Certification Test Report

FCC ID: 2AN99AR303

FCC Rule Part: 15.517

TÜV SÜD Report Number: RD72135459.102

Manufacturer: IntraPosition
Model: AR303

Test Begin Date: July 16, 2018
Test End Date: July 18, 2018

Report Issue Date: August 06, 2018

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code AT-1921

This report must not be used by the client to claim product certification, approval, or endorsement by ANAB, ANSI, or any agency of the Federal Government.

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This report contains 27 pages

REVISION HISTORY Report Number: RD72135459.102 Manufacturer: IntraPosition Model: AR303					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
July 31, 2018	---	.100	Initial Release	All	Randle Sherian
August 2, 2018	---	.101	Change of model number	P1, 2, 27	Randle Sherian
August 6, 2018	---	.102	Change of FCC ID	P1, 2	Randle Sherian

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart F (15.517) of the FCC's Code of Federal Regulations.

1.2 Product Description

The AR303 is a component in an indoor-positioning UWB system (FCC 15.517) which is based upon the Decawave DWM1000 UWB transceiver chip. Such devices will be installed in an indoor perimeter to provide positioning service. They communicate with one another as well as with portable, UWB transceivers.

The general radio characteristics are:
• Single channel (#2), operating from 3.774 GHz to 4.243 GHz. Carrier wave: 3.993 GHz.
• Pulse repetition frequency (PRF) of the modulated signal: 16Mhz.

Technical Information:

Detail	Description
Frequency Range	Center Frequency 3993 GHz
Number of Channels	1
Modulation Format	BPM w/ BPSK
Data Rates	6.8 Mbps
Operating Voltage	12 VDC with dedicated power adapter
Antenna Type / Gain	Dielectric Chip 2.73 dBi (Peak)
Type of Equipment	Indoor/Stand-alone

Manufacturer Information:
IntraPosition
4 Hamada,
Yokne'am, Israel

Contact:
Yaron Shavit
yaron@intraposition.com

EUT Serial Numbers: TUV SUD 13

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

The device is typically installed indoor in a fixed location. In order to ensure that the worse orientation is covered in the field, the fundamental was evaluated in the X, Y, and Z planes. The worst-case plane was X-Plane. The data in the report represents the worst case.

The EUT is configured via UWB communication, transmitted by the configurator anchor. The configurator anchor receives the parameters from a raspberry-pi computer via Wi-Fi. The configuration settings are written to the raspberry-pi through an IP terminal accessed via a PC. The EUT Power levels are indicated with 2 parameters: [SD_pwr, PHR_pwr], both within the range [0, 33.5]. The maximum power used through the entire testing was based on the settings SD=33, PHR=28.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

TÜV SÜD America Inc.
2320 Presidential Drive, Suite 101
Durham, NC 27703
Phone: (919) 381-4235

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America Inc. is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board under their ANAB program and has been issued certificate number AT-1921 in recognition of this accreditation. Unless otherwise specified, all test methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

FCC Registered Test Site Number: 637011
ISED Canada Test Site Registration Number: 20446

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 18' x 28' x 18' shielded enclosure. The chamber is lined with Samwha Electronics Co. LTD Ferrite Absorber, model number SFA300 (HSN-1). The ferrite tile is 10cm x 10 cm and weighs approximately 1.4lbs. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber. On top of the ferrite tiles is DMAS HT-45 (Dutch Microwave Absorber Solutions) hybrid absorber on all walls except the wall behind the antenna mast which has a shorter DMAS HT-25 absorber.

The turntable is 1.50m in diameter and is located 150cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using short #6 copper wire. The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the turntable. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane.

Behind the turntable is a 2' x 6' x 1.5' deep shielded pit used for support equipment if necessary. The pit is equipped with 2 - 4" PVC chase from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

To comply with the requirements of the test methods given on page 4, RF absorbing foam was placed inside the chamber in a configuration that provided the best results. First, a 12ft X 12ft. patch of 10" tall absorber was placed on the floor between the turntable and the receiving antenna. This absorber meets the absorption requirements specified in ANSI C63.4:2009.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

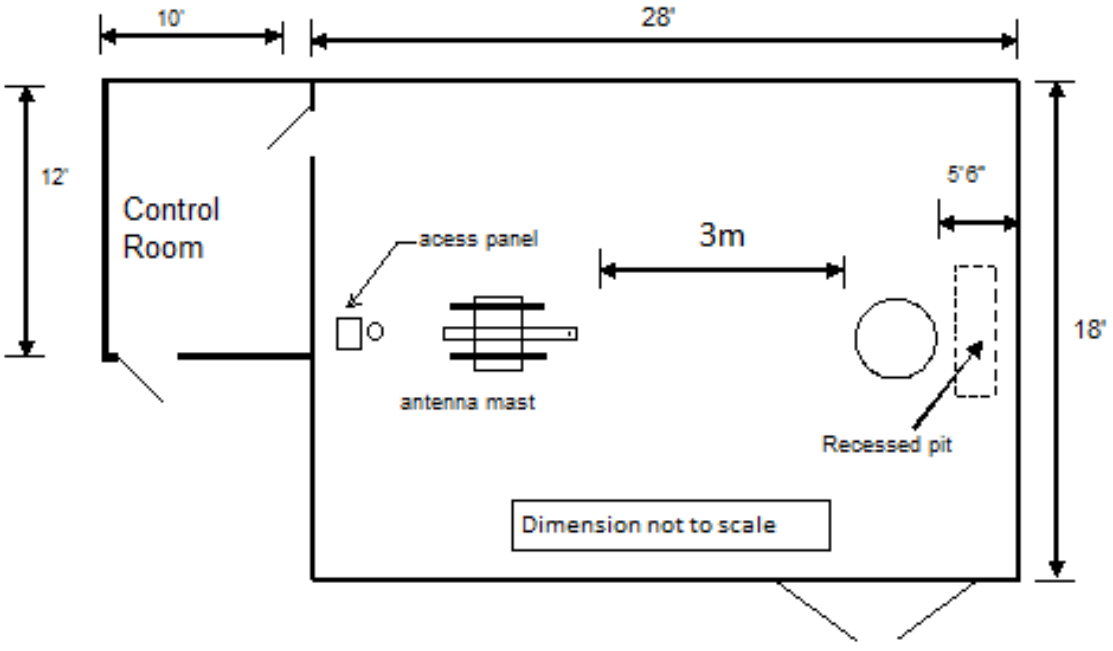

Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 10' sheet galvanized steel horizontal ground reference plane (GRP) bonded every 6" to an 8' X 8' aluminum vertical ground plane.

A diagram of the room is shown below in figure 1.7-1:

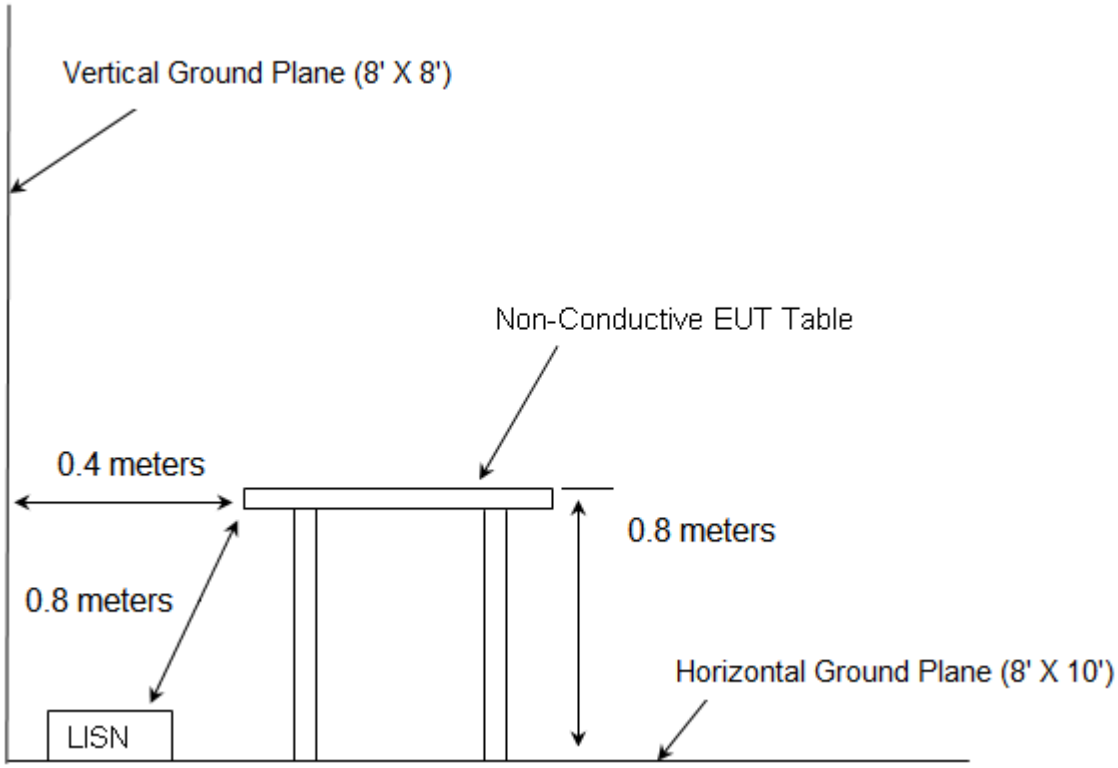

Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart F: Radio Frequency Devices, Ultra-Wideband Operation, 2017

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

Asset ID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
DEMC0277	EMCO	93146	Antennas	9904-5199	9/12/2016	9/12/2018
332	Rohde & Schwarz	TS-PR40	Amplifiers	100021	7/10/2018	7/10/2019
333	Rohde & Schwarz	3160-10	Antennas	00045576	NCR	NCR
335*	Suhner	SF-102A	Cables	882/2A	7/10/2018	7/10/2019
DEMC0626	EMCO	3110B	Antennas	9411-1945	3/21/2017	3/21/2019
DEMC3002	Rohde & Schwarz	ESU40	Receiver	100346	7/24/2017	7/24/2018
DEMC3006	Rohde & Schwarz	TS-PR18	Amplifiers	122006	1/10/2018	1/10/2019
DEMC3007	Rohde & Schwarz	TS-PR26	Amplifiers	100051	1/10/2018	1/10/2019
DEMC3011	Rohde & Schwarz	ENV216	LISN	3011	1/10/2018	1/10/2019
DEMC3012	Rohde & Schwarz	EMC32-EB	Software	100731	NCR	NCR
DEMC3016	Fei Teng Wireless Technology	HA-07M18G-NF	Antennas	2013120203	2/7/2018	2/7/2020
DEMC3032	Hasco, Inc.	HLL142-S1-S1-192/WA	Cables	3075	1/9/2018	1/9/2019
DEMC3038	Florida RF Labs	NMSE-290AW-60.0-NMSE	Cable Set	1448	1/5/2018	1/5/2019
DEMC3039	Florida RF Labs	NMSE-290AW-396.0-NMSE	Cable Set	1447	1/5/2018	1/5/2019
DEMC3042	Aeroflex Inmet	18N10W-10	Attenuator	1444	1/8/2018	1/8/2019
DEMC3051	Mountain View Cable	BMS-RG400-264.0-BMS	Cables	3051	1/8/2018	1/8/2019
DEMC3055	Rohde & Schwarz	3005	Cables	3055	1/8/2018	1/8/2019
DEMC3057	Advanced Technical Materials	42-441-6/BR	Antennas	R110602	NCR	NCR
DEMC3059	Mountain View Cable	A	Cables	3059	1/9/2018	1/9/2019
DEMC3085	Rohde & Schwarz	FSW43	Spectrum Analyzer	103997	3/15/2018	3/15/2019

NCR = No Calibration Required
Asset DEMC3002: Firmware Version: ESU40 is 4.73 SP4
Asset DEMC3012: Software Version: EMC32-B is 9.15
Asset DEMC3085: Instrument Firmware 2.90 SP1

5 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Intraposition	AR303	TUV SUD 13
2	Power Supply	DVE	DSA-12PFA-09 FEU 120100	TUV SUD 21

Table 5-2: Cable Description

Cable #	Cable Type	Length	Shield	Termination
A	DC Power	140cm	No	1 to 2
B	AC Power Extension	180cm	No	2 to AC

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

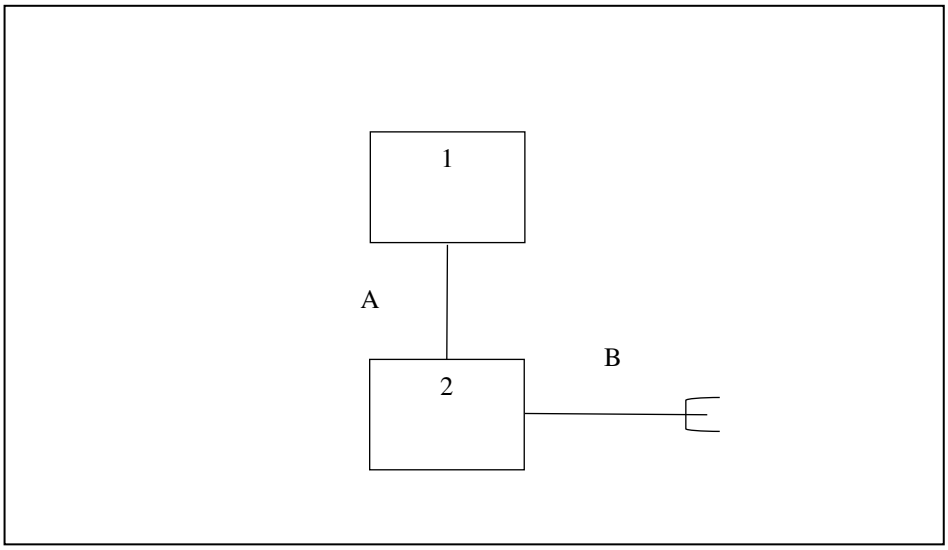

Figure 6-1: EUT Test Setup Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement – FCC 15.203

The antenna is integrated into the device.

7.2 Power Line Conducted Emissions – FCC 15.207

7.2.1 Measurement Procedure

ANSI C63.10 section 6.2 was the guiding document for this evaluation. Conducted emissions were performed from 150 kHz to 30 MHz with the spectrum analyzer's resolution bandwidth set to 9 kHz and the video bandwidth set to 30 kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.2.2 Measurement Results

Measurement Performed By: Charles Callis

The equipment under test is a module and compliance for conducted emissions was tested in a representative configuration of a final product.

Table 7.2.2-1 - Line

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.162000	---	31.77	55.30	23.53	5000.0	9.000	L1	OFF	9.6
0.162000	46.83	---	65.31	18.48	5000.0	9.000	L1	OFF	9.6
0.280000	45.18	---	60.61	15.43	5000.0	9.000	L1	OFF	9.6
0.280000	---	31.95	50.57	18.62	5000.0	9.000	L1	OFF	9.6
0.288000	45.50	---	60.38	14.88	5000.0	9.000	L1	OFF	9.6
0.288000	---	32.74	50.34	17.60	5000.0	9.000	L1	OFF	9.6
0.504000	---	23.41	46.00	22.59	5000.0	9.000	L1	OFF	9.7
0.504000	37.24	---	56.00	18.76	5000.0	9.000	L1	OFF	9.7
0.804000	---	21.64	46.00	24.36	5000.0	9.000	L1	OFF	9.7
0.804000	35.02	---	56.00	20.98	5000.0	9.000	L1	OFF	9.7
0.840000	---	21.38	46.00	24.62	5000.0	9.000	L1	OFF	9.7
0.840000	34.73	---	56.00	21.27	5000.0	9.000	L1	OFF	9.7
1.784000	---	19.51	46.00	26.49	5000.0	9.000	L1	OFF	9.8
1.784000	33.33	---	56.00	22.67	5000.0	9.000	L1	OFF	9.8
2.412000	---	19.25	46.00	26.75	5000.0	9.000	L1	OFF	9.8
2.412000	32.55	---	56.00	23.45	5000.0	9.000	L1	OFF	9.8
3.804000	---	17.06	46.00	28.94	5000.0	9.000	L1	OFF	9.8
3.804000	30.10	---	56.00	25.90	5000.0	9.000	L1	OFF	9.8
7.918000	---	13.53	50.00	36.47	5000.0	9.000	L1	OFF	10.0
7.918000	25.35	---	60.00	34.65	5000.0	9.000	L1	OFF	10.0

Table 7.2.2-2 - Neutral

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.288000	40.58	---	60.38	19.80	5000.0	9.000	N	OFF	9.6
0.288000	---	27.36	50.34	22.98	5000.0	9.000	N	OFF	9.6
0.292000	40.64	---	60.26	19.62	5000.0	9.000	N	OFF	9.6
0.292000	---	27.45	50.23	22.78	5000.0	9.000	N	OFF	9.6
0.304000	---	24.53	49.90	25.37	5000.0	9.000	N	OFF	9.6
0.304000	37.52	---	59.93	22.41	5000.0	9.000	N	OFF	9.6
0.476000	---	18.12	46.37	28.25	5000.0	9.000	N	OFF	9.6
0.476000	29.84	---	56.38	26.54	5000.0	9.000	N	OFF	9.6
0.832000	---	15.96	46.00	30.04	5000.0	9.000	N	OFF	9.7
0.832000	27.53	---	56.00	28.47	5000.0	9.000	N	OFF	9.7
1.272000	---	13.90	46.00	32.10	5000.0	9.000	N	OFF	9.7
1.272000	26.37	---	56.00	29.63	5000.0	9.000	N	OFF	9.7
1.692000	---	13.44	46.00	32.56	5000.0	9.000	N	OFF	9.7
1.692000	25.95	---	56.00	30.05	5000.0	9.000	N	OFF	9.7
3.172000	---	12.25	46.00	33.75	5000.0	9.000	N	OFF	9.8
3.172000	24.39	---	56.00	31.61	5000.0	9.000	N	OFF	9.8
3.800000	---	11.83	46.00	34.17	5000.0	9.000	N	OFF	9.8
3.800000	23.79	---	56.00	32.21	5000.0	9.000	N	OFF	9.8
8.314000	---	12.47	50.00	37.53	5000.0	9.000	N	OFF	9.9
8.314000	21.77	---	60.00	38.23	5000.0	9.000	N	OFF	9.9

7.3 10 dB Bandwidth – FCC 15.517(b)

7.3.1 Measurement Procedure

The 10 dB bandwidth was measured in accordance with the ANSI C63.10: 2013 Section 10.1. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1MHz. The video bandwidth (VBW) was set to ≥ 1 to 3 times the RBW. The trace was set to max hold with a Peak detector active.

7.3.2 Measurement Results

Measurement Performed By: Jean Tezil

Table 7.3.2-1 – Frequency Bounds

Frequency Bounds	Frequency [MHz]
F_m	4148.828
F_l	3648.388
F_h	4339.164

Table 7.3.2-2: 10 dB Bandwidth

Frequency fc [MHz]	10 dB Bandwidth [MHz]
3993.776	690.776

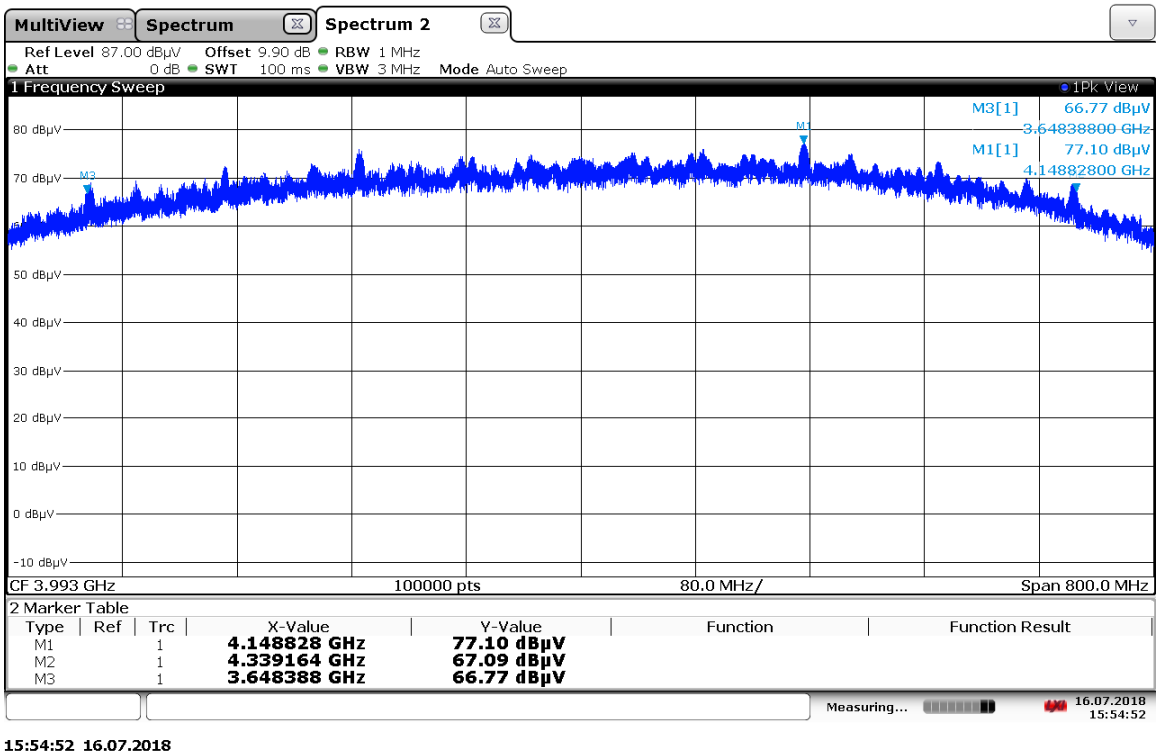

Figure 7.3.2-1: 10 dB Bandwidth

7.4 Fundamental Emission Peak Power – FCC 15.517(e)

7.4.1 Measurement Procedure

The maximum peak radiated output power was measured in accordance with ANSI C63.10: 2013 Section 10.3.5. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 50MHz. The Video Bandwidth (VBW) was set to its maximum 80MHz. The trace was set to max hold with a peak detector active.

7.4.2 Measurement Results

Measurement Performed By: Jean Tezil

Field Strength: Data (from plot) + antenna CF = Field Strength
91.52 dBµV/m + 1.25 dB/m = 92.77 dBµV/m

Field Strength to EIRP (dBm): Field Strength – 95.3 = EIRP (dBm)
92.77dBuV/m - 95.3dB = -2.53 dBm EIRP
Per 15.517(e) the peak limit on the fundamental is 0 dBm EIRP.

Table 7.4.2-1: Maximum Peak Radiated Output Power

Frequency (MHz)	Output Power (EIRP) (dBm)
3993	-2.53

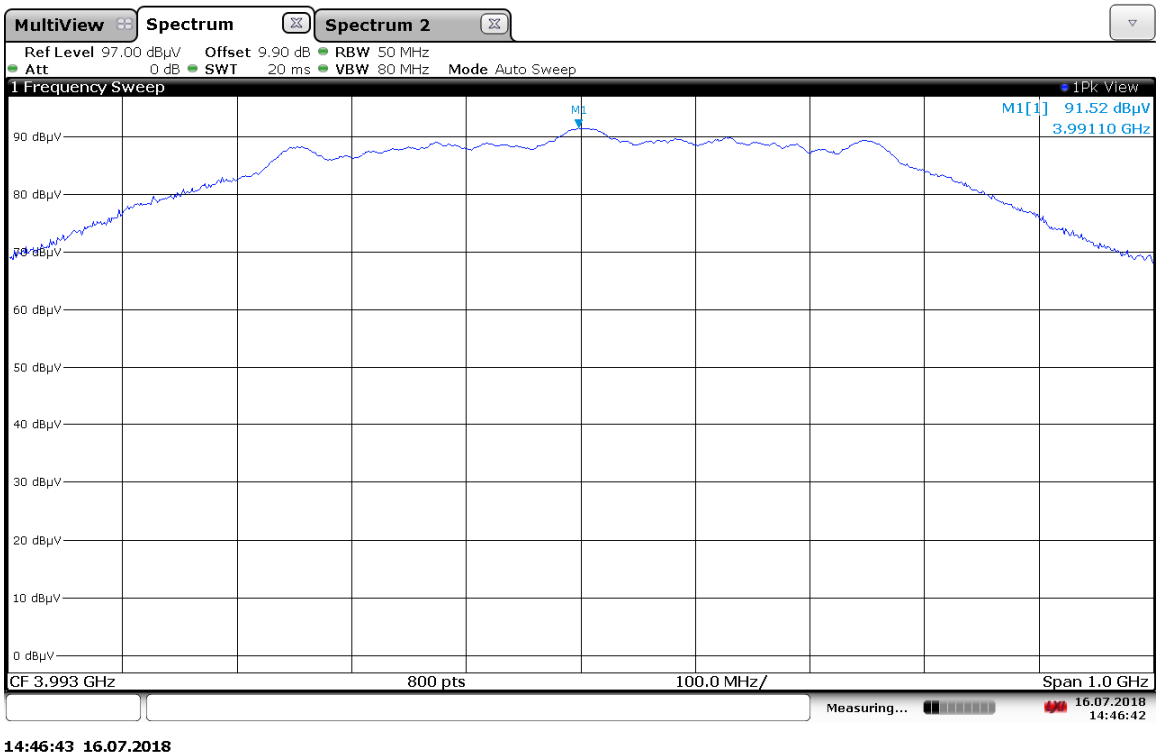

Figure 7.4.2-1: Peak Power Plot

7.5 Power Spectral Density in the Fundamental Emission – FCC 15.517(c).

7.5.1 Measurement Procedure

The power spectral density was measured in accordance with the ANSI C63.10 Section 10.3.7. The equipment under test was tested radiated. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1 MHz. The video bandwidth (VBW) was set to ≥1 MHz. Span was set to a convenient frequency segment. The trace was set to max hold with a RMS detector active. The sweep time did not exceed 1ms per bin. For the 600 bins used a 600 ms sweep time was used.

7.5.2 Measurement Results

Measurement Performed By: Jean Tezil

Field Strength: Data (from plot) + antenna CF = Field Strength
49.82 dBµV/m + 1.26 dB/m = 51.08 dBµV/m

Field Strength to EIRP (dBm): Field Strength – 95.3 = EIRP (dBm)
51.08dBuV/m - 95.3 = -44.22 dBm EIRP
Per 15.517(c) the limit on the fundamental is -41.3 dBm EIRP.

Table 7.5.2-1: Power Spectral Density

Frequency (MHz)	PSD Level EIRP(dBm)
3993.5	-44.22

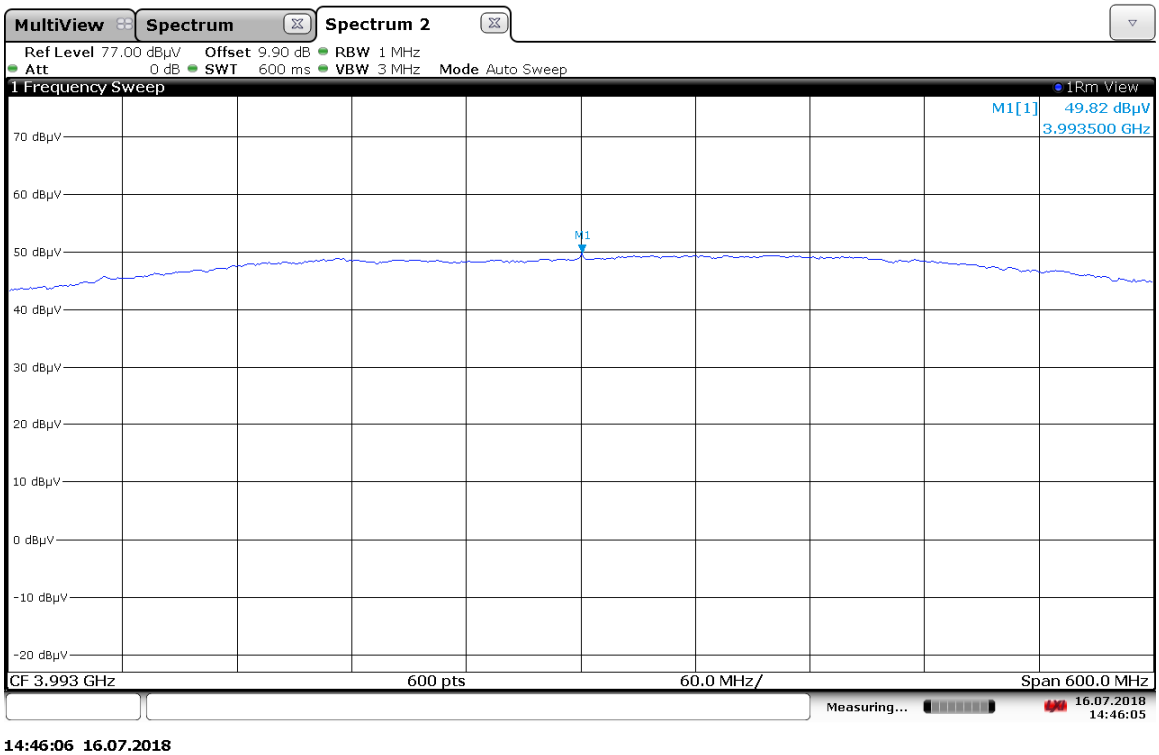

Figure 7.5.2-1: PSD Plot

7.6 Radiated Emissions – FCC 15.517(c)

7.6.1 Emissions into Frequency Bands above 960 MHz

7.6.1.1 Measurement Procedure

The unwanted emissions above 960 MHz were measured radiated in accordance with ANSI 63.10: 2013 Section 10.3. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 1 MHz. The Video Bandwidth (VBW) was set to ≥ 1MHz. The trace was set to max hold with a RMS detector active. The sweep time did not exceed 1ms per bin. Below 1.61GHz, 600 bins were used with a sweep time of 600 ms. Above 1.61GHz, 1000 bins were used with a 1000 ms sweep time.

The correction factor is a combination of coax cable loss, preamp gain, antenna factor, and a measurement distance correction factor (when needed).

7.6.1.2 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)+DCF
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DCF	=	Distance Correction Factor

Example Calculation: RMS

Corrected Level: 18.55 + -7.27 = 11.28dBµV/m

Limit Conversion to dBµV/m: EIRP (dBm) + 95.3 = dBµV/m

Table 7.6.1.2-1 Limits from 15.517(c):

Frequency MHz	EIRP dBm	Limit dBµV/m @3m
960 to 1610	-75.3	20
1610 to 1990	-53.3	42
1990 to 3100	-51.3	44
3100 to 10600	-41.3	54
Above 10600	-51.3	44

7.6.1.3 Measurement Results

Measurement Performed By: Jean Tezil

Emission Frequency MHz	Reading From plot dBµV	Antenna Polarity	Measurement Distance meter	Correction Factors dB/m	Field Strength dBµV/m	Limit dBµV/m @3m
1245.5	18.55*	H	1	-7.27	11.28	20
1807.4	27.90	H	3	-5.71	22.19	42
2413.5	28.08	H	3	-3.82	24.26	44
4866.5	27.69	H	3	2.61	30.3	54
7987.16	41.46	H	3	8.72	50.18	54
16827.1	16.23*	H	1	13.65	29.88	44
26200	23.2*	H	1	11.72	34.92	44
28447.1	33.55*	H	1	0.06	33.61	44

*Measurements were made at 1 meter. The reading from the plot was corrected to a 3-meter measurement distance using the extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements) (9.54 dB).

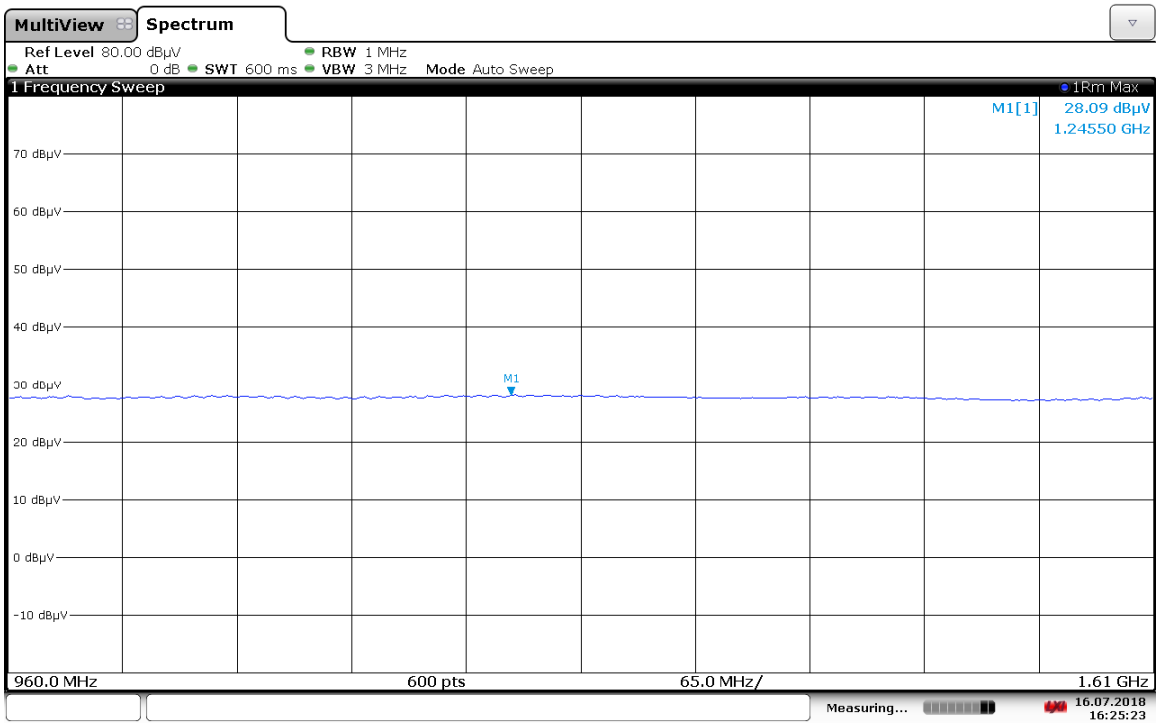

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Figure 7.6.1.3-1: 960 MHz – 1.61 GHz

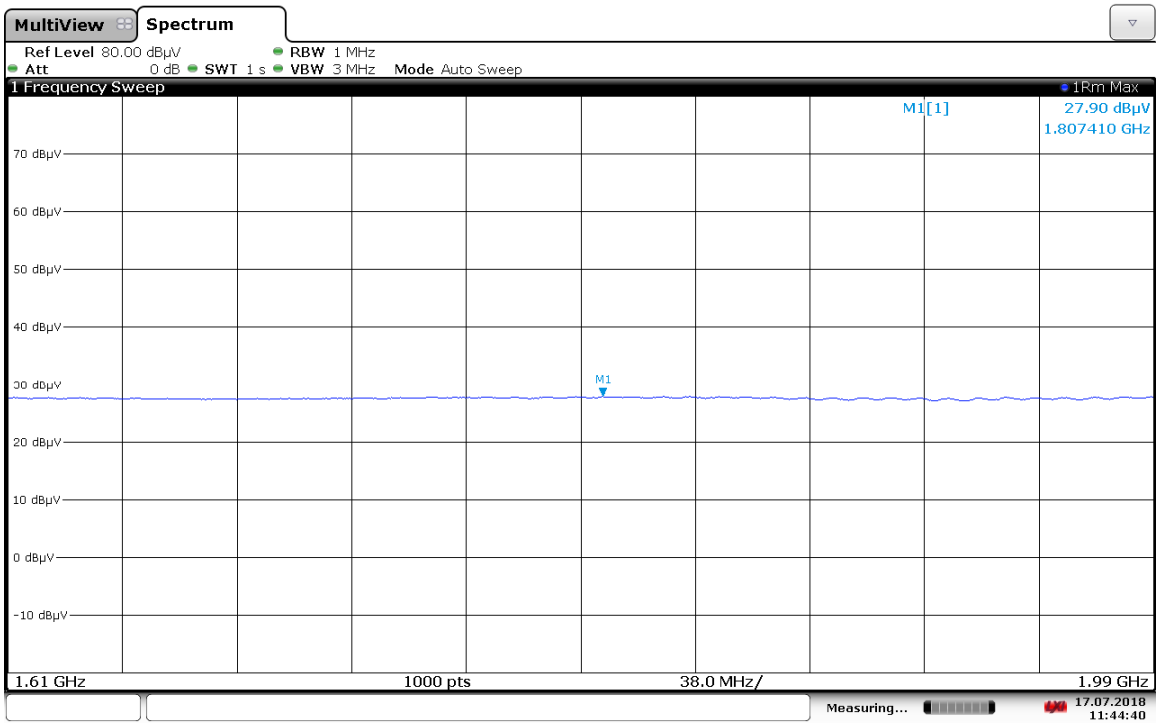

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Figure 7.6.1.3-2: 1.61 GHz – 1.99 GHz

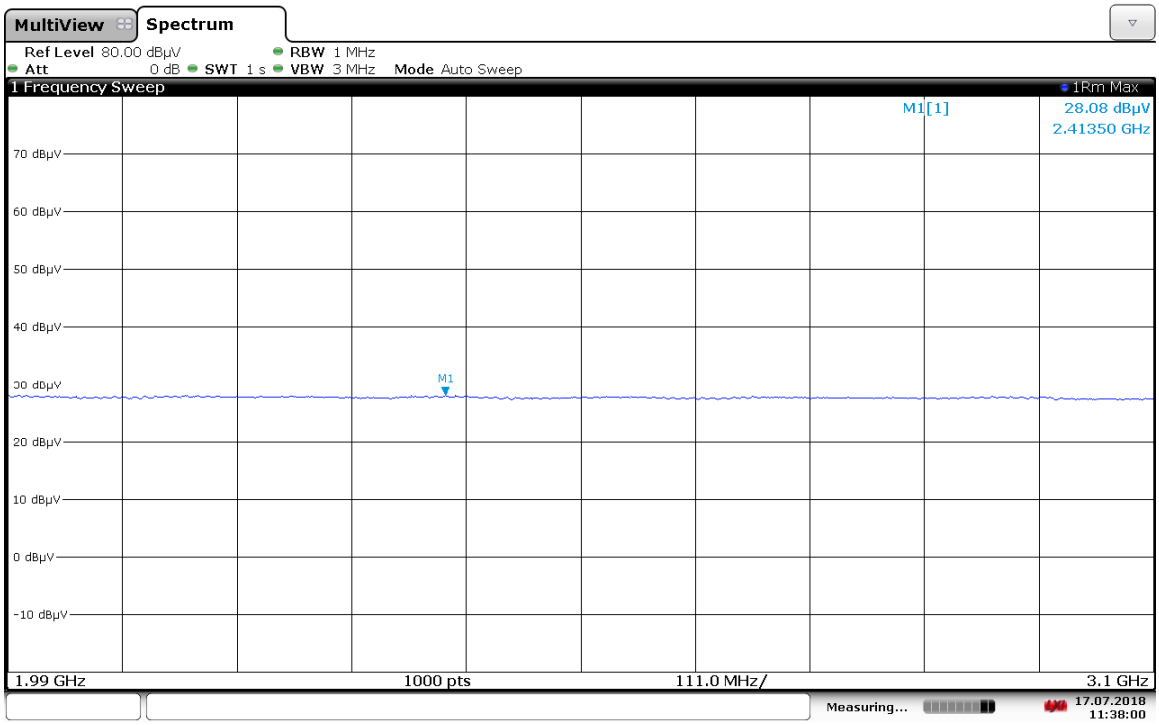

Figure 7.6.1.3-3: 1.99 GHz – 3.1 GHz

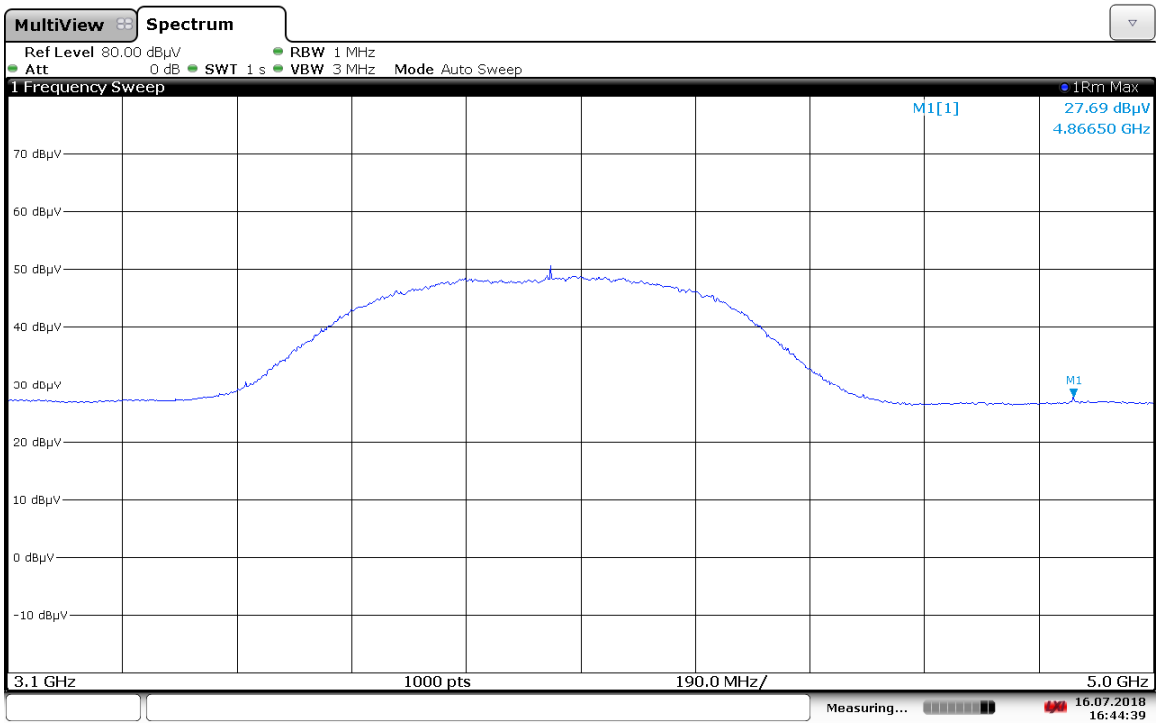

Figure 7.6.1.3-4: 3.1 GHz – 5 GHz

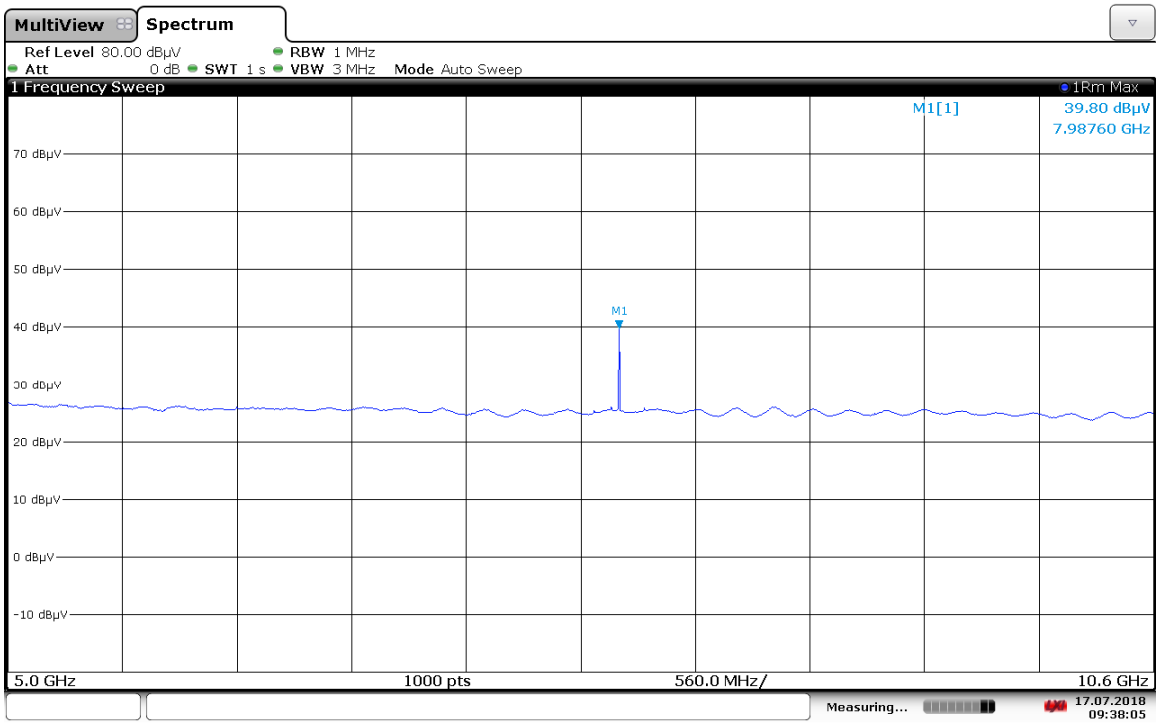

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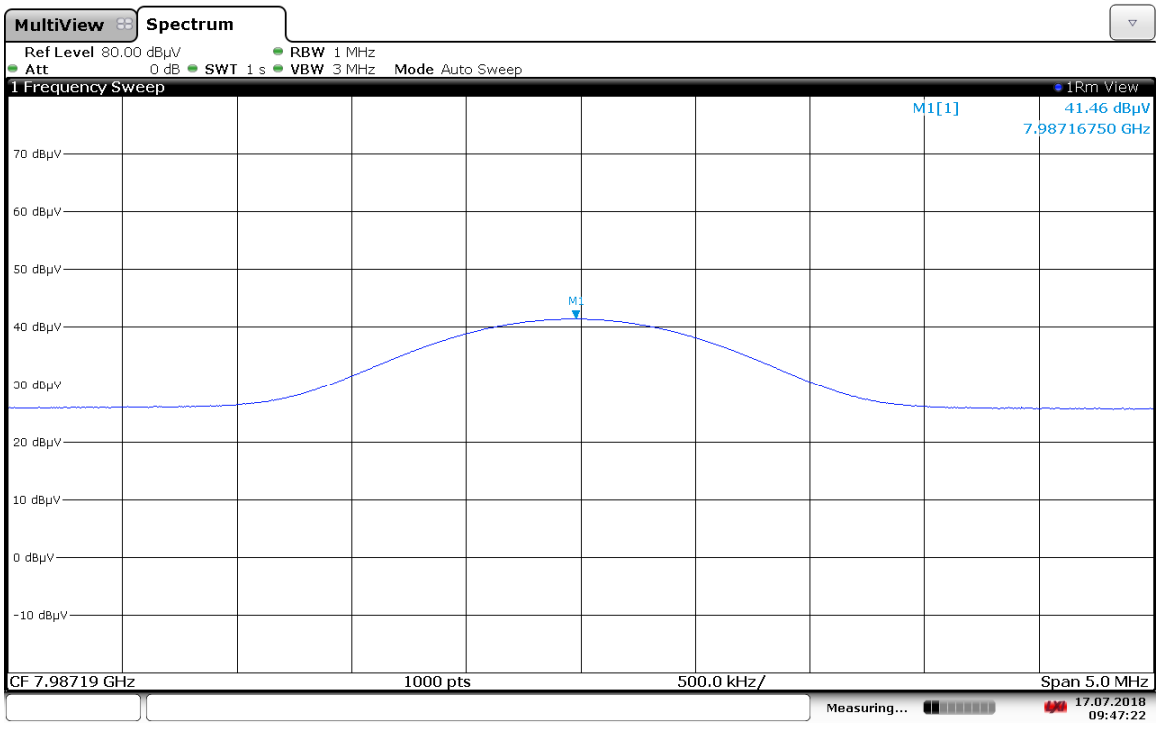
Figure 7.6.1.3-5: 5 GHz – 10.6 GHz



09:47:22 17.07.2018

Figure 7.6.1.3-6: Spurious Emissions - 7987 MHz

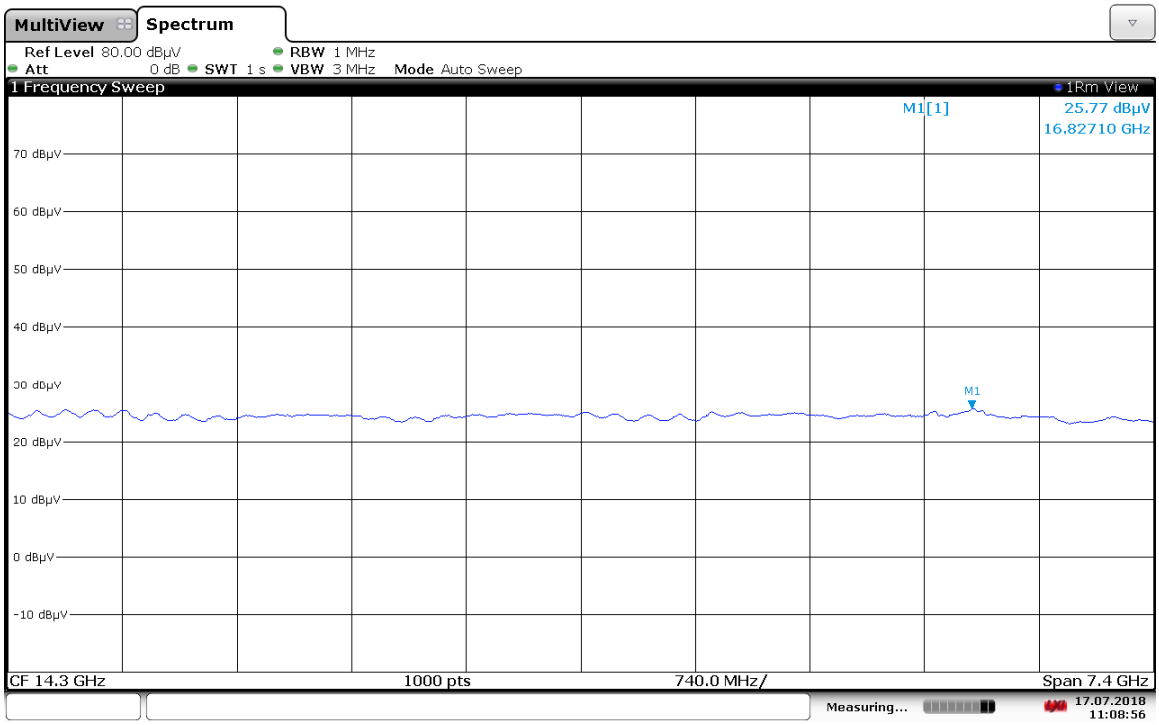


Figure 7.6.1.3-7: 10.6 GHz – 18 GHz

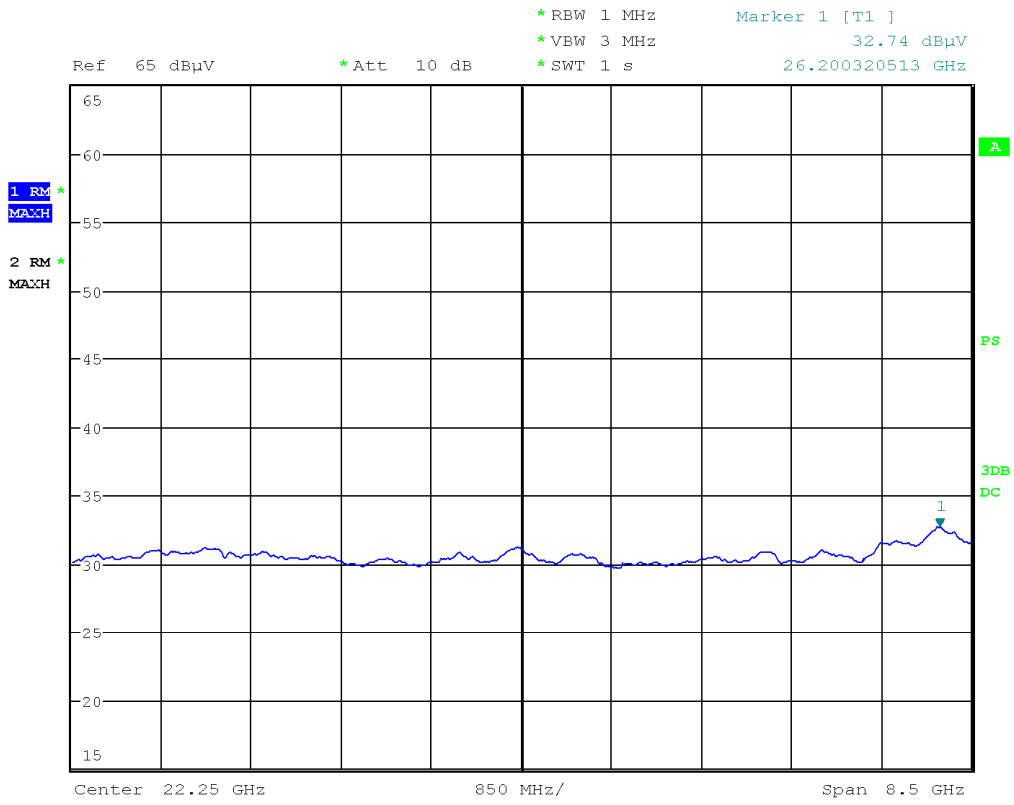


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Figure 7.6.1.3-8: 18 GHz – 26.5 GHz

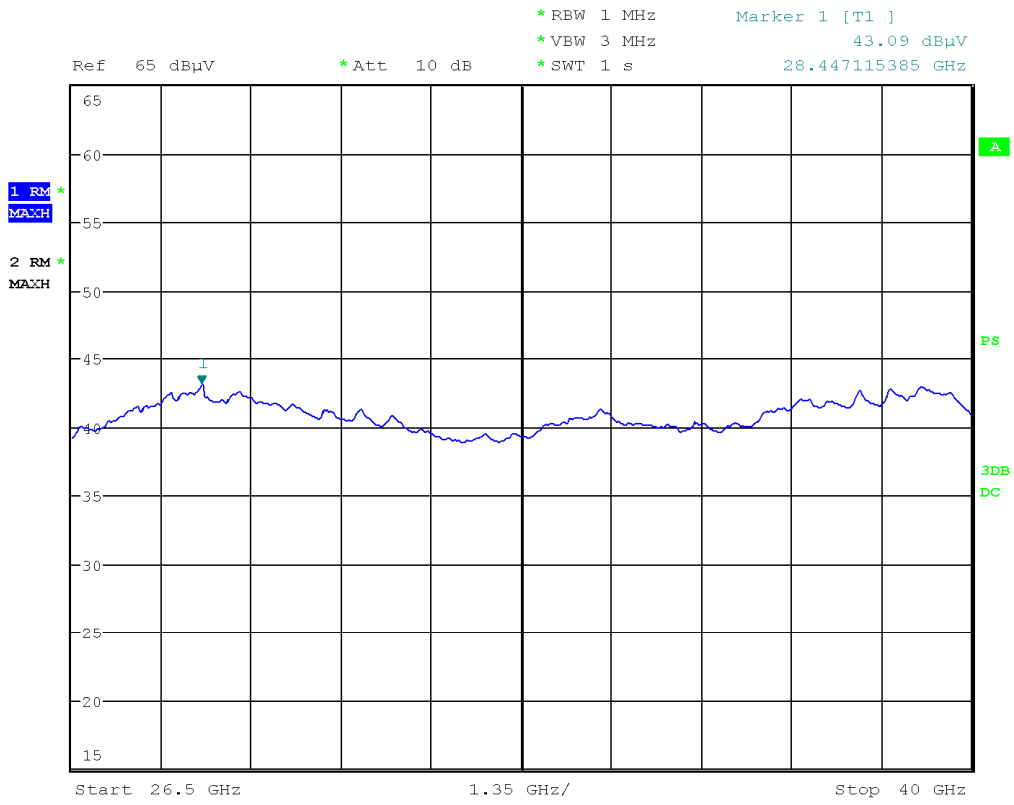

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Figure 7.6.1.3-9: 26.5 GHz – 40 GHz

7.6.2 Emissions into Frequency Bands below 960 MHz FCC 15.209

7.6.2.1 Measurement Procedure

The unwanted emissions from the lowest frequency generated or 9 kHz to 960 MHz in accordance with ANSI 63.10: 2013 Section 10.2. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 100 kHz. The Video Bandwidth (VBW) was set to ≥ 100 kHz. The trace was set to max hold with a Q-P detector active.

The correction factor is a combination of coax cable loss, preamp gain, antenna factor, and a distance correction factor (if needed).

Table 7.6.2.1-1 Limits from 15.109:

Emission Type	Frequency Range (MHz)	Voltage limits (dBµV/m)
Radiated Class B @ 3 meters	0.009 to 0.490	20log(2400/F(kHz)) @300m
	0.490 to 1.705	20log(24000/F(kHz)) @30m
	30.0 to 88.0	40.0
	88.0 to 216.0	43.5
	216.0 to 960.0	46.0

7.6.2.2 Measurement Results

Measurement Performed By: Charles Callis

Table 7.6.2.1-2 Emissions below 960 MHz

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
30.40		17.10	V	14.19	---------	31.29	--------	40.00	---------	8.71
36.05		21.40	V	12.63	---------	34.03	--------	40.00	---------	5.97
42.60		14.60	V	11.18	---------	25.78	--------	40.00	---------	14.22
83.90		4.90	V	9.88	---------	14.78	--------	40.00	---------	25.22
264.10		1.50	H	13.99	---------	15.49	--------	46.00	---------	30.51
673.10		-0.60	H	22.14	---------	21.54	--------	46.00	---------	24.46

7.6.3 Radiated Emissions in the GPS bands FCC 15.517(d)

7.6.3.1 Measurement Procedure

Unwanted emissions in the above bands were measured radiated in accordance with ANSI 63.10: 2013 Section 10.3.10 and 10.3.7 and the FCC rules. The resolution bandwidth (RBW) of the spectrum analyzer was set to 30 kHz with the minimum allowed being 1 kHz. The ratio of the RBW to Video Bandwidth (VBW) was set to ≥ 3 where possible. The trace was set to max hold with a RMS detector active. The sweep time did not exceed 1ms per bin. For the 1000 bins used, a 1000 ms sweep time was used.

7.6.3.2 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)+DCF
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DCF	=	Distance Correction Factor

Example Calculation: RMS
Corrected Level: 15.3 + -7.28 = 8.02dBµV/m
Limit Conversion to dBµV/m: EIRP (dBm) + 95.3 = dBµV/m

The frequency bands to be investigated and the associated limits are:

Table 7.6.3.1-1 Frequency Bands

Frequency MHz	EIRP dBm	Field Strength @3m dBµV/m
1164 to 1240	-85.3	10
1559 to 1610	-85.3	10

7.6.3.3 Measurement Results:

Measurement Performed By: Jean Tezil

Emission Frequency MHz	Reading From plot dBµV	Antenna Polarity	Measurement Distance m	Correction Factors dB/m	Field Strength dBµV/m	Limit dBµV/m @3m
1223.13	15.3	H	3	-7.28	8.02	10
1598.74	14.99	H	3	-6.71	8.28	10

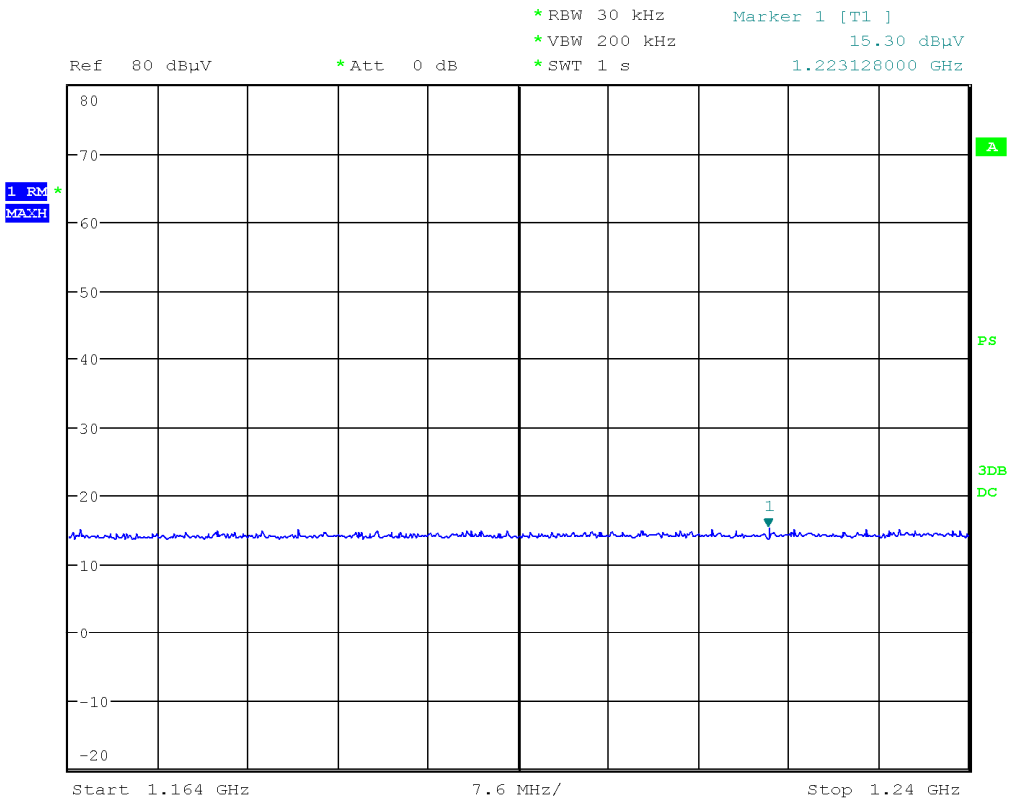

Figure 7.6.3.2-1: 1.164 GHz – 1.24 GHz

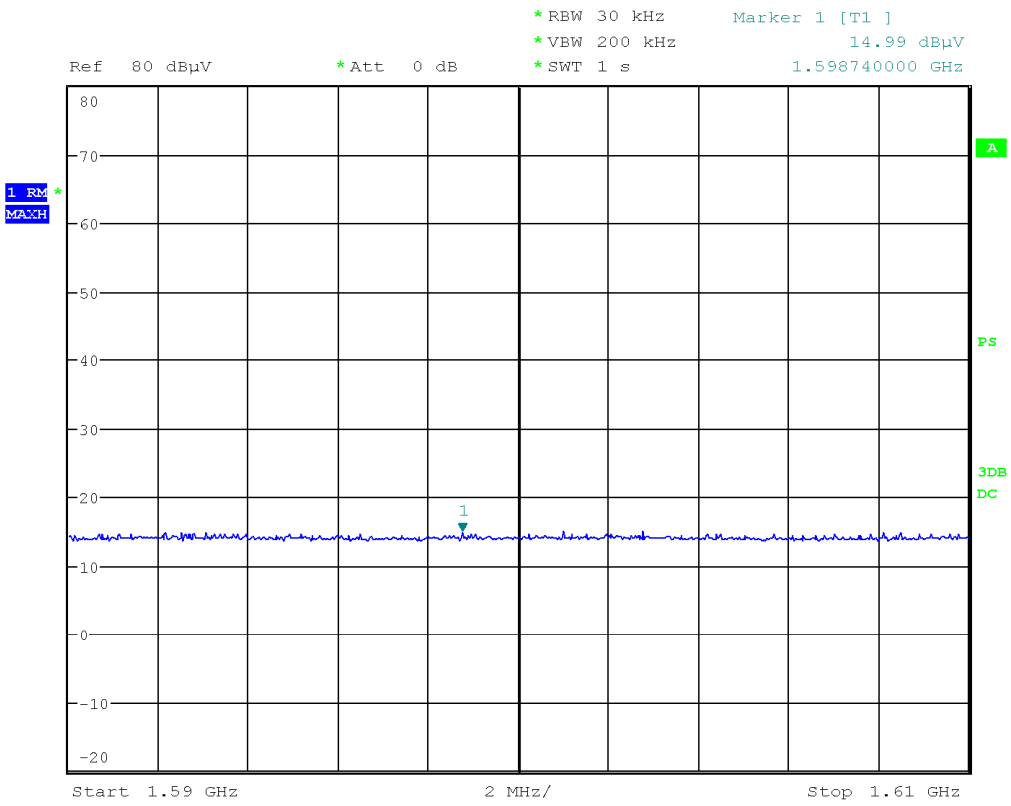

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Figure 7.6.3.2-2: 1.559 GHz – 1.610 GHz

8 MEASUREMENT UNCERTAINTY

The expanded laboratory measurement uncertainty figures (U_{Lab}) provided below correspond to an expansion factor (coverage factor) k = 1.96 which provide confidence levels of 95%.

Parameter	U_{lab}
Occupied Channel Bandwidth	± 0.004%
RF Conducted Output Power	± 0.689 dB
Power Spectral Density	±0.5 dB
Antenna Port Conducted Emissions	± 2.717 dB
Radiated Emissions	± 5.877 dB
Temperature	± 0.860 ℃
Radio Frequency	±2.832 x 10-8
AC Power Line Conducted Emissions	±2.85 dB

9 CONCLUSION

In the opinion of TÜV SÜD America Inc. The AR303, manufactured by IntraPosition meets the requirements of FCC Part 15 subpart F.

END REPORT