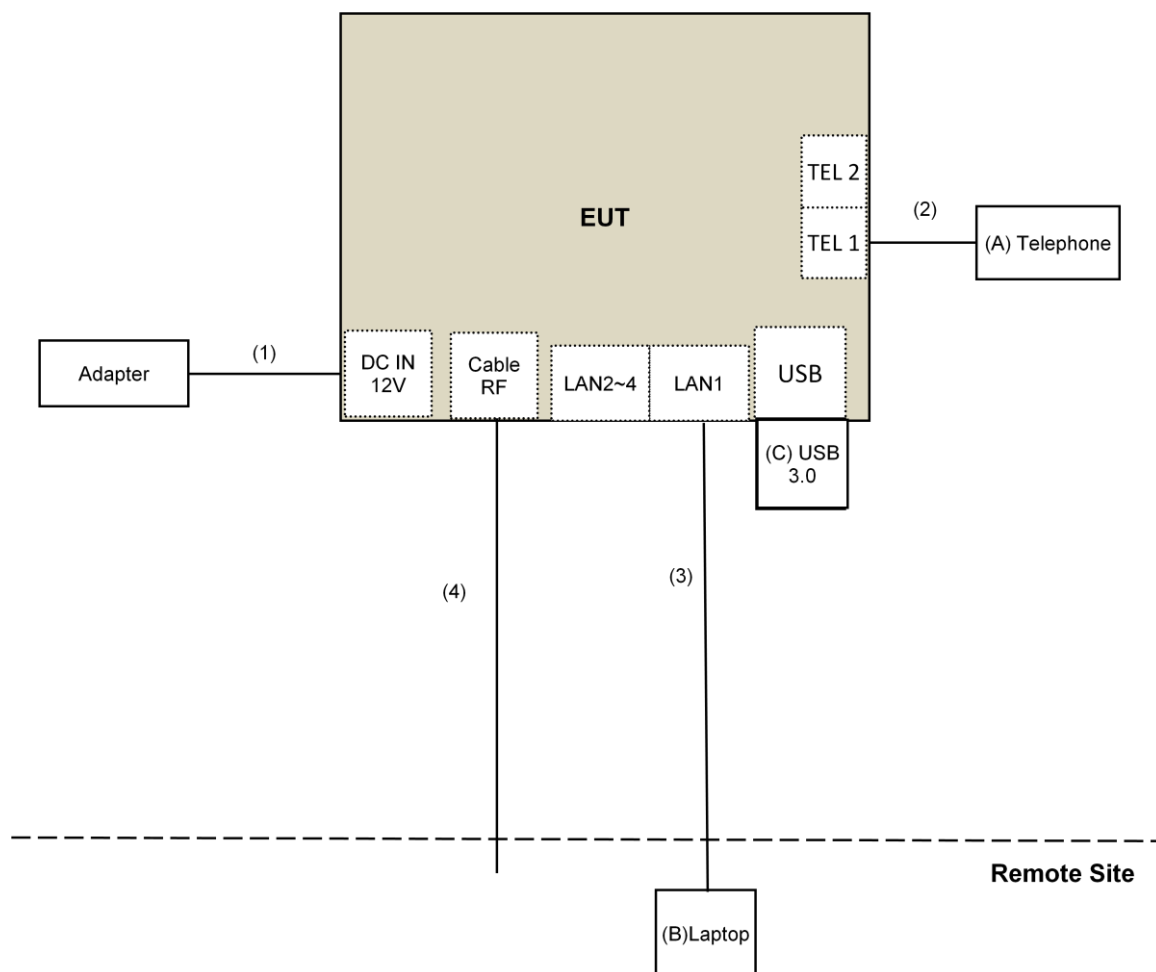
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.5	No	0	Supplied by client
2.	RJ-11 Cable	1	1.8	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	Coaxial Cable	1	10	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test

For Conducted Emission Test:



For Radiated Emission Test:



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 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 30dB 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 Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
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-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Dec. 13, 2016	Dec. 12, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	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	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Aug. 15 to Sep. 06, 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:

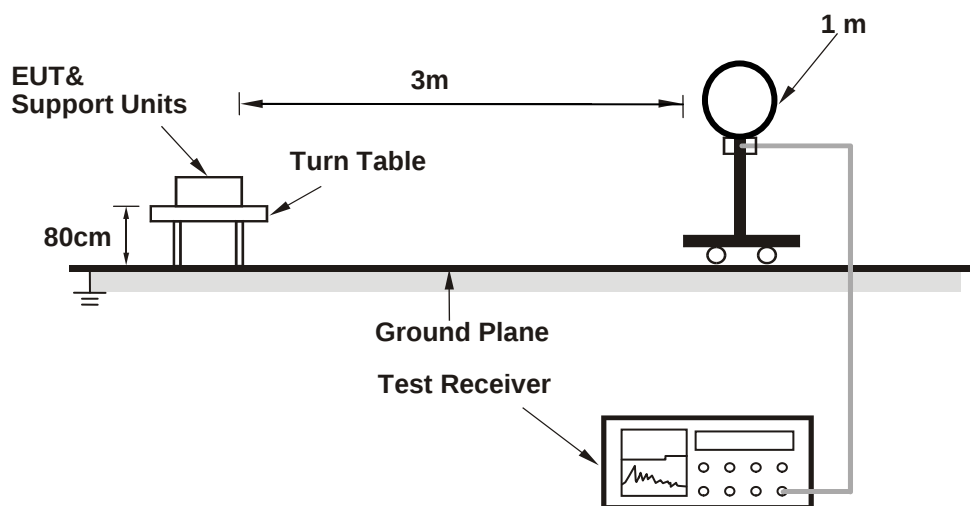
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

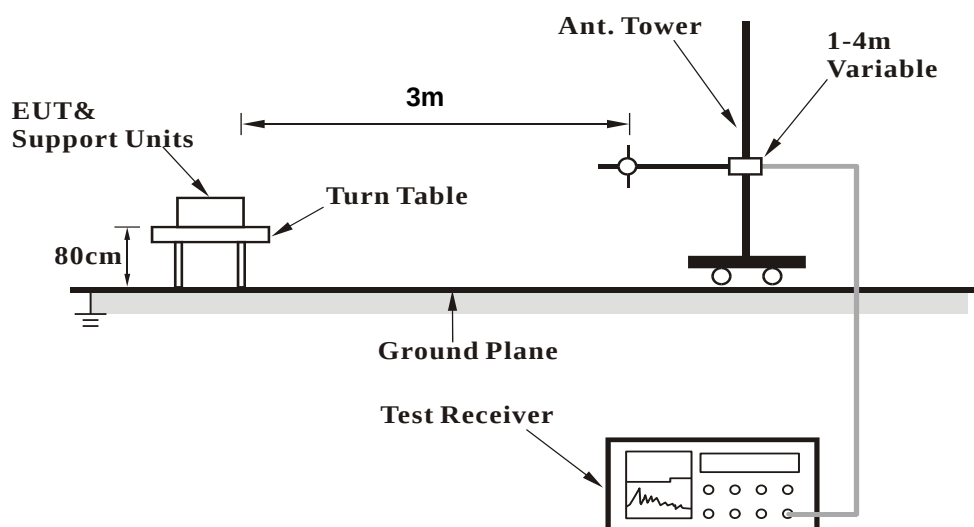
No deviation.

4.1.5 Test Setup

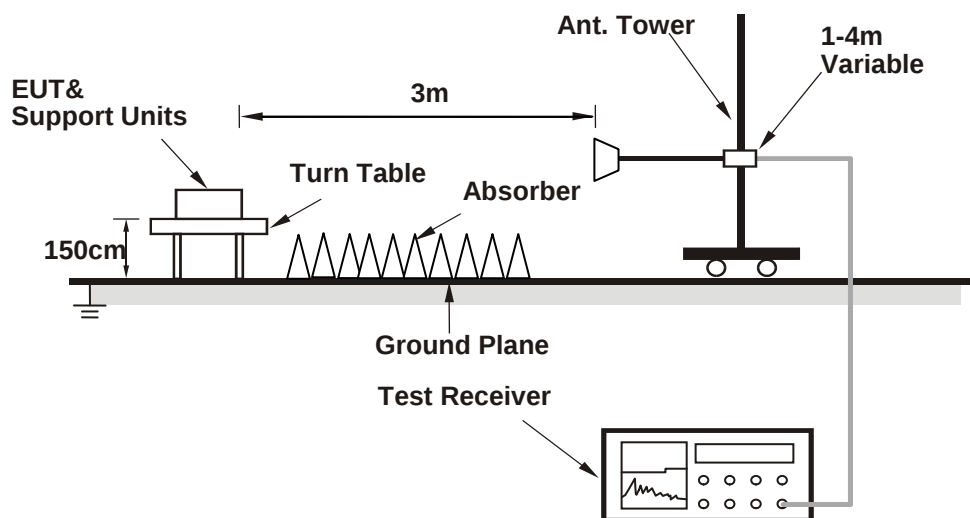
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- Connected the EUT with the Laptop which is placed on remote site.
- Contorlling software (HyperTerminal paste wl.txt command) has been activated to set the EUT on specific status.

4.1.7 Test Results (Mode 1)

Above 1GHz Data :

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.20	56.6 PK	74.0	-17.4	1.53 H	313	57.9	-1.3
2	2387.20	49.8 AV	54.0	-4.2	1.53 H	313	51.1	-1.3
3	*2412.00	106.3 PK			1.53 H	313	107.4	-1.1
4	*2412.00	103.7 AV			1.53 H	313	104.8	-1.1
5	4824.00	47.2 PK	74.0	-26.8	1.46 H	244	44.0	3.2
6	4824.00	45.3 AV	54.0	-8.7	1.46 H	244	42.1	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.20	60.4 PK	74.0	-13.6	1.04 V	265	61.7	-1.3
2	2387.20	53.6 AV	54.0	-0.4	1.04 V	265	54.9	-1.3
3	*2412.00	112.1 PK			1.04 V	265	113.2	-1.1
4	*2412.00	109.5 AV			1.04 V	265	110.6	-1.1
5	4824.00	45.5 PK	74.0	-28.5	1.53 V	222	42.3	3.2
6	4824.00	43.1 AV	54.0	-10.9	1.53 V	222	39.9	3.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.8 PK			1.54 H	312	105.0	-1.2
2	*2437.00	101.2 AV			1.54 H	312	102.4	-1.2
3	4874.00	47.1 PK	74.0	-26.9	1.50 H	258	43.8	3.3
4	4874.00	45.2 AV	54.0	-8.8	1.50 H	258	41.9	3.3
5	7311.00	51.3 PK	74.0	-22.7	1.50 H	275	41.5	9.8
6	7311.00	47.7 AV	54.0	-6.3	1.50 H	275	37.9	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.6 PK			1.40 V	268	110.8	-1.2
2	*2437.00	107.0 AV			1.40 V	268	108.2	-1.2
3	4874.00	45.6 PK	74.0	-28.4	1.50 V	232	42.3	3.3
4	4874.00	43.4 AV	54.0	-10.6	1.50 V	232	40.1	3.3
5	7311.00	56.2 PK	74.0	-17.8	1.78 V	226	46.4	9.8
6	7311.00	53.7 AV	54.0	-0.3	1.78 V	226	43.9	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.1 PK			1.50 H	325	106.2	-1.1
2	*2462.00	102.7 AV			1.50 H	325	103.8	-1.1
3	2483.50	54.6 PK	74.0	-19.4	1.50 H	325	55.6	-1.0
4	2483.50	44.3 AV	54.0	-9.7	1.50 H	325	45.3	-1.0
5	4924.00	47.7 PK	74.0	-26.3	1.45 H	265	44.2	3.5
6	4924.00	45.6 AV	54.0	-8.4	1.45 H	265	42.1	3.5
7	7386.00	51.1 PK	74.0	-22.9	1.48 H	283	41.2	9.9
8	7386.00	47.4 AV	54.0	-6.6	1.48 H	283	37.5	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.1 PK			1.37 V	268	112.2	-1.1
2	*2462.00	108.5 AV			1.37 V	268	109.6	-1.1
3	2483.50	58.1 PK	74.0	-15.9	1.37 V	268	59.1	-1.0
4	2483.50	48.1 AV	54.0	-5.9	1.37 V	268	49.1	-1.0
5	4924.00	46.0 PK	74.0	-28.0	1.49 V	219	42.5	3.5
6	4924.00	43.7 AV	54.0	-10.3	1.49 V	219	40.2	3.5
7	7386.00	57.4 PK	74.0	-16.6	1.58 V	230	47.5	9.9
8	7386.00	53.7 AV	54.0	-0.3	1.58 V	230	43.8	9.9

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	1.01 H	322	69.7	-1.3
2	2390.00	53.9 AV	54.0	-0.1	1.01 H	322	55.2	-1.3
3	*2412.00	114.3 PK			1.01 H	322	115.4	-1.1
4	*2412.00	103.6 AV			1.01 H	322	104.7	-1.1
5	4824.00	57.3 PK	74.0	-16.7	1.50 H	206	54.1	3.2
6	4824.00	44.4 AV	54.0	-9.6	1.50 H	206	41.2	3.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.1 PK	74.0	-5.9	2.53 V	360	69.4	-1.3
2	2390.00	53.2 AV	54.0	-0.8	2.53 V	360	54.5	-1.3
3	*2412.00	114.0 PK			2.53 V	360	115.1	-1.1
4	*2412.00	103.4 AV			2.53 V	360	104.5	-1.1
5	4824.00	59.7 PK	74.0	-14.3	1.74 V	286	56.5	3.2
6	4824.00	46.5 AV	54.0	-7.5	1.74 V	286	43.3	3.2

REMARKS:

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

CHANNEL	TX Channel 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	54.3 PK	74.0	-19.7	1.52 H	36	55.6	-1.3
2	2390.00	42.1 AV	54.0	-11.9	1.52 H	36	43.4	-1.3
3	*2437.00	115.4 PK			1.52 H	36	116.6	-1.2
4	*2437.00	104.9 AV			1.52 H	36	106.1	-1.2
5	2483.50	58.7 PK	74.0	-15.3	1.52 H	36	59.7	-1.0
6	2483.50	43.6 AV	54.0	-10.4	1.52 H	36	44.6	-1.0
7	4874.00	59.4 PK	74.0	-14.6	1.50 H	212	56.1	3.3
8	4874.00	46.3 AV	54.0	-7.7	1.50 H	212	43.0	3.3
9	7311.00	66.3 PK	74.0	-7.7	3.08 H	344	56.5	9.8
10	7311.00	51.6 AV	54.0	-2.4	3.08 H	344	41.8	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.5 PK	74.0	-19.5	1.17 V	266	55.8	-1.3
2	2390.00	42.3 AV	54.0	-11.7	1.17 V	266	43.6	-1.3
3	*2437.00	116.4 PK			1.17 V	266	117.6	-1.2
4	*2437.00	106.2 AV			1.17 V	266	107.4	-1.2
5	2483.50	58.8 PK	74.0	-15.2	1.17 V	266	59.8	-1.0
6	2483.50	43.9 AV	54.0	-10.1	1.17 V	266	44.9	-1.0
7	4874.00	61.2 PK	74.0	-12.8	1.77 V	296	57.9	3.3
8	4874.00	48.2 AV	54.0	-5.8	1.77 V	296	44.9	3.3
9	7311.00	67.8 PK	74.0	-6.2	1.96 V	224	58.0	9.8
10	7311.00	53.6 AV	54.0	-0.4	1.96 V	224	43.8	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.8 PK			1.50 H	25	115.9	-1.1
2	*2462.00	104.4 AV			1.50 H	25	105.5	-1.1
3	2483.50	70.8 PK	74.0	-3.2	1.50 H	25	71.8	-1.0
4	2483.50	53.6 AV	54.0	-0.4	1.50 H	25	54.6	-1.0
5	4924.00	58.2 PK	74.0	-15.8	1.46 H	220	54.7	3.5
6	4924.00	45.3 AV	54.0	-8.7	1.46 H	220	41.8	3.5
7	7386.00	57.7 PK	74.0	-16.3	3.10 H	360	47.8	9.9
8	7386.00	48.9 AV	54.0	-5.1	3.10 H	360	39.0	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.3 PK			1.15 V	68	116.4	-1.1
2	*2462.00	105.7 AV			1.15 V	68	106.8	-1.1
3	2483.50	71.8 PK	74.0	-2.2	1.15 V	68	72.8	-1.0
4	2483.50	53.7 AV	54.0	-0.3	1.15 V	68	54.7	-1.0
5	4924.00	60.3 PK	74.0	-13.7	1.73 V	298	56.8	3.5
6	4924.00	47.4 AV	54.0	-6.6	1.73 V	298	43.9	3.5
7	7386.00	66.3 PK	74.0	-7.7	1.95 V	235	56.4	9.9
8	7386.00	50.9 AV	54.0	-3.1	1.95 V	235	41.0	9.9

REMARKS:

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

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
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	2389.10	66.2 PK	74.0	-7.8	1.50 H	323	67.5	-1.3
2	2389.10	52.1 AV	54.0	-1.9	1.50 H	323	53.4	-1.3
3	*2412.00	111.5 PK			1.50 H	323	112.6	-1.1
4	*2412.00	100.7 AV			1.50 H	323	101.8	-1.1
5	4824.00	56.7 PK	74.0	-17.3	1.53 H	222	53.5	3.2
6	4824.00	44.1 AV	54.0	-9.9	1.53 H	222	40.9	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.10	68.2 PK	74.0	-5.8	1.13 V	347	69.5	-1.3
2	2389.10	52.4 AV	54.0	-1.6	1.13 V	347	53.7	-1.3
3	*2412.00	112.9 PK			1.13 V	347	114.0	-1.1
4	*2412.00	102.3 AV			1.13 V	347	103.4	-1.1
5	4824.00	60.2 PK	74.0	-13.8	1.73 V	312	57.0	3.2
6	4824.00	47.3 AV	54.0	-6.7	1.73 V	312	44.1	3.2

REMARKS:

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

CHANNEL	TX Channel 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	53.9 PK	74.0	-20.1	1.46 H	308	55.2	-1.3
2	2390.00	42.4 AV	54.0	-11.6	1.46 H	308	43.7	-1.3
3	*2437.00	114.0 PK			1.46 H	308	115.2	-1.2
4	*2437.00	103.9 AV			1.46 H	308	105.1	-1.2
5	2483.50	55.6 PK	74.0	-18.4	1.46 H	308	56.6	-1.0
6	2483.50	43.2 AV	54.0	-10.8	1.46 H	308	44.2	-1.0
7	4874.00	59.6 PK	74.0	-14.4	1.53 H	203	56.3	3.3
8	4874.00	46.8 AV	54.0	-7.2	1.53 H	203	43.5	3.3
9	7311.00	65.9 PK	74.0	-8.1	3.06 H	332	56.1	9.8
10	7311.00	51.4 AV	54.0	-2.6	3.06 H	332	41.6	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.1 PK	74.0	-19.9	1.03 V	351	55.4	-1.3
2	2390.00	42.5 AV	54.0	-11.5	1.03 V	351	43.8	-1.3
3	*2437.00	115.3 PK			1.03 V	351	116.5	-1.2
4	*2437.00	105.2 AV			1.03 V	351	106.4	-1.2
5	2483.50	56.1 PK	74.0	-17.9	1.03 V	351	57.1	-1.0
6	2483.50	43.3 AV	54.0	-10.7	1.03 V	351	44.3	-1.0
7	4874.00	61.4 PK	74.0	-12.6	1.74 V	312	58.1	3.3
8	4874.00	48.6 AV	54.0	-5.4	1.74 V	312	45.3	3.3
9	7311.00	67.5 PK	74.0	-6.5	3.66 V	260	57.7	9.8
10	7311.00	53.9 AV	54.0	-0.1	3.66 V	260	44.1	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.5 PK			1.50 H	321	114.6	-1.1
2	*2462.00	102.6 AV			1.50 H	321	103.7	-1.1
3	2483.50	69.8 PK	74.0	-4.2	1.50 H	321	70.8	-1.0
4	2483.50	52.3 AV	54.0	-1.7	1.50 H	321	53.3	-1.0
5	4924.00	57.1 PK	74.0	-16.9	1.51 H	208	53.6	3.5
6	4924.00	44.3 AV	54.0	-9.7	1.51 H	208	40.8	3.5
7	7386.00	63.4 PK	74.0	-10.6	3.01 H	321	53.5	9.9
8	7386.00	48.9 AV	54.0	-5.1	3.01 H	321	39.0	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.1 PK			2.67 V	0	114.2	-1.1
2	*2462.00	103.2 AV			2.67 V	0	104.3	-1.1
3	2483.50	70.3 PK	74.0	-3.7	2.67 V	0	71.3	-1.0
4	2483.50	52.8 AV	54.0	-1.2	2.67 V	0	53.8	-1.0
5	4924.00	58.9 PK	74.0	-15.1	1.75 V	301	55.4	3.5
6	4924.00	46.1 AV	54.0	-7.9	1.75 V	301	42.6	3.5
7	7386.00	65.0 PK	74.0	-9.0	3.63 V	246	55.1	9.9
8	7386.00	50.4 AV	54.0	-3.6	3.63 V	246	40.5	9.9

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.2 PK	74.0	-7.8	1.28 H	322	67.5	-1.3
2	2390.00	53.7 AV	54.0	-0.3	1.28 H	322	55.0	-1.3
3	*2422.00	103.2 PK			1.28 H	322	104.5	-1.3
4	*2422.00	94.2 AV			1.28 H	322	95.5	-1.3
5	4844.00	48.8 PK	74.0	-25.2	1.55 H	202	45.5	3.3
6	4844.00	36.4 AV	54.0	-17.6	1.55 H	202	33.1	3.3
7	7266.00	55.6 PK	74.0	-18.4	3.06 H	306	45.8	9.8
8	7266.00	42.1 AV	54.0	-11.9	3.06 H	306	32.3	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.6 PK	74.0	-8.4	1.02 V	263	66.9	-1.3
2	2390.00	52.8 AV	54.0	-1.2	1.02 V	263	54.1	-1.3
3	*2422.00	103.0 PK			1.02 V	263	104.3	-1.3
4	*2422.00	94.8 AV			1.02 V	263	96.1	-1.3
5	4844.00	50.5 PK	74.0	-23.5	1.74 V	295	47.2	3.3
6	4844.00	37.7 AV	54.0	-16.3	1.74 V	295	34.4	3.3
7	7266.00	56.6 PK	74.0	-17.4	3.62 V	240	46.8	9.8
8	7266.00	43.4 AV	54.0	-10.6	3.62 V	240	33.6	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.10	62.4 PK	74.0	-11.6	1.07 H	319	63.7	-1.3
2	2389.10	51.7 AV	54.0	-2.3	1.07 H	319	53.0	-1.3
3	*2437.00	104.0 PK			1.07 H	319	105.2	-1.2
4	*2437.00	94.8 AV			1.07 H	319	96.0	-1.2
5	2483.50	60.8 PK	74.0	-13.2	1.07 H	319	61.8	-1.0
6	2483.50	45.7 AV	54.0	-8.3	1.07 H	319	46.7	-1.0
7	4874.00	48.4 PK	74.0	-25.6	1.60 H	189	45.1	3.3
8	4874.00	36.3 AV	54.0	-17.7	1.60 H	189	33.0	3.3
9	7311.00	55.5 PK	74.0	-18.5	3.06 H	304	45.7	9.8
10	7311.00	41.8 AV	54.0	-12.2	3.06 H	304	32.0	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.10	65.5 PK	74.0	-8.5	1.30 V	264	66.8	-1.3
2	2389.10	51.5 AV	54.0	-2.5	1.30 V	264	52.8	-1.3
3	*2437.00	105.3 PK			1.30 V	264	106.5	-1.2
4	*2437.00	96.1 AV			1.30 V	264	97.3	-1.2
5	2483.50	61.7 PK	74.0	-12.3	1.30 V	264	62.7	-1.0
6	2483.50	46.7 AV	54.0	-7.3	1.30 V	264	47.7	-1.0
7	4874.00	50.4 PK	74.0	-23.6	1.70 V	290	47.1	3.3
8	4874.00	37.5 AV	54.0	-16.5	1.70 V	290	34.2	3.3
9	7311.00	56.9 PK	74.0	-17.1	3.64 V	246	47.1	9.8
10	7311.00	43.7 AV	54.0	-10.3	3.64 V	246	33.9	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.3 PK			1.50 H	321	102.4	-1.1
2	*2452.00	92.4 AV			1.50 H	321	93.5	-1.1
3	2483.50	70.1 PK	74.0	-3.9	1.50 H	321	71.1	-1.0
4	2483.50	48.1 AV	54.0	-5.9	1.50 H	321	49.1	-1.0
5	4904.00	48.5 PK	74.0	-25.5	1.65 H	202	45.0	3.5
6	4904.00	36.5 AV	54.0	-17.5	1.65 H	202	33.0	3.5
7	7356.00	55.7 PK	74.0	-18.3	3.08 H	288	45.8	9.9
8	7356.00	41.9 AV	54.0	-12.1	3.08 H	288	32.0	9.9
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	*2452.00	103.0 PK			1.50 V	269	104.1	-1.1
2	*2452.00	93.5 AV			1.50 V	269	94.6	-1.1
3	2483.50	70.9 PK	74.0	-3.1	1.50 V	269	71.9	-1.0
4	2483.50	49.8 AV	54.0	-4.2	1.50 V	269	50.8	-1.0
5	4904.00	50.9 PK	74.0	-23.1	1.67 V	293	47.4	3.5
6	4904.00	37.8 AV	54.0	-16.2	1.67 V	293	34.3	3.5
7	7356.00	55.1 PK	74.0	-18.9	1.50 V	227	45.2	9.9
8	7356.00	43.3 AV	54.0	-10.7	1.50 V	227	33.4	9.9

REMARKS:

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

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 1	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	34.15	35.9 QP	40.0	-4.1	1.00 H	96	44.7	-8.8
2	109.13	33.8 QP	43.5	-9.7	3.00 H	262	44.9	-11.1
3	216.05	37.1 QP	46.0	-8.9	1.00 H	291	48.6	-11.5
4	463.86	30.5 QP	46.0	-15.5	1.50 H	360	33.9	-3.4
5	677.04	30.4 QP	46.0	-15.6	2.50 H	314	30.0	0.4
6	945.20	31.6 QP	46.0	-14.4	3.00 H	317	27.0	4.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.49	36.3 QP	40.0	-3.7	1.00 V	287	44.7	-8.4
2	109.18	37.4 QP	43.5	-6.1	1.00 V	334	48.5	-11.1
3	464.41	31.9 QP	46.0	-14.1	1.00 V	105	35.3	-3.4
4	654.80	32.8 QP	46.0	-13.2	1.00 V	39	32.5	0.3
5	891.00	37.2 QP	46.0	-8.8	1.00 V	107	33.4	3.8
6	945.00	38.5 QP	46.0	-7.5	1.00 V	107	33.9	4.6

REMARKS:

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

4.1.8 Test Results (Mode 2)

Above 1GHz Data :

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.20	57.4 PK	74.0	-16.6	2.04 H	41	58.7	-1.3
2	2387.20	50.9 AV	54.0	-3.1	2.04 H	41	52.2	-1.3
3	*2412.00	107.0 PK			2.04 H	41	108.1	-1.1
4	*2412.00	104.8 AV			2.04 H	41	105.9	-1.1
5	4824.00	47.4 PK	74.0	-26.6	1.54 H	231	44.2	3.2
6	4824.00	45.3 AV	54.0	-8.7	1.54 H	231	42.1	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.20	61.0 PK	74.0	-13.0	1.25 V	194	62.3	-1.3
2	2387.20	53.2 AV	54.0	-0.8	1.25 V	194	54.5	-1.3
3	*2412.00	110.4 PK			1.25 V	194	111.5	-1.1
4	*2412.00	108.0 AV			1.25 V	194	109.1	-1.1
5	4824.00	52.3 PK	74.0	-21.7	2.66 V	265	49.1	3.2
6	4824.00	50.7 AV	54.0	-3.3	2.66 V	265	47.5	3.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.0 PK			2.01 H	46	105.2	-1.2
2	*2437.00	101.8 AV			2.01 H	46	103.0	-1.2
3	4874.00	47.1 PK	74.0	-26.9	1.46 H	223	43.8	3.3
4	4874.00	44.9 AV	54.0	-9.1	1.46 H	223	41.6	3.3
5	7311.00	53.7 PK	74.0	-20.3	3.45 H	233	43.9	9.8
6	7311.00	50.3 AV	54.0	-3.7	3.45 H	233	40.5	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.3 PK			1.23 V	190	108.5	-1.2
2	*2437.00	105.0 AV			1.23 V	190	106.2	-1.2
3	4874.00	50.0 PK	74.0	-24.0	2.53 V	262	46.7	3.3
4	4874.00	48.3 AV	54.0	-5.7	2.53 V	262	45.0	3.3
5	7311.00	55.0 PK	74.0	-19.0	1.58 V	311	45.2	9.8
6	7311.00	51.7 AV	54.0	-2.3	1.58 V	311	41.9	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.1 PK			1.66 H	67	105.2	-1.1
2	*2462.00	101.5 AV			1.66 H	67	102.6	-1.1
3	2483.50	55.4 PK	74.0	-18.6	1.66 H	67	56.4	-1.0
4	2483.50	45.3 AV	54.0	-8.7	1.66 H	67	46.3	-1.0
5	4924.00	47.0 PK	74.0	-27.0	1.50 H	232	43.5	3.5
6	4924.00	45.0 AV	54.0	-9.0	1.50 H	232	41.5	3.5
7	7386.00	55.9 PK	74.0	-18.1	3.69 H	238	46.0	9.9
8	7386.00	52.5 AV	54.0	-1.5	3.69 H	238	42.6	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.6 PK			1.46 V	220	110.7	-1.1
2	*2462.00	107.1 AV			1.46 V	220	108.2	-1.1
3	2483.50	58.3 PK	74.0	-15.7	1.46 V	220	59.3	-1.0
4	2483.50	50.2 AV	54.0	-3.8	1.46 V	220	51.2	-1.0
5	4924.00	50.1 PK	74.0	-23.9	2.58 V	260	46.6	3.5
6	4924.00	48.3 AV	54.0	-5.7	2.58 V	260	44.8	3.5
7	7386.00	55.8 PK	74.0	-18.2	1.68 V	314	45.9	9.9
8	7386.00	52.6 AV	54.0	-1.4	1.68 V	314	42.7	9.9

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.1 PK	74.0	-3.9	1.50 H	322	71.4	-1.3
2	2390.00	52.3 AV	54.0	-1.7	1.50 H	322	53.6	-1.3
3	*2412.00	114.3 PK			1.50 H	322	115.4	-1.1
4	*2412.00	105.4 AV			1.50 H	322	106.5	-1.1
5	4824.00	43.6 PK	74.0	-30.4	1.51 H	226	40.4	3.2
6	4824.00	41.4 AV	54.0	-12.6	1.51 H	226	38.2	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.8 PK	74.0	-3.2	1.18 V	353	72.1	-1.3
2	2390.00	52.6 AV	54.0	-1.4	1.18 V	353	53.9	-1.3
3	*2412.00	116.4 PK			1.18 V	353	117.5	-1.1
4	*2412.00	106.0 AV			1.18 V	353	107.1	-1.1
5	4824.00	45.6 PK	74.0	-28.4	2.49 V	277	42.4	3.2
6	4824.00	44.0 AV	54.0	-10.0	2.49 V	277	40.8	3.2

REMARKS:

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

CHANNEL	TX Channel 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	60.8 PK	74.0	-13.2	1.79 H	327	62.1	-1.3
2	2390.00	46.6 AV	54.0	-7.4	1.79 H	327	47.9	-1.3
3	*2437.00	120.1 PK			1.79 H	327	121.3	-1.2
4	*2437.00	109.8 AV			1.79 H	327	111.0	-1.2
5	2483.50	60.7 PK	74.0	-13.3	1.79 H	327	61.7	-1.0
6	2483.50	45.7 AV	54.0	-8.3	1.79 H	327	46.7	-1.0
7	4874.00	47.6 PK	74.0	-26.4	1.50 H	222	44.3	3.3
8	4874.00	45.4 AV	54.0	-8.6	1.50 H	222	42.1	3.3
9	7311.00	68.3 PK	74.0	-5.7	3.67 H	226	58.5	9.8
10	7311.00	53.4 AV	54.0	-0.6	3.67 H	226	43.6	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.1 PK	74.0	-12.9	1.14 V	357	62.4	-1.3
2	2390.00	46.9 AV	54.0	-7.1	1.14 V	357	48.2	-1.3
3	*2437.00	122.2 PK			1.14 V	357	123.4	-1.2
4	*2437.00	110.4 AV			1.14 V	357	111.6	-1.2
5	2483.50	61.0 PK	74.0	-13.0	1.14 V	357	62.0	-1.0
6	2483.50	46.0 AV	54.0	-8.0	1.14 V	357	47.0	-1.0
7	4874.00	49.6 PK	74.0	-24.4	2.52 V	274	46.3	3.3
8	4874.00	48.0 AV	54.0	-6.0	2.52 V	274	44.7	3.3
9	7311.00	68.8 PK	74.0	-5.2	1.58 V	313	59.0	9.8
10	7311.00	53.6 AV	54.0	-0.4	1.58 V	313	43.8	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.4 PK			1.79 H	317	117.5	-1.1
2	*2462.00	107.6 AV			1.79 H	317	108.7	-1.1
3	2484.50	70.4 PK	74.0	-3.6	1.79 H	317	71.4	-1.0
4	2484.50	53.2 AV	54.0	-0.8	1.79 H	317	54.2	-1.0
5	4924.00	61.4 PK	74.0	-12.6	1.50 H	260	57.9	3.5
6	4924.00	48.3 AV	54.0	-5.7	1.50 H	260	44.8	3.5
7	7386.00	63.2 PK	74.0	-10.8	1.50 H	225	53.3	9.9
8	7386.00	49.4 AV	54.0	-4.6	1.50 H	225	39.5	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.5 PK			1.50 V	80	118.6	-1.1
2	*2462.00	107.3 AV			1.50 V	80	108.4	-1.1
3	2484.50	71.2 PK	74.0	-2.8	1.50 V	80	72.2	-1.0
4	2484.50	52.7 AV	54.0	-1.3	1.50 V	80	53.7	-1.0
5	4924.00	62.7 PK	74.0	-11.3	1.77 V	292	59.2	3.5
6	4924.00	49.1 AV	54.0	-4.9	1.77 V	292	45.6	3.5
7	7386.00	67.2 PK	74.0	-6.8	2.85 V	251	57.3	9.9
8	7386.00	51.8 AV	54.0	-2.2	2.85 V	251	41.9	9.9

REMARKS:

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

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
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	67.3 PK	74.0	-6.7	1.50 H	328	68.6	-1.3
2	2390.00	53.8 AV	54.0	-0.2	1.50 H	328	55.1	-1.3
3	*2412.00	115.7 PK			1.50 H	328	116.8	-1.1
4	*2412.00	105.6 AV			1.50 H	328	106.7	-1.1
5	2487.40	59.5 PK	74.0	-14.5	1.50 H	328	60.5	-1.0
6	2487.40	53.6 AV	54.0	-0.4	1.50 H	328	54.6	-1.0
7	4824.00	45.7 PK	74.0	-28.3	1.55 H	247	42.5	3.2
8	4824.00	43.1 AV	54.0	-10.9	1.55 H	247	39.9	3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.0 PK	74.0	-9.0	1.07 V	358	66.3	-1.3
2	2390.00	51.6 AV	54.0	-2.4	1.07 V	358	52.9	-1.3
3	*2412.00	114.8 PK			1.07 V	358	115.9	-1.1
4	*2412.00	105.5 AV			1.07 V	358	106.6	-1.1
5	2487.40	57.5 PK	74.0	-16.5	1.36 V	358	58.5	-1.0
6	2487.40	52.3 AV	54.0	-1.7	1.36 V	358	53.3	-1.0
7	4824.00	49.2 PK	74.0	-24.8	2.48 V	282	46.0	3.2
8	4824.00	47.8 AV	54.0	-6.2	2.48 V	282	44.6	3.2

REMARKS:

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

CHANNEL	TX Channel 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	53.8 PK	74.0	-20.2	1.52 H	340	55.1	-1.3
2	2390.00	42.9 AV	54.0	-11.1	1.52 H	340	44.2	-1.3
3	*2437.00	117.3 PK			1.52 H	340	118.5	-1.2
4	*2437.00	108.1 AV			1.52 H	340	109.3	-1.2
5	2483.50	54.1 PK	74.0	-19.9	1.52 H	340	55.1	-1.0
6	2483.50	43.1 AV	54.0	-10.9	1.52 H	340	44.1	-1.0
7	4874.00	45.4 PK	74.0	-28.6	1.50 H	238	42.1	3.3
8	4874.00	43.1 AV	54.0	-10.9	1.50 H	238	39.8	3.3
9	7311.00	67.9 PK	74.0	-6.1	3.73 H	229	58.1	9.8
10	7311.00	51.8 AV	54.0	-2.2	3.73 H	229	42.0	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.1 PK	74.0	-19.9	1.00 V	358	55.4	-1.3
2	2390.00	43.1 AV	54.0	-10.9	1.00 V	358	44.4	-1.3
3	*2437.00	116.5 PK			1.00 V	358	117.7	-1.2
4	*2437.00	107.3 AV			1.00 V	358	108.5	-1.2
5	2483.50	54.8 PK	74.0	-19.2	1.00 V	358	55.8	-1.0
6	2483.50	43.4 AV	54.0	-10.6	1.00 V	358	44.4	-1.0
7	4874.00	49.6 PK	74.0	-24.4	2.56 V	283	46.3	3.3
8	4874.00	47.8 AV	54.0	-6.2	2.56 V	283	44.5	3.3
9	7311.00	65.2 PK	74.0	-8.8	2.40 V	249	55.4	9.8
10	7311.00	52.9 AV	54.0	-1.1	2.40 V	249	43.1	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.2 PK			1.11 H	328	117.3	-1.1
2	*2462.00	106.2 AV			1.11 H	328	107.3	-1.1
3	2483.50	69.4 PK	74.0	-4.6	1.11 H	328	70.4	-1.0
4	2483.50	53.9 AV	54.0	-0.1	1.11 H	328	54.9	-1.0
5	4924.00	43.3 PK	74.0	-30.7	1.56 H	233	39.8	3.5
6	4924.00	41.0 AV	54.0	-13.0	1.56 H	233	37.5	3.5
7	7386.00	65.8 PK	74.0	-8.2	3.78 H	233	55.9	9.9
8	7386.00	49.7 AV	54.0	-4.3	3.78 H	233	39.8	9.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.4 PK			1.00 V	359	115.5	-1.1
2	*2462.00	105.4 AV			1.00 V	359	106.5	-1.1
3	2483.50	65.1 PK	74.0	-8.9	1.00 V	359	66.1	-1.0
4	2483.50	53.2 AV	54.0	-0.8	1.00 V	359	54.2	-1.0
5	4924.00	47.5 PK	74.0	-26.5	2.54 V	289	44.0	3.5
6	4924.00	45.7 AV	54.0	-8.3	2.54 V	289	42.2	3.5
7	7386.00	63.1 PK	74.0	-10.9	2.44 V	234	53.2	9.9
8	7386.00	50.8 AV	54.0	-3.2	2.44 V	234	40.9	9.9

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.00	65.9 PK	74.0	-8.1	1.50 H	330	67.2	-1.3
2	2388.00	53.9 AV	54.0	-0.1	1.50 H	330	55.2	-1.3
3	*2422.00	108.0 PK			1.50 H	330	109.3	-1.3
4	*2422.00	97.1 AV			1.50 H	330	98.4	-1.3
5	4844.00	38.1 PK	74.0	-35.9	1.55 H	210	34.8	3.3
6	4844.00	36.2 AV	54.0	-17.8	1.55 H	210	32.9	3.3
7	7266.00	57.3 PK	74.0	-16.7	3.72 H	249	47.5	9.8
8	7266.00	41.4 AV	54.0	-12.6	3.72 H	249	31.6	9.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.00	65.1 PK	74.0	-8.9	1.06 V	360	66.4	-1.3
2	2388.00	52.9 AV	54.0	-1.1	1.06 V	360	54.2	-1.3
3	*2422.00	107.2 PK			1.06 V	360	108.5	-1.3
4	*2422.00	96.3 AV			1.06 V	360	97.6	-1.3
5	4844.00	39.4 PK	74.0	-34.6	2.54 V	262	36.1	3.3
6	4844.00	37.8 AV	54.0	-16.2	2.54 V	262	34.5	3.3
7	7266.00	55.6 PK	74.0	-18.4	1.44 V	294	45.8	9.8
8	7266.00	42.1 AV	54.0	-11.9	1.44 V	294	32.3	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.30	67.4 PK	74.0	-6.6	1.50 H	328	68.7	-1.3
2	2387.30	53.9 AV	54.0	-0.1	1.50 H	328	55.2	-1.3
3	*2437.00	110.1 PK			1.50 H	328	111.3	-1.2
4	*2437.00	100.4 AV			1.50 H	328	101.6	-1.2
5	2483.50	62.1 PK	74.0	-11.9	1.50 H	328	63.1	-1.0
6	2483.50	48.9 AV	54.0	-5.1	1.50 H	328	49.9	-1.0
7	4874.00	40.4 PK	74.0	-33.6	1.54 H	224	37.1	3.3
8	4874.00	37.4 AV	54.0	-16.6	1.54 H	224	34.1	3.3
9	7311.00	59.9 PK	74.0	-14.1	3.73 H	249	50.1	9.8
10	7311.00	43.8 AV	54.0	-10.2	3.73 H	249	34.0	9.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.30	66.6 PK	74.0	-7.4	1.04 V	360	67.9	-1.3
2	2387.30	53.1 AV	54.0	-0.9	1.04 V	360	54.4	-1.3
3	*2437.00	109.3 PK			1.04 V	360	110.5	-1.2
4	*2437.00	99.6 AV			1.04 V	360	100.8	-1.2
5	2483.50	61.3 PK	74.0	-12.7	1.04 V	360	62.3	-1.0
6	2483.50	48.1 AV	54.0	-5.9	1.04 V	360	49.1	-1.0
7	4874.00	41.6 PK	74.0	-32.4	2.59 V	274	38.3	3.3
8	4874.00	39.8 AV	54.0	-14.2	2.59 V	274	36.5	3.3
9	7311.00	57.5 PK	74.0	-16.5	1.50 V	298	47.7	9.8
10	7311.00	44.0 AV	54.0	-10.0	1.50 V	298	34.2	9.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	109.5 PK			1.25 H	329	110.6	-1.1
2	*2452.00	99.3 AV			1.25 H	329	100.4	-1.1
3	2483.50	66.0 PK	74.0	-8.0	1.25 H	329	67.0	-1.0
4	2483.50	53.7 AV	54.0	-0.3	1.25 H	329	54.7	-1.0
5	4904.00	39.4 PK	74.0	-34.6	1.52 H	223	35.9	3.5
6	4904.00	36.5 AV	54.0	-17.5	1.52 H	223	33.0	3.5
7	7356.00	58.6 PK	74.0	-15.4	3.77 H	238	48.7	9.9
8	7356.00	42.4 AV	54.0	-11.6	3.77 H	238	32.5	9.9
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	*2452.00	108.2 PK			1.05 V	360	109.3	-1.1
2	*2452.00	98.6 AV			1.05 V	360	99.7	-1.1
3	2483.50	65.8 PK	74.0	-8.2	1.05 V	360	66.8	-1.0
4	2483.50	53.4 AV	54.0	-0.6	1.05 V	360	54.4	-1.0
5	4904.00	41.1 PK	74.0	-32.9	2.60 V	268	37.6	3.5
6	4904.00	39.0 AV	54.0	-15.0	2.60 V	268	35.5	3.5
7	7356.00	56.8 PK	74.0	-17.2	1.46 V	309	46.9	9.9
8	7356.00	43.2 AV	54.0	-10.8	1.46 V	309	33.3	9.9

REMARKS:

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

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 1	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	65.04	34.5 QP	40.0	-5.5	3.00 H	67	43.5	-9.0
2	159.06	28.2 QP	43.5	-15.3	2.00 H	61	35.9	-7.7
3	218.81	32.2 QP	46.0	-13.8	1.50 H	69	43.6	-11.4
4	461.53	30.0 QP	46.0	-16.0	1.50 H	40	33.4	-3.4
5	543.88	29.1 QP	46.0	-16.9	1.50 H	210	31.2	-2.1
6	676.94	31.1 QP	46.0	-14.9	1.50 H	50	30.7	0.4
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	45.40	34.1 QP	40.0	-5.9	1.00 V	347	42.2	-8.1
2	66.50	34.0 QP	40.0	-6.0	1.00 V	237	43.3	-9.3
3	90.94	35.5 QP	43.5	-8.0	2.00 V	5	49.6	-14.1
4	463.18	31.7 QP	46.0	-14.3	1.00 V	95	35.1	-3.4
5	665.86	33.7 QP	46.0	-12.3	1.00 V	315	33.3	0.4
6	923.54	33.3 QP	46.0	-12.7	1.00 V	85	28.9	4.4

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	100287	Apr. 19, 2017	Apr. 18, 2018
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100071	Nov. 09, 2016	Nov. 08, 2017
RF Cable	5D-FB	COACAB-001	May 23, 2017	May 22, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-005	June 19, 2017	June 18, 2018
50 ohms Terminator	50	3	Oct. 26, 2016	Oct. 25, 2017
50 ohms Terminator	N/A	EMC-04	Nov. 02, 2016	Nov. 01, 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. D.
3. The VCCI Con D Registration No. is C-20005.
4. Tested Date: Sep. 04, 2017.

4.2.3 Test Procedures

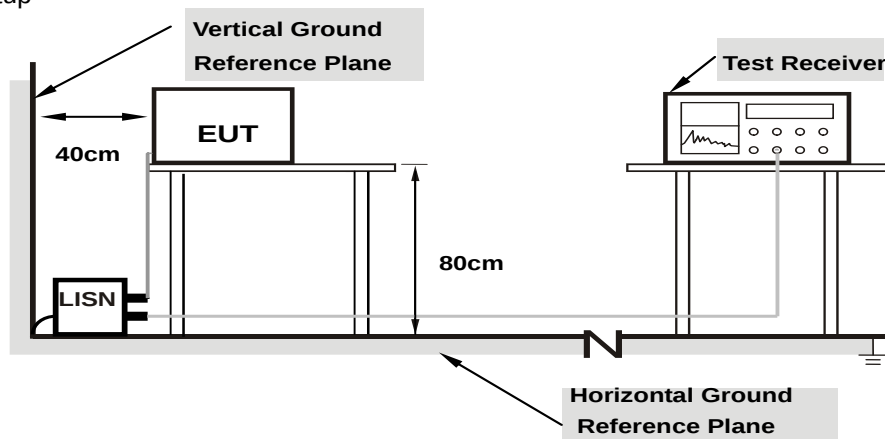
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

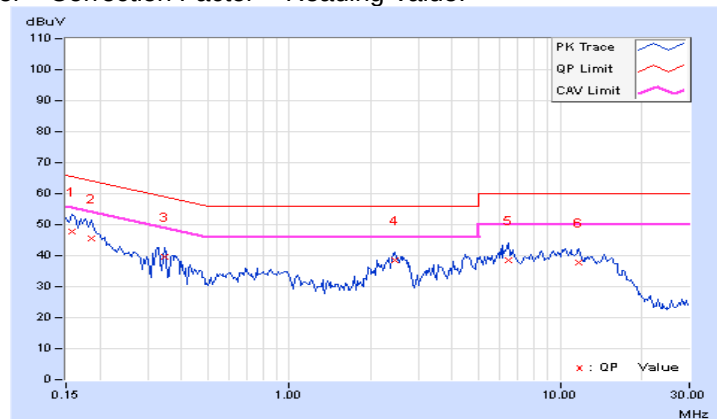
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.14	37.61	24.99	47.75	35.13	65.58	55.58	-17.83	-20.45
2	0.18516	10.12	35.27	23.22	45.39	33.34	64.25	54.25	-18.86	-20.91
3	0.34531	10.16	29.62	24.86	39.78	35.02	59.07	49.07	-19.29	-14.05
4	2.46875	10.31	28.31	20.53	38.62	30.84	56.00	46.00	-17.38	-15.16
5	6.44141	10.49	28.20	21.87	38.69	32.36	60.00	50.00	-21.31	-17.64
6	11.74219	10.64	27.29	22.41	37.93	33.05	60.00	50.00	-22.07	-16.95

REMARKS:

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

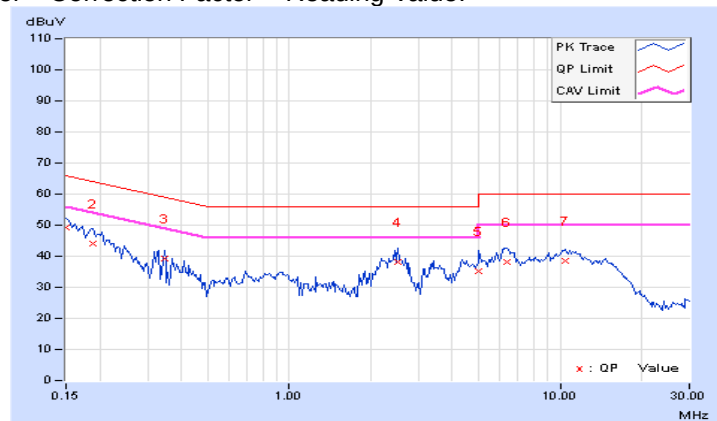


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.21	39.17	24.77	49.38	34.98	66.00	56.00	-16.62	-21.02
2	0.18906	10.19	34.01	21.46	44.20	31.65	64.08	54.08	-19.88	-22.43
3	0.34531	10.25	29.06	24.48	39.31	34.73	59.07	49.07	-19.76	-14.34
4	2.52734	10.44	27.81	20.08	38.25	30.52	56.00	46.00	-17.75	-15.48
5	5.00000	10.51	24.80	19.16	35.31	29.67	56.00	46.00	-20.69	-16.33
6	6.34766	10.54	27.49	21.35	38.03	31.89	60.00	50.00	-21.97	-18.11
	10.43750	10.63	27.77	23.09	38.40	33.72	60.00	50.00	-21.60	-16.28

REMARKS:

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



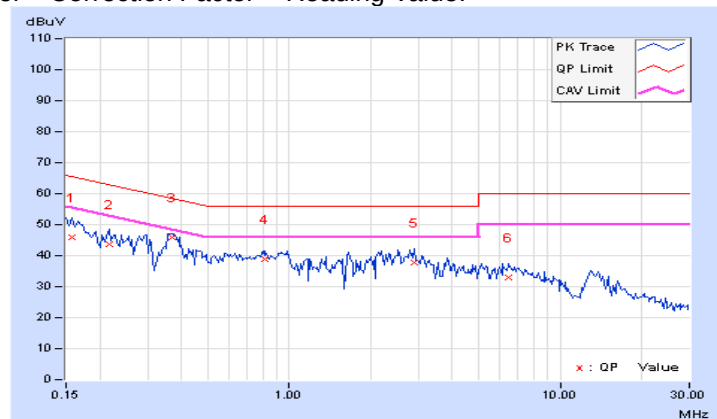
4.2.8 Test Results (Mode 3)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.14	35.79	26.37	45.93	36.51	65.58	55.58	-19.65	-19.07
2	0.21641	10.12	33.57	24.43	43.69	34.55	62.96	52.96	-19.27	-18.41
3	0.36875	10.17	35.59	26.58	45.76	36.75	58.53	48.53	-12.77	-11.78
4	0.81797	10.26	28.51	17.14	38.77	27.40	56.00	46.00	-17.23	-18.60
5	2.89063	10.34	27.51	19.55	37.85	29.89	56.00	46.00	-18.15	-16.11
6	6.47656	10.49	22.33	15.75	32.82	26.24	60.00	50.00	-27.18	-23.76

REMARKS:

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

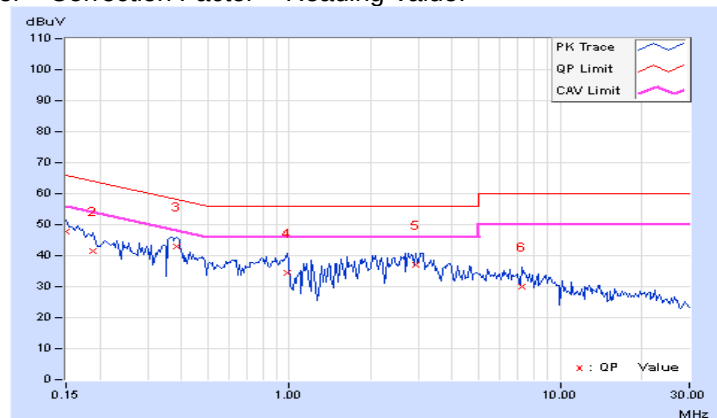


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.21	37.51	28.18	47.72	38.39	66.00	56.00	-18.28	-17.61
2	0.18906	10.19	31.26	22.21	41.45	32.40	64.08	54.08	-22.63	-21.68
3	0.38438	10.27	32.77	23.06	43.04	33.33	58.18	48.18	-15.14	-14.85
4	0.98594	10.34	24.26	15.62	34.60	25.96	56.00	46.00	-21.40	-20.04
5	2.93750	10.45	26.55	18.81	37.00	29.26	56.00	46.00	-19.00	-16.74
6	7.26953	10.56	19.43	12.72	29.99	23.28	60.00	50.00	-30.01	-26.72

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.

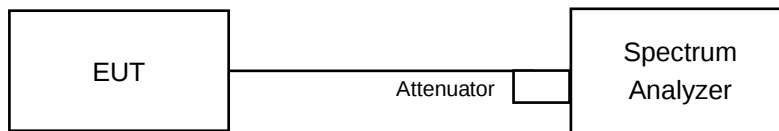


4.3 6dB Bandwidth Measurement

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	7.60	0.5	PASS
6	2437	8.07	0.5	PASS
11	2462	8.07	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 3		
1	2412	15.19	15.19	15.16	0.5	PASS
6	2437	15.17	15.19	15.20	0.5	PASS
11	2462	15.17	15.18	15.18	0.5	PASS

802.11n (HT20)

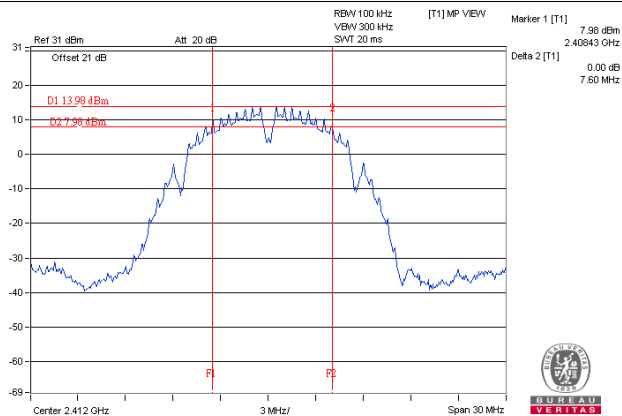
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 3		
1	2412	15.20	15.19	15.18	0.5	Pass
6	2437	15.19	15.51	15.36	0.5	Pass
11	2462	15.19	15.17	15.18	0.5	Pass

802.11n (HT40)

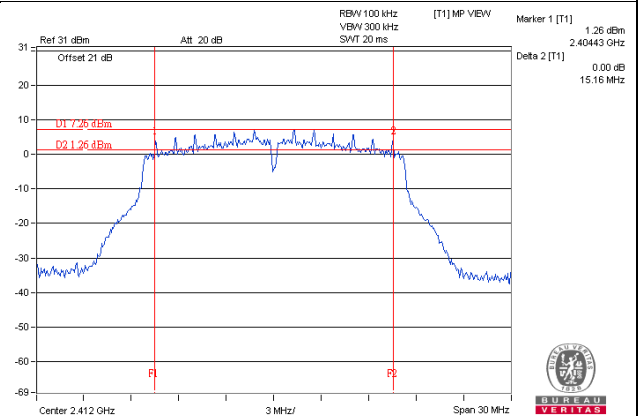
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 3		
3	2422	36.15	36.40	36.10	0.5	Pass
6	2437	36.51	36.54	36.53	0.5	Pass
9	2452	36.55	36.48	36.52	0.5	Pass

Spectrum Plot of Worst Value

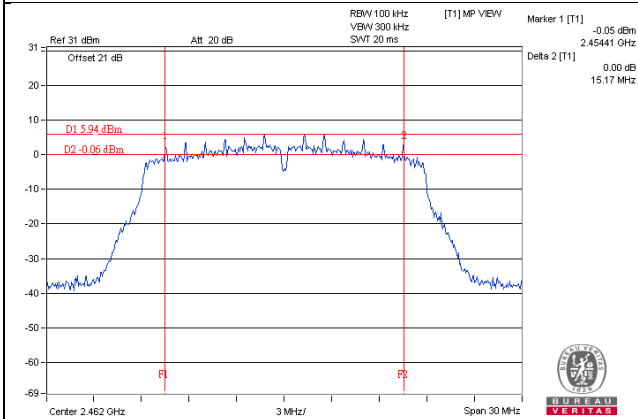
802.11b / Chain 0 : CH1



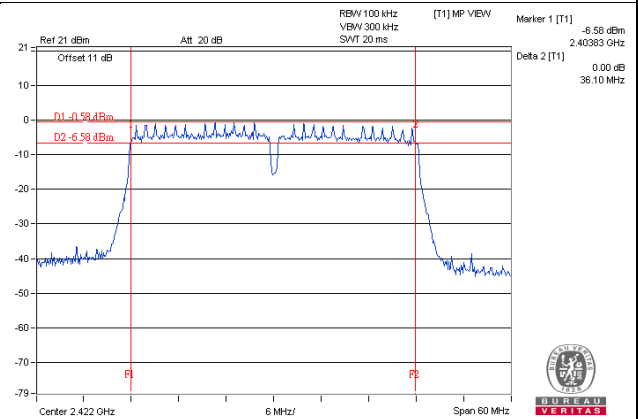
802.11g / Chain 3 : CH1



802.11n (HT20) / Chain 1 : CH11



802.11n (HT40) / Chain 3 : CH3



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)

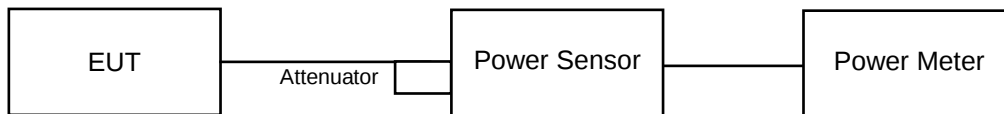
Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

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 Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedures

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

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

Same as Item 4.3.6.

4.4.6 Test Results

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	165.959	22.20	30.00	Pass
6	2437	89.125	19.50	30.00	Pass
11	2462	118.85	20.75	30.00	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 3				
1	2412	17.51	16.56	17.71	160.674	22.06	30	Pass
6	2437	21.08	20.03	22.57	409.643	26.12	30	Pass
11	2462	19.04	18.05	20.72	262.026	24.18	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 3				
1	2412	16.90	16.14	18.50	160.888	22.07	30	Pass
6	2437	19.58	18.59	21.04	290.116	24.63	30	Pass
11	2462	16.96	15.86	18.39	157.231	21.97	30	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 3				
3	2422	13.04	11.49	13.83	58.385	17.66	30	Pass
6	2437	16.14	15.05	17.43	128.439	21.09	30	Pass
9	2452	14.64	13.49	15.84	89.814	19.53	30	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 3				
1	2412	16.90	16.14	18.50	160.888	22.07	27.38	Pass
6	2437	19.58	18.59	21.04	290.116	24.63	27.38	Pass
11	2462	16.96	15.86	18.39	157.231	21.97	27.38	Pass

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (8.62 - 6) = 27.38\text{dBm}$.

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 3				
3	2422	13.04	11.49	13.83	58.385	17.66	27.38	Pass
6	2437	16.14	15.05	17.43	128.439	21.09	27.38	Pass
9	2452	14.64	13.49	15.84	89.814	19.53	27.38	Pass

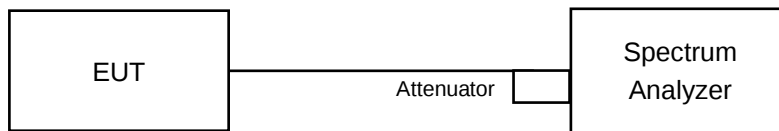
Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (8.62 - 6) = 27.38\text{dBm}$.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For 802.11b

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

For 802.11g, 802.11n (HT20), 802.11n (HT40)

- Measure the duty cycle (x).
- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- Sweep time = auto couple.
- Do not use sweep triggering. Allow sweep to "free run".
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- Add $10 \log (1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-7.50	8	Pass
6	2437	-11.00	8	Pass
11	2462	-10.27	8	Pass

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=3) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.96	4.77	0.10	-7.09	5.38	Pass
	6	2437	-8.65	4.77	0.10	-3.78	5.38	Pass
	11	2462	-11.11	4.77	0.10	-6.24	5.38	Pass
1	1	2412	-12.96	4.77	0.10	-8.09	5.38	Pass
	6	2437	-10.05	4.77	0.10	-5.18	5.38	Pass
	11	2462	-10.22	4.77	0.10	-5.35	5.38	Pass
3	1	2412	-12.30	4.77	0.10	-7.43	5.38	Pass
	6	2437	-8.46	4.77	0.10	-3.59	5.38	Pass
	11	2462	-9.40	4.77	0.10	-4.53	5.38	Pass

Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.62-6) = 5.38\text{dBm}$.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=3) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-14.40	4.77	0.10	-9.53	5.38	Pass
	6	2437	-12.82	4.77	0.10	-7.95	5.38	Pass
	11	2462	-15.09	4.77	0.10	-10.22	5.38	Pass
1	1	2412	-15.61	4.77	0.10	-10.74	5.38	Pass
	6	2437	-13.88	4.77	0.10	-9.01	5.38	Pass
	11	2462	-16.14	4.77	0.10	-11.27	5.38	Pass
3	1	2412	-13.71	4.77	0.10	-8.84	5.38	Pass
	6	2437	-10.82	4.77	0.10	-5.95	5.38	Pass
	11	2462	-13.81	4.77	0.10	-8.94	5.38	Pass

Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.62-6) = 5.38\text{dBm}$.
2. Refer to section 3.3 for duty cycle spectrum plot.

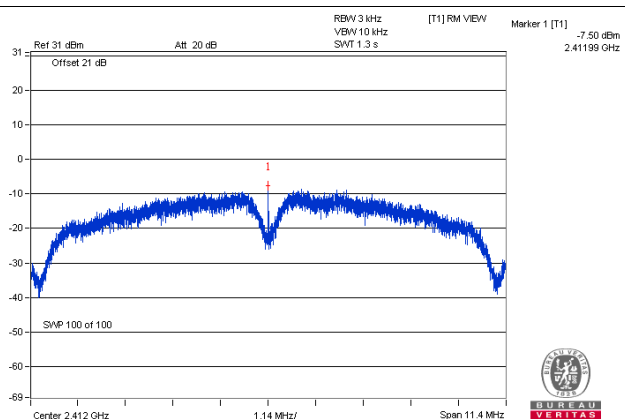
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=3) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-22.11	4.77	0.20	-17.14	5.38	Pass
	6	2437	-19.07	4.77	0.20	-14.10	5.38	Pass
	9	2452	-21.04	4.77	0.20	-16.07	5.38	Pass
1	3	2422	-24.40	4.77	0.20	-19.43	5.38	Pass
	6	2437	-20.55	4.77	0.20	-15.58	5.38	Pass
	9	2452	-21.16	4.77	0.20	-16.19	5.38	Pass
3	3	2422	-22.32	4.77	0.20	-17.35	5.38	Pass
	6	2437	-18.01	4.77	0.20	-13.04	5.38	Pass
	9	2452	-19.38	4.77	0.20	-14.41	5.38	Pass

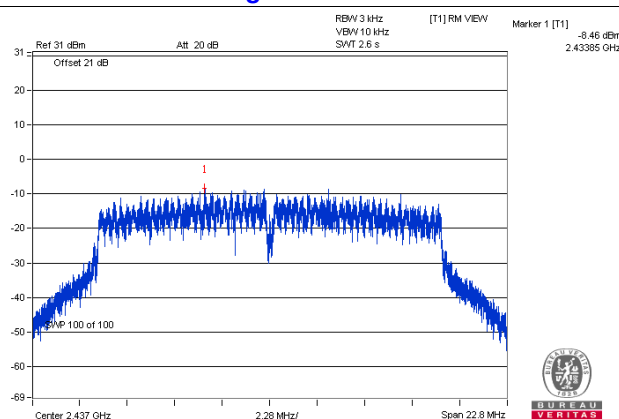
Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.62-6) = 5.38\text{dBm}$.
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

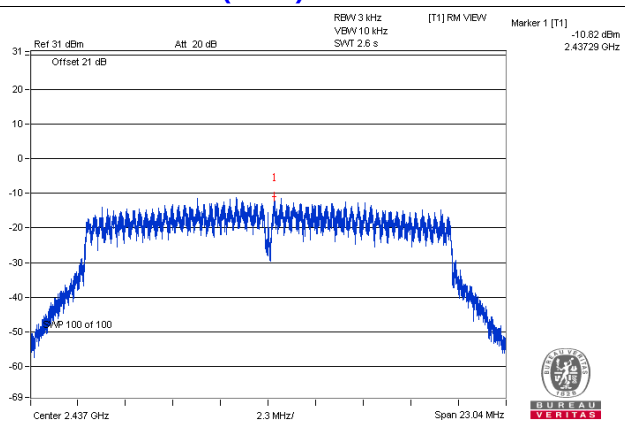
802.11b / Chain 0 : CH1



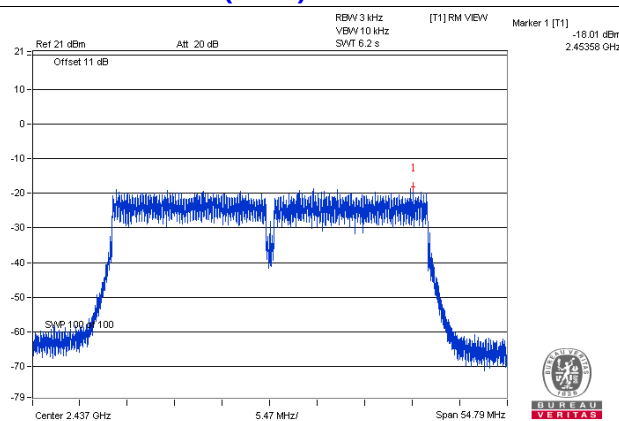
802.11g / Chain 3 : CH6



802.11n (HT20) / Chain 3 : CH6



802.11n (HT40) / Chain 3 : CH6

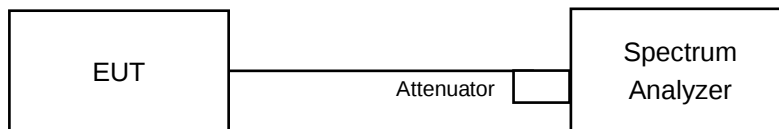


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB 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.

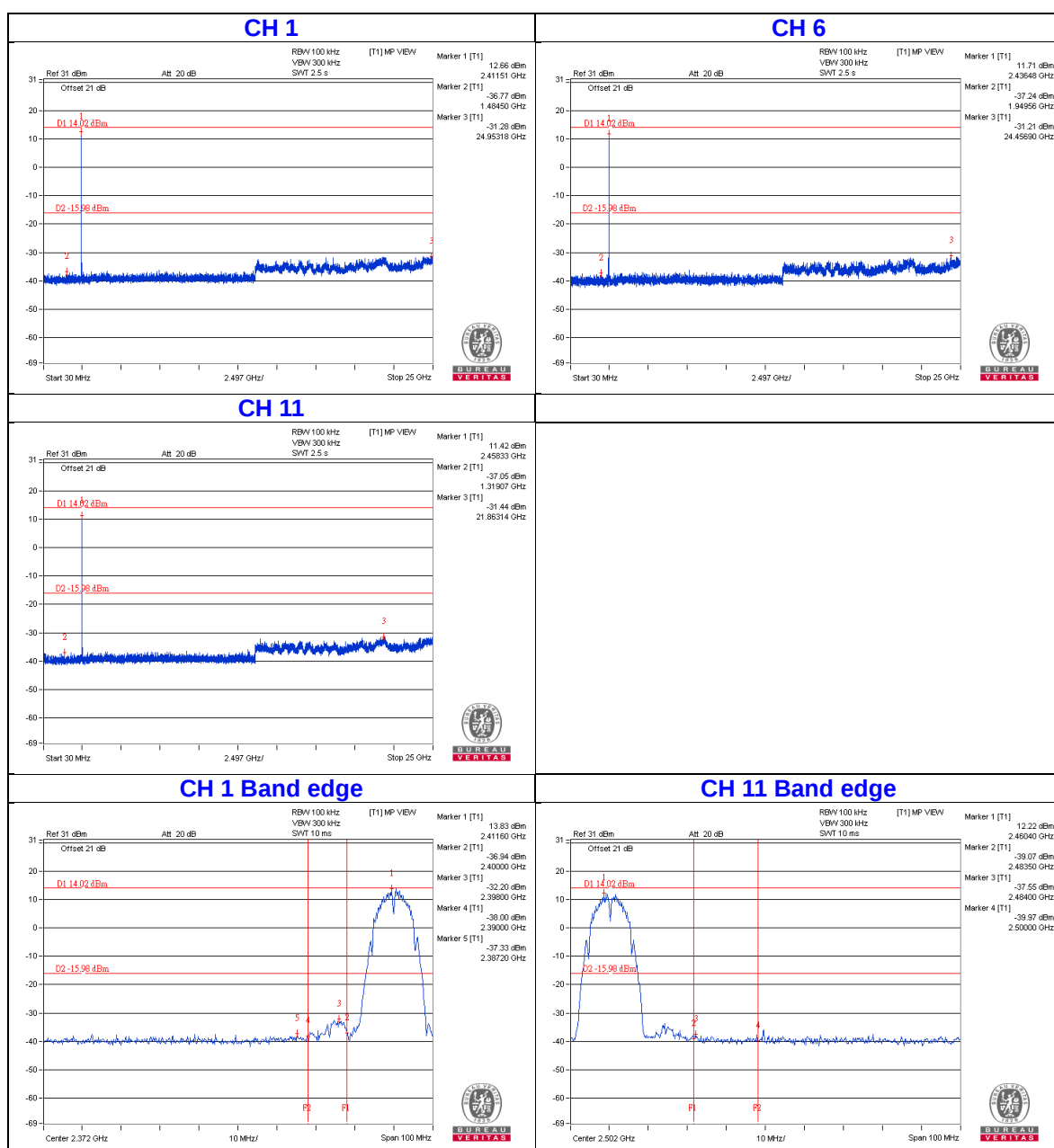
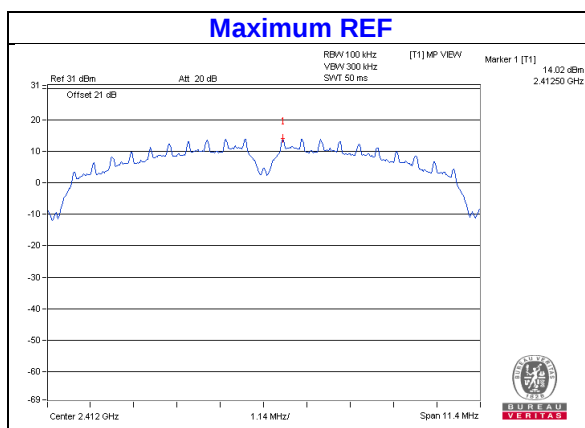
4.6.6 EUT Operating Condition

Same as Item 4.3.6

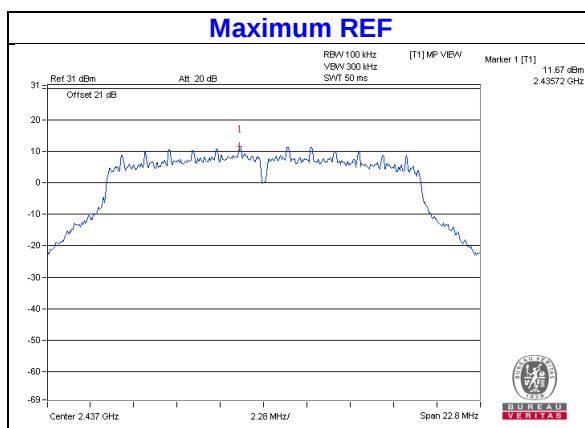
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

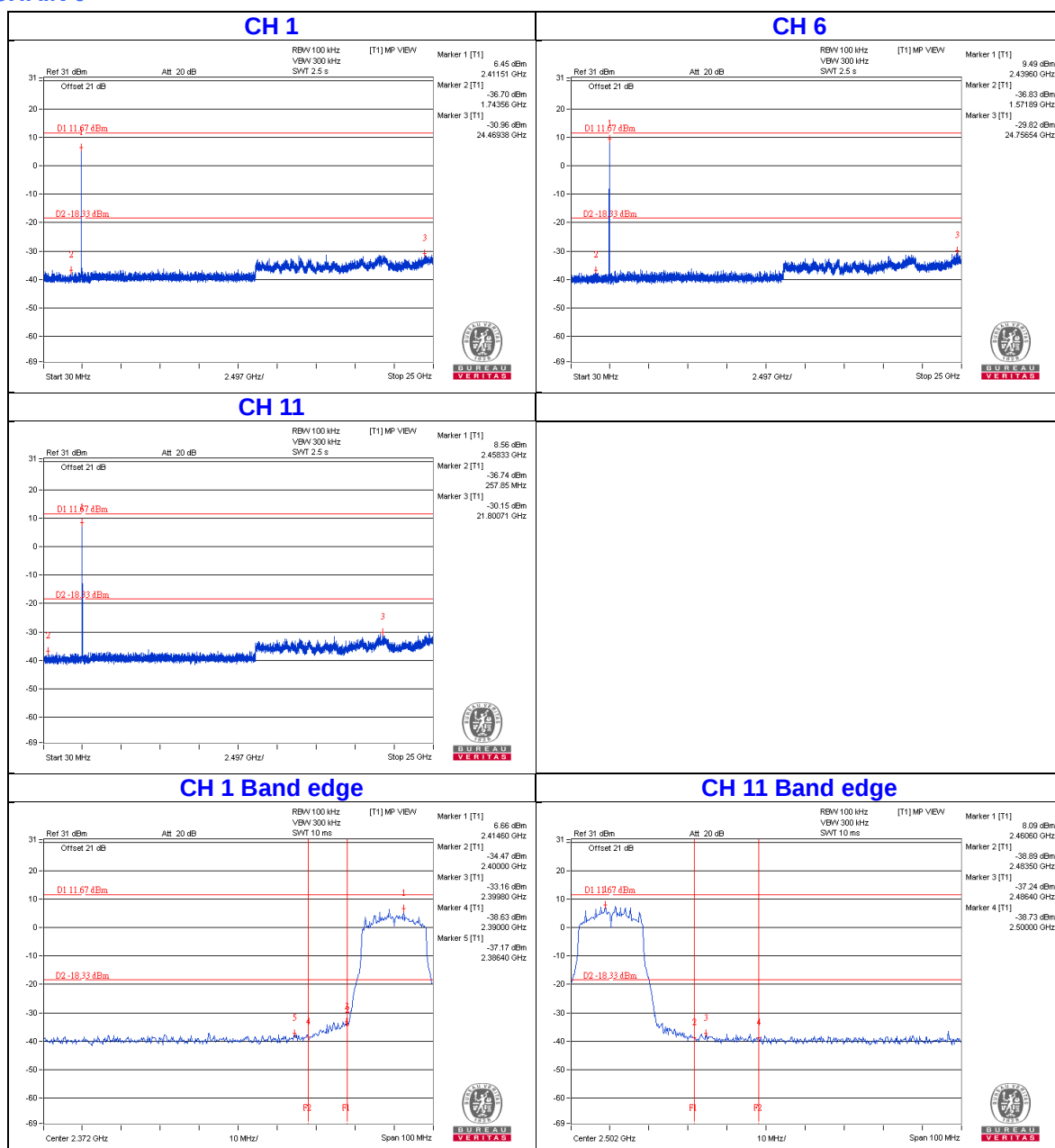
802.11b



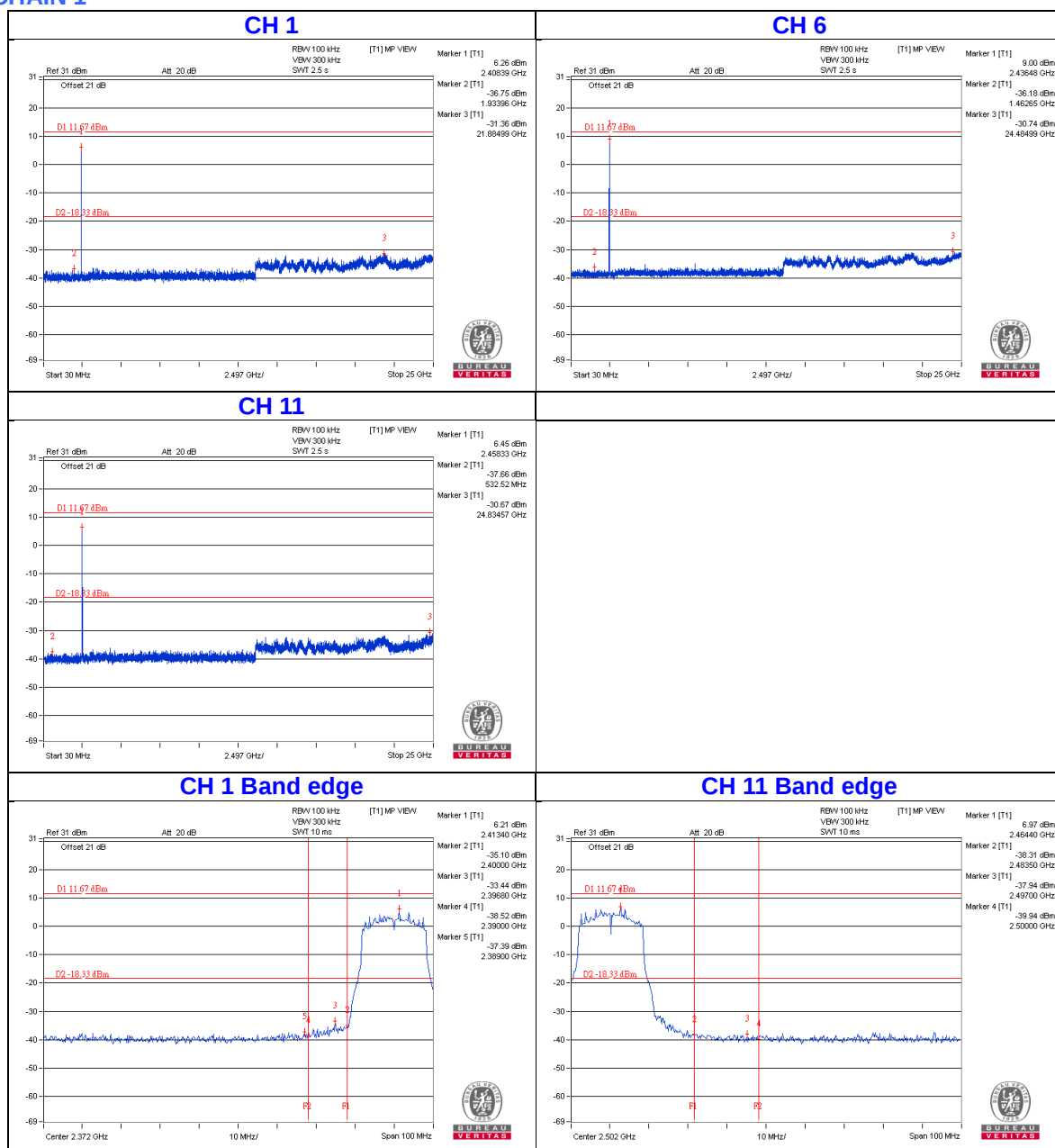
802.11g



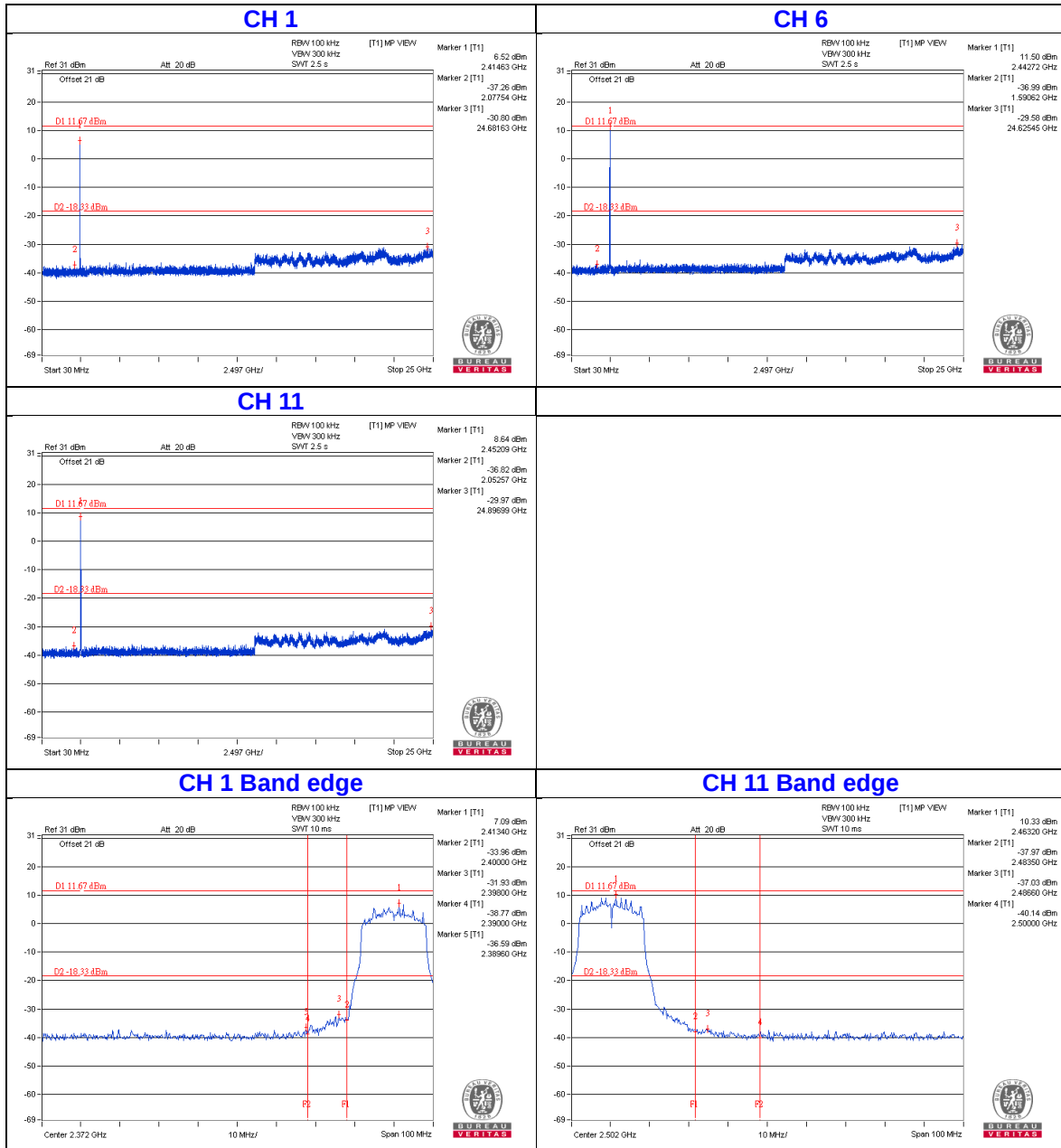
CHAIN 0



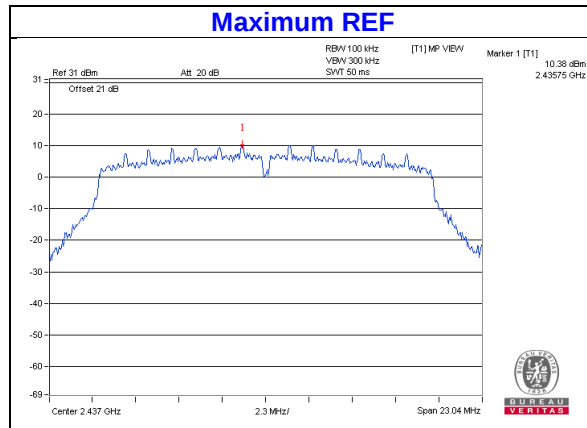
CHAIN 1



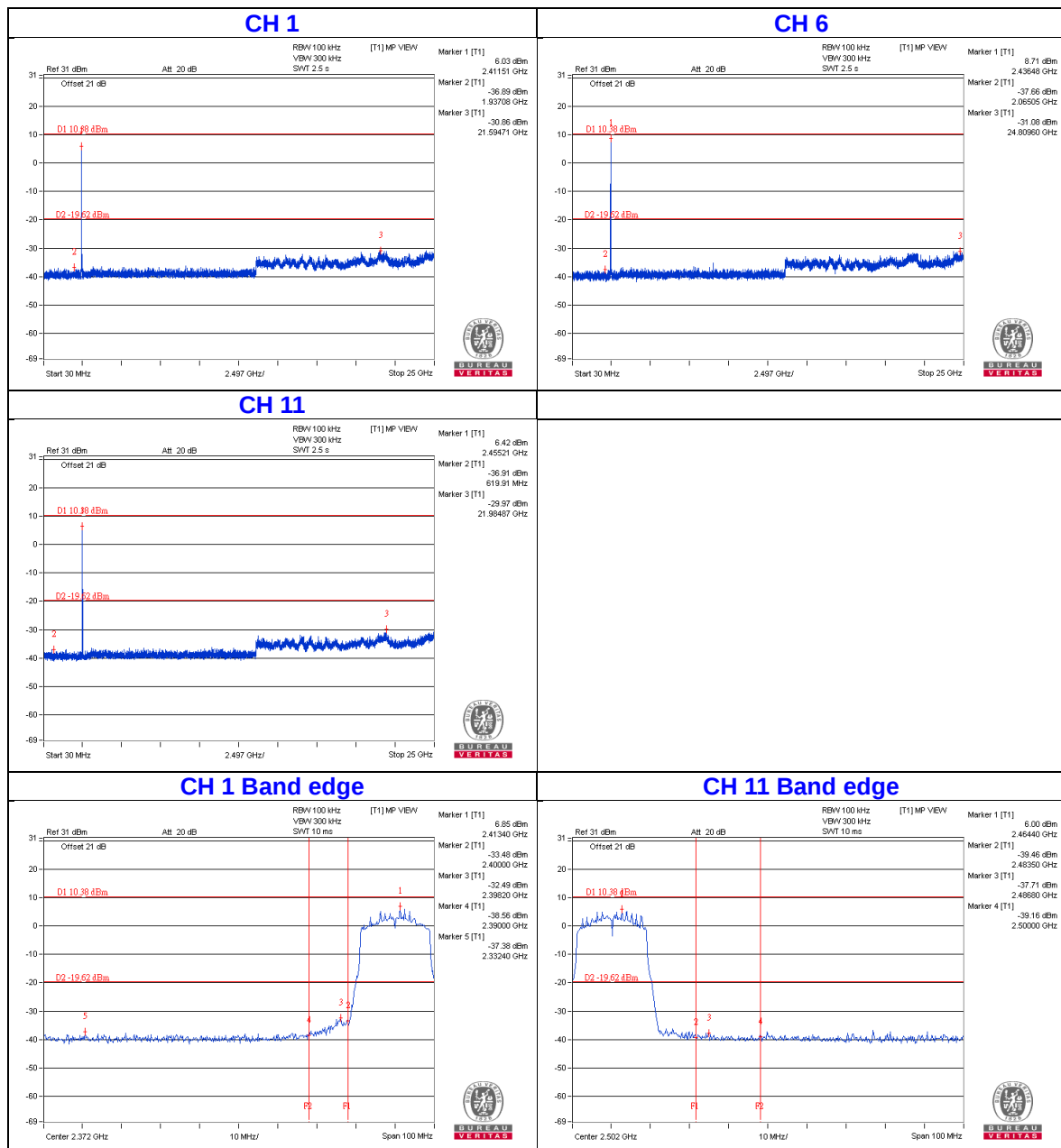
CHAIN 3



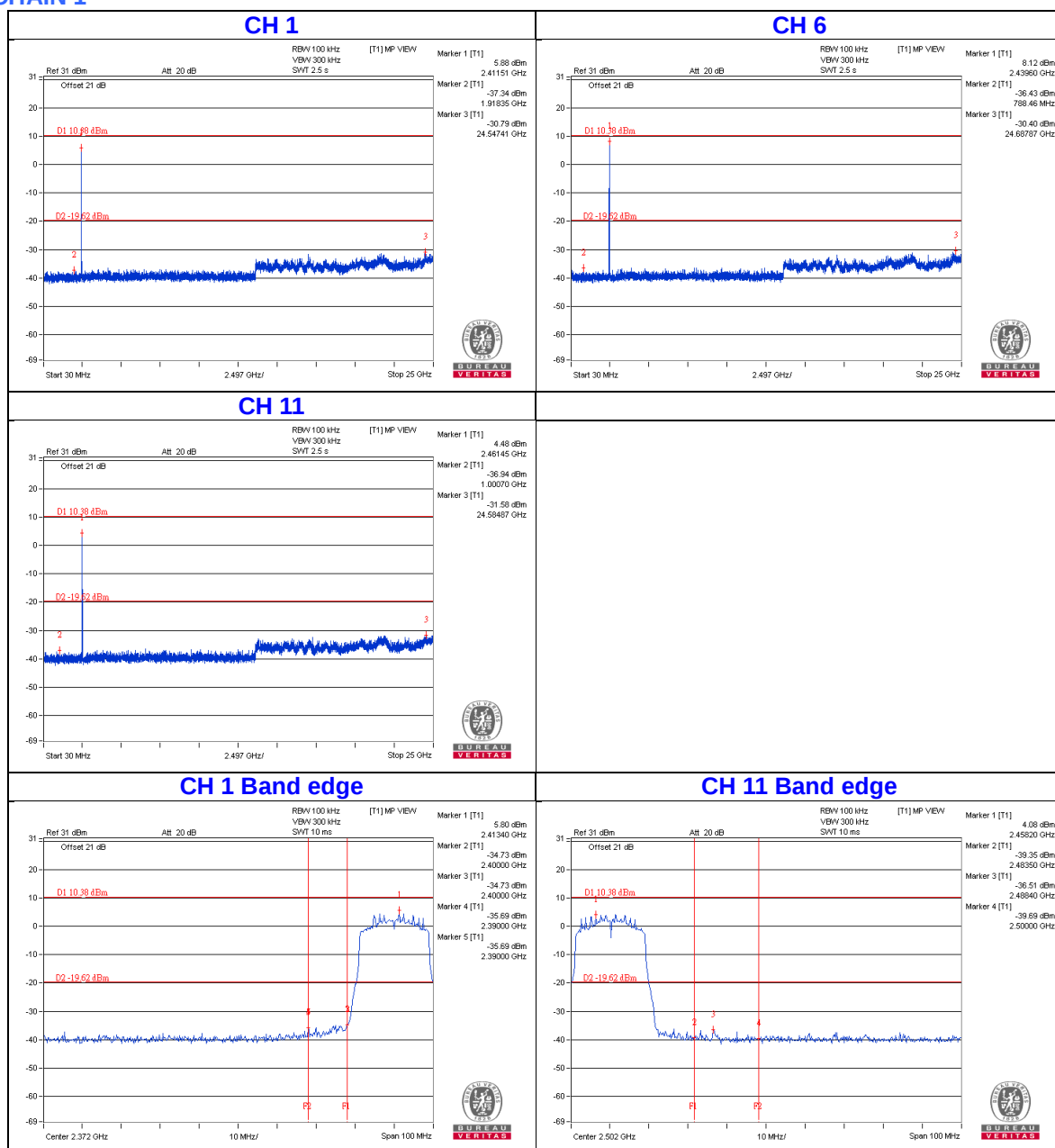
802.11n (HT20)



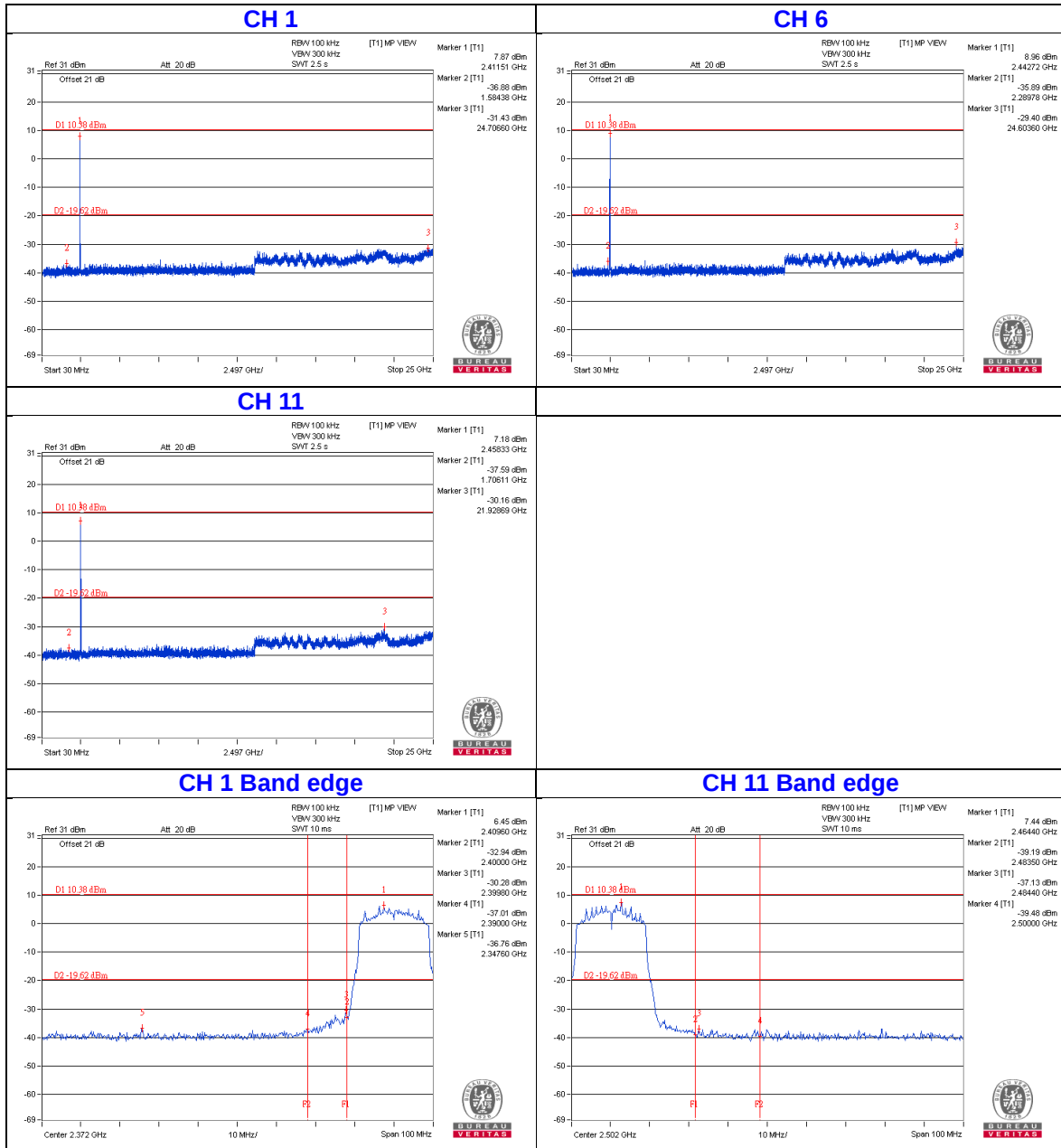
CHAIN 0



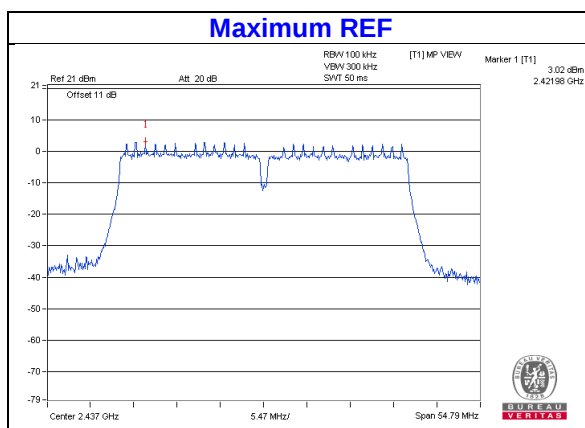
CHAIN 1



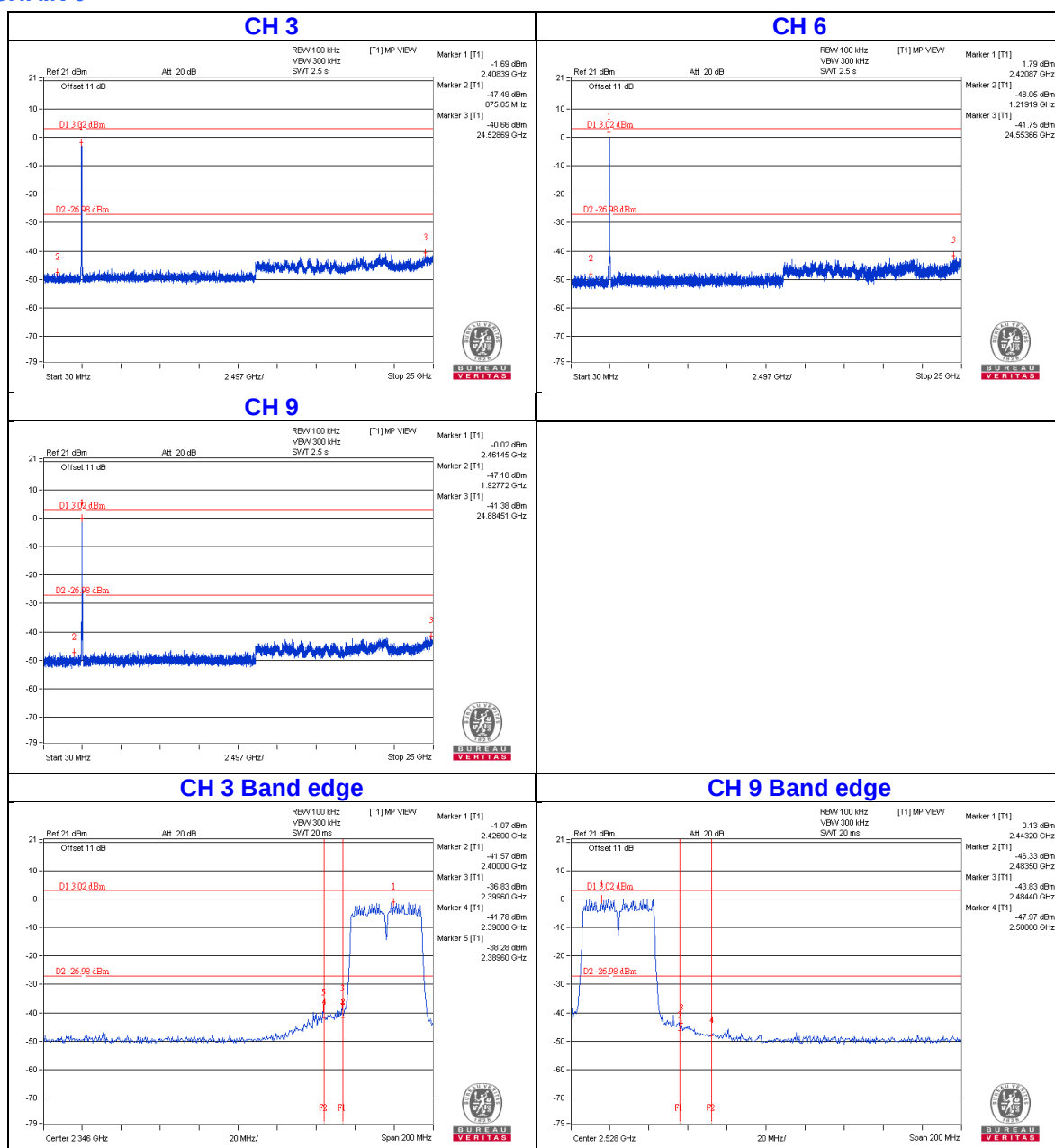
CHAIN 3



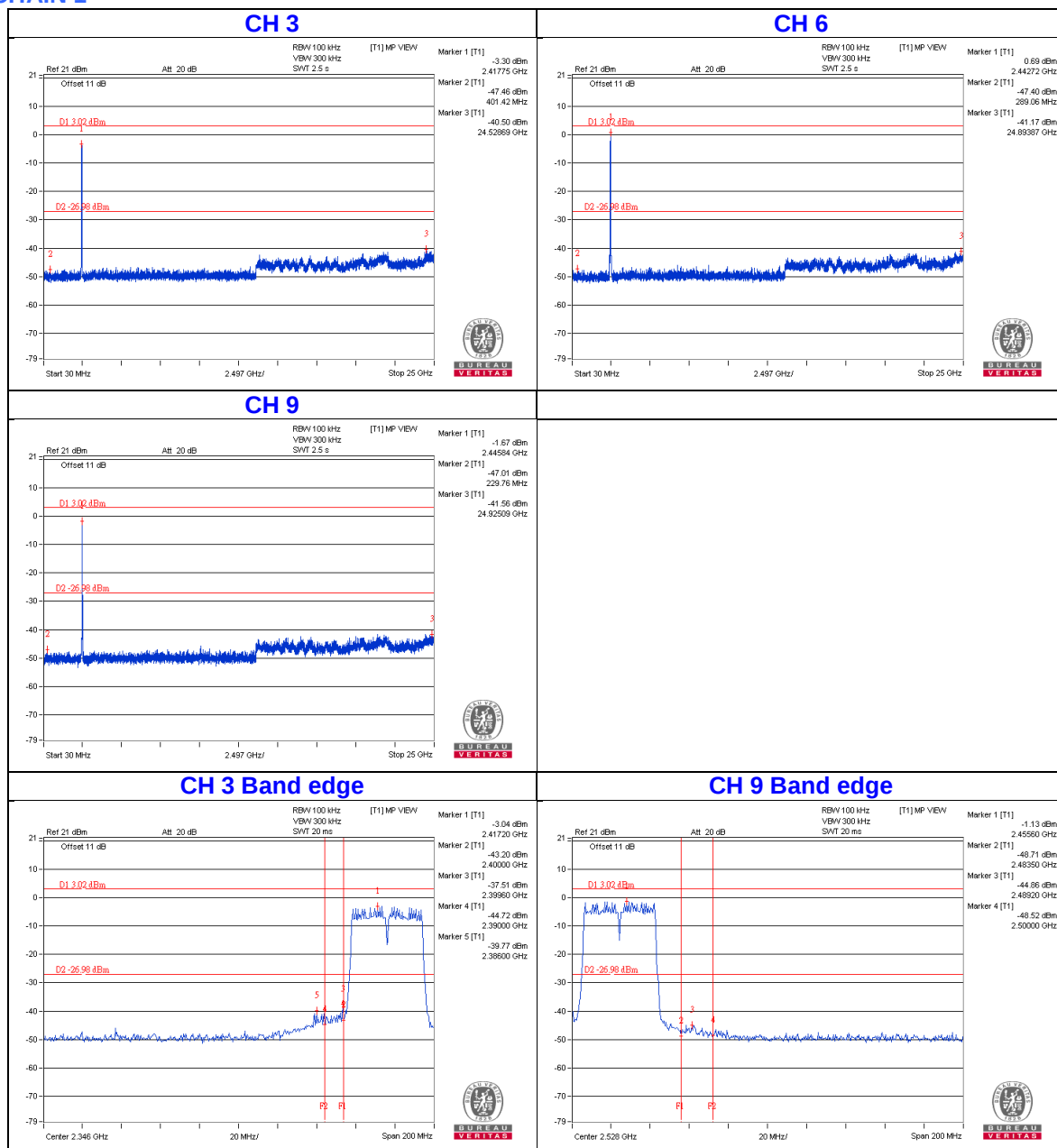
802.11n (HT40)



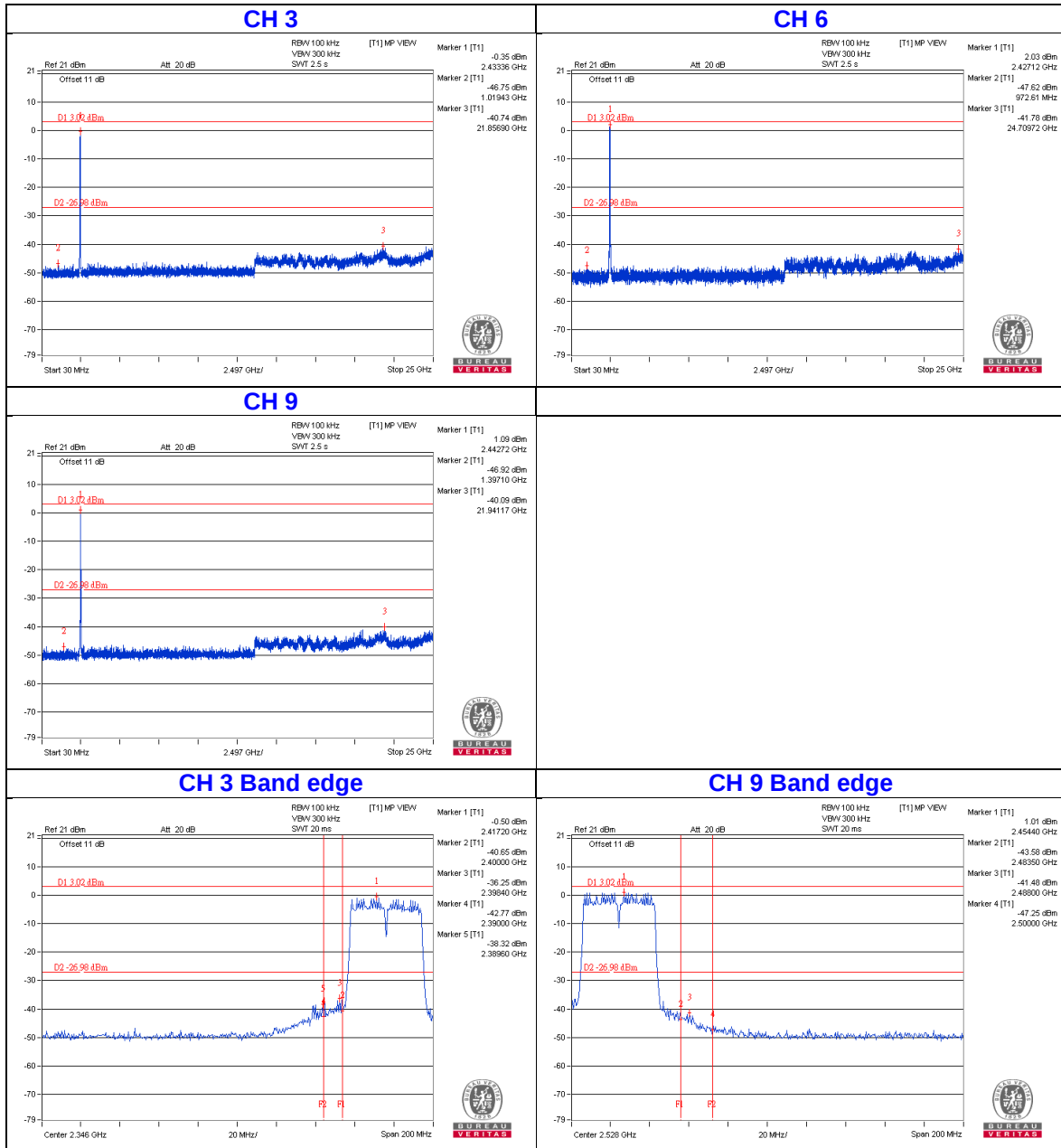
CHAIN 0



CHAIN 1



CHAIN 3



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

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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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