

# **FCC Test Report**

# Report No.: AGC01110190339FE03

FCC ID	: 2A0KB-A3167
іс	23451-A3167
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: Soundcore Flare Mini
BRAND NAME	: Soundcore
MODEL NAME	: A3167
CLIENT	: Anker Innovations Limited
DATE OF ISSUE	: Apr. 08, 2019
STANDARD(S)	FCC Part 15.247 ANSI C63.10: 2013 RSS-GEN: Issue 5 RSS-247: Issue 2
REPORT VERSION	: V1.0

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

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### **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0		Apr. 08, 2019	Valid	Initial Release

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### **1. VERIFICATION OF CONFORMITY**

Applicant	Anker Innovations Limited		
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong		
Manufacturer	Anker Innovations Limited		
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong		
Factory	Eastech Electronics(Huiyang)Co., Ltd.		
Address	Dong Feng District, Xinxu, Hui Yang, Huizhou, Guangdong, China		
Product Designation	Soundcore Flare Mini		
Brand Name	Soundcore		
Test Model	A3167		
Date of test	Mar. 26, 2019 to Apr. 08, 2019		
Deviation	None		
Condition of Test Sample	Normal		
Test Result	Pass		
Report Template	AGCRT-US-BR/RF		

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 radiated emission limits of FCC PART 15.247.

John Zeng(Zeng Weiqiang)

Apr. 08, 2019

Max 2hang

**Reviewed By** 

Tested By

Max Zhang(Zhang Yi)

Apr. 08, 2019

Approved By

Forrest Lei(Lei Yonggang) Authorized Officer

west is

Apr. 08, 2019

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# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as "Soundcore Flare Mini". It is designed by way of utilizing the GFSK, Pi/4 DQPSK and 8DPSK technology to achieve the system operation.

A major technical description of EUT is described as following

<b>Operation Frequency</b>	2.402 GHz to 2.480GHz		
RF Output Power	4.812dBm(Max)		
Bluetooth Version	V 5.0		
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps		
Number of channels	79 Channel		
Hardware Version	REV:A		
Software Version	1.00		
Antenna Designation	PCB Antenna(Comply with requirements of the FCC part 15.203)		
Antenna Gain	-0.61dBi		
Power Supply	DC 3.7V by battery		
Note: 1 The EUT descrites	inport RI E		

Note: 1. The EUT doesn't support BLE.

2. The USB port only used for charging and can't be used to transfer data with PC.

3. Charging and LED light are subject to SDOC.

# 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
8 5 - Hono Contra C	in the second second	2402MHZ
GC TO SC	1	2403MHZ
	The Real Provide States	o a think of a co
To the man of the second control of the seco	38	2440 MHZ
2402~2480MHZ	39	2441 MHZ
	40	2442 MHZ
The mark	The Comments of Figure Comments	
B There Could contre	77	2479 MHZ
, The second	78	2480 MHZ

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### 2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHZ, In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the

master. Additionally the type of connection(e.g. single of multislot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

### 2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a 79 hopping sequence in data mode: 40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67 56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59 72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75 09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06 01, 51, 03, 55, 05, 04

### 2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values: 1. LAP/UAP of the master of the connection.

2. Internal master clock

The LAP(lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD\_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For ehavior zation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us.The clock has a cycle of about one day(23h30).In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire. LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations)are performed to generate te Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following ehavior:

The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer(and it Cannot be shorter) than the minimum resolution of the clock(312.5us).The hopping sequence will always Differ from the first one.

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

This submittal(s) (test report) is intended for FCC ID: 2AOKB-A3167 filing to comply with the FCC PART

### 15.247 requirements.

This submittal(s) (test report) is intended for IC: 23451-A3167 filing to comply with the RSS-247 requirements.

### 2.7. 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.

### 2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

### 2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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# **3. MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard

uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted,  $Uc = \pm 0.8dB$
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Dwell Time: Uc = ±2 %
- Uncertainty of Frequency:  $Uc = \pm 2\%$

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### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
The I	Low channel GFSK
o 2	Middle channel GFSK
3	High channel GFSK
4	Low channel π/4-DQPSK
5	Middle channel π/4-DQPSK
6-0	High channel π/4-DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	Hopping mode GFSK
11	Hopping mode π/4-DQPSK
12	Hopping mode 8DPSK

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

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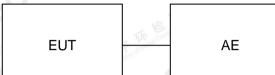
# 5. SYSTEM TEST CONFIGURATION

# 5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure :

EUT

Conducted Emission Configure :



### 5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
P P	Soundcore Flare Mini	Soundcore	A3167	EUT
2	adapter	Zhongli	ZL-PCB0100020502000EU01	Support

# 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.247 (b)(1)	Peak Output Power	Compliant
15.247 (a)(1)	20 dB Bandwidth	Compliant
15.247 (d)	Conducted Spurious Emission	Compliant
15.209	Radiated Emission	Compliant
15.247 (a)(1)(iii)	Number of Hopping Frequency	Compliant
15.247 (a)(1)(iii)	Time of Occupancy	Compliant
15.247 (a)(1)	Frequency Separation	Compliant
15.207	Conducted Emission	Compliant

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# 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		
<b>Designation Number</b>	CN1259		
FCC Test Firm Registration Number	975832		
IC Designation Number	24842		
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	Jun. 12, 2018	Jun. 11, 2019
LISN	R&S	ESH2-Z5	100086	Aug. 28, 2018	Aug. 27, 2019

### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2018	Jun. 11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	Micro-tronics	087	N/A	Jun. 12, 2018	Jun. 11, 2019
Attenuator	Weinachel Corp	58-30-33	N/A	Jun. 12, 2018	Jun. 11, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

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# 7. PEAK OUTPUT POWER

### 7.1. MEASUREMENT PROCEDURE

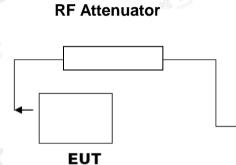
For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 3. RBW > 20 dB bandwidth of the emission being measured.
- 4. VBW  $\geq$  RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

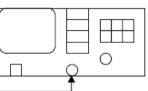
Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

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

# PEAK POWER TEST SETUP



### **Spectrum Analyzer**





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### 7.3. LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT				
LATION				
Frequency Peak Power Applicable Limits				
(dBm)	Pass or Fail			
30	Pass			
30	Pass			
30	Pass			
	LATION Applicable Limits (dBm) 30 30			

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PEAK OUTPUT POWER MEASURI	EMENT RESULT			
FOR II /4-DQPSK MODU	LATION			
Frequency Peak Power Applicable Limits				
(dBm)	(dBm)	Pass or Fail		
3.610	30	Pass		
3.458	30	Pass		
2.689	30	Pass		
	FOR II /4-DQPSK MODU Peak Power (dBm) 3.610 3.458	(dBm)     (dBm)       3.610     30       3.458     30		

CH0



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	PEAK OUTPUT POWER MEAS	SUREMENT RESULT	
	FOR 8-DPSK MOD	ULATION	
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	3.812	30	Pass
2.441	3.731	30	Pass
2.480	2.930	30	Pass

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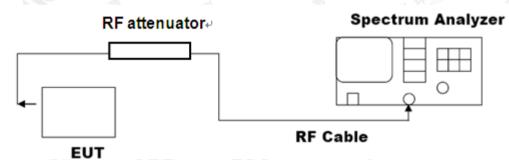
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### 8. 20DB BANDWIDTH

### 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 Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

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



### 8.3. LIMITS AND MEASUREMENT RESULTS

MEASUREMENT RESULT FOR GFSK MOUDULATION				
	Measurement Result			
Applicable Limits	Test Data (MHz)		Criteria	
CC The N/A C The state of the s	Low Channel	0.9087	PASS	
	Middle Channel	0.9093	PASS	
	High Channel	0.9081	PASS	

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### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

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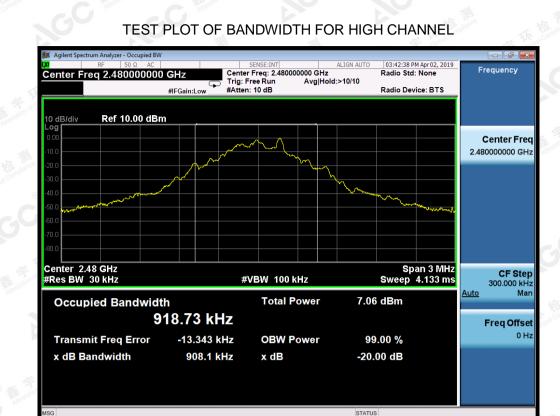
GC

### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

STATUS



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MEASUREMENT RESULT FOR II /4-DQPSK MODULATION				
Annlinghin Limite	Measurement Resu	lt		
Applicable Limits	(MHz)	Criteria		
N/A	Low Channel	1.262	PASS	
	Middle Channel	1.263	PASS	
	High Channel	1.263	PASS	

#### 03:43:30 PM Apr 02, 2019 Radio Std: None SENSE:INI ALIGNAL Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hold:>10/10 #Atten: 10 dB Frequency Center Freg 2.402000000 GH Radio Device: BTS #IEGain:Low Ref 10.00 dBm 0 dB/div **Center Freq** 2.402000000 GHz CF Step 300.000 kHz Mar Center 2.402 GHz #Res BW 30 kHz Span 3 MHz Sweep 4.133 ms #VBW 100 kHz Auto **Occupied Bandwidth Total Power** 9.04 dBm 1.1746 MHz Freq Offset 0 Hz -13.211 kHz Transmit Freq Error **OBW Power** 99.00 % 1.262 MHz x dB -20.00 dB x dB Bandwidth

### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

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### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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MEASUREMENT RESULT FOR 8-DPSK MODULATION					
Measurement Result					
Applicable Limits	Test Data	(MHz)	Criteria		
N/A C	Low Channel	1.273	PASS		
	Middle Channel	1.284	PASS		
	High Channel	1.255	PASS		

#### 03:43:40 PM Apr 02, 2019 Radio Std: None SENSE:INI ALIGNAL Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hold:>10/10 #Atten: 10 dB Frequency Center Freg 2.402000000 GH Radio Device: BTS #IEGain:Low Ref 10.00 dBm 0 dB/div **Center Freq** 2.402000000 GHz CF Step 300.000 kHz Mar Center 2.402 GHz #Res BW 30 kHz Span 3 MHz Sweep 4.133 ms #VBW 100 kHz Auto **Occupied Bandwidth Total Power** 9.10 dBm 1.1777 MHz Freq Offset 0 Hz -7.329 kHz Transmit Freq Error **OBW Power** 99.00 % 1.273 MHz x dB -20.00 dB x dB Bandwidth

### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

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### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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# 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.
- Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
  RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.
- 4. Set SPA Trace 1 Max hold, then View.

### 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

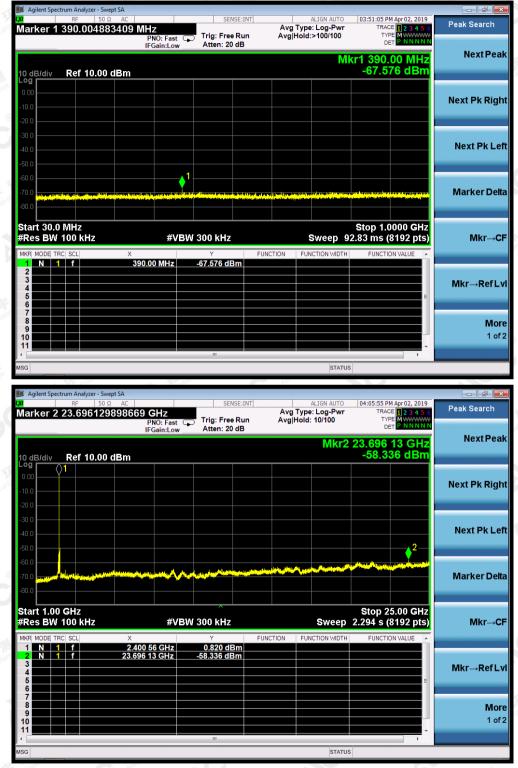
### 9.4. LIMITS AND MEASUREMENT RESULT

CIO V	LIMITS AND MEASUREMENT RESULT			
		Measurement Result		
	Applicable Limits	Test Data	Criteria	
	any 100 KHz Bandwidth Outside the equency band in which the spread spectrum	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS	
po be wi de In re: co	tentional radiator is operating, the radio frequency ower that is produce by the intentional radiator shall a at least 20 dB below that in 100KHz bandwidth thin the band that contains the highest level of the esired power. addition, radiation emissions which fall in the stricted bands, as defined in §15.205(a), must also omply with the radiated emission limits specified §15.209(a))	At least -20dBc than the limit Specified on the TOP Channel	PASS	

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# TEST RESULT FOR ENTIRE FREQUENCY RANGE TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 8-DPSK MODULATION IN LOW CHANNEL



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#### PM Apr 02, 2019 ACE 1 2 3 4 5 6 Peak Search Avg Type: Log-Pwi Avg|Hold:>100/100 Marker 1 390.004883409 MHz Trig: Free Run Atten: 20 dB PNO: Fast Next Peak Mkr1 390.00 MHz -67.488 dBm Ref 10.00 dBm 0 dB/div Next Pk Right Next Pk Left Marker Delta Start 30.0 MHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 92.83 ms (8192 pts) #VBW 300 kHz Mkr→CF FUNCTION ELINC 390.00 MHz -67.488 dBm Mkr→RefLvl More 1 of 2 04:06:36 PM Apr 02, 2019 TRACE 1 2 3 4 5 6 TYPE M ALIGN AUTO Peak Search Avg Type: Log-Pwr Avg|Hold: 7/100 Marker 2 21.595287510683 GHz Trig: Free Run Atten: 20 dB PNO: Fast IFGain:Low Next Pea Mkr2 21.5 29 59.038 dBm Ref 10.00 dBm ٥g Next Pk Right Next Pk Leff 2 Marker Delta Start 1.00 GHz #Res BW 100 kHz Stop 25.00 GHz Sweep 2.294 s (8192 pts) #VBW 300 kHz Mkr→CF 2.441 58 GHz 21.595 29 GHz 0.695 dBm -59.038 dBm Mkr→RefLv More 1 of 2 STATUS

TEST PLOT OF OUT OF BAND EMISSIONS OF 8-DPSK MODULATION IN MIDDLE CHANNEL

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#### PM Apr 02, 2019 ACE <mark>1 2 3 4 5 (</mark> Peak Search Avg Type: Log-Pw Avg|Hold:>100/100 Marker 1 390.004883409 MHz Trig: Free Run Atten: 20 dB PNO: Fast Next Peak Mkr1 390.00 MHz -67.488 dBm Ref 10.00 dBm 0 dB/div Next Pk Right Next Pk Left Marker Delta Stop 1.0000 GHz Sweep 92.83 ms (81<u>92 pts</u>) Start 30.0 MHz #Res BW 100 kHz #VBW 300 kHz Mkr→CF 390.00 MHz -67.488 dBm Mkr→RefLvl More 1 of 2 ALIGN AUTO 04:07:18 PM Apr 02, 2019 Peak Search Avg Type: Log-Pwi Avg|Hold: 14/100 Marker 2 21.431204981077 GHz Trig: Free Run Atten: 20 dB PNO: Fast IFGain:Low Next Peal Mkr2 21.431 20 58.878 dBm Ref 10.00 dBm Next Pk Right Next Pk Left Marker Delta Start 1.00 GHz Stop 25.00 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.294 s (8192 pts) Mkr→CF 2.479 67 GHz 21.431 20 GHz -0.388 dBm -58.878 dBm Mkr→RefLv More 1 of 2

### TEST PLOT OF OUT OF BAND EMISSIONS OF 8-DPSK MODULATION IN HIGH CHANNEL

Note: The peak emissions without marker on the above plots are fundamental wave and need not to compare with the limit. The 8-DPSK modulation is the worst case and only those data recorded in the report.

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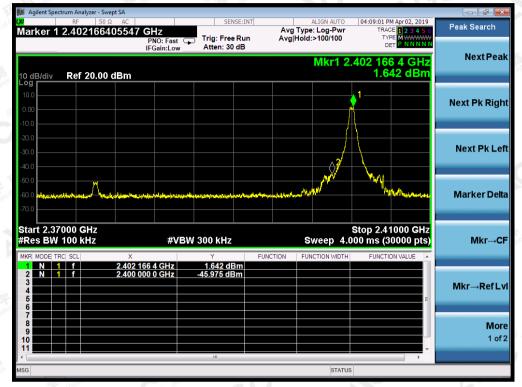


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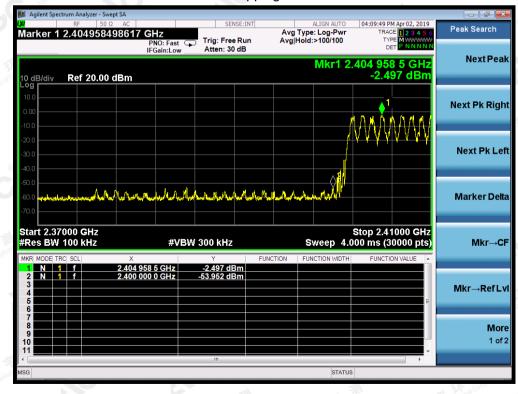
### TEST RESULT FOR BAND EDGE

### 8-DPSK MODULATION IN LOW CHANNEL

Hopping off



Hopping on

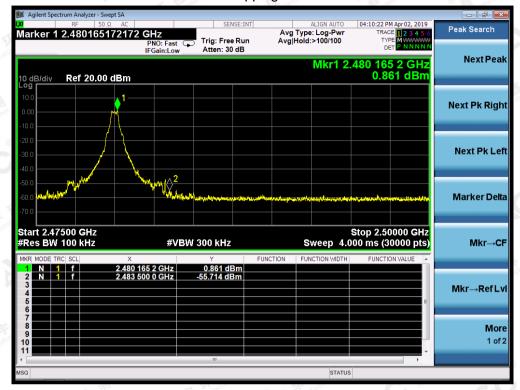


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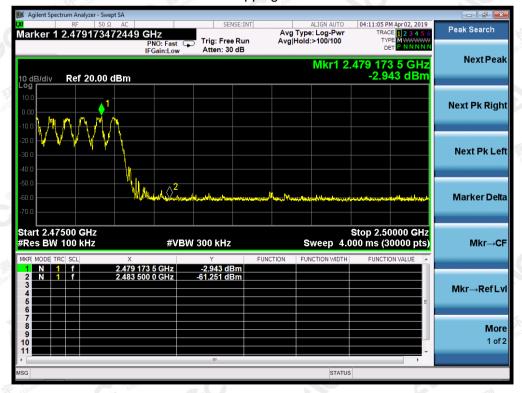


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### 8-DPSK MODULATION IN HIGH CHANNEL Hopping off

Hopping on



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# **10. RADIATED EMISSION**

### 10.1. 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 3MHz 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.

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The following table is the setting of spectrum analyzer and receiver.

	Spectrum Parameter	Setting
Compliance	Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
	Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
GC *	Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
The The W	Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/3MHz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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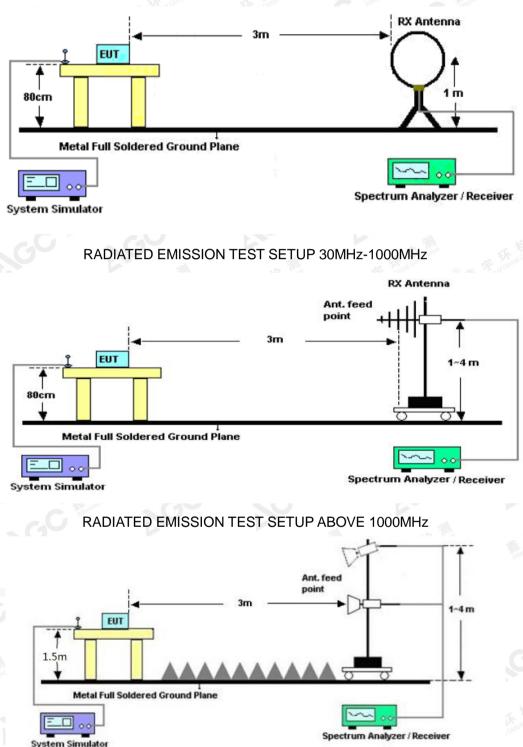


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### 10.2. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



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# **10.3. LIMITS AND MEASUREMENT RESULT**

15.209 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.

# 10.4. TEST RESULT

# **RADIATED EMISSION BELOW 30MHZ**

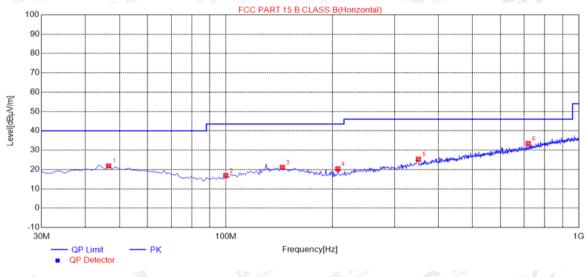
No emission found between lowest internal used/generated frequencies to 30MHz.

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Temperature25°CRelative Humidity55.4%Pressure960hPaTest VoltageNormal VoltageTest ModeMode 7AntennaHorizontal	EUT	Soundcore Flare Mini	Model Name	A3167
	Temperature	25°C	Relative Humidity	55.4%
Test Mode 7 Antenna Horizontal	Pressure	960hPa	Test Voltage	Normal Voltage
	Test Mode	Mode 7	Antenna	Horizontal

# **RADIATED EMISSION BELOW 1GHZ**



#### **Suspected Data List**

ouspe		LIST						
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polality
1	46.4900	21.82	14.77	40.00	18.18	150	350	Horizontal
2	99.8400	16.79	11.35	43.50	26.71	150	350	Horizontal
3	144.460	21.11	14.88	43.50	22.39	200	210	Horizontal
4	207.510	20.29	12.52	43.50	23.21	200	300	Horizontal
5	351.070	25.31	17.89	46.00	20.69	100	10	Horizontal
6	718.700	33.45	26.42	46.00	12.55	150	290	Horizontal

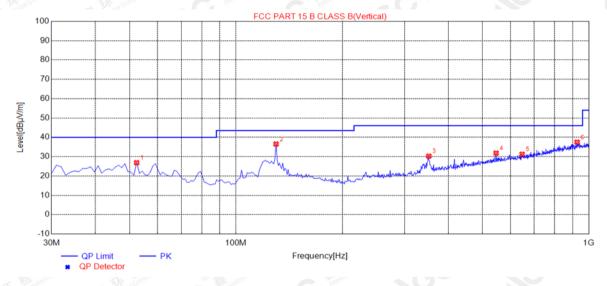
#### **RESULT: PASS**

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical



Sus	pected Data	List						
	Freq.	Level	Factor	Limit	Margin	Height	Angle	Delority
NO	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
1	52.3100	26.88	14.49	40.00	13.12	100	10	Vertical
2	129.910	36.52	14.14	43.50	6.98	200	300	Vertical
3	352.040	30.25	17.92	46.00	15.75	100	100	Vertical
4	546.040	31.82	23.18	46.00	14.18	100	350	Vertical
5	646.920	31.25	25.10	46.00	14.75	100	170	Vertical
6	926.280	37.49	30.35	46.00	8.51	150	50	Vertical

# **RESULT: PASS**

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

2. All test modes had been pre-tested. The mode 7 is the worst case and recorded in the report.

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

## **RADIATED EMISSION ABOVE 1GHZ**

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.022	46.68	0.08	46.76	74.00	-27.24	peak
4804.022	43.67	0.08		54.00	-10.55	AVG
7206.033	37.58	2.21	39.79	74.00	-34.21	peak
7206.033	34.97	2.21	37.18	54.00	-16.82	AVG
and a station of	C anton of Car	Allestation				
						1
emark: 🔍			10-	4	A Manplance	The al Complete
actor = Anter	nna Factor + Cable	e Loss – Pre-	amplifier.	B The Start	Joba ®	a dation of Green
,			3 N . CO.	The state		

#### EUT Soundcore Flare Mini **Model Name** A3167 25°C **Relative Humidity** 55.4% Temperature 960hPa Normal Voltage Pressure **Test Voltage Test Mode** Mode 7 Antenna Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.022	45.82	0.08	45.90	74.00	-28.10	peak
4804.022	44.12	0.08	44.20	54.00	-9.80	AVG
7206.033	40.46	2.21	42.67	74.00	-31.33	peak
7206.033	38.81	2.21	41.02	54.00	-12.98	AVG
	The Compliant	The Global Collin	C Thestallon of C	Alles V	10 <sup>1</sup>	
8 <b>5</b>	of Gire	estation				
emark:						11175
actor = Anten	ina Factor + Cab	le Loss – Pre-a	mplifier.		~	12 pliance

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.022	45.98	0.14	46.12	74.00	-27.88	peak
4882.022	43.65	0.14	43.79	54.00	-10.21	AVG
7323.033	39.36	2.36	41.72	74.00	-32.28	peak
7323.033	37.55	2.36	39.91	54.00	-14.09	AVG
The Meridian	In the mouth	The second	Complete	testation	Attestar	0
3 The son of Globe	(R) F of Global	C at tation of Gru				
Remark:	Allestand	C Atter	No.		in the second seco	
actor = Anten	na Factor + Cable	Loss – Pre-a	amplifier.		ALL THE	The the motions

EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
45.98	0.14	46.12	74.00	-27.88	peak 🧹
43.87	0.14	44.01	54.00	-9.99	AVG
41.46	2.36	43.82	74.00	-30.18	peak
38.78	2.36	41.14	54.00	-12.86	AVG
of Goba	ation of Gar		GU		
				1	R. The
	(dBµV) 45.98 43.87 41.46	(dBµV)     (dB)       45.98     0.14       43.87     0.14       41.46     2.36	(dBµV)     (dB)     (dBµV/m)       45.98     0.14     46.12       43.87     0.14     44.01       41.46     2.36     43.82	(dBµV)     (dB)     (dBµV/m)     (dBµV/m)       45.98     0.14     46.12     74.00       43.87     0.14     44.01     54.00       41.46     2.36     43.82     74.00	(dBµV)     (dB)     (dBµV/m)     (dBµV/m)     (dB)       45.98     0.14     46.12     74.00     -27.88       43.87     0.14     44.01     54.00     -9.99       41.46     2.36     43.82     74.00     -30.18

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.022	46.32	0.22	46.54	74.00	-27.46	peak
4960.022	40.69	0.22	40.91	54.00	-13.09	AVG 👘
7440.033	41.23	2.64	43.87	74.00	-30.13	peak
7440.033	37.78	2.64	40.42	54.00	-13.58	AVG
The los	The tel motion	The second	Complia Complia	testation	Attestan	0
The Top of Globa	O Global	C Station of Cr				
emark:	Allestand	C Allen			11	-70
actor = Anter	nna Factor + Cable	Loss – Pre-a	amplifier.		ANT THEY	The Welmphan
				3	in complete	2 th acol

EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.022	46.12	0.22	46.34	74.00	-27.66	peak
4960.022	44.71	0.22	44.93	54.00	-9.07	AVG
7440.033	37.56	2.64	40.20	74.00	-33.80	peak
7440.033	36.74	2.64	39.38	54.00	-14.62	AVG
	HEL Mance	The compliance	State State	8	on of Glot	
	The Come	Clobal C	C station	Allesu		

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

# **RESULT: PASS**

Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report. Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

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

All test modes had been tested. The 8-DPSK modulation is the worst case and recorded in the report.

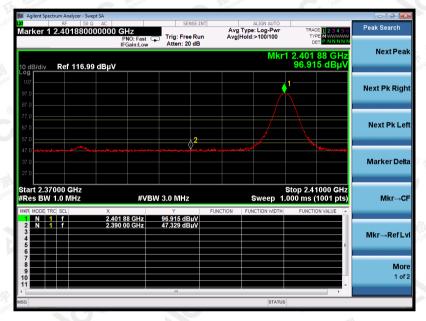
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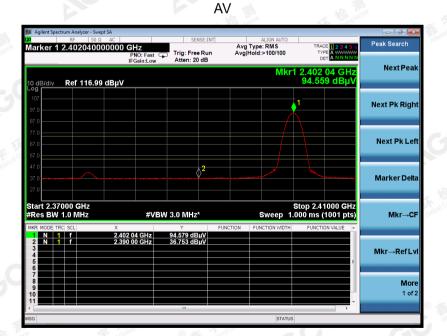


EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

PK





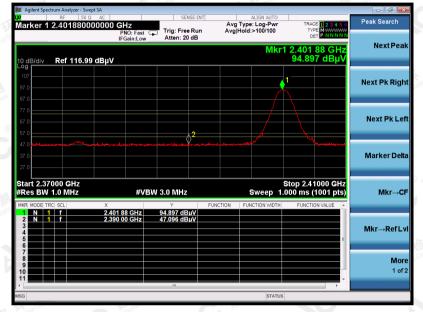
**RESULT: PASS** 

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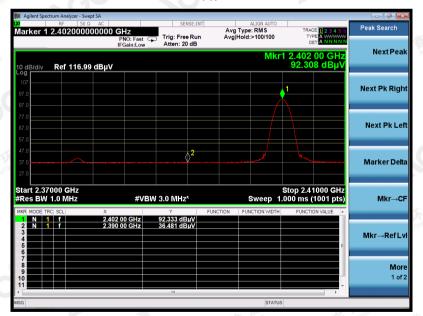
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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

PK



AV



**RESULT: PASS** 

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

PK



AV



**RESULT: PASS** 

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EUT	Soundcore Flare Mini	Model Name	A3167
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

PK







### **RESULT: PASS**

**Note**: 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. All test modes had been pre-tested. The 8-DPSK modulation is the worst case and recorded in the report.

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# **11. NUMBER OF HOPPING FREQUENCY**

### 11.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

3. VBW  $\geq$  RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

# 11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

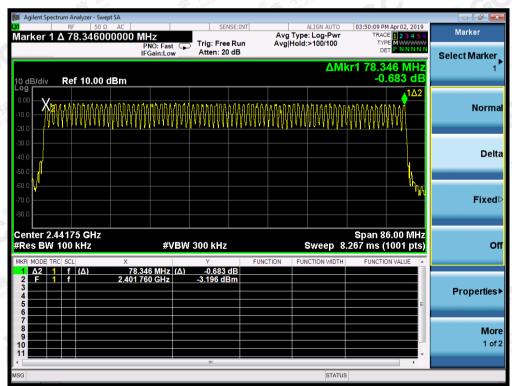
Same as described in section 8.2

# **11.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6

# **11.4. LIMITS AND MEASUREMENT RESULT**

TOTAL NO. OF	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
HOPPING CHANNEL	>=15	79	PASS



TEST PLOT FOR NO. OF TOTAL CHANNELS

Note: The GFSK modulation is the worst case and recorded in the report.

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# 12. TIME OF OCCUPANCY (DWELL TIME)

# 12.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Zero span, centered on a hopping channel.

2. RBW shall be  $\leq$  channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.

3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.

4. Detector function: Peak. Trace: Max hold.

5. Use the marker-delta function to determine the transmit time per hop.

6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer)  $\times$  (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

# 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

# 12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

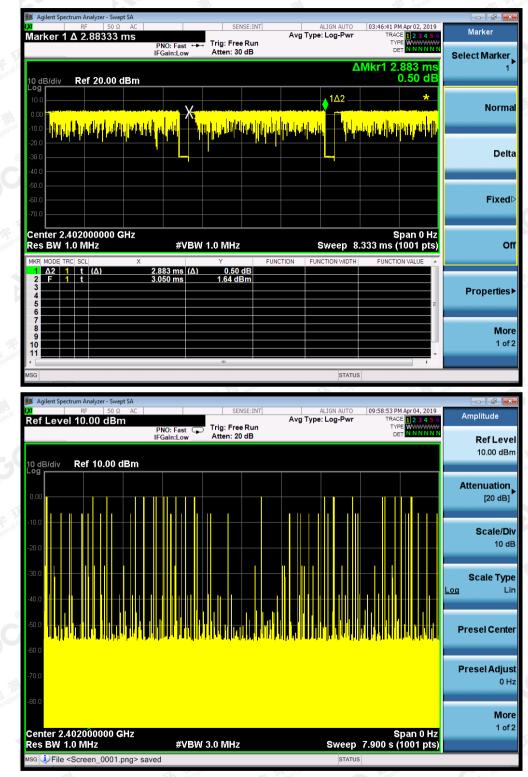
# **12.4. LIMITS AND MEASUREMENT RESULT**

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)
Low	2.883	24*4	271.680	400
Middle	2.883	26*4	299.832	400
High	2.883	34*4	392.088	400

Note: The 8-DPSK modulation is the worst case and recorded in the report.

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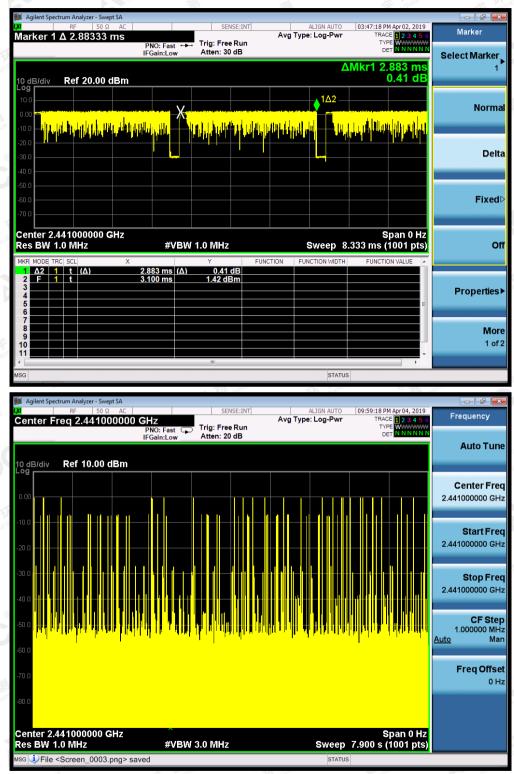
### TEST PLOT OF LOW CHANNEL

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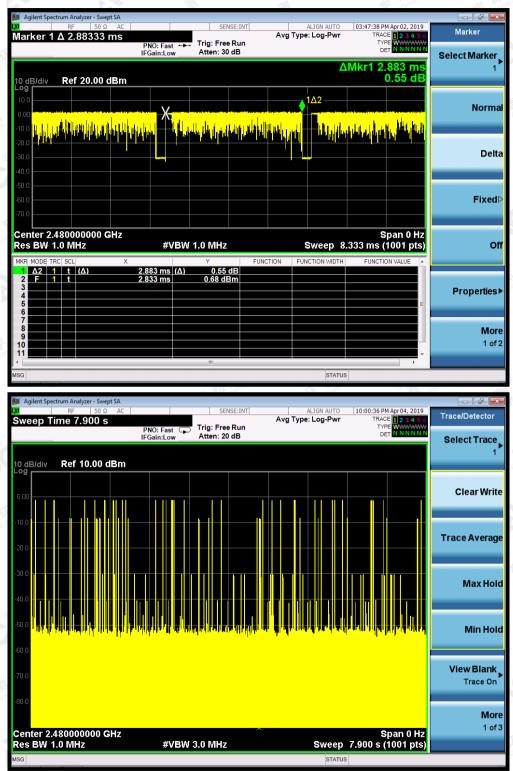
TEST PLOT OF MIDDLE CHANNEL

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# TEST PLOT OF HIGH CHANNEL

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# **13. FREQUENCY SEPARATION**

### 13.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Wide enough to capture the peaks of two adjacent channels.

2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

3. Video (or average) bandwidth (VBW)  $\geq$  RBW.

4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

# **13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

Same as described in section 6.2

# **13.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6.3

# **13.4. LIMITS AND MEASUREMENT RESULT**

CHANNEL	CHANNEL LIMIT SEPARATION		RESULT
	KHz	KHz	Door the P
CH01-CH02	1000	>=25 KHz or 2/3 20 dB BW	Pass

TEST PLOT FOR FREQUENCY SEPARATION



Note: The 8-DPSK modulation is the worst case and recorded in the report.

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

# 14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

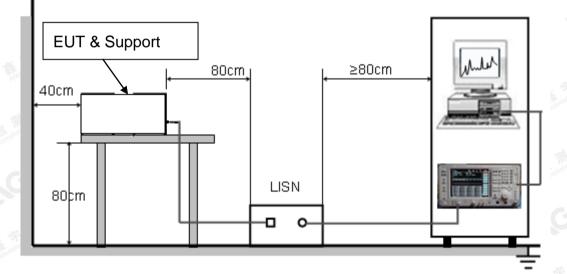
5	Fromierou	Maximum RF Line Voltage			
, C	Frequency	Q.P.( dBuV)	Average( dBuV)		
	150kHz~500kHz	66-56	56-46		
	500kHz~5MHz	56	46		
C A	5MHz~30MHz	60	50		

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.

# 14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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### 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 DC 15V power from adapter which received AC120V/60Hz power from 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.

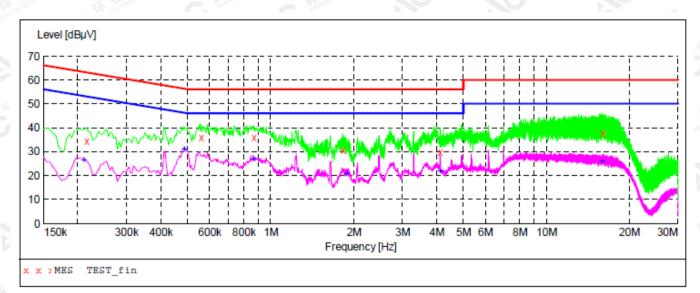
### 14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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.

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# 14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L

#### MEASUREMENT RESULT: "TEST fin"

4/2/2019 3:55PM									
Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line	PE		
0.214000	34.50	10.3	63	28.5	QP	L1	FLO		
0.558000	35.90	10.3	56	20.1	QP	L1	FLO		
0.866000	36.00	10.4	56	20.0	QP	L1	FLO		
1.822000	30.40	10.4	56	25.6	QP	L1	FLO		
4.102000	29.70	10.4	56	26.3	QP	L1	FLO		
15.898000	37.70	10.9	60	22.3	QP	L1	FLO		

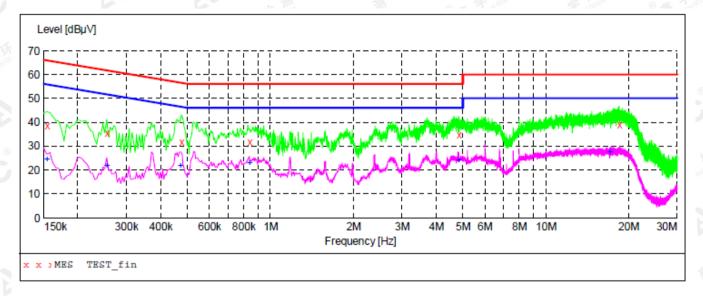
#### MEASUREMENT RESULT: "TEST fin2"

4/2/2019 3:59 Frequency MHz	5PM Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.210000 0.486000 0.866000 1.878000	26.60 31.10 26.90 20.60	10.3 10.3 10.4 10.4	53 46 46 46		AV AV AV	L1 L1 L1 L1	FLO FLO FLO FLO
4.102000 15.906000	22.00 25.90	10.4 10.9	46 50	24.0 24.1	AV AV	L1 L1	FLO FLO

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Line Conducted Emission Test Line 2-N

#### MEASUREMENT RESULT: "TEST fin"

4/2/2019 3:36PM									
Freque	ency	Level	Transd	Limit	Margin	Detector	Line	PE	
	MHz	dBµV	dB	dBµV	dB				
0.154	1000	38.60	10.3	66	27.2	QP	N	FLO	
0.254	1000	35.50	10.2	62	26.1	QP	N	FLO	
0.474	1000	31.60	10.3	56	24.8	QP	N	FLO	
0.838	3000	31.90	10.4	56	24.1	QP	N	FLO	
4.822	2000	34.80	10.4	56	21.2	QP	N	FLO	
18.446	5000	38.80	11.0	60	21.2	QP	N	FLO	

#### MEASUREMENT RESULT: "TEST fin2"

4/2/201								
Freq	luency	Level				Detector	Line	PE
	MHz	dBµV	dB	dBµV	dB			
0.1	54000	24.40	10.3	56	31.4	AV	N	FLO
0.2	54000	21.80	10.2	52	29.8	AV	Ν	FLO
0.4	70000	21.90	10.3	47	24.6	AV	Ν	FLO
0.8	38000	22.90	10.4	46	23.1	AV	N	FLO
4.8	22000	24.20	10.4	46	21.8	AV	N	FLO
17.0	66000	27.40	10.9	50	22.6	AV	Ν	FLO

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### **RESULT: PASS**

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Note: All the test modes had been tested, the mode 1 was the worst case. Only the data of the worst case would be record in this test report.

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

Refer to Attached file(appendix I)

# **APPENDIX B: PHOTOGRAPHS OF EUT**

Refer to Attached file(appendix I)

----END OF REPORT----

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