# **FCC Test Report**

Report No.: AGC00594170602FE04

FCC ID	:	2AI3K-CS24SA
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Rugged Mobile Phone
BRAND NAME	:	Cyrus
MODEL NAME	:	CS24SA
CLIENT	:	Cyrus Technology GmbH
DATE OF ISSUE	:	July 11, 2017
STANDARD(S) TEST PROCEDURE(S)	:	FCC Part 15.247 KDB 558074 D01 DTS Meas Guidance v04
<b>REPORT VERSION</b>	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Ishenzhen

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2



# **Report Revise Record**

<b>Report Version</b>	Revise Time	Issued Date	Valid Version	Notes
V1.0	1	July 11, 2017	Valid	Original Report

# TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	6
2.2. TABLE OF CARRIER FREQUENCYS	6
2.3. IEEE 802.11N MODULATION SCHEME	7
2.4. RELATED SUBMITTAL(S) / GRANT (S)	7
2.5. TEST METHODOLOGY	7
2.6. SPECIAL ACCESSORIES	7
2.7. EQUIPMENT MODIFICATIONS	
3. MEASUREMENT UNCERTAINTY	9
4. DESCRIPTION OF TEST MODES	9
5. SYSTEM TEST CONFIGURATION	10
5.1. CONFIGURATION OF EUT SYSTEM	10
5.2. EQUIPMENT USED IN EUT SYSTEM	10
5.3. SUMMARY OF TEST RESULTS	10
6. TEST FACILITY	11
7. OUTPUT POWER	13
7.1. MEASUREMENT PROCEDURE	13
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	14
7.3. LIMITS AND MEASUREMENT RESULT	15
8. 6DB BANDWIDTH	17
8.1. MEASUREMENT PROCEDURE	17
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	17
8.3. LIMITS AND MEASUREMENT RESULTS	17
9. CONDUCTED SPURIOUS EMISSION	20
9.1. MEASUREMENT PROCEDURE	
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	20
9.3. MEASUREMENT EQUIPMENT USED	20
9.4. LIMITS AND MEASUREMENT RESULT	20
10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY	27
10.1 MEASUREMENT PROCEDURE	27
10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	27
10.3 MEASUREMENT EQUIPMENT USED	27
10.4 LIMITS AND MEASUREMENT RESULT	27

#### Report No.: AGC00594170602FE04 Page 4 of 45

11. RADIATED EMISSION	30
11.1. MEASUREMENT PROCEDURE	30
11.2. TEST SETUP	31
11.3. LIMITS AND MEASUREMENT RESULT	31
11.4. TEST RESULT	32
12. BAND EDGE EMISSION	36
12.1. MEASUREMENT PROCEDURE	36
12.2. TEST SET-UP	36
12.3. Radiated Test Result	37
12.4. Conducted Test Result	38
13. FCC LINE CONDUCTED EMISSION TEST	40
13.1. LIMITS OF LINE CONDUCTED EMISSION TEST	40
13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	40
13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	41
13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	41
13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	42
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	44

Applicant	Cyrus Technology GmbH	
Address	Hergelsbendenstraße 49 D-52080 Aachen Germany	
Manufacturer	Shenzhen Xin Kingbrand Enterprises Co., Ltd	
Address	ingBrand Industrial Zone, Nanpu Road,Shang Liao Lin Pikeng,Shajing own,Baoan District,Shenzhen City,Guangdong Province,China	
Product Designation	Rugged Mobile Phone	
Brand Name	Cyrus	
Test Model	CS24SA	
Date of test	June 23, 2017~July 11, 2017	
Deviation	None	
Condition of Test Sample	Normal	
Report Template	AGCRT-US-BGN/RF	
	·	

# **1. VERIFICATION OF CONFORMITY**

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service 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 C63.10 (2013) 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.

Tested By	donjon strang	
	Donjon Huang(Huang Dongyang)	July 11, 2017
Reviewed By	Borre sie	
	Bart Xie(Xie Xiaobin)	July 11, 2017
Approved By	Selya shory	
	Solger Zhang(Zhang Hongyi) Authorized Officer	July 11, 2017

# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as "Rugged Mobile 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

<b>Operation Frequency</b>	2.412 GHz~2.462GHz	
Output Power	IEEE 802.11b: <b>12.59</b> dBm, IEEE 802.11g: <b>10.62</b> dBm;	
	IEEE 802.11n(20):10.55dBm, IEEE 802.11n(40):10.32dBm;	
Modulation	DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM)	
Number of channels	11	
Hardware Version	FQ5_02	
Software Version	V18N_smartphone_20170608_V1.04	
Antenna Designation	Integrated Antenna	
Antenna Gain	0.6dBi	
Power Supply	DC3.8V 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

MCS Index	Nss	Modulation	R	NBPSC	NCI	BPS	NDI	BPS		ata //bps) nsGl
					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

#### 2.3. IEEE 802.11N MODULATION SCHEME

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: 2AI3K-CS24SA** filing to comply with the FCC Part 15 requirements.

#### 2.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters. Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.247 rules KDB

#### 2.6. SPECIAL ACCESSORIES

558074 D01 DTS Meas Guidance v04.

Refer to section 5.2.

#### 2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

# **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			
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, and the eut is operating at its maximum duty cycle>or equal 98%

- 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.

# **5. SYSTEM TEST CONFIGURATION**

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

# Configure:

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

Item	Equipment	Model No.	ID or Specification	Remark
1	Rugged Mobile Phone	CS24SA	FCC ID: 2AI3K-CS24SA	EUT
2	Adapter	TPA-10120125UU-MTK	DC 5V 2A	Accessory
3	Battery	V18H	DC3.8V/ 5000mAh	Accessory
4	USB Cable	N/A	N/A	Accessory
5	Earphone	N/A	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	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 DC3.8V lithium battery.

# 6. TEST FACILITY

Site         Dongguan Precise Testing Service Co., Ltd.	
Location	Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.10:2013.

#### ALL TEST EQUIPMENT LIST

# FOR RADIATED EMISSION TEST (BELOW 1GHZ)

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 3, 2016	July 2, 2017
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 2, 2017	July 1, 2018
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 3, 2016	July 2, 2017
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 2, 2017	July 1, 2018
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 3, 2016	July 2, 2017
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 2, 2017	July 1, 2018
RF Cable	SCHWARZBECK	AK9515E	96221	July 3, 2016	July 2, 2017
RF Cable	SCHWARZBECK	AK9515E	96221	July 2, 2017	July 1, 2018
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 5, 2016	June 4, 2017
3m Anechoic Chamber	CHENGYU	966	PTS-001	July 2, 2017	July 1, 2018
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 5, 2016	June 4, 2018
Spectrum analyzer	Agilent	E4407B	MY46185649	June 5, 2016	June 4, 2017
Spectrum analyzer	Agilent	E4407B	MY46185649	June 2, 2017	June 1, 2018
Power Probe	R&S	NRP-Z23	100323	July 24,2016	July 23,2017
RF attenuator	N/A	RFA20db	68	N/A	N/A

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 3, 2016	July 2, 2017
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 2, 2017	July 1, 2018
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 10, 2016	July 9, 2018
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 3, 2016	July 2, 2017
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 2, 2017	July 1, 2018
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 6, 2016	July 5, 2017
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 2, 2017	July 1, 2018
RF Cable	SCHWARZBECK	AK9515H	96220	July 7, 2016	July 6, 2017
RF Cable	SCHWARZBECK	AK9515H	96220	July 2, 2017	July 1, 2018
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 2, 2017	June 1, 2018
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 5, 2016	June 4, 2018
Power Probe	R&S	NRP-Z23	100323	July 24,2016	July 23,2017
RF attenuator	N/A	RFA20db	68	N/A	N/A

# FOR RADIATED EMISSION TEST (1GHZ ABOVE)

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 3, 2016	July 2, 2017
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 2, 2017	July 1, 2018
Artificial Mains Network	Narda	L2-16B	000WX31025	July 7, 2016	July 6, 2017
Artificial Mains Network	Narda	L2-16B	000WX31025	July 2, 2017	July 1, 2018
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 7, 2016	July 6, 2017
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 2, 2017	July 1, 2018
RF Cable	SCHWARZBECK	AK9515E	96222	July 3, 2016	July 2, 2017
RF Cable	SCHWARZBECK	AK9515E	96222	July 2, 2017	July 1, 2018
Shielded Room	CHENGYU	843	PTS-002	June 2, 2017	June 1, 2018

# 7. OUTPUT POWER

#### 7.1. MEASUREMENT PROCEDURE

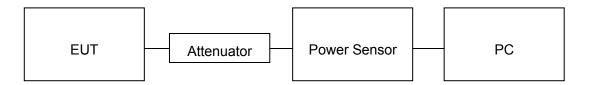
For max average conducted output power test:

- 1. Connect EUT RF output port to power probe through an RF attenuator.
- 2. Connect the power probe to the PC.
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Record the maximum power from the software.

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)

#### AVERAGE POWER SETUP



# 7.3. LIMITS AND MEASUREMENT RESULT

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

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	10.11	30	Pass
2.437	12.59	30	Pass
2.462	11.67	30	Pass

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

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	6.82	30	Pass
2.437	10.62	30	Pass
2.462	9.76	30	Pass

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

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	6.85	30	Pass
2.437	10.55	30	Pass
2.462	9.80	30	Pass

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

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.422	10.30	30	Pass
2.437	10.32	30	Pass
2.452	8.85	30	Pass

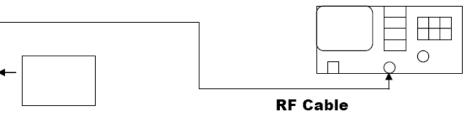
# 8. 6DB BANDWIDTH

#### 8.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. 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 $\ge$ 3×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)



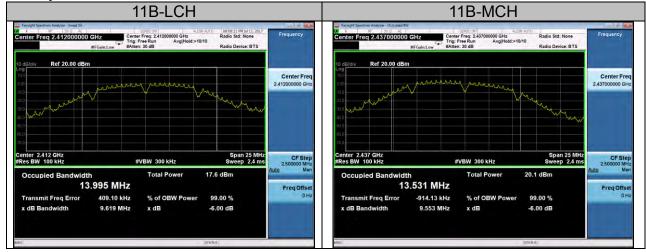
EUT

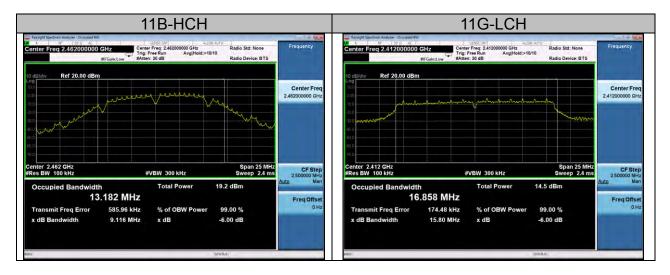
#### 8.3. LIMITS AND MEASUREMENT RESULTS

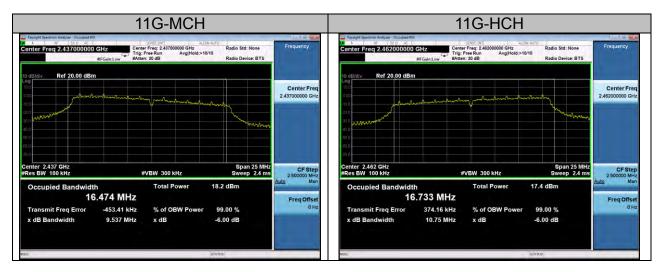
Mode	Channel	6dB Bandwidth [MHz]	Verdict
	LCH	9.619	PASS
11B	MCH	9.553	PASS
	НСН	9.116	PASS
	LCH	15.80	PASS
11G	MCH	9.537	PASS
	НСН	10.75	PASS
	LCH	17.22	PASS
11nHT20	MCH	10.14	PASS
	НСН	11.38	PASS
	LCH	11.38	PASS
11nHT40	MCH	10.27	PASS
	HCH	36.12	PASS

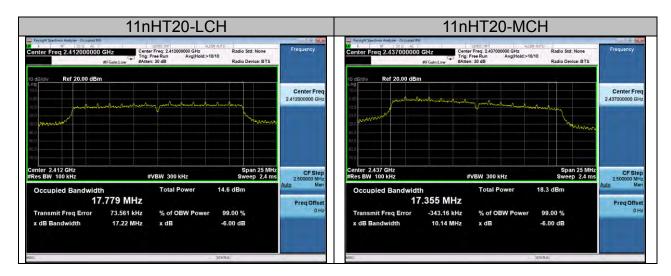
#### Spectrum Analyzer

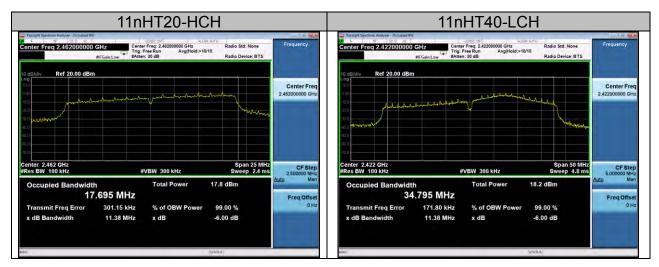
#### **Test Graph**

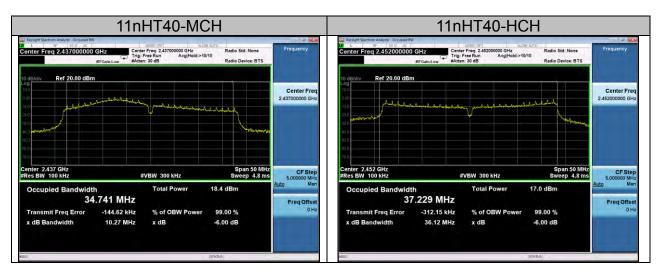












# 9. CONDUCTED SPURIOUS EMISSION

#### 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. 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. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW > RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW > RBW) are conform to the requirement.

#### 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.

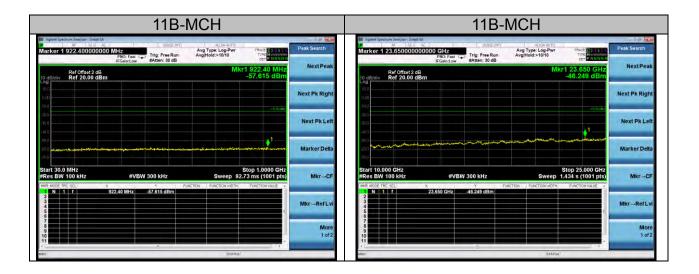
#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEA	SUREMENT RESULT	
Applieghte Limite	Measurement Re	sult
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. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the TOP Channel	PASS

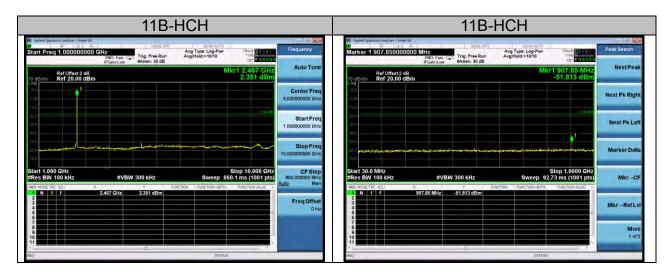
#### **Test Graph**

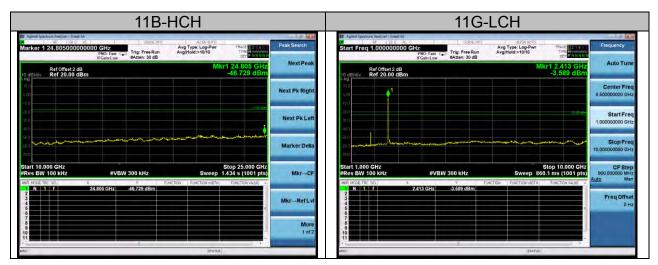
	11B-LCH			11B-LCH				
Peak Search	Avg Type: Log-Pwr Avg Hold:>10/10 TRACE TO A LOG Der Castalitation	ar Aglient Spectrum Anstorn-Sweet 3A Br Jaco 26 MHz Marker 1 770.110000000 MHz FNO: Fast Car IFGaint.ow \$Atten: 30 dB	Frequency	Avg Type: Log-Pwr Avg/Hold:>10/10 Der		M Agilent Spectrum Analyzer - Swept SA RF 50 Ω - 34 Start Freq 1.0000000000		
Next Peak	Mkr1 770.11 MHz -57.375 dBm	Ref Offset 2 dB 10 dB/div Ref 20.00 dBm	Auto Tune	Mkr1 2.413 GHz 1.367 dBm		10 dB/div Ref 20.00 dBm		
Next Pk Righ		100	Center Freq 5.50000000 GHz			100 1100		
Next Pk Let	-19.6:001	300 300 400	Start Freq 1,000000000 GHz	-19 61-109		290 390		
Marker Del	1	SED 300 Englander an english of the result of a start of the second	Stop Freq 10.00000000 GHz		an a	580 500		
Mkr→C	Stop 1.0000 GHz Sweep 92.73 ms (1001 pts)	Start 30.0 MHz #Res BW 100 kHz #VBW 300 kHz	CF Step 900.000000 MHz Auto Man	Stop 10.000 GHz Sweep 860.1 ms (1001 pts)	#VBW 300 kHz	Start 1.000 GHz #Res BW 100 kHz		
Mkr→RefL	FUNCTION FUNCTION WOTH FUNCTION VALUE +	NMK MODE TRC SCL X Y 1 N 1 f 770.11 MHz 57.375 dBm 3 6 6	Freq Offset 0 Hz	FUNCTION FUNCTION WIDTH: FUNCTION VALUE >	2.413 GHz 1.367 dBm	MMR MODE TRC SCL 1		
Mor 1 of		7 8 9 10 11				7 8 9 10 11		
_	STATUS	itig		STATUS	1	ASIO		

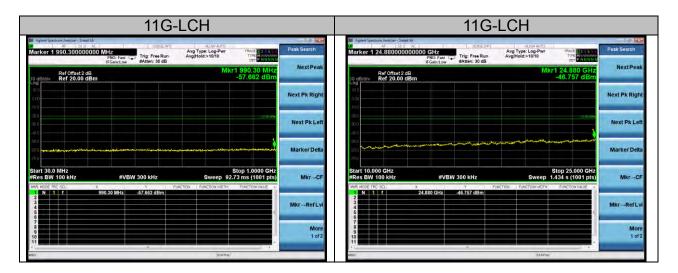
11B-LCH		11B-MCH
Bill Agener Spectrum Aasjonn Sweet SA     All On Autor Sales SA     All On Autor SALE     All On Autor SA	Peak Search	Bit Agenet Spectrum Averyanis Sweet Ski         Strict Error 4L000000000 GHz         Strict Error 4L000000000 GHz         Fire Run         Avg Type: Log-Pwc         Trace Type: Log-Pwc         Fire Run Avg Typ
Ref Offset 2 dB Mkr1 25.000 GHz 10 dēJdiv Ref 20.00 dBm -45.874 dBm	NextPeak	Ref Offset 2 dB         Mkr1 2.431 GHz         Auto Tune           10 dB/ofv         Ref 20.00 dBm         4.303 dBm         Auto Tune
	Next Pk Right	50 Center Freq 0.00 5.0000000 GH2
30	Next Pk Left	100 Comparison Compari
	Marker Delta	Stop Freq 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
Start 10.000 GHz         Stop 25.000 GHz           #Res BW 100 kHz         #VBW 300 kHz         Stop 25.000 GHz           #Res BW 100 kHz         #VBW 300 kHz         Stop 12.000 (b)           #Res BW 100 kHz         #VBW 300 kHz         Stop 12.000 (b)	Mkr→CF	Start 1.000 GHz         Stop 10.000 GHz         CF Step 90000000 Hz         Stop 10.000 GHz         Stop 00.000 GHz         Stop 00.0000 Hz         Man           #Res BW 100 kHz         #VBW 300 kHz         Sweep 800.1ms (100 1 pts)         Man         Man         Man         Man
N 1 f 25,000 GHz 45,872 dBm 2 4 4 4 4 5 872 dBm	Mkr→RefLvi	1         N         1         f         2.431 GHz         4.303 dBm           2         3         3         5         5         6         6         7         0 Hz           6         5         5         5         6         7         0 Hz         0 Hz         0 Hz
	More 1 of 2	
KSO STATUS		MSO STATUS



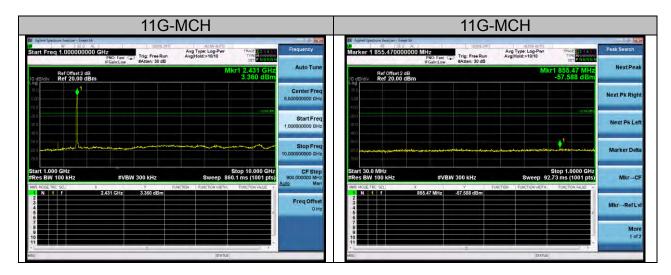
#### Report No.: AGC00594170602FE04 Page 22 of 45







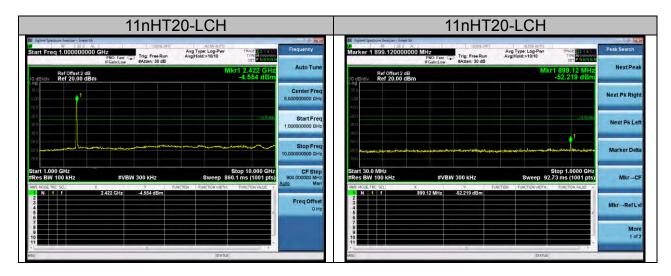
#### Report No.: AGC00594170602FE04 Page 23 of 45



11G-MCH		11G-HCH
AppliertSpraw Avergers-Sweet M         Selection         4LCOV AUTO           SP         SF         SAL         Selection         4LCOV AUTO           Markor 1 24,537000000000 GHz         Trig: Free Run         Ang Type: Log-Por         Trivic: IPE Exception           PNO: Fast         Trig: Free Run         Ang Type: Log-Por         Trivic: IPE Exception           Editation         #Stern: 30 B         Control of the Run Automation         Control of the Run Automation	Peak Search	Bit Agent Spranse Averyanis Sweet SA     Bit Stat Ac     Sector State Trace Tra
Ref Offset 2 dB. Mkr1 24.370 GHz	Next Peak.	Ref 20,00 dBm 0.516 dBm 4.407 GHz
	Next Pk Right	Center Freq 6.00 5.50000000 GHz
	Next Pk Left	1.00 2.0 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
	Marker Delta	Stop Freq 10 0000000 GHz
Start 10.000 GHz Stop 25.000 GHz #Res BW 100 kHz Sweep 1.434 s (1001 pts) we not no start	Mkr→CF	Start 1.000 GHz         #VBW 300 kHz         Stop 10.000 GHz         GP 5tep 90000000 MHz           #Res BW 100 kHz         Sweep 860.1 ms (1001 pts) Mark 100 km start         Adda         Mark
N 1 7 24.370 GHz 46.923 dBm	Mkr→RefLvi	N 1 1 7 2.457 GHz 0.516 dBm Freq Offset 0 Hz
	More 1 of 2	
ее нае на		4

11G-HCH		11G-HCH	
Agent (source) Aperts (source	NextDeak	Appendigeneral Appendigeneral Appendigeneral Appendigeneral Appendigeneral Appendigeneral Appendigeneral Applied Appendigeneral Applied A	Peak Search Next Peak
aBidiv Ref 05set2 dB Mkr1 883.60 MJ aBidiv Ref 2000 dBm -56.855 dB -56.855 dB	a service a service of the service o	Ref Offset 2 dB         Mkr1 24.895 GHz           10 dBldis/         Ref 20.00 dBm         -48.127 dBm           90	Next Pk Right
	Next Pk Left	400	Next Pk Lef
10 10 general general sector and the sector of the sector	Marker Delta	<ul> <li>(1)</li> <li>(2)</li> <li>(3)</li> <li>(3)</li> <li>(3)</li> <li>(4)</li> </ul>	Marker Delta
art 30.0 MHz         Stop 1.0000 GP           Res BW 100 kHz         #VBW 300 kHz         Sweep 92.73 ms (1001 pt           R MOG TRC SQL         X         Y         Factors           N         F         883.60 MHz         -56.655 dBm	ts) Mkr→CF	Start 10.000 GHz         Stop 25.000 GHz           #Res BW 100 kHz         #VBW 300 kHz         Sweep 1.434 s (1001 pts)           WR MOSE TR: Sec.         x         Y         Function #Duttion #Function #Uter Function           N H         1         24.895 GHz         -45.127 dBm         Function #Uter Function	Mkr→CF
	Mkr→RefLvl		Mkr→RefLv
	More 1 of 2		Mon
3 STATUS		MSG. STATUS	

#### Report No.: AGC00594170602FE04 Page 24 of 45



11nHT20-LCH		11nHT20-MCH
Applient Spectrum, Awayers, Sweet SA         State Sum         ALlow Autros           All (SL)         ALlow Autros         Trail         <	Peak Search	Agener Sperson Anagener Sweet SA     Set ST Frag 4.0000000000 GHZ     First Common Fragment SA     Set Start Frag 4.0000000000 GHZ     First Common Fragment SA     Set Start Fragment SA
Ref Offset2 dB Mkr1 23.620 GHz 10 dEkili Ref 20.00 dBm -46.975 dBm -46.975 dBm	Next Peak	Ref Offset2 dB Mkr1 2.431 GHz Auto Tune 0.991 dBm 0.991 dBm
	Next Pk Right	60 Center Preq 60 55000000 GHz 50000000 GHz
20	Next Pk Left	5.0 Start Freq 1000000 GHz
	Marker Delta	The second secon
Start 10.000 GHz Stop 25.000 GHz #Res BW 100 kHz Sweep 1.434 s (100 pts) was knot #r 50. x y Placton Unit Placton with Placton Vite	Mkr→CF	Start 1.000 GHz         Stop 10.000 GHz         Stop 10.000 GHz         CF Step 90000000 Hz         Stop 10.000 GHz         Stop 00.000 GHz         Main Main           Mer for dot         x         y         Painton         Painton         Painton         Main         Main
2 3 4 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Mkr→RefLvi	N         I         I         Z         2431 GHz         0.491 dBm         Freq Offset           2         3         3         3         3         100 Hz         100 Hz <td< td=""></td<>
9 9 10	More 1 of 2	
e (		4 (

	11nHT2	D-MCH			11nHT2	0-MCH	
Agilent Spectrum Analyzer - Sweet SA	MHz PNO: Fast Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg[Hold:>10/10 TRACE Decided Der Content	Peak Search	Agilent Spectrum Analyzer – Sweet SA	00 GHZ PNO: Fast ↔ Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg[Hold:>10/10 Der Cattern	Peak Search
Ref Offset 2 dB 0 dB/dīv Ref 20.00 dBm		Mkr1 773.99 MHz -57.711 dBm	Next Peak	Ref Offset 2 dB		Mkr1 24.400 GHz -46.902 dBm	Next Peak
00 00		i i i i i i i i i i i i i i i i i i i	Next Pk Right	0.00 -19.0 -28.0		-190) dia	Next Pk Right
90 90 80			Next Pk Left	30 0 48 0 	and the answer a strate for a strategy and a	an a prairie and a second	Next Pk Left
tart 30.0 MHz	an ang kalang sang sang sang sang sang sang sang s	Stop 1.0000 CHz	Marker Delta	380 700 Start 10.000 GHz		Stop 25.000 GHz	Marker Delta
Res BW 100 kHz	#VBW 300 kHz Y Func 773.99 MHz -57,711 dBm	Sweep 92.73 ms (1001 pts)	Mkr→CF	#Res BW 100 kHz	#VBW 300 kHz ** Fill 24,400 GHz -46,902 dBm	Sweep 1.434 s (1001 pts)	Mkr→CF
3		r .	Mkr→RefLvl	3 4 6 6 7			Mkr→RefLvl
			More 1 of 2				More 1 of 2
2		STATUS		MSG.		STATUS	

Peak Search Next Pea

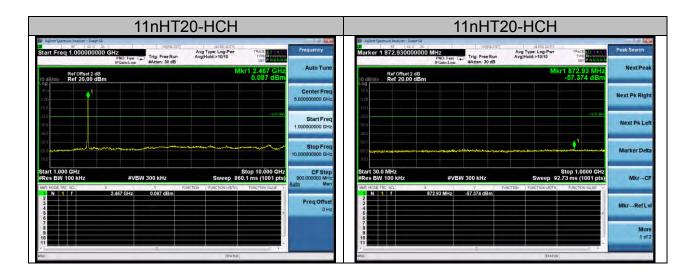
Next Pk Righ

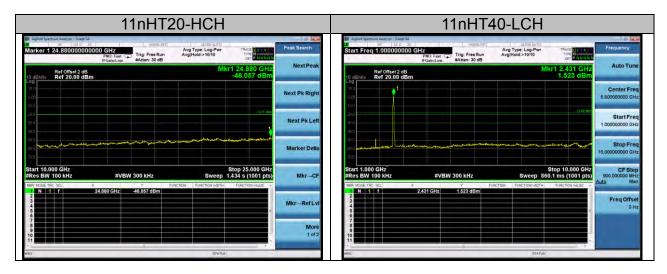
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More 1 of 2





	11nHT4	40-LCH			11nHT4	0-LCH	
Aglient Spectrum Analyzer - Sweet SA	MHz PND: Fast - Trig: Free Run IFGsin:Low #Atten: 30 dB	Avg Type: Log-Pwr Avg[Hold:>10/10 DET P NNMM	Peak Search	Agilent Spectrum Analyzer - Sweet 34           VP         8F         50 0         AC           Marker 1 24.910000000         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40		Avg Type: Log-Pwr Avg Hold:>10/10 Der P.N	
Ref Offset 2 dB		Mkr1 910.76 MHz -57.279 dBm	NextPeak	Ref Offset 2 dB 10 dB/div Ref 20.00 dBn	n	Mkr1 24.910 -47.090 d	
			Next Pk Right	10 R 0.00			
na no			Next Pk Left	30.0			1
80 80 80	alafahan disana ana ing metatakan mengenalang	1	Marker Delta		han a first an a first an an Africa an Africa a first a first an Africa a first an Africa a first an Africa an	ميلاملوسكامين إيلامين المالي مستع <sup>م</sup> ويعملون والمس	
Start 30.0 MHz #Res BW 100 kHz	#VBW 300 kHz	Stop 1.0000 GHz Sweep 92.73 ms (1001 pts)	Mkr→CF	Start 10.000 GHz #Res BW 100 kHz	#VBW 300 kHz	Stop 25.000 Sweep 1.434 s (1001	GHz 1 pts)
MRR MODE TRC SCL X	Υ F 910,76 MHz -57.279 dBm		Mkr→RefLvi	MRR MODE TRC SCL	X Y Fillo 24,910 GHz 47,090 dBm	пок рикспониюти рикспонужи	JE *
			More 1 of 2	7 8 9 10 11			
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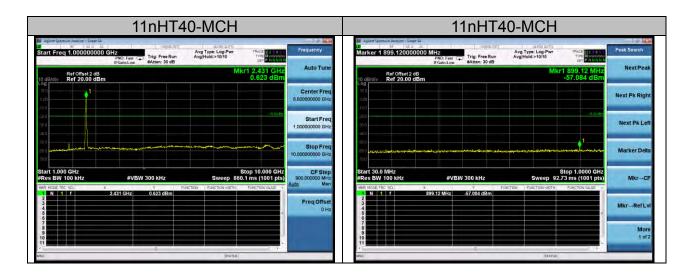
Mkr-RefL

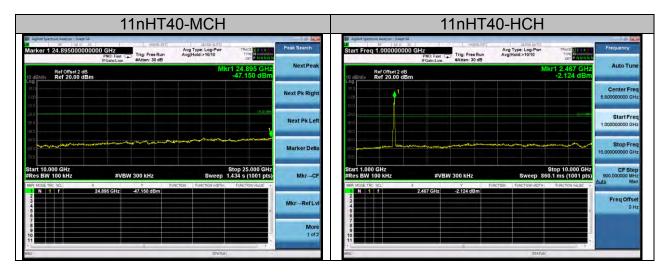
More 1 of 2

Mkr-C

TYPE NWWW

Stop 25.000 GHz 1.434 s (1001 pts)





11nHT40-HCł				-HCH	InHT4	11		
SEQ ACT SENSEJINT ALLOW ALL	M Agilens Spectrum Anayzer- Sweet 00 2F 58 Ω Marker 1 21.5350000	Peak Search		Avg Type: Log-Pwr Avg Hold:>10/10	SENSE.IMT	MHz PNO: Fast 🗭 IFGain:Low	am Analyzer - Sweet SA AF 50 0 AC 907.85000000	
et 2 dB 00 dBm	Ref Offset 2 d 10 dB/div Ref 20.00 d	NextPeak	r1 907.85 MHz -56.917 dBm	MI			Ref Offset 2 dB Ref 20.00 dBm	10 dB/div
	Log 10 0 0.00	Next Pk Right						0.00
	-30.0	Next Pk Left	2004an					30 0
		Marker Delta	11	والمعر ورود والمعر ومعاور والمعالية	r daver and a state of a	والمهرج والمحاور والمراجع		68 0 68 0 68 0
#VBW 300 kHz Swee	Start 10.000 GHz #Res BW 100 kHz	Mkr→CF	Stop 1.0000 GHz .73 ms (1001 pts)	Sweep 9	300 kHz	#VBW		Start 30.0 Res BW
X Y FUNCTION FUNCTION MI 21,535 GHz 46,664 dBm	WAR MODE THE SEL		FUNCTION VALUE *	IN FUNCTION WIDTH	Y FUNC -56.917 dBm	)7.85 MHz		MKR MODE TR
		Mkr→RefLvi						3 4 5 6
	7 8 9 10	More 1 of 2						7 8 9 10
at	K (			stana	я			* ( 192)

#### **10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY**

#### **10.1 MEASUREMENT PROCEDURE**

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set SPA Trace 1 Max hold, then View.

Note: The method of AVGPSD in the KDB 558074 item 10.3 was used in this testing.

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

Refer To Section 8.2.

#### **10.3 MEASUREMENT EQUIPMENT USED**

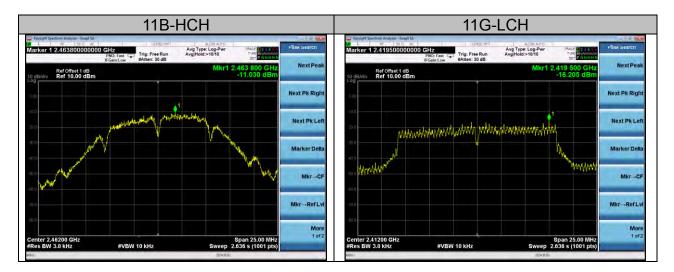
Refer To Section 6.

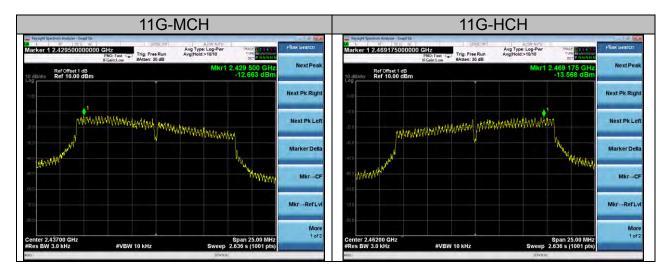
#### **10.4 LIMITS AND MEASUREMENT RESULT**

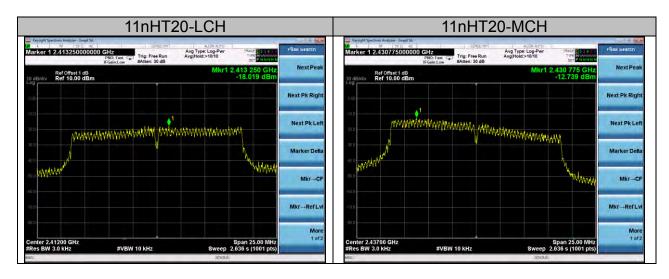
Mode	Channel	PSD [dBm/3kHz]	Limit[dBm/3kHz]	Verdict
	LCH	-12.796	8	PASS
11B	MCH	-10.111	8	PASS
	HCH	-11.030	8	PASS
	LCH	-16.205	8	PASS
11G	MCH	-12.663	8	PASS
	HCH	-13.568	8	PASS
	LCH	-18.019	8	PASS
11nHT20	MCH	-12.739	8	PASS
	HCH	-13.084	8	PASS
	LCH	-13.084	8	PASS
11nHT40	MCH	-12.184	8	PASS
	HCH	-15.075	8	PASS

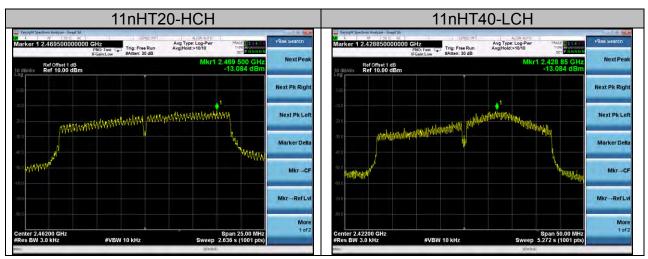
# **Test Graph**

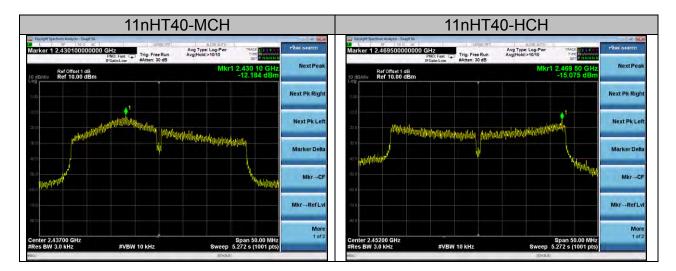












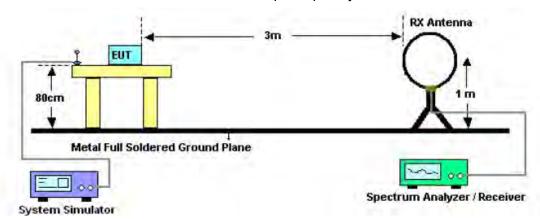
# **11. RADIATED EMISSION**

#### **11.1. MEASUREMENT PROCEDURE**

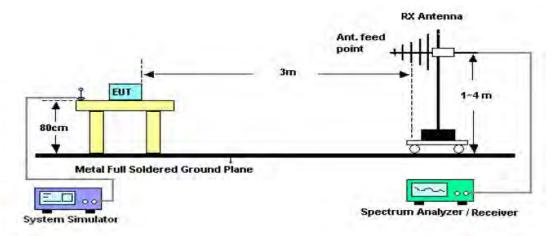
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated 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. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 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.

#### 11.2. TEST SETUP

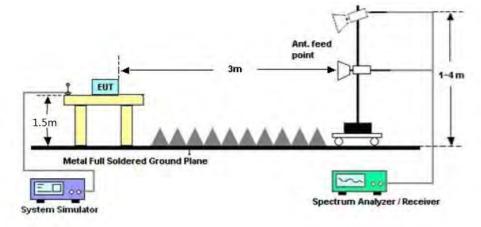
Radiated Emission Test-Setup Frequency Below 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



# RADIATED EMISSION TEST SETUP ABOVE 1000MHz



#### **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.

#### 66.9 dBuV/m Limit: Margin: 6 27 -13 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 MHz Antenna Table Freq. Reading Factor Measurement Limit Over Mk Height Degree No Detector Comment MHz dBuV dB/m dBuV/m dBuV/m dB cm degree 1 49.4000 11.24 11.28 22.52 40.00 -17.48 peak 2 99.5167 17.82 10.00 27.82 43.50 -15.68 peak 3 183.5833 21.64 11.24 32.88 43.50 -10.62 peak

46.00

46.00

46.00

-7.16

-4.84

-14.07

peak

peak

peak

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

RADIATED EMISSION TEST- (30MHZ-1GHZ) -HORIZONTAL

**RESULT: PASS** 

329.0833

539.2500

940.1833

21.49

18.97

2.20

17.35

22.19

29.73

38.84

41.16

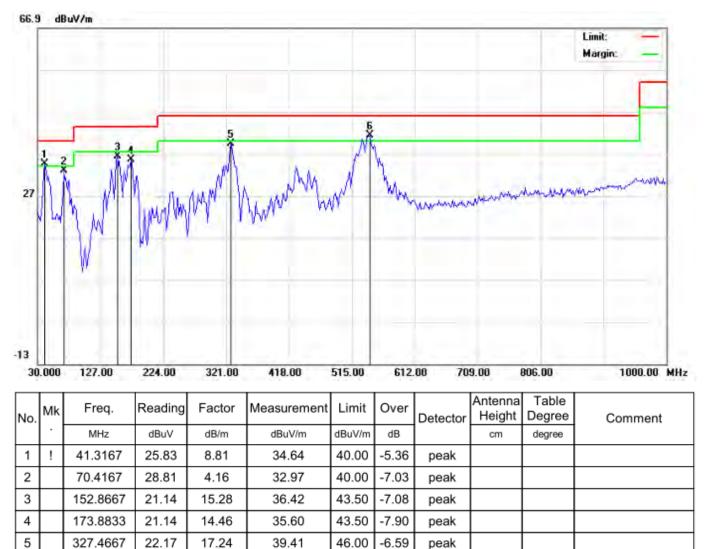
31.93

4

5

6

\*



# RADIATED EMISSION TEST- (30MHZ-1GHZ) -VERTICAL

#### **RESULT: PASS**

542.4833

19.09

6

Note: 1. Factor=Antenna Factor + Cable loss, Margin= Result -Limit.

22.28

2. The "Factor" value can be calculated automatically by software of measurement system.

41.37

3. All test modes had been pre-tested. The 802.11b at low channel is the worst case and recorded in the report.

46.00

-4.63

peak

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

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	
					-		Comment
(MHz)	(MHz) (dBµV) (dB) (dB)		(dBµV/m)	(dBµV/m)	(dB)	Туре	
			TX 11b 2412M	Hz			
4824	41.05	10.44	51.49	74	-22.51	Pk	Horizontal
4824	29.77	10.44	40.21	54	-13.79	AV	Horizontal
7236	41.96	10.39	52.35	74	-21.65	pk	Horizontal
7236	31.12	10.39	41.51	54	-12.49	AV	Horizontal
4824	42.09	10.39	52.48	74	-21.52	Pk	Vertical
4824	29.19	10.39	39.58	54	-14.42	AV	Vertical
7236	41.68	10.68	52.36	74	-21.64	Pk	Vertical
7236	30.11	10.68	40.79	54	-13.21	AV	Vertical
			TX 11b 2437M	Hz			
4874	42.64	10.39	53.03	74	-20.72	Pk	Horizontal
4874	32.70	10.39	43.09	54	-11.97	AV	Horizontal
7311	41.47	12.68	54.15	74	-21.65	Pk	Horizontal
7311	27.55	12.68	40.23	54	-13.54	AV	Horizontal
4874	43.82	10.39	54.21	74	-22.08	Pk	Vertical
4874	30.46	10.39	40.85	54	-11.72	AV	Vertical
7311	39.51	12.68	52.19	74	-20.17	Pk	Vertical
7311	28.75	12.68	41.43	54	-13.36	AV	Vertical
			TX 11b 2462M	Hz			
4924	43.05	10.39	53.44	74	-20.56	pk	Horizontal
4924	29.52	10.39	39.91	54	-14.09	AV	Horizontal
7386	40.47	12.68	53.15	74	-20.85	pk	Horizontal
7386	29.04	12.68	41.72	54	-12.28	AV	Horizontal
4924	42.75	10.39	53.14	74	-20.86	pk	Vertical
4924	31.17	10.39	41.56	54	-12.44	AV	Vertical
7386	39.12	12.68	51.80	74	-22.20	pk	Vertical
7386	30.09	12.68	42.77	54	-11.23	AV	Vertical

# **RESULT: PASS**

Note:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. Emission Level = Meter Reading + Factor

3. Margin = Emission Leve - Limit

4.1GHz-25GHz(All test modes had been pre-tested. The 802.11b mode is the worst case and recorded

in the report. No recording in the test report at least have 20dB margin).

# **12. BAND EDGE EMISSION**

#### **12.1. MEASUREMENT PROCEDURE**

1)Radiated restricted band edge measurements

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting

2)Conducted Emissions at the bang edge

a)The transmitter output was connected to the spectrum analyzer

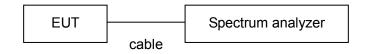
b)Set RBW=100kHz,VBW=300kHz

c)Suitable frequency span including 100kHz bandwidth from band edge

#### 12.2. TEST SET-UP

Radiated same as 11.2

Conducted set up



Frequency	Meter Reading	Factor	Emission Level	Limits	Limits Margin		Comment					
(MHz)	(dBµV)	(dBµV) (dB) (dBµV/m) (dBµV/m) (dB)		(dB)	Туре							
TX 11b 2412MHz												
2399.9	67.68	-13	54.68	74	-19.32	pk	Horizontal					
2399.9	56.53	-13	43.53	54	-10.47	AV	Horizontal					
2400	67.48	-12.99	54.49	74	-19.51	pk	Horizontal					
2400	54.14	-12.99	41.15	54	-12.85	AV	Horizontal					
2399.9	65.51	-12.97	52.54	74	-21.46	pk	Vertical					
2399.9	54.77	-12.97	41.80	54	-12.20	AV	Vertical					
2400	65.41	-12.94	52.47	74	-21.53	pk	Vertical					
2400	55.10	-12.94	42.16 54		-11.84	AV	Vertical					
			TX 11b 2	2462MHz								
2483.5	67.16	-12.78	54.38	74	-19.62	pk	Horizontal					
2483.5	54.20	-12.78	41.42	54	-12.58	AV	Horizontal					
2483.6	66.33	-12.77	53.56	74	-20.44	pk	Horizontal					
2483.6	54.37	-12.77	41.60	54	-12.40	AV	Horizontal					
2483.5	64.95	-12.76	52.19	74	-21.81	pk	Vertical					
2483.5	55.43	-12.76	42.67	54	-11.33	AV	Vertical					
2483.6	64.62	-12.72	51.90	74	-22.10	pk	Vertical					
2483.6	54.44	-12.72	41.72	54	-12.28	AV	Vertical					

#### 12.3. Radiated Test Result

#### **RESULT: PASS**

Note: Scan with 11b,11g,11n, the worst casw is 11b Mode

Factor=Antenna Factor + Cable loss - Amplifier gain,

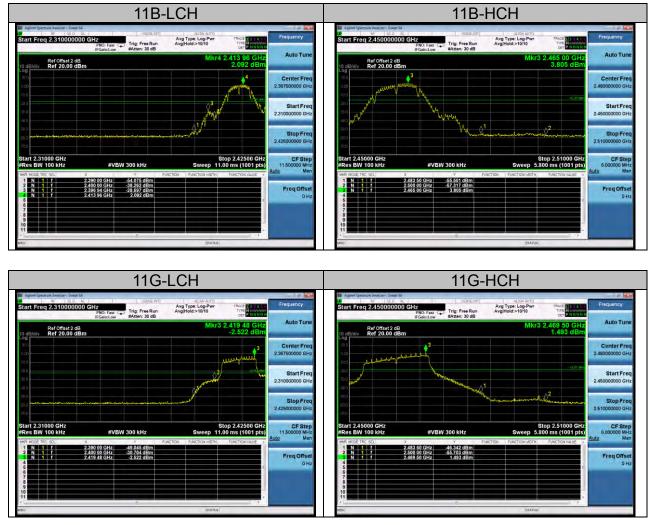
Emission Level = Meter Reading + Factor

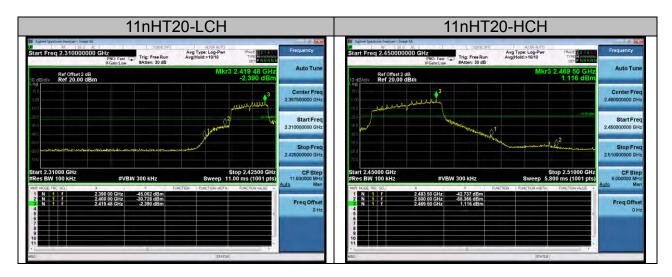
Margin= Emission Level -Limit.

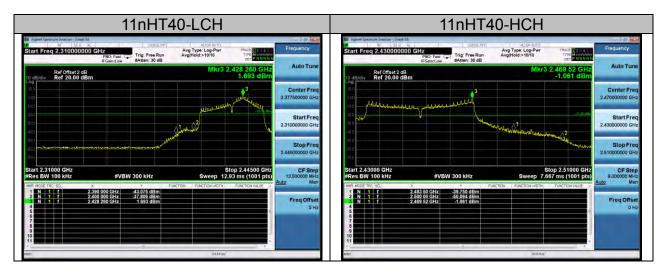
The "Factor" value can be calculated automatically by software of measurement system.

#### 12.4. Conducted Test Result

# **Test Graph**







# **13. FCC LINE CONDUCTED EMISSION TEST**

# **13.1. LIMITS OF LINE CONDUCTED EMISSION TEST**

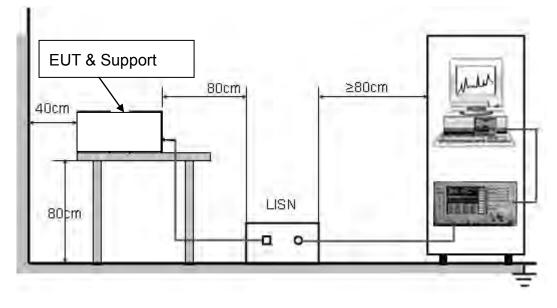
Frequency	Maximum RF Line Voltage						
Frequency	Q.P.( dBuV)	Average( dBuV)					
150kHz~500kHz	66-56	56-46					
500kHz~5MHz	56	46					
5MHz~30MHz	60	50					

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



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

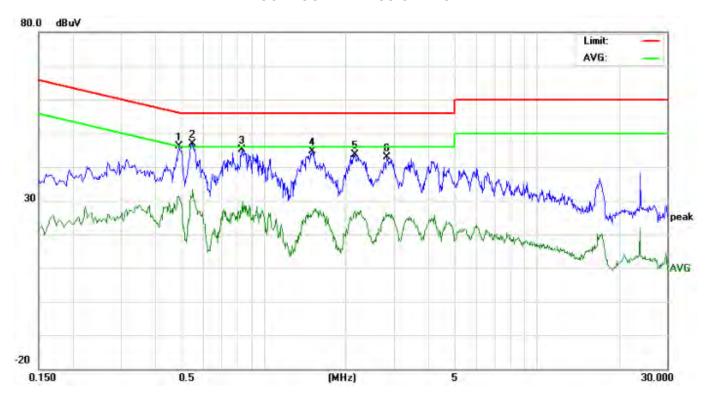
- The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground 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 C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipments received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received 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

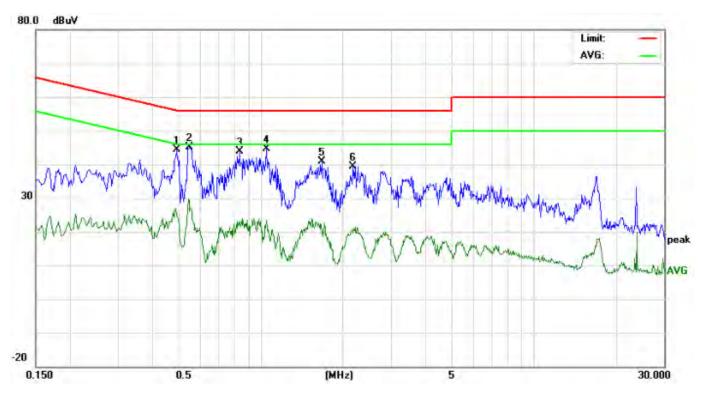
- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used 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.

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



#### LINE CONDUCTED EMISSION TEST LINE 1-L

No.	No. Freq.				0		Limit (dBuV)		Margin (dB)		P/F	Comment		
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4900	35.63		21.03	10.39	46.02		31.42	56.17	46.17	-10.15	-14.75	Р	
2	0.5500	36.63		22.97	10.35	46.98		33.32	56.00	46.00	-9.02	-12.68	Р	
3	0.8340	34.88		16.95	10.32	45.20		27.27	56.00	46.00	-10.80	-18.73	Р	
4	1.5060	34.17		15.80	10.38	44.55		26.18	56.00	46.00	-11.45	-19.82	Р	
5	2.1660	33.25		16.61	10.29	43.54		26.90	56.00	46.00	-12.46	-19.10	Р	
6	2.8300	32.43		14.79	10.51	42.94		25.30	56.00	46.00	-13.06	-20.70	Р	



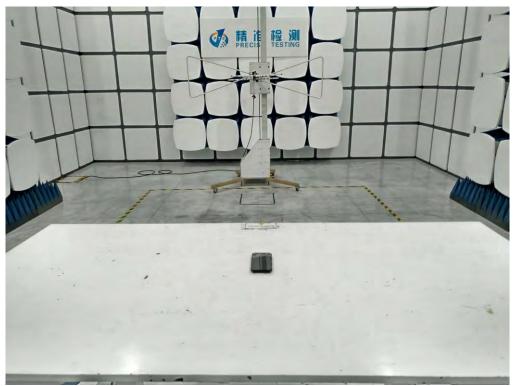
### Line Conducted Emission Test Line 2-N

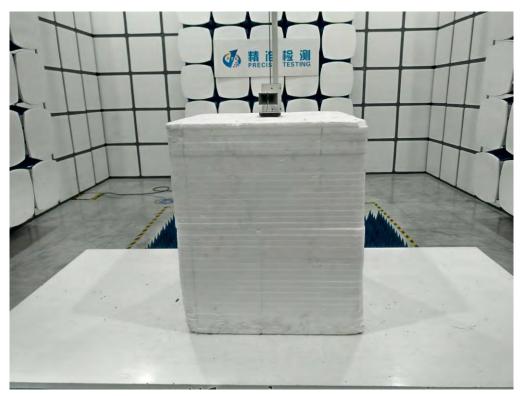
No.	Freq.	Rea	iding_L (dBuV)		Correct Factor	1	easurer (dBuV)			nit uV)		rgin IB)	P/F	Comment
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4940	33.93		14.25	10.40	44.33		24.65	56.10	46.10	-11.77	-21.45	Р	
2	0.5500	34.89		15.88	10.35	45.24		26.23	56.00	46.00	-10.76	-19.77	Р	
3	0.8380	33.62		12.74	10.33	43.95		23.07	56.00	46.00	-12.05	-22.93	Р	
4	1.0540	34.16		13.11	10.37	44.53		23.48	56.00	46.00	-11.47	-22.52	Р	
5	1.6780	30.44		9.79	10.32	40.76		20.11	56.00	46.00	-15.24	-25.89	Р	
6	2.1860	29.20		9.36	10.30	39.50		19.66	56.00	46.00	-16.50	-26.34	Р	

# APPENDIX A: PHOTOGRAPHS OF TEST SETUP LINE CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP





# ----END OF REPORT----