

FCC Test Report

Report No.: AGC00137231007FR01

FCC ID	:	2AJIV-EF1160
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Creative Aurvana Ace 2
BRAND NAME	:	CREATIVE
MODEL NAME	:	EF1160
APPLICANT	:	Creative Labs Pte. Ltd.
DATE OF ISSUE	:	Nov. 01, 2023
STANDARD(S)	:	FCC Part 15 Subpart C §15.247
REPORT VERSION	:	V1.0







Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 01, 2023	Valid	Initial Release



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1. General Information

Applicant	Creative Labs Pte. Ltd.
Address	31 International Business Park, #03-01, Singapore 609921, Singapore
Manufacturer	Creative Labs Pte. Ltd.
Address	31 International Business Park, #03-01, Singapore 609921, Singapore
Factory	N/A
Address	N/A
Product Designation	Creative Aurvana Ace 2
Brand Name	CREATIVE
Test Model	EF1160
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Oct. 19, 2023
Date of Test	Oct. 19, 2023 to Nov. 01, 2023
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-BLE-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Thea Yuang Prepared By Thea Huang Nov. 01, 2023 (Project Engineer) **Reviewed By** Calvin Liu Nov. 01, 2023 (Reviewer)

Approved By

Max Zhang (Authorized Officer)

Nov. 01, 2023



2. Product Information

2.1 Product Technical Description

Frequency Band	2400MHz-2483.5MHz
Operation Frequency Range	2402MHz-2480MHz
Bluetooth Version	V5.3
Modulation Type	BLE GFSK 1Mbps GFSK 2Mbps
Number of channels	40
Carrier Frequency of Each Channel	40 Channel (37 hopping + 3 advertising channel)
Channel Separation	2 MHz
Maximum Transmitter Power	BLE GFSK 1Mbps: 4.500dBm (2.818mW) BLE GFSK 2Mbps: 4.528dBm (2.837mW)
Hardware Version	V1.0
Software Version	V0.1.5
Antenna Designation	FPC Antenna
Antenna Gain	Left headset: 2.1dBi; Right headset: 2.26dBi;
Power Supply	DC 3.7V by battery or DC 5V by adapter
Adapter Information	N/A
Note:	

Note:

The EUT comprises left and right channel headsets, both are the same. The RF output power of each earphone has been tested and recorded in the report. For other test items, due to the higher power, the left headset has been tested and recorded in this report, which is the worst case.

2.2 Test Frequency List

Frequency Band	Channel Number	Frequency		
	0	2402 MHz		
	1	2404 MHz		
2400~2483.5MHz		:		
	19	2440MHz		
		:		
	38	2478 MHz		
	39	2480 MHz		
Note: $f = 2402 + 2*k$ MHz, $k = 0,, 39$ f is the operating frequency (MHz) k is the operating channel.				



2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2AJIV-EF1160**, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title		
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations		
2	FCC 47 CFR Part 15	Radio Frequency Devices		
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices		
4	KDB 558074 D01 15.247 Meas Guidance v05r02	Guidance for compliance measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum system, and Hybrid system devices operating under Section 15.247 of the FCC rules		

2.5 Special Accessories

Not available for this EUT intended for grant.

2.6 Equipment Modifications

Not available for this EUT intended for grant.

2.7 Antenna Requirement

Standard Requirement

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

EUT Antenna:

The non-detachable antenna inside the device cannot be replaced by the user at will.



3. Test Environment

3.1 Address of the Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



3.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106
Power supply	

3.4 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	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
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 = ±2 %
Uncertainty of Occupied Channel Bandwidth	U _c = ±2 %



3.5 List of Equipment Use

● R	RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
\boxtimes	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31	
\boxtimes	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2023-03-03	2024-03-02	
	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2023-03-03	2024-03-02	
\boxtimes	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	
\boxtimes	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A	
\boxtimes	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A	
• R	Radiated Spurious Emission							

• +	Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-18	2024-02-17	
\square	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02	
\square	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31	
\boxtimes	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11	
\boxtimes	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10	
\boxtimes	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22	
\square	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23	
\square	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03	
\bowtie	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2023-06-01	2024-05-31	
	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	
	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	

• A	AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02	
	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024-06-02	
	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08	



• Tes	Test Software						
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information		
	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71		
\boxtimes	AGC-EM-S003	RE-Test System	FARA	EZ-EMC	VRA-03A		
	AGC-ER-S012	BT/WIFI-Test System	Tonscend	JS1120-2	2.6		
	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0		



4.System Test Configuration

4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Radiated Emission Configure:



Conducted Emission Configure:

EUT

4.4 Equipment Used In Tested System

The following peripheral devices and interface cables were connected during the measurement:

☐ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Specification Information	Note
1	Control Box	QUALCOMM TRBI200	N/A	AE
2	Xiaomi Phone	MI 10	N/A	AE

Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	ID or Specification	Note
1	Creative Aurvana Ace 2	EF1160	2AJIV-EF1160	EUT



4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203&15.247(b)(4)	Antenna Equipment	Pass
2	§15.247 (b)(1)	RF Output Power	Pass
3	§15.247 (a)(1)	6 dB Bandwidth	Pass
4	§15.247 (e)	Power Spectral Density	Pass
4	§15.247 (d)	Conducted Band Edge and Out-of-Band Emissions	Pass
5	§15.209	Radiated Emission& Band Edge	Pass
6	§15.207	AC Power Line Conducted Emission	Not applicable

Note: The BT function cannot transmit when charging.



5. Description of Test Modes

	Summary Table of Test Cases
	Data Rate / Modulation
Test Item	Bluetooth – LE(1Mbps/2Mbps) / GFSK
Test Item Radiated & Conducted Test Cases AC Conducted Emission	Bluetooth – LE(1Mbps/2Mbps) / GFSK Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps(Battery powered) Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps(Battery powered) Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps(Battery powered) Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps(Battery powered) Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps(Battery powered) Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps(Battery powered)
 The battery is full-cha For Radiated Emission 	worst case was recorded in the report, if no other cases. my 3 axis were chosen for testing for each applicable mode. nethod, a temporary antenna connector is provided by the manufacture. Software Setting Diagram Test Commands Test Arguments Test A



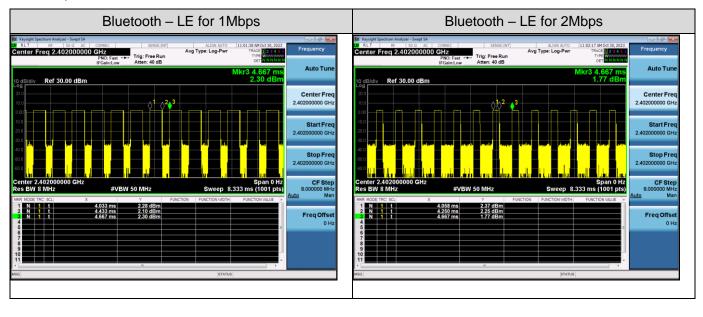
6. Duty Cycle Measurement

The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Peak. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Operating mode	T(µs)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)
BLE_1Mbps	400	63.09%	2.0	2.5
BLE_2Mbps	192	31.53%	5.01	5.2

Remark:

2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value



The test plots as follows:

^{1.} Duty Cycle factor = 10 * log (1/ Duty cycle)



7. RF Output Power Measurement

7.1 Provisions Applicable

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W.

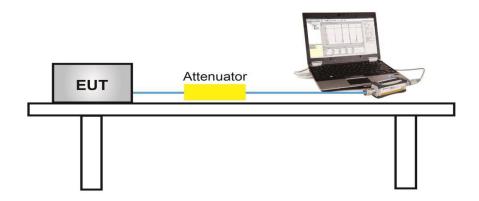
7.2 Measurement Procedure

For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.2 Method Integrated band power:

- 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.
- 8. 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.
- For Average power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G:
- 1. The RF output of EUT was connected to the power meter by RF cable and attenuator.
- 2. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power and record the results in the test report.

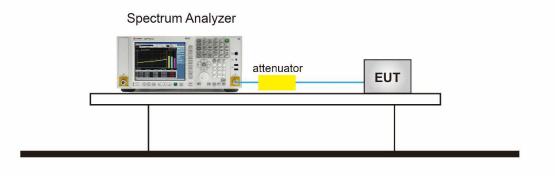
7.3 Measurement Setup (Block Diagram of Configuration)

⊠For Average power test setup





For peak power test setup



7.4 Measurement Result

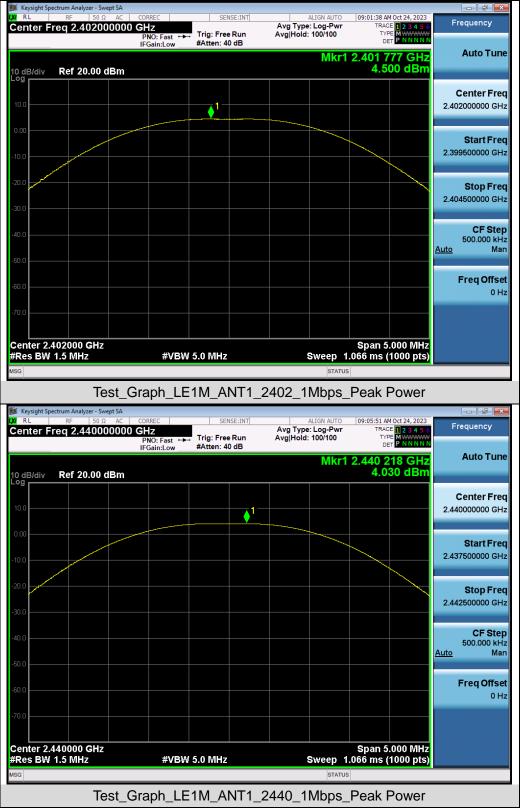
Left headset:

Test Data of Conducted Output Power						
Test Mode	Test Frequency (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail		
GFSK_1Mbps	2402	4.500	≤30	Pass		
	2440	4.030	≤30	Pass		
	2480	3.396	≤30	Pass		
	2402	4.528	≤30	Pass		
GFSK_2Mbps	2440	4.071	≤30	Pass		
	2480	3.439	≤30	Pass		

Test Result of Average Output Power (Reporting Only)

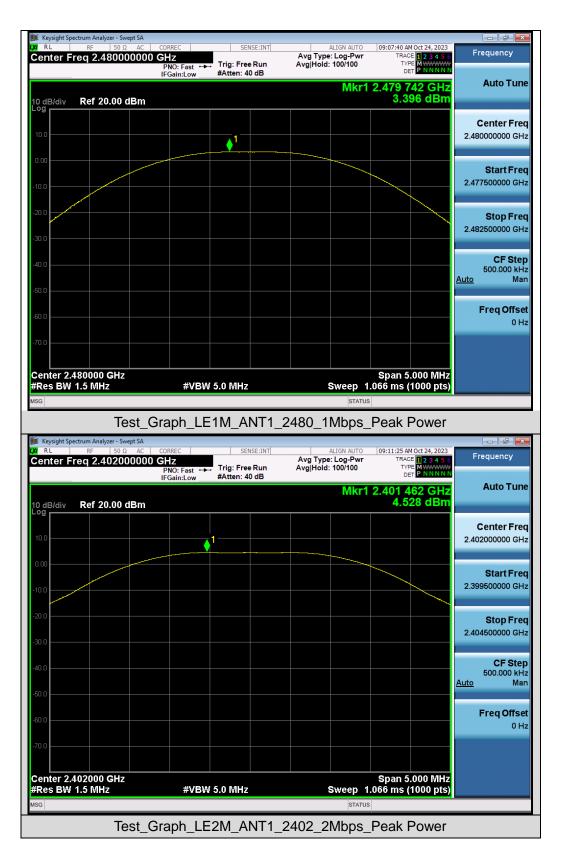
Test Data of Conducted Output Power					
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail	
	2402	2.285	≤30	Pass	
GFSK_1Mbps	2440	2.147	≤30	Pass	
	2480	1.642	≤30	Pass	
	2402	2.451	≤30	Pass	
GFSK_2Mbps	2440	2.235	≤30	Pass	
	2480	1.586	≤30	Pass	



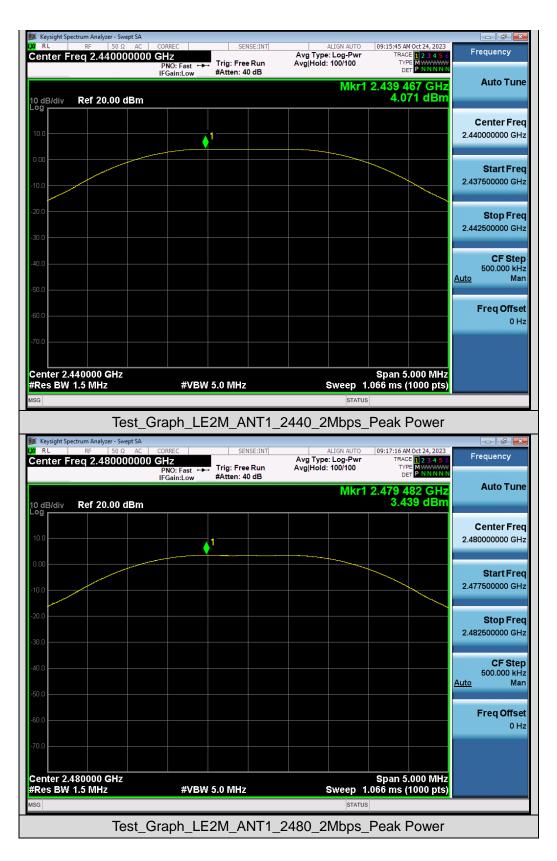


Test Graphs of Conducted Output Power











Right headset:

Test Data of Conducted Output Power					
Test Mode	Test Frequency (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2402	2.264	≤30	Pass	
GFSK_1Mbps	2440	1.863	≤30	Pass	
	2480	1.603	≤30	Pass	
	2402	2.324	≤30	Pass	
GFSK_2Mbps	2440	1.852	≤30	Pass	
	2480	1.613	≤30	Pass	

Test Result of Average Output Power (Reporting Only)

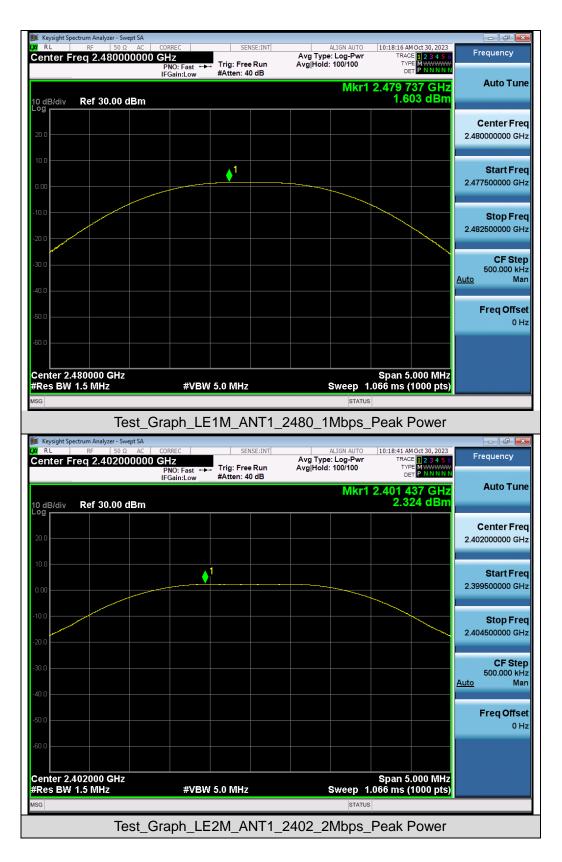
Test Data of Conducted Output Power						
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail		
GFSK_1Mbps	2402	0.566	≤30	Pass		
	2440	-1.412	≤30	Pass		
	2480	-1.573	≤30	Pass		
	2402	0.429	≤30	Pass		
GFSK_2Mbps	2440	-1.461	≤30	Pass		
	2480	-1.355	≤30	Pass		





Test Graphs of Conducted Output Power











8. 6dB Bandwidth Measurement

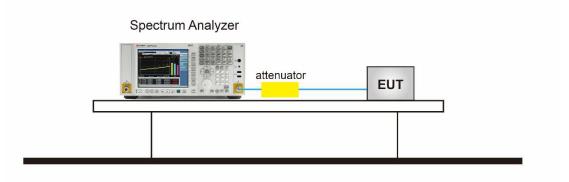
8.1 Provisions Applicable

The minimum 6 dB bandwidth shall be 500 kHz.

8.2 Measurement Procedure

- 1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
- For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
- 6. Measure and record the results in the test report.

8.3 Measurement Setup (Block Diagram of Configuration)

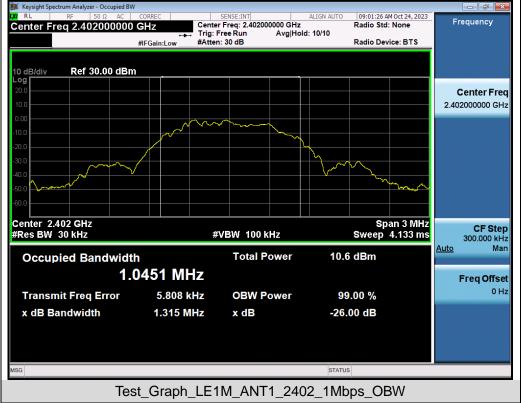




8.4 Measurement Results

Test Data of Occupied Bandwidth and DTS Bandwidth						
Test Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	DTS BW (MHz)	DTS BW Limits	Pass or Fail	
GFSK_1Mbps	2402	1.045	0.720	≥0.5	Pass	
	2440	1.045	0.714	≥0.5	Pass	
	2480	1.043	0.713	≥0.5	Pass	
GFSK_2Mbps	2402	2.057	1.212	≥0.5	Pass	
	2440	2.056	1.211	≥0.5	Pass	
	2480	2.055	1.212	≥0.5	Pass	

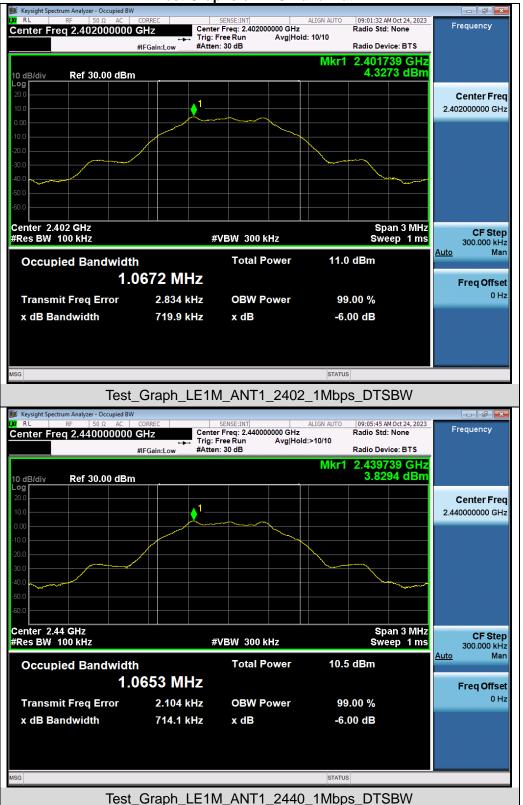
Test Graphs of Occupied Bandwidth





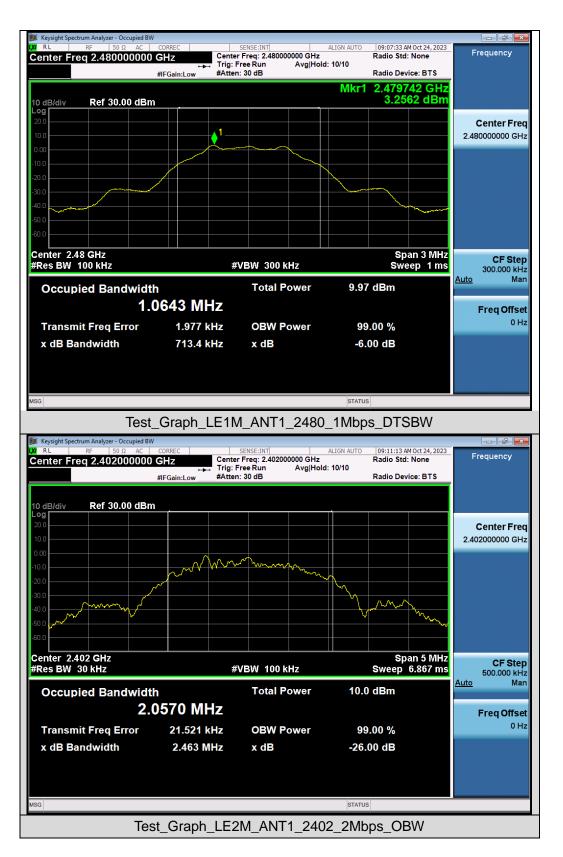






Test Graphs of DTS Bandwidth







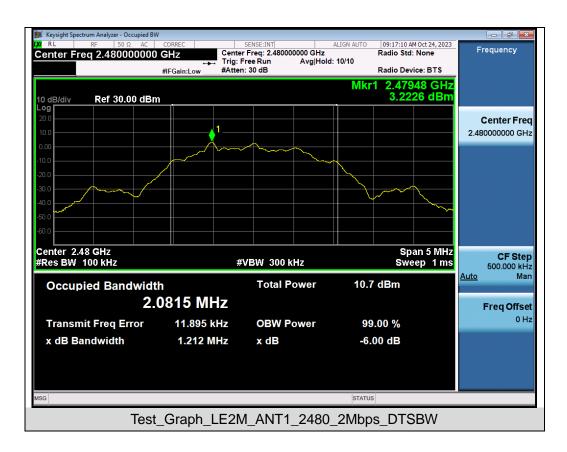






Test Graphs of DTS Bandwidth







9. Power Spectral Density Measurement

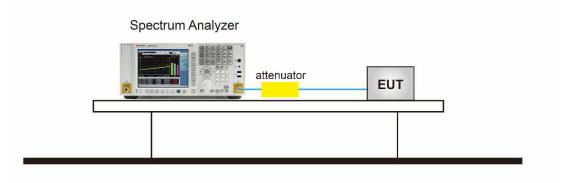
9.1 Provisions Applicable

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

9.2 Measurement Procedure

- 1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz in order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.
- The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

9.3 Measurement Setup (Block Diagram of Configuration)

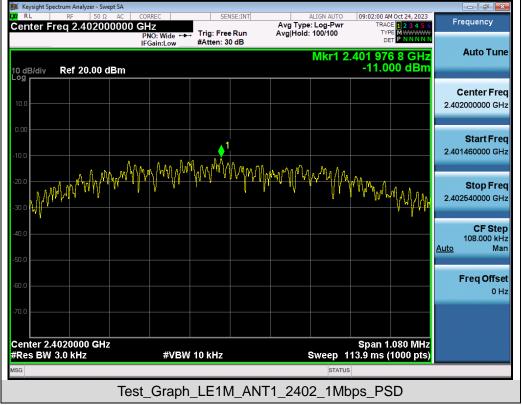




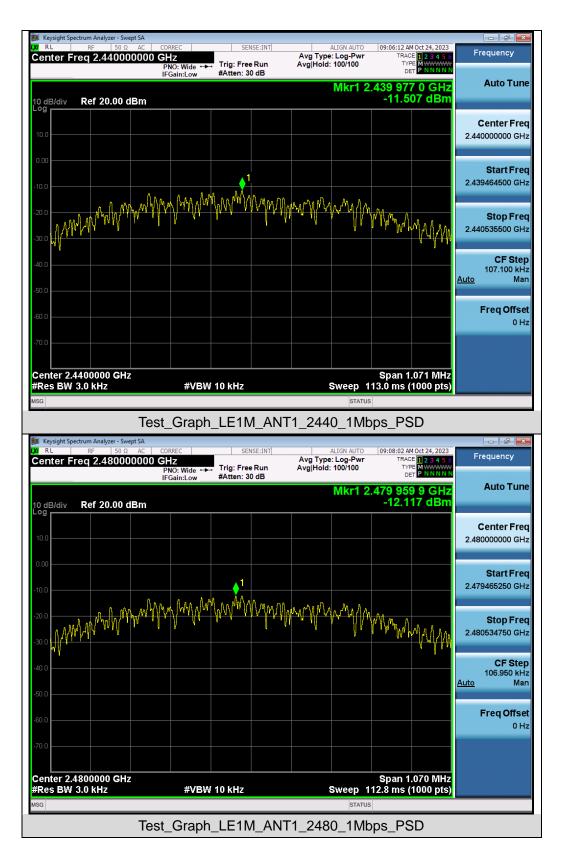
9.4 Measurement Results

Test Data of Conducted Output Power Spectral Density				
Test Mode	Test Frequency (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail
GFSK_1Mbps	2402	-11.000	≤8	Pass
	2440	-11.507	≤8	Pass
	2480	-12.117	≤8	Pass
GFSK_2Mbps	2402	-14.485	≤8	Pass
	2440	-14.994	≤8	Pass
	2480	-15.551	≤8	Pass

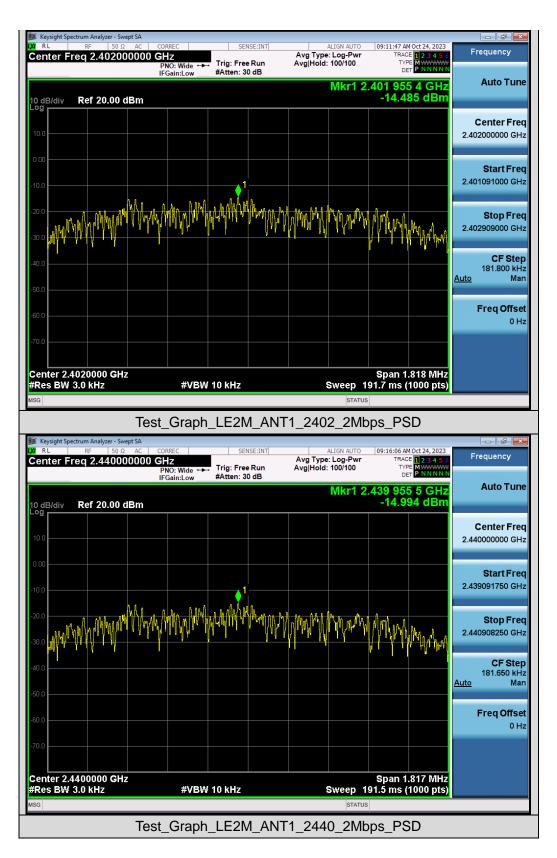
Test Graphs of Conducted Output Power Spectral Density



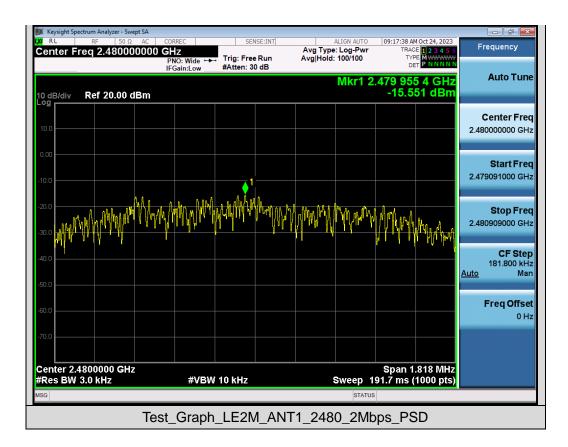
















10. Conducted Band Edge And Out-of-Band Emissions

10.1 Provisions Applicable

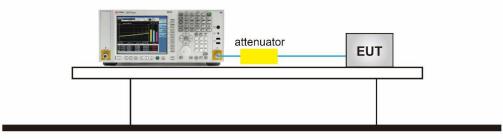
The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure.

10.2 Measurement Procedure

- Reference level measurement
- 1. Set instrument center frequency to DTS channel center frequency
- 2. Set the span to \geq 1.5 times the DTS bandwidth
- 3. Set the RBW = 100 kHz
- 4. Set the VBW \geq 3 x RBW
- 5. Detector = peak
- 6. Sweep time = auto couple
- 7. Trace mode = max hold
- 8. Allow trace to fully stabilize
- Emission level measurement
- 1. Set the center frequency and span to encompass frequency range to be measured
- 2. RBW = 100kHz
- 3. VBW = 300kHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

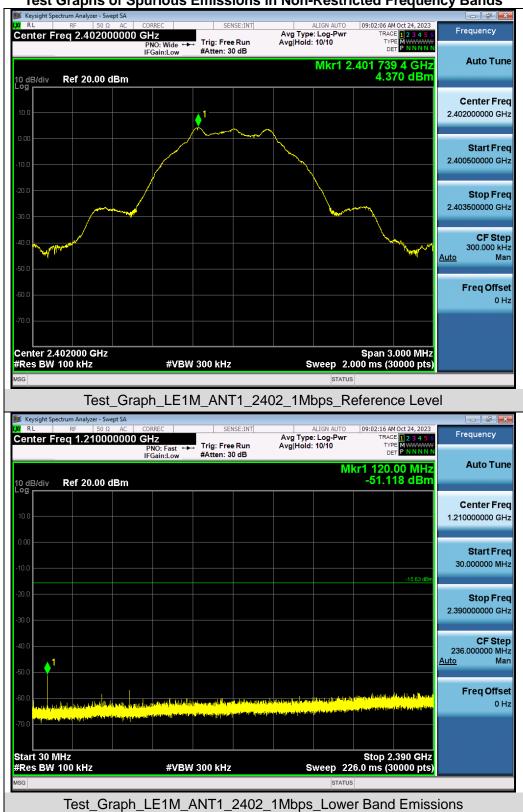
10.3 Measurement Setup (Block Diagram of Configuration)

Spectrum Analyzer





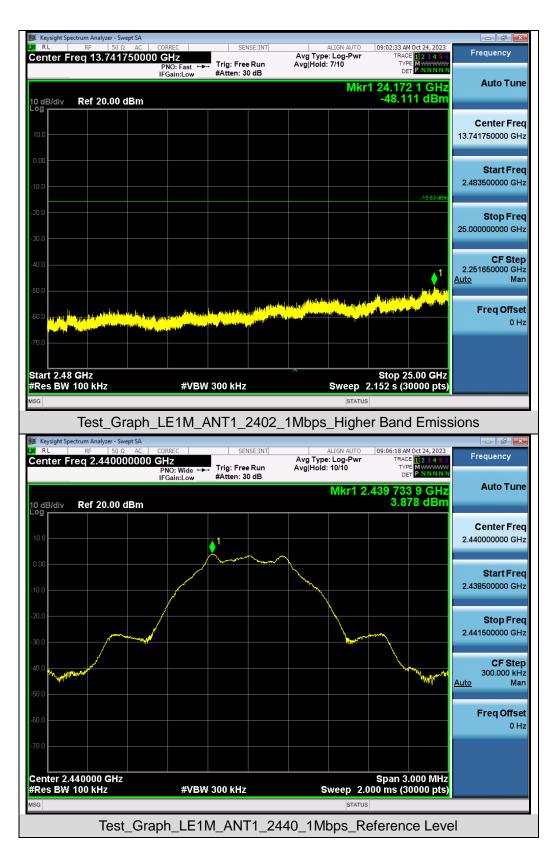
10.4 Measurement Results



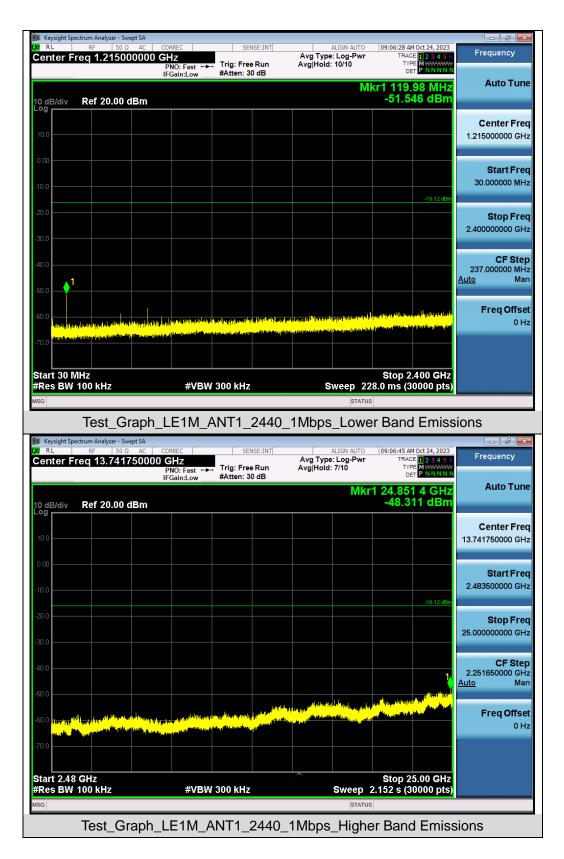
Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

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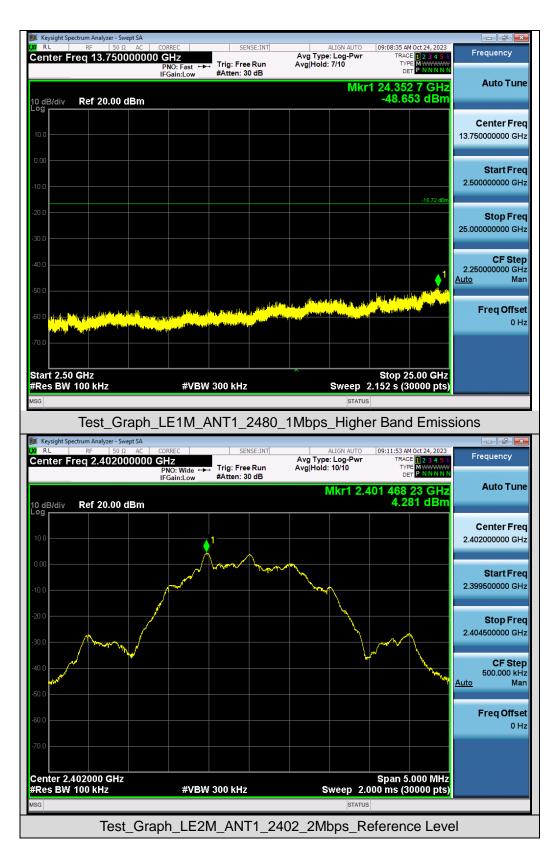




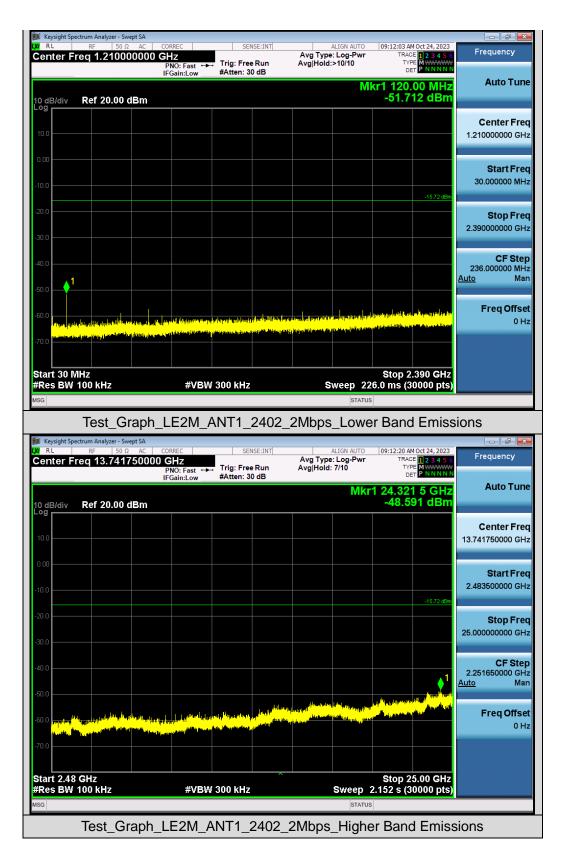








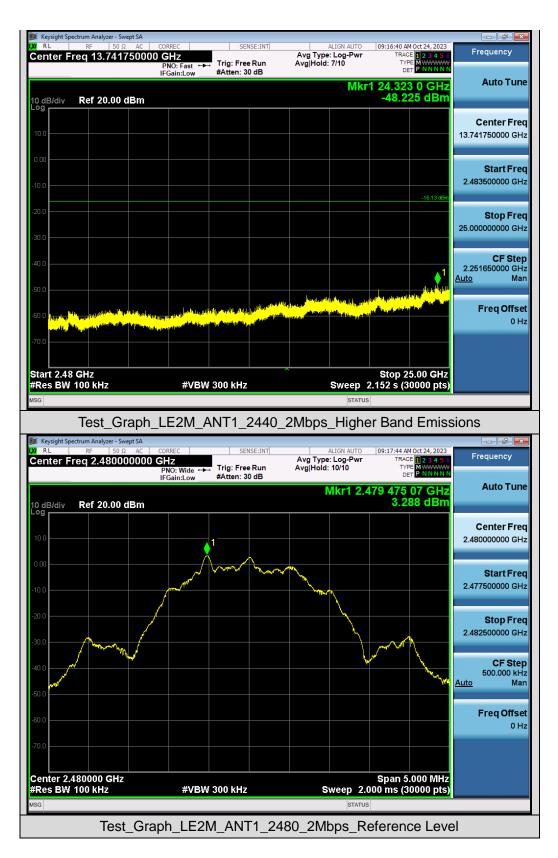




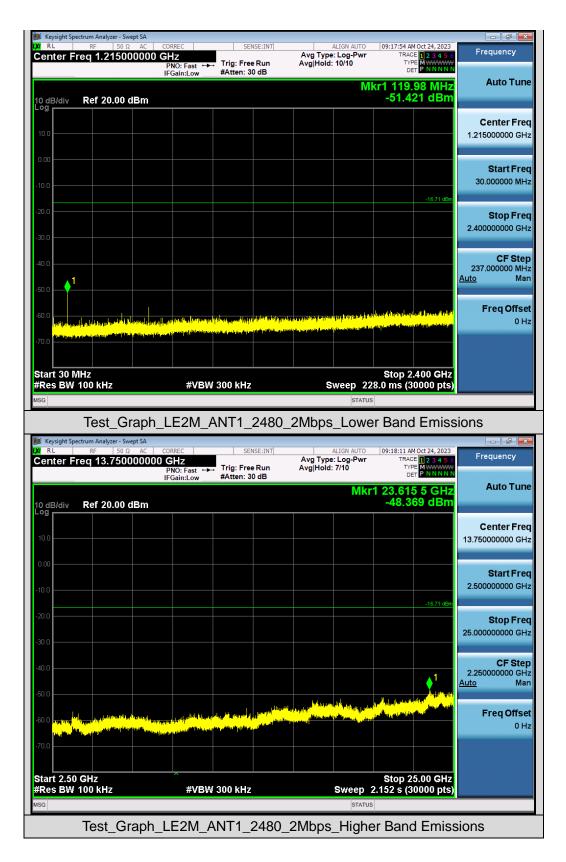




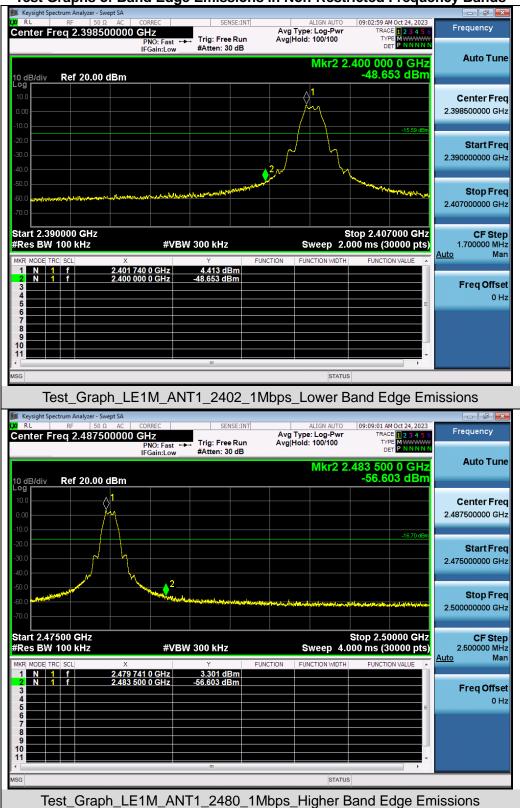












Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands







11. Radiated Spurious Emission

11.1 Measurement Limit

FCC Part 15.209 Limit in the below table 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.

11.2 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.

Any rep Ashang alternative b(provided pther, transmitter aloperates a forril page in than out of the seconds) e or bin cases in where is the 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 15 days 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.



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.

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

Spectrum 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
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



• Quasi-Peak Measurements below 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. Span was set greater than 1MHz
- 3. RBW = as shown in the table above
- 4. Detector = CISPR quasi-peak
- 5. Sweep time = auto couple
- 6. Trace was allowed to stabilize

Peak Measurements above 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

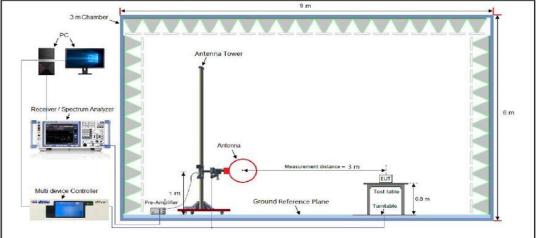
<u>Average Measurements above 1GHz (Method VB)</u>

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW setting requirements are as follows:
- 4. If the EUT is configured to transmit with duty cycle \ge 98%, set VBW = 10 Hz.
- 5. If the EUT duty cycle is < 98%, set VBW \ge 1/T. T is the minimum transmission duration.
- 6. Detector = Peak
- 7. Sweep time = auto
- 8. Trace mode = max hold
- 8. Trace was allowed to stabilize

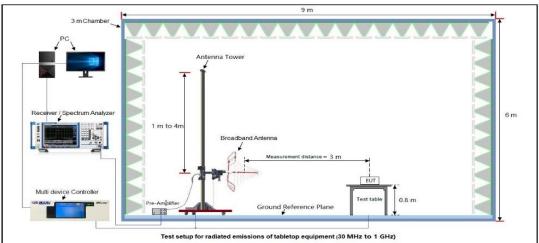


11.3 Measurement Setup (Block Diagram of Configuration)

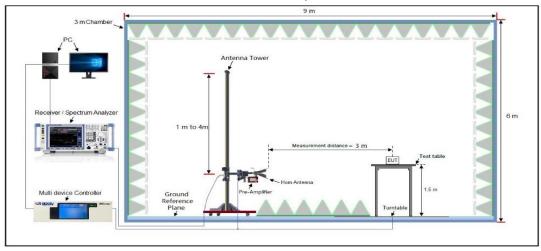




Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz



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 Attestation of Global Compliance(Shenzhen)Co., Ltd

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 Tel: +86-755 2523 4088
 E-mail: agc@agccert.com

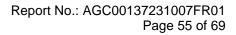


11.4 Measurement Result

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.

		Radia	ted Emiss	ion Test Res	ults at 30MHz	z-1GHz		
EUT Name	Cre	Creative Aurvana Ace 2 Model Name			EF1160			
Temperatu	re 25	25℃ Relative Humidity			67%			
Pressure	960	OhPa			Test Volta	age	Normal Vo	ltage
Test Mode	Мо	de 4			Antenna	Polarity	Horizontal	
	72.0 dBuV/	'n						
	32 	40 50 60 70	2 	(MHz)	300	3		00
Final Data							-	
	⁻ req. MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1 43	8.0504	18.99	13.69	40.00	21.01	100	80	Horizontal
2 10	7.5100	21.81	16.27	43.50	21.69	100	150	Horizontal
3 44	7.9821	30.55	24.82	46.00	15.45	100	90	Horizontal
4 52	0.8881	30.78	25.14	46.00	15.22	100	220	Horizontal
5 62	0.7096	31.20	25.13	46.00	14.8	100	110	Horizontal
6 89	6.9964	37.34	31.42	46.00	8.66	100	140	Horizontal





			Radia	ted Emiss	ion Test Res	ults at 30I	MHz-1GHz		
EUT Na	ame	Creative Aurvana Ace 2			Model	Model Name		EF1160	
Tempe	rature	25℃			Relati	ve Humidity	67%		
Pressu	re	960h	Pa			Test V	oltage	Normal Vo	ltage
Test M	ode	Mode	e 4			Anten	na Polarity	Vertical	
	72.0	dBu∀/m							
	-8 30.00	M.M.		80	(MHz)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Annal and	Limit: Margin:	00
Final D	ata List								
NO.	Freq. [MHz]		Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.154	2	22.69	16.92	40.00	17.31	100	160	Vertical
2	63.982	28	23.85	17.06	40.00	16.15	100	170	Vertical
3	145.86	11	25.20	18.20	43.50	18.3	100	90	Vertical
4	447.98	22	32.30	25.74	46.00	13.7	100	220	Vertical
5	672.84	44	35.12	27.63	46.00	10.88	100	160	Vertical
6	948.76	10	37.34	30.65	46.00	8.66	100	140	Vertical

RESULT: Pass

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

2. All test modes had been pre-tested. The mode 4 is the worst case and recorded in the report.



UT Name		Creative Aurvana Ace 2			Mode	I Name	EF1160	
		Clealive A	uivalla ACE 2		woue			
emperature			Relative Humidity		67%	67%		
ressure			/oltage	Normal V	oltage			
est Mode		Mode 4			Anter	nna Polarity	Horizonta	I
Frequency	Meter	r Reading	Factor	Emissio	n Level	Limits	Margin	Value Type
(MHz)	(0	dBµV)	(dB)	(dBµ∖	//m)	(dBµV/m)	(dB)	value Type
4804.000	4	46.85	0.08	46.9	93	74	-27.07	peak
4804.000	3	37.47	0.08	37.5	55	54	-16.45	AVG
7206.000	4	41.26	2.21	43.4	47	74	-30.53	peak
7206.000	3	32.31	2.21	34.5	52	54	-19.48	AVG
Remark: Factor = Anter	nna Fac	ctor + Cable	e Loss – Pre-a	amplifier.				
Factor = Anter		Creative A	e Loss – Pre-a urvana Ace 2	amplifier.		l Name	EF1160	
Factor = Anter				amplifier.	Relat	ive Humidity	67%	oltage
Factor = Anter		Creative A 25℃		amplifier.	Relat			oltage
Factor = Anter UT Name Temperature Pressure Test Mode		Creative A 25°C 960hPa Mode 4	urvana Ace 2		Relat Test V Anter	ive Humidity /oltage nna Polarity	67% Normal Vertical	oltage
Frequency	Meter	Creative A 25°C 960hPa Mode 4 r Reading	urvana Ace 2 Factor	Emissio	Relat Test V Anter	ive Humidity /oltage nna Polarity Limits	67% Normal V Vertical Margin	
Factor = Anter	Meter	Creative A 25°C 960hPa Mode 4	urvana Ace 2		Relat Test V Anter	ive Humidity /oltage nna Polarity	67% Normal Vertical	oltage Value Type
Frequency (MHz) 4804.000	Meter (d	Creative A 25°C 960hPa Mode 4 r Reading dBµV) 46.64	urvana Ace 2 Factor	Emission (dBµ\ 46.7	Relat Test V Anter n Level //m) 72	ive Humidity /oltage nna Polarity Limits	67% Normal Vertical Margin (dB) -27.28	- Value Type peak
Factor = Anter	Meter (d	Creative A 25℃ 960hPa Mode 4 r Reading dBµV)	urvana Ace 2 Factor (dB)	Emission (dBµ\	Relat Test V Anter n Level //m) 72	ive Humidity /oltage nna Polarity Limits (dBµV/m)	67% Normal Vertical Margin (dB)	Value Type peak AVG
Frequency (MHz) 4804.000		Creative A 25°C 960hPa Mode 4 r Reading dBµV) 46.64	urvana Ace 2 Factor (dB) 0.08	Emission (dBµ\ 46.7	Relat Test V Anter n Level //m) 72 49	ive Humidity /oltage nna Polarity Limits (dBµV/m) 74	67% Normal Vertical Margin (dB) -27.28	- Value Type peak
Frequency (MHz) 4804.000		Creative A 25°C 960hPa Mode 4 r Reading dBµV) 46.64 37.41	Factor (dB) 0.08 0.08	Emission (dBµ\ 46.7 37.4	Relat Test V Anter n Level //m) 72 49 59	ive Humidity /oltage nna Polarity Limits (dBµV/m) 74 54	67% Normal Vertical Vertical Margin (dB) -27.28 -16.51	Value Type peak AVG
Eactor = Anter		Creative A 25°C 960hPa Mode 4 r Reading dBµV) 46.64 37.41 41.38	Urvana Ace 2 Factor (dB) 0.08 0.08 2.21	Emission (dBµ\ 46.7 37.4 43.5	Relat Test V Anter n Level //m) 72 49 59	Limits (dBµV/m) 74 54 74	67% Normal Vertical Margin (dB) -27.28 -16.51 -30.41	Value Type peak AVG peak
Frequency (MHz) 4804.000 7206.000		Creative A 25°C 960hPa Mode 4 r Reading dBµV) 46.64 37.41 41.38	Urvana Ace 2 Factor (dB) 0.08 0.08 2.21	Emission (dBµ\ 46.7 37.4 43.5	Relat Test V Anter n Level //m) 72 49 59	Limits (dBµV/m) 74 54 74	67% Normal Vertical Margin (dB) -27.28 -16.51 -30.41	Value Type peak AVG peak

Radiated Emissions Test Results for Above 1GHz

RESULT: Pass



UT Name	Creative	Aurvana Ace	2 M	odel Name		EF1160)	
emperature	25 ℃		R	elative Humic	lity	67%		
ressure	960hPa		Те	Test Voltage		Normal Voltage		
est Mode	Mode 5		A	ntenna Polari	ty	Horizor	ntal	
Frequency	Meter Reading	Factor	Emission Le	vel Limits		Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)		(dB)	value Type	
4880.000	45.45	0.14	45.59	74		-28.41	peak	
4880.000	37.51	0.14	37.65	54		-16.35	AVG	
7320.000	41.78	2.36	44.14	74		-29.86	peak	
7320.000	34.76	2.36	37.12	54		-16.88	AVG	
Remark:								
Factor = Anten	na Factor + Ca	able Loss – Pr	e-amplifier.					
UT Name	Creative	Aurvana Ace	2 M	odel Name		EF1160)	
emperature	25 ℃		R	elative Humic	lity	67%		
ressure	960hPa		Tes			Normal	Voltage	
est Mode	Mode 5		A	ntenna Polari	ty	Vertica		
Frequency	Veter Reading	Factor	Emission Level	Limits	M	argin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)		dB)	Value Type	
(11111-)	45.36	0.14	45.5	(dbµ1/////) 74	· ·	28.5	peak	
4880.000	10.00	0.14	37.66	54	-	6.34	AVG	
4880.000 4880.000	37.52							
4880.000	37.52 41.48		43.84	74	1	016	beak	
4880.000 7320.000	41.48	2.36	43.84	74 54		0.16	peak AVG	
4880.000			43.84 36.69	74 54		7.31	AVG	
4880.000 7320.000	41.48	2.36					•	

Radiated Emissions Test Results for Above 1GHz

RESULT: Pass



UT Name	Creative Au	Creative Aurvana Ace 2			Name	EF1160		
emperature	25 ℃			Relative Humidity		67%		
Pressure	960hPa			Test V	oltage	Normal V	Normal Voltage	
est Mode	Mode 6			Anten	na Polarity	Horizonta	al	
	·							
Frequency	Meter Reading	Factor	Emission	n Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV	//m)	(dBµV/m)	(dB)	value Type	
4960.000	46.94	0.22	47.1	6	74	-26.84	peak	
4960.000	36.58	0.22	36.8	3	54	-17.2	AVG	
7440.000	41.84	2.64	44.4	8	74	-29.52	peak	
7440.000	32.46	2.64	35.1	1	54	-18.9	AVG	
	<u> </u>	<u> </u>						
Remark:								
Factor = Anten	ina Factor + Cab	e Loss – Pre-	amplifier.					
UT Name	Creative Au	irvana Ace 2		Model	Name	EF1160		
emperature	25 ℃			Relativ	ve Humidity	67%		
			Test Voltage		Normal Voltage			
Pressure	960hPa			lest v	oltage	Normai v	oltage	
Pressure Test Mode	960hPa Mode 6				oltage na Polarity	Vertical	oltage	
est Mode	Mode 6	Factor		Anten	na Polarity	Vertical		
Frequency	Mode 6	Factor (dB)	Emission	Anten	na Polarity Limits	Vertical Margin		
Frequency (MHz)	Mode 6 Meter Reading (dBµV)	(dB)	Emission (dBµV	Anten n Level (m)	Limits (dBµV/m)	Vertical Margin (dB)	- Value Type	
Frequency (MHz) 4960.000	Mode 6 Meter Reading (dBµV) 46.84	(dB) 0.22	Emission (dBµV) 47.0	Anten n Level (/m)	Limits (dBµV/m) 74	Vertical Margin (dB) -26.94	- Value Type peak	
Frequency (MHz) 4960.000 4960.000	Mode 6 Meter Reading (dBµV) 46.84 36.76	(dB) 0.22 0.22	Emission (dBµV 47.0 36.9	Anten n Level 1/m) 16 18	Limits (dBµV/m) 74 54	Vertical Margin (dB) -26.94 -17.02	- Value Type peak AVG	
Frequency (MHz) 4960.000 4960.000 7440.000	Mode 6 Meter Reading (dBµV) 46.84 36.76 41.58	(dB) 0.22 0.22 2.64	Emission (dBµV 47.0 36.9 44.2	Anten n Level (/m) 16 18 12	Limits (dBμV/m) 74 54 74	Vertical Margin (dB) -26.94 -17.02 -29.78	- Value Type peak	
Frequency (MHz) 4960.000 4960.000	Mode 6 Meter Reading (dBµV) 46.84 36.76	(dB) 0.22 0.22	Emission (dBµV 47.0 36.9	Anten n Level //m) 16 18 12	Limits (dBµV/m) 74 54	Vertical Margin (dB) -26.94 -17.02	Value Type peak AVG peak	
Frequency (MHz) 4960.000 4960.000 7440.000	Mode 6 Meter Reading (dBµV) 46.84 36.76 41.58	(dB) 0.22 0.22 2.64	Emission (dBµV 47.0 36.9 44.2	Anten n Level //m) 16 18 12	Limits (dBμV/m) 74 54 74	Vertical Margin (dB) -26.94 -17.02 -29.78	Value Type peak AVG peak	

Radiated Emissions Test Results for Above 1GHz

RESULT: Pass

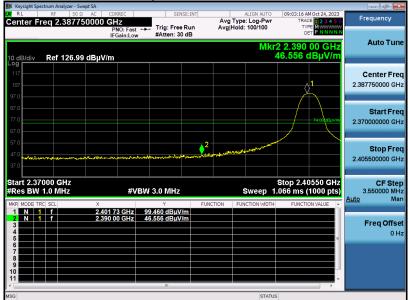
Note:

- 1. 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.
- 2. Factor = Antenna Factor + Cable loss Pre-amplifier gain, Margin = Emission Level-Limit.
- 3. The "Factor" value can be calculated automatically by software of measurement system.
- 4. All test modes had been tested. The BLE GFSK 2Mbps modulation is the worst case and recorded in the report.

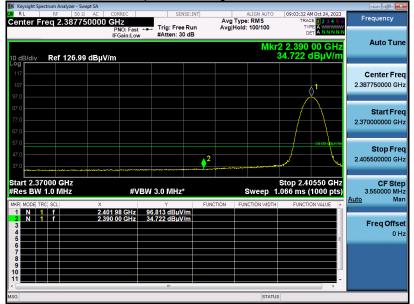


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna Polarity	Horizontal

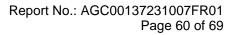
Test Graph for Peak Measurement



Test Graph for Average Measurement

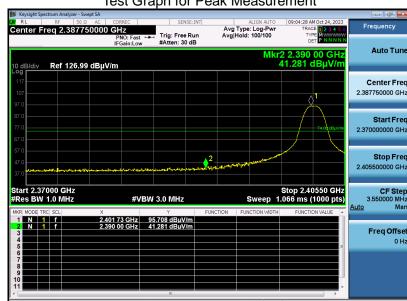


RESULT: Pass



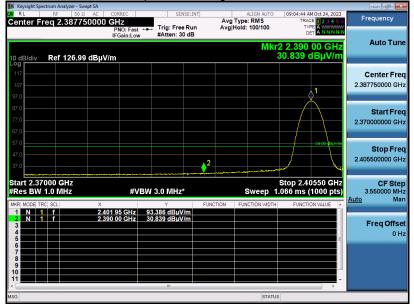


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna Polarity	Vertical

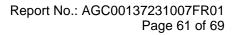


Test Graph for Peak Measurement

Test Graph for Average Measurement

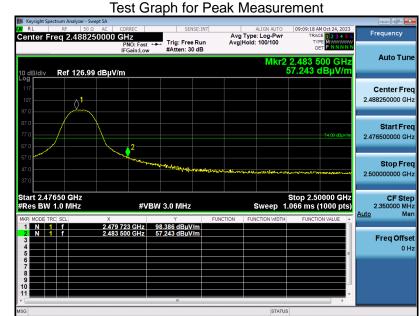


RESULT: Pass

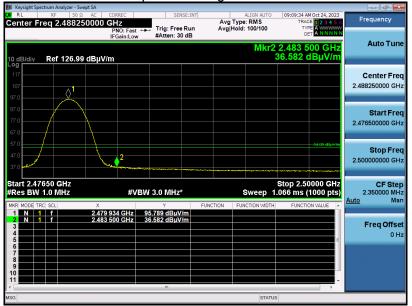




EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna Polarity	Horizontal



Test Graph for Average Measurement

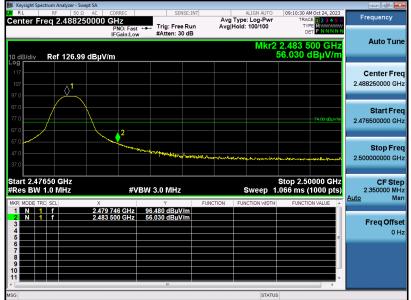


RESULT: Pass



EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna Polarity	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement

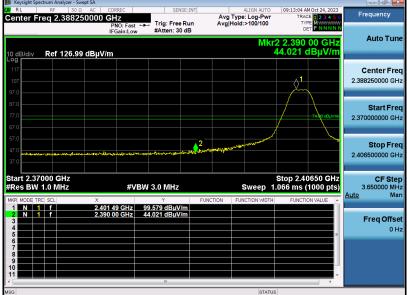


RESULT: Pass

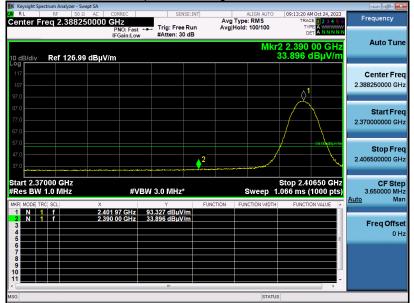


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna Polarity	Horizontal

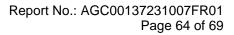
Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: Pass



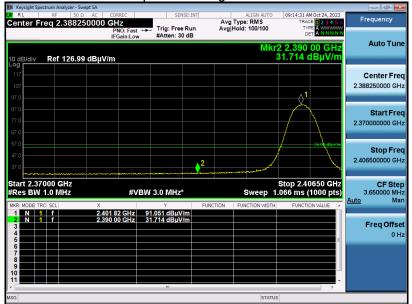


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna Polarity	Vertical

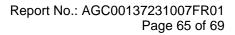


Test Graph for Peak Measurement

Test Graph for Average Measurement

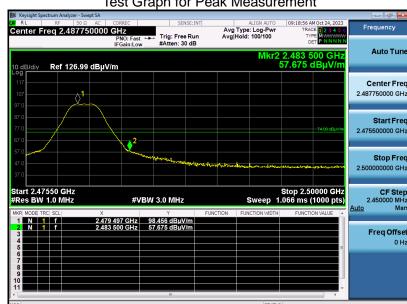


RESULT: Pass



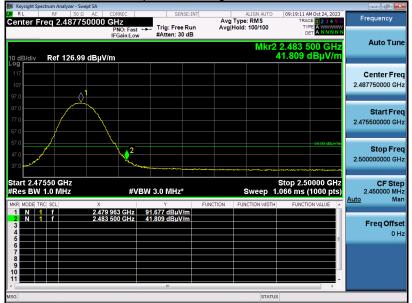


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25 ℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna Polarity	Horizontal



Test Graph for Peak Measurement

Test Graph for Average Measurement

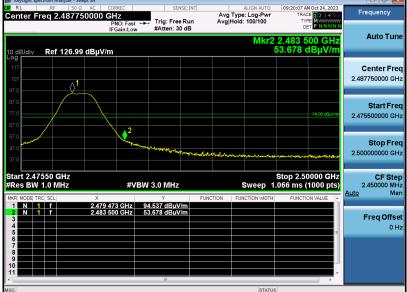


RESULT: Pass

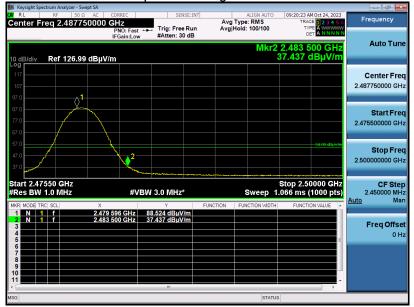


EUT Name	Creative Aurvana Ace 2	Model Name	EF1160
Temperature	25℃	Relative Humidity	67%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna Polarity	Vertical





Test Graph for Average Measurement



RESULT: Pass

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



12. AC Power Line Conducted Emission Test

12.1 Measurement Limit

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

Note:

1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

12.2 Measurement Setup (Block Diagram of Configuration)

