

7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §22.917(a) §24.238(a) §27.53(c) §27.53(h)

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.

Test Procedure Used

KDB 971168 D01 v02r02 – 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 x 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.

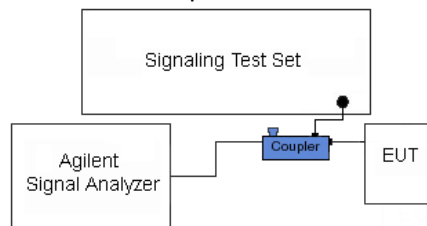




Figure 7-3. Test Instrument & Measurement Setup

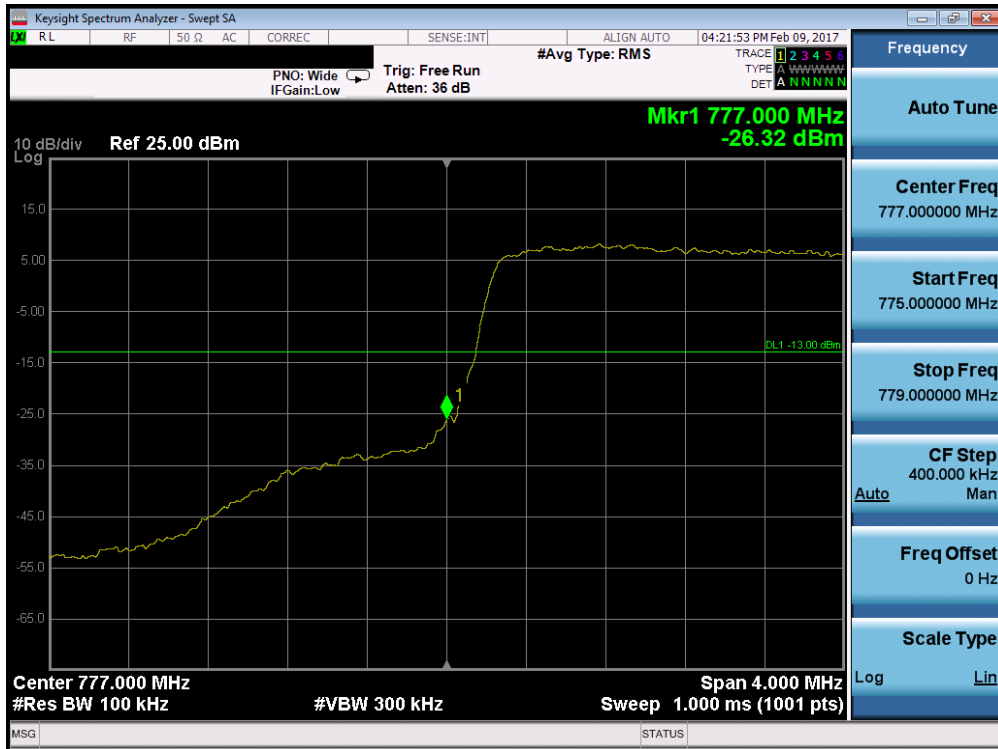
Test Notes

Per 22.917(b) 24.238(a) 27.53(h) 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(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.

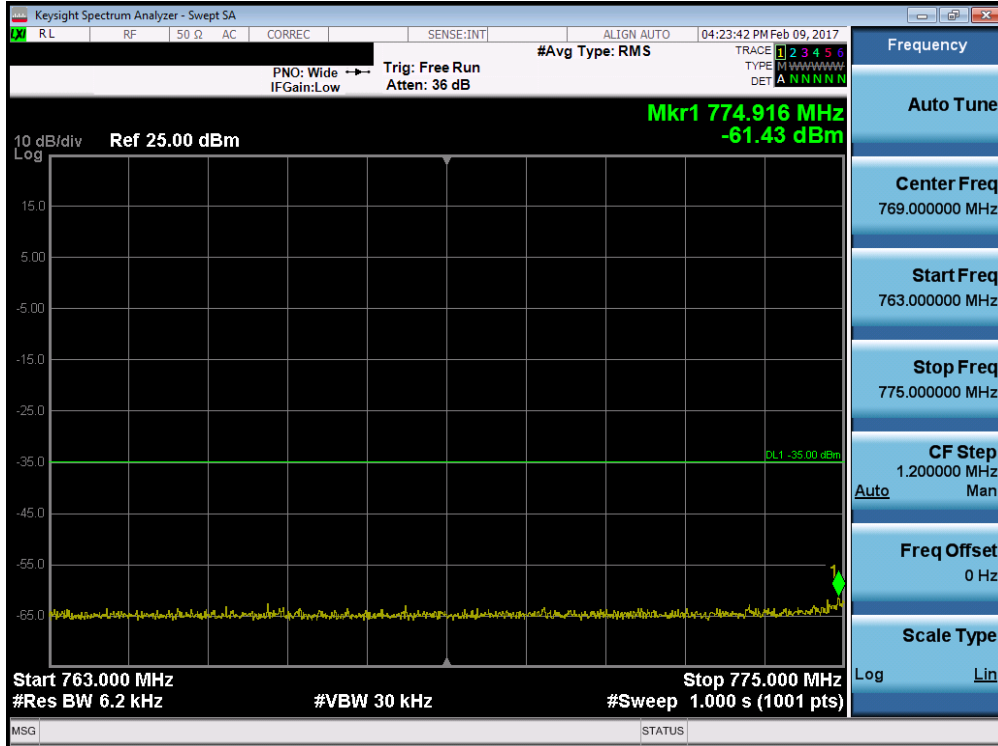
FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet	Page 54 of 118	

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.

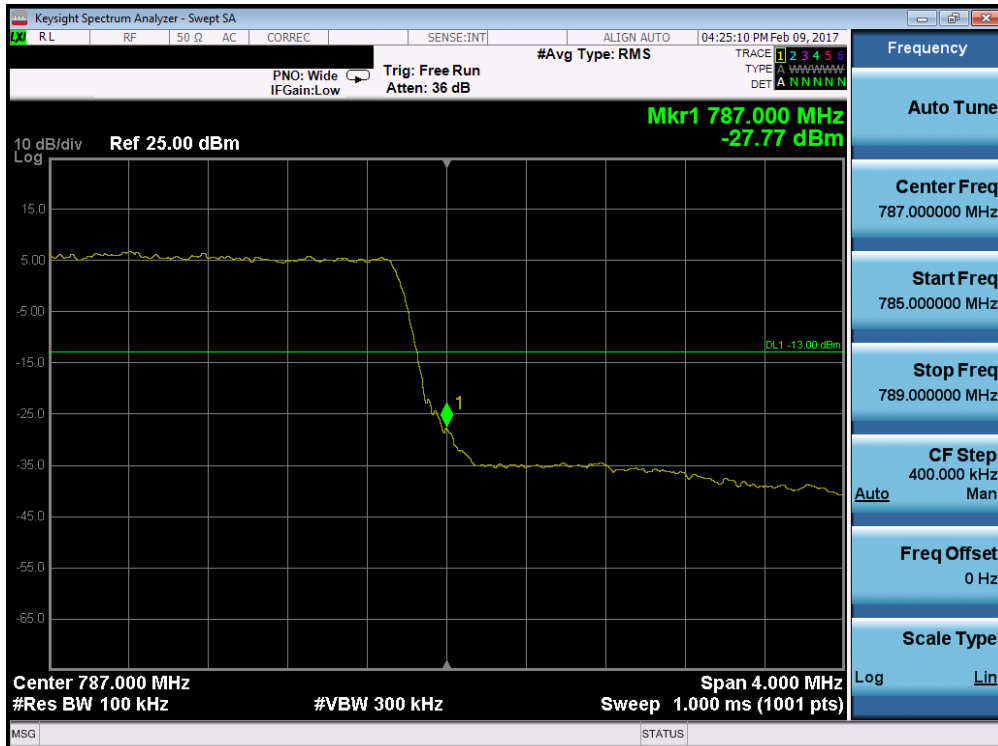


Plot 7-76. Lower Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 55 of 118

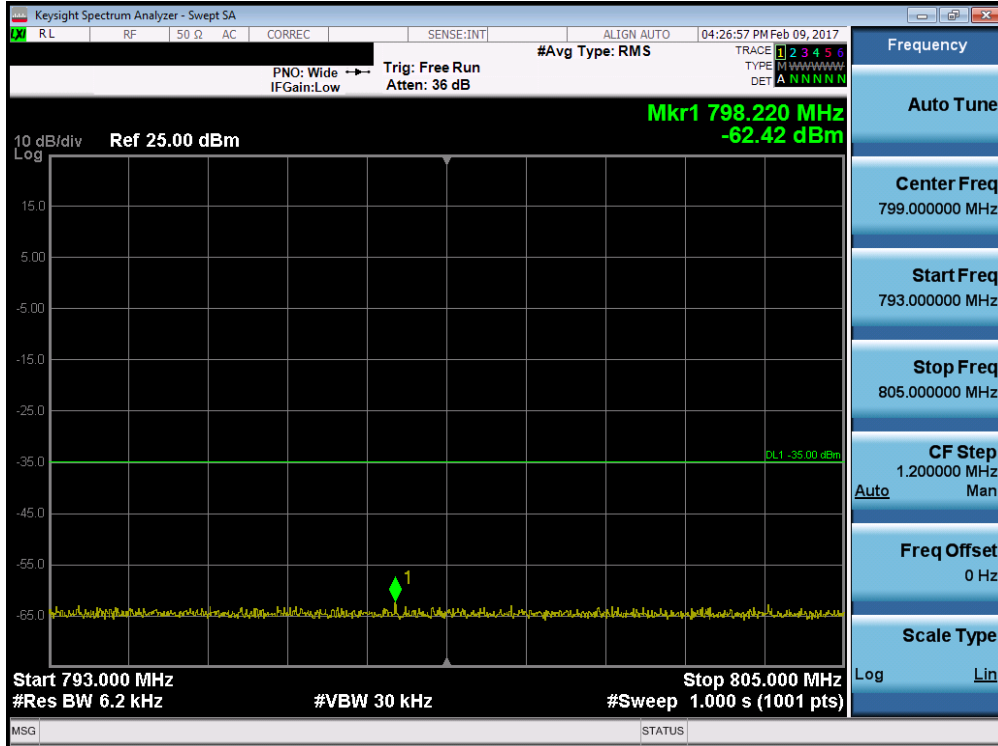


Plot 7-77. Lower Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

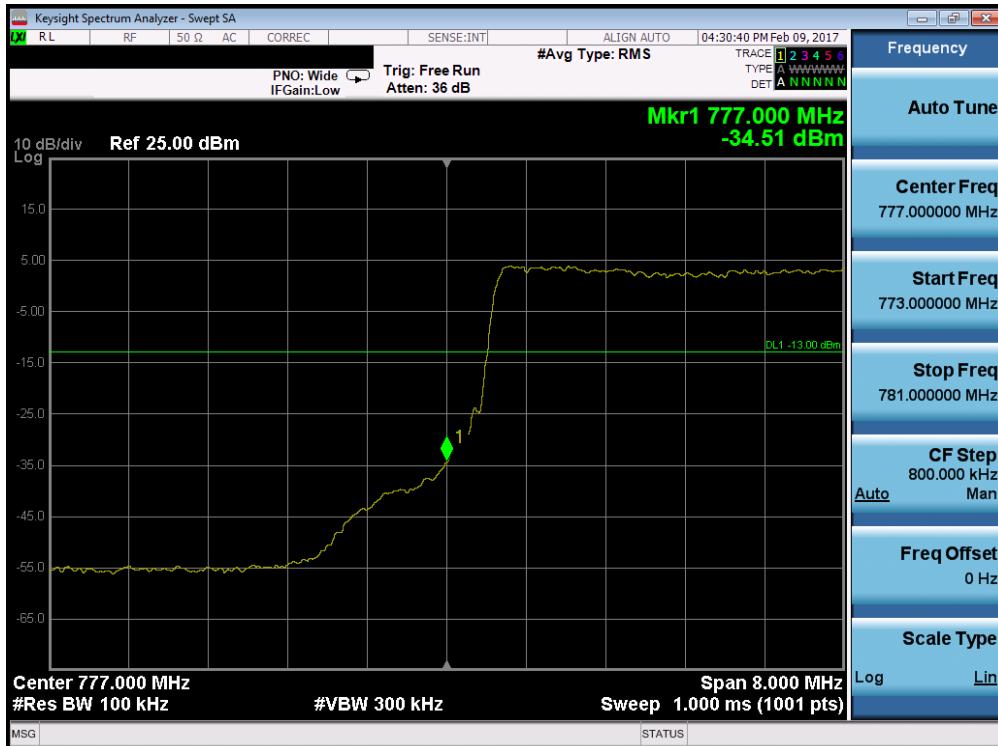


Plot 7-78. Upper Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 56 of 118

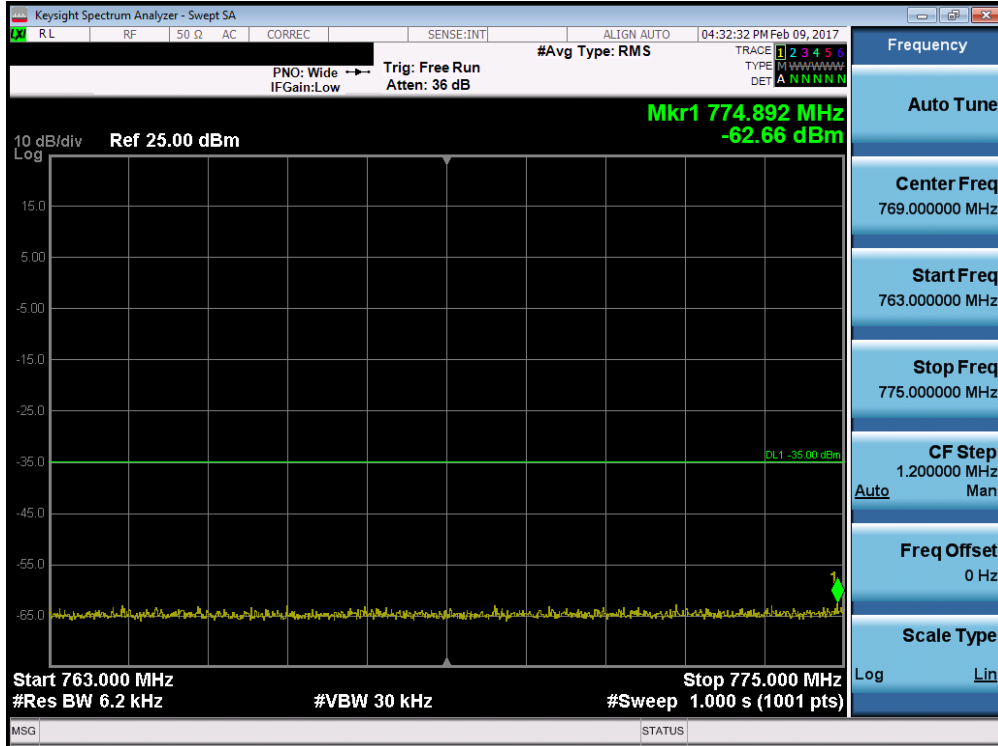


Plot 7-79. Upper Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



Plot 7-80. Lower Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 57 of 118

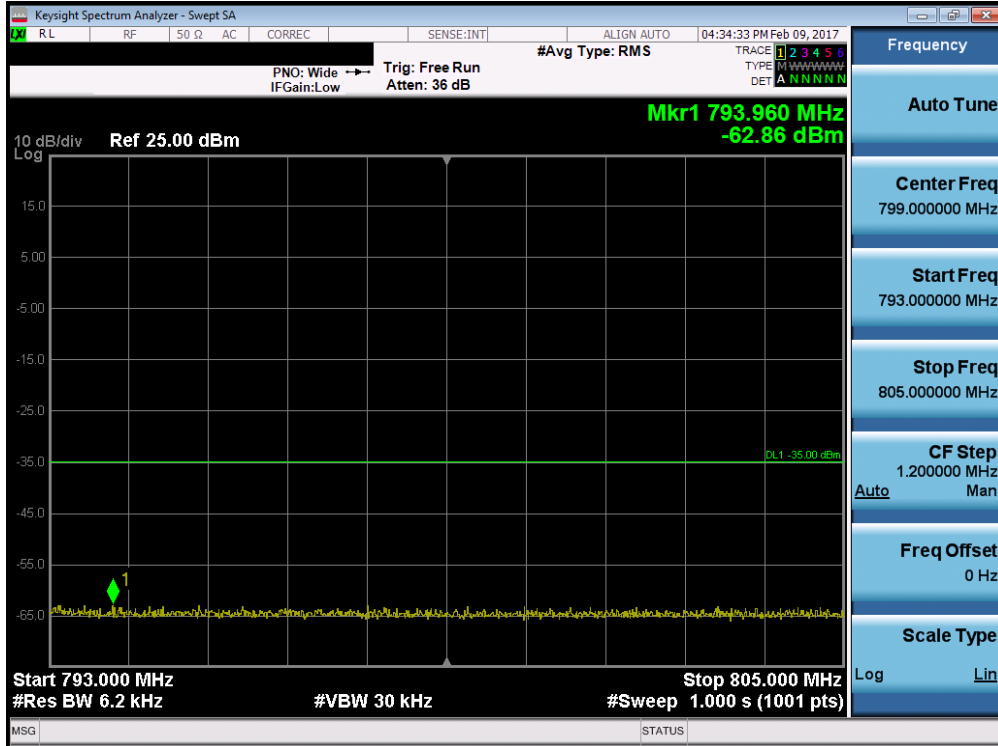


Plot 7-81. Lower Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

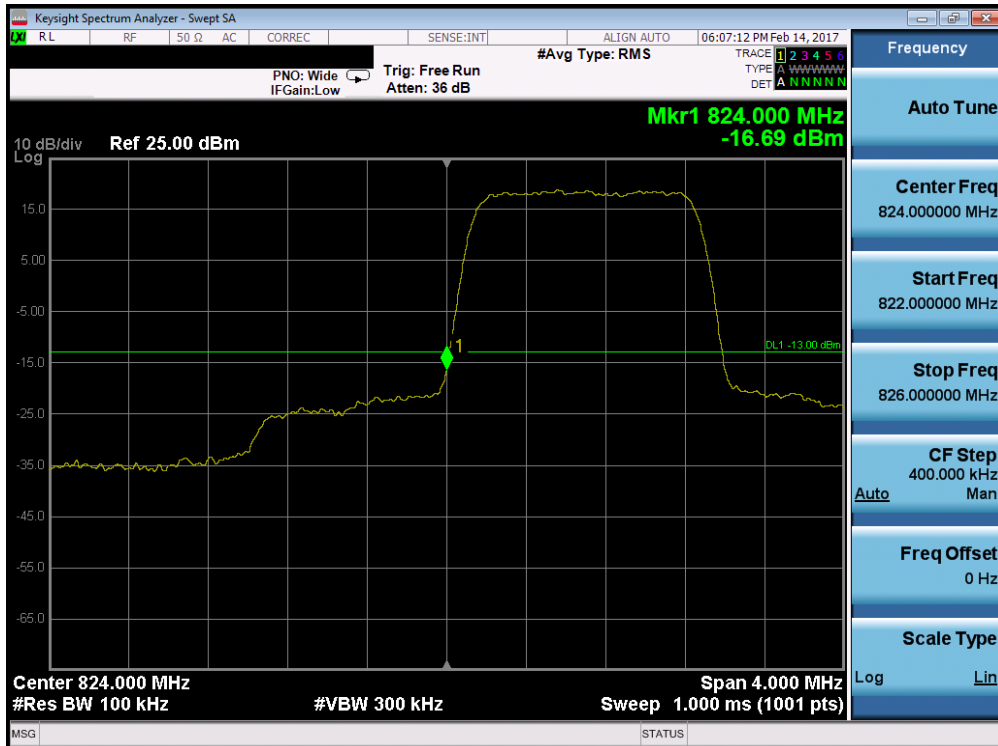


Plot 7-82. Upper Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-83. Upper Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

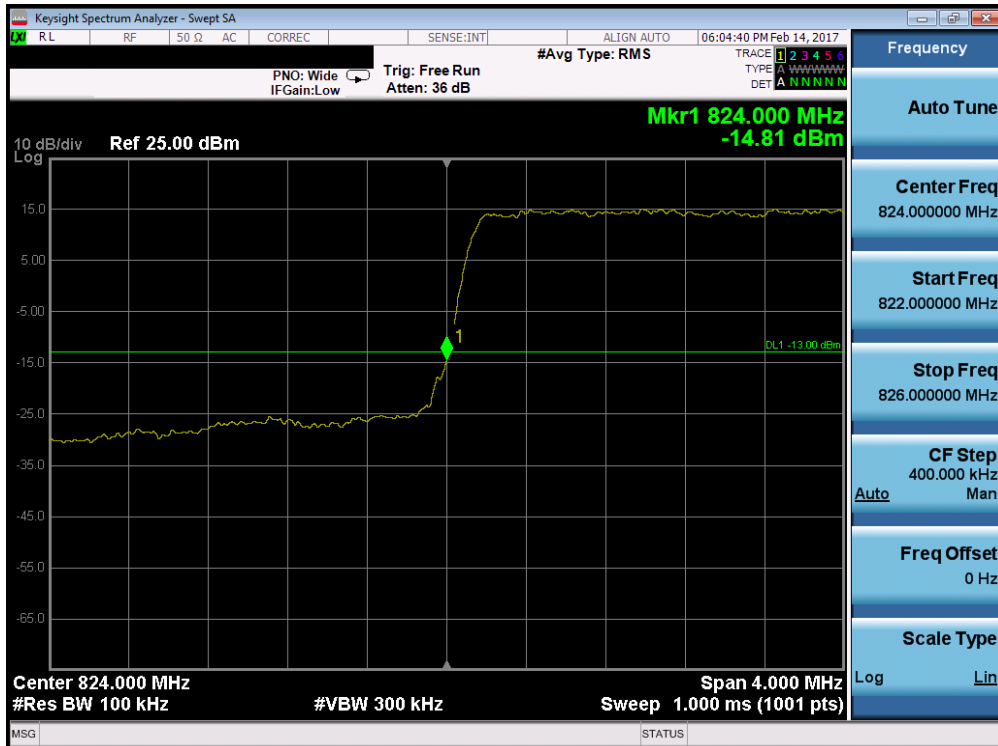


Plot 7-84. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMT827V	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 59 of 118

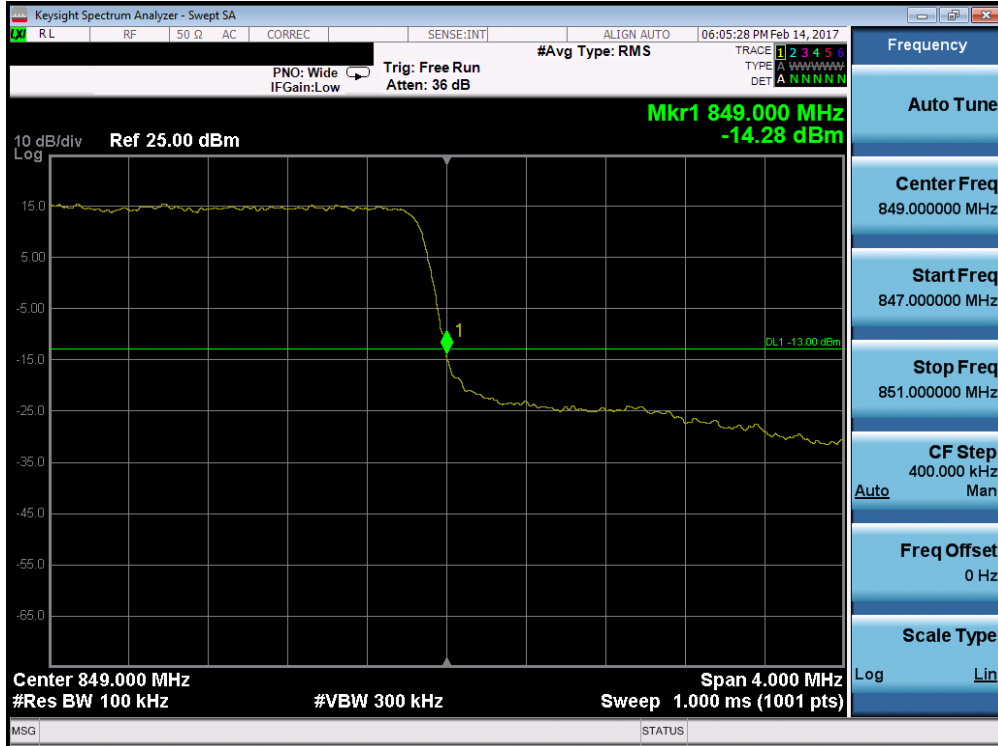


Plot 7-85. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

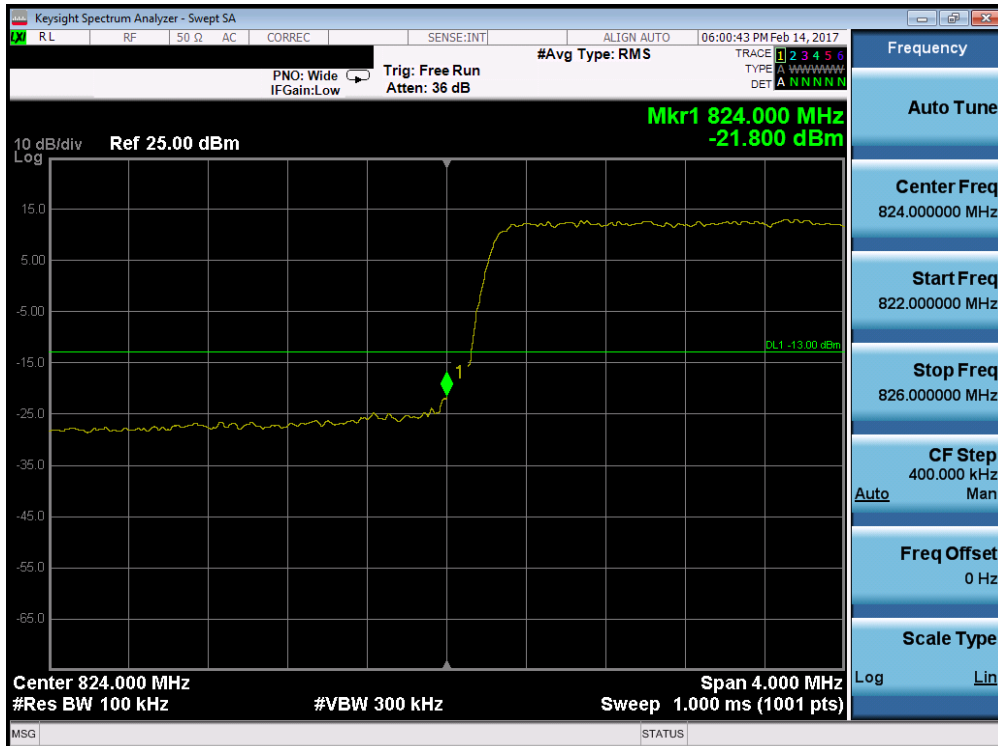


Plot 7-86. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-87. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

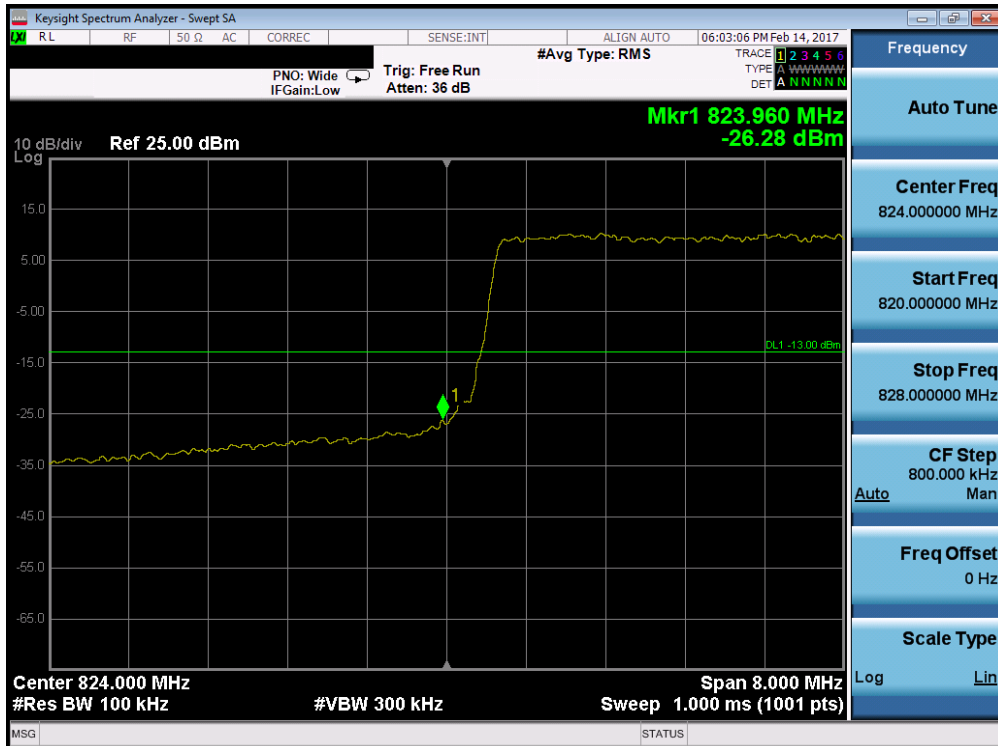


Plot 7-88. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-89. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

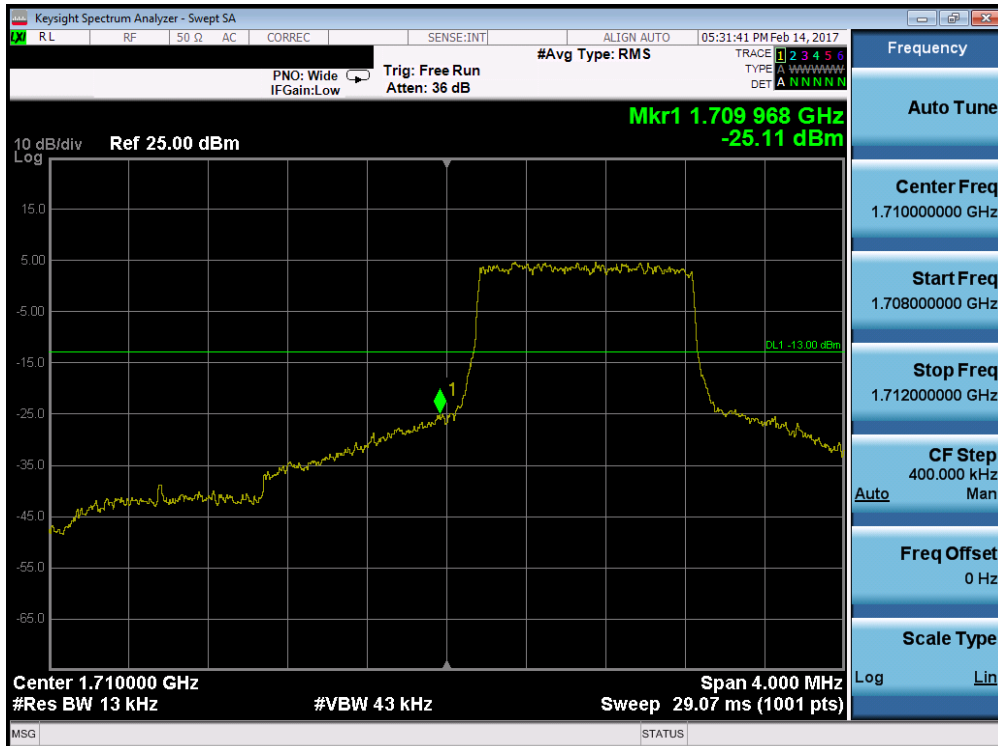


Plot 7-90. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 62 of 118

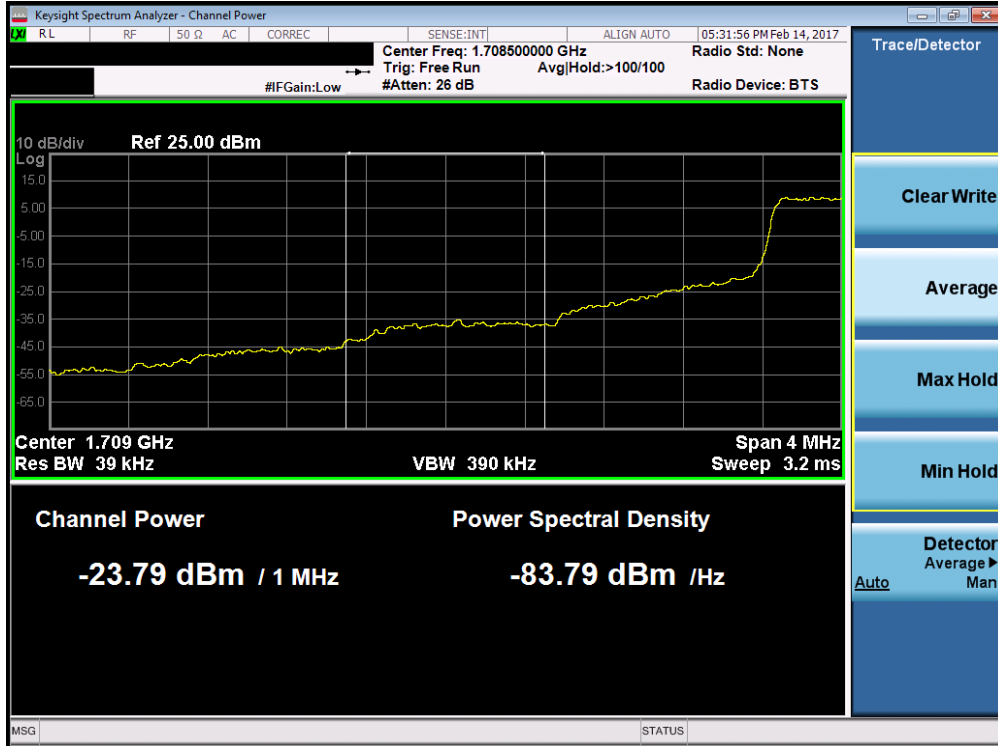


Plot 7-91. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-92. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-93. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

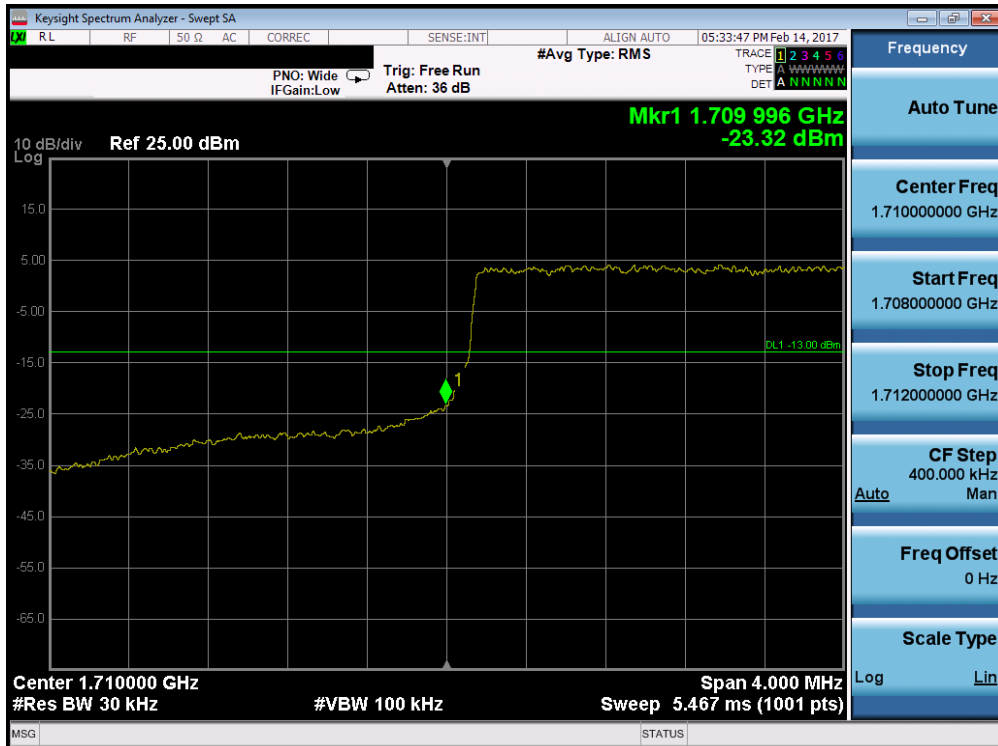


Plot 7-94. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 64 of 118

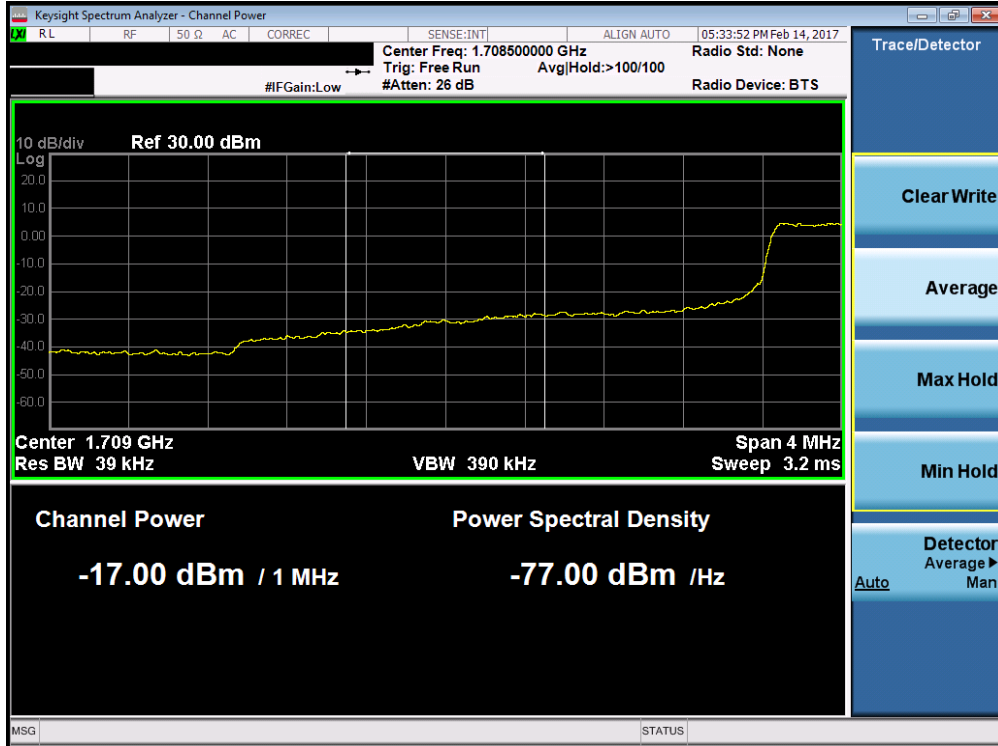


Plot 7-95. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



Plot 7-96. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 65 of 118

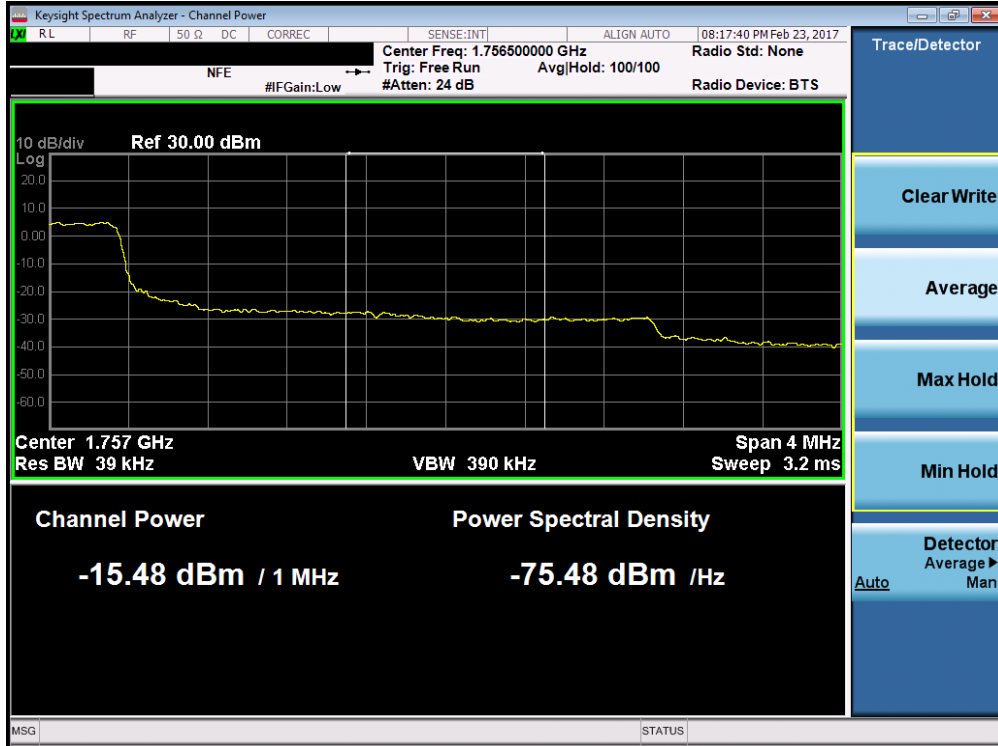


Plot 7-97. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

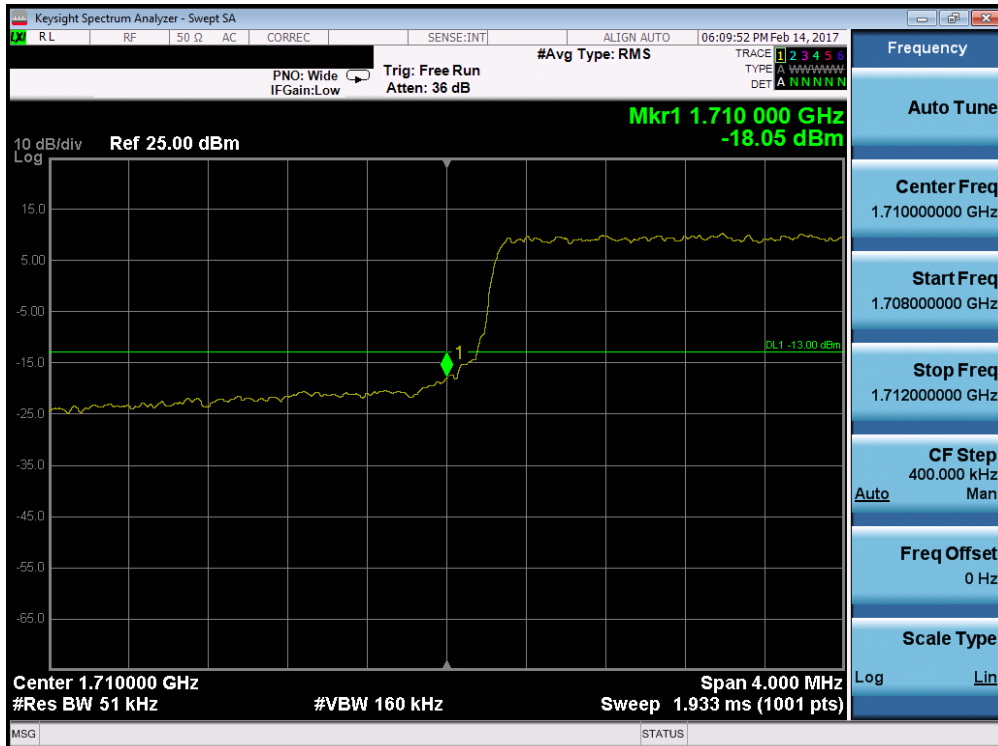


Plot 7-98. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 66 of 118

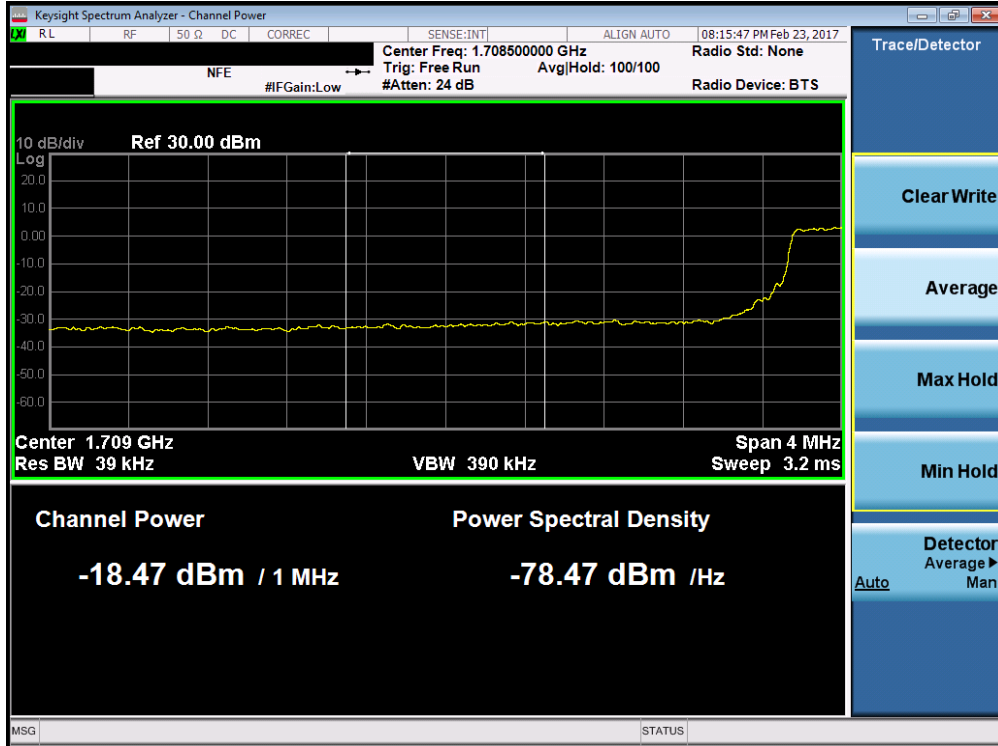


Plot 7-99. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

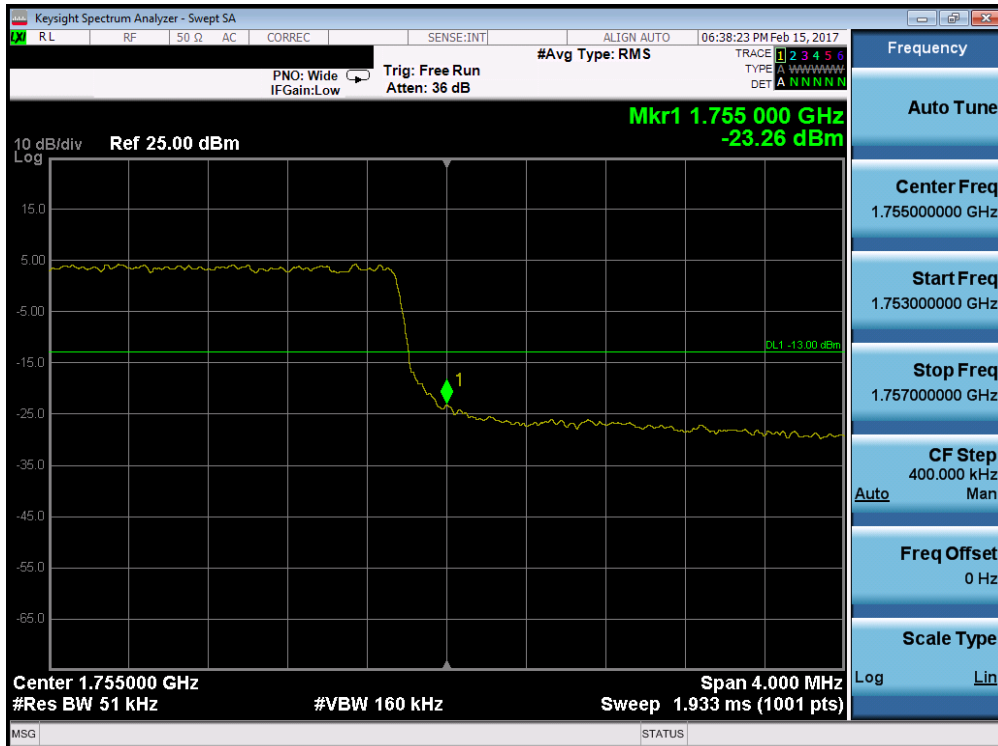


Plot 7-100. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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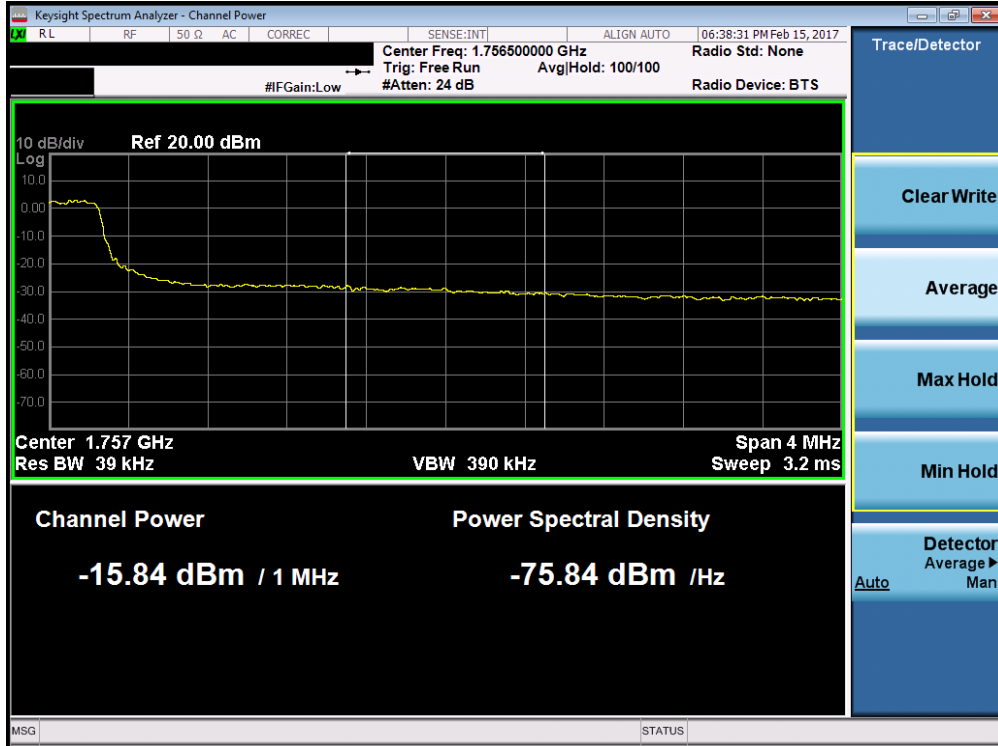


Plot 7-101. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

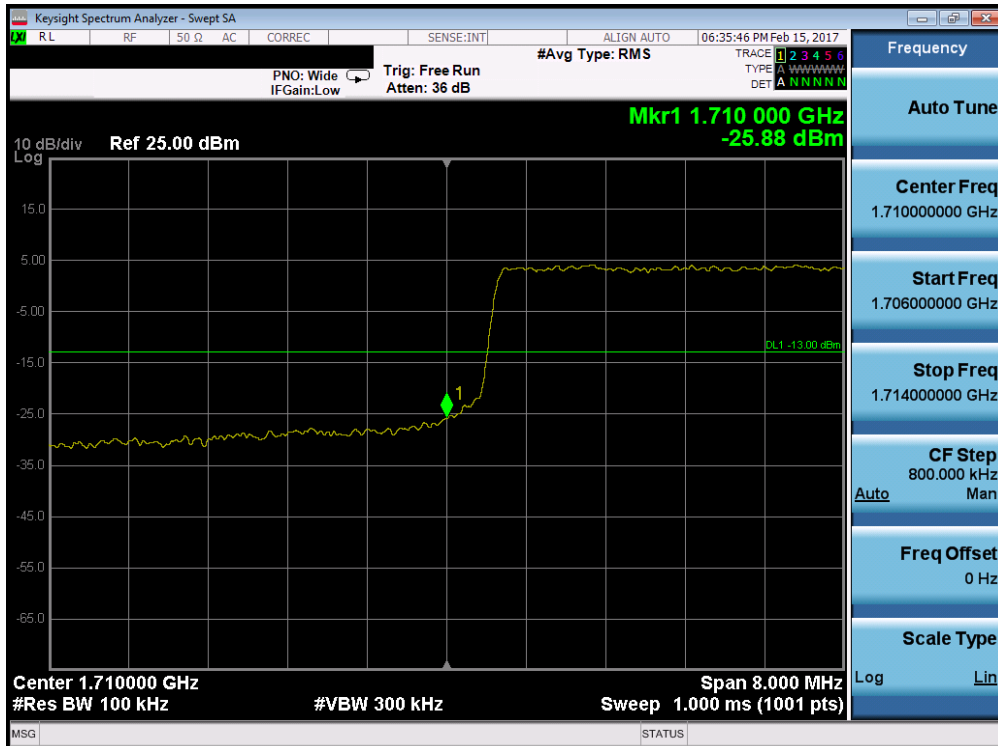


Plot 7-102. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 68 of 118

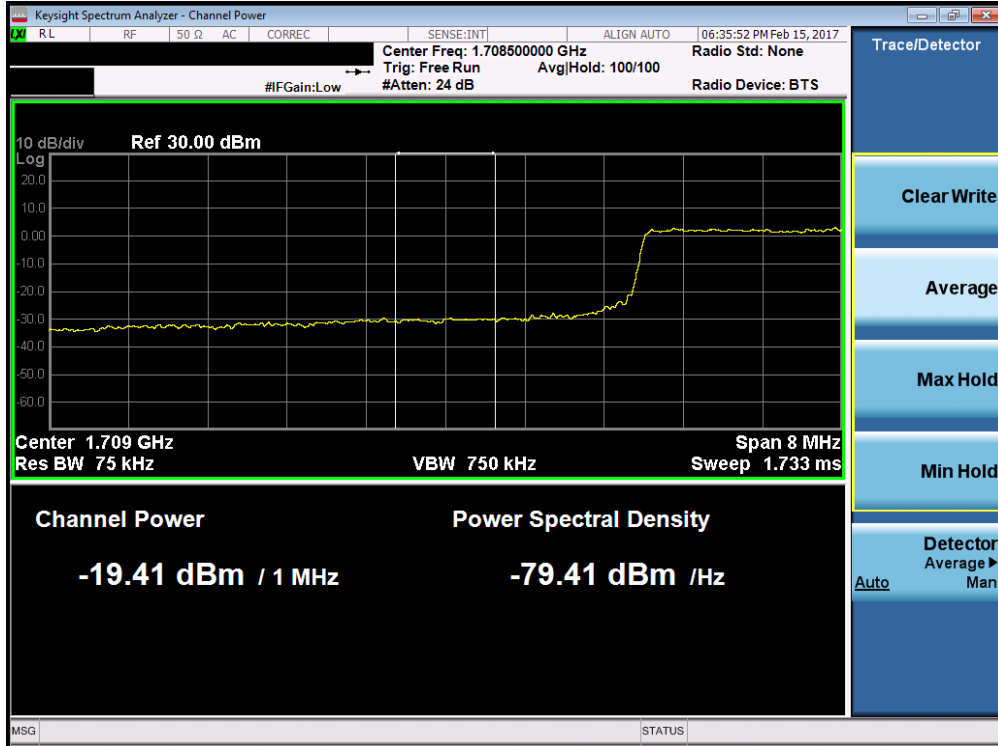


Plot 7-103. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

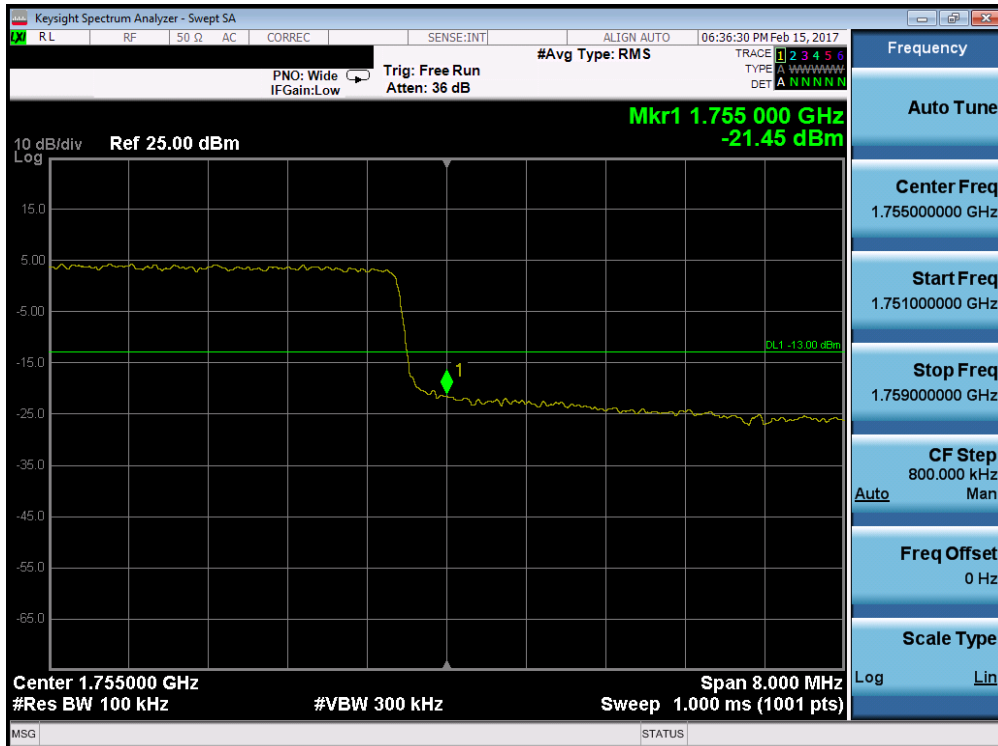


Plot 7-104. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 69 of 118

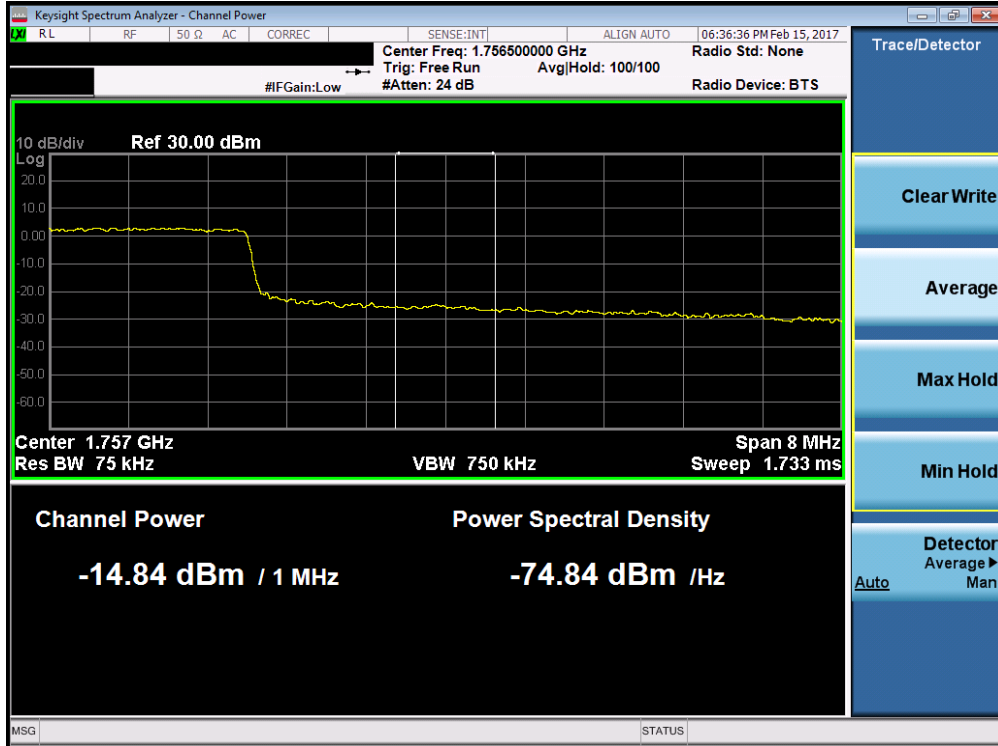


Plot 7-105. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

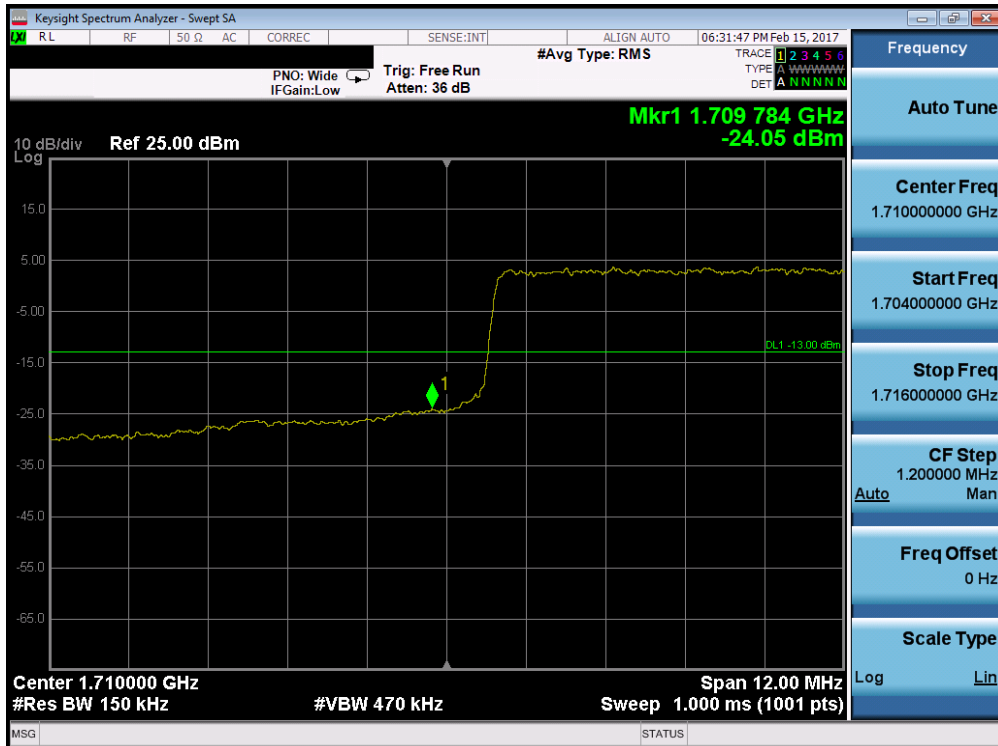


Plot 7-106. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 70 of 118

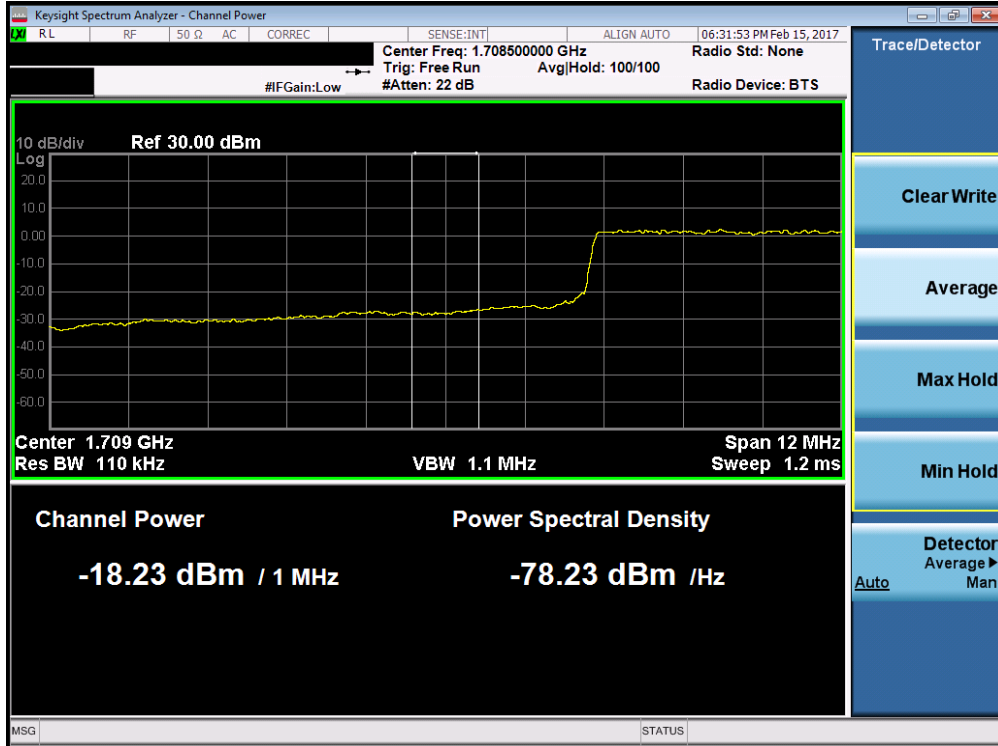


Plot 7-107. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

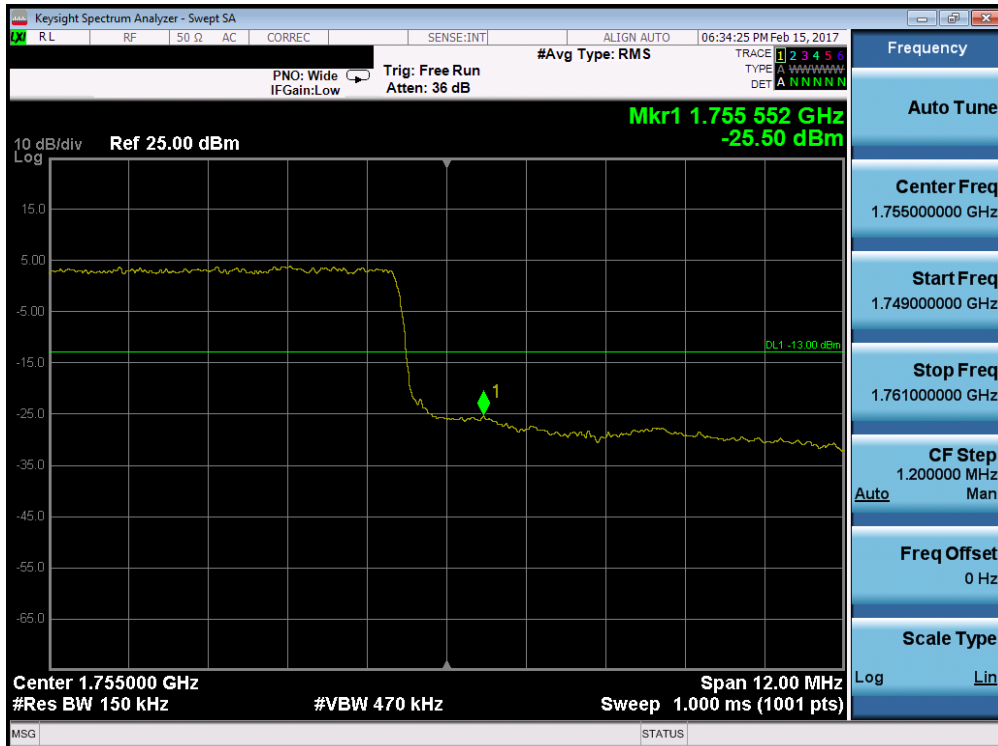


Plot 7-108. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 71 of 118

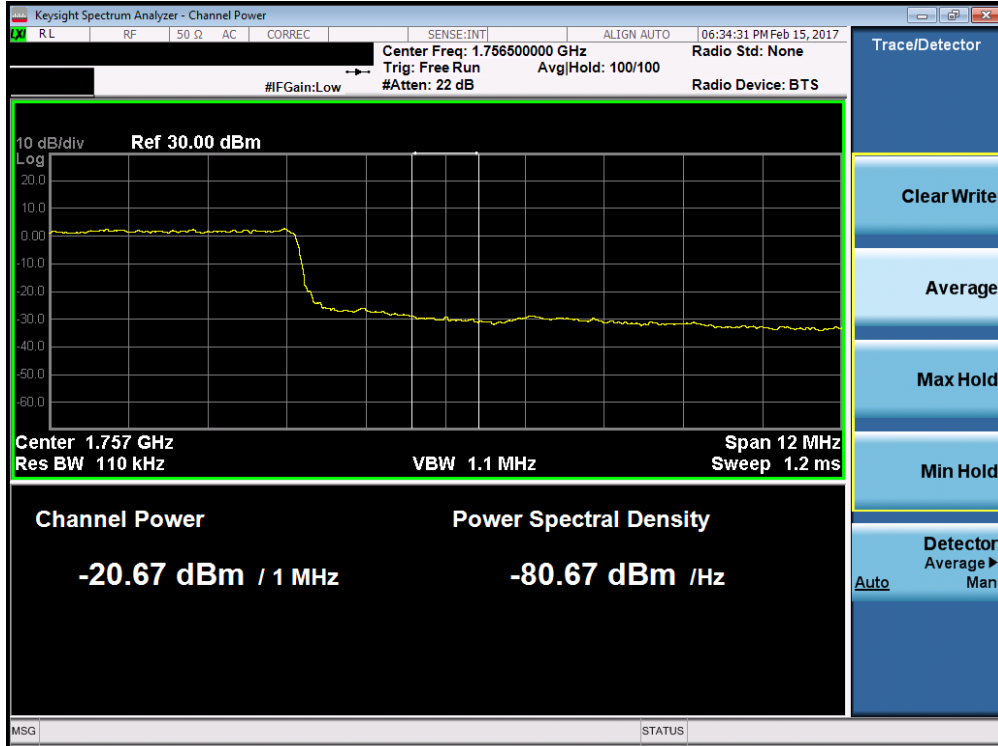


Plot 7-109. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

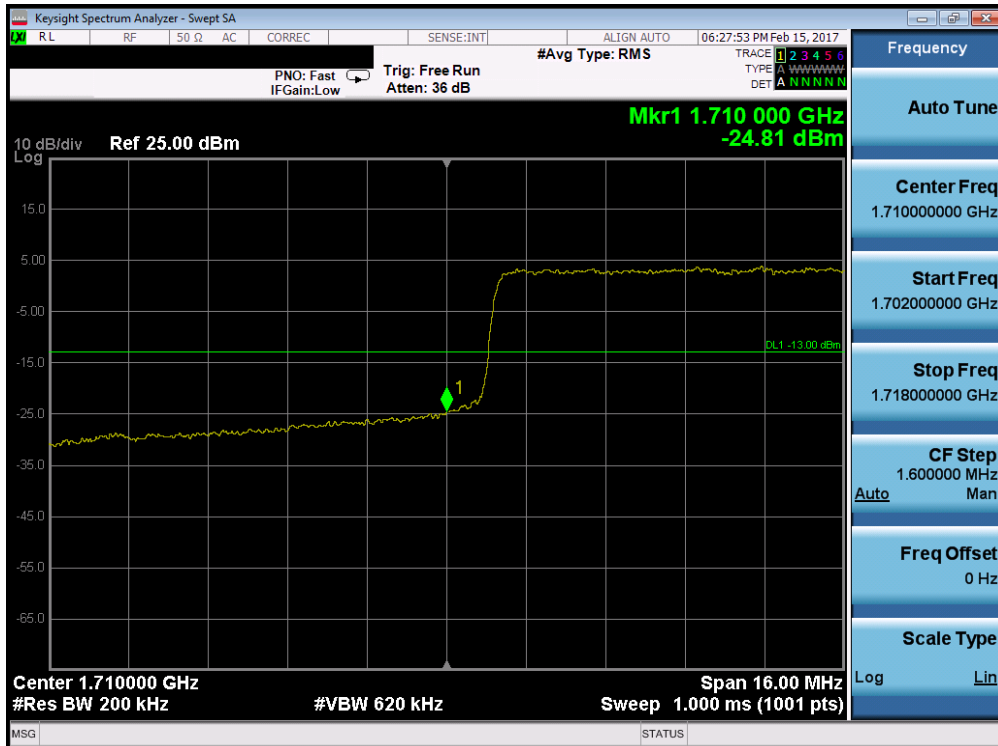


Plot 7-110. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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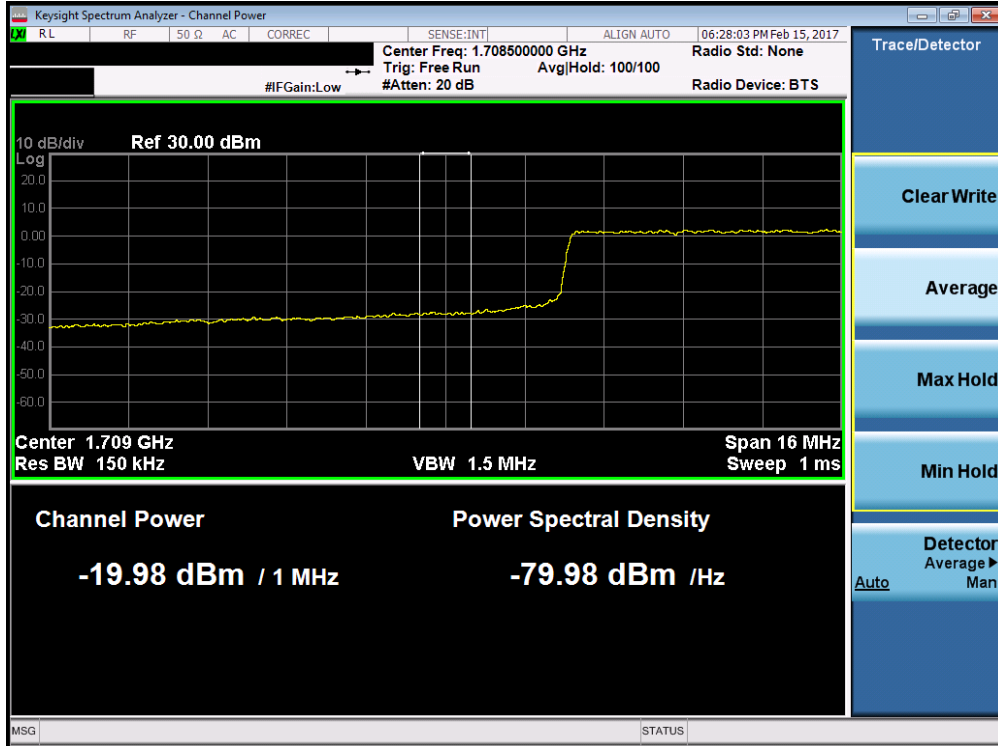


Plot 7-111. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

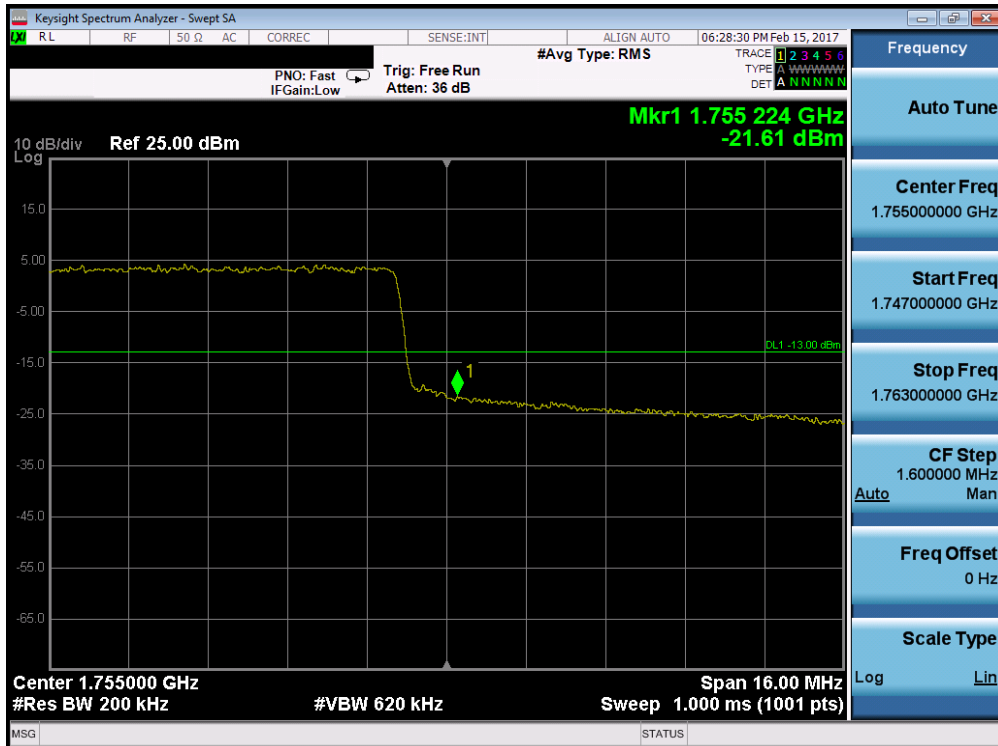


Plot 7-112. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 73 of 118

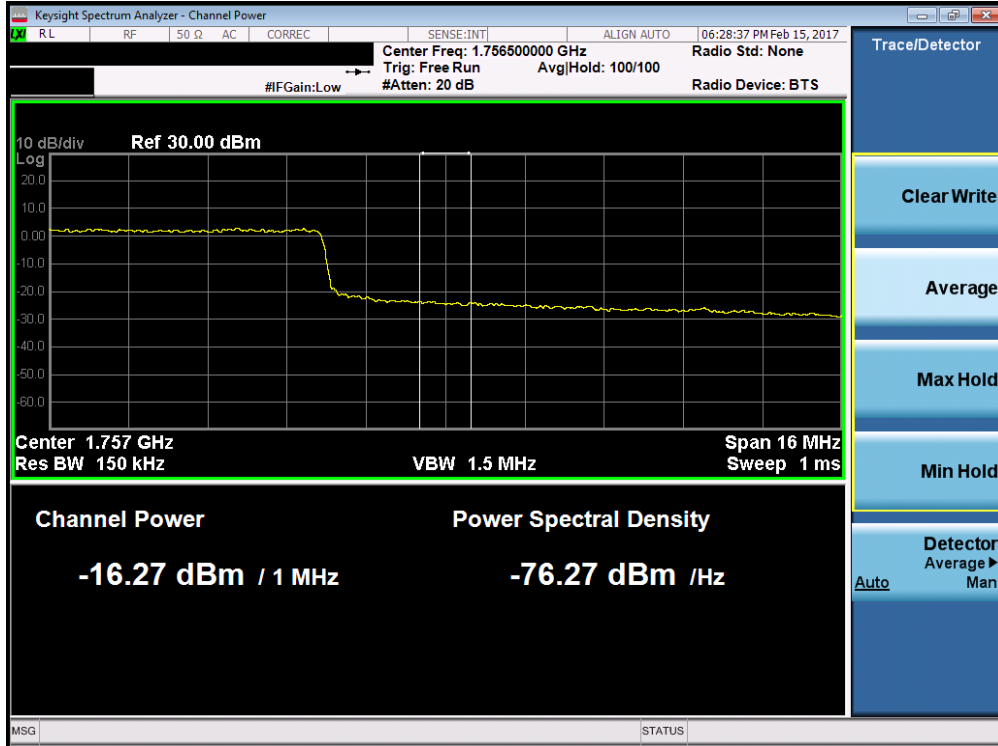


Plot 7-113. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

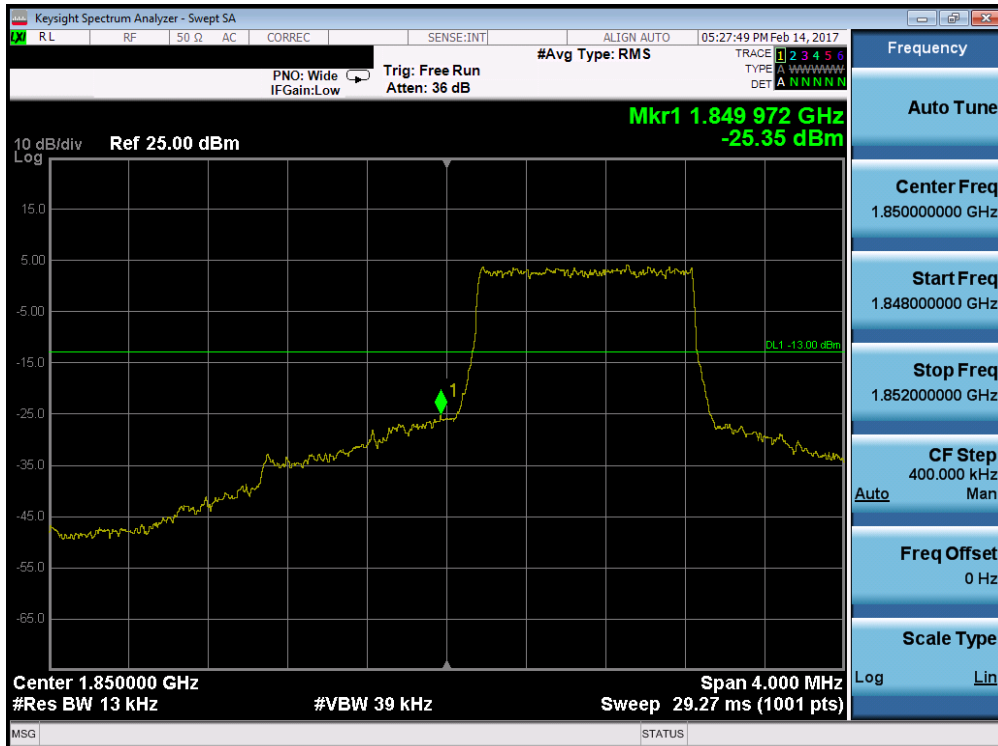


Plot 7-114. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 74 of 118

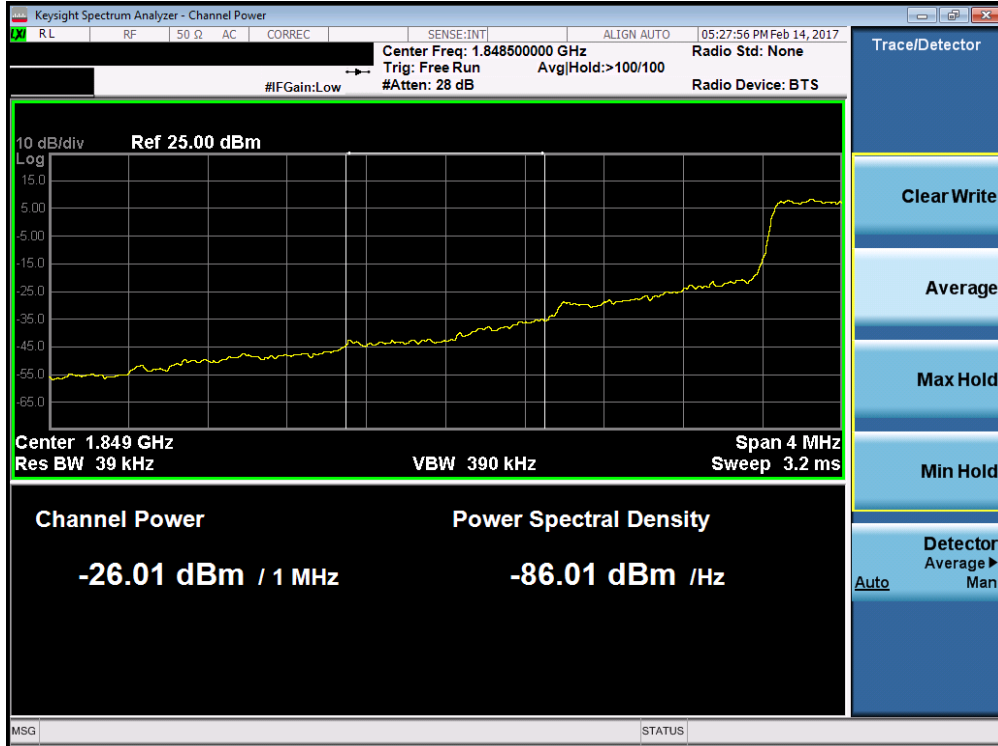


Plot 7-115. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

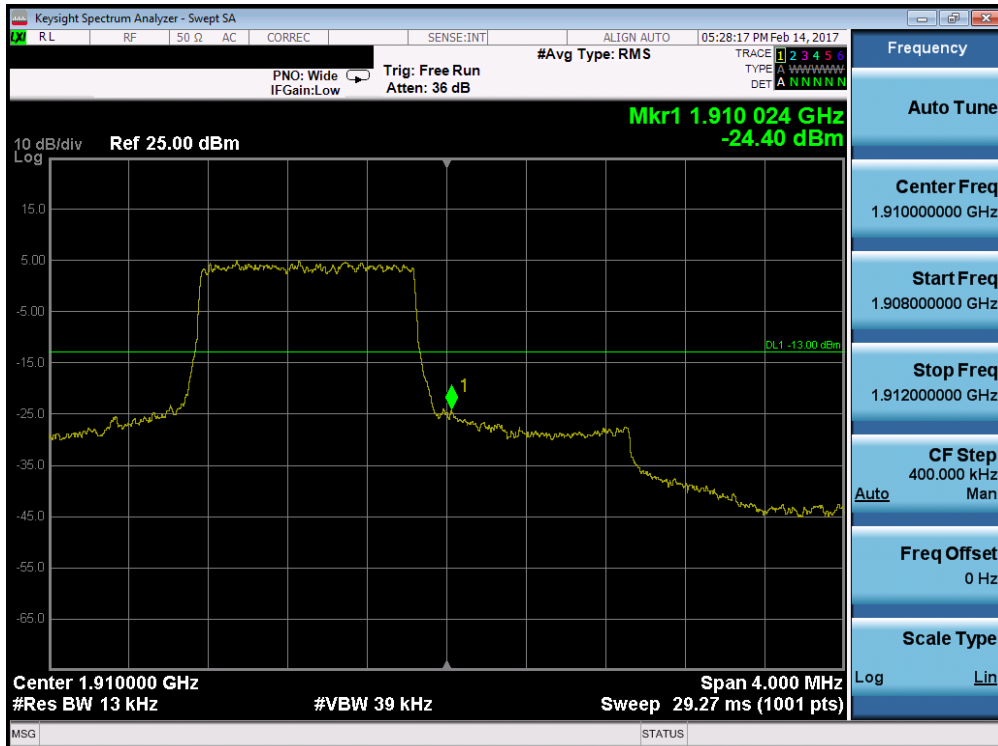


Plot 7-116. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 75 of 118

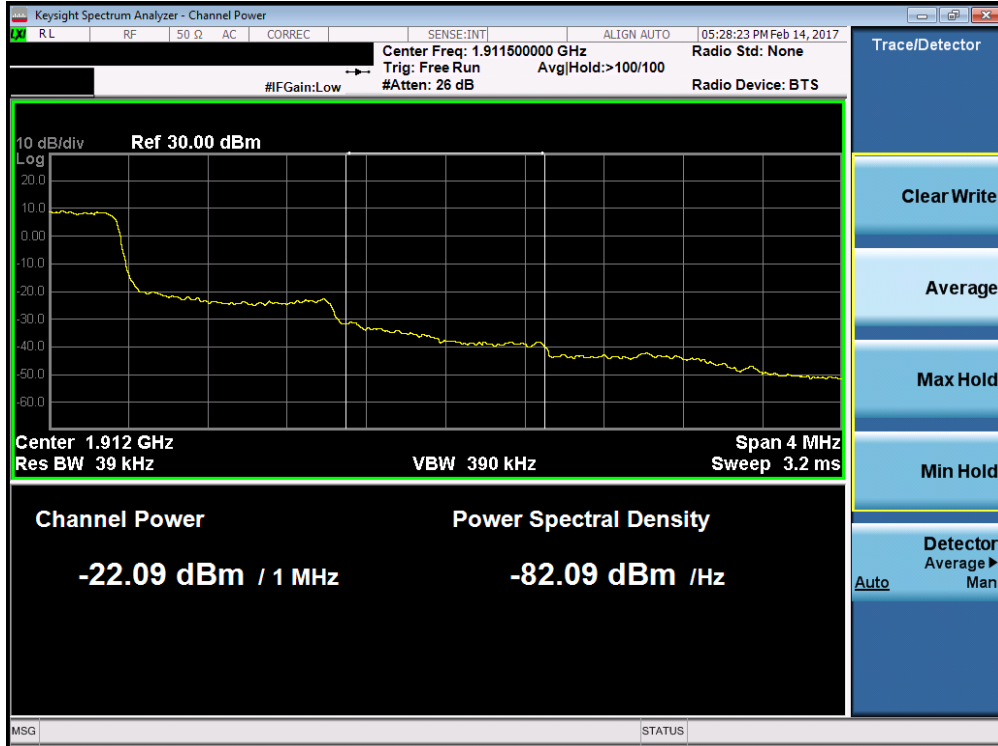


Plot 7-117. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

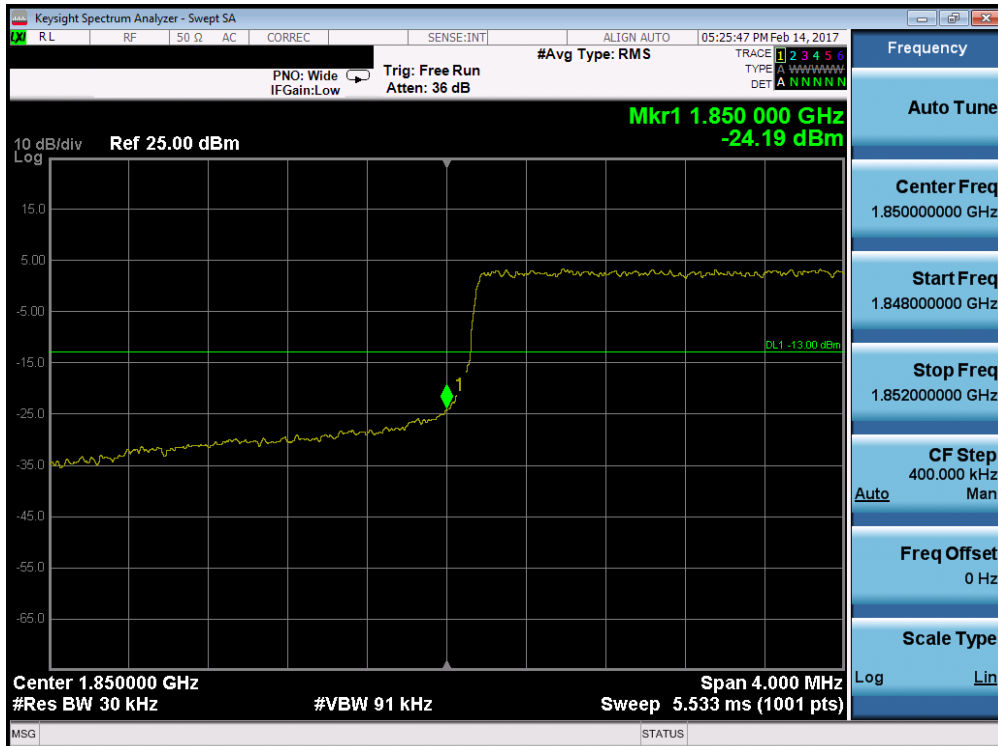


Plot 7-118. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 76 of 118

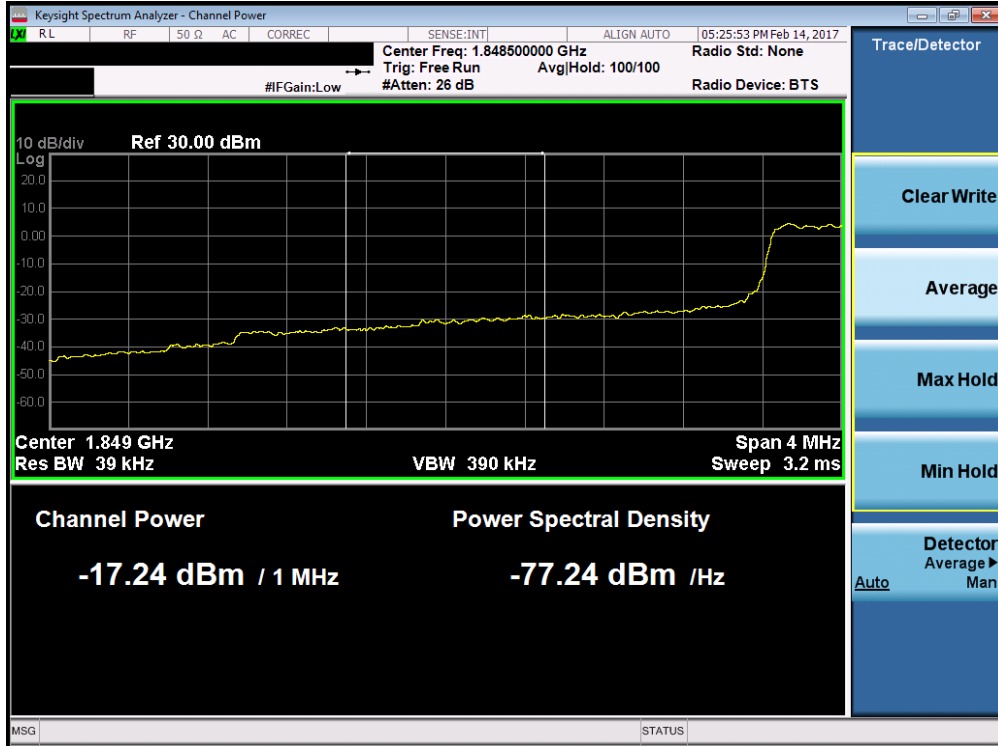


Plot 7-119. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 7-120. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 77 of 118

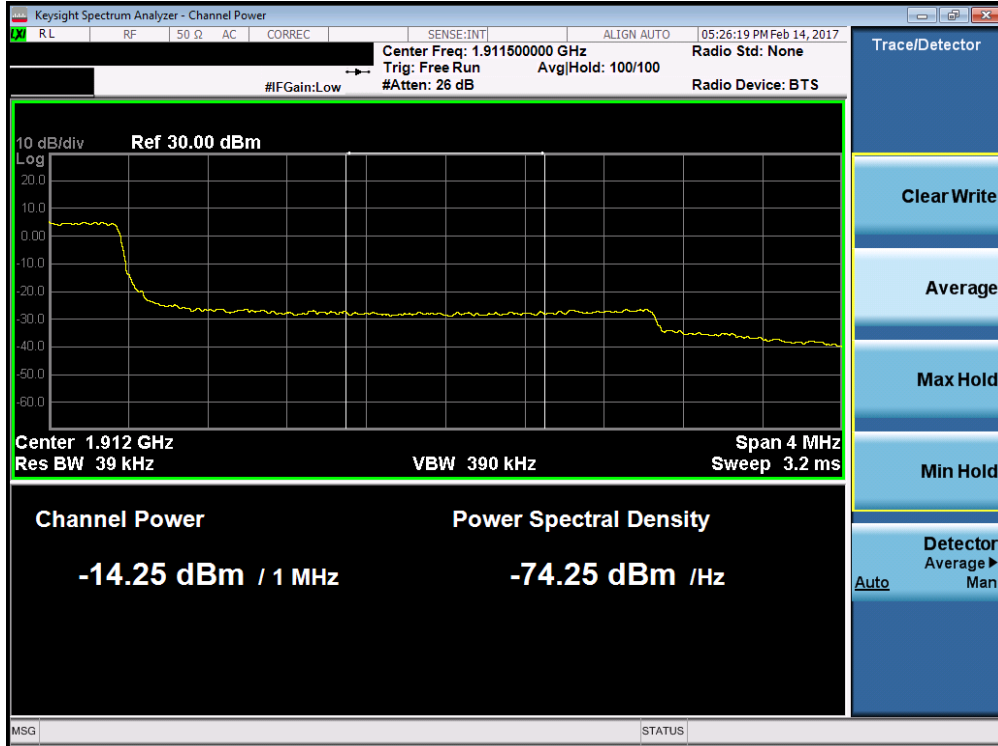


Plot 7-121. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

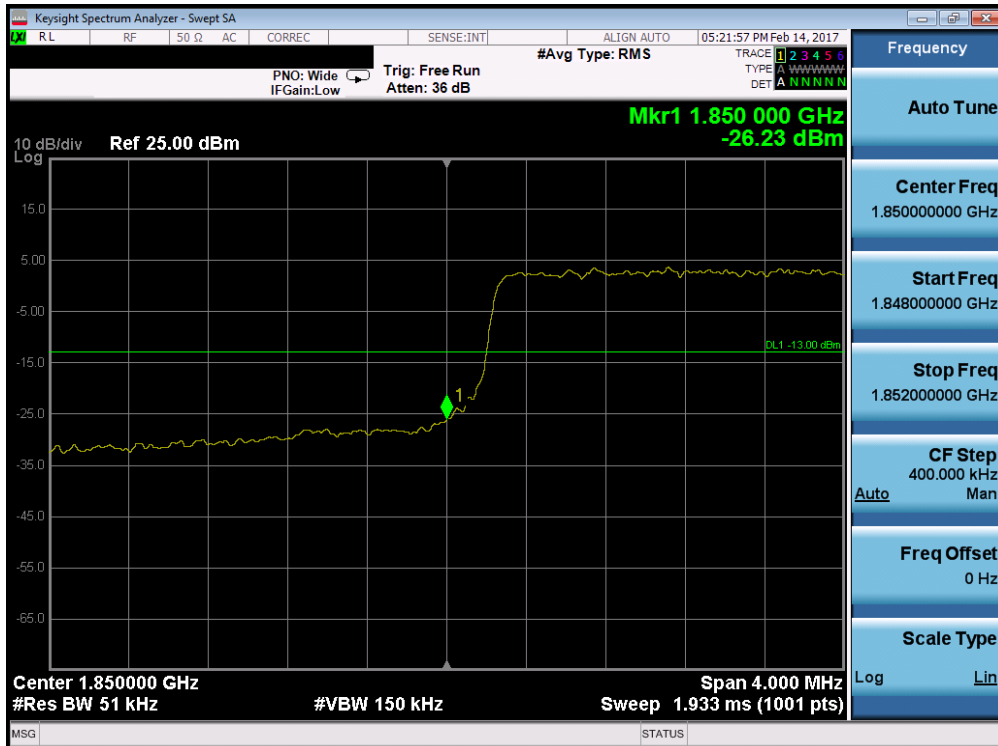


Plot 7-122. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 78 of 118

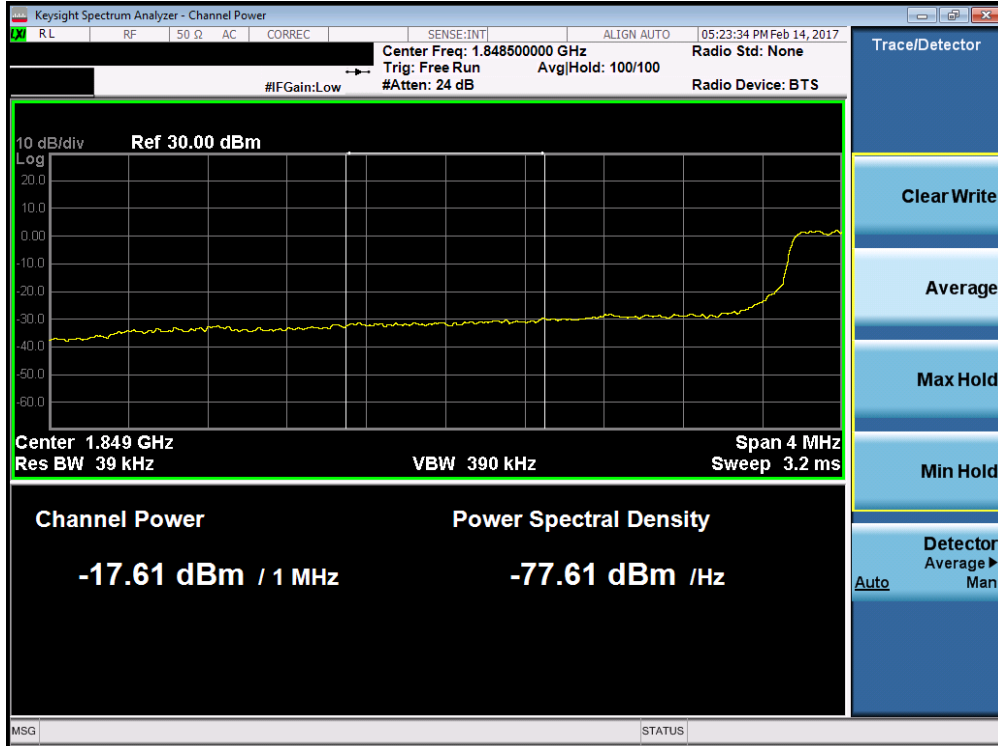


Plot 7-123. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

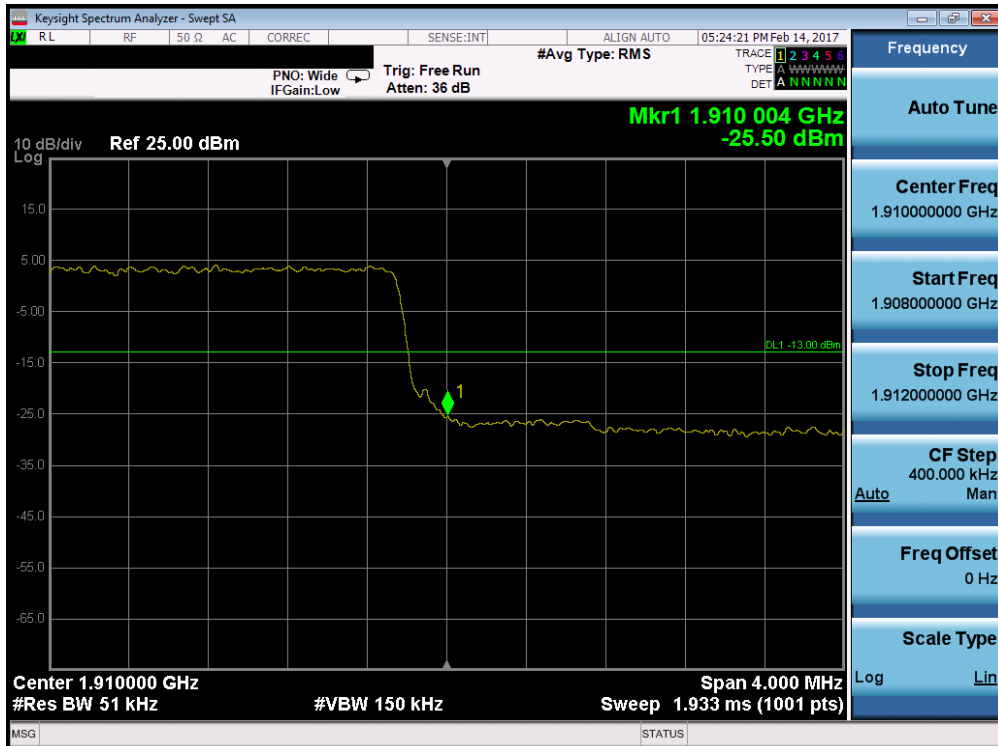


Plot 7-124. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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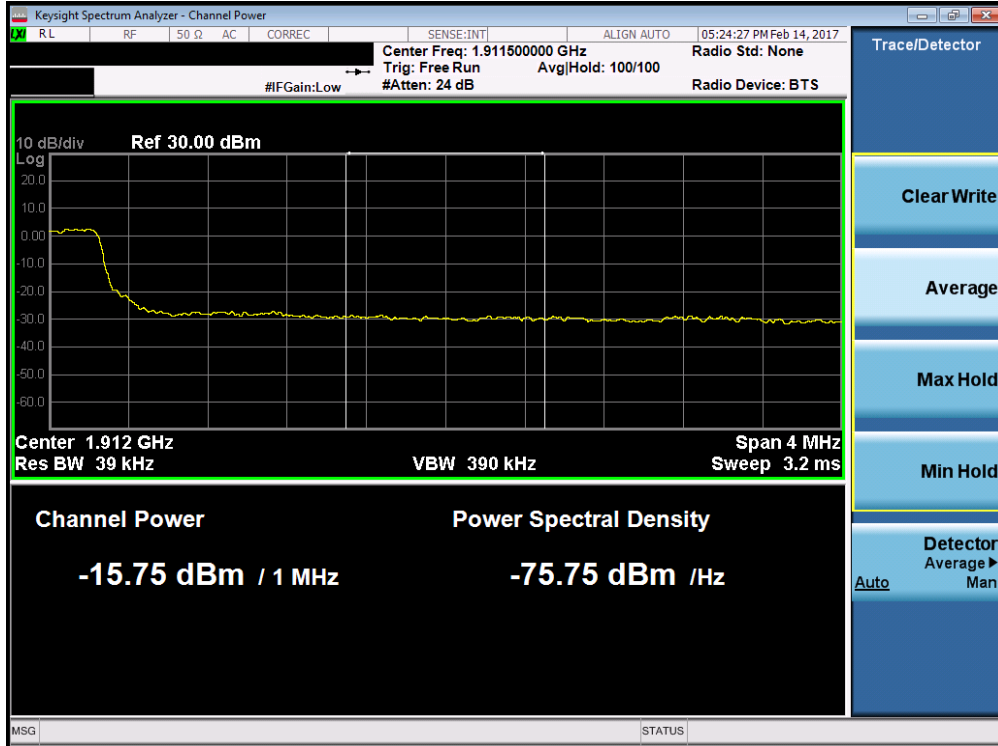


Plot 7-125. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

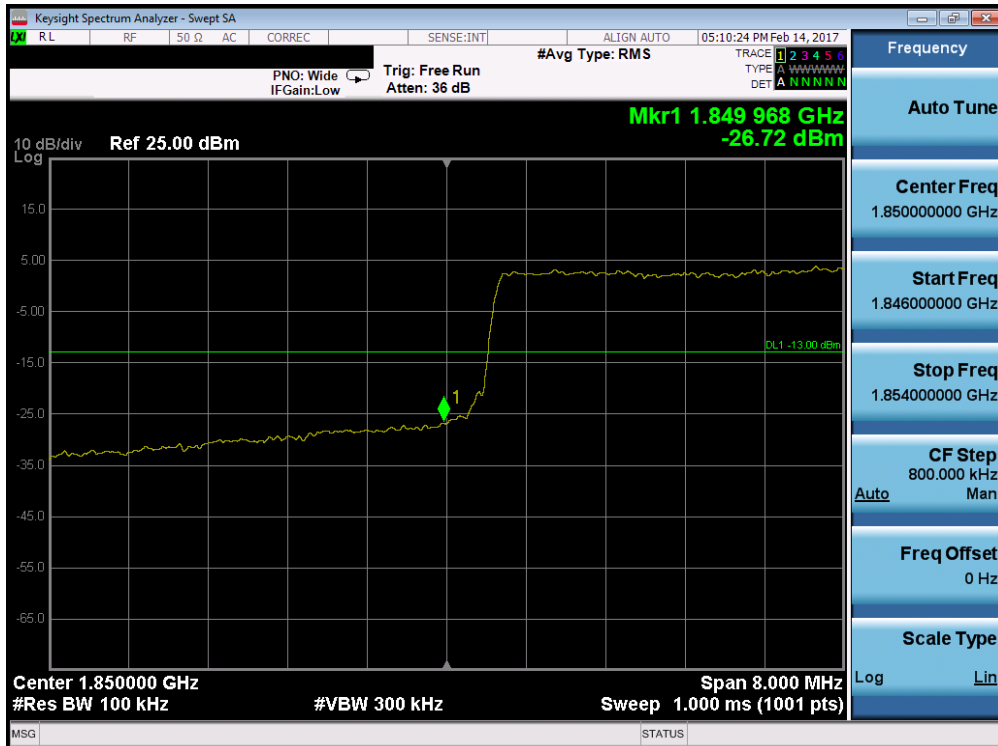


Plot 7-126. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 80 of 118

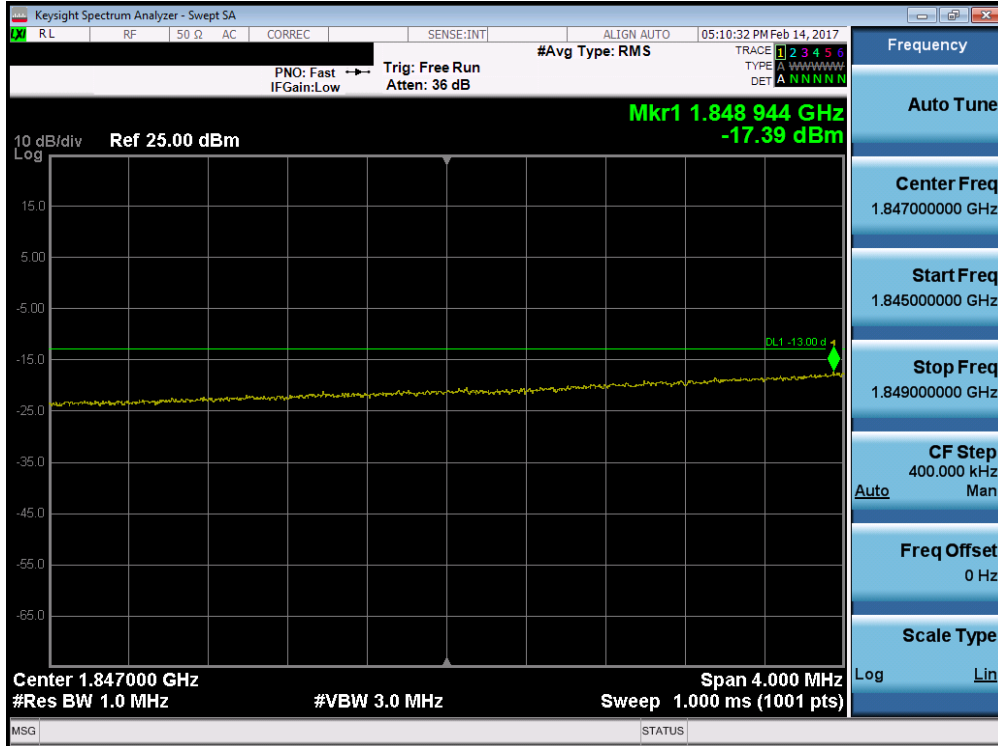


Plot 7-127. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

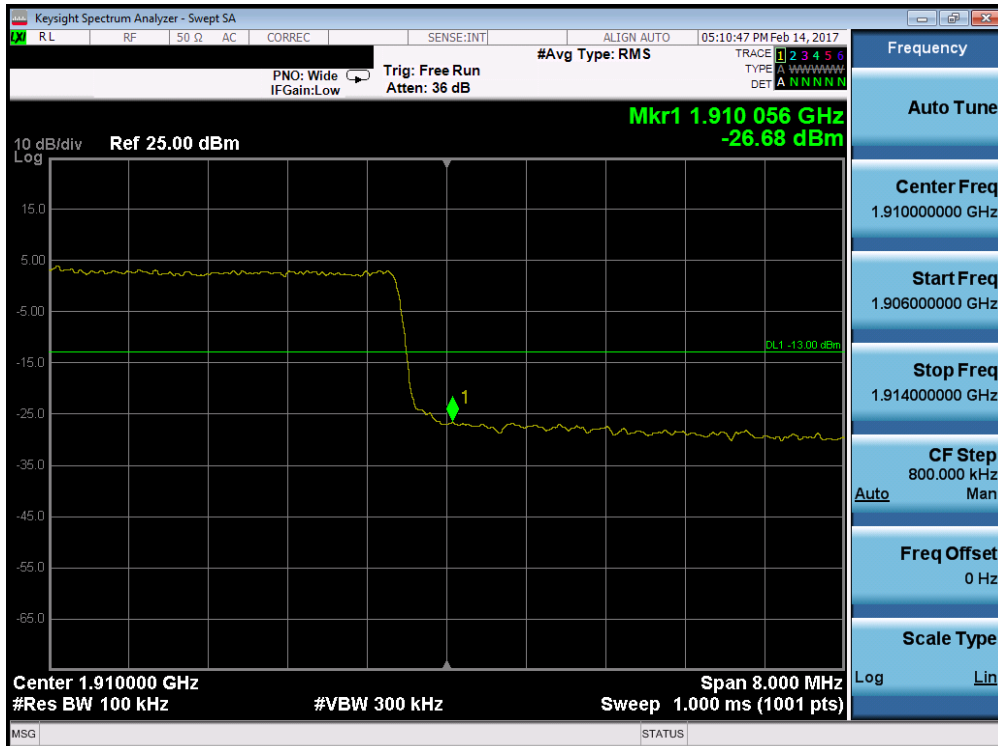


Plot 7-128. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 81 of 118

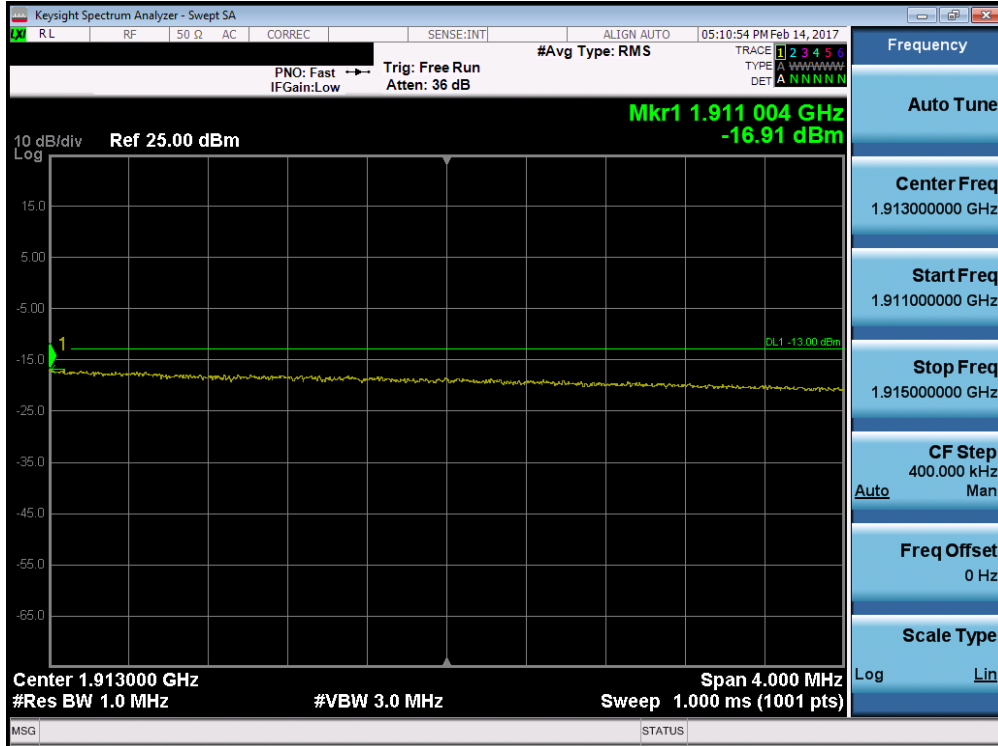


Plot 7-129. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

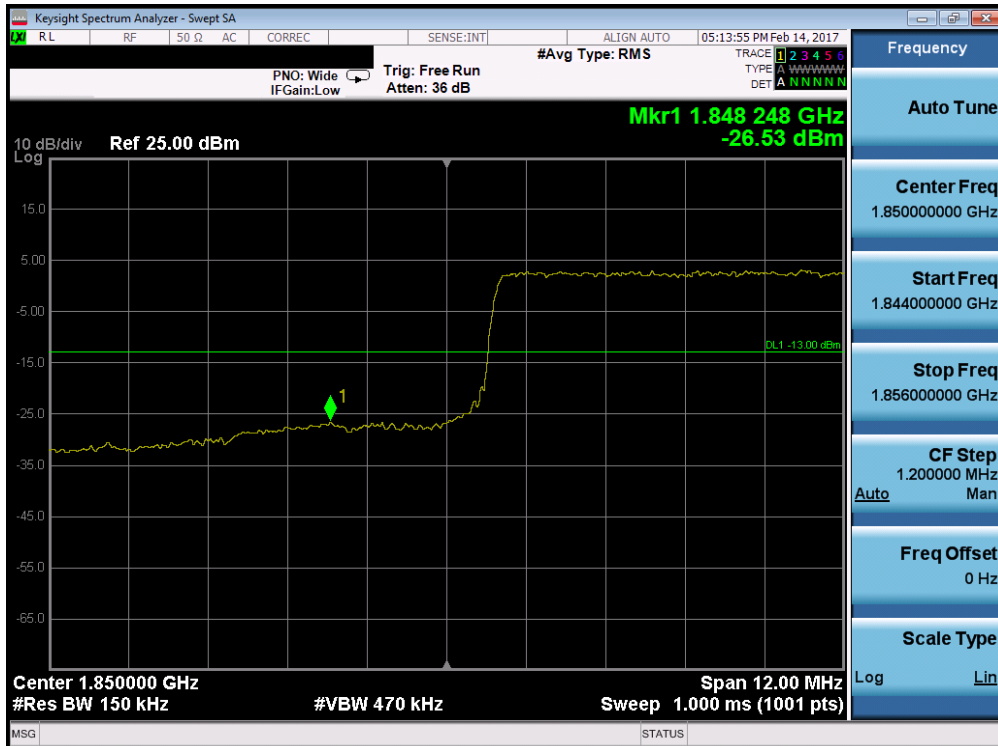


Plot 7-130. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 82 of 118

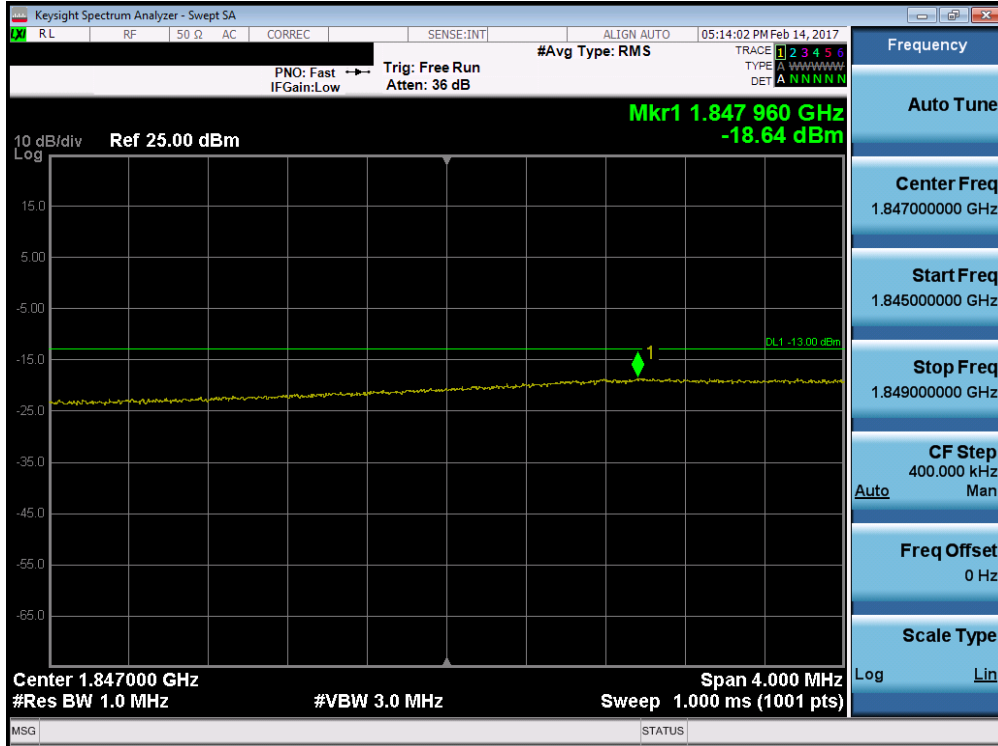


Plot 7-131. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

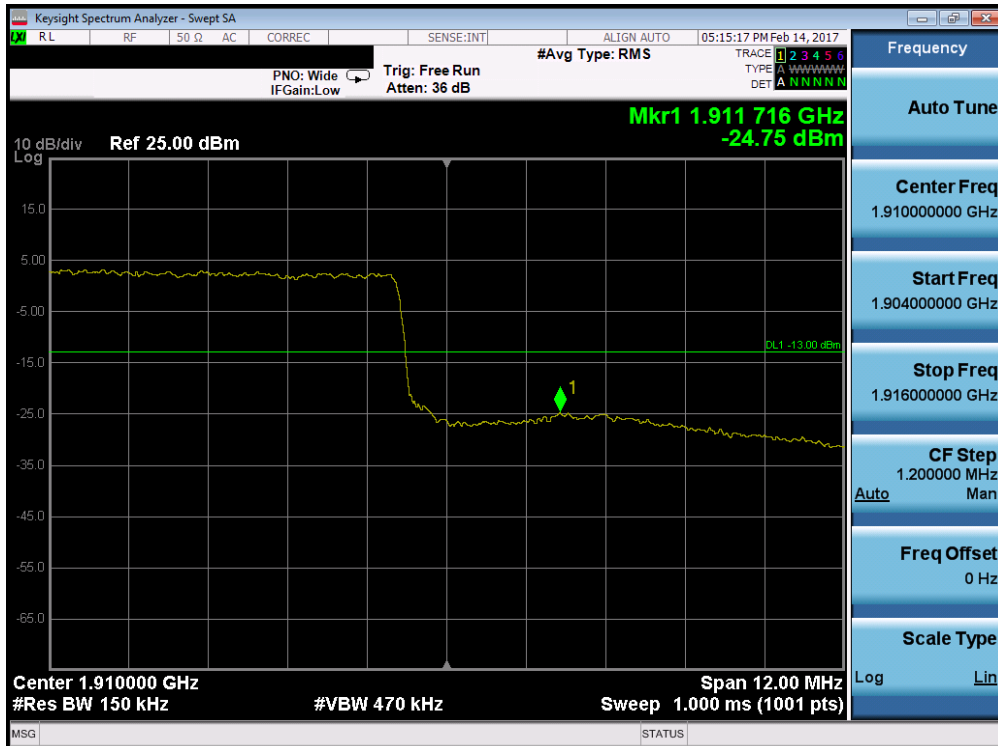


Plot 7-132. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 83 of 118

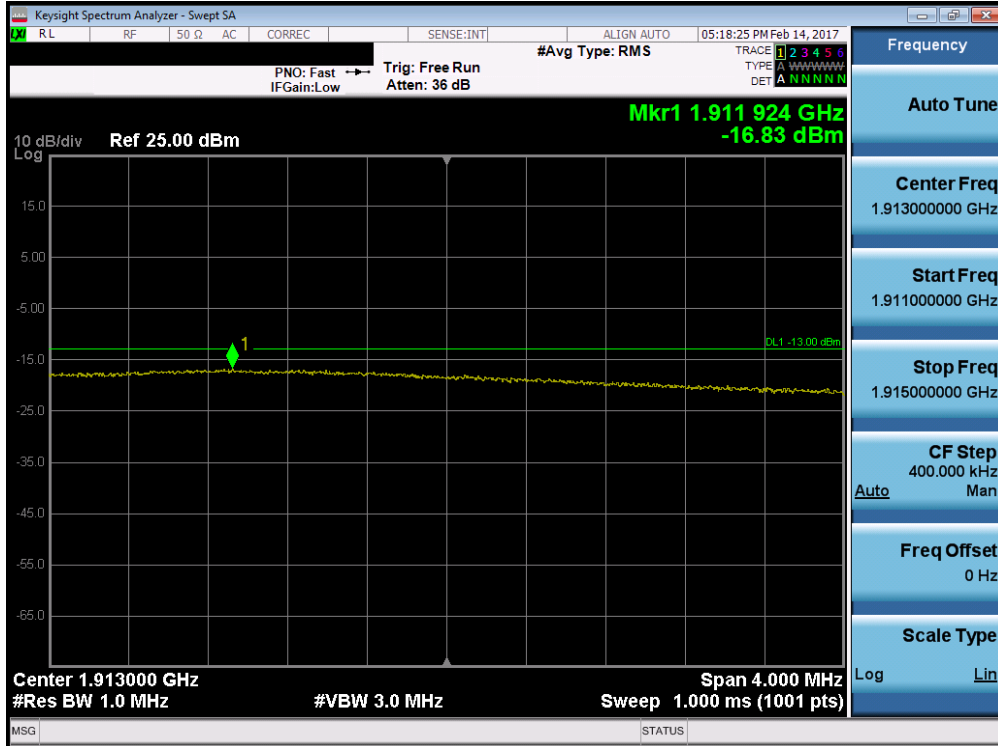


Plot 7-133. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

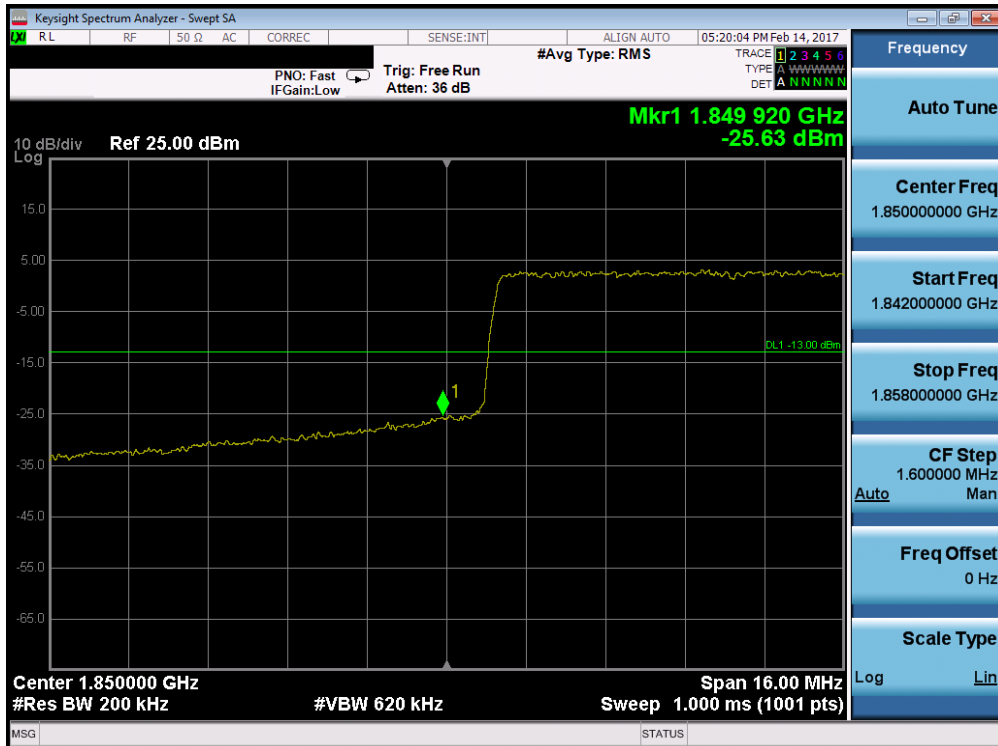


Plot 7-134. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 84 of 118

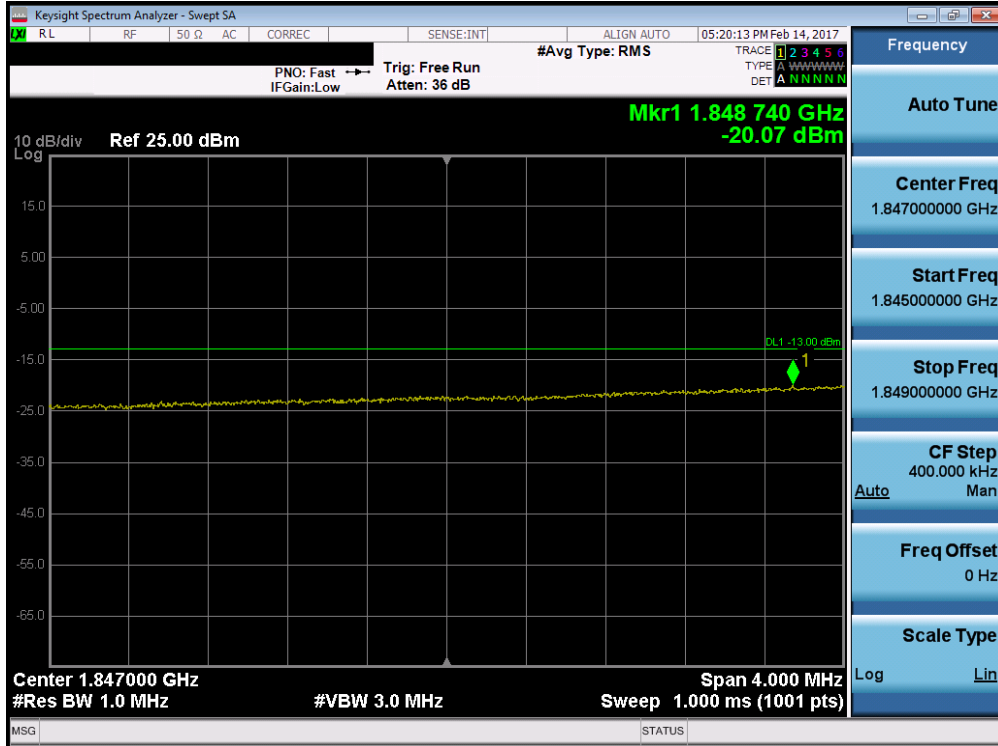


Plot 7-135. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

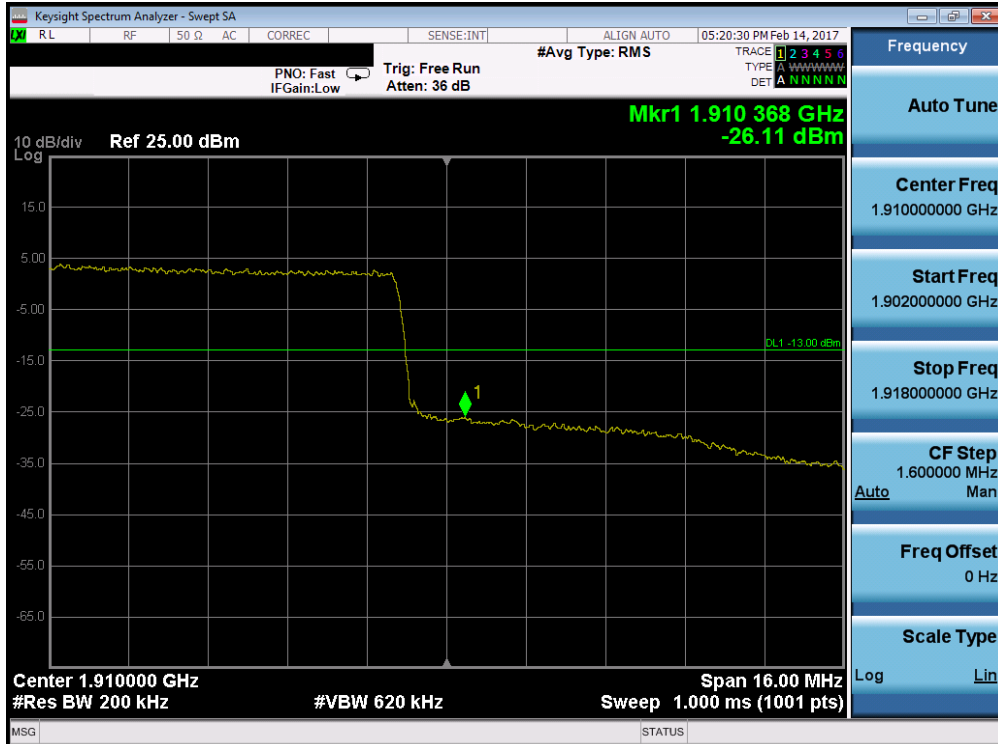


Plot 7-136. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 85 of 118

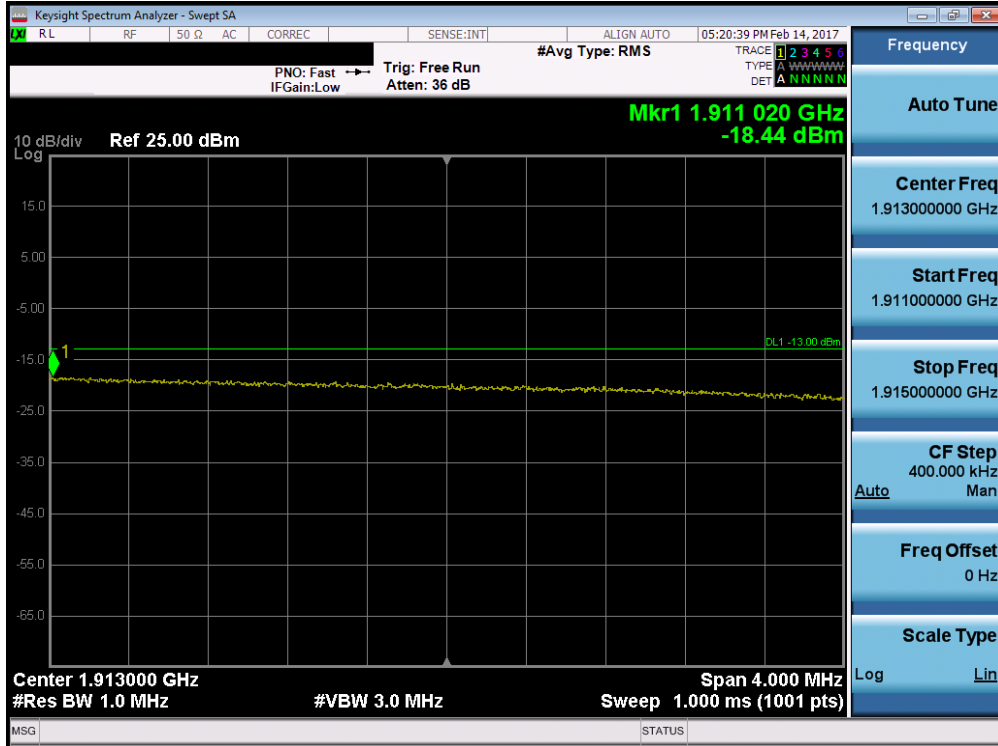


Plot 7-137. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-138. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 86 of 118



Plot 7-139. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 87 of 118

7.5 Peak-Average Ratio

§24.232(d)

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v02r02 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

Test Setup

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

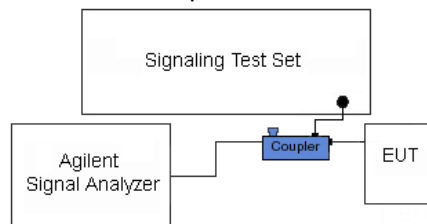


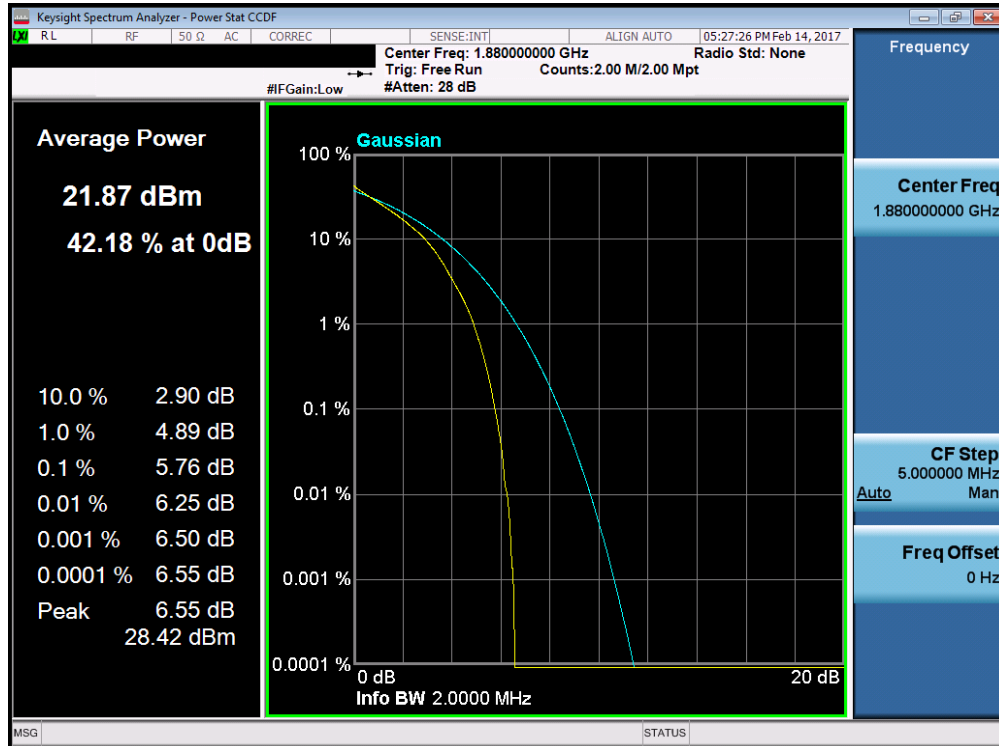


Figure 7-4. Test Instrument & Measurement Setup

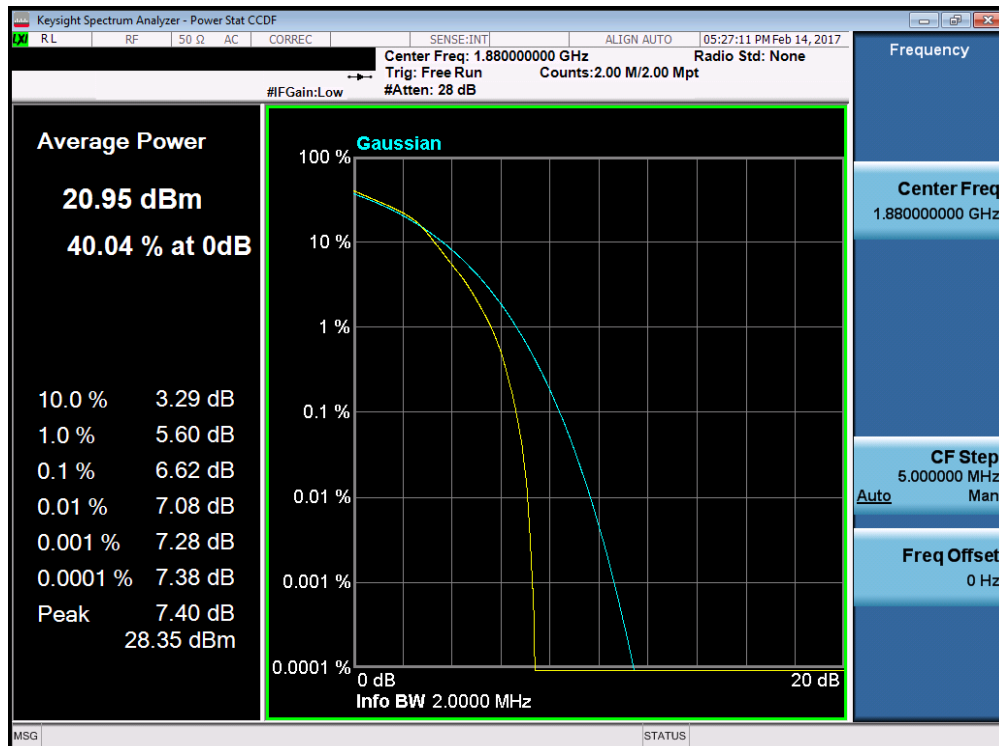
Test Notes

None.

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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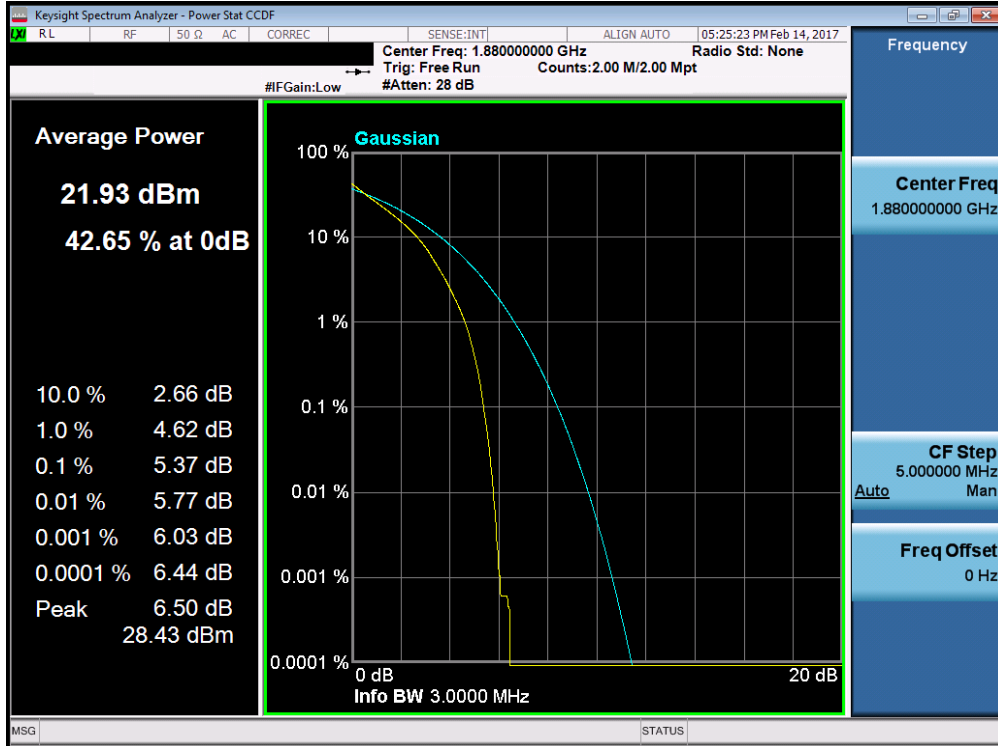


Plot 7-140. PAR Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

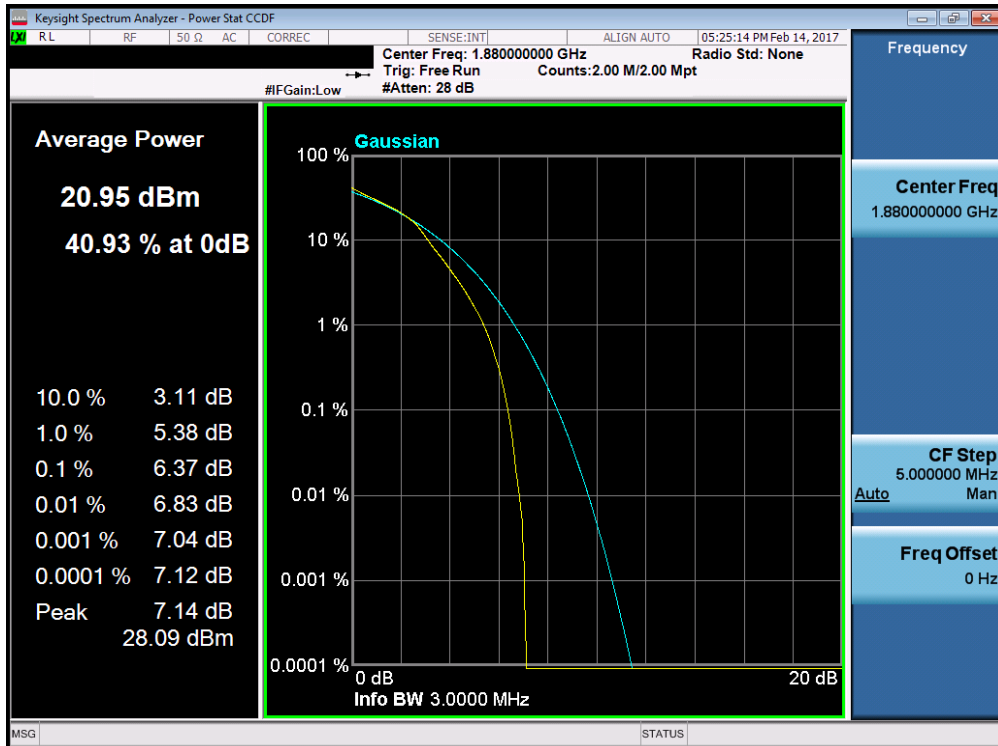


Plot 7-141. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 89 of 118

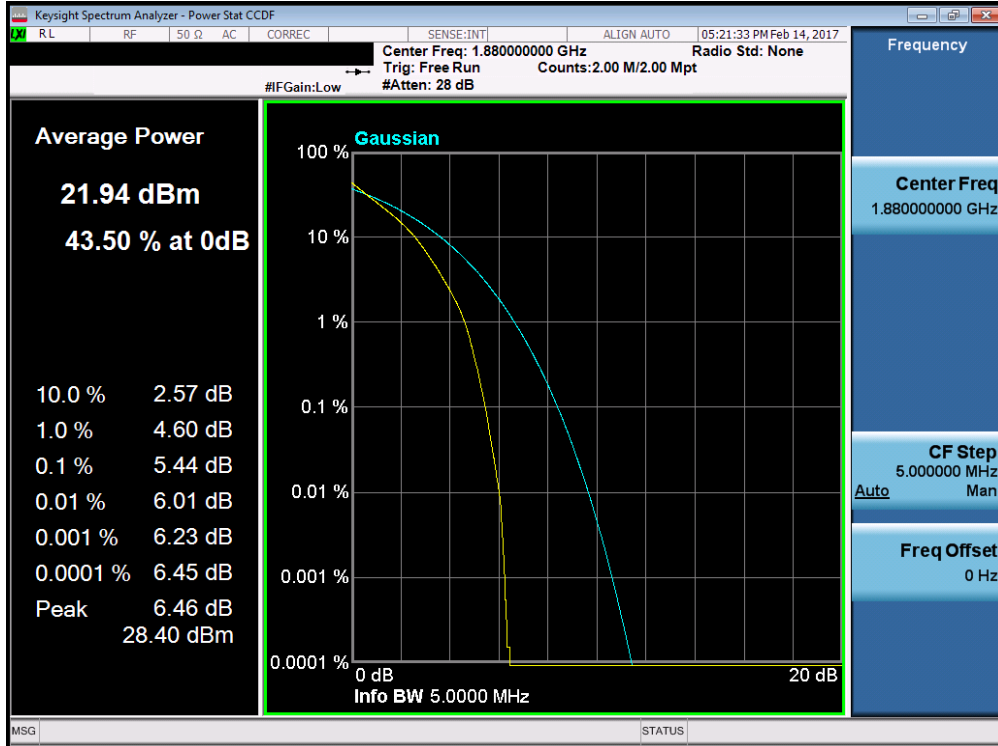


Plot 7-142. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

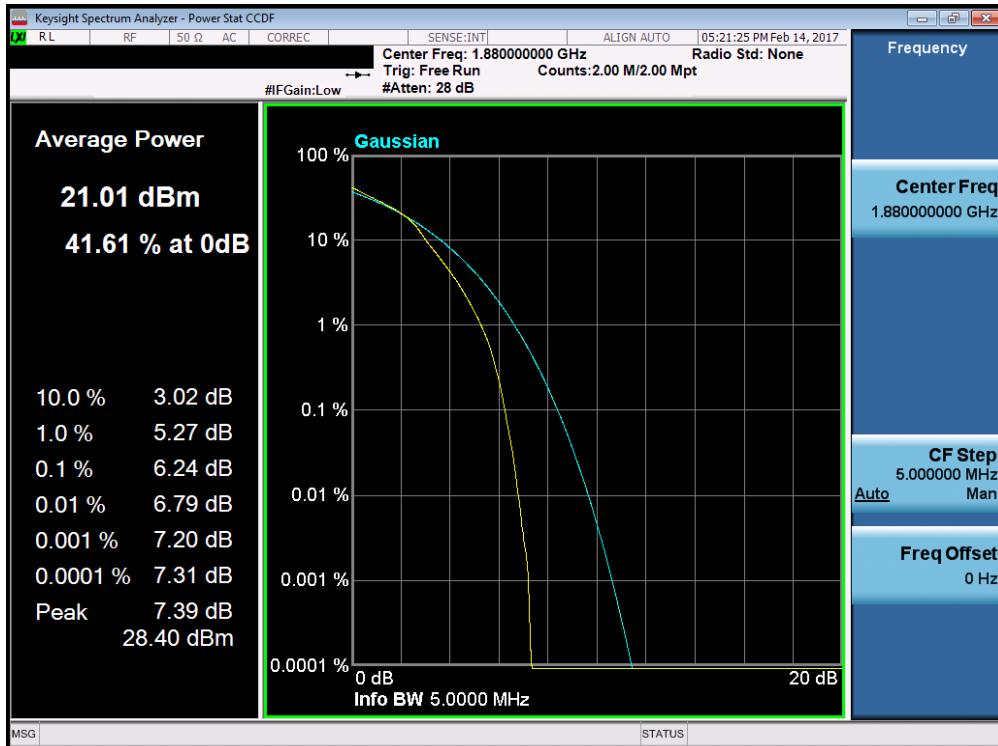


Plot 7-143. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 90 of 118

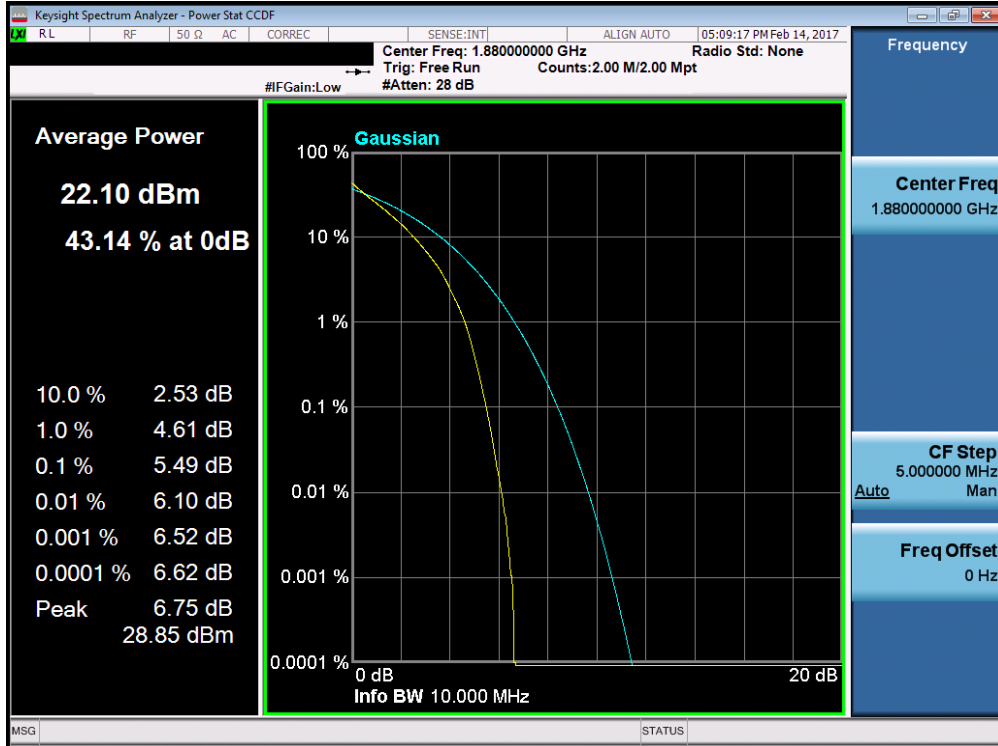


Plot 7-144. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

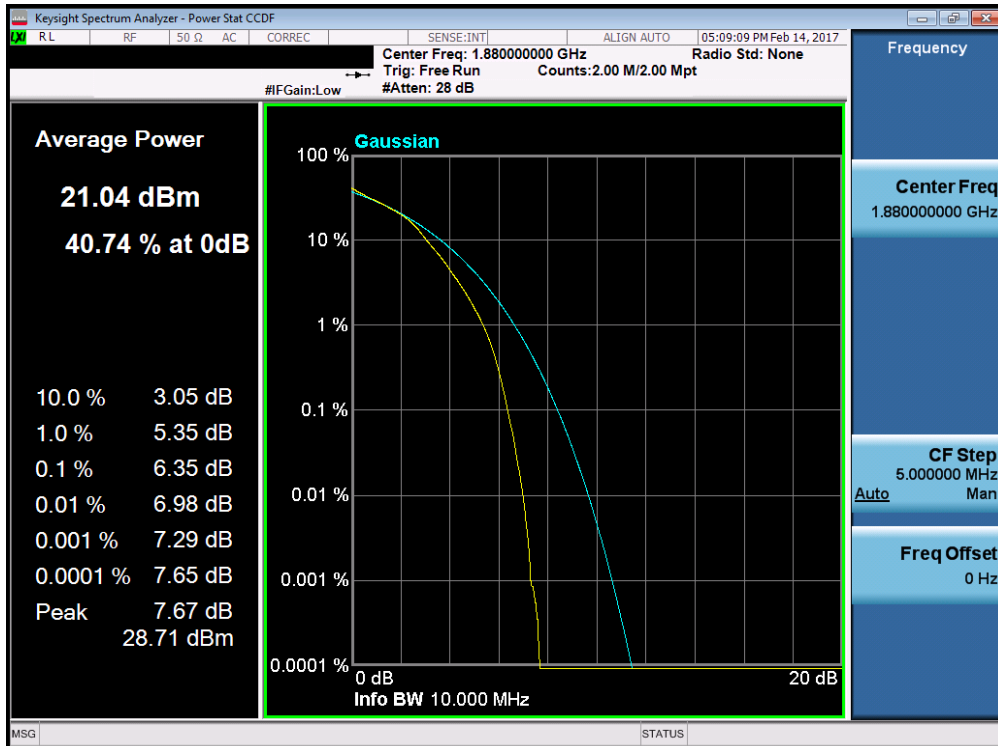


Plot 7-145. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 91 of 118

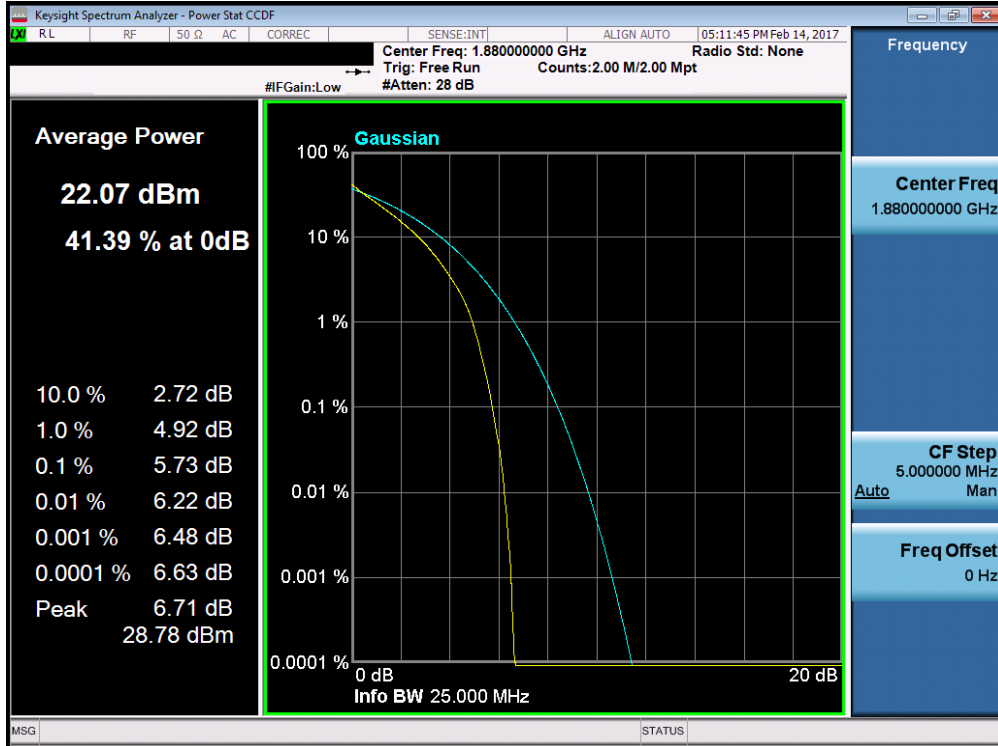


Plot 7-146. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

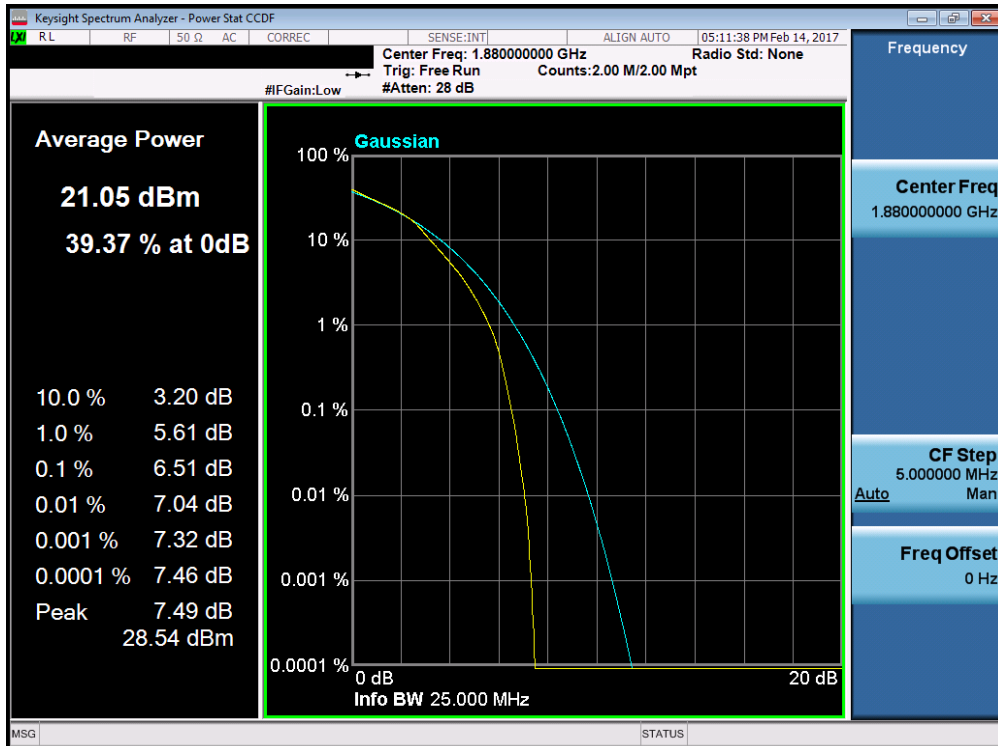


Plot 7-147. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 92 of 118

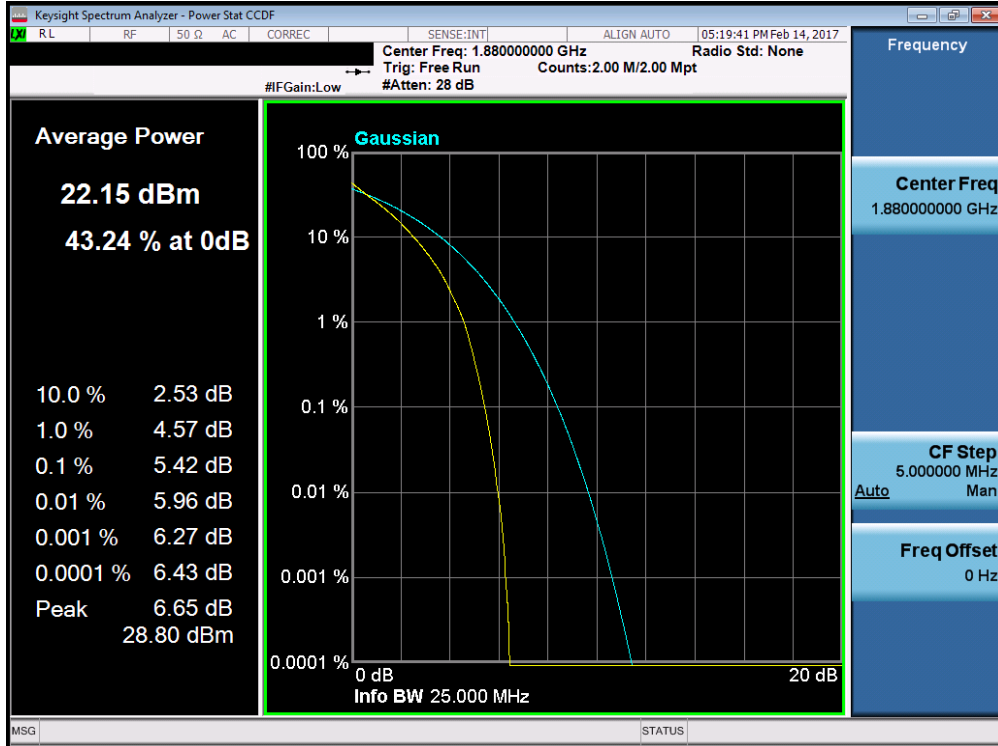


Plot 7-148. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

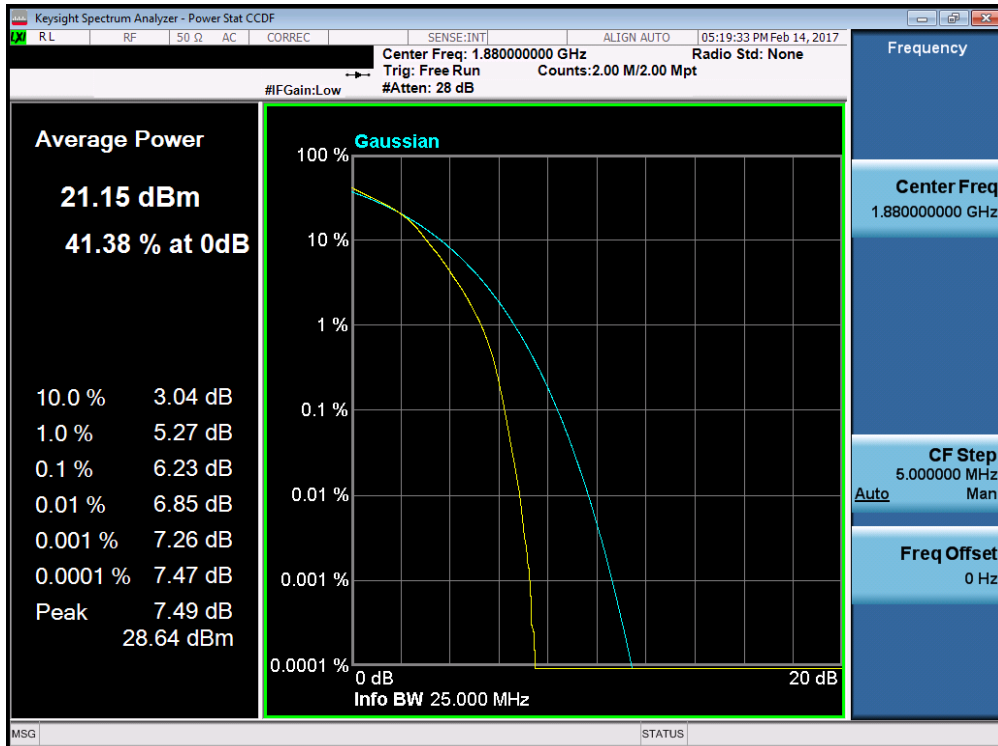


Plot 7-149. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-150. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-151. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1701270042-03.A3L	Test Dates: 2/1-3/2/2017	EUT Type: Portable Tablet		Page 94 of 118

7.6 Radiated Power (ERP/EIRP)
§22.913(a.2) §24.232(c.2) §27.50(b.10) §27.50(d.4)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) 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 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 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer’s “channel power” measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE 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.

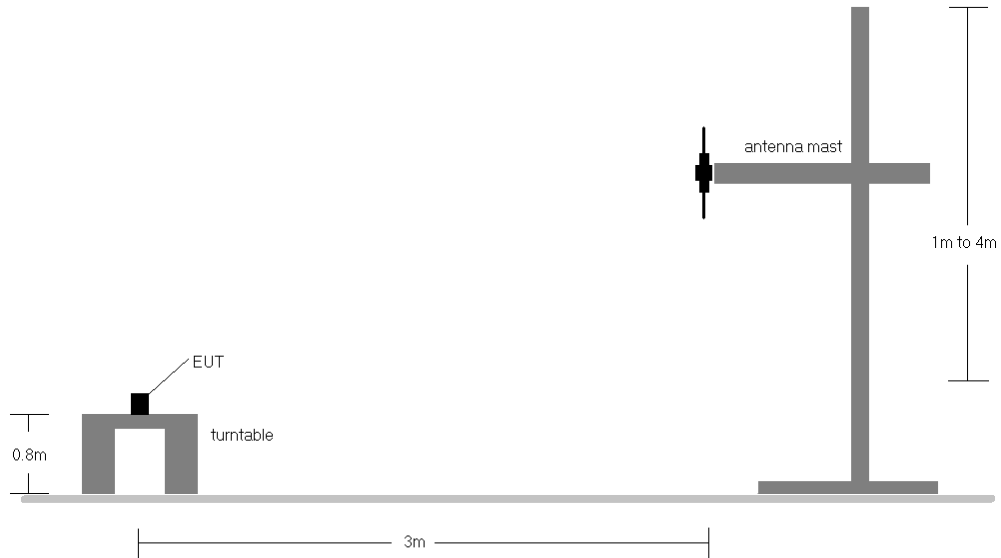


Figure 7-5. Radiated Test Setup <1GHz

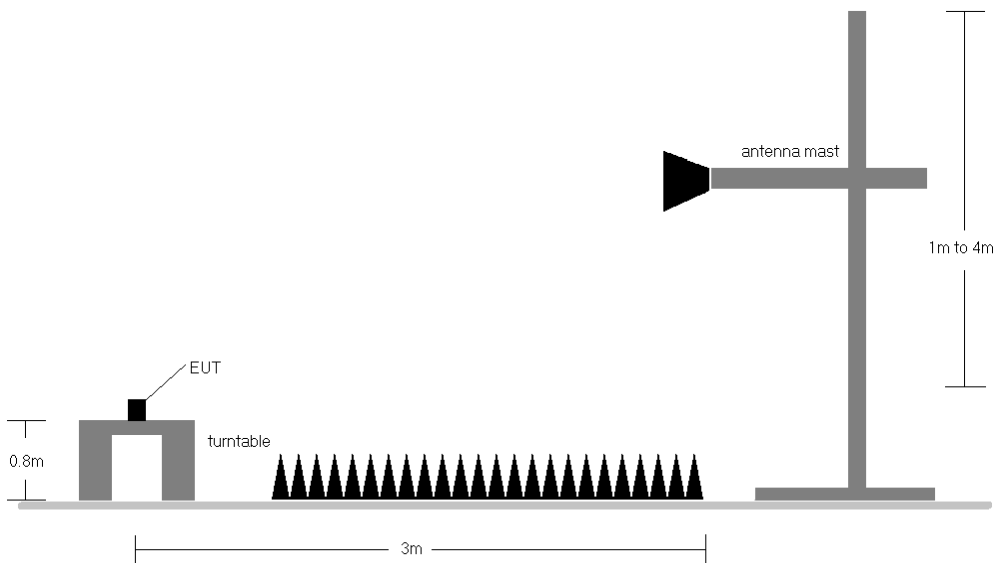




Figure 7-6. Radiated Test Setup >1GHz

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.



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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	150	4	1 / 0	21.14	-0.83	20.31	34.77	-14.46
782.00	5	QPSK	H	150	0	1 / 0	21.37	-0.82	20.55	34.77	-14.22
784.50	5	QPSK	H	150	1	1 / 0	21.28	-0.81	20.47	34.77	-14.30
782.00	5	16-QAM	H	150	0	1 / 0	20.29	-0.82	19.47	34.77	-15.30
782.00	10	QPSK	H	150	0	1 / 0	20.88	-0.82	20.06	34.77	-14.71
782.00	10	16-QAM	H	150	0	1 / 0	19.71	-0.82	18.89	34.77	-15.88
782.00	5	QPSK	V	150	284	1 / 0	20.65	-0.82	19.82	34.77	-14.95

Table 7-2. ERP Data (Band 13)



Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	9	1 / 0	18.76	-0.65	18.11	38.45	-20.34
836.50	1.4	QPSK	H	150	13	1 / 0	19.20	-0.65	18.55	38.45	-19.90
848.30	1.4	QPSK	H	150	14	1 / 0	19.96	-0.65	19.31	38.45	-19.14
848.30	1.4	16-QAM	H	150	14	1 / 0	18.95	-0.65	18.30	38.45	-20.15
825.50	3	QPSK	H	150	21	1 / 0	19.94	-0.65	19.29	38.45	-19.16
836.50	3	QPSK	H	150	32	1 / 0	20.05	-0.65	19.40	38.45	-19.05
847.50	3	QPSK	H	150	28	1 / 0	20.70	-0.65	20.05	38.45	-18.40
847.50	3	16-QAM	H	150	28	1 / 0	19.32	-0.65	18.67	38.45	-19.78
826.50	5	QPSK	H	150	24	1 / 0	20.88	-0.65	20.23	38.45	-18.22
836.50	5	QPSK	H	150	22	1 / 0	21.14	-0.65	20.49	38.45	-17.96
846.50	5	QPSK	H	150	29	1 / 0	21.43	-0.65	20.78	38.45	-17.67
846.50	5	16-QAM	H	150	29	1 / 0	20.22	-0.65	19.57	38.45	-18.88
829.00	10	QPSK	H	150	21	1 / 0	20.56	-0.65	19.91	38.45	-18.54
836.50	10	QPSK	H	150	26	1 / 0	21.02	-0.65	20.37	38.45	-18.08
844.00	10	QPSK	H	150	25	1 / 0	20.58	-0.65	19.93	38.45	-18.52
836.50	10	16-QAM	H	150	26	1 / 0	19.76	-0.65	19.11	38.45	-19.34
846.50	5	QPSK	V	150	267	1 / 0	20.79	-0.65	20.14	38.45	-18.31

Table 7-3. ERP Data (Band 5)

FCC ID: A3LSMT827V	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	107	1 / 0	19.07	5.56	24.63	30.00	-5.37
1732.50	1.4	QPSK	H	150	108	1 / 0	18.39	5.41	23.80	30.00	-6.20
1754.30	1.4	QPSK	H	150	102	1 / 0	18.07	5.26	23.33	30.00	-6.67
1710.70	1.4	16-QAM	H	150	108	1 / 0	17.79	5.56	23.35	30.00	-6.65
1711.50	3	QPSK	H	150	108	1 / 0	19.98	5.55	25.53	30.00	-4.47
1732.50	3	QPSK	H	150	108	1 / 0	19.28	5.41	24.69	30.00	-5.31
1753.50	3	QPSK	H	150	107	1 / 0	19.02	5.26	24.28	30.00	-5.72
1711.50	3	16-QAM	H	150	105	1 / 0	18.74	5.55	24.29	30.00	-5.71
1712.50	5	QPSK	H	150	105	1 / 0	20.72	5.55	26.27	30.00	-3.73
1732.50	5	QPSK	H	150	101	1 / 0	20.12	5.41	25.53	30.00	-4.47
1752.50	5	QPSK	H	150	103	1 / 0	19.97	5.27	25.24	30.00	-4.76
1712.50	5	16-QAM	H	150	104	1 / 0	19.59	5.55	25.14	30.00	-4.86
1715.00	10	QPSK	H	150	105	1 / 0	20.69	5.53	26.22	30.00	-3.78
1732.50	10	QPSK	H	150	105	1 / 0	20.30	5.41	25.71	30.00	-4.29
1750.00	10	QPSK	H	150	107	1 / 0	19.98	5.29	25.27	30.00	-4.73
1715.00	10	16-QAM	H	150	105	1 / 0	19.48	5.53	25.01	30.00	-4.99
1717.50	15	QPSK	H	150	100	1 / 0	21.29	5.51	26.80	30.00	-3.20
1732.50	15	QPSK	H	150	102	1 / 0	21.03	5.41	26.44	30.00	-3.56
1747.50	15	QPSK	H	150	102	1 / 0	20.54	5.31	25.85	30.00	-4.15
1717.50	15	16-QAM	H	150	100	1 / 0	19.92	5.51	25.43	30.00	-4.57
1720.00	20	QPSK	H	150	104	1 / 0	20.79	5.49	26.28	30.00	-3.72
1732.50	20	QPSK	H	150	101	1 / 0	20.98	5.41	26.39	30.00	-3.61
1745.00	20	QPSK	H	150	98	1 / 0	20.57	5.32	25.89	30.00	-4.11
1732.50	20	16-QAM	H	150	101	1 / 0	20.01	5.41	25.42	30.00	-4.58
1717.50	15	QPSK	V	150	271	1 / 0	16.40	5.57	21.97	30.00	-8.03

Table 7-4. EIRP Data (Band 4)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	108	1 / 0	17.80	4.82	22.62	33.01	-10.39
1880.00	1.4	QPSK	H	150	109	1 / 0	17.71	4.74	22.45	33.01	-10.56
1909.30	1.4	QPSK	H	150	114	1 / 0	18.62	4.68	23.30	33.01	-9.71
1909.30	1.4	16-QAM	H	150	108	1 / 0	17.42	4.68	22.10	33.01	-10.91
1851.50	3	QPSK	H	150	113	1 / 0	18.89	4.82	23.71	33.01	-9.30
1880.00	3	QPSK	H	150	111	1 / 0	18.50	4.74	23.24	33.01	-9.77
1908.50	3	QPSK	H	150	113	1 / 0	19.31	4.68	23.99	33.01	-9.02
1908.50	3	16-QAM	H	150	110	1 / 0	18.01	4.68	22.69	33.01	-10.32
1852.50	5	QPSK	H	150	110	1 / 0	19.71	4.81	24.52	33.01	-8.49
1880.00	5	QPSK	H	150	115	1 / 0	19.51	4.74	24.25	33.01	-8.76
1907.50	5	QPSK	H	150	113	1 / 0	20.03	4.68	24.71	33.01	-8.30
1907.50	5	16-QAM	H	150	108	1 / 0	18.55	4.68	23.23	33.01	-9.78
1855.00	10	QPSK	H	150	109	1 / 0	19.72	4.81	24.53	33.01	-8.48
1880.00	10	QPSK	H	150	114	1 / 0	19.56	4.74	24.30	33.01	-8.71
1905.00	10	QPSK	H	150	110	1 / 0	19.45	4.68	24.13	33.01	-8.88
1855.00	10	16-QAM	H	150	108	1 / 0	18.35	4.81	23.16	33.01	-9.85
1857.50	15	QPSK	H	150	114	1 / 0	19.90	4.80	24.70	33.01	-8.31
1880.00	15	QPSK	H	150	108	1 / 0	20.18	4.74	24.92	33.01	-8.09
1902.50	15	QPSK	H	150	111	1 / 0	20.46	4.69	25.15	33.01	-7.86
1902.50	15	16-QAM	H	150	111	1 / 0	19.09	4.69	23.78	33.01	-9.23
1860.00	20	QPSK	H	150	108	1 / 0	20.02	4.79	24.81	33.01	-8.20
1880.00	20	QPSK	H	150	116	1 / 0	20.15	4.74	24.89	33.01	-8.12
1900.00	20	QPSK	H	150	113	1 / 0	20.29	4.69	24.98	33.01	-8.03
1900.00	20	16-QAM	H	150	116	1 / 0	19.47	4.69	24.16	33.01	-8.85
1902.50	15	QPSK	V	150	14	1 / 0	18.15	4.88	23.03	33.01	-9.98

Table 7-5. EIRP Data (Band 2)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(h)

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 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points \geq 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE 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.

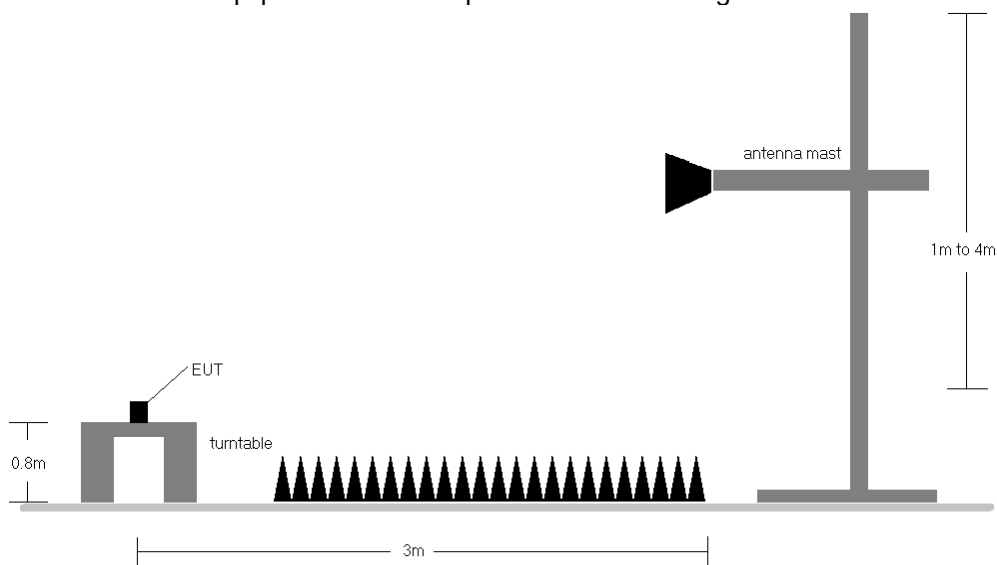


Figure 7-7. Test Instrument & Measurement Setup

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.

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OPERATING FREQUENCY: 779.50 MHz
 CHANNEL: 23205
 MEASURED OUTPUT POWER: 20.31 dBm = 0.107 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.31 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2338.50	H	155	322	-55.25	7.35	-47.90	68.2
3118.00	H	131	309	-62.62	7.19	-55.43	75.7
3897.50	H	-	-	-70.41	7.31	-63.10	83.4

Table 7-6. Radiated Spurious Data (Band 13 – Low Channel)

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MEASURED OUTPUT POWER: 20.55 dBm = 0.113 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.55 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	125	317	-58.22	7.33	-50.89	71.4
3128.00	H	110	322	-66.47	7.20	-59.27	79.8
3910.00	H	-	-	-67.96	7.34	-60.62	81.2

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

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MEASURED OUTPUT POWER: 20.47 dBm = 0.111 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.47 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	149	319	-53.47	7.30	-46.17	66.6
3138.00	H	154	304	-59.70	7.21	-52.48	73.0
3922.50	H	-	-	-67.99	7.37	-60.62	81.1

Table 7-8. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 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 [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	119	345	-59.09	6.55	-52.54	-12.5
1564.00	H	113	331	-60.43	6.57	-53.86	-13.9

Table 7-9. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 826.50 MHz
 CHANNEL: 20425
 MEASURED OUTPUT POWER: 20.23 dBm = 0.105 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.23 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	-	-	-75.94	6.70	-69.24	89.5
2479.50	H	-	-	-73.34	7.54	-65.80	86.0
3306.00	H	-	-	-68.78	7.38	-61.40	81.6

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

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MEASURED OUTPUT POWER: 20.49 dBm = 0.112 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.49 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	-	-	-76.74	6.70	-70.04	90.5
2509.50	H	-	-	-73.79	7.63	-66.16	86.7
3346.00	H	-	-	-70.87	7.51	-63.36	83.8

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

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 20625
 MEASURED OUTPUT POWER: 20.78 dBm = 0.120 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.78 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	-	-	-75.41	6.70	-68.72	89.5
2539.50	H	-	-	-72.52	7.60	-64.92	85.7
3386.00	H	-	-	-70.37	7.65	-62.72	83.5

Table 7-12. Radiated Spurious Data (Band 5 – High Channel)

OPERATING FREQUENCY: 1717.50 MHz
 CHANNEL: 20025
 MEASURED OUTPUT POWER: 26.80 dBm = 0.479 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 39.80 dBc

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]	[dBc]
3435.00	H	121	68	-51.19	9.88	-41.31	68.1
5152.50	H	137	12	-57.55	10.75	-46.79	73.6
6870.00	H	110	360	-37.81	11.69	-26.12	52.9
8587.50	H	149	15	-45.33	11.07	-34.27	61.1
10305.00	H	115	358	-58.66	12.43	-46.23	73.0
12022.50	H	119	54	-51.07	12.76	-38.32	65.1
13740.00	H	-	-	-54.31	11.95	-42.36	69.2

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

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 26.44 dBm = 0.440 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 39.44 dBc



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]	[dBc]
3465.00	H	136	48	-56.55	9.91	-46.64	73.1
5197.50	H	135	323	-57.68	10.75	-46.94	73.4
6930.00	H	131	1	-44.81	11.76	-33.05	59.5
8662.50	H	144	7	-46.28	11.00	-35.28	61.7
10395.00	H	120	353	-57.00	12.65	-44.35	70.8
12127.50	H	122	296	-52.55	12.99	-39.56	66.0
13860.00	H	-	-	-51.82	11.80	-40.02	66.5

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

OPERATING FREQUENCY: 1747.50 MHz
 CHANNEL: 20325
 MEASURED OUTPUT POWER: 25.85 dBm = 0.384 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 38.85 dBc

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]	[dBc]
3495.00	H	139	25	-54.17	9.94	-44.23	70.1
5242.50	H	140	310	-52.78	10.72	-42.06	67.9
6990.00	H	141	359	-42.93	11.83	-31.10	56.9
8737.50	H	115	17	-45.73	10.96	-34.77	60.6
10485.00	H	124	353	-55.93	12.67	-43.26	69.1
12232.50	H	124	395	-52.10	13.18	-38.92	64.8
13980.00	H	-	-	-52.12	11.60	-40.53	66.4

Table 7-15. Radiated Spurious Data (Band 4 – High Channel)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1857.50 MHz
 CHANNEL: 18675
 MEASURED OUTPUT POWER: 24.70 dBm = 0.295 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.70 dBc

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]	[dBc]
3715.00	H	162	56	-59.82	9.49	-50.33	75.0
5572.50	H	155	305	-53.71	11.08	-42.63	67.3
7430.00	H	160	26	-52.14	10.98	-41.16	65.9
9287.50	H	130	331	-48.00	11.54	-36.46	61.2
11145.00	H	134	291	-55.06	12.79	-42.28	67.0
13002.50	H	-	-	-55.91	13.34	-42.57	67.3

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

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 24.92 dBm = 0.310 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 37.92 dBc

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]	[dBc]
3760.00	H	161	62	-56.32	9.39	-46.94	71.9
5640.00	H	158	315	-56.24	11.22	-45.02	69.9
7520.00	H	131	5	-47.91	11.10	-36.80	61.7
9400.00	H	130	355	-50.52	11.54	-38.98	63.9
11280.00	H	145	305	-56.36	12.76	-43.60	68.5
13160.00	H	-	-	-55.73	13.05	-42.68	67.6



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

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1902.50 MHz
 CHANNEL: 19125
 MEASURED OUTPUT POWER: 25.15 dBm = 0.327 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 38.15 dBc

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]	[dBc]
3805.00	H	121	58	-57.73	9.30	-48.43	73.6
5707.50	H	162	305	-54.79	11.31	-43.49	68.6
7610.00	H	116	280	-49.32	11.30	-38.02	63.2
9512.50	H	134	341	-51.43	11.68	-39.75	64.9
11415.00	H	134	293	-55.58	12.73	-42.86	68.0
13317.50	H	-	-	-55.94	12.74	-43.20	68.3

Table 7-18. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.8 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-D-2010. The frequency stability of the transmitter is measured by:

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

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 and 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-D-2010

Test Settings



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

Test Setup

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

Test Notes

None

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Band 13 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 782,000,000 Hz
 CHANNEL: 23230
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	782,000,214	214	0.0000274
100 %		- 30	782,000,066	66	0.0000084
100 %		- 20	782,000,104	104	0.0000133
100 %		- 10	781,999,916	-84	-0.0000107
100 %		0	782,000,059	59	0.0000075
100 %		+ 10	782,000,103	103	0.0000132
100 %		+ 20	782,000,029	29	0.0000037
100 %		+ 30	781,999,973	-27	-0.0000035
100 %		+ 40	782,000,248	248	0.0000317
100 %		+ 50	782,000,139	139	0.0000178
BATT. ENDPOINT	3.45	+ 20	782,000,154	154	0.0000197

Table 7-19. Frequency Stability Data (Band 13)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 13 Frequency Stability Measurements
§2.1055 §27.54

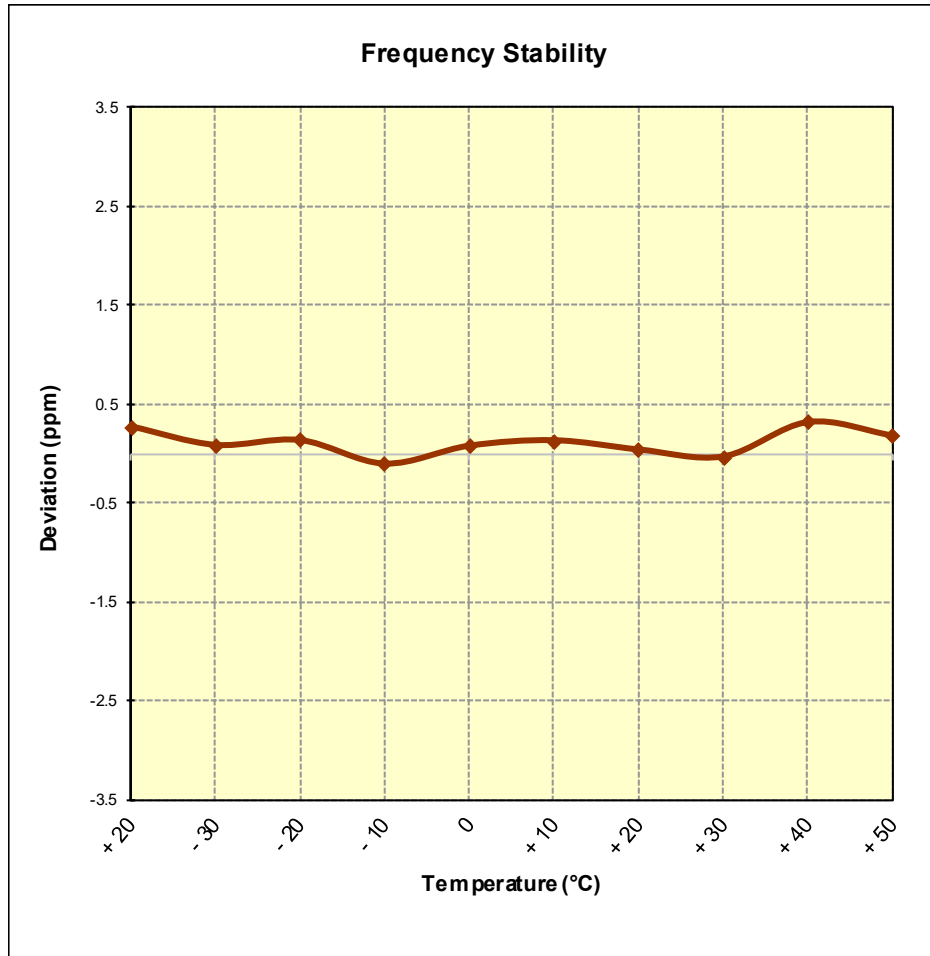


Figure 7-8. Frequency Stability Graph (Band 13)

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Band 5 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525
 REFERENCE VOLTAGE: 3.85 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,500,261	261	0.0000312
100 %		- 30	836,500,123	123	0.0000147
100 %		- 20	836,499,920	-80	-0.0000096
100 %		- 10	836,499,745	-255	-0.0000305
100 %		0	836,499,983	-17	-0.0000020
100 %		+ 10	836,500,020	20	0.0000024
100 %		+ 20	836,500,151	151	0.0000181
100 %		+ 30	836,499,985	-15	-0.0000018
100 %		+ 40	836,500,081	81	0.0000097
100 %		+ 50	836,499,821	-179	-0.0000214
BATT. ENDPOINT	3.45	+ 20	836,500,045	45	0.0000054

Table 7-20. Frequency Stability Data (Band 5)

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Band 5 Frequency Stability Measurements
§2.1055 §22.355

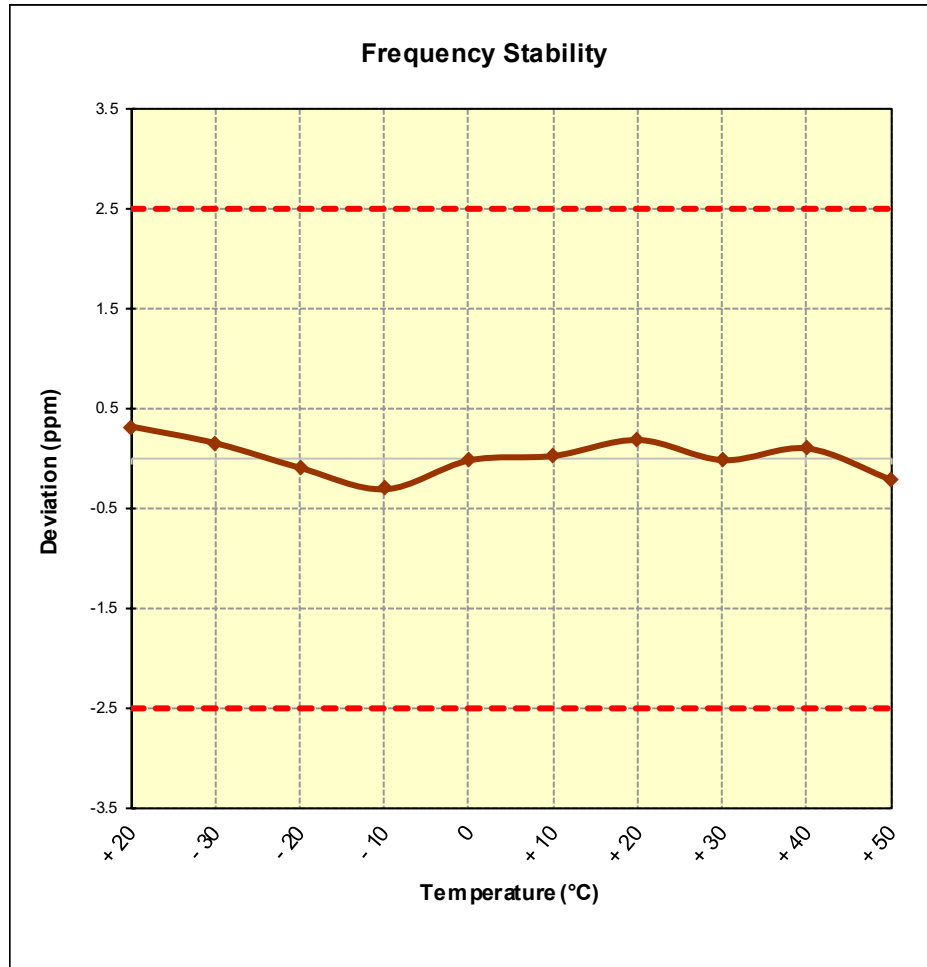




Figure 7-9. Frequency Stability Graph (Band 5)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 4 Frequency Stability Measurements

§2.1055 §§27.54

OPERATING FREQUENCY: 1,732,500,000 Hz
 CHANNEL: 20175
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,732,499,775	-225	-0.0000130
100 %		- 30	1,732,500,306	306	0.0000177
100 %		- 20	1,732,499,991	-9	-0.0000005
100 %		- 10	1,732,499,920	-80	-0.0000046
100 %		0	1,732,499,856	-144	-0.0000083
100 %		+ 10	1,732,499,974	-26	-0.0000015
100 %		+ 20	1,732,500,069	69	0.0000040
100 %		+ 30	1,732,499,553	-447	-0.0000258
100 %		+ 40	1,732,500,033	33	0.0000019
100 %		+ 50	1,732,500,009	9	0.0000005
BATT. ENDPOINT	3.45	+ 20	1,732,500,029	29	0.0000017

Table 7-21. Frequency Stability Data (Band 4)

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 4 Frequency Stability Measurements
§2.1055 §§27.54

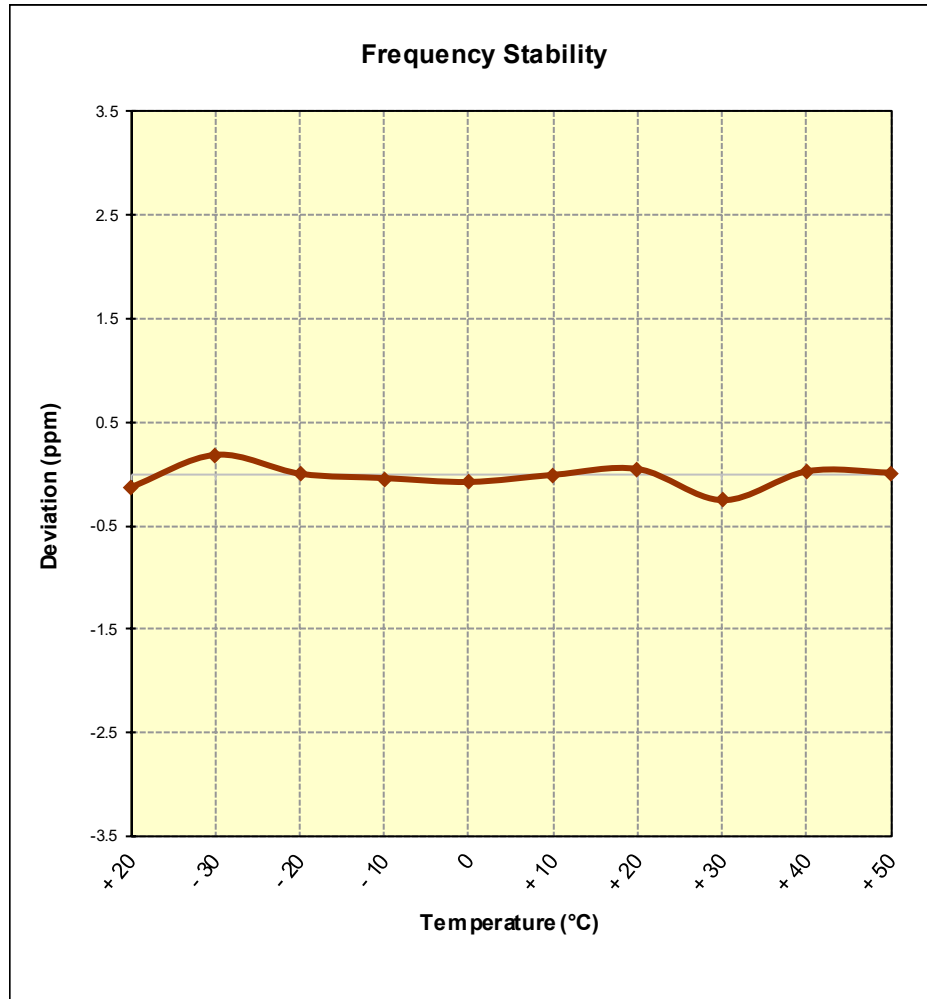


Figure 7-10. Frequency Stability Graph (Band 4)

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Band 2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 18900
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,058	58	0.0000031
100 %		- 30	1,879,999,901	-99	-0.0000053
100 %		- 20	1,880,000,090	90	0.0000048
100 %		- 10	1,879,999,972	-28	-0.0000015
100 %		0	1,880,000,187	187	0.0000099
100 %		+ 10	1,879,999,990	-10	-0.0000005
100 %		+ 20	1,879,999,727	-273	-0.0000145
100 %		+ 30	1,879,999,834	-166	-0.0000088
100 %		+ 40	1,879,999,935	-65	-0.0000035
100 %		+ 50	1,880,000,037	37	0.0000020
BATT. ENDPOINT	3.45	+ 20	1,880,000,195	195	0.0000104

Table 7-22. Frequency Stability Data (Band 2)

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: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 2 Frequency Stability Measurements
§2.1055 §24.235

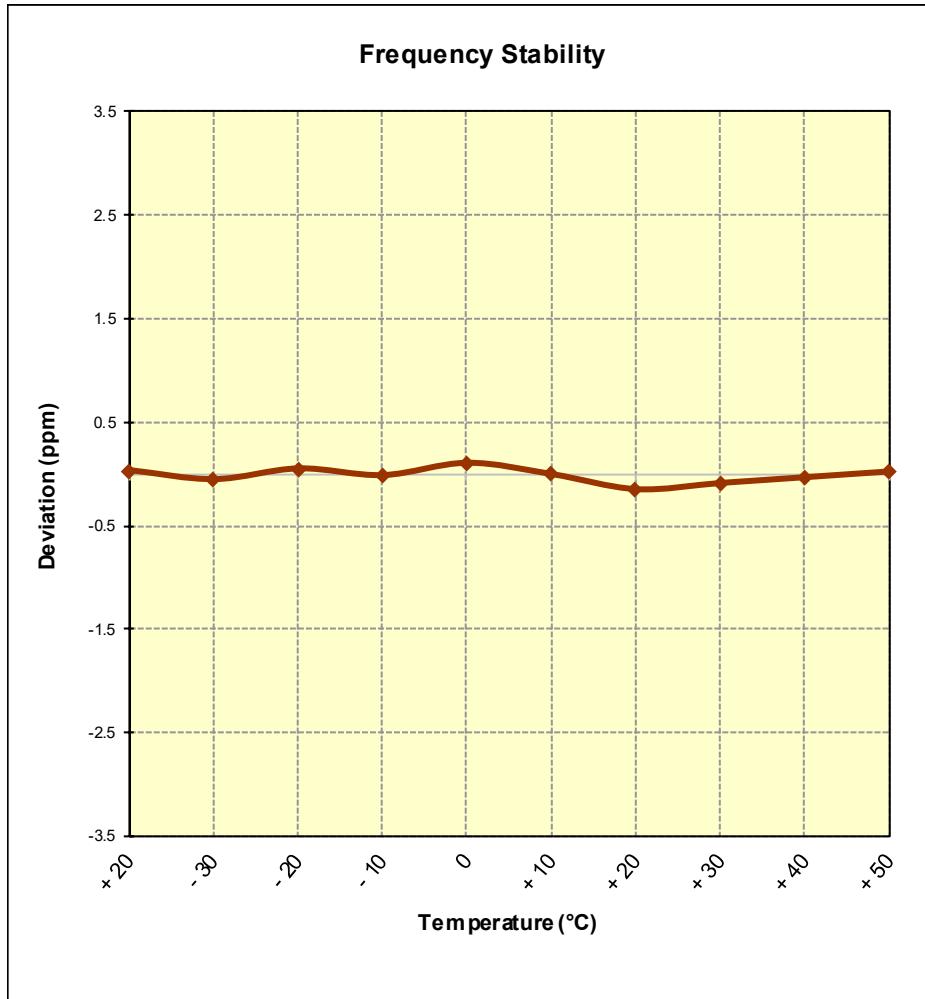






Figure 7-11. Frequency Stability Graph (Band 2)

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Tablet FCC ID: A3LSMT827V** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: A3LSMT827V		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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