

FCC MEASUREMENT AND TEST REPORT

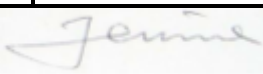
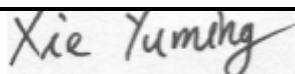
For

ZTE Corporation

ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen,
Guangdong, China 518057

FCC ID: Q78-R8119F851719A

May 20, 2017

This Report Concerns: ☒ Original Report		Equipment Type: LTE Remote Radio Unit
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Report No.:	RP20170504027-2	
Test Date:	Feb 28 – Mar 2, 2017	
Reviewed By:	Xie Yuming 	
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Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of ZRT EMC Shenzhen Laboratory. This report must not be used by the client to claim product certification 、 approval 、 or endorsement by any agency of the US Government.

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2 GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The ZTE Corporation's product, model number: ZXSDR R8119 F851719A or the "EUT" as referred to in this report is a LTE Remote Radio Unit.

Technical specification:

Size: 230 mm (Diameter) * 43.5 mm (Depth)

Input voltage: -48V

Frequency range: UL:1710MHz~1755MHz; DL: 2110MHz~2155 MHz

Max RF output power: 20dBm

Appearance of EUT:

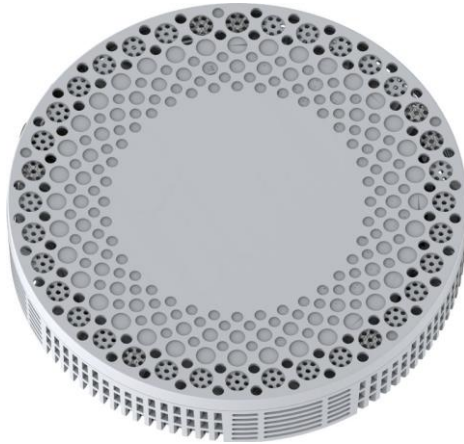


FIGURE 1 APPEARANCE OF ZXSDR R8119 F851719A

Objective

This type approval report is prepared on behalf of ZRT EMC Shenzhen Laboratory in accordance with Part 1、Part 2、part15、Part 24 of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal

Regulations Title 47 Part 2 as well as the following parts:

Part 24 MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

Applicable Standards: TIA EIA 137-A, TIA EIA 97-D, TIA/EIA 603-C, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

All radiated and conducted measurement was performed at ZTE Corporation Reliability Testing Center. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Shenzhen ZTE Technology Service Co., Ltd to collect test data is located in the ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China, Tel: +86-755-26770000, Fax: +86-755-26771999. Test site at ZRT EMC Shenzhen Laboratory has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 0007895832. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

3 SYSTEM TEST CONFIGURATION

Description of Test Configuration

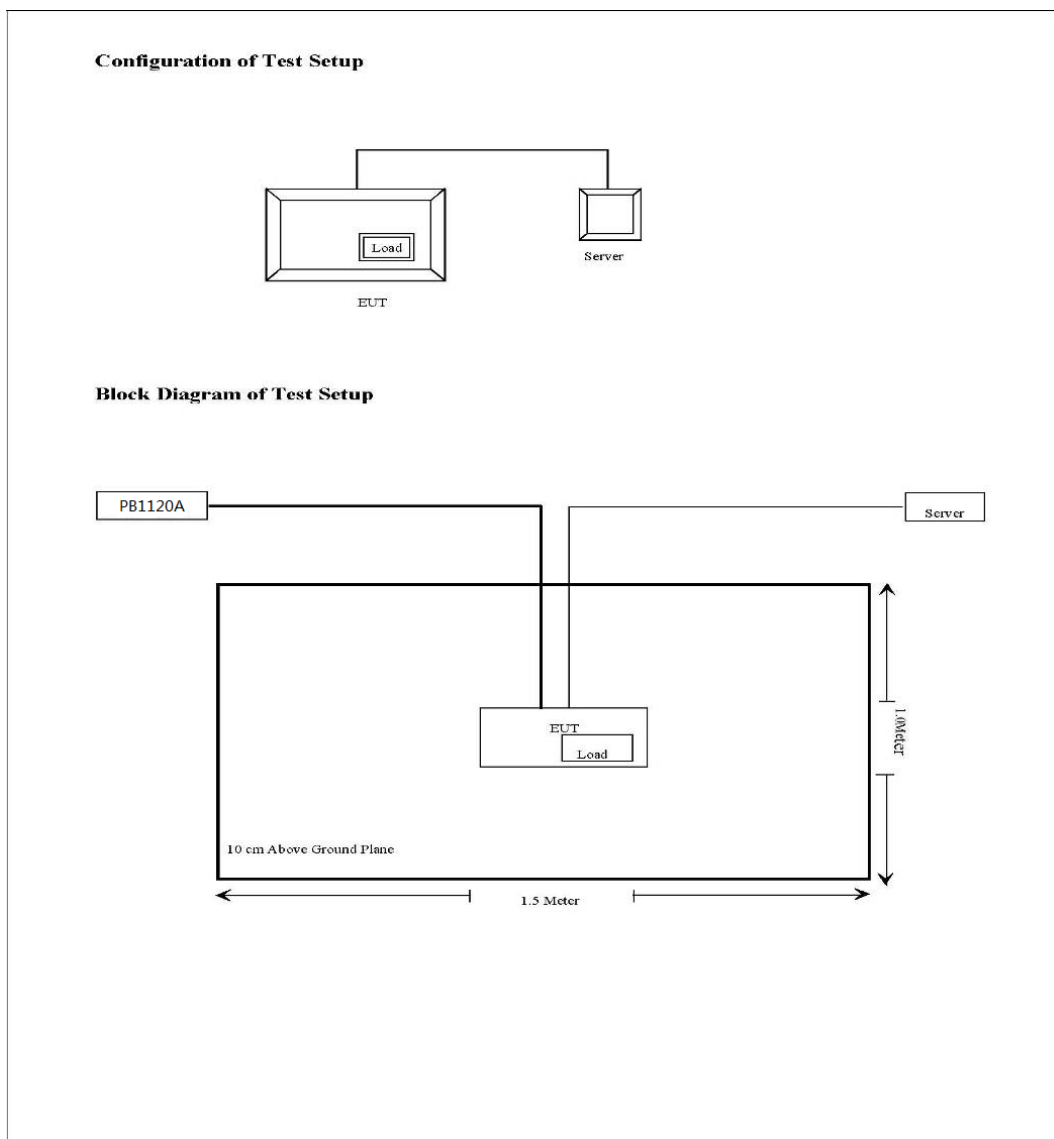
Justification

The EUT was configured for testing according to TIA/EIA-603C.

The final qualification test was performed with EUT operating at normal mode.

Equipment Modifications

ZTE Corporation has not done any modification on the EUT.



4 SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1046 , §27.50	Transmitter output Power	Compliant
§ 2.1091 ,§1.1037	RF Exposure	Compliant
§ 2.1047	Modulation Characteristic	Compliant
§ 2.1053, §27.53	Spurious Radiated Emissions	Compliant

§ 2.1051, §27.53	Spurious Emissions AT Antenna Terminals	Compliant
§ 2.1049	Occupied Bandwidth	Compliant
§ 2.1051,§27.53	Band Edge	Compliant
§ 2.1055, ,§27.54	Frequency stability	Compliant

5 TRANSMITTER OUTPUT POWER

Applicable Standard: FCC §2.1046, §27.50

According to FCC §2.1046 &27.50, the EIRP (equivalent isotropically radiated power) must not exceed 2000Watts.

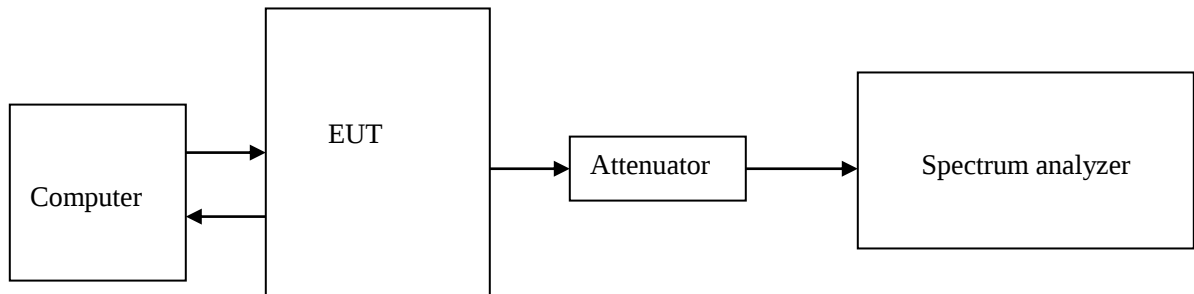
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 20dB Attenuator	DTS50-20-3-1	09112005	2016.09.12	2017.09.12
Silverline	Silverline RF Cable	SLA18-NMN1T	100311-04-0001	N/A	N/A

***statement of traceability:** ZTE Corporation Reliability Testing Center attests that all calibration has been performed per the NVLAP requirements, traceable to NIST.

Test Procedure



The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. External attenuation Loss is 20dB, Cable Loss is about 3.5dB

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

Test Result: Pass

Test Mode: Transmitting LTE

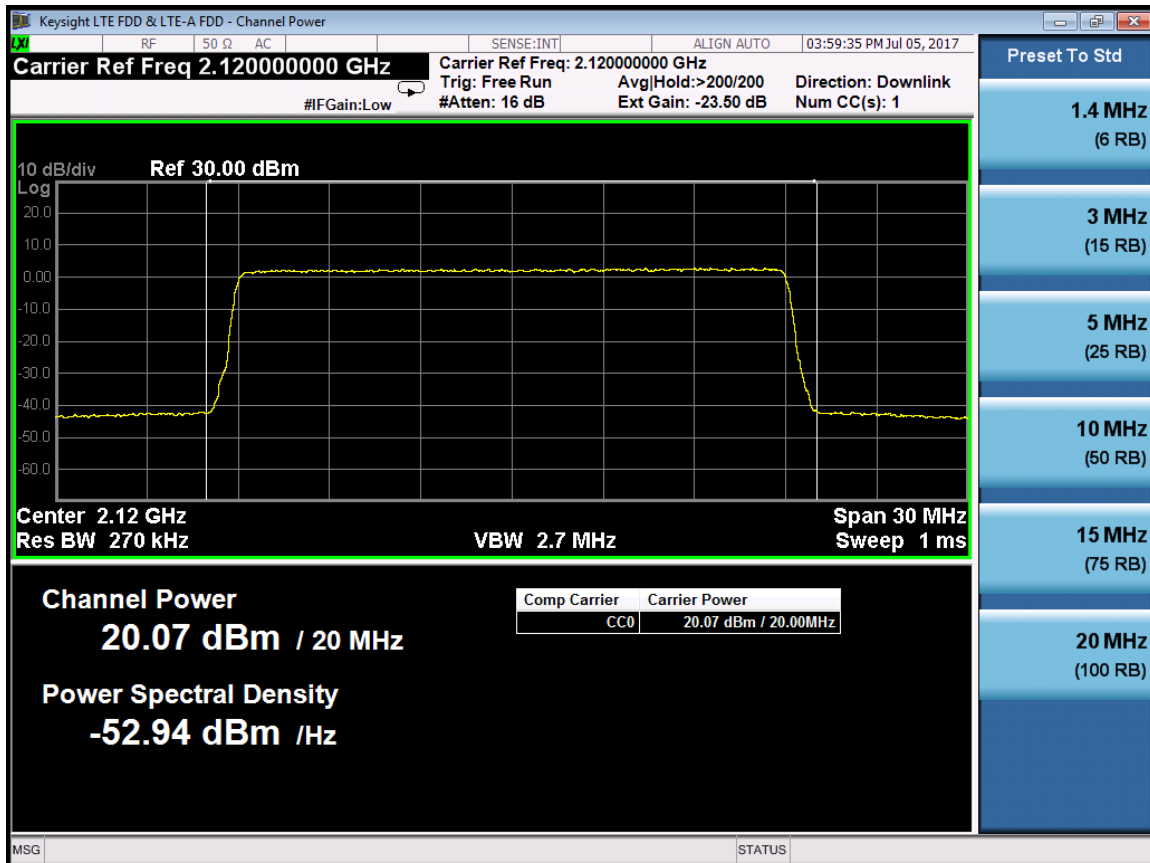
Test Data:

RF Bandwidth :IBW 20MHz(LTE 20MHz)

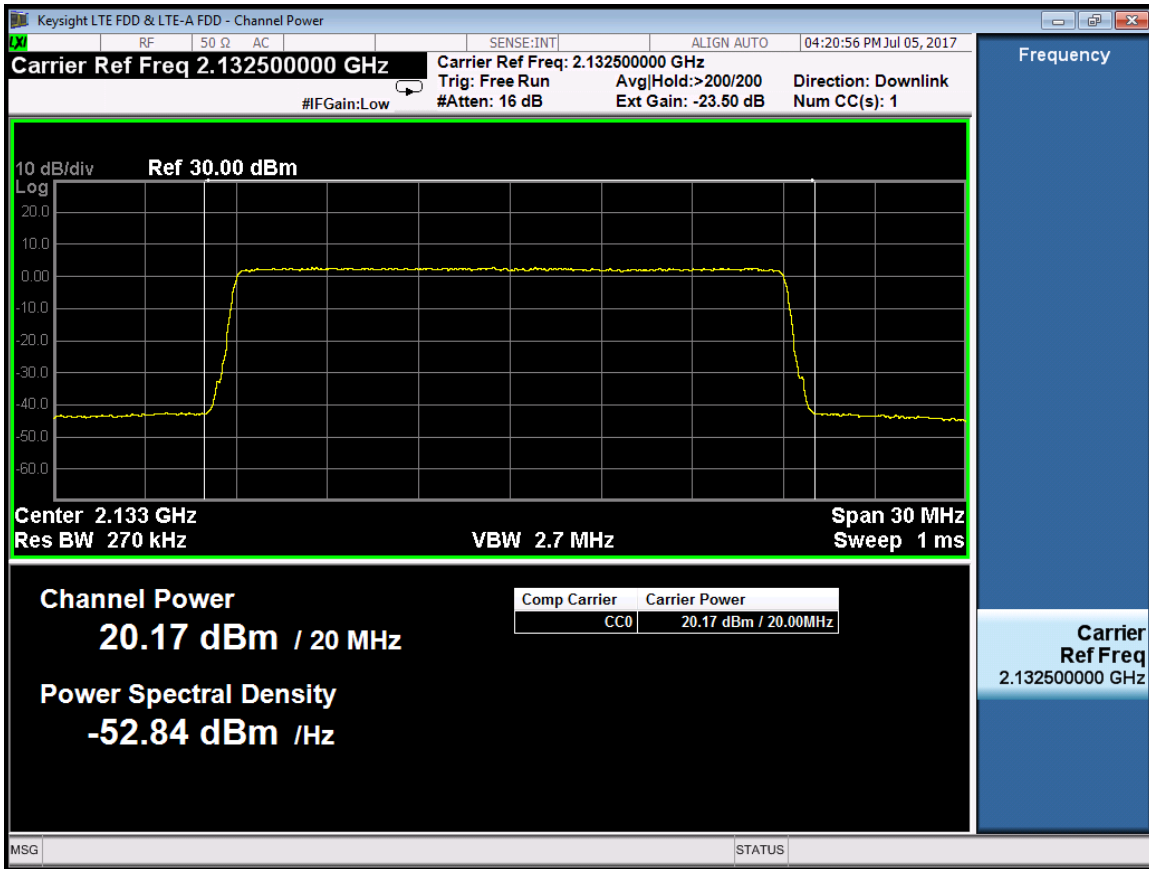
Port	Center Freq. (MHz)	Max output Power in dBm	Total Power in W Of single antenna
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0	2120	20.07	34.71
	2132.5	20.17	34.70
	2145	19.88	34.71
1	2120	20.01	34.71
	2132.5	20.15	34.70
	2145	19.81	34.70

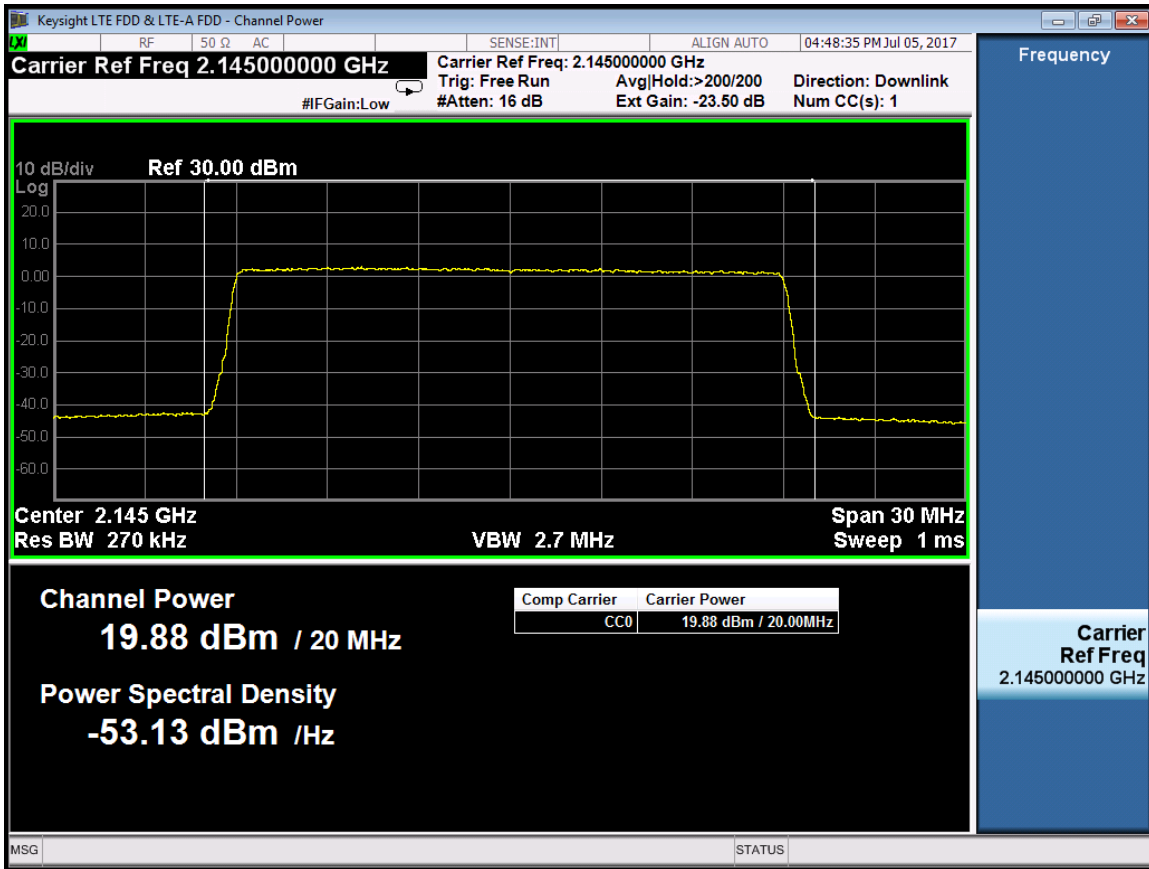
Port 0 -2120MHz



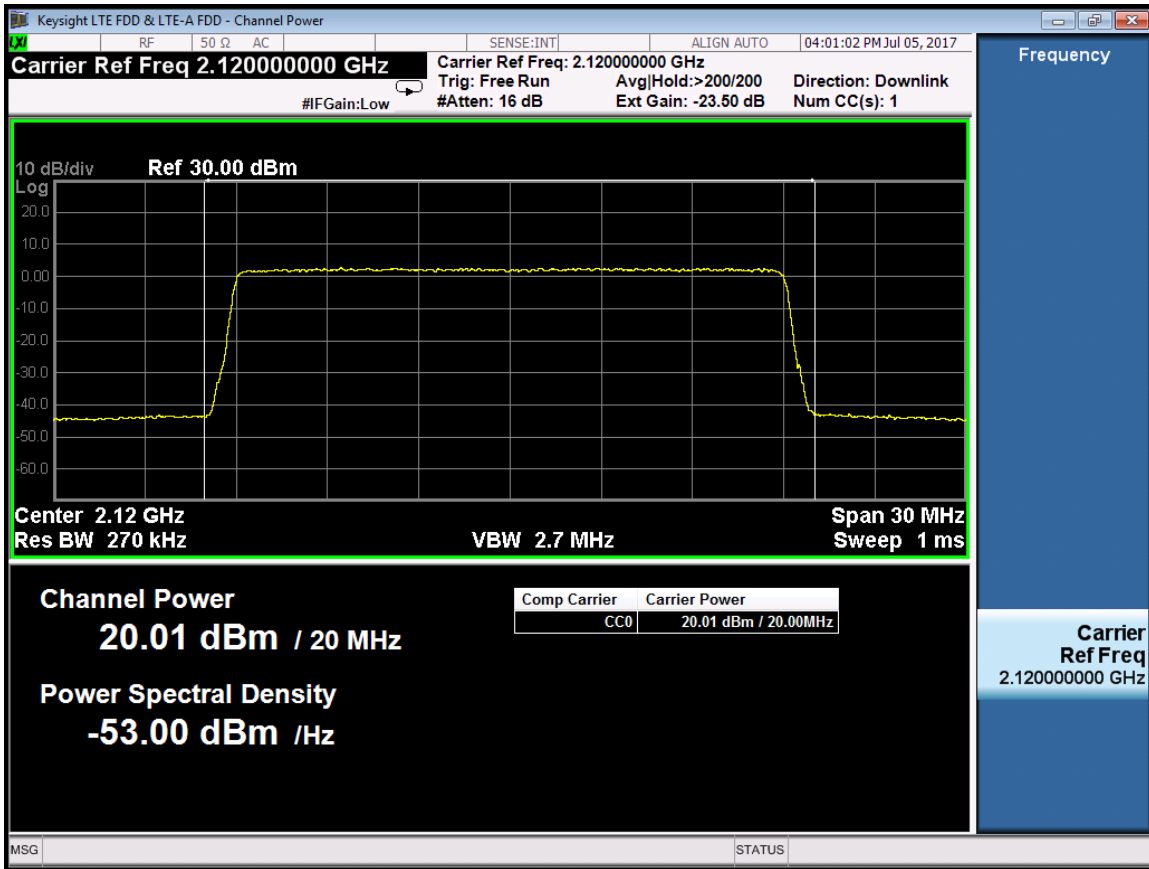
Port 0 -2132.5MHz



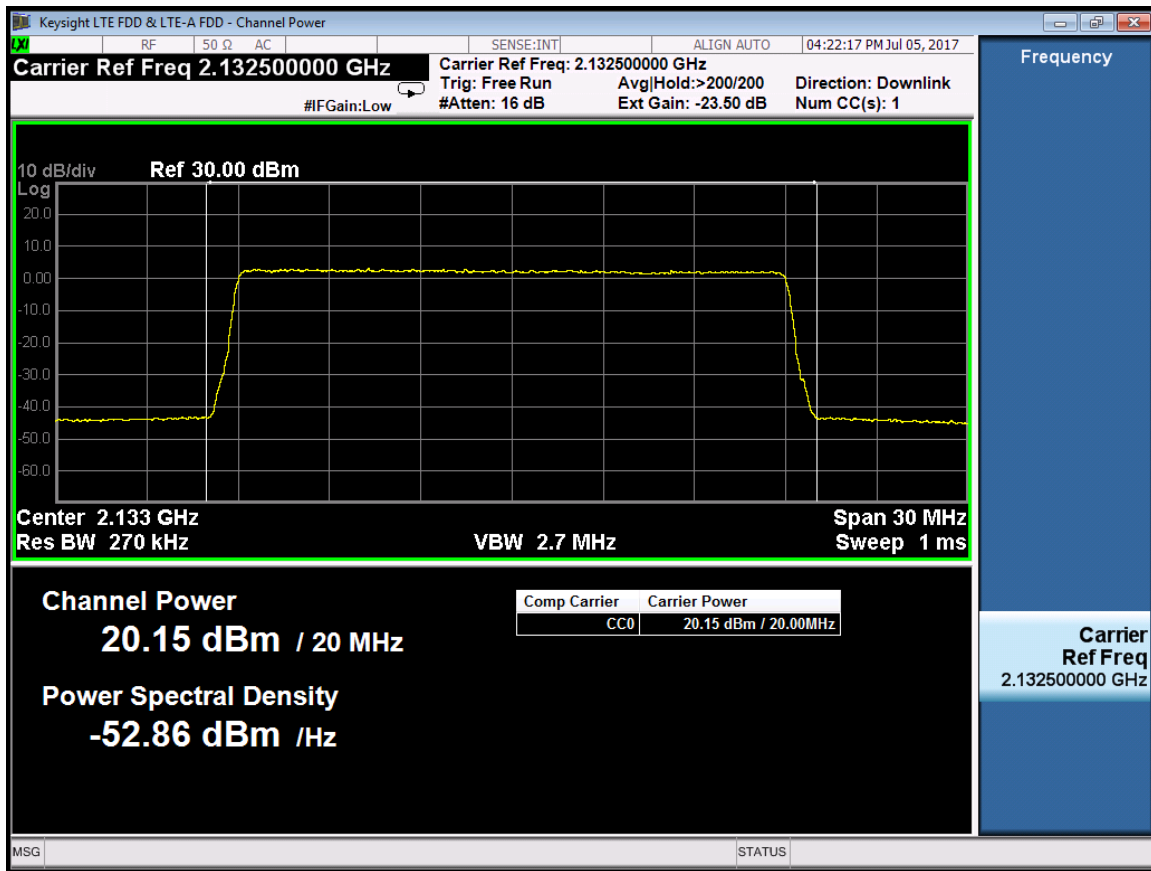
Port 0 -2145MHz



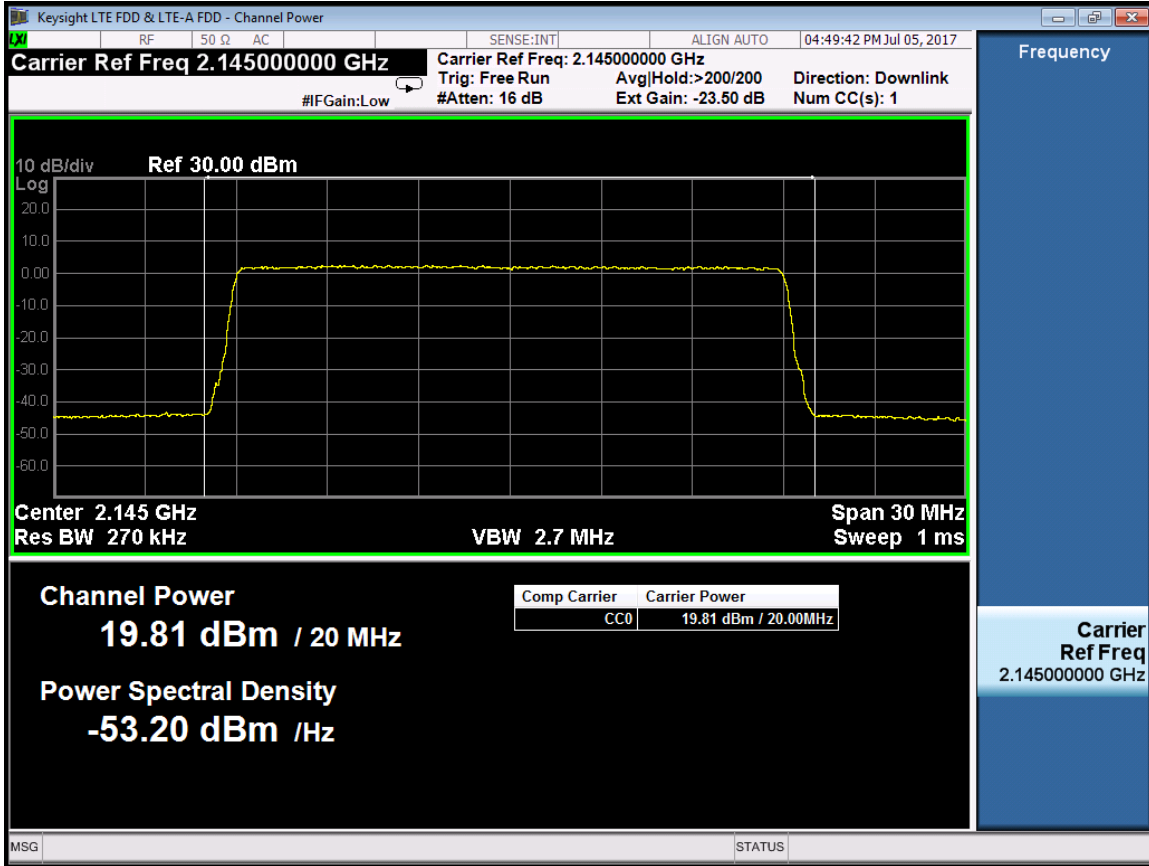
Port 1 -2120MHz



Port 1 -2132.5MHz



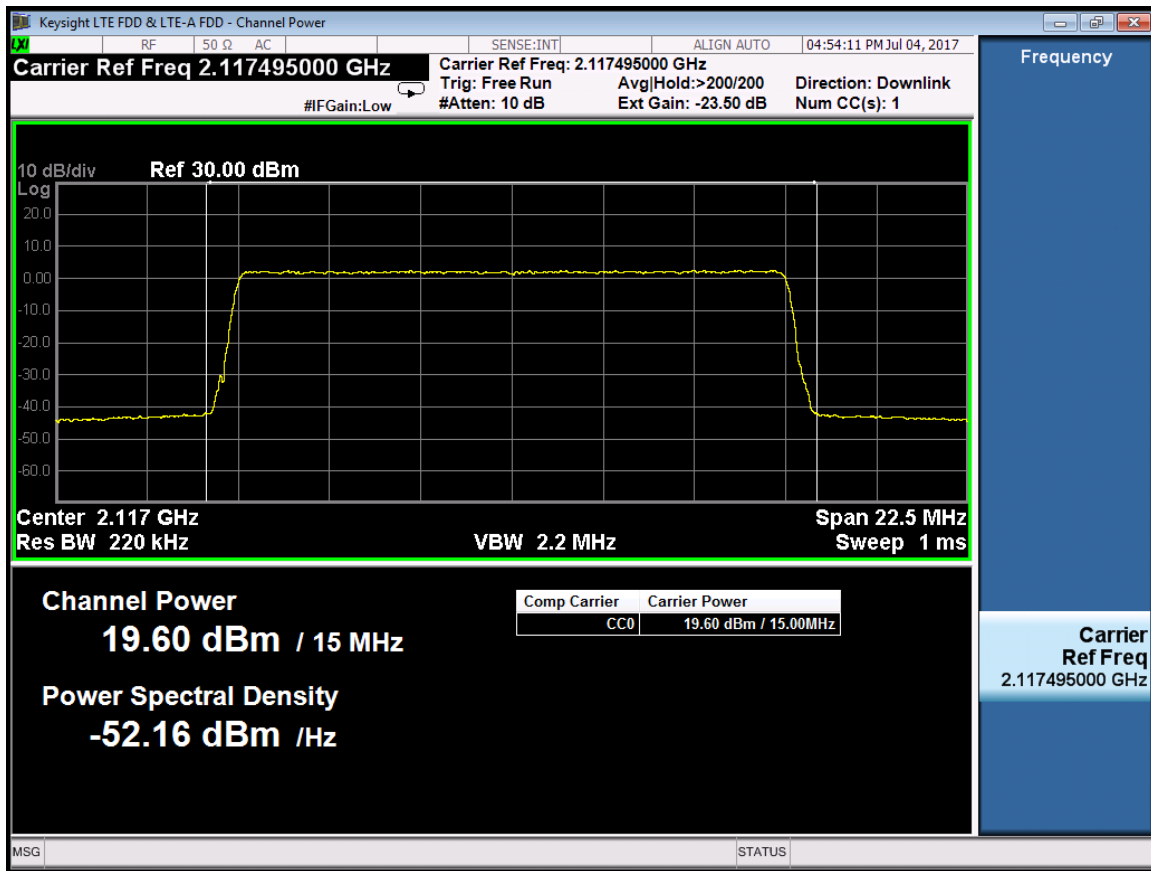
Port 1 -2145MHz



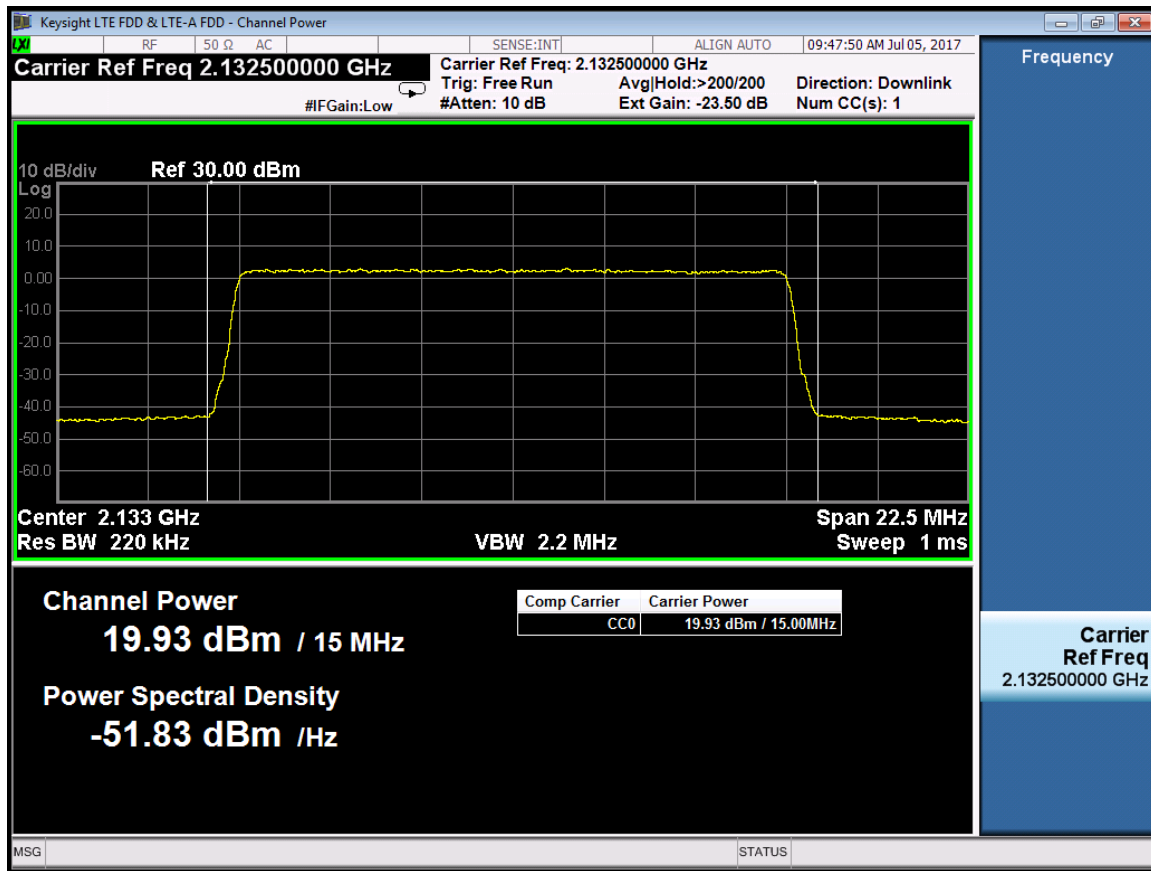
RF Bandwidth :IBW 15MHz(LTE 15MHz)

Port	Center Freq. (MHz)	Max output Power in dBm	Total Power in W Of single antenna
0	2117.5	20. 07	34. 70
	2132.5	20. 17	34. 70
	2147.5	19. 88	34. 70
1	2117.5	20. 01	34. 70
	2132.5	20. 15	34. 70
	2147.5	19. 81	34. 70

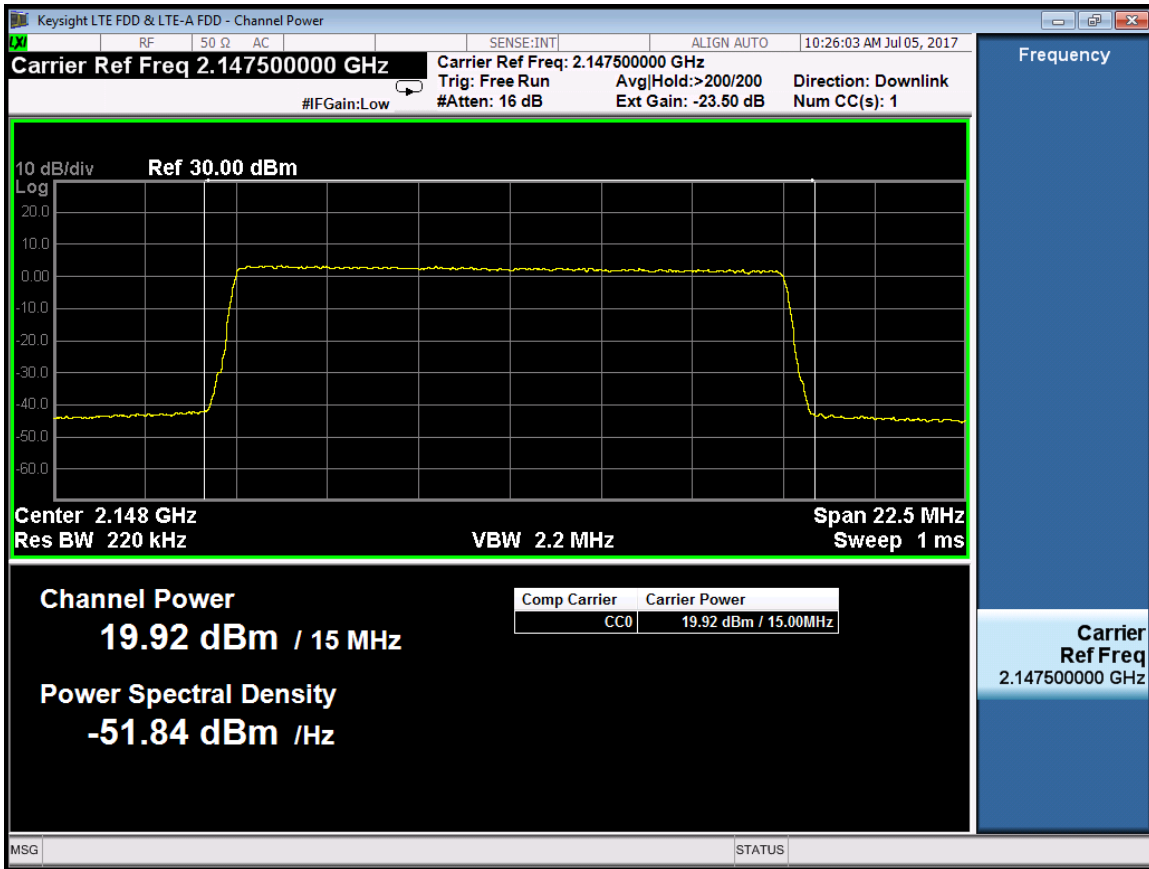
Port 0 -2117.5MHz



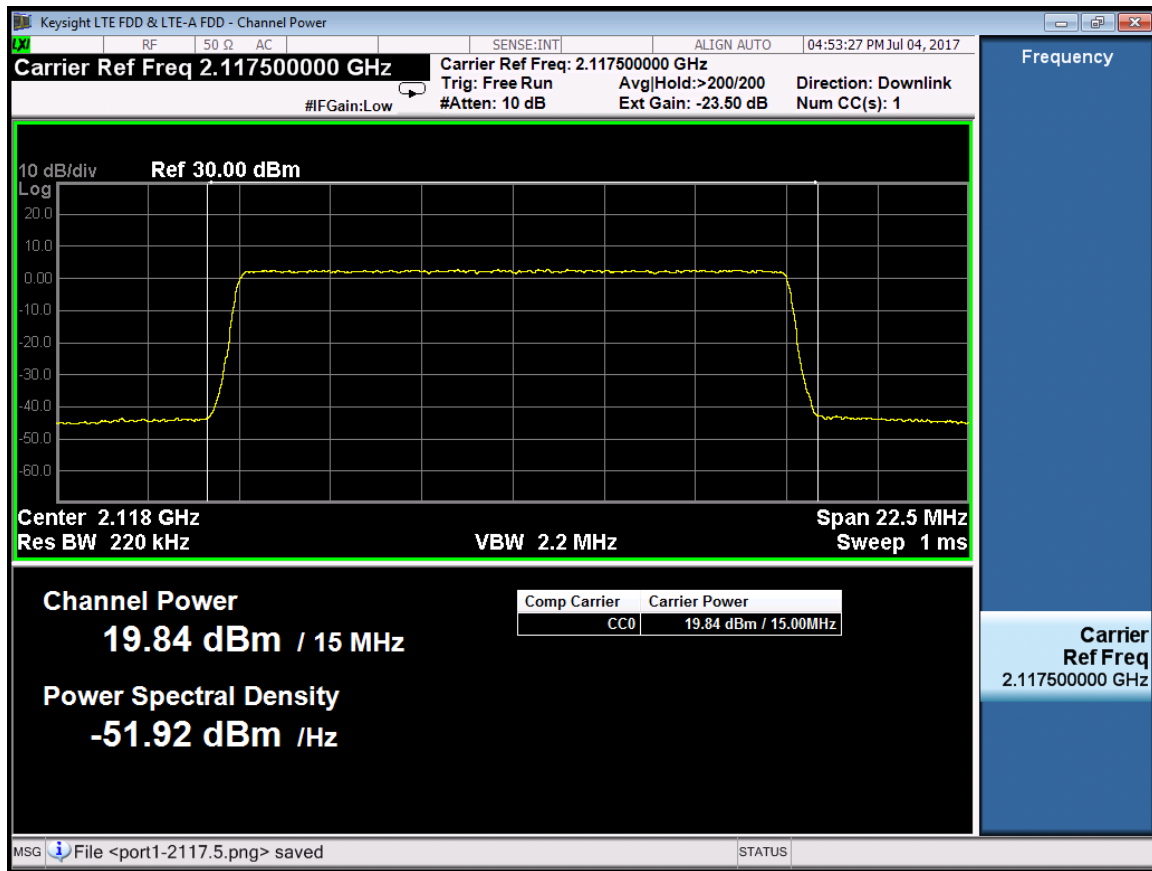
Port 0 -2132.5MHz



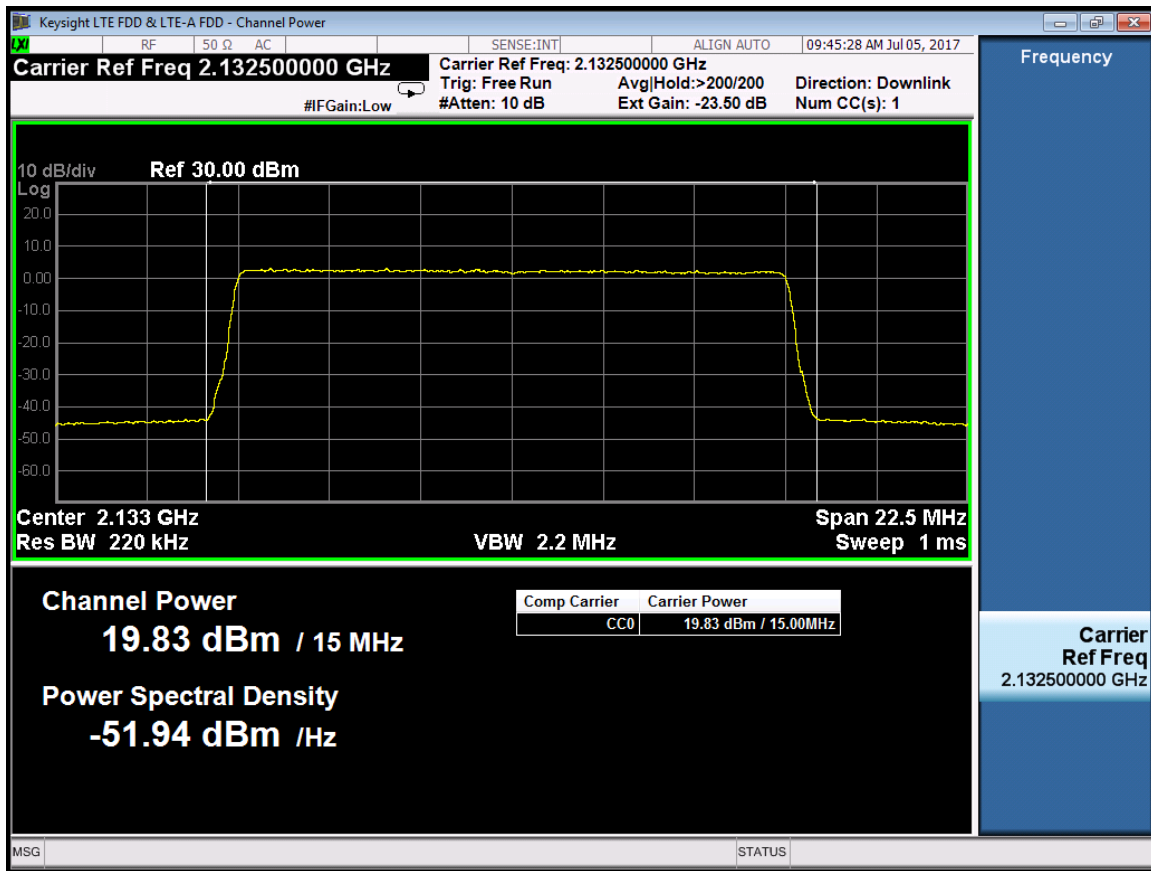
Port 0 -2147.5MHz



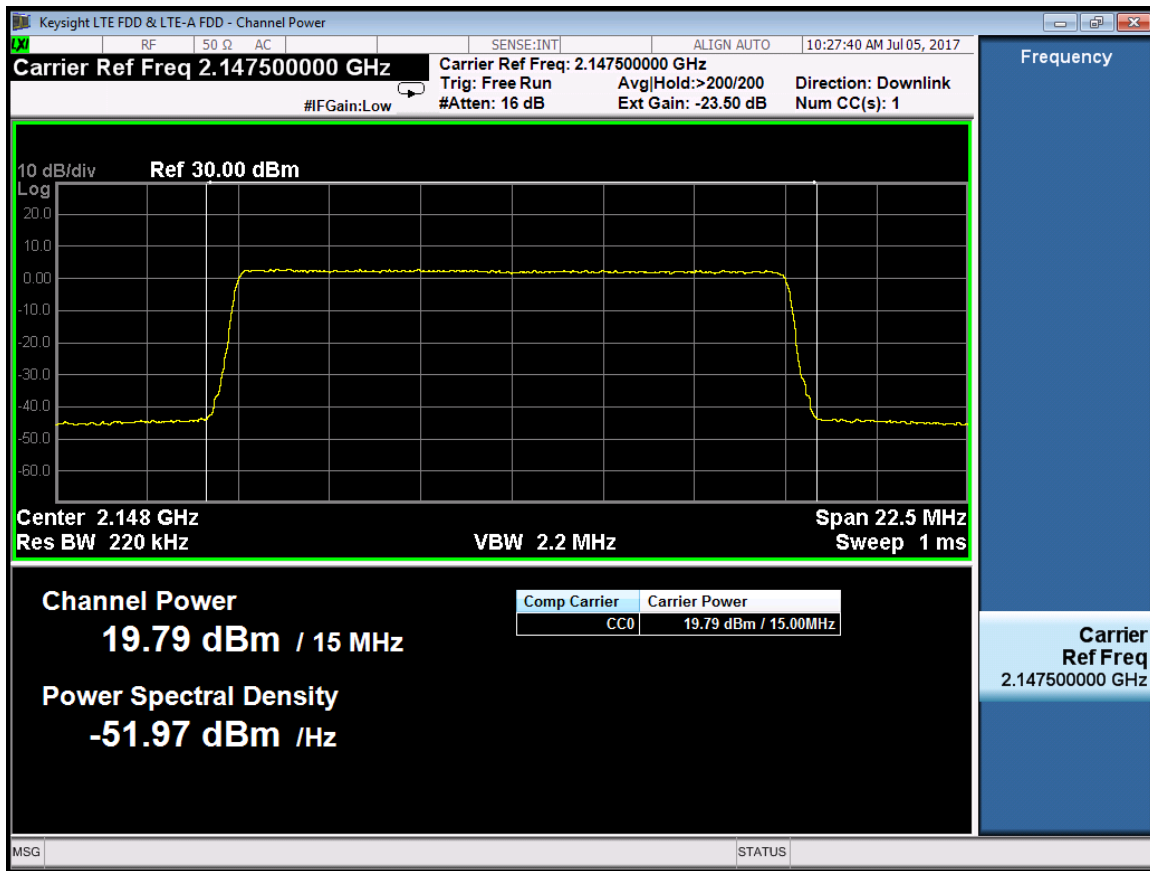
Port 1 -2117.5MHz



Port 1 -2132.5MHz



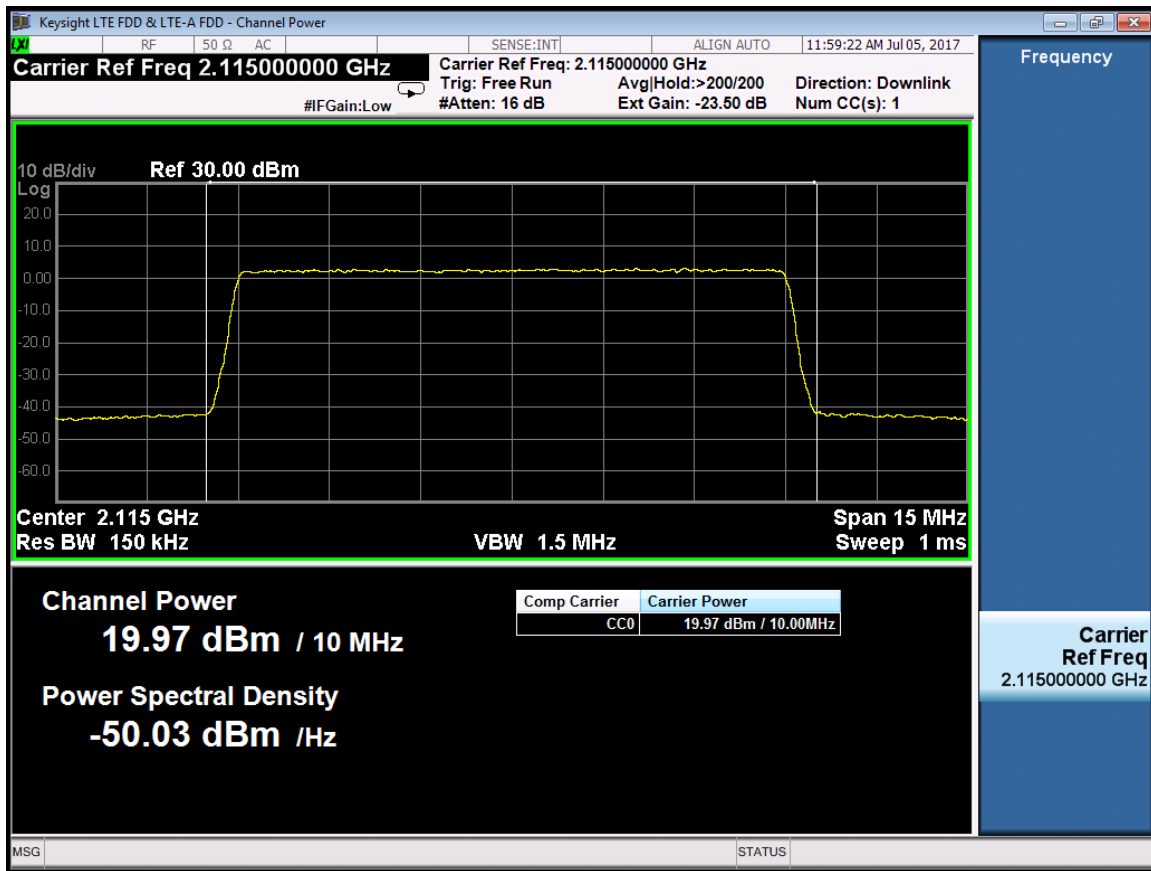
Port 1 -2147.5MHz



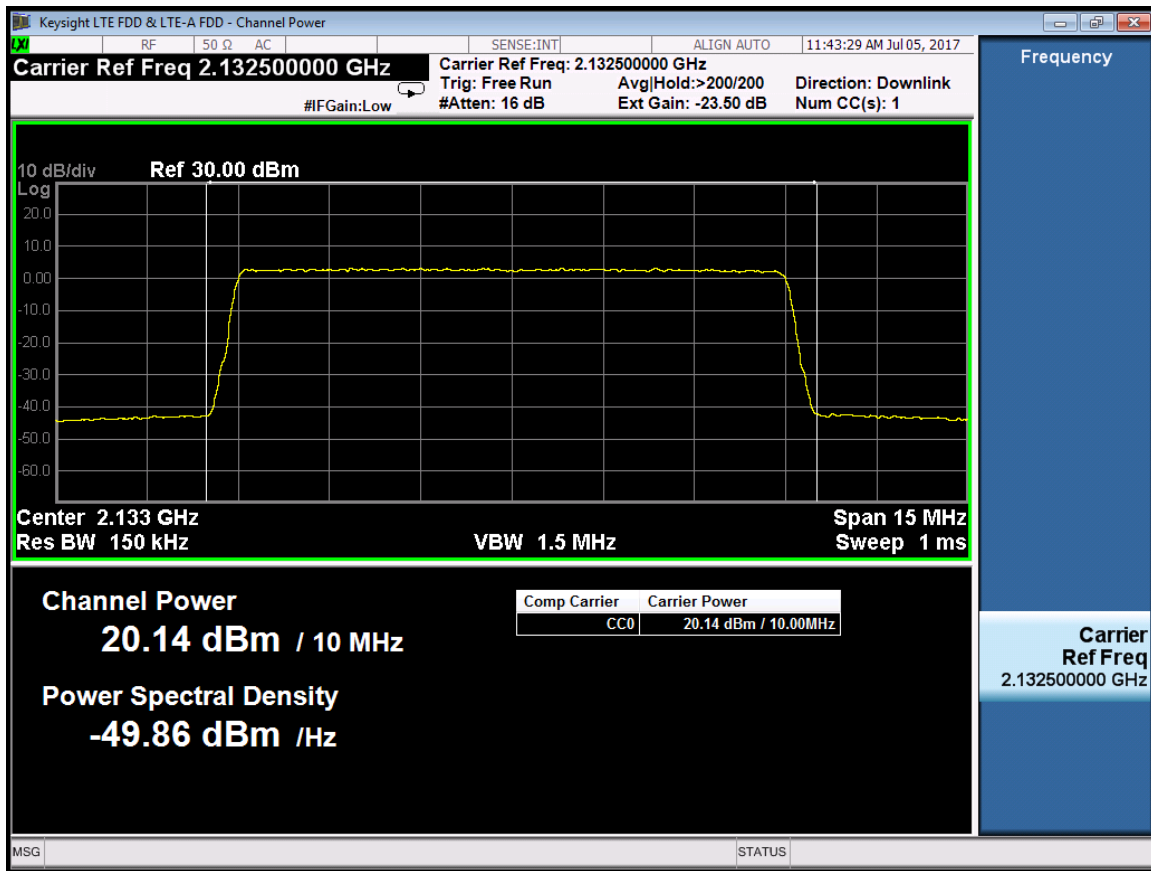
RF Bandwidth :IBW 10MHz(LTE 10MHz)

Port	Center Freq. (MHz)	Max output Power in dBm	Total Power in W Of single antenna
0	2115	19.97	34.70
	2132.5	20.14	34.70
	2150	19.87	34.70
1	2115	20.01	34.70
	2132.5	19.91	34.70
	2150	19.72	34.70

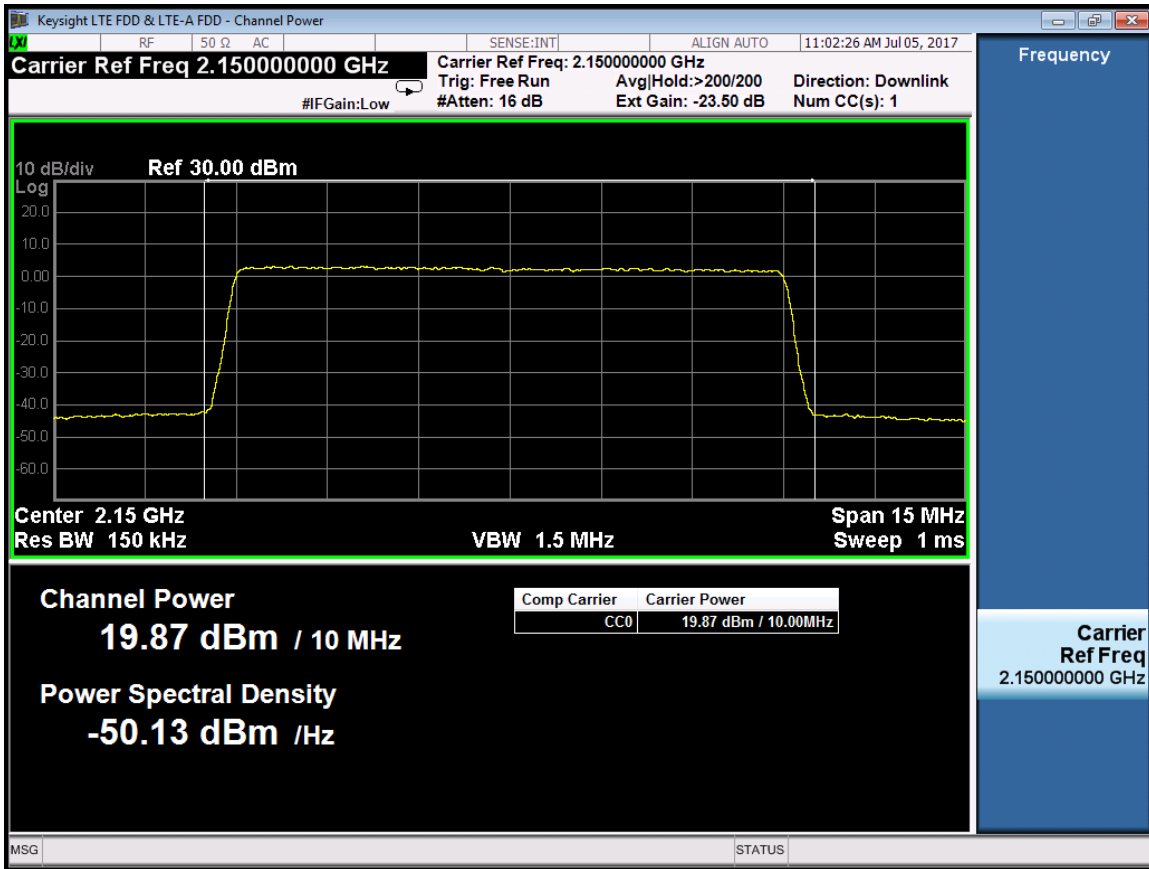
Port 0 -2115MHz



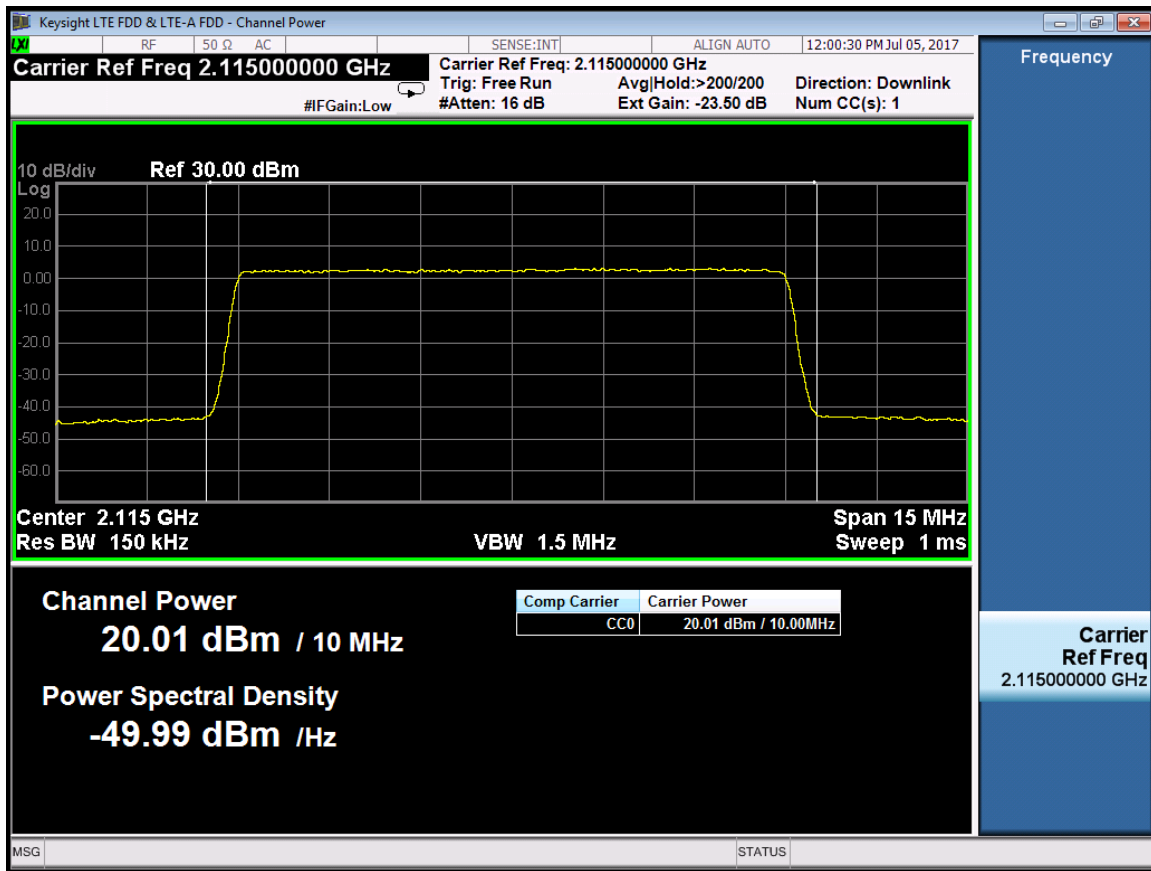
Port 0 -2132.5MHz



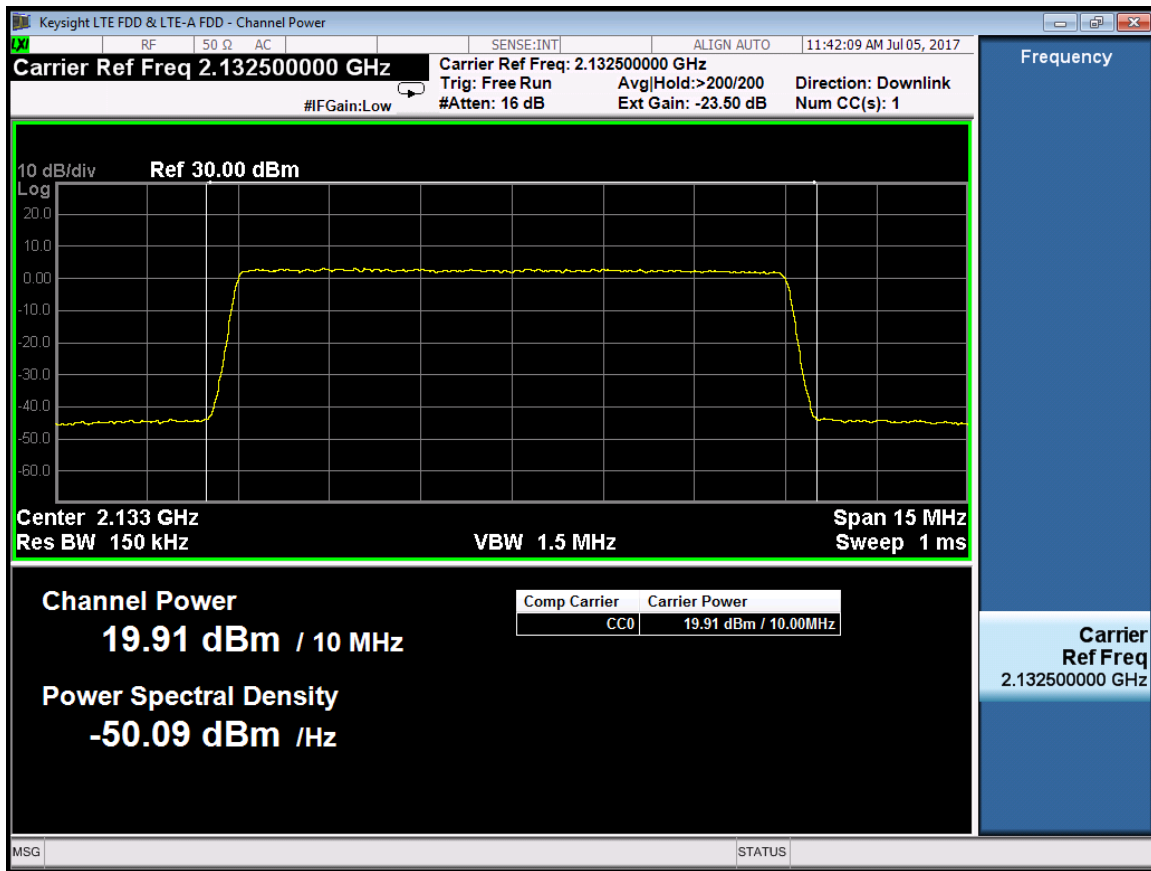
Port 0 -2150MHz



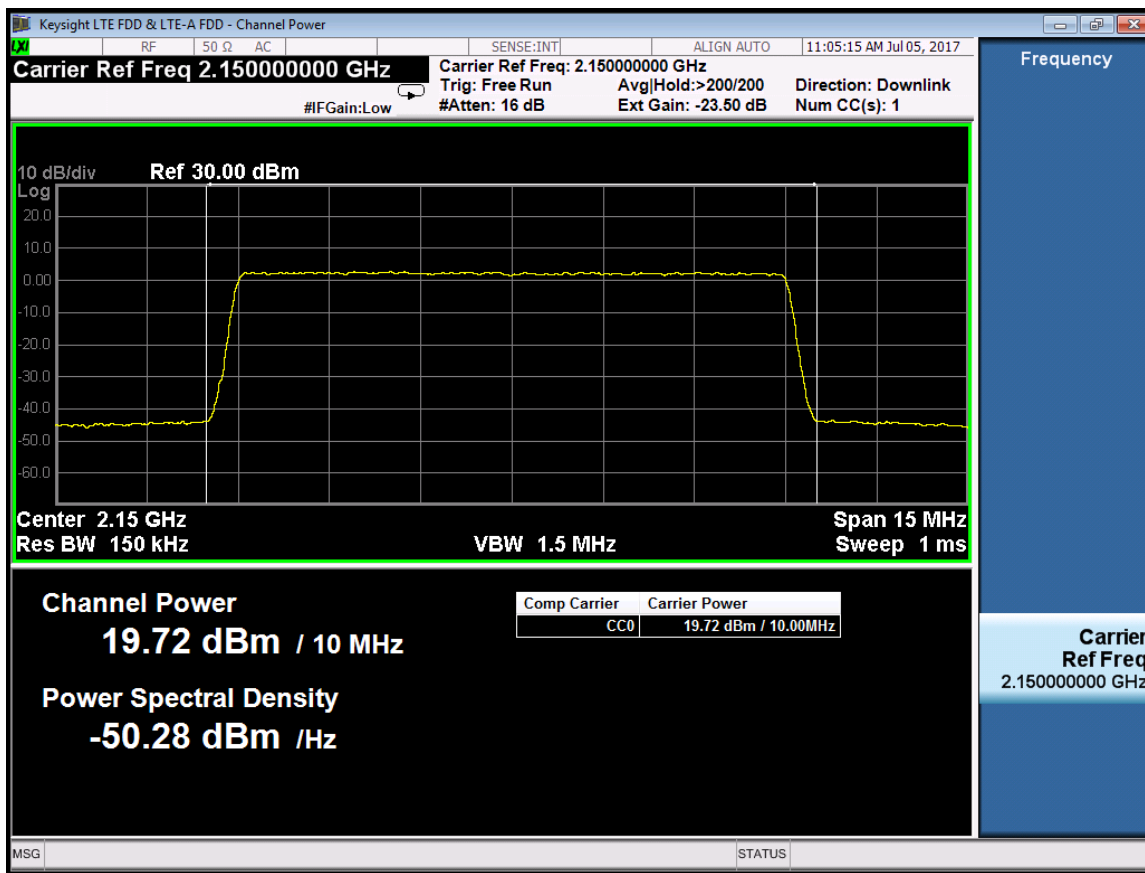
Port 1 -2115MHz



Port 1 -2132.5MHz



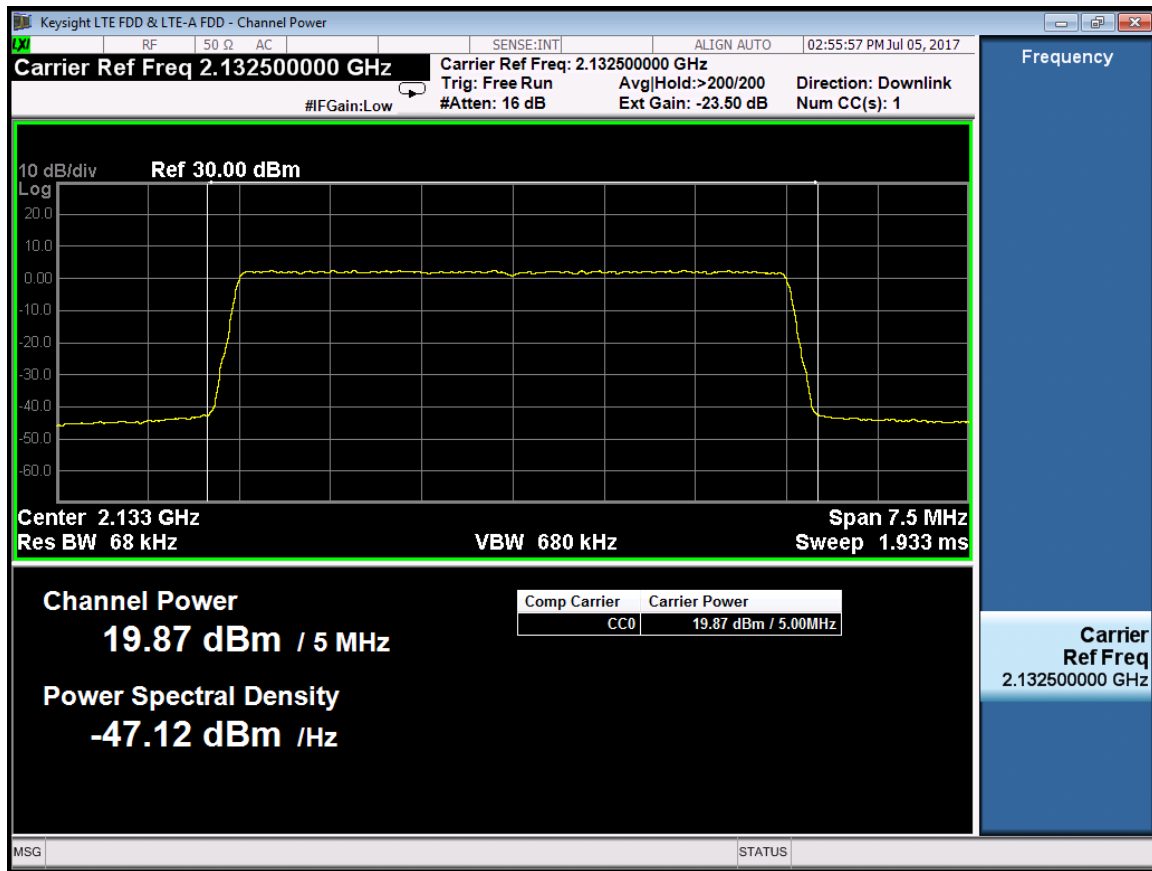
Port 1 -2150MHz



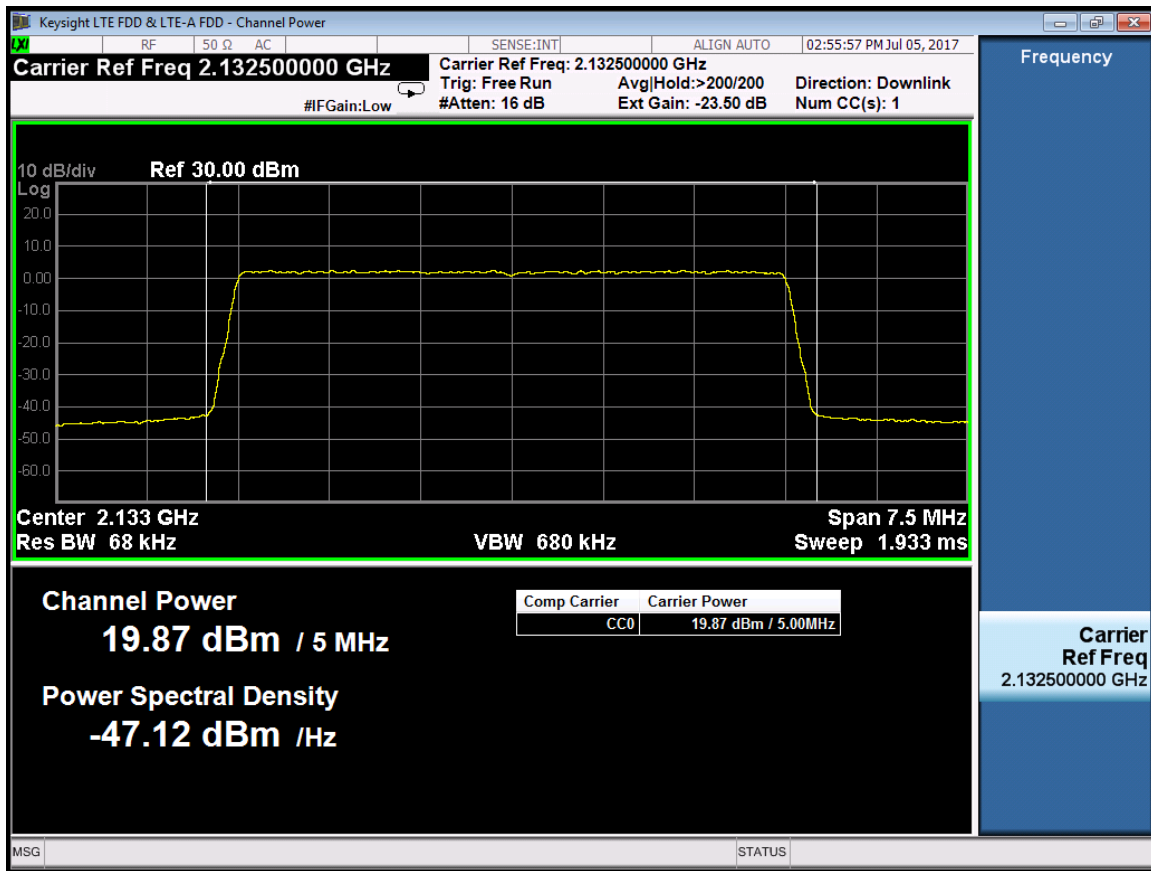
RF Bandwidth :IBW 5MHz(LTE 5MHz)

Port	Center Freq. (MHz)	Max output Power in dBm	Total Power in W Of single antenna
0	2112.5	20. 10	34. 70
	2132.5	19. 87	34. 70
	2152.5	19. 92	34. 70
1	2112.5	20. 04	34. 70
	2132.5	19. 84	34. 70
	2152.5	19. 93	34. 70

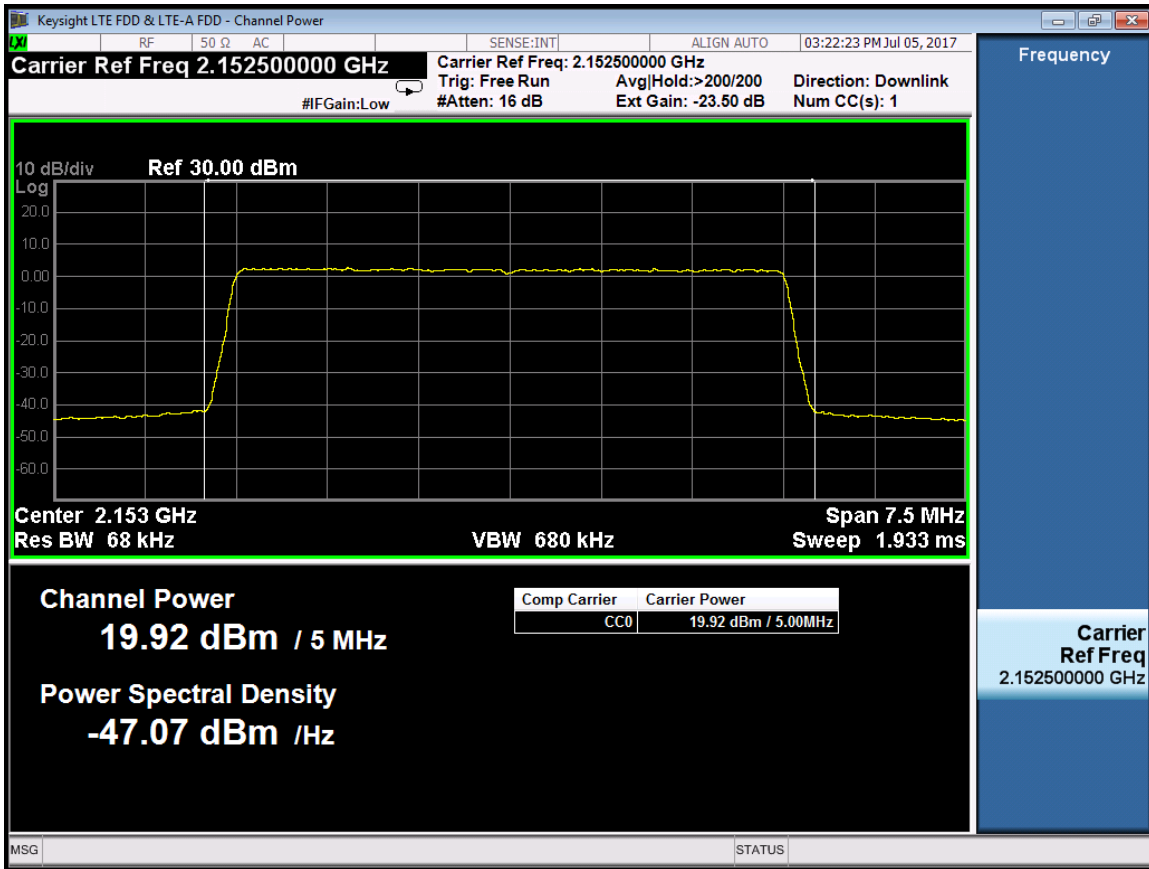
Port 0 -2112.5MHz



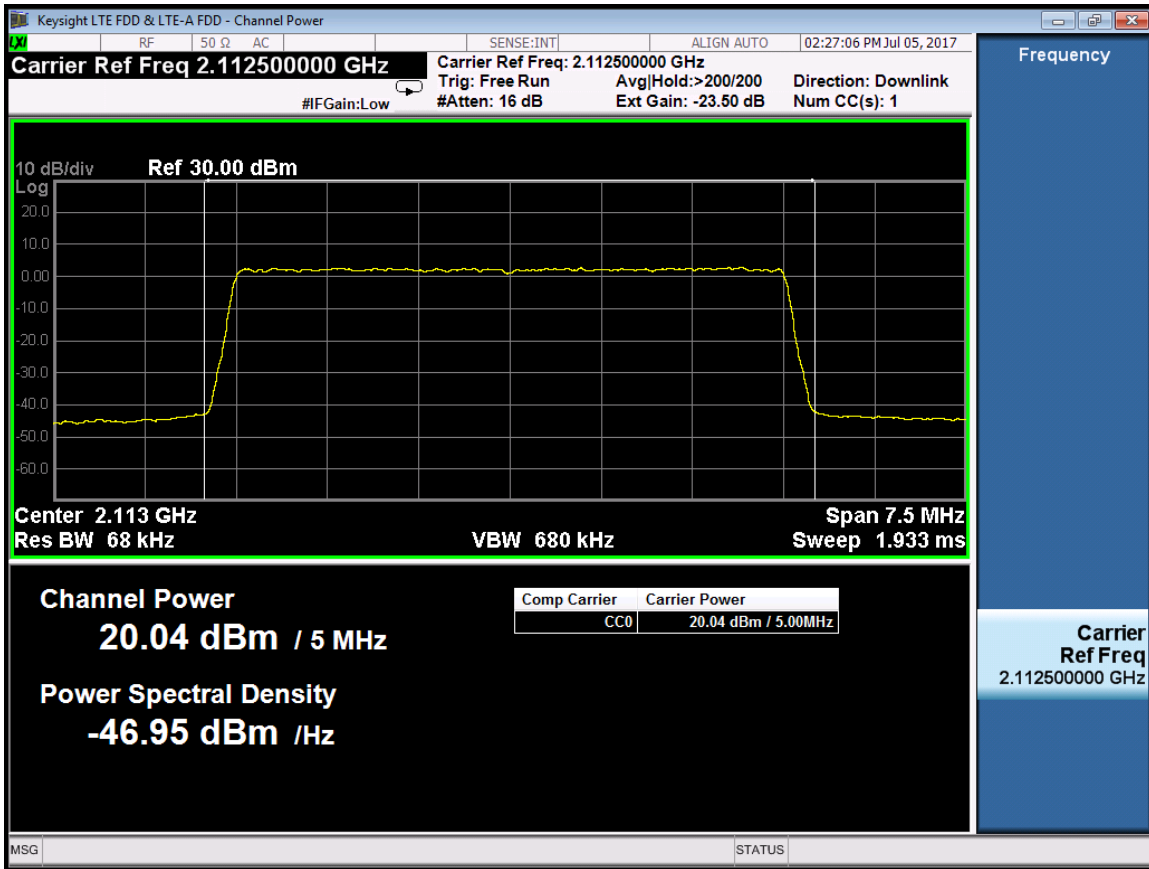
Port 0 -2132.5MHz



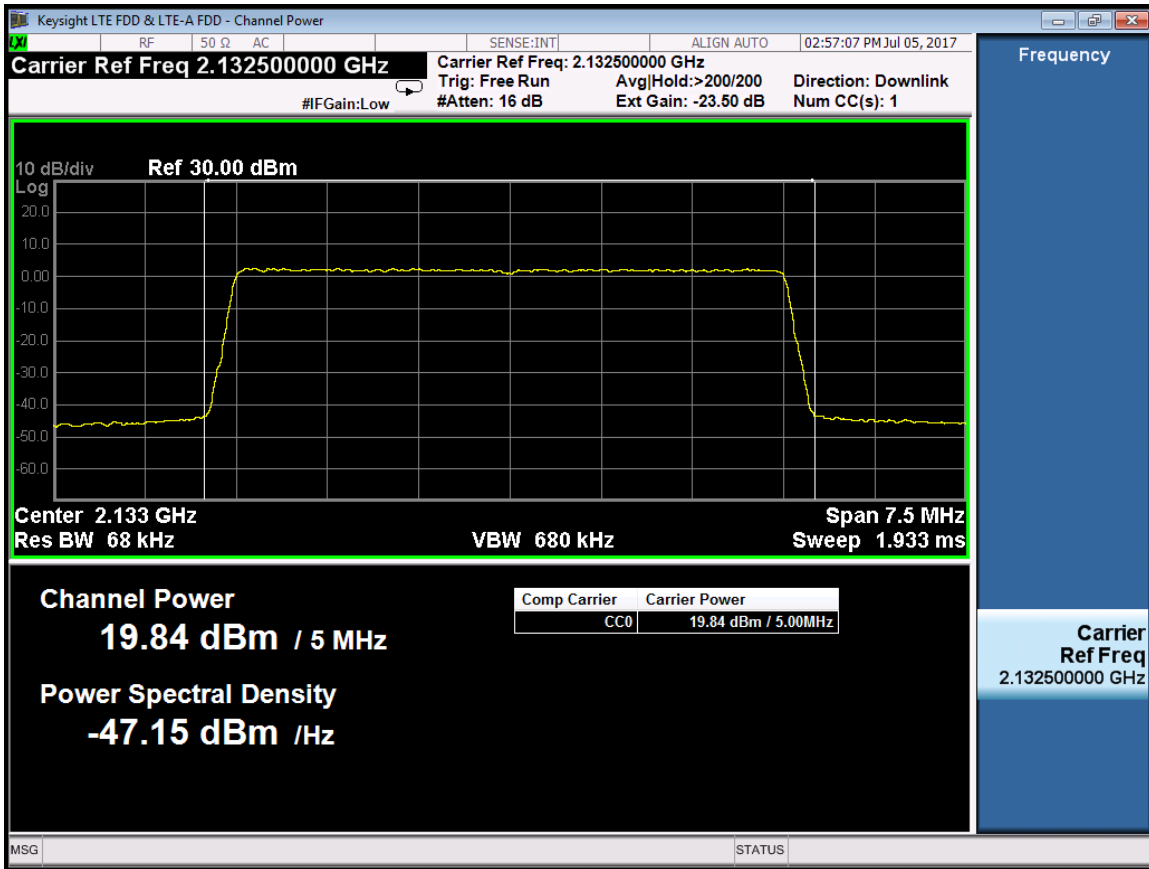
Port 0 -2152.5MHz



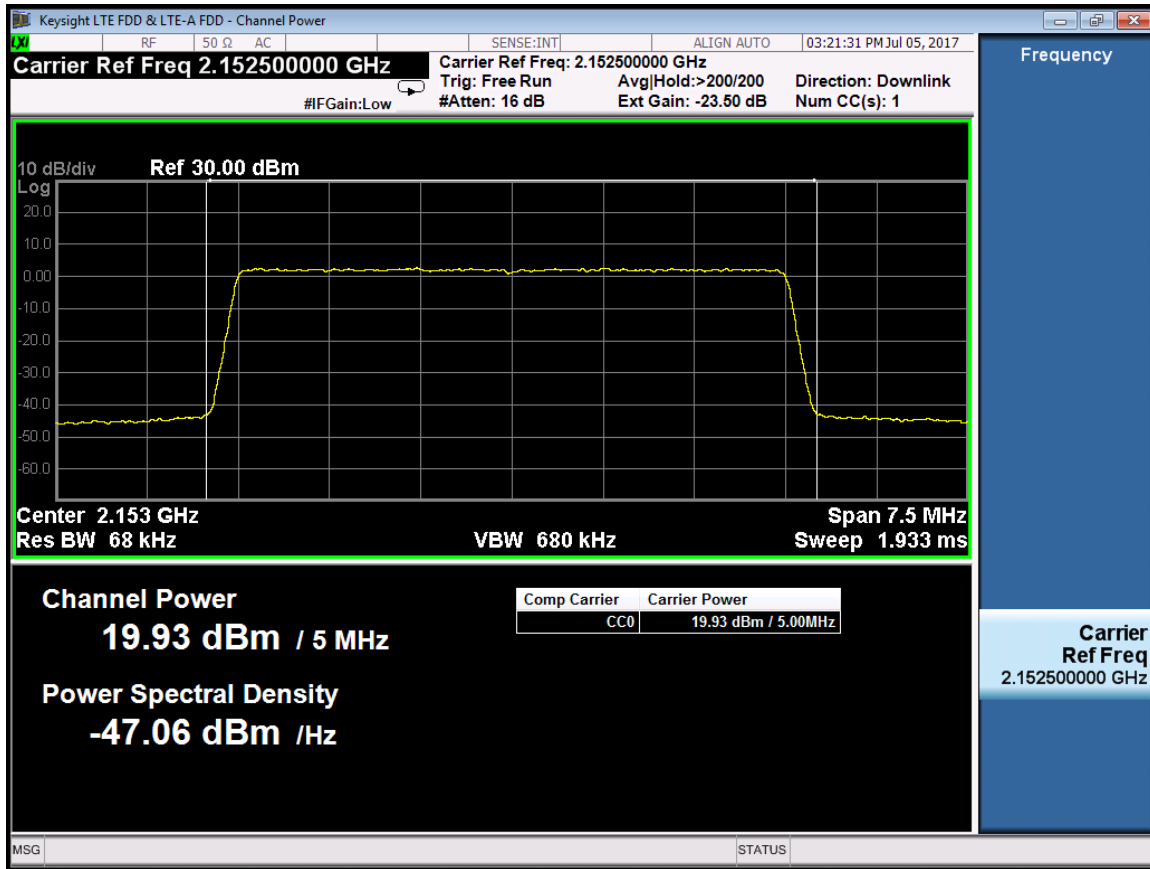
Port 1 -2112.5MHz



Port 1 -2132.5MHz



Port 1 -2152.5MHz



6 RF EXPOSURE

Applicable standard: FCC §2.1091 §1.1037

Limit

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated. Limits for Maximum Permissible Exposure (MPE)

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

Test Data

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \text{EIRP} / 4\pi R^2$$

Where: S = power density

R = distance to the center of radiation of the antenna= $[\text{EIRP} / 4\pi S]^{1/2}$

According to §27.50, the equivalent isotropically radiated power (EIRP) of base transmitters and cellular repeaters must not exceed 2000 Watts.

Frequency 2155MHz is between 1500MHz and 100,000MHz, and the Maximum S=1mW/cm²

$$\Rightarrow R=3.99\text{m.}$$

This equipment should be installed and operated with minimum distance 3.99m between the radiator& your body.

Test Result: pass

7 MODULATION CHARACTERISTIC

Applicable Standard: FCC §2.1047

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 20dB Attenuator	DTS50-20-3-1	09112005	2016.09.12	2017.09.12

Silverline	Silverline RF Cable	SLA18-NMN1T	100311-04-0001	N/A	N/A
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***statement of traceability:** ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

Test Procedure

LTE digital mode is used by EUT.

Test Data Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

Test Result: Pass

Test Mode: Transmitting LTE

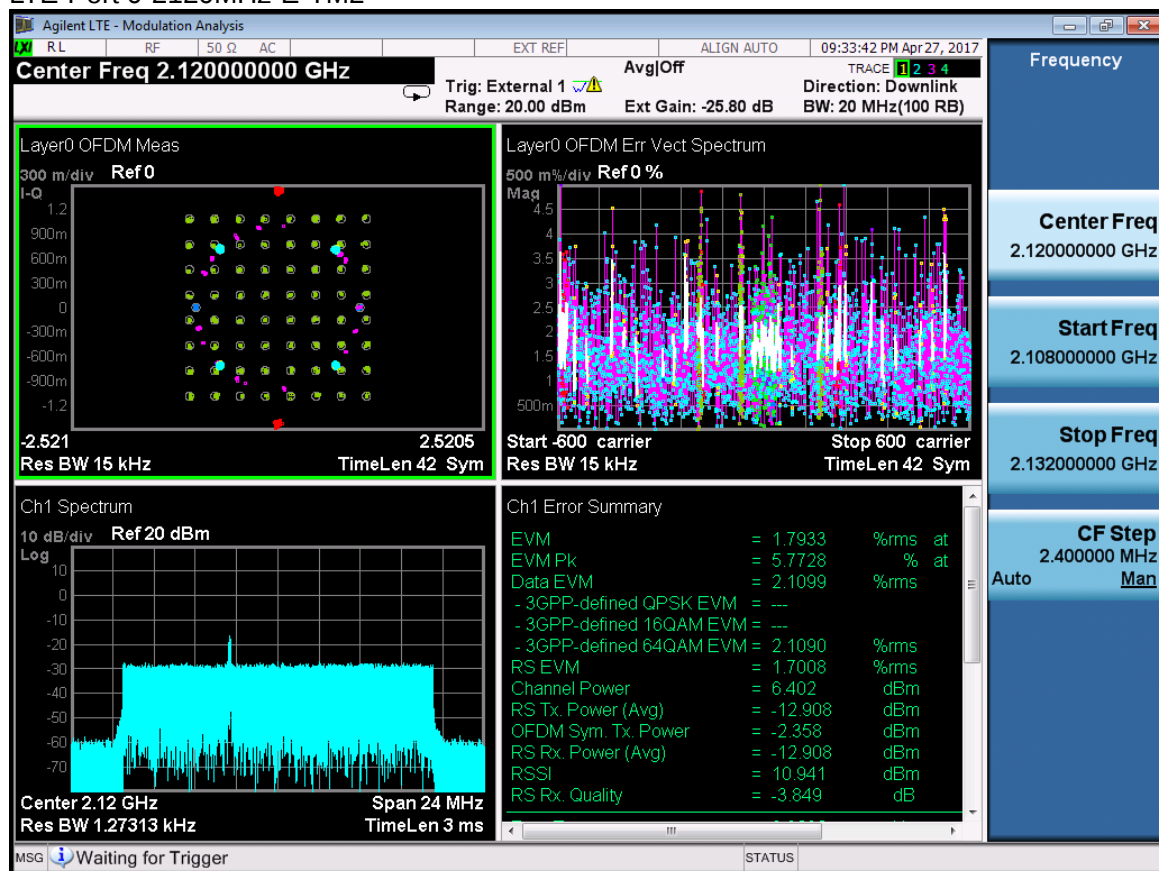
Test Data:

RF Bandwidth :IBW 20MHz(LTE 20MHz)

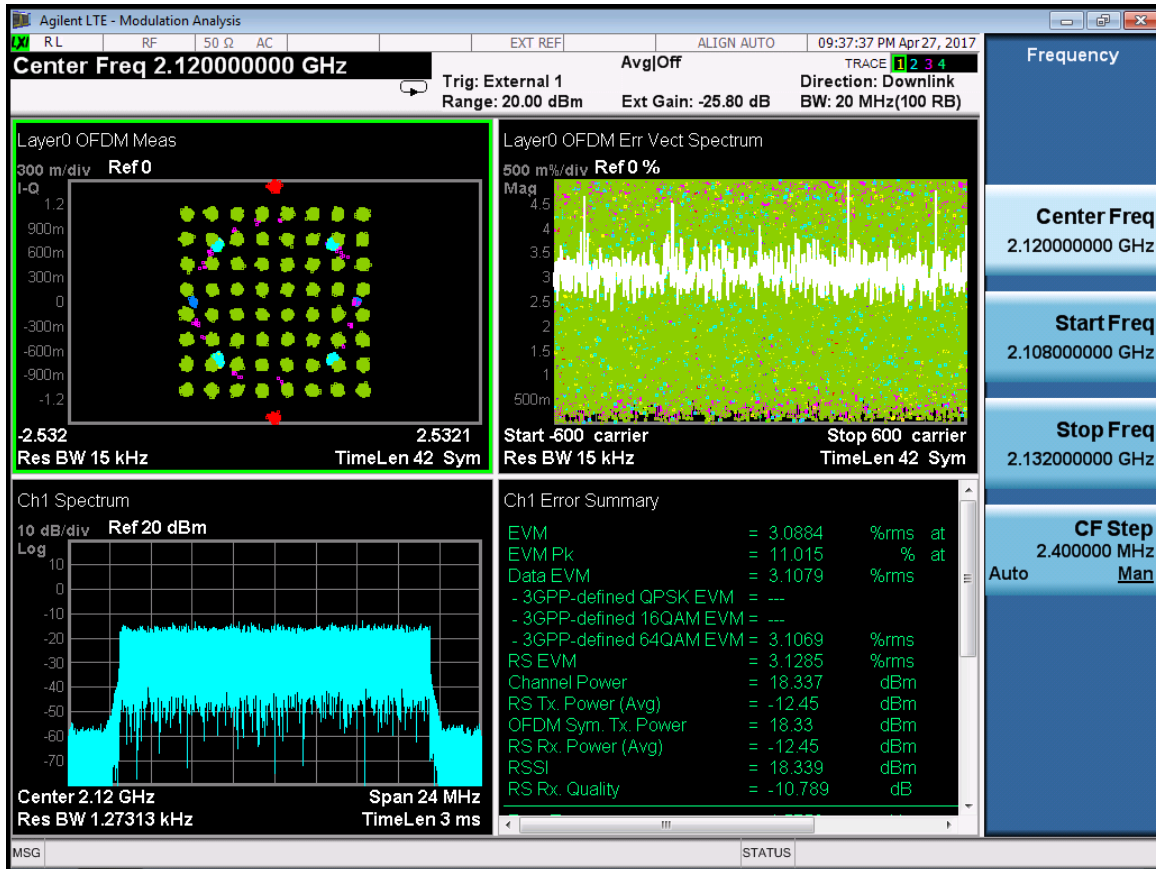
Port	RF Center Freq. (MHz)	Test mode	EVM%
0	2120	E-TM2	1.82709
		E-TM3.1	3.08938
		E-TM 3.2	4.03838
		E-TM 3.3	3.94445
	2132.5	E-TM2	1.79427
		E-TM3.1	3.09752
		E-TM 3.2	4.06098
		E-TM 3.3	3.93335
	2145	E-TM2	1.80182
		E-TM3.1	3.0784
		E-TM 3.2	4.03961
		E-TM 3.3	3.92782
1	2120	E-TM2	1.8625

		E-TM3.1	3.09572
		E-TM 3.2	4.05386
		E-TM 3.3	3.94971
	2132.5	E-TM2	1.86541
		E-TM3.1	3.14035
		E-TM 3.2	4.04204
		E-TM 3.3	3.93355
	2145	E-TM2	1.90809
		E-TM3.1	3.07185
		E-TM 3.2	4.02996
		E-TM 3.3	3.9306

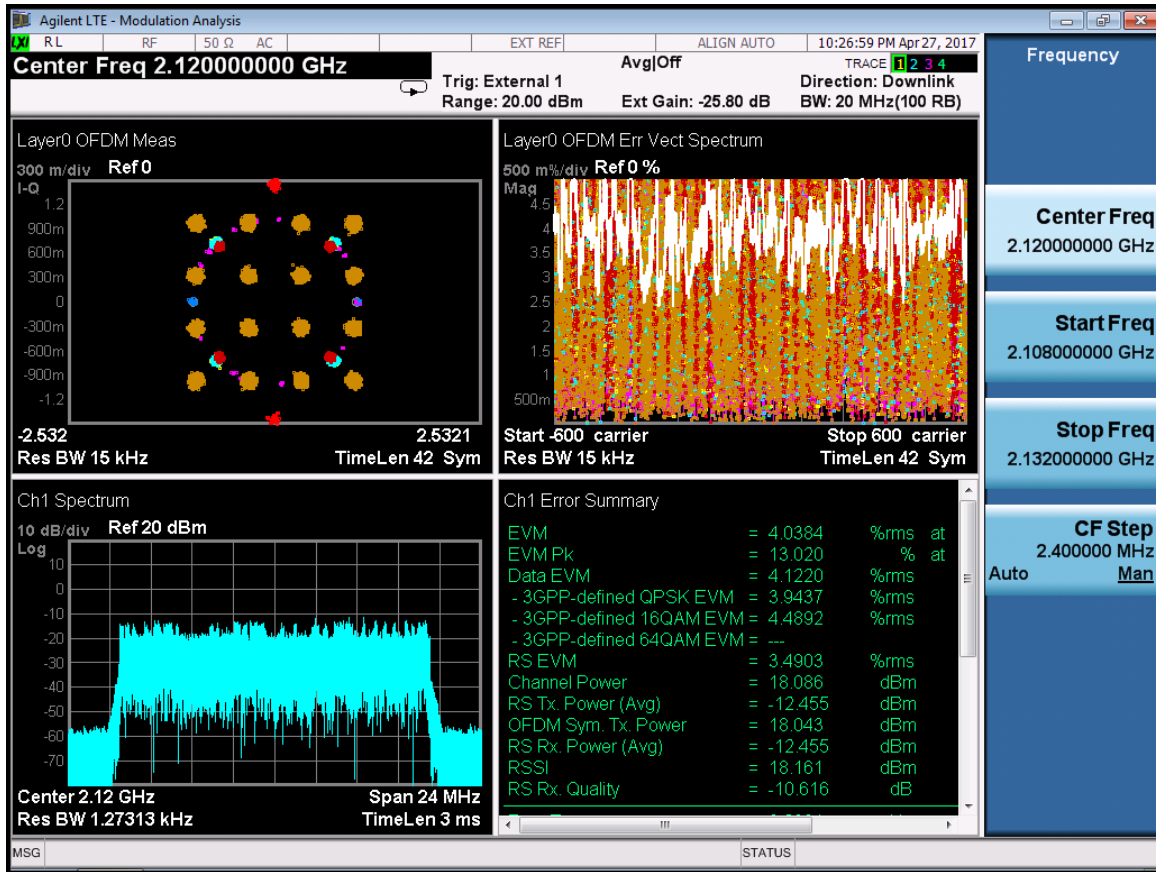
RF 2120MHz:
LTE-Port 0-2120MHz-E-TM2



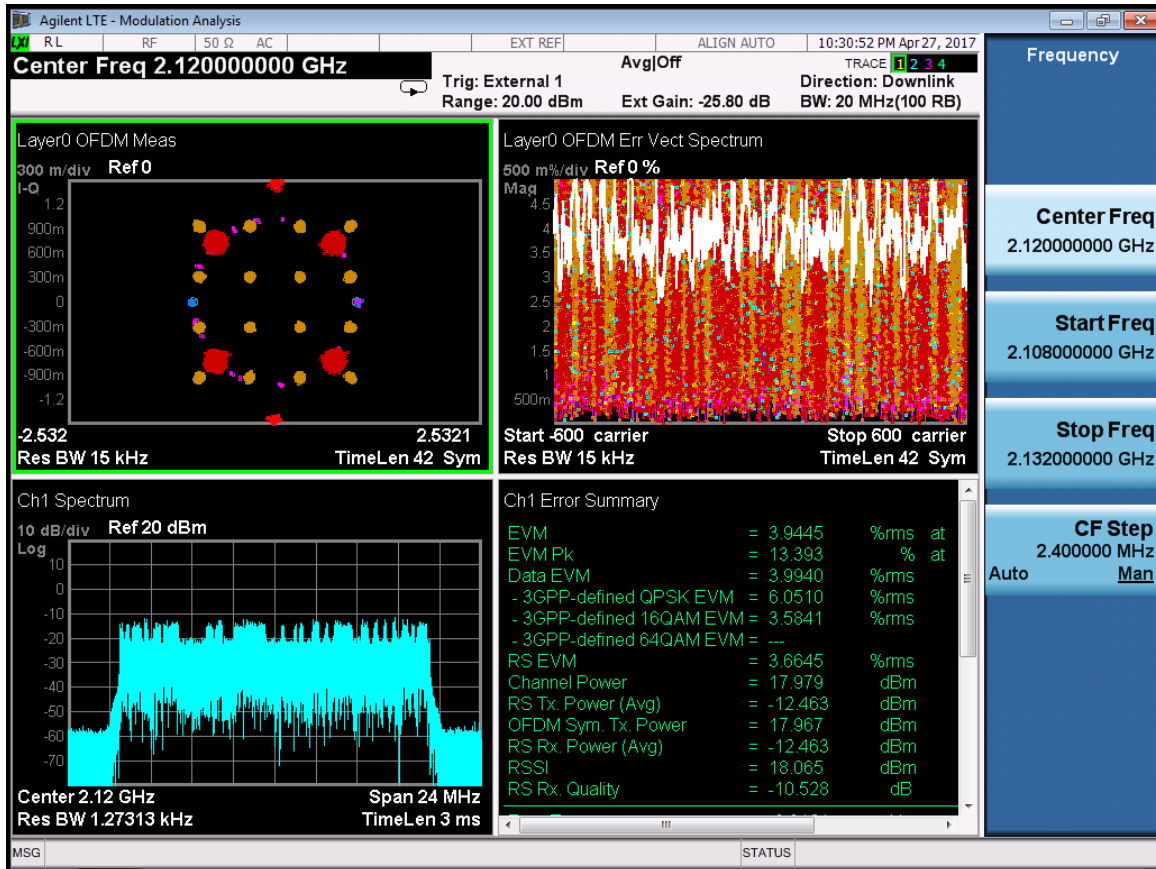
LTE-Port 0-2120MHz-E-TM3.1



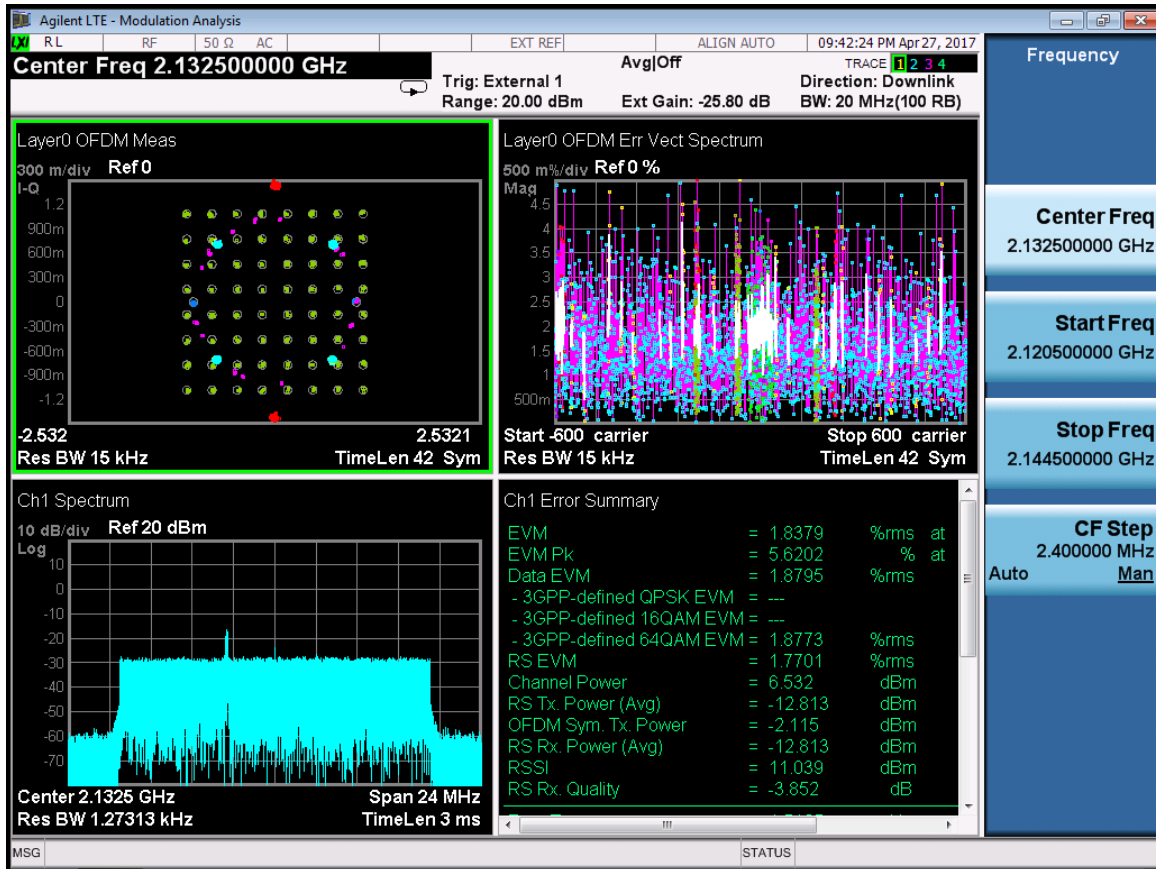
LTE-Port 0-2120MHz-E-TM3.2



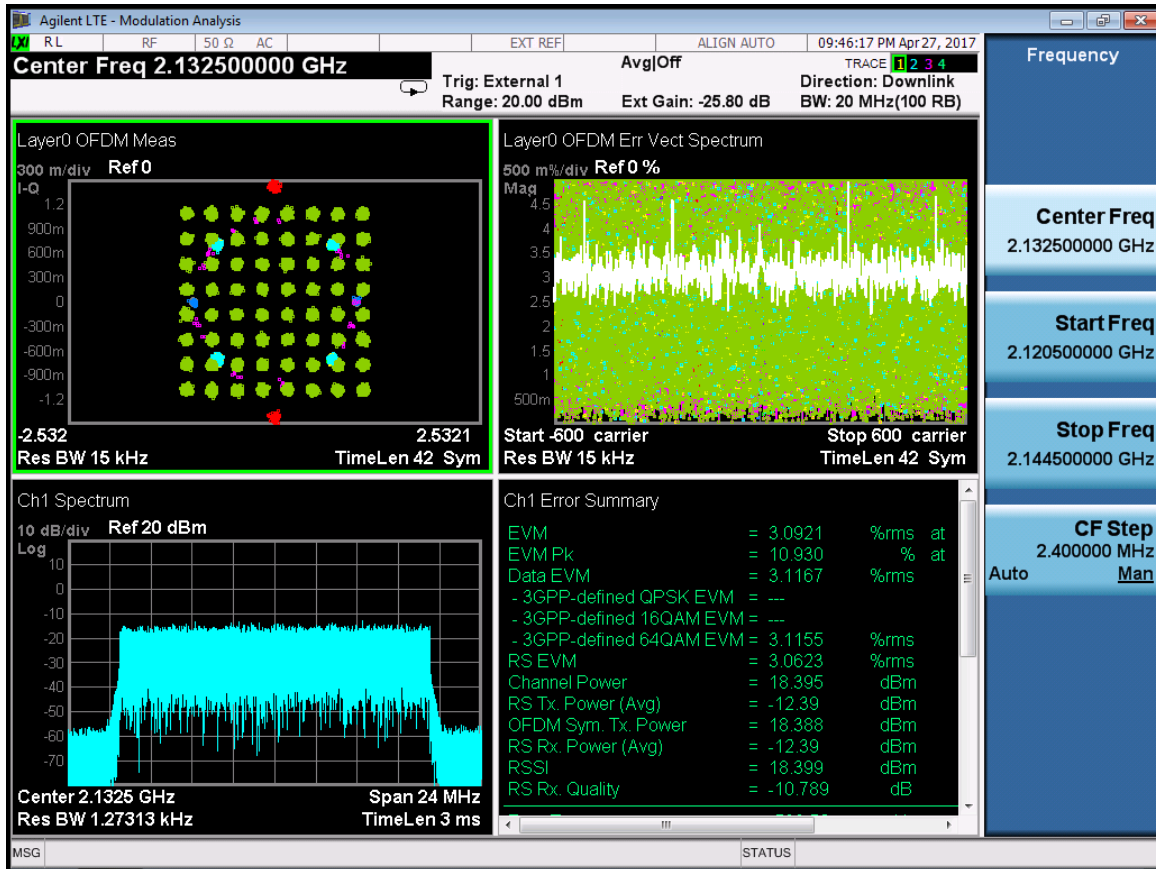
LTE-Port 0-2120MHz-E-TM3.3



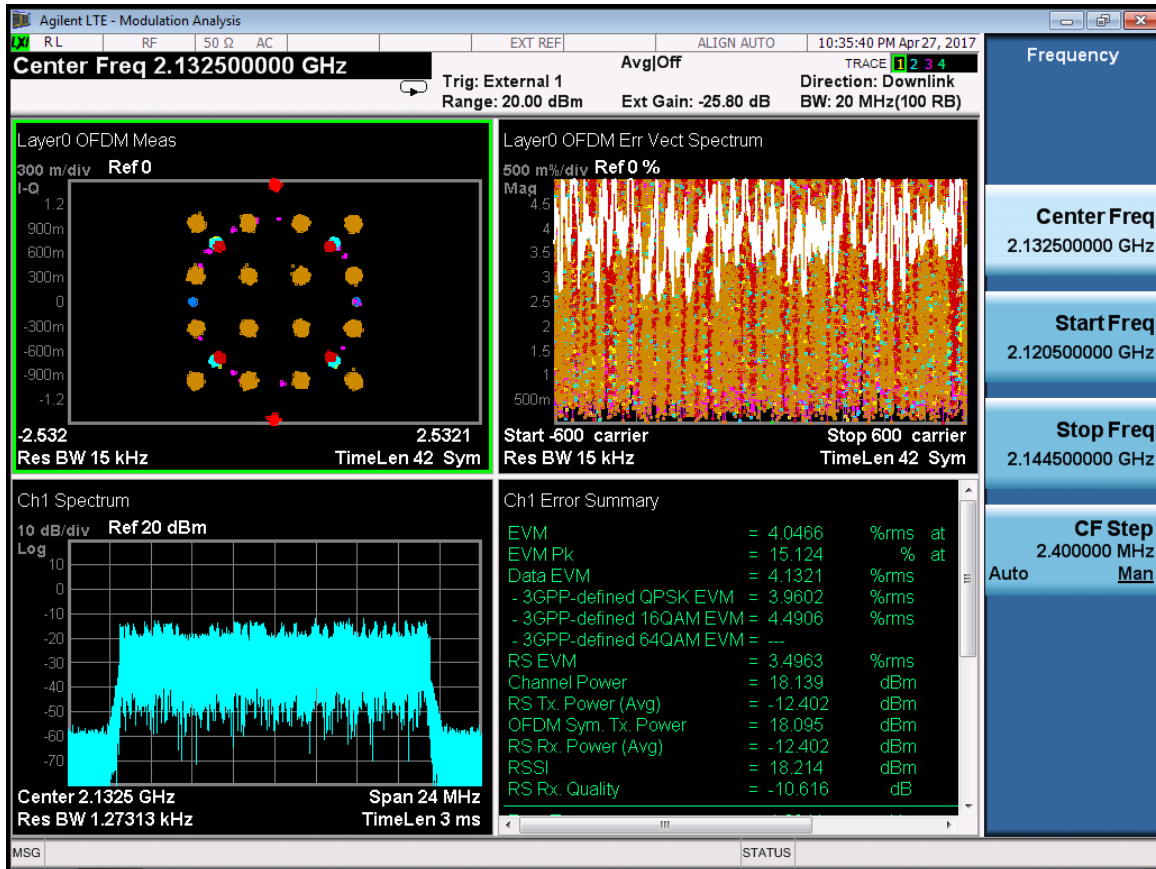
RF 2132.5MHz:
LTE-Port 0-2132.5MHz-E-TM2



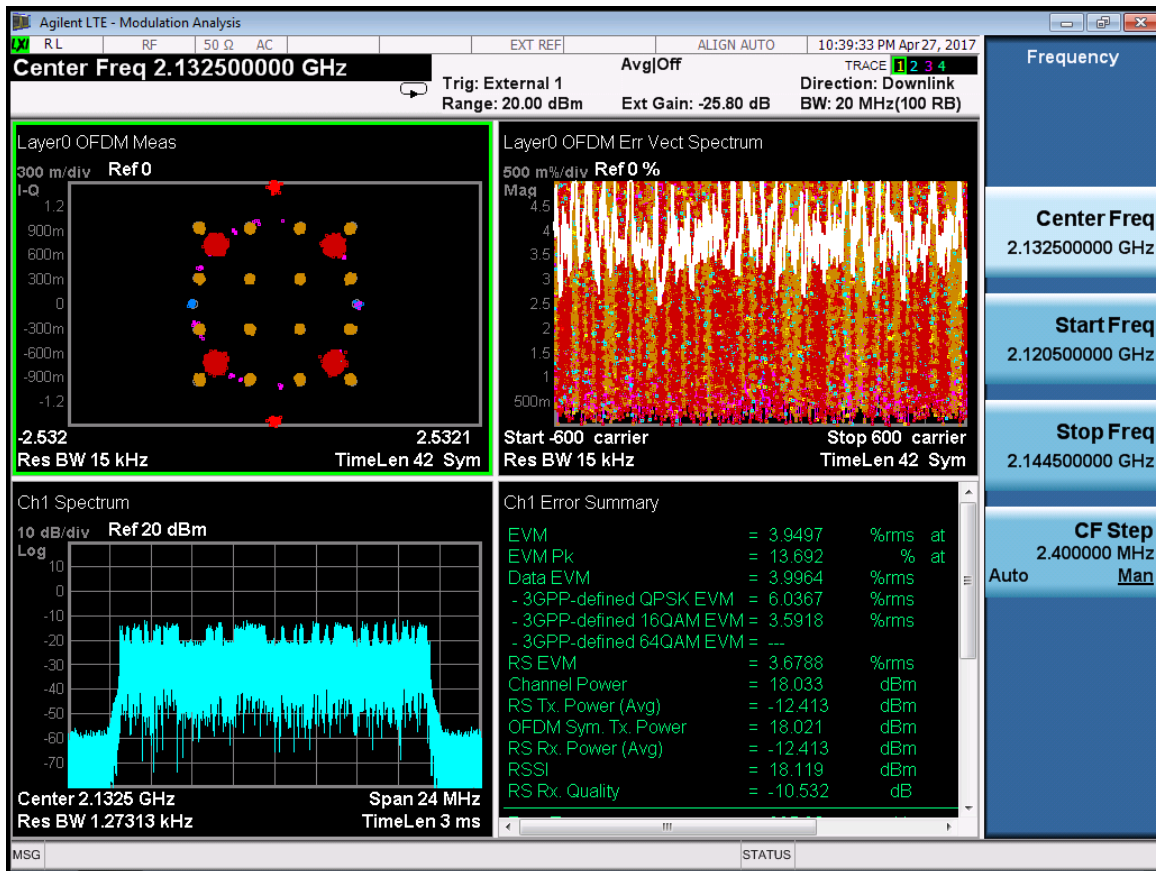
LTE-Port 0-2132.5MHz-E-TM3.1



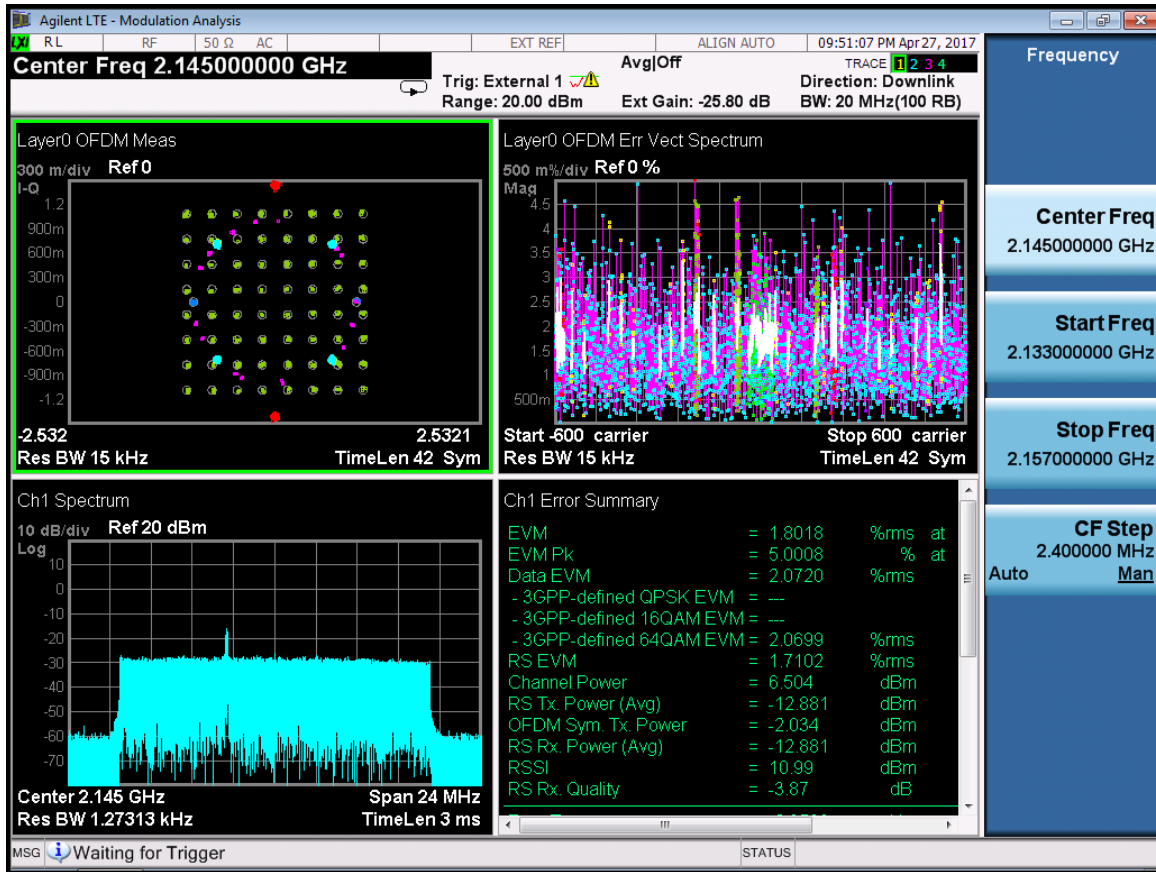
LTE-Port 0-2132.5MHz-E-TM3.2



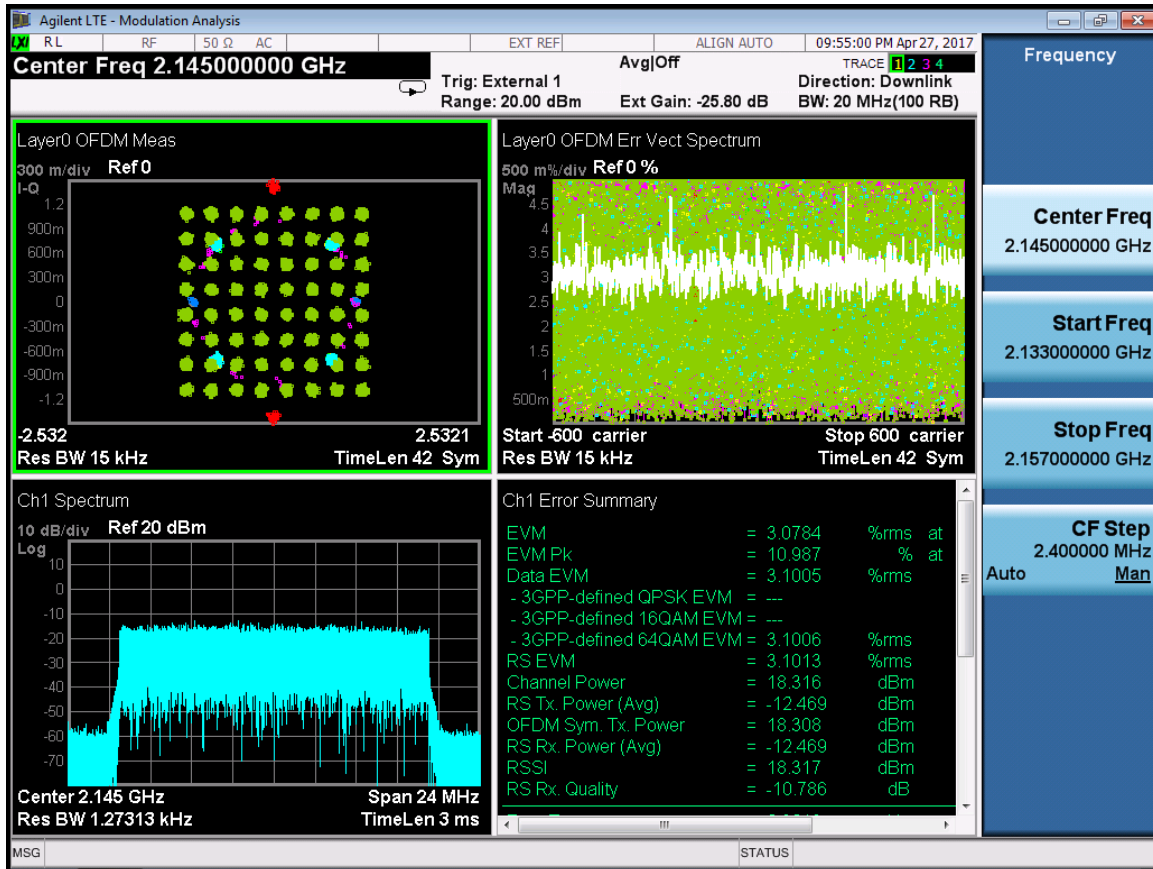
LTE-Port 0-2132.5MHz-E-TM3.3



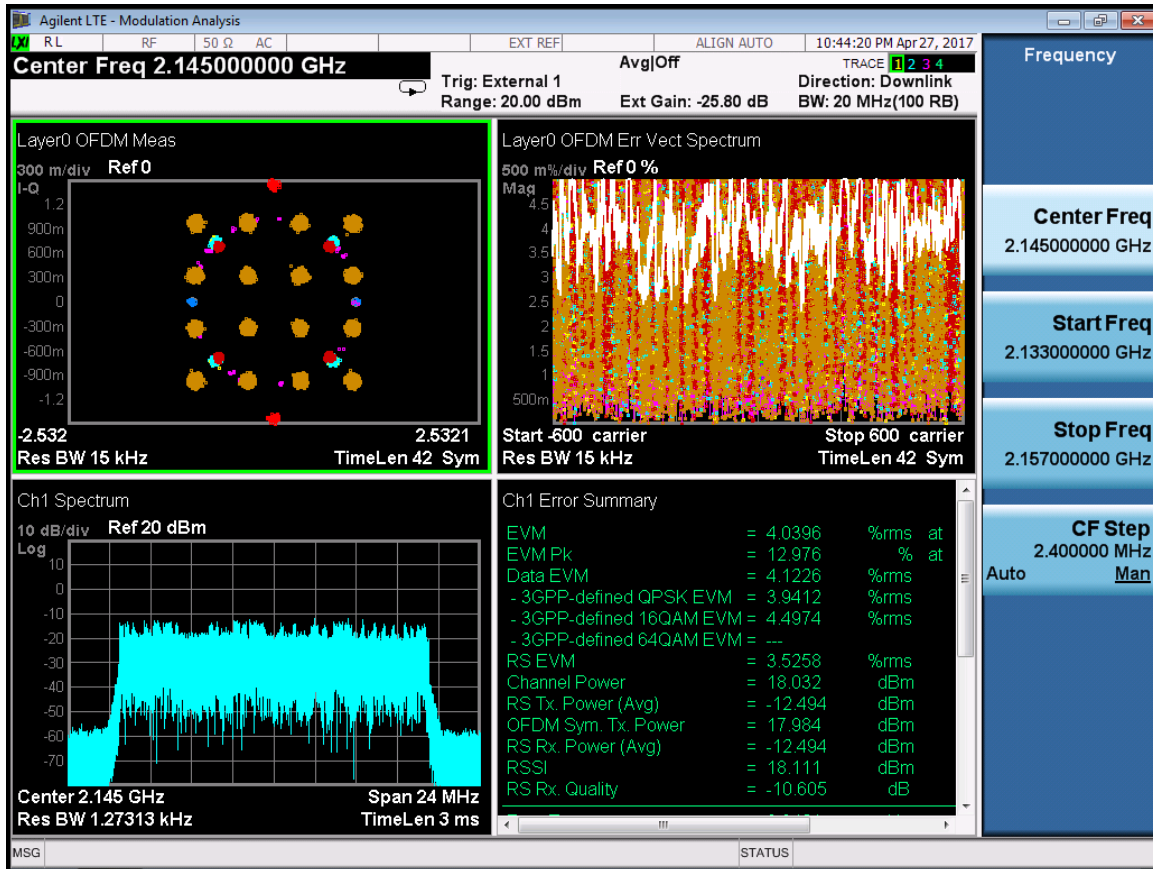
RF 2145MHz:
LTE-Port 0-2145MHz-E-TM2



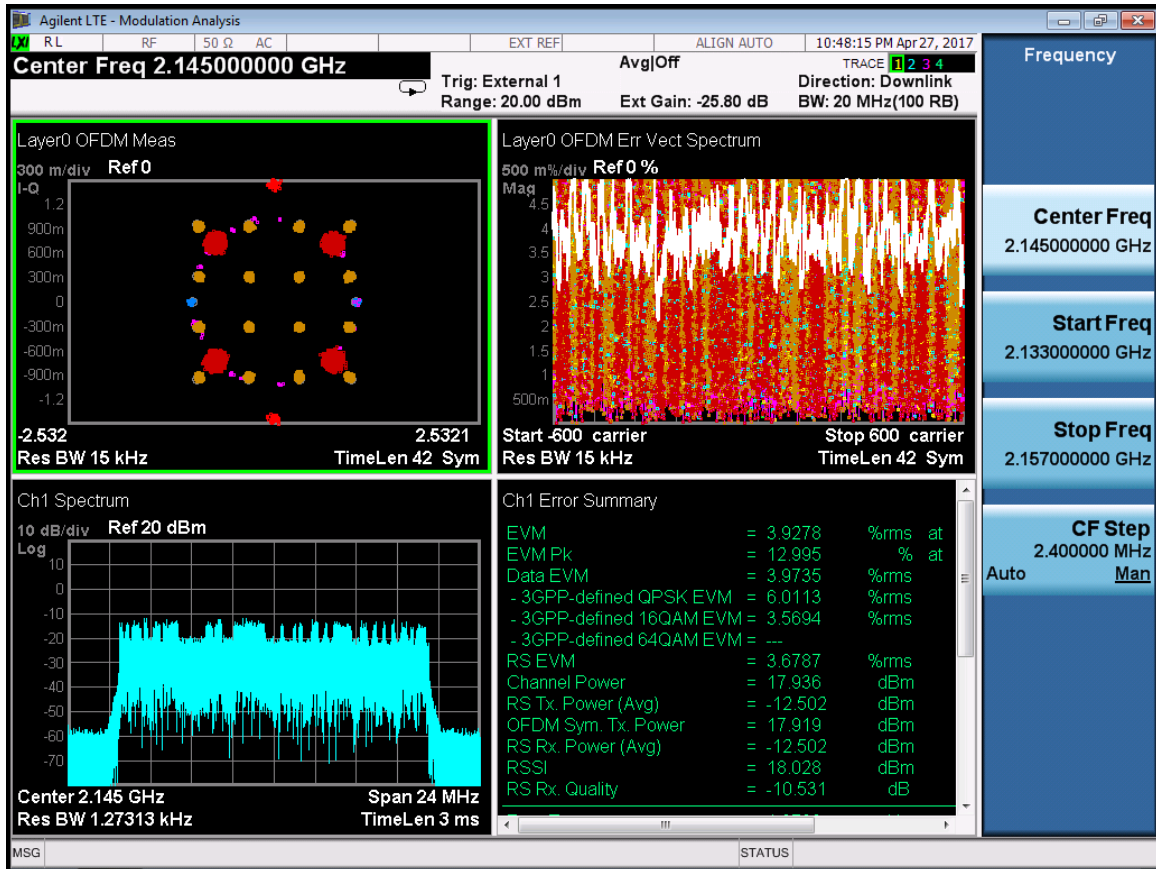
LTE-Port 0-2145MHz-E-TM3.1



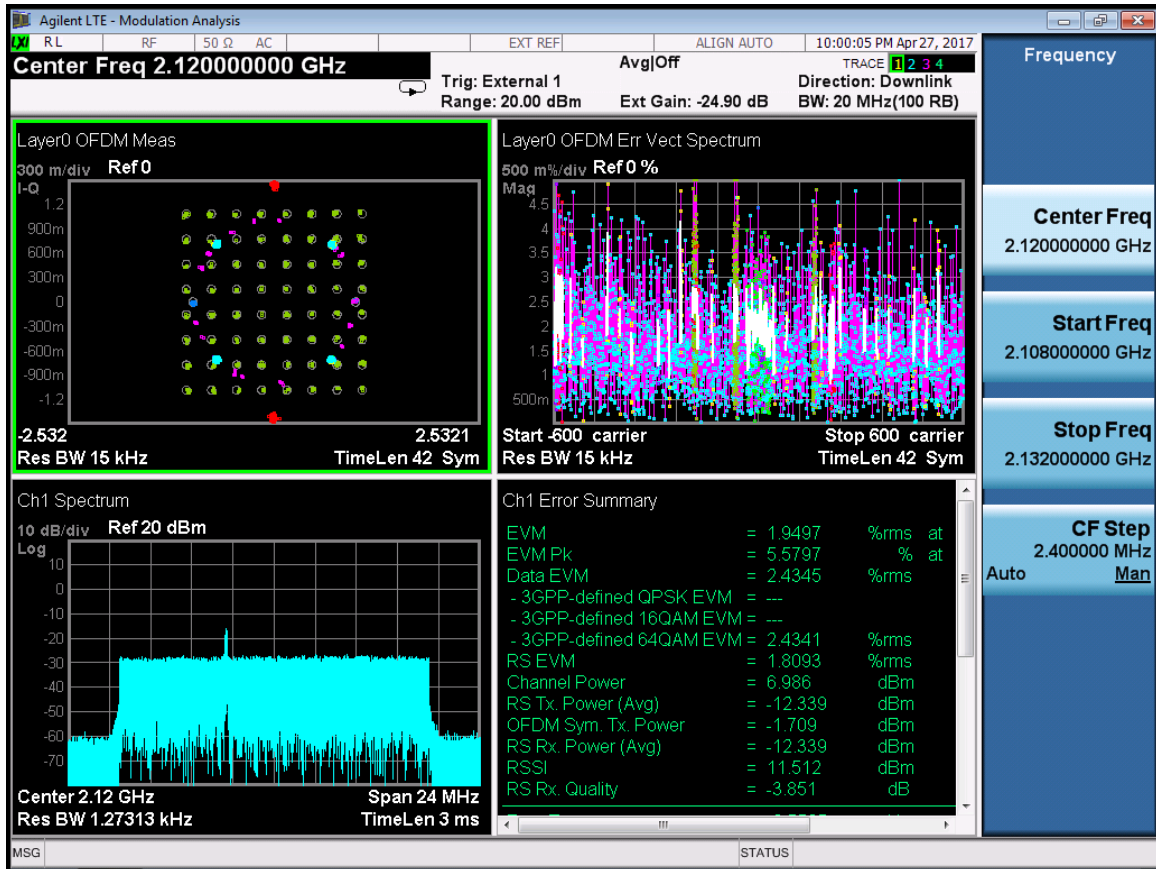
LTE-Port 0-2145MHz-E-TM3.2



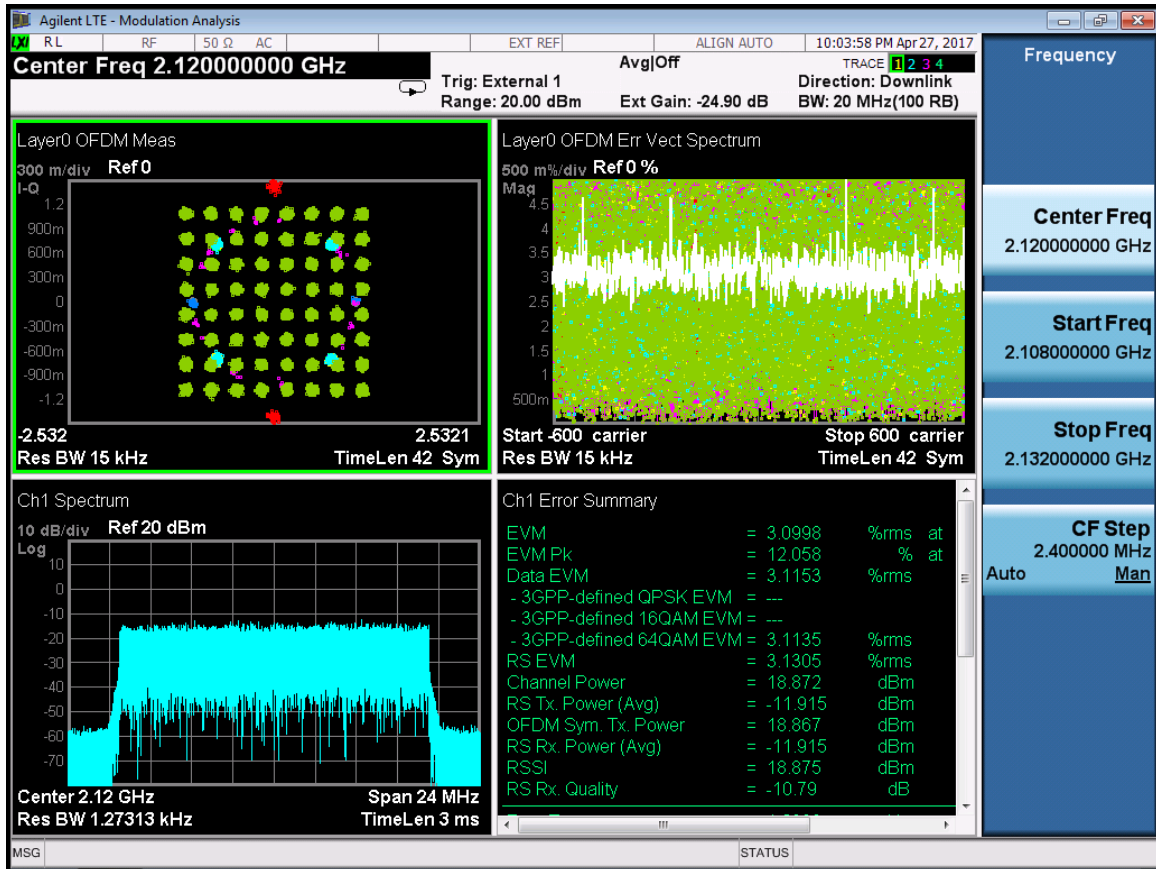
LTE-Port 0-2145MHz-E-TM3.3



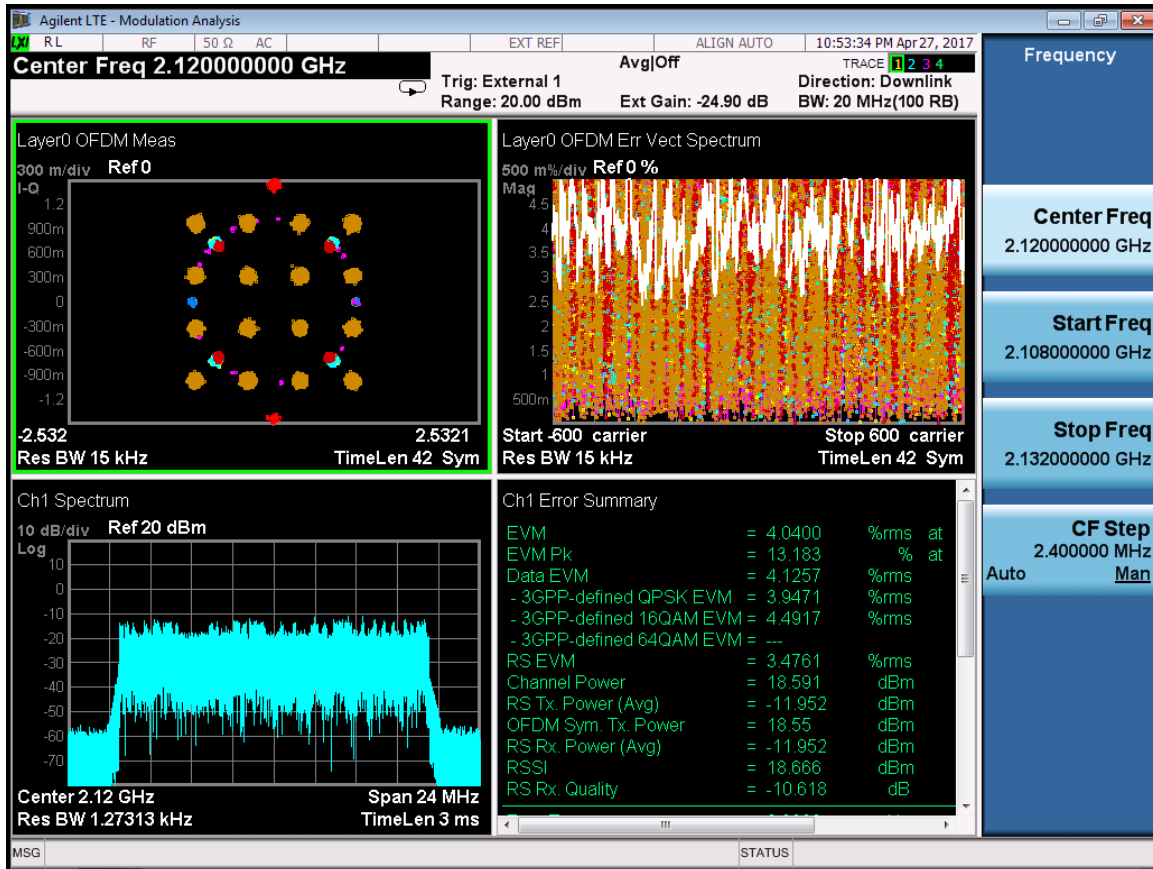
RF 2120MHz:
LTE-Port 1-2120MHz-E-TM2



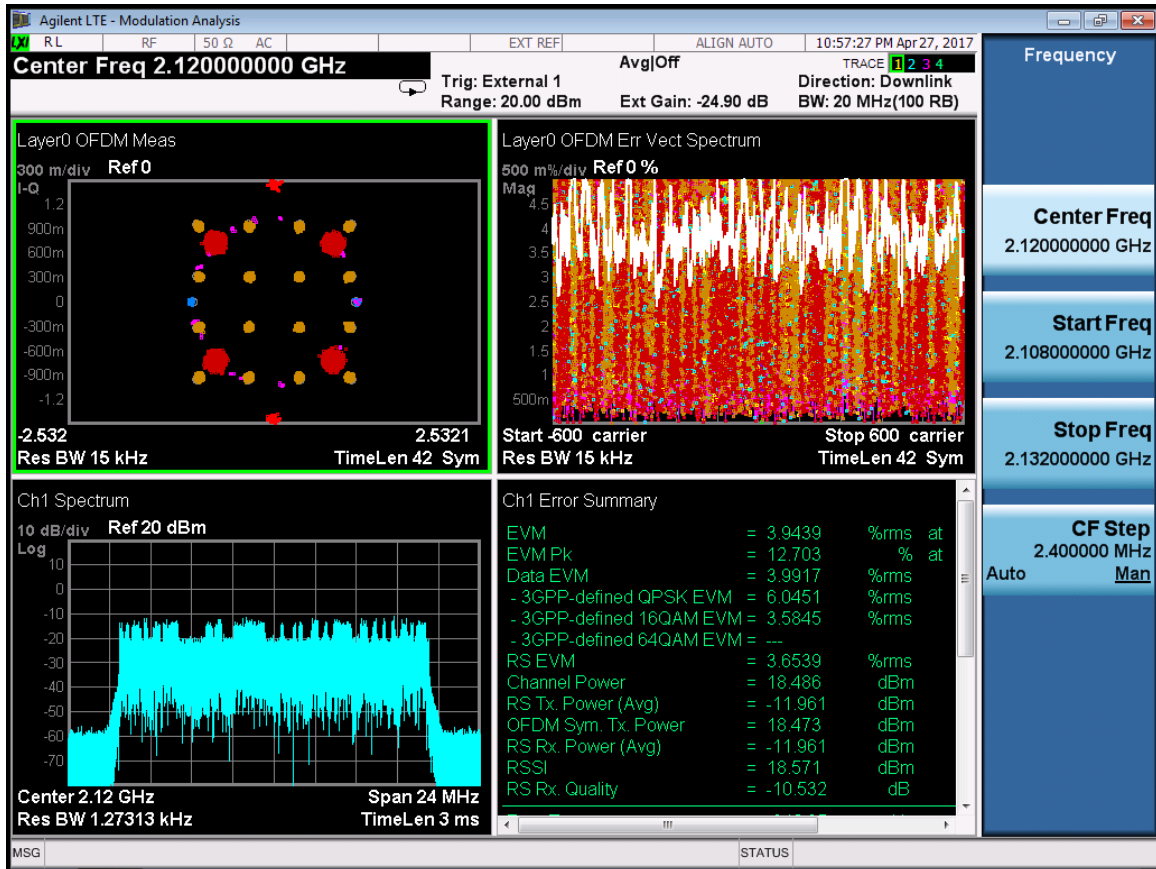
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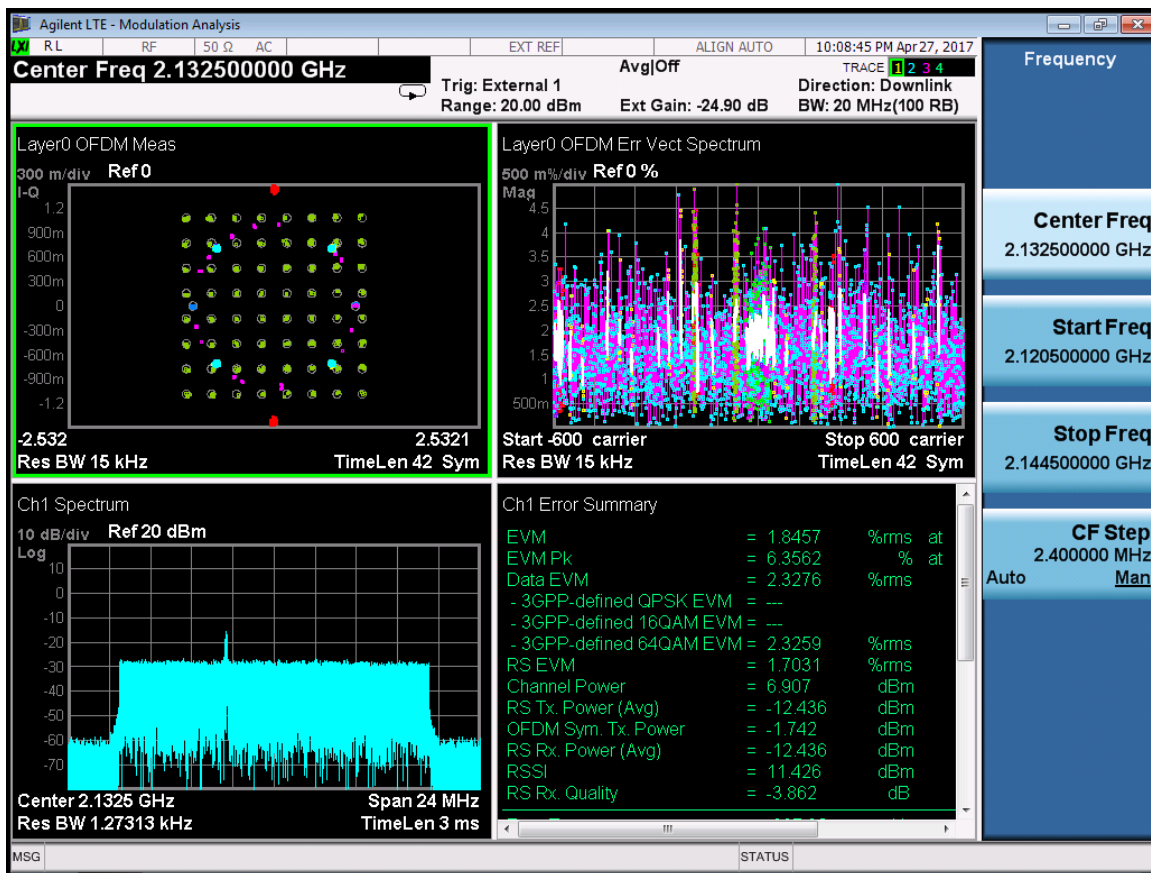
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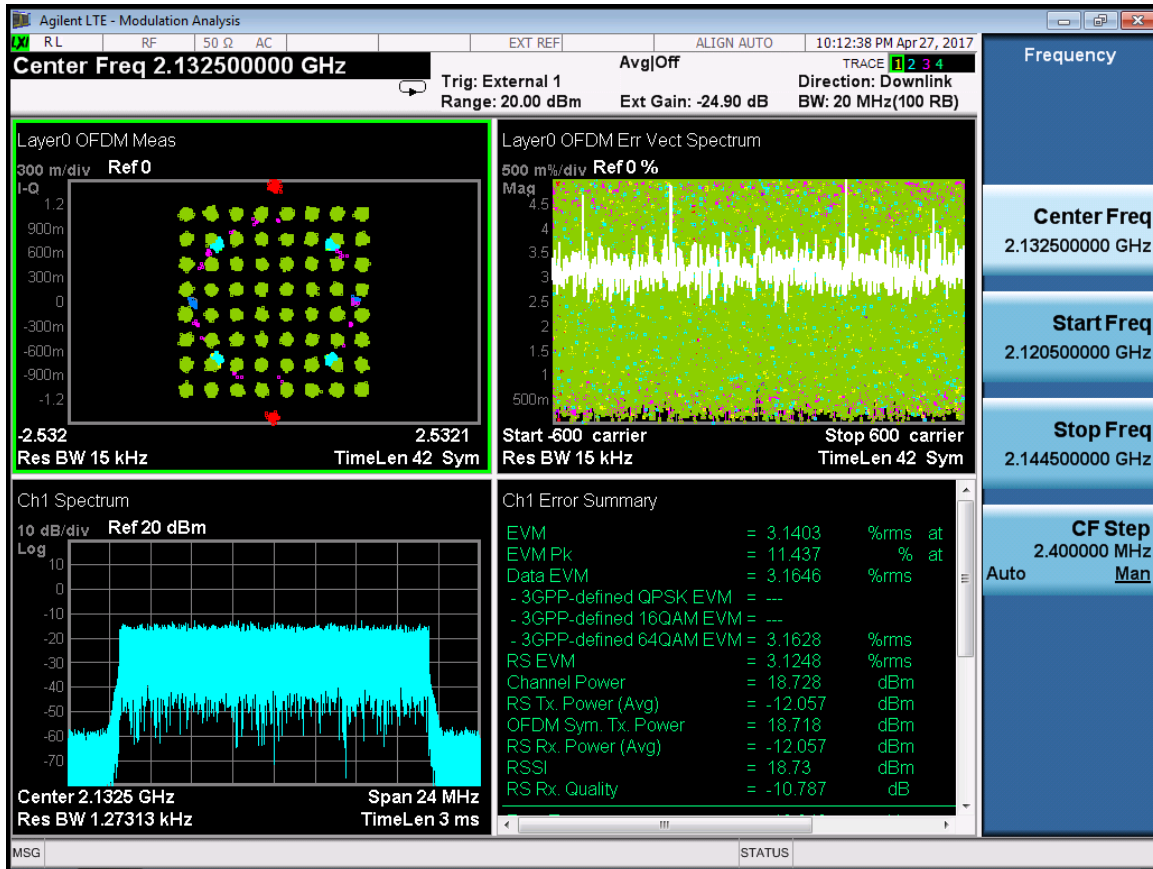
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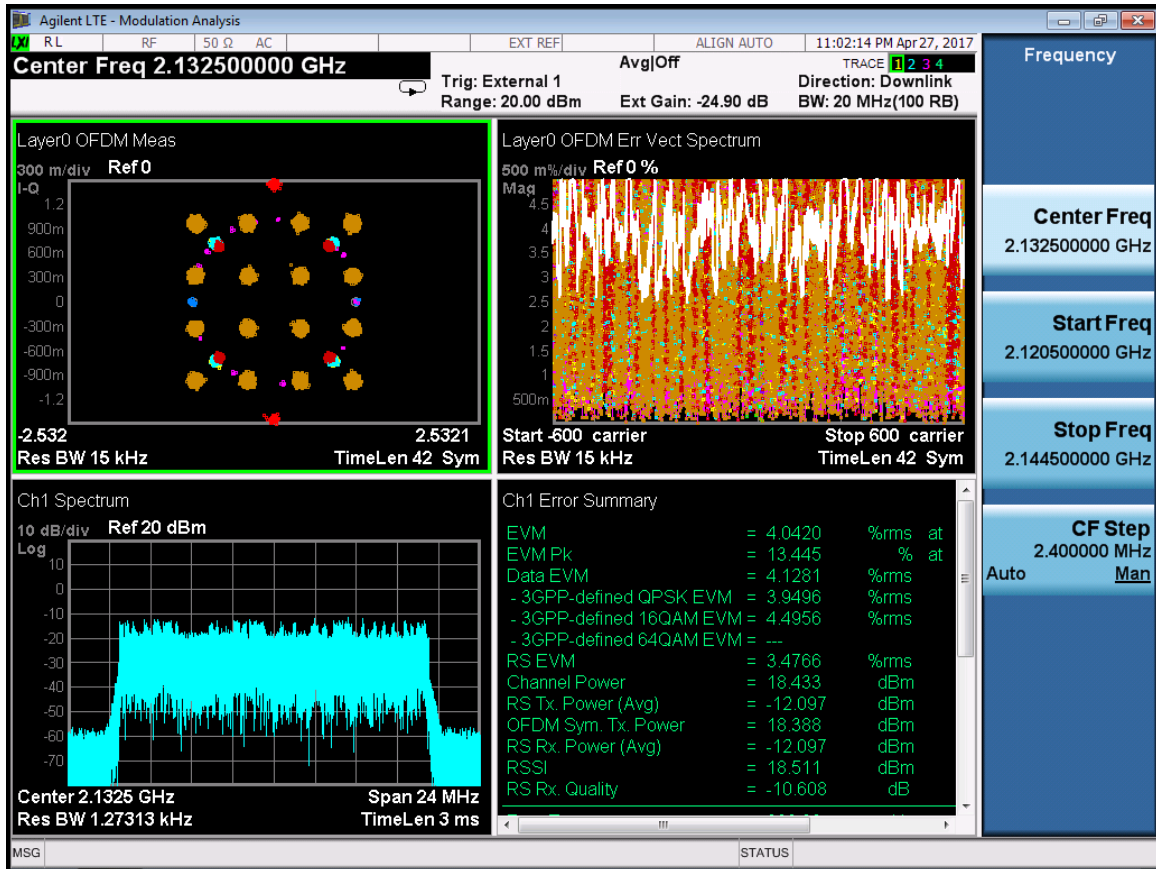
RF 2132.5MHz:
LTE-Port 1-2132.5MHz-E-TM2



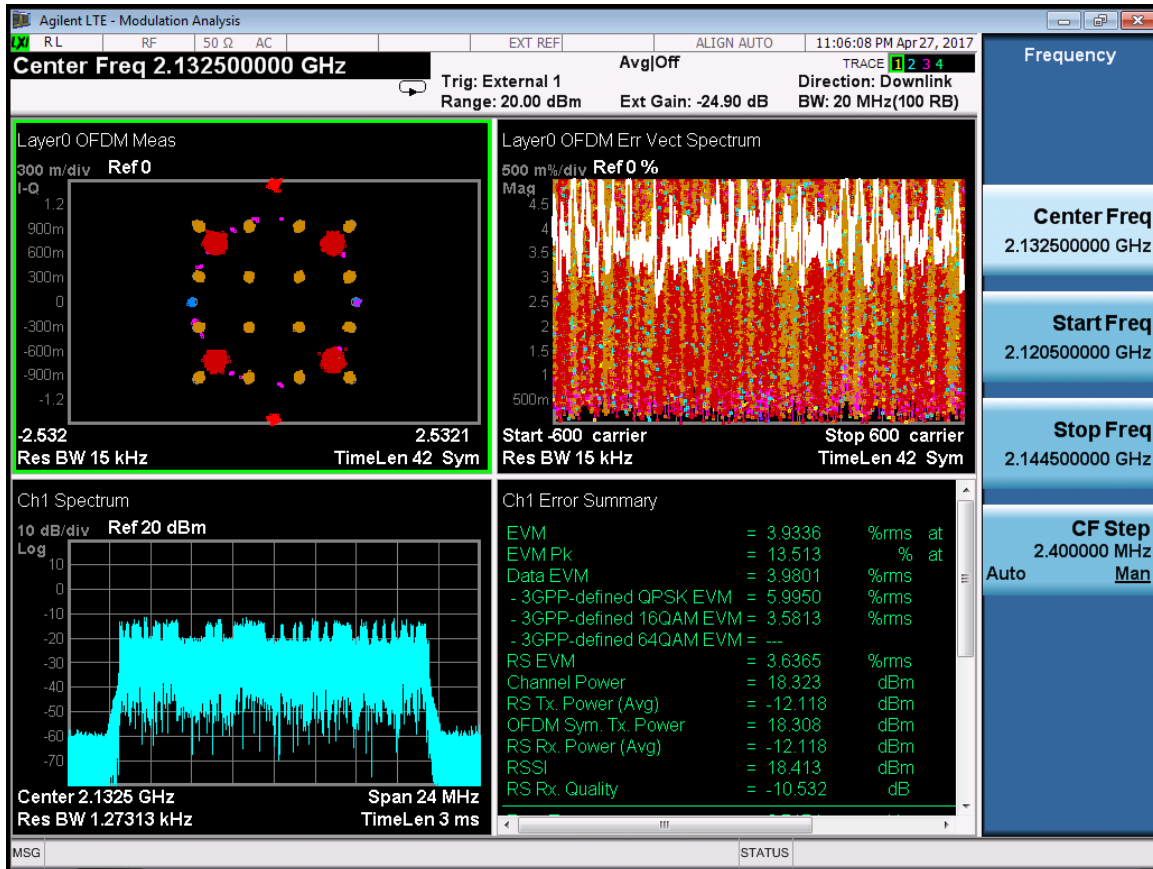
LTE-Port 1-2132.5MHz-E-TM3.1



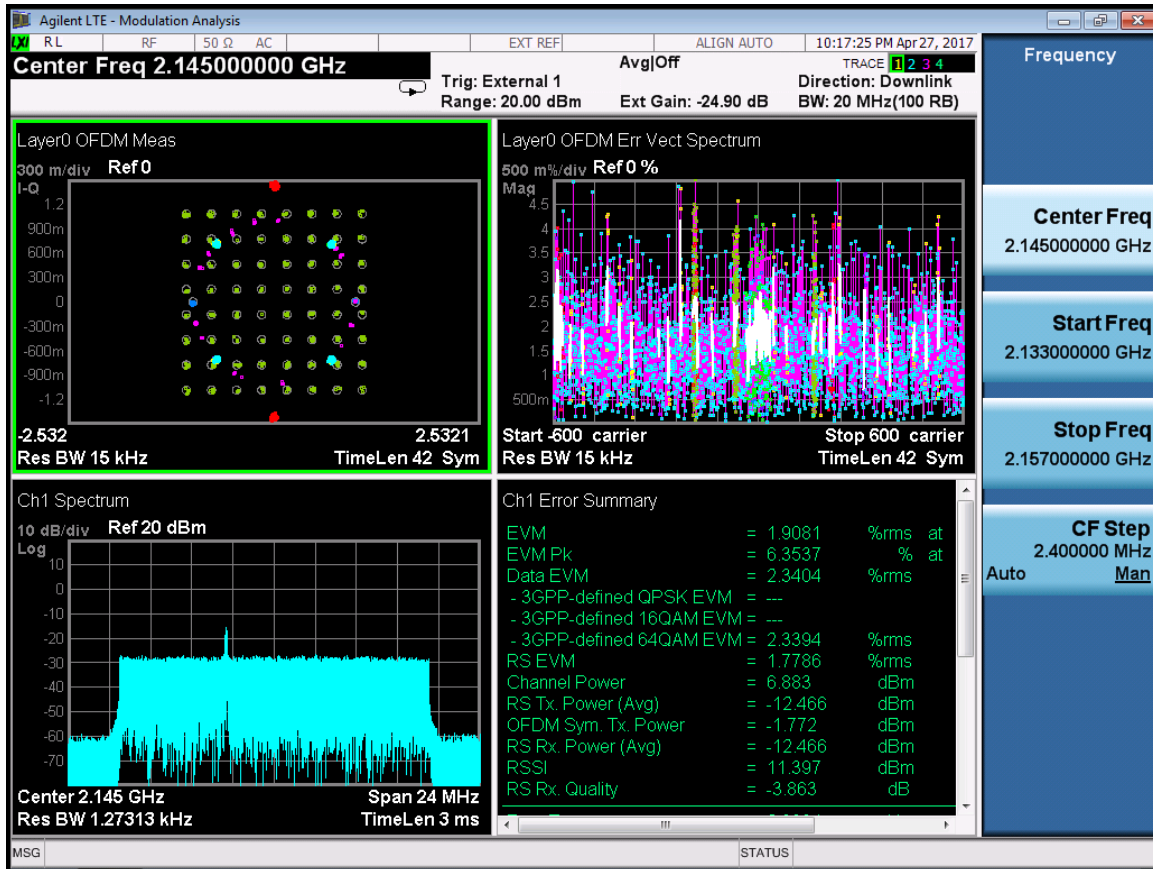
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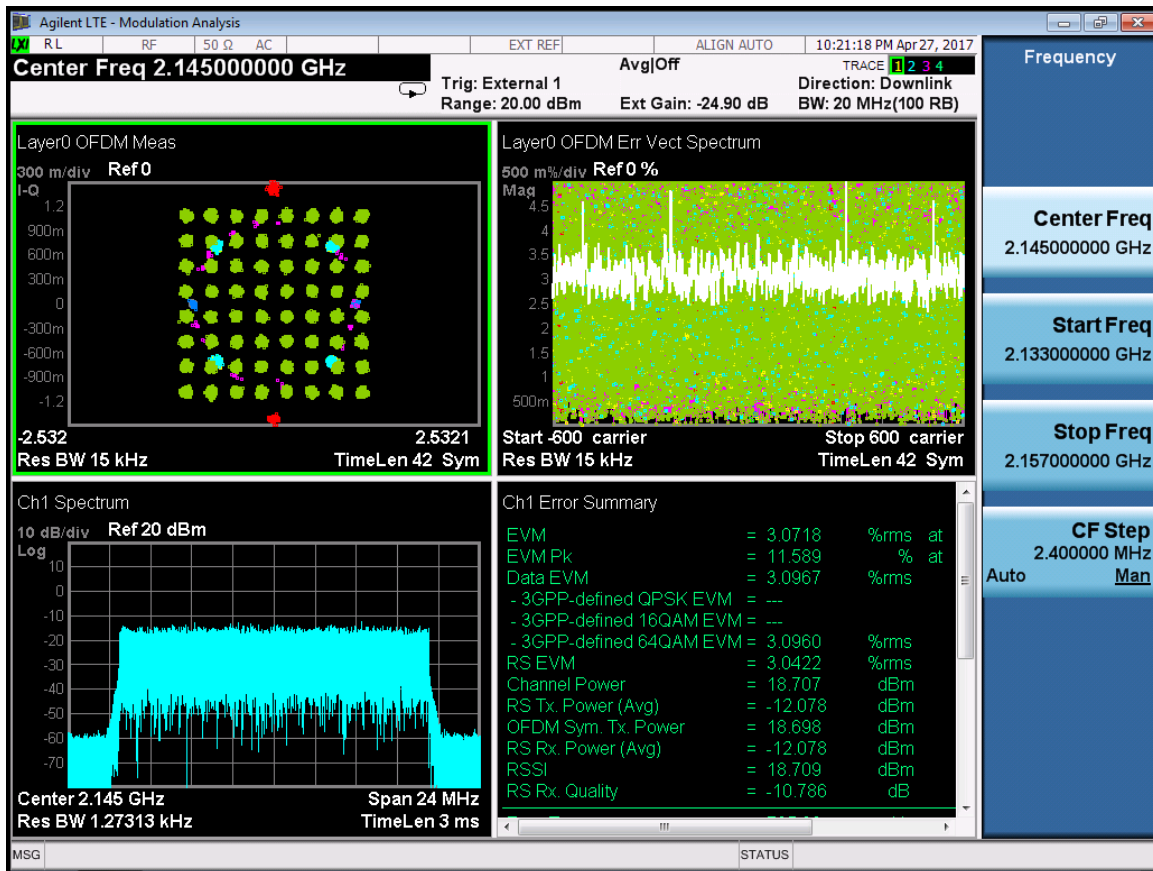
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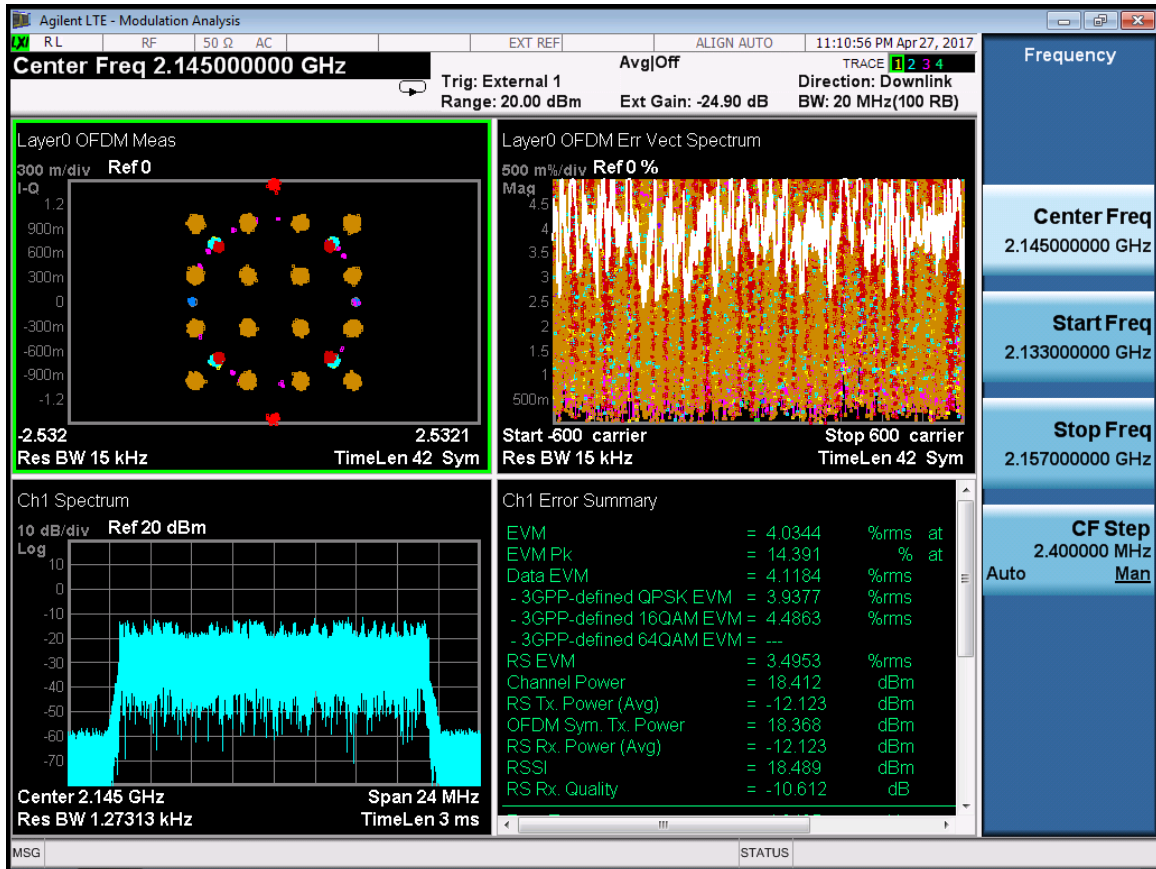
RF 2145MHz:
LTE-Port 1-2145MHz-E-TM2



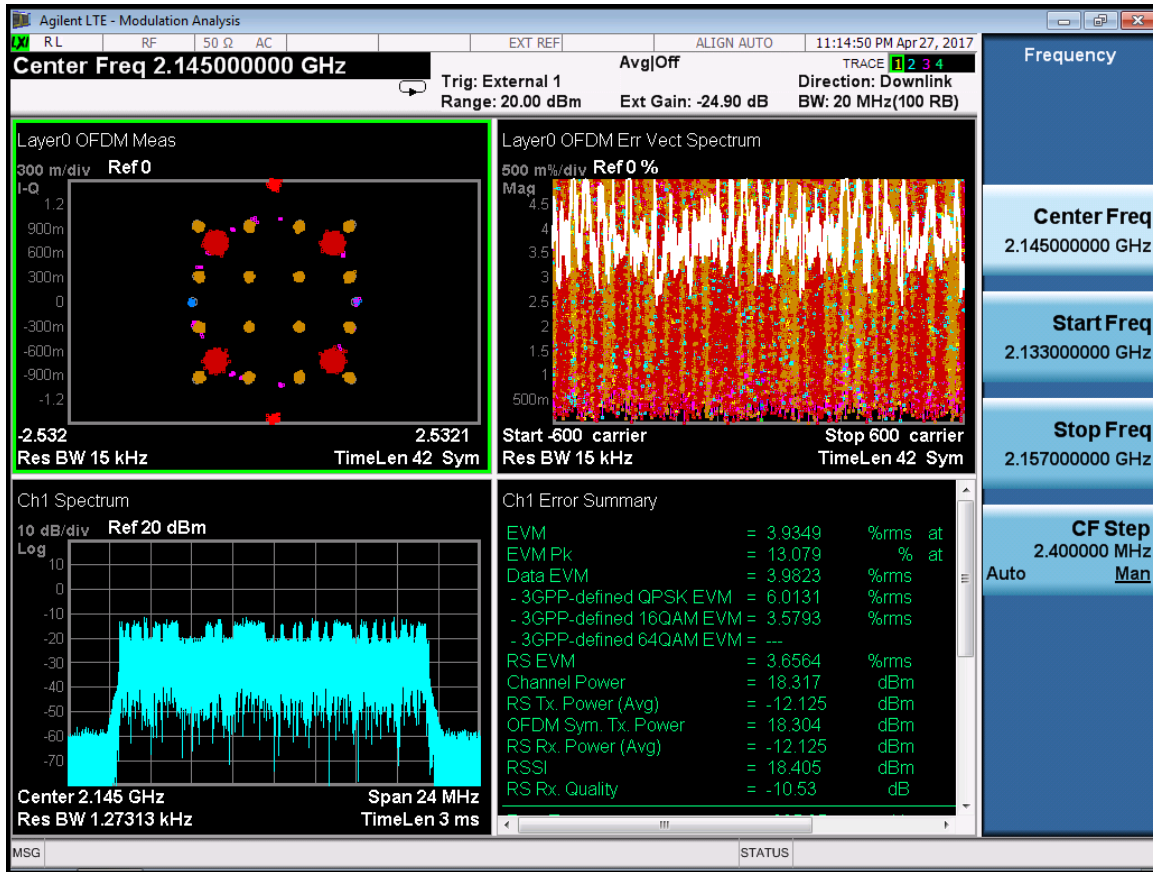
LTE-Port 1-2145MHz-E-TM3.1



LTE-Port 1-2145MHz-E-TM3.2



LTE-Port 1-2145MHz-E-TM3.3

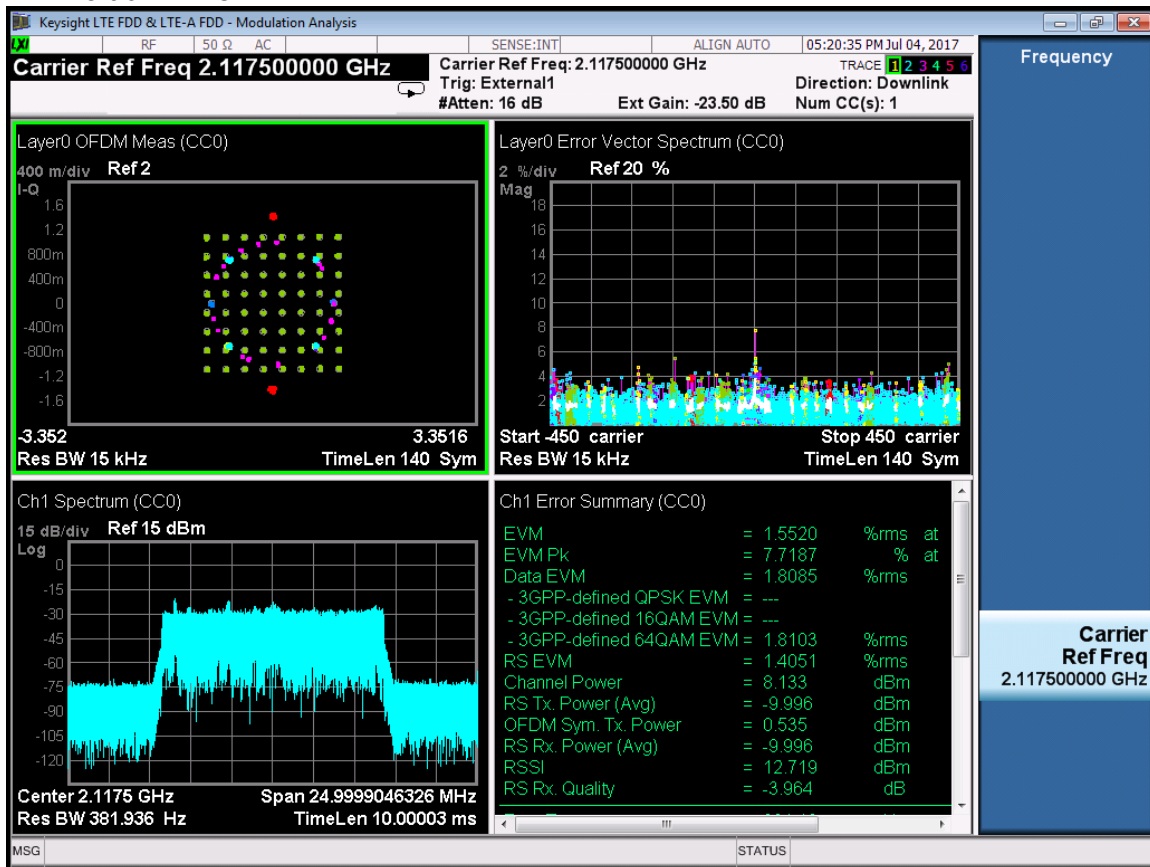


RF Bandwidth :IBW 15MHz(LTE 15MHz)

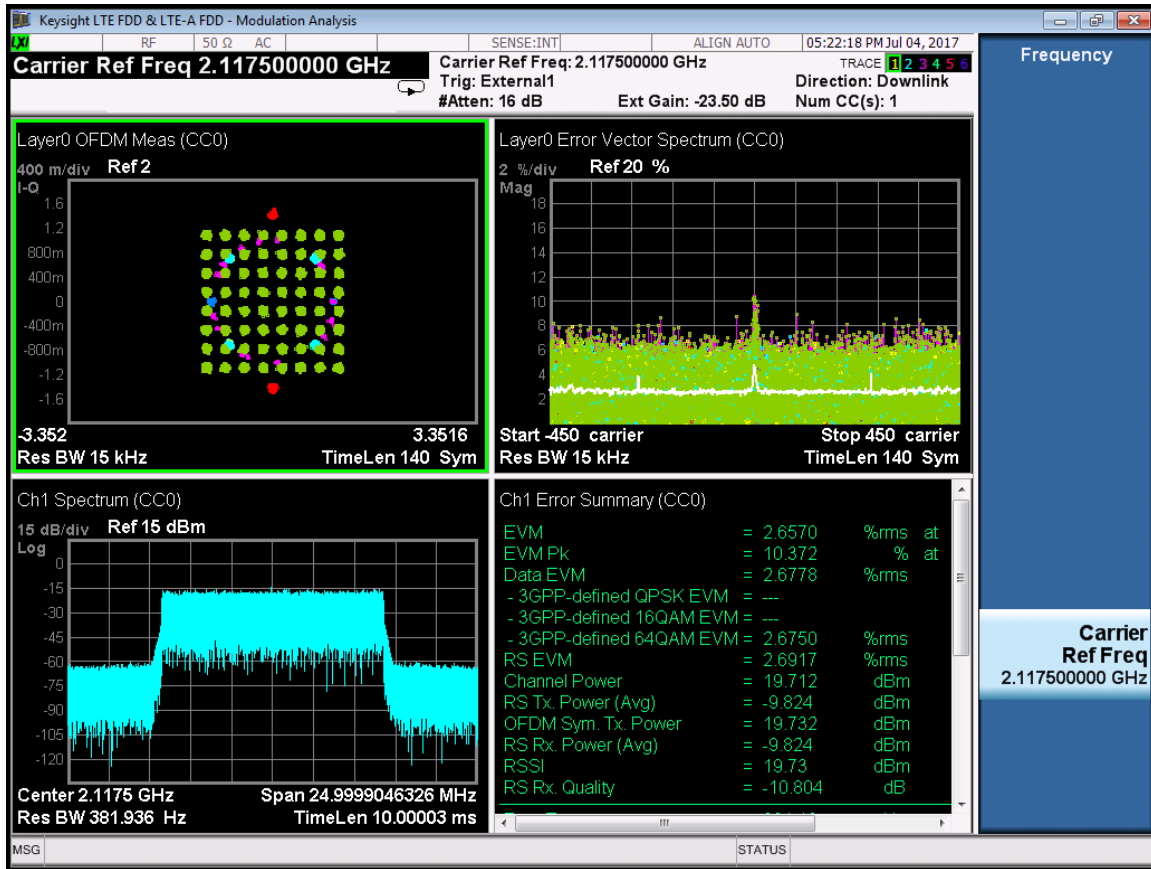
Port	RF Center Freq. (MHz)	Test mode	EVM%
0	2117.5	E-TM2	1.8103
		E-TM3.1	2.6750
		E-TM 3.2	3.6357
		E-TM 3.3	4.8076
	2132.5	E-TM2	1.8173
		E-TM3.1	2.6758
		E-TM 3.2	3.6270
		E-TM 3.3	4.8047
	2147.5	E-TM2	1.6844
		E-TM3.1	2.6712
		E-TM 3.2	3.6315
		E-TM 3.3	4.7863
1	2117.5	E-TM2	2.1652
		E-TM3.1	2.6852
		E-TM 3.2	3.609
		E-TM 3.3	4.7864

	2132.5	E-TM2	1.9783
		E-TM3.1	2.6899
		E-TM 3.2	3.6169
		E-TM 3.3	4.7920
	2147.5	E-TM2	1.8812
		E-TM3.1	2.6851
		E-TM 3.2	3.6160
		E-TM 3.3	4.7918

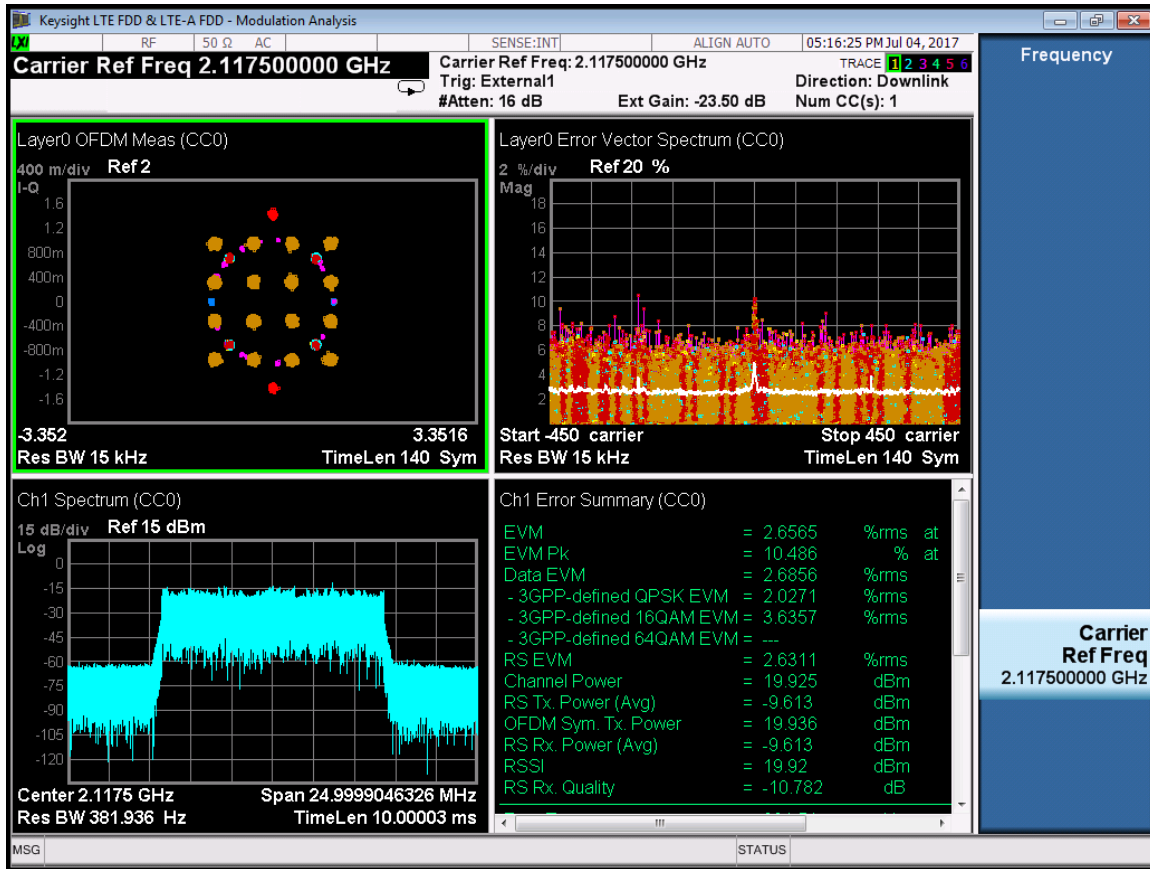
RF 2117.5MHz:
LTE-Port 0-2117.5MHz-E-TM2



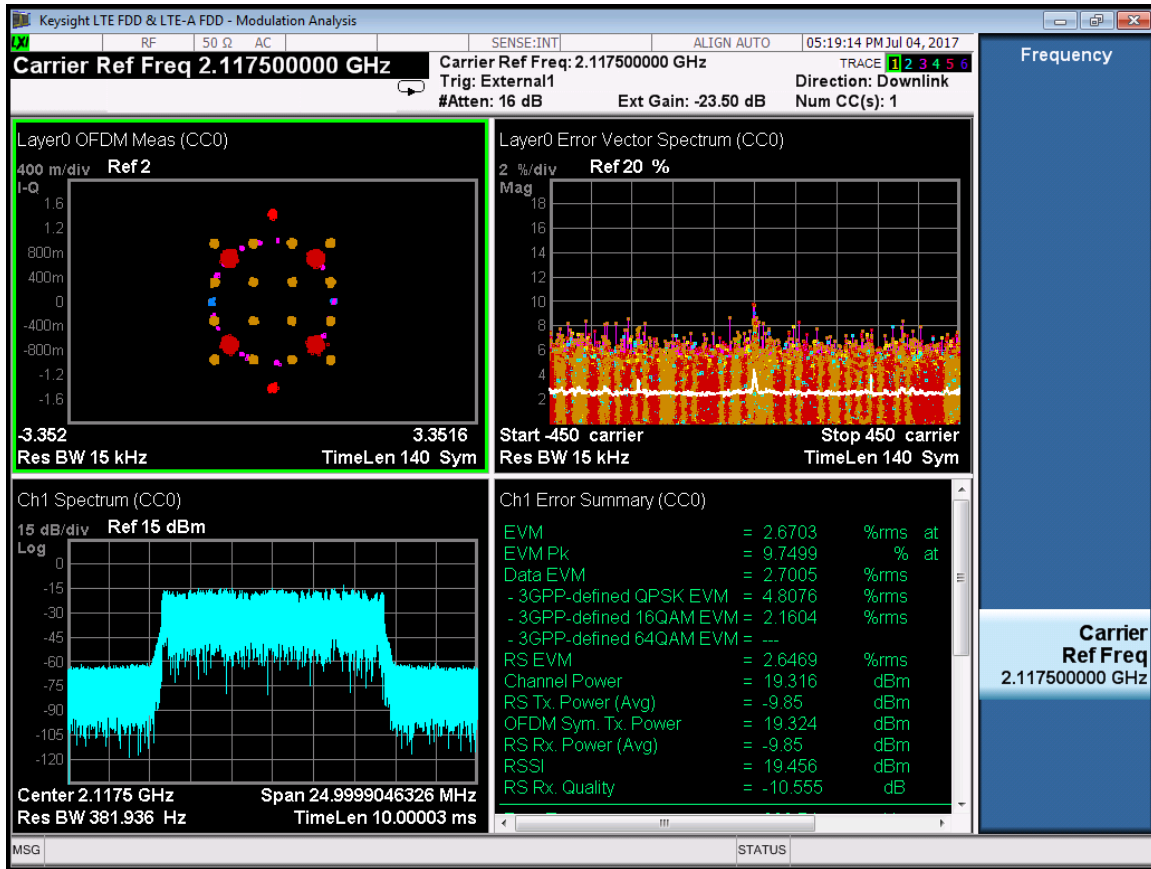
LTE-Port 0-2117.5MHz-E-TM3.1



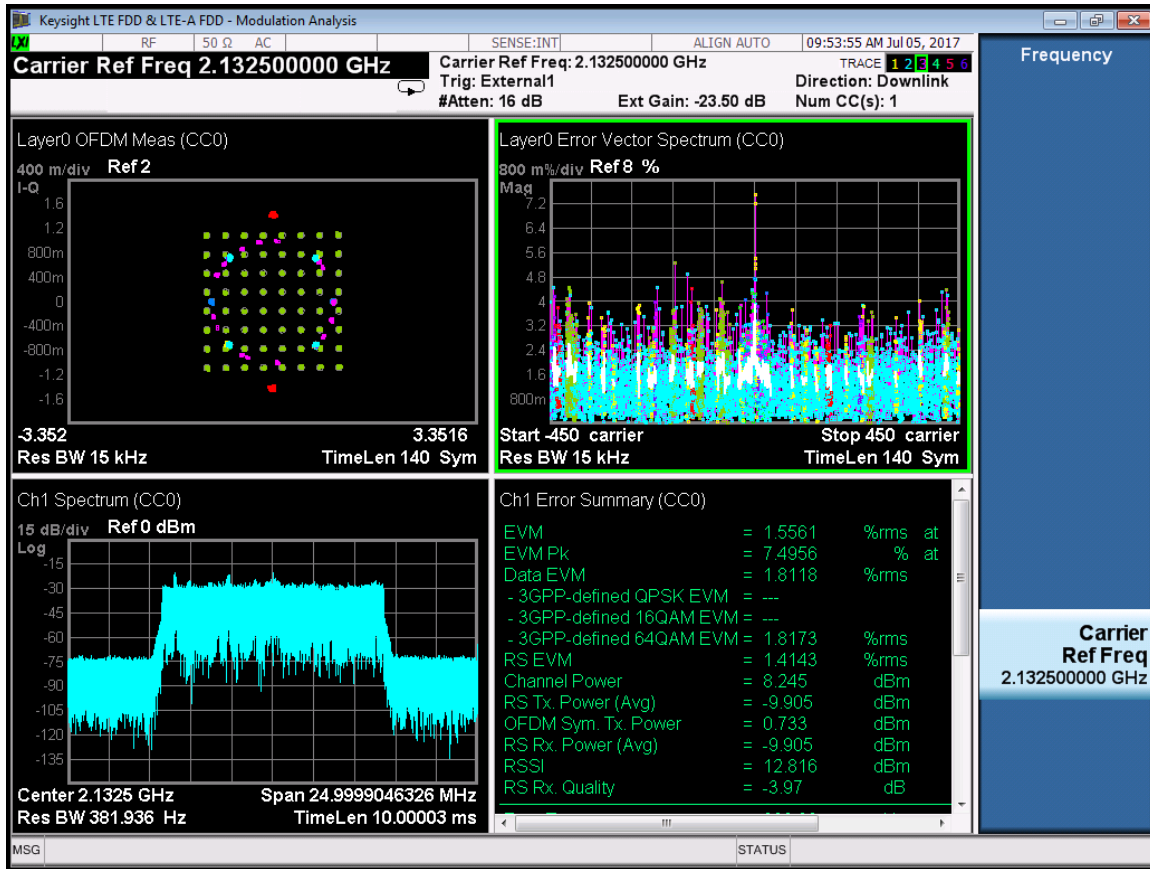
LTE-Port 0-2117.5MHz-E-TM3.2



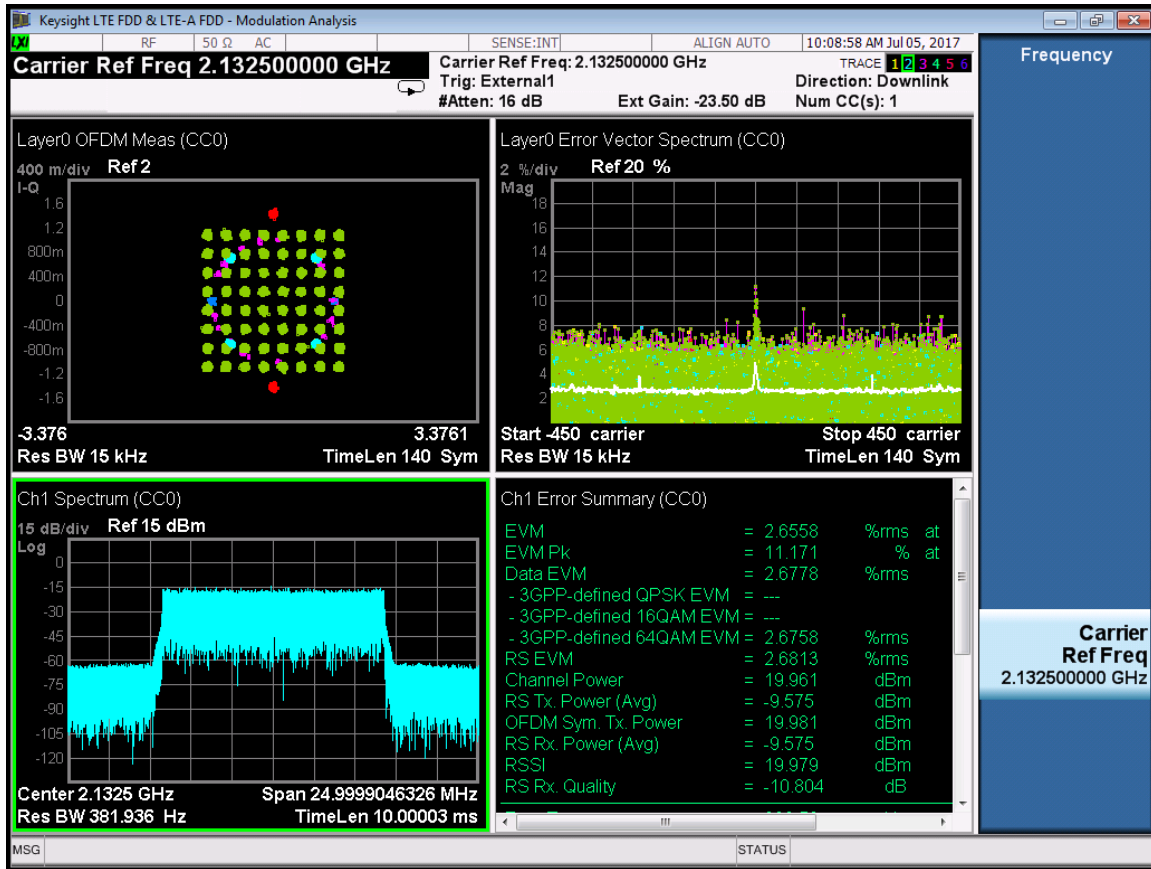
LTE-Port 0-2117.5MHz-E-TM3.3



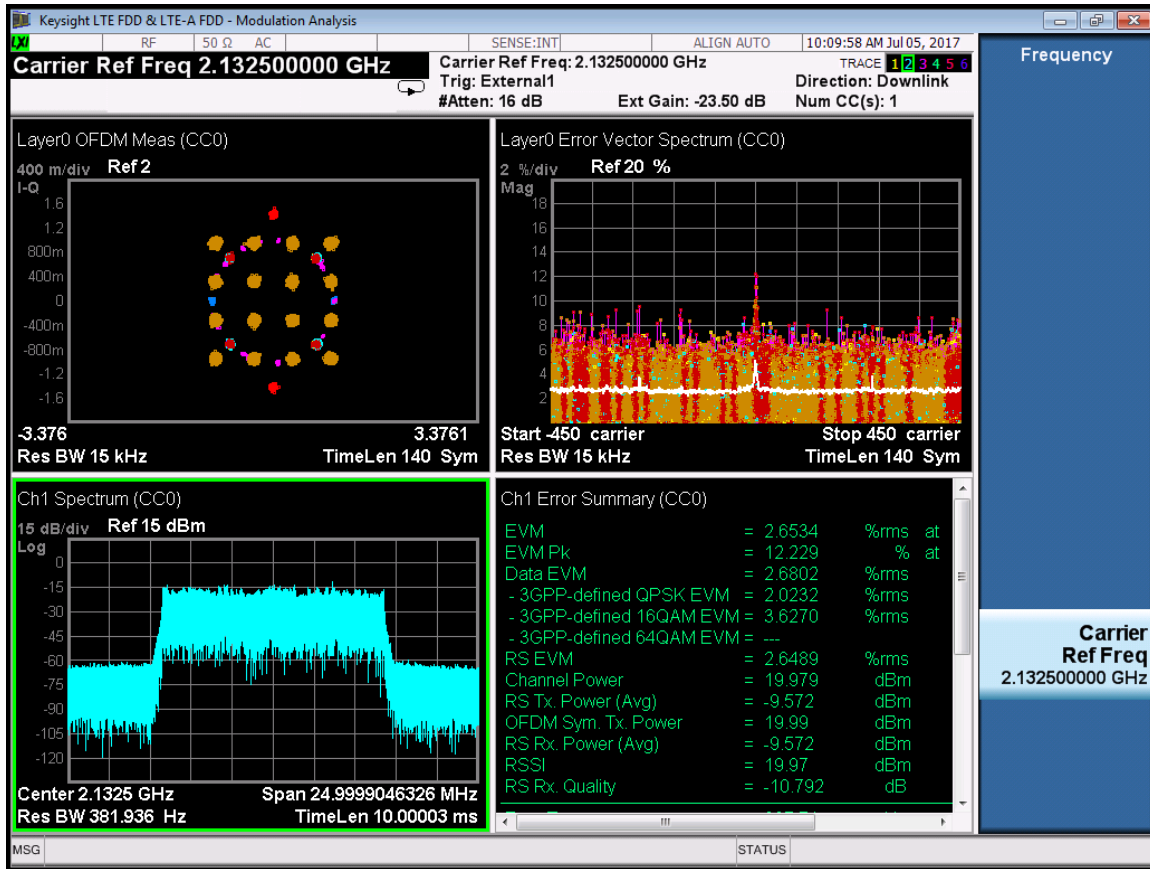
RF 2132.5MHz:
 LTE-Port 0-2132.5MHz-E-TM2



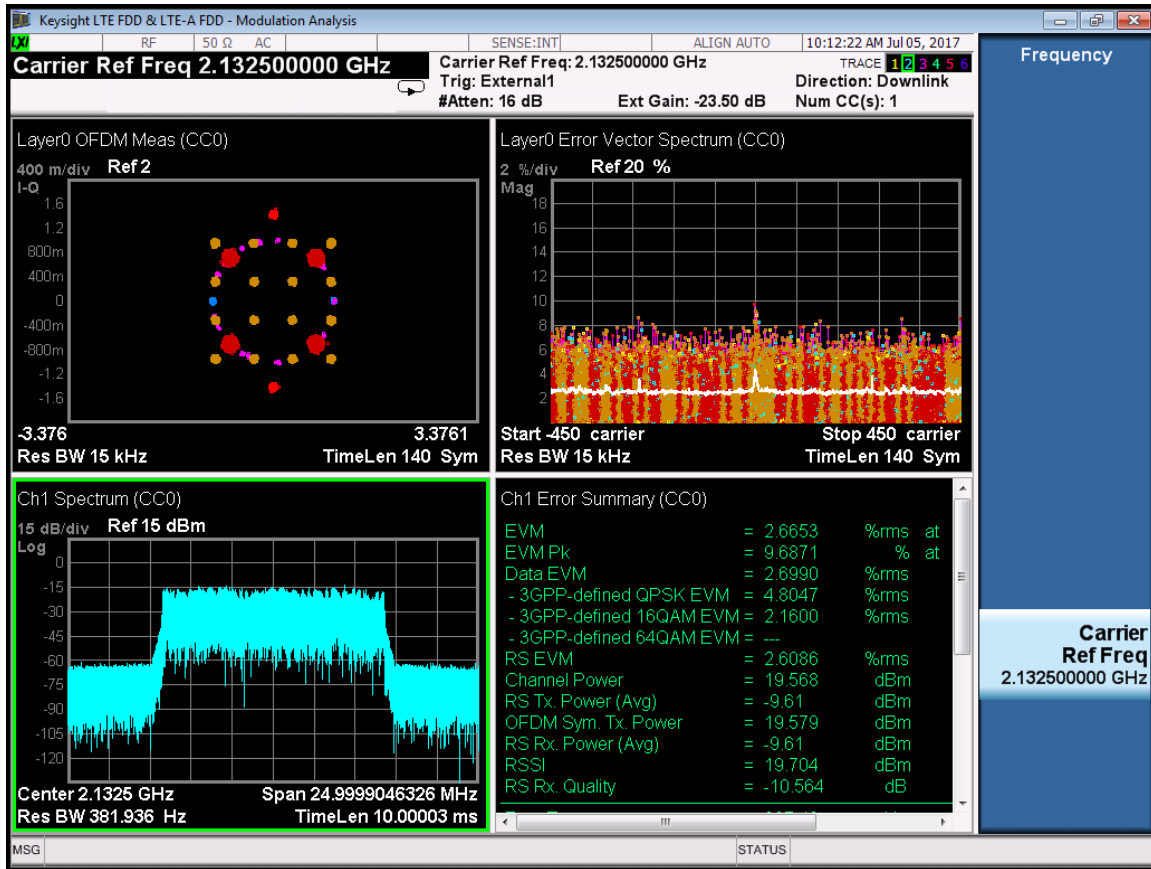
LTE-Port 0-2132.5MHz-E-TM3.1



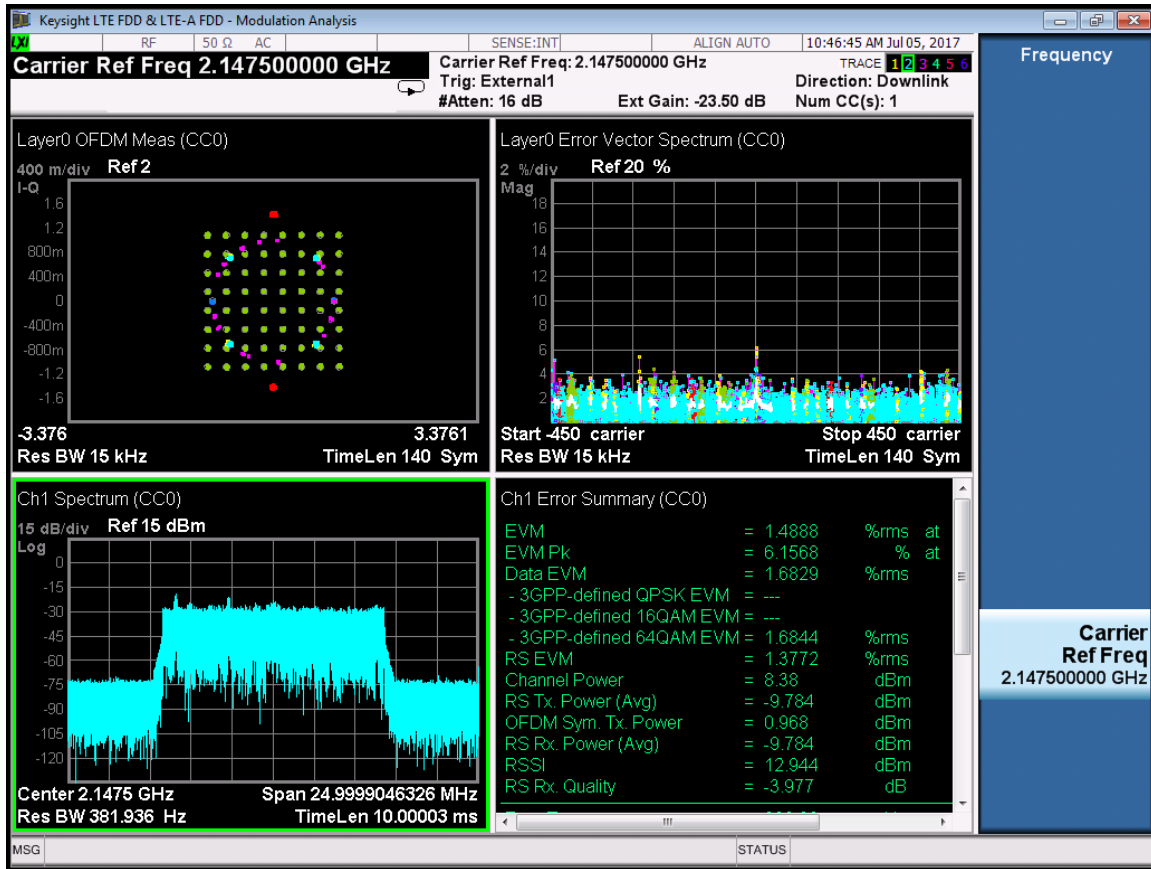
LTE-Port 0-2132.5MHz-E-TM3.2



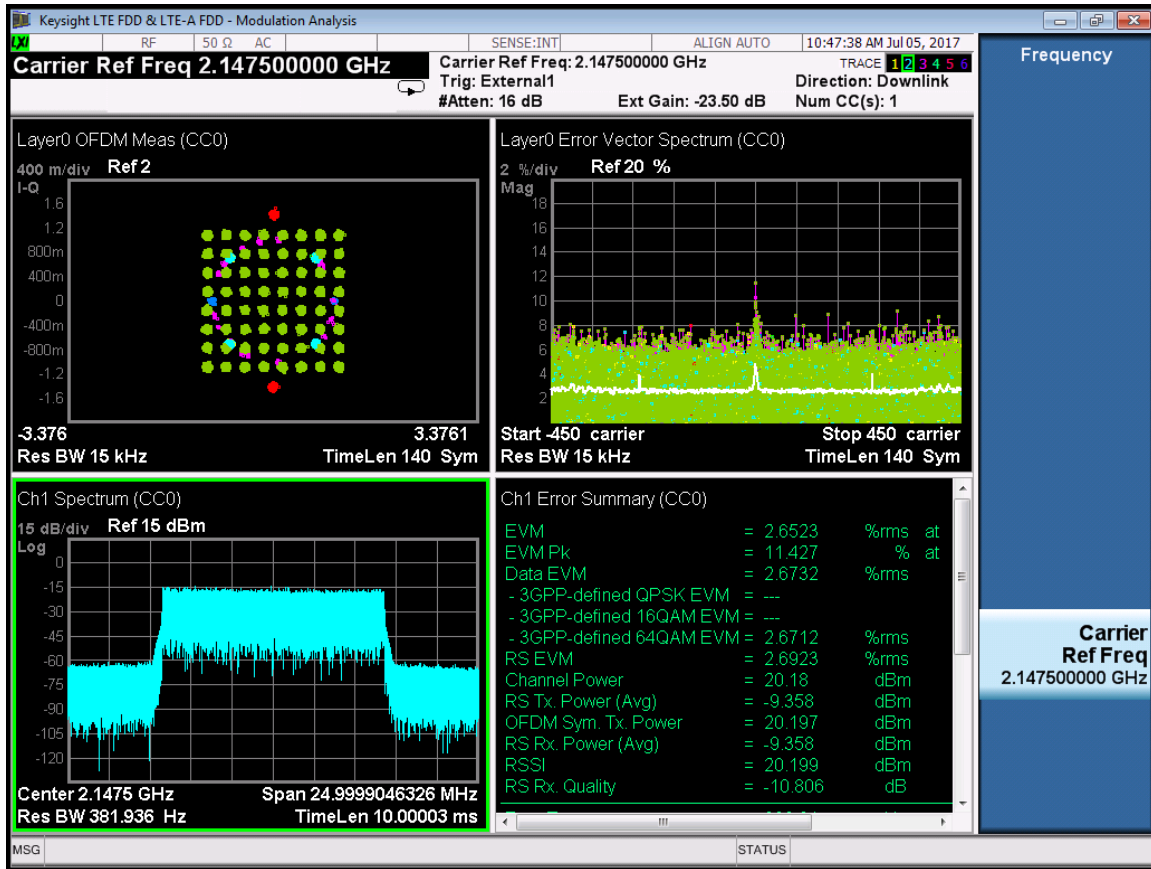
LTE-Port 0-2132.5MHz-E-TM3.3



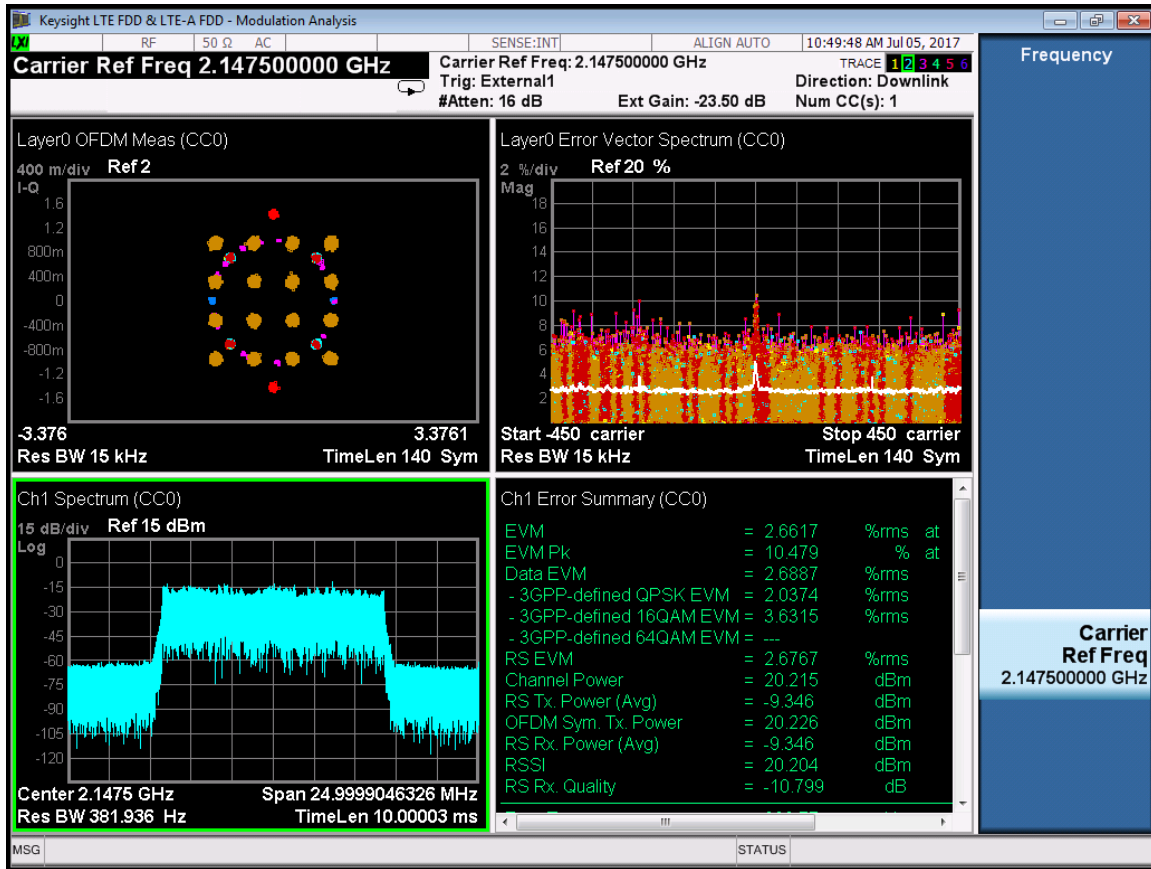
RF 2147.5MHz:
 LTE-Port 0-2147.5MHz-E-TM2



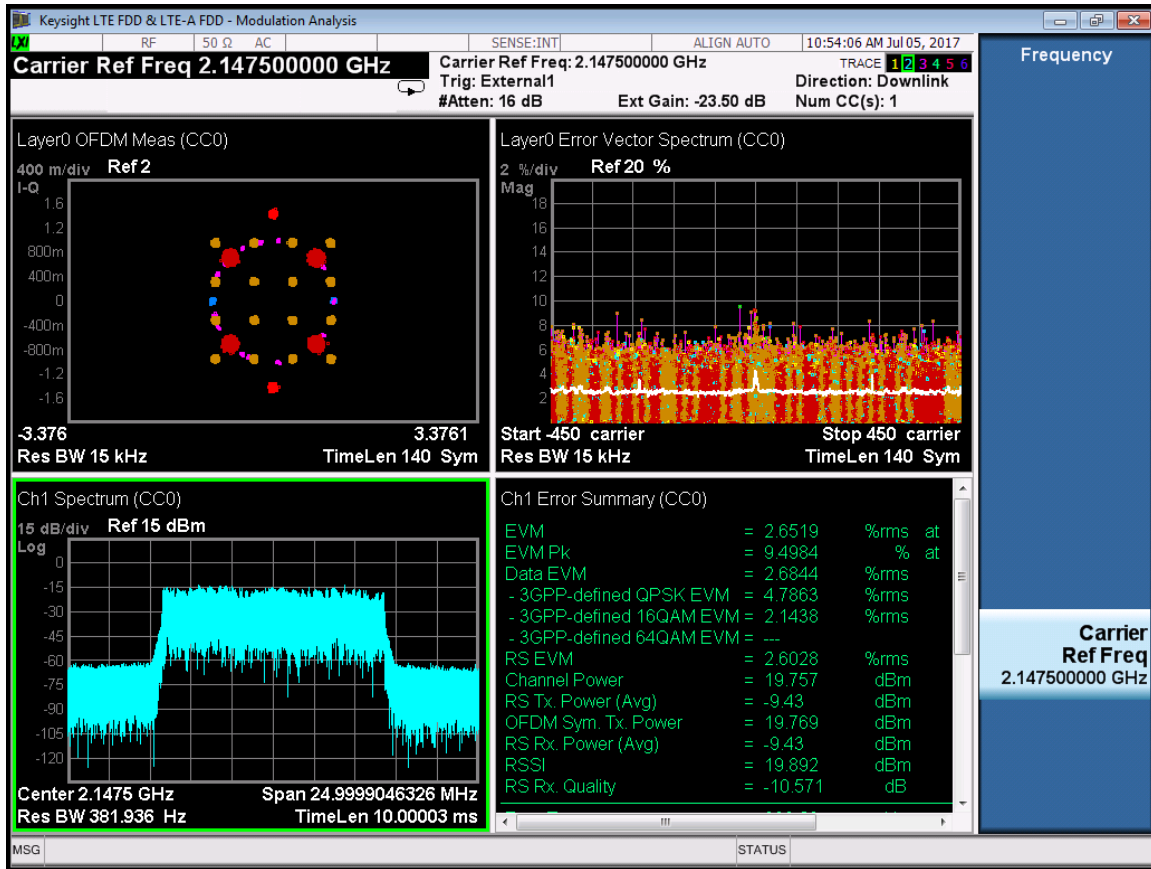
LTE-Port 0-2147.5MHz-E-TM3.1



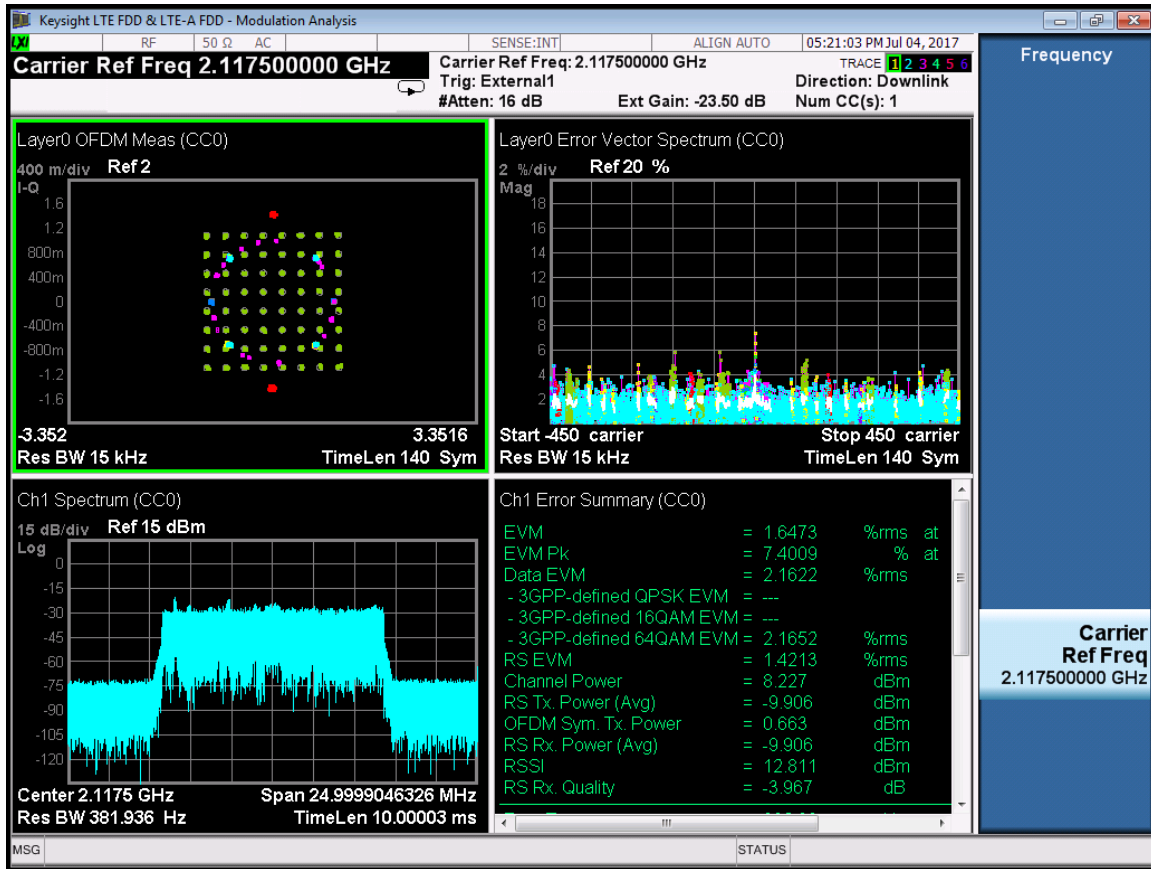
LTE-Port 0-2147.5MHz-E-TM3.2



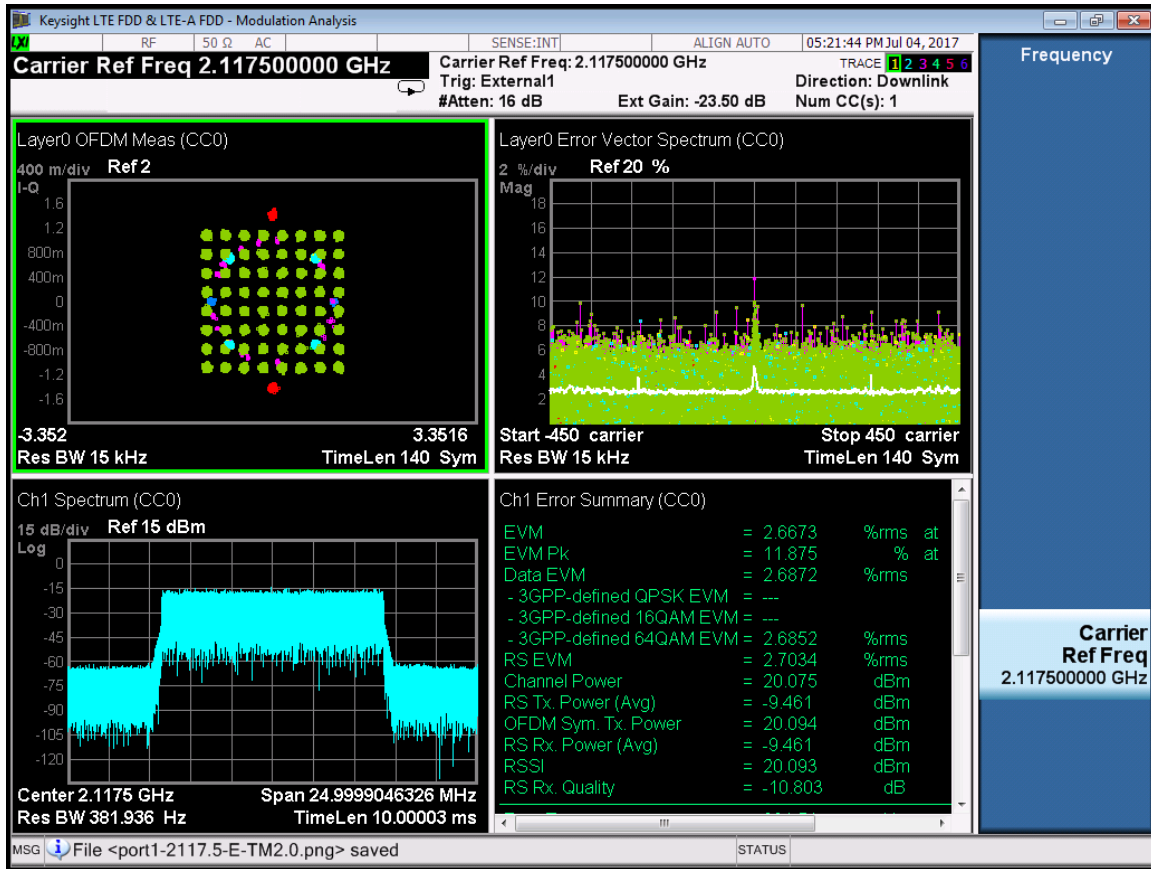
LTE-Port 0-2147.5MHz-E-TM3.3



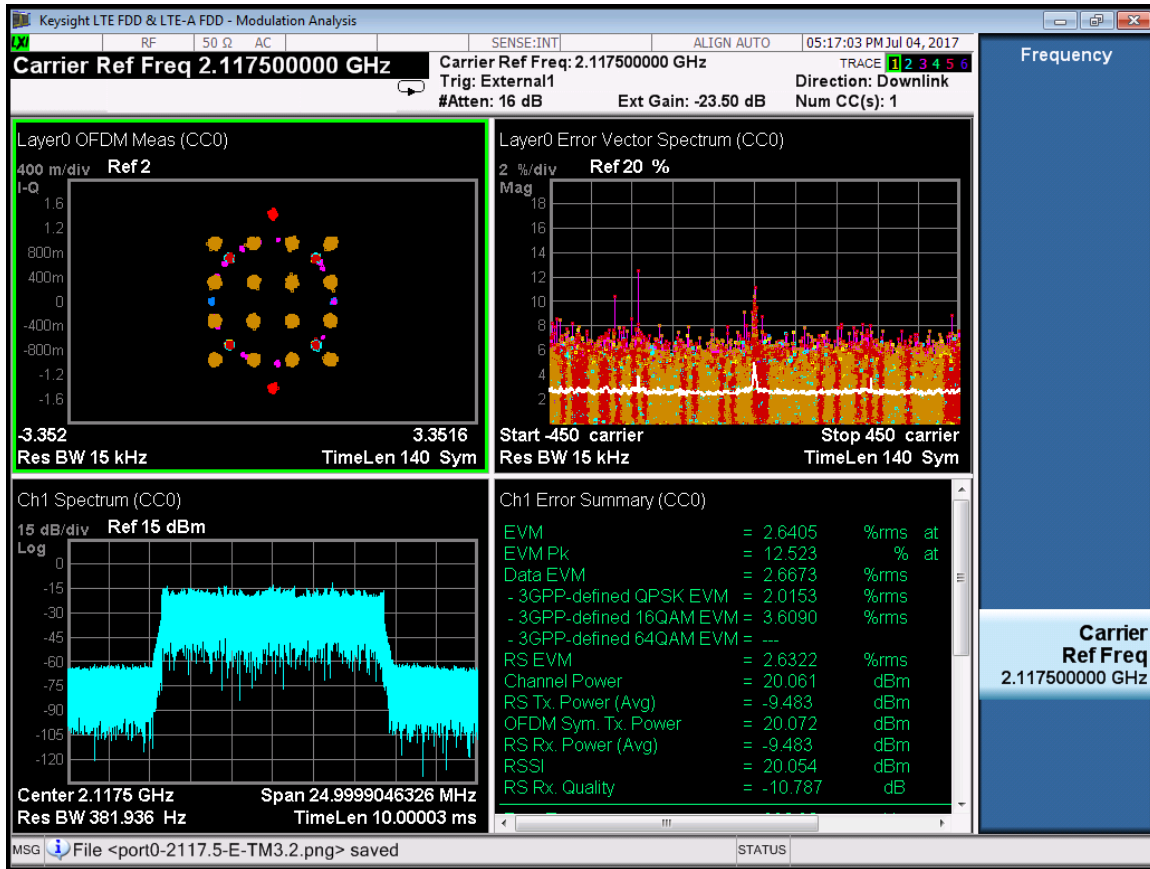
RF 2117.5MHz:
 LTE-Port 1-2117.5MHz-E-TM2



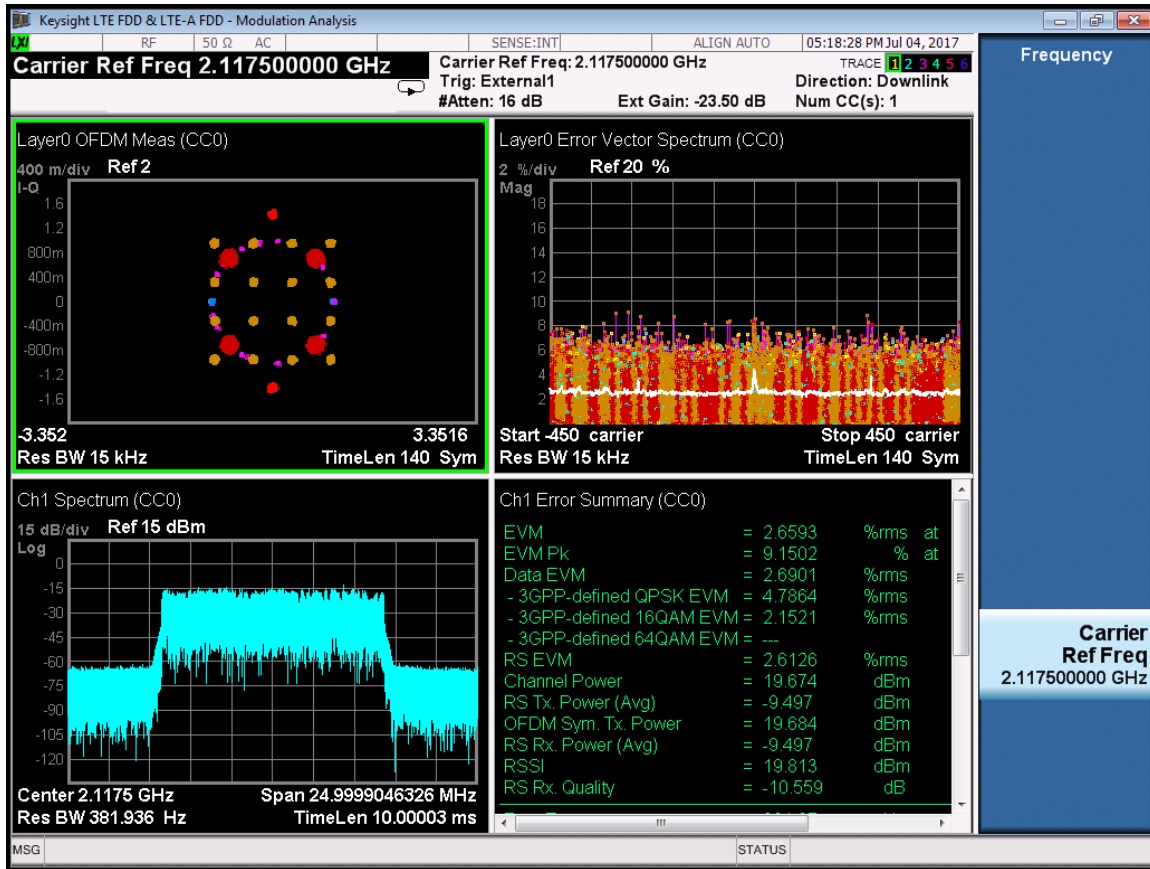
LTE-Port 1-2117.5MHz-E-TM3.1



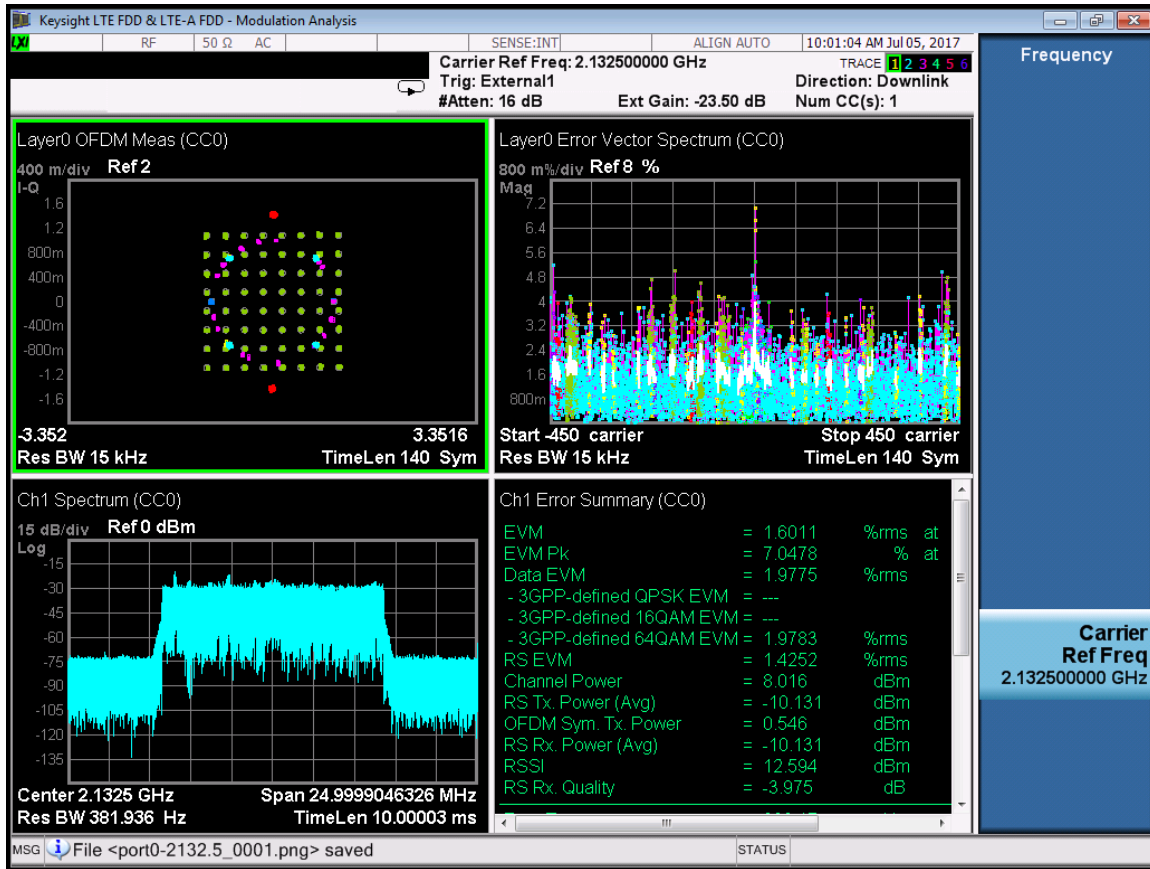
LTE-Port 1-2117.5MHz-E-TM3.2



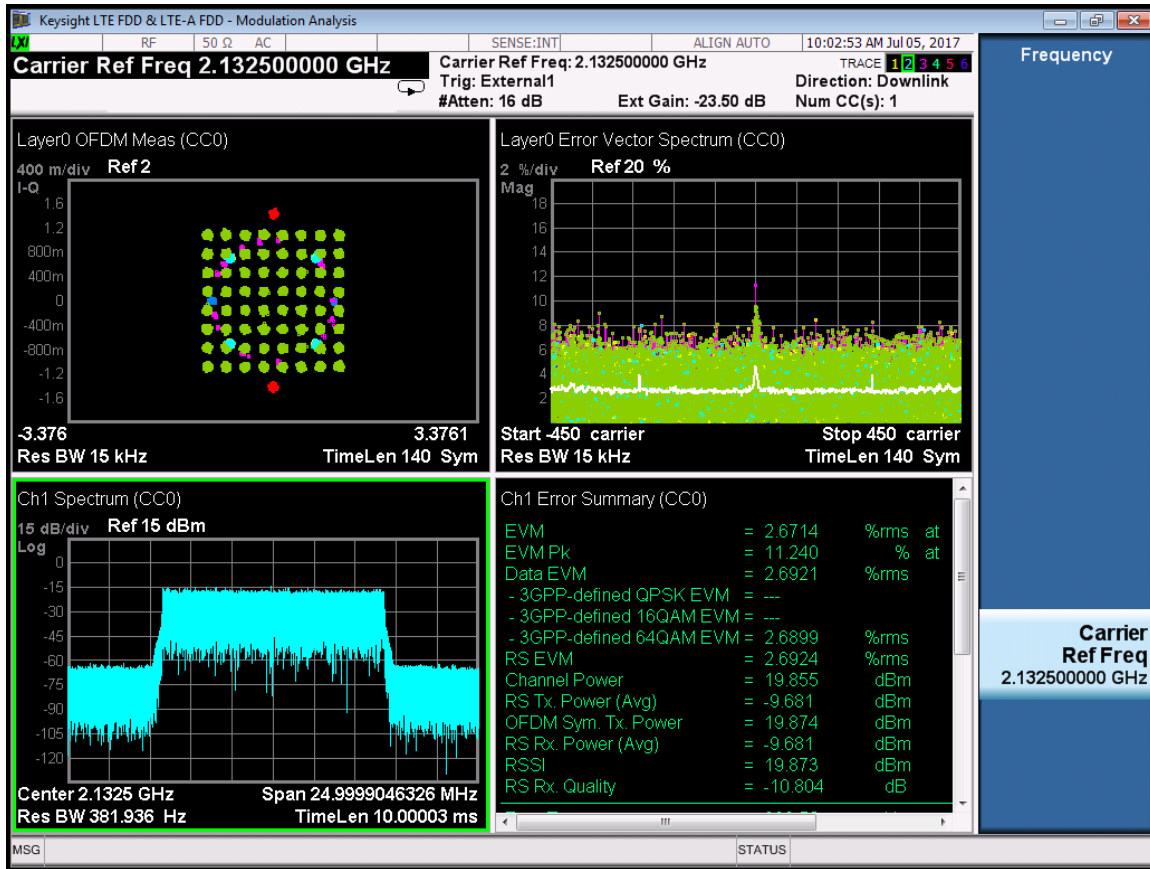
LTE-Port 1-2117.5MHz-E-TM3.3



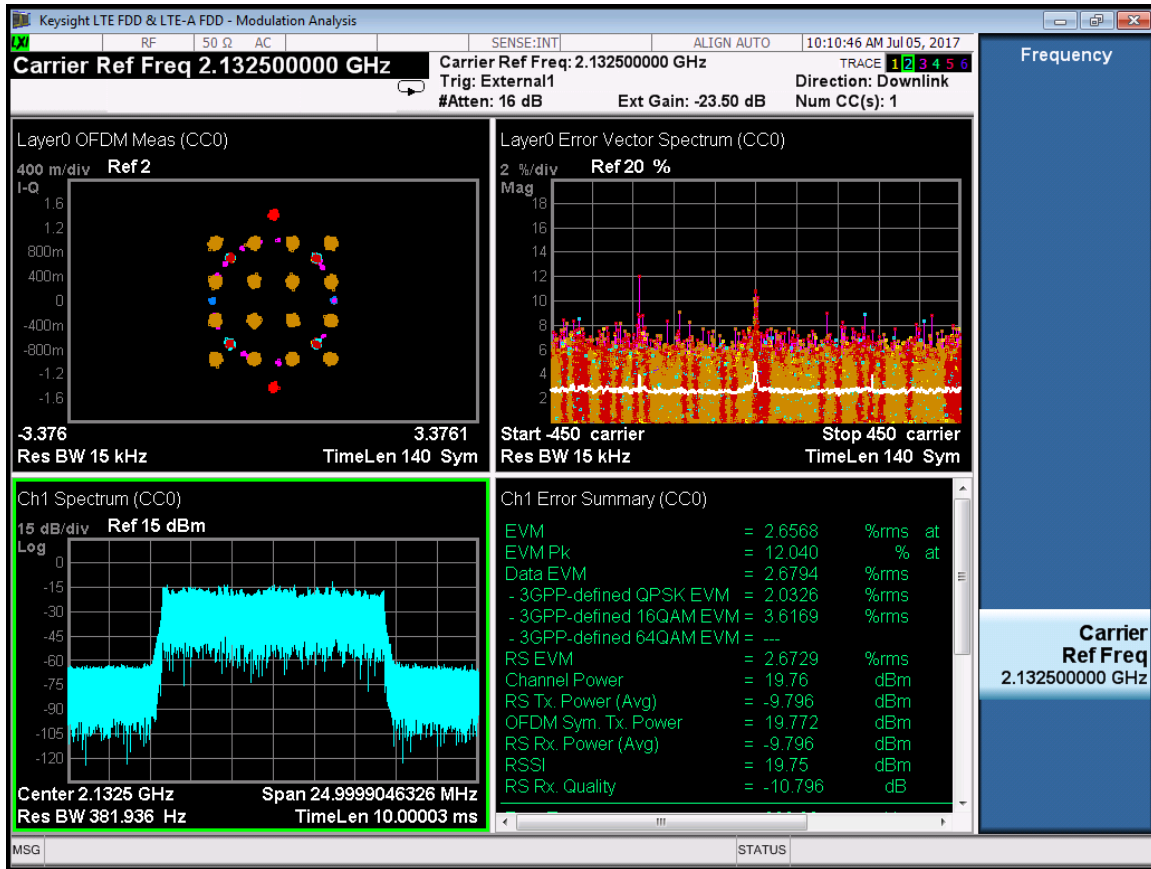
RF 2132.5MHz:
LTE-Port 1-2132.5MHz-E-TM2



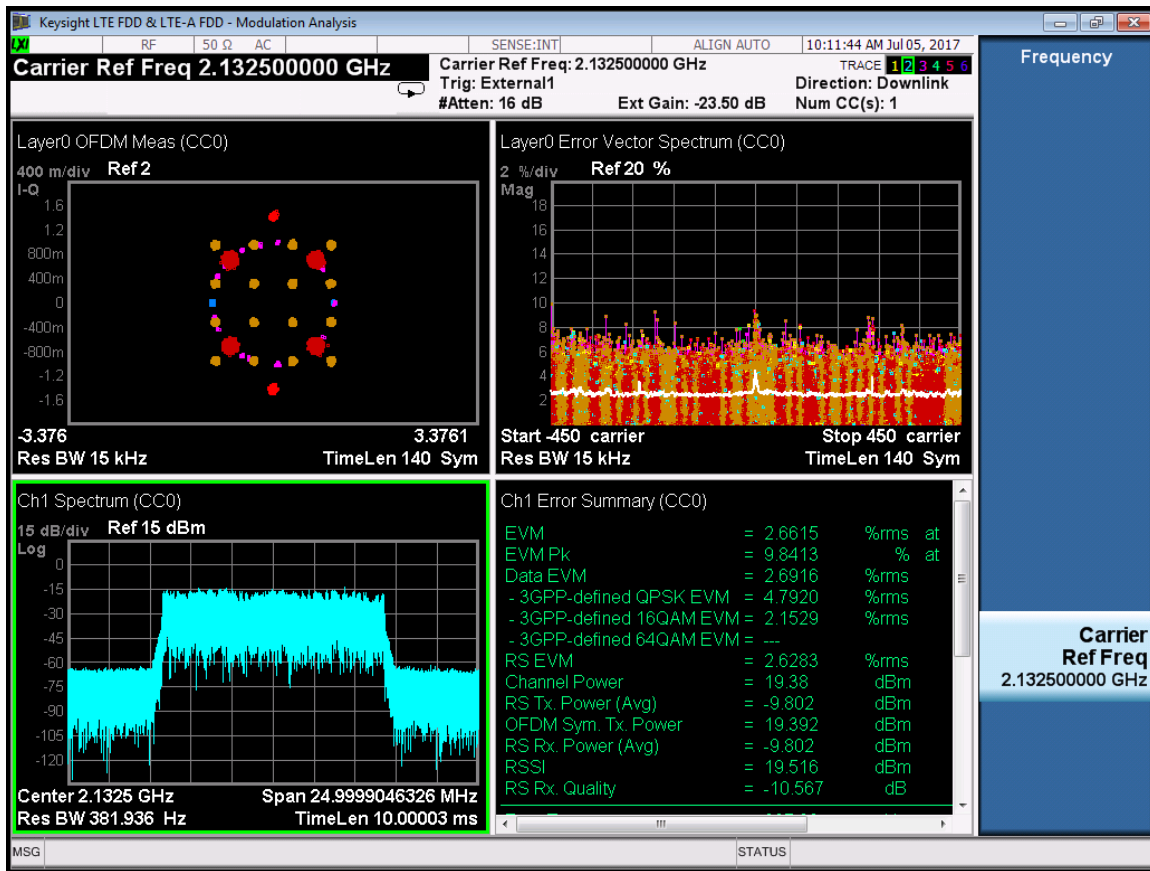
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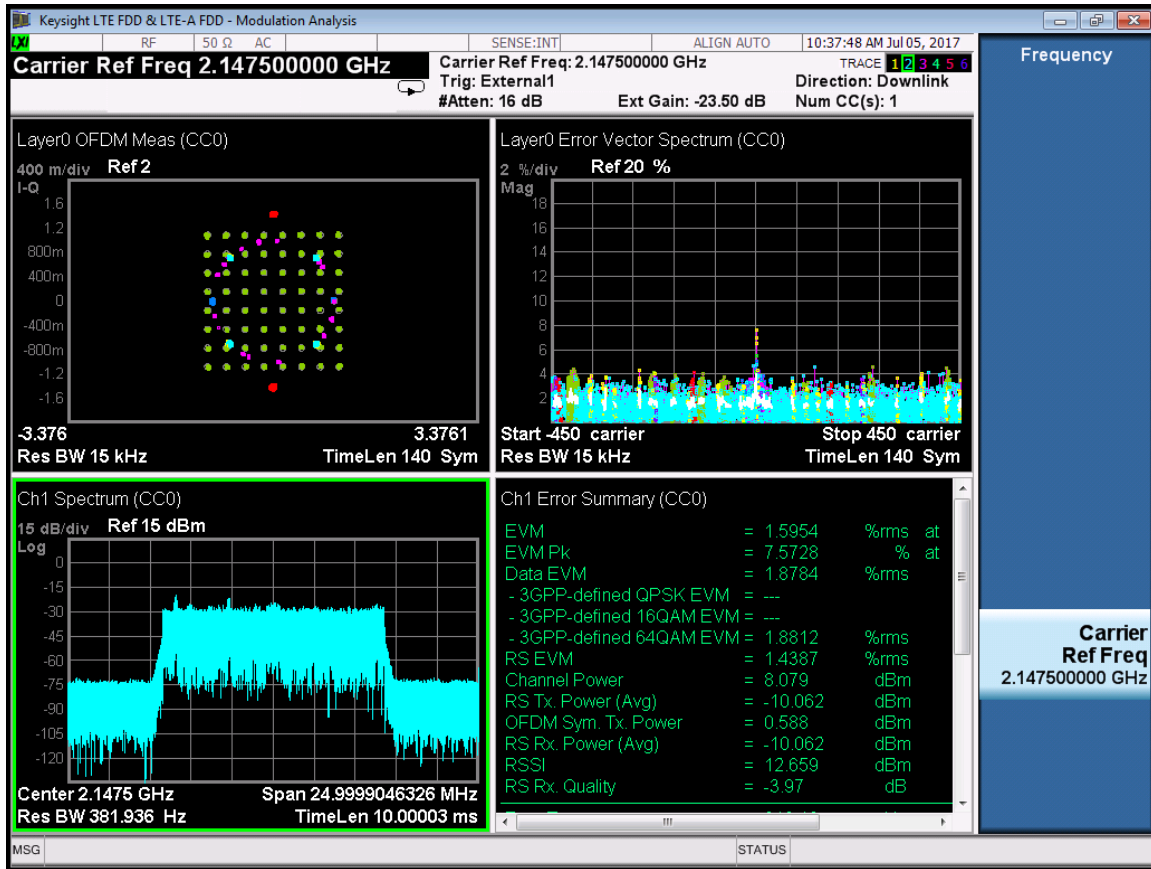
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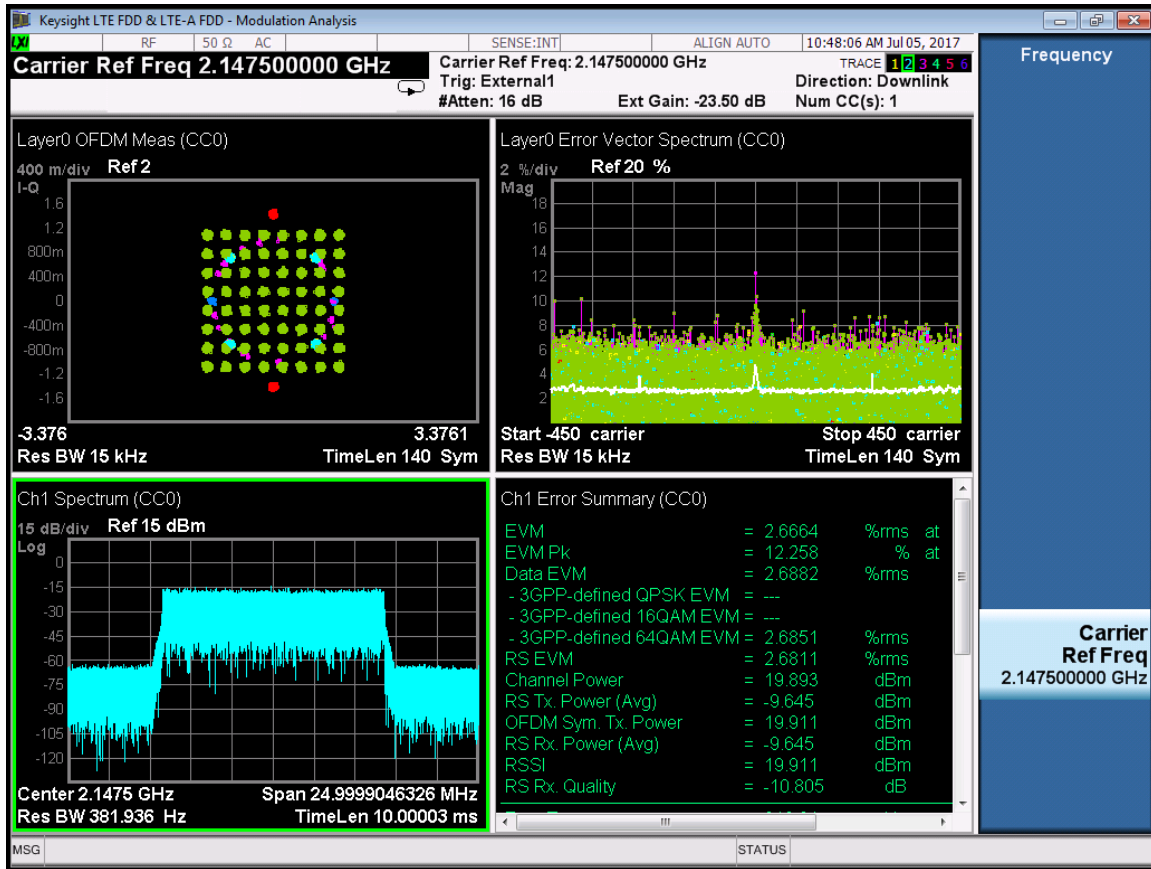
LTE-Port 1-2132.5MHz-E-TM3.3



RF 2147.5MHz:
 LTE-Port 1-2147.5MHz-E-TM2



LTE-Port 1-2147.5MHz-E-TM3.1



LTE-Port 1-2147.5MHz-E-TM3.2