FCC REPORT

Applicant	:	Shanghai Huace Navigation Technology Ltd.
Address of Applicant	:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Manufacturer	:	Shanghai Huace Navigation Technology Ltd.
Address of Manufacturer	:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Equipment under Test	:	Geodetic GNSS Receiver
Model No.	:	i76
FCC ID	:	SY4-A02064
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart E, ANSI C63.10:2013
Report No.	:	A2503163-C03-R03
Issue Date	:	2025/05/26
Issued By	:	Shenzhen Alpha Product Testing Co., Ltd. Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,518103, Shenzhen City, Guangdong Province, P.R. China.

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Test Report Declare

Applicant	:	Shanghai Huace Navigation Technology Ltd.
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Equipment under Test	:	Geodetic GNSS Receiver
Model No.	:	i76
Trademark	:	CHCNAV

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart E, ANSI C63.10:2013

We Declare:

The equipment described above is tested by Shenzhen Alpha Product Testing Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	A2503163-C03-R03		
Date of Receipt:	2025/04/14	**Date of Test:**	2025/04/14 - 2025/05/23

Prepared By:

Yannis Wen

Yannis Wen/Engineer

Approved By:

Jack Xu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
V0	Initial issue	2025/05/26	Yannis Wen

1. Summary of Test Results

No.	Test Parameter	Clause No.	Result
1	26dB/6dB&99% Bandwidth	FCC Part 15: 15.407, ANSI C63.10 :2013	Pass
2	Peak Transmit Power	FCC Part 15: 15.407(a), ANSI C63.10 :2013	Pass
3	Power Spectral Density	FCC Part 15: 15.407(a), ANSI C63.10 :2013	Pass
4	Band Edge (Conducted)	FCC Part 15: 15.407(B), ANSI C63.10 :2013	Pass
5	Radiated Emission	FCC Part 15: 15.209, FCC Part 15: 15.407(b), ANSI C63.10 :2013	Pass
6	Band Edge (Radiated)	FCC Part 15: 15.205, FCC Part 15: 15.407(b), ANSI C63.10 :2013	Pass
7	Frequency Stability	FCC Part 15: 15.407(f), ANSI C63.10 :2013	Pass
8	Power Line Conducted Emissions	FCC Part 15: 15.207, ANSI C63.10 :2013	Pass
9	Antenna Requirement	FCC Part 15: 15.203	Pass
Note: 1.N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard. 2. Decision rules for the conclusion of this test report: decision by actual test data without considering measurement uncertainty.			

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	Farad	Alpha-3A1
RF-CE	MTS 8310	MWRFtest	V2.0.0.0

2. General Test Information

2.1. Description of EUT

EUT Name	:	Geodetic GNSS Receiver
Model Number	:	i76
Difference of model number	:	/
Power Supply	:	DC 7.2V from battery, DC 5V form adapter
Hardware Version	:	V1.3.0
Software Version	:	V1.0

Radio Technology	:	5G WIFI
Operation frequency	:	802.11ac80: 5210MHz, 5775MHz
Channel separation	:	80MHz for 802.11ac80
Modulation	:	IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Type	:	PCB Antenna
Max Antenna Gain(dBi)	:	0dBi(Antenna information is provided by applicant.)

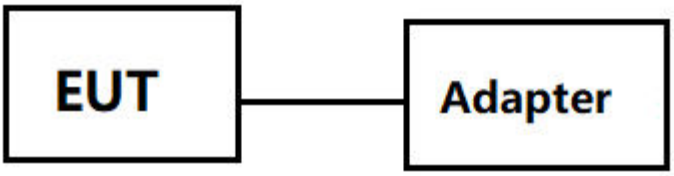
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

“☒” means to be chosen or applicable; “□” means don’t to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
AC Adapter	EDACPOWER ELEC.	EA1012AVRU-050	AC Input: 100-240Vac~50/60Hz 1.0A; DC Output: 5.0V⎓2.4A 12.0W

2.3. Block diagram of EUT configuration for test



2.4. Test mode description

U-NII-1:

Mode	Data rate(Mbps)	Channel	Frequency(MHz)
IEEE 802.11ac VHT80	433.3	CH42	5210
Note: According exploratory test and product specification EUT will have maximum output power in those data rate, so those data rate were used for all test.			

U-NII-3:

Mode	Data rate (Mbps)	Channel	Frequency (MHz)
IEEE 802.11ac VHT80	433.3	CH155	5775
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.			

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Items	Required
Temperature range:	15-35℃
Humidity range:	25-75%
Pressure range:	86-106kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Shenzhen Alpha Product Testing Co., Ltd.
Add.: Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen City, Guangdong Province, P.R. China.
Tel.: 4008-3008-95, Website: http://www.a-lab.cn, Email: service@a-lab.cn

CNAS Accreditation No. L7472; A2LA Accreditation Number: 4762.01
FCC Designation Number: CN1182, Test Firm Registration Number: 203110
Innovation, Science and Economic Development Canada Site Registration Number: 12135A

2.8. Measurement uncertainty

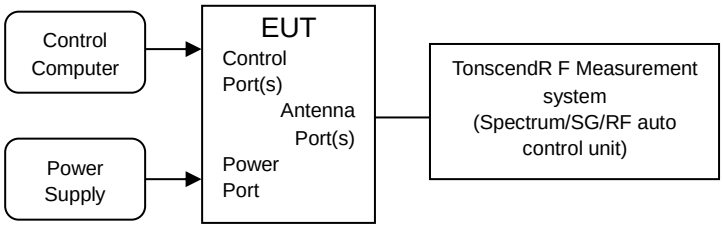
Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

3. 26dB/6dB&99% Bandwidth

3.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07

3.2. Block diagram of test setup



3.3. Limits

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725−5.85 GHz. The following procedure shall be used for measuring this bandwidth:

3.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

3.5. Test procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

3.6. Test result

Test Site: RF Laboratory	Test Date: 2025/05/06--2025/05/07
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

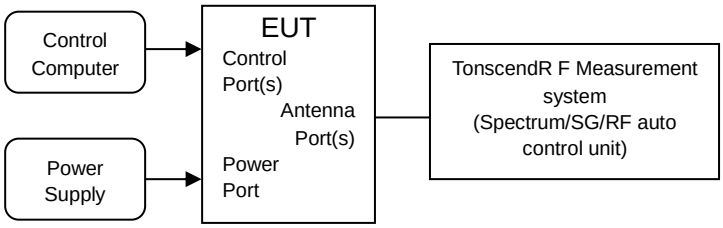
EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 7.2V from battery	Memo: The test data can be referred to the Annex -26dB Bandwidth&-6dB Bandwidth

4. Peak Transmit Power

4.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07

4.2. Block diagram of test setup



4.3. Limits

FCC Part15 E Section 15.407: For the band 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW. For the band 5.725-5.85GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 1W.

4.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

4.5. Test procedure

Measurement using an RF average power meter

Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied

- ♣ The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- ♣ At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- ♣ The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).
Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).

4.6. Test result

Test Site: RF Laboratory	Test Date: 2025/05/06--2025/05/07
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 7.2V from battery	Memo: The test data can be referred to the Annex Maximum Conducted Output Power

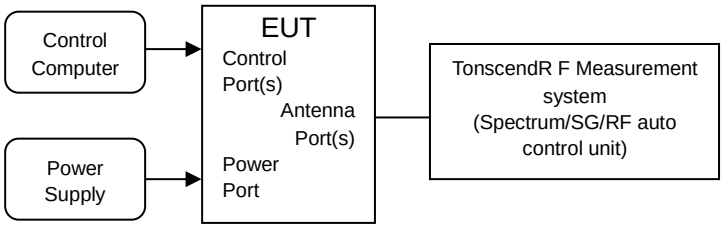
/

5. Power Spectral Density

5.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07

5.2. Block diagram of test setup



5.3. Limits

≤11.00dBm/MHz for 5150MHz-5250MHz, 5250-5350MHz and 5470-5725 MHz
≤30.00dBm/500KHz for 5725MHz-5850MHz
For 5150MHz-5250MHz: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

5.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

5.5. Test procedure

Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum
conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each)
and apply it up to, but not including, the step labeled, “Compute power…”
Use the peak search function on the instrument to find the peak of the spectrum.
Make the following adjustments to the peak value of the spectrum, if applicable:

- ♣ a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

- b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

The result is the PSD.

5.6. Test result

Test Site: RF Laboratory	Test Date: 2025/05/06--2025/05/07
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 7.2V from battery	Memo: The test data can be referred to the Annex Maximum Power Spectral Density Level

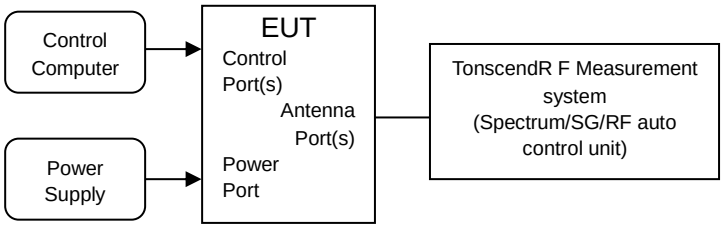
/

6. Band Edge (Conducted)

6.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07

6.2. Block diagram of test setup



6.3. Limits

(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

(4) For transmitters operating solely in the 5.725-5.850 GHz band: all emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

6.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

6.5. Test procedure

1) Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.
2) Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation.
3) Attenuation: Auto (at least 10 dB preferred).
4) Sweep time: Coupled.
5) Resolution bandwidth: 100 kHz.
6) Video bandwidth: 300 kHz.
7) Detector: Peak.
8) Trace: Max hold.

6.6. Test result

Test Site: RF Laboratory	Test Date: 2025/05/06--2025/05/07
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: 802.11ac80 5775MHz
Power supply: DC 7.2V from battery	Memo: The test data can be referred to the Annex Band Edge

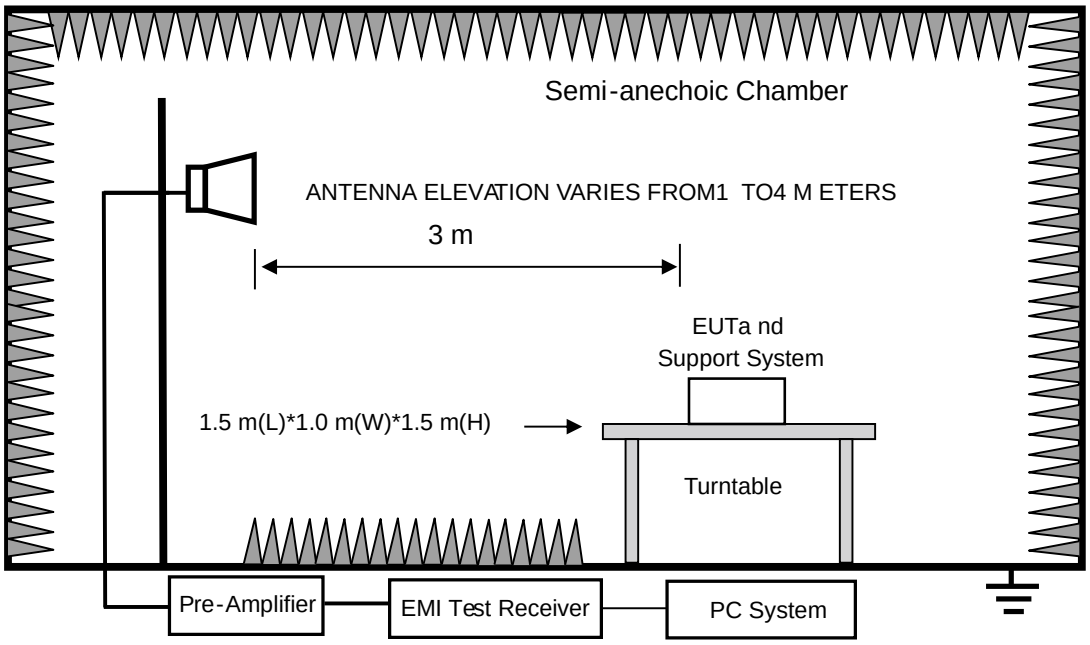
/

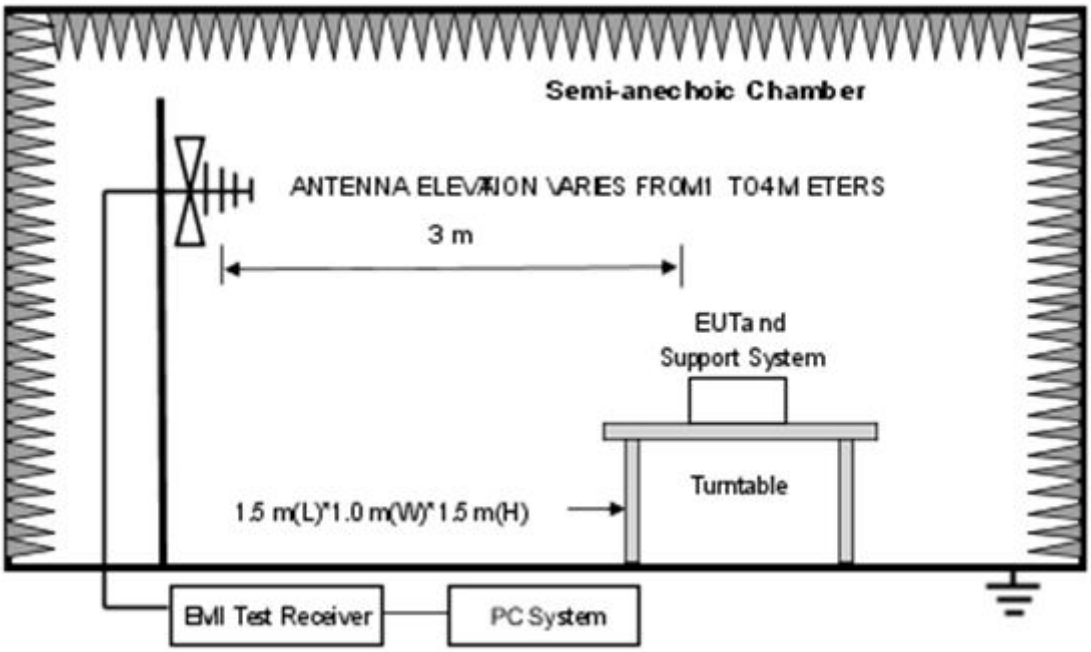
7. Radiated Emission

7.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Bilog Antenna	SCHWARZBECK	VULB 9168	Aa-EE001	2023/08/28	2025/08/27
Amplifier	SKET	LNPA_0118G-45	Aa-EE087	2024/08/08	2025/08/07
Horn Antenna	SCHWARZBECK	BBHA 9120 D	Aa-EE076	2023/08/19	2025/08/18
Spectrum analyzer	ROHDE&SCHWARZ	FSU	Aa-EE075	2024/08/08	2025/08/07
Loop Antenna	SCHWARZBECK	FMZB 1519B	Aa-EE074	2023/08/19	2025/08/18
Horn Antenna	SCHWARZBECK	BBHA 9170	Aa-EE077	2023/08/19	2025/08/18
Test Receiver	ROHDE&SCHWARZ	ESR	Aa-EE048	2024/08/08	2025/08/07

7.2. Block diagram of test setup





7.3. Limits

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	74.0	Peak Value
	54.0	Average Value

7.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

7.5. Test procedure

Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:

Below 1GHz test procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure:

1. On the test site as test setup graph above,the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:
   EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi)
   where:
   Pg is the generator output power into the substitution antenna.

7.6. Test result

Test Site: Chamber 1#(RSE)	Test Date: 2025/04/27--2025/04/27
Condition: 22.8°C,54%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 7.2V from battery	Memo: /

Note: 1.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

2. Only show the test data of the worst Channel in this report.

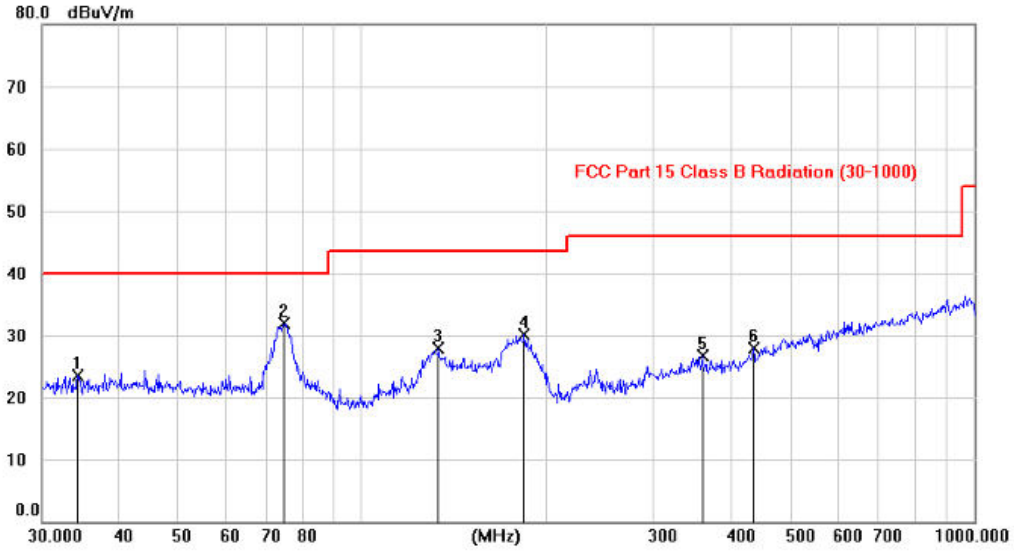
7.7. Test data

深圳阿尔法商品检验有限公司 SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.
深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co., Ltd
地址: ALPHA 深圳市宝安区福永街道立新路2号i栋
TEL:4008-3008-95

Site LAB 966 Chamber 1	Polarization: *Horizontal*	Temperature: 22.8
Limit: FCC Part 15 Class B Radiation (30-1000)	Power: DC 7.2V From battery	Humidity: 54 %
EUT/Task No : A2503163-C03	Distance: 3m	
M/N/Sample No: A2503163-S0003		
Mode : IEEE 802.11ac VHT80-5210MHz		
Note:		
Engineer Signature: Yanni3 wen		

Radiated Emission Measurement

File :A2503163-C03 Data :#5 Date: 2025/4/27 Time: 15:58:28



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		34.3000	9.76	13.71	23.47	40.00	-16.53	peak			
2	*	74.5520	21.17	10.64	31.81	40.00	-8.19	peak			
3		133.1665	14.13	13.82	27.95	43.50	-15.55	peak			
4		184.4464	17.88	12.14	30.02	43.50	-13.48	peak			
5		360.0264	11.19	15.43	26.62	46.00	-19.38	peak			
6		437.0688	10.69	17.25	27.94	46.00	-18.06	peak			

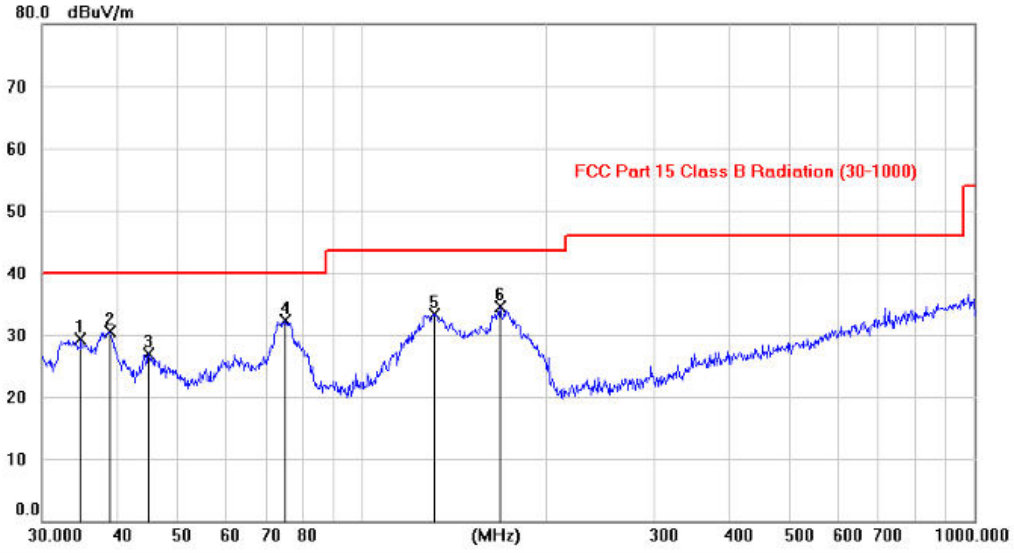
Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

深圳阿尔法商品检验有限公司 SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.
深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co., Ltd
地址: ALPHA 深圳市宝安区福永街道立新路2号i栋
TEL:4008-3008-95

Site LAB 966 Chamber 1	Polarization: *Vertical*	Temperature:	22.8
Limit: FCC Part 15 Class B Radiation (30-1000)	Power: DC 7.2V From battery	Humidity:	54 %
EUT/Task No : A2503163-C03	Distance: 3m		
M/N/Sample No: A2503163-S0003			
Mode : IEEE 802.11ac VHT80-5210MHz			
Note:			
Engineer Signature: Yanni3 wen			

Radiated Emission Measurement

File :A2503163-C03 Data :#6 Date: 2025/4/27 Time: 15:00:53



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		34.7398	15.55	13.73	29.28	40.00	-10.72	peak			
2		38.7969	16.07	14.39	30.46	40.00	-9.54	peak			
3		44.7486	12.82	14.14	26.96	40.00	-13.04	peak			
4	*	74.9191	21.79	10.53	32.32	40.00	-7.68	peak			
5		131.3884	19.54	13.69	33.23	43.50	-10.27	peak			
6		168.1973	20.17	14.25	34.42	43.50	-9.08	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

802.11ac(HT80) 5210MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.19	51.08	11.25	14.62	32.65	44.30	68.20	-23.90	Vertical
15630.21	52.94	11.93	17.66	34.46	48.07	74.00	-25.93	Vertical
10420.02	51.72	9.4	14.62	32.65	43.09	68.20	-25.11	Horizontal
15630.05	51.61	8.5	17.66	34.46	43.31	74.00	-30.69	Horizontal

802.11ac(HT80) 5775MHz

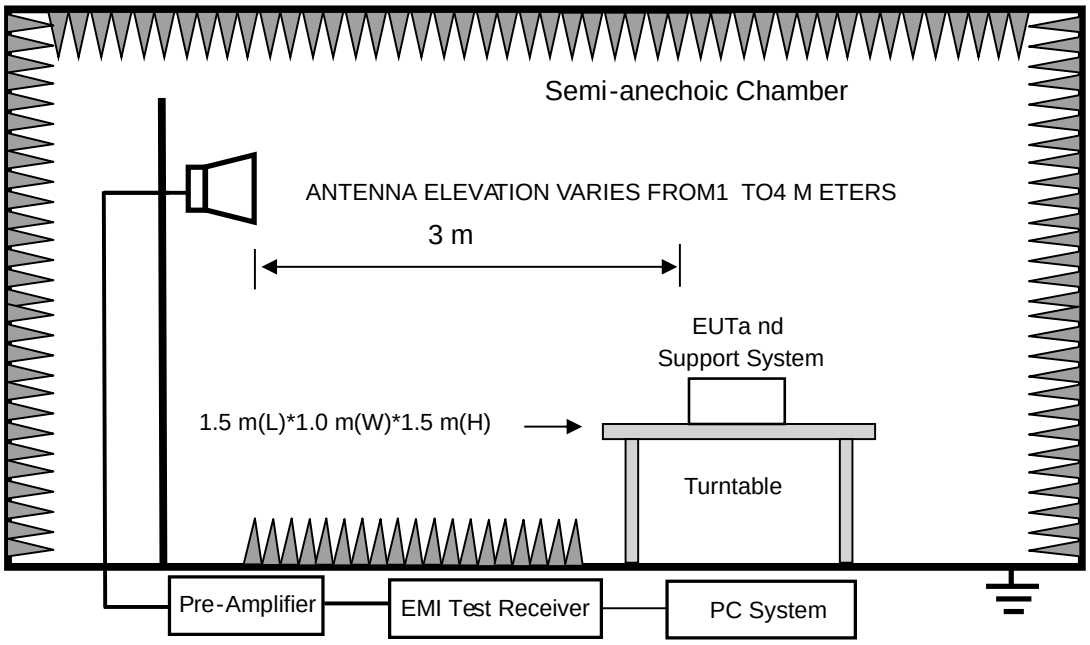
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.23	48.97	16.29	17.66	34.46	48.46	74.00	-25.54	Vertical
17325.14	46.49	21.83	17.66	34.46	51.52	68.20	-16.68	Vertical
11550.10	50.53	8.73	17.66	34.46	42.46	74.00	-31.54	Horizontal
17325.07	50.83	11.73	17.66	34.46	45.76	68.20	-22.44	Horizontal

8. Band Edge (Radiated)

8.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Horn Antenna	SCHWARZBECK	BBHA 9120 D	Aa-EE076	2023/08/19	2025/08/18
Horn Antenna	SCHWARZBECK	BBHA 9170	Aa-EE077	2023/08/19	2025/08/18
Test Receiver	ROHDE&SCHWARZ	ESR	Aa-EE048	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSU	Aa-EE075	2024/08/08	2025/08/07
Amplifier	SKET	LNPA_0118G-45	Aa-EE087	2024/08/08	2025/08/07
Bilog Antenna	SCHWARZBECK	VULB 9168	Aa-EE001	2023/08/28	2025/08/27
Loop Antenna	SCHWARZBECK	FMZB 1519B	Aa-EE074	2023/08/19	2025/08/18

8.2. Block diagram of test setup



8.3. Limits

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	68.2	Peak Value

8.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

8.5. Test procedure

- ♣ The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- ♣ The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- ♣ The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- ♣ For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- ♣ The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- ♣ If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

8.6. Test result

Test Site: Chamber 1#(RSE)	Test Date: 2025/05/22--2025/05/22
Condition: 24.1°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: 802.11ac80 5210MHz
Power supply: DC 7.2V from battery	Memo: /

Pass. (See below detailed test result)

Remark: According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

E[dBuV/m] = EIRP[dBm] + 95.2,

For example, if EIRP = -27dBm

E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

8.7. Test data

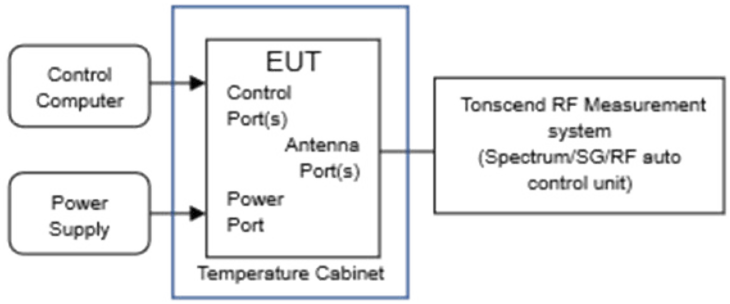
Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	38.19	17.21	55.40	68.20	-12.80	PK
V	5150.00	35.37	17.21	52.58	68.20	-15.62	PK
Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	25.64	17.18	42.82	54.00	-11.18	AV
V	5150.00	26.14	17.18	43.32	54.00	-10.68	AV
Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	34.30	17.21	51.51	68.20	-16.69	PK
V	5350.00	36.35	17.21	53.56	68.20	-14.64	PK
Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	26.17	17.18	43.35	54.00	-10.65	AV
V	5350.00	22.52	17.18	39.70	54.00	-14.30	AV

9. Frequency Stability

9.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07

9.2. Block diagram of test setup



9.3. Limits

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

9.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

9.5. Test procedure

According to ANSI C63.10 :2013 6.8.

9.6. Test result

Test Site: RF Laboratory	Test Date: 2025/05/23--2025/05/23
Condition: 24.1°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 7.2V from battery	Memo: /

/

9.7. Test data

Mode	Voltage (V)	FHL (5210MHz)	Deviation (KHz)	FHH (5775MHz)	Deviation (KHz)
802.11 ac80	DC 6.12V	5209.992	8	5774.995	5
	DC 7.2V	5209.990	10	5774.989	11
	DC 8.28V	5209.992	8	5774.992	8

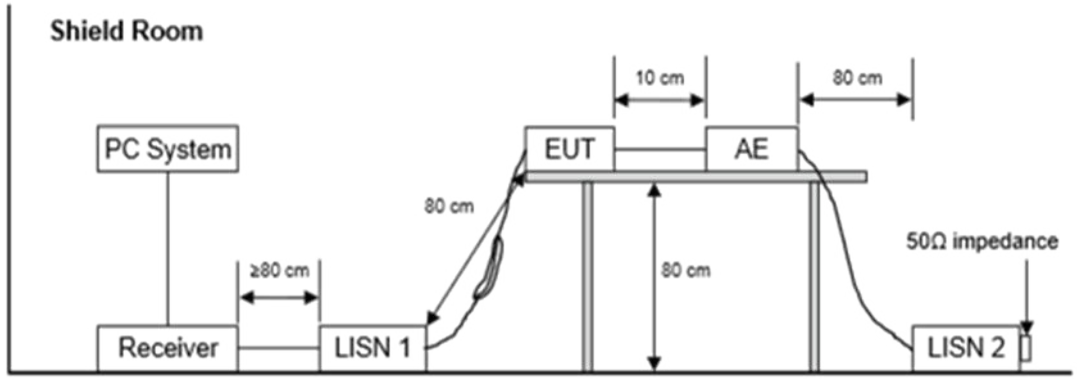
Mode	Temperature (℃)	FHL (5210MHz)	Deviation (KHz)	FHH (5775MHz)	Deviation (KHz)
802.11 ac80	-20℃	5209.990	10	5774.991	9
	-10℃	5209.987	13	5774.991	9
	-5℃	5209.990	10	5774.990	10
	0℃	5209.994	6	5774.995	5
	+10℃	5209.993	7	5774.996	4
	+20℃	5209.990	10	5774.995	5
	+30℃	5209.986	14	5774.987	13
	+40℃	5209.990	10	5774.991	9
	+50℃	5209.992	8	5774.987	13

10.Power Line Conducted Emissions

10.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Test Receiver	ROHDE&SCHWARZ	ESCI	Aa-EE005	2024/08/08	2025/08/07
Pulse Limiter	SCHWARZBECK	9516F	Aa-EE004	2024/08/08	2025/08/07
L.I.S.N.	SCHWARZBECK	NSLK8126	Aa-EE003	2024/08/08	2025/08/07

10.2. Block diagram of test setup



10.3. Limits

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

10.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

10.5. Test procedure

The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

10.6. Test result

Test Site: Shield Room CE 1#	Test Date: 2025/04/28--2025/04/28

Condition: 23.2°C,54%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: All modes
Power supply: DC 5V from adapter	Memo: /

Pass. (See below detailed test result)

An initial pre-scan was performed on the line and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Only show the test data of the worst case.

10.7. Test data

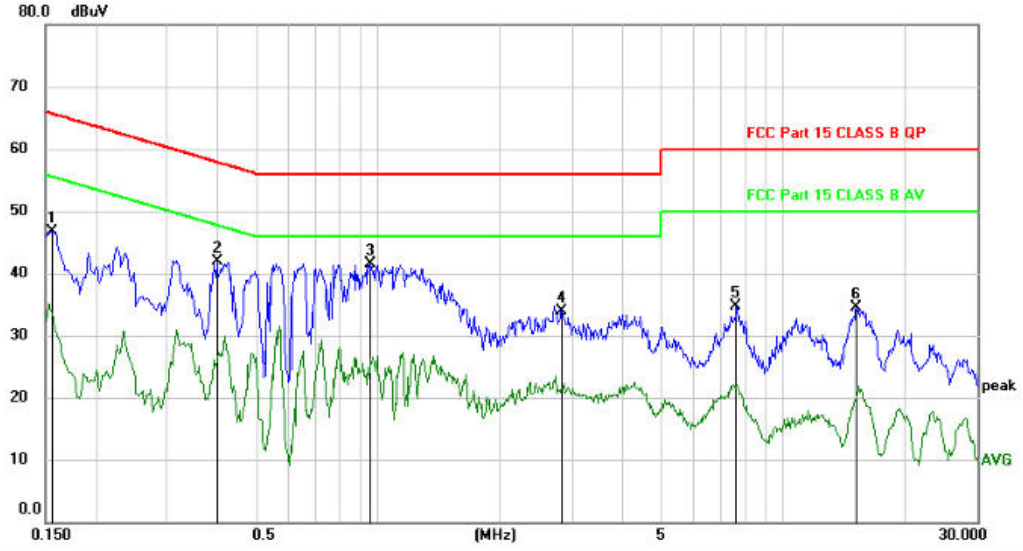
深圳阿尔法商品检验有限公司
SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.

深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co.,Ltd.
地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋
TEL: 4008-3008-95

Site LAB	Phase: N	Temperature:	23.2
Limit: FCC Part 15 CLASS B QP	Power: DC 5V From Adapter	Humidity:	54 %
EUT/Task No : A2503163-C03			
M/N/Sample No: A2503163-S0003			
Mode : IEEE 802.11ac VHT80-5210MHz			
Note:			
Engineer Signature: Yanni3 wen			

Conducted Emission Measurement

File :A2503163-C03 Data :#5 Date: 2025/4/28 Time: 9:52:30



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1559	37.64	9.14	46.78	65.68	-18.90	peak	
2		0.3990	32.74	9.14	41.88	57.87	-15.99	peak	
3	*	0.9507	32.42	9.14	41.56	56.00	-14.44	peak	
4		2.8349	24.74	9.21	33.95	56.00	-22.05	peak	
5		7.6410	25.41	9.34	34.75	60.00	-25.25	peak	
6		15.0690	25.01	9.53	34.54	60.00	-25.46	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

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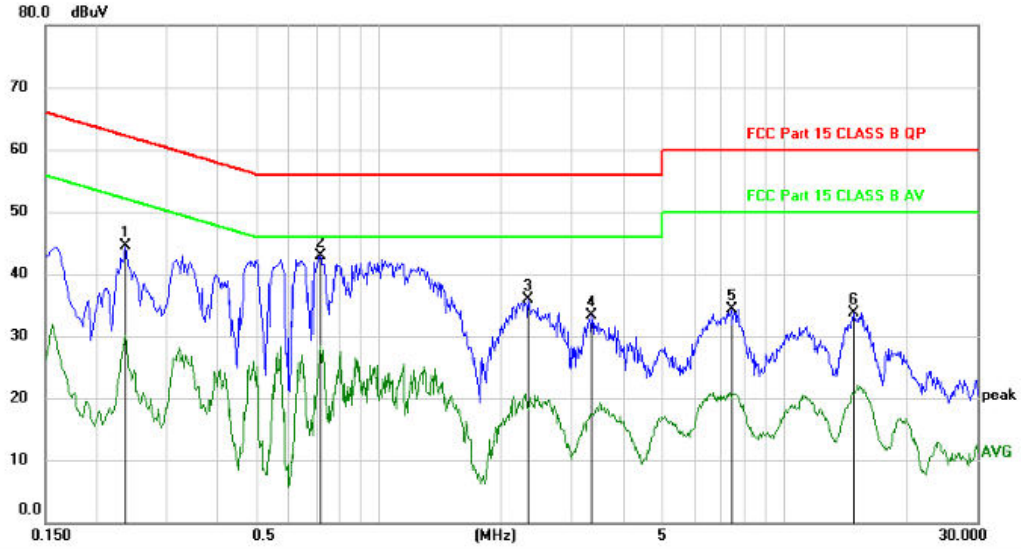
SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.
深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co.,Ltd.
地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋
TEL: 4008-3008-95

Site LAB	Phase: L1	Temperature:	23.2
Limit: FCC Part 15 CLASS B QP	Power: DC 5V From Adapter	Humidity:	54 %
EUT/Task No : A2503163-C03			
M/N/Sample No: A2503163-S0003			
Mode : IEEE 802.11ac VHT80-5210MHz			
Note:			
Engineer Signature: Yanni3 Wen			

Conducted Emission Measurement

File :A2503163-C03 Data :#6 Date: 2025/4/28 Time: 9:54:42



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2368	35.35	9.16	44.51	62.21	-17.70	peak	
2	*	0.7168	33.81	9.13	42.94	56.00	-13.06	peak	
3		2.3338	26.66	9.19	35.85	56.00	-20.15	peak	
4		3.3479	24.03	9.21	33.24	56.00	-22.76	peak	
5		7.4160	25.05	9.33	34.38	60.00	-25.62	peak	
6		14.9039	24.21	9.53	33.74	60.00	-26.26	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

11.Antenna Requirement

11.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07

11.2. Block diagram of test setup

11.3. Limits

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

11.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

11.5. Test procedure

The antenna is internal antenna and no consideration of replacement. Please see EUT photo for details.

11.6. Test result

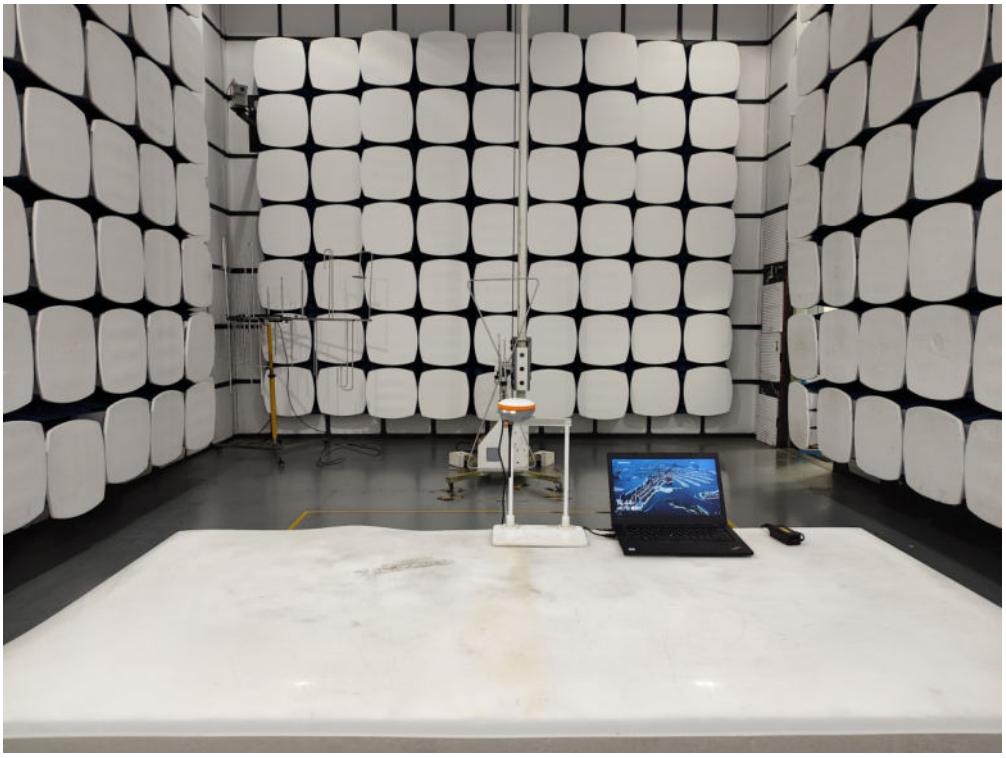
Test Site: RF Laboratory	Test Date: 2025/05/14--2025/05/14
Condition: 24.1°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

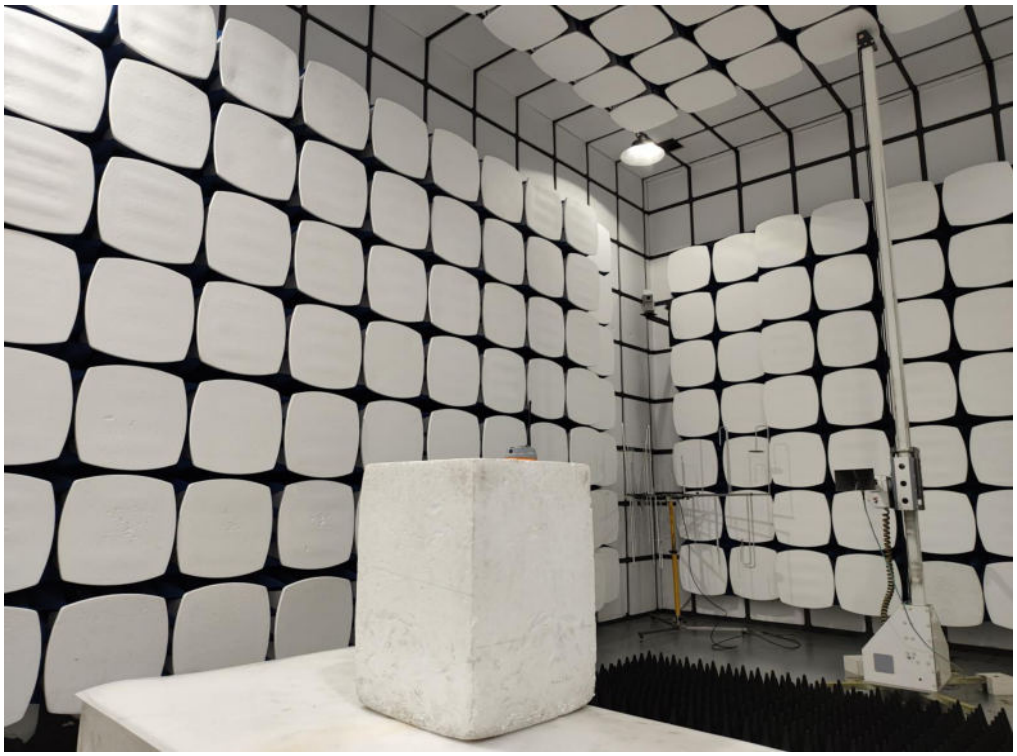
EUT Name: Geodetic GNSS Receiver	EUT Model: i76
Sample No.: A2503163-S0003	Test Mode: /

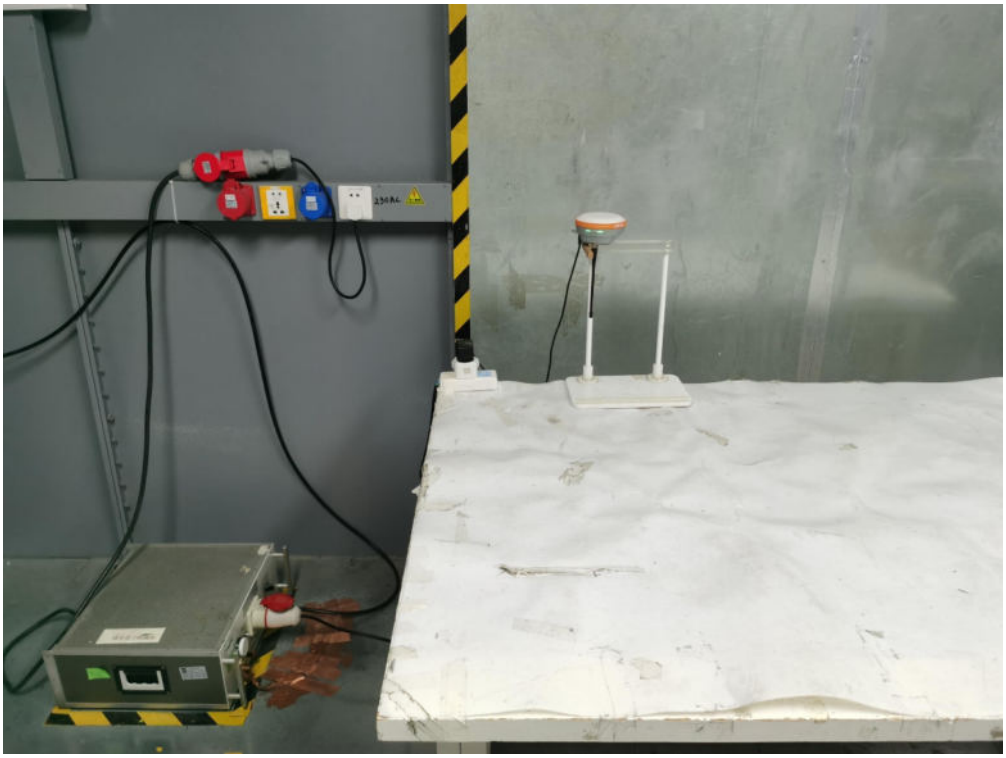
Power supply: /	Memo: The EUT antenna is Internal Antenna. It complies with the standard requirement.

/

12. Test Setup Photograph







13. Photos of the EUT

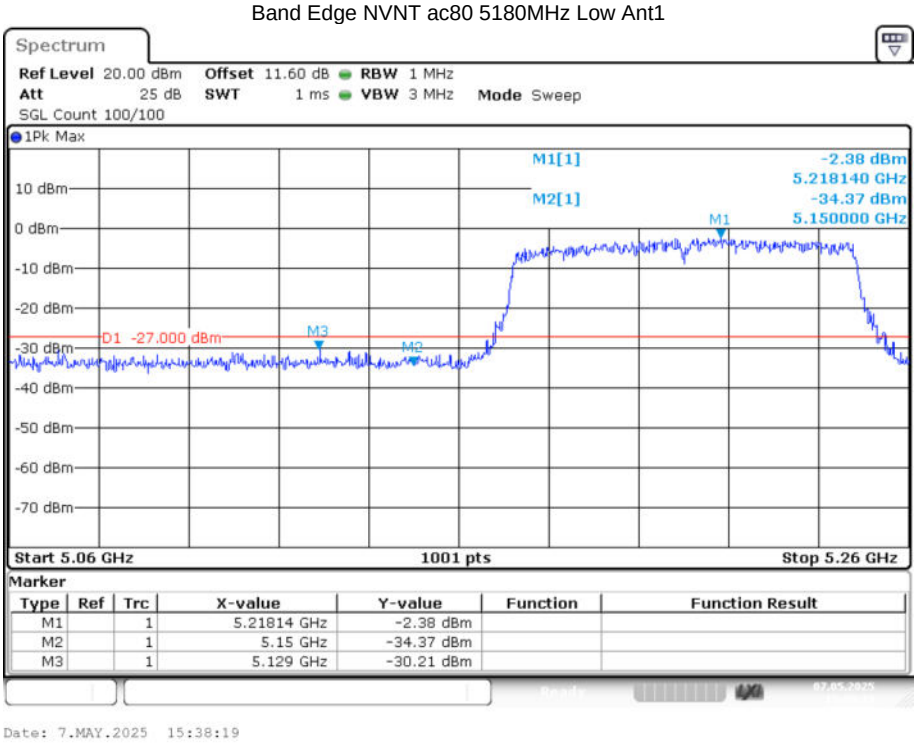
Please refer to the report A2503163-C03-R01.

14. Annex

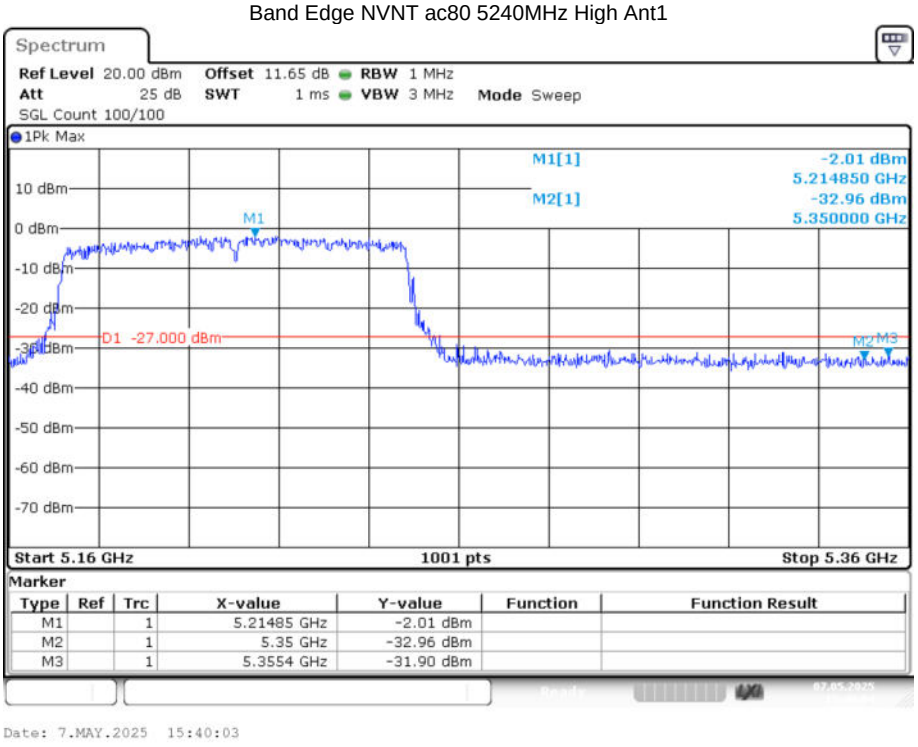
Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	ac80	5180	Ant1	-30.2	-27	Pass
NVNT	ac80	5240	Ant1	-31.89	-27	Pass
NVNT	ac80	5745	Ant1	-30.2	-14.2	Pass
NVNT	ac80	5825	Ant1	-29.4	-21.67	Pass

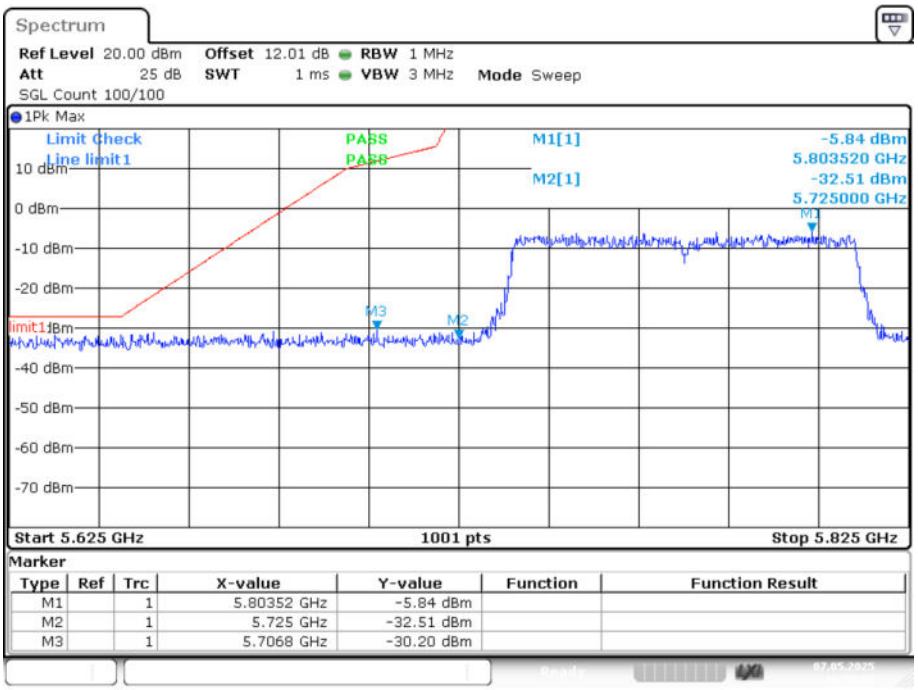
Band Edge NVNT ac80 5180MHz Low Ant1



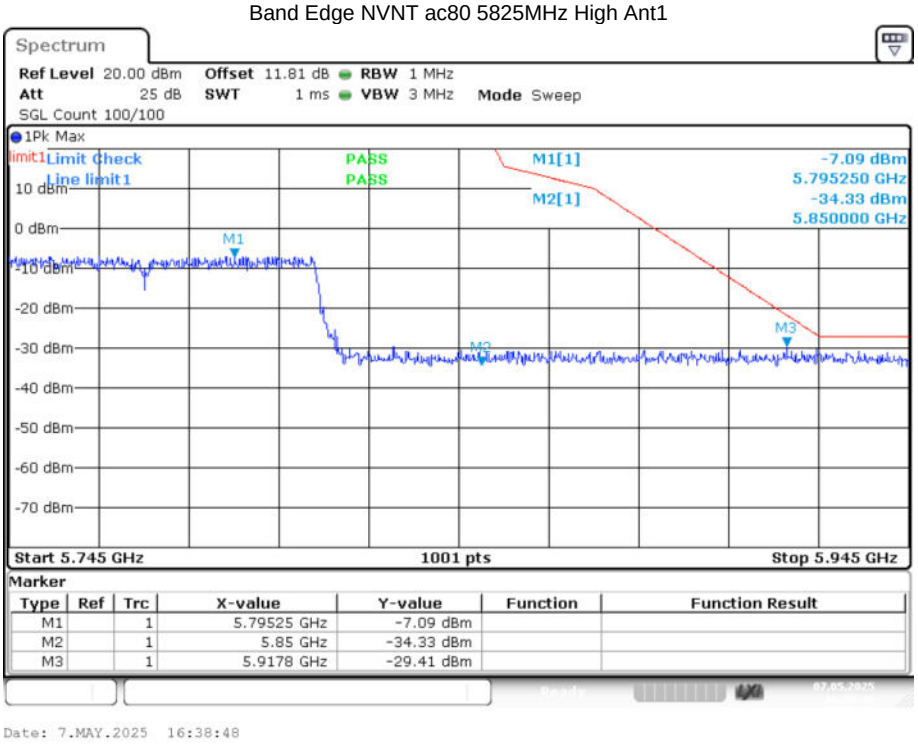
Band Edge NVNT ac80 5240MHz High Ant1



Band Edge NVNT ac80 5745MHz Low Ant1



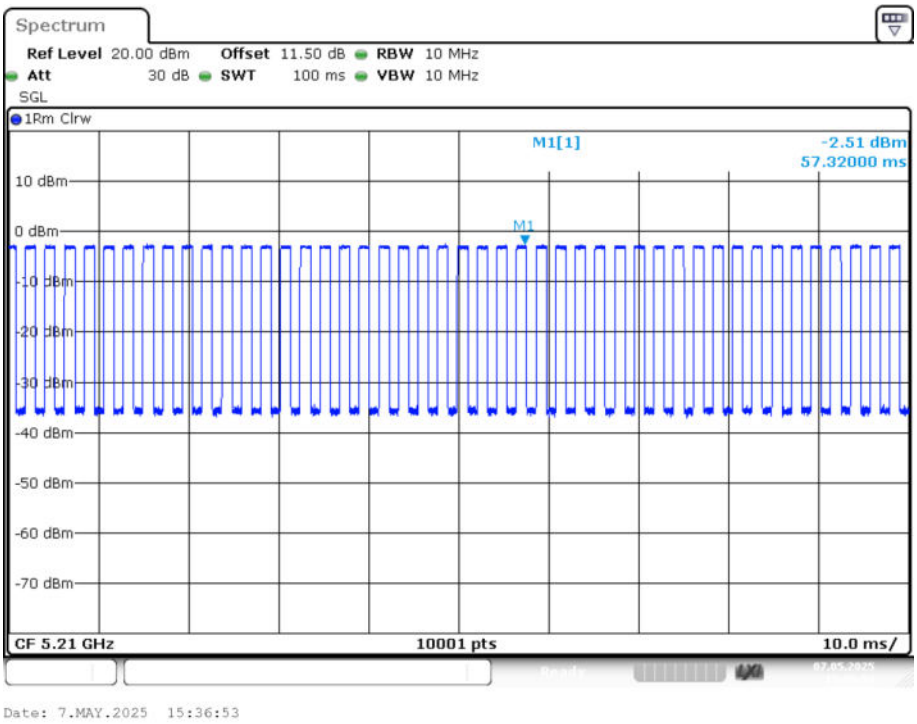
Band Edge NVNT ac80 5825MHz High Ant1



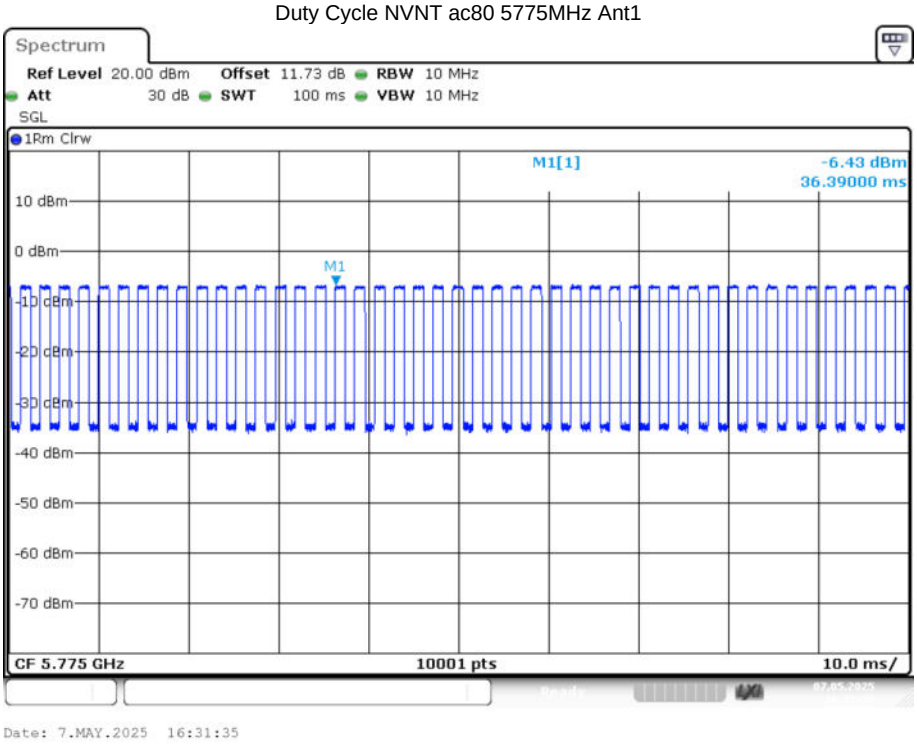
Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	ac80	5210	Ant1	53.38	2.73
NVNT	ac80	5775	Ant1	53.07	2.75

Duty Cycle NVNT ac80 5210MHz Ant1



Duty Cycle NVNT ac80 5775MHz Ant1



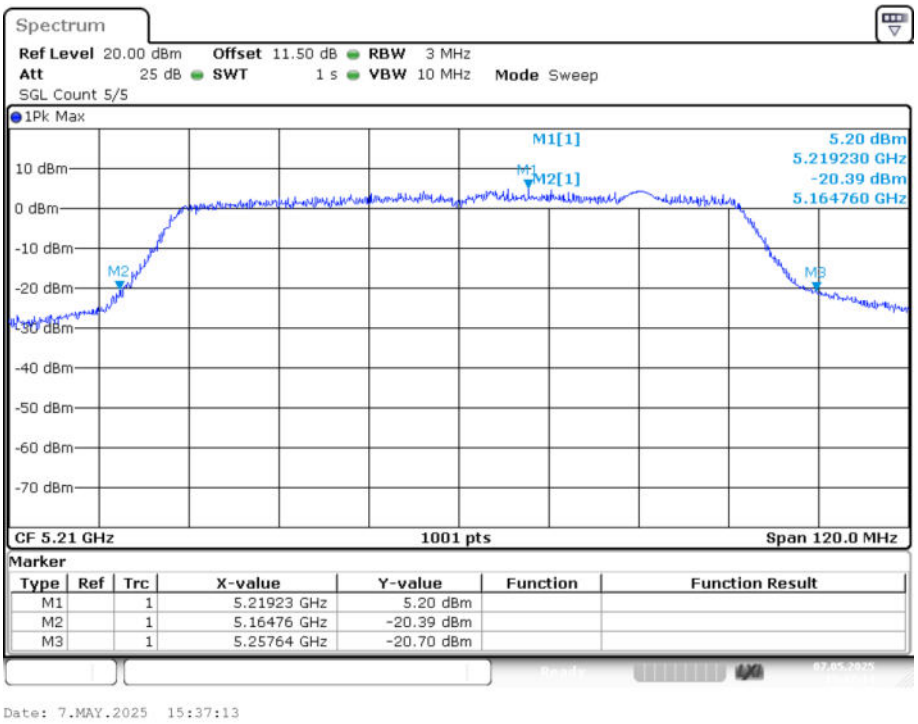
Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5210	Ant1	15.051	24	Pass
NVNT	ac80	5775	Ant1	11.821	30	Pass

-26dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	ac80	5210	Ant1	92.88	Pass

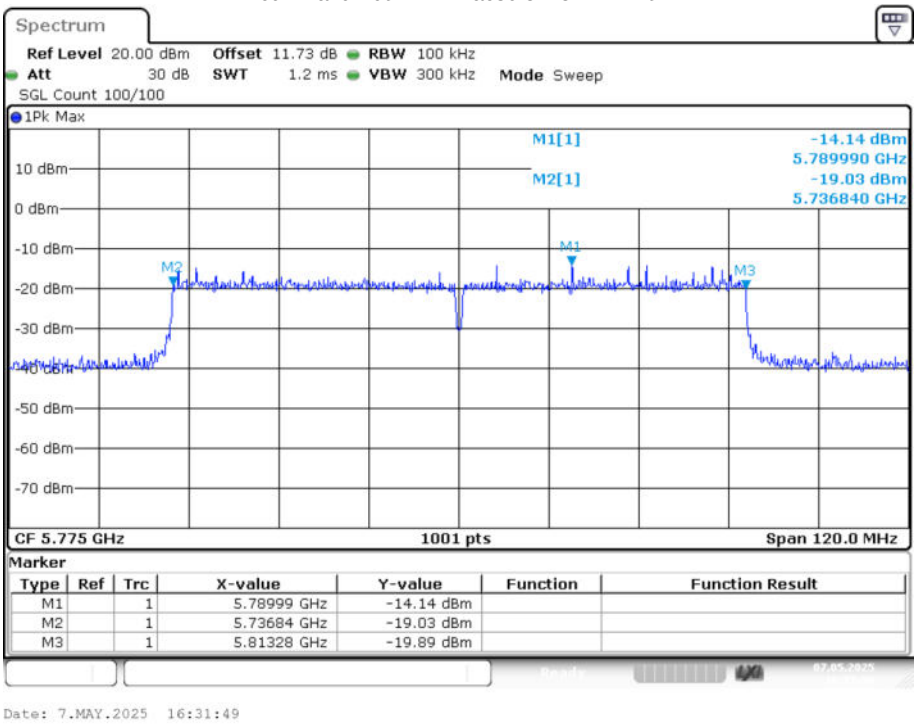
-26dB Bandwidth NVNT ac80 5210MHz Ant1



-6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	ac80	5775	Ant1	76.44	0.5	Pass

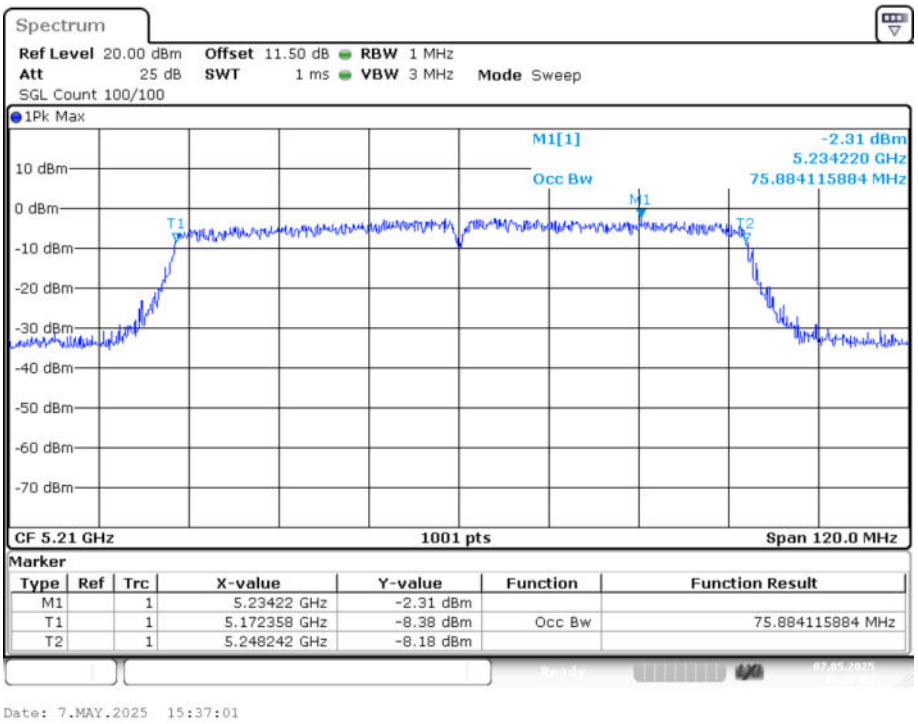
-6dB Bandwidth NVNT ac80 5775MHz Ant1



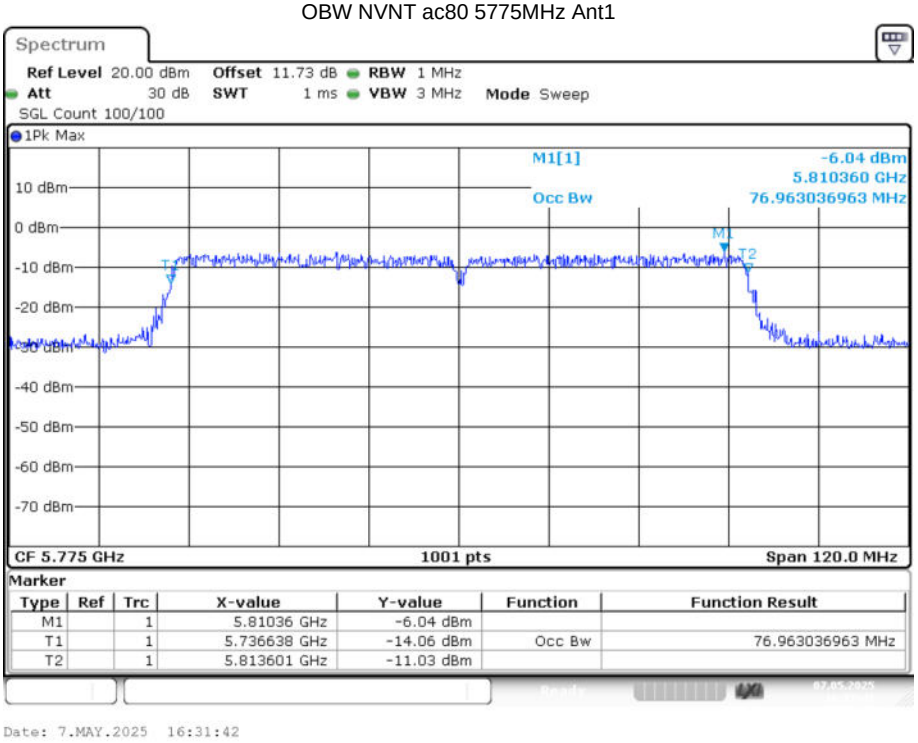
Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	ac80	5210	Ant1	75.884
NVNT	ac80	5775	Ant1	76.963

OBW NVNT ac80 5210MHz Ant1



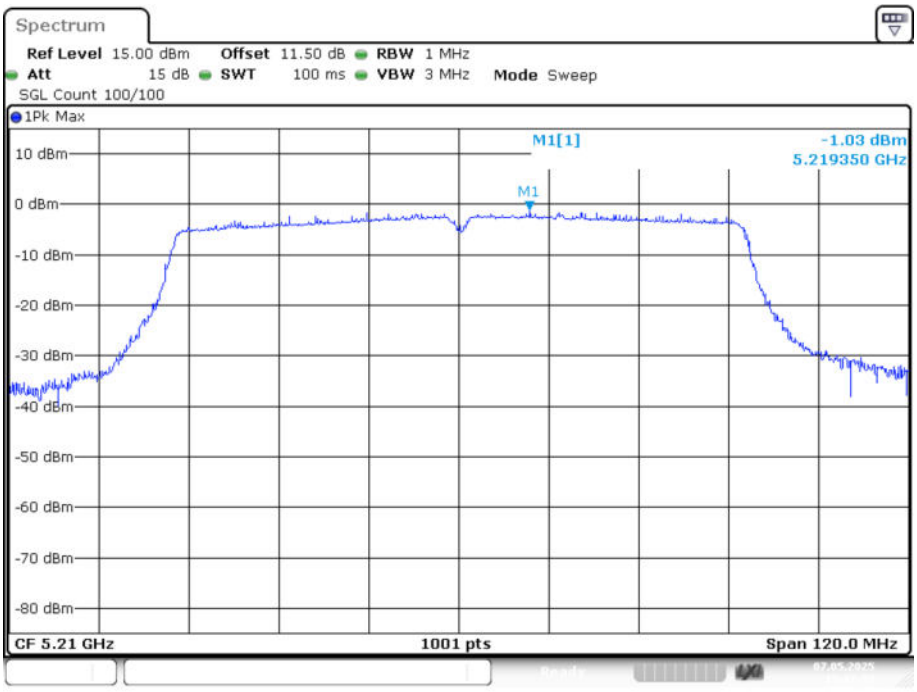
OBW NVNT ac80 5775MHz Ant1



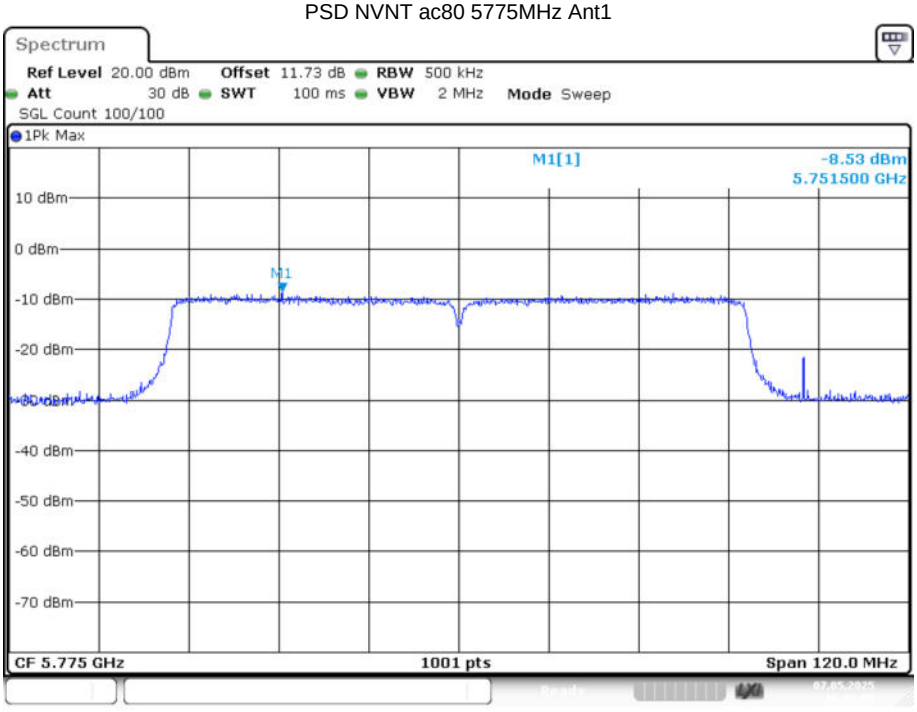
Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5210	Ant1	-1.035	11	Pass
NVNT	ac80	5775	Ant1	-8.528	30	Pass

PSD NVNT ac80 5210MHz Ant1



PSD NVNT ac80 5775MHz Ant1



----------End Report----------