

**MEASUREMENT REPORT**
FCC Part 22, 24, & 27 LTE**Applicant Name:**

Samsung Electronics Co., Ltd.

129, Samsung-ro,

Yeongtong-gu, Suwon-si

Gyeonggi-do, 16677, Korea

Date of Testing:

3/6 - 3/21/2017

Test Site/Location:

PCTEST Lab., Columbia, MD, USA

Test Report Serial No.:

1M1703100104-03.A3L

FCC ID : **A3LSMG955N****APPLICANT:** **SAMSUNG ELECTRONICS CO., LTD.****Application Type:**

Class II Permissive Change

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

§2; §22; §24; §27

Test Procedure(s):

ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02, KDB 648474 D03 v01r04

EUT Type:

Portable Handset

Model:

SM-G955N

Test Device Serial No.:*identical prototype* [S/N: CD7B8, E57BB, E5667]**Class II Permissive Change:**

Please see FCC change document

Original Grant Date:

3/10/2017

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.

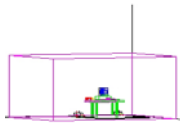

Randy Ortanez
President

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 1 of 30

TABLE OF CONTENTS

FCC PART 22, 24, & 27 MEASUREMENT REPORT	3
1.0 INTRODUCTION	5
1.1 Scope.....	5
1.2 Testing Facility	5
2.0 PRODUCT INFORMATION.....	6
2.1 Equipment Description	6
2.2 Device Capabilities	6
2.3 Test Configuration.....	6
2.4 EMI Suppression Device(s)/Modifications.....	6
3.0 DESCRIPTION OF TESTS	7
3.1 Measurement Procedure.....	7
3.1 Block C Frequency Range	7
3.2 Block A Frequency Range	7
3.3 Cellular - Base Frequency Blocks	7
3.4 Cellular - Mobile Frequency Blocks.....	8
3.5 PCS - Base Frequency Blocks.....	8
3.6 PCS - Mobile Frequency Blocks	8
3.7 AWS - Base Frequency Blocks	8
3.8 AWS - Mobile Frequency Blocks.....	9
3.9 BRS/EBS Frequency Block.....	9
3.10 Radiated Power and Radiated Spurious Emissions.....	10
4.0 MEASUREMENT UNCERTAINTY	11
5.0 TEST EQUIPMENT CALIBRATION DATA	12
6.0 SAMPLE CALCULATIONS	13
7.0 TEST RESULTS.....	14
7.1 Summary.....	14
7.2 Radiated Power (ERP/EIRP)	15
7.3 Radiated Spurious Emissions Measurements.....	20
8.0 CONCLUSION.....	30

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 2 of 30	



MEASUREMENT REPORT

FCC Part 22, 24, & 27

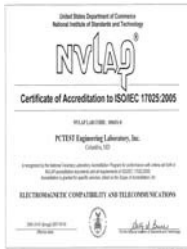
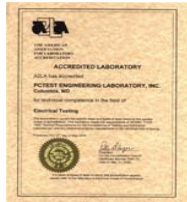


§2.1033 General Information

APPLICANT: Samsung Electronics Co., Ltd.
APPLICANT ADDRESS: 129, Samsung-ro,
 Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §22; §24; §27
BASE MODEL: SM-G955N
FCC ID: A3LSMG955N
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE: $\pm 0.00025\%$ (2.5 ppm)
Test Device Serial No.: CD7B8, E57BB, E5667 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST: 3/6 - 3/21/2017
TEST REPORT S/N: 1M1703100104-03.A3L

Test Facility / Accreditations

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



- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 3 of 30	



MEASUREMENT REPORT

FCC Part 22, 24, & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP/EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 12/17	27	701.5 - 713.5	0.021	13.20	QPSK
LTE Band 12/17	27	701.5 - 713.5	0.015	11.78	16QAM
LTE Band 13	27	779.5 - 784.5	0.037	15.68	QPSK
LTE Band 13	27	779.5 - 784.5	0.030	14.81	16QAM
LTE Band 5/26	22H	831.5 - 841.5	0.044	16.45	QPSK
LTE Band 5/26	22H	831.5 - 841.5	0.031	14.87	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.127	21.03	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.091	19.59	16QAM
LTE Band 2/25	24E	1852.5 - 1912.5	0.139	21.42	QPSK
LTE Band 2/25	24E	1852.5 - 1912.5	0.098	19.91	16QAM
LTE Band 41	27	2498.5 - 2687.5	0.054	17.33	QPSK
LTE Band 41	27	2498.5 - 2687.5	0.043	16.37	16QAM

EUT Overview

FCC ID: A3LSMG955N		 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset			Page 4 of 30

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) 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 Industry Canada Certification and Engineering Bureau.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. 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 detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

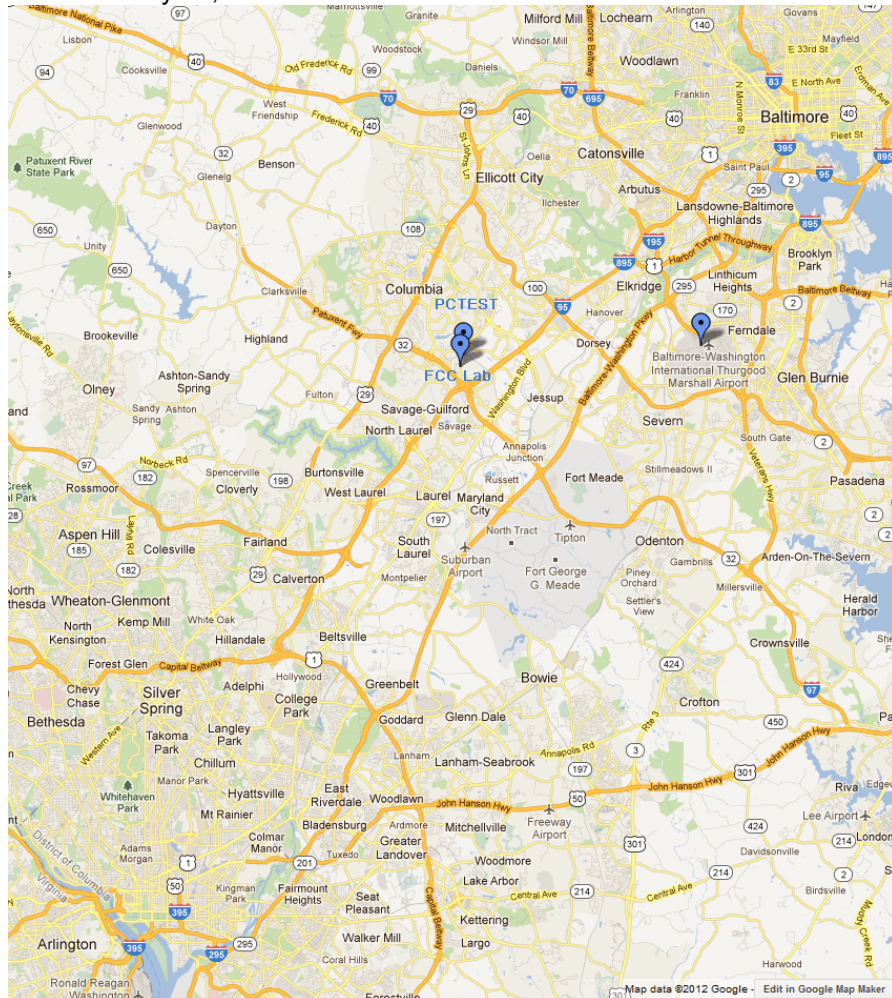


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: A3LSMG955N	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 5 of 30

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG955N**. 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:

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

LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore, test data provided in this report covers Band 17 as well as Band 12.

LTE Band 26 (814.7 – 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.

LTE Band 25 (1850 - 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-D-2010 and KDB 971168 D01 v02r02. See Section 7.0 of this test report for a description of the radiated emissions tests.

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 the EUT lying flat on a certified wireless charging pad (WCP) while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 6 of 30	

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-D-2010) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v02r02) were used in the measurement of the EUT.

3.1 Block C Frequency Range

§27.5(b)(3)

Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

3.2 Block A Frequency Range

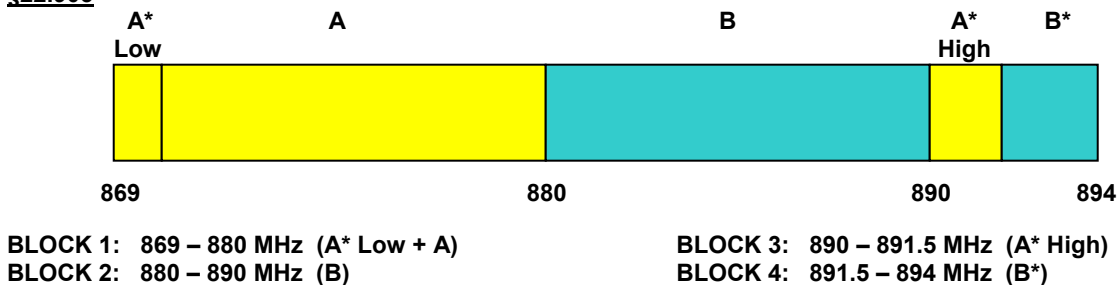
§27.5(c)

698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

Block A: 698-704 MHz and 728-734 MHz;
Block B: 704-710 MHz and 734-740 MHz; and
Block C: 710-716 MHz and 740-746 MHz.

3.3 Cellular - Base Frequency Blocks

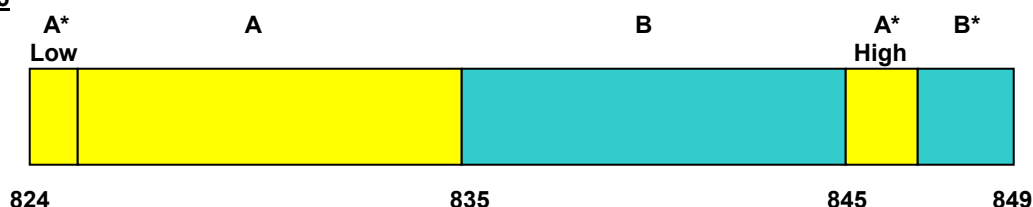
§22.905



FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 7 of 30	

3.4 Cellular - Mobile Frequency Blocks

§22.905



BLOCK 1: 824 – 835 MHz (A* Low + A)

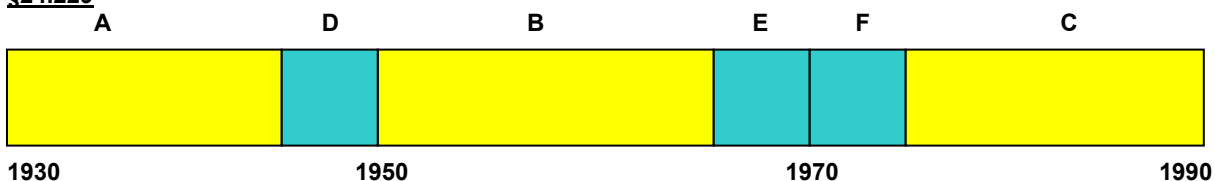
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.5 PCS - Base Frequency Blocks

§24.229



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 2: 1945 – 1950 MHz (D)

BLOCK 3: 1950 – 1965 MHz (B)

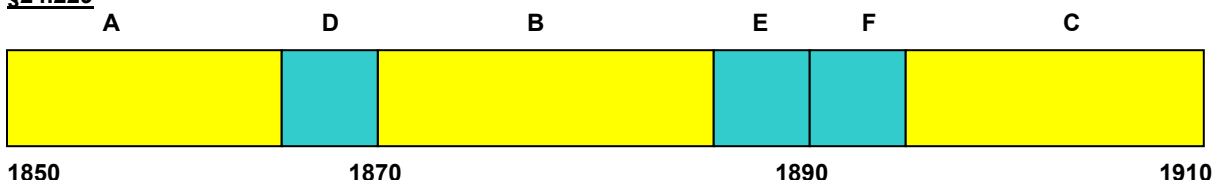
BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 6: 1975 – 1990 MHz (C)

3.6 PCS - Mobile Frequency Blocks

§24.229



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 3: 1870 – 1885 MHz (B)

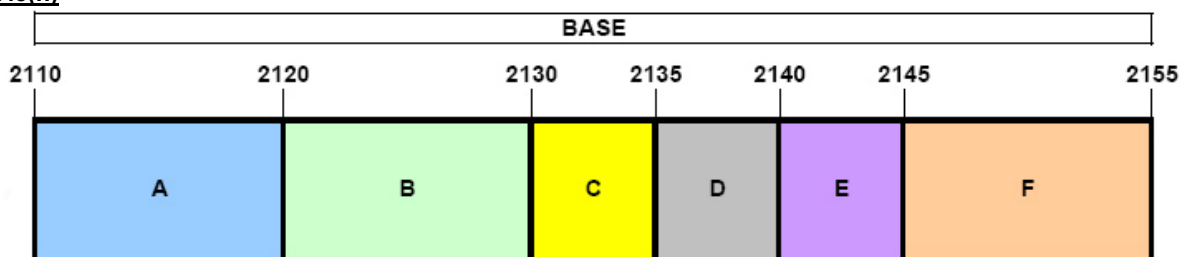
BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 6: 1895 – 1910 MHz (C)

3.7 AWS - Base Frequency Blocks

§27.5(h)



BLOCK 1: 2110 – 2120 MHz (A)

BLOCK 2: 2120 – 2130 MHz (B)

BLOCK 3: 2130 – 2135 MHz (C)

BLOCK 4: 2135 – 2140 MHz (D)

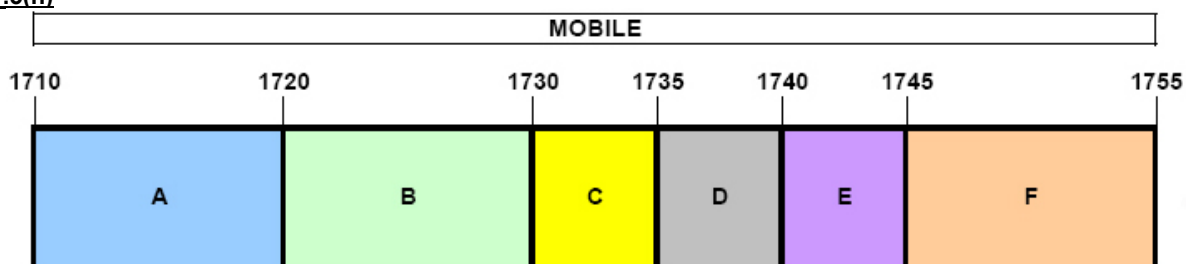
BLOCK 5: 2140 – 2145 MHz (E)

BLOCK 6: 2145 – 2155 MHz (F)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 8 of 30

3.8 AWS - Mobile Frequency Blocks

§27.5(h)

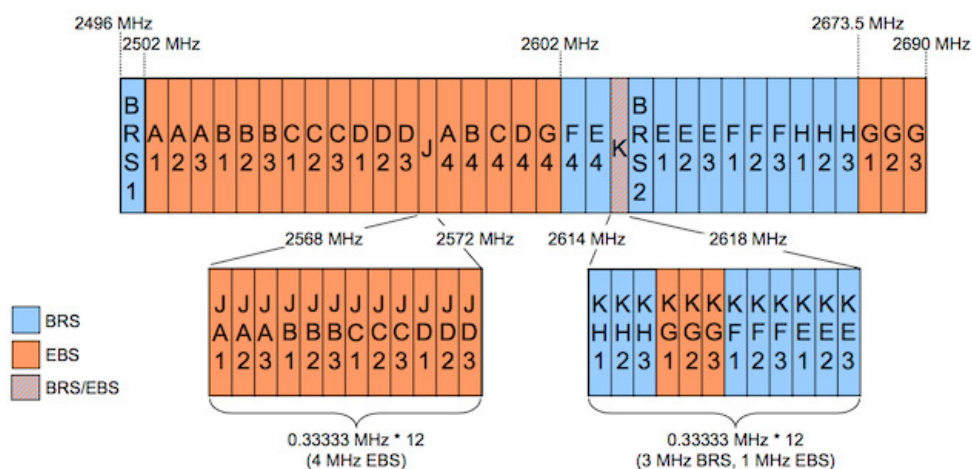


BLOCK 1: 1710 – 1720 MHz (A)
BLOCK 2: 1720 – 1730 MHz (B)
BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 4: 1735 – 1740 MHz (D)
BLOCK 5: 1740 – 1745 MHz (E)
BLOCK 6: 1745 – 1755 MHz (F)

3.9 BRS/EBS Frequency Block

§27.5



FCC ID: A3LSMG955N	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 9 of 30

3.10 Radiated Power and Radiated Spurious Emissions

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(b.10) §27.50(c.10) §27.50(d.4) §27.53(f) §27.53(g) §27.53(h) §27.53(m)

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. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

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 v02r02.

Per the guidance of ANSI/TIA-603-D-2010, 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 $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 41, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of $55 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset			Page 10 of 30

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 data shown herein 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)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 11 of 30

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 C63.5-2006.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/11/2016	Annual	7/11/2017	RE1
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	7/11/2016	Annual	7/11/2017	441128
Emco	6502	Active Loop Antenna (10k - 30 MHz)	8/9/2016	Biennial	8/9/2018	2936
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/26/2016	Biennial	4/26/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	8/23/2016	Biennial	8/23/2018	135427
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/4/2016	Annual	4/4/2017	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
PCTEST	-	EMC Switch System	7/11/2016	Annual	7/11/2017	NM1
PCTEST	-	EMC Switch System	7/6/2016	Annual	7/6/2017	NM2
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	7/27/2016	Annual	7/27/2017	103200
Rohde & Schwarz	CMU200	Base Station Simulator	6/2/2016	Annual	6/2/2017	109892
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	4/7/2016	Annual	4/7/2017	100040
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/18/2015	Biennial	11/18/2017	91052523RX
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107
Sunol Sciences	DRH-118	Horn Antenna (1-18GHz)	7/1/2015	Biennial	7/1/2017	A060215

Table 5-1. Test Equipment

Notes:

1. 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.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 12 of 30	

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).

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 13 of 30	

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMG955N
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Result	Reference
22.913(a.2)	Effective Radiated Power (Band 5/26)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
27.50(b.10) 27.50(c.10)	Effective Radiated Power (Band 12/17, 13)	< 3 Watts max. ERP		PASS	Section 7.2
24.232(c) 27.50(h.2)	Equivalent Isotropic Radiated Power (Band 2/25, 41)	< 2 Watts max. EIRP		PASS	Section 7.2
27.50(d.4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz		PASS	Section 7.3
27.53(m)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) at channel edges > 55 + 10log ₁₀ (P[Watts]) at 5.5MHz away and beyond channel edges		PASS	Section 7.3

Table 7-1. Summary of Test Results

Notes:

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

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 14 of 30	

7.2 Radiated Power (ERP/EIRP)

§22.913(a.2) §24.232(c.2) §27.50(h.2) §27.50(b.10) §27.50(c.10) §27.50(d.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-D-2010 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 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – 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

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 15 of 30

Test Setup

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

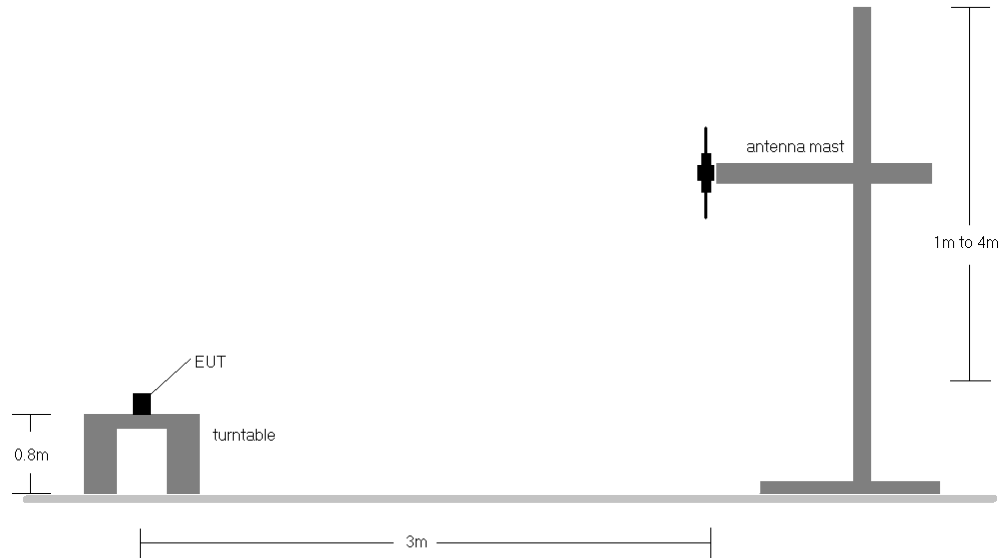


Figure 7-1. Radiated Test Setup <1GHz

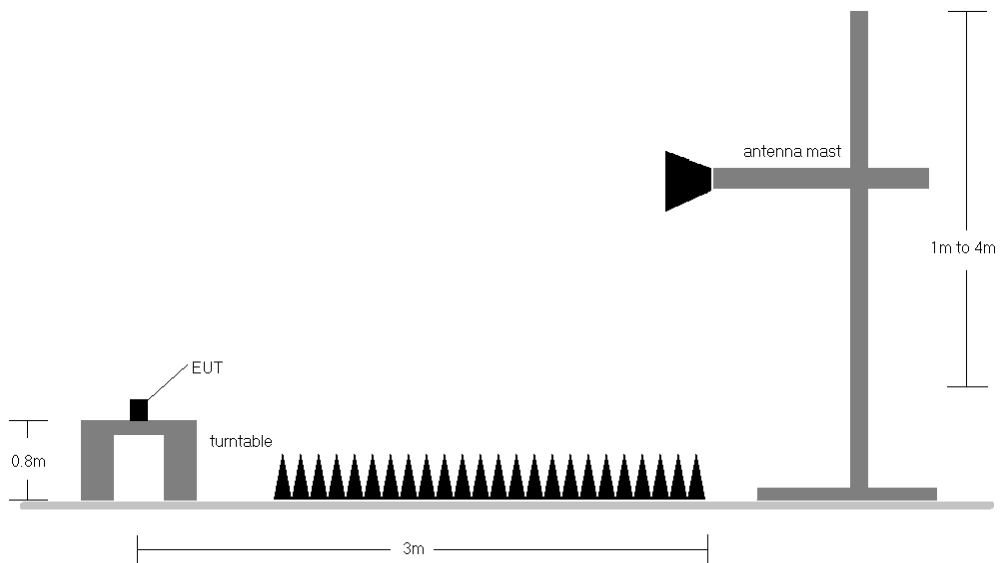


Figure 7-2. Radiated Test Setup >1GHz

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.
- 2) This unit was tested with its standard battery.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 16 of 30	

7.2.1 Antenna-A Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	150	83	1 / 24	13.08	-1.04	12.04	34.77	-22.74
707.50	5	QPSK	H	150	83	1 / 24	13.83	-1.02	12.81	34.77	-21.96
713.50	5	QPSK	H	150	83	1 / 24	14.20	-1.00	13.20	34.77	-21.57
713.50	5	16-QAM	H	150	83	1 / 24	12.78	-1.00	11.78	34.77	-22.99
713.50	5	QPSK	V	150	124	1 / 74	12.19	-1.00	11.19	34.77	-23.58
713.50	5 (WCP)	QPSK	H	150	32	1 / 0	13.88	-1.00	12.88	34.77	-21.89

Table 7-2. ERP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	150	87	1 / 0	15.43	-0.83	14.60	34.77	-20.17
782.00	5	QPSK	H	150	86	1 / 0	16.49	-0.82	15.67	34.77	-19.10
784.50	5	QPSK	H	150	94	1 / 0	16.49	-0.81	15.68	34.77	-19.09
784.50	5	16-QAM	H	150	94	1 / 0	15.62	-0.81	14.81	34.77	-19.96
784.50	5	QPSK	V	150	132	1 / 0	14.49	-0.81	13.68	34.77	-21.09
784.50	5 (WCP)	QPSK	H	150	84	1 / 0	16.36	-0.81	15.55	34.77	-19.22

Table 7-3. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
831.50	15	QPSK	H	150	87	1 / 0	17.04	-0.65	16.39	38.45	-22.06
836.50	15	QPSK	H	150	90	1 / 0	17.10	-0.65	16.45	38.45	-22.00
841.50	15	QPSK	H	150	92	1 / 0	17.03	-0.65	16.38	38.45	-22.07
836.50	15	16-QAM	H	150	90	1 / 0	15.52	-0.65	14.87	38.45	-23.58
836.50	15	QPSK	V	150	32	1 / 0	15.29	-0.65	14.64	38.45	-23.81
836.50	15 (WCP)	QPSK	H	150	97	1 / 0	15.79	-0.66	15.13	38.45	-23.32

Table 7-4. ERP Data (Band 26/5)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 17 of 30

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 Limit [dBm]	Margin [dB]
1712.50	5	QPSK	H	150	7	1 / 0	15.18	5.55	20.73	30.00	-9.27
1732.50	5	QPSK	H	150	322	1 / 24	14.70	5.41	20.11	30.00	-9.89
1752.50	5	QPSK	H	150	360	1 / 0	15.76	5.27	21.03	30.00	-8.97
1752.50	5	16-QAM	H	150	360	1 / 0	14.32	5.27	19.59	30.00	-10.41
1752.50	5	QPSK	V	150	124	1 / 0	13.90	5.27	19.17	30.00	-10.83
1752.50	5 (WCP)	QPSK	H	150	360	1 / 0	14.31	5.27	19.58	30.00	-10.42

Table 7-5. EIRP Data (Band 4)

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 Limit [dBm]	Margin [dB]
1852.50	5	QPSK	H	150	42	1 / 0	16.61	4.81	21.42	33.01	-11.59
1882.50	5	QPSK	H	150	19	1 / 24	16.11	4.73	20.84	33.01	-12.17
1912.50	5	QPSK	H	150	47	1 / 0	16.33	4.68	21.01	33.01	-12.00
1852.50	5	16-QAM	H	150	42	1 / 0	15.10	4.81	19.91	33.01	-13.10
1852.50	5	QPSK	V	150	35	1 / 0	14.91	4.81	19.72	33.01	-13.29
1852.50	5 (WCP)	QPSK	H	150	23	1 / 0	16.55	4.81	21.36	33.01	-11.65

Table 7-6. EIRP Data (Band 25/2)

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 Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	3	1 / 0	11.60	5.73	17.33	33.01	-15.68
2593.00	5	QPSK	H	150	25	1 / 0	10.85	6.07	16.92	33.01	-16.09
2687.50	5	QPSK	H	150	0	1 / 0	10.30	6.48	16.78	33.01	-16.23
2498.50	5	16-QAM	H	150	3	1 / 0	10.50	5.73	16.23	33.01	-16.78
2498.50	5	QPSK	V	150	32	1 / 0	9.85	5.73	15.58	33.01	-17.43
2498.50	5 (WCP)	QPSK	H	150	35	1 / 0	10.95	5.73	16.68	33.01	-16.33

Table 7-7. EIRP Data (Band 41)

FCC ID: A3LSMG955N	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 				Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset			Page 18 of 30

7.2.2 Antenna-B Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
826.50	5	QPSK	H	202	6	1 / 24	11.76	5.51	17.27	38.45	-21.18
836.50	5	QPSK	H	200	370	1 / 0	10.64	5.14	15.78	38.45	-22.67
846.50	5	QPSK	H	400	16	1 / 0	10.11	4.66	14.77	38.45	-23.68
826.50	5	16-QAM	H	202	6	1 / 24	10.52	5.51	16.03	38.45	-22.42
826.50	5	QPSK	V	123	224	1 / 0	10.12	5.51	15.63	38.45	-22.82
826.50	5 (WCP)	QPSK	H	206	355	1 / 0	11.70	5.51	17.21	38.45	-21.24

Table 7-8. ERP Data (Band 5)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 19 of 30	

7.3 Radiated Spurious Emissions Measurements

\$2.1053 \$22.917(a) \$24.238(a) \$27.53(c) \$27.53(f) \$27.53(g) \$27.53(h) \$27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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 peak 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 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – 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: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 20 of 30	

Test Setup

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

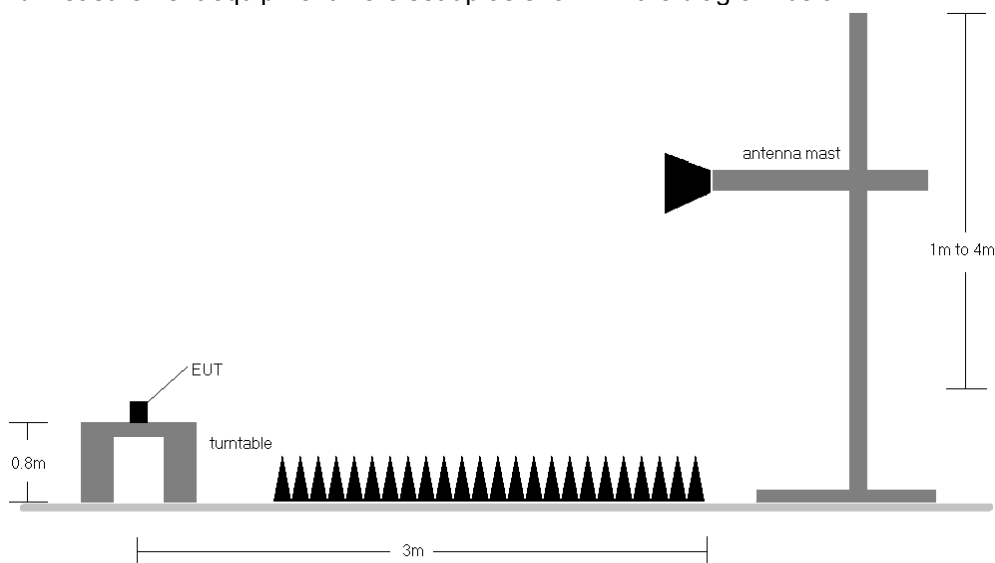


Figure 7-3. Test Instrument & Measurement Setup

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) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) 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.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 21 of 30

7.3.1 Antenna-A Radiated Spurious Emissions Measurements

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MEASURED OUTPUT POWER: 13.20 dBm = 0.021 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 26.20 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	-	-	-75.14	6.01	-69.13	82.3
2140.50	H	-	-	-73.02	6.89	-66.13	79.3

Table 7-9. Radiated Spurious Data (Band 12/17 – High Channel)

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MEASURED OUTPUT POWER: 12.88 dBm = 0.019 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 25.88 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	104	66	-76.92	6.01	-70.91	83.8
2140.50	H	101	76	-74.48	6.89	-67.59	80.5
2854.00	H	-	-	-75.63	8.15	-67.48	80.4

Table 7-10. Radiated Spurious Data with WCP (Band 12/17 – High Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 22 of 30

OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MEASURED OUTPUT POWER: 15.68 dBm = 0.037 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 28.68 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	113	154	-71.19	6.99	-64.20	79.9
3138.00	H	-	-	-68.87	7.20	-61.67	77.3

Table 7-11. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	-	-	-75.69	6.41	-69.28	-29.3

Table 7-12. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 23 of 30	

OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MEASURED OUTPUT POWER: 15.55 dBm = 0.036 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 28.55 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	-	-	-73.94	6.99	-66.95	82.5

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

MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1569.00	H	129	189	-76.84	6.42	-70.42	-30.4

Table 7-14. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset	Page 24 of 30	

OPERATING FREQUENCY: 821.50 MHz
 CHANNEL: 26765
 MEASURED OUTPUT POWER: 16.86 dBm = 0.049 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 29.86 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1643.00	H	-	-	-77.06	6.21	-70.85	87.7
2464.50	H	-	-	-73.54	6.86	-66.68	83.5

Table 7-15. Radiated Spurious Data (Band 26/5 – Mid Channel)

OPERATING FREQUENCY: 821.50 MHz
 CHANNEL: 26765
 MEASURED OUTPUT POWER: 15.13 dBm = 0.033 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 28.13 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1643.00	H	-	-	-76.37	6.21	-70.16	85.3
2464.50	H	-	-	-73.08	6.86	-66.22	81.3

Table 7-16. Radiated Spurious Data with WCP (Band 26/5 – Mid Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 25 of 30

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20375
 MEASURED OUTPUT POWER: 21.03 dBm = 0.127 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.03 dBc

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]	[dBc]
3505.00	H	-	-	-68.85	9.89	-58.97	80.0
5257.50	H	-	-	-66.73	10.92	-55.80	76.8

Table 7-17. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20375
 MEASURED OUTPUT POWER: 19.58 dBm = 0.091 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.58 dBc

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]	[dBc]
3505.00	H	171	156	-68.64	9.89	-58.76	78.3
5257.50	H	145	362	-66.15	10.92	-55.22	74.8
7010.00	H	-	-	-61.45	11.06	-50.39	70.0

Table 7-18. Radiated Spurious Data with WCP (Band 4 – High Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 26 of 30

OPERATING FREQUENCY: 1852.50 MHz
 CHANNEL: 26065
 MEASURED OUTPUT POWER: 21.42 dBm = 0.139 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.42 dBc

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]	[dBc]
3705.00	H	100	168	-66.85	10.01	-56.84	78.3
5557.50	H	-	-	-67.63	11.20	-56.44	77.9

Table 7-19. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY: 1852.50 MHz
 CHANNEL: 26065
 MEASURED OUTPUT POWER: 21.36 dBm = 0.137 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.36 dBc

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]	[dBc]
3705.00	H	204	137	-66.58	10.01	-56.57	77.9
5557.50	H	-	-	-68.35	11.20	-57.16	78.5

Table 7-20. Radiated Spurious Data with WCP (Band 25/2 – Low Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 27 of 30

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MEASURED OUTPUT POWER: 16.92 dBm = 0.049 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 41.92 dBc

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]	[dBc]
5186.00	H	-	-	-65.33	10.75	-54.58	71.5
7779.00	H	-	-	-57.10	11.40	-45.70	62.6
10372.00	H	-	-	-57.28	12.59	-44.69	61.6

Table 7-21. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MEASURED OUTPUT POWER: 16.68 dBm = 0.047 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 41.68 dBc

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]	[dBc]
5186.00	H	113	314	-62.94	10.75	-52.19	68.9
7779.00	H	-	-	-57.03	11.40	-45.63	62.3

Table 7-22. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 28 of 30

7.3.2 Antenna-B Radiated Spurious Emissions Measurements

OPERATING FREQUENCY: 826.50 MHz
 CHANNEL: 20425
 MEASURED OUTPUT POWER: 17.27 dBm = 0.053 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) = 30.27$ dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	112	289	-61.15	3.65	-57.51	74.8
2479.50	H	-	-	-64.87	3.58	-61.30	78.6

Table 7-23. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY: 826.50 MHz
 CHANNEL: 20425
 MEASURED OUTPUT POWER: 17.21 dBm = 0.053 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) = 30.21$ dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	110	303	-62.70	3.65	-59.06	76.3
2479.50	H	-	-	-64.97	3.58	-61.40	78.6

Table 7-24. Radiated Spurious Data with WCP (Band 5 – Low Channel)

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 29 of 30

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG955N** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: A3LSMG955N		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1703100104-03.A3L	Test Dates: 3/6 - 3/21/2017	EUT Type: Portable Handset		Page 30 of 30