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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: 10/8/2021-10/25/2021 Test Report Issue Date: 12/31/2021 Test Site/Location: PCTEST Lab. Morgan Hill, CA, USA Test Report Serial No.: 1M2112100159-13.A3L

FCC ID:

Model:

EUT Type:

A3LSMS908JPN

APPLICANT:

Application Type:

Additional Model(s):

Frequency Range:

FCC Classification:

ISED Specification:

Test Procedure(s):

FCC Rule Part(s):

Max. RF Output Power:

Certification SC-52C SCG14 Portable Handset 62.13mW (17.93dBm) Peak Conducted 2402 – 2480MHz Digital Transmission System (DTS) Part 15 Subpart C (15.247) RSS-247 Issue 2

Samsung Electronics Co., Ltd.

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: A3LSMS908JPN.** 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 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer

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	×	×	*
1256005	iPA	✓	✓	*
500kbps	ePA	×	×	*
500kbps	iPA	✓	✓	*
1Mbpc	ePA	✓	✓	*
1Mbps	iPA	✓	✓	✓
	ePA	√	√	×
2Mbps	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:	A3LSMS908JPN
FCC Classification:	Digital Transmission System (DTS)
Number of Channels:	<u>40</u>

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.
- 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 \geq 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

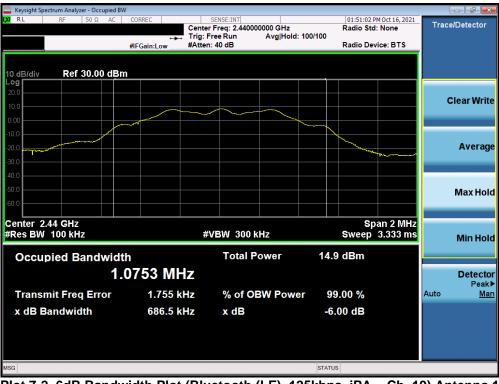
Table 7-2. Conducted Bandwidth Measurements Antenna 1

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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



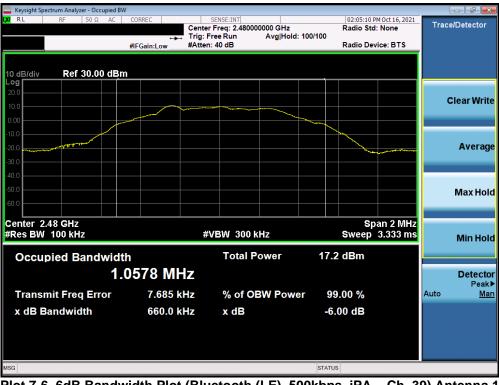
Plot 7-4. 6dB Bandwidth Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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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: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dara 40 at 400
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Keysight Spectrum Analyzer - Occupied BW	1			
LX/ RL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 2.402000000 GHz	02:24:19 PM Oct 16, 2021 Radio Std: None	Frequency
	T	Frig: Free Run Avg Hold: 10 Atten: 40 dB		
	#IFGain:Low #	Atten: 40 db	Radio Device. B 13	-
10 dB/div Ref 30.00 dBm Log				
20.0				Center Freq
10.0				2.402000000 GHz
0.00				
-10.0				
-20.0				
-30.0				
-40.0				
-50.0				
-60.0				
Center 2.402 GHz			Span 2 MH	
#Res BW 100 kHz		#VBW 300 kHz	Sweep 3.333 m	CF Step 200.000 kHz
				Auto Man
Occupied Bandwidt		Total Power	23.8 dBm	
1.	0678 MHz	2		Freq Offset
Transmit Freq Error	11.352 kHz	z % of OBW Power	99.00 %	0 Hz
x dB Bandwidth	721.1 kHz		-6.00 dB	
	721.FKH		-0.00 ub	
MSG			STATUS	

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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: 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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 100
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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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 129
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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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dece 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: A3LSMS908JPN	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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Keysight Spectrum Analyzer - Occupied BW				o đ
LXU RE 50Ω AC	CORREC	SENSE:INT ter Freg: 2.402000000 GHz	11:40:39 AM Oct Radio Std: Nor	
		: Free Run Avg Hold: 1 en: 40 dB	00/100 Radio Device: I	ats
	#IFGall:Low #Att		Radio Device.	
10 dB/div Ref 30.00 dBm				
20.0				
10.0				Clear Write
0.00			~	
-10.0				
-20.0				Average
-30.0				
-40.0				
-50.0				Max Hold
-60.0				
Center 2.402 GHz			Span 2	
#Res BW 100 kHz		#VBW 300 kHz	Sweep 3.3	33 ms Min Hold
				MITTOIC
Occupied Bandwidth		Total Power	21.6 dBm	
1.0	691 MHz			Detector Peak▶
Transmit Freq Error	9.920 kHz	% of OBW Power	99.00 %	Auto <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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 24 of 429
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Plot 7-21. 6dB Bandwidth Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 39) Antenna 2



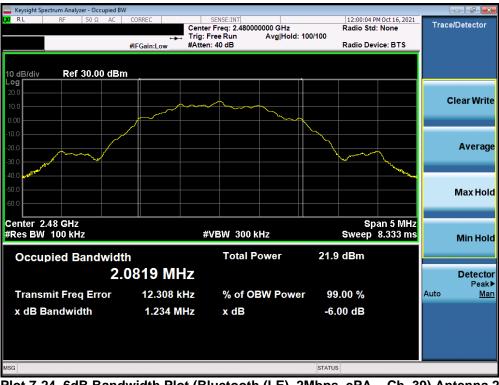
Plot 7-22. 6dB Bandwidth Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 0) Antenna 2

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 25 of 129
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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: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		
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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		nducted wer
[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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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RL RF S0 @ AC CORREC SERVECINT D15712PM OC16,2011 Frequency PNO: Fast Trig: Free Run IFGainLow Trig: Free Run Atten: 40 dB Mikr1 2.401 77 GHz 11.72 dBm Frequency 00 dB/div Ref 30.00 dBm 11.72 dBm Center Freq 2.40200000 GHz Center Freq 2.40200000 GHz 200 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		ight Spect	trum Analy											_	
PR0: Fast Trig: Free Run Mikr1 2:401 77 GHz Auto Tune 10 dB/div Ref 30.00 dBm 11.72 dBm Center Freq 2.40200000 GHz 200 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC		SE	NSE:INT	#Ava Tvp	e: RMS			F	requency
Log 200 200 200 200 200 200 200 20						PNO: IFGain	Fast 🖵 ::Low					TYF DE			Auto Tune
200 1 Center Freq 2.402200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.40700000 GHz Stop Freq 4.00 Stop Freq 2.40700000 GHz Stop Freq 4.00 Man Freq Offset 0 Hz 0 Stop Freq 2.402000 GHz Stop Freq 2.402000 GHz Stop Freq 2.402000 GHz Stop Freq 2.40200 GHz Stop Freq 2.4020 GHz Stop Freq		div	Ref 30	0.00 d	Bm							11.	72 dBm		
100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1									ľ						•
000 Start Freq 100 Stop Freq 2.30700000 GHz 300 Stop Freq 400 Stop Freq 500									 					2.40	2000000 GHz
100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1000000 GHz 1000000 GHz 1000000 GHz 1000000 GHz 1000000 GHz 100 Man Freq Offset 0 Hz 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100	10.0				ممنو	مسمسمون	and the second second second								
200 2.40700000 GHz 400 2.40700000 GHz 400 400 400 400 400 400 400 400 400 400	0.00			, or and	- AREAL									2.39	7000000 GHz
200 2.40700000 GHz 300 2.40700000 GHz 400 300 4.20 4.0000 GHz 400 4.00 4.00 4.00 4.00 4.00 4.00 4.00	-10.0	مر													Stop Freq
300 1.000000 MHz 400 1.000000 MHz 400 1.00000 MHz 400 1.000 Mz 400 1.000 Mz </td <td>-20.0</td> <td>Areash</td> <td></td> <td>2.40</td> <td></td>	-20.0	Areash												2.40	
300 1.000000 MHz 400 1.000000 MHz 400 1.00000 MHz 400 1.000 Mz 400 1.000 Mz 400 1.000 Mz	20.0														CF Step
-500 -500 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600 -600	-30.0														1.000000 MHz
500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 <td>-40.0</td> <td></td>	-40.0														
Scale Type Center 2.402000 GHz #Res BW 3.0 MHz #VBW 50 MHz Sweep 1.000 ms (1001 pts)	-50.0														•
Center 2.402000 GHz #Res BW 3.0 MHz #VBW 50 MHz Sweep 1.000 ms (1001 pts)	-60.0														
#Res BW 3.0 MHz #VBW 50 MHz Sweep 1.000 ms (1001 pts)															Scale Type
							#\/D\4	50 MU-			Puroon 4	Span 1	0.00 10112	Log	Lin
		BW 3					#VBW	50 WIHZ					toot pis)		

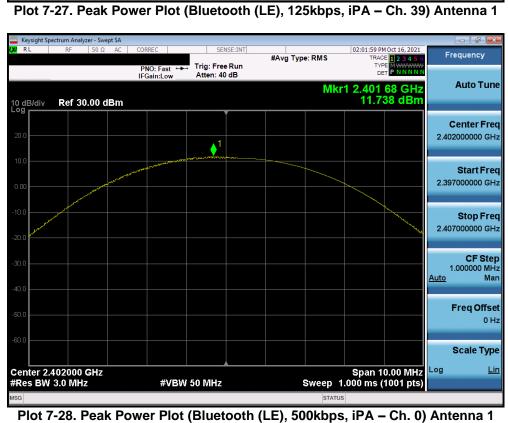


Plot 7-26. Peak Power Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	pectrum Analyze											_	- • •
L <mark>XI</mark> RL	RF	50 Ω A	AC CO	RREC		SEI	ISE:INT	#Avg Typ	e: RMS		MOct 16, 2021	Fi	equency
			P IF	PNO: Fas Gain:Lo	t 🖵 w	Trig: Fre Atten: 40		• 7.		TYF DE			Auto Tune
10 dB/div Log	Ref 30.	00 dBr	m							11.	13 dBm		
20.0													Center Freq 0000000 GHz
10.0						¹						2.40	000000000112
0.00												2.47	Start Freq 5000000 GHz
-10.0											and the second s	2.48	Stop Freq 5000000 GHz
-30.0													CF Step
-40.0												<u>Auto</u>	Man
-50.0													Freq Offset 0 Hz
-60.0													
													Scale Type
Center 2 #Res BW	.480000 G 3.0 MHz	Hz		#\	/BW :	50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	<u>Lin</u>
MSG									STATUS	5			



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	ectrum Analyzer - S										
LXI RL	RF 50	Ω AC	CORREC	SEI	ISE:INT	#Avg Typ	e: RMS		M Oct 16, 2021	F	requency
			PNO: Fast C IFGain:Low	Trig: Free Atten: 40		• //		TYF De			Auto Tune
10 dB/div Log	Ref 30.00	dBm					Mkr	1 2.439 11.	92 GHz 95 dBm		Auto Tune
20.0					1						Center Freq 0000000 GHz
0.00		and and and a second second	Sector and Sector and							2.43	Start Freq 5000000 GHz
-10.0									and the second s	2.44	Stop Freq 5000000 GHz
-30.0										, <u>Auto</u>	CF Step I.000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0											Scale Type
Center 2.4 #Res BW	440000 GH 3.0 MHz	Z	#VB	N 50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	Lin
MSG							STATUS	3			



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

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	pectrum Analyzer - Sw									_	
LX/RL	RF 50 Ω	AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS		M Oct 16, 2021	Fi	equency
10 dB/div	Ref 30.00 (dBm	PNO: Fast IFGain:Low	Trig: Free Atten: 40			Mkr	TYP	95 GHz 68 dBm		Auto Tune
20.0					1						Center Freq 2000000 GHz
0.00										2.39	Start Freq 7000000 GHz
-10.0										2.40	Stop Freq 7000000 GHz
-30.0										Auto	CF Step 1.000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0	.402000 GHz							Snan 1	0.00 MHz	Log	Scale Type Lin
	/ 3.0 MHz		#VBV	/ 50 MHz			Sweep 1	.000 ms (1001 pts)		
MSG							STATUS				



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

FCC ID: A3LSMS908JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 129
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		ctrum Anal												
l ,XI R	L	RF	<u>50 Ω</u>	AC	CORRE	C	SE	NSE:INT	#Avg Typ	e: RMS	TRAC	M Oct 16, 2021	Fr	equency
					PNO IFGai	:Fast ⊆ in:Low	Trig: Fre Atten: 4			Mk	TYF DE r1 2.479	97 GHz		Auto Tune
10 di Log	B/div	Ref 3	0.00 d	Bm							17.1	67 dBm		
20.0								1						Center Freq 0000000 GHz
													2.47	Start Freq 5000000 GHz
													2.48	Stop Freq 5000000 GHz
-30.0 -40.0													Auto ¹	CF Step 1.000000 MHz Man
														Freq Offset 0 Hz
														Scale Type
		80000 3.0 MH				#VBW	/ 50 MHz			Sweep	Span 1 1.000 ms (Log	<u>Lin</u>
MSG										STATU	IS			



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	ISUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 128
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	ctrum Analyzer -									_	
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SEN	SE:INT	#Avg Type	e: RMS		E 1 2 3 4 5 6	Fr	equency
			PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 40				TYF DE			Auto Tune
10 dB/div Log	Ref 30.00) dBm					WIKF	12.439	78 GHz 05 dBm		
											Center Freq
20.0				1 						2.44	0000000 GHz
10.0			and the second se								Start Freq
0.00										2.43	5000000 GHz
-10.0	and the second se								and the second second	2.44	Stop Freq 5000000 GHz
-20.0											CF Step
-40.0										1 <u>Auto</u>	.000000 MHz Man
-50.0											Freq Offset
-60.0											0 Hz
											Scale Type
Center 2.4 #Res BW	40000 GH 3.0 MHz	z	#VBV	/ 50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	<u>Lin</u>
MSG							STATUS				



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 129
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	nt Spectrum Anal											_	
l <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	e: RMS		M Oct 16, 2021	F	requency
				PNO: Fa IFGain:L	ow	Trig: Free Atten: 40				TYP			
10 dB/di Log	v Ref 3	0.00 dl	Bm						Mk	r1 2.402 17.8	05 GHz 66 dBm		Auto Tune
20.0							1						Center Freq 2000000 GHz
10.0			- Contraction of the contraction									2.39	Start Freq 97000000 GHz
-10.0												2.40	Stop Freq 07000000 GHz
-30.0												<u>Auto</u>	CF Step 1.000000 MHz Man
-40.0													Freq Offset 0 Hz
-60.0													Scale Type
	2.402000 W 3.0 MH			#	VBW :	50 MHz			Sweep	Span 1 1.000 ms (0.00 MHz 1001 pts)	Log	<u>Lin</u>
MSG									STATI	JS			



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 25 of 129
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	nt Spectrum A	•										_	
LXI RL	RF	50 Ω	AC	CORREC		SEI	NSE:INT	#Avg Typ	e: RMS		E 1 2 3 4 5 6	Fi	equency
				PNO: Fa IFGain:L	ast 🖵 .ow	Trig: Fre Atten: 40		0.91		TYF DE			Auto Turo
10 dB/di Log	iv Ref	30.00 d	IBm						Mk	r1 2.479 17.4	89 GHz 62 dBm		Auto Tune
20.0						•	1						Center Freq 0000000 GHz
10.0 0.00												2.47	Start Freq 5000000 GHz
-10.0												2.48	Stop Freq 5000000 GHz
-30.0												, <u>Auto</u>	CF Step 1.000000 MHz Man
-50.0													Freq Offset 0 Hz
-60.0													Scale Type
	Center 2.480000 GHz Span 10.00 MHz #Res BW 3.0 MHz #VBW 50 MHz Sweep 1.000 ms (1001 pts)						Log	<u>Lin</u>					
MSG									STATU	s			



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	De res 00 st 400
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		ctrum Analy											_	
l ,XI R	L	RF	50 Ω	AC	CORREC		SEI	NSE:INT	#Avg Typ	e: RMS	TRAC	HOct 16, 2021	F	requency
					PNO: F IFGain:	ast ⊶⊷ Low	Trig: Fre Atten: 40				TYP De			Auto Tune
10 dl Log	B/div	Ref 30).00 d	Bm						MIKI	1 2.440 11.9	30 GHZ 92 dBm		
								Í					(Center Freq
								↓ ¹					2.44	0000000 GHz
									- some -					Start Freq
													2.43	5000000 GHz
-10.0												the second se		
-10.0	and a start of the											and the second	2.44	Stop Freq 5000000 GHz
	\vdash												, Auto	CF Step 1.000000 MHz Man
	<u> </u>													
														Freq Offset
														0 Hz
														Scale Type
		40000									Span 1	0.00 191112	Log	<u>Lin</u>
-	sBW	3.0 MH	Z			#VBW	50 MHz				1.000 ms (1001 pts)		
MSG										STATU	5			



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 27 of 129
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Antenna 2

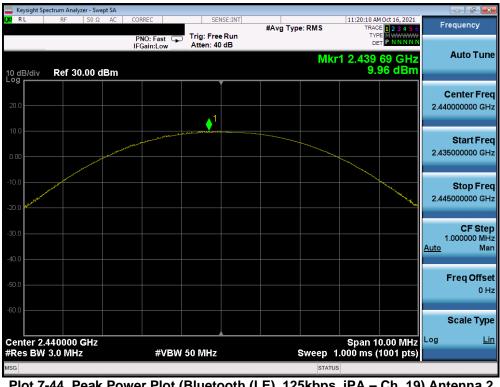
Freework	Dete Dete	Devier	Channel	Divete eth	Peak Conducted Power			
Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	Bluetooth Mode	[dBm]	[mW]		
2402	125 kbps	iPA	0	LE	9.84	9.647		
2440	125 kbps	iPA	19	LE	9.96	9.897		
2480	125 kbps	iPA	39	LE	9.07	8.078		
2402	500 kbps	iPA	0	LE	9.89	9.748		
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: A3LSMS908JPN	Pctest Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 120
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	pectrum Analyzei										
LXI RL	RF	50 Ω AC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		E 1 2 3 4 5 6	Fr	equency
	_	NFE	PNO: Fast 😱 IFGain:Low	Trig: Free Atten: 40		0.91		TYF DE 1 2.401			Auto Tune
10 dB/div Log	Ref 30.0	00 dBm						9.	84 dBm		
20.0				1							Center Freq 2000000 GHz
0.00			and the second second second							2.39	Start Freq 7000000 GHz
-10.0									and the second s	2.40	Stop Freq 7000000 GHz
-30.0										1 <u>Auto</u>	CF Step .000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0											Scale Type
Center 2. #Res BW	402000 G 3.0 MHz	Hz	#VBW	50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	Lin
MSG							STATUS	;			

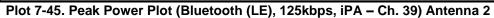


Plot 7-44. Peak Power Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 2

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	N G	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 120
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	ectrum Analyzer - S										- đ -
LX/RL	RF 50	Ω AC	CORREC	SENS	E:INT	#Avg Type	e: RMS		E 1 2 3 4 5 6	Fr	equency
			PNO: Fast IFGain:Low	Trig: Free Atten: 40		0 71		TYF DE 1 2.479	85 GHz		Auto Tune
10 dB/div Log	Ref 30.00	dBm						9.	олавш		
20.0				1							Center Freq 0000000 GHz
0.00				/						2.47	Start Freq 5000000 GHz
-10.0									A A A A A A A A A A A A A A A A A A A	2.48	Stop Freq 5000000 GHz
-30.0										1 <u>Auto</u>	CF Step 1.000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0											Scale Type
Center 2.4 #Res BW	180000 GH 3.0 MHz	Z	#VBW	50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	Lin
MSG							STATUS				





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

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	ISUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 40 of 100
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	ectrum Analyzer -										
LXVI RL	RF 50	Ω AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS		HOct 16, 2021	Fre	quency
			PNO:Fast ⊂ IFGain:Low	Trig: Free Atten: 40				TYP			Auto Tune
10 dB/div Log	Ref 30.00	0 dBm						9.	92 dBm		
20.0											e nter Freq 000000 GHz
10.0				×1	<u>-</u>						
0.00		Arrange and a second	menon and a second second								Start Freq
-10.0											Stop Freq
-20.0										2.4450	000000 GHz
-30.0										1.0 <u>Auto</u>	CF Step 000000 MHz Man
-40.0										F	req Offset 0 Hz
-60.0											
								0		Log	cale Type
#Res BW	140000 GH 3.0 MHz	Z	#VBV	V 50 MHz			Sweep 1	.000 ms (0.00 MHz 1001 pts)	_09	
MSG							STATUS	3			



Plot 7-48. Peak Power Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 2

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 100	
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Keysight Spectrum Analyzer - Swept SA				
X RL RF 50Ω AC	CORREC SENSE:INT	#Avg Type: RMS	11:44:05 AM Oct 16, 2021 TRACE 1 2 3 4 5 6	Peak Search
10 dB/div Ref 30.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 40 dB	Mkr	1 2.401 89 GHz 15.756 dBm	NextPeak
20.0	1			Next Pk Right
0.00				Next Pk Left
-10.0				Marker Delta
-30.0				Mkr→CF
50.0				Mkr→RefLvl
Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 50 MHz	Sweep 1	Span 10.00 MHz .000 ms (1001 pts)	More 1 of 2
ISG		STATUS		

Plot 7-49. Peak Power Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 0) Antenna 2



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 129	
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	pectrum Analyzer -						
L <mark>XI</mark> RL	RF 50	DΩ AC	CORREC	SENSE:INT	#Avg Type: RMS	11:44:52 AM Oct 16, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 30.00	0 dBm	PNO: Fast 🕞 IFGain:Low	Trig: Free Run Atten: 40 dB	M	Kr1 2.479 95 GHz 15.11 dBm	Auto Tune
20.0				1			Center Freq 2.48000000 GHz
10.0 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
	.480000 GH V 3.0 MHz	Z	#VBW	50 MHz	Sweep	Span 10.00 MHz 1.000 ms (1001 pts)	Log <u>Lin</u>
MSG					ST/	ATUS	



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 129
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	ctrum Analyzer - Sv							- 6
L <mark>XI</mark> RL	RF 50 S	AC AC	CORREC	SENSE:I	NT #Avg Type		TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast IFGain:Low	Trig: Free Ru Atten: 40 dB	n			Auto Tune
10 dB/div Log	Ref 30.00	dBm					9.93 dBm	
								Center Freq
20.0				↓ ¹				2.440000000 GHz
10.0								Start Freq
0.00								2.435000000 GHz
-10.0								Stop Freq 2.445000000 GHz
-20.0								CF Step
-40.0								1.000000 MHz <u>Auto</u> Man
-50.0								Freq Offset 0 Hz
-60.0								UHZ
								Scale Type
Center 2.4 #Res BW 3	40000 GHz 3.0 MHz		#VBW	50 MHz		Sp Sweep 1.000	an 10.00 MHz ms (1001 pts)	Log <u>Lin</u>
MSG						STATUS	inter (inter)	





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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 129
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	ight Spect	rum Analyz												
LXI RL		RF	50 Ω	AC	CORRE	C		SENSE:INT	#Avg Typ	e: RMS		MOct 16, 2021	Fr	equency
					PNO IFGai	:Fast ⊂ n:Low		Free Run : 40 dB	0.71		TYF DE			Auto Tune
10 dB/ Log r	'div	Ref 30	.00 d	Bm						Mk	r1 2.402 15.	07 GHz 87 dBm		Auto Tune
20.0								1						Center Freq 2000000 GHz
10.0														
0.00													2.39	Start Freq 7000000 GHz
-10.0	/													Stop Freq
-20.0													2.40	7000000 GHz
-30.0 -													1 <u>Auto</u>	CF Step .000000 MHz Man
-40.0														Freq Offset 0 Hz
-60.0														Scale Type
)2000 (.0 MHz				#VBW	/ 50 MH	lz		Sweep	Span 1 1.000 ms (0.00 10112	Log	<u>Lin</u>
MSG										STATU				



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 45 of 100	
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	oectrum Analyzer - S						
(XI RL	RF 50	Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	11:59:51 AM Oct 16, TRACE 1 2 3	4 5 6 Frequency
	_		PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 40 dB		TYPE MWW DET P NN	N N N
10 dB/div Log	Ref 30.00	dBm			N	/kr1 2.480 05 G 15.34 d	iHz Auto Tune Bm
20.0							Center Freq 2.480000000 GHz
10.0							2.48000000 GH2
0.00							Start Freq 2.475000000 GHz
-10.0							Oton Error
-20.0							Stop Freq 2.485000000 GHz
-30.0							CF Step 1.000000 MHz
-40.0							Auto Man
-50.0							Freq Offset
-60.0							
							Scale Type
Center 2. #Res BW	480000 GH: 3.0 MHz	Z	#VBW	50 MHz	Swee	Span 10.00 ľ p 1.000 ms (1001	/IHz ^{Log} Lin pts)
MSG					ST	TATUS	



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 46 of 128			
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	ht Spectre	um Analyz												
LXI RL		RF	50 Ω	AC	CORRE	C		SENSE:INT	#Avg Typ	e: RMS		M Oct 16, 2021	Fr	equency
						:Fast ↔ n:Low	Trig: F Atten:	ree Run 40 dB			TYF DE			Auto Tune
10 dB/d Log	iv	Ref 30	.00 d	Bm						Mki	r1 2.440 9.9	01 GHz 83 dBm		Auto Tune
20.0														Center Freq 0000000 GHz
10.0								1					2.43	Start Freq
-10.0	a a a a a a a a a a a a a a a a a a a											And a start of the	2.44	Stop Freq
-20.0													1 Auto	CF Step 0.000000 MHz Man
-40.0														Freq Offset
-60.0														Scale Type
Center #Res E						#VBW	/ 50 MH	z		Sweep 1	Span 1 1.000 ms (0.00 MHz (1001 pts)	Log	Lin
MSG										STATU	s			



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Page 47 of 128		
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Dual Antenna

Frequency	Data Rate	Rate Power Channel Bluetooth Power Ant 1			Peak Co Power		Peak Conducted Power _Dual			
[MHz]	[Mbps]	Scheme	No.	Mode	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:

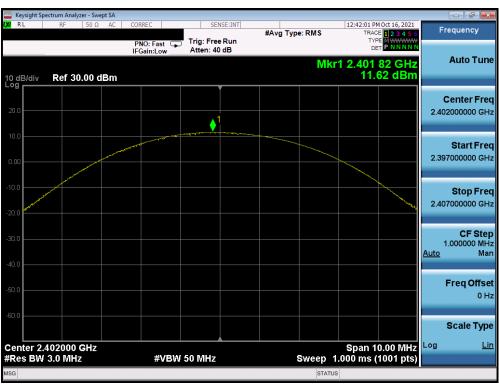
This device can operate simultaneously on two antennas. The directional gains are shown in Table 2-2 in Section 2.3 of this report. The directional gain from the operation of two antennas is shown to operate at less than 6dBi per the calculation below:

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.

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-61. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 1

	trum Analyzer - Sw						
LX/ RL	RF 50 Ω	2 AC	CORREC	SENSE:INT	#Avg Type: RMS	12:44:02 PM Oct 16, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWW	Frequency
10 dB/div	Ref 30.00	dBm	IFGain:Low	Atten: 40 dB	Μ	kr1 2.439 93 GHz 11.68 dBm	Auto Tune
20.0				1			Center Free 2.440000000 GH
0.00				and and a set of the s			Start Fre 2.435000000 GH
-10.0							Stop Fre 2.445000000 GH
30.0							CF Ste 1.000000 MH <u>Auto</u> Ma
50.0							Freq Offs 0 F
60.0							Scale Typ
Center 2.44 #Res BW 3	40000 GHz 3.0 MHz		#VB\	V 50 MHz	Sweep	Span 10.00 MHz 1.000 ms (1001 pts)	Log <u>Li</u>
ISG					ST/	ATUS	

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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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	ectrum Analyzer -											_	
L <mark>XI</mark> RL	RF 5	i0Ω A	AC C	ORREC		SE	NSE:INT	#Avg Typ	e: RMS		HOct 16, 2021	Fr	equency
				PNO: Fa FGain:L	ow	Trig: Fre Atten: 40			Miles	TYF			Auto Tune
10 dB/div Log	Ref 30.0	0 dBi	m						IVIKI	12.479	85 GHz 82 dBm		
							ľ						Center Freq
20.0						♦	1					2.48	0000000 GHz
10.0													Start Freq
0.00												2.47	5000000 GHz
-10.0	Jer -										have a second se		Stop Freq
-20.0											New York	2.48	5000000 GHz
													CF Step
-30.0												1 <u>Auto</u>	.000000 MHz Man
-40.0													
-50.0													Freq Offset 0 Hz
-60.0													UTIL CTIL
													Scale Type
Center 2.4 #Res BW	480000 GH 3 0 MHz	łz			NBM	50 MHz	•		Sween_1	Span 1	0.00 MHz 1001 pts)	Log	Lin
MSG	5.0 10112			"		50 10112			STATUS		roor prs)		

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



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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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	pectrum Analyzer -								
I <mark>XI</mark> RL	RF 50	DΩ AC	CORREC	SENSE:1		ype: RMS	12:48:43 PM O TRACE	ct 16, 2021	Frequency
	-		PNO: Fast G	Trig: Free Ru Atten: 40 dB	in		TYPE DET		Auto Tune
10 dB/div Log	Ref 30.00	0 dBm				MKI	r1 2.440 3 11.67	1 GHZ 7 dBm	
				Ĭ					Center Freq
20.0					1				2.440000000 GHz
10.0									Start Freq
0.00									2.435000000 GHz
-10.0								a de la construcción de la const	Stop Freq
-20.0									2.445000000 GHz
-30.0									CF Step 1.000000 MHz
-40.0									<u>Auto</u> Man
50.0									Freq Offset
-50.0									0 Hz
-60.0									Scale Type
	.440000 GH	Iz					Span 10.	00 1911 12	Log <u>Lin</u>
#Res BV	/ 3.0 MHz		#VBW	50 MHz		Sweep 1	1.000 ms (10	iun pts)	
						31410	<u> </u>		

Plot 7-65. Peak Power Plot	(Dual Bluetooth	(LE), 2Mbps, iPA	– Ch. 19) Antenna 1	

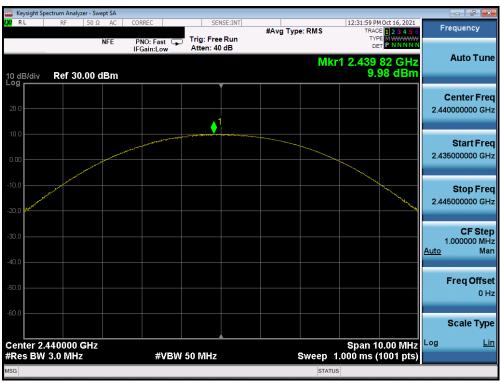


Plot 7-66. Peak Power Plot (Dual Bluetooth (LE), 2Mbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 51 of 100
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	ectrum Analyzer - Swe										
L <mark>XI</mark> RL	RF 50 Ω	AC	CORREC	SEI	NSE:INT	#Avg Typ	e: RMS		E 1 2 3 4 5 6	Fr	equency
			PNO: Fast C IFGain:Low _	Trig: Free Atten: 40			Mkr	TYF DE 1 2.402			Auto Tune
10 dB/div Log	Ref 30.00 d	IBm				_		9.	51 dBm		
20.0					▲1						Center Freq 2000000 GHz
0.00				and a second growth a second						2.39	Start Freq 7000000 GHz
-10.0									and the second s	2.40	Stop Freq 7000000 GHz
-30.0										Auto ¹	CF Step .000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0											Scale Type
Center 2.4 #Res BW	102000 GHz 3.0 MHz		#VB	W 50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	Log	Lin
MSG							STATUS				



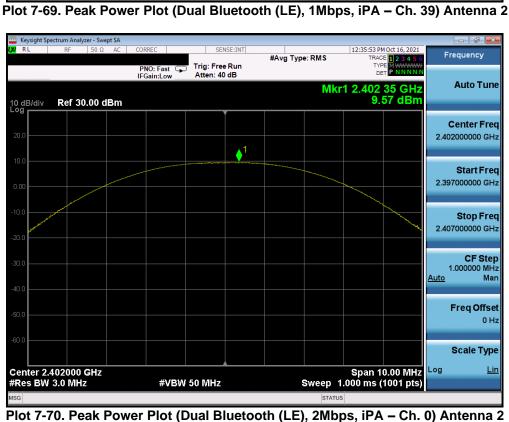
Plot 7-67. Peak Power Plot (Dual Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 2

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

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dawa 50 at 400	
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	ctrum Analyzer - Sv									_	
L <mark>XI</mark> RL	RF 50 S	2 AC	CORREC	SEN	SE:INT	#Avg Type	e: RMS	TRAC	HOct 16, 2021	Fr	equency
10 dB/div	Ref 30.00	NFE	PNO: Fast IFGain:Low	Trig: Free Atten: 40			Mkr	TYF DE 1 2.479	99 GHz 16 dBm		Auto Tune
20.0					1						Center Freq 0000000 GHz
0.00										2.47	Start Freq 5000000 GHz
-10.0 -20.0										2.48	Stop Freq 5000000 GHz
-30.0										Auto ¹	CF Step 1.000000 MHz Man
-50.0											Freq Offset 0 Hz
-60.0	80000 GHz							Spap 1	0.00 MHz	Log	Scale Type Lin
#Res BW			#VBV	/ 50 MHz			Sweep 1	.000 ms (0.00 MHz 1001 pts)		
MSG							STATUS	5			



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EUT Type:

MEASUREMENT REPORT

(CERTIFICATION)

Approved by:

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Technical Manager

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Proud to be part of 🖨 element

6

Test Dates:

FCC ID: A3LSMS908JPN

Test Report S/N:



		n Analyzer - S											
L <mark>XI</mark> RL	F	RF 50	Ω AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		HOct 16, 2021	F	requency
10 dB/di	v R	ef 30.00	dBm	PNO: IFGain	Fast 🕞	Trig: Fre Atten: 4			Mkr	TYF DE 1 2.440	[₽] [₽] [№]		Auto Tune
20.0							1						Center Freq 10000000 GHz
0.00												2.43	Start Freq 5000000 GHz
-10.0 -20.0	and the second											2.44	Stop Freq 15000000 GHz
-30.0												<u>Auto</u>	CF Step 1.000000 MHz Man
-50.0													Freq Offset 0 Hz
-60.0												Log	Scale Type
Center #Res B		000 GH: MHz	Z		#VBW	50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	LUg	<u>Lin</u>
MSG									STATUS	3			





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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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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

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
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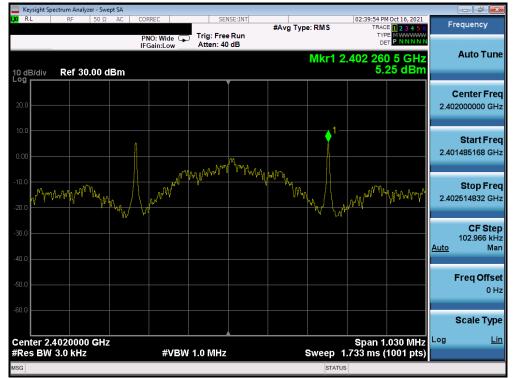
Antenna 1

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: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	I G	Approved by: Fechnical Manager
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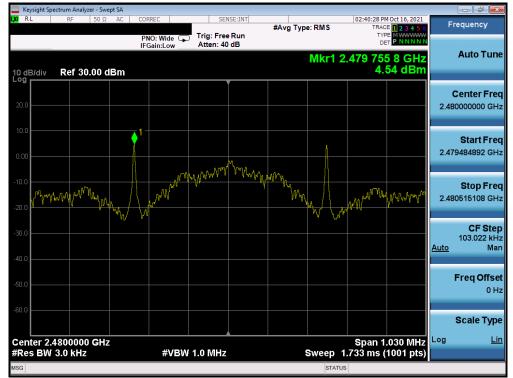
Plot 7-73. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA – Ch. 0) Antenna 1



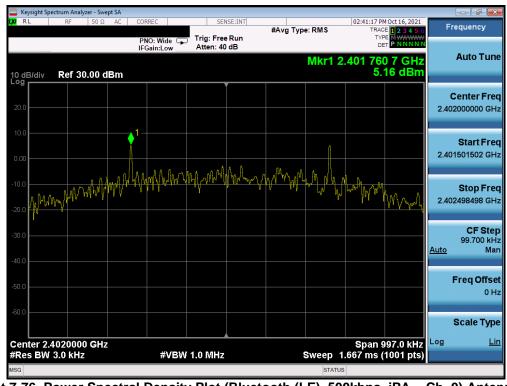
Plot 7-74. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 1

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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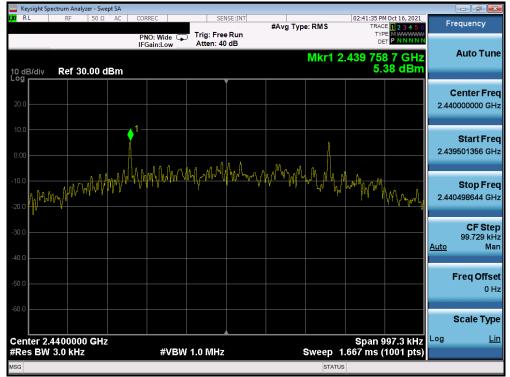
Plot 7-75. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 39) Antenna 1



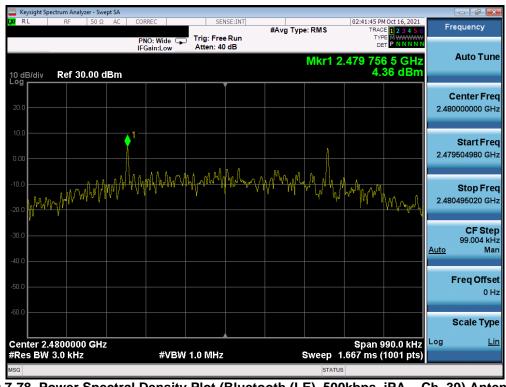
Plot 7-76. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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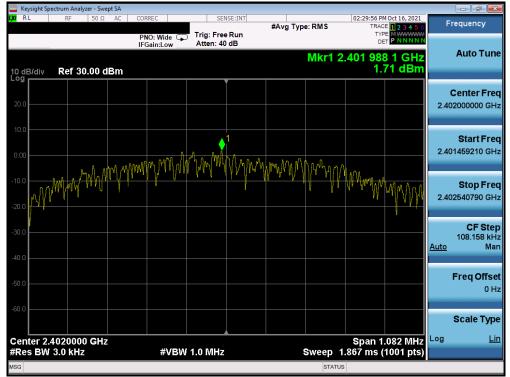
Plot 7-77. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 1



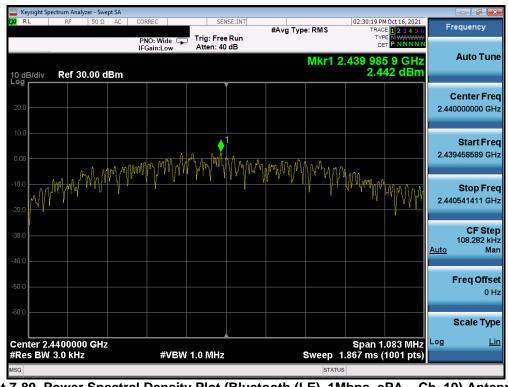
Plot 7-78. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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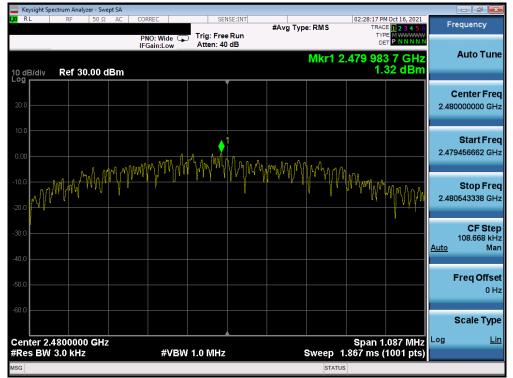
Plot 7-79. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 0) Antenna 1



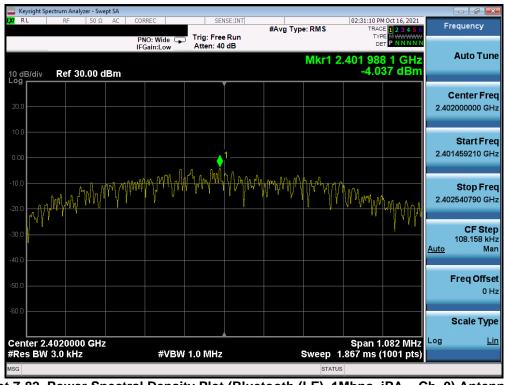
Plot 7-80. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 19) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of relement			Approved by: Technical Manager
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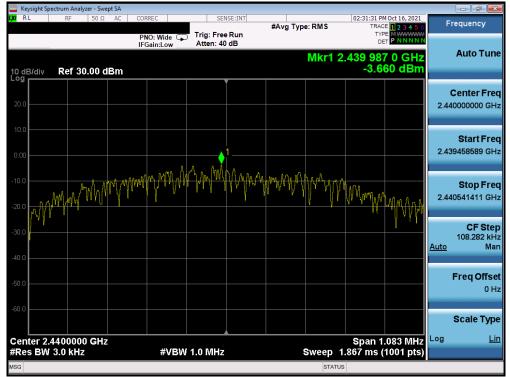
Plot 7-81. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA - Ch. 39) Antenna 1



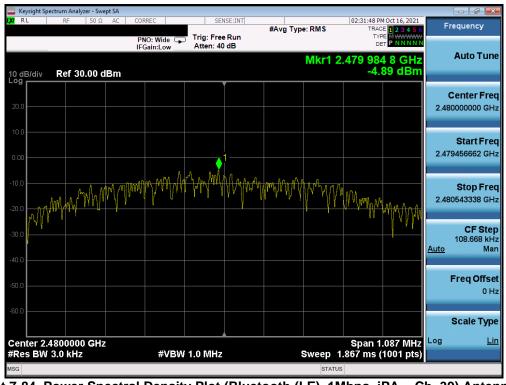
Plot 7-82. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of element			Approved by: Technical Manager
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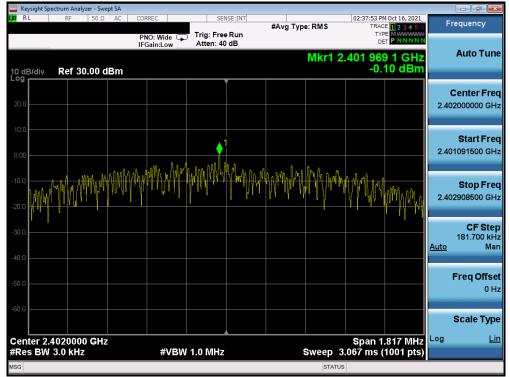
Plot 7-83. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 19) Antenna 1



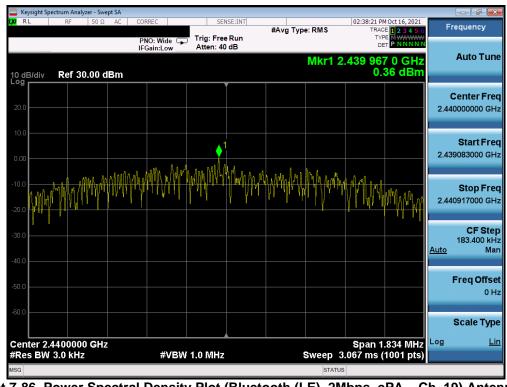
Plot 7-84. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 39) Antenna 1

FCC ID: A3LSMS908JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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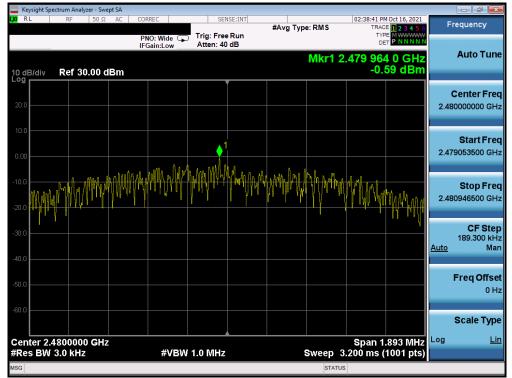
Plot 7-85. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 0) Antenna 1



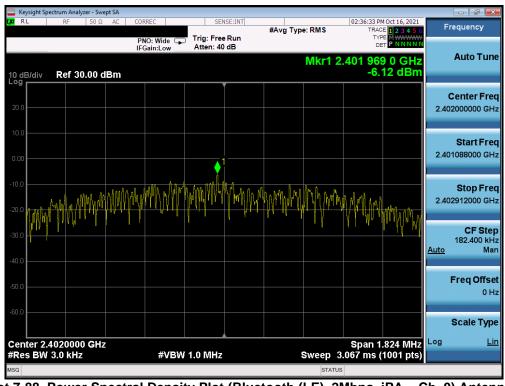
Plot 7-86. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 1

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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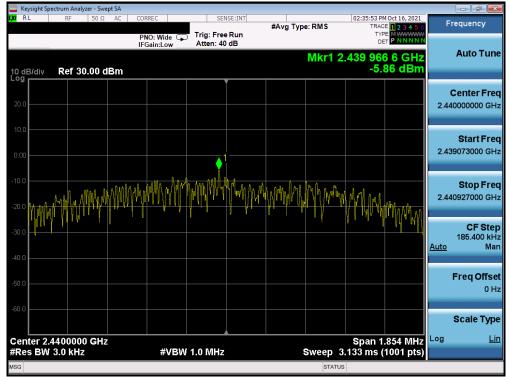
Plot 7-87. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA – Ch. 39) Antenna 1



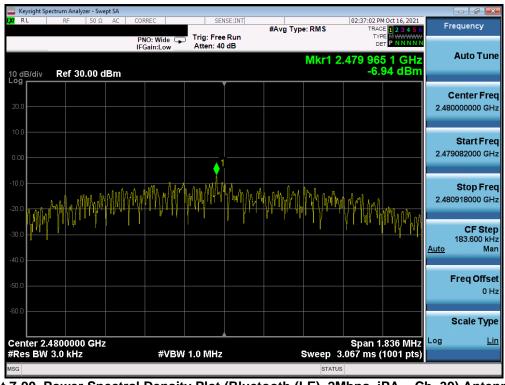
Plot 7-88. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, iPA - Ch. 0) Antenna 1

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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: A3LSMS908JPN	PCTEST Proud to be part of @ element			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: A3LSMS908JPN	PCTEST 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



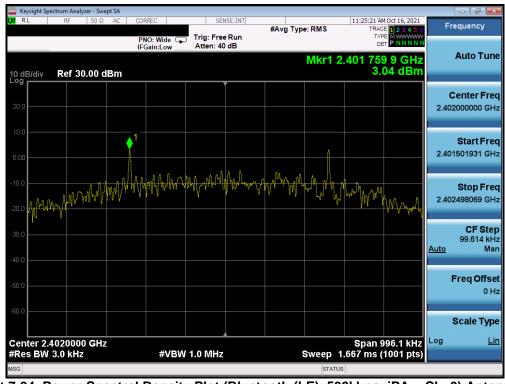
Plot 7-92. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 19) Antenna 2

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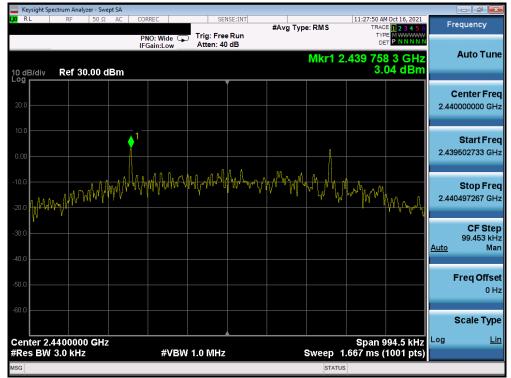
Plot 7-93. Power Spectral Density Plot (Bluetooth (LE), 125kbps, iPA - Ch. 39) Antenna 2



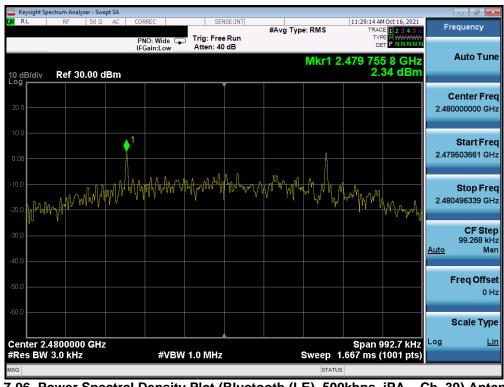
Plot 7-94. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 0) Antenna 2

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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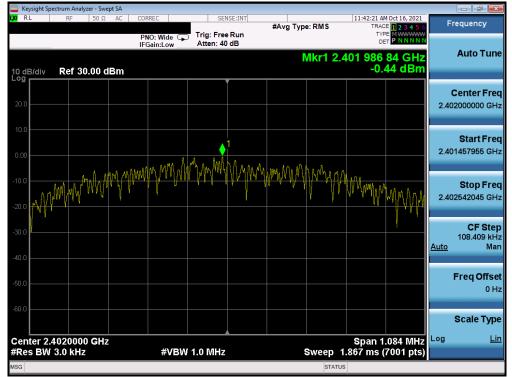
Plot 7-95. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 19) Antenna 2



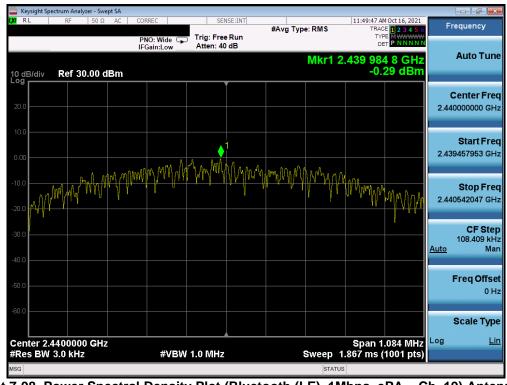
Plot 7-96. Power Spectral Density Plot (Bluetooth (LE), 500kbps, iPA - Ch. 39) Antenna 1

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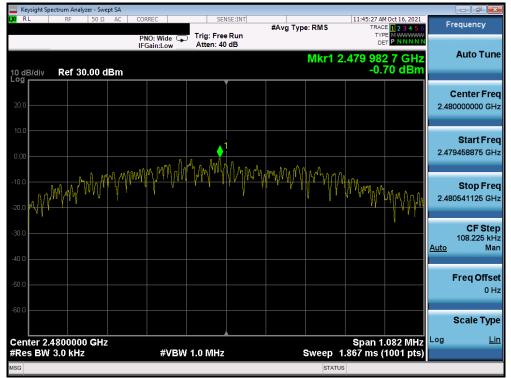
Plot 7-97. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, ePA – Ch. 0) Antenna 2



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

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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

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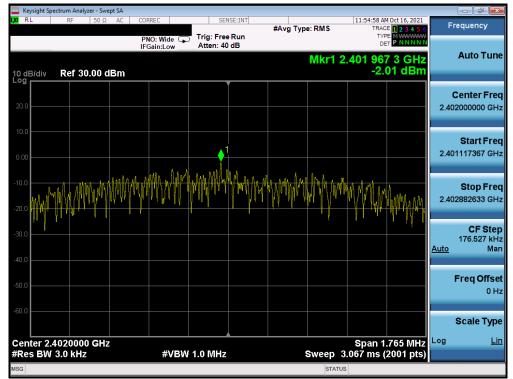
Plot 7-101. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA - Ch. 19) Antenna 2



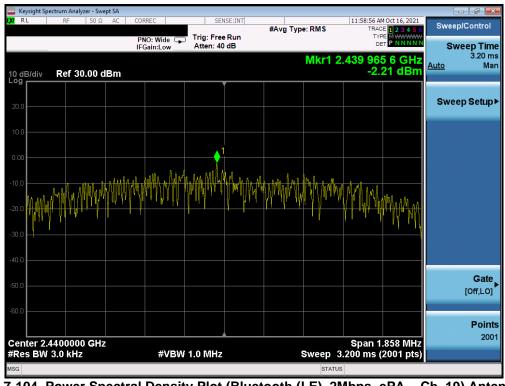
Plot 7-102. Power Spectral Density Plot (Bluetooth (LE), 1Mbps, iPA – Ch. 39) Antenna 2

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-103. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA – Ch. 0) Antenna 2



Plot 7-104. Power Spectral Density Plot (Bluetooth (LE), 2Mbps, ePA - Ch. 19) Antenna 2

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