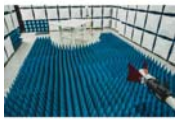
PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



MEASUREMENT REPORT
LTE

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.:
1M1801160004-03.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

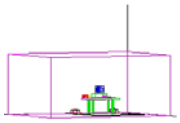
ACCREDITED
TESTING CERT#2041.01

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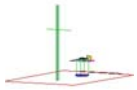
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MEASUREMENT REPORT
FCC Part 22, 24, & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	
LTE Band 17	27	706.5 - 713.5	0.065	18.13	0.107	20.28	QPSK
LTE Band 17	27	706.5 - 713.5	0.054	17.32	0.089	19.47	16QAM
LTE Band 17	27	709 - 711	0.066	18.18	0.108	20.33	QPSK
LTE Band 17	27	709 - 711	0.057	17.54	0.093	19.69	16QAM
LTE Band 5	22H	824.7 - 848.3	0.110	20.43	0.181	22.58	QPSK
LTE Band 5	22H	824.7 - 848.3	0.076	18.78	0.124	20.93	16QAM
LTE Band 5	22H	825.5 - 847.5	0.107	20.28	0.175	22.43	QPSK
LTE Band 5	22H	825.5 - 847.5	0.073	18.66	0.121	20.81	16QAM
LTE Band 5	22H	826.5 - 846.5	0.107	20.31	0.176	22.46	QPSK
LTE Band 5	22H	826.5 - 846.5	0.074	18.68	0.121	20.83	16QAM
LTE Band 5	22H	829 - 844	0.110	20.41	0.180	22.56	QPSK
LTE Band 5	22H	829 - 844	0.074	18.69	0.121	20.84	16QAM
LTE Band 4	27	1710.7 - 1754.3			0.297	24.73	QPSK
LTE Band 4	27	1710.7 - 1754.3			0.263	24.20	16QAM
LTE Band 4	27	1711.5 - 1753.5			0.306	24.85	QPSK
LTE Band 4	27	1711.5 - 1753.5			0.267	24.27	16QAM
LTE Band 4	27	1712.5 - 1752.5			0.302	24.81	QPSK
LTE Band 4	27	1712.5 - 1752.5			0.264	24.22	16QAM
LTE Band 4	27	1715 - 1750			0.313	24.96	QPSK
LTE Band 4	27	1715 - 1750			0.263	24.20	16QAM
LTE Band 4	27	1717.5 - 1747.5			0.309	24.90	QPSK
LTE Band 4	27	1717.5 - 1747.5			0.255	24.07	16QAM
LTE Band 4	27	1720 - 1745			0.304	24.83	QPSK
LTE Band 4	27	1720 - 1745			0.262	24.19	16QAM
LTE Band 2	24E	1850.7 - 1909.3			0.259	24.14	QPSK
LTE Band 2	24E	1850.7 - 1909.3			0.209	23.21	16QAM
LTE Band 2	24E	1851.5 - 1908.5			0.261	24.17	QPSK
LTE Band 2	24E	1851.5 - 1908.5			0.216	23.34	16QAM
LTE Band 2	24E	1852.5 - 1907.5			0.245	23.90	QPSK
LTE Band 2	24E	1852.5 - 1907.5			0.214	23.30	16QAM
LTE Band 2	24E	1855 - 1905			0.257	24.10	QPSK
LTE Band 2	24E	1855 - 1905			0.206	23.13	16QAM
LTE Band 2	24E	1857.5 - 1902.5			0.269	24.29	QPSK
LTE Band 2	24E	1857.5 - 1902.5			0.214	23.31	16QAM
LTE Band 2	24E	1860 - 1900			0.265	24.23	QPSK
LTE Band 2	24E	1860 - 1900			0.221	23.45	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 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 ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG532M**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 08715, 00365

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 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

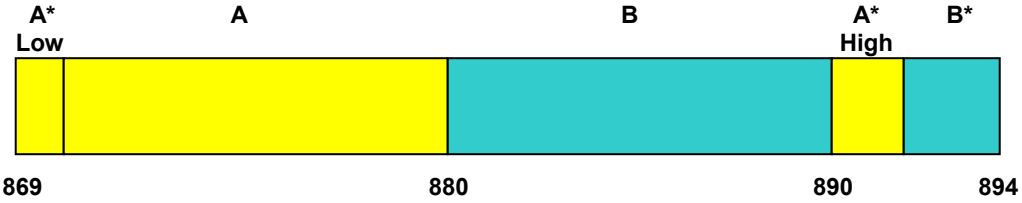
The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission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

3.2 Block A Frequency Range

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:

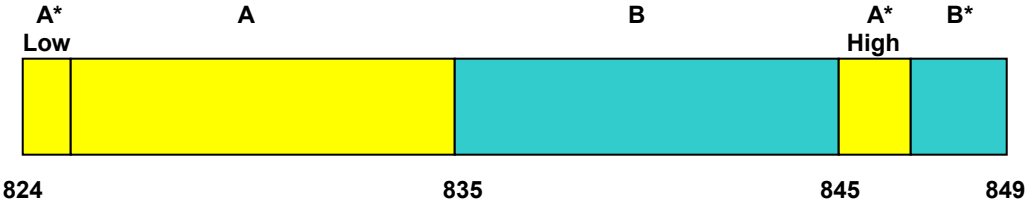
Block A: 698-704 MHz and 728-734 MHz;
Block B: 704-710 MHz and 734-740 MHz; and
Block C: 710-716 MHz and 740-746 MHz.

3.3 Cellular - Base Frequency Blocks



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*)

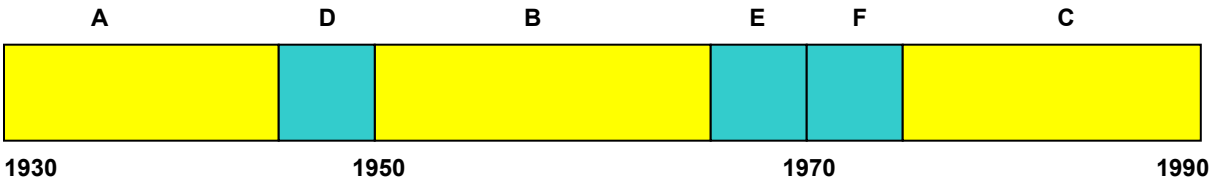
3.4 Cellular - Mobile Frequency Blocks



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*)

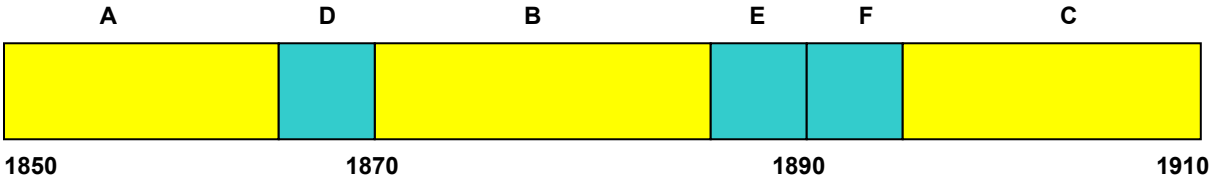
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3.5 PCS - Base Frequency Blocks



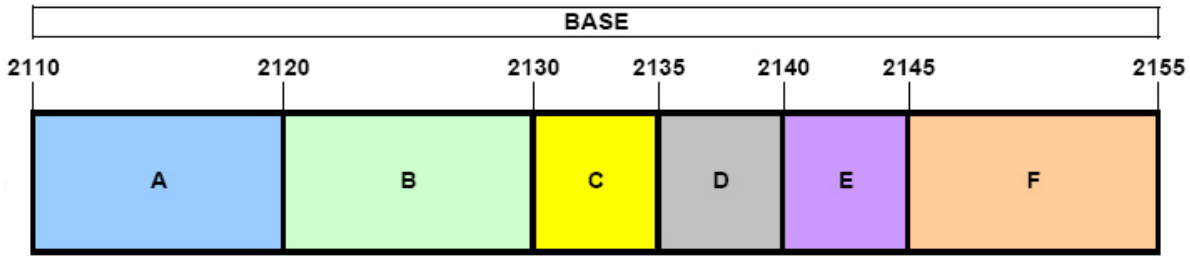
BLOCK 1: 1930 – 1945 MHz (A)
BLOCK 2: 1945 – 1950 MHz (D)
BLOCK 3: 1950 – 1965 MHz (B)
BLOCK 4: 1965 – 1970 MHz (E)
BLOCK 5: 1970 – 1975 MHz (F)
BLOCK 6: 1975 – 1990 MHz (C)

3.6 PCS - Mobile Frequency Blocks



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)

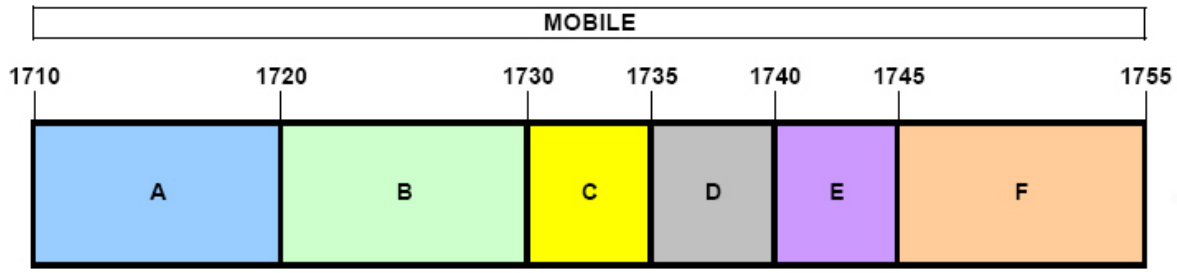
3.7 AWS - Base Frequency Blocks



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)

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3.8 AWS - Mobile Frequency Blocks



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 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. 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. 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:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]}$$

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 $P_{g\ [dBm]}$ – 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 + 10log$_{10}$(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 (±dB)
Conducted Bench Top Measurements	1.13
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
-	LTx2	Licensed Transmitter Cable Set	8/10/2017	Annual	8/10/2018	LTx2
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/27/2017	Annual	3/27/2018	MY52350166
COM-Power	AL-130R	Active Loop Antenna	6/5/2017	Annual	6/5/2018	121085
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	5/19/2017	Annual	5/19/2018	251425001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A		N/A	QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		N/A	11208010032
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	4/19/2017	Annual	4/19/2018	100342
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/11/2017	Annual	8/11/2018	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102135
Anritsu	MT8820C	Radio Communication Analyzer	10/25/2017	Annual	10/25/2018	6201144419
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Rohde & Schwarz	TS-PR8	Preamplifier-Antenna SYS; 30MHz-8GHz	10/19/2017	Annual	10/19/2018	102324
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
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

Table 5-1. Test Equipment

Notes:

1. 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 analzyer. 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: A3LSMG532M

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

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 (ISED)	RADIATED	PASS	Section 7.2
27.50(c)(10)	RSS-130(4.4)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 17)	< 3 Watts max. ERP < 5 Watts max. EIRP (ISED)		PASS	Section 7.2
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP		PASS	Section 7.2
27.50(d)(4)	RSS-139(6.5)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS	Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-130(4.6) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Undesirable Emissions	> 43 + 10log$_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Section 7.3

Table 7-1. Summary of Radiated 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.

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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 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.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
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.

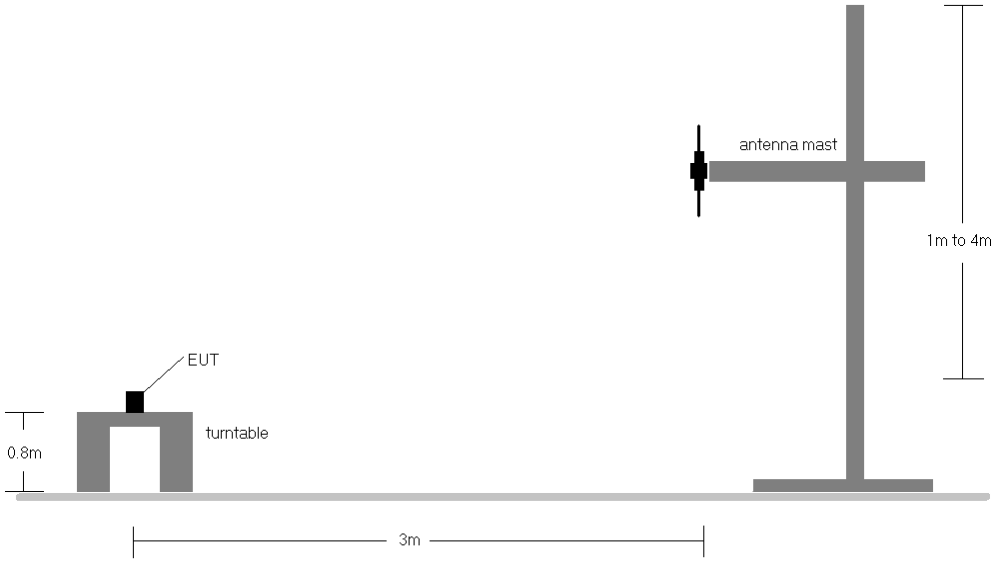


Figure 7-1. Radiated Test Setup <1GHz

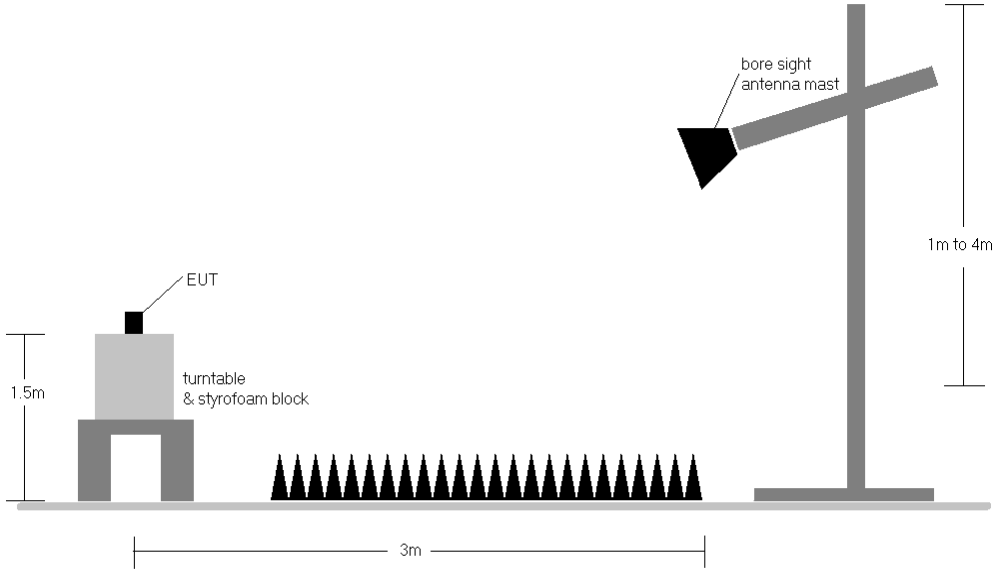


Figure 7-2. Radiated Test Setup >1GHz

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.

2) This unit was tested with its standard battery.

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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]
706.50	5	QPSK	V	150	12	1 / 24	18.89	1.13	17.87	0.061	34.77	-16.90	20.02	0.100	36.99	-16.97
710.00	5	QPSK	V	150	6	1 / 24	18.89	1.14	17.88	0.061	34.77	-16.89	20.03	0.101	36.99	-16.96
713.50	5	QPSK	V	150	18	1 / 24	19.13	1.15	**18.13**	0.065	34.77	-16.64	**20.28**	0.107	36.99	-16.71
713.50	5	16-QAM	V	150	18	1 / 24	18.32	1.15	**17.32**	0.054	34.77	-17.45	**19.47**	0.089	36.99	-17.52
709.00	10	QPSK	V	150	9	1 / 49	19.19	1.14	**18.18**	**0.066**	34.77	-16.59	**20.33**	**0.108**	36.99	-16.66
710.00	10	QPSK	V	150	349	1 / 49	18.76	1.14	17.75	0.060	34.77	-17.02	19.90	0.098	36.99	-17.09
711.00	10	QPSK	V	150	30	1 / 49	18.91	1.14	17.90	0.062	34.77	-16.87	20.05	0.101	36.99	-16.94
709.00	10	16-QAM	V	150	9	1 / 49	18.55	1.14	**17.54**	0.057	34.77	-17.23	**19.69**	0.093	36.99	-17.30
709.00	10	QPSK	H	150	112	1 / 49	17.67	1.14	16.66	0.046	34.77	-18.11	18.81	0.076	36.99	-18.18

Table 7-2. ERP/EIRP Data (Band 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 [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	9	1 / 5	20.63	1.50	19.98	0.100	38.45	-18.47	22.13	0.163	40.61	-18.48
836.50	1.4	QPSK	H	150	4	1 / 0	21.00	1.50	20.35	0.108	38.45	-18.10	22.50	0.178	40.61	-18.11
848.30	1.4	QPSK	H	150	7	1 / 0	21.08	1.50	**20.43**	**0.110**	38.45	-18.02	**22.58**	**0.181**	40.61	-18.03
848.30	1.4	16-QAM	H	150	7	1 / 0	19.43	1.50	**18.78**	0.076	38.45	-19.67	**20.93**	0.124	40.61	-19.68
825.50	3	QPSK	H	150	4	1 / 14	20.86	1.50	20.21	0.105	38.45	-18.24	22.36	0.172	40.61	-18.25
836.50	3	QPSK	H	150	6	1 / 0	20.90	1.50	20.25	0.106	38.45	-18.20	22.40	0.174	40.61	-18.21
847.50	3	QPSK	H	150	2	1 / 0	20.93	1.50	**20.28**	0.107	38.45	-18.17	**22.43**	0.175	40.61	-18.18
847.50	3	16-QAM	H	150	2	1 / 0	19.31	1.50	**18.66**	0.073	38.45	-19.79	**20.81**	0.121	40.61	-19.80
826.50	5	QPSK	H	150	9	1 / 24	20.81	1.50	20.16	0.104	38.45	-18.29	22.31	0.170	40.61	-18.30
836.50	5	QPSK	H	150	1	1 / 0	20.95	1.50	20.30	0.107	38.45	-18.15	22.45	0.176	40.61	-18.16
846.50	5	QPSK	H	150	10	1 / 0	20.96	1.50	**20.31**	0.107	38.45	-18.14	**22.46**	0.176	40.61	-18.15
846.50	5	16-QAM	H	150	10	1 / 0	19.33	1.50	**18.68**	0.074	38.45	-19.77	**20.83**	0.121	40.61	-19.78
829.00	10	QPSK	H	150	10	1 / 49	20.86	1.50	20.21	0.105	38.45	-18.24	22.36	0.172	40.61	-18.25
836.50	10	QPSK	H	150	5	1 / 0	21.06	1.50	**20.41**	0.110	38.45	-18.04	**22.56**	0.180	40.61	-18.05
844.00	10	QPSK	H	150	4	1 / 0	21.04	1.50	20.39	0.109	38.45	-18.06	22.54	0.179	40.61	-18.07
836.50	10	16-QAM	H	150	5	1 / 0	19.34	1.50	**18.69**	0.074	38.45	-19.76	**20.84**	0.121	40.61	-19.77
848.30	1.4	QPSK	V	150	10	1 / 0	20.13	1.50	19.48	0.089	38.45	-18.97	21.63	0.146	40.61	-18.98

Table 7-3. ERP/EIRP Data (Band 5)

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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]
1710.70	1.4	QPSK	H	150	355	1 / 0	19.17	5.56	**24.73**	0.297	30.00	-5.27
1732.50	1.4	QPSK	H	150	360	1 / 0	18.99	5.41	24.40	0.275	30.00	-5.60
1754.30	1.4	QPSK	H	150	357	1 / 5	19.19	5.26	24.45	0.279	30.00	-5.55
1710.70	1.4	16-QAM	H	150	355	1 / 0	18.64	5.56	**24.20**	0.263	30.00	-5.80
1711.50	3	QPSK	H	150	357	1 / 0	19.30	5.55	**24.85**	0.306	30.00	-5.15
1732.50	3	QPSK	H	150	359	1 / 0	18.93	5.41	24.34	0.272	30.00	-5.66
1753.50	3	QPSK	H	150	355	1 / 14	19.16	5.26	24.42	0.277	30.00	-5.58
1711.50	3	16-QAM	H	150	357	1 / 0	18.72	5.55	**24.27**	0.267	30.00	-5.73
1712.50	5	QPSK	H	150	356	1 / 24	19.26	5.55	**24.81**	0.302	30.00	-5.19
1732.50	5	QPSK	H	150	358	1 / 0	19.07	5.41	24.48	0.280	30.00	-5.52
1752.50	5	QPSK	H	150	357	1 / 24	18.92	5.27	24.19	0.263	30.00	-5.81
1712.50	5	16-QAM	H	150	356	1 / 24	18.67	5.55	**24.22**	0.264	30.00	-5.78
1715.00	10	QPSK	H	150	356	1 / 49	19.43	5.53	**24.96**	**0.313**	30.00	-5.04
1732.50	10	QPSK	H	150	358	1 / 0	19.22	5.41	24.63	0.290	30.00	-5.37
1750.00	10	QPSK	H	150	358	1 / 49	18.19	5.29	23.48	0.223	30.00	-6.52
1715.00	10	16-QAM	H	150	356	1 / 49	18.67	5.53	**24.20**	0.263	30.00	-5.80
1717.50	15	QPSK	H	150	358	1 / 74	19.39	5.51	**24.90**	0.309	30.00	-5.10
1732.50	15	QPSK	H	150	360	1 / 0	19.15	5.41	24.56	0.286	30.00	-5.44
1747.50	15	QPSK	H	150	356	1 / 74	18.54	5.31	23.85	0.242	30.00	-6.15
1717.50	15	16-QAM	H	150	358	1 / 74	18.56	5.51	**24.07**	0.255	30.00	-5.93
1720.00	20	QPSK	H	150	360	1 / 99	19.06	5.49	24.55	0.285	30.00	-5.45
1732.50	20	QPSK	H	150	358	1 / 0	19.42	5.41	**24.83**	0.304	30.00	-5.17
1745.00	20	QPSK	H	150	358	1 / 0	19.12	5.32	24.44	0.278	30.00	-5.56
1732.50	20	16-QAM	H	150	358	1 / 0	18.78	5.41	**24.19**	0.262	30.00	-5.81
1715.00	10	QPSK	V	150	249	1 / 49	15.18	5.60	20.78	0.120	30.00	-9.22

Table 7-4. EIRP Data (Band 4)

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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]
1850.70	1.4	QPSK	H	150	340	1 / 5	19.06	4.82	23.88	0.244	33.01	-9.13
1880.00	1.4	QPSK	H	150	342	1 / 5	19.40	4.74	**24.14**	0.259	33.01	-8.87
1909.30	1.4	QPSK	H	150	338	1 / 5	18.07	4.68	22.75	0.188	33.01	-10.26
1880.00	1.4	16-QAM	H	150	342	1 / 5	18.47	4.74	**23.21**	0.209	33.01	-9.80
1851.50	3	QPSK	H	150	342	1 / 14	19.19	4.82	24.01	0.252	33.01	-9.00
1880.00	3	QPSK	H	150	340	1 / 0	19.43	4.74	**24.17**	0.261	33.01	-8.84
1908.50	3	QPSK	H	150	337	1 / 0	18.27	4.68	22.95	0.197	33.01	-10.06
1880.00	3	16-QAM	H	150	340	1 / 0	18.60	4.74	**23.34**	0.216	33.01	-9.67
1852.50	5	QPSK	H	150	349	1 / 0	19.03	4.81	23.84	0.242	33.01	-9.17
1880.00	5	QPSK	H	150	344	1 / 0	19.16	4.74	**23.90**	0.245	33.01	-9.11
1907.50	5	QPSK	H	150	340	1 / 0	18.23	4.68	22.91	0.196	33.01	-10.10
1880.00	5	16-QAM	H	150	344	1 / 0	18.56	4.74	**23.30**	0.214	33.01	-9.71
1855.00	10	QPSK	H	150	343	1 / 49	19.29	4.81	24.10	0.257	33.01	-8.91
1880.00	10	QPSK	H	150	338	1 / 49	19.36	4.74	**24.10**	0.257	33.01	-8.91
1905.00	10	QPSK	H	150	337	1 / 0	18.35	4.68	23.03	0.201	33.01	-9.98
1880.00	10	16-QAM	H	150	338	1 / 49	18.39	4.74	**23.13**	0.206	33.01	-9.88
1857.50	15	QPSK	H	150	341	1 / 74	19.49	4.80	**24.29**	**0.269**	33.01	-8.72
1880.00	15	QPSK	H	150	339	1 / 74	19.35	4.74	24.09	0.256	33.01	-8.92
1902.50	15	QPSK	H	150	339	1 / 0	18.73	4.69	23.42	0.220	33.01	-9.59
1857.50	15	16-QAM	H	150	341	1 / 74	18.51	4.80	**23.31**	0.214	33.01	-9.70
1860.00	20	QPSK	H	150	342	1 / 99	19.44	4.79	**24.23**	0.265	33.01	-8.78
1880.00	20	QPSK	H	150	340	1 / 0	19.42	4.74	24.16	0.261	33.01	-8.85
1900.00	20	QPSK	H	150	340	1 / 0	18.97	4.69	23.66	0.232	33.01	-9.35
1880.00	20	16-QAM	H	150	340	1 / 0	18.71	4.74	**23.45**	0.221	33.01	-9.56
1857.50	15	QPSK	V	150	136	1 / 74	17.78	4.80	22.58	0.181	33.01	-10.43

Table 7-5. EIRP Data (Band 2)

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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 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 ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. 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.

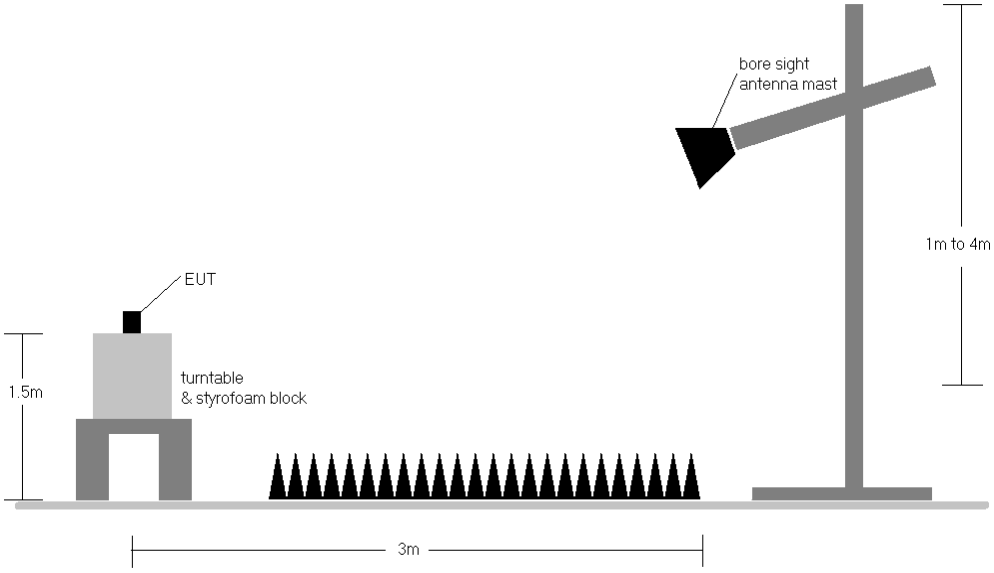


Figure 7-3. Test Instrument & Measurement Setup

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.

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Band 17

OPERATING FREQUENCY:	709.00	MHz
CHANNEL:	23780	
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]
1418.00	H	115	104	-55.64	8.12	-47.52	-34.5
2127.00	H	158	318	-66.75	8.87	-57.88	-44.9
2836.00	H	130	184	-70.09	10.14	-59.94	-46.9
3545.00	H	-	-	-69.92	9.70	-60.23	-47.2

Table 7-6. Radiated Spurious Data (Band 17 – Low Channel)

OPERATING FREQUENCY:	710.00	MHz
CHANNEL:	23790	
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]
1420.00	H	104	119	-58.20	8.15	-50.06	-37.1
2130.00	H	130	312	-64.18	8.87	-55.31	-42.3
2840.00	H	135	134	-69.32	10.15	-59.16	-46.2
3550.00	H	-	-	-69.56	9.70	-59.86	-46.9

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

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OPERATING FREQUENCY:	711.00	MHz
CHANNEL:	23800	
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]
1422.00	H	115	111	-55.33	8.17	-47.16	-34.2
2133.00	H	104	304	-63.07	8.87	-54.20	-41.2
2844.00	H	133	316	-69.14	10.16	-58.97	-46.0
3555.00	H	-	-	-69.56	9.71	-59.85	-46.8

Table 7-8. Radiated Spurious Data (Band 17 – High Channel)

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Band 5

OPERATING FREQUENCY:	824.70	MHz
CHANNEL:	20407	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
1649.40	V	175	321	-69.40	8.85	-60.54	-47.5
2474.10	V	283	260	-57.61	9.18	-48.43	-35.4
3298.80	V	-	-	-70.02	9.43	-60.59	-47.6

Table 7-9. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	20525	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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	135	300	-64.58	8.71	-55.87	-42.9
2509.50	V	204	291	-63.51	9.24	-54.27	-41.3
3346.00	V	-	-	-70.37	9.34	-61.03	-48.0

Table 7-10. Radiated Spurious Data (Band 5 – Mid Channel)

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OPERATING FREQUENCY:	848.30	MHz
CHANNEL:	20643	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
1696.60	V	191	308	-64.39	8.56	-55.84	-42.8
2544.90	V	191	280	-64.57	9.20	-55.37	-42.4
3393.20	V	-	-	-69.35	9.44	-59.91	-46.9

Table 7-11. Radiated Spurious Data (Band 5 – High Channel)

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Band 4

OPERATING FREQUENCY:	1715.00	MHz
CHANNEL:	20000	
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]
3430.00	H	100	135	-46.13	9.53	-36.61	-23.6
5145.00	H	113	205	-53.60	10.79	-42.81	-29.8
6860.00	H	121	73	-55.48	10.84	-44.64	-31.6
8575.00	H	100	97	-61.64	11.67	-49.96	-37.0
10290.00	H	-	-	-61.68	12.48	-49.20	-36.2

Table 7-12. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	MHz
CHANNEL:	20175	
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]
3465.00	H	113	133	-55.34	9.59	-45.74	-32.7
5197.50	H	103	208	-54.49	10.83	-43.66	-30.7
6930.00	H	104	76	-57.96	10.90	-47.06	-34.1
8662.50	H	115	94	-62.70	11.76	-50.94	-37.9
10395.00	H	-	-	-61.96	12.57	-49.39	-36.4

Table 7-13. Radiated Spurious Data (Band 4 – Mid Channel)

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OPERATING FREQUENCY:	1750.00	MHz
CHANNEL:	20350	
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]
3500.00	H	109	141	-52.11	9.67	-42.44	-29.4
5250.00	H	100	205	-50.78	10.97	-39.81	-26.8
7000.00	H	104	84	-54.77	10.99	-43.78	-30.8
8750.00	H	113	100	-61.05	11.88	-49.17	-36.2
10500.00	H	-	-	-61.66	12.58	-49.08	-36.1

Table 7-14. Radiated Spurious Data (Band 4 – High Channel)

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Band 2

OPERATING FREQUENCY:	1857.50	MHz
CHANNEL:	18675	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
3715.00	H	100	131	-47.54	9.68	-37.86	-24.9
5572.50	H	233	297	-47.03	11.02	-36.01	-23.0
7430.00	H	104	330	-58.17	10.84	-47.34	-34.3
9287.50	H	-	-	-63.02	12.29	-50.74	-37.7

Table 7-15. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY:	1880.00	MHz
CHANNEL:	18900	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
3760.00	H	116	131	-45.97	9.50	-36.47	-23.5
5640.00	H	146	296	-47.30	11.16	-36.14	-23.1
7520.00	H	100	330	-54.65	11.03	-43.62	-30.6
9400.00	H	227	1	-61.96	12.19	-49.77	-36.8
11280.00	H	-	-	-63.32	13.15	-50.17	-37.2

Table 7-16. Radiated Spurious Data (Band 2 – Mid Channel)

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OPERATING FREQUENCY:	1902.50	MHz
CHANNEL:	19125	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
3805.00	H	104	127	-46.09	9.33	-36.75	-23.8
5707.50	H	131	194	-49.78	11.31	-38.47	-25.5
7610.00	H	112	329	-57.17	11.23	-45.94	-32.9
9512.50	H	172	4	-62.71	12.21	-50.50	-37.5
11415.00	H	-	-	-62.72	13.26	-49.46	-36.5

Table 7-17. Radiated Spurious Data (Band 2 – High Channel)

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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: A3LSMG532M** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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