

# FCC TEST REPORT

## (Part 15, Subpart E)

**Product:** Intel Euclid Developer Kit

**Model Name:** CCS-G003

**FCC ID:** 2AK6WEUCLID1

**Applicant:** Intel Corporation

**Address:** 2191 Laurelwood Road M/S SC11-201 Santa Clara, CA  
95054 USA

**Manufacturer:** Intel Corporation

**Address:** 2191 Laurelwood Road M/S SC11-201 Santa Clara, CA  
95054 USA

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**Report No.:** RF170103W003-3

**Received Date:** Jan. 03, 2017

**Test Date:** Feb. 24, 2017 ~ Mar. 22, 2017

**Issued Date:** Mar. 23, 2017

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Test Report No.: RF170103W003-3

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF170103W003-3	Original release	Mar. 23, 2017

## 1 CERTIFICATION

**PRODUCT:** Intel Euclid Developer Kit  
**BRAND NAME:** INTEL  
**MODEL NO.:** CCS-G003  
**APPLICANT:** Intel Corporation  
**TESTED:** Feb. 24, 2017 ~ Mar. 22, 2017  
**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 :** Harry , **DATE:** Mar. 23, 2017  
(Harry Li/ Engineer)

**APPROVED BY :** Sam Tung , **DATE:** Mar. 23, 2017  
( Sam Tung / Manager)



## 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 -8.27dB at 0.56853MHz.
15.407(b)(1/2/3/4/6)	Radiated Emission & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -5.28dB at 11610MHz.
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(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.

### 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	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1GMHz	4.06dB
	1GHz ~ 18GHz	4.58dB
	18GHz ~ 40GHz	1.94dB

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



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Intel Euclid Developer Kit
<b>BRAND NAME</b>	INTEL
<b>MODEL NO.</b>	CCS-G003
<b>POWER SUPPLY</b>	5vdc (adapter or host equipment) 3.8Vdc (lion, battery)
<b>MODULATION TYPE</b>	64QAM, 16QAM, QPSK, BPSK
<b>MODULATION TECHNOLOGY</b>	OFDM
<b>TRANSFER RATE</b>	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to MCS7
<b>OPERATING FREQUENCY</b>	5180 ~ 5240MHz, 5745 ~ 5825MHz
<b>NUMBER OF CHANNEL</b>	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 5745 ~ 5805MHz: 4 for 802.11a, 802.11n (20MHz)
<b>AVERAGE POWER</b>	11.614mW for 5180 ~ 5240MHz 11.015mW for 5745 ~ 5805MHz
<b>ANTENNA TYPE</b>	FPC PIFA Antenna with 2dBi gain
<b>HW VERSION</b>	9602C
<b>SW VERSION</b>	4.4.0-9014-cs1p
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	USB cable: non-shielded, detachable, 1.0m

**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. Physically, the EUT provides two completed transmitters and two receivers.

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

- The EUT was powered by the following adapter:

ADAPTER	
<b>BRAND:</b>	ECOGUY
<b>MODEL:</b>	KSA29A0500300D5
<b>INPUT:</b>	AC 100-240V, 500mA
<b>OUTPUT:</b>	DC 5V, 3000mA



4. The EUT matched the following USB cable:

USB CABLE	
BRAND:	Upway
MODEL:	YX LG-074
SIGNAL LINE:	1.0 METER

5. 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

#### FOR 5725 ~ 5825MHz

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

#### 3.2.1 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)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
A	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
A	802.11a	5725-5825	149 to 161	149, 157, 161	OFDM	BPSK	6.0
A	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)
A	802.11n (20MHz)	5725-5825	149 to 161	161	OFDM	BPSK	MCS0

**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	802.11n (20MHz)	5725-5825	149 to 161	161	OFDM	BPSK	MCS0

**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)
A	802.11a	5180-5240	36 to 48	36, 48	OFDM	BPSK	6.0
A	802.11n (20MHz)		36 to 48	36, 48	OFDM	BPSK	MCS0
A	802.11a	5725-5825	149 to 161	149, 161	OFDM	BPSK	6.0
A	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	5725-5825	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, 62%RH	DC 5V By Adapter	Tony Zou
RE≥1G	23deg. C, 62%RH	DC 5V By Adapter	Tony Zou
PLC	24deg. C, 61%RH	DC 5V By Adapter	Yang
APCM	23.5deg. C, 60%RH	DC 3.8V By battery	Moon Xiong

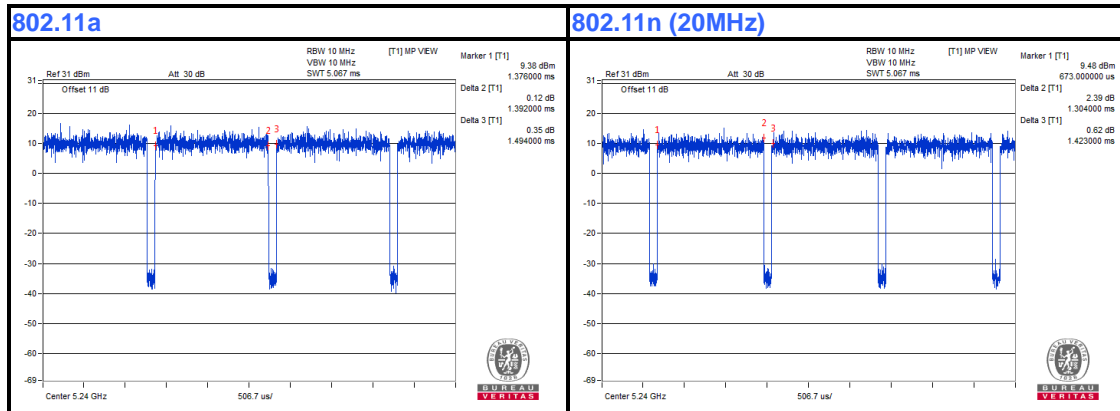


### 3.3 DUTY CYCLE OF TEST SIGNAL

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

**802.11a:** Duty cycle =  $1.392/1.494 = 0.932$ , Duty factor =  $10 * \log(1/0.932) = 0.31$

**802.11n (20MHz):** Duty cycle =  $1.304/1.423 = 0.916$ , Duty factor =  $10 * \log(1/0.916) = 0.38$





### 3.4 DESCRIPTION OF SUPPORT UNITS

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

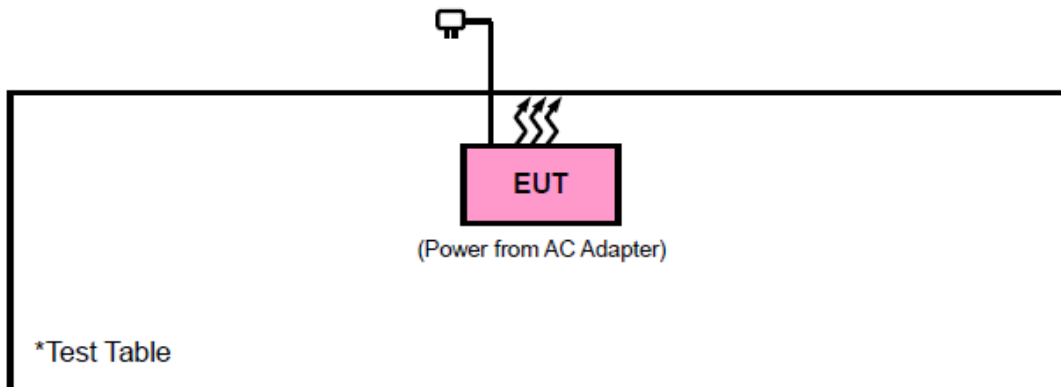
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

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

**NOTE:**

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

### 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)**

**KDB 789033 D02 General U-NII Test Procedures New Rules v01r02**

**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 (DOC). The test report has been issued separately.

## 4 TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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

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)(2)		
	15.407(b)(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:

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

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.

#### 4.1.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Loop antenna	Daze	ZN30900A	0708	Nov. 28, 16	Nov. 27, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Mar. 12,16	Mar. 11,18
Test Software	E3	V 9.160323	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 02,17	Mar. 01,18
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Feb. 10,17	Feb. 09,18
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,16	Aug. 07,17

**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 10 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 (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 10 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.

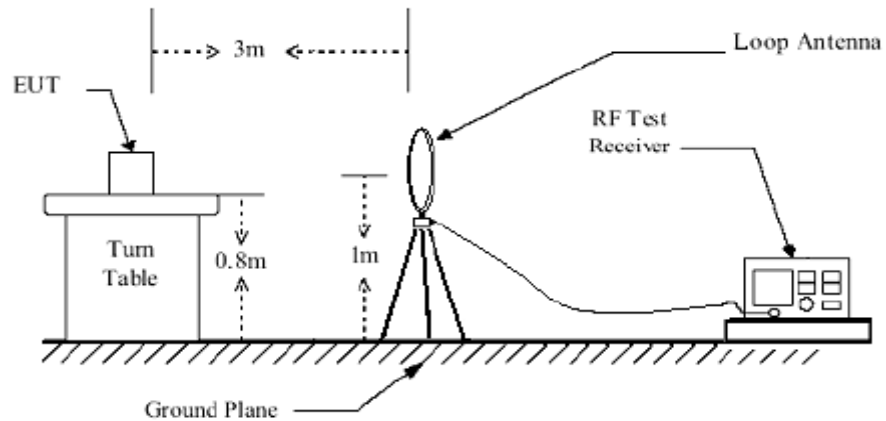
#### 4.1.5 DEVIATION FROM TEST STANDARD

No deviation.

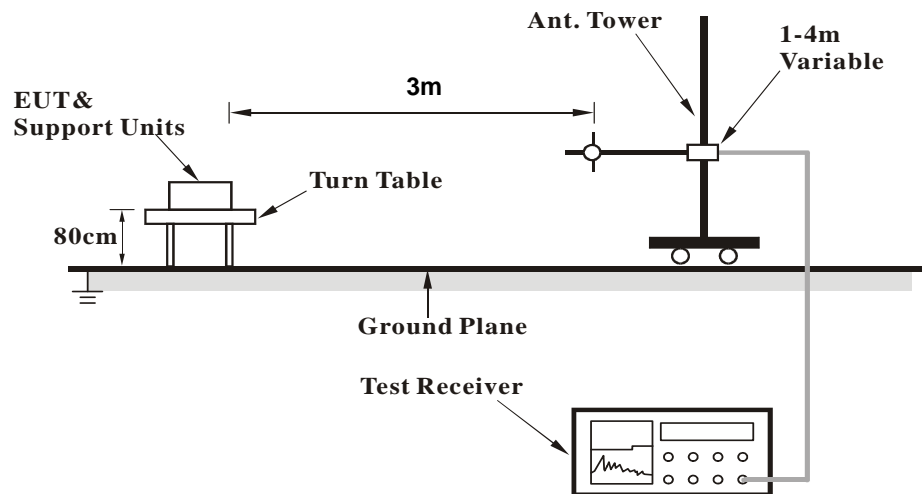


#### 4.1.6 TEST SETUP

##### < Frequency Range below 30MHz >

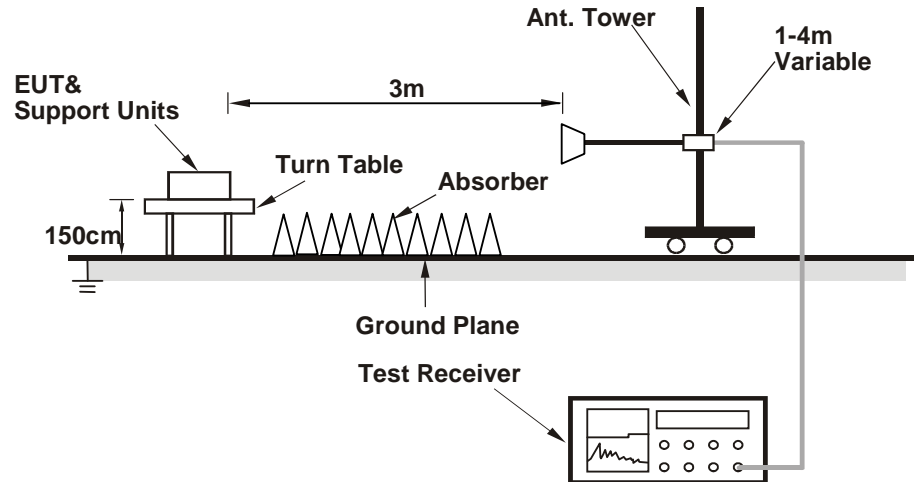


##### < Frequency Range 30MHz~1GHz >





<Frequency Range above 1GHz>



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

#### 4.1.7 EUT OPERATING CONDITION

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



## 4.1.8 TEST RESULTS

## BELOW 1GHz WORST-CASE DATA:

**9 KHz – 30 MHz data:** the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**30 MHz – 1GHz data:**

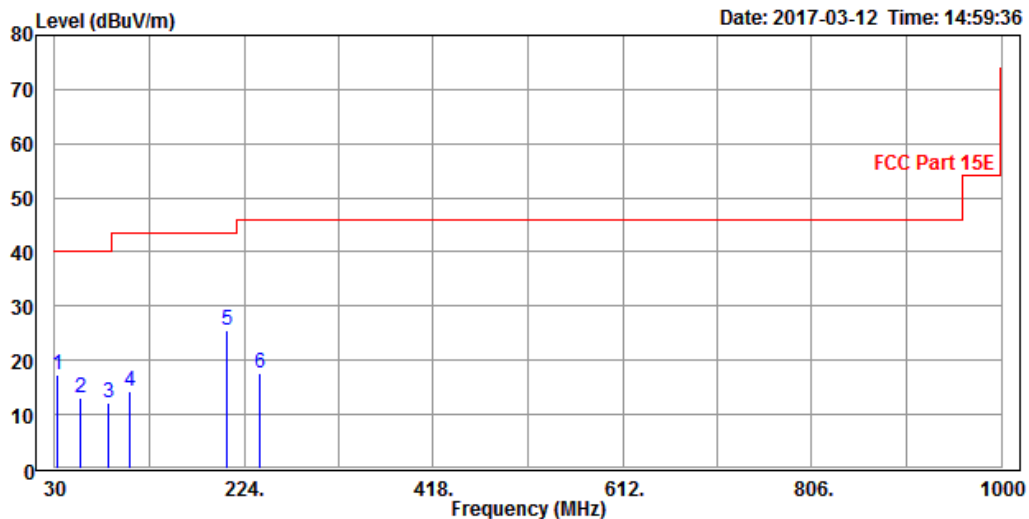
**802.11n (20MHz)**

<b>CHANNEL</b>	TX Channel 161	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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
32.91	17.29	38.90	40.00	-22.71	15.09	0.84	37.54	100	58	QP
56.19	12.97	42.73	40.00	-27.03	6.44	1.14	37.34	100	180	QP
85.29	12.21	41.12	40.00	-27.79	6.76	1.42	37.09	100	94	QP
107.6	14.44	42.09	43.50	-29.06	7.73	1.59	36.97	100	69	QP
206.54	25.47	49.40	43.50	-18.03	10.40	2.21	36.54	100	156	QP
240.49	17.51	39.67	46.00	-28.49	11.96	2.40	36.52	100	248	QP

## 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.





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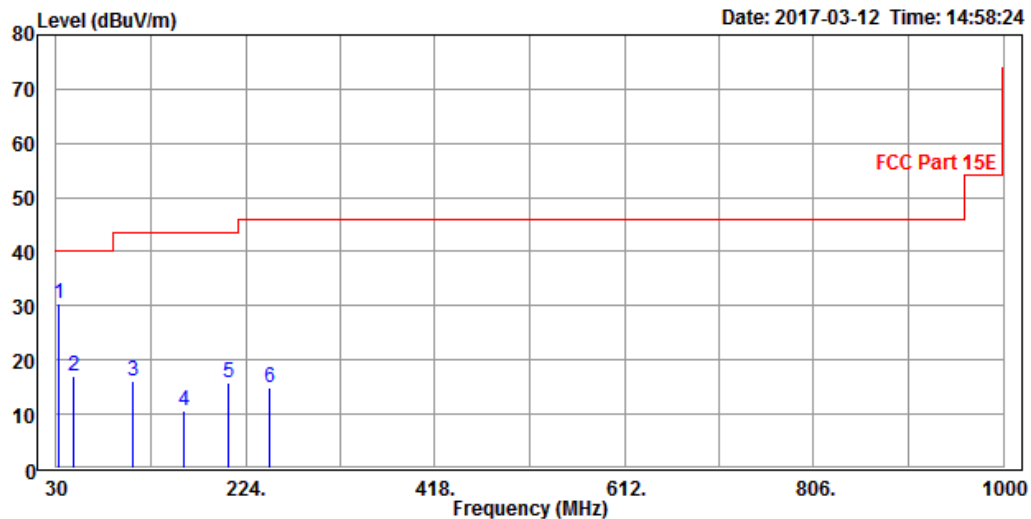
Test Report No.: RF170103W003-3

CHANNEL	Channel 161	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
32.91	30.29	51.90	40.00	-9.71	15.09	0.84	37.54	100	20	QP
48.43	17.07	46.34	40.00	-22.93	7.08	1.05	37.40	100	48	QP
108.57	16.02	43.69	43.50	-27.48	7.70	1.60	36.97	100	90	QP
159.98	10.69	35.30	43.50	-32.81	10.20	1.93	36.74	100	140	QP
206.54	15.70	39.63	43.50	-27.80	10.40	2.21	36.54	100	212	QP
249.22	14.85	36.56	46.00	-31.15	12.36	2.45	36.52	100	84	QP

**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 DATA

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

**Band 1:**

**802.11a**

<b>CHANNEL</b>	TX Channel 36	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	40.86	41.68	54.00	-13.14	34.48	13.71	49.01	120	70	Average
5150	55.33	56.15	74.00	-18.67	34.48	13.71	49.01	120	70	Peak
5180	84.06	84.77			34.52	13.79	49.02	120	70	Average
5180	96.83	97.54			34.52	13.79	49.02	120	70	Peak
5350	41.07	41.15	54.00	-12.93	34.72	14.28	49.08	120	70	Average
5350	53.71	53.79	74.00	-20.29	34.72	14.28	49.08	120	70	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
5150	41.03	41.85	54.00	-12.97	34.48	13.71	49.01	100	360	Average
5150	59.23	60.05	74.00	-14.77	34.48	13.71	49.01	100	360	Peak
5180	85.69	86.40			34.52	13.79	49.02	100	360	Average
5180	99.77	100.48			34.52	13.79	49.02	100	360	Peak
5350	41.74	41.82	54.00	-12.26	34.72	14.28	49.08	100	360	Average
5350	54.45	54.53	74.00	-19.55	34.72	14.28	49.08	100	360	Peak

## REMARKS:

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



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Test Report No.: RF170103W003-3

<b>CHANNEL</b>	TX Channel 44	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	40.38	41.20	54.00	-13.62	34.48	13.71	49.01	110	70	Average
5150	53.97	54.79	74.00	-20.03	34.48	13.71	49.01	110	70	Peak
5220	84.34	84.91			34.56	13.91	49.04	110	70	Average
5220	98.91	99.48			34.56	13.91	49.04	110	70	Peak
5350	41.29	41.37	54.00	-12.71	34.72	14.28	49.08	110	70	Average
5350	53.51	53.59	74.00	-20.49	34.72	14.28	49.08	110	70	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
5150	40.42	41.24	54.00	-13.58	34.48	13.71	49.01	100	358	Average
5150	53.13	53.95	74.00	-20.87	34.48	13.71	49.01	100	358	Peak
5220	83.07	83.64			34.56	13.91	49.04	100	358	Average
5220	97.25	97.82			34.56	13.91	49.04	100	358	Peak
5350	41.05	41.13	54.00	-12.95	34.72	14.28	49.08	100	358	Average
5350	53.55	53.63	74.00	-20.45	34.72	14.28	49.08	100	358	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5220MHz: Fundamental frequency.



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Test Report No.: RF170103W003-3

<b>CHANNEL</b>	TX Channel 48	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	40.31	41.13	54.00	-13.69	34.48	13.71	49.01	100	72	Average
5150	53.59	54.41	74.00	-20.41	34.48	13.71	49.01	100	72	Peak
5240	84.45	84.93			34.59	13.97	49.04	100	72	Average
5240	97.58	98.06			34.59	13.97	49.04	100	72	Peak
5350	41.26	41.34	54.00	-12.74	34.72	14.28	49.08	100	72	Average
5350	53.67	53.75	74.00	-20.33	34.72	14.28	49.08	100	72	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
5150	40.30	41.12	54.00	-13.70	34.48	13.71	49.01	150	358	Average
5150	53.08	53.90	74.00	-20.92	34.48	13.71	49.01	150	358	Peak
5240	83.73	84.21			34.59	13.97	49.04	150	358	Average
5240	96.71	97.19			34.59	13.97	49.04	150	358	Peak
5350	42.24	42.32	54.00	-11.76	34.72	14.28	49.08	150	358	Average
5350	54.65	54.73	74.00	-19.35	34.72	14.28	49.08	150	358	Peak

**REMARKS:**

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





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Test Report No.: RF170103W003-3

802.11n (20MHz)

<b>CHANNEL</b>	TX Channel 36	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	40.73	41.55	54.00	-13.27	34.48	13.71	49.01	120	70	Average
5150	54.15	54.97	74.00	-19.85	34.48	13.71	49.01	120	70	Peak
5180	82.93	83.64			34.52	13.79	49.02	120	70	Average
5180	96.39	97.10			34.52	13.79	49.02	120	70	Peak
5350	41.14	41.22	54.00	-12.86	34.72	14.28	49.08	120	70	Average
5350	54.19	54.27	74.00	-19.81	34.72	14.28	49.08	120	70	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
5150	40.94	41.76	54.00	-13.06	34.48	13.71	49.01	100	360	Average
5150	53.18	54.00	74.00	-20.82	34.48	13.71	49.01	100	360	Peak
5180	84.61	85.32			34.52	13.79	49.02	100	360	Average
5180	97.80	98.51			34.52	13.79	49.02	100	360	Peak
5350	41.07	41.15	54.00	-12.93	34.72	14.28	49.08	100	360	Average
5350	54.56	54.64	74.00	-19.44	34.72	14.28	49.08	100	360	Peak

**REMARKS:**

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



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<b>CHANNEL</b>	TX Channel 44	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	40.45	41.27	54.00	-13.55	34.48	13.71	49.01	110	72	Average
5150	53.42	54.24	74.00	-20.58	34.48	13.71	49.01	110	72	Peak
5220	83.96	84.53			34.56	13.91	49.04	110	72	Average
5220	96.29	96.86			34.56	13.91	49.04	110	72	Peak
5350	41.19	41.27	54.00	-12.81	34.72	14.28	49.08	110	72	Average
5350	53.81	53.89	74.00	-20.19	34.72	14.28	49.08	110	72	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
5150	40.42	41.24	54.00	-13.58	34.48	13.71	49.01	100	358	Average
5150	53.91	54.73	74.00	-20.09	34.48	13.71	49.01	100	358	Peak
5220	82.93	83.50			34.56	13.91	49.04	100	358	Average
5220	95.59	96.16			34.56	13.91	49.04	100	358	Peak
5350	41.24	41.32	54.00	-12.76	34.72	14.28	49.08	100	358	Average
5350	54.53	54.61	74.00	-19.47	34.72	14.28	49.08	100	358	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5220MHz: 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	40.37	41.19	54.00	-13.63	34.48	13.71	49.01	100	70	Average
5150	52.52	53.34	74.00	-21.48	34.48	13.71	49.01	100	70	Peak
5240	83.25	83.73			34.59	13.97	49.04	100	70	Average
5240	96.12	96.60			34.59	13.97	49.04	100	70	Peak
5350	41.29	41.37	54.00	-12.71	34.72	14.28	49.08	100	70	Average
5350	54.97	55.05	74.00	-19.03	34.72	14.28	49.08	100	70	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
5150	40.32	41.14	54.00	-13.68	34.48	13.71	49.01	110	360	Average
5150	53.05	53.87	74.00	-20.95	34.48	13.71	49.01	110	360	Peak
5240	82.28	82.76			34.59	13.97	49.04	110	360	Average
5240	96.19	96.67			34.59	13.97	49.04	110	360	Peak
5350	41.86	41.94	54.00	-12.14	34.72	14.28	49.08	110	360	Average
5350	54.57	54.65	74.00	-19.43	34.72	14.28	49.08	110	360	Peak

**REMARKS:**

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



## ABOVE 1GHz WORST-CASE DATA: Band 4

## 802.11a

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	91.22	88.86			35.19	16.31	49.14	100	72	Average
5745	104.61	102.25			35.19	16.31	49.14	100	72	Peak
11490	48.17	38.15	54.00	-5.83	39.10	19.08	48.16	100	120	Average
11490	60.25	50.23	74.00	-13.75	39.10	19.08	48.16	100	120	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
5745	85.21	82.85			35.19	16.31	49.14	115	355	Average
5745	99.08	96.72			35.19	16.31	49.14	115	355	Peak
11490	48.04	38.02	54.00	-5.96	39.10	19.08	48.16	100	320	Average
11490	59.38	49.36	74.00	-14.62	39.10	19.08	48.16	100	320	Peak

## REMARKS:

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



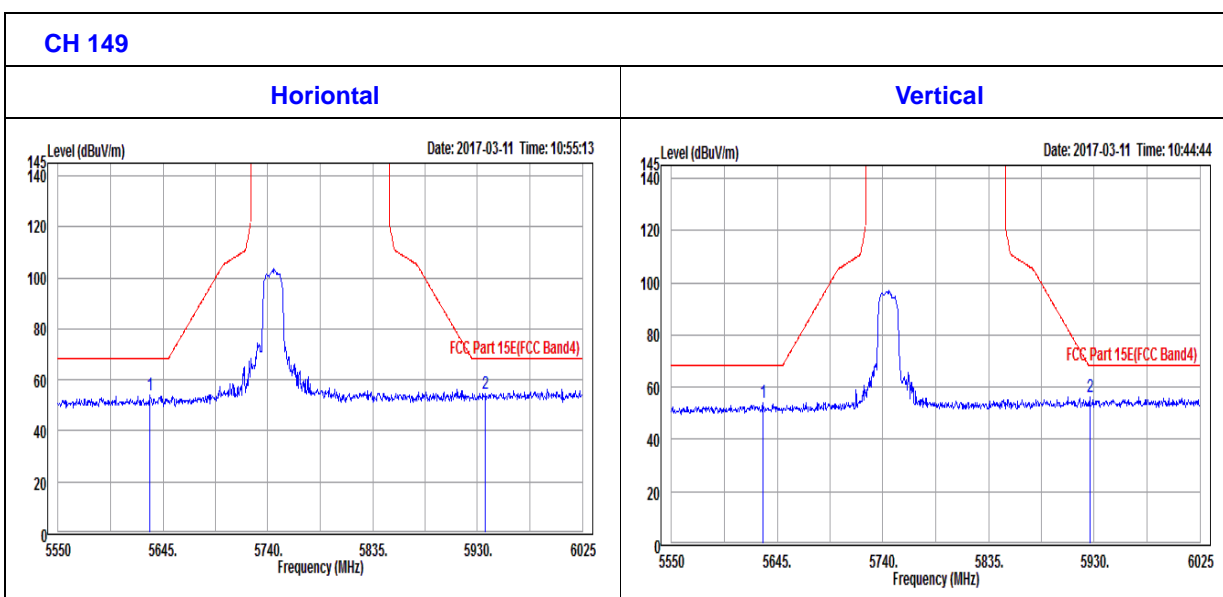
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Test Report No.: RF170103W003-3

## OOBE DATA

802.11a

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
5632.65	53.83	52.33	68.3	-14.47	35.06	15.57	49.13	100	72	Peak
5937.13	54.74	50.92	68.3	-13.56	35.42	17.56	49.16	100	72	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
5632.18	54.13	52.63	68.3	-14.17	35.06	15.57	49.13	115	355	Peak
5926.2	56.08	52.34	68.3	-12.22	35.41	17.49	49.16	115	355	Peak





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	90.32	87.66			35.24	16.57	49.15	100	72	Average
5785	103.96	101.30			35.24	16.57	49.15	100	72	Peak
11570	48.47	38.36	54.00	-5.53	39.16	19.12	48.17	100	115	Average
11570	60.98	50.87	74.00	-13.02	39.16	19.12	48.17	100	115	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
5785	85.80	83.14			35.24	16.57	49.15	150	355	Average
5785	100.39	97.73			35.24	16.57	49.15	150	355	Peak
11570	47.97	37.86	54.00	-6.03	39.16	19.12	48.17	100	30	Average
11570	60.14	50.03	74.00	-13.86	39.16	19.12	48.17	100	30	Peak

**REMARKS:**

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



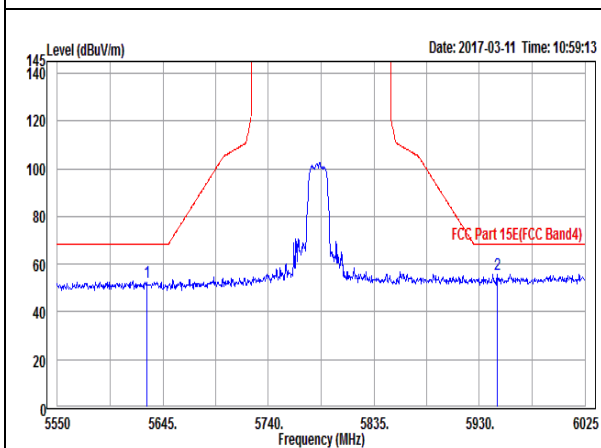
## OOBE DATA

## 802.11a

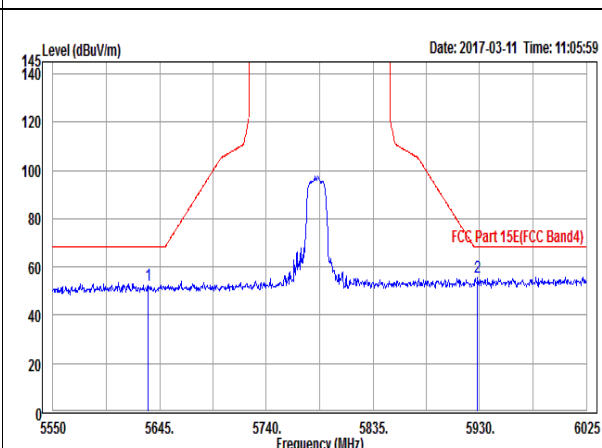
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5630.28	52.6	51.11	68.3	-15.7	35.06	15.56	49.13	100	72	Peak
5946.15	55.94	52.04	68.3	-12.36	35.44	17.62	49.16	100	72	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
5634.55	52.57	51.05	68.3	-15.73	35.06	15.59	49.13	150	355	Peak
5928.10	55.53	51.78	68.3	-12.77	35.41	17.5	49.16	150	355	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
5805	91.53	88.71			35.27	16.70	49.15	100	55	Average
5805	105.35	102.53			35.27	16.70	49.15	100	55	Peak
11610	48.65	38.50	54.00	-5.35	39.19	19.14	48.18	100	145	Average
11610	61.03	50.88	74.00	-12.97	39.19	19.14	48.18	100	145	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
5805	85.69	82.87			35.27	16.70	49.15	155	356	Average
5805	99.86	97.04			35.27	16.70	49.15	155	356	Peak
11610	48.62	38.47	54.00	-5.38	39.19	19.14	48.18	100	45	Average
11610	60.83	50.68	74.00	-13.17	39.19	19.14	48.18	100	45	Peak

**REMARKS:**

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





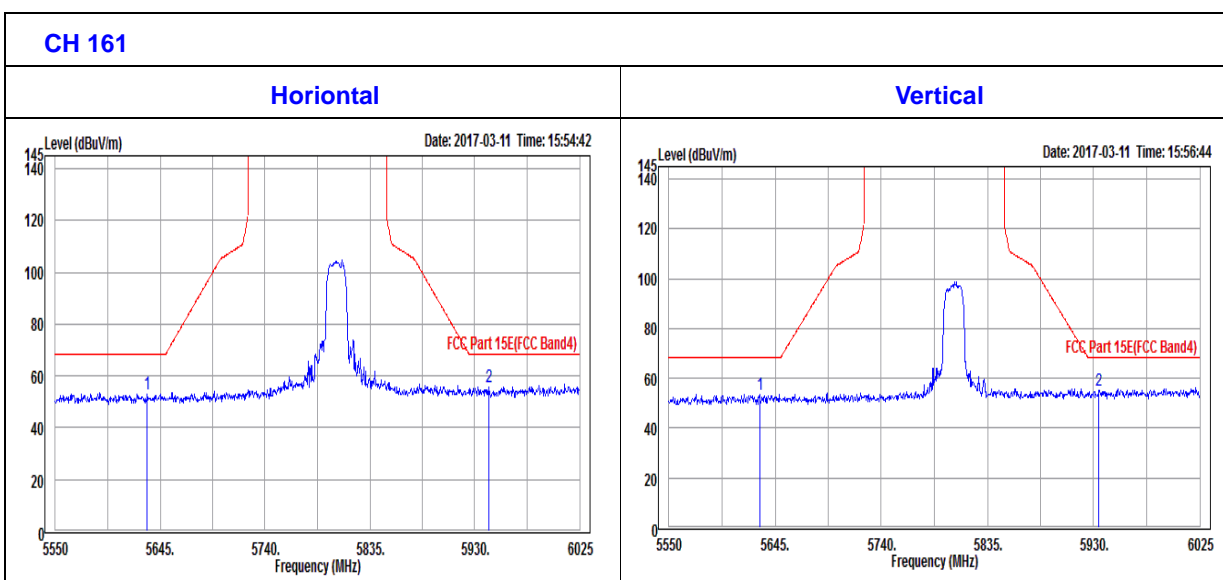
**BUREAU  
VERITAS**

Test Report No.: RF170103W003-3

## OOBE DATA

802.11a

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
5633.13	52.66	51.15	68.3	-15.64	35.06	15.58	49.13	100	55	Peak
5942.83	55.71	51.84	68.3	-12.59	35.43	17.6	49.16	100	55	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
5631.23	53.64	52.14	68.3	-14.66	35.06	15.57	49.13	155	356	Peak
5934.75	54.98	51.18	68.3	-13.32	35.42	17.54	49.16	155	356	Peak





**BUREAU  
VERITAS**

Test Report No.: RF170103W003-3

802.11n (20MHz)

<b>CHANNEL</b>	TX Channel 149	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	90.15	87.79			35.19	16.31	49.14	100	55	Average
5745	103.98	101.62			35.19	16.31	49.14	100	55	Peak
11490	48.16	38.14	54.00	-5.84	39.10	19.08	48.16	100	120	Average
11490	60.34	50.32	74.00	-13.66	39.10	19.08	48.16	100	120	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
5745	83.69	81.33			35.19	16.31	49.14	150	355	Average
5745	97.99	95.63			35.19	16.31	49.14	150	355	Peak
11490	47.89	37.87	54.00	-6.11	39.10	19.08	48.16	100	45	Average
11490	59.95	49.93	74.00	-14.05	39.10	19.08	48.16	100	45	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5745MHz: Fundamental frequency.



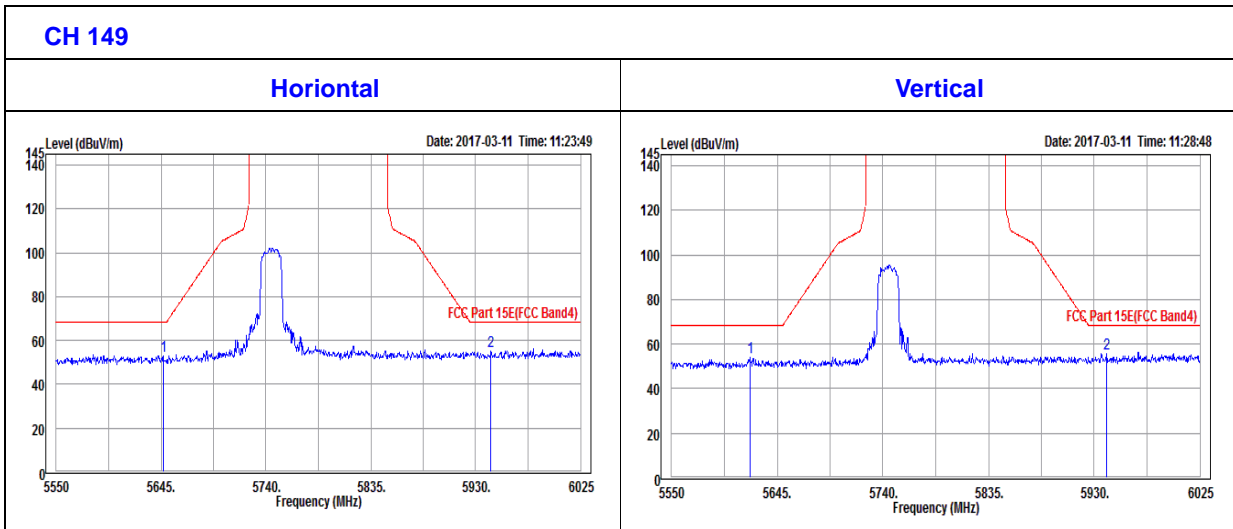
BUREAU  
VERITAS

Test Report No.: RF170103W003-3

## Oobe Data

802.11n (20MHz)

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
5646.90	53.18	51.56	68.3	-15.12	35.08	15.67	49.13	100	55	Peak
5943.78	55.13	51.26	68.3	-13.17	35.43	17.60	49.16	100	55	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
5620.3	53.83	52.43	68.3	-14.47	35.04	15.49	49.13	150	355	Peak
5941.4	55.43	51.57	68.3	-12.87	35.43	17.59	49.16	150	355	Peak





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	90.84	88.18			35.24	16.57	49.15	100	55	Average
5785	104.61	101.95			35.24	16.57	49.15	100	55	Peak
11570	48.57	38.46	54.00	-5.43	39.16	19.12	48.17	100	125	Average
11570	60.75	50.64	74.00	-13.25	39.16	19.12	48.17	100	125	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
5785	84.34	81.68			35.24	16.57	49.15	100	355	Average
5785	97.55	94.89			35.24	16.57	49.15	100	355	Peak
11570	48.36	38.25	54.00	-5.64	39.16	19.12	48.17	100	30	Average
11570	60.45	50.34	74.00	-13.55	39.16	19.12	48.17	100	30	Peak

**REMARKS:**

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

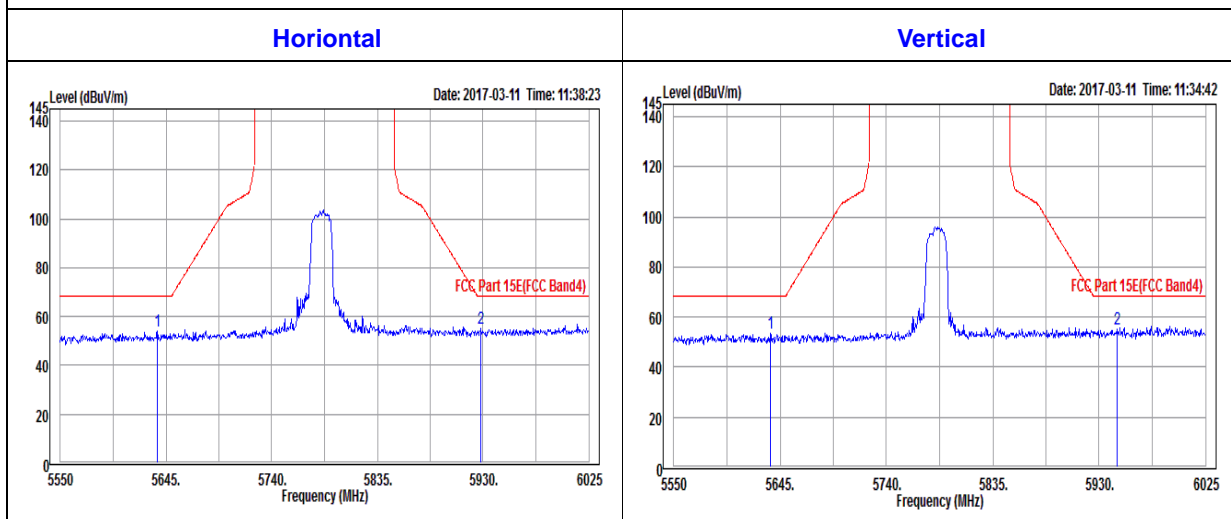


## OOBE DATA

802.11n (20MHZ)

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
5636.93	54.17	52.64	68.3	-14.13	35.06	15.6	49.13	100	55	Peak
5928.1	55.07	51.32	68.3	-13.23	35.41	17.5	49.16	100	55	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
5636.45	53.23	51.7	68.3	-15.07	35.06	15.6	49.13	100	355	Peak
5946.15	55.33	51.43	68.3	-12.97	35.44	17.62	49.16	100	355	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
5805	90.55	87.73			35.27	16.70	49.15	100	56	Average
5805	103.61	100.79			35.27	16.70	49.15	100	56	Peak
11610	48.72	38.57	54.00	-5.28	39.19	19.14	48.18	100	115	Average
11610	61.08	50.93	74.00	-12.92	39.19	19.14	48.18	100	115	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
5805	85.53	82.71			35.27	16.70	49.15	100	355	Average
5805	99.57	96.75			35.27	16.70	49.15	100	355	Peak
11610	48.47	38.32	54.00	-5.53	39.19	19.14	48.18	100	25	Average
11610	60.56	50.41	74.00	-13.44	39.19	19.14	48.18	100	25	Peak

**REMARKS:**

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



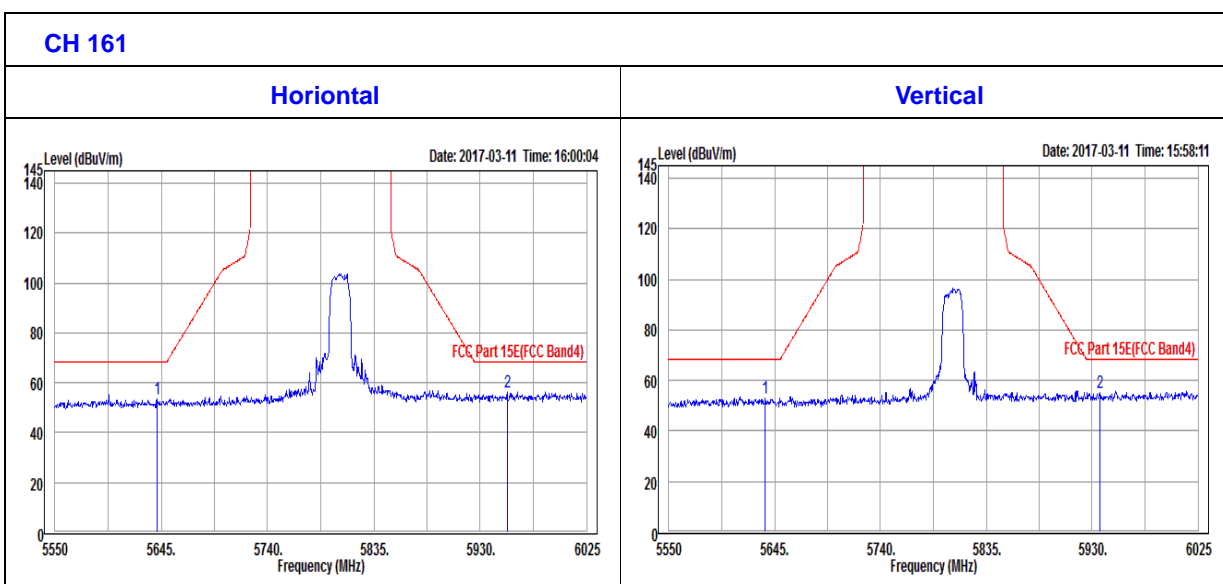
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Test Report No.: RF170103W003-3

## OOBE DATA

802.11n (20MHZ)

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
5641.2	53.37	51.8	68.3	-14.93	35.07	15.63	49.13	100	56	Peak
5954.23	56.12	52.17	68.3	-12.18	35.45	17.67	49.17	100	56	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
5636.45	52.97	51.44	68.3	-15.33	35.06	15.6	49.13	100	355	Peak
5937.13	55.12	51.3	68.3	-13.18	35.42	17.56	49.16	100	355	Peak



## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ 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.
  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 10,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Feb. 18,17	Feb. 17,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

- NOTE:**
1. The test was performed in shielded room 553.
  2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GREGT/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.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

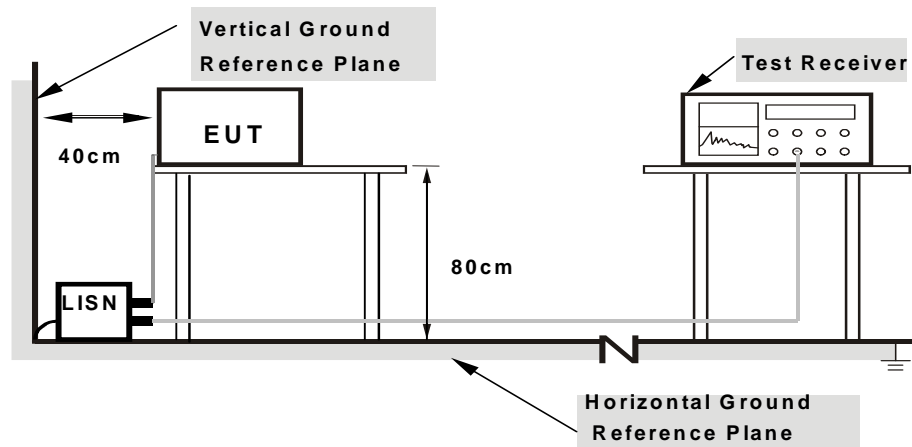




#### 4.2.4 DEVIATION FROM TEST STANDARD

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.



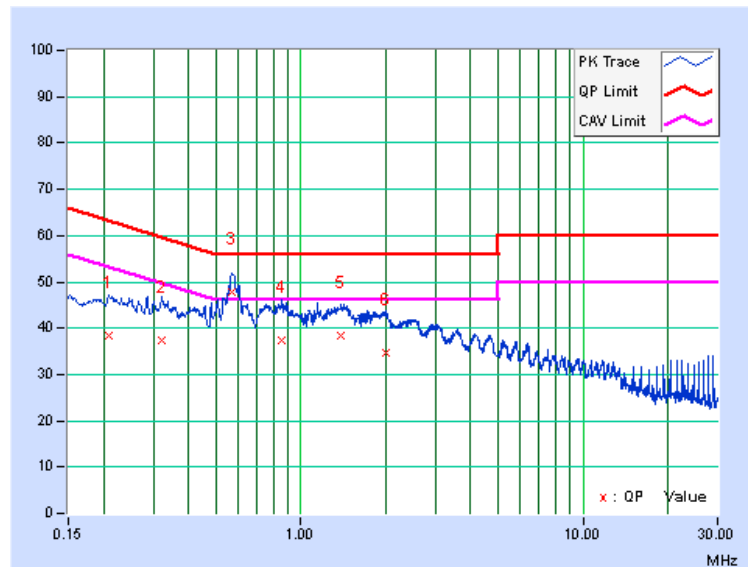
## 4.2.7 TEST RESULTS

## CONDUCTED WORST-CASE DATA :

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 45RH
Tested by	Yang	Test Date	2017/03/06

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20846	10.12	28.24	14.44	38.36	24.56	63.27	53.27	-24.9	-28.7
2	0.32312	10.19	27.29	14.79	37.48	24.98	59.63	49.63	-22.15	-24.65
3	0.56853	10.29	37.44	27.2	47.73	37.49	56	46	<b>-8.27</b>	-8.51
4	0.85377	10.34	27.09	12.35	37.43	22.69	56	46	-18.57	-23.31
5	1.3875	10.37	28.08	13.49	38.45	23.86	56	46	-17.55	-22.14
6	1.99262	10.38	24.2	12.3	34.58	22.68	56	46	-21.42	-23.32

- 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.

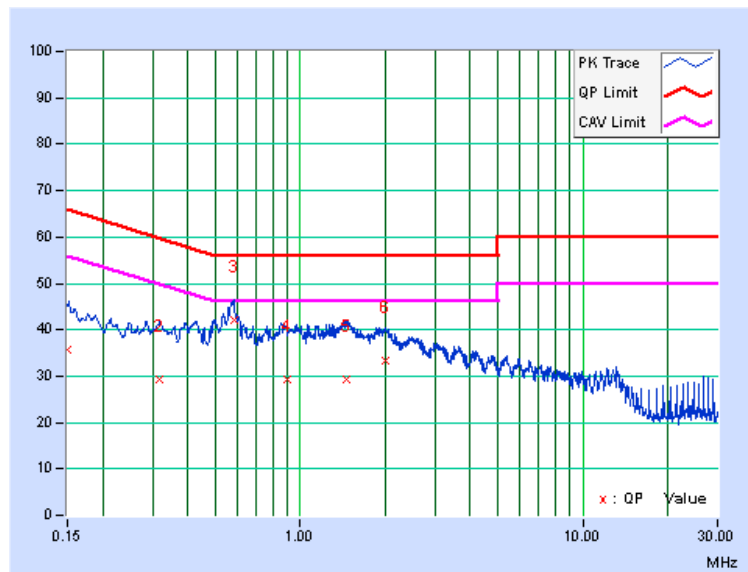




Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 45RH
Tested by	Yang	Test Date	2017/03/06

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15	9.86	25.82	8.25	35.68	18.11	66	56	-30.32	-37.89
2	0.31888	9.89	19.51	5.18	29.4	15.07	59.74	49.74	-30.34	-34.67
3	0.58066	9.94	32.02	16.54	41.96	26.48	56	46	-14.04	-19.52
4	0.89532	9.97	19.19	1.99	29.16	11.96	56	46	-26.84	-34.04
5	1.46175	10	19.38	3.67	29.38	13.67	56	46	-26.62	-32.33
6	1.9995	10.02	23.35	9.93	33.37	19.95	56	46	-22.63	-26.05

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. Correction factor = Insertion loss + Cable loss  
6. Emission Level = Correction Factor + Reading Value.





### 4.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

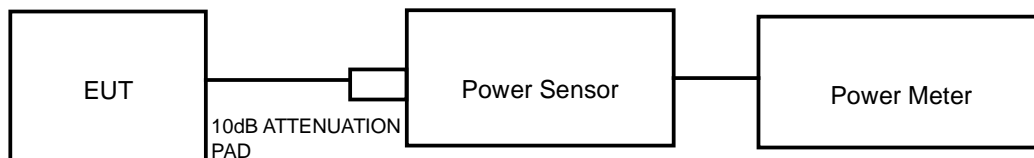
#### 4.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq 125\text{mW}$ (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-2A	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	-		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

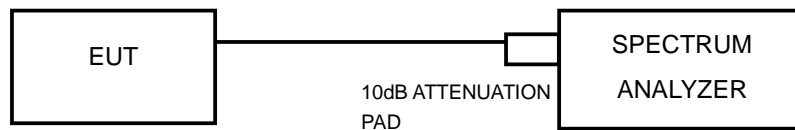
**NOTE:** Where B is the 26dB emission bandwidth in MHz.

#### 4.3.2 TEST SETUP

##### FOR POWER OUTPUT MEASUREMENT



##### FOR 26dB BANDWIDTH



#### 4.3.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

#### 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 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)  $\geq 3$  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.

#### 4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at 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	10.351	10.15	30	PASS
40	5200	11.614	10.65	30	PASS
48	5240	10.914	10.38	30	PASS
149	5745	11.015	10.42	30	PASS
157	5785	9.616	9.83	30	PASS
161	5805	9.311	9.69	30	PASS

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	9.484	9.77	30	PASS
40	5200	8.710	9.40	30	PASS
48	5240	8.750	9.42	30	PASS
149	5745	8.570	9.33	30	PASS
157	5785	8.318	9.20	30	PASS
161	5805	8.147	9.11	30	PASS

**99% OCCUPIED BANDWIDTH & 26dB BANDWIDTH/6dB BANDWIDTH:****802.11a**

CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	26dB BANDWIDTH (MHz)	PASS/FAIL
36	5180	16.44	18.90	PASS
40	5200	16.44	19.01	PASS
48	5240	16.38	19.05	PASS
CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	6dB BANDWIDTH (MHz)	PASS/FAIL
149	5745	16.62	16.25	PASS
157	5785	16.44	13.89	PASS
161	5805	16.50	15.90	PASS

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	26dB BANDWIDTH (MHz)	PASS/FAIL
36	5180	17.52	19.19	PASS
40	5200	17.52	19.20	PASS
48	5240	17.52	19.42	PASS
CHANNEL	CHANNEL FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH	6dB BANDWIDTH (MHz)	PASS/FAIL
149	5745	17.52	15.09	PASS
157	5785	17.58	17.29	PASS
161	5805	17.52	15.95	PASS

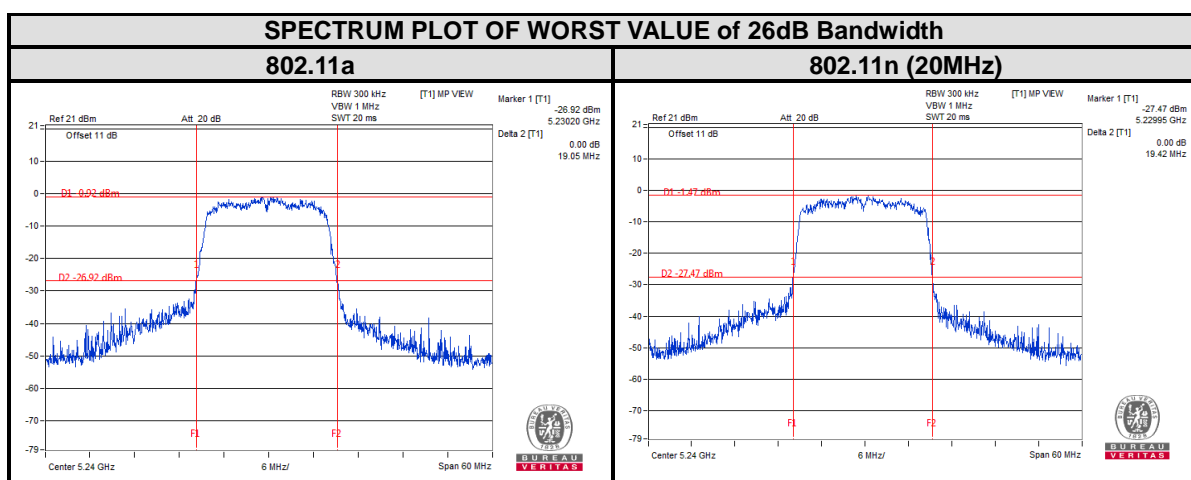
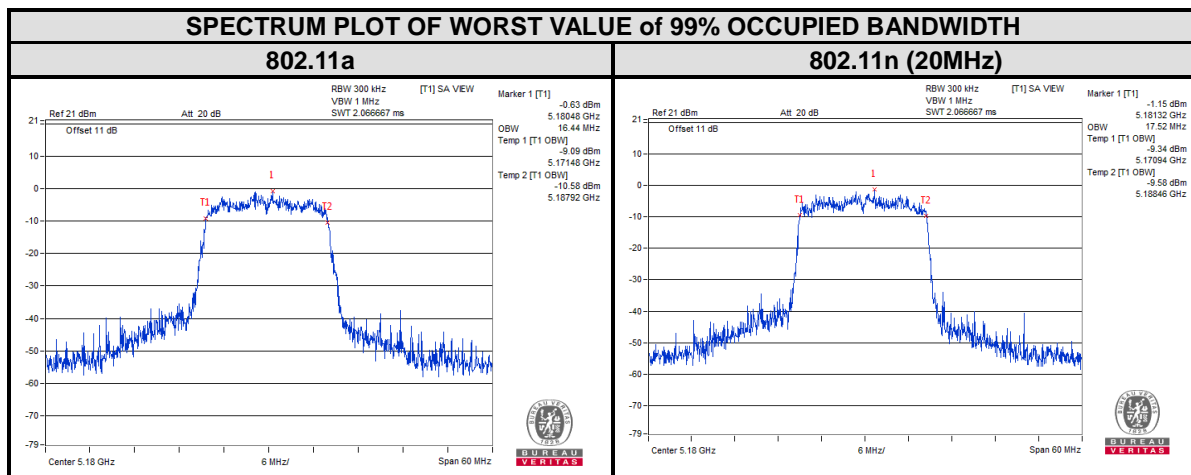




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For U-NII-1:

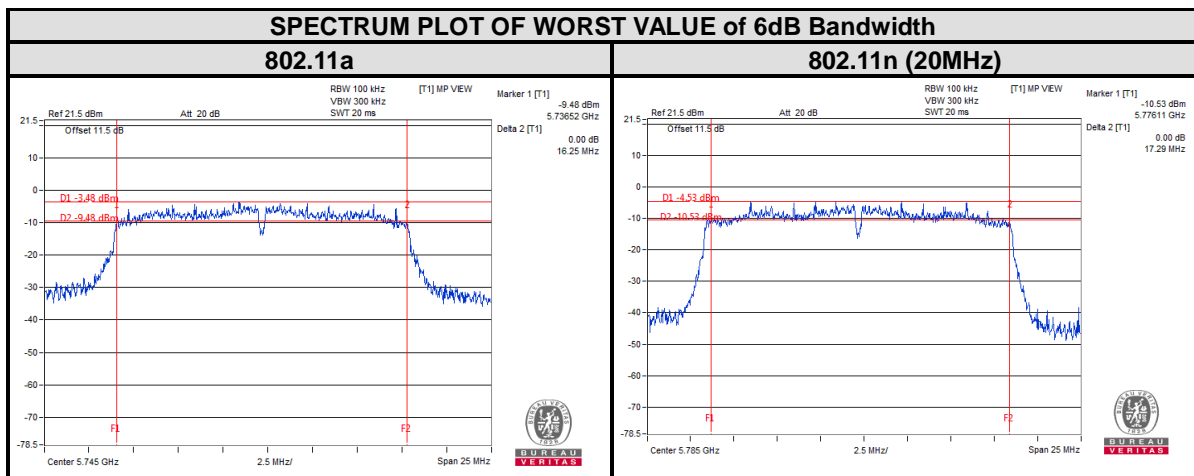
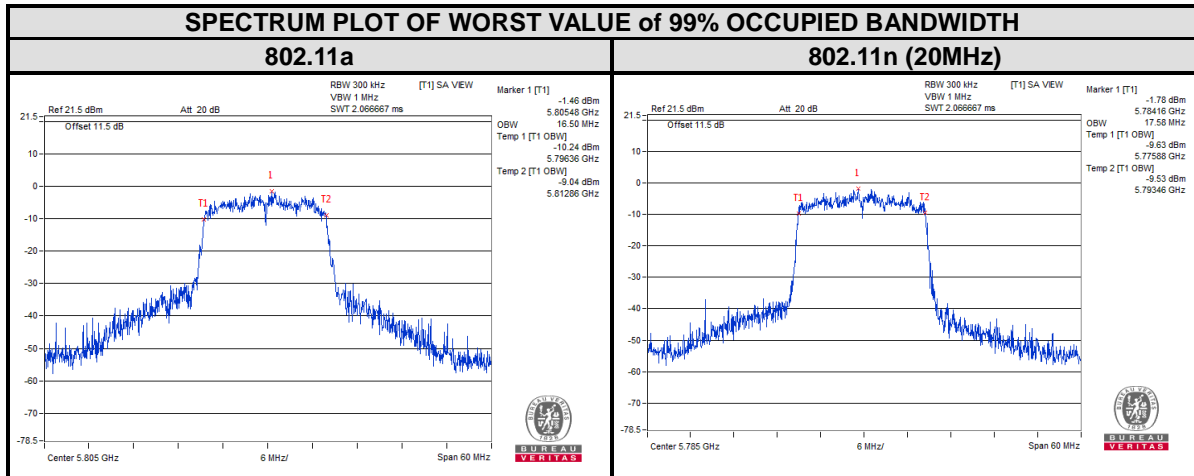




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For U-NII-3:

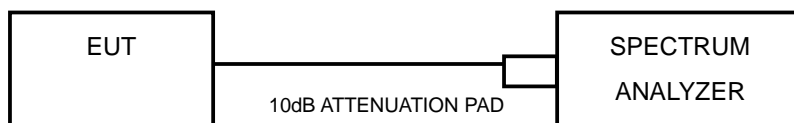


## 4.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

### 4.4.1 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

### 4.4.2 TEST SETUP



### 4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

#### 4.4.4 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

#### 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:

##### 802.11a

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	2.92	0.31	3.23	17	PASS
40	5200	2.26	0.31	2.57	17	PASS
48	5240	1.60	0.31	1.91	17	PASS

##### 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	1.45	0.38	1.83	17	PASS
40	5200	1.17	0.38	1.55	17	PASS
48	5240	0.48	0.38	0.86	17	PASS



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For U-NII-3:

802.11a

CHANNEL	FREQUENCY (MHz)	PSD w/o Duty Factor (dBm/MHz)	PSD w/o Duty Factor (dBm/500kHz)	Duty Factor	PSD with Duty Factor (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
149	5745	7.78	4.77	0.31	5.08	30	PASS
157	5785	6.21	3.20	0.31	3.51	30	PASS
161	5805	6.83	3.82	0.31	4.13	30	PASS

802.11n (20MHz)

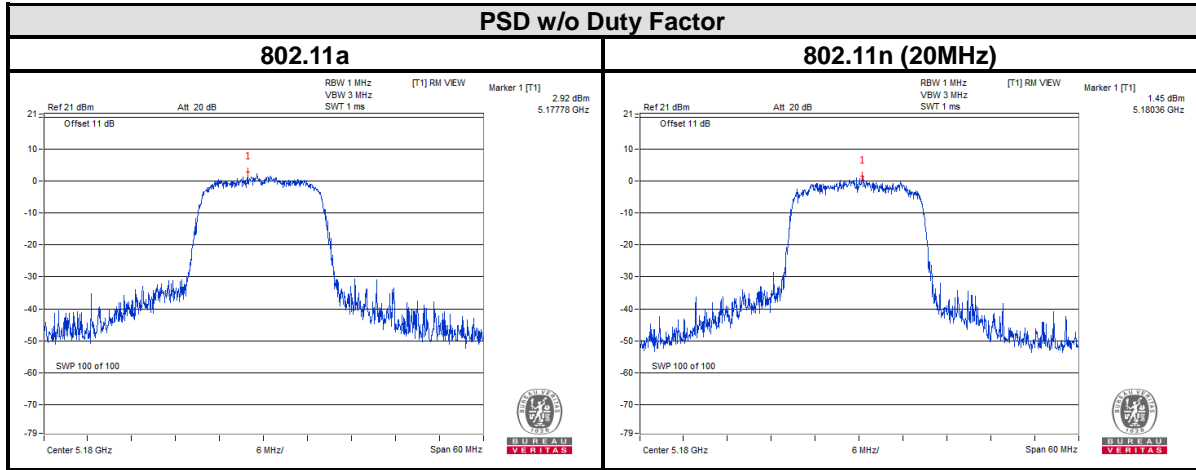
CHANNEL	FREQUENCY (MHz)	PSD w/o Duty Factor (dBm/MHz)	PSD w/o Duty Factor (dBm/500kHz)	Duty Factor	PSD with Duty Factor (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
149	5745	5.79	2.78	0.38	3.16	30	PASS
157	5785	6.45	3.44	0.38	3.82	30	PASS
161	5805	5.06	2.05	0.38	2.43	30	PASS



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For 5180~5240MHz

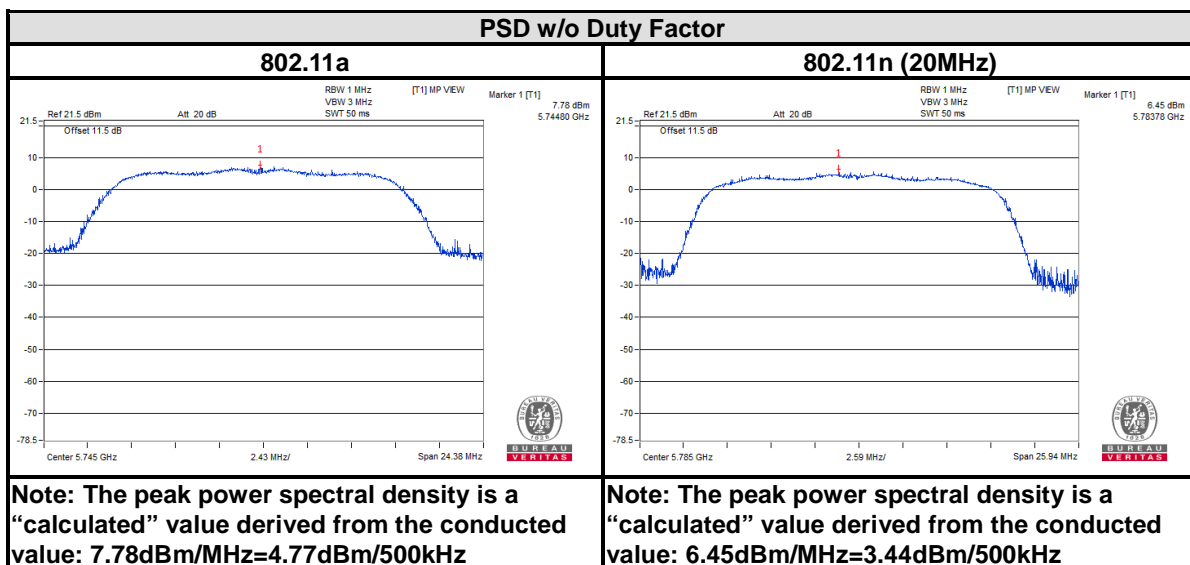




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Test Report No.: RF170103W003-3

For 5745~5825MHz



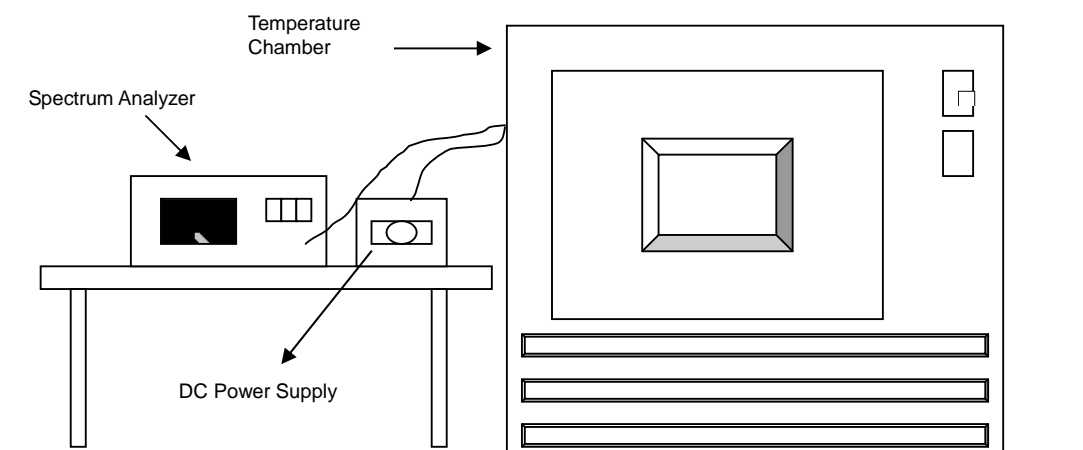


## 4.5 FREQUENCY STABILITY

### 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 4.1.3 to get information of above instrument.

#### 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.



## 4.5.7 TEST RESULTS

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	5	5180.0247	4.768	5180.0287	5.541	5180.0221	4.266	5180.029	5.598	PASS
40	5	5179.9978	-0.425	5180.0049	0.946	5180.0018	0.347	5180.0003	0.058	PASS
30	5	5180.0184	3.552	5180.0183	3.533	5180.0177	3.417	5180.0205	3.958	PASS
20	5	5179.9802	-3.822	5179.9741	-5.000	5179.9811	-3.649	5179.9752	-4.788	PASS
10	5	5179.986	-2.703	5179.9858	-2.741	5179.9875	-2.413	5179.9855	-2.799	PASS
0	5	5180.0001	0.019	5180.0045	0.869	5180.0071	1.371	5180.0045	0.869	PASS
-10	5	5179.9805	-3.764	5179.982	-3.475	5179.9798	-3.900	5179.9789	-4.073	PASS
-20	5	5180.0135	2.606	5180.011	2.124	5180.0024	0.463	5180.0059	1.139	PASS
-30	5	5180.0126	2.432	5180.0182	3.514	5180.0143	2.761	5180.021	4.054	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	5.2	5179.9791	-4.035	5179.9742	-4.981	5179.9803	-3.803	5179.9766	-4.517	PASS
	5	5179.9802	-3.822	5179.9741	-5.000	5179.9811	-3.649	5179.9752	-4.788	PASS
	4.8	5179.9792	-4.015	5179.9726	-5.290	5179.9807	-3.726	5179.975	-4.826	PASS



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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	5	5804.9712	-4.961	5804.9745	-4.393	5804.9785	-3.704	5804.9687	-5.392	PASS
40	5	5804.9782	-3.755	5804.9751	-4.289	5804.9771	-3.945	5804.9825	-3.015	PASS
30	5	5805.0008	0.138	5804.9997	-0.052	5805.0056	0.965	5805.0071	1.223	PASS
20	5	5804.9874	-2.171	5804.9853	-2.532	5804.9808	-3.307	5804.9926	-1.275	PASS
10	5	5804.9772	-3.928	5804.9781	-3.773	5804.9781	-3.773	5804.9708	-5.030	PASS
0	5	5804.9925	-1.292	5804.9847	-2.636	5804.988	-2.067	5804.9816	-3.170	PASS
-10	5	5805.0272	4.686	5805.0183	3.152	5805.0204	3.514	5805.018	3.101	PASS
-20	5	5805.0185	3.187	5805.0129	2.222	5805.0081	1.395	5805.0143	2.463	PASS
-30	5	5804.9859	-2.429	5804.9892	-1.860	5804.9977	-0.396	5804.9943	-0.982	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	5.2	5804.9868	-2.274	5804.9853	-2.532	5804.9815	-3.187	5804.9929	-1.223	PASS
	5	5804.9874	-2.171	5804.9853	-2.532	5804.9808	-3.307	5804.9926	-1.275	PASS
	4.8	5804.9878	-2.102	5804.9849	-2.601	5804.9803	-3.394	5804.9929	-1.223	PASS



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## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



## 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---