



# FCC TEST REPORT (WIFI 5G)

**Product:** LTE Smartphone

Model No.: Smart-Ex 01

FCC ID: WYPL14V012AB

Applicant: Sonim Technologies, Inc.

Address: 1825 S. Grant St., Suite 200., San Mateo, CA, 94402

Manufacturer: Sonim Technologies (Shenzhen) Limited

2nd Floor, No. 2 Building Phase B, Daqian Industrial park,

Address: Langebong Bond, 67 District, Bong, Shanghan, B, B, Chin

Longchang Road, 67 District, Baoan, Shenzhen, P. R. China

Prepared by: Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

Lab Location: No. 34, Chenwulu Section, Guantai Rd., Houjie Town,

Dongguan City, Guangdong 523942, China

**TEL:** +86 769 8593 5656

**FAX:** +86 769 8593 1080

E-MAIL: customerservice.dg@cn.bureauveritas.com

Report No.: RF151116W001-6

Received Date: Nov. 16, 2015

**Test Date:** Nov. 17, 2015 ~ Nov. 24, 2015

**Issued Date:** Nov. 25, 2015

This report should not be used by the client to claim product certification, approval, or endorsement by A2LA or any government agencies.

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.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com



## **TABLE OF CONTENTS**

R	ELEASE (	CONTROL RECORD	4
1	CERTIF	ICATION	5
2	SUMMA	RY OF TEST RESULTS	6
	2.1 ME	ASUREMENT UNCERTAINTY	6
3	GENER	AL INFORMATION	7
	3.1 GE	NERAL DESCRIPTION OF EUT	7
	3.2 DE	SCRIPTION OF TEST MODES	8
	3.2.1	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	9
	3.3 DU	TY CYCLE OF TEST SIGNAL	12
	3.4 DE	SCRIPTION OF SUPPORT UNITS	13
	3.4.1	CONFIGURATION OF SYSTEM UNDER TEST	14
	3.5 GE	NERAL DESCRIPTION OF APPLIED STANDARDS	14
4	TEST	TYPES AND RESULTS	15
	4.1 RAI	DIATED EMISSION AND BANDEDGE MEASUREMENT	15
	4.1.1	LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	15
	4.1.2	LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	15
	4.1.3	TEST INSTRUMENTS	16
	4.1.4	TEST PROCEDURES	17
	4.1.5	DEVIATION FROM TEST STANDARD	17
	4.1.6	TEST SETUP	18
	4.1.7	EUT OPERATING CONDITION	18
	4.1.8	TEST RESULTS	19
	4.2 CO	NDUCTED EMISSION MEASUREMENT	46
	4.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	46
	4.2.2	TEST INSTRUMENTS	46
	4.2.3	TEST PROCEDURES	46
	4.2.4	DEVIATION FROM TEST STANDARD	47
	4.2.5	TEST SETUP	47
	4.2.6	EUT OPERATING CONDITIONS	47
	4.2.7	TEST RESULTS	48
	4.3 MA	XIMUM CONDUCTED OUTPUT POWER MEASUREMENT	50



	DEVIATION FROM TEST STANDARD  EUT OPERATING CONDITION  TEST RESULTS  DGRAPHS OF THE TEST CONFIGURATION  IDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE	59 60
4.5.6 4.5.7	EUT OPERATING CONDITION TEST RESULTS	59 60
4.5.6	EUT OPERATING CONDITION	59
4.5.5	DEVIATION FROM TEST STANDARD	59
4.5.4	TEST PROCEDURE	59
4.5.3	TEST INSTRUMENTS	58
4.5.2	TEST SETUP	58
4.5.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	58
5 FRE	QUENCY STABILITY	58
4.4.7	TEST RESULTS	56
4.4.6	EUT OPERATING CONDITIONS	56
4.4.5	DEVIATION FROM TEST STANDARD	56
4.4.4	TEST PROCEDURES	
4.4.3	TEST INSTRUMENTS	
4.4.2		
_		-
		_
		_
	4.4.1 4.4.2 4.4.3 4.4.4 4.4.5 4.4.6 4.4.7 5 FRE 4.5.1 4.5.2 4.5.3	4.3.2 TEST SETUP

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF151116W001-6	Original release	Nov. 25, 2015

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

## 1 CERTIFICATION

**PRODUCT:** LTE Smartphone

**BRAND NAME:** ecom MOBILE SAFETY

MODEL NAME: Smart-Ex 01

APPLICANT: Sonim Technologies, Inc.

**TESTED:** Nov. 17, 2015 ~ Nov. 24, 2015

**TEST SAMPLE:** Identical Prototype

STANDARDS: FCC Part 15, Subpart E (15.407), Section 15.407

ANSI C63.10-2013

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan 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: I

Nov. 25, 2015

APPROVED BY :

William Chung / Manager)

DATE:

Nov. 25, 2015

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)					
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK		
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.16dB at 0.61920MHz.		
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -4.1dB at 406.19MHz.		
15.407(a/1/2/3)	Maximum conducted output Power	PASS	Meet the requirement of limit.		
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.		
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.		
15.203	Antenna Requirement	PASS	No antenna connector is used.		

## 2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY	
Conducted emissions	9kHz~30MHz	2.66dB	
	9KHz ~ 30MHz	2.74dB	
Radiated emissions	30MHz ~ 1GMHz	3.55dB	
Nadialed emissions	1GHz ~ 18GHz	4.84dB	
	18GHz ~ 40GHz	1.94dB	

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

Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

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

Tel: +86 769 8593 5656



## 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

EUT	LTE Smartphone
MODEL NO.	Smart-Ex 01
TYPE NUMBER	L14V012AB
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc (battery)
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to MCS7
OPERATING FREQUENCY	5180 ~ 5240MHz, 5260 ~ 5320MHz, 5500 ~ 5700MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (20MHz) 3 for 802.11n (40MHz)
AVERAGE POWER	8.650mW for 5180 ~ 5240MHz 8.492mW for 5260 ~ 5320MHz 8.318mW for 5500 ~ 5700MHz
ANTENNA TYPE	5180 ~ 5240MHz: PIFA Antenna with 1.5dBi gain 5260 ~ 5320MHz: PIFA Antenna with 1.5dBi gain 5500 ~ 5700MHz: PIFA Antenna with 1.5dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	See note 3

#### NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	Sonim
MODEL:	S11C02
NPUT:	AC 100-240V, 450mA
OUTPUT:	DC 5V, 2100mA

3. The EUT matched the following USB cable:

The Let materied the relieving CCD cable.				
USB CABLE				
BRAND: ecom MOBILE SAFETY				
MODEL:	Safety Box SB S01			
SIGNAL LINE:	1.1 METER			

4. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitters



and one receivers.

MODULATION MODE	TX FUNCTION	
802.11a	1TX/1RX	
802.11n (20MHz)	1TX/1RX	
802.11n (40MHz)	1TX/1RX	

For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

## 3.2 DESCRIPTION OF TEST MODES

## FOR 5150 ~ 5250MHz

4 channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

## 2 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

#### FOR 5250 ~ 5350MHz

4 channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

## 2 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	
54	5270 MHz	62	5310 MHz	

Branch

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## FOR 5470 ~ 5725MHz

8 channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	116	5580 MHz
104	5520 MHz	132	5660 MHz
108	5540 MHz	136	5680 MHz
112	5560 MHz	140	5700 MHz

## 3 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY CHANNEL		FREQUENCY
102	5510 MHz	134	5670 MHz
110	5550 MHz		

## 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT	EUT CONFIGURE  MODE  RE≥1G  RE<1G  RE<1G  PLC  APCM		DESCRIPTION		
			APCM	BESCKII TION	
Α	$\sqrt{}$	V	$\sqrt{}$	-	Powered by Adapter with wifi(5G) link
В	-	-	-	√	Powered by Battery with wifi(5G) link
С	-	-	-	-	Powered by USB with wifi(5G) link

Where

**RE≥1G:** Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

**PLC:** Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

#### NOTE

The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**. **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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Α	802.11a		36 to 48	36, 40, 48	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	MCS0
Α	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
Α	802.11a		52 to 64	52, 60, 64	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
Α	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
Α	802.11a		100 to 140	100, 116, 140	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
Α	802.11n (40MHz)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0

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



#### RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Α	802.11a	5180-5320	36 to 64	36	OFDM	BPSK	6.0

#### **POWER LINE CONDUCTED EMISSION TEST:**

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Α	802.11a	5180-5320	36 to 64	36	OFDM	BPSK	6.0

#### **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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Α	802.11a		36 to 48	36, 48	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5180-5240	36 to 48	36, 48	OFDM	BPSK	MCS0
Α	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
Α	802.11a		52 to 64	52, 64	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5260-5320	52 to 64	52, 64	OFDM	BPSK	MCS0
Α	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
Α	802.11a		100 to 140	100, 140	OFDM	BPSK	6.0
Α	802.11n (20MHz)	5500-5700	100 to 140	100, 140	OFDM	BPSK	MCS0
А	802.11n (40MHz)		102 to 134	102, 134	OFDM	BPSK	MCS0

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com



## **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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
В	802.11a		36 to 48	36, 40, 48	OFDM	BPSK	6.0
В	802.11n (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	MCS0
В	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
В	802.11a		52 to 64	52, 60, 64	OFDM	BPSK	6.0
В	802.11n (20MHz)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
В	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
В	802.11a		100 to 140	100, 116, 140	OFDM	BPSK	6.0
В	802.11n (20MHz)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
В	802.11n (40MHz)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0

## **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE<1G	23deg. C, 62%RH	DC 5V By Adapter	Blue Zheng
RE≥1G	23deg. C, 62%RH	DC 5V By Adapter	Blue Zheng
PLC	24deg. C, 61%RH	DC 5V By Adapter	Yuqiang Yin
APCM	23.5deg. C, 60%RH	DC 3.7V By battery	Yuqiang Yin

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com



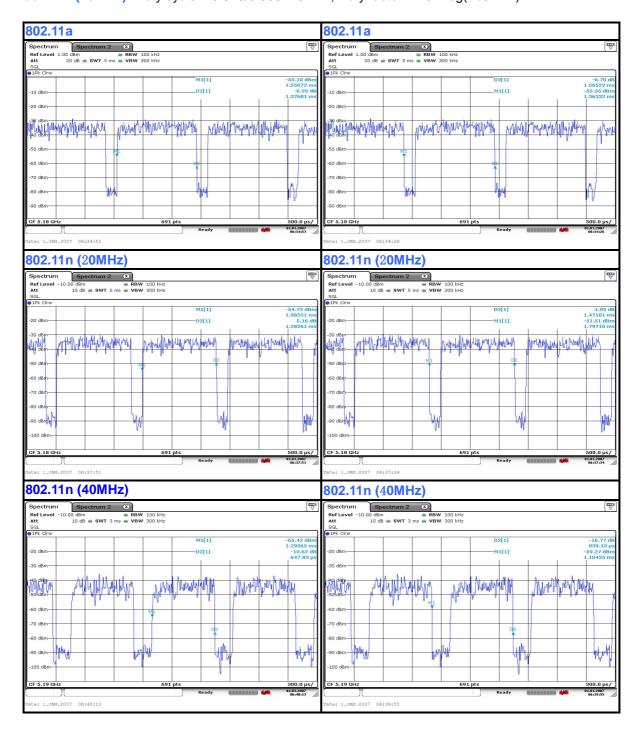
## 3.3 DUTY CYCLE OF TEST SIGNAL

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

**802.11a:** Duty cycle = 1.377/1.565 = 0.880, Duty factor = 10 \* log(1/0.880) = 0.55

**802.11n (20MHz):** Duty cycle = 1.282/1.471 = 0.872, Duty factor = 10 \* log(1/0.872) = 0.59

**802.11n (40MHz):** Duty cycle = 0.648/0.839 = 0.772, Duty factor = 10 \* log(1/0.772) = 1.12



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## **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	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A
3	Earphone	Minami	ME-816B5-E	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line: Unshielded, Detachable 1.5m
3	DC Line: Unshielded, Detachable 1.2m

## NOTE:

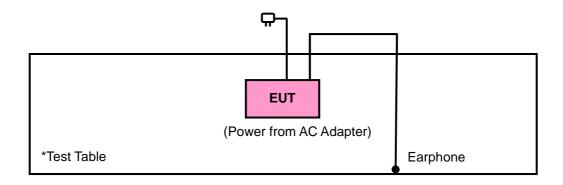
1. All power cords of the above support units are non shielded (1.8m).

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



#### 3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



## 3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart E (15.407)
789033 D02 General UNII Test Procedure New Rules v01
ANSI C63.10-2013

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (verification). The test report has been issued separately.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

## 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:

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 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT					
	FIELD STRENGTH AT 3m (dBµV/m) PK AV					
	74	54				
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBµV/m)				
$\checkmark$	PK	PK				
	-27	68.3				

**NOTE:** The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$
 µV/m, where P is the eirp (Watts).

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



## 4.1.3 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&Schwarz	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
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 21,14	Jan. 20,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,15	Mar. 03, 16
Pre-Amplifier (0.5~18GHz)	SCHWARZBECK	BBV 9718	9718-266	Mar 26,14	Mar. 25,16
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 19,15	Nov. 18,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 14	Aug. 07, 16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	April. 19,14	April. 18,16
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A

## NOTE:

- 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 2. The test was performed in 966 Chamber.
- 3. The FCC Site Registration No. is 502831.



#### 4.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### NOTE:

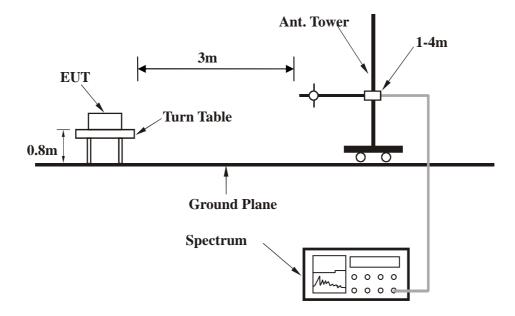
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency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

#### 4.1.5 DEVIATION FROM TEST STANDARD

No deviation.



## 4.1.6 TEST SETUP



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

## 4.1.7 EUT OPERATING CONDITION

- 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.

Email: <a href="mailto:customerservice.dg@cn.bureauveritas.com">customerservice.dg@cn.bureauveritas.com</a>

Tel: +86 769 8593 5656

Fax: +86 769 8593 1080



## 4.1.8 TEST RESULTS

## **BELOW 1GHz WORST-CASE DATA:**

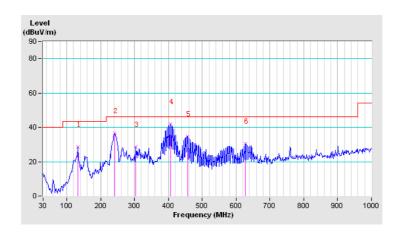
#### 802.11a

CHANNEL	Channel 36	DETECTOR FUNCTION	Oversi Bask (OB)
FREQUENCY RANGE		DETECTOR 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 (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	132.60	28.7 QP	43.5	-14.8	2.58 H	0	14.91	13.82	
2	241.41	36.6 QP	46.0	-9.4	1.12 H	332	23.29	13.32	
3	303.59	28.7 QP	46.0	-17.3	2.23 H	0	12.16	16.54	
4	406.19	41.9 QP	46.0	-4.1	1.28 H	344	21.91	19.98	
5	457.48	34.5 QP	46.0	-11.5	1.93 H	0	13.70	20.84	
6	626.92	30.4 QP	46.0	-15.6	1.57 H	360	5.94	24.49	

#### **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

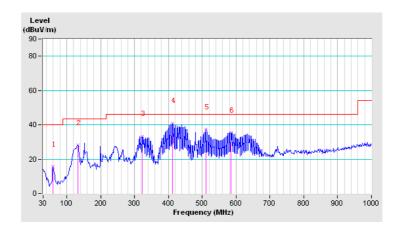


CHANNEL	Channel 36	DETECTOR FUNCTION	Overi Back (OB)
FREQUENCY RANGE		DETECTOR FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	59.54	15.7 QP	40.0	-24.3	1.65 V	0	8.93	6.80	
2	132.60	28.2 QP	43.5	-15.3	1.48 V	9	14.35	13.82	
3	322.24	33.3 QP	46.0	-12.7	1.00 V	84	16.24	17.09	
4	412.40	41.0 QP	46.0	-5.0	1.28 V	23	20.69	20.28	
5	511.89	37.3 QP	46.0	-8.7	1.00 V	55	15.33	21.94	
6	584.95	35.6 QP	46.0	-10.4	1.06 V	39	11.65	23.92	

#### **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



#### **ABOVE 1GHz WORST-CASE DATA: Band 1**

#### 802.11a

CHANNEL	TX Channel 36	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	56.8 PK	74.0	-17.2	1.00 H	165	16.83	39.98
2	5150.00	44.4 AV	54.0	-9.6	1.00 H	165	4.39	39.98
3	*5180.00	101.0 PK			1.00 H	165	60.91	40.04
4	*5180.00	84.6 AV			1.00 H	165	44.60	40.04
5	#10360.00	55.6 PK	74.0	-18.4	1.00 H	0	9.13	46.44
6	#10360.00	42.7 AV	54.0	-11.3	1.00 H	0	-3.78	46.44
		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	5150.00	57.2 PK	74.0	-16.8	1.00 V	61	17.22	39.98
2	5150.00	44.0 AV	54.0	-10.0	1.00 V	61	4.04	39.98
3	*5180.00	99.5 PK			1.00 V	61	59.45	40.04
4	*5180.00	81.8 AV			1.00 V	61	41.76	40.04
5	#10360.00	57.1 PK	74.0	-16.9	1.00 V	0	10.70	46.44
6	#10360.00	42.6 AV	54.0	-11.4	1.00 V	0	-3.82	46.44

#### **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 44	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	57.3 PK	74.0	-16.7	1.00 H	158	17.31	39.98	
2	5150.00	44.6 AV	54.0	-9.4	1.00 H	158	4.60	39.98	
3	*5220.00	100.5 PK			1.00 H	158	60.43	40.11	
4	*5220.00	86.0 AV			1.00 H	158	45.85	40.11	
5	#10440.00	55.6 PK	74.0	-18.4	1.00 H	105	8.95	46.61	
6	#10440.00	41.3 AV	54.0	-12.7	1.00 H	105	-5.33	46.61	
		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	5150.00	57.7 PK	74.0	-16.3	1.10 V	55	17.73	39.98	
2	5150.00	44.7 AV	54.0	-9.3	1.10 V	55	4.69	39.98	
3	*5220.00	99.6 PK			1.10 V	55	59.47	40.11	
4	*5220.00	81.8 AV			1.10 V	55	41.65	40.11	
5	#10440.00	58.7 PK	74.0	-15.3	1.00 V	57	12.13	46.61	
6	#10440.00	43.6 AV	54.0	-10.4	1.00 V	57	-3.05	46.61	

## **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 48	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		ANTENNA I	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	5150.00	58.5 PK	74.0	-15.5	1.00 H	164	18.48	39.98
2	5150.00	45.2 AV	54.0	-8.8	1.00 H	164	5.24	39.98
3	*5240.00	99.2 PK			1.00 H	164	59.09	40.14
4	*5240.00	85.7 AV			1.00 H	164	45.54	40.14
5	#10480.00	57.0 PK	74.0	-17.0	1.00 H	120	10.29	46.69
6	#10480.00	43.5 AV	54.0	-10.5	1.00 H	120	-3.22	46.69
		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	5150.00	57.7 PK	74.0	-16.3	1.00 V	109	17.68	39.98
2	5150.00	43.5 AV	54.0	-10.5	1.00 V	109	3.49	39.98
3	*5240.00	97.4 PK			1.00 V	109	57.25	40.14
4	*5240.00	82.6 AV			1.00 V	109	42.50	40.14
5	#10480.00	58.4 PK	74.0	-15.7	1.00 V	74	11.66	46.69
6	#10480.00	45.5 AV	54.0	-8.5	1.00 V	74	-1.17	46.69

## **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (20MHz)

CHANNEL	TX Channel 36	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	57.9 PK	74.0	-16.1	1.00 H	158	17.88	39.98								
2	5150.00	45.0 AV	54.0	-9.0	1.00 H	158	5.05	39.98								
3	*5180.00	100.2 PK			1.00 H	158	60.11	40.04								
4	*5180.00	84.6 AV			1.00 H	158	44.58	40.04								
5	#10360.00	56.3 PK	74.0	-17.7	1.00 H	0	9.89	46.44								
6	#10360.00	44.3 AV	54.0	-9.7	1.00 H	0	-2.16	46.44								
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
	FREQ. (MHz) EMISSION LIMIT MARGIN HEIGHT ANGLE RAW CORRECTION (MHz) (MHz															
NO.					, <b>_</b>			CORRECTION FACTOR (dB/m)								
<b>NO</b> .		LEVEL			HEIGHT	ANGLE	VALUE	FACTOR								
	(MHz)	LEVEL (dBuV/m)	(dBuV/m)	(dB)	HEIGHT (m)	ANGLE (Degree)	VALUE (dBuV)	FACTOR (dB/m)								
1	(MHz) 5150.00	LEVEL (dBuV/m) 56.7 PK	(dBuV/m)	(dB)	HEIGHT (m)	ANGLE (Degree)	<b>VALUE</b> (dBuV) 16.76	FACTOR (dB/m) 39.98								
1 2	(MHz) 5150.00 5150.00	<b>LEVEL</b> (dBuV/m) 56.7 PK 44.3 AV	(dBuV/m)	(dB)	HEIGHT (m)  1.00 V  1.00 V	ANGLE (Degree) 47 47	VALUE (dBuV) 16.76 4.28	FACTOR (dB/m) 39.98 39.98								
1 2 3	(MHz) 5150.00 5150.00 *5180.00	LEVEL (dBuV/m) 56.7 PK 44.3 AV 96.9 PK	(dBuV/m)	(dB)	HEIGHT (m)  1.00 V  1.00 V  1.00 V	ANGLE (Degree)  47  47  47	VALUE (dBuV) 16.76 4.28 56.81	FACTOR (dB/m) 39.98 39.98 40.04								

## **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



CHANNEL	TX Channel 44	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	57.3 PK	74.0	-16.8	1.00 H	160	17.27	39.98
2	5150.00	45.1 AV	54.0	-8.9	1.00 H	160	5.11	39.98
3	*5220.00	99.0 PK			1.00 H	160	58.85	40.11
4	*5220.00	83.2 AV			1.00 H	160	43.11	40.11
5	#10440.00	56.9 PK	74.0	-17.1	1.00 H	14	10.26	46.61
6	#10440.00	44.0 AV	54.0	-10.0	1.00 H	14	-2.65	46.61
		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	5150.00	57.7 PK	74.0	-16.3	1.00 V	49	17.71	39.98
2	5150.00	45.9 AV	54.0	-8.2	1.00 V	49	5.87	39.98
3	*5220.00	96.5 PK			1.00 V	49	56.43	40.11
4	*5220.00	82.4 AV			1.00 V	49	42.26	40.11
5	#10440.00	59.7 PK	74.0	-14.4	1.00 V	247	13.04	46.61
6	#10440.00	46.4 AV	54.0	-7.6	1.00 V	247	-0.24	46.61

## **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



CHANNEL	TX Channel 48	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	57.8 PK	74.0	-16.2	1.00 H	172	17.85	39.98	
2	5150.00	45.8 AV	54.0	-8.3	1.00 H	172	5.77	39.98	
3	*5240.00	97.5 PK			1.00 H	172	57.38	40.14	
4	*5240.00	83.2 AV			1.00 H	172	43.07	40.14	
5	#10480.00	55.7 PK	74.0	-18.4	1.00 H	112	8.96	46.69	
6	#10480.00	43.2 AV	54.0	-10.8	1.00 H	112	-3.46	46.69	
		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	5150.00	58.6 PK	74.0	-15.4	1.00 V	124	18.58	39.98	
2	5150.00	46.3 AV	54.0	-7.7	1.00 V	124	6.34	39.98	
3	*5240.00	96.9 PK			1.00 V	124	56.72	40.14	
4	*5240.00	82.4 AV			1.00 V	124	42.30	40.14	
5	#10480.00	57.7 PK	74.0	-16.4	1.00 V	32	10.96	46.69	
	#10480.00	44.3 AV	54.0	-9.7	1.00 V	32	-2.43	46.69	

#### **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (40MHz)

CHANNEL	TX Channel 38	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	59.2 PK	74.0	-14.8	1.00 H	160	19.18	39.98
2	5150.00	45.0 AV	54.0	-9.0	1.00 H	160	5.06	39.98
3	*5190.00	95.4 PK			1.00 H	160	55.31	40.05
4	*5190.00	75.4 AV			1.00 H	160	35.34	40.05
5	#10380.00	59.6 PK	74.0	-14.4	1.00 H	0	13.15	46.48
6	#10380.00	43.6 AV	54.0	-10.4	1.00 H	0	-2.92	46.48
		ANTENNA	A 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	5150.00	56.4 PK	74.0	-17.7	1.00 V	89	16.37	39.98
2	5150.00	42.3 AV	54.0	-11.7	1.00 V	89	2.29	39.98
3	*5190.00	93.2 PK			1.00 V	89	53.19	40.05
	+=400.00				1.00 V	89	34.33	40.05
4	*5190.00	74.4 AV			1.00 V	00	57.55	10.00
4 5	*5190.00 #10380.00	74.4 AV 57.7 PK	74.0	-16.3	1.00 V	24	11.20	46.48

## **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 46	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	58.6 PK	74.0	-15.4	1.00 H	165	18.65	39.98
2	5150.00	44.3 AV	54.0	-9.7	1.00 H	165	4.30	39.98
3	*5230.00	96.6 PK			1.00 H	165	56.52	40.12
4	*5230.00	78.5 AV			1.00 H	165	38.36	40.12
5	#10460.00	57.3 PK	74.0	-16.8	1.00 H	75	10.60	46.65
6	#10460.00	42.9 AV	54.0	-11.1	1.00 H	75	-3.79	46.65
		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	5150.00	58.2 PK	74.0	-15.8	1.00 V	165	18.26	39.98
2	5150.00	45.6 AV	54.0	-8.4	1.00 V	165	5.64	39.98
3	*5230.00	95.4 PK			1.00 V	165	55.24	40.12
4	*5230.00	76.9 AV			1.00 V	165	36.77	40.12
5	#10460.00	59.0 PK	74.0	-15.0	1.00 V	98	12.33	46.65
6	#10460.00	43.3 AV	54.0	-10.8	1.00 V	98	-3.40	46.65

## **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



## **ABOVE 1GHz WORST-CASE DATA: Band 2**

#### 802.11a

CHANNEL	TX Channel 52	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5260.00	99.7 PK			1.07 H	158	59.47	40.18	
2	*5260.00	83.4 AV			1.07 H	158	43.20	40.18	
3	5350.00	61.3 PK	74.0	-12.8	1.07 H	158	20.91	40.34	
4	5350.00	46.5 AV	54.0	-7.5	1.07 H	158	6.18	40.34	
5	#10520.00	55.4 PK	74.0	-18.6	1.00 H	45	8.61	46.75	
6	#10520.00	40.4 AV	54.0	-13.6	1.00 H	45	-6.39	46.75	
		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	*5260.00	97.9 PK			1.00 V	49	57.73	40.18	
2	*5260.00	82.5 AV			1.00 V	49	42.29	40.18	
3	5350.00	50.7 PK	74.0	-23.3	1.00 V	49	10.32	40.34	
4	5350.00	36.9 AV	54.0	-17.1	1.00 V	49	-3.47	40.34	
_	#10520.00	54.7 PK	74.0	-19.3	1.00 V	36	7.94	46.75	
5	#10020.00	5 <del>4</del> .7 1 K	74.0	13.5	1.00 V	0	7.54	10.70	

#### **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.

Email: <a href="mailto:customerservice.dg@cn.bureauveritas.com">customerservice.dg@cn.bureauveritas.com</a>

Tel: +86 769 8593 5656



CHANNEL	TX Channel 60	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5300.00	94.3 PK			1.00 H	224	54.07	40.25
2	*5300.00	79.7 AV			1.00 H	224	39.43	40.25
3	5350.00	53.2 PK	74.0	-20.8	1.00 H	157	12.90	40.34
4	5350.00	38.7 AV	54.0	-15.3	1.00 H	157	-1.68	40.34
5	10600.00	56.0 PK	74.0	-18.0	1.00 H	37	9.14	46.84
6	10600.00	40.2 AV	54.0	-13.8	1.00 H	37	-6.60	46.84
		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	*5300.00	97.6 PK			1.00 V	157	57.39	40.25
2	*5300.00	82.5 AV			1.00 V	157	42.20	40.25
3	5350.00	51.4 PK	74.0	-22.6	1.00 V	157	11.02	40.34
4	5350.00	37.1 AV	54.0	-16.9	1.00 V	157	-3.23	40.34
5	10600.00	56.4 PK	74.0	-17.6	1.00 V	27	9.52	46.84
6	10600.00	42.9 AV	54.0	-11.1	1.00 V	27	-3.97	46.84

## **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.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



CHANNEL	TX Channel 64	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5320.00	93.7 PK			1.00 H	129	53.46	40.28
2	*5320.00	78.3 AV			1.00 H	129	38.01	40.28
3	5350.00	52.0 PK	74.0	-22.0	1.00 H	129	11.69	40.34
4	5350.00	38.6 AV	54.0	-15.4	1.00 H	129	-1.77	40.34
5	10640.00	54.3 PK	74.0	-19.7	1.00 H	129	7.38	46.88
6	10640.00	40.2 AV	54.0	-13.9	1.00 H	129	-6.73	46.88
		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	*5320.00	95.6 PK			1.00 V	118	55.29	40.28
2	*5320.00	80.3 AV			1.00 V	118	39.98	40.28
3	5350.00	51.7 PK	74.0	-22.3	1.00 V	17	11.33	40.34
4	5350.00	36.9 AV	54.0	-17.1	1.00 V	17	-3.45	40.34
5	10640.00	56.7 PK	74.0	-17.3	1.00 V	287	9.81	46.88
6	10640.00	42.9 AV	54.0	-11.1	1.00 V	287	-4.00	46.88

## **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.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (20MHz)

CHANNEL	TX Channel 52	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5260.00	96.6 PK			1.00 H	290	56.46	40.18
2	*5260.00	81.3 AV			1.00 H	290	41.07	40.18
3	#10520.00	52.9 PK	74.0	-21.2	1.00 H	189	6.10	46.75
4	#10520.00	37.5 AV	54.0	-16.5	1.00 H	189	-9.21	46.75
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	
	FREQ. EMISSION LIMIT MARGIN ANTENNA TABLE RAW CORRECTION							
NO.	-	LEVEL			HEIGHT	ANGLE	VALUE	CORRECTION FACTOR (dB/m)
<b>NO.</b>	-	LEVEL			HEIGHT	ANGLE	VALUE	FACTOR
	(MHz)	LEVEL (dBuV/m)			HEIGHT (m)	ANGLE (Degree)	VALUE (dBuV)	FACTOR (dB/m)
1	(MHz) *5260.00	LEVEL (dBuV/m) 95.6 PK			HEIGHT (m)	ANGLE (Degree)	VALUE (dBuV) 55.40	FACTOR (dB/m) 40.18

## **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 60	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5300.00	95.6 PK			1.00 H	200	55.38	40.25
2	*5300.00	80.0 AV			1.00 H	200	39.77	40.25
3	10600.00	54.7 PK	74.0	-19.3	1.00 H	245	7.84	46.84
4	10600.00	40.6 AV	54.0	-13.4	1.00 H	245	-6.26	46.84
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	-
NO.	FREQ. EMISSION LIMIT MARGIN ANTENNA TABLE RAW CORRECTION							
1	*5300.00	96.1 PK			1.00 V	158	55.87	40.25
2	*5300.00	81.2 AV			1.00 V	158	40.99	40.25
3	10600.00	56.2 PK	74.0	-17.8	1.00 V	230	9.40	46.84
4	10600.00	41.9 AV	54.0	-12.2	1.00 V	230	-4.99	46.84

#### **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.



CHANNEL	TX Channel 64	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5320.00	93.8 PK			1.00 H	45	53.56	40.28	
2	*5320.00	78.6 AV			1.00 H	45	38.30	40.28	
3	5350.00	49.7 PK	74.0	-24.3	1.00 H	45	9.34	40.34	
4	5350.00	36.5 AV	54.0	-17.5	1.00 H	45	-3.84	40.34	
5	10640.00	53.7 PK	74.0	-20.4	1.00 H	122	6.77	46.88	
6	10640.00	38.5 AV	54.0	-15.5	1.00 H	122	-8.41	46.88	
		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	*5320.00	97.0 PK			1.00 V	112	56.76	40.28	
2	*5320.00	83.0 AV			1.00 V	112	42.67	40.28	
3	5350.00	50.3 PK	74.0	-23.7	1.00 V	148	9.92	40.34	
4	5350.00	36.9 AV	54.0	-17.1	1.00 V	148	-3.47	40.34	
5	10640.00	56.3 PK	74.0	-17.7	1.00 V	0	9.41	46.88	
6	10640.00	41.9 AV	54.0	-12.1	1.00 V	0	-5.00	46.88	

## **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.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (40MHz)

CHANNEL	TX Channel 54	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5270.00	94.5 PK			1.00 H	163	54.25	40.20		
2	*5270.00	76.5 AV			1.00 H	163	36.34	40.20		
3	#10540.00	53.2 PK	74.0	-20.8	1.00 H	73	6.47	46.77		
4	#10540.00	38.5 AV	54.0	-15.5	1.00 H	73	-8.30	46.77		
	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)		
<b>NO.</b>	_	EMISSION LEVEL			ANTENNA HEIGHT	TABLE ANGLE	VALUE	FACTOR		
	(MHz)	EMISSION LEVEL (dBuV/m)			ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	VALUE (dBuV)	FACTOR (dB/m)		
1	(MHz) *5270.00	EMISSION LEVEL (dBuV/m) 91.6 PK			ANTENNA HEIGHT (m) 1.00 V	TABLE ANGLE (Degree)	VALUE (dBuV) 51.37	FACTOR (dB/m) 40.20		

## **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



CHANNEL	TX Channel 62	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5310.00	95.4 PK			1.00 H	98	55.15	40.27		
2	*5310.00	80.2 AV			1.00 H	98	39.97	40.27		
3	5350.00	51.2 PK	74.0	-22.8	1.00 H	98	10.90	40.34		
4	5350.00	36.8 AV	54.0	-17.2	1.00 H	98	-3.52	40.34		
5	10620.00	52.2 PK	74.0	-21.8	1.00 H	173	5.38	46.86		
6	10620.00	37.0 AV	54.0	-17.0	1.00 H	173	-9.86	46.86		
	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	*5310.00	94.7 PK			1.00 V	145	54.41	40.27		
2	*5310.00	78.2 AV			1.00 V	145	37.97	40.27		
3	5350.00	54.4 PK	74.0	-19.7	1.00 V	238	14.01	40.34		
4	5350.00	39.7 AV	54.0	-14.3	1.00 V	238	-0.66	40.34		
5	10620.00	53.2 PK	74.0	-20.8	1.00 V	49	6.35	46.86		
6	10620.00	38.5 AV	54.0	-15.5	1.00 V	49	-8.37	46.86		

## **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.

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

Tel: +86 769 8593 5656

Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch



#### **ABOVE 1GHz WORST-CASE DATA: Band 3**

#### 802.11a

CHANNEL	TX Channel 100	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	#5470.00	50.5 PK	68.3	-17.8	1.00 H	163	9.98	40.55
2	*5500.00	98.7 PK			1.00 H	163	58.06	40.60
3	*5500.00	81.0 AV			1.00 H	163	40.41	40.60
4	11000.00	52.0 PK	74.0	-22.0	1.00 H	25	4.70	47.26
5	11000.00	38.5 AV	54.0	-15.6	1.00 H	25	-8.81	47.26
		ANTENNA	POLARITY	& TEST D	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	#5470.00	48.0 PK	68.3	-20.3	1.23 V	281	7.43	40.55
2	*5500.00	93.5 PK			1.23 V	281	52.94	40.60
3	*5500.00 *5500.00	93.5 PK 78.2 AV			1.23 V 1.23 V	281 281	52.94 37.62	40.60 40.60
			74.0	-21.3		-		

## **REMARKS:**

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

 $\pmb{\mathsf{Email} \colon \underline{\mathsf{customerservice.dg@cn.bureauveritas.com}}}$ 



CHANNEL	TX Channel 116	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5580.00	98.5 PK			1.00 H	17	57.73	40.81
2	*5580.00	81.3 AV			1.00 H	17	40.45	40.81
3	11160.00	50.4 PK	74.0	-23.6	1.00 H	136	2.97	47.39
4	11160.00	35.2 AV	54.0	-18.8	1.00 H	136	-12.15	47.39
		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	*5580.00	96.7 PK			1.14 V	60	55.88	40.81
2	*5580.00	80.2 AV			1.14 V	60	39.43	40.81
3	11160.00	51.3 PK	74.0	-22.7	1.00 V	20	3.87	47.39
	11160.00	35.7 AV	54.0	-18.3	1.00 V	20	-11.65	47.39

#### **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.

Tel: +86 769 8593 5656



CHANNEL	TX Channel 140	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		ANITENINIA	DOL ADITY	o TECT DIC	TANCE: UO	DIZONTAL	AT 2 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	TANCE: HO ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	95.7 PK			1.00 H	150	54.53	41.13
2	*5700.00	76.9 AV			1.00 H	150	35.79	41.13
3	#5725.00	50.5 PK	68.3	-17.8	1.00 H	150	9.34	41.19
4	11400.00	50.3 PK	74.0	-23.7	1.00 H	149	2.72	47.60
5	11400.00	35.5 AV	54.0	-18.5	1.00 H	149	-12.13	47.60
		ANTENNA	POLARITY	/ & TEST D	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	*5700.00	93.8 PK			1.24 V	60	52.68	41.13
2	*5700.00	78.4 AV			1.24 V	60	37.23	41.13
	#F70F 00	Dir	CO 0	16	1.24 V	60	11.14	41.19
3	#5725.00	52.3 PK	68.3	-16	1.24 V	00	11.14	41.13
3	#5725.00 11400.00	52.3 PK 52.3 PK	74.0	-16	1.24 V 1.00 V	132	4.74	47.60

#### **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



## 802.11n (20MHz)

CHANNEL	TX Channel 100	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		411771114	DOL ADITY	TEOT DIO	TANOE 110	DIZONITAL	AT 0 14	
		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	#5470.00	58.7 PK	68.3	-9.6	1.13 H	328	18.17	40.55
2	*5500.00	98.4 PK			1.13 H	328	57.75	40.60
3	*5500.00	83.3 AV			1.13 H	328	42.67	40.60
4	11000.00	51.4 PK	74.0	-22.6	1.00 H	217	4.10	47.26
5	11000.00	40.2 AV	54.0	-13.8	1.00 H	217	-7.07	47.26
		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	#5470.00	58.5 PK	68.3	-9.8	1.24 V	244	17.94	40.55
2	#5470.00 *5500.00	58.5 PK 95.0 PK	68.3	-9.8	1.24 V 1.24 V	244 244	17.94 54.39	40.55 40.60
			68.3	-9.8				
2	*5500.00	95.0 PK	74.0	-9.8 -21.6	1.24 V	244	54.39	40.60

#### **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.

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



CHANNEL	TX Channel 116	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		ANTFNNA	POI ARITY	R 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	*5580.00	99.5 PK			1.12 H	320	58.66	40.81
2	*5580.00	85.0 AV			1.12 H	320	44.15	40.81
3	11160.00	50.3 PK	74.0	-23.7	1.00 H	124	2.87	47.39
4	11160.00	40.0 AV	54.0	-14.0	1.00 H	124	-7.41	47.39
		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	*5580.00	95.4 PK			1.00 V	173	54.55	40.81
2	*5580.00	80.1 AV			1.00 V	173	39.24	40.81
3	11160.00	52.4 PK	74.0	-21.6	1.00 V	26	4.97	47.39
4	11160.00	41.0 AV	54.0	-13.0	1.00 V	26	-6.37	47.39

#### **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.



CHANNEL	TX Channel 140	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		ANITENINIA	DOL ADITY	O TEOT DIO	TANOE HO	DIZONITAL	AT 0.14	
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	*5700.00	93.3 PK			1.00 H	135	52.12	41.13
2	*5700.00	78.1 AV			1.00 H	135	36.98	41.13
3	#5725.00	57.3 PK	68.3	-11	1.00 H	135	16.07	41.19
4	11400.00	53.2 PK	74.0	-20.9	1.00 H	24	5.55	47.60
5	11400.00	41.3 AV	54.0	-12.8	1.00 H	24	-6.35	47.60
		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	*5700.00	91.6 PK			1.00 V	234	50.47	41.13
2	*5700.00 *5700.00	91.6 PK 76.6 AV			1.00 V 1.00 V	234 234	50.47 35.42	41.13 41.13
			68.3	-10.6				_
2	*5700.00	76.6 AV	68.3 74.0	-10.6 -20.3	1.00 V	234	35.42	41.13

#### **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



## 802.11n (40MHz)

CHANNEL	TX Channel 102	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	#5470.00	60.2 PK	68.3	-8.1	1.00 H	225	19.61	40.55		
2	*5510.00	91.8 PK			1.00 H	225	51.21	40.63		
3	*5510.00	71.6 AV			1.00 H	225	30.95	40.63		
4	11020.00	55.0 PK	74.0	-19.0	1.00 H	287	7.68	47.28		
5	11020.00	43.2 AV	54.0	-10.8	1.00 H	287	-4.10	47.28		
		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	#5470.00	59.7 PK	68.3	-8.6	1.00 V	254	19.10	40.55		
2	*5510.00	89.7 PK			1.00 V	254	49.02	40.63		
3	*5510.00	74.2 AV			1.00 V	254	33.59	40.63		
4	11020.00	56.9 PK	74.0	-17.2	1.00 V	27	9.57	47.28		

#### **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.

Fax: +86 769 8593 1080

Branch

Email: <a href="mailto:customerservice.dg@cn.bureauveritas.com">customerservice.dg@cn.bureauveritas.com</a>

Tel: +86 769 8593 5656



CHANNEL	TX Channel 110	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	FUNCTION	Average (AV)

		ANTENNA	DOL ADITY	o TEST DIS	TANCE, HO	DIZONTAL	AT 2 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m) (dB) ANTENNA TABLE RAW VALUE (m) (Degree) (dBuV)		MARGIN HEIGHT ANGLE VALUE FAC		CORRECTION FACTOR (dB/m)	
1	*5550.00	90.5 PK			1.00 H	221	49.76	40.73
2	*5550.00	75.5 AV			1.00 H	221	34.72	40.73
3	11100.00	53.3 PK	74.0	-20.7	1.00 H	0	5.95	47.34
4	11100.00	42.2 AV	54.0	-11.9	1.00 H	0	-5.19	47.34
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	-
NO.   FREQ. (MHz)   EMISSION LEVEL (dBuV/m)   LIMIT (dBuV/m)   (dB)   (m)   (Degree)   (dBuV)   (dBuV/m)   (dB)   (dBuV/m)   (dB)   (dBuV/m)   (dB)   (dBuV/m)   (dBu								
1	*5550.00	89.6 PK			1.00 V	248	48.83	40.73
2	*5550.00	74.3 AV			1.00 V	248	33.52	40.73
3	11100.00	54.7 PK	74.0	-19.3	1.00 V	58	7.32	47.34
4	11100.00	43.3 AV	54.0	-10.8	1.00 V	58	-4.09	47.34

#### **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.

Email: customerservice.dg@cn.bureauveritas.com



CHANNEL	TX Channel 134	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5670.00	93.5 PK			1.00 H	112	52.42	41.05
2	*5670.00	78.3 AV			1.00 H	112	37.21	41.05
3	#5725.00	57.2 PK	68.3	-11.1	1.00 H	112	16.03	41.19
4	11340.00	55.3 PK	74.0	-18.8	1.00 H	28	7.70	47.55
5	11340.00	43.3 AV	54.0	-10.7	1.00 H	28	-4.26	47.55
		ANTENNA	POLARITY	& TEST D	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	*5670.00	90.4 PK			1.00 V	118	49.30	41.05
2	*5670.00	75.6 AV			1.00 V	118	34.57	41.05
3	#5725.00	57.5 PK	68.3	-10.8	1.00 V	118	16.26	41.19
4	11340.00	56.4 PK	74.0	-17.6	1.00 V	47	8.81	47.55
5	11340.00	45.2 AV	54.0	-8.8	1.00 V	47	-2.35	47.55

#### **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



#### 4.2 CONDUCTED EMISSION MEASUREMENT

#### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTE	D 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.

#### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	100340	May 11,15	May 10,16
<b>Artificial Mains Network</b>	Rohde&Schwarz	ENV216	101173	April 25,15	April 24,16
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	April 25,15	April 24,16
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.

#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit 20dB) was not recorded.

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

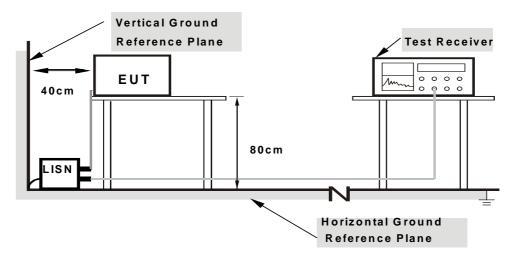
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

## 4.2.5 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).

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

Tel: +86 769 8593 5656

Fax: +86 769 8593 1080



## 4.2.7 TEST RESULTS

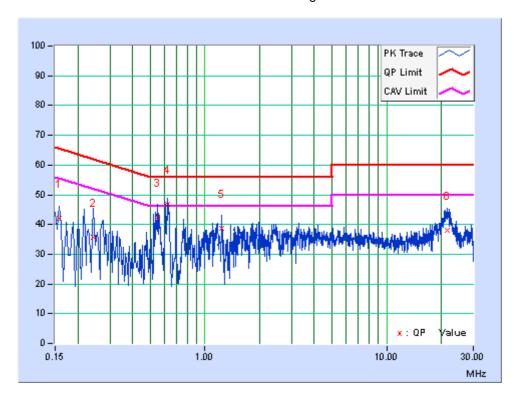
#### **CONDUCTED WORST-CASE DATA: 802.11a**

PHASE	Line	6dB BANDWIDTH	9kHz
CHANNEL	Channel 36		

No	Freq. [MHz]	Corr. Factor	ctor [dB (uV)] [dB (uV)] [dB (uV			Maı (d	rgin B)			
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	10.94	31.2	17.34	42.14	28.28	65.58	55.58	-23.44	-27.3
2	0.24384	10.76	25.02	14.48	35.78	25.24	61.96	51.96	-26.18	-26.72
3	0.54882	10.67	31.85	23.88	42.52	34.55	56	46	-13.48	-11.45
4	0.61920	10.63	36.31	28.21	46.94	38.84	56	46	-9.06	-7.16
5	1.23698	10.4	28.36	16.5	38.76	26.9	56	46	-17.24	-19.1
6	21.54943	11.18	26.86	14.78	38.04	25.96	60	50	-21.96	-24.04

**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.



Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

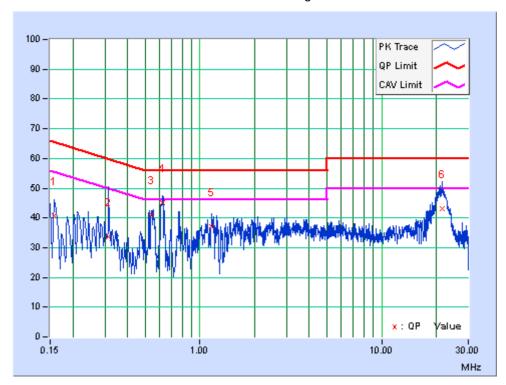


PHASE	Neutral	6dB BANDWIDTH	9kHz
CHANNEL	Channel 36		

No	IIMHTII			g Value (uV)]		on Level (uV)]	Lir [dB (		Maı (d	rgin B)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	10.75	30.04	13.46	40.79	24.21	65.58	55.58	-24.79	-31.37
2	0.31422	10.68	22.85	11.22	33.53	21.9	59.86	49.86	-26.33	-27.96
3	0.54375	10.67	30.38	19.76	41.05	30.43	56	46	-14.95	-15.57
4	0.62359	10.59	34.49	22.78	45.08	33.37	56	46	-10.92	-12.63
5	1.15878	10.27	26.69	14.97	36.96	25.24	56	46	-19.04	-20.76
6	21.48687	11.11	31.98	15.97	43.09	27.08	60	50	-16.91	-22.92

**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.



Page 49 of 62

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



#### 4.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

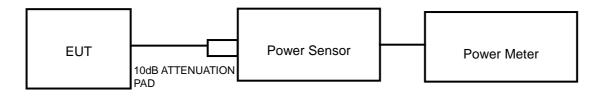
## 4.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

Operation Band		EUT Category	LIMIT
		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≤ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
U-NII-1		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	$\sqrt{}$	Mobile and Portable client device	250mW (24 dBm)
U-NII-2A		$\sqrt{}$	250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C		$\sqrt{}$	250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3			1 Watt (30 dBm)

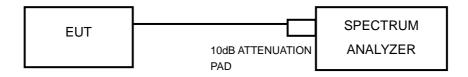
NOTE: Where B is the 26dB emission bandwidth in MHz.

## 4.3.2 TEST SETUP

## FOR POWER OUTPUT MEASUREMENT



#### **FOR 26dB BANDWIDTH**



Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 4.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (10Hz–40GHz)	Rohde&Schwarz	FSV40	101003	Apr. 07,15	Apr. 06,16
Power Meter	Anritsu	ML2495A	1139001	Feb. 20,15	Feb. 19,16
Power Sensor	Anritsu	MA2411B	1126068	Feb. 20,15	Feb. 19,16
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,15	Feb. 17,16
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,15	Feb. 17,16
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct. 11, 16

### NOTE:

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

## 4.3.4 TEST PROCEDURE

#### FOR POWER MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

## **FOR 26dB BANDWIDTH**

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

## 4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

Guangdong 523942, China

Email: <a href="mailto:customerservice.dg@cn.bureauveritas.com">customerservice.dg@cn.bureauveritas.com</a>

Tel: +86 769 8593 5656

Fax: +86 769 8593 1080



#### 4.3.6 **EUT OPERATING CONDITIONS**

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

#### 4.3.7 TEST RESULTS

#### **OUTPUT POWER:**

## 802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	7.691	8.86	24	PASS
40	5200	8.472	9.28	24	PASS
48	5240	6.982	8.44	24	PASS
52	5260	8.356	9.22	24	PASS
60	5300	7.998	9.03	24	PASS
64	5320	8.185	9.13	24	PASS
100	5500	8.072	9.07	24	PASS
116	5580	8.318	9.20	24	PASS
140	5700	8.110	9.09	24	PASS

#### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz) AVERAGE POWER (mW)		AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	7.762	8.90	24	PASS
40	5200	8.650	9.37	24	PASS
48	5240	8.260	9.17	24	PASS
52	5260	7.980	9.02	24	PASS
60	5300	8.128	9.10	24	PASS
64	5320	8.492	9.29	24	PASS
100	5500	6.902	8.39	24	PASS
116	5580	7.362	8.67	24	PASS
140	5700	7.328	8.65	24	PASS

Branch

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	8.185	9.13	24	PASS
46	5230	7.638	8.83	24	PASS
54	5270	8.453	9.27	24	PASS
62	5310	8.492	9.29	24	PASS
102	5510	7.674	8.85	24	PASS
110	5550	7.396	8.69	24	PASS
134	5670	7.816	8.93	24	PASS

## **26dB BANDWIDTH:**

#### 802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	20.86	PASS
40	5200	20.28	PASS
48	5240	20.42	PASS
52	5260	20.89	PASS
60	5300	20.19	PASS
64	5320	21.56	PASS
100	5500	20.78	PASS
116	5580	20.34	PASS
132	5660	20.45	PASS
140	5700	20.17	PASS

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: <u>customerservice.dg@cn.bureauveritas.com</u>



# 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	20.95	PASS
40	5200	20.59	PASS
48	5240	21.15	PASS
52	5260	21.01	PASS
60	5300	20.78	PASS
64	5320	20.63	PASS
100	5500	20.94	PASS
116	5580	21.52	PASS
132	5660	21.32	PASS
140	5700	21.08	PASS

## 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	43.32	PASS
46	5230	42.77	PASS
54	5270	43.59	PASS
62	5310	44.09	PASS
102	5510	43.53	PASS
110	5550	43.58	PASS
134	5670	43.94	PASS

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: <u>customerservice.dg@cn.bureauveritas.com</u>

## 4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

#### 4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
		Outdoor Access Point	
11 NIII 4		Fixed point-to-point Access Point	17dBm/ MHz
U-NII-1		Indoor Access Point	
	$\sqrt{}$	Mobile and Portable client device	11dBm/ MHz
U-NII-2A		$\sqrt{}$	11dBm/ MHz
U-NII-2C		√ ·	11dBm/ MHz
U-NII-3			30dBm/ 500kHz

#### 4.4.2 TEST SETUP



#### 4.4.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

## 4.4.4 TEST PROCEDURES

Using method SA-1

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 KHz, Set VBW ≥ 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value



## 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

## 4.4.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 4.4.7 TEST RESULTS

## For U-NII-1, U-NII-2A & U-NII-2C:

#### 802.11a

CHANNEL	FREQUENCY (MHz)	PSD w/o Duty Factor	Duty Factor	PSD with Duty Factor	MAXIMUM LIMIT	PASS/FAIL
	()	(dBm/MHz)		(dBm/MHz)	(dBm/MHz)	
36	5180	3.81	0.55	4.36	11	PASS
40	5200	3.86	0.55	4.41	11	PASS
48	5240	4.01	0.55	4.56	11	PASS
52	5260	2.79	0.55	3.34	11	PASS
60	5300	3.36	0.55	3.91	11	PASS
64	5320	3.83	0.55	4.38	11	PASS
100	5500	1.61	0.55	2.16	11	PASS
116	5580	2.22	0.55	2.77	11	PASS
140	5700	2.35	0.55	2.90	11	PASS

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



## 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor	PSD with Duty Factor (dBm/MHz)	MAXIMUM LIMIT (dBm/MHz)	PASS/FAIL
36	5180	2.37	0.59	2.96	11	PASS
40	5200	2.68	0.59	2.27	11	PASS
48	5240	2.20	0.59	2.79	11	PASS
52	5260	2.84	0.59	2.43	11	PASS
60	5300	3.21	0.59	3.80	11	PASS
64	5320	3.08	0.59	3.67	11	PASS
100	5500	1.60	0.59	2.19	11	PASS
116	5580	1.60	0.59	2.19	11	PASS
140	5700	2.26	0.59	2.85	11	PASS

## 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor	PSD with Duty Factor (dBm/MHz)	MAXIMUM LIMIT (dBm/MHz)	PASS/FAIL
38	5190	-0.66	1.12	0.46	11	PASS
46	5230	-0.96	1.12	0.16	11	PASS
54	5270	-9.60	1.12	-8.58	11	PASS
62	5310	0.02	1.12	1.14	11	PASS
102	5510	-0.89	1.12	0.23	11	PASS
110	5550	-1.14	1.12	-0.02	11	PASS
134	5670	-0.65	1.12	0.47	11	PASS

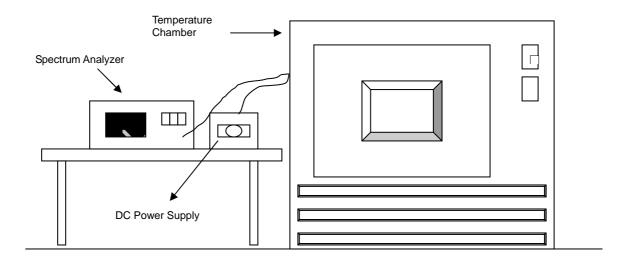
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

## 4.5 FREQUENCY STABILITY

## 4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation

## 4.5.2 TEST SETUP



## 4.5.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: <u>customerservice.dg@cn.bureauveritas.com</u>



#### 4.5.4 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

#### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

## 4.5.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



#### 4.5.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.												
OPERATING FREQUENCY: 5320MHz												
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTES		5 MINUTES		10 MINUTE				
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)			
50	3.8	5320.0157	0.0002951	5320.0075	0.0001410	5320.0143	0.0002688	5320.0164	0.0003083			
40	3.8	5320.0035	0.0000658	5319.9971	-0.0000545	5320.0042	0.0000789	5319.9985	-0.0000282			
30	3.8	5319.9786	-0.0004023	5319.9854	-0.0002744	5319.9773	-0.0004267	5319.9862	-0.0002594			
20	3.8	5319.9871	-0.0002425	5319.9812	-0.0003534	5319.9787	-0.0004004	5319.9805	-0.0003665			
10	3.8	5319.9772	-0.0004286	5319.9778	-0.0004173	5319.9768	-0.0004361	5319.9743	-0.0004831			
0	3.8	5320.0098	0.0001842	5320.0119	0.0002237	5320.0104	0.0001955	5320.0149	0.0002801			
-10	3.8	5319.9883	-0.0002199	5319.9909	-0.0001711	5319.9818	-0.0003421	5319.9808	-0.0003609			
-20	3.8	5320.0233	0.0004380	5320.0216	0.0004060	5320.0228	0.0004286	5320.0221	0.0004154			
-30	3.8	5320.0038	0.0000714	5320.0046	0.0000865	5320.0025	0.0000470	5320.0011	0.0000207			

FREQUEMCY STABILITY VERSUS VOLTAGE												
OPERATING FREQUENCY: 5320MHz												
<b>TEMP.</b> (℃)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE				
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)			
20	4.35	5319.9876	-0.0002331	5319.9808	-0.0003609	5319.9783	-0.0004079	5319.9824	-0.0003308			
	3.8	5319.9871	-0.0002425	5319.9812	-0.0003534	5319.9787	-0.0004004	5319.9805	-0.0003665			
	3.5	5319.9868	-0.0002481	5319.9802	-0.0003722	5319.9776	-0.0004211	5319.9816	-0.0003459			

Guangdong 523942, China

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: <u>customerservice.dg@cn.bureauveritas.com</u>



# 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



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

No modifications were made to the EUT by the lab during the test.

---END---

Tel: +86 769 8593 5656 Fax: +86 769 8593 1080