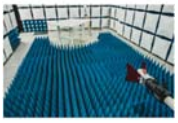
PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



MEASUREMENT REPORT
FCC Part 15B

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
10/31/2018-1/09/2019
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M181025019712.A3L

FCC ID:	**A3LSMG975U**
APPLICANT:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SM-G975U
Additional Model(s):	SM-G975U1, SM-G975W, SM-G975XU
EUT Type:	Portable Handset
FCC Classification:	Part 15 Class B Computing Device Peripheral (JBP)
FCC Rule Part(s):	FCC Part 15 Subpart B
Test Procedure(s):	ANSI C63.4-2014

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2014 (See Test Report). These measurements were performed with no deviation from the standards. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
TESTING CERT#2041.01

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

TABLE OF CONTENTS

1.0 INTRODUCTION 3
- 1.1 Scope 3
- 1.2 PCTEST Test Location 3
- 1.3 Test Facility / Accreditations 3

2.0 PRODUCT INFORMATION 4
- 2.1 Equipment Description 4
- 2.2 Device Capabilities 4
- 2.3 Test Configuration 4
- 2.4 EMI Suppression Device(s)/Modifications 4

3.0 DESCRIPTION OF TESTS 5
- 3.1 Evaluation Procedure 5
- 3.2 AC Line Conducted Emissions 5
- 3.3 Radiated Emissions 6
- 3.4 Environmental Conditions 6

4.0 SAMPLE CALCULATIONS 7
- 4.1 Conducted Emission Measurement Sample Calculation 7
- 4.2 Radiated Emission Measurement Sample Calculation 7

5.0 MEASUREMENT UNCERTAINTY 8

6.0 TEST EQUIPMENT CALIBRATION DATA 9

7.0 TEST DATA 10
- 7.1 Summary 10
- 7.2 Test Support Equipment 11
- 7.3 Radiated Measurement Data 12
- 7.4 Line Conducted Measurement Data 14

8.0 CONCLUSION 31

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG975U**. The test data contained in this report pertains only to the emissions due to the digital circuitry of the EUT.

Test Device Serial No.: 0505M, 0753M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, ANT+

2.3 Test Configuration

The EUT was tested with a laptop PC connected via USB interface port. The EUT was exercised during testing by means of software installed on the PC. Since the EUT is a peripheral device, the host PC was populated with another USB device and an additional peripheral device with a non-USB interface, as shown in Table 7-2, thus satisfying the minimum system requirement of two different I/O interfaces. All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

For more information please see Section 7.0 for test data and the test setup photos document for the test setup photographs.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2014) was used in the measurement of the EUT.

Deviation from measurement procedure…….....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.4. Automated test software was used to perform the AC line conducted emissions testing.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2014. A raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. . An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

4.0 SAMPLE CALCULATIONS

4.1 Conducted Emission Measurement Sample Calculation

@ 20.3 MHz

Class B limit	**=**	**60.0 dBμV (Quasi-peak limit)**
Reading	=	- 57.8 dBm (calibrated quasi-peak level)
Convert to dBμV	=	- 57.8 + 107 = 49.2 dBμV
Margin	=	49.2 - 60.0 = - 10.8 dB
	=	**10.8 dB below limit**

4.2 Radiated Emission Measurement Sample Calculation

@ 66.7 MHz

Class B limit	**=**	**100 μV/m = 40.0 dBμV/m**
Reading	=	- 76.0 dBm (calibrated level)
Convert to dBμV	=	- 76.0 + 107 = 31.0 dBμV
Antenna Factor + Cable Loss	=	5.8 dB/m
Total	=	36.8 dBμV/m
Margin	=	36.8 - 40.0 = - 3.2 dB
	=	**3.2 dB below limit**

Note:

Level [dBμV] = 20 log $_{10}$ (Level [μV/m])

Level [dBμV] = Level [dBm] + 107

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9038A	MXE EMI Receiver	6/11/2018	Annual	6/11/2019	MY51210133
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	6/18/2018	Biennial	6/18/2020	114451
Rohde & Schwarz	CMU200	Base Station Simulator	5/18/2018	Annual	5/18/2019	109892
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.0 TEST DATA

7.1 Summary

Test Date(s): 10/31/2018-1/09/2019

Test Engineer:

FCC Part 15 Section	Description	Result
15.107	Conducted Emissions	PASS
15.109	Radiated Emissions	PASS

Table 7-1. Summary of Test Results

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.2 Test Support Equipment

Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A
Samsung EVO SD Card	Model:	N/A	S/N:	N/A
Dell Laptop	Model:	Latitude E5570	S/N:	H6TYTF2
Dell AC Adapter	Model:	HA65NM130	S/N:	N/A
CISCO Router	Model:	Linksys E900	S/N:	12310C65201062

Table 7-2. Test Support Equipment Used

Case 1				
Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A
Dell Laptop	Model:	Latitude E5570	S/N:	H6TYTF2
Dell AC Adapter	Model:	HA65NM130	S/N:	N/A
CISCO Router	Model:	Linksys E900	S/N:	12310C65201062
Case 2				
Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A
Samsung Earphone	Model:	N/A	S/N:	N/A
Case 3				
Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A
Samsung Earphone	Model:	N/A	S/N:	N/A
AudioQuest Caebon OTG Adapter	Model:	N/A	S/N:	N/A
Tecknet Mouse	Model:	UM013	S/N:	MGQ398
Case 4				
Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A
Samsung Earphone	Model:	N/A	S/N:	N/A
Case 5				
Samsung Travel Adapter	Model:	EP-TA200	S/N:	R37K6PAALY1DK3
Samsung USB Cable	Model:	N/A	S/N:	N/A

Table 7-3. Test Support Equipment Used (Radiated and Conducted)

Note: See test configuration in each test section for actual configuration. See test setup photographs for actual system test setup.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.3 Radiated Measurement Data

§15.109

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.105 of the Title 47 CFR must not exceed the limits shown in Table 7-4 per Section 15.109.

Frequency [MHz]	Field Strength Limit [μV/m]
30 – 88	100
88 – 216	150
216 – 960	200
> 960	500

Table 7-4. 3-Meter Radiated Limits (Section 15.109)

Test Procedures Used

ANSI C63.4-2014

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
2. RBW = 100kHz, VBW = 300kHz (for emissions between 30MHz – 1GHz)
3. RBW = 1MHz, VBW = 3MHz (for emissions above 1GHz)
4. Detector = Quasi-peak (for emissions between 30MHz – 1GHz)
5. Detector = Peak (for emissions above 1GHz)
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown test setup photos provided.

Test Configuration

1. Camera (rear) + Charging (w/ TA) + FM (Low Ch.)
2. Camera (front) + USB OTG (w/ USB gender: mouse or keyboard) + FM (Mid Ch.)
3. Wired LAN (w/ USB to LAN converter) + FM (High Ch.)
4. Video + Audio playback from Internal memory data + Display out (w/ USB to HDMI converter)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

5. USB Data Communication with PC (from external memory data)

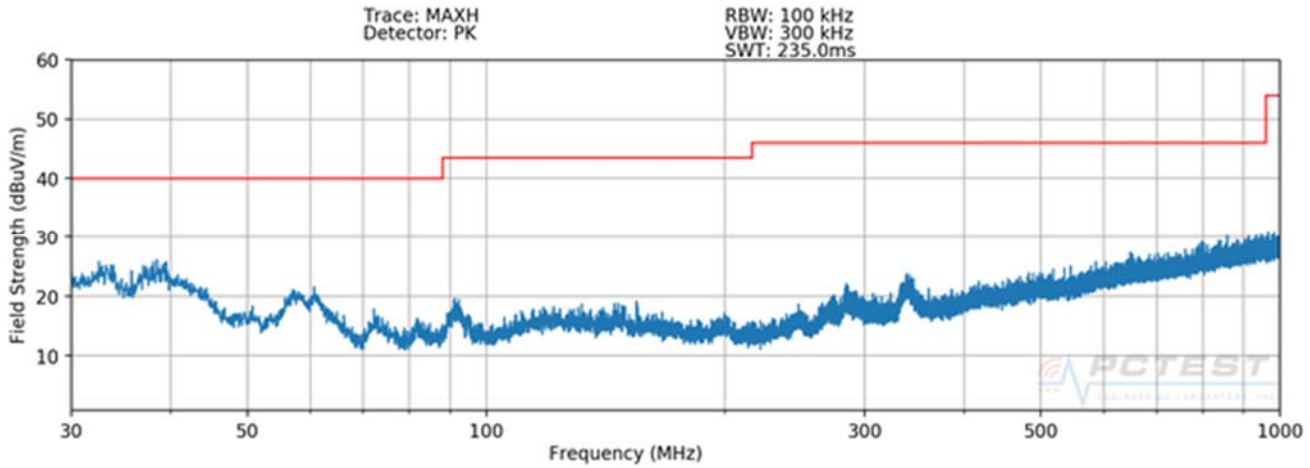
Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported.
2. Radiated emissions were measured from 30MHz – 30GHz to ensure that the provisions of 15.33(b)(1) are satisfied with respect to the upper frequency scanning range.
3. The radiated limits for unintentional radiators at a distance of 3 meters are used in the table above, as specified in 15.109(a).
4. All readings are calibrated by a signal generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
5. AFCL (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
6. Level (dBμV/m) = Analyzer Reading (dBm) + AFCL (dB/m) + 107
7. Margin (dB) = Field strength (dBμV/m) – Limit (dBμV/m)
8. Measurements are made using a CISPR quasi-peak detector with a 120kHz resolution bandwidth. Above 1GHz, peak measurements are made using a peak detector with a resolution bandwidth of 1MHz and a video bandwidth of 3MHz and average measurements are made with a RMS detector using a resolution bandwidth of 1MHz and a video bandwidth of 3MHz.
9. Calibrated linearly polarized broadband and horn antennas were used for measurements below and above 1GHz, respectively. For measurements made below 1GHz, the results recorded using the broadband antenna are known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antennas was found to be less than 2:1.
10. Calibrated low-loss microwaves cables and broadband amplifiers are used.

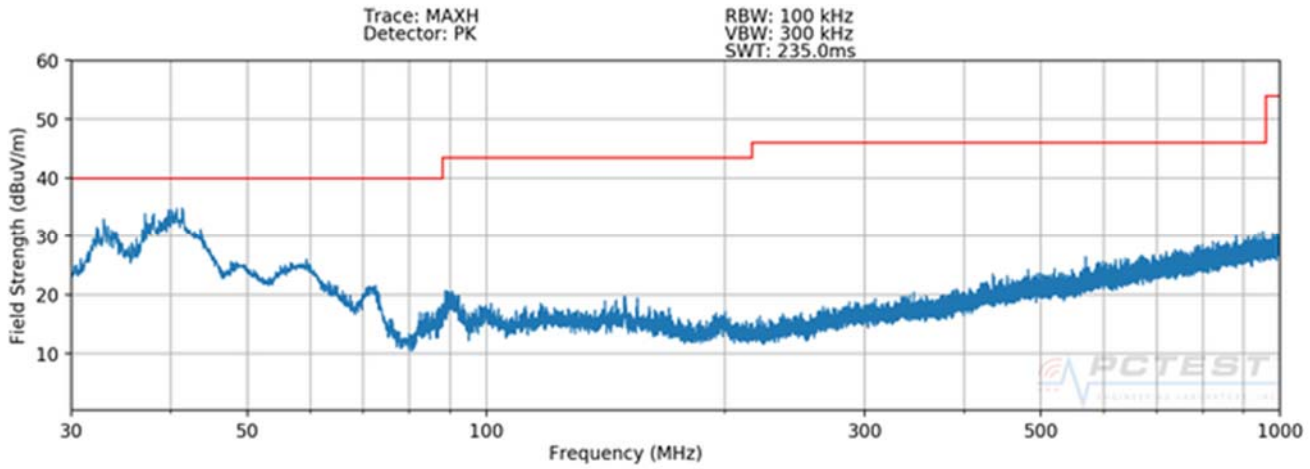
© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

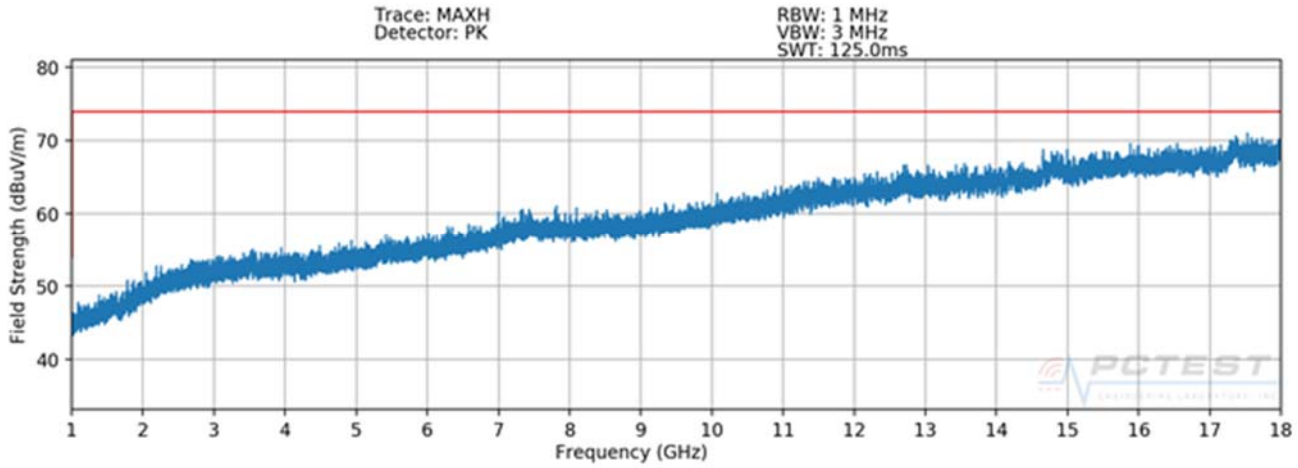
Configuration 1



Plot 7-1. Radiated Spurious Plot below 1GHz (Configuration 1 - H)



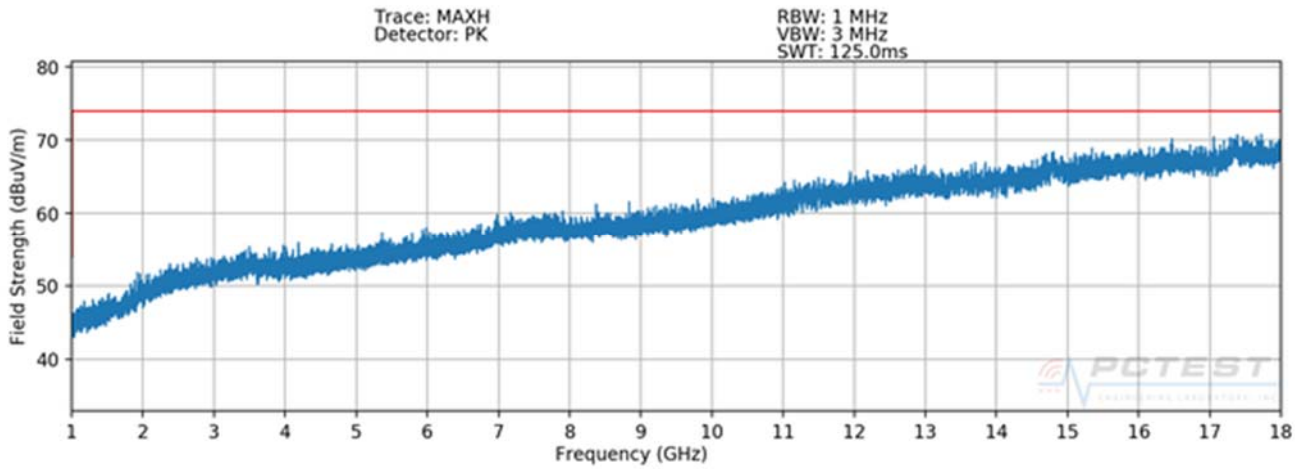
Plot 7-2. Radiated Spurious Plot below 1GHz (Configuration 1 - V)



Plot 7-3. Radiated Spurious Plot above 1GHz (Configuration 1 - H)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



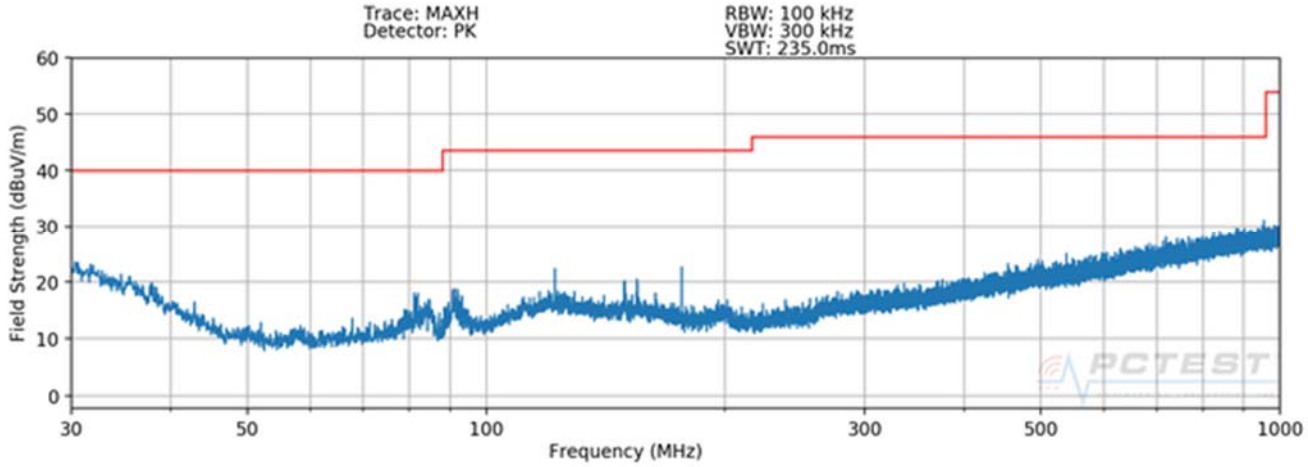
Plot 7-4. Radiated Spurious Plot above 1GHz (Configuration 1 - V)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
36.88	Quasi-Peak	V	225	167	-63.44	-12.83	30.73	40.00	-9.27
37.34	Quasi-Peak	V	250	55	-64.99	-13.27	28.74	40.00	-11.26
41.04	Quasi-Peak	V	197	224	-69.30	-16.34	21.36	40.00	-18.64
143.88	Quasi-Peak	V	250	142	-75.17	-16.43	15.40	43.52	-28.12
149.47	Quasi-Peak	V	210	17	-67.35	-16.43	23.22	43.52	-20.30
566.23	Quasi-Peak	V	150	10	-78.94	-8.28	19.78	46.02	-26.24

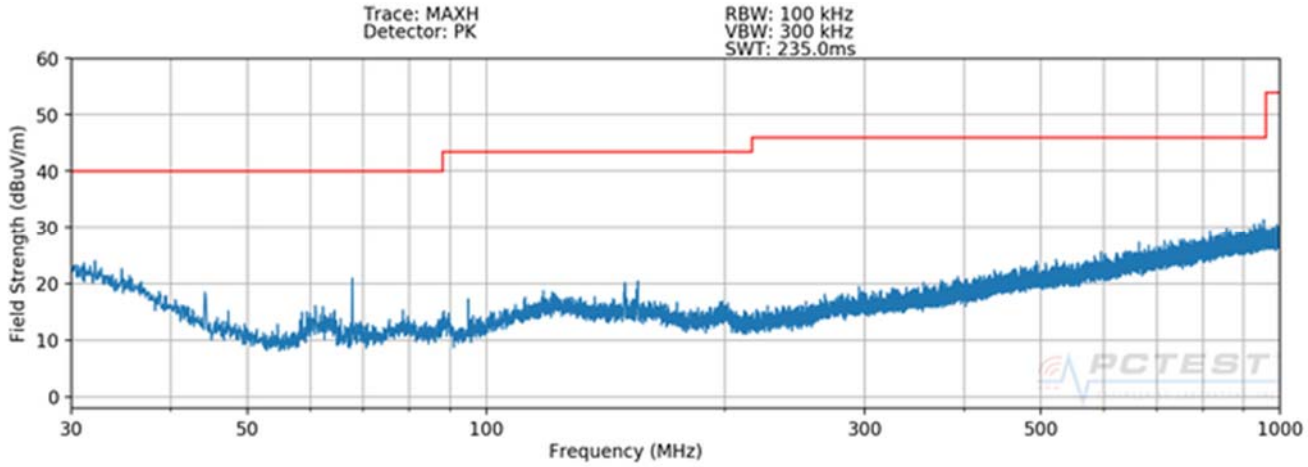
Table 7-5. Radiated Measurements at 3-meters (Configuration 1)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

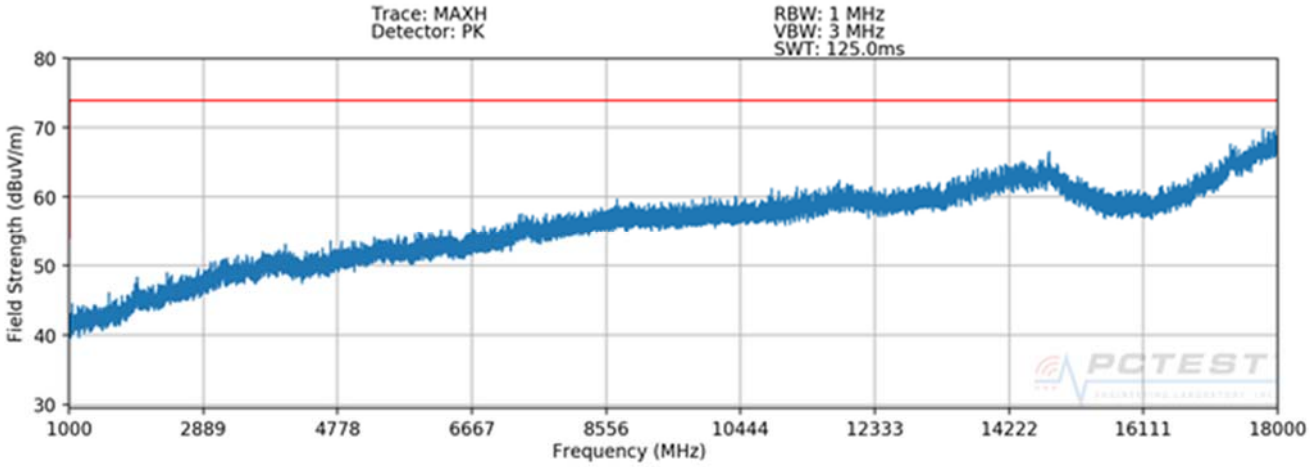
Configuration 2



Plot 7-5. Radiated Spurious Plot below 1GHz (Configuration 2 - H)

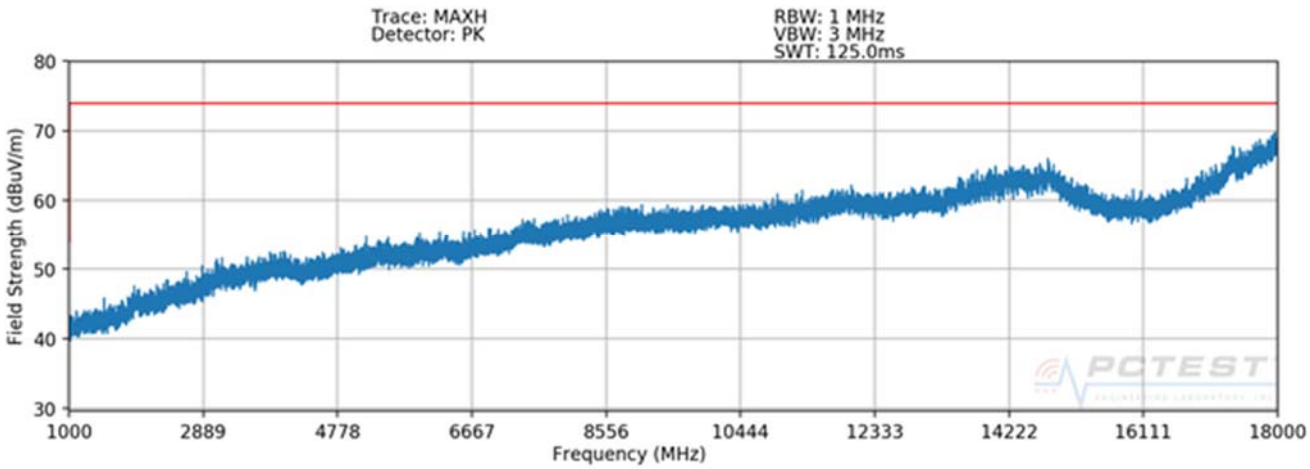


Plot 7-6. Radiated Spurious Plot below 1GHz (Configuration 2 - V)



Plot 7-7. Radiated Spurious Plot above 1GHz (Configuration 2 - H)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



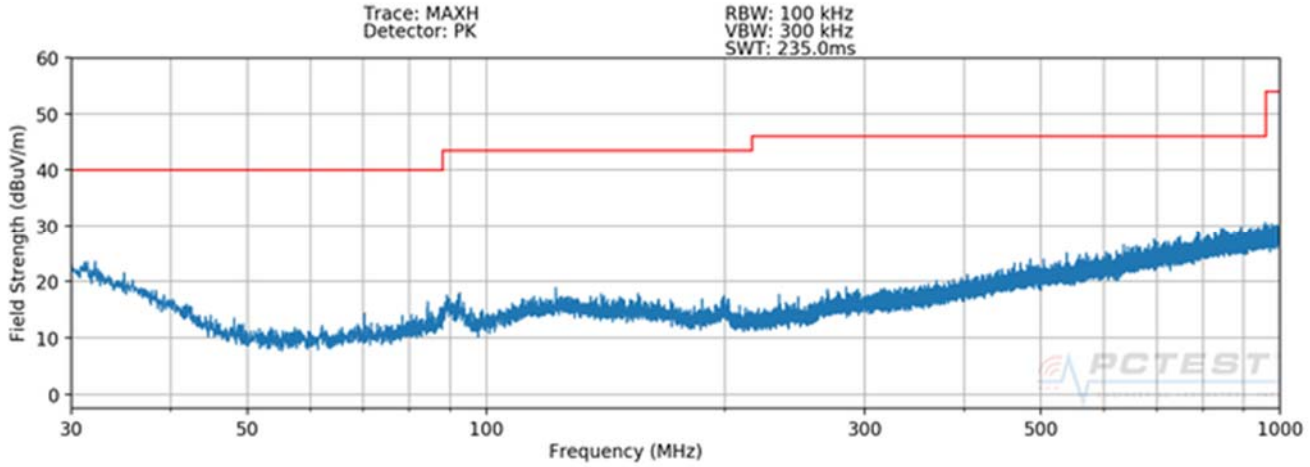
Plot 7-8. Radiated Spurious Plot above 1GHz (Configuration 2 - V)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
41.31	Quasi-Peak	V	250	0	-73.47	-16.57	16.96	40.00	-23.04
67.98	Quasi-Peak	V	250	45	-67.50	-21.03	18.47	40.00	-21.53
93.56	Quasi-Peak	V	225	110	-71.40	-20.51	15.09	43.52	-28.43
98.29	Quasi-Peak	H	197	180	-66.70	-19.28	21.02	43.52	-22.50
158.95	Quasi-Peak	V	243	165	-69.50	-16.26	21.24	43.52	-22.29
202.26	Quasi-Peak	H	197	264	-69.20	-16.86	20.94	43.52	-22.58

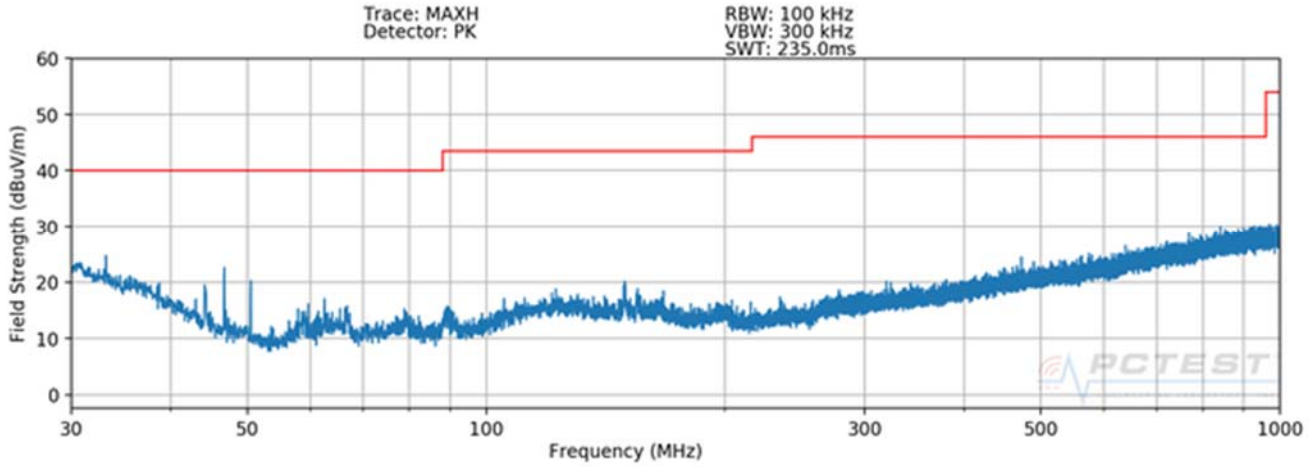
Table 7-6. Radiated Measurements at 3-meters (Configuration 2)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

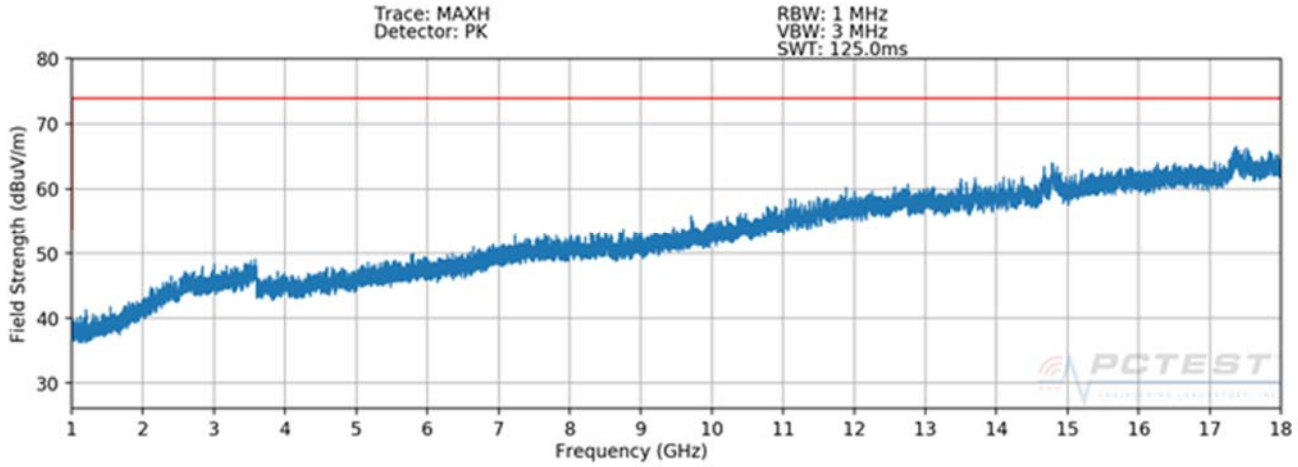
Configuration 3



Plot 7-9. Radiated Spurious Plot below 1GHz (Configuration 3 - H)

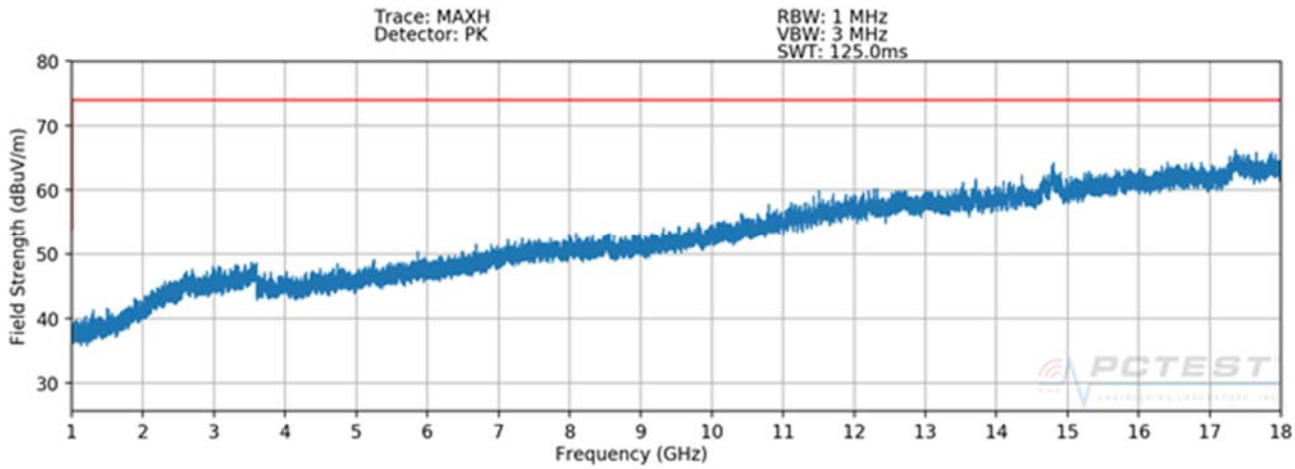


Plot 7-10. Radiated Spurious Plot below 1GHz (Configuration 3 - V)



Plot 7-11. Radiated Spurious Plot above 1GHz (Configuration 3 - H)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



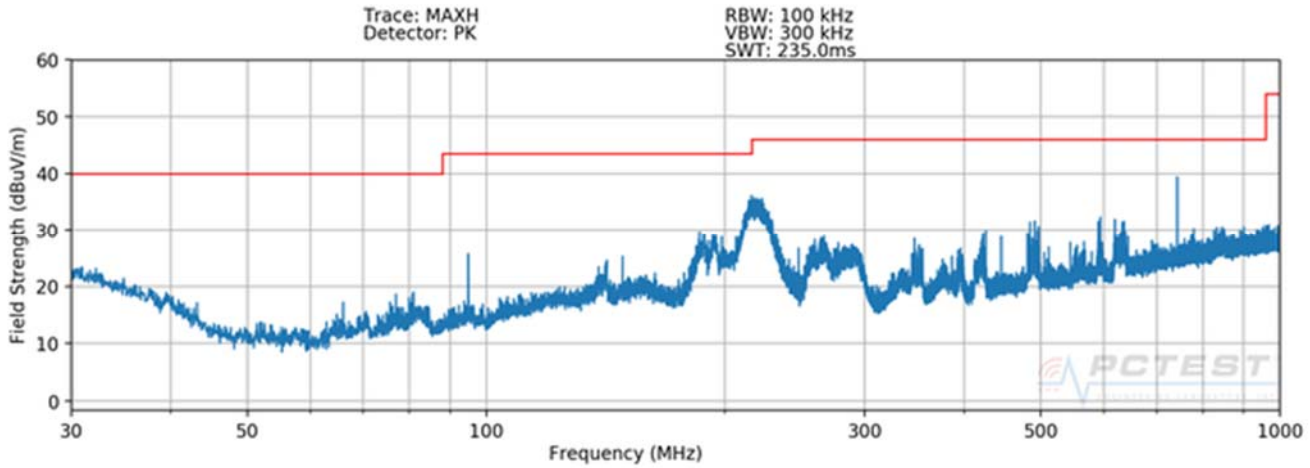
Plot 7-12. Radiated Spurious Plot above 1GHz (Configuration 3 - V)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
34.97	Quasi-Peak	V	374	268	-72.10	-11.69	23.21	40.00	-16.79
44.38	Quasi-Peak	V	200	77	-71.64	-18.69	16.67	40.00	-23.33
45.88	Quasi-Peak	V	181	200	-67.19	-19.60	20.21	40.00	-19.79
50.78	Quasi-Peak	V	176	352	-68.60	-21.32	17.08	40.00	-22.92
149.75	Quasi-Peak	V	215	43	-69.60	-16.43	20.97	43.52	-22.55

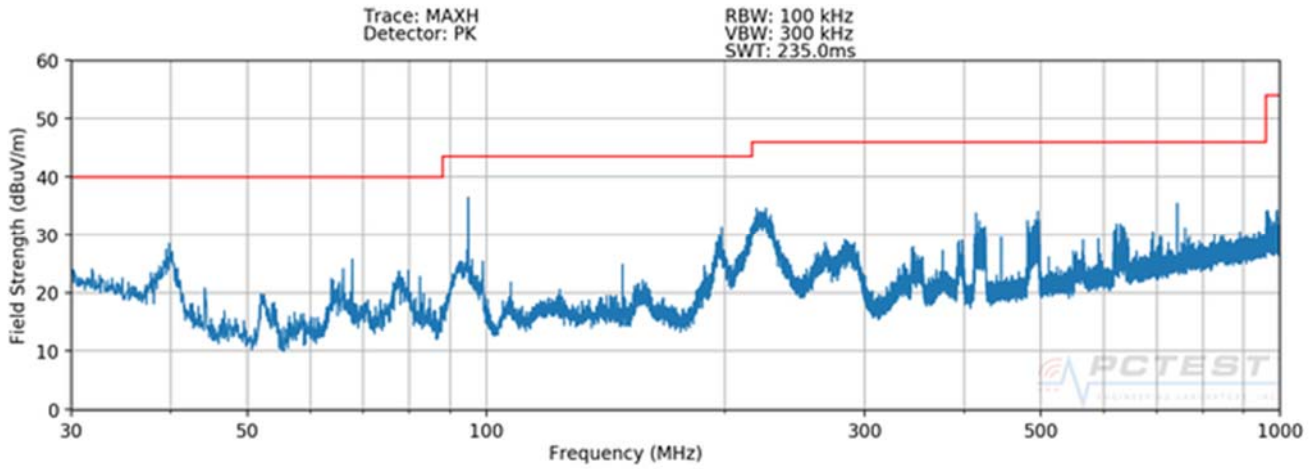
Table 7-7. Radiated Measurements at 3-meters (Configuration 3)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

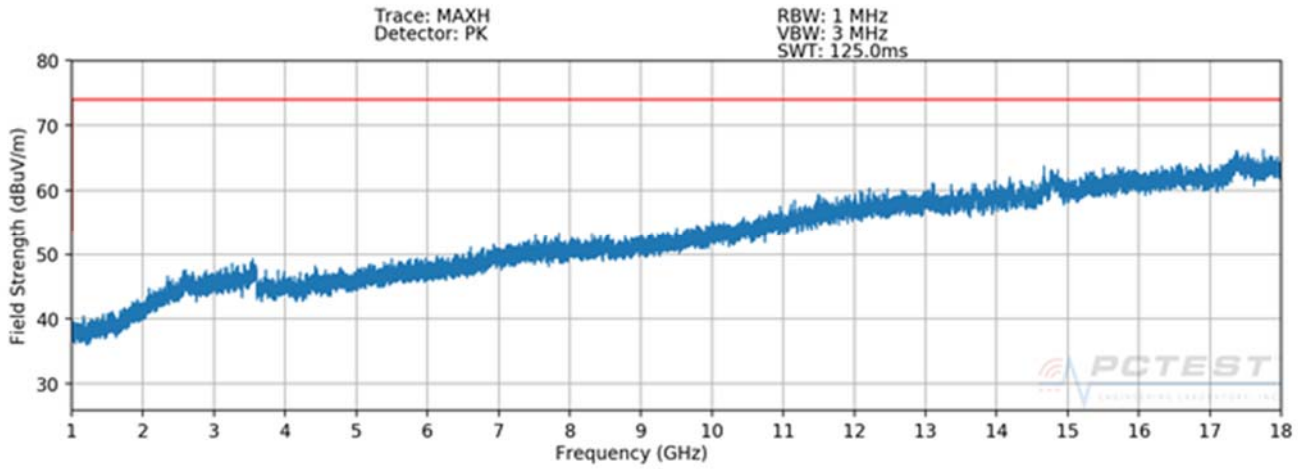
Configuration 4



Plot 7-13. Radiated Spurious Plot below 1GHz (Configuration 4 - H)

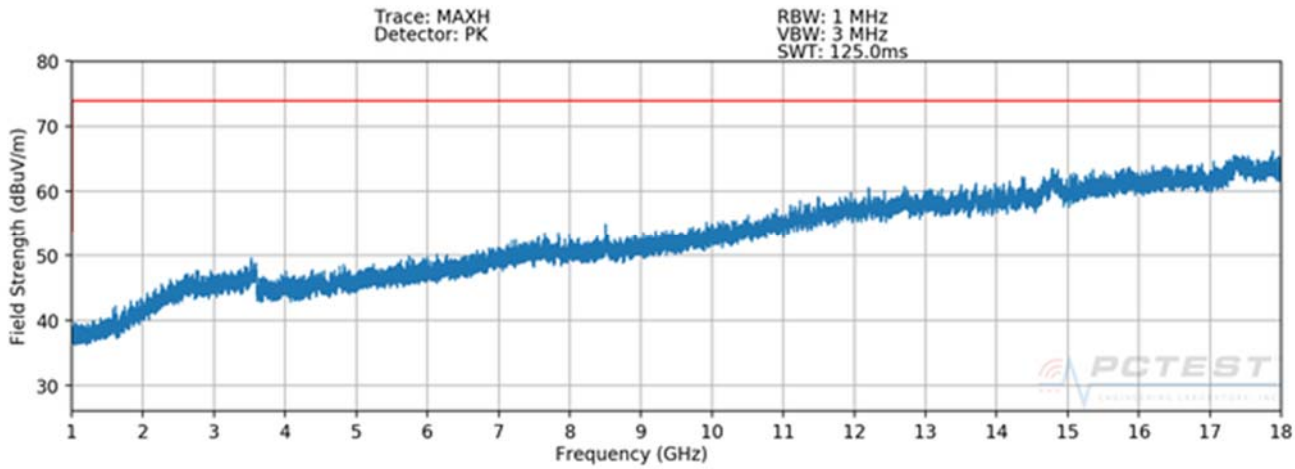


Plot 7-14. Radiated Spurious Plot below 1GHz (Configuration 4 - V)



Plot 7-15. Radiated Spurious Plot above 1GHz (Configuration 4 - H)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



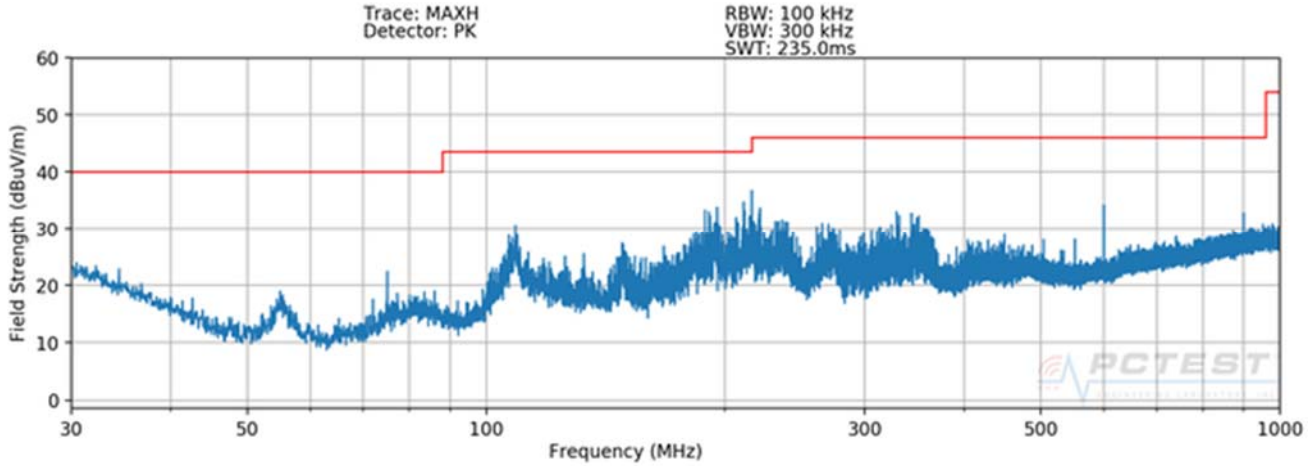
Plot 7-16. Radiated Spurious Plot above 1GHz (Configuration 4 - V)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
40.00	Quasi-Peak	V	250	110	-66.99	-15.49	24.52	40.00	-15.48
77.40	Quasi-Peak	V	250	300	-73.71	-21.14	12.15	40.00	-27.85
91.85	Quasi-Peak	V	250	115	-54.42	-20.91	31.67	43.52	-11.85
220.00	Quasi-Peak	V	250	225	-65.13	-17.89	23.98	46.02	-22.04
495.40	Quasi-Peak	V	250	332	-72.10	-9.55	25.35	46.02	-20.67
742.50	Quasi-Peak	H	250	234	-74.20	-4.35	28.45	46.02	-17.58

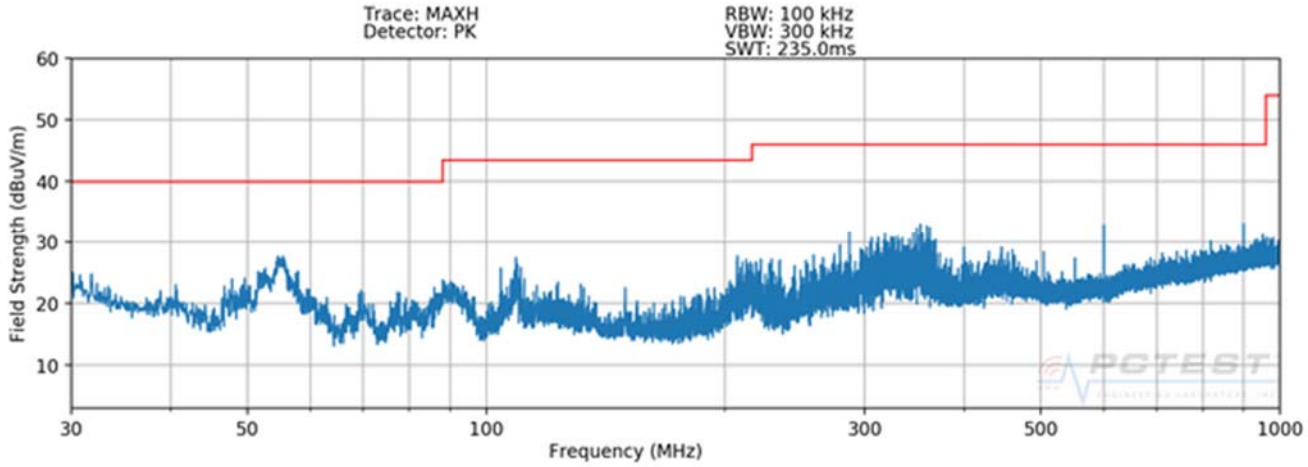
Table 7-8. Radiated Measurements at 3-meters (Configuration 4)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

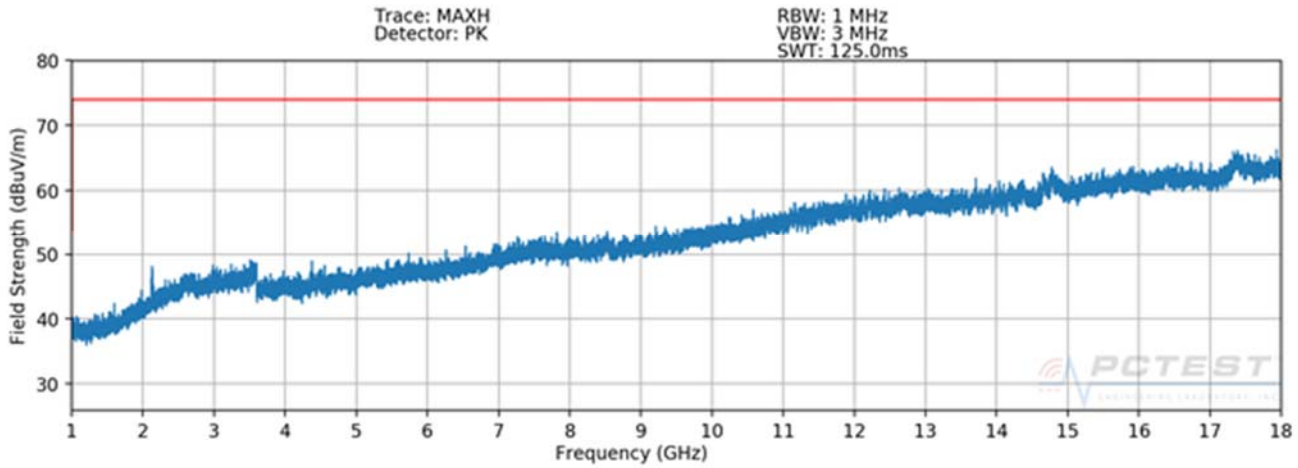
Configuration 5



Plot 7-17. Radiated Spurious Plot below 1GHz (Configuration 5 - H)

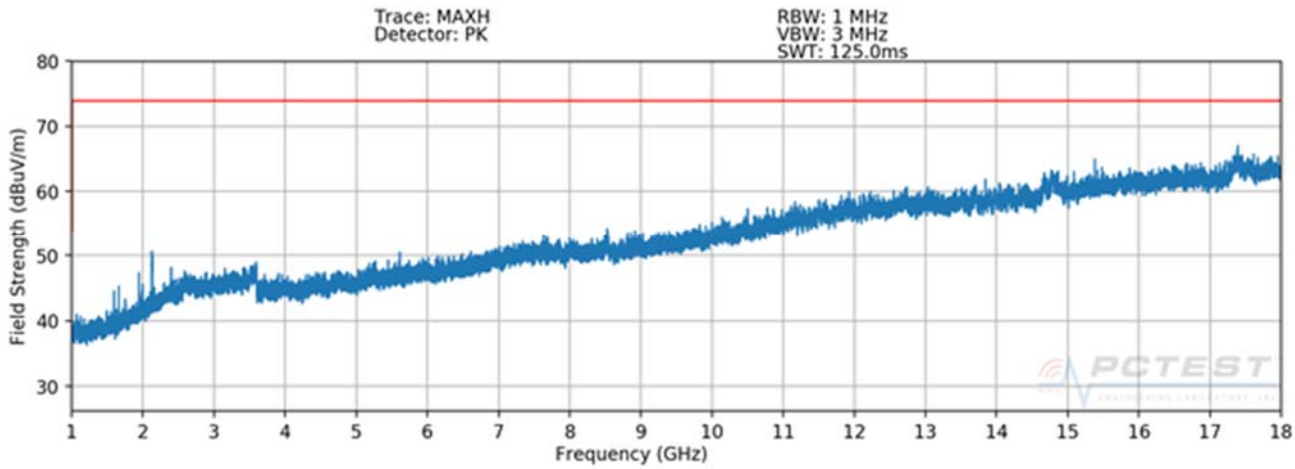


Plot 7-18. Radiated Spurious Plot below 1GHz (Configuration 5 - V)



Plot 7-19. Radiated Spurious Plot above 1GHz (Configuration 5 - H)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



Plot 7-20. Radiated Spurious Plot above 1GHz (Configuration 5 - V)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
122.00	Quasi-Peak	H	250	115	-71.71	-15.47	19.82	43.52	-23.71
185.00	Quasi-Peak	H	250	123	-66.56	-17.63	22.81	43.52	-20.71
190.00	Quasi-Peak	H	250	342	-58.79	-17.44	30.77	43.52	-12.75
225.00	Quasi-Peak	H	250	43	-56.73	-17.63	32.64	46.02	-13.38
325.00	Quasi-Peak	H	250	223	-72.45	-13.97	20.58	46.02	-25.44
600.00	Quasi-Peak	H	250	113	-76.59	-7.82	22.59	46.02	-23.43

Table 7-9. Radiated Measurements at 3-meters (Configuration 5)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.4 Line Conducted Measurement Data

§15.107

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.107 and ICES-003 (6.1).

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

Table 7-10. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.4-2014

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Test Setup

The EUT and measurement equipment were set up as shown in the test setup photos provided.

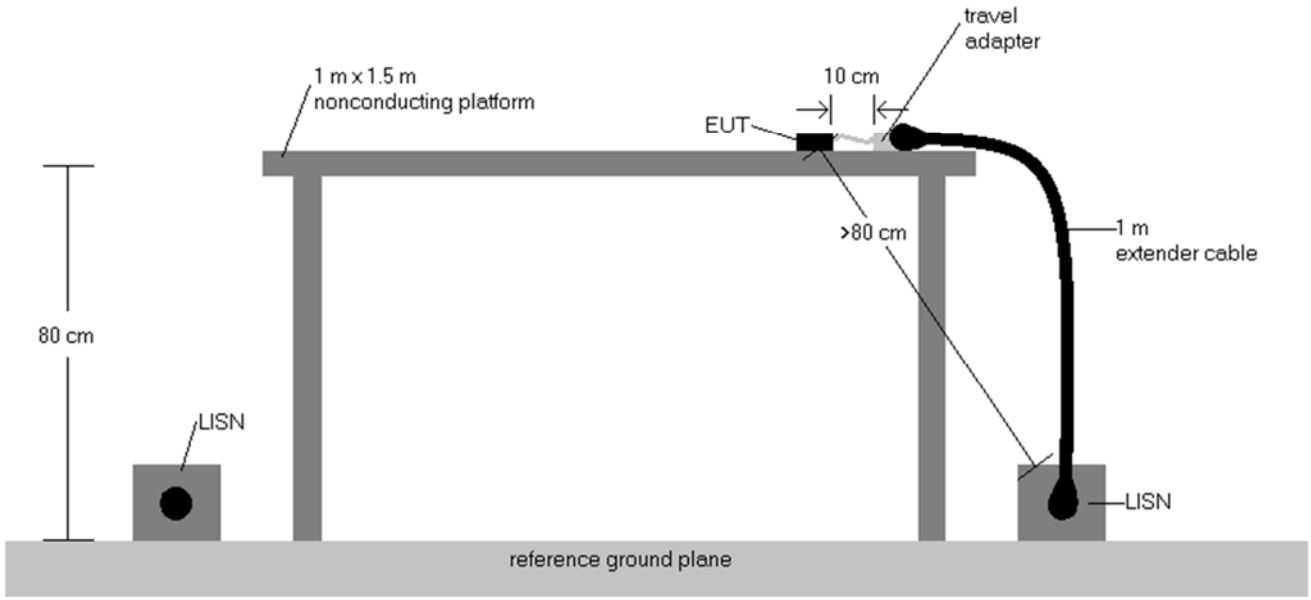


Figure 7-1. Test Instrument & Measurement Setup

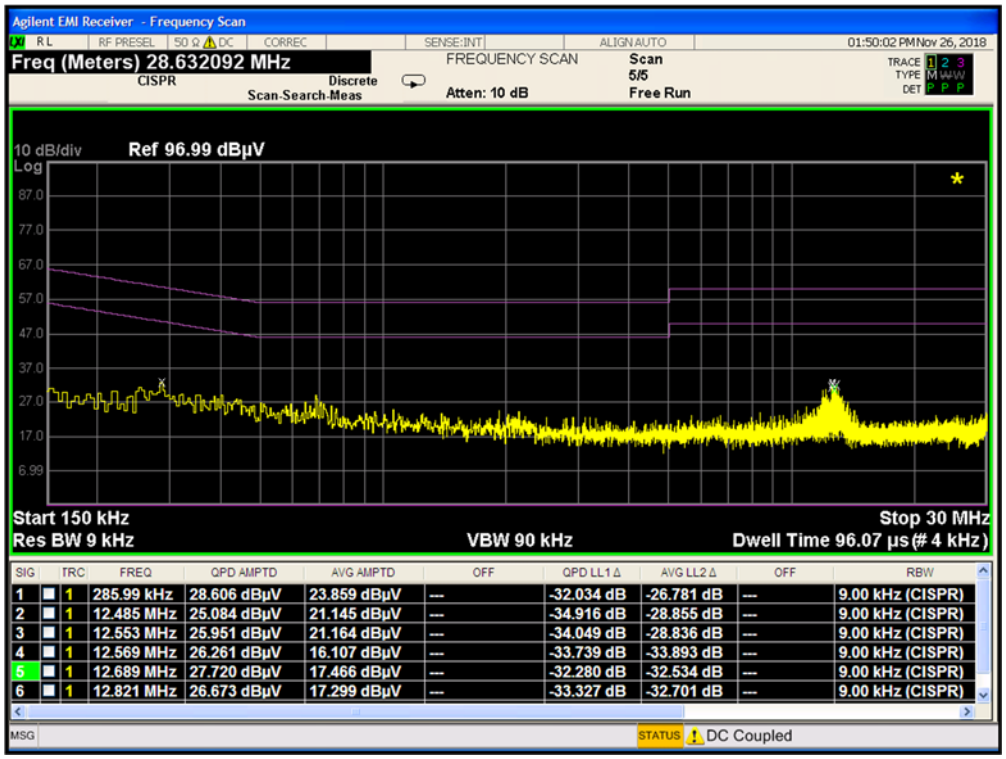
EUT Configuration

1. USB Data Communication with PC (from external memory data)
2. Camera (rear) + Charging (w/ TA) + FM (Low Ch.) + License Rx mode (Worst Band Mid Ch)
3. Camera (front) + Charging (w/ TA) + FM (Mid Ch.)
4. Charging (w/ TA) + FM (High Ch.)
5. Video + Audio playback from Internal memory data + Charging (w/ TA)

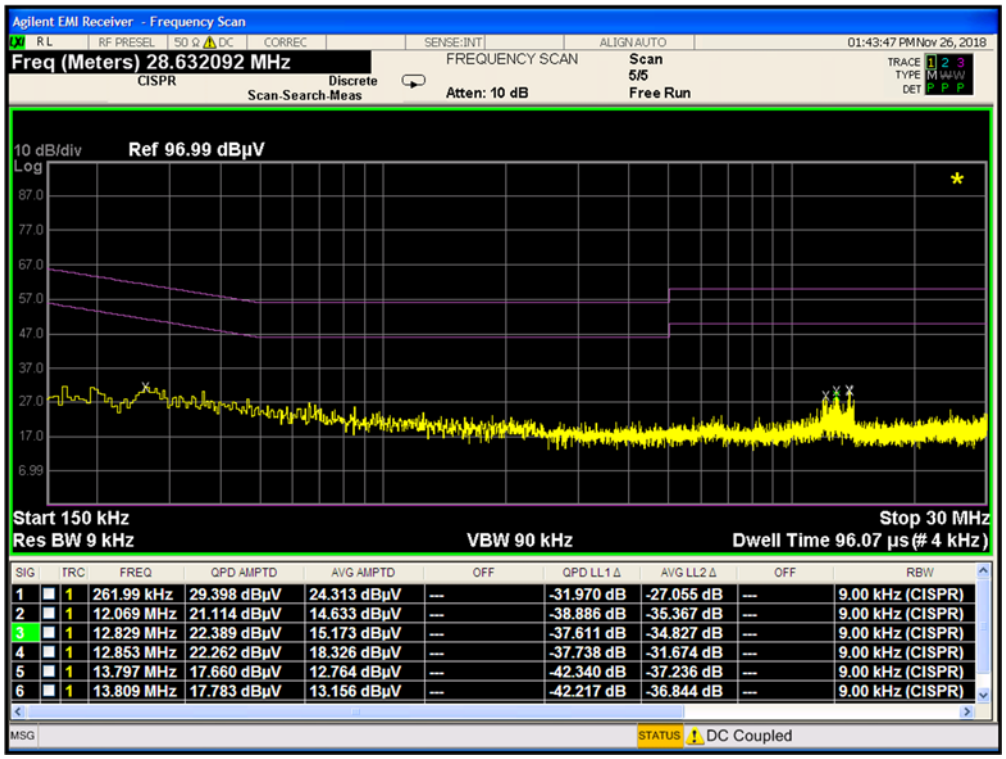
Test Notes

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 and ICES-003.
3. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Reading (dBµV) + Factor (dB)
6. Margin (dB) = QP/AV Limit (dBµV) – QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

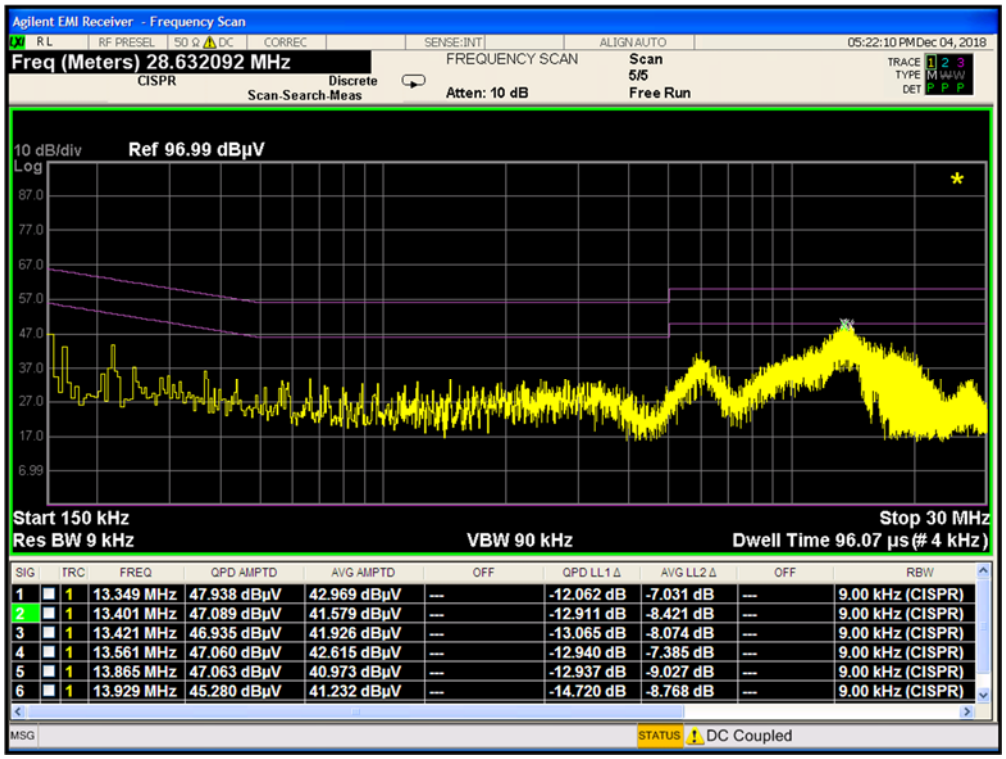


Plot 7-21. Line Conducted Plot (L1- Configuration 1)

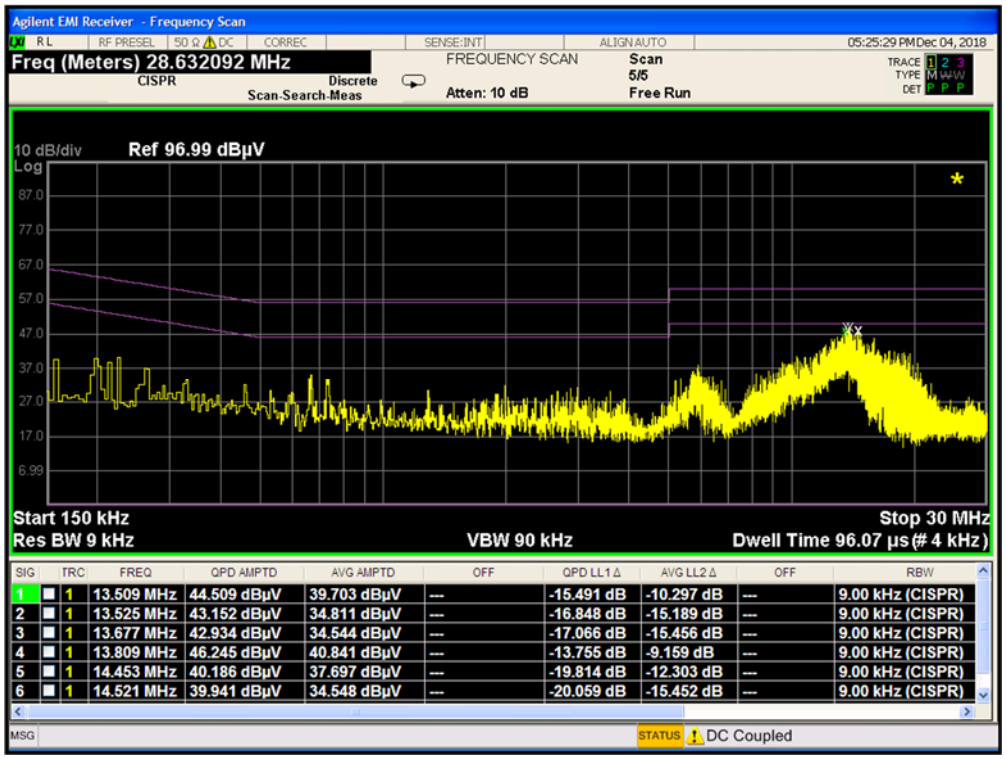


Plot 7-22. Line Conducted Plot (N- Configuration 1)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

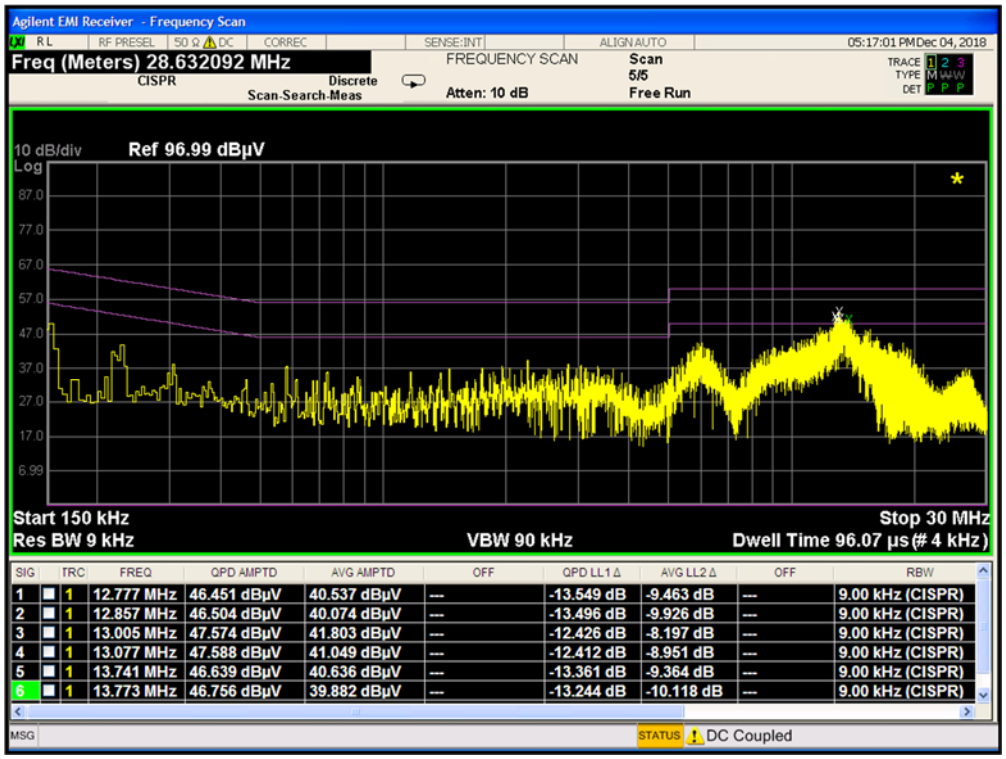


Plot 7-23. Line Conducted Plot (L1 - Configuration 2)

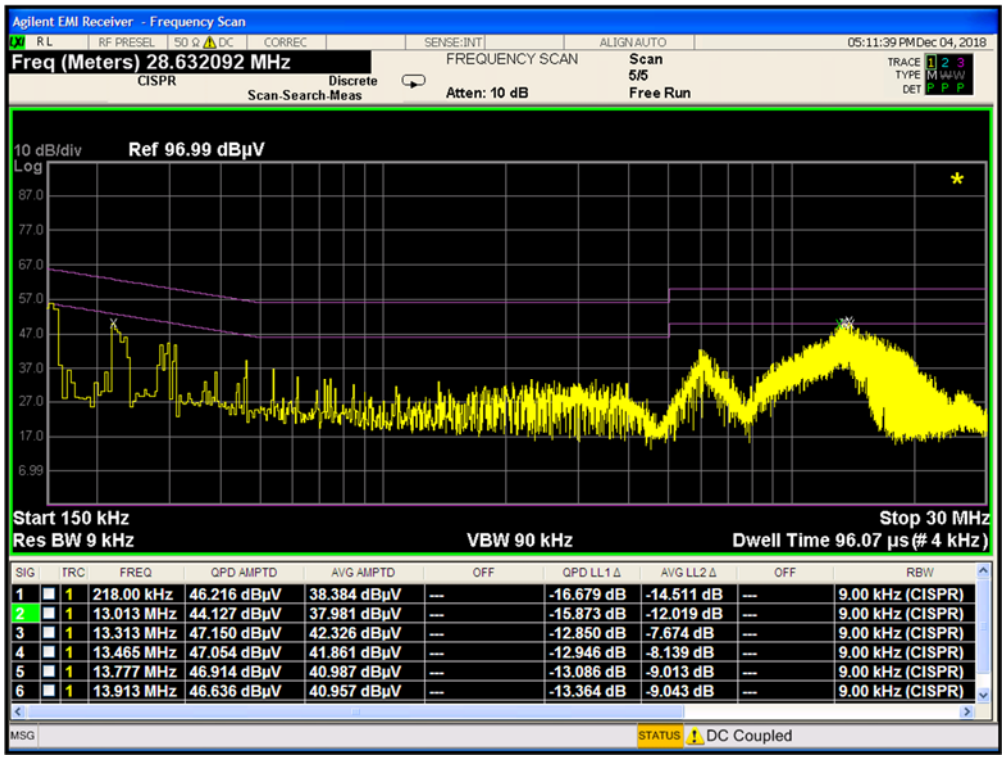


Plot 7-24. Line Conducted Plot (N – Configuration 2)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

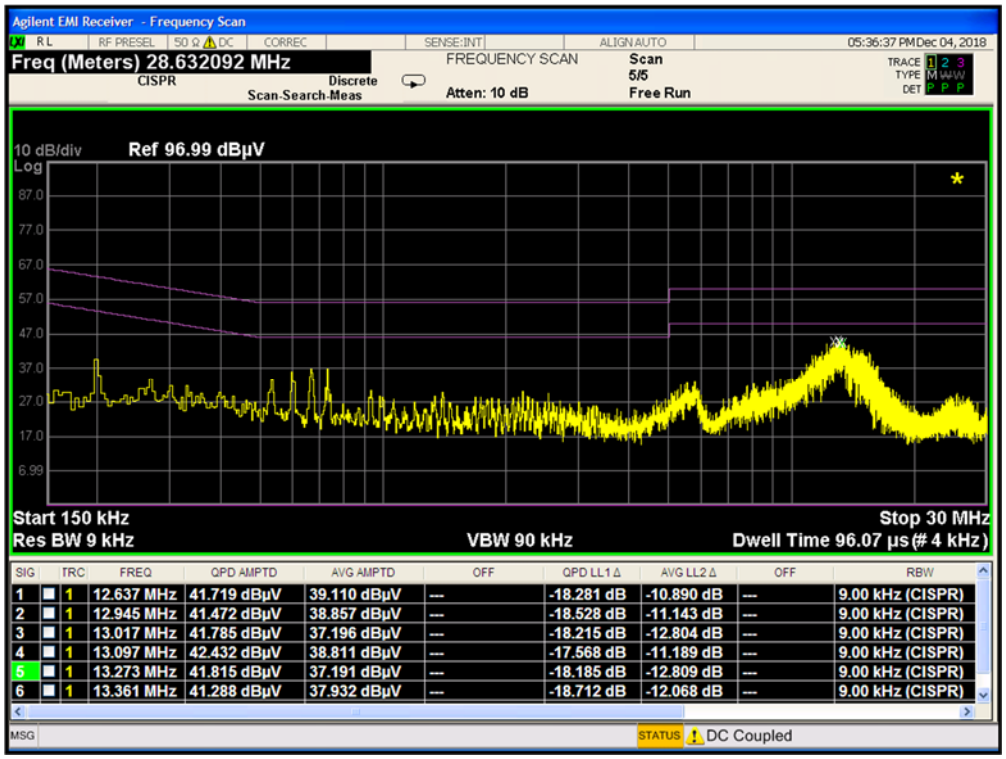


Plot 7-25. Line Conducted Plot (L1 - Configuration 3)

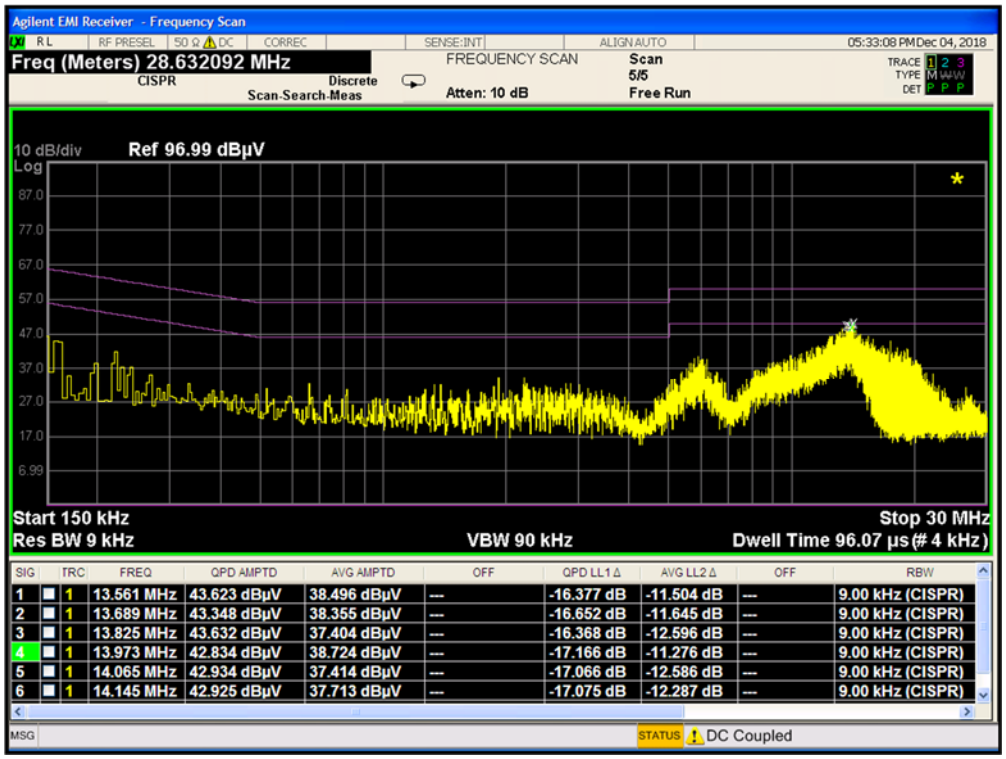


Plot 7-26. Line Conducted Plot (N – Configuration 3)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



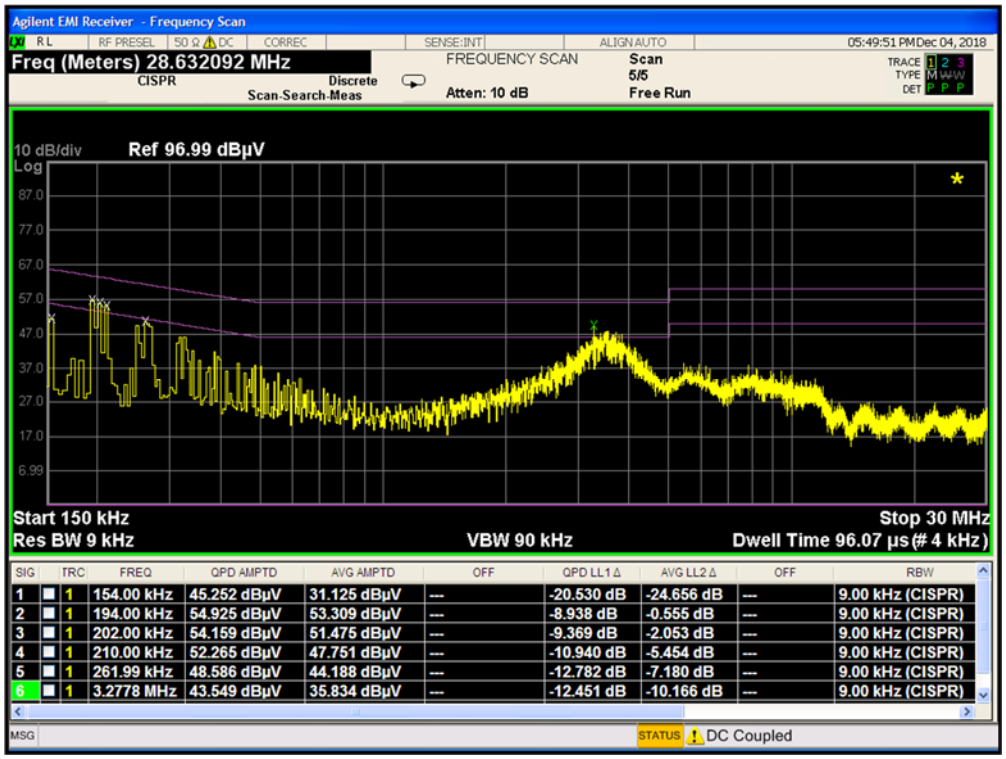
Plot 7-27. Line Conducted Plot (L1 - Configuration 4)



Plot 7-28. Line Conducted Plot (N – Configuration 4)

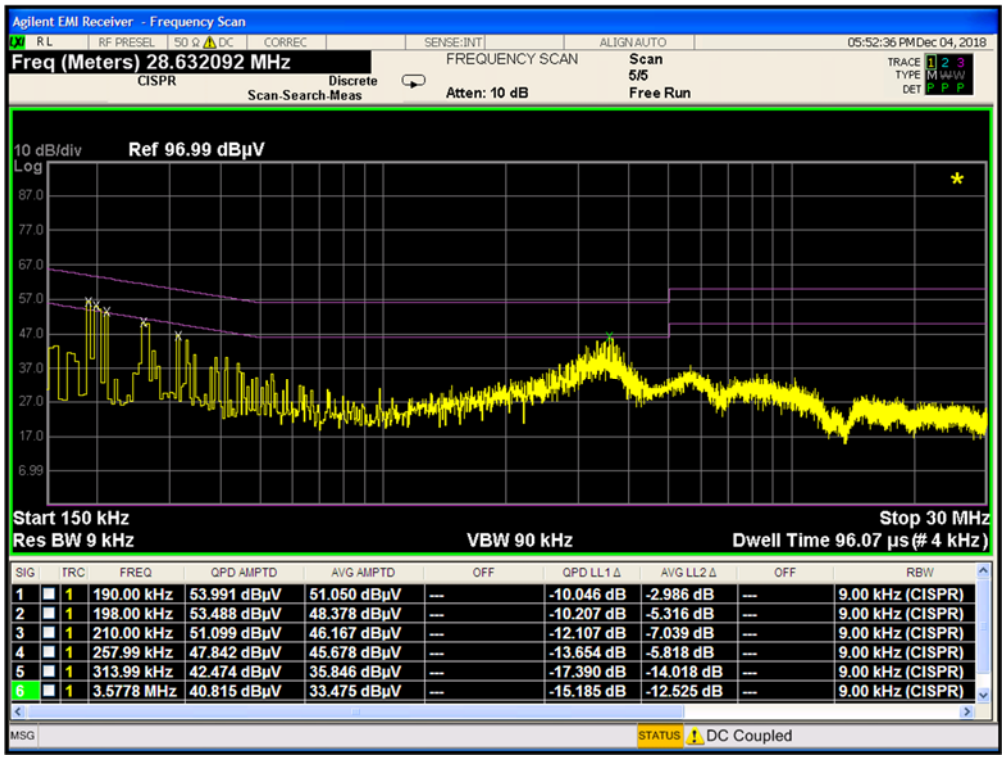
© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	154.00 kHz	45.252 dBµV	31.125 dBµV	---	-20.530 dB	-24.656 dB	---	9.00 kHz (CISPR)
2	1	194.00 kHz	54.925 dBµV	53.309 dBµV	---	-8.938 dB	-0.555 dB	---	9.00 kHz (CISPR)
3	1	202.00 kHz	54.159 dBµV	51.475 dBµV	---	-9.369 dB	-2.053 dB	---	9.00 kHz (CISPR)
4	1	210.00 kHz	52.265 dBµV	47.751 dBµV	---	-10.940 dB	-5.454 dB	---	9.00 kHz (CISPR)
5	1	261.99 kHz	48.586 dBµV	44.188 dBµV	---	-12.782 dB	-7.180 dB	---	9.00 kHz (CISPR)
6	1	3.2778 MHz	43.549 dBµV	35.834 dBµV	---	-12.451 dB	-10.166 dB	---	9.00 kHz (CISPR)

Plot 7-29. Line Conducted Plot (L1 - Configuration 5)



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	RBW
1	1	190.00 kHz	53.991 dBµV	51.050 dBµV	---	-10.046 dB	-2.986 dB	---	9.00 kHz (CISPR)
2	1	198.00 kHz	53.488 dBµV	48.378 dBµV	---	-10.207 dB	-5.316 dB	---	9.00 kHz (CISPR)
3	1	210.00 kHz	51.099 dBµV	46.167 dBµV	---	-12.107 dB	-7.039 dB	---	9.00 kHz (CISPR)
4	1	257.99 kHz	47.842 dBµV	45.678 dBµV	---	-13.654 dB	-5.818 dB	---	9.00 kHz (CISPR)
5	1	313.99 kHz	42.474 dBµV	35.846 dBµV	---	-17.390 dB	-14.018 dB	---	9.00 kHz (CISPR)
6	1	3.5778 MHz	40.815 dBµV	33.475 dBµV	---	-15.185 dB	-12.525 dB	---	9.00 kHz (CISPR)

Plot 7-30. Line Conducted Plot (N – Configuration 5)

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG975U** has been tested to comply with the requirements specified in §15.107 and §15.109 of the FCC rules.

© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.