

FCC Test Report

Report No.: AGC00174200501FE02

FCC ID : XBE-ABLRF

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION: ABL

BRAND NAME : LINAK

MODEL NAME : ABLRF

APPLICANT : LINAK A/S

DATE OF ISSUE : Jun. 22, 2020

STANDARD(S) : FCC Part 15.247

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

CAUTION:

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



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the sedicated restriction. 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 AGE. The test resurresented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issuance of the test report report and the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issuance of the test report apply only to the test report should be addressed to AGC by agc@agc-cert.com.



Page 2 of 39

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	9 /	Jun. 22, 2020	Valid	Initial Release

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Restrict/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc=cert.com.



Report No.: AGC00174200501FE02 Page 3 of 39

TABLE OF CONTENTS

1. VERIFICATION OF COMPLIANCE	4
2.GENERAL INFORMATION	5
2.1PRODUCT DESCRIPTION	
2.3 RELATED SUBMITTAL(S)/GRANT(S)	6
2.4TEST METHODOLOGY 2.5 SPECIAL ACCESSORIES	
2.6 EQUIPMENT MODIFICATIONS	
2.7. ANTENNA REQUIREMENT	
3. MEASUREMENT UNCERTAINTY	7
4. DESCRIPTION OF TEST MODES	8
5. SYSTEM TEST CONFIGURATION	9
5.1 CONFIGURATION OF TESTED SYSTEM	
5.2 EQUIPMENT USED IN TESTED SYSTEM	S
5.3. SUMMARY OF TEST RESULTS	
6. TEST FACILITY	10
7. PEAK OUTPUT POWER	11
7.1. MEASUREMENT PROCEDURE	11
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	11
7.3. LIMITS AND MEASUREMENT RESULT	
8. 6 DB BANDWIDTH	
8.1. MEASUREMENT PROCEDURE	14
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	14
8.3. LIMITS AND MEASUREMENT RESULTS	
9. CONDUCTED SPURIOUS EMISSION	
9.1. MEASUREMENT PROCEDURE	16
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
9.4. LIMITS AND MEASUREMENT RESULT	
10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY	
10.1 MEASUREMENT PROCEDURE	
10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	21
10.3 MEASUREMENT EQUIPMENT USED	21
10.4 LIMITS AND MEASUREMENT RESULT	
11. RADIATED EMISSION	
11.1. MEASUREMENT PROCEDURE	
11.2. TEST SETUP	24
11.3. LIMITS AND MEASUREMENT RESULT11.4. TEST RESULT	
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	
APPENDIX B: PHOTOGRAPHS OF EUT	36

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 4 of 39

1. VERIFICATION OF COMPLIANCE

Applicant	LINAK A/S
Address	Group Headquarters, Smedevænget 8, Guderup DK-6430 Nordborg, Denmark
Manufacturer	LINAK A/S
Address	Group Headquarters, Smedevænget 8, Guderup DK-6430 Nordborg, Denmark
Factory	Shenzhen Top-Tek Electronics.,Co Ltd
Address	Jufa Industrial, Liaokeng village, Shiyan Town, Bao'an Dis, Shenzhen, China 518000
Product Designation	ABL
Brand Name	LINAK
Test Model	ABLRF
Date of test	Jun. 09, 2020 to Jun. 22, 2020
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.

Prepared By	Sky dong	
	Sky Dong (Project Engineer)	Jun. 22, 2020
Reviewed By	Max Zhang	NGO N
CC	Max Zhang (Reviewer)	Jun. 22, 2020
Approved By	Formesticis	
3C CC	Forrest Lei (Authorized Officer)	Jun. 22, 2020

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the bedicated restriction Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter pathorization of AGC within 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 5 of 39

2.GENERAL INFORMATION

2.1PRODUCT DESCRIPTION

The EUT is designed as a "ABL". 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

Operation Frequency	2.402 GHz to 2.480GHz
RF Output Power	-0.915dBm(Max)
Bluetooth Version	V4.2
Modulation	BR □GFSK, EDR □π /4-DQPSK, □8DPSK BLE ☑GFSK 1Mbps □GFSK 2Mbps
Number of channels	40 Channel
Antenna Designation	Intrgral Antenna(Comply with requirements of the FCC part 15.203)
Antenna Gain	4.46dBi
Hardware Version	Version C
Software Version	02023016-54642
Power Supply	DC 3V

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	
100	0	2402MHZ	
		2404MHZ	
2400~2483.5MHZ	- 10 : 10 ·		
100 CO	38	2478 MHZ	
0	39	2480 MHZ	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Festing/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 appropriation 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc=cert.com.



Page 6 of 39

2.3 RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: XBE-ABLRF** filing to comply with the FCC Part 15.247 requirements.

2.4TEST 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 2.2.

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.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Feet (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 issuence of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 7 of 39

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 Db
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 Db
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 Db
- Uncertainty of total RF power, conducted, $Uc = \pm 0.8Db$
- Uncertainty of RF power density, conducted, Uc = ±2.6Db
- Uncertainty of spurious emissions, conducted, $Uc = \pm 2.7Db$
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Feating/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 where 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc=cert.com.



Page 8 of 39

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.
- 4. The test software is the XDS-GY006106-CC2640R2F_BLE Device Control Panel which can set the EUT into the individual test modes.
- 5. For battery operated equipment, the equipment tests are performed using a new battery.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Factorization Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written exphorization of AGC where 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.

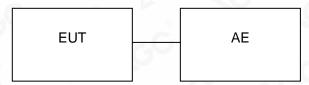


Page 9 of 39

5. SYSTEM TEST CONFIGURATION

5.1 CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	ABL	ABLRF	XBE-ABLRF	EUT
2	Battery	LR03	DC 3V	AE
3	Control board	EPS-35-3.3	1m	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	N/A

Note: The EUT is powered by DC Power.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Psychological Psycholo



Page 10 of 39

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, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec. 11, 2020
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 09, 2019	Sep. 08, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 15, 2019	Oct. 16, 2020
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Test software	FARA	EZ-EMC (Ver RA-03A)	N/A	N/A	N/A

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 11 of 39

7. PEAK OUTPUT POWER

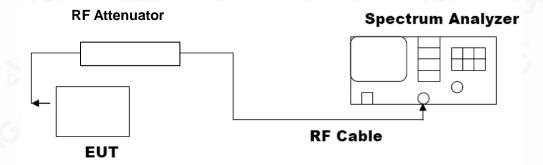
7.1. MEASUREMENT PROCEDURE

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



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.



Page 12 of 39

7.3. LIMITS AND MEASUREMENT RESULT

	PEAK OUTPUT POWER MEA	SUREMENT RESULT		
	FOR GFSK MOUD	DULATION		
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.402	-0.915	30	Pass	
2.440	-0.977	30	Pass	
2.480	-1.012	30	Pass	

CH₀



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/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 perhorization of AGE. 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



CH19



CH39



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Festivo/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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 14 of 39

8. 6 DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

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

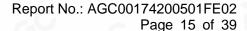
8.3. LIMITS AND MEASUREMENT RESULTS

LIMITS AND MEASUREMENT RESULT					
Applicable Limite		Applicable Limits			
Applicable Limits	Test Data (kHz)		Criteria		
>500KHZ	Low Channel	688.5	PASS		
	Middle Channel	706.5	PASS		
	High Channel	727.5	PASS		

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Bedicated Restrog/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 AGE. 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Festivo/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 portorization 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 16 of 39

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.

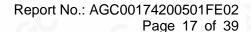
9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT					
Annilla alda I limita	Measurement Result				
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			

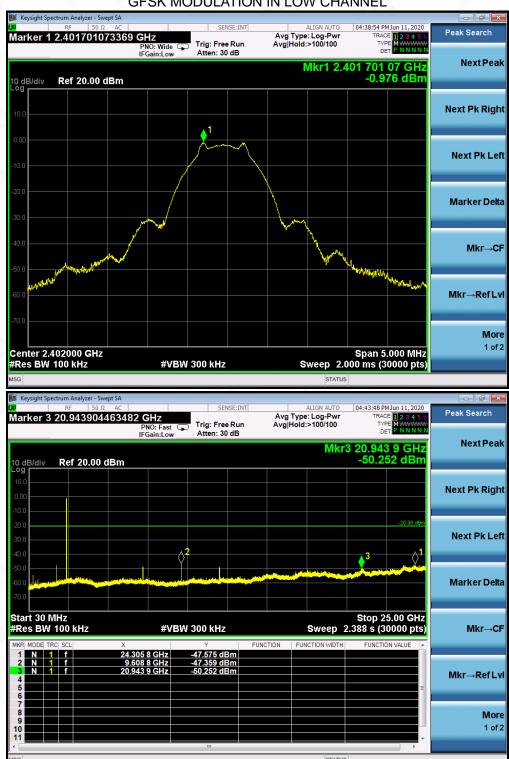
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Feat and Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written explorization of ACC whe 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



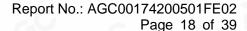


TEST RESULT FOR ENTIRE FREQUENCY RANGE

GFSK MODULATION IN LOW CHANNEL



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Pesting/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 the tested comple. Any objections to report issued by AGC should be submitted to AGC within 15day Cafter the issuance of the test report. Complian Bedicated Festing/Inspection Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.





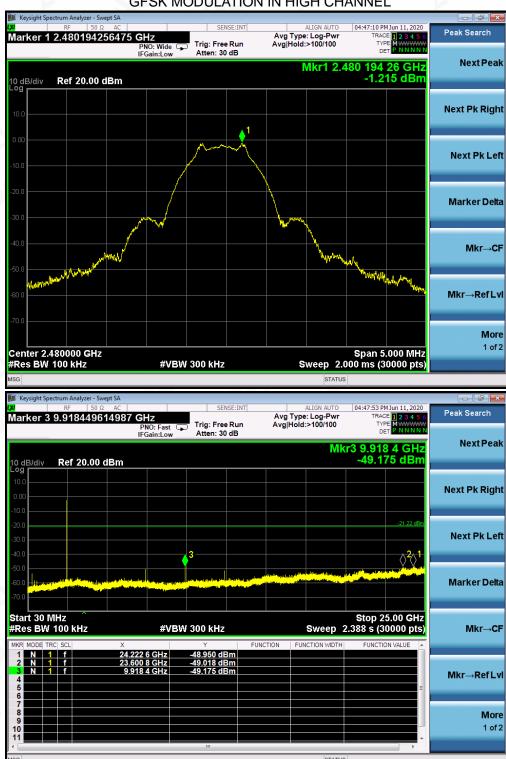
GFSK MODULATION IN MIDDLE CHANNEL



Compliance Shared Festi Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Post not/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 to the test deemed any objections to report issued by AGC should be submitted to AGC within 15day after the issuence of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.

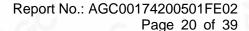


GFSK MODULATION IN HIGH CHANNEL



Note: The peak emissions without marker on the above plots are fundamental wave and need not to compare with the limit.

Complian Bedicated Festing/Inspection Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by 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 exception of AGE 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 15d ace of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.





TEST RESULT FOR BAND EDGE

GFSK MODULATION IN LOW CHANNEL



GFSK MODULATION IN HIGH CHANNEL



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Festivo/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 he 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 21 of 39

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 SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the KDB 558074 item 10.2 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.

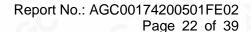
10.4 LIMITS AND MEASUREMENT RESULT

Channel No.	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low Channel	-10.451	8	Pass
Middle Channel	-9.791	8	Pass
High Channel	-9.560	8	Pass





Compliance Section 1981 Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the a/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter withorization of AĞÇ 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 15d he test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.





TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Festing/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 he 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 23 of 39

11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 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.

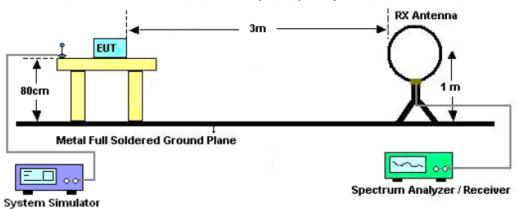
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Bedicated Festivo/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the 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 agc@agc=cert.com.



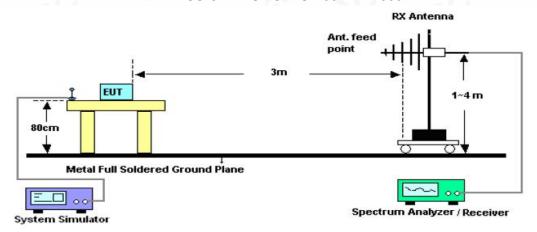
Page 24 of 39

11.2. TEST SETUP

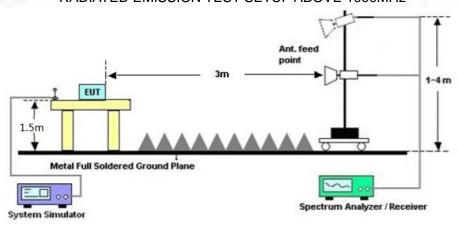
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Coedicated Postuagina Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written pathorization of AGC where 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 25 of 39

11.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

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

Note: All modes were tested For restricted band radiated emission,

the test records reported below are the worst result compared to other modes.

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.

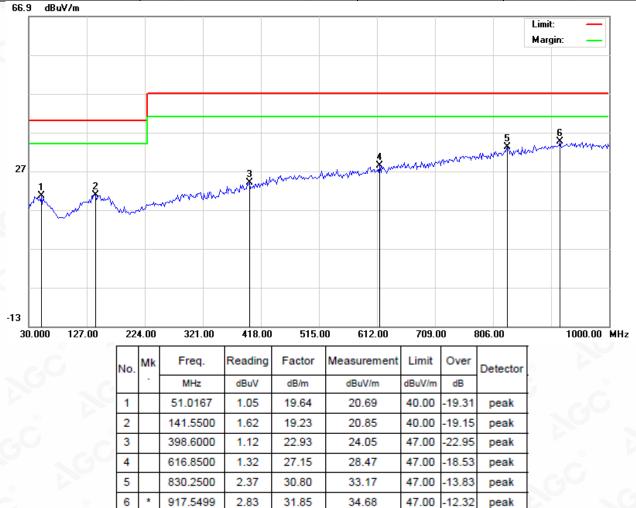
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter perhorization of AGE. 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 26 of 39

RADIATED EMISSION BELOW 1GHZ

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



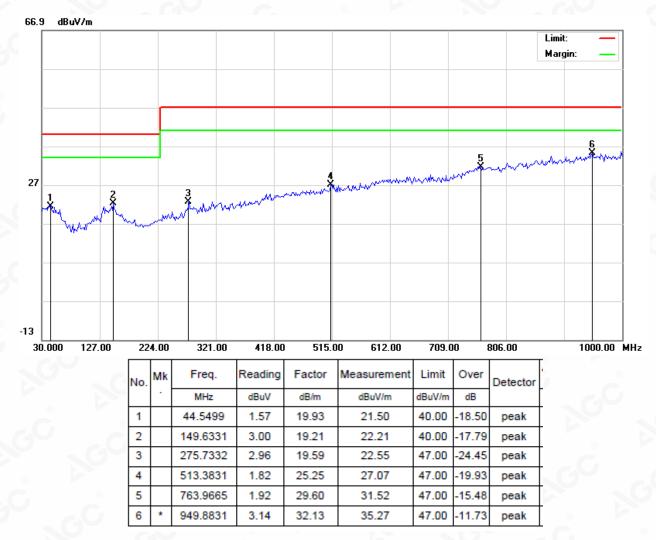
RESULT: PASS

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Psycholinspection 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 where 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 agc@agc=cert.com.



Page 27 of 39

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



RESULT: PASS

Note:

- 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
- 2. All test modes had been tested. The mode 1 is the worst case and recorded in the report.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pestod/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 agc@agc-cert.com.



Page 28 of 39

g/Inspection The test results

RADIATED EMISSION ABOVE 1GHZ

EUT	ABL	Model Name	ABLRF	
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 Trees
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.000	46.23	0.08	46.31	74	-27.69	peak
4804.000	38.15	0.08	38.23	54	-15.77	AVG
7206.000	40.84	2.21	43.05	74	-30.95	peak
7206.000	32.55	2.21	34.76	54	-19.24	AVG
	®				@	
	-6	®			- 6	8
Remark:		G .	8			
Factor = Anter	na Factor + Cabl	e Loss – Pre-	-amplifier.			
	(8)				(e)	

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

Frequency Mete (MHz) 4804.000	er Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
` (6) /	` ' '	(dB)	(dBµV/m)	(dBuV/m)	(dB)	value Type
4804.000				(· r · /	(~-)	value Type
	46.97	0.08	47.05	74	-26.95	peak
4804.000	38.26	0.08	38.34	54	-15.66	AVG
7206.000	41.38	2.21	43.59	74	-30.41	peak
7206.000	32.32	2.21	34.53	54	-19.47	AVG
			160			
emark:						

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Bedicated Pesture 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 presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issuance of Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Report No.: AGC00174200501FE02 Page 29 of 39

EUT	ABL	Model Name	ABLRF
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 Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4880.000	48.12	0.14	48.26	74	-25.74	peak
4880.000	39.57	0.14	39.71	54	-14.29	AVG
7320.000	41.23	2.36	43.59	74	-30.41	peak
7320.000	32.96	2.36	35.32	54	-18.68	AVG
	®				®	
		®				8
Remark:			®			- 6
actor = Anter	na Factor + Cable	e Loss – Pre-	amplifier.			
7				0		

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

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4880.000	45.29	0.14	45.43	74	-28.57	peak
4880.000	36.47	0.14 @	36.61	54	-17.39	AVG
7320.000	40.28	2.36	42.64	74	-31.36	peak
7320.000	32.91	2.36	35.27	54	-18.73	AVG
				<u>G</u>		8
Remark:	6.0	©				0
Factor = Anter	nna Factor + Cable	e Loss – Pre-	amplifier.			-C
@						

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 30 of 39

EUT	ABL	Model Name	ABLRF
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 Trees
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4960.000	46.29	0.22	46.51	74	-27.49	peak
4960.000	37.15	0.22	37.37	54	-16.63	AVG
7440.000	41.98	2.64	44.62	74	-29.38	peak
7440.000	33.02	2.64	35.66	54	-18.34	AVG
	®				®	
		®				8
Remark:		C	8			- 6
	na Factor + Cabl	e Loss – Pre-	amplifier.			
			0			

EUT	ABL	Model Name	ABLRF
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	\/-\T
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4960.000	45.91	0.22	46.13	74	-27.87	peak
4960.000	37.15	0.22	37.37	54	-16.63	AVG
7440.000	40.34	2.64	42.98	74	-31.02	peak
7440.000	32.48	2.64	35.12	54	-18.88	AVG
			7.0		©	
Remark:						3
actor = Anter	nna Factor + Cable	e Loss – Pre-	-amplifier.			8
		- C1	. (8)			-6

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, Over=Measure-Limit.

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

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Festing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter portionization of AGC where 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 15day after the issued by the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.

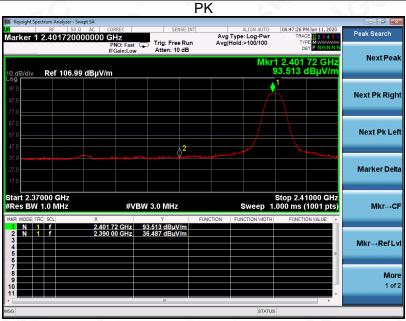


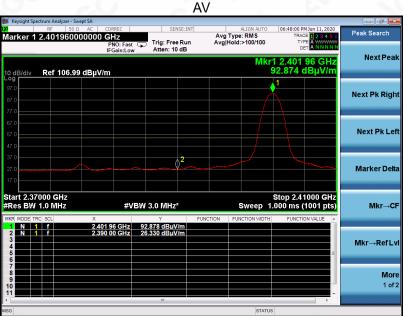
Page 31 of 39

TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

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

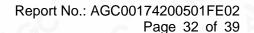






RESULT: PASS

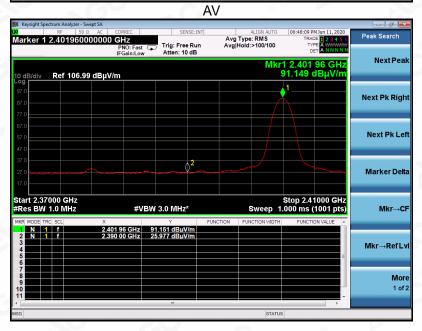
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Bedicated Festivation" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization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





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





RESULT: PASS

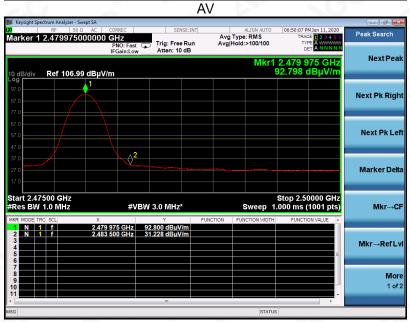
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the bedicated restriction Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter pathorization of AGC within 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Report No.: AGC00174200501FE02 Page 33 of 39

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





RESULT: PASS

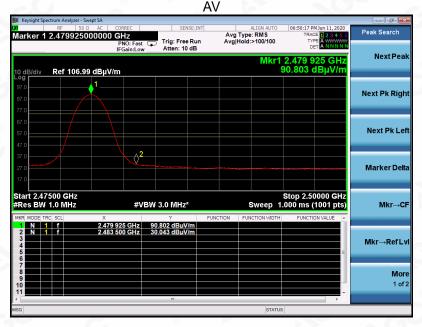
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter perhorization of AGE. 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 34 of 39

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





RESULT: PASS

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

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Pesthod/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 where 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 agc@agc=cert.com.



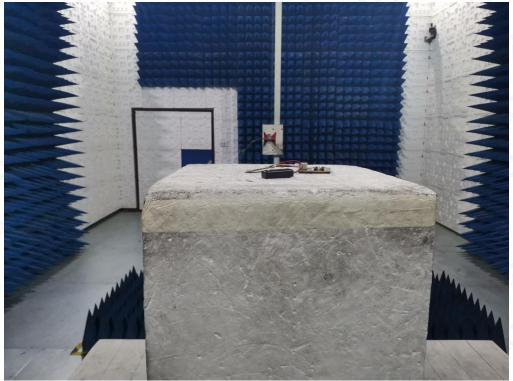
Page 35 of 39

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1GHZ







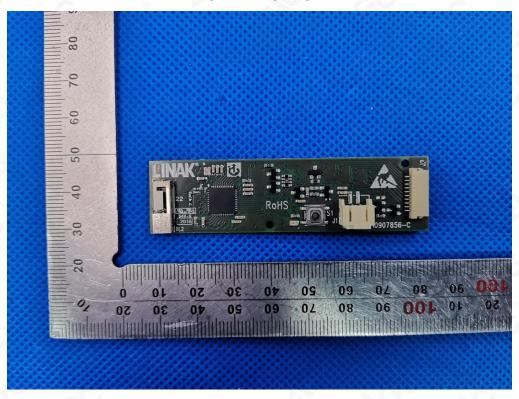
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the specificated resting/inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter pathorization 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



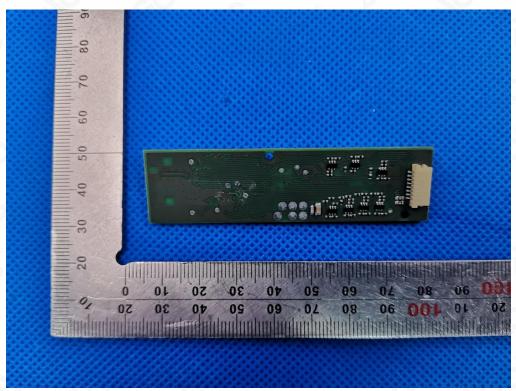
Page 36 of 39

APPENDIX B: PHOTOGRAPHS OF EUT

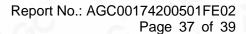
TOP VIEW OF EUT



BOTTOM VIEW OF EUT

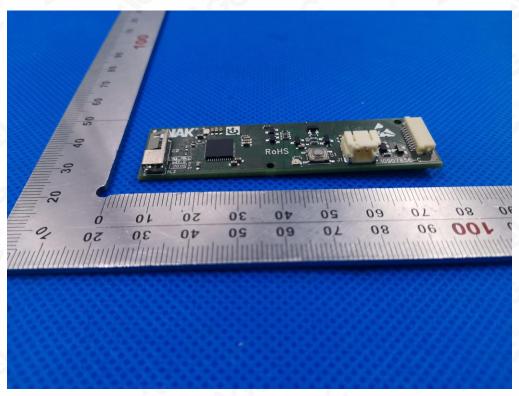


Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Coedicated Postuagina Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written pathorization of AGC where 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.

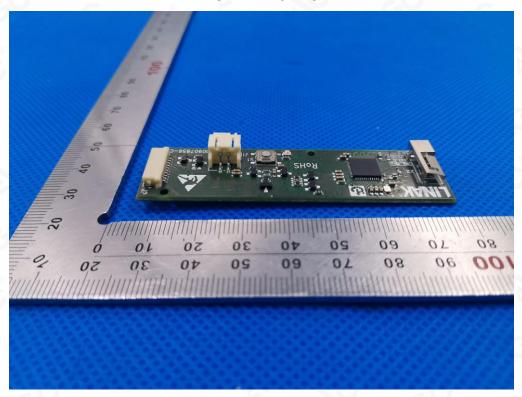




FRONT VIEW OF EUT



BACK VIEW OF EUT

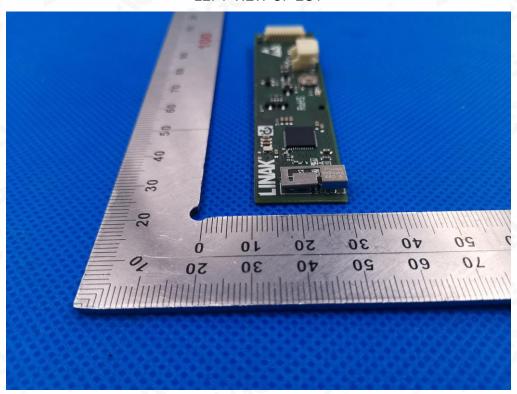


Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Restriction Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written appropriation 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc=cert.com.

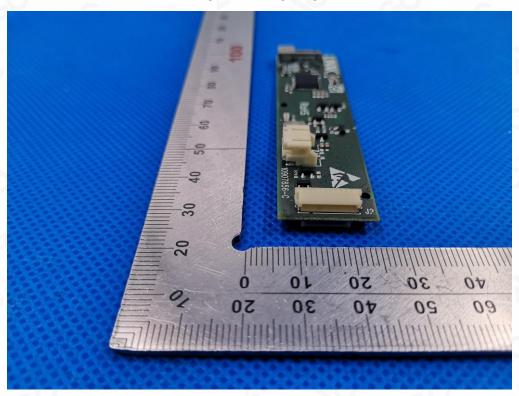


Page 38 of 39

LEFT VIEW OF EUT



RIGHT VIEW OF EUT

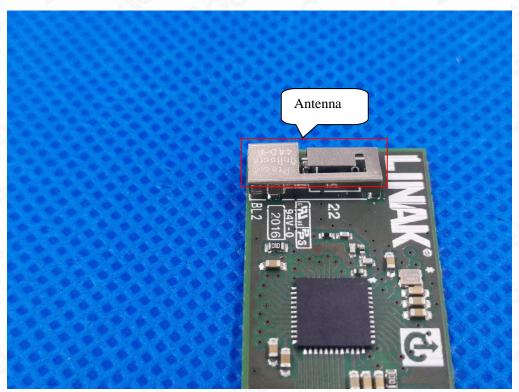


Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the specificated resting/inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter pathorization 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



Page 39 of 39

INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the specificated resting/inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the writter pathorization 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 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.