



TEST REPORT

Applicant	MTRLC LLC
Address	PO Box 121147 Boston, MA 02112-1147, United States.

Manufacturer or Supplier	MTRLC LLC
Address	PO Box 121147 Boston, MA 02112-1147, United States.
Product	16x4 DOCSIS 3.0 Cable Modem plus AC1600 Router
Brand Name	Motorola
Model	MG7540
Additional Model & Model Difference	MG7540XY (Where X can be A, B, C, D or blank, and Y can be A, B, C, D or blank), See item 3.1 Note
Date of tests	Feb. 23, 2016 ~ Mar. 29, 2016

The tests have been carried out according to the requirements of the following standard:

CONCLUSION: The submitted sample was found to <u>COMPLY</u> with the test requirement

Tested by Blue Zheng	Approved by Chris Chen
Project Engineer / EMC Department	Manager / EMC Department
Tom	Mis

Date: Mar. 29, 2016

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



TABLE OF CONTENTS

R	ELEA	SE (CONTROL RECORD	4
1	S	UMM	ARY OF TEST RESULTS	5
2	M	EAS	UREMENT UNCERTAINTY	5
3	G	ENE	RAL INFORMATION	6
	3.1	GEI	NERAL DESCRIPTION OF EUT	6
	3.2	DES	SCRIPTION OF TEST MODES	8
	3.	2.1	CONFIGURATION OF SYSTEM UNDER TEST	9
	3.	2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	9
	3.3	DU	TY CYCLE OF TEST SIGNAL	11
	3.4	GEI	NERAL DESCRIPTION OF APPLIED STANDARDS	12
	3.5	DES	SCRIPTION OF SUPPORT UNITS	12
4	T	EST	TYPES AND RESULTS	13
	4.1	COI	NDUCTED EMISSION MEASUREMENT	13
	4.	1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	13
	4.	1.2	TEST INSTRUMENTS	13
	4.	1.3	TEST PROCEDURES	14
	4.	1.4	DEVIATION FROM TEST STANDARD	14
	4.	1.5	TEST SETUP	15
	4.	1.6	EUT OPERATING CONDITIONS	15
	4.	1.7	TEST RESULTS	16
	4.2	RAI	DIATED EMISSION MEASUREMENT	18
	4.	2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	18
	4.	2.2	TEST INSTRUMENTS	19
	4.	2.3	TEST PROCEDURES	20
	4.	2.4	DEVIATION FROM TEST STANDARD	20
	4.	2.5	TEST SETUP	21
	4.	2.6	EUT OPERATING CONDITIONS	21
	4.	2.7	TEST RESULTS	22
	4.3	6DE	BANDWIDTH MEASUREMENT	36
	4.	3.1	LIMITS OF 6DB BANDWIDTH MEASUREMENT	36
	4.	3.2	TEST INSTRUMENTS	36
	4.	3.3	TEST PROCEDURE	36
	4.	3.4	DEVIATION FROM TEST STANDARD	36
	4.	3.5	TEST SETUP	37
	4.	3.6	EUT OPERATING CONDITIONS	37

Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch No. 34, Chenwulu Section, Guantai Rd., Houjie Town, Dongguan City, Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com



	4.3.7		
4	4.4 CONI	DUCTED OUTPUT POWER	42
	4.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	42
	4.4.2	TEST SETUP	42
	4.4.3	TEST INSTRUMENTS	42
	4.4.4	TEST PROCEDURES	43
	4.4.5	DEVIATION FROM TEST STANDARD	43
	4.4.6	EUT OPERATING CONDITIONS	43
	4.4.7	TEST RESULTS	44
	4.4.7	.1 MAXIMUM PEAK OUTPUT POWER	44
	4.4.7	.2 AVERAGE OUTPUT POWER (FOR REFERENCE)	46
4	4.5 POW	ER SPECTRAL DENSITY MEASUREMENT	48
	4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	48
	4.5.2	TEST SETUP	48
	4.5.3	TEST INSTRUMENTS	48
	4.5.4	TEST PROCEDURE	48
	4.5.5	DEVIATION FROM TEST STANDARD	48
	4.5.6	EUT OPERATING CONDITION	49
	4.5.7	TEST RESULTS	49
4	4.6 OUT	OF BAND EMISSION MEASUREMENT	53
	4.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	53
	4.6.2	TEST SETUP	53
	4.6.3	TEST INSTRUMENTS	53
	4.6.4	TEST PROCEDURE	53
	4.6.5	DEVIATION FROM TEST STANDARD	54
	4.6.6	EUT OPERATING CONDITION	54
	4.6.7	TEST RESULTS	55
5	PHOT	OGRAPHS OF THE TEST CONFIGURATION	66
ô	APPEN	IDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE I	EUT
	DV TUI	ELAD	67



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160223N031-2	Original release	Mar. 29, 2016

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT		REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Unique antenna connector is used

2 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
	9KHz ~ 30MHz	2.90dB
Radiated emissions	30MHz ~ 1GMHz	3.67dB
Nadiated emissions	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	16x4 DOCSIS 3.0 Cable Modem plus AC1600 Router	
MODEL NO.	MG7540	
ADDITIONAL MODEL	MG7540XY	
FCC ID	2AF5PMG7540	
NOMINAL VOLTAGE	DC 12V from Adapter	
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM	
MODULATION TECHNOLOGY	DSSS, OFDM	
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)	
PEAK POWER	WLAN: 29.84dBm	
ANTENNA TYPE	Wire Antenna, 3.1dBi Gain	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	RJ 45 Cable: Unshielded, Non-detachable, 1.48m	

NOTE:

1. The EUT incorporates a MIMO function. Physically, the EUT provides transmitters and receivers listed as attach.

MODULATION MODE	FUNCTION	
802.11b	1TX/1RX	
802.11g	2TX/2RX	
802.11n (20MHz)	2TX/2RX	
802.11n (40MHz)	2TX/2RX	

- 2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- 4. Please refer to the EUT photo document (Reference No.: 160223N031) for detailed product photo.
- 5. MG7540XY (Where X can be A, B, C, D or blank, and Y can be A, B, C, D or blank) are identical with each other except the model no. for trading purpose.



6. The EUT was powered by the following adapters:

ADAPTER		
BRAND:		
MODEL:	S24B72-120A200-C4	
INPUT:	AC 100-240V, 50/60Hz, 0.8A Max	
OUTPUT:	DC 12.0V, 2A	
CABLE:	Unshielded, Non-detachable, 1.50m	

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 7 of 67



3.2 DESCRIPTION OF TEST MODES

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

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

7 channels are provided for 802.11n (HT40):

CHANNEL FREQUENCY		CHANNEL	FREQUENCY	
3	3 2422MHz 7		2442MHz	
4	2427MHz	8	2447MHz	
5	2432MHz	9	2452MHz	
6	2437MHz			



3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE		APPLIC	ABLE TO	E TO MODE				
MODE	RE<1G	RE≥1G	PLC	APCM	MODE			
Α	√	√	V	\checkmark	Powered by adapter with WIFI function			

Where

RE<1G: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	TESTED CONDITION
-	WIFI (2.4G) Link + Adapter

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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
А	802.11b	1 to 11	1	OFDM	BPSK	6.0	Х

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 9 of 67



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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

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

BANDEDGE MEASUREMENT:

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

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

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



ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY	
RE<1G	25deg. C, 55%RH	DC 12.0V from Adapter	Sen He	
RE≥1G	25deg. C, 55%RH	DC 12.0V from Adapter	Sen He	
PLC	20deg. C, 56%RH	DC 12.0V from Adapter	Blue Zheng	
APCM	20deg. C, 55%RH	DC 12.0V from Adapter	Blue Zheng	

3.3 DUTY CYCLE OF TEST SIGNAL

Chain 0:

Duty cycle of test signal is 100 %

Chain 1:

Duty cycle of test signal is 100 %

Bureau Veritas Shenzhen Co., Ltd.



3.4 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, Section 15.247 558074 D01 DTS Meas Guidance v03r04 ANSI C63.10-2013

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

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

3.5 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 12 of 67

Report Version 1



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)		
	Quasi-peak	Average	
0.15 ~ 0.5	66 to 56	56 to 46	
0.5 ~ 5	56	46	
5 ~ 30	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.
- 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 05,16	Mar. 04,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Apr. 25,15	Apr. 24,16
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 25,15	Apr. 24,16
Voltage probe	SCHWARZBECK	IIK 0421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

NOTE:

- 1. The test was performed in shielded room 553.
- 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

Tel: +86 769 8593 5656

Fax: +86 769 8593 1080



4.1.3 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) were not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

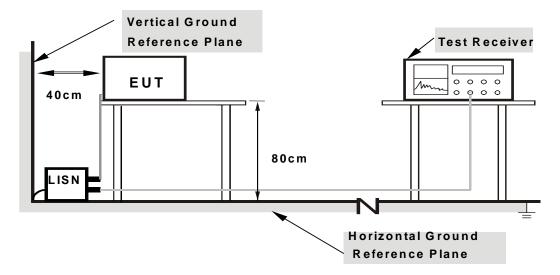
4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



4.1.5 TEST SETUP



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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 15 of 67



4.1.7 TEST RESULTS

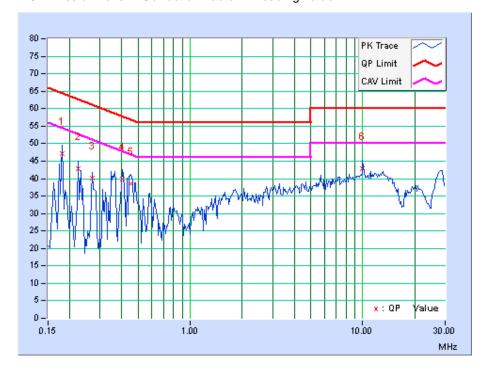
CONDUCTED WORST-CASE DATA: WIFI LINK

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

No	·			g Value (uV)]		n Level (uV)]		nit (uV)]		rgin B)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	9.80	37.39	28.86	47.19	38.66	64.43	54.43	-17.24	-15.77
2	0.22422	9.80	33.00	24.20	42.80	34.00	62.66	52.66	-19.86	-18.66
3	0.27109	9.82	30.35	26.00	40.17	35.82	61.08	51.08	-20.92	-15.27
4	0.40391	9.88	30.04	27.97	39.92	37.85	57.77	47.77	-17.85	-9.92
5	0.45469	9.90	28.73	25.16	38.63	35.06	56.79	46.79	-18.16	-11.73
6	9.99609	10.15	32.76	22.45	42.91	32.60	60.00	50.00	-17.09	-17.40

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 16 of 67

Report Version 1

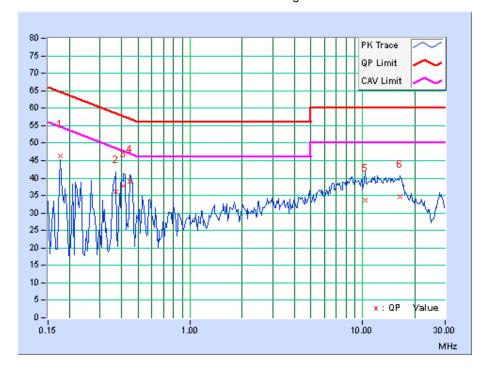


PHASE	Neutral	6dB BANDWIDTH	9kHz
-------	---------	---------------	------

No	·			g Value (uV)]		on Level (uV)]		nit (uV)]		rgin B)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	9.50	36.96	25.74	46.46	35.24	64.61	54.61	-18.15	-19.37
2	0.37266	9.53	26.51	15.27	36.04	24.80	58.44	48.44	-22.40	-23.64
3	0.41172	9.54	28.29	23.63	37.83	33.17	57.61	47.61	-19.78	-14.44
4	0.44688	9.54	29.43	24.55	38.97	34.09	56.93	46.93	-17.96	-12.84
5	10.27344	9.89	23.76	18.19	33.65	28.08	60.00	50.00	-26.35	-21.92
6	16.44531	9.99	24.85	20.20	34.84	30.19	60.00	50.00	-25.16	-19.81

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

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. As shown in 15.35(b), 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.



4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 27,15	Apr. 26,16
Signal and Spectrum Analyzer	Rohde&Schwar z	FSV40	101094	Apr. 23,15	Apr. 22,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 16, 15	Jul. 15, 16
Horn Antenna	ETS-Lindgren	3117	00062558	May 30,14	May 29,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 14	Aug. 07,16
3m Semi-anechoic Chamber	ETS-LINDGRE N	9m*6m*6m	NSEMC003	Apr. 19,14	Apr. 18,16
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBEC K	BBHA 9170	BBHA9170147	Jan. 21,14	Jan. 20,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,15	Apr. 24,16
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwar z	CBT32	100811	Sep. 01,15	Aug. 31,16

NOTE:

- 1. The test was performed in 966 Chamber.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
- 4. The FCC Site Registration No. is 494399.

Tel: +86 769 8593 5656



4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meters semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

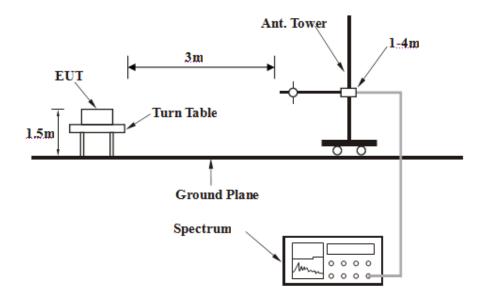
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.
- 5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file Test Setup Photo.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

- a. Set the EUT under full load condition and placed them on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 21 of 67



4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

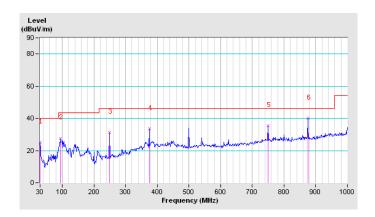
802.11b

CHANNEL	Channel 1	DETECTOR	Ougoi Pook (OP)
FREQUENCY RANGE	30MHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	30.00	24.98	40.00	-15.02	100	0	37.29	-12.31		
2	93.26	27.62	43.50	-15.88	100	0	47.93	-20.31		
3	249.30	31.18	46.00	-14.82	100	0	47.06	-15.88		
4	374.42	33.61	46.00	-12.39	100	0	45.42	-11.81		
5	749.77	35.47	46.00	-10.53	100	0	37.13	-1.66		
6	874.88	40.09	46.00	-5.91	100	0	40.67	-0.58		

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).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

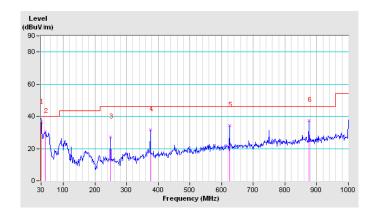


CHANNEL	Channel 1	DETECTOR	Quasi Peak (QD)
FREQUENCY RANGE	30MHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	30.05	36.27	40.00	-3.73	108	62	48.60	-12.33		
2	42.65	30.50	40.00	-9.50	100	0	48.88	-18.38		
3	249.30	27.15	46.00	-18.85	100	0	43.03	-15.88		
4	374.42	31.73	46.00	-14.27	100	0	43.54	-11.81		
5	624.65	34.38	46.00	-11.62	100	0	39.15	-4.77		
6	874.88	37.43	46.00	-8.57	100	0	38.01	-0.58		

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).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



ABOVE 1GHz DATA

802.11b

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

		ANITENINIA	DOL ADITY	TECT DIC	TANCE: UO	DIZONITAL	AT 0 M	
	FREQ.	EMISSION	LIMIT	MARGIN	ANTENNA	TABLE	RAW	CORRECTION
NO.	(MHz)	LEVEL (dBuV/m)	(dBuV/m)	(dB)	HEIGHT (m)	ANGLE (Degree)	VALUE (dBuV)	FACTOR (dB/m)
1	2390.00	55.6 PK	74.0	-18.4	1.21 H	254	51.94	3.67
2	2390.00	53.2 AV	54.0	-0.8	1.21 H	254	49.55	3.67
3	*2412.00	101.9 PK			1.35 H	54	98.14	3.76
4	*2412.00	97.9 AV			1.35 H	54	94.15	3.76
5	4824.00	47.2 PK	74.0	-26.8	1.02 H	216	38.78	8.46
6	4824.00	41.9 AV	54.0	-12.1	1.02 H	216	33.48	8.46
7	#7236.00	44.3 PK	81.9	-37.6	1.00 H	216	31.10	13.16
8	#7236.00	40.9 AV	77.9	-37.0	1.00 H	216	27.73	13.16
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	51.3 PK	74.0	-22.7	2.01 V	274	47.59	3.67
2	2390.00	48.6 AV	54.0	-5.4	2.01 V	274	44.94	3.67
3	*2412.00	94.3 PK			1.16 V	55	90.50	3.76
4	*2412.00	88.9 AV			1.16 V	55	85.18	3.76
5	4824.00	45.8 PK	74.0	-28.2	1.00 V	44	37.38	8.46
6	4824.00	40.7 AV	54.0	-13.3	1.00 V	44	32.23	8.46
7	#7236.00	44.6 PK	74.3	-29.7	1.00 V	102	31.46	13.16
8	#7236.00	40.1 AV	68.9	-28.8	1.00 V	102	26.95	13.16

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).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " * ": Fundamental frequency.
- 6. " # ": The radiated frequency is out of the restricted band.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



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

		411771114	DOL ADITY	. TEOT DIO	TANIOE 110	DIZONITAL	47014	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.4 PK			1.84 H	88	99.55	3.87
2	*2437.00	99.9 AV			1.84 H	88	96.01	3.87
3	4874.00	56.6 PK	74.0	-17.4	1.01 H	216	48.10	8.50
4	4874.00	53.1 AV	54.0	-0.9	1.01 H	216	44.61	8.50
5	7311.00	46.2 PK	74.0	-27.8	1.02 H	166	32.96	13.24
6	7311.00	41.5 AV	54.0	-12.5	1.02 H	166	28.28	13.24
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	93.8 PK			1.02 V	261	89.89	3.87
2	*2437.00	88.4 AV			1.02 V	261	84.54	3.87
3	4874.00	56.2 PK	74.0	-17.8	1.21 V	184	47.74	8.50
4	4874.00	49.6 AV	54.0	-4.4	1.21 V	184	41.10	8.50
5	7311.00	46.3 PK	74.0	-27.7	1.08 V	130	33.08	13.24
6	7311.00	42.8 AV	54.0	-11.2	1.08 V	130	29.52	13.24

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA I	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)				
1	*2462.00	98.2 PK			1.02 H	360	94.28	3.96				
2	*2462.00	95.2 AV			1.02 H	360	91.20	3.96				
3	2483.50	57.2 PK	74.0	-16.8	1.72 H	256	53.15	4.05				
4	2483.50	53.5 AV	54.0	-0.5	1.72 H	256	49.40	4.05				
5	4924.00	46.2 PK	74.0	-27.8	1.02 H	55	37.66	8.55				
6	4924.00	40.5 AV	54.0	-13.5	1.02 H	55	31.91	8.55				
7	7386.00	47.2 PK	74.0	-26.8	1.26 H	288	33.86	13.34				
8	7386.00	42.7 AV	54.0	-11.3	1.26 H	288	29.34	13.34				
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	87.6 PK			1.94 V	312	83.64	3.96				
2	*2462.00	84.9 AV			1.94 V	312	80.95	3.96				
3	2483.50	51.6 PK	74.0	-22.4	1.36 V	211	47.57	4.05				
4	2483.50	44.9 AV	54.0	-9.1	1.36 V	211	40.82	4.05				
5	4924.00	45.8 PK	74.0	-28.2	1.00 V	98	37.29	8.55				
6	4924.00	40.1 AV	54.0	-13.9	1.00 V	98	31.57	8.55				
7	7386.00	46.8 PK	74.0	-27.2	1.01 V	74	33.48	13.34				
8	7386.00	42.3 AV	54.0	-11.7	1.01 V	74	28.97	13.34				

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	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	60.2 PK	74.0	-13.8	1.81 H	200	56.57	3.67
2	2390.00	53.6 AV	54.0	-0.4	1.81 H	200	49.92	3.67
3	*2412.00	99.0 PK			1.66 H	352	95.21	3.76
4	*2412.00	93.4 AV			1.66 H	352	89.65	3.76
5	4824.00	45.1 PK	74.0	-28.9	1.01 H	226	36.66	8.46
6	4824.00	40.7 AV	54.0	-13.3	1.01 H	226	32.28	8.46
7	7326.00	47.1 PK	74.0	-26.9	1.00 H	7	33.86	13.27
8	7326.00	42.6 AV	54.0	-11.4	1.00 H	7	29.35	13.27
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	54.7 PK	74.0	-19.3	1.06 V	84	51.04	3.67
2	2390.00	47.2 AV	54.0	-6.8	1.06 V	84	43.56	3.67
3	*2412.00	88.7 PK			1.51 V	211	84.98	3.76
4	*2412.00	82.4 AV			1.51 V	211	78.65	3.76
5	4824.00	44.8 PK	74.0	-29.2	1.00 V	88	36.38	8.46
6	4824.00	40.0 AV	54.0	-14.0	1.00 V	88	31.57	8.46
7	#7236.00	45.9 PK	68.7	-22.8	1.12 V	318	32.71	13.16
8	#7236.00	41.7 AV	62.4	-20.7	1.12 V	318	28.58	13.16

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).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " * ": Fundamental frequency.
- 6. " # ": The radiated frequency is out of the restricted band.

Tel: +86 769 8593 5656

Fax: +86 769 8593 1080



CHANNEL	TX Channel 6	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	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	104.5 PK			1.07 H	216	100.63	3.87	
2	*2437.00	98.7 AV			1.07 H	216	94.79	3.87	
3	4874.00	58.6 PK	74.0	-15.4	1.03 H	284	50.10	8.50	
4	4874.00	53.3 AV	54.0	-0.7	1.03 H	284	44.76	8.50	
5	7311.00	53.1 PK	74.0	-20.9	1.02 H	42	39.86	13.24	
6	7311.00	46.8 AV	54.0	-7.2	1.02 H	42	33.58	13.24	
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	-	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	*2437.00	95.4 PK			1.21 V	61	91.55	3.87	
2	*2437.00	89.7 AV			1.21 V	61	85.87	3.87	
3	4874.00	54.2 PK	74.0	-19.8	1.01 V	74	45.74	8.50	
4	4874.00	47.2 AV	54.0	-6.8	1.01 V	74	38.71	8.50	
E	7311.00	45.3 PK	74.0	-28.7	1.00 V	2	32.04	13.24	
5	7011.00	10.011		=0					

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	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	96.8 PK			1.33 H	228	92.88	3.96
2	*2462.00	92.4 AV			1.33 H	228	88.48	3.96
3	2483.50	60.2 PK	74.0	-13.8	1.21 H	41	56.16	4.05
4	2483.50	53.6 AV	54.0	-0.4	1.21 H	41	49.56	4.05
5	4924.00	54.2 PK	74.0	-19.8	1.02 H	225	45.66	8.55
6	4924.00	41.9 AV	54.0	-12.1	1.02 H	225	33.39	8.55
7	7386.00	55.9 PK	74.0	-18.1	1.00 H	223	42.54	13.34
8	7386.00	43.2 AV	54.0	-10.8	1.00 H	223	29.90	13.34
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	89.9 PK			1.21 V	205	85.94	3.96
2	*2462.00	86.2 AV			1.21 V	205	82.26	3.96
3	2483.50	55.6 PK	74.0	-18.4	1.03 V	174	51.55	4.05
4	2483.50	43.7 AV	54.0	-10.3	1.03 V	174	39.61	4.05
5	4924.00	45.1 PK	74.0	-28.9	1.02 V	226	36.55	8.55
6	4924.00	40.8 AV	54.0	-13.2	1.02 V	226	32.21	8.55
7	7386.00	46.2 PK	74.0	-27.8	1.00 V	254	32.87	13.34
8	7386.00	42.8 AV	54.0	-11.2	1.00 V	254	29.43	13.34

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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 (20MHz)

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

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	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	61.2 PK	74.0	-12.8	1.21 H	42	57.53	3.67
2	2390.00	53.5 AV	54.0	-0.5	1.21 H	42	49.84	3.67
3	*2412.00	96.7 PK			1.61 H	242	92.98	3.76
4	*2412.00	90.9 AV			1.61 H	242	87.13	3.76
5	4824.00	48.6 PK	74.0	-25.4	1.00 H	41	40.14	8.46
6	4824.00	43.8 AV	54.0	-10.2	1.00 H	41	35.31	8.46
7	#7236.00	46.2 PK	76.7	-30.5	1.00 H	211	33.05	13.16
8	#7236.00	42.8 AV	70.9	-28.1	1.00 H	211	29.60	13.16
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	53.2 PK	74.0	-20.8	1.46 V	92	49.54	3.67
2	2390.00	47.0 AV	54.0	-7.0	1.46 V	92	43.35	3.67
3	*2412.00	86.4 PK			1.99 V	66	82.64	3.76
4	*2412.00	81.1 AV			1.99 V	66	77.32	3.76
5	4824.00	45.1 PK	74.0	-28.9	1.01 V	147	36.66	8.46
6	4824.00	41.3 AV	54.0	-12.7	1.01 V	147	32.84	8.46
7	#7236.00	47.2 PK	66.4	-19.2	1.02 V	87	34.02	13.16
8	#7236.00	43.6 AV	61.1	-17.5	1.02 V	87	30.46	13.16

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " * ": Fundamental frequency.
- 6. " # ": The radiated frequency is out of the restricted band.



CHANNEL	TX Channel 6	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	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	102.1 PK			1.17 H	62	98.27	3.87			
2	*2437.00	96.7 AV			1.17 H	62	92.87	3.87			
3	4874.00	59.6 PK	74.0	-14.4	1.03 H	84	51.10	8.50			
4	4874.00	53.3 AV	54.0	-0.7	1.03 H	84	44.83	8.50			
5	7311.00	54.2 PK	74.0	-19.8	1.20 H	336	40.97	13.24			
6	7311.00	47.9 AV	54.0	-6.1	1.20 H	336	34.67	13.24			
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	-			
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	*2437.00	93.4 PK			1.17 H	62	89.53	3.87			
2	*2437.00	86.7 AV			1.17 H	62	82.83	3.87			
3	4874.00	50.8 PK	74.0	-23.2	1.02 V	36	42.28	8.50			
4	4874.00	45.0 AV	54.0	-9.0	1.02 V	36	36.47	8.50			
5	7311.00	46.7 PK	74.0	-27.3	1.00 V	174	33.45	13.24			
6	7311.00	42.8 AV	54.0	-11.2	1.00 V	174	29.60	13.24			

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY &	& TEST DIS	TANCE: HO	RIZONTAL	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	95.5 PK			1.22 H	317	91.51	3.96
2	*2462.00	89.0 AV			1.22 H	317	85.03	3.96
3	2483.50	61.6 PK	74.0	-12.4	1.23 H	8	57.55	4.05
4	2483.50	53.4 AV	54.0	-0.6	1.23 H	8	49.39	4.05
5	4924.00	45.2 PK	74.0	-28.8	1.00 H	74	36.66	8.55
6	4924.00	41.1 AV	54.0	-12.9	1.00 H	74	32.54	8.55
7	7386.00	47.2 PK	74.0	-26.8	1.03 H	41	33.87	13.34
8	7386.00	42.9 AV	54.0	-11.1	1.03 H	41	29.54	13.34
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 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	86.4 PK			1.02 V	62	82.44	3.96
2	*2462.00	80.4 AV			1.02 V	62	76.46	3.96
3	4924.00	47.7 PK	74.0	-26.3	1.01 V	217	39.13	8.55
4	4924.00	43.6 AV	54.0	-10.4	1.01 V	217	35.00	8.55
5	7386.00	48.6 PK	74.0	-25.4	1.07 V	104	35.28	13.34
6	7386.00	44.2 AV	54.0	-9.8	1.07 V	104	30.82	13.34

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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 (40MHz)

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

		ANTENNA	POLARITY 8	& TEST DIS	TANCE: HO	RIZONTAL	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	63.1 PK	74.0	-10.9	1.74 H	51	59.47	3.67
2	2390.00	53.7 AV	54.0	-0.3	1.74 H	51	49.99	3.67
3	*2422.00	93.1 PK			1.31 H	44	89.34	3.80
4	*2422.00	89.4 AV			1.31 H	44	85.56	3.80
5	4844.00	45.8 PK	74.0	-28.2	1.00 H	22	37.33	8.47
6	4844.00	41.9 AV	54.0	-12.1	1.00 H	22	33.44	8.47
7	7266.00	47.3 PK	74.0	-26.7	1.01 H	195	34.12	13.20
8	7266.00	43.3 AV	54.0	-10.7	1.01 H	195	30.13	13.20
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	57.3 PK	74.0	-16.7	1.62 V	34	53.59	3.67
2	2390.00	47.1 AV	54.0	-6.9	1.62 V	34	43.38	3.67
3	*2422.00	82.6 PK			1.28 V	91	78.82	3.80
4	*2422.00	77.9 AV			1.28 V	91	74.13	3.80
5	4844.00	46.0 PK	74.0	-28.0	1.06 V	255	37.54	8.47
6	4844.00	41.0 AV	54.0	-13.0	1.05 V	255	32.53	8.47
7	7266.00	45.9 PK	74.0	-28.1	1.00 V	77	32.68	13.20
8	7266.00	43.0 AV	54.0	-11.0	1.00 V	77	29.81	13.20

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	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	95.1 PK			1.88 H	241	91.27	3.87			
2	*2437.00	90.3 AV			1.88 H	241	86.41	3.87			
3	4874.00	59.2 PK	74.0	-14.8	1.02 H	216	50.70	8.50			
4	4874.00	53.3 AV	54.0	-0.7	1.02 H	216	44.79	8.50			
5	7311.00	46.2 PK	74.0	-27.8	1.01 H	27	32.96	13.24			
6	7311.00	42.9 AV	54.0	-11.1	1.01 H	27	29.62	13.24			
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 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	87.6 PK			1.14 V	25	83.73	3.87			
2	*2437.00	82.5 AV			1.14 V	25	78.64	3.87			
3	4874.00	53.6 PK	74.0	-20.4	1.00 V	241	45.12	8.50			
4	4874.00	48.0 AV	54.0	-6.0	1.00 V	241	39.52	8.50			
5	7311.00	45.7 PK	74.0	-28.3	1.01 V	228	32.47	13.24			
6	7311.00	43.4 AV	54.0	-10.6	1.01 V	228	30.14	13.24			

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable 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	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	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	90.7 PK			1.22 H	358	86.76	3.92
2	*2452.00	85.4 AV			1.22 H	358	81.52	3.92
3	2483.50	61.2 PK	74.0	-12.8	1.06 H	312	57.15	4.05
4	2483.50	53.5 AV	54.0	-0.5	1.06 H	312	49.46	4.05
5	4904.00	46.2 PK	74.0	-27.8	1.08 H	200	37.68	8.53
6	4904.00	41.8 AV	54.0	-12.2	1.08 H	200	33.23	8.53
7	7356.00	44.8 PK	74.0	-29.2	1.01 H	254	31.51	13.30
8	7356.00	42.9 AV	54.0	-11.1	1.01 H	254	29.61	13.30
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 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	84.0 PK			1.69 V	99	80.07	3.92
2	*2452.00	78.0 AV			1.69 V	99	74.11	3.92
3	2483.50	55.2 PK	74.0	-18.8	1.02 V	243	51.18	4.05
4	2483.50	47.9 AV	54.0	-6.1	1.02 V	243	43.86	4.05
5	4904.00	45.4 PK	74.0	-28.6	1.00 V	62	36.83	8.53
6	4904.00	42.4 AV	54.0	-11.6	1.00 V	62	33.86	8.53
7	7356.00	47.0 PK	74.0	-27.0	1.02 V	216	33.71	13.30
8	7356.00	44.2 AV	54.0	-9.8	1.02 V	216	30.92	13.30

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



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 INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.	
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,16	Feb. 17,17	
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17	
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16	
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16	
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16	
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 05,15	Nov. 04,16	
Signal Generator	Agilent	N5183A	MY50140980	Nov. 05,15	Nov. 04,16	
ESG Vector Signal	A sile set	E44000	NAV/40070505	A = = 00 45	A = = 04 40	
Generator	Agilent	E4438C	MY49072505	Apr. 22, 15	Apr. 21, 16	
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16	

NOTE:

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.3.3 TEST PROCEDURE

- 1. Set resolution bandwidth (RBW) = 100KHz
- 2. Set the video bandwidth (VBW) \geq 3 x RBW, Detector = Peak.
- 3. Trace mode = max hold.
- 4. Sweep = auto couple.
- 5. 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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.



4.3.5 TEST SETUP



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.

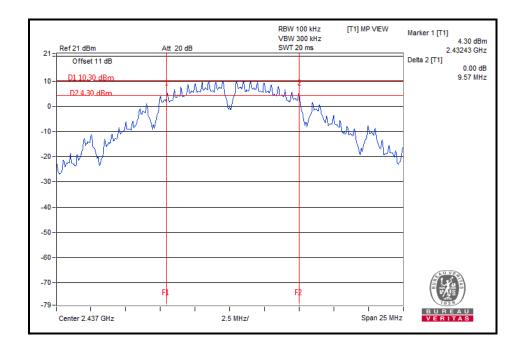
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com



4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL	
1	2412	8.10	0.5	PASS	
6	2437	9.57	0.5	PASS	
11	2462	8.12	0.5	PASS	



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 38 of 67



802.11g

CHANNE	FREQUENCY	6dB BANDV	VIDTH (MHz)	MINIMUM	DAGG / FAII	
CHANNEL	(MHz)	CHAIN 0	CHAIN 1	LIMIT (MHz)	PASS / FAIL	
1	2412	15.12	15.16	0.5	PASS	
6	2437	15.08	15.13	0.5	PASS	
11	2462	15.10	15.14	0.5	PASS	

802.11n 20MHz

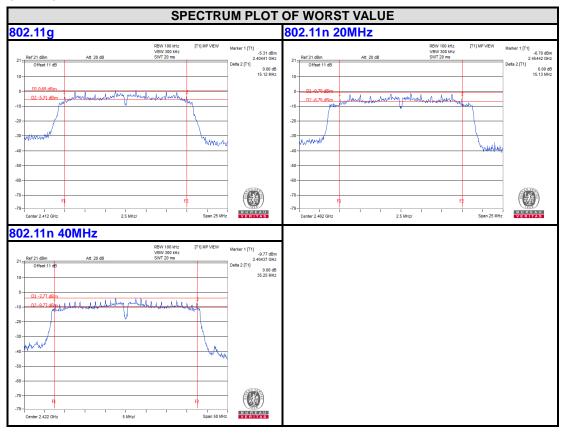
CHANNE	FREQUENCY	6dB BANDV	VIDTH (MHz)	MINIMUM	D400 / E411	
CHANNEL	(MHz)	CHAIN 0	CHAIN 1	LIMIT (MHz)	PASS / FAIL	
1	2412	15.10	16.86	0.5	PASS	
6	2437	15.09	15.11	0.5	PASS	
11	2462	15.13	16.28	0.5	PASS	

802.11n 40MHz

CHANNEL	FREQUENCY	6dB BANDV	VIDTH (MHz)	MINIMUM	DACC / FAIL	
CHANNEL	(MHz)	CHAIN 0	CHAIN 1	LIMIT (MHz)	PASS / FAIL	
3	2422	35.25	35.27	0.5	PASS	
6	2437	35.20	35.42	0.5	PASS	
9	2452	35.23	35.82	0.5	PASS	



CHAIN 0

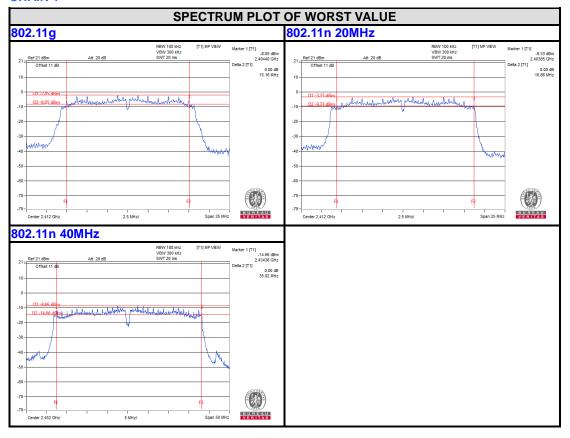


Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 40 of 67 Report Version 1



CHAIN 1



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 41 of 67

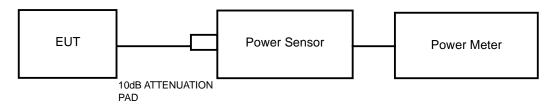


4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.	
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,16	Feb. 17,17	
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,16	Feb. 17,17	
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16	
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16	
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16	
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 05,15	Nov. 04,16	
Signal Generator	Agilent	N5183A	MY50140980	Nov. 05,15	Nov. 04,16	
ESG Vector Signal	A sile set	E44000	NAV/40070505	A = = 00 45	A== 04 40	
Generator	Agilent	E4438C	MY49072505	Apr. 22, 15	Apr. 21, 16	
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16	

NOTE:

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



4.4.4 TEST PROCEDURES

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

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

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 43 of 67



4.4.7 TEST RESULTS

4.4.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER(dBm)	PEAK POWER(mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	18.72	74.473	1	PASS
6	2437	23.26	211.836	1	PASS
11	2462	18.32	67.920	1	PASS

802.11g

CHAN.	FREQ		PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL POWER	PEAK POWER LIMIT	PASS /
	(MHz)	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	(dBm)	(W)	FAIL
1	2412	20.64	19.52	115.878	89.536	205.414	23.13	1	PASS
6	2437	26.98	26.68	498.884	465.586	964.470	29.84	1	PASS
11	2462	19.56	19.34	90.365	85.901	176.266	22.46	1	PASS



802.11n 20MHz

CHAN	FREQ	PEAK POWER(dBm		PEAK POWER(mW)		TOTAL	TOTAL POWER	PEAK POWER LIMIT	PASS /
CHAN.	(MHz)	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	(dBm)	(W)	FAIL
1	2412	19.75	17.36	94.406	54.450	148.856	21.73	1	PASS
6	2437	25.82	25.48	381.944	353.183	735.127	28.66	1	PASS
11	2462	19.07	17.79	80.724	60.117	140.841	21.49	1	PASS

802.11n 40MHz

CHAN.	FREQ	PEAK POWER(dBm)		PEAK POWER(mW)		TOTAL	TOTAL POWER	PEAK POWER LIMIT	PASS /
	(MHz)	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	(dBm)	(W)	FAIL
3	2422	18.65	17.75	73.282	59.566	132.848	21.23	1	PASS
6	2437	23.36	22.98	216.77	198.609	415.379	26.18	1	PASS
9	2452	18.06	16.86	63.973	48.529	112.502	20.51	1	PASS



4.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER LIMIT (dBm)
1	2412	15.85	30
6	2437	19.71	30
11	2462	15.35	30

802.11g

CHAN	FREQ	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL	TOTAL POWER	AVG. POWER LIMIT	PASS /
	(MHz)	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	(dBm)	(W)	FAIL
1	2412	12.02	9.98	15.922	9.954	25.876	14.13	30	PASS
6	2437	18.21	16.89	66.222	48.865	115.087	20.61	30	PASS
11	2462	10.75	9.57	11.885	9.057	20.942	13.21	30	PASS



802.11n 20MHz

CHAN	FREQ	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL	TOTAL POWER	AVG. POWER LIMIT	PASS /
CHAN.	(MHz)	CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	(dBm)	(W)	FAIL
1	2412	11.42	8.36	13.868	6.855	20.723	13.16	30	PASS
6	2437	17.14	16.97	51.761	49.774	101.535	20.07	30	PASS
11	2462	10.78	9.02	11.967	7.980	19.947	13.00	30	PASS

802.11n 40MHz

CHAN.	FREQ (MHz)	AVG. POWER (dBm)		AVG. POWER (mW)		TOTAL	TOTAL	AVG. POWER LIMIT	PASS /
		CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1	POWER (mW)	POWER (dBm)	(W)	FAIL
3	2422	10.15	8.62	10.351	7.278	17.629	12.46	30	PASS
6	2437	14.69	13.80	29.444	23.988	53.432	17.28	30	PASS
9	2452	9.53	8.02	8.974	6.339	15.313	11.85	30	PASS

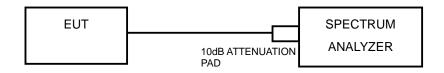


4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: 3 kHz
- d) Set VBW $\geq 3 \times RBW$.
- e) Detector = peak.
- g) Sweep time = auto couple.
- h) Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.



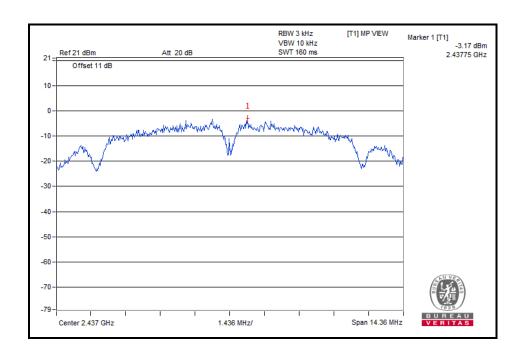
4.5.6 EUT OPERATING CONDITION

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	-7.04	8	PASS	
6	2437	-3.17	8	PASS	
11	2462	-7.25	8	PASS	



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 49 of 67



802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-13.43	3.01	-10.42	7.89	PASS
	6	2437	-7.76	3.01	-4.75	7.89	PASS
	11	2462	-15.15	3.01	-12.14	7.89	PASS
1	1	2412	-16.73	3.01	-13.72	7.89	PASS
	6	2437	-8.65	3.01	-5.64	7.89	PASS
	11	2462	-16.92	3.01	-13.91	7.89	PASS

NOTE:

- 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- 2. Directional gain = gain of antenna element + 10 log (2)=6.11, therefore the limit is 8dBm (directional gain 6dBm) = 7.89dBm.

802.11n 20MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-14.07	3.01	-11.06	7.89	PASS
	6	2437	-8.30	3.01	-5.29	7.89	PASS
	11	2462	-14.97	3.01	-11.96	7.89	PASS
1	1	2412	-17.41	3.01	-14.40	7.89	PASS
	6	2437	-9.98	3.01	-6.97	7.89	PASS
	11	2462	-18.23	3.01	-15.22	7.89	PASS

NOTE:

- 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- 2. Directional gain = gain of antenna element + 10 log (2)=6.11, therefore the limit is 8dBm (directional gain 6dBm) = 7.89dBm.



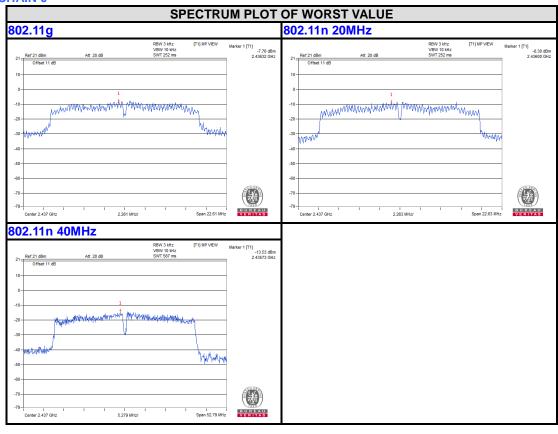
802.11n 40MHz

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-17.81	3.01	-14.80	7.89	PASS
	6	2437	-13.53	3.01	-10.52	7.89	PASS
	9	2452	-18.89	3.01	-15.88	7.89	PASS
1	3	2422	-21.21	3.01	-18.20	7.89	PASS
	6	2437	-15.17	3.01	-12.16	7.89	PASS
	9	2452	-22.96	3.01	-19.95	7.89	PASS

NOTE:

- 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- 2. Directional gain = gain of antenna element + 10 log (2)=6.11, therefore the limit is 8dBm (directional gain 6dBm) = 7.89dBm.

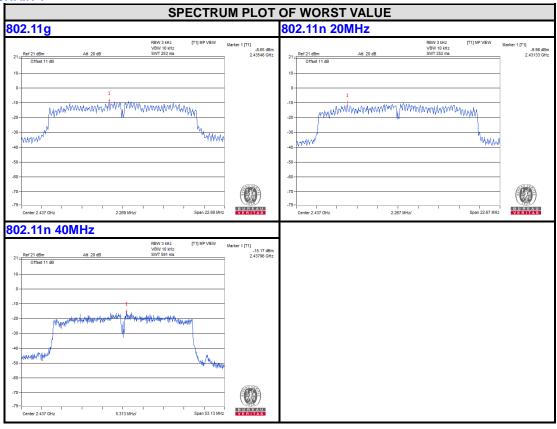
CHAIN 0



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



CHAIN 1



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

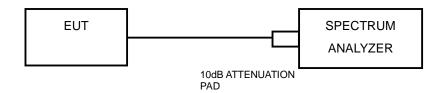


4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF 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 4.3.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

Measurement Procedure - Reference Level

- 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 - Unwanted Emission Level

- 1. Set RBW = 100 kHz.
- 2. Set VBW ≥ 300 kHz.
- 3. Set span to encompass the spectrum to be examined
- 4. Detector = peak.
- 5. Trace Mode = max hold.
- 6. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as item 4.3.6

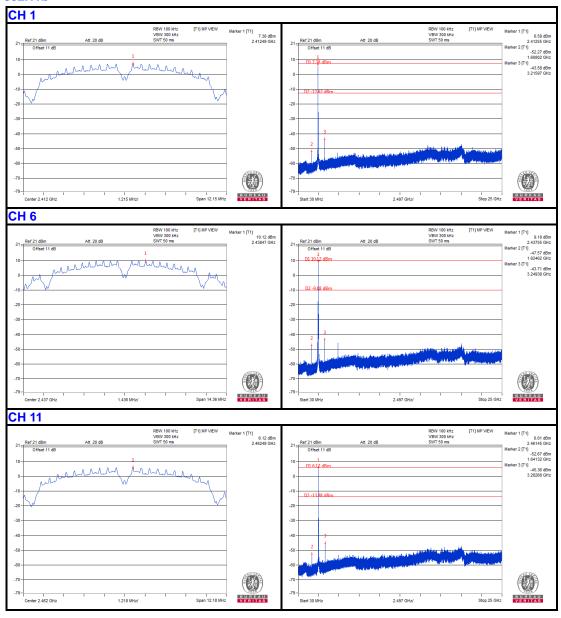
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 54 of 67



4.6.7 TEST RESULTS

802.11b



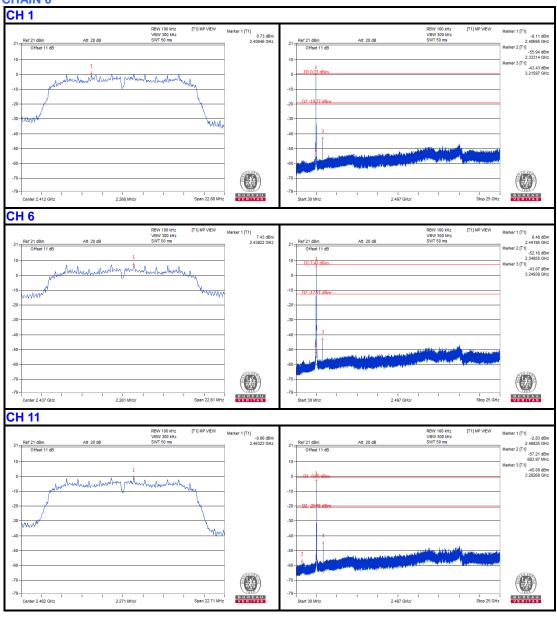
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 55 of 67



802.11g

CHAIN 0

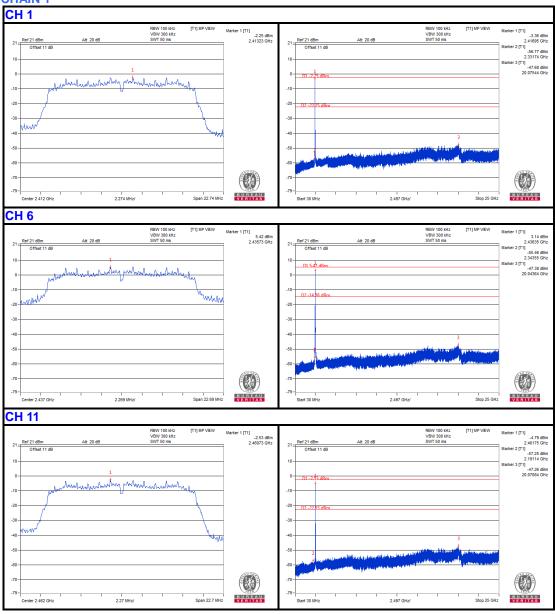


Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 56 of 67



CHAIN 1

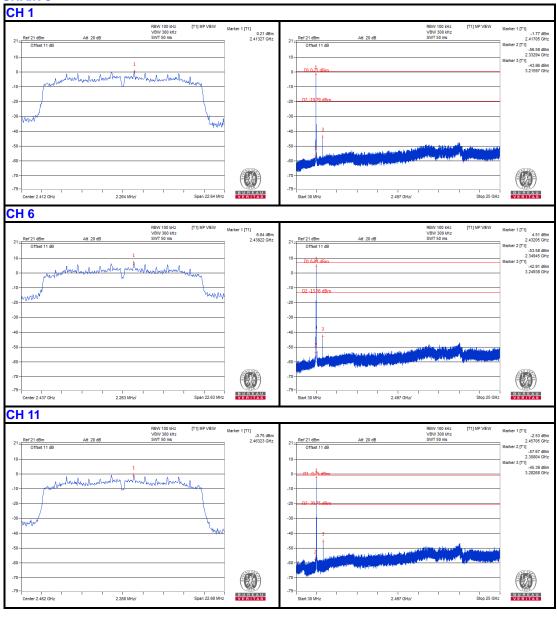


Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



802.11n (20MHz)

CHAIN 0

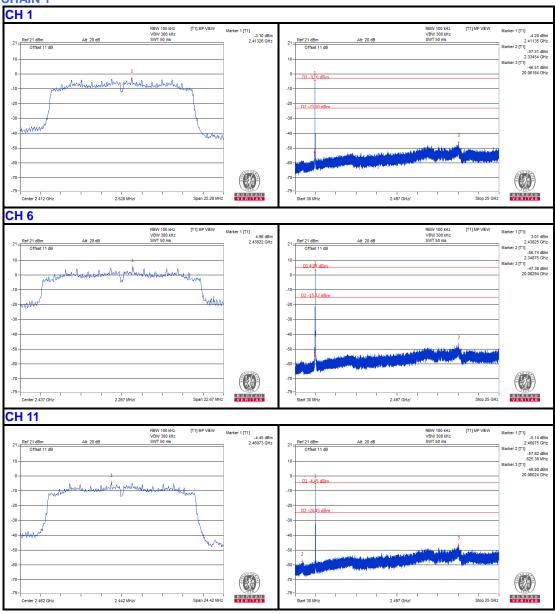


Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 58 of 67



CHAIN 1



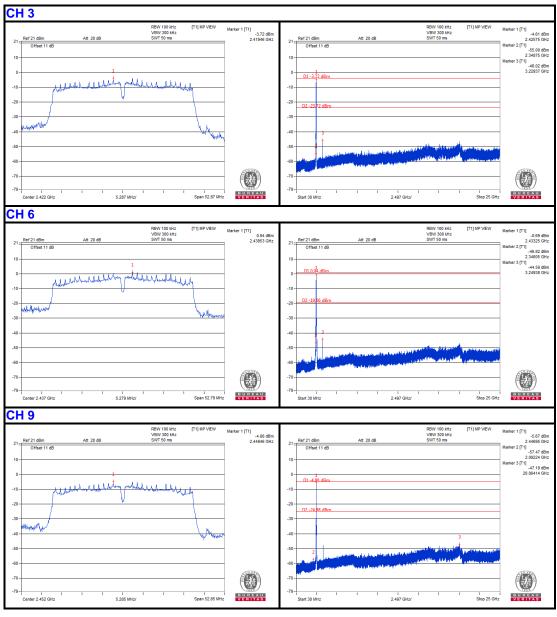
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 59 of 67



802.11n (40MHz)

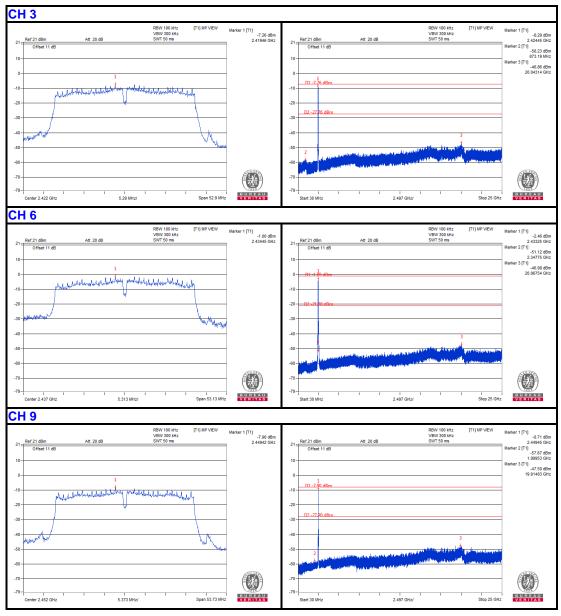
Chain 0



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com



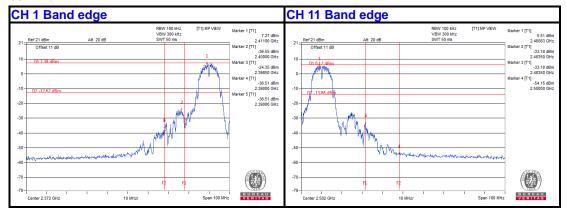
Chain 1



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>



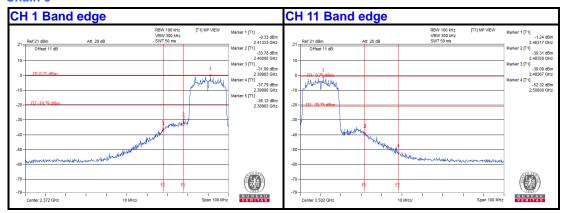
802.11b



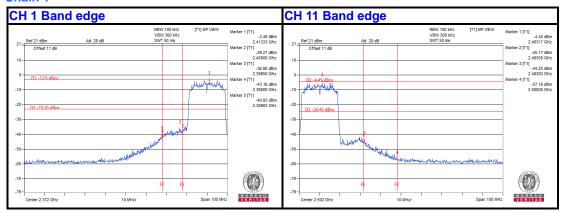
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com



802.11g Chain 0



Chain 1



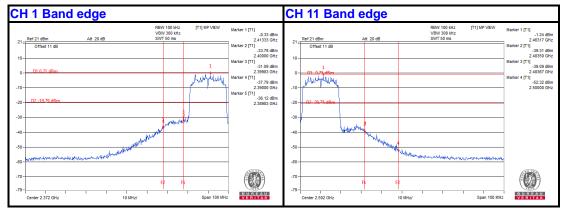
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 63 of 67

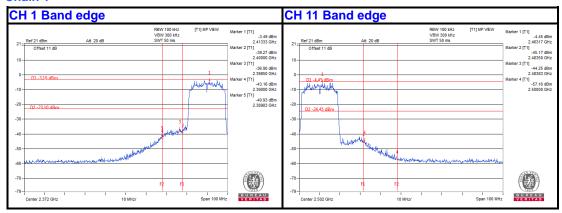


802.11n (20MHz)

Chain 0



Chain 1



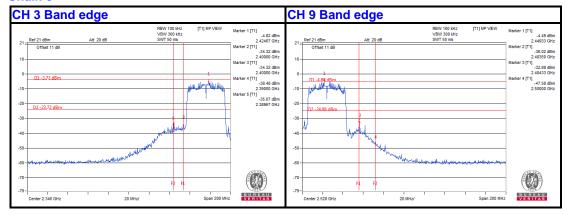
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 64 of 67

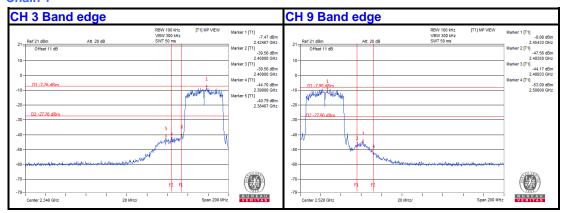


802.11n (40MHz)

Chain 0



Chain 1



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 65 of 67



5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 66 of 67



6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080 Email: customerservice.dg@cn.bureauveritas.com

Page 67 of 67