

7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §22.917(a) §27.53(c) §27.53(g) §27.53(m)

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

The minimum permissible attenuation level for Band 41 is as noted in the Test Notes on the following page.

Test Procedure Used

KDB 971168 D01 v03 – 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. $VBW \geq 3 \times RBW$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/RBW$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
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.

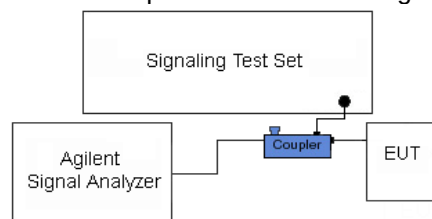


Figure 7-3. Test Instrument & Measurement Setup

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Test Notes

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

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

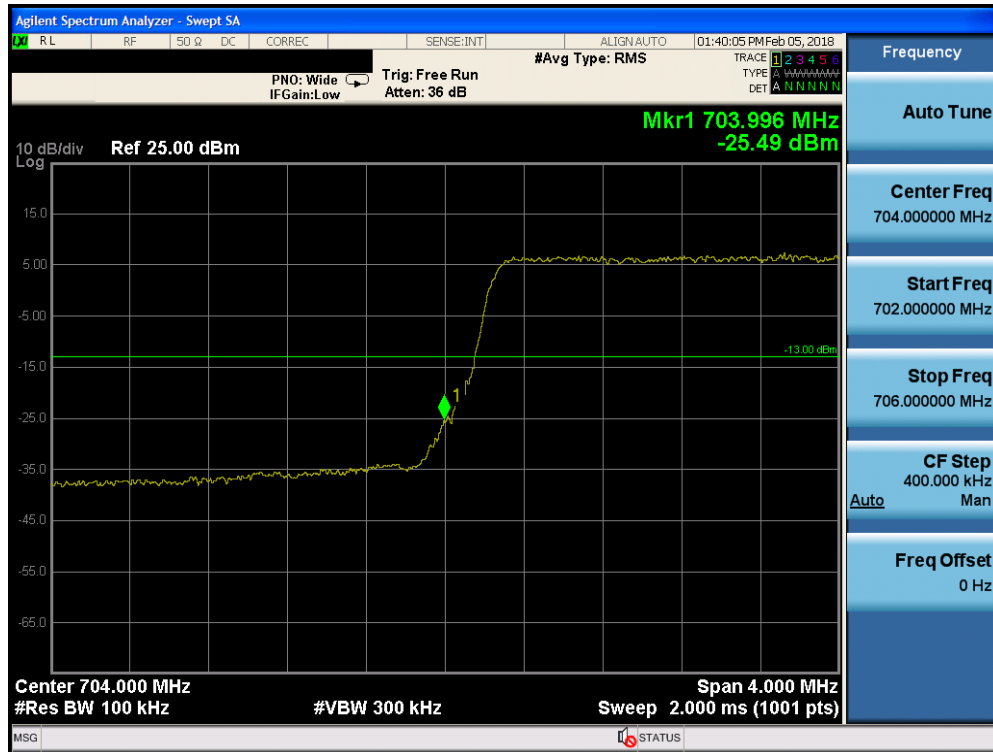
Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

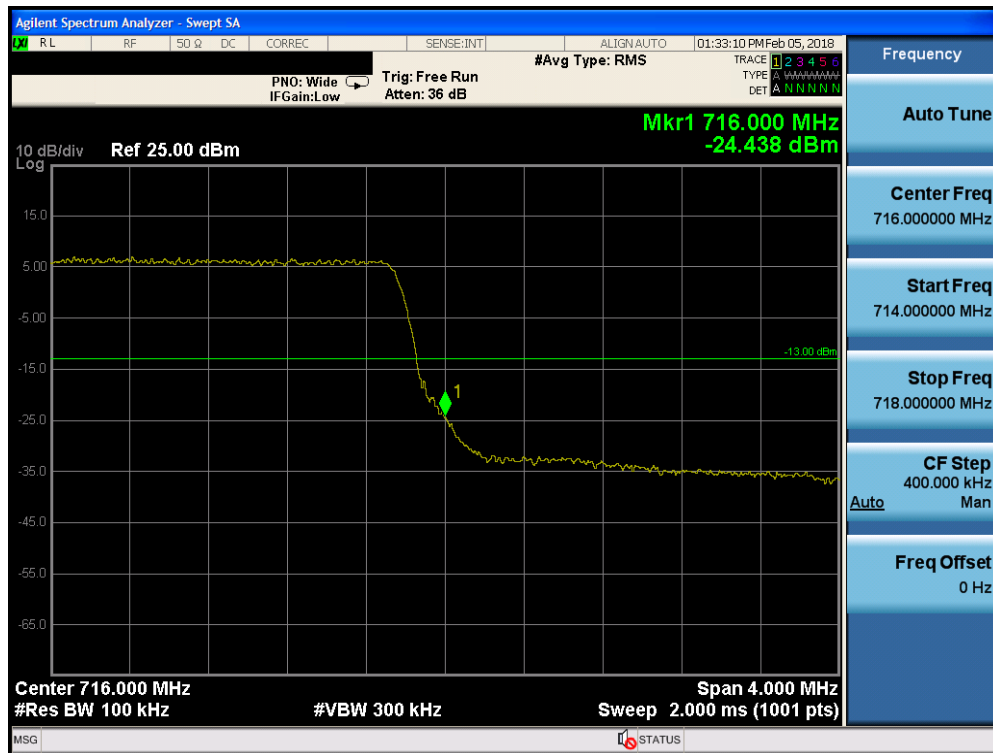
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz.

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Band 17

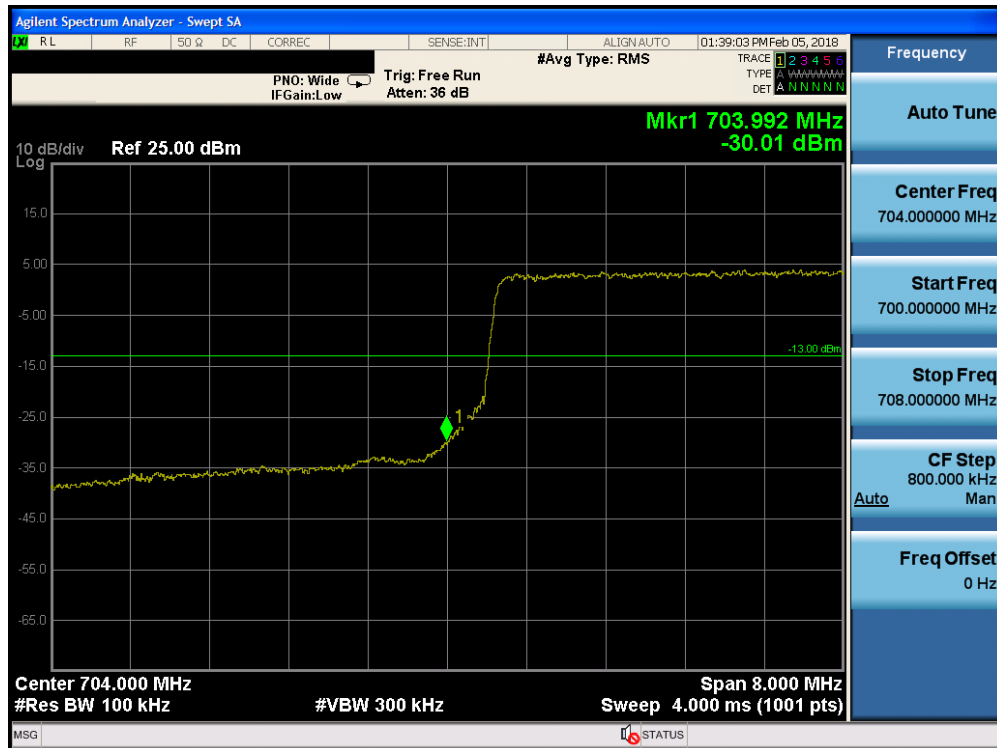


Plot 7-76. Lower Band Edge Plot (Band 17 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-77. Upper Band Edge Plot (Band 17 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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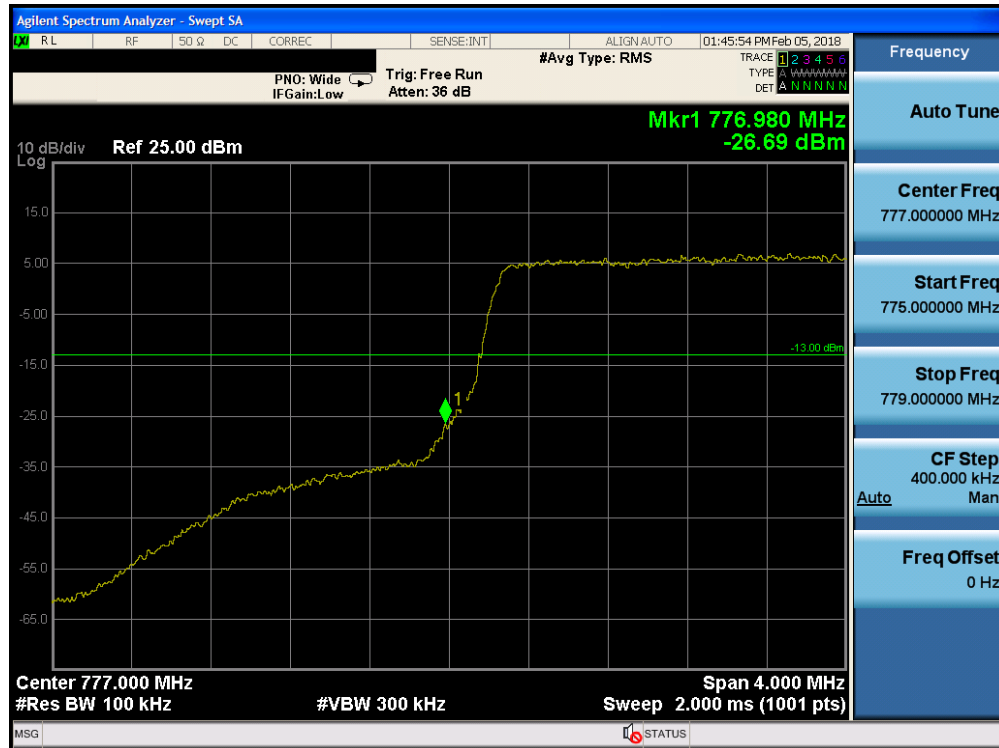
Plot 7-78. Lower Band Edge Plot (Band 17 - 10.0MHz QPSK - Full RB Configuration)



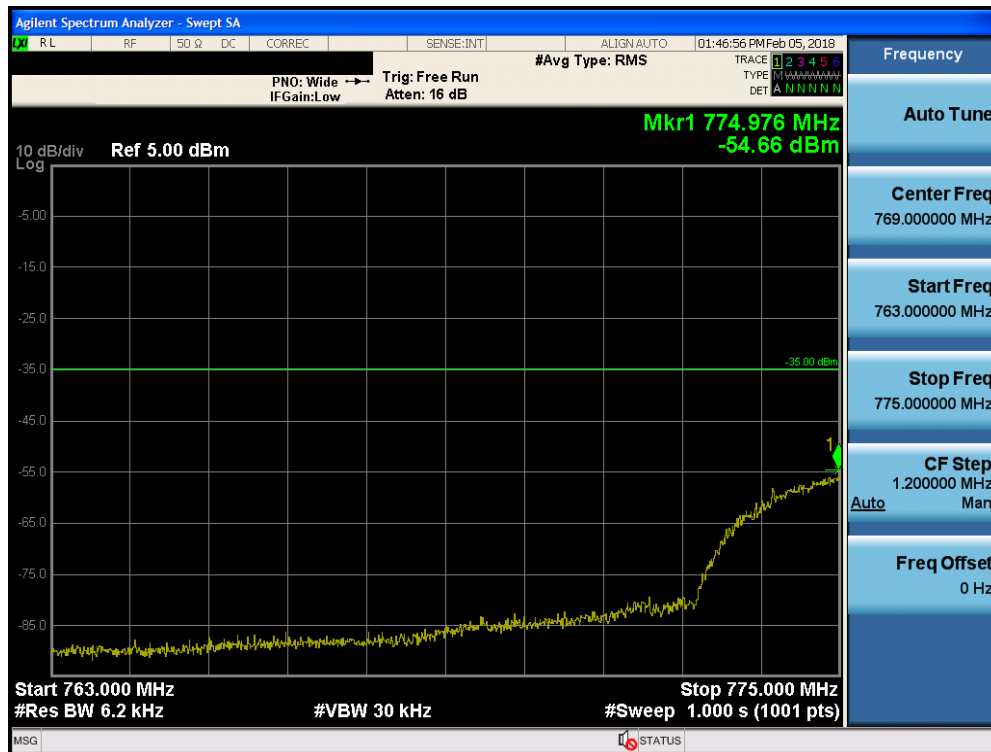
Plot 7-79. Upper Band Edge Plot (Band 17 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 13

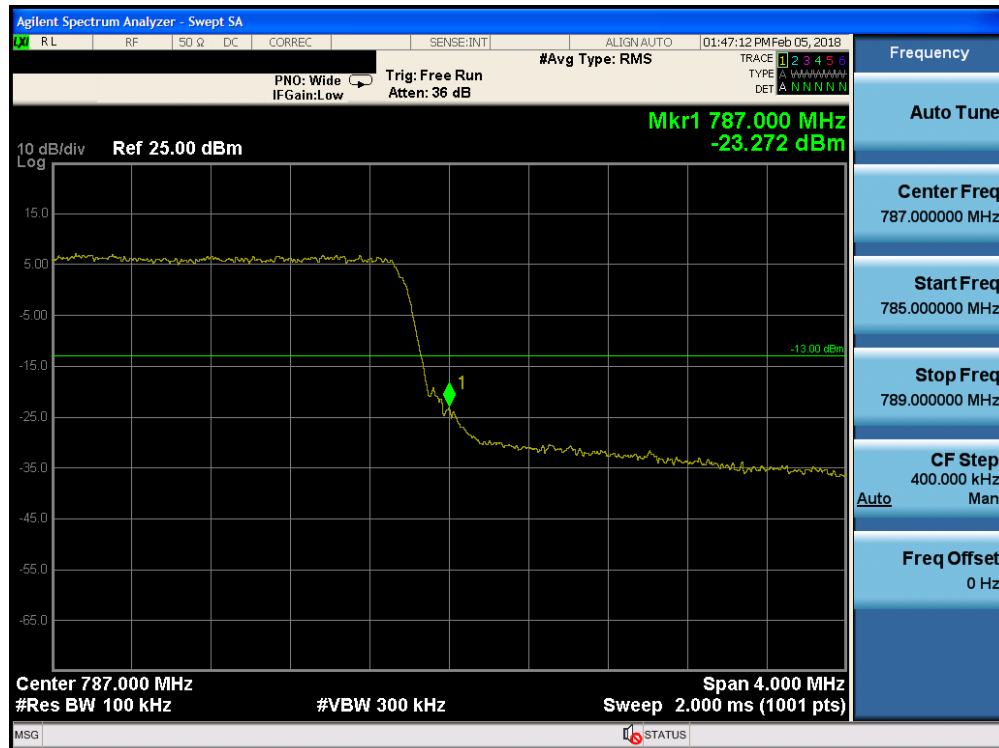


Plot 7-80. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

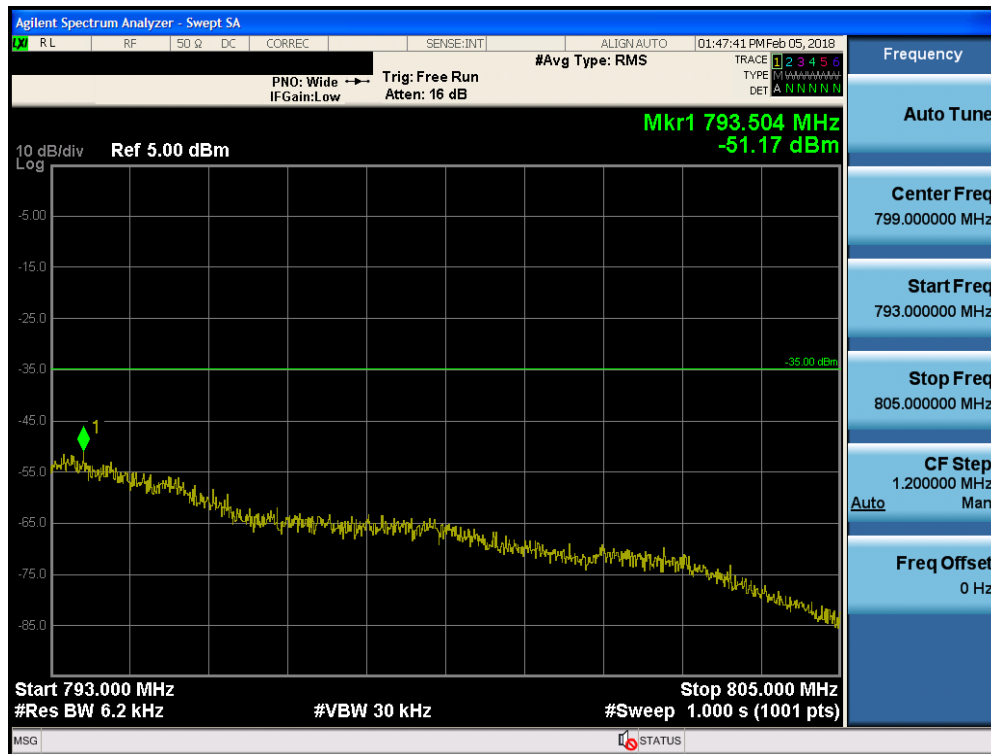


Plot 7-81. Lower Emission Mask Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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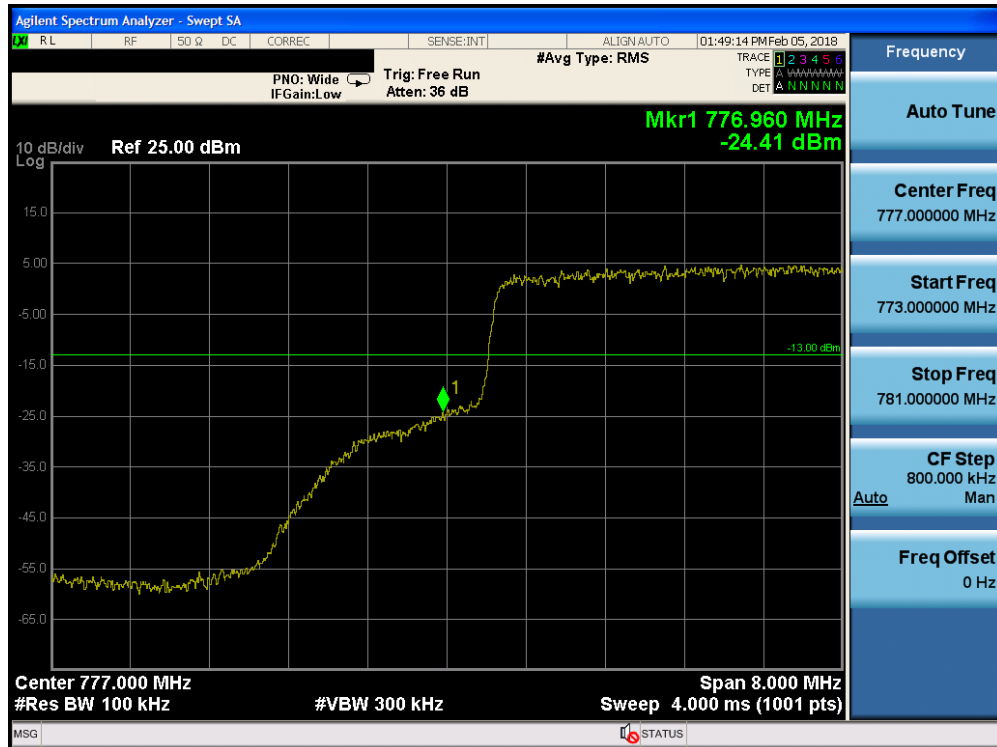


Plot 7-82. Upper Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

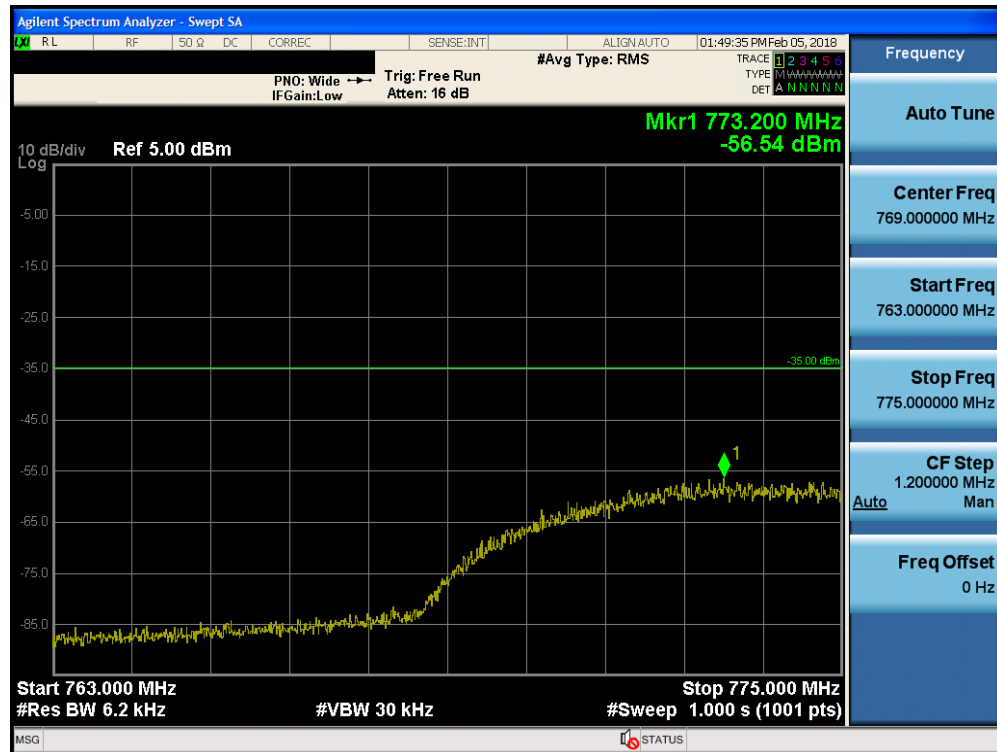


Plot 7-83. Upper Emission Mask Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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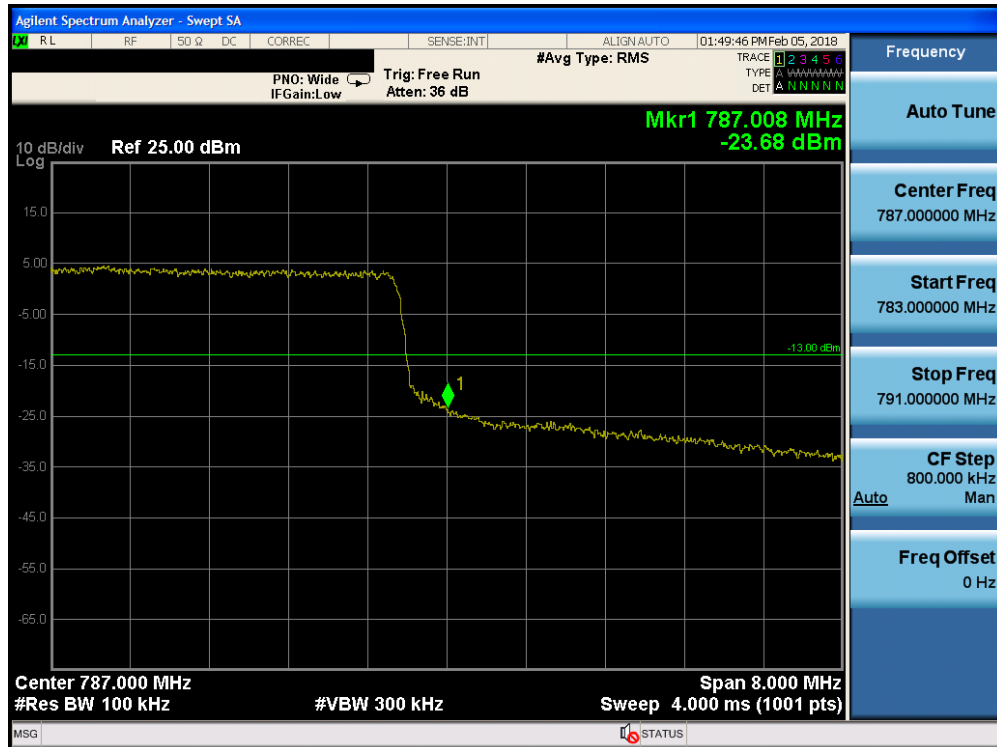


Plot 7-84. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

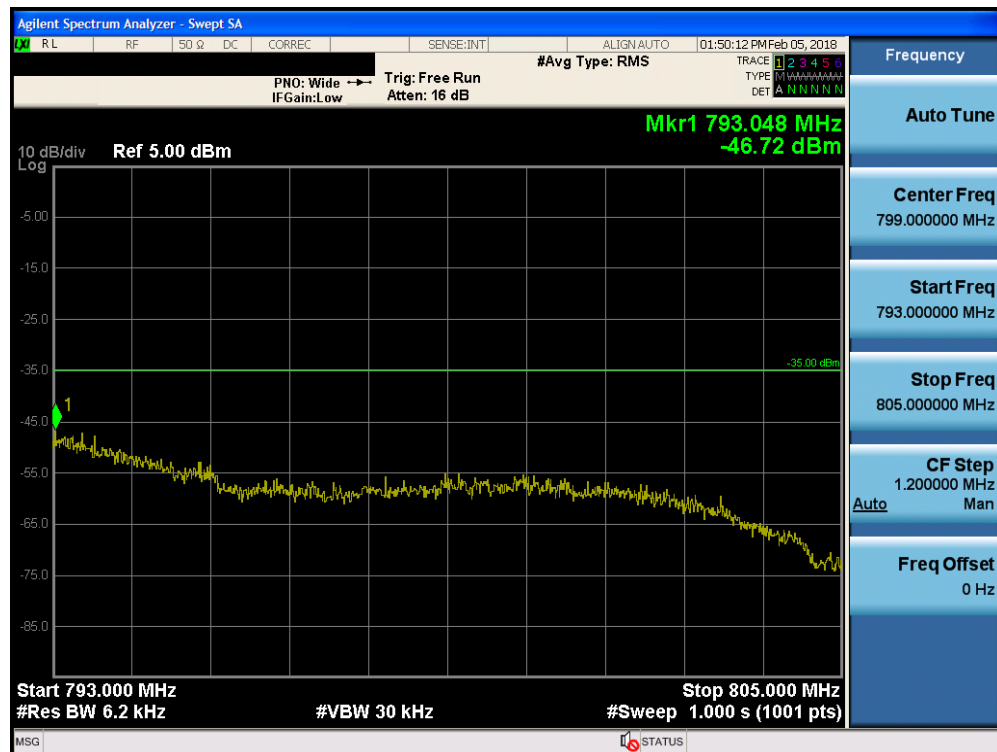


Plot 7-85. Lower Emission Mask Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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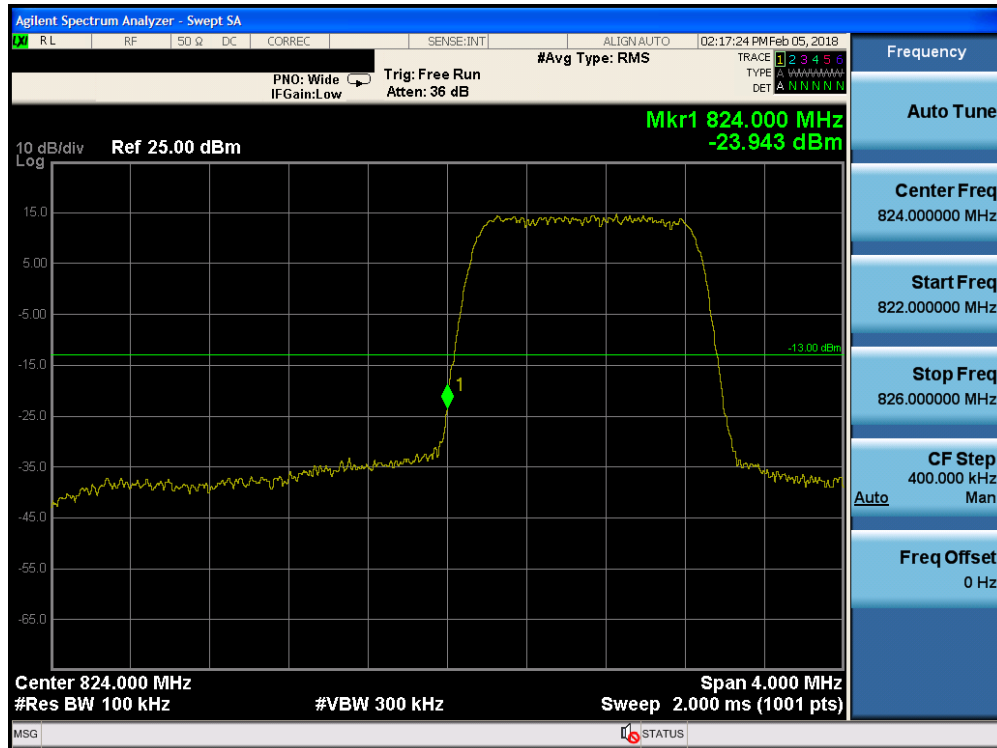
Plot 7-86. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



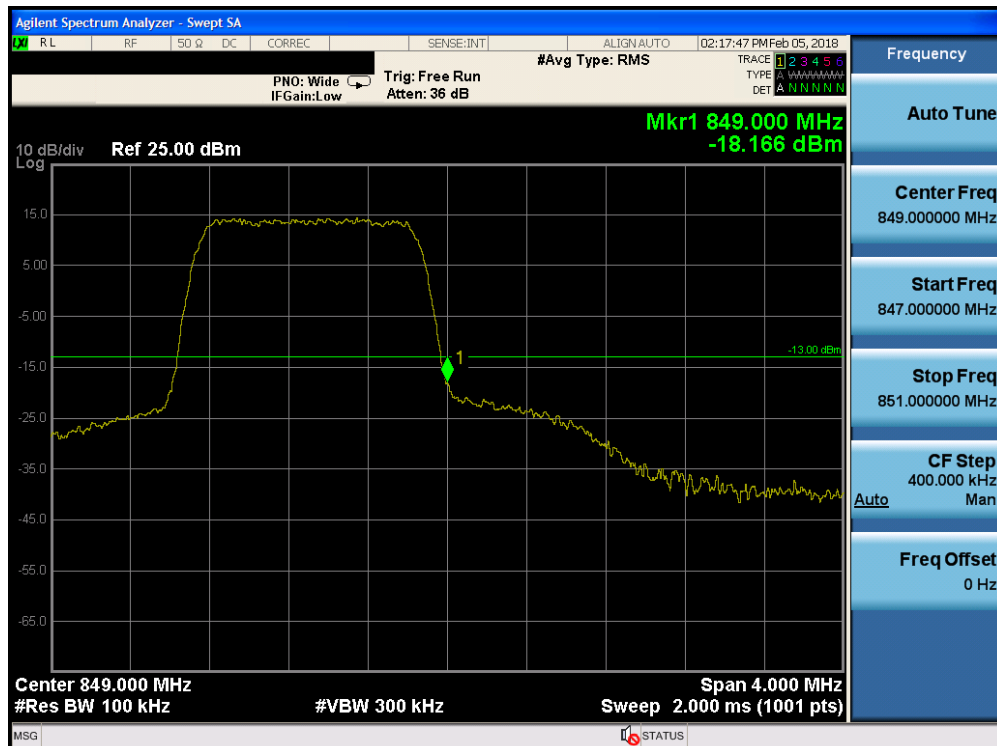
Plot 7-87. Upper Emission Mask Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 5/26

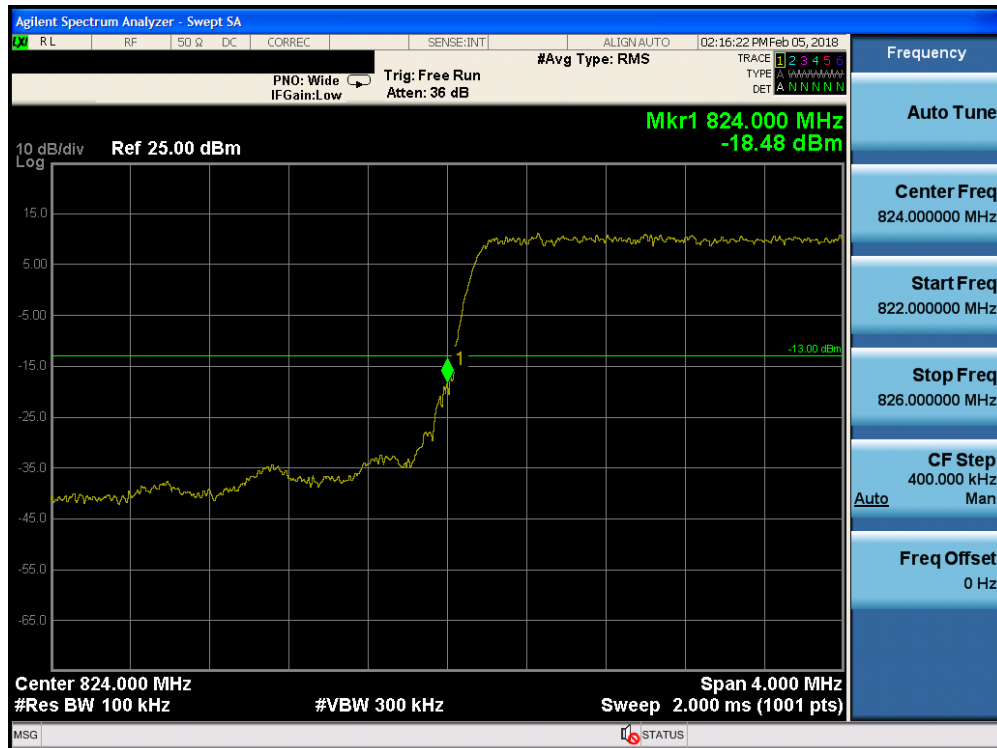


Plot 7-88. Lower Band Edge Plot (Band 5/26 - 1.4MHz QPSK - Full RB Configuration)

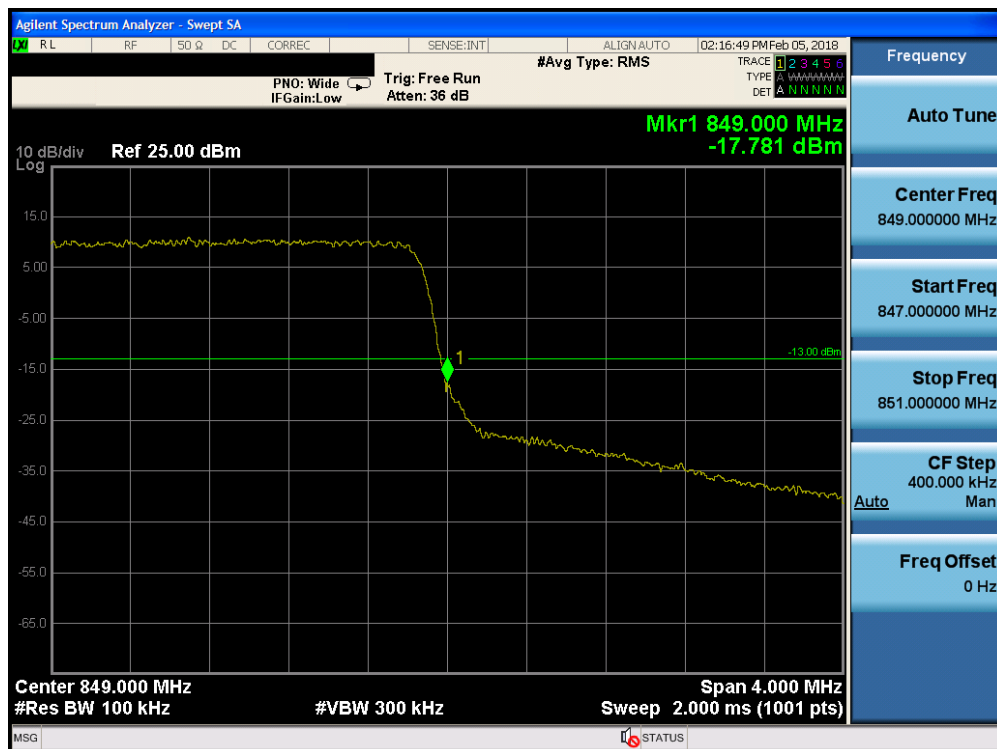


Plot 7-89. Upper Band Edge Plot (Band 5/26 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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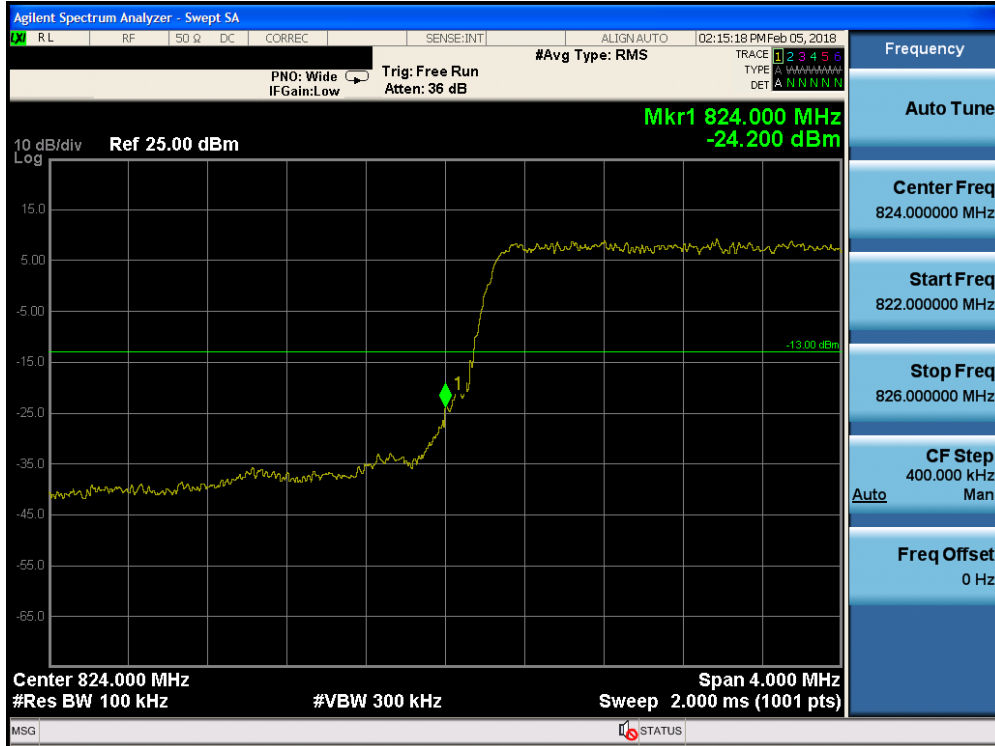


Plot 7-90. Lower Band Edge Plot (Band 5/26 - 3.0MHz QPSK - Full RB Configuration)

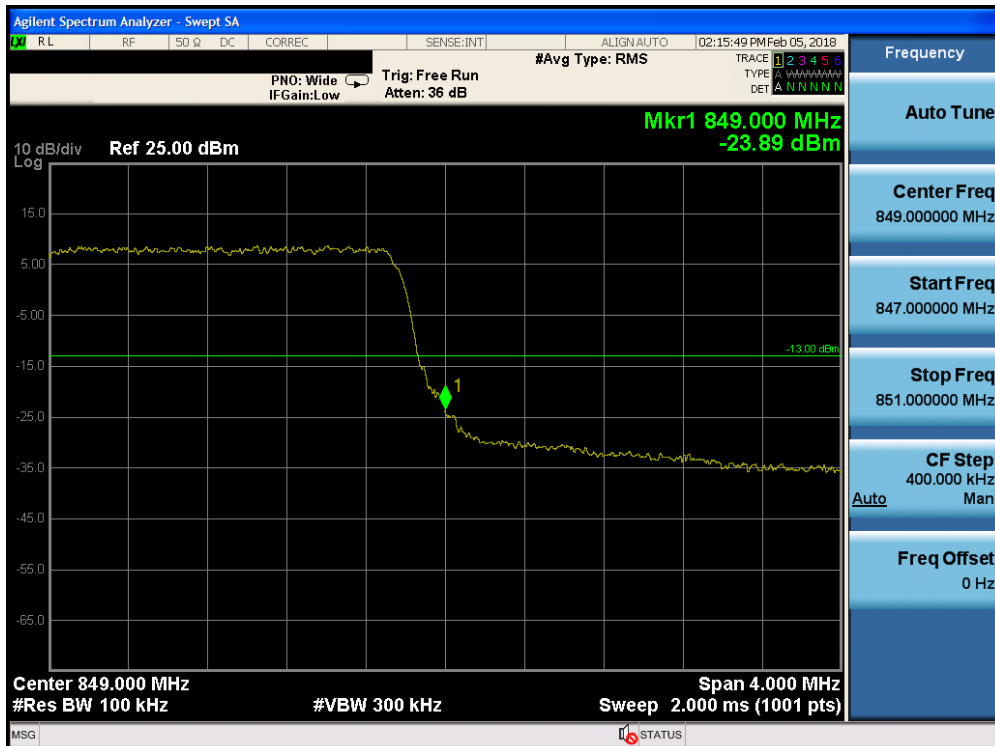


Plot 7-91. Upper Band Edge Plot (Band 5/26 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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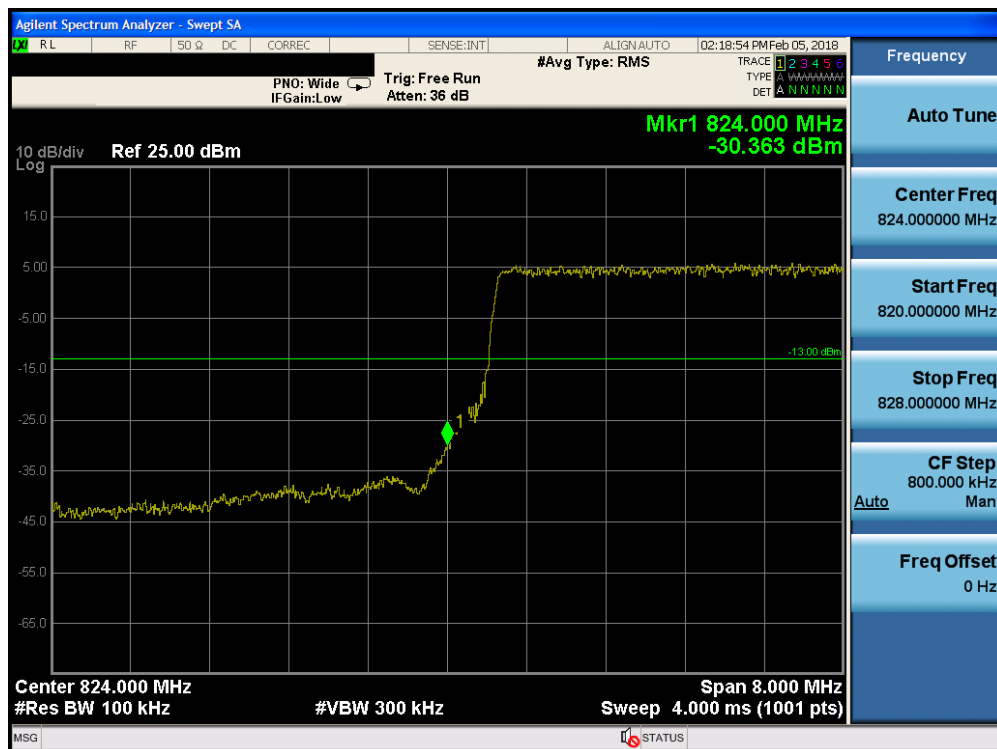


Plot 7-92. Lower Band Edge Plot (Band 5/26 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-93. Upper Band Edge Plot (Band 5/26 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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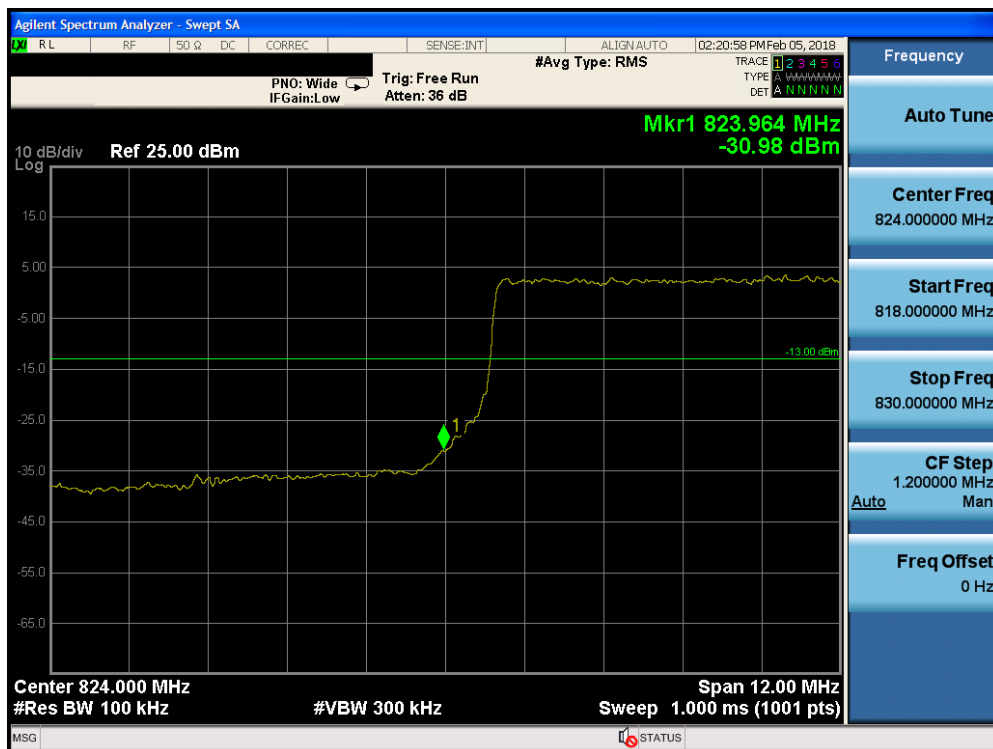


Plot 7-94. Lower Band Edge Plot (Band 5/26 - 10.0MHz QPSK - Full RB Configuration)

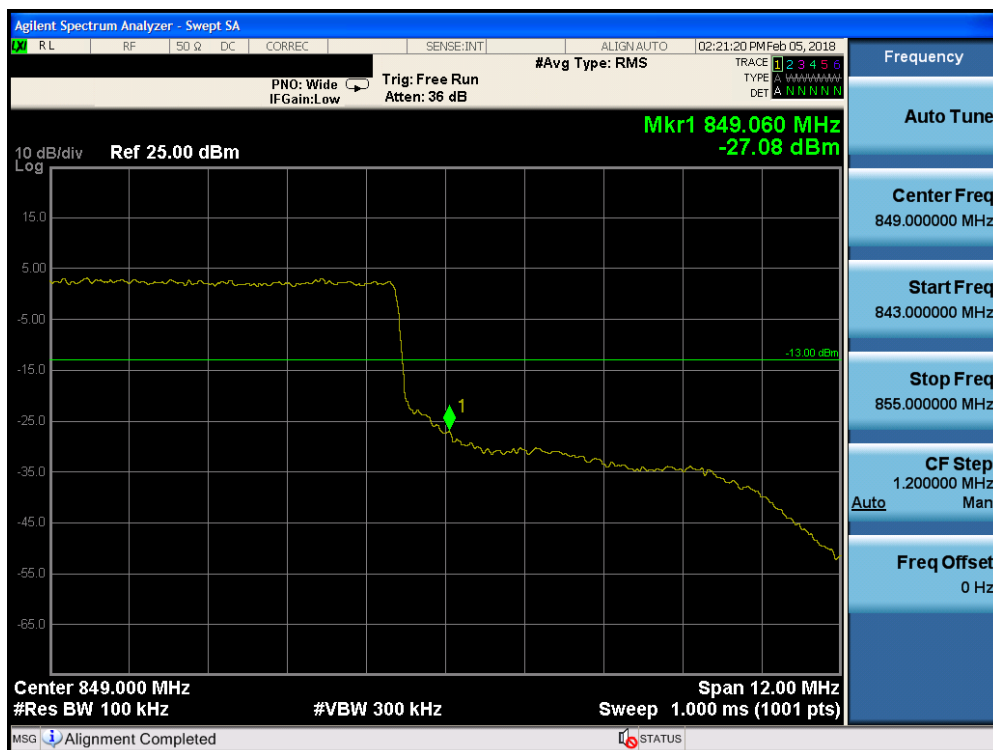


Plot 7-95. Upper Band Edge Plot (Band 5/26 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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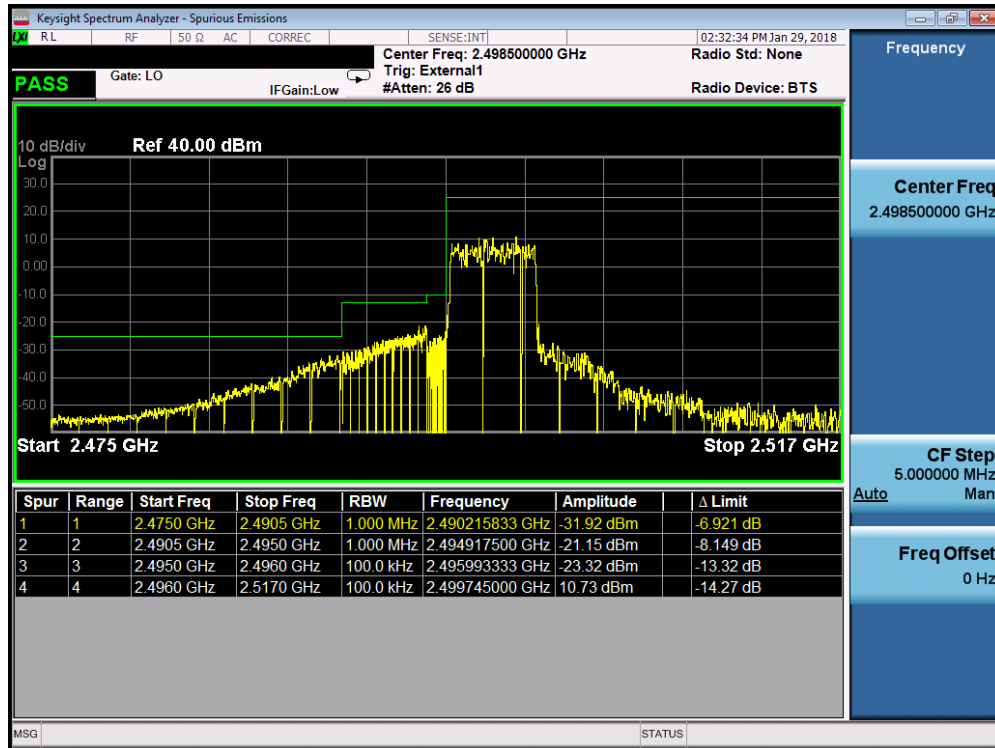
Plot 7-96. Lower Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)



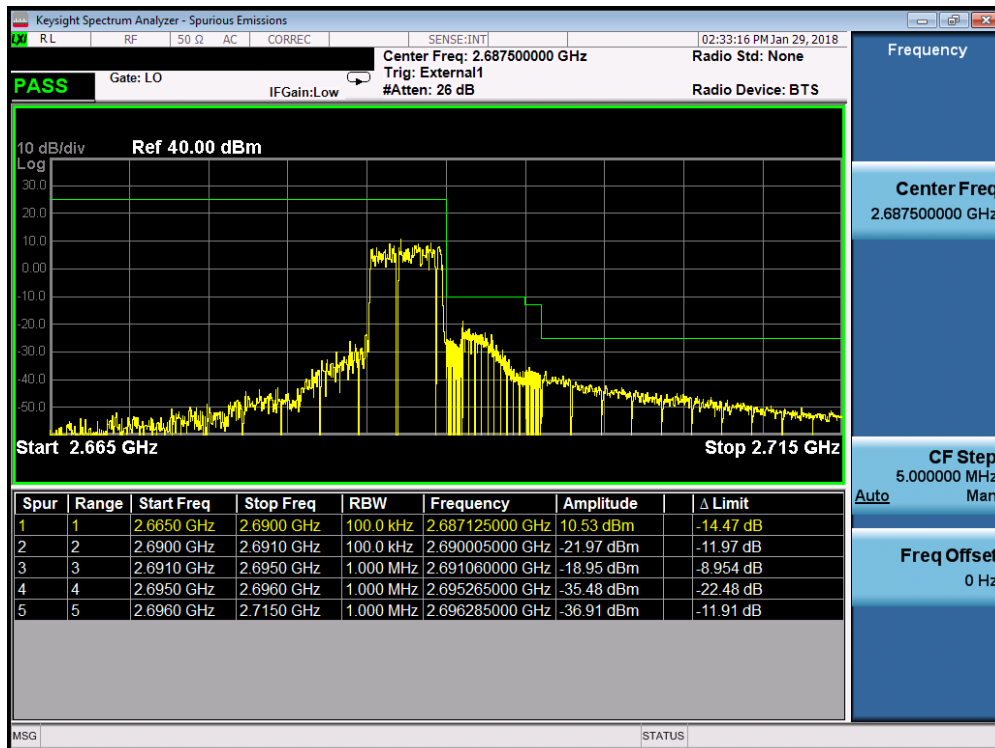
Plot 7-97. Upper Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 41

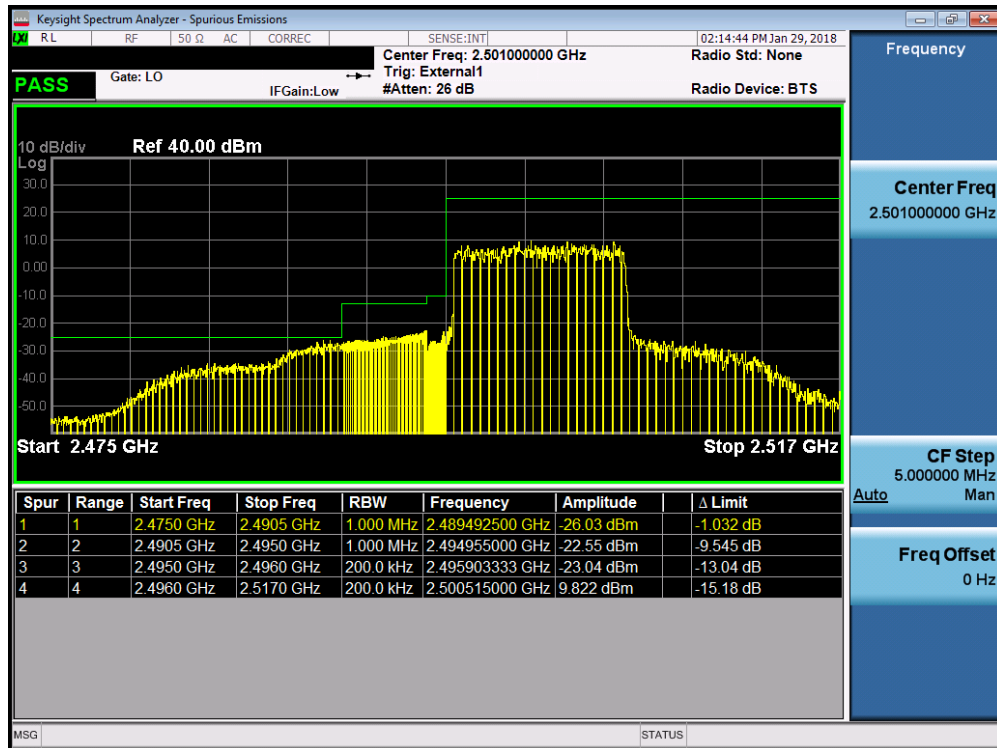


Plot 7-98. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - RB Size 25)

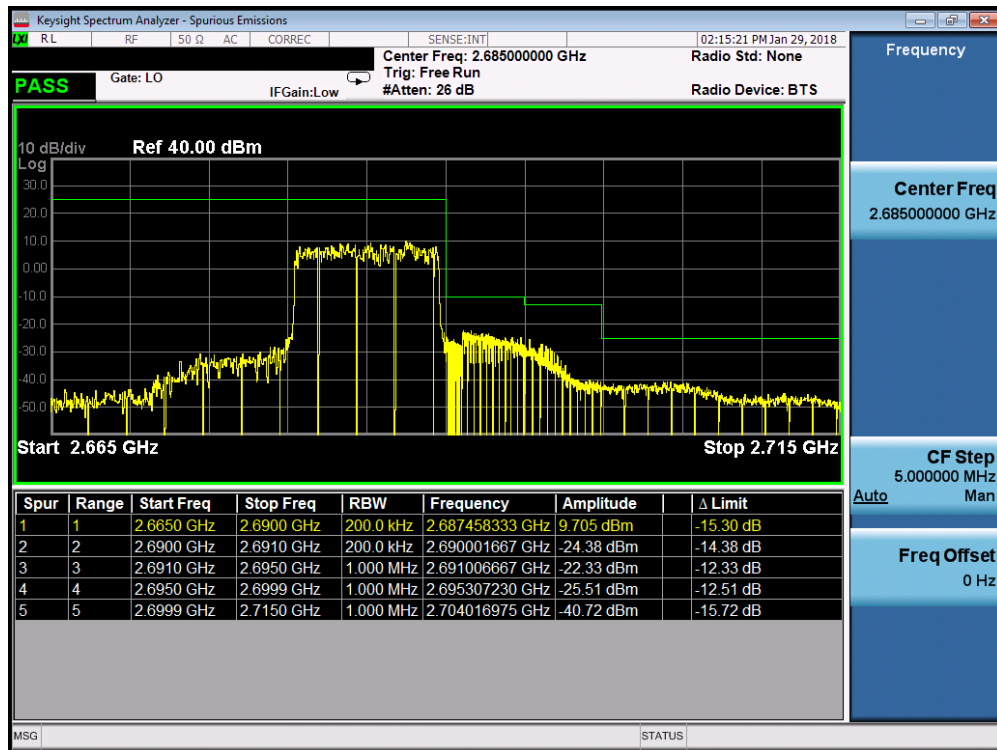


Plot 7-99. Upper ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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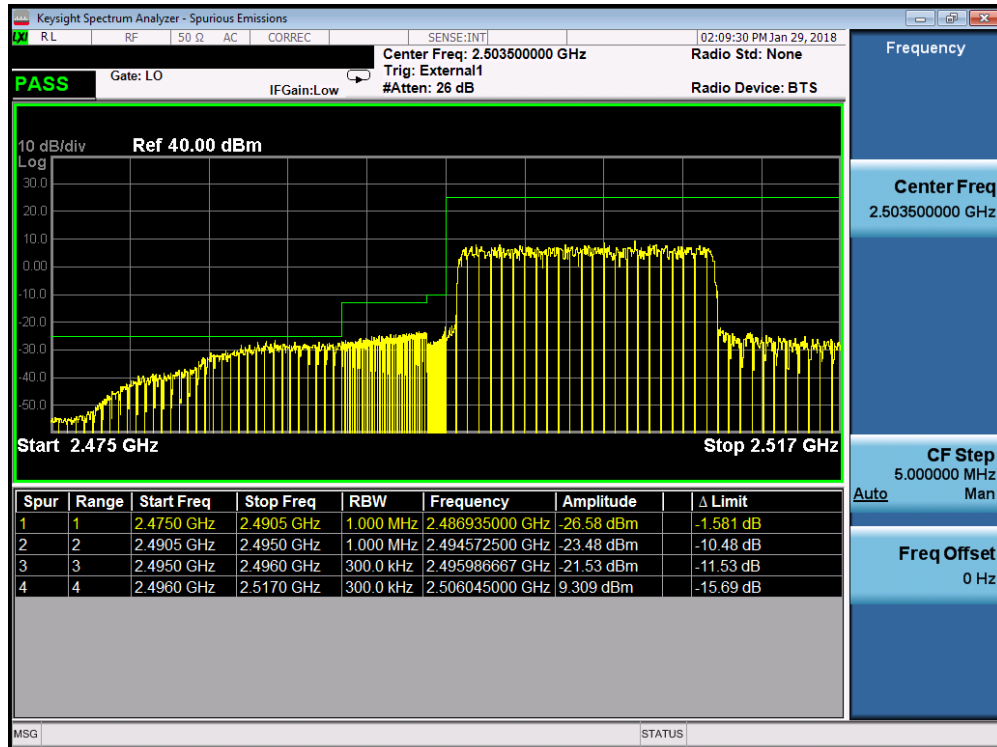


Plot 7-100. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - RB Size 25)

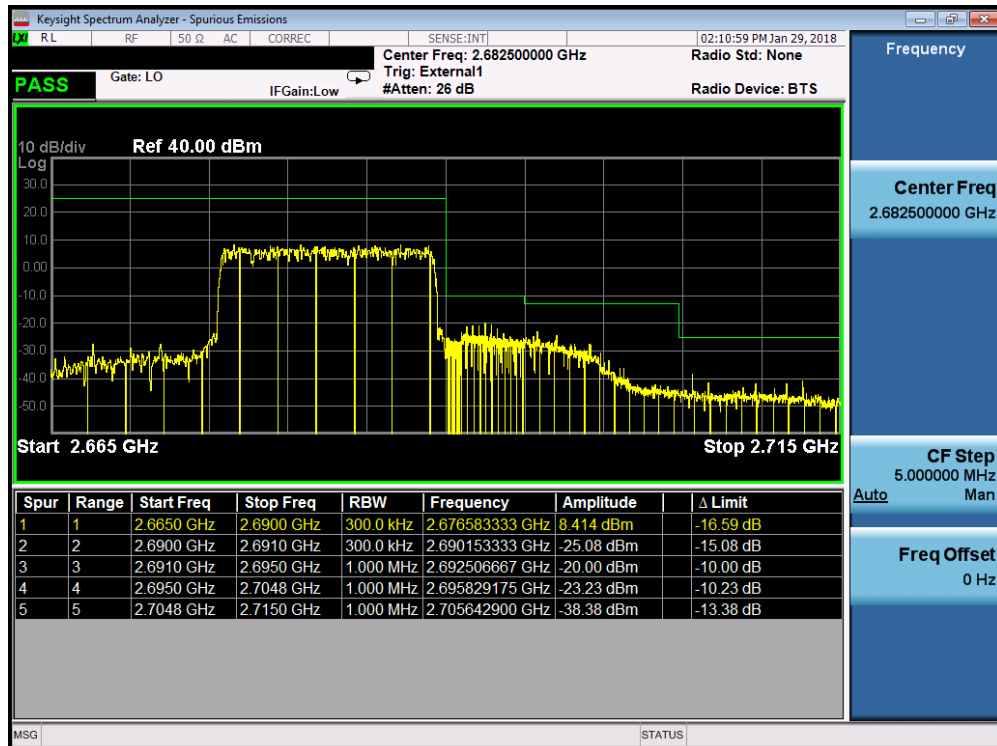


Plot 7-101. Upper ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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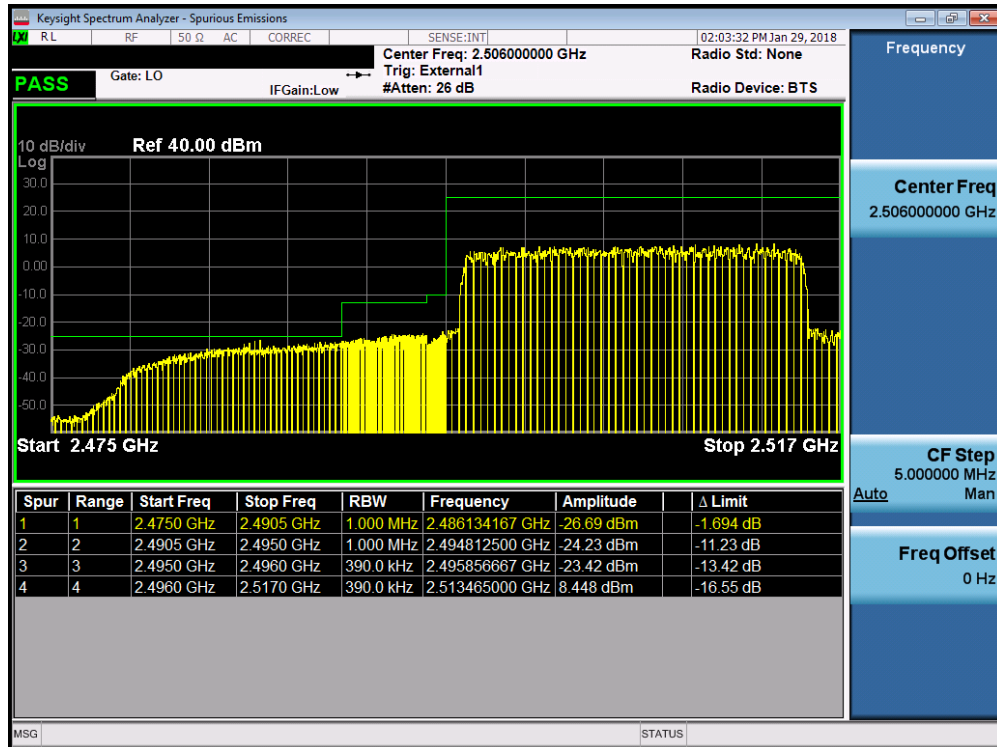


Plot 7-102. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - RB Size 25)

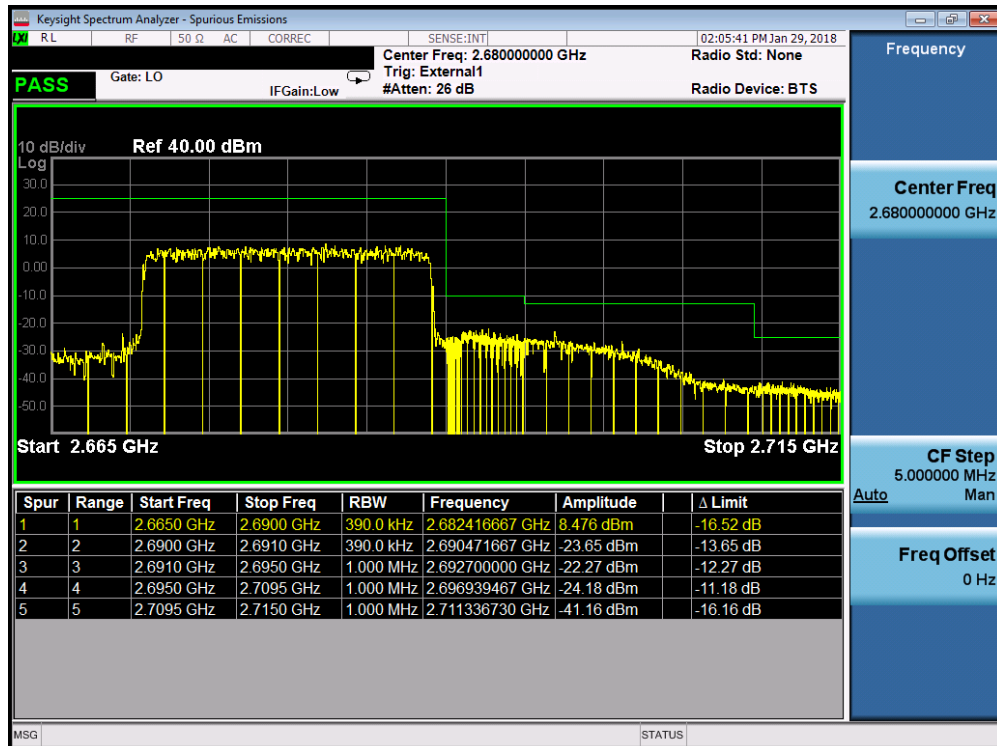


Plot 7-103. Upper ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 25)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Plot 7-104. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - RB Size 25)



Plot 7-105. Upper ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 25)

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7.5 Uplink Carrier Aggregation

§27.53(m)

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.

For Band 41, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P_{\text{Watts}})$.

Test Procedure Used

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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.

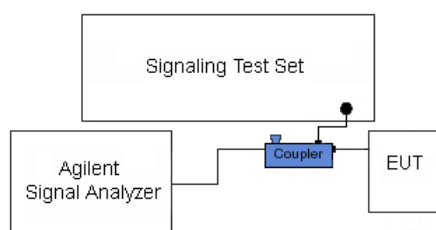


Figure 7-4. Test Instrument & Measurement Setup

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Test Notes

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
2. 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 7-503 and 7-504 below, with both carriers set to transmit using 1RB.
3. 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.

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Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	20	39844	2515.4	QPSK	1	0	23.88
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	24.10
Max	LTE B41	20	41396	2670.6	QPSK	1	99	LTE B41	10	41540	2685	QPSK	1	0	23.99
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	15	39875	2518.5	QPSK	1	0	24.09
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	20	39896	2520.6	QPSK	1	0	23.97
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	24.10
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	23.95
Max	LTE B41	15	41365	2667.5	QPSK	1	74	LTE B41	15	41515	2682.5	QPSK	1	0	23.98
Max	LTE B41	20	41344	2665.4	QPSK	1	99	LTE B41	15	41515	2682.5	QPSK	1	0	23.89
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	10	39894	2520.4	QPSK	1	0	23.96
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	15	39921	2523.1	QPSK	1	0	23.79
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.91
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	24.01
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	23.98
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	24.29
Max	LTE B41	10	41346	2665.6	QPSK	1	49	LTE B41	20	41490	2680	QPSK	1	0	23.85
Max	LTE B41	15	41319	2662.9	QPSK	1	74	LTE B41	20	41490	2680	QPSK	1	0	23.91
Max	LTE B41	20	41292	2660.2	QPSK	1	99	LTE B41	20	41490	2680	QPSK	1	0	23.81

Table 7-3. Conducted Powers (B41 – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	19.99
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	20.05
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	15.96
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	19.97
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.91
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	21.53
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	20.87
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	20.63

Table 7-4. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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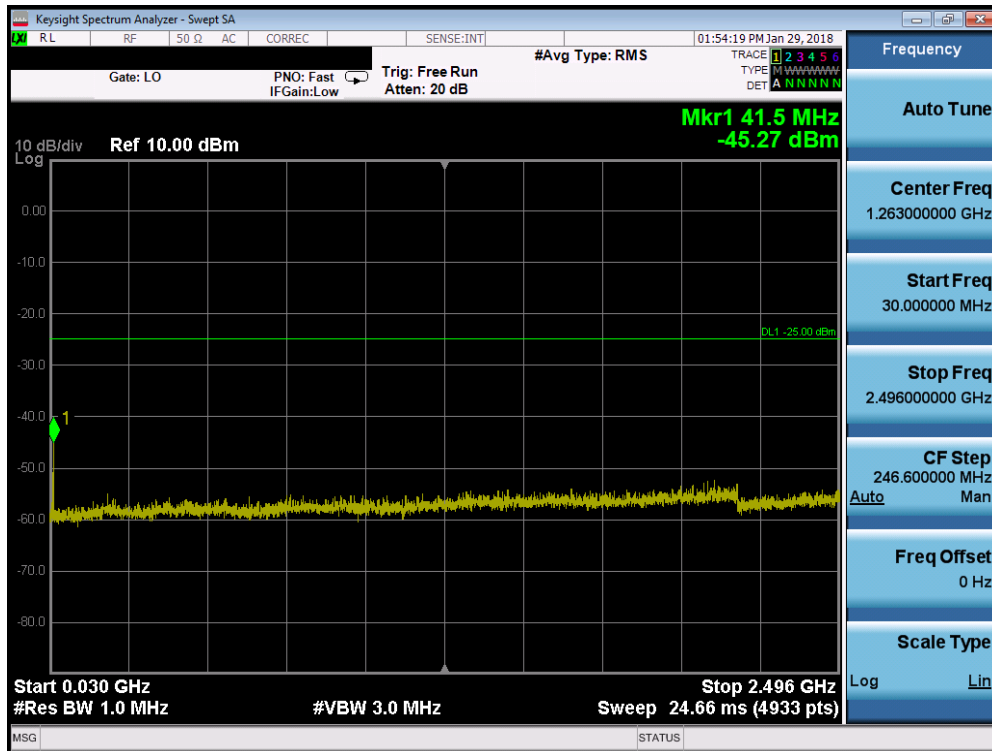


Table 7-106. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

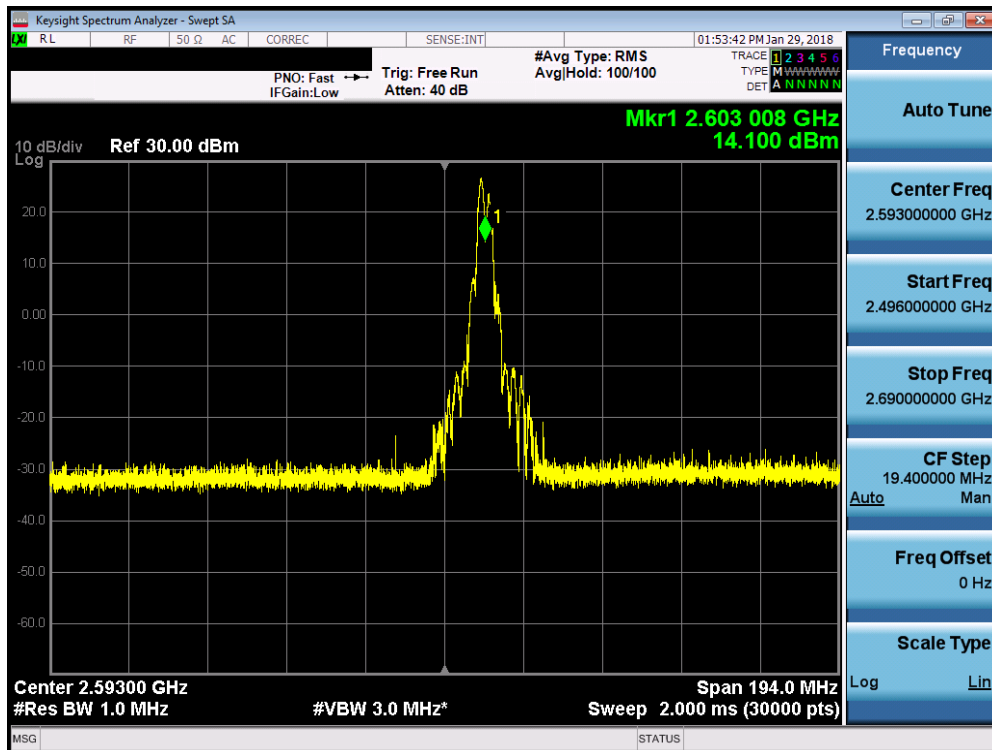


Table 7-107. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 76 of 113

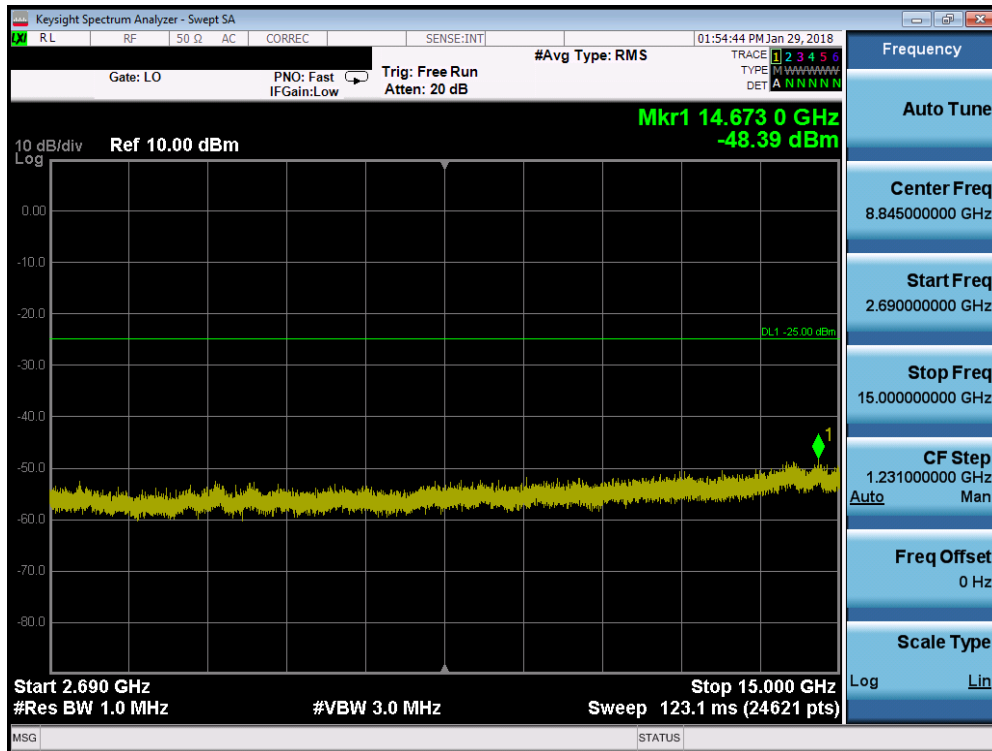


Table 7-108. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

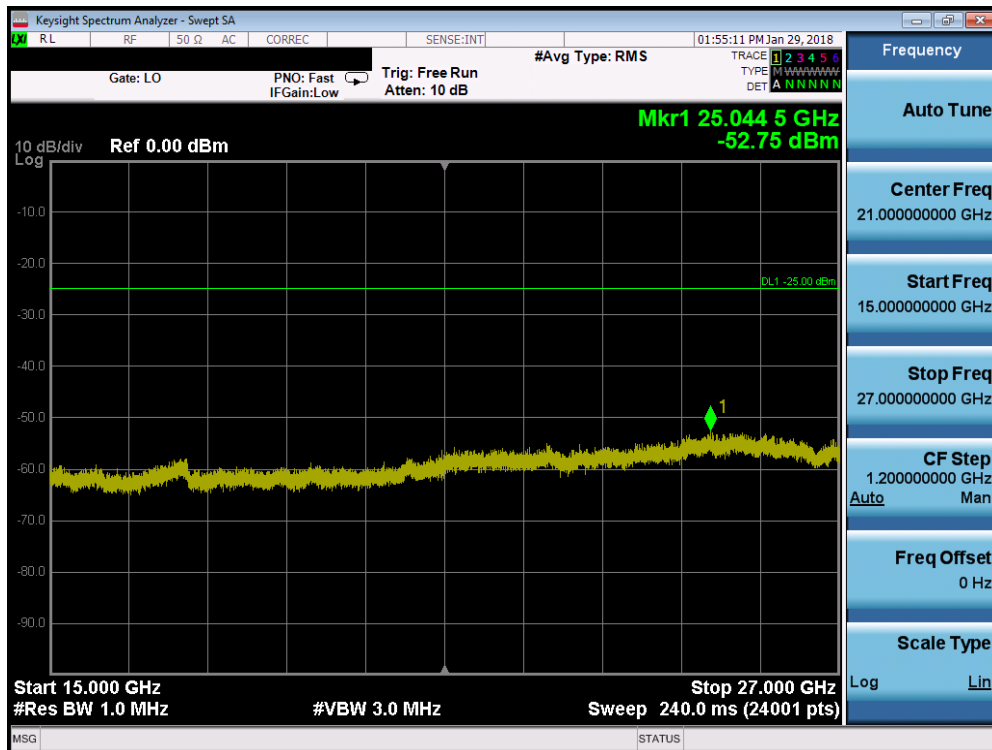


Table 7-109. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 77 of 113

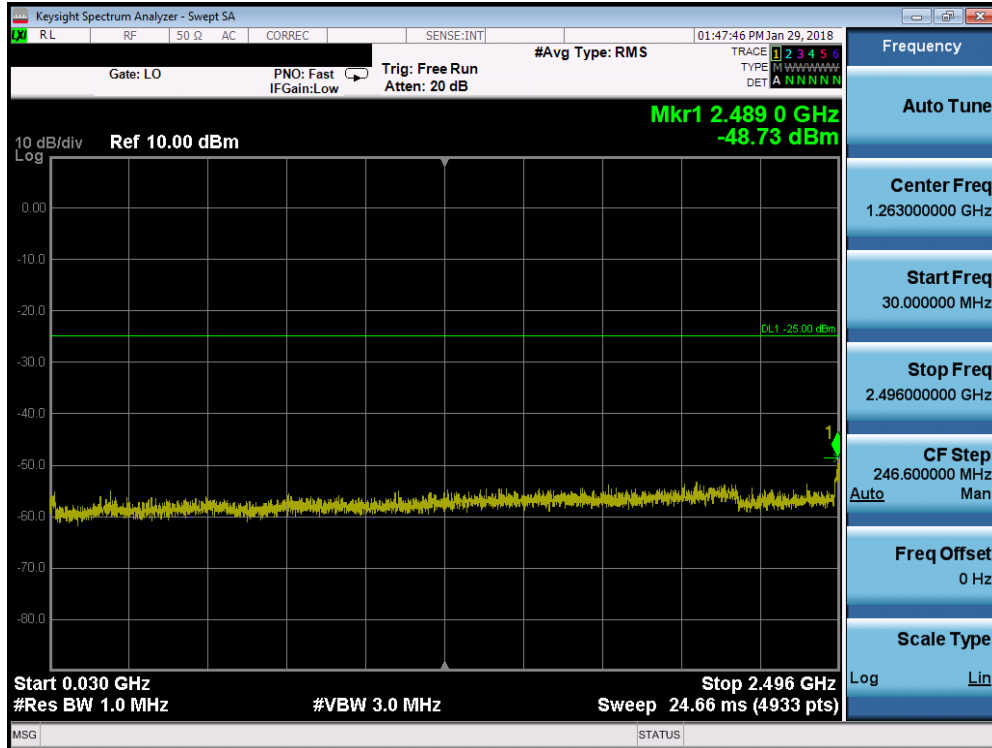


Table 7-110. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

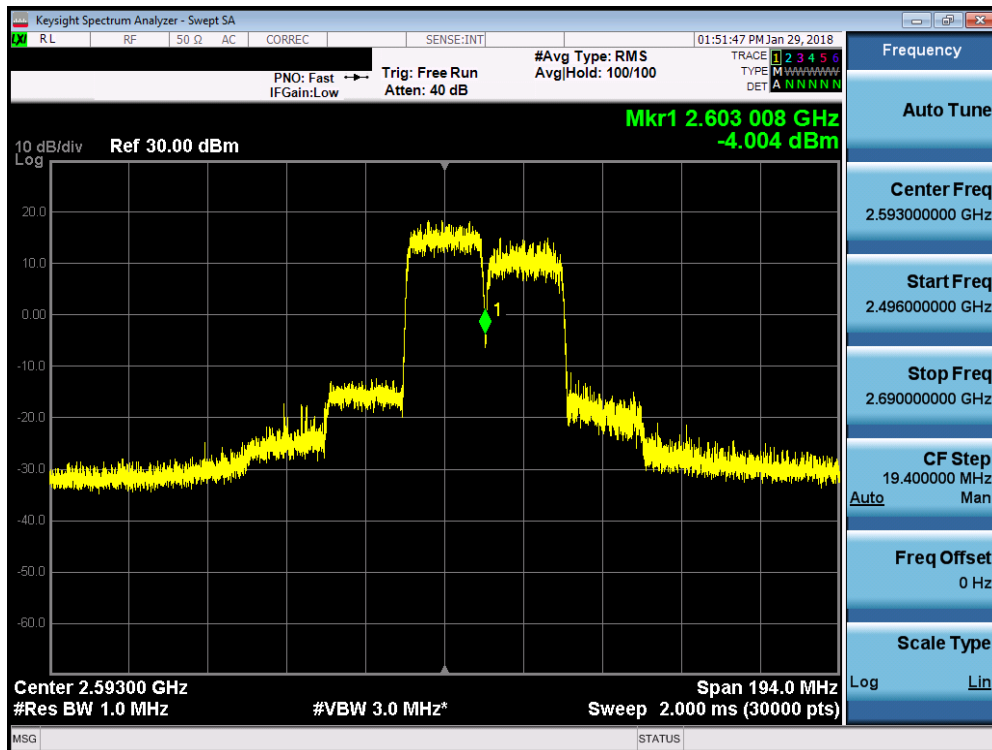


Table 7-111. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 78 of 113

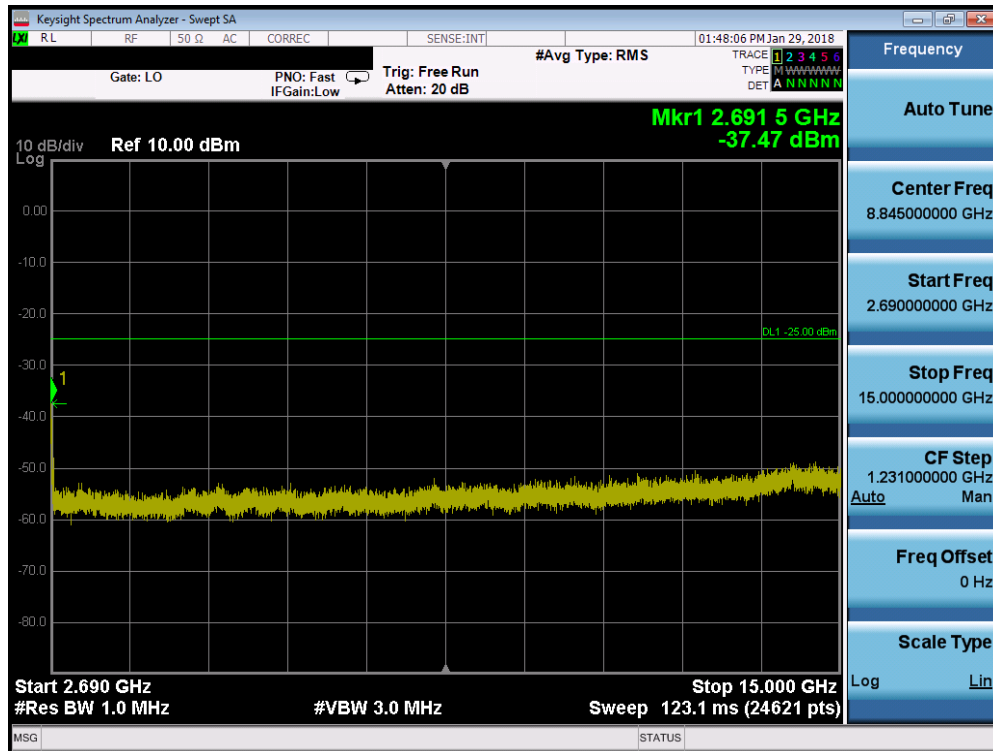


Table 7-112. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

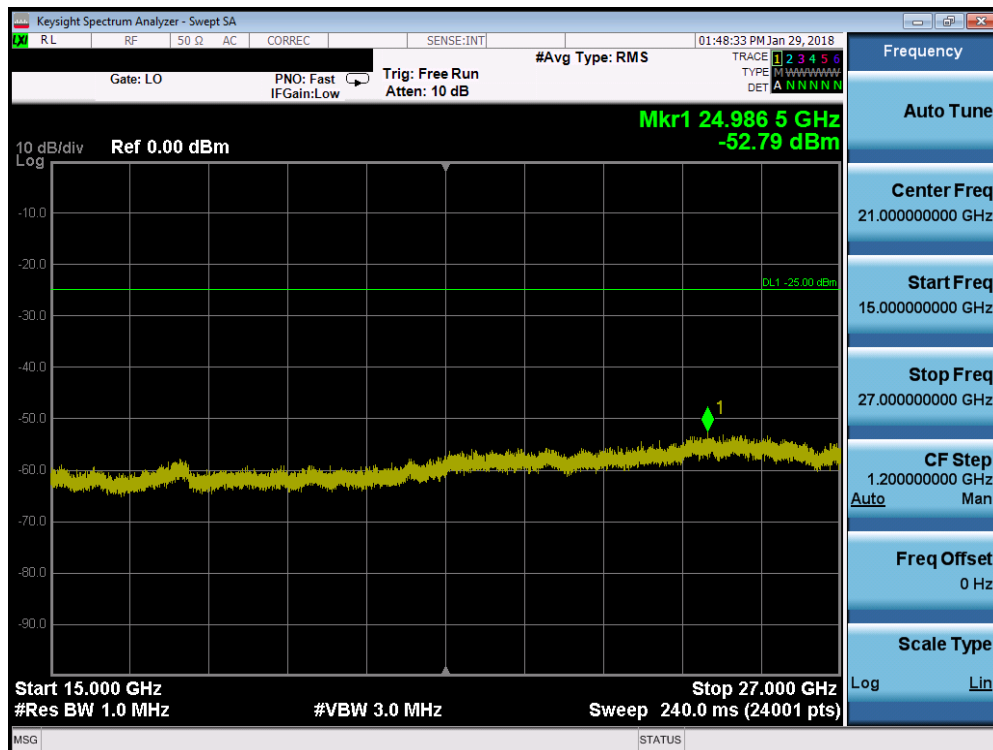


Table 7-113. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 79 of 113

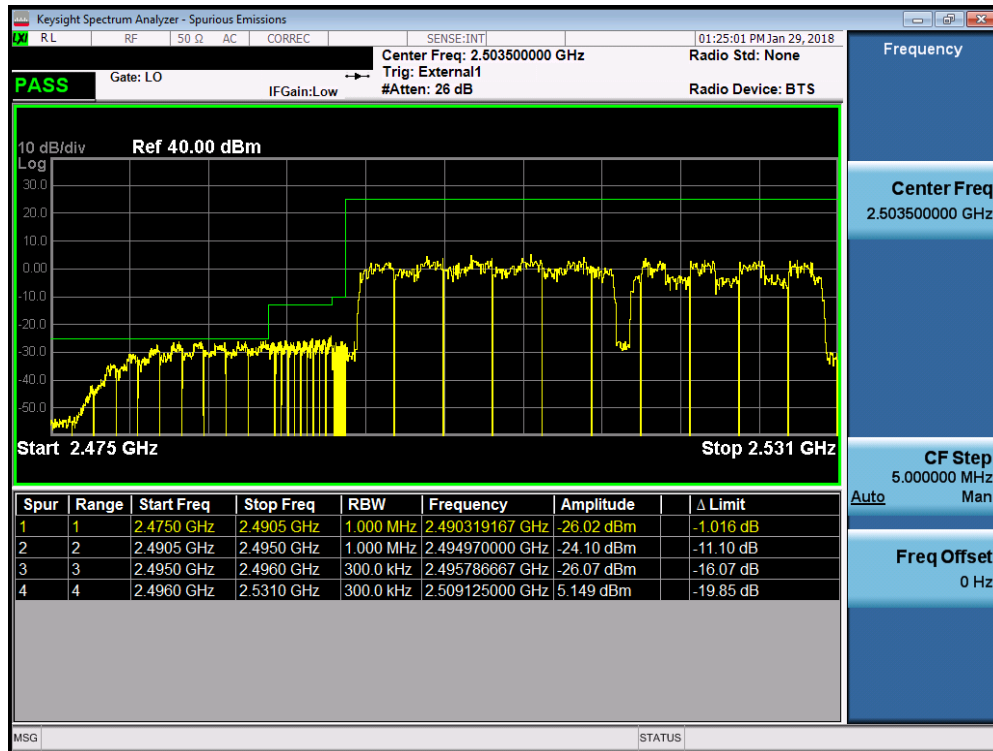


Table 7-114. Lower ACP Plot (Band 41 QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

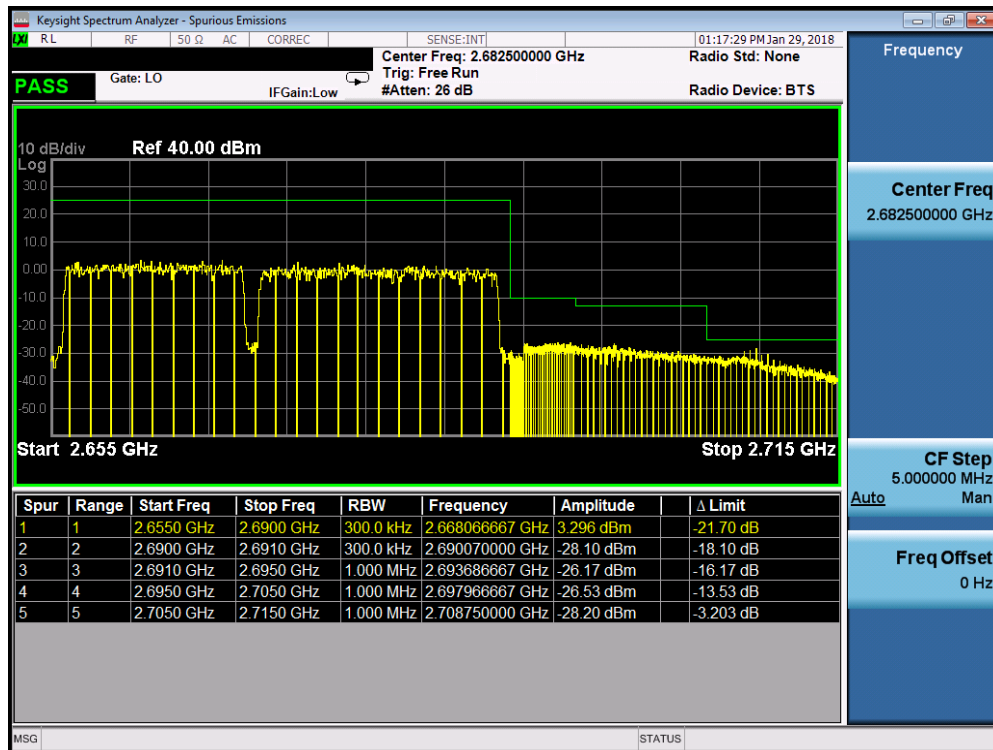


Table 7-115. Upper ACP Plot (Band 41 QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 80 of 113

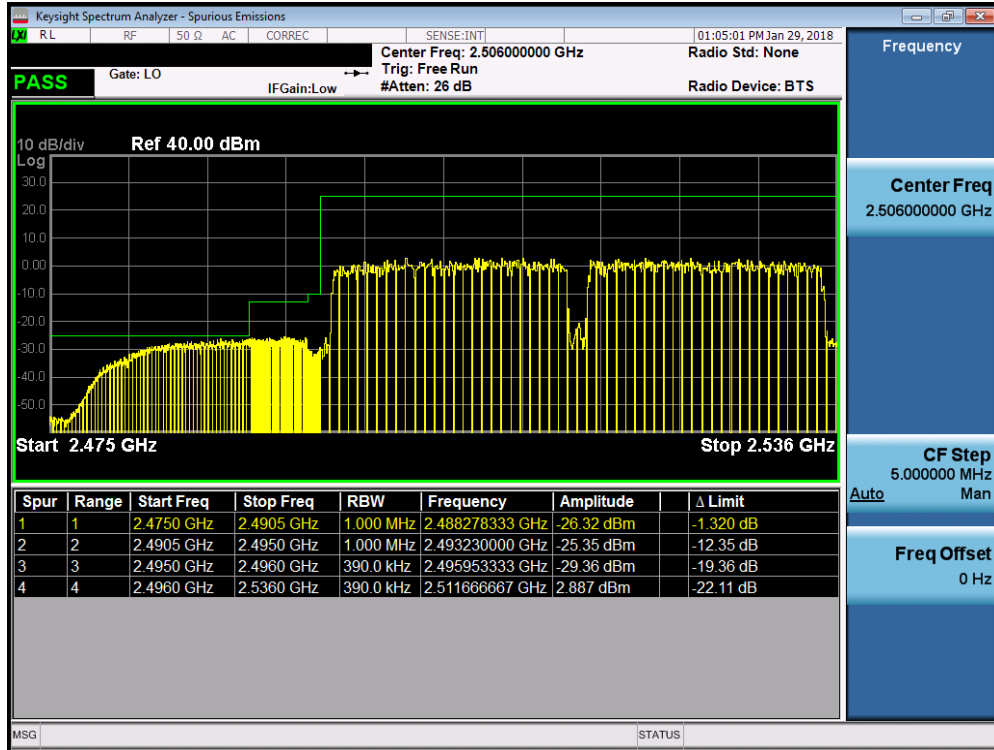


Table 7-116. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

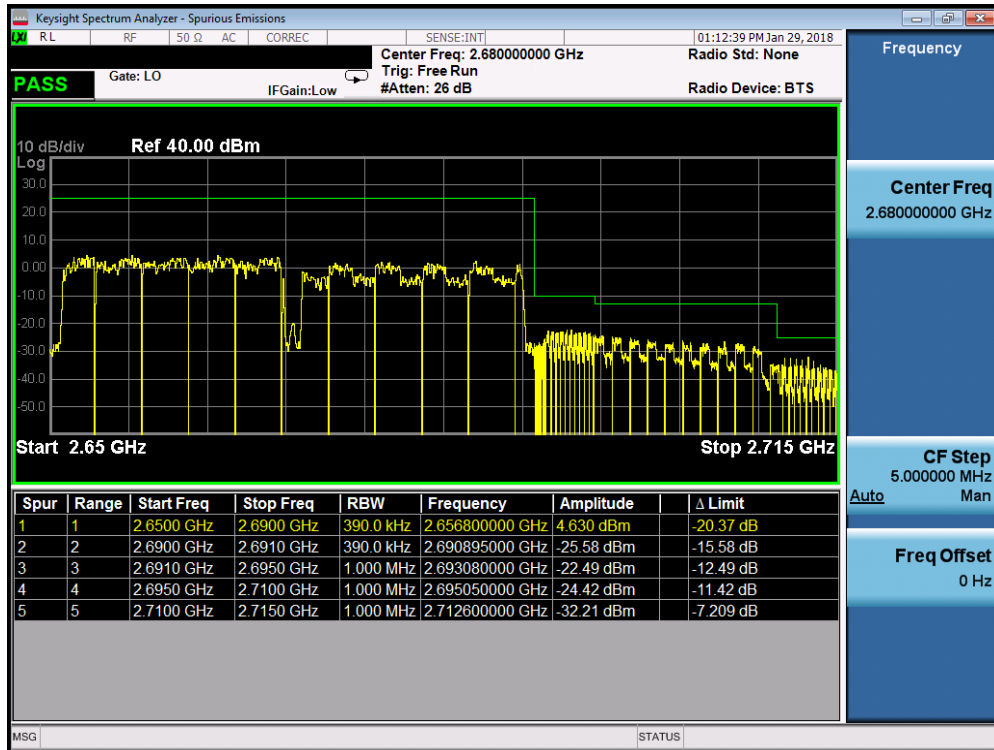


Table 7-117. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 81 of 113

7.6 Radiated Power (ERP/EIRP)

\$22.913(a)(2) \$27.50(h)(2) \$27.50(b)(10) \$27.50(c)(10) \$27.50(d)(4) \$27.50(a)(3)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 82 of 113

Test Setup

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

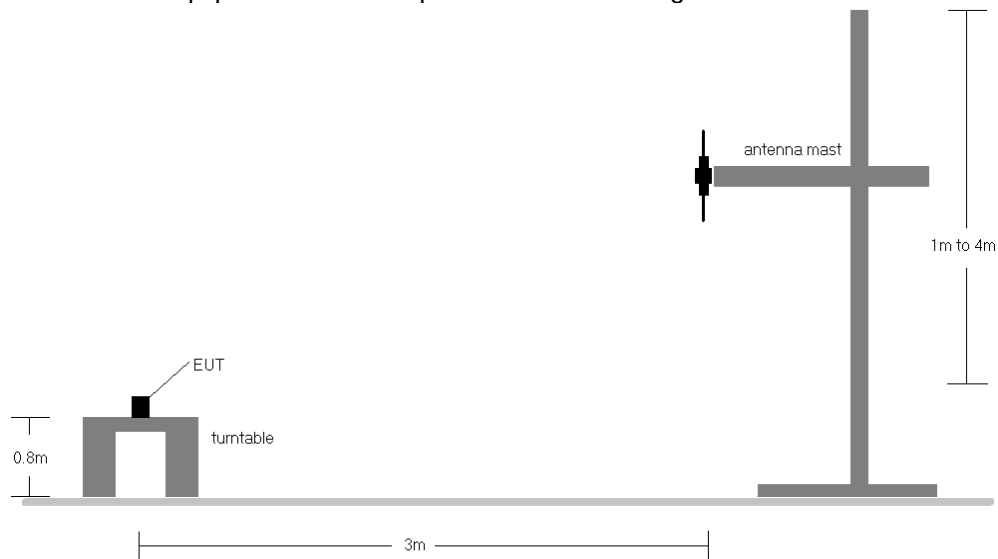


Figure 7-5. Radiated Test Setup <1GHz

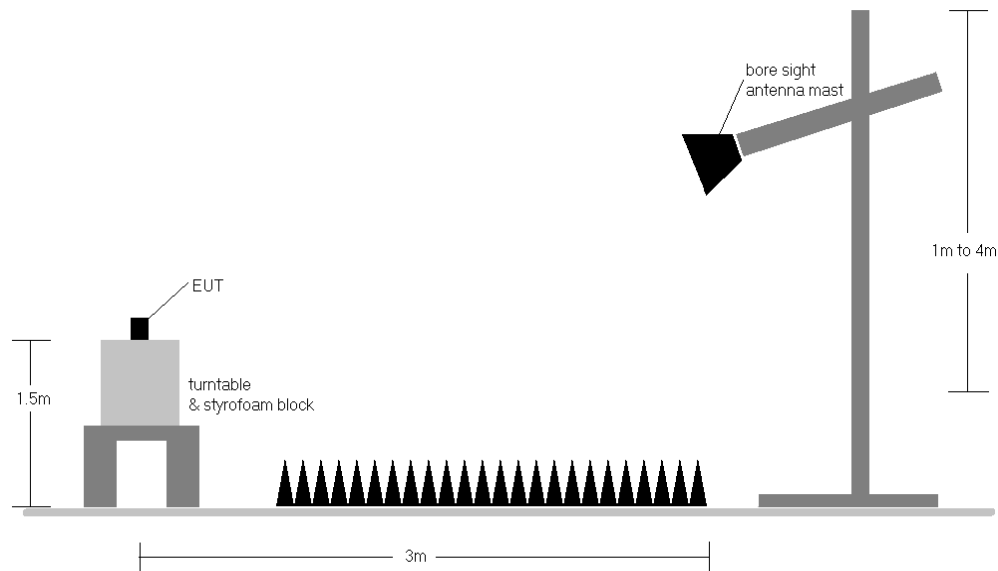


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 83 of 113

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
706.50	5	QPSK	H	150	18	1 / 24	18.65	1.11	17.61	0.058	34.77	-17.17
710.00	5	QPSK	H	150	19	1 / 24	19.12	1.13	18.10	0.065	34.77	-16.67
713.50	5	QPSK	H	15	18	1 / 24	19.21	1.15	18.21	0.066	34.77	-16.56
713.50	5	16-QAM	H	15	18	1 / 24	18.34	1.15	17.34	0.054	34.77	-17.43
713.50	5	64-QAM	H	15	18	1 / 24	17.46	1.15	16.46	0.044	34.77	-18.31
709.00	10	QPSK	H	150	16	1 / 49	18.89	1.12	17.86	0.061	34.77	-16.91
710.00	10	QPSK	H	150	23	1 / 49	18.78	1.13	17.76	0.060	34.77	-17.01
711.00	10	QPSK	H	150	16	1 / 49	19.36	1.14	18.35	0.068	34.77	-16.42
711.00	10	16-QAM	H	150	16	1 / 49	18.40	1.14	17.39	0.055	34.77	-17.38
711.00	10	64-QAM	H	150	16	1 / 49	17.54	1.14	16.53	0.045	34.77	-18.24
711.00	10	QPSK	V	150	30	1 / 74	18.61	1.14	17.60	0.058	34.77	-17.17
711.00	10 (WCP)	QPSK	H	150	40	1 / 74	18.45	1.14	17.44	0.056	34.77	-17.33

Table 7-5. ERP Data (Band 17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	150	330	1 / 0	17.99	1.32	17.16	0.052	34.77	-17.61
782.00	5	QPSK	H	150	330	1 / 0	17.85	1.33	17.03	0.050	34.77	-17.74
784.50	5	QPSK	H	150	330	1 / 0	17.67	1.34	16.86	0.049	34.77	-17.91
779.50	5	16-QAM	H	150	330	1 / 0	17.18	1.32	16.35	0.043	34.77	-18.42
779.50	5	64-QAM	H	150	330	1 / 0	16.23	1.32	15.40	0.035	34.77	-19.37
782.00	10	QPSK	H	150	8	1 / 0	17.98	1.33	17.16	0.052	34.77	-17.61
782.00	10	16-QAM	H	150	8	1 / 0	17.13	1.33	16.31	0.043	34.77	-18.46
782.00	10	64-QAM	H	150	8	1 / 0	15.36	1.33	14.54	0.028	34.77	-20.23
782.00	10	QPSK	V	150	330	1 / 0	13.74	1.33	12.92	0.020	34.77	-21.85
782.00	10 (WCP)	QPSK	H	150	8	1 / 0	16.80	1.33	15.98	0.040	34.77	-18.79

Table 7-6. ERP Data (Band 13)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 84 of 113

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	150	10	1 / 0	20.73	1.50	20.08	0.102	38.45	-18.37
836.50	1.4	QPSK	V	150	10	1 / 5	21.27	1.50	20.62	0.115	38.45	-17.83
848.30	1.4	QPSK	V	150	10	1 / 0	20.49	1.50	19.84	0.096	38.45	-18.61
836.50	1.4	16-QAM	V	150	10	1 / 5	20.00	1.50	19.35	0.086	38.45	-19.10
836.50	1.4	64-QAM	V	150	10	1 / 5	19.17	1.50	18.52	0.071	38.45	-19.93
825.50	3	QPSK	V	150	34	1 / 14	20.92	1.50	20.27	0.106	38.45	-18.18
836.50	3	QPSK	V	150	34	1 / 0	21.19	1.50	20.54	0.113	38.45	-17.91
847.50	3	QPSK	V	150	34	1 / 0	20.71	1.50	20.06	0.101	38.45	-18.39
836.50	3	16-QAM	V	150	34	1 / 0	20.24	1.50	19.59	0.091	38.45	-18.86
836.50	3	64-QAM	V	150	34	1 / 0	19.17	1.50	18.52	0.071	38.45	-19.93
826.50	5	QPSK	V	150	29	1 / 24	20.93	1.50	20.28	0.107	38.45	-18.17
836.50	5	QPSK	V	150	29	1 / 0	21.61	1.50	20.96	0.125	38.45	-17.49
846.50	5	QPSK	V	150	29	1 / 0	20.82	1.50	20.17	0.104	38.45	-18.28
836.50	5	16-QAM	V	150	29	1 / 0	20.25	1.50	19.60	0.091	38.45	-18.85
836.50	5	64-QAM	V	150	29	1 / 0	19.18	1.50	18.53	0.071	38.45	-19.92
829.00	10	QPSK	V	150	13	1 / 49	21.09	1.50	20.44	0.111	38.45	-18.01
836.50	10	QPSK	V	150	13	1 / 0	21.12	1.50	20.47	0.111	38.45	-17.98
844.00	10	QPSK	V	150	13	1 / 0	21.01	1.50	20.36	0.109	38.45	-18.09
836.50	10	16-QAM	V	150	13	1 / 0	20.35	1.50	19.70	0.093	38.45	-18.75
836.50	10	64-QAM	V	150	13	1 / 0	19.17	1.50	18.52	0.071	38.45	-19.93
836.50	5.0	QPSK	H	150	357	36 / 18	18.90	1.50	18.25	0.067	38.45	-20.20
836.50	5 (WCP)	QPSK	H	150	3	1 / 99	19.57	1.50	18.92	0.078	38.45	-19.53

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

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	150	66	1 / 0	21.47	1.50	20.82	0.121	38.45	-17.63
836.50	15	QPSK	V	150	66	1 / 0	21.58	1.50	20.93	0.124	38.45	-17.52
841.50	15	QPSK	V	150	66	1 / 0	21.56	1.50	20.91	0.123	38.45	-17.54
836.50	15	16-QAM	V	150	66	1 / 0	20.81	1.50	20.16	0.104	38.45	-18.29
836.50	15	64-QAM	V	150	66	1 / 0	19.90	1.50	19.25	0.084	38.45	-19.20

Table 7-8. ERP Data (Band 26)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 				Approved by: Quality Manager
Test Report S/N: 1M1801230010-03-A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset			Page 85 of 113

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	303	1 / 0	13.67	5.73	19.40	0.087	33.01	-13.61
2593.00	5	QPSK	H	150	319	1 / 0	17.28	6.07	23.35	0.216	33.01	-9.66
2687.50	5	QPSK	H	150	303	1 / 0	16.84	6.48	23.32	0.215	33.01	-9.69
2593.00	5	16-QAM	H	150	319	1 / 0	15.99	6.07	22.06	0.161	33.01	-10.95
2593.00	5	64-QAM	H	150	319	1 / 0	15.06	6.07	21.13	0.130	33.01	-11.88
2501.00	10	QPSK	H	150	318	1 / 0	17.86	5.73	23.59	0.229	33.01	-9.42
2593.00	10	QPSK	H	150	319	1 / 0	17.84	6.07	23.91	0.246	33.01	-9.10
2685.00	10	QPSK	H	150	319	1 / 0	16.85	6.47	23.32	0.215	33.01	-9.69
2593.00	10	16-QAM	H	150	319	1 / 0	16.51	6.07	22.58	0.181	33.01	-10.43
2593.00	10	64-QAM	H	150	319	1 / 0	15.79	6.07	21.86	0.154	33.01	-11.15
2503.50	15	QPSK	H	150	315	1 / 74	14.81	5.74	20.55	0.114	33.01	-12.46
2593.00	15	QPSK	H	150	323	1 / 74	16.93	6.07	23.00	0.200	33.01	-10.01
2682.50	15	QPSK	H	150	324	1 / 0	16.26	6.46	22.72	0.187	33.01	-10.29
2507.50	15	16-QAM	H	150	322	1 / 74	16.03	5.76	21.79	0.151	33.01	-11.22
2593.00	15	64-QAM	H	150	323	1 / 74	15.38	6.07	21.45	0.140	33.01	-11.56
2506.00	20	QPSK	H	150	322	1 / 0	14.47	5.75	20.22	0.105	33.01	-12.79
2593.00	20	QPSK	H	150	322	1 / 0	17.56	6.07	23.63	0.231	33.01	-9.38
2680.00	20	QPSK	H	150	322	1 / 0	16.91	6.45	23.36	0.217	33.01	-9.65
2593.00	20	16-QAM	H	150	322	1 / 0	16.38	6.07	22.45	0.176	33.01	-10.56
2593.00	20	64-QAM	H	150	322	1 / 0	15.68	6.07	21.75	0.150	33.01	-11.26
2593.00	10	QPSK	V	150	15	1 / 0	12.26	6.27	18.53	0.071	33.01	-14.48
2593.00	10 (WCP)	QPSK	H	150	311	1 / 0	15.45	6.07	21.52	0.142	33.01	-11.49

Table 7-9. EIRP Data (Band 41)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 86 of 113

7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §27.53(c) §27.53(f) §27.53(g) §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 87 of 113

Test Setup

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

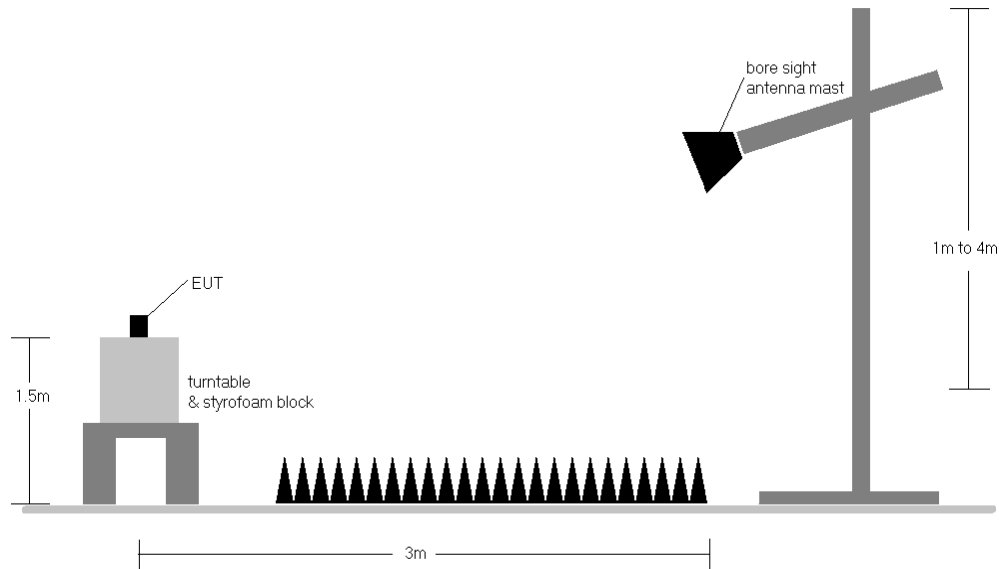


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 17

OPERATING FREQUENCY: 704.00 MHz
 CHANNEL: 23060
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	-	-	-70.32	3.84	-66.48	-53.5
2112.00	H	-	-	-68.03	4.79	-63.23	-50.2
2816.00	H	-	-	-67.20	5.69	-61.51	-48.5

Table 7-10. Radiated Spurious Data (Band 17 – Low Channel)

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	-	-	-70.07	3.90	-66.16	-53.2
2122.50	H	-	-	-68.28	4.78	-63.49	-50.5
2830.00	H	-	-	-66.79	5.73	-61.06	-48.1

Table 7-11. Radiated Spurious Data (Band 17 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 89 of 113

OPERATING FREQUENCY: 711.00 MHz
 CHANNEL: 23130
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	150	304	-69.74	3.97	-65.78	-52.8
2133.00	H	-	-	-67.24	4.78	-62.47	-49.5
2844.00	H	-	-	-66.76	5.77	-60.99	-48.0

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

OPERATING FREQUENCY: 711.00 MHz
 CHANNEL: 23130
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	150	13	-69.59	3.97	-65.63	-52.6
2133.00	H	-	-	-67.92	4.78	-63.14	-50.1
2844.00	H	-	-	-67.02	5.77	-61.25	-48.2

Table 7-13. Radiated Spurious Data with WCP (Band 17 – High Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 90 of 113

Band 13

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	-	-	-63.51	4.88	-58.63	-45.6
3128.00	H	-	-	-63.14	6.02	-57.12	-44.1

Table 7-14. Radiated Spurious Data (Band 13 – Mid Channel)

MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	-	-	-63.90	4.50	-59.40	-19.4

Table 7-15. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	-	-	-67.21	4.88	-62.33	-49.3

Table 7-16. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 				Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset			Page 91 of 113

Band 5/26

OPERATING FREQUENCY: 826.50 MHz
 CHANNEL: 26815
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	H	-	-	-66.74	4.81	-61.93	-48.9
2479.50	H	-	-	-63.37	4.99	-58.38	-45.4

Table 7-17. Radiated Spurious Data (Band 5/26 – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-66.99	4.86	-62.13	-49.1
2509.50	H	-	-	-62.82	5.10	-57.72	-44.7

Table 7-18. Radiated Spurious Data (Band 5/26 – Mid Channel)

FCC ID: A3LSCV39			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset			Page 92 of 113

OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 27015
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.00	H	-	-	-66.70	4.91	-61.79	-48.8
2539.50	H	-	-	-63.32	5.27	-58.04	-45.0

Table 7-19. Radiated Spurious Data (Band 5/26 – High Channel)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-70.22	4.86	-65.36	-52.4
2509.50	H	-	-	-67.09	5.10	-61.99	-49.0

Table 7-20. Radiated Spurious Data with WCP (Band 5/26 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 93 of 113

Band 41

OPERATING FREQUENCY: 2505.00 MHz
 CHANNEL: 39740
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5010.00	H	150	333	-53.77	8.34	-45.43	-20.4
7515.00	H	150	101	-53.90	8.44	-45.46	-20.5
10020.00	H	-	-	-56.69	9.87	-46.83	-21.8
12525.00	H	-	-	-53.12	9.34	-43.78	-18.8

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

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5186.00	H	-	-	-59.63	8.45	-51.18	-26.2
7779.00	H	150	328	-49.39	8.75	-40.64	-15.6
10372.00	H	150	39	-53.88	9.73	-44.16	-19.2
12965.00	H	-	-	-51.67	9.19	-42.48	-17.5

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

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 94 of 113

OPERATING FREQUENCY: 2685.00 MHz
 CHANNEL: 41540
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5370.00	H	150	312	-57.65	8.40	-49.25	-24.2
8055.00	H	150	32	-56.22	9.21	-47.00	-22.0
10740.00	H	-	-	-54.79	9.51	-45.27	-20.3
13425.00	H	-	-	-50.76	9.06	-41.70	-16.7

Table 7-23. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5186.00	H	150	86	-55.19	8.45	-46.74	-21.7
7779.00	H	150	57	-52.04	8.75	-43.29	-18.3
10372.00	H	-	-	-52.11	9.73	-42.38	-17.4

Table 7-24. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 95 of 113

7.8 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW $\geq 3 \times$ RBW
3. No. of sweep points $\geq 2 \times$ span / RBW
4. Detector = RMS
5. Trace mode = Max Hold
6. The trace was allowed to stabilize

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Test Setup

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

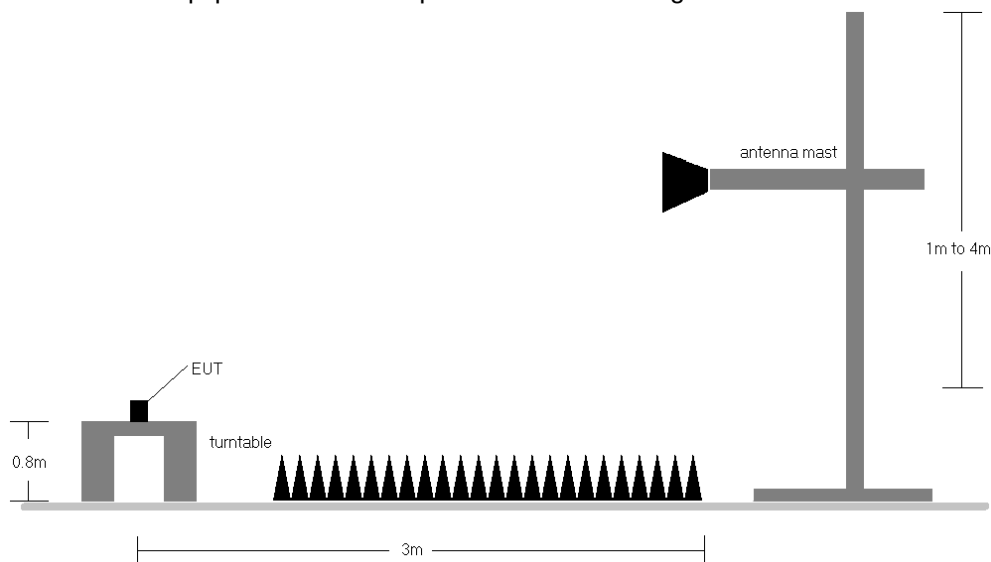
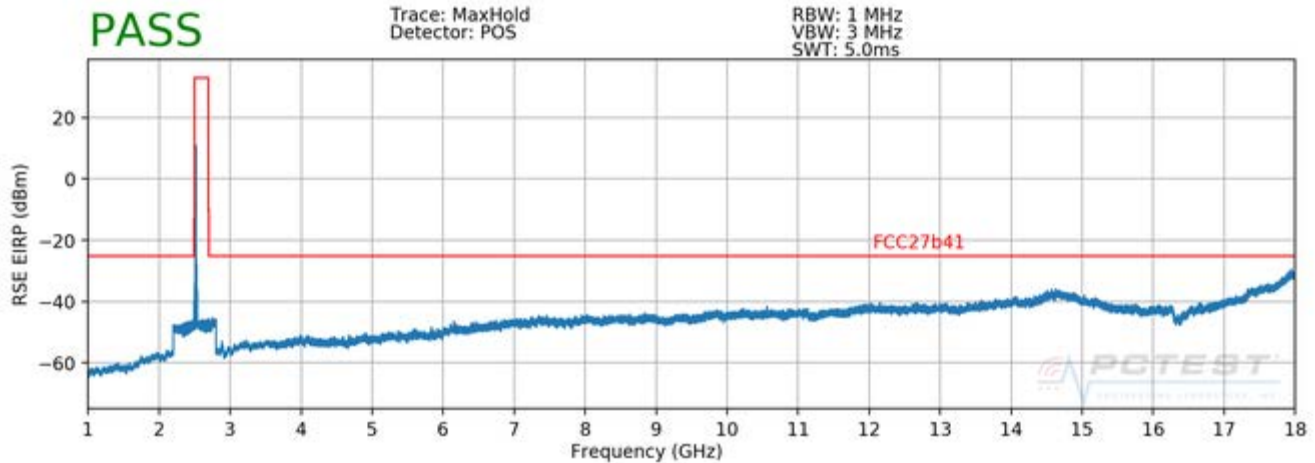


Figure 7-8. Test Instrument & Measurement Setup

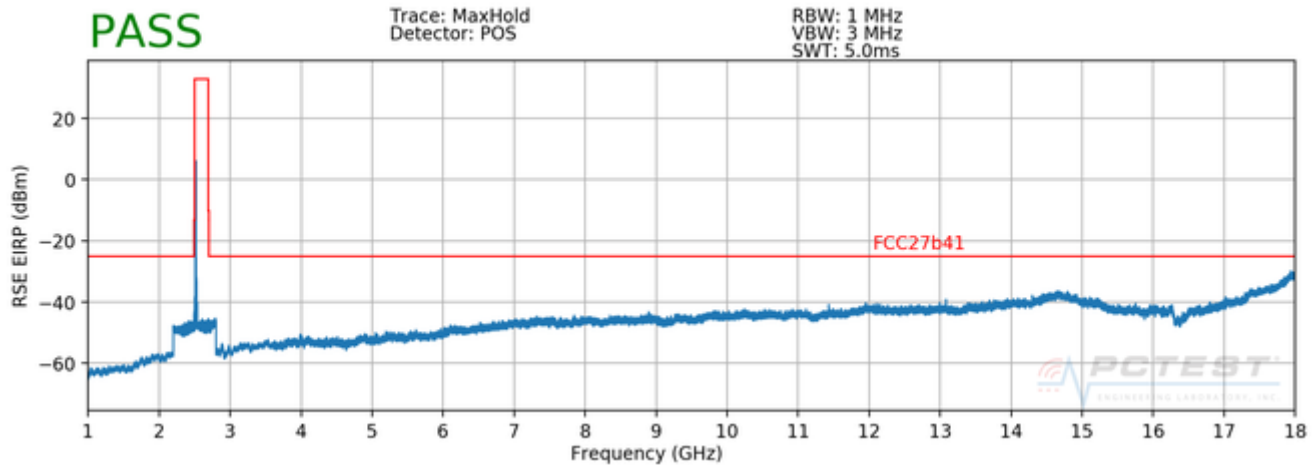
Test Notes

- 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 with its standard battery.
- 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.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

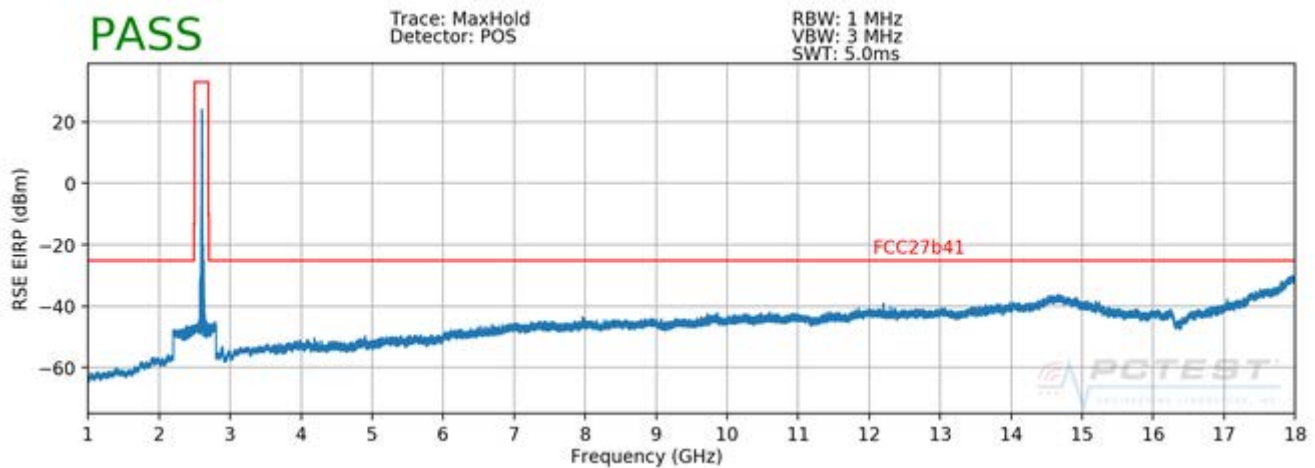
FCC ID: A3LSCV39	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 97 of 113



Plot 7-25. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. H – Low Channel)

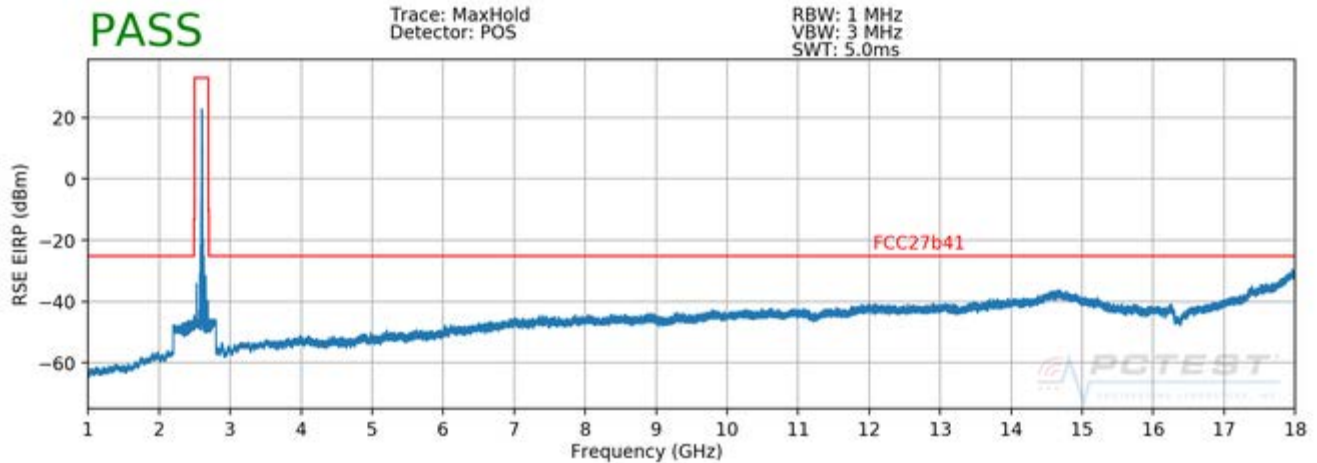


Plot 7-26. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. V – Low Channel)

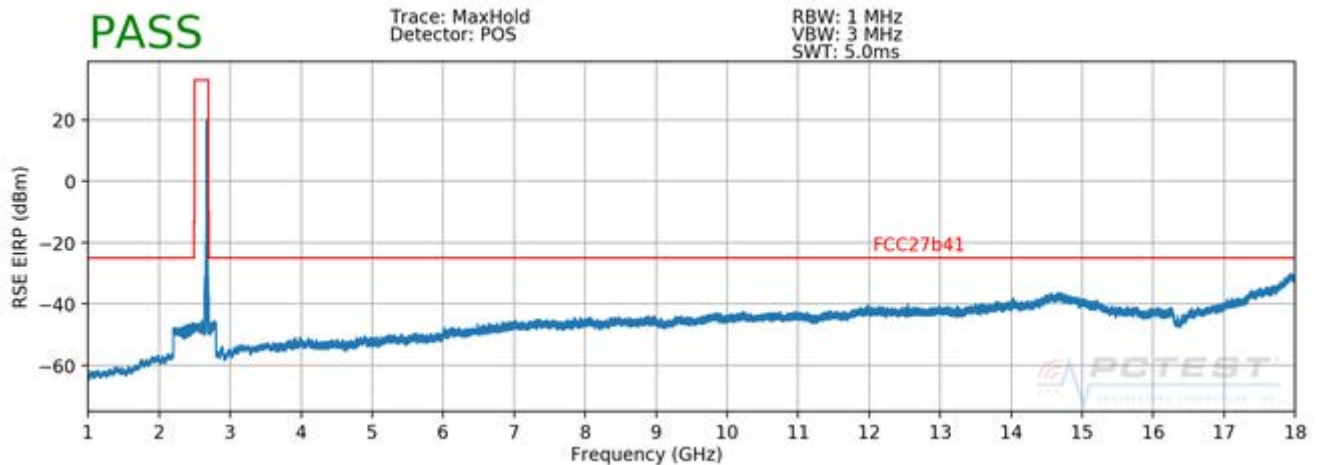


Plot 7-27. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. H – Mid Channel)

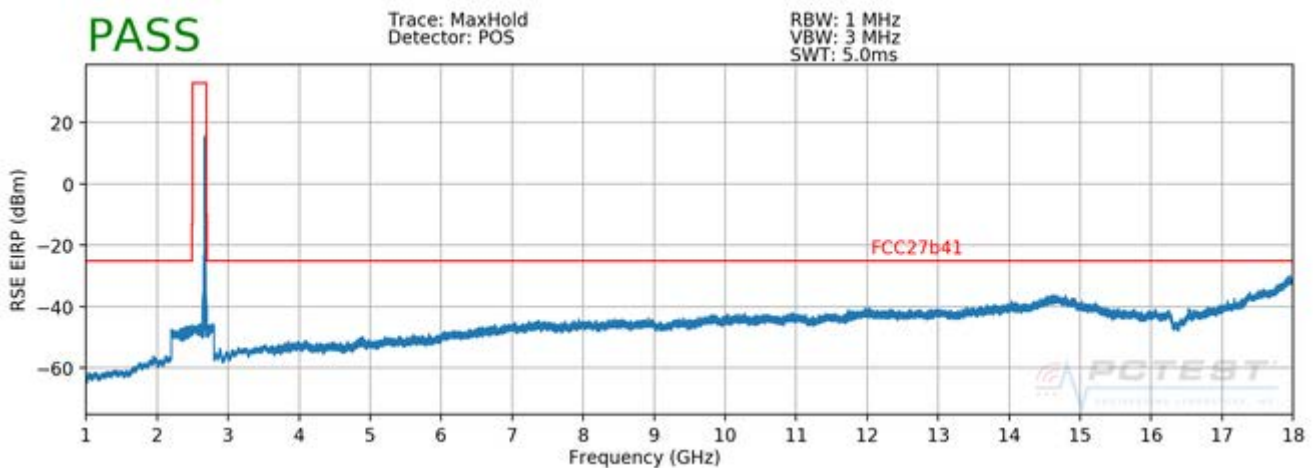
FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 98 of 113



Plot 7-28. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. V – Mid Channel)

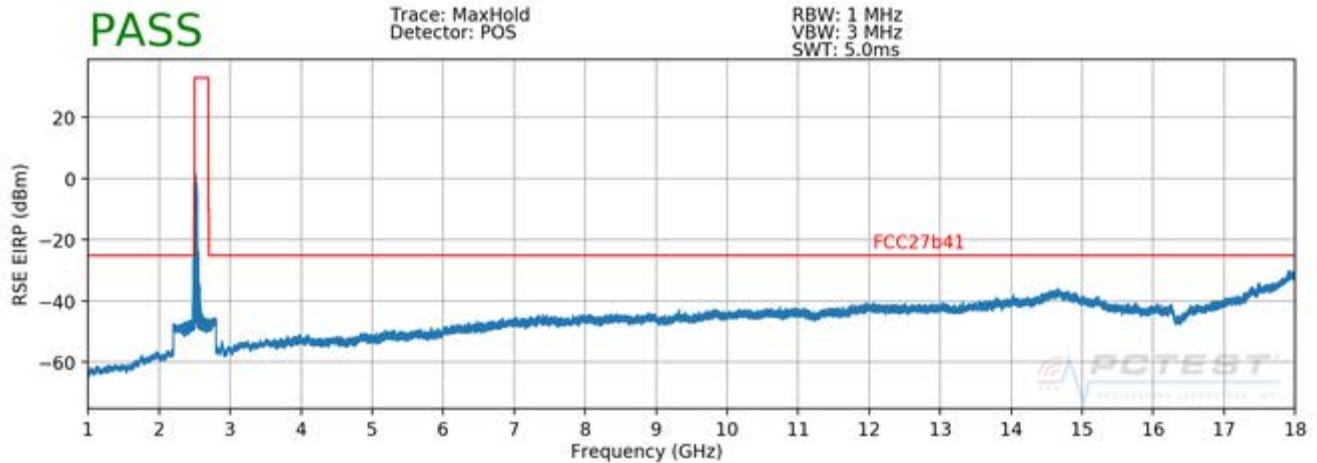


Plot 7-29. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. H- High Channel)

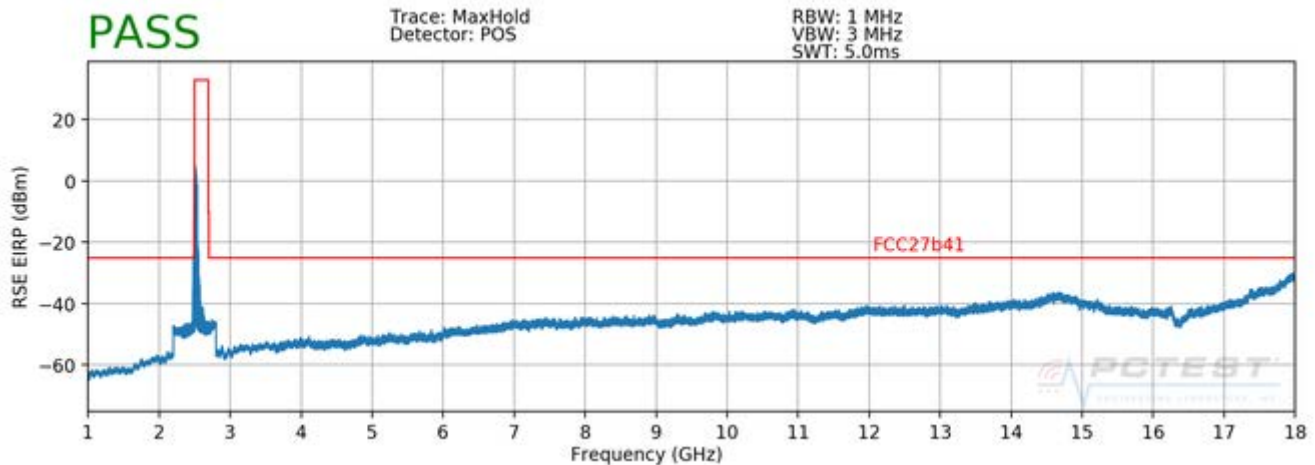


Plot 7-30. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 1/99 SCC 1/0, Ant.Pol. V – High Channel)

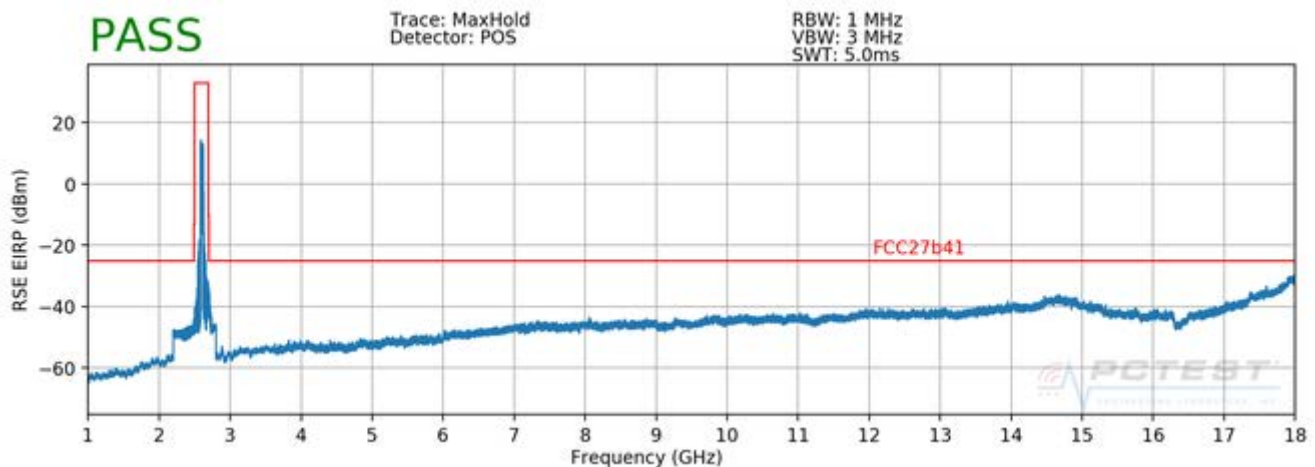
FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 99 of 113



Plot 7-31. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. H – Low Channel)

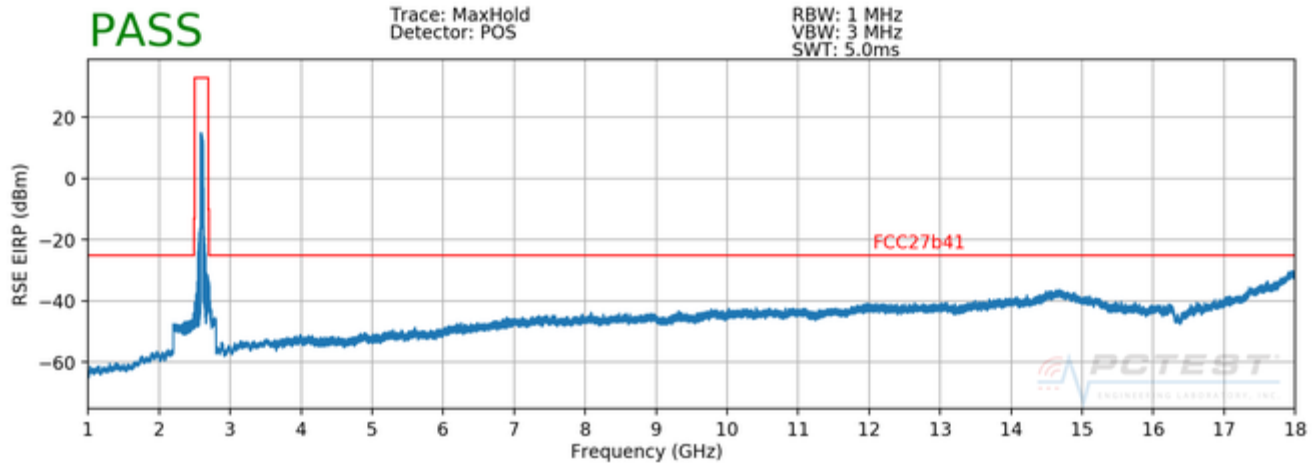


Plot 7-32. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. V – Low Channel)

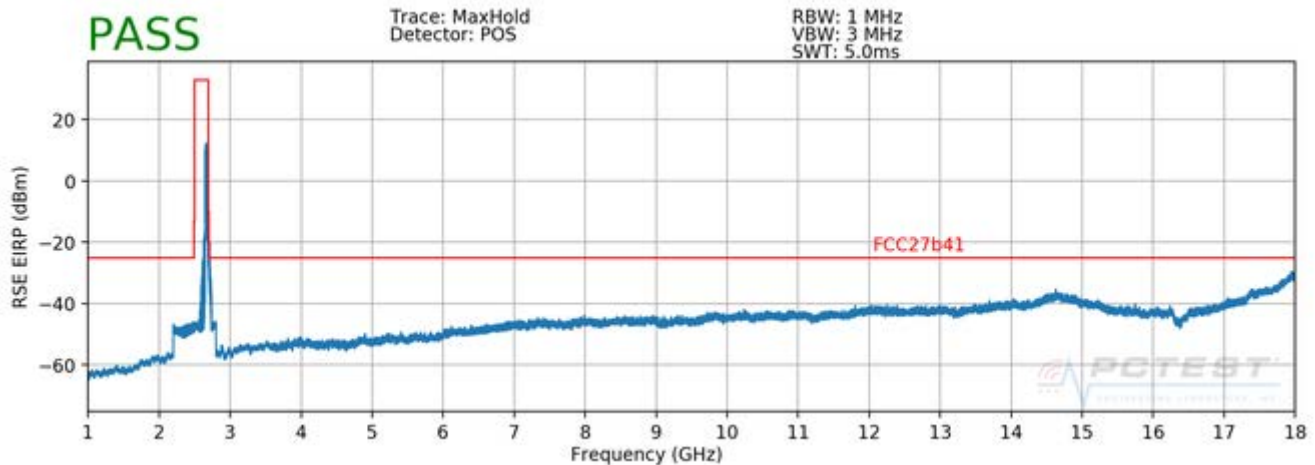


Plot 7-33. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. H – Mid Channel)

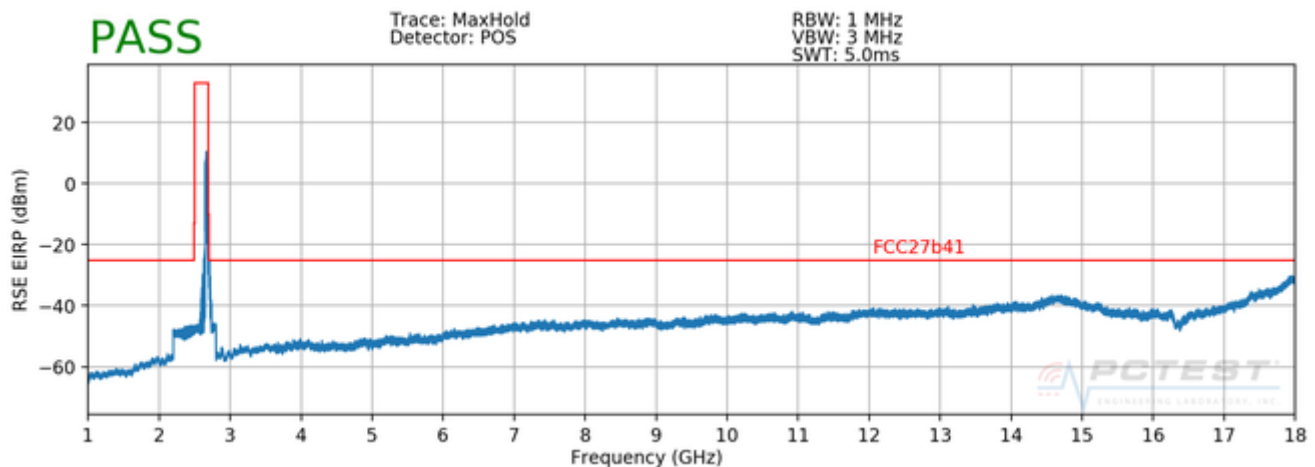
FCC ID: A3LSCV39	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset		Page 100 of 113



Plot 7-34. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. V – Mid Channel)



Plot 7-35. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. H– High Channel)



Plot 7-36. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz QPSK – PCC 100/0 SCC 100/0, Ant.Pol. V – High Channel)

FCC ID: A3LSCV39	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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OPERATING FREQUENCY (PCC): 2506.00 MHz
 OPERATING FREQUENCY (SCC): 2525.80
 CHANNEL (PCC): 39750
 CHANNEL (SCC): 39948
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5012.00	H	120	319	-56.94	11.13	-45.80	-20.8
7518.00	H	-	-	-65.48	11.02	-54.45	-29.5
10024.00	H	-	-	-64.77	12.16	-52.61	-27.6

Table 7-5. (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – Low Channel)

OPERATING FREQUENCY (PCC): 2593.00 MHz
 OPERATING FREQUENCY (SCC): 2573.00
 CHANNEL (PCC): 40620
 CHANNEL (SCC): 40422
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5186.00	H	340	241	-66.79	10.75	-56.04	-31.0
7779.00	H	398	70	-68.58	11.40	-57.18	-32.2
10372.00	H	-	-	-68.64	12.59	-56.05	-31.1
12965.00	H	-	-	-66.13	12.70	-53.43	-28.4

Table 7-6. (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – Mid Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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OPERATING FREQUENCY (SCC): 2680.00 MHz
 OPERATING FREQUENCY (PCC): 2660.20
 CHANNEL (SCC): 41490
 CHANNEL (PCC): 41292
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5360.00	H	150	324	-61.91	11.02	-50.88	-25.9
8040.00	H	398	318	-61.08	11.39	-49.69	-24.7
10720.00	H	-	-	-63.56	12.82	-50.74	-25.7

Table 7-7. (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – High Channel)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1801230010-03.A3L	Test Dates: 1/24-2/20/2018	EUT Type: Portable Handset	Page 103 of 113

7.9 Frequency Stability / Temperature Variation

\$2.1055 \$22.355 \$24.235 \$27.54

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 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, 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

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

Test Setup

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

Test Notes

None

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
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Band 17 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 4.24 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.24	+ 20 (Ref)	707,500,084	84	0.0000119
100 %		- 30	707,500,025	25	0.0000035
100 %		- 20	707,499,669	-331	-0.0000468
100 %		- 10	707,500,113	113	0.0000160
100 %		0	707,500,188	188	0.0000266
100 %		+ 10	707,499,997	-3	-0.0000004
100 %		+ 20	707,499,819	-181	-0.0000256
100 %		+ 30	707,499,995	-5	-0.0000007
100 %		+ 40	707,499,959	-41	-0.0000058
100 %		+ 50	707,499,867	-133	-0.0000188
BATT. ENDPOINT	3.56	+ 20	707,499,765	-235	-0.0000332

Table 7-37. Frequency Stability Data (Band 17)

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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Band 17 Frequency Stability Measurements

§2.1055 §27.54

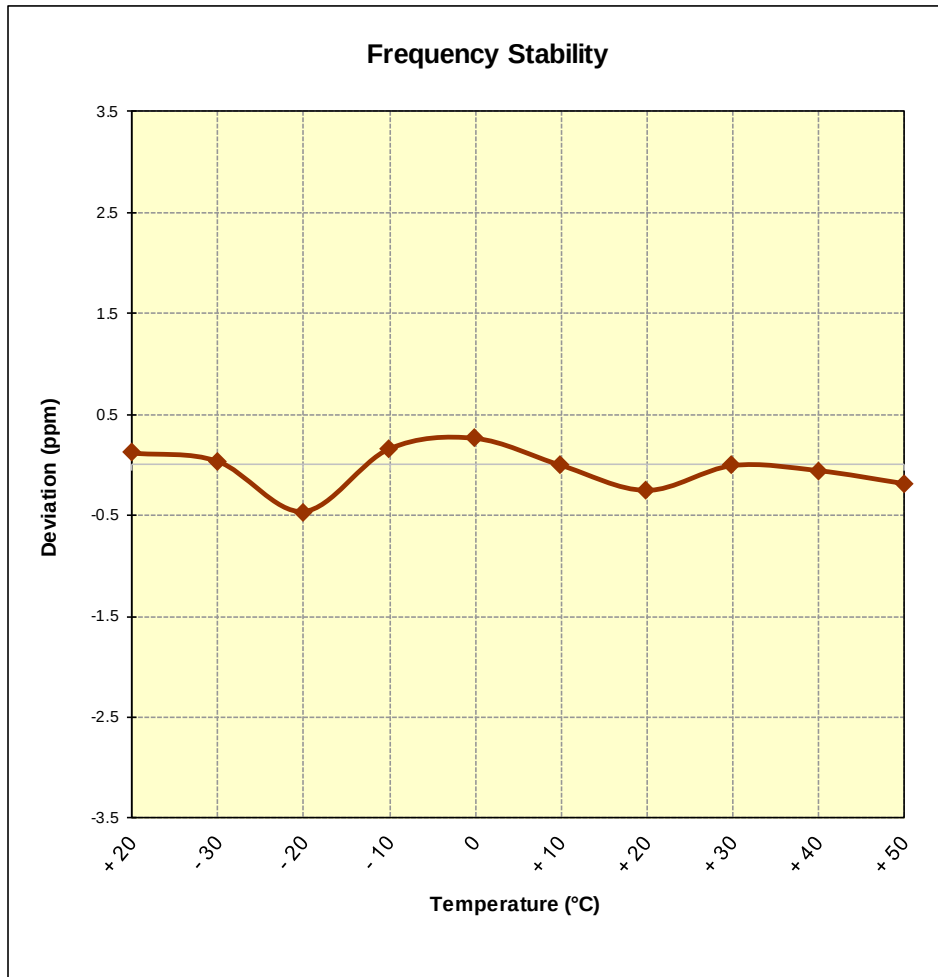


Figure 7-9. Frequency Stability Graph (Band 17)

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Band 13 Frequency Stability Measurements

\$2.1055 \$27.54

OPERATING FREQUENCY: 782,000,000 Hz
 CHANNEL: 23230
 REFERENCE VOLTAGE: 4.24 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.24	+ 20 (Ref)	782,000,286	286	0.0000366
100 %		- 30	781,999,529	-471	-0.0000602
100 %		- 20	781,999,857	-143	-0.0000183
100 %		- 10	781,999,726	-274	-0.0000350
100 %		0	781,999,905	-95	-0.0000121
100 %		+ 10	781,999,928	-72	-0.0000092
100 %		+ 20	782,000,060	60	0.0000077
100 %		+ 30	781,999,899	-101	-0.0000129
100 %		+ 40	781,999,846	-154	-0.0000197
100 %		+ 50	781,999,738	-262	-0.0000335
BATT. ENDPOINT	3.56	+ 20	782,000,375	375	0.0000480

Table 7-38. Frequency Stability Data (Band 13)

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.

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 13 Frequency Stability Measurements

§2.1055 §27.54

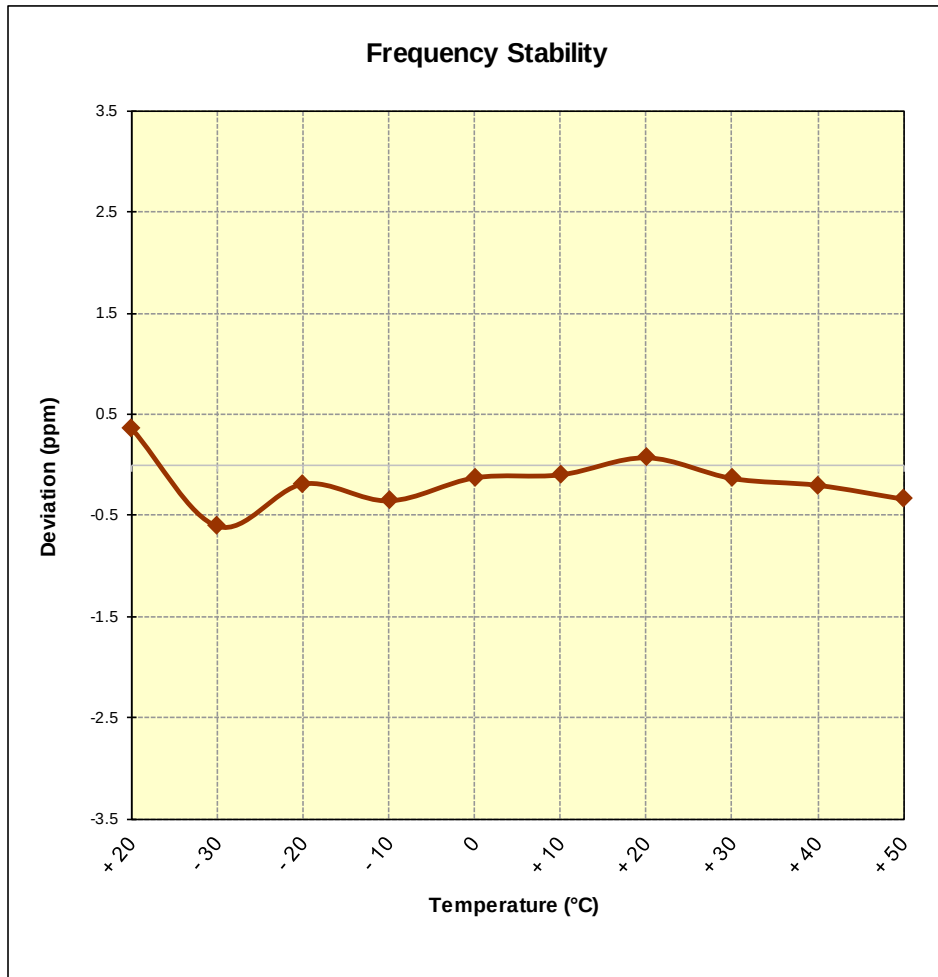


Figure 7-10. Frequency Stability Graph (Band 13)

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Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY: 831,500,000 Hz

CHANNEL: 26865

REFERENCE VOLTAGE: 4.24 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.24	+ 20 (Ref)	831,500,049	49	0.0000059
100 %		- 30	831,500,053	53	0.0000064
100 %		- 20	831,500,019	19	0.0000023
100 %		- 10	831,500,008	8	0.0000010
100 %		0	831,499,895	-105	-0.0000126
100 %		+ 10	831,499,531	-469	-0.0000564
100 %		+ 20	831,500,047	47	0.0000057
100 %		+ 30	831,500,083	83	0.0000100
100 %		+ 40	831,499,778	-222	-0.0000267
100 %		+ 50	831,499,959	-41	-0.0000049
BATT. ENDPOINT	3.56	+ 20	831,500,136	136	0.0000164

Table 7-39. Frequency Stability Data (Band 5/26)

FCC ID: A3LSCV39	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 5/26 Frequency Stability Measurements
§2.1055 §22.355

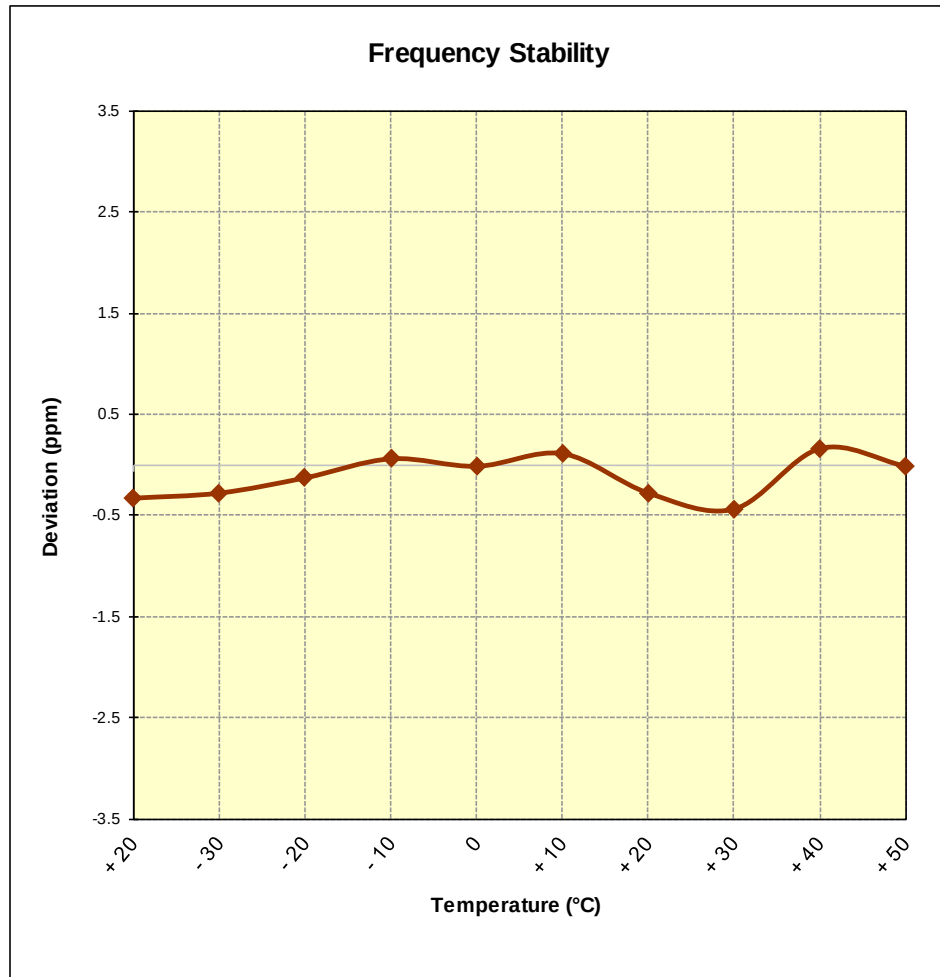


Figure 7-11. Frequency Stability Graph (Band 5/26)

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Band 41 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 4.24 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.24	+ 20 (Ref)	2,593,000,138	138	0.0000053
100 %		- 30	2,593,000,034	34	0.0000013
100 %		- 20	2,593,000,395	395	0.0000152
100 %		- 10	2,592,999,895	-105	-0.0000040
100 %		0	2,592,999,690	-310	-0.0000120
100 %		+ 10	2,592,999,962	-38	-0.0000015
100 %		+ 20	2,592,999,904	-96	-0.0000037
100 %		+ 30	2,592,999,711	-289	-0.0000111
100 %		+ 40	2,592,999,920	-80	-0.0000031
100 %		+ 50	2,592,999,952	-48	-0.0000019
BATT. ENDPOINT	3.56	+ 20	2,593,000,318	318	0.0000123

Table 7-40. Frequency Stability Data (Band 41)

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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Band 41 Frequency Stability Measurements
§2.1055 §27.54

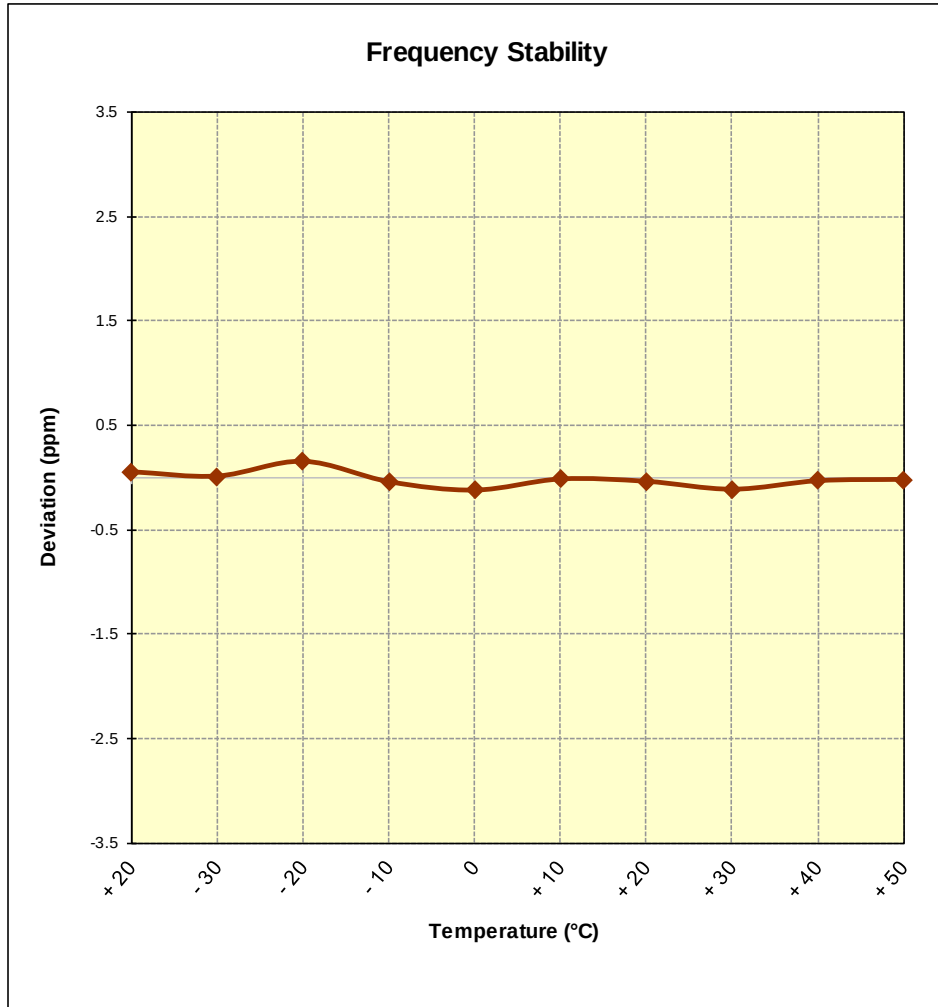


Figure 7-12. Frequency Stability Graph (Band 41)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset**
FCC ID: A3LSCV39 complies with all the requirements of Part 22 & 27 of the FCC Rules for LTE operation only.

FCC ID: A3LSCV39		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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