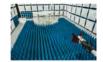


PCTEST

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



MEASUREMENT REPORT

Part 96 LTE

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 4/29 - 8/12/2020 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2004140062-04.A3L

FCC ID:	A3LSMH204V
APPLICANT:	Samsung Electronics Co., Ltd.
· · · · · ·	
Application Type:	Certification
Model:	SM-H204V
EUT Type:	Indoor Customer Premises Equipment (CPE)
FCC Classification:	Citizens Band End User Devices (CBE)
FCC Rule Part(s):	96
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, ANSI C63.26-2015,
	KDB 971168 D01 v03r01, KDB 940660 D01 v02, WINNF-TS-0122 V1.0.0

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.

Råndy Ortanez President



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#

MEASUREMENT REPORT FCC Part 96

				EI	RP		
Mode	CCs Active	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Emission Designator	Modulation
LTE Band 48	1	96	3552.5 - 3697.5	0.142	21.53	4M52G7D	QPSK
LTE Band 48	1	96	3552.5 - 3697.5	0.113	20.54	4M52W7D	16QAM
LTE Band 48	1	96	3552.5 - 3697.5	0.096	19.84	4M51W7D	64QAM
LTE Band 48	1	96	3555 - 3695	0.148	21.69	8M99G7D	QPSK
LTE Band 48	1	96	3555 - 3695	0.122	20.87	9M00W7D	16QAM
LTE Band 48	1	96	3555 - 3695	0.089	19.51	9M06W7D	64QAM
LTE Band 48	1	96	3557.5 - 3692.5	0.143	21.56	13M5G7D	QPSK
LTE Band 48	1	96	3557.5 - 3692.5	0.126	21.01	13M5W7D	16QAM
LTE Band 48	1	96	3557.5 - 3692.5	0.093	19.67	13M6W7D	64QAM
LTE Band 48	1	96	3560 - 3690	0.125	20.96	18M0G7D	QPSK
LTE Band 48	1	96	3560 - 3690	0.113	20.51	18M0W7D	16QAM
LTE Band 48	1	96	3560 - 3690	0.093	19.67	18M0W7D	64QAM
LTE Band 48	2	96	3562.5-3687.5	0.125	20.96	23M0G7D	QPSK
LTE Band 48	2	96	3562.5-3687.5	0.110	20.39	23M0W7D	16QAM
LTE Band 48	2	96	3562.5-3687.5	0.089	19.47	23M0W7D	64QAM
LTE Band 48	2	96	3565-3685	0.152	21.80	27M8G7D	QPSK
LTE Band 48	2	96	3565-3685	0.145	21.62	27M8W7D	16QAM
LTE Band 48	2	96	3565-3685	0.090	19.57	27M9W7D	64QAM
LTE Band 48	2	96	3567.5-3682.5	0.149	21.73	33M0G7D	QPSK
LTE Band 48	2	96	3567.5-3682.5	0.146	21.63	33M2W7D	16QAM
LTE Band 48	2	96	3567.5-3682.5	0.108	20.34	33M3W7D	64QAM
LTE Band 48	2	96	3570-3680	0.155	21.89	37M8G7D	QPSK
LTE Band 48	2	96	3570-3680	0.136	21.32	37M8W7D	16QAM
LTE Band 48	2	96	3570-3680	0.121	20.83	37M7W7D	64QAM
EUT Overview // TE B49							

EUT Overview (LTE B48)

Note: EIRP levels shown in the table above are measured over the full channel bandwidth. These values will appear on the Grant of Authorization.

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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.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST 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 located in Columbia, MD 21046, U.S.A.

- PCTEST is a CBRS Alliance (OnGo) Approved Test Lab
- PCTEST is a WInnForum Approved Test Lab
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WInnForum Conformance and Performance Test Technical Standard.
- 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 Indoor Customer Premises Equipment (CPE) FCC ID: A3LSMH204V**. The test data contained in this report pertains only to the emissions due to the EUT's LTE Band 48 operation in the CBRS band. Per FCC Part 96, this device is evaluated under Citizens Band End User Devices (CBE).

Test Device Serial No.: 14510, 43712, 04955, 43712, 06243

2.2 Device Capabilities

This device contains the following capabilities:

Multi-band LTE, 5G NR (n5, n66, n2, n261, n260), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (LE)

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. 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 v03r01) were used in the measurement of the EUT.

3.2 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 v03r01.

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:

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

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 P_d levels are then compared to the absolute spurious emission limit of -40dBm/MHz for End User Devices.

Per the guidance of ANSI C63.26-2015, field strength method may be performed for both Radiated power and Radiated Spurious Emissions. The filed strength is converted direct from radiated emission measurement.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01.

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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	4/9/2020	Annual	4/9/2021	LTx2
-	LTx3	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Espec	ESX-2CA	Environmental Chamber	8/13/2019	Annual	8/13/2020	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
Mini Circuits	TVA-11-422	RF Power Amp		N/A		
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	8/26/2019	Annual	8/26/2020	100976
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/21/2020	Annual	2/21/2021	102133
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

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

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM 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 (7250 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:	A3LSMH204V
FCC Classification:	Citizens Band End User Devices (CBE)
Mode(s):	<u>LTE</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1046	Transmitter Conducted Output Power	N/A		PASS	Section 7.3
2.1051 96.41(e)(ii)	Out of Band Emissions	 -13 dBm/MHz at frequencies within 0-B MHz of channel edge (where B is the bandwidth of the assigned channel) -25 dBm/MHz at frequencies greater than B MHz above and below channel edge -40 dBm/MHz at frequencies below 3530 MHz and above 3720 MHz 		PASS	Section 7.4, 7.5
2.1046	Additional Maximum Power Reduction (AMPR)	N/A		PASS	Section 7.6
96.41(e)	Uplink Carrier Aggregation	>43 + 10log(P[Watts]) at Band Edge and for all out-of-band emissions	CONDUCTED	PASS	Section 7.7
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Section 7.11
96.47	End User Device Additional Requirements (CBSD Protocol)	End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.		PASS	Section 7.12

Table 7-1. Summary of Conducted Test Results

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FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
96.41(b)	Equivalent Isotropic Radiated Power (EIRP)	23 dBm/10MHz		PASS	Section 7.8
2.1053 96.41(e)	Undesirable Emissions	-40 dBm/MHz	RADIATED	PASS	Section 7.9
96.41(e)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)		PASS	Section 7.10

Table 7-2. 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.
- 2) The analyzer plots were all 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 "LTE Automation," Version 5.3.

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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 v03r01 - 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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LTE Band 48



Plot 7-1. Occupied Bandwidth Plot (Band 48 - 5.0MHz QPSK - Full RB Configuration)

Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω DC	Trig	SENSE:INT ter Freq: 3.625000000 GH j: Free Run Avg H ten: 36 dB	z old: 100/100	10:23:47 PM May 16, 2020 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 25.00 dBm .og 150	man	mannamana	n		ClearWrite
5:00 15:0 15:0 16:0			M. Market	wom when of here	Averag
45.0					Max Hold
Center 3.625 GHz Res BW 120 kHz		#VBW 390 kHz		Span 12.5 MHz Sweep 1 ms	Min Hole
Occupied Bandwidth 4.5	5243 MHz	Total Power	30.	6 dBm	Detecto
Transmit Freq Error x dB Bandwidth	-245 Hz 4.954 MHz	% of OBW Po x dB		9.00 % .00 dB	Auto <u>Mar</u>
SG			STATU	s	1

Plot 7-2. Occupied Bandwidth Plot (Band 48 - 5.0MHz 16-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied BW					0 6 ×
00 RL RF 50 Ω DC	#FGain:Low Center #Atten	SENSE:INT Freq: 3.625000000 GHz Free Run Avg Hold 1: 36 dB	Radio	5:22 PM May 16, 2020 5 Std: None 5 Device: BTS	Trace/Detector
10 dB/div Ref 30.00 dBm		mmmmmm			Clear Write
-10.0 -20.0 -30.0	w		Vinnen	m www	Average
-40 0					Max Hold
Center 3.625 GHz Res BW 120 kHz Occupied Bandwidtl		VBW 390 kHz Total Power		oan 12.5 MHz Sweep 1 ms	Min Hold
	-4.502 MHz -4.909 MHz	% of OBW Power		6	Detector Peak► Auto <u>Man</u>
MSG			STATUS		

Plot 7-3. Occupied Bandwidth Plot (Band 48 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (Band 48 - 10.0MHz QPSK - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied BW			_		0 8 ×
RL RF 58Ω DC	Trig:	SENSE:INTI er Freq: 3.625000000 GH Free Run Avg t en: 36 dB	Hz Hold: 100/100	10:28:00 PM May : Radio Std: Non Radio Device: E	e Trace/Detector
10 dB/div Ref 35.00 dBm					
25.0 15.0	manthaganha	monanterport	~		Clear Write
5.00			N.		
-15.0 -25.0 mr. marin marin marine	not		menny	home man for the most	Average
35.0					
-45.0					Max Hold
Center 3.625 GHz Res BW 240 kHz		#VBW 750 kHz		Span 25 Sweep	
Occupied Bandwidth 8.9	h 9989 MHz	Total Power	30.	7 dBm	Detector
Transmit Freq Error x dB Bandwidth	2.166 kHz 9.770 MHz	% of OBW Po x dB		9.00 % .00 dB	Peak≯ Auto <u>Man</u>
ASG			STATL	IS	

Plot 7-5. Occupied Bandwidth Plot (Band 48 - 10.0MHz 16-QAM - Full RB Configuration)



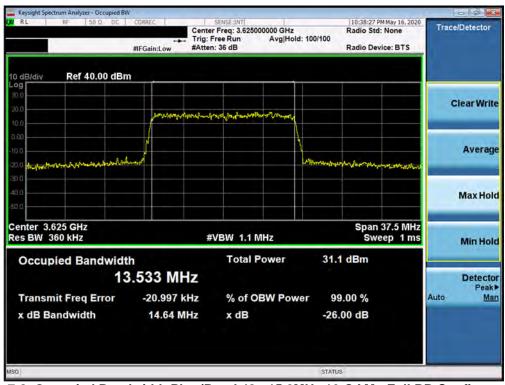
Plot 7-6. Occupied Bandwidth Plot (Band 48 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Pred Jobe part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		D	
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Keysight Spectrum Analyzer - Occupied BW						0 8 ×
	Trig	sense:mt] tter Freq: 3.625000000 GHz ; Free Run Avg Ho ten: 36 dB	bld: 100/100	10:37:58 PM May Radio Std: Nor Radio Device:	ne Ir	ace/Detector
200	Manunahan	~1994~410-384-39-10-10-10-10-10-10-10-10-10-10-10-10-10-				Clear Write
0.00 -10 0 -20 0 Pathan-y-burgayangh-an-an-Abhan-an-			Immedia	Ant Marine Marine	Arrent.	Average
30 0 -4α 0 -50 0						Max Hold
Center 3.625 GHz Res BW 360 kHz Occupied Bandwidth		#VBW 1.1 MHz Total Power	34.0	Span 37. Sweep dBm		Min Hold
	543 MHz -5.003 kHz 14.62 MHz	% of OBW Por x dB	wer 99	9.00 % 00 dB	Auto	Detector Peak≯ <u>Mar</u>
MSG			STATU	s		

Plot 7-7. Occupied Bandwidth Plot (Band 48 - 15.0MHz QPSK - Full RB Configuration)



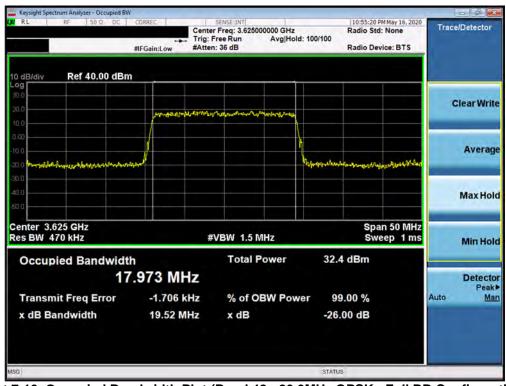
Plot 7-8. Occupied Bandwidth Plot (Band 48 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Da - a 40 a 6 70
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Keysight Spectrum Analyzer - Occupied BW					and the second	0 6 👗
	#IFGain:Low #A	SENSE:INT nter Freq: 3.625000000 g: Free Run Avy tten: 36 dB	GHz g Hold: 100/100	Radio Std: Radio Dev		Trace/Detector
10 dB/div Ref 40.00 dBm Log 30 0 20 0		405-m. Toman ar and for the Balline				Clear Write
10.0 0.00 10.0 20.0	MM		hann	webernary	-Wandre a	Average
40 0 50 0						Max Hold
Center 3.625 GHz Res BW 360 kHz		#VBW 1.1 MHz	ar 30		37.5 MHz ep 1 ms	Min Hold
Occupied Bandwidth 13	.556 MHz	roturi owe		LE GOM		Detecto
Transmit Freq Error x dB Bandwidth	-1.553 kHz 14.54 MHz	% of OBW x dB		9.00 % 5.00 dB		Auto <u>Man</u>
sq			STAT	us		

Plot 7-9. Occupied Bandwidth Plot (Band 48 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (Band 48 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Presid (size part of (size)	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 47 at 70
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Keysight Spectrum Analyzer - Occupied BW						0 8 ×
#1	Trig:	SENSE:INT ter Freq: 3.625000000 (: Free Run Avg en: 36 dB	3Hz Hold: 100/100	Radio Std:		Trace/Detector
10 dB/div Ref 40.00 dBm	Junearthe	~Withour seal of a factor	1.44			Clear Write
0.0 0.00 			harring		11-1-lensoue	Average
-30.0 -40.0 -50.0						Max Hold
Center 3.625 GHz Res BW 470 kHz Occupied Bandwidth	3	#VBW 1.5 MHz Total Powe	r 31.		n 50 MHz sep 1 ms	Min Hold
	968 MHz 10.540 kHz 19.61 MHz	% of OBW F x dB	Power 9	9.00 % .00 dB		Detector Peak≯ Auto <u>Man</u>
MSG			STATU	s		

Plot 7-11. Occupied Bandwidth Plot (Band 48 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (Band 48 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Da an 10 at 70
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Keysight Spectrum Analyzer - Occupied BV						- 6 ×
	#IFGain:Low #Atter	SENSE:JNT Ir Freq: 3.627500000 GHz Free Run Avg Ho n: 36 dB	z old: 100/100	09:47:36 Pi Radio Std: Radio Dev		Trace/Detector
10 dB/div Ref 40.00 dBn Log 30.0 20.0	n Juckenstranstause	magnalitics				Clear Write
0.00 -10.0 -20.0 Junilization from the state of the state	~~~~		Housevery	mallinger	erth-haven	Average
-40 0 -40 0 -50 0						Max Hold
Center 3.628 GHz Res BW 620 kHz	#	VBW 1.5 MHz			62.5 MHz ep 1 ms	Min Hold
Occupied Bandwidt	^h 3.017 MHz	Total Power	32.9	dBm		Detector Peak
Transmit Freq Error x dB Bandwidth	118.99 kHz 24.31 MHz	% of OBW Po x dB		.00 % 00 dB		Auto <u>Mar</u>
MSG			STATUS			

Plot 7-13. Occupied Bandwidth Plot (LTE Band 48 ULCA - 25.0MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 48 ULCA - 25.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proid Jolie part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW		Section 1		and the second	o & ×
	#IFGain:Low #Atte	SENSE:INT Pr Freq: 3.627500000 GHz Free Run Avg Hol n: 36 dB	Radio St Id: 100/100	PMMay 16, 2020 cd: None evice: BTS	Trace/Detector
10 dB/div Ref 40.00 dBm Log 30 0 20.0	juturingthingthing	mytrensment alteration			Clear Write
0.00 -10.0 -20.0 Antiplesson and Antiplesson and Anti-	hud		Handlen would be strong	www.ward	Average
-40 0 -50 0					Max Hold
Center 3.628 GHz Res BW 620 kHz		¢VBW 1.5 MHz	Sv	n 62.5 MHz veep 1 ms	Min Hold
Occupied Bandwidtl 22 Transmit Freg Error	h . 961 MHz 75.536 kHz	Total Power % of OBW Pov	32.0 dBm ver 99.00 %		Detector Peak► Auto <u>Man</u>
x dB Bandwidth	24.30 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-15. Occupied Bandwidth Plot (LTE Band 48 ULCA - 25.0MHz 64-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 48 ULCA - 30.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 76
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				Same -	- 6 ×
Center Trig: F	Free Run Avg H		Radio Std: None	Trac	e/Detector
		وعوال			Clear Write
pomphalamanth	restances applications				Glear Wille
	V				
W		withownite	radiumprondisonisty	aba	Average
وي وي ال					
ک کے ا					Max Hold
#	VBW 1.5 MHz		Span 75 N Sweep 1	MHz ms	Min Hold
	Total Power	32.	3 dBm		
771 MHz					Detector Peak
-17.154 kHz	% of OBW Po	wer 9	9.00 %	Auto	Mar
29.49 MHz	x dB	-26	.00 dB		
		STATI	JS		
F	FGain:Low Trig: F #Atter	Center Freq: 3.63000000 GH FGain:Low Trig: Free Run AvgH #Atten: 36 dB #VBW 1.5 MHz Total Power 771 MHz -17.154 kHz % of OBW Po	Center Freq: 3.63000000 GHz Trig: Free Run Avg Hold: 100/100 #Atten: 36 dB #VBW 1.5 MHz Total Power 32. 771 MHz -17.154 kHz % of OBW Power 99 29.49 MHz x dB -26	Center Freq: 3.63000000 GHz FGain:Low Trig: Free Run Avg Hold: 100/100 #Atten: 36 dB Radio Device: BT Radio Device: BT Radio Device: BT Radio Device: BT Span 75 f #VBW 1.5 MHz Syme 1 Total Power 32.3 dBm 771 MHz -17.154 kHz % of OBW Power 99.00 %	Conter Freq: 3.63000000 GHz FGain:Low #Atten: 36 dB Avg Hold: 100/100 Radio Device: BTS Addio Device: BTS Radio Device: BTS

Plot 7-17. Occupied Bandwidth Plot (LTE Band 48 ULCA - 30.0MHz 16-QAM - Full RB Configuration)



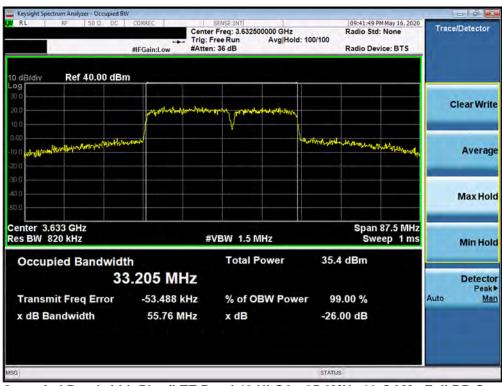
Plot 7-18. Occupied Bandwidth Plot (LTE Band 48 ULCA - 30.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Predd Jobe part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dogo 01 of 70			
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Keysight Spectrum Analyzer - Occupied BW						08
	#IFGain:Low #Atte	SENSE:INT er Freq: 3.632500000 GH Free Run Avg H en: 36 dB	Hz Hold: 100/100	Radio Std		Trace/Detector
10 dB/div Ref 40.00 dBm	n julftiksgrammitksfrimite	water and and a second	hat			Clear Writ
0.00 -10.0 -20.0	MANA		horrowhend	man	a alfanta with	Averag
-30.0 -40.0 -50.0						Max Hol
Center 3.633 GHz Res BW 820 kHz	#	#VBW 1.5 MHz			87.5 MHz eep 1 ms	Min Hol
Occupied Bandwidt	^h 2.970 MHz	Total Power	35.1	1 dBm		Detecto
Transmit Freq Error x dB Bandwidth	-118.28 kHz 46.41 MHz	% of OBW Po x dB		9.00 % .00 dB		Peak Auto <u>Ma</u>
MSG			STATU	IS		

Plot 7-19. Occupied Bandwidth Plot (LTE Band 48 ULCA - 35.0MHz QPSK - Full RB Configuration)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 48 ULCA - 35.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager			
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Keysight Spectrum Analyzer - Occupied BW		S. S. A.		and the second states	00 00
RL RF 50Ω DC	Trig: F	SENSE:INT r Freq: 3.632500000 GHz Free Run Avg Ho n: 36 dB	d: 100/100	09:42:26 PM May 16, 2020 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBm					
200	- jonelainskiperkinen	whet we many many	4		Clear Write
0.00 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			haven have been a	americania di dana	Average
-30.0					Max Hold
Center 3.633 GHz Res BW 820 kHz	#	VBW 1.5 MHz		Span 87.5 MHz Sweep 1 ms	Min Hold
Occupied Bandwidtl 33	^h 3.326 MHz	Total Power	35.1	dBm	Detector Peak▶
Transmit Freq Error x dB Bandwidth	-25.944 kHz 66.66 MHz	% of OBW Pov x dB	wer 99.0 -26.0		Auto <u>Man</u>
MSG			STĂTUS		

Plot 7-21. Occupied Bandwidth Plot (LTE Band 48 ULCA - 35.0MHz 64-QAM - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 48 ULCA - 40.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW					0 6 ×
	#IFGain:Low Center Trig: Fr #Atten:		d: 100/100 Radio Std Radio Dev		Trace/Detector
10 dB/div Ref 40.00 dBm Log 30 0 20 0	n Juran janta basartana	And water and the second se			Clear Write
0.00 -100 -20.0 wisewaya wata fu yaka ay fu bit	Me		homenstyles have a first and the second s	Societania	Average
-30.0 -40.0 -50.0					Max Hold
Center 3.635 GHz Res BW 910 kHz		/BW 1.5 MHz	Swe	100 MHz ep 1 ms	Min Hold
Occupied Bandwidt 37 Transmit Freq Error x dB Bandwidth	h 7.785 MHz -147.17 kHz 39.97 MHz	Total Power % of OBW Pow x dB	31.4 dBm er 99.00 % -26.00 dB		Detector Peak⊧ Auto <u>Man</u>
MSG			STĂTUS		

Plot 7-23. Occupied Bandwidth Plot (LTE Band 48 ULCA - 40.0MHz 16-QAM - Full RB Configuration)



Plot 7-24. Occupied Bandwidth Plot (LTE Band 48 ULCA - 40.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager			
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7.3 Transmitter Conducted Output Power

Test Overview and Limit

A transmitter port of EUT is connected to the input of a signal analyzer. 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 Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2 ANSI/TIA-603-E-2016 – Section 2.2.17 KDB 662911 D01 v02r01 – Section E)1) In-Band Power Measurements

Test Settings

- 1. Conducted 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 = 2 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trace mode = Trace-Averaging (RMS) set to average over 100 sweeps
- 8. 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

None

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	INC	Approved by: Quality Manager
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LTE Band 48 5 MHz Bandwidth							
			Low Channel	Mid Channel	High Channel		
Modulation	RB Size	RB Offset	55265 (3552.5 MHz)	55990 (3625.0 MHz)	56715 (3697.5 MHz)		
			Conducted Power [dBm]				
	1	0	22.73	22.79	22.46		
QPSK	1	12	22.83	22.92	22.50		
QPSK	1	24	22.85	22.85	22.54		
	25	0	21.84	21.86	21.54		
	1	0	21.78	21.52	21.52		
16QAM	1	12	21.87	21.65	21.56		
IOQAIVI	1	24	21.92	21.55	21.59		
	25	0	20.91	20.89	20.63		
	1	0	20.35	20.77	20.12		
C 4 O 4 M	1	12	20.50	21.01	20.22		
64QAM	1	24	20.46	20.82	20.23		
	25	0	19.95	19.86	19.64		

 Table 7-3. Conducted Powers (B48 5MHz)

LTE Band 48 10 MHz Bandwidth						
			Low Channel	Mid Channel	High Channel	
Modulation	RB Size	RB Offset	55290 (3555.0 MHz)	55990 (3625.0 MHz)	56690 (3695.0 MHz)	
			Co	nducted Power [dB	m]	
	1	0	22.56	22.64	22.25	
QPSK	1	25	22.94	23.05	22.58	
QFSK	1	49	22.73	22.79	22.37	
	50	0	21.79	21.85	21.56	
	1	0	21.42	21.55	21.13	
16QAM	1	25	21.83	21.96	21.44	
TOQAIVI	1	49	21.62	21.70	21.22	
	50	0	20.81	20.89	20.56	
	1	0	20.20	20.23	19.84	
64QAM	1	25	20.59	20.66	20.20	
	1	49	20.31	20.37	19.92	
	50	0	19.83	19.88	19.50	

Table 7-4. Conducted Powers (B48 10MHz)

FCC ID: A3LSMH204V	PCTEST Preed to be pert of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager	
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LTE Band 48 15 MHz Bandwidth						
			Low Channel	Mid Channel	High Channel	
Modulation	RB Size	RB Offset	55315 (3557.5 MHz)	55990 (3625.0 MHz)	56665 (3692.5 MHz)	
			nducted Power [dB	m]		
	1	0	22.53	22.80	22.25	
QPSK	1	36	22.85	22.92	22.43	
QFSK	1	74	22.78	22.84	22.20	
	75	0	21.69	21.96	21.52	
	1	0	21.74	22.04	21.50	
16QAM	1	36	21.79	22.08	21.57	
TOQAM	1	74	21.60	22.05	21.61	
	75	0	20.75	21.06	20.63	
	1	0	20.06	20.59	20.25	
64QAM	1	36	20.32	20.80	20.31	
	1	74	20.03	20.65	20.17	
	75	0	19.67	20.10	19.65	

Table 7-5. Conducted Powers (B48 15MHz)

LTE Band 48 20 MHz Bandwidth							
			Low Channel	Mid Channel	High Channel		
Modulation	RB Size	RB Offset	RB Offset	55340 (3560.0 MHz)	55990 (3625.0 MHz)	56640 (3690.0 MHz)	
			Conducted Power [dBm]				
	1	0	22.33	22.25	22.12		
QPSK	1	50	22.66	22.63	22.42		
QFON	1	99	22.41	22.44	22.03		
	100	0	21.66	21.64	21.55		
	1	0	21.53	21.13	21.49		
16QAM	1	50	21.90	21.47	21.74		
IOQAIVI	1	99	21.60	21.19	21.34		
	100	0	20.71	20.73	20.48		
	1	0	20.28	20.26	20.03		
640044	1	50	20.57	20.68	20.32		
64QAM	1	99	20.21	20.41	19.91		
	100	0	19.82	19.70	19.54		

Table 7-6. Conducted Powers (B48 20MHz)

FCC ID: A3LSMH204V	PCTEST Preed to be pertial	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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7.4 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §96.41(e)

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 its maximum duty cycle, 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 conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/Mhz.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = Max Hold
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

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

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. 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.

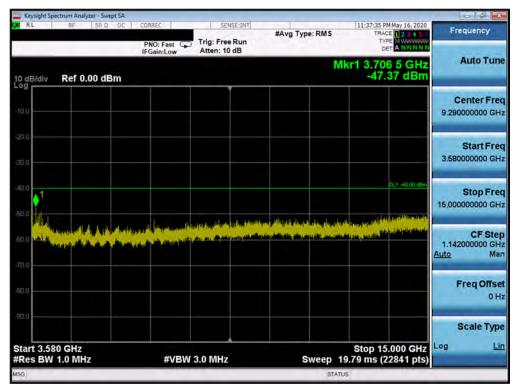
FCC ID: A3LSMH204V	PCTEST Prood (size part of (s)	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Da a 20 at 70
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LTE Band 48

Keysight Spectrum Analyzer - Swept S RL RF 50 Ω 0		SENSE:INT		11:40:11 PM May 16, 2020	- 6 -
	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 20 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 0 TYPE MWWWW DET A N N N N N	Frequency
0 dB/div Ref 10.00 dB	m		MI	cr1 3.410 5 GHz -44.11 dBm	Auto Tur
0.00					Center Fre 1.780000000 GH
0.0					Start Fre 30.000000 Mi
0.0				01.1-40.0001	Stop Fre 3.530000000 Gi
	ya daga sa kasa dagi si ka		a som i statist til 110 in det i		CF Ste 350.000000 MI <u>Auto</u> M
0.0					Freq Offs 01
Start 30 MHz Res BW 1.0 MHz	#VBW 3		Sween	Stop 3.530 GHz .667 ms (7001 pts)	Scale Typ Log L
G	# 4 D 44 (5.0 10112	Statu		

Plot 7-25. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



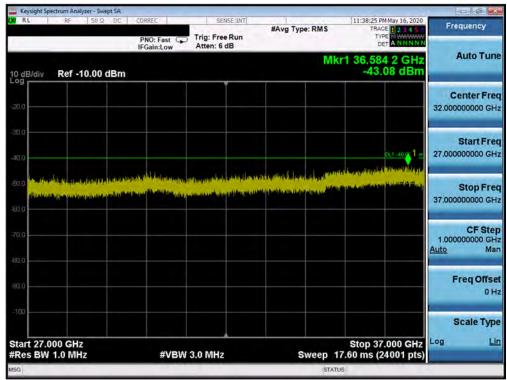
Plot 7-26. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMH204V	PCTEST Proof Joine pert of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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CORREC	SENSE:INT		11:37:47 PM May 16, 2020	- 6 -
PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 10 dB	#Avg Type: RMS	TRACE 2 3 4 5 0 TYPE M	Frequency
		Mkr	1 26.417 5 GHz -43.21 dBm	Auto Tune
				Center Free 21.000000000 GH
				Start Fre 15.000000000 GH
singuta life balance al days	en de filmeden de julikiers an	A DESCRIPTION OF THE OWNER OF THE		Stop Fre 27.000000000 GH
				CF Ste 1.200000000 GH Auto Ma
				Freq Offse 0 H
			Stop 27.000 GHz	Scale Type
	PNO: Fast C	PNO: Fast IFGain:Low Trig: Free Run Atten: 10 dB	PNO: Fast Trig: Free Run IFGain:Low Trig: Free Run Atten: 10 dB Mkr	PNO: Fast Free Run IFGain:Low Trig: Free Run Atten: 10 dB Trig: Market State

Plot 7-27. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



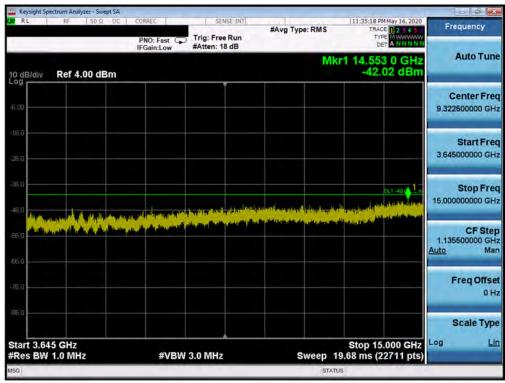
Plot 7-28. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 30 of 76
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Keysight Spectrum Analyzer - Swept SA				67 <mark></mark>
X RL RF 50 Q DC	CORREC SENSE:INT PNO: Fast Trig: Free Run IFGain:Low #Atten: 22 dB	#Avg Type: RMS	11:34:45 PM May 16, 2020 TRACE 2 3 4 5 0 TYPE MUNICIPAL DET A NNNNN	Frequency
10 dB/div Ref 4.00 dBm		M	kr1 3.602 0 GHz -36.78 dBm	Auto Tune
6.00				Center Fred 1.817500000 GHz
36.0				Start Free 30.000000 MH
45.0			DL1-40.00 dBm	Stop Free 3.605000000 GH
	ura lin ya asa dal la bian dal ana ku aluku bian ing ku Pangan na ku aluku bian dalam ku aluku bian dalam d		in a state making filled at the state	CF Step 357.50000 MH <u>Auto</u> Ma
75.a				Freq Offse 0 H
65.0				Scale Type
Start 30 MHz #Res BW 1.0 MHz #SG	#VBW 3.0 MHz	Sweep (Stop 3.605 GHz 5.197 ms (7151 pts)	

Plot 7-29. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



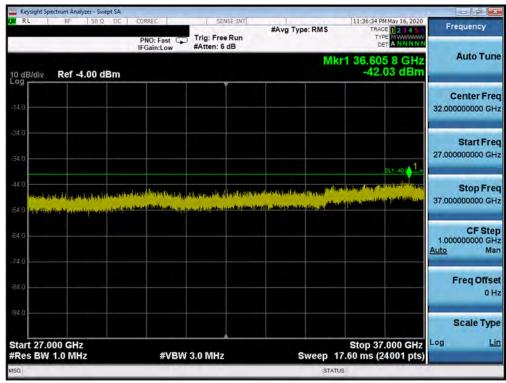
Plot 7-30. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMH204V	PCTEST Preed to be pert of @	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Swept					Ø
KL RF 50 Ω	PNO: Fast	SENSE:INT Trig: Free Run #Atten: 6 dB	#Avg Type: RMS	11:35:36 PM May 16, 2020 TRACE 2 3 4 5 0 TYPE MWWWWWW DET A NN NN N	Frequency
10 dB/div Ref -4.00 dB	m		Mk	r1 26.473 5 GHz -46.54 dBm	Auto Tune
-14.0					Center Freq 21.00000000 GHz
34.0				DL1 -40.00 rPm	Start Free 15.00000000 GH:
44.0 54.0 All-Jacob shall be as a 1947.0	annusian ann an thatan baile	names little and the second	- Mineral Angle - Angle	1	Stop Free 27.000000000 GH:
54 0 100 000 000 000 000 000 000 000 000	a a sa a	andra Luck, 200, all the se			CF Step 1.200000000 GH <u>Auto</u> Mar
84.0					Freq Offse 0 H
94 0 Start 15.000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz	Swaan 2	Stop 27.000 GHz 0.80 ms (24001 pts)	Scale Type Log <u>Lir</u>
ISG	#4 BV4	5.6-WIL12	SWEED		

Plot 7-31. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



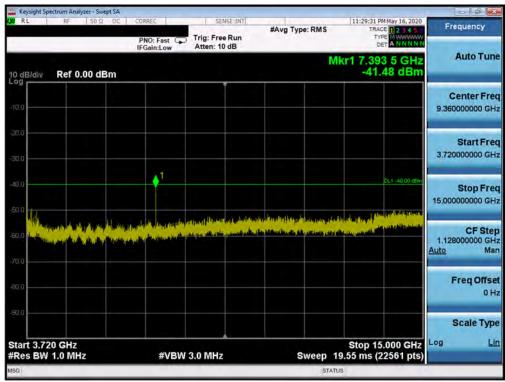
Plot 7-32. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
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- 6 ×	the second second				Keysight Spectrum Analyzer -
Frequency	11:29:17 PM May 16, 2020 TRACE 2 3 4 5 0 TYPE MUMMANN DET A NNNNN	#Avg Type: RMS	SENSE:INT	S0 Ω DC CORREC PNO: Fast IFGain:Low	KA RL RF 50
Auto Tune	kr1 3.543 0 GHz -44.86 dBm	м			10 dB/div Ref 10.00
Center Freq 1.850000000 GHz					0.00
Start Freq 30.000000 MHz					-10.0
Stop Freq 3.670000000 GHz	DL1 +40.00 1 1				-40.0
CF Step 364.000000 MHz Auto Man					sa a tan isin kulu kulunini
Freq Offset 0 Hz					70.0
Scale Type	Stop 3.670 GHz 6.309 ms (7281 pts)	Swaan	3.0 MHz	4)(D)M	Start 30 MHz #Res BW 1.0 MHz
		sweep	5.0 10112	*****	MSG

Plot 7-33. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)



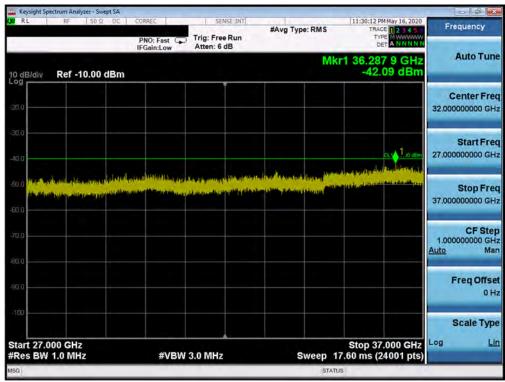
Plot 7-34. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)

FCC ID: A3LSMH204V	PCTEST Preed to be pert of @	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Da at 20 at 70
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Keysight Spectrum Analyzer - Swept SA					- 6 ×
RL RF 50 Q DO	PNO: East	rig: Free Run Atten: 10 dB	#Avg Type: RMS	11:29:39 PM May 16, 2020 TRACE 2 3 4 5 0 TYPE WWWWWW DET A NNNNN	Frequency
0 dB/div Ref 0.00 dBm			Mk	r1 25.921 0 GHz -43.08 dBm	Auto Tune
10.0					Center Fred 21.00000000 GH
30.0					Start Free 15.000000000 GH
40.0	and a state of the state of the state of the state	utating distance for the Ministerio	an algerichte von Standartigtan	n 1 1000 days	Stop Free 27.000000000 GH
	sussey of edit structure in the second s	h-antipaget parlet area			CF Ster 1.200000000 GH <u>Auto</u> Ma
60.0					Freq Offse 0 H
90.0 Start 15.000 GHz				Stop 27.000 GHz	Scale Type
Res BW 1.0 MHz	#VBW 3.	0 MHz	Sweep 2	0.80 ms (24001 pts)	
ISG			STATL	IS	

Plot 7-35. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)



Plot 7-36. Conducted Spurious Plot (Band 48 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)

FCC ID: A3LSMH204V	PCTEST Preed to be pert of @	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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7.5 Band Edge Emissions at Antenna Terminal §2.1051 §96.41(e)(ii)

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 its maximum duty cycle, 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 conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B MHz (where B is the bandwidth in MHz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B MHz below the lower CBSD-assigned channel edge. At all frequencies greater than B MHz above the upper CBSD assigned channel edge and less than B MHz below the lower CBSD-assigned channel edge, the conducted power of any end user device emission shall not exceed -25 dBm/MHz. The conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW \geq 1% of the emission bandwidth
- 4. VBW \geq 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None

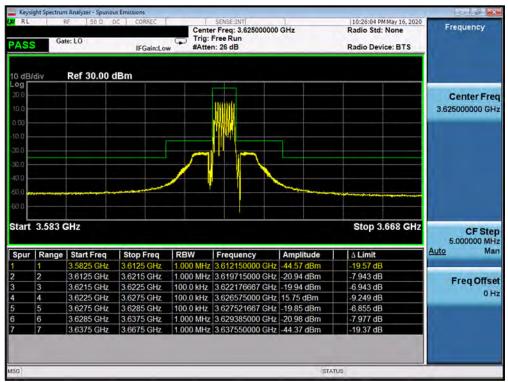
FCC ID: A3LSMH204V	PCTEST Proted John Participant	MEASUREMENT REPORT (CERTIFICATION)	Quality	r ed by: Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 25	- of 76
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LTE Band 48

Center Free 3.552500000 GH			n: 26 dB	Trig: #Atte	IFGain:Lov	e: LO	Gat	AS
					iBm	Ref 30.00 (/div	0 dB
		1						.0g - 20.0 - 10.0 - 0.00 - 10.0 -
								10,0 10,0 10,0 10,0 10,0
GHz CF Step 5.000000 MH	Stop 3.595 GHz					12	3.51 GI	lan
CF Ste	Stop 3.595 GHz	Amplitude	Frequency	RBW	Stop Freq	Start Freq		Spur
5.000000 MH			Frequency 3.529333333 GF		Stop Freq 3.5300 GHz			
5.000000 MH Auto Mai	∆ Limit	-51.63 dBm		1.000 MHz		Start Freq	Range	
Auto Ma	Δ Limit -11.63 dB	-51.63 dBm -45.00 dBm	3.529333333 GH	1.000 MHz 1.000 MHz	3.5300 GHz	Start Freq 3.5100 GHz	Range	Spur
5.000000 MH Auto Mai	Δ Limit -11.63 dB -20.00 dB	-51.63 dBm -45.00 dBm -19.02 dBm	3.529333333 GH 3.539550000 GH	1.000 MHz 1.000 MHz 1.000 MHz	3.5300 GHz 3.5400 GHz	Start Freq 3.5100 GHz 3.5300 GHz	Range 1 2 3 4	Spur
Auto Ma	Δ Limit -11.63 dB -20.00 dB -6.017 dB	-51.63 dBm -45.00 dBm -19.02 dBm -20.16 dBm	3.529333333 GH 3.539550000 GH 3.546510000 GH	1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 100.0 kHz	3.5300 GHz 3.5400 GHz 3.5490 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz	Range 1 2 3	Spur
Auto Ma	Δ Limit -11.63 dB -20.00 dB -6.017 dB -7.157 dB	-51.63 dBm -45.00 dBm -19.02 dBm -20.16 dBm 16.03 dBm	3.529333333 GH 3.539550000 GH 3.546510000 GH 3.549163333 GH	1.000 MHz 1.000 MHz 1.000 MHz 100.0 KHz 100.0 KHz	3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz	Range 1 2 3 4 5	Spur
Auto Ma	<u>A Limit</u> -11.63 dB -20.00 dB -6.017 dB -7.157 dB -8.969 dB	-51.63 dBm -45.00 dBm -19.02 dBm -20.16 dBm 16.03 dBm -21.28 dBm	3.529333333 GF 3.539550000 GF 3.546510000 GF 3.549163333 GF 3.552133333 GF	1.000 MHz 1.000 MHz 1.000 MHz 100.0 KHz 100.0 KHz 100.0 KHz	3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5550 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Range 1 2 3 4 5 6	Spur

Plot 7-37. Lower Channel Edge Plot (Band 48 - 5.0MHz QPSK - Full RB Configuration)



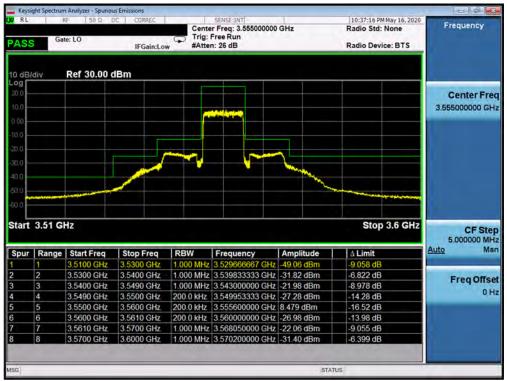
Plot 7-38. Mid Channel Edge Plot (Band 48 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preed to be pertial	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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PASS		17F 50 Ω 0 10e:LO	IFGain:Lov	Trig:	SENSE:JNT Freq: 3.697500000 Free Run n: 26 dB	GHz	10:26:47 PM May 16, 2020 Radio Std: None Radio Device: BTS	Frequency
10 dB/	(div	Ref 30.00 c	lBm					
20.0 10.0 0.00								Center Fred 3.697500000 GHz
-20.0				7				
-40.0 -	3 655 0	202					Stop 3 74 CHz	
50,0 <mark>-</mark> 60,0 -	3.655 0	GHz					Stop 3.74 GHz	5.000000 MH
50,0 <mark>-</mark> 60,0 -		GHZ Start Freq	Stop Freq	RBW	Frequency	Amplitude	Stop 3.74 GHz	5.000000 MH
50.0 60.0 Start			Stop Freq 3.6850 GHz		Frequency 3.684900000 GHz			5.000000 MH
50.0 60.0 Start	Range	Start Freq		1.000 MHz		-45.56 dBm	∆ Limit	5.000000 MH <u>Auto</u> Mar
50.0 60.0 Start Spur 1	Range	Start Freq 3.6550 GHz	3.6850 GHz	1.000 MHz 1.000 MHz	3.684900000 GHz	-45.56 dBm -21.84 dBm	Δ Limit -20.56 dB	5.000000 MH Auto Mar Freq Offse
50.0 60.0 Start Spur 1 2	Range	Start Freq 3.6550 GHz 3.6850 GHz	3.6850 GHz 3.6940 GHz	1.000 MHz 1.000 MHz 100.0 kHz	3.684900000 GHz 3.693970000 GHz	-45.56 dBm -21.84 dBm -21.11 dBm	Δ Limit -20.56 dB -8.842 dB	5.000000 MH Auto Mar Freq Offse
50.0 60.0 Start Spur 1 2 3	Range 1 2 3	Start Freq 3.6550 GHz 3.6850 GHz 3.6940 GHz	3.6850 GHz 3.6940 GHz 3.6950 GHz	1.000 MHz 1.000 MHz 100.0 kHz 100.0 kHz	3.684900000 GHz 3.693970000 GHz 3.694705000 GHz	-45.56 dBm -21.84 dBm -21.11 dBm 14.50 dBm	∆ Limit -20.56 dB -8.842 dB -8.114 dB	5.000000 MH Auto Mar Freq Offse
58.0 60.0 Start Spur 1 2 3 4	Range 1 2 3 4	Start Freq 3.6550 GHz 3.6850 GHz 3.6940 GHz 3.6950 GHz	3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz	1.000 MHz 1.000 MHz 100.0 kHz 100.0 kHz 100.0 kHz	3.68490000 GHz 3.693970000 GHz 3.694705000 GHz 3.699083333 GHz	-45.56 dBm -21.84 dBm -21.11 dBm 14.50 dBm -19.31 dBm	∆ Limit -20.56 dB -8.842 dB -8.114 dB -10.50 dB	5.000000 MH Auto Mar Freq Offse
50.0 60.0 Start Spur 1 2 3 4 5	Range 1 2 3 4 5	Start Freq 3.6550 GHz 3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz	3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz 3.7010 GHz	1.000 MHz 1.000 MHz 100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz	3.684900000 GHz 3.693970000 GHz 3.694705000 GHz 3.699083333 GHz 3.700020000 GHz	-45.56 dBm -21.84 dBm -21.11 dBm 14.50 dBm -19.31 dBm -22.23 dBm	Δ Limit -20.56 dB -8.842 dB -8.114 dB -10.50 dB -6.306 dB	5.000000 MH Auto Mar Freq Offse
50.0	Range 1 2 3 4 5 6	Start Freq 3.6550 GHz 3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz 3.7010 GHz	3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz 3.7010 GHz 3.7100 GHz	1.000 MHz 1.000 MHz 100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz 1.000 MHz	3.684900000 GHz 3.693970000 GHz 3.694705000 GHz 3.699083333 GHz 3.700020000 GHz 3.701750000 GHz	-45.56 dBm -21.84 dBm -21.11 dBm 14.50 dBm -19.31 dBm -22.23 dBm -44.72 dBm	Δ Limit -20.56 dB -8.842 dB -8.114 dB -10.50 dB -6.306 dB -9.227 dB	CF Step 5.000000 MH; Auto Mar Freq Offse 0 H;
50.0 60.0 Start Spur 1 2 3 4 5 6	Range 1 2 3 4 5 6 7	Start Freq 3.6550 GHz 3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz 3.7010 GHz 3.7100 GHz	3.6850 GHz 3.6940 GHz 3.6950 GHz 3.7000 GHz 3.7010 GHz 3.7100 GHz 3.7200 GHz	1.000 MHz 1.000 MHz 100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz 1.000 MHz	3 68490000 GHz 3.693970000 GHz 3.694705000 GHz 3.699083333 GHz 3.700020000 GHz 3.701750000 GHz 3.710150000 GHz	-45.56 dBm -21.84 dBm -21.11 dBm 14.50 dBm -19.31 dBm -22.23 dBm -44.72 dBm	Δ Limit -20,56 dB -8,842 dB -8,114 dB -10,50 dB -6,306 dB -9,227 dB -19,72 dB	5.000000 MH Auto Mar Freq Offse

Plot 7-39. Upper Channel Edge Plot (Band 48 - 5.0MHz QPSK - Full RB Configuration)



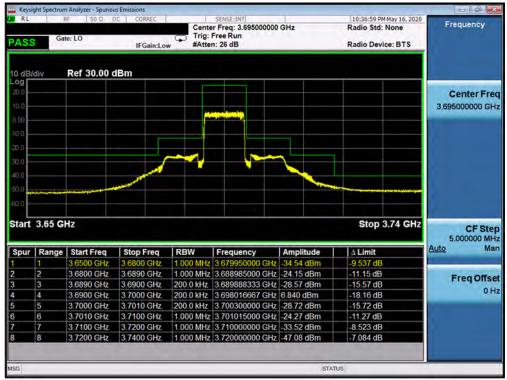
Plot 7-40. Lower Channel Edge Plot (Band 48 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Frequency	10:30:09 PM May 16, 2020 Radio Std: None Radio Device: BTS	GHz	SENSE:JNT r Freq: 3.625000000 Free Run h: 26 dB	Trig:	IFGain:Lov	F 50 Ω D		AS
					IBm	Ref 30.00 d	div	O dB
Center Free 3.625000000 GH								20,0 10,0
								10.0
		James .	- V		-			30.0
								50,0 60,0 -
	Stop 3.67 GHz					łz	3.58 GH	Start
CF Step 5.000000 MH	Stop 5.07 GHz							
CF Step 5.000000 MH Auto Ma	∆ Limit	Amplitude	Frequency	RBW	Stop Freq	Start Freq	Range	Spur
5.000000 MH			Frequency 3.609800000 GHz		Stop Freq 3.6100 GHz	Start Freq 3.5800 GHz		Spur
5.000000 MH Auto Mai	∆ Limit	-32.69 dBm		1.000 MHz			1	Spur
5.000000 MH Auto Mai Freq Offse	Δ Limit -7.687 dB	-32.69 dBm -23.19 dBm	3.609800000 GHz	1.000 MHz 1.000 MHz	3.6100 GHz	3.5800 GHz	1 2	1
5.000000 MH Auto Mai	∆ Limit -7.687 dB -10.19 dB	-32.69 dBm -23.19 dBm -27.80 dBm	3.609800000 GHz 3.612775000 GHz	1.000 MHz 1.000 MHz 200.0 kHz	3.6100 GHz 3.6190 GHz	3.5800 GHz 3.6100 GHz	1 2 3	1
5.000000 MH Auto Mai Freq Offse	∆ Limit -7.687 dB -10.19 dB -14.80 dB	-32.69 dBm -23.19 dBm -27.80 dBm 7.618 dBm	3.609800000 GHz 3.612775000 GHz 3.620000000 GHz	1.000 MHz 1.000 MHz 200.0 kHz 200.0 kHz	3.6100 GHz 3.6190 GHz 3.6200 GHz	3.5800 GHz 3.6100 GHz 3.6190 GHz	1 2 3 4	2
5.000000 MH Auto Mai Freq Offse	Δ Limit -7.687 dB -10.19 dB -14.80 dB -17.38 dB	-32.69 dBm -23.19 dBm -27.80 dBm 7.618 dBm -27.90 dBm	3.609800000 GHz 3.612775000 GHz 3.620000000 GHz 3.625600000 GHz	1.000 MHz 1.000 MHz 200.0 kHz 200.0 kHz 200.0 kHz	3.6100 GHz 3.6190 GHz 3.6200 GHz 3.6300 GHz	3.5800 GHz 3.6100 GHz 3.6190 GHz 3.6200 GHz	1 2 3 4 5	1 2 3 4

Plot 7-41. Mid Channel Edge Plot (Band 48 - 10.0MHz QPSK - Full RB Configuration)



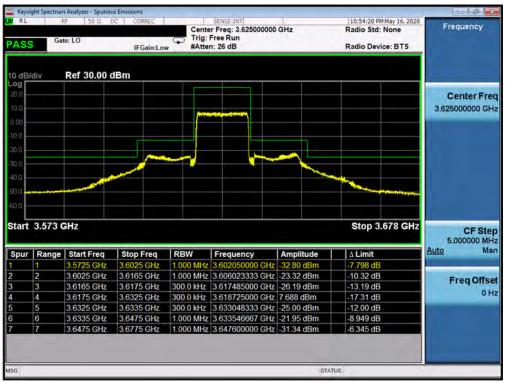
Plot 7-42. Upper Channel Edge Plot (Band 48 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Frequency	12:50:18 AM Jun 17, 2020 Radio Std: None Radio Device: BTS	ALIGN AUTO	SENSE:INT r Freq: 3.557500000 Free Run h: 26 dB	Trig:	IFGain:Lov	ιε 50 Ω τ te:LO		PASS
					IBm	Ref 30.00 c	/div	
Center Fre 3.557500000 GH								
				-				20.0
		- Marine						40.0
CF Ste	Stop 3.605 GHz					Hz	3.51 GI	50:0 - 60.0 -
CF Ste 5.00000 MH <u>Auto</u> Ma	Stop 3.605 GHz	nplitude	Frequency	RBW	Stop Freq			50:0 60.0 Start
5.000000 MH		nplitude	Frequency 3.529766667 GHz		Stop Freq 3.5300 GHz		Range	50:0 - 60.0 -
5.000000 MH <u>Auto</u> Ma	∆ Limit	.52 dBm		1.000 MHz		Start Freq	Range	50:0 60.0 Start
5.000000 MH Auto Ma Freq Offse	Δ Limit -6.521 dB	.52 dBm .74 dBm	3.529766667 GHz	1.000 MHz 1.000 MHz	3.5300 GHz	Start Freq 3.5100 GHz	Range 1 2	50:0 60:0 Start Spur 1
5.000000 MH <u>Auto</u> Ma	Δ Limit -6.521 dB -4.741 dB	.52 dBm .74 dBm .60 dBm	3.529766667 GHz 3.538366667 GHz	1.000 MHz 1.000 MHz 1.000 MHz	3.5300 GHz 3.5400 GHz	Start Freq 3.5100 GHz 3.5300 GHz	Range 1 2 3	50:0 60:0 Start Spur 1 2
5.000000 MH Auto Ma Freq Offse	Δ Limit -6.521 dB -4.741 dB -8.602 dB	.52 dBm .74 dBm .60 dBm .98 dBm	3.529766667 GHz 3.538366667 GHz 3.547710000 GHz	1.000 MHz 1.000 MHz 1.000 MHz 300.0 kHz	3.5300 GHz 3.5400 GHz 3.5490 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz	Range 1 2 3 4	50:0 60:0 Start Spur 1 2 3
5.000000 MH Auto Ma Freq Offse	Δ Limit -6.521 dB -4.741 dB -8.602 dB -12.98 dB	.52 dBm .74 dBm .60 dBm .98 dBm .64 dBm	3.529766667 GHz 3.538366667 GHz 3.547710000 GHz 3.549055000 GHz	1.000 MHz 1.000 MHz 1.000 MHz 300.0 kHz 300.0 kHz	3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz	Range 1 2 3 4 5	50:0 60:0 Start Spur 1 2 3 4
5.000000 MH Auto Ma Freq Offse	Δ Limit -6.521 dB -4.741 dB -8.602 dB -12.98 dB -20.24 dB	.52 dBm .74 dBm .60 dBm .98 dBm .64 dBm .38 dBm	3.529766667 GHz 3.538366667 GHz 3.547710000 GHz 3.549055000 GHz 3.551050000 GHz	1.000 MHz 1.000 MHz 1.000 MHz 300.0 kHz 300.0 kHz 300.0 kHz	3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5650 GHz	Start Freq 3.5100 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Range 1 2 3 4 5 6	50:0 60:0 Start Spur 1 2 3 4 5

Plot 7-43. Lower Channel Edge Plot (Band 48 - 15.0MHz QPSK - Full RB Configuration)



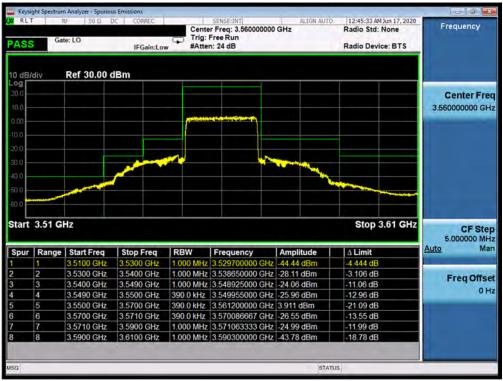
Plot 7-44. Mid Channel Edge Plot (Band 48 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Prod Jobe part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Frequency	12:49:23 AM Jun 17, 2020 Radio Std: None Radio Device: BTS	GHz	SENSE:INT r Freq: 3.692500000 Free Run h: 26 dB	Trig:	IFGain:Lov	F 50Ω 0 e:LO		PAS
					dBm	Ref 30.00 c	/div	10 dB
Center Fre 3.692500000 GF			ingenige of the State of The St					20.0 -
								-10.0
		-	1					-30.0
		-		_	and the second s			-40.0
								-50:0 -
CF Ste	Stop 3.74 GHz					GHz	3.645 0	-60.0
CF Ste 5.000000 MH <u>Auto</u> Ma		Amplitude	Frequency	RBW	Stop Freq			-60.0
5.000000 MH		Amplitude	Frequency 3.668958333 GHz		Stop Freq 3.6700 GHz			Start
5.000000 MH <u>Auto</u> Ma	∆ Limit	-37.74 dBm		1.000 MHz		Start Freq	Range	Start
5.000000 MH Auto Ma Freq Offse	Δ Limit -12.74 dB	-37.74 dBm -23.52 dBm	3.668958333 GHz	1.000 MHz 1.000 MHz	3.6700 GHz	Start Freq 3.6450 GHz	Range 1 2	Start
5.000000 MH <u>Auto</u> Ma	Δ Limit -12.74 dB -10.52 dB	-37.74 dBm -23.52 dBm -28.33 dBm	3.668958333 GHz 3.683276667 GHz	1.000 MHz 1.000 MHz	3.6700 GHz 3.6840 GHz	Start Freq 3.6450 GHz 3.6700 GHz	Range 1 2 3	Start
5.000000 MH Auto Ma Freq Offse	Δ Limit -12.74 dB -10.52 dB -15.33 dB	-37.74 dBm -23.52 dBm -28.33 dBm 4.696 dBm	3.668958333 GHz 3.683276667 GHz 3.684113333 GHz	1.000 MHz 1.000 MHz 300.0 kHz 300.0 kHz	3.6700 GHz 3.6840 GHz 3.6850 GHz	Start Freq 3.6450 GHz 3.6700 GHz 3.6840 GHz	Range 1 2 3	Start
5.000000 MH Auto Ma Freq Offse	Δ Limit -12.74 dB -10.52 dB -15.33 dB -20.30 dB	-37.74 dBm -23.52 dBm -28.33 dBm 4.696 dBm -28.82 dBm	3.668958333 GHz 3.683276667 GHz 3.684113333 GHz 3.695400000 GHz	1.000 MHz 1.000 MHz 300.0 kHz 300.0 kHz 300.0 kHz 300.0 kHz	3.6700 GHz 3.6840 GHz 3.6850 GHz 3.7000 GHz	Start Freq 3.6450 GHz 3.6700 GHz 3.6840 GHz 3.6850 GHz	Range 1 2 3 4 5	50.0 Start Spur 1 2 3 4
5.000000 MH Auto Ma Freq Offse	△ Limit -12.74 dB -10.52 dB -15.33 dB -20.30 dB -15.82 dB	-37.74 dBm -23.52 dBm -28.33 dBm 4.696 dBm -28.82 dBm -24.22 dBm	3.668958333 GHz 3.683276667 GHz 3.684113333 GHz 3.695400000 GHz 3.700603333 GHz	1.000 MHz 1.000 MHz 300.0 kHz 300.0 kHz 300.0 kHz 1.000 MHz	3.6700 GHz 3.6840 GHz 3.6850 GHz 3.7000 GHz 3.7010 GHz	Start Freq 3.6450 GHz 3.6700 GHz 3.6840 GHz 3.6850 GHz 3.7000 GHz	Range 1 2 3 4 5 6	-60.0 Start Spur 1 2 3 4 5

Plot 7-45. Upper Channel Edge Plot (Band 48 - 15.0MHz QPSK - Full RB Configuration)



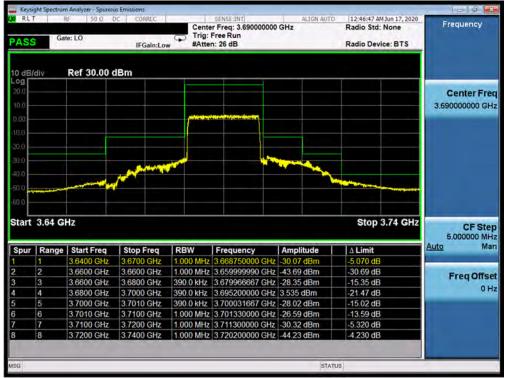
Plot 7-46. Lower Channel Edge Plot (Band 48 - 20.0MHz QPSK - Full RB Configuration)

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Frequency	11:06:17 PM May 16, 2020 Radio Std: None Radio Device: BTS	GHz	SENSE:JNT r Freq: 3.6250000 Free Run h: 26 dB	Trig:	IFGain:Lov	rF 50Ω 0 re:LO	G	AS
					IBm	Ref 30.00 c	div	0 dB
Center Free 3.625000000 GH				Applean				20.0 10.0
								0.00 10.0
				-				20.0
								40.0
	and the second s					- Aller and a second	-	
								50,0 60,0
CF Step	Stop 3.675 GHz					GHz	3.575 0	50,0 50,0 -
CF Step 5.000000 MH Auto Mar	Stop 3,675 GHz	Amplitude	Frequency	RBW	Stop Freq	GHz Start Freq		50,0 50,0 -
5.000000 MH	Stop 3.675 GHz		Frequency 3.594866667 GH		Stop Freq 3.5950 GHz			50.0 60.0 Start
5.000000 MH Auto Mar	Stop 3.675 GHz	-34.98 dBm		1.000 MHz		Start Freq	Range	50.0 60.0 Start
5.000000 MH Auto Mar Freq Offse	Stop 3.675 GHz △ Limit -9.983 dB	-34.98 dBm -25.50 dBm	3.594866667 GH	1.000 MHz 1.000 MHz	3.5950 GHz	Start Freq 3.5750 GHz	Range	Start
5.000000 MH Auto Mar	Stop 3.675 GHz △ Limit -9.983 dB -12.50 dB	-34.98 dBm -25.50 dBm -26.49 dBm	3.594866667 GH 3.598610000 GH	1.000 MHz 1.000 MHz 390.0 kHz	3.5950 GHz 3.6140 GHz	Start Freq 3.5750 GHz 3.5950 GHz	Range	Start
5.000000 MH Auto Mar Freq Offse	Stop 3.675 GHz △ Limit -9.983 dB -12.50 dB -13.49 dB	-34.98 dBm -25.50 dBm -26.49 dBm 8.296 dBm	3.594866667 GH 3.598610000 GH 3.614996667 GH	1.000 MHz 1.000 MHz 390.0 kHz 390.0 kHz	3.5950 GHz 3.6140 GHz 3.6150 GHz	Start Freq 3.5750 GHz 3.5950 GHz 3.6140 GHz	Range 1 2 3	Start
5.000000 MH Auto Mar Freq Offse	Stop 3.675 GHz △ Limit -9.983 dB -12.50 dB -13.49 dB -16.70 dB	-34.98 dBm -25.50 dBm -26.49 dBm 8.296 dBm -26.83 dBm	3.594866667 GH 3.598610000 GH 3.614996667 GH 3.628566667 GH	1.000 MHz 1.000 MHz 390.0 kHz 390.0 kHz 390.0 kHz	3.5950 GHz 3.6140 GHz 3.6150 GHz 3.6350 GHz	Start Freq 3.5750 GHz 3.5950 GHz 3.6140 GHz 3.6150 GHz	Range 1 2 3 4	50.0 50.0 Start Spur

Plot 7-47. Mid Channel Edge Plot (Band 48 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-48. Upper Channel Edge Plot (Band 48 - 20.0MHz QPSK - Full RB Configuration)

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7.6 Additional Maximum Power Reduction (A-MPR) §2.1046

Test Overview

A-MPR is implemented in this device per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 5.2.2

Test Settings

- 1. Span = $2 \times OBW$ to $3 \times OBW$
- 2. RBW = 1% to 5% of the OBW
- 3. Number of measurement points in sweep $\geq 2 \times \text{span} / \text{RBW}$
- 4. Sweep = auto-couple (less than transmission burst duration)
- 5. Detector = RMS (power)
- 6. Trigger was set to enable power measurements only on full power bursts
- 7. Trace was allowed to stabilize
- 8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

Test Notes

- 1. A-MPR was only applied for test purposes to the 2CC case since the 1CC case was compliant for all testing at max power.
- 2. A-MPR was verified to comply with the "CA_NS_10" specification in the 3GPP TS 36.101 standard by setting the MCC to a U.S. code and the MNC to a U.S. carrier supporting LTE B48 operation.

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Test Case	NS	MCC	MNC	Channel BW [MHz]	PCC Channel Number	PCC Channel Frequency [MHz]	SCC Channel Frequency [MHz]	Modulation	PCC RB Size	PCC RB Offset	SCC RB Size	SCC RB Offset	A-MPR [dB]	MPR [dB]	A-MPR [dB]	A-MPR Measured Power [dBm]
								QPSK	100	0	100	0		0		13.34
1				20 + 20	55340	3560	3579.8	16-QAM	100	0	100	0	≤ 11	1	≤ 11	13.40
								64-QAM	100	0	100	0		2		13.46
								QPSK	1	99	1	0		0		20.56
2				20 + 20	55340	3560	3579.8	16-QAM	1	99	1	0	≤ 11	1	≤ 11	21.09
								64-QAM	1	99	1	0		2		20.73
								QPSK	100	0	100	0		0		19.63
4				20 + 20	55791	3605.1	3624.9	16-QAM	100	0	100	0	≤ 4.5	1	≤ 4.5	19.79
	NS 01	310	910					64-QAM	100	0	100	0		2		19.72
	NS_01	310	910					QPSK	1	99	1	0		0		22.52
5				20 + 20	55791	3605.1	3624.9	16-QAM	1	99	1	0	≤ 4.5	1	≤ 4.5	22.84
								64-QAM	1	99	1	0		2		22.37
								QPSK	100	0	100	0		0		13.53
7				20 + 20	56442	3690	3670.2	16-QAM	100	0	100	0	≤ 11	1	≤ 11	13.48
								64-QAM	100	0	100	0		2		13.37
								QPSK	1	0	1	99		0		13.42
8				20 + 20	56442	3690	3670.2	16-QAM	1	0	1	99	≤ 11	1	≤ 11	13.34
								64-QAM	1	0	1	99		2		13.39

Table 7-7. A-MPR Conducted Power Measurements

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7.7 Uplink Carrier Aggregation §96.41(e)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers 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 its maximum duty cycle, 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 conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0-B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B MHz below the lower CBSD assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz.

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-6. Test Instrument & Measurement Setup

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Test Notes

- Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-4 and 7-5 below, with both carriers set to transmit using 1RB.
- 2. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed.

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Uplink CA Configuration 48C

	PCC SCC											
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
56640	3690.0	20	QPSK	100	0	56442	3670.2	20	QPSK	100	0	22.60
56640	3690.0	20	16-QAM	100	0	56442	3670.2	20	16-QAM	100	0	21.86
56640	3690.0	20	64-QAM	100	0	56442	3670.2	20	64-QAM	100	0	21.52

Table 7-8. Conducted Powers (B48 with 20MHz BW for all modulations)

	PCC SCC											
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
55340	3560.0	20	QPSK	1	99	55538	3669.8	20	QPSK	1	0	23.06
55891	3615.1	20	QPSK	1	99	56089	3634.9	20	QPSK	1	0	23.96
56640	3690.0	20	QPSK	1	0	56442	3670.2	20	QPSK	1	99	23.29

Table 7-9. Conducted Powers (B48 – PCC/SCC: RB Size 1)

- G 🛃					ectrum Analyzer - Swept SA	
Frequency	12:46:29 AM Jun 20, 2020 TRACE 1 2 3 4 5 0 TVPE M WWWWWWW DET A N N N N N	ALIGN AUTO	ig: Free Run	PNO: Fast	RF 50 Ω DC	K RL
Auto Tune	r1 3.415 2 GHz -43.66 dBm	MI	tten: 20 dB	IFGain:Low	Ref 10.00 dBm	0 dB/div
Center Fre 1.765000000 GH						.og
Start Fre 30.000000 MH						19.0 29.0
Stop Freq 3.50000000 GHz	pL1-40.00 g1					40.0
CF Ste 347.000000 MH <u>Auto</u> Ma				at it i lant is bibilit		0.0
Freq Offse 0 H						/0;0
Scale Typ	Stop 5.500 GHZ	Susan		#\/D\//		
Log <u>Lir</u>	.667 ms (7001 pts)	Sweep 4	MHz	#VBW 3		Start 30 M #Res BW

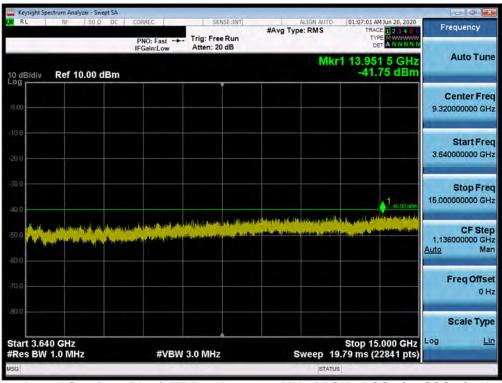
Plot 7-49. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Low Channel)

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Frequency Center Freq 3.56000000 GHz	01:11:15 AM Jun 20, 2020 Radio Std: None Radio Device: BTS	ALIGN AUTO GHz	SENSE:INT r Freq: 3.560000000 Free Run h: 26 dB	Trig:	C CORREC	r 50 ቧ D	Gat	PASS
					Bm	Ref 30.00 d	'div	10 dB/
								10.0 - 0.00 - -10.0 - -20.0 - -30.0 -
		J	AL BALL	trup M				-40.0 -50.0 -
CF Stej 5.000000 MH	Stop 3.64 GHz	J				Z	3.5 GH2	-50:0 -60.0 —
	Stop 3.64 GHz	Amplitude	Frequency	Louip ^{A1}	Stop Freq		3.5 GH	-50:0 -60.0 —
5.000000 MH		Amplitude		RBW			Range	-50:0 -60.0 Start
5.000000 MH <u>Auto</u> Ma	∆ Limit	Amplitude	Frequency	RBW	Stop Freq	Start Freq	Range	-50:0 -60.0 Start Spur 1
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -14.49 dB	Amplitude -54.49 dBm -54.18 dBm	Frequency 3.502000000 GHz	RBW 1.000 MHz 1.000 MHz	Stop Freq 3.5300 GHz 3.5400 GHz 3.5490 GHz	Start Freq 3.5000 GHz 3.5300 GHz 3.5400 GHz	Range 1 2 3	-50:0 -60.0 Start Spur 1 2
5.000000 MH <u>Auto</u> Ma	Δ Limit -14.49 dB -29.18 dB	Amplitude	Frequency 3.50200000 GHz 3.532600000 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz	Stop Freq 3.5300 GHz 3.5400 GHz	Start Freq 3.5000 GHz 3.5300 GHz	Range 1 2 3 4	-50:0 -60.0 Start
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -14.49 dB -29.18 dB -39.67 dB -39.82 dB -4.957 dB	Amplitude -54.49 dBm -54.18 dBm -52.67 dBm -52.82 dBm 20.04 dBm	Frequency 3.50200000 GHz 3.548065000 GHz 3.548065000 GHz 3.549926667 GHz 3.570800000 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 820.0 KHz 820.0 KHz	Stop Freq 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5500 GHz	Start Freq 3.5000 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Range 1 2 3 4 5	-50:0 -50.0 Start Spur 1 2 3
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -14.49 dB -29.18 dB -39.67 dB -39.82 dB -4.957 dB -40.86 dB	Amplitude -54.49 dBm -54.18 dBm -52.67 dBm -52.82 dBm -53.86 dBm -53.86 dBm	Frequency 3.502000000 GHz 3.532600000 GHz 3.548085000 GHz 3.570800000 GHz 3.570800000 GHz 3.590220000 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 820.0 KHz 820.0 KHz 820.0 KHz	Stop Freq 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5900 GHz 3.5910 GHz	Start Freq 3.5000 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5900 GHz	Range 1 2 3 4 5 6	-50:0 -50:0 Start Spur 1 2 3 4
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -14.49 dB -29.18 dB -39.67 dB -39.82 dB -4.957 dB	Amplitude -54.49 dBm -54.18 dBm -52.67 dBm -52.82 dBm 20.04 dBm -53.86 dBm -49.72 dBm	Frequency 3.50200000 GHz 3.548065000 GHz 3.548065000 GHz 3.549926667 GHz 3.570800000 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz 820.0 kHz 1.000 MHz	Stop Freq 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz 3.5500 GHz	Start Freq 3.5000 GHz 3.5300 GHz 3.5400 GHz 3.5490 GHz 3.5500 GHz	Range 1 2 3 4 5 6 7	-50:0 -60:0 Start Start 1 2 3 4 5

Plot 7-50. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Low Channel)



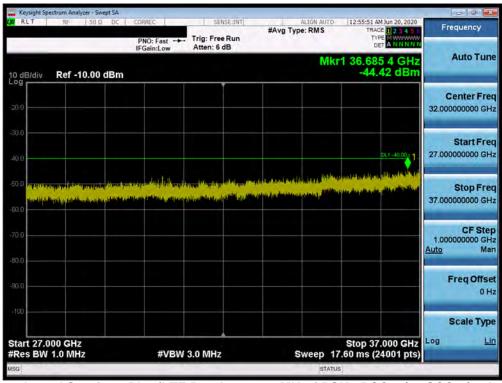
Plot 7-51. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Low Channel)

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C CORREC	SENSE:INT	ALIGN AUTO	12:55:05 AM Jun 20, 2020	
PNO: Fast	Trig: Free Run Atten: 10 dB	#Avg Type: RMS	TRACE 23450 TYPE MWWWWW DET ANNNNN	Frequency Auto Tune
		Mkr	1 26.457 0 GHz -45.13 dBm	
				Center Fre 21.000000000 GH
				Start Fre 15.00000000 GH
	stranger better better blever be	a la la sana ang ing kana bahari na pangan	OLT-40.01 1 3m	Stop Fre 27.000000000 GH
				CF Ste 1.20000000 GF Auto Ma
				Freq Offs 0 F
#VBW:	3.0 MHz	Sweep 20	0100 21.000 0112	Scale Typ Log <u>L</u>
		IFGain:Low Atten: 10 dB	Atten: 10 dB	IFGain:Low Atten: 10 dB Image: State of the state o

Plot 7-52. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Low Channel)



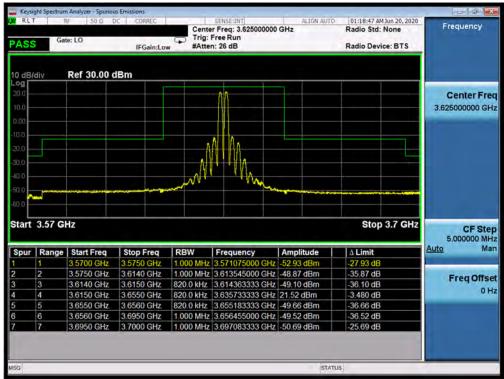
Plot 7-53. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Low Channel)

FCC ID: A3LSMH204V	PCTEST Preddjorbe pert of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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- 3 🛃					nalyzer - Swept SA		
Frequency	01:26:19 AM Jun 20, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET A N N N N N	#Avg Type: RMS	SENSE:INT	CORREC	50 Ω DC		XU F
Auto Tun	43.54 dBm	M	Atten: 20 dB	IFGain:Low	10.00 dBm		
Center Free 1.800000000 GH							.og
Start Fre 30.000000 MH							
Stop Fre 3.570000000 GH	DL1-10.00 1						
CF Ste 354.000000 MH Auto Ma	and the second		, and taken and the second		وفاحدا والمرجو الماحي	a siles of a si	
Freq Offs 0 F							
Scale Typ	Stop 3.570 GHz					rt 30 MHz	80:0
	.767 ms (7151 pts)	Sweep 4	3.0 MHz	#VBW 3	IHz	s BW 1.0	
-		STATUS	1.1.1				SG

Plot 7-54. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)



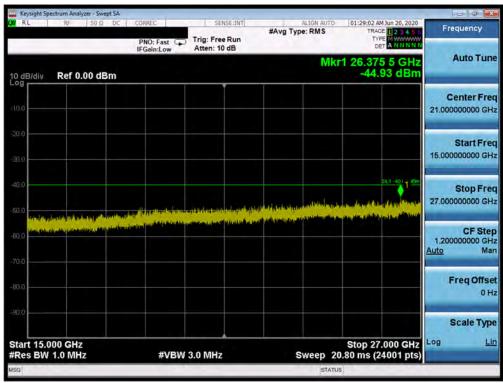
Plot 7-55. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)

FCC ID: A3LSMH204V	PCTEST Preid Jobe part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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RL	RE 5	Swept SA	CORREC	SENSE:INT	ALIGN AUTO	01:28:45 AM Jun 20, 2020	
			PNO: Fast		#Avg Type: RMS	TRACE 2 2 4 5 6 TYPE MWWWWW DET A N N N N N	Frequency
0 dB/div	Ref 10.0	0 dBm			Mk	r1 10.575 5 GHz -41.85 dBm	Auto Tun
0.00							Center Fre 9.350000000 GH
10.0 20.0							Start Fre 3.700000000 GH
10.0					1	DL1 -40.00 nBm	Stop Fre 15.00000000 GF
	n an Asland	an de fisio		leggener terg lege statistic	in land anno seografia in i ag bioline ta brains anlain	called addates a second second	CF Ste 1.130000000 GH Auto Ma
50.0							
70.0							Freq Offso 0 H
10.0	00 GHz 1.0 MHz			3.0 MHz		Stop 15.000 GHz 9.68 ms (22711 pts)	0 H Scale Typ Log <u>L</u>

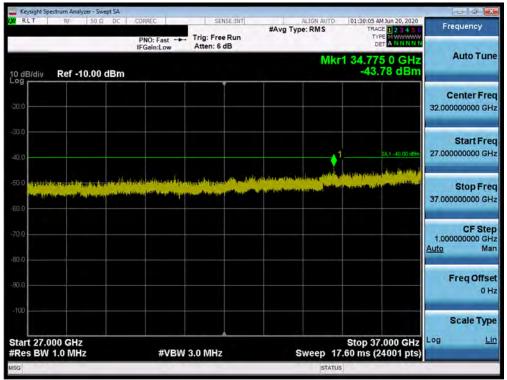
Plot 7-56. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)



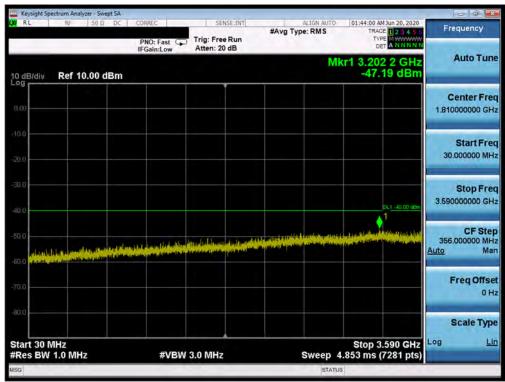
Plot 7-57. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)

FCC ID: A3LSMH204V	PCTEST Preddjorbe pert of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Plot 7-58. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)



Plot 7-59. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/0 SCC 1/99 - High Channel)

FCC ID: A3LSMH204V	PCTEST Preddjorbe pert of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 54 of 70
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Frequency	01:41:46 AM Jun 20, 2020 Radio Std: None Radio Device: BTS	GHz	SENSE:INT r Freq: 3.690000000 Free Run h: 26 dB	Trig: I	IFGain:Lov	F ∫50Ω D e:LO	C.	PAS
					IBm	Ref 30.00 d	/div	10 dB
Center Fre 3.690000000 GH								20.0 - 10.0 - 10.0 - -10.0 - -20.0 - -30.0 - -40.0 -
			11 10					
CF Stej 5.000000 MH <u>Auto</u> Ma	Stop 3.77 GHz	Amplitude	Frequency		Stop Fred		3.59 G	
5.000000 MH	∆ Limit	Amplitude	Frequency	RBW	Stop Freq	Start Freq	Range	-60.0
5.000000 MH Auto Ma Freq Offse		-50.61 dBm -51.77 dBm	Frequency 3.596300000 GHz 3.659660000 GHz 3.659660000 GHz	1.000 MHz 1.000 MHz	Stop Freq 3.6200 GHz 3.6590 GHz 3.6600 GHz		Range 1 2	Start
5.000000 MH <u>Auto</u> Ma	Δ Limit -25.61 dB -38.77 dB	-50.61 dBm -51.77 dBm -52.95 dBm	3.596300000 GHz 3.620780000 GHz	1.000 MHz 1.000 MHz 820.0 kHz	3.6200 GHz 3.6590 GHz	Start Freq 3.5900 GHz 3.6200 GHz	Range 1 2 3	Start
5.000000 MH Auto Ma Freq Offse	Δ Limit -25.61 dB -38.77 dB -39.95 dB	-50.61 dBm -51.77 dBm -52.95 dBm 10.96 dBm	3.596300000 GHz 3.620780000 GHz 3.659660000 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz	3.6200 GHz 3.6590 GHz 3.6600 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz	Range 1 2 3 4	-50.0 Start Spur 1 2 3
5.000000 MH Auto Ma Freq Offse	Δ Limit -25.61 dB -38.77 dB -39.95 dB -14.04 dB	-50.61 dBm -51.77 dBm -52.95 dBm 10.96 dBm -51.69 dBm	3.59630000 GHz 3.620780000 GHz 3.659660000 GHz 3.679133333 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz 820.0 kHz	3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz 3.6600 GHz	Range 1 2 3 4 5	50.0 Start Spur 1 2 3 4
5.000000 MH Auto Ma Freq Offse	△ Limit -25.61 dB -38.77 dB -39.95 dB -14.04 dB -38.69 dB	-50.61 dBm -51.77 dBm -52.95 dBm 10.96 dBm -51.69 dBm -50.75 dBm	3.596300000 GHz 3.620780000 GHz 3.659660000 GHz 3.679133333 GHz 3.700863333 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz 820.0 kHz 1.000 MHz	3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz 3.7010 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz	Range 1 2 3 4 5 6	50.0 Start Spur 2 3 4 5

Plot 7-60. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/0 SCC 1/99 - High Channel)



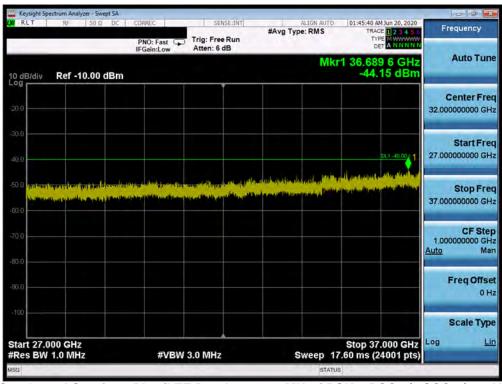
Plot 7-61. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK - PCC 1/0 SCC 1/99 - High Channel)

FCC ID: A3LSMH204V	PCTEST Preddjorbe pert of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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RL RF 50 1	Ω DC CORREC	SENSE:INT	ALIGN AUTO	01:44:38 AM Jun 20, 2020	Frequency
	PNO: Fast IFGain:Low		#Avg Type: RMS	TRACE 2 2 4 5 6 TYPE MWWWWWW DET ANNNNN	
aB/div Ref 0.00 d	IBm		Mkr	1 26.080 5 GHz -45.33 dBm	Auto Tun
0.0					Center Fre 21.000000000 GF
0.0					Start Fre 15.00000000 GF
0.0		listen taalaata ay siya taa ah taa kara karaata	many distant	DL1 1 00 00M	Stop Fre 27.00000000 GF
					CF Ste 1.200000000 GI Auto Mi
0.0					Freq Offs 01
tart 15.000 GHz				Stop 27.000 GHz	Scale Typ
Res BW 1.0 MHz	243.0	BW 3.0 MHz	Bitter	.80 ms (24001 pts)	

Plot 7-62. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK – PCC 1/0 SCC 1/99 - High Channel)



Plot 7-63. Conducted Spurious Plot (LTE Band 48 - 20.0MHz QPSK – PCC 1/0 SCC 1/99 - High Channel)

FCC ID: A3LSMH204V	PCTEST Preddjorbe pert of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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PAS		RF 50Ω 4	AC CORREC	Trig:	SENSE:JNT SOURCE OF Freq: 3.570000000 Free Run n: 36 dB		01:49:03 AM Jun 19, 2020 Radio Std: None Radio Device: BTS	Frequency
10 dB	div	Ref 30.00 c	lBm					
20.0								Center Free 3.570000000 GH
10.0								1
20.6 30.6								<u> </u>
40,0 59.0		*****						÷ .
60,0								
Start	3.5 GH	z					Stop 3.64 GHz	CF Ste 5.000000 MH
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit	Auto Ma
	1	3.5000 GHz	3.5300 GHz	1.000 MHz	3.529400000 GHz	-40.92 dBm	-0.923 dB	
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539766667 GHz	-38.76 dBm	-13.76 dB	Freq Offse
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.547650000 GHz	-38.05 dBm	-25.05 dB	
	4	3.5490 GHz	3.5500 GHz	820.0 kHz	3.549903333 GHz	-38.71 dBm	-25.71 dB	0 H
5	5	3.5500 GHz	3.5900 GHz	820.0 kHz	3.556066667 GHz	-2.954 dBm	-27.95 dB	
5	6	3.5900 GHz	3.5910 GHz	820.0 kHz	3.590845000 GHz	-39.14 dBm	-26.14 dB	
7	7	3.5910 GHz	3.6300 GHz	1.000 MHz	3.591130000 GHz	-38.63 dBm	-25.63 dB	
8	8	3.6300 GHz	3.6400 GHz	1.000 MHz	3.637283333 GHz	-43.39 dBm	-18.39 dB	
8 3.	3	5300 GHz	3.6400 GHz	11.000 MHz	3.037283333 GHz	-43.39 dBm	-18.39 dB	1

Plot 7-64. Lower Band Edge Plot (Band 48 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-65. Mid Band Edge Plot (Band 48 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: A3LSMH204V	PCTEST Preid Joine part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Frequency	02:01:55 AM Jun 19, 2020 Radio Std: None Radio Device: BTS		SENSE:JNT SOURCE OF r Freq: 3.690000000 Free Run h: 26 dB	Trig: I	IFGain:Lov	F 50 Ω 4		ASS
					IBm	Ref 30.00 c	/div	0 dBl
Center Fre 3.69000000 GH								.og 20.0 10.0
								10.0
								387.Q
		and a second sec			and the second s			
							unduntiquist inguigent	-
CF Ste 5.000000 MH	Stop 3.77 GHz					tz	3.59 GI	50,0 50,0 Start
		Amplitude	Frequency	RBW	Stop Freg	Hz Start Freq		30,0
5.000000 MH			Frequency 3.618750000 GHz		Stop Freq			start
5.000000 MH <u>Auto</u> Ma	∆ Limit	-50.84 dBm		1.000 MHz		Start Freq	Range	so.o Start Spur
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -25.84 dB	-50.84 dBm -38.65 dBm	3.618750000 GHz	1.000 MHz 1.000 MHz	3.6200 GHz	Start Freq 3.5900 GHz	Range	start
5.000000 MH <u>Auto</u> Ma	Δ Limit -25.84 dB -25.65 dB	-50.84 dBm -38.65 dBm -39.12 dBm	3.618750000 GHz 3.658870000 GHz	1.000 MHz 1.000 MHz 820.0 kHz	3.6200 GHz 3.6590 GHz	Start Freq 3.5900 GHz 3.6200 GHz	Range	Start
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -25.84 dB -25.65 dB -26.12 dB	-50.84 dBm -38.65 dBm -39.12 dBm -2,818 dBm	3.618750000 GHz 3.658870000 GHz 3.659960000 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz	3.6200 GHz 3.6590 GHz 3.6600 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz	Range 1 2 3	Start
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -25.84 dB -25.65 dB -26.12 dB -27.82 dB -26.65 dB -27.05 dB	-50.84 dBm -38.65 dBm -39.12 dBm -2.818 dBm -39.65 dBm -40.05 dBm	3.618750000 GHz 3.658870000 GHz 3.659960000 GHz 3.685933333 GHz 3.700025000 GHz 3.701705000 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz 820.0 kHz 1.000 MHz	3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz 3.6600 GHz	Range 1 2 3 4 5 6	Start
5.000000 MH <u>Auto</u> Ma Freq Offse	Δ Limit -25.84 dB -26.65 dB -26.12 dB -27.82 dB -26.65 dB	-50.84 dBm -38.65 dBm -39.12 dBm -2.818 dBm -39.65 dBm -40.05 dBm -40.80 dBm	3.618750000 GHz 3.658870000 GHz 3.659960000 GHz 3.685933333 GHz 3.700025000 GHz	1.000 MHz 1.000 MHz 820.0 kHz 820.0 kHz 820.0 kHz 1.000 MHz 1.000 MHz	3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz 3.7010 GHz	Start Freq 3.5900 GHz 3.6200 GHz 3.6590 GHz 3.6600 GHz 3.7000 GHz	Range 1 2 3 4 5	Spur

Plot 7-66. Upper Band Edge Plot (Band 48 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

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7.8 Radiated Power (EIRP) §96.41(b)

Test Overview

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 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 v03r01 - 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 \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 set equal to 10MHz.
- 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.

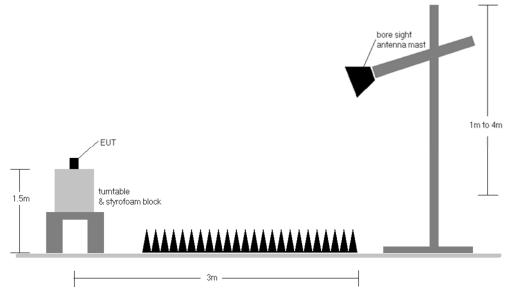


Figure 7-7. Radiated Test Setup >1GHz

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 while powered by an DC power source.
- 3) The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz).

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Frequency [MHz]	Channel Bandwidth [MHz]	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/10MHz]	EIRP [mW/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
3552.50	5	3552.50	5	QPSK	V	170	254	1 / 24	12.61	7.26	19.87	96.952	23.00	-3.13
3625.00	5	3625.00	5	QPSK	V	167	255	12 / 6	14.54	6.99	21.53	142.255	23.00	-1.47
3697.50	5	3697.50	5	QPSK	V	180	266	1 / 24	14.57	6.44	21.01	126.198	23.00	-1.99
3625.00	5	3625.00	5	16-QAM	V	167	255	12 / 6	14.10	6.44	20.54	113.254	23.00	-2.46
3625.00	5	3625.00	5	64-QAM	V	167	255	12 / 6	13.40	6.44	19.84	96.395	23.00	-3.16
3555.00	10	3555.00	10	QPSK	v	177	253	25 / 12	13.81	7.25	21.06	127.651	23.00	-1.94
3625.00	10	3625.00	10	QPSK	V	173	265	25 / 12	14.70	6.99	21.69	147.594	23.00	-1.31
3695.00	10	3695.00	10	QPSK	V	174	259	25 / 12	14.61	6.46	21.07	127.961	23.00	-1.93
3625.00	10	3625.00	10	16-QAM	V	173	265	25 / 12	14.41	6.46	20.87	122.201	23.00	-2.13
3625.00	10	3625.00	10	64-QAM	V	173	265	25 / 12	13.05	6.46	19.51	89.346	23.00	-3.49
3557.50	15	3557.50	15	QPSK	V	180	256	36 / 18	13.72	7.24	20.96	124.880	23.00	-2.04
3625.00	15	3625.00	15	QPSK	V	177	258	36 / 18	14.57	6.99	21.56	143.241	23.00	-1.44
3692.50	15	3692.50	15	QPSK	V	174	263	36 / 18	14.46	6.48	20.94	124.194	23.00	-2.06
3625.00	15	3625.00	15	16-QAM	V	177	258	36 / 18	14.53	6.48	21.01	126.212	23.00	-1.99
3625.00	15	3625.00	15	64-QAM	V	177	258	36 / 18	13.19	6.48	19.67	92.704	23.00	-3.33
3560.00	20	3560.00	20	QPSK	V	176	256	1 / 99	13.28	7.16	20.44	110.558	23.00	-2.56
3625.00	20	3625.00	20	QPSK	V	174	262	1 / 99	14.09	6.87	20.96	124.880	23.00	-2.04
3690.00	20	3690.00	20	QPSK	V	180	265	1 / 99	14.15	6.30	20.45	110.791	23.00	-2.55
3625.00	20	3625.00	20	16-QAM	V	174	262	1 / 99	13.64	6.87	20.51	112.588	23.00	-2.49
3625.00	20	3625.00	20	64-QAM	V	174	262	1 / 99	12.80	6.87	19.67	92.788	23.00	-3.33
3625.00	10	3625.00	10	QPSK	Н	237	354	50 / 0	11.26	6.87	18.13	65.087	23.00	-4.87

Table 7-10. EIRP Data (Band 48)

FCC ID: A3LSMH204V	PCTEST Pred Johe part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	SCC Frequency [MHz]	SCC Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	SCC RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm/10MHz]	EIRP [mW/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
3560.00	20	3571.70	5	QPSK	V	124	20	1 / 0	15.27	7.16	20.28	106.559	23.00	-2.72
3625.00	20	3636.70	5	QPSK	V	118	23	1 / 0	16.24	6.87	20.96	124.880	23.00	-2.04
3690.00	20	3678.30	5	QPSK	V	117	25	1 / 24	16.71	6.30	20.86	121.760	23.00	-2.14
3625.00	20	3636.70	5	16-QAM	V	118	23	1 / 0	15.67	6.87	20.39	109.520	23.00	-2.61
3625.00	20	3636.70	5	64-QAM	V	118	23	1 / 0	14.75	6.87	19.47	88.612	23.00	-3.53
3560.00	20	3574.40	10	QPSK	V	121	22	1 / 0	16.33	7.16	21.34	136.016	23.00	-1.66
3625.00	20	3639.40	10	QPSK	V	121	24	1 / 0	17.08	6.87	21.80	151.528	23.00	-1.20
3690.00	20	3675.60	10	QPSK	V	117	20	1 / 49	17.65	6.30	21.80	151.183	23.00	-1.20
3625.00	20	3639.40	10	16-QAM	V	121	24	1 / 0	16.90	6.87	21.62	145.376	23.00	-1.38
3560.00	20	3574.40	10	64-QAM	V	121	22	1 / 0	14.56	7.16	19.57	90.488	23.00	-3.43
3560.00	20	3577.10	15	QPSK	V	118	22	1 / 0	16.47	7.16	21.48	140.472	23.00	-1.52
3625.00	20	3642.10	15	QPSK	V	123	29	1 / 0	17.01	6.87	21.73	149.106	23.00	-1.27
3690.00	20	3672.90	15	QPSK	V	107	24	1 / 74	16.60	6.30	20.75	118.714	23.00	-2.25
3625.00	20	3642.10	15	16-QAM	V	123	29	1 / 0	16.91	6.87	21.63	145.712	23.00	-1.37
3625.00	20	3642.10	15	64-QAM	V	123	29	1 / 0	15.62	6.87	20.34	108.266	23.00	-2.66
3560.00	20	3579.80	20	QPSK	V	106	18	1 / 0	16.11	7.16	21.12	129.297	23.00	-1.88
3625.00	20	3644.80	20	QPSK	V	121	31	1 / 0	17.17	6.87	21.89	154.701	23.00	-1.11
3690.00	20	3670.20	20	QPSK	V	102	22	1 / 99	16.88	6.30	21.03	126.620	23.00	-1.97
3625.00	20	3644.80	20	16-QAM	V	121	31	1 / 0	16.60	6.87	21.32	135.673	23.00	-1.68
3625.00	20	3644.80	20	64-QAM	V	121	31	1 / 0	16.11	6.87	20.83	121.198	23.00	-2.17
3690.00	20	3644.80	20	QPSK	Н	107	43	1/0	16.39	6.87	21.11	129.269	23.00	-1.89

Table 7-11. EIRP Data (Band 48 ULCA)

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7.9 Radiated Spurious Emissions Measurements §2.1053 §96.41(e)

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 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

ANSI C63.26-2015 – Section 5.5.4

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 = Max Hold (In cases where the level is within 2dB of the limit, the final measurement is taken

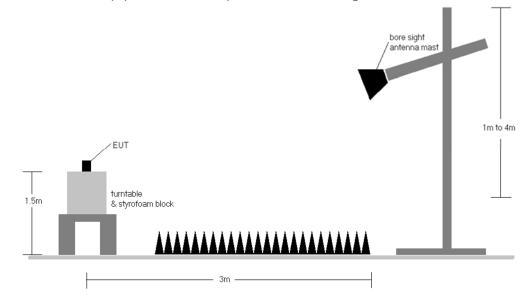
using triggering/gating and trace averaging.)

7. The trace was allowed to stabilize

FCC ID: A3LSMH204V	PCTEST Predd Jobe part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager		
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Test Setup



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

Figure 7-8. Test Instrument & Measurement Setup

Test Notes

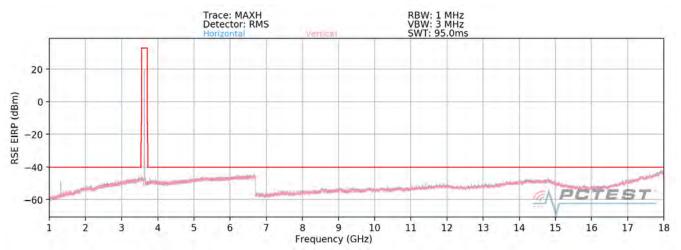
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested while powered by an DC power source.
- 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.
- Per KDB 971168, Field Strength Level (dBµV/m) is converted to EIRP Spurious Emission Level (dBm) using the formula in Section 5.8.4 (d):

EIRP (dBm) = E (dB μ V/m) + 20 log D - 104.8; where D is the measurement distance in meters

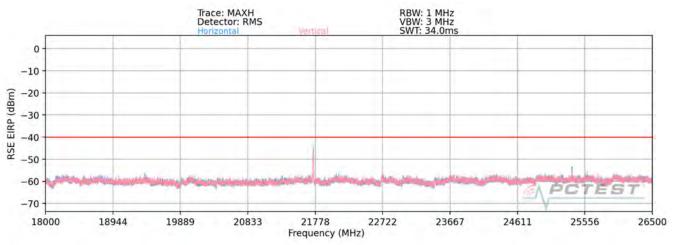
FCC ID: A3LSMH204V	PCTEST Proid late part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:					
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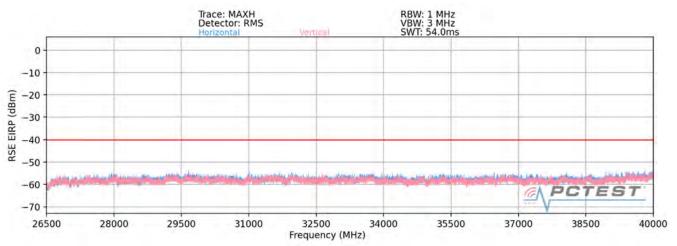
LTE Band 48











Plot 7-69. Radiated Spurious Plot 26.5 - 40GHz (Band 48)

FCC ID: A3LSMH204V	PCTEST Preed to be pert of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 62 of 76
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Bandwidth (MHz):	20
Frequency (MHz):	3560.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1245.8	Н	205	247	-68.98	3.97	41.99	-53.27	-40.00	-13.27
7120.0	Н	174	276	-74.70	7.54	39.84	-55.42	-40.00	-15.42
10680.0	Н	400	52	-79.79	13.12	40.33	-54.93	-40.00	-14.93
14240.0	Н	400	117	-80.50	17.70	44.20	-51.06	-40.00	-11.06
17800.0	Н	400	198	-80.51	21.87	48.36	-46.90	-40.00	-6.90

Table 7-12. Radiated Spurious Data (Band 48 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1311.4	Н	208	226	-72.43	4.14	38.71	-56.55	-40.00	-16.55
7250.0	Н	222	304	-72.86	8.62	42.76	-52.50	-40.00	-12.50
10875.0	Н	400	28	-79.31	12.03	39.72	-55.54	-40.00	-15.54
14500.0	Н	400	313	-79.22	18.01	45.79	-49.46	-40.00	-9.46
21748.3	Н	150	46	-56.66	-3.38	46.96	-57.84	-40.00	-17.84

Table 7-13. Radiated Spurious Data (Band 48 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3690.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1375.96	Н	216	251	-67.98	5.19	44.21	-51.05	-40.00	-11.05
7380.00	Н	400	305	-78.37	9.69	38.32	-56.94	-40.00	-16.94
11070.00	Н	154	6	-81.06	12.11	38.05	-57.21	-40.00	-17.21
14760.00	Н	398	69	-80.52	15.97	42.45	-52.81	-40.00	-12.81

Table 7-14. Radiated Spurious Data (Band 48 – High Channel)

FCC ID: A3LSMH204V	PCTEST Proid to be part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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7.10 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §96.41(e)

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. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.8

ANSI/TIA- 603-E-2016 - Section 2.2.12

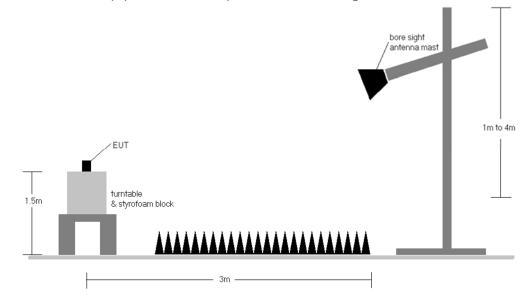
Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. No. of sweep points \geq 2 x span / RBW
- 4. Detector = RMS
- 5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 6. The trace was allowed to stabilize

FCC ID: A3LSMH204V	PCTEST Proid Jobe part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 64 of 76
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Test Setup



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

Figure 7-9. Test Instrument & Measurement Setup

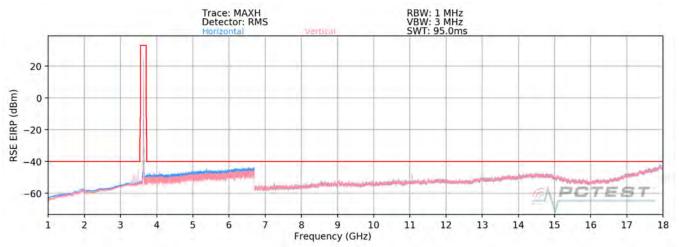
Test Notes

- 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 while powered by an DC power source.
- 3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) 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.

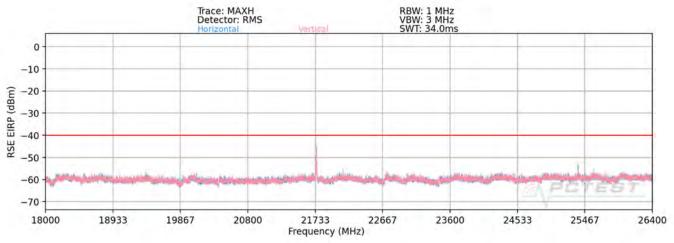
FCC ID: A3LSMH204V	PCTEST Provid Solar Particle	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage CE of 70
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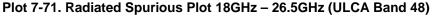


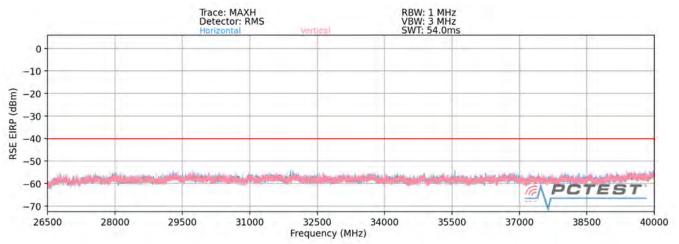
ULCA Band 48



Plot 7-70. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 48) Mid Channel – PCC/SCC: 1RB)







Plot 7-72. Radiated Spurious Plot 26.5 - 40GHz (Band 48)

FCC ID: A3LSMH204V	PCTEST Preed to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager	
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OPERATING FREQUENCY (PCC):	356	60.00	MHz
OPERATING FREQUENCY (SCC):	366	69.80	MHz
CHANNEL (PCC):	55340		
CHANNEL (SCC):	55538		
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-40	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]
7120.00	V	183	226	-61.68	8.63	-53.05	-13.0
10680.00	V	143	13	-66.91	9.41	-57.50	-17.5
14240.00	V	230	63	-56.17	8.82	-47.35	-7.4
17800.00	V	-	-	-56.92	7.64	-49.28	-9.3
21360.00	V	150	182	-70.24	16.40	-53.84	-13.8
24920.00	V	150	166	-71.86	17.63	-54.23	-14.2

Table 7-15. Radiated Spurious Data (ULCA 48) PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC):	361	5.10	MHz
OPERATING FREQUENCY (SCC):	3634.90		MHz
CHANNEL (PCC):	55891		
CHANNEL (SCC):	56	089	_
MODULATION SIGNAL:	QPSK		_
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-40	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]
7230.20	V	115	23	-59.87	8.47	-51.40	-11.4
10845.30	V	112	358	-65.56	9.28	-56.28	-16.3
14460.40	V	283	53	-52.60	8.77	-43.83	-3.8
18075.50	V	-	-	-78.29	14.63	-63.66	-23.7
21690.60	V	150	193	-60.71	16.42	-44.29	-4.3
25305.70	V	150	182	-72.02	17.75	-54.26	-14.3

Table 7-16. Radiated Spurious Data (ULCA 48) PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)

FCC ID: A3LSMH204V	PCTEST Prod Jobe part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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OPERATING FREQUENCY (PCC):	369	0.00	MHz
OPERATING FREQUENCY (SCC):	3670.20		MHz
CHANNEL (PCC):	56640		
CHANNEL (SCC):	56	442	
MODULATION SIGNAL:	QPSK	_	_
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-40	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]
7380.00	V	121	33	-64.55	8.41	-56.14	-16.1
11070.00	V	120	3	-66.07	9.31	-56.77	-16.8
14760.00	V	155	17	-59.74	8.72	-51.02	-11.0
18450.00	V	-	-	-78.19	14.94	-63.25	-23.2
22140.00	V	150	124	-70.33	16.59	-53.75	-13.7
25830.00	V	150	203	-75.92	17.90	-58.02	-18.0

Table 7-17. Radiated Spurious Data (ULCA 48) PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

FCC ID: A3LSMH204V	PCTEST Preid Joise part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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7.11 Frequency Stability / Temperature Variation §2.1055

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. 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.

For Part 96, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

- 9. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 10. 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.
- 11. 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

FCC ID: A3LSMH204V	PCTEST Preid Jobe part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
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LTE Band 48 Frequency Stability Measurements

OPERATING FREQUENCY:	3,625,000,000	Hz
CHANNEL:	55990	
REFERENCE VOLTAGE:	20.00	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	3,625,000,167	167	0.0000046
100 %		- 20	3,624,999,978	-22	-0.000006
100 %		- 10	3,624,999,990	-10	-0.000003
100 %		0	3,625,000,106	106	0.0000029
100 %		+ 10	3,624,999,739	-261	-0.0000072
100 %		+ 20	3,625,000,214	214	0.0000059
100 %		+ 30	3,624,999,849	-151	-0.0000042
100 %		+ 40	3,624,999,981	-19	-0.0000005
100 %		+ 50	3,624,999,807	-193	-0.0000053
85 %	17.00	+ 20	3,624,999,840	-160	-0.0000044

Table 7-18. Frequency Stability Data (LTE Band 48)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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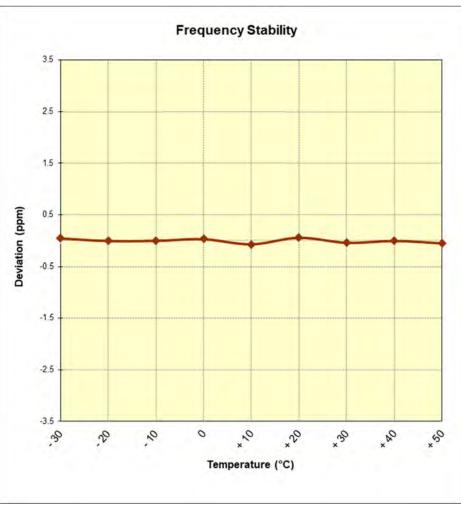


Figure 7-10. Frequency Stability Graph (LTE Band 48)

FCC ID: A3LSMH204V	PCTEST Prood to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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7.12 End User Device Additional Requirement (CBSD Protocol) §96.47

Test Overview and Limit

End user device additional requirements (CBSD Protocol) are tested per the test procedures listed below. During testing, the EUT is connected to a certified CBSD (Ruckus FCC ID: S9GQ910US00) as a companion device to show compliance with Part 96.47.

End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.

An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

Test Procedure Used

KDB 940660 D01 v02, WINNF-TS-0122 V1.0.0.

Test Setup/Method

The EUT was connected via an RF cable to a certified CBSD and spectrum analyzer. The following procedure is performed by applying WINNF-TS-0122 CBRS CBSD Test Specification.

- 1. Run#1:
 - a. Setup WINNF.PT.C.HBT.1 with 3615MHz 3635MHz.
 - b. Enable AP service from Ruckus Cloud management.
 - c. Check EUT Tx frequency.
 - d. Disable AP service from Ruckus Cloud management and check EUT stop transmission within 10s.
- 2. Run#2:
 - a. Setup WINNF.PT.C.HBT.1 with 3660MHz 3680MHz.
 - b. Enable AP service from Ruckus Cloud management.
 - c. Check EUT Tx frequency.
 - d. Disable AP service from Ruckus Cloud management and check EUT stop transmission within 10s.

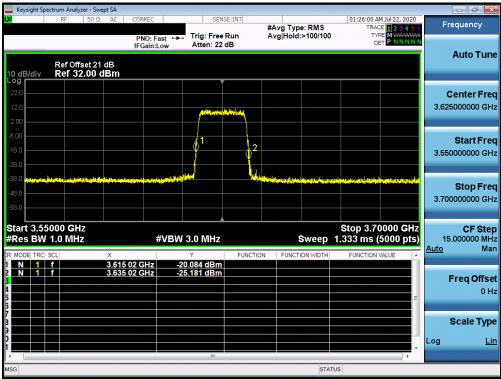
Test Notes

The EUT is an End User Device.

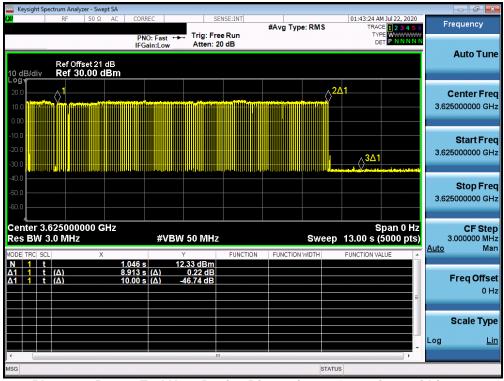
FCC ID: A3LSMH204V	PCTEST Proid Jobs part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
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Run#1:



Plot 7-73. Run#1 End User Device Frequency of Operations

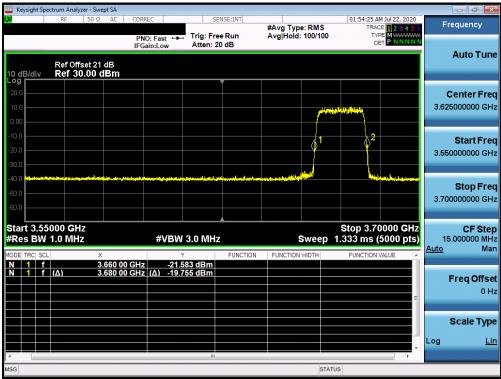


Plot 7-74. Run#1 End User Device Discontinues Operations within 10s

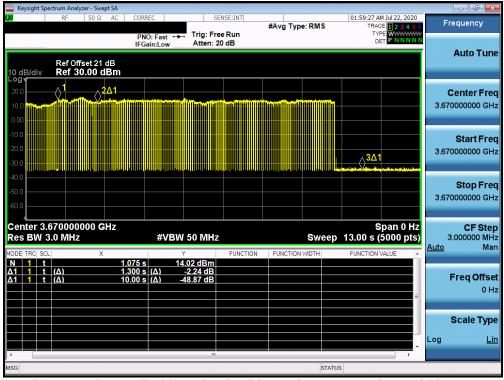
FCC ID: A3LSMH204V	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSONE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 72 of 76
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Run#2:



Plot 7-75. Run#2 End User Device Frequency of Operations



Plot 7-76. Run#2 End User Device Discontinues Operations within 10s

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Note:

- Marker 1: CBSD sends instructions to discontinue LTE operations.
- Marker 2: EUT discontinues operation.
- Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Indoor Customer Premises Equipment (CPE) FCC ID: A3LSMH204V** complies with all of the End User Device requirements of Part 96 of the FCC Rules for LTE operation only.

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