

Limited Radio Testing of the
Privoro LLC
Model: M0003 SafeCase
In accordance with

FCC Part 15 Subpart C §15.247 RSS-247 Issue 2 February 2017

* Radiated Spurious Emissions only

Privoro LLC
3100 W. Ray Road, #201
Chandler, AZ 85226
USA



Product Service

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Date: March 2020

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Authorized Signatory	Ferdinand S. Custodio	March 30, 2020	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

EXECUTIVE SUMMARY

Test reports and supporting documents of this product was reviewed and the EUT in general was confirmed to be in compliance with FCC Part 15 Subpart C §15.247 and RSS-247 Issue 2 February 2017.



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REPORT ON Limited Radio Testing of the
Privoro LLC
M0003 SafeCase

TEST REPORT NUMBER 72155702A

REPORT DATE March 2020

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Revision History

72155702A Privoro LLC M0003 SafeCase					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
03/30/2020	—	Initial Release			Ferdinand S. Custodio

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SECTION 1

REPORT SUMMARY

Radio Testing of the
Privoro LLC
M0003 SafeCase



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Privoro LLC M0003 SafeCase to the requirements of FCC Part 15 Subpart C §15.247 and RSS-247 Issue 2 February 2017.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Privoro LLC
Model Name	SafeCase
Model Number(s)	M0003
EUT	SafeCase
FCC ID	2APWUPM03SC
IC ID	23953-PM03SC
FCC Classification	Low power Communications Device Transmitter (DTS)
Serial Number(s)	Sample 1
Number of Samples Tested	1
Test Specification/Issue/Date	• FCC Part 15 Subpart C §15.247 (October 1, 2019) • RSS-247 – Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices (issue 2, February 2017) • RSS-Gen - General Requirements for Compliance of Radio Apparatus (Issue 5, March 2019 Amendment 1)
Start of Test	March 13, 2020
Finish of Test	March 16, 2020
Name of Engineer(s)	Xiaoying Zhang
Related Document(s)	• ANSI C63.10-2013. American National Standard of Procedures for Compliance testing of Unlicensed Wireless Devices. • KDB 558074 D01 15.247 v05r02 Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under Section 15.247 of the FCC rules.



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart C §15.247 and RSS-247 Issue 2 February 2017 and client's test plan is shown below:

Section	FCC Part 15	RSS	Test Description	Result
2.1	§15.247(d)	RSS-247 5.5	Radiated Spurious Emissions	Compliant
2.2	§15.247(d)	RSS-247 5.5	Radiated Immediate Restricted Bands	Compliant



1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Privoro LLC M0003 SafeCase. The EUT is an iPhone case that serves several functions, all targeted toward user security and privacy: (1) video protection: a hood on the SafeCase covers the iPhone camera; (2) audio protections: small speakers drive noise into the iPhone microphones to prevent eavesdropping; (3) secure wireless communications (Bluetooth Low Energy); (4) accelerometer and Gyroscope and magnetometer; (5) GPS; (6) RF power detector. Bluetooth LE was verified in this test report.

1.3.2 EUT General Description

EUT Description	SafeCase
Model Name	SafeCase
Model Number(s)	M0003
Rated Voltage	Battery Operated 3.7V 900 mAh Lithium Ion
Mode Verified	BT LE V5.0
Frequency Bands	2402 – 2483.5 MHz
Capability	BT LE V5.0
Primary Unit (EUT)	☒ Production ☐ Pre-Production ☐ Engineering
Manufacturer Declared Voltage Range	100-240VAC 50-60Hz 0.15A (via external AC/DC adaptor)
Manufacturer Declared Temperature Range	N/A
Antenna Type	Ceramic Chip
Manufacturer	-
Antenna Model	-
Antenna Gain	

Radio	Gain
BT LE	Max. 1 dBi

1.3.3 Transmit Frequency Table

Mode	Tx Frequency (MHz)	EIRP Output Power (dBm)	EIRP (W)
Bluetooth LE	2402 - 2480	N/A	N/A

* Limited testing only according to client's test plan.

1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
Default	Radiated test setup. EUT is connected to a Raspberry Pi mini PC via UART cable and controlled to transmit in different BT LE channels.

1.4.2 EUT Exercise Software

Manufacturer provided a mini PC running Putty to set up BT LE channel.

1.4.3 Support Equipments and I/O cables

Manufacturer	Equipment/Cable	Description
Apple	AD/DC Adaptor	M/N: A1385
Privoro	USB Cable	USB Type A to USB Micro B
-	Mini PC	Raspberry Pi mini PC with USB, HDMI connectors to connect to mouse, keyboard and monitor.
CanaKit	AD/DC Adaptor for Mini PC	M/N: DCAR-052A5 IP: 100 – 240V AC, 50 – 60 Hz / 0.5A, OP: 5V DC, 2.5A
IBM	Mouse	M/N: MO28UO S/N: 23-326810
Dell	Keyboard	M/N: L100 S/N: CN0NY4147357185G03GS
Panasonic	HDMI Cable	HDMI to HDMI
PLANAR	Monitor	M/N: PXN2470MW, S/N: PL848NS500105

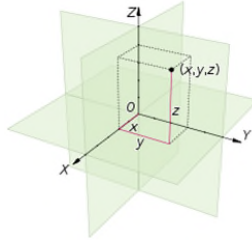
1.4.4 Worst Case Configuration

Bluetooth LE Low, Middle and High channels are verified:

Mode	Channel No.	Frequency	Data Rate
Bluetooth LE	37 (Low)	2402 MHz	2 Mbps
	40 (Middle)	2440 MHz	
	39 (High)	2480 MHz	

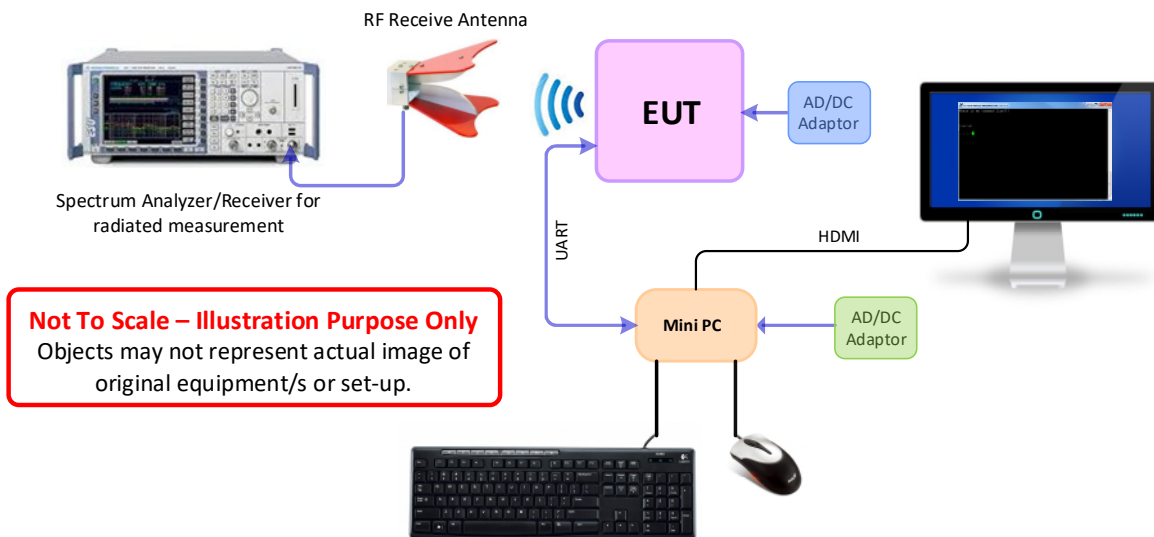
Low, Middle and high channel number were set to 2, 40 and 80 using the control software according to client's test instruction.

Final installation position is unknown at the time of verification. For radiated measurements X, Y and Z orientations were verified. No major variation in emissions observed between the three orientations. Verifications performed using "X" configuration.



1.4.5 Simplified Test Configuration Diagram

Radiated Test Configuration





1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number: Sample 1		
None	-	-

The table above details modifications made to the EUT during the test program. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

For conducted and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.10-2013. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.8 TEST FACILITY LOCATION

1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: (858) 678 1400 Fax: (858) 546 0364.

1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

16936 Via Del Campo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: (858) 678 1400 Fax: (858) 546 0364.

1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Designation No.: US1146

TÜV SÜD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Designation is US1146.



1.9.2 Innovation, Science and Economic Development Canada (IC) Registration No.: 3067A-1 & 22806-1

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego Rancho Bernardo) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 3067A-1.

The 3m Semi-anechoic chamber of TUV SUD America Inc. (San Diego Mira Mesa) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 22806-1.

1.9.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TUV Product Service Inc. (San Diego) is a recognized EMC testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

1.9.4 NCC (National Communications Commission - US0102)

TUV SUD America Inc. (San Diego) is listed as a Foreign Recognized Telecommunication Equipment Testing Laboratory and is accredited to ISO/IEC 17025 (A2LA Certificate No.2955.13) which under APEC TEL MRA Phase 1 was designated as a Conformity Assessment Body competent to perform testing of equipment subject to the Technical Regulations covered under its scope of accreditation including RTTE01, PLMN01 and PLMN08 for TTE type of testing and LP002 for Low-Power RF Device type of testing.

1.9.5 VCCI – Registration No. A-0280 and A-0281

TUV SUD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

1.9.6 RRA – Identification No. US0102

TUV SUD America Inc. (San Diego) is National Radio Research Agency (RRA) recognized laboratory under Phase I of the APEC Tel MRA.

1.9.7 OFCA – U.S. Identification No. US0102

TUV SUD America Inc. (San Diego) is recognized by Office of the Communications Authority (OFCA) under Appendix B, Phase I of the APEC Tel MRA.



SECTION 2

TEST DETAILS

Radio Test of the
Privoro LLC
M0003 SafeCase



2.1 RADIATED SPURIOUS EMISSIONS

2.1.1 Specification Reference

FCC 47 CFR Part 15, Clause 15.247(d)
RSS-247, Clause 5.5

2.1.2 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

2.1.3 Equipment Under Test and Modification State

Serial No: Sample 1 / Default Test Configuration

2.1.4 Date of Test/Initial of test personnel who performed the test

March 13, 2020 / XYZ

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	22.9°C
Relative Humidity	50.0%
ATM Pressure	98.8kPa

2.1.7 Additional Observations

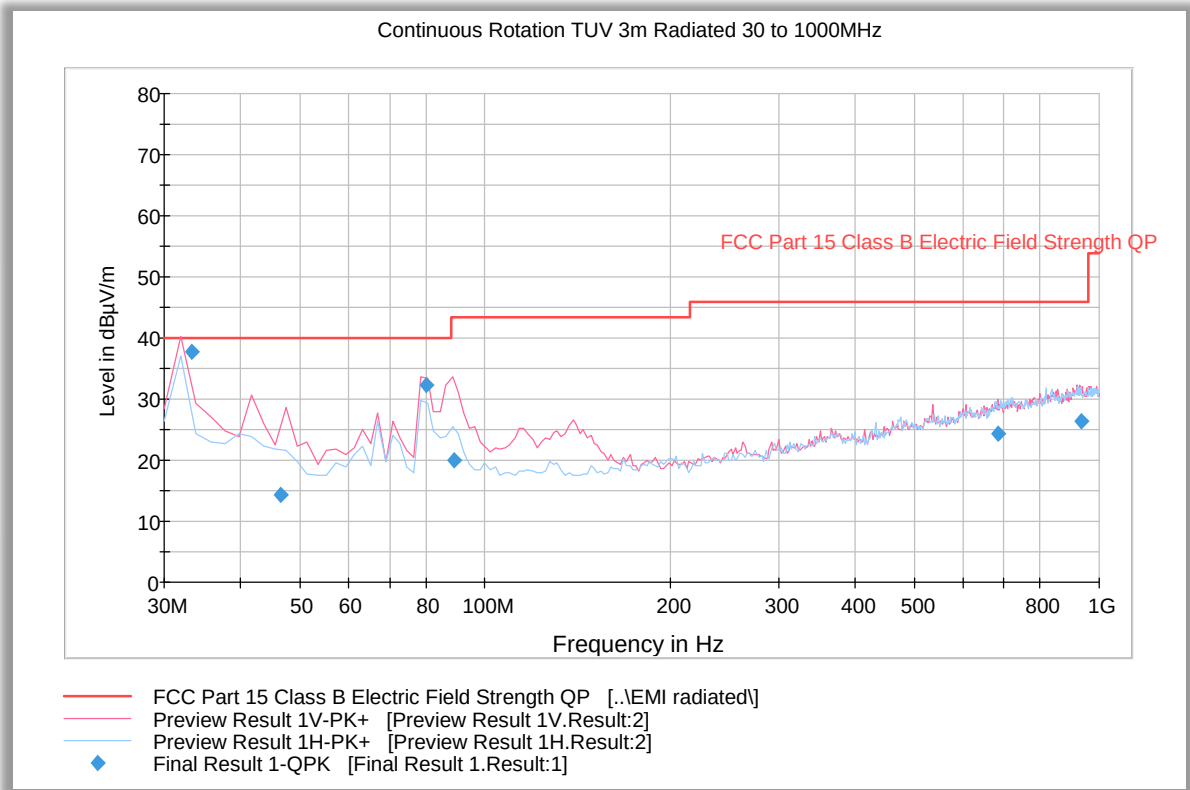
- This is a radiated test. The spectrum was searched from 30MHz to the 10th harmonic.
- There are no emissions found that do not comply to the restricted bands defined in FCC Part 15 Subpart C, 15.205 or Part 15.247(d).
- Low, Middle and High channels are verified and presented. There are no significant differences in emissions between all channels.
- Only noise floor measurements observed above 18GHz.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.1.8 for sample computation.



2.1.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dbμV) @ 30 MHz			24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3	-12.6
	Asset# 1172 (cable)	0.3	
	Asset# 1016 (preamplifier)	-30.7	
	Asset# 1175(cable)	0.3	
	Asset# 1002 (antenna)	17.2	
Reported QuasiPeak Final Measurement (dbμV/m) @ 30MHz			11.8

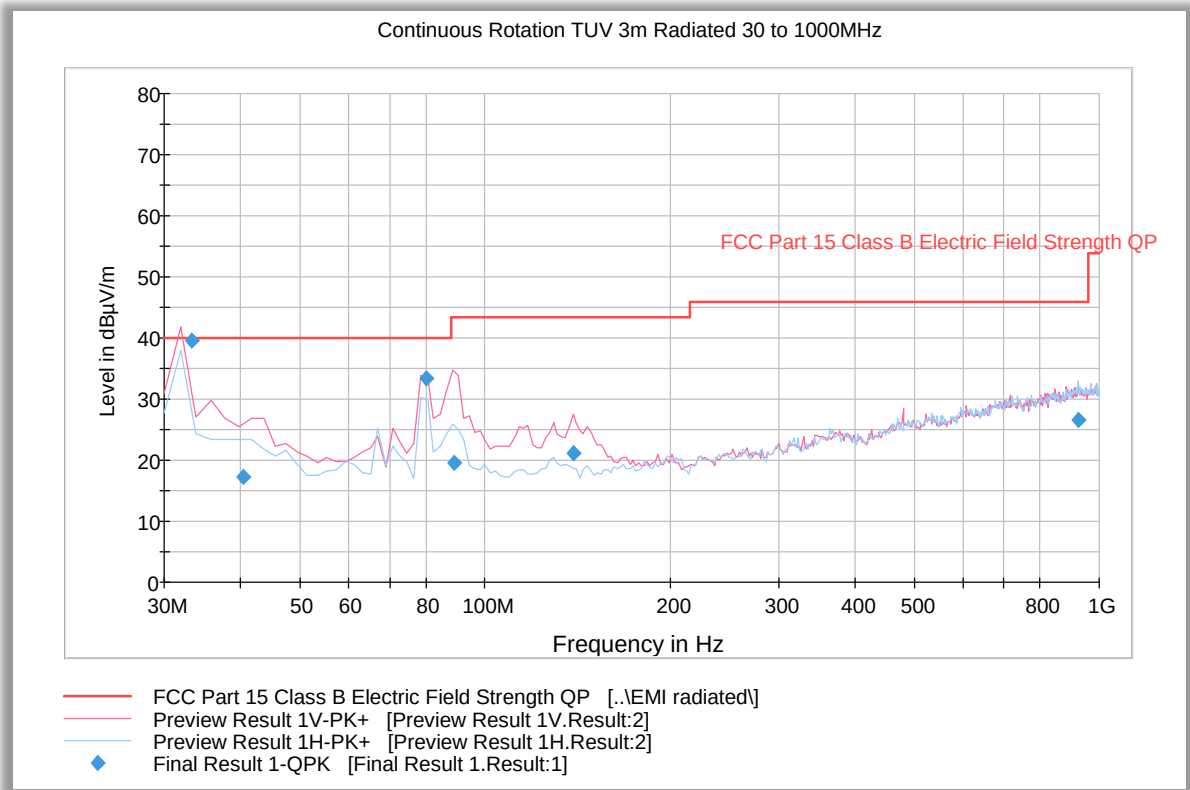
2.1.9 Test Results Below 1GHz - Low Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.280000	37.7	1000.0	120.000	100.0	V	78.0	-9.9	2.3	40.0
46.534990	14.2	1000.0	120.000	176.0	V	41.0	-14.0	25.8	40.0
79.997194	32.3	1000.0	120.000	110.0	V	40.0	-16.8	7.7	40.0
89.156633	20.0	1000.0	120.000	100.0	V	1.0	-15.0	23.5	43.5
685.730180	24.2	1000.0	120.000	139.0	V	74.0	2.3	21.8	46.0
934.083928	26.4	1000.0	120.000	350.0	V	27.0	5.9	19.6	46.0

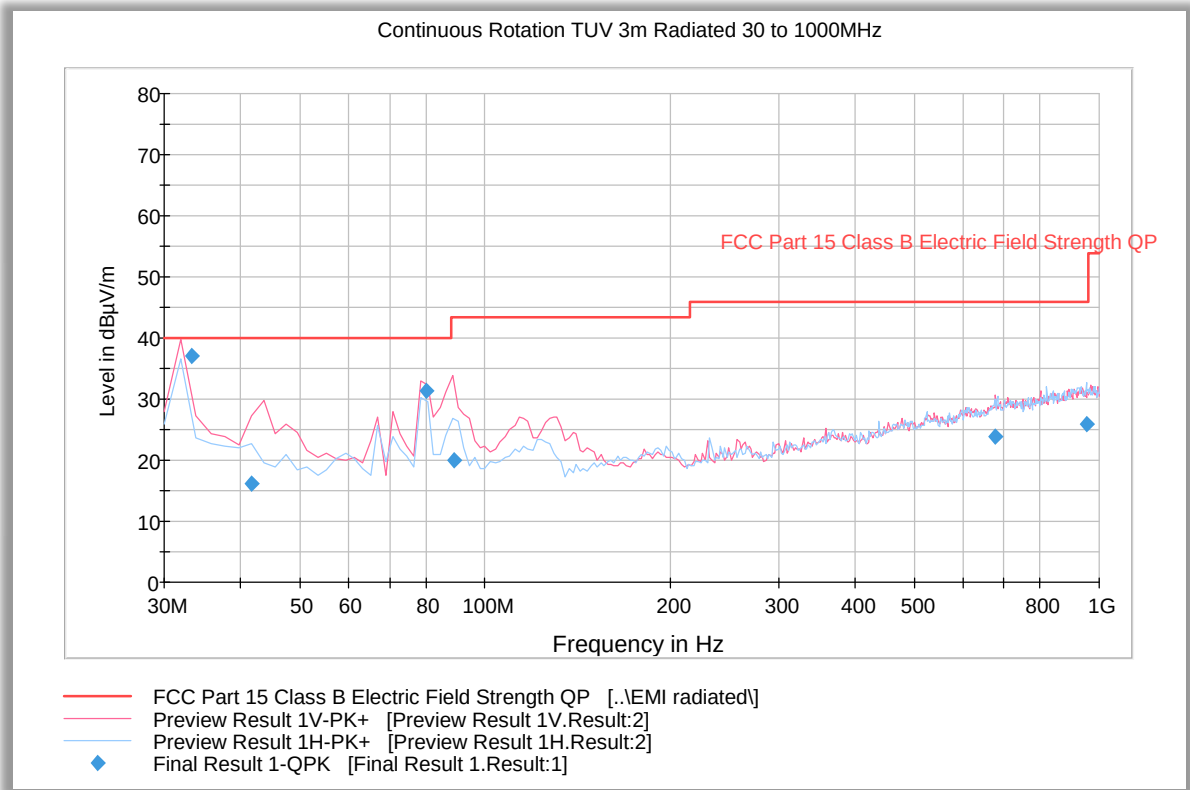
2.1.10 Test Results Below 1GHz - Middle Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.280000	39.6	1000.0	120.000	100.0	V	279.0	-9.9	0.4	40.0
40.327214	17.3	1000.0	120.000	116.0	V	118.0	-13.3	22.7	40.0
79.997194	33.4	1000.0	120.000	109.0	V	141.0	-16.8	6.6	40.0
88.996633	19.7	1000.0	120.000	100.0	V	2.0	-15.0	23.8	43.5
139.217715	21.2	1000.0	120.000	100.0	V	297.0	-14.1	22.3	43.5
924.908377	26.5	1000.0	120.000	250.0	H	136.0	5.9	19.5	46.0

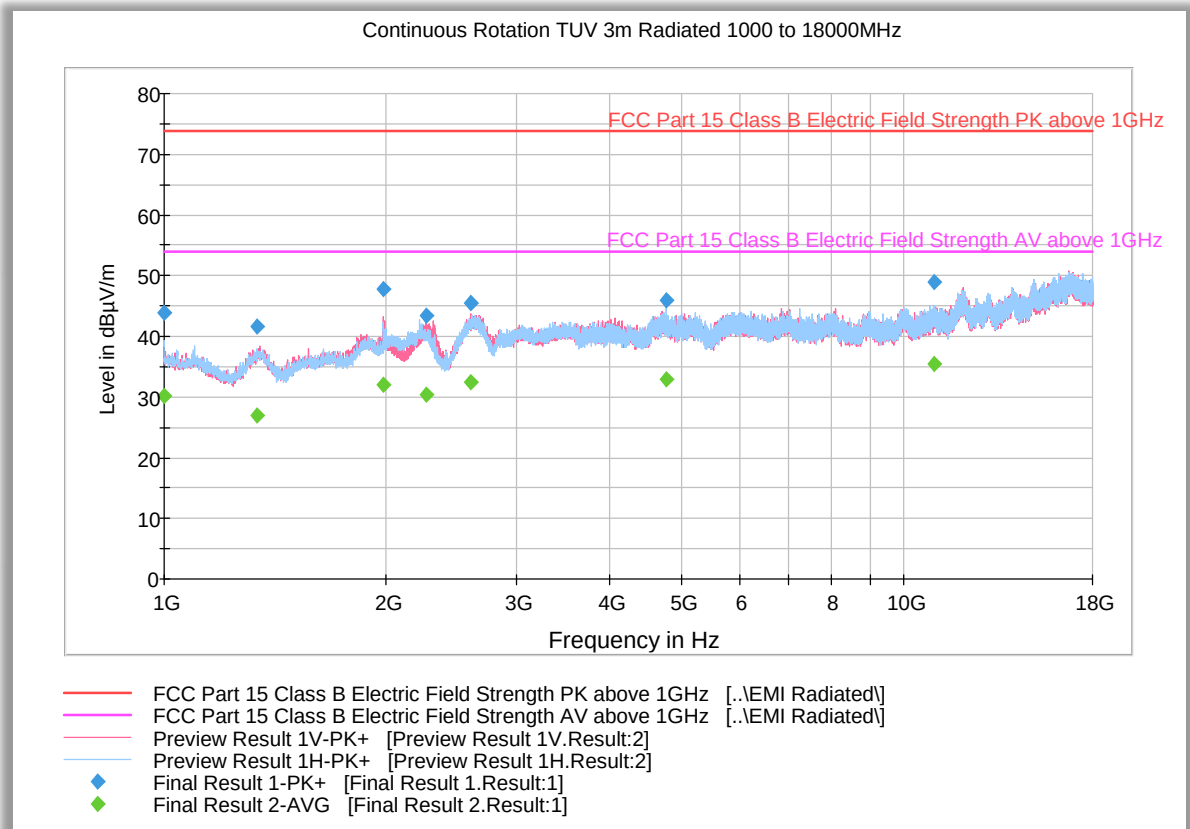
2.1.11 Test Results Below 1GHz - High Channel



Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.280000	37.1	1000.0	120.000	127.0	V	338.0	-9.9	2.9	40.0
41.607214	16.2	1000.0	120.000	100.0	V	107.0	-13.4	23.8	40.0
79.997194	31.4	1000.0	120.000	109.0	V	92.0	-16.8	8.6	40.0
89.036633	19.9	1000.0	120.000	109.0	V	1.0	-15.0	23.6	43.5
675.634629	23.8	1000.0	120.000	394.0	V	133.0	2.3	22.2	46.0
953.946693	25.9	1000.0	120.000	202.0	H	141.0	5.6	20.1	46.0

2.1.12 Test Results Above 1GHz - Low Channel



Peak Data

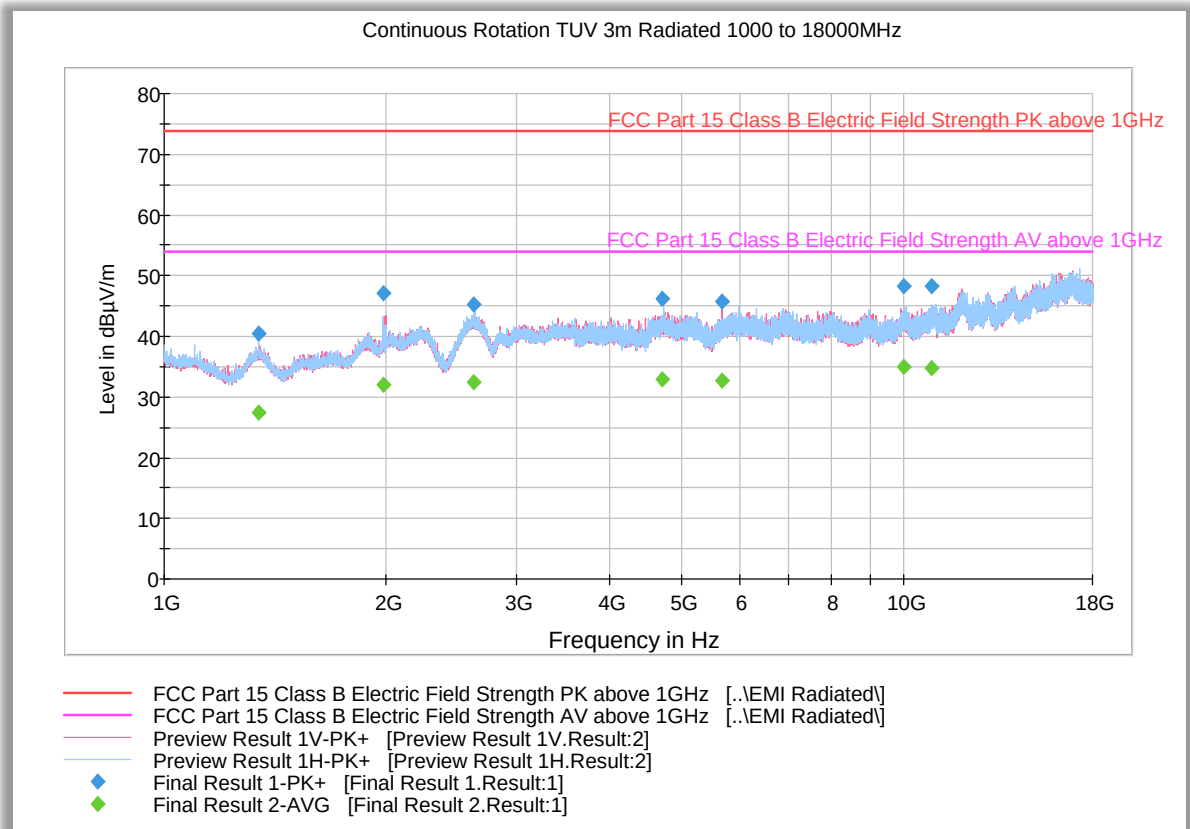
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1000.00000	43.9	1000.0	1000.000	269.3	H	263.0	-7.2	30.0	73.9
1333.76666	41.6	1000.0	1000.000	146.7	V	255.0	-5.4	32.3	73.9
1976.16666	47.7	1000.0	1000.000	406.7	V	-7.0	-2.1	26.2	73.9
2267.30000	43.5	1000.0	1000.000	162.7	V	80.0	-0.8	30.4	73.9
2596.10000	45.5	1000.0	1000.000	139.7	V	161.0	0.4	28.4	73.9
4785.33333	45.9	1000.0	1000.000	251.5	H	11.0	4.9	28.0	73.9
10996.9666	48.9	1000.0	1000.000	139.7	H	281.0	11.3	25.0	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1000.00000	30.1	1000.0	1000.000	269.3	H	263.0	-7.2	23.8	53.9
1333.76666	27.1	1000.0	1000.000	146.7	V	255.0	-5.4	26.8	53.9
1976.16666	32.1	1000.0	1000.000	406.7	V	-7.0	-2.1	21.8	53.9
2267.30000	30.5	1000.0	1000.000	162.7	V	80.0	-0.8	23.4	53.9
2596.10000	32.4	1000.0	1000.000	139.7	V	161.0	0.4	21.5	53.9
4785.33333	32.9	1000.0	1000.000	251.5	H	11.0	4.9	21.0	53.9
10996.9666	35.5	1000.0	1000.000	139.7	H	281.0	11.3	18.4	53.9

Note: Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 18GHz. Measurements above 18GHz are noise floor figures

2.1.13 Test Results Above 1GHz - Middle Channel



Peak Data

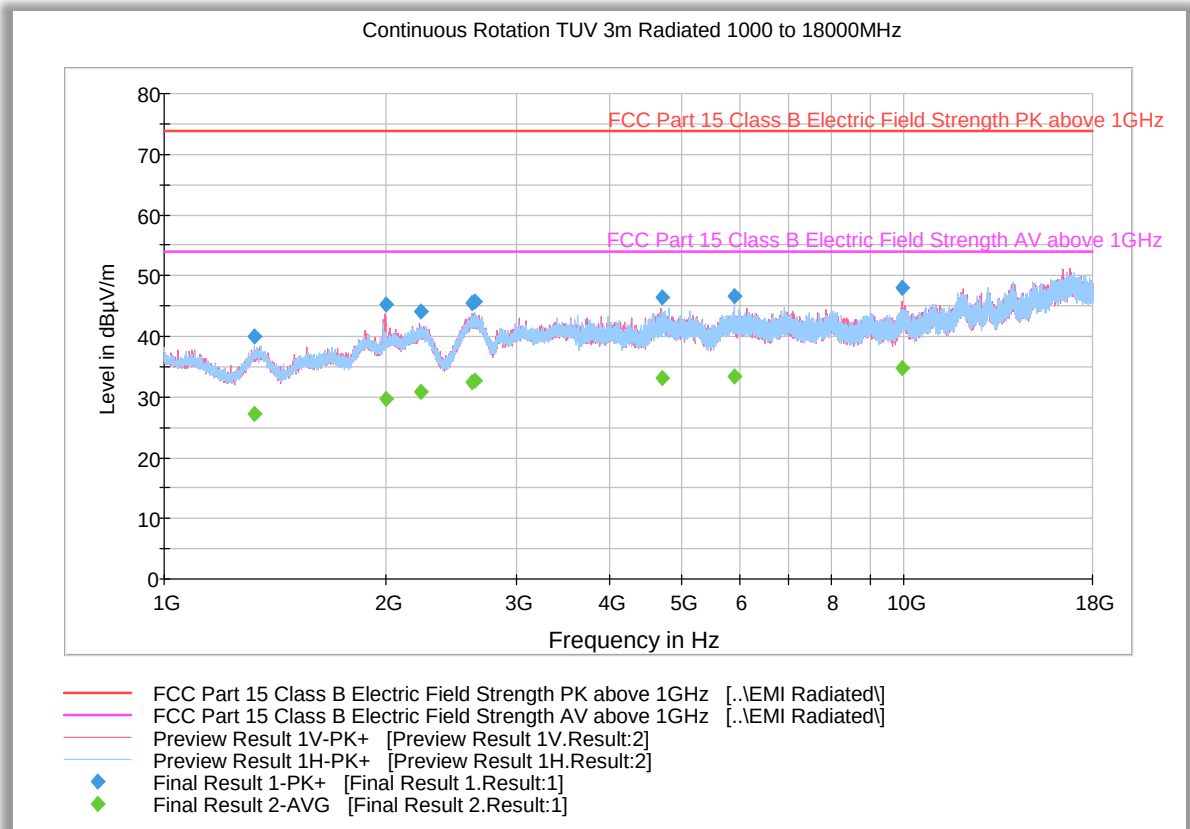
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1340.53333	40.5	1000.0	1000.000	389.1	H	112.0	-5.4	33.4	73.9
1976.20000	47.1	1000.0	1000.000	219.4	V	20.0	-2.1	26.8	73.9
2617.06666	45.4	1000.0	1000.000	152.6	H	83.0	0.4	28.5	73.9
4712.20000	46.2	1000.0	1000.000	152.2	V	293.0	4.8	27.7	73.9
5677.86666	45.7	1000.0	1000.000	406.7	V	16.0	6.0	28.2	73.9
10020.0000	48.3	1000.0	1000.000	103.7	H	70.0	10.0	25.6	73.9
10898.9333	48.3	1000.0	1000.000	188.5	H	12.0	11.2	25.6	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1340.53333	27.4	1000.0	1000.000	389.1	H	112.0	-5.4	26.5	53.9
1976.20000	32.0	1000.0	1000.000	219.4	V	20.0	-2.1	21.9	53.9
2617.06666	32.4	1000.0	1000.000	152.6	H	83.0	0.4	21.5	53.9
4712.20000	33.0	1000.0	1000.000	152.2	V	293.0	4.8	20.9	53.9
5677.86666	32.7	1000.0	1000.000	406.7	V	16.0	6.0	21.2	53.9
10020.0000	34.9	1000.0	1000.000	103.7	H	70.0	10.0	19.0	53.9
10898.9333	34.8	1000.0	1000.000	188.5	H	12.0	11.2	19.1	53.9

Note: Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 18GHz. Measurements above 18GHz are noise floor figures.

2.1.14 Test Results Below 1GHz - High Channel



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1325.83333	39.9	1000.0	1000.000	325.1	H	190.0	-5.5	34.0	73.9
1993.93333	45.3	1000.0	1000.000	227.4	V	-1.0	-2.0	28.6	73.9
2225.26666	44.1	1000.0	1000.000	265.3	V	16.0	-1.1	29.8	73.9
2608.56666	45.4	1000.0	1000.000	406.7	V	69.0	0.4	28.5	73.9
2637.53333	45.7	1000.0	1000.000	225.4	H	312.0	0.5	28.2	73.9
4707.10000	46.4	1000.0	1000.000	327.2	H	164.0	4.8	27.5	73.9
5899.36666	46.7	1000.0	1000.000	244.4	H	251.0	6.3	27.2	73.9
9938.23333	48.1	1000.0	1000.000	406.7	V	47.0	9.7	25.8	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1325.83333	27.1	1000.0	1000.000	325.1	H	190.0	-5.5	26.8	53.9
1993.93333	29.6	1000.0	1000.000	227.4	V	-1.0	-2.0	24.3	53.9
2225.26666	30.9	1000.0	1000.000	265.3	V	16.0	-1.1	23.0	53.9
2608.56666	32.6	1000.0	1000.000	406.7	V	69.0	0.4	21.3	53.9
2637.53333	32.6	1000.0	1000.000	225.4	H	312.0	0.5	21.3	53.9
4707.10000	33.1	1000.0	1000.000	327.2	H	164.0	4.8	20.8	53.9
5899.36666	33.4	1000.0	1000.000	244.4	H	251.0	6.3	20.5	53.9
9938.23333	34.7	1000.0	1000.000	406.7	V	47.0	9.7	19.2	53.9

Note: Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 18GHz. Measurements above 18GHz are noise floor figures



2.2 RADIATED IMMEDIATE RESTRICTED BANDS

2.2.1 Specification Reference

FCC 47 CFR Part 15, Clause 15.247(d)
RSS-247, Clause 5.5

2.2.2 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

2.2.3 Equipment Under Test and Modification State

Serial No: Sample 1 / Default Test Configuration

2.2.4 Date of Test/Initial of test personnel who performed the test

March 16, 2020 / XYZ

2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.7°C
Relative Humidity	43.5%
ATM Pressure	99.0kPa

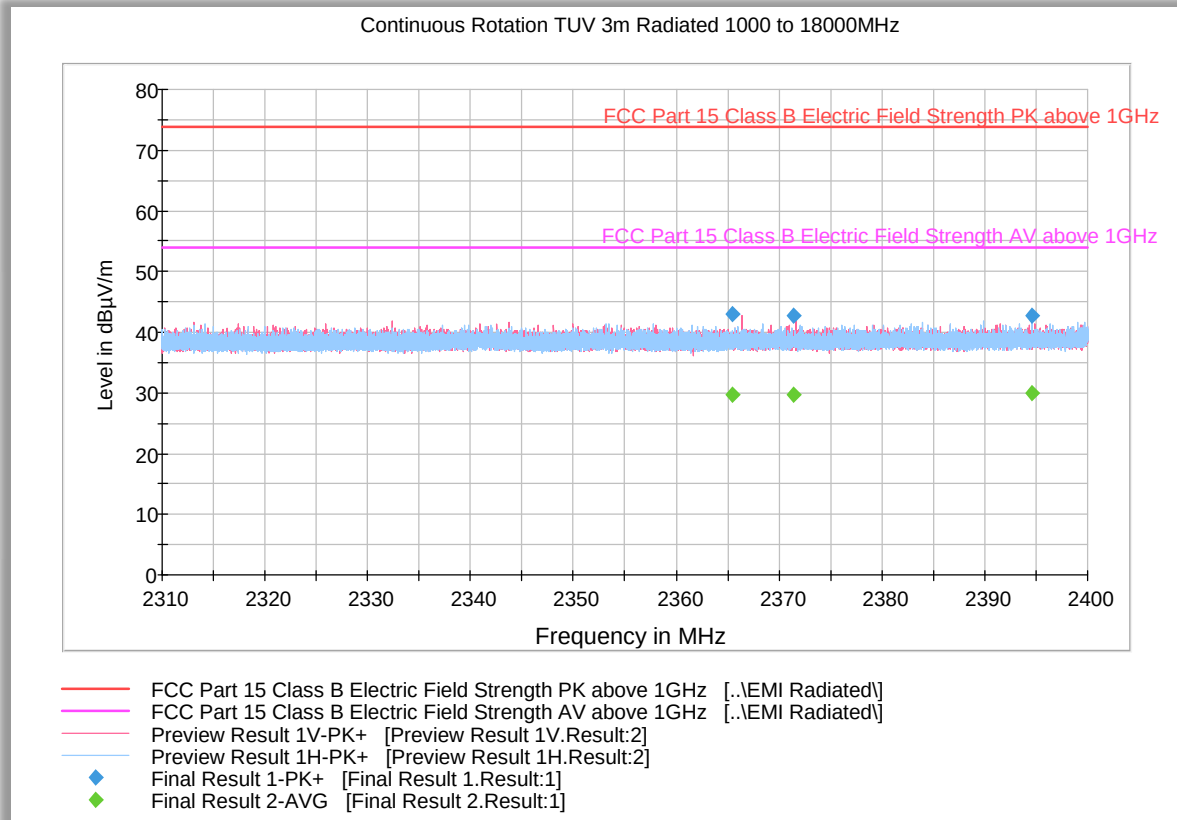
2.2.7 Additional Observations

- This is a radiated test. The spectrum was searched from 2310MHz to 2390MHz for lower immediate restricted band and 2483.5MHz to 2500MHz for the upper immediate restricted band.
- There are no emissions found that do not comply with the restricted bands defined in FCC Part 15 Subpart C, 15.205.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.2.8 for sample computation.

2.2.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dB μ V) @ 2400 MHz			53.9
Correction Factor (dB)	Asset# 1153 (cable)	3.4	-0.4
	Asset# 8628(preamplifier)	-36.5	
	Asset#7575 (antenna)	32.7	
Reported Max Peak Final Measurement (dB μ V/m) @ 2400 MHz			53.5

2.2.9 Test Results Restricted Band 2310MHz to 2400MHz



Peak Data

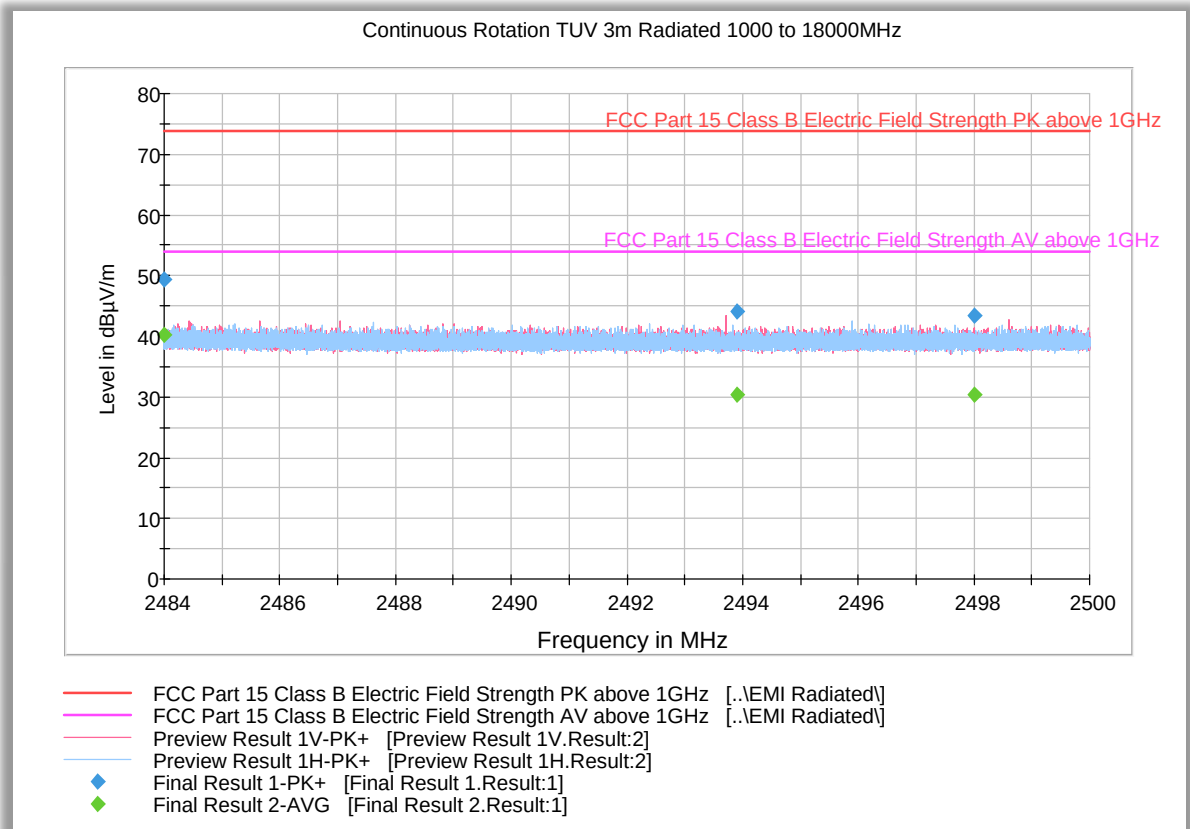
Frequency (MHz)	MaxPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2365.46600	43.0	1000.0	1000.000	333.2	V	85.0	-0.5	30.9	73.9
2371.42300	42.8	1000.0	1000.000	327.2	V	5.0	-0.5	31.1	73.9
2394.65100	42.7	1000.0	1000.000	138.7	H	113.0	-0.4	31.2	73.9

Average Data

Frequency (MHz)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2365.46600	29.8	1000.0	1000.000	333.2	V	85.0	-0.5	24.1	53.9
2371.42300	29.7	1000.0	1000.000	327.2	V	5.0	-0.5	24.2	53.9
2394.65100	29.9	1000.0	1000.000	138.7	H	113.0	-0.4	24.0	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.2.10 Test Results Restricted Band 2483.5MHz to 2500MHz



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2484.00000	49.4	1000.0	1000.000	280.3	V	28.0	0.2	24.5	73.9
2493.91733	44.0	1000.0	1000.000	218.4	V	103.0	0.2	29.9	73.9
2497.99786	43.3	1000.0	1000.000	311.2	V	144.0	0.2	30.6	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2484.00000	40.1	1000.0	1000.000	280.3	V	28.0	0.2	13.8	53.9
2493.91733	30.5	1000.0	1000.000	218.4	V	103.0	0.2	23.4	53.9
2497.99786	30.4	1000.0	1000.000	311.2	V	144.0	0.2	23.5	53.9

Test Notes: 2.4GHz notch filter removed for this test.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Radiated Test Setup						
1033	Bilog Antenna	3142C	00044556	EMCO	09/05/19	09/05/21
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	06/16/18	06/16/20
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	02/26/20	02/26/21
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	10/11/19	10/11/20
7620	EMI Test Receiver	ESU	100399	Rhode & Schwarz	10/18/19	10/18/20
1016	Pre-amplifier	PAM-0202	187	A.H. Systems, Inc.	02/26/20	02/26/21
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	01/22/20	01/22/21
7608	Vector Signal Generator	SMBV100A	259021	Rhode & Schwarz	10/10/19	10/10/21
8816	2.4G Notch Filter	BRM50716	015	Micro-Tronics	Verified by 7582 and 7608	
Miscellaneous						
11312	Mini Environmental Quality Meter	850027	CF099-56010-340	Sper Scientific	04/16/19	04/16/20
	Test Software	EMC32	V8.53	Rhode & Schwarz	N/A	

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 RADIATED MEASUREMENTS (BELOW 1GHZ)

	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, $k=1$	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20 dB	Normal, $k=2$	2.000	0.10	0.01
3	Antenna factor AF	0.75 dB	Normal, $k=2$	2.000	0.38	0.14
4	Receiver sinewave accuracy	0.45 dB	Normal, $k=2$	2.000	0.23	0.05
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50 dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95 dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30 dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10 dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 3 m	3.12 dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 3 m	1.00 dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00 dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	3.76 dB	Triangular	2.449	1.54	2.36
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.77 dB	Rectangular	1.732	0.44	0.20
18	Table height at 3 m	0.10 dB	Normal, $k=2$	2.000	0.05	0.00
19	Near-field effects	0.00 dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00 dB				0.00
Combined standard uncertainty			Normal	2.95	dB	
Expanded uncertainty			Normal, $k=2$	5.90	dB	

3.2.2 RADIATED EMISSION MEASUREMENTS (ABOVE 1GHZ)

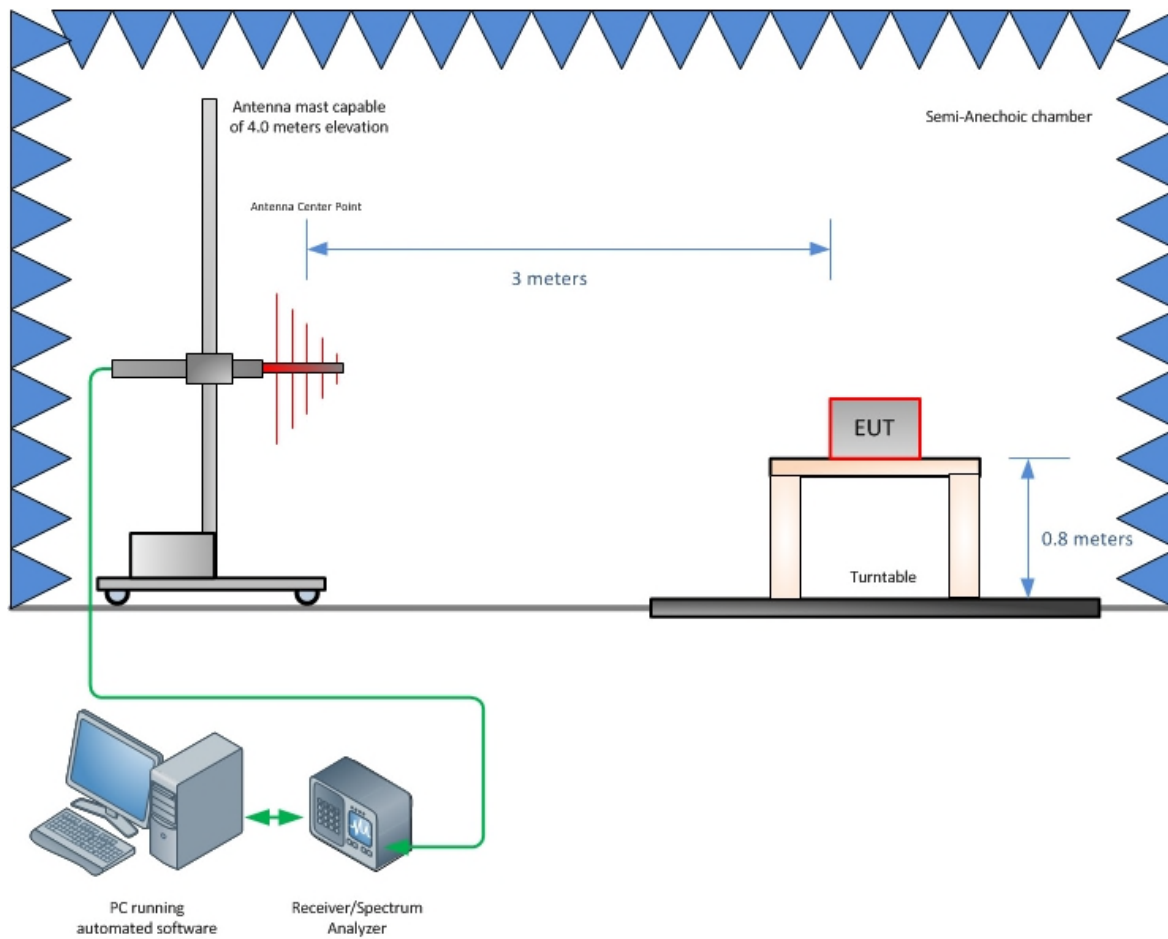
	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20 dB	Normal, k=2	2.000	0.10	0.01
3	Antenna factor AF	0.75 dB	Normal, k=2	2.000	0.38	0.14
4	Receiver sinewave accuracy	0.45 dB	Normal, k=2	2.000	0.23	0.05
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50 dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95 dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30 dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10 dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 3 m	3.12 dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 3 m	1.00 dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00 dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	3.25 dB	Triangular	2.449	1.33	1.76
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.77 dB	Rectangular	1.732	0.44	0.20
18	Table height at 3 m	0.10 dB	Normal, k=2	2.000	0.05	0.00
19	Near-field effects	0.00 dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00 dB				0.00
Combined standard uncertainty			Normal	2.85 dB		
Expanded uncertainty			Normal, k=2	5.70 dB		



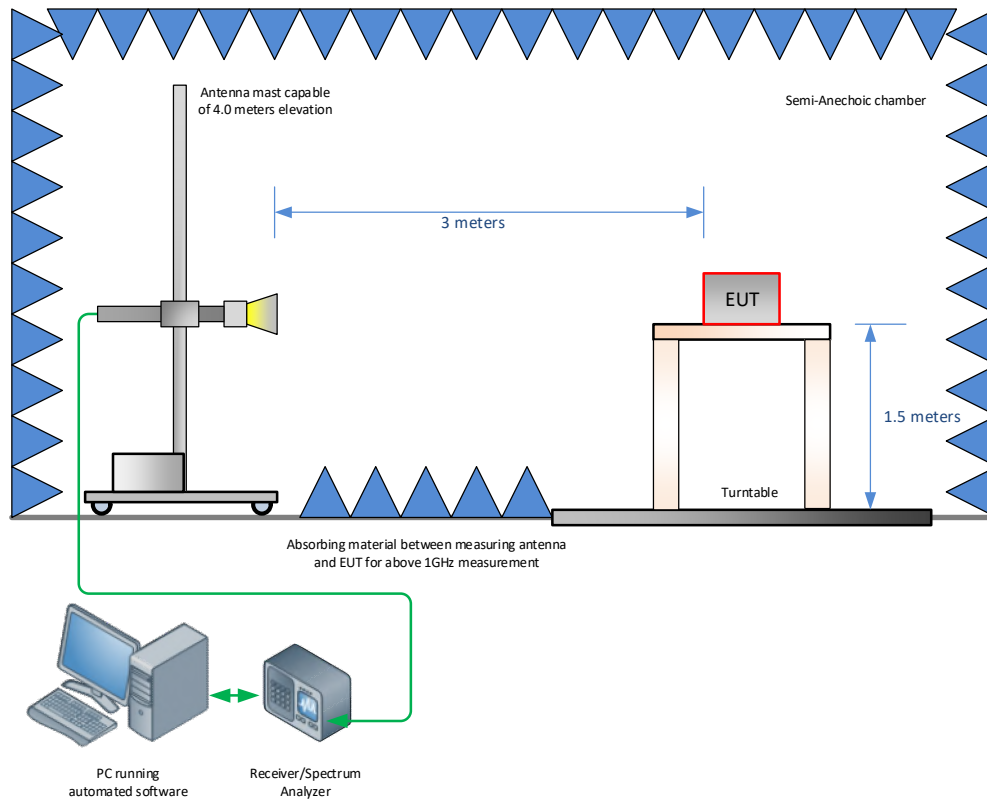
SECTION 4

DIAGRAM OF TEST SETUP

4.1 TEST SETUP DIAGRAM



Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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