



FCC RF Test Report

APPLICANT : TCL Communication Ltd.
EQUIPMENT : GSM Quad-band / UMTS Quad-band / LTE hexa-band mobile phone
BRAND NAME : alcatel
MODEL NAME : 6055P
FCC ID : 2ACCJA019
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Mar. 31, 2016 and testing was completed on May 23, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR611504-04E	Rev. 01	Initial issue of report	May 26, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	FCC $\leq 30, 24$ dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	FCC $\leq 17, 11$ dBm (depend on band)	Pass	-
3.4	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm (depend on band)&15.209(a)	Pass	Under limit 1.94 dB at 11100.000 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 4.01 dB at 0.630 MHz
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

TCL Communication Ltd.

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

1.2 Manufacturer

TCL Communication Ltd.

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM Quad-band / UMTS Quad-band / LTE hexa-band mobile phone
Brand Name	alcatel
Model Name	6055P
FCC ID	2ACCJA019
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/HT40/ WLAN 5GHz 802.11a/n HT20/HT40/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE Bluetooth v4.2 LE
IMEI Code	Conducted:NA Conduction: 358476070060750/358476070060768 Radiation: 358476070058630/358476070058648
HW Version	PIO
SW Version	A2E
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz
Maximum Output Power to Antenna	<5180 MHz ~ 5240 MHz> 802.11a : 12.96 dBm / 0.0198 W 802.11n HT20 : 11.96 dBm / 0.0157 W 802.11n HT40 : 11.88 dBm / 0.0154 W <5260 MHz ~ 5320 MHz> 802.11a : 12.62 dBm / 0.0183 W 802.11n HT20 : 11.75 dBm / 0.0150 W 802.11n HT40 : 12.39 dBm / 0.0173 W <5500 MHz ~ 5700 MHz > 802.11a : 10.98 dBm / 0.0125 W 802.11n HT20 : 10.13 dBm / 0.0103 W 802.11n HT40 : 9.96 dBm / 0.0099 W
99% Occupied Bandwidth	<5180 MHz ~ 5240 MHz> 802.11a : 18.73 MHz 802.11n HT20 : 19.33 MHz 802.11n HT40 : 36.56 MHz <5260 MHz ~ 5320 MHz> 802.11a : 18.63 MHz 802.11n HT20 : 19.33 MHz 802.11n HT40 : 36.66 MHz <5500 MHz ~ 5700 MHz> 802.11a : 18.63 MHz 802.11n HT20 : 19.28 MHz 802.11n HT40 : 36.96 MHz
Antenna Type	<5180 MHz ~ 5240 MHz> : -2.40 dBi <5260 MHz ~ 5320 MHz> : -2.40 dBi <5500 MHz ~ 5700 MHz> : -2.40 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	ALCATEL onetouch	Model Name	UC13US
	Power Rating	I/P: 100-240Vac, 400mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AG0C2		
AC Adapter 2	Brand Name	ALCATEL onetouch	Model Name	UC13US
	Power Rating	I/P: 100-240Vac, 350mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AG0C4		
AC Adapter 3	Brand Name	N/A	Model Name	UC13US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AG4C1		
AC Adapter 4	Brand Name	alcatel	Model Name	UC13US
	Power Rating	I/P: 100-240Vac, 350mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AGAC4		
AC Adapter 5	Brand Name	alcatel	Model Name	UC13US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA		
	P/N	CBA0059AGAC1		
Battery 1	Brand Name	ALCATEL onetouch	Model Name	TLp026EJ
	Power Rating	3.85Vdc, 2610mAh		
Battery 2	Brand Name	ALCATEL onetouch	Model Name	TLp026E2
	Power Rating	3.84Vdc, 2610mAh		
Battery 3	Brand Name	alcatel	Model Name	TLp026EJ
	Power Rating	3.85Vdc, 2610mAh		
Battery 4	Brand Name	alcatel	Model Name	TLp026E2
	Power Rating	3.84Vdc, 2610mAh		
USB Cable 1	Brand Name	N/A	Model Name	CDA0000043C8
	Signal Line Type	1.0m shielded without core		
USB Cable 2	Brand Name	N/A	Model Name	CDA0000043C2
	Signal Line Type	1.0m shielded without core		
Earphone 1	Brand Name	alcatel	Model Name	J22C
	Signal Line Type	1.4m non-shielded without core		
	P/N	CCB0029A10CC		
Earphone 2	Brand Name	alcatel	Model Name	J22H
	Signal Line Type	1.0m non-shielded without core		
	P/N	CCB0047A10CC		

Note: The adapter 4, 5 and battery 3, 4 are just with different logo, all the designs are identical with adapter 2, 3 and battery 1, 2.



1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC Registration No.
	TH01-KS	CO01-KS	03CH03-KS	306251

Note: The test site complies with ANSI C63.4 2014 requirement.

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.



2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180- 5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5260-5320 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54	5270	62	5310
	56	5280	64	5320
	58	5290		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5700 MHz Band 3 (U-NII-2C)	100	5500	120	5600
	102	5510	122	5610
	104	5520	124	5620
	106	5530	126	5630
	108	5540	128	5640
	110	5550	132	5660
	112	5560	134	5670
	116	5580	136	5680
	118	5590	140	5700

Note: The above Frequency and Channel in boldface were 802.11n HT40.



2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables.

WLAN 5GHz 802.11a Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
		6Mbps								
CH 36	5180	12.96	CH 36	12.88	12.93	12.92	12.87	12.91	12.90	12.89
CH 44	5220	12.50								
CH 48	5240	12.39								
CH 52	5260	12.43	CH 64	12.39	12.43	12.43	12.37	12.44	12.50	12.38
CH 60	5300	12.04								
CH 64	5320	12.62								
CH 100	5500	10.98	CH 100	10.76	10.78	10.84	10.87	10.94	10.86	10.88
CH 116	5580	10.96								
CH 140	5700	10.07								

WLAN 5GHz 802.11n-HT20 Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0								
CH 36	5180	11.96	CH 36	11.93	11.83	11.82	11.81	11.95	11.94	11.90
CH 44	5220	11.60								
CH 48	5240	11.53								
CH 52	5260	11.59	CH 64	11.69	11.66	11.68	11.58	11.70	11.74	11.73
CH 60	5300	11.30								
CH 64	5320	11.75								
CH 100	5500	10.13	CH 100	9.99	9.93	9.83	9.89	9.92	9.96	10.01
CH 116	5580	10.08								
CH 140	5700	9.40								

WLAN 5GHz 802.11n-HT40 Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0								
CH 38	5190	11.88	CH 38	11.76	11.77	11.73	11.83	11.85	11.86	11.84
CH 46	5230	11.68								
CH 54	5270	12.39	CH 54	12.36	12.27	12.29	12.25	12.34	12.33	12.35
CH 62	5310	12.06								
CH 102	5510	9.96	CH 102	9.76	9.84	9.83	9.88	9.74	9.80	9.85
CH 110	5550	9.63								
CH 134	5670	9.46								

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone 1 + USB Cable 1 (Charging from Adapter 1) + Battery 1
	Mode 2 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone 1 + USB Cable 1 (Charging from Adapter 2) + Battery 2
	Mode 3 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone 1 + USB Cable 1 (Charging from Adapter 3) + Battery 2
Remark:	
1. For Radiated TCs, the tests were performed with Adapter 1, Earphone 1, Battery 1 and USB Cable 1, only the worst mode need to verify Adapter 2 and Battery 2.	
2. The worst case of conducted emission is mode 2; only the test data of it was reported.	



Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700 MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

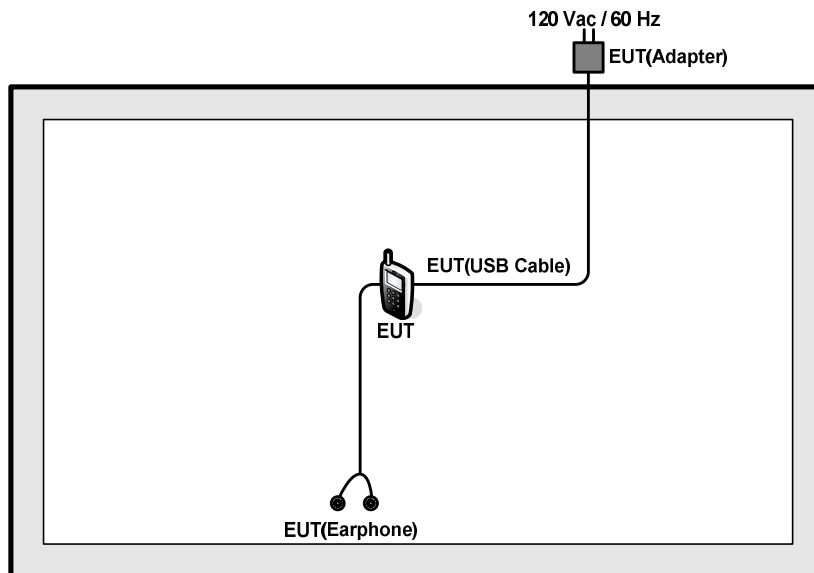
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700 MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700 MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

2.4 Connection Diagram of Test System

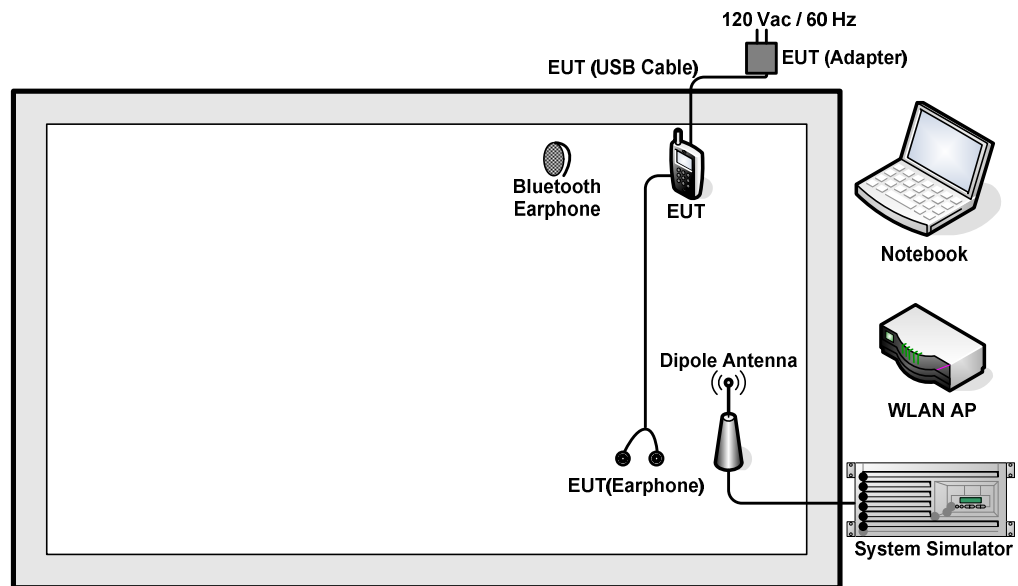
<WLAN Tx Mode>

For WLAN 5GHz 802.11a/802.11n HT40



For WLAN 5GHz 802.11n HT20



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
2.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	Unshielded, 1.8 m
3.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the Notebook under large package sizes transmission.



2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 6.5 dB.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 6.5 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

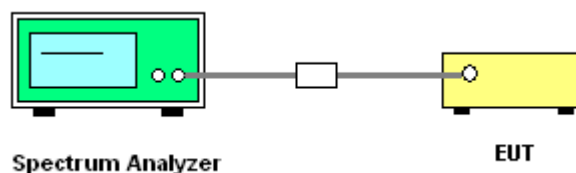
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

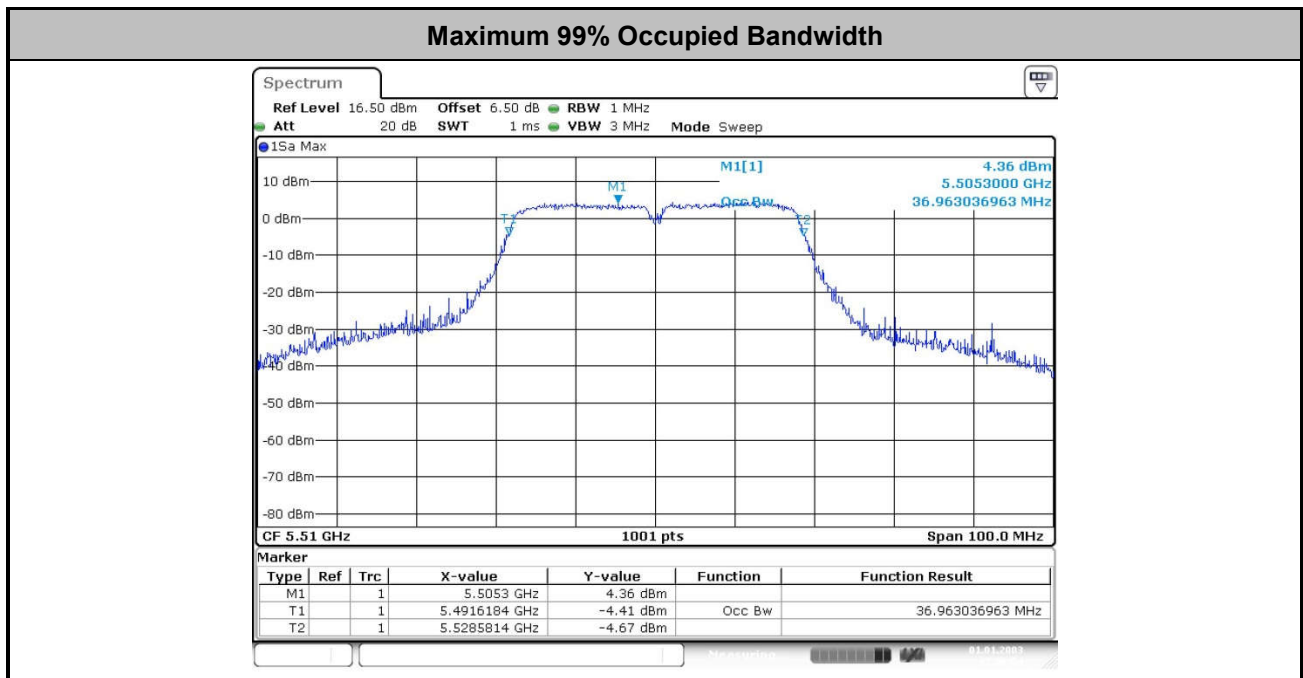
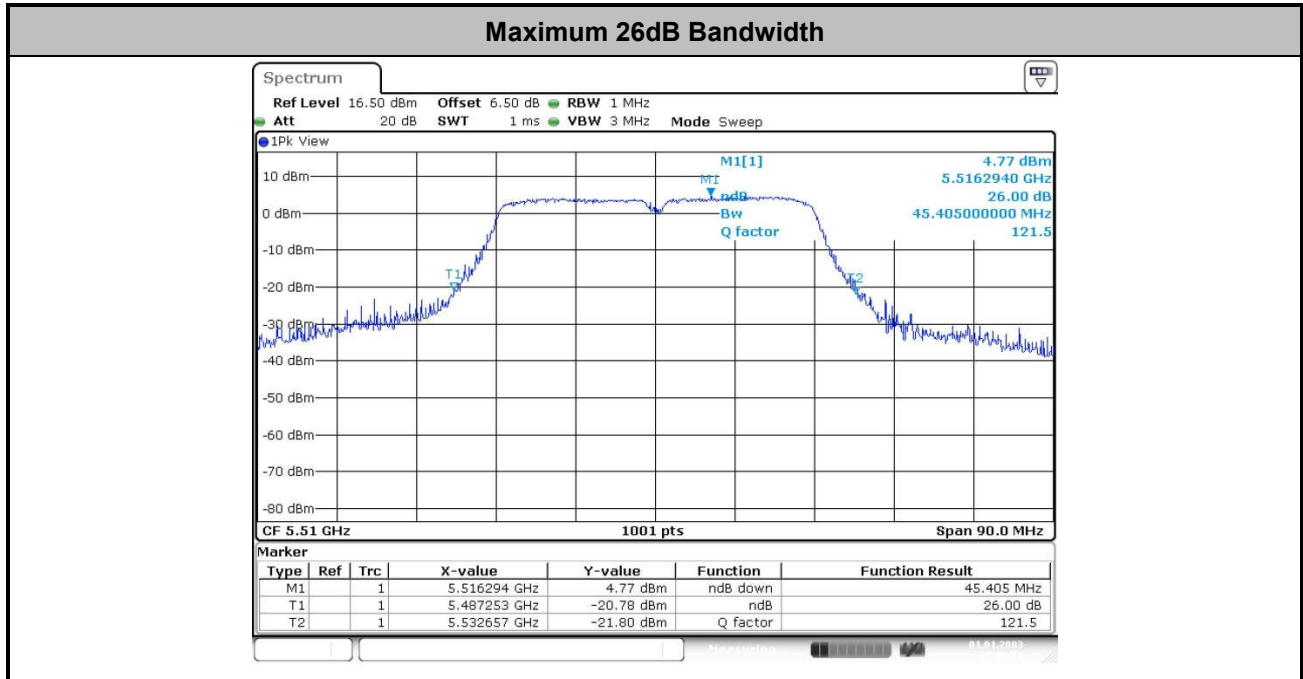
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.
Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB 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%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Please refer to Appendix A.



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

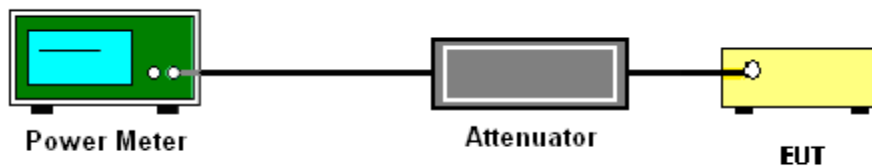
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.

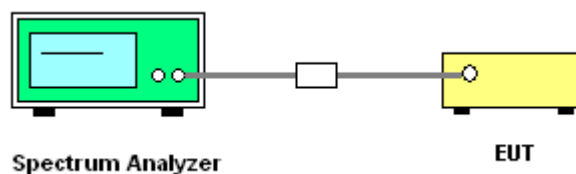
Section F) Maximum power spectral density.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - 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. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

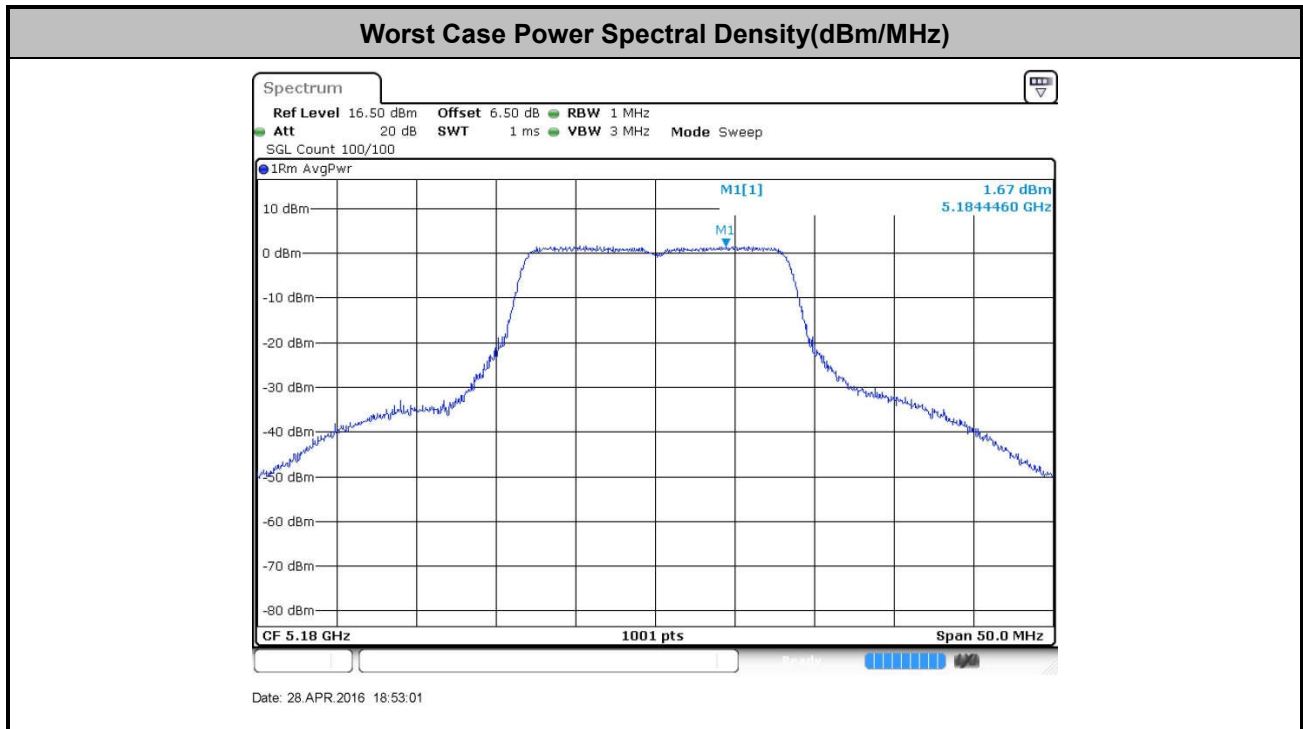
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



Note: Average Power Density (dB) = Measured value+ Duty Factor

3.4 Unwanted Radiated Emission Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part 15.205.

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

- (2) Unwanted spurious emissions fallen in restricted bands per FCC Part 15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

Frequency (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: The following formula is used to convert the EIRP to field strength.

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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

- (3) KDB789033 D01 v01r02 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17



dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.



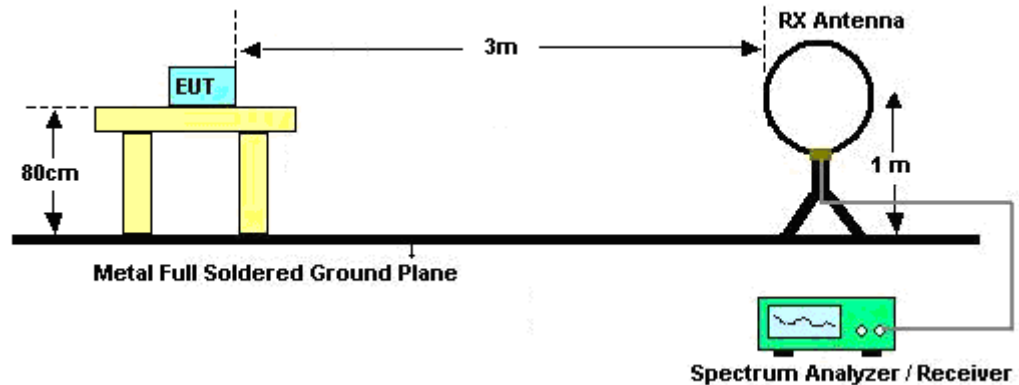
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.
Section G) Unwanted emissions measurement.
(1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW \geq 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in

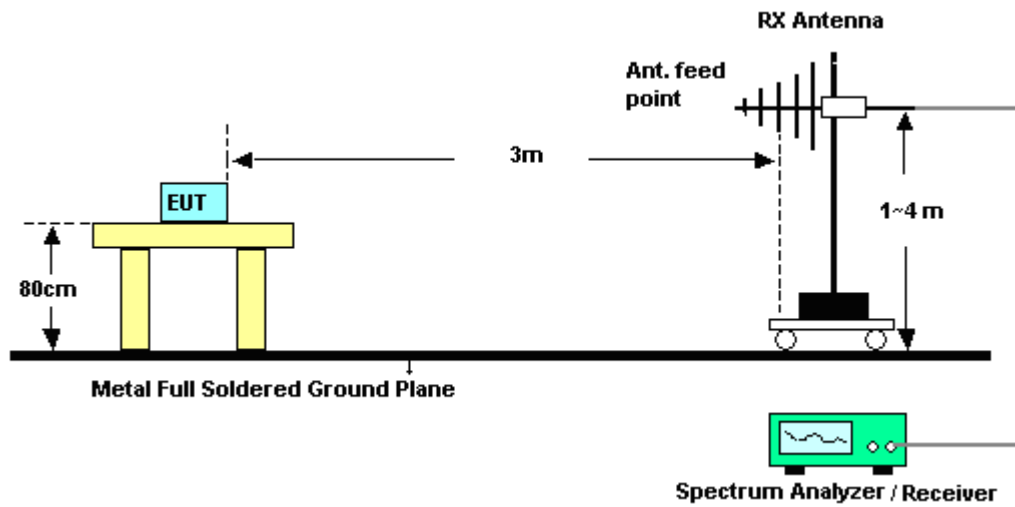
average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

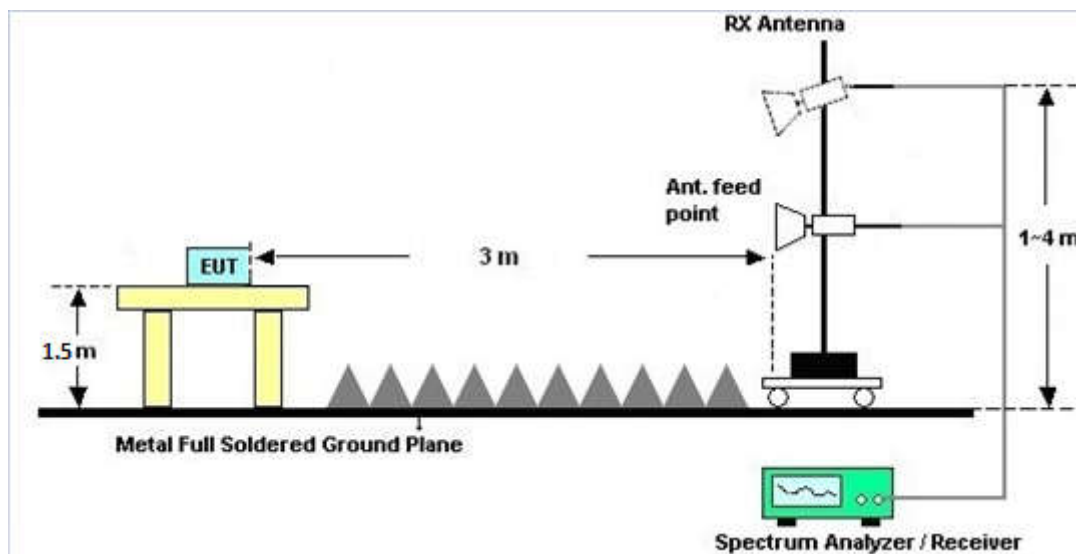
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B.

3.4.7 Duty Cycle

Please refer to Appendix C.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

*Decreases with the logarithm of the frequency.

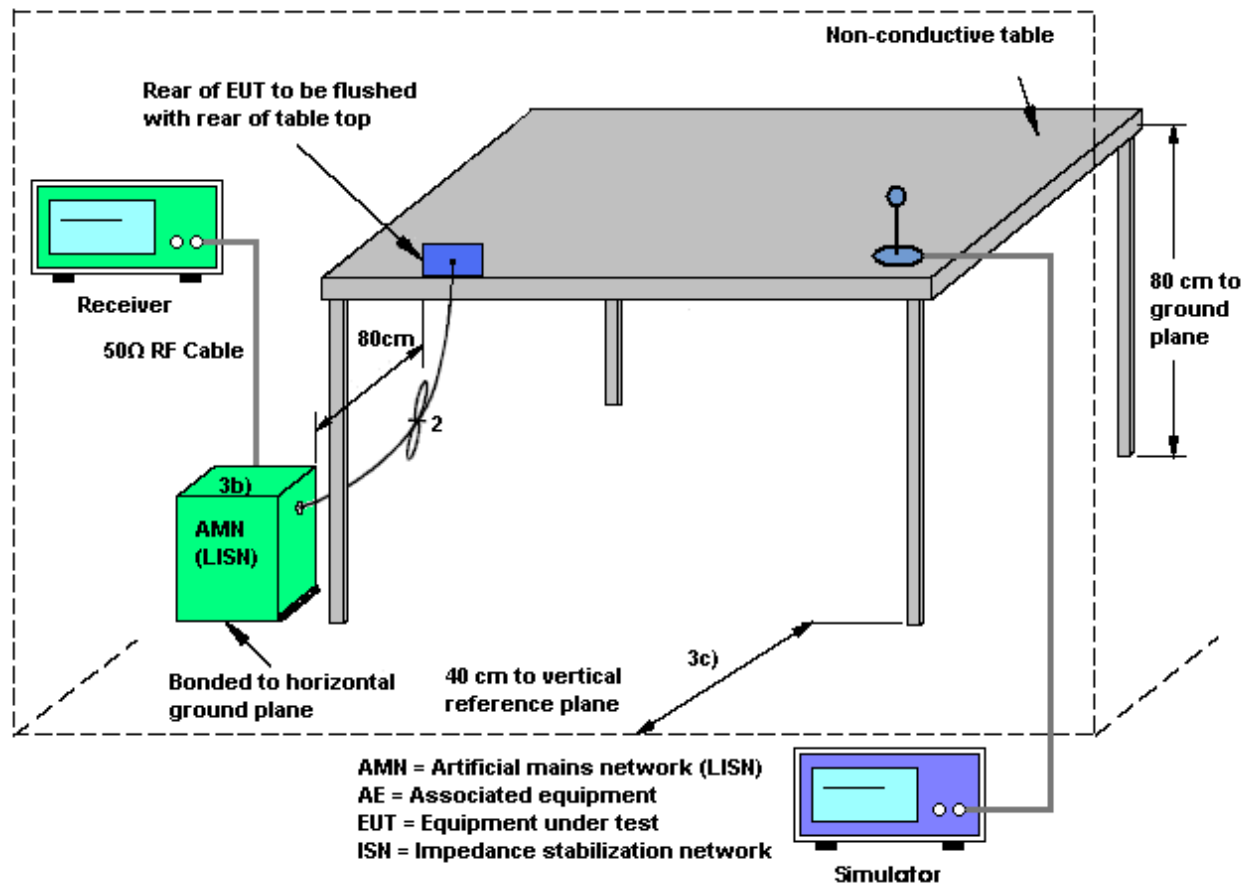
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

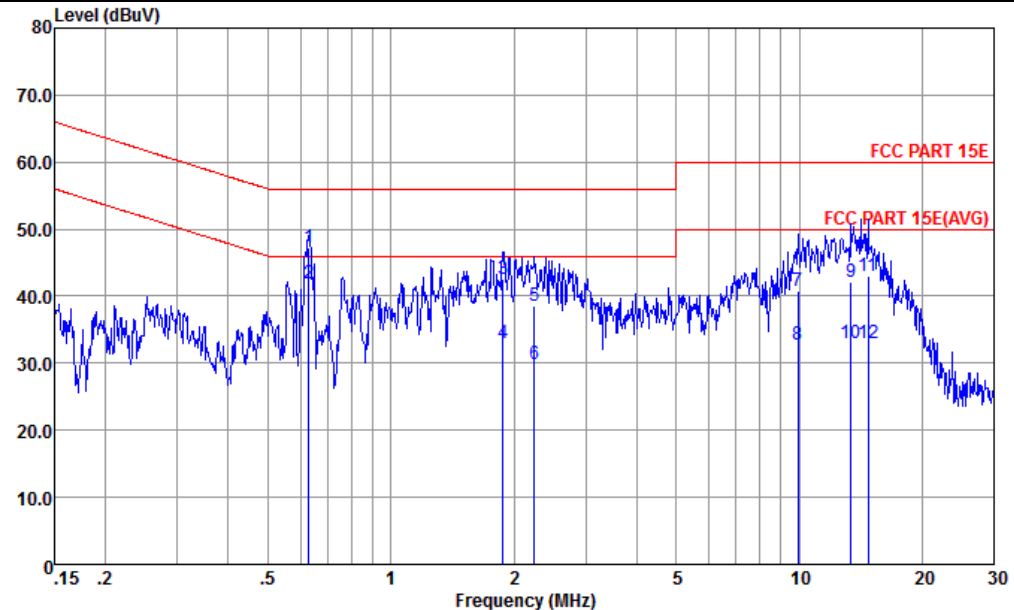
3.5.4 Test Setup





3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone 1 + USB Cable 2 (Charging from Adapter 2) + Battery 2		

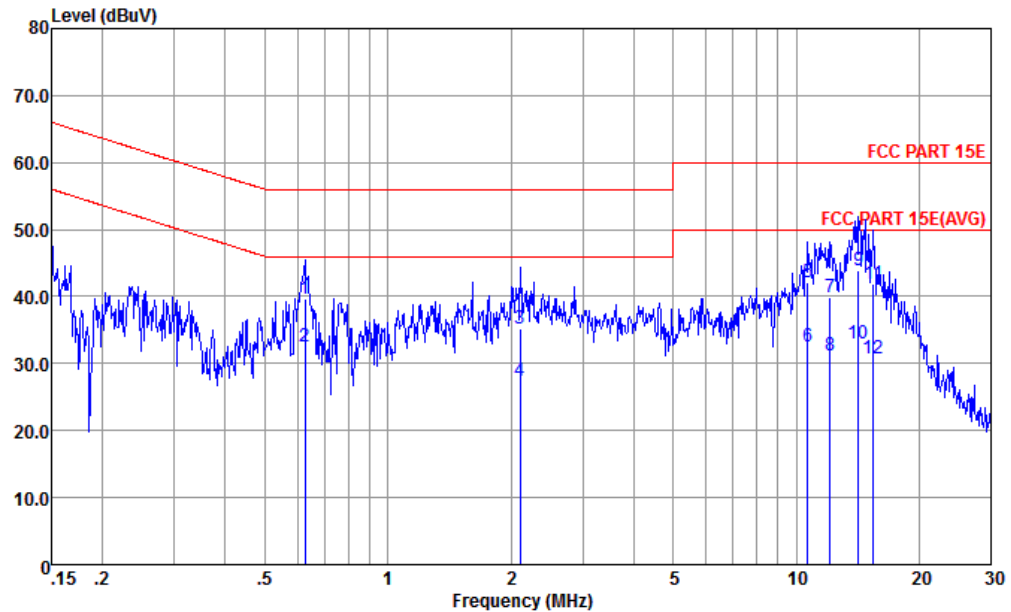


Site : CO01-KS
Condition : FCC PART 15E LISN-L-20151024 LINE
mode : Mode 2
: 356133070060750/356136070060768 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.63	47.19	-8.81	56.00	36.79	0.24	10.16	QP
2 *	0.63	41.99	-4.01	46.00	31.59	0.24	10.16	Average
3	1.88	42.63	-13.37	56.00	32.30	0.19	10.14	QP
4	1.88	32.93	-13.07	46.00	22.60	0.19	10.14	Average
5	2.25	38.53	-17.47	56.00	28.21	0.18	10.14	QP
6	2.25	29.83	-16.17	46.00	19.51	0.18	10.14	Average
7	9.91	40.72	-19.28	60.00	30.20	0.25	10.27	QP
8	9.91	32.82	-17.18	50.00	22.30	0.25	10.27	Average
9	13.41	42.21	-17.79	60.00	31.60	0.26	10.35	QP
10	13.41	32.91	-17.09	50.00	22.30	0.26	10.35	Average
11	14.75	42.94	-17.06	60.00	32.30	0.26	10.38	QP
12	14.75	32.94	-17.06	50.00	22.30	0.26	10.38	Average



Test Mode :	Mode 2	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	44~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone 1 + USB Cable 2 (Charging from Adapter 2) + Battery 2		



Site : CO01-KS
Condition : FCC PART 15E LISN-N-20151024 NEUTRAL

mode : Mode 2
: 356133070060750/356136070060768 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.63	39.69	-16.31	56.00	29.20	0.33	10.16	QP
2 *	0.63	32.59	-13.41	46.00	22.10	0.33	10.16	Average
3	2.11	35.12	-20.88	56.00	24.60	0.38	10.14	QP
4	2.11	27.32	-18.68	46.00	16.80	0.38	10.14	Average
5	10.68	42.16	-17.84	60.00	31.60	0.28	10.28	QP
6	10.68	32.46	-17.54	50.00	21.90	0.28	10.28	Average
7	12.12	39.79	-20.21	60.00	29.19	0.28	10.32	QP
8	12.12	31.19	-18.81	50.00	20.59	0.28	10.32	Average
9	14.21	43.84	-16.16	60.00	33.20	0.27	10.37	QP
10	14.21	32.94	-17.06	50.00	22.30	0.27	10.37	Average
11	15.47	41.97	-18.03	60.00	31.30	0.27	10.40	QP
12	15.47	30.77	-19.23	50.00	20.10	0.27	10.40	Average

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Please refer to Appendix A.



3.7 Automatically Discontinue Transmission

3.7.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



3.8 Antenna Requirements

3.8.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2), if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

The antenna gain is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	10Hz~30GHz	Apr. 22, 2016	Apr. 28, 2016~ May 23, 2016	Apr. 21, 2017	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	30MHz~40GHz	Jan. 20, 2016	Apr. 28, 2016~ May 23, 2016	Jan. 19, 2017	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 20, 2016	Apr. 28, 2016~ May 23, 2016	Jan. 19, 2017	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Apr. 28, 2016~ May 23, 2016	Oct. 23, 2016	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 10, 2015	Apr. 28, 2016~ May 16, 2016	Sep. 09, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44GHz	Jun. 05, 2015	Apr. 28, 2016~ May 16, 2016	Jun. 04, 2016	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 07, 2015	Apr. 28, 2016~ May 16, 2016	Nov. 06, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25MHz~2GHz	Mar. 12, 2016	Apr. 28, 2016~ May 16, 2016	Mar. 11, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120 D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Apr. 28, 2016~ May 16, 2016	Jun. 24, 2016	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101070	18Ghz~40Ghz	Oct. 10, 2015	Apr. 28, 2016~ May 16, 2016	Oct. 09, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz~3000M Hz	Aug. 10, 2015	Apr. 28, 2016~ May 16, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Apr. 28, 2016~ May 16, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18GHz~40GHz	Aug. 27, 2015	Apr. 28, 2016~ May 16, 2016	Aug. 26, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Apr. 28, 2016~ May 16, 2016	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Apr. 28, 2016~ May 16, 2016	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Apr. 28, 2016~ May 16, 2016	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	May 04, 2015	Apr. 18, 2016	May 03, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Apr. 18, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Apr. 18, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Apr. 18, 2016	Oct. 23, 2016	Conduction (CO01-KS)

NCR: No Calibration Required



5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.5 dB
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Appendix A. Conducted Test Results

Report Number : FR611504-04E

Test Engineer:	Issac Song	Temperature:	24~25	°C
Test Date:	2016/4/28~2016/5/23	Relative Humidity:	49~51	%

TEST RESULTS DATA
26dB and 99% OBW

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)		
11a	6Mbps	1	36	5180	18.73	23.33	-	22.73		
11a	6Mbps	1	44	5220	18.63	23.83	-	22.70		
11a	6Mbps	1	48	5240	18.63	23.83	-	22.70		
HT20	MCS0	1	36	5180	19.33	23.88	-	22.86		
HT20	MCS0	1	44	5220	19.33	24.03	-	22.86		
HT20	MCS0	1	48	5240	19.33	23.73	-	22.86		
HT40	MCS0	1	38	5190	36.56	44.60	-	23.01		
HT40	MCS0	1	46	5230	36.46	44.51	-	23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.58	12.96	24.00	-2.40		Pass
11a	6Mbps	1	44	5220	0.58	12.50	24.00	-2.40		Pass
11a	6Mbps	1	48	5240	0.58	12.39	24.00	-2.40		Pass
HT20	MCS0	1	36	5180	0.65	11.96	24.00	-2.40		Pass
HT20	MCS0	1	44	5220	0.65	11.60	24.00	-2.40		Pass
HT20	MCS0	1	48	5240	0.65	11.53	24.00	-2.40		Pass
HT40	MCS0	1	38	5190	1.18	11.88	24.00	-2.40		Pass
HT40	MCS0	1	46	5230	1.18	11.68	24.00	-2.40		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.58	2.25	11.00	-2.40		Pass
11a	6Mbps	1	44	5220	0.58	2.00	11.00	-2.40		Pass
11a	6Mbps	1	48	5240	0.58	2.06	11.00	-2.40		Pass
HT20	MCS0	1	36	5180	0.65	1.31	11.00	-2.40		Pass
HT20	MCS0	1	44	5220	0.65	0.92	11.00	-2.40		Pass
HT20	MCS0	1	48	5240	0.65	0.84	11.00	-2.40		Pass
HT40	MCS0	1	38	5190	1.18	-1.75	11.00	-2.40		Pass
HT40	MCS0	1	46	5230	1.18	-1.83	11.00	-2.40		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band II										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	52	5260	18.58	23.63	23.69	29.69	23.98	
11a	6M bps	1	60	5300	18.63	23.78	23.70	29.70	23.98	
11a	6M bps	1	64	5320	18.63	23.93	23.70	29.70	23.98	
HT20	MCS 0	1	52	5260	19.28	23.93	23.85	29.85	23.98	
HT20	MCS 0	1	60	5300	19.33	24.18	23.86	29.86	23.98	
HT20	MCS 0	1	64	5320	19.33	24.03	23.86	29.86	23.98	
HT40	MCS 0	1	54	5270	36.56	44.78	23.98	30.00	23.98	
HT40	MCS 0	1	62	5310	36.66	44.96	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band II										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	52	5260	0.58	12.43	23.98	-2.40		Pass
11a	6M bps	1	60	5300	0.58	12.04	23.98	-2.40		Pass
11a	6M bps	1	64	5320	0.58	12.62	23.98	-2.40		Pass
HT20	MCS 0	1	52	5260	0.65	11.59	23.98	-2.40		Pass
HT20	MCS 0	1	60	5300	0.65	11.30	23.98	-2.40		Pass
HT20	MCS 0	1	64	5320	0.65	11.75	23.98	-2.40		Pass
HT40	MCS 0	1	54	5270	1.18	12.39	23.98	-2.40		Pass
HT40	MCS 0	1	62	5310	1.18	12.06	23.98	-2.40		Pass

TEST RESULTS DATA
Power Spectral Density

Band II										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	52	5260	0.58	2.17	11.00	-2.40		Pass
11a	6M bps	1	60	5300	0.58	1.73	11.00	-2.40		Pass
11a	6M bps	1	64	5320	0.58	0.93	11.00	-2.40		Pass
HT20	MCS 0	1	52	5260	0.65	0.53	11.00	-2.40		Pass
HT20	MCS 0	1	60	5300	0.65	-0.06	11.00	-2.40		Pass
HT20	MCS 0	1	64	5320	0.65	0.13	11.00	-2.40		Pass
HT40	MCS 0	1	54	5270	1.18	-1.38	11.00	-2.40		Pass
HT40	MCS 0	1	62	5310	1.18	-1.71	11.00	-2.40		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band III										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	18.63	23.43	23.70	29.70	23.98	
11a	6M bps	1	116	5580	18.38	23.83	23.64	29.64	23.98	
11a	6M bps	1	140	5700	18.63	23.68	23.70	29.70	23.98	
HT20	MCS 0	1	100	5500	19.23	23.88	23.84	29.84	23.98	
HT20	MCS 0	1	116	5580	19.28	23.53	23.85	29.85	23.98	
HT20	MCS 0	1	140	5700	19.23	23.68	23.84	29.84	23.98	
HT40	MCS 0	1	102	5510	36.96	45.41	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	36.76	44.96	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	36.66	44.87	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band III										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.58	10.98	23.98	-2.40		Pass
11a	6M bps	1	116	5580	0.58	10.96	23.98	-2.40		Pass
11a	6M bps	1	140	5700	0.58	10.07	23.98	-2.40		Pass
HT20	MCS 0	1	100	5500	10.00	10.13	23.98	-2.40		Pass
HT20	MCS 0	1	116	5580	10.00	10.08	23.98	-2.40		Pass
HT20	MCS 0	1	140	5700	10.00	9.40	23.98	-2.40		Pass
HT40	MCS 0	1	102	5510	1.18	9.96	23.98	-2.40		Pass
HT40	MCS 0	1	110	5550	1.18	9.63	23.98	-2.40		Pass
HT40	MCS 0	1	134	5670	1.18	9.46	23.98	-2.40		Pass

TEST RESULTS DATA
Power Spectral Density

Band III										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.58	-0.18	11.00	-2.40		Pass
11a	6M bps	1	116	5580	0.58	0.81	11.00	-2.40		Pass
11a	6M bps	1	140	5700	0.58	0.13	11.00	-2.40		Pass
HT20	MCS 0	1	100	5500	0.65	-1.20	11.00	-2.40		Pass
HT20	MCS 0	1	116	5580	0.65	-0.72	11.00	-2.40		Pass
HT20	MCS 0	1	140	5700	0.65	-1.31	11.00	-2.40		Pass
HT40	MCS 0	1	102	5510	1.18	-3.25	11.00	-2.40		Pass
HT40	MCS 0	1	110	5550	1.18	-3.33	11.00	-2.40		Pass
HT40	MCS 0	1	134	5670	1.18	-3.93	11.00	-2.40		Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	3.55	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	4.35	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	3.9	
11a	6Mbps	1	36	5180	5180.075	0.075	14.48	-30	3.9	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	50	3.9	

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	64	5320	5260.050	-59.950	-11268.80	20	3.55	
11a	6Mbps	1	64	5320	5260.050	-59.950	-11268.80	20	4.35	
11a	6Mbps	1	64	5320	5260.050	-59.950	-11268.80	20	3.9	
11a	6Mbps	1	64	5320	5260.075	-59.925	-11264.10	-30	3.9	
11a	6Mbps	1	64	5320	5260.050	-59.950	-11268.80	50	3.9	

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	20	3.55	
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	20	4.35	
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	20	3.9	
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	-30	3.9	
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	50	3.9	



Appendix B. Radiated Spurious Emission

15E Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5149.45	48.63	-25.37	74	45.19	31.84	8.13	36.53	100	10	P	H
		5127.45	38.76	-15.24	54	35.35	31.84	8.11	36.54	100	10	A	H
	*	5186	96.53	-	-	93.02	31.85	8.17	36.51	100	10	P	H
	*	5186	89.65	-	-	86.14	31.85	8.17	36.51	100	10	A	H
		5104.8	46.77	-27.23	74	43.42	31.83	8.08	36.56	114	353	P	V
		5127.7	38.03	-15.97	54	34.62	31.84	8.11	36.54	114	353	A	V
	*	5176	94.38	-	-	90.87	31.85	8.17	36.51	114	353	P	V
	*	5188	86.86	-	-	83.35	31.85	8.17	36.51	114	353	A	V
802.11a CH 44 5220MHz	*	5226	98.46	-	-	94.88	31.87	8.21	36.5	232	0	P	H
	*	5226	90.97	-	-	87.39	31.87	8.21	36.5	232	0	A	H
	*	5228	93.49	-	-	89.91	31.87	8.21	36.5	314	360	P	V
	*	5216	86.28	-	-	82.72	31.86	8.2	36.5	314	360	A	V
802.11a CH 48 5240MHz	*	5244	99.58	-	-	95.98	31.88	8.22	36.5	252	334	P	H
	*	5246	92.11	-	-	88.51	31.88	8.22	36.5	252	334	A	H
		5385.9	45.47	-28.53	74	41.73	31.92	8.32	36.5	252	334	P	H
		5374.15	36.6	-17.4	54	32.88	31.91	8.31	36.5	252	334	A	H
	*	5246	95.1	-	-	91.5	31.88	8.22	36.5	100	0	P	V
	*	5246	87.59	-	-	83.99	31.88	8.22	36.5	100	0	A	V
		5367.4	45.56	-28.44	74	41.84	31.91	8.31	36.5	100	0	P	V
		5377.85	36.4	-17.6	54	32.66	31.92	8.32	36.5	100	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a		10359	46.45	-27.55	74	55.99	38.02	13.54	61.1	100	0	P	H
CH 36		10359	49.95	-24.05	74	59.49	38.02	13.54	61.1	100	360	P	V
5180MHz													
802.11a		10440	45.93	-28.07	74	55.36	38.06	13.58	61.07	100	0	P	H
CH 44		10440	49.91	-24.09	74	59.34	38.06	13.58	61.07	100	360	P	V
5220MHz													
802.11a		10479	44.87	-29.13	74	54.21	38.09	13.61	61.04	100	0	P	H
CH 48		10479	50.37	-23.63	74	59.71	38.09	13.61	61.04	100	360	P	V
5240MHz													
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 36 5180MHz		5147.4	50.05	-23.95	74	46.61	31.84	8.13	36.53	335	359	P	H
		5128.5	38.88	-15.12	54	35.47	31.84	8.11	36.54	335	359	A	H
	*	5188	96.55	-	-	93.04	31.85	8.17	36.51	335	359	P	H
	*	5186	89.83	-	-	86.32	31.85	8.17	36.51	335	359	A	H
		5127.25	48.4	-25.6	74	44.99	31.84	8.11	36.54	302	34	P	V
		5128.25	38.38	-15.62	54	34.97	31.84	8.11	36.54	302	34	A	V
	*	5182	93.4	-	-	89.89	31.85	8.17	36.51	302	34	P	V
	*	5186	86.14	-	-	82.63	31.85	8.17	36.51	302	34	A	V
802.11n HT20 CH 44 5220MHz	*	5224	97.96	-	-	94.4	31.86	8.2	36.5	313	358	P	H
	*	5228	90.88	-	-	87.3	31.87	8.21	36.5	313	358	A	H
	*	5218	92.67	-	-	89.11	31.86	8.2	36.5	339	4	P	V
	*	5226	85.98	-	-	82.4	31.87	8.21	36.5	339	4	A	V
802.11n HT20 CH 48 5240MHz	*	5236	98.28	-	-	94.7	31.87	8.21	36.5	325	330	P	H
	*	5248	90.88	-	-	87.28	31.88	8.22	36.5	325	330	A	H
		5374.7	45.99	-28.01	74	42.27	31.91	8.31	36.5	325	330	P	H
		5381.9	36.65	-17.35	54	32.91	31.92	8.32	36.5	325	330	A	H
	*	5248	93.33	-	-	89.73	31.88	8.22	36.5	100	347	P	V
	*	5248	86.06	-	-	82.46	31.88	8.22	36.5	100	347	A	V
		5370.15	47.42	-26.58	74	43.7	31.91	8.31	36.5	100	347	P	V
		5387.2	36.44	-17.56	54	32.7	31.92	8.32	36.5	100	347	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 36 5180MHz		10359	46.96	-27.04	74	56.5	38.02	13.54	61.1	100	0	P	H
		10359	51.02	-22.98	74	60.56	38.02	13.54	61.1	100	360	P	V
	!	10359	49.26	-4.74	54	58.8	38.02	13.54	61.1	100	349	A	V
802.11n HT20 CH 44 5220MHz		10440	46.03	-27.97	74	55.46	38.06	13.58	61.07	100	0	P	H
		10440	49.19	-24.81	74	58.62	38.06	13.58	61.07	100	360	P	V
	!	10440	48.95	-5.05	54	58.38	38.06	13.58	61.07	100	354	A	V
802.11n HT20 CH 48 5240MHz		10479	46.81	-27.19	74	56.15	38.09	13.61	61.04	100	0	P	H
		10479	50.54	-23.46	74	59.88	38.09	13.61	61.04	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 38 5190MHz		5146.7	52.8	-21.2	74	49.36	31.84	8.13	36.53	333	1	P	H
		5149.95	42.78	-11.22	54	39.34	31.84	8.13	36.53	333	1	A	H
	*	5200	92.67	-	-	89.12	31.86	8.19	36.5	333	1	P	H
	*	5204	85.82	-	-	82.27	31.86	8.19	36.5	333	1	A	H
		5148.75	51.03	-22.97	74	47.59	31.84	8.13	36.53	100	359	P	V
		5149.8	41.63	-12.37	54	38.19	31.84	8.13	36.53	100	359	A	V
	*	5204	90.12	-	-	86.57	31.86	8.19	36.5	100	359	P	V
	*	5202	83.28	-	-	79.73	31.86	8.19	36.5	100	359	A	V
802.11n HT40 CH 46 5230MHz	*	5242	92.95	-	-	89.35	31.88	8.22	36.5	326	346	P	H
	*	5234	85.78	-	-	82.2	31.87	8.21	36.5	326	346	A	H
		5380.7	45.53	-28.47	74	41.79	31.92	8.32	36.5	326	346	P	H
		5375.5	36.92	-17.08	54	33.2	31.91	8.31	36.5	326	346	A	H
	*	5244	91.4	-	-	87.8	31.88	8.22	36.5	128	0	P	V
	*	5242	84.61	-	-	81.01	31.88	8.22	36.5	128	0	A	V
		5391.9	46.65	-27.35	74	42.91	31.92	8.32	36.5	128	0	P	V
		5374.85	37.38	-16.62	54	33.66	31.91	8.31	36.5	128	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 38 5190MHz		10380	46.08	-27.92	74	55.6	38.03	13.55	61.1	100	0	P	H
		10380	48.66	-25.34	74	58.18	38.03	13.55	61.1	100	360	P	V
802.11n HT40 CH 46 5230MHz		10461	45.03	-28.97	74	54.4	38.08	13.6	61.05	100	0	P	H
		10461	48.97	-25.03	74	58.34	38.08	13.6	61.05	100	360	P	V
	!	10461	48.19	-5.81	54	57.56	38.08	13.6	61.05	100	360	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 2 - 5250~5350MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 52 5260MHz		5113.4	46.87	-27.13	74	43.49	31.83	8.1	36.55	100	321	P	H
		5110.4	37.26	-16.74	54	33.88	31.83	8.1	36.55	100	321	A	H
	*	5258	100.99	-	-	97.39	31.88	8.22	36.5	100	321	P	H
	*	5266	93.49	-	-	89.88	31.88	8.23	36.5	100	321	A	H
		5113.5	46.73	-27.27	74	43.35	31.83	8.1	36.55	142	0	P	V
		5110.05	37.2	-16.8	54	33.82	31.83	8.1	36.55	142	0	A	V
	*	5268	97.29	-	-	93.68	31.88	8.23	36.5	142	0	P	V
	*	5266	89.31	-	-	85.7	31.88	8.23	36.5	142	0	A	V
802.11a CH 60 5300MHz	*	5304	100.41	-	-	96.76	31.89	8.26	36.5	100	24	P	H
	*	5304	93.08	-	-	89.43	31.89	8.26	36.5	100	24	A	H
	*	5296	96.47	-	-	92.82	31.89	8.26	36.5	100	265	P	V
	*	5294	89.08	-	-	85.43	31.89	8.26	36.5	100	265	A	V
802.11a CH 64 5320MHz	*	5326	99.05	-	-	95.38	31.9	8.27	36.5	300	6	P	H
	*	5324	91.82	-	-	88.15	31.9	8.27	36.5	300	6	A	H
		5353.7	49.33	-24.67	74	45.63	31.91	8.29	36.5	300	6	P	H
		5372.55	40.49	-13.51	54	36.77	31.91	8.31	36.5	300	6	A	H
	*	5316	96.32	-	-	92.65	31.9	8.27	36.5	100	0	P	V
	*	5314	89.21	-	-	85.54	31.9	8.27	36.5	100	0	A	V
		5351.7	49.47	-24.53	74	45.77	31.91	8.29	36.5	100	0	P	V
		5372.45	38.97	-15.03	54	35.25	31.91	8.31	36.5	100	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a		10521	44.82	-29.18	74	54.11	38.11	13.63	61.03	100	360	P	H
CH 52		10521	50.16	-23.84	74	59.45	38.11	13.63	61.03	100	0	P	V
5260MHz													
802.11a		10599	43.79	-30.21	74	31.15	38.16	11.75	37.27	100	360	P	H
CH 60		10602	50.38	-23.62	74	37.74	38.16	11.75	37.27	100	0	P	V
5300MHz													
802.11a		10641	44.74	-29.26	74	53.83	38.18	13.7	60.97	100	0	P	H
CH 64		10641	48.75	-25.25	74	57.84	38.18	13.7	60.97	100	360	P	V
5320MHz													
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 52 5260MHz		5134.15	47	-27	74	43.59	31.84	8.11	36.54	283	342	P	H
		5104.65	37.15	-16.85	54	33.8	31.83	8.08	36.56	283	342	A	H
	*	5256	98.19	-	-	94.59	31.88	8.22	36.5	283	342	P	H
	*	5266	90.48	-	-	86.87	31.88	8.23	36.5	283	342	A	H
		5113.7	46.02	-27.98	74	42.64	31.83	8.1	36.55	100	351	P	V
		5111.7	37.01	-16.99	54	33.63	31.83	8.1	36.55	100	351	A	V
	*	5258	94.84	-	-	91.24	31.88	8.22	36.5	100	351	P	V
	*	5256	87.64	-	-	84.04	31.88	8.22	36.5	100	351	A	V
802.11n HT20 CH 60 5300MHz	*	5296	98.09	-	-	94.44	31.89	8.26	36.5	316	3	P	H
	*	5308	90.62	-	-	86.97	31.89	8.26	36.5	316	3	A	H
	*	5300	95.18	-	-	91.53	31.89	8.26	36.5	100	351	P	V
	*	5296	87.92	-	-	84.27	31.89	8.26	36.5	100	351	A	V
802.11n HT20 CH 64 5320MHz	*	5324	98.31	-	-	94.64	31.9	8.27	36.5	345	1	P	H
	*	5324	90.89	-	-	87.22	31.9	8.27	36.5	345	1	A	H
		5350	51.29	-22.71	74	47.59	31.91	8.29	36.5	345	1	P	H
		5371.75	40.5	-13.5	54	36.78	31.91	8.31	36.5	345	1	A	H
	*	5328	94.35	-	-	90.67	31.9	8.28	36.5	105	0	P	V
	*	5316	87.52	-	-	83.85	31.9	8.27	36.5	105	0	A	V
		5352.85	47.03	-26.97	74	43.33	31.91	8.29	36.5	105	0	P	V
		5371.85	38.47	-15.53	54	34.75	31.91	8.31	36.5	105	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 52 5260MHz		10521	46.03	-27.97	74	55.32	38.11	13.63	61.03	100	0	P	H
		10521	49.92	-24.08	74	59.21	38.11	13.63	61.03	100	360	P	V
	!	10521	49.26	-4.74	54	58.55	38.11	13.63	61.03	100	355	A	V
802.11n HT20 CH 60 5300MHz		10599	44.62	-29.38	74	53.76	38.16	13.68	60.98	100	0	P	H
		10599	49.29	-24.71	74	58.43	38.16	13.68	60.98	100	360	P	V
	!	10599	48.94	-5.06	54	58.08	38.16	13.68	60.98	100	353	A	V
802.11n HT20 CH 64 5320MHz		10641	46.56	-27.44	74	55.65	38.18	13.7	60.97	100	0	P	H
		10641	49.64	-24.36	74	58.73	38.18	13.7	60.97	100	360	P	V
	!	10641	49.27	-4.73	54	58.36	38.18	13.7	60.97	100	350	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 54 5270MHz		5138.55	46.77	-27.23	74	43.36	31.84	8.11	36.54	400	0	P	H
		5140.75	37.66	-16.34	54	34.22	31.84	8.13	36.53	400	0	A	H
	*	5264	95.3	-	-	91.69	31.88	8.23	36.5	400	0	P	H
	*	5258	87.39	-	-	83.79	31.88	8.22	36.5	400	0	A	H
		5128.15	47.18	-26.82	74	43.77	31.84	8.11	36.54	127	356	P	V
		5122.95	37.5	-16.5	54	34.09	31.84	8.11	36.54	127	356	A	V
	*	5282	90.3	-	-	86.66	31.89	8.25	36.5	127	356	P	V
	*	5282	83.48	-	-	79.84	31.89	8.25	36.5	127	356	A	V
802.11n HT40 CH 62 5310MHz	*	5322	94.84	-	-	91.17	31.9	8.27	36.5	326	6	P	H
	*	5324	87.62	-	-	83.95	31.9	8.27	36.5	326	6	A	H
		5354.55	62.25	-11.75	74	58.55	31.91	8.29	36.5	326	6	P	H
	!	5350.75	48.1	-5.9	54	44.4	31.91	8.29	36.5	326	6	A	H
	*	5304	91.21	-	-	87.56	31.89	8.26	36.5	100	350	P	V
	*	5298	83.85	-	-	80.2	31.89	8.26	36.5	100	350	A	V
		5350.15	54.65	-19.35	74	50.95	31.91	8.29	36.5	100	350	P	V
		5350.15	44.19	-9.81	54	40.49	31.91	8.29	36.5	100	350	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 54 5270MHz		10539	46.75	-27.25	74	56.01	38.12	13.64	61.02	100	0	P	H
		10539	50.33	-23.67	74	59.59	38.12	13.64	61.02	100	360	P	V
802.11n HT40 CH 62 5310MHz		10620	45.12	-28.88	74	54.24	38.17	13.69	60.98	100	0	P	H
		10620	49.54	-24.46	74	58.66	38.17	13.69	60.98	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 3 - 5470~5725MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 100 5500MHz		5468.08	48.67	-25.33	74	44.74	31.95	8.38	36.4	310	333	P	H
		5447.76	39.32	-14.68	54	35.43	31.94	8.37	36.42	310	333	A	H
	*	5498	94.68	-	-	90.67	31.96	8.4	36.35	310	333	P	H
	*	5496	87.93	-	-	83.97	31.95	8.39	36.38	310	333	A	H
		5464.48	46.34	-27.66	74	42.41	31.95	8.38	36.4	100	335	P	V
		5447.6	38.07	-15.93	54	34.18	31.94	8.37	36.42	100	335	A	V
	*	5494	91.06	-	-	87.1	31.95	8.39	36.38	100	335	P	V
	*	5494	84.07	-	-	80.11	31.95	8.39	36.38	100	335	A	V
802.11a CH 116 5580MHz	*	5586	95.18	-	-	90.96	31.98	8.47	36.23	300	337	P	H
	*	5586	88.03	-	-	83.81	31.98	8.47	36.23	300	337	A	H
	*	5576	91.75	-	-	87.57	31.98	8.45	36.25	100	360	P	V
	*	5576	84.57	-	-	80.39	31.98	8.45	36.25	100	360	A	V
802.11a CH 140 5700MHz	*	5708	93.41	-	-	89.1	32.03	8.55	36.27	354	0	P	H
	*	5706	85.84	-	-	81.53	32.03	8.55	36.27	354	0	A	H
		5725.8	47.18	-26.82	74	42.85	32.04	8.57	36.28	354	0	P	H
		5725.16	38.6	-15.4	54	34.27	32.04	8.57	36.28	354	0	A	H
	*	5706	90.01	-	-	85.7	32.03	8.55	36.27	119	0	P	V
	*	5694	82.58	-	-	78.27	32.02	8.54	36.25	119	0	A	V
		5725	47.5	-26.5	74	43.17	32.04	8.57	36.28	119	0	P	V
		5725	37.69	-16.31	54	33.36	32.04	8.57	36.28	119	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 100 5500MHz		11001	46.17	-27.83	74	54.65	38.4	13.91	60.79	100	0	P	H
	!	10995	50.38	-3.62	54	58.86	38.4	13.91	60.79	232	0	A	H
		11001	54	-20	74	62.48	38.4	13.91	60.79	100	360	P	V
	!	11001	49.97	-4.03	54	58.45	38.4	13.91	60.79	100	360	A	V
802.11a CH 116 5580MHz		11160	44.93	-29.07	74	53.16	38.47	14.01	60.71	100	0	P	H
		11160	52.75	-21.25	74	60.98	38.47	14.01	60.71	100	360	P	V
		11160	48.4	-5.6	54	56.63	38.47	14.01	60.71	100	360	A	V
802.11a CH 140 5700MHz		11400	44.88	-29.12	74	52.76	38.56	14.15	60.59	100	0	P	H
		11400	47.3	-26.7	74	55.18	38.56	14.15	60.59	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 100 5500MHz		5464.4	47.22	-26.78	74	43.29	31.95	8.38	36.4	276	337	P	H
		5448.24	40.08	-13.92	54	36.19	31.94	8.37	36.42	276	337	A	H
	*	5494	95.87	-	-	91.91	31.95	8.39	36.38	276	337	P	H
	*	5494	88.63	-	-	84.67	31.95	8.39	36.38	276	337	A	H
		5468.4	46.31	-27.69	74	42.38	31.95	8.38	36.4	163	360	P	V
		5448.56	38.36	-15.64	54	34.47	31.94	8.37	36.42	163	360	A	V
	*	5492	91.5	-	-	87.54	31.95	8.39	36.38	163	360	P	V
	*	5494	84.47	-	-	80.51	31.95	8.39	36.38	163	360	A	V
802.11n HT20 CH 116 5580MHz	*	5584	94.49	-	-	90.27	31.98	8.47	36.23	325	338	P	H
	*	5586	87.11	-	-	82.89	31.98	8.47	36.23	325	338	A	H
	*	5588	90.68	-	-	86.46	31.98	8.47	36.23	121	354	P	V
	*	5576	83.26	-	-	79.08	31.98	8.45	36.25	121	354	A	V
802.11n HT20 CH 140 5700MHz	*	5706	91.25	-	-	86.94	32.03	8.55	36.27	310	60	P	H
	*	5696	83.61	-	-	79.3	32.02	8.54	36.25	310	60	A	H
		5726.84	47.1	-26.9	74	42.77	32.04	8.57	36.28	310	60	P	H
		5725	38.28	-15.72	54	33.95	32.04	8.57	36.28	310	60	A	H
	*	5696	89.16	-	-	84.85	32.02	8.54	36.25	100	353	P	V
	*	5694	81.66	-	-	77.35	32.02	8.54	36.25	100	353	A	V
		5725	47.46	-26.54	74	43.13	32.04	8.57	36.28	100	353	P	V
		5725.08	37.77	-16.23	54	33.44	32.04	8.57	36.28	100	353	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		11001	46	-28	74	54.48	38.4	13.91	60.79	100	0	P	H
HT20		11001	50.2	-23.8	74	58.68	38.4	13.91	60.79	100	360	P	V
CH 100	!	11001	48.73	-5.27	54	57.21	38.4	13.91	60.79	100	351	A	V
5500MHz													
802.11n		11160	46.07	-27.93	74	54.3	38.47	14.01	60.71	100	0	P	H
HT20													
CH 116		11160	49.87	-24.13	74	58.1	38.47	14.01	60.71	100	360	P	V
5580MHz													
802.11n		11400	44.43	-29.57	74	52.31	38.56	14.15	60.59	100	0	P	H
HT20													
CH 140		11400	46.63	-27.37	74	54.51	38.56	14.15	60.59	100	360	P	V
5700MHz													
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 102 5510MHz		5469.36	56.92	-17.08	74	52.99	31.95	8.38	36.4	400	337	P	H
		5470	47.31	-6.69	54	43.38	31.95	8.38	36.4	400	337	A	H
	*	5522	94.11	-	-	90.06	31.96	8.42	36.33	400	337	P	H
	*	5498	87.4	-	-	83.39	31.96	8.4	36.35	400	337	A	H
		5468.56	53.93	-20.07	74	50	31.95	8.38	36.4	119	359	P	V
		5469.68	44.03	-9.97	54	40.1	31.95	8.38	36.4	119	359	A	V
	*	5496	89.17	-	-	85.21	31.95	8.39	36.38	119	359	P	V
	*	5498	82.37	-	-	78.36	31.96	8.4	36.35	119	359	A	V
802.11n HT40 CH 110 5550MHz	*	5552	93.1	-	-	88.97	31.97	8.44	36.28	400	343	P	H
	*	5546	85.87	-	-	81.77	31.97	8.43	36.3	400	343	A	H
	*	5544	88.86	-	-	84.76	31.97	8.43	36.3	137	337	P	V
	*	5540	81.8	-	-	77.7	31.97	8.43	36.3	137	337	A	V
802.11n HT40 CH 134 5670MHz	*	5682	92.37	-	-	88.06	32.02	8.53	36.24	400	1	P	H
	*	5658	85.4	-	-	81.1	32.01	8.52	36.23	400	1	A	H
		5730.28	47.8	-26.2	74	43.47	32.04	8.57	36.28	400	1	P	H
		5725.16	38.47	-15.53	54	34.14	32.04	8.57	36.28	400	1	A	H
	*	5660	87.96	-	-	83.66	32.01	8.52	36.23	182	360	P	V
	*	5660	81.07	-	-	76.77	32.01	8.52	36.23	182	360	A	V
		5735.48	46.93	-27.07	74	42.59	32.05	8.58	36.29	182	360	P	V
		5725.08	38.33	-15.67	54	34	32.04	8.57	36.28	182	360	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 102 5510MHz		11019	46.23	-27.77	74	54.68	38.41	13.92	60.78	100	0	P	H
		11019	53.69	-20.31	74	62.14	38.41	13.92	60.78	100	360	P	V
	!	11019	50.03	-3.97	54	58.48	38.41	13.92	60.78	100	360	A	V
802.11n HT40 CH 110 5550MHz		11100	48.05	-25.95	74	56.38	38.44	13.97	60.74	100	0	P	H
		11100	53.78	-20.22	74	62.11	38.44	13.97	60.74	100	358	P	V
		11100	50.66	-3.34	54	58.99	38.44	13.97	60.74	100	358	A	V
802.11n HT40 CH 134 5670MHz		11340	46.25	-27.75	74	54.23	38.53	14.11	60.62	100	0	P	H
		11340	47.25	-26.75	74	55.23	38.53	14.11	60.62	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Emission below 1GHz
WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 LF		39.7	24.06	-15.94	40	41.67	14.2	0.75	32.56			P	H
		61.04	36.13	-3.87	40	60.85	6.88	0.93	32.53	100	21	P	H
		91.11	32.5	-11	43.5	51.65	12.04	1.15	32.34			P	H
		117.3	33.75	-9.75	43.5	51.46	13.34	1.3	32.35			P	H
		153.19	38.21	-5.29	43.5	55.52	13.62	1.5	32.43			P	H
		205.57	31.08	-12.42	43.5	50.75	10.99	1.73	32.39			P	H
		30	34.71	-5.29	40	48.07	18.6	0.65	32.61			P	V
		40.67	33.66	-6.34	40	51.54	13.92	0.77	32.57			P	V
		65.89	35.7	-4.3	40	59.96	7.34	0.98	32.58	100	36	P	V
		93.05	30.27	-13.23	43.5	49.12	12.32	1.16	32.33			P	V
		163.86	28.87	-14.63	43.5	46.8	12.95	1.55	32.43			P	V
		228.85	24.61	-21.39	46	43.07	12.14	1.73	32.33			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n	*	5540	93.14	-	-	89.04	31.97	8.43	36.3	326	336	P	H
HT40	*	5538	86.19	-	-	82.09	31.97	8.43	36.3	326	336	A	H
CH 110	*	5562	88.43	-	-	84.3	31.97	8.44	36.28	100	360	P	V
5550MHz	*	5562	81.34	-	-	77.21	31.97	8.44	36.28	100	360	A	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



15E band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		11100	47.76	-26.24	74	56.09	38.44	13.97	60.74	100	0	P	H
HT40		11100	54.83	-19.17	74	63.16	38.44	13.97	60.74	100	360	P	V
CH 110 5550MHz		11100	52.06	-1.94	54	60.39	38.44	13.97	60.74	100	360	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Emission below 1GHz
WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 LF		39.7	24.06	-15.94	40	41.67	14.2	0.75	32.56			P	H
		61.04	36.13	-3.87	40	60.85	6.88	0.93	32.53	100	21	P	H
		91.11	32.5	-11	43.5	51.65	12.04	1.15	32.34			P	H
		117.3	33.75	-9.75	43.5	51.46	13.34	1.3	32.35			P	H
		153.19	38.21	-5.29	43.5	55.52	13.62	1.5	32.43			P	H
		205.57	31.08	-12.42	43.5	50.75	10.99	1.73	32.39			P	H
		30	34.71	-5.29	40	48.07	18.6	0.65	32.61			P	V
		40.67	33.66	-6.34	40	51.54	13.92	0.77	32.57			P	V
		65.89	35.7	-4.3	40	59.96	7.34	0.98	32.58	100	36	P	V
		93.05	30.27	-13.23	43.5	49.12	12.32	1.16	32.33			P	V
		163.86	28.87	-14.63	43.5	46.8	12.95	1.55	32.43			P	V
		228.85	24.61	-21.39	46	43.07	12.14	1.73	32.33			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

**Note symbol**

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is over limit line.
P/A	P eak or A verage
H/V	H orizontal or V ertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

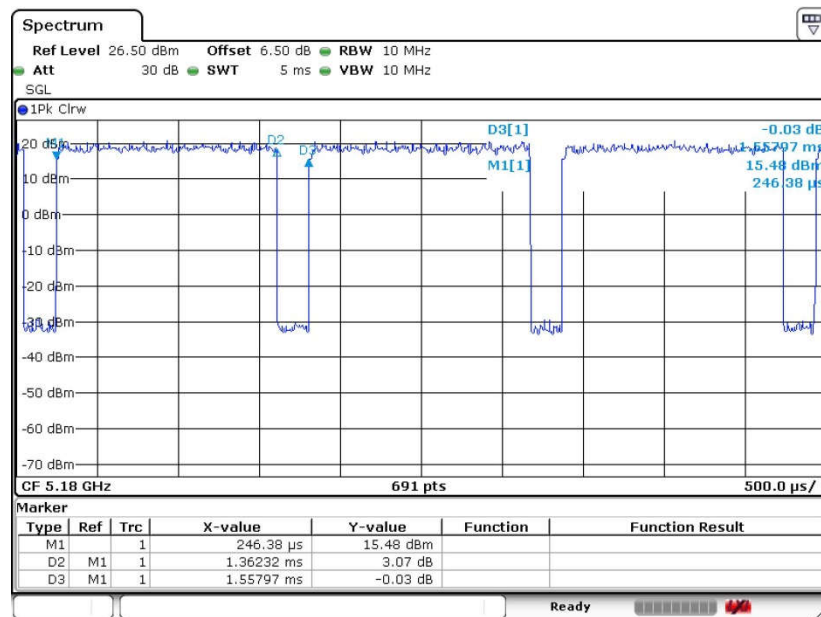
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.442	1.362	0.734	1kHz
802.11n HT20	86.092	1.274	0.785	1kHz
802.11n HT40	76.215	0.636	1.572	3kHz

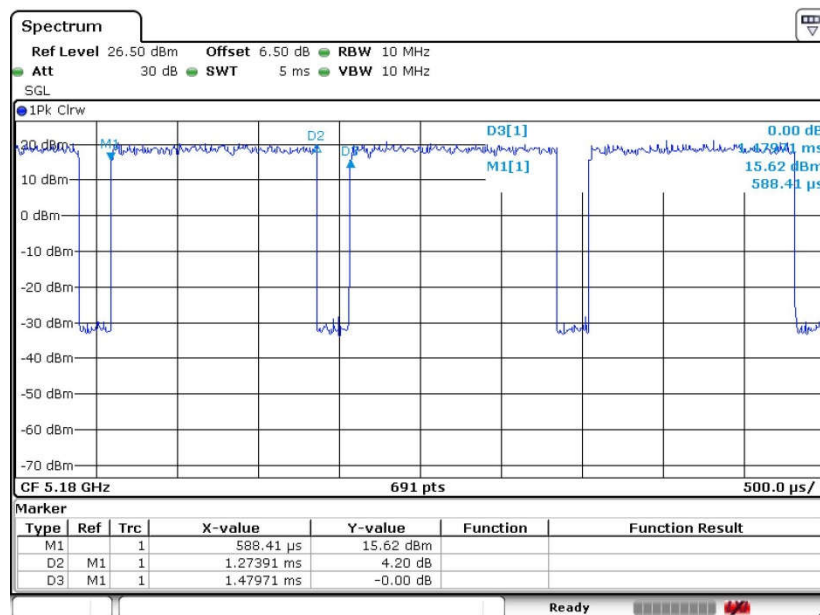
802.11a



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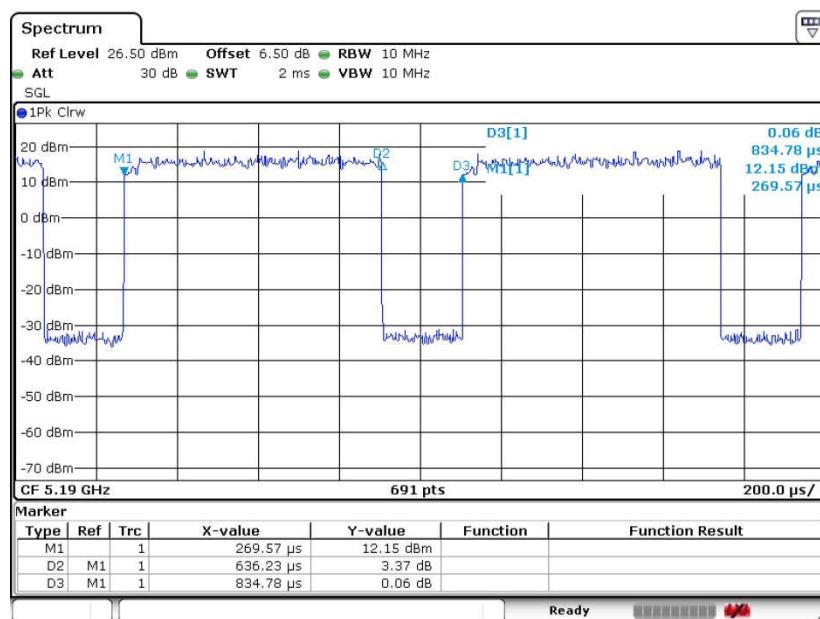


802.11n HT20



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802.11n HT40



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