

Report No.: AGC00338130401FE04 Page 1 of 69

# **FCC Test Report**

Report No.: AGC00338130401FE04

**FCC ID** : 2AAA6S406

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION**: Cellular phone

**BRAND NAME** : SENWA

MODEL NAME : S406

**CLIENT**: SENWA MEXICO ,S.A. DE C.V

**DATE OF ISSUE** : May,06,2013

**STANDARD(S)** : FCC Part 15 Rules

**REPORT VERSION**: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May,06,2013	Valid	Original Report

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## 1. VERIFICATION OF CONFORMITY

Applicant	SENWA MEXICO ,S.A. DE C.V
Address  Av. Javier Barros Sierra 540, Torre I, Planta 5; COL. LOMAS DE SANT DELEGACION ALVARO OBREGON C.P. 01210 MEXICO, DISTRITO F	
Manufacturer GPLUS TELECOM CO., LTD.	
Address 2nd, Fl., B Building, Jiada R&D Building 5 Langshan Rd., North, Hi-tech Industrial Park, Shenzhen, China	
Product Designation	Cellular phone
Brand Name	SENWA
Test Model	S406
Date of test	Apr.26, 2013 to May,04, 2013
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BGN/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Wall Huang May,06,2013

Checked By

Forrest Lei May,06,2013

Authorized By

Solger Zhang May,06,2013

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## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

The EUT is designed as "Cellular phone". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

A major technical description of EoT is described as following			
Operation Frequency	2.412 GHz~2.462GHz		
Max. Output Power	IEEE 802.11b:11.77Bm (Max)		
Modulation	DSSS(BPSK/QPSK/CCK);OFDM(16-QAM/64-QAM)		
Data Data	DSSS(1/2/5.5/11),OFDM(6/9/12/18/24/36/48/54)		
Data Rate	See section 2.3 for 802.11n		
Number of channels	11		
Hardware Version	E106_V1.1_PCB		
Software Version	N/A		
Antenna Designation	Integrated Antenna		
Antenna Gain	1.0dBi		
Power Supply	DC3.7V by Built-in Li-ion Battery		

## 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	1	2412 MHZ
	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
2400~2483.5MHZ	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11 For 40MHZ bandwidth system use Channel 3 to Channel 9

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### 2.3. IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps) 800nsGl	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation	
NSS Number of spatial streams		
R Code rate		
NBPSC	Number of coded bits per single carrier	
NCBPS	Number of coded bits per symbol	
NDBPS	Number of data bits per symbol	
GI	Guard interval	

## 2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AAA6S406** filing to comply with the FCC Part 15 requirements.

## 2.5. TEST METHODOLOGY

Because the EUT received power from DC3.7V lithium battery, so only radiated testing was performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

## 2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

## 2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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### 3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB Radiated measurement: +/- 3.2dB

### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX
4	Normal operating (WiFi)

#### Note:

Transmit by 802.11b with Date rate (1/2/5.5/11)

Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54)

Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65)

Transmit by 802.11n (40MHz) with Date rate

(13.5/27/40.5/54/81/108/121.5/135)

#### Note:

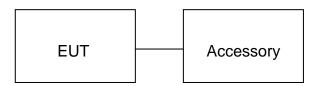
- 1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually.
- 2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
- 3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

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## **5. SYSTEM TEST CONFIGURATION**

## **5.1. CONFIGURATION OF EUT SYSTEM**

Configure:



## **5.2. EQUIPMENT USED IN EUT SYSTEM**

Item	Equipment	Mfr/Brand Model/Type No.		Remark	
1	Cellular phone	S406	FCC ID: 2AAA6S406	EUT	
2	Adapter S406		DC5.0V /500mA	Accessory	
3	Battery S406 DC3.7V/ 650mAh		Accessory		
4	4 Earphone S406 N/A Acce		Accessory		
5	USB Cable S406 N/A		Accessory		

Note: All the accessories have been used during the test in conduction emission test.

## **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

Note: The EUT received power from DC3.7V lithium battery.

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## **6. TEST FACILITY**

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd		
Location	2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China		
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003.		

## **ALL TEST EQUIPMENT LIST**

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power meter	R&S	NRP-Z23	100323	07/18/2012	07/17/2013
RF attenuator	N/A	RFA20db	68	N/A	N/A
Spectrum Analyzer	Agilent	E4440A	US44300399	07/18/2012	06/17/2013
Amplifier	EM	EM30180	0607030	07/18/2012	07/17/2013
Horn Antenna	EM	EM-AH-10180	67	04/21/2012	04/20/2014
Horn Antenna	A.H. Systems Inc.	SAS-574	26	07/18/2012	07/17/2013
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/18/2012	07/17/2013
Biological Antenna	A.H. Systems Inc.	SAS-521-4	28	06/08/2012	06/09/2013
Loop Antenna	A.H.	SAS-526B	264	07/15/2012	07/14/2013

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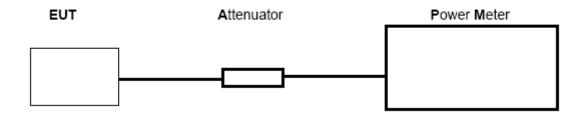
## 7. PEAK OUTPUT POWER

## 7.1. MEASUREMENT PROCEDURE

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Connect EUT RF output port to power meter through an RF attenuator
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Set the RBW greater than 6DB bandwidth of emission.
- 5. Record the maximum power from the power meter.
- 6. The maximum peak power shall be less 1 Watt (30dBm).

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

## 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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## 7.3. LIMITS AND MEASUREMENT RESULT

TEST ITEM	PEAK POWER
TEST MODE	802.11b with data rate 1

	LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.412	9.82	11.77	30	Pass	
2.437	9.53	11.44	30	Pass	
2.462	9.66	11.52	30	Pass	

TEST ITEM	PEAK POWER
TEST MODE	802.11g with data rate 6

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	9.25	11.15	30	Pass
2.437	9.12	11.03	30	Pass
2.462	9.36	11.23	30	Pass

TEST ITEM	PEAK POWER
TEST MODE	802.11n 20 with data rate 6.5

	LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	9.03	10.95	30	Pass
2.437	8.86	10.75	30	Pass
2.462	9.12	11.02	30	Pass

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TEST ITEM	PEAK POWER
TEST MODE	802.11n 40 with data rate 13.5

	LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.422	6.42	8.33	30	Pass
2.437	6.24	8.12	30	Pass
2.452	6.34	8.26	30	Pass

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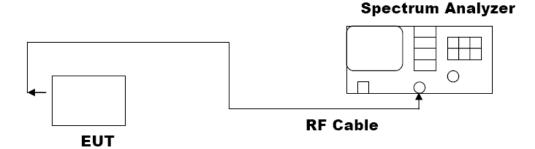
## 8. 6DB BANDWIDTH

## **8.1. MEASUREMENT PROCEDURE**

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW≥RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

## 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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## 8.3. LIMITS AND MEASUREMENT RESULTS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11b with data rate 11

LIMITS AND MEASUREMENT RESULT				
Applicable Limite	Applicable Limits			
Applicable Limits	Test Data (MHz) Criteria			
	Low Channel	9.068	PASS	
>500KHZ	Middle Channel	9.088	PASS	
	High Channel	8.556	PASS	

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11g with data rate 54

LIMITS AND MEASUREMENT RESULT			
Annliachta Limita	Applicable Limits		
Applicable Limits	Test Data (MHz)		Criteria
>500KHZ	Low Channel	16.432	PASS
	Middle Channel	16.422	PASS
	High Channel	16.395	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 20 with data rate 65

LIMITS AND MEASUREMENT RESULT				
Applicable Limite		Applicable Limits		
Applicable Limits	Test Data (MHz)		Criteria	
>500KHZ	Low Channel	17.604	PASS	
	Middle Channel	17.810	PASS	
	High Channel	17.632	PASS	

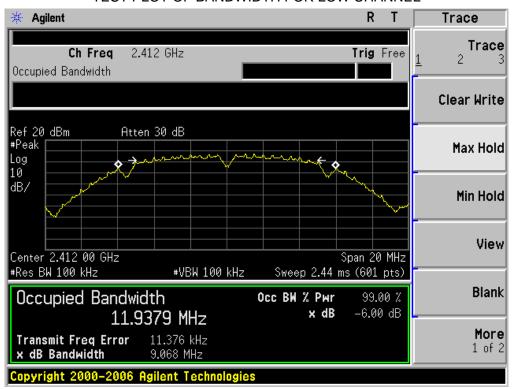
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TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 40 with data rate 135

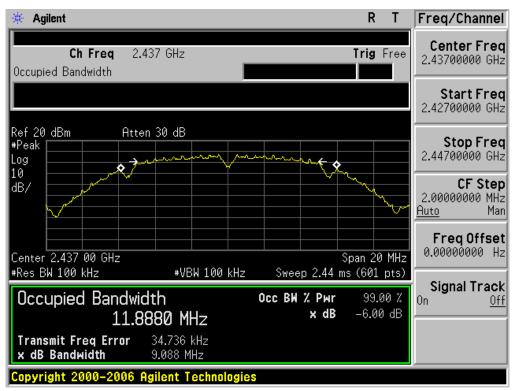
LIMITS AND MEASUREMENT RESULT			
Applicable Limits			
Applicable Limits	Test Data (MHz)		Criteria
>500KHZ	Low Channel	36.342	PASS
	Middle Channel	36.353	PASS
	High Channel	36.156	PASS

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**802.11b TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

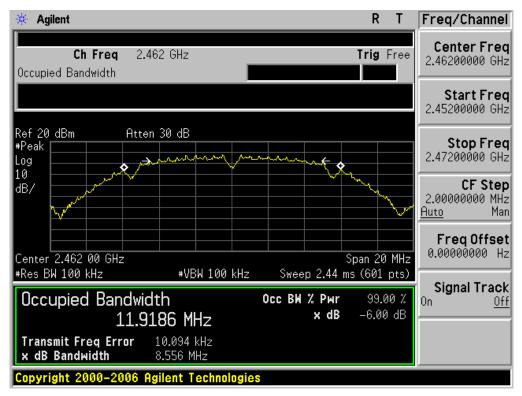


## TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



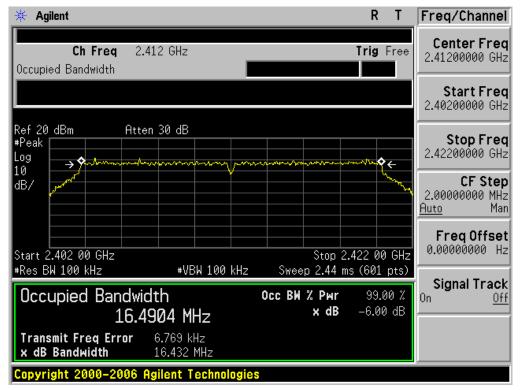
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## TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

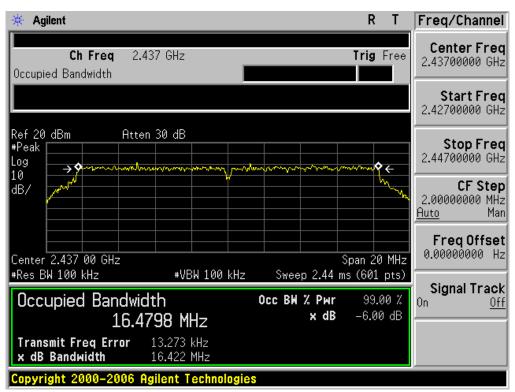


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**802.11g TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

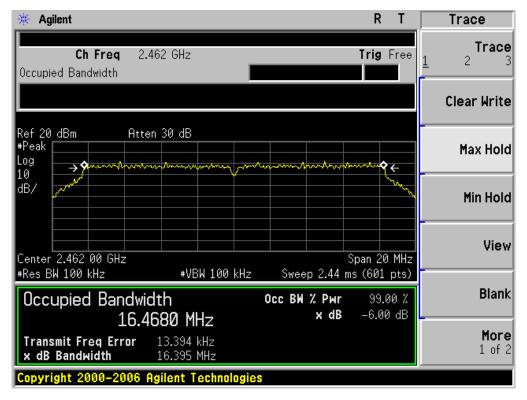


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



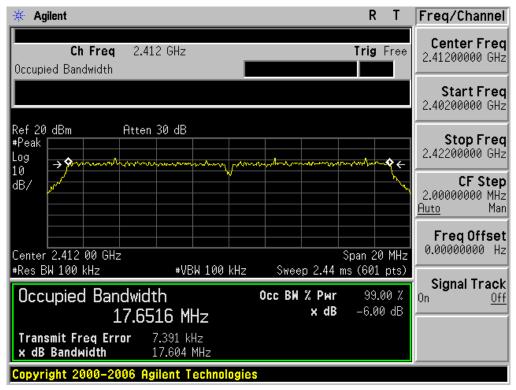
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## TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

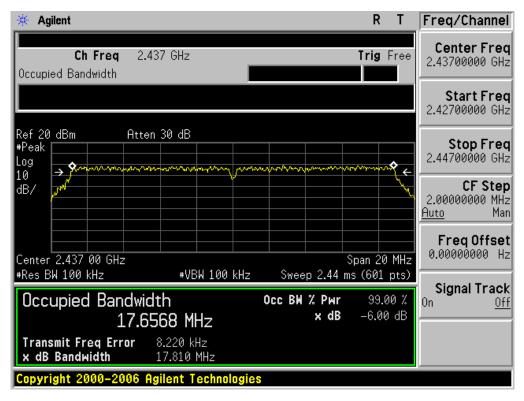


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**802.11n(20) TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

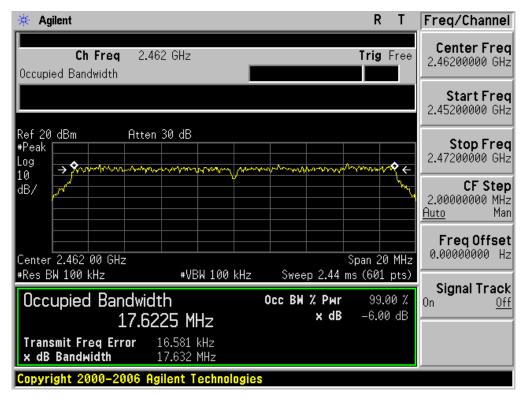


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



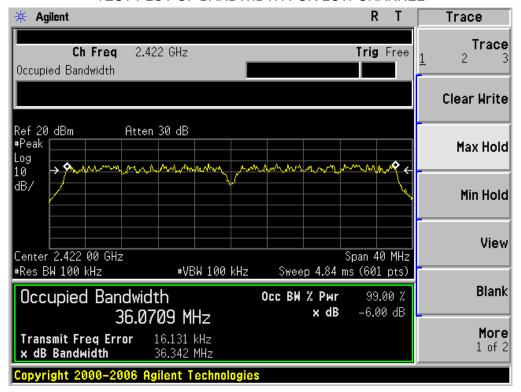
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### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

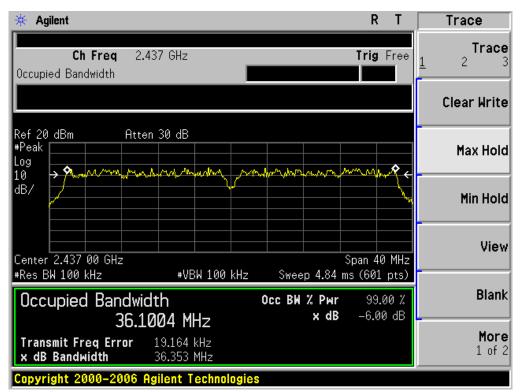


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**802.11n(40) TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

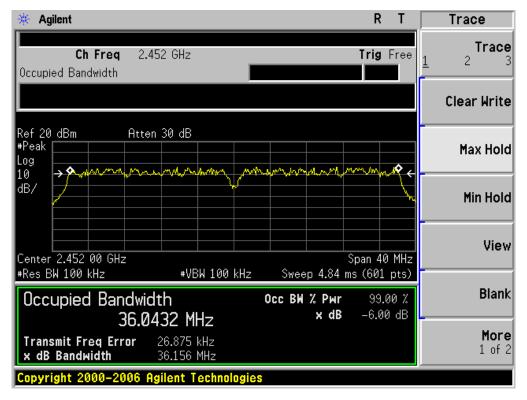


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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## TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## 9. CONDUCTED SPURIOUS EMISSION

## 9.1. MEASUREMENT PROCEDURE

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Set SPA Trace 1 Max hold, then View.

**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

## 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

## 9.3. MEASUREMENT EQUIPMENT USED

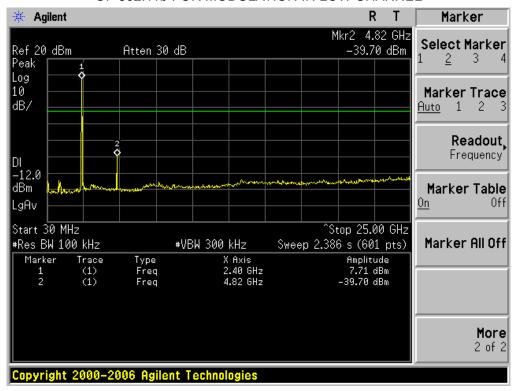
The same as described in section 6.

## 9.4. LIMITS AND MEASUREMENT RESULT

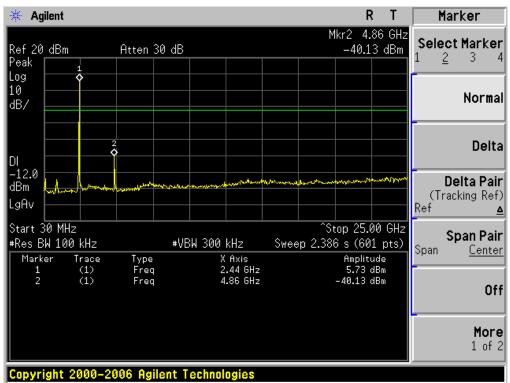
LIMITS AND MEASUREMENT RESULT				
Angliaghla Limite	Measurement Result			
Applicable Limits	Test Data	Criteria		
In any 100 KHz Bandwidth Outside the	At least -20dBc than the limit			
frequency band in which the spread spectrum	Specified on the BOTTOM	PASS		
intentional radiator is operating, the radio frequency	Channel			
power that is produce by the intentional radiator				
shall be at least 20 dB below that in 100KHz				
bandwidth within the band that contains the highest				
level of the desired power.	At least -20dBc than the limit	DACC		
In addition, radiation emissions which fall in the	Specified on the TOP Channel	PASS		
restricted bands, as defined in §15.205(a), must also				
comply with the radiated emission limits specified				
in§15.209(a))				

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## TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11b FOR MODULATION IN LOW CHANNEL

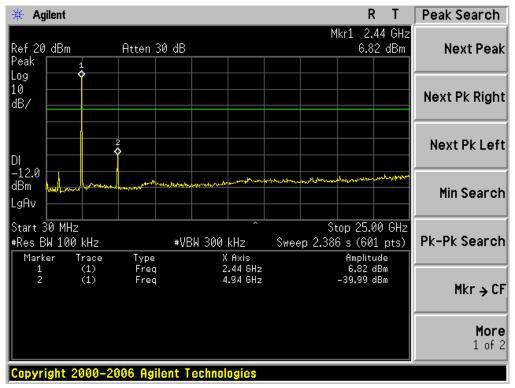


## TEST PLOT OF OUT OF BAND EMISSIONS OF 802.11b FOR MODULATION IN MIDDLE CHANNEL



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# TEST PLOT OF OUT OF BAND EMISSIONS OF 802.11b FOR MODULATION IN HIGH CHANNEL



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## 10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

## **10.1 MEASUREMENT PROCEDURE**

- (1). The EUT was placed on a turn table which is 0.8m above ground plane.
- (2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (4). Set SPA Trace 1 Max hold, then View.

## 10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

## **10.3 MEASUREMENT EQUIPMENT USED**

Refer To Section 6.

## **10.4 LIMITS AND MEASUREMENT RESULT**

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11b with data rate 1

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-9.36	8	Pass
Middle Channel	-13.23	8	Pass
High Channel	-12.08	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11g with data rate 6

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-17.1	8	Pass
Middle Channel	-18.68	8	Pass
High Channel	-15.73	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 20 with data rate 6.5

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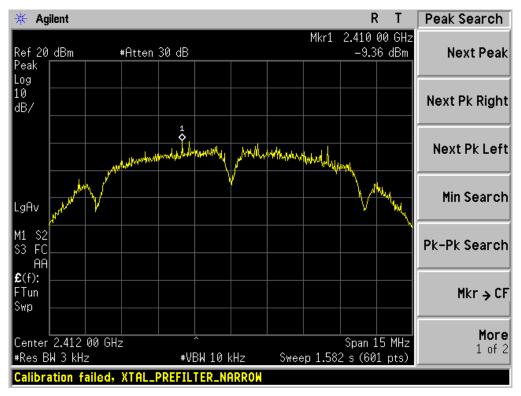
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-17.35	8	Pass
Middle Channel	-18.51	8	Pass
High Channel	-16.17	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 40 with data rate 13.5

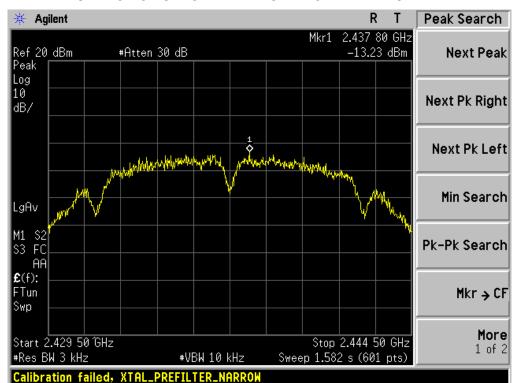
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-22.68	8	Pass
Middle Channel	-24.09	8	Pass
High Channel	-23.92	8	Pass

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802.11b TEST RESULT
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

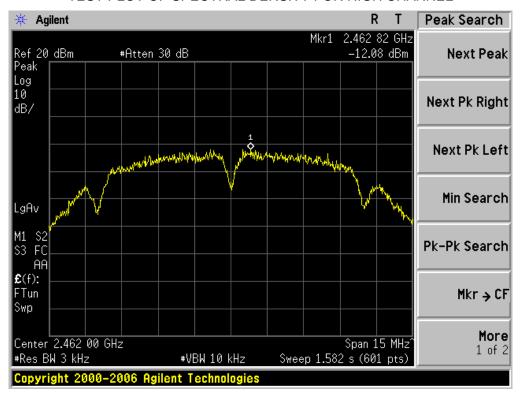


## TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



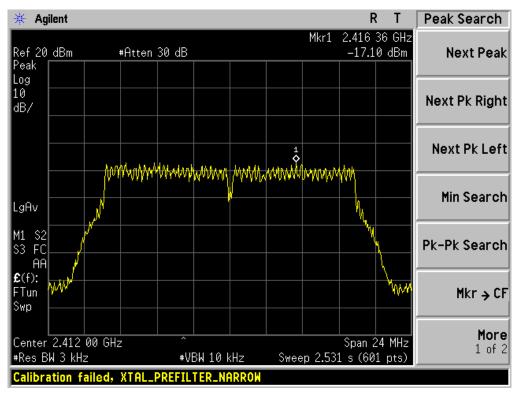
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

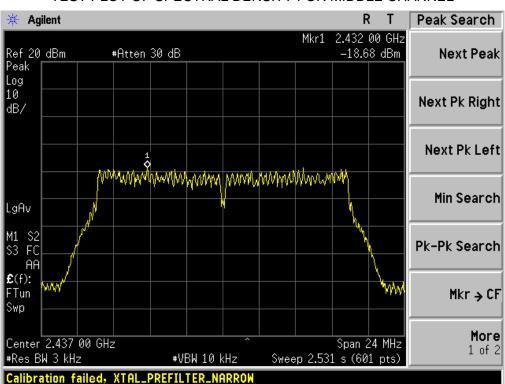


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**802.11g TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

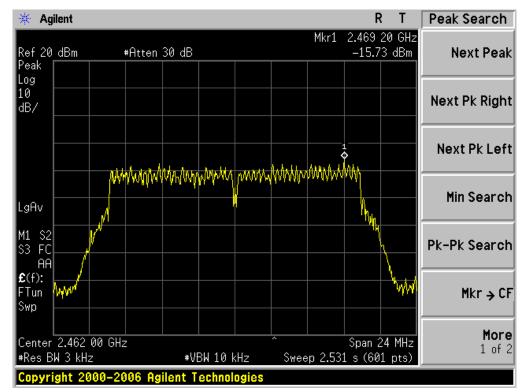


### TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



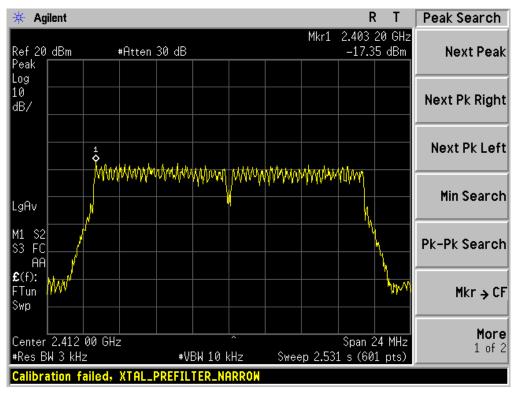
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

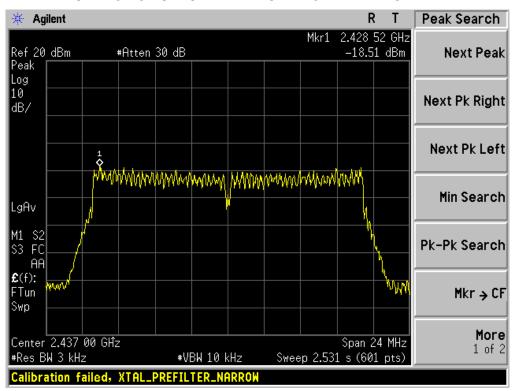


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**802.11n 20 TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

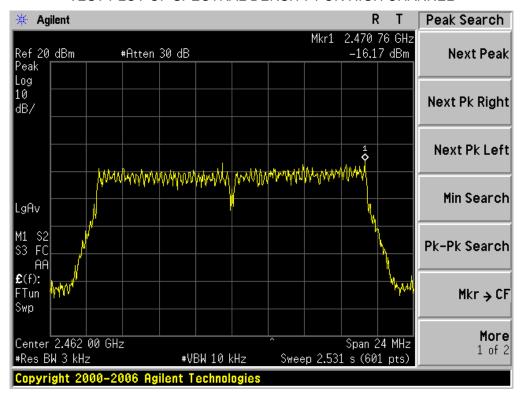


### TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



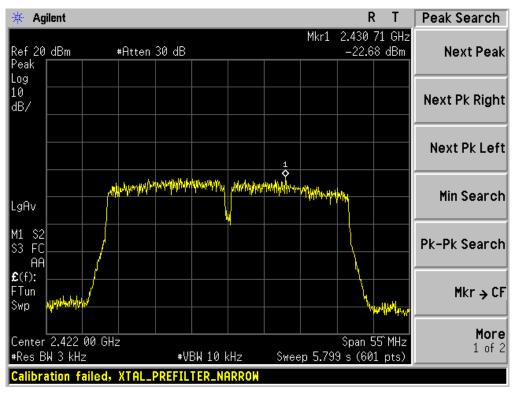
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

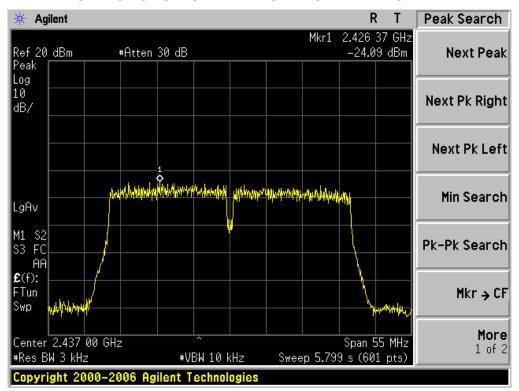


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**802.11n 40 TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

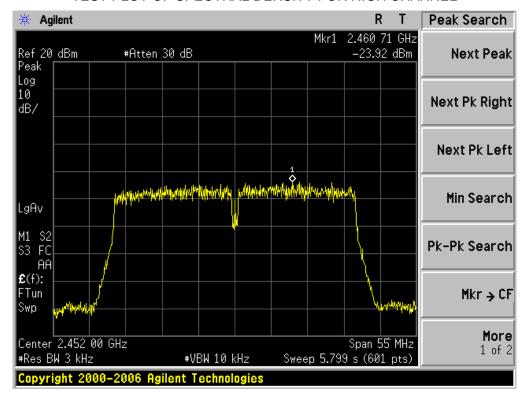


### TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



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# TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



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#### 11. RADIATED EMISSION

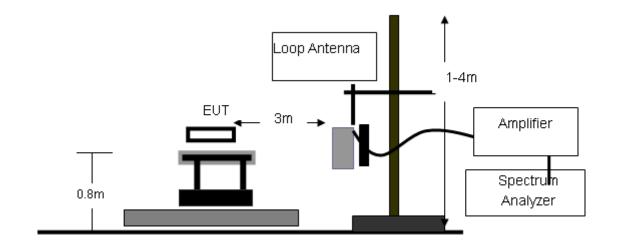
#### 11.1. MEASUREMENT PROCEDURE

- 1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

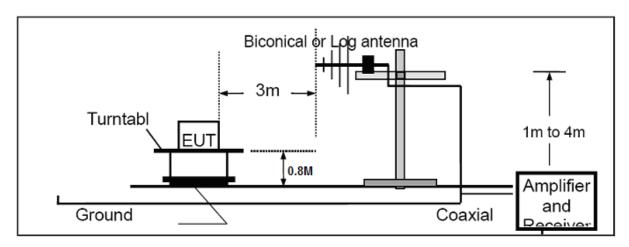
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#### 11.2. TEST SETUP

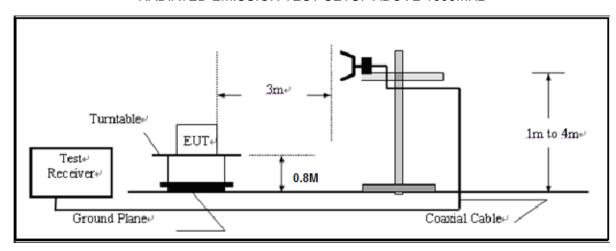
### RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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### 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/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: All modes were tested For restricted band radiated emission,

the test records reported below are the worst result compared to other modes.

# 11.4. TEST RESULT

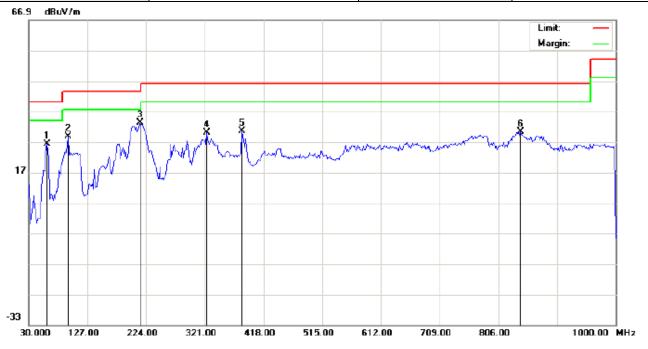
### **RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.

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### **RADIATED EMISSION BELOW 1GHZ**

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

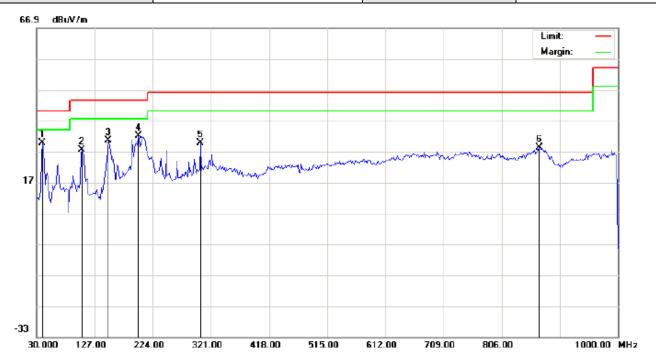
M/N: S406

Mode: Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1		60.7167	22.12	4.06	26.18	40.00	-13.82	peak			
2		94.6667	13.61	15.06	28.67	43.50	-14.83	peak			
3	*	214.3000	22.96	10.32	33.28	43.50	-10.22	peak			
4		324.2332	11.70	18.45	30.15	46.00	-15.85	peak			
5		382.4331	11.82	18.82	30.64	46.00	-15.36	peak			
6		843.1833	-0.73	30.99	30.26	46.00	-15.74	peak		·	

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

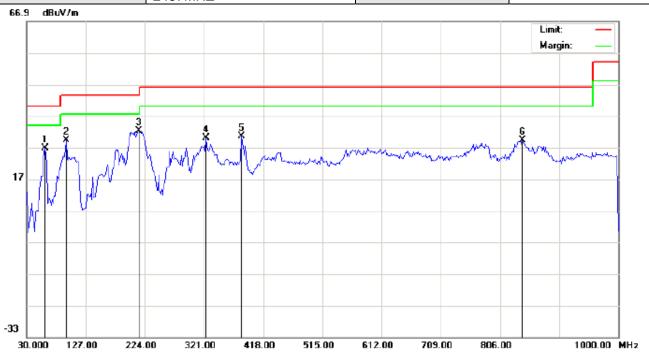
M/N: S406

Mode: Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1	*	39.7000	21.93	7.76	29.69	40.00	-10.31	peak			
2		105.9832	18.13	9.40	27.53	43.50	-15.97	peak			
3		149.6331	16.38	14.15	30.53	43.50	-12.97	peak			
4		199.7500	23.81	8.23	32.04	43.50	-11.46	peak			
5		303.2167	12.61	17.21	29.82	46.00	-16.18	peak			
6		869.0499	-1.37	29.71	28.34	46.00	-17.66	peak			

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

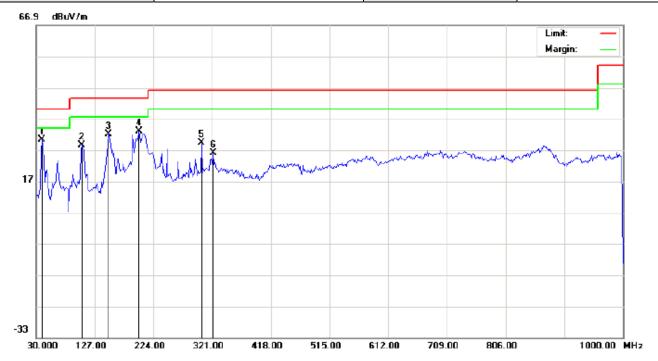
M/N: S406

Mode: Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		60.7167	22.62	4.06	26.68	40.00	-13.32	peak			
2		94.6667	14.11	15.06	29.17	43.50	-14.33	peak			
3	*	214.3000	21.96	10.32	32.28	43.50	-11.22	peak			
4		324.2332	11.70	18.45	30.15	46.00	-15.85	peak			
5		382.4331	11.82	18.82	30.64	46.00	-15.36	peak			
6		843.1833	-1.73	30.99	29.26	46.00	-16.74	peak			

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

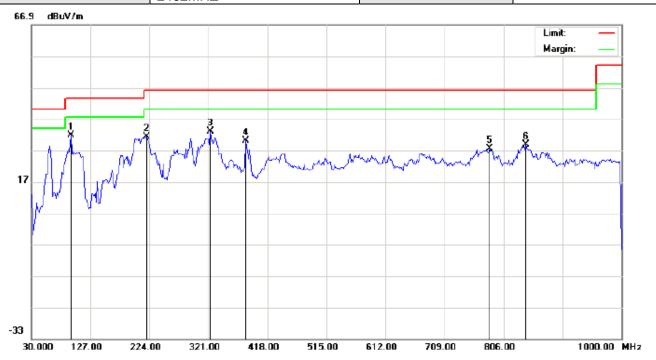
M/N: S406

Mode: Midde Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	39.7000	22.43	7.76	30.19	40.00	-9.81	peak			
2		105.9832	19.13	9.40	28.53	43.50	-14.97	peak			
3		149.6331	17.88	14.15	32.03	43.50	-11.47	peak			
4		199.7500	24.81	8.23	33.04	43.50	-10.46	peak			
5		303.2167	12.11	17.21	29.32	46.00	-16.68	peak			
6		322.6166	7.58	18.40	25.98	46.00	-20.02	peak			

EUT	Cellular phone	Model Name	S406	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Horizontal	



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

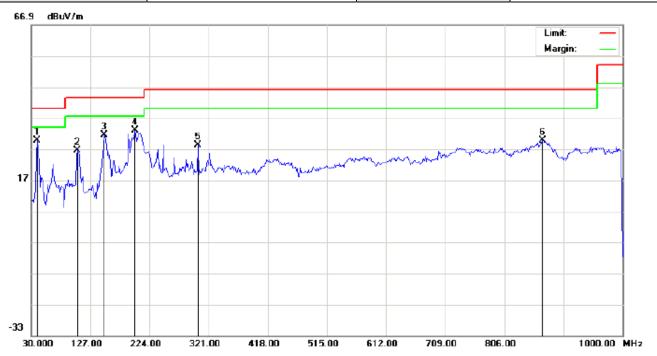
Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	94.6667	16.61	15.06	31.67	43.50	-11.83	peak			
2		219.1500	19.21	12.15	31.36	46.00	-14.64	peak			
3		324.2332	14.70	18.45	33.15	46.00	-12.85	peak			
4		382.4331	11.32	18.82	30.14	46.00	-15.86	peak			
5		783.3667	-0.67	28.11	27.44	46.00	-18.56	peak			
6		843.1833	-2.23	30.99	28.76	46.00	-17.24	peak			

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EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1	*	39.7000	21.93	7.76	29.69	40.00	-10.31	peak			
2		105.9832	17.13	9.40	26.53	43.50	-16.97	peak			
3		149.6331	17.38	14.15	31.53	43.50	-11.97	peak			
4		199.7500	24.81	8.23	33.04	43.50	-10.46	peak			
5		303.2167	11.11	17.21	28.32	46.00	-17.68	peak			
6		869.0499	0.13	29.71	29.84	46.00	-16.16	peak			

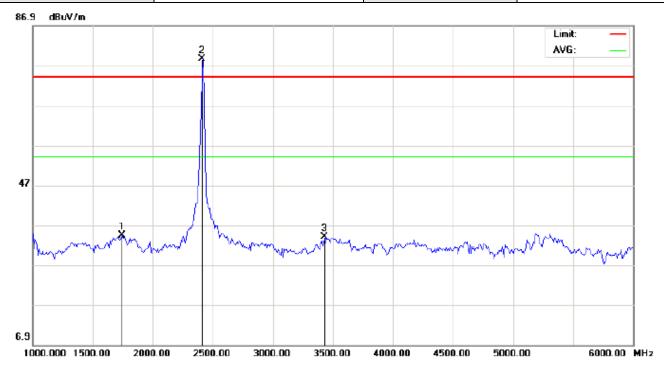
### **RESULT: PASS**

**Note:** Measurement= Reading + Factor, Over=Measure-Limit.

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### **RADIATED EMISSION ABOVE 1GHZ**

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

Mode: Low channel

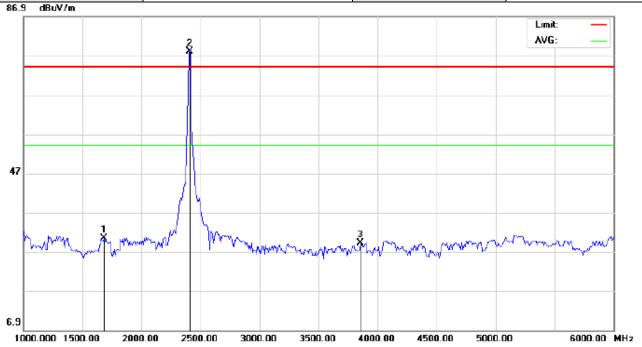
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		1741.667	34.41	0.00	34.41	74.00	-39.59	peak			
2	*	2412.000	78.66	0.00	78.66	74.00	4.66	peak			
3		3433.333	33.98	0.00	33.98	74.00	-40.02	peak			

<sup>\*\*</sup>The mark "2" is the basic frequency.

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EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

Mode: Low channel

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		1683.333	30.35	0.00	30.35	74.00	-43.65	peak			
2	*	2412.000	77.92	0.00	77.92	74.00	3.92	peak			
3		3858.333	29.15	0.00	29.15	74.00	-44.85	peak			

<sup>\*\*</sup>The mark "2" is the basic frequency.

#### **RESULT: PASS**

**Note:** The other modes radiation emissions have more than 20dB margin.

Measurement= Reading + Factor, Over=Measure-Limit.

All modes radiation emission from 6GHz to 25GHz at least have 20dB margin.

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# 12. BAND EDGE EMISSION

# 12.1. MEASUREMENT PROCEDURE

- 1. Set the EUT Work on the top, the bottom operation frequency individually.
- 2. Set SPA Start or Stop Frequency = Operation Frequency, RBW>=1%span, VBW>=RBW
- 3. The band edges was measured and recorded.

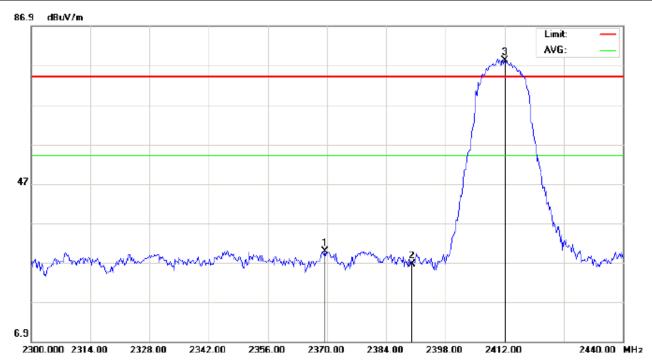
# **12.2. TEST SET-UP**

Radiated same as 11.2

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### 12.3. TEST RESULT

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

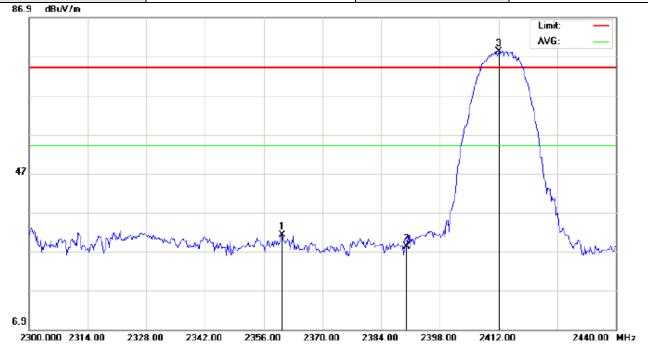
M/N: S406

Mode: 802.11b Low channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2369.533	29.80	0.00	29.80	74.00	-44.20	peak			
2		2390.000	26.60	0.00	26.60	74.00	-47.40	peak			
3	*	2412.000	78.22	0.00	78.22	74.00	4.22	peak			

EUT	Cellular phone	Model Name	S406	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Vertical	



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

Mode: 802.11b Low channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1		2360.433	31.16	0.00	31.16	74.00	-42.84	peak			
2		2390.000	28.25	0.00	28.25	74.00	-45.75	peak			
3	*	2412.000	78.19	0.00	78.19	74.00	4.19	peak			

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

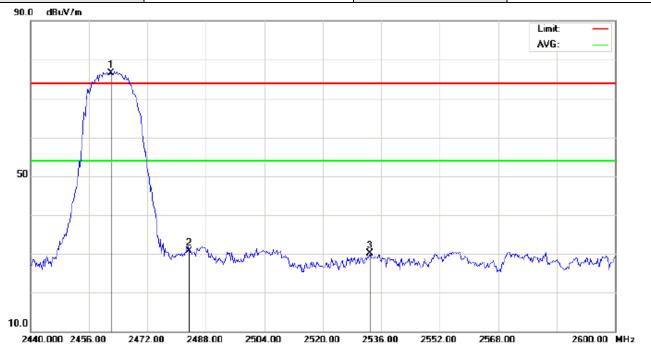
Mode: 802.11b High channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2462.000	76.76	0.00	76.76	74.00	2.76	peak			
2		2483.500	27.58	0.00	27.58	74.00	-46.42	peak			
3		2538.933	30.87	0.00	30.87	74.00	-43.13	peak			

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EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

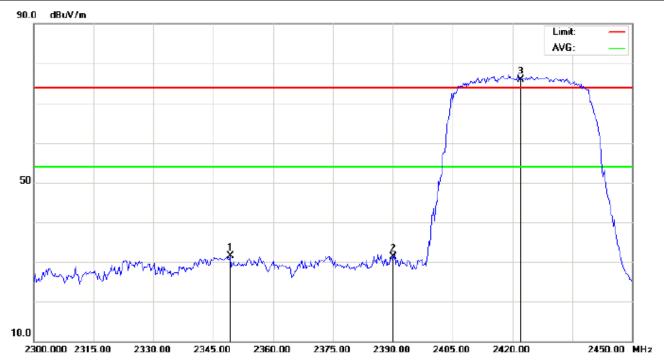
M/N: S406

Mode: 802.11b High channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2462.000	76.49	0.00	76.49	74.00	2.49	peak			
2		2483.500	30.63	0.00	30.63	74.00	-43.37	peak			
3		2532.800	30.02	0.00	30.02	74.00	-43.98	peak			

EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

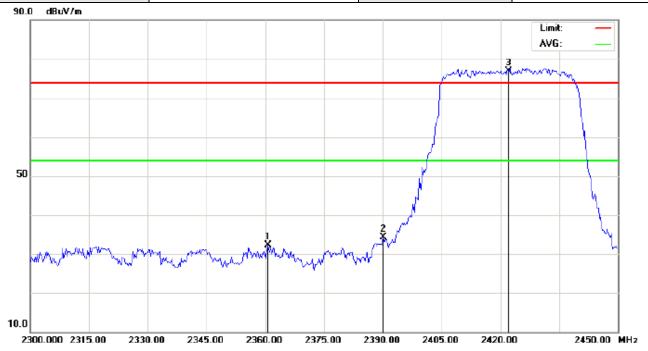
Mode: 802.11n 40 Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm degree		
1		2349.250	31.44	0.00	31.44	74.00	-42.56	peak			
2		2390.000	31.24	0.00	31.24	74.00	-42.76	peak			
3	*	2422.086	75.93	0.00	75.93	74.00	1.93	peak			

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EUT	Cellular phone	Model Name	S406	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Vertical	



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

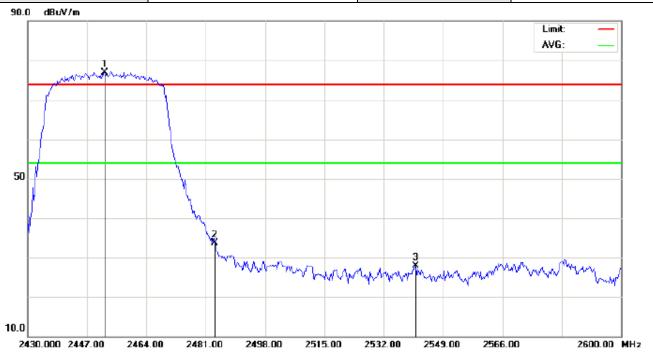
Mode: 802.11n 40 Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2360.750	32.27	0.00	32.27	74.00	-41.73	peak			
2		2390.000	34.30	0.00	34.30	74.00	-39.70	peak			
3	*	2422.000	76.98	0.00	76.98	74.00	2.98	peak			

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EUT	Cellular phone	Model Name	S406	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	802.11n 40 with data rate 13.5 2452MHZ	Antenna	Horizontal	



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

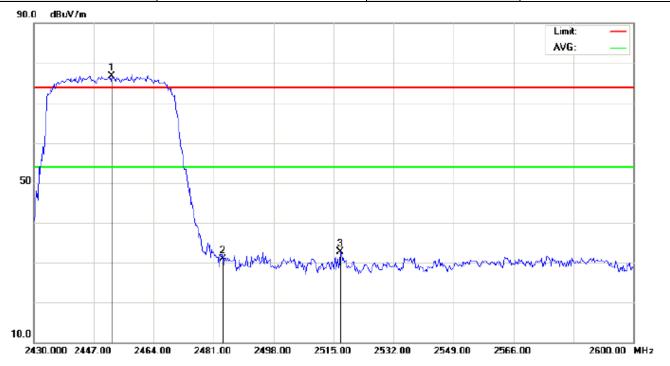
Mode: 802.11n 40 High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2452.096	77.00	0.00	77.00	74.00	3.00	peak			
2		2483.500	33.73	0.00	33.73	74.00	-40.27	peak			
3		2541.067	27.89	0.00	27.89	74.00	-46.11	peak			

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EUT	Cellular phone	Model Name	S406
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2452MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: Cellular phone Distance: 3m

M/N: S406

Mode: 802.11n 40 High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2452.136	76.61	0.00	76.61	74.00	2.61	peak			
2		2483.500	30.92	0.00	30.92	74.00	-43.08	peak			
3		2516.983	32.69	0.00	32.69	74.00	-41.31	peak			

## **RESULT: PASS**

**Note**: the other modes radiation emission have enough 20dB margin.

Measurement= Reading + Factor, Over=Measure-Limit.

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# 13. FCC LINE CONDUCTED EMISSION TEST

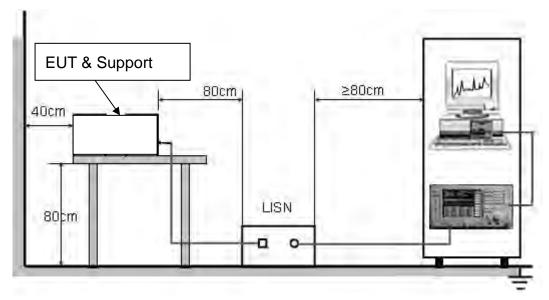
### 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francis	Maximum RF Line Voltage								
Frequency	Q.P.( dBuV)	Average( dBuV)							
150kHz~500kHz	66-56	56-46							
500kHz~5MHz	56	46							
5MHz~30MHz	60	50							

### Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

# 13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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#### 13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

- 2. Support equipment, if needed, was placed as per ANSI C63.4.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4. All support equipments received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC5V charging voltage by adapter which received 120V/60Hzpower by a LISN...
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

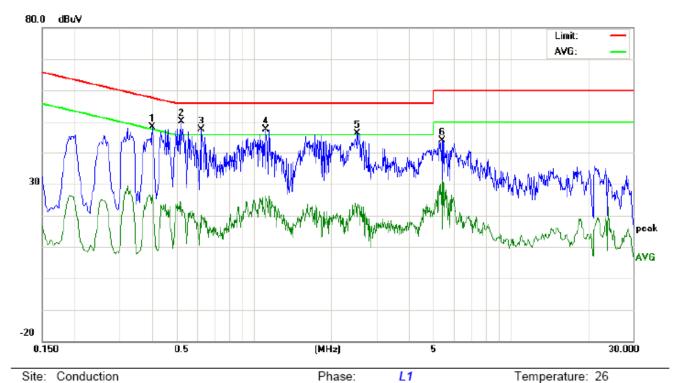
- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

Humidity: 60 %

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### 13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

# LINE CONDUCTED EMISSION TEST LINE 1-L



Limit: FCC Class B Conduction(QP)

EUT: Cellular phone

M/N: S406

Mode: Normal Operating

Note:

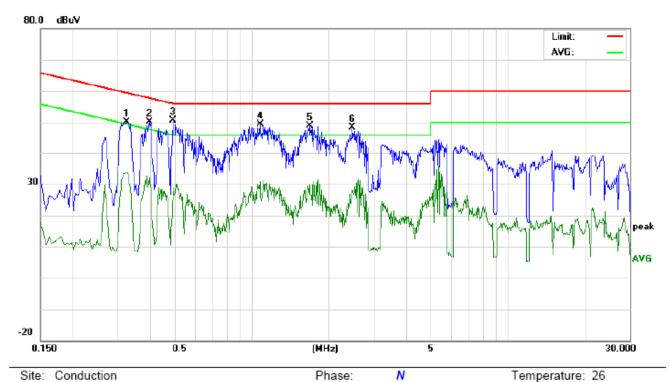
No.	Freq.	Reading_Level (dBuV)					Measurement (dBuV)			Limit (dBuV)		rgin IB)	P/F	Comment
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4020	38.08		16.18	10.33	48.41		26.51	57.81	47.81	-9.40	-21.30	Р	
2	0.5220	39.65		13.67	10.38	50.03		24.05	56.00	46.00	-5.97	-21.95	Р	
3	0.6260	37.38		9.82	10.32	47.70		20.14	56.00	46.00	-8.30	-25.86	Р	
4	1.1140	37.14		15.76	10.37	47.51		26.13	56.00	46.00	-8.49	-19.87	Р	
5	2.5339	36.05		12.14	10.44	46.49		22.58	56.00	46.00	-9.51	-23.42	Р	
6	5.3978	33.94		21.23	10.25	44.19		31.48	60.00	50.00	-15.81	-18.52	Р	

Power:

Humidity: 60 %

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# Line Conducted Emission Test Line 2-N



Limit: FCC Class B Conduction(QP)

EUT: Cellular phone

M/N: S406

Mode: Normal Operating

Note:

No.	Freq.	Reading_Level (dBuV)		Correct Factor	Measurement (dBuV)						Margin (dB)		Comment	
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG	P/F	
1	0.3260	39.87		23.47	10.30	50.17		33.77	59.55	49.55	-9.38	-15.78	Р	
2	0.3980	39.90		21.70	10.33	50.23		32.03	57.89	47.89	-7.66	-15.86	Р	
3	0.4939	40.28		18.59	10.40	50.68		28.99	56.10	46.10	-5.42	-17.11	Р	
4	1.0780	39.07		20.47	10.37	49.44		30.84	56.00	46.00	-6.56	-15.16	Р	
5	1.6818	38.54		19.46	10.32	48.86		29.78	56.00	46.00	-7.14	-16.22	Р	
6	2.4860	37.86		17.86	10.42	48.28		28.28	56.00	46.00	-7.72	-17.72	Р	

Power:

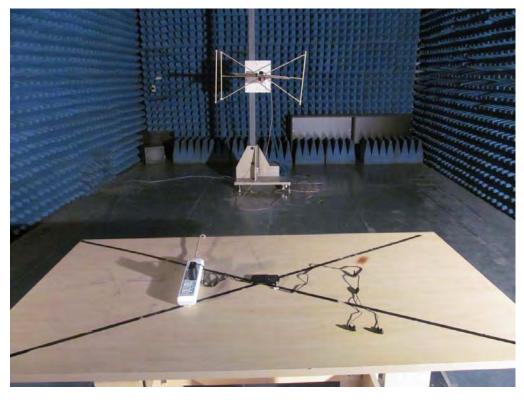
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# **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP



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# **APPENDIX B: PHOTOGRAPHS OF EUT**

TOTAL VIEW OF EUT



TOP VIEW OF EUT



**BOTTOM VIEW OF EUT** 



FRONT VIEW OF EUT



**BACK VIEW OF EUT** 



LEFT VIEW OF EUT



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RIGHT VIEW OF EUT



**OPEN VIEW OF EUT-1** 



# **OPEN VIEW OF EUT-2**

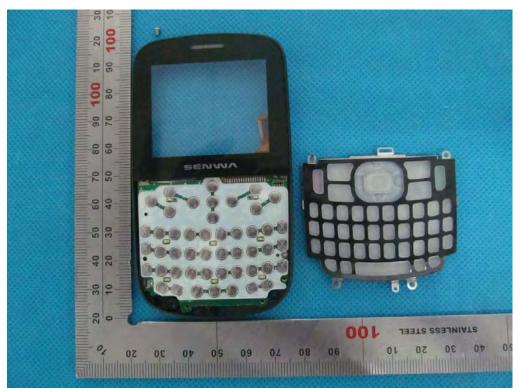


**OPEN VIEW OF EUT-3** 

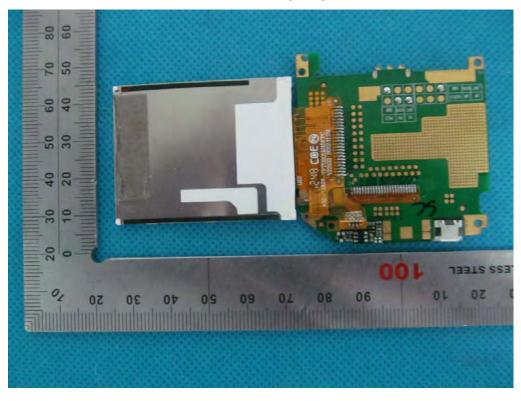


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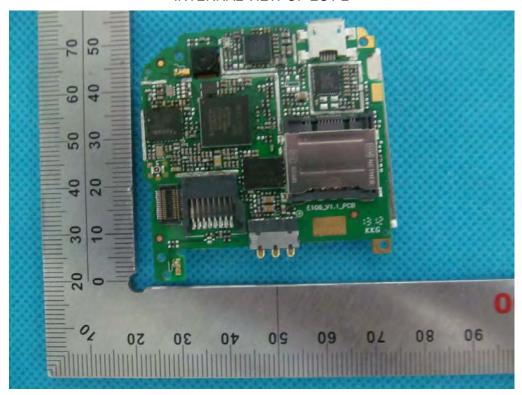
**OPEN VIEW OF EUT-4** 



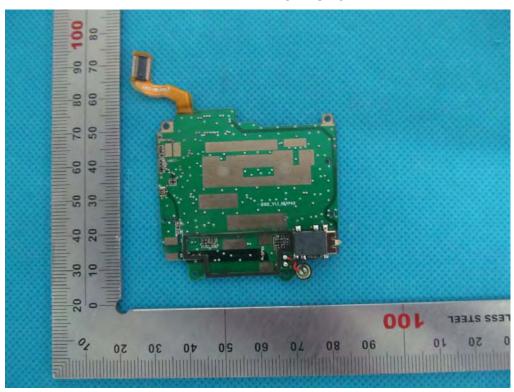
**INTERNAL VIEW OF EUT-1** 



# **INTERNAL VIEW OF EUT-2**



**INTERNAL VIEW OF EUT-3** 



----END OF REPORT----