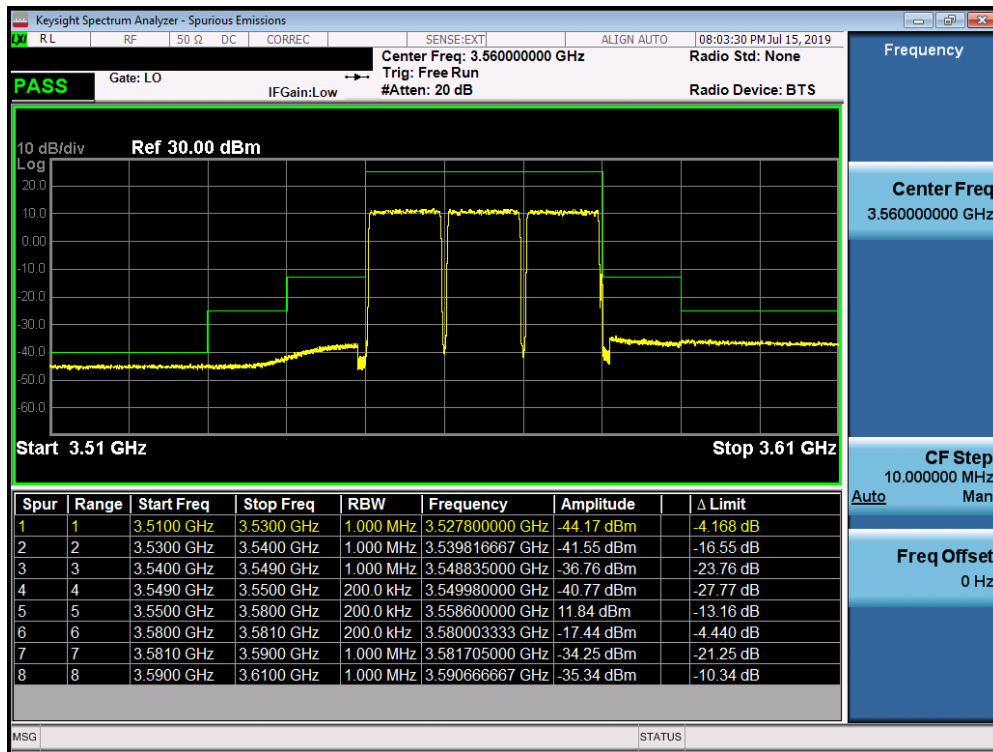
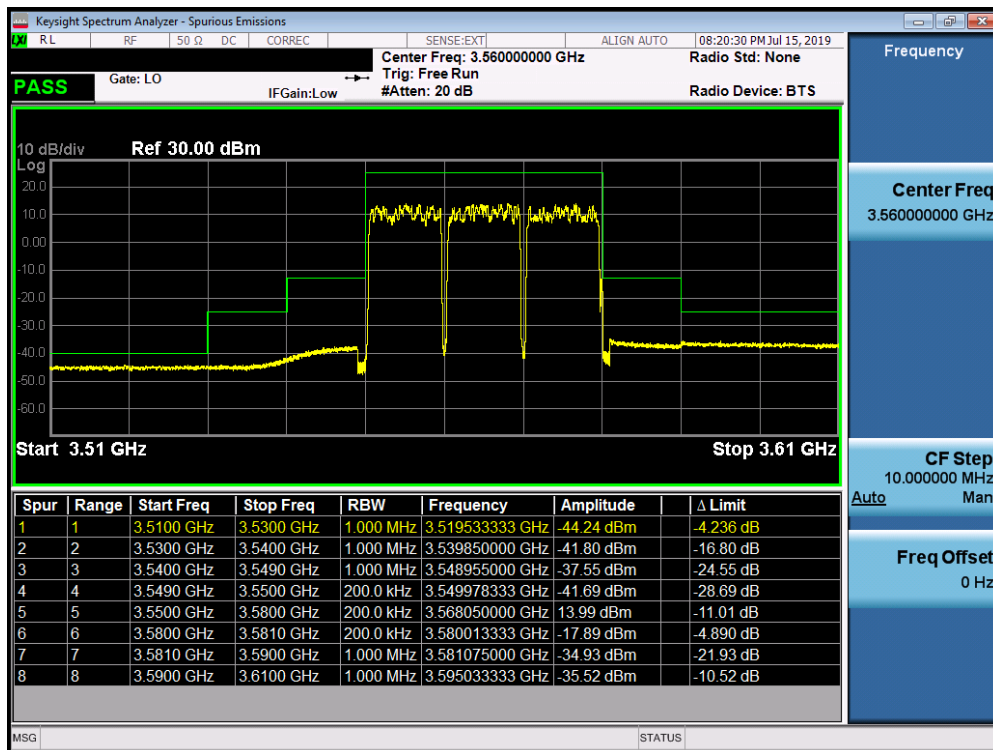


## Low Channel 30MHz Total Bandwidth Channel Edge

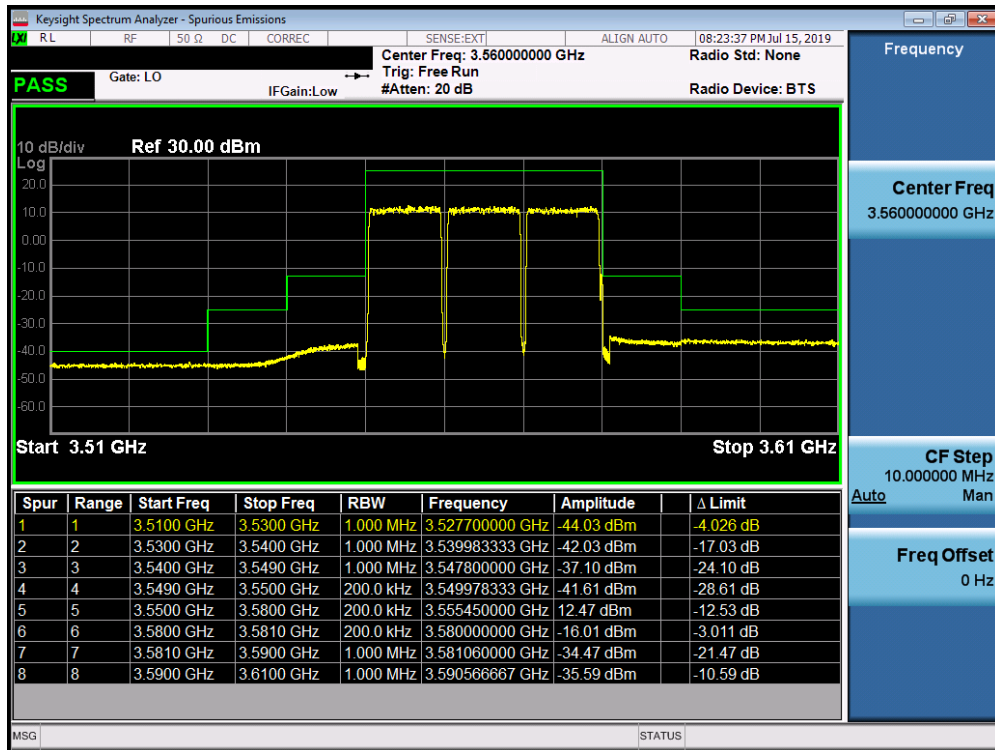


Plot 7-160. Low Channel Edge Plot (30MHz Total Bandwidth QPSK)

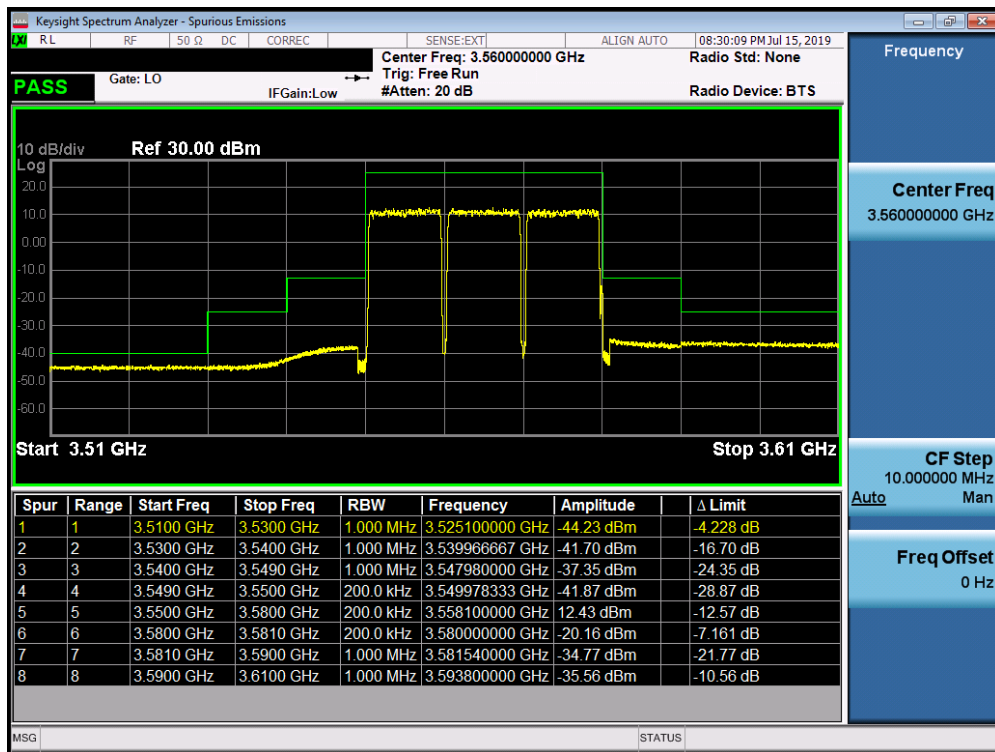


Plot 7-161. Low Channel Edge Plot (30MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 144 of 172



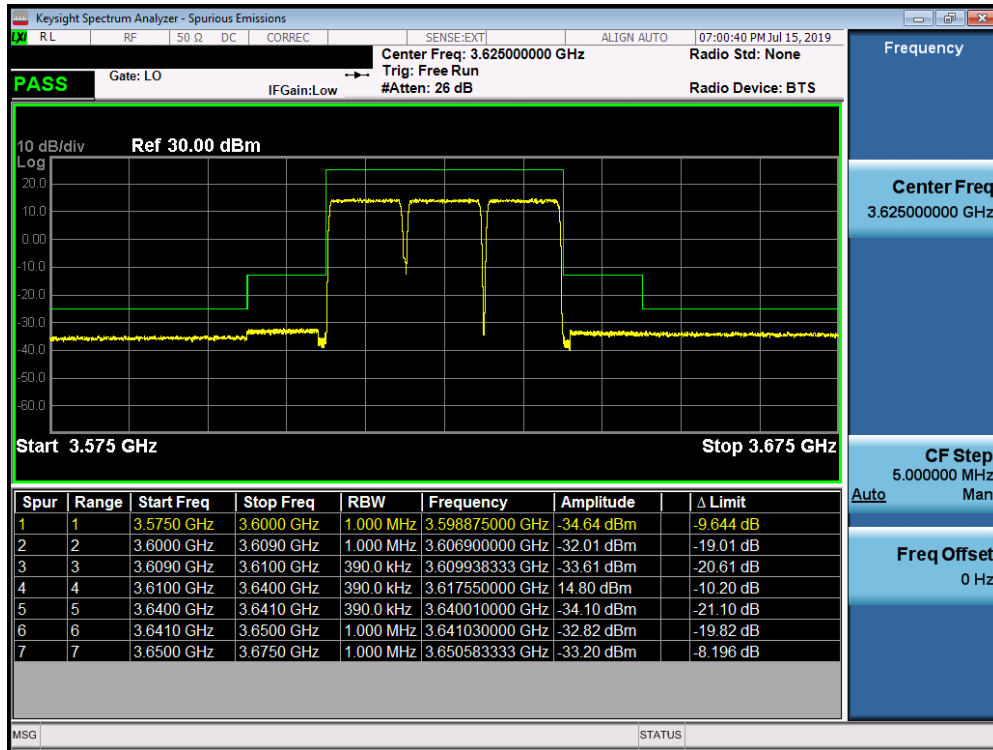
Plot 7-162. Low Channel Edge Plot (30MHz Total Bandwidth 64QAM)



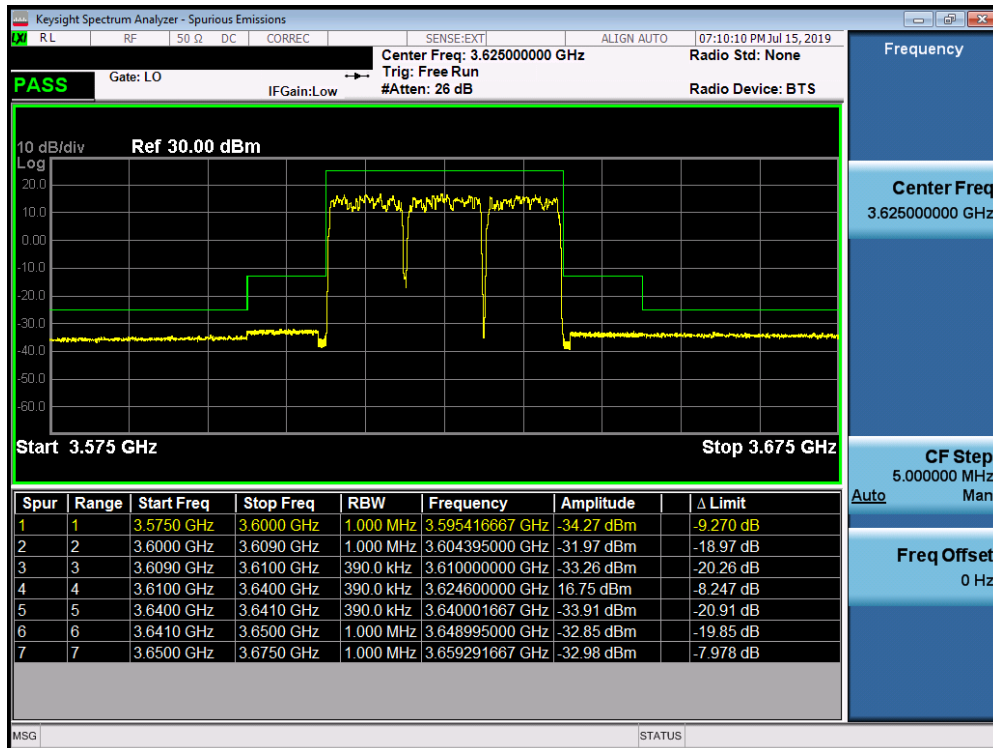
Plot 7-163. Low Channel Edge Plot (30MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 145 of 172

## Mid Channel 30MHz Total Bandwidth Channel Edge

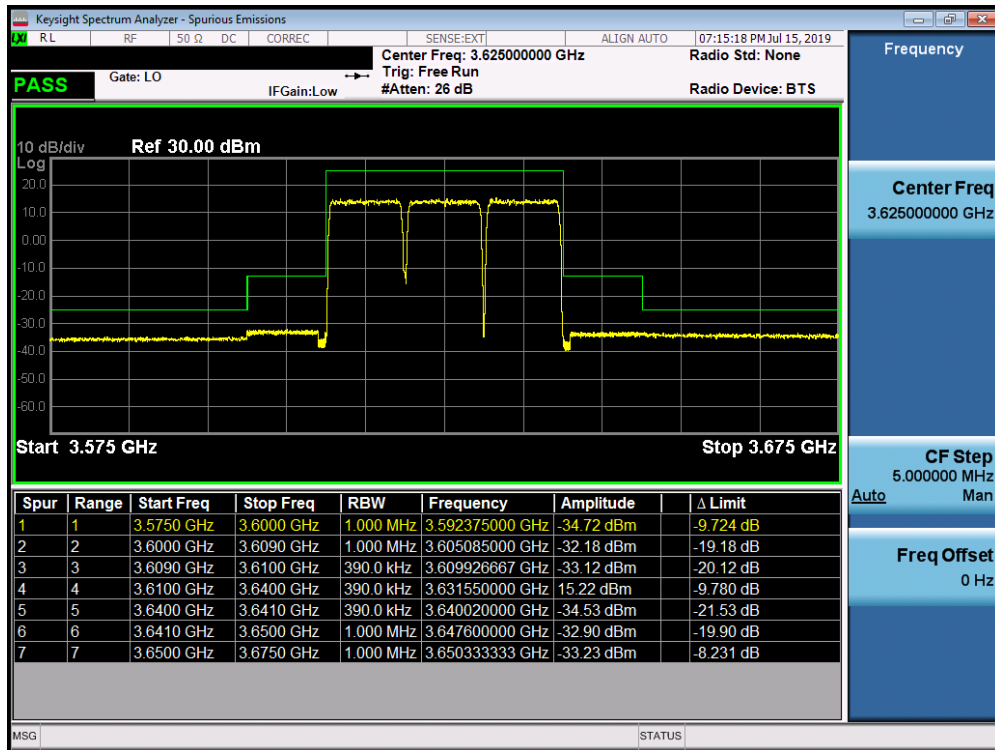


Plot 7-164. Mid Channel Edge Plot (30MHz Total Bandwidth QPSK)

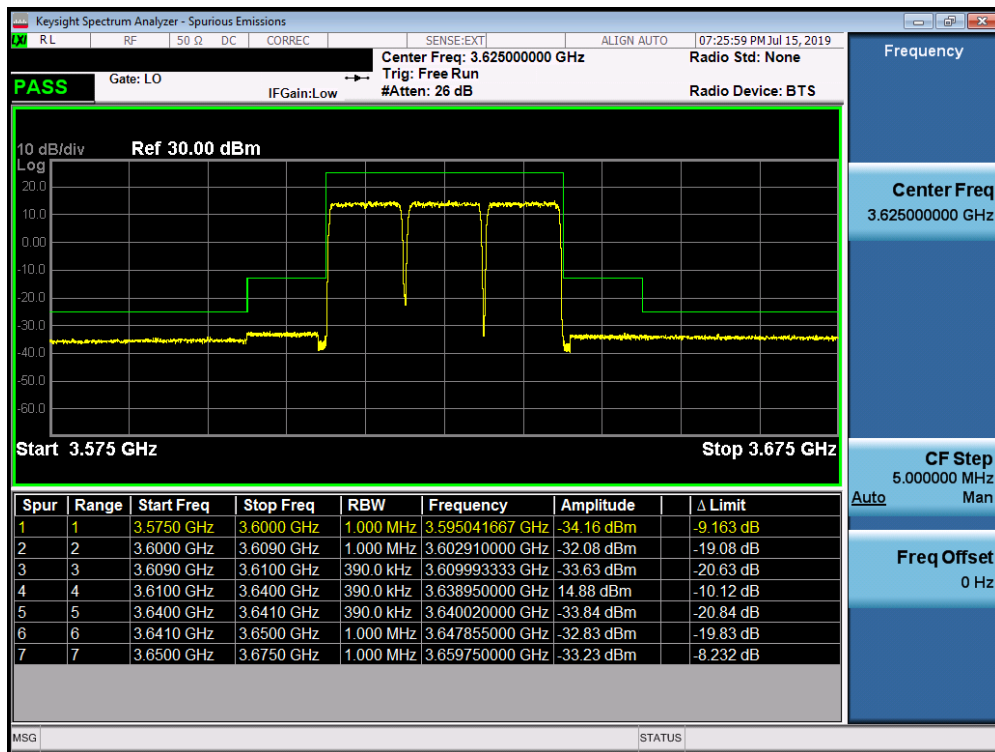


Plot 7-165. Mid Channel Edge Plot (30MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 146 of 172



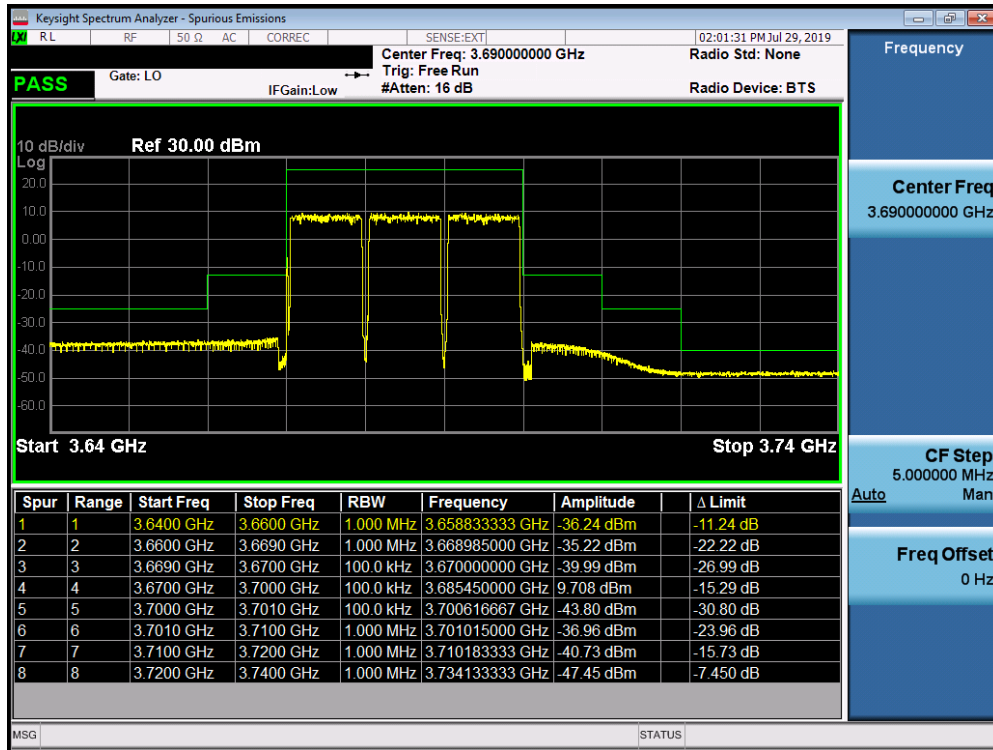
Plot 7-166. Mid Channel Edge Plot (30MHz Total Bandwidth 64QAM)



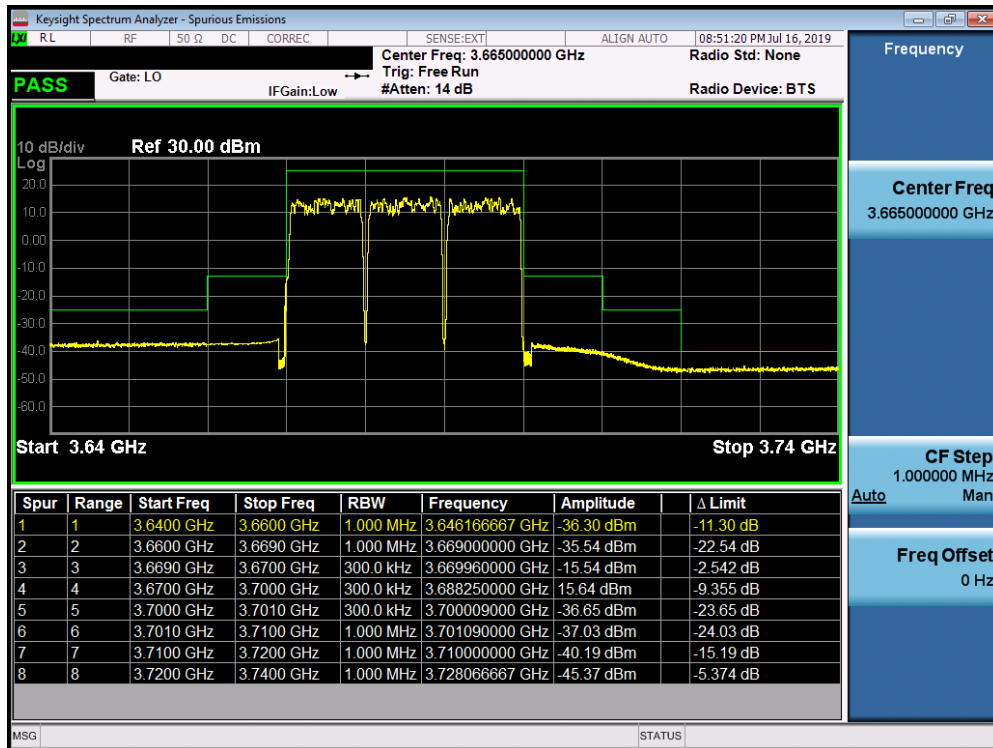
Plot 7-167. Mid Channel Edge Plot (30MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 147 of 172

## High Channel 30MHz Total Bandwidth Channel Edge



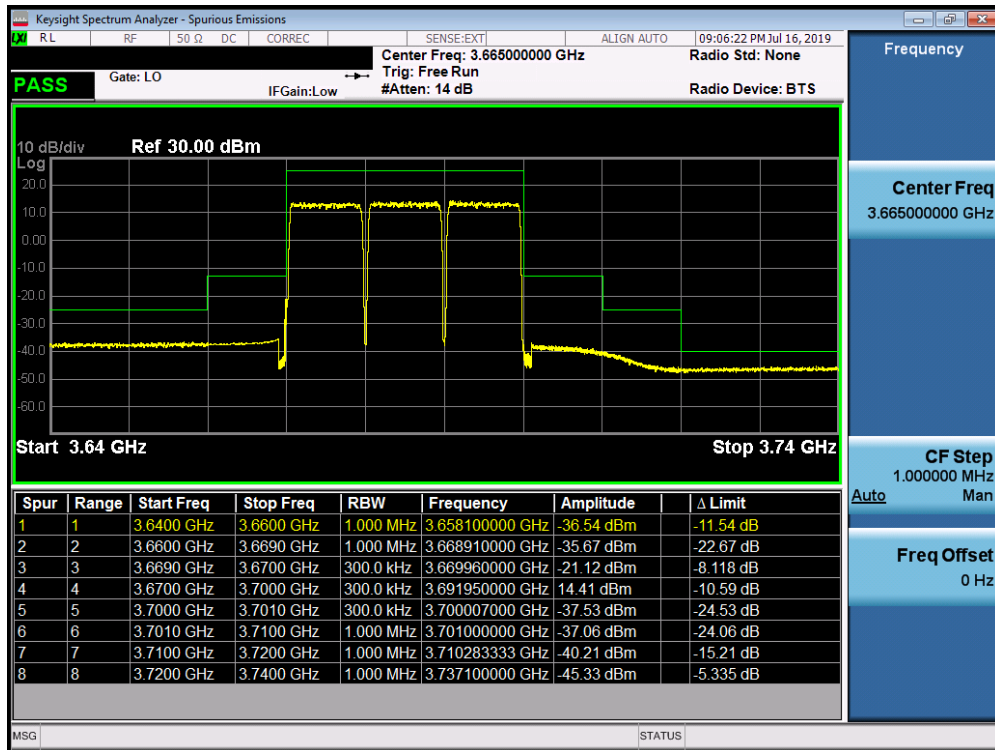
Plot 7-168. High Channel Edge Plot (30MHz Total Bandwidth QPSK)



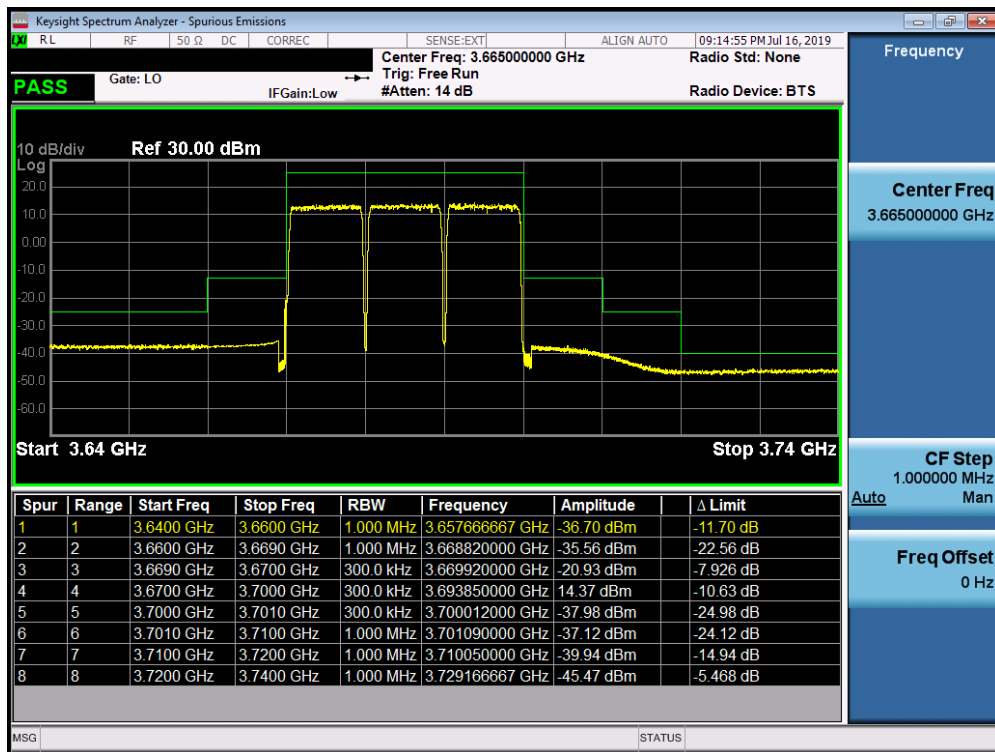
Plot 7-169. High Channel Edge Plot (30MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 148 of 172





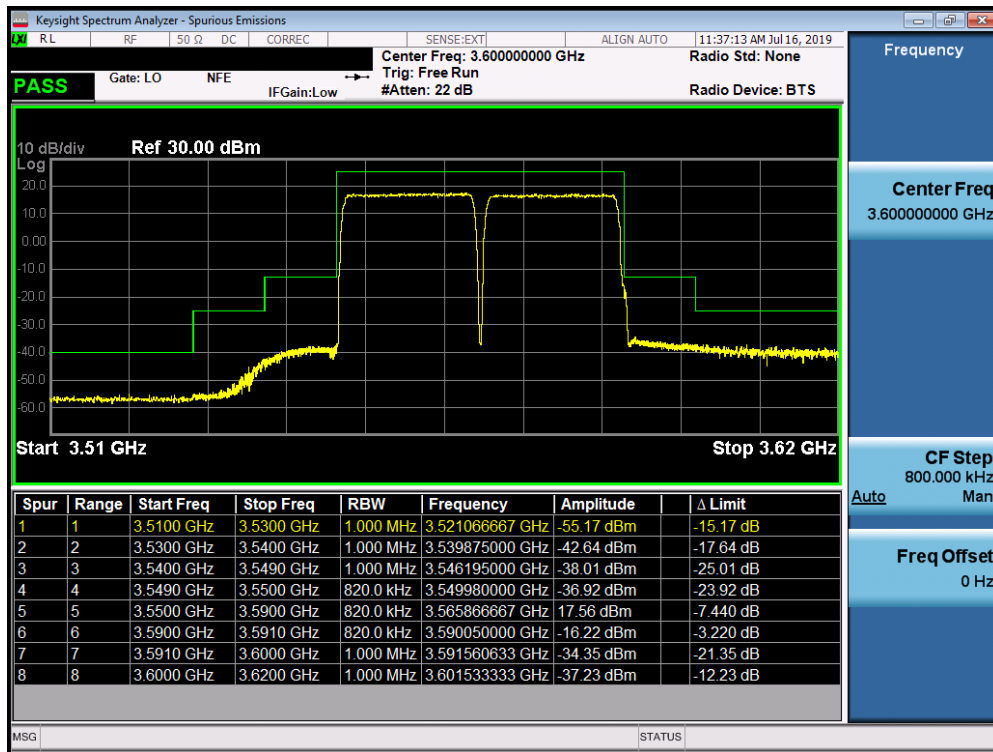
Plot 7-170. High Channel Edge Plot (30MHz Total Bandwidth 64QAM)



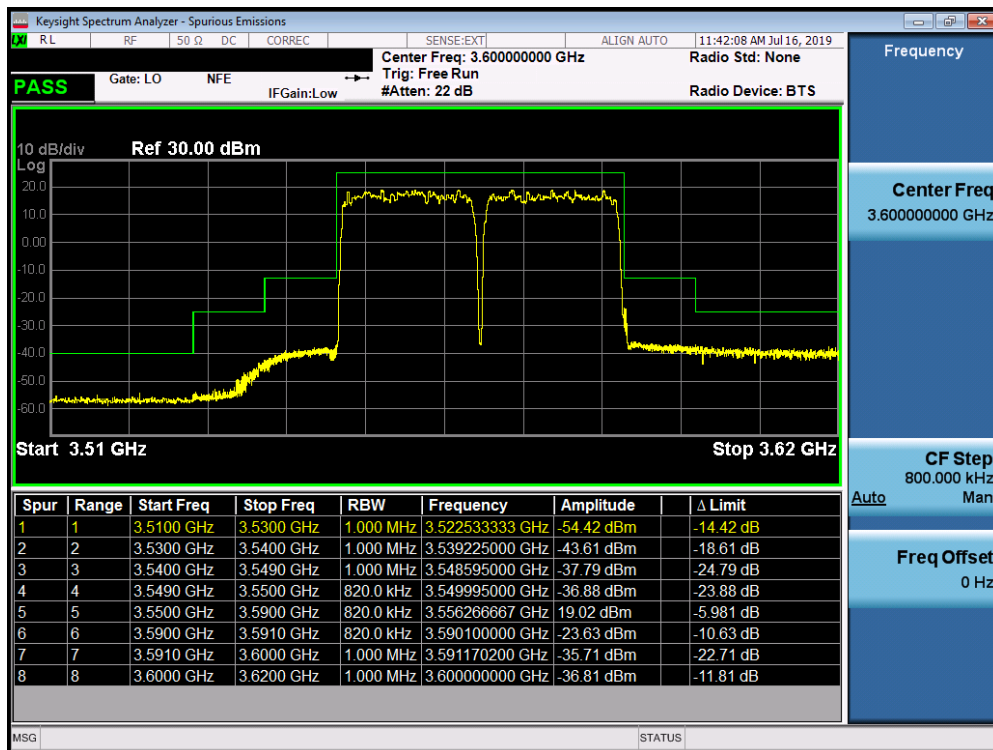
Plot 7-171. High Channel Edge Plot (30MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 149 of 172

## Low Channel 40MHz Total Bandwidth Channel Edge

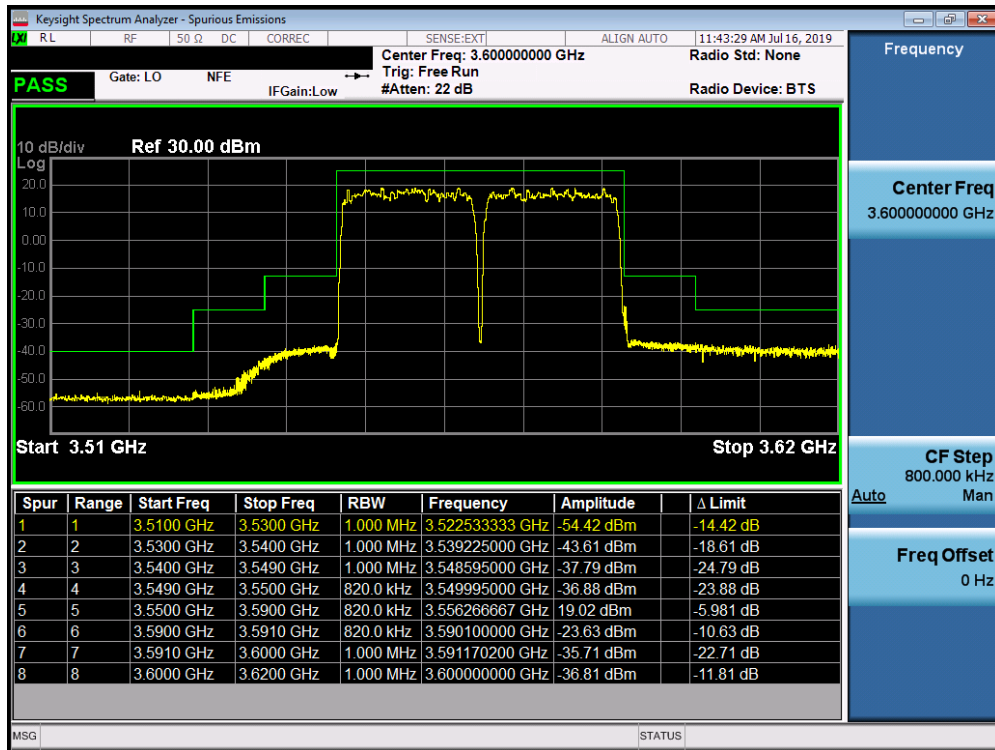


Plot 7-172. Low Channel Edge Plot (40MHz Total Bandwidth QPSK)

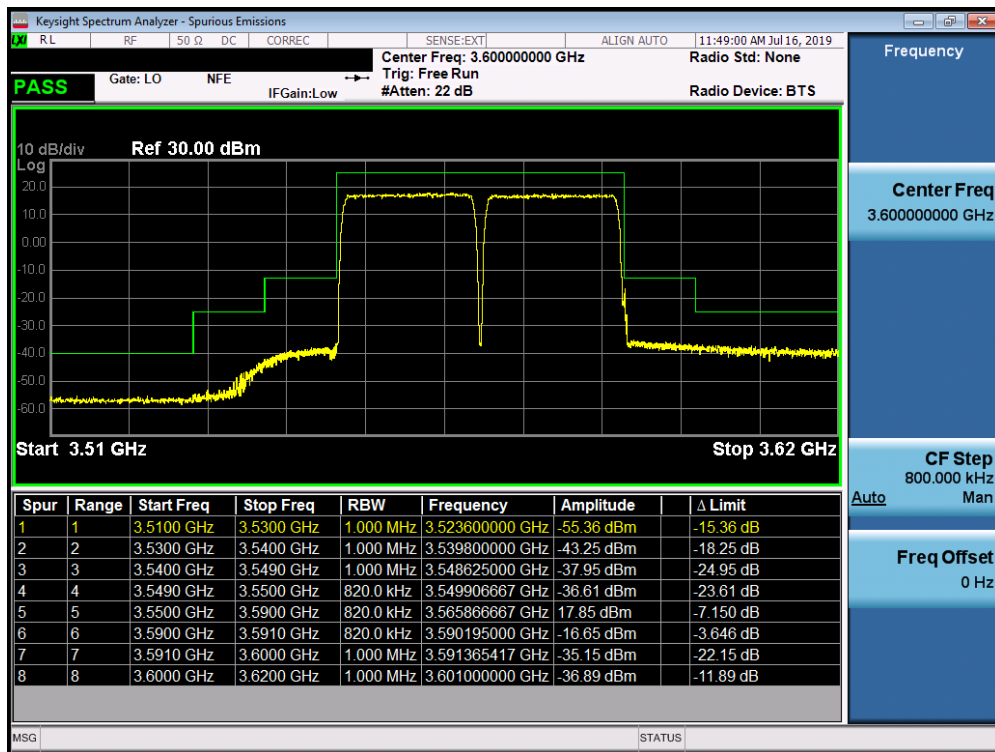


Plot 7-173. Low Channel Edge Plot (40MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 150 of 172



Plot 7-174. Low Channel Edge Plot (40MHz Total Bandwidth 64QAM)

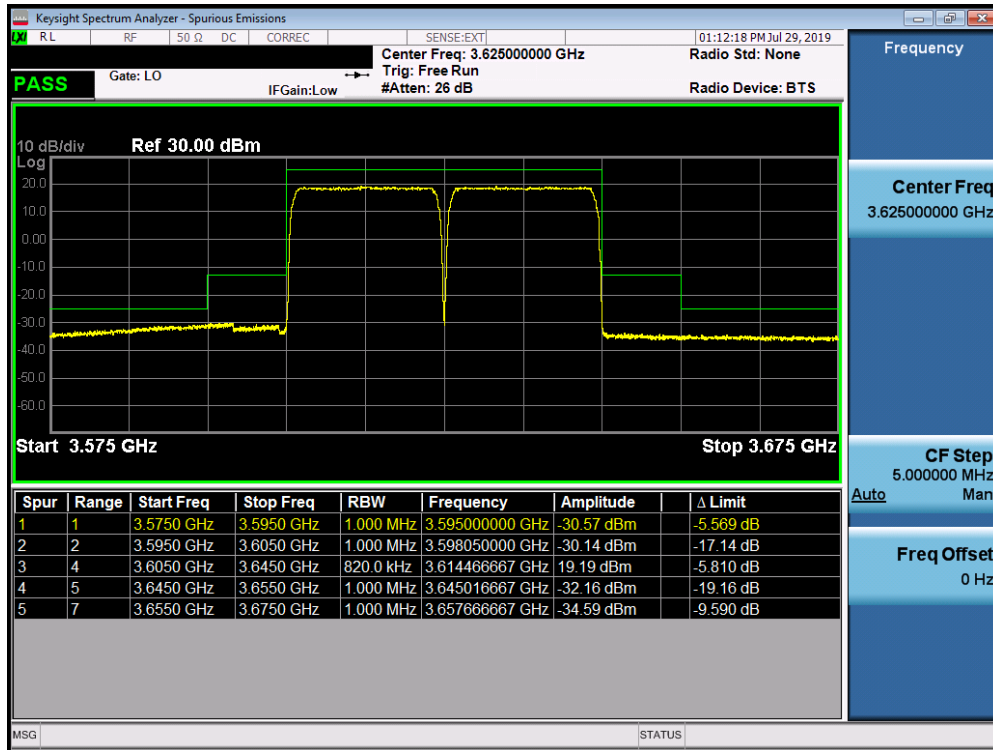


Plot 7-175. Low Channel Edge Plot (40MHz Total Bandwidth 256QAM)

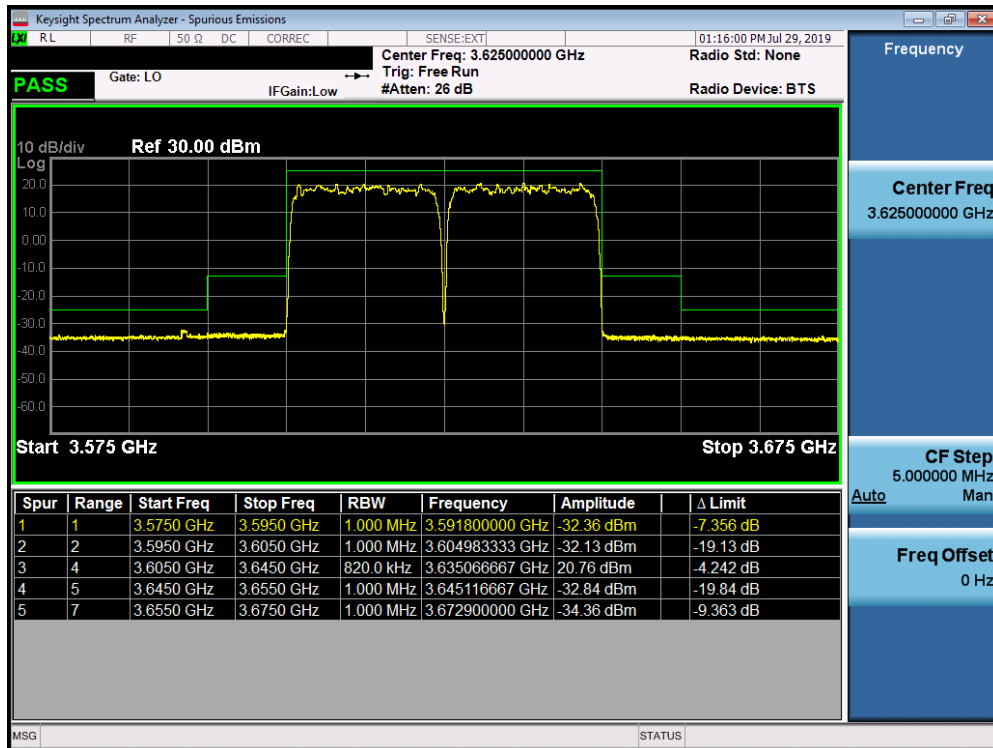
FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 151 of 172



## Mid Channel 40MHz Total Bandwidth Channel Edge

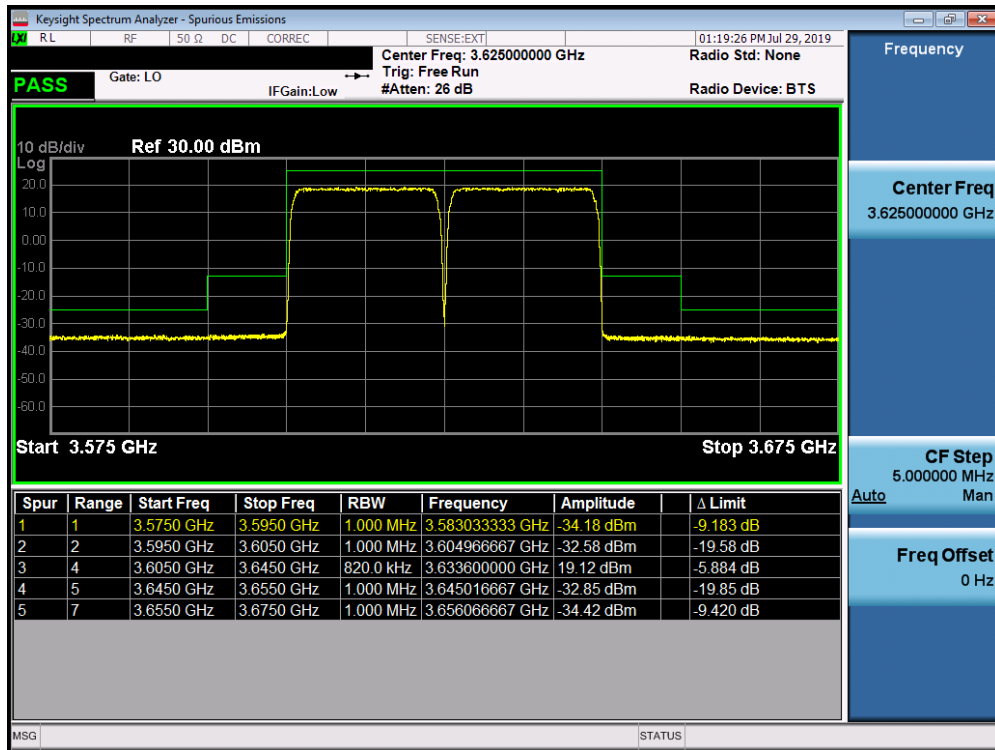


Plot 7-176. Mid Channel Edge Plot (40MHz Total Bandwidth QPSK)

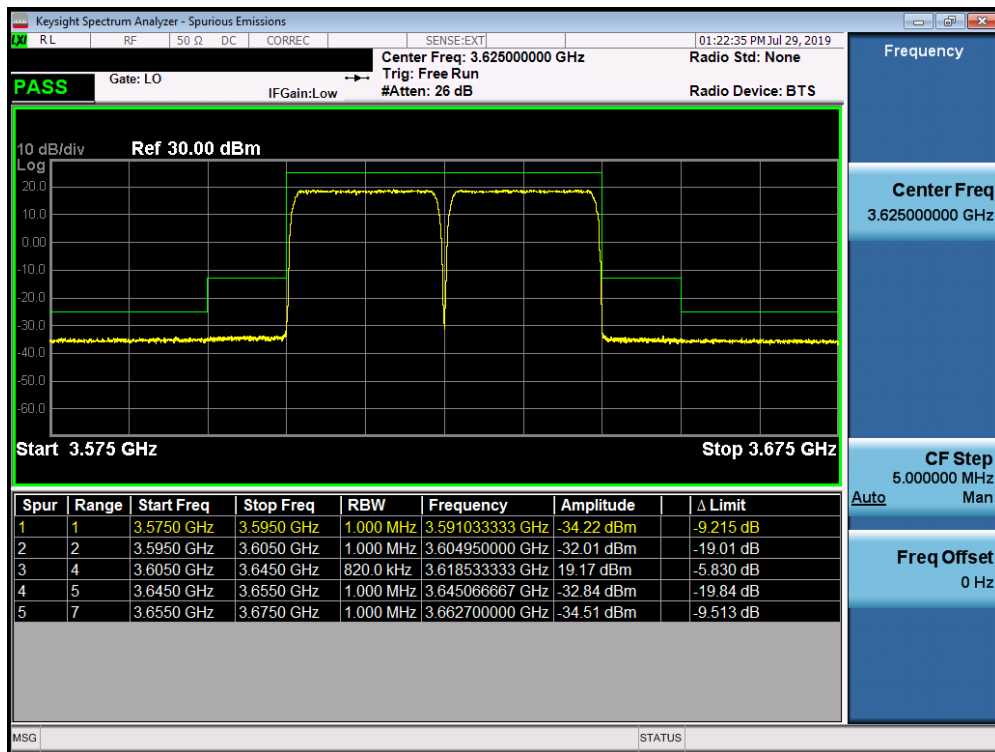


Plot 7-177. Mid Channel Edge Plot (40MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 152 of 172



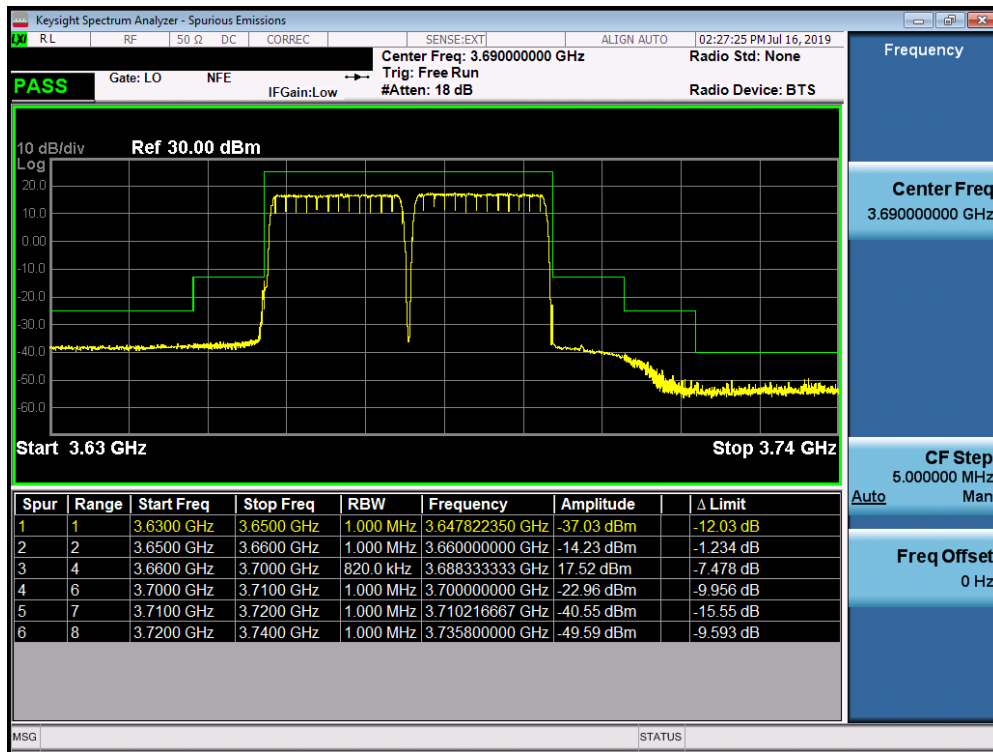
Plot 7-178. Mid Channel Edge Plot (40MHz Total Bandwidth 64QAM)



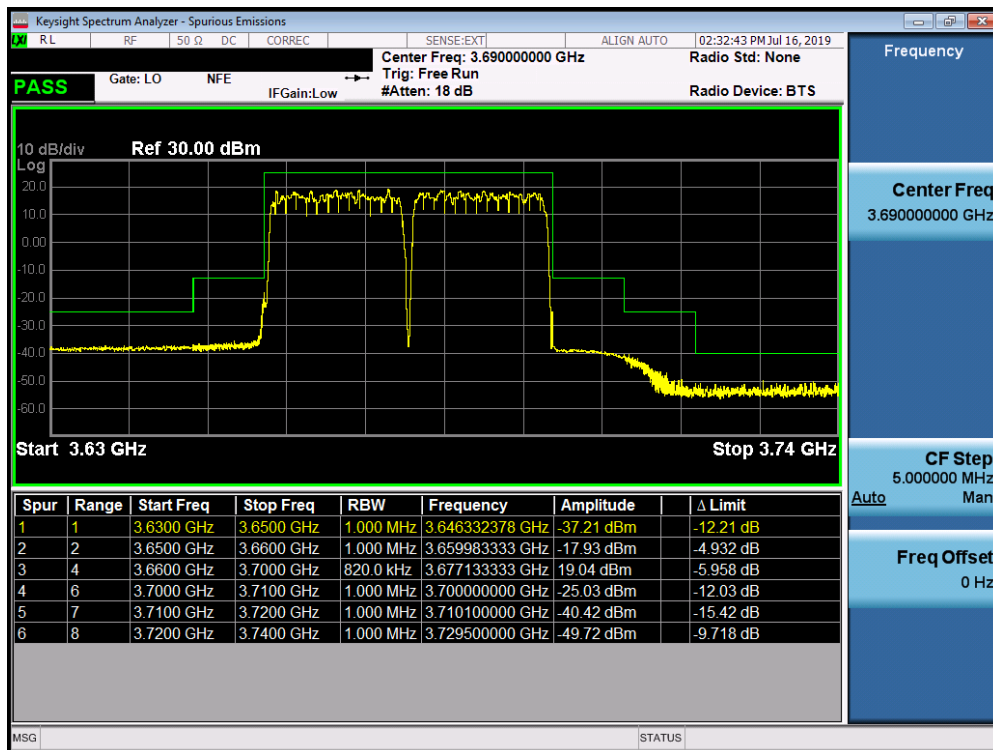
Plot 7-179. Mid Channel Edge Plot (40MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 153 of 172

## High Channel 40MHz Total Bandwidth Channel Edge

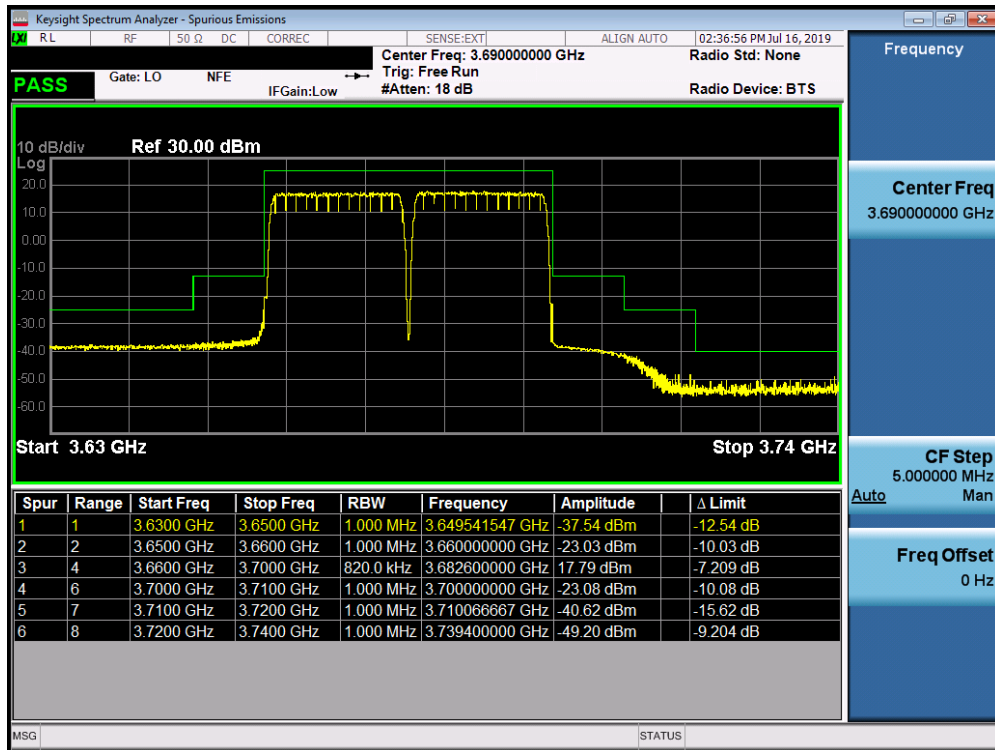


Plot 7-180. High Channel Edge Plot (40MHz Total Bandwidth QPSK)

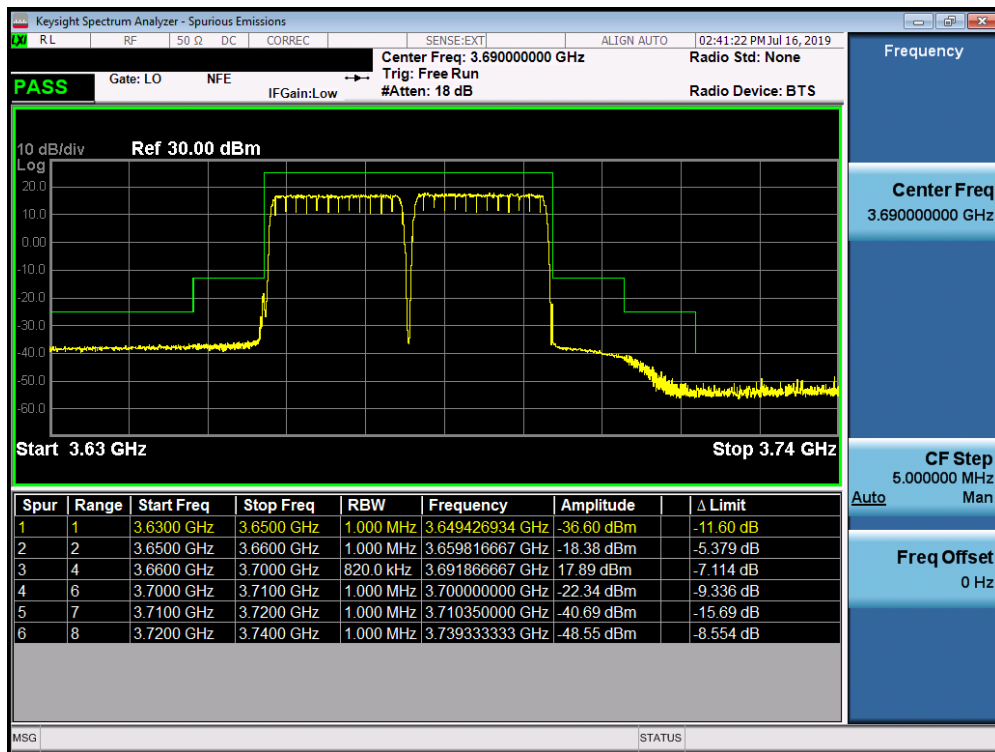


Plot 7-181. High Channel Edge Plot (40MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 154 of 172



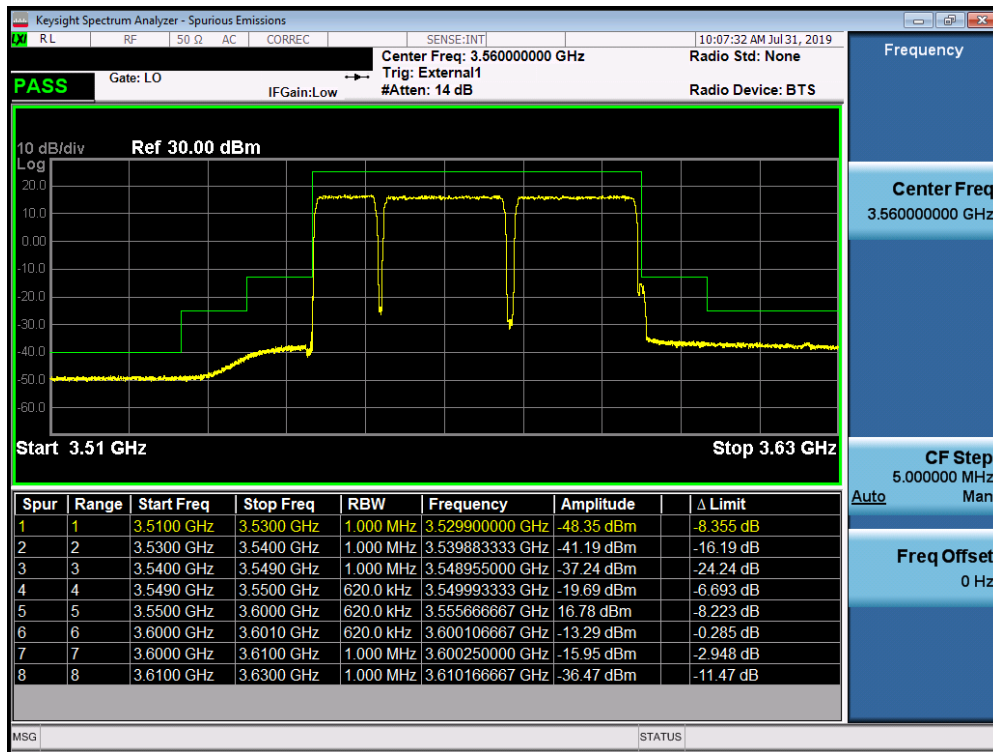
Plot 7-182. High Channel Edge Plot (40MHz Total Bandwidth 64QAM)



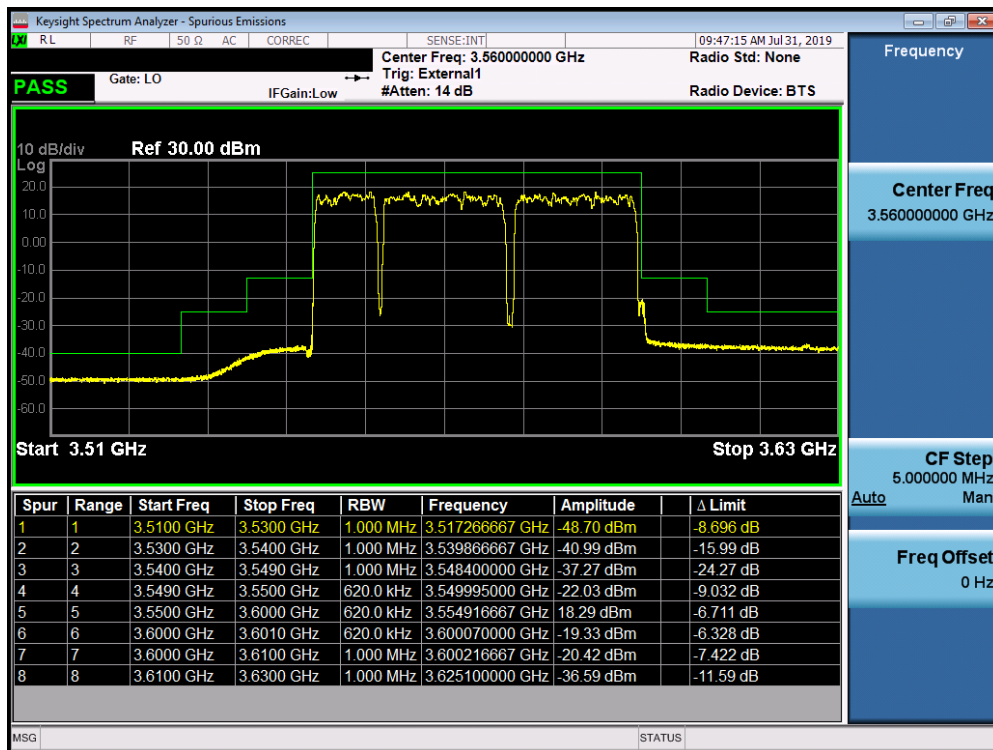
Plot 7-183. High Channel Edge Plot (40MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 155 of 172

## Low Channel 50MHz Total Bandwidth Channel Edge



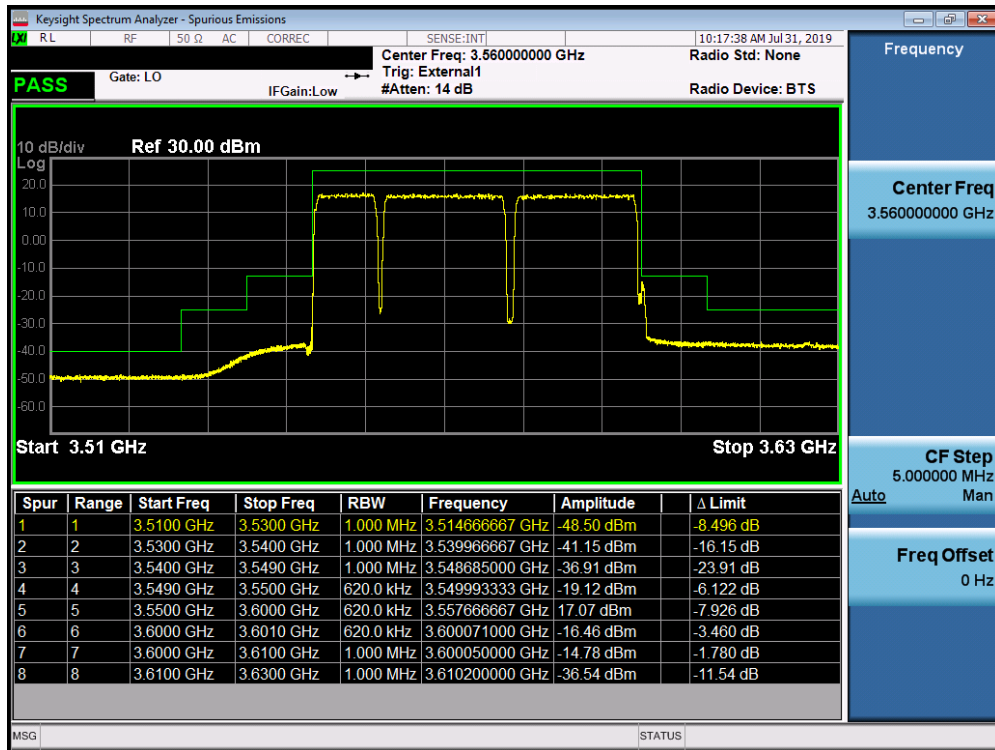
Plot 7-184. Low Channel Edge Plot (50MHz Total Bandwidth QPSK)



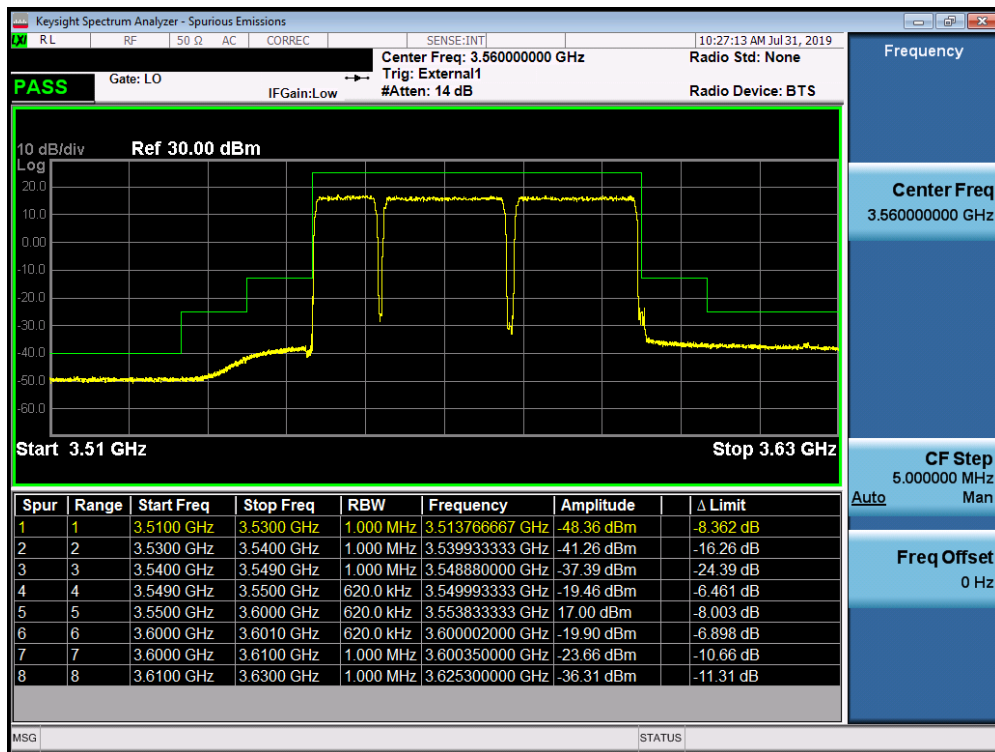
Plot 7-185. Low Channel Edge Plot (50MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 156 of 172





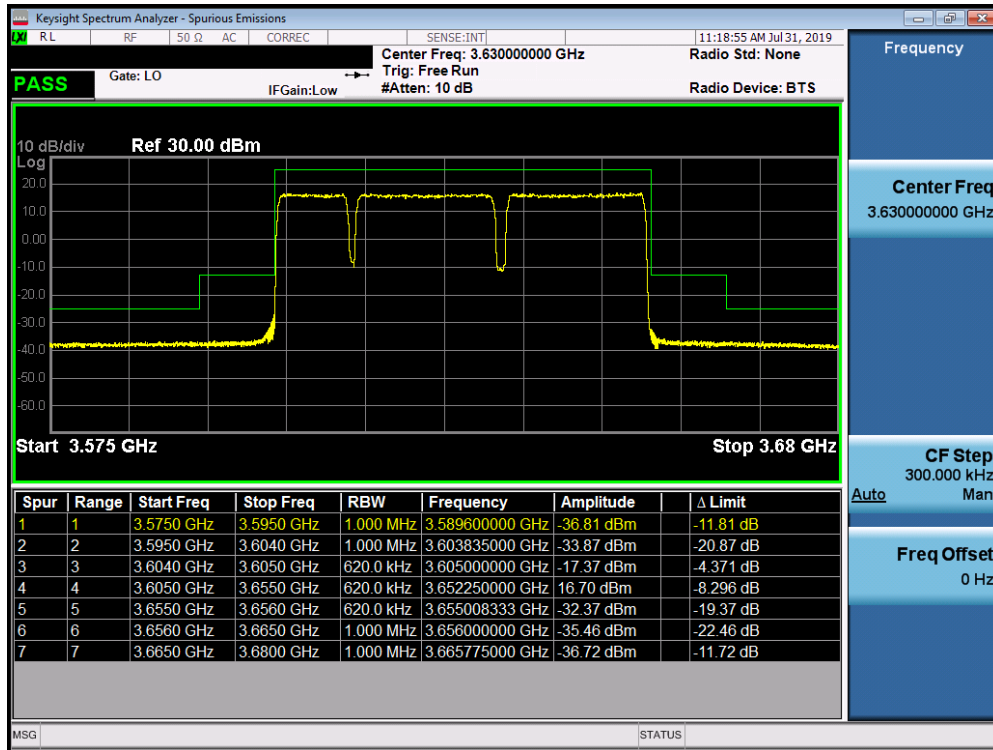
Plot 7-186. Low Channel Edge Plot (50MHz Total Bandwidth 64QAM)



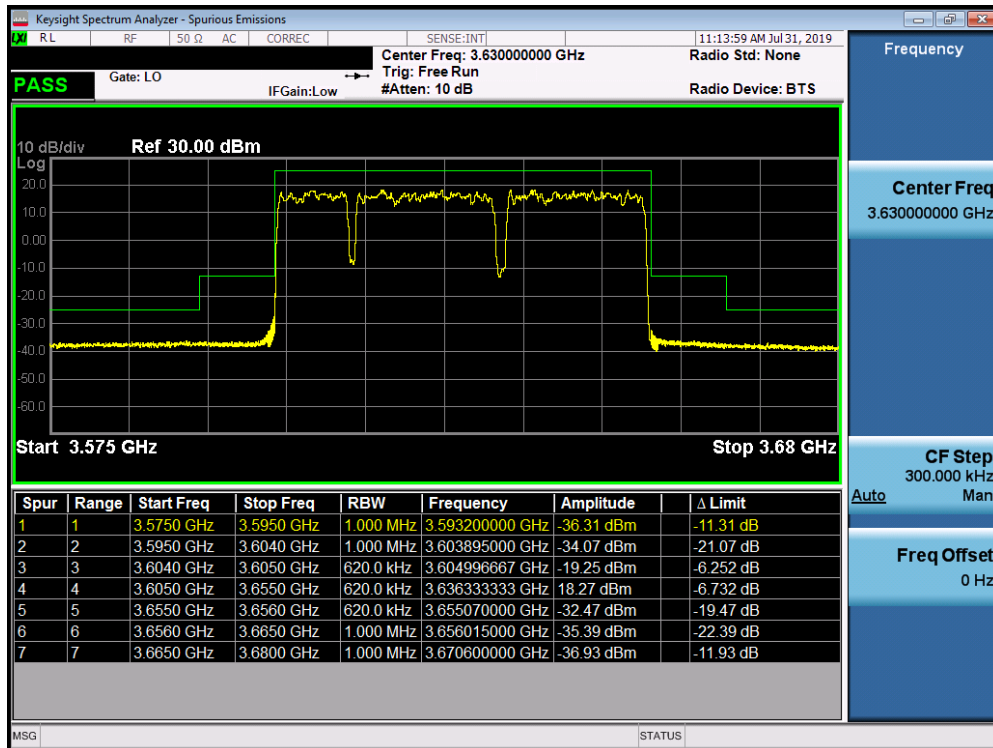
Plot 7-187. Low Channel Edge Plot (50MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 157 of 172

## Mid Channel 50MHz Total Bandwidth Channel Edge

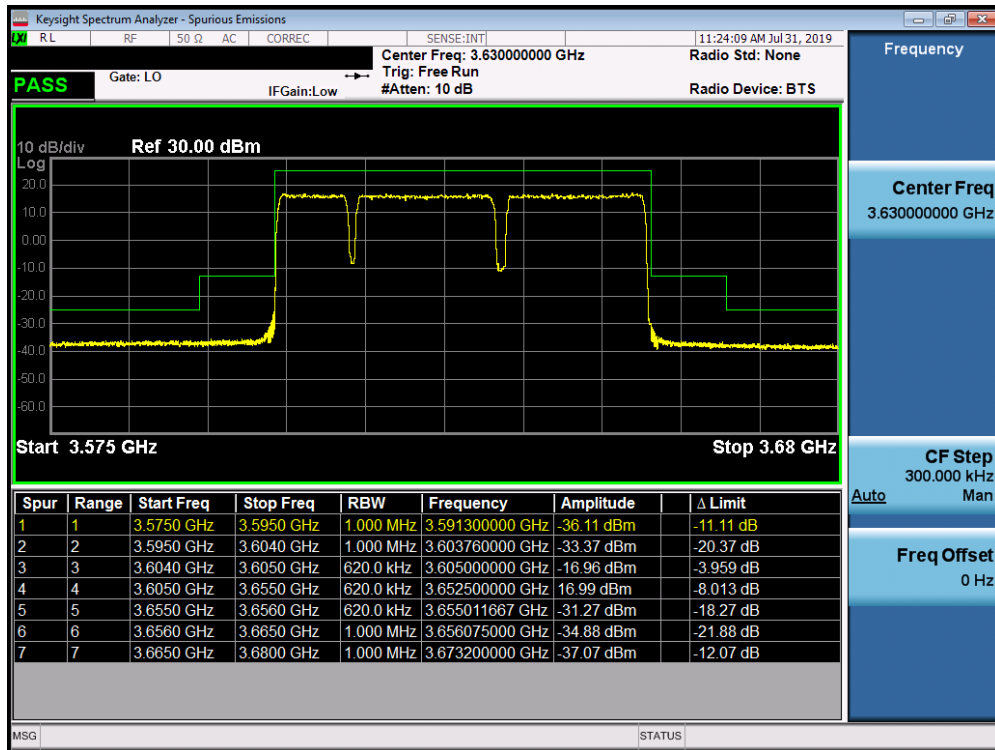


Plot 7-188. Mid Channel Edge Plot (50MHz Total Bandwidth QPSK)

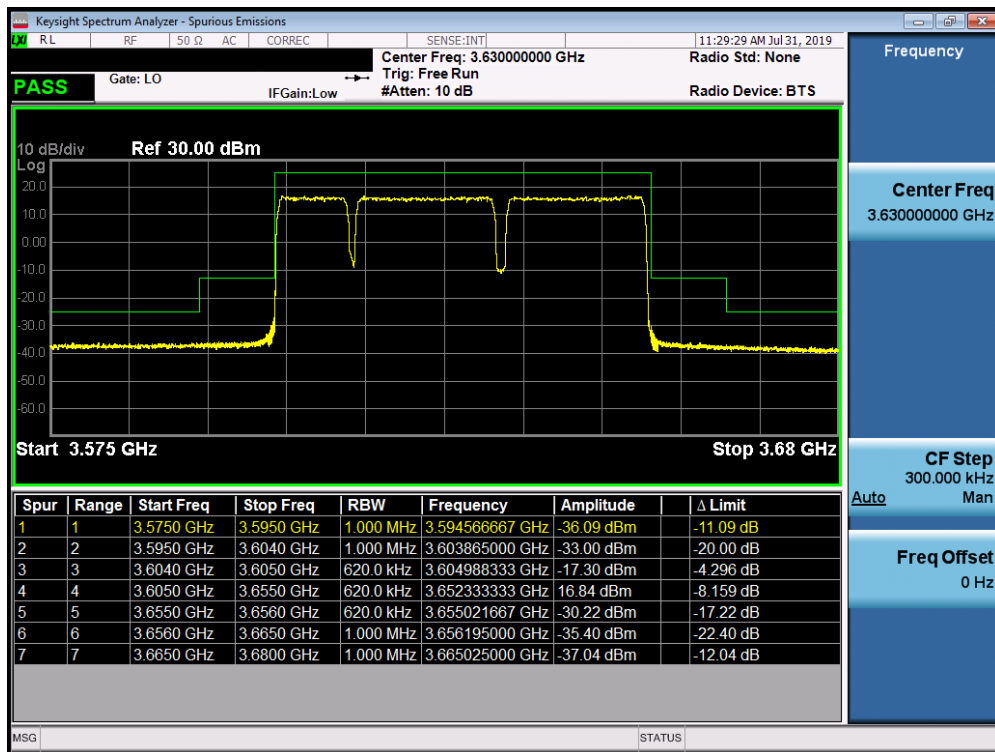


Plot 7-189. Mid Channel Edge Plot (50MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 158 of 172



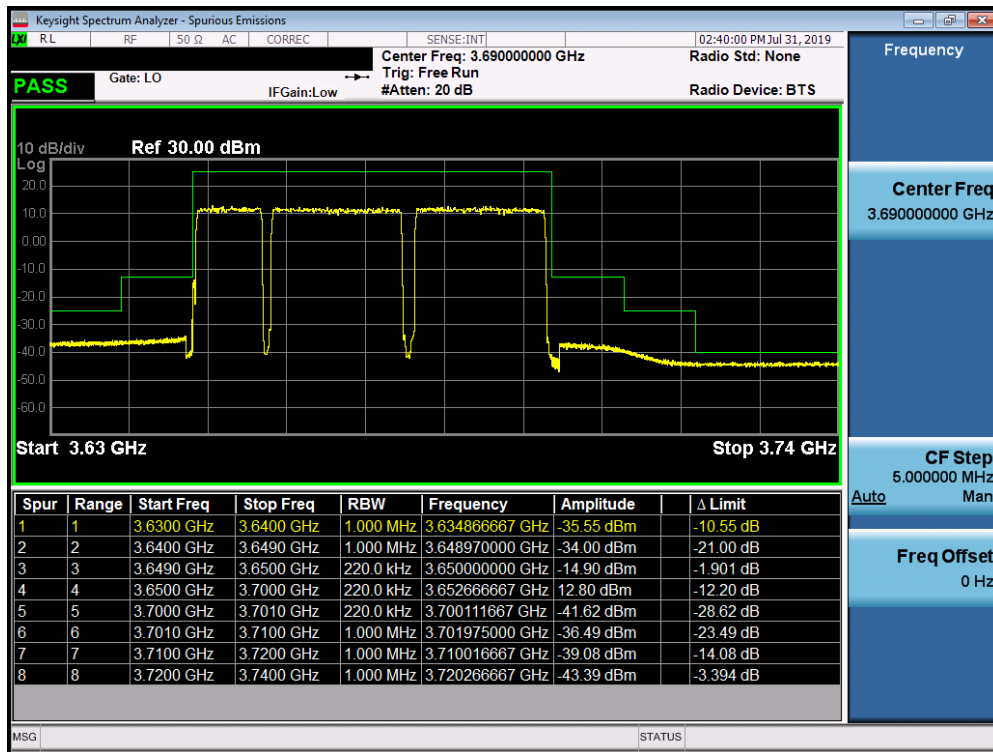
Plot 7-190. Mid Channel Edge Plot (50MHz Total Bandwidth 64QAM)



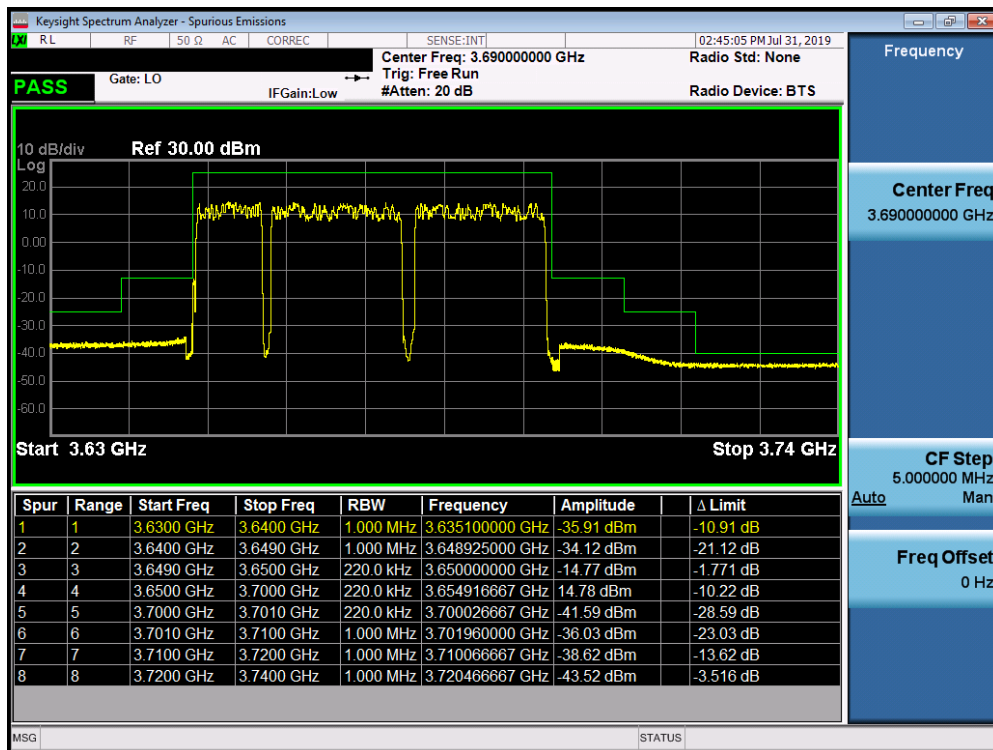
Plot 7-191. Mid Channel Edge Plot (50MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 159 of 172

## High Channel 50MHz Total Bandwidth Channel Edge

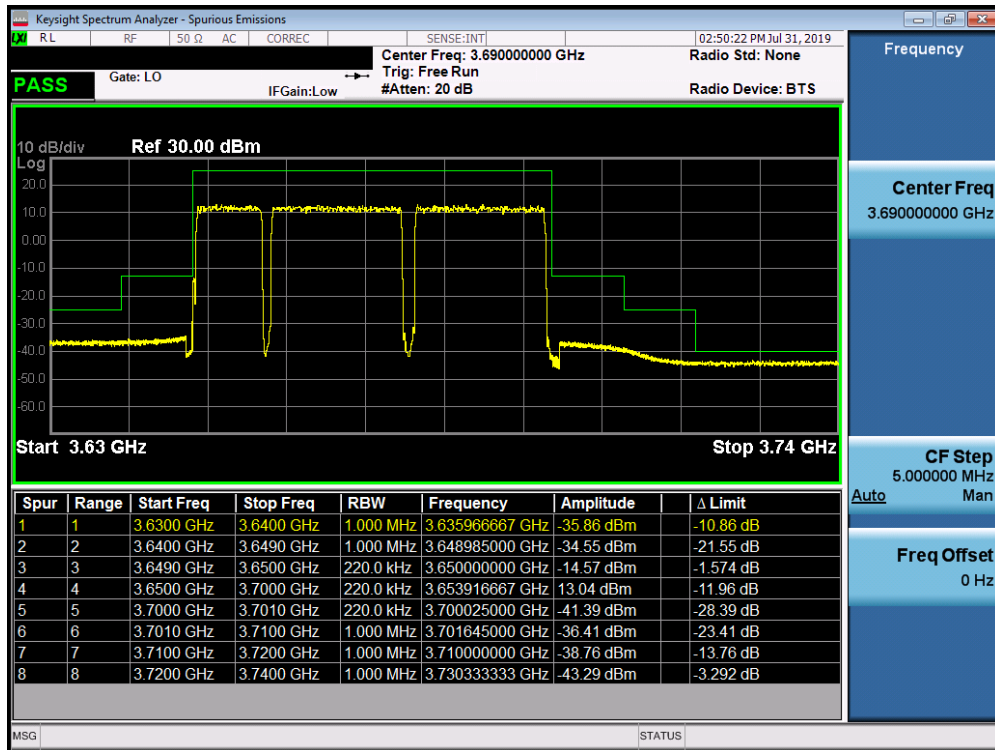


Plot 7-192. High Channel Edge Plot (50MHz Total Bandwidth QPSK)

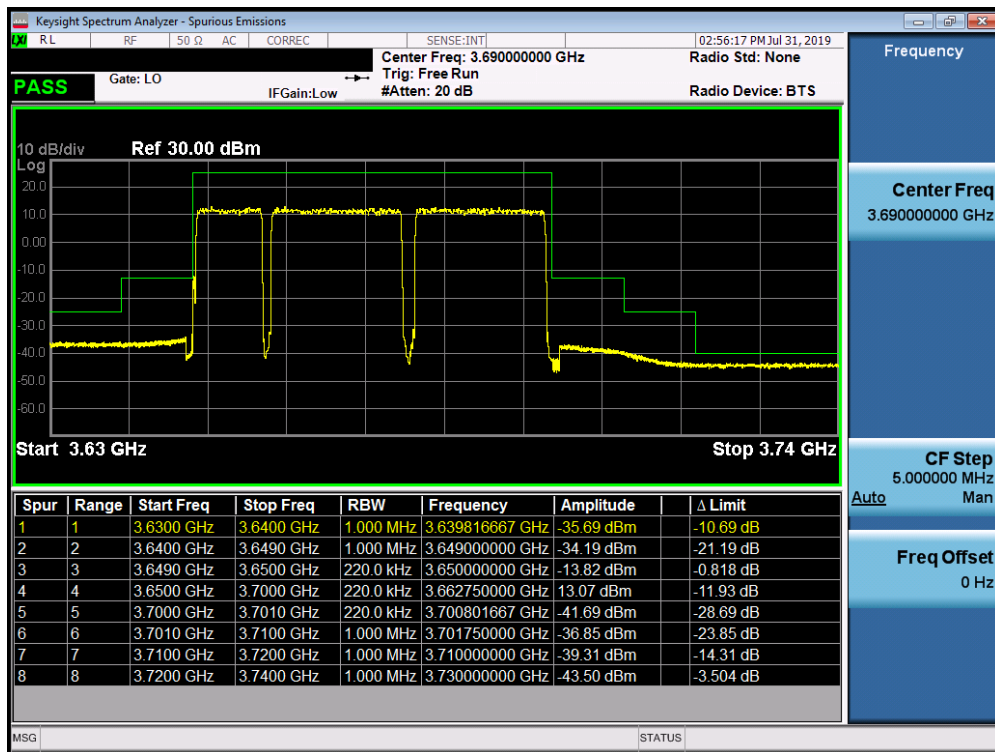


Plot 7-193. High Channel Edge Plot (50MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 160 of 172



Plot 7-194. High Channel Edge Plot (50MHz Total Bandwidth 64QAM)



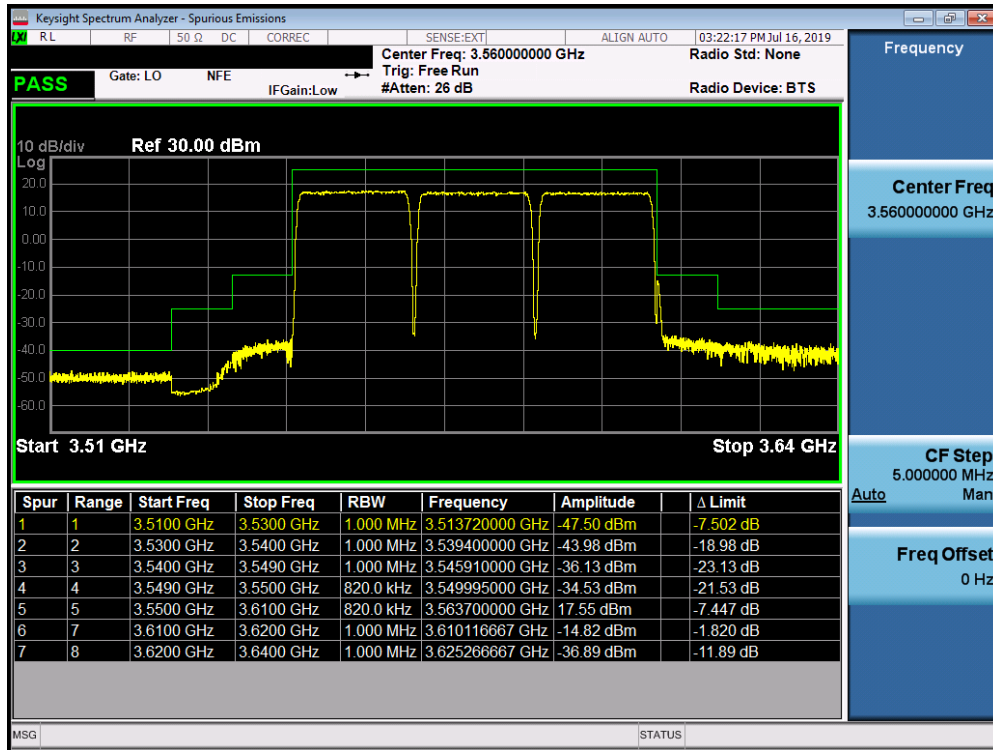
Plot 7-195. High Channel Edge Plot (50MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 161 of 172

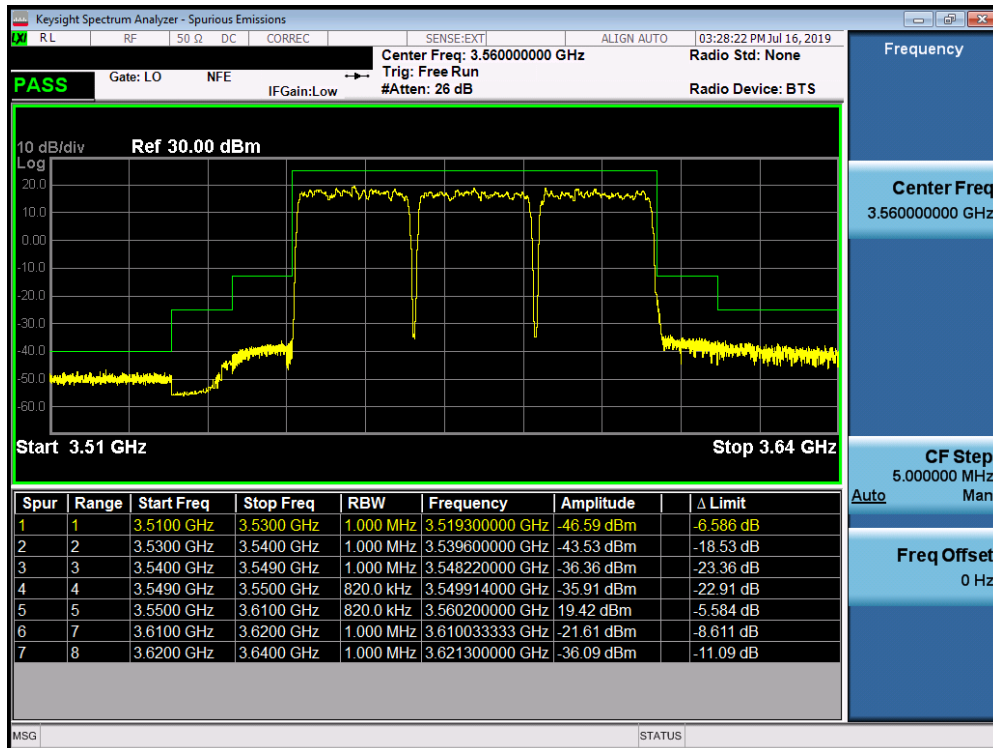


<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD		Page 162 of 172

## Low Channel 60MHz Total Bandwidth Channel Edge

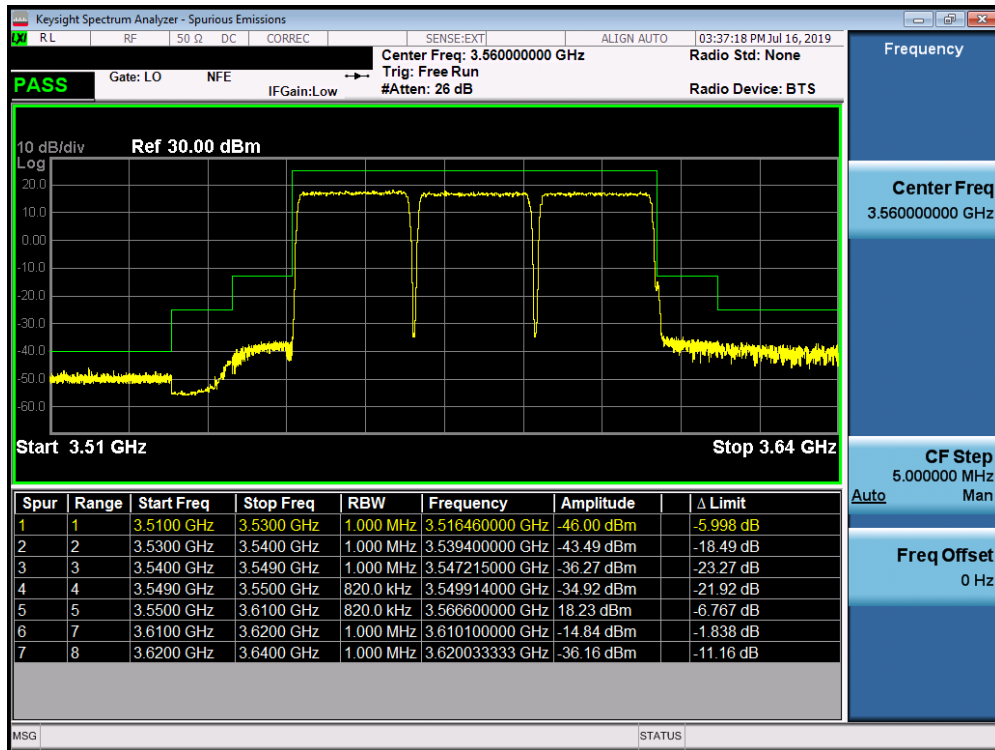


Plot 7-196. Low Channel Edge Plot (60MHz Total Bandwidth QPSK)

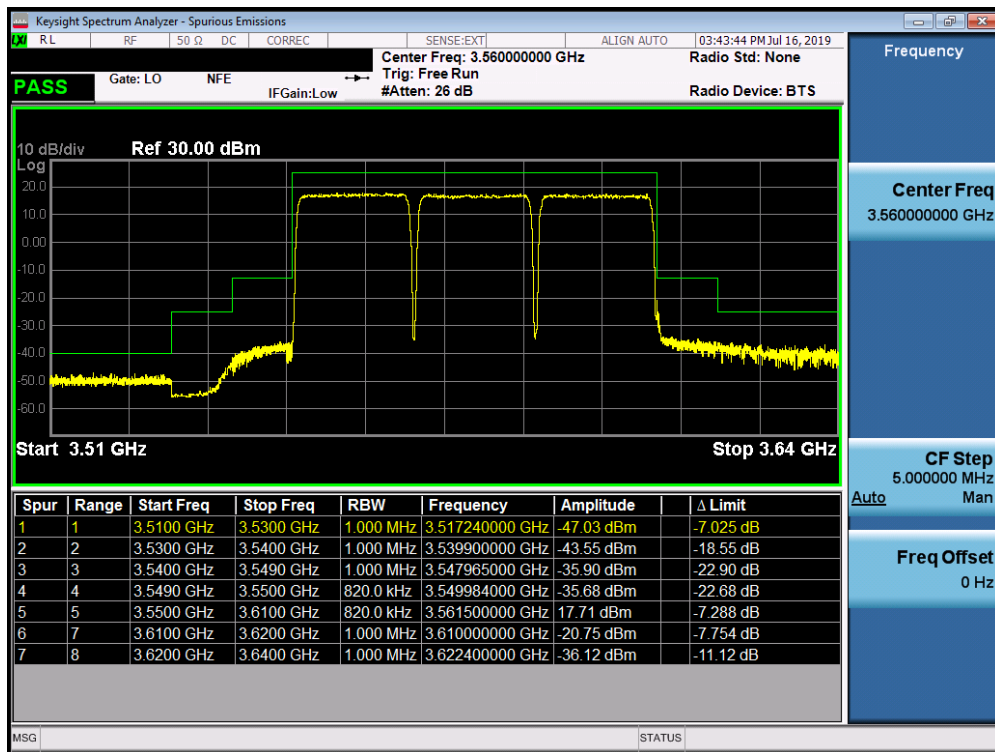


Plot 7-197. Low Channel Edge Plot (60MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 163 of 172



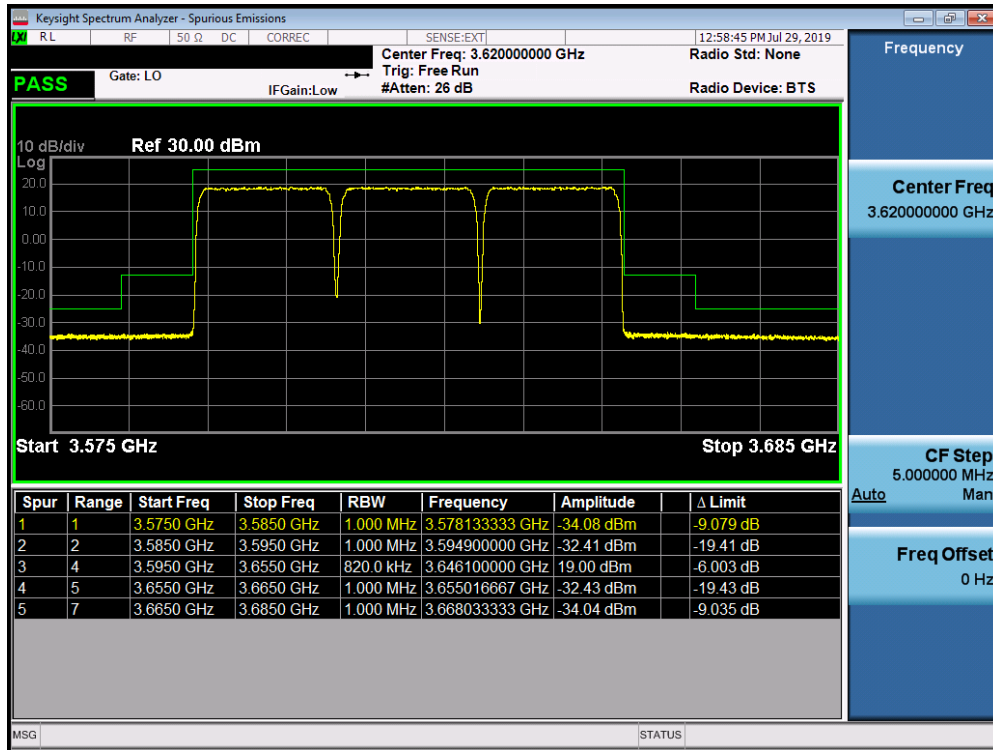
Plot 7-198. Low Channel Edge Plot (60MHz Total Bandwidth 64QAM)



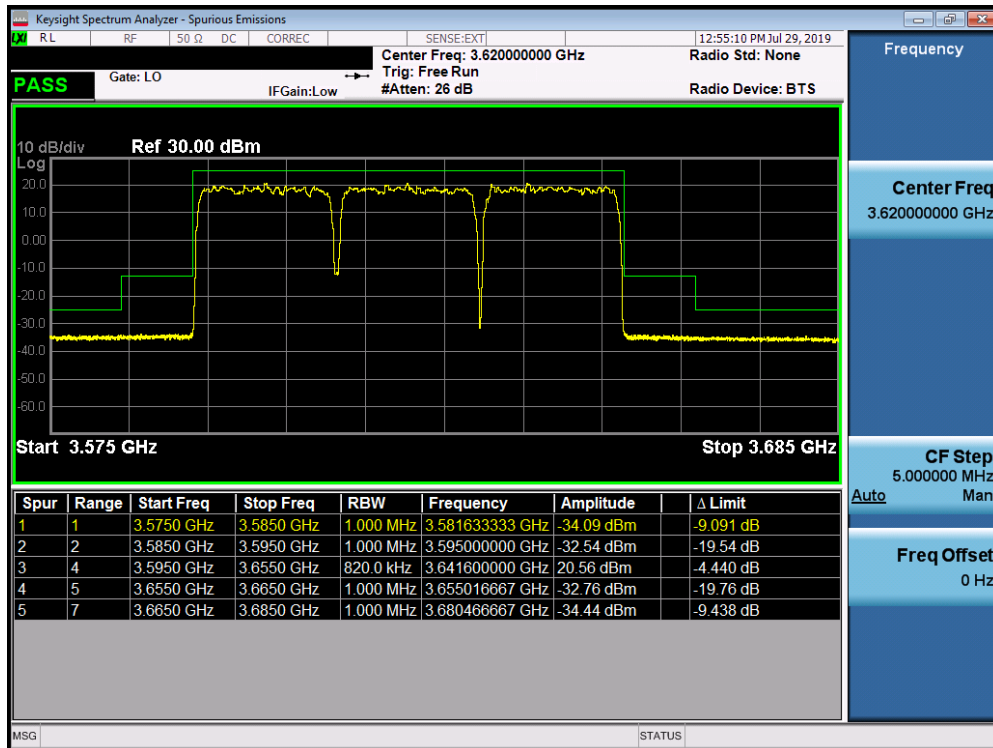
Plot 7-199. Low Channel Edge Plot (60MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 164 of 172

## Mid Channel 60MHz Total Bandwidth Channel Edge

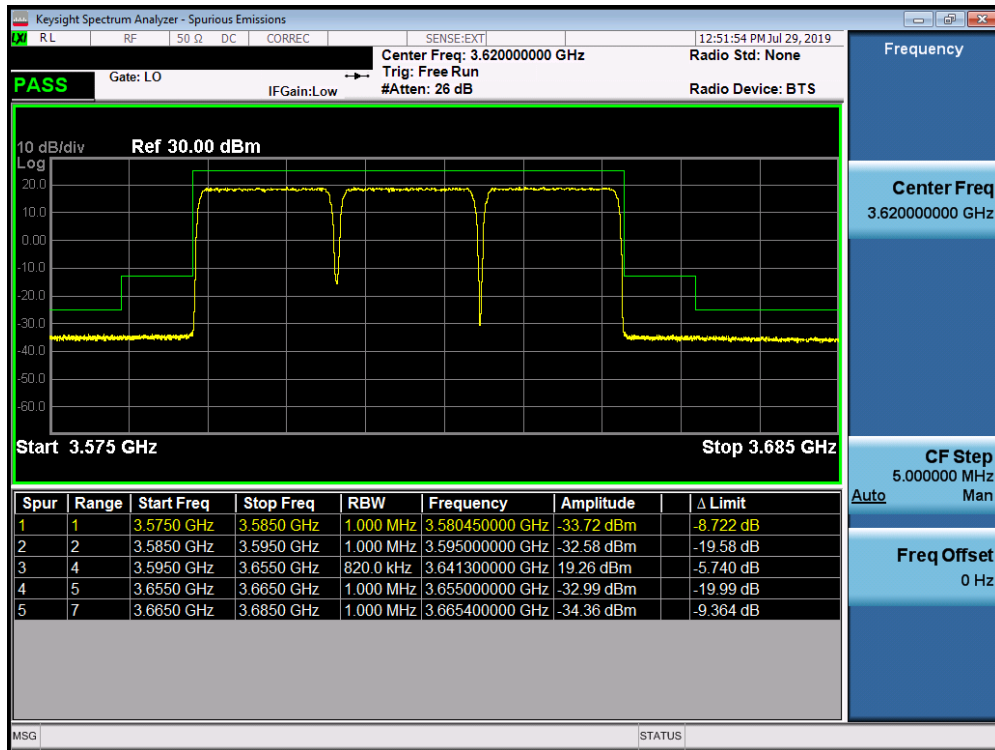


Plot 7-200. Mid Channel Edge Plot (60MHz Total Bandwidth QPSK)

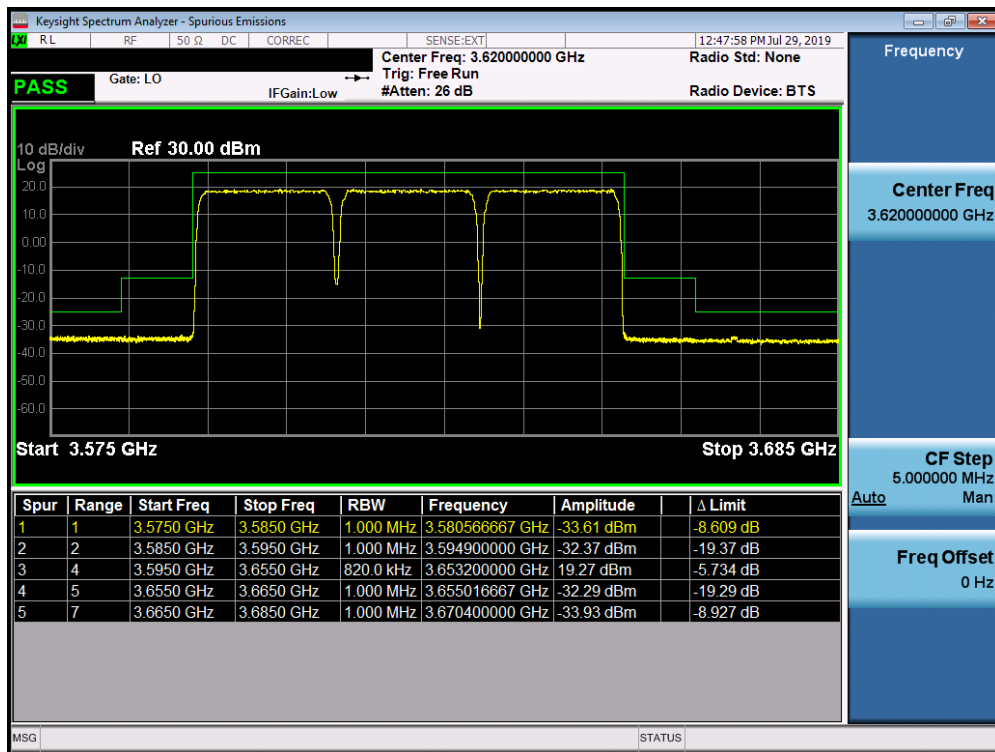


Plot 7-201. Mid Channel Edge Plot (60MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 165 of 172



Plot 7-202. Mid Channel Edge Plot (60MHz Total Bandwidth 64QAM)

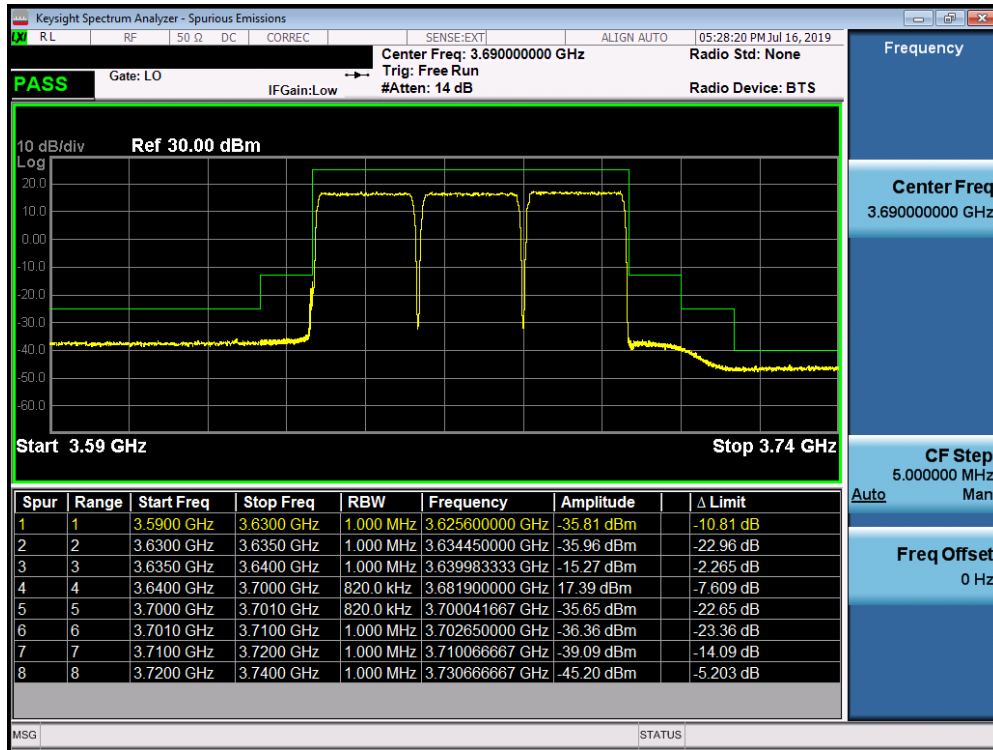


Plot 7-203. Mid Channel Edge Plot (60MHz Total Bandwidth 256QAM)

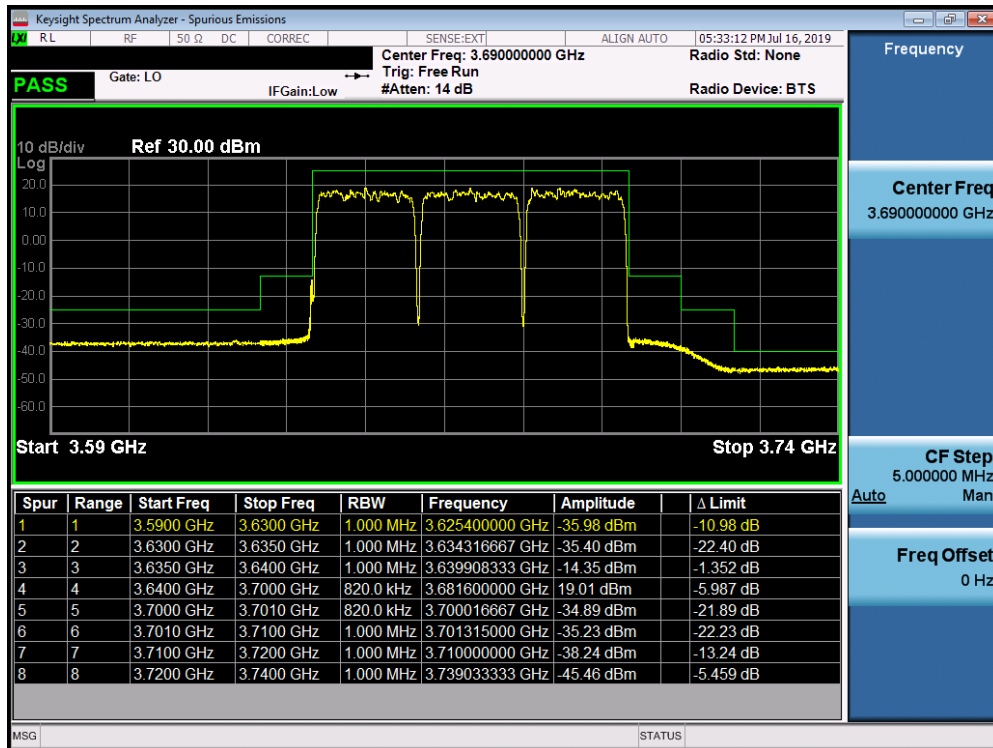
FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 166 of 172



## High Channel 60MHz Total Bandwidth Channel Edge

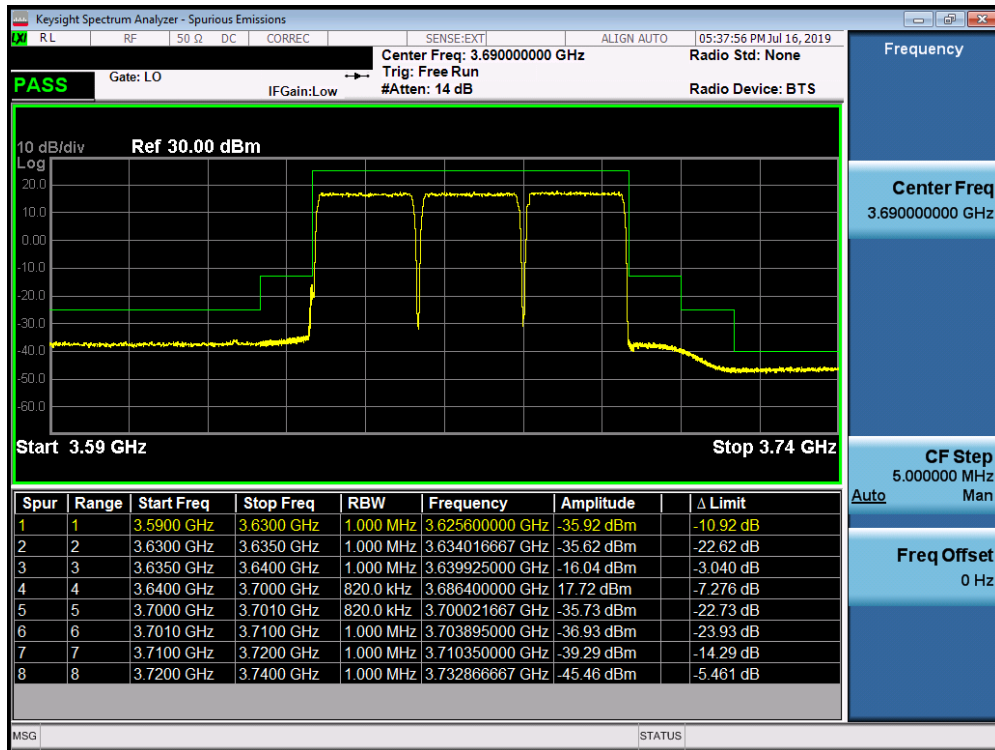


Plot 7-204. High Channel Edge Plot (60MHz Total Bandwidth QPSK)

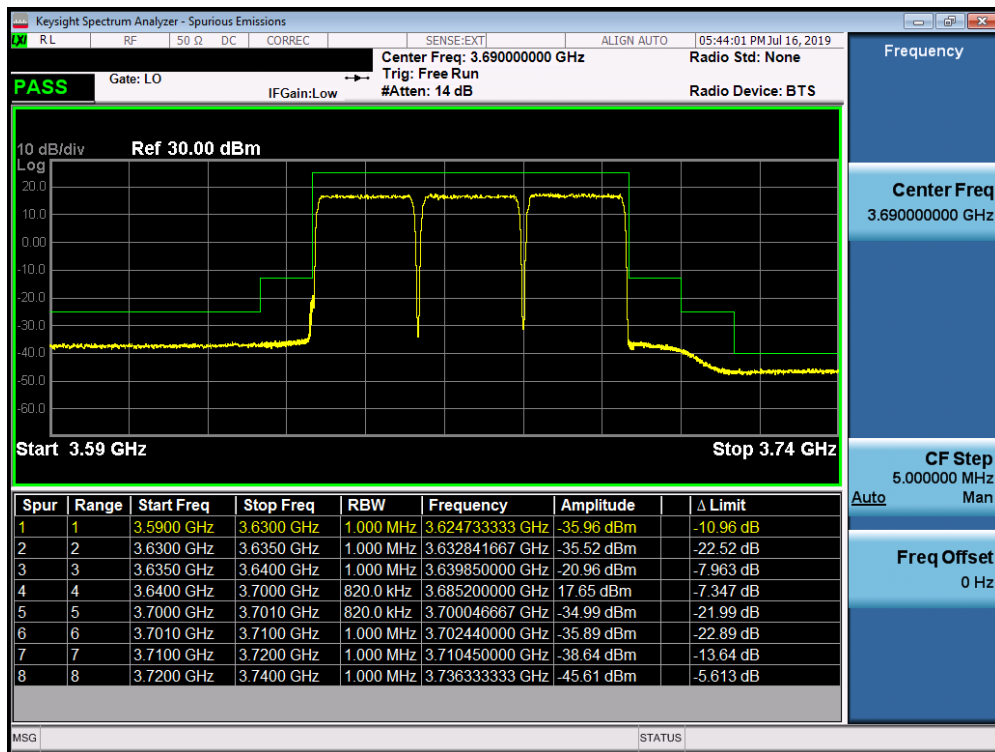


Plot 7-205. High Channel Edge Plot (60MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 167 of 172



Plot 7-206. High Channel Edge Plot (60MHz Total Bandwidth 64QAM)



Plot 7-207. High Channel Edge Plot (60MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 168 of 172

## 7.9 Frequency Stability / Temperature Variation

### §2.1055

#### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +60°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.

#### 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 +60°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

#### Test Setup

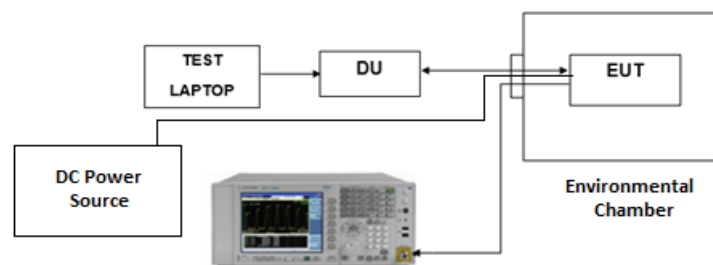
The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

#### Test Notes

A spectrum analyzer was used for this test with settings as follows:

1. Trace = Average RMS
2. Detector = Peak
3. RBW = 100kHz
4. VBW = 600 kHz

Corrections for the cable, connectors and attenuators was accounted for as an offset before measurement.



**Figure 7-8. Test Instrument & Measurement Setup**

FCC ID: A3LMT6402-48A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 169 of 172

## Band 48 Frequency Stability Measurements



OPERATING FREQUENCY: 3,625,000,000 Hz  
 REFERENCE VOLTAGE: 48.00 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	48.00	+ 20 (Ref)	3,625,094,697	0	0.0000000
100 %	48.00	- 30	3,624,684,912	-315,088	-0.0086918
100 %		- 20	3,625,003,129	3,129	0.0000863
100 %		- 10	3,624,784,870	-215,130	-0.0059345
100 %		0	3,624,467,777	-532,223	-0.0146816
100 %		+ 10	3,625,101,593	101,593	0.0028025
100 %		+ 30	3,624,921,097	-78,903	-0.0021766
100 %		+ 40	3,625,077,677	77,677	0.0021427
100 %		+ 50	3,624,782,531	-217,469	-0.0059990
85 %	40.80	+ 20	3,625,211,630	211,630	0.0058379
115 %	55.20	+ 20	3,625,111,969	111,969	0.0030887

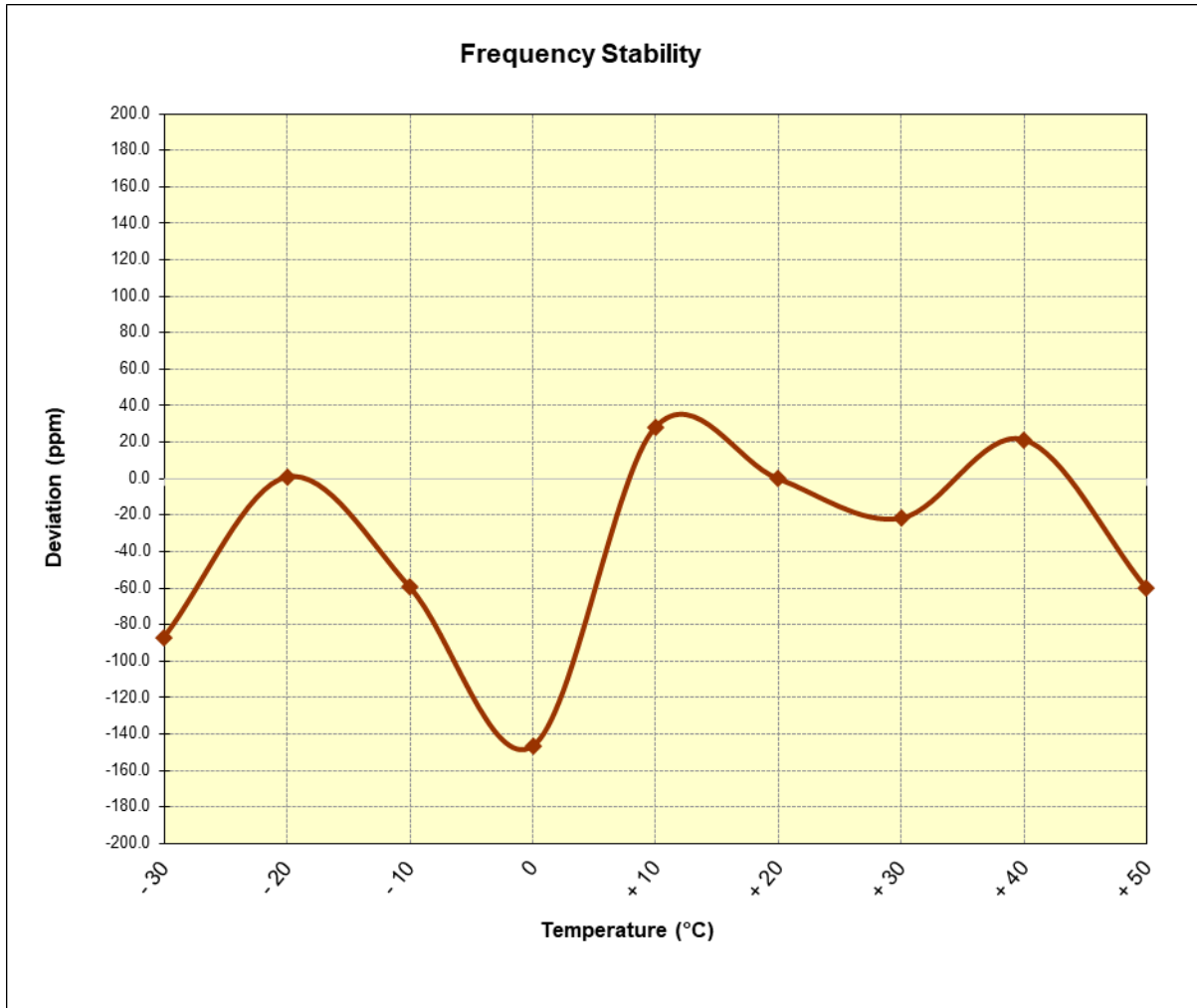
**Table 7-40. Frequency Stability Data (Band 48)**

### Note:

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

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## Band 48 Frequency Stability Measurements



**Figure 7-9. Frequency Stability Graph (Band 48)**

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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Massive MIMO CBSD FCC ID: A3LMT6402-48A** complies with all of the Category B CBSD requirements of Part 96 of the FCC Rules.

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