# FCC Test Report

Report No.: AGC00742200401FE06

FCC ID	:	2ALP3X2
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Smart phone
BRAND NAME	:	kodak
MODEL NAME	:	X2
APPLICANT	:	Industria Fuegina de Relojeria Electronica S.A.
DATE OF ISSUE	:	Jun. 18, 2020
STANDARD(S) TEST PROCEDURE(S)	:	FCC Part 15.407 KDB 789033 D02 v02r01
<b>REPORT VERSION</b>	:	V1.0

## Attestation of Global Compliance (Shenzhen) Co., Ltd

## CAUTION:

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.



#### **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 18, 2020	Valid	Initial Release

## 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. RELATED SUBMITTAL(S) / GRANT (S)	7
2.4. TEST METHODOLOGY	7
2.5. SPECIAL ACCESSORIES	
2.6. EQUIPMENT MODIFICATIONS	7
3. MEASUREMENT UNCERTAINTY	
4. DESCRIPTION OF TEST MODES	9
5. SYSTEM TEST CONFIGURATION	
5.1. CONFIGURATION OF EUT SYSTEM	
5.2. EQUIPMENT USED IN EUT SYSTEM	
5.3. SUMMARY OF TEST RESULTS	
6. TEST FACILITY	11
7. MAXIMUM CONDUCTED OUTPUT POWER	
7.1. MEASUREMENT PROCEDURE	
7.2. TEST SET-UP	
7.3. LIMITS AND MEASUREMENT RESULT	
8. EMISSION BANDWIDTH	15
8.1. MEASUREMENT PROCEDURE	
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
8.3. LIMITS AND MEASUREMENT RESULTS	
9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY	
9.1 MEASUREMENT PROCEDURE	24
9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
9.3 MEASUREMENT EQUIPMENT USED	
9.4 LIMITS AND MEASUREMENT RESULT	
10. CONDUCTED SPURIOUS EMISSION	
10.1. MEASUREMENT PROCEDURE	

#### Report No.: AGC00742200401FE06 Page 4 of 67

10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	33
10.3. MEASUREMENT EQUIPMENT USED	33
10.4. LIMITS AND MEASUREMENT RESULT	33
11. RADIATED EMISSION	4
11.1. MEASUREMENT PROCEDURE	
11.2. TEST SETUP	5
11.3. LIMITS AND MEASUREMENT RESULT 4	6
11.4. TEST RESULT	6
12. BAND EDGE EMISSION	51
12.1. MEASUREMENT PROCEDURE	51
12.2. TEST SET-UP	51
12.3. TEST RESULT	52
13. FREQUENCY STABILITY	68
13.1. MEASUREMENT PROCEDURE	58
13.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)5	58
13.3. MEASUREMENT RESULTS	59
14. FCC LINE CONDUCTED EMISSION TEST6	62
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST6	52
14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST6	52
14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	63
14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST6	3
14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST6	64
APPENDIX A: PHOTOGRAPHS OF TEST SETUP6	6

1. VERIFICATION OF C	
Applicant	INDUSTRIA FUEGUINA DE RELOJERIA ELECTRONICA SA
Address	SARMIENTO 2920,9420, RIO GRANDE, Argentina
Manufacturer	Luzhou Maisui Smart Technology Co., Ltd.
Address	No.19, Section 5, Jiugu Avenue, Luzhou high-tech Zone, Sichuan Province,China
Factory 1	Industria Fuegina de Relojeria Electronica S.A.
Address	Sarmiento 2920, CP 9420), Rio Grande, Tierra del Fuego, Argentina
Product Designation	Smart phone
Brand Name	kodak
Test Model	X2
Date of test	May 22, 2020~Jun. 18, 2020
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

## **1. VERIFICATION OF CONFORMITY**

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 C63.10 (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.

Prepared By	Calin Lin	
	Calvin Liu (Project Engineer)	Jun. 18, 2020
Reviewed By	Max 2hang	
-	Max Zhang (Reviewer)	Jun. 18, 2020
Approved By	Forvest le	
-	Forrest Lei Authorized Officer	Jun. 18, 2020

## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

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

· · · · · · · · · · · · · · · · · · ·		
Operation Frequency	5150 MHz~5250MHz	
Output Power	IEEE 802.11a20:10.26dBm IEEE 802.11n(20):10.09dBm; IEEE802.11n(40):9.78dBm IEEE802.11ac(20):9.28dBm IEEE802.11ac(40):9.23dBm EEE802.11ac(80):8.79dBm	
Modulation	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM	
Number of channels	7	
Hardware Version	V1.0	
Software Version	TE9572_KODAK_62_Q0_V0.1.6.1_S200507	
Antenna Gain	0.70dBi	
Power Supply	DC 3.8V by Built-in Li-ion Battery	

A major technical description of EUT is described as following

## 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	36	5180 MHz
	38	5190 MHz
5150 GHz~5250GHz	40	5200 MHz
	42	5210 MHz
	44	5220 MHz
	46	5230 MHz
	48	5240 MHz

Note: For 20MHZ bandwidth system use Channel 36,40,44,48; For 40MHZ bandwidth system use Channel 38,46; For 80MHZ bandwidth system use Channel 42

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

This submittal(s) (test report) is intended for FCC ID: 2ALP3X2 filing to comply with the FCC Part 15

requirements.

#### 2.4. 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 15.407 rules KDB 789033 D02

#### **2.5. SPECIAL ACCESSORIES**

Refer to section 5.2.

#### 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

## **3. MEASUREMENT UNCERTAINTY**

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission,  $Uc = \pm 3.1 \text{ dB}$
- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±5.4 dB

## 4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	36,40,44,48	36,38,48	OFDM	6/6.5
802.11n40/ac40	38,46	38,46	OFDM	13.5
802.11ac80	42	42	OFDM	13.5

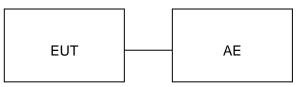
#### Note:

- 1. The EUT has been set to operate continuously on tested channel 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. The test software is the RtkTestAPP-v2.0.0\_20170425 which can set the EUT into the individual test modes.

## **5. SYSTEM TEST CONFIGURATION**

## 5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



## 5.2. EQUIPMENT USED IN EUT SYSTEM

ltem	Equipment	Model No.	ID or Specification	Remark
1	Smart phone	X2	2ALP3X2	EUT
2	Adapter	FJ-SW266B50502000A	Input: AC 100-240V, 50/60Hz, 0.4A Output: DC 5V, 2000mA	AE
3	Battery	L63464	DC3.8V 3900mAh	AE
4	USB Cable	N/A	N/A	AE
5	Earphone	N/A	N/A	AE

## 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

## 6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

## TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2022
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

## TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec. 11, 2020
Power sensor	Aglient	U2021XA	MY54110007	Sep. 09, 2019	Sep. 08, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
preamplifier	ChengYi	EMC184045SE	980508	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	A.H.	SAS-562B	XGIMI	Jun. 14, 2018	Jun. 13, 2020
Active loop antenna (9K-30MHz)	A.H.	SAS-562B	XGIMI	Jun. 12, 2020	Jun. 11, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Oct. 15, 2019	Oct. 16, 2020
ANTENNA	SCHWARZBECK	VULB9168	D69250	Jan. 09, 2019	Jan. 08, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

## 7. MAXIMUM CONDUCTED OUTPUT POWER

## 7.1. MEASUREMENT PROCEDURE

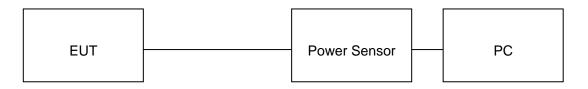
For average power test:

- 1. Connect EUT RF output port to power sensor through an RF attenuator.
- 2. Connect the power sensor 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 789033 for compliance to FCC 47CFR 15.407 requirements.

## 7.2. TEST SET-UP

## AVERAGE POWER SETUP



LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
5180	9.95	30	Pass		
5200	10.26	30	Pass		
5240	9.72	30	Pass		

## 7.3. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
5180	10.09	30	Pass		
5200	10.09	30	Pass		
5240	9.77	30	Pass		

LIMITS AND MEASUREMENT RESULT FOR 802.11AC20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
5180	9.75	30	Pass		
5200	9.78	30	Pass		
5240	8.87	30	Pass		

LIMITS AND MEASUREMENT RESULT FOR 802.11N40 MODULATION				
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
5190	9.28	30	Pass	
5230	8.99	30	Pass	

LIMITS AND MEASUREMENT RESULT FOR 802.11 AC40 MODULATION				
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
5190	9.23	30	Pass	
5230	9.03	30	Pass	

LIMITS AND MEASUREMENT RESULT FOR 802.11 AC80 MODULATION				
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
5210	8.79	30	Pass	

## 8. EMISSION BANDWIDTH

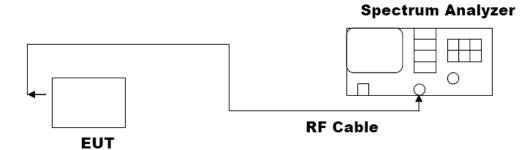
## 8.1. MEASUREMENT PROCEDURE

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

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



## 8.3. LIMITS AND MEASUREMENT RESULTS

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION					
	Applicable Limits				
Applicable Limits	Test Da	Criteria			
Within the Band	5180MHz	19.45	PASS		
	5200MHz	19.84	PASS		
	5240MHz	19.64	PASS		

LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION					
Annlinghla Limita		Applicable Limits			
Applicable Limits	Test Dat	Criteria			
	5180MHz	20.03	PASS		
	5200MHz	20.01	PASS		
Within the Band	5240MHz	20.14	PASS		
	5190MHz	40.17	PASS		
	5230MHz	40.14	PASS		

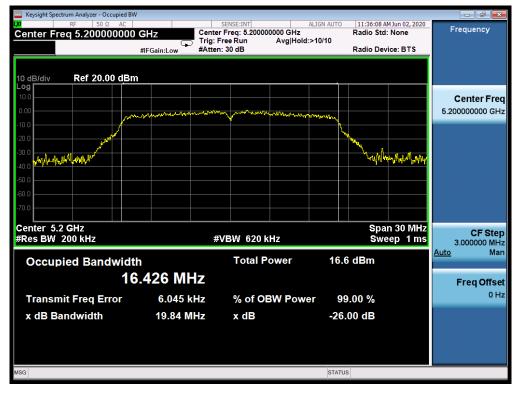
LIMITS AND MEASUREMENT RESULT FOR 802.11AC80 MODULATION					
Applicable Limits		Applicable Limits			
	Test Da	ita (MHz)	Criteria		
	5180MHz	20.08	PASS		
	5200MHz	19.77	PASS		
Within the Band	5240MHz	20.01	PASS		
within the Band	5190MHz	39.77	PASS		
	5230MHz	39.99	PASS		
	5210MHz	80.22	PASS		



#### 802.11a20 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5180MHz

#### TEST PLOT OF BANDWIDTH FOR 5200MHz

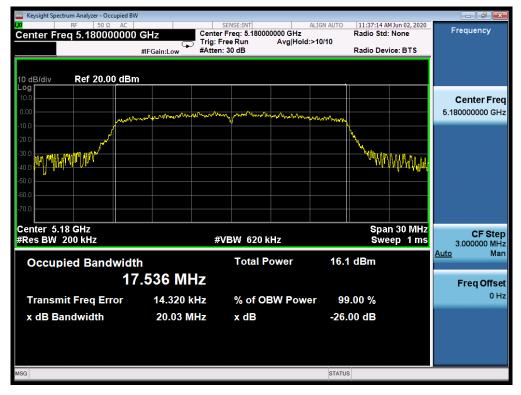




## TEST PLOT OF BANDWIDTH FOR 5240MHz

## 802.11n20 TEST RESULT

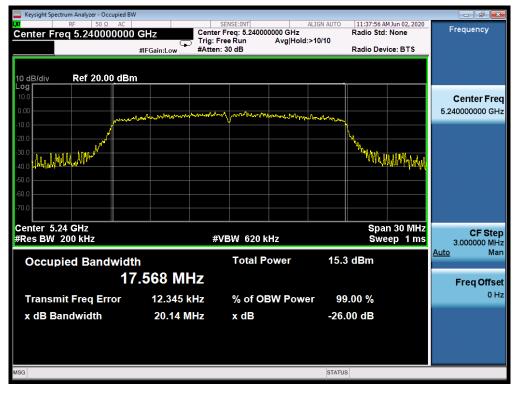
#### TEST PLOT OF BANDWIDTH FOR 5180MHz





## TEST PLOT OF BANDWIDTH FOR 5200MHz

#### TEST PLOT OF BANDWIDTH FOR 5240MHz

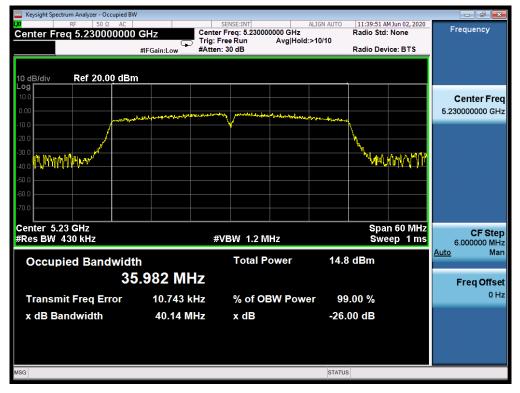




#### 802.11n40 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5190MHz

#### TEST PLOT OF BANDWIDTH FOR 5230MHz





#### 802.11ac20 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5180MHz

#### TEST PLOT OF BANDWIDTH FOR 5200MHz





#### TEST PLOT OF BANDWIDTH FOR 5240MHz

## 802.11ac40 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5190MHz





## TEST PLOT OF BANDWIDTH FOR 5230MHz

## 802.11ac80 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5210MHz



## 9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY

## 9.1 MEASUREMENT PROCEDURE

Refer to KDB 789033 section F

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

Refer To Section 8.2.

## 9.3 MEASUREMENT EQUIPMENT USED

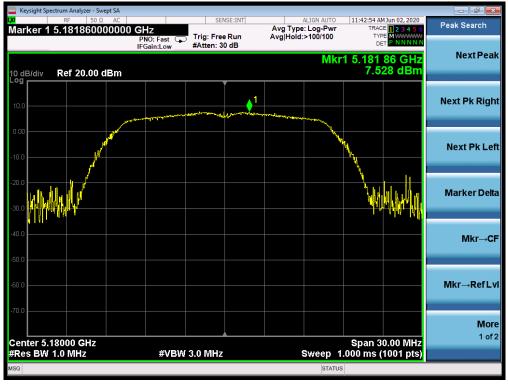
Refer To Section 6.

#### 9.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION					
Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail		
5180	7.528	17	Pass		
5200	7.642	17	Pass		
5240	7.208	17	Pass		

LIMIT	IITS AND MEASUREMENT RESULT FOR 802.11 N20/40 MODULATION					
Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail			
5180	6.989	17	Pass			
5200	6.993	17	Pass			
5240	7.108	17	Pass			
5190	4.427	17	Pass			
5230	4.301	17	Pass			

	LIMITS AND MEASUREMENT RESULT FOR 802.11AC20/40/80 MODULATION						
Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail				
5180	6.788	17	Pass				
5200	6.849	17	Pass				
5240	6.658	17	Pass				
5190	4.166	17	Pass				
5230	4.177	17	Pass				
5210	1.613	17	Pass				



## 802.11a20 TEST RESULT TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz





TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz

802.11n20 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz





## TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz

TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz





## 802.11n40 TEST RESULT TEST PLOT OF SPECTRAL DENSITY FOR 5190MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5230MHz





#### 802.11ac20 TEST RESULT

#### TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz





## TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz

#### 802.11ac40 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5190MHz





TEST PLOT OF SPECTRAL DENSITY FOR 5230MHz

## 802.11ac80 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5210MHz



## **10. CONDUCTED SPURIOUS EMISSION**

#### **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 EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

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

The same as described in section 8.2.

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

The same as described in section 6.

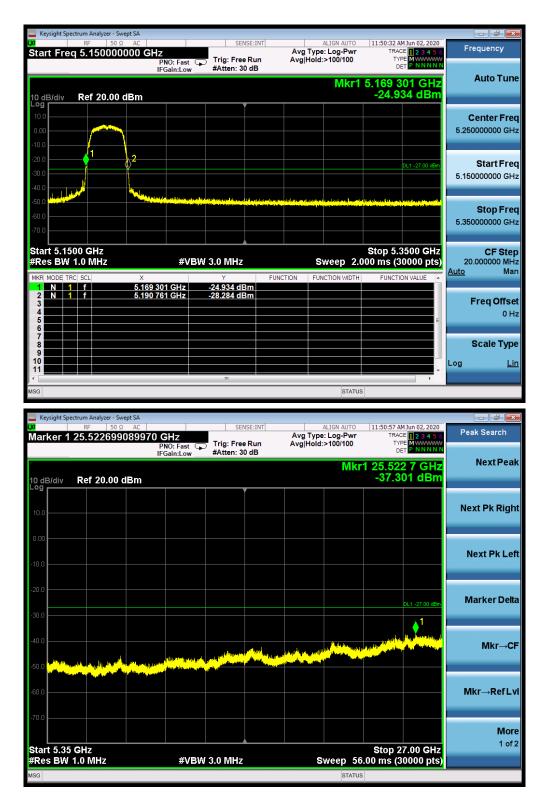
#### **10.4. LIMITS AND MEASUREMENT RESULT**

LIMITS AND MEASUREMENT RESULT		
Angliaghta Limite	Measurement Result Test channel Criteria	
Applicable Limits		
-27dBm/MHz	5150MHz-5250MHz	PASS

#### Keysight Spectrum Analyzer - Swept SA 11:47:56 AM Jun 02, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWW DET PNNNN Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 839.233307777 MHz PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB Next Peak Mkr1 839.23 MHz -59.076 dBm 10 dB/div Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF **♦**<sup>1</sup> Mkr→RefLvl day bara الد بالطلاب عل والمتعالم والنعا فالمرادة أرروه وال More 1 of 2 Start 0.0300 GHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 94.00 ms (30000 pts) #VBW 300 kHz Keysight Sp ALIGN AUTO 11:48:25 AM Jun 02, 2020 e: Log-Pwr TRACE 1 2 3 4 5 6 1:>100/100 TYPE M WWWWW DET P NNNN Avg Type: Log-Pwr Avg|Hold:>100/100 Peak Search Marker 1 5.150000000000 GHz PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB **Next Peak** Mkr1 5.150 00 GHz -33.790 dBm Ref 20.00 dBm 10 dB/div Log Next Pk Right Next Pk Left Marker Delta Mkr→CF ամ մահ։ Mkr→RefLvl More 1 of 2 Start 1.000 GHz #Res BW 1.0 MHz Stop 5.150 GHz Sweep 8.000 ms (30000 pts) #VBW 3.0 MHz G STATUS

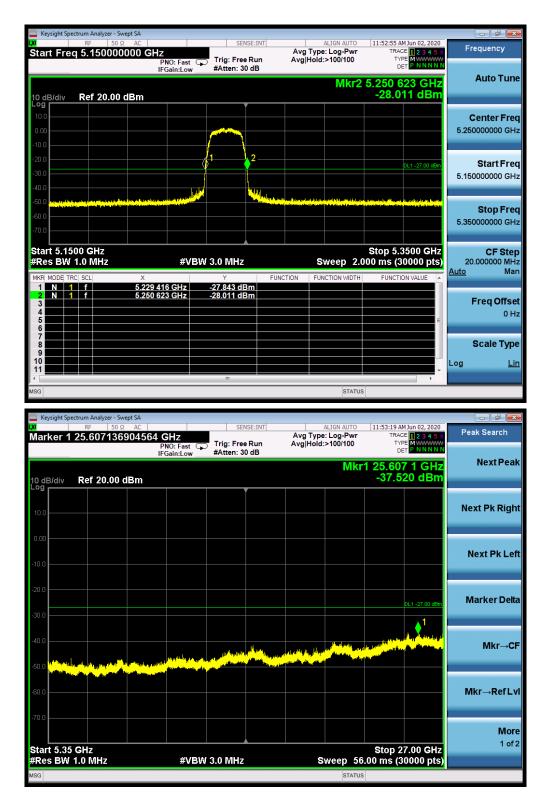
#### FOR 802.11A20 MODULATION

#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5180MHz



-60.0	D0 GHz 1.0 MHz	produktion to the second	<sub>Line o</sub> transference de la substituí de la sec	1.0 MHz			weep 8.0	Stop 5	.150 GHz	Next Pk Righ Next Pk Le Marker Del Mkr→C Mkr→Ref L Mor 1 of
10.0 0.00 20.0 20.0 40.0	rynn haf fer yn yn de fan de Antonie fan de feren fan de fer		and the fillence of the fillen	e i leg un geografi de tri						Next Pk Le Marker Del Mkr→C Mkr→Ref L Mor
10.0 0.00 10.0 20.0 -30.0 -40.0 -50.0 -41.1 -50.0 -41.1 -50.0				e day tanggaya ji da						Next Pk Le Marker Del Mkr→C Mkr→RefL
10.0 0.00 10.0 20.0 30.0 				e day yang berga ji dari						Next Pk Le Marker Del Mkr→C
10.0 0.00 10.0 20.0 30.0 				ester rengering Bette			Antika katika			Next Pk Le Marker Del Mkr→C
10.0 0.00 			entities and the second	< they we get up ( 1 Min						Next Pk Le
10.0 0.00 .10.0 .20.0 .30.0									<u>DL1 -27 00 dēm</u>	Next Pk Le
10.0 0.00									DL1 -27 00 dBn	Next Pk Le
10.0 0.00									011-27.00 dBm	Next Pk Le
10.0										Next Pk Le
0.00										
0.00										
10.0										Next Pk Rigl
										Next Pk Rig
										Next Bir Bir
_od					V					
10 dB/div	Ref 20.00 dE	m						-45.9	91 dBm	
		IFG	Gain:Low	#Atten. 3			Mkr		72 GHz	Next Pea
harker 1	5.123715790	PN	NO: Fast 🖕	Trig: Free #Atten: 3		Avg Type Avg Hold	: Log-Pwr :>100/100	TYF	E 1 2 3 4 5 6 E M WWWW T P N N N N N	
u i i i	RF 50 Ω	AC		SEI	NSE:INT		ALIGN AUTO	11:52:04 A	M Jun 02, 2020	Peak Search
Vaurishe	ectrum Analyzer - Swept	SV.								
ISG							STATUS			
Start 0.03	300 GHz 100 kHz		#VBW	300 kHz		-	weep 94	Stop 1.0	0000 GHz	101
										Moi 1 of
70.0										
60.0			l ben detroited pr		Washings Nation	in den het konstel sterke Name an der sterke	in (Mained Selection Anglishes at a factor			Mkr→RefL
~~~~										Mkr. Dofl
-50.0										
-40.0										Mkr→C
-30.0									DL1 -27.00 dBm	
-20.0										Marker Del
-10.0										Next Pk Le
0.00										
10.0										J
										Next Pk Rig
	Ref 20.00 dE	lm			•			-59.3	55 dBm	
10 dB/div _og							M	kr1 740.	23 MHz	Next Pea
0 dB/div			Sain:Low	Trig: Free #Atten: 3		Avg Hold		TYF DE	E 1 2 3 4 5 6 E M P NNNNN	
0 dB/div	740.2253408	PN	NO: Fast 🔾 🖵			Avd Type	ALIGN AUTO	11:51:24 A	E 1 2 3 4 5 6	Peak Search

## TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5240MHz

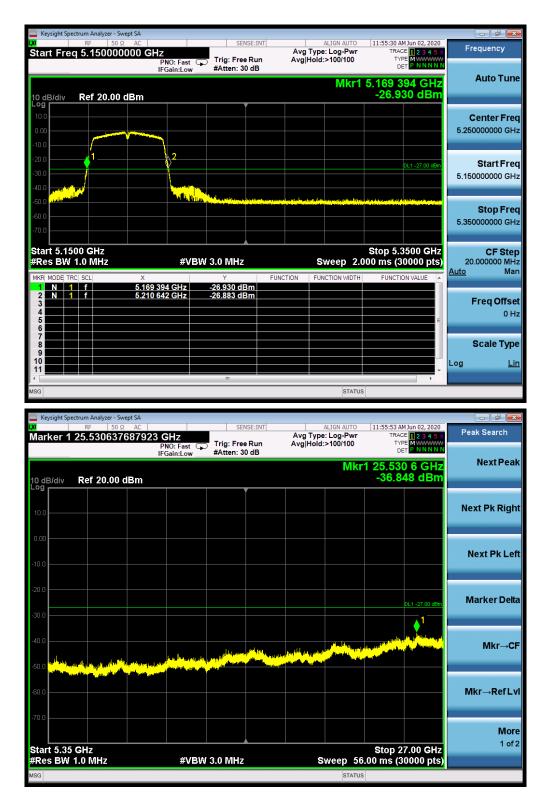


# Keysight Spectrum Analyzer - Swept SA - Jan Marker 1 920.845361512 MHz PNO: Fast IFGain:Low HAtten: 30 dB ALIGN AUTO 11:53:55 AM Jun 02, 2020 Avg Type: Log-Pwr TRACE 2 3 4 5 6 AvgjHold:>100/100 TYPE M Peak Search Next Peak Mkr1 920.85 MHz -59.705 dBm 10 dB/div Log Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF ▲1 Mkr→RefLvl وتعادياته والمتعادي والمتعادين More 1 of 2 Start 0.0300 GHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 94.00 ms (30000 pts) #VBW 300 kHz STATUS

### FOR 802.11N40 MODULATION

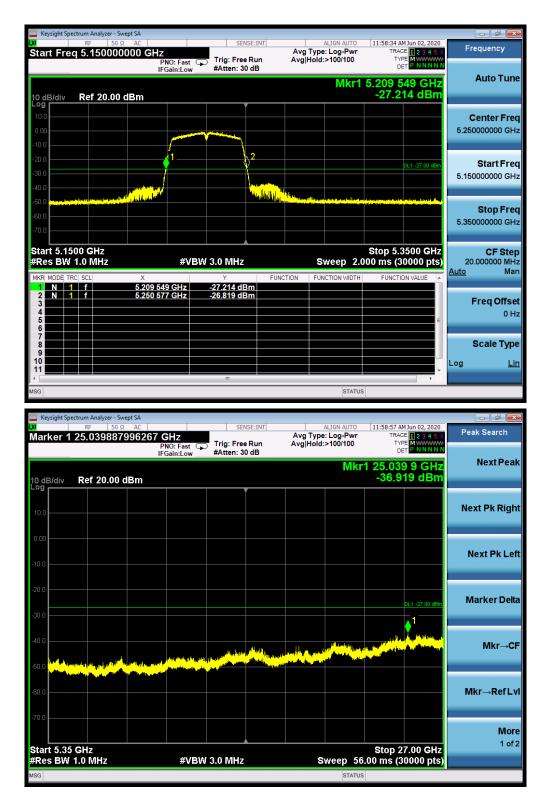
#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5190MHz

Keysight Spectrum Analyzer - Swept SA				
Marker 1 5.12675922530		AVG Type:	LIGN AUTO 11:54:28 AM Jun Log-Pwr TRACE	2 3 4 5 6 Peak Search
	PNO: Fast IFGain:Low #Atten: 30	Run Avg Hold:>	•100/100 TYPE M DET P	WWWWW N N N N N
10 dB/div Ref 20.00 dBm			Mkr1 5.126 76 -44.821	GHZ
10.0				Next Pk Right
-10.0				Next Pk Left
-20.0			DL1	-27.00 dBm Marker Delta
-40.0				1\ Mkr→CF
-50.0 Weine Links for any empiric provident of -60.0	(party of the stand back of a statistic distance of the statistic dist	i a di fan di kali da ang manga <sup>h</sup> ada bingga ta sa an Andréa da kita sayan na da kita di kanga kang	n f general (na 1975) en sen fan sjen fan sjen fan ster fan ster fan ster fan ster fan ster fan ster fan ster Ny sjen weken fan ster	Mnordfi nak-add Mkr→RefLvi
-70.0				More 1 of 2
Start 1.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sv	Stop 5.15 veep 8.000 ms (300	0 GHz 00 pts)
MSG			STATUS	



-60.0	Ref 20.00 dBm		00 P. 10 45 1 P. 10 00 P. 10 P. 10 00 P. 10 P. 10 00 P. 10 P. 10 00 P. 10 P. 10 00 P. 10				-42.7	92 GHz 88 dBm	Next Pea Next Pk Righ Next Pk Le Marker Deh Mkr→C Mkr→Ref L Moi 1 of
-00								92 GHz 88 dBm	Next Pk Righ Next Pk Le Marker Deh Mkr→C Mkr→Ref L
-00							-42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le Marker Del Mkr→C Mkr→Ref L
-09							-42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le Marker Del Mkr→C
-09							-42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le Marker Del Mkr→C
- • 9							-42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le Marker Del
-og 10.0 10.0 10.0 20.0 30.0	Ref 20.00 dBm						1 5.147 -42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le Marker Del
- <b>og</b> 10.0 0.00 	Ref 20.00 dBn						1 5.147 -42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le
10.0	Ref 20.00 dBm						1 5.147 -42.7	92 GHz 88 dBm	Next Pk Rigi Next Pk Le
- <b>og</b> 10.0 0.00 10.0	Ref 20.00 dBm	1					1 5.147 -42.7	92 GHz	Next Pk Rigi Next Pk Le
- <b>og</b> 10.0 0.00	Ref 20.00 dBn	n					1 5.147 -42.7	92 GHz	Next Pk Rigi
- <b>og</b> 10.0 0.00	Ref 20.00 dBm	1 					1 5.147 -42.7	92 GHz	Next Pk Rigi
- <b>og</b> 10.0	Ref 20.00 dBm	1					1 5.147 -42.7	92 GHz	_
-°g	Ref 20.00 dBn	1					1 5.147 -42.78	92 GHz	
	Ref 20.00 dBn	1					1 5.147 -42.73	92 GHz	_
	Ref 20.00 dBn	າ				IVINI	1 5.147 -42.7	92 GHz	Next Pea
							1 5 147		NextPea
		IFGain:Low	#Atten: 3	30 dB		Mice	DE	IN IN IN IN IN	
larker 1	5.1479249308	31 GHz PNO: Fast	Trig: Fre	e Run		: Log-Pwr	TRAC TYP	E 1 2 3 4 5 6 E M WWWW T P N N N N N	Peak Search
Keysight Sp	ectrum Analyzer - Swept SA RF 50 Ω AC		SE	NSE:INT		ALIGN AUTO	11:57:32 AM	4 Jun 02, 2020	
						500			
Res BW	100 kHz	#VB	W 300 kHz		S	weep 94 STATUS		0000 pts)	
Start 0.03				<u> </u>			Stop 1.0	0000 GHz	1 of
									Мо
70.0	a and a start of the second	internation of the state of the	Sinche Libererg al, Jili, Jea Jahrimer	n'n offersen gielen oor	a na ang ang ang ang ang ang ang ang ang	an Malagal A	nthy for the provident of bits	and the second as	
60.0 <mark>/////////</mark> //	un an the shirt of the state of the state of the state of the	Aller marks of the Marks and	ator passion (pass) of s	<sup>Mell</sup> andary Paul <mark>M</mark> e	gan ta batha an			an in the second second	Mkr→RefL
33.0								1	
-50.0									
-40.0									Mkr→C
30.0									
								DL1 -27.00 dBm	Marker Del
20.0									
10.0									HOATT NEC
0.00									Next Pk Le
10.0									Next Pk Rig
	Ref 20.00 dBm			Y					
10 dB/div - <sup>og</sup> <b>[</b>	-					MI	(r1 892.	10 MHz 15 dBm	NextPea
0 dB/div			#Atten: 3		Avg Hold	:>100/100	TYF		
0 dB/div	892.10007000	PNO: Fast IFGain:Low	Trig: Fre			: Log-Pwr	TRAC	E 1 2 3 4 5 6 E MWWWW	Peak Search

# TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5230MHz

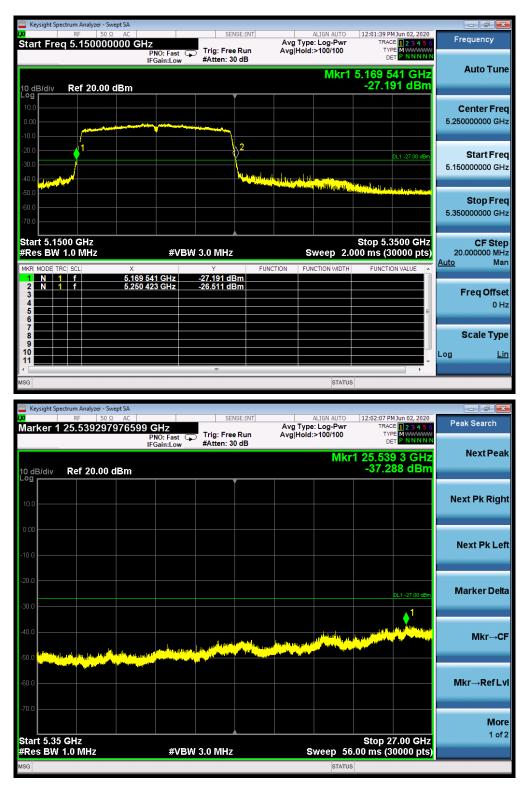


# Keysight Spectrum Analyzer - Swept SA - F Marker 1 838.101603387 MHz PNO: Fast IFGain:Low HAtten: 30 dB ALIGN AUTO 11:59:29 AM Jun 02, 2020 Avg Type: Log-Pwr TRACE 2 3 4 5 6 AvgjHold:>100/100 TYPE M DET Peak Search Next Peak Mkr1 838.10 MHz -59.908 dBm 10 dB/div Log Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF 2 Mkr→RefLvl More 1 of 2 Start 0.0300 GHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 94.00 ms (30000 pts) #VBW 300 kHz STATUS

# FOR 802.11AC80 MODULATION

#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5210MHz

Keysight Spectrum Analyzer - Swept SA					
Marker 1 5.14778659288				6 PM Jun 02, 2020 RACE 1 2 3 4 5 6	Peak Search
	PNO: Fast Trig: Free IFGain:Low #Atten: 3		:>100/100		NextBack
10 dB/div Ref 20.00 dBm			Mkr1 5.14 -43	7 79 GHz .938 dBm	Next Peak
10.0					Next Pk Right
-10.0					Next Pk Left
-20.0				DL1 -27.00 dBm	Marker Delta
-30.0					Mkr→CF
	n bereinen gehen er stellen bereinen die bestellte bereinigt im die bestellte bestellte bestellte bestellte bes Gehen im gehen er stellte bestellte bestellte bestellte bestellte bestellte bestellte bestellte bestellte beste Gehen im gehen er stellte bestellte bestellte bestellte bestellte bestellte bestellte bestellte bestellte beste	a tali daha dina kata papanan Matai daha panangana kata manganyan	a spala provinsi ka se politi ka minani ka ka ka Mina ka se politi ka se di ka ka ma paka ka se ba se se		Mkr→RefLvi
-70.0					More
Start 1.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	s	Stop weep 8.000 ms	5.150 GHz (30000 pts)	1 of 2
MSG			STATUS		



Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report. All the 80MHz bandwidth modulation had been tested, the 802.11ac80 was the worst case and record in his test report.

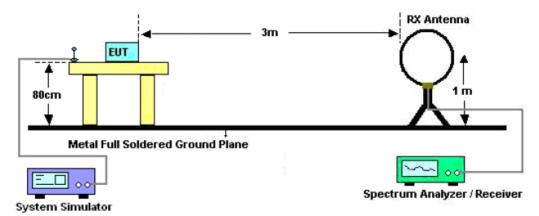
# **11. RADIATED EMISSION**

# **11.1. MEASUREMENT PROCEDURE**

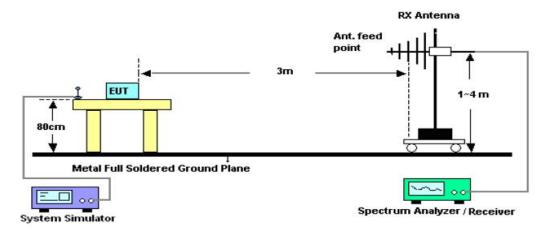
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated 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 RBW and 3M VBW for peak reading. 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

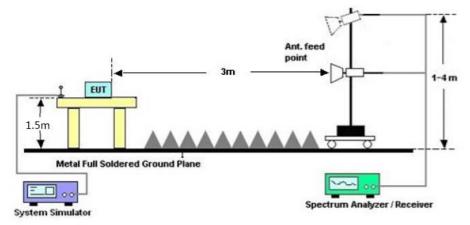
Radiated Emission Test-Setup Frequency Below 30MHz



#### 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.

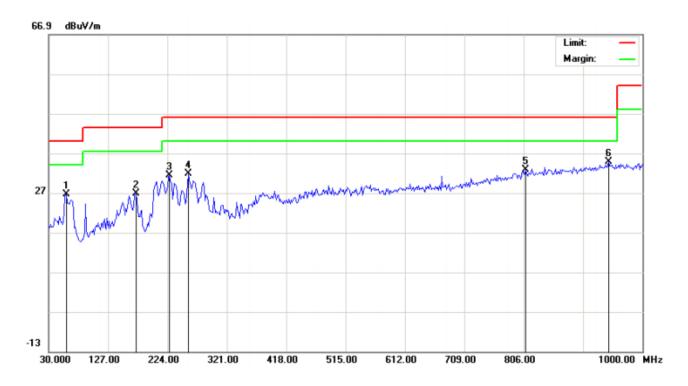
# 11.4. TEST RESULT

# **RADIATED EMISSION BELOW 30MHZ**

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

# **RADIATED EMISSION BELOW 1GHZ**

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal

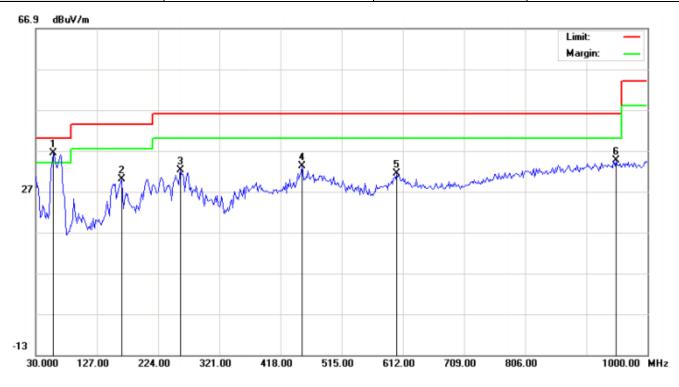


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	•	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		59.1000	7.74	18.95	26.69	40.00	-13.31	peak			
2		172.2667	8.78	17.93	26.71	43.50	-16.79	peak			
3		227.2333	13.62	17.75	31.37	46.00	-14.63	peak			
4		257.9500	13.41	18.35	31.76	46.00	-14.24	peak			
5		809.2333	2.29	30.53	32.82	46.00	-13.18	peak			
6	*	945.0333	2.65	32.09	34.74	46.00	-11.26	peak			

#### **RESULT: PASS**

#### Report No.: AGC00742200401FE06 Page 48 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	•	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	57.4833	17.26	19.09	36.35	40.00	-3.65	peak			
2		165.8000	11.45	18.59	30.04	43.50	-13.46	peak			
3		259.5667	13.93	18.32	32.25	46.00	-13.75	peak			
4		451.9500	9.18	24.02	33.20	46.00	-12.80	peak			
5		602.3000	4.46	26.98	31.44	46.00	-14.56	peak			
6		949.8833	2.51	32.13	34.64	46.00	-11.36	peak			

### **RESULT: PASS**

**Note:** All test channels had been tested. The 802.11a20 at 5180MHz is the worst case and recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

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

# **RADIATED EMISSION ABOVE 1GHZ**

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal/Vertical

#### RADIATED EMISSION ABOVE 1GHZ-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
10360.042	43.55	9.14	52.69	74.00	-21.31	peak
10360.042	38.27	9.14	47.41	54.00	-6.59	AVG
15540.063	41.85	10.22	52.07	74.00	-21.93	peak
15540.063	37.44	10.22	47.66	54.00	-6.34	AVG
Remark:						
-actor = Anter	nna Factor + Cabl	e Loss – Pre-	amplifier.			

# RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
10360.042	45.42	9.14	54.56	74.00	-19.44	peak
10360.042	38.42	9.14	47.56	54.00	-6.44	AVG
15540.063	40.66	10.22	50.88	74.00	-23.12	peak
15540.063	35.27	10.22	45.49	54.00	-8.51	AVG
Remark:	Remark:					
Factor = Anten	na Factor + Cabl	le Loss – Pre-a	mplifier.			

#### Report No.: AGC00742200401FE06 Page 50 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5240MHz	Antenna	Horizontal/Vertical

### RADIATED EMISSION ABOVE 1GHZ-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type	
10480.042	44.79	9.27	54.06	74.00	-19.94	peak	
10480.042	35.24	9.27	44.51	54.00	-9.49	AVG	
15720.063	42.88	10.38	53.26	74.00	-20.74	peak	
15720.063	36.21	10.38	46.59	54.00	-7.41	AVG	
Remark:							
Tootor Antor	na Eastar I Cabl	alaaa Draa	molifior				

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

# RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type	
10480.042	46.11	9.27	55.38	74.00	-18.62	peak	
10480.042	37.15	9.27	46.42	54.00	-7.58	AVG	
15720.063	45.39	10.38	55.77	74.00	-18.23	peak	
15720.063	35.28	10.38	45.66	54.00	-8.34	AVG	
Remark:							
Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

**Note:** All the case had been tested. The 802.11a modulation is the worst case and recorded in the test report. Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

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

# **12. BAND EDGE EMISSION**

# **12.1. MEASUREMENT PROCEDURE**

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

3. Other procedures refer to clause 11.2.

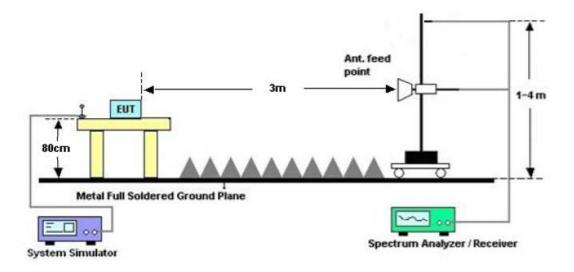
# Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level

2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F.

3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz record in the report. Other restricted band 5.35GHz-5.46GHz and 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

# 12.2. TEST SET-UP



### 12.3. TEST RESULT

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal



### PK Value

AV	Val	lue
	• •	

Keysight Spectrum Analyzer - Sw					
arker 1 5.1785785		SENSE:INT Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: RMS Avg Hold:>100/100	12:04:04 PM Jun 02, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Peak Search
dB/div Ref 110.00	dBµV/m		Mkr	1 5.178 58 GHz 94.502 dBµV/m	Next Pea
					Next Pk Rigl
0.0			¢ <sup>2</sup>	- Marken and a second	Next Pk Le
0.0		مەرىيىتى بىرىم بىرىم يېرىم <u>مەرىيى بىر بىر ب</u>			Marker Del
tart 5.0000 GHz Res BW 1.0 MHz		3.0 MHz*		Stop 5.2000 GHz 066 ms (1000 pts)	Mkr→C
KR         MODE         TRC         SCL           1         N         1         f           2         N         1         f           3		Y FUNC 502 dBµV/m 865 dBµV/m	TION FUNCTION WIDTH	FUNCTION VALUE	Mkr→RefL
7 8 9 0 1					Moi 1 of

#### Report No.: AGC00742200401FE06 Page 53 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical





AV Value

Keysight Spectrum Analyzer - Swe							- J ×
ଯା ା ଜ⊧ା 50 ହ Marker 1 5.17857857	PNO: Fast	Trig: Free Run #Atten: 30 dB	Avg Type: Avg Hold:>	LIGN AUTO RMS >100/100			Peak Search
10 dB/div Ref 110.00	IFGain:Low	#Atten: 30 dB			5.178 58 2.398 dB	GHz	NextPeak
100 90.0							Next Pk Righ
60.0 60.0 50.0							Next Pk Le
40.0 30.0 20.0							Marker Delt
Start 5.0000 GHz Res BW 1.0 MHz	#VI	BW 3.0 MHz*		weep 1.0	Stop 5.200 066 ms (100	00 pts)	Mkr→C
1         N         1         f           2         N         1         f           3         -         -         -           4         -         -         -           5         -         -         -	5.178 58 GHz 5.150 00 GHz	92.398 dBµV/m 39.109 dBµV/m					Mkr→RefLv
6 7 8 9 10 11							Mor 1 of
sg		m		STATUS			

#### Report No.: AGC00742200401FE06 Page 54 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz	Antenna	Horizontal



### PK Value

AV Value

Keysight S	pectrum Analyzer - S RF 50						
larker ′		Ω AC CORREC 508509 GHz PNO: IEGain	Fast 😱 Trig: Free	Run Avg H	ALIGN AUTO Type: RMS Hold: 99/100	12:06:38 PM Jun 02, 20 TRACE 1 2 3 4 TYPE A WWW DET A N N N	5 6 Peak Search
I0 dB/div	Ref 110.0	0 dBµV/m			Mkr	1 5.188 51 GH 90.578 dBµV/	NextPea m
. <b>og</b> 100 90.0						1-	Next Pk Righ
30.0 70.0 30.0 50.0							Next Pk Le
40.0 30.0 20.0				an a	- Alashan and a start		Marker Del
Res BN	000 GHz / 1.0 MHz		#VBW 3.0 MHz*		Sweep 1	Stop 5.2200 GI .066 ms (1000 pt	lz s) Mkr→0
	rrc scl 1 f 1 f	× 5.188 51 G 5.150 00 G			FUNCTION WIDTH	FUNCTION VALUE	Mkr→RefL
7 8 9 0 1							Mo 1 of
G			m		STATUS	•	

#### Report No.: AGC00742200401FE06 Page 55 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz	Antenna	Vertical





AV Value

Keysight Spe	ectrum Analyzer - S					- 3 ×
<mark>×</mark> Marker 1	RF 50 5.192472	AC CORREC 472472 GHz PNO: Fast IEGain: Log		ALIGN AUTO Avg Type: RMS Avg Hold: 81/100	12:07:30 PM Jun 02, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Peak Search
10 dB/div	Ref 110.0	00 dBµV/m			1 5.192 47 GHz 88.290 dBµV/m	NextPeak
100 90.0 80.0					1	Next Pk Righ
70.0 60.0 50.0						Next Pk Lei
40.0 30.0 20.0						Marker Delt
Start 5.00 Res BW	1.0 MHz	#V	BW 3.0 MHz*	Sweep 1	Stop 5.2200 GHz .066 ms (1000 pts)	Mkr→C
1 N 1 2 N 1 3 4 5 6	f	5.192 47 GHz 5.150 00 GHz	88.320 dBµV/m 39.749 dBµV/m	PORCHON	FORCHORVALUE	Mkr→RefLv
7 8 9 9 10 10 11 11 10 10 10 10 10 10 10 10 10						Mor 1 of
ISG				STATU	5	

#### Report No.: AGC00742200401FE06 Page 56 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5210MHz	Antenna	Horizontal



#### PK Value





#### Report No.: AGC00742200401FE06 Page 57 of 67

EUT	Smart phone	Model Name	X2
Temperature	25°C	Relative Humidity	53%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5210MHz	Antenna	Vertical



#### PK Value





#### **RESULT: PASS**

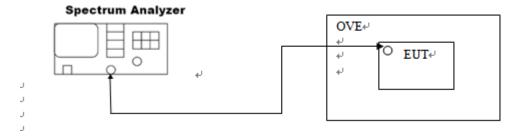
Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report.

# **13. FREQUENCY STABILITY**

# **13.1. MEASUREMENT PROCEDURE**

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the operation frequency.
- 3. Set SPA Centre Frequency = Operation Frequency. SPAN=enough to measure the emission is maintained within the band
- 4. Set SPA Trace 1 Max hold, then View.
- 5. Extreme temperature rule is -10°C~60°C.

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



# **13.3. MEASUREMENT RESULTS**

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	<b>- 10</b> ℃	5180	within the band	PASS
	<b>0</b> °C	5180	within the band	PASS
	<b>10</b> ℃	5180	within the band	PASS
	<b>20</b> °C	5180	within the band	PASS
	<b>30</b> ℃	5180	within the band	PASS
	<b>40</b> °C	5180	within the band	PASS
	<b>50</b> ℃	5180	within the band	PASS
802.11a	<b>60</b> ℃	5180	within the band	PASS
002.11a	<b>- 10</b> ℃	5240	within the band	PASS
	<b>0</b> °C	5240	within the band	PASS
	<b>10</b> ℃	5240	within the band	PASS
	<b>20</b> °C	5240	within the band	PASS
	<b>30</b> °C	5240	within the band	PASS
	<b>40</b> ℃	5240	within the band	PASS
	<b>50</b> ℃	5240	within the band	PASS
	<b>60</b> ℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	<b>- 10</b> ℃	5180	within the band	PASS
	<b>0</b> °C	5180	within the band	PASS
	<b>10</b> ℃	5180	within the band	PASS
	<b>20</b> ℃	5180	within the band	PASS
	<b>30</b> ℃	5180	within the band	PASS
	<b>40</b> ℃	5180	within the band	PASS
	<b>50</b> ℃	5180	within the band	PASS
802.11n20	<b>60</b> ℃	5180	within the band	PASS
002.11120	<b>- 10</b> ℃	5240	within the band	PASS
	<b>0</b> °C	5240	within the band	PASS
	<b>10</b> ℃	5240	within the band	PASS
	<b>20</b> ℃	5240	within the band	PASS
	<b>30</b> °C	5240	within the band	PASS
	<b>40</b> ℃	5240	within the band	PASS
	<b>50</b> ℃	5240	within the band	PASS
	<b>60</b> ℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	- 10℃	5180	within the band	PASS
	<b>0</b> °C	5180	within the band	PASS
	<b>10</b> ℃	5180	within the band	PASS
	<b>20</b> ℃	5180	within the band	PASS
	<b>30</b> ℃	5180	within the band	PASS
	<b>40</b> ℃	5180	within the band	PASS
	<b>50</b> ℃	5180	within the band	PASS
802.11ac20	<b>60</b> °C	5180	within the band	PASS
002.118020	- 10℃	5240	within the band	PASS
	<b>0</b> °C	5240	within the band	PASS
	<b>10</b> ℃	5240	within the band	PASS
	<b>20</b> ℃	5240	within the band	PASS
	<b>30</b> ℃	5240	within the band	PASS
	<b>40</b> ℃	5240	within the band	PASS
	<b>50</b> ℃	5240	within the band	PASS
	<b>60</b> ℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	- 10℃	5190	within the band	PASS
	<b>0</b> °C	5190	within the band	PASS
	<b>10</b> ℃	5190	within the band	PASS
	<b>20</b> ℃	5190	within the band	PASS
	<b>30</b> ℃	5190	within the band	PASS
	<b>40</b> ℃	5190	within the band	PASS
	<b>50</b> ℃	5190	within the band	PASS
802.11n40	<b>60</b> ℃	5190	within the band	PASS
002.11140	<b>- 10</b> ℃	5230	within the band	PASS
	<b>0</b> °C	5230	within the band	PASS
	<b>10</b> ℃	5230	within the band	PASS
	<b>20</b> ℃	5230	within the band	PASS
	<b>30</b> ℃	5230	within the band	PASS
	<b>40</b> ℃	5230	within the band	PASS
	<b>50</b> ℃	5230	within the band	PASS
	<b>60</b> ℃	5230	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	- 10℃	5190	within the band	PASS
	<b>0</b> °C	5190	within the band	PASS
	<b>10</b> ℃	5190	within the band	PASS
	<b>20</b> °C	5190	within the band	PASS
	<b>30</b> °C	5190	within the band	PASS
	<b>40</b> °C	5190	within the band	PASS
	<b>50</b> ℃	5190	within the band	PASS
802.11ac40	<b>60</b> ℃	5190	within the band	PASS
002.11ac40	<b>- 10</b> ℃	5230	within the band	PASS
	<b>0</b> °C	5230	within the band	PASS
	<b>10</b> ℃	5230	within the band	PASS
	<b>20</b> °C	5230	within the band	PASS
	<b>30</b> °C	5230	within the band	PASS
	<b>40</b> °C	5230	within the band	PASS
	<b>50</b> ℃	5230	within the band	PASS
	<b>60</b> ℃	5230	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
	<b>- 10</b> ℃	5210	within the band	PASS
	<b>0</b> °C	5210	within the band	PASS
	<b>10</b> ℃	5210	within the band	PASS
802.11ac80	<b>20</b> ℃	5210	within the band	PASS
002.11800	<b>30</b> ℃	5210	within the band	PASS
	<b>40</b> ℃	5210	within the band	PASS
	<b>50</b> ℃	5210	within the band	PASS
	<b>60</b> ℃	5210	within the band	PASS

# 14. FCC LINE CONDUCTED EMISSION TEST

# 14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

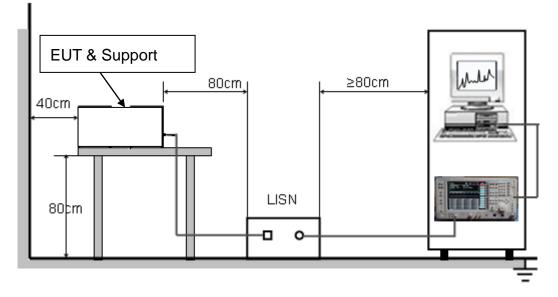
Frequency	Maximum RF Line Voltage				
Frequency	Q.P.( dBuV)	Average( dBuV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

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 0.50MHz.

# 14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



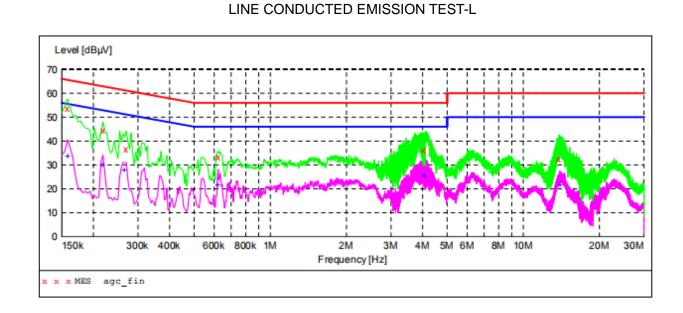
# 14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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/60Hz power 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.

# 14.4. 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.



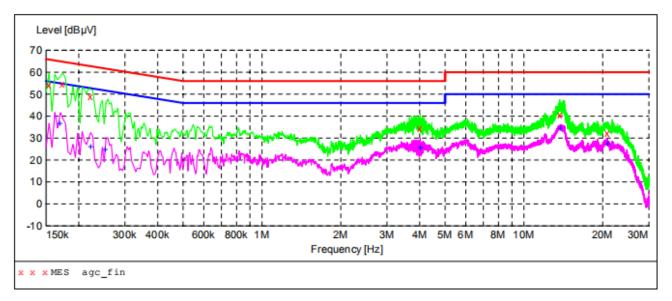
### 14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

# MEASUREMENT RESULT: "agc\_fin"

2020/4/29 2:20 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.158000 0.218000 0.270000 0.622000 4.066000 13.874000	53.80 44.40 36.70 33.40 36.20 32.40	11.3 11.3 11.3 11.3 11.4 11.9	66 63 56 56 60	11.8 18.5 24.4 22.6 19.8 27.6	QP QP QP QP QP QP QP	L1 L1 L1 L1 L1 L1 L1	FLO FLO FLO FLO FLO FLO

#### MEASUREMENT RESULT: "agc\_fin2"

2020/4/29 2:20 Frequency MHz	) Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.158000	33.80	11.3	56	21.8	AV	L1	FLO
0.218000	29.80	11.3	53	23.1	AV	L1	FLO
0.266000	28.00	11.3	51	23.2	AV	L1	FLO
0.622000	21.80	11.3	46	24.2	AV	L1	FLO
4.058000	25.50	11.4	46	20.5	AV	L1	FLO
13.970000	21.60	11.9	50	28.4	AV	L1	FLO



### LINE CONDUCTED EMISSION TEST-N

#### MEASUREMENT RESULT: "agc\_fin"

2020/4/29	2:15							
Frequen	су	Level	Transd	Limit	Margin	Detector	Line	PE
М	Hz	dBµV	dB	dBµV	dB			
0.1540	00	54.00	11.3	66	11.8	QP	N	FLO
0.1740	00	54.70	11.3	65	10.1	QP	N	FLO
0.2220	00	48.80	11.3	63	13.9	QP	N	FLO
4.0180	00	34.30	11.4	56	21.7	QP	N	FLO
13.6940	00	40.50	11.9	60	19.5	QP	N	FLO
20.8500	00	32.30	12.3	60	27.7	QP	N	FLO

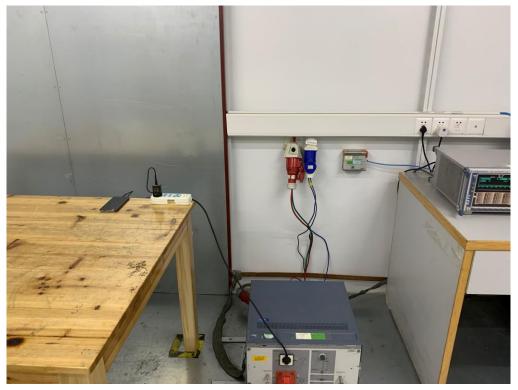
#### MEASUREMENT RESULT: "agc\_fin2"

2020/4/29	2:16							
Frequen	су	Level	Transd	Limit	Margin	Detector	Line	PE
M	Iz	dBµV	dB	dBµV	dB			
0.1700	00	36.40	11.3	55	18.6	AV	N	FLO
0.2220	00	26.10	11.3	53	26.6	AV	N	FLO
0.2540	00	24.70	11.3	52	26.9	AV	N	FLO
4.0180	00	25.60	11.4	46	20.4	AV	N	FLO
13.7740	00	34.20	11.9	50	15.8	AV	N	FLO
20.8700	00	27.50	12.3	50	22.5	AV	N	FLO

#### **RESULT: PASS**

# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ





FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ

----END OF REPORT----