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Report On

Radio Testing of the
SMK Electronics Corp.
Melbourne 52.0 UHF 2G Remote Control

FCC Part 15 Subpart C §15.249

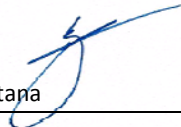
Report No. SD72104697A

June 2015



America

TÜV SÜD America Inc., 10040 Mesa Rim Road, San Diego, CA 92121
Tel: (858) 678-1400. Website: www.TUVamerica.com

REPORT ON	Radio Testing of the SMK Electronics Corp. Remote Control
TEST REPORT NUMBER	SD72104697A
PREPARED FOR	SMK Electronics Corp. 1055 Tierra del Rey, Suite H Chula Vista, CA 91910
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APPROVED BY	 Juan Manuel Gonzalez Name Authorized Signatory Title: Commercial/Wireless EMC Lab Manager
DATED	June 02 , 2015



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Revision History

SD72104697A SMK Electronics Corp. Melbourne Remote Control					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
06/02/15	Initial Release				Juan Manuel Gonzalez

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SECTION 1

REPORT SUMMARY

Radio Testing of the
SMK Electronics Corp.
Remote Control



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the SMK Electronics Corp. 52.0 UHF 2G Remote Control to the requirements of FCC Part 15 Subpart C §15.249.

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	SMK Electronics Corp.
FCC ID Number	QVE4MELB
Serial Number(s)	N/A
Number of Samples Tested	1
Test Specification/Issue/Date	FCC Part 15 Subpart C §15.249 (October 1, 2014).
Start of Test	May 09, 2015
Finish of Test	May 15, 2015
Name of Engineer(s)	Ivan Retana
Related Document(s)	None. Supporting documents for EUT certification are separate exhibits.

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart C §15.249 is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
2.1	§15.207(a)	Conducted Emissions	N/A	
2.2	§15.215(c)	20 dB Bandwidth	Compliant	
2.3	§15.249(a)	Field Strength Limits for Fundamental and Harmonics	Compliant	
2.4	§15.249(d)	Spurious Radiated Emissions	Compliant	

N/A *Not applicable, EUT is battery powered*



1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Melbourne 52.0 UHF 2G SMK Electronics Corp. Remote Control.



1.3.2 EUT General Description

EUT Description	Remote Control
Model Name	Melbourne
Model Number	52.0 UHF 2G
Rated Voltage	3.0 VDC (Uses 2-AA Batteries)
Output Power	79.0 dBμV/m @ 3 meters or 0.02382mW
Frequency Range	2425MHz to 2475 MHz in the 2400 MHz to 2483.5 MHz Band
Number of Operating Frequencies	3
Channels Verified	Low Channel 2425MHz Mid Channel 2450MHz High Channel 2475MHz
Antenna Type (used during evaluation)	Integral (Complies with Part 15.203 requirements)

1.3.3 Antenna Details

Model	N/A (Trace)
Manufacturer	SMK
Antenna Type	Inverted F
Antenna Gain	0 dBi
EUT Antenna Connector	N/A (surface mount).
Maximum Dimensions	2.0 x 1.0mm



1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configurations	Description
Default	Radiated only configuration. EUT transmitting through the integral antenna. The EUT was placed in continuous transmission @ 100% duty cycle.
Modulated	Modulated Configuration. EUT transmitting through the integral antenna. The EUT was placed in continuous transmission @ QPSK modulation.

1.4.2 EUT Exercise Software

LG-CC2650 Rev.1

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
	N/A	

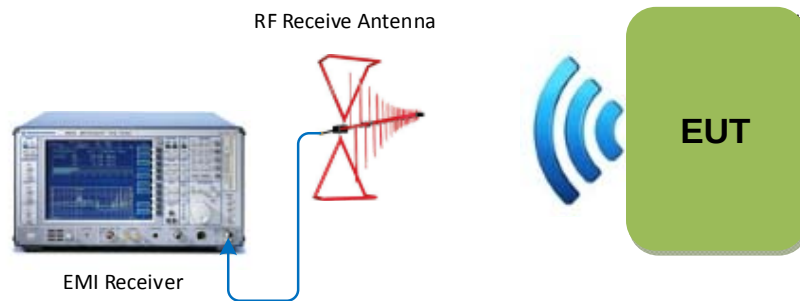
1.4.4 Worst Case Configuration

For radiated measurements X, Y and Z orientations were verified. The worst case was determined to be Y orientation, so verification was performed with the EUT in Y orientation.

Worst case channel used is Mid Channel (2450 MHz). This is based from Peak Output Power test results under Section 2.3 of this test report.

1.4.5 Simplified Test Configuration Diagram

Radiated Emission Test Configuration



Not To Scale – Illustration Purpose Only
Objects may not represent actual image of
original equipment/s or set-up.



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 N/A		
N/A		

The table above details modifications made to the EUT during the test programme. 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 C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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 C63.4-2009. 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)

Sony Electronics Inc., Building #8 16530 Via Esprillo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: 858 942 5542 FAX: 858-546 0364



1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Registration No.: US1146

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.498 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US1146.

1.9.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego) has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.



SECTION 2

TEST DETAILS

Radio Testing of the
SMK Electronics Corp.
Remote Control

2.1 CONDUCTED EMISSIONS

2.1.1 Specification Reference

Part 15 Subpart C §15.207(a)

2.1.2 Standard Applicable

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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.*

2.1.3 Equipment Under Test and Modification State

Not performed. EUT is battery operated only.



2.2 20 dB BANDWIDTH

2.2.1 Specification Reference

Part 15 Subpart C §15.215(c)

2.2.2 Standard Applicable

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

2.2.3 Equipment Under Test and Modification State

Serial No: N/A / Modulated Configuration

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

May 15, 2015/IR

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 Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.2°C
Relative Humidity	50.5%
ATM Pressure	99.3 kPa

2.2.7 Additional Observations

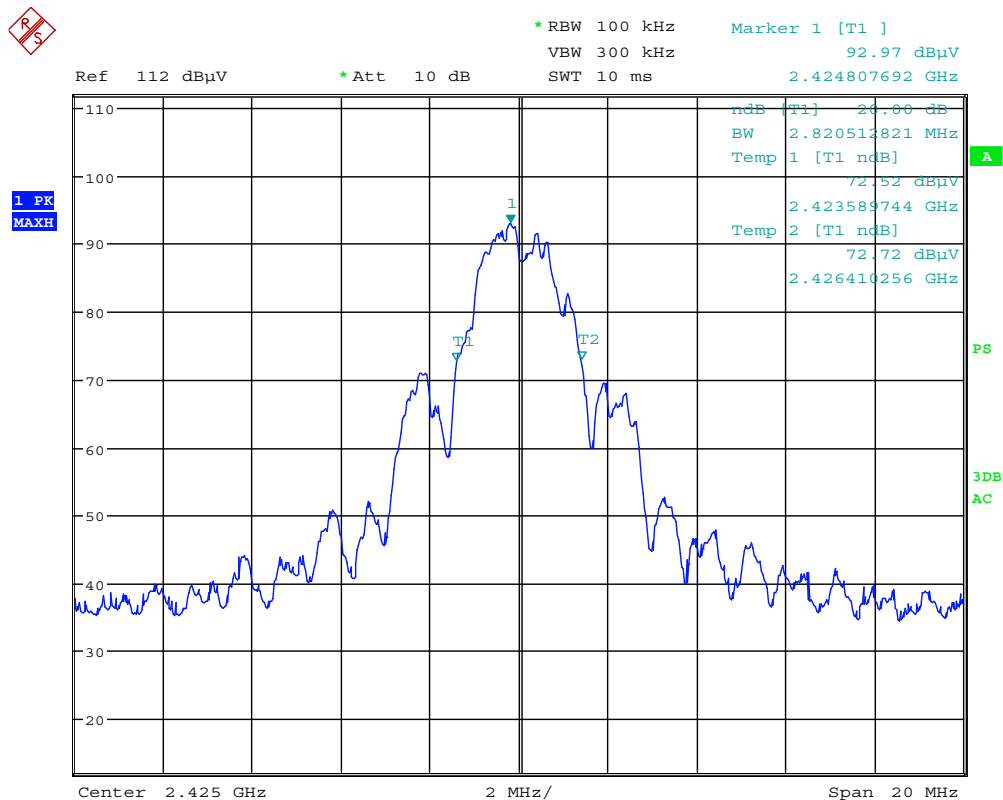
- This is a radiated test.
- "n dB down" marker function of the Spectrum Analyzer used.
- Span is wide enough to capture the channel transmission.
- RBW is 1% of the span, VBW is 3X RBW.
- Sweep is auto.
- Detector is peak.
- Trace is max hold.

2.2.8 Test Results

Low Channel (2425 MHz)	Mid Channel (2450MHz)	High Channel (2475MHz)
2.820 MHz	2.884 MHz	2.820MHz

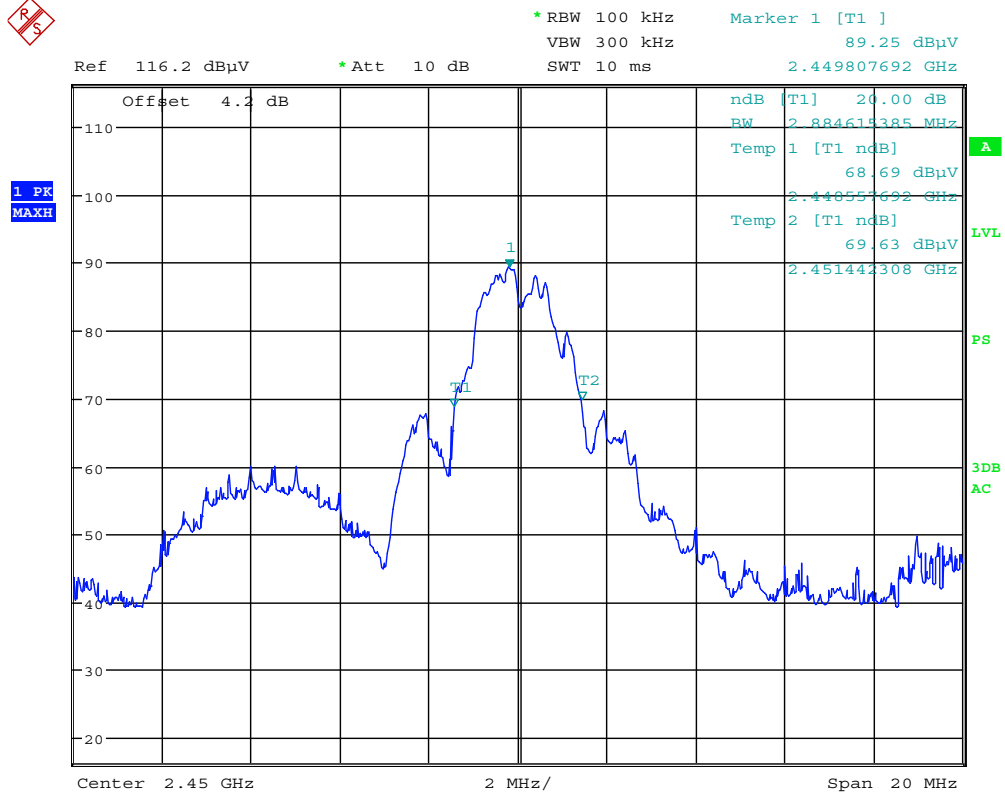
2425.00 MHz – (20dB BW/2) = 2423.59MHz (within the frequency band - **Compliant**)

2475.00MHz + (20dB BW/2) = 2476.41MHz (within the frequency band - **Compliant**)



Date: 15.MAY.2015 21:23:06

Low Channel



Date: 15.MAY.2015 21:38:30

Mid Channel



Date: 15.MAY.2015 21:55:38

High Channel



2.3 FIELD STRENGTH LIMITS FOR FUNDAMENTAL AND HARMONICS

2.3.1 Specification Reference

Part 15 Subpart C §15.249(a)

2.3.2 Standard Applicable

(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

2.3.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

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

May 09, 2015/IR

2.3.5 Test Equipment Used

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

2.3.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.5°C
Relative Humidity	43.2%
ATM Pressure	99.5 kPa

2.3.7 Additional Observations

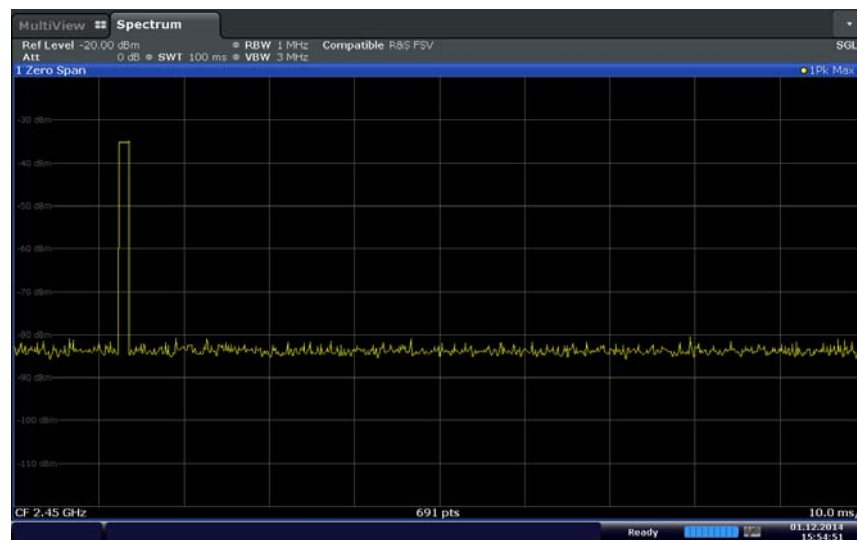
- This is a radiated test. The spectrum was searched from 1GHz to the 10th harmonic (25GHz).
- There are no emissions observed above 10GHz.
- When calculating Duty Cycle, the EUT was configured to normal operation (actual duty cycle vs. 100% duty cycle when in test mode).
- Both the Fundamental and the Harmonic measurements corrected for DCCF, all other emissions complies with the general radiated emission limits of §15.209 even at 100% duty cycle (test mode).

- Measurement was done using EMC32 V8.53 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 2.4.8 for sample computation.
- A 2.4GHz to 2.5GHz Notch filter was used for harmonic emissions measurements.

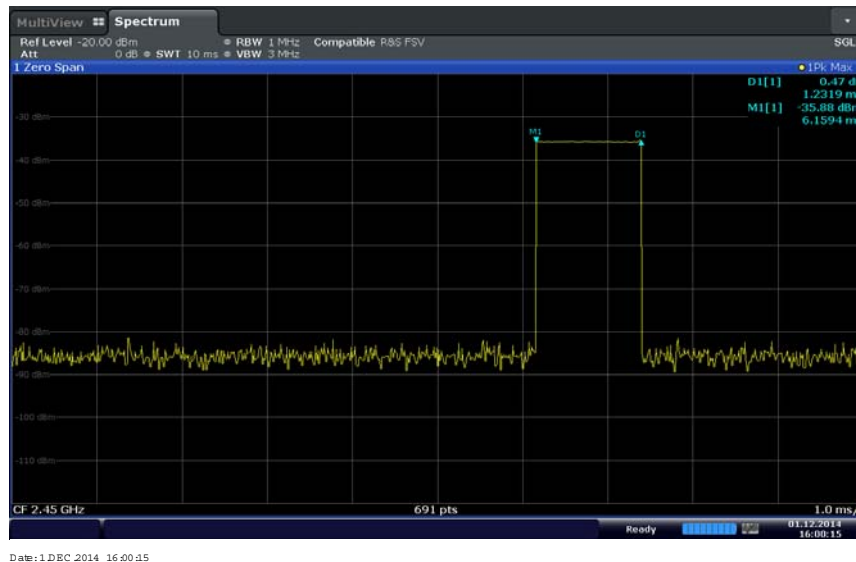
2.3.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dbμV) @ 2400 MHz			58.4
Correction Factor (dB)	Asset# 1153 (cable)	3.3	-4.8
	Asset# 8628 (preamplifier)	-36.4	
	Asset# 6669 (antenna)	28.3	
Reported Peak Final Measurement (dbμV/m) @ 2400 MHz			53.6

2.3.9 Duty Cycle Correction Factor Calculation



100ms sweep (representative channel)



10ms sweep (representative channel)

Duty Cycle Calculation: = 1.2319 ms "On" time per 100 ms sweep
Duty Cycle Correction Factor = $20 \log(0.012319)$
= **-38.1885(Limited to -20dB)**

Sample Calculation for High Channel (96.5dB μ V/m Peak @ 3 meters):
= 96.5dB μ V/m – 20dB
= 76.5 dB μ V/m Average @ 3 meters

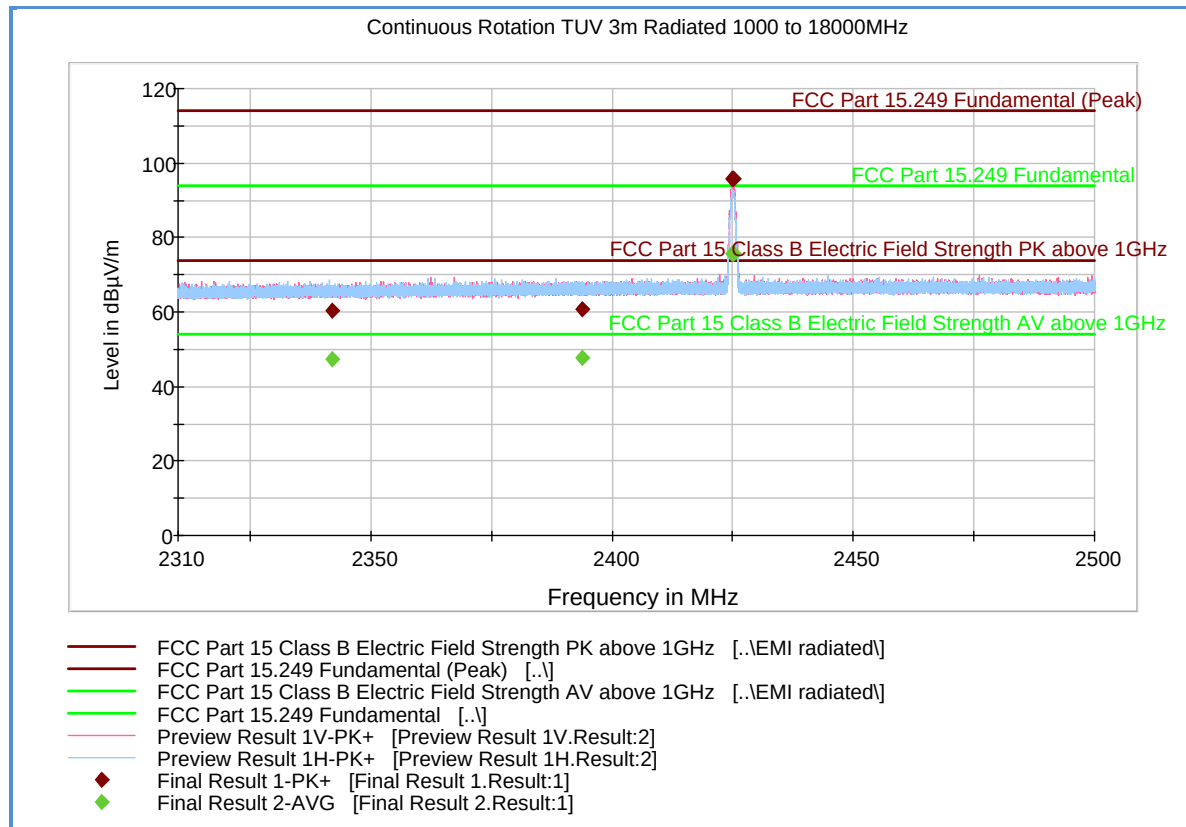
Duty Cycle correction factor verification was performed when the EUT is in normal operating mode. For actual measurements, the EUT was placed in test mode (100% Duty cycle)

Note: The above Duty Cycle measurements were taken from TUV test report: "SC1411276 SMK FCC Part 15.249 RSS210 Test Report" with FCC ID QVE4SYDN since per customer declaration the measurement is identical.

2.3.10 Test Results

See attached plots.

2.3.11 Test Results for Low Channel (Fundamental and Band Edges)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2342.03233	60.4	1000.0	1000.000	322.2	H	281.0	34.7	13.5	73.9
2393.71033	60.7	1000.0	1000.000	228.4	H	187.0	34.8	13.2	73.9
2424.83866	95.9	1000.0	1000.000	157.6	V	18.0	35.0	18.1	114.0
2425.18166	95.8	1000.0	1000.000	157.6	V	18.0	35.0	18.2	114.0

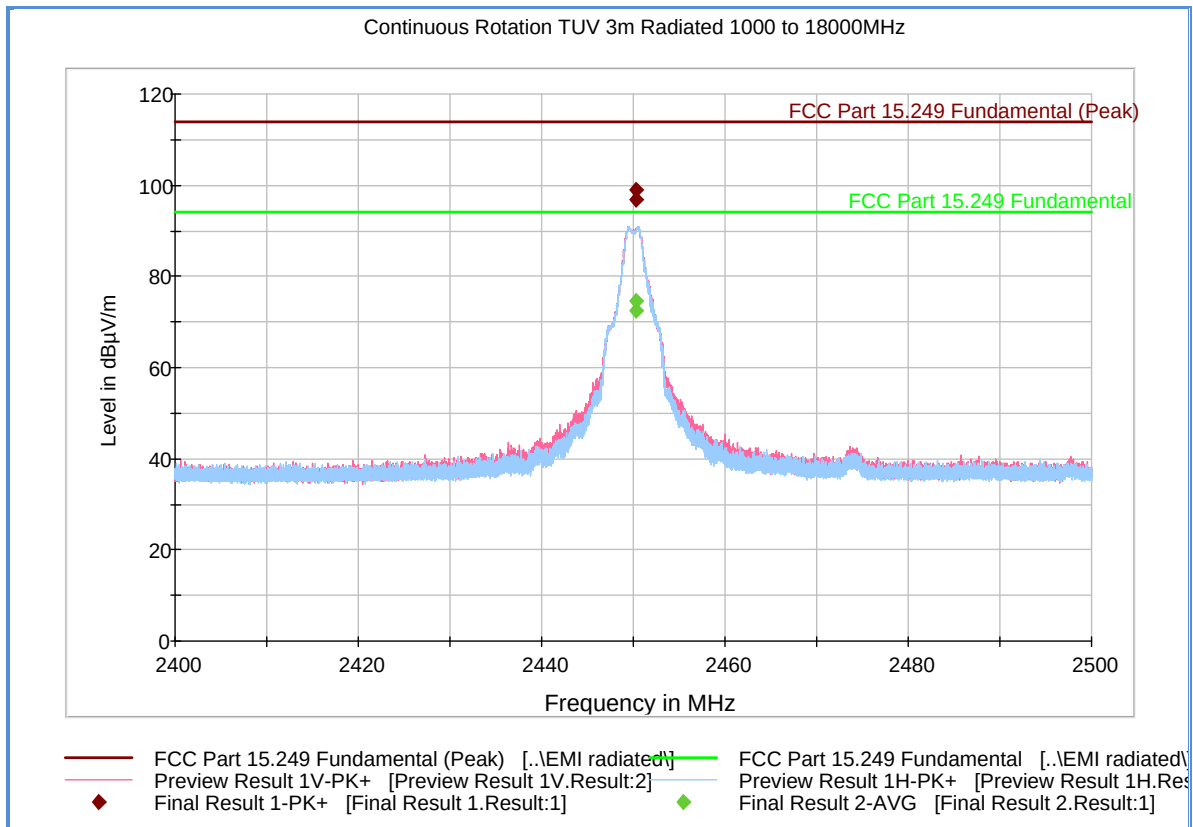
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2342.03233	47.3	1000.0	1000.000	322.2	H	281.0	34.7	6.6	53.9
2393.71033	47.7	1000.0	1000.000	228.4	H	187.0	34.8	6.2	53.9

Average Data using Duty Cycle correction factor (Fundamental Frequency)

Frequency (MHz)	MaxPeak (dBµV/m)	Duty Cycle Correction (dB)	Calculated Average (dBµV/m)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2424.838667	95.9	-20	75.9	35.0	18.4	94.0
2425.181667	95.8	-20	75.8	35.0	18.5	94.0

2.3.12 Test Results for Mid Channel (Fundamental)



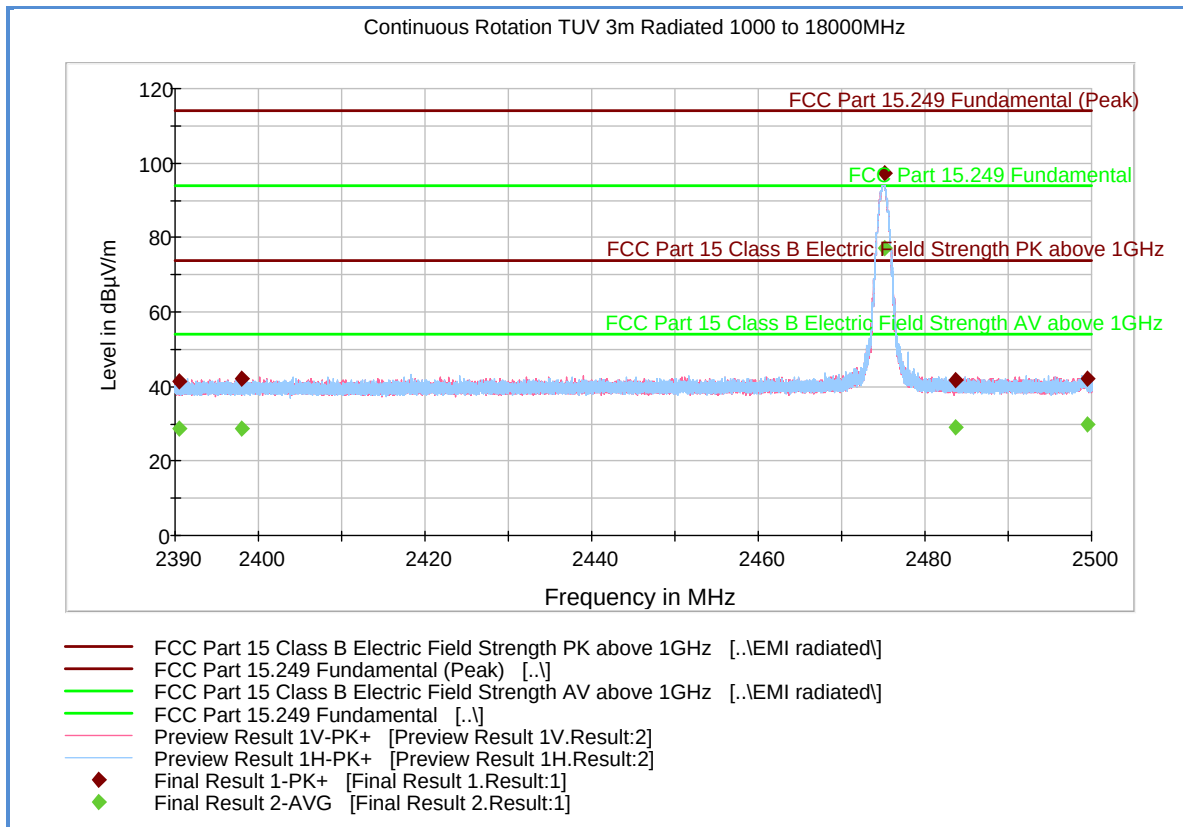
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2450.27666	96.8	1000.0	1000.000	331.1	V	10.0	-4.3	17.2	114.0
2450.30333	99.0	1000.0	1000.000	400.3	V	66.0	-4.3	14.9	114.0

Average Data using Duty Cycle correction factor (Fundamental Frequency)

Frequency (MHz)	MaxPeak (dBμV/m)	Duty Cycle Correction (dB)	Calculated Average (dBμV/m)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2450.276667	96.8	-20	76.8	-4.3	21.5	94.0
2450.303333	99.0	-20	79.0	-4.3	19.5	94.0

2.3.13 Test Results for High Channel (Fundamental and Band Edges)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2390.44033	41.5	1000.0	1000.000	402.7	V	60.0	-0.6	32.4	73.9
2397.98633	42.0	1000.0	1000.000	402.7	V	3.0	-0.6	31.9	73.9
2483.70000	41.8	1000.0	1000.000	102.7	H	176.0	-0.1	32.1	73.9
2499.57100	42.2	1000.0	1000.000	172.6	V	159.0	-0.1	31.7	73.9
2475.10900	97.4	1000.0	1000.000	124.7	V	58.0	35.2	16.6	114.0

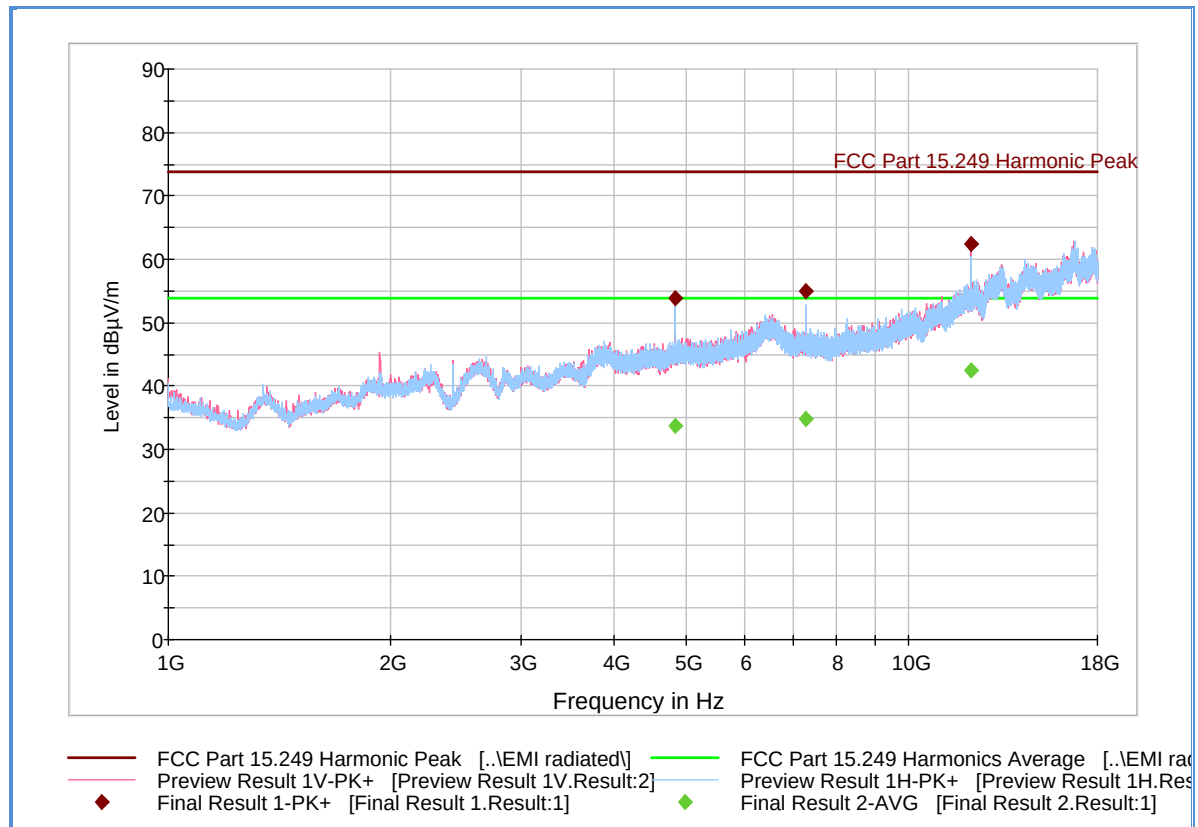
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2390.44033	28.8	1000.0	1000.000	402.7	V	60.0	-0.6	25.1	53.9
2397.98633	28.9	1000.0	1000.000	402.7	V	3.0	-0.6	25.0	53.9
2483.70000	29.2	1000.0	1000.000	102.7	H	176.0	-0.1	24.7	53.9
2499.57100	29.8	1000.0	1000.000	172.6	V	159.0	-0.1	24.1	53.9

Average Data using Duty Cycle correction factor (Fundamental Frequency)

Frequency (MHz)	MaxPeak (dBµV/m)	Duty Cycle Correction (dB)	Calculated Average (dBµV/m)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2475.109000	97.4	-20	77.4	35.2	16.9	94.0

2.3.14 Test Results for Low Channel (Harmonics)



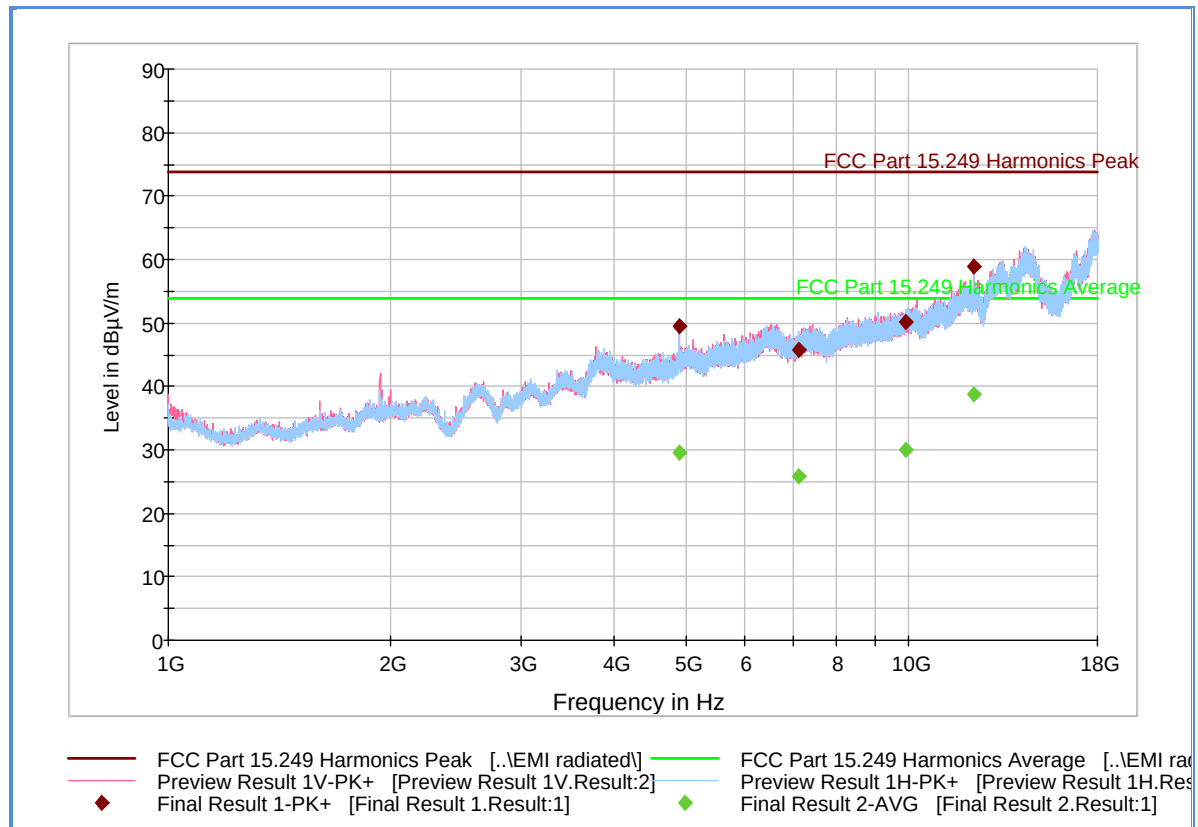
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4850.13333	53.8	1000.0	1000.000	227.4	H	71.0	5.9	20.1	73.9
7274.90000	54.9	1000.0	1000.000	166.6	H	340.0	9.6	19.0	73.9
12124.800	62.5	1000.0	1000.000	300.6	V	291.0	17.1	11.4	73.9

Average Data using Duty Cycle correction factor

Frequency (MHz)	MaxPeak (dBμV/m)	Duty Cycle Correction (dB)	Calculated Average (dBμV/m)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4850.13333	53.8	-20	33.8	5.9	20.1	53.9
7274.90000	54.9	-20	34.9	9.6	19.0	53.9
12124.800	62.5	-20	42.5	17.1	8.6	53.9

2.3.15 Test Results for Mid Channel (Harmonics)



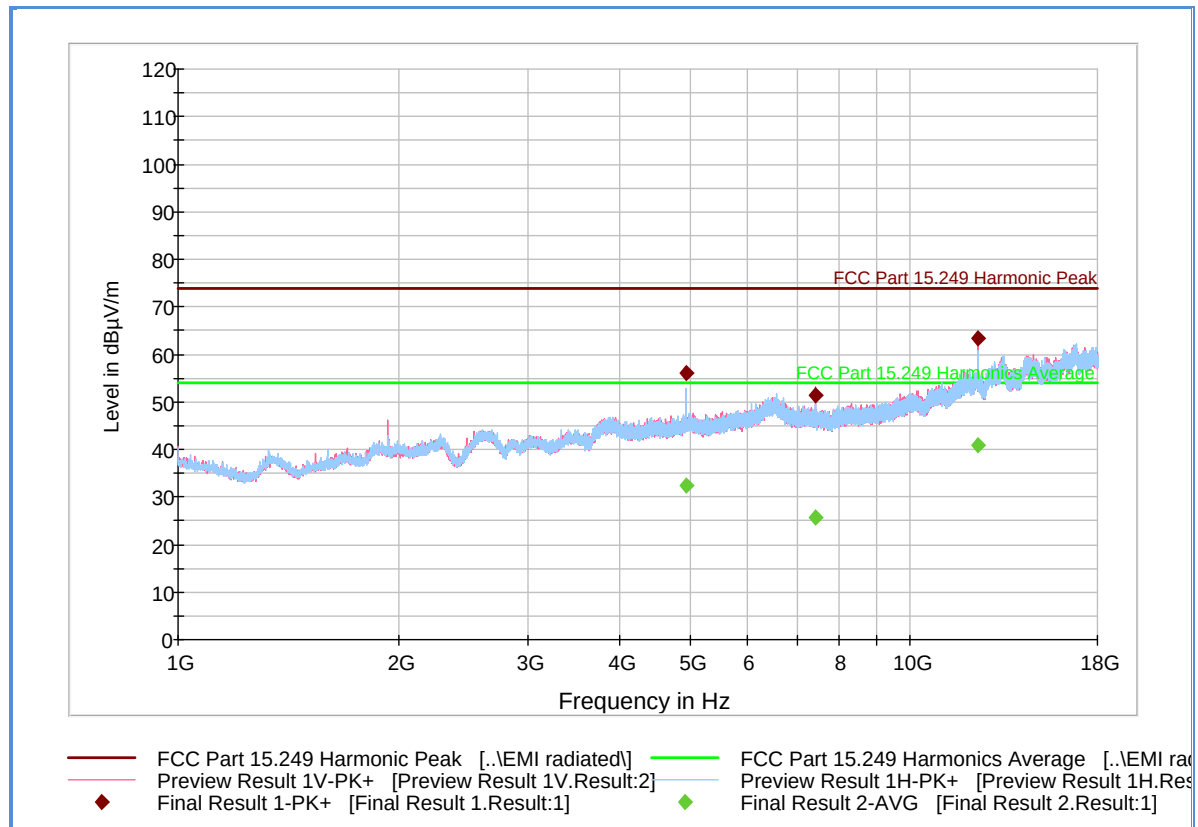
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4900.00000	49.5	1000.0	1000.000	247.3	V	282.0	5.0	24.4	73.9
7115.10000	45.8	1000.0	1000.000	400.3	H	10.0	9.1	28.1	73.9
9903.70000	50.1	1000.0	1000.000	287.2	H	11.0	13.2	23.8	73.9
12250.0333	58.8	1000.0	1000.000	400.3	V	51.0	16.9	15.1	73.9

Average Data using Duty Cycle correction factor

Frequency (MHz)	MaxPeak (dBμV/m)	Duty Cycle Correction (dB)	Calculated Average (dBμV/m)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4900.000000	49.5	-20	29.5	5.0	30.4	53.9
7115.100000	45.8	-20	25.8	9.1	34.1	53.9
9903.700000	50.1	-20	30.1	13.2	29.8	53.9
12250.0333	58.8	-20	38.8	16.9	15.1	53.9

2.3.16 Test Results for High Channel (Harmonics)



Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4949.86666	56.0	1000.0	1000.000	217.4	H	54.0	6.4	17.9	73.9
7425.06666	51.5	1000.0	1000.000	267.3	V	119.0	9.2	22.4	73.9
12375.0666	63.3	1000.0	1000.000	300.2	V	219.0	17.1	10.6	73.9

Average Data using Duty Cycle correction factor

Frequency (MHz)	MaxPeak (dBμV/m)	Duty Cycle Correction (dB)	Calculated Average (dBμV/m)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4949.866667	56.0	-20	36.0	6.4	23.9	53.9
7425.066667	51.5	-20	31.5	9.2	28.4	53.9
12375.066667	63.3	-20	43.3	17.1	16.6	53.9



2.4 SPURIOUS RADIATED EMISSIONS

2.4.1 Specification Reference

Part 15 Subpart C §15.249(d)

2.4.2 Standard Applicable

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

2.4.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

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

May 15, 2015/IR

2.4.5 Test Equipment Used

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

2.4.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	23.2°C
Relative Humidity	50.5%
ATM Pressure	99.3 kPa

2.4.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to the 10th harmonic (25GHz). There are no significant emissions observed beyond 18GHz.
- No significant emission difference between the three channels observed below 1GHz. Data presented is from worst configuration based from fundamental/harmonics verification ("Y" axis configuration).
- No significant spurious emissions observed other than harmonics of the fundamental frequency.
- Measurement was done using EMC32 V8.53 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 2.5.1 for sample computation.
- A 2.4GHz to 2.5GHz Notch filter was used for spurious emission measurements above 1GHz.



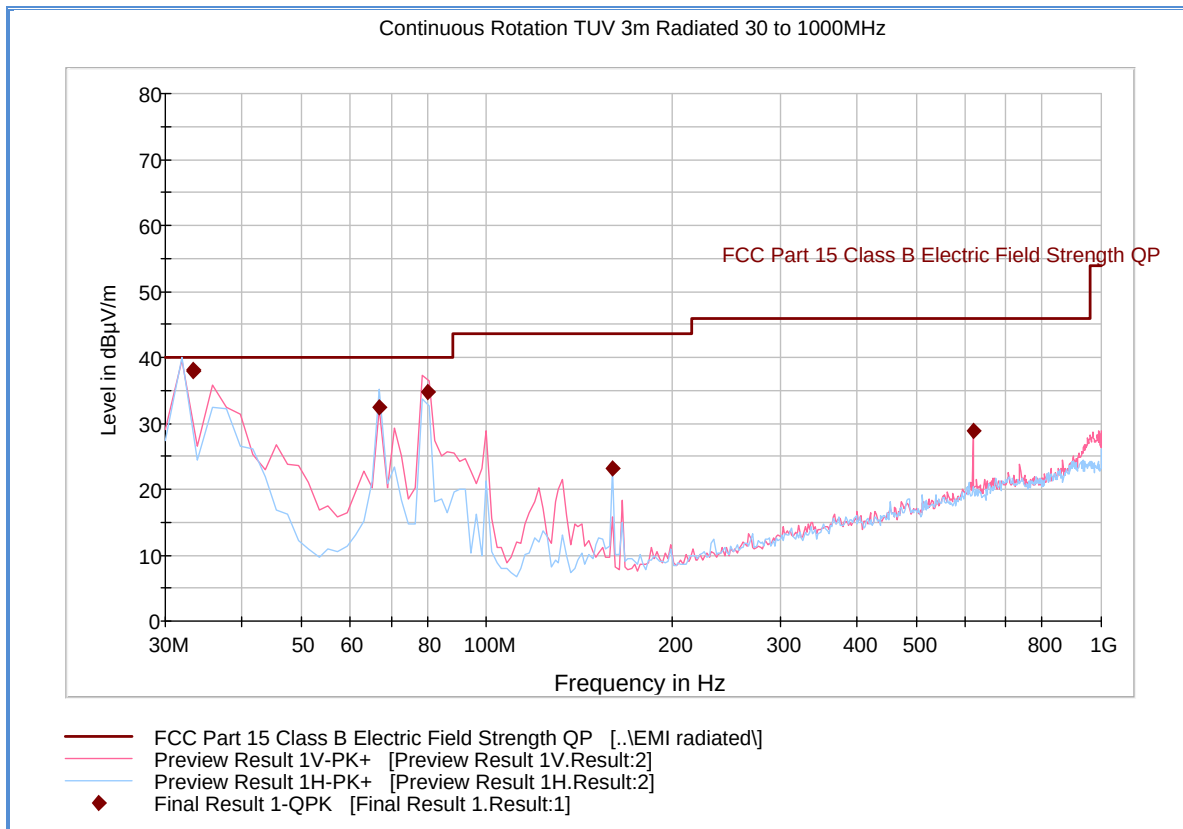
2.4.1 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (db μ V) @ 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 (db μ V/m) @ 30MHz			11.8

2.4.2 Test Results

See attached plots.

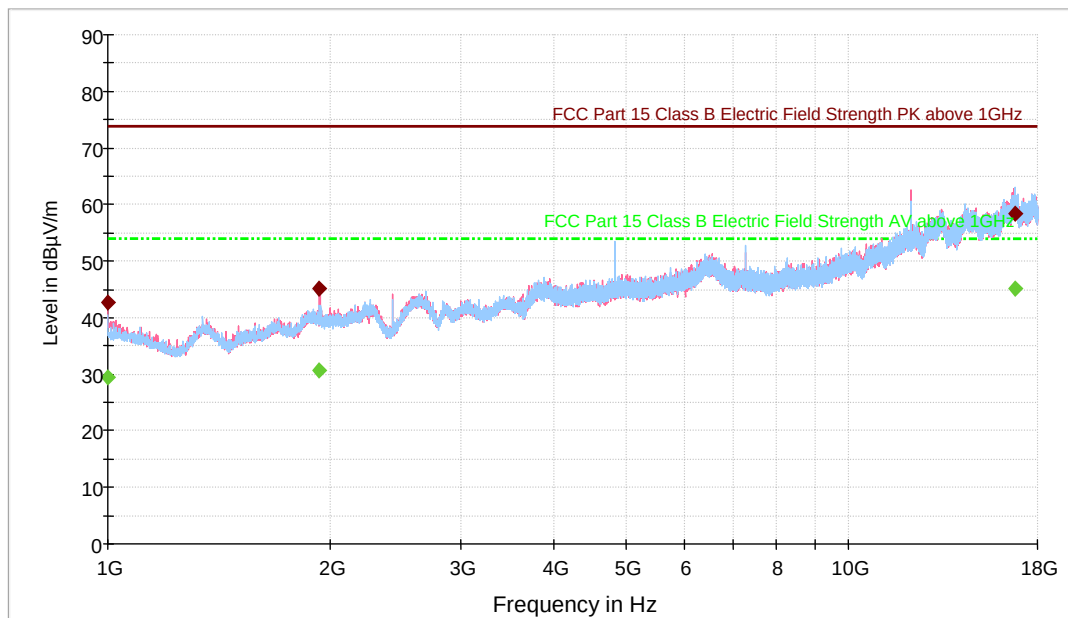
2.4.3 Test Results Below 1GHz (Worst Case Configuration)



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)
33.271663	38.1	1000.0	120.000	100.0	V	1.0	-13.2	1.9	40.0
33.280000	38.0	1000.0	120.000	109.0	H	62.0	-13.2	2.0	40.0
66.773868	32.5	1000.0	120.000	105.0	H	2.0	-22.3	7.5	40.0
79.997194	34.7	1000.0	120.000	109.0	V	235.0	-22.0	5.3	40.0
160.000481	23.1	1000.0	120.000	109.0	H	204.0	-18.2	20.4	43.5
618.757996	28.9	1000.0	120.000	150.0	V	34.0	-3.8	17.1	46.0

2.4.4 Test Results Above 1GHz (Low Channel)



— FCC Part 15 Class B Electric Field Strength PK above 1GHz [..EMI radiated\
 - - - - - FCC Part 15 Class B Electric Field Strength AV above 1GHz [..EMI radiated\
 — Preview Result 1V-PK+ [Preview Result 1V.Result:2]
 — Preview Result 1H-PK+ [Preview Result 1H.Result:2]
 ◆ Final Result 1-PK+ [Final Result 1.Result:1]
 ◆ Final Result 2-AVG [Final Result 2.Result:1]

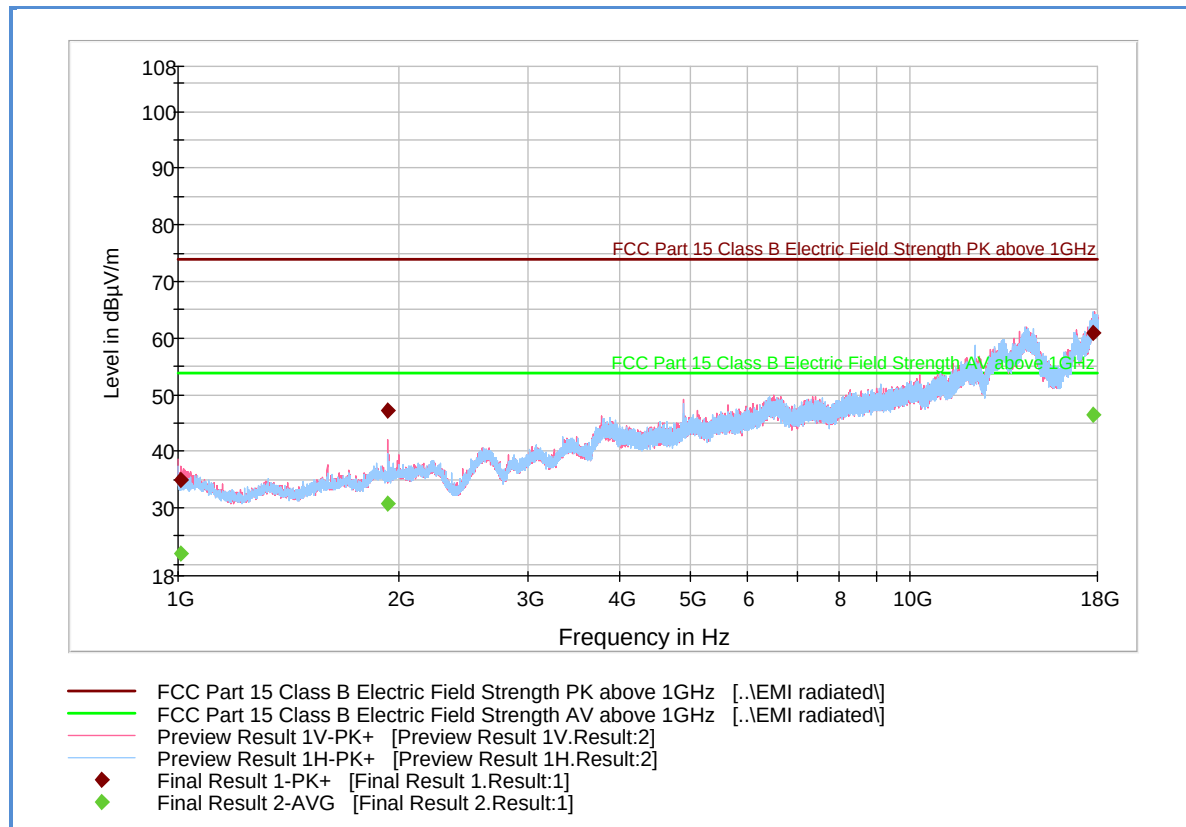
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.00000	42.7	1000.0	1000.000	180.6	V	210.0	-7.2	31.2	73.9
1932.56666	45.0	1000.0	1000.000	140.7	V	16.0	-2.3	28.9	73.9
16794.1333	58.4	1000.0	1000.000	334.1	H	71.0	23.8	15.5	73.9

Spurious Average Data

Frequency (MHz)	Spurious Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.00000	29.3	1000.0	1000.000	180.6	V	210.0	-7.2	24.6	53.9
1932.56666	30.6	1000.0	1000.000	140.7	V	16.0	-2.3	23.3	53.9
16794.1333	45.2	1000.0	1000.000	334.1	H	71.0	23.8	8.7	53.9

2.4.5 Test Results Above 1GHz (Mid Channel)



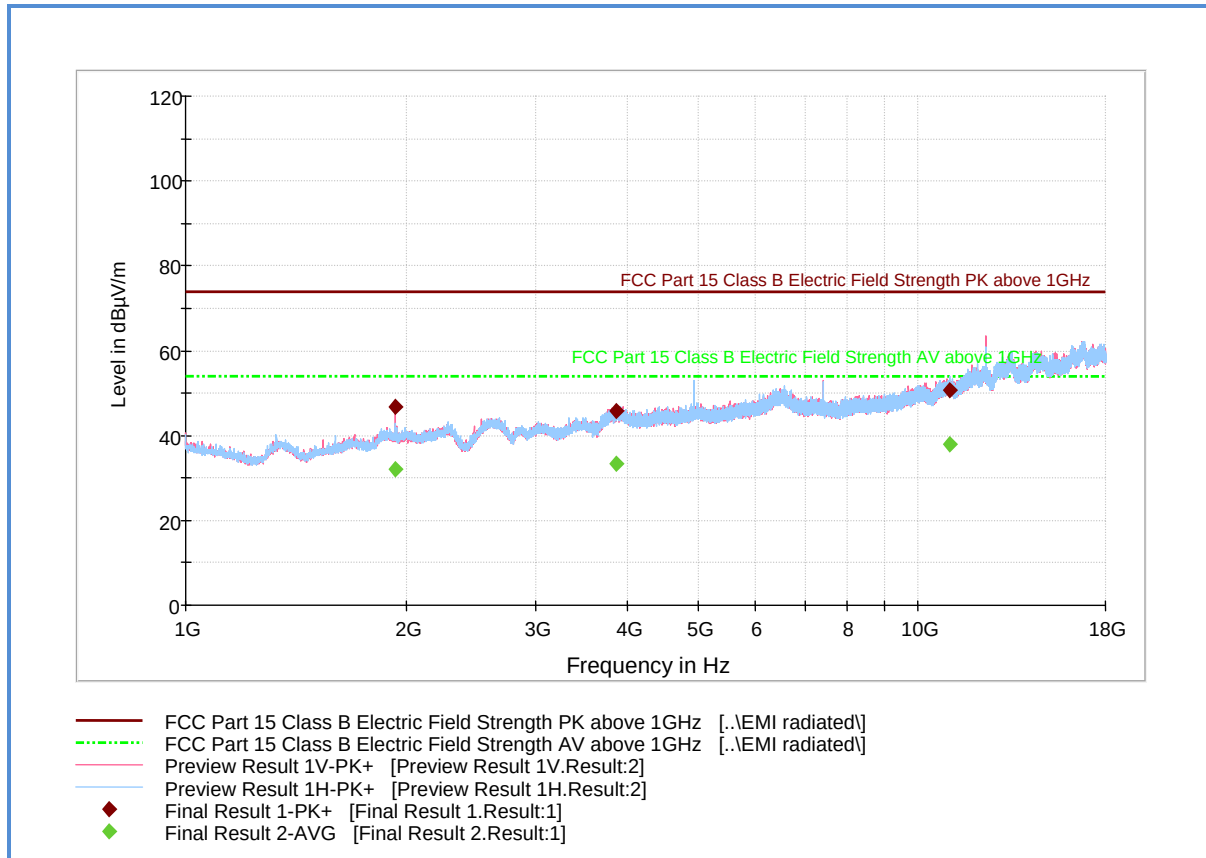
Peak Data

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1010.16666	34.9	1000.0	1000.000	275.3	V	152.0	-10.5	39.0	73.9
1932.93333	47.1	1000.0	1000.000	188.5	V	142.0	-5.9	26.8	73.9
17765.8333	60.9	1000.0	1000.000	400.3	H	103.0	25.8	13.0	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)
1010.16666	22.0	1000.0	1000.000	275.3	V	152.0	-10.5	32.0	54.0
1932.93333	30.6	1000.0	1000.000	188.5	V	142.0	-5.9	23.3	54.0
17765.8333	46.5	1000.0	1000.000	400.3	H	103.0	25.8	7.4	54.0

2.4.6 Test Results Above 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)
1932.53333	46.7	1000.0	1000.000	403.0	V	140.0	-2.3	27.2	73.9
3865.46666	45.9	1000.0	1000.000	345.1	H	192.0	4.9	28.0	73.9
11027.0000	50.7	1000.0	1000.000	401.7	H	59.0	14.8	23.2	73.9

Spurious Average Data

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1932.53333	31.9	1000.0	1000.000	403.0	V	140.0	-2.3	22.0	53.9
3865.46666	33.2	1000.0	1000.000	345.1	H	192.0	4.9	20.7	53.9
11027.0000	38.0	1000.0	1000.000	401.7	H	59.0	14.8	15.9	53.9



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						
1002	Bilog Antenna	3142C	00058717	ETS-Lindgren	01/30/14	01/30/16
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	04/27/15	04/27/16
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	03/20/15	03/20/16
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	08/29/14	08/29/15
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	03/11/15	03/11/16
6815	2.4GHz Band Notch Filter	BRM50702	008	Micro-Tronics	Verified by 1189 and 7582	
1016	Pre-amplifier	PAM-0202	187	PAM	12/10/14	12/10/15
Miscellaneous						
	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 Emission Measurements (Below 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.45	0.26	0.07
2	Cables	Rectangular	0.50	0.29	0.08
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.75	0.43	0.19
5	Site	Rectangular	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.41
Coverage Factor (k):					2
Expanded Uncertainty:					4.82

3.2.2 Radiated Emission Measurements (Above 1GHz)

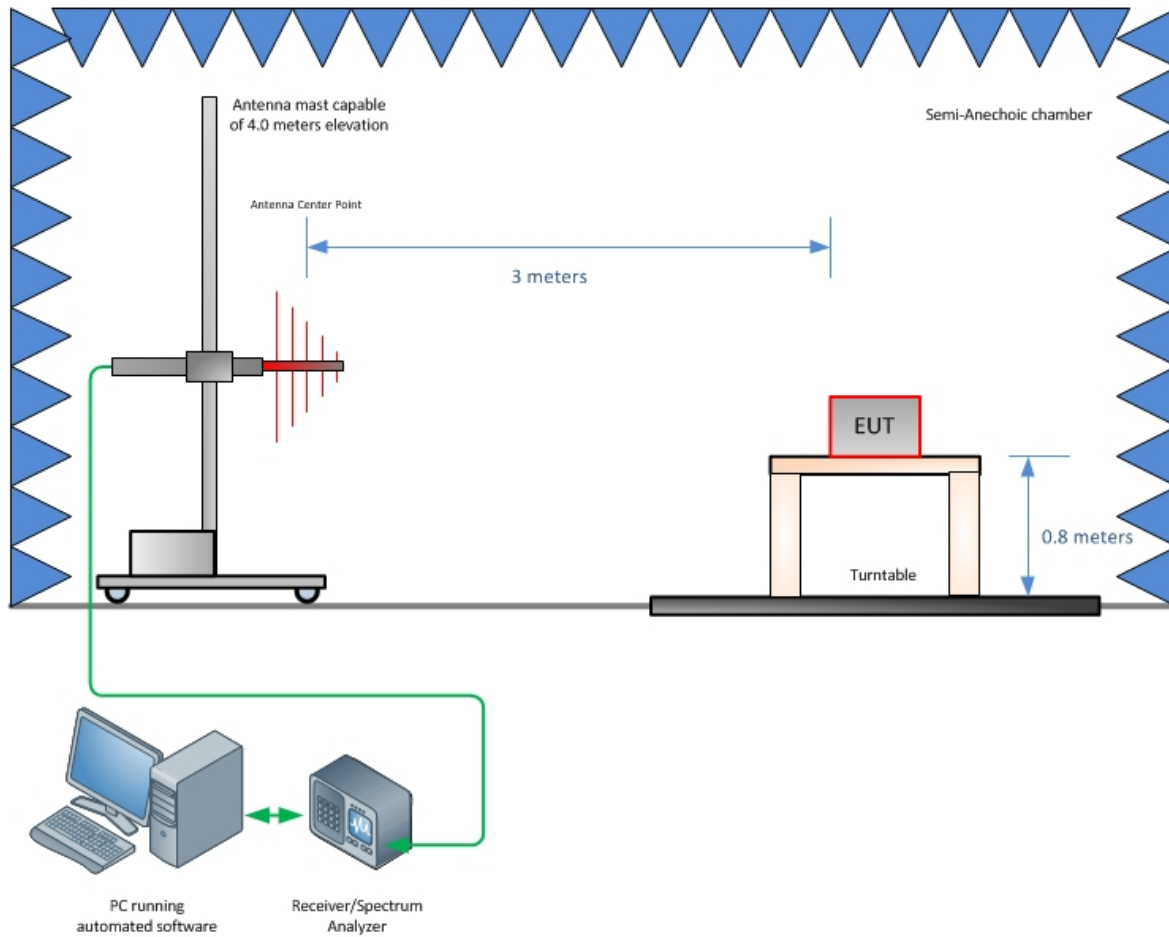
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2	Cables	Rectangular	0.70	0.40	0.16
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.37	0.21	0.05
5	Site	Rectangular	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.40
Coverage Factor (k):					2
Expanded Uncertainty:					4.81



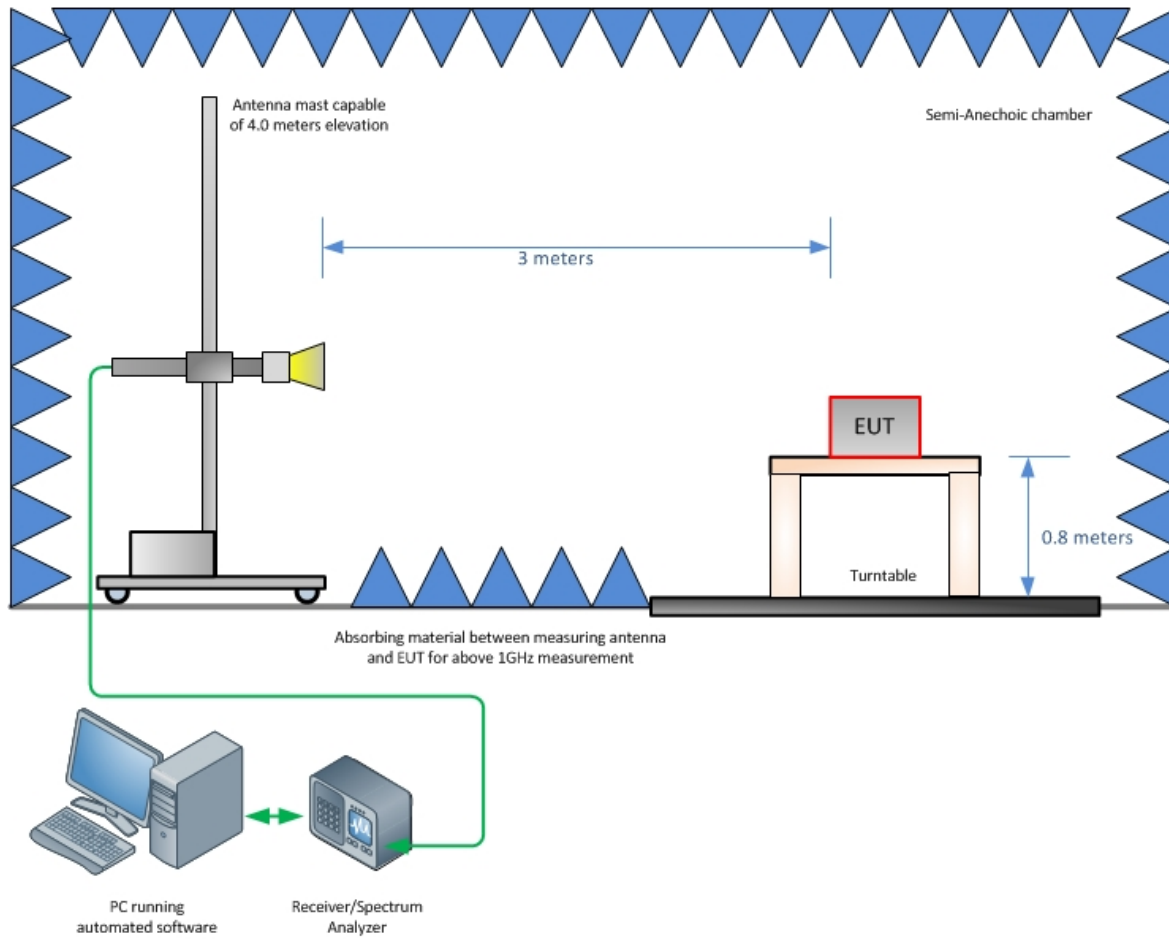
SECTION 4

DIAGRAM OF TEST SETUP

4.1 RADIATED EMISSION TEST SETUP (BELOW 1GHZ)



4.2 RADIATED EMISSION TEST SETUP (ABOVE 1GHZ)





SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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