

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

FCC Part 22 & 90

Applicant Name:

FCC ID:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 2/16 - 4/6/2018 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1802160028-04.A3L

A3LSMJ737P

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:	Certification
Model:	SM-J737P
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	§2.1049, §22(H), §90.691
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03

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.





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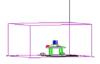


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MEASUREMENT REPORT FCC Part 22(H) & 90

Mode	Tx Frequency (MHz)	Measurement	Max. Power (W)	Max. Power (dBm)	Emission Designator	Modulation
CDMA800 (BC10)	817.9 - 823.1	Conducted	0.275	24.40	1M28F9W	CDMA
LTE Band 26	814.7 - 823.3	Conducted	0.281	24.48	1M09G7D	QPSK
LTE Band 26	814.7 - 823.3	Conducted	0.224	23.50	1M08W7D	16-QAM
LTE Band 26	815.5 - 822.5	Conducted	0.281	24.48	2M71G7D	QPSK
LTE Band 26	815.5 - 822.5	Conducted	0.215	23.32	2M70W7D	16-QAM
LTE Band 26	816.5 - 821.5	Conducted	0.280	24.47	4M54W7D	QPSK
LTE Band 26	816.5 - 821.5	Conducted	0.223	23.49	4M53G7D	16-QAM
LTE Band 26	819	Conducted	0.281	24.48	9M00G7D	QPSK
LTE Band 26	819	Conducted	0.222	23.46	9M02W7D	16-QAM
LTE Band 26	821.5	Conducted	0.250	23.91	13M4G7D	QPSK
LTE Band 26	821.5	Conducted	0.187	22.71	13M5W7D	16-QAM
LTE Band 26	821.5	ERP	0.090	19.54	13M4G7D	QPSK
LTE Band 26	821.5	ERP	0.069	18.42	13M5W7D	16-QAM

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: A3LSMJ737P**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 22(H) and 90.691.

Test Device Serial No.: 34978, 35017

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), ANT+

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-D-2010 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 Evaluation 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 v03) were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

<u>§2.1053, §90.635, §90.691</u>

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 wooden turntable 80cm above the ground plane and 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-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:

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

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 Pd levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10log₁₀(Power [Watts]) specified in 90.691.

For fundamental radiated power measurements, the guidance of KDB 971168 D01 v03 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-D-2010.

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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	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	8/28/2017	Annual	8/28/2018	MY49432391
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
Espec	ESX-2CA	Environmental Chamber	4/11/2017	Annual	4/11/2018	17620
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	CMW500	Radio Communication Tester	10/13/2017	Annual	10/13/2018	102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	4/19/2017	Annual	4/19/2018	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/31/2017	Annual	7/31/2018	100348
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	102135
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	102133
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
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:

- 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.

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6.0 SAMPLE CALCULATIONS

Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

Spurious Radiated Emission – BC10

Example: Channel 476 CDMA BC10 Mode 3rd Harmonic (2453.70MHz)

The average spectrum analzyer 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 2453.70 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) = 50.3 dBc.

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

- G = Phase Modulation
- 7 = Quantized/Digital Info
- D = Data transmission, telemetry, telecommand

16QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

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

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

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMJ737P
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>CDMA / EvDO / LTE</u>
Band:	<u>Band Class 10 / Band 26</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 90.691	Conducted Band Edge / Spurious Emissions	 > 43 + log₁₀ (P[Watts]) for all out- of-band emissions except > 50 + 10log₁₀ (P[Watts]) at Band Edge and for all out-of- band emissions within 37.5kHz of Block Edge 	CONDUCTED	PASS	Sections 7.3, 7.4
2.1055 90.213	Frequency Stability	< 2.5 ppm		PASS	Section 7.8
2.1046 90.635	Conducted Power	< 100 Watts		PASS	Section 7.5
22.913(a.2)	Effective Radiated Power (Band 26)	< 7 Watts max. ERP		PASS	Section 7.6
2.1053 90.691	Radiated Spurious Emissions	 > 43 + log₁₀ (P[Watts]) for all out- of-band emissions except > 50 + 10log₁₀ (P[Watts]) at Band Edge and for all out-of- band emissions within 37.5kHz of Block Edge 	RADIATED	PASS	Section 7.7

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.
- 2) The analyzer plots shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 3.9.

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7.2 Occupied Bandwidth §2.1049

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03 - Section 4.2

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within

1-5% of the 99% occupied bandwidth observed in Step 7

Test Setup

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

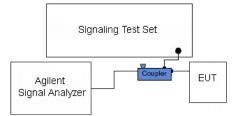


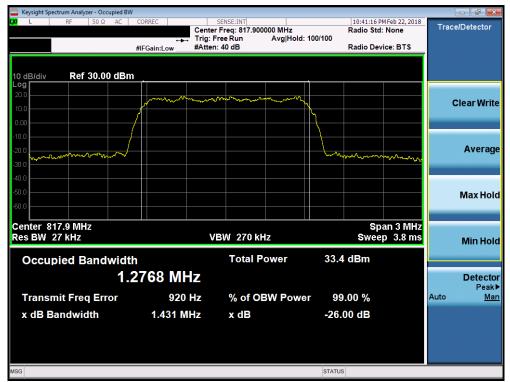
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

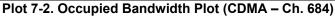
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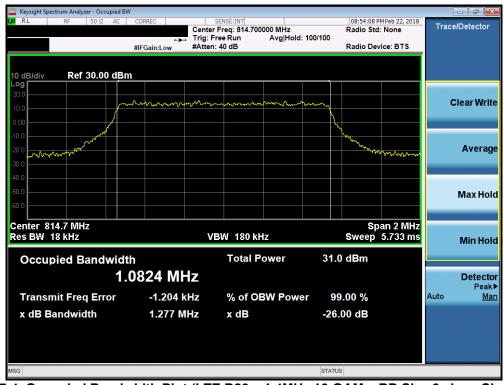


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Keysight Spectrum Analyzer - Occupied BW					
X RL RF 50Ω AC	CORREC	SENSE:INT ter Freq: 814.700000 MHz	08:53:53 PM Radio Std:	None Trace/Detec	ctor
	🛶 Trig	: Free Run Avg Hold	1: 100/100		
	#IFGain:Low #At	ten: 40 dB	Radio Devi	ce: BTS	
10 dB/div Ref 30.00 dBn					
20.0					
10.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	Clear	Nrit
0.00			<u> </u>		
10.0			- Andrew -		
20.0				Ave	erag
30.0				and the second for	
40.0					
50.0				Max	
60.0				Widx	по
Center 814.7 MHz Res BW 18 kHz		VBW 180 kHz	Spa Sweep \$	an 2 MHz	
			Sweep	5.753 Min	Но
Occupied Bandwidt	h	Total Power	32.1 dBm		
1	0878 MHz			Dete	ect
				P	Peak
Transmit Freq Error	-1.839 kHz	% of OBW Pow	er 99.00 %	Auto	M
x dB Bandwidth	1.298 MHz	x dB	-26.00 dB		
SG			STATUS		_

Plot 7-3. Occupied Bandwidth Plot (LTE B26 – 1.4MHz QPSK – RB Size 6– Low Channel)



Plot 7-4. Occupied Bandwidth Plot (LTE B26 – 1.4MHz 16-QAM – RB Size 6– Low Channel)

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Keysight Spectrum Analyzer - Occupie RL RF 50 Ω AG		SENSE:INT	09:13:01 PM Feb 22	2018
	CONNEC	Center Freq: 815.500000 MHz	Radio Std: None	
	+→- #IEGain:Low	Trig: Free Run Avg Hold #Atten: 40 dB	Radio Device: B	тя
	#IFGall.LOW		Kullo Dolloci D	
0 dB/div Ref 30.00 d	Bm			
.og				
20.0				Clear Writ
10.0				Clear wri
).00			<u> </u>	
0.0				
0.0				Avera
0.0				
50.0				Max Ho
60.0				Maxilo
enter 815.5 MHz es BW 47 kHz		VBW 470 kHz	Span 5 Sweep 2.13	
		*D¥¥ 70 KHZ	Gweep 2.13	5 Min Ho
Occupied Bandwi	dth	Total Power	32.5 dBm	
	2.7050 MH	7		Detect
				Peal
Transmit Freq Error	2.629 ki	Iz % of OBW Pow	er 99.00 %	Auto <u>Ma</u>
x dB Bandwidth	3.115 MI	Hz x dB	-26.00 dB	
G			STATUS	

Plot 7-5. Occupied Bandwidth Plot (LTE B26 – 3MHz QPSK – RB Size 15– Low Channel)



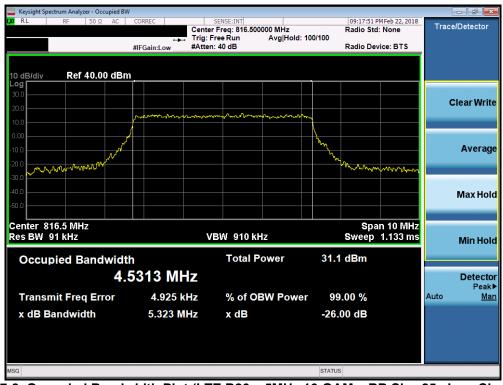
Plot 7-6. Occupied Bandwidth Plot (LTE B26 – 3MHz 16-QAM – RB Size 15– Low Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 12
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Plot 7-7. Occupied Bandwidth Plot (LTE B26 – 5MHz QPSK – RB Size 25– Low Channel)



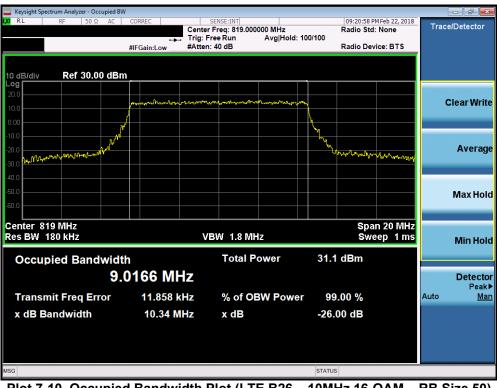
Plot 7-8. Occupied Bandwidth Plot (LTE B26 – 5MHz 16-QAM – RB Size 25– Low Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 12
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Plot 7-9. Occupied Bandwidth Plot (LTE B26 – 10MHz QPSK – RB Size 50)



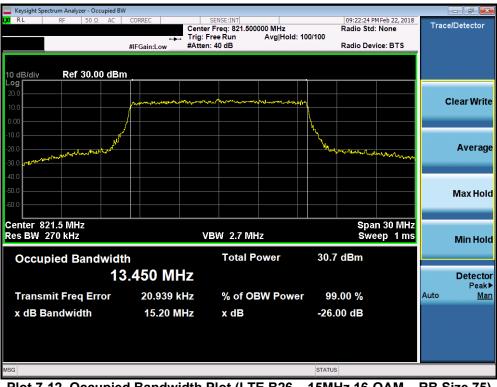
Plot 7-10. Occupied Bandwidth Plot (LTE B26 – 10MHz 16-QAM – RB Size 50)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-11. Occupied Bandwidth Plot (LTE B26 – 15MHz QPSK – RB Size 75)



Plot 7-12. Occupied Bandwidth Plot (LTE B26 – 15MHz 16-QAM – RB Size 75)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	UNG	Approved by: Quality Manager	
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7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §90.691

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. RBW ≥ 1MHz
- 3. VBW \geq 3 x RBW
- 4. Detector = RMS
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

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

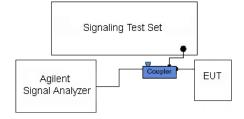


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 22. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

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	ectrum Analy	zer - Swep	ot SA										- d -×
LX/RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	e: RMS	TRA	M Feb 22, 2018 CE 1 2 3 4 5 6	Fr	equency
				PNO: Fa IFGain:L	ist ⊶⊶ ow	Trig: Free Atten: 40				TY C			Auto Tune
10 dB/div Log	Ref 30).00 dl	Bm						Mkr1	379.19 -49.	3 6 MHz 35 dBm		Auto Tune
												c	enter Freq
20.0												422	.000000 MHz
10.0													Start Freq
0.00												30	.000000 MHz
-10.0											DL1 -13.00 dBm		Stop Freq
-20.0												814	.000000 MHz
-30.0													CF Step
												78 <u>Auto</u>	.400000 MHz Man
-40.0						1							
-50.0			and the Andrews						alay (1) marks are a literat			I	Freq Offset
-60.0													
													Scale Type
Start 30.0										Stop 8	14.0 MHz	Log	<u>Lin</u>
#Res BW	100 KH	Z		#	VBW	300 kHz		S	weep 9		20001 pts)		
m30									STATU	3			





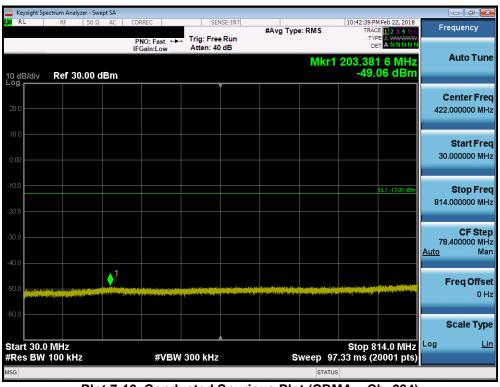
Plot 7-14. Conducted Spurious Plot (CDMA – Ch. 476)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Swept SA				
LX RL RF 50Ω AC		SE:INT #Avg Type: RM		Frequency
10 dB/div Ref 0.00 dBm	PNO: Fast Trig: Free IFGain:Low #Atten: 32	dB	TYPE A WARNEN DET A NNNNN Mkr1 9.492 85 GHz -40.70 dBm	Auto Tune
-10.0			DL1 -13.00 dBm	Center Freq 5.500000000 GHz
-20.0			.1	Start Freq 1.000000000 GHz
-40.0 -50.0		a fan a fallen a fan ar fan fan ar fan	n ng mang sa	Stop Freq 10.000000000 GHz
-60.0				CF Step 900.000000 MHz <u>Auto</u> Man
-80.0				Freq Offset 0 Hz
-90.0				Scale Type
Start 1.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	Stop 10.000 GHz p 16.00 ms (20001 pts)	Log <u>Lin</u>
MSG			STATUS	

Plot 7-15. Conducted Spurious Plot (CDMA - Ch. 476)



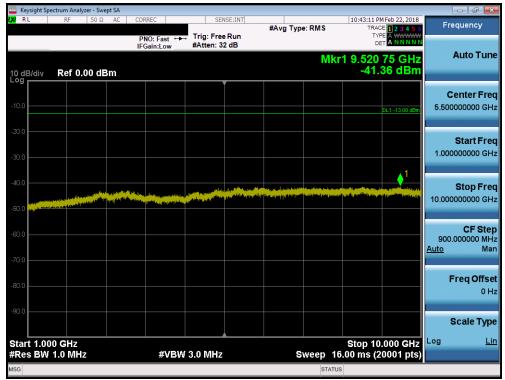
Plot 7-16. Conducted Spurious Plot (CDMA – Ch. 684)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 20 of 43			
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🔤 Keysight Spectrum Analyzer - Swept SA			- 7 💌
ΙΧΙ RF 50 Ω AC		10:43:01 PM Feb 22, #Avg Type: RMS TRACE	Frequency
	PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 14 dB	TYPE A WW DET ANNI Mkr1 824.088 M	
10 dB/div Ref 0.00 dBm		-23.73 dl	Bm
			Center Fred
-10.0		DL1 -13.0	912.000000 MH:
-20.0 1			
~			Start Free 824.000000 MH
-30.0			024.000000 mm
-40.0			Stop Free
-50.0			1.000000000 GH
			05.04
-60.0			CF Step 17.600000 MH
-70.0			Auto Mai
The second se	n digert varies die einer het son die Arabit naam geste geste aan een die ferferig in vereinder sondaar	۲۵٬۰۶۹ բոնքնացին բարգնություրը։ «Ալ որ մի ու ֆին բվերությունը՝ հնացի պետրիսին է հաստոներին։ «Արանանություն» է ۱۹	Freq Offse
-80.0			0 H:
-90.0			
			Scale Type
Start 0.82400 GHz #Res BW 100 kHz	#VBW 300 kHz	Stop 1.00000 C Sweep 21.87 ms (4001	Hz Log Lir
MSG	#1211-300 KH2	STATUS	





Plot 7-18. Conducted Spurious Plot (CDMA – Ch. 684)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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		ctrum Analy												
l <mark>,XI</mark> R	L	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		PM Feb 22, 2018 ACE 1 2 3 4 5 6	F	equency
					PNO: F IFGain:	ast ↔ Low	Trig: Fre Atten: 4				Т			
10 di Log	B/div	Ref 3	0.00 d	Bm							Mkr1 813 -25	8.86 MHz .84 dBm		Auto Tune
20.0														Center Freq 1.931250 MHz
10.0 0.00													30	Start Freq 0.000000 MHz
-10.0 -20.0												DL1 -13.00 dBm	813	Stop Freq 8.862500 MHz
-30.0													78 <u>Auto</u>	CF Step 3.386250 MHz Man
-40.0														Freq Offset 0 Hz
-60.0														Scale Type
	t 30.0 s BW	MHz 100 kH	z			#VBW	300 kHz		S	weep	Stop 97.33 ms (813.9 MHz 20001 pts)	Log	<u>Lin</u>
MSG										STA	TUS			

Plot 7-19. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



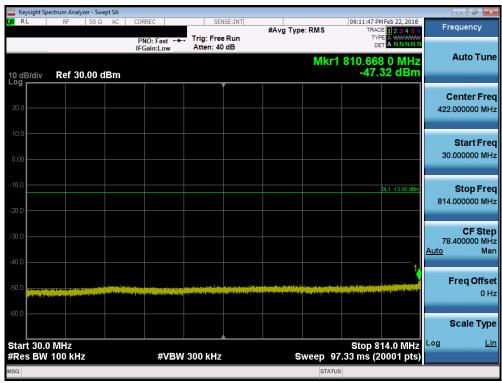
Plot 7-20. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager					
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		trum Ana	ilyzer - Swe	pt SA										
L <mark>XI</mark> RL		RF	50 Ω	AC	CORRE	C	SEN	ISE:INT	#Avg Typ	e: RMS		M Feb 22, 2018	Fi	equency
						:Fast ↔→ n:Low	Trig: Free #Atten: 3				TY	PE A WWWWW ET A N N N N N		
10 dB. Log r	/div	Ref ().00 dE	sm						М	kr1 8.666 -41.	20 GHz 18 dBm		Auto Tune
-10.0												DL1 -13.00 dBm		Center Freq 0000000 GHz
-20.0 -													1.00	Start Freq 0000000 GHz
-40.0						ingen af States			Edit a construction and a state of the line of the line of the state of the state of the line of the l				10.00	Stop Freq 0000000 GHz
-60.0 -													900 <u>Auto</u>	CF Step 0.000000 MHz Man
-80.0														Freq Offset 0 Hz
-90.0													Log	Scale Type Lin
	1.000 BW 1					#VBW	3.0 MHz		s	weep	Stop 10 16.00 ms (2	.000 GHZ	LUg	<u>-m</u>
MSG										STA	TUS			

Plot 7-21. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



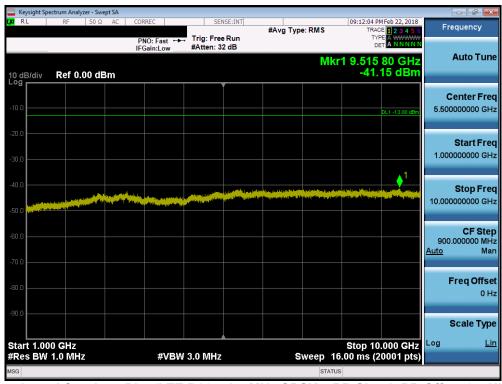
Plot 7-22. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Anal	· · · · · · · · · · · · · · · · · · ·											
L <mark>XU</mark> RL	RF	50 Ω	AC		ast 🗭	Trig: Free		#Avg Typ	e: RMS	TRAC	M Feb 22, 2018 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fr	equency
				IFGain:L	.ow	Atten: 10	dB		Mk	r1 824.1	32 MHz		Auto Tune
10 dB/div Log	Ref 0	.00 dB	m							-40.	85 dBm		
-10.0											DL1 -13.00 dBm		Center Freq
-20.0												824	Start Freq
-40.0												4.00	Stop Freq
-50.0												1.00	0000000 GHz CF Step
-70.0	Hannahar											17 <u>Auto</u>	7.600000 MHz Man
-80.0		No.	in the second	and the second	ادر ایر ادور ار دهار (۱۹	<i>ĿŦ\$\$\$\$</i>	addinin'n'n New Yorkinger	ng n	44 4 45193 147 147 147 147 147 147 147 147 147 147	n.j.p.elg _{en.f} .e. _g .e.gladie in profesion	all brighter and first		Freq Offset
-90.0													
													Scale Type
Start 0.82 #Res BW				#	VBW	300 kHz			Sweep 2	Stop 1.0 21.87 ms (0000 GHz (4001 pts)	Log	<u>Lin</u>
MSG									STATU	s			

Plot 7-23. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-24. Conducted Spurious Plot (LTE B26 – 1.4 MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	UNG	Approved by: Quality Manager
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7.4 Band Edge Emissions at Antenna Terminal §2.1051 §90.691

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by greater than 37.5 kHz is $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by up to and including 37.5 kHz is $50 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03 – Section 6.0

Test Settings

- 1. Span was set large enough so as to capture all out of band emissions near the band edge
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = RMS
- 5. Trace mode = trace average
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

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

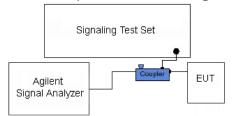


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

For channel edge emission, the signal analyzer's "ACP" measurement capability is used.

Per 22.917(b) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

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Keysight Spectrum Analyzer - ACP RL	Center	SENSE:INT Freq: 817.9000 ree Run : 28 dB	000 MHz Avg Hold	1: 100/100	10:42:09 PM Fi Radio Std: N Radio Device	one	Trace/Detector
10 dB/div Ref 40.00 dBm	24	1.4 dBm					1 Clear Write
						RMS AVG	Average
40.0 -40.0 -50.0 Center 817.9 MHz					Snar	3 MHz	Max Hold
#Res BW 100 kHz Total Carrier Power 24.417 dBn		ACP-I	BW		Sweep	20 ms	Min Hold
Carrier Power Filt	er Offset Freg	Integ BW	dBc	wer dBm dB	Upper c dBm	Filter	View/Blank
1 24.417 dBm / 1.808 MHz OFF	Gilberting	37.50 kHz 100.0 kHz	-56.20	-31.78 -56.4 -27.06 -51.9	7 -32.05	OFF OFF	Trace On
							Mor 1 of
SG				STATUS			

Plot 7-25.	Channel	Edge Plot	(CDMA –	Ch. 476)
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Plot 7-26. Channel Edge Plot (CDMA – Ch. 684)

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Keysight Spectrum Analyzer - ACP C RL RF 50 Ω AC CORREC		NSE:INT req: 814.7000 e Run	00 MHz Avg Hold:	100/100		57:50 PM F o Std: N	eb 22, 2018 one	Trace/Detector
PASS IFGain 10 dB/div Ref 40.00 dBm	Low #Atten: 2	28 dB			Radi	o Device	: BTS	Select Trace 1
	23.1	l dBm						Clear Writ
0.00							RMS AVG	Averag
40.0								Max Hol
Center 814.7 MHz Res BW 100 kHz Total Carrier Power 23.063 dBm/1		300 ki ACP-II			5	Span 2 Sweep	2.1 MHz 20 ms	Min Hol
	.+0 10112	ACF-II	Low	er	Un	per		
Carrier Power Filter	Offset Freq	Integ BW	dBc	dBm	dBc	dBm	Filter	View/Blank
1 23.063 dBm / 1.400 MHz OFF	0.0 Hz 37.50 kHz	37.50 kHz 100.0 kHz		-22.43 -4 -22.74 -4		-23.04 -22.98	OFF OFF	Trace Or
								Mo 1 of
3G				STAT	US			

Plot 7-27. Channel Edge Plot (LTE B26 – 1.4MHz QPSK – RB Size 6– Low Channel)



Plot 7-28. Channel Edge Plot (LTE B26 – 1.4MHz QPSK – RB Size 6 – High Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - ACP X RL RL RF 50 Ω AC CORREC	SENSE:INT Center Freq: 815.50 →→ Low #Atten: 28 dB	0000 MHz Avg Hold: 100/100	09:14:08 PM F Radio Std: N Radio Device	one	Trace/Detector
10 dB/div Ref 30.00 dBm					1
20.0 10.0	23.1 dBm				Clear Write
000 100 -200 -300				RMS AVG	Average
-40.0					Max Hold
Center 815.5 MHz #Res BW 100 kHz Total Carrier Power 23.071 dBm/3	#VBW 300			1 4 MHz 20 ms	Min Hold
Total Carrier Power 23.071 dBm/3	.00 MHz ACP	-IBW Lower	Upper		
Carrier Power Filter	Offset Freq Integ BW	dBc dBm	dBc dBm	Filter	View/Blank
1 23.071 dBm / 3.000 MHz OFF	0.0 Hz 37.50 kHz 37.50 kHz 100.0 kHz		-46.05 -22.98 -45.66 -22.59	OFF OFF	Trace On
					More 1 of 2
ISG		STA	TUS		

Plot 7-29. Channel Edge Plot (LTE B26 – 3MHz QPSK – RB Size 15– Low Channel)



Plot 7-30. Channel Edge Plot (LTE B26 – 3MHz QPSK – RB Size 15 – High Channel)

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Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 42				
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Keysight Spectrum Analyzer - ACP RL RF 50 Ω AC PASS	CORREC	Center F Trig: Fre		000 MHz Avg Hold	: 100/100	Radio			Trace/Detector
10 dB/div Ref 40.00 dB	m								1
20.0		23.4	l dBm						Clear Write
0.00 -10.0 -20.0								RMS AVG	Average
-30.0									Max Hold
Center 816.5 MHz #Res BW 100 kHz Total Carrier Power 23.03	58 dBm/ 5.00		300 ki ACP-I					ò.5 MHz 20 ms	Min Hold
Total Camer Power 20.00	50 abili 5.00	111112	ACP-I		wer	Upp	er		
Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm		dBm	Filter	View/Blank
1 23.058 dBm / 5.000 MHz	OFF	0.0 Hz 37.50 kHz	37.50 kHz 100.0 kHz	-48.65 -46.19	-25.59 - -23.14 -		26.22 23.63	OFF OFF	Trace On
									More 1 of:
ISG					STA	TUS			

Plot 7-31. Channel Edge Plot (LTE B26 – 5MHz QPSK – RB Size 25– Low Channel)



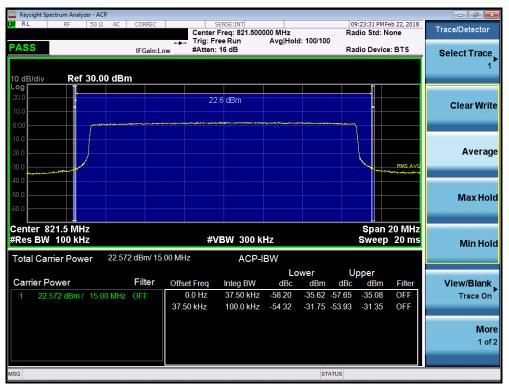
Plot 7-32. Channel Edge Plot (LTE B26 – 5MHz QPSK – RB Size 25 – High Channel)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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Keysight Spectrum Analyzer - ACP RL RF 50 Ω AC CORREC PASS IFGain:	Center Fr		000 MHz Avg Hold:	: 100/100	09:21:52 PM Fe Radio Std: N Radio Device	one	Trace/Detector
10 dB/div Ref 40.00 dBm							1
	23.1	dBm					Clear Write
20.0						RMS AVG	Average
-30.0							Max Hold
Center 819 MHz #Res BW 100 kHz		3W 300 ki	Hz			12 MHz 20 ms	Min Hold
Total Carrier Power 23.093 dBm/1	0.00 MHz	ACP-I					
Carrier Power Filter	Offset Freq	Integ BW	Lov dBc		Upper Bc dBm	Filter	View/Blank
1 23.093 dBm / 10.00 MHz OFF	0.0 Hz 37.50 kHz	37.50 kHz 100.0 kHz	-55.67	-32.58 -56. -28.97 -52.	32 -33.22	OFF OFF	Trace On
							More 1 of 2
ISG				STATUS		_ _	

Plot 7-33. Channel Edge Plot (LTE B26 – 10MHz QPSK – RB Size 50)



Plot 7-34. Channel Edge Plot (LTE B26 – 15MHz QPSK – RB Size 75)

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Conducted Power Output Data 7.5 §90.635

Frequency [MHz]	BC10 [Channel]	Battery Type	Cond. PWR [dBm]	Cond. PWR [Watts]	Cond. PWR Limit [dBm]	Margin [dB]
817.90	476	Standard	24.37	0.274	50.00	-25.63
823.10	684	Standard	24.40	0.275	50.00	-25.60

Table 7-2. CDMA BC10 Conducted Power Output Data

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Cond. PWR [dBm]	Cond. PWR [Watts]	Cond. PWR Limit [dBm]	Margin [dB]
814.70	1.4	QPSK	24.48	0.281	50.00	-25.52
823.30	1.4	QPSK	24.45	0.279	50.00	-25.55
814.70	1.4	16-QAM	23.50	0.224	50.00	-26.50
823.30	1.4	16-QAM	23.16	0.207	50.00	-26.84
815.50	3	QPSK	24.48	0.281	50.00	-25.52
822.50	3	QPSK	24.38	0.274	50.00	-25.62
815.50	3	16-QAM	23.32	0.215	50.00	-26.68
822.50	3	16-QAM	23.31	0.214	50.00	-26.69
816.50	5	QPSK	24.45	0.279	50.00	-25.55
821.50	5	QPSK	24.47	0.280	50.00	-25.53
816.50	5	16-QAM	23.30	0.214	50.00	-26.70
821.50	5	16-QAM	23.49	0.223	50.00	-26.51
819.00	10	QPSK	24.48	0.281	50.00	-25.52
819.00	10	16-QAM	23.46	0.222	50.00	-26.54
821.50	15	QPSK	23.91	0.246	50.00	-26.09
821.50	15	16-QAM	22.71	0.187	50.00	-27.29

Table 7-3. LTE Band 26 Conducted Power Output Data

NOTES:

- 1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
- 2. This unit was tested with its standard battery.

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7.6 Radiated Power (ERP) §22.913(a.2)

Test Overview

Effective Radiated Power (ERP) 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. 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-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.
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \geq 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.

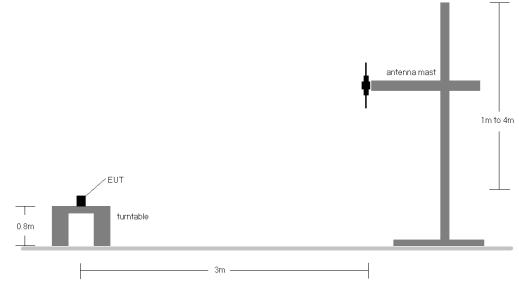


Figure 7-4. Radiated Test Setup <1GHz

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.

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]
821.50	15	QPSK	н	150	1	1 / 74	20.20	1.49	19.54	0.090	38.45	-18.91
821.50	15	16-QAM	Н	150	1	1 / 74	19.08	1.49	18.42	0.069	38.45	-20.03
821.50	15	QPSK	V	150	350	1 / 74	20.12	1.49	19.46	0.088	38.45	-18.99

Table 7-35. ERP Data (LTE – Band 26)

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7.7 Radiated Spurious Emissions Measurements §2.1053 §90.691

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 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

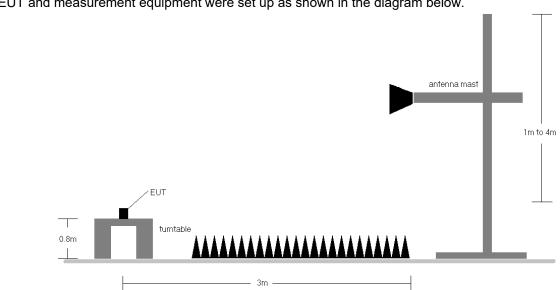
ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 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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The EUT and measurement equipment were set up as shown in the diagram below.

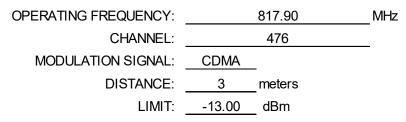
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

- 1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 2. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
- 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 "-" shown in the following RSE tables are used to denote a noise floor measurement.

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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]
1635.80	Н	150	342	-66.83	4.78	-62.05	-49.1
2453.70	Н	-	-	-66.35	4.95	-61.40	-48.4
3271.60	Н	-	-	-65.85	6.19	-59.66	-46.7

Table 7-4. CDMA BC10 Radiated Spurious Data (Ch. 476)

OPERATING FREQUENCY:

823.10 CHANNEL: 684

MHz

MODULATION SIGNAL: CDMA

DISTANCE: <u>3</u> meters

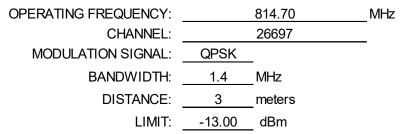
LIMIT: -13.00 dBm

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]
1646.20	Н	150	344	-66.14	4.80	-61.34	-48.3
2469.30	Н	150	353	-65.43	4.98	-60.45	-47.4
3292.40	Н	-	-	-65.86	6.23	-59.62	-46.6

Table 7-5. CDMA BC10 Radiated Spurious Data (Ch. 684)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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]
1629.40	Н	150	336	-64.77	4.77	-60.00	-47.0
2444.10	Н	-	-	-64.93	4.94	-59.99	-47.0
3258.80	Н	-	-	-64.30	6.16	-58.14	-45.1

Table 7-6. Radiated Spurious Data (LTE B26 - Ch. 26697)

OPERATING FREQUENCY:		823.30	MHz
CHANNEL:		26783	_
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	1.4	MHz	
DISTANCE:	3	meters	
LIMIT:	-13.00	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]
1646.60	Н	150	351	-64.68	4.81	-59.87	-46.9
2469.90	Н	150	340	-65.25	4.98	-60.27	-47.3
3293.20	Н	-	-	-65.97	6.24	-59.74	-46.7

Table 7-7. Radiated Spurious Data (LTE B26 - Ch. 26783)

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Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Test Procedure Used

ANSI/TIA-603-D-2010

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

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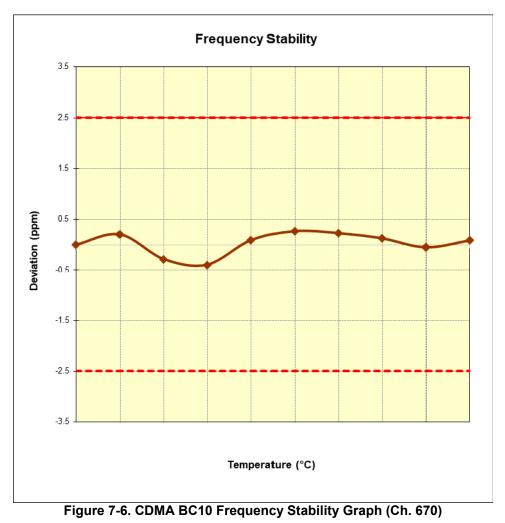
OPERATING FREQUENCY:	817,900,000	_Hz
CHANNEL:	476	_
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	817,900,001	1	0.0000001
100 %		- 30	817,900,170	170	0.0000208
100 %		- 20	817,899,769	-231	-0.0000282
100 %		- 10	817,899,677	-323	-0.0000395
100 %		0	817,900,075	75	0.0000092
100 %		+ 10	817,900,222	222	0.0000271
100 %		+ 20	817,900,190	190	0.0000232
100 %		+ 30	817,900,106	106	0.0000130
100 %		+ 40	817,899,960	-40	-0.0000049
100 %		+ 50	817,900,071	71	0.0000087
BATT. ENDPOINT	3.70	+ 20	817,899,935	-65	-0.0000079

Table 7-8. CDMA BC10 Frequency Stability Data (Ch. 670)

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OPERATING FREQUENCY:	819,000,000	Hz
CHANNEL:	26740	_
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	819,000,125	125	0.0000153
100 %		- 30	818,999,937	-63	-0.0000077
100 %		- 20	819,000,124	124	0.0000151
100 %		- 10	819,000,242	242	0.0000295
100 %		0	819,000,205	205	0.0000250
100 %		+ 10	818,999,971	-29	-0.0000035
100 %		+ 20	818,999,892	-108	-0.0000132
100 %		+ 30	819,000,227	227	0.0000277
100 %		+ 40	819,000,094	94	0.0000115
100 %		+ 50	818,999,994	-6	-0.0000007
BATT. ENDPOINT	3.70	+ 20	818,999,754	-246	-0.0000300

Table 7-9. LTE Band 26 Frequency Stability Data (Ch. 26697)

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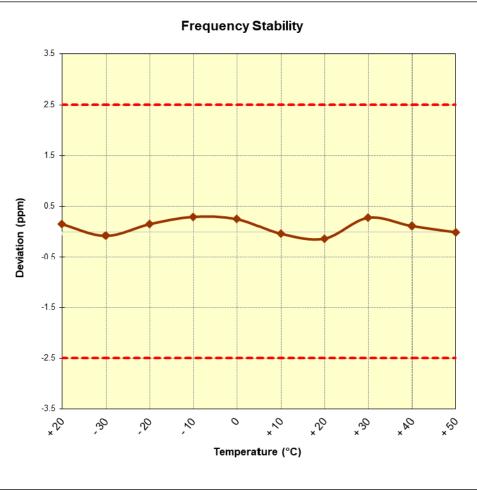


Table 7-10. LTE Band 26 Frequency Stability Data (Ch. 26697)

FCC ID: A3LSMJ737P		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMJ737P** complies with all the requirements of Parts 22(H) and 90 of the FCC rules.

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