

# FCC Test Report

Report No.: AGC13808220304FE01

FCC ID	:	2A4IR-SL9CIL19600
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Rock light
BRAND NAME	:	Sealight
MODEL NAME	:	SL9CIL19600, SL9CIL19400, SL9CIL19500
APPLICANT	:	ShenZhen Suncent Auto Parts Technology Company Limited
DATE OF ISSUE	:	May. 06, 2022
STANDARD(S)	:	FCC Part 15.247
<b>REPORT VERSION</b>	:	V1.0
<u>Attestation of (</u>	<u>710</u>	bal Compliance (Shenzhen) Co., Ltd



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Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



#### **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May. 06, 2022	Valid	Initial Release



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# **1. VERIFICATION OF COMPLIANCE**

Applicant	ShenZhen Suncent Auto Parts Technology Company Limited	
Address	5A1, Building C, Qingchuangcheng, Zhangkeng Community, Minzhi Street, Longhua District, Shenzhen	
Manufacturer	ShenZhen Suncent Auto Parts Technology Company Limited	
Address	5A1, Building C, Qingchuangcheng, Zhangkeng Community, Minzhi Street, Longhua District, Shenzhen	
Factory	ShenZhen Suncent Auto Parts Technology Company Limited	
Address	5A1, Building C, Qingchuangcheng, Zhangkeng Community, Minzhi Street, Longhua District, Shenzhen	
Product Designation	Rock light	
Brand Name	Sealight	
Test Model	SL9CIL19600	
Series Model	SL9CIL19400, SL9CIL19500	
Declaration of Difference	All the same except for the model name.	
Date of test	Apr. 01, 2022 to May 06, 2022	
Deviation	No any deviation from the test method	
Condition of Test Sample	Normal	
Test Result	Pass	
Report Template	AGCRT-US-BLE/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.

and bai Prepared By Jack Gui May. 06, 2022 (Project Engineer) Reviewed By Calvin Liu May. 06, 2022 (Reviewer) Approved By Max Zhang May. 06, 2022 (Authorized Officer)

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

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# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as a "Rock light". It is designed by way of utilizing the GFSK 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	GFSK 1Mbps:1.830dBm (Max) GFSK 2Mbps:1.839dBm (Max)
Bluetooth Version	V5.0
Modulation	BR □GFSK, EDR □π /4-DQPSK, □8DPSK BLE ⊠GFSK 1Mbps ⊠GFSK 2Mbps
Number of channels	40 Channels
Antenna Designation	PCB Antenna (Comply with requirements of the FCC part 15.203)
Antenna Gain	0dBi
Hardware Version	V:02
Software Version	V1.0
Power Supply	DC 12.0V by battery
Note: The EUT doesn't support	

Note: The EUT doesn't support BR&EDR.

# 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	
2400~2483.5MHz	0	2402 MHz	
	1	2404 MHz	
	:	:	
	38	2478 MHz	
	39	2480 MHz	



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

This submittal(s) (test report) is intended for FCC ID: 2A4IR-SL9CIL19600 filing to comply with the FCC Part 15.247 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.

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

Refer to section 5.2.

## 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

#### 2.7. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device. For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.



# **3. MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement y  $\pm U$ , 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%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$



# 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX

Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 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.

# Software Setting

tim ESISTER ST Tool			
A VALAD	8251_8253_8258_8359_8 • SWIRE	• SWB SP	
	RF PM		
	Setting:	TX RX	
	2402 Set_Channel	PA PAO - PAO - Set_Gpio	
	1.9dbm · Set Power	Log_Window:	
AB5312B		Total Time: 0 ms	-
	BLE_1M · Set_RF_Mode	@ Send Start Carrier Command	
	Carrier:	TC32 EVK: Swire OK Total Time: 0 ms	
AB153x_AL. BT_Tool V1:1:0	Carrier CarrierData Hop	***********	
	1 Carrier Data	Set Parameter	
et WPS Office FCC_assist.	RX:	@ Send CarrierData Command	
	The second se	**************************************	
	RxTest	Total Time: 0 ms	
		@ Send Hopping Channel Setting	
Ring Foxmail [Debug Tool]-Sec		TC32 EVK: Swire OK	
		Total Time: 0 ms	
R THERE REPAIL	· ·	@ Send Start CarrierData Command	
EMI_Test_		TC32 EVK: Swire OK Total Time: 0 ms	



# **5. SYSTEM TEST CONFIGURATION**

# **5.1. CONFIGURATION OF TESTED SYSTEM**

Radiated Emission Configure:

EUT

Conducted Emission Configure:

EUT	AE

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

ltem	Equipment	Model No.	ID or Specification	Remark
1	Rock light	SL9CIL19600	A4IR-SL9CIL19600	EUT
2	Control Box	USB-TTL	N/A	AE

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

FCC RULES	DESCRIPTION OF TEST	RESULT
15.247 (b)(3)	Peak Output Power	Compliant
15.247 (a)(2)	6 dB Bandwidth	Compliant
15.247 (d)	Conducted Spurious Emission	Compliant
15.247 (e)	Maximum Conducted Output Power Density	Compliant
15.209	Radiated Emission	Compliant
15.207	Conducted Emission	Not applicable

Note: The BT function cannot transmit when charging.



# 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 RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15,2021	May 14,2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
2.4GHz Filter	EM Electronics	2400-2500	N/A	Mar. 22, 2022	Mar. 21, 2024
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A



# 7. PEAK OUTPUT POWER

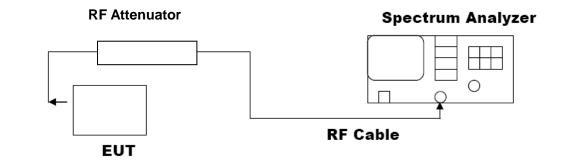
# 7.1. MEASUREMENT PROCEDURE

For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. RBW≥DTS bandwidth
- 3. VBW≥3\*RBW.
- 4. SPAN≥VBW.
- 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





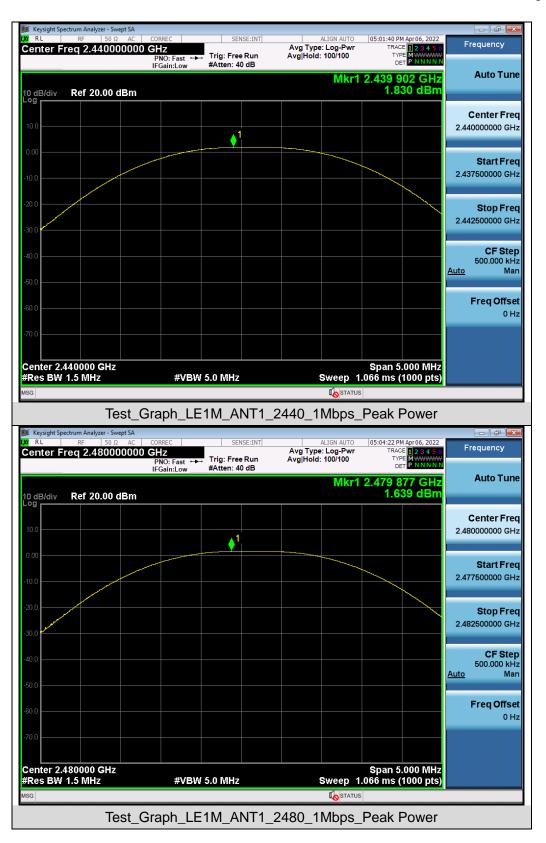
#### 7.3. LIMITS AND MEASUREMENT RESULT BLE GFSK 1Mbps:

Test Data of Conducted Output Power						
Test Mode	Test Channel (MHz)Peak Power (dBm)Limits (dBm)Pass or F					
	2402	1.725	≪30	Pass		
GFSK 1M	2440	1.830	≪30	Pass		
	2480	1.639	≪30	Pass		

# **Test Graphs of Conducted Output Power**









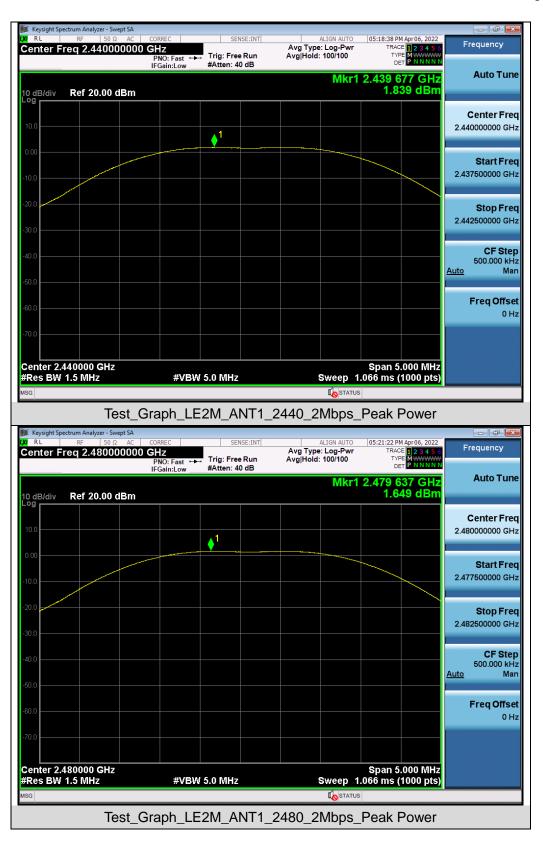
# BLE GFSK 2Mbps:

Test Data of Conducted Output Power						
Test Mode	de Test Channel Peak Power Limits (MHz) (dBm) (dBm)					
	2402	1.684	≪30	Pass		
GFSK 2M	2440	1.839	≪30	Pass		
	2480	1.649	≪30	Pass		

# Test Graphs of Conducted Output Power

	ectrum Analyzer - Swept SA					
Center F	RF 50 Ω AC	O GH7	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	05:09:49 PM Apr 06, 2022 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 40 dB	Avg Hold: 100/100	TYPE MWWWWW DET PNNNNN	
		I Guilleon		Mkr1	2.401 547 GHz	Auto Tune
10 dB/div	Ref 20.00 dBm				1.684 dBm	
Log						Center Freq
10.0						2.402000000 GHz
			<b>♦</b> <sup>1</sup>			
0.00						Start Freq
-10.0						2.399500000 GHz
-20.0						Stop Freq
-30.0						2.404500000 GHz
-30.0						
-40.0						CF Step 500.000 kHz
						<u>Auto</u> Man
-50.0						
-60.0						Freq Offset
						0 Hz
-70.0						
Center 2. #Res BW	402000 GHz	#\/B)	V 5.0 MHz	Sween 1	Span 5.000 MHz .066 ms (1000 pts)	
MSG						
	Test Creek   FOM ANTA 2402 ONtre Deals Dever					
	Test_Graph_LE2M_ANT1_2402_2Mbps_Peak Power					







# 8. BANDWIDTH

#### **8.1. MEASUREMENT PROCEDURE**

6dB bandwidth:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 kHz, VBW≥3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Occupied bandwidth:

- 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.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

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

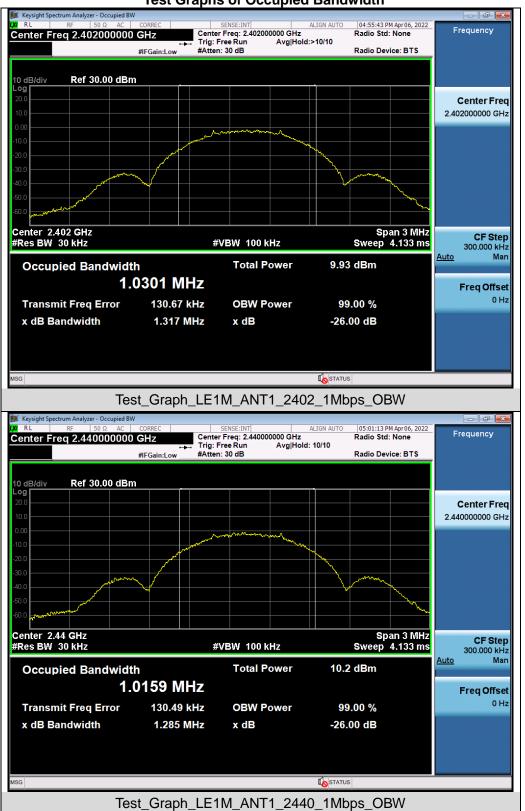
The same as described in section 7.2.

# 8.3. LIMITS AND MEASUREMENT RESULTS

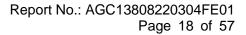
Test Data of Occupied Bandwidth and DTS Bandwidth						
Test Mode	Test Channel (MHz)         99% Occupied Bandwidth (MHz)         -6dB Bandwidth (MHz)         Limits (MHz)         Pass or Fail					
	2402	1.030	0.681	≥0.5	Pass	
GFSK 1M	2440	1.016	0.676	≥0.5	Pass	
	2480	1.032	0.685	≥0.5	Pass	

#### BLE GFSK 1Mbps:

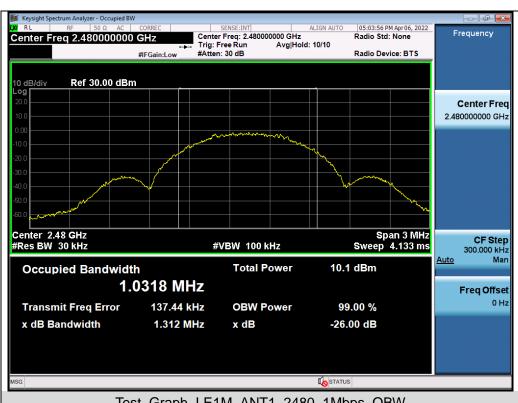




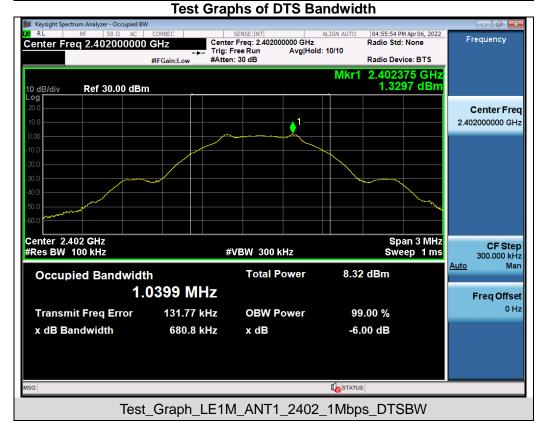
## Test Graphs of Occupied Bandwidth







Test\_Graph\_LE1M\_ANT1\_2480\_1Mbps\_OBW









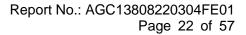
## BLE GFSK 2Mbps:

Test Data of Occupied Bandwidth and DTS Bandwidth						
Test Mode	Test Channel (MHz)99% Occupied Bandwidth (MHz)-6dB Bandwidth (MHz)Limits (MHz)Pass or Fail					
	2402	2.047	1.317	≥0.5	Pass	
GFSK 2M	2440	2.060	1.421	≥0.5	Pass	
	2480	2.042	1.374	≥0.5	Pass	





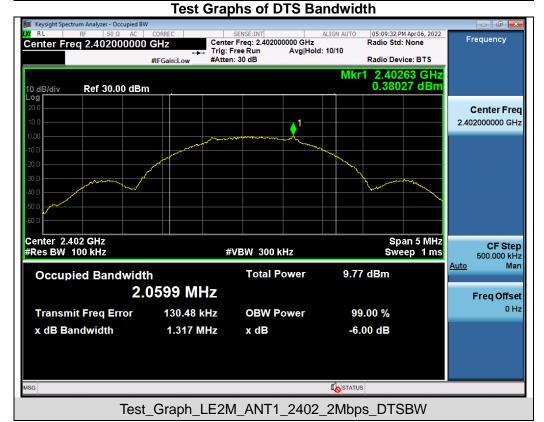
#### **Test Graphs of Occupied Bandwidth**







Test\_Graph\_LE2M\_ANT1\_2480\_2Mbps\_OBW









# 9. CONDUCTED SPURIOUS EMISSION

#### 9.1. MEASUREMENT PROCEDURE

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

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

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

The same as described in section 7.2.

#### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT					
Angliaghta Limite	Measurement Re	sult			
Applicable Limits	Test Data	Criteria			
In any 100 kHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -20dBc than the reference level	PASS			

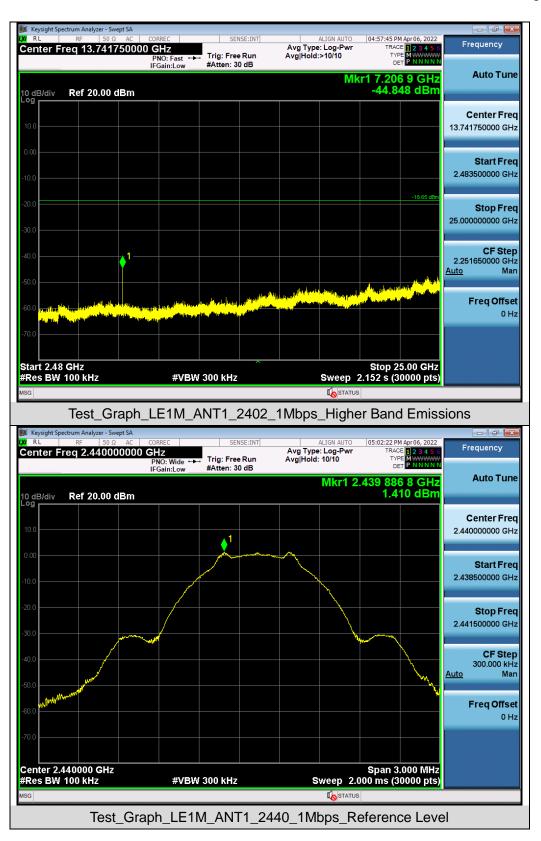


# BLE GFSK 1Mbps:

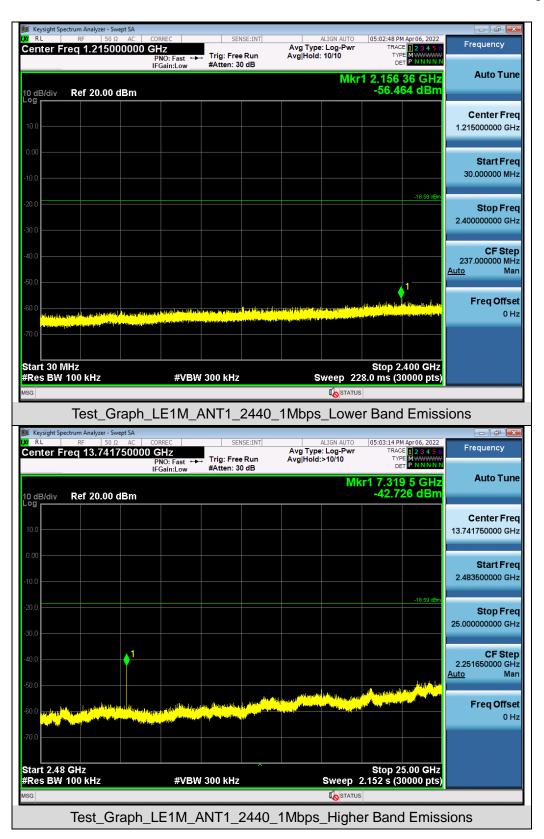


Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

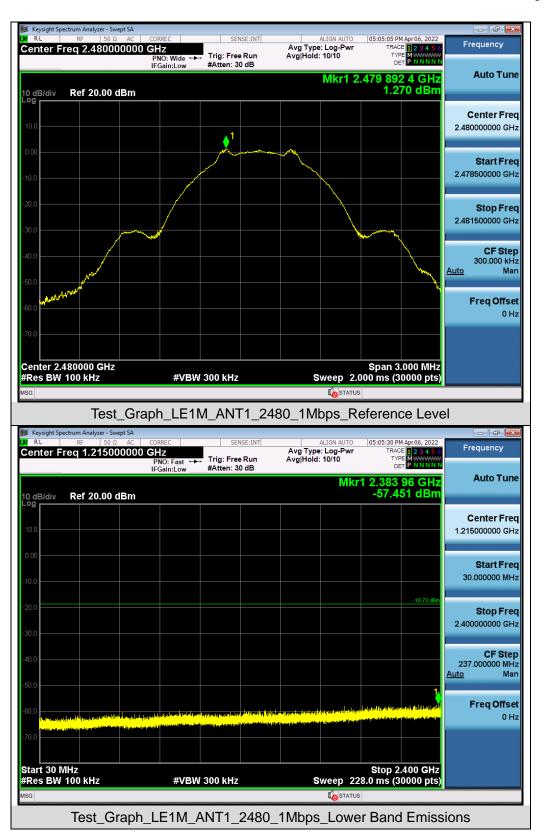




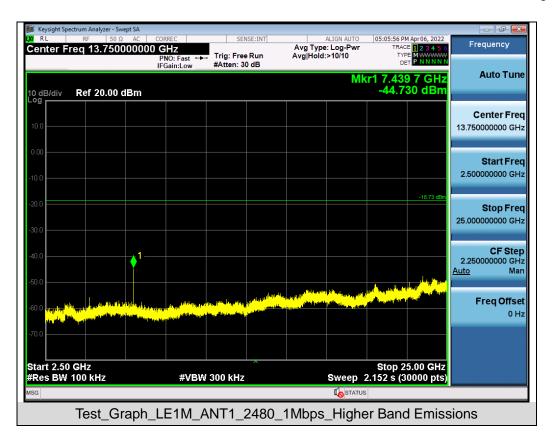






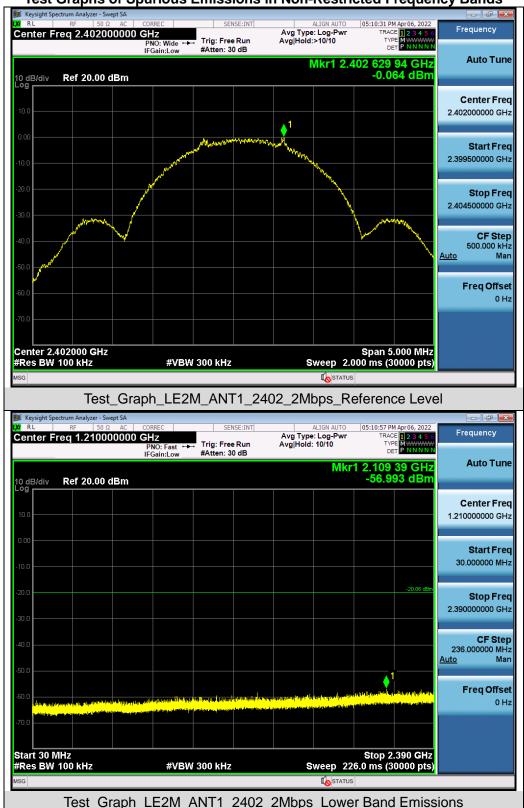






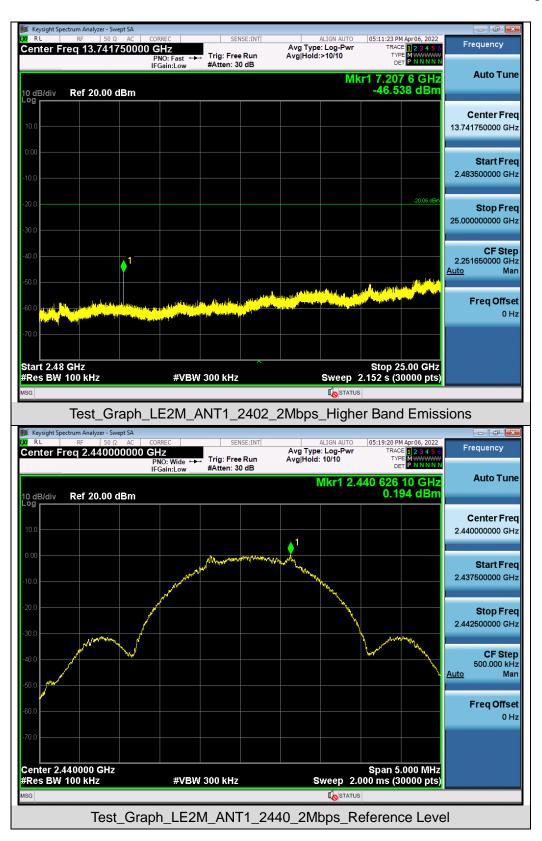


#### BLE GFSK 2Mbps:

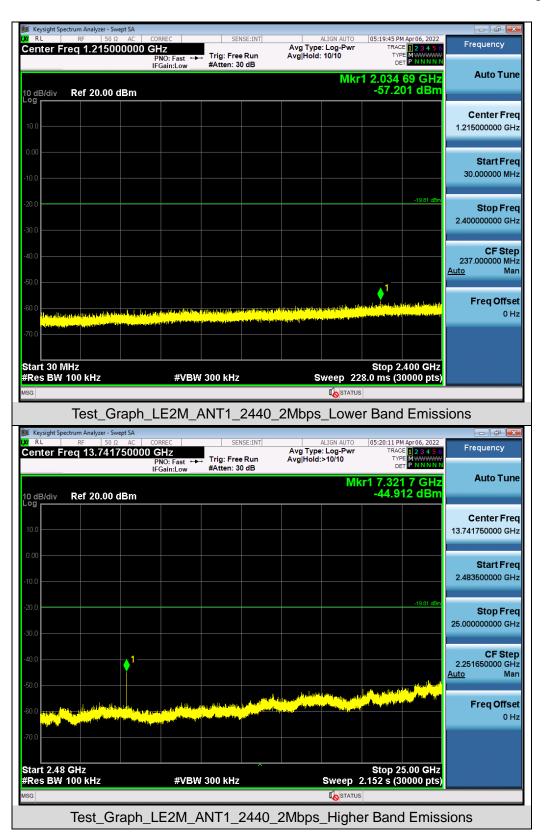


. Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands





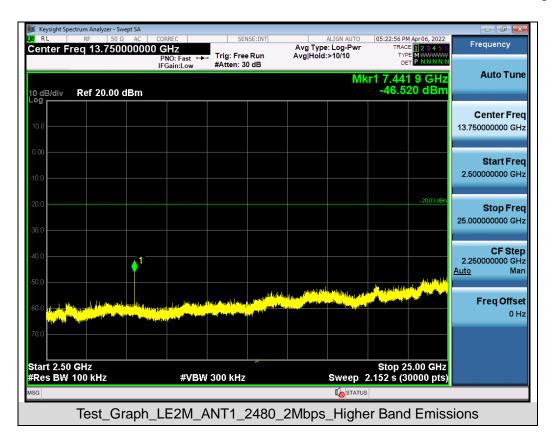














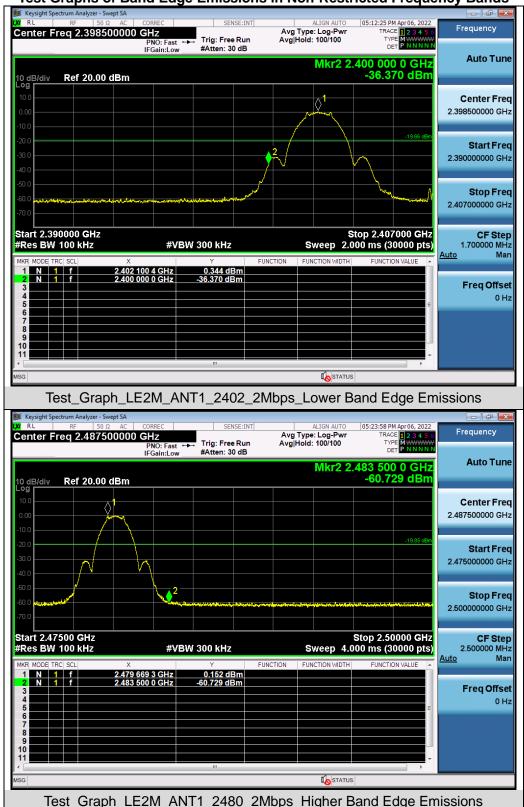
# **BLE GFSK 1Mbps:**

Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands

SENSE:INT 04:58:45 PM Apr 06, 2022 Center Freq 2.398500000 GHz PN0: Fast →→ IFGain:Low Avg Type: Log-Pw Avg|Hold: 100/100 Frequency TACE 1 2 3 4 TYPE MWWW DET P N N N Trig: Free Run #Atten: 30 dB Auto Tune Mkr2 2.400 000 0 GHz -60.367 dBm Ref 20.00 dBm 0 dB/div og  $\Diamond^1$ **Center Freq** 2.398500000 GHz Start Freq 2 390000000 GHz Stop Freq 2.40700000 GHz Stop 2.407000 GHz Sweep 2.000 ms (30000 pts) CF Step 1.700000 MHz Start 2.390000 GHz #Res BW 100 kHz #VBW 300 kHz Man Auto 2.402 379 2 GHz 2.400 000 0 GHz 1.379 dBm -60.367 dBm N Freq Offset 0 Hz **I**STATUS Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_Lower Band Edge Emissions 05:06:57 PM Apr 06, 2022 GN AUTO Avg Type: Log-Pwi Avg|Hold: 100/100 Frequency Center Freq 2.487500000 GHz RACE Trig: Free Run #Atten: 30 dB TYPE PNO: Fast IFGain:Low Auto Tune Mkr2 2.483 500 0 GHz -61.263 dBm Ref 20.00 dBm og Center Frea  $\langle \rangle$ 2.487500000 GHz Start Freq 2.475000000 GHz <mark>⁄2</mark> Stop Freq 2.50000000 GHz Stop 2.50000 GHz Sweep 4.000 ms (30000 pts) Start 2.47500 GHz #Res BW 100 kHz CF Step 2.500000 MHz #VBW 300 kHz Man Auto 2.480 390 2 GHz 2.483 500 0 GHz 1.407 dBm -61.263 dBm N **Freq Offset** 0 Hz **I**STATUS Test Graph LE1M ANT1 2480 1Mbps Higher Band Edge Emissions



#### BLE GFSK 2Mbps:



Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands



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

## **10.1. MEASUREMENT PROCEDURE**

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

Note: The method of PKPSD in the KDB 558074 item 8.4 was used in this testing.

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

Refer to Section 7.2.

## **10.3. MEASUREMENT EQUIPMENT USED**

Refer to Section 6.

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

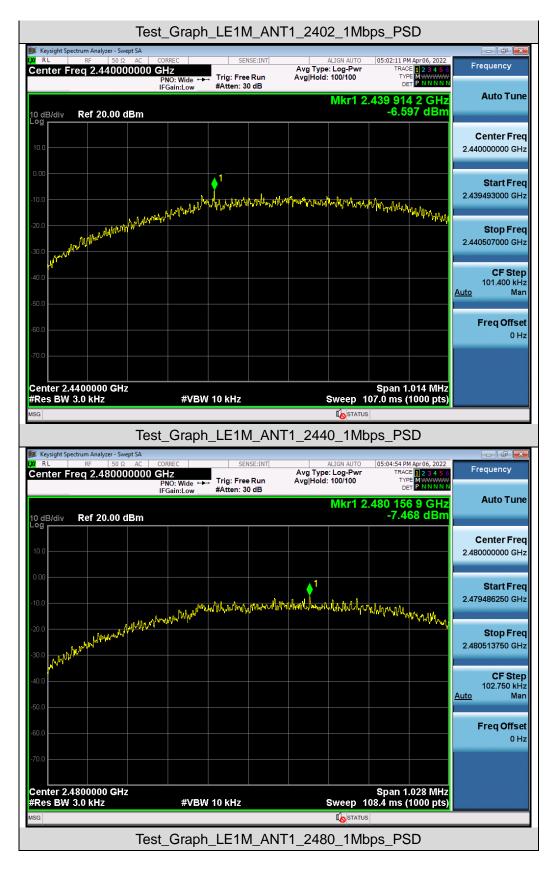
BLE GFSK 1Mbps:

Test Data of Conducted Output Power Spectral Density						
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail		
	2402	-7.835	<b>≤8</b>	Pass		
GFSK 1M	2440	-6.597	<b>≤8</b>	Pass		
	2480	-7.468	≪8	Pass		

#### Test Graphs of Conducted Output Power Spectral Density









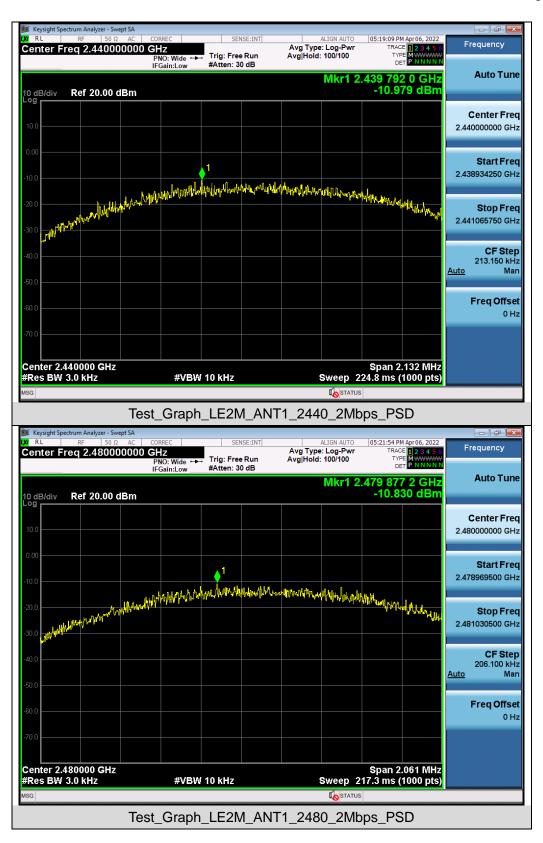
## BLE GFSK 2Mbps:

Test Data of Conducted Output Power Spectral Density						
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail		
	2402	-10.811	<b>≤8</b>	Pass		
GFSK 2M	2440	-10.979	<b>≤8</b>	Pass		
	2480	-10.830	≪8	Pass		

## Test Graphs of Conducted Output Power Spectral Density

Keysight Spectrum Analyzer - Sv		DRREC	SENSE:INT	ALIGN AUTO	05:10:20 PM Apr 06, 2022	
Center Freq 2.4020	P	NO: Wide ↔ Gain:Low		Avg Type: Log-Pwr Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
10 dB/div Ref 20.00	dBm			Mkr1 2	2.402 038 6 GHz -10.811 dBm	Auto Tun
10.0						Center Fre 2.402000000 GH
10.0		auth line fill a sure	1	หมือชียไหรคร	str	<b>Start Fre</b> 2.401012250 GF
10.0 20.0 30.0 MN <sup>34</sup> /MNMM/MNMM	W. W. AND	<sup>4</sup> Jalua al Ilia Ilia al Ilia 1	na waati be weee	and a second particular shifted	an managaran ang ang ang ang ang ang ang ang ang a	<b>Stop Fre</b> 2.402987750 G⊦
40.0						CF Ste 197.550 kł <u>Auto</u> Ma
50.0						Freq Offs 0 H
20.0 Center 2.4020000 GH	Iz				Span 1.976 MHz	
Res BW 3.0 kHz		#VBW	10 kHz	Sweep 2	208.3 ms (1000 pts) s	
	Test	_Graph	_LE2M_AN	IT1_2402_2MI	ops_PSD	







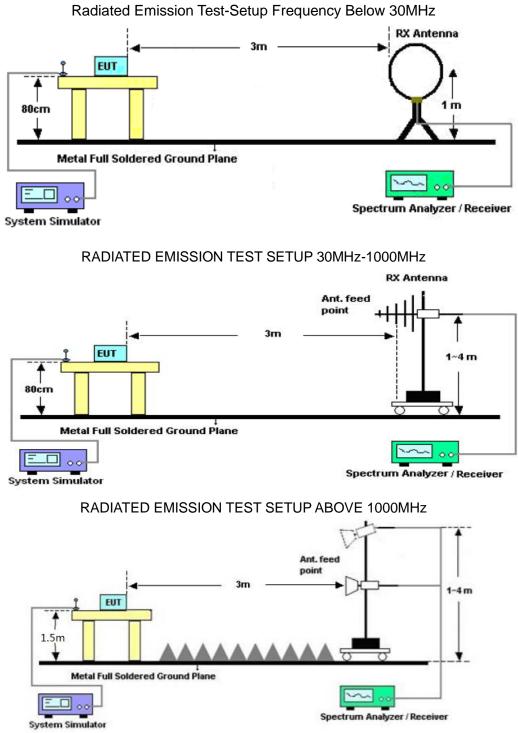
# **11. RADIATED EMISSION**

## **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 emission, 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.



## 11.2. TEST SETUP





## **11.3. LIMITS AND MEASUREMENT RESULT**

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.



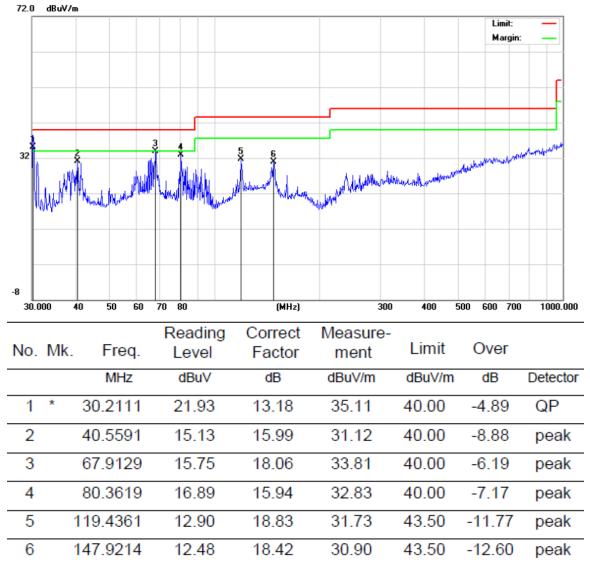
# BLE GFSK 1Mbps&BLE GFSK 2Mbps:

BLE GFSK 1Mbps&BLE GFSK 2Mbps: Radiated emission from 30MHz to 1000MHz							
EUT	Rock light		Model Name	SL9CI	L19600		
Temperature	25° C		Relative Humid	ity 55.4%			
Pressure	960hPa		Test Voltage	Norma	al Voltage		
Test Mode	Mode 2		Antenna	Horizo	ontal		
72.0 dBuV/m				Nardien Investigation of the second sec			
30.000 40 50	0 60 70 80	(MHz)	300 400	500 600 700	1000.000		
No. Mk. F	Reading req. Level	Correct N Factor	leasure- ment Limi	t Over			
Ν	MHz dBuV	dB o	IBuV/m dBuV	/m dB	Detector		
1 * 65.8	3031 16.15	17.85	34.00 40.00	0 -6.00	peak		
2 80.3	3619 19.36	14.01	33.37 40.00	) -6.63	peak		
3 96.7	7749 18.94	15.76	34.70 43.50	0 -8.80	peak		
4 261.9	9753 17.80	17.57	35.37 46.00	0 -10.63	peak		
5 284.9	9767 15.39	21.06	36.45 46.00	) -9.55	peak		
6 326.7	7395 14.68	24.24	38.92 46.00	) -7.08	peak		

## **RESULT: PASS**



EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical



# RESULT: PASS Note:

1. Factor=Antenna Factor + Cable loss, Over=Measurement-Limit.

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



#### BLE GFSK 1Mbps&BLE GFSK 1Mbps:

Radiated emission above 1GHz					
EUT	Rock light	Model Name	SL9CIL19600		
Temperature	25° C	Relative Humidity	55.4%		
Pressure	960hPa	Test Voltage	Normal Voltage		
Test Mode	Mode 1	Antenna	Horizontal		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	43.85	0.08	43.93	74	-30.07	peak
4804.000	35.62	0.08	35.7	54	-18.3	AVG
7206.000	38.41	2.21	40.62	74	-33.38	peak
7206.000	31.22	2.21	33.43	54	-20.57	AVG
lemark:						

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

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	- Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
4804.000	44.95	0.08	45.03	74	-28.97	peak
4804.000	34.62	0.08	34.7	54	-19.3	AVG
7206.000	38.45	2.21	40.66	74	-33.34	peak
7206.000	30.53	2.21	32.74	54	-21.26	AVG
mark:						
mark: tor = Antenr	na Factor + Cable	e Loss – Pre-	amplifier.			



#### Report No.: AGC13808220304FE01 Page 47 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
4880.000	44.42	0.14	44.56	74	-29.44	peak	
4880.000	35.59	0.14	35.73	54	-18.27	AVG	
7320.000	39.63	2.36	41.99	74	-32.01	peak	
7320.000	31.78	2.36	34.14	54	-19.86	AVG	
Remark:			1		!	- <b>I</b>	
actor = Anter	nna Factor + Cabl	e Loss – Pre-a	amplifier.				

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
45.64	0.14	45.78	74	-28.22	peak
38.49	0.14	38.63	54	-15.37	AVG
40.75	2.36	43.11	74	-30.89	peak
32.68	2.36	35.04	54	-18.96	AVG
	(dBµV) 45.64 38.49 40.75	(dBµV)         (dB)           45.64         0.14           38.49         0.14           40.75         2.36	(dBµV)         (dB)         (dBµV/m)           45.64         0.14         45.78           38.49         0.14         38.63           40.75         2.36         43.11	(dBµV)         (dB)         (dBµV/m)         (dBµV/m)           45.64         0.14         45.78         74           38.49         0.14         38.63         54           40.75         2.36         43.11         74	(dBµV)         (dB)         (dBµV/m)         (dBµV/m)         (dB)           45.64         0.14         45.78         74         -28.22           38.49         0.14         38.63         54         -15.37           40.75         2.36         43.11         74         -30.89



#### Report No.: AGC13808220304FE01 Page 48 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	44.95	0.22	45.17	74	-28.83	peak
4960.000	35.74	0.22	35.96	54	-18.04	AVG
7440.000	38.52	2.64	41.16	74	-32.84	peak
7440.000	29.63	2.64	32.27	54	-21.73	AVG
Remark:	••				•	-
actor = Anter	na Factor + Cabl	e Loss – Pre-	amplifier.			

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	42.63	0.22	42.85	74	-31.15	peak
4960.000	34.41	0.22	34.63	54	-19.37	AVG
7440.000	38.52	2.64	41.16	74	-32.84	peak
7440.000	29.75	2.64	32.39	54	-21.61	AVG
lemark:						
actor = Anter	nna Factor + Cable	Loss – Pre-	amplifier.			

#### **RESULT: PASS**

#### Note:

The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

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

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

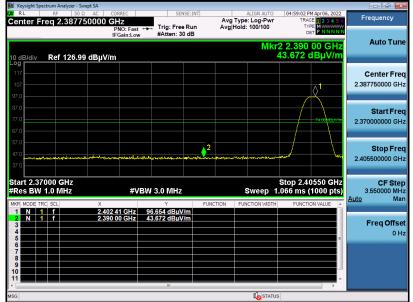


#### **BLE GFSK 1Mbps:**

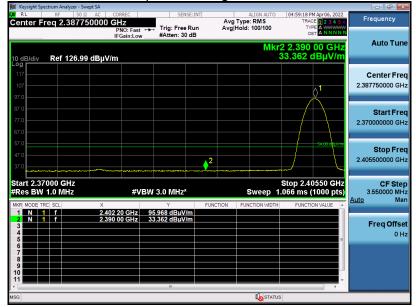
#### Test result for band edge emission at restricted bands

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

#### Test Graph for Peak Measurement



Test Graph for Average Measurement



# **RESULT: PASS**

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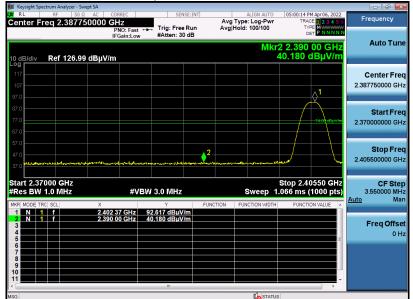
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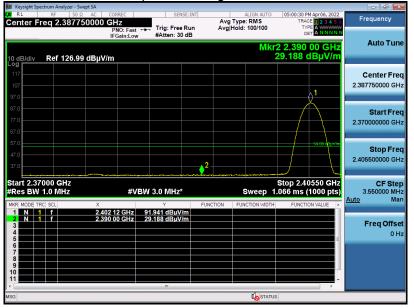
#### Report No.: AGC13808220304FE01 Page 50 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



## **RESULT: PASS**

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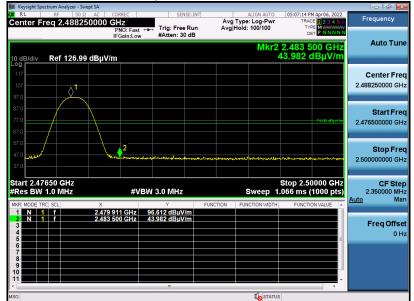
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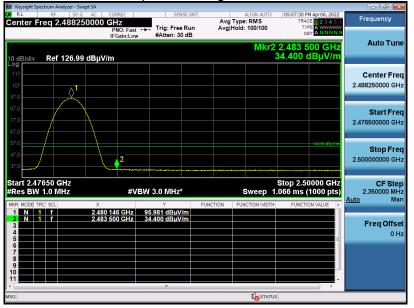
#### Report No.: AGC13808220304FE01 Page 51 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



## **RESULT: PASS**

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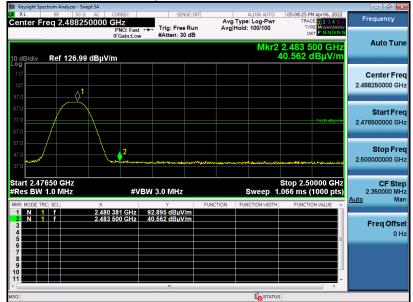
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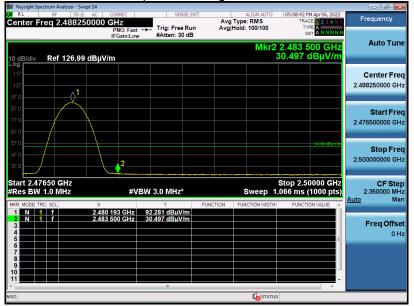
#### Report No.: AGC13808220304FE01 Page 52 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



## **RESULT: PASS**

Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer.

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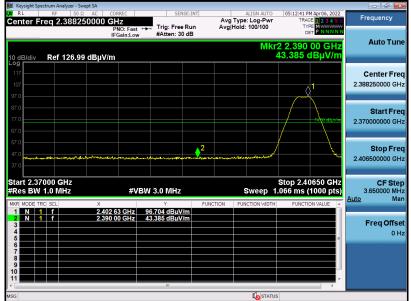


#### BLE GFSK 2Mbps:

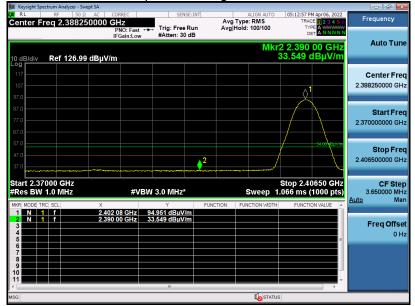
#### Test result for band edge emission at restricted bands

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

#### Test Graph for Peak Measurement



Test Graph for Average Measurement



# **RESULT: PASS**

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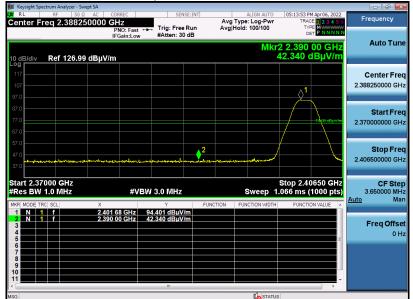
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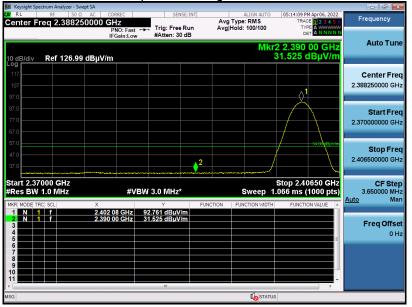
#### Report No.: AGC13808220304FE01 Page 54 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



## **RESULT: PASS**

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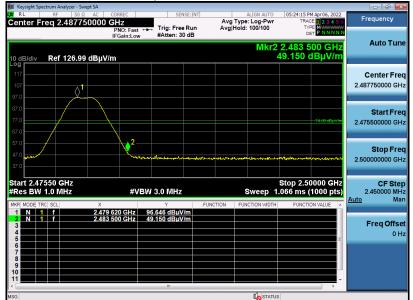
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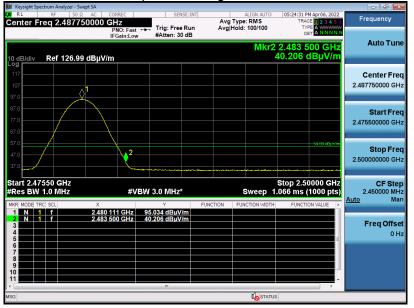
#### Report No.: AGC13808220304FE01 Page 55 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



**RESULT: PASS** 

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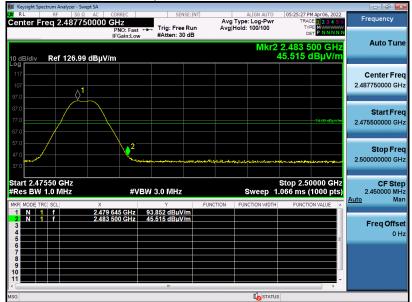
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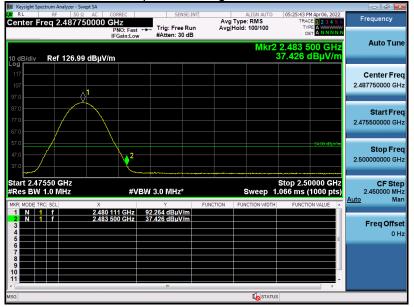
#### Report No.: AGC13808220304FE01 Page 56 of 57

EUT	Rock light	Model Name	SL9CIL19600
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



## **RESULT: PASS**

Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer.



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

Refer to the Report No.: AGC13808220304AP01

APPENDIX B: PHOTOGRAPHS OF EUT Refer to the Report No.: AGC13808220304AP02

----END OF REPORT----



# Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.