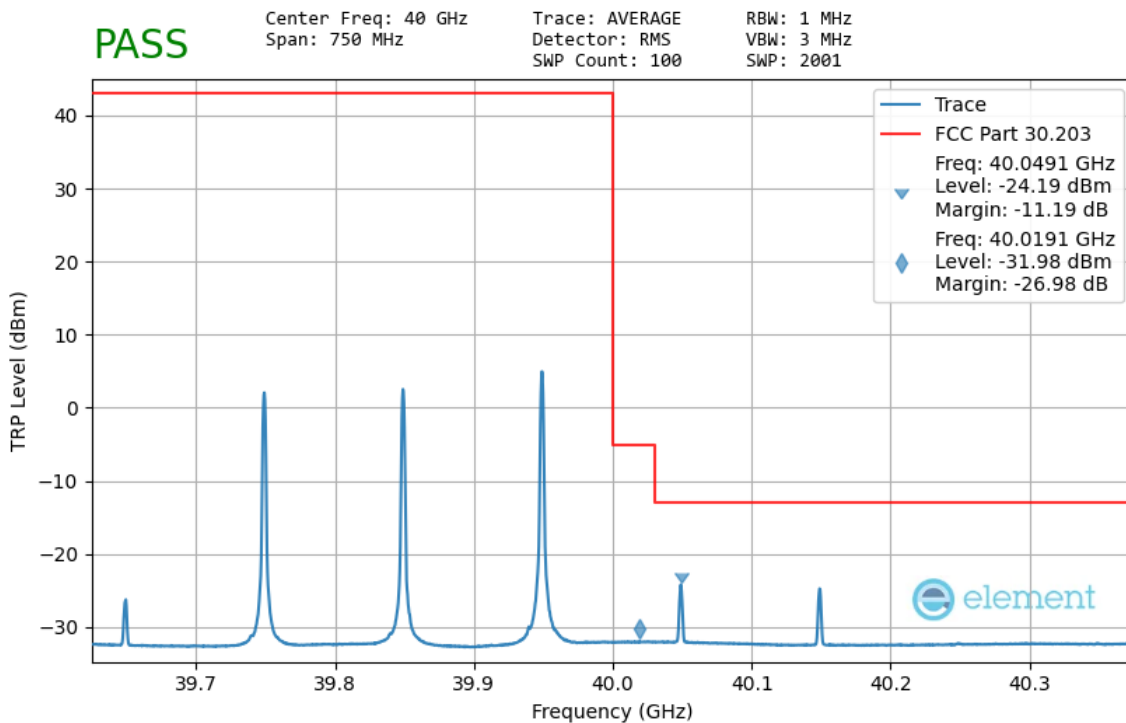
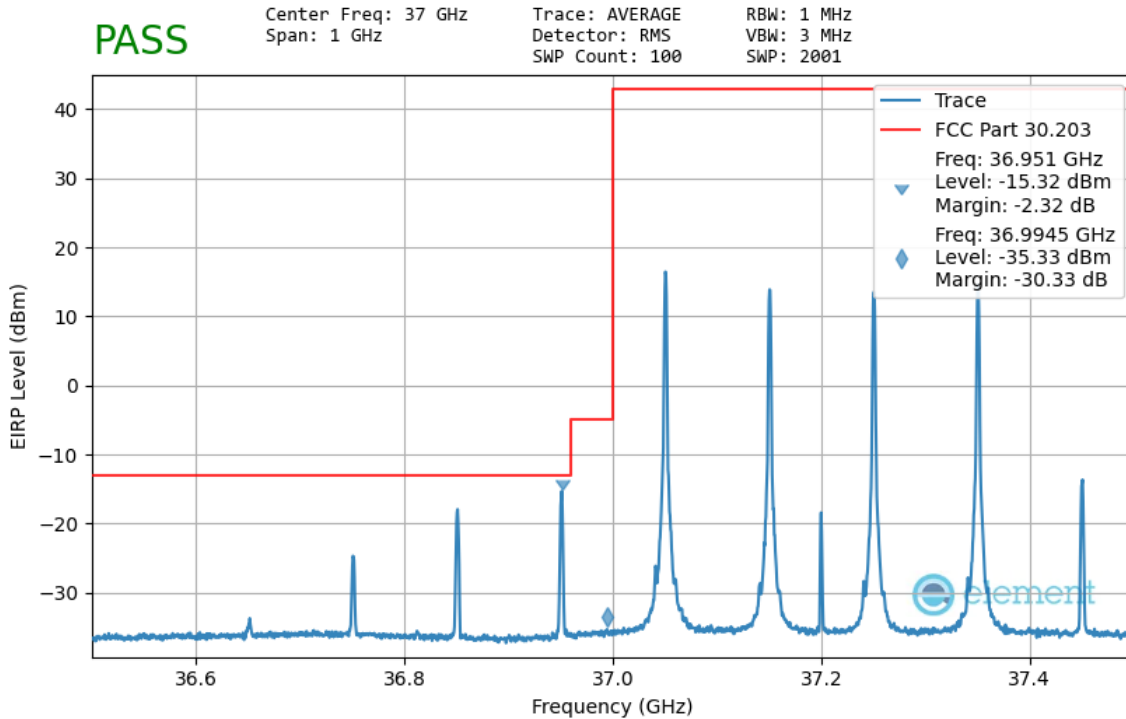


Plot 7-231. N patch Lower Band Edge (100MHz-3CC – CP-OFDM QPSK 1 RB)

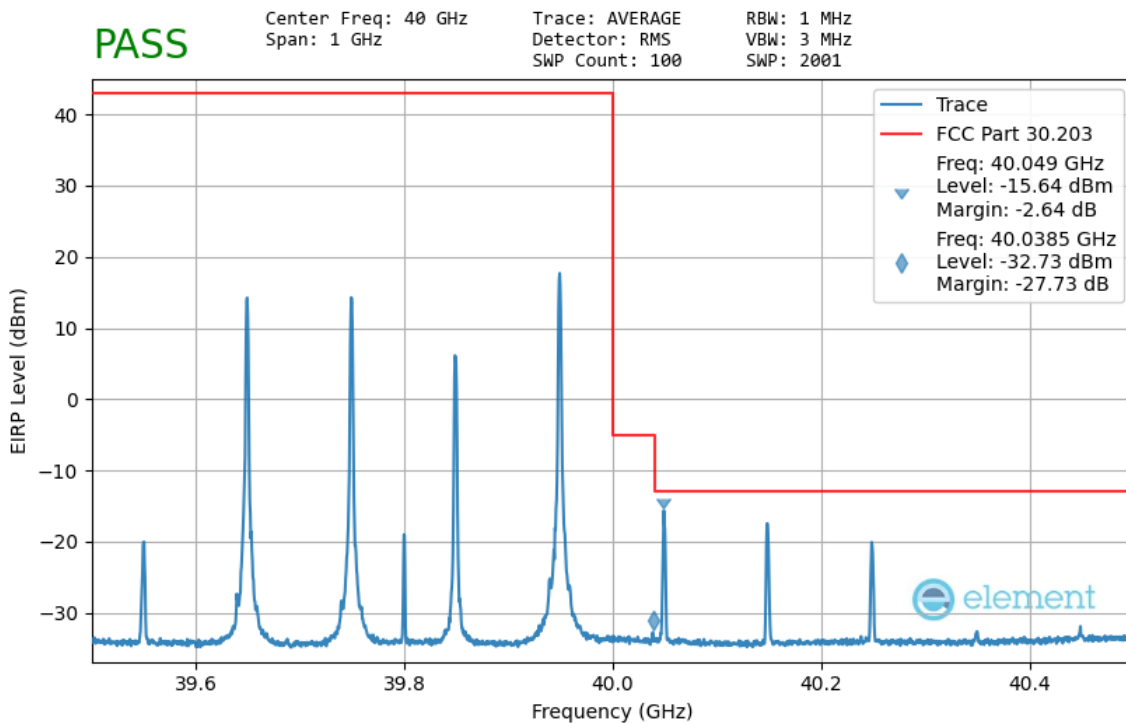


Plot 7-232. N patch Upper Band Edge - TRP (100MHz-3CC – CP-OFDM QPSK 1 RB)

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-233. N patch Lower Band Edge (100MHz-4CC – DFT-s-OFDM QPSK 1 RB)



Plot 7-234. N patch Upper Band Edge (100MHz-4CC – DFT-s-OFDM QPSK 1 RB)

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2209010096-08.A3L	Test Dates: 10/18/2022 – 11/14/2022	EUT Type: Portable Handset	Page 184 of 201

7.6 Frequency Stability / Temperature Variation

§2.1055

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Test Procedure Used

ANSI C63.26-2015 Section 5.6
KDB 842590 D01 v01r02 Section 4.5

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was measured using horn antenna connected to a spectrum analyzer. The EUT was placed inside an environmental chamber that uses a foam plug to maintain the temperature condition inside the chamber. The horn antenna measured the frequency of the fundamental signal.

Test Notes

The Frequency Deviation column in the table below is the amount of deviation measured from the center frequency of the Reference measurement (first row).

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Frequency Stability Measurements (Band n258)
§2.1055

OPERATING FREQUENCY: 24,350,040,000 Hz
 CHANNEL: 2018333
 REFERENCE VOLTAGE: 4.38 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.38	+ 20 (Ref)	24,350,644,671	0	0.0000000
100 %		- 30	24,350,652,795	-8,124	-0.0000334
100 %		- 20	24,350,667,896	-23,225	-0.0000954
100 %		- 10	24,350,649,295	-4,624	-0.0000190
100 %		0	24,350,641,085	3,586	0.0000147
100 %		+ 10	24,350,637,518	7,153	0.0000294
100 %		+ 30	24,350,648,698	-4,027	-0.0000165
100 %		+ 40	24,350,667,208	-22,537	-0.0000926
100 %		+ 50	24,350,658,848	-14,177	-0.0000582
BATT. ENDPOINT		3.71	+ 20	24,350,635,472	9,199

Table 7-77. Frequency Stability Data (n258)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency Stability Measurements (Band n258)
§2.1055

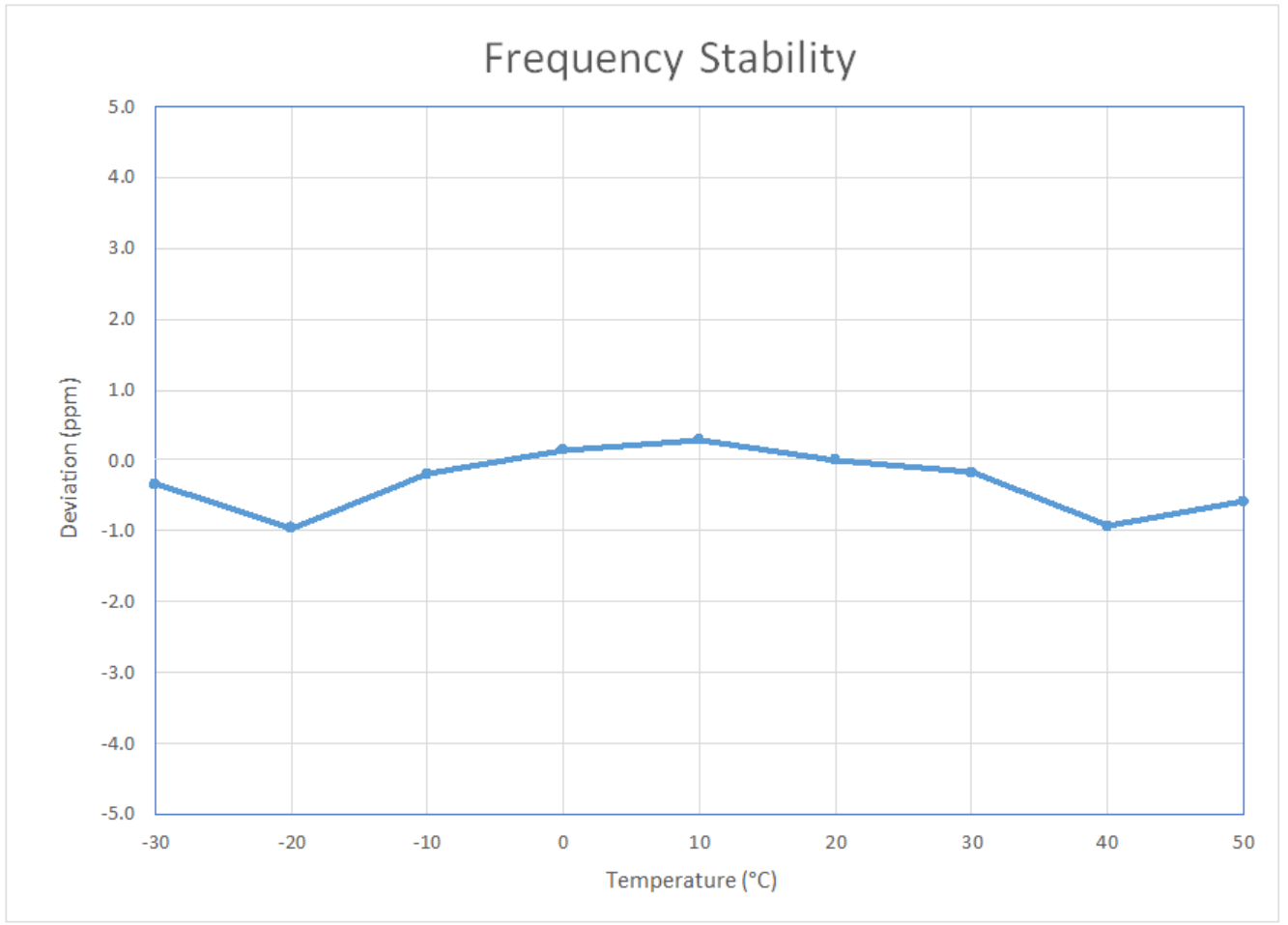


Table 7-78. Frequency Stability Graph (n258)

FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency Stability Measurements (Band n261)
§2.1055

OPERATING FREQUENCY: 27,924,960,000 Hz
 CHANNEL: 2077915
 REFERENCE VOLTAGE: 4.38 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.38	+ 20 (Ref)	27,925,619,225	0	0.0000000
100 %		- 30	27,925,591,626	27,599	0.0000988
100 %		- 20	27,925,625,991	-6,766	-0.0000242
100 %		- 10	27,925,593,715	25,510	0.0000913
100 %		0	27,925,627,813	-8,588	-0.0000308
100 %		+ 10	27,925,581,142	38,083	0.0001364
100 %		+ 30	27,925,581,671	37,554	0.0001345
100 %		+ 40	27,925,628,300	-9,075	-0.0000325
100 %		+ 50	27,925,601,434	17,791	0.0000637
BATT. ENDPOINT		3.71	+ 20	27,925,621,789	-2,564

Table 7-79. Frequency Stability Data (n261)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency Stability Measurements (Band n261)
§2.1055

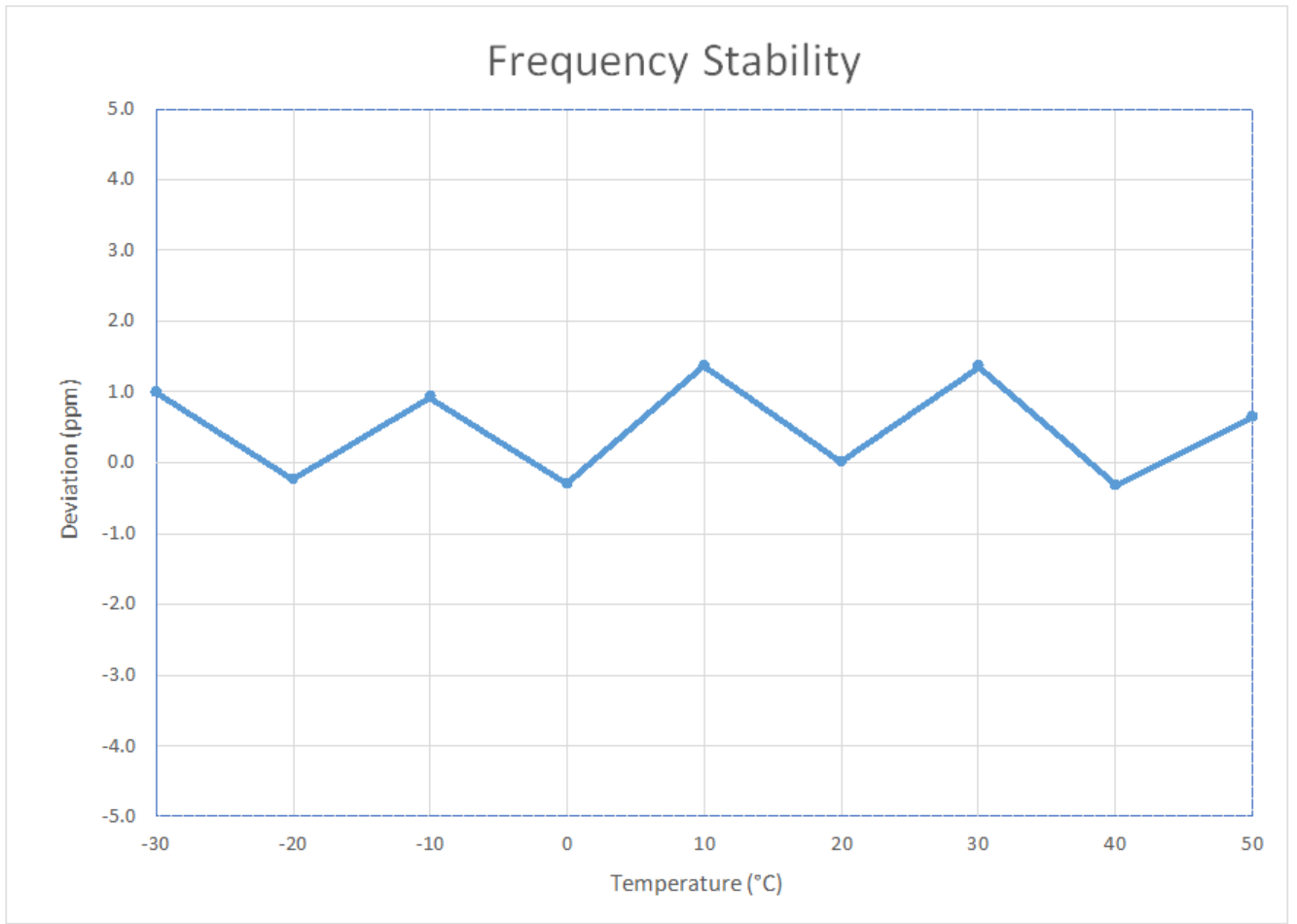


Table 7-80. Frequency Stability Graph (n261)

FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency Stability Measurements (Band n260)
§2.1055

OPERATING FREQUENCY: 38,499,960,000 Hz
 CHANNEL: 2254165
 REFERENCE VOLTAGE: 4.38 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.38	+ 20 (Ref)	38,500,655,336	0	0.0000000
100 %		- 30	38,500,637,871	17,465	0.0000454
100 %		- 20	38,500,649,413	5,923	0.0000154
100 %		- 10	38,500,645,671	9,665	0.0000251
100 %		0	38,500,646,284	9,052	0.0000235
100 %		+ 10	38,500,643,540	11,796	0.0000306
100 %		+ 30	38,500,644,620	10,716	0.0000278
100 %		+ 40	38,500,671,677	-16,341	-0.0000424
100 %		+ 50	38,500,627,268	28,068	0.0000729
BATT. ENDPOINT		3.71	+ 20	38,500,671,169	-15,833

Table 7-81. Frequency Stability Data (n260)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency Stability Measurements (Band n260)
§2.1055

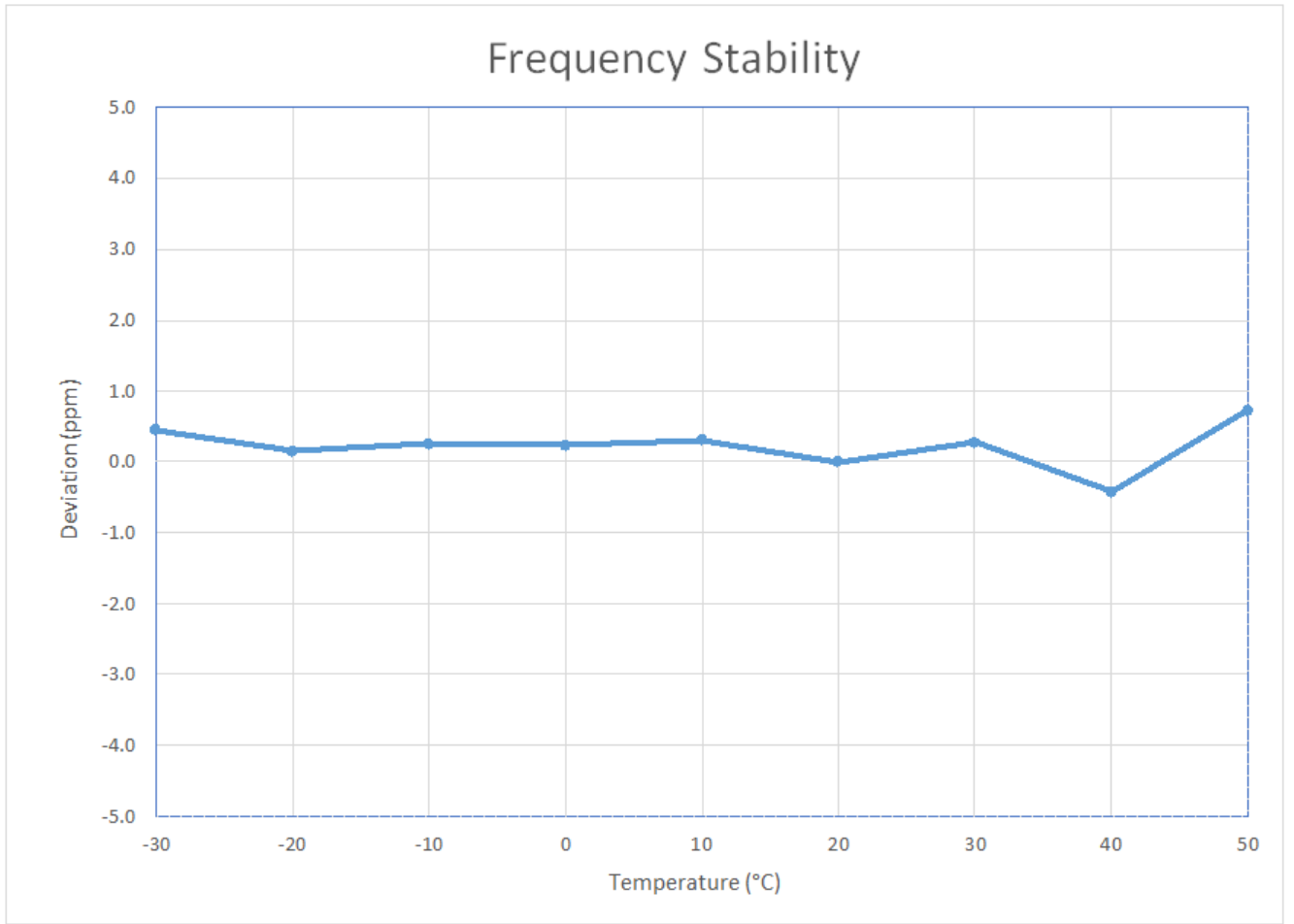


Table 7-82. Frequency Stability Graph (n260)

FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS911U** complies with all the requirements of Part 30.

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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APPENDIX A - VDI MIXER VERIFICATION CERTIFICATE



Virginia Diodes, Inc
 979 2nd St. SE
 Suite 309
 Charlottesville, VA 22902
 Phone: 434-297-3257
 Fax: 434-297-3258

Certificate of Conformance

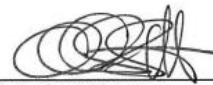
To: PCTEST Engineering Laboratory
 7185 Oakland Mills Road
 Columbia, MD 21046
 United States

From: Virginia Diodes, Inc
 979 2nd St. SE
 Suite 309
 Charlottesville, VA 22902

Packing List No: 210608	Today's Date: 02/24/21
Shipping Date: 02/23/21	PO Number: 210119.DP1

Quantity	Unit	Description	Order-Job Number
1	EA	RETEST-WR19SAX SAX 411	21036-01
1	EA	RETEST-WR12SAX SAX 252	21036-02
1	EA	RETEST-WR8.0SAX SAX 253	21036-03
1	EA	RETEST-WR5.1SAX SAX 254	21036-04

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).



 Authorized Signature
 Virginia Diodes, Inc

FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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APPENDIX B - TEST SCOPE ACCREDITATION



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Element Materials Technology Suwon, Ltd.
 (#1407) 13, Heungdeok 1-ro,
 Giheung-gu, Yongin-si, Gyeonggi-do 16954
 South Korea
 YoonYoung Cho Phone: +82.10.3443.6010
 Email: yoonyoung.cho@tpctest.com

ELECTRICAL

Valid To: January 31, 2023

Certificate Number: 2041.04

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following EMC, SAR, and RF testing of wireless devices:

Test Technology:	Test Method(s) ¹ :
Emissions	
Radiated and Conducted	CFR 47, FCC Parts 15B/C/E (using ANSI C63.4:2014, ANSI C63.10:2013, and FCC KDB 905462 D02 (v02)); CFR 47, FCC Part 18 (using MP-5:1986); TS 136 141; TS 138 141-1; TS 138 141-2
Radio	
U.S.	47 CFR FCC Parts 2, 22, 24, 25, 27, 30, 74, 90, 95, 96, 97, 101 (using ANSI/TIA-603-E, ANSI C63.26:2015); ANSI/TIA 603-D; TIA-102.CAAA-D
Canada	RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247 (w/o DFS); RSS-248; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN

(A2LA Cert. No. 2041.04) Revised 06/21/2022



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5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

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<u>Test Technology:</u>	<u>Test Method(s)¹:</u>
Korea	KS X 3123(2019); KS X 3142 (2019); Unlicensed Radio Equipment Established Without Notice (MSIT Public Notification 2018-38); Technical Requirements for Radio Equipment (Enforcement Decree of MSIT No.1);
European / UK Radio	EN 301 502; EN 301 908-1; EN 301 908-3; EN 301 908-14; EN 301 908-18; EN 301 908-24
<u>SAR/RF Exposure</u>	RSS-102 (NS, RF Exp., SAR); SPR-002; FCC KDB 248227 D01; FCC KDB 447498 D01, D02; FCC KDB 248227 D01; FCC KDB 615223 D01; FCC KDC 643646 D01; FCC KDB 648474 D03, D04; FCC KDB 616217 D04; FCC KDB 865664 D01, D02; FCC KDB 680106 D01; FCC KDB 941225 D01, D05, D05A, D06, and D07; EN 62209-1; EN 62209-2; IEC TR 62630; IEEE 1528:2013; IEEE C95.1(1999); IEEE Std. C95.1 (2005); IEEE Std C95.3.1 (2010); IEEE Std C95.3 (2002); EN 50385:2017; EN 50401:2017; EN 62232:2017

¹ When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories.*

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1²

<u>Rule Subpart/Technology</u>	<u>Test Method</u>	<u>Maximum Frequency (MHz)</u>
<u>Unintentional Radiators</u> Part 15B	ANSI C63.4:2014	220000
<u>Industrial, Scientific, and Medical Equipment</u> Part 18	FCC MP-5:1986	220000
<u>Intentional Radiators</u> Part 15C	ANSI C63.10:2013	220000
<u>U-NII without DFS Intentional Radiators</u> Part 15E	ANSI C63.10:2013	40000

(A2LA Cert. No. 2041.04) Revised 06/21/2022



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Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1²

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
<u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; ANSI C63.26:2015	220000
<u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97 (below 3 GHz), and 101 (below 3 GHz)	ANSI/TIA-603-E; ANSI C63.26:2015	220000
<u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u> Part 96	ANSI/TIA-603-E; ANSI C63.26:2015	220000
<u>Microwave and Millimeter Bands Radio Services</u> Parts 25, 30, 74, 90 (M, DSRC, Y, Z), Part 95 (M and L), and 101	ANSI/TIA-603-E; ANSI C63.26:2015	220000
<u>RF Exposure</u> Devices Subject to SAR Requirements	IEEE Std 1528:2013	100000

²Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/eas/>) for a listing of FCC approved laboratories.



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Accredited Laboratory

A2LA has accredited

Element Materials Technology Suwon. Ltd.

Gyeonggi-do, South Korea

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 24th day of September 2021.

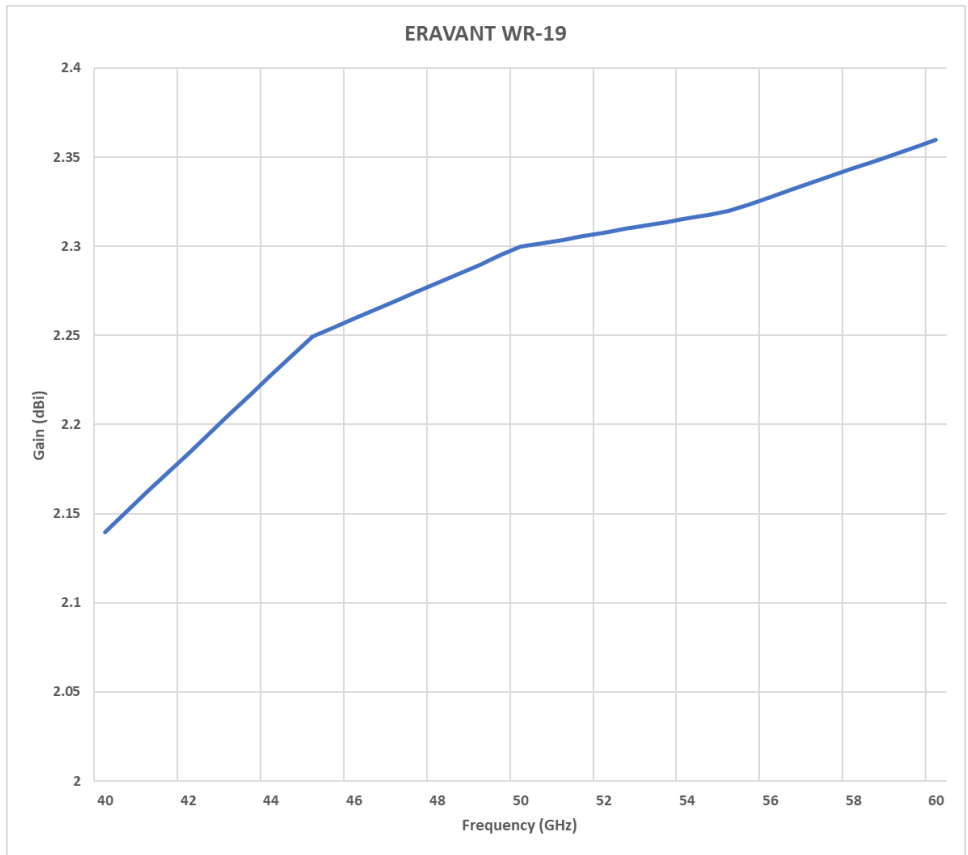
Vice President, Accreditation Services
 For the Accreditation Council
 Certificate Number 2041.04
 Valid to January 31, 2023
 Revised June 1, 2022


For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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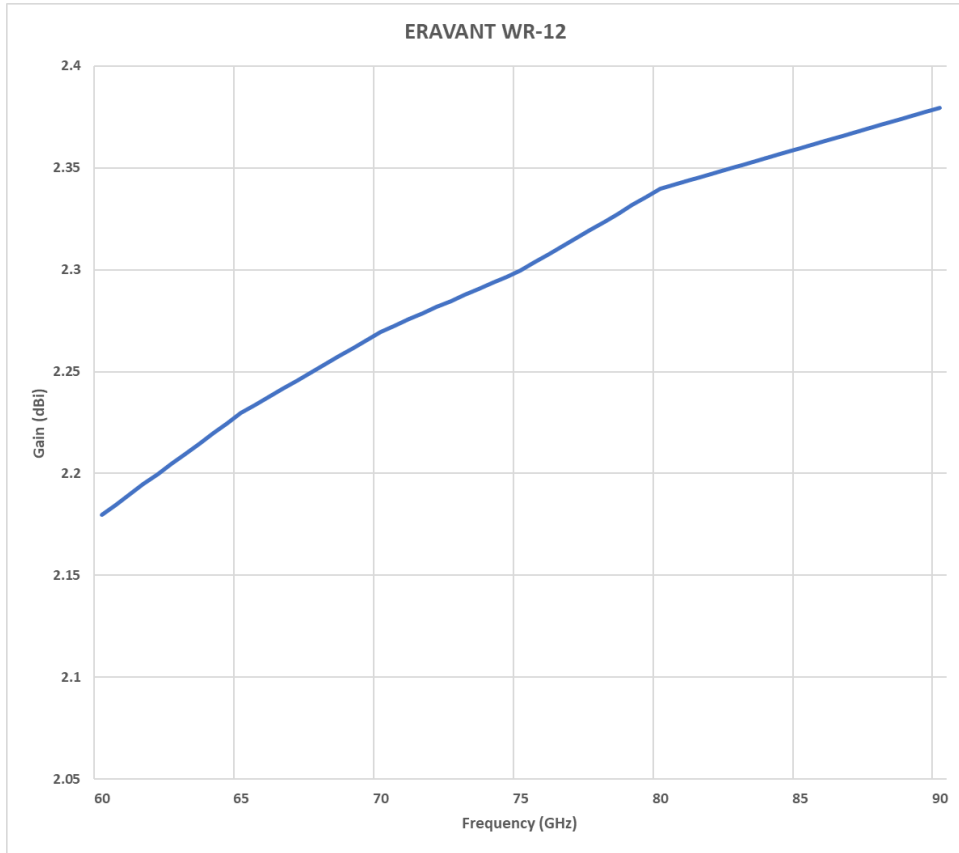
APPENDIX C - HORN ANTENNA GAIN CURVES

ERAVANT WR-19 Horn Antenna Gain (40 – 60GHz)



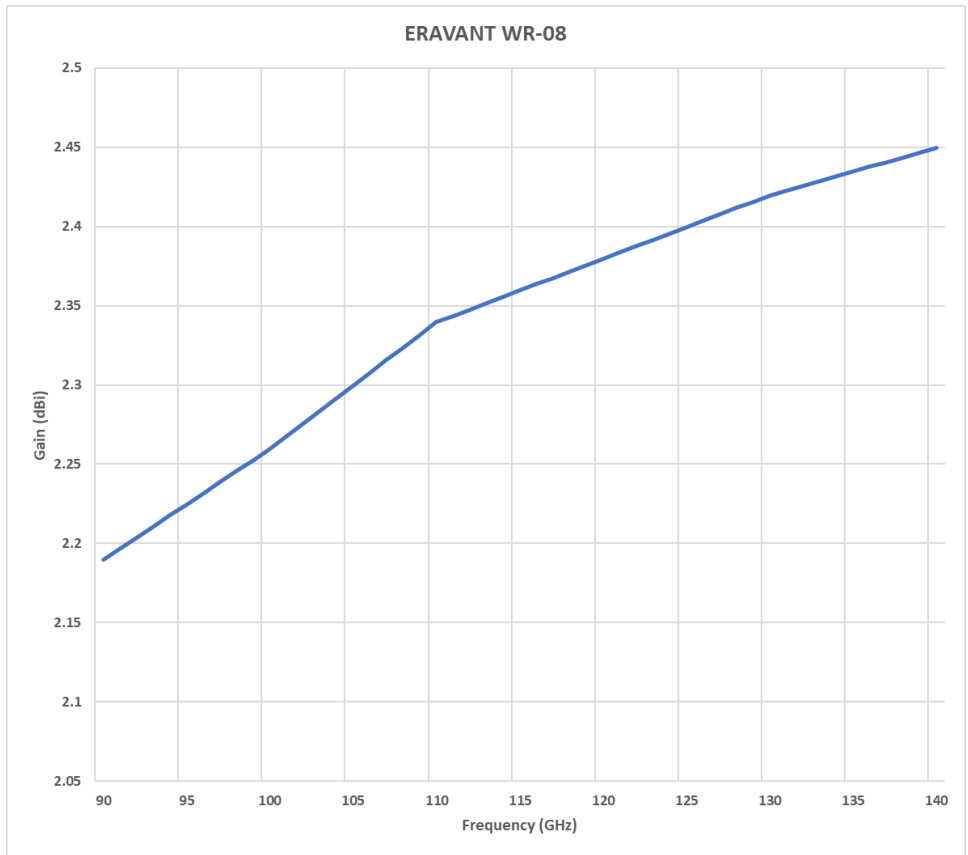
FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2209010096-08.A3L	Test Dates: 10/18/2022 – 11/14/2022	EUT Type: Portable Handset
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ERAVANT WR-12 Horn Antenna Gain (60 – 90GHz)



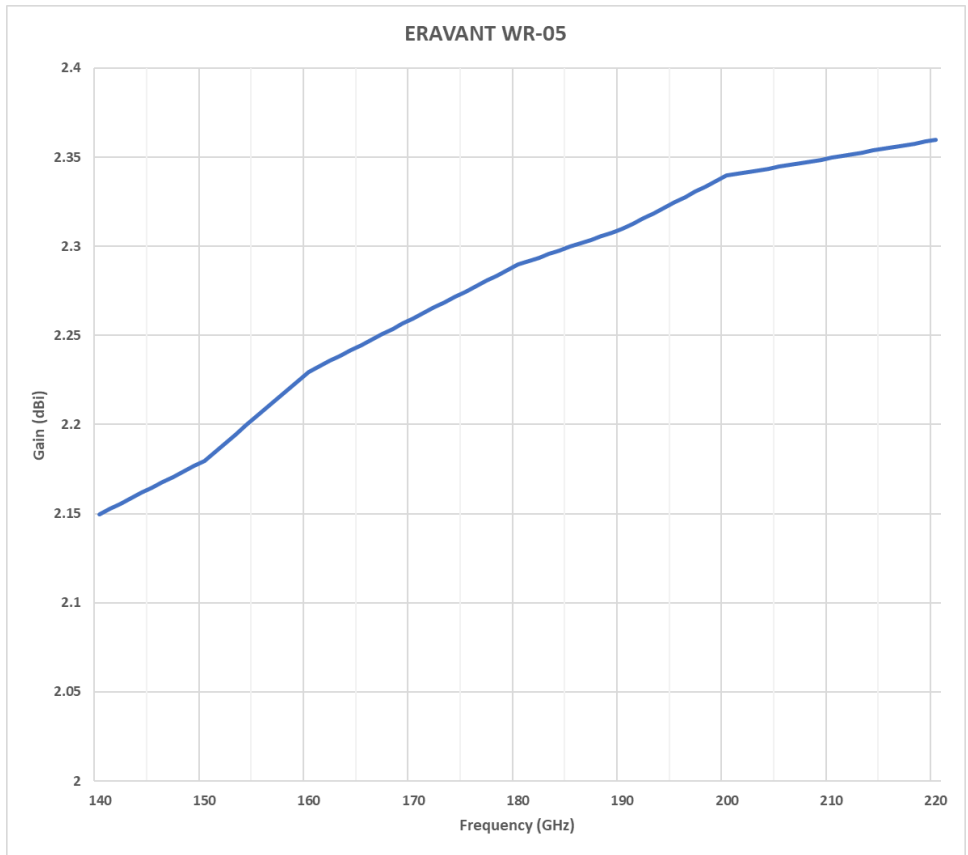
FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2209010096-08.A3L		Test Dates: 10/18/2022 – 11/14/2022

ERAVANT WR-08 Horn Antenna Gain (90 – 140GHz)



FCC ID: A3LSMS911U		PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2209010096-08.A3L	Test Dates: 10/18/2022 – 11/14/2022		EUT Type: Portable Handset

ERAVANT WR-05 Horn Antenna Gain (140 – 220GHz)



FCC ID: A3LSMS911U	 PART 30 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1M2209010096-08.A3L		Test Dates: 10/18/2022 – 11/14/2022