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Report On

Radio Testing of the
Pinnacle Technology
Model 9087 RFID Reader

FCC Part 15 Subpart C §15.207 and §15.209
IC RSS-Gen Issue 4 November 2014

Report No. SD72125578-0317A Rev 1.0 **January 2018**

REPORT ON	EMC Evaluation of the Pinnacle Technology 9087 Model No. 9087
TEST REPORT NUMBER	SD72125578-0317A Rev 1.0
REPORT DATE	January 2018
PREPARED FOR	Pinnacle Technology 2721 Oregon St. Lawrence, KS 66046 USA
CONTACT PERSON	David Johnson CTO (785) 832-8866 davej@pinnaclet.com
PREPARED BY	Ferdinand S. Custodio **Name** Authorized Signatory Title: EMC/Senior Wireless Test Engineer
APPROVED BY	Alex Chang **Name** Authorized Signatory Title: Commercial/Medical EMC Supervisor
DATED	January 17, 2018

TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

Revision History

SD72125578-0317A Rev 1.0 Pinnacle Technology RFID Reader					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
11/21/2017	—	Initial Release			Alex Chang
01/17/2018	Initial Release	Rev 1.0	Correct the company name		Alex Chang

CONTENTS

TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

SECTION 1

REPORT SUMMARY

Radio Testing of the
Pinnacle Technology
RFID Reader

TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Pinnacle Technology Model 9087 RFID Reader to the requirements of the following:

- FCC Part 15 Subpart C §15.207 and §15.209
- IC RSS-Gen Issue 4 November 2014.

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	Pinnacle Technology
Model Name	9087 RFID Reader
Model Number(s)	9087
FCC ID Number	2AN64-9087
IC Number	23348-9087
Serial Number(s)	N/A
Number of Samples Tested	1
Test Specification/Issue/Date	• FCC Part 15 Subpart C §15.207 and §15.209 (October 1, 2016). • RSS-Gen - General Requirements and Information for the Certification of Radio Apparatus (Issue 4, November 2014).
Start of Test	September 25, 2017
Finish of Test	September 25, 2017
Name of Engineer(s)	Ferdie Custodio
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 §15.207 and §15.209 with cross-reference to RSS-Gen is shown below:

Section	FCC Part 15	RSS	Test Description	Result	Comments/Base Standard
-	§15.203 and 204	RSS-Gen 8.3	Antenna Requirements	Compliant	See Test Note[1]
2.1	-	RSS-Gen 6.6	Occupied Bandwidth	Compliant	
2.2	§15.209(a)	RSS-Gen 8.9	Radiated emission limits; general requirements	Compliant	
2.3	-	RSS-Gen 8.11	Transmitter Frequency Stability	Compliant	
2.4	§15.207(a)	RSS-Gen 8.8	Conducted Emissions	Compliant	
-	-	RSS-Gen 7.0	Receiver Spurious Emissions	N/A	See Test Note[2]

Test Note[1]: The EUT has an integral antenna.
Test Not2[3]: The EUT does not fall into the category of a Receiver as per RSS-Gen 5.0.

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Pinnacle Technology Model 9087 RFID Reader. The EUT is an RFID reader for rodent identification in research facilities.

1.3.2 EUT General Description

EUT Description	RFID Reader
Model Number(s)	9087
Rated Voltage	12VDC (ITE Power Supply, Model PW173KB1203B01 by SL POWER and AULT)
Frequency (Capability)	125 – 134.2 kHz Tx/Rx
Mode Verified	128 kHz
Modulation	OOK
Measured Field Strength	96.5 dBµV/m @ 3 meters
Operating Temperature	0°C to +50°C
Humidity	<93%RH non-condensing
Size	117.35 mm W x 117.35 mm D x 57.15 mm H
Weight	326 g
Antenna	Trovan ANT-C100-OEM
Q-Factor	Q>40
Resonant Frequency	125 kHz
Inductance L	0.39 mH

1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
Default	Running an Experiment via USB (9087 RFID Module) using Sirenia Acquisition – 2017-09-12_12_37_13

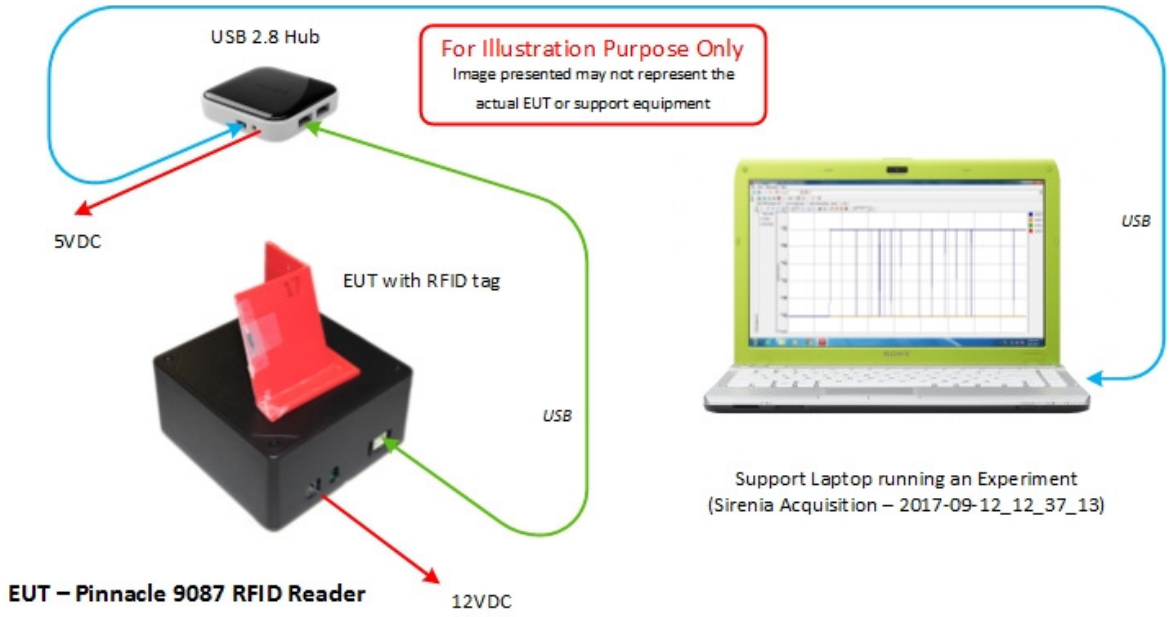
1.4.2 EUT Exercise Software

Sirenia Acquisition – 2017-09-12_12_37_13.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Dell	Support Laptop	Model PP39L S/N 20L9RJ1
Dell	Support AC Adapter for Laptop	Model LA65NS1-00 S/N CN-0YD637-71615-VKT-2208
SL Power	EUT I.T.E Power Supply	Model PW173KB1203B01 12VDC 2.5A
Belkin	USB 2.0 4 Port Hub	Model F4U020
Belkin	Switching Adapter for USB Hub	Model ADS-6MA-06 05050EPCU

1.4.4 Simplified Test Configuration Diagram



1.5 DEVIATIONS FROM THE STANDARD

All deviations made during testing from the applicable test standards or test plan are detailed under Section 1.2 of this test report.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number: N/A		
None	—	—

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 C63.10-2013. 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

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 §2.948 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-0230

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.

SECTION 2

TEST DETAILS

Radio Testing of the
Pinnacle Technology
RFID Reader

2.1 99% EMISSION BANDWIDTH

2.1.1 Specification Reference

RSS-Gen Clause 6.6

2.1.2 Standard Applicable

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.
The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.
The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

2.1.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

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

September 25, 2017 / FSC

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	25.2 °C
Relative Humidity	33.0 %
ATM Pressure	98.6 kPa

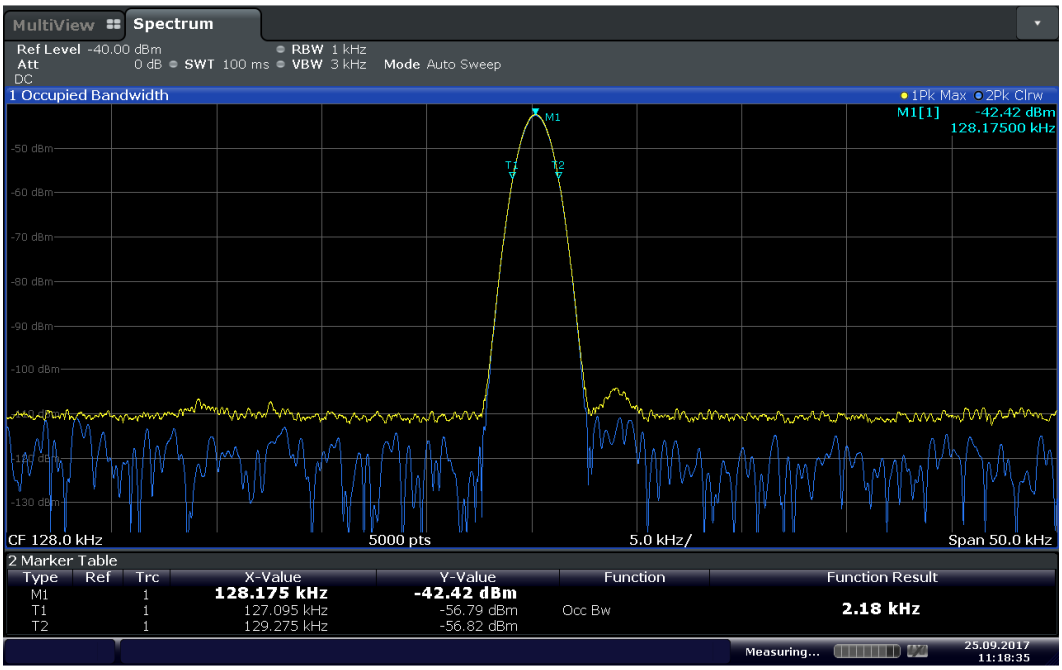
2.1.7 Additional Observations

- This is a radiated test.
- Span is wide enough to capture the channel transmission.
- RBW was set to 1 kHz.
- VBW is 3X RBW.
- Sweep is auto.
- Detector is peak.

- The % Power Bandwidth setting in the spectrum analyzer was set to 99% (default).
- The Channel Bandwidth measurement function of the spectrum analyzer was used for this test.

2.1.8 Test Results (Reporting Purposes Only)

Frequency	99% Emission bandwidth
128.175 kHz	2.18 kHz



Date: 25.SEP.2017 11:18:35

99% OBW

2.2 RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS

2.2.1 Specification Reference

Part 15 Subpart C §15.209(a) and RSS-Gen 8.9

2.2.2 Standard Applicable

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

2.2.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

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

September 25, 2017 / FSC

2.2.5 Test Equipment Used

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

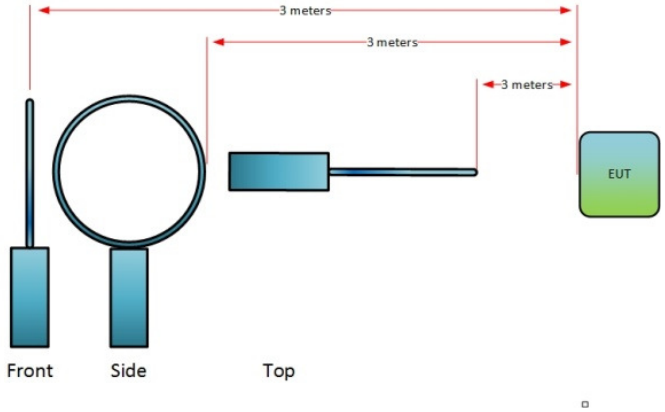
2.2.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.2 °C
Relative Humidity	33.0 %
ATM Pressure	98.6 kPa

2.2.7 Additional Observations

- This is a radiated test. The spectrum was searched from 9 kHz to the 1 GHz.
- There are no emissions found that do not comply with the restricted bands defined in FCC Part 15 Subpart C, 15.205.
- Prescans were performed to determine the best test antenna orientation with the highest recorded emissions. Verification was performed using "Front" configuration (see the figure below) corresponding to the best antenna orientation as found during the prescans.
- Only Quasi-Peak results presented (passing margin >6dB) for ranges requiring Average detector.
- 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 and 2.2.9 for sample computations.



2.2.8 Sample Computation (Radiated Emission 9 kHz to 30 MHz)

Measuring equipment raw measurement (dBµV) @ 9 kHz			25.0
Correction Factor (dB)	Asset# 1057 (cable)	0.1	25.9
	Asset# 8850 (cable)	0.0	
	Asset# 6628 (antenna)	25.8	
	Asset# 1026 (cable)	0.0	
Reported Quasi Peak Final Measurement (dBµV/m) @ 9kHz			**50.9**

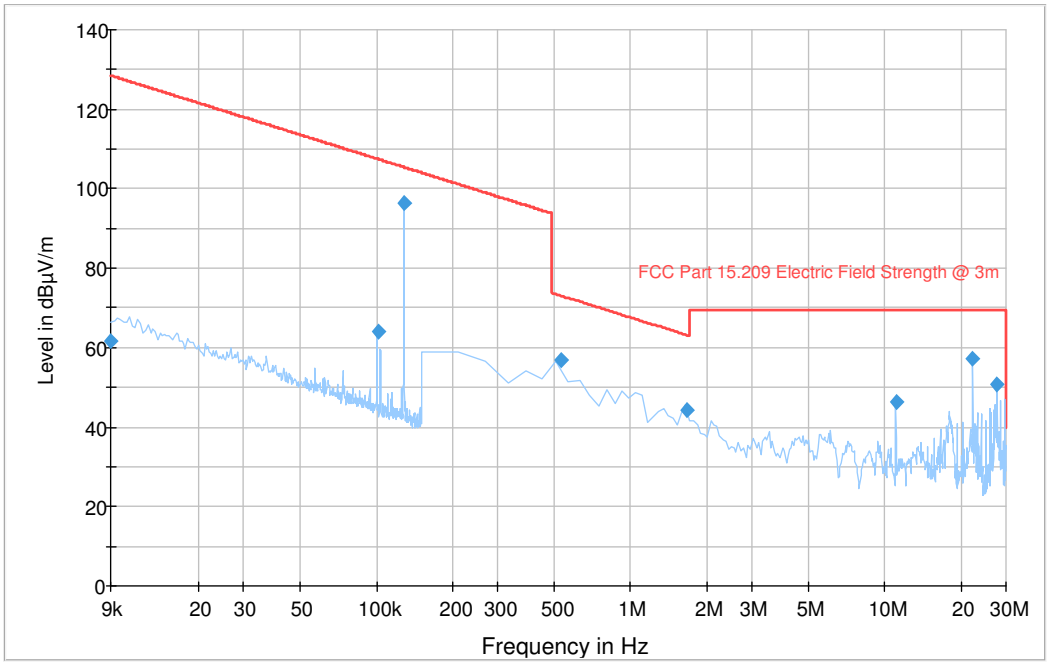
2.2.9 Sample Computation (Radiated Emission 30 MHz to 1 GHz)

Measuring equipment raw measurement (dBµV) @ 30 MHz			24.4
Correction Factor (dB)	Asset# 1026 (cable)	0.8	-7.0
	Asset# 1057 (cable)	0.2	
	Asset# 1016 (preamplifier)	-30.8	
	Asset# 8850 (cable)	0.2	
	Asset# 1033 (antenna)	17.2	
	Asset# 8771 (6-dB attenuator)	5.4	
Reported Quasi Peak Final Measurement (dBµV/m) @ 30MHz			**17.4**

2.2.10 Test Results

See attached plots.

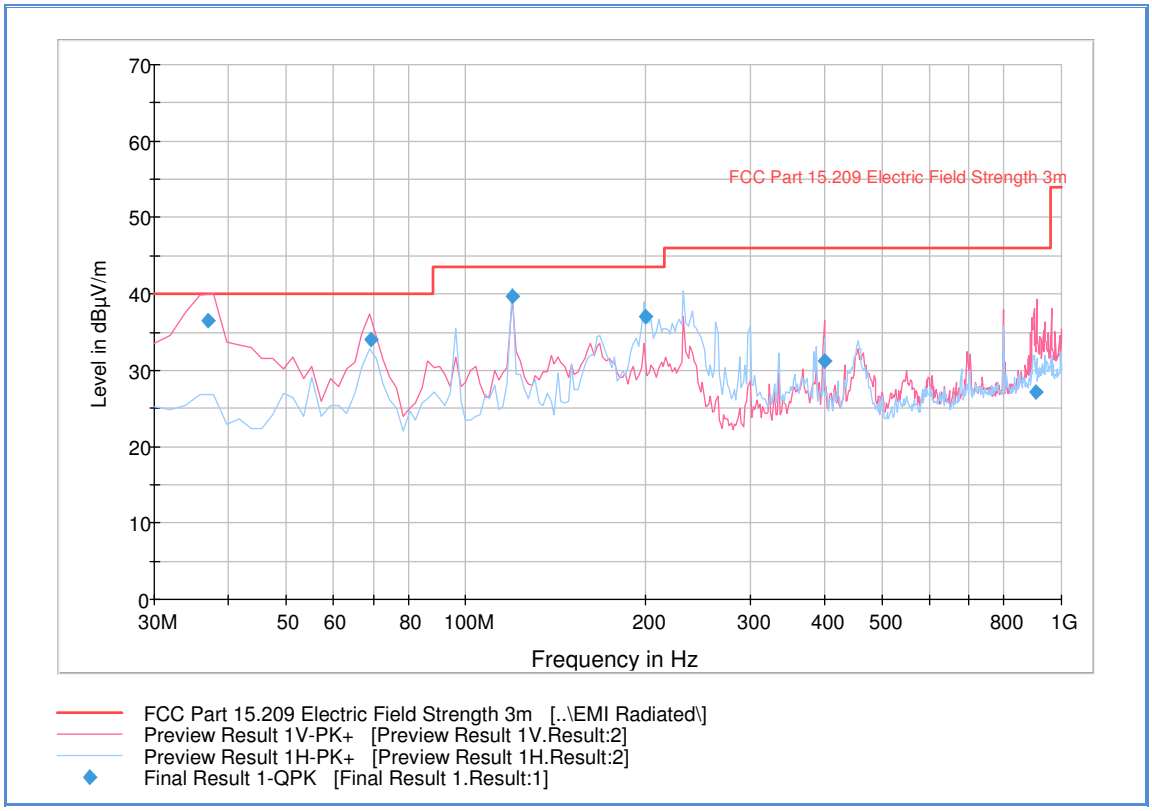
2.2.11 Test Results Below 30MHz



Quasi Peak Data (§15.209 Limits)

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
0.009000	61.5	1000.0	0.200	100.0	H	238.0	16.0	67.0	128.5
0.101269	63.9	1000.0	0.200	100.0	H	95.0	14.2	43.6	107.5
0.128242	96.5	1000.0	0.200	100.0	H	203.0	14.2	8.7	105.2
0.533918	56.8	1500.0	9.000	100.0	H	125.0	14.4	16.3	73.1
1.658491	44.4	1500.0	9.000	100.0	H	147.0	14.9	18.8	63.2
11.058174	46.4	1500.0	9.000	100.0	H	176.0	15.8	23.2	69.5
22.120627	57.3	1500.0	9.000	100.0	H	299.0	15.4	12.3	69.5
27.652034	50.8	1500.0	9.000	100.0	H	169.0	14.6	18.8	69.5

2.2.12 Test Results 30MHz to 1GHz



Quasi Peak Data (§15.209 Limits)

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
36.895551	36.5	1000.0	120.000	100.0	V	25.0	-10.8	3.5	40.0
69.157756	34.0	1000.0	120.000	100.0	V	235.0	-17.0	6.0	40.0
120.018838	39.6	1000.0	120.000	200.0	H	3.0	-15.8	3.9	43.5
199.998236	37.0	1000.0	120.000	100.0	H	76.0	-12.0	6.5	43.5
399.618677	31.2	1000.0	120.000	100.0	V	162.0	-4.3	14.8	46.0
908.157275	27.2	1000.0	120.000	139.0	V	47.0	5.8	18.8	46.0

2.3 TRANSMITTER FREQUENCY STABILITY

2.3.1 Specification Reference

RSS-Gen 8.11

2.3.2 Standard Applicable

Transmitter frequency stability for licence-exempt radio apparatus shall be measured in accordance with Section 6.11. For licence-exempt radio apparatus, the frequency stability shall be measured at temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F) instead of at the temperatures specified in Section 6.11.

If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable standard (RSS), measurement of the frequency stability is not required provided that the occupied bandwidth of the licence-exempt radio apparatus lies entirely outside the restricted bands and the prohibited TV bands of 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz.

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

September 25, 2017 / FSC

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

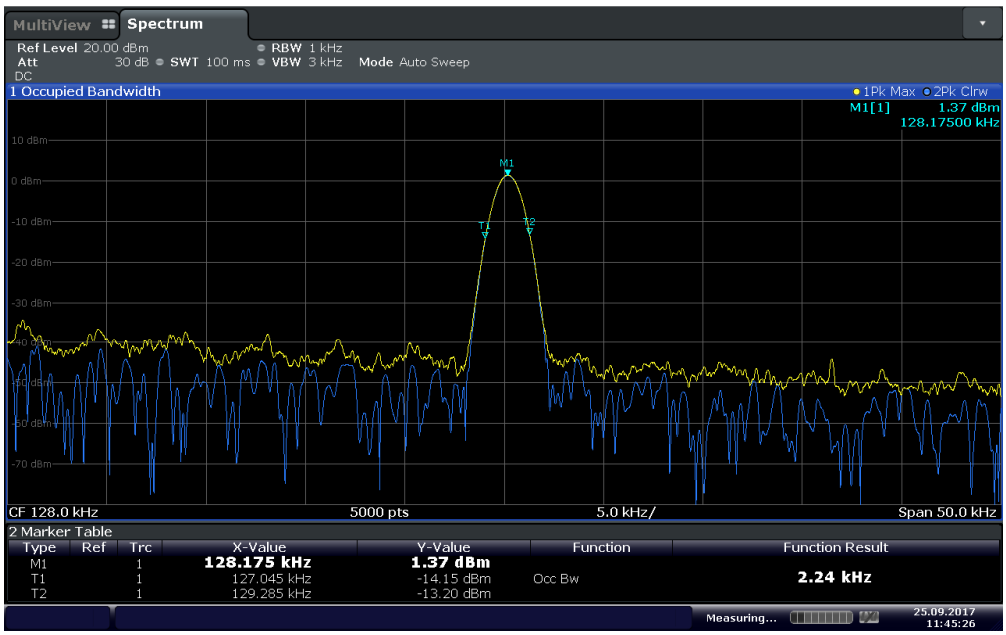
Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.2 °C
Relative Humidity	33.0 %
ATM Pressure	98.6 kPa

2.3.7 Test Results

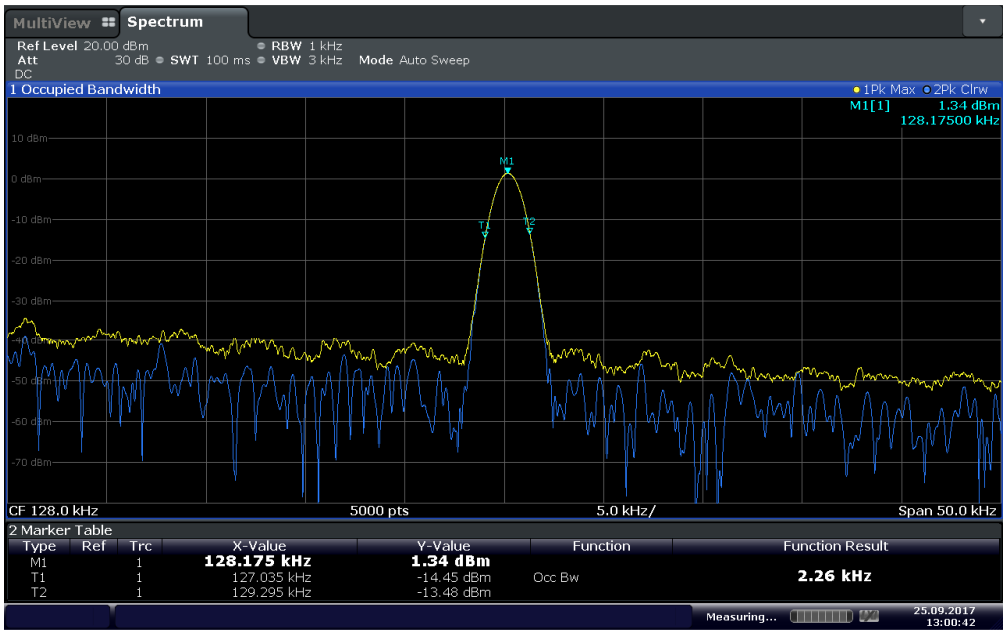
Complies. The fundamental frequency occupied bandwidth of EUT lies entirely outside the restricted band during the test.

2.3.8 Test Plots



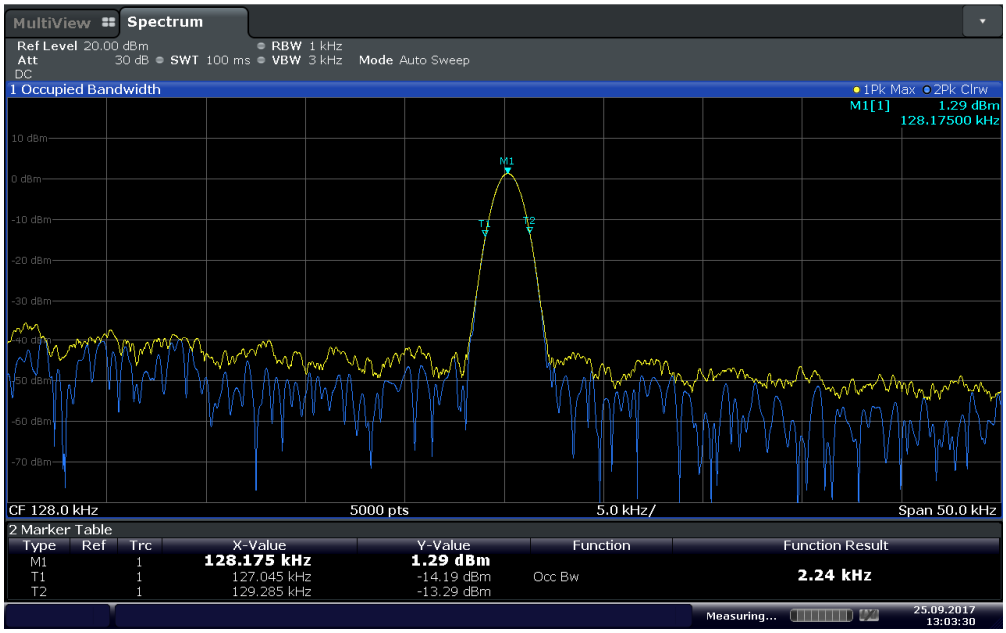
Date: 25.SEP.2017 11:45:26

Frequency Stability @ 50°C Nominal Voltage (12VDC)



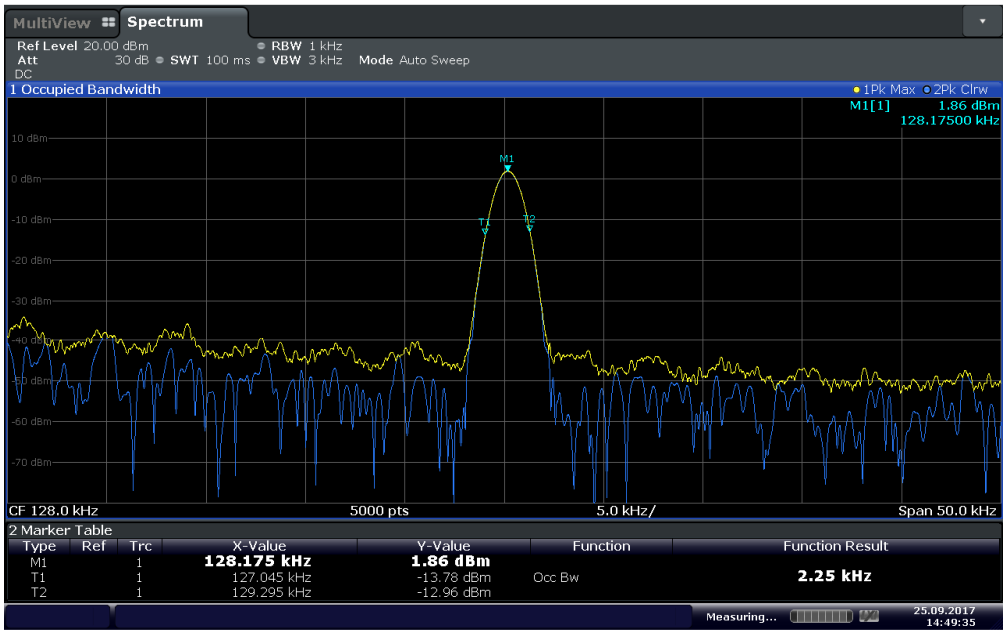
Date: 25.SEP.2017 13:00:43

Frequency Stability @ 20°C 13.8VDC



Date: 25.SEP.2017 13:03:30

Frequency Stability @ 20°C 10.2VDC



Date: 25.SEP.2017 14:49:35

Frequency Stability @ -20°C Nominal Voltage (12VDC)

2.4 CONDUCTED LIMITS

2.4.1 Specification Reference

Part 15 Subpart C §15.207(a) and RSS-Gen 8.8

2.4.2 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 µH/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dBµV)	
	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.*

2.4.3 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

September 25, 2017 / FSC

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	25.2 °C
Relative Humidity	33.0 %
ATM Pressure	98.6 kPa

2.4.1 Additional Observations

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 2.4.2 for sample computation.

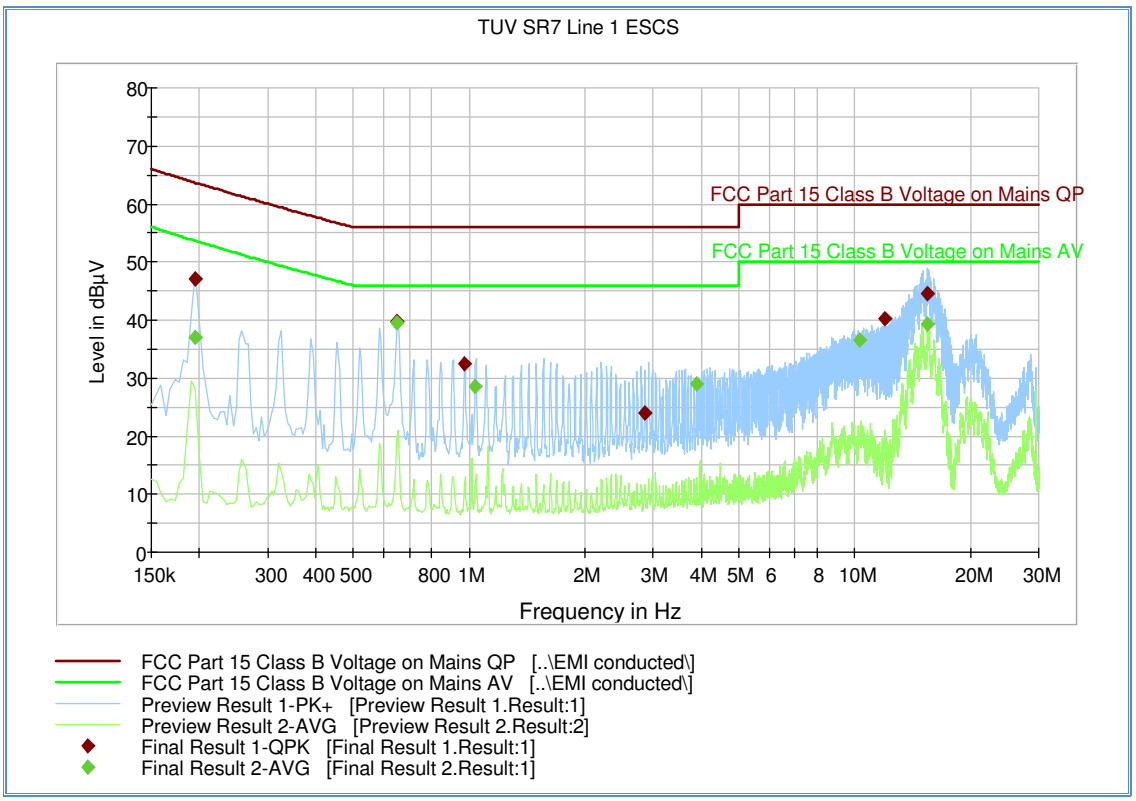
2.4.2 Sample Computation (Conducted Emission – Quasi Peak)

Measuring equipment raw measurement (dBµV) @ 150kHz			5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9	20.7
	Asset# 1177 (cable)	0.15	
	Asset# 1176 (cable)	0.35	
	Asset# 7568 (LISN)	0.30	
Reported Quasi Peak Final Measurement (dBµV) @ 150kHz			**26.2**

2.4.3 Test Results

Compliant. See attached plots and tables.

2.4.4 120VAC 60Hz (Line 1)



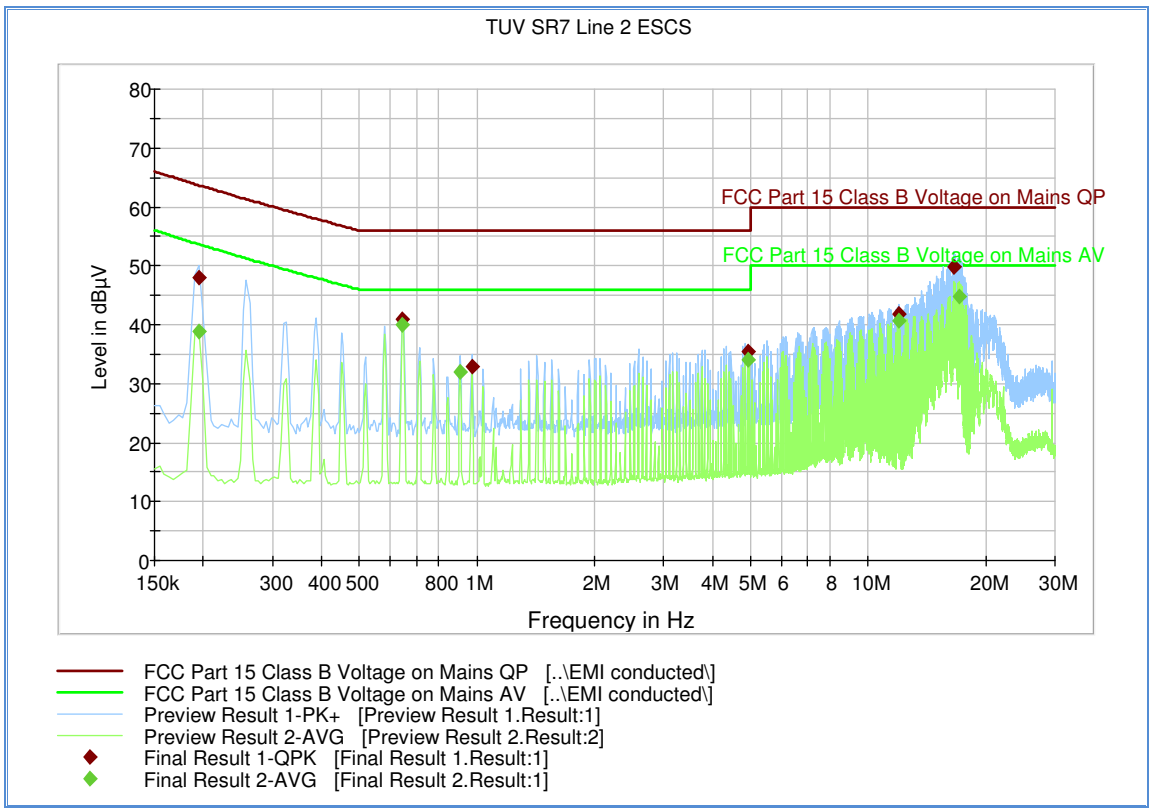
Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.195000	47.2	1000.0	9.000	Off	L1	19.9	16.5	63.7
0.649500	39.9	1000.0	9.000	Off	L1	20.0	16.1	56.0
0.969000	32.5	1000.0	9.000	Off	L1	20.0	23.5	56.0
2.845500	24.0	1000.0	9.000	Off	L1	20.3	32.0	56.0
11.976000	40.2	1000.0	9.000	Off	L1	20.5	19.8	60.0
15.472500	44.7	1000.0	9.000	Off	L1	20.6	15.3	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.195000	37.0	1000.0	9.000	Off	L1	19.9	16.6	53.7
0.649500	39.5	1000.0	9.000	Off	L1	20.0	6.5	46.0
1.036500	28.5	1000.0	9.000	Off	L1	19.9	17.5	46.0
3.885000	29.1	1000.0	9.000	Off	L1	20.3	16.9	46.0
10.293000	36.5	1000.0	9.000	Off	L1	20.4	13.5	50.0
15.477000	39.3	1000.0	9.000	Off	L1	20.6	10.7	50.0

2.4.5 120VAC 60Hz (Line 2)



Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.195000	48.0	1000.0	9.000	Off	N	19.9	15.7	63.7
0.645000	41.0	1000.0	9.000	Off	N	20.0	15.0	56.0
0.969000	33.0	1000.0	9.000	Off	N	20.0	23.0	56.0
4.920000	35.4	1000.0	9.000	Off	N	20.4	20.6	56.0
11.976000	41.8	1000.0	9.000	Off	N	20.6	18.2	60.0
16.575000	49.8	1000.0	9.000	Off	N	20.6	10.2	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.195000	38.8	1000.0	9.000	Off	N	19.9	14.8	53.7
0.645000	40.0	1000.0	9.000	Off	N	20.0	6.0	46.0
0.906000	31.9	1000.0	9.000	Off	N	20.1	14.1	46.0
4.920000	34.1	1000.0	9.000	Off	N	20.4	11.9	46.0
11.976000	40.7	1000.0	9.000	Off	N	20.6	9.3	50.0
17.155500	44.8	1000.0	9.000	Off	N	20.7	5.2	50.0

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
Conducted Emissions						
1024	EMI Test Receiver	ESCS 30	847793/001	Rhode & Schwarz	09/15/17	09/15/18
7567	LISN	FCC-LISN-50-25-2-10	120304	Fischer Custom Comm.	11/05/16	11/05/17
7568	LISN	FCC-LISN-50-25-2-10	120305	Fischer Custom Comm.	11/05/16	11/05/17
8822	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	Verified by 7582 and 7608	
8824	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	Verified by 7582 and 7608	
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	10/26/16	10/26/17
7608	Vector Signal Generator	SMBV100A	259021	Rhode & Schwarz	09/19/17	09/19/19
Radiated Emission						
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	10/26/16	10/26/17
7640	Loop Antenna	AL-130R	121086	Com-Power	11/21/16	11/21/17
1033	Bilog Antenna	3142C	00044556	EMCO	10/11/16	10/11/18
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	10/07/16	10/07/17
1016	Pre-amplifier	PAM-0202	187	PAM	02/09/17	02/09/18
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	10/26/16	10/26/17
Miscellaneous						
6708	Multimeter	34401A	US36086974	Hewlett Packard	07/05/17	07/05/18
7579	Temperature Chamber	115	151617	TestQuity	08/22/17	08/22/18
7554	Barometer/Temperature/Humidity Transmitter	iBTHX-W	0400706	Omega	01/17/17	01/17/18
-	DC Power Supply	6015A	3044A-00106	Hewlett Packard	Verified by 6708	
-	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 30MHz)

	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
4	Loop Antenna	Rectangular	0.75	0.44	0.19
5	Site	Triangular	3.52	1.44	2.07
6	EUT Setup	Rectangular	1.00	0.58	0.33
				Combined Uncertainty (u_c):	1.66
				Coverage Factor (k):	2
				Expanded Uncertainty:	3.31

3.2.2 Radiated Measurements (30 MHz to 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	Triangular	3.52	1.44	2.07
6	EUT Setup	Rectangular	1.00	0.58	0.33
				Combined Uncertainty (u_c):	1.68
				Coverage Factor (k):	2
				Expanded Uncertainty:	3.36

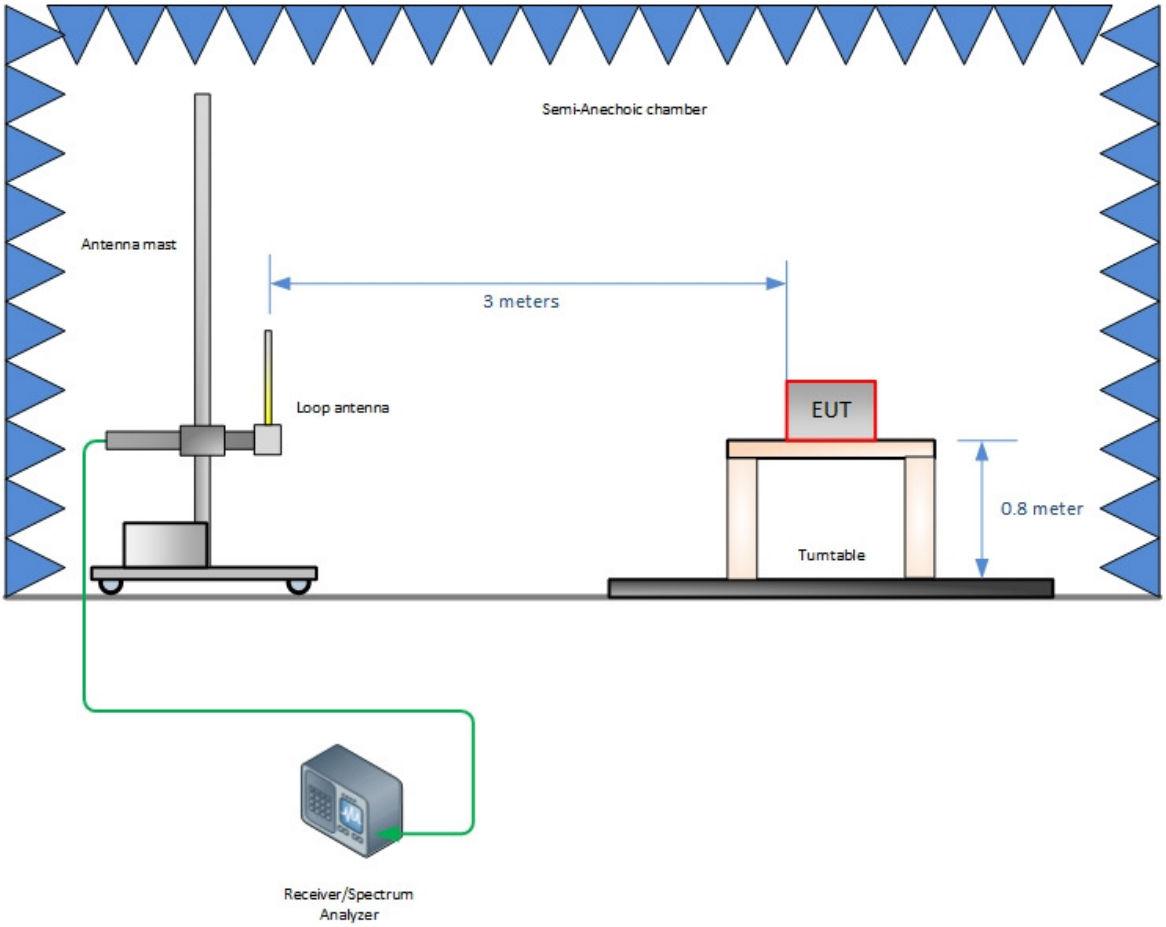
3.2.1 AC Conducted Emissions

	Contribution	Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.36	0.21	0.04
2	Cables	Rectangular	0.50	0.29	0.08
3	LISN	Rectangular	0.66	0.38	0.15
4	Attenuator	Rectangular	0.30	0.17	0.03
5	EUT Setup	Rectangular	1.00	0.58	0.33
				Combined Uncertainty (u_c):	0.80
				Coverage Factor (k):	2
				Expanded Uncertainty:	1.59

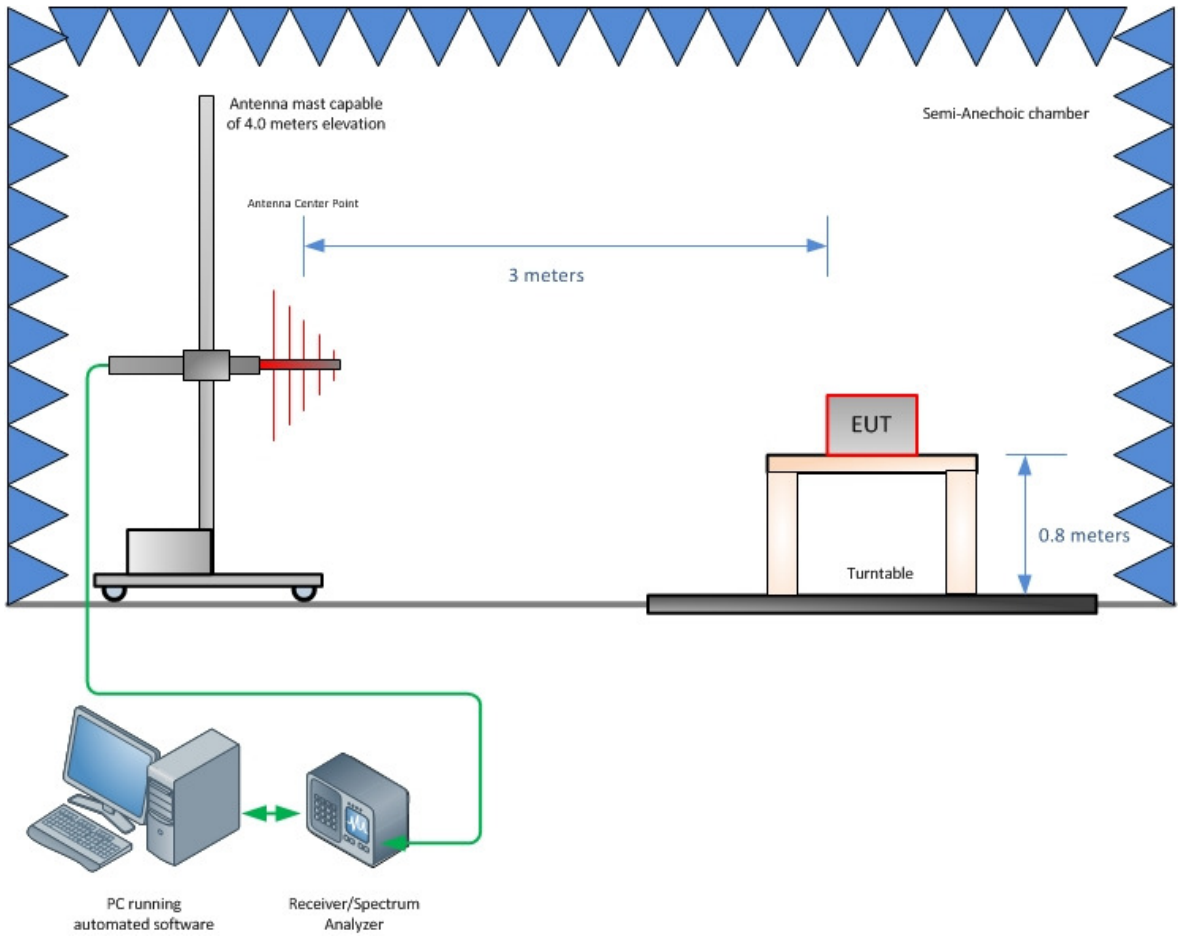
SECTION 4

DIAGRAM OF TEST SETUP

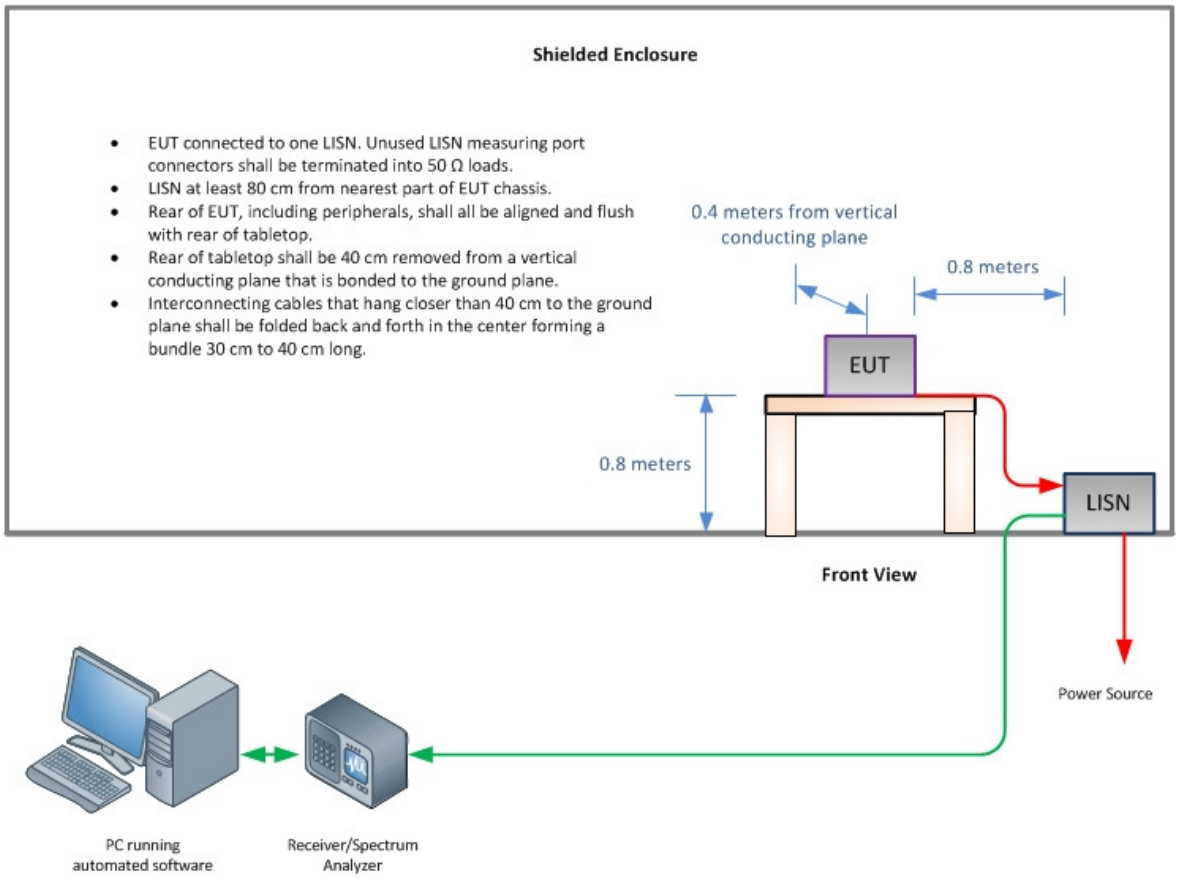
4.1 TEST SETUP DIAGRAM



Radiated Emission Test Setup (Below 30MHz)



Radiated Emission Test Setup (Below 1GHz)



Conducted Emission Test Setup

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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