



**BUREAU
VERITAS**

Test Report No.: RF2102WSZ0083



TEST REPORT

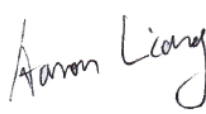
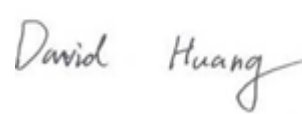
Applicant	Shenzhen Little Way Technology Limited
Address	12th, No.4 Building,Hengchangrong High-tech Industrial Park, Shajing Street Shenzhen 518103 China (Peoples Republic Of)

Manufacturer or Supplier	Shenzhen Little Way Technology Limited
Address	12th, No.4 Building,Hengchangrong High-tech Industrial Park, Shajing Street Shenzhen 518103 China (Peoples Republic Of)
Product	Oreo Next Generation DJ Box
Brand Name	N/A
Model	OREO13
Additional Model & Model Difference	N/A
Date of tests	Feb. 26, 2021 ~ Mar. 15, 2021

the tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Aaron Liang Project Engineer / EMC Department	Approved by David Huang Supervisor / EMC Department
	 Date: Mar. 15, 2021

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS.....	5
2 MEASUREMENT UNCERTAINTY	5
3 GENERAL INFORMATION	6
3.1 GENERAL DESCRIPTION OF EUT	6
3.2 DESCRIPTION OF TEST MODES	7
3.2.1. CONFIGURATION OF SYSTEM UNDER TEST	7
3.2.2. Test Mode Applicability and tested channel detail	7
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	10
3.4 DESCRIPTION OF SUPPORT UNITS	10
4 TEST TYPES AND RESULTS.....	11
4.1 RADIATED EMISSION MEASUREMENT	16
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT	16
4.1.2 TEST INSTRUMENTS.....	17
4.1.3 TEST PROCEDURES	18
4.1.4 DEVIATION FROM TEST STANDARD	19
4.1.5 TEST SETUP	19
4.1.6 EUT OPERATING CONDITIONS	20
4.1.7 TEST RESULTS	21
4.2 6dB BANDWIDTH MEASUREMENT.....	26
4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	26
4.2.2 TEST INSTRUMENTS.....	26
4.2.3 TEST PROCEDURE.....	27
4.2.4 DEVIATION FROM TEST STANDARD	27
4.2.5 TEST SETUP	28
4.2.6 EUT OPERATING CONDITIONS	28
4.2.7 TEST RESULTS	29
4.3 CONDUCTED OUTPUT POWER.....	30
4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	30
4.3.2 TEST SETUP	30
4.3.3 TEST INSTRUMENTS.....	30
4.3.4 TEST PROCEDURES	31



4.3.5	DEVIATION FROM TEST STANDARD	31
4.3.6	EUT OPERATING CONDITIONS	31
4.3.7	TEST RESULTS	31
4.3.7.1	MAXIMUM PEAK OUTPUT POWER	31
4.3.7.2	AVERAGE OUTPUT POWER (FOR REFERENCE)	32
4.4	POWER SPECTRAL DENSITY MEASUREMENT	33
4.4.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	33
4.4.2	TEST SETUP	33
4.4.3	TEST INSTRUMENTS	33
4.4.4	TEST PROCEDURE	33
4.4.5	DEVIATION FROM TEST STANDARD	33
4.4.6	EUT OPERATING CONDITION	33
4.4.7	TEST RESULTS	34
4.5	OUT OF BAND EMISSION MEASUREMENT	35
4.5.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	35
4.5.2	TEST SETUP	35
4.5.3	TEST INSTRUMENTS	35
4.5.4	TEST PROCEDURE	35
4.5.5	DEVIATION FROM TEST STANDARD	36
4.5.6	EUT OPERATING CONDITION	36
4.5.7	TEST RESULTS	37
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	40
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	41



Test Report No.: RF2102WSZ0083

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2102WSZ0083	Original release	Mar. 15, 2021



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.205 15.209	Radiated Emission	PASS	Meet the requirement of limit.
15.247(d)	Out of band Emission Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9kHz~30MHz	2.16dB
	30MHz ~ 1GMHz	3.74dB
	1GHz ~ 18GHz	4.66dB
	18GHz ~ 40GHz	4.67dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Oreo Next Generation DJ Box
MODEL NO.	OREO13
ADDITIONAL MODELS	N/A
FCC ID	2AZF9-OREO13
NOMINAL VOLTAGE	DC 3.7V from Li-ion battery or DC 5V from USB
MODULATION TECHNOLOGY	DTS
MODULATION TYPE	BT-LE(GFSK)
OPERATING FREQUENCY	2402-2480MHz
PEAK OUTPUT POWER	0.807mW (Max. Measured)
ANTENNA TYPE	PCB Antenna, with 2dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB Line: Unshielded, Detachable 50cm

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 2102WSZ0083) for detailed product photo.



3.2 DESCRIPTION OF TEST MODES

40 channels are provided for BT-LE(GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1. CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

3.2.2. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	APCM	
A	√	√	√	√	DC 3.7V from full Battery

Where

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

**RADIATED EMISSION TEST (BELOW 1GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
BT-LE	0 to 39	39	DTS	BT-LE	2

For the test results, only the worst case was shown in test report.

RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
BT-LE	0 to 39	0,19, 39	DTS	BT-LE	2

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
BT-LE	0 to 39	0, 19, 39	DTS	BT-LE	2



Test Report No.: RF2102WSZ0083

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 55%RH	DC 3.7V from full Battery	Aaron Liang
RE≥1G	24deg. C, 58%RH	DC 3.7V from full Battery	Aaron Liang
PLC	24deg. C, 58%RH	DC 5V from USB	Aaron Liang
APCM	25deg. C, 60%RH	DC 3.7V from full Battery	Aaron Liang



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2013

Note: All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit without any other necessary accessories or support units.representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Phone	BLU	J2 LTE	K1952B1X79060115	N/A
2	Memory card	SanDisk	N/A	N/A	N/A
3	Adapter	BQ	824A-20150U-EUT	G008170	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	Aux line: no shielding, no detachable 0.3M



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

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

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	8471241027	Mar. 24, 21
Artificial Mains Network	SCHWARZBECK	8127	8127713	Mar. 24, 21
ISN	Com-Power	ISN T800	34373	Mar. 24, 21
Test software	EZ-EMC	ICP-03A1	N/A	N/A

NOTE:

1. The test was performed in shielded room 843.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

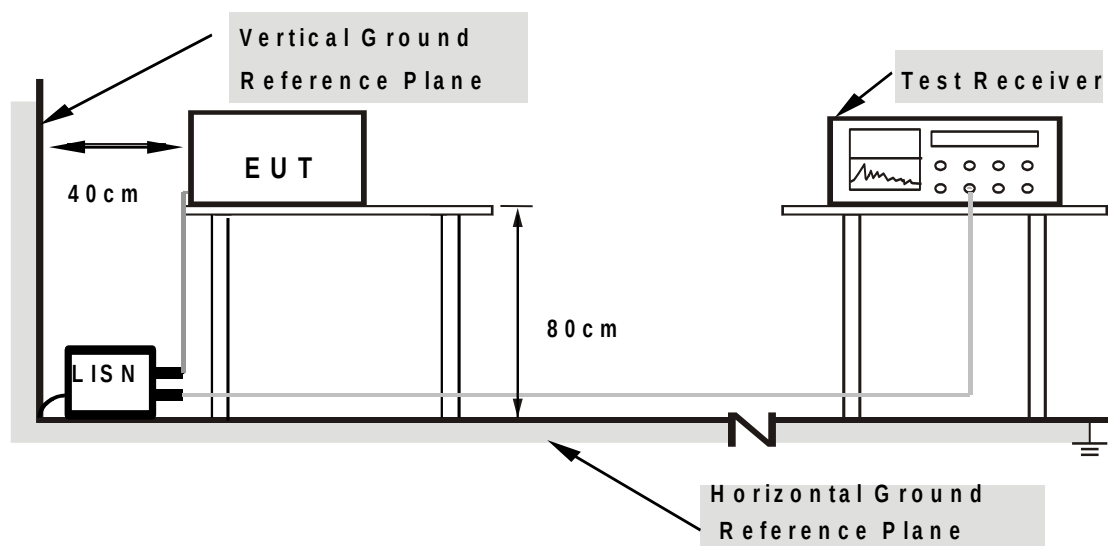
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.



4.1.5 TEST SETUP



- Note: 1.Support units were connected to second LISN .
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80
from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Turned on the power and connected of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



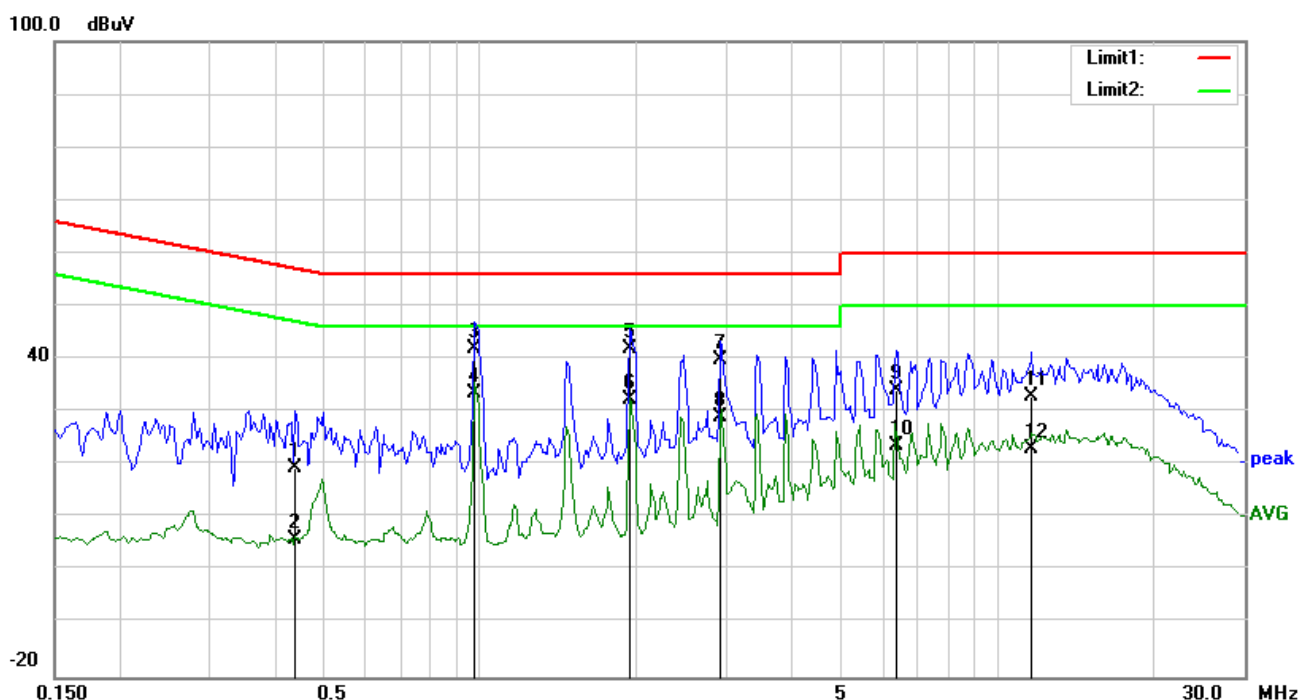
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: BT-LE GFSK (2 Mbps) CH39

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

NO.	P/L	FREQUENCY (MHZ)	READING (DBUV)	DETECTOR	CORRECTED (DB)	RESULT (DBUV)	LIMIT (DBUV)	MARGIN (DB)
1	L1	0.4386	9.23	QP	10.17	19.40	57.09	-37.69
2	L1	0.4386	-4.21	AVG	10.17	5.96	47.09	-41.13
3	L1	0.9729	31.90	QP	10.20	42.10	56.00	-13.90
4	L1	0.9729	23.21	AVG	10.20	33.41	46.00	-12.59
5	L1	1.9440	31.71	QP	10.23	41.94	56.00	-14.06
6	L1	1.9440	22.16	AVG	10.23	32.39	46.00	-13.61
7	L1	2.9112	29.57	QP	10.25	39.82	56.00	-16.18
8	L1	2.9112	18.89	AVG	10.25	29.14	46.00	-16.86
9	L1	6.3813	23.64	QP	10.37	34.01	60.00	-25.99
10	L1	6.3813	13.30	AVG	10.37	23.67	50.00	-26.33
11	L1	11.6736	22.55	QP	10.55	33.10	60.00	-26.90
12	L1	11.6736	12.41	AVG	10.55	22.96	50.00	-27.04

REMARKS: The emission levels of other frequencies were very low against the limit.

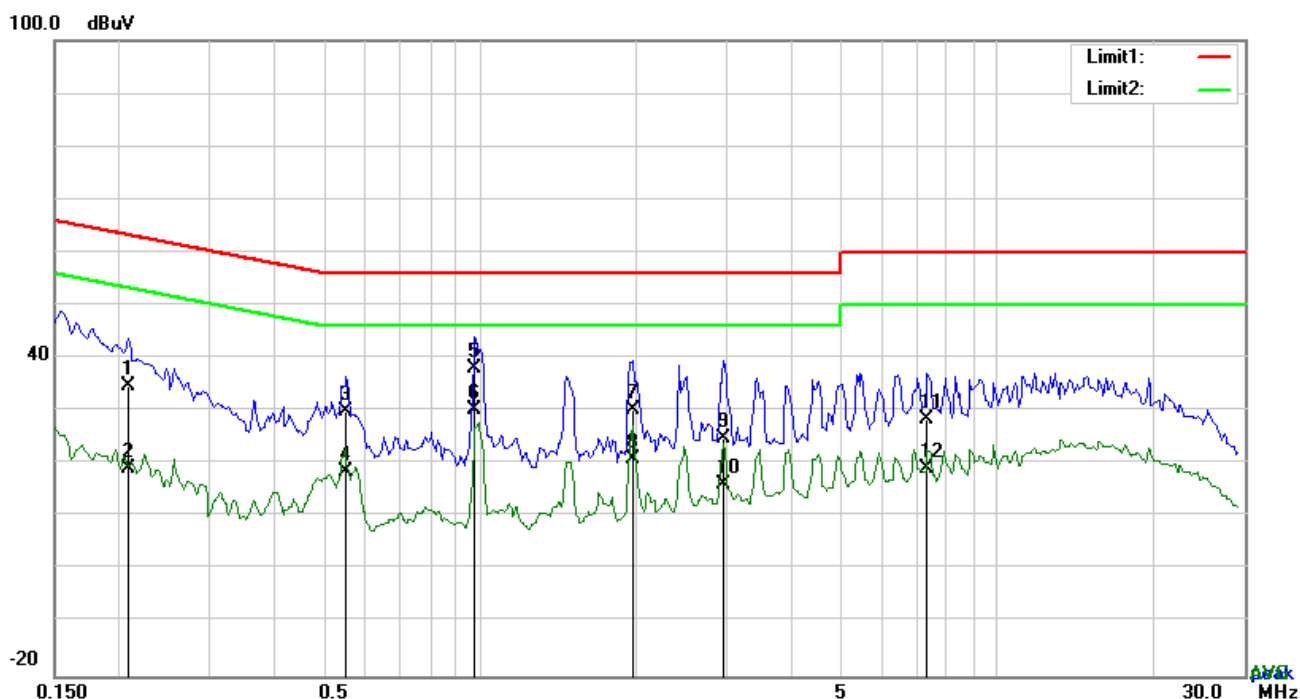




PHASE	Neutral	6dB BANDWIDTH	9kHz
-------	---------	---------------	------

NO.	P/L	FREQUENCY (MHZ)	READING (DBUV)	DETECTOR	CORRECTED (DB)	RESULT (DBUV)	LIMIT (DBUV)	MARGIN (DB)
1	N	0.2085	24.68	QP	10.15	34.83	63.26	-28.43
2	N	0.2085	9.11	AVG	10.15	19.26	53.26	-34.00
3	N	0.5517	19.64	QP	10.18	29.82	56.00	-26.18
4	N	0.5517	8.48	AVG	10.18	18.66	46.00	-27.34
5	N	0.9768	27.84	QP	10.23	38.07	56.00	-17.93
6	N	0.9768	20.14	AVG	10.23	30.37	46.00	-15.63
7	N	1.9752	20.06	QP	10.28	30.34	56.00	-25.66
8	N	1.9752	10.61	AVG	10.28	20.89	46.00	-25.11
9	N	2.9541	14.57	QP	10.32	24.89	56.00	-31.11
10	N	2.9541	5.97	AVG	10.32	16.29	46.00	-29.71
11	N	7.2978	17.99	QP	10.53	28.52	60.00	-31.48
12	N	7.2978	8.51	AVG	10.53	19.04	50.00	-30.96

REMARKS: The emission levels of other frequencies were very low against the limit.





4.2 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

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:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06-100262-eQ	Mar. 24, 21
Bilog Antenna	Sunol Sciences	JB6	A110712	Jul. 21, 21
Active Antenna	CMO-POWER	AL-130	121031	Jun. 30, 21
Signal Amplifier	HP	8447E	443008	Mar. 24, 21
Signal and Spectrum Analyzer	R&S	FSV40	101094	Mar. 19, 21
MXA signal analyzer	Agilent	N9020A	MY49100060	Mar. 24, 21
Horn Antenna	COM-POWER	AH-118	71259	Apr. 17, 21
Horn Antenna	COM-POWER	AH-118	71283	Jul. 21, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170147	May 10, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170242	May 10, 21
SHF-EHF Horn	Schwarzbeck	BBHA 9170	01023	Dec. 26, 21
SHF-EHF Horn	Schwarzbeck	BBHA 9170	01024	Dec. 26, 21
AMPLIFIER	EM Electornic Corporation	EM01G26G	60613	Mar. 24, 21
Pre-amplifier	Rohde&Schwarz	SCU40	100437	Nov. 17, 21
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Oct. 17, 21
Frequency Analyzer	Keysight	N9010B	MY60240432	Dec. 22, 21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 months (Except 3m Semi-anechoic Chamber). And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 535293.



4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
- 4.All modes of operation were investigated and the worst-case emissions are reported.
- 5.The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

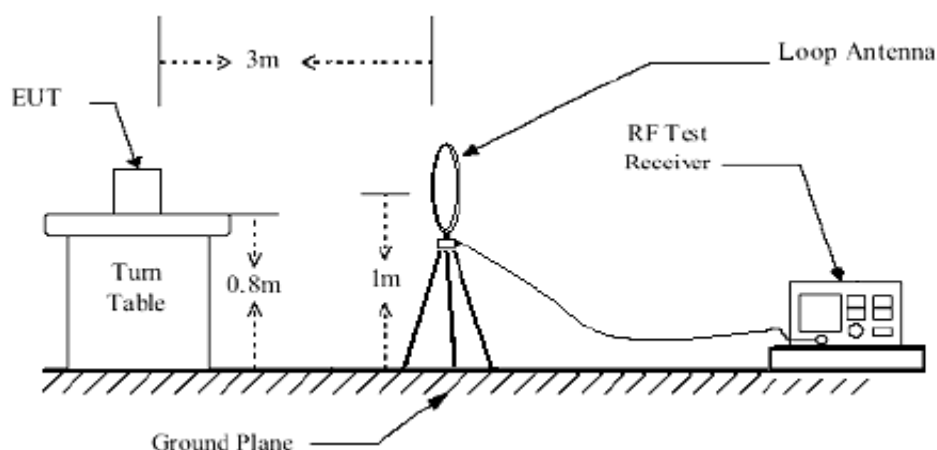


4.1.4 DEVIATION FROM TEST STANDARD

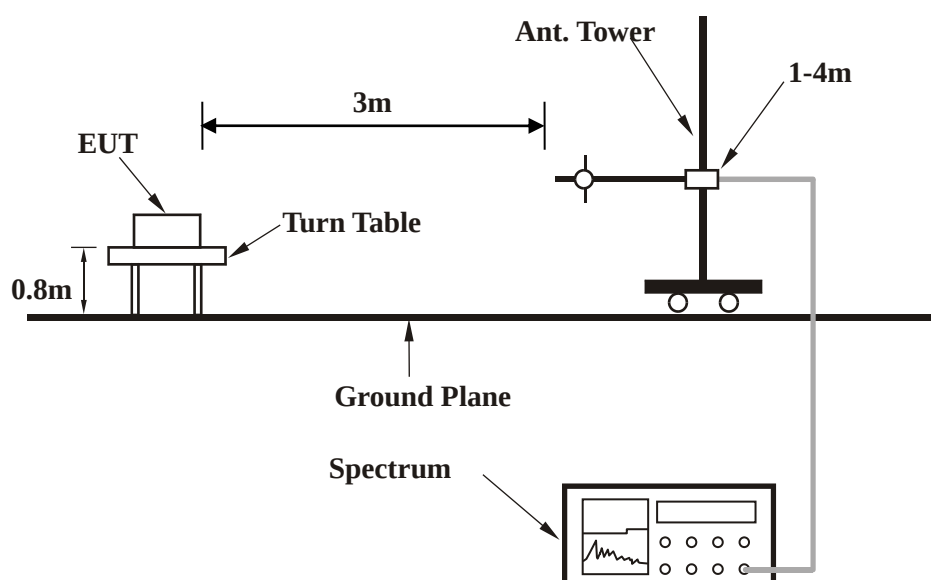
No deviation.

4.1.5 TEST SETUP

Below 30MHz test setup



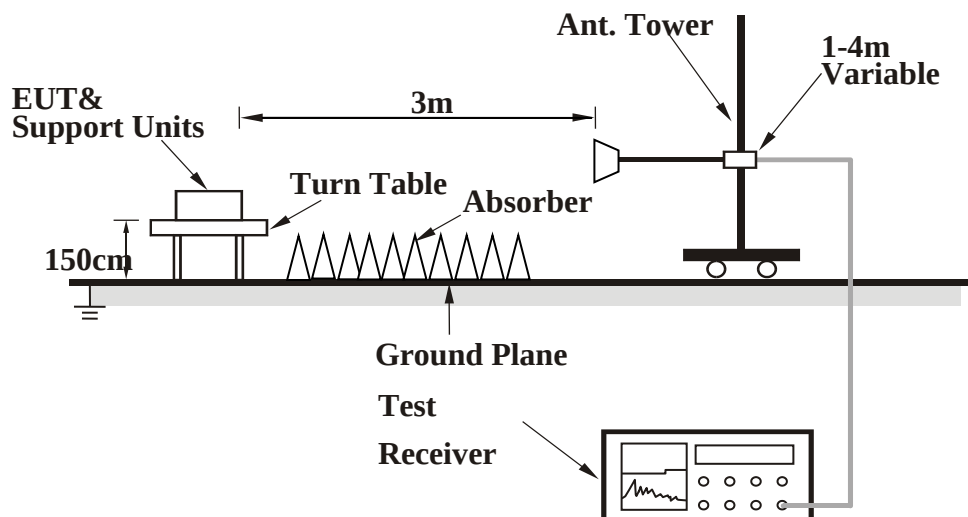
Below 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).



Above 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



4.1.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

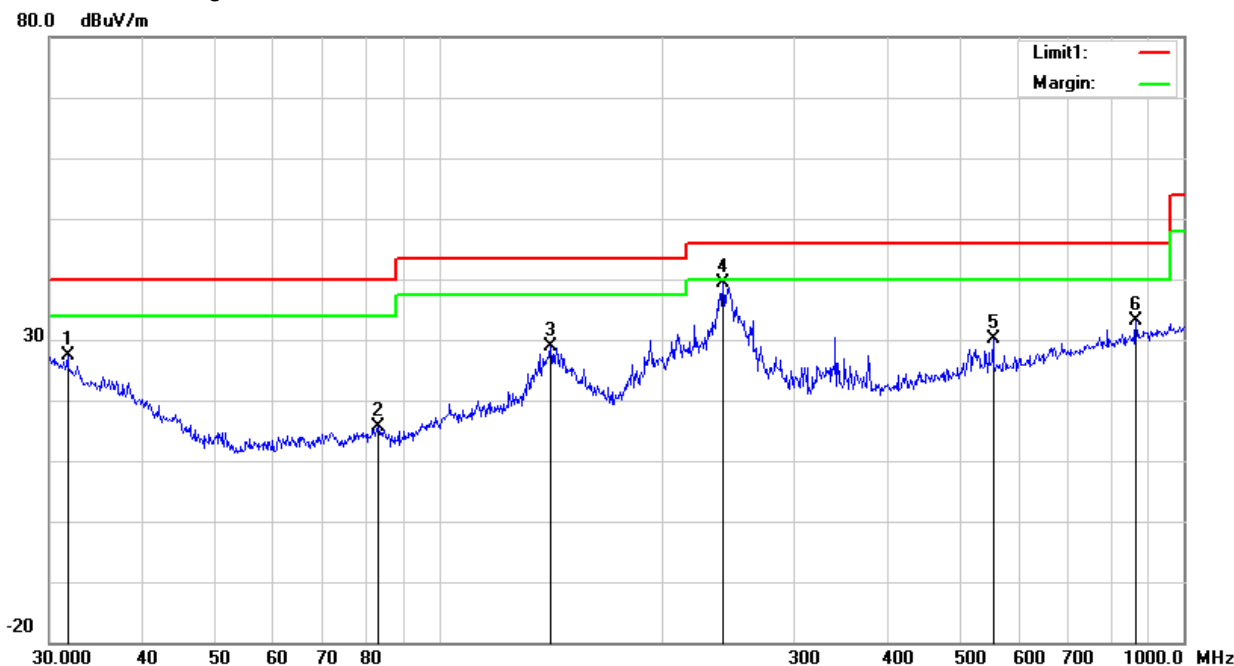
BT-LE GFSK (2 Mbps)

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	31.7313	28.51	19.99	21.63	0.44	27.31	40.00	-12.69	100	239
2	82.9385	28.99	7.34	21.61	0.88	15.60	40.00	-24.40	100	131
3	141.3298	36.46	12.91	21.69	1.19	28.87	43.50	-14.63	200	75
4	240.8304	48.58	11.18	21.88	1.59	39.47	46.00	-6.53	100	55
5	554.8254	31.52	18.18	22.03	2.40	30.07	46.00	-15.93	100	260
6	863.0562	29.69	22.03	21.60	3.11	33.23	46.00	-12.77	200	29

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.





**BUREAU
VERITAS**

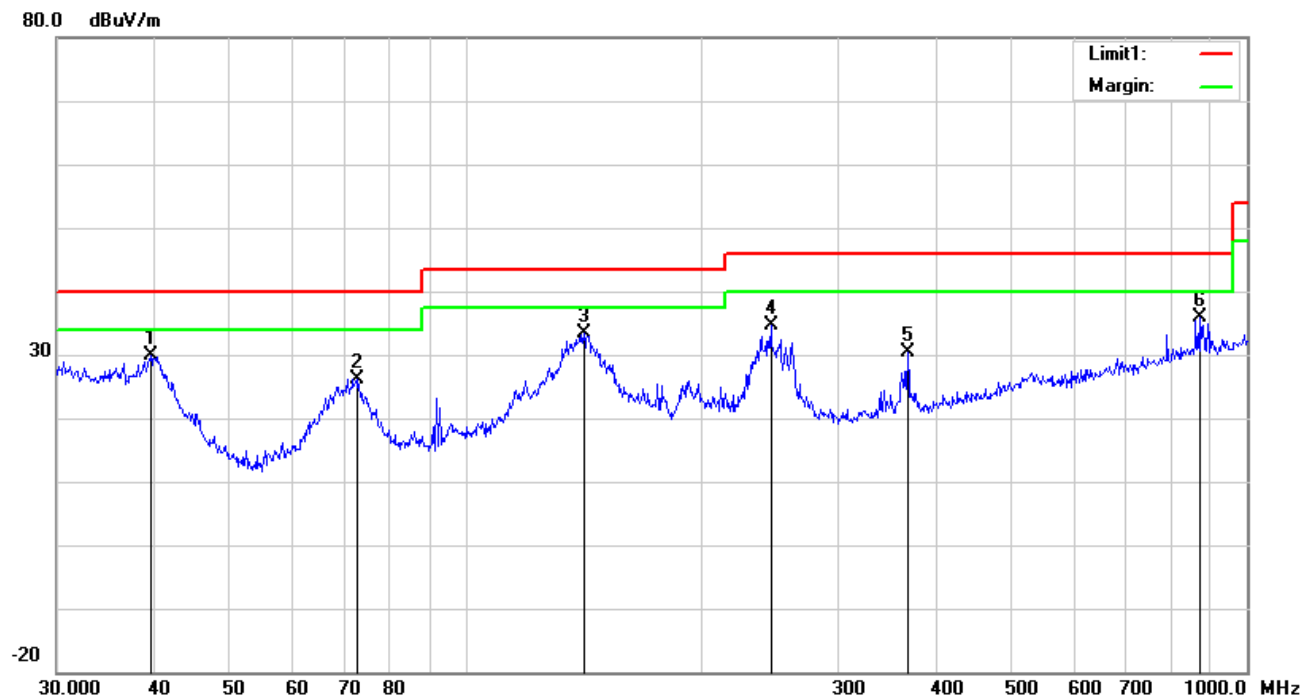
Test Report No.: RF2102WSZ0083

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m										
No.	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	39.5757	36.55	14.50	21.62	0.50	29.93	40.00	-10.07	100	326
2	72.5917	39.20	7.80	21.62	0.79	26.17	40.00	-13.83	200	12
3	141.8262	40.91	12.89	21.69	1.20	33.31	43.50	-10.19	100	102
4	245.9509	43.51	11.30	21.89	1.61	34.53	46.00	-11.47	100	99
5	368.1116	35.65	14.76	22.00	1.98	30.39	46.00	-15.61	100	299
6	869.1302	32.15	22.09	21.59	3.12	35.77	46.00	-10.23	200	151

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.





ABOVE 1GHz TEST DATA:

BT-LE GFSK (2 Mbps)

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	(dB/m)
1	2389.92	54.75 PK	74	-19.25	122	96	66.13	-11.38
2	2389.92	40.62 AV	54	-13.38	122	96	52	-11.38
3	*2402	90.65 PK			227	125	102.03	-11.38
4	*2402	88.93 AV			227	125	100.31	-11.38
5	4804	49.07 PK	74	-24.93	157	195	55.14	-6.07
6	4804	40.27 AV	54	-13.73	157	195	46.34	-6.07
7	7206	53.13 PK	74	-20.87	188	36	52.84	0.29
8	7206	45.2 AV	54	-8.8	188	36	44.91	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	((dB/m)
1	2390	54.7 PK	74	-19.3	115	307	66.08	-11.38
2	2390	39.78 AV	54	-14.22	115	307	51.16	-11.38
3	*2402	90.83 PK			165	271	102.21	-11.38
4	*2402	89.29 AV			165	271	100.67	-11.38
5	4804	47.89 PK	74	-26.11	107	177	53.96	-6.07
6	4804	39.89 AV	54	-14.11	107	177	45.96	-6.07
7	7206	53.4 PK	74	-20.6	167	172	53.11	0.29
8	7206	45.63 AV	54	-8.37	167	172	45.34	0.29

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	(dB/m)
1	*2440	89.27 PK			162	186	100.65	-11.38
2	*2440	87.72 AV			162	186	99.1	-11.38
3	4880	47.19 PK	74	-26.81	176	14	53.26	-6.07
4	4880	39.53 AV	54	-14.47	176	14	45.6	-6.07
5	7320	53.72 PK	74	-20.28	147	90	53.43	0.29
6	7320	44.97 AV	54	-9.03	147	90	44.68	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	(dB/m)
1	*2440	91.4 PK			144	203	102.78	-11.38
2	*2440	90.73 AV			144	203	102.11	-11.38
3	4880	47.89 PK	74	-26.11	171	79	53.96	-6.07
4	4880	40.05 AV	54	-13.95	171	79	46.12	-6.07
5	7320	53.06 PK	74	-20.94	207	214	52.77	0.29
6	7320	45.51 AV	54	-8.49	207	214	45.22	0.29

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	(dB/m)
1	2483.5	62.11 PK	74	-11.89	159	130	73.49	-11.38
2	2483.5	42.15 AV	54	-11.85	159	130	53.53	-11.38
3	*2480	90.32 PK			165	321	101.7	-11.38
4	*2480	88.9 AV			165	321	100.28	-11.38
5	4960	47.72 PK	74	-26.28	140	185	53.79	-6.07
6	4960	40.1 AV	54	-13.9	140	185	46.17	-6.07
7	7440	53.41 PK	74	-20.59	202	187	53.12	0.29
8	7440	44.9 AV	54	-9.1	202	187	44.61	0.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	FREQ.	Emission Level	Limit	Margin	Height	Degree	Raw Value	Correction Factor
	(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	(dBuV)	(dB/m)
1	2483.5	62.65 PK	74	-11.35	201	31	74.03	-11.38
2	2483.5	42.8 AV	54	-11.2	201	31	54.18	-11.38
3	*2480	91.48 PK			208	320	102.86	-11.38
4	*2480	90.27 AV			208	320	101.65	-11.38
5	4960	49.92 PK	74	-24.08	217	353	55.99	-6.07
6	4960	42.85 AV	54	-11.15	217	353	48.92	-6.07
7	7440	53.5 PK	74	-20.5	106	303	53.21	0.29
8	7440	45.04 AV	54	-8.96	106	303	44.75	0.29

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Gain (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



4.3 6dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Wireless Connectivity Tester	R&S	CMW270	1201.0002K75	Dec. 22, 21
MXA VEXTOR SIGNAL	Agilent	n5182a	MY50140530	Mar. 24, 21
MXA signal analyzer	Agilent	n9020a	MY49100060	Mar. 24, 21
RF Control Unit	Tonscend	JS0806-2	188060112	Mar. 24, 21
Signal Generation	Agilent	E4421B	US40051152	Dec. 22, 21
DC Power Supply	Agilent	E3640A	MY40004013	Mar. 30, 21
Programmable Temperature & Humidity Chamber	Hongjin	HYC-TH-225 DH	DG-180746	Mar. 24, 21
Test System	Tonscend	JS 1120-3	N/A	N/A
Power Splitter	Weinschel	1580-1	TL177	Mar. 27, 21

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



4.2.3 TEST PROCEDURE

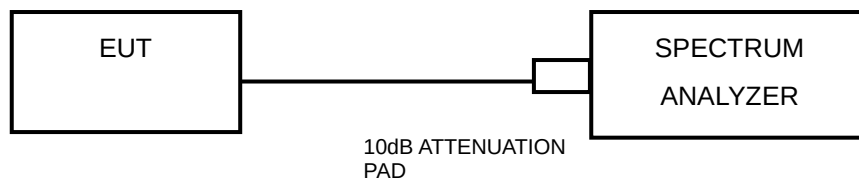
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



4.2.7 TEST RESULTS

BT-LE GFSK (2 Mbps)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.844	0.5	PASS
19	2440	0.868	0.5	PASS
39	2480	0.860	0.5	PASS

WORSE PLOT



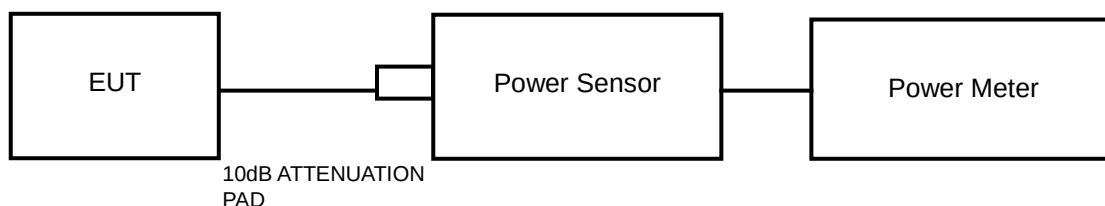


4.4 CONDUCTED OUTPUT POWER

4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Wireless Connectivity Tester	R&S	CMW270	1201.0002K75	Dec. 22, 21
MXA VEXTOR SIGNAL	Agilent	n5182a	MY50140530	Mar. 24, 21
MXA signal analyzer	Agilent	n9020a	MY49100060	Mar. 24, 21
RF Control Unit	Tonscend	JS0806-2	188060112	Mar. 24, 21
Signal Generation	Agilent	E4421B	US40051152	Dec. 22, 21
DC Power Supply	Agilent	E3640A	MY40004013	Mar. 30, 21
Programmable Temperature & Humidity Chamber	Hongjin	HYC-TH-225 DH	DG-180746	Mar. 24, 21
Test System	Tonscend	JS 1120-3	N/A	N/A
Power Splitter	Weinschel	1580-1	TL177	Mar. 27, 21

NOTE:1. The test was performed in RF Oven room.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



4.3.4 TEST PROCEDURES

A peak sensor was used on the output port of the EUT. A peak power meter was used to read the response of the peak power sensor. Record the peak power level.

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

4.3.7.1 MAXIMUM PEAK OUTPUT POWER

BT-LE GFSK (2 Mbps)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
0	2402	-2.73	0.533	1	PASS
19	2440	-1.78	0.664	1	PASS
39	2480	-0.93	0.807	1	PASS



4.3.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

BT-LE GFSK (2 Mbps)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)
0	2402	-5.02
19	2440	-4.05
39	2480	-3.12

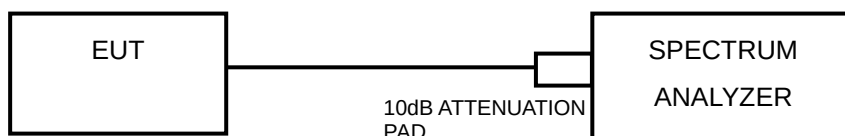


4.4 POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

4.4.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW $\geq 3 \times$ RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

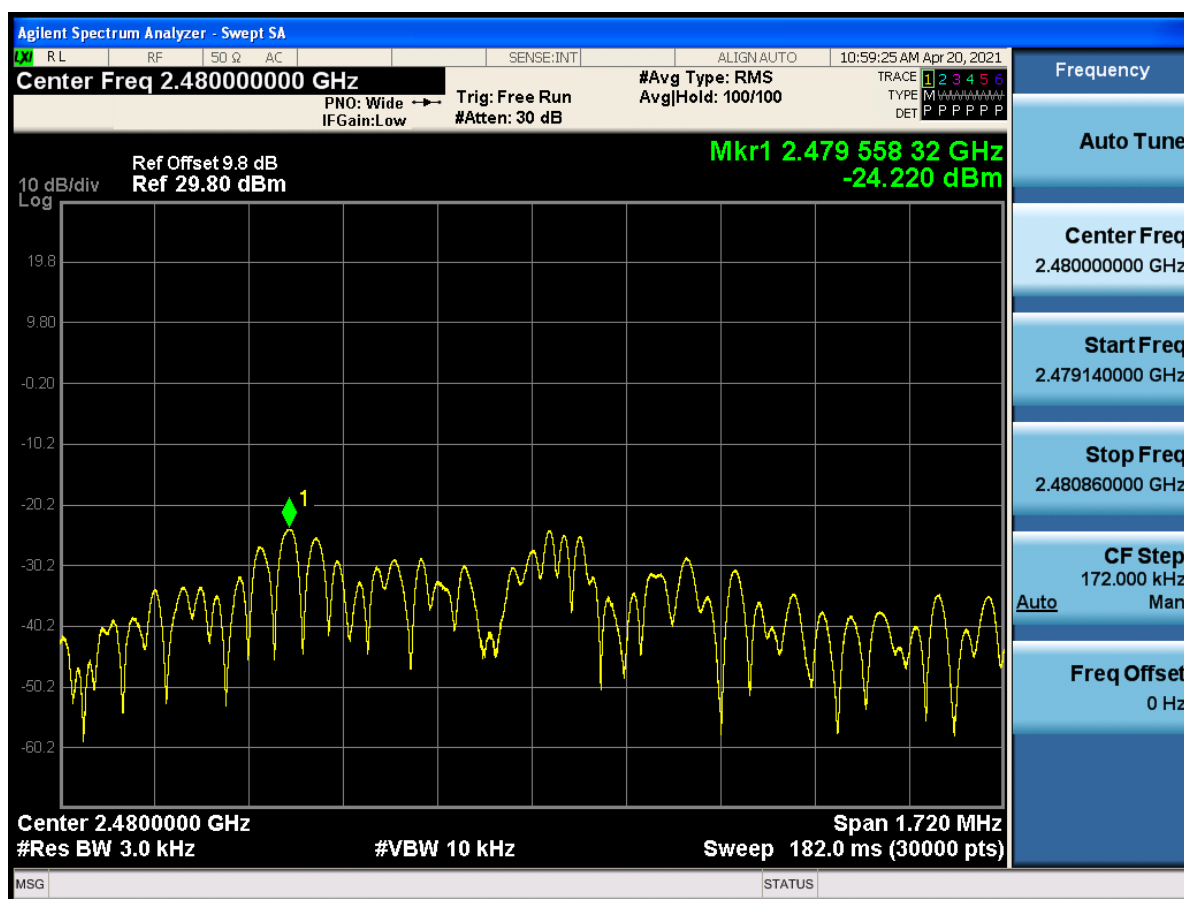


4.4.7 TEST RESULTS

BT-LE GFSK (2 Mbps)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	-26.063	8	PASS
19	2440	-25.156	8	PASS
39	2480	-24.220	8	PASS

WORSE PLOT



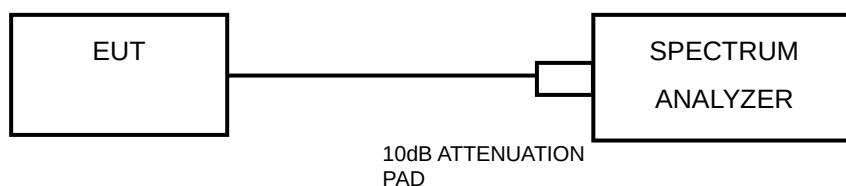


4.5 OUT OF BAND EMISSION MEASUREMENT

4.5.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

4.5.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz .
2. Set the VBW $\geq 300\text{ kHz}$.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

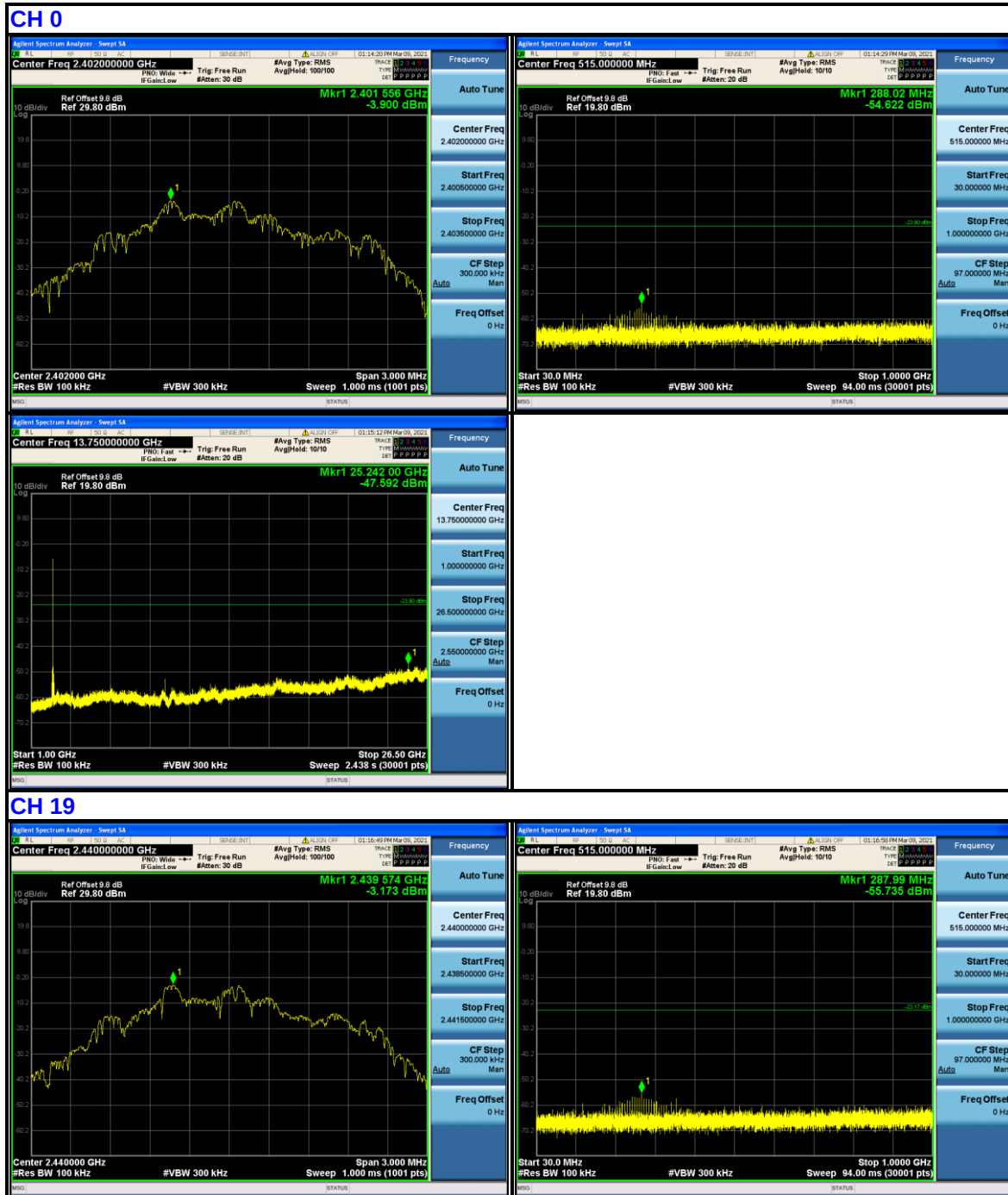


BUREAU
VERITAS

Test Report No.: RF2102WSZ0083

4.5.7 TEST RESULTS

BT-LE GFSK (2 Mbps)



Bureau Veritas (Shenzhen)
Consumer Products Services Co., Ltd.

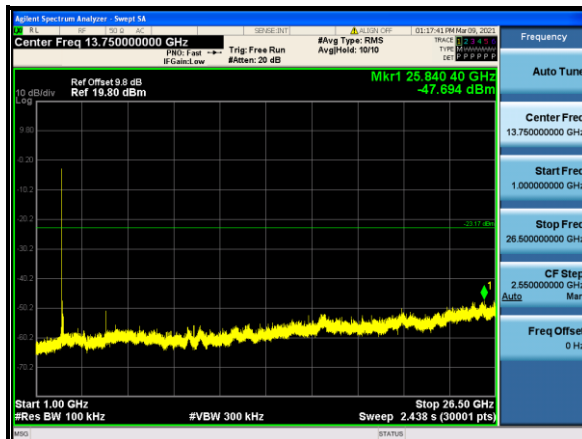
Zone A, Floor 1, Building 2, Wan Ye Long Technology
Park, South Side of Zhoushi Road, Bao'an District,
Shenzhen Guangdong, 518108, China.

Tel: +86-755-26014629 Ext.800
Email: customerservice.dq@cn.bureauveritas.com

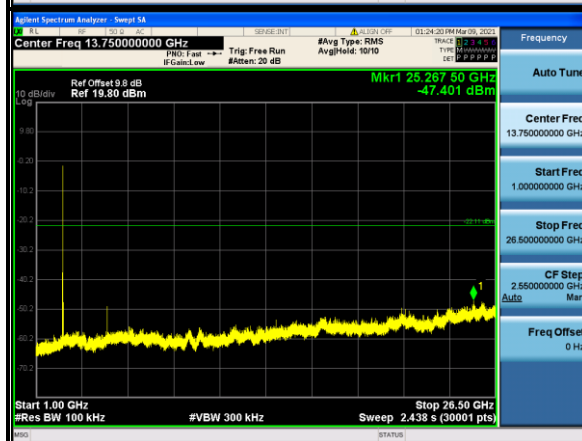
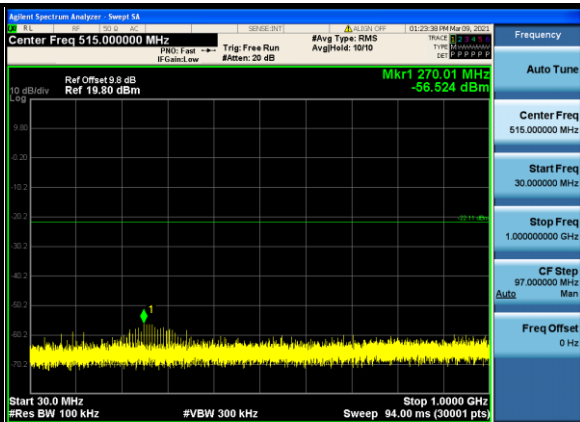


BUREAU
VERITAS

Test Report No.: RF2102WSZ0083



CH 39



Bureau Veritas (Shenzhen)
Consumer Products Services Co., Ltd.

Zone A, Floor 1, Building 2, Wan Ye Long Technology
Park, South Side of Zhoushi Road, Bao'an District,
Shenzhen Guangdong, 518108, China.

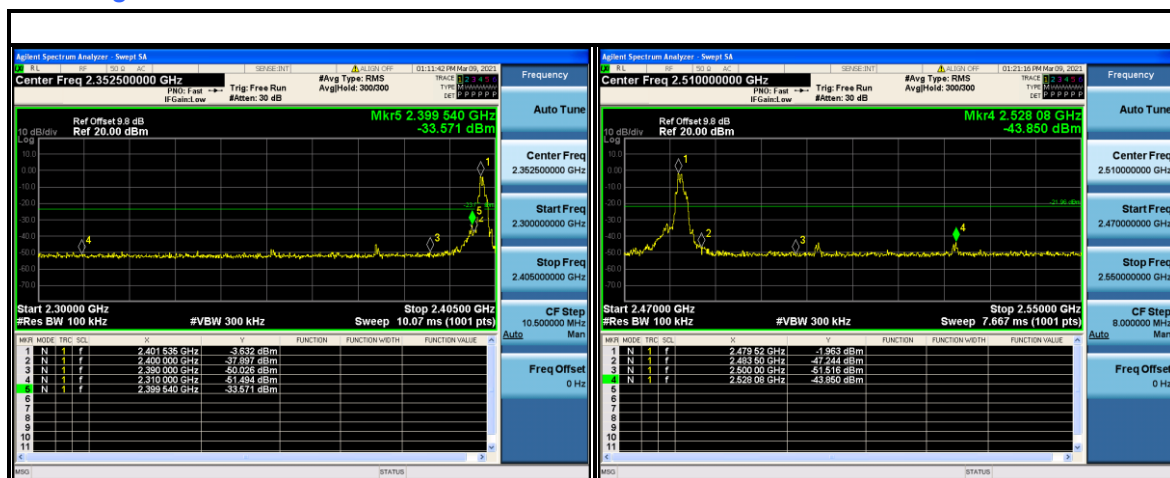
Tel: +86-755-26014629 Ext.800
Email: customerservice.dq@cn.bureauveritas.com



BUREAU
VERITAS

Test Report No.: RF2102WSZ0083

Band Edge:



Bureau Veritas (Shenzhen)
Consumer Products Services Co., Ltd.

Zone A, Floor 1, Building 2, Wan Ye Long Technology
Park, South Side of Zhoushi Road, Bao'an District,
Shenzhen Guangdong, 518108, China.

Tel: +86-755-26014629 Ext.800
Email: customerservice.dq@cn.bureauveritas.com



Test Report No.: RF2102WSZ0083

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



Test Report No.: RF2102WSZ0083

6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---