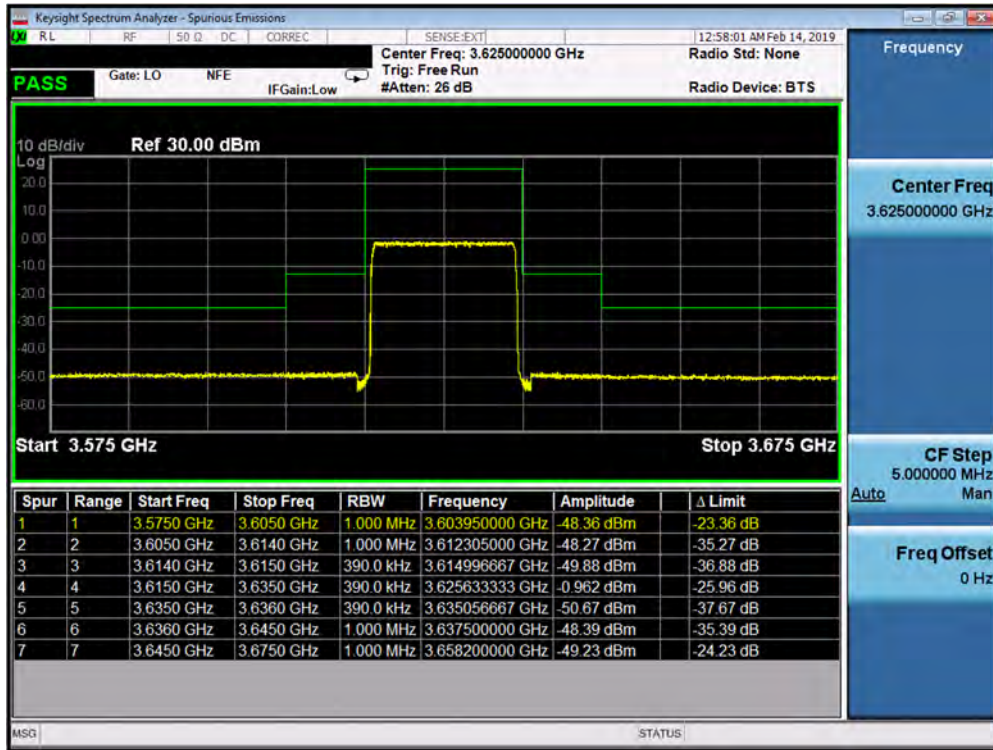
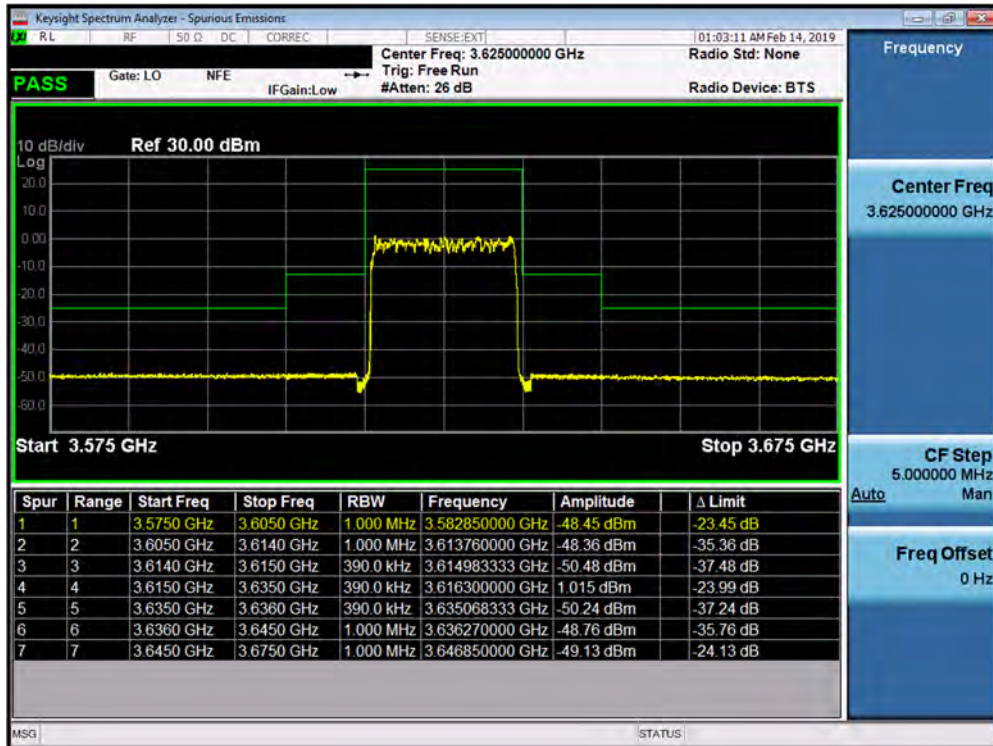


1CC Mid Channel SISO

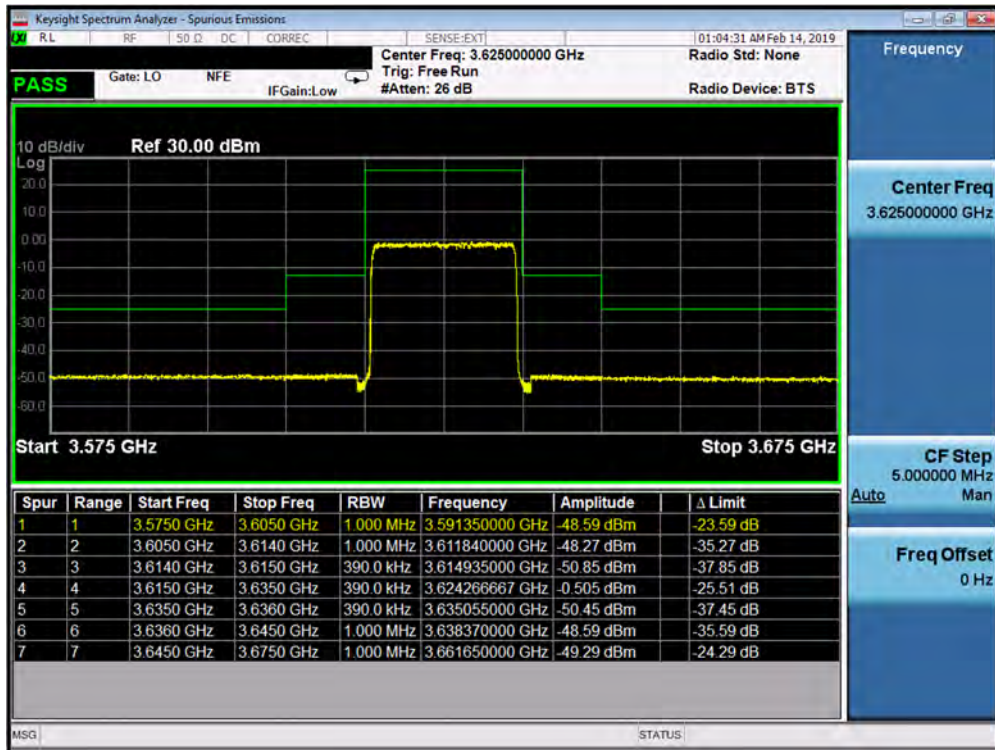


Plot 7-455. Channel Edge Plot (20.0MHz QPSK Mid Channel - SISO)

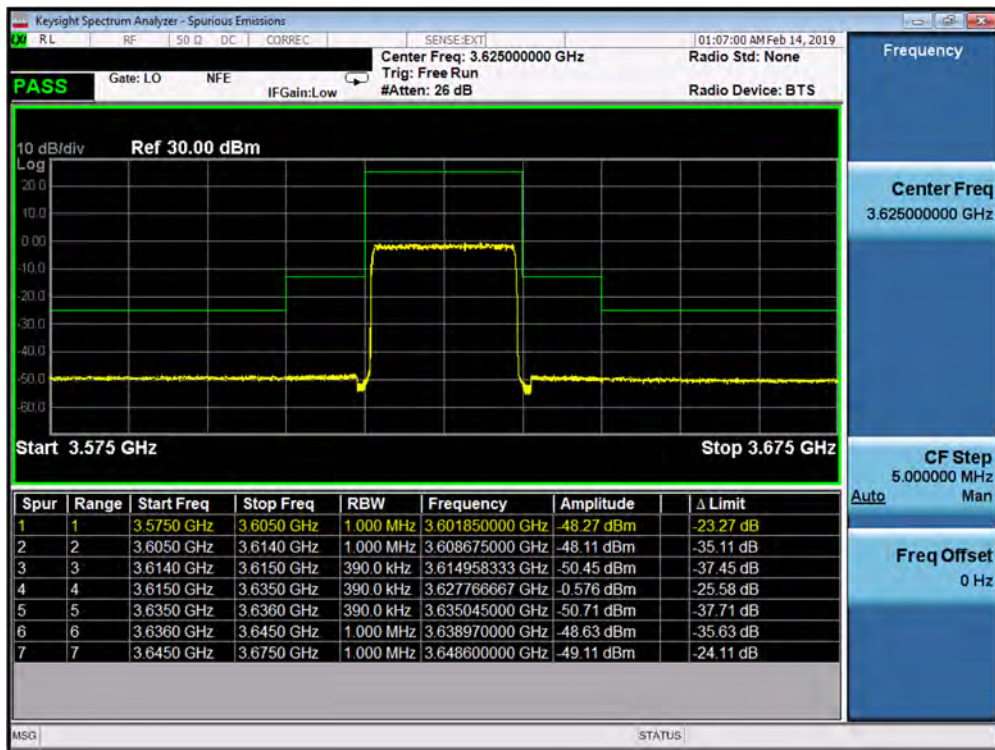


Plot 7-456. Channel Edge Plot (20.0MHz 16QAM Mid Channel - SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2-A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBSD		Page 296 of 313



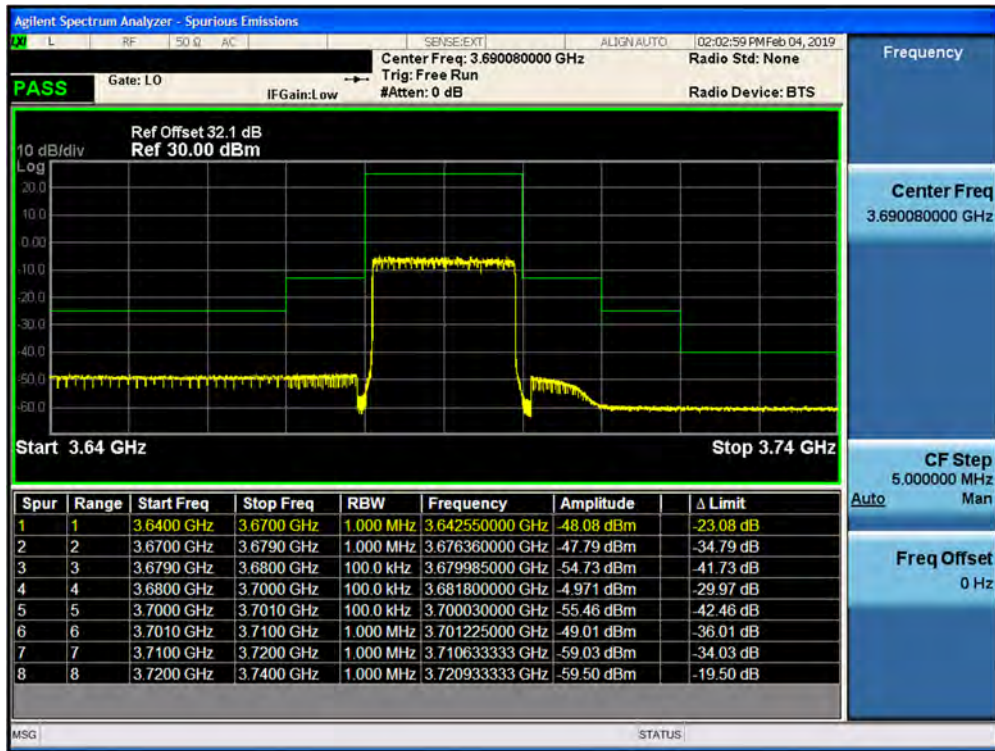
Plot 7-457. Channel Edge Plot (20.0MHz 64QAM Mid Channel - SISO)



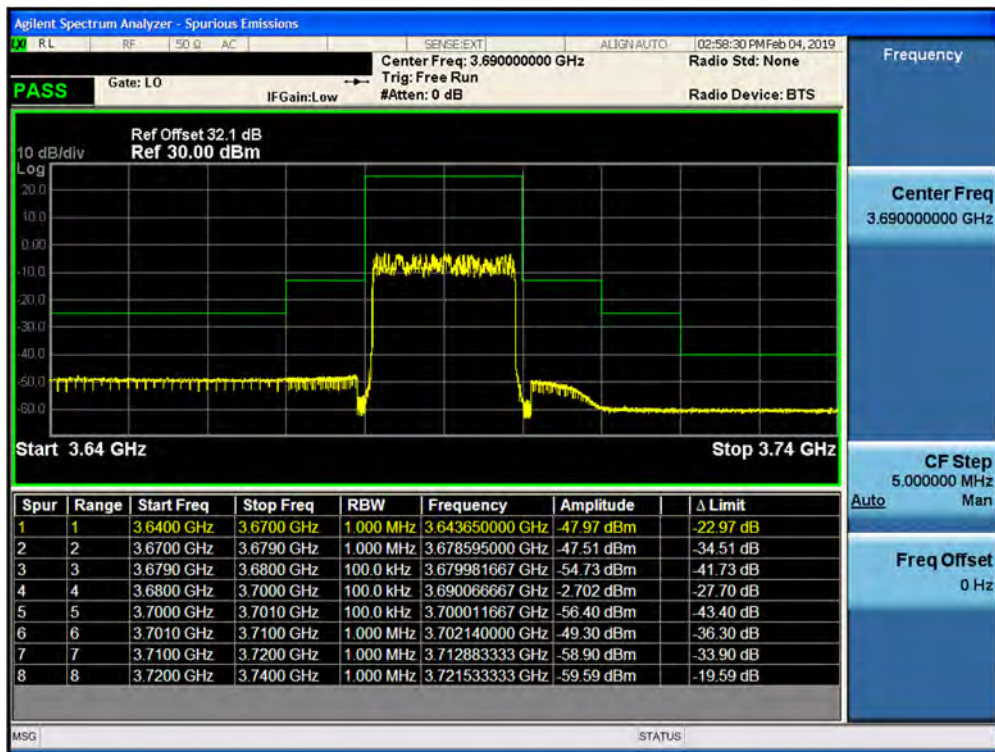
Plot 7-458. Channel Edge Plot (20.0MHz 256QAM Mid Channel - SISO)

FCC ID: A3LMT3204-48A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2.A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBSD			Page 297 of 313

1CC High Channel SISO

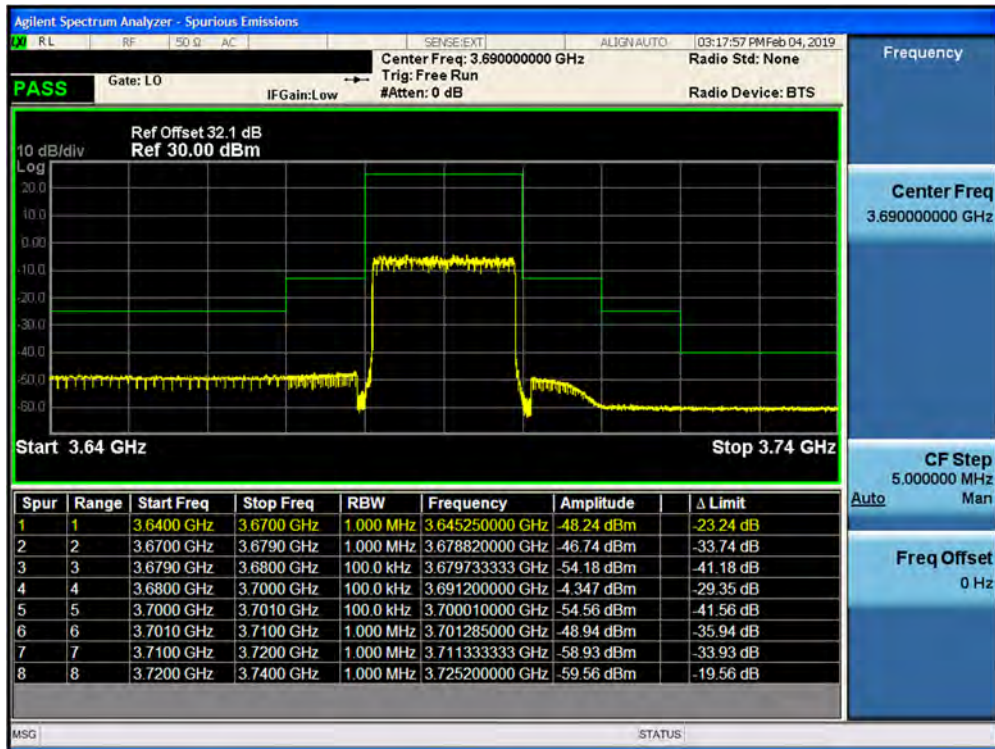


Plot 7-459. Upper Channel Edge Plot (20.0MHz QPSK High Channel- SISO)

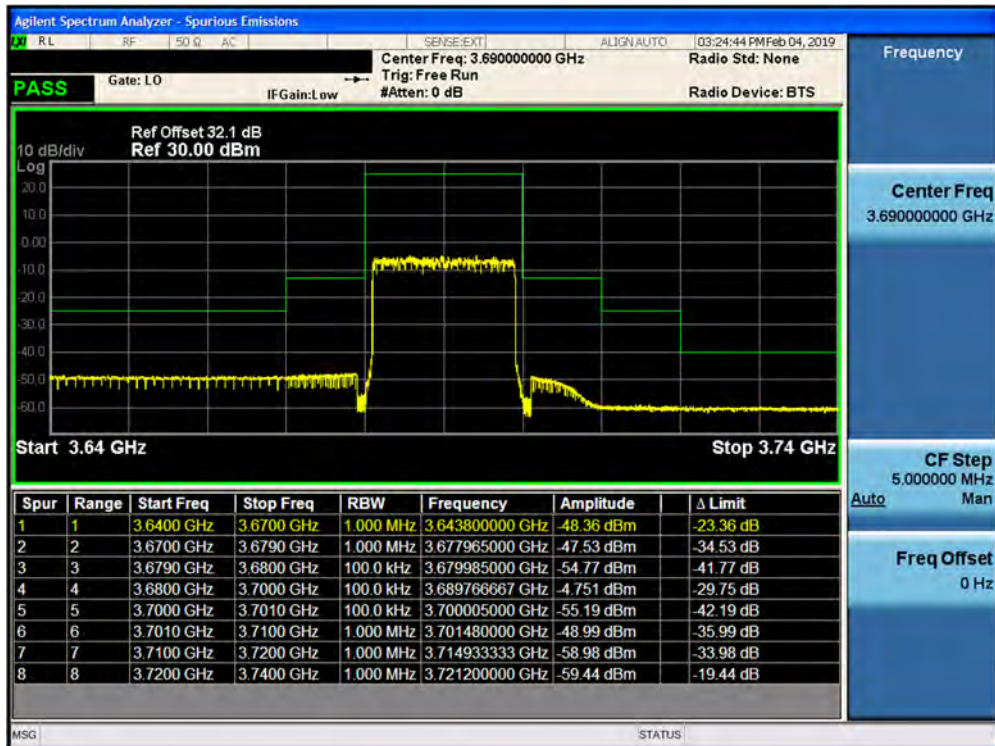


Plot 7-460. Upper Channel Edge Plot (20.0MHz 16QAM High Channel- SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2-A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBSD		Page 298 of 313



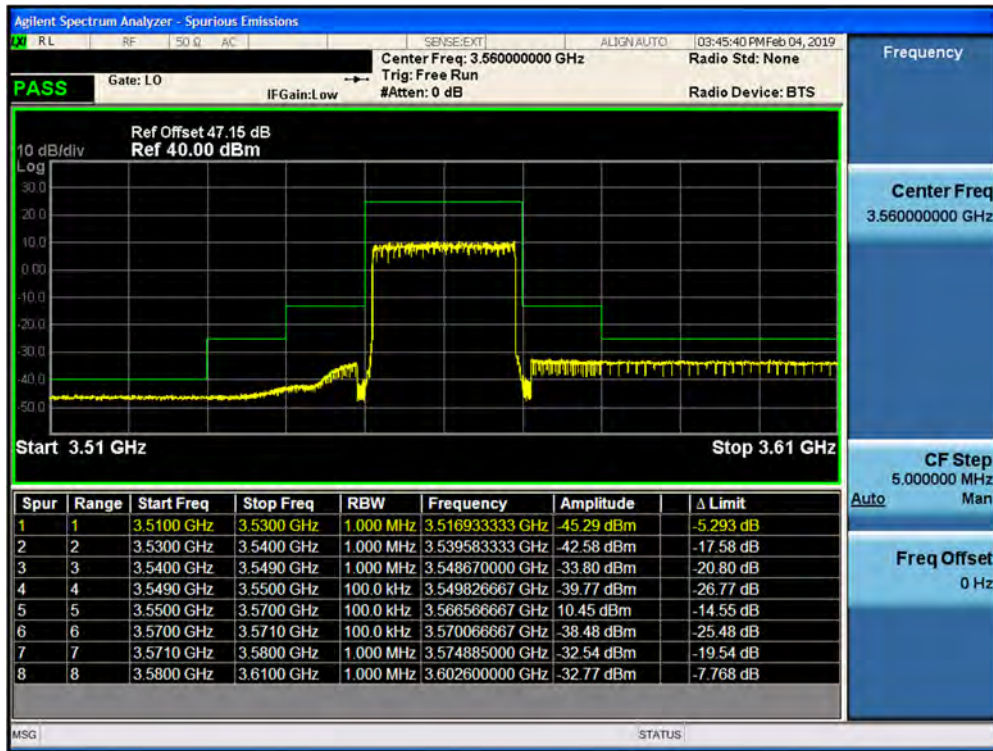
Plot 7-461. Upper Channel Edge Plot (20.0MHz 64QAM High Channel– SISO)



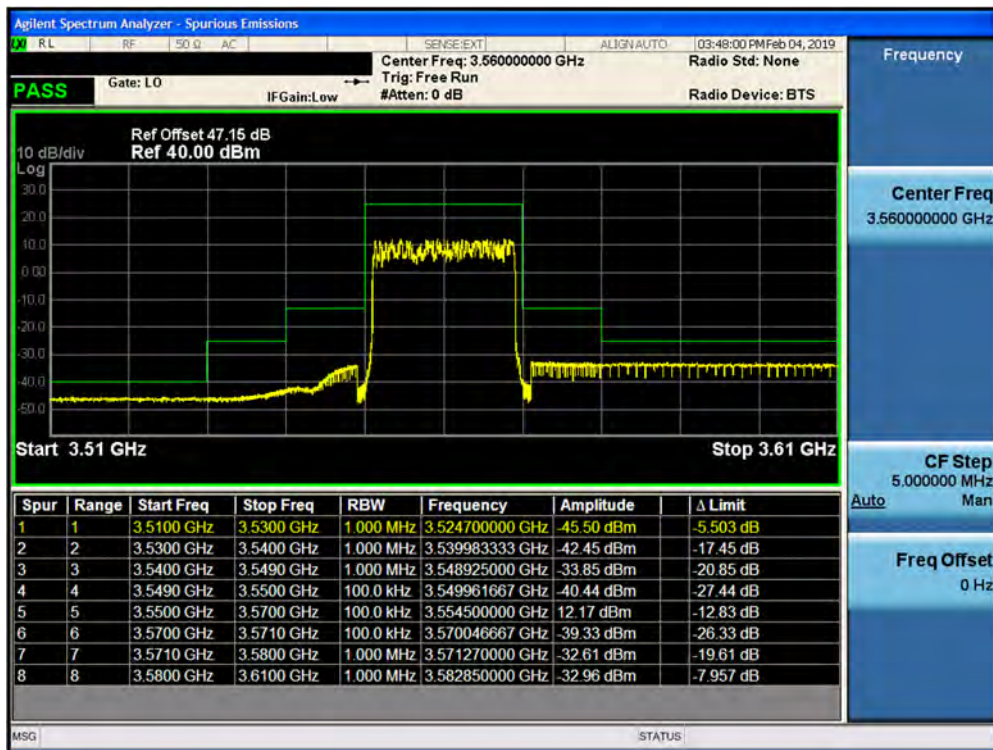
Plot 7-462. Upper Channel Edge Plot (20.0MHz 256QAM High Channel– SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2.A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBSD		Page 299 of 313

1CC Low Channel MIMO

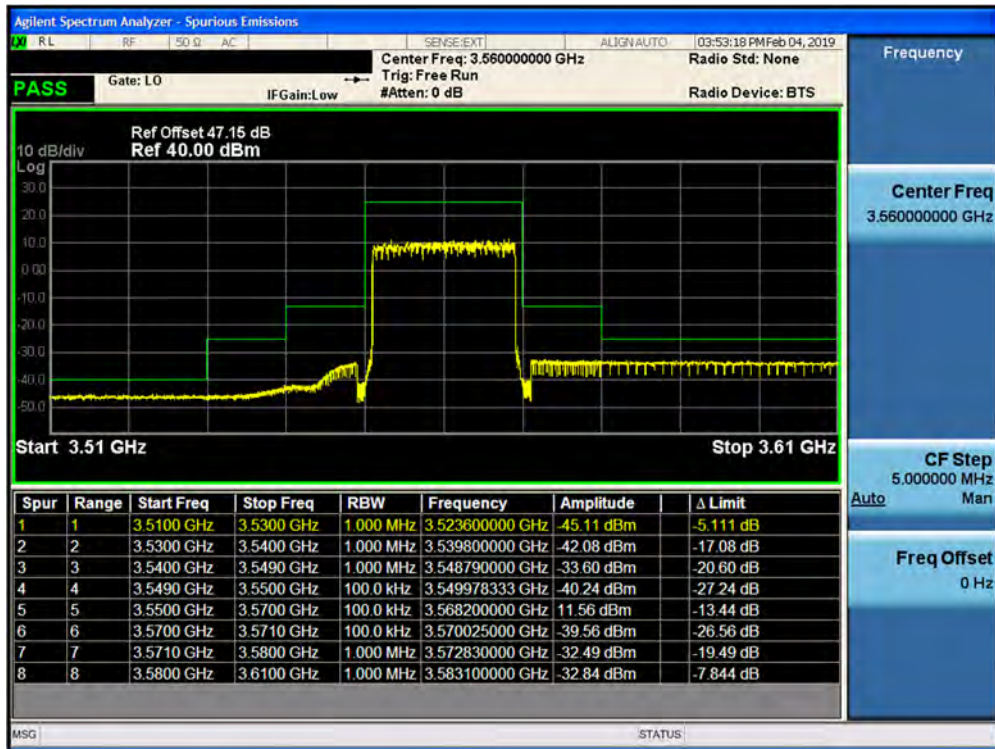


Plot 7-463. Lower Channel Edge Plot (20.0MHz QPSK Low Channel– MIMO)

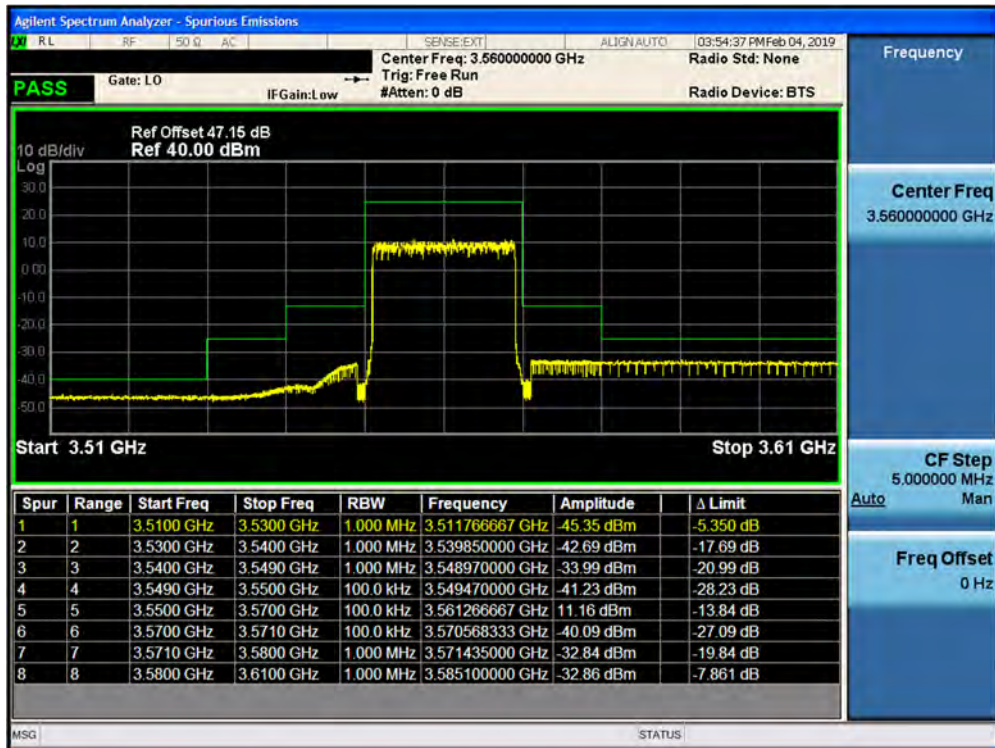


Plot 7-464. Lower Channel Edge Plot (20.0MHz 16QAM Low Channel– MIMO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2-A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBS		Page 300 of 313



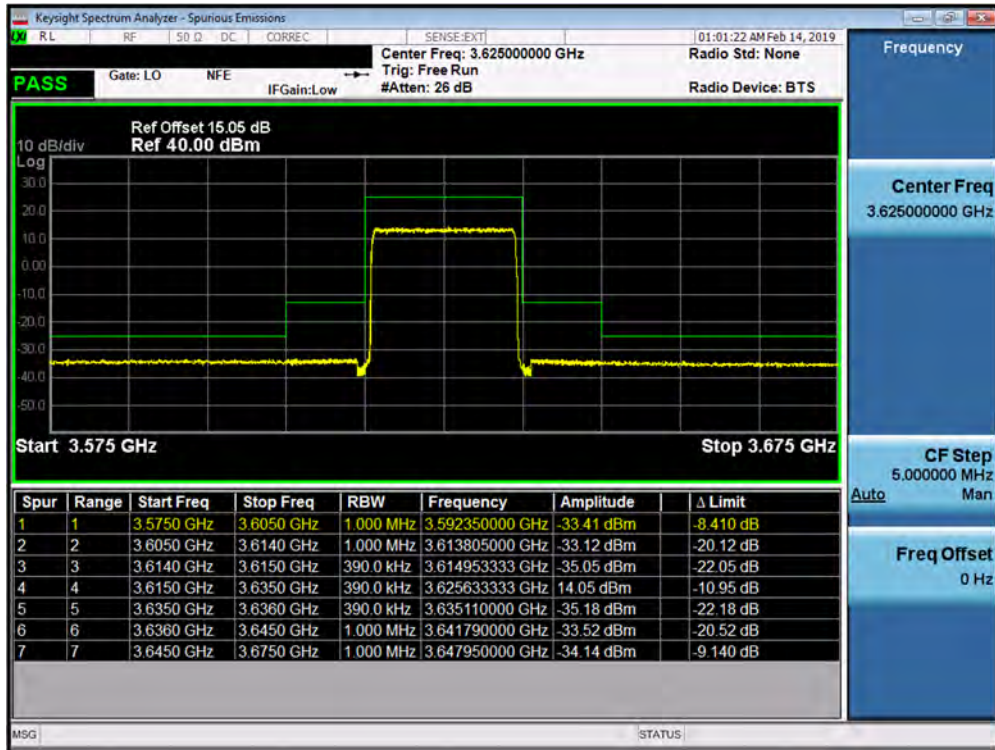
Plot 7-465. Lower Channel Edge Plot (20.0MHz 64QAM Low Channel- MIMO)



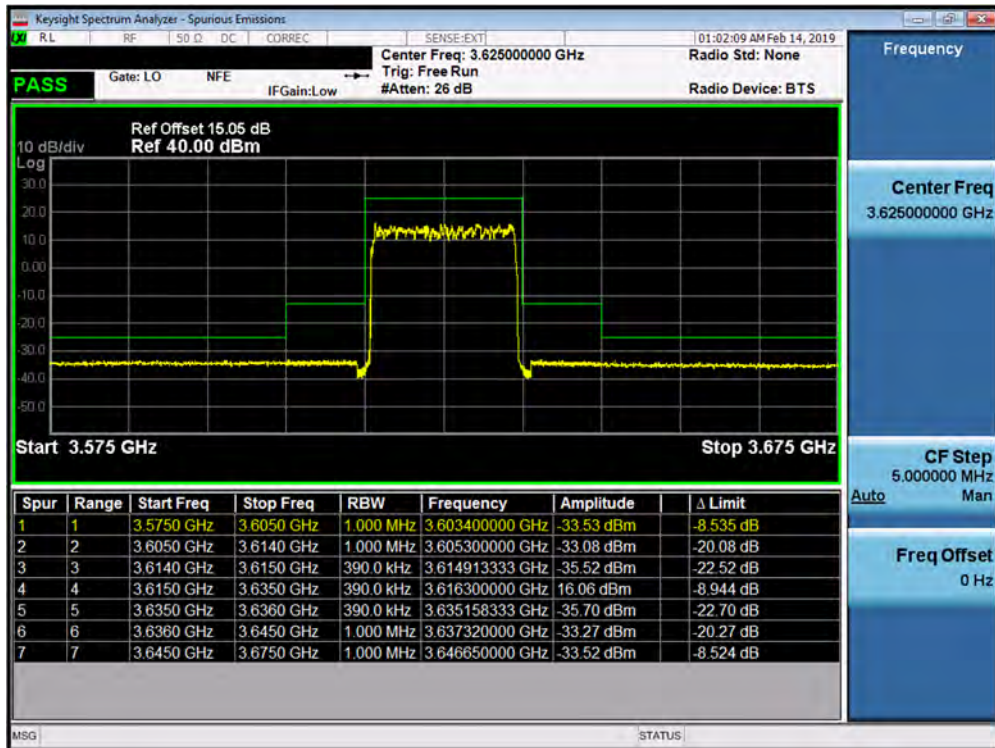
Plot 7-466. Lower Channel Edge Plot (20.0MHz 256QAM Low Channel- MIMO)

FCC ID: A3LMT3204-48A	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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1CC Mid Channel MIMO

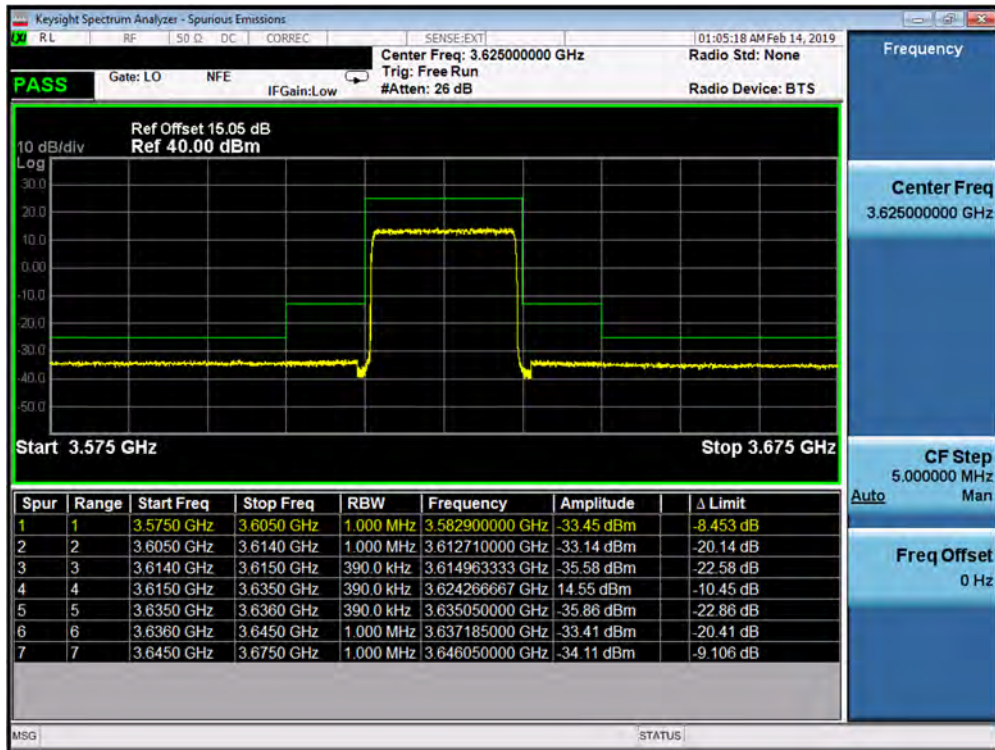


Plot 7-467. Channel Edge Plot (20.0MHz QPSK Mid Channel- MIMO)

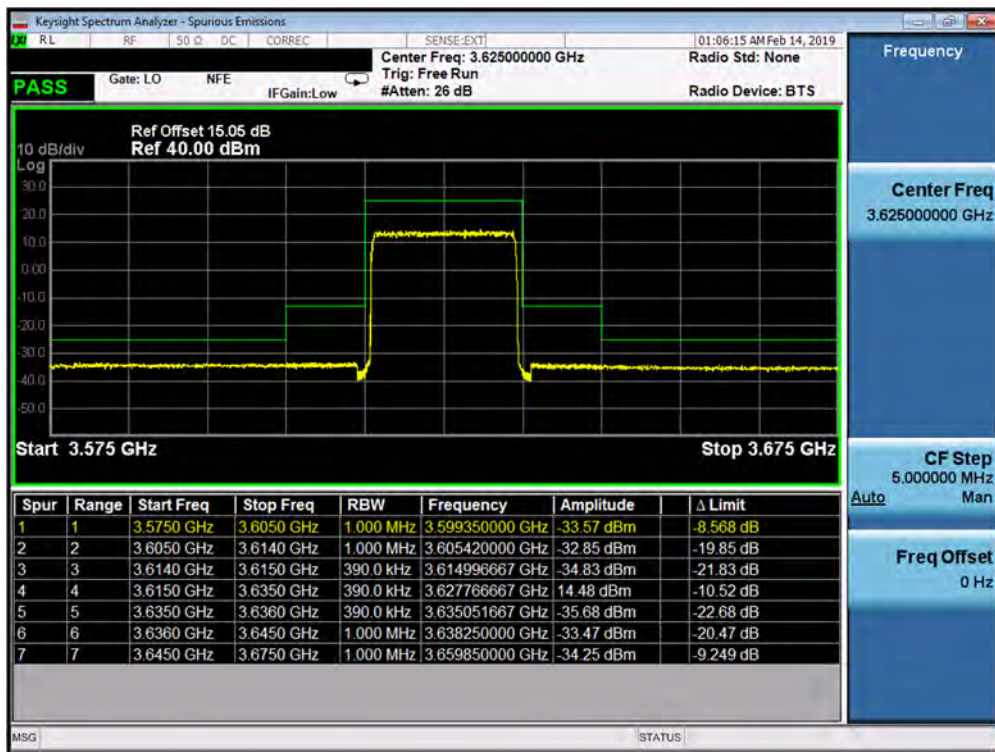


Plot 7-468. Channel Edge Plot (20.0MHz 16QAM Mid Channel- MIMO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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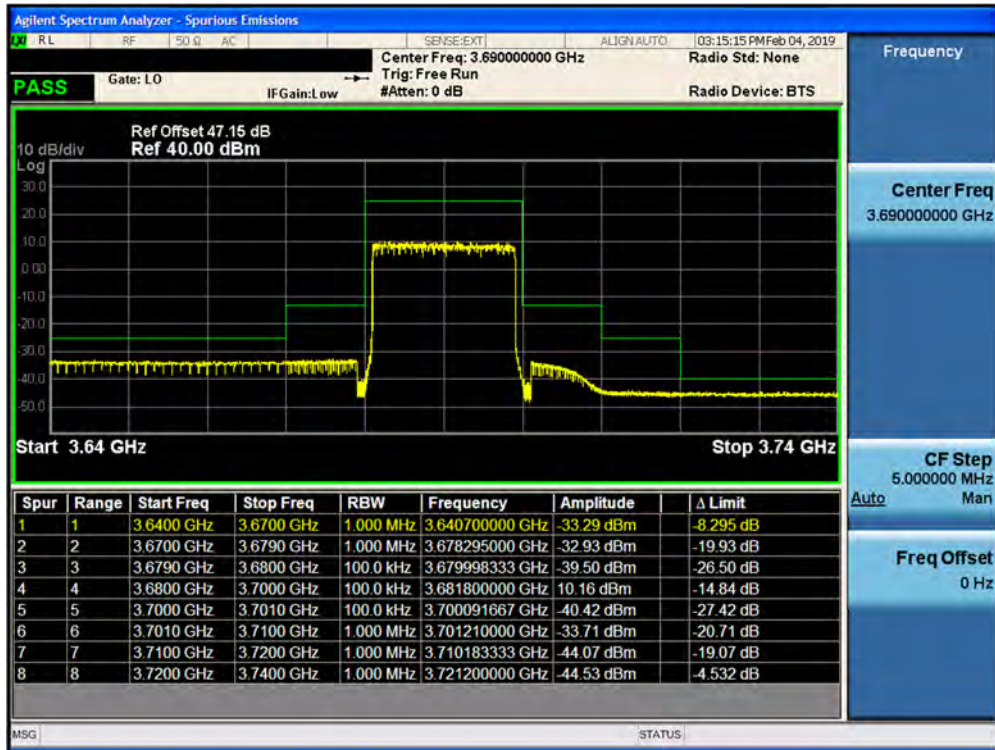
Plot 7-469. Channel Edge Plot (20.0MHz 64QAM Mid Channel- MIMO)



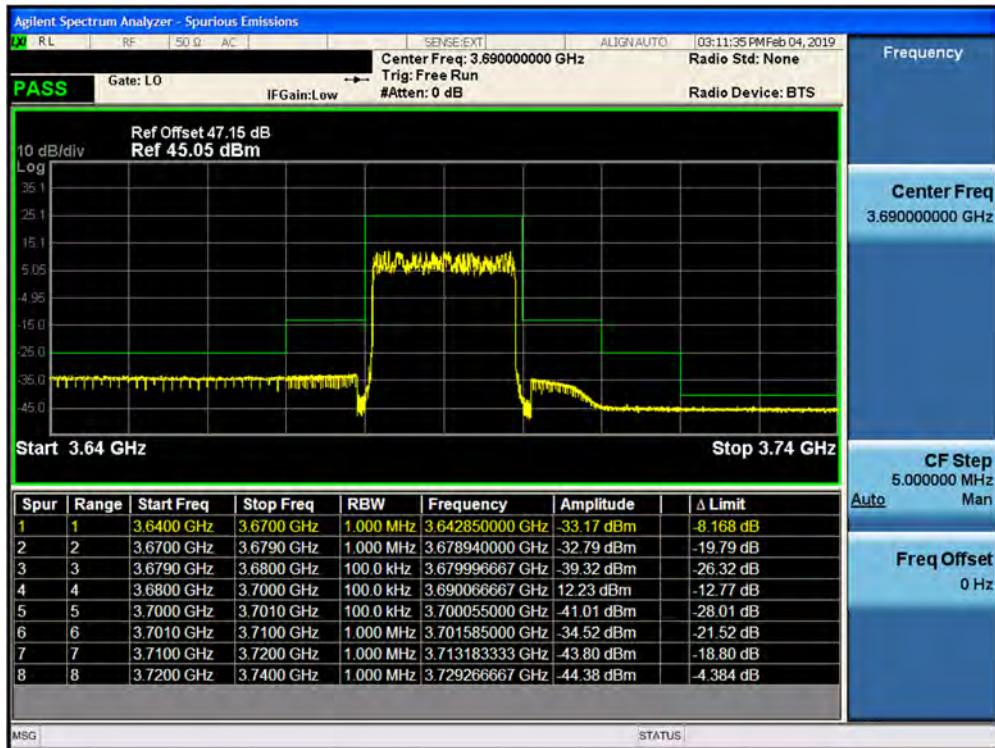
Plot 7-470. Channel Edge Plot (20.0MHz 256QAM Mid Channel- MIMO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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1CC High Channel MIMO

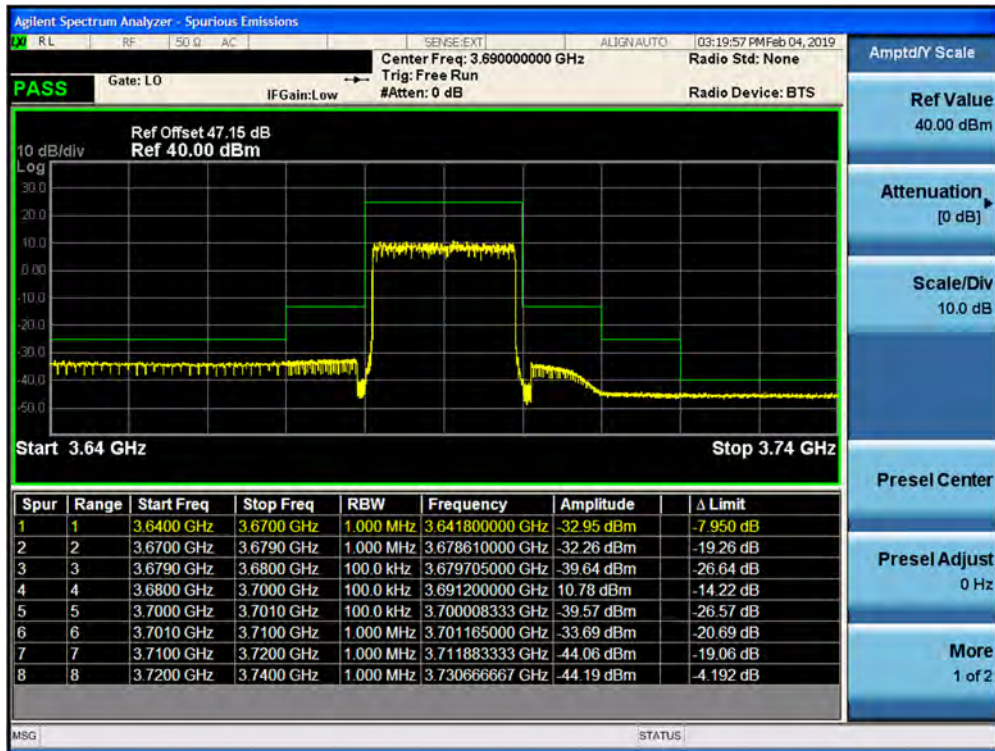


Plot 7-471. Upper Channel Edge Plot (20.0MHz QPSK High Channel- MIMO)

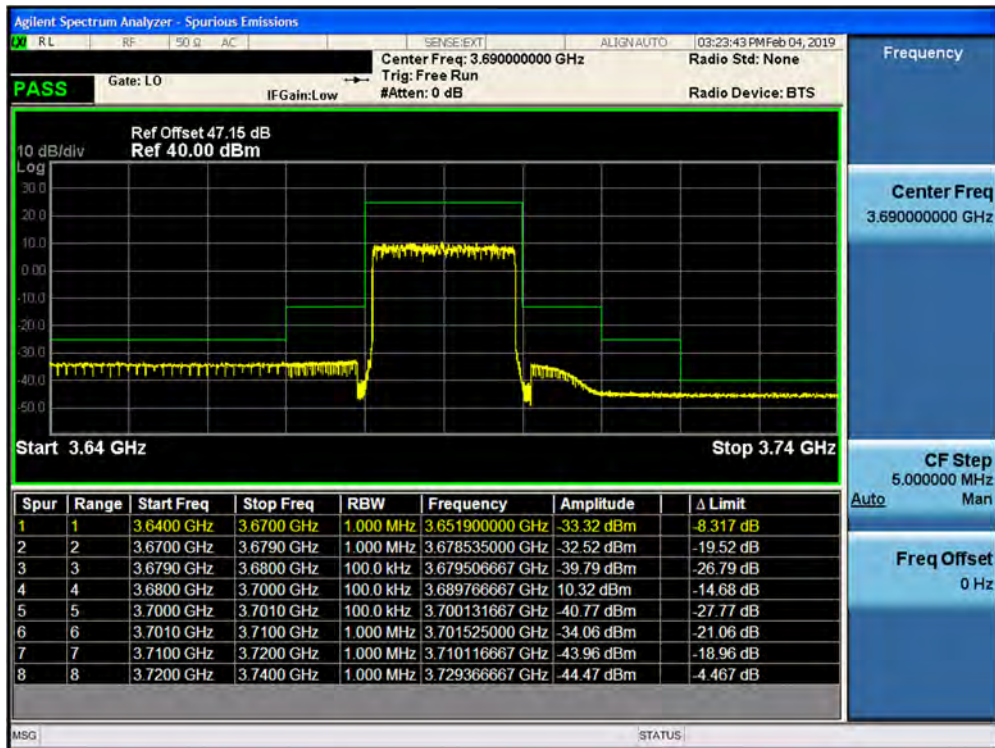


Plot 7-472. Upper Channel Edge Plot (20.0MHz 16QAM High Channel- MIMO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240015-01-R2-A3L	Test Dates: 01/23/2019 - 02/28/2019	EUT Type: Massive MIMO CBS		Page 304 of 313



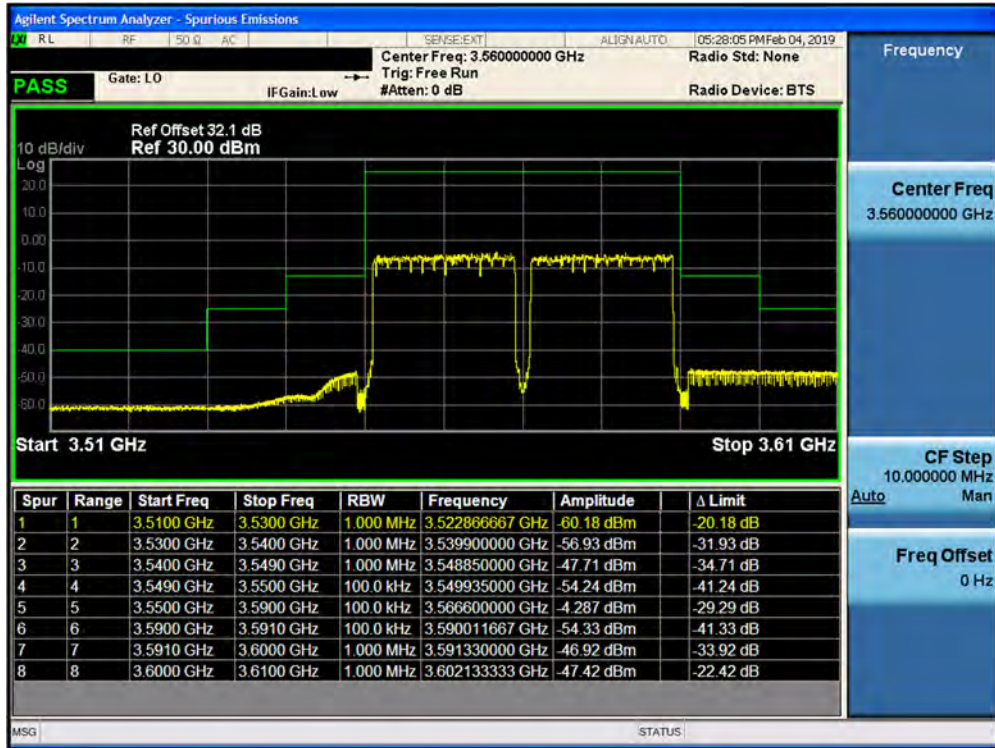
Plot 7-473. Upper Channel Edge Plot (20.0MHz 64QAM High Channel- MIMO)



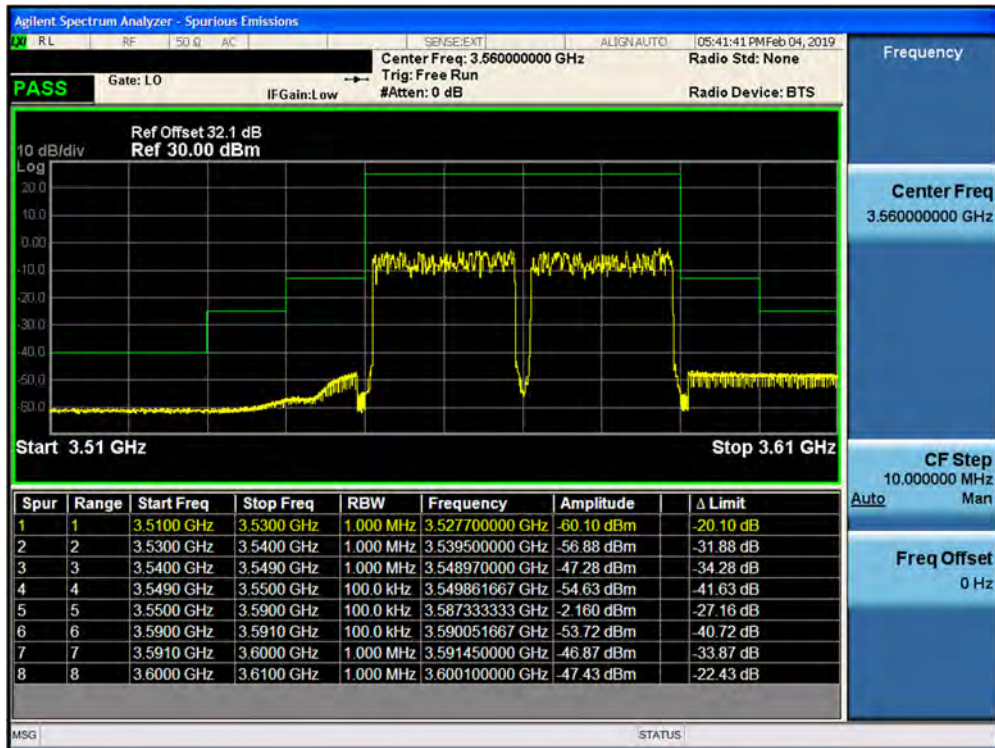
Plot 7-474. Upper Channel Edge Plot (20.0MHz 256QAM High Channel- MIMO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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2CC Contiguous Low Channel SISO

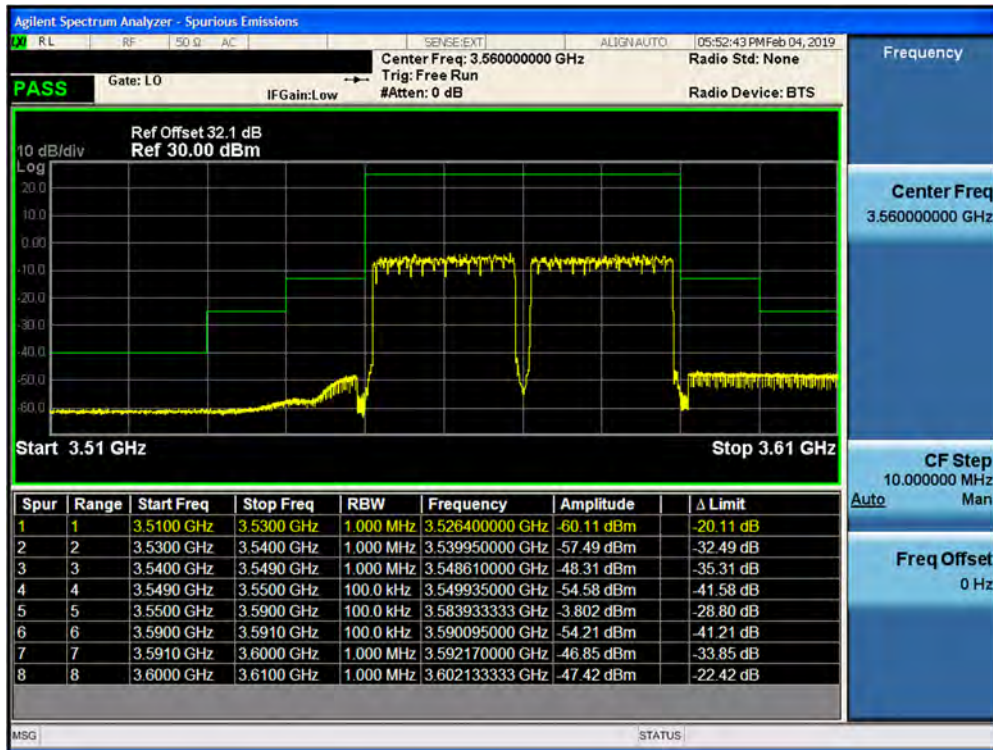


Plot 7-475. Lower Channel Edge Plot (40.0MHz QPSK Low Channel- SISO)

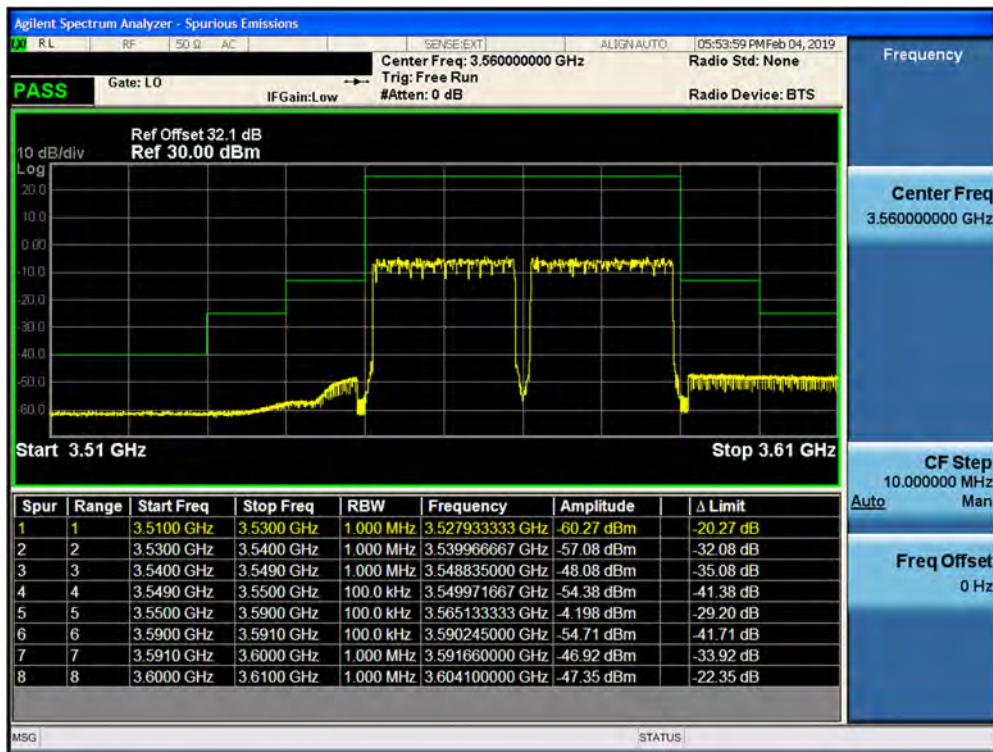


Plot 7-476. Lower Channel Edge Plot (40.0MHz 16QAM Low Channel- SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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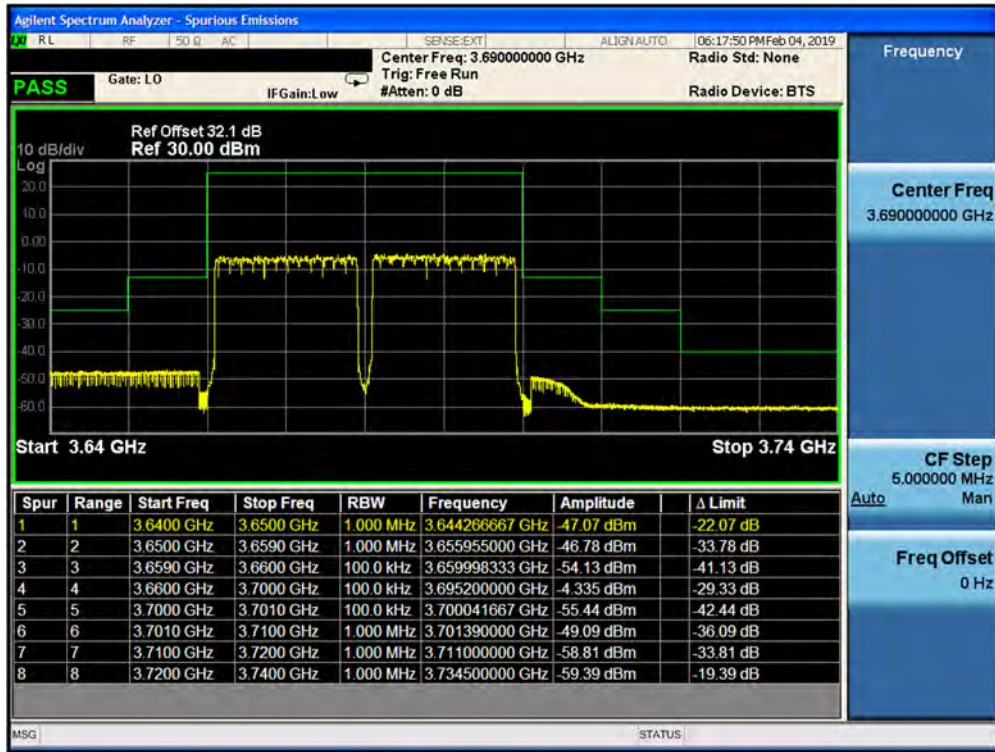
Plot 7-477. Lower Channel Edge Plot (40.0MHz 64QAM Low Channel- SISO)



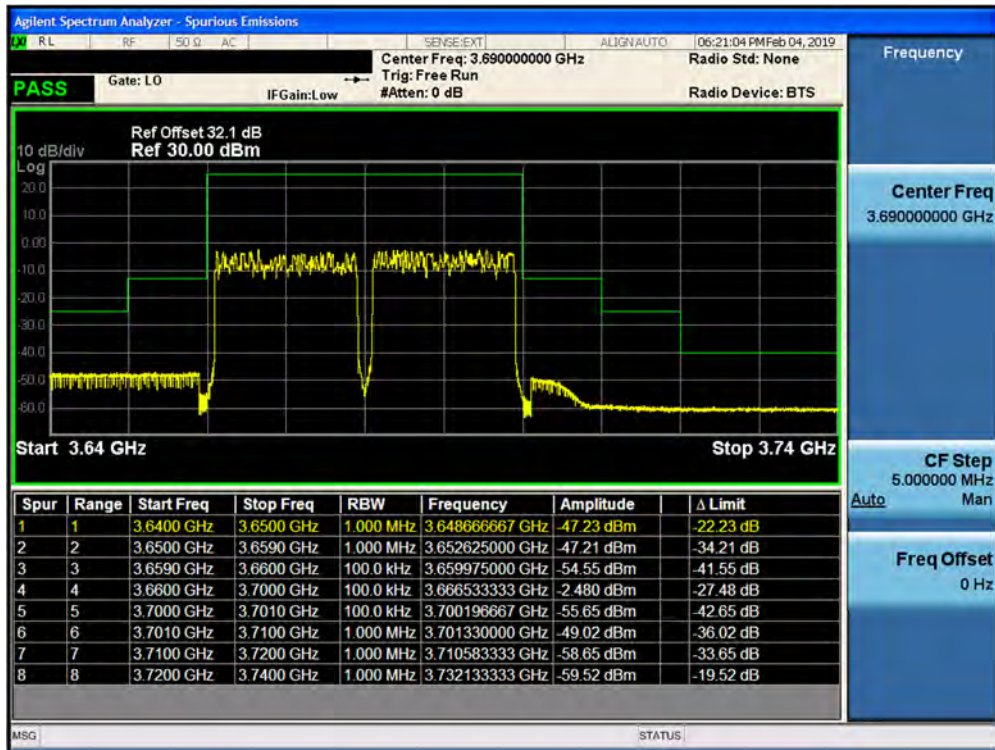
Plot 7-478. Lower Channel Edge Plot (40.0MHz 256QAM Low Channel- SISO)

FCC ID: A3LMT3204-48A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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2CC Contiguous High Channel SISO

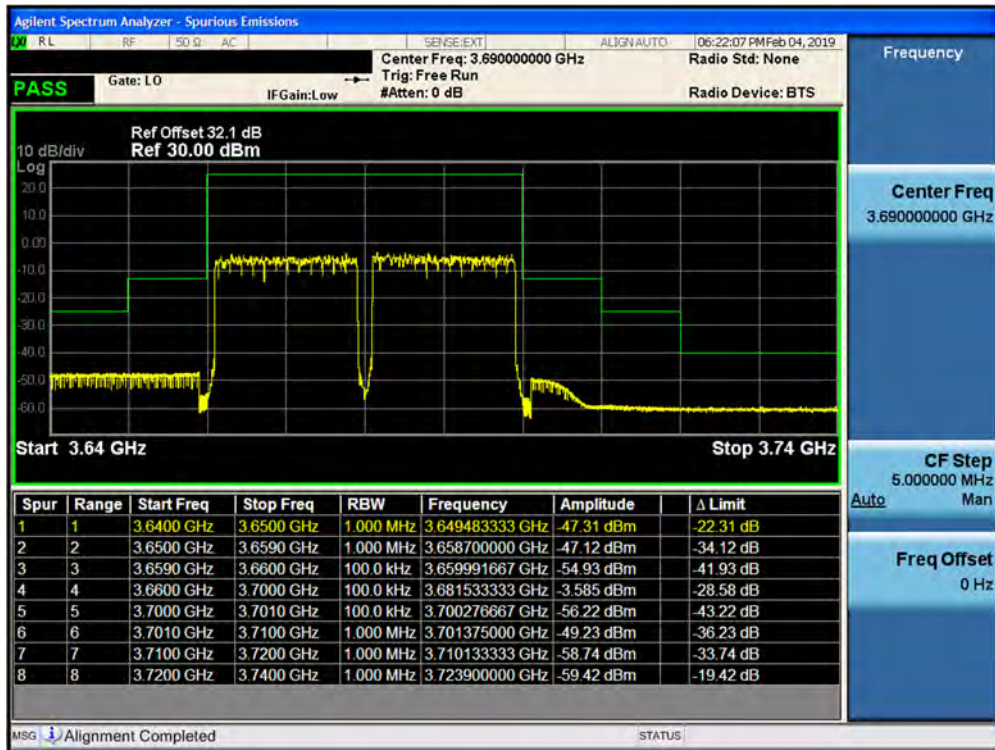


Plot 7-479. Upper Channel Edge Plot (40.0MHz QPSK High Channel- SISO)

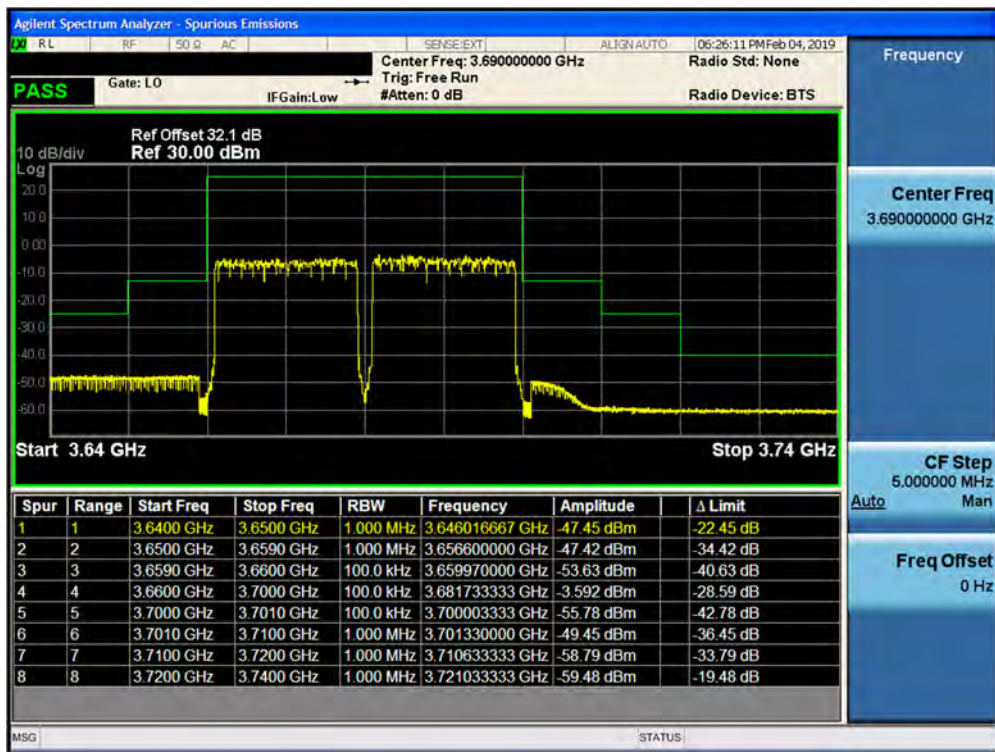


Plot 7-480. Upper Channel Edge Plot (40.0MHz 16QAM High Channel- SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-481. Upper Channel Edge Plot (40.0MHz 64QAM High Channel- SISO)



Plot 7-482. Upper Channel Edge Plot (40.0MHz 256QAM High Channel- SISO)

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.8 Frequency Stability / Temperature Variation

\$2.1055

Test Overview and Limit

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

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

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

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

1. Trace = Average RMS
2. Detector = Peak
3. RBW = 100kHz
4. VBW = 500 kHz

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

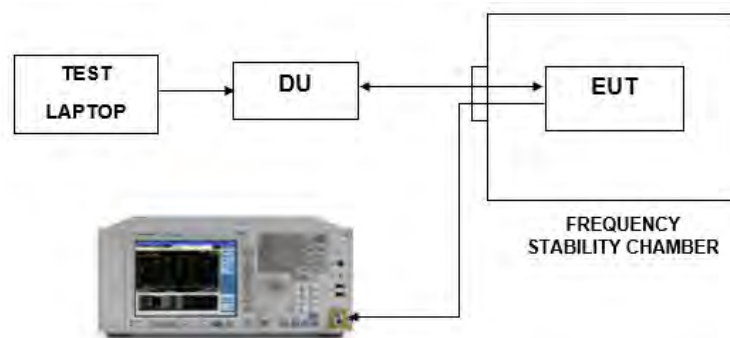


Figure 7-7. Test Instrument & Measurement Setup

FCC ID: A3LMT3204-48A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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)	3,624,968,739	0	0.0000000
100 %	48.00	- 30	3,624,781,444	-187,295	-0.0051668
100 %		- 20	3,624,766,229	-202,510	-0.0055865
100 %		- 10	3,625,009,563	40,824	0.0011262
100 %		0	3,624,868,000	-100,739	-0.0027790
100 %		+ 10	3,624,922,125	-46,614	-0.0012859
100 %		+ 30	3,625,113,118	144,378	0.0039829
100 %		+ 40	3,625,150,467	181,728	0.0050132
100 %		+ 50	3,625,220,875	252,136	0.0069555
85 %	40.80	+ 20	3,624,982,612	13,873	0.0003827
115 %	55.20	+20	3,625,171,416	202,677	0.0055911

Table 7-44. 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

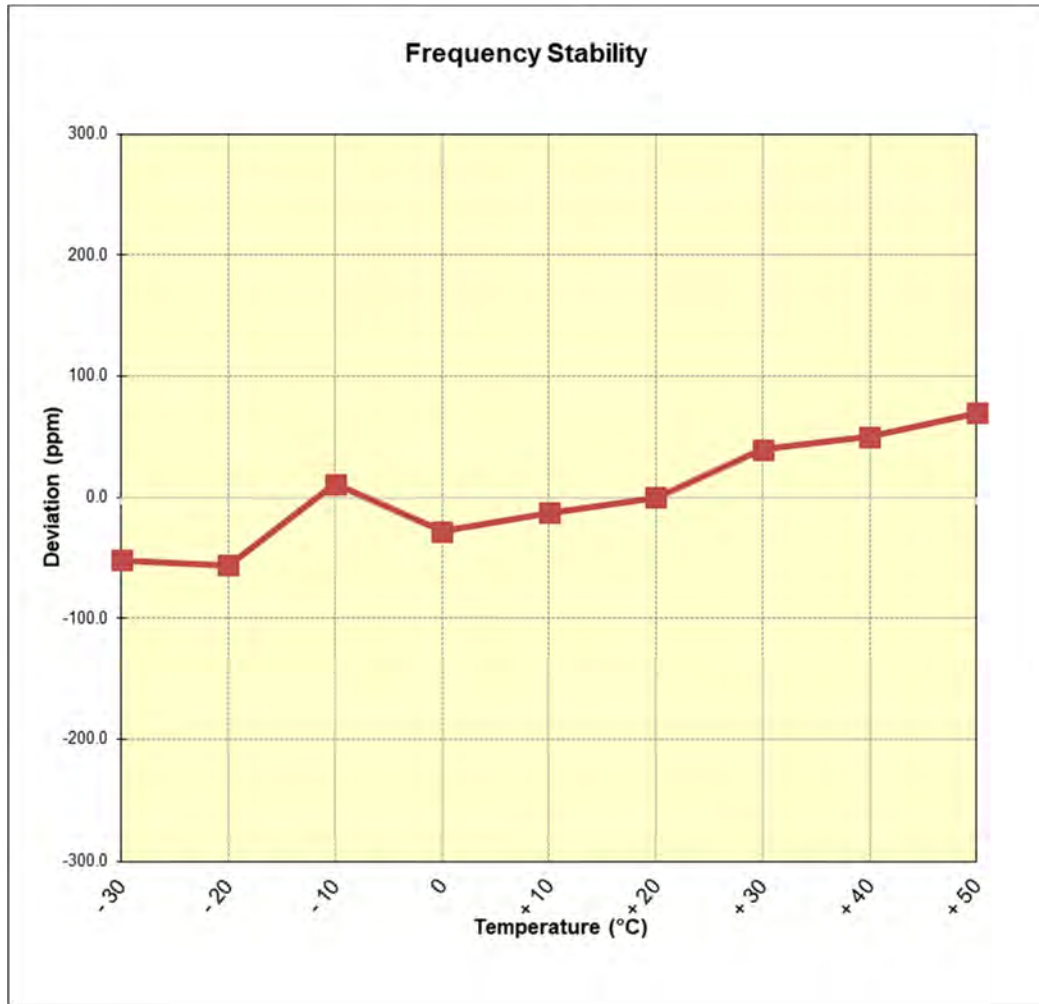


Figure 7-8. Frequency Stability Graph (Band 48)

FCC ID: A3LMT3204-48A	 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 Massive MIMO CBSD FCC ID: A3LMT3204-48A** complies with all of the Category B CBSD requirements of Part 96 of the FCC Rules.

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