

FCC TEST REPORT

(Part 15, Subpart E)


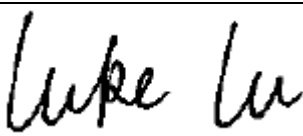
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Address:	313 Bldg 7, Qianhai Shenzhen-Hong Kong Youth Innovation and Entrepreneur Hub, 35 Qianwan 1st Rd, Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone, Shenzhen, Guangdong Province, China

Manufacturer or Supplier:	Shenzhen GJS technology Co., LTD.
Address:	313 Bldg 7, Qianhai Shenzhen-Hong Kong Youth Innovation and Entrepreneur Hub, 35 Qianwan 1st Rd, Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone, Shenzhen, Guangdong Province, China
Product:	GANKER EX Joystick Controller
Brand Name:	GJS ROBOT
Model Name:	G50500
FCC ID:	2A14F-G50500
Date of tests:	Jul. 03, 2019 ~ Jul. 29, 2019

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

☒ **FCC Part 15, Subpart E, Section 15.407**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Jul. 31, 2019	 Date: Jul. 31, 2019

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Test Report No.: RF190702W004

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF190702W004	Original release	Jul. 31, 2019

1 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 -15.47dB at 23.184000MHz.
15.407(b) (1/2/3/4/6)	Radiated Emission & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -2.31dB at 83.35MHz.
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(a) (1),(5)	26 dB Bandwidth	PASS	Meet the requirement of limit. (for U-NII-1 Band)
15.407(e)	6 dB Bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

1.1 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	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
All Radiated emissions	±4.48dB
Conducted emissions	±2 dB
Occupied Channel Bandwidth	±21.7KHz
Conducted Output power	±1.03 dB
Power Spectral Density	±0.95 dB

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	GANKER EX Joystick Controller
BRAND NAME	GJS ROBOT
MODEL NAME	G50500
NOMINAL VOLTAGE	5Vdc (adapter or host equipment) 3.7Vdc 1500mA(Li-ion, 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, 5745 ~ 5805MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 5745 ~ 5805MHz: 4 for 802.11a, 802.11n (20MHz)
AVERAGE POWER	18.18dBm for 5180 ~ 5240MHz 18.28dBm for 5745 ~ 5805MHz
ANTENNA TYPE	5180 ~ 5240MHz: PCB Antenna0 with 1.07dBi gain 5180 ~ 5240MHz: PCB Antenna1 with 1.07dBi gain 5745 ~ 5805MHz: PCB Antenna0 with 1.07dBi gain 5745 ~ 5805MHz: PCB Antenna1 with 1.07dBi gain
HW VERSION	V4.0
SW VERSION	V0.32
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: non-shielded, detachable, 0.3m

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function with 802.11a mode and a MIMO function with 802.11n (20MHz) mode. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11a	1TX/1RX diversity
802.11n (20MHz)	2TX/2RX

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

2.2 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

FOR 5725 ~ 5805MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	157	5785 MHz
153	5765 MHz	161	5805 MHz



2.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE<1G	PLC	APCM	
A	-	-	√	-	Powered by Adapter with wifi(5G) link
B	√	√	-	√	Powered by Battery with wifi(5G) link
C	-	-	-	-	Powered by USB with wifi(5G) link

Where

RE \geq 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 **X-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)
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
B	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	MCS0
B	802.11a	5725-5805	149 to 161	149, 157, 161	OFDM	BPSK	6.0
B	802.11n (20MHz)		149 to 161	149, 157, 161	OFDM	BPSK	MCS0

**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)
B	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)
A	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)
B	802.11a	5180-5240	36 to 48	36, 48	OFDM	BPSK	6.0
B	802.11n (20MHz)		36 to 48	36, 48	OFDM	BPSK	MCS0
B	802.11a	5725-5805	149 to 161	149, 161	OFDM	BPSK	6.0
B	802.11n (20MHz)		149 to 161	149, 161	OFDM	BPSK	MCS0

**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)
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
B	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	MCS0
B	802.11a	5725-5805	149 to 161	149, 161	OFDM	BPSK	6.0
B	802.11n (20MHz)		149 to 161	149, 161	OFDM	BPSK	MCS0

TEST CONDITION:

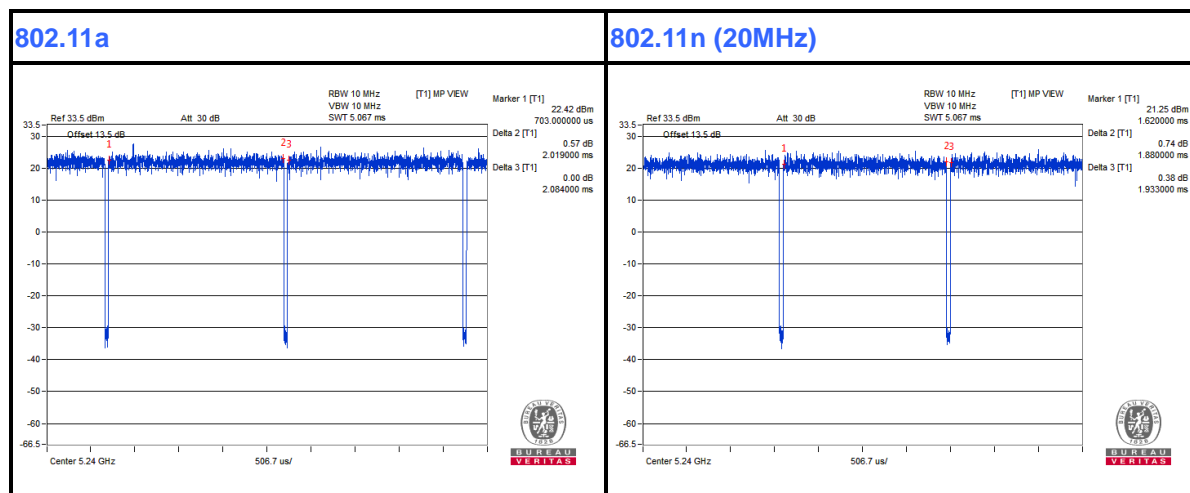
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE<1G	23deg. C, 70%RH	DC 3.7V from battery	Tony Xiong
RE≥1G	23deg. C, 70%RH	DC 3.7V from battery	Tony Xiong
PLC	23deg. C, 70%RH	DC 5V from adapter	Jacky Liu
APCM	23deg. C, 70%RH	DC 3.7V from battery	Walker Ye

2.3 DUTY CYCLE OF TEST SIGNAL

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

802.11a: Duty cycle = $2.019/2.084 = 0.969$, Duty factor = $10 * \log(1/0.969) = 0.138$

802.11n (20MHz): Duty cycle = $1.880/1.933 = 0.973$, Duty factor = $10 * \log(1/0.973) = 0.121$





2.4 DESCRIPTION OF SUPPORT UNITS

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

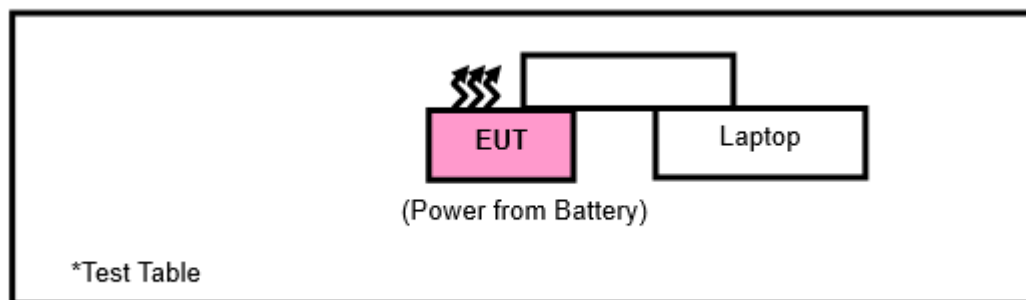
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Laptop	Lenovo	Thnikpad L440	R90FTFKN	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m

NOTE:

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

2.4.1 CONFIGURATION OF SYSTEM UNDER TEST



2.5 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)

KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

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 (Certification). The test report has been issued separately.

3 TEST TYPES AND RESULTS

3.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

3.1.1 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.

3.1.2 LIMITS OF UNWANTED EMISSION

RESTRICTED BANDS	APPLICABLE TO	LIMIT	
	789033 D02 General UNII Test Procedures New Rules v01r02	FIELD STRENGTH AT 3m (dBμV/m)	
		PK : 74	AV : 54
OUT OF THE RESTRICTED BANDS	APPLICABLE TO	EIRP LIMIT (dBm/MHz)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m)
	15.407(b)(1)	PK : -27	PK : 68.3
	15.407(b)(4)	See note 2 (FCC 16-24)	

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

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

2. All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

3.1.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Feb. 26,19	Feb. 25,20
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
Horn Antenna	ETS-LINDGREN	3117	00168728	Feb. 26,19	Feb. 25,20
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Nov. 21, 18	Nov. 20, 19
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jul. 09,19	Jul. 08, 20
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jun. 24,19	Jun. 23,20

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 3m Chamber.
3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

3.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The 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:

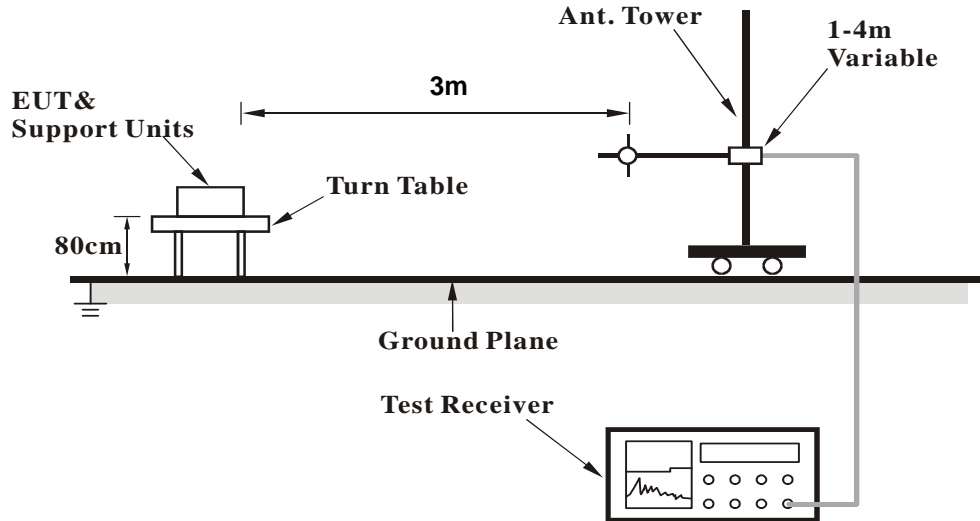
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency 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.

3.1.5 DEVIATION FROM TEST STANDARD

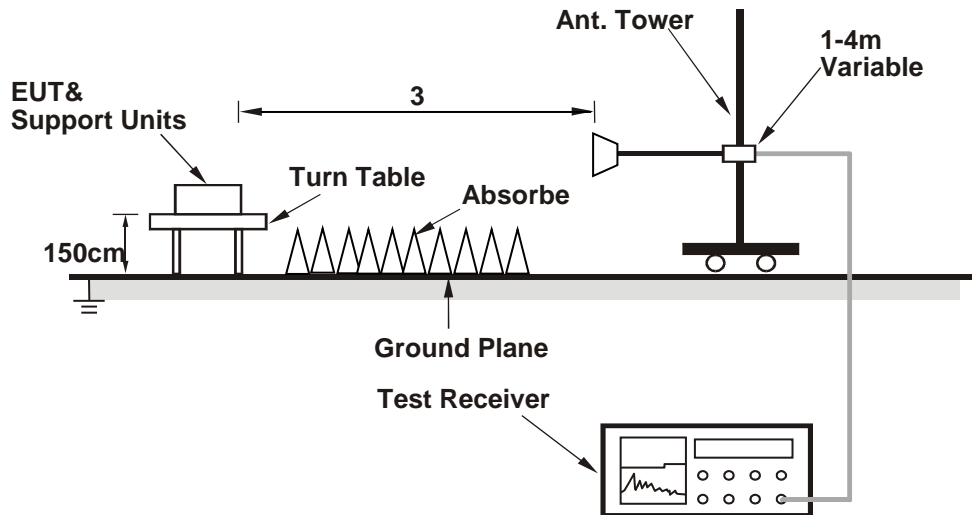
No deviation.

3.1.6 TEST SETUP

< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



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



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3.1.7 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.

3.1.8 TEST RESULTS

BELOW 1GHz WORST-CASE

30 MHz – 1GHz data:

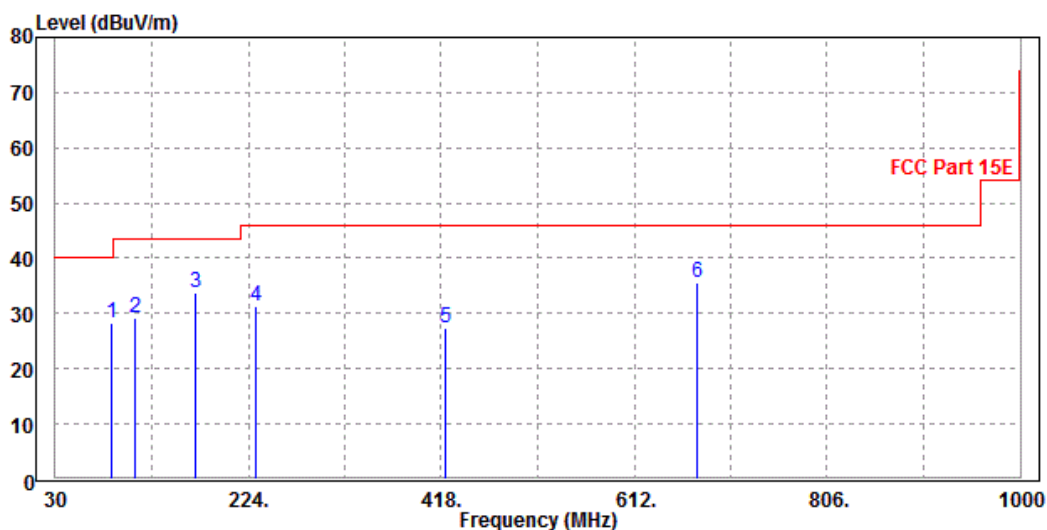
802.11a TEST DATA FROM ANT 0:

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
86.26	28.2	55.88	40	-11.8	8.35	1.25	37.28	100	0	Peak
109.54	29.19	55.8	43.5	-14.31	9.13	1.38	37.12	100	0	Peak
171.62	33.88	58.5	43.5	-9.62	10.38	1.68	36.68	100	0	Peak
231.76	31.26	53.72	46	-14.74	12.2	1.95	36.61	100	0	Peak
422.85	27.28	43.95	46	-18.72	17.5	2.7	36.87	100	0	Peak
675.05	35.64	47.41	46	-10.36	22.28	3.44	37.49	100	0	Peak

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.

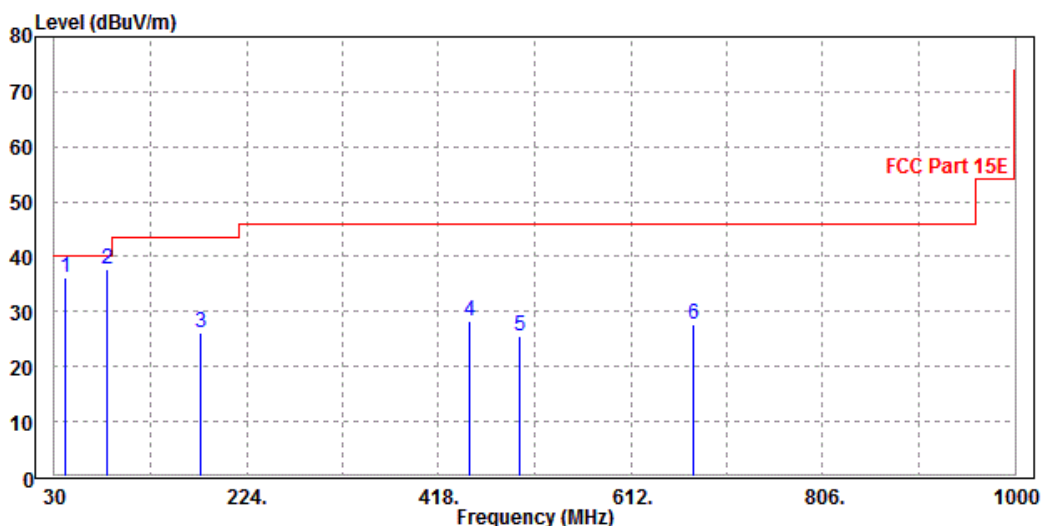


CHANNEL	Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	36.27	59.96	40	-3.73	12.88	0.93	37.5	100	360	Peak
83.35	37.69	65.37	40	-2.31	8.4	1.23	37.31	100	360	Peak
178.41	26.05	50.6	43.5	-17.45	10.4	1.7	36.65	100	360	Peak
450.01	28.28	44.39	46	-17.72	18	2.81	36.92	100	360	Peak
500.45	25.42	40.72	46	-20.58	18.71	2.99	37	100	360	Peak
675.05	27.82	39.59	46	-18.18	22.28	3.44	37.49	100	360	Peak

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.



**ABOVE 1GHz WORST-CASE:**

Note: For higher frequency, the emission is too low to be detected.

Band 1**802.11a TEST DATA FROM ANT 0:**

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	63.78	66.76	74	-10.22	35.95	7.42	46.35	200	73	Peak
5150	50.94	53.92	54	-3.06	35.95	7.42	46.35	200	73	Average
5180	105.57	108.51			35.98	7.43	46.35	200	73	Peak
5180	96.78	99.72			35.98	7.43	46.35	200	73	Average
5350	58.51	61.19	74	-15.49	36.15	7.47	46.3	200	73	Peak
5350	45.06	47.74	54	-8.94	36.15	7.47	46.3	200	73	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	63.8	66.44	74	-10.2	36.29	7.42	46.35	100	290	Peak
5150	49.03	51.67	54	-4.97	36.29	7.42	46.35	100	290	Average
5180	105.65	108.26	74			7.43	46.35	100	290	Peak
5180	95.87	98.48	54			7.43	46.35	100	290	Average
5350	57.93	60.35	74	-16.07	36.41	7.47	46.3	100	290	Peak
5350	44.63	47.05	54	-9.37	36.41	7.47	46.3	100	290	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5180MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	62.21	65.19	74	-11.79	35.95	7.42	46.35	200	72	Peak
5150	50.37	53.35	54	-3.63	35.95	7.42	46.35	200	72	Average
5200	109.3	112.21			36	7.43	46.34	200	72	Peak
5200	99.5	102.41			36	7.43	46.34	200	72	Average
5350	58.83	61.51	74	-15.17	36.15	7.47	46.3	200	72	Peak
5350	45.47	48.15	54	-8.53	36.15	7.47	46.3	200	72	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	60.75	63.39	74	-13.25	36.29	7.42	46.35	100	215	Peak
5150	48.65	51.29	54	-5.35	36.29	7.42	46.35	100	215	Average
5200	108.33	110.92			36.32	7.43	46.34	100	215	Peak
5200	98.94	101.53			36.32	7.43	46.34	100	215	Average
5350	58.22	60.64	74	-15.78	36.41	7.47	46.3	100	215	Peak
5350	45.1	47.52	54	-8.9	36.41	7.47	46.3	100	215	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 5200MHz: Fundamental frequency.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	60.02	63	74	-13.98	35.95	7.42	46.35	100	98	Peak
5150	46.6	49.58	54	-7.4	35.95	7.42	46.35	100	98	Average
5240	108.98	111.83			36.04	7.44	46.33	100	98	Peak
5240	99.61	102.46			36.04	7.44	46.33	100	98	Average
5350	57.46	60.14	74	-16.54	36.15	7.47	46.3	100	98	Peak
5350	45.01	47.69	54	-8.99	36.15	7.47	46.3	100	98	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	60.87	63.51	74	-13.13	36.29	7.42	46.35	154	47	Peak
5150	47.75	50.39	54	-6.25	36.29	7.42	46.35	154	47	Average
5240	110.72	113.27			36.34	7.44	46.33	154	47	Peak
5240	101.71	104.26			36.34	7.44	46.33	154	47	Average
5350	58.26	60.68	74	-15.74	36.41	7.47	46.3	154	47	Peak
5350	45.51	47.93	54	-8.49	36.41	7.47	46.3	154	47	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 5240MHz: Fundamental frequency.



802.11n (20MHz) TEST DATA FROM ANT 0+ANT1:

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	61.65	64.63	74	-12.35	35.95	7.42	46.35	120	95	Peak
5150	49.04	52.02	54	-4.96	35.95	7.42	46.35	120	95	Average
5180	108.68	111.62			35.98	7.43	46.35	120	95	Peak
5180	98.91	101.85			35.98	7.43	46.35	120	95	Average
5350	58.12	60.8	74	-15.88	36.15	7.47	46.3	120	95	Peak
5350	45.35	48.03	54	-8.65	36.15	7.47	46.3	120	95	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	60.37	63.01	74	-13.63	36.29	7.42	46.35	100	215	Peak
5150	47.33	49.97	54	-6.67	36.29	7.42	46.35	100	215	Average
5180	104.41	107.02			36.31	7.43	46.35	100	215	Peak
5180	95.48	98.09			36.31	7.43	46.35	100	215	Average
5350	58.65	61.07	74	-15.35	36.41	7.47	46.3	100	215	Peak
5350	45.28	47.7	54	-8.72	36.41	7.47	46.3	100	215	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 5180MHz: Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	60.31	63.29	74	-13.69	35.95	7.42	46.35	157	96	Peak
5150	47.25	50.23	54	-6.75	35.95	7.42	46.35	157	96	Average
5200	106.05	108.96			36	7.43	46.34	157	96	Peak
5200	96.36	99.27			36	7.43	46.34	157	96	Average
5350	56.96	59.64	74	-17.04	36.15	7.47	46.3	157	96	Peak
5350	44.76	47.44	54	-9.24	36.15	7.47	46.3	157	96	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	59.55	62.19	74	-14.45	36.29	7.42	46.35	100	220	Peak
5150	46.45	49.09	54	-7.55	36.29	7.42	46.35	100	220	Average
5200	103.03	105.62			36.32	7.43	46.34	100	220	Peak
5200	94.33	96.92			36.32	7.43	46.34	100	220	Average
5350	57.7	60.12	74	-16.3	36.41	7.47	46.3	100	220	Peak
5350	44.92	47.34	54	-9.08	36.41	7.47	46.3	100	220	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 5200MHz: Fundamental frequency.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	59.79	62.77	74	-14.21	35.95	7.42	46.35	158	104	Peak
5150	46.64	49.62	54	-7.36	35.95	7.42	46.35	158	104	Average
5240	106.69	109.54			36.04	7.44	46.33	158	104	Peak
5240	97.06	99.91			36.04	7.44	46.33	158	104	Average
5350	59.1	61.78	74	-14.9	36.15	7.47	46.3	158	104	Peak
5350	45.18	47.86	54	-8.82	36.15	7.47	46.3	158	104	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5150	59.19	61.83	74	-14.81	36.29	7.42	46.35	100	215	Peak
5150	46.41	49.05	54	-7.59	36.29	7.42	46.35	100	215	Average
5240	105.48	108.03			36.34	7.44	46.33	100	215	Peak
5240	95.12	97.67			36.34	7.44	46.33	100	215	Average
5350	57.8	60.22	74	-16.2	36.41	7.47	46.3	100	215	Peak
5350	45.23	47.65	54	-8.77	36.41	7.47	46.3	100	215	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
2. 5240MHz: Fundamental frequency.

Band 4

802.11a TEST DATA FROM ANT 0:

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	110.41	112.44			36.4	7.75	46.18	200	84	Peak
5745	100.22	102.25			36.4	7.75	46.18	200	84	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	109.35	111.13			36.65	7.75	46.18	100	12	Peak
5745	100.1	101.88			36.65	7.75	46.18	100	12	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5745MHz: Fundamental frequency.

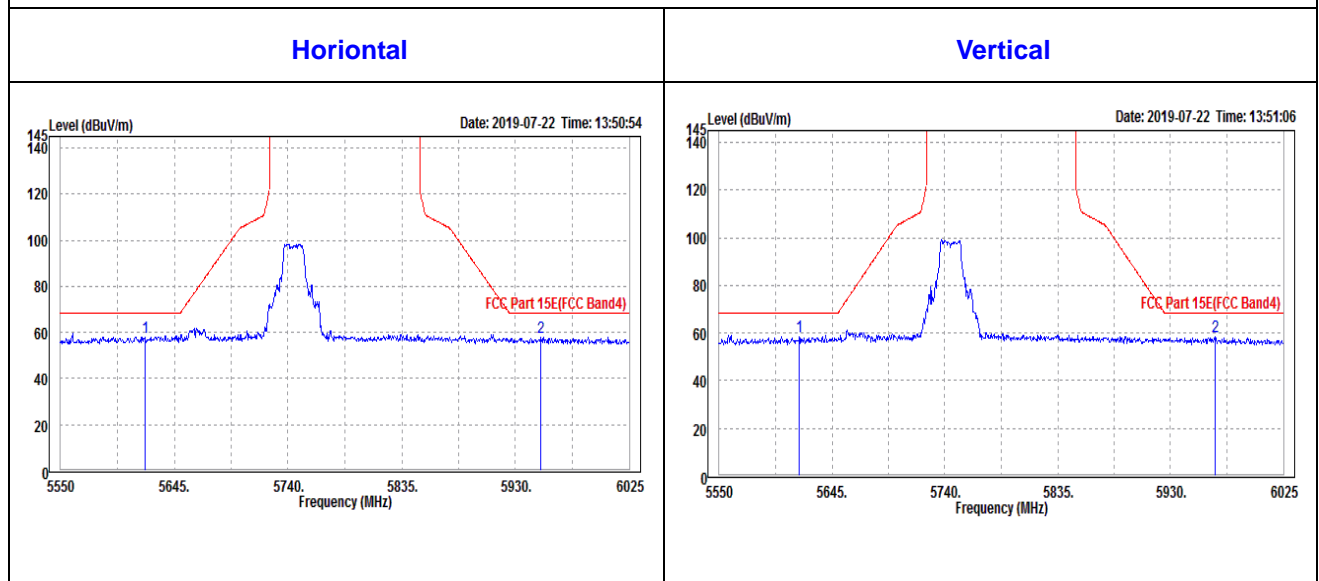


OOBE DATA

802.11a TEST DATA FROM ANT 0:

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5620.3	58.15	60.4	68.3	-10.15	36.35	7.62	46.22	100	0	Peak
5951.375	57.86	59.54	68.3	-10.44	36.48	7.96	46.12	100	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5617.45	58.17	60.2	68.3	-10.13	36.57	7.62	46.22	200	0	Peak
5967.525	58.41	59.77	68.3	-9.89	36.78	7.98	46.12	200	0	Peak

CH 149





CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	105.85	107.82			36.41	7.79	46.17	200	197	Peak
5785	96.29	98.26			36.41	7.79	46.17	200	197	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	107.55	109.26			36.67	7.79	46.17	120	196	Peak
5785	99.93	101.64			36.67	7.79	46.17	120	196	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5785MHz: Fundamental frequency.

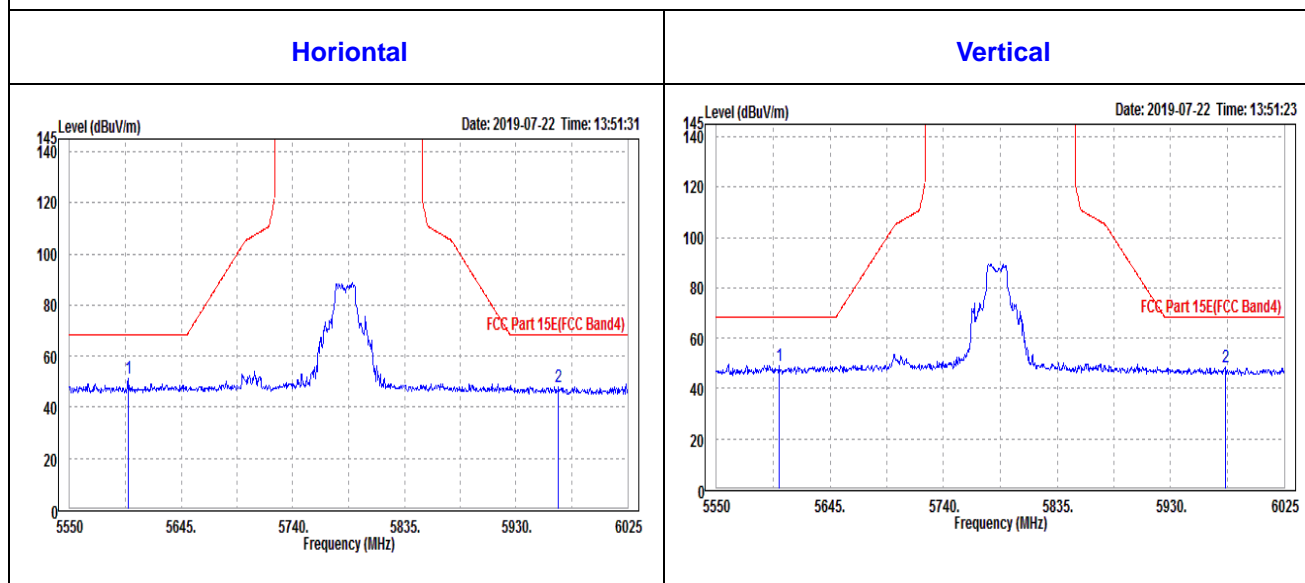


OOBE DATA

802.11a TEST DATA FROM ANT 0:

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5599.875	51.51	53.79	68.3	-16.79	36.34	7.6	46.22	200	0	Peak
5966.1	48.14	49.79	68.3	-20.16	36.49	7.98	46.12	200	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5602.25	49.33	51.39	68.3	-18.97	36.56	7.6	46.22	100	0	Peak
5975.6	48.7	50.04	68.3	-19.6	36.79	7.99	46.12	100	0	Peak

CH 157





CHANNEL	TX Channel 161	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	109.14	111.04			36.43	7.83	46.16	143	118	Peak
5825	100.94	102.84			36.43	7.83	46.16	143	118	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	108.43	110.07			36.69	7.83	46.16	100	161	Peak
5825	100.32	101.96			36.69	7.83	46.16	100	161	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5805MHz: Fundamental frequency.



**BUREAU
VERITAS**

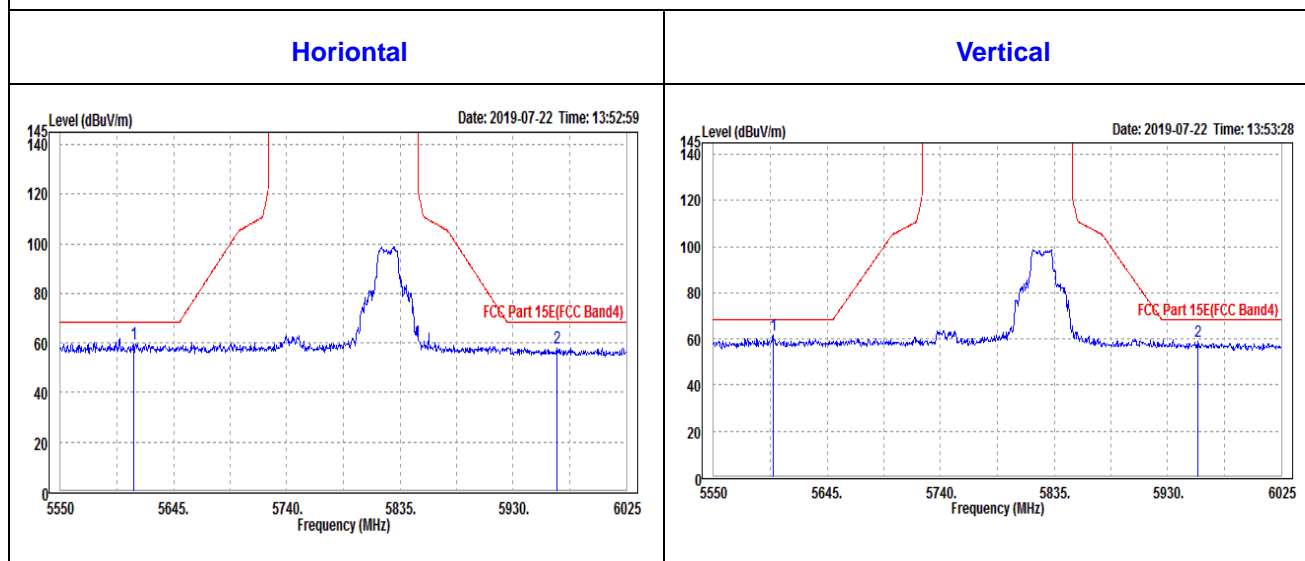
Test Report No.: RF190702W004

OUBE DATA

802.11a TEST DATA FROM ANT 0:

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5611.275	59.79	62.06	68.3	-8.51	36.34	7.61	46.22	200	0	Peak
5966.575	57.63	59.28	68.3	-10.67	36.49	7.98	46.12	200	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5599.875	61.98	64.04	68.3	-6.32	36.56	7.6	46.22	100	0	Peak
5955.175	58.8	60.19	68.3	-9.5	36.77	7.96	46.12	100	0	Peak

CH 161





802.11n (20MHz) TEST DATA FROM ANT 0+ANT1:

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	105.5	107.53			36.4	7.75	46.18	100	144	Peak
5745	97.79	99.82			36.4	7.75	46.18	100	144	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	109	110.78			36.65	7.75	46.18	131	59	Peak
5745	98.76	100.54			36.65	7.75	46.18	131	59	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5745MHz: Fundamental frequency.



**BUREAU
VERITAS**

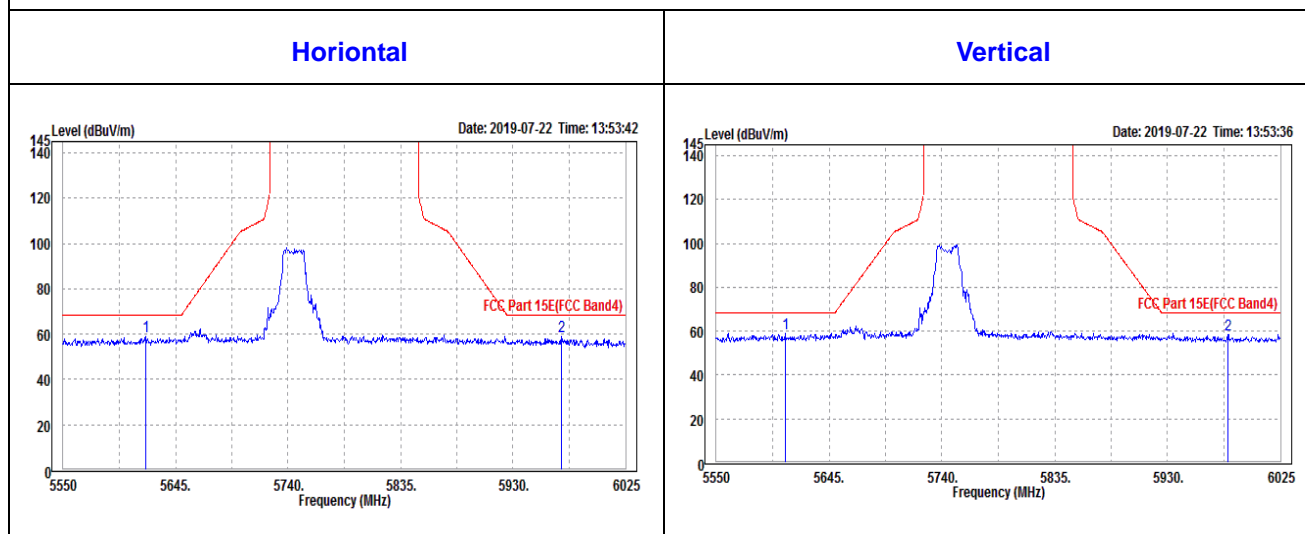
Test Report No.: RF190702W004

OUBE DATA

802.11n (20MHZ) TEST DATA FROM ANT 0+ANT1:

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5619.825	59.07	61.32	68.3	-9.23	36.35	7.62	46.22	100	0	Peak
5970.85	59	60.65	68.3	-9.3	36.49	7.98	46.12	100	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5607.95	58.96	61.01	68.3	-9.34	36.56	7.61	46.22	200	0	Peak
5980.825	58.51	59.85	68.3	-9.79	36.79	7.99	46.12	200	0	Peak

CH 149



CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	107.79	109.76			36.41	7.79	46.17	148	105	Peak
5785	99.23	101.2			36.41	7.79	46.17	148	105	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	107.42	109.13			36.67	7.79	46.17	100	138	Peak
5785	97.87	99.58			36.67	7.79	46.17	100	138	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5785MHz: Fundamental frequency.



**BUREAU
VERITAS**

Test Report No.: RF190702W004

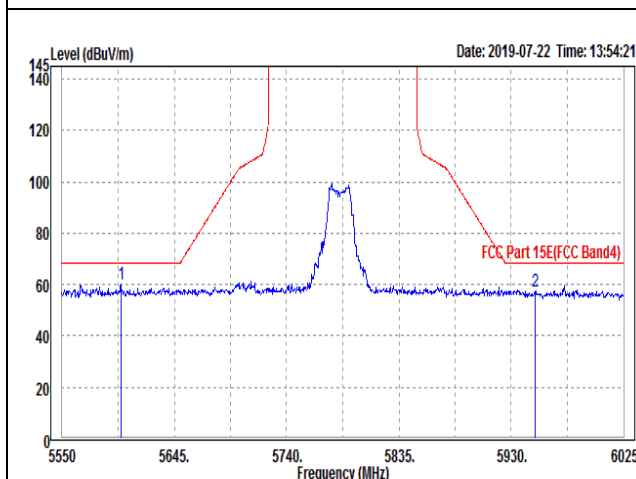
OOBE DATA

802.11n (20MHZ) TEST DATA FROM ANT 0+ANT1:

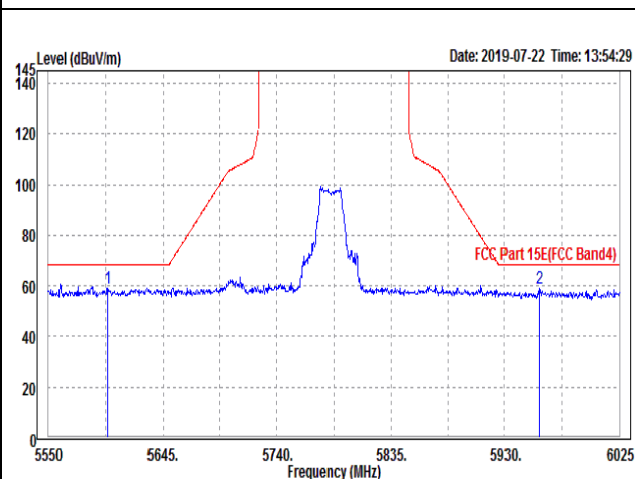
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5599.87 5	60.33	62.61	68.3	-7.97	36.34	7.6	46.22	200	0	Peak
5949.95	57.46	59.14	68.3	-10.84	36.48	7.96	46.12	200	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5598.92 5	59.22	61.28	68.3	-9.08	36.56	7.6	46.22	100	0	Peak
5958.5	58.78	60.15	68.3	-9.52	36.78	7.97	46.12	100	0	Peak

CH 157

Horizontal



Vertical





CHANNEL	TX Channel 161	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	107.23	109.13			36.43	7.83	46.16	119	87	Peak
5825	98.34	100.24			36.43	7.83	46.16	119	87	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	107.51	109.15			36.69	7.83	46.16	100	200	Peak
5825	98.61	100.25			36.69	7.83	46.16	100	200	Average

REMARKS:

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
Margin value = Emission level – Limit value.
- 5805MHz: Fundamental frequency.



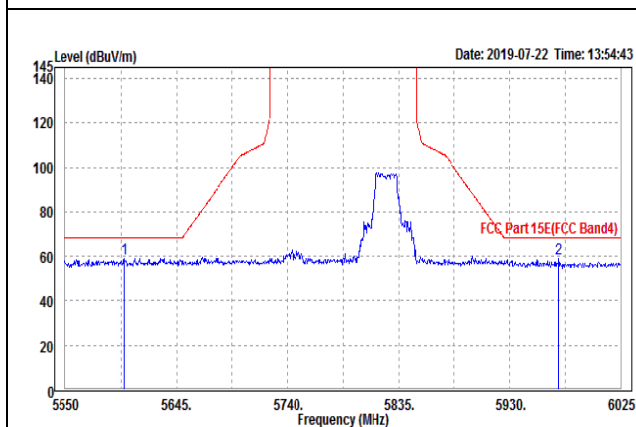
OOBE DATA

802.11n (20MHZ) TEST DATA FROM ANT 0+ANT1:

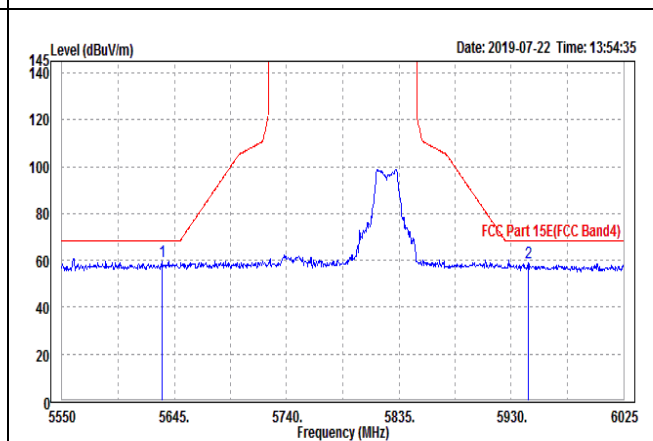
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5599.875	59.12	61.4	68.3	-9.18	36.34	7.6	46.22	100	0	Peak
5971.8	59.11	60.76	68.3	-9.19	36.49	7.98	46.12	100	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5635.025	59.73	61.72	68.3	-8.57	36.58	7.64	46.21	200	0	Peak
5944.25	59.11	60.52	68.3	-9.19	36.77	7.95	46.13	200	0	Peak

CH 161

Horizontal



Vertical



3.2 CONDUCTED EMISSION MEASUREMENT

3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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.

- The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
- 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.

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 26,19	Feb. 25,20
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 26,19	Feb. 25,20

NOTE:

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

3.2.3 TEST PROCEDURES

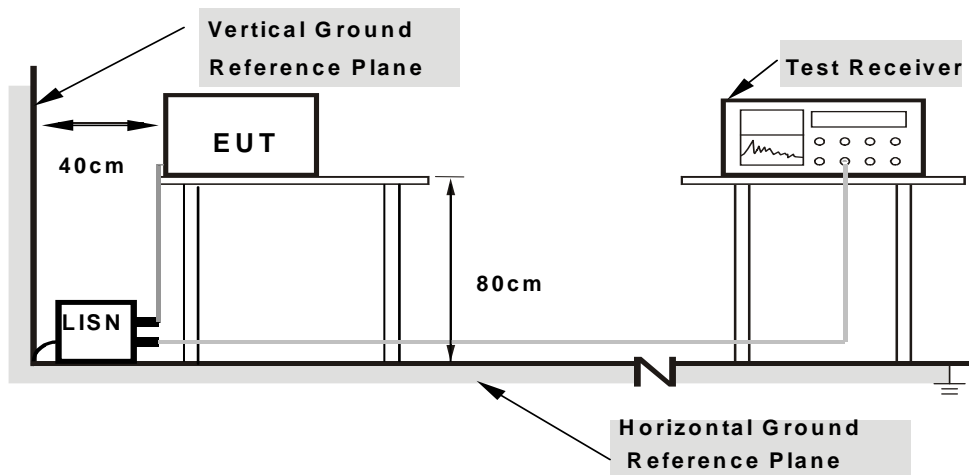
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

3.2.5 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 cm from other units and other metal planes

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

3.2.6 EUT OPERATING CONDITIONS

Same as 3.1.6.

3.2.7 TEST RESULTS

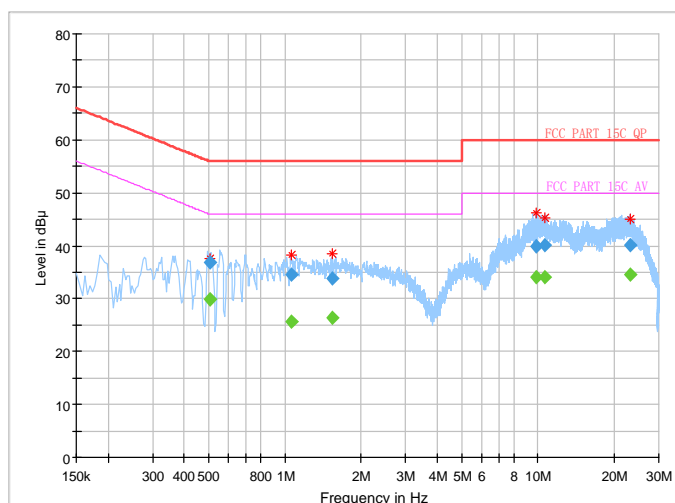
CONDUCTED WORST-CASE TEST DATA FROM 11a MODE ANT 0 :

Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 52RH
Tested By	Jacky Liu	TEST DATE	2019/6/27

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.508000	---	29.94	46.00	-16.06	L	ON	10.1
0.508000	36.81	---	56.00	-19.19	L	ON	10.1
1.060000	---	25.65	46.00	-20.35	L	ON	10.3
1.060000	34.62	---	56.00	-21.38	L	ON	10.3
1.532000	---	26.45	46.00	-19.55	L	ON	10.3
1.532000	33.77	---	56.00	-22.23	L	ON	10.3
9.872000	---	33.98	50.00	-16.02	L	ON	10.6
9.872000	39.95	---	60.00	-20.05	L	ON	10.6
10.696000	---	34.09	50.00	-15.91	L	ON	10.6
10.696000	40.02	---	60.00	-19.98	L	ON	10.6
23.184000	---	34.53	50.00	-15.47	L	ON	11.3
23.184000	40.20	---	60.00	-19.80	L	ON	11.3

- 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.

Full Spectrum

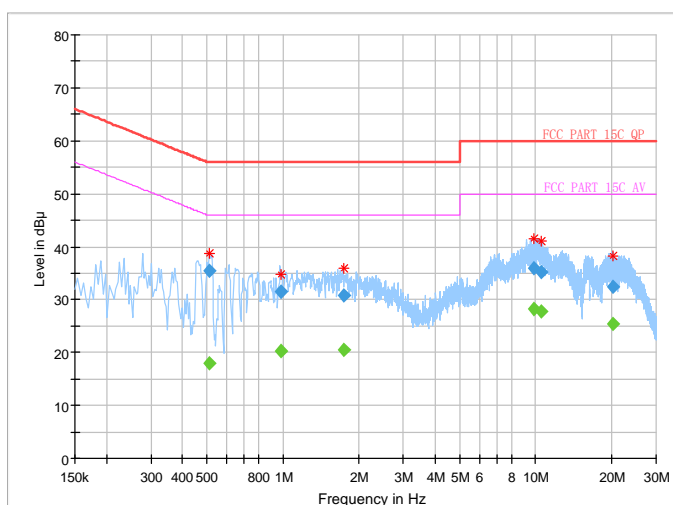


Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 52RH
Tested By	Jacky Liu	TEST DATE	2019/6/27

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.512000	---	18.04	46.00	-27.96	N	ON	9.9
0.512000	35.48	---	56.00	-20.52	N	ON	9.9
0.984000	---	20.23	46.00	-25.77	N	ON	10.0
0.984000	31.38	---	56.00	-24.62	N	ON	10.0
1.740000	---	20.46	46.00	-25.54	N	ON	10.0
1.740000	30.71	---	56.00	-25.29	N	ON	10.0
9.900000	---	28.19	50.00	-21.81	N	ON	10.3
9.900000	35.80	---	60.00	-24.20	N	ON	10.3
10.486000	---	27.86	50.00	-22.14	N	ON	10.3
10.486000	35.13	---	60.00	-24.87	N	ON	10.3
20.204000	---	25.34	50.00	-24.66	N	ON	10.5
20.204000	32.34	---	60.00	-27.66	N	ON	10.5

- 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.

Full Spectrum



3.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

3.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Client devices	250mW (24 dBm)
U-NII-3	√		1 Watt (30 dBm)

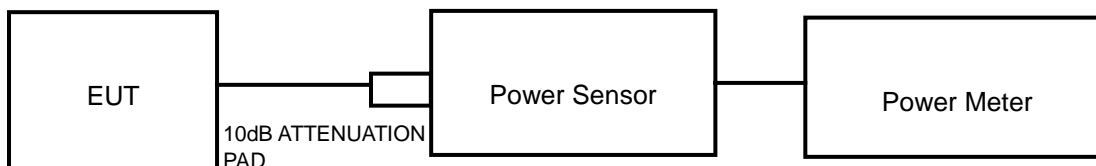
NOTE: Where B is the 26dB emission bandwidth in MHz.



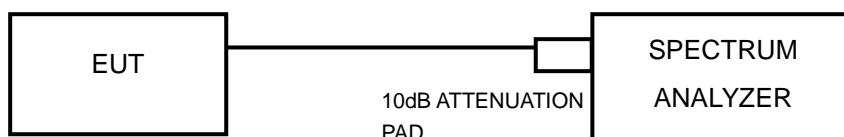
3.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT

802.11a, 802.11n (20MHz), TEST CONFIGURATION



FOR 26dB BANDWIDTH



3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Feb. 26,19	Feb. 25,20
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 26,19	Feb. 25,20

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.

3.3.4 TEST PROCEDURE

FOR POWER MEASUREMENT

For 802.11a, 802.11n (20MHz)

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 99 PERCENT OCCUPIED BANDWIDTH

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

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%.

FOR 6dB BANDWIDTH

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

3.3.6 EUT OPERATING CONDITIONS

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



3.3.7 TEST RESULTS

OUTPUT POWER:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER				POWER LIMIT (dBm)	PASS/FAIL
		ANT 0 (dBm)	ANT 1 (dBm)	Total (mW)	Total (dBm)		
36	5180	15.72	15.65	/	/	24	PASS
40	5200	17.21	16.70	/	/	24	PASS
48	5240	18.18	18.05	/	/	24	PASS
149	5745	18.01	18.21	/	/	30	PASS
157	5785	18.22	18.28	/	/	30	PASS
161	5805	18.06	18.18	/	/	30	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER				POWER LIMIT (dBm)	PASS/FAIL
		ANT 0 (dBm)	ANT 1 (dBm)	Total (mW)	Total (dBm)		
36	5180	15.57	14.53	64.44	18.09	24	PASS
40	5200	15.55	14.58	64.6	18.1	24	PASS
48	5240	15.61	14.55	64.9	18.12	24	PASS
149	5745	15.03	15.34	66.04	18.2	30	PASS
157	5785	15.31	14.93	65.08	18.13	30	PASS
161	5805	15.53	14.47	63.72	18.04	30	PASS

**99% OCCUPIED BANDWIDTH & 26dB BANDWIDTH/6dB BANDWIDTH DATA FROM ANT 0:****802.11a**

CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	26dB BANDWIDTH (MHz)	PASS/FAIL
36	5180	16.86	27.29	PASS
40	5200	16.98	29.24	PASS
48	5240	17.22	32.49	PASS
CHANNEL	CHANNEL FREQUENCY	99% OCCUPIED BANDWIDTH	6dB BANDWIDTH	PASS/FAIL
149	5745	16.80	16.27	PASS
157	5785	18.00	16.08	PASS
161	5805	18.00	16.93	PASS

**802.11n (20MHz)**

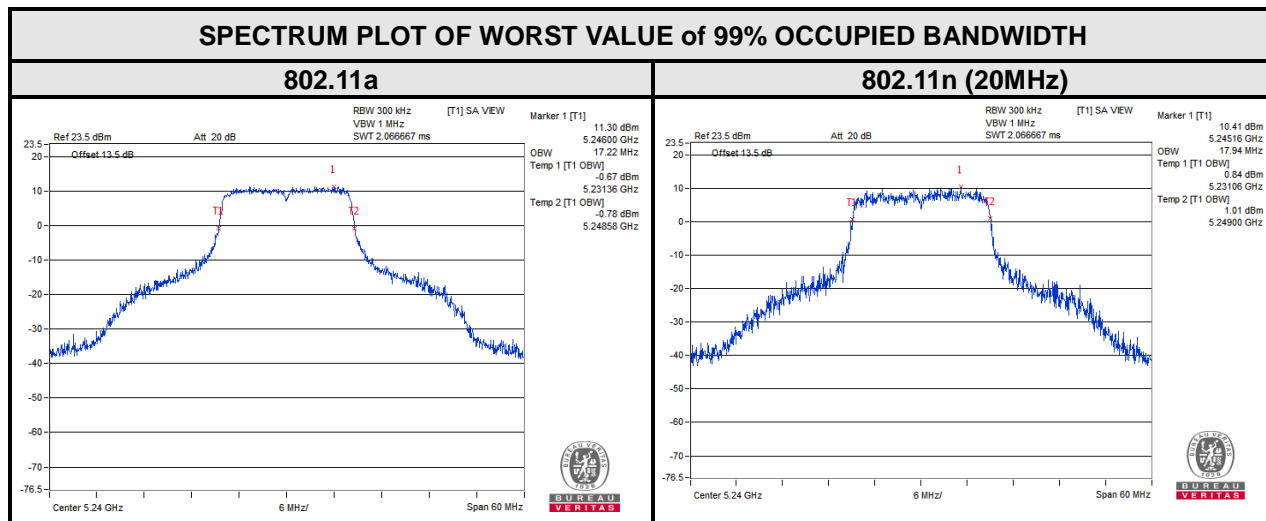
CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	26dB BANDWIDTH (MHz)	PASS/FAIL
36	5180	16.92	27.83	PASS
40	5200	16.86	30.00	PASS
48	5240	17.94	25.17	PASS
CHANNEL	CHANNEL FREQUENCY	99% OCCUPIED BANDWIDTH	6dB BANDWIDTH	PASS/FAIL
149	5745	18.12	17.13	PASS
157	5785	18.12	17.16	PASS
161	5805	17.76	17.68	PASS



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VERITAS

Test Report No.: RF190702W004

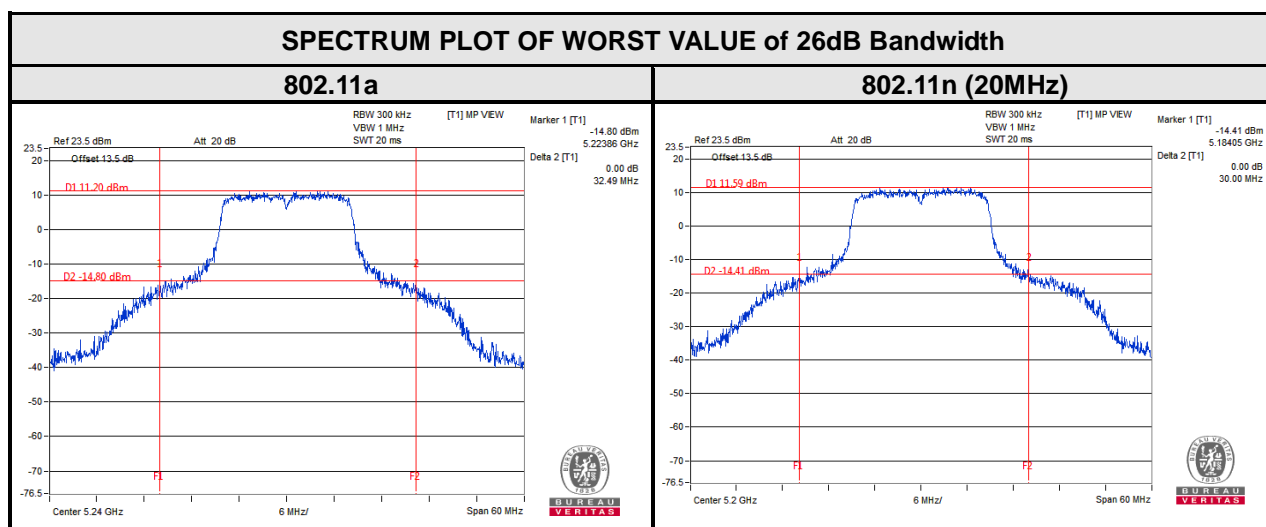
For U-NII-1:





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Test Report No.: RF190702W004

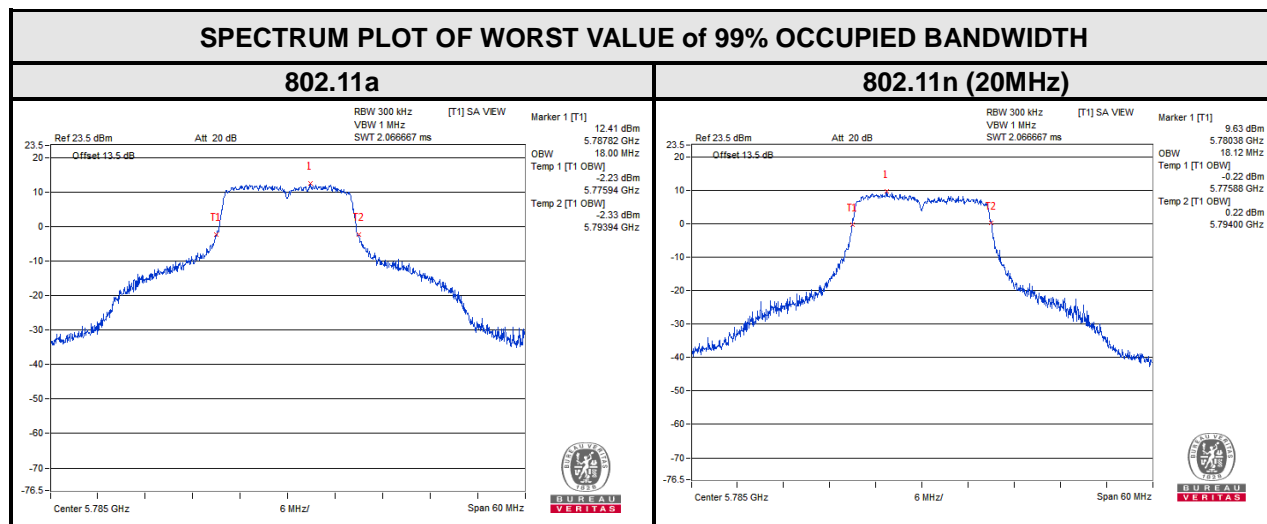




BUREAU
VERITAS

Test Report No.: RF190702W004

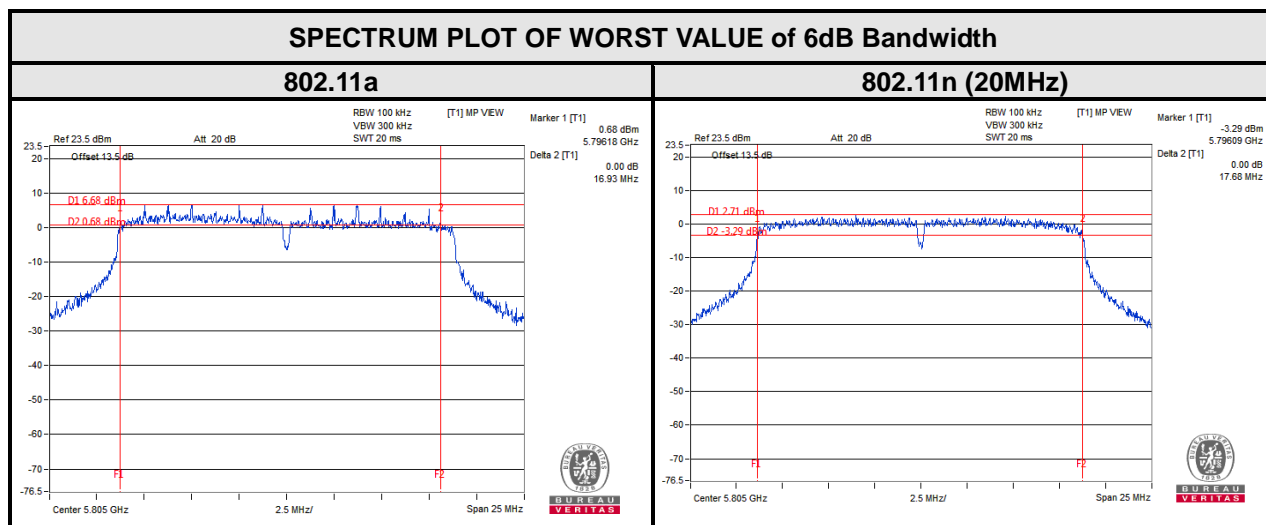
For U-NII-3:





BUREAU
VERITAS

Test Report No.: RF190702W004

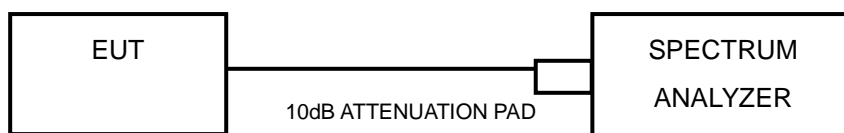


3.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

3.4.1 LIMITS OF MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Client devices	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.4.4 TEST PROCEDURES

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz, Set VBW \geq 3 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) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).
- 7) Record the max value

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

Same as 3.1.6.



3.4.7 TEST RESULTS

For U-NII-1

802.11a

CHANNEL	FREQUENCY (MHz)	ANT 0 PSD w/o Duty Factor (dBm/MHz)	ANT 1 PSD w/o Duty Factor (dBm/MHz)	Duty Factor	ANT 0 PSD with Duty Factor (dBm/MHz)	ANT 1 PSD with Duty Factor (dBm/MHz)	MAXIMUM LIMIT (dBm/MHz)	PASS/ FAIL
36	5180	9.75	8.89	0.138	9.89	9.03	11	PASS
40	5200	9.85	8.55	0.138	9.99	8.69	11	PASS
48	5240	9.61	8.92	0.138	9.75	9.06	11	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	ANT 0 PSD w/o Duty Factor (dBm/MHz)	ANT 1 PSD w/o Duty Factor (dBm/MHz)	Duty Factor	Total PSD with Duty Factor (dBm/MHz)	MAXIMUM LIMIT (dBm/MHz)	PASS/FAIL
36	5180	7.93	4.24	0.121	9.6	11	PASS
40	5200	8.43	4.35	0.121	9.98	11	PASS
48	5240	8.46	4.14	0.121	9.95	11	PASS

Note: $N_{ANT} = 2$, $N_{SS}=1$, Directional gain = $G_{ANT} + 10 \log(N_{ANT}/N_{SS})$ dBi = 4.08dBi < 6dBi, density limit shall not be reduced.

For U-NII-3:

802.11a

CHANNEL	FREQUENCY (MHz)	ANT 0 PSD w/o Duty Factor (dBm/MHz)	ANT 1 PSD w/o Duty Factor (dBm/MHz)	Duty Factor	ANT 0 PSD with Duty Factor (dBm/500kHz)	ANT 1 PSD with Duty Factor (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
149	5745	7.42	9.53	0.138	4.55	6.66	30	PASS
157	5785	9.55	9.32	0.138	6.68	6.45	30	PASS
161	5805	7.24	4.82	0.138	4.37	1.95	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	ANT 0 PSD w/o Duty Factor (dBm/MHz)	ANT 1 PSD w/o Duty Factor (dBm/MHz)	Total PSD w/o Duty Factor (dBm/500kHz)	Duty Factor	Total PSD with Duty Factor (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
149	5745	6.89	6.35	6.63	0.121	6.75	30	PASS
157	5785	6.98	5.68	6.38	0.121	6.50	30	PASS
161	5805	4.22	5.29	4.79	0.121	4.91	30	PASS

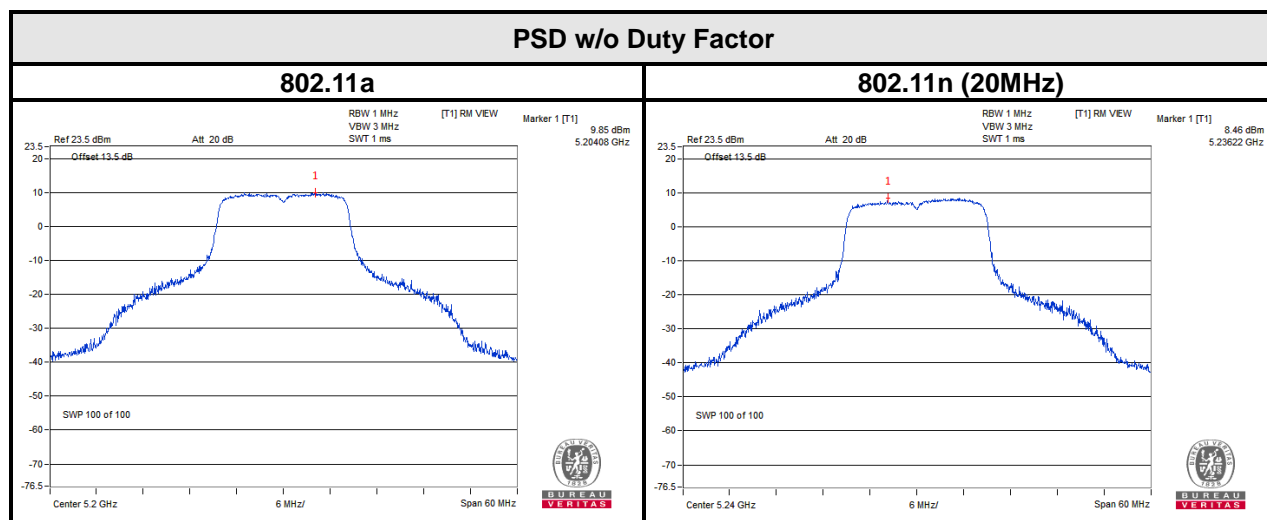
Note: $N_{ANT} = 2$, $N_{SS} = 1$, Directional gain = $G_{ANT} + 10 \log(N_{ANT}/N_{SS})$ dBi = 4.08dBi < 6dBi, density limit shall not be reduced.



BUREAU
VERITAS

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For 5180~5240MHz

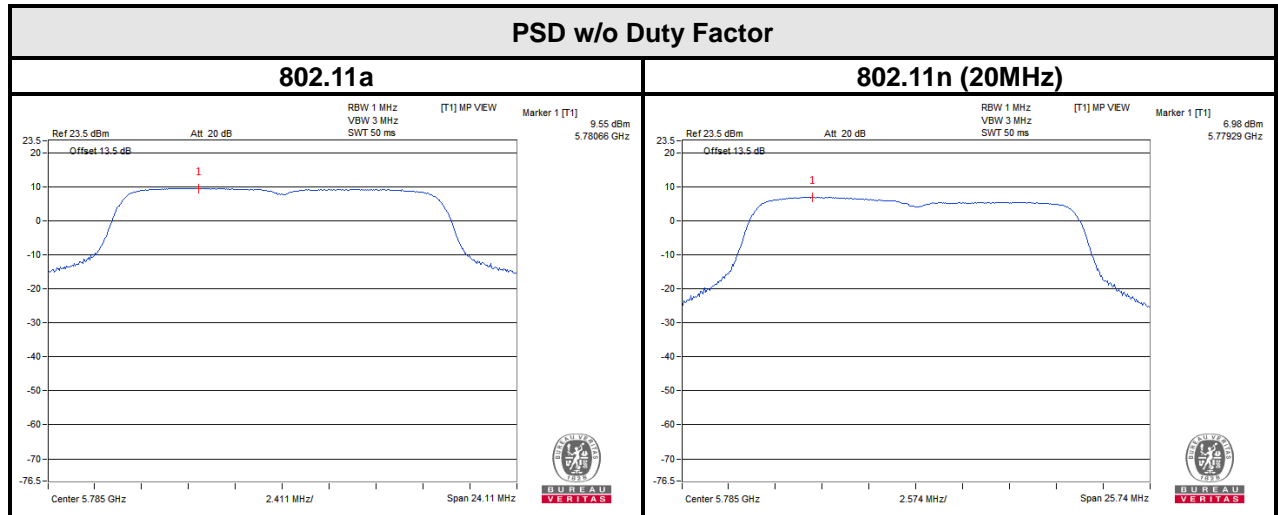




BUREAU
VERITAS

Test Report No.: RF190702W004

For 5745~5805MHz

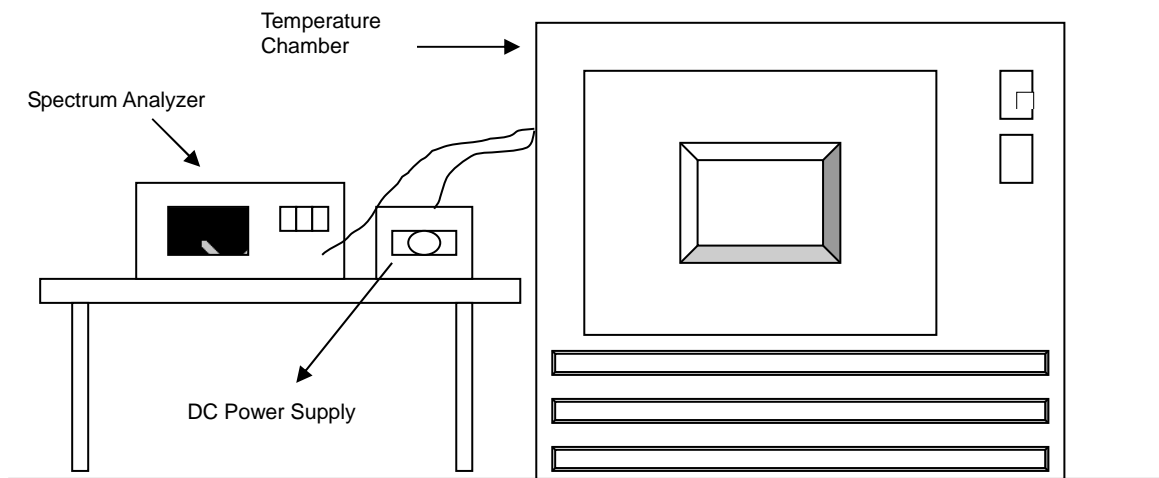


3.5 FREQUENCY STABILITY

3.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.5.4 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.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

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

3.5.7 TEST RESULTS

TEST DATA FROM ANT 0:

FREQUENCY STABILITY VERSUS TEMP.										RESULT
OPERATING FREQUENCY: 5180MHz										
TEMP. (°C)	Power Supply (Vdc)	0 MINUTE		2 MINUTES		5 MINUTES		10 MINUTE		
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	
50	120	5179.977	-4.382	5179.979	-3.919	5179.979	-4.035	5179.982	-3.398	PASS
40	120	5179.984	-3.069	5179.980	-3.822	5179.979	-4.035	5179.978	-4.208	PASS
30	120	5180.012	2.452	5180.011	2.201	5180.013	2.548	5180.015	2.973	PASS
20	120	5179.988	-2.259	5179.986	-2.568	5179.984	-3.089	5179.985	-2.838	PASS
10	120	5179.972	-5.386	5179.976	-4.614	5179.974	-4.903	5179.979	-3.958	PASS
0	120	5179.969	-5.830	5179.969	-5.927	5179.971	-5.502	5179.971	-5.425	PASS
-10	120	5180.000	0.019	5179.998	-0.367	5179.997	-0.483	5179.994	-1.120	PASS
-20	120	5180.000	0.097	5180.006	1.178	5180.001	0.347	5179.999	-0.019	PASS
-30	120	5179.984	-3.012	5179.982	-3.320	5179.978	-4.228	5179.987	-2.490	PASS

FREQUENCY STABILITY VERSUS VOLTAGE										RESULT
OPERATING FREQUENCY: 5180MHz										
TEMP. (°C)	Power Supply (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE		
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	
20	138	5179.989	-2.124	5179.985	-2.780	5179.985	-2.896	5179.985	-2.819	PASS
	120	5179.988	-2.259	5179.986	-2.568	5179.984	-3.089	5179.985	-2.838	PASS
	102	5179.988	-2.162	5179.985	-2.799	5179.985	-2.819	5179.985	-2.799	PASS



FREQUENCY STABILITY VERSUS TEMP.										RESULT
OPERATING FREQUENCY: 5805MHz										
TEMP. (°C)	Power Supply (Vdc)	0 MINUTE		2 MINUTES		5 MINUTES		10 MINUTE		
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	
50	120	5805.008	1.413	5805.005	0.999	5805.003	0.551	5805.004	0.844	PASS
40	120	5804.987	-2.222	5804.983	-2.825	5804.979	-3.583	5804.976	-4.083	PASS
30	120	5805.015	2.722	5805.014	2.481	5805.02	3.445	5805.019	3.307	PASS
20	120	5805.006	1.189	5805.009	1.585	5805.005	0.999	5804.998	-0.345	PASS
10	120	5805.001	0.207	5805.001	0.310	5805.007	1.344	5805.006	1.068	PASS
0	120	5805.003	0.637	5805.001	0.241	5805.003	0.603	5804.997	-0.362	PASS
-10	120	5805.021	3.669	5805.015	2.739	5805.019	3.325	5805.021	3.652	PASS
-20	120	5804.981	-3.152	5804.982	-3.101	5804.988	-2.033	5804.981	-3.118	PASS
-30	120	5804.995	-0.758	5805.004	0.724	5805.001	0.207	5804.995	-0.706	PASS

FREQUENCY STABILITY VERSUS VOLTAGE										RESULT
OPERATING FREQUENCY: 5805MHz										
TEMP. (°C)	Power Supply (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE		
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	
20	138	5805.006	1.171	5805.008	1.516	5805.004	0.827	5804.999	-0.172	PASS
	120	5805.006	1.189	5805.009	1.585	5805.005	0.999	5804.998	-0.345	PASS
	102	5805.007	1.206	5805.008	1.430	5805.005	0.965	5804.998	-0.241	PASS



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4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

5 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---