CERTIFICATION TEST REPORT

Report Number. : 4790047184-E3V1

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	NP545XLA
FCC ID	:	A3LNP545XLA1
EUT Description	:	WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax
Test Standard(s)	:	FCC CFR47 PART 27 SUBPART M

Date Of Issue:
2021-09-06

Prepared by:
UL Korea, Ltd.
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Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2021-09-06	Initial issue	SunGeun Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax
MODEL NUMBER:	NP545XLA
SERIAL NUMBER:	GE5J930R700055E (CONDUCTED) GE5J930R700048X (RADIATED)
DATE TESTED:	2021-08-23 ~ 2021-08-27;

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 27M	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Sungeun Lee
Suwon Lab Engineer
UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 27.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01
6. KDB 412172 D01 Determining ERP and EIRP v01r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☒ Chamber 2
☐ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna)

(Path loss = Signal generator output – PSA reading with substitution antenna)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.01 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 dB
Radiated Disturbance, Above 18 GHz	5.49 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax.
This test report addresses the WWAN operational mode.

5.2. MAXIMUM OUTPUT POWER AND EIRP

The transmitter has a maximum average radiated EIRP output powers as follows:

LTE Band 41C (Uplink CA) PC2

Part 27	
EIRP Limit [dBm]	33.00
Antenna Gain [dBi]	3.86

Frequency Range [MHz]	Bandwidth [MHz]	Modulation	Output Power			Margin
			Conducted Average Power [dBm]	e.i.r.p. Average Power		
				dBm	mW	
2496 ~ 2690	5 + 20	QPSK	26.45	30.31	1073.99	-2.69
		16QAM	25.05	28.91	778.04	-4.09
	20 + 5	QPSK	26.46	30.32	1076.47	-2.68
		16QAM	25.04	28.90	776.25	-4.10
	10 + 15	QPSK	26.37	30.23	1054.39	-2.77
		16QAM	24.86	28.72	744.73	-4.28
	15 + 10	QPSK	26.24	30.10	1023.29	-2.90
		16QAM	25.15	29.01	796.16	-3.99
	10 + 20	QPSK	26.27	30.13	1030.39	-2.87
		16QAM	24.97	28.83	763.84	-4.17
	20 + 10	**QPSK**	**26.82**	**30.68**	**1169.50**	**-2.32**
		16QAM	25.31	29.17	826.04	-3.83
	15 + 15	QPSK	26.19	30.05	1011.58	-2.95
		16QAM	24.92	28.78	755.09	-4.22
	15 + 20	QPSK	26.27	30.13	1030.39	-2.87
		16QAM	24.89	28.75	749.89	-4.25
	20 + 15	QPSK	26.38	30.24	1056.82	-2.76
		16QAM	25.16	29.02	797.99	-3.98
	20 + 20	QPSK	26.64	30.50	1122.02	-2.50
		16QAM	25.19	29.05	803.53	-3.95

Note. The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results It was found that QPSK and 16QAM results were worst case. Only 16QAM and 64QAM, 256QAM power data are listed.

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the [List the bands supported] with a maximum peak gain as follow:

Frequency [MHz]	Peak Gain [dBi]
LTE Band 41 (PC2) 2496 ~ 2690 MHz	3.86

5.4. WORST-CASE ORIENTATION

For all LTE Bands, the worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, 64QAM and 256QAM modulations. It was found that QPSK and 16QAM results were worst case. All testing was performed using QPSK and 16QAM modulations to represent the worst case. However, the out of band emissions and spurious radiation were only performed on bandwidth and RB offset(with RB size 1) with the highest conducted power in QPSK.

Highest power setting for each bands					
LTE Band	Component Carrier	Frequency [MHz]	Bandwidth [MHz]	RB size	RB offset
41C_PC2 (Uplink CA)	PCC	2670.1	20	1	99
	SCC	2684.5	10	1	0

i. Worst Axis Condition

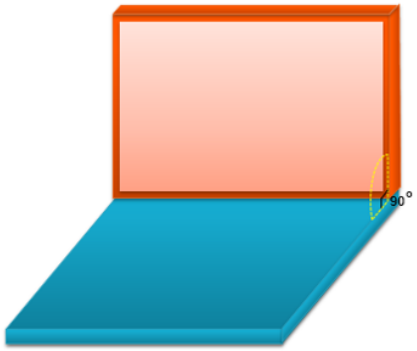
The fundamental and radiated spurious emission were investigated in three orthogonal orientations X and Y, it was determined that below orientation was worst-case orientation for each band.

Band	RSE	
	X	Y
LTE B41C	Laptop	-

i. Foldable Condition

The Fundamental of the EUT was investigated two foldable conditions(Fold, Laptop).

Fold



Laptop(90 degree)

The EUT is continuously communicated with the call box during the tests.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37R32A00XADK3	N/A
Data Cable	SAMSUNG	EP-DW767JWE	N/A	N/A

I/O CABLE

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	C Type	Shielded	1.0 m	N/A

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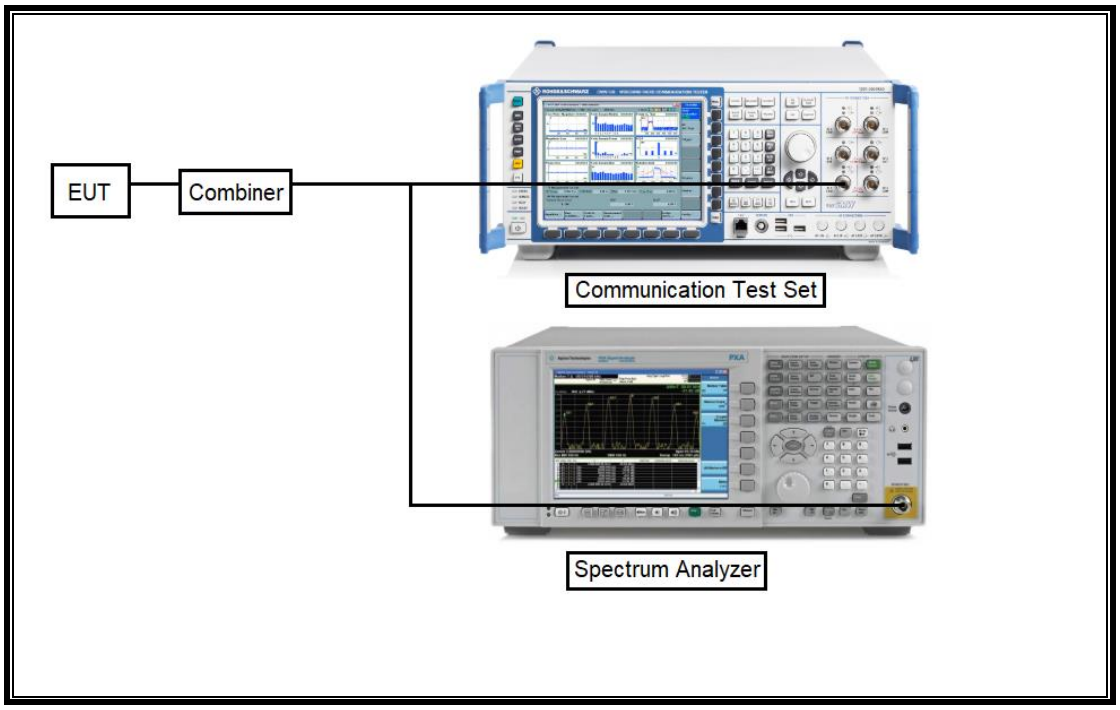
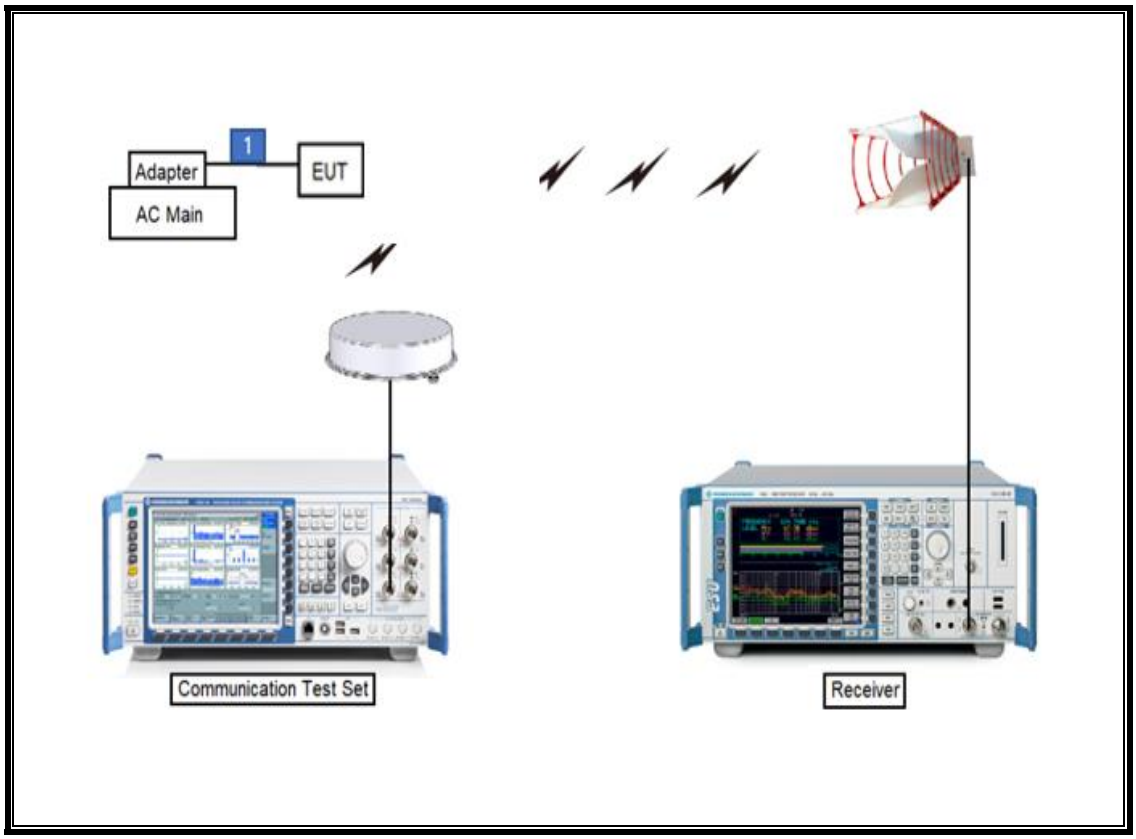
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2023/02/08
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022/08/04
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2021/10/02
Preamplifier	ETS	3116C-PA	00168841	2022/08/04
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2022/08/19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022/08/13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022/08/13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022/07/27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022/08/15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022/07/27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022/08/15
Communications Test Set	R&S	CMW500	169796	2022/01/27
DC Power Supply	Agilent / HP	E3640A	MY54226395	2022/08/02
Preamplifier, 1000 MHz	Sonoma	310N	341282	2022/08/02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022/08/02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022/08/02
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022/08/04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022/08/04
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022/08/02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022/08/02
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2022/08/03
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2022/08/02
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2022/08/03
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2022/08/02
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2022/08/03
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2022/08/02
Attenuator	PASTERNACK	PE7087-10	A009	2022/08/03
Attenuator	PASTERNACK	PE7087-10	A001	2022/08/03
Attenuator	PASTERNACK	PE7087-10	A008	2022/08/03
Attenuator	PASTERNACK	PE7004-10	2	2022/08/02
Attenuator	PASTERNACK	PE7395-10	A011	2022/08/03
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2021/10/02
Temperature Chamber	ESPEC	SH-642	93001109	2022/08/02
Power Splitter	MINI-CIRCUITS	WA1534	UL001	2022/01/27
Power Splitter	MINI-CIRCUITS	WA1534	UL002	2022/01/27

UL Software			
Description	**Manufacturer**	**Model**	**Version**
Antenna port test software	UL	CLT	Ver 3.4
Radiated software	UL	UL EMC	Ver 9.5

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7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth(99%)	N/A	Conducted	Pass
27.53(m)	Conducted Spurious Emission	-25 dBm		Pass
27.53(m)	Emission mask	Section 9.2.2.		Pass
2.1046	Conducted output power	N/A		Pass
27.50(h)(2)	Equivalent Isotropic Radiated Power	33 dBm		Pass
27.53(m)	Radiated Spurious Emission	-25 dBm	Radiated	Pass

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8. LIMITS AND CONDUCTED RESULTS

8.1. RF OUTPUT POWER VERIFICATION (CONDUCTED AND EIRP)

Rule Part(s)

FCC: §2.1046, §27.50

Limit

§27.50(h)
(h) The following power limits shall apply in the BRS and EBS:
(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

TIA-603-E Clause 2.2.17
KDB 971168 Section 5.6

ERP/EIRP = $P_{Meas} + G_T - L_C$
where:
ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);
P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;
G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2

RESULTS

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

OUTPUT POWER FOR LTE BAND 41C (5 MHz + 20 MHz)

Antenna Gain (dBi)	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average Power [dBm] QPSK	Conducted Average Power [dBm] 16QAM
5MHz / 20MHz	2499.3	2511	1	24	1	0	26.41	25.04
			1	0	1	99	17.96	18.00
			25	0	100	0	24.58	23.54
	2583.8	2595.5	1	24	1	0	25.68	24.97
			1	0	1	99	17.88	18.23
			25	0	100	0	24.45	23.46
	2668.3	2680	1	24	1	0	26.45	25.05
			1	0	1	99	18.01	18.15
			25	0	100	0	24.65	23.64

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OUTPUT POWER FOR LTE BAND 41C (20 MHz + 5 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
20MHz / 5MHz	2506	2517.7	1	99	1	0	26.26	25.02
			1	0	1	24	18.08	18.57
			100	0	25	0	24.52	23.51
	2590.5	2602.2	1	99	1	0	25.60	24.59
			1	0	1	24	17.99	18.49
			100	0	25	0	24.26	23.48
	2675	2686.7	1	99	1	0	26.46	25.04
			1	0	1	24	18.11	18.63
			100	0	25	0	24.84	23.83

OUTPUT POWER FOR LTE BAND 41C (10 MHz + 15 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
10MHz / 15MHz	2501.3	2513.3	1	49	1	0	26.08	24.86
			1	0	1	74	18.11	18.12
			50	0	75	0	24.59	23.60
	2585.9	2597.9	1	49	1	0	25.67	24.86
			1	0	1	74	18.01	18.06
			50	0	75	0	24.47	23.50
	2670.5	2682.5	1	49	1	0	26.37	24.75
			1	0	1	74	18.07	18.43
			50	0	75	0	24.71	23.71

OUTPUT POWER FOR LTE BAND 41C (15 MHz + 10 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
15MHz / 10MHz	2503.5	2515.5	1	74	1	0	26.24	24.88
			1	0	1	49	18.10	18.05
			75	0	50	0	24.57	23.60
	2588.1	2600.1	1	74	1	0	25.64	24.86
			1	0	1	49	17.89	18.02
			75	0	50	0	24.40	23.43
	2672.7	2684.7	1	74	1	0	26.01	25.15
			1	0	1	49	18.03	18.25
			75	0	50	0	24.72	23.73

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OUTPUT POWER FOR LTE BAND 41C (10 MHz + 20 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
10MHz / 20MHz	2501.5	2515.9	1	49	1	0	26.06	24.83
			1	0	1	99	18.03	18.10
			50	0	100	0	24.57	23.55
	2583.6	2598	1	49	1	0	25.84	24.82
			1	0	1	99	17.74	18.16
			50	0	100	0	24.38	23.38
	2665.6	2680	1	49	1	0	26.27	24.97
			1	0	1	99	17.90	18.09
			50	0	100	0	24.59	23.57

OUTPUT POWER FOR LTE BAND 41C (20 MHz + 10 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
20MHz / 10MHz	2506	2520.4	1	99	1	0	26.30	24.90
			1	0	1	49	17.81	18.20
			100	0	50	0	24.56	23.56
	2588.1	2602.5	1	99	1	0	25.66	24.79
			1	0	1	49	17.75	17.89
			100	0	50	0	24.37	23.41
	2670.1	2684.5	1	99	1	0	26.82	25.31
			1	0	1	49	17.88	18.14
			100	0	50	0	24.68	23.66

OUTPUT POWER FOR LTE BAND 41C (15 MHz + 15 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
15MHz / 15MHz	2503.5	2518.5	1	74	1	0	26.17	24.76
			1	0	1	74	17.92	17.90
			75	0	75	0	24.56	23.56
	2585.5	2600.5	1	74	1	0	25.75	24.90
			1	0	1	74	17.83	17.99
			75	0	75	0	24.52	23.50
	2667.5	2682.5	1	74	1	0	26.19	24.92
			1	0	1	74	18.01	18.12
			75	0	75	0	24.70	23.67

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OUTPUT POWER FOR LTE BAND 41C (15 MHz + 20 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
15MHz / 20MHz	2503.8	2520.9	1	74	1	0	26.27	24.88
			1	0	1	99	17.92	18.16
			75	0	100	0	24.67	23.67
	2583.3	2600.4	1	74	1	0	25.82	24.77
			1	0	1	99	17.93	17.99
			75	0	100	0	24.44	23.47
	2662.9	2680	1	74	1	0	26.19	24.89
			1	0	1	99	17.89	18.06
			75	0	100	0	24.59	23.62

OUTPUT POWER FOR LTE BAND 41C (20 MHz + 15 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
20MHz / 15MHz	2506	2523.1	1	99	1	0	25.85	24.84
			1	0	1	74	17.91	18.04
			100	0	75	0	24.70	23.71
	2585.6	2602.7	1	99	1	0	25.82	24.54
			1	0	1	74	17.79	18.00
			100	0	75	0	24.48	23.52
	2665.1	2682.2	1	99	1	0	26.38	25.16
			1	0	1	74	17.84	18.03
			100	0	75	0	24.66	23.79

OUTPUT POWER FOR LTE BAND 41C (20 MHz + 20 MHz)

Antenna Gain [dBi]	3.86							
Bandwidth	PCC Frequency [MHz]	SCC1 Frequency [MHz]	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power [dBm]	
			Size	Offset	Size	Offset	QPSK	16QAM
20MHz / 20MHz	2506	2525.8	1	99	1	0	26.64	25.19
			1	0	1	99	17.81	17.93
			100	0	100	0	24.66	23.70
	2583.1	2602.9	1	99	1	0	25.84	24.84
			1	0	1	99	17.80	18.29
			100	0	100	0	24.60	23.63
	2660.2	2680	1	99	1	0	26.21	24.98
			1	0	1	99	18.00	18.28
			100	0	100	0	24.73	23.76

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8.2. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

RESULTS

See the following pages.

- LTE Band 41C_PC2

Frequency Band [MHz]	Bandwidth [MHz]	Modulation	Frequency [MHz]	99% BW [MHz]	-26dB BW [MHz]
2496 ~ 2690	5 + 20	QPSK	2593.0	21.668	23.580
		16QAM	2593.0	21.518	23.510
	20 + 5	QPSK	2593.0	22.517	23.840
		16QAM	2593.0	22.581	23.770
	10 + 15	QPSK	2593.0	22.200	23.950
		16QAM	2593.0	22.230	23.970
	15 + 10	QPSK	2593.0	22.487	24.070
		16QAM	2593.0	22.433	24.040
	10 + 20	QPSK	2593.0	26.628	28.710
		16QAM	2593.0	26.413	28.680
	20 + 10	QPSK	2593.0	27.093	28.820
		16QAM	2593.0	27.188	28.840
	15 + 15	QPSK	2593.0	27.461	29.330
		16QAM	2593.0	27.497	29.440
	15 + 20	QPSK	2593.0	31.317	33.900
		16QAM	2593.0	31.214	33.690
	20 + 15	QPSK	2593.0	31.679	33.950
		16QAM	2593.0	31.632	33.730
	20 + 20	QPSK	2593.0	36.335	38.840
		16QAM	2593.0	36.370	39.070

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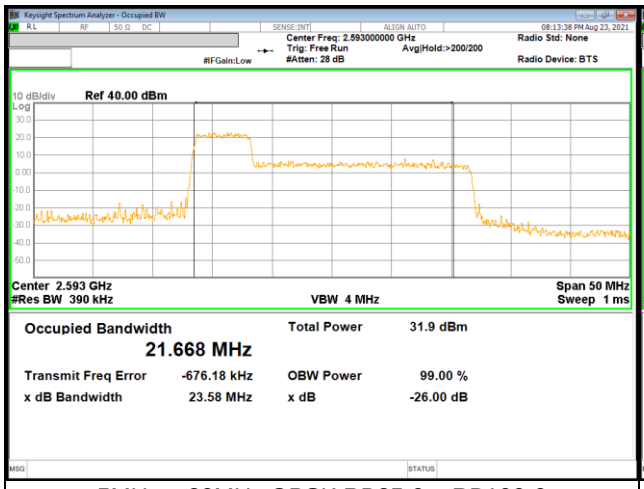
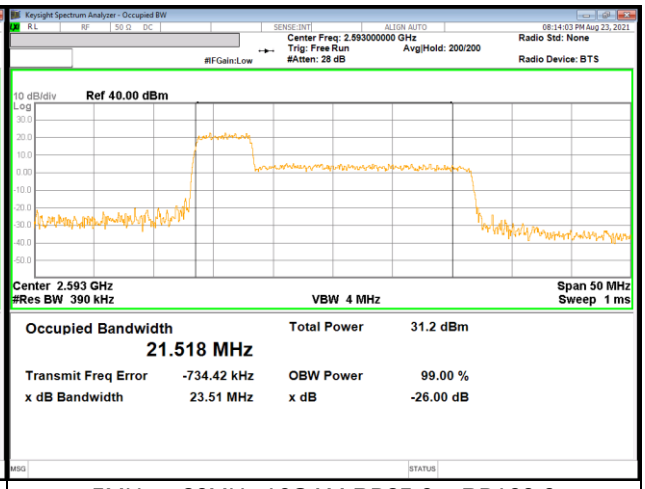
8.2.1. OCCUPIED BANDWIDTH RESULTS

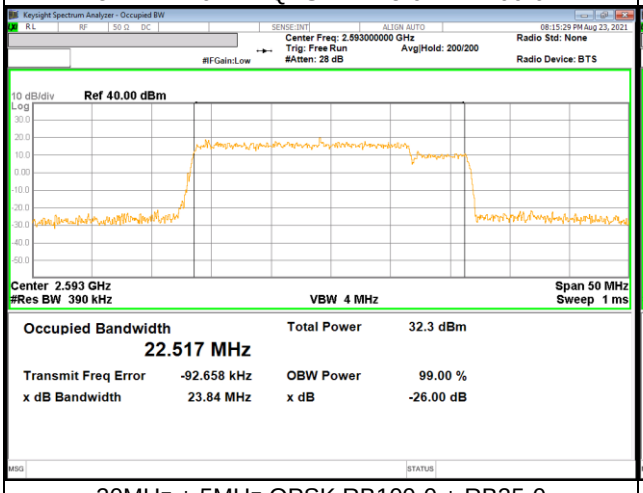
LTE Band 41C (UL CA) PC2



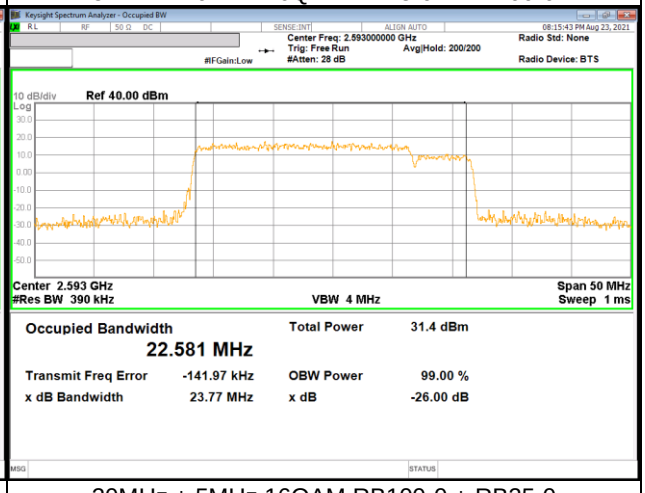
5MHz + 20MHz QPSK RB25-0 + RB100-0



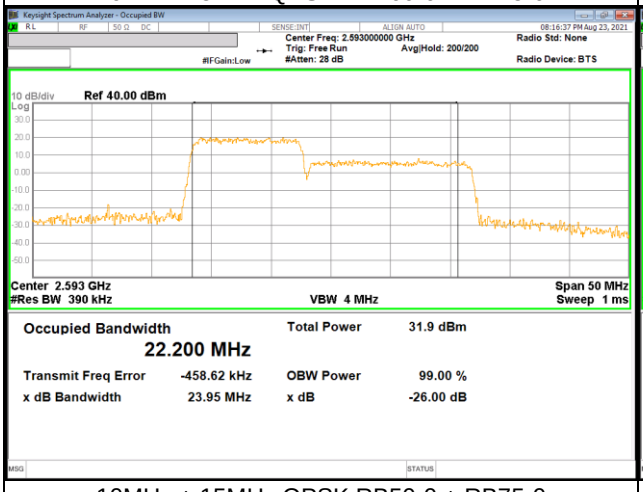
5MHz + 20MHz 16QAM RB25-0 + RB100-0



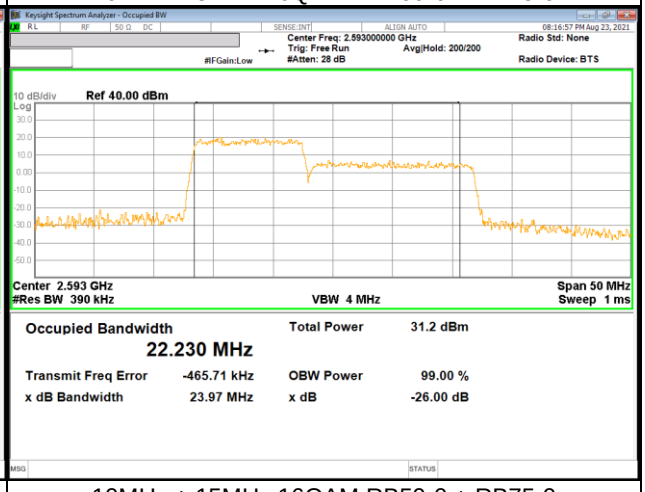
20MHz + 5MHz QPSK RB100-0 + RB25-0



20MHz + 5MHz 16QAM RB100-0 + RB25-0



10MHz + 15MHz QPSK RB50-0 + RB75-0



10MHz + 15MHz 16QAM RB50-0 + RB75-0

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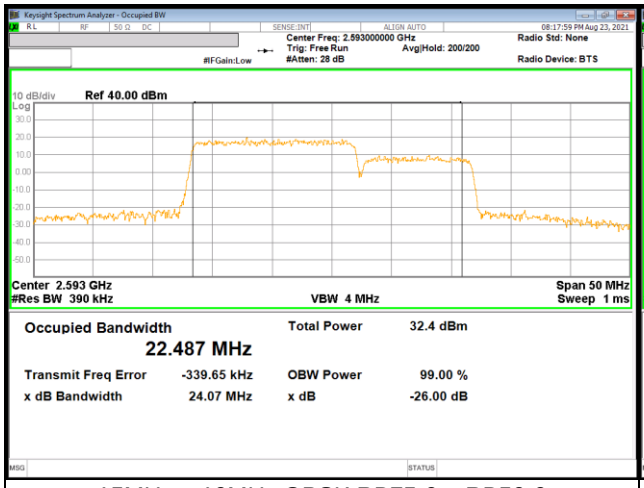
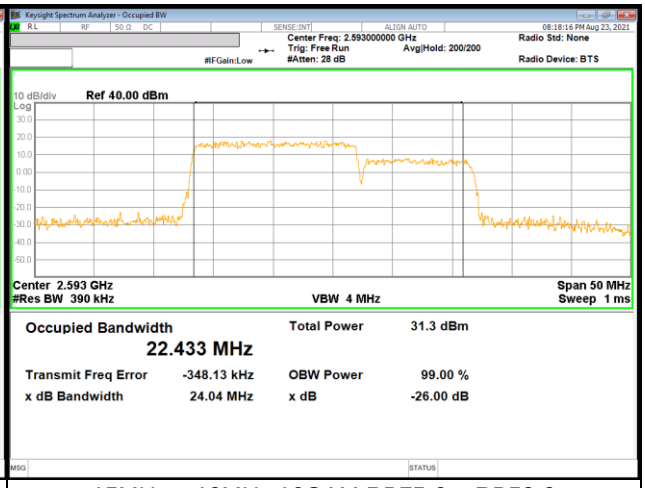
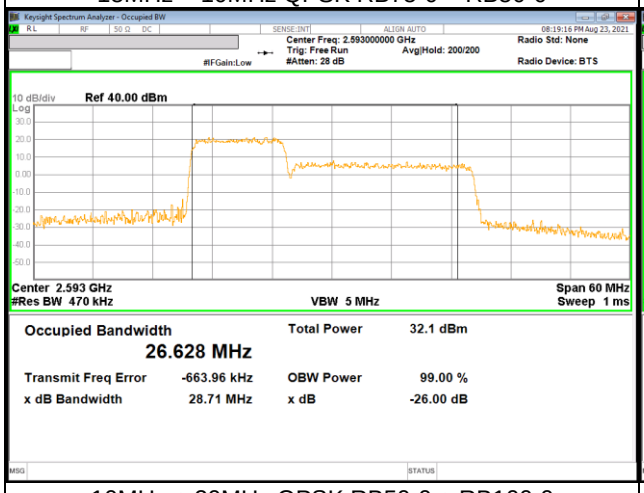


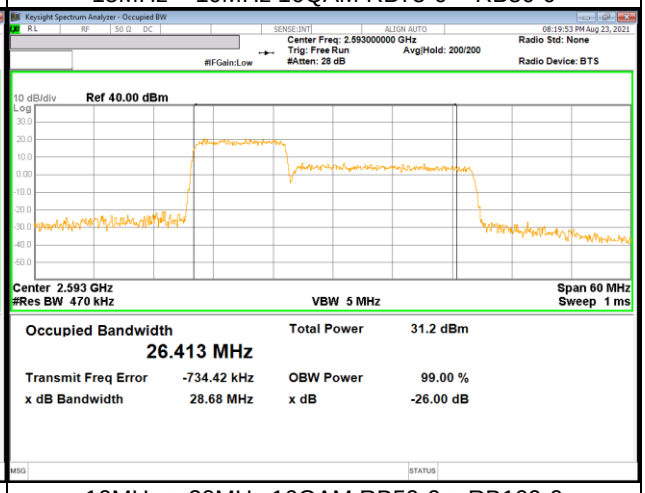
15MHz + 10MHz QPSK RB75-0 + RB50-0



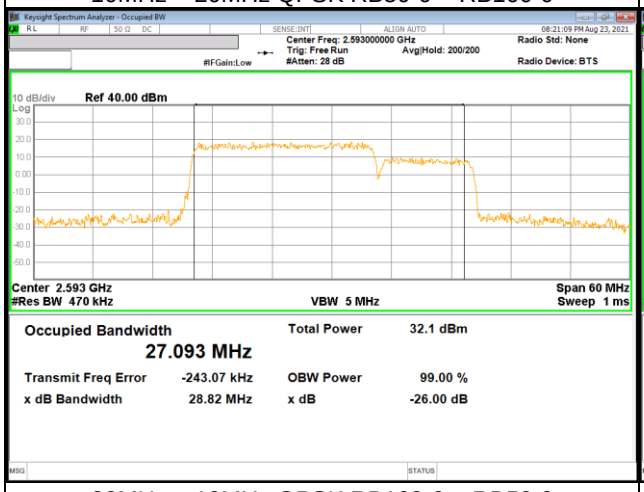
15MHz + 10MHz 16QAM RB75-0 + RB50-0



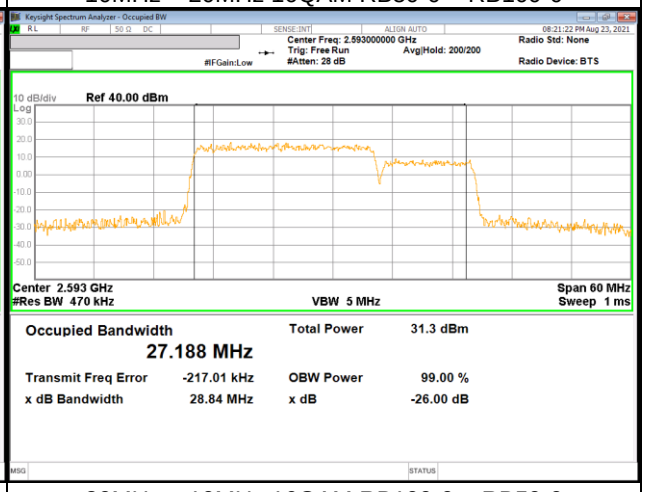
10MHz + 20MHz QPSK RB50-0 + RB100-0



10MHz + 20MHz 16QAM RB50-0 + RB100-0



20MHz + 10MHz QPSK RB100-0 + RB50-0



20MHz + 10MHz 16QAM RB100-0 + RB50-0

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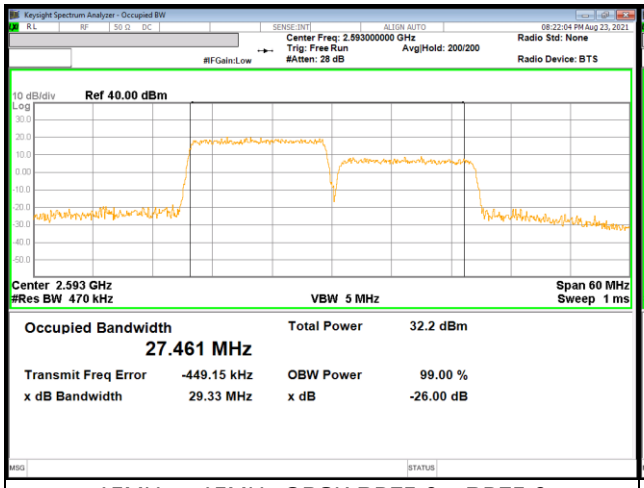
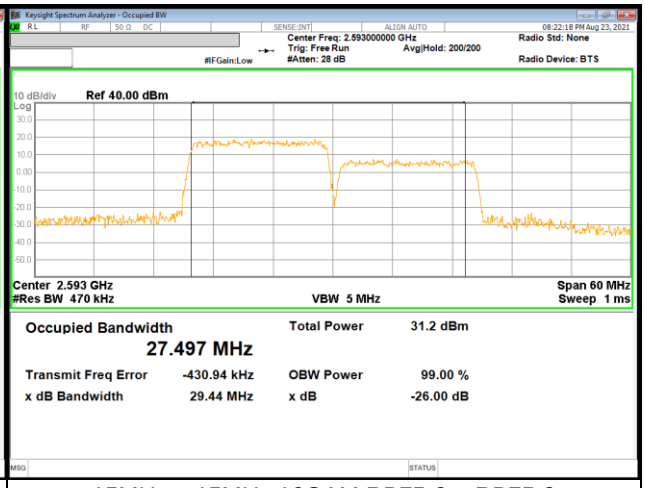
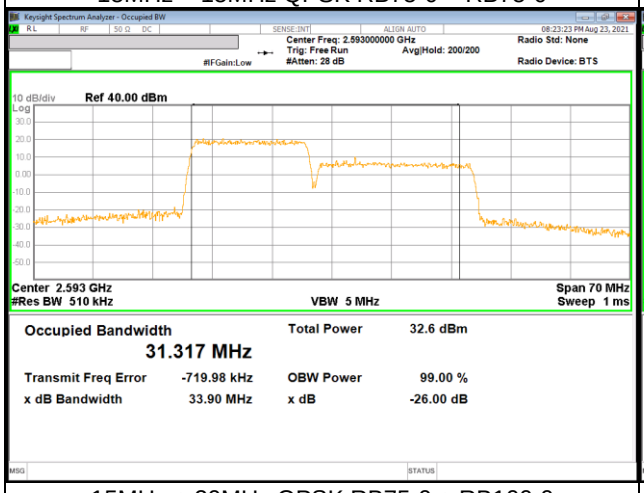


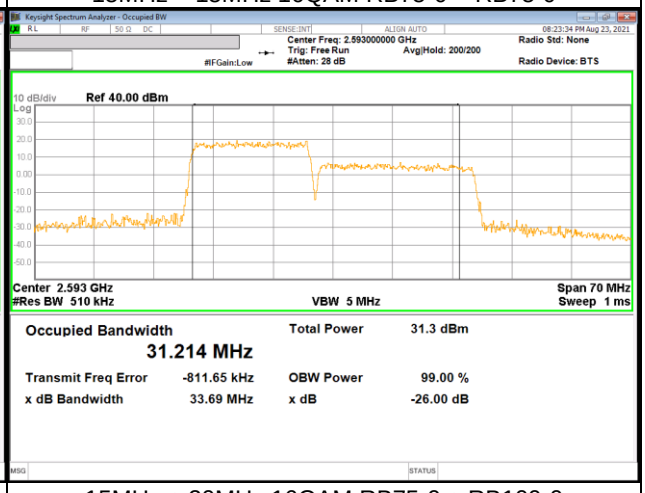
15MHz + 15MHz QPSK RB75-0 + RB75-0



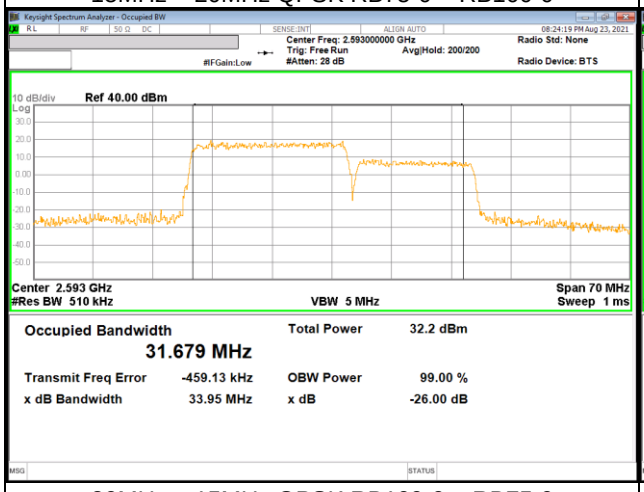
15MHz + 15MHz 16QAM RB75-0 + RB75-0



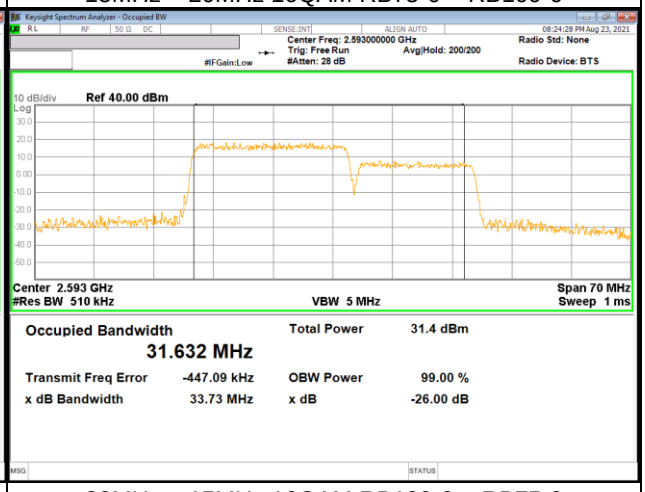
15MHz + 20MHz QPSK RB75-0 + RB100-0



15MHz + 20MHz 16QAM RB75-0 + RB100-0



20MHz + 15MHz QPSK RB100-0 + RB75-0



20MHz + 15MHz 16QAM RB100-0 + RB75-0

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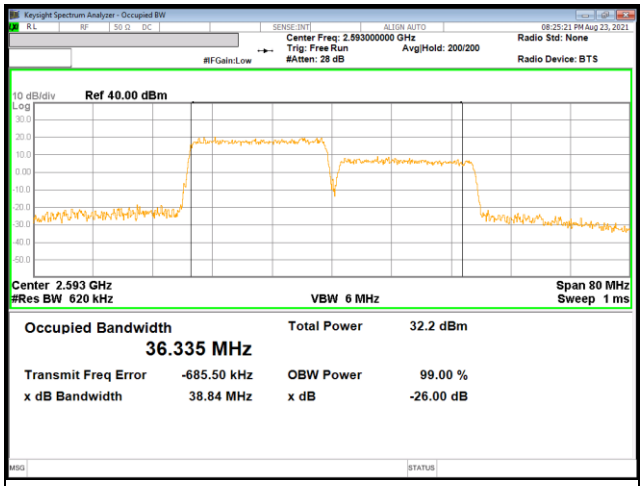
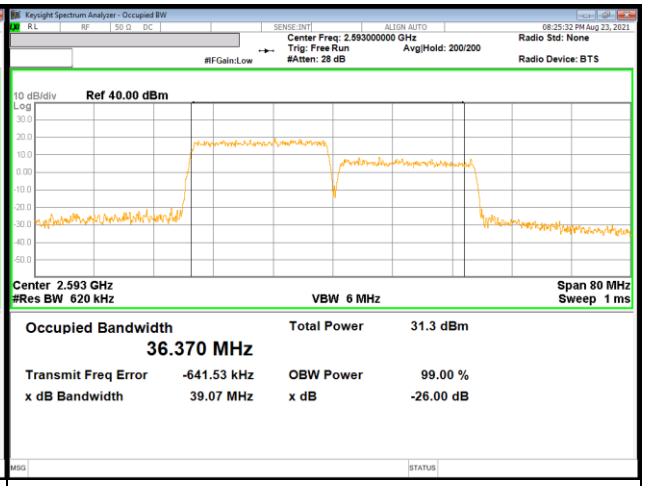


20MHz + 20MHz QPSK RB100-0 + RB100-0



20MHz + 20MHz 16QAM RB100-0 + RB100-0

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8.3. EMISSION MASK

RULE PART(S)

FCC: §27. 53

LIMITS

Part 27.53:

(m) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

RESULTS

See the following pages.

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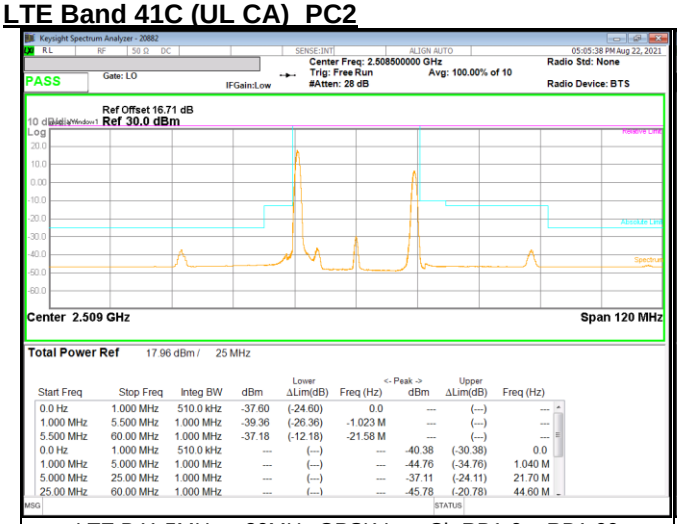
8.3.1. EMISSION MASK RESULT

LTE Band 41C (UL CA) PC2

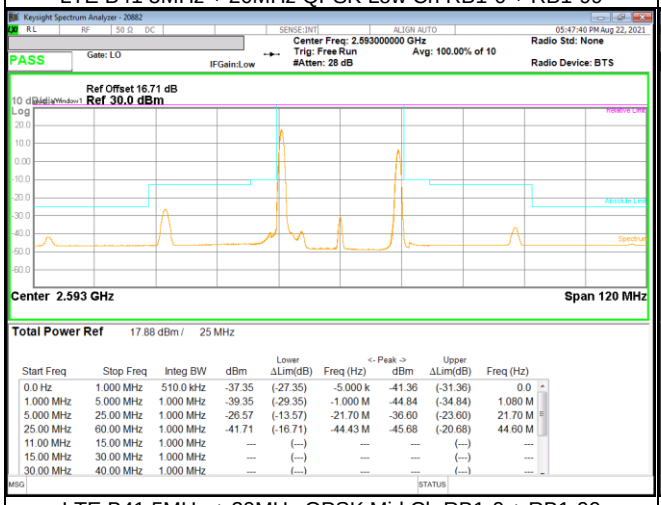


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-37.60	(-24.60)	0.0	---	(---)	---
1.000 MHz	5.500 MHz	1.000 MHz	-39.36	(-26.36)	-1.023 M	---	(---)	---
5.500 MHz	60.00 MHz	1.000 MHz	-37.18	(-12.18)	-21.58 M	---	(---)	---
0.0 Hz	1.000 MHz	510.0 kHz	---	(---)	---	-40.38	(-30.38)	0.0
1.000 MHz	5.000 MHz	1.000 MHz	---	(---)	---	-44.76	(-34.76)	1.040 M
5.000 MHz	25.00 MHz	1.000 MHz	---	(---)	---	-37.11	(-24.11)	21.70 M
25.00 MHz	60.00 MHz	1.000 MHz	---	(---)	---	-45.78	(-20.78)	44.60 M

LTE B41 5MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99

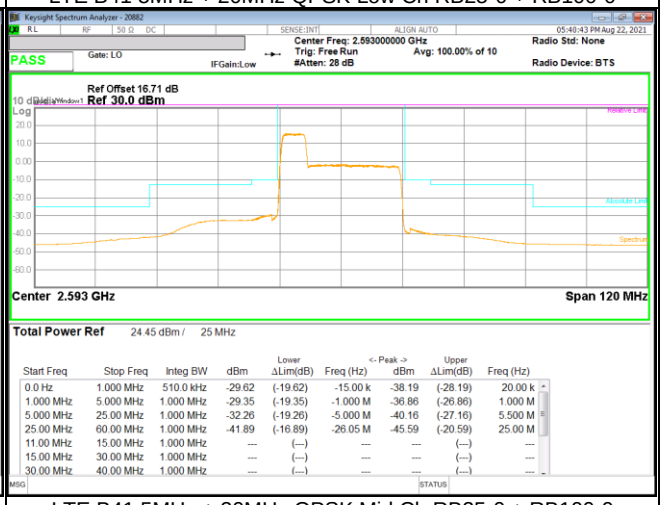
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-25.54	(-12.54)	-35.00 k	---	(---)	---
1.000 MHz	5.500 MHz	1.000 MHz	-23.51	(-10.51)	-1.023 M	---	(---)	---
5.500 MHz	60.00 MHz	1.000 MHz	-28.97	(-3.97)	-5.500 M	---	(---)	---
0.0 Hz	1.000 MHz	510.0 kHz	---	(---)	---	-32.46	(-22.46)	65.00 k
1.000 MHz	5.000 MHz	1.000 MHz	---	(---)	---	-30.91	(-20.91)	1.040 M
5.000 MHz	25.00 MHz	1.000 MHz	---	(---)	---	-36.67	(-23.67)	5.000 M
25.00 MHz	60.00 MHz	1.000 MHz	---	(---)	---	-45.58	(-20.58)	25.00 M

LTE B41 5MHz + 20MHz QPSK Low Ch RB25-0 + RB100-0



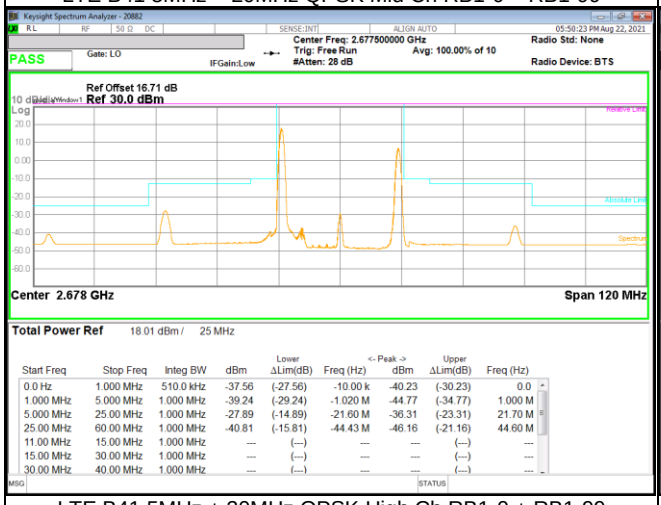
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-37.35	(-27.35)	-5.000 k	-41.36	(-31.36)	0.0
1.000 MHz	5.000 MHz	1.000 MHz	-39.35	(-29.35)	-1.000 M	-44.84	(-34.84)	1.080 M
5.000 MHz	25.00 MHz	1.000 MHz	-26.57	(-13.57)	-21.70 M	-36.60	(-23.60)	21.70 M
25.00 MHz	60.00 MHz	1.000 MHz	-41.71	(-16.71)	-44.43 M	-45.68	(-20.68)	44.60 M
11.00 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
15.00 MHz	30.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
30.00 MHz	40.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

LTE B41 5MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



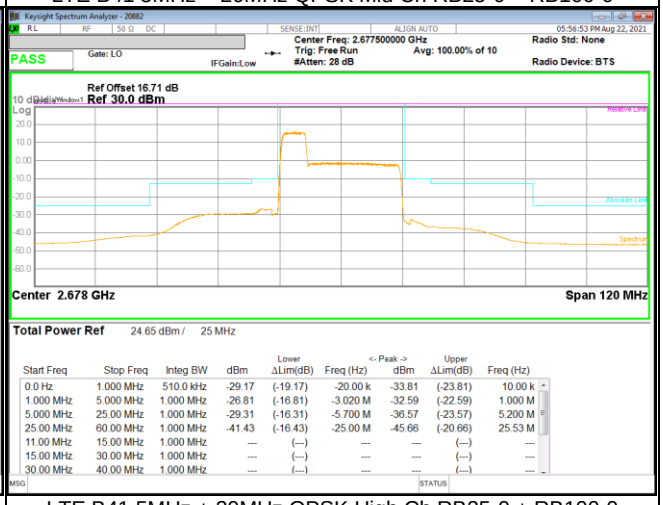
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-29.62	(-19.62)	-15.00 k	-38.19	(-28.19)	20.00 k
1.000 MHz	5.000 MHz	1.000 MHz	-29.35	(-19.35)	-1.000 M	-36.86	(-26.86)	1.000 M
5.000 MHz	25.00 MHz	1.000 MHz	-32.26	(-19.26)	-5.000 M	-40.16	(-27.16)	5.500 M
25.00 MHz	60.00 MHz	1.000 MHz	-41.89	(-16.89)	-26.05 M	-45.59	(-20.59)	25.00 M
11.00 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
15.00 MHz	30.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
30.00 MHz	40.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

LTE B41 5MHz + 20MHz QPSK Mid Ch RB25-0 + RB100-0



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-37.56	(-27.56)	-10.00 k	-40.23	(-30.23)	0.0
1.000 MHz	5.000 MHz	1.000 MHz	-39.24	(-29.24)	-1.020 M	-44.77	(-34.77)	1.000 M
5.000 MHz	25.00 MHz	1.000 MHz	-27.89	(-14.89)	-21.60 M	-36.31	(-23.31)	21.70 M
25.00 MHz	60.00 MHz	1.000 MHz	-40.81	(-15.81)	-44.43 M	-46.16	(-21.16)	44.60 M
11.00 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
15.00 MHz	30.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
30.00 MHz	40.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

LTE B41 5MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	510.0 kHz	-29.17	(-19.17)	-20.00 k	-33.81	(-23.81)	10.00 k
1.000 MHz	5.000 MHz	1.000 MHz	-26.81	(-16.81)	-3.020 M	-32.59	(-22.59)	1.000 M
5.000 MHz	25.00 MHz	1.000 MHz	-29.31	(-16.31)	-5.700 M	-36.57	(-23.57)	5.200 M
25.00 MHz	60.00 MHz	1.000 MHz	-41.43	(-16.43)	-25.00 M	-45.66	(-20.66)	25.53 M
11.00 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
15.00 MHz	30.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
30.00 MHz	40.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

LTE B41 5MHz + 20MHz QPSK High Ch RB25-0 + RB100-0

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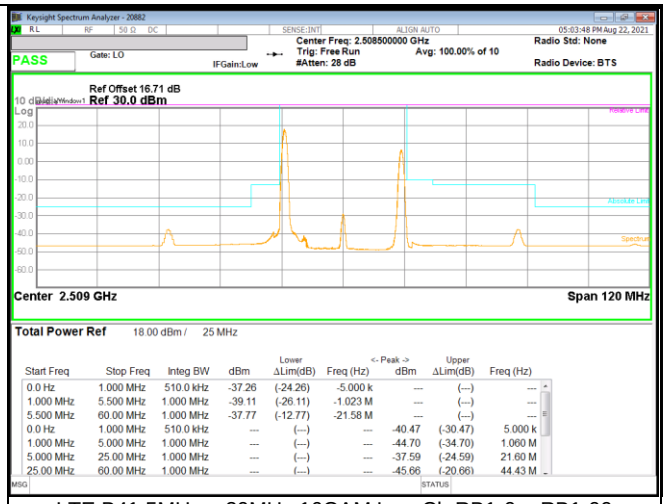
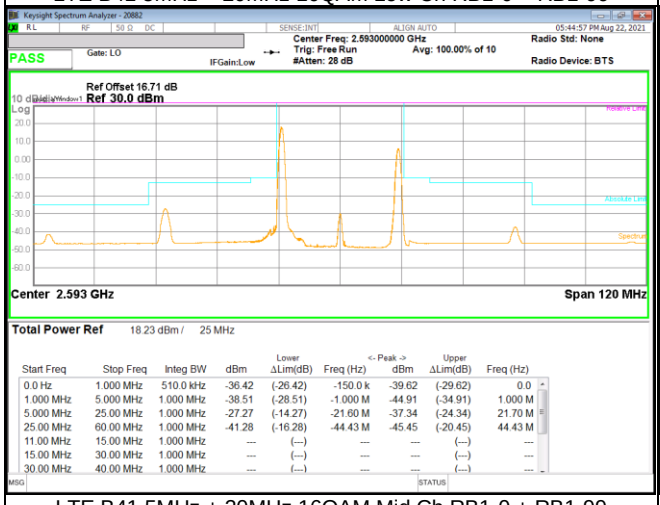
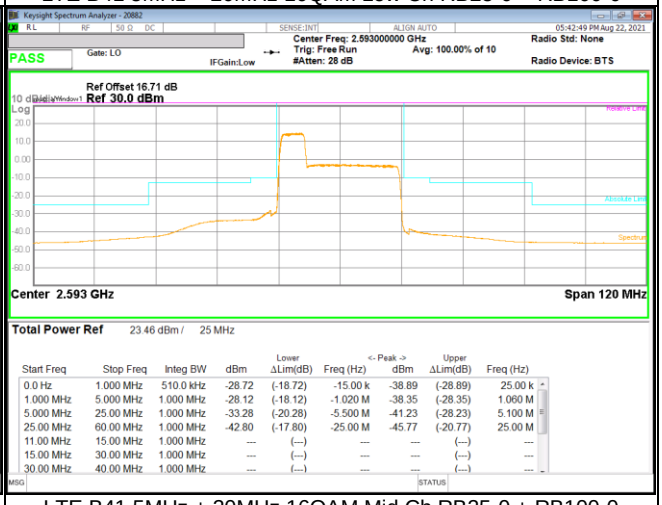


LTE B41 5MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99

LTE B41 5MHz + 20MHz 16QAM Low Ch RB25-0 + RB100-0



LTE B41 5MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



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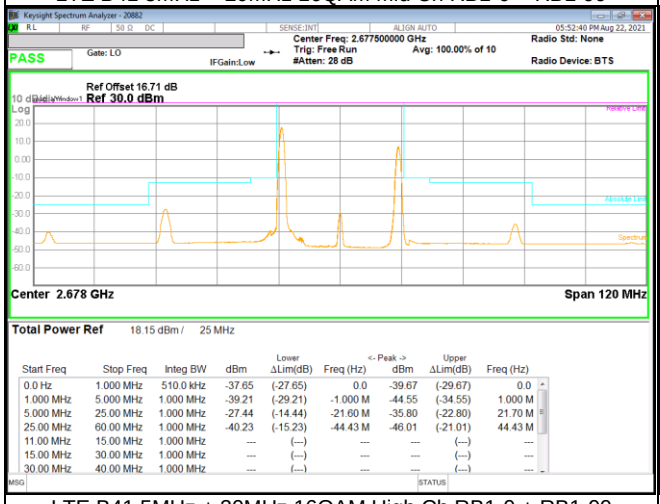
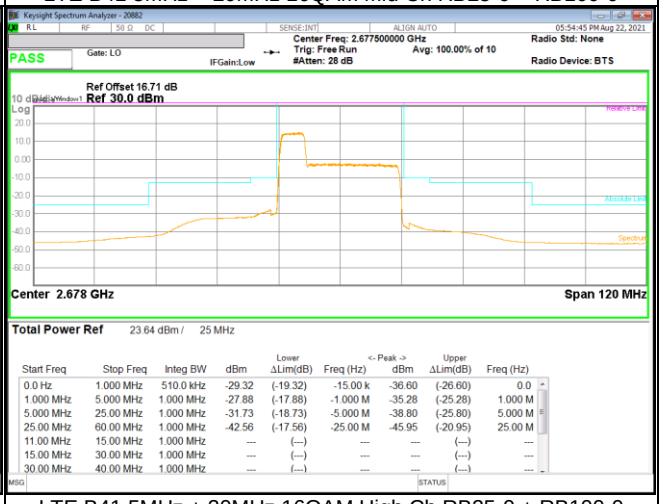


LTE B41 5MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



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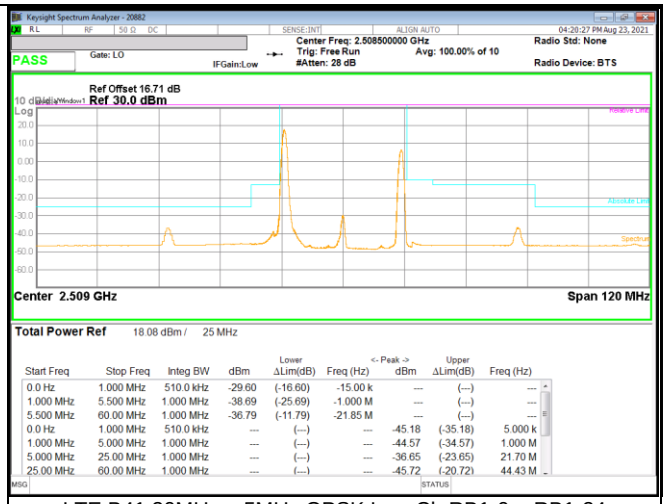
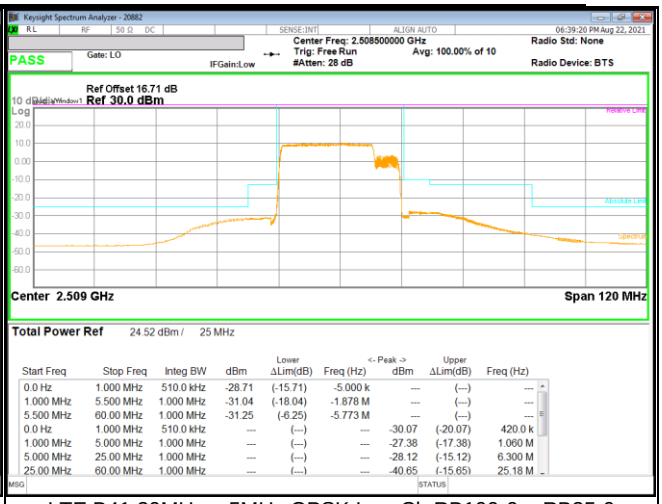


LTE B41 20MHz + 5MHz QPSK Low Ch RB1-0 + RB1-24



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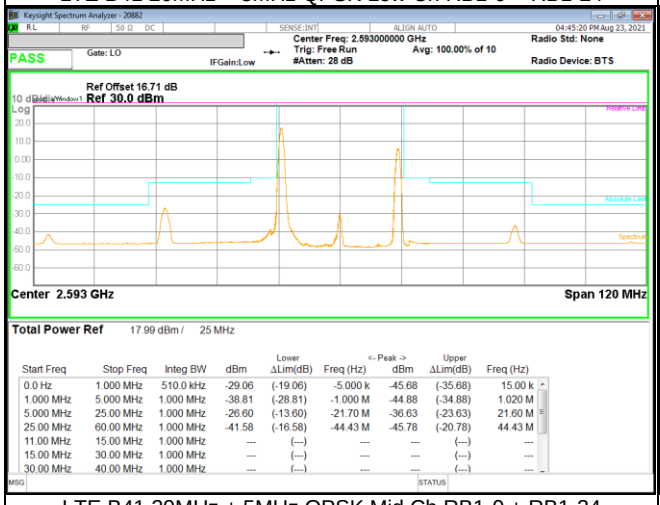
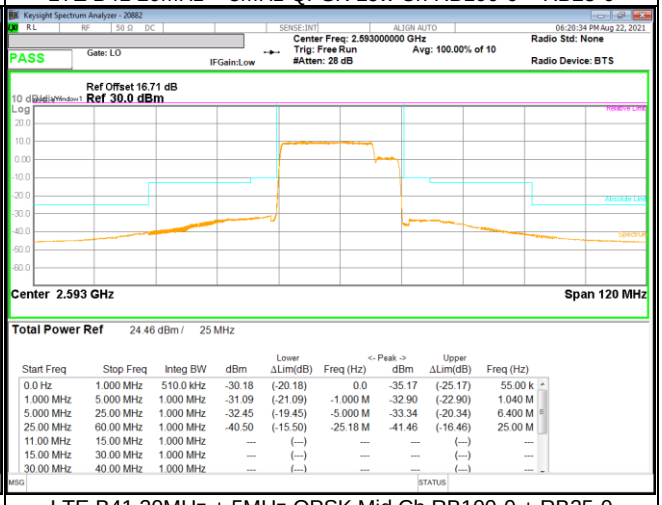


LTE B41 20MHz + 5MHz QPSK Mid Ch RB1-0 + RB1-24



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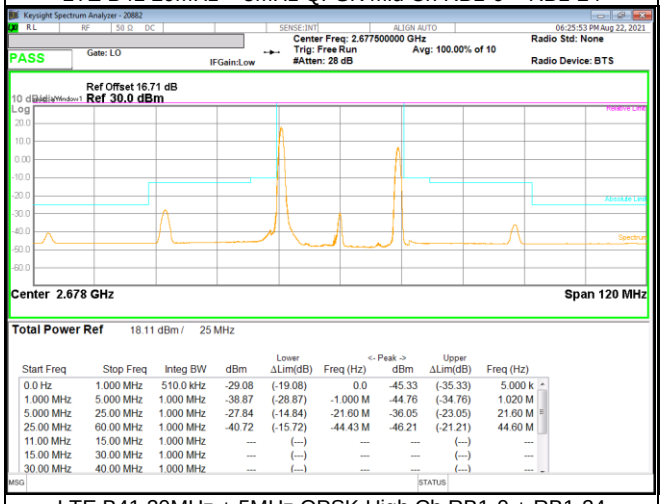
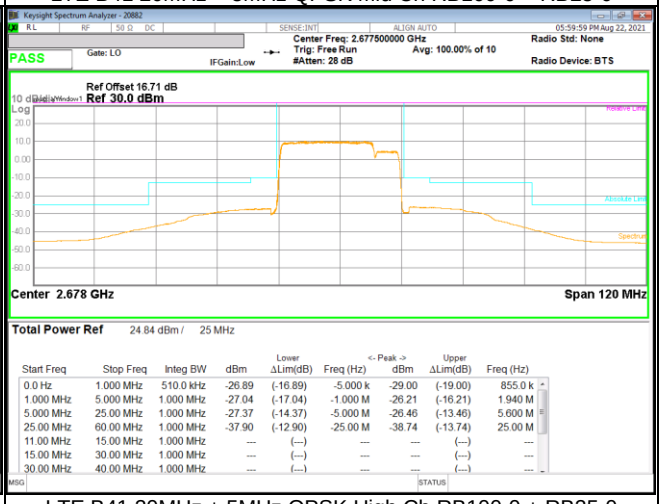


LTE B41 20MHz + 5MHz QPSK High Ch RB1-0 + RB1-24



LTE B41 20MHz + 5MHz QPSK High Ch RB100-0 + RB25-0

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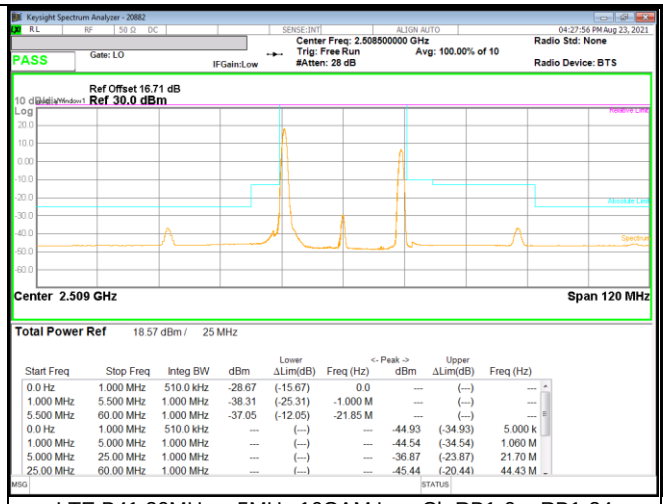
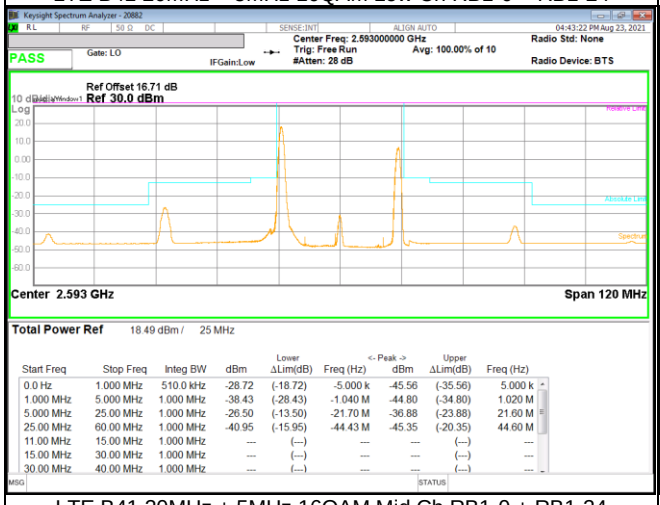
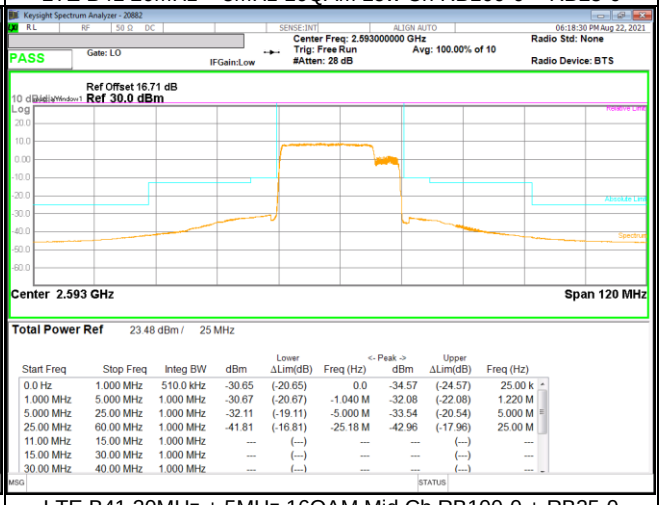


LTE B41 20MHz + 5MHz 16QAM Low Ch RB1-0 + RB1-24

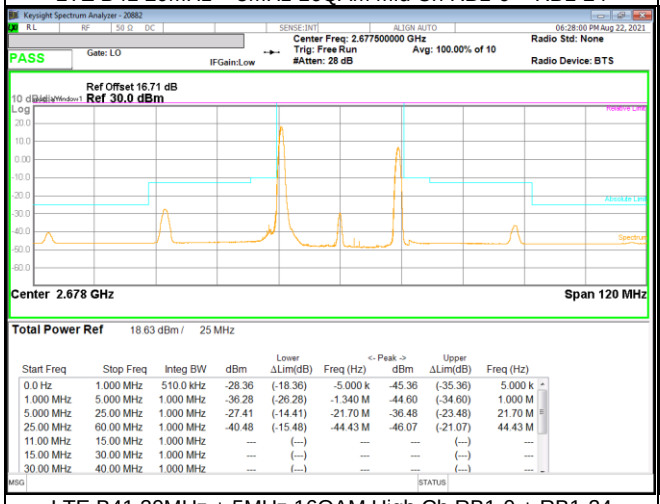
LTE B41 20MHz + 5MHz 16QAM Low Ch RB100-0 + RB25-0



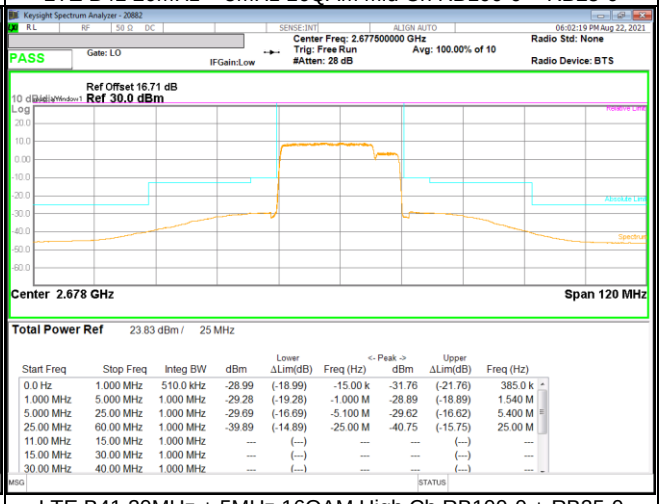
LTE B41 20MHz + 5MHz 16QAM Mid Ch RB1-0 + RB1-24



LTE B41 20MHz + 5MHz 16QAM Mid Ch RB100-0 + RB25-0



LTE B41 20MHz + 5MHz 16QAM High Ch RB1-0 + RB1-24



LTE B41 20MHz + 5MHz 16QAM High Ch RB100-0 + RB25-0

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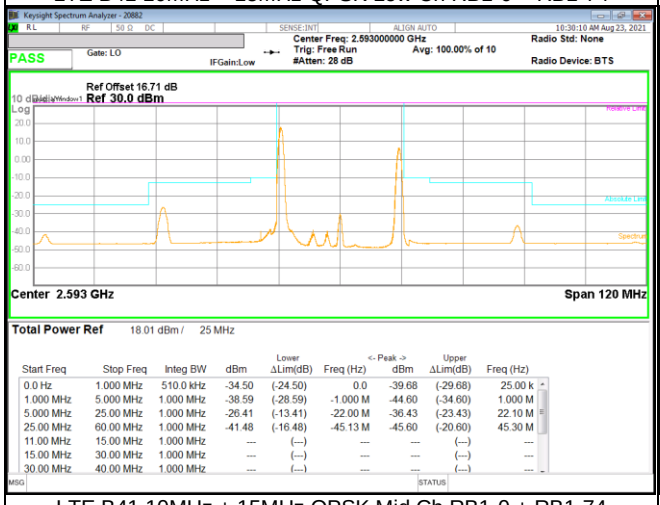
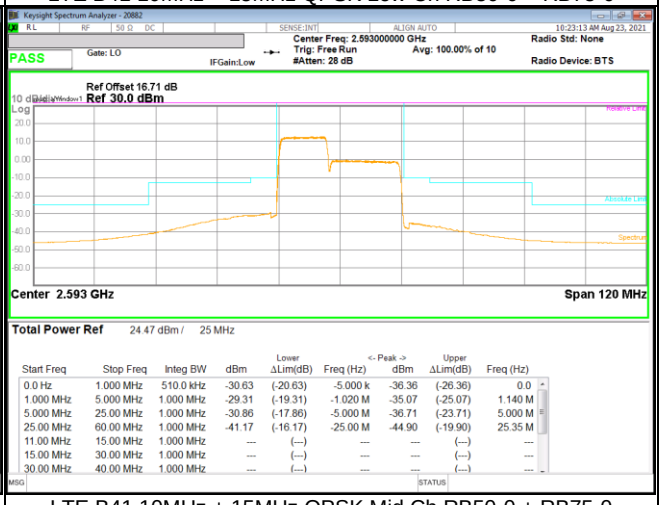
LTE B41 10MHz + 15MHz QPSK Low Ch RB1-0 + RB1-74

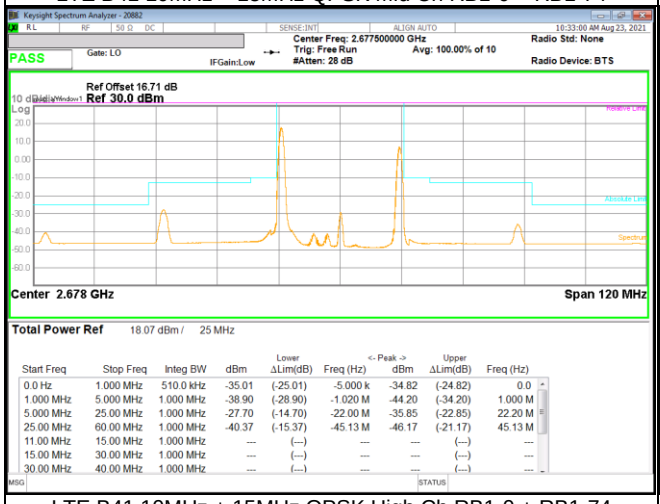
LTE B41 10MHz + 15MHz QPSK Low Ch RB50-0 + RB75-0



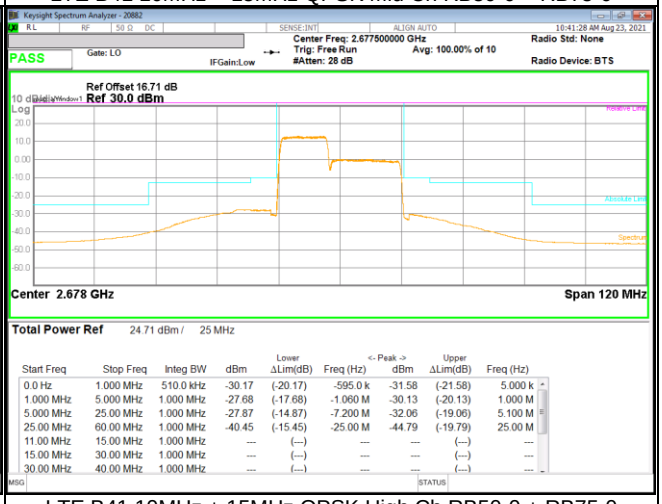
LTE B41 10MHz + 15MHz QPSK Mid Ch RB1-0 + RB1-74



LTE B41 10MHz + 15MHz QPSK Mid Ch RB50-0 + RB75-0



LTE B41 10MHz + 15MHz QPSK High Ch RB1-0 + RB1-74



LTE B41 10MHz + 15MHz QPSK High Ch RB50-0 + RB75-0

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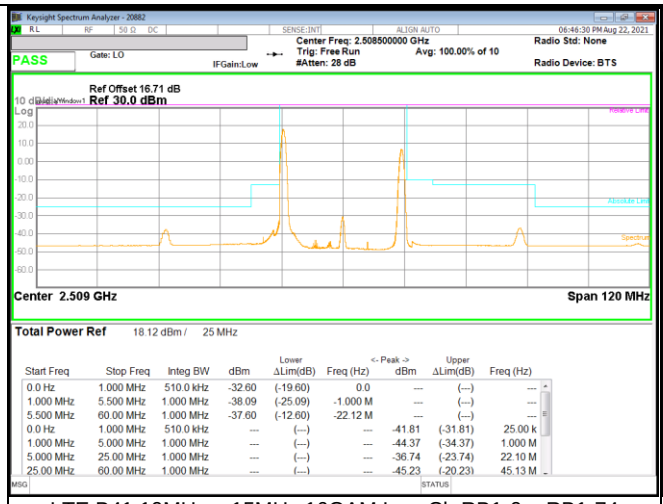
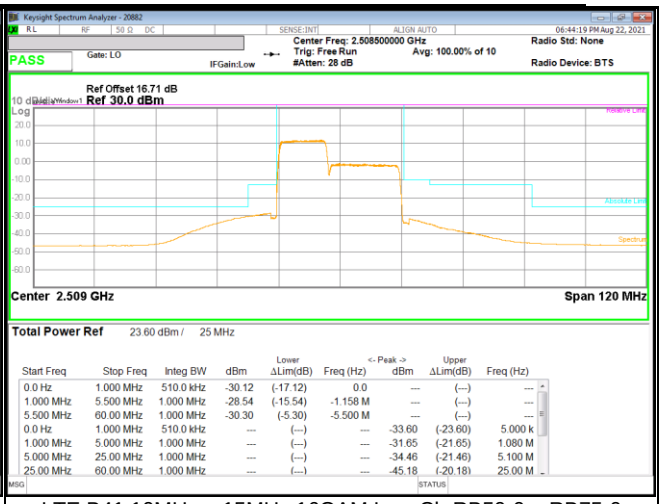
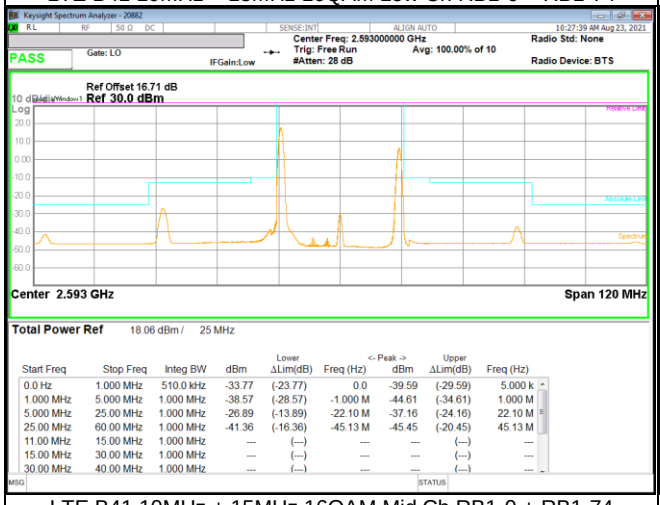


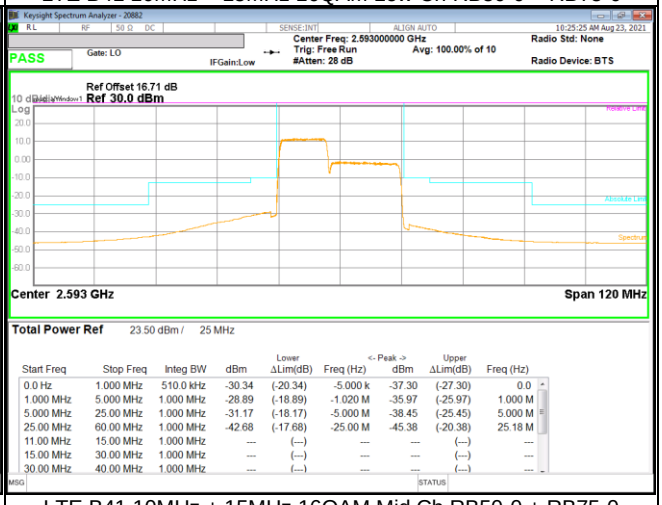
LTE B41 10MHz + 15MHz 16QAM Low Ch RB1-0 + RB1-74



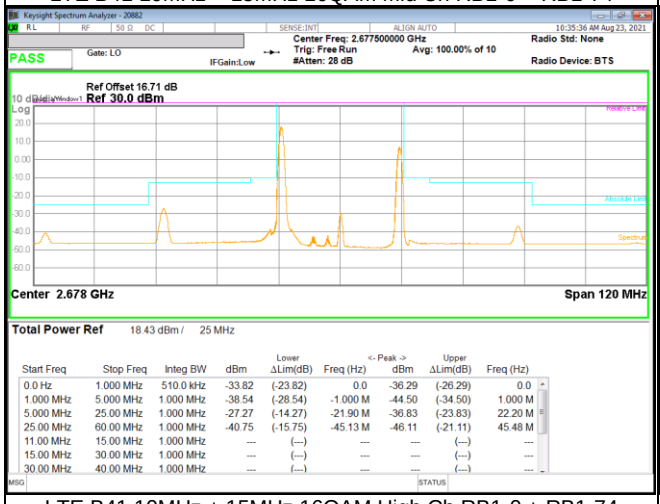
LTE B41 10MHz + 15MHz 16QAM Low Ch RB50-0 + RB75-0



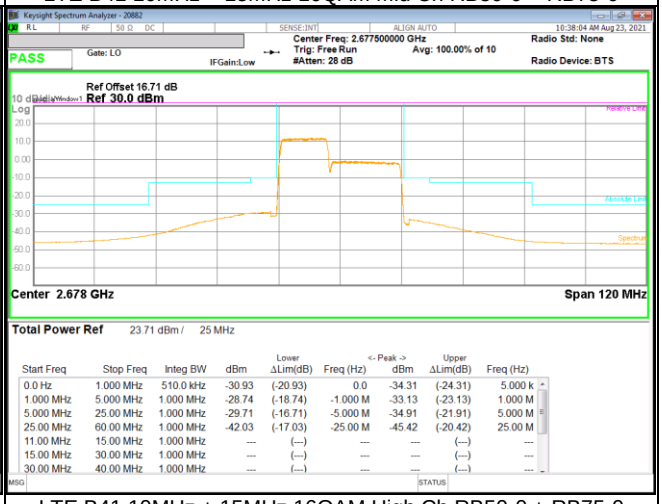
LTE B41 10MHz + 15MHz 16QAM Mid Ch RB1-0 + RB1-74



LTE B41 10MHz + 15MHz 16QAM Mid Ch RB50-0 + RB75-0



LTE B41 10MHz + 15MHz 16QAM High Ch RB1-0 + RB1-74



LTE B41 10MHz + 15MHz 16QAM High Ch RB50-0 + RB75-0

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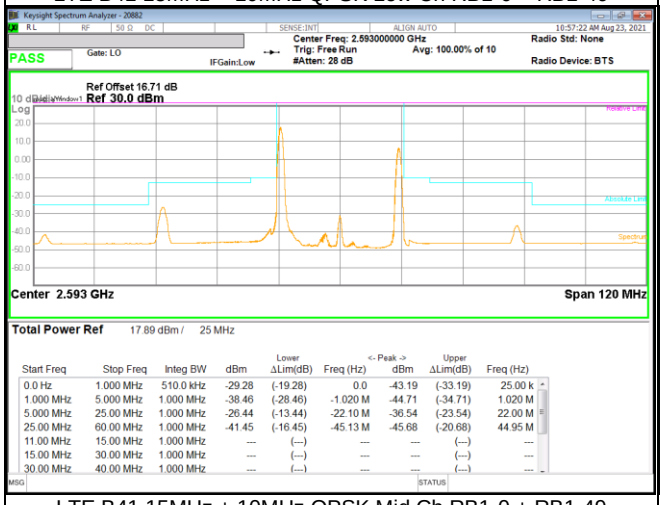
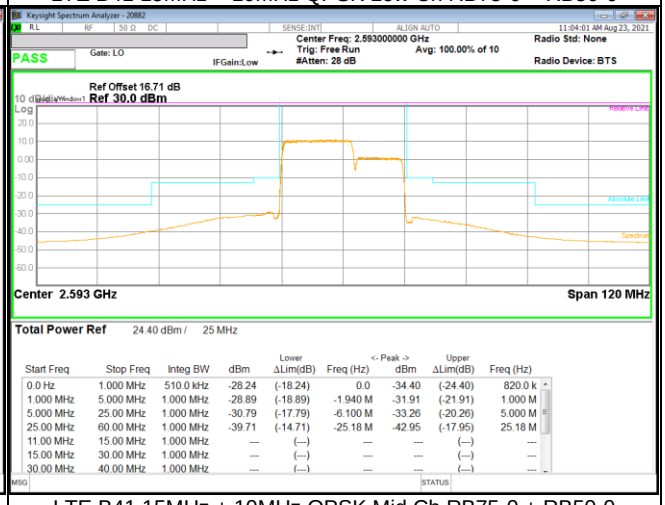
LTE B41 15MHz + 10MHz QPSK Low Ch RB1-0 + RB1-49

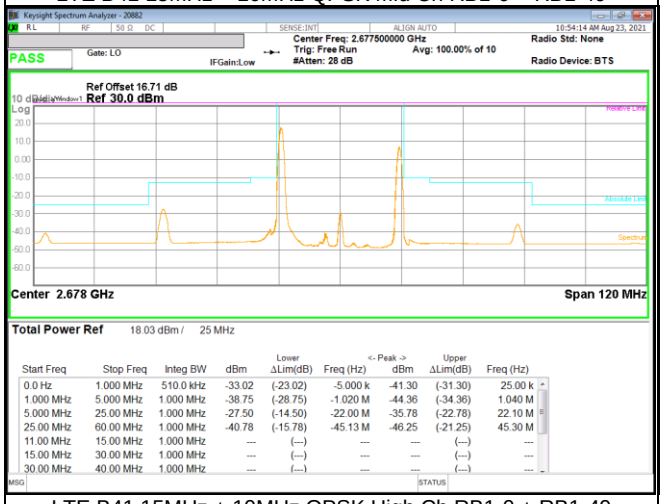
LTE B41 15MHz + 10MHz QPSK Low Ch RB75-0 + RB50-0



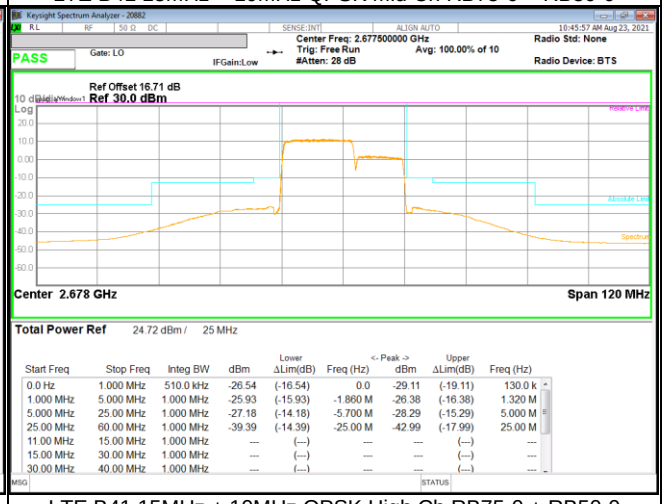
LTE B41 15MHz + 10MHz QPSK Mid Ch RB1-0 + RB1-49



LTE B41 15MHz + 10MHz QPSK Mid Ch RB75-0 + RB50-0



LTE B41 15MHz + 10MHz QPSK High Ch RB1-0 + RB1-49



LTE B41 15MHz + 10MHz QPSK High Ch RB75-0 + RB50-0

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