

TEST REPORT



DT&C Co., Ltd.

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1. Report No : DRTFCC2108-0080

2. Customer

- Name (FCC) : DASAN Networks, Inc. / Name (IC) : DASAN Networks, Inc.
- Address (FCC) : DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu Seongnam-si
South Korea 13493
- Address (IC) : DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu Seongnam-si/
Gyeonggi-do 13493 Korea (Republic Of)

3. Use of Report : FCC & IC Certification

4. Product Name / Model Name : Vehicle Control Terminal / TMS3.0 (300611-01929)
FCC ID : 2AXDMTMS30CELLTYPEA
IC : 26419-TMS30TYPEA

5. FCC Regulation(s): Part 22, 24, 27
IC Standard(s): RSS-130 Issue 2, 132 Issue 3, 133 Issue 6, 139 Issue 3, 199 Issue 3
Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015

6. Date of Test : 2021.06.21 ~ 2021.07.21



7. Location of Test : Permanent Testing Lab On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test report is not related to KOLAS accreditation.

Affirmation	Tested by	Reviewed by
	Name : JaeHyeok Bang  (Signature)	Name : JaeJin Lee  (Signature)

2021 . 08 . 04 .

DT&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2108-0080	Aug. 04, 2021	Initial issue	JaeHyeok Bang	JaeJin Lee

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1. GENERAL INFORMATION

FCC Classification	PCS Licensed Transmitter (PCB)
FCC ID	2AXDMTMS30CELLTYPEA
IC	26419-TMS30TYPEA
Product Name	Vehicle Control Terminal
Model Name	TMS3.0 (300611-01929)
Add Model Name	-
FVIN(Firmware Version Identification Number)	2
EUT Serial Number	Undesignated
Supplying power	DC 12 V,24 V
Antenna Information	Antenna Type: Chip Antenna Gain: 0.4 dBi (Band 12), 1.96 dBi (Band 13), 1.84 dBi (Band 26, 5), 2.50 dBi (Band 4), 2.98 dBi (Band 25, 2), 1.46 dBi (Band 38, 7, 41)

Note: This device uses the certified module.(FCC ID : XMR201903EG25G)

Please refer to the certified module report for emission designator.

For GSM/EDGE 1900, emission designator was reported based on the new test result.

Mode	TX Frequency (MHz)	Emission Designator <small>Note</small>	Modulation	ERP(FCC&IC)		EIRP	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 12	704 ~ 711	-	QPSK	15.48	0.035	-	-
LTE Band 12	704 ~ 711	-	16QAM	14.21	0.026	-	-
LTE Band 12	701.5 ~ 713.5	-	QPSK	15.08	0.032	-	-
LTE Band 12	701.5 ~ 713.5	-	16QAM	14.13	0.026	-	-
LTE Band 12	700.5 ~ 714.5	-	QPSK	15.11	0.032	-	-
LTE Band 12	700.5 ~ 714.5	-	16QAM	14.21	0.026	-	-
LTE Band 12	699.7 ~ 715.3	-	QPSK	15.46	0.035	-	-
LTE Band 12	699.7 ~ 715.3	-	16QAM	14.51	0.028	-	-
LTE Band 13	782 ~ 782	-	QPSK	20.03	0.101	-	-
LTE Band 13	782 ~ 782	-	16QAM	19.09	0.081	-	-
LTE Band 13	779.5 ~ 784.5	-	QPSK	20.00	0.100	-	-
LTE Band 13	779.5 ~ 784.5	-	16QAM	19.59	0.091	-	-

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP(For the FCC)		EIRP(For the IC)	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 26	831.5 ~ 841.5	-	QPSK	17.07	0.051	19.22	0.084
LTE Band 26	831.5 ~ 841.5	-	16QAM	15.66	0.037	17.81	0.060
LTE Band 26(5)	829 ~ 844	-	QPSK	16.99	0.050	19.14	0.082
LTE Band 26(5)	829 ~ 844	-	16QAM	16.18	0.041	18.33	0.068
LTE Band 26(5)	826.5 ~ 846.5	-	QPSK	16.98	0.050	19.13	0.082
LTE Band 26(5)	826.5 ~ 846.5	-	16QAM	16.16	0.041	18.31	0.068
LTE Band 26(5)	825.5 ~ 847.5	-	QPSK	16.96	0.050	19.11	0.081
LTE Band 26(5)	825.5 ~ 847.5	-	16QAM	15.78	0.038	17.93	0.062
LTE Band 26(5)	824.7 ~ 848.3	-	QPSK	17.02	0.050	19.17	0.083
LTE Band 26(5)	824.7 ~ 848.3	-	16QAM	16.23	0.042	18.38	0.069

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP(FCC & IC)	
				Max power(dBm)	Max power(W)
LTE Band 4	1 720 ~ 1 745	-	QPSK	26.07	0.405
LTE Band 4	1 720 ~ 1 745	-	16QAM	25.16	0.328
LTE Band 4	1 717.5 ~ 1 747.5	-	QPSK	24.12	0.258
LTE Band 4	1 717.5 ~ 1 747.5	-	16QAM	23.08	0.203
LTE Band 4	1 715 ~ 1 750	-	QPSK	24.12	0.258
LTE Band 4	1 715 ~ 1 750	-	16QAM	22.92	0.196
LTE Band 4	1 712.5 ~ 1 752.5	-	QPSK	23.86	0.243
LTE Band 4	1 712.5 ~ 1 752.5	-	16QAM	22.84	0.192
LTE Band 4	1 711.5 ~ 1 753.5	-	QPSK	23.87	0.244
LTE Band 4	1 711.5 ~ 1 753.5	-	16QAM	22.84	0.192
LTE Band 4	1 710.7 ~ 1 754.3	-	QPSK	23.94	0.248
LTE Band 4	1 710.7 ~ 1 754.3	-	16QAM	22.84	0.192
LTE Band 25(2)	1 860 ~ 1 905	-	QPSK	25.78	0.378
LTE Band 25(2)	1 860 ~ 1 905	-	16QAM	24.13	0.259
LTE Band 25(2)	1 857.5 ~ 1 907.5	-	QPSK	25.05	0.320
LTE Band 25(2)	1 857.5 ~ 1 907.5	-	16QAM	23.93	0.247
LTE Band 25(2)	1 855 ~ 1 910	-	QPSK	25.04	0.319
LTE Band 25(2)	1 855 ~ 1 910	-	16QAM	23.92	0.247
LTE Band 25(2)	1 852.5 ~ 1 912.5	-	QPSK	25.04	0.319
LTE Band 25(2)	1 852.5 ~ 1 912.5	-	16QAM	23.81	0.240
LTE Band 25(2)	1 851.5 ~ 1 913.5	-	QPSK	24.94	0.312
LTE Band 25(2)	1 851.5 ~ 1 913.5	-	16QAM	23.72	0.236
LTE Band 25(2)	1 850.7 ~ 1 914.3	-	QPSK	25.01	0.317
LTE Band 25(2)	1 850.7 ~ 1 914.3	-	16QAM	23.66	0.232
LTE Band 38	2 580 ~ 2 610	-	QPSK	26.60	0.457
LTE Band 38	2 580 ~ 2 610	-	16QAM	26.09	0.406
LTE Band 38	2 577.5 ~ 2 612.5	-	QPSK	26.56	0.453
LTE Band 38	2 577.5 ~ 2 612.5	-	16QAM	25.37	0.344
LTE Band 38	2 575 ~ 2 615	-	QPSK	26.49	0.446
LTE Band 38	2 575 ~ 2 615	-	16QAM	25.89	0.388
LTE Band 38	2 572.5 ~ 2 617.5	-	QPSK	26.37	0.434
LTE Band 38	2 572.5 ~ 2 617.5	-	16QAM	25.46	0.352

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP(FCC & IC)	
				Max power(dBm)	Max power(W)
LTE Band 7	2 510 ~ 2 560	-	QPSK	27.16	0.520
LTE Band 7	2 510 ~ 2 560	-	16QAM	26.28	0.425
LTE Band 7	2 507.5 ~ 2 562.5	-	QPSK	26.95	0.495
LTE Band 7	2 507.5 ~ 2 562.5	-	16QAM	25.61	0.364
LTE Band 7	2 505 ~ 2 565	-	QPSK	26.91	0.491
LTE Band 7	2 505 ~ 2 565	-	16QAM	25.51	0.356
LTE Band 7	2 502.5 ~ 2 567.5	-	QPSK	26.96	0.497
LTE Band 7	2 502.5 ~ 2 567.5	-	16QAM	25.45	0.351
LTE Band 41	2 506 ~ 2 680	17M7G7D	QPSK	24.53	0.283
LTE Band 41	2 506 ~ 2 680	17M8W7D	16QAM	23.95	0.248
LTE Band 41	2 503.5 ~ 2 682.5	13M3G7D	QPSK	23.52	0.225
LTE Band 41	2 503.5 ~ 2 682.5	13M2W7D	16QAM	22.78	0.190
LTE Band 41	2 501 ~ 2 685	8M96G7D	QPSK	23.58	0.228
LTE Band 41	2 501 ~ 2 685	8M98W7D	16QAM	22.78	0.190
LTE Band 41	2 498.5 ~ 2 687.5	4M46G7D	QPSK	23.47	0.222
LTE Band 41	2 498.5 ~ 2 687.5	4M48W7D	16QAM	22.87	0.194

2. INTRODUCTION

2.1 EUT DESCRIPTION

This EUT contains the following capabilities:

850/1900 GPRS/EDGE, 850/1700/1900 WCDMA/HSUPA, Multi-band LTE.

Operation test setup for EUT

- The call simulator was used to control the transmit parameters during test.

And power control setting of simulator is set to "TPC Pattern : All + 3dB" to get the maximum power for EUT.

2.2 TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 °C ~ +25 °C
▪ Relative Humidity	42 % ~ 45 %

2.3 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.4 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	4.9 dB (The confidence level is about 95 %, $k = 2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.0 dB (The confidence level is about 95 %, $k = 2$)
Radiated Disturbance (Above 18 GHz)	5.3 dB (The confidence level is about 95 %, $k = 2$)

2.5 TEST FACILITY

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.

The test site complies with the requirements of § 2.948 according to ANSI 63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED #: 5740A

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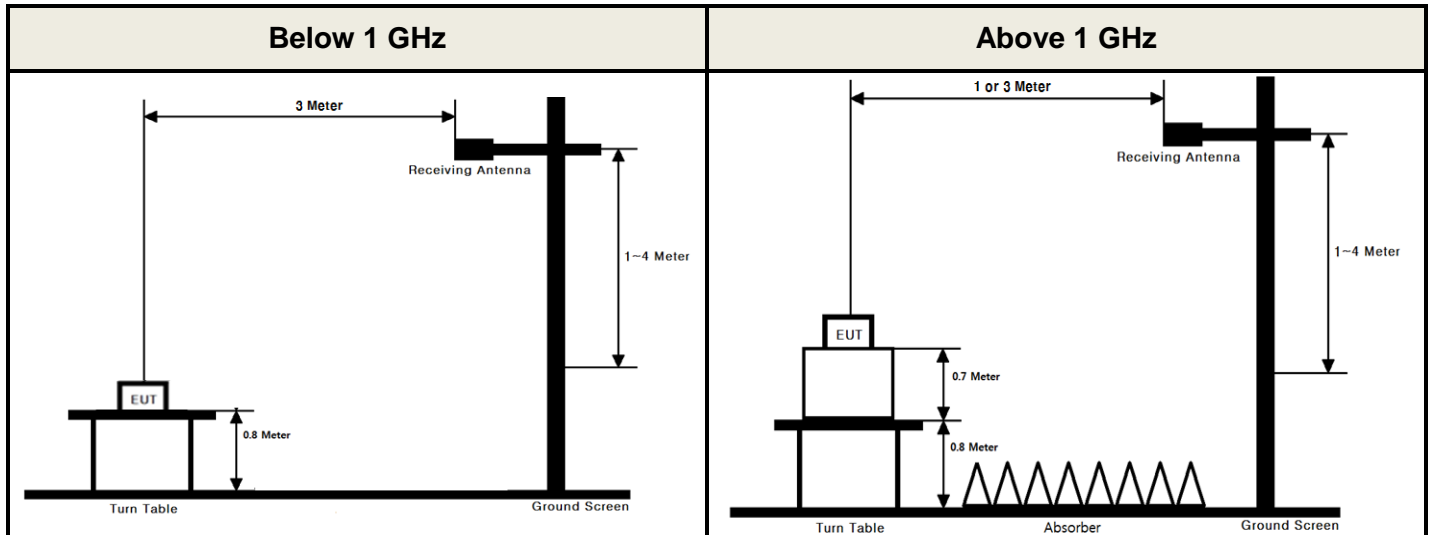
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3. DESCRIPTION OF TESTS

3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 m above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.17
- KDB971168 D01v03 - Section 5.2.2
- ANSI C63.26-2015 – Section 5.2.4.4.1

Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1 % to 5 % of the OBW.
3. Set VBW \geq 3 x RBW.
4. Set number of points in sweep \geq 2 x span / RBW.
5. Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set \geq $[10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).

9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

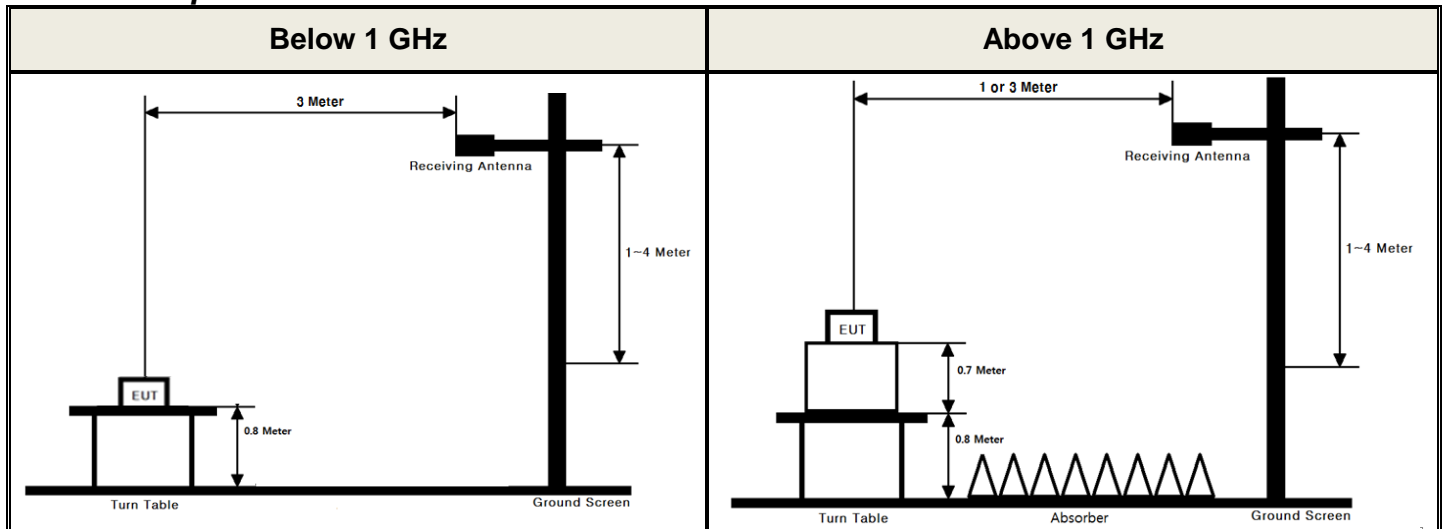
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna's terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn antenna and an isotropic antenna are taken into consideration.

3.2 UNDESIRABLE EMISSIONS

Test Set-up



These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 m above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.12
- KDB971168 D01v03 - Section 5.8
- ANSI C63.26-2015 – Section 5.5

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW \geq 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point \geq 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	21/06/24	22/06/24	US47360812
Spectrum Analyzer	KETSIGHT	N9030B	20/12/16	21/12/16	MY55480168
DC power supply	SM techno	SDP30-5D	21/06/24	22/06/24	305DMG305
DC power supply	SM techno	SDP30-5D	21/06/24	22/06/24	305DMG304
Multimeter	FLUKE	17B+	20/12/16	21/12/16	36390701WS
Power Splitter	Anritsu	K241B	21/06/24	22/06/24	1701102
Radio Communication Analyzer	Anritsu	MT8820C	21/06/24	22/06/24	6201274519
Thermohygrometer	BODYCOM	BJ5478	20/12/16	21/12/16	120612-2
Thermohygrometer	XIAOMI	MHO-C201	20/12/16	21/12/16	0089675
Signal Generator	Rohde Schwarz	SMBV100A	20/12/16	21/12/16	255571
Signal Generator	ANRITSU	MG3695C	20/12/16	21/12/16	173501
Loop Antenna	ETS-Lindgren	6502	21/01/28	23/01/28	00226186
Bilog Antenna	Schwarzbeck	VULB 9160	20/12/16	21/12/16	9160-3362
Dipole Antenna	A.H.Systems Inc.	FCC-4	20/12/16	22/12/16	710A
Dipole Antenna	Schwarzbeck	UHA9105	20/04/10	22/04/10	2262
HORN ANT	ETS	3117	20/12/16	21/12/16	00140394
HORN ANT	ETS	3117	21/06/24	22/06/24	00143278
HORN ANT	A.H.Systems	SAS-574	21/06/24	22/06/24	154
HORN ANT	A.H.Systems	SAS-574	21/06/24	22/06/24	155
Amplifier	EMPOWER	BBS3Q7ELU	21/06/24	22/06/24	1020
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	20/06/24	21/06/24	163
PreAmplifier	H.P	8447D	20/12/16	21/12/16	2944A07774
PreAmplifier	Agilent	8449B	21/06/24	22/06/24	3008A02108
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	21/06/24	22/06/24	7
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	21/06/24	22/06/24	2
High-pass filter	Wainwright	WHNX8.5/26.5G-6SS	21/06/24	22/06/24	1
Cable	RADIAL	TESTPRO3	21/01/05	22/01/05	RFC-03
Cable	HUBER+SUHNER	SUCOFLEX100	21/01/08	22/01/08	M-01
Cable	HUBER+SUHNER	SUCOFLEX100	21/01/08	22/01/08	M-02
Cable	JUNFLON	MWX241/B	21/01/08	22/01/08	M-03
Cable	JUNFLON	MWX221	21/01/08	22/01/08	M-04
Cable	JUNFLON	MWX221	21/01/08	22/01/08	M-05
Cable	DTNC	Cable	21/01/08	22/01/08	M-06
Cable	JUNFLON	J12J101757-00	21/01/08	22/01/08	M-07
Cable	HUBER+SUHNER	SUCOFLEX104	21/01/08	22/01/08	M-08
Cable	HUBER+SUHNER	SUCOFLEX106	21/01/08	22/01/08	M-09

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

5. SUMMARY OF TEST RESULTS

- Band 4, 7, 12, 13, 25(2), 26(5), 38

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	-	Conducted Output Power	N/A	Conducted	NA Note 2
2.1049	RSS-GEN[6.7]	Occupied Bandwidth	N/A		NA Note 2
24.232(d) 27.50(d.5)	RSS-130 [4.6] RSS-132 [5.4] RSS-133 [6.4] RSS-139 [6.5] RSS-199 [4.4]	Peak to Average Ratio	< 13 dB		NA Note 2
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Band Edge / Conducted Spurious Emissions	> 43 + 10log ₁₀ (P) dB at Band edge and for all out-of-band emissions		NA Note 2
27.53(m)	RSS-199 [4.5]	Band Edge / Conducted Spurious Emissions	> 40 + 10log ₁₀ (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log ₁₀ (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log ₁₀ (P) dB at all frequencies more than X MHz from the channel edge		NA Note 2
27.53(c.4)	RSS-130 [4.7.2]	Undesirable emissions in 763 ~ 775MHz & 793 ~ 806MHz	>65 + 10 log (P) dB in a 6.25 kHz band segment frequencies between 763-775 MHz and 793-805 MHz		NA Note 2
2.1055 22.355 24.235 27.54	RSS-130 [4.5] RSS-132 [5.3] RSS-133 [6.3] RSS-139 [6.4] RSS-199 [4.3]	Frequency Stability	< 2.5 ppm (Part 22) or Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		NA Note 2
27.50(b.10) 27.50(c.10)	RSS-130 [4.6]	Radiated Output Power (B12, 13)	< 3 Watts max. ERP (FCC & IC)		Radiated
22.913(a.5)	RSS-132 [5.4]	Radiated Output Power (B26, B5)	< 7 Watts max. ERP (FCC) < 11.5 Watts max. EIRP (IC)	C	
27.50(d.4)	RSS-139 [6.5]	Radiated Output Power (B4)	< 1 Watts max. EIRP (FCC & IC)	C	
24.232(c) 27.50(h.2)	RSS-133 [6.4] RSS-199 [4.4]	Radiated Output Power (B25, 2, 7, 38)	< 2 Watts max. EIRP (FCC & IC)	C	
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Undesirable Emissions	> 43 + 10log ₁₀ (P) dB for all out-of-band emissions	C	
27.53(m)	RSS-199 [4.5]	Undesirable Emissions (B7, 38)	> 55 + 10log ₁₀ (P) dB for all out-of-band emissions	C	
27.53(f)	RSS-130 [4.7.2]	Undesirable Emissions in 1559 ~ 1610 MHz	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions of less than 700 Hz bandwidth)	C	

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: These test items were not performed because this device uses the granted module.

(FCC ID : XMR201903EG25G, IC: 10224A-201903EG25G)

Please refer to the test report of the granted module

Note 3: The radiated test items were tested at DC 12 V and DC 24 V. And the worst case data are reported.

- Band41

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	-	Conducted Output Power	N/A	Conducted	C
2.1049	RSS-GEN[6.7]	Occupied Bandwidth	N/A		C
27.50(d.5)	RSS-199 [4.4]	Peak to Average Ratio	< 13 dB		C
27.53(m)	RSS-199 [4.5]	Band Edge / Conducted Spurious Emissions	> 40 + 10log10 (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log10 (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log10 (P) dB at all frequencies more than X MHz from the channel edge		C
27.54	RSS-199 [4.3]	Frequency Stability	Fundamental emissions must stay within Authorized frequency block (Part 27)		C
27.50(h.2)	RSS-199 [4.4]	Radiated Output Power (B41)	< 2 Watts max. EIRP (FCC & IC)		C
27.53(m)	RSS-199 [4.5]	Undesirable Emissions (B41)	> 55 + 10log ₁₀ (P) dB for all out-of-band emissions		C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: The radiated test items were tested at DC 12 V and DC 24 V. And the worst case data are reported.

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 41 (QPSK) DC 12 V

Emission Designator = **17M7G7D**

LTE OBW = 17.706 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41 (QPSK) DC 24 V

Emission Designator = **17M7G7D**

LTE OBW = 17.749 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41 (16QAM) DC 12 V

Emission Designator = **17M8W7D**

LTE OBW = 17.761 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41 (16QAM) DC 24 V

Emission Designator = **17M8W7D**

LTE OBW = 17.757 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

B. For substitution method

- 1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1 GHz respectively above ground.
- 2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
- 3) During the test, the turn table is rotated until the maximum signal is found.
- 4) Record the field strength meter's level. (ex. Spectrum reading level is -8.5 dBm)
- 5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 6) Increase the signal generator output till the field strength meter's level is equal to the item (4).
(ex. Signal generator level is -18.04 dBm)
- 7) The gain of the cable and amplifier between the signal generator and terminals of substituted antenna is 46.92 dB at test frequency.
- 8) Record the level at substituted antenna terminal. (ex. 28.88dBm)
- 9) The result is calculated as below;

$$\text{EIRP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBi)}$$

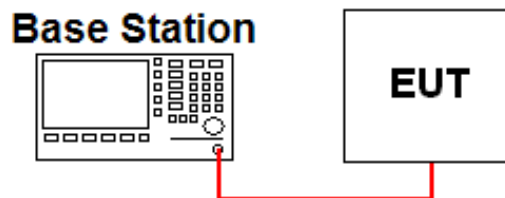
$$\text{ERP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBd)}$$

$$\text{Where, TX Antenna Gain (dBd)} = \text{TX Antenna Gain (dBi)} - 2.15 \text{ dB}$$

7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



- Band 41(DC 24V)

Conducted Power [dBm]									
RB Alloc			1 RB			MID RB			FULL RB
B.W(MHz)	Freq.(MHz)	Modulation	LOW	MID	HIGH	LOW	MID	HIGH	
20M	2 506	QPSK	19.57	19.83	19.65	18.45	18.74	18.74	18.60
		16QAM	17.98	18.53	18.08	17.52	17.72	17.81	17.65
	2 593	QPSK	19.63	19.70	19.60	18.50	18.52	18.47	18.40
		16QAM	18.04	18.26	17.92	17.52	17.62	17.37	17.49
	2 680	QPSK	19.62	19.68	19.49	18.64	18.53	18.41	18.60
		16QAM	18.20	18.27	17.83	17.60	17.50	17.47	17.54
15M	2 503.5	QPSK	19.61	19.65	19.77	18.44	18.61	18.64	18.53
		16QAM	17.91	18.04	18.28	17.44	17.62	17.65	17.58
	2 593	QPSK	19.65	19.71	19.61	18.40	18.46	18.35	18.38
		16QAM	18.07	18.12	18.00	17.33	17.51	17.39	17.57
	2 682.5	QPSK	19.60	19.49	19.49	18.62	18.58	18.40	18.55
		16QAM	18.21	18.08	17.86	17.44	17.51	17.45	17.59
10M	2 501	QPSK	19.71	19.73	19.96	18.55	18.72	18.64	18.50
		16QAM	18.21	18.40	18.26	17.71	17.67	17.61	17.64
	2 593	QPSK	19.60	19.58	19.59	18.52	18.49	18.33	18.37
		16QAM	18.00	18.19	17.90	17.49	17.76	17.42	17.48
	2 685	QPSK	19.53	19.50	19.48	18.50	18.46	18.39	18.54
		16QAM	18.13	18.20	17.97	17.52	17.72	17.66	17.51
5M	2 498.5	QPSK	19.54	19.54	19.55	18.51	18.55	18.51	18.57
		16QAM	18.13	18.16	18.17	17.71	17.76	17.73	17.59
	2 593	QPSK	19.48	19.57	19.52	18.35	18.47	18.31	18.40
		16QAM	17.94	18.11	17.98	17.49	17.60	17.48	17.54
	2 687.5	QPSK	19.45	19.44	19.57	18.38	18.41	18.41	18.44
		16QAM	17.91	17.92	17.88	17.41	17.62	17.42	17.49

Note 1: The conducted output power was measured using the Anritsu MT8820C

▪ Band 41(DC 12V)

Conducted Power [dBm]									
RB Alloc			1 RB			MID RB			FULL RB
B.W(MHz)	Freq.(MHz)	Modulation	LOW	MID	HIGH	LOW	MID	HIGH	
20M	2 506	QPSK	19.55	19.88	19.71	18.52	18.79	18.79	18.65
		16QAM	17.94	18.57	18.11	17.56	17.85	17.85	17.69
	2 593	QPSK	19.63	19.71	19.52	18.53	18.52	18.47	18.51
		16QAM	18.02	18.22	18.01	17.60	17.51	17.55	17.47
	2 680	QPSK	19.65	19.69	19.48	18.62	18.61	18.50	18.58
		16QAM	18.13	18.31	17.88	17.55	17.54	17.53	17.58
15M	2 680	QPSK	19.58	19.72	19.83	18.51	18.67	18.69	18.59
		16QAM	18.06	18.09	18.33	17.39	17.66	17.69	17.63
	2 503.5	QPSK	19.69	19.72	19.71	18.51	18.48	18.45	18.49
		16QAM	18.07	18.13	18.00	17.53	17.59	17.58	17.56
	2 593	QPSK	19.69	19.61	19.51	18.62	18.59	18.53	18.55
		16QAM	18.25	18.14	18.03	17.49	17.57	17.51	17.47
10M	2 682.5	QPSK	19.80	19.69	19.93	18.63	18.79	18.70	18.57
		16QAM	18.19	18.46	18.30	17.58	17.84	17.68	17.61
	2 501	QPSK	19.63	19.69	19.71	18.62	18.58	18.43	18.47
		16QAM	18.01	18.41	17.99	17.49	17.76	17.71	17.54
	2 593	QPSK	19.83	19.63	19.52	18.60	18.49	18.41	18.48
		16QAM	18.30	18.26	17.95	17.67	17.65	17.73	17.53
5M	2 685	QPSK	19.66	19.70	19.67	18.55	18.70	18.66	18.62
		16QAM	18.21	18.24	18.23	17.60	17.74	17.70	17.66
	2 498.5	QPSK	19.55	19.64	19.49	18.42	18.55	18.40	18.48
		16QAM	18.03	18.21	17.98	17.68	17.61	17.56	17.73
	2 593	QPSK	19.46	19.55	19.45	18.49	18.43	18.42	18.48
		16QAM	17.97	17.97	17.88	17.50	17.63	17.53	17.68

Note 1: The conducted output power was measured using the Anritsu MT8820C

7.2 OCCUPIED BANDWIDTH

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.1

7.3 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.2

7.4 BAND EDGE EMISSIONS (Conducted)

- Plots of the EUT's Band Edge Emissions are shown in Clause 8.3

7.5 SPURIOUS AND HARMONICS EMISSIONS (Conducted)

- Plots of the EUT's Spurious Emissions are shown in Clause 8.4

7.6 ERP & EIRP

- Test Notes

- 1) This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the below table.

7.6.1 LTE Band 12

<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	704	QPSK	1/49	H	15.83	-0.63	15.20	0.033
		16QAM	1/49	H	14.84	-0.63	14.21	0.026
	711	QPSK	1/25	H	16.10	-0.62	15.48	0.035
		16QAM	1/25	H	14.83	-0.62	14.21	0.026
5	701.5	QPSK	1/12	H	15.16	-0.63	14.53	0.028
		16QAM	1/12	H	13.94	-0.63	13.31	0.021
	707.5	QPSK	1/12	H	15.45	-0.62	14.83	0.030
		16QAM	1/12	H	14.75	-0.62	14.13	0.026
	713.5	QPSK	1/12	H	15.70	-0.62	15.08	0.032
		16QAM	1/12	H	14.61	-0.62	13.99	0.025
3	700.5	QPSK	1/7	H	15.25	-0.63	14.62	0.029
		16QAM	1/7	H	14.04	-0.63	13.41	0.022
	707.5	QPSK	1/7	H	15.47	-0.62	14.85	0.031
		16QAM	1/7	H	14.78	-0.62	14.16	0.026
	714.5	QPSK	1/7	H	15.73	-0.62	15.11	0.032
		16QAM	1/7	H	14.83	-0.62	14.21	0.026
1.4	699.7	QPSK	1/2	H	16.09	-0.63	15.46	0.035
		16QAM	1/2	H	15.14	-0.63	14.51	0.028
	707.5	QPSK	1/2	H	14.60	-0.62	13.98	0.025
		16QAM	1/2	H	13.80	-0.62	13.18	0.021
	715.3	QPSK	1/2	H	15.86	-0.62	15.24	0.033
		16QAM	1/2	H	14.49	-0.62	13.87	0.024

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	711	QPSK	1/49	H	15.90	-0.62	15.28	0.034
		16QAM	1/49	H	14.72	-0.62	14.10	0.026

7.6.2 LTE Band 13
<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	782	QPSK	1/25	H	20.61	-0.58	20.03	0.101
		16QAM	1/25	H	19.67	-0.58	19.09	0.081
5	779.5	QPSK	1/12	H	20.58	-0.58	20.00	0.100
		16QAM	1/12	H	19.78	-0.58	19.20	0.083
	784.5	QPSK	1/12	H	20.53	-0.58	19.95	0.099
		16QAM	1/12	H	20.17	-0.58	19.59	0.091

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	782	QPSK	1/25	H	20.20	-0.58	19.62	0.092
		16QAM	1/25	H	18.98	-0.58	18.40	0.069

7.6.3 LTE Band 26

<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
15	831.5	QPSK	1/36	H	17.88	-0.81	17.07	0.051
		16QAM	1/36	H	16.47	-0.81	15.66	0.037
	841.5	QPSK	1/36	H	17.18	-0.89	16.29	0.043
		16QAM	1/36	H	15.76	-0.89	14.87	0.031

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
15	831.5	QPSK	1/36	H	17.59	-0.81	16.78	0.048
		16QAM	1/36	H	16.39	-0.81	15.58	0.036

7.6.4 LTE Band 26(5)

<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	829	QPSK	1/25	H	17.74	-0.79	16.95	0.050
		16QAM	1/25	H	16.36	-0.79	15.57	0.036
	836.5	QPSK	1/25	H	17.84	-0.85	16.99	0.050
		16QAM	1/25	H	17.03	-0.85	16.18	0.041
	844	QPSK	1/25	H	17.31	-0.91	16.40	0.044
		16QAM	1/25	H	15.73	-0.91	14.82	0.030
5	826.5	QPSK	1/12	H	17.53	-0.78	16.75	0.047
		16QAM	1/12	H	16.12	-0.78	15.34	0.034
	836.5	QPSK	1/12	H	17.83	-0.85	16.98	0.050
		16QAM	1/12	H	17.01	-0.85	16.16	0.041
	846.5	QPSK	1/12	H	17.32	-0.93	16.39	0.044
		16QAM	1/12	H	15.82	-0.93	14.89	0.031
3	825.5	QPSK	1/7	H	17.52	-0.77	16.75	0.047
		16QAM	1/7	H	15.99	-0.77	15.22	0.033
	836.5	QPSK	1/7	H	17.81	-0.85	16.96	0.050
		16QAM	1/7	H	16.63	-0.85	15.78	0.038
	847.5	QPSK	1/7	H	17.23	-0.94	16.29	0.043
		16QAM	1/7	H	15.80	-0.94	14.86	0.031
1.4	824.7	QPSK	1/2	H	17.49	-0.76	16.73	0.047
		16QAM	1/2	H	15.98	-0.76	15.22	0.033
	836.5	QPSK	1/2	H	17.87	-0.85	17.02	0.050
		16QAM	1/2	H	17.08	-0.85	16.23	0.042
	848.3	QPSK	1/2	H	17.25	-0.95	16.30	0.043
		16QAM	1/2	H	15.78	-0.95	14.83	0.030

**7.6.5 LTE Band 4
<DC 24 V>**

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 720	QPSK	1/50	V	19.33	6.47	25.80	0.380
		16QAM	1/50	V	18.65	6.47	25.12	0.325
	1 732.5	QPSK	1/50	V	19.23	6.31	25.54	0.358
		16QAM	1/50	V	18.85	6.31	25.16	0.328
	1 745	QPSK	1/50	V	19.40	6.15	25.55	0.359
		16QAM	1/50	V	18.02	6.15	24.17	0.261
15	1 717.5	QPSK	1/36	V	17.62	6.50	24.12	0.258
		16QAM	1/36	V	16.58	6.50	23.08	0.203
	1 732.5	QPSK	1/36	V	17.30	6.31	23.61	0.230
		16QAM	1/36	V	16.56	6.31	22.87	0.194
	1 747.5	QPSK	1/36	V	17.91	6.12	24.03	0.253
		16QAM	1/36	V	16.57	6.12	22.69	0.186
10	1 715	QPSK	1/25	V	17.58	6.54	24.12	0.258
		16QAM	1/25	V	16.38	6.54	22.92	0.196
	1 732.5	QPSK	1/25	V	17.19	6.31	23.50	0.224
		16QAM	1/25	V	16.39	6.31	22.70	0.186
	1 750	QPSK	1/25	V	17.83	6.09	23.92	0.247
		16QAM	1/25	V	16.43	6.09	22.52	0.179
5	1 712.5	QPSK	1/12	V	17.25	6.57	23.82	0.241
		16QAM	1/12	V	16.27	6.57	22.84	0.192
	1 732.5	QPSK	1/12	V	17.06	6.31	23.37	0.217
		16QAM	1/12	V	16.44	6.31	22.75	0.188
	1 752.5	QPSK	1/12	V	17.80	6.06	23.86	0.243
		16QAM	1/12	V	16.35	6.06	22.41	0.174
3	1 711.5	QPSK	1/7	V	17.29	6.58	23.87	0.244
		16QAM	1/7	V	16.20	6.58	22.78	0.190
	1 732.5	QPSK	1/7	V	17.04	6.31	23.35	0.216
		16QAM	1/7	V	16.53	6.31	22.84	0.192
	1 753.5	QPSK	1/7	V	17.74	6.05	23.79	0.239
		16QAM	1/7	V	16.45	6.05	22.50	0.178
1.4	1 710.7	QPSK	1/2	V	17.35	6.59	23.94	0.248
		16QAM	1/2	V	16.25	6.59	22.84	0.192
	1 732.5	QPSK	1/2	V	16.76	6.31	23.07	0.203
		16QAM	1/2	V	16.40	6.31	22.71	0.187
	1 754.3	QPSK	1/2	V	17.61	6.04	23.65	0.232
		16QAM	1/2	V	16.33	6.04	22.37	0.173

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 720	QPSK	1/50	V	19.60	6.47	26.07	0.405
		16QAM	1/50	V	18.47	6.47	24.94	0.312

7.6.6 LTE Band 25(2)
<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 860	QPSK	1/50	V	20.06	5.31	25.37	0.344
		16QAM	1/50	V	18.82	5.31	24.13	0.259
	1 882.5	QPSK	1/50	V	19.86	5.19	25.05	0.320
		16QAM	1/50	V	18.55	5.19	23.74	0.237
	1 905	QPSK	1/50	V	20.69	5.09	25.78	0.378
		16QAM	1/50	V	18.96	5.09	24.05	0.254
15	1 857.5	QPSK	1/36	V	19.62	5.32	24.94	0.312
		16QAM	1/36	V	18.61	5.32	23.93	0.247
	1 882.5	QPSK	1/36	V	19.80	5.19	24.99	0.316
		16QAM	1/36	V	18.49	5.19	23.68	0.233
	1 907.5	QPSK	1/36	V	19.97	5.08	25.05	0.320
		16QAM	1/36	V	18.23	5.08	23.31	0.214
10	1 855	QPSK	1/25	V	19.41	5.33	24.74	0.298
		16QAM	1/25	V	18.59	5.33	23.92	0.247
	1 882.5	QPSK	1/25	V	19.49	5.19	24.68	0.294
		16QAM	1/25	V	18.37	5.19	23.56	0.227
	1 910	QPSK	1/25	V	19.96	5.08	25.04	0.319
		16QAM	1/25	V	18.28	5.08	23.36	0.217
5	1 852.5	QPSK	1/12	V	19.15	5.34	24.49	0.281
		16QAM	1/12	V	18.47	5.34	23.81	0.240
	1 882.5	QPSK	1/12	V	19.38	5.19	24.57	0.286
		16QAM	1/12	V	18.15	5.19	23.34	0.216
	1 912.5	QPSK	1/12	V	19.96	5.08	25.04	0.319
		16QAM	1/12	V	18.35	5.08	23.43	0.220
3	1 851.5	QPSK	1/7	V	19.28	5.34	24.62	0.290
		16QAM	1/7	V	18.38	5.34	23.72	0.236
	1 882.5	QPSK	1/7	V	19.28	5.19	24.47	0.280
		16QAM	1/7	V	18.13	5.19	23.32	0.215
	1 913.5	QPSK	1/7	V	19.87	5.07	24.94	0.312
		16QAM	1/7	V	18.35	5.07	23.42	0.220
1.4	1 850.7	QPSK	1/2	V	19.31	5.35	24.66	0.292
		16QAM	1/2	V	18.31	5.35	23.66	0.232
	1 882.5	QPSK	1/2	V	19.26	5.19	24.45	0.279
		16QAM	1/2	V	18.06	5.19	23.25	0.211
	1 914.3	QPSK	1/2	V	19.94	5.07	25.01	0.317
		16QAM	1/2	V	18.07	5.07	23.14	0.206

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 905	QPSK	1/50	V	20.18	5.09	25.27	0.337
		16QAM	1/50	V	18.85	5.09	23.94	0.248

7.6.7 LTE Band 38
<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 580	QPSK	1/99	V	19.07	6.52	25.59	0.362
		16QAM	1/99	V	18.12	6.52	24.64	0.291
	2 595	QPSK	1/99	V	20.00	6.60	26.60	0.457
		16QAM	1/99	V	19.49	6.60	26.09	0.406
	2 610	QPSK	1/99	V	19.32	6.68	26.00	0.398
		16QAM	1/99	V	18.35	6.68	25.03	0.318
15	2 577.5	QPSK	1/74	V	19.04	6.51	25.55	0.359
		16QAM	1/74	V	18.10	6.51	24.61	0.289
	2 595	QPSK	1/74	V	19.96	6.60	26.56	0.453
		16QAM	1/74	V	18.77	6.60	25.37	0.344
	2 612.5	QPSK	1/74	V	19.39	6.69	26.08	0.406
		16QAM	1/74	V	18.61	6.69	25.30	0.339
10	2 575	QPSK	1/49	V	19.21	6.51	25.72	0.373
		16QAM	1/49	V	17.71	6.51	24.22	0.264
	2 595	QPSK	1/49	V	19.89	6.60	26.49	0.446
		16QAM	1/49	V	19.29	6.60	25.89	0.388
	2 615	QPSK	1/49	V	19.31	6.71	26.02	0.400
		16QAM	1/49	V	18.78	6.71	25.49	0.354
5	2 572.5	QPSK	1/24	V	19.17	6.50	25.67	0.369
		16QAM	1/24	V	18.58	6.50	25.08	0.322
	2 595	QPSK	1/24	V	19.77	6.60	26.37	0.434
		16QAM	1/24	V	18.86	6.60	25.46	0.352
	2 617.5	QPSK	1/24	V	19.07	6.72	25.79	0.379
		16QAM	1/24	V	18.37	6.72	25.09	0.323

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 595	QPSK	1/99	V	19.49	6.60	26.09	0.406
		16QAM	1/99	V	18.42	6.60	25.02	0.317
	2 610	QPSK	1/99	V	19.51	6.68	26.19	0.416
		16QAM	1/99	V	18.79	6.68	25.47	0.352

7.6.7 LTE Band 41
<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 506	QPSK	1/99	V	18.21	6.32	24.53	0.283
		16QAM	1/99	V	17.63	6.32	23.95	0.248
	2 593	QPSK	1/99	V	17.32	6.59	23.91	0.246
		16QAM	1/99	V	16.36	6.59	22.95	0.197
	2 680	QPSK	1/99	V	15.46	6.65	22.11	0.162
		16QAM	1/99	V	14.80	6.65	21.45	0.140
15	2 503.5	QPSK	1/74	V	17.20	6.32	23.52	0.225
		16QAM	1/74	V	16.20	6.32	22.52	0.179
	2 593	QPSK	1/74	V	16.89	6.59	23.48	0.223
		16QAM	1/74	V	16.19	6.59	22.78	0.190
	2 682.5	QPSK	1/74	V	15.45	6.65	22.10	0.162
		16QAM	1/74	V	14.46	6.65	21.11	0.129
10	2 501	QPSK	1/49	V	17.25	6.31	23.56	0.227
		16QAM	1/49	V	16.04	6.31	22.35	0.172
	2 593	QPSK	1/49	V	16.99	6.59	23.58	0.228
		16QAM	1/49	V	16.19	6.59	22.78	0.190
	2 685	QPSK	1/49	V	16.06	6.65	22.71	0.187
		16QAM	1/49	V	15.12	6.65	21.77	0.150
5	2 498.5	QPSK	1/24	V	17.16	6.31	23.47	0.222
		16QAM	1/24	V	16.56	6.31	22.87	0.194
	2 593	QPSK	1/24	V	16.69	6.59	23.28	0.213
		16QAM	1/24	V	15.88	6.59	22.47	0.177
	2 687.5	QPSK	1/24	V	15.78	6.65	22.43	0.175
		16QAM	1/24	V	15.20	6.65	21.85	0.153

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 506	QPSK	1/99	V	17.42	6.32	23.74	0.237
		16QAM	1/99	V	16.12	6.32	22.44	0.175
	2 680	QPSK	1/99	V	15.95	6.65	22.60	0.182
		16QAM	1/99	V	15.30	6.65	21.95	0.157

7.6.8 LTE Band 7
<DC 24 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 510	QPSK	1/50	V	20.54	6.33	26.87	0.486
		16QAM	1/50	V	18.76	6.33	25.09	0.323
	2 535	QPSK	1/50	V	20.73	6.37	27.10	0.513
		16QAM	1/50	V	19.38	6.37	25.75	0.376
	2 560	QPSK	1/50	V	19.78	6.45	26.23	0.420
		16QAM	1/50	V	18.79	6.45	25.24	0.334
15	2 507.5	QPSK	1/36	V	19.71	6.33	26.04	0.402
		16QAM	1/36	V	18.20	6.33	24.53	0.284
	2 535	QPSK	1/36	V	20.58	6.37	26.95	0.495
		16QAM	1/36	V	19.24	6.37	25.61	0.364
	2 562.5	QPSK	1/36	V	19.68	6.46	26.14	0.411
		16QAM	1/36	V	18.65	6.46	25.11	0.324
10	2 505	QPSK	1/25	V	19.69	6.32	26.01	0.399
		16QAM	1/25	V	18.51	6.32	24.83	0.304
	2 535	QPSK	1/25	V	20.54	6.37	26.91	0.491
		16QAM	1/25	V	19.14	6.37	25.51	0.356
	2 565	QPSK	1/25	V	19.72	6.47	26.19	0.416
		16QAM	1/25	V	18.39	6.47	24.86	0.306
5	2 502.5	QPSK	1/12	V	19.53	6.32	25.85	0.385
		16QAM	1/12	V	18.20	6.32	24.52	0.283
	2 535	QPSK	1/12	V	20.59	6.37	26.96	0.497
		16QAM	1/12	V	19.08	6.37	25.45	0.351
	2 567.5	QPSK	1/12	V	19.60	6.48	26.08	0.406
		16QAM	1/12	V	18.37	6.48	24.85	0.305

<DC 12 V>

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 535	QPSK	1/50	V	20.79	6.37	27.16	0.520
		16QAM	1/50	V	19.91	6.37	26.28	0.425

7.7 UNDESIRABLE EMISSIONS (Radiated)

- Test Notes

- 1) This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported.
- 2) The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions.
- 3) Limit Calculation for Band 2/4/5/12/13/25/26 = $43 + 10 \log_{10}(P[\text{Watts}])$
- 4) Limit Calculation for Band 7/38/41 = $55 + 10 \log_{10}(P[\text{Watts}])$
- 5) Limit Calculation for 1 559 MHz ~ 1 610 MHz in Band 13 = -70 dBW/MHz (equivalent isotropically radiated power for wideband signals)

7.7.1 LTE Band 12

<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	704	1/49	QPSK	1 416.90	V	-55.27	3.23	-52.04	67.24	28.20
				2 125.07	V	-56.39	3.32	-53.07	68.27	
				2 833.69	V	-56.03	5.05	-50.98	66.18	
				4 249.48	H	-55.90	7.84	-48.06	63.26	
			16QAM	1 417.05	V	-55.97	3.23	-52.74	66.95	27.21
				2 128.91	V	-55.57	3.32	-52.25	66.46	
	2 845.26	V		-56.08	5.06	-51.02	65.23			
	4 250.46	H		-56.49	7.84	-48.65	62.86			
	711	1/25	QPSK	1 422.31	V	-57.51	3.27	-54.24	69.72	28.48
				2 126.72	V	-55.48	3.32	-52.16	67.64	
				2 840.72	V	-56.26	5.06	-51.20	66.68	
				4 266.64	H	-56.47	7.81	-48.66	64.14	
16QAM			1 422.43	V	-57.81	3.27	-54.54	68.75	27.21	
			2 138.91	V	-56.51	3.32	-53.19	67.40		
				2 840.00	V	-55.87	5.06	-50.81	65.02	
				4 253.63	H	-57.13	7.83	-49.30	63.51	

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	711	1/49	QPSK	1 422.00	V	-55.47	3.27	-52.20	67.48	28.28
				2 124.79	V	-56.06	3.31	-52.75	68.03	
				2 847.60	V	-55.77	5.07	-50.70	65.98	
		1/49	16QAM	1 421.95	V	-55.60	3.27	-52.33	66.43	27.10
				2 127.89	V	-56.49	3.32	-53.17	67.27	
				2 843.93	V	-56.21	5.06	-51.15	65.25	

7.7.2 LTE Band 13
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	782	1/25	QPSK	2 356.30	H	-64.89	4.19	-60.70	80.73	33.03
				3 128.33	H	-61.46	5.68	-55.78	75.81	
				3 910.23	H	-58.55	7.27	-51.28	71.31	
				4 692.52	V	-61.31	8.28	-53.03	73.06	
			16QAM	2 355.85	H	-64.71	4.19	-60.52	79.61	32.09
				3 128.67	H	-62.70	5.68	-57.02	76.11	
				3 910.38	H	-59.52	7.27	-52.25	71.34	
				4 692.42	V	-62.74	8.28	-54.46	73.55	

UNDESIRABLE EMISSIONS IN 1 559 MHz ~ 1 610 MHz (LTE Band 13)

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result	Margin	Limit (dBm/MHz)
								(dBm)	(dB)	
10	782	1/25	QPSK	1 564.10	H	-54.04	6.01	-48.03	8.03	-40.00
			16QAM	1 564.17	H	-56.24	6.01	-50.23	10.23	

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	782	1/25	QPSK	2 346.38	H	-64.73	4.18	-60.55	80.17	32.62
				3 128.45	H	-59.21	5.68	-53.53	73.15	
				3 910.43	H	-59.29	7.27	-52.02	71.64	
				4 692.50	V	-62.39	8.28	-54.11	73.73	
10	782	1/25	16QAM	2 346.52	H	-65.15	4.18	-60.97	79.37	31.40
				3 128.35	H	-60.43	5.68	-54.75	73.15	
				3 910.48	H	-60.34	7.27	-53.07	71.47	
				4 692.38	V	-63.44	8.28	-55.16	73.56	

UNDESIRABLE EMISSIONS IN 1 559 MHz ~ 1 610 MHz (LTE Band 13)

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result	Margin	Limit (dBm/MHz)
								(dBm)	(dB)	
10	782	1/25	QPSK	1 564.17	H	-51.38	6.01	-45.37	5.37	-40.00
		1/25	16QAM	1 564.17	H	-54.93	6.01	-48.92	8.92	

7.7.3 LTE Band 26
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
15	831.5	1/36	QPSK	1 662.60	H	-53.85	4.54	-49.31	66.38	30.07
				2 494.22	V	-55.45	4.13	-51.32	68.39	
				3 325.70	H	-54.68	6.16	-48.52	65.59	
				4 156.73	H	-55.97	7.73	-48.24	65.31	
			16QAM	4 987.58	V	-56.62	8.35	-48.27	65.34	28.66
				1 662.48	H	-54.50	4.53	-49.97	65.63	
				2 477.68	V	-55.07	4.14	-50.93	66.59	
				3 325.19	H	-53.94	6.16	-47.78	63.44	
	841.5	1/36	QPSK	4 156.14	H	-56.32	7.73	-48.59	64.25	29.29
				4 988.20	V	-56.67	8.35	-48.32	63.98	
				1 682.69	H	-54.58	4.56	-50.02	66.31	
				2 538.08	V	-55.31	4.18	-51.13	67.42	
			16QAM	3 365.33	H	-50.09	6.31	-43.78	60.07	27.87
				4 206.71	H	-51.84	7.74	-44.10	60.39	
				5 047.88	V	-55.61	8.53	-47.08	63.37	
16QAM	1 682.46	H	-55.24	4.56	-50.68	65.55	27.87			
	2 537.76	V	-54.70	4.18	-50.52	65.39				
	3 365.02	H	-50.81	6.31	-44.50	59.37				
	4 206.68	H	-51.81	7.74	-44.07	58.94				
				5 047.73	V	-55.25	8.53	-46.72	61.59	

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
15	831.5	1/36	QPSK	1 662.60	H	-53.85	4.54	-49.31	66.08	29.78
				2 494.22	V	-55.45	4.13	-51.32	68.10	
				3 325.70	H	-54.68	6.16	-48.52	65.30	
				4 156.73	H	-55.97	7.73	-48.24	65.02	
				4 987.58	V	-56.62	8.35	-48.27	65.05	
			16QAM	1 662.48	H	-54.50	4.53	-49.97	65.55	28.58
				2 477.68	V	-55.07	4.14	-50.93	66.51	
				3 325.19	H	-53.94	6.16	-47.78	63.36	
				4 156.14	H	-56.32	7.73	-48.59	64.17	
				4 988.20	V	-56.67	8.35	-48.32	63.90	

7.7.4 LTE Band 4
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)		
								(dBm)	(dBc)			
20	1 720	1/50	QPSK	3 439.95	V	-53.02	8.73	-44.29	70.09	38.80		
				5 160.41	H	-53.76	10.80	-42.96	68.76			
				6 880.42	V	-42.09	12.03	-30.06	55.86			
				8 600.43	V	-50.84	13.51	-37.33	63.13			
			16QAM	3 440.11	V	-53.76	8.73	-45.03	70.15	38.12		
				5 160.05	H	-53.94	10.80	-43.14	68.26			
	6 880.42	V		-44.32	12.03	-32.29	57.41					
	1732.5	1/50	QPSK	3 465.30	V	-53.87	8.79	-45.08	70.62	38.54		
				5 197.79	H	-52.59	10.93	-41.66	67.20			
				6 930.29	V	-40.44	12.14	-28.30	53.84			
				8 662.61	V	-48.92	13.67	-35.25	60.79			
				16QAM	3 465.27	V	-53.30	8.79	-44.51		69.67	38.16
					5 197.91	H	-52.81	10.93	-41.88		67.04	
			6 930.20		V	-40.29	12.14	-28.15	53.31			
			8 662.94		V	-50.00	13.67	-36.33	61.49			
			1 745	1/50	QPSK	3 490.26	V	-53.17	8.80	-44.37	69.92	38.55
5 235.44						H	-52.27	10.93	-41.34	66.89		
6 980.46						V	-40.55	12.20	-28.35	53.90		
8 725.61						V	-49.70	13.74	-35.96	61.51		
16QAM	3 489.96	V			-55.48	8.80	-46.68	70.85	37.17			
	5 235.69	H			-53.44	10.93	-42.51	66.68				
	6 980.18	V			-42.27	12.20	-30.07	54.24				
	8 725.28	V			-49.58	13.74	-35.84	60.01				

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 720	1/50	QPSK	3 440.01	V	-54.12	8.73	-45.39	71.46	39.07
				5 160.63	H	-52.05	10.80	-41.25	67.32	
				6 880.23	V	-43.87	12.03	-31.84	57.91	
				8 600.69	V	-50.84	13.51	-37.33	63.40	
20	1 720	1/50	16QAM	3 440.52	V	-54.13	8.74	-45.39	70.33	37.94
				5 160.45	H	-52.01	10.80	-41.21	66.15	
				6 880.22	V	-45.07	12.03	-33.04	57.98	
				8 600.67	V	-52.62	13.51	-39.11	64.05	

7.7.5 LTE Band 25(2)
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)	
								(dBm)	(dBc)		
20	1 860	1/50	QPSK	3 720.11	V	-56.06	8.89	-47.17	72.54	38.37	
				5 580.09	V	-50.28	11.01	-39.27	64.64		
				7 440.56	V	-42.85	12.43	-30.42	55.79		
				9 300.60	H	-48.48	13.79	-34.69	60.06		
			16QAM	3 703.04	V	-56.84	8.88	-47.96	72.09		37.13
				5 580.25	V	-49.57	11.01	-38.56	62.69		
	7 440.30	V		-43.37	12.43	-30.94	55.07				
	QPSK	9 300.26	H	-47.68	13.79	-33.89	58.02	38.05			
		3 777.69	V	-56.41	8.97	-47.44	72.49				
		5 647.97	V	-53.24	11.06	-42.18	67.23				
	7 530.45	V	-44.05	12.56	-31.49	56.54	36.74				
	16QAM	9 413.05	H	-48.73	13.77	-34.96			60.01		
3 760.12		V	-56.88	8.92	-47.96	71.70					
5 647.85		V	-54.37	11.06	-43.31	67.05					
1 882.5	QPSK	1/50	7 530.44	V	-45.05	12.56		-32.49	56.23	38.78	
			9 413.25	H	-49.58	13.77		-35.81	59.55		
			3 810.09	V	-56.06	9.06	-47.00	72.78			
			5 715.48	V	-51.21	11.19	-40.02	65.80			
	16QAM	7 620.42	V	-43.21	12.60	-30.61	56.39	37.05			
		9 525.40	H	-48.18	13.74	-34.44	60.22				
		3 813.35	V	-55.47	9.08	-46.39	70.44				
		5 715.39	V	-50.63	11.19	-39.44	63.49				
QPSK	7 620.47	V	-44.39	12.60	-31.79	55.84	37.05				
	9 525.64	H	-49.25	13.74	-35.51	59.56					

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 905	1/50	QPSK	3 809.97	V	-55.08	9.06	-46.02	71.29	38.27
				5 715.09	V	-50.09	11.19	-38.90	64.17	
				7 620.35	V	-41.10	12.60	-28.50	53.77	
				9 525.58	H	-46.70	13.74	-32.96	58.23	
20	1 905	1/50	16QAM	3 810.21	V	-55.24	9.06	-46.18	70.12	36.94
				5 715.18	V	-50.34	11.19	-39.15	63.09	
				7 620.39	V	-42.10	12.60	-29.50	53.44	
				9 525.39	H	-47.85	13.74	-34.11	58.05	

7.7.6 LTE Band 38
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 580	1/99	QPSK	5 177.85	V	-52.80	10.86	-41.94	67.53	50.59
				7 766.82	V	-47.29	12.73	-34.56	60.15	
				10 355.85	H	-45.70	13.52	-32.18	57.77	
			16QAM	5 177.89	V	-53.46	10.86	-42.60	67.24	49.64
				7 766.76	V	-50.02	12.73	-37.29	61.93	
				10 355.46	H	-46.49	13.52	-32.97	57.61	
	2 595	1/99	QPSK	5 207.95	V	-50.64	10.94	-39.70	66.30	51.60
				7 811.78	V	-48.29	12.80	-35.49	62.09	
				10 415.82	H	-43.93	13.57	-30.36	56.96	
			16QAM	5 207.89	V	-52.68	10.94	-41.74	67.83	51.09
				7 811.72	V	-49.94	12.80	-37.14	63.23	
				10 415.60	H	-44.43	13.57	-30.86	56.95	
	2 610	1/99	QPSK	5 237.87	V	-51.23	10.92	-40.31	66.31	51.00
				7 856.69	V	-49.12	12.91	-36.21	62.21	
				10 475.67	H	-40.29	13.62	-26.67	52.67	
16QAM			5 237.89	V	-52.64	10.92	-41.72	66.75	50.03	
			7 856.68	V	-51.19	12.91	-38.28	63.31		
			10 475.61	H	-42.32	13.62	-28.70	53.73		

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 595	1/99	QPSK	5 207.75	V	-51.99	10.94	-41.05	67.14	51.09
				7 811.60	V	-46.98	12.80	-34.18	60.27	
				10 415.81	H	-43.22	13.57	-29.65	55.74	
			16QAM	5 207.97	V	-53.45	10.94	-42.51	67.53	50.02
				7 811.88	V	-48.96	12.80	-36.16	61.18	
				10 415.57	H	-46.30	13.57	-32.73	57.75	
	2 610	1/99	QPSK	5 237.95	V	-53.11	10.92	-42.19	68.38	51.19
				7 856.78	V	-47.45	12.91	-34.54	60.73	
				10 475.73	H	-40.56	13.62	-26.94	53.13	
			16QAM	5 238.06	V	-55.72	10.92	-44.80	70.27	50.47
				7 856.60	V	-49.56	12.91	-36.65	62.12	
				10 475.60	H	-43.72	13.62	-30.10	55.57	

7.7.6 LTE Band 41
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 506	1/99	QPSK	5 029.94	V	-63.26	10.61	-52.65	77.18	49.53
				7 544.89	V	-58.08	12.57	-45.51	70.03	
				10 355.73	V	-42.06	13.52	-28.54	53.07	
			16QAM	5 029.89	V	-64.25	10.61	-53.64	77.59	48.95
				7 544.77	V	-60.45	12.57	-47.88	71.83	
				10 355.77	V	-44.34	13.52	-30.82	54.77	
	2 593	1/99	QPSK	5 203.76	V	-59.76	10.94	-48.82	72.73	48.91
				7 805.90	V	-55.96	12.78	-43.18	67.10	
				10 407.66	V	-46.57	13.57	-33.00	56.91	
			16QAM	5 203.87	V	-61.21	10.94	-50.27	73.22	47.95
				7 805.79	V	-58.41	12.78	-45.63	68.58	
				10 407.79	V	-49.42	13.57	-35.85	58.80	
	2 680	1/99	QPSK	5 377.73	V	-57.72	10.92	-46.80	68.91	47.11
				8 066.94	V	-54.67	13.16	-41.51	63.62	
				10 755.68	V	-39.41	13.54	-25.87	47.97	
			16QAM	5 378.00	V	-59.75	10.92	-48.83	70.28	46.45
				8 066.68	V	-56.42	13.16	-43.26	64.71	
				10 755.71	V	-42.09	13.54	-28.55	50.00	

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 506	1/99	QPSK	5 029.81	V	-57.06	10.61	-46.45	70.19	48.74
				7 544.61	V	-53.56	12.57	-40.99	64.73	
				10 355.74	V	-46.78	13.52	-33.26	57.00	
			16QAM	5 029.67	V	-59.76	10.61	-49.15	71.59	47.44
				7 544.82	V	-54.13	12.57	-41.56	64.00	
				10 355.63	V	-46.37	13.52	-32.85	55.29	
	2 680	1/99	QPSK	5 377.81	V	-55.60	10.92	-44.68	67.28	47.60
				8 066.92	V	-47.83	13.16	-34.67	57.27	
				10 755.50	V	-39.59	13.54	-26.05	48.65	
			16QAM	5 377.61	V	-58.41	10.92	-47.49	69.44	46.95
				8 066.70	V	-49.01	13.16	-35.85	57.80	
				10 755.63	V	-41.27	13.54	-27.73	49.68	

7.7.7 LTE Band 7
<DC 24 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 510	1/50	QPSK	5 020.18	V	-47.71	10.58	-37.13	64.00	51.87
				7 530.36	H	-54.42	12.56	-41.86	68.73	
				10 040.46	H	-51.17	13.49	-37.68	64.55	
			16QAM	5 020.23	V	-49.28	10.58	-38.70	63.79	50.09
				7 530.31	H	-56.33	12.56	-43.77	68.86	
				10 040.31	H	-52.84	13.49	-39.35	64.44	
	2 535	1/50	QPSK	5 070.17	V	-47.21	10.72	-36.49	63.59	52.10
				7 605.17	H	-58.50	12.56	-45.94	73.04	
				10 140.44	H	-53.08	13.36	-39.72	66.82	
			16QAM	5 070.24	V	-49.15	10.72	-38.43	64.18	50.75
				7 605.27	H	-60.08	12.56	-47.52	73.27	
				10 140.47	H	-54.08	13.36	-40.72	66.47	
	2 560	1/99	QPSK	5 120.23	V	-46.51	10.77	-35.74	61.97	51.23
				7 680.35	H	-52.05	12.67	-39.38	65.61	
				10 240.41	H	-46.01	13.42	-32.59	58.82	
16QAM			5 120.07	V	-47.56	10.77	-36.79	62.03	50.24	
			7 680.21	H	-54.14	12.67	-41.47	66.71		
			10 240.46	H	-48.26	13.42	-34.84	60.08		

<DC 12 V>

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 535	1/50	QPSK	5 070.27	V	-50.46	10.72	-39.74	66.90	52.16
				7 605.27	H	-58.43	12.56	-45.87	73.03	
				10 140.45	H	-50.97	13.36	-37.61	64.77	
20	2 535	1/50	16QAM	5 070.14	V	-52.67	10.72	-41.95	68.23	51.28
				7 605.28	H	-59.03	12.56	-46.47	72.75	
				10 140.34	H	-52.60	13.36	-39.24	65.52	

7.8 FREQUENCY STABILITY

- Test Notes

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.

OPERATING FREQUENCY : 2 593 MHz
 REFERENCE VOLTAGE : 12 VDC
 LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	12	+20(Ref)	2,592,999,989	-11	-0.004 2	-0.000 000 424
100 %		-30	2,593,000,010	+10	+0.003 9	+0.000 000 386
100 %		-20	2,592,999,998	-2	-0.000 8	-0.000 000 077
100 %		-10	2,593,000,007	+7	+0.002 7	+0.000 000 270
100 %		+0	2,592,999,994	-6	-0.002 3	-0.000 000 231
100 %		+10	2,592,999,991	-9	-0.003 5	-0.000 000 347
100 %		+20	2,592,999,989	-11	-0.004 2	-0.000 000 424
100 %		+30	2,593,000,007	+7	+0.002 7	+0.000 000 270
100 %		+40	2,592,999,995	-5	-0.001 9	-0.000 000 193
100 %		+50	2,593,000,008	+8	+0.003 1	+0.000 000 309
115 %		13.80	+20	2,593,000,011	+11	+0.004 2
85 %	10.20	+20	2,592,999,994	-6	-0.002 3	-0.000 000 231

OPERATING FREQUENCY : 2 593 MHz
 REFERENCE VOLTAGE : 24 VDC
 LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	24	+20(Ref)	2,592,999,993	-7	-0.002 7	-0.000 000 270
100 %		-30	2,593,000,005	+5	+0.001 9	+0.000 000 193
100 %		-20	2,593,000,011	+11	+0.004 2	+0.000 000 424
100 %		-10	2,592,999,997	-3	-0.001 2	-0.000 000 116
100 %		0	2,593,000,016	+16	+0.006 2	+0.000 000 617
100 %		+10	2,592,999,998	-2	-0.000 8	-0.000 000 077
100 %		+20	2,592,999,993	-7	-0.002 7	-0.000 000 270
100 %		+30	2,593,000,005	+5	+0.001 9	+0.000 000 193
100 %		+40	2,592,999,993	-7	-0.002 7	-0.000 000 270
100 %		+50	2,592,999,989	-11	-0.004 2	-0.000 000 424
115 %		27.60	+20	2,593,000,008	+8	+0.003 1
85 %	20.40	+20	2,593,000,001	+1	+0.000 4	+0.000 000 039

8. TEST PLOTS

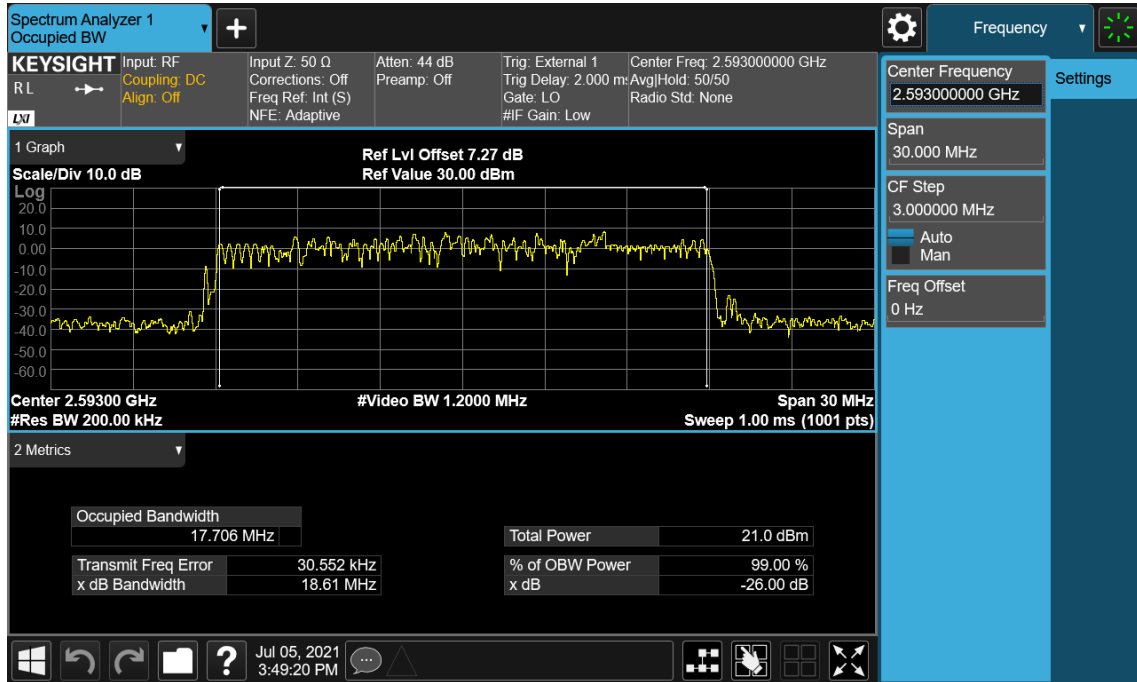
- Test Notes:

All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported.

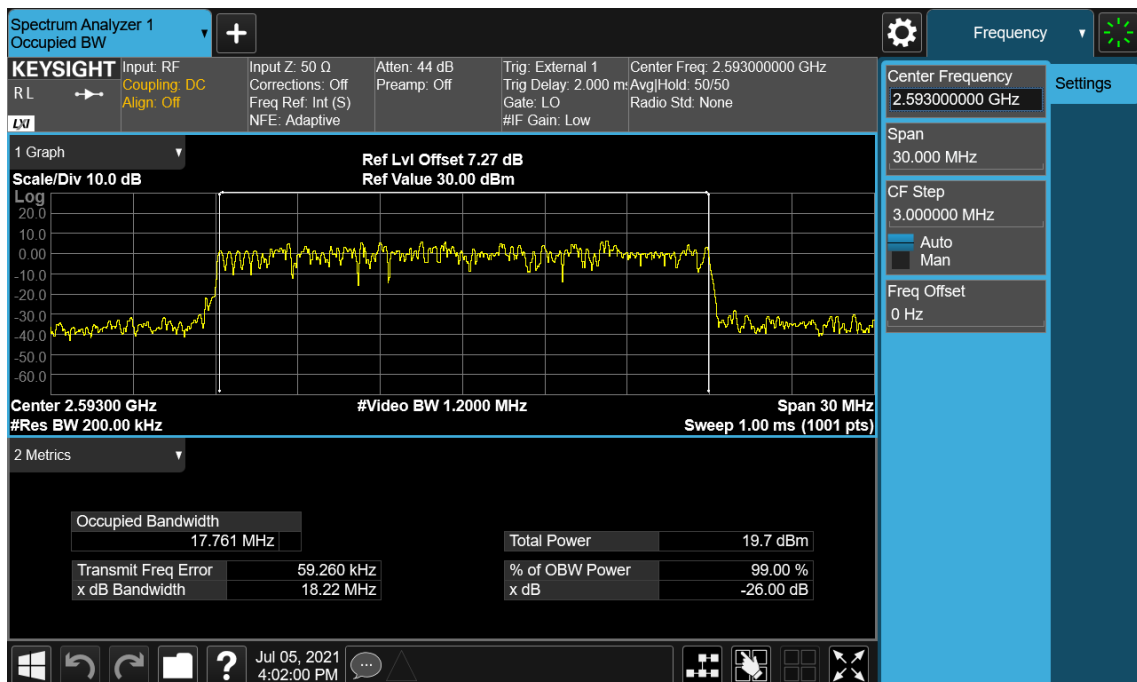
8.1 OCCUPIED BANDWIDTH

8.1.1 LTE Band 41

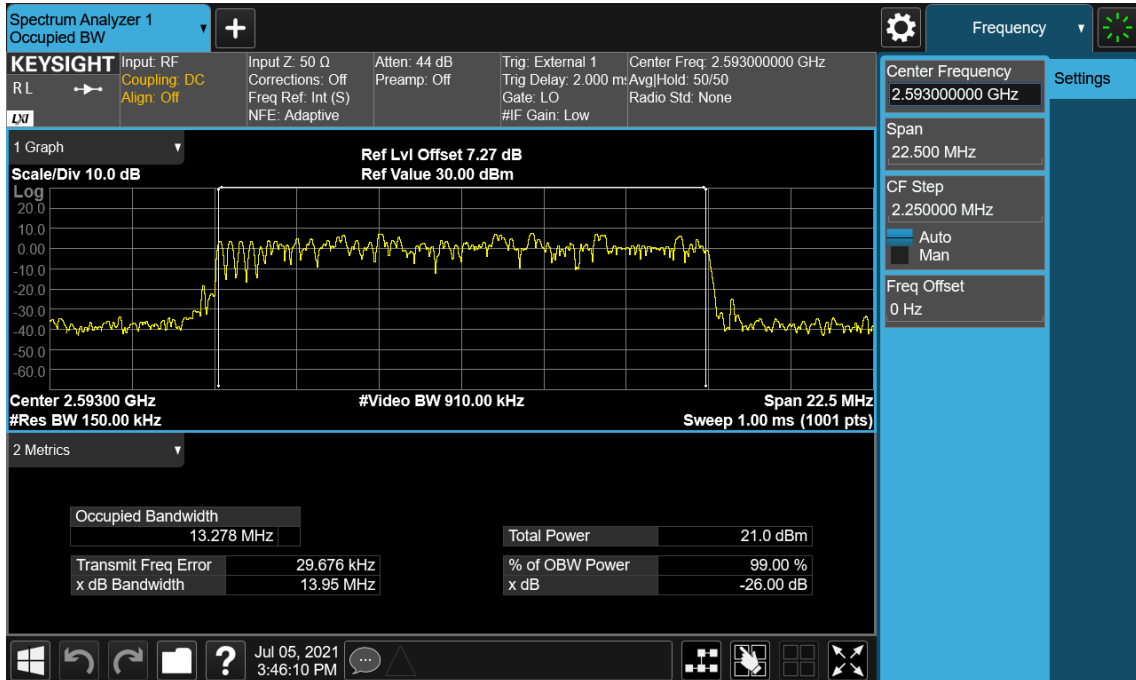
<DC 12 V>



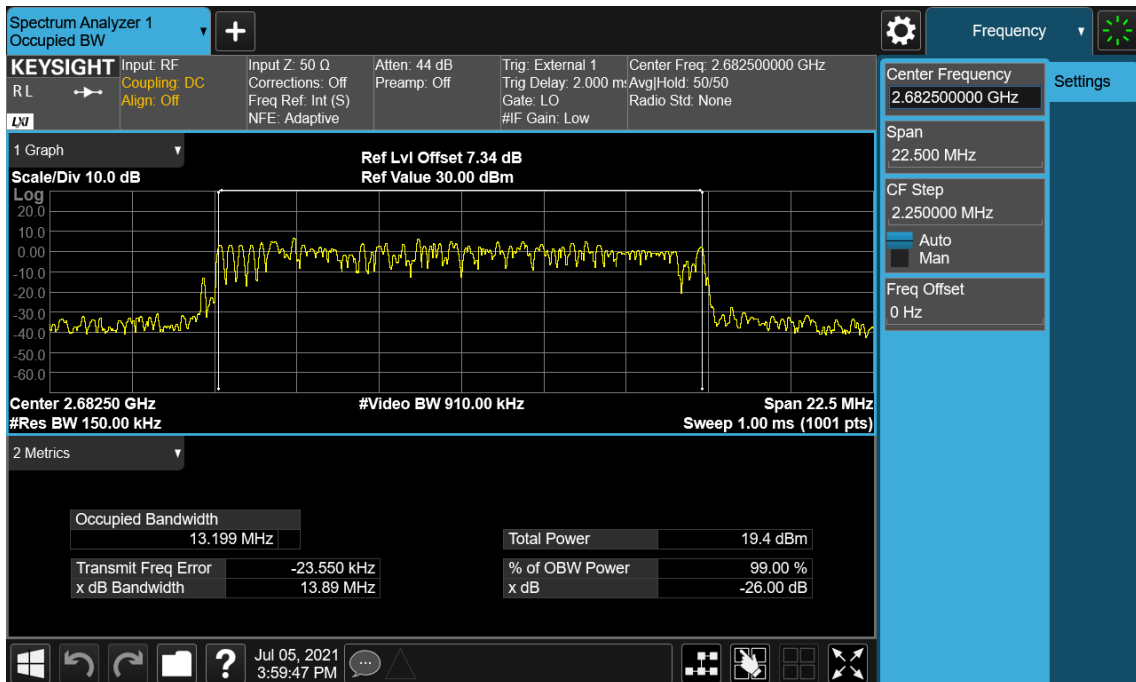
LTE Band 41 / 20 MHz / QPSK - RB Size 100



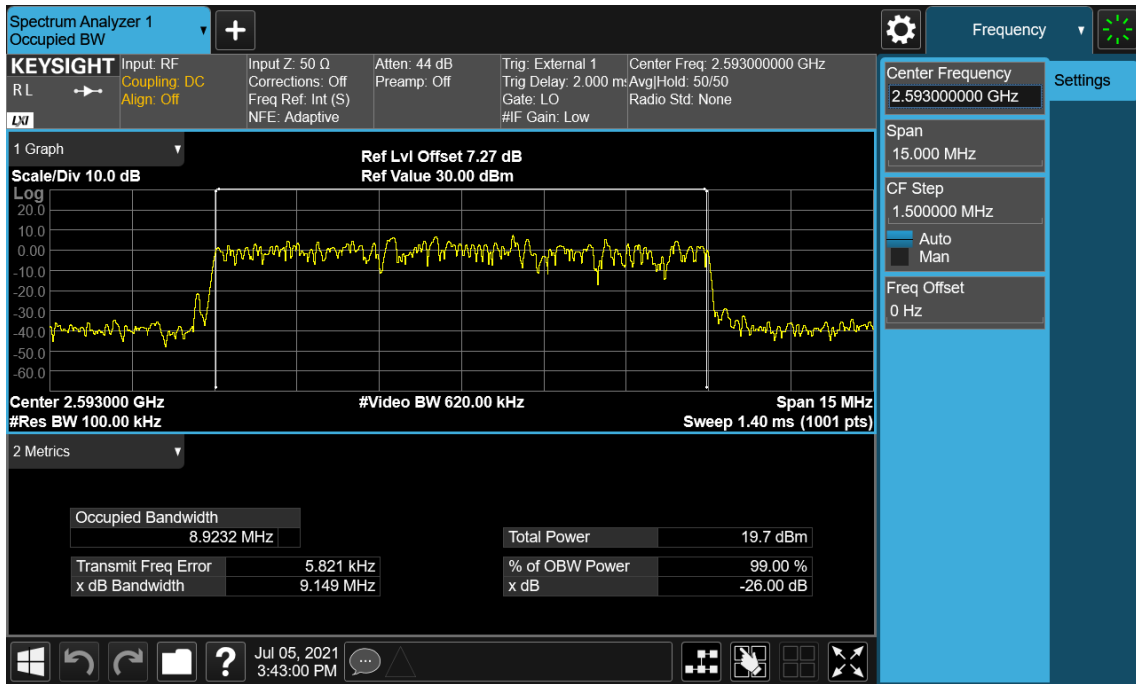
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



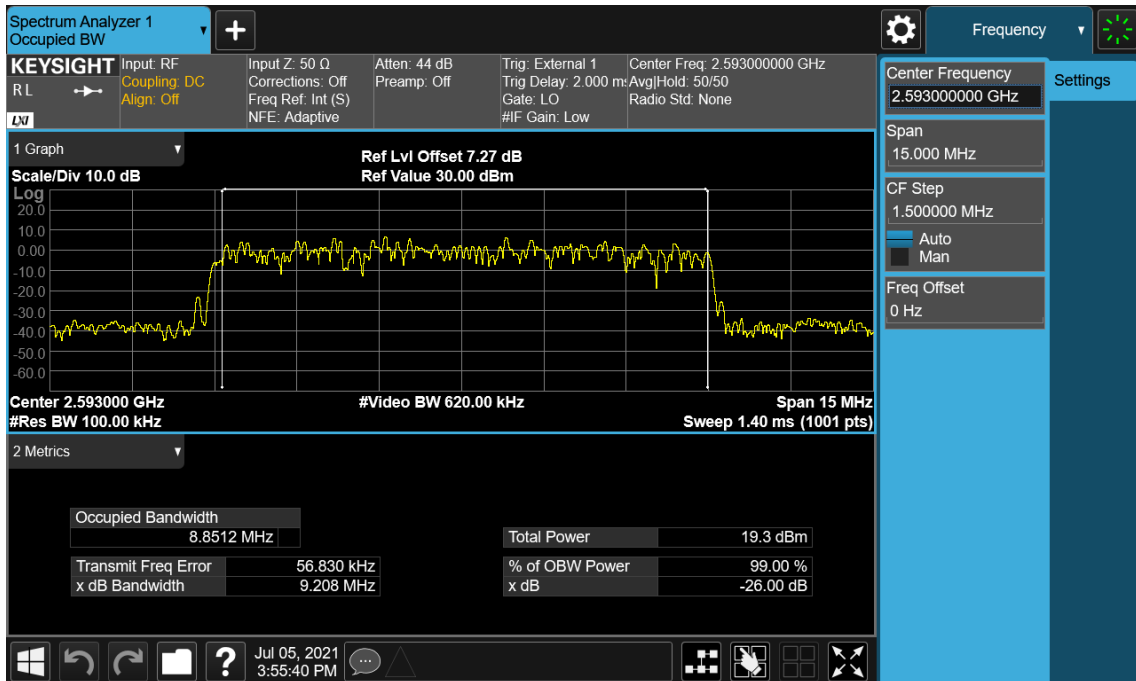
LTE Band 41 / 15 MHz / QPSK - RB Size 75



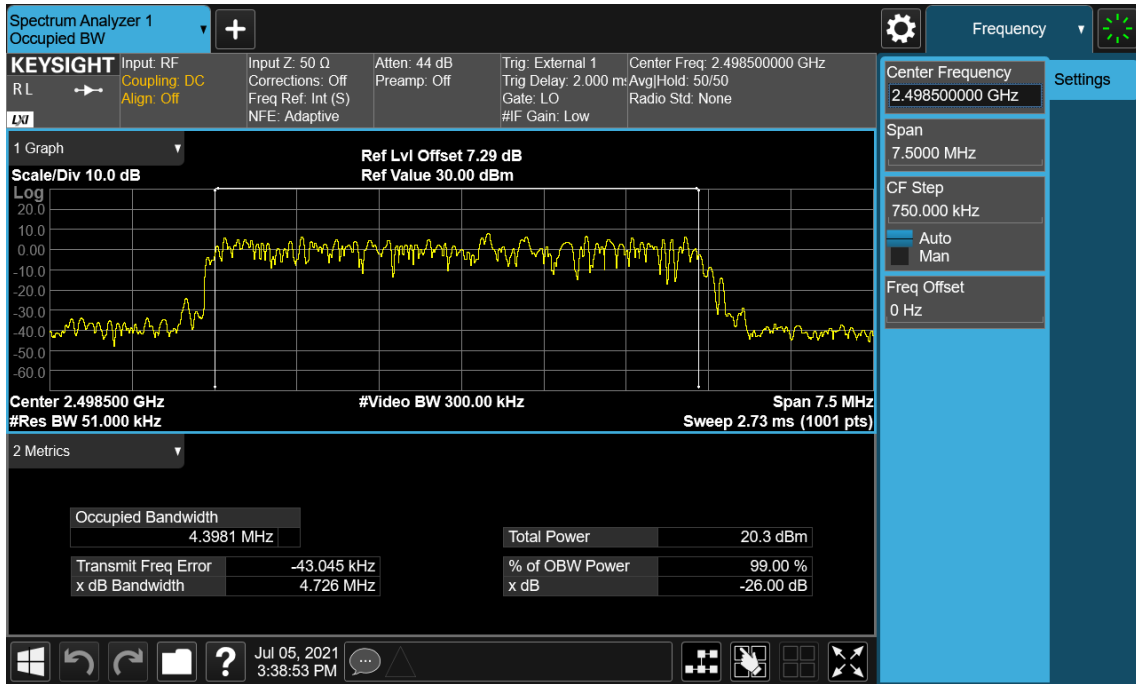
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



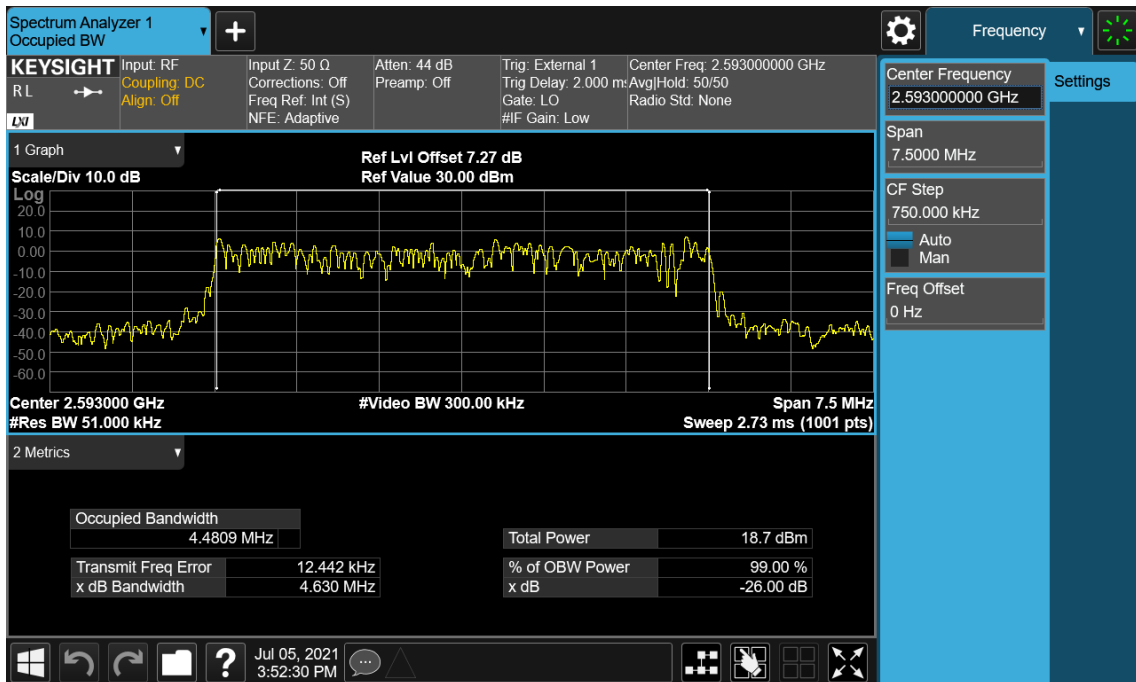
LTE Band 41 / 10 MHz / QPSK - RB Size 50



LTE Band 41 / 10 MHz / 16QAM - RB Size 50

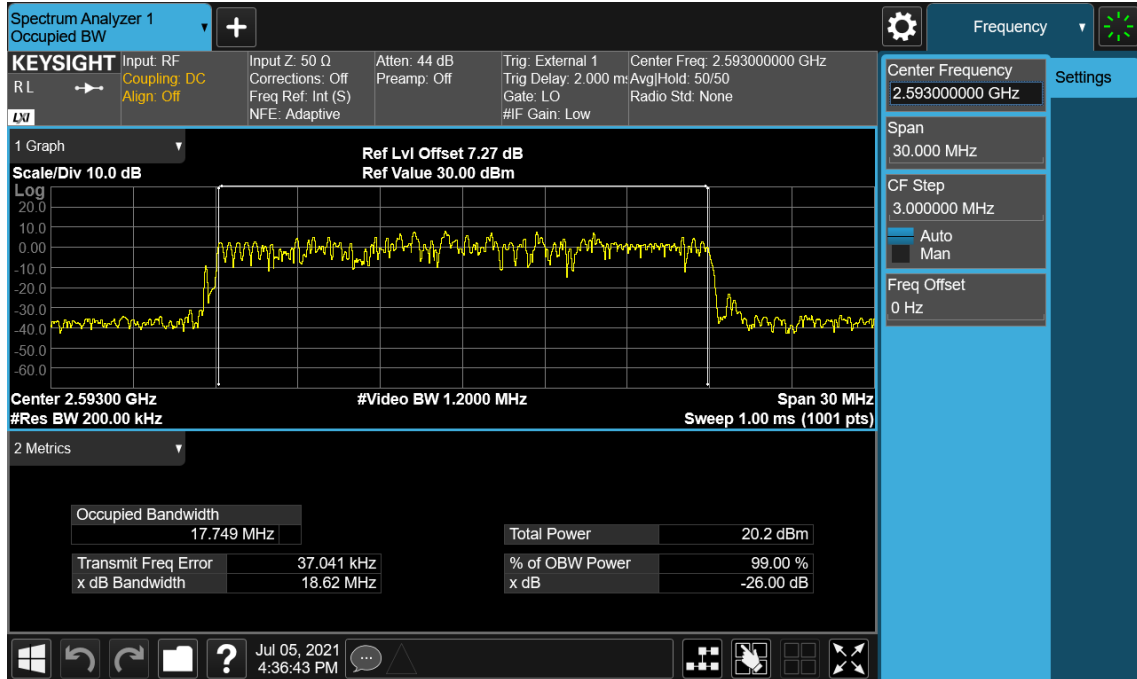


LTE Band 41 / 5 MHz / QPSK - RB Size 25

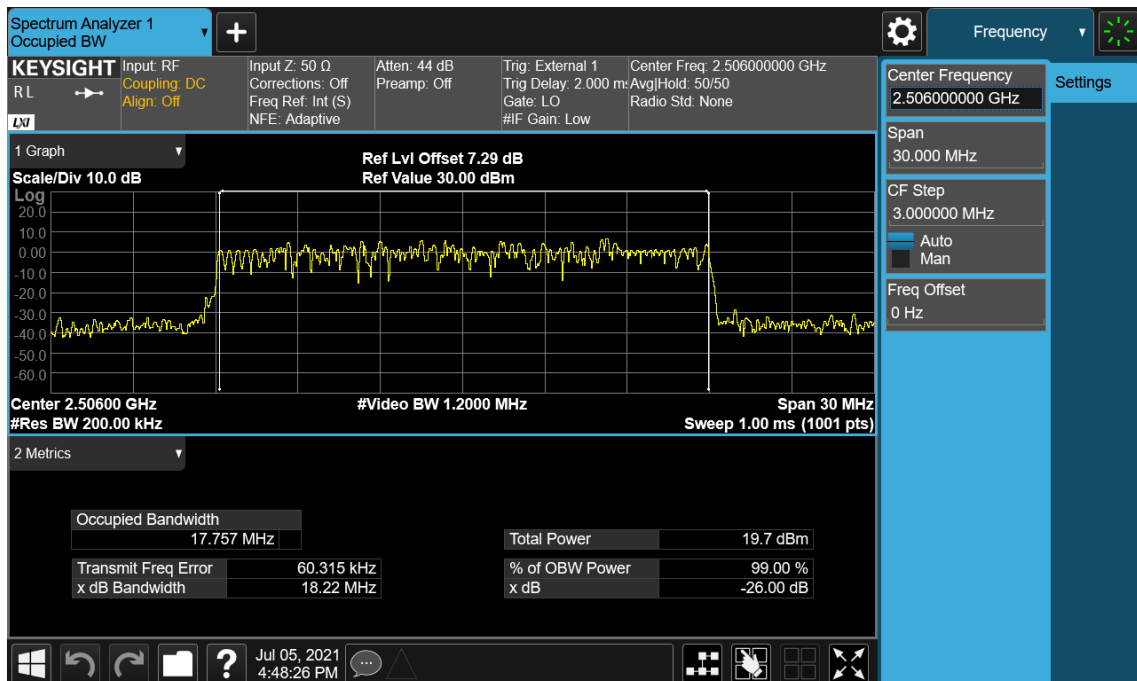


LTE Band 41 / 5 MHz / 16QAM - RB Size 25

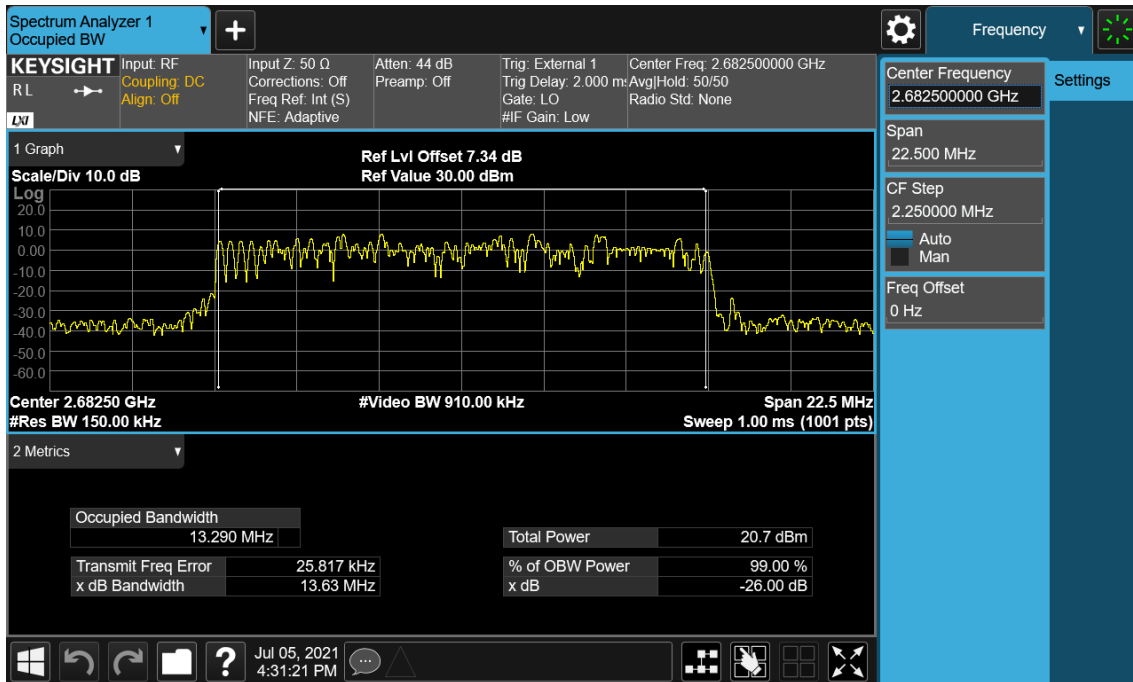
<DC 24 V>



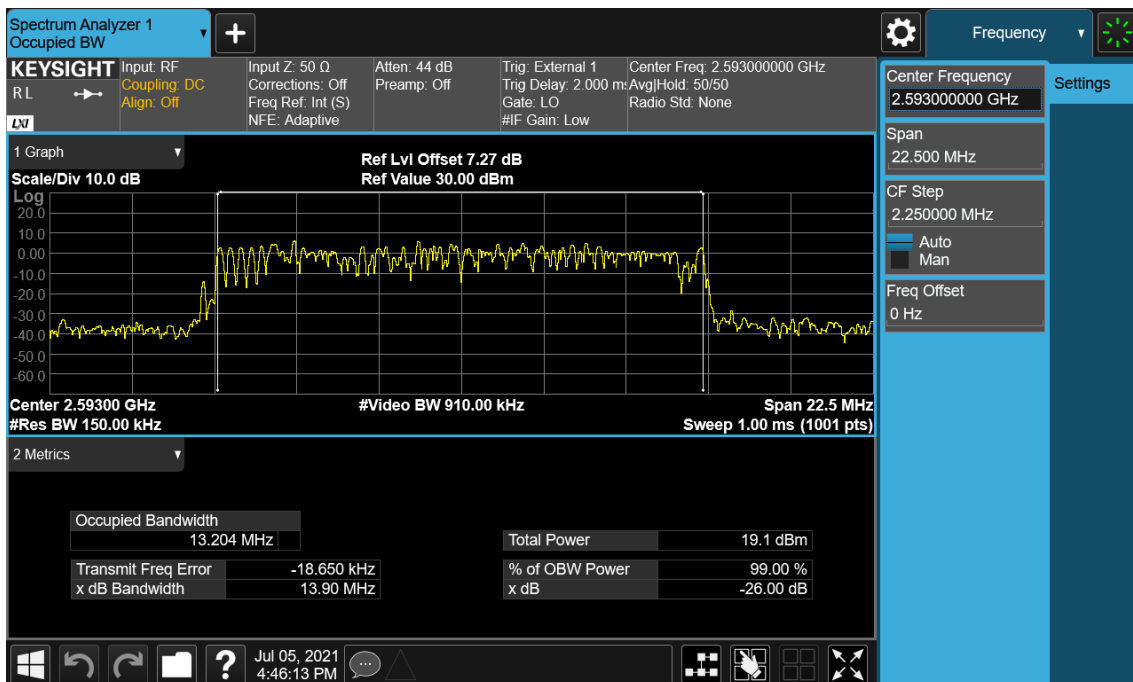
LTE Band 41 / 20 MHz / QPSK - RB Size 100



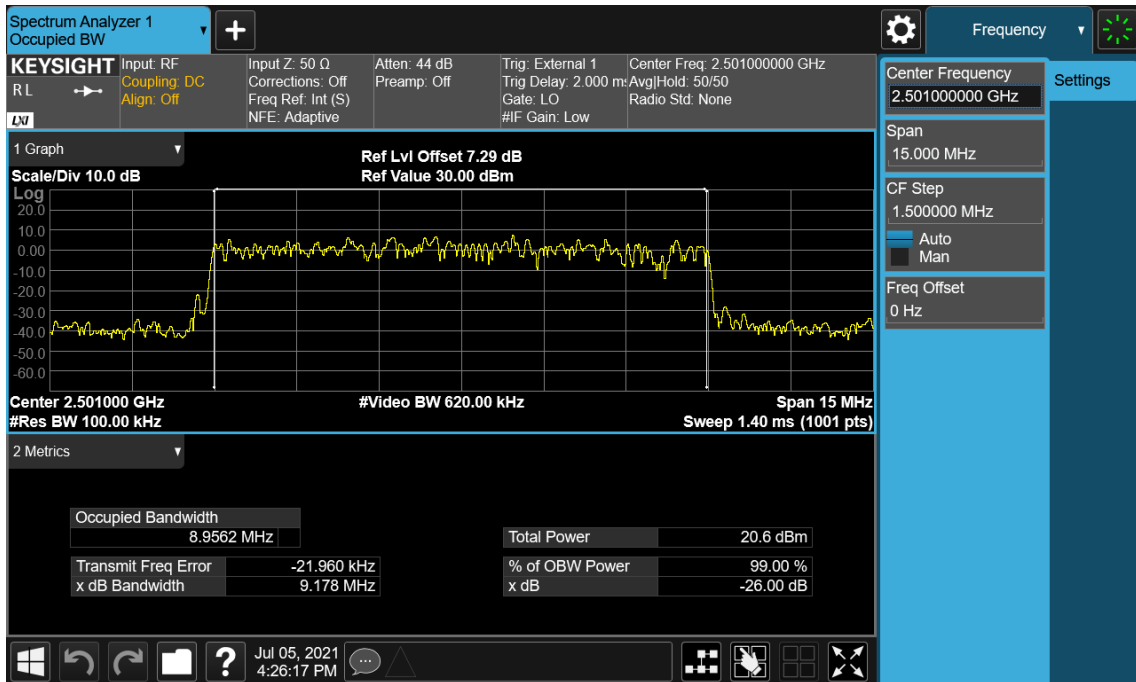
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



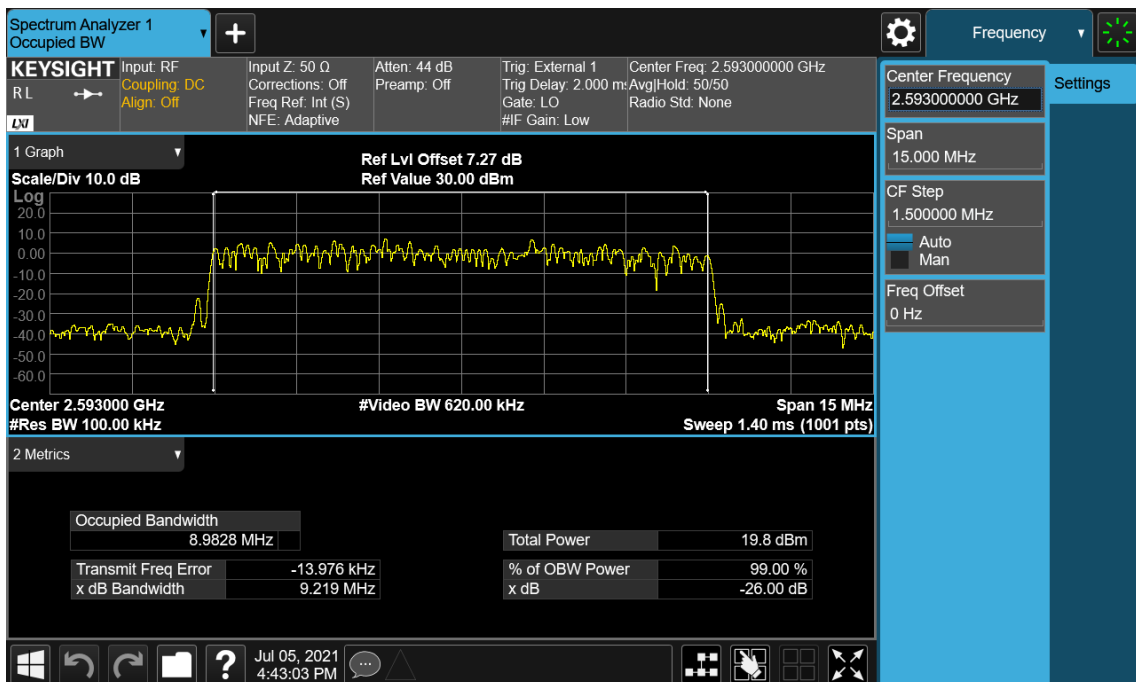
LTE Band 41 / 15 MHz / QPSK - RB Size 75



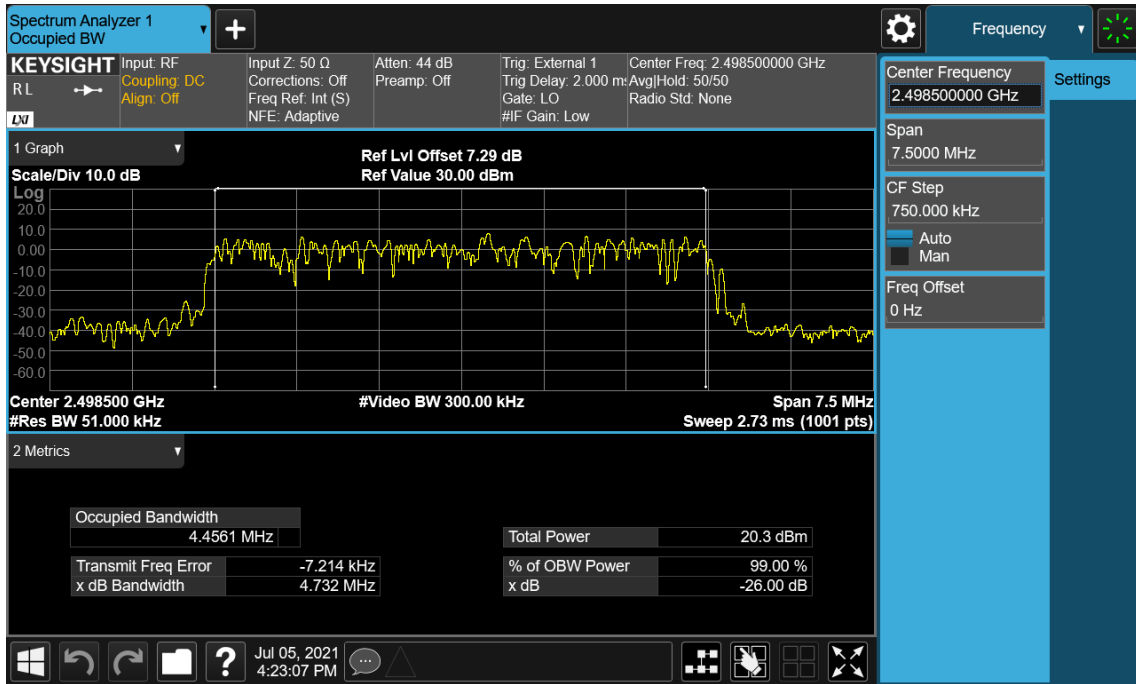
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



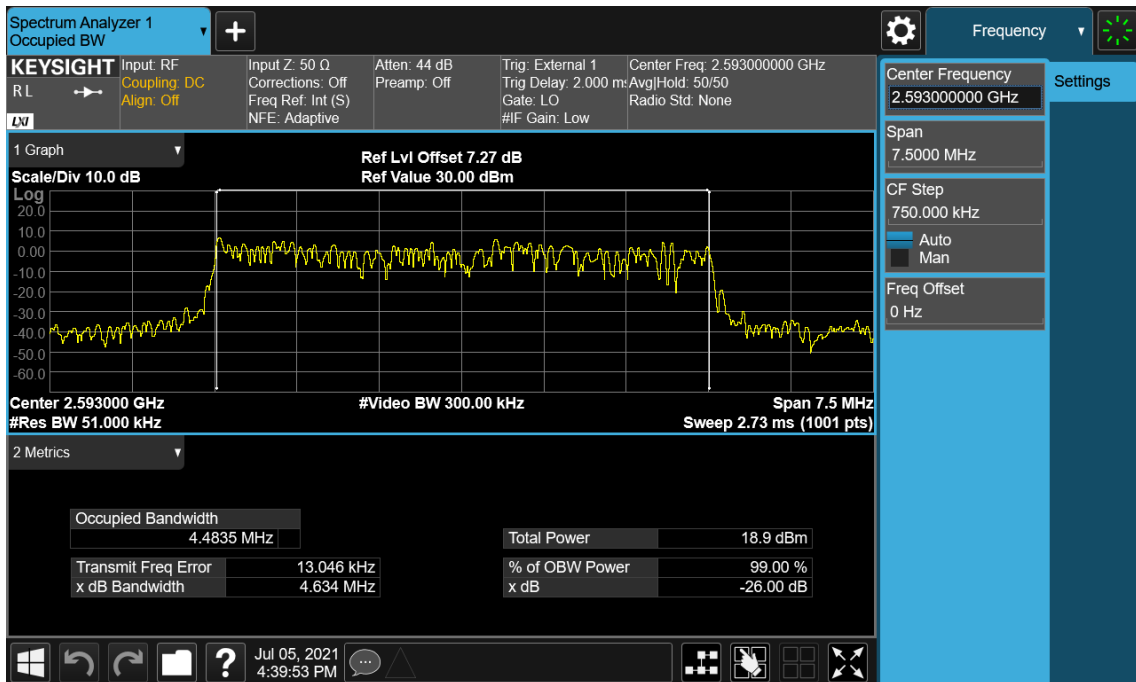
LTE Band 41 / 10 MHz / QPSK - RB Size 50



LTE Band 41 / 10 MHz / 16QAM - RB Size 50



LTE Band 41 / 5 MHz / QPSK - RB Size 25

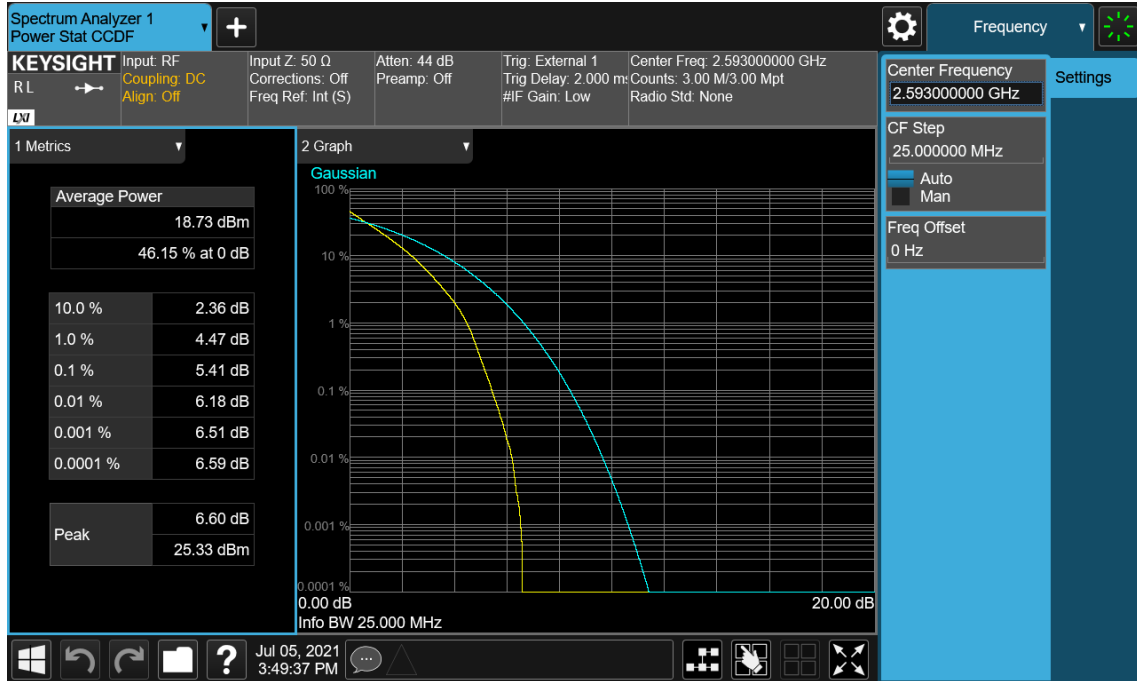


LTE Band 41 / 5 MHz / 16QAM - RB Size 25

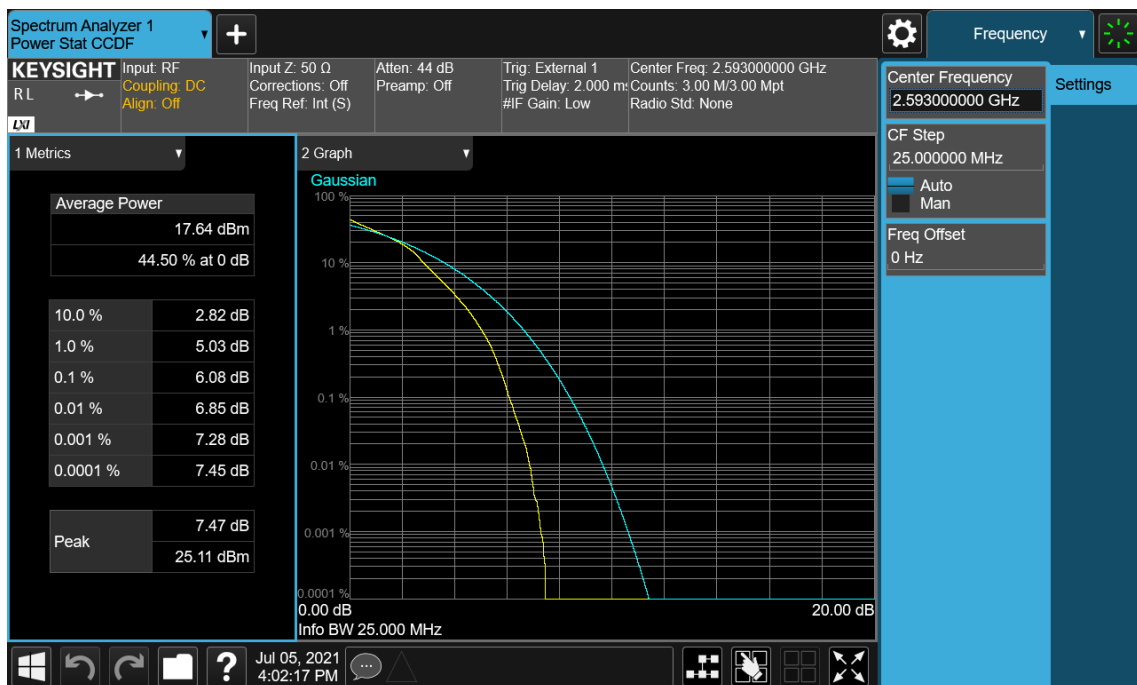
8.2 PEAK TO AVERAGE RATIO

8.2.1 LTE Band 41

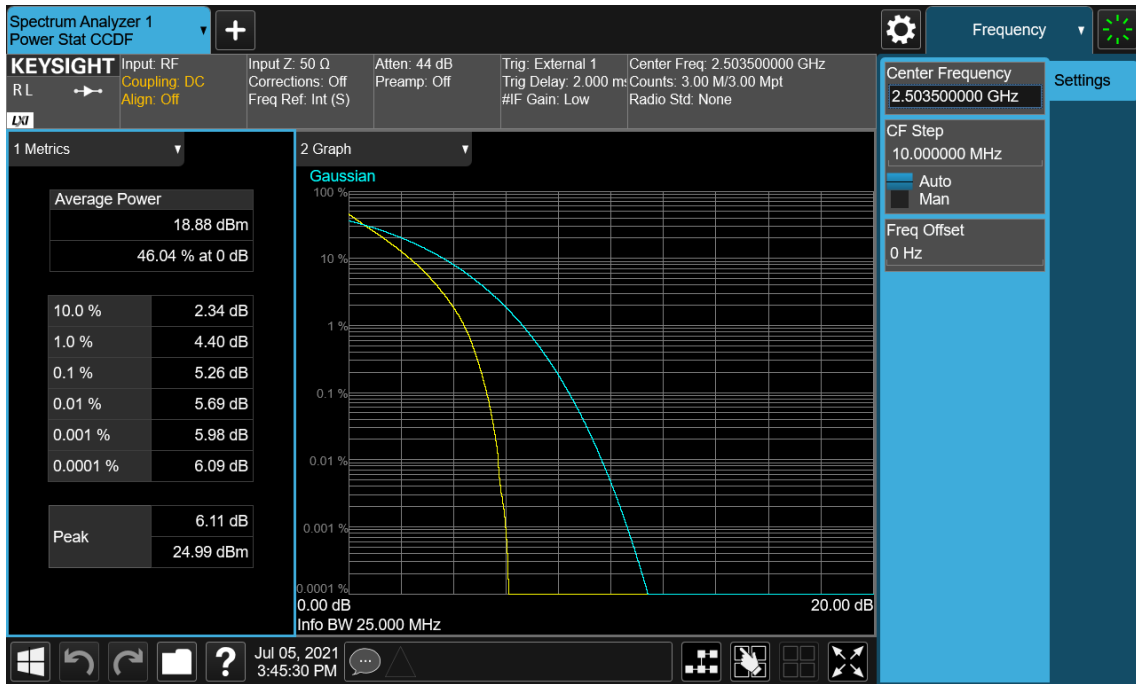
<DC 12 V>



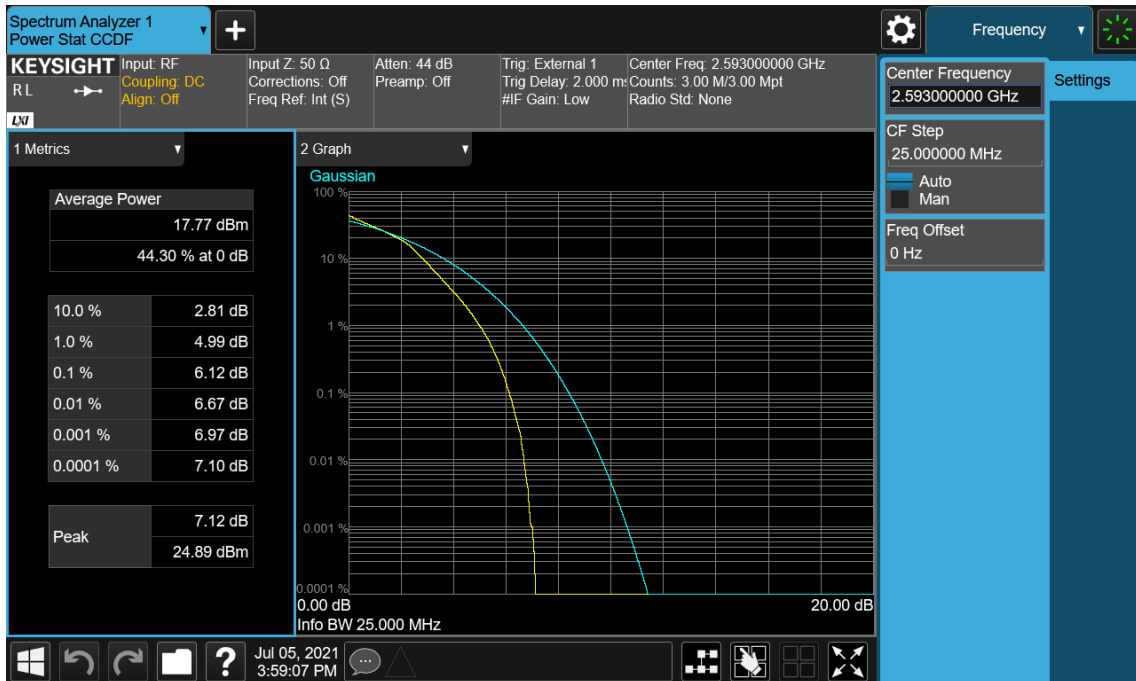
LTE Band 41 / 20 MHz / QPSK - RB Size 100



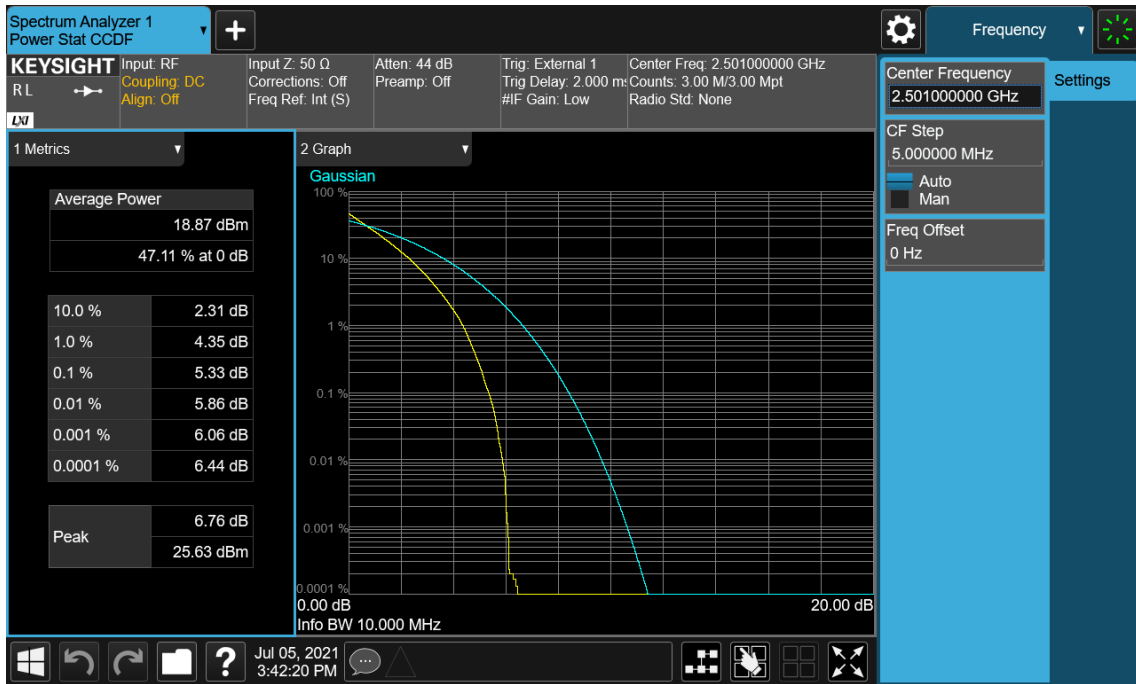
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



LTE Band 41 / 15 MHz / QPSK - RB Size 75



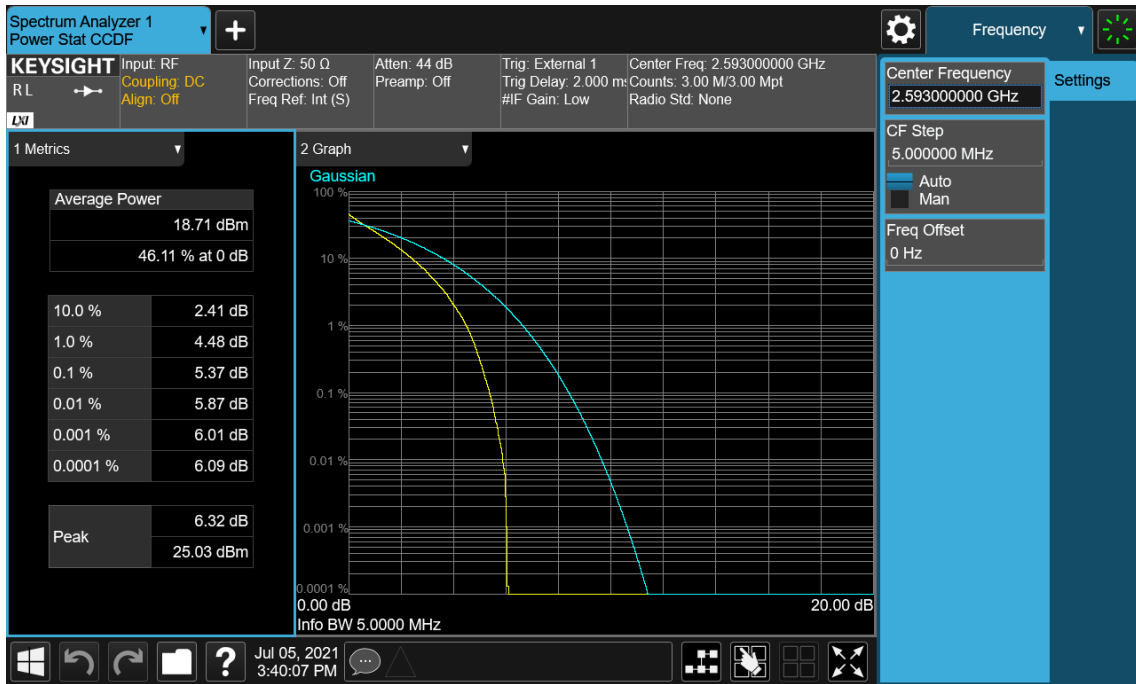
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



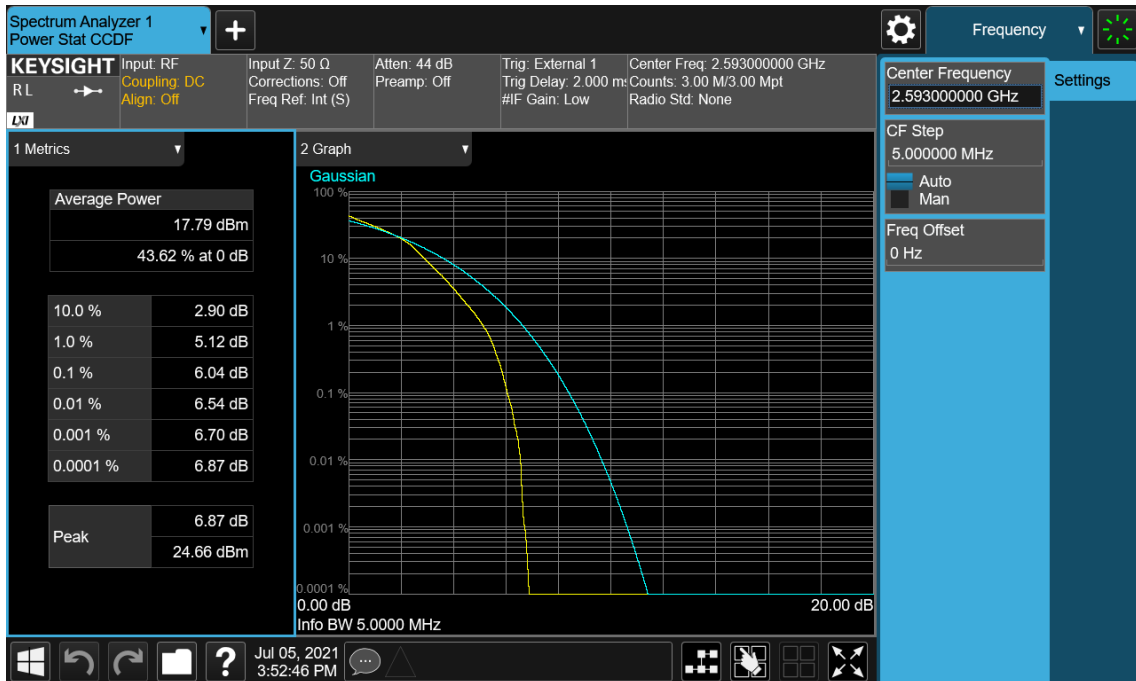
LTE Band 41 / 10 MHz / QPSK - RB Size 50



LTE Band 41 / 10 MHz / 16QAM - RB Size 50

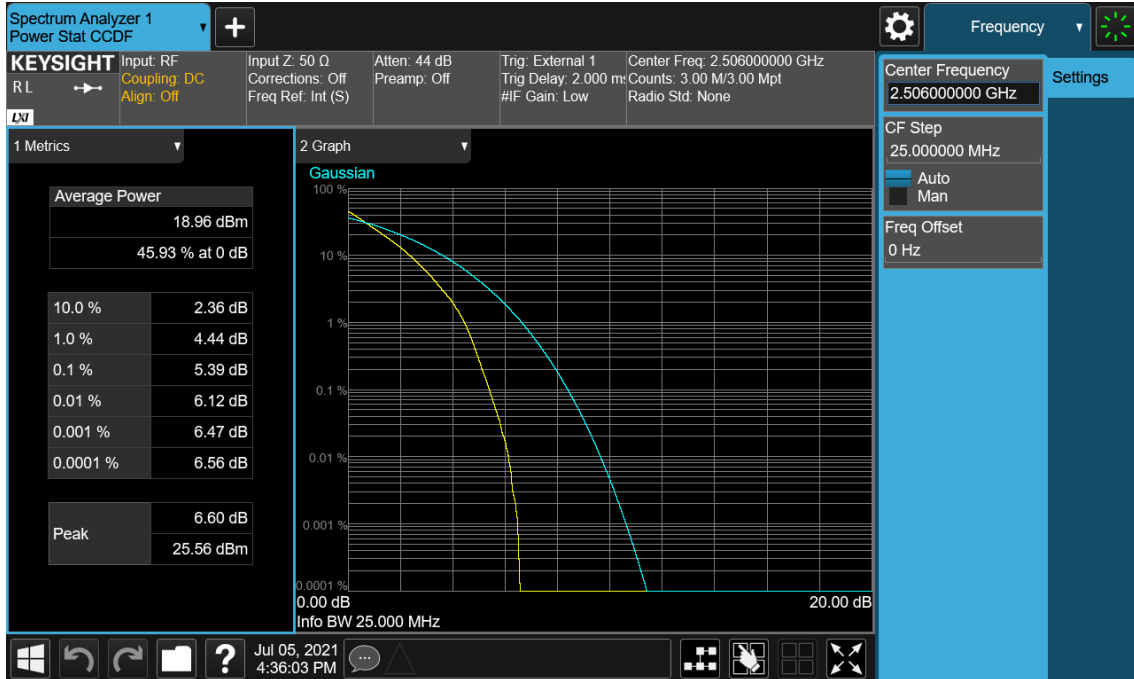


LTE Band 41 / 5 MHz / QPSK - RB Size 25

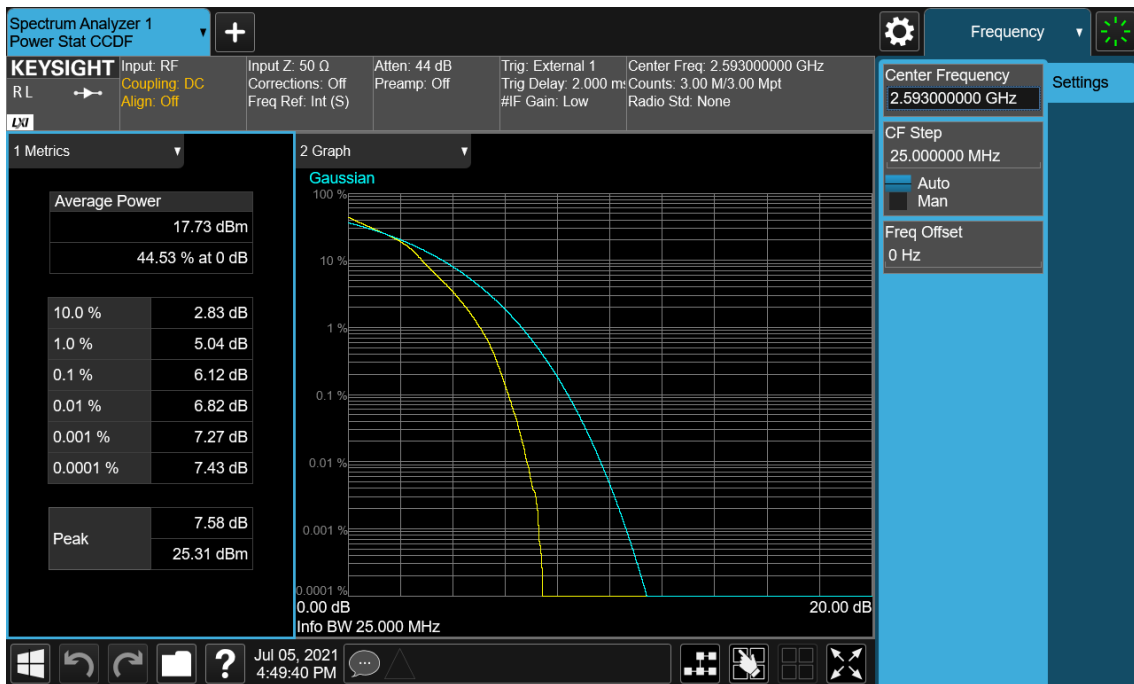


LTE Band 41 / 5 MHz / 16QAM - RB Size 25

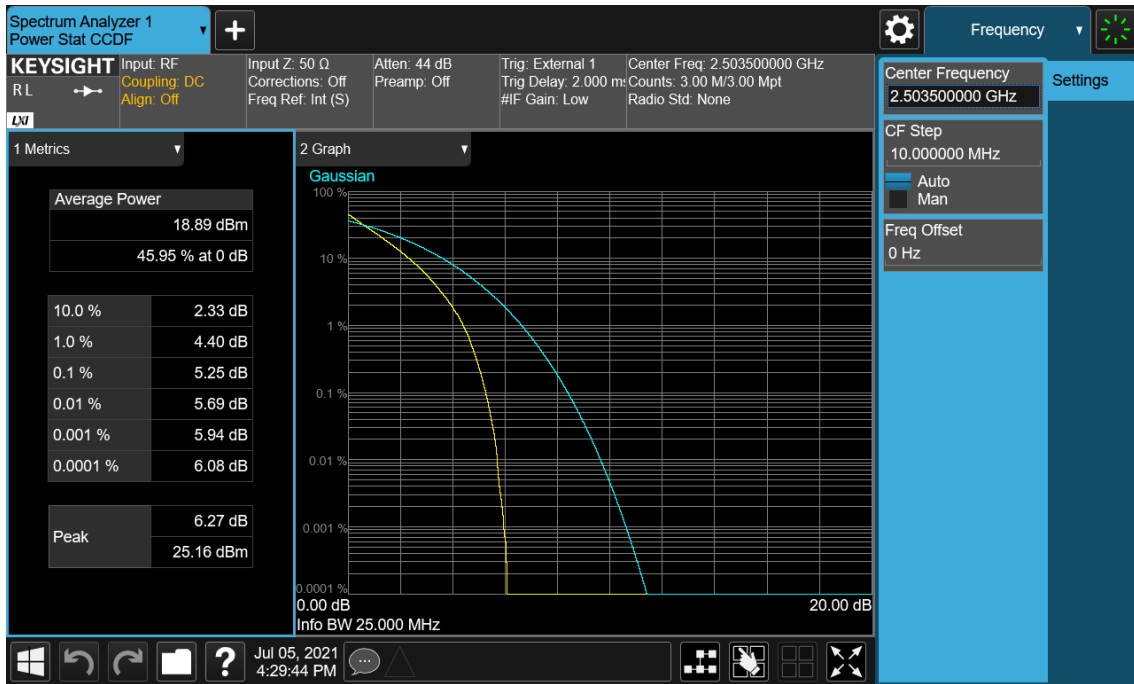
<DC 24 V>



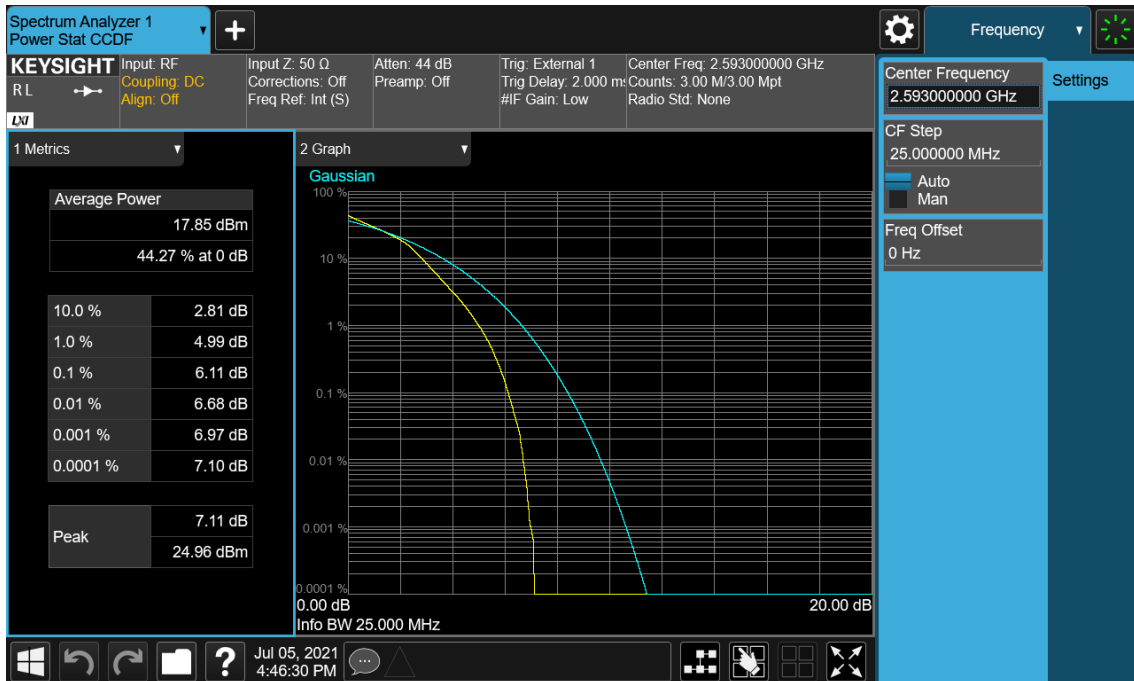
LTE Band 41 / 20 MHz / QPSK - RB Size 100



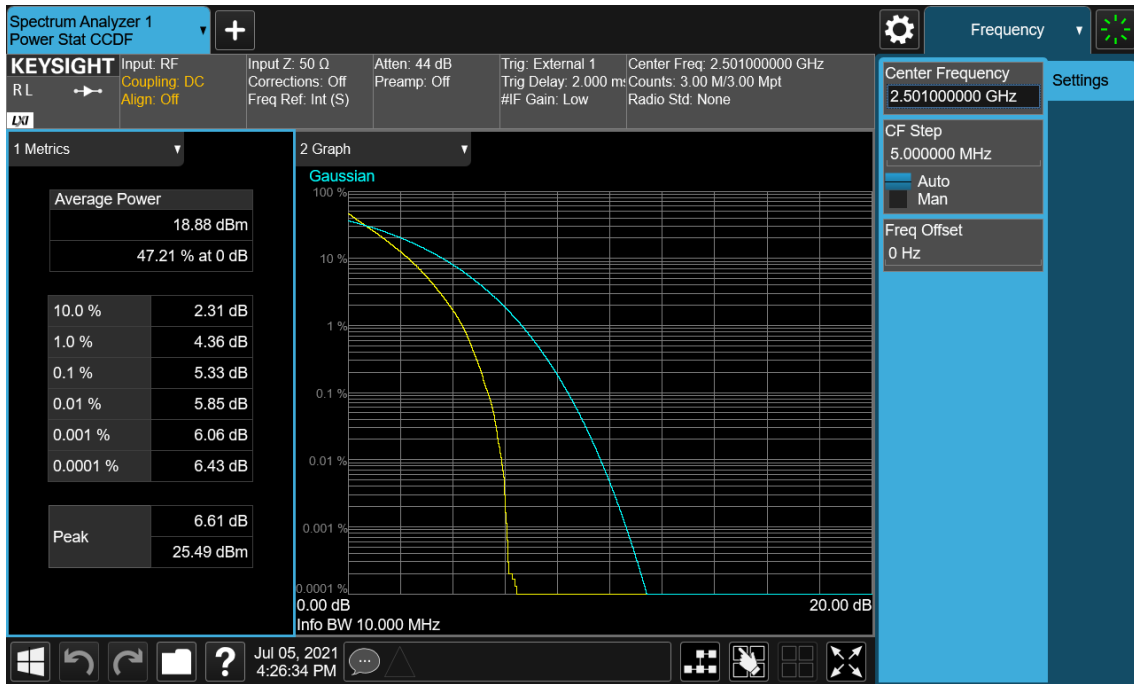
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



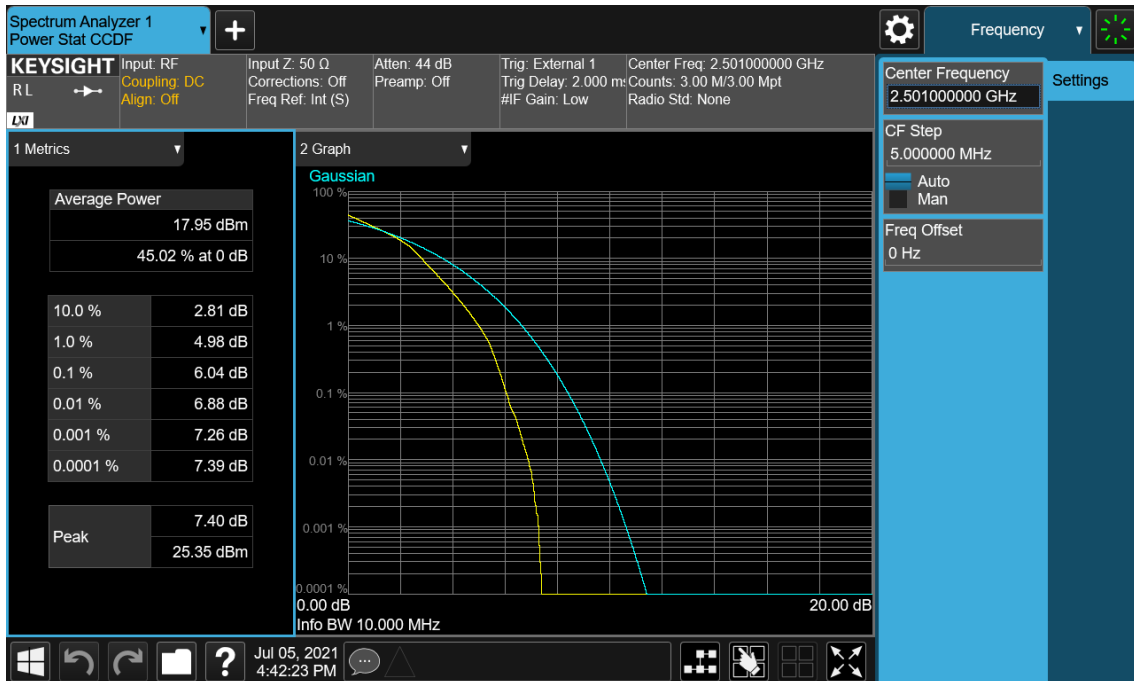
LTE Band 41 / 15 MHz / QPSK - RB Size 75



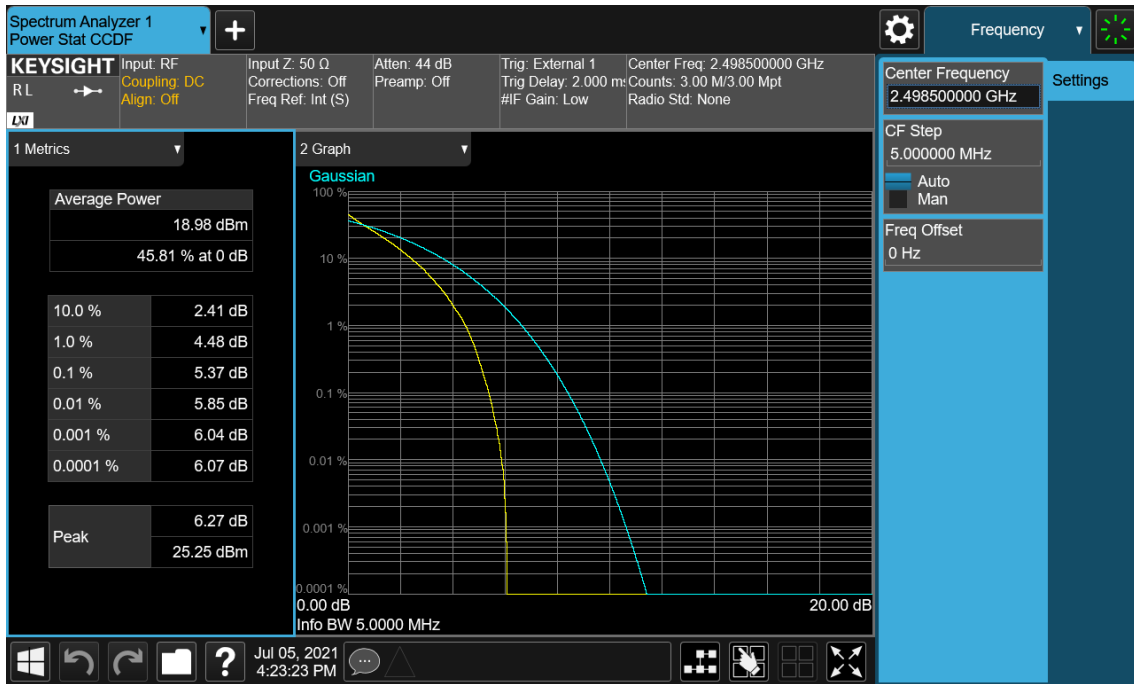
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



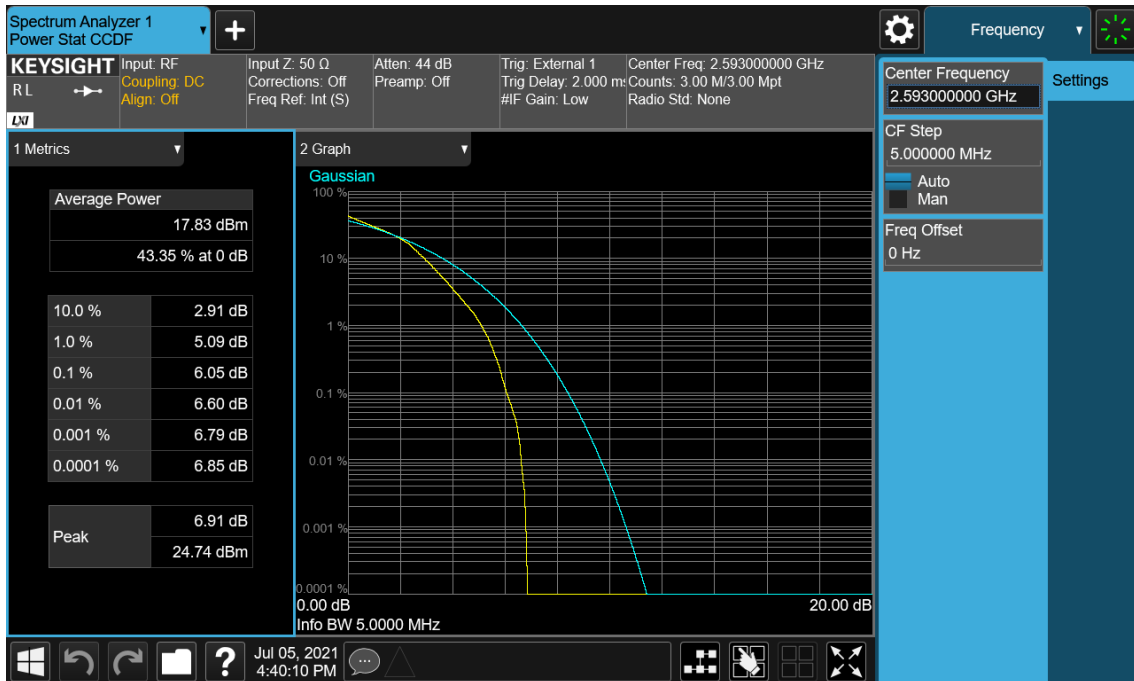
LTE Band 41 / 10 MHz / QPSK - RB Size 50



LTE Band 41 / 10 MHz / 16QAM - RB Size 50



LTE Band 41 / 5 MHz / QPSK - RB Size 25

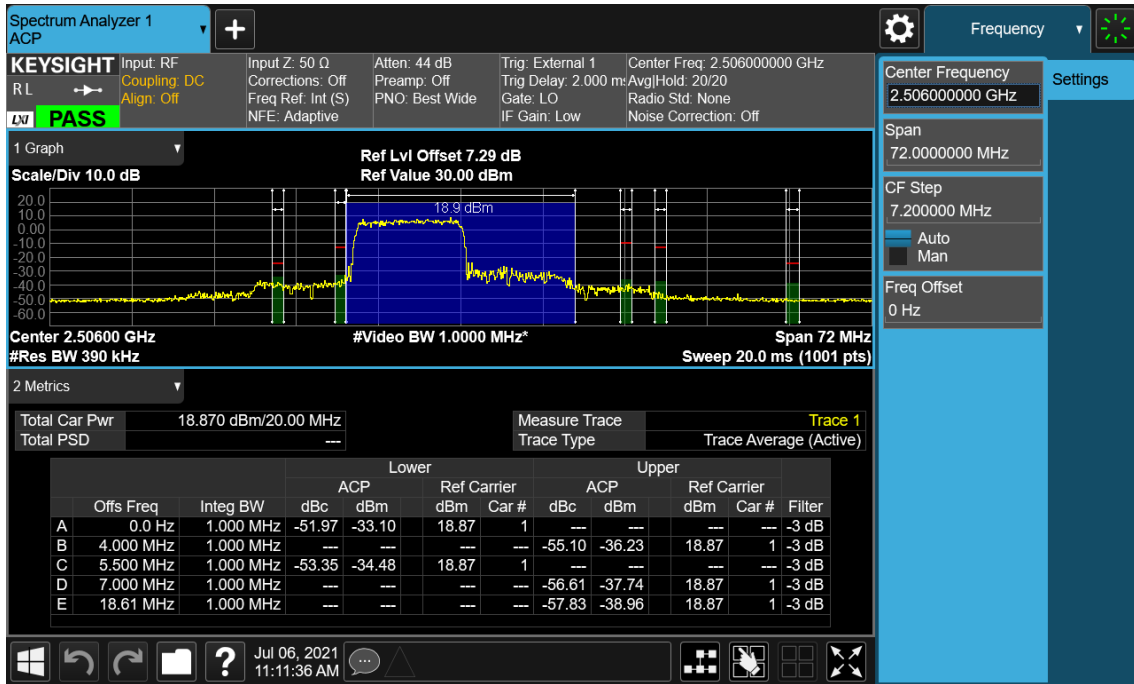


LTE Band 41 / 5 MHz / 16QAM - RB Size 25

8.3 BAND EDGE EMISSIONS(Conducted)

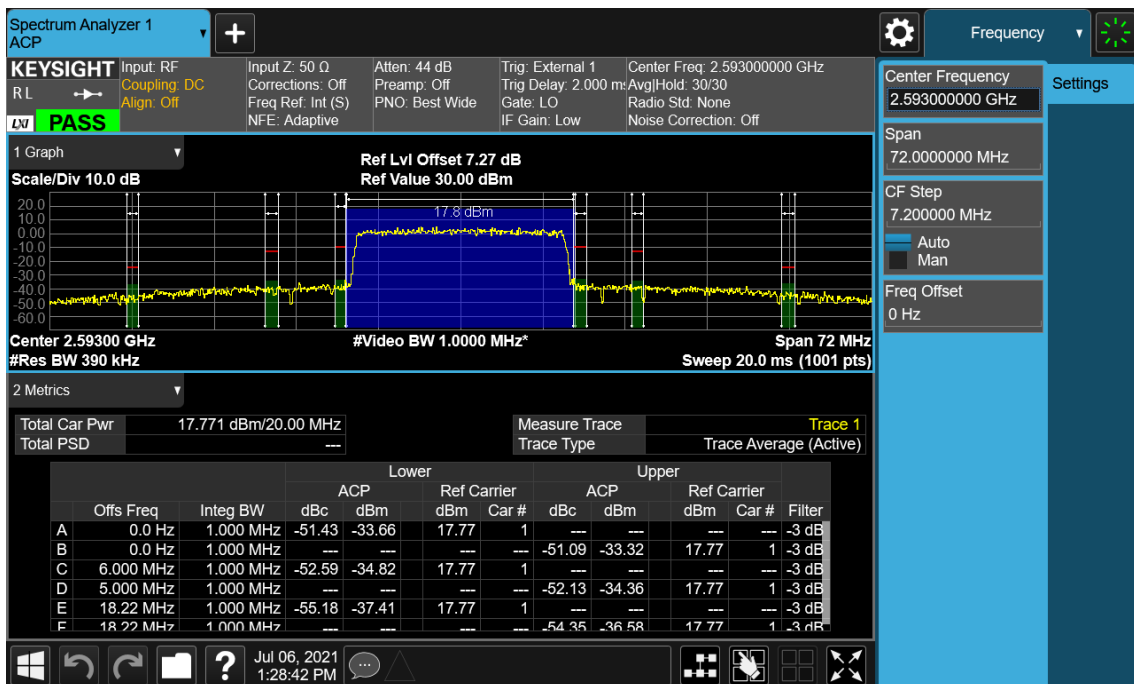
8.3.1 LTE Band 41 <DC 12 V>

- Extended Band Edge (Low CH)



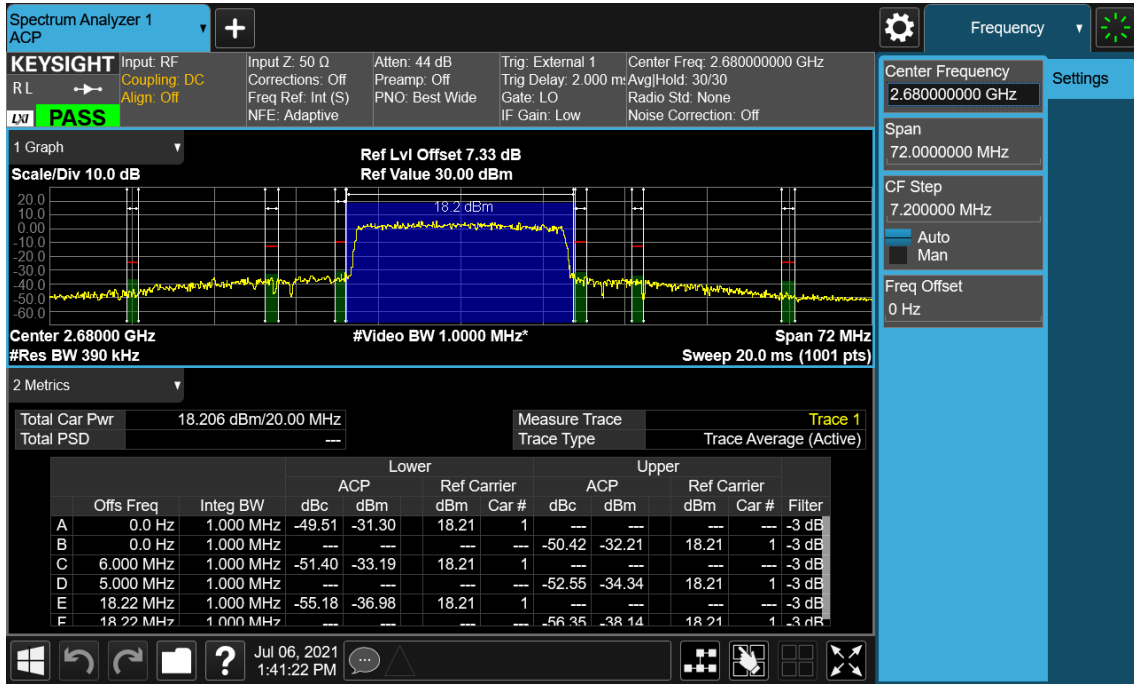
LTE Band 41 / 20 MHz / QPSK - RB Size/Offset (50/0)

- Extended Band Edge (MID CH)



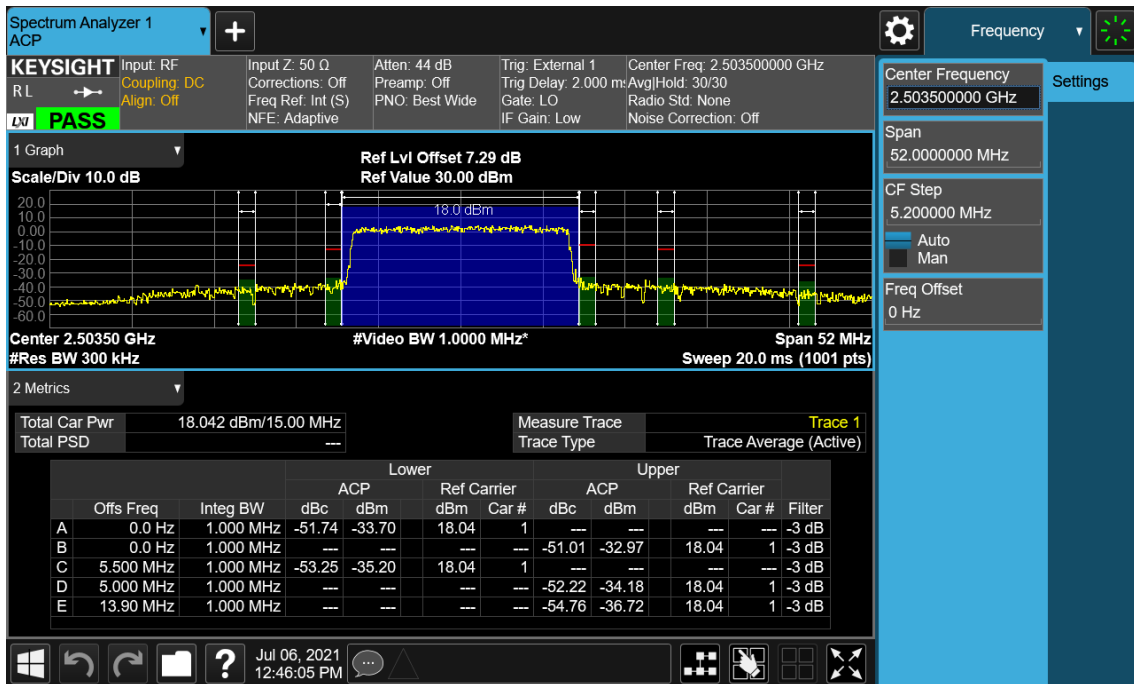
LTE Band 41 / 20 MHz / 16QAM - RB Size/Offset (100/0)

- Extended Band Edge (High CH)



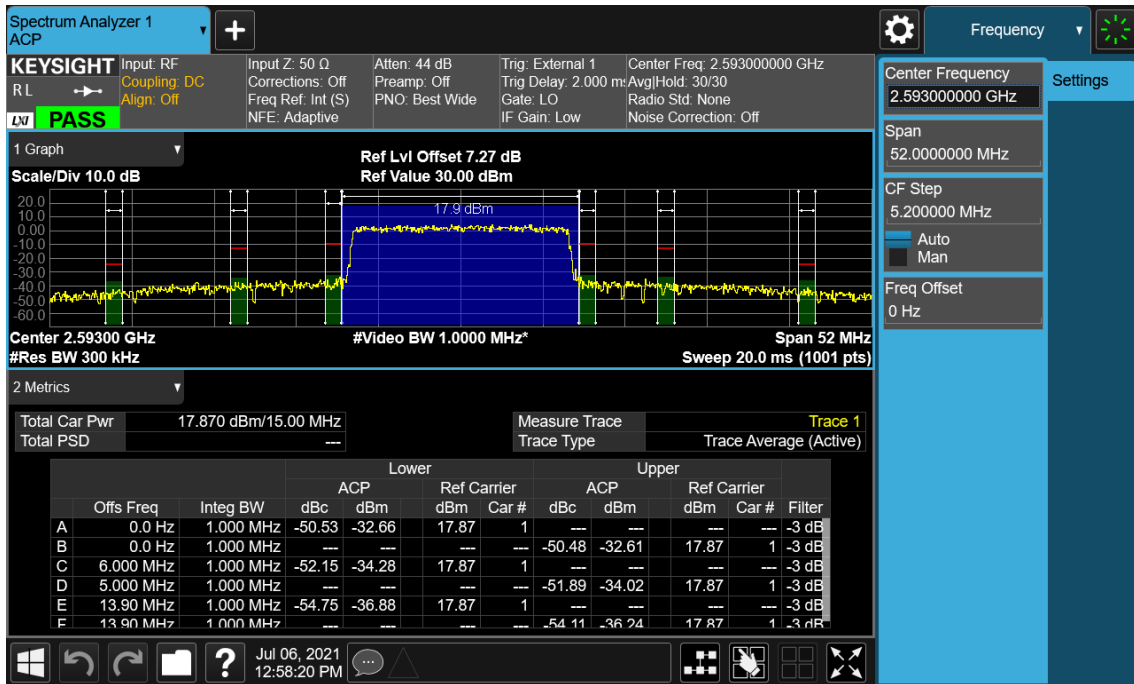
LTE Band 41 / 20 MHz / 16QAM - RB Size/Offset (100/0)

- Extended Band Edge (Low CH)



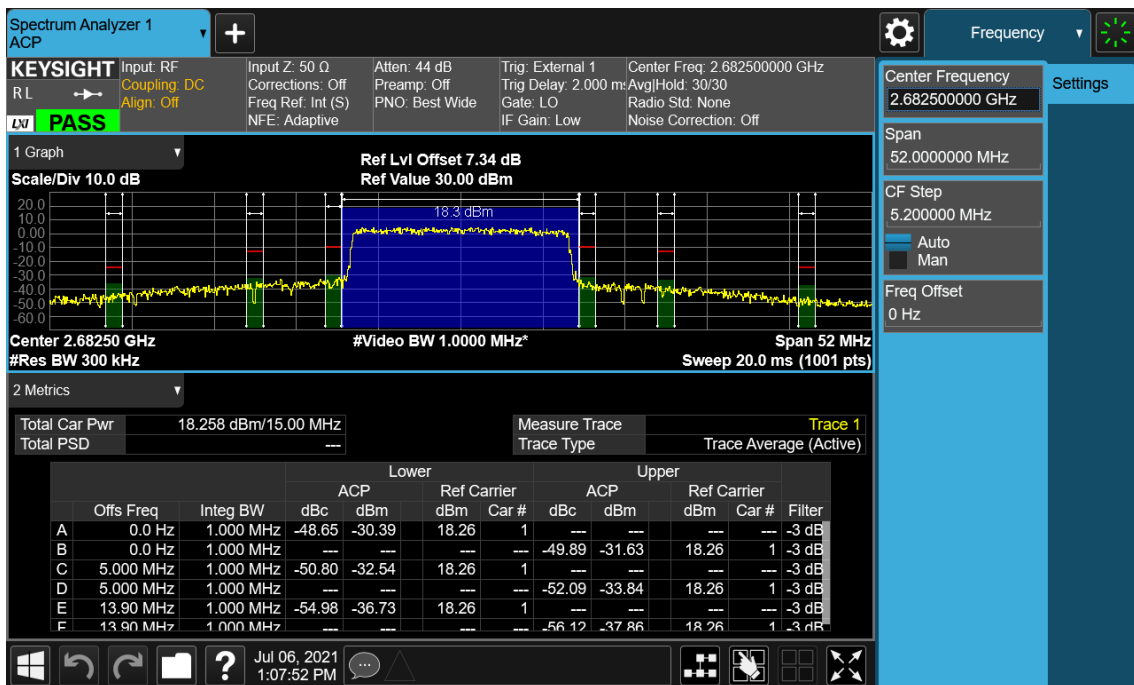
LTE Band 41 / 15 MHz / 16QAM - RB Size/Offset (75/0)

- Extended Band Edge (MID CH)



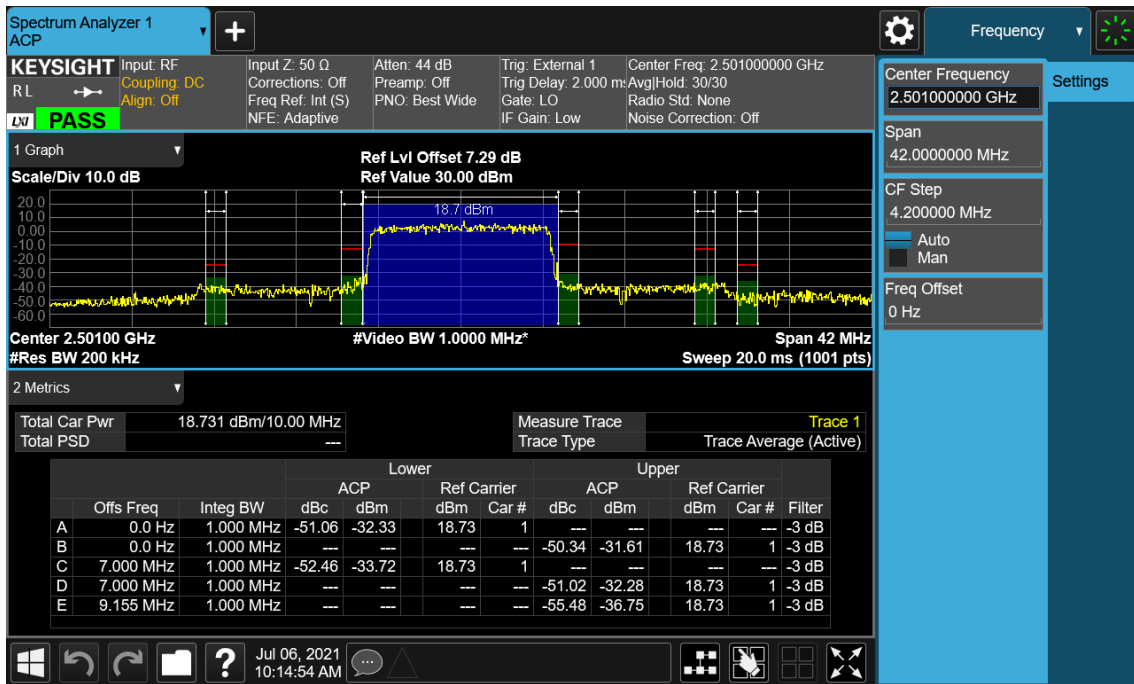
LTE Band 41 / 15 MHz / 16QAM - RB Size/Offset (75/0)

- Band Edge (High CH)



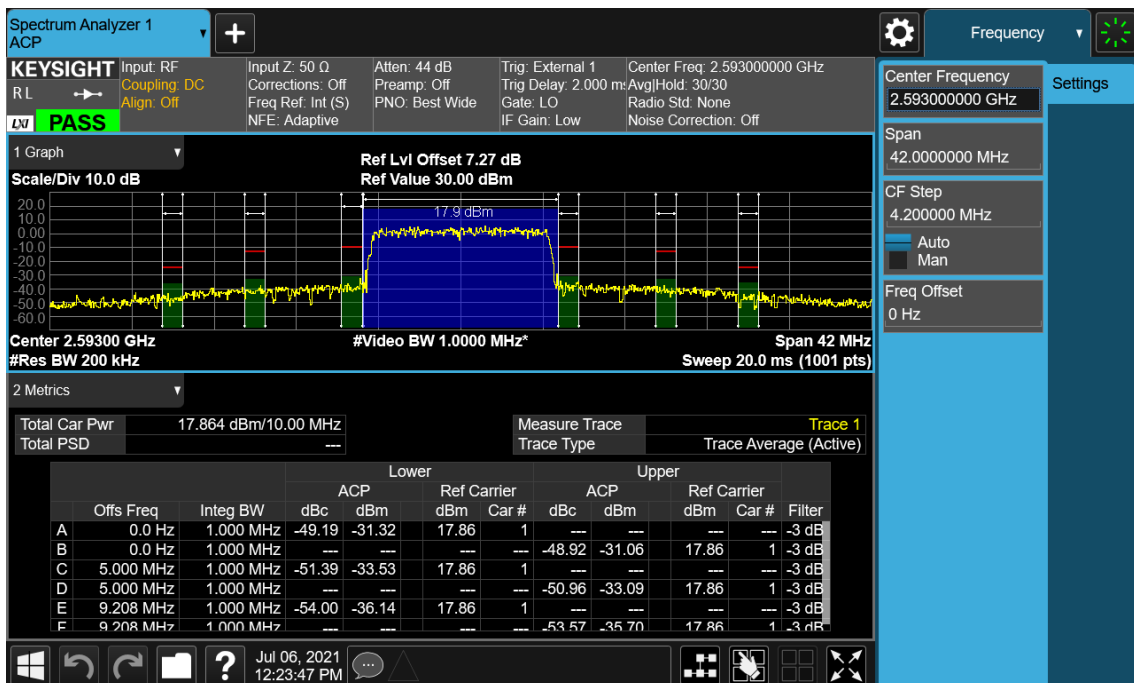
LTE Band 41 / 15 MHz / 16QAM - RB Size/Offset (75/0)

- Extended Band Edge (Low CH)



LTE Band 41 / 10 MHz / QPSK - RB Size/Offset (50/0)

- Extended Band Edge (MID CH)



LTE Band 41 / 10 MHz / 16QAM - RB Size/Offset (50/0)