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MEASUREMENT REPORT FCC PART 15.247 Bluetooth (Low Energy)

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 10/8/2021 - 10/20/2021 Test Report Issue Date: 12/16/2021 Test Site/Location: PCTEST Lab. Morgan Hill, CA, USA Test Report Serial No.: 1M2109220110-15.A3L

FCC ID:

A3LSMS908E

Certification

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: Max. RF Output Power: Frequency Range: FCC Classification: FCC Rule Part(s): ISED Specification: Test Procedure(s):

SM-S908E/DS SM-S908E Portable Handset 62.13mW (17.93dBm) Peak Conducted 2402 – 2480MHz Digital Transmission System (DTS) Part 15 Subpart C (15.247) RSS-247 Issue 2 ANSI C63.10-2013, KDB 558074 D01 v05r02, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 558074 D01 v05r02. 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



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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 the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 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 (22831) test laboratory with the site description on file with ISED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS908E.** The data found in this test report was taken with the EUT operating in Bluetooth low energy mode. While in low energy mode, the Bluetooth transmitter hops pseudo-randomly between 40 channels, three of which are "advertising channels". When the transmitter is hopping only between the three advertising channels, the EUT does not fall under the category of a "hopper" as defined in 15.247(a)(iii) which states that a "frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels." As operation on only the advertising channels does not qualify the EUT as a hopper, the EUT is certified as a DTS device in this mode. The data found in this report is representative of the device when it transmits on its advertising channels. Typical Bluetooth operation is covered under the DSS report found with this application.

Test Device Serial No: 0507M, 0579M, 0229M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, Ultra Wideband

Ch.	Frequency (MHz)
0	2402
:	:
19	2440
:	:
39	2480

Table 2-1. Frequency / Channel Operations

Data Rate	Power Scheme	Antenna 1	Antenna 2	Dual
125kbps	ePA	×	×	×
	iPA	✓	✓	×
500kbps	ePA	×	×	×
	iPA	✓	✓	×
1Mbps	ePA	✓	✓	×
	iPA	✓	✓	✓
2Mbps	ePA	✓	✓	×
	iPA	✓	✓	✓

Table 2-2. Supported Data Rate and Power Scheme

✓ = Supported

×= Not Supported

Note: This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 40 different channels in the 2400 – 2483.5MHz band.

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2.3 Antenna Description

Frequency [MHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)	Directional Gain (dBi)
2402	-6.82	-6.12	-3.45
2441	-7.77	-5.84	-3.74
2480	-7.11	-5.76	-3.40

Following antenna gains provided by manufacturer were used for the test.

2.4 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013. ANSI C63.10-2013 was also used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, and 7.8 for antenna port conducted emissions test setups.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with wireless charging pad (WCP) EP-N5105 while EUT operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.5 Software and Firmware

The test was conducted with firmware version S908USQU0AUJ9 installed on the EUT

2.6 EMI Suppression Device(s)/Modifications

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

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Table 2-3. Highest Antenna Gain



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 558074 D01 v05r02 were 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 7m x 3.66m x 2.7m shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. 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, $50\Omega/50\mu$ H 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 EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOS 2X48A filters (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 7.10. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.04.

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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 Figure 5.7 of Clause 5 in ANSI C63.4-2014. 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.

Per KDB 414788, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was rotated about its vertical axis

while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

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 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.

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).

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna(s) of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The EUT complies with the requirement of §15.203.

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5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. 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 Bench Top Measurements	1.65
Line Conducted Disturbance	2.75
Radiated Disturbance (<30MHz)	4.06
Radiated Disturbance (30MHz - 1GHz)	4.30
Radiated Disturbance (1 - 18GHz)	4.78
Radiated Disturbance (>18GHz)	4.79

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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 Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/31/2021	Annual	3/31/2022	MY49430244
ATM	180-442-KF	20dB Nominal Gain Horn Antenna (18-40GHz)	12/9/2020	Annual	12/9/2021	T058701-01
ETS-Lindgren	3142E	BiConiLog Antenna (30MHz - 6GHz)	6/8/2021	Annual	6/8/2022	224569
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	5/3/2021	Annual	5/3/2022	205956
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	12/3/2020	Annual	12/3/2021	102327
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	12/3/2020	Annual	12/3/2021	101648
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	4/29/2021	Annual	4/29/2022	100051
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	3/16/2021	Annual	3/16/2022	101619
Rohde & Schwarz	ESW26	EMI Test Receiver	6/11/2021	Annual	6/11/2022	101299
Rohde & Schwarz	ESW44	EMI Test Receiver	11/9/2020	Annual	11/9/2021	101570
Rohde & Schwarz	HFH2-Z2	Loop Antenna	4/5/2021	Annual	4/5/2022	100519
Rohde & Schwarz	ENV216	Two-Line-V-Network (LISN)	12/7/2020	Annual	12/7/2021	101364

Table 6-1.Test Equipment List

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS908E
FCC Classification:	Digital Transmission System (DTS)
Number of Channels:	40

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	> 500kHz		PASS	Section 7.2
15.247(b)(3)	RSS-247 [5.4(d)]	Transmitter Output Power	< 1 Watt		PASS	Sections 7.3
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density	< 8dBm / 3kHz Band	CONDUCTED	PASS	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	≥ 20dBc		PASS	Sections 7.5, 7.6
15.205 15.209	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	RADIATED	PASS	Sections 7.7,7.8, 7.9
15.207	RSS-Gen [8.8]	AC Line Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits (RSS-Gen[8.8])	AC LINE CONDUCTED	PASS	Section 7.10

Table 7-1. Summary of Test Results

Notes:

- 1. All modes of operation were investigated. The test results shown in the following sections represent the worst case emissions.
- 2. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Bluetooth LE Automation," Version 3.6.
- 5. For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.3.2.

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7.2 6dB Bandwidth Measurement – Bluetooth (LE) §15.247(a.2); RSS-247 [5.2]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible 6dB bandwidth is 500 kHz.

Test Procedure Used

ANSI C63.10-2013 – Section 11.8.2 Option 2 KDB 558074 D01 v05r02 – Section 8.2

Test Settings

- The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100kHz
- 3. VBW \ge 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

All supported modulations and power schemes have been tested on the unit and only the worst case configuration is reported.

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Antenna 1

Frequency [MHz]	Data Rate	Modulati on	Power Scheme	Channel No.	Bluetooth Mode	Measured Bandwidth [kHz]	Minimum Bandwidth [kHz]	Pass / Fail
2402	125 kbps	GFSK	iPA	0	LE	686.4	500	Pass
2440	125 kbps	GFSK	iPA	19	LE	686.5	500	Pass
2480	125 kbps	GFSK	iPA	39	LE	686.8	500	Pass
2402	500 kbps	GFSK	iPA	0	LE	664.7	500	Pass
2440	500 kbps	GFSK	iPA	19	LE	664.9	500	Pass
2480	500 kbps	GFSK	iPA	39	LE	660.0	500	Pass
2402	1 Mbps	GFSK	ePA	0	LE	721.1	500	Pass
2440	1 Mbps	GFSK	ePA	19	LE	721.9	500	Pass
2480	1 Mbps	GFSK	ePA	39	LE	724.4	500	Pass
2402	2 Mbps	GFSK	ePA	0	LE	1235.0	500	Pass
2440	2 Mbps	GFSK	ePA	19	LE	1239.0	500	Pass
2480	2 Mbps	GFSK	ePA	39	LE	1240.0	500	Pass

Table 7-2. Conducted Bandwidth Measurements Antenna 1

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Plot 7-1. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA - Ch. 0) Antenna 1



Plot 7-2. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 1

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Plot 7-3. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA - Ch. 39) Antenna 1



Plot 7-4. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 1

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Plot 7-5. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 1



Plot 7-6. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							
XV RL RF 50Ω AC	CORREC	SENSE:INT	0000 CH-		02:24:19 P	M Oct 16, 2021	Frequency
		ig: Free Run	Avg Hold:	100/100	Radio Sta	None	
	#IFGain:Low #A	tten: 40 dB			Radio Dev	ice: BTS	
10 dB/div Ref 30.00 dBm							
Log							
20.0							Center Freq
10.0							2.402000000 GHz
0.00							
-10.0							
.20.0					June 1		
20.0							
-30.0							
-40.0							
-50.0							
-60.0							
Center 2.402 GHZ		#\/P\// 200 k	Ц -7		Sp	an 2 WiHz	CF Step
#Res BW 100 KHZ		#VBVV JUON	.HZ		Sweep	J.JJJ IIIS	200.000 kHz
Occupied Bandwidth	h	Total P	ower	23.8	dBm		<u>Auto</u> Man
1.0	J678 MHZ						Freq Offset
Transmit Fred Error	11 352 kHz	% of O		r 90	00 %		0 Hz
		,, ,, ,,		-			
x dB Bandwidth	721.1 kHz	x dB		-6.	00 dB		
MSG				STATUS	3		

Plot 7-7. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 0) Antenna 1



Plot 7-8. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 19) Antenna 1

FCC ID: A3LSMS908E	<i>╔</i> PCTEST°	MEASUREMENT REPORT	Approved by:
	Proud to be part of element	(CERTIFICATION)	Technical Manager
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Plot 7-9. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 39) Antenna 1



Plot 7-10. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 19 of 129
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Plot 7-11. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 1



Plot 7-12. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Antenna 2

Frequency [MHz]	Data Rate	Mod.	Power Scheme	Channel No.	Bluetooth Mode	Measured Bandwidth [kHz]	Minimum Bandwidth [kHz]	Pass / Fail
2402	125 kbps	GFSK	iPA	0	LE	688.1	500	Pass
2440	125 kbps	GFSK	iPA	19	LE	689.4	500	Pass
2480	125 kbps	GFSK	iPA	39	LE	687.8	500	Pass
2402	500 kbps	GFSK	iPA	0	LE	664.1	500	Pass
2440	500 kbps	GFSK	iPA	19	LE	663.0	500	Pass
2480	500 kbps	GFSK	iPA	39	LE	661.8	500	Pass
2402	1 Mbps	GFSK	ePA	0	LE	722.7	500	Pass
2440	1 Mbps	GFSK	ePA	19	LE	722.7	500	Pass
2480	1 Mbps	GFSK	ePA	39	LE	721.5	500	Pass
2402	2 Mbps	GFSK	ePA	0	LE	1177.0	500	Pass
2440	2 Mbps	GFSK	ePA	19	LE	1238.0	500	Pass
2480	2 Mbps	GFSK	ePA	39	LE	1234.0	500	Pass

Table 7-3. Conducted Bandwidth Measurements Antenna 2

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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Plot 7-13. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA - Ch. 0) Antenna 2



Plot 7-14. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA – Ch. 19) Antenna 2

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-15. 6dB Bandwidth Plot (Bluetooth (LE), 125kbps, iPA – Ch. 39) Antenna 2



Plot 7-16. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 2

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 22 of 129
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Plot 7-17. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA – Ch. 19) Antenna 2



Plot 7-18. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA – Ch. 39) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 22 of 129
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LXI RL RF 50 Ω AC CORREC SENSE:INT 11:40:39 AM Oct 16, 2021	
Center Freq: 2.402000000 GHz Radio Std: None Trac	e/Detector
#IFGain:Low #Atten: 40 dB Radio Device: BTS	
10 dB/div Ref 30.00 dBm	
	Clear Write
	Average
	Average
-40.0	
50.0	Max Hold
-60.0	
Center 2.402 CHz Span 2.MHz	
#Res BW 100 kHz #VBW 300 kHz Sweep 3.333 ms	Min Hold
Occurried Dendwidth Total Power 21.6 dPm	
Occupied Bandwidth Total Power 21.0 dBill	
1.0691 MHz	Detector
Transmit Freq Error 9.920 kHz % of OBW Power 99.00 %	Peak► <u>Man</u>
x dB Bandwidth 722.7 kHz x dB -6.00 dB	
MSG STATUS	

Plot 7-19. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 0) Antenna 2



Plot 7-20. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 19) Antenna 2

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 24 of 129
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Plot 7-21. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 39) Antenna 2



Plot 7-22. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 0) Antenna 2

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage OF of 100
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Plot 7-23. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 2



Plot 7-24. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA – Ch. 39) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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7.3 Output Power Measurement – Bluetooth (LE) §15.247(b.3); RSS-247 [5.4(d)]

Test Overview and Limits

The transmitter antenna terminal of the EUT is connected to the input of a spectrum analyzer. Measurements are made while the EUT is operating at maximum power and at the appropriate frequencies.

The maximum peak conducted output power of digital modulation systems operating in the 2400-2483.5 MHz band is 1 Watt.

The conducted output power limit on paragraph above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.1 KDB 558074 D01 v05r02 – Section 8.3.1.1 ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

- 1. Span \ge 3 x RBW
- 2. RBW = 3MHz
- 3. VBW = 50MHz
- 4. Sweep = auto couple
- 5. Detector = peak
- 6. Trace mode = max hold
- 7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-2. Test Instrument & Measurement Setup for Peak and Average Power Measurement

Test Notes

None

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Antenna 1

Frequency	Data Rate	Power	Channel	Bluetooth	Peak Conducted	
[MHz]	[Mbps]	Scheme	No.	Mode	[dBm]	[mW]
2402	125 kbps	iPA	0	LE	11.72	14.859
2440	125 kbps	iPA	19	LE	11.96	15.707
2480	125 kbps	iPA	39	LE	11.13	12.984
2402	500 kbps	iPA	0	LE	11.74	14.921
2440	500 kbps	iPA	19	LE	11.95	15.671
2480	500 kbps	iPA	39	LE	11.16	13.062
2402	1 Mbps	ePA	0	LE	17.68	58.573
2440	1 Mbps	ePA	19	LE	17.85	60.912
2480	1 Mbps	ePA	39	LE	17.17	52.083
2402	1 Mbps	iPA	0	LE	11.89	15.467
2440	1 Mbps	iPA	19	LE	11.91	15.506
2480	1 Mbps	iPA	39	LE	11.23	13.274
2402	2 Mbps	ePA	0	LE	17.87	61.179
2440	2 Mbps	ePA	19	LE	17.93	62.130
2480	2 Mbps	ePA	39	LE	17.46	55.744
2402	2 Mbps	iPA	0	LE	11.77	15.018
2440	2 Mbps	iPA	19	LE	11.99	15.820
2480	2 Mbps	iPA	39	LE	11.24	13.295

Table 7-4. Conducted Output Power Measurements (Bluetooth LE) Antenna 1

	PCTEST	MEASUREMENT REPORT	Approved by:
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🔤 Keysigh	t Spectrum Analyzer - Swept	SA				- @ X
I,XI RL	RF 50 Ω	AC CORREC	SENSE:INT	#Avg Type: RMS	01:57:12 PM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/di	v Ref 30.00 dB	PNO: Fast 😱 IFGain:Low	Atten: 40 dB	Μ	Ikr1 2.401 77 GHz 11.72 dBm	Auto Tune
20.0			↓ ¹			Center Freq 2.402000000 GHz
0.00		and an and a second				Start Freq 2.397000000 GHz
-10.0 -20.0						Stop Freq 2.407000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0						Freq Offset 0 Hz
00.0						Scale Type
Center	2.402000 GHz	#)/B)//		Swoon	Span 10.00 MHz	Log <u>Lin</u>
MSG	W 5.0 WINZ	#VBW		Sweep	atus	
				51.	100	

Plot 7-25. Peak Power Plot (Blueto	oth (LE), 125kbps,	iPA – Ch. 0) Antenna 1
------------------------------------	--------------------	------------------------



Plot 7-26. Peak Power Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 1

FCC ID: A3LSMS908E	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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M RL RF SO Q AC CORREC SENSE.INT Integration of the sense	🔤 Keysight Sp	ectrum Analyzer - Swe	pt SA							
Auto Tune PN0: Fast C Mg: Heekdin IF GainLow Atten: 40 dB Mkr1 2.479 73 GHz 11.13 dBm Center Freq 2.48000000 GHz Start Freq 2.47500000 GHz Center 2.480000 GHz #VBW 50 MHz Sweep 1.000 mHz Sweep 1.000 ms (1001 Pts) Msi	(X/ RL	RF 50 Ω	AC CORREC	c	SENSE:INT	#Avg Typ	e: RMS	01:59:55 PM TRAC	E 1 2 3 4 5 6	Frequency
200 1	10 dB/div	Ref 30.00 d	PNO: IFGair I B M	Fast 😱 Ir n:Low A	tten: 40 dB		Mk	r1 2.479 11.	73 GHz 13 dBm	Auto Tune
100 Start Freq 100 Start Freq 100 Start Freq 100 Stop Freq 2.47500000 GHz 200 Stop Freq 2.48500000 GHz 2.00 Stop Freq 2.48500000 GHz .000 Stop Freq .000	20.0				↓1					Center Fred 2.480000000 GH:
-10.0 -20.0 Stop Freq -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -30.0 -20.0 -20.0 -20.0 -20.0 -40.0 -20.0 -20.0 -20.0 -20.0 -40.0 -20.0 -20.0 -20.0 -20.0 -50.0 -20.0 -20.0 -20.0 -20.0 -50.0 -20.0 -20.0 -20.0 -20.0 -50.0 -20.0 -20.0 -20.0 -20.0 -50.0 -20.0 -20.0 -20.0 -20.0 -50.0 -20.0 -20.0 -20.0 -20.0 -60.0 -20.0 -20.0 -20.0 -20.0 <t< td=""><td>0.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Start Free 2.475000000 GH:</td></t<>	0.00									Start Free 2.475000000 GH:
30.0	-10.0									Stop Free 2.485000000 GH:
-50.0 -60.0 -70.0 -70.0 -70.0 -70.0 -70.0 -70.0 -70.0 -7	-30.0									CF Step 1.000000 MH <u>Auto</u> Mar
Center 2.480000 GHz #Res BW 3.0 MHz #So	-50.0									Freq Offse 0 H:
Center 2.480000 GHz Span 10.00 MHz Log Lin #Res BW 3.0 MHz #VBW 50 MHz Sweep 1.000 ms (1001 pts)										Scale Type
	Center 2.	480000 GHz		#\/B\// 50	MHZ		Sween	Span 1	0.00 MHz	Log <u>Lir</u>
	MSG	5.0 10112		#VBVV J0	WII 12		STATI	is l	roor pis)	



Plot 7-27. Peak Power Plot (Bluetooth (LE), 125kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Swept SA					
(X/ RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	02:03:19 PM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00 dBm	PNO: Fast 😱 IFGain:Low	Atten: 40 dB	M	kr1 2.439 92 GHz 11.95 dBm	Auto Tune
20.0			1			Center Freq 2.440000000 GHz
0.00		and the second s				Start Freq 2.435000000 GHz
-10.0 -20.0						Stop Freq 2.445000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0						Freq Offset 0 Hz
						Scale Type
Center 2. #Res BW	440000 GHz 3.0 MHz	#VBW :	50 MHz	Sweep	Span 10.00 MHz 1.000 ms (1001 pts)	Log <u>Lin</u>
MSG				STA	TUS	



Plot 7-30. Peak Power Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Swept SA						- ē 🔀
LXX RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	02:24:07 PM TRAC	HOct 16, 2021 E 1 2 3 4 5 6	Frequency
10 dB/div Ref 30.00 dBm	PNO: Fast IFGain:Low	Atten: 40 dB	N	/kr1 2.401 17.0	95 GHz 68 dBm	Auto Tune
20.0		1				Center Freq 2.402000000 GHz
0.00						Start Freq 2.397000000 GHz
-10.0						Stop Freq 2.407000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0						Freq Offset 0 Hz
-60.0						Scale Type
Center 2.402000 GHz				Span 1	0.00 MHz	Log <u>Lin</u>
#Res BW 3.0 MHz	#VBW 5	0 MHz	Swee	p 1.000 ms (1001 pts)	
MSG			ST	TATUS		



Plot 7-32. Peak Power Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 19) Antenna 1

FCC ID: A3LSMS908E	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectre	um Analyzer - Swept SA									
LXU RL	RF 50 Ω AC	CORREC	SENS	E:INT	#Avg Type	e: RMS	02:26:42 PI TRAC	4 Oct 16, 2021 E 1 2 3 4 5 6	F	requency
		PNO: Fast 😱 IFGain:Low	Atten: 40	dB		Mk	r1 2.479	97 GHz		Auto Tune
10 dB/div	Ref 30.00 dBm						17.1	67 dBm		
20.0				1					2.48	Center Freq 30000000 GHz
10.0										
0.00									2.47	Start Freq 5000000 GHz
-10.0								- Au	2.48	Stop Freq 85000000 GHz
-20.0										
-30.0									<u>Auto</u>	CF Step 1.000000 MHz Man
-40.0										
-50.0										Freq Offset
-60.0										0 H2
										Scale Type
Center 2.48	0000 GHz						Span 1	0.00 MHz	Log	<u>Lin</u>
#Res BW 3.	0 MHz	#VBW	50 MHz			Sweep	1.000 ms (1001 pts)		
MSG						STATU	s			



Plot 7-34. Peak Power Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight S	pectrum Analyzer - Sw	ept SA							
LXI RL	RF 50 Ω	AC CORREC	SE	NSE:INT	#Avg Type	:RMS	02:20:46 PM TRAC	10ct 16, 2021 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00 d	PNO: I IFGain d Bm	Fast ↔ Trig: Fre :Low Atten: 4	e Run) dB		Mkr	1 2.439 11.9	78 GHz 05 dBm	Auto Tune
20.0									Center Freq 2.440000000 GHz
0.00									Start Freq 2.435000000 GHz
-10.0 -20.0								and the second s	Stop Freq 2.445000000 GHz
-30.0									CF Step 1.000000 MHz <u>Auto</u> Man
-50.0									Freq Offset 0 Hz
									Scale Type
Center 2	440000 GHz		#\/B\\/ 50 MU-			Swoon 1	Span 1	0.00 MHz	Log <u>Lin</u>
#Res DW	3.0 MHZ					oweep	.000 ms (roo r pisj	
MSG						STATUS	s		



Plot 7-36. Peak Power Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Swept SA						
LXX RL RF 50Ω AC	CORREC SE	ENSE:INT #Avg Ty	/pe: RMS	02:13:25 PM (TRACE	Dct 16, 2021	Frequency
	PNO: Fast +++ IFig: Fre IFGain:Low Atten: 4	ee Run 10 dB	B (Le	DET	PNNNNN	Auto Tune
10 dB/div Ref 30.00 dBm			WIK	17.86	6 dBm	
20.0		1				Center Freq 2.402000000 GHz
10.0						Start Freq
-10.0						2.397000000 GH2
-20.0						2.407000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0						Freq Offset 0 Hz
-60.0						Scale Type
Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 50 MHz		Sweep	Span 10 1.000 ms (1	.00 MHz 001 pts)	Log <u>Lin</u>
MSG			STATU	IS		



Plot 7-38. Peak Power Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Swept Si	A				
LX/ RL RF 50Ω A	C CORREC S	ENSE:INT #Avg Typ	02:15	52 PM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 30.00 dBr	PNO: Fast 🕞 Ing: Fr IFGain:Low Atten: 4	ee Run 40 dB	Mkr1 2.4 17	79 89 GHz 7.462 dBm	Auto Tune
20.0		1			Center Freq 2.48000000 GHz
0.00					Start Freq 2.475000000 GHz
-10.0					Stop Freq 2.485000000 GHz
-30.0					CF Step 1.000000 MHz <u>Auto</u> Man
-50.0					Freq Offset 0 Hz
-60.0					Scale Type
Center 2.480000 GHz	Log <u>Lin</u>				
#Res BW 3.0 MHz	#VBW 50 WHz		Sweep 1.000 h	is (1001 pts)	
MSG			STATUS		



Plot 7-40. Peak Power Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Swept SA							
lxi Rl	RF 50 Ω AC	CORREC	SENSE:IN	#Avg Typ	e: RMS	02:09:59 Pf	HOct 16, 2021	Frequency
10 dB/div	Ref 30.00 dBm	PNO: Fast ↔ IFGain:Low	Atten: 40 dB		Mk	r1 2.440 11.9	30 GHz 92 dBm	Auto Tune
20.0				1				Center Freq 2.440000000 GHz
0.00								Start Freq 2.435000000 GHz
-10.0								Stop Freq 2.445000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-6U.U								Scale Type
Center 2.	440000 GHz		C 0 1 0 1 -		_	Span 1	0.00 MHz	Log <u>Lin</u>
#Res BW	3.0 WHZ	#VBW	50 WIHZ		sweep	1.000 ms (1001 pts)	
MSG					STATU	US		



Plot 7-42. Peak Power Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Antenna 2

_		-			Peak Conducted Power		
Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	Bluetooth Mode	[dBm]	[mW]	
2402	125 kbps	iPA	0	LE	9.84	9.647	
2440	125 kbps	iPA	19	LE	9.96	9.897	
2480	125 kbps	iPA	39	LE	9.07	8.078	
2402	500 kbps	iPA	0	LE	9.89	9.748	
2440	500 kbps	iPA	19	LE	9.92	9.827	
2480	500 kbps	iPA	39	LE	9.07	8.076	
2402	1 Mbps	ePA	0	LE	15.76	37.636	
2440	1 Mbps	ePA	19	LE	15.67	36.864	
2480	1 Mbps	ePA	39	LE	15.11	32.464	
2402	1 Mbps	iPA	0	LE	9.85	9.661	
2440	1 Mbps	iPA	19	LE	9.93	9.838	
2480	1 Mbps	iPA	39	LE	9.09	8.115	
2402	2 Mbps	ePA	0	LE	15.87	38.654	
2440	2 Mbps	ePA	19	LE	15.71	37.248	
2480	2 Mbps	ePA	39	LE	15.34	34.190	
2402	2 Mbps	iPA	0	LE	9.69	9.307	
2440	2 Mbps	iPA	19	LE	9.98	9.961	
2480	2 Mbps	iPA	39	LE	9.25	8.418	

 Table 7-5. Conducted Output Power Measurements (Bluetooth LE) Antenna 2

FCC ID: A3LSMS908E	PCTEST [®] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Sv	wept SA									7 ×
lxi Rl	RF 50 \$	Ω AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS	11:14:34 A TRAC	M Oct 16, 2021	Frequen	су
10 dB/div	Ref 30.00	NFE dBm	PNO: Fast IFGain:Low	Atten: 40	dB		M	<mark>(r1 2.401</mark> 9.	71 GHz 84 dBm	Auto	Tune
20.0				▲1						Center 2.40200000	r Freq 10 GHz
0.00			and the second							Star 2.39700000	t Freq 10 GHz
-10.0									and the second s	Stop 2.40700000	Freq 10 GHz
-30.0										CF 1.00000 <u>Auto</u>	⁶ Step 0 MHz Man
-50.0										Freq (Offset 0 Hz
-60.0										Scale	Туре
Center 2. #Res BW	402000 GHz 3.0 MHz		#VBW	50 MHz			Sweep	Span 1 1.000 ms (0.00 MHz 1001 pt <u>s)</u>	Log	Lin
MSG							STAT	rus			



Plot 7-44. Peak Power Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 20 of 129	
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Keysight Spectrum Ar	nalyzer - Swept SA							- ē 🔀
LXIRL RF	50 Ω AC	CORREC	SENSE:	INT #Avg Ty	pe: RMS	11:22:35 AM	E 1 2 3 4 5 6	Frequency
10 dB/div Ref	30.00 dBm	PNO: Fast	Atten: 40 dE	3	MI	kr1 2.479 9.(85 GHz 07 dBm	Auto Tune
20.0								Center Freq 2.48000000 GHz
0.00		and a second second						Start Freq 2.475000000 GHz
-10.0 -20.0							and the second s	Stop Freq 2.485000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-60.0								Scale Type
Center 2.48000 #Res BW 3.0 M	0 GHz Hz	#VBW	50 MHz		Sweep	Span 1 1.000 ms (0.00 MHz 1001 pts)	Log <u>Lin</u>
MSG					STAT	US		





Plot 7-46. Peak Power Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 129
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🔤 Keysigh	it Spectrum Analyzer - Swept SA							
L <mark>XI</mark> RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type	e: RMS	11:27:27 Al TRAC	MOct 16, 2021	Frequency
10 dB/di	v Ref 30.00 dBm	PNO: Fast 😱 IFGain:Low	Atten: 40 dB		Mk	r1 2.439 9.1	74 GHz 92 dBm	Auto Tune
20.0			▲ ¹ ,					Center Freq 2.440000000 GHz
0.00		warman and a second and a						Start Freq 2.435000000 GHz
-10.0 -20.0 -20.0								Stop Freq 2.445000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
00.0								Scale Type
Center	2.440000 GHz	/// (B141 /				Span 1	0.00 MHz	Log <u>Lin</u>
#Res B	W 3.0 MHz	#VBW :	50 WIHZ		sweep	1.000 ms (1001 pts)	
MSG					STATI	US		



Plot 7-47. Peak Power Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 2

Plot 7-48. Peak Power Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Swept SA					
LXX RL RF 50 Ω AC	CORREC SEN	SE:INT #Avg Type	11:44:05 AM : RMS TRAC	HOct 16, 2021 E 1 2 3 4 5 6	Peak Search
10 dB/div Ref 30.00 dBm	IFGain:Low Atten: 40	dB	Mkr1 2.401 15.7	89 GHz 56 dBm	NextPeak
20.0					Next Pk Right
0.00					Next Pk Left
-10.0					Marker Delta
-30.0					Mkr→CF
-40.0					Mkr→RefLvl
-60.0					More 1 of 2
#Res BW 3.0 MHz	#VBW 50 MHz		Span 1 weep 1.000 ms (1001 pts)	
MSG			STATUS		





Plot 7-50. Peak Power Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 19) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum	ectrum Analyzer - Swept SA							
LXU RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type:	RMS	11:44:52 AM Oct 16 TRACE 2	5,2021 3 4 5 6	Frequency
10 dB/div	Ref 30.00 dBm	PNO: Fast 😱 IFGain:Low	Atten: 40 dB		Mkr1	DET P N 2.479 95 (15.11 d	GHz IBm	Auto Tune
20.0			1					Center Freq 2.48000000 GHz
0.00								Start Freq 2.475000000 GHz
-10.0								Stop Freq 2.485000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-00.0								Scale Type
Center 2.4	480000 GHz				:	Span 10.00	MHz	og <u>Lin</u>
#Res BW	3.0 MHz	#VBW	50 MHz	Sv	veep 1.00	00 ms (1001	pts)	
MSG					STATUS			





Plot 7-52. Peak Power Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 0) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Swe	pt SA							
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SEI	SE:INT	#Avg Type	:RMS	11:34:20 A TRAC	HOct 16, 2021	Frequency
10 dB/div	Ref 30.00 d	PNO: Fast IFGain:Lov	Trig: Free Atten: 40	e Run I dB		Mki	1 2.439 9.1	92 GHz 93 dBm	Auto Tune
20.0				1					Center Freq 2.440000000 GHz
0.00									Start Freq 2.435000000 GHz
-10.0 -20.0								and a second sec	Stop Freq 2.445000000 GHz
-30.0									CF Step 1.000000 MHz <u>Auto</u> Man
-50.0									Freq Offset 0 Hz
-00.0									Scale Type
Center 2.	440000 GHz						Span 1	0.00 MHz	Log <u>Lin</u>
#Res BW	3.0 MHZ	#V	BW 50 MHZ			sweep	ms (TOUT pts)	
MSG						STATU	S		





Plot 7-54. Peak Power Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 2

FCC ID: A3LSMS908E	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spe	ctrum Analyzer - Swept SA								
LXI RL	RF 50 Ω AC	CORREC	SENS	:INT #	‡Avg Type	RMS	11:53:55 A	4 Oct 16, 2021 E 1 2 3 4 5 6	Frequency
		PNO: Fast IFGain:Low	Atten: 40 d	B		Mk	r1 2.402	07 GHz	Auto Tune
10 dB/div	Ref 30.00 dBm						15.	87 aBm	
20.0				1					Center Freq 2.402000000 GHz
10.0									
0.00									Start Freq 2.397000000 GHz
-10.0									Stop Freq 2.407000000 GHz
-20.0									
-30.0									CF Step 1.000000 MHz <u>Auto</u> Man
-40.0									
-50.0									Freq Offset 0 Hz
-60.0									
									Scale Type
Center 2.4	02000 GHz						Span 1	0.00 MHz	Log <u>Lin</u>
#Res BW	3.0 MHz	#VBW	50 MHz		\$	Sweep	1.000 ms (1001 pts)	
MSG						STATU	JS		



Plot 7-56. Peak Power Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 2

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Swept SA								
LXI RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type	RMS	11:59:51 A	MOct 16, 2021	Fr	equency
		PNO: Fast	Atten: 40 dB		Mk	r1 2.480	05 GHz		Auto Tune
10 dB/div	Ref 30.00 dBm					15.	34 aBM		
20.0			1					C 2.480	Center Freq
10.0									
0.00								2.47	Start Freq
-10.0								2.48	Stop Freq
-20.0									
-30.0								1 <u>Auto</u>	CF Step .000000 MHz Man
-50.0									Freq Offset
-60.0									0 H2
									Scale Type
Center 2	480000 GH7					Snan 1	0 00 MHz	Log	Lin
#Res BW	3.0 MHz	#VBW	50 MHz	S	weep	1.000 ms (1001 pts)		
MSG					STATU	JS			



Plot 7-58. Peak Power Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 0) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - Swept S	5A						
(X/ RL	RF 50 Ω A	AC CORREC	SENSE:INT	#Avg Type	e: RMS	12:07:07 PM TRAC	E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00 dBi	PNO: Fast ↔→ IFGain:Low	Atten: 40 dB		Mk	r1 2.440 9.9	01 GHz 83 dBm	Auto Tune
20.0			1					Center Freq 2.440000000 GHz
0.00								Start Freq 2.435000000 GHz
-10.0 -20.0							And a start of the	Stop Freq 2.445000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-60.0								Scale Type
Center 2. #Res BW	440000 GHz 3.0 MHz	#VBW	50 MHz		Sweep	Span 1 1.000 m <u>s (</u>	0.00 MHz 1001 pt <u>s)</u>	Log <u>Lin</u>
MSG					STAT	us		

$\cdot \cdot $
--



Plot 7-60. Peak Power Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 39) Antenna 2

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Dual Antenna

Frequency	quency Data Power Channel Bluetooth		Bluetooth	Peak Conducted Power _Ant 1		Peak Co Power	nducted _Ant 2	Peak Conducted Power _Dual		
[MHz]	[Mbps]	Scheme	No.	Mode	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2402	1 Mbps	iPA	0	LE	11.62	14.534	9.51	8.939	13.71	23.474
2440	1 Mbps	iPA	19	LE	11.68	14.723	9.98	9.956	13.92	24.679
2480	1 Mbps	iPA	39	LE	10.82	12.078	9.16	8.238	13.08	20.316
2402	2 Mbps	iPA	0	LE	12.00	15.849	9.57	9.061	13.96	24.910
2440	2 Mbps	iPA	19	LE	11.67	14.693	9.97	9.929	13.91	24.622
2480	2 Mbps	iPA	39	LE	11.00	12.589	9.19	8.291	13.20	20.880

Table 7-6. Conducted Output Power Measurements (Bluetooth LE) Dual Antenna

Note:

This device can operate simultaneously on two antennas. The directional gains are shown in Table 2-2 in Section 2.3 of this report. The directional gain from the operation of two antennas is shown to operate at less than 6dBi per the calculation below:

Directional gain = $10 \log[(10^{G_{1/20}} + 10^{G_{2/20}} + ... + 10^{G_{N/20}})^2 / N_{ANT}] dBi$ = $10 \log[(10^{-6.82/20} + 10^{-6.12/20})^2 / 2] dBi$ = -3.45dBi

where G_N is the gain of the nth antenna and N_{ANT} is the total number of antennas used.

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Plot 7-61. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 1

Key	/sight Spe	trum Analyzer - S	wept SA									
l <mark>xi</mark> Ri		RF 50	Ω AC	CORREC	SEI	NSE:INT	#Ava Type	RMS	12:44:02 PI TRAC	MOct 16, 2021	F	requency
				PNO: Fast C	Trig: Free Atten: 40	e Run) dB			TYF DE			
10 dE	3/div	Ref 30.00	dBm					Mk	r1 2.439 11.	93 GHz 68 dBm		Auto Tune
20.0						1					2.44	Center Freq 40000000 GHz
10.0 0.00			and the second sec	and the second s	ALL AND A REAL PROPERTY.						2.43	Start Freq 35000000 GHz
-10.0	Burnan										2.44	Stop Freq 45000000 GHz
-30.0											<u>Auto</u>	CF Step 1.000000 MHz Man
-40.0 -50.0												Freq Offset 0 Hz
-60.0												Scale Type
Cent #Res	ter 2.4 s BW :	40000 GH: 3.0 MHz	Z	#VB	W 50 MHz			Sweep	Span 1 1.000 m <u>s (</u>	0.00 MHz 1001 pt <u>s)</u>	Log	Lin
MSG								STATU	s			

Plot 7-62. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 19) Antenna 1

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🔤 Keysig	ht Spectrum Analyzer - Swe	pt SA				
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	#Avg Type: RMS	12:45:56 PM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/d	iv Ref 30.00 d	PNO: Fast IFGain:Low	Atten: 40 dB	Mł	cr1 2.479 85 GHz 10.82 dBm	Auto Tune
20.0			↓1			Center Freq 2.480000000 GHz
0.00						Start Freq 2.475000000 GHz
-10.0 سرم -20.0	*					Stop Freq 2.485000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0 —						Freq Offset 0 Hz
-60.0						Scale Type
Center	2.480000 GHz		50 MUL-	0	Span 10.00 MHz	Log <u>Lin</u>
#Res	SW 3.0 WHZ	#VBW	50 MHZ	Sweep	1.000 ms (1001 pts)	
MSG				STAT	US	



Plot 7-63. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 1

Plot 7-64. Peak Power Plot (Dual Bluetooth (LE), 2Mbps, iPA – Ch. 0) Antenna 1

FCC ID: A3LSMS908E	PCTEST [°] Proud to be part of [®] element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spect	rum Analyzer - Swept SA							
LXI RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Typ	e: RMS	12:48:43 PM TRAC	4 Oct 16, 2021 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00 dBm	PNO: Fast 😱	Trig: Free Run Atten: 40 dB		Mkr	1 2.440 11.0	31 GHz 67 dBm	Auto Tune
20.0			↓					Center Freq 2.440000000 GHz
0.00								Start Freq 2.435000000 GHz
-10.0								Stop Freq 2.445000000 GHz
-30.0								CF Step 1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-00:0								Scale Type
Center 2.44	0000 GHz	#\/D\//			D	Span 1	0.00 MHz	Log <u>Lin</u>
#Res BW 3	.0 MHz	#VBW :	SUIVIAZ		sweep 1	.000 ms (1001 pts)	
MSG					STATUS			





Plot 7-66. Peak Power Plot (Dual Bluetooth (LE), 2Mbps, iPA - Ch. 39) Antenna 1

	PCTEST'		Approved by:
FCC ID: A3LSMS908E	Proud to be part of @ element	(CERTIFICATION)	Technical Manager
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🔤 Keysigh	nt Spectrum Analyzer - Swept SA						
IXI RL	RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type: RM	12:16:49 PM IS TRACE TYPE	Oct 16, 2021	Frequency
10 dB/di	iv Ref 30.00 dBm	PNO: Fast IFGain:Low	Atten: 40 dB		Mkr1 2.402 (9.5	P NNNNN 06 GHz 11 dBm	Auto Tune
20.0			1				Center Freq 2.402000000 GHz
0.00							Start Freq 2.397000000 GHz
-10.0	Northern Contraction of the second se					N. N	Stop Freq 2.407000000 GHz
-30.0							CF Step 1.000000 MHz <u>Auto</u> Man
-50.0							Freq Offset 0 Hz
-00.0							Scale Type
Center	2.402000 GHz				Span 10	.00 MHz	Log <u>Lin</u>
#Res E	3W 3.0 MHz	#VBW 5	0 MHz	Swe	ep 1.000 ms (1	001 pts)	
MSG					STATUS		



Plot 7-67. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 2

Plot 7-68. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 19) Antenna 2

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🦲 Keysight Sp	ectrum Analyzer - S	wept SA									
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SEN	SE:INT	#Ava Tvp	a. DMS	12:32:59 P	4 Oct 16, 2021	Fr	equency
		NFE	PNO: Fast 😱 IFGain:Low	Trig: Free Atten: 40	Run dB	#A18 19P	e. KW3	TYF			
10 dB/div	Ref 30.00	dBm					Mk	r1 2.479 9.	99 GHz 16 dBm		Auto Tune
20.0					1					C 2.480	enter Freq 0000000 GHz
0.00		-								2.475	Start Freq 5000000 GHz
-10.0 -20.0									and the second s	2.485	Stop Freq 5000000 GHz
-30.0										1 <u>Auto</u>	CF Step .000000 MHz Man
-50.0										F	F req Offset 0 Hz
-60.0										:	Scale Type
Center 2.	480000 GHz	2						Span 1	0.00 MHz	Log	Lin
#Res BW	3.0 MHz		#VBW	50 MHz			sweep	1.000 ms (1001 pts)		
MSG							STAT	US			



Plot 7-69. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 2

Plot 7-70. Peak Power Plot (Dual Bluetooth (LE), 2Mbps, iPA – Ch. 0) Antenna 2

#VBW 50 MHz

Center 2.402000 GHz #Res BW 3.0 MHz Span 10.00 MHz Log Sweep 1.000 ms (1001 pts)

Lin

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Keysight Sp	ectrum Analyzer - Swep	pt SA				
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	#Avg Type: RMS	12:38:55 PM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00 di	PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 40 dB	M	kr1 2.440 04 GHz 9.97 dBm	Auto Tune
20.0			1			Center Freq 2.440000000 GHz
0.00						Start Freq 2.435000000 GHz
-10.0						Stop Freq 2.445000000 GHz
-30.0						CF Step 1.000000 MHz <u>Auto</u> Man
-50.0						Freq Offset 0 Hz
-60.0						Scale Type
Center 2.	440000 GHz	#\/R\//	50 MHz	Sween	Span 10.00 MHz	
WRGS DW	5.0 10112	#VDVV	50 WH12	Sweep	nood ma (1001 pts)	
MSG				STA	105	





Plot 7-72. Peak Power Plot (Dual Bluetooth (LE), 2Mbps, iPA – Ch. 39) Antenna 2

			-
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7.4 Power Spectral Density – Bluetooth (LE) §15.247(e); RSS-247 [5.2]

Test Overview and Limit

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies.

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

Test Procedure Used

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission

Test Settings

- 1. Analyzer was set to the center frequency of the DTS channel under investigation
- 2. Span = 1.5 times the DTS channel bandwidth
- 3. RBW = 3kHz
- 4. VBW = 1MHz
- 5. Detector = peak
- 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 in the diagram below.



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

None

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Antenna 1

Frequency [MHz]	Data Rate	Power Scheme	Channel No.	Bluetooth Mode	Measured Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]
2402	125 kbps	iPA	0	LE	5.25	8.0	-2.75
2440	125 kbps	iPA	19	LE	5.57	8.0	-2.43
2480	125 kbps	iPA	39	LE	4.54	8.0	-3.46
2402	500 kbps	iPA	0	LE	5.16	8.0	-2.84
2440	500 kbps	iPA	19	LE	5.38	8.0	-2.62
2480	500 kbps	iPA	39	LE	4.36	8.0	-3.64
2402	1 Mbps	ePA	0	LE	1.71	8.0	-6.29
2440	1 Mbps	ePA	19	LE	2.44	8.0	-5.56
2480	1 Mbps	ePA	39	LE	1.32	8.0	-6.68
2402	1 Mbps	iPA	0	LE	-4.04	8.0	-14.12
2440	1 Mbps	iPA	19	LE	-3.66	8.0	-13.86
2480	1 Mbps	iPA	39	LE	-4.89	8.0	-14.94
2402	2 Mbps	ePA	0	LE	-0.10	8.0	-8.10
2440	2 Mbps	ePA	19	LE	0.36	8.0	-7.64
2480	2 Mbps	ePA	39	LE	-0.59	8.0	-8.59
2402	2 Mbps	iPA	0	LE	-6.12	8.0	-14.12
2440	2 Mbps	iPA	19	LE	-5.86	8.0	-13.86
2480	2 Mbps	iPA	39	LE	-6.94	8.0	-14.94

Table 7-7. Conducted Power Density Measurements Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-73. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA – Ch. 0) Antenna 1



Plot 7-74. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 1

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Plot 7-75. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA – Ch. 39) Antenna 1



Plot 7-76. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-77. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 1



Plot 7-78. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-79. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 0) Antenna 1



Plot 7-80. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 19) Antenna 1

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-81. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 39) Antenna 1



Plot 7-82. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-83. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 19) Antenna 1



Plot 7-84. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 1

				Approved by:
FCC ID: A3LSMS908E	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by:
	Proud to be part of element			Technical Manager
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Plot 7-85. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 0) Antenna 1



Plot 7-86. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 1

FCC ID: A3LSMS908E	PCTEST [®] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-87. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 39) Antenna 1



Plot 7-88. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-89. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, iPA – Ch. 19) Antenna 1



Plot 7-90. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Antenna 2

Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	Bluetooth Mode	Measured Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]
2402	125 kbps	iPA	0	LE	3.05	8.0	-4.95
2440	125 kbps	iPA	19	LE	3.32	8.0	-4.68
2480	125 kbps	iPA	39	LE	2.52	8.0	-5.48
2402	500 kbps	iPA	0	LE	3.04	8.0	-4.96
2440	500 kbps	iPA	19	LE	3.04	8.0	-4.96
2480	500 kbps	iPA	39	LE	2.34	8.0	-5.66
2402	1 Mbps	ePA	0	LE	-0.44	8.0	-8.44
2440	1 Mbps	ePA	19	LE	-0.29	8.0	-8.29
2480	1 Mbps	ePA	39	LE	-0.70	8.0	-8.70
2402	1 Mbps	iPA	0	LE	-6.25	8.0	-14.25
2440	1 Mbps	iPA	19	LE	-6.25	8.0	-14.25
2480	1 Mbps	iPA	39	LE	-6.96	8.0	-14.96
2402	2 Mbps	ePA	0	LE	-2.01	8.0	-10.01
2440	2 Mbps	ePA	19	LE	-2.21	8.0	-10.21
2480	2 Mbps	ePA	39	LE	-2.60	8.0	-10.60
2402	2 Mbps	iPA	0	LE	-8.54	8.0	-16.54
2440	2 Mbps	iPA	19	LE	-8.22	8.0	-16.22
2480	2 Mbps	iPA	39	LE	-8.86	8.0	-16.86

Table 7-8. Conducted Power Density Measurements Antenna 2

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-91. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA – Ch. 0) Antenna 2



Plot 7-92. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 2

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Plot 7-93. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 39) Antenna 2



Plot 7-94. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 2

FCC ID: A3LSMS908E	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-95. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 2



Plot 7-96. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-97. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 0) Antenna 2



Plot 7-98. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 19) Antenna 2

FCC ID: A3LSMS908E	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-99. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 39) Antenna 2



Plot 7-100. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 0) Antenna 2

FCC ID: A3I SMS908F	PCTEST	MEASUREMENT REPORT	Approved by:
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Plot 7-101. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 19) Antenna 2



Plot 7-102. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 39) Antenna 2

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