



# FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : WCDMA/LTE Multi-mode Digital  
Mobile Phone  
**BRAND NAME** : ZTE  
**MODEL NAME** : Z835, Z851  
**FCC ID** : SRQ-Z835  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

The product was received on Feb. 28, 2017 and testing was completed on Apr. 01, 2017. 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.

Prepared by: James Huang / Manager

Approved by: Jones Tsai / Manager



**Sporton International (KunShan) INC.**  
**No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China**



# TABLE OF CONTENTS

**REVISION HISTORY..... 3**

**SUMMARY OF TEST RESULT ..... 4**

**1 GENERAL DESCRIPTION ..... 5**

    1.1 Applicant ..... 5

    1.2 Manufacturer ..... 5

    1.3 Product Feature of Equipment Under Test..... 5

    1.4 Product Specification of Equipment Under Test..... 6

    1.5 Modification of EUT ..... 6

    1.6 Testing Location ..... 6

    1.7 Applicable Standards..... 6

**2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 7**

    2.1 Carrier Frequency and Channel ..... 7

    2.2 Test Mode ..... 8

    2.3 Connection Diagram of Test System..... 9

    2.4 Support Unit used in test configuration and system ..... 10

    2.5 EUT Operation Test Setup ..... 11

    2.6 Measurement Results Explanation Example..... 11

**3 TEST RESULT ..... 12**

    3.1 6dB Bandwidth Measurement ..... 12

    3.2 Output Power Measurement..... 14

    3.3 Power Spectral Density Measurement ..... 15

    3.4 Conducted Band Edges and Spurious Emission Measurement ..... 17

    3.5 Radiated Band Edges and Spurious Emission Measurement ..... 30

    3.6 AC Conducted Emission Measurement..... 34

    3.7 Antenna Requirements ..... 39

**4 LIST OF MEASURING EQUIPMENT ..... 40**

**5 UNCERTAINTY OF EVALUATION ..... 41**

**APPENDIX A. CONDUCTED TEST RESULTS**

**APPENDIX B. RADIATED SPURIOUS EMISSION**

**APPENDIX C. DUTY CYCLE PLOTS**

**APPENDIX D. SETUP PHOTOGRAPHS**





### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.94 dB at 2389.950 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.74 dB at 0.452 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.2 Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.3 Product Feature of Equipment Under Test

Product Feature	
<b>Equipment</b>	WCDMA/LTE Multi-mode Digital Mobile Phone
<b>Brand Name</b>	ZTE
<b>Model Name</b>	Z835, Z851
<b>FCC ID</b>	SRQ-Z835
<b>EUT supports Radios application</b>	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/LTE/ WLAN 2.4GHz 802.11b/g/n TH20/HT40 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE/ Bluetooth v4.1 LE/Bluetooth v4.2 LE
<b>IMEI Code</b>	Conducted: 864237030001351 Radiation: 864237030001484 Conduction: 864237030001401
<b>EUT Stage</b>	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 Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 17.72 dBm (0.0592 W) 802.11g : 21.26 dBm (0.1337 W) 802.11n HT20 : 19.97 dBm (0.0993 W) 802.11n HT40 : 20.32 dBm (0.1076 W)
Antenna Type / Gain	PIFA Antenna with gain -3.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

### 1.5 Modification of EUT

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

### 1.6 Testing Location

Test Site	Sporton International (KunShan) INC.		
Test Site Location	No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC Registration No.
	TH01-KS	03CH02-KS	CO01-KS
			418269

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

### 1.7 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 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 were recorded in this report.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-



## 2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

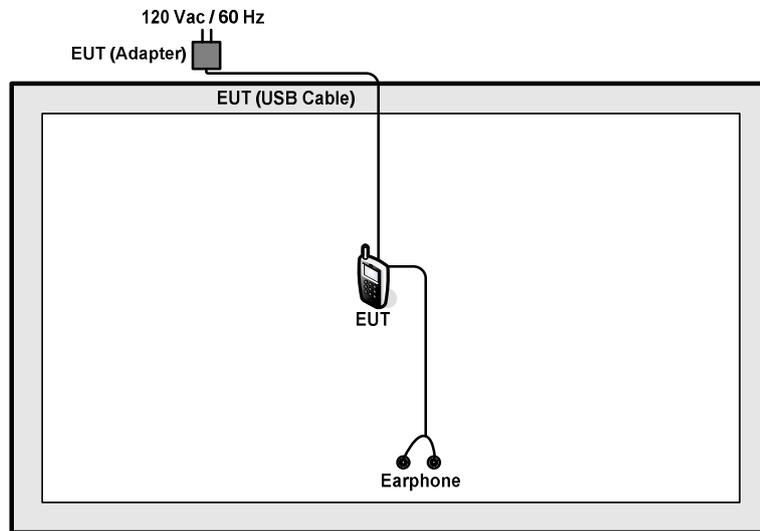
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases	
<b>AC Conducted Emission</b>	Mode 1: GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Earphone + USB Cable (Charging from Adapter)
<b>Remark:</b> For Radiated TCs, the tests were performed with adapter, earphone and USB cable.	

## 2.3 Connection Diagram of Test System

<WLAN Tx Mode>

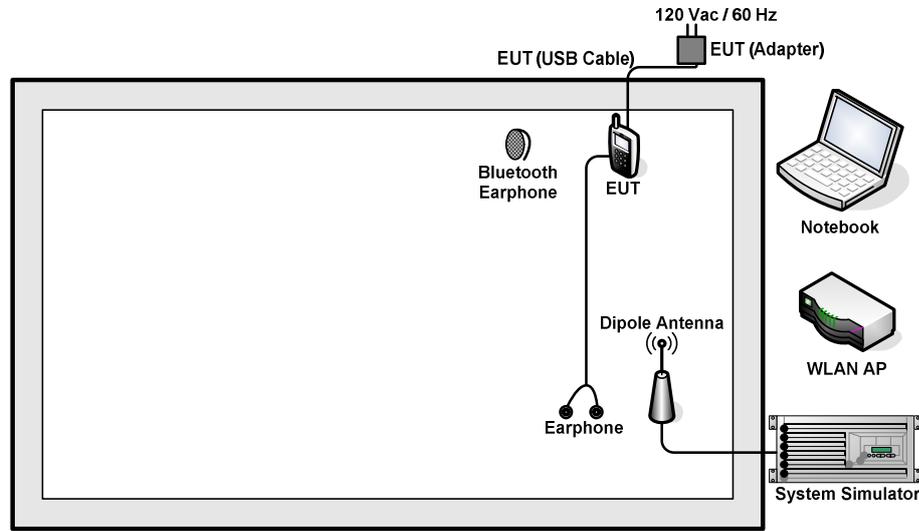
For 802.11b



For 802.11g, 802.11n HT20, 802.11n HT40



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8m
3.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
5.	Earphone	Lenovo	SH100	N/A	Unshielded,1.2m	N/A



## 2.5 EUT Operation Test Setup

For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

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

## 2.6 Measurement Results Explanation Example

### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 5.8 dB.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 5.8 \text{ (dB)} \end{aligned}$$

### 3 Test Result

#### 3.1 6dB Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

##### 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 Publication No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

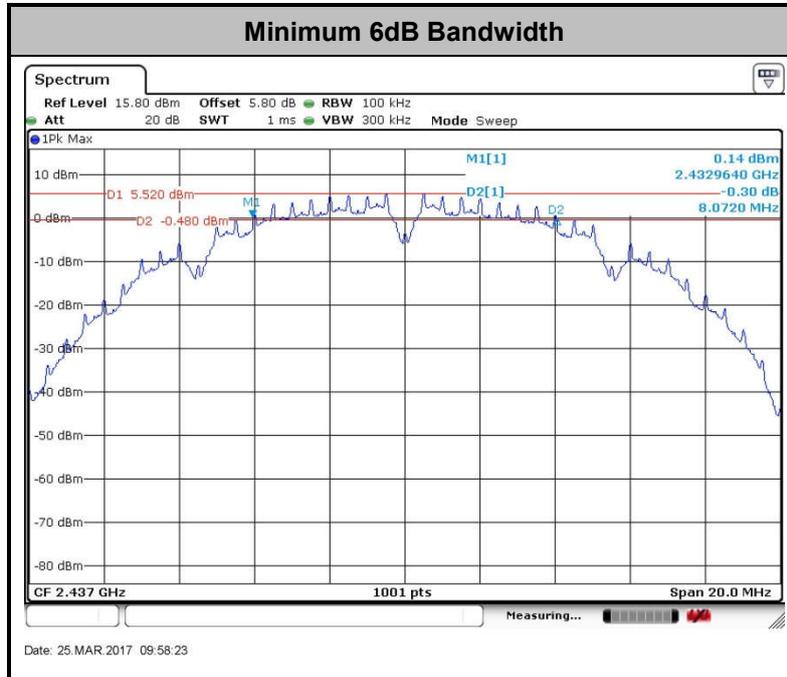
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.



## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

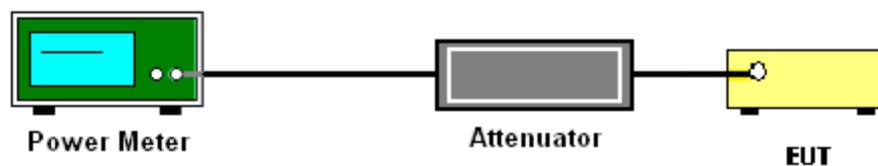
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

### 3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

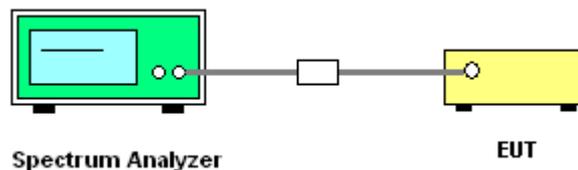
#### 3.3.2 Measuring Instruments

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

#### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

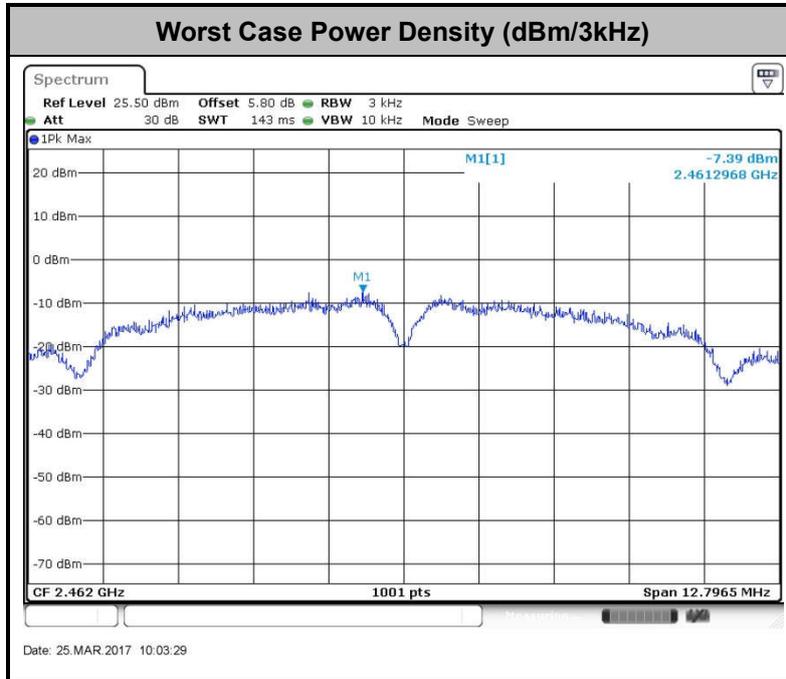
#### 3.3.4 Test Setup





### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

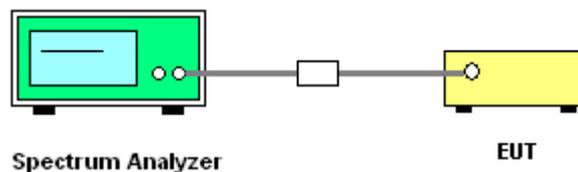
### 3.4.2 Measuring Instruments

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

### 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

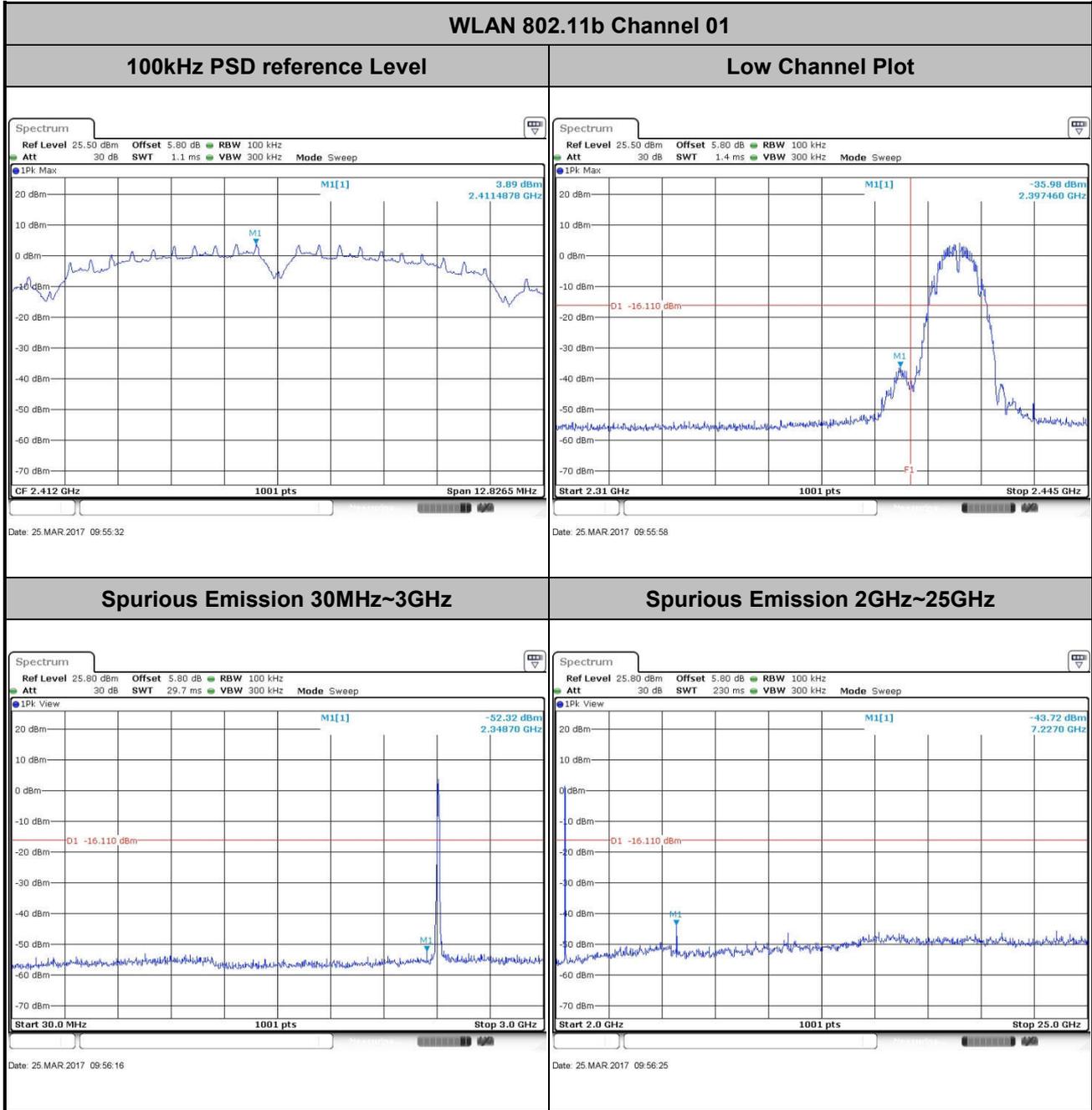
### 3.4.4 Test Setup





### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

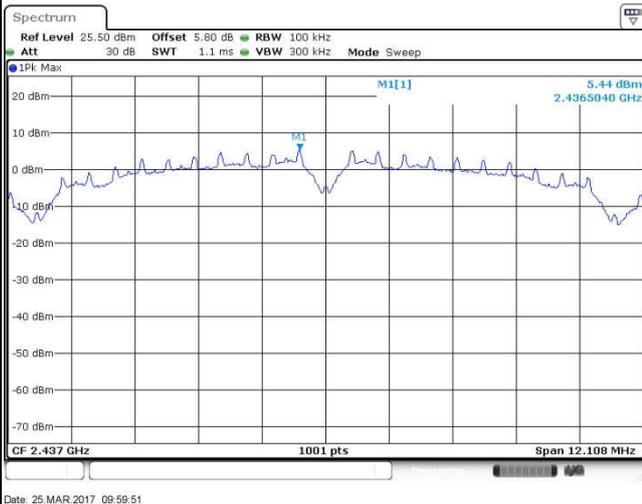




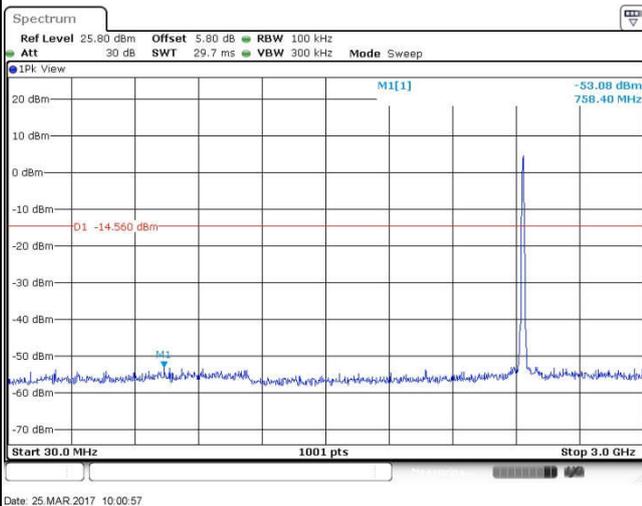
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

WLAN 802.11b Channel 06

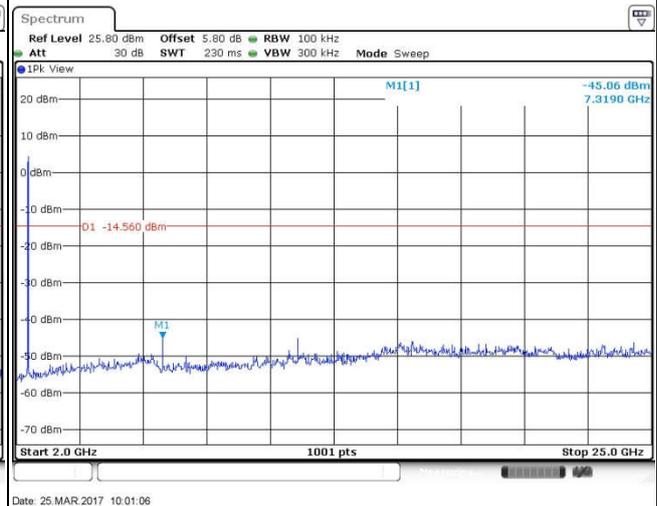
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

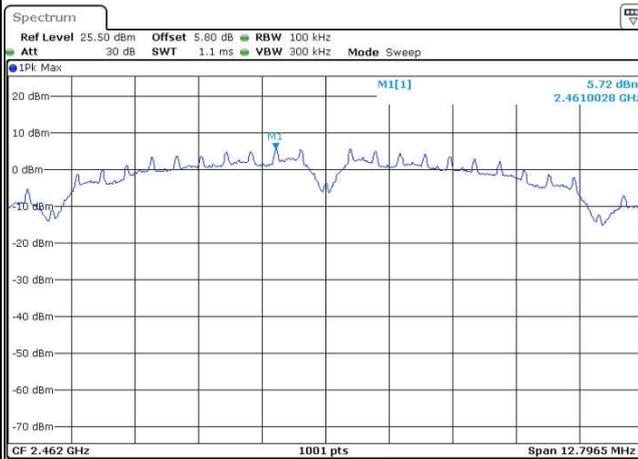




Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

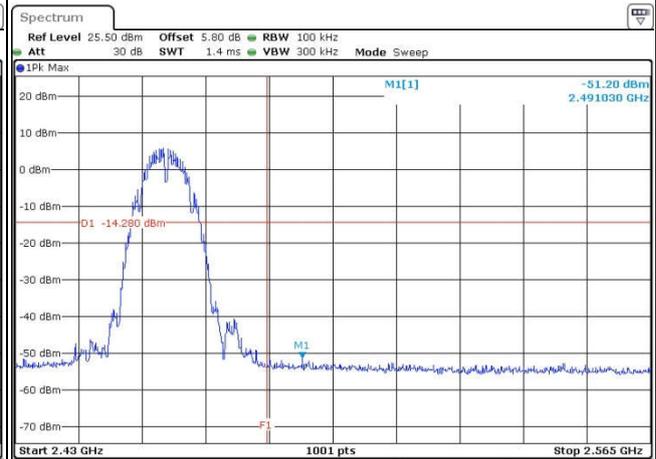
WLAN 802.11b Channel 11

100kHz PSD reference Level



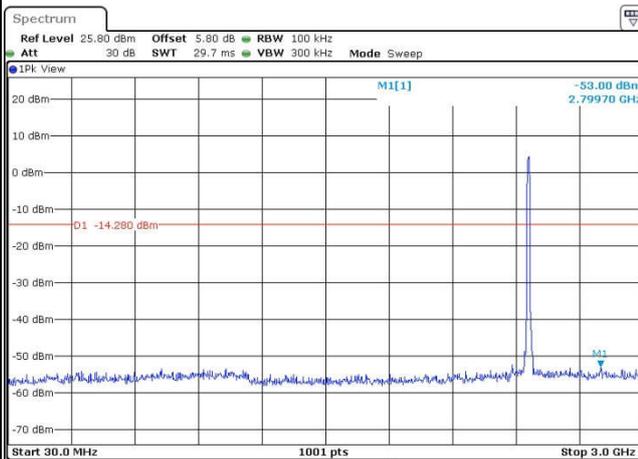
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High Channel Plot



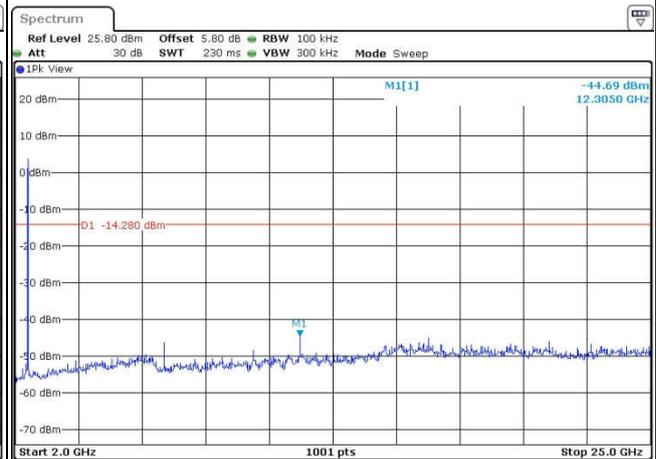
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Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10.05.54

Spurious Emission 2GHz~25GHz



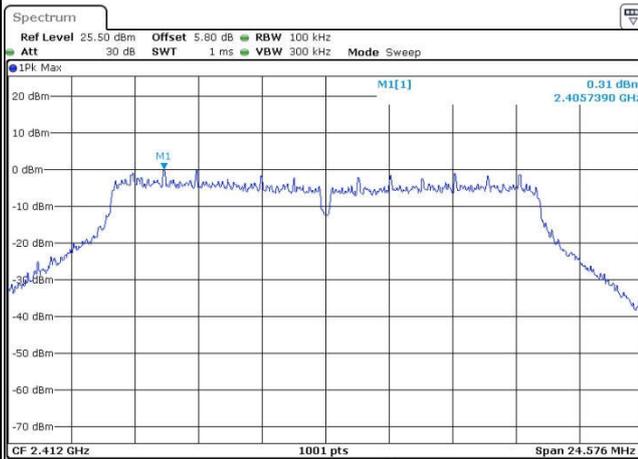
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Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

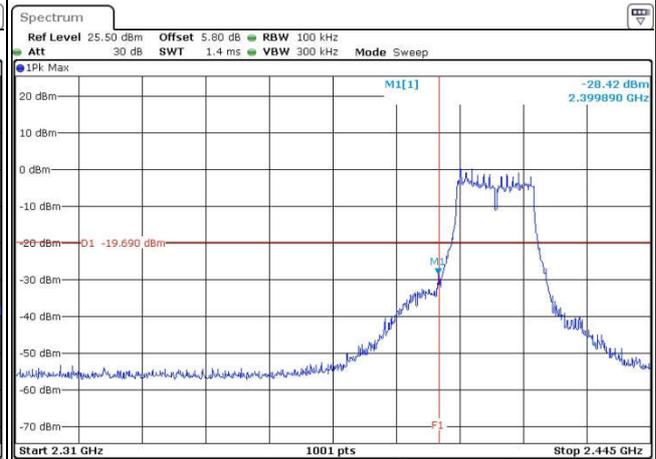
WLAN 802.11g Channel 01

100kHz PSD reference Level



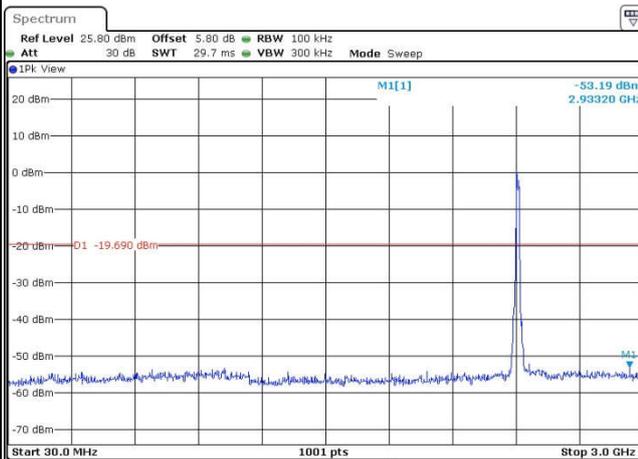
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Low Channel Plot



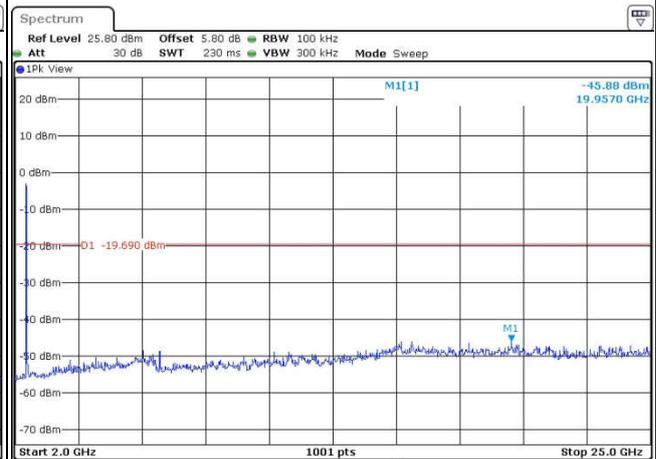
Date: 25.MAR.2017 10:11:30

Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:12:41

Spurious Emission 2GHz~25GHz



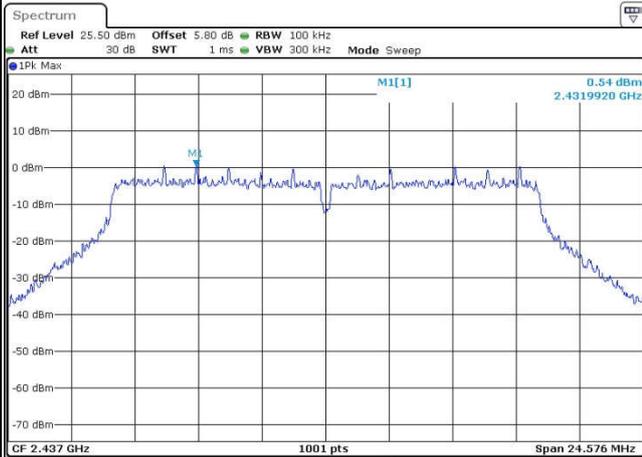
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Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

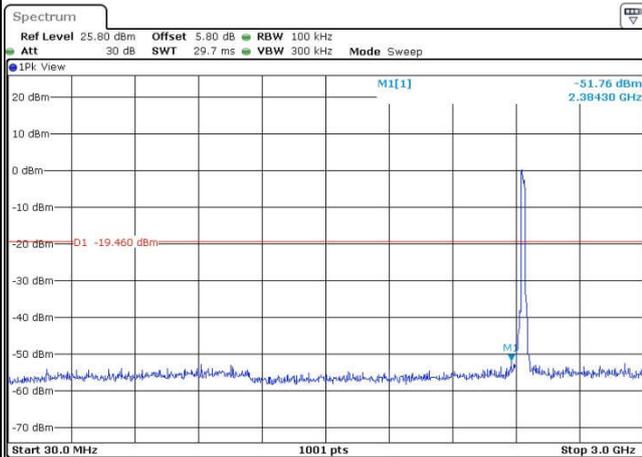
WLAN 802.11g Channel 06

100kHz PSD reference Level



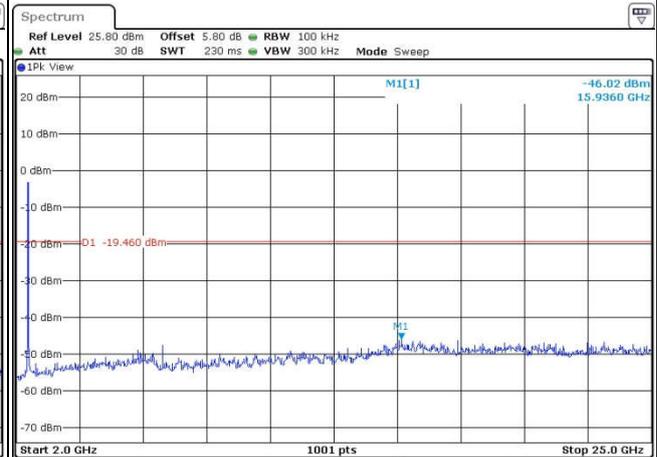
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Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:16:42

Spurious Emission 2GHz~25GHz



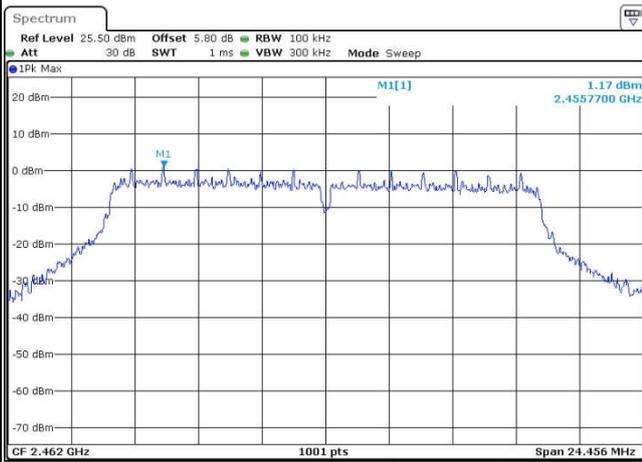
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Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

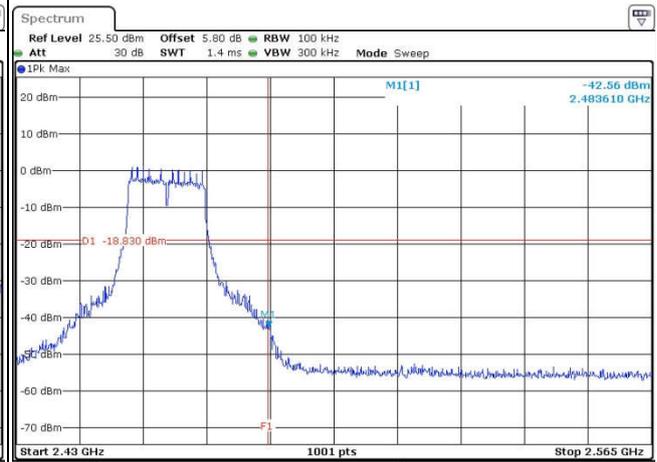
WLAN 802.11g Channel 11

100kHz PSD reference Level



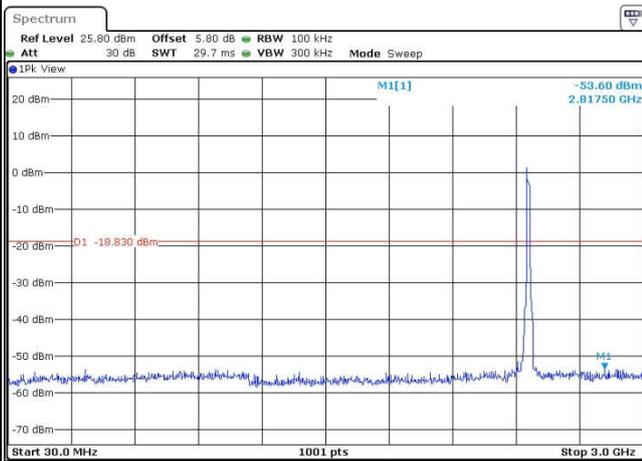
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High Channel Plot



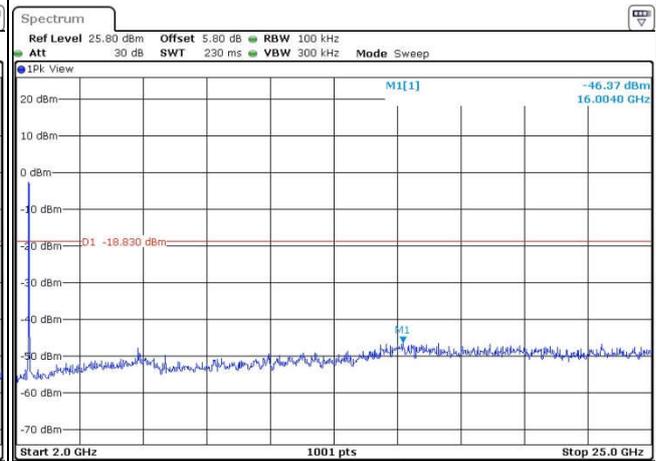
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Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:22:15

Spurious Emission 2GHz~25GHz



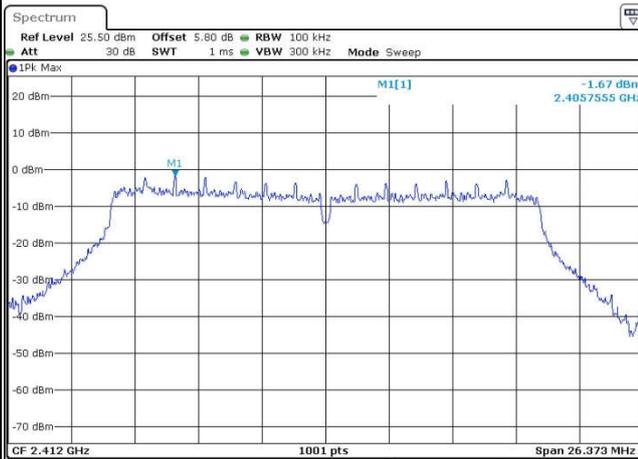
Date: 25.MAR.2017 10:22:24



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	01	Test Engineer :	Silent Hai

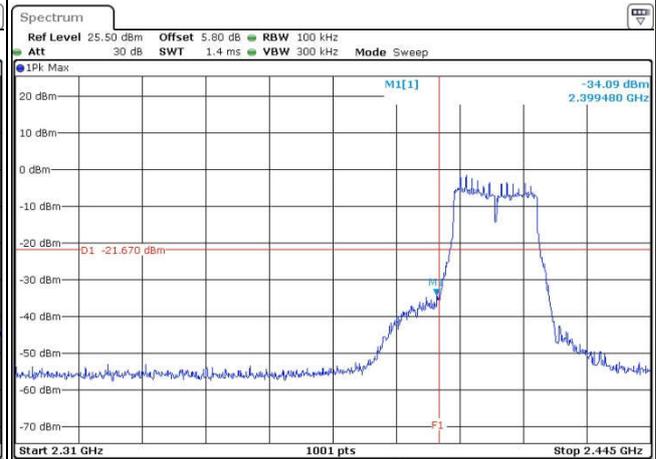
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



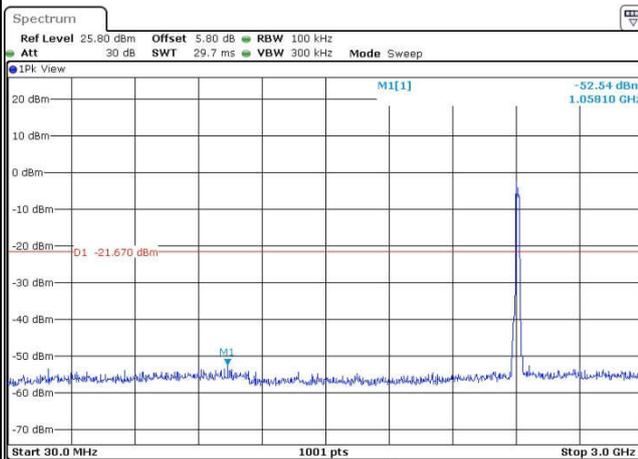
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Low Channel Plot



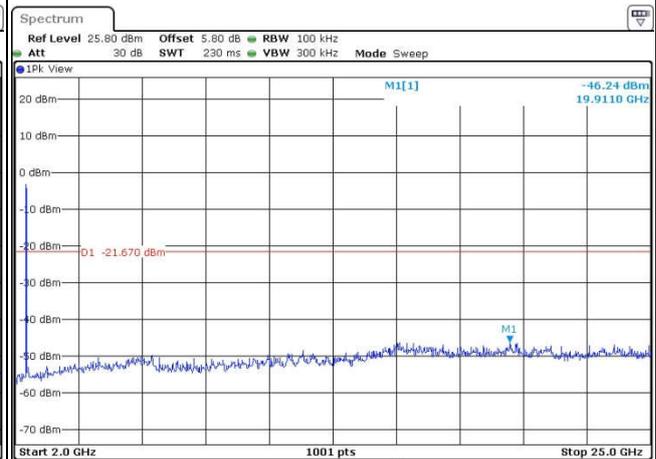
Date: 25.MAR.2017 10:29:58

Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:32:01

Spurious Emission 2GHz~25GHz



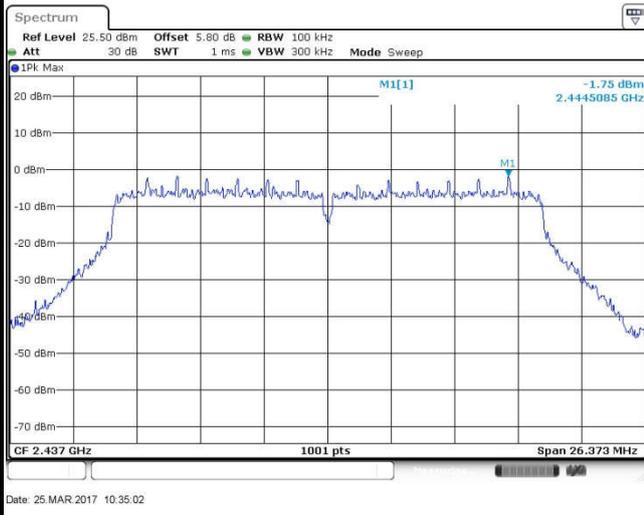
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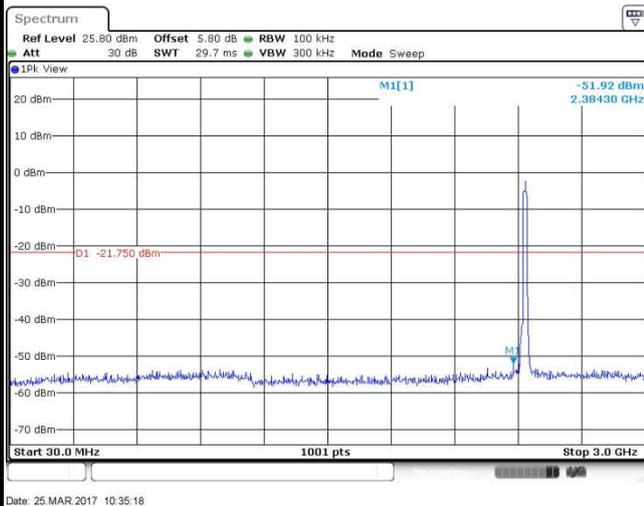
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

WLAN 802.11n HT20 Channel 06

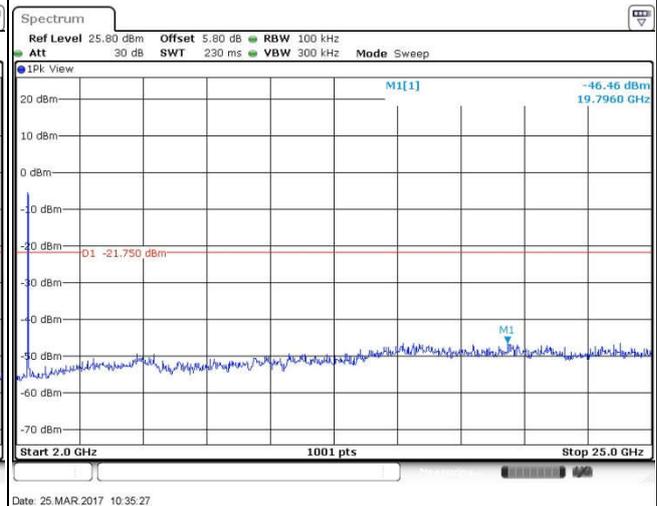
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

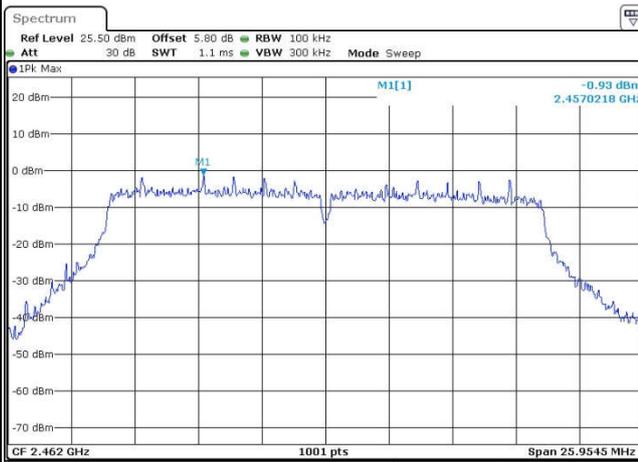




Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	11	Test Engineer :	Silent Hai

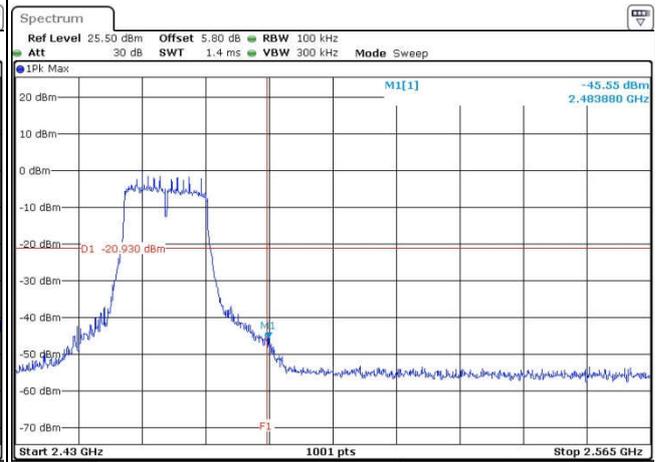
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



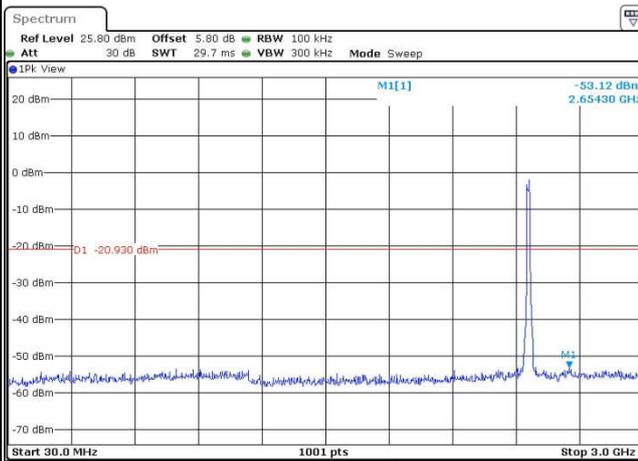
Date: 25.MAR.2017 10:40:36

High Channel Plot



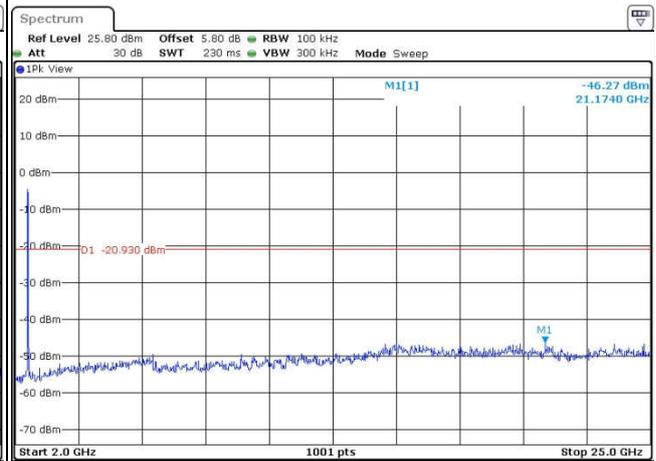
Date: 25.MAR.2017 10:41:40

Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:41:58

Spurious Emission 2GHz~25GHz



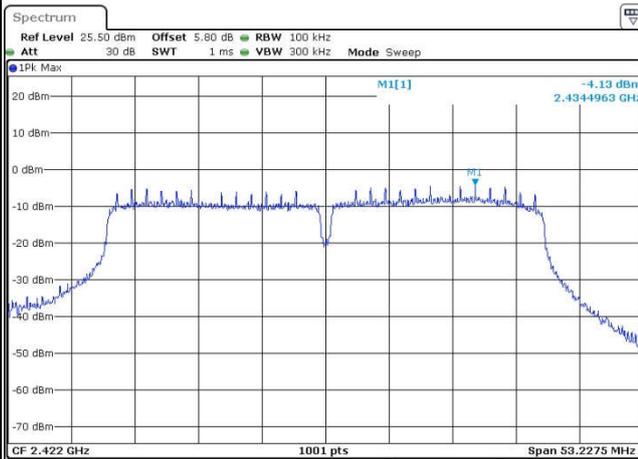
Date: 25.MAR.2017 10:42:06



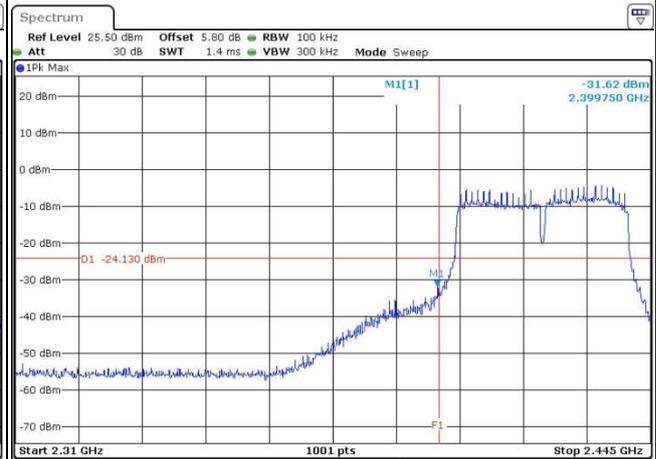
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~55%
Test Channel :	03	Test Engineer :	Silent Hai

WLAN 802.11n HT40 Channel 03

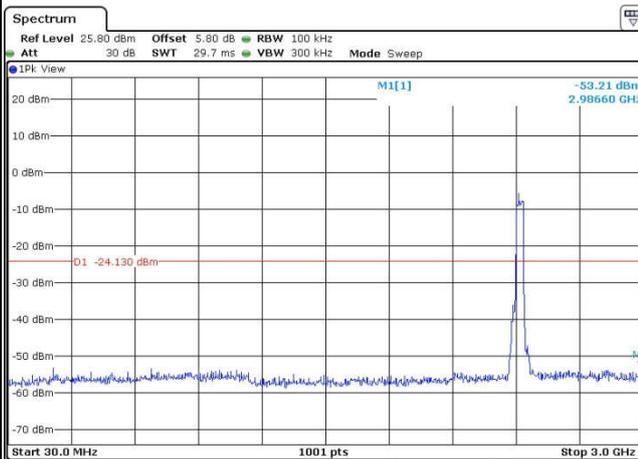
100kHz PSD reference Level



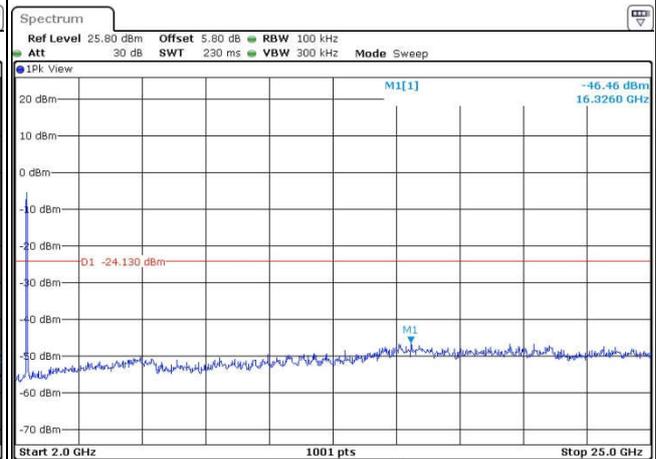
Low Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

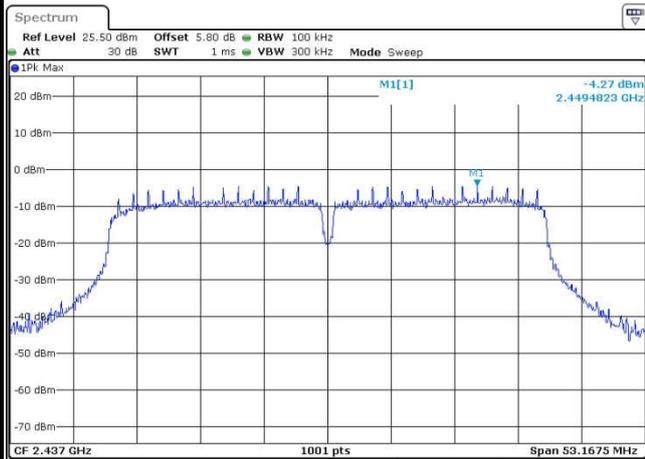




Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~55%
Test Channel :	06	Test Engineer :	Silent Hai

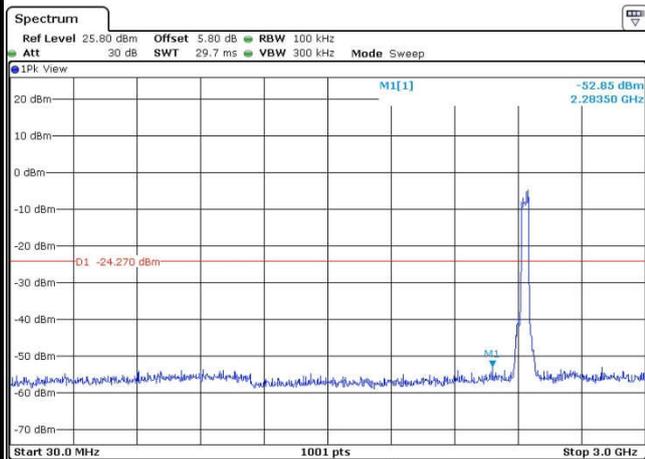
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



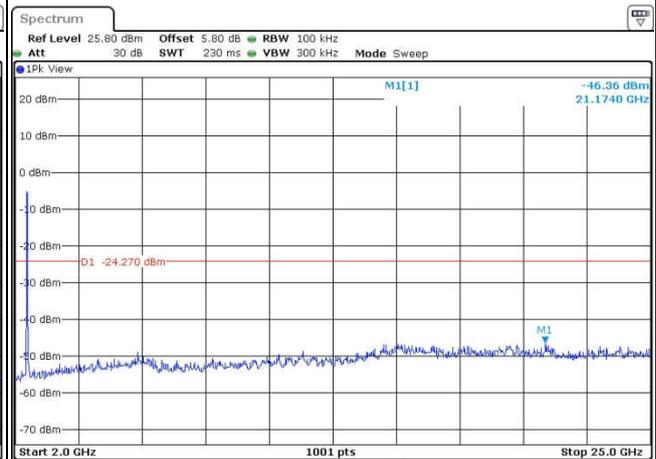
Date: 25.MAR.2017 10:53:27

Spurious Emission 30MHz~3GHz



Date: 25.MAR.2017 10:54:44

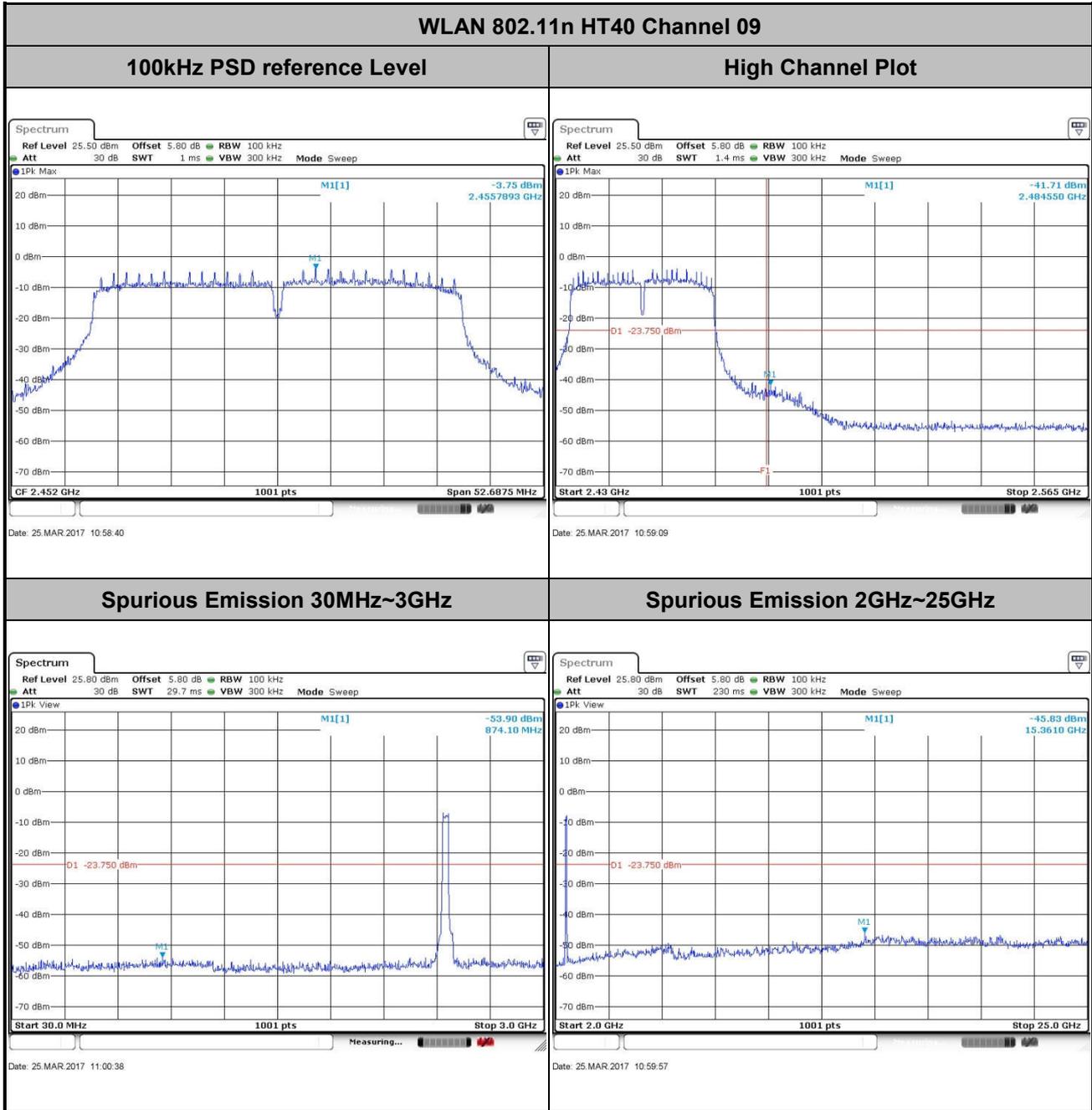
Spurious Emission 2GHz~25GHz



Date: 25.MAR.2017 10:54:05



Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~55%
Test Channel :	09	Test Engineer :	Silent Hai





### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

#### 3.5.2 Measuring Instruments

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



### 3.5.3 Test Procedures

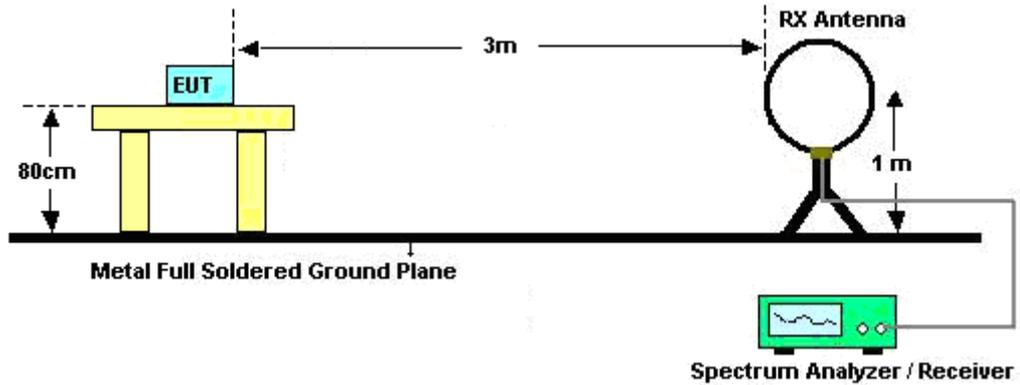
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. 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.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.

For average measurement:

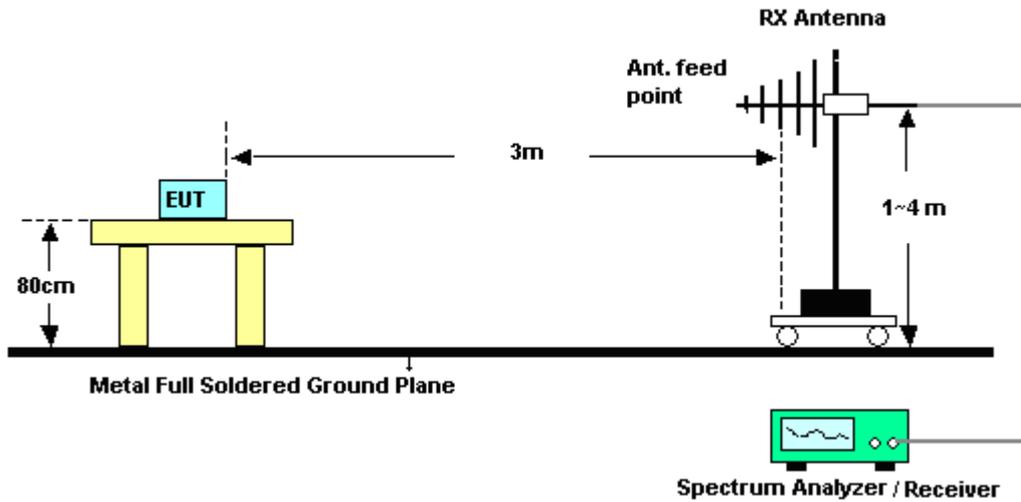
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

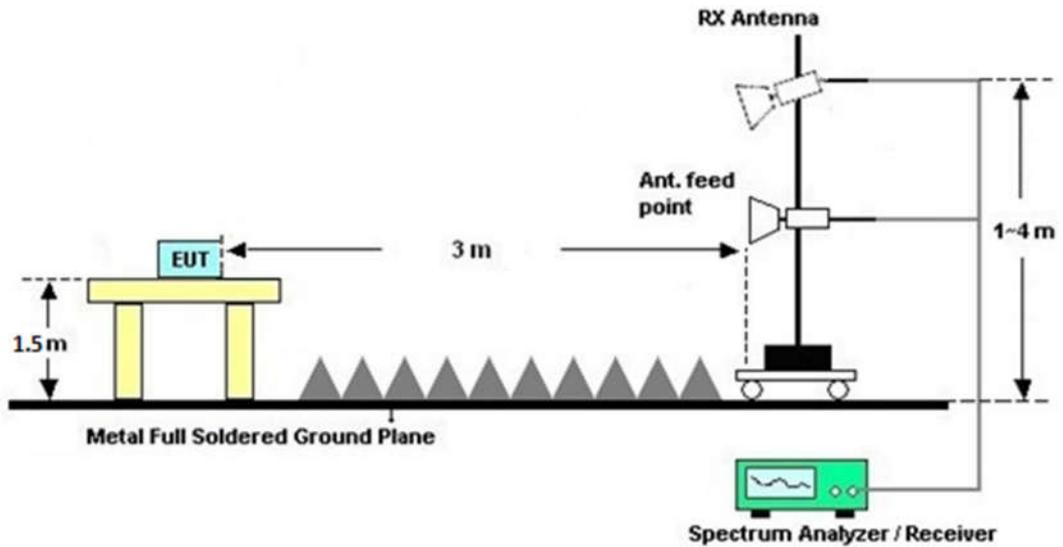
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

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

### 3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

### 3.5.7 Duty Cycle

Please refer to Appendix C.

### 3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix B.



### 3.6 AC Conducted Emission Measurement

#### 3.6.1 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 (dBµV)	
	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.

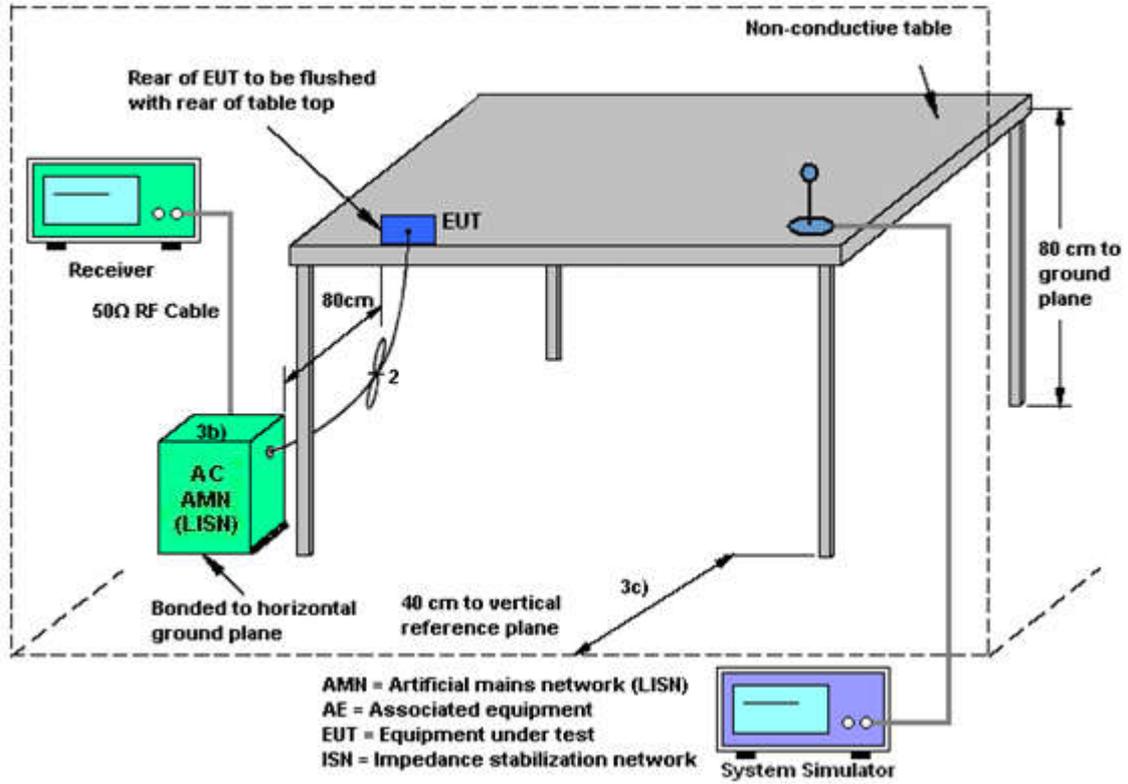
#### 3.6.2 Measuring Instruments

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

#### 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

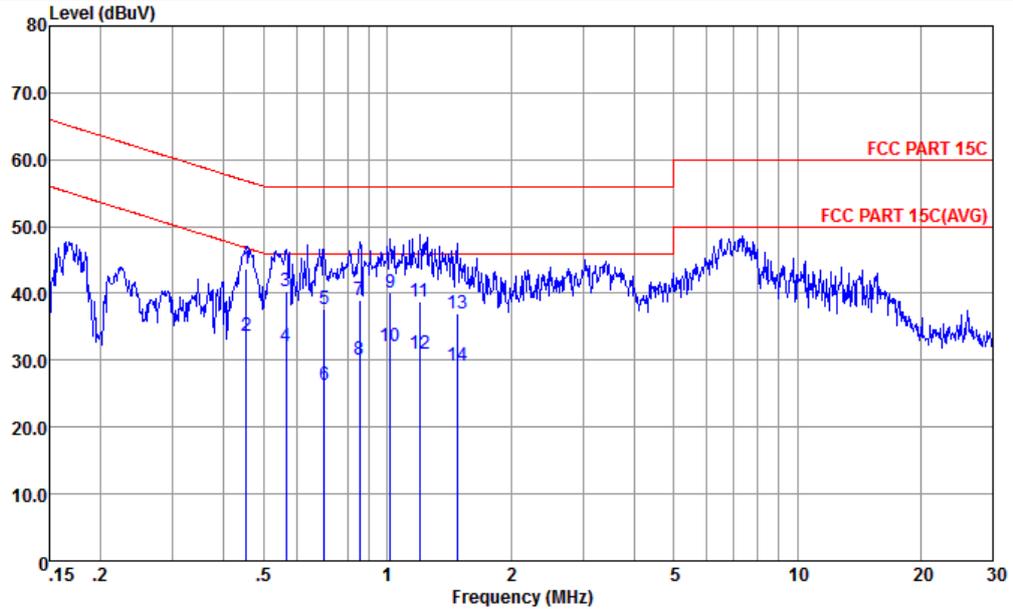
### 3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Earphone + USB Cable (Charging from Adapter)		



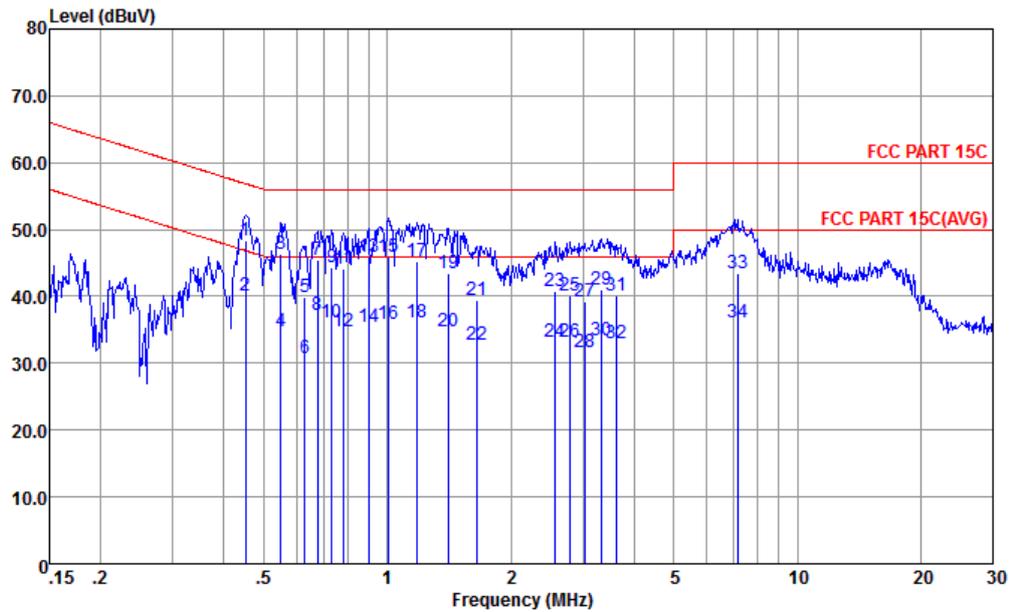
Site : CO01-KS  
Condition : FCC PART 15C LISN-L-20151024 LINE

mode : Mode 1  
IMEI : 864237030001401

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.454	43.72	-13.08	56.80	33.30	0.23	10.19	QP
2	0.454	33.72	-13.08	46.80	23.30	0.23	10.19	Average
3	0.567	40.32	-15.68	56.00	29.91	0.23	10.18	QP
4	0.567	32.02	-13.98	46.00	21.61	0.23	10.18	Average
5	0.701	37.72	-18.28	56.00	27.30	0.24	10.18	QP
6	0.701	26.32	-19.68	46.00	15.90	0.24	10.18	Average
7	0.857	39.02	-16.98	56.00	28.59	0.25	10.18	QP
8	0.857	30.02	-15.98	46.00	19.59	0.25	10.18	Average
9	1.016	40.04	-15.96	56.00	29.60	0.25	10.19	QP
10	1.016	32.04	-13.96	46.00	21.60	0.25	10.19	Average
11	1.197	38.72	-17.28	56.00	28.30	0.23	10.19	QP
12	1.197	31.02	-14.98	46.00	20.60	0.23	10.19	Average
13	1.487	37.00	-19.00	56.00	26.60	0.21	10.19	QP
14	1.487	29.30	-16.70	46.00	18.90	0.21	10.19	Average



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Earphone + USB Cable (Charging from Adapter)		



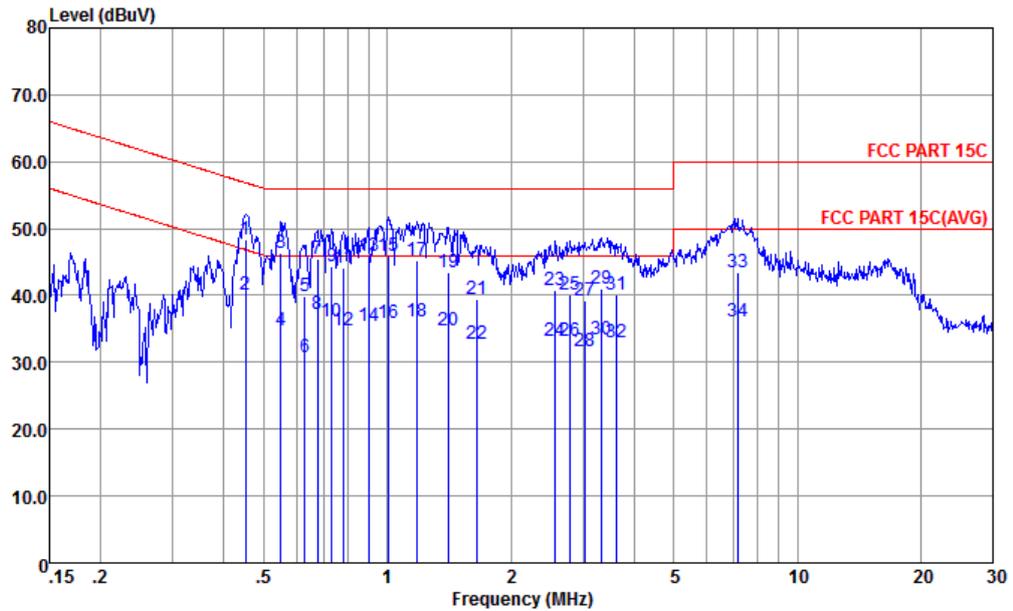
Site : CO01-KS  
 Condition : FCC PART 15C LISN-N-20151024 NEUTRAL

mode : Mode 1  
 IMEI : 864237030001401

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.452	48.41	-8.44	56.85	37.90	0.32	10.19	QP
2 *	0.452	40.11	-6.74	46.85	29.60	0.32	10.19	Average
3	0.549	46.41	-9.59	56.00	35.90	0.33	10.18	QP
4	0.549	34.81	-11.19	46.00	24.30	0.33	10.18	Average
5	0.630	39.81	-16.19	56.00	29.30	0.33	10.18	QP
6	0.630	30.81	-15.19	46.00	20.30	0.33	10.18	Average
7	0.675	45.42	-10.58	56.00	34.90	0.34	10.18	QP
8	0.675	37.12	-8.88	46.00	26.60	0.34	10.18	Average
9	0.731	44.42	-11.58	56.00	33.90	0.34	10.18	QP
10	0.731	36.12	-9.88	46.00	25.60	0.34	10.18	Average
11	0.783	44.12	-11.88	56.00	33.60	0.35	10.17	QP
12	0.783	34.82	-11.18	46.00	24.30	0.35	10.17	Average
13	0.899	45.84	-10.16	56.00	35.30	0.36	10.18	QP
14	0.899	35.44	-10.56	46.00	24.90	0.36	10.18	Average
15	1.010	45.86	-10.14	56.00	35.30	0.37	10.19	QP
16	1.010	35.86	-10.14	46.00	25.30	0.37	10.19	Average
17	1.184	45.16	-10.84	56.00	34.60	0.37	10.19	QP



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (2.4G) Link + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-KS  
 Condition : FCC PART 15C LISN-N-20151024 NEUTRAL  
 mode : Mode 1  
 IMEI : 864237030001401

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
18	1.184	36.16	-9.84	46.00	25.60	0.37	10.19	Average
19	1.411	43.46	-12.54	56.00	32.90	0.37	10.19	QP
20	1.411	34.86	-11.14	46.00	24.30	0.37	10.19	Average
21	1.654	39.47	-16.53	56.00	28.90	0.38	10.19	QP
22	1.654	32.87	-13.13	46.00	22.30	0.38	10.19	Average
23	2.567	40.88	-15.12	56.00	30.30	0.37	10.21	QP
24	2.567	33.18	-12.82	46.00	22.60	0.37	10.21	Average
25	2.794	40.19	-15.81	56.00	29.61	0.37	10.21	QP
26	2.794	33.19	-12.81	46.00	22.61	0.37	10.21	Average
27	3.025	39.19	-16.81	56.00	28.60	0.37	10.22	QP
28	3.025	31.69	-14.31	46.00	21.10	0.37	10.22	Average
29	3.328	40.89	-15.11	56.00	30.29	0.37	10.23	QP
30	3.328	33.49	-12.51	46.00	22.89	0.37	10.23	Average
31	3.623	40.20	-15.80	56.00	29.60	0.37	10.23	QP
32	3.623	32.90	-13.10	46.00	22.30	0.37	10.23	Average
33	7.137	43.48	-16.52	60.00	32.90	0.29	10.29	QP
34	7.137	36.18	-13.82	50.00	25.60	0.29	10.29	Average



## **3.7 Antenna Requirements**

### **3.7.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

### **3.7.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.7.3 Antenna Gain**

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



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 09, 2016	Mar. 21, 2017~ Mar. 25, 2017	Aug. 08, 2017	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Mar. 21, 2017~ Mar. 25, 2017	Jan. 18, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Mar. 21, 2017~ Mar. 25, 2017	Jan. 18, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Aug. 09, 2016	Mar. 21, 2017~ Mar. 28, 2017	Aug. 08, 2017	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz, MAX 30dB	Apr. 22, 2016	Mar. 21, 2017~ Mar. 28, 2017	Apr. 21, 2017	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	Mar. 21, 2017~ Mar. 28, 2017	Nov. 22, 2017	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Aug. 20, 2016	Mar. 21, 2017~ Mar. 28, 2017	Aug. 19, 2017	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 22, 2016	Mar. 21, 2017~ Mar. 28, 2017	Oct. 21, 2017	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 15, 2017	Mar. 21, 2017~ Mar. 28, 2017	Feb. 14, 2018	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	Apr. 22, 2016	Mar. 21, 2017~ Mar. 28, 2017	Apr. 21, 2017	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz	Oct. 13, 2016	Mar. 21, 2017~ Mar. 28, 2017	Oct. 12, 2017	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18GHz~40GHz	Oct. 13, 2016	Mar. 21, 2017~ Mar. 28, 2017	Oct. 12, 2017	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Mar. 21, 2017~ Mar. 28, 2017	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Mar. 21, 2017~ Mar. 28, 2017	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Mar. 21, 2017~ Mar. 28, 2017	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Apr. 29, 2016	Apr. 01, 2017	Apr. 28, 2017	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2016	Apr. 01, 2017	Oct. 12, 2017	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2016	Apr. 01, 2017	Oct. 12, 2017	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000811	AC 0V~300V, 45Hz~1000Hz	Oct. 13, 2016	Apr. 01, 2017	Oct. 12, 2017	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% ( $U = 2Uc(y)$ )	2.3dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.2dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.7dB
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.3dB
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## Appendix A. Conducted Test Results

**A1 - DTS Part**

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2017/3/21~2017/3/25	Relative Humidity:	51~55	%

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	13.54	8.55	0.50	Pass
11b	1Mbps	1	6	2437	13.34	8.07	0.50	Pass
11b	1Mbps	1	11	2462	13.39	8.53	0.50	Pass
11g	6Mbps	1	1	2412	18.93	16.38	0.50	Pass
11g	6Mbps	1	6	2437	18.18	16.38	0.50	Pass
11g	6Mbps	1	11	2462	18.33	16.30	0.50	Pass
HT20	MCS0	1	1	2412	19.53	17.58	0.50	Pass
HT20	MCS0	1	6	2437	19.13	17.58	0.50	Pass
HT20	MCS0	1	11	2462	18.83	17.30	0.50	Pass
HT40	MCS0	1	3	2422	36.96	35.49	0.50	Pass
HT40	MCS0	1	6	2437	36.66	35.45	0.50	Pass
HT40	MCS0	1	9	2452	36.56	35.13	0.50	Pass

**TEST RESULTS DATA**  
**Peak Power Table**

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	17.17	30.00	-3.00	14.17	36.00	Pass
11b	1Mbps	1	6	2437	17.23	30.00	-3.00	14.23	36.00	Pass
11b	1Mbps	1	11	2462	17.72	30.00	-3.00	14.72	36.00	Pass
11g	6Mbps	1	1	2412	21.10	30.00	-3.00	18.10	36.00	Pass
11g	6Mbps	1	6	2437	21.15	30.00	-3.00	18.15	36.00	Pass
11g	6Mbps	1	11	2462	21.26	30.00	-3.00	18.26	36.00	Pass
HT20	MCS0	1	1	2412	19.58	30.00	-3.00	16.58	36.00	Pass
HT20	MCS0	1	6	2437	19.94	30.00	-3.00	16.94	36.00	Pass
HT20	MCS0	1	11	2462	19.97	30.00	-3.00	16.97	36.00	Pass
HT40	MCS0	1	3	2422	19.89	30.00	-3.00	16.89	36.00	Pass
HT40	MCS0	1	6	2437	20.07	30.00	-3.00	17.07	36.00	Pass
HT40	MCS0	1	9	2452	20.32	30.00	-3.00	17.32	36.00	Pass

**TEST RESULTS DATA**  
**Average Power Table**  
*(Reporting Only)*

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.11	13.88
11b	1Mbps	1	6	2437	0.11	14.58
11b	1Mbps	1	11	2462	0.11	15.08
11g	6Mbps	1	1	2412	0.58	12.04
11g	6Mbps	1	6	2437	0.58	12.74
11g	6Mbps	1	11	2462	0.58	13.00
HT20	MCS0	1	1	2412	0.64	10.23
HT20	MCS0	1	6	2437	0.64	10.83
HT20	MCS0	1	11	2462	0.64	11.06
HT40	MCS0	1	3	2422	0.64	10.41
HT40	MCS0	1	6	2437	0.64	10.65
HT40	MCS0	1	9	2452	0.64	10.95

**TEST RESULTS DATA**  
**Peak Power Density**

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-10.46	-3.00	8.00	Pass
11b	1Mbps	1	6	2437	-8.43	-3.00	8.00	Pass
11b	1Mbps	1	11	2462	-7.39	-3.00	8.00	Pass
11g	6Mbps	1	1	2412	-14.67	-3.00	8.00	Pass
11g	6Mbps	1	6	2437	-13.21	-3.00	8.00	Pass
11g	6Mbps	1	11	2462	-13.92	-3.00	8.00	Pass
HT20	MCS0	1	1	2412	-16.11	-3.00	8.00	Pass
HT20	MCS0	1	6	2437	-15.52	-3.00	8.00	Pass
HT20	MCS0	1	11	2462	-14.03	-3.00	8.00	Pass
HT40	MCS0	1	3	2422	-19.14	-3.00	8.00	Pass
HT40	MCS0	1	6	2437	-19.33	-3.00	8.00	Pass
HT40	MCS0	1	9	2452	-18.61	-3.00	8.00	Pass



## Appendix B. Radiated Spurious Emission

### 15C 2.4GHz 2400~2483.5MHz WIFI 802.11b (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)
802.11b CH 01 2412MHz		2389.04	42.97	-31.03	74	44.33	25.4	4.76	31.52	261	47	P	H
		2389.95	33.32	-20.68	54	34.68	25.4	4.76	31.52	261	47	A	H
	*	2412	98.86	-	-	100.04	25.54	4.78	31.5	261	47	P	H
	*	2410	95.64	-	-	96.82	25.54	4.78	31.5	261	47	A	H
		2384.62	42.11	-31.89	74	43.54	25.35	4.75	31.53	100	146	P	V
		2389.95	31.9	-22.10	54	33.26	25.4	4.76	31.52	100	146	A	V
	*	2412	95.46	-	-	96.64	25.54	4.78	31.5	100	146	P	V
	*	2410	92.31	-	-	93.49	25.54	4.78	31.5	100	146	A	V
802.11b CH 06 2437MHz		2380.46	42.04	-31.96	74	43.47	25.35	4.75	31.53	324	47	P	H
		2381.11	32.1	-21.90	54	33.53	25.35	4.75	31.53	324	47	A	H
	*	2436	96.22	-	-	97.22	25.69	4.8	31.49	324	47	P	H
	*	2436	92.98	-	-	93.98	25.69	4.8	31.49	324	47	A	H
		2490.7	43.01	-30.99	74	43.32	26.26	4.88	31.45	324	47	P	H
		2493.04	33.51	-20.49	54	33.82	26.26	4.88	31.45	324	47	A	H
		2384.23	40.79	-33.21	74	42.22	25.35	4.75	31.53	302	152	P	V
		2381.5	30.51	-23.49	54	31.94	25.35	4.75	31.53	302	152	A	V
	*	2436	92.58	-	-	93.58	25.69	4.8	31.49	302	152	P	V
	*	2438	89.45	-	-	90.28	25.83	4.82	31.48	302	152	A	V
		2492.8	42.33	-31.67	74	42.64	26.26	4.88	31.45	302	152	P	V
		2493.58	32.1	-21.90	54	32.41	26.26	4.88	31.45	302	152	A	V



802.11b CH 11 2462MHz	*	2462	99.59	-	-	100.25	25.97	4.84	31.47	112	64	P	H
	*	2460	96.16	-	-	96.82	25.97	4.84	31.47	112	64	A	H
		2490.58	43.89	-30.11	74	44.2	26.26	4.88	31.45	112	64	P	H
		2484.1	33.33	-20.67	54	33.82	26.11	4.86	31.46	112	64	A	H
	*	2462	95.18	-	-	95.84	25.97	4.84	31.47	100	148	P	V
	*	2460	92	-	-	92.66	25.97	4.84	31.47	100	148	A	V
		2496.28	43.27	-30.73	74	43.58	26.26	4.88	31.45	100	148	P	V
		2483.68	31.78	-22.22	54	32.27	26.11	4.86	31.46	100	148	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (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)
802.11b CH 01 2412MHz		4824	36.97	-37.03	74	58.58	30.9	6.87	59.38	150	360	P	H
		4824	36.27	-37.73	74	57.88	30.9	6.87	59.38	150	360	P	V
802.11b CH 06 2437MHz		4872	36.33	-37.67	74	57.6	31.01	6.86	59.14	150	360	P	H
		7308	40.83	-33.17	74	55.57	35.34	8.47	58.55	150	360	P	H
		4872	36.26	-37.74	74	57.53	31.01	6.86	59.14	150	360	P	V
		7308	40.65	-33.35	74	55.39	35.34	8.47	58.55	150	360	P	V
802.11b CH 11 2462MHz		4926	36.72	-37.28	74	57.66	31.12	6.84	58.9	150	360	P	H
		7386	41.83	-32.17	74	56.77	35.55	8.49	58.98	150	360	P	H
		4926	37.04	-36.96	74	57.98	31.12	6.84	58.9	150	360	P	V
		7386	40.58	-33.42	74	55.52	35.55	8.49	58.98	150	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Cable, Preamp, Ant, Table, Peak, Pol. It contains two main sections of data for 802.11g channels 01 and 06.



802.11g CH 11 2462MHz	*	2456	99.12	-	-	99.78	25.97	4.84	31.47	230	40	P	H
	*	2458	90.72	-	-	91.38	25.97	4.84	31.47	230	40	A	H
		2483.86	61.59	-12.41	74	62.08	26.11	4.86	31.46	230	40	P	H
		2483.56	42.55	-11.45	54	43.04	26.11	4.86	31.46	230	40	A	H
	*	2456	102.01	-	-	102.67	25.97	4.84	31.47	130	77	P	V
	*	2458	93.94	-	-	94.6	25.97	4.84	31.47	130	77	A	V
		2483.86	64.58	-9.42	74	65.07	26.11	4.86	31.46	130	77	P	V
		2483.5	46.22	-7.78	54	46.71	26.11	4.86	31.46	130	77	A	V

Remark	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> </ol>
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15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (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)
802.11g CH 01 2412MHz		4824	37.12	-36.88	74	58.73	30.9	6.87	59.38	150	360	P	H
		4824	35.8	-38.20	74	57.41	30.9	6.87	59.38	150	360	P	V
802.11g CH 06 2437MHz		4872	36.31	-37.69	74	57.58	31.01	6.86	59.14	150	360	P	H
		7308	40.59	-33.41	74	55.33	35.34	8.47	58.55	150	360	P	H
		4872	36.05	-37.95	74	57.32	31.01	6.86	59.14	150	360	P	V
		7308	42.15	-31.85	74	56.89	35.34	8.47	58.55	150	360	P	V
802.11g CH 11 2462MHz		4926	37.03	-36.97	74	57.97	31.12	6.84	58.9	150	360	P	H
		7386	40.78	-33.22	74	55.72	35.55	8.49	58.98	150	360	P	H
		4926	36.14	-37.86	74	57.08	31.12	6.84	58.9	150	360	P	V
		7386	41.46	-32.54	74	56.4	35.55	8.49	58.98	150	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**15C 2.4GHz 2400~2483.5MHz  
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 01 2412MHz		2389.82	62.7	-11.30	74	64.06	25.4	4.76	31.52	241	41	P	H
		2389.95	46.34	-7.66	54	47.7	25.4	4.76	31.52	241	41	A	H
	*	2406	97.44	-	-	98.62	25.54	4.78	31.5	241	41	P	H
	*	2404	89.25	-	-	90.43	25.54	4.78	31.5	241	41	A	H
		2389.95	66.05	-7.95	74	67.41	25.4	4.76	31.52	188	101	P	V
		2389.95	50.78	-3.22	54	52.14	25.4	4.76	31.52	188	101	A	V
	*	2406	101.29	-	-	102.47	25.54	4.78	31.5	188	101	P	V
	*	2404	93.4	-	-	94.58	25.54	4.78	31.5	188	101	A	V
802.11n HT20 CH 06 2437MHz		2385.27	43.93	-30.07	74	45.36	25.35	4.75	31.53	134	55	P	H
		2385.27	34.63	-19.37	54	36.06	25.35	4.75	31.53	134	55	A	H
	*	2442	95.98	-	-	96.81	25.83	4.82	31.48	134	55	P	H
	*	2444	87.94	-	-	88.77	25.83	4.82	31.48	134	55	A	H
		2488.48	45.3	-28.70	74	45.61	26.26	4.88	31.45	134	55	P	H
		2488.66	36.1	-17.90	54	36.41	26.26	4.88	31.45	134	55	A	H
		2385.01	45.41	-28.59	74	46.84	25.35	4.75	31.53	268	92	P	V
		2385.53	36.41	-17.59	54	37.77	25.4	4.76	31.52	268	92	A	V
	*	2442	99.42	-	-	100.25	25.83	4.82	31.48	268	92	P	V
	*	2444	91.31	-	-	92.14	25.83	4.82	31.48	268	92	A	V
		2488.96	48.03	-25.97	74	48.34	26.26	4.88	31.45	268	92	P	V
	2488.78	38.03	-15.97	54	38.34	26.26	4.88	31.45	268	92	A	V	



802.11n HT20 CH 11 2462MHz	*	2456	97.23	-	-	97.89	25.97	4.84	31.47	295	50	P	H
	*	2454	90.07	-	-	90.73	25.97	4.84	31.47	295	50	A	H
		2483.74	59.38	-14.62	74	59.87	26.11	4.86	31.46	295	50	P	H
		2483.68	39.36	-14.64	54	39.85	26.11	4.86	31.46	295	50	A	H
	*	2456	99.7	-	-	100.36	25.97	4.84	31.47	106	97	P	V
	*	2456	91.87	-	-	92.53	25.97	4.84	31.47	106	97	A	V
		2484.4	60.11	-13.89	74	60.6	26.11	4.86	31.46	106	97	P	V
	2483.5	42.09	-11.91	54	42.58	26.11	4.86	31.46	106	97	A	V	

Remark	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> </ol>												
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**15C 2.4GHz 2400~2483.5MHz  
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 01 2412MHz		4824	36.64	-37.36	74	58.25	30.9	6.87	59.38	150	360	P	H
		4824	37.41	-36.59	74	59.02	30.9	6.87	59.38	150	360	P	V
802.11n HT20 CH 06 2437MHz		4872	36.38	-37.62	74	57.65	31.01	6.86	59.14	150	360	P	H
		7308	41.19	-32.81	74	55.93	35.34	8.47	58.55	150	360	P	H
		4872	36.67	-37.33	74	57.94	31.01	6.86	59.14	150	360	P	V
		7308	40.92	-33.08	74	55.66	35.34	8.47	58.55	150	360	P	V
802.11n HT20 CH 11 2462MHz		4926	37.05	-36.95	74	57.99	31.12	6.84	58.9	150	360	P	H
		7386	40.51	-33.49	74	55.45	35.55	8.49	58.98	150	360	P	H
		4926	36.93	-37.07	74	57.87	31.12	6.84	58.9	150	360	P	V
		7386	41.07	-32.93	74	56.01	35.55	8.49	58.98	150	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**15C 2.4GHz 2400~2483.5MHz  
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 03 2422MHz		2389.56	60.91	-13.09	74	62.27	25.4	4.76	31.52	240	44	P	H
		2389.95	50.19	-3.81	54	51.55	25.4	4.76	31.52	240	44	A	H
	*	2408	92.14	-	-	93.32	25.54	4.78	31.5	240	44	P	H
	*	2408	84.27	-	-	85.45	25.54	4.78	31.5	240	44	A	H
		2484.28	44.47	-29.53	74	44.96	26.11	4.86	31.46	240	44	P	H
		2494.48	31.8	-22.20	54	32.11	26.26	4.88	31.45	240	44	A	H
		2389.95	64.79	-9.21	74	66.15	25.4	4.76	31.52	246	103	P	V
		2389.95	53.06	-0.94	54	54.42	25.4	4.76	31.52	246	103	A	V
	*	2408	95.4	-	-	96.58	25.54	4.78	31.5	246	103	P	V
	*	2408	87.7	-	-	88.88	25.54	4.78	31.5	246	103	A	V
		2485.06	45.35	-28.65	74	45.84	26.11	4.86	31.46	246	103	P	V
		2494	32.11	-21.89	54	32.42	26.26	4.88	31.45	246	103	A	V
802.11n HT40 CH 06 2437MHz		2389.95	55.81	-18.19	74	57.17	25.4	4.76	31.52	236	50	P	H
		2389.95	38.96	-15.04	54	40.32	25.4	4.76	31.52	236	50	A	H
	*	2452	92.81	-	-	93.64	25.83	4.82	31.48	236	50	P	H
	*	2450	84.8	-	-	85.63	25.83	4.82	31.48	236	50	A	H
		2483.56	53.79	-20.21	74	54.28	26.11	4.86	31.46	236	50	P	H
		2483.74	36.08	-17.92	54	36.57	26.11	4.86	31.46	236	50	A	H
		2389.95	55.66	-18.34	74	57.02	25.4	4.76	31.52	179	95	P	V
		2389.95	42	-12.00	54	43.36	25.4	4.76	31.52	179	95	A	V
	*	2450	95.16	-	-	95.99	25.83	4.82	31.48	179	95	P	V
	*	2450	87.38	-	-	88.21	25.83	4.82	31.48	179	95	A	V
		2483.74	56.11	-17.89	74	56.6	26.11	4.86	31.46	179	95	P	V
		2483.5	38.93	-15.07	54	39.42	26.11	4.86	31.46	179	95	A	V



<b>802.11n</b>  <b>HT40</b>  <b>CH 09</b>  <b>2452MHz</b>		2387.74	48.37	-25.63	74	49.73	25.4	4.76	31.52	100	66	P	H
		2387.35	32.43	-21.57	54	33.79	25.4	4.76	31.52	100	66	A	H
	*	2458	93.44	-	-	94.1	25.97	4.84	31.47	100	66	P	H
	*	2456	85.41	-	-	86.07	25.97	4.84	31.47	100	66	A	H
		2487.82	60.69	-13.31	74	61	26.26	4.88	31.45	100	66	P	H
		2484.82	41.01	-12.99	54	41.5	26.11	4.86	31.46	100	66	A	H
		2387.35	47.08	-26.92	74	48.44	25.4	4.76	31.52	294	91	P	V
		2389.69	33.55	-20.45	54	34.91	25.4	4.76	31.52	294	91	A	V
	*	2458	96.97	-	-	97.63	25.97	4.84	31.47	294	91	P	V
	*	2460	88.78	-	-	89.44	25.97	4.84	31.47	294	91	A	V
		2487.88	63.27	-10.73	74	63.58	26.26	4.88	31.45	294	91	P	V
		2483.74	44.85	-9.15	54	45.34	26.11	4.86	31.46	294	91	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Cable, Preamp, Ant, Table, Peak, Pol. It contains multiple rows of test data for various channels and frequencies, and a final 'Remark' row.



15C 2.4GHz 2400~2483.5MHz

15C Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (LF)

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)
2.4GHz 802.11n HT40 LF		30	24.89	-15.11	40	29.6	26.3	0.09	31.1	-	-	P	H
		101.78	18.09	-25.41	43.5	30.6	17.78	0.42	30.71	-	-	P	H
		348.16	21.6	-24.40	46	29.69	21.14	2.27	31.5	-	-	P	H
		422.85	23.82	-22.18	46	29.89	22.92	2.56	31.55	-	-	P	H
		679.9	27.48	-18.52	46	29.03	26.6	2.63	30.78	-	-	P	H
		924.34	31.13	-14.87	46	29.47	29.64	3.22	31.2	100	256	P	H
		30	24.64	-15.36	40	29.35	26.3	0.09	31.1	100	36	P	V
		42.61	21.82	-18.18	40	34	18.72	0.42	31.32	-	-	P	V
		161.92	17.5	-26.00	43.5	29.89	16.92	1.64	30.95	-	-	P	V
		488.81	24.74	-21.26	46	29.41	23.92	3.01	31.6	-	-	P	V
		661.47	28.19	-17.81	46	29.55	26.42	2.89	30.67	-	-	P	V
	861.29	29.51	-16.49	46	29.46	28.64	2.59	31.18	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

*	<b>Fundamental Frequency</b> 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 <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



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+2		( 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

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

**For Peak Limit @ 2390MHz:**

- 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)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

- 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)
- 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
802.11b	97.59	8.232	0.121	300Hz
802.11g	87.50	1.370	0.730	1kHz
802.11n HT20	86.27	1.275	0.784	1kHz
802.11n HT40	86.29	1.232	0.812	1kHz

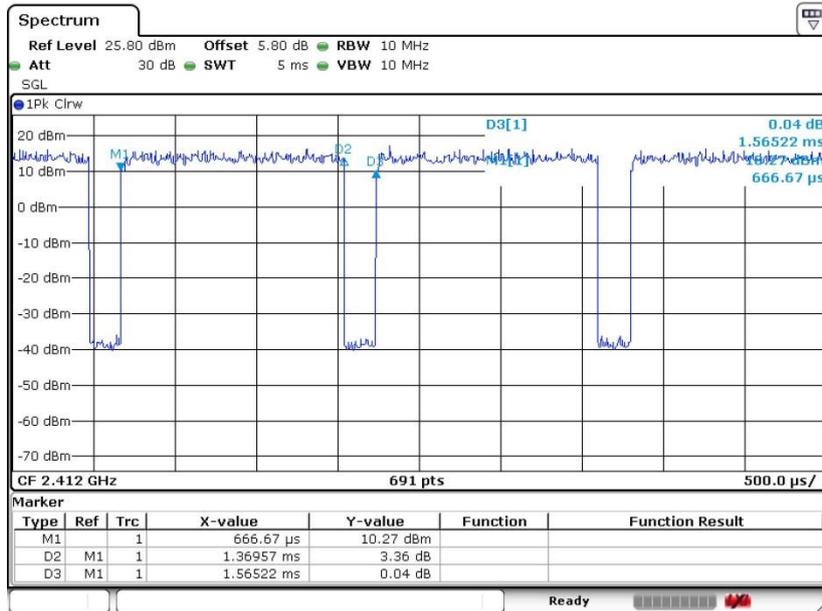
### 802.11b



Date: 21.MAR.2017 20:01:39

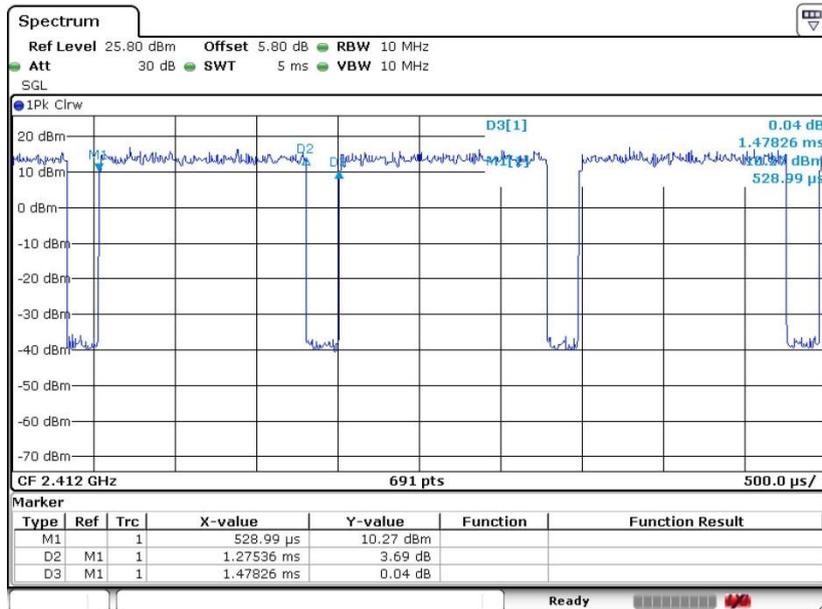


802.11g



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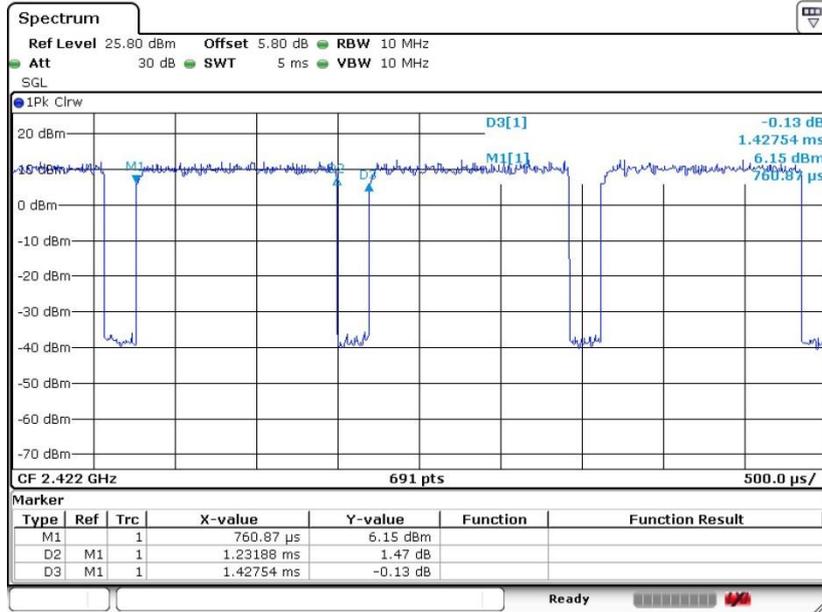
802.11n20



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802.11n40



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