

**MEASUREMENT REPORT**
LTE**Applicant Name:**

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

Date of Testing:

Nov. 10 - 15, 2017

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1711020283-03.A3L

FCC ID:

A3LSMJ250F

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Class II Permissive Change

Model:

SM-J250F/DS

Additional Model:

SM-J250F, SM-J250G/DS, SM-J250G

EUT Type:

Portable Handset

FCC Classification:

TNE (Licensed Non-Broadcast Transmitter Held to Ear)

FCC Rule Part(s):

22 & 27

Test Procedure(s):

ANSI/TIA-603-E-2016, KDB 971168 D01 v03

Test Device Serial No.:

production model [S/N: 01845]

Class II Permissive Change:

Please see FCC change document

Original Grant Date:

Nov. 01, 2017

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 §2.947. 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

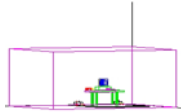


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FCC Part



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	
LTE Band 5	22H	824.7 - 848.3	0.095	19.79	0.156	21.94	QPSK
LTE Band 5	22H	824.7 - 848.3	0.063	17.96	0.103	20.11	16QAM
LTE Band 5	22H	825.5 - 847.5	0.098	19.92	0.161	22.07	QPSK
LTE Band 5	22H	825.5 - 847.5	0.063	17.99	0.103	20.14	16QAM
LTE Band 5	22H	826.5 - 846.5	0.098	19.93	0.161	22.08	QPSK
LTE Band 5	22H	826.5 - 846.5	0.056	17.46	0.091	19.61	16QAM
LTE Band 5	22H	829 - 844	0.110	20.41	0.180	22.56	QPSK
LTE Band 5	22H	829 - 844	0.072	18.55	0.117	20.70	16QAM
LTE Band 7	27	2502.5 - 2567.5			0.094	19.75	QPSK
LTE Band 7	27	2502.5 - 2567.5			0.067	18.27	16QAM
LTE Band 7	27	2505 - 2565			0.127	21.03	QPSK
LTE Band 7	27	2505 - 2565			0.098	19.90	16QAM
LTE Band 7	27	2507.5 - 2562.5			0.102	20.10	QPSK
LTE Band 7	27	2507.5 - 2562.5			0.078	18.90	16QAM
LTE Band 7	27	2510 - 2560			0.095	19.76	QPSK
LTE Band 7	27	2510 - 2560			0.070	18.44	16QAM
LTE Band 38	27	2572.5 - 2617.5			0.137	21.38	QPSK
LTE Band 38	27	2572.5 - 2617.5			0.105	20.20	16QAM
LTE Band 38	27	2575 - 2615			0.147	21.68	QPSK
LTE Band 38	27	2575 - 2615			0.131	21.16	16QAM
LTE Band 38	27	2577.5 - 2612.5			0.117	20.66	QPSK
LTE Band 38	27	2577.5 - 2612.5			0.096	19.82	16QAM
LTE Band 38	27	2580 - 2610			0.127	21.05	QPSK
LTE Band 38	27	2580 - 2610			0.097	19.85	16QAM

EUT Overview

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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 Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISSED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISSED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMJ250F**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

2.2 Device Capabilities

This device contains the following capabilities:

850 GPRS/EDGE, 850/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, Bluetooth (1x, EDR, LE)

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

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

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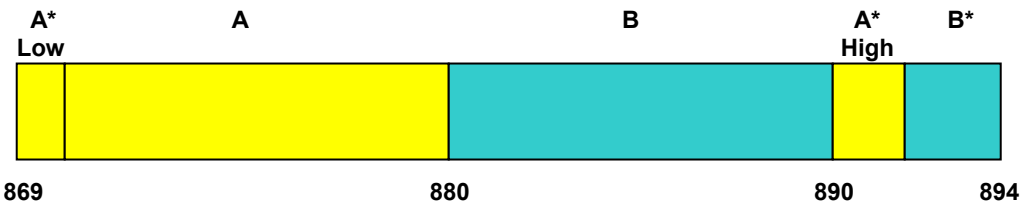
3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v03) were used in the measurement of the EUT.

3.2 Cellular - Base Frequency Blocks

§22.905



BLOCK 1: 869 – 880 MHz (A* Low + A)

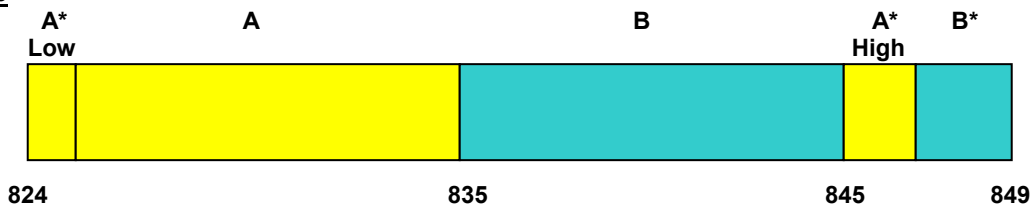
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks

§22.905



BLOCK 1: 824 – 835 MHz (A* Low + A)

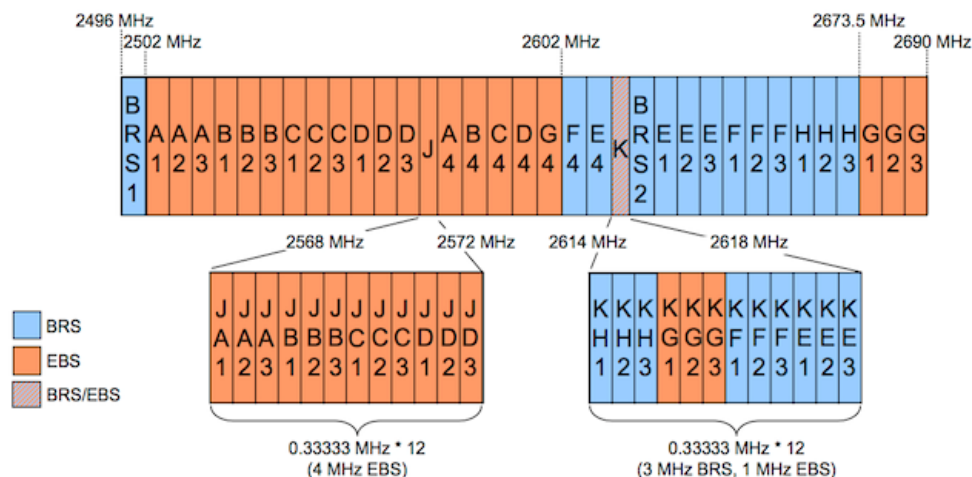
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.4 BRS/EBS Frequency Block

§27.5



FCC ID: A3LSMJ250F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Quality Manager
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3.5 Radiated Power and Radiated Spurious Emissions

§2.1053 §22.913(a)(2) §22.917(a) §27.53(m) §27.50(h)(2) RSS-132(5.4) RSS-132(5.5) RSS-199(4.4) RSS-199(4.5)

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. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03.

Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power [Watts]})$. For Band 7 and 38, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of $55 + 10\log_{10}(\text{Power [Watts]})$.

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4.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty ($\pm$ dB)
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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5.0 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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	6/21/2018	RE1
Agilent	8648D	(9kHz-4GHz) Signal Generator	11/26/2016	Annual	11/26/2017	3613A00315
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	8/28/2017	Annual	8/28/2018	MY49432391
Agilent	87405C	Pre-amplifier (0.1 - 18 GHz)	3/19/2014	Annual	3/19/2015	MY53010007
Com-Power	PAM-118A	Pre-Amplifier	6/21/2017	Annual	6/21/2018	551042
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	6/21/2017	Annual	6/21/2018	441119
Emco	6502	Active Loop Antenna (10k - 30 MHz)	8/9/2016	Biennial	8/9/2018	2936
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A		N/A	QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		N/A	11208010032
PCTEST	-	EMC Switch System	6/21/2017	Annual	6/21/2018	NM1
Rohde & Schwarz	CMW500	Radio Communication Tester	5/4/2017	Annual	5/4/2018	112347
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/7/2017	Annual	3/7/2018	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/11/2017	Annual	8/11/2018	103200
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	3/30/2016	Biennial	3/30/2018	9105-2403
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/11/2017	Biennial	8/11/2019	A042511
VWR	62344-734	Thermometer with Clock	2/20/2016	Biennial	2/20/2018	140140336

Table 5-1. Test Equipment

Notes:

- 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.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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6.0 SAMPLE CALCULATIONS

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (–24.80).

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMJ250F
 FCC Classification: TNE (Licensed Non-Broadcast Transmitter Held to Ear)
 Mode(s): LTE

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(2)	RSS-132(5.4)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 5)	< 7 Watts max. ERP < 11.5 Watts max. EIRP	RADIATED	PASS	Section 7.2
27.50(h)(2)	RSS-199(4.4)	Equivalent Isotropic Radiated Power (Band 7,38)	< 2 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a)	RSS-132(5.5)	Undesirable Emissions (Band 5)	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3
27.53(m)	RSS-199(4.5)	Undesirable Emissions (Band 7, 38)	Undesirable emissions must meet the limits detailed in 27.53(m) (RSS-199 [6.4])		PASS	Section 7.3

Table 7-1. Summary of Radiated Test Results

Note:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

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7.2 Radiated Power (ERP/EIRP)

\$22.913(a)(2) §27.50(h)(2) §27.50(a)(3) RSS-132(5.4) RSS-199(4.4)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

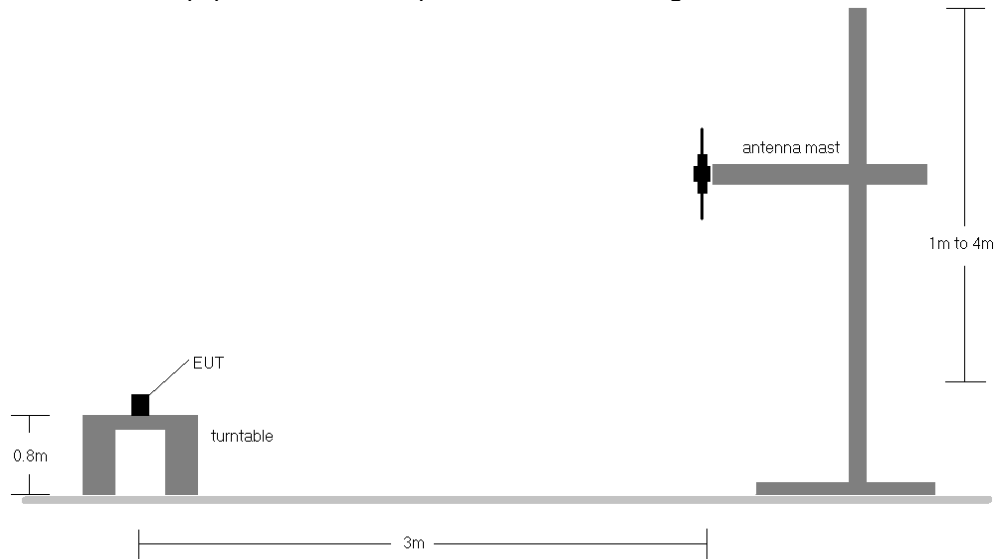


Figure 7-1. Radiated Test Setup <1GHz

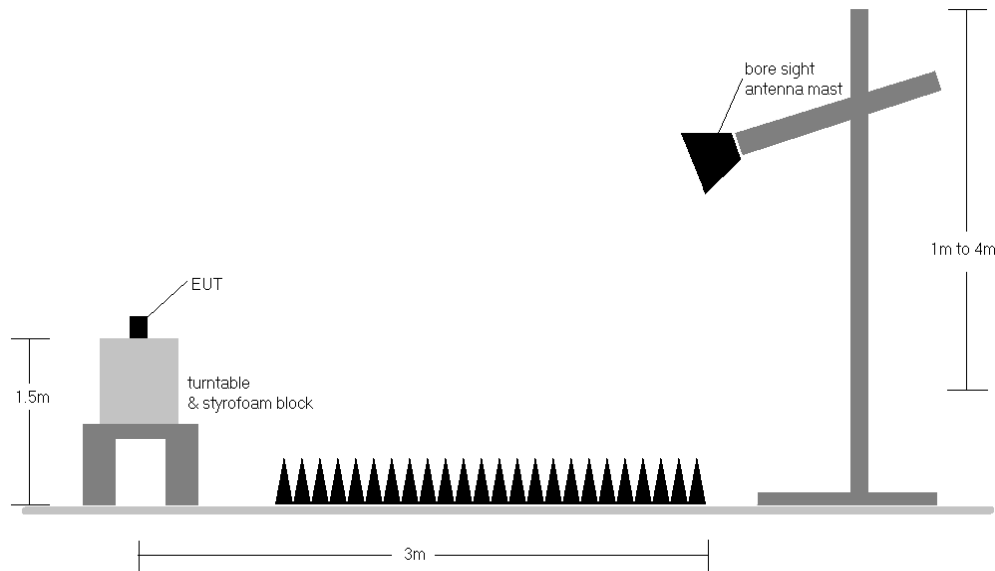


Figure 7-2. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	131	283	1 / 5	12.18	0.70	10.73	0.012	38.45	-27.72	12.88	0.019	36.99	-24.11
836.50	1.4	QPSK	V	118	244	1 / 5	20.49	0.75	19.09	0.081	38.45	-19.36	21.24	0.133	36.99	-15.75
848.30	1.4	QPSK	V	123	247	1 / 5	21.15	0.79	19.79	0.095	38.45	-18.66	21.94	0.156	36.99	-15.05
825.50	3	QPSK	V	131	297	1 / 14	12.64	0.70	11.19	0.013	38.45	-27.26	13.34	0.022	36.99	-23.65
836.50	3	QPSK	V	118	246	1 / 14	20.38	0.75	18.98	0.079	38.45	-19.47	21.13	0.130	36.99	-15.86
847.50	3	QPSK	V	125	245	1 / 14	21.28	0.79	19.92	0.098	38.45	-18.53	22.07	0.161	36.99	-14.92
826.50	5	QPSK	V	117	270	1 / 24	16.85	0.71	15.41	0.035	38.45	-23.04	17.56	0.057	36.99	-19.43
836.50	5	QPSK	V	125	244	1 / 24	21.12	0.75	19.72	0.094	38.45	-18.73	21.87	0.154	36.99	-15.12
846.50	5	QPSK	V	120	241	1 / 24	21.29	0.79	19.93	0.098	38.45	-18.52	22.08	0.161	36.99	-14.91
829.00	10	QPSK	V	126	240	1 / 49	20.09	0.72	18.66	0.073	38.45	-19.79	20.81	0.120	36.99	-16.18
836.50	10	QPSK	V	121	244	1 / 49	21.21	0.75	19.81	0.096	38.45	-18.64	21.96	0.157	36.99	-15.03
844.00	10	QPSK	V	120	238	1 / 49	21.78	0.78	20.41	0.110	38.45	-18.04	22.56	0.180	36.99	-14.43
836.50	10	16-QAM	V	121	244	1 / 49	19.95	0.75	18.55	0.072	38.45	-19.90	20.70	0.117	36.99	-16.29
844.00	10	QPSK	H	107	304	1 / 49	19.31	0.78	17.93	0.062	38.45	-20.52	20.08	0.102	36.99	-16.91

Table 7-2. ERP/EIRP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	V	115	238	1 / 0	10.94	8.81	19.75	0.094	33.01	-13.26
2535.00	5	QPSK	V	141	271	1 / 0	10.79	8.81	19.60	0.091	33.01	-13.41
2567.50	5	QPSK	V	113	44	1 / 0	10.46	8.81	19.27	0.084	33.01	-13.74
2505.00	10	QPSK	V	114	238	1 / 0	12.23	8.81	21.03	0.127	33.01	-11.98
2535.00	10	QPSK	V	115	246	1 / 0	9.42	8.81	18.22	0.066	33.01	-14.79
2565.00	10	QPSK	V	112	38	1 / 0	10.40	8.81	19.20	0.083	33.01	-13.81
2505.00	10	16-QAM	V	114	238	1 / 0	11.10	8.81	19.90	0.098	33.01	-13.11
2507.50	15	QPSK	V	139	240	1 / 0	11.19	8.81	19.99	0.100	33.01	-13.02
2535.00	15	QPSK	V	115	153	1 / 0	8.66	8.81	17.46	0.056	33.01	-15.55
2562.50	15	QPSK	V	140	289	1 / 0	11.30	8.81	20.10	0.102	33.01	-12.91
2510.00	20	QPSK	V	141	248	1 / 0	10.96	8.81	19.76	0.095	33.01	-13.25
2535.00	20	QPSK	V	140	239	1 / 0	8.45	8.81	17.25	0.053	33.01	-15.76
2560.00	20	QPSK	V	141	160	1 / 0	9.05	8.81	17.85	0.061	33.01	-15.16
2505.00	10	QPSK	H	100	138	1 / 0	7.86	8.81	16.66	0.046	33.01	-16.35

Table 7-3. EIRP Data (Band 7)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2572.50	5	QPSK	H	145	63	1 / 0	11.49	8.81	20.29	0.107	33.01	-12.72
2595.00	5	QPSK	H	144	58	1 / 0	12.32	8.81	21.12	0.130	33.01	-11.89
2617.50	5	QPSK	H	100	50	1 / 0	12.53	8.85	21.38	0.137	33.01	-11.63
2575.00	10	QPSK	H	145	236	1 / 0	11.72	8.81	20.52	0.113	33.01	-12.49
2595.00	10	QPSK	H	141	60	1 / 0	12.88	8.81	21.68	0.147	33.01	-11.33
2615.00	10	QPSK	H	142	56	1 / 0	11.41	8.85	20.26	0.106	33.01	-12.75
2595.00	10	16-QAM	H	141	60	1 / 0	12.36	8.81	21.16	0.131	33.01	-11.85
2577.50	15	QPSK	H	123	47	1 / 0	11.86	8.81	20.66	0.117	33.01	-12.35
2595.00	15	QPSK	H	142	57	1 / 0	11.72	8.81	20.52	0.113	33.01	-12.49
2612.50	15	QPSK	H	123	48	1 / 0	11.00	8.84	19.84	0.096	33.01	-13.17
2580.00	20	QPSK	H	167	243	1 / 0	12.25	8.81	21.05	0.127	33.01	-11.96
2595.00	20	QPSK	H	159	57	1 / 0	11.95	8.81	20.75	0.119	33.01	-12.26
2610.00	20	QPSK	H	121	49	1 / 0	11.65	8.83	20.48	0.112	33.01	-12.53
2595.00	10	QPSK	V	140	96	1 / 0	9.15	8.81	17.96	0.062	33.01	-15.06

Table 7-4. EIRP Data (Band 38)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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7.3 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §27.53(m) RSS-132(5.5) RSS-199(4.5)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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Test Setup

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

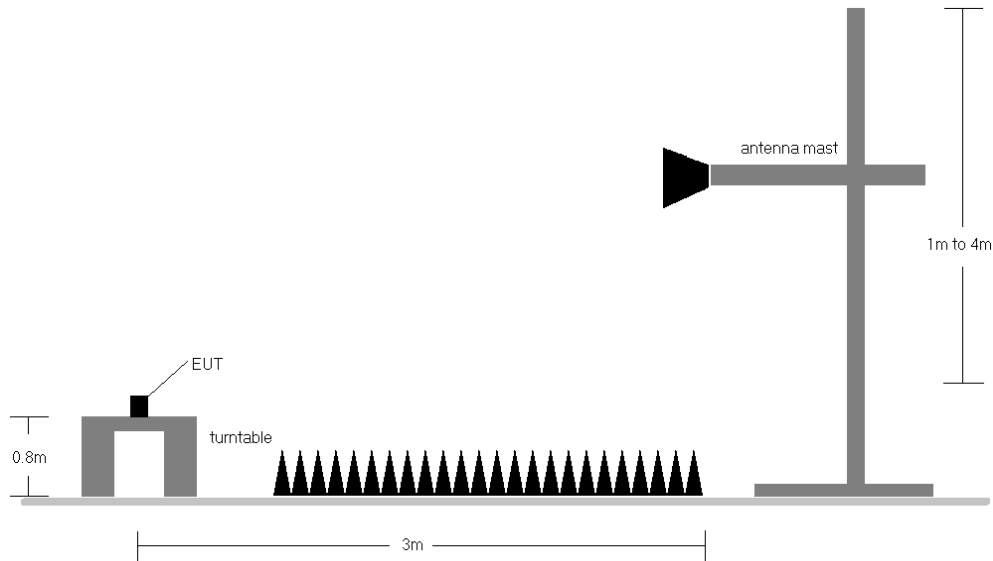


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 3) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 4) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMJ250F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Quality Manager
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LTE Band 5

OPERATING FREQUENCY: 829.00 MHz
 CHANNEL: 20450
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	V	156	69	-46.99	8.98	-38.01	-25.0
2487.00	V	100	87	-54.60	8.98	-45.62	-32.6
3316.00	V	-	-	-57.51	9.30	-48.21	-35.2

Table 7-5. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	153	272	-45.14	8.84	-36.30	-23.3
2509.50	V	100	234	-58.17	9.02	-49.15	-36.1
3346.00	V	-	-	-56.98	9.32	-47.67	-34.7

Table 7-6. Radiated Spurious Data (Band 5 – Mid Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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OPERATING FREQUENCY: 844.00 MHz
 CHANNEL: 20600
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	V	136	336	-54.31	8.70	-45.61	-32.6
2532.00	V	192	72	-54.82	9.09	-45.73	-32.7
3376.00	V	103	90	-53.62	9.40	-44.23	-31.2
4220.00	V	-	-	-56.31	10.40	-45.91	-32.9

Table 7-7. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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LTE Band 7

OPERATING FREQUENCY: 2505.00 MHz
 CHANNEL: 20800
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5010.00	H	133	70	-53.42	11.19	-42.24	-17.2
7515.00	H	102	41	-46.59	10.87	-35.72	-10.7
10020.00	H	255	106	-46.50	11.97	-34.54	-9.5
12525.00	H	-	-	-44.55	12.91	-31.64	-6.6

Table 7-8. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY: 2535.00 MHz
 CHANNEL: 21100
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	141	73	-51.33	11.00	-40.33	-15.3
7605.00	H	140	73	-43.42	11.03	-32.38	-7.4
10140.00	H	-	-	-48.83	12.09	-36.74	-11.7

Table 7-9. Radiated Spurious Data (Band 7 – Mid Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2565.00 MHz
 CHANNEL: 21400
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5130.00	H	153	66	-50.28	10.97	-39.31	-14.3
7695.00	H	113	67	-41.07	11.14	-29.93	-4.9
10260.00	H	-	-	-43.12	12.21	-35.89	-10.9

Table 7-10. Radiated Spurious Data (Band 7 – High Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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LTE Band 38

OPERATING FREQUENCY: 2575.00 MHz
 CHANNEL: 37800
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5150.00	H	133	70	-52.83	10.95	-41.88	-16.9
7725.00	H	102	41	-46.72	11.16	-35.55	-10.6
10300.00	H	255	106	-46.44	12.33	-34.11	-9.1
12875.00	H	-	-	-44.18	13.47	-30.71	-5.7

Table 7-11. Radiated Spurious Data (Band 38 – Low Channel)

OPERATING FREQUENCY: 2595.00 MHz
 CHANNEL: 38000
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5190.00	H	141	73	-51.23	10.97	-40.26	-15.3
7785.00	H	140	73	-43.34	11.21	-32.13	-7.1
10380.00	H	-	-	-48.86	12.43	-36.43	-11.4

Table 7-12. Radiated Spurious Data (Band 38 – Mid Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2615.00 MHz
 CHANNEL: 38200
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5230.00	H	153	66	-50.43	11.04	-39.39	-14.4
7845.00	H	113	67	-40.87	11.22	-29.65	-4.6
10460.00	H	-	-	-48.01	12.51	-35.50	-10.5

Table 7-13. Radiated Spurious Data (Band 38 – High Channel)

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMJ250F** complies with all the requirements of Part of the FCC Rules for LTE operation only.

FCC ID: A3LSMJ250F		FCC Pt. 22 & 27 LTE TEST REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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