

# **FCC Test Report**

Report No.: AGC03652230302FE02

FCC ID : 2AJFWXOSSA

**APPLICATION PURPOSE**: Original Equipment

**PRODUCT DESIGNATION**: Smart GPS Cycling Computer

**BRAND NAME** : XOSS

**MODEL NAME** : NAV, A1, A2, A3, A4, A5, NAV+

APPLICANT Shanghai Dabuziduo Information and Technology Co.,

Ltd.

**DATE OF ISSUE** : Jun.06, 2023

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

**REPORT VERSION**: V1.0

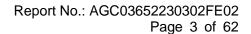
Attestation of Global Compliance (Shenzhen) Co., Ltd



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# **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun.06, 2023	Valid	Initial Release





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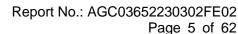
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10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY  Any report having not been signed by authorized approver, or having been altered without authorization, or having not Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to	been stamped by the "Dedicated Testing/Inspection without the written authorization of AGC. The test results

Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.



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#### 1. VERIFICATION OF COMPLIANCE

Applicant	Shanghai Dabuziduo Information and Technology Co., Ltd.	
Address	Room 602 East Tower 6F XINGZHE Office No.800 Guo Shun East Road, Yangpu District, Shanghai P.R.China	
Manufacturer	Shanghai Dabuziduo Information and Technology Co., Ltd.	
Address	Room 602 East Tower 6F XINGZHE Office No.800 Guo Shun East Road, Yangpu District, Shanghai P.R.China	
Factory	Shanghai Dabuziduo Information and Technology Co., Ltd.	
Address	Room 602 East Tower 6F XINGZHE Office No.800 Guo Shun East Road, Yangpu District, Shanghai P.R.China	
Product Designation	Smart GPS Cycling Computer	
Brand Name	XOSS	
Test Model	NAV	
Series Model	A1, A2, A3, A4, A5, NAV+	
Declaration of Difference	All the same except for the model name and appearance color	
Date of receipt of test item	Mar. 24, 2023	
Date of test	Mar. 24, 2023 to Jun. 06, 2023	
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	Bi bo zhay	
	Bibo Zhang (Project Engineer)	Jun. 06, 2023
Reviewed By	Calin Lin	
	Calvin Liu (Reviewer)	Jun. 06, 2023
Approved By	Max Zhang	
	Max Zhang (Authorized Officer)	Jun. 06, 2023



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#### 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as a "Smart GPS Cycling Computer". 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	2.402GHz to 2.480GHz
RF Output Power	GFSK 1Mbps:2.285dBm (Max) GFSK 2Mbps:2.358dBm (Max)
Bluetooth Version	V5.0
Modulation	BR□GFSK, EDR□π /4-DQPSK, □8DPSK BLE☑GFSK 1Mbps ☑GFSK 2Mbps
Number of channels	40 Channels
Antenna Designation	Chip Antenna (Comply with requirements of the FCC part 15.203)
Antenna Gain	2.1dBi
Hardware Version	V1.5C
Software Version	V0.1
Power Supply	DC 3.7V by battery or DC 5V 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



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

This submittal(s) (test report) is intended for **FCC ID:2AJFWXOSSA** 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.

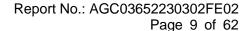


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#### 3. MEASUREMENT UNCERTAINTY

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	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2.7 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$



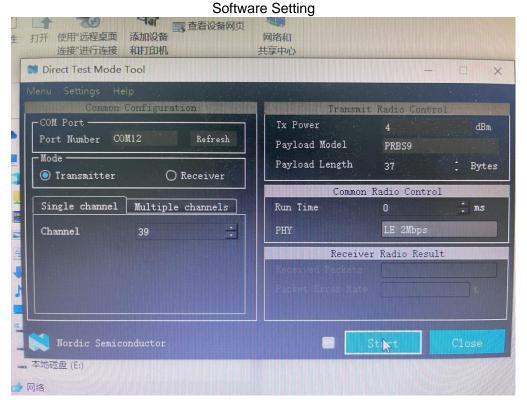


#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION	
1	Low channel TX_2402MHz_GFSK_1Mbps	
2	Middle channel TX_2440MHz_GFSK_1Mbps	
3	High channel TX_2480MHz_GFSK_1Mbps	
4	Low channel TX_2402MHz_GFSK_2Mbps	
5	Middle channel TX_2440MHz_GFSK_2Mbps	
6	High channel TX_2480MHz_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.





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#### 5. SYSTEM TEST CONFIGURATION

# **5.1. CONFIGURATION OF TESTED SYSTEM**

Radiated Emission Configure:

	EUT
ı	

Conducted Emission Configure:

EUT	AE

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

Item	Equipment	Model No.	ID or Specification	Remark
1	Smart GPS Cycling Computer	NAV	2AJFWXOSSA	EUT
2	Control Box	USB TO TTL	N/A	AE
3	Charger line	N/A	0.3m unshielded	Accessories
4	Adapter	HW-050200C01	DC 5V	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	Compliant



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# 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

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Aug. 04, 2022	Aug. 03, 2023
Artificial power network	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023
Test Software	FARA	EZ-EMC	Ver.AGC-CON03 A1	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
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Wideband Antenna	SCHWARZBECK	VULB9168	D69250	May 11, 2023	May 10, 2025
Signal Analyzer	Aglient	N9020A	MY52090123	Aug. 04, 2022	Aug. 03, 2023
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
2.4GHz Filter	EM Electronics	N/A	N/A	Mar. 18, 2022	Mar. 19, 2024
Horn Antenna	SCHWARZBEC	BBHA9170	768	Oct. 31, 2021	Oct. 30, 2023
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 01, 2022	Sep. 02, 2024
Double-Ridged Waveguide Horn	ETS	3117	00154520	Sep. 06, 2021	Sep. 05, 2023
Test Software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A



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#### 7. PEAK OUTPUT POWER

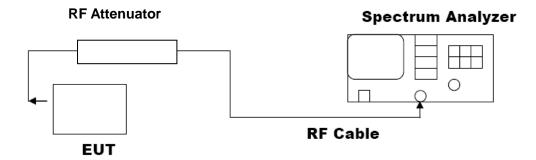
#### 7.1. MEASUREMENT PROCEDURE

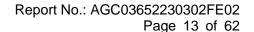
For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. RBW ≥ DTS bandwidth
- 3. VBW≥3\*RBW.
- 4. SPAN≥VBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

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



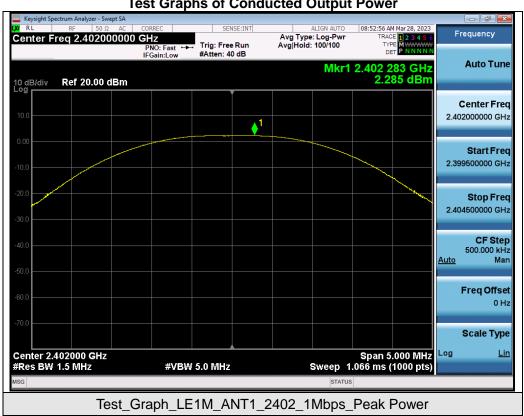


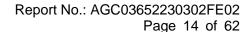


7.3. LIMITS AND MEASUREMENT RESULT

7.6. EIMITO AND MEAGONEMENT NEGGET						
Test Data of Conducted Output Power						
Test Mode	Test Channel (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail		
	2402	2.285	≤30	Pass		
GFSK 1M	2440	1.976	≤30	Pass		
	2480	2.254	≤30	Pass		
	2402	2.303	≤30	Pass		
GFSK 2M	2440	2.358	≤30	Pass		
	2480	2.304	≤30	Pass		

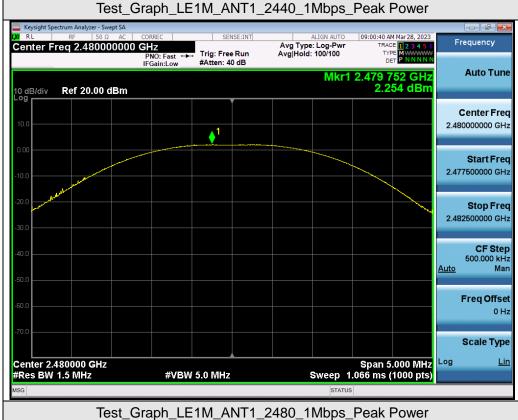
**Test Graphs of Conducted Output Power** 

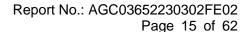








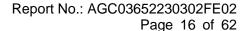




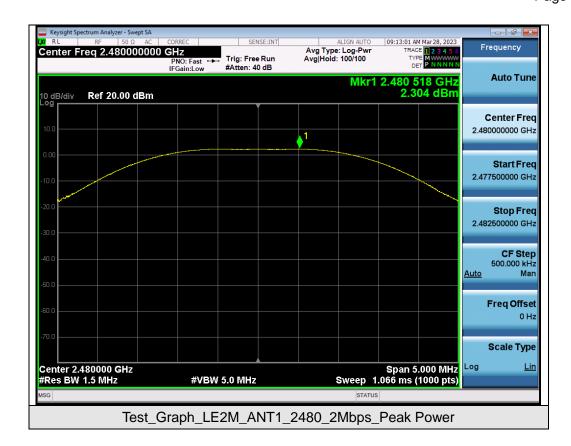














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#### 8. BANDWIDTH

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

#### 6dB bandwidth:

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

#### Occupied bandwidth:

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

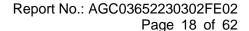
Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

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

The same as described in section 7.2.

#### 8.3. LIMITS AND MEASUREMENT RESULTS

Test Data of Occupied Bandwidth and DTS Bandwidth					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
GFSK 1M	2402	1.055	0.695	≥0.5	Pass
	2440	1.058	0.697	≥0.5	Pass
	2480	1.058	0.709	≥0.5	Pass
GFSK 2M	2402	2.047	1.145	≥0.5	Pass
	2440	2.052	1.151	≥0.5	Pass
	2480	2.050	1.148	≥0.5	Pass





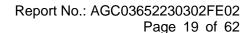
Test Graphs of Occupied Bandwidth 08:52:29 AM Mar 28, 2023 Radio Std: None SENSE:INT Center Freq: 2.402000000 GHz
Trig: Free Run Avg|Hol
#Atten: 30 dB Frequency Center Freq 2.402000000 GHz Avg|Hold: 10/10 Radio Device: BTS Ref 30.00 dBm Center Freq 2.402000000 GHz Center 2.402 GHz #Res BW 30 kHz Span 3 MHz Sweep 4.133 ms **CF Step #VBW 100 kHz** 300.000 kHz **Auto Total Power** 8.52 dBm **Occupied Bandwidth** 1.0551 MHz Freq Offset 0 Hz 26.187 kHz **Transmit Freq Error** % of OBW Power 99.00 % x dB Bandwidth 1.267 MHz x dB -26.00 dB Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_OBW 08:58:08 AM Mar 28, 2023 SENSE:INT

Center Freq: 2.440000000 GHz

Trig: Free Run Avg|Hol
#Atten: 30 dB Frequency Freq 2.440000000 GHz Radio Std: None Avg|Hold: 10/10 Radio Device: BTS Ref 30.00 dBm Center Freq 2 440000000 GHz Span 3 MHz Sweep 4.133 ms Center 2.44 GHz #Res BW 30 kHz **CF Step #VBW 100 kHz** 300,000 kHz <u>Auto</u> **Total Power** 8.26 dBm **Occupied Bandwidth** 1.0578 MHz Freq Offset **Transmit Freq Error** 25.270 kHz % of OBW Power 99.00 % x dB Bandwidth -26.00 dB 1.265 MHz x dB

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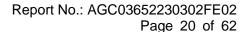
Test\_Graph\_LE1M\_ANT1\_2440\_1Mbps\_OBW







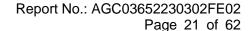






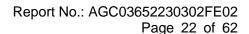








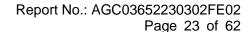




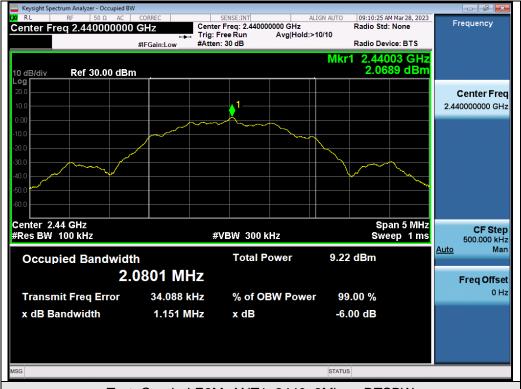
















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#### 9. CONDUCTED SPURIOUS EMISSION

#### 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)

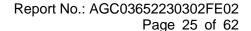
The same as described in section 7.2.

#### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

#### 9.4. LIMITS AND MEASUREMENT RESULT

C.H. EIMITO AND MEAGONEMENT NEGGET				
LIMITS AND MEASUREMENT RESULT				
Applicable Limite	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		



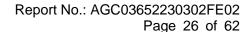


Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

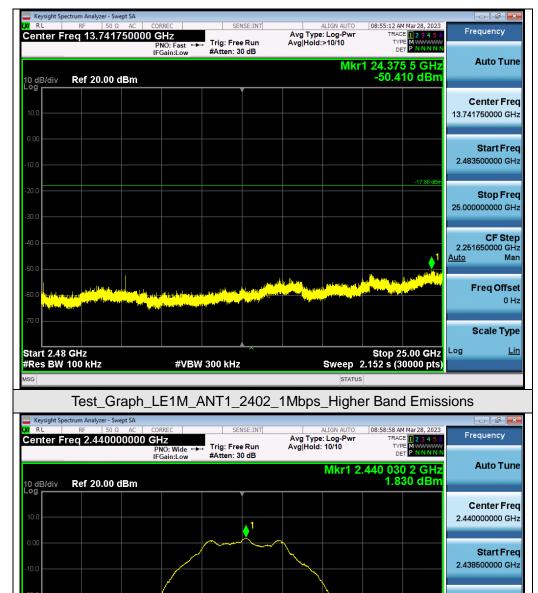


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Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_Lower Band Emissions







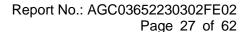
Stop Freq 2.441500000 GHz

CF Step 300.000 kHz
Auto Man

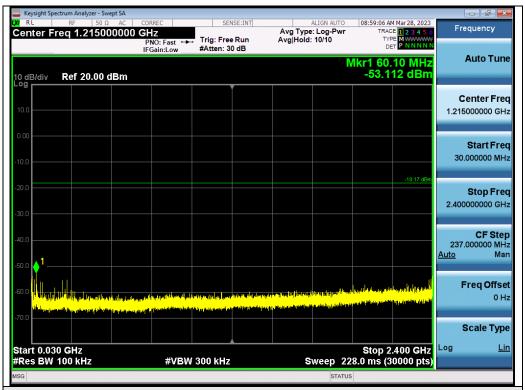
Freq Offset 0 Hz

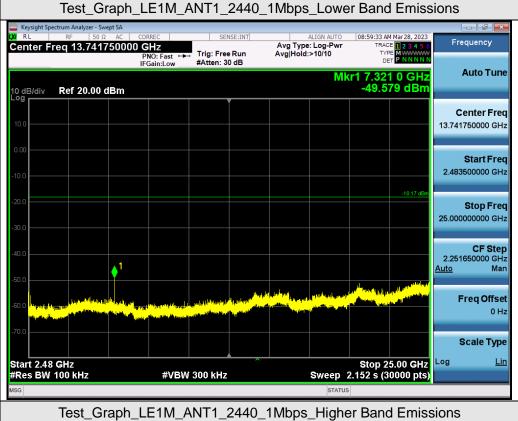
#Res BW 100 kHz #VBW 300 kHz Sweep 2.000 ms (30000 pts)

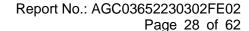
Test\_Graph\_LE1M\_ANT1\_2440\_1Mbps\_Reference Level





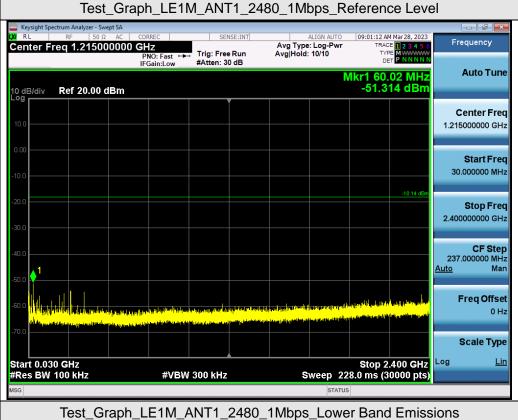


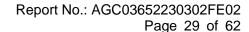








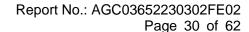




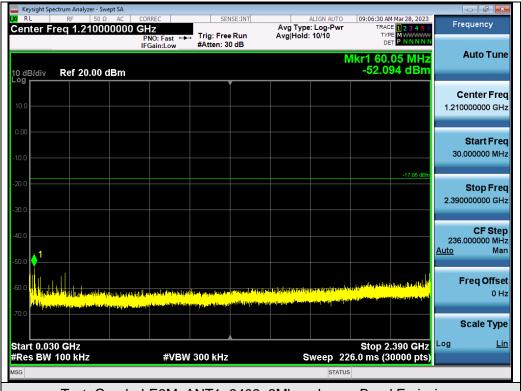


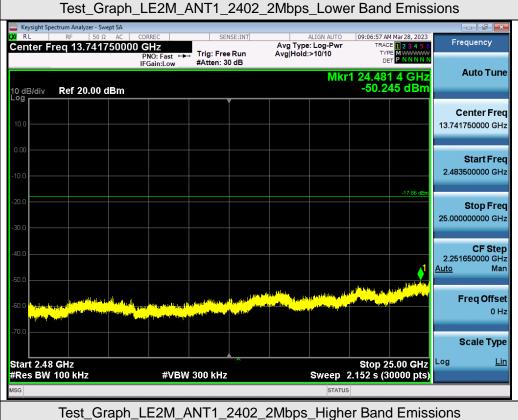


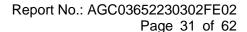






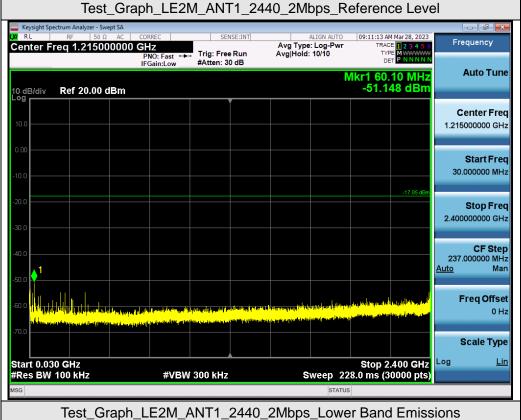


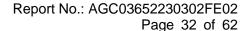








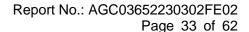




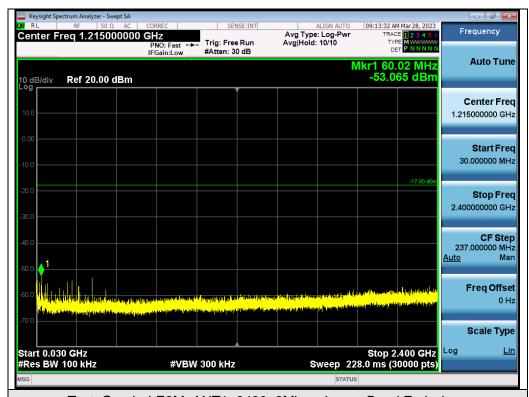


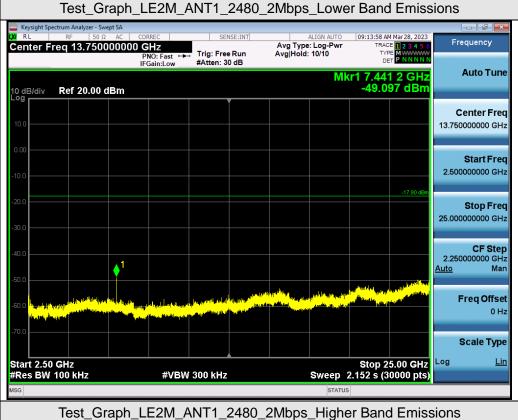


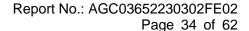






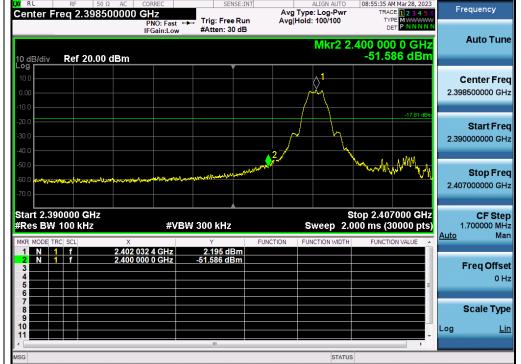


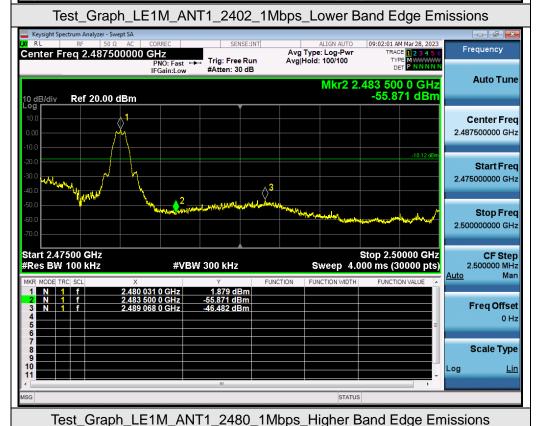


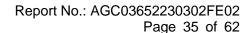




Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands Frequency Avg Type: Log-Pwr Avg|Hold: 100/100 RACE 1 2 3
TYPE MWW
DET P N N Center Freq 2.398500000 GHz Trig: Free Run #Atten: 30 dB **Auto Tune** Mkr2 2.400 000 0 GHz

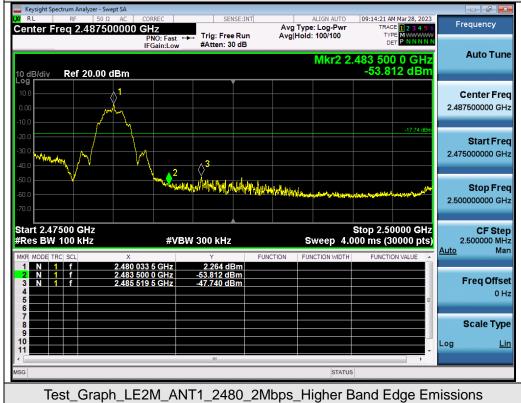














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#### 10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

#### 10.1. MEASUREMENT PROCEDURE

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

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

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

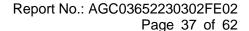
Refer to Section 7.2.

#### 10.3. MEASUREMENT EQUIPMENT USED

Refer to Section 6.

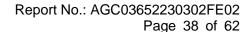
#### 10.4. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power Spectral Density					
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail	
	2402	-13.257	≪8	Pass	
GFSK 1M	2440	-13.718	≪8	Pass	
	2480	-13.654	≪8	Pass	
	2402	-15.820	≪8	Pass	
GFSK 2M	2440	-15.712	≪8	Pass	
	2480	-15.773	≪8	Pass	

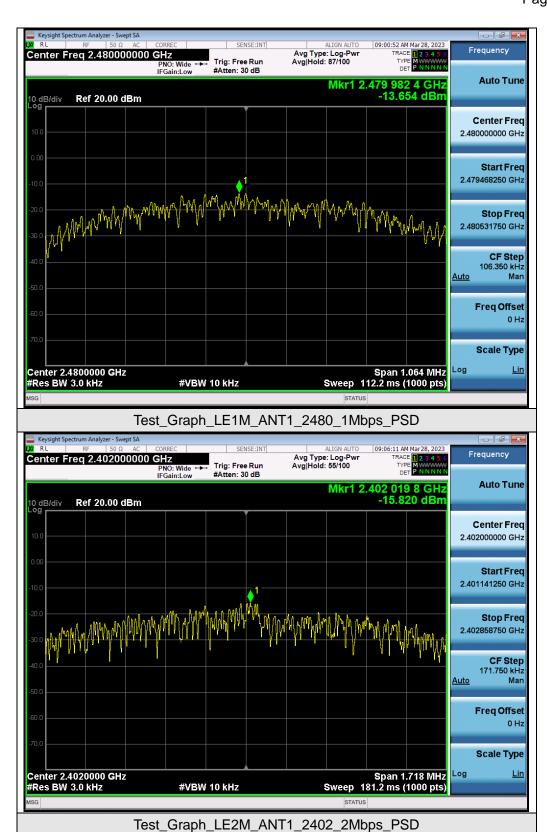


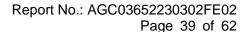


**Test Graphs of Conducted Output Power Spectral Density** Frequency Avg Type: Log-Pwr Avg|Hold: 89/100 Center Freq 2.402000000 GHz Trig: Free Run #Atten: 30 dB PNO: Wide IFGain:Low Mkr1 2.401 981 7 GHz -13.257 dBm **Auto Tune** Ref 20.00 dBm 10 dB/div Center Freq 2.402000000 GHz Start Freq 2.401478750 GHz MAN WANT WARM Stop Freq 2.402521250 GHz **CF Step** 104,250 kHz <u>Auto</u> Freq Offset 0 Hz **Scale Type** Center 2.4020000 GHz #Res BW 3.0 kHz Span 1.043 MHz Sweep 110.0 ms (1000 pts) Log **#VBW 10 kHz** Test\_Graph\_LE1M\_ANT1\_2402\_1Mbps\_PSD Frequency Center Freq 2.440000000 GHz Avg Type: Log-Pwr Avg|Hold: 88/100 Trig: Free Run #Atten: 30 dB PNO: Wide → IFGain:Low **Auto Tune** Mkr1 2.439 982 7 GHz -13.718 dBm Ref 20.00 dBm 10 dB/div Center Freq 2.440000000 GHz Start Freq 2.439477250 GHz Why Why My My what who Stop Freq 2.440522750 GHz **CF Step** 104.550 kHz <u>Auto</u> Freq Offset 0 Hz **Scale Type** Center 2.4400000 GHz #Res BW 3.0 kHz Span 1.046 MHz Sweep 110.3 ms (1000 pts) **#VBW 10 kHz** Test\_Graph\_LE1M\_ANT1\_2440\_1Mbps\_PSD

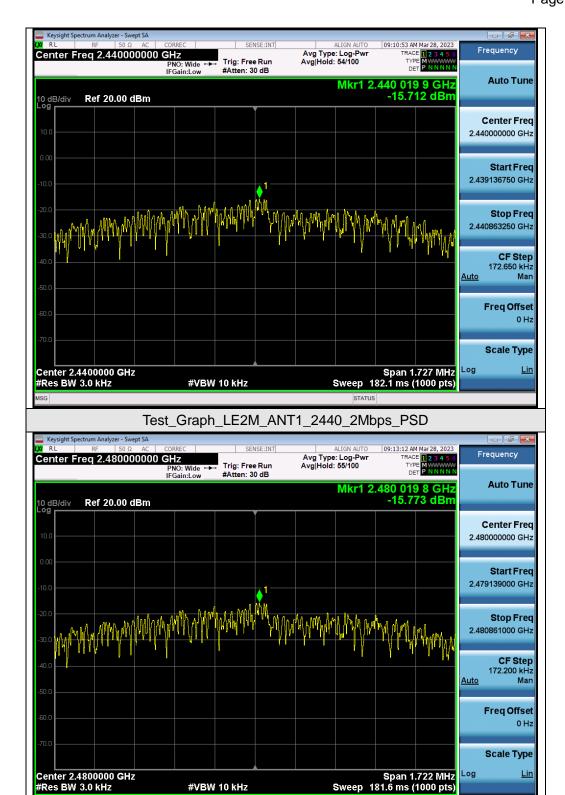












Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the 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\_LE2M\_ANT1\_2480\_2Mbps\_PSD

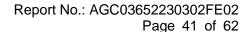


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### 11. RADIATED EMISSION

#### 11.1. MEASUREMENT PROCEDURE

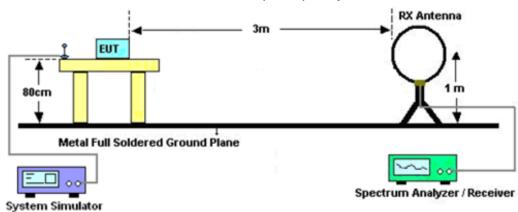
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated 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.



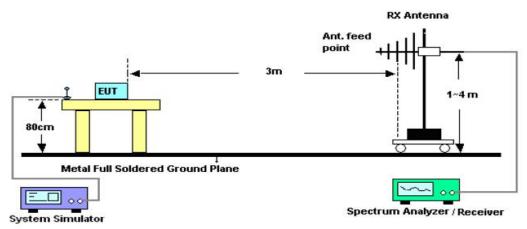


#### 11.2. TEST SETUP

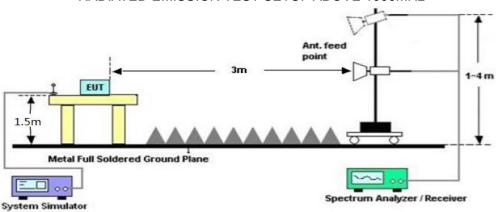
## Radiated Emission Test-Setup Frequency Below 30MHz



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



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz





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### 11.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

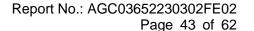
Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

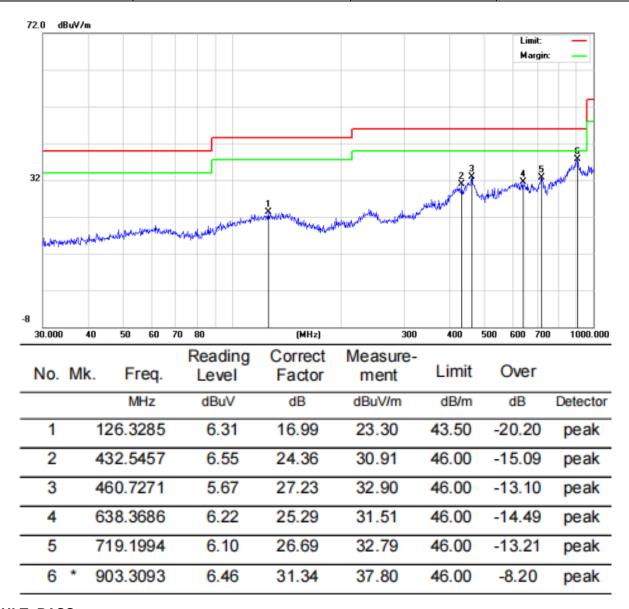
The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.



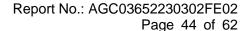


Radiated emission from 30MHz to 1000MHz

EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	21.8°C	Relative Humidity	52.3%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

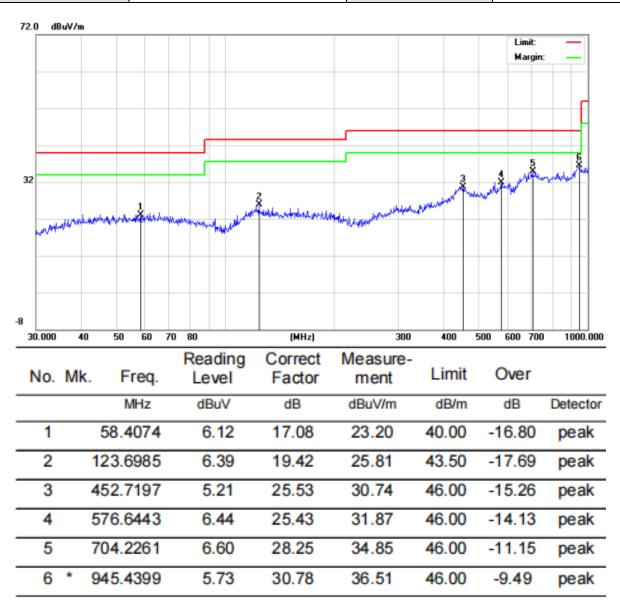


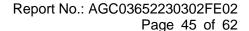
**RESULT: PASS** 





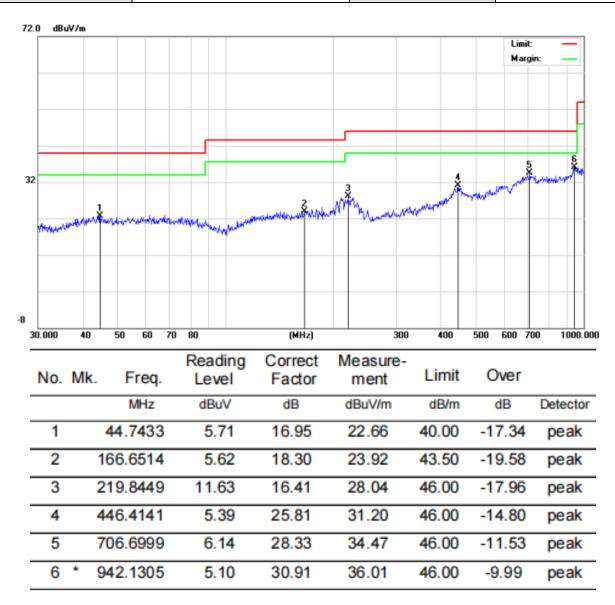
EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	21.8°C	Relative Humidity	52.3%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



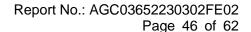




EUT	Smart GPS Cycling Computer	Model Name	NAV+
Temperature	24.5°C	Relative Humidity	60.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

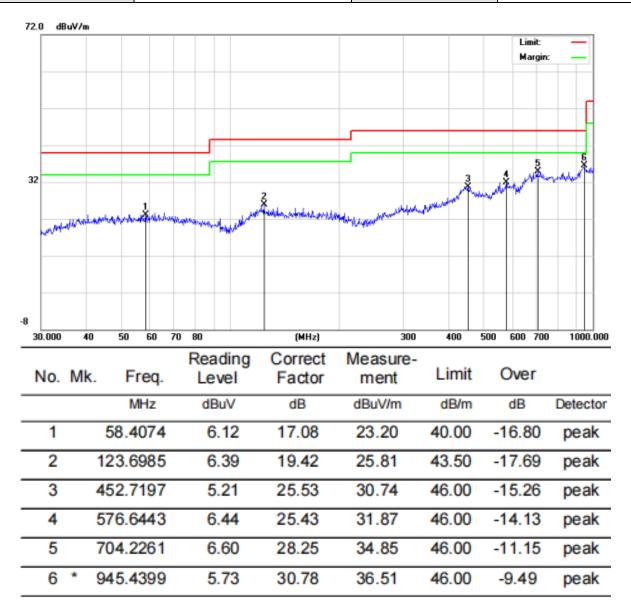


**RESULT: PASS** 





EUT	Smart GPS Cycling Computer	Model Name	NAV+
Temperature	24.5°C	Relative Humidity	60.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



#### **RESULT: PASS**

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

2. All test modes had been tested. The BLE 1M mode 1 is the worst case and recorded in the report.



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### Radiated emission above 1GHz

EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.000	52.67	0.08	52.75	74	-21.25	peak
4804.000	40.23	0.08	40.31	54	-13.69	AVG
7206.000	46.82	2.21	49.03	74	-24.97	peak
7206.000	36.54	2.21	38.75	54	-15.25	AVG
Remark:						
actor = Anter	actor = Antenna Factor + Cable Loss – Pre-amplifier.					

EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	\/alua Tima
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.000	50.31	0.08	50.39	74	-23.61	peak
4804.000	38.54	0.08	38.62	54	-15.38	AVG
7206.000	45.28	2.21	47.49	74	-26.51	peak
7206.000	34.98	2.21	37.19	54	-16.81	AVG
Remark:						
Factor = Anter	Factor = Antenna Factor + Cable Loss - Pre-amplifier.					



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EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	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	50.67	0.14	50.81	74	-23.19	peak
4880.000	38.59	0.14	38.73	54	-15.27	AVG
7320.000	45.27	2.36	47.63	74	-26.37	peak
7320.000	35.78	2.36	38.14	54	-15.86	AVG
Remark:						
Factor = Anter	na Factor + Cabl	e Loss – Pre-a	amplifier.			

EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	\/alva Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4880.000	48.59	0.14	48.73	74	-25.27	peak
4880.000	37.68	0.14	37.82	54	-16.18	AVG
7320.000	44.19	2.36	46.55	74	-27.45	peak
7320.000	34.82	2.36	37.18	54	-16.82	AVG
emark:						



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EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	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	52.94	0.22	53.16	74	-20.84	peak
4960.000	39.51	0.22	39.73	54	-14.27	AVG
7440.000	47.05	2.64	49.69	74	-24.31	peak
7440.000	36.82	2.64	39.46	54	-14.54	AVG
						_
Remark:						
Factor = Anter	nna Factor + Cabl	e Loss – Pre-	amplifier.			

EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	22.1°C	Relative Humidity	53.9%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Time		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type		
4960.000	50.34	0.22	50.56	74	-23.44	peak		
4960.000	36.76	0.22	36.98	54	-17.02	AVG		
7440.000	45.47	2.64	48.11	74	-25.89	peak		
7440.000	33.52	2.64	36.16	54	-17.84	AVG		
Remark:	1		1			1		
Factor = Antenna Factor + Cable Loss - Pre-amplifier.								

**RESULT: PASS** 

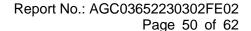
### Note:

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

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

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

All test modes had been tested. The BLE 1M mode 1 modulation is the worst case and recorded in the report.

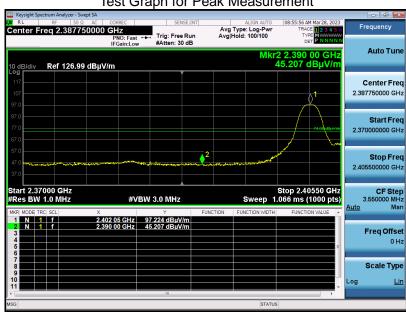


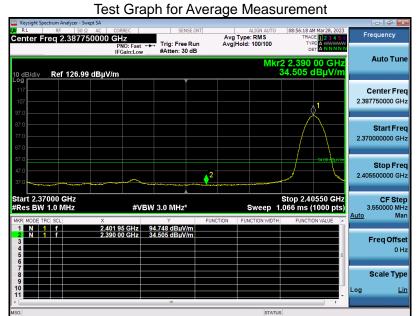


Test result for band edge emission at restricted bands (GFSK 1Mbps)

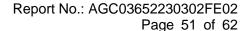
EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	24°C	Relative Humidity	56%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Test Graph for Peak Measurement





**RESULT: PASS** 

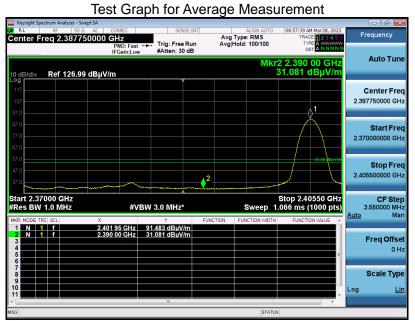




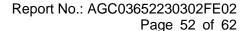
**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 1 **Antenna** Vertical

Test Graph for Peak Measurement





**RESULT: PASS** 

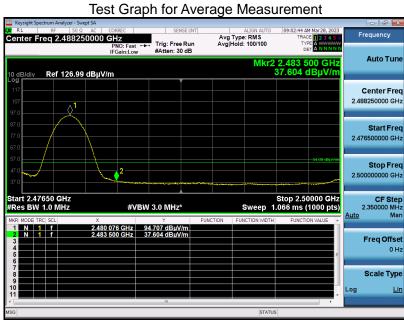




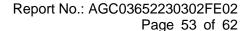
**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 3 **Antenna** Horizontal

Test Graph for Peak Measurement





**RESULT: PASS** 

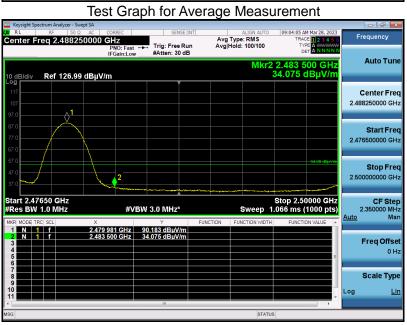




**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa Normal Voltage **Pressure Test Voltage Test Mode** Mode 3 **Antenna** Vertical

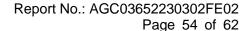
Test Graph for Peak Measurement





#### **RESULT: PASS**

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

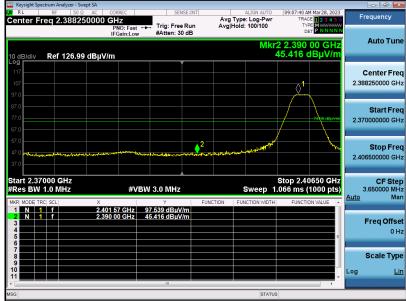


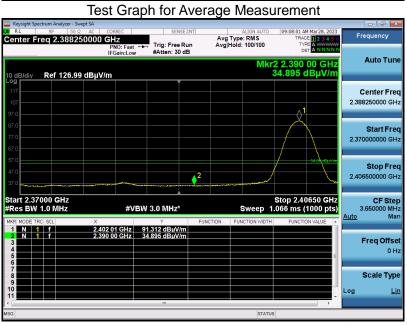


Test result for band edge emission at restricted bands (GFSK 2Mbps)

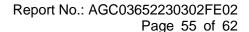
EUT	Smart GPS Cycling Computer	Model Name	NAV
Temperature	24°C	Relative Humidity	56%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

Test Graph for Peak Measurement Avg Type: Log-Pw AvalHold: 100/100





**RESULT: PASS** 

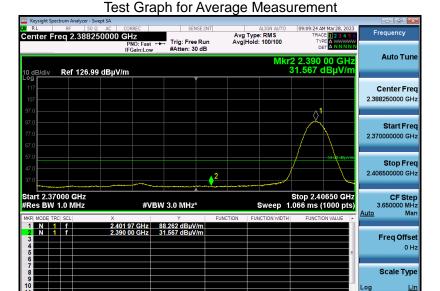




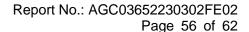
**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 4 **Antenna** Vertical

Test Graph for Peak Measurement





**RESULT: PASS** 



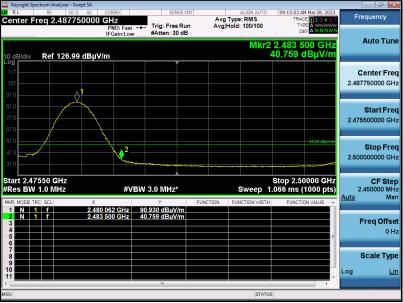


**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa **Test Voltage** Normal Voltage **Pressure Test Mode** Mode 6 **Antenna** Horizontal

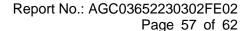
Test Graph for Peak Measurement







**RESULT: PASS** 

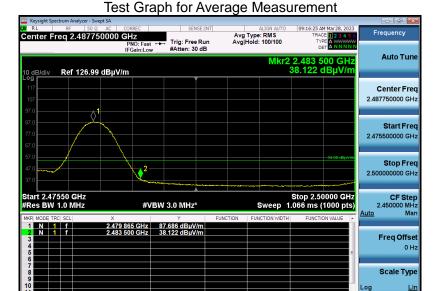




**EUT Smart GPS Cycling Computer Model Name** NAV 24°C **Temperature Relative Humidity** 56% 985hPa Normal Voltage **Pressure Test Voltage Test Mode** Mode 6 **Antenna** Vertical

Test Graph for Peak Measurement





#### **RESULT: PASS**

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



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### 12. LINE CONDUCTED EMISSION TEST

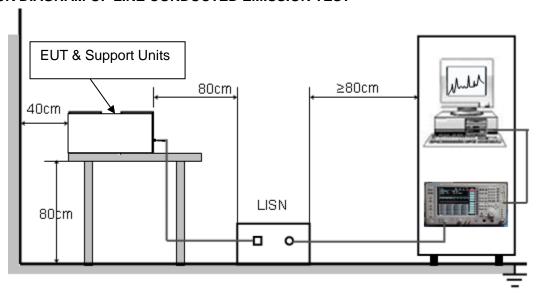
#### 12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Fraguency	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  $0.15\,\mathrm{MHz}$  to  $0.50\,\mathrm{MHz}$ .

### 12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





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#### 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 5V 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.

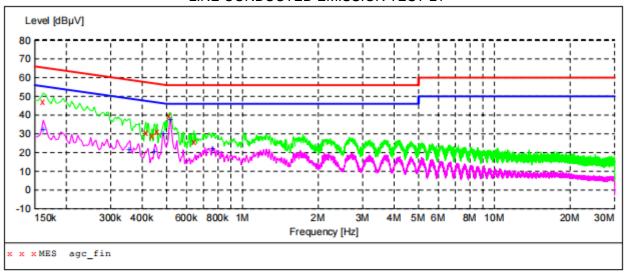
#### 12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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-L1



## MEASUREMENT RESULT: "agc\_fin"

2023/3/27	15:54						
Frequen	cy Level	Transd	Limit	Margin	Detector	Line	PE
M	Hz dBµV	dB	dΒμV	dB			
0.1620	00 47.30	6.8	65	18.1	QP	L1	GND
0.4140	00 30.50	5.6	58	27.1	QP	L1	GND
0.4380	00 29.20	5.6	57	27.9	QP	L1	GND
0.4580	00 31.20	5.5	57	25.5	QP	L1	GND
0.5140	00 39.50	5.4	56	16.5	QP	L1	GND
0.6420	00 26.00	5.4	56	30.0	QP	L1	GND

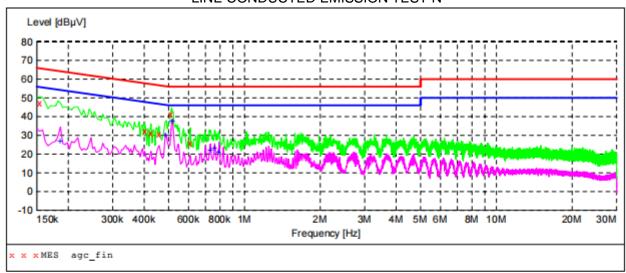
### MEASUREMENT RESULT: "agc fin2"

2023/3/27 1 Frequency MHz	5:54 Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.162000	32.20	6.8	55	23.2	AV	L1	GND
0.358000	21.60	5.8	49	27.2	AV	L1	GND
0.450000	20.40	5.5	47	26.5	AV	L1	GND
0.486000	30.20	5.4	46	16.0	AV	L1	GND
0.518000	37.40	5.4	46	8.6	AV	L1	GND
0.762000	22.30	5.4	46	23.7	AV	L1	GND

**RESULT: PASS** 



### LINE CONDUCTED EMISSION TEST-N



### MEASUREMENT RESULT: "agc fin"

2023/3/27 15 Frequency MHz	:57 Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.154000	47.00	6.9	66	18.8	QP	N	GND
0.402000	32.20	5.7	58	25.6	QP	N	GND
0.426000	31.20	5.6	57	26.1	QP	N	GND
0.458000	30.60	5.5	57	26.1	QP	N	GND
0.514000	41.50	5.4	56	14.5	QР	N	GND
0.610000	25.80	5.4	56	30.2	QP	N	GND

#### MEASUREMENT RESULT: "agc fin2"

2023/3/27 15	:57						
Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz	dΒμV	dB	dΒμV	dB			
0.186000	26.70	6.6	54	27.5	AV	N	GND
0.486000	30.20	5.4	46	16.0	AV	N	GND
0.518000	37.50	5.4	46	8.5	AV	N	GND
0.734000	22.20	5.4	46	23.8	AV	N	GND
0.762000	22.90	5.4	46	23.1	AV	N	GND
0.794000	21.20	5.4	46	24.8	AV	N	GND

### **RESULT: PASS**

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



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

Refer to the Report No.: AGC03652230302AP02

**APPENDIX B: PHOTOGRAPHS OF EUT** 

Refer to the Report No.: AGC03652230302AP03

----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.