

DSS Ratio	Channel	Port	QPSK	16QAM	64QAM	256QAM
LTE 3 : NR 7	Low	0	39.87	39.95	39.96	39.90
		1	39.98	40.13	39.97	39.84
		2	39.35	39.44	39.42	39.39
		3	39.75	39.90	39.79	39.79
		Total MIMO Conducted Power (mW)	37709.70	38751.99	38117.28	37628.23
		Total MIMO Conducted Power(dBm)	45.76	45.88	45.81	45.76
	Mid	0	39.96	39.99	39.82	39.91
		1	39.89	39.96	39.78	39.86
		2	39.90	39.98	39.80	39.83
		3	39.96	40.04	39.89	39.83
		Total MIMO Conducted Power (mW)	39338.91	39931.90	38399.88	38709.92
		Total MIMO Conducted Power(dBm)	45.95	46.01	45.84	45.88
	High	0	39.80	39.91	39.79	39.85
		1	39.86	40.02	39.84	39.87
		2	39.90	39.93	39.90	39.90
		3	39.83	39.86	39.78	39.77
		Total MIMO Conducted Power (mW)	38621.20	39363.95	38444.67	38622.17
		Total MIMO Conducted Power(dBm)	45.87	45.95	45.85	45.87

Table 7-51. Conducted Average Output Power Table (DSS_B5_10M_3:7_1C)

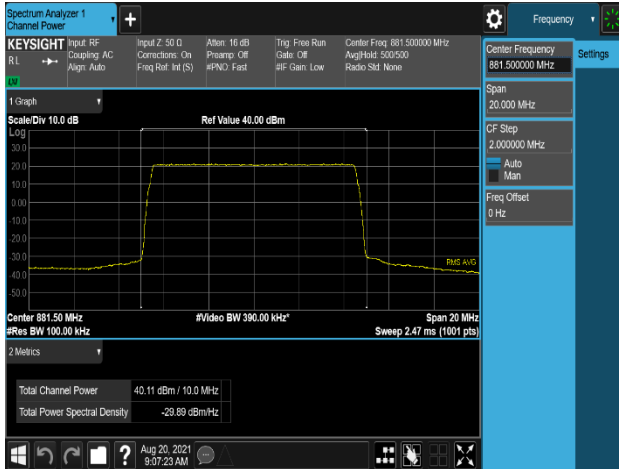
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 80 of 225

DSS Ratio	Channel	Port	QPSK	16QAM	64QAM	256QAM
LTE 2 : NR 8	Low	0	39.62	39.60	39.53	39.57
		1	39.89	39.91	39.88	39.83
		2	39.44	39.45	39.39	39.36
		3	39.76	39.84	39.68	39.72
		Total MIMO Conducted Power (mW)	37164.70	37363.79	36681.03	36678.85
		Total MIMO Conducted Power(dBm)	45.70	45.72	45.64	45.64
	Mid	0	39.86	39.97	39.87	39.89
		1	39.92	40.05	39.84	39.91
		2	39.83	39.91	39.80	39.76
		3	39.91	40.00	39.86	39.85
		Total MIMO Conducted Power (mW)	38911.28	39841.85	38576.09	38667.68
		Total MIMO Conducted Power(dBm)	45.90	46.00	45.86	45.87
	High	0	39.80	39.93	39.80	39.78
		1	39.83	39.98	39.87	39.87
		2	39.90	39.97	39.82	39.88
		3	39.78	39.89	39.74	39.79
		Total MIMO Conducted Power (mW)	38444.47	39475.22	38267.93	38466.58
		Total MIMO Conducted Power(dBm)	45.85	45.96	45.83	45.85

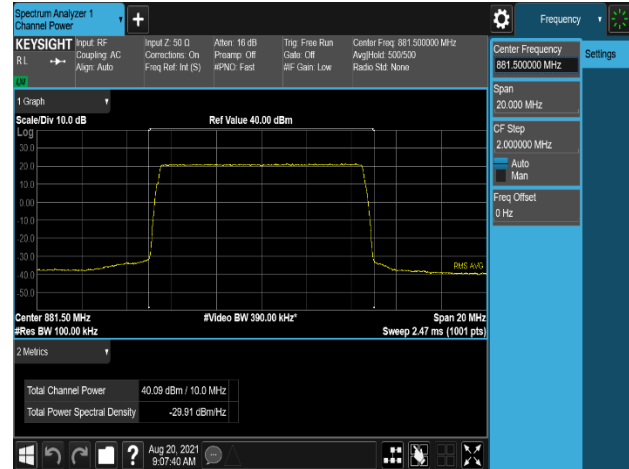
Table 7-52. Conducted Average Output Power Table (DSS_B5_10M_2:8_1C)

Note: Test result is no big difference depending on DSS Ratio. So, the only worst-ratio plots are included in this report.

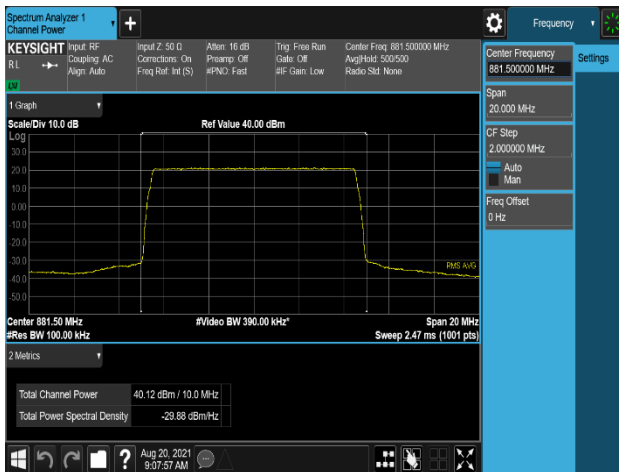
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 81 of 225



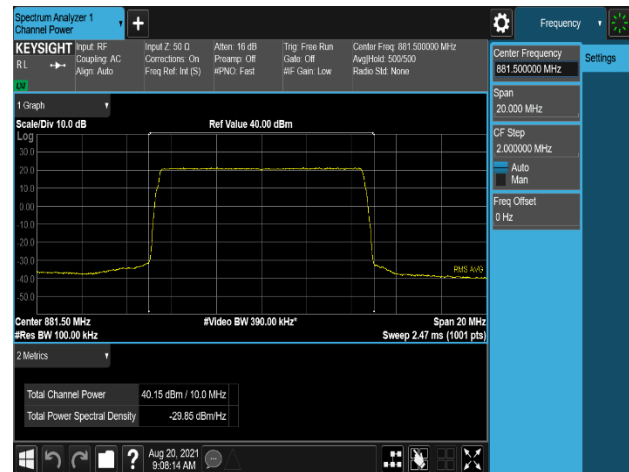
Plot 7-222. Conducted Average Output Power Plot (DSS_B5_10M_9:1_1C_QPSK - Mid Channel, Port 0)



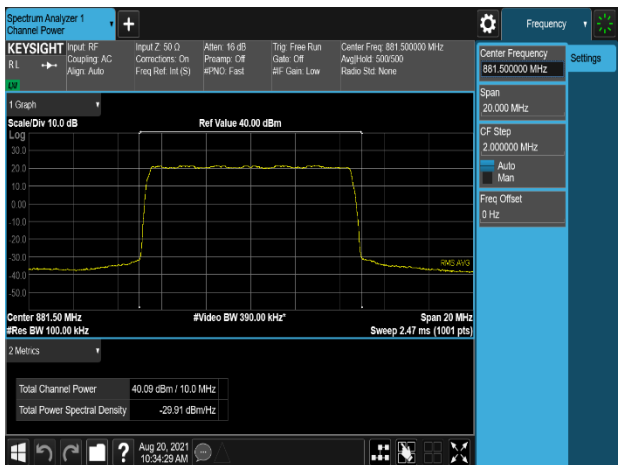
Plot 7-223. Conducted Average Output Power Plot (DSS_B5_10M_9:1_1C_Mid - Low Channel, Port 1)



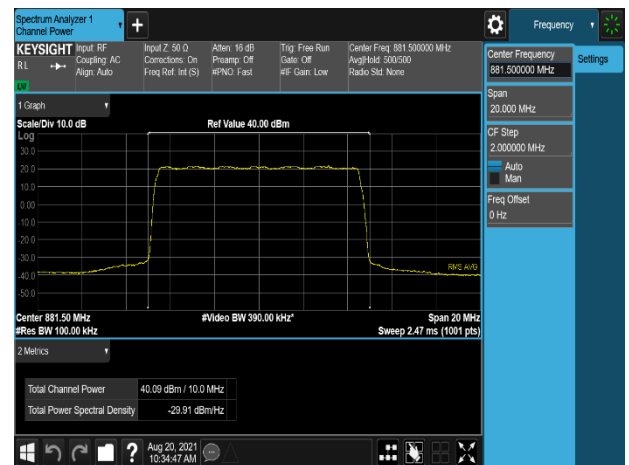
Plot 7-224. Conducted Average Output Power Plot (DSS_B5_10M_9:1_1C_QPSK - Mid Channel, Port 2)



Plot 7-225. Conducted Average Output Power Plot (DSS_B5_10M_9:1_1C_Mid - Low Channel, Port 3)

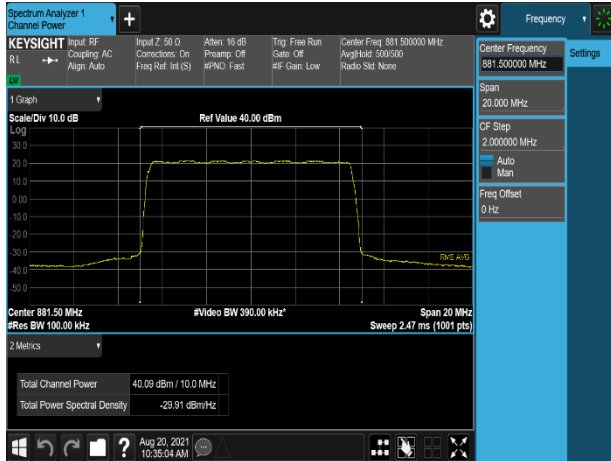


Plot 7-226. Conducted Average Output Power Plot (DSS_B5_10M_8:2_1C_16QAM - Mid Channel, Port 0)



Plot 7-227. Conducted Average Output Power Plot (DSS_B5_10M_8:2_1C_16QAM - Mid Channel, Port 1)

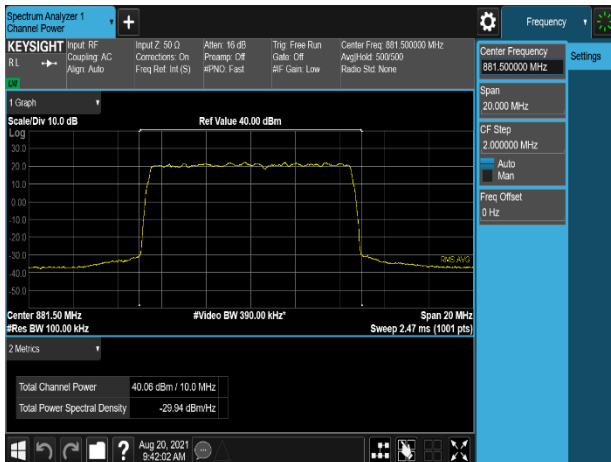
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 82 of 225



Plot 7-228. Conducted Average Output Power Plot (DSS_B5_10M_8:2)_1C_16QAM - Mid Channel, Port 2)



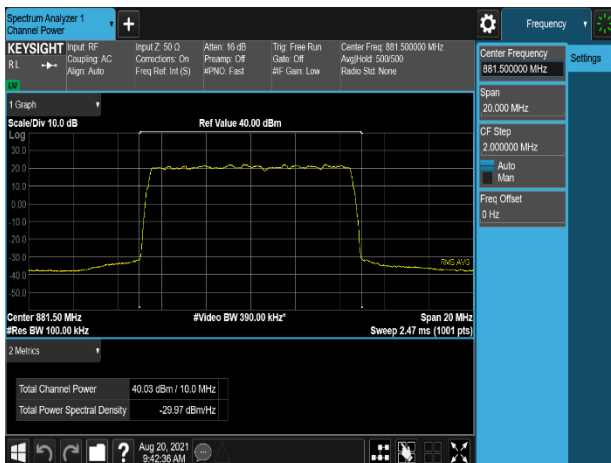
Plot 7-229. Conducted Average Output Power Plot (DSS_B5_10M_8:2)_1C_16QAM - Mid Channel, Port 3)



Plot 7-230. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_64QAM – Mid Channel, Port 0)



Plot 7-231. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_64QAM – Mid Channel, Port 1)

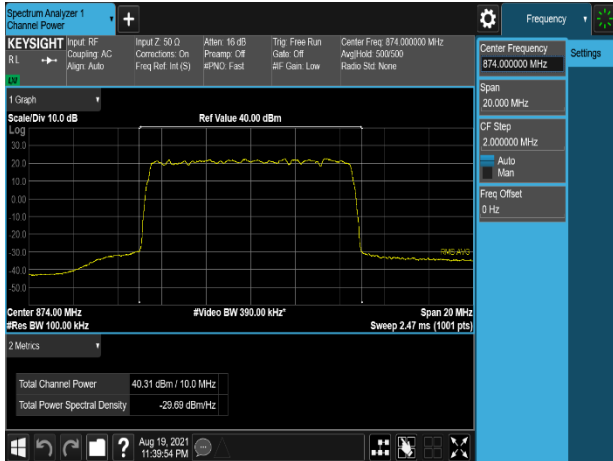


Plot 7-232. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_64QAM – Mid Channel, Port 2)



Plot 7-233. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_64QAM – Mid Channel, Port 3)

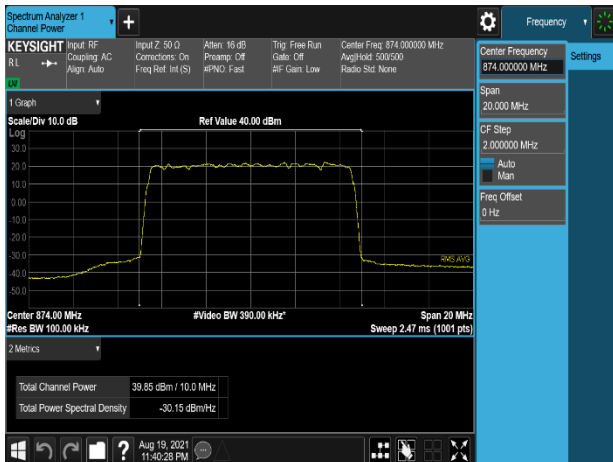
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 83 of 225



Plot 7-234. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_256QAM – Low Channel, Port 0)



Plot 7-235. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_256QAM – Low Channel, Port 1)



Plot 7-236. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_256QAM – Low Channel, Port 2)



Plot 7-237. Conducted Average Output Power Plot (DSS_B5_10M_9:1)_1C_256QAM – Low Channel, Port 3)

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 84 of 225

DSS Ratio	Channel	Port	QPSK	16QAM	64QAM	256QAM
LTE 5 : NR 5	Low	0	39.89	39.88	39.85	39.91
		1	39.90	39.90	40.00	39.91
		2	39.65	39.81	39.76	39.73
		3	39.54	39.59	39.64	39.67
		Total MIMO Conducted Power (mW)	37742.96	38170.92	38327.38	38255.33
		Total MIMO Conducted Power(dBm)	45.77	45.82	45.84	45.83
	Mid	0	39.76	39.81	39.78	39.84
		1	39.96	39.84	39.89	39.88
		2	39.74	39.76	39.71	39.66
		3	39.61	39.54	39.57	39.46
		Total MIMO Conducted Power (mW)	37930.72	37667.58	37667.33	37443.54
		Total MIMO Conducted Power(dBm)	45.79	45.76	45.76	45.73
	High	0	39.76	39.77	39.86	39.73
		1	39.99	39.96	39.92	40.00
		2	39.73	39.77	39.74	39.73
		3	39.60	39.69	39.50	39.54
		Total MIMO Conducted Power (mW)	37956.71	38187.77	37831.66	37789.44
		Total MIMO Conducted Power(dBm)	45.79	45.82	45.78	45.77

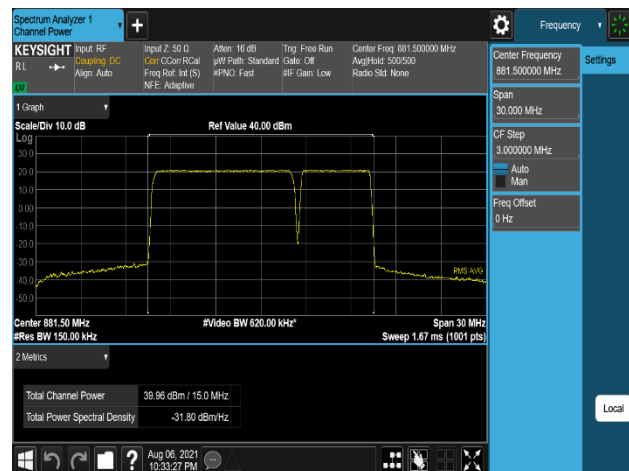
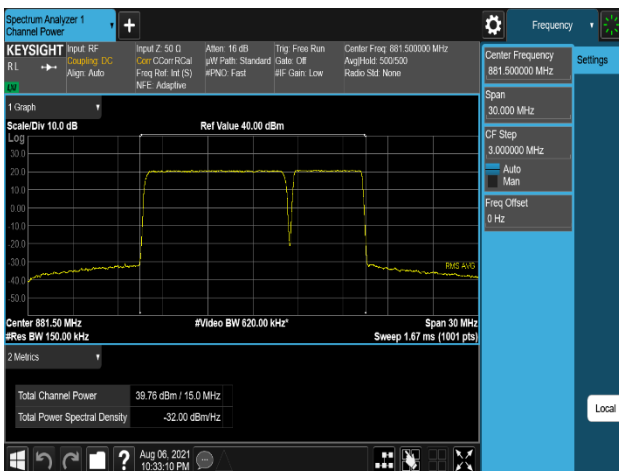
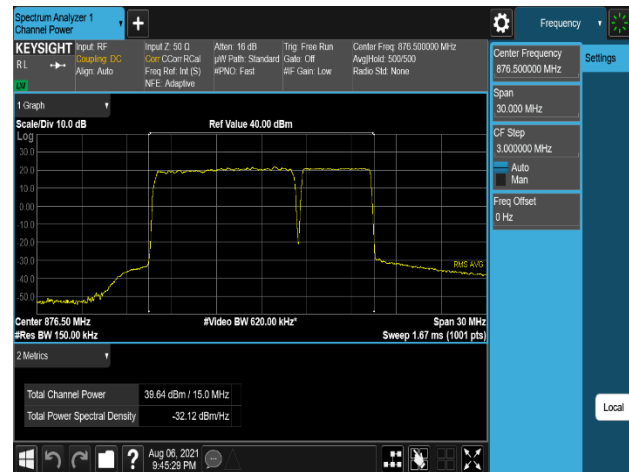
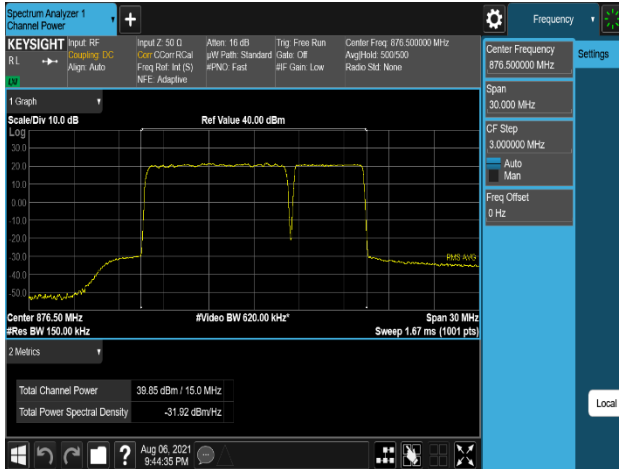
Table 7-53. Conducted Average Output Power Table (DSS_B5_10M+5M_2C)

FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 85 of 225

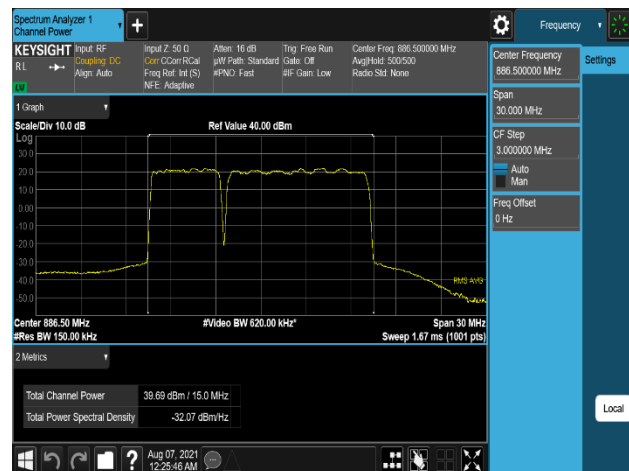
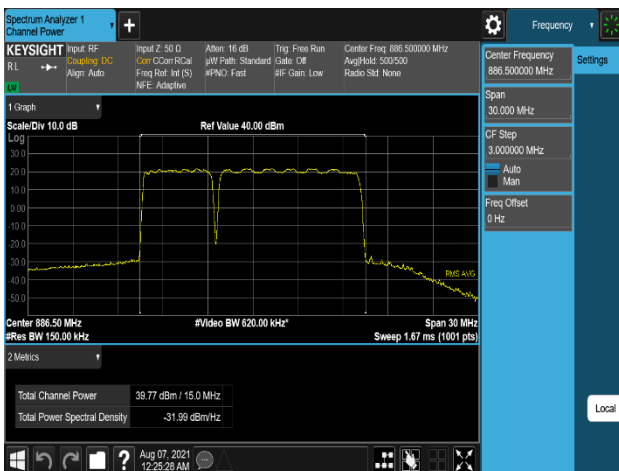
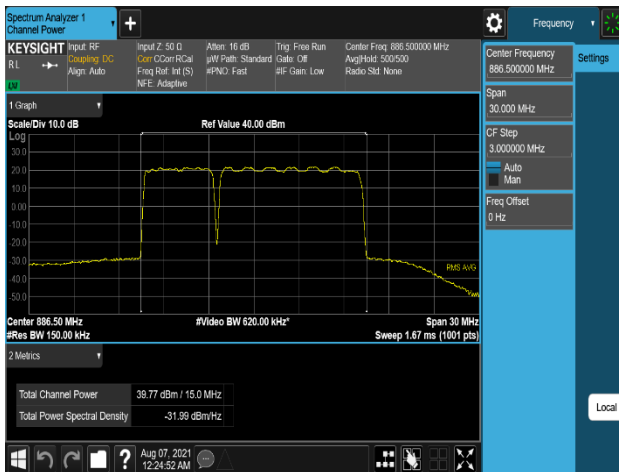
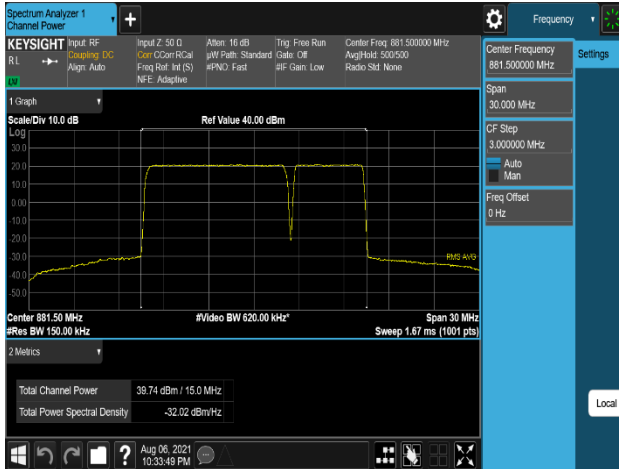
DSS Ratio	Channel	Port	QPSK	16QAM	64QAM	256QAM
LTE 5 : NR 5	Low	0	39.93	39.86	39.76	39.61
		1	39.97	39.92	39.81	39.88
		2	39.87	39.90	39.80	39.75
		3	39.88	39.86	39.87	39.76
		Total MIMO Conducted Power (mW)	39203.84	38955.41	38289.34	37771.59
		Total MIMO Conducted Power(dBm)	45.93	45.91	45.83	45.77
	Mid	0	39.72	39.69	39.46	39.81
		1	39.90	39.94	39.88	39.84
		2	39.76	39.82	39.71	39.84
		3	39.82	39.75	39.80	39.80
		Total MIMO Conducted Power (mW)	38204.37	38208.49	37462.25	38398.45
		Total MIMO Conducted Power(dBm)	45.82	45.82	45.74	45.84
	High	0	40.08	40.11	40.02	39.92
		1	39.98	39.95	39.98	39.92
		2	39.85	39.92	39.86	39.85
		3	39.77	39.71	39.72	39.70
		Total MIMO Conducted Power (mW)	39284.66	39313.59	39058.61	38628.01
		Total MIMO Conducted Power(dBm)	45.94	45.95	45.92	45.87

Table 7-54. Conducted Average Output Power Table (DSS_B5_10M+10M_2C)

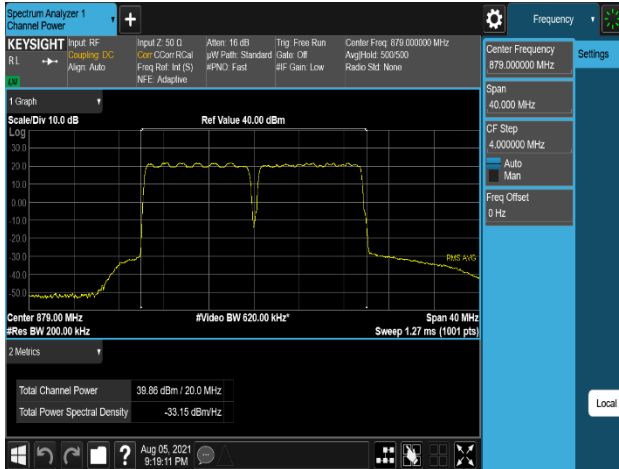
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 86 of 225



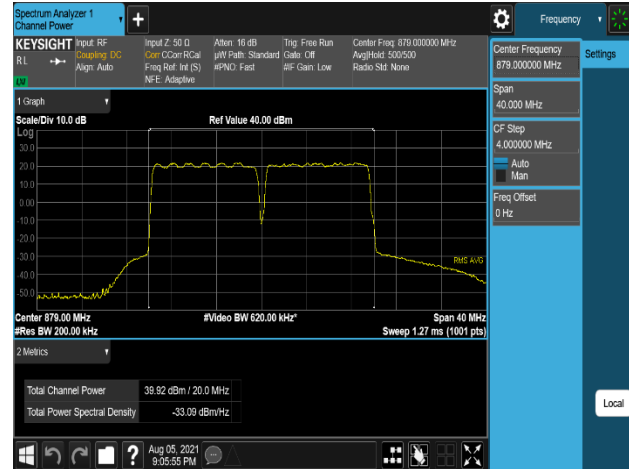
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 87 of 225



FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 88 of 225



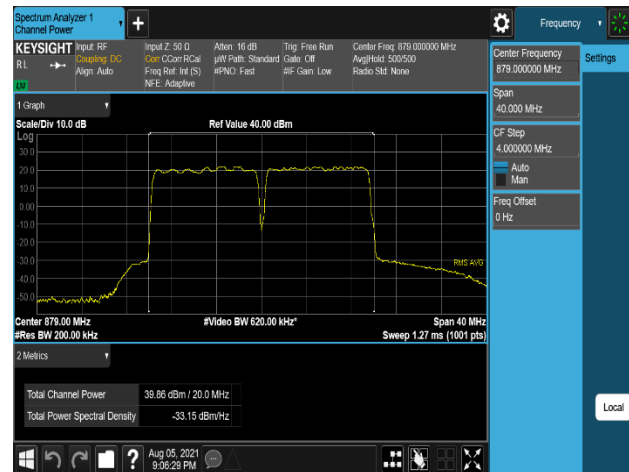
Plot 7-250. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_16QAM - Low Channel, Port 0)



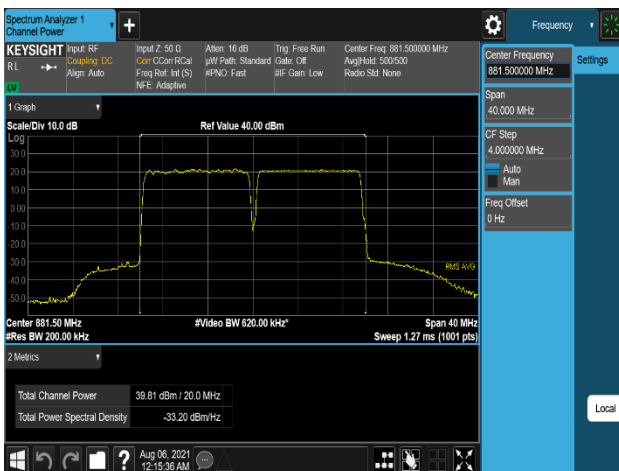
Plot 7-251. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_16QAM - Low Channel, Port 1)



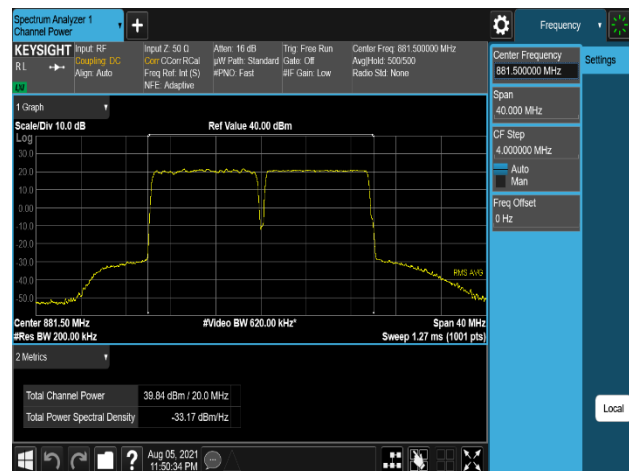
Plot 7-252. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_16QAM - Low Channel, Port 2)



Plot 7-253. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_16QAM - Low Channel, Port 3)

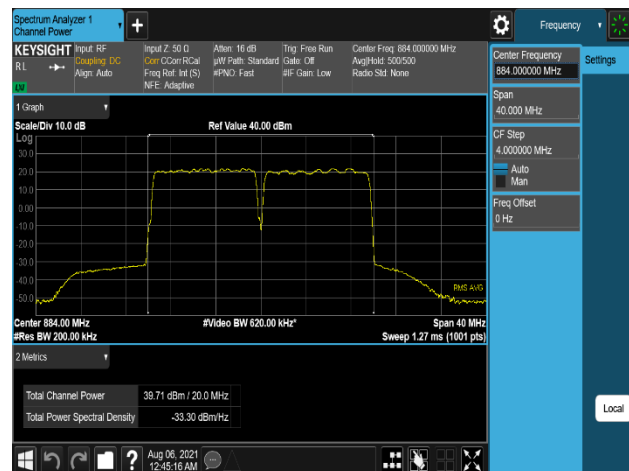
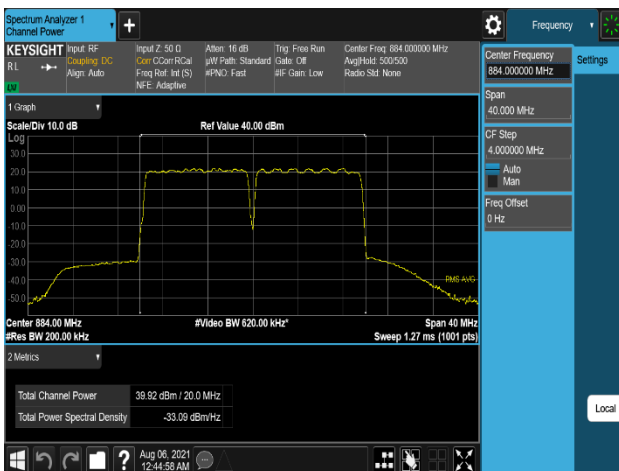
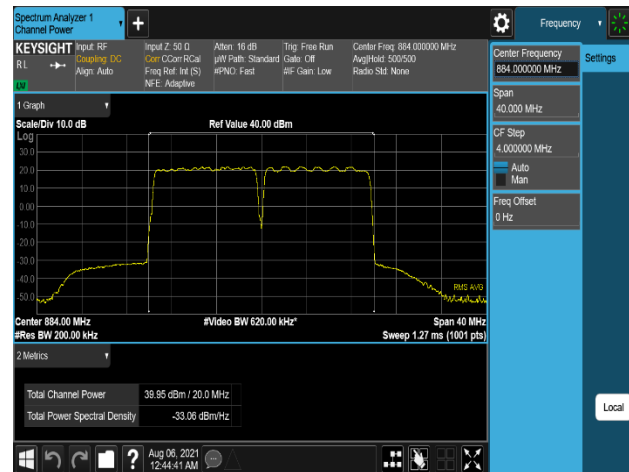
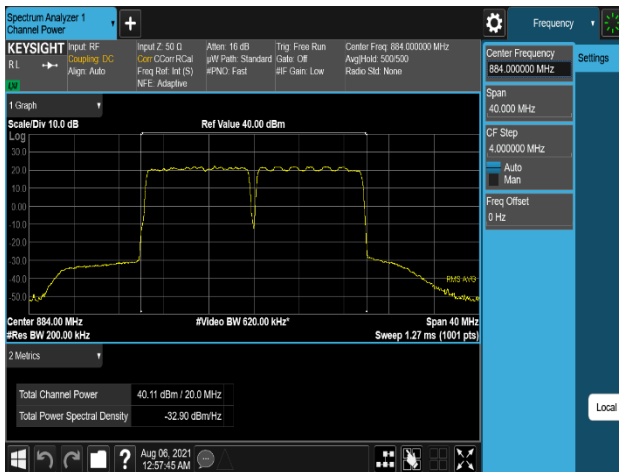
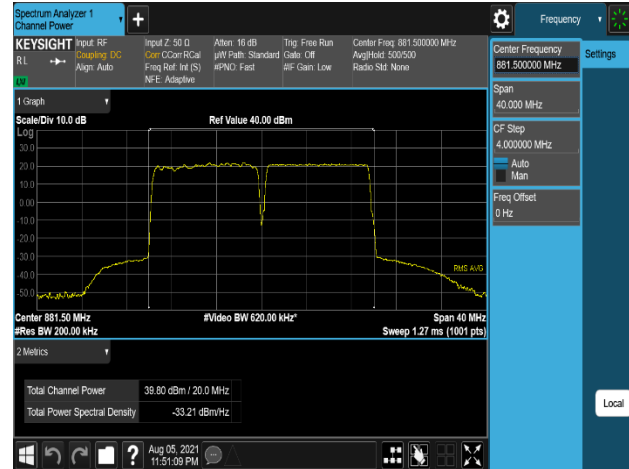
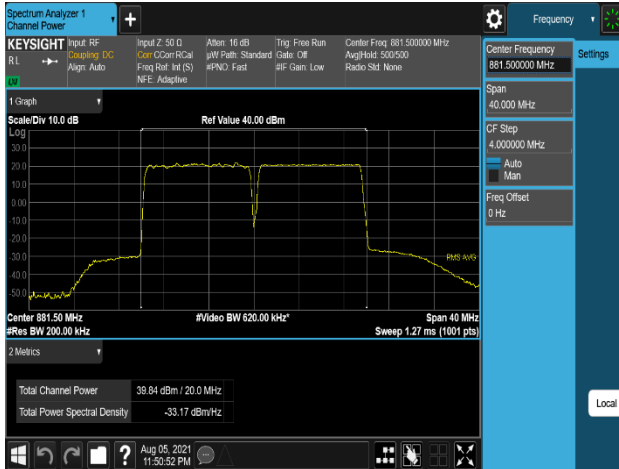


Plot 7-254. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_256QAM - Mid Channel, Port 0)



Plot 7-255. Conducted Average Output Power Plot
(DSS_B5_10M+10M_2C_256QAM - Mid Channel, Port 1)

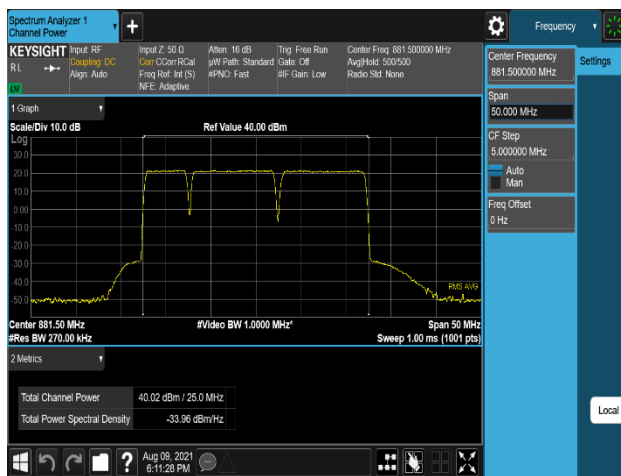
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 89 of 225



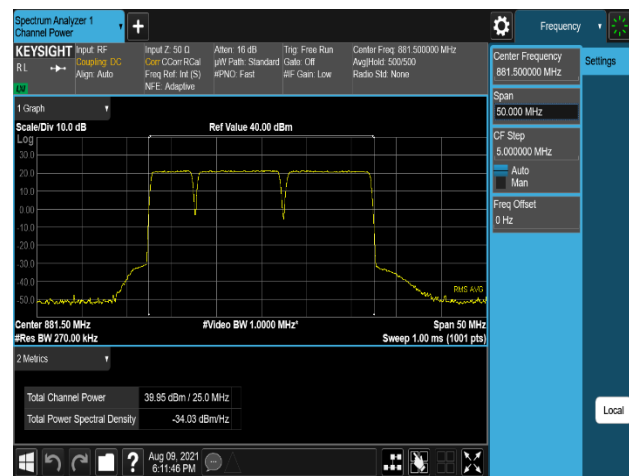
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 90 of 225

DSS Ratio	Channel	Port	QPSK	16QAM	64QAM	256QAM
LTE 5 : NR 5	Middle	0	40.02	40.10	40.05	40.09
		1	39.95	39.92	39.93	39.91
		2	39.96	39.93	39.87	39.91
		3	39.79	39.69	39.79	39.74
		Total MIMO Conducted Power (mW)	39367.97	39201.60	39188.97	39218.09
		Total MIMO Conducted Power(dBm)	45.95	45.93	45.93	45.93

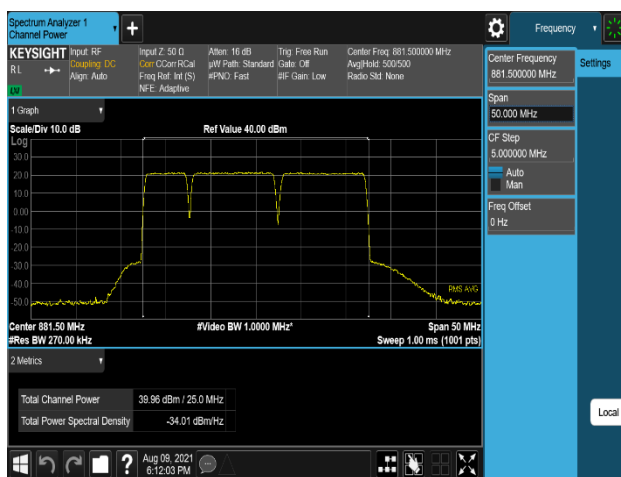
Table 7-55. Conducted Average Output Power Table (DSS_B5_10M+10M+5M_3C)



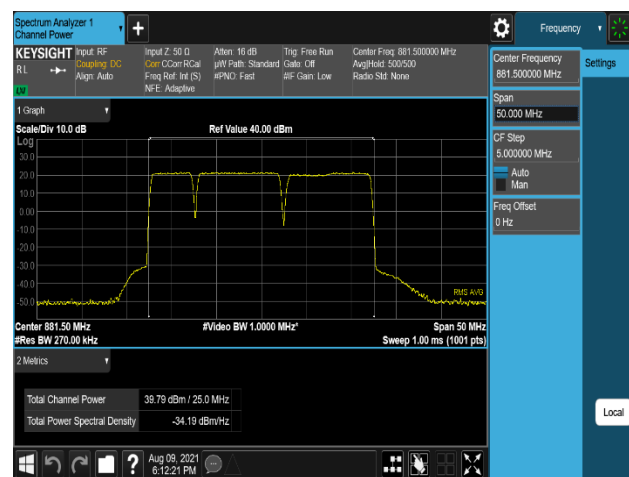
Plot 7-262. Conducted Average Output Power Plot (DSS_B5_10M+10M+5M_3C_QPSK - Port 0)



Plot 7-263. Conducted Average Output Power Plot (DSS_B5_10M+10M+5M_3C_QPSK - Port 1)



Plot 7-264. Conducted Average Output Power Plot (DSS_B5_10M+10M+5M_3C_QPSK - Port 2)



Plot 7-265. Conducted Average Output Power Plot (DSS_B5_10M+10M+5M_3C_QPSK - Port 3)

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 91 of 225

7.4 Peak To Average Power Ratio (PAPR)

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 v03r01 – Section 5.7

ANSI C63.26-2015 – Section 5.2.3.4

Test Setting

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The spectrum analyzer setting were as follows:

1. The signal analyzer's CCDF function is enabled.
2. Frequency = carrier center frequency
3. Measurement BW $\geq$ OBW or specified reference bandwidth
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.

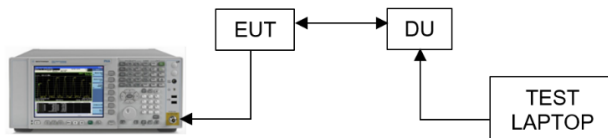


Figure 7-4. Test Instrument & Measurement Setup

Limit

The peak-to-average power ratio (PAPR) limit shall not exceed 13 dB for more than 0.1% of the time.

Test Notes

1. All ports and test channels were tested and only the worst case data were reported.
2. The port with highest PAPR i.e. worst case port per modulation has been highlighted in the following PAPR tables.
3. The peak to average ratio measurement is performed at the conducted ports of the EUT for single RAT mode.

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 92 of 225

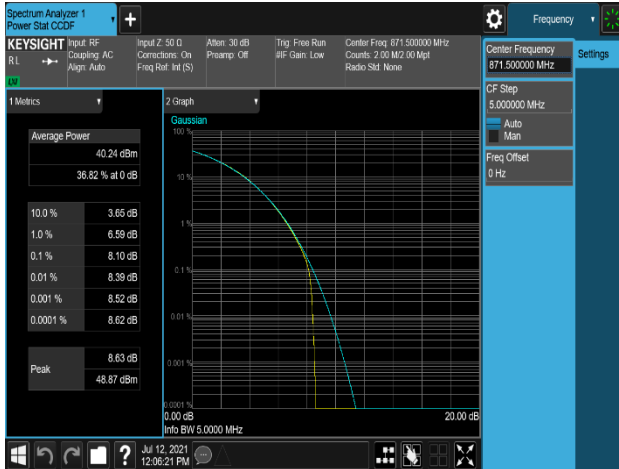
Channel	Port	PAPR (dB)				Limit (dB)
		QPSK	16QAM	64QAM	256QAM	
Low	0	8.05	8.07	8.07	8.10	< 13
	1	8.06	8.05	8.05	8.10	< 13
	2	8.07	8.05	8.06	8.10	< 13
	3	8.07	8.07	8.04	8.08	< 13
Middle	0	8.18	8.06	8.07	8.14	< 13
	1	8.09	8.03	8.04	8.10	< 13
	2	8.09	8.06	8.08	8.10	< 13
	3	8.09	8.10	8.07	8.09	< 13
High	0	8.11	8.08	8.05	8.09	< 13
	1	8.11	8.08	8.06	8.10	< 13
	2	8.11	8.05	8.06	8.10	< 13
	3	8.08	8.08	8.07	8.10	< 13

Table 7-56. Peak To Average Power Ratio Summary Data (LTE_B5_5M_1C)

Channel	Port	PAPR (dB)				Limit (dB)
		QPSK	16QAM	64QAM	256QAM	
Low	0	8.06	8.04	8.08	8.16	< 13
	1	8.06	8.03	8.09	8.12	< 13
	2	8.09	8.04	8.10	8.10	< 13
	3	8.05	8.07	8.10	8.08	< 13
Middle	0	8.16	8.08	8.12	8.28	< 13
	1	8.11	8.05	8.11	8.13	< 13
	2	8.14	8.06	8.10	8.22	< 13
	3	8.11	8.10	8.08	8.13	< 13
High	0	8.11	8.06	8.10	8.14	< 13
	1	8.09	8.07	8.10	8.09	< 13
	2	8.11	8.06	8.11	8.12	< 13
	3	8.10	8.07	8.11	8.13	< 13

Table 7-57. Peak To Average Power Ratio Summary Data (LTE_B5_10M_1C)

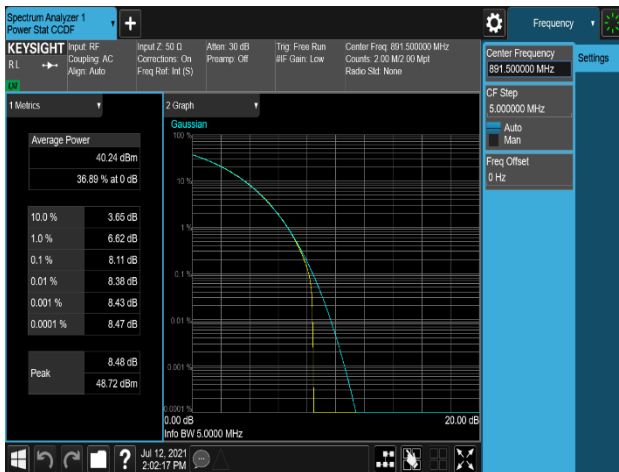
FCC ID: A3LRF4442D-13A	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 93 of 225



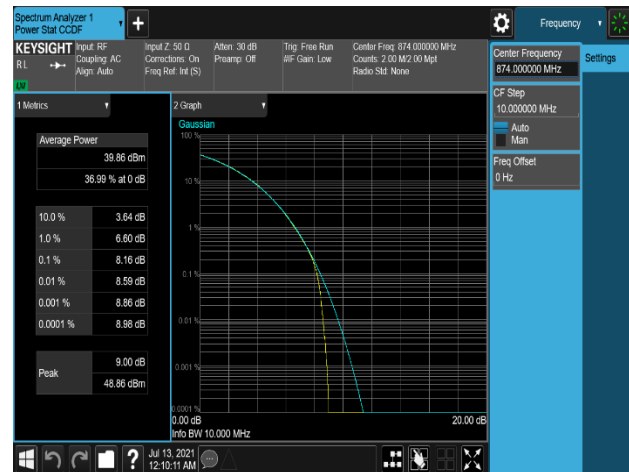
Plot 7-266. Peak To Average Power Radio Plot
(LTE_B5_5M_1C_256QAM - Low Channel, Port 0)



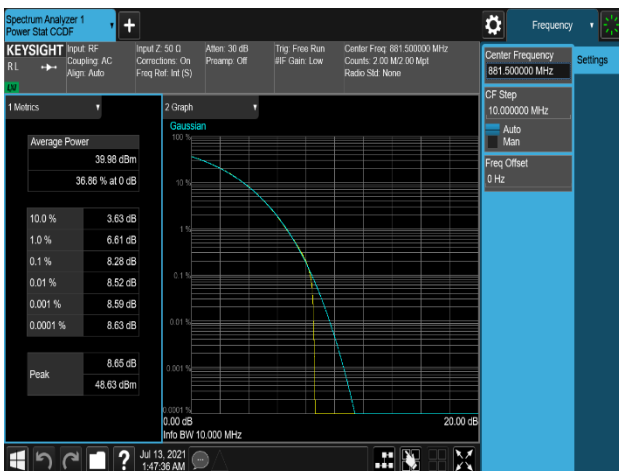
Plot 7-267. Peak To Average Power Radio Plot
(LTE_B5_5M_1C_QPSK - Mid Channel, Port 0)



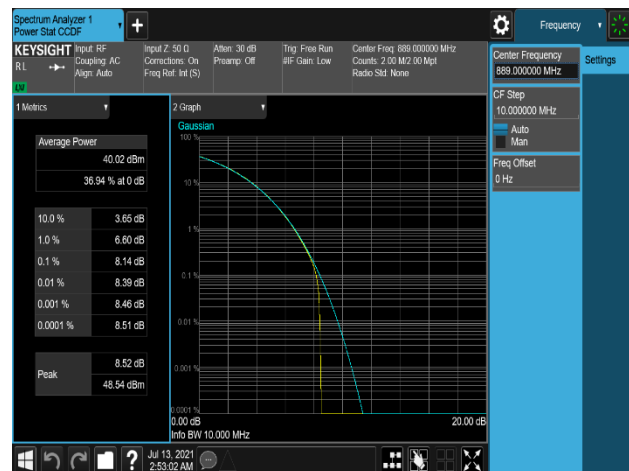
Plot 7-268. Peak To Average Power Radio Plot
(LTE_B5_5M_1C_QPSK - High Channel, Port 0)



Plot 7-269. Peak To Average Power Radio Plot
(LTE_B5_10M_1C_256QAM - Low Channel, Port 0)



Plot 7-270. Peak To Average Power Radio Plot
(LTE_B5_10M_1C_256QAM - Mid Channel, Port 0)



Plot 7-271. Peak To Average Power Radio Plot
(LTE_B5_10M_1C_256QAM - High Channel, Port 0)

FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 94 of 225

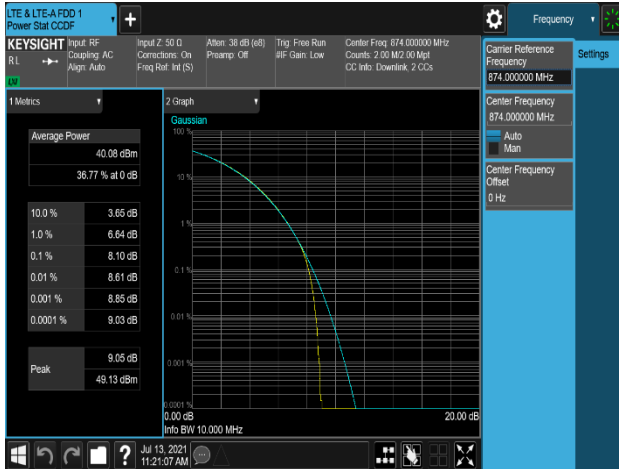
Channel	Port	PAPR (dB)				Limit (dB)
		QPSK	16QAM	64QAM	256QAM	
Low	0	8.08	8.07	8.10	8.06	< 13
	1	8.09	8.05	8.09	8.04	< 13
	2	8.10	8.06	8.07	8.05	< 13
	3	8.07	8.08	8.10	8.05	< 13
Middle	0	8.17	8.15	8.17	8.11	< 13
	1	8.14	8.11	8.13	8.07	< 13
	2	8.13	8.11	8.12	8.06	< 13
	3	8.12	8.10	8.12	8.06	< 13
High	0	8.16	8.11	8.13	8.09	< 13
	1	8.16	8.10	8.12	8.09	< 13
	2	8.11	8.10	8.13	8.09	< 13
	3	8.14	8.11	8.13	8.09	< 13

Table 7-58. Peak To Average Power Ratio Summary Data (LTE_B5_5M+5M_2C)

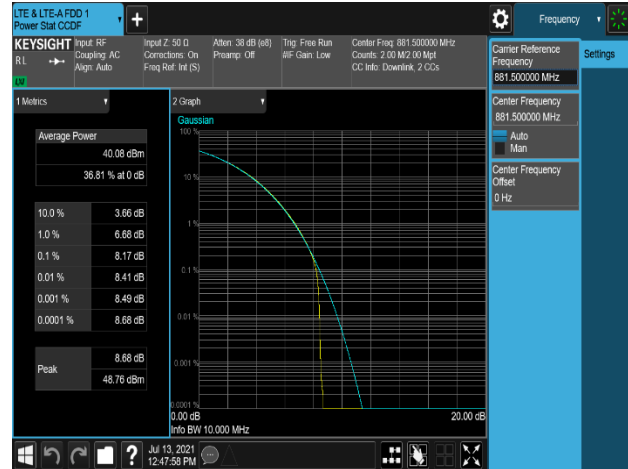
Channel	Port	PAPR (dB)				Limit (dB)
		QPSK	16QAM	64QAM	256QAM	
Low	0	8.09	8.09	8.10	8.14	< 13
	1	8.07	8.05	8.09	8.09	< 13
	2	8.15	8.10	8.09	8.12	< 13
	3	8.13	8.06	8.09	8.12	< 13
Middle	0	8.09	8.05	8.09	8.10	< 13
	1	8.05	8.05	8.08	8.09	< 13
	2	8.14	8.07	8.07	8.10	< 13
	3	8.12	8.05	8.07	8.09	< 13
High	0	8.15	8.10	8.11	8.15	< 13
	1	8.10	8.09	8.10	8.10	< 13
	2	8.13	8.12	8.12	8.11	< 13
	3	8.13	8.09	8.11	8.10	< 13

Table 7-59. Peak To Average Power Ratio Summary Data (LTE_B5_10M+10M_2C)

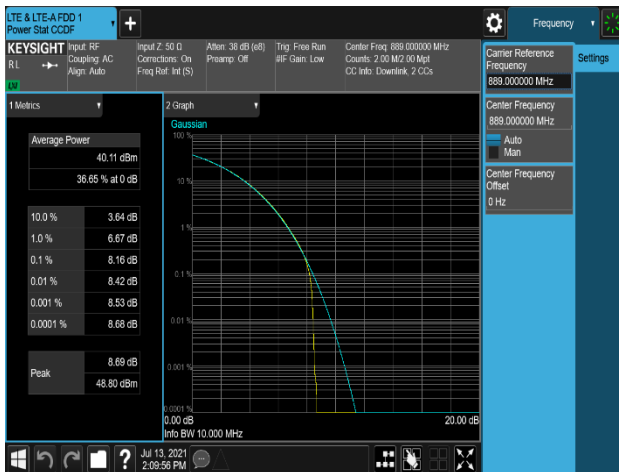
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 95 of 225



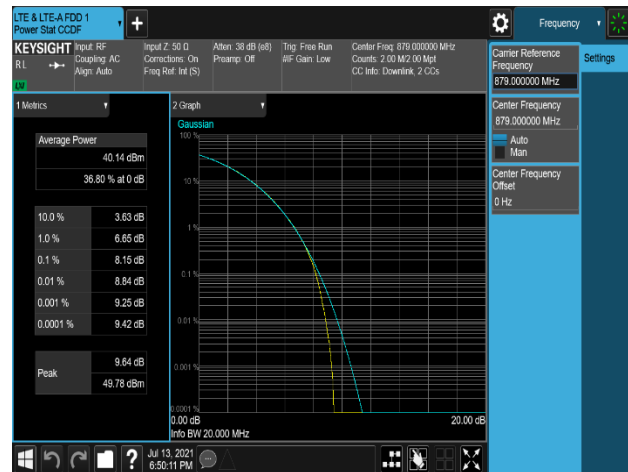
Plot 7-272. Peak To Average Power Ratio Plot
(LTE_B5_5M+5M_2C_QPSK - Low Channel, Port 2)



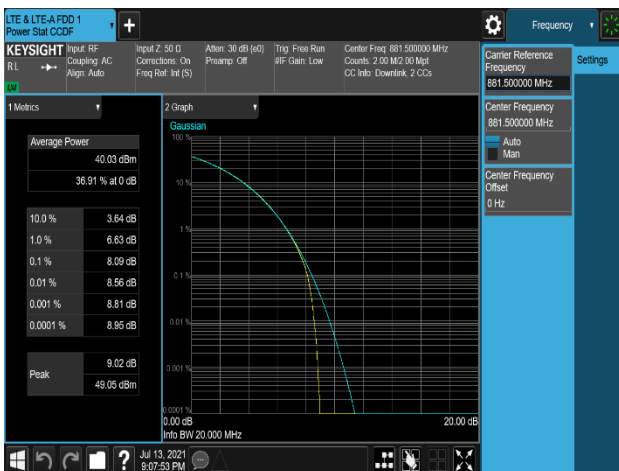
Plot 7-273. Peak To Average Power Ratio Plot
(LTE_B5_5M+5M_2C_QPSK - Mid Channel, Port 0)



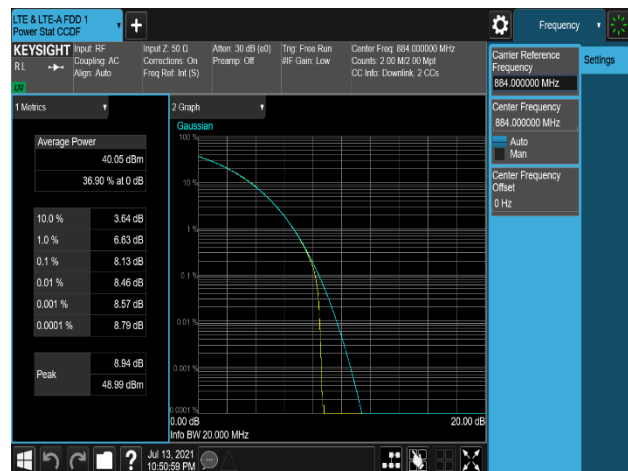
Plot 7-274. Peak To Average Power Ratio Plot
(LTE_B5_5M+5M_2C_QPSK - High Channel, Port 0)



Plot 7-275. Peak To Average Power Ratio Plot
(LTE_B5_10M+10M_2C_QPSK - Low Channel, Port 2)



Plot 7-276. Peak To Average Power Ratio Plot
(LTE_B5_10M+10M_2C_QPSK - Mid Channel, Port 2)

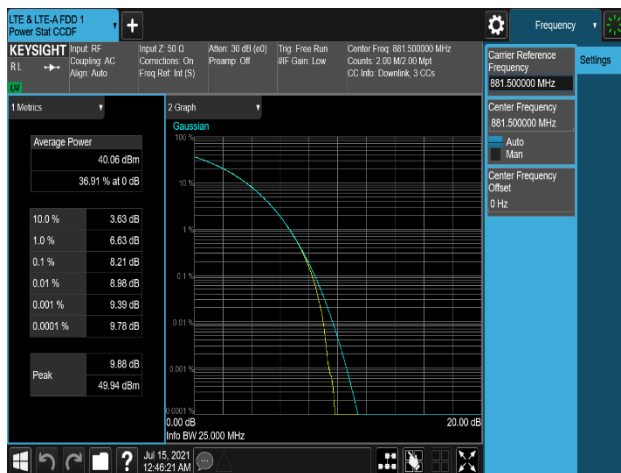


Plot 7-277. Peak To Average Power Ratio Plot
(LTE_B5_10M+10M_2C_QPSK - High Channel, Port 0)

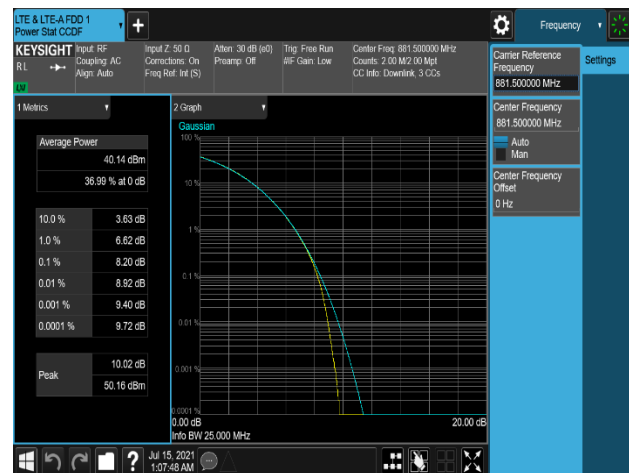
FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 96 of 225

Channel	Port	PAPR (dB)				Limit (dB)
		QPSK	16QAM	64QAM	256QAM	
Middle	0	8.20	8.19	8.19	8.24	< 13
	1	8.21	8.18	8.20	8.21	< 13
	2	8.20	8.20	8.19	8.25	< 13
	3	8.17	8.20	8.19	8.25	< 13

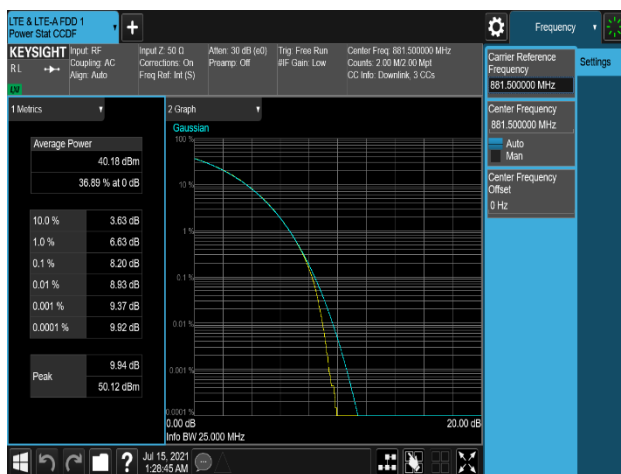
Table 7-60. Peak To Average Power Radio Summary Data (LTE_B5_5M+10M+10M_3C)



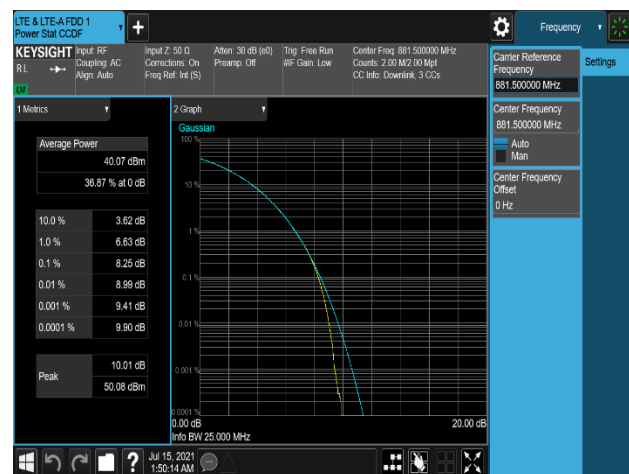
Plot 7-278. Peak To Average Power Radio Plot (LTE_B5_5M+10M+10M_3C_QPSK - Low Channel, Port 1)



Plot 7-279. Peak To Average Power Radio Plot (LTE_B5_5M+10M+10M_3C_16QAM - Low Channel, Port 2)



Plot 7-280. Peak To Average Power Radio Plot (LTE_B5_5M+10M+10M_3C_64QAM - Low Channel, Port 1)



Plot 7-281. Peak To Average Power Radio Plot (LTE_B5_5M+10M+10M_3C_256QAM - Low Channel, Port 2)

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 97 of 225

DSS Ratio	Channel	Port	PAPR (dB)				Limit (dB)
			QPSK	16QAM	64QAM	256QAM	
LTE 9 : NR 1	Low	0	8.16	8.13	8.11	8.12	< 13
		1	8.14	8.12	8.10	8.11	< 13
		2	8.12	8.14	8.11	8.11	< 13
		3	8.13	8.15	8.08	8.10	< 13
	Middle	0	8.18	8.17	8.17	8.16	< 13
		1	8.15	8.18	8.14	8.15	< 13
		2	8.19	8.16	8.11	8.16	< 13
		3	8.17	8.14	8.12	8.17	< 13
	High	0	8.17	8.16	8.13	8.15	< 13
		1	8.16	8.16	8.17	8.15	< 13
		2	8.18	8.19	8.13	8.14	< 13
		3	8.18	8.14	8.14	8.15	< 13
LTE 8 : NR 2	Low	0	8.14	8.13	8.10	8.14	< 13
		1	8.15	8.16	8.08	8.15	< 13
		2	8.21	8.19	8.10	8.15	< 13
		3	8.20	8.14	8.12	8.13	< 13
	Middle	0	8.17	8.17	8.20	8.18	< 13
		1	8.17	8.17	8.14	8.18	< 13
		2	8.17	8.17	8.14	8.18	< 13
		3	8.16	8.17	8.13	8.16	< 13
	High	0	8.20	8.17	8.13	8.18	< 13
		1	8.17	8.19	8.14	8.16	< 13
		2	8.19	8.20	8.16	8.18	< 13
		3	8.19	8.17	8.14	8.19	< 13
LTE 7 : NR 3	Low	0	8.19	8.12	8.17	8.19	< 13
		1	8.18	8.15	8.19	8.20	< 13
		2	8.17	8.16	8.19	8.18	< 13
		3	8.14	8.14	8.17	8.19	< 13
	Middle	0	8.21	8.19	8.13	8.23	< 13
		1	8.21	8.21	8.14	8.23	< 13
		2	8.22	8.21	8.17	8.23	< 13
		3	8.19	8.23	8.15	8.22	< 13
	High	0	8.19	8.19	8.19	8.23	< 13
		1	8.19	8.19	8.18	8.20	< 13
		2	8.22	8.22	8.16	8.23	< 13
		3	8.17	8.18	8.15	8.25	< 13
LTE 6 : NR 4	Low	0	8.23	8.19	8.18	8.15	< 13
		1	8.19	8.19	8.15	8.21	< 13
		2	8.18	8.19	8.18	8.22	< 13
		3	8.16	8.21	8.17	8.18	< 13
	Middle	0	8.20	8.26	8.11	8.19	< 13
		1	8.17	8.26	8.12	8.20	< 13
		2	8.18	8.25	8.11	8.21	< 13
		3	8.17	8.24	8.13	8.19	< 13
	High	0	8.22	8.22	8.19	8.22	< 13
		1	8.17	8.20	8.23	8.26	< 13
		2	8.22	8.24	8.19	8.24	< 13
		3	8.18	8.20	8.16	8.21	< 13

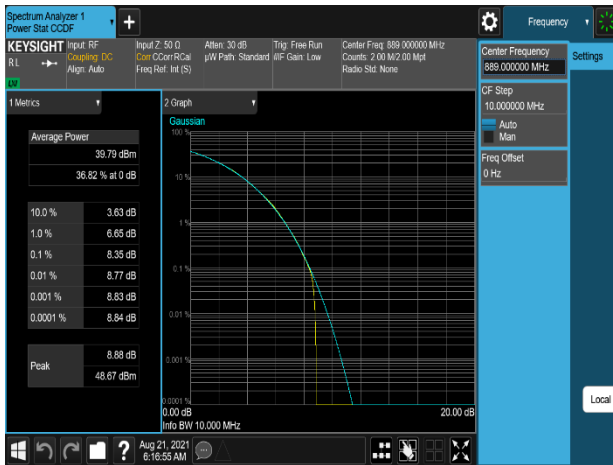
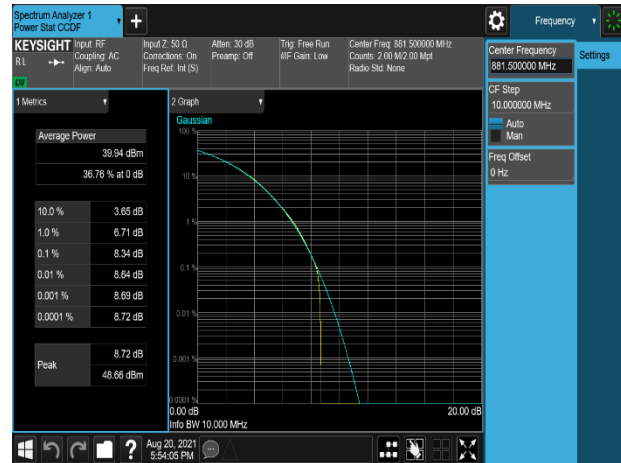
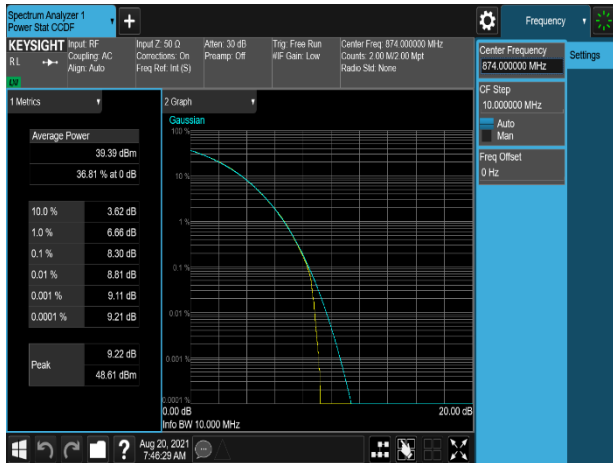
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 98 of 225

LTE 5 : NR 5	Low	0	8.21	8.27	8.13	8.24	< 13
		1	8.17	8.20	8.15	8.26	< 13
		2	8.21	8.24	8.10	8.22	< 13
		3	8.18	8.22	8.14	8.26	< 13
	Middle	0	8.25	8.22	8.28	8.28	< 13
		1	8.18	8.28	8.28	8.28	< 13
		2	8.19	8.28	8.26	8.27	< 13
		3	8.22	8.25	8.22	8.19	< 13
	High	0	8.23	8.21	8.24	8.27	< 13
		1	8.22	8.23	8.14	8.27	< 13
		2	8.24	8.26	8.18	8.25	< 13
		3	8.21	8.22	8.22	8.23	< 13
LTE 4 : NR 6	Low	0	8.30	8.25	8.10	8.21	< 13
		1	8.25	8.27	8.14	8.26	< 13
		2	8.25	8.26	8.17	8.26	< 13
		3	8.24	8.22	8.12	8.24	< 13
	Middle	0	8.25	8.31	8.22	8.33	< 13
		1	8.24	8.28	8.24	8.31	< 13
		2	8.26	8.28	8.26	8.26	< 13
		3	8.28	8.27	8.22	8.23	< 13
	High	0	8.27	8.22	8.16	8.23	< 13
		1	8.24	8.27	8.23	8.25	< 13
		2	8.23	8.28	8.24	8.29	< 13
		3	8.22	8.24	8.24	8.26	< 13
LTE 7 : NR 3	Low	0	8.24	8.31	8.23	8.27	< 13
		1	8.22	8.30	8.23	8.18	< 13
		2	8.25	8.27	8.19	8.26	< 13
		3	8.25	8.25	8.12	8.21	< 13
	Middle	0	8.26	8.30	8.18	8.34	< 13
		1	8.27	8.32	8.15	8.32	< 13
		2	8.27	8.30	8.12	8.32	< 13
		3	8.26	8.26	8.17	8.29	< 13
	High	0	8.25	8.28	8.19	8.23	< 13
		1	8.24	8.27	8.22	8.26	< 13
		2	8.20	8.25	8.24	8.27	< 13
		3	8.23	8.25	8.24	8.27	< 13
LTE 2 : NR 8	Low	0	8.27	8.29	8.11	8.26	< 13
		1	8.27	8.27	8.16	8.26	< 13
		2	8.30	8.27	8.22	8.29	< 13
		3	8.28	8.29	8.25	8.30	< 13
	Middle	0	8.23	8.34	8.27	8.31	< 13
		1	8.26	8.28	8.26	8.25	< 13
		2	8.29	8.30	8.24	8.27	< 13
		3	8.27	8.27	8.16	8.31	< 13
	High	0	8.27	8.30	8.16	8.26	< 13
		1	8.28	8.29	8.21	8.34	< 13
		2	8.30	8.29	8.24	8.33	< 13
		3	8.28	8.26	8.26	8.35	< 13

Table 7-61. Peak To Average Power Ratio Summary Data (DSS_B5_10M_1C)

Note: Test result is no big difference depending on DSS Ratio. So, the only worst-ratio plots are included in this report.

FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 99 of 225



FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 100 of 225

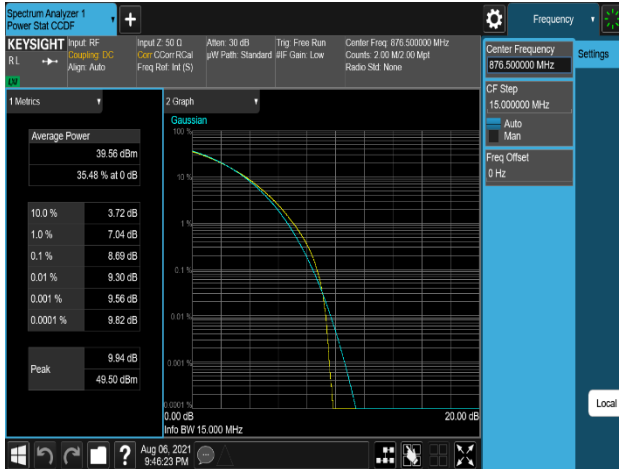
DSS Ratio	Channel	Port	PAPR (dB)				Limit (dB)
			QPSK	16QAM	64QAM	256QAM	
LTE 5 : NR 5	Low	0	8.64	8.41	8.49	8.56	< 13
		1	8.48	8.52	8.47	8.49	< 13
		2	8.66	8.41	8.45	8.53	< 13
		3	8.62	8.62	8.69	8.63	< 13
	Middle	0	8.46	8.52	8.51	8.46	< 13
		1	8.45	8.42	8.49	8.41	< 13
		2	8.42	8.64	8.44	8.43	< 13
		3	8.63	8.60	8.64	8.63	< 13
	High	0	8.45	8.58	8.47	8.50	< 13
		1	8.43	8.43	8.46	8.46	< 13
		2	8.40	8.49	8.44	8.45	< 13
		3	8.68	8.65	8.67	8.61	< 13

Table 7-62. Peak To Average Power Ratio Summary Data (DSS_B5_10M+5M_2C)

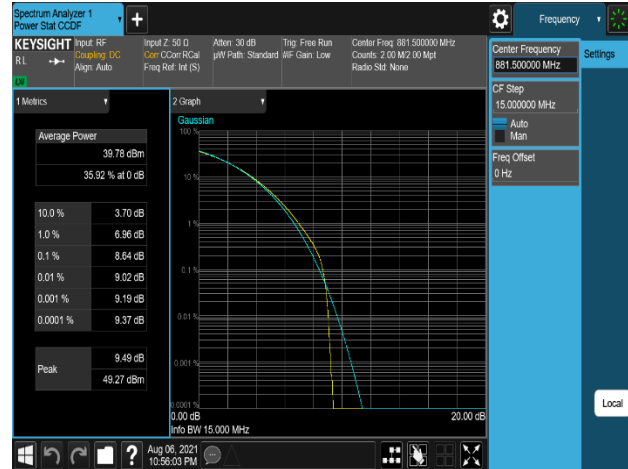
DSS Ratio	Channel	Port	PAPR (dB)				Limit (dB)
			QPSK	16QAM	64QAM	256QAM	
LTE 5 : NR 5	Low	0	8.34	8.34	8.37	8.39	< 13
		1	8.33	8.32	8.33	8.38	< 13
		2	8.34	8.35	8.33	8.36	< 13
		3	8.49	8.47	8.45	8.48	< 13
	Middle	0	8.33	8.34	8.35	8.41	< 13
		1	8.27	8.34	8.36	8.43	< 13
		2	8.39	8.25	8.32	8.36	< 13
		3	8.45	8.38	8.50	8.48	< 13
	High	0	8.35	8.36	8.36	8.36	< 13
		1	8.32	8.34	8.32	8.36	< 13
		2	8.38	8.34	8.34	8.40	< 13
		3	8.50	8.45	8.51	8.52	< 13

Table 7-63. Peak To Average Power Ratio Summary Data (DSS_B5_10M+10M_2C)

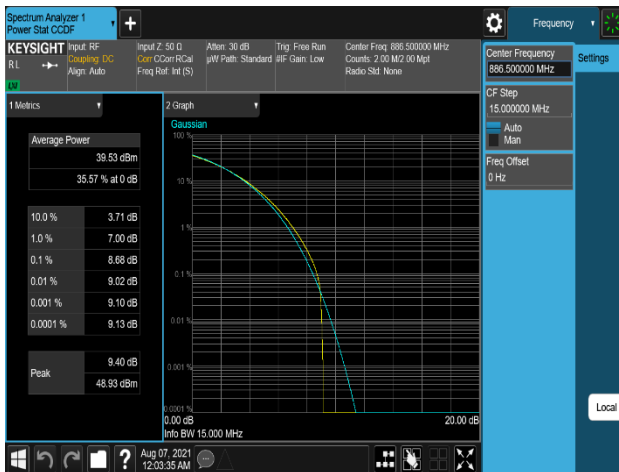
FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 101 of 225	



Plot 7-285. Peak To Average Power Radio Plot
(DSS_B5_10M+5M_2C_64QAM - Low Channel, Port 3)



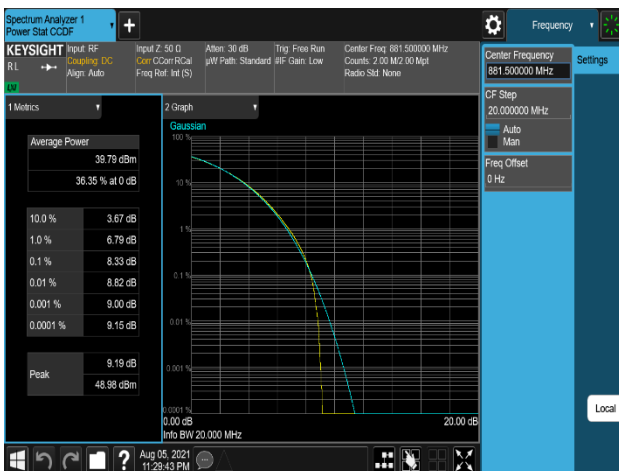
Plot 7-286. Peak To Average Power Radio Plot
(DSS_B5_10M+5M_2C_16QAM - Mid Channel, Port 2)



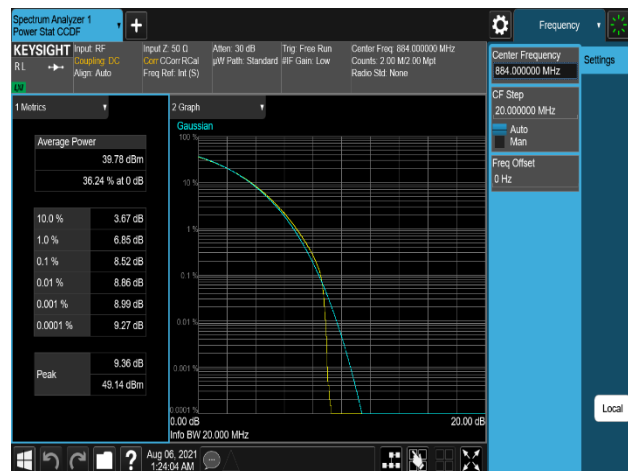
Plot 7-287. Peak To Average Power Radio Plot
(DSS_B5_10M+5M_2C_QPSK - High Channel, Port 3)



Plot 7-288. Peak To Average Power Radio Plot
(DSS_B5_10M+10M_2C_QPSK - Low Channel, Port 3)



Plot 7-289. Peak To Average Power Radio Plot
(DSS_B5_10M+10M_2C_64QAM - Mid Channel, Port 2)

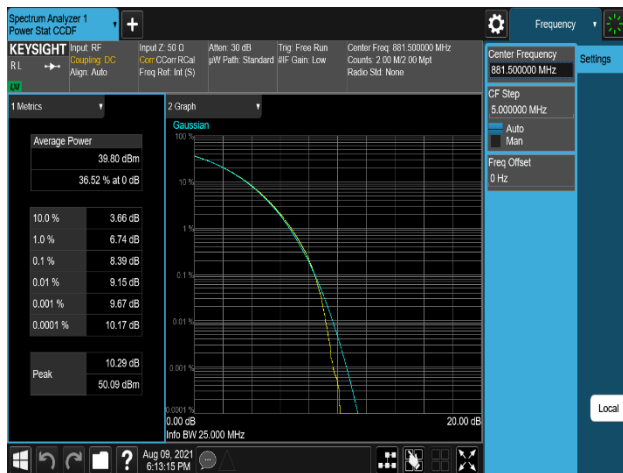


Plot 7-290. Peak To Average Power Radio Plot
(DSS_B5_10M+10M_2C_256QAM - High Channel, Port 3)

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 102 of 225

DSS Ratio	Channel	Port	PAPR (dB)				Limit (dB)
			QPSK	16QAM	64QAM	256QAM	
LTE 5 : NR 5	Middle	0	8.27	8.31	8.26	8.29	< 13
		1	8.29	8.29	8.31	8.31	< 13
		2	8.28	8.27	8.28	8.30	< 13
		3	8.39	8.42	8.38	8.46	< 13

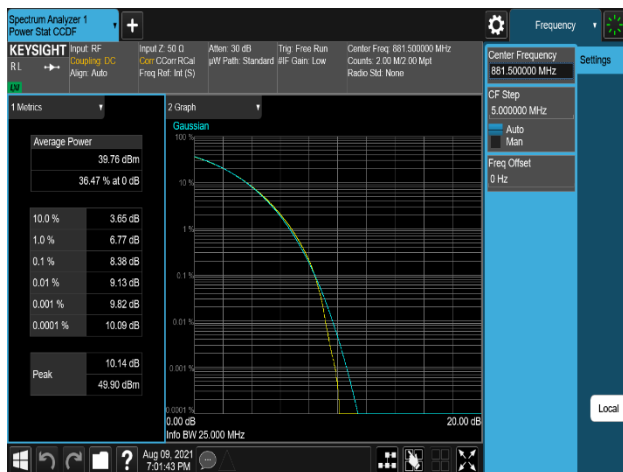
Table 7-64. Peak To Average Power Ratio Summary Data (DSS_B5_10M+10M+5M_3C)



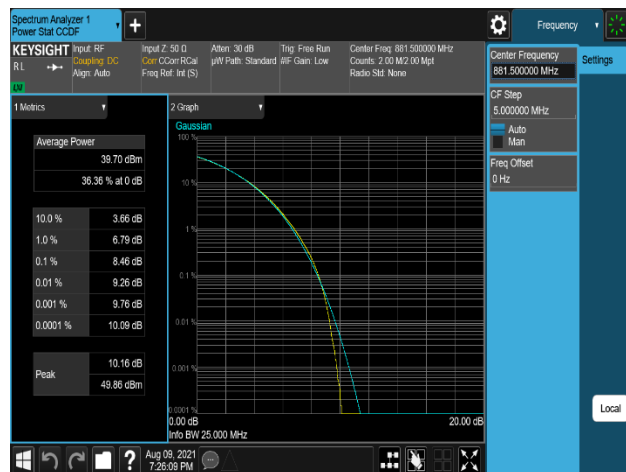
Plot 7-291. Peak To Average Power Ratio Plot (DSS_B5_10M+10M+5M_3C_QPSK - Port 3)



Plot 7-292. Peak To Average Power Ratio Plot (DSS_B5_10M+10M+5M_3C_16QAM - Port 3)



Plot 7-293. Peak To Average Power Ratio Plot (DSS_B5_10M+10M+5M_3C_64QAM - Port 3)



Plot 7-294. Peak To Average Power Ratio Plot (DSS_B5_10M+10M+5M_3C_256QAM - Port 3)

FCC ID: A3LRF4442D-13A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 103 of 225

7.5 Band Edge Emissions at Antenna Terminal

\$2.1051, \$22.917, \$27.53(c)

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.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6

KDB 662911 D01 v02r01 – Section E)3) Out-of-Band and Spurious Emission Measurements

a) Absolute Emission Limits

iii) Measure and add $10 \log(N_{ANT})$ dB

ANSI C63.26-2015 – Section 5.7

Test Setting

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: Please see test notes below.
4. VBW $\geq 3 \times$ RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times$ Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limit

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

The power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per KDB 662911 D01 v02r01 - section E)3) because the EUT operate as a 4 port MIMO transmitter.

FCC ID: A3LRF4442D-13A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 8K21070502R3.A3L	Test Dates: 07/09/2021 - 08/26/2021	EUT Type: RRU (RF4442d)		Page 104 of 225