



MEASUREMENT REPORT

GSM / GPRS / EDGE / WCDMA

Applicant Name:

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

Date of Testing:

1/16/2018-1/25-2018

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1801160004-02.A3L

FCC ID:

A3LSMG532M

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Class II Permissive Change

Model:

SM-G532M

Additional Model(s):

SM-G532M/DS, SM-G532MT, SM-G532MT/SS

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

22, 24, & 27

Test Procedure(s):

ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03

Class II Permissive Change:

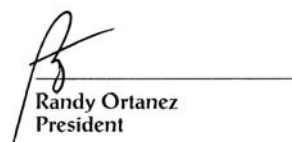
Please see FCC change document

Original Grant Date:

09/23/2016

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

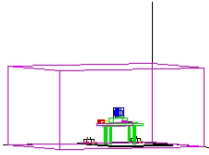


FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 1 of 30

T A B L E O F C O N T E N T S

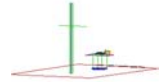
1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION.....	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Test Configuration	5
2.4	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Evaluation Procedure	6
3.2	Cellular - Base Frequency Blocks	6
3.3	Cellular - Mobile Frequency Blocks	6
3.4	PCS - Base Frequency Blocks	6
3.5	PCS - Mobile Frequency Blocks.....	6
3.6	AWS - Base Frequency Blocks	7
3.7	AWS - Mobile Frequency Blocks	7
3.8	Radiated Measurements	8
4.0	MEASUREMENT UNCERTAINTY	9
5.0	TEST EQUIPMENT CALIBRATION DATA	10
6.0	SAMPLE CALCULATIONS	11
7.0	TEST RESULTS	12
7.1	Summary.....	12
7.2	Radiated Power (ERP/EIRP).....	13
7.3	Radiated Spurious Emissions Measurements	18
8.0	CONCLUSION	30

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 2 of 30



MEASUREMENT REPORT

GSM / GPRS / EDGE / WCDMA



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP	
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)
GPRS850	22H	824.2 - 848.8	1.338	31.27	2.195	33.42
EDGE850	22H	824.2 - 848.8	0.391	25.93	0.642	28.08
WCDMA850	22H	826.4 - 846.6	0.073	18.61	0.119	20.76
WCDMA1700	27	1712.4 - 1752.6			0.252	24.01
GPRS1900	24E	1850.2 - 1909.8			1.262	31.01
EDGE1900	24E	1850.2 - 1909.8			0.401	26.03
WCDMA1900	24E	1852.4 - 1907.6			0.248	23.95

EUT Overview

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 3 of 30

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 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 (2451B) test laboratory with the site description on file with ISSED.

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 4 of 30

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG532M**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

Test Device Serial No.: 08715, 00365, 00282

2.2 Device Capabilities

The following capabilities were investigated as part of this permissive change:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA, Multi-band LTE

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 tests.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 5 of 30

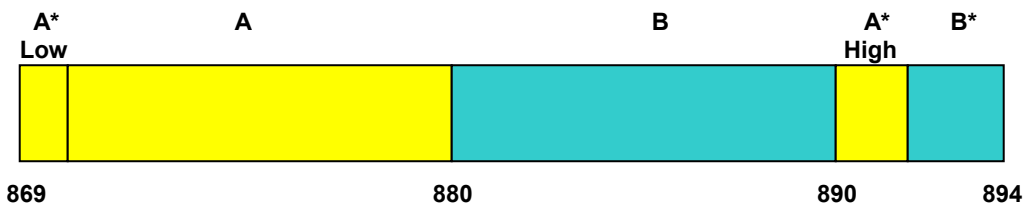
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Measurement Guidance for Certification of Licensed Digital Transmitters” (KDB 971168 D01 v03) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

3.2 Cellular - Base Frequency Blocks



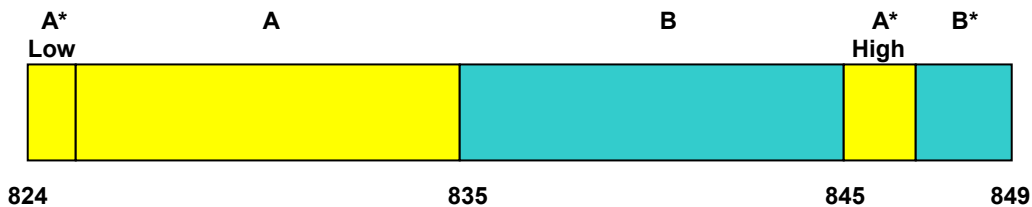
BLOCK 1: 869 – 880 MHz (A* Low + A)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks



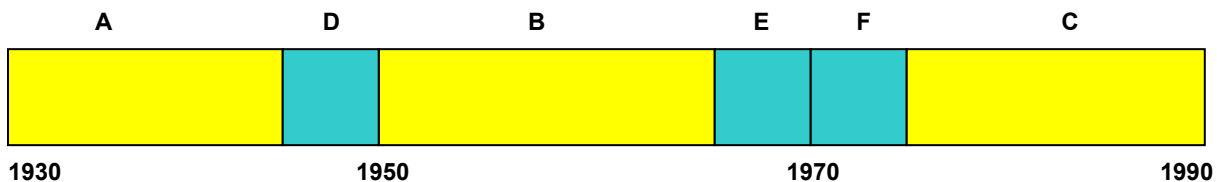
BLOCK 1: 824 – 835 MHz (A* Low + A)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 4: 846.5 – 849 MHz (B*)

3.4 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 2: 1945 – 1950 MHz (D)

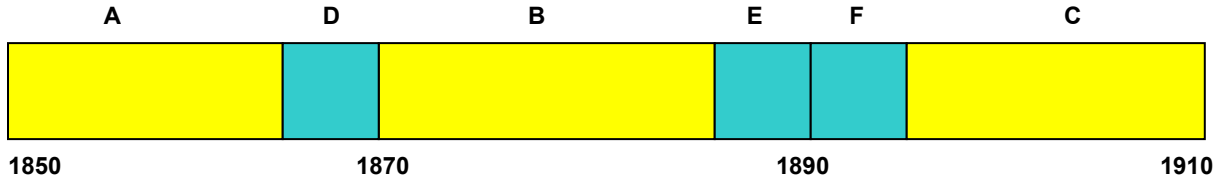
BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 6: 1975 – 1990 MHz (C)

3.5 PCS - Mobile Frequency Blocks

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 6 of 30



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 4: 1885 – 1890 MHz (E)

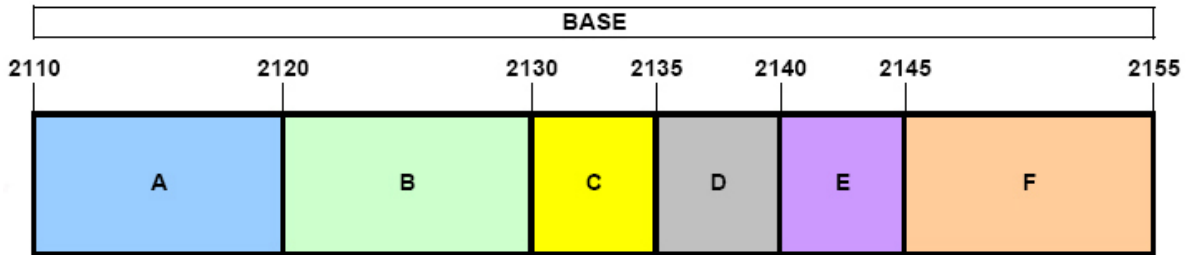
BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 6: 1895 – 1910 MHz (C)

3.6 AWS - Base Frequency Blocks



BLOCK 1: 2110 – 2120 MHz (A)

BLOCK 4: 2135 – 2140 MHz (D)

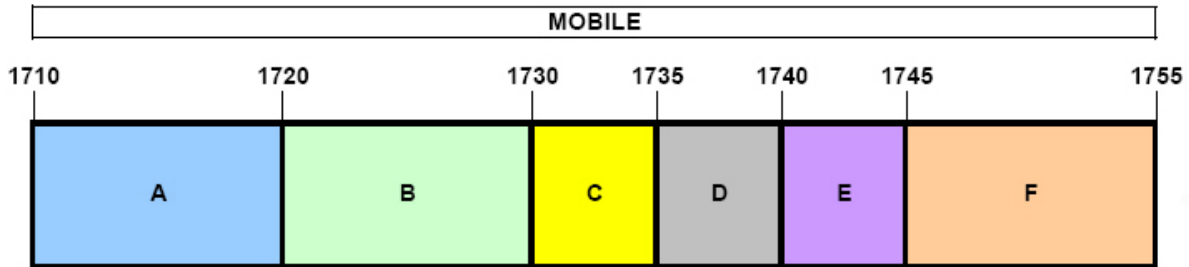
BLOCK 2: 2120 – 2130 MHz (B)

BLOCK 5: 2140 – 2145 MHz (E)

BLOCK 3: 2130 – 2135 MHz (C)

BLOCK 6: 2145 – 2155 MHz (F)

3.7 AWS - Mobile Frequency Blocks



BLOCK 1: 1710 – 1720 MHz (A)

BLOCK 4: 1735 – 1740 MHz (D)

BLOCK 2: 1720 – 1730 MHz (B)

BLOCK 5: 1740 – 1745 MHz (E)

BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 6: 1745 – 1755 MHz (F)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 7 of 30

3.8 Radiated Measurements

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. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

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.

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 $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 8 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 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)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 9 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 C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
Mini Circuits	TVA-11-422	RF Power Amp	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			11208010032
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/31/2017	Annual	7/31/2018	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102135
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
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

Table 5-1. Test Equipment

Notes:

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

FCC ID: A3LSMG532M	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset	Page 10 of 30

6.0 SAMPLE CALCULATIONS

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive 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 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm $- (-24.80) = 50.3$ dBc.

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 11 of 30

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMG532M
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): GSM / GPRS / EDGE / WCDMA

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	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 7.2
27.50(d)(4)	RSS-139(6.5)	Equivalent Isotropic Radiated Power	< 1 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	> 43 + log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3

Table 7-1. Summary of Test Results

Notes:

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

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 12 of 30

7.2 Radiated Power (ERP/EIRP)

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 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

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 13 of 30

Test Setup

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

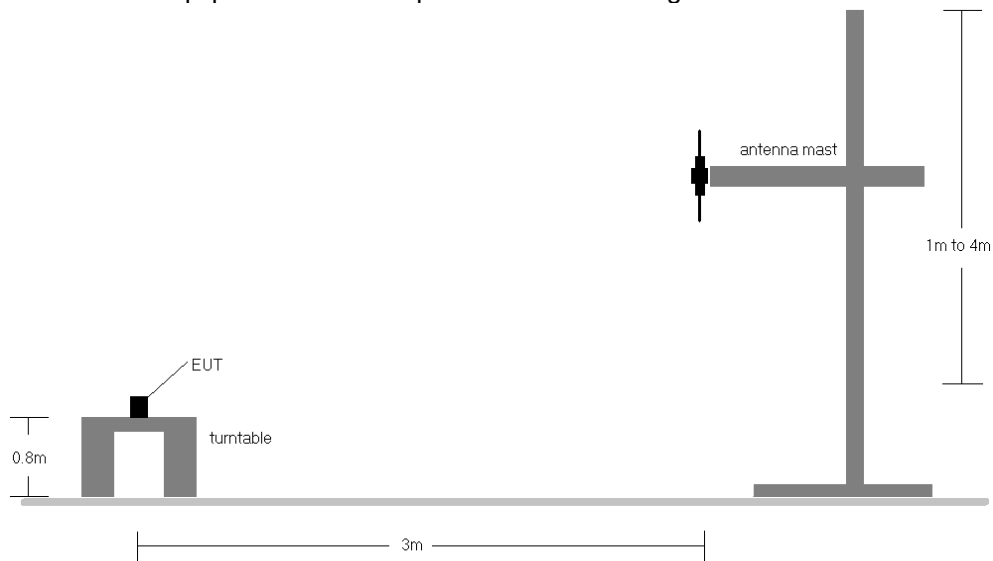


Figure 7-1. Radiated Test Setup <1GHz

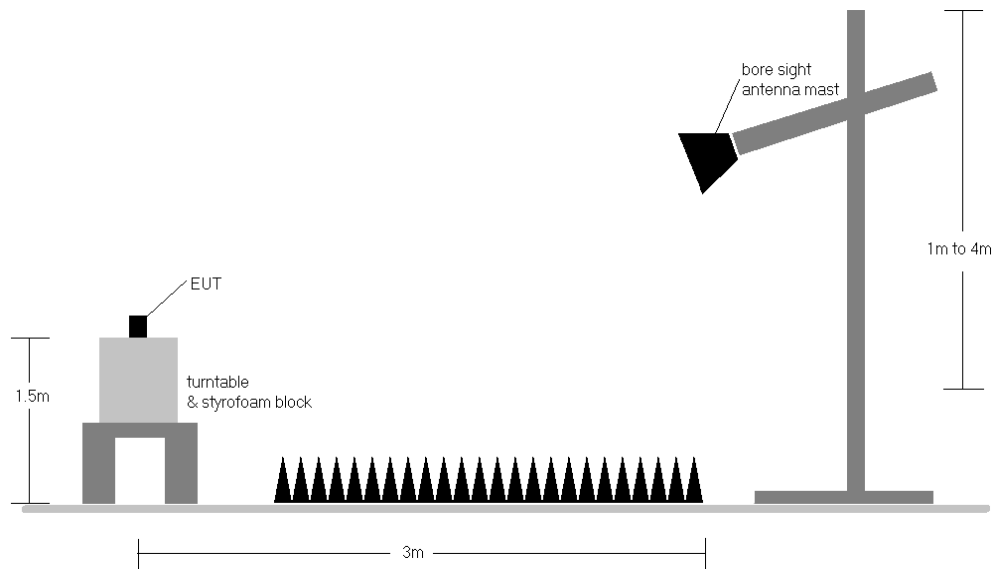


Figure 7-2. Radiated Test Setup >1GHz

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 14 of 30

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 15 of 30

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
824.20	GPRS850	H	150	5	30.62	1.50	29.97	38.45	-8.48	32.12	40.61	-8.49
836.60	GPRS850	H	150	6	31.43	1.50	30.78	38.45	-7.67	32.93	40.61	-7.68
848.80	GPRS850	H	150	6	31.92	1.50	31.27	38.45	-7.19	33.42	40.61	-7.19
848.80	GPRS850	V	150	356	30.99	1.50	30.34	38.45	-8.11	32.49	40.61	-8.11
848.80	EDGE850	H	150	6	26.58	1.50	25.93	38.45	-12.52	28.08	40.61	-12.53

Table 7-2. ERP/EIRP (Cellular GPRS)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	H	150	235	19.26	1.50	18.61	38.45	-19.84	20.76	40.61	-19.85
836.60	WCDMA850	H	150	258	19.18	1.50	18.53	38.45	-19.92	20.68	40.61	-19.93
846.60	WCDMA850	H	150	237	18.77	1.50	18.12	38.45	-20.33	20.27	40.61	-20.34
826.40	WCDMA850	V	150	310	17.71	1.50	17.06	38.45	-21.39	19.21	40.61	-21.40

Table 7-3. ERP/EIRP (Cellular WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	H	150	236	17.89	5.55	23.44	30.00	-6.56
1732.60	WCDMA1700	H	150	246	18.09	5.41	23.50	30.00	-6.50
1752.60	WCDMA1700	H	150	256	18.74	5.27	24.01	30.00	-5.99
1752.60	WCDMA1700	V	150	354	15.99	5.19	21.18	30.00	-8.82

Table 7-4. EIRP (AWS WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	H	150	0	26.19	4.82	31.01	33.01	-2.00
1880.00	GPRS1900	H	150	359	25.07	4.74	29.81	33.01	-3.20
1909.80	GPRS1900	H	150	270	25.31	4.68	29.99	33.01	-3.02
1850.20	GPRS1900	V	150	234	22.80	4.79	27.59	33.01	-5.42
1850.20	EDGE1900	H	150	0	21.21	4.82	26.03	33.01	-6.98

Table 7-5. EIRP (PCS GPRS)

FCC ID: A3LSMG532M	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 				Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset			Page 16 of 30

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	H	150	104	17.44	4.81	22.25	33.01	-10.76
1880.00	WCDMA1900	H	150	124	19.21	4.74	23.95	33.01	-9.06
1907.60	WCDMA1900	H	150	136	17.27	4.68	21.95	33.01	-11.06
1880.00	WCDMA1900	V	150	23	14.43	4.84	19.27	33.01	-13.74

Table 7-6. EIRP (PCS WCDMA)

FCC ID: A3LSMG532M	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 			Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 17 of 30

7.3 Radiated Spurious Emissions Measurements

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 horizontally and vertically 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 maximum power, and at the appropriate frequencies.

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: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 18 of 30

Test Setup

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

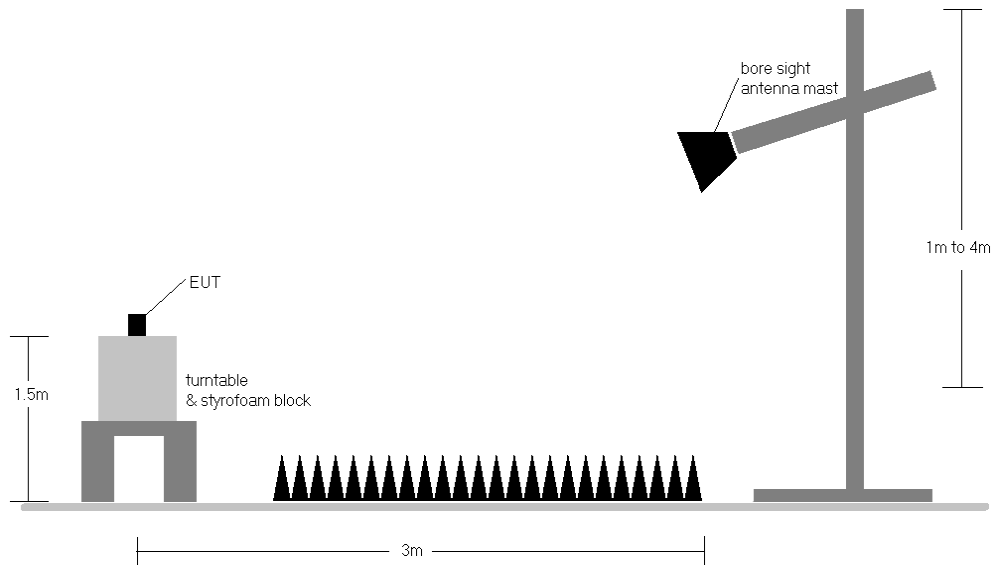


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) 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.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMG532M	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 19 of 30

Cellular GPRS Mode

OPERATING FREQUENCY: 824.20 MHz
 CHANNEL: 128
 MODULATION SIGNAL: GPRS (GMSK)
 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]
1648.40	H	150	4	-51.78	4.81	-46.97	-34.0
2472.60	H	150	358	-51.40	4.99	-46.41	-33.4
3296.80	H	150	9	-55.39	6.24	-49.15	-36.1
4121.00	H	150	336	-62.72	7.57	-55.15	-42.2
4945.20	H	150	85	-57.43	8.37	-49.06	-36.1
5769.40	H	150	189	-55.41	8.60	-46.82	-33.8
6593.60	H	150	179	-56.01	8.88	-47.13	-34.1
7417.80	H	150	173	-54.05	8.29	-45.76	-32.8
8242.00	H	150	310	-49.47	9.36	-40.11	-27.1

Table 7-7. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 20 of 30

OPERATING FREQUENCY: 836.60 MHz
 CHANNEL: 190
 MODULATION SIGNAL: GPRS (GMSK)
 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]
1673.20	H	150	367	-48.67	4.86	-43.80	-30.8
2509.80	H	150	9	-43.13	5.10	-38.03	-25.0
3346.40	H	150	299	-57.97	6.25	-51.72	-38.7
4183.00	H	150	28	-61.97	7.68	-54.29	-41.3
5019.60	H	150	102	-57.48	8.35	-49.14	-36.1
5856.20	H	150	205	-54.62	8.74	-45.88	-32.9

Table 7-8. Radiated Spurious Data (Cellular GPRS Mode – Ch. 190)

OPERATING FREQUENCY: 848.80 MHz
 CHANNEL: 251
 MODULATION SIGNAL: GPRS (GMSK)
 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]
1697.60	H	150	354	-46.69	4.91	-41.78	-28.8
2546.40	H	150	358	-43.54	5.28	-38.26	-25.3
3395.20	H	150	27	-57.39	6.39	-51.00	-38.0
4244.00	H	150	247	-60.04	7.75	-52.29	-39.3
5092.80	H	150	261	-55.68	8.41	-47.27	-34.3

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 21 of 30

Cellular WCDMA Mode

OPERATING FREQUENCY: 826.40 MHz
 CHANNEL: 4132
 MODULATION SIGNAL: WCDMA
 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]
1652.80	V	156	23	-72.03	8.83	-63.20	-50.2
2479.20	V	104	77	-66.41	9.19	-57.21	-44.2
3305.60	V	-	-	-74.69	9.42	-65.27	-52.3

Table 7-10. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

OPERATING FREQUENCY: 836.60 MHz
 CHANNEL: 4183
 MODULATION SIGNAL: WCDMA
 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]
1673.20	V	115	42	-68.30	8.70	-59.60	-46.6
2509.80	V	113	63	-71.34	9.24	-62.11	-49.1
3346.40	V	-	-	-75.43	9.34	-66.09	-53.1

Table 7-11. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 22 of 30

OPERATING FREQUENCY: 846.60 MHz
 CHANNEL: 4233
 MODULATION SIGNAL: WCDMA
 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]
1693.20	V	104	50	-67.42	8.58	-58.85	-45.8
2539.80	V	100	100	-66.91	9.20	-57.71	-44.7
3386.40	V	-	-	-74.83	9.43	-65.41	-52.4

Table 7-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 23 of 30

AWS WCDMA Mode

OPERATING FREQUENCY: 1712.40 MHz
 CHANNEL: 1312
 MODULATION SIGNAL: WCDMA
 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]
3424.80	H	109	134	-48.71	9.52	-39.19	-26.2
5137.20	H	393	222	-58.60	10.81	-47.79	-34.8
6849.60	H	100	72	-55.78	10.84	-44.94	-31.9
8562.00	H	117	96	-58.32	11.66	-46.66	-33.7
10274.40	H	104	95	-57.05	12.46	-44.59	-31.6
11986.80	H	302	298	-57.94	12.24	-45.70	-32.7
13699.20	H	-	-	-59.51	12.54	-46.98	-34.0

Table 7-13. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

OPERATING FREQUENCY: 1732.60 MHz
 CHANNEL: 1413
 MODULATION SIGNAL: WCDMA
 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]
3465.20	H	100	134	-56.24	9.59	-46.64	-33.6
5197.80	H	104	72	-57.53	10.83	-46.69	-33.7
6930.40	H	100	87	-60.87	10.90	-49.97	-37.0
8663.00	H	202	107	-66.14	11.76	-54.38	-41.4
10395.60	H	101	93	-61.24	12.57	-48.68	-35.7
12128.20	H	102	36	-60.20	12.31	-47.89	-34.9
13860.80	H	-	-	-59.80	12.32	-47.49	-34.5

Table 7-14. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 24 of 30

OPERATING FREQUENCY: 1752.60 MHz
 CHANNEL: 1513
 MODULATION SIGNAL: WCDMA
 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]
3505.20	H	105	130	-57.59	9.67	-47.92	-34.9
5257.80	H	102	73	-57.61	10.97	-46.65	-33.6
7010.40	H	103	95	-57.34	11.00	-46.34	-33.3
8763.00	H	102	89	-61.44	11.89	-49.56	-36.6
10515.60	H	106	96	-60.69	12.58	-48.11	-35.1
12268.20	H	102	305	-57.45	12.49	-44.96	-32.0
14020.80	H	-	-	-57.84	11.90	-45.93	-32.9

Table 7-15. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 25 of 30

PCS GPRS Mode

OPERATING FREQUENCY: 1850.20 MHz
 CHANNEL: 512
 MODULATION SIGNAL: GPRS (GMSK)
 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]
3700.40	V	150	262	-57.81	6.76	-51.05	-38.1
5550.60	V	150	256	-41.53	8.43	-33.10	-20.1
7400.80	V	150	309	-42.66	8.26	-34.40	-21.4
9251.00	V	150	291	-49.41	9.88	-39.53	-26.5
11101.20	V	150	81	-48.86	9.30	-39.56	-26.6
12951.40	V	150	212	-48.85	9.20	-39.65	-26.6

Table 7-16. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 661
 MODULATION SIGNAL: GPRS (GMSK)
 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]
3760.00	V	150	174	-52.77	6.84	-45.93	-32.9
5640.00	V	150	255	-39.28	8.52	-30.76	-17.8
7520.00	V	150	113	-37.96	8.44	-29.52	-16.5
9400.00	V	150	289	-44.51	9.79	-34.72	-21.7
11280.00	V	150	174	-49.43	9.13	-40.30	-27.3
13160.00	V	150	262	-48.65	9.18	-39.47	-26.5

Table 7-17. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 26 of 30

OPERATING FREQUENCY: 1909.80 MHz
 CHANNEL: 810
 MODULATION SIGNAL: GPRS (GMSK)
 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]
3819.60	V	150	160	-54.69	7.00	-47.69	-34.7
5729.40	V	150	122	-42.86	8.58	-34.28	-21.3
7639.20	V	150	297	-42.87	8.56	-34.30	-21.3
9549.00	V	150	197	-50.05	9.82	-40.23	-27.2
11458.80	V	150	84	-50.19	9.09	-41.10	-28.1
13368.60	V	150	339	-49.02	9.11	-39.91	-26.9

Table 7-18. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 27 of 30

PCS WCDMA Mode

OPERATING FREQUENCY: 1852.40 MHz
 CHANNEL: 9262
 MODULATION SIGNAL: WCDMA
 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]
3704.80	V	150	40	-50.46	6.77	-43.69	-30.7
5557.20	V	150	0	-49.32	8.44	-40.88	-27.9
7409.60	V	150	53	-58.16	8.28	-49.88	-36.9
9262.00	V	-	-	-61.51	9.88	-51.63	-38.6

Table 7-19. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 9400
 MODULATION SIGNAL: WCDMA
 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]
3760.00	V	150	44	-43.73	6.84	-36.89	-23.9
5640.00	V	150	34	-48.84	8.52	-40.32	-27.3
7520.00	V	150	331	-58.41	8.44	-49.97	-37.0
9400.00	V	-	-	-60.60	9.79	-50.81	-37.8

Table 7-20. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 28 of 30

OPERATING FREQUENCY: 1907.60 MHz
 CHANNEL: 9538
 MODULATION SIGNAL: WCDMA
 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]
3815.20	V	150	38	-50.72	6.98	-43.73	-30.7
5722.80	V	150	58	-50.66	8.58	-42.08	-29.1
7630.40	V	150	51	-55.90	8.55	-47.35	-34.4
9538.00	V	-	-	-60.86	9.81	-51.05	-38.1

Table 7-21. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	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: A3LSMG532M** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules.

FCC ID: A3LSMG532M		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1801160004-02.A3L	Test Dates: 1/16/2018-1/25-2018	EUT Type: Portable Handset		Page 30 of 30