

# **FCC Test Report**

Report No.: AGC13525230201FE02

FCC ID : 2AATLK265B-PR

**APPLICATION PURPOSE**: Original Equipment

**PRODUCT DESIGNATION**: WiFi/BT module

**BRAND NAME** : FN-LINK

**MODEL NAME** : K265B-PR

**APPLICANT**: FN-LINK TECHNOLOGY LIMITED

**DATE OF ISSUE** : Sep. 04, 2023

**STANDARD(S)** : FCC Part 15.247

**REPORT VERSION**: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



Page 2 of 61

# **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 04, 2023	Valid	Initial Release



Report No.: AGC13525230201FE02 Page 3 of 61

# **TABLE OF CONTENTS**

1. VERIFICATION OF COMPLIANCE	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	6
2.2. TABLE OF CARRIER FREQUENCYS	6
2.3. RELATED SUBMITTAL(S)/GRANT(S)	7
2.4. TEST METHODOLOGY	7
2.5. SPECIAL ACCESSORIES	7
2.6. EQUIPMENT MODIFICATIONS	
2.7. ANTENNA REQUIREMENT	7
3. MEASUREMENT UNCERTAINTY	g
4. DESCRIPTION OF TEST MODES	10
5. SYSTEM TEST CONFIGURATION	11
5.1. CONFIGURATION OF TESTED SYSTEM	11
5.2. EQUIPMENT USED IN TESTED SYSTEM	11
5.3. SUMMARY OF TEST RESULTS	11
6. TEST FACILITY	12
7. PEAK OUTPUT POWER	13
7.1. MEASUREMENT PROCEDURE	13
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	13
7.3. LIMITS AND MEASUREMENT RESULT	14
8. BANDWIDTH	18
8.1. MEASUREMENT PROCEDURE	18
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	18
8.3. LIMITS AND MEASUREMENT RESULTS	18
9. CONDUCTED SPURIOUS EMISSION	25
9.1. MEASUREMENT PROCEDURE	25
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
9.3. MEASUREMENT EQUIPMENT USED	25
9.4. LIMITS AND MEASUREMENT RESULT	25
10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY	dicated Testing/Inspection



Page 4 of 61

10.1. MEASUREMENT PROCEDURE	37
10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	37
10.3. MEASUREMENT EQUIPMENT USED	
10.4. LIMITS AND MEASUREMENT RESULT	37
11. RADIATED EMISSION	41
11.1. MEASUREMENT PROCEDURE	41
11.2. TEST SETUP	42
11.3. LIMITS AND MEASUREMENT RESULT	43
11.4. TEST RESULT	43
12. LINE CONDUCTED EMISSION TEST	57
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST	57
12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	57
12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	58
12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	
12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	58
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	61
APPENDIX B: PHOTOGRAPHS OF EUT	61



Report No.: AGC13525230201FE02 Page 5 of 61

#### 1. VERIFICATION OF COMPLIANCE

FN-LINK TECHNOLOGY LIMITED	
No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan, CHINA	
FN-LINK TECHNOLOGY LIMITED	
No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan, CHINA	
FN-LINK TECHNOLOGY LIMITED	
No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan, CHINA	
WiFi/BT module	
FN-LINK	
K265B-PR	
Feb. 12, 2023	
Feb. 12, 2023 to Sep. 04, 2023	
No any deviation from the test method	
Normal	
Pass	
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	Alan	Duan
	Alan Duan	
	(Project Engineer)	Sep. 04, 2023
Reviewed By	Colin	, Lin
_	Calvin Liu	Son 04 2022
	(Reviewer)	Sep. 04, 2023
Approved By	Max 24	ang
	Max Zhang	004.0000
	(Authorized Officer)	Sep. 04, 2023



Page 6 of 61

#### 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as a "WiFi/BT module". 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	GFSK 1Mbps: 1.797dBm (Max) GFSK 2Mbps: 1.707dBm (Max)	
Bluetooth Version	V5.2	
Modulation	BR □GFSK, EDR □π /4-DQPSK, □8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps	
Number of channels	40 Channels	
Antenna Designation	PCB Antenna (Comply with requirements of the FCC part 15.203)	
Antenna Gain	4.59dBi	
Hardware Version	1.0	
Software Version	1.0	
Power Supply	DC 12V by adapter	

#### 2.2. TABLE OF CARRIER FREQUENCYS

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



Page 7 of 61

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

This submittal(s) (test report) is intended for **FCC ID: 2AATLK265B-PR** filing to comply with the FCC Part 15.247 requirements.

#### 2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

#### 2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

#### 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

#### 2.7. ANTENNA REQUIREMENT

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

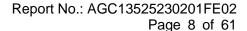
### 2.8. Duty Cycle Measurement

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	95	15.20	8.18	10.53
BLE_2Mbps	59	9.45	10.25	16.95

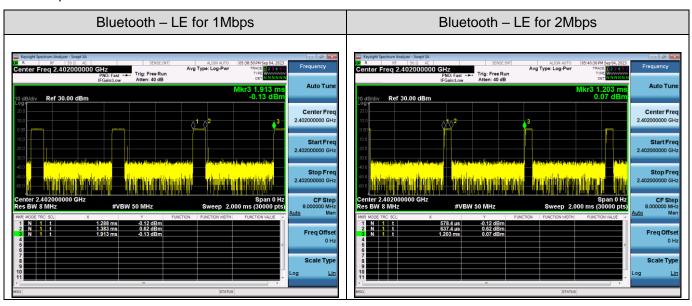
#### Remark:

- 1. Duty Cycle factor = 10 \* log (1/ Duty cycle)
- 2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value





# The test plots as follows:





Page 9 of 61

#### 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%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2.7 \%$
Uncertainty of Occupied Channel Bandwidth	U <sub>c</sub> = ±2 %



Report No.: AGC13525230201FE02 Page 10 of 61

#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX for GFSK 1Mbps
2	Middle channel TX for GFSK 1Mbps
3	High channel TX for GFSK 1Mbps
4	Low channel TX for GFSK 2Mbps
5	Middle channel TX for GFSK 2Mbps
6	High channel TX for GFSK 2Mbps

#### Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

Software Setting

| Commitment | Continue |

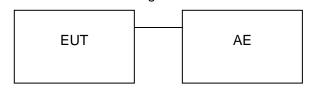


Page 11 of 61

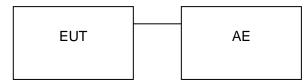
# 5. SYSTEM TEST CONFIGURATION

#### **5.1. CONFIGURATION OF TESTED SYSTEM**

Radiated Emission Configure:



Conducted Emission Configure:



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

Item	Equipment	Model No.	ID or Specification	Remark
1	WiFi/BT module	K265B-PR	2AATLK265B-PR	EUT
2	Adaptor	JF012WR-0900150UH	Input: AC100-240V,50-60Hz	AE
	Adapter	01012001-0900130011	Output: DC12V2A	AL

#### 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	Compliant



Page 12 of 61

#### 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 CONDUCTED EMISSION TEST**

1201 24011 111211 01 0011200122 21111001011 1201					
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 03, 2023	Jun. 02, 2024
LISN	R&S	ESH2-Z5	100086	Jun. 03, 2023	Jun. 02, 2024
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

# **TEST EQUIPMENT OF RADIATED EMISSION TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Jun. 01, 2023	May 31, 2024
2.4GHz Filter	EM Electronics	N/A	N/A	Mar. 18, 2022	Mar. 19, 2024
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2023	Apr. 22, 2024
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 01, 2022	Sep. 02, 2024
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A



Page 13 of 61

#### 7. PEAK OUTPUT POWER

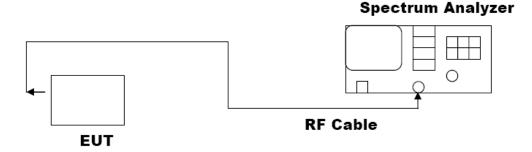
#### 7.1. MEASUREMENT PROCEDURE

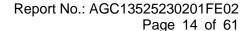
For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer
- 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 cables.

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





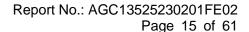


#### 7.3. LIMITS AND MEASUREMENT RESULT

	7.6. Elimito Ata Meadorement Reddet				
Test Data of Conducted Output Power					
Test Mode	Test Channel (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2402	0.341	≤30	Pass	
GFSK 1M	2440	0.647	≤30	Pass	
	2480	1.797	≤30	Pass	
	2402	0.266	≤30	Pass	
GFSK 2M	2440	0.565	≤30	Pass	
	2480	1.707	≤30	Pass	

**Test Graphs of Conducted Output Power** 

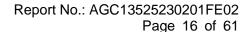








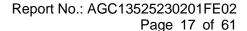


















Page 18 of 61

#### 8. BANDWIDTH

#### 8.1. MEASUREMENT PROCEDURE

#### 6dB bandwidth:

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

#### Occupied bandwidth:

- 1. Connect EUT RF output port to the Spectrum Analyzer
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel
  The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video
  bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

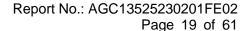
**Note:** The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

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

The same as described in section 7.2.

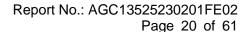
#### 8.3. LIMITS AND MEASUREMENT RESULTS

Test Data of Occupied Bandwidth and DTS Bandwidth					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
	2402	1.016	0.660	≥0.5	Pass
GFSK 1M	2440	1.011	0.662	≥0.5	Pass
	2480	1.017	0.656	≥0.5	Pass
	2402	2.030	1.136	≥0.5	Pass
GFSK 2M	2440	2.036	1.121	≥0.5	Pass
	2480	2.036	1.126	≥0.5	Pass

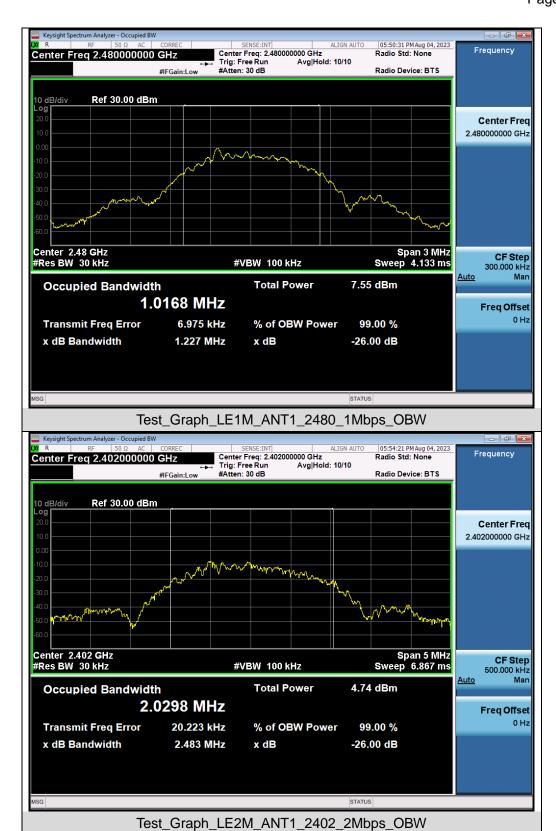


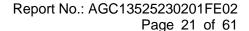










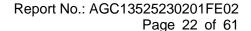






Test\_Graph\_LE2M\_ANT1\_2480\_2Mbps\_OBW

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/





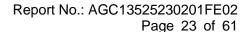
Test Graphs of DTS Bandwidth



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

Test\_Graph\_LE1M\_ANT1\_2440\_1Mbps\_DTSBW

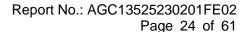
Web: http://www.agccert.com/







Test\_Graph\_LE2M\_ANT1\_2402\_2Mbps\_DTSBW









Page 25 of 61

#### 9. CONDUCTED SPURIOUS EMISSION

#### 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer
- 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)

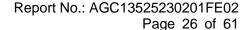
The same as described in section 7.2.

#### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITO AND MEAGUDEMENT DEGULT				
LIMITS AND MEASUREMENT RESULT				
Annilia alala I insita	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		



**Scale Type** 

<u>Lin</u>

Log

Span 3.000 MHz Sweep 2.000 ms (30000 pts)



Center 2.402000 GHz #Res BW 100 kHz

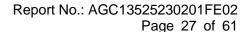
Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands Avg Type: Log-Pwr Avg|Hold: 10/10 Frequency Center Freq 2.402000000 GHz TYPE MWWW Trig: Free Run #Atten: 30 dB IFGain:Low **Auto Tune** 754 3 GHz 0.054 dBm Mkr1 2.401 10 dB/div Ref 20.00 dBm Center Freq 2.402000000 GHz Start Freq 2.400500000 GHz Stop Freq 2.403500000 GHz CF Step 300.000 kHz Auto Man Frea Offset 0 Hz

#VBW 300 kHz

# Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_Reference Level Center Freq 1.210000000 GHz Frequency Avg Type: Log-Pwr Avg|Hold: 10/10 PNO: Fast ---IFGain:Low Trig: Free Run #Atten: 30 dB **Auto Tune** Mkr1 2.387 80 GHz -56.704 dBm Ref 20.00 dBm 10 dB/div Center Frea 1.210000000 GHz Start Freq 30.000000 MHz Stop Freq 2 390000000 GHz CF Step 236.000000 MHz <u>Auto</u> Freq Offset 0 Hz **Scale Type** Start 0.030 GHz #Res BW 100 kHz Stop 2.390 GHz Sweep 226.0 ms (30000 pts) <u>Lin</u> #VBW 300 kHz

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

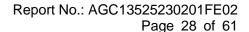
Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_Lower Band Emissions





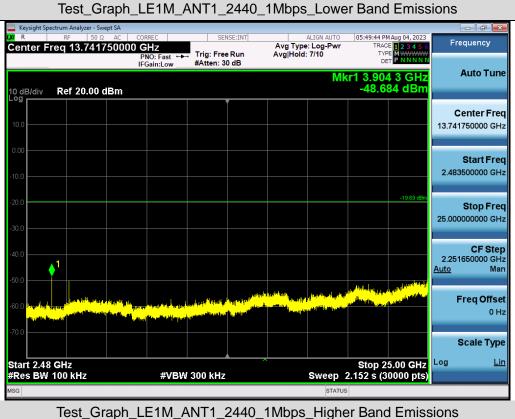


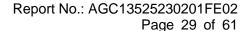






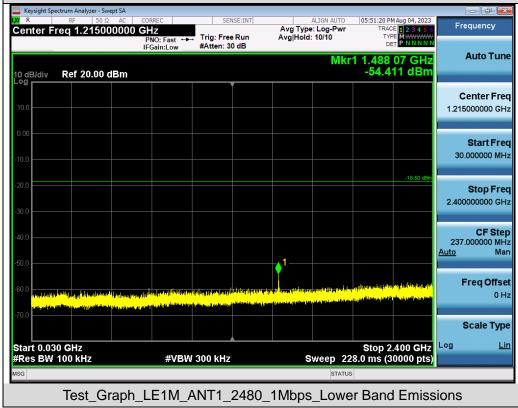


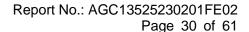




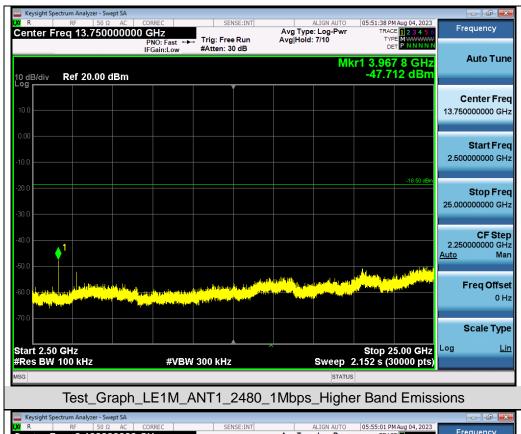




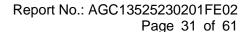




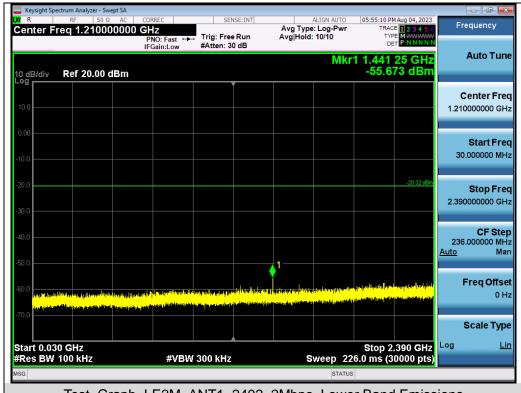


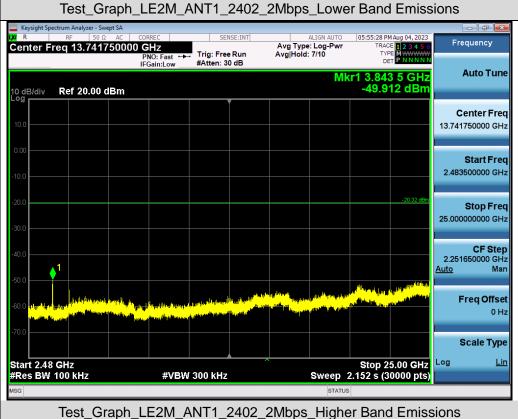


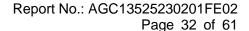






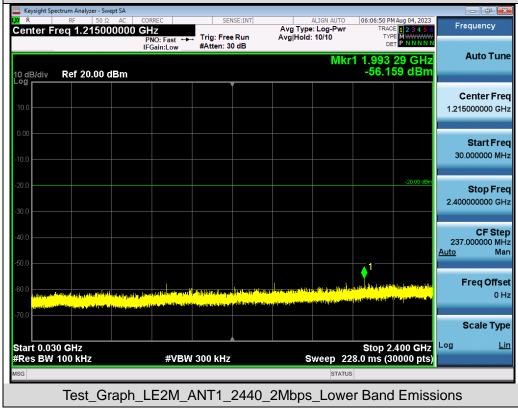


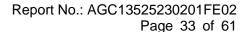




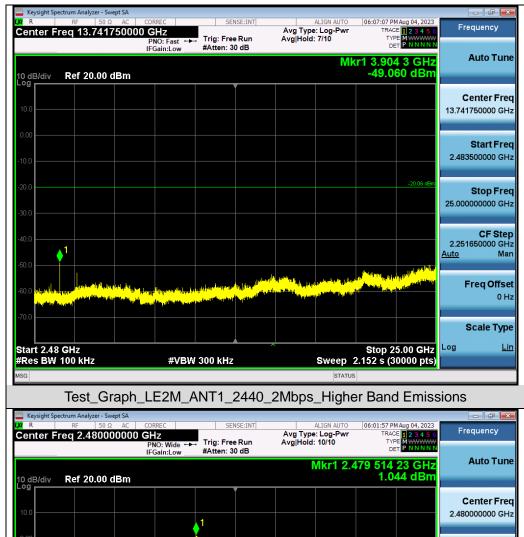


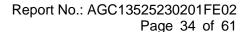




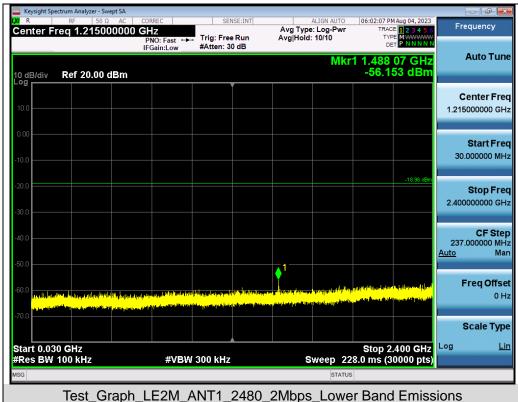


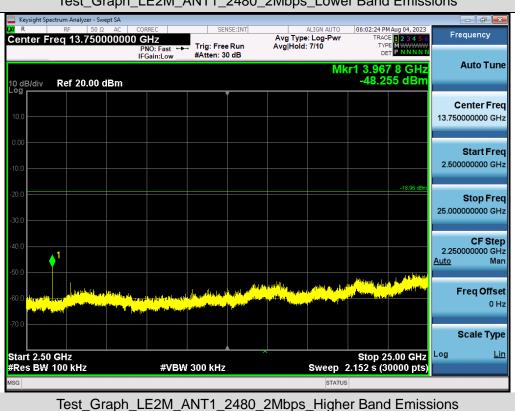


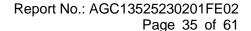










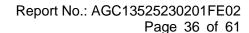




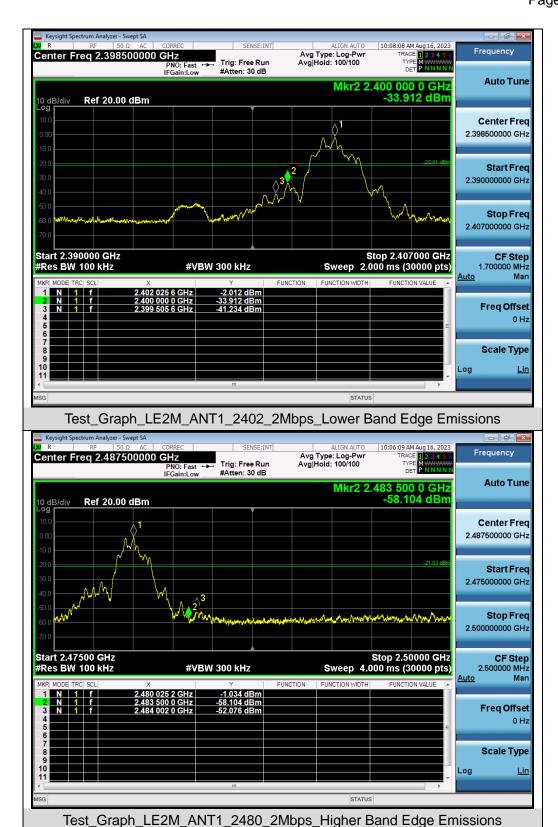
Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Center Freq 2.398500000 GHz Trig: Free Run #Atten: 30 dB TYPE **Auto Tune** Mkr2 2.400 000 0 GHz -49.977 dBm Ref 20.00 dBm Center Freq 2.398500000 GHz Start Freq 2.390000000 GHz Stop Freq 2.407000000 GHz Start 2.390000 GHz #Res BW 100 kHz Stop 2.407000 GHz 2.000 ms (30000 pts) CF Step 1.700000 MHz **#VBW** 300 kHz Auto Man 0.050 dBm -49.977 dBm Freq Offset 0 Hz Scale Type Log <u>Lin</u> Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_Lower Band Edge Emissions Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Center Freq 2.487500000 GHz Trig: Free Run #Atten: 30 dB PNO: Fast ↔ IFGain:Low **Auto Tune** Mkr2 2.483 500 0 GHz -50.915 dBm Ref 20.00 dBm Center Frea 2.487500000 GHz Start Freq 2.475000000 GHz Stop Freq 2 500000000 GHz Start 2.47500 GHz #Res BW 100 kHz Stop 2.50000 GHz Sweep 4.000 ms (30000 pts) **CF Step** #VBW 300 kHz 2.500000 MHz <u>Auto</u> Freq Offset 0 Hz **Scale Type** Log <u>Lin</u>

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

Test\_Graph\_LE1M\_ANT1\_2480\_1Mbps\_Higher Band Edge Emissions









Page 37 of 61

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

#### 10.1. MEASUREMENT PROCEDURE

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

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

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

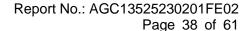
Refer to Section 7.2.

#### 10.3. MEASUREMENT EQUIPMENT USED

Refer to Section 6.

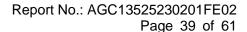
#### 10.4. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power Spectral Density								
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail				
	2402	-15.478	≪8	Pass				
GFSK 1M	2440	-15.149	≤8	Pass				
	2480	-14.122	<b>≤8</b>	Pass				
	2402	-20.029	<b>≤8</b>	Pass				
GFSK 2M	2440	-19.693	≪8	Pass				
	2480	-18.593	<b>≤8</b>	Pass				

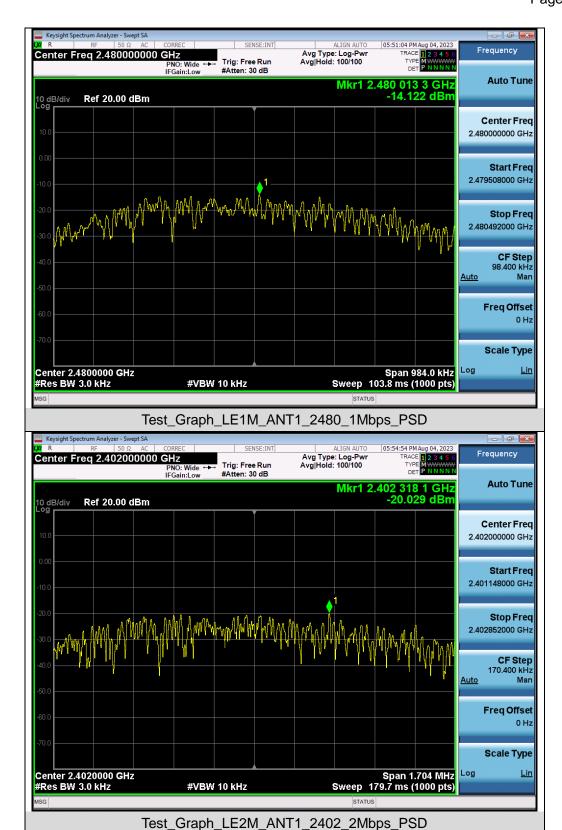


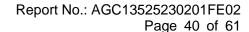


**Test Graphs of Conducted Output Power Spectral Density** Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Center Freq 2.402000000 GHz Trig: Free Run #Atten: 30 dB PNO: Wide IFGain:Low **Auto Tune** Mkr1 2.402 012 4 GHz -15.478 dBm IO dB/div Ref 20.00 dBm Center Freq 2.402000000 GHz Start Freq 2.401505000 GHz who have he had be more than the who was the had Stop Freq 2.402495000 GHz CF Step 99.000 kHz Auto Man Freq Offset 0 Hz Scale Type Log Center 2.4020000 GHz #Res BW 3.0 kHz Span 990.0 kHz Sweep 104.4 ms (1000 pts) <u>Lin</u> #VBW 10 kHz Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_PSD Center Freq 2.440000000 GHz Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Trig: Free Run #Atten: 30 dB PNO: Wide ↔ IFGain:Low **Auto Tune** Mkr1 2.440 012 4 GHz -15.149 dBm Ref 20.00 dBm 10 dB/div Center Frea 2.440000000 GHz Start Freq 2.439503500 GHz Stop Freq 2 440496500 GHz CF Step 99.300 kHz <u>Auto</u> Freq Offset 0 Hz **Scale Type** Center 2.4400000 GHz #Res BW 3.0 kHz Span 993.0 kHz Sweep 104.8 ms (1000 pts) <u>Lin</u> #VBW 10 kHz Test\_Graph\_LE1M\_ANT1\_2440\_1Mbps\_PSD

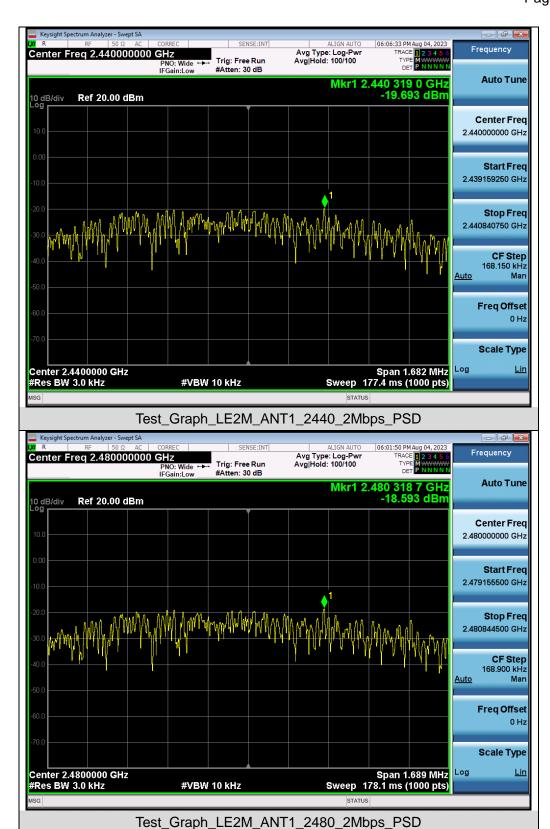












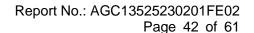


Page 41 of 61

#### 11. RADIATED EMISSION

#### 11.1. MEASUREMENT PROCEDURE

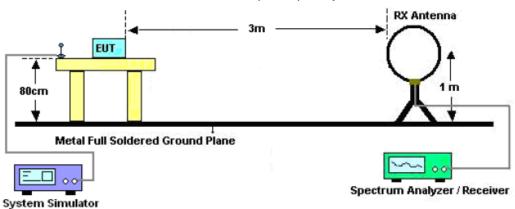
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.



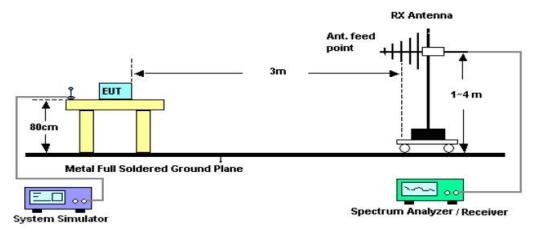


#### 11.2. TEST SETUP

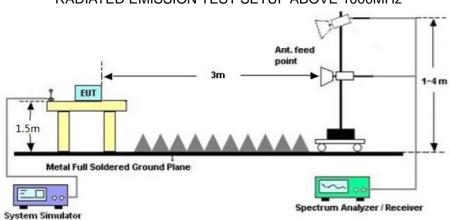
## Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz





Page 43 of 61

## 11.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

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

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

#### 11.4. TEST RESULT

#### Radiated emission below 30MHz

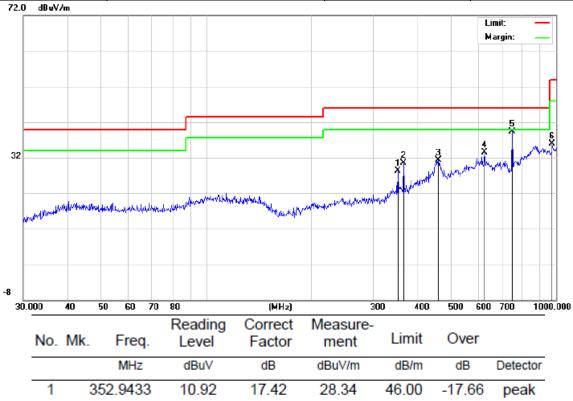
The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.



Page 44 of 61

## Radiated emission from 30MHz to 1000MHz

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal



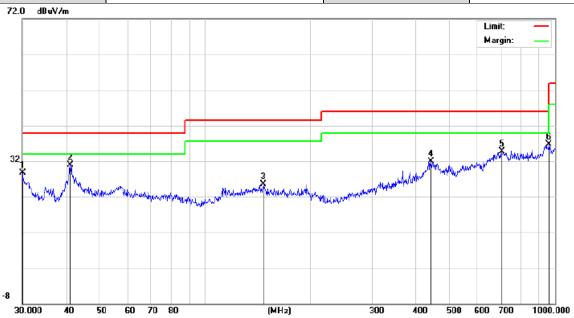
No.	Mk	. Freq.	Level	Factor	ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		352.9433	10.92	17.42	28.34	46.00	-17.66	peak
2		366.8231	12.78	17.80	30.58	46.00	-15.42	peak
3		460.7271	5.07	26.23	31.30	46.00	-14.70	peak
4		625.0780	8.24	25.23	33.47	46.00	-12.53	peak
5	*	750.1083	15.15	24.06	39.21	46.00	-6.79	peak
6		975.7529	6.85	29.02	35.87	54.00	-18.13	peak

**RESULT: PASS** 



Page 45 of 61

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		30.0000	15.02	13.60	28.62	40.00	-11.38	peak
2	*	41.1320	14.03	16.91	30.94	40.00	-9.06	peak
3		146.8877	7.35	18.20	25.55	43.50	-17.95	peak
4		441.7426	5.84	26.02	31.86	46.00	-14.14	peak
5		704.2261	6.46	28.25	34.71	46.00	-11.29	peak
6		962.1623	6.52	30.10	36.62	54.00	-17.38	peak

# **RESULT: PASS**

#### Note:

- 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
- 2. All test modes had been tested. The mode 3 is the worst case and recorded in the report.



Page 46 of 61

## Radiated emission above 1GHz

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	45.26	0.08	45.34	74	-28.66	peak
4804.000	36.12	0.08	36.2	54	-17.8	AVG
7206.000	40.18	2.21	42.39	74	-31.61	peak
7206.000	31.59	2.21	33.8	54	-20.2	AVG

Remark:

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

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	<ul> <li>Value Type</li> </ul>
4804.000	45.19	0.08	45.27	74	-28.73	peak
4804.000	35.87	0.08	35.95	54	-18.05	AVG
7206.000	40.12	2.21	42.33	74	-31.67	peak
7206.000	29.68	2.21	31.89	54	-22.11	AVG

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



Page 47 of 61

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type			
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type			
4880.000	45.18	0.14	45.32	74	-28.68	peak			
4880.000	36.27	0.14	36.41	54	-17.59	AVG			
7320.000	41.05	2.36	43.41	74	-30.59	peak			
7320.000	32.49	2.36	34.85	54	-19.15	AVG			
Remark:									
Factor - Anter	na Factor + Cabl	aloce Drag	mplifier		•				

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

EUT	WiFi/BT module	Model Name	K265B-PR
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 Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4880.000	46.18	0.14	46.32	74	-27.68	peak
4880.000	38.54	0.14	38.68	54	-15.32	AVG
7320.000	40.15	2.36	42.51	74	-31.49	peak
7320.000	31.59	2.36	33.95	54	-20.05	AVG
Remark:					<u> </u>	

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



Page 48 of 61

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	47.15	0.22	47.37	74	-26.63	peak
4960.000	37.84	0.22	38.06	54	-15.94	AVG
7440.000	41.54	2.64	44.18	74	-29.82	peak
7440.000	31.59	2.64	34.23	54	-19.77	AVG
Remark:						

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

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

EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	46.28	0.22	46.5	74	-27.5	peak
4960.000	35.27	0.22	35.49	54	-18.51	AVG
7440.000	41.06	2.64	43.7	74	-30.3	peak
7440.000	31.59	2.64	34.23	54	-19.77	AVG
Remark:						

#### **RESULT: PASS**

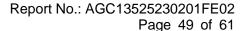
#### Note

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.

All test modes had been tested. The GFSK 1Mbps is the worst case and recorded in the report.

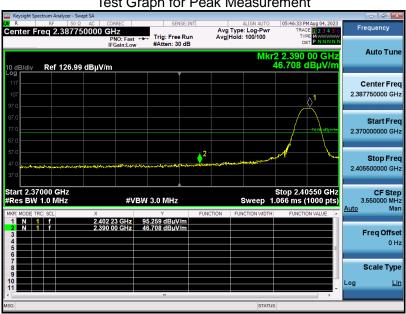


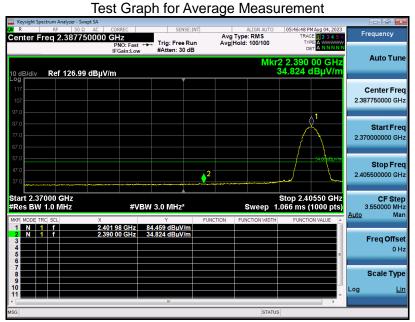


Test result for band edge emission at restricted bands

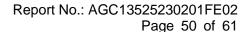
EUT	WiFi/BT module	Model Name	K265B-PR
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Test Graph for Peak Measurement





**RESULT: PASS** 

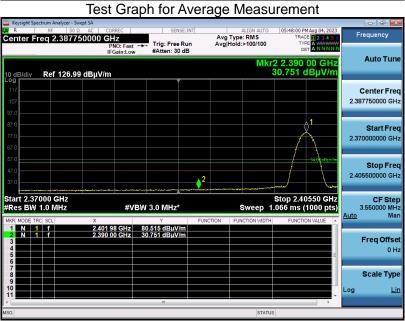




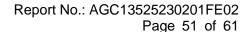
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 1 **Antenna** Vertical

Test Graph for Peak Measurement





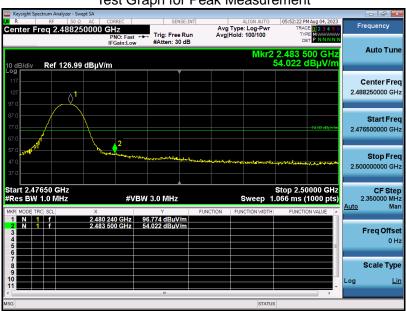
**RESULT: PASS** 

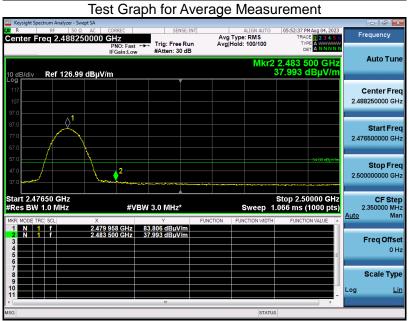




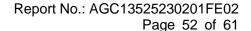
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 3 **Antenna** Horizontal

Test Graph for Peak Measurement





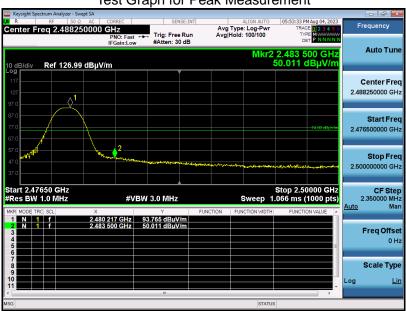
**RESULT: PASS** 

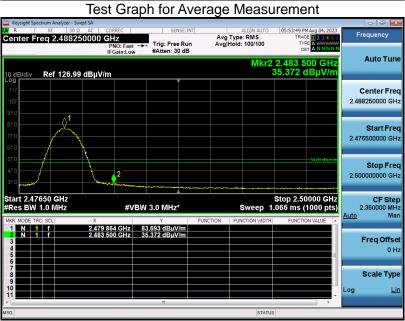




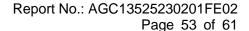
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 3 **Antenna** Vertical

Test Graph for Peak Measurement





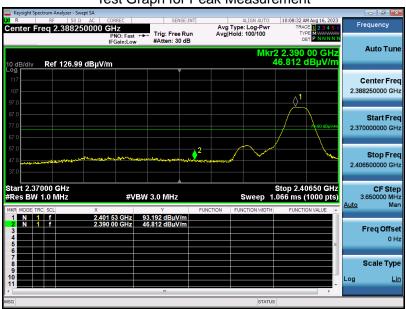
**RESULT: PASS** 

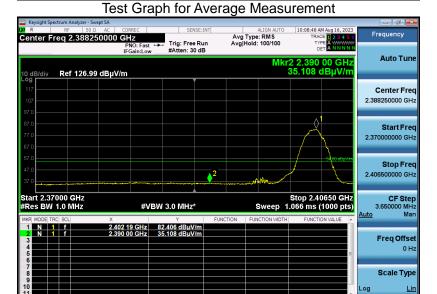




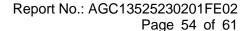
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 4 **Antenna** Horizontal

Test Graph for Peak Measurement





**RESULT: PASS** 

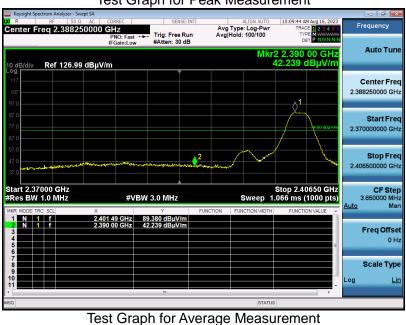


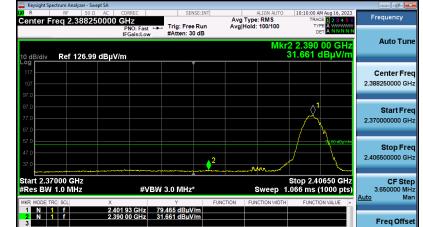
Scale Type



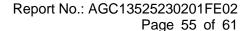
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 4 **Antenna** Vertical

Test Graph for Peak Measurement





**RESULT: PASS** 

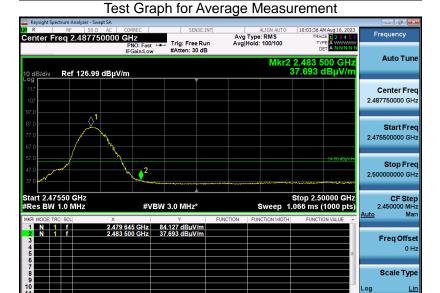




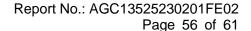
**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 6 **Antenna** Horizontal

Test Graph for Peak Measurement





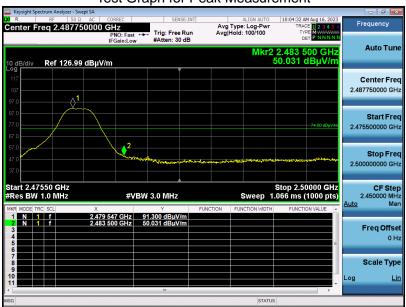
**RESULT: PASS** 

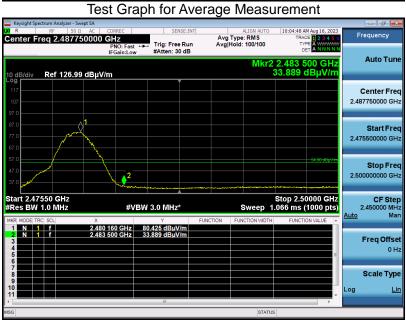




**EUT** WiFi/BT module **Model Name** K265B-PR 25° C **Temperature Relative Humidity** 55.4% 960hPa Normal Voltage **Pressure Test Voltage Test Mode** Mode 6 **Antenna** Vertical

Test Graph for Peak Measurement





#### **RESULT: PASS**

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



Page 57 of 61

#### 12. LINE CONDUCTED EMISSION TEST

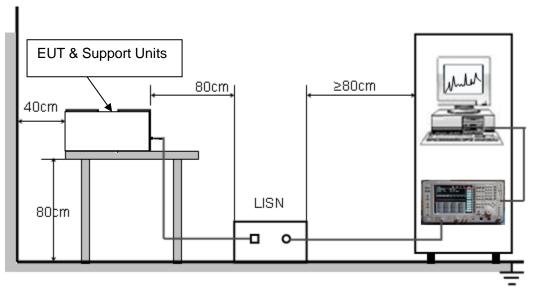
## 12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

F	Maximum RF Line Voltage				
Frequency	Q.P.( dBuV)	Average( dBuV)			
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. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





Page 58 of 61

#### 12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC 12V power from adapter which received AC120V/60Hz power from a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

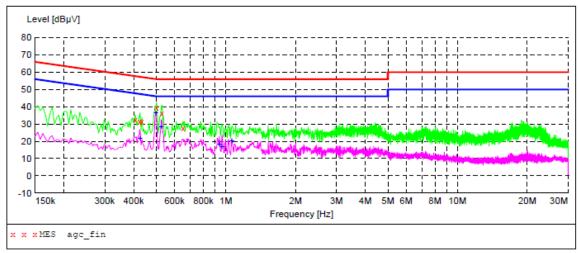
#### 12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

#### 12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST



## Line Conducted Emission Test Line 1-L



# MEASUREMENT RESULT: "agc\_fin"

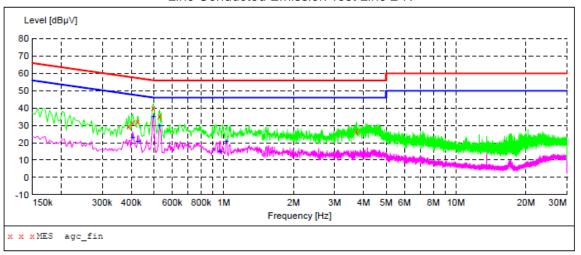
2023/5/26 9:44 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.406000 0.426000 0.434000 0.502000 0.530000 0.654000	32.60 31.50 31.40 39.40 36.20 27.40	6.2 6.2 6.2 6.2 6.3	58 57 57 56 56	25.1 25.8 25.8 16.6 19.8 28.6	QP QP	L1 L1 L1 L1 L1

# MEASUREMENT RESULT: "agc\_fin2"

2023/5/26 9:44 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.426000	21.70	6.2	47	25.6	AV	L1
0.498000	36.60	6.2	46	9.4	AV	L1
0.526000	28.60	6.2	46	17.4	AV	L1
0.938000	18.70	6.3	46	27.3	AV	L1
0.962000	16.90	6.3	46	29.1	AV	L1
1.058000	20.60	6.3	46	25.4	AV	L1



#### Line Conducted Emission Test Line 2-N



# MEASUREMENT RESULT: "agc\_fin"

2023/5/26 9:47 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.390000 0.406000	29.40 31.30	6.2 6.2	58 58	28.7 26.4	_	N N
0.426000	32.20	6.2	57	25.1	QP	N
0.498000 0.530000	40.20 35.30	6.2 6.2	56 56	15.8 20.7	QP OP	N N
3.730000	26.50	6.4	56	29.5	_	N

# MEASUREMENT RESULT: "agc fin2"

2023/5/26 9:4	7					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.406000	23.30	6.2	48	24.4	AV	N
0.426000	20.70	6.2	47	26.6	AV	N
0.498000	35.20	6.2	46		AV	N
0.530000	29.90	6.2	46	16.1	AV	N
0.966000	15.30	6.3	46	30.7	AV	N
1.026000	20.70	6.3	46	25.3	AV	N

#### **RESULT: PASS**

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



Page 61 of 61

#### APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC13525230201AP02

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC13525230201AP03

----END OF REPORT----



# Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
- 2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
- 6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
- 7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
- 9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.