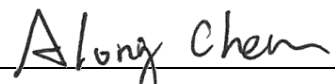


FCC Test Report

FCC ID : MXF-WLTGFC105CBRS
Equipment : LTE ODU Small cell
Model No. : WLTGFC-105
Brand Name : Gemtek
Applicant : Gemtek Technology Co., Ltd.
Address : No. 15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352.
Standard : 47 CFR FCC Part 96
Type : ☐ End User Device
☒ Category A CBSD
☐ Category B CBSD
Received Date : Oct. 01, 2019
Tested Date : Oct. 07 ~ Oct. 21, 2019

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

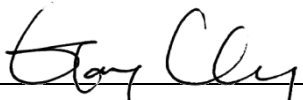

Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FG9O0102	Rev. 01	Initial issue	Nov. 13, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 96.41(b)	Maximum RF Power Output EIRP	Power[dBm/10MHz]: 29.47	Pass
96.41(b)	Maximum Power Spectral Density	Meet the requirement of limit	Pass
96.41(g)	Peak to Average Ratio	Meet the requirement of limit	Pass
2.1053 / 96.41(e)	Radiated Spurious Emission	Meet the requirement of limit	Pass
2.1051 / 96.41(e)	Conducted Spurious Emission	Meet the requirement of limit	Pass
2.1051 / 96.41(e)	Band Edge	Meet the requirement of limit	Pass
2.1049	Emission Bandwidth	Meet the requirement of limit	Pass
2.1055 / 96.41(e)	Frequency Stability	Meet the requirement of limit	Pass
96.41(f)	Reception Limits	Meet the requirement of limit	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

Operating Band	Band 48 Channel Bandwidth: 10MHz: 3555.0 MHz ~ 3695.0 MHz Channel Bandwidth: 20MHz: 3560.0 MHz ~ 3690.0 MHz
Modulation Type	QPSK, 16QAM, 64QAM (Uplink) QPSK, 16QAM, 64QAM (Downlink)
Duplex Mode	TDD
UE Category	Cat. 4
Release	9
TX/RX function	2TX / 2RX

1.1.2 Antenna Details

Ant.	Type	Connector	Gain (dBi)	Remark
1	Omni	N Type	6	---
2	Omni	N Type	6	---

1.1.3 EUT Operational Condition

Supply Voltage	56Vdc from PoE		
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (50°C)	☒ Tmin (-40°C)

1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	PoE	Brand: PHIHONG Model: POE29U-1AT I/P: 100-240Vac, 0.8 Max, 50-60Hz O/P: 56Vdc, 0.536A Power cord: 1.8m non-shielded without core
2	RJ45(Blue)	1.5m shielded without core
3	Core	Brand: King Model: KCF-130-B

1.1.5 Maximum EIRP and Emission Designator

Channel Bandwidth (MHz)	Modulation	Maximum EIRP (W)	Emission Designator
10	QPSK	0.78524	8M95G7D
10	16QAM	0.72111	8M95W7D
10	64QAM	0.78163	8M95W7D
20	QPSK	1.52757	17M9G7D
20	16QAM	1.32739	17M9W7D
20	64QAM	1.57761	17M9W7D

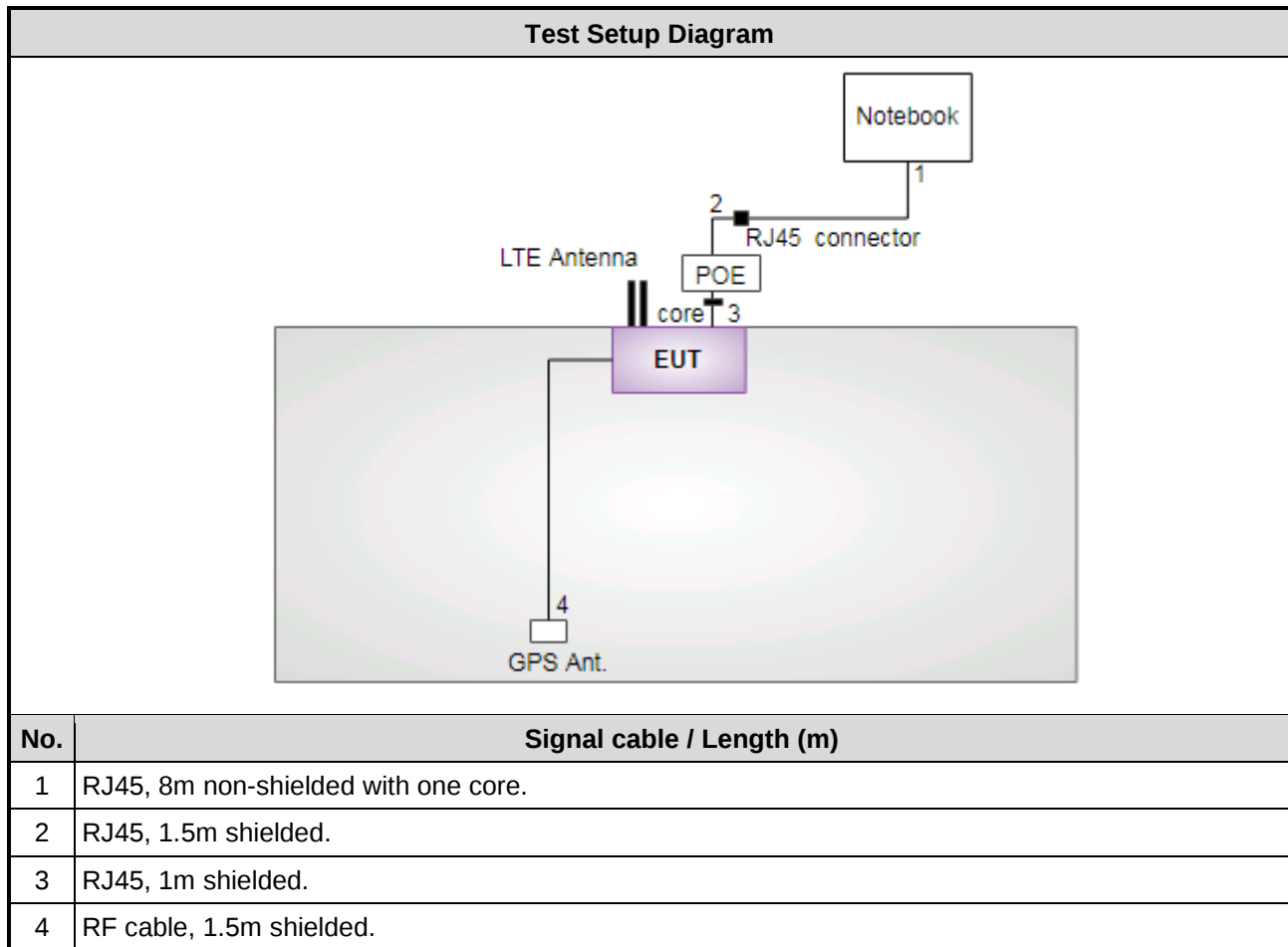
1.1.6 Operating Channel List

Channel Bandwidth (MHz)	Channel	Frequency (MHz)
10	55290	3555.0
10	55990	3625.0
10	56690	3695.0
20	55340	3560.0
20	55990	3625.0
20	56640	3690.0

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Oct. 18, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 27, 2018	Dec. 26, 2019
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 18, 2018	Dec. 17, 2019
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 07, 2019	Oct. 06, 2020
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 08, 2019	Oct. 07, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC104-SM-SM-80 00	181106	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 07, 2019	Oct. 06, 2020
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 07, 2019	Oct. 06, 2020
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 07, 2019	Oct. 06, 2020
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 07, 2019	Oct. 06, 2020
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Oct. 07 ~ Oct. 21, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Spectrum Analyzer	R&S	FSV40	101499	Jan. 07, 2019	Jan. 06, 2020
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 05, 2018	Dec. 04, 2019
Power Meter	Anritsu	ML2495A	1241001	Aug. 01, 2019	Jul. 31, 2020
Power Sensor	Anritsu	MA2411B	1207362	Aug. 01, 2019	Jul. 31, 2020
Signal Generator	R&S	SMB100A	175727	Dec. 24, 2018	Dec. 23, 2019
MXG-B RF Vector Signal Generator	Agilent	N5182B	MY53050081	Apr. 21, 2019	Apr. 20, 2020
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 96

ANSI C63.4-2014

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Frequency error	$\pm 1 \times 10^{-9}$
Conducted emission	± 2.715 dB
Radiated emission ≤ 1 GHz	± 3.41 dB
Radiated emission > 1 GHz	± 4.59 dB
Temperature	± 0.4 °C

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
RF Conducted	TH01-WS	25°C / 67%	Aska Huang
Radiated Emissions	03CH01-WS	22°C / 67%	Aska Huang

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISSED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Channel Bandwidth	Modulation	Test channel (MHz)
Equivalent Isotropically Radiated Power	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Maximum Power Spectral Density	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Radiated Emissions $\leq$ 1GHz	10MHz 20MHz	64QAM 64QAM	3625.0 3625.0
Radiated Emissions > 1GHz	10MHz 20MHz	64QAM 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Conducted Emissions	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Band Edge	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Emission Bandwidth	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Peak to Average Ratio	10MHz 20MHz	QPSK / 16QAM / 64QAM QPSK / 16QAM / 64QAM	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0
Frequency Stability	10MHz 20MHz	Un-modulation	3625.0 3625.0
Reception Limits	10MHz 20MHz	QPSK QPSK	3555.0 / 3625.0 / 3695.0 3560.0 / 3625.0 / 3690.0

3 Test Results

3.1 Output Power

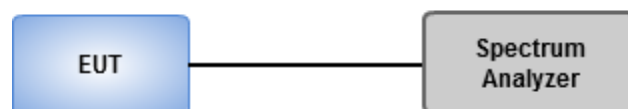
3.1.1 Limit of Output Power

Device	Maximum EIRP (dBm/10MHz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD	47	37

3.1.2 Test Procedures

1. Connect the transmitter to the spectrum analyzer via coaxial cable (i.e., conducted measurement) while ensuring proper impedance matching.
2. Tune the analyzer to the nominal center frequency of the emission bandwidth.
3. Set the span to twice the nominal EBW (span = 2 x EBW).
4. Set the resolution bandwidth (RBW) to 1 MHz.
5. Set the video bandwidth (VBW) to 3 MHz
6. Select the average power (RMS) display detector.
7. Set the number of measurement points to ≥ 1001 .
8. Use auto-coupled sweep time.
9. Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.
10. Utilize trace averaging over 100 traces in the power averaging.
11. Find the maximum trace amplitude (peak search) and record.
12. Adjust the recorded level by applying appropriate correction factors for the measurement set-up.
13. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

3.1.3 Test Setup



3.1.4 Duty Cycle and Duty Factor

Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	QPSK	100.00%	0.00
	16QAM	100.00%	0.00
	64QAM	100.00%	0.00

3.1.5 Test Result of EIRP

Summary of AV power @10MHz Summary

Mode	Power (dBm)	Power (W)	EIRP (dBm)	EIRP (W)
Band 48	-	-	-	-
LTE_10MHz_Nss1,QPSK_2TX	22.95	0.197	28.95	0.785
LTE_10MHz_Nss1,16QAM_2TX	22.58	0.181	28.58	0.721
LTE_10MHz_Nss1,64QAM_2TX	22.93	0.196	28.93	0.782
LTE_20MHz_Nss1,QPSK_2TX	23.32	0.215	29.32	0.855
LTE_20MHz_Nss1,16QAM_2TX	22.62	0.183	28.62	0.728
LTE_20MHz_Nss1,64QAM_2TX	23.47	0.222	29.47	0.885

Result

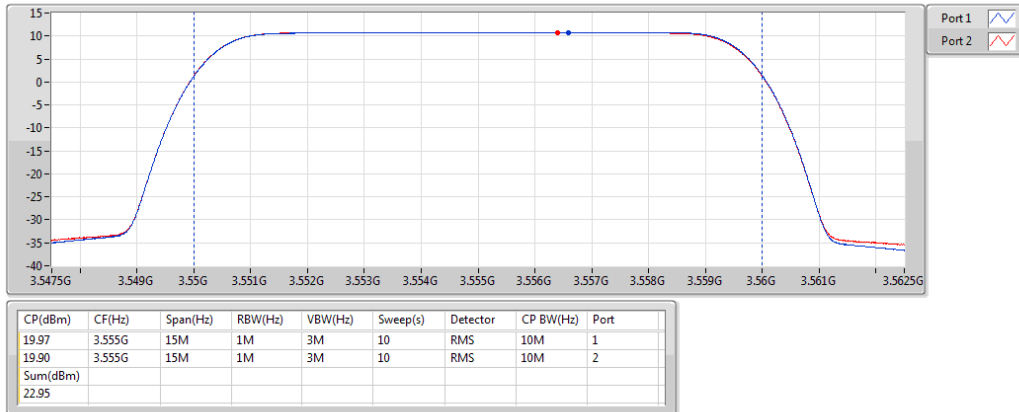
Mode	Result	DG (dBi)	Port 1 (dBm/10 MHz)	Port 2 (dBm/10 MHz)	Power (dBm/10 MHz)	EIRP (dBm/10 MHz)	EIRP Lim. (dBm/10 MHz)
Band 48_LTE_10MHz_Nss1_2TX	-	-	-	-	-	-	-
3555MHz_QPSK_RB 50,#RB 0	Pass	6	19.97	19.9	22.95	28.95	30
3625MHz_QPSK_RB 50,#RB 0	Pass	6	19.9	19.84	22.88	28.88	30
3695MHz_QPSK_RB 50,#RB 0	Pass	6	19.81	19.79	22.81	28.81	30
3555MHz_16QAM_RB 50,#RB 0	Pass	6	19.42	19.37	22.41	28.41	30
3625MHz_16QAM_RB 50,#RB 0	Pass	6	19.48	19.4	22.45	28.45	30
3695MHz_16QAM_RB 50,#RB 0	Pass	6	19.58	19.55	22.58	28.58	30
3555MHz_64QAM_RB 50,#RB 0	Pass	6	19.95	19.88	22.93	28.93	30
3625MHz_64QAM_RB 50,#RB 0	Pass	6	19.91	19.86	22.9	28.9	30
3695MHz_64QAM_RB 50,#RB 0	Pass	6	19.83	19.8	22.83	28.83	30
Band 48_LTE_20MHz_Nss1_2TX	-	-	-	-	-	-	-
3560MHz_QPSK_RB 100,#RB 0	Pass	6	20.3	20.31	23.32	29.32	30
3625MHz_QPSK_RB 100,#RB 0	Pass	6	20.27	20.24	23.27	29.27	30
3690MHz_QPSK_RB 100,#RB 0	Pass	6	20.26	20.27	23.28	29.28	30
3560MHz_16QAM_RB 100,#RB 0	Pass	6	19.56	19.57	22.58	28.58	30
3625MHz_16QAM_RB 100,#RB 0	Pass	6	19.64	19.51	22.59	28.59	30
3690MHz_16QAM_RB 100,#RB 0	Pass	6	19.67	19.54	22.62	28.62	30
3560MHz_64QAM_RB 100,#RB 0	Pass	6	20.41	20.43	23.43	29.43	30
3625MHz_64QAM_RB 100,#RB 0	Pass	6	20.49	20.42	23.47	29.47	30
3690MHz_64QAM_RB 100,#RB 0	Pass	6	20.26	20.28	23.28	29.28	30

DG = Directional Gain; Port n = Port n output power

Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

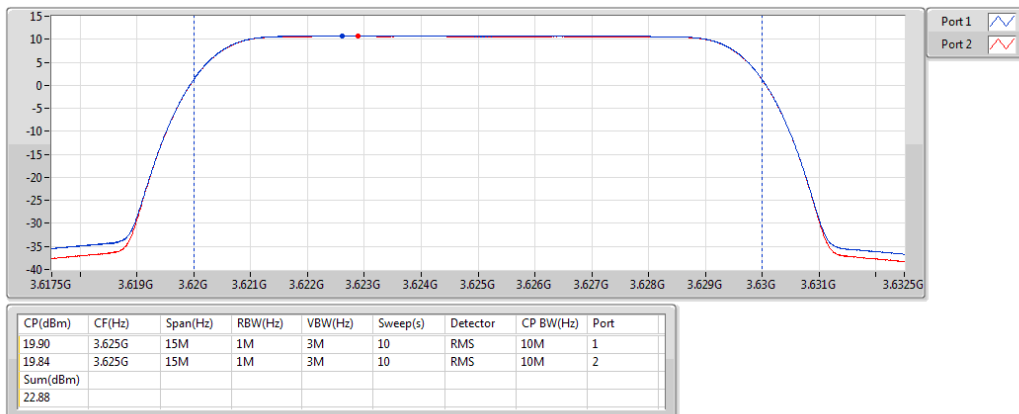
3555MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

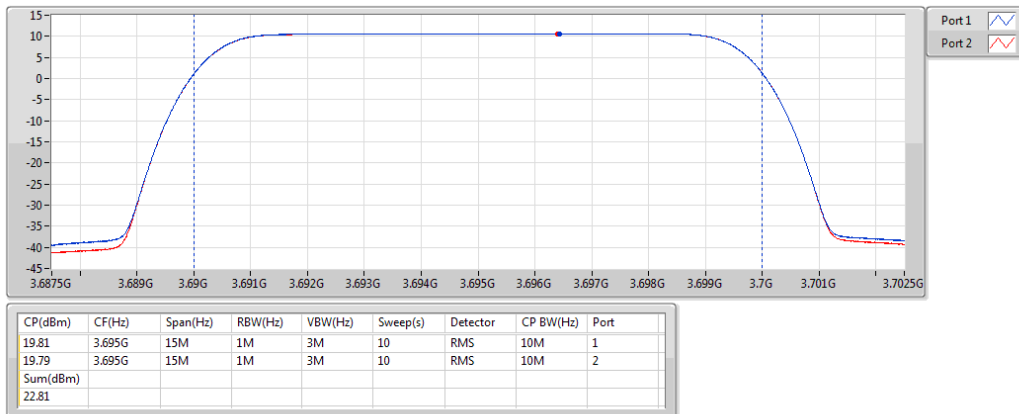
3625MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

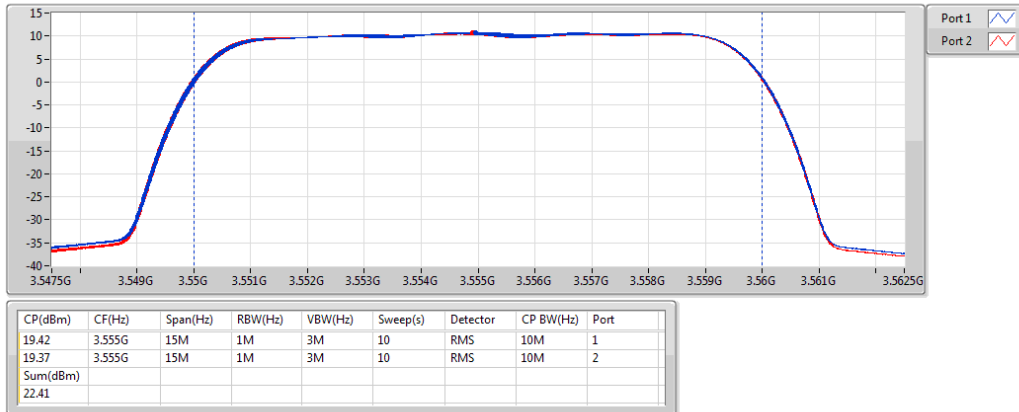
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Band 48_LTE_10MHz_Nss1,16QAM_2TX

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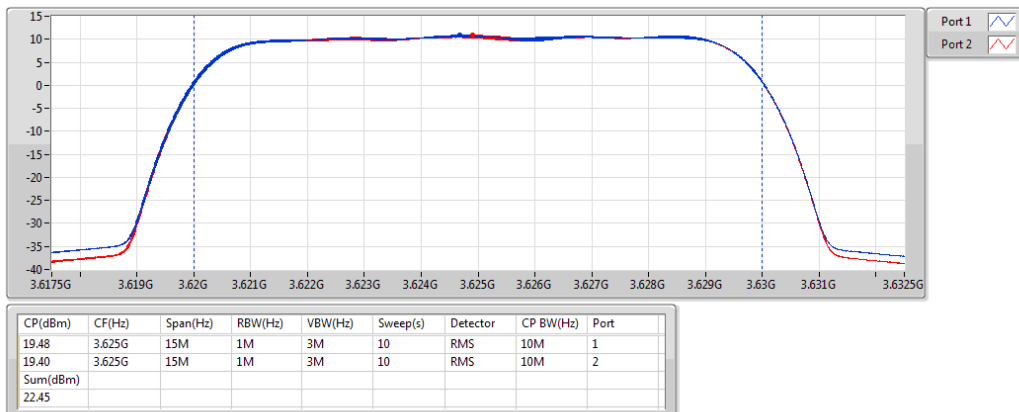
3555MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PowerAV

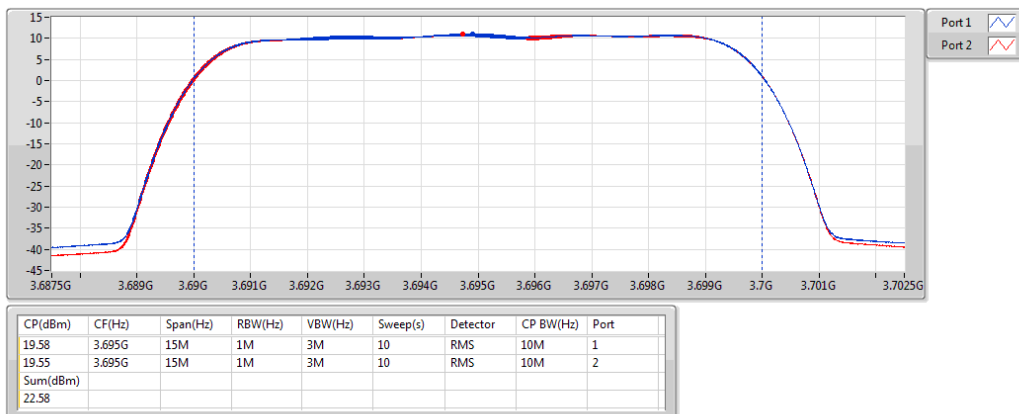
3625MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PowerAV

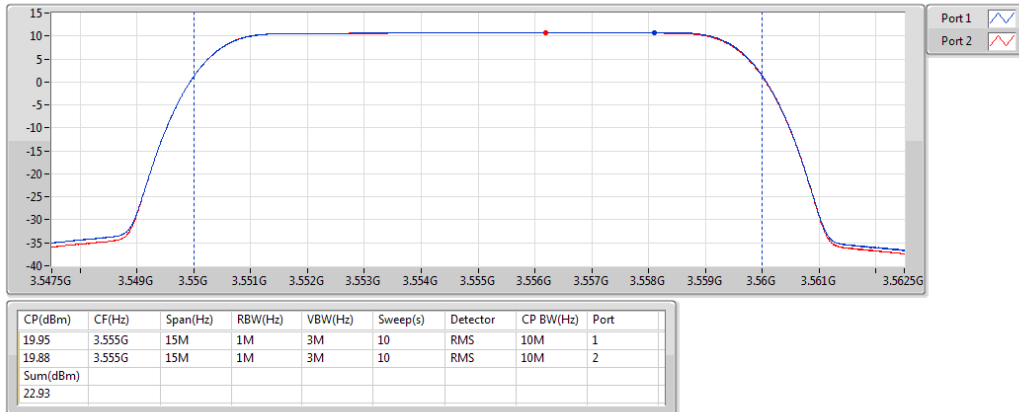
3695MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

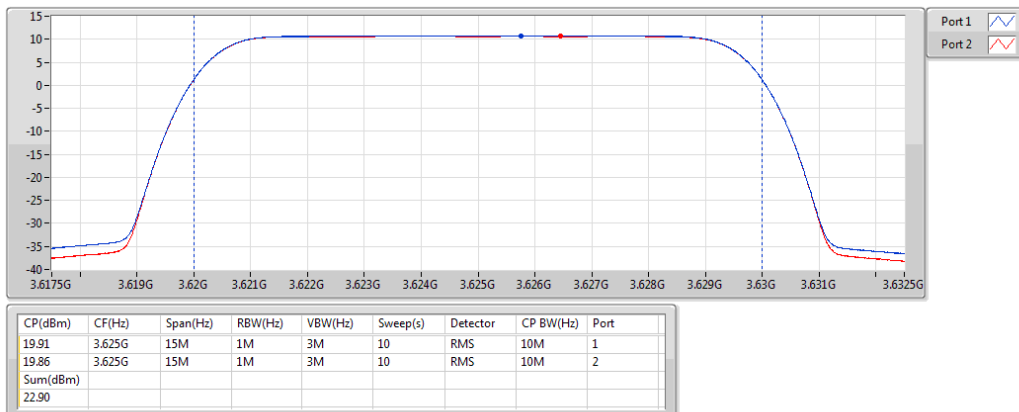
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Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

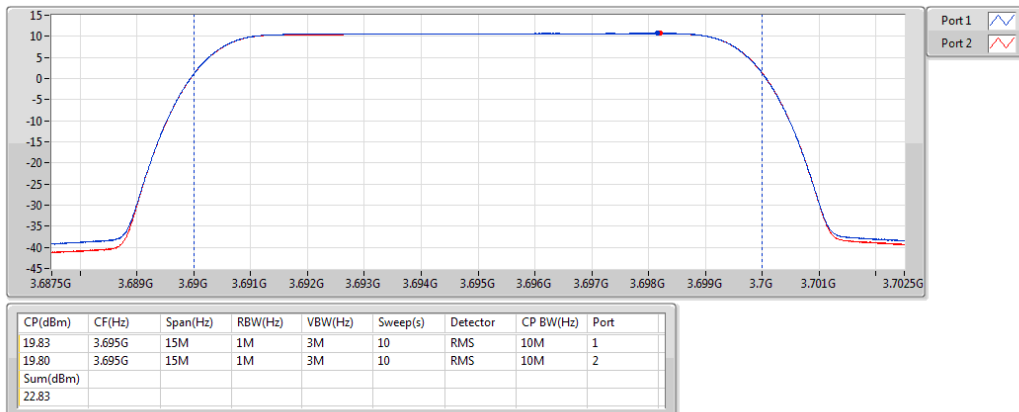
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Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

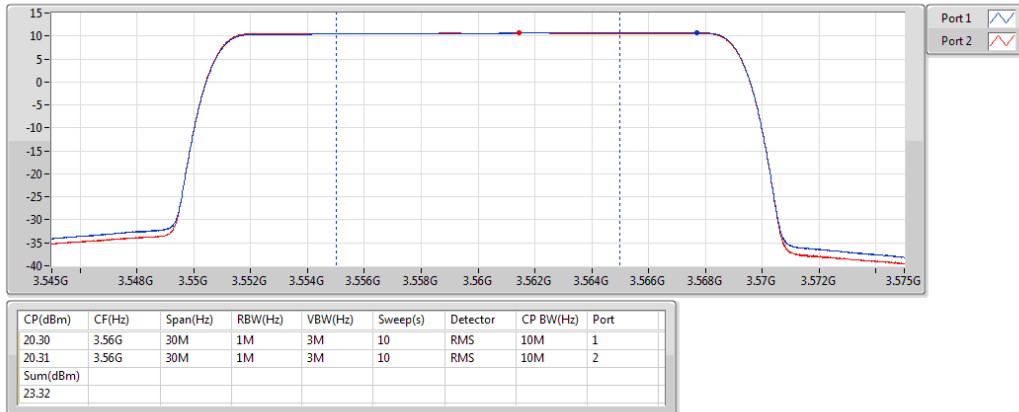
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Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

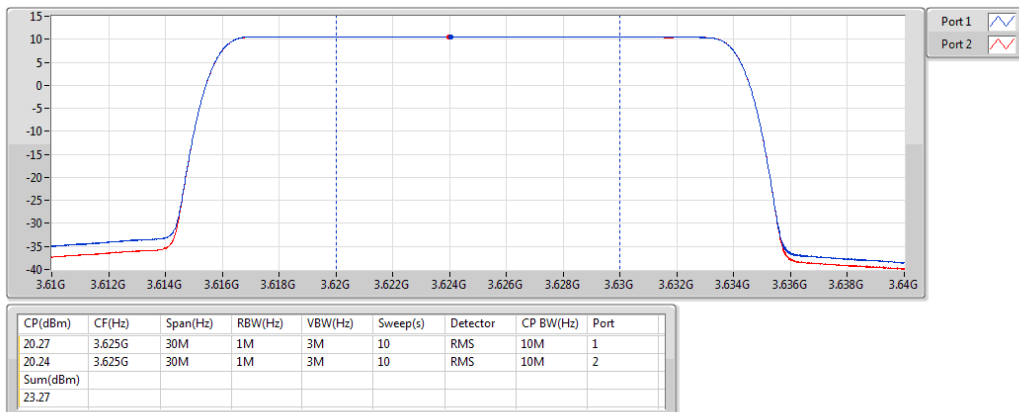
3560MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

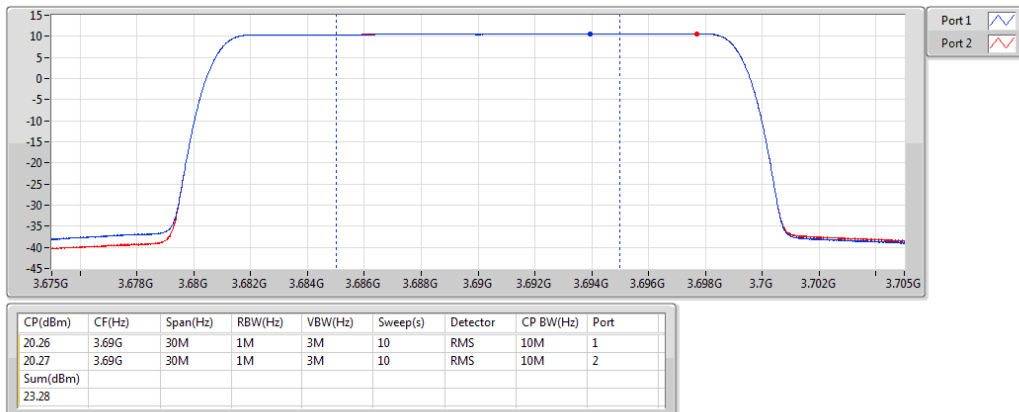
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Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

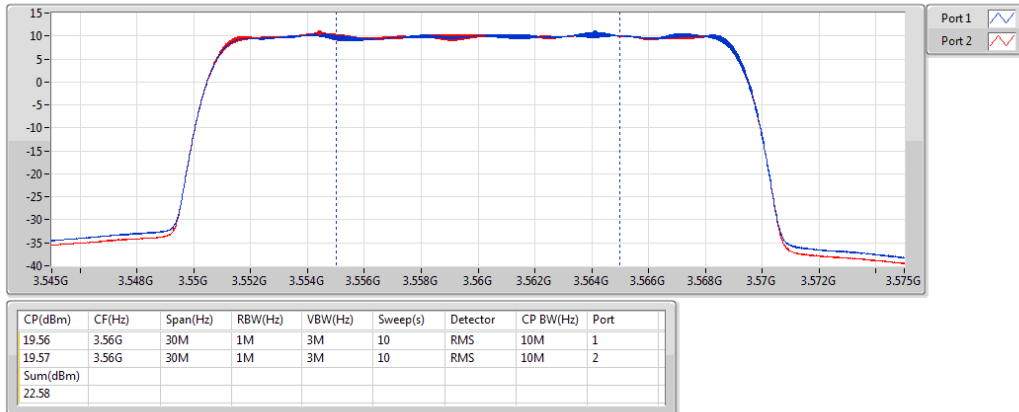
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Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

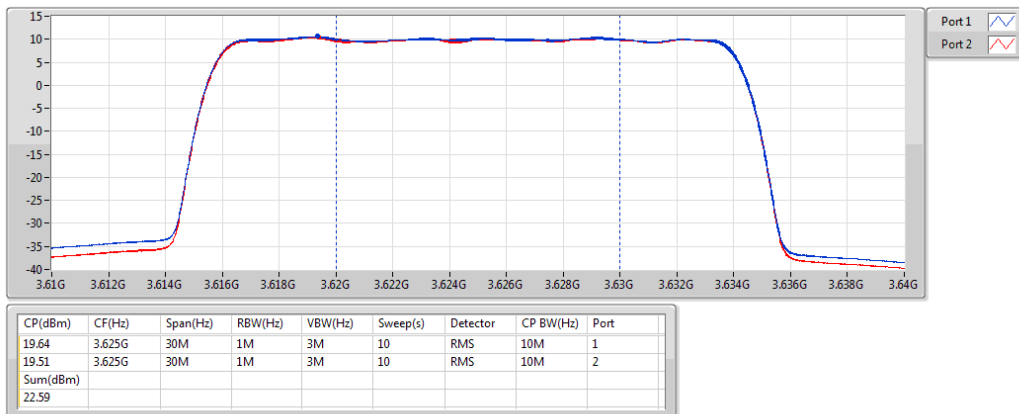
3560MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

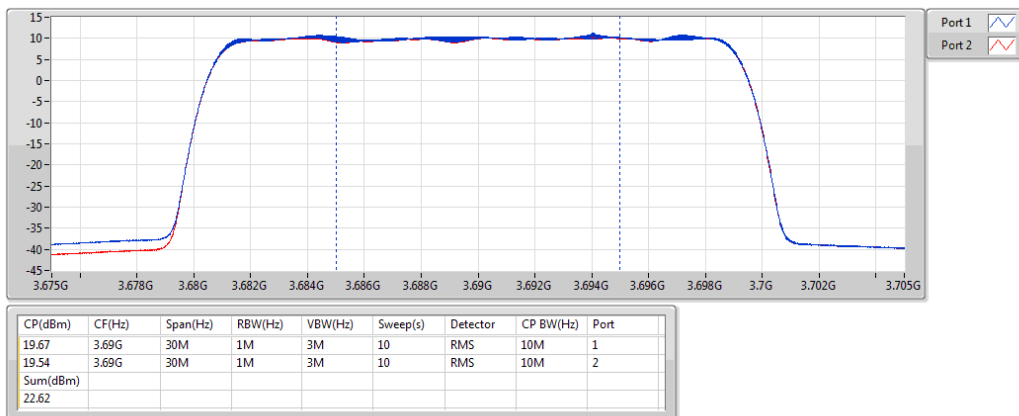
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Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

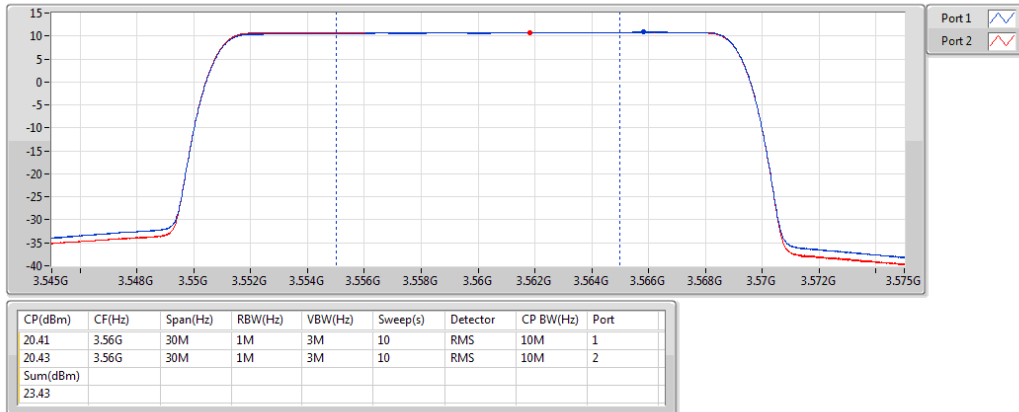
3690MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

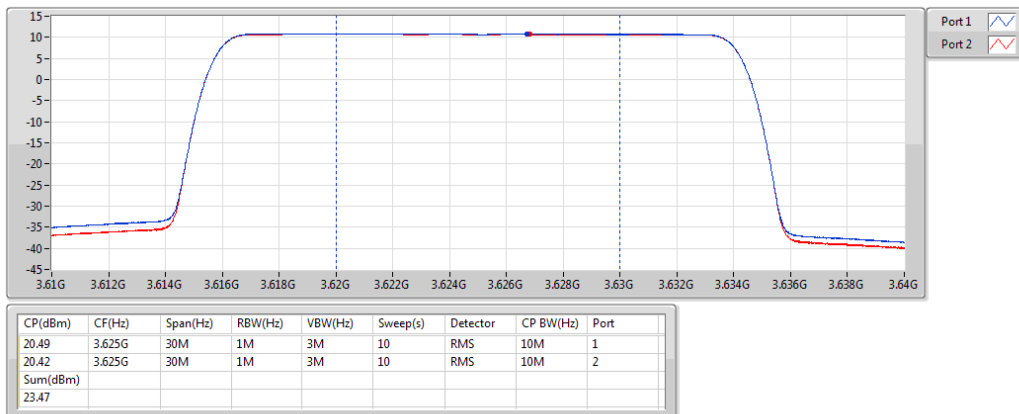
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Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

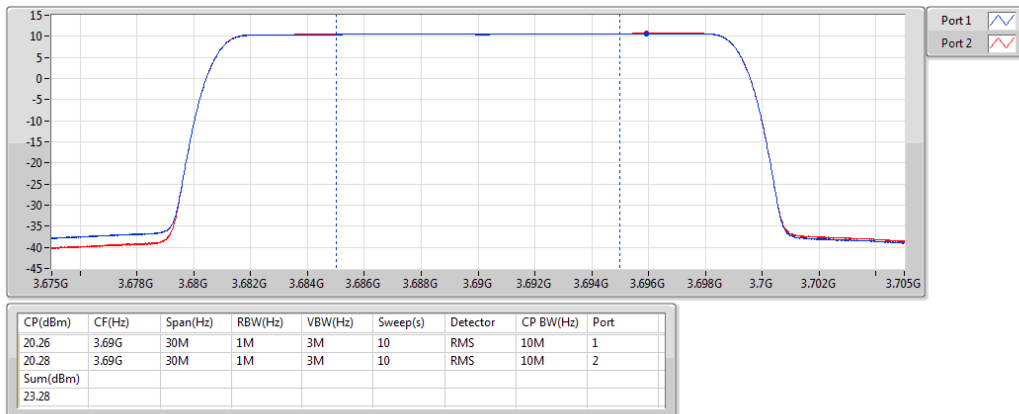
3625MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

3690MHz_64QAM_RB 100,#RB 0



Full Power Result Summary

Mode	Power (dBm)	Power (W)	EIRP (dBm)	EIRP (W)
Band 48	-	-	-	-
LTE_10MHz_Nss1,QPSK_2TX	22.95	0.197	28.95	0.78524
LTE_10MHz_Nss1,16QAM_2TX	22.58	0.181	28.58	0.72111
LTE_10MHz_Nss1,64QAM_2TX	22.93	0.196	28.93	0.78163
LTE_20MHz_Nss1,QPSK_2TX	25.84	0.384	31.84	1.52757
LTE_20MHz_Nss1,16QAM_2TX	25.23	0.333	31.23	1.32739
LTE_20MHz_Nss1,64QAM_2TX	25.98	0.396	31.98	1.57761

Result

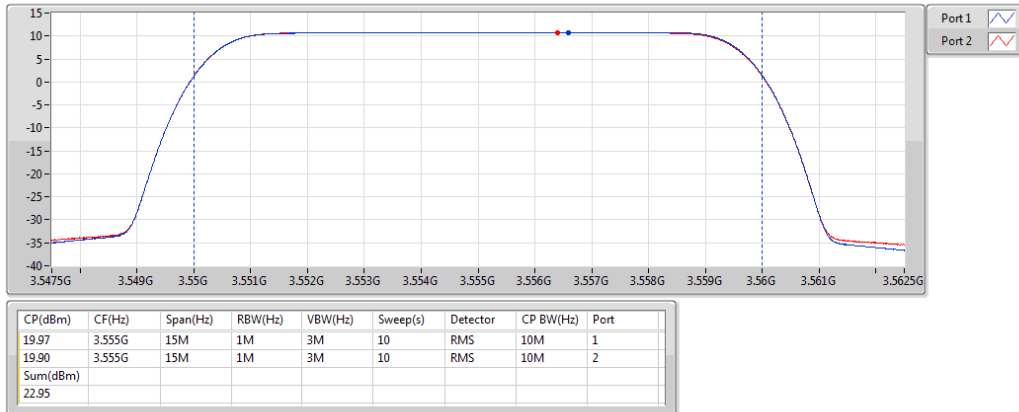
Mode	Result	DG (dBi)	EIRP (dBm)	EIRP (W)	EIRP Lim. (W)	Power (dBm)	Power (W)	Power Lim. (W)	Port 1 (dBm)	Port 2 (dBm)
Band 48_LTE_10MHz_Nss1_2TX	-	-	-	-	-	-	-	-	-	-
3555MHz_QPSK_RB 50,#RB 0	Pass	6	28.95	0.78524	Inf	22.95	0.197	Inf	19.97	19.90
3625MHz_QPSK_RB 50,#RB 0	Pass	6	28.88	0.77268	Inf	22.88	0.194	Inf	19.90	19.84
3695MHz_QPSK_RB 50,#RB 0	Pass	6	28.81	0.76033	Inf	22.81	0.191	Inf	19.81	19.79
3555MHz_16QAM_RB 50,#RB 0	Pass	6	28.41	0.69343	Inf	22.41	0.174	Inf	19.42	19.37
3625MHz_16QAM_RB 50,#RB 0	Pass	6	28.45	0.69984	Inf	22.45	0.176	Inf	19.48	19.40
3695MHz_16QAM_RB 50,#RB 0	Pass	6	28.58	0.72111	Inf	22.58	0.181	Inf	19.58	19.55
3555MHz_64QAM_RB 50,#RB 0	Pass	6	28.93	0.78163	Inf	22.93	0.196	Inf	19.95	19.88
3625MHz_64QAM_RB 50,#RB 0	Pass	6	28.90	0.77625	Inf	22.90	0.195	Inf	19.91	19.86
3695MHz_64QAM_RB 50,#RB 0	Pass	6	28.83	0.76384	Inf	22.83	0.192	Inf	19.83	19.80
Band 48_LTE_20MHz_Nss1_2TX	-	-	-	-	-	-	-	-	-	-
3560MHz_QPSK_RB 100,#RB 0	Pass	6	31.84	1.52757	Inf	25.84	0.384	Inf	22.81	22.85
3625MHz_QPSK_RB 100,#RB 0	Pass	6	31.71	1.48252	Inf	25.71	0.372	Inf	22.71	22.69
3690MHz_QPSK_RB 100,#RB 0	Pass	6	31.75	1.49624	Inf	25.75	0.375	Inf	22.73	22.74
3560MHz_16QAM_RB 100,#RB 0	Pass	6	31.18	1.31220	Inf	25.18	0.329	Inf	22.15	22.18
3625MHz_16QAM_RB 100,#RB 0	Pass	6	31.20	1.31826	Inf	25.20	0.331	Inf	22.23	22.15
3690MHz_16QAM_RB 100,#RB 0	Pass	6	31.23	1.32739	Inf	25.23	0.333	Inf	22.26	22.17
3560MHz_64QAM_RB 100,#RB 0	Pass	6	31.98	1.57761	Inf	25.98	0.396	Inf	22.95	22.98
3625MHz_64QAM_RB 100,#RB 0	Pass	6	31.96	1.57036	Inf	25.96	0.394	Inf	22.97	22.93
3690MHz_64QAM_RB 100,#RB 0	Pass	6	31.79	1.51008	Inf	25.79	0.379	Inf	22.76	22.80

DG = Directional Gain; Port n = Port n output power

Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

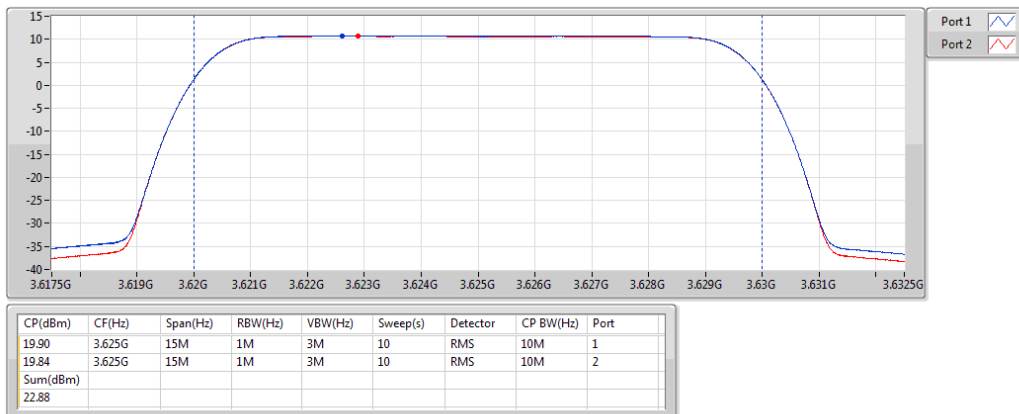
3555MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

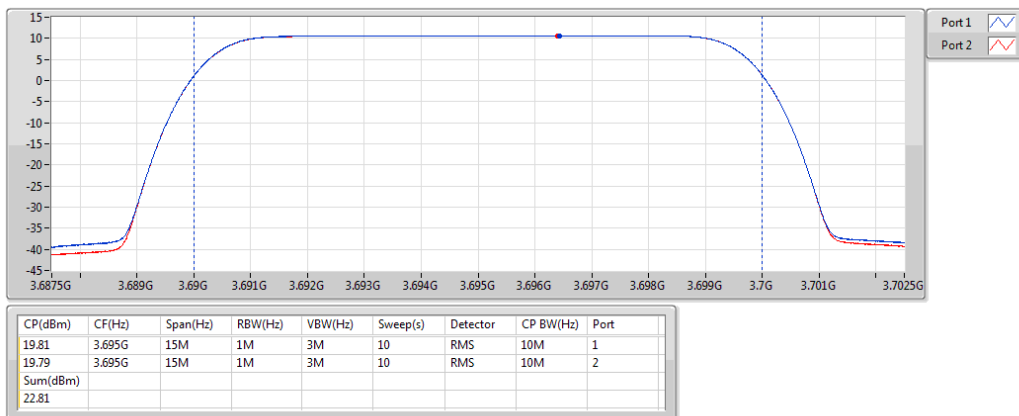
3625MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PowerAV

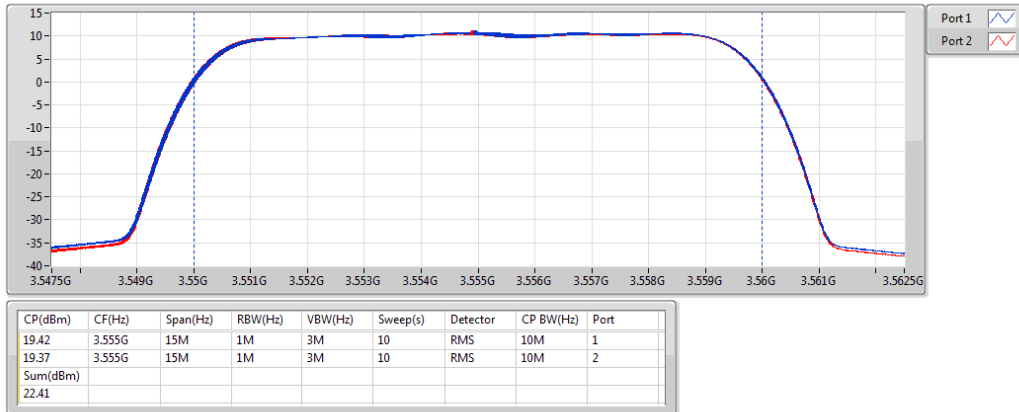
3695MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PowerAV

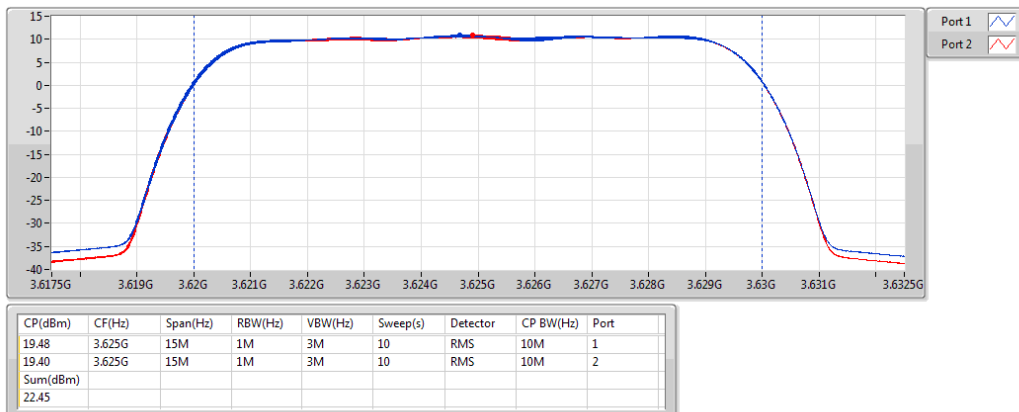
3555MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PowerAV

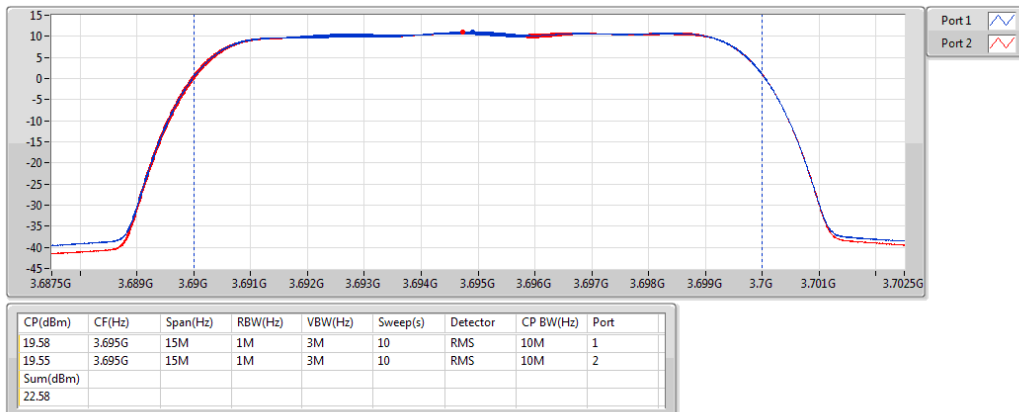
3625MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PowerAV

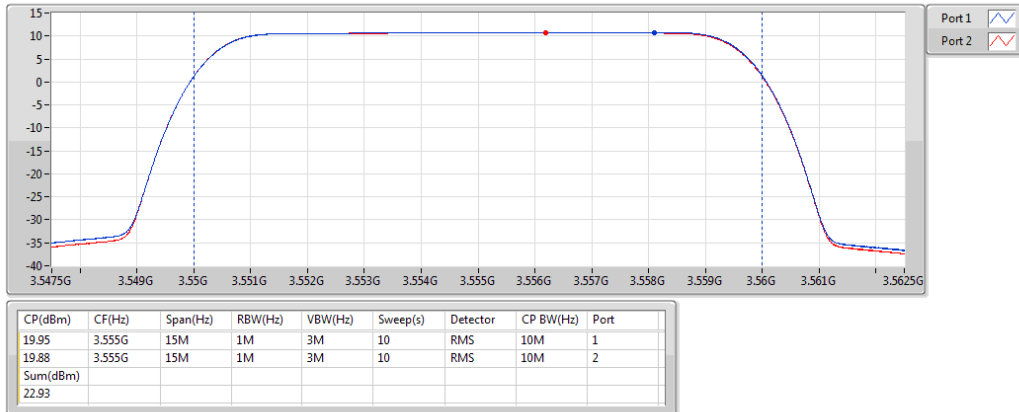
3695MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

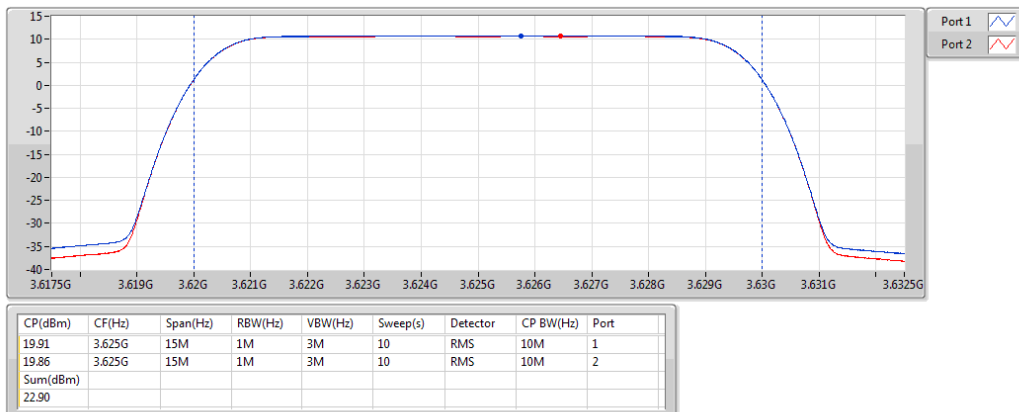
3555MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

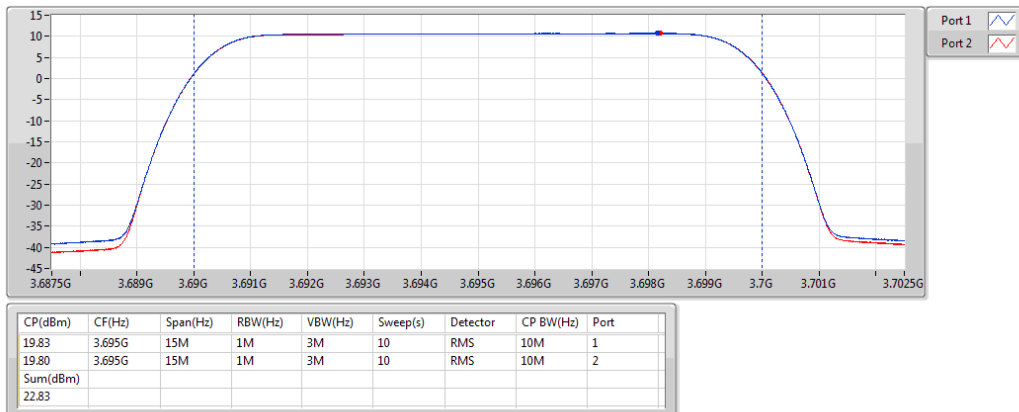
3625MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PowerAV

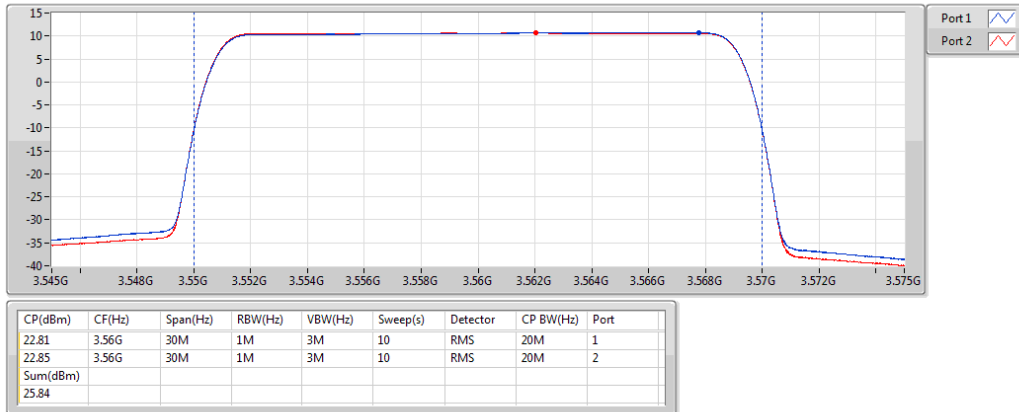
3695MHz_64QAM_RB 50,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

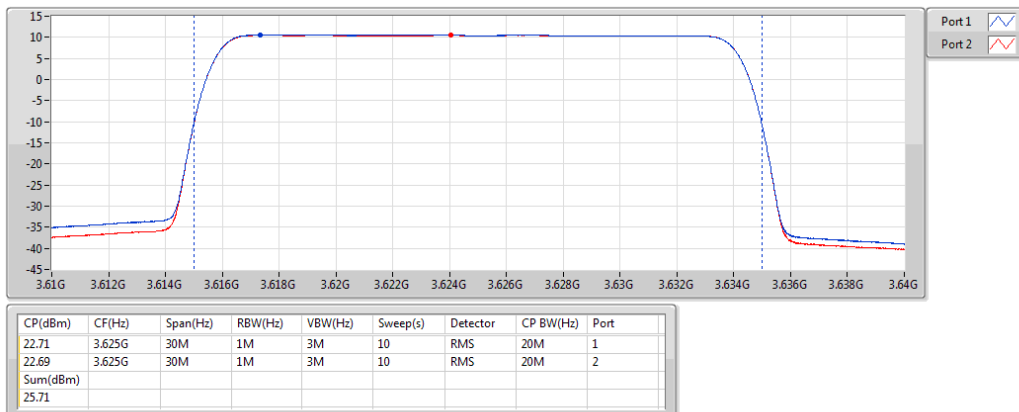
3560MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

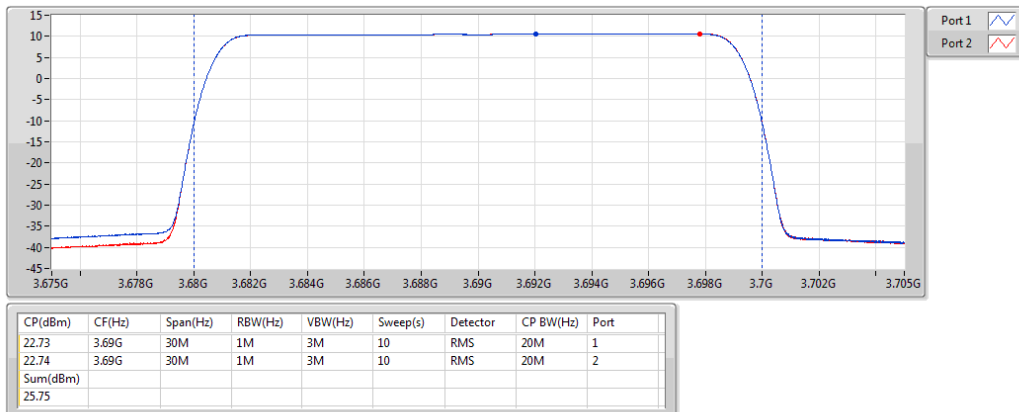
3625MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PowerAV

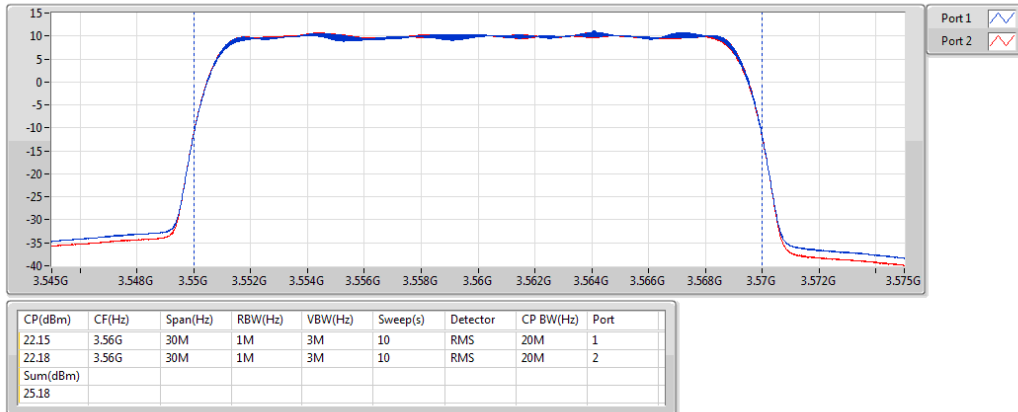
3690MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

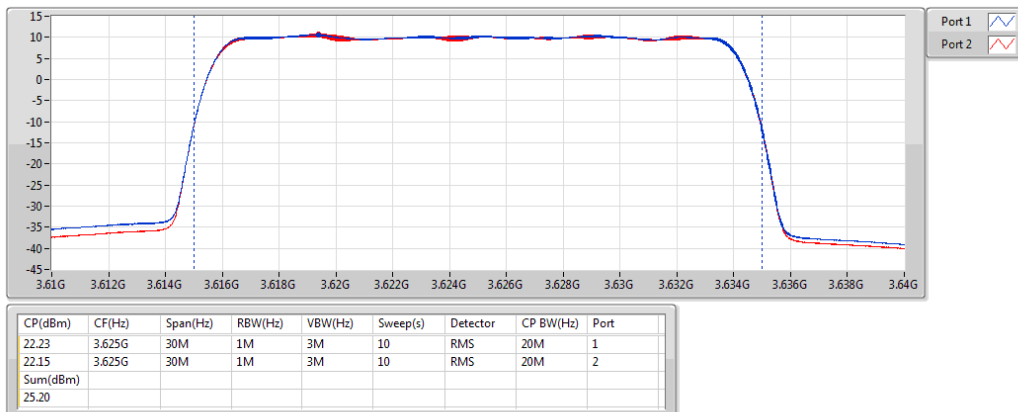
3560MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

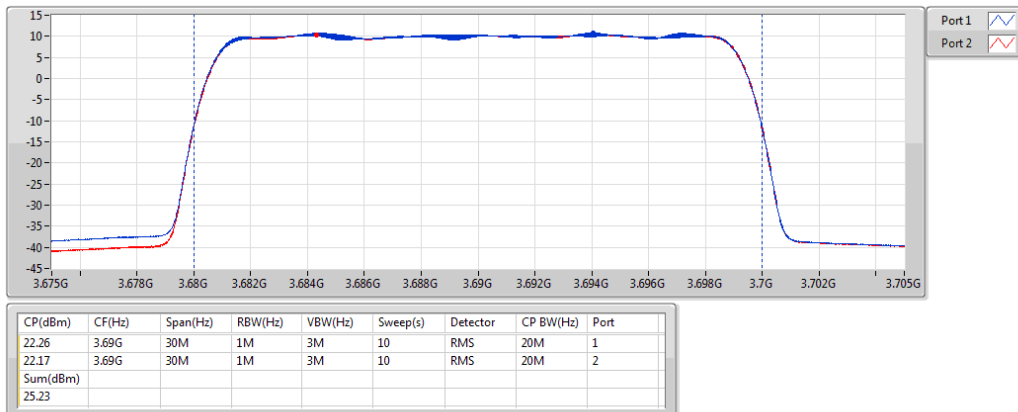
3625MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PowerAV

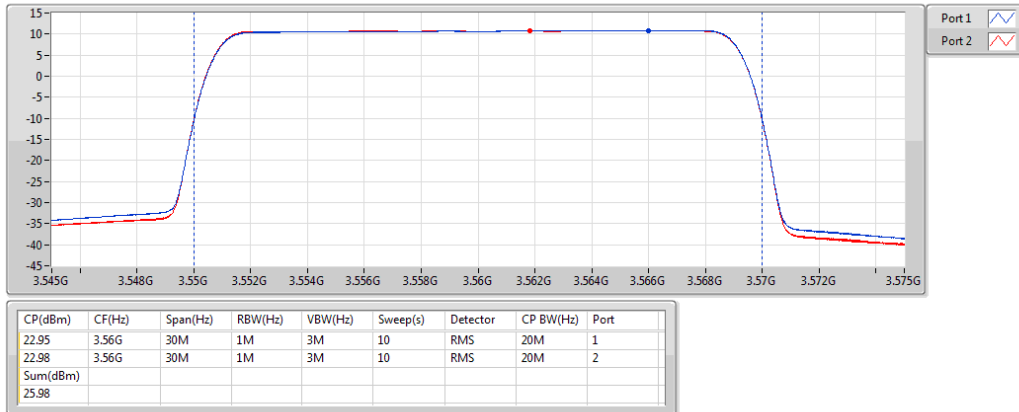
3690MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

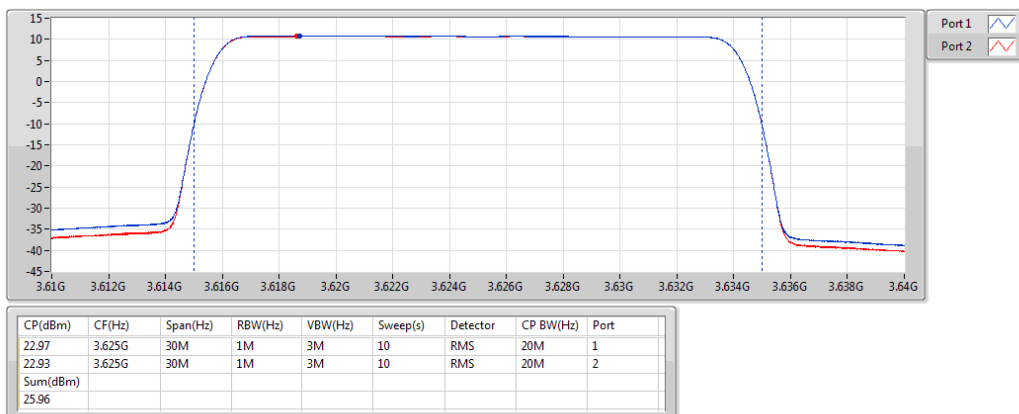
3560MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

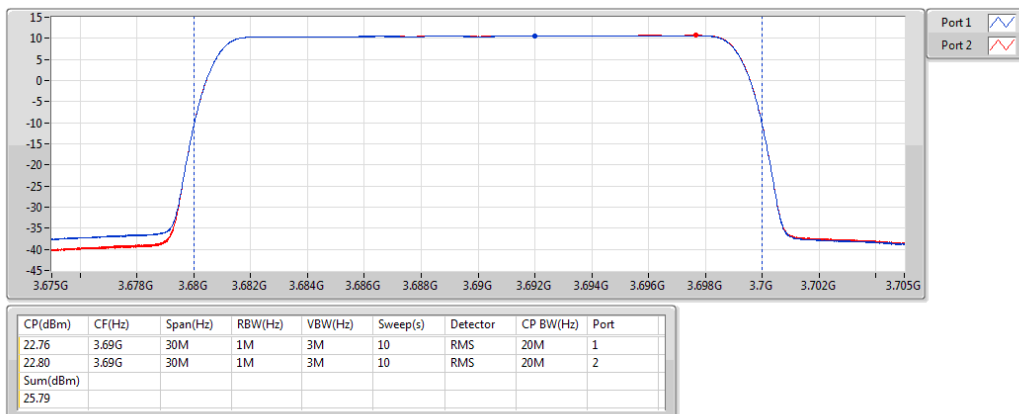
3625MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PowerAV

3690MHz_64QAM_RB 100,#RB 0



3.1.6 Test Result of PSD

Summary

Mode	PD (dBm/MHz)	EIRP PD (dBm/MHz)
Band 48	-	-
LTE_10MHz_Nss1,QPSK_2TX	13.74	19.74
LTE_10MHz_Nss1,16QAM_2TX	13.74	19.74
LTE_10MHz_Nss1,64QAM_2TX	13.76	19.76
LTE_20MHz_Nss1,QPSK_2TX	13.67	19.67
LTE_20MHz_Nss1,16QAM_2TX	13.71	19.71
LTE_20MHz_Nss1,64QAM_2TX	13.79	19.79

Result

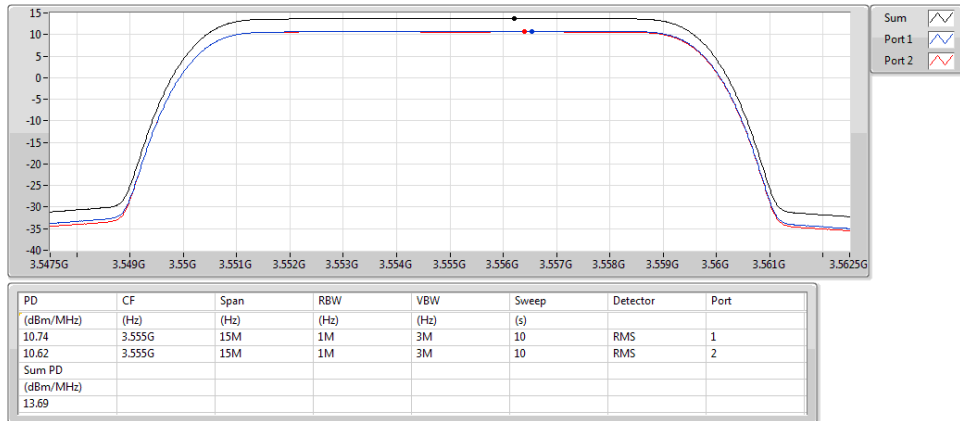
Mode	Result	DG (dBi)	PD (dBm/MHz)	PD Limit (dBm/MHz)	EIRP PD (dBm/MHz)	EIRP PD Limit (dBm/MHz)	Port 1 (dBm/MHz)	Port 2 (dBm/MHz)
Band 48_LTE_10MHz_Nss1_2TX	-	-	-	-	-	-	-	-
3555MHz_QPSK_RB 50,#RB 0	Pass	6	13.69	Inf	19.69	20.00	10.74	10.62
3625MHz_QPSK_RB 50,#RB 0	Pass	6	13.74	Inf	19.74	20.00	10.73	10.72
3695MHz_QPSK_RB 50,#RB 0	Pass	6	13.69	Inf	19.69	20.00	10.65	10.70
3555MHz_16QAM_RB 50,#RB 0	Pass	6	13.63	Inf	19.63	20.00	10.65	10.60
3625MHz_16QAM_RB 50,#RB 0	Pass	6	13.58	Inf	19.58	20.00	10.57	10.56
3695MHz_16QAM_RB 50,#RB 0	Pass	6	13.74	Inf	19.74	20.00	10.74	10.72
3555MHz_64QAM_RB 50,#RB 0	Pass	6	13.76	Inf	19.76	20.00	10.82	10.69
3625MHz_64QAM_RB 50,#RB 0	Pass	6	13.59	Inf	19.59	20.00	10.60	10.56
3695MHz_64QAM_RB 50,#RB 0	Pass	6	13.66	Inf	19.66	20.00	10.65	10.64
Band 48_LTE_20MHz_Nss1_2TX	-	-	-	-	-	-	-	-
3560MHz_QPSK_RB 100,#RB 0	Pass	6	13.67	Inf	19.67	20.00	10.70	10.64
3625MHz_QPSK_RB 100,#RB 0	Pass	6	13.58	Inf	19.58	20.00	10.59	10.58
3690MHz_QPSK_RB 100,#RB 0	Pass	6	13.63	Inf	19.63	20.00	10.58	10.65
3560MHz_16QAM_RB 100,#RB 0	Pass	6	13.61	Inf	19.61	20.00	10.56	10.66
3625MHz_16QAM_RB 100,#RB 0	Pass	6	13.63	Inf	19.63	20.00	10.71	10.52
3690MHz_16QAM_RB 100,#RB 0	Pass	6	13.71	Inf	19.71	20.00	10.75	10.65
3560MHz_64QAM_RB 100,#RB 0	Pass	6	13.79	Inf	19.79	20.00	10.82	10.75
3625MHz_64QAM_RB 100,#RB 0	Pass	6	13.77	Inf	19.77	20.00	10.77	10.75
3690MHz_64QAM_RB 100,#RB 0	Pass	6	13.71	Inf	19.71	20.00	10.67	10.72

DG = Directional Gain;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port Xpower density;

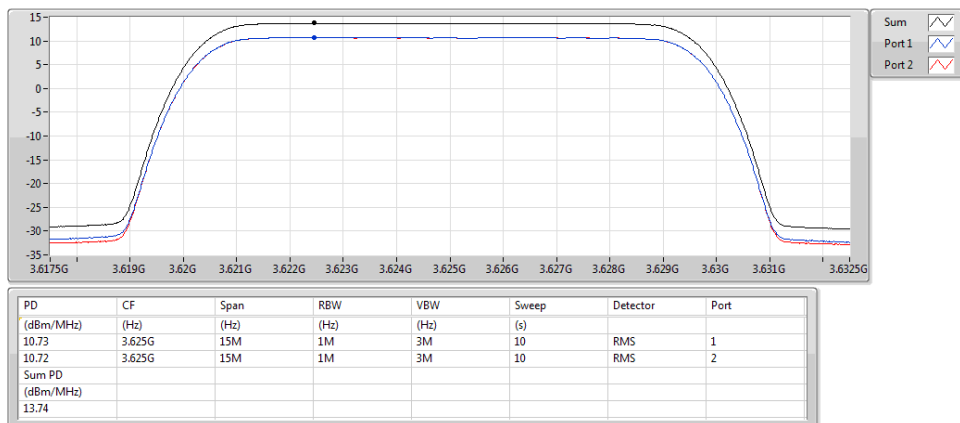
Band 48_LTE_10MHz_Nss1,QPSK_2TX
3555MHz_QPSK_RB 50,#RB 0

PSD



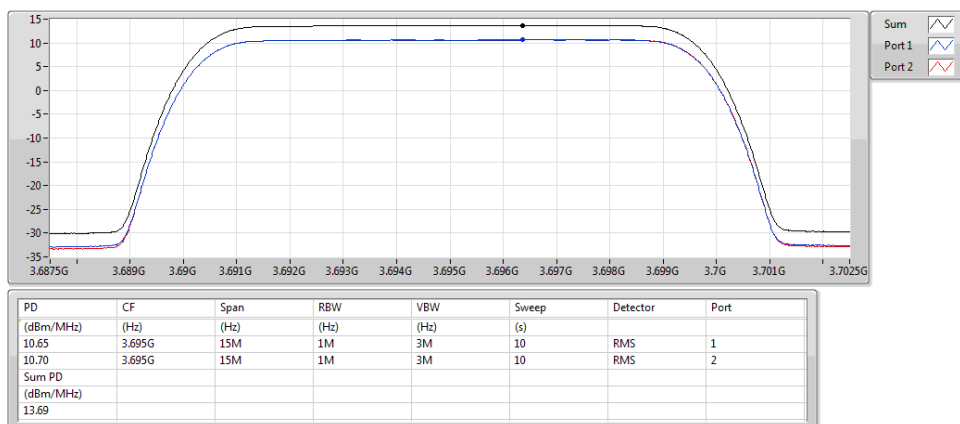
Band 48_LTE_10MHz_Nss1,QPSK_2TX
3625MHz_QPSK_RB 50,#RB 0

PSD



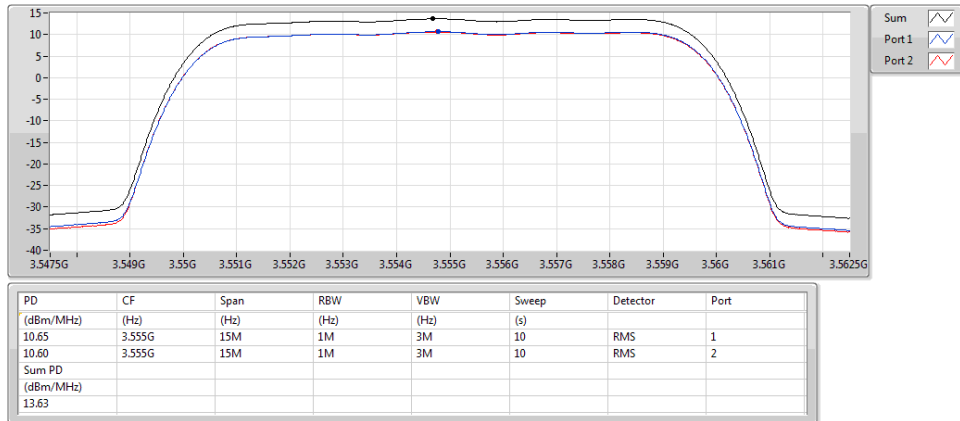
Band 48_LTE_10MHz_Nss1,QPSK_2TX
3695MHz_QPSK_RB 50,#RB 0

PSD



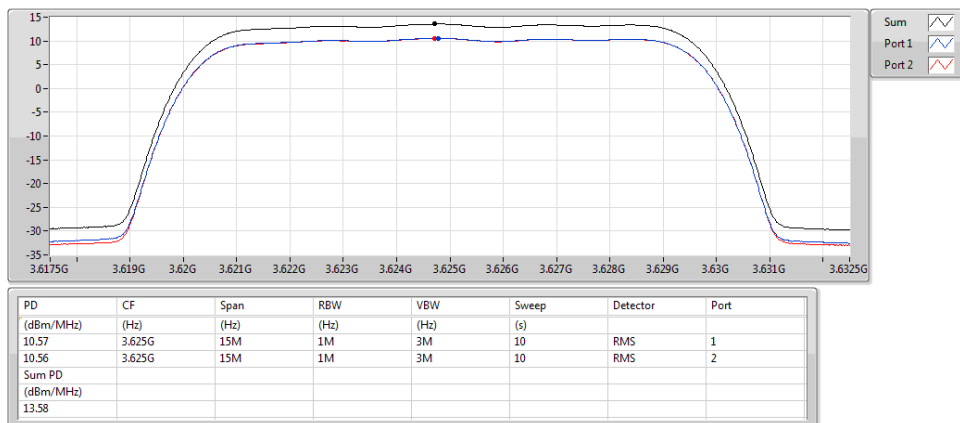
Band 48_LTE_10MHz_Nss1,16QAM_2TX
3555MHz_16QAM_RB 50,#RB 0

PSD



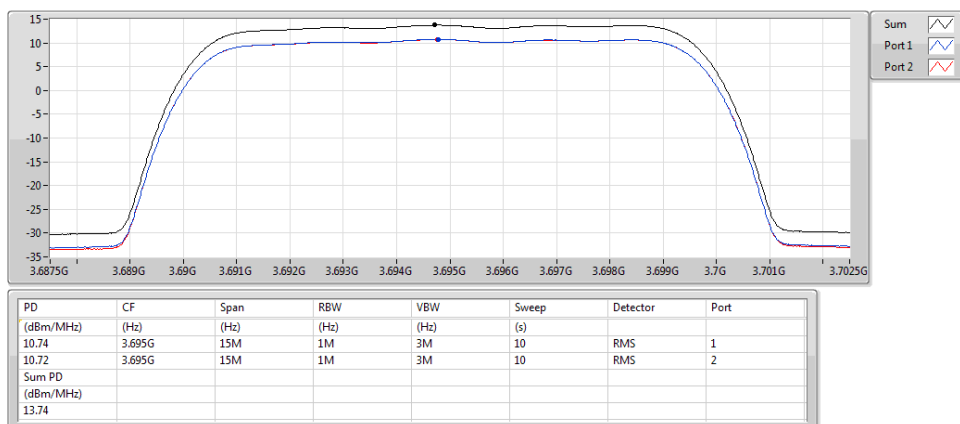
Band 48_LTE_10MHz_Nss1,16QAM_2TX
3625MHz_16QAM_RB 50,#RB 0

PSD



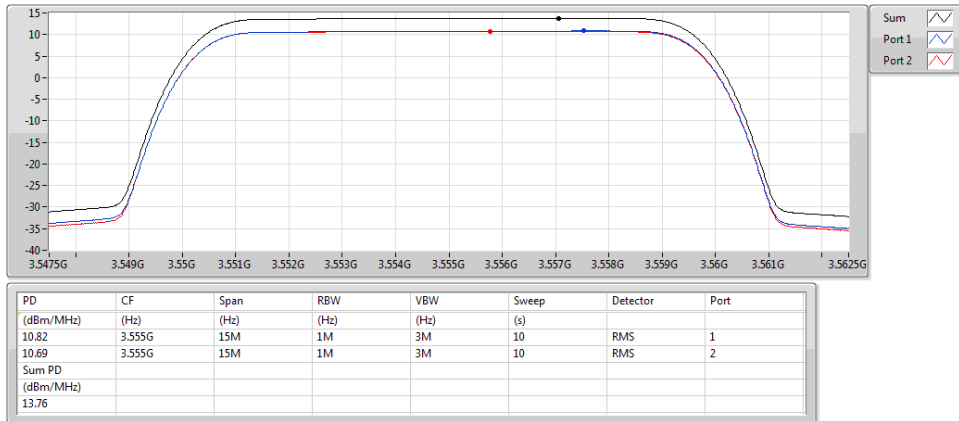
Band 48_LTE_10MHz_Nss1,16QAM_2TX
3695MHz_16QAM_RB 50,#RB 0

PSD



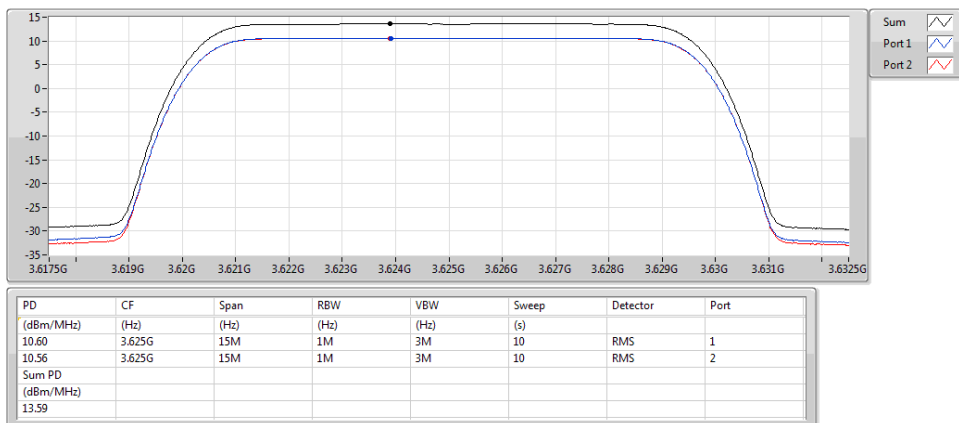
Band 48_LTE_10MHz_Nss1,64QAM_2TX
3555MHz_64QAM_RB 50,#RB 0

PSD



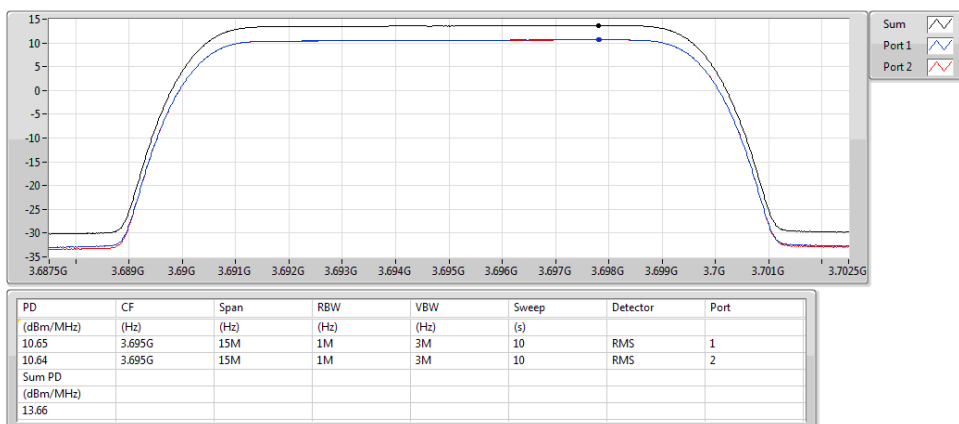
Band 48_LTE_10MHz_Nss1,64QAM_2TX
3625MHz_64QAM_RB 50,#RB 0

PSD



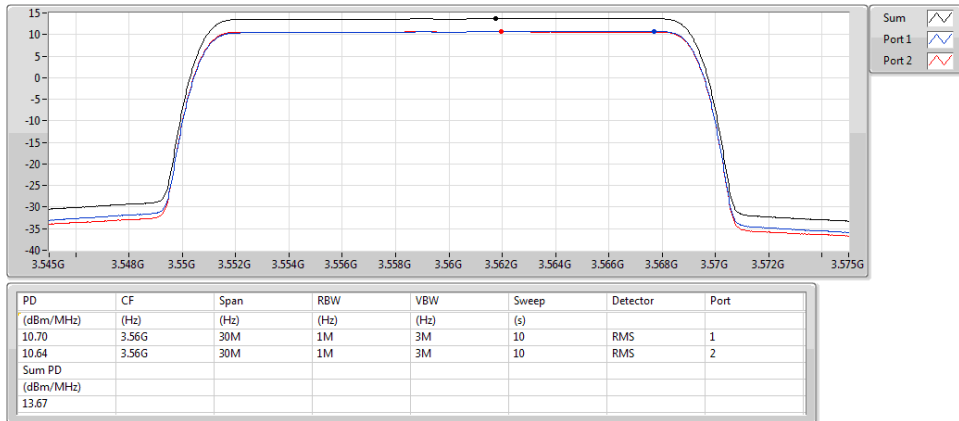
Band 48_LTE_10MHz_Nss1,64QAM_2TX
3695MHz_64QAM_RB 50,#RB 0

PSD



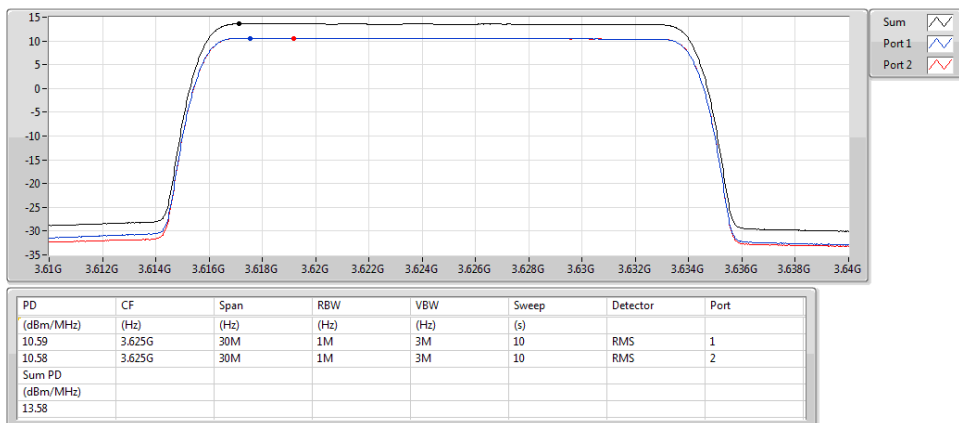
Band 48_LTE_20MHz_Nss1,QPSK_2TX
3560MHz_QPSK_RB 100,#RB 0

PSD



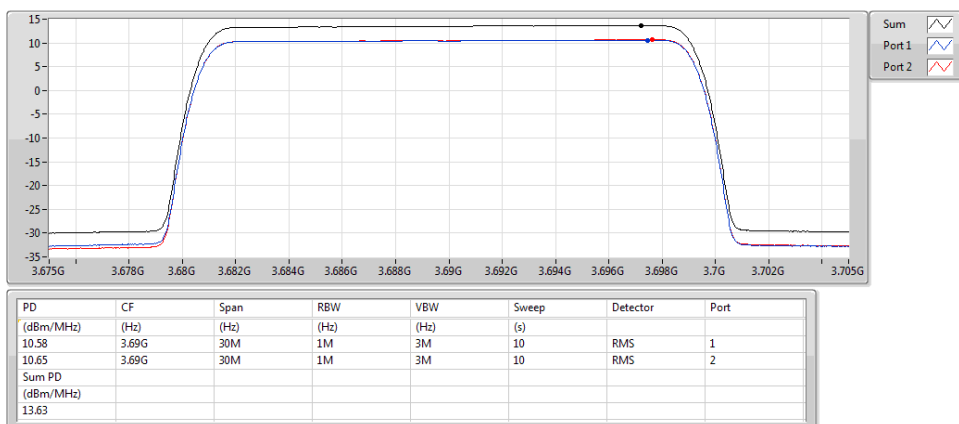
Band 48_LTE_20MHz_Nss1,QPSK_2TX
3625MHz_QPSK_RB 100,#RB 0

PSD



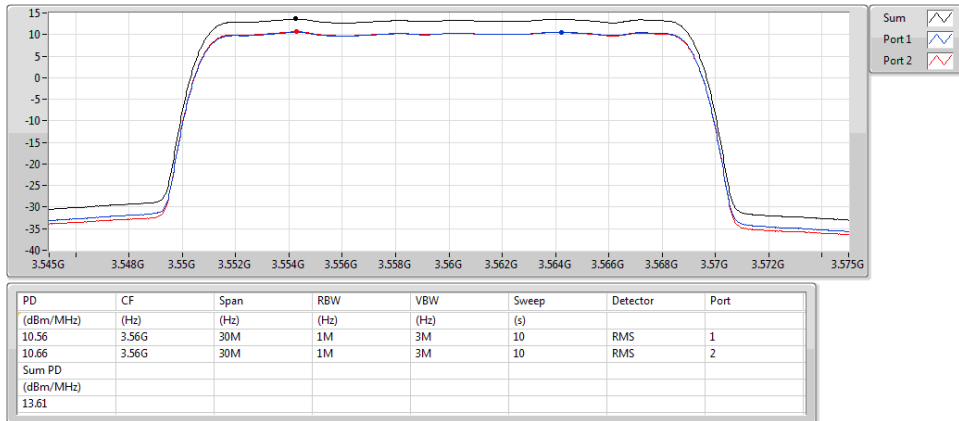
Band 48_LTE_20MHz_Nss1,QPSK_2TX
3690MHz_QPSK_RB 100,#RB 0

PSD



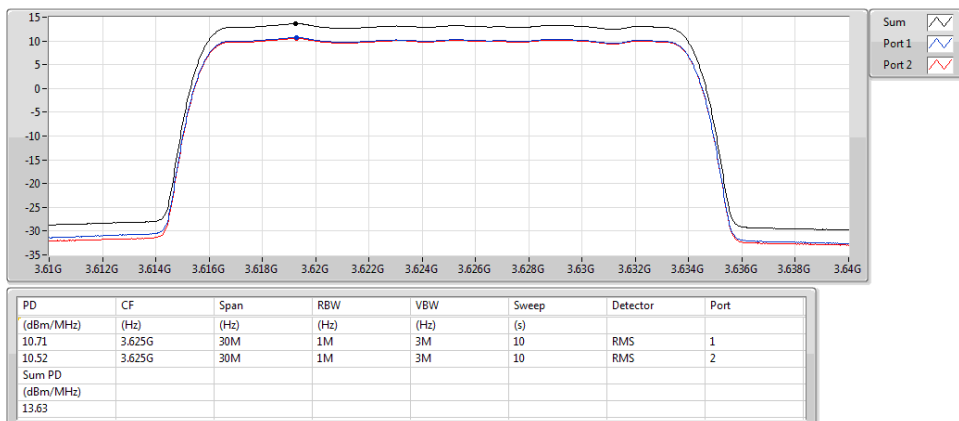
Band 48_LTE_20MHz_Nss1,16QAM_2TX
3560MHz_16QAM_RB 100,#RB 0

PSD



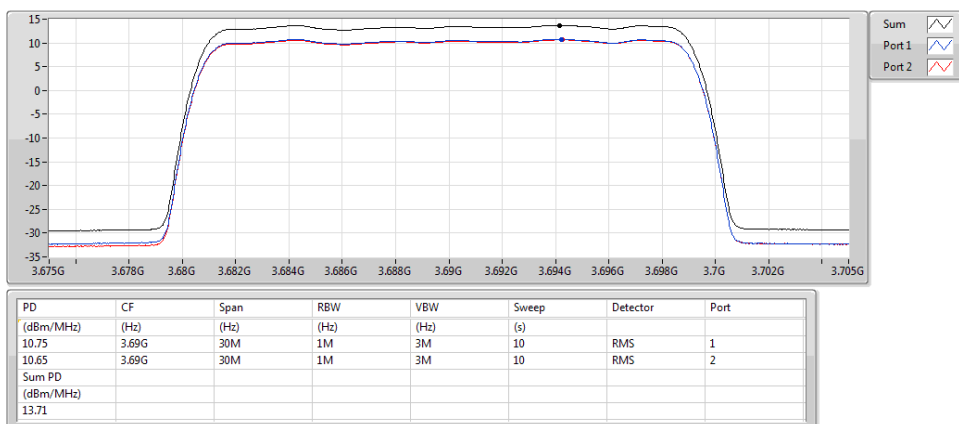
Band 48_LTE_20MHz_Nss1,16QAM_2TX
3625MHz_16QAM_RB 100,#RB 0

PSD



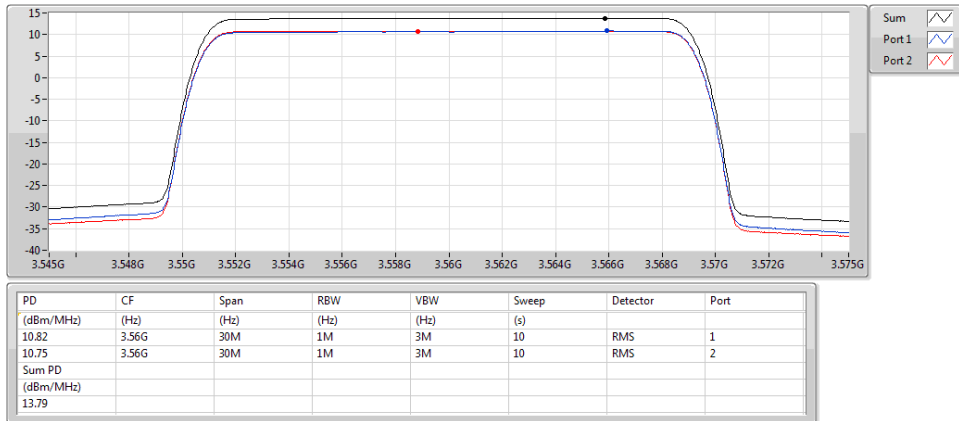
Band 48_LTE_20MHz_Nss1,16QAM_2TX
3690MHz_16QAM_RB 100,#RB 0

PSD



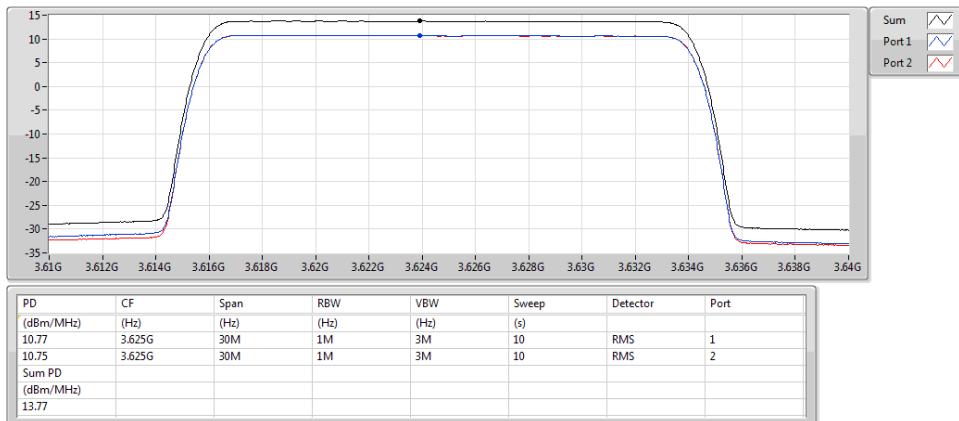
Band 48_LTE_20MHz_Nss1,64QAM_2TX
3560MHz_64QAM_RB 100,#RB 0

PSD



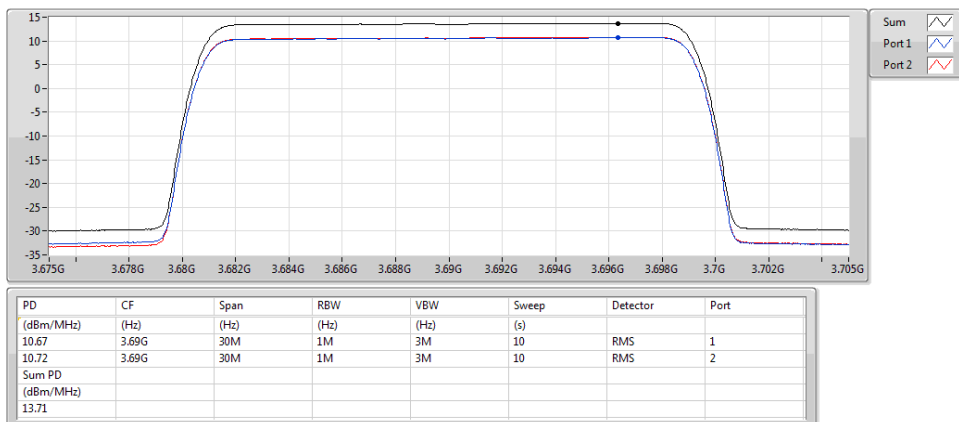
Band 48_LTE_20MHz_Nss1,64QAM_2TX
3625MHz_64QAM_RB 100,#RB 0

PSD



Band 48_LTE_20MHz_Nss1,64QAM_2TX
3690MHz_64QAM_RB 100,#RB 0

PSD



3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

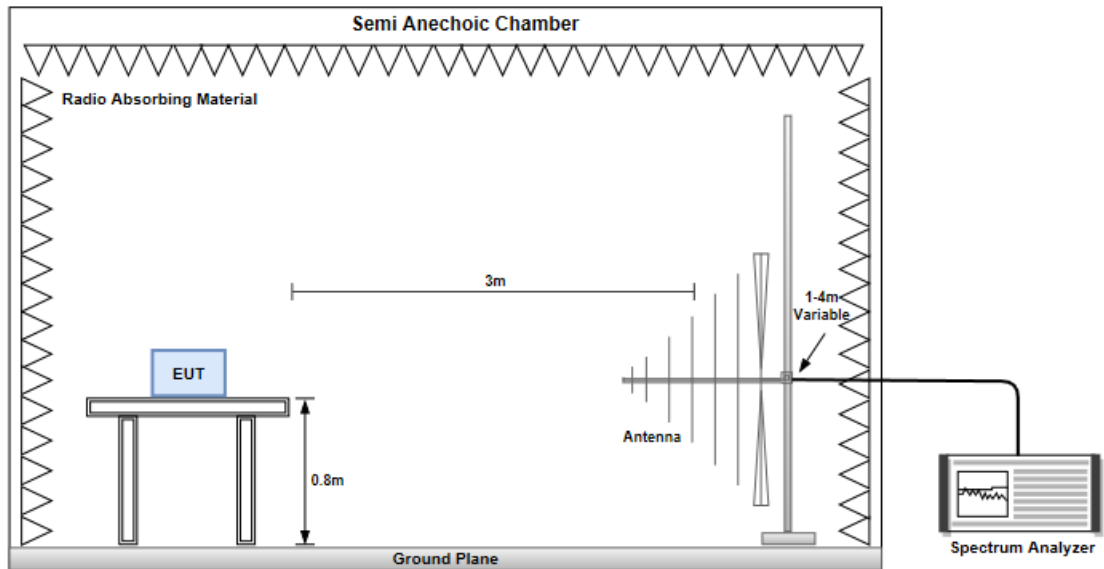
Frequency range	Limit (dBm/MHz)
Within 0-10 MHz above the Assigned Channel Within 0-10 MHz below the assigned Channel	-13
Greater than 10 MHz above the Assigned Channel Greater than 10 MHz below the Assigned Channel	-25
Power of any Emission below 3530 MHz Power of any Emission above 3720 MHz	-40

3.2.2 Test Procedures

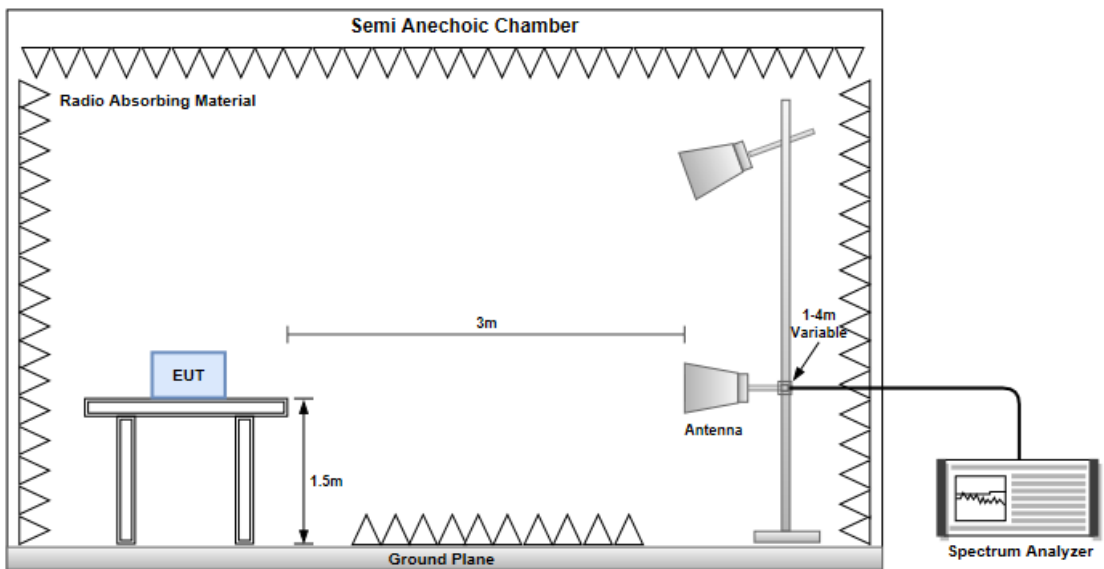
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. $E.I.R.P = \text{output power of step 4} + \text{gain of substitution antenna} - \text{cable loss of RF cable}$. ERP can be calculated by below formula:

3.2.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.2.4 Test Result of Radiated Emissions below 1GHz

Mode	LTE Band 48, 64QAM, CB:10 MHz, 50 RB Offset 0, Channel: 55290						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
32.91	H	-61.14	-40	-21.14	-69.99	-41.99	-19.15
52.31	H	-58.58	-40	-18.58	-61.87	-42.88	-15.7
77.53	H	-59.41	-40	-19.41	-58.12	-51.09	-8.32
190.05	H	-66.33	-40	-26.33	-63.72	-62.88	-3.45
462.62	H	-62.38	-40	-22.38	-64.99	-61.15	-1.23
549.92	H	-66.62	-40	-26.62	-70.19	-65.19	-1.43
30.97	V	-53.43	-40	-13.43	-53.49	-33.73	-19.7
48.43	V	-53.55	-40	-13.55	-51.05	-37.17	-16.38
80.44	V	-52.28	-40	-12.28	-51.79	-44.88	-7.4
192.96	V	-62.33	-40	-22.33	-63.77	-59.16	-3.17
450.01	V	-59.04	-40	-19.04	-61.85	-57.88	-1.16
486.87	V	-60.98	-40	-20.98	-64.58	-59.62	-1.36

NOTE: EIRP = S.G power value + correction factor

Mode	LTE Band 48, 64QAM, CB:20 MHz, 100 RB Offset 0, Channel: 55340						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
32.91	H	-60.13	-40	-20.13	-68.98	-40.98	-19.15
55.22	H	-58.64	-40	-18.64	-60.99	-43.49	-15.15
74.62	H	-59.72	-40	-19.72	-58.65	-50.45	-9.27
139.61	H	-67.1	-40	-27.1	-66.41	-60.01	-7.09
430.61	H	-63.25	-40	-23.25	-65.62	-62	-1.25
549.92	H	-66.6	-40	-26.6	-69.87	-65.17	-1.43
32.91	V	-53.63	-40	-13.63	-51.64	-34.48	-19.15
46.49	V	-53.99	-40	-13.99	-50.87	-37.29	-16.7
85.29	V	-53.02	-40	-13.02	-52.44	-46.87	-6.15
192.96	V	-59.32	-40	-19.32	-60.76	-56.15	-3.17
458.74	V	-62.09	-40	-22.09	-65.09	-60.88	-1.21
549.92	V	-62.72	-40	-22.72	-69.16	-61.29	-1.43

NOTE: EIRP = S.G power value + correction factor

3.2.5 Test Result of Radiated Emissions above 1GHz

Mode	LTE Band 48, 64QAM, CB:10 MHz, 50 RB Offset 0, Channel: 55290						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7110	H	-54.72	-40	-14.72	-74.68	-58.78	4.06
10665	H	-51.21	-40	-11.21	-74.32	-52.35	1.14
14220	H	-49.3	-40	-9.3	-74.29	-49.42	0.12
7110	V	-53.67	-40	-13.67	-74.66	-57.73	4.06
10665	V	-52.42	-40	-12.42	-74.75	-53.56	1.14
14220	V	-48.33	-40	-8.33	-74.34	-48.45	0.12

Mode	LTE Band 48, 64QAM, CB:10 MHz, 50 RB Offset 0, Channel: 55990						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7250	H	-53.51	-40	-13.51	-74.66	-57.06	3.55
10875	H	-51.77	-40	-11.77	-74.37	-52.76	0.99
14500	H	-48.47	-40	-8.47	-74.68	-48.34	-0.13
7250	V	-54.51	-40	-14.51	-74.56	-58.06	3.55
10875	V	-51.47	-40	-11.47	-74.39	-52.46	0.99
14500	V	-50.6	-40	-10.6	-74.43	-50.47	-0.13

Mode	LTE Band 48, 64QAM, CB: 10MHz, Channel: 56690						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7390	H	-54.12	-40	-14.12	-74.76	-57.46	3.34
11085	H	-51.6	-40	-11.6	-74.56	-52.5	0.9
14780	H	-47.31	-40	-7.31	-74.29	-47.77	0.46
7390	V	-54.42	-40	-14.42	-74.56	-57.76	3.34
11085	V	-51.68	-40	-11.68	-74.61	-52.58	0.9
14780	V	-50.29	-40	-10.29	-74.47	-50.75	0.46

NOTE: EIRP = S.G power value + correction factor

Mode	LTE Band 48, 64QAM, CB:20 MHz, 100 RB Offset 0, Channel: 55340						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7120	H	-55.16	-40	-15.16	-75.13	-59.17	4.01
10680	H	-51.29	-40	-11.29	-74.38	-52.42	1.13
14240	H	-49.38	-40	-9.38	-74.28	-49.48	0.1
7120	V	-53.85	-40	-13.85	-74.89	-57.86	4.01
10680	V	-52.1	-40	-12.1	-74.36	-53.23	1.13
14240	V	-48.6	-40	-8.6	-74.62	-48.7	0.10

Mode	LTE Band 48, 64QAM, CB:20 MHz, 100 RB Offset 0, Channel: 55990						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7250	H	-53.07	-40	-13.07	-74.22	-56.62	3.55
10875	H	-51.56	-40	-11.56	-74.16	-52.55	0.99
14500	H	-48.17	-40	-8.17	-74.38	-48.04	-0.13
7250	V	-54.41	-40	-14.41	-74.46	-57.96	3.55
10875	V	-51.32	-40	-11.32	-74.24	-52.31	0.99
14500	V	-50.8	-40	-10.8	-74.63	-50.67	-0.13

Mode	LTE Band 48, 64QAM, CB:20 MHz, 100 RB Offset 0, Channel: 56640						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7380	H	-54.44	-40	-14.44	-75.11	-57.79	3.35
11070	H	-51.93	-40	-11.93	-74.86	-52.83	0.9
14760	H	-47.81	-40	-7.81	-74.73	-48.23	0.42
7380	V	-54.64	-40	-14.64	-74.76	-57.99	3.35
11070	V	-51.72	-40	-11.72	-74.63	-52.62	0.9
14760	V	-50.41	-40	-10.41	-74.56	-50.83	0.42

NOTE: EIRP = S.G power value + correction factor

3.3 Conducted Emissions & Band Edge

3.3.1 Limit of Conducted Emissions & Band Edge

Frequency range	Limit (dBm/MHz)
Within 0-10 MHz above the Assigned Channel Within 0-10 MHz below the assigned Channel	-13
Greater than 10 MHz above the Assigned Channel Greater than 10 MHz below the Assigned Channel	-25
Power of any Emission below 3530 MHz Power of any Emission above 3720 MHz	-40

3.3.2 Test Procedures

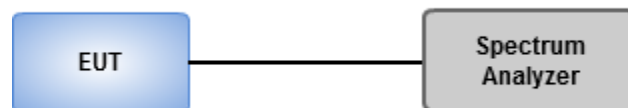
Emission below 3530 MHz / Emission above 3720 MHz

1. Lowest, middle and highest operating channels are tested for this item.
2. Scan frequency range is from 30 MHz ~ 37 GHz.
3. Set RBW = 1MHz, VBW = 3MHz, detector = RMS, sweep time = auto.
4. Record the max trace value and capture the test plot of each sub frequency band.

3530 MHz ~ $(F_c - BW/2) / (F_c + BW/2)$ ~ 3720 MHz

1. Lowest /middel / highest operating channels are tested for this item.
2. The center frequency of spectrum analyzer will be set to Lowest /middel / highest operating channels.
3. Set RBW = 100 kHz, VBW = 300 kHz, detector = RMS, sweep time = auto.
4. Using channel power function to measure test result and record the max trace value and capture the test plot.

3.3.3 Test Setup



3.3.4 Test Result of Conducted Emissions & Band Edge

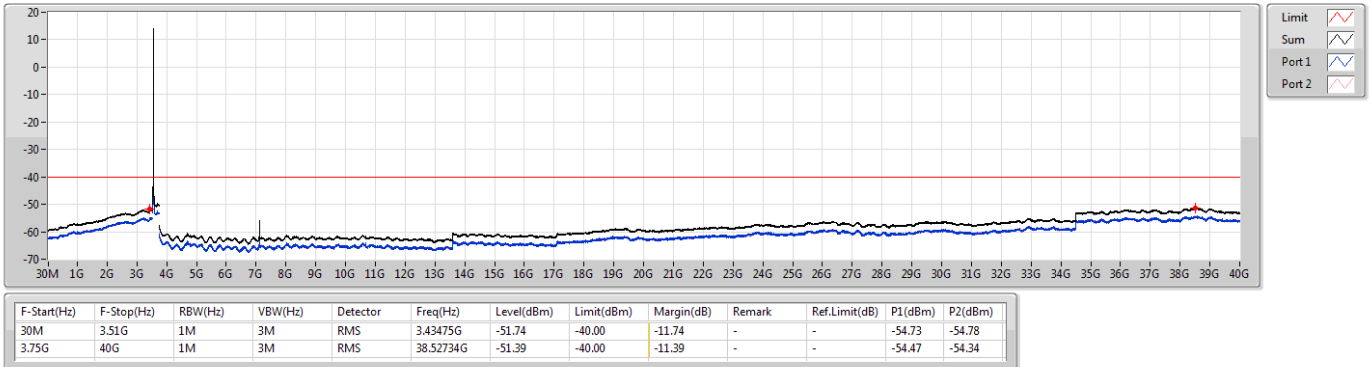
Conducted Emissions Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	VBW (Hz)	Detector	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Remark	Ref.Limit (dB)
Band 48	-	-	-	-	-	-	-	-	-	-	-	-
LTE_10MHz_Nss1,QPSK_2TX	Pass	30M	3.51G	1M	3M	RMS	3.50087G	-50.18	-40.00	-10.18	-	-
LTE_10MHz_Nss1,16QAM_2TX	Pass	30M	3.51G	1M	3M	RMS	3.50174G	-49.99	-40.00	-9.99	-	-
LTE_10MHz_Nss1,64QAM_2TX	Pass	30M	3.51G	1M	3M	RMS	3.50435G	-50.27	-40.00	-10.27	-	-
LTE_20MHz_Nss1,QPSK_2TX	Pass	30M	3.51G	1M	3M	RMS	3.44084G	-49.31	-40.00	-9.31	-	-
LTE_20MHz_Nss1,16QAM_2TX	Pass	30M	3.51G	1M	3M	RMS	3.44084G	-49.37	-40.00	-9.37	-	-
LTE_20MHz_Nss1,64QAM_2TX	Pass	30M	3.51G	1M	3M	RMS	3.44084G	-49.21	-40.00	-9.21	-	-

Band 48_LTE_10MHz_Nss1,QPSK_2TX

CSE-TX-Sum

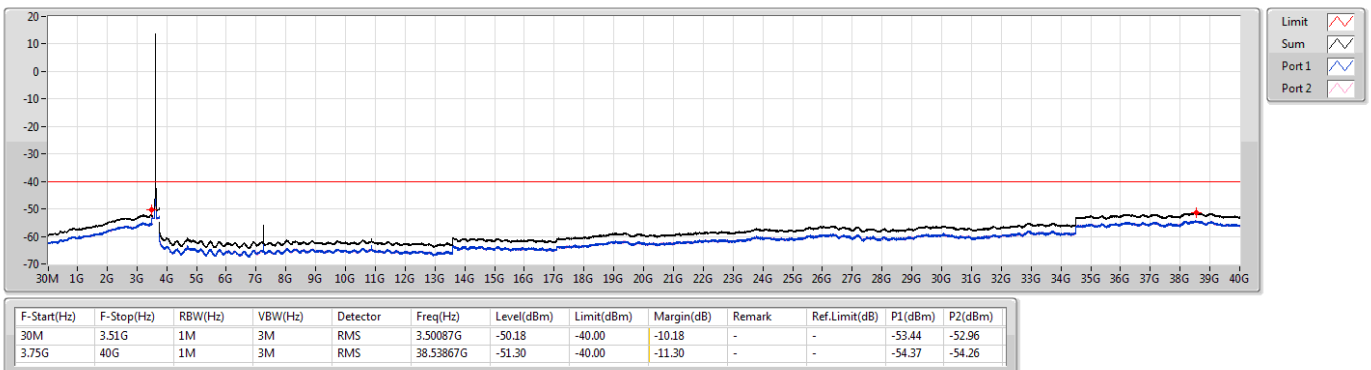
3555MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

CSE-TX-Sum

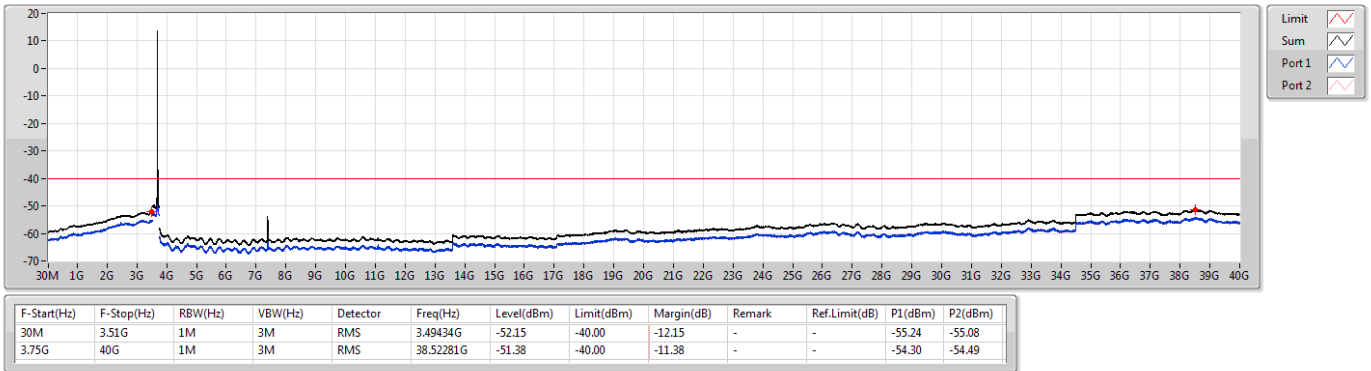
3625MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

CSE-TX-Sum

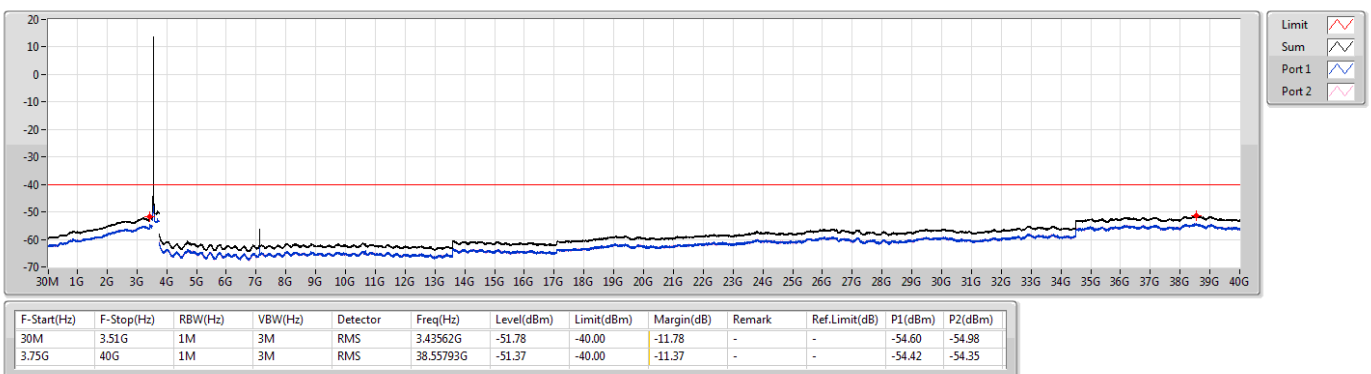
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Band 48_LTE_10MHz_Nss1,16QAM_2TX

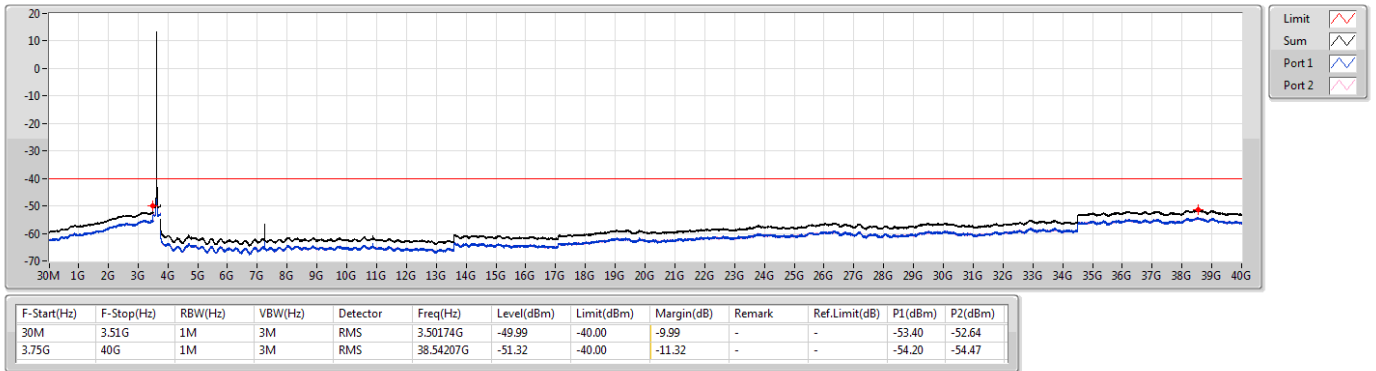
CSE-TX-Sum

3555MHz_16QAM_RB 50,#RB 0



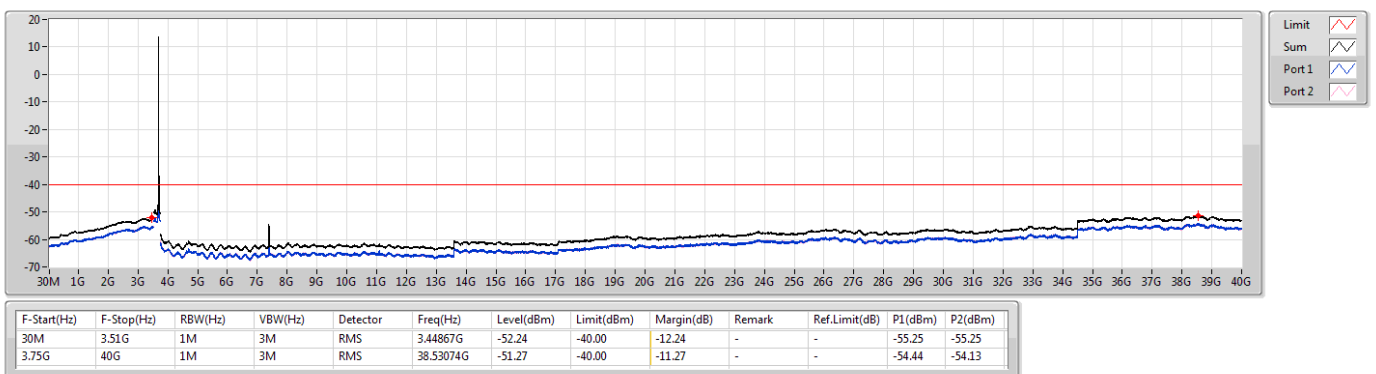
Band 48_LTE_10MHz_Nss1,16QAM_2TX
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CSE-TX-Sum



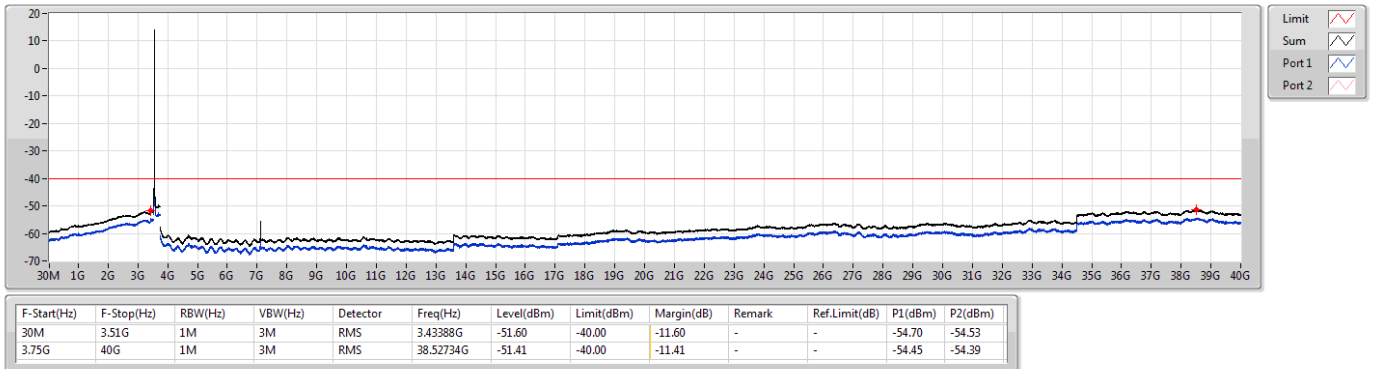
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CSE-TX-Sum



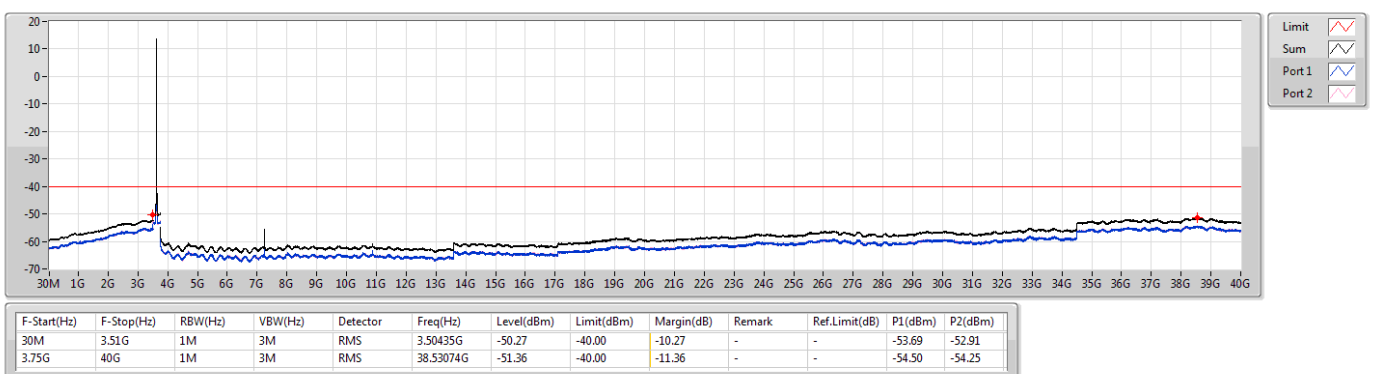
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CSE-TX-Sum



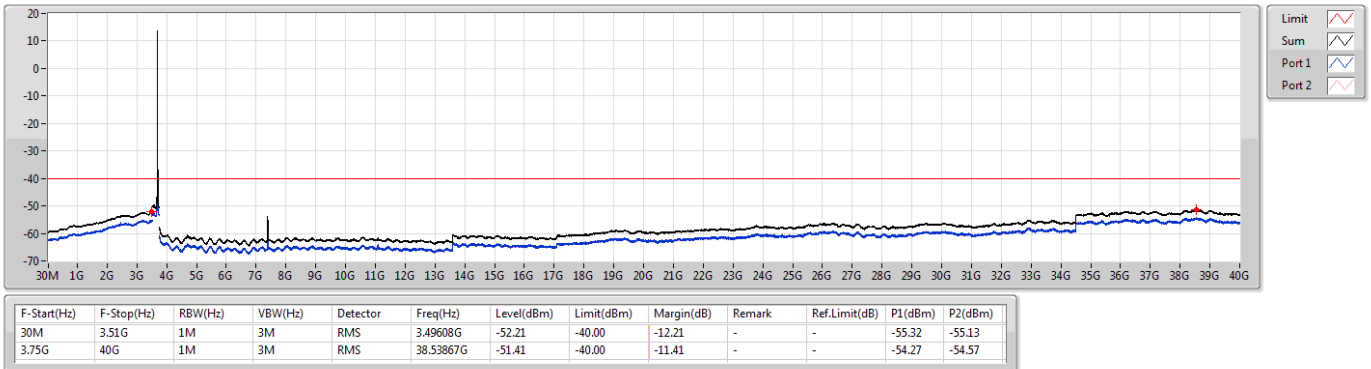
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CSE-TX-Sum



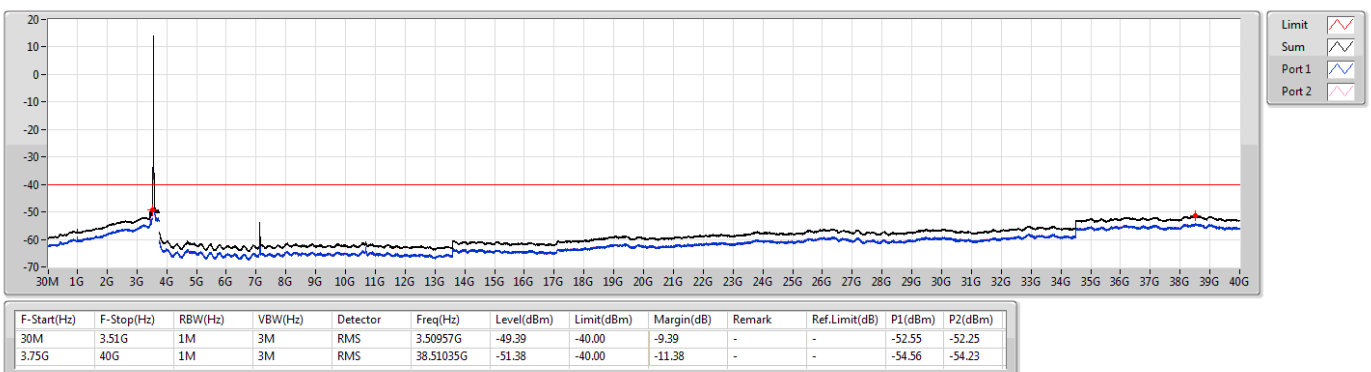
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CSE-TX-Sum



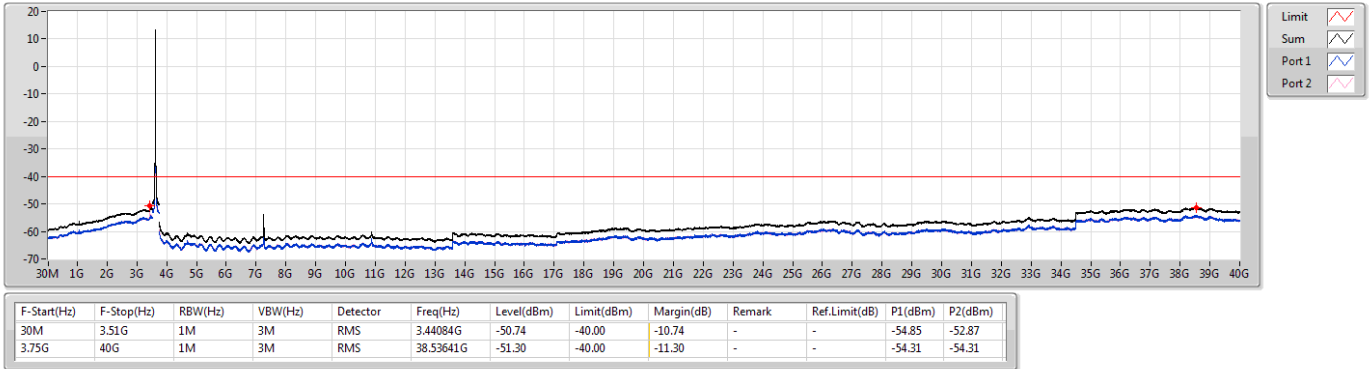
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3560MHz_QPSK_RB 100,#RB 0

CSE-TX-Sum



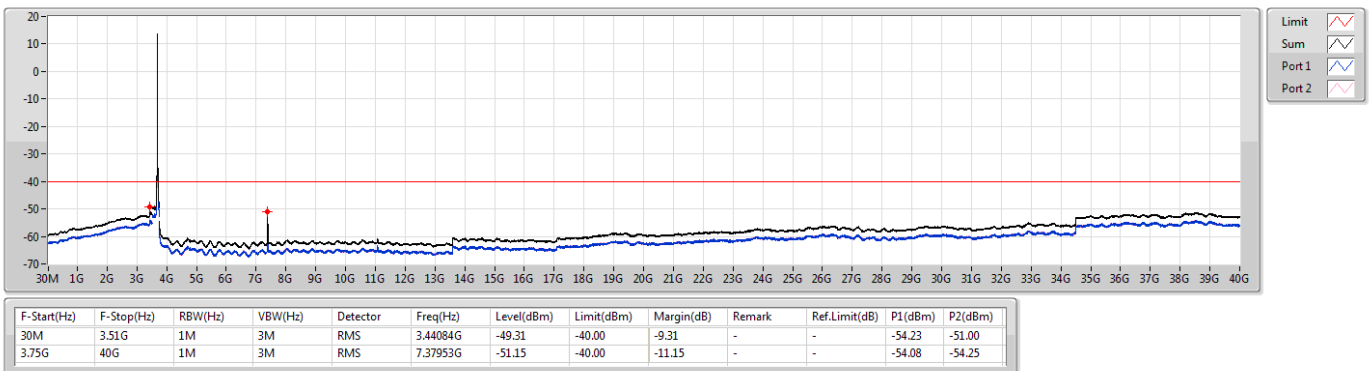
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CSE-TX-Sum



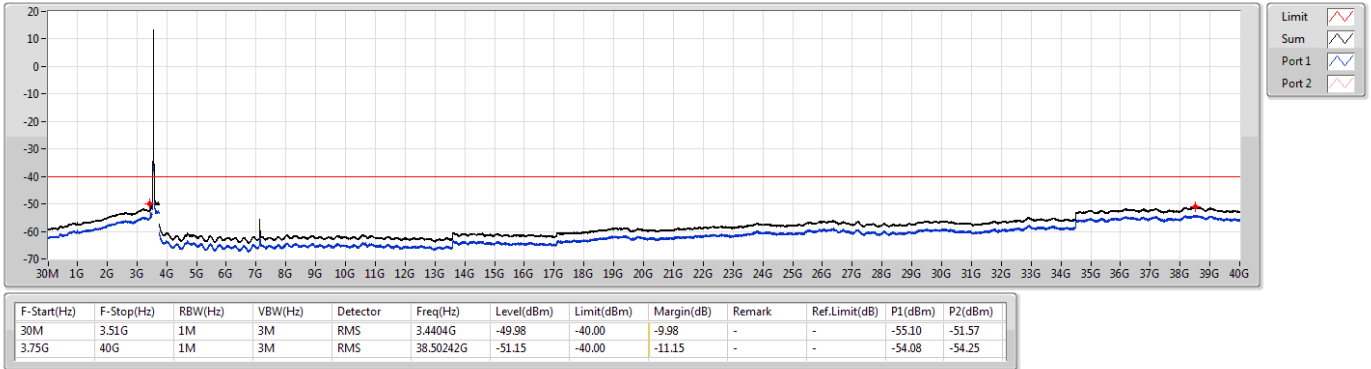
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CSE-TX-Sum



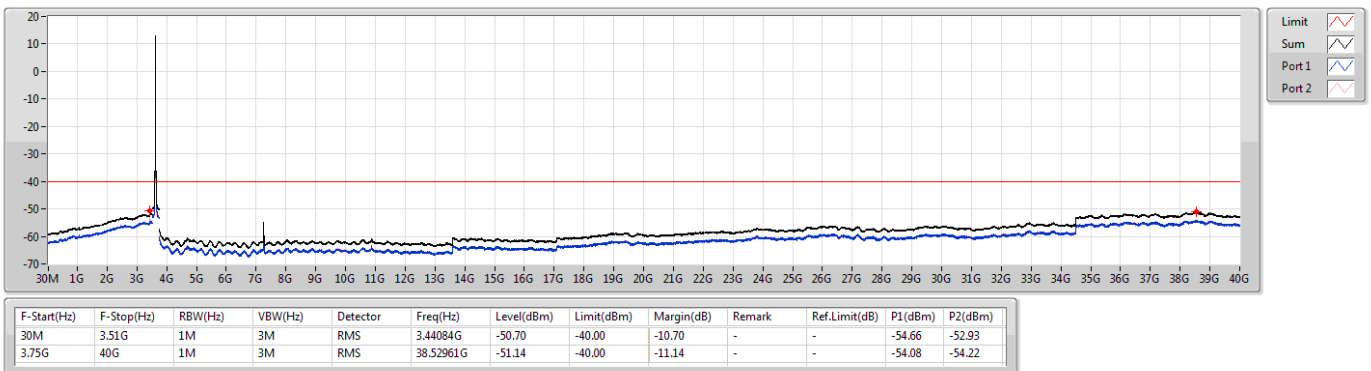
Band 48_LTE_20MHz_Nss1,16QAM_2TX
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CSE-TX-Sum



Band 48_LTE_20MHz_Nss1,16QAM_2TX
3625MHz_16QAM_RB 100,#RB 0

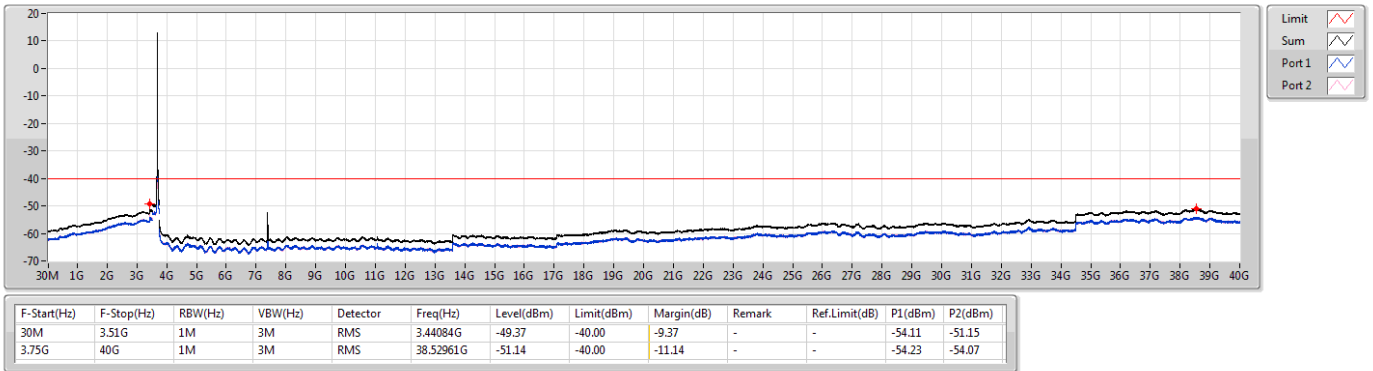
CSE-TX-Sum



Band 48_LTE_20MHz_Nss1,16QAM_2TX

CSE-TX-Sum

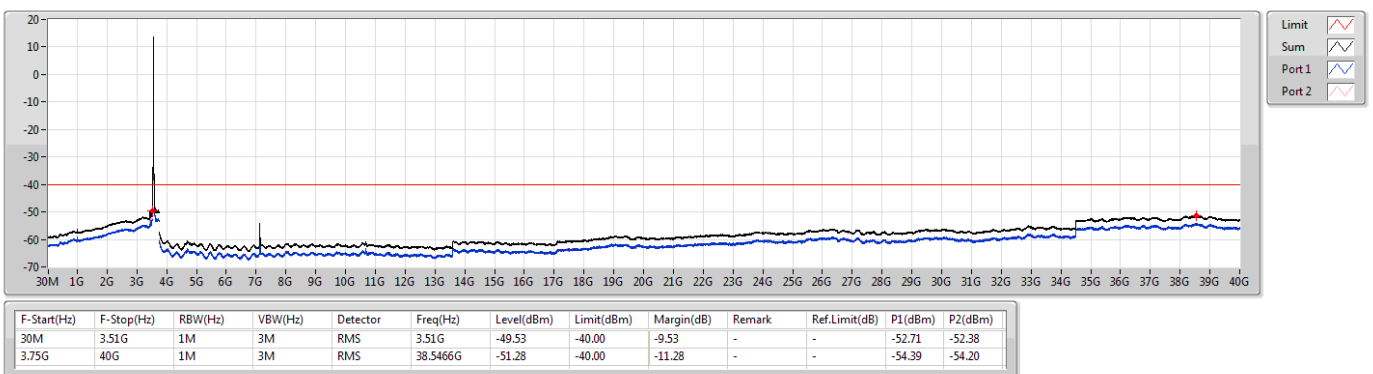
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Band 48_LTE_20MHz_Nss1,64QAM_2TX

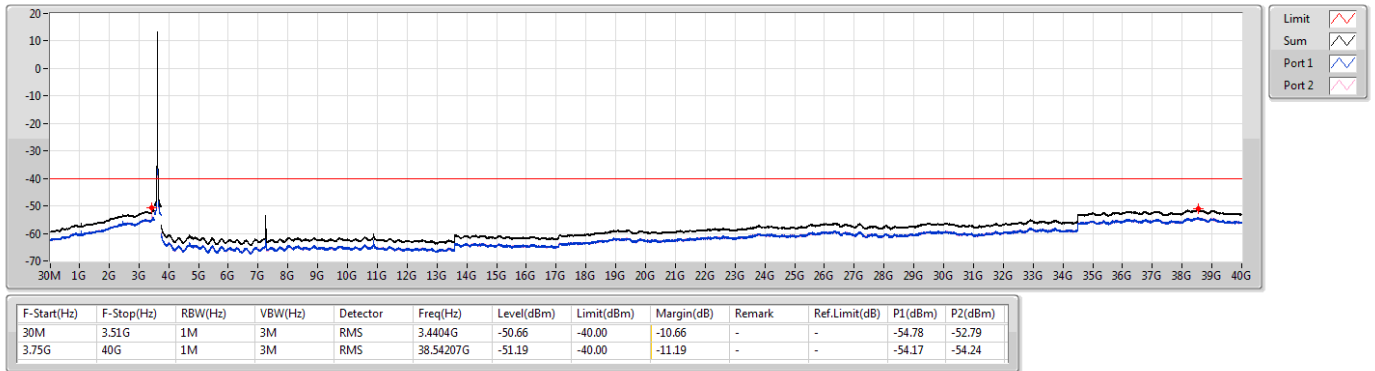
CSE-TX-Sum

3560MHz_64QAM_RB 100,#RB 0



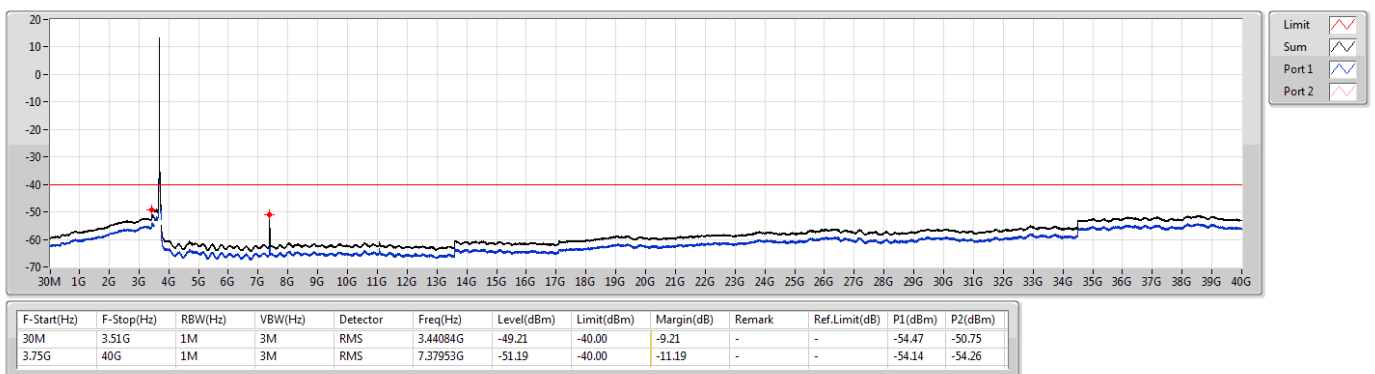
Band 48_LTE_20MHz_Nss1,64QAM_2TX
3625MHz_64QAM_RB 100,#RB 0

CSE-TX-Sum



Band 48_LTE_20MHz_Nss1,64QAM_2TX
3690MHz_64QAM_RB 100,#RB 0

CSE-TX-Sum

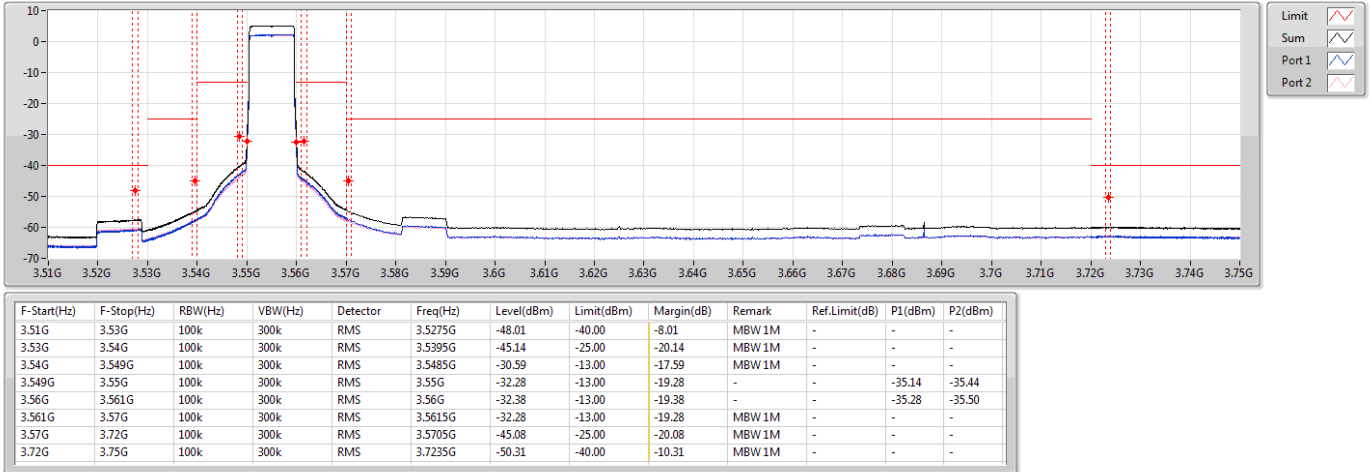


Band Edge Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	VBW (Hz)	Detector	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Remark	Ref.Lim it (dB)
Band 48	-	-	-	-	-	-	-	-	-	-	-	-
LTE_10MHz_Nss1 ,QPSK_2TX	Pass	3.72G	3.75G	100k	300k	RMS	3.7225G	-46.88	-40.00	-6.88	MBW 1M	-
LTE_10MHz_Nss1 ,16QAM_2TX	Pass	3.72G	3.75G	100k	300k	RMS	3.7255G	-47.09	-40.00	-7.09	MBW 1M	-
LTE_10MHz_Nss1 ,64QAM_2TX	Pass	3.72G	3.75G	100k	300k	RMS	3.7225G	-46.55	-40.00	-6.55	MBW 1M	-
LTE_20MHz_Nss1 ,QPSK_2TX	Pass	3.51G	3.53G	200k	620k	RMS	3.5295G	-41.65	-40.00	-1.65	MBW 1M	-
LTE_20MHz_Nss1 ,16QAM_2TX	Pass	3.72G	3.75G	200k	620k	RMS	3.7205G	-42.95	-40.00	-2.95	MBW 1M	-
LTE_20MHz_Nss1 ,64QAM_2TX	Pass	3.51G	3.53G	200k	620k	RMS	3.5295G	-41.76	-40.00	-1.76	MBW 1M	-

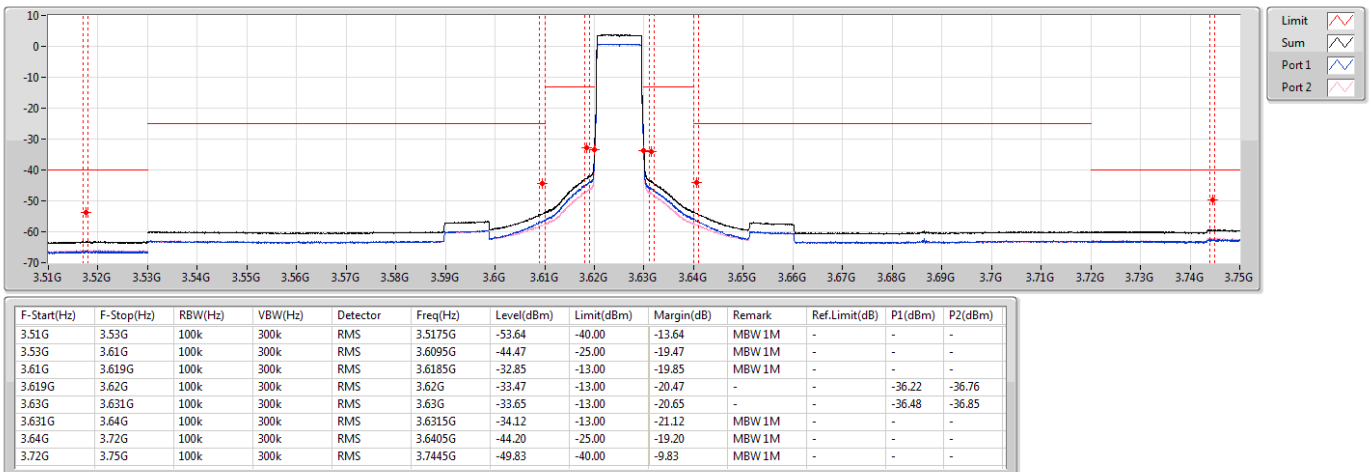
Band 48_LTE_10MHz_Nss1,QPSK_2TX
3555MHz_QPSK_RB 50,#RB 0

CSE-TX-Sum



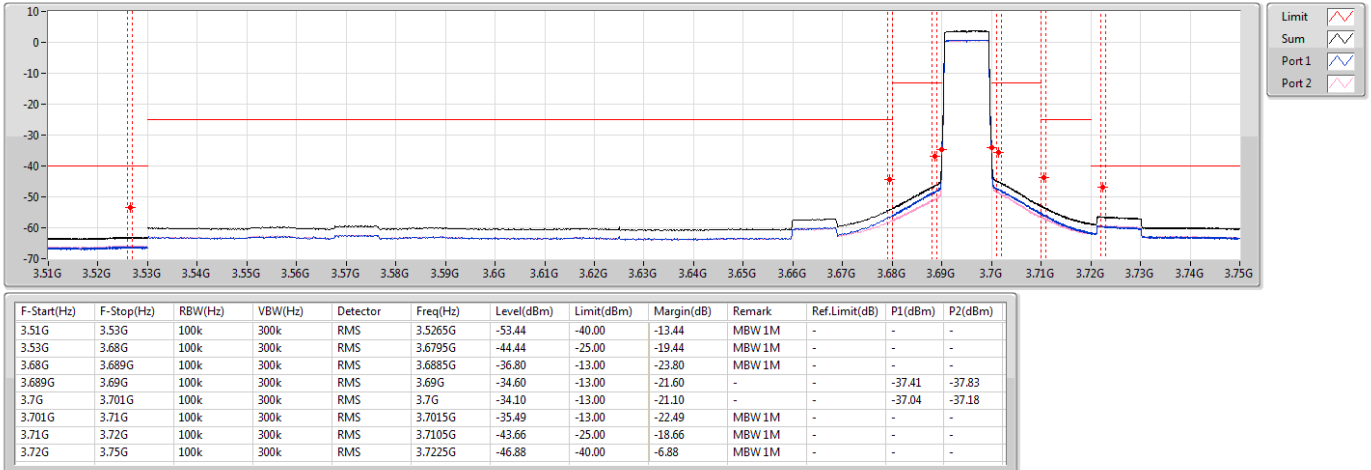
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3625MHz_QPSK_RB 50,#RB 0

CSE-TX-Sum



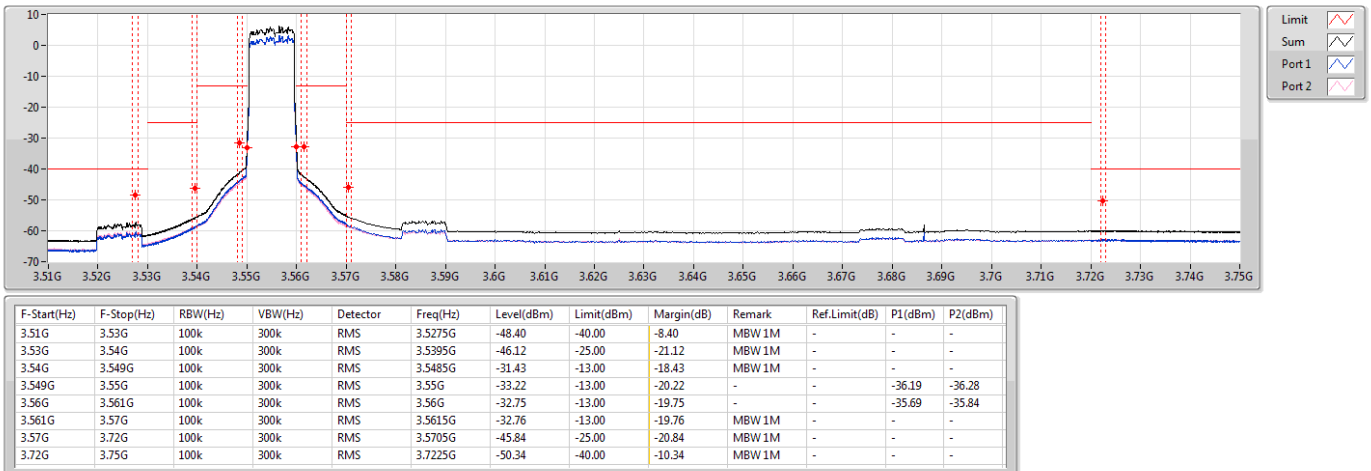
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CSE-TX-Sum



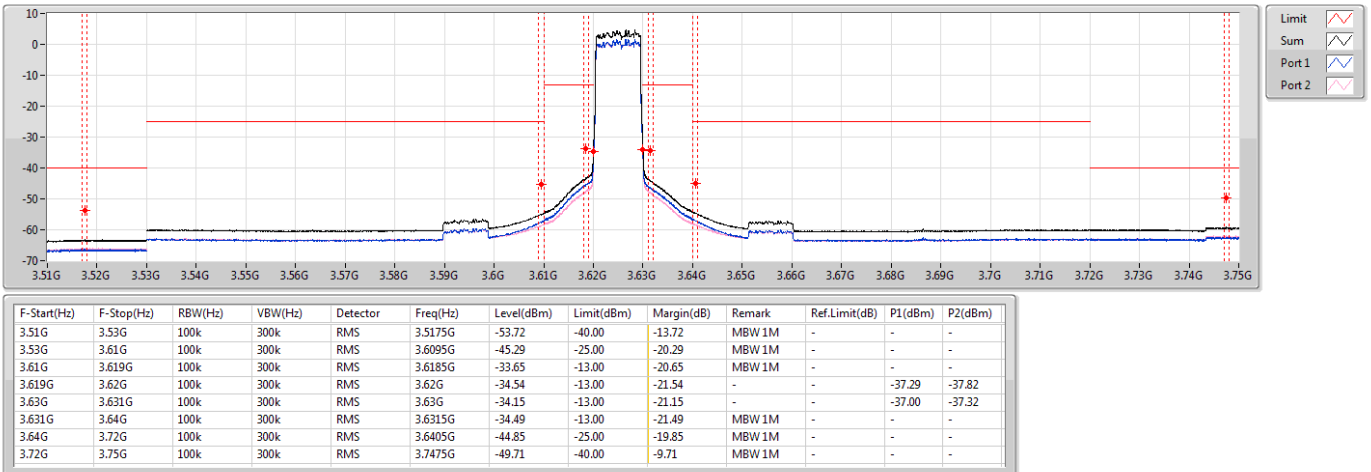
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3555MHz_16QAM_RB 50,#RB 0

CSE-TX-Sum



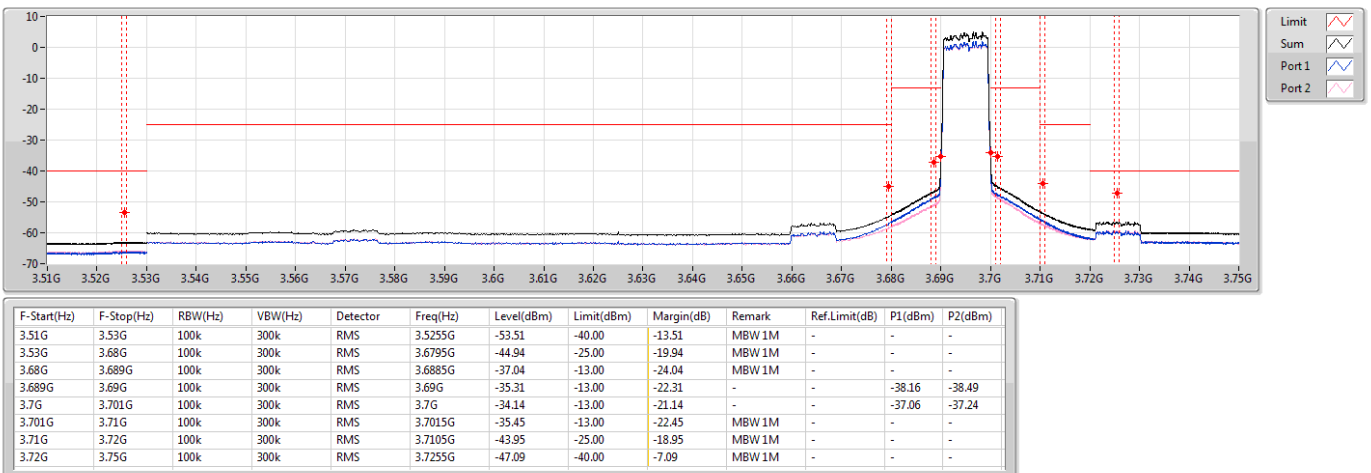
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CSE-TX-Sum



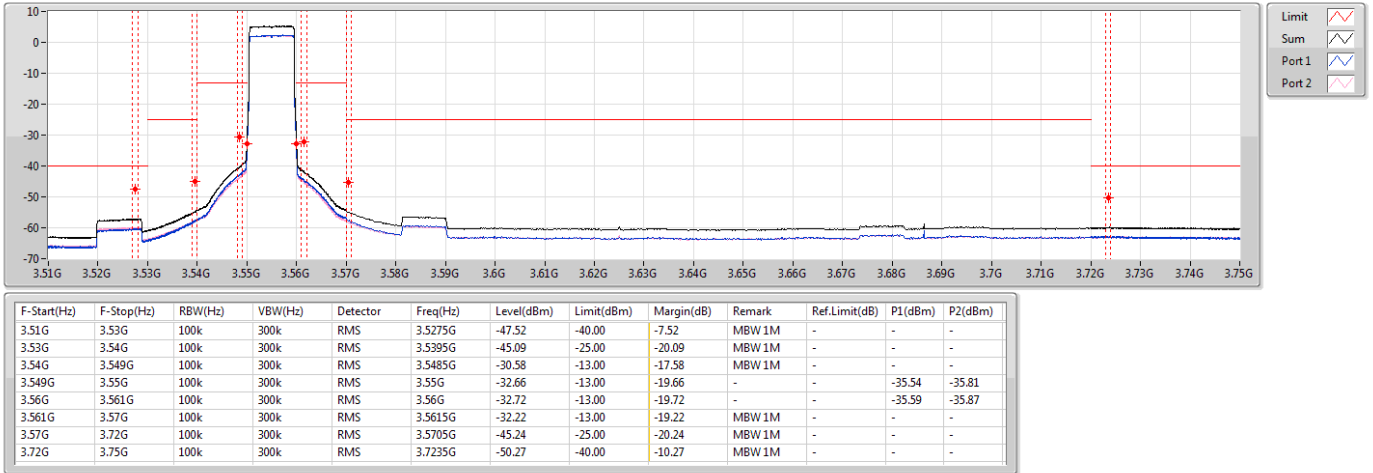
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CSE-TX-Sum



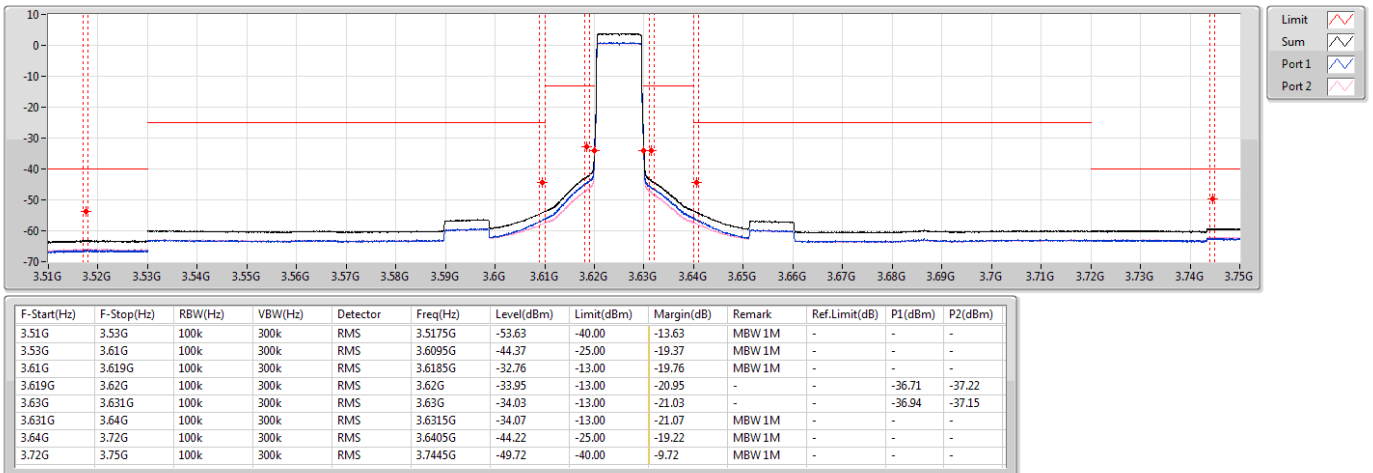
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CSE-TX-Sum



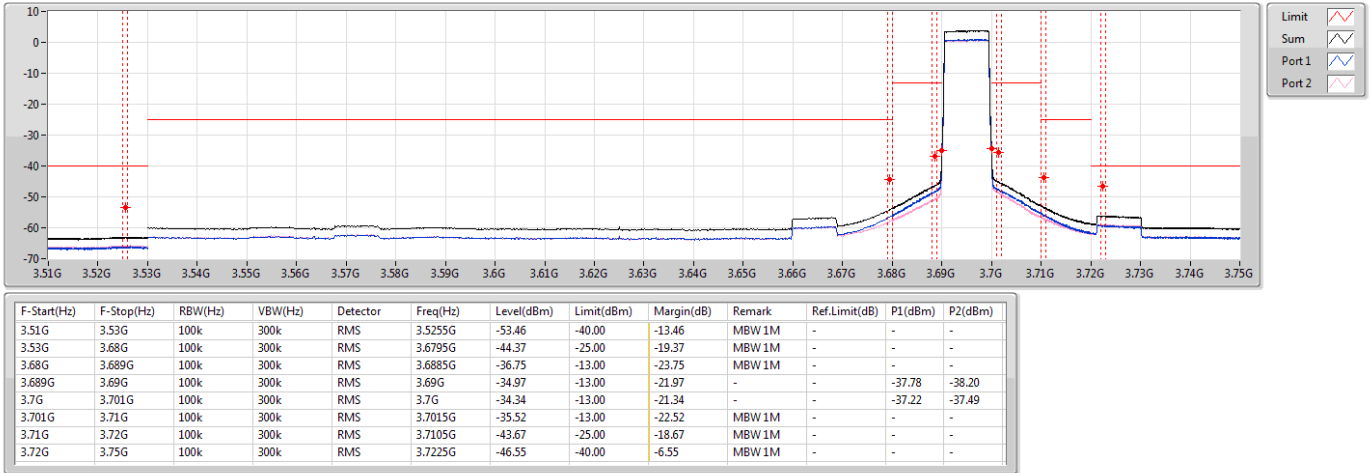
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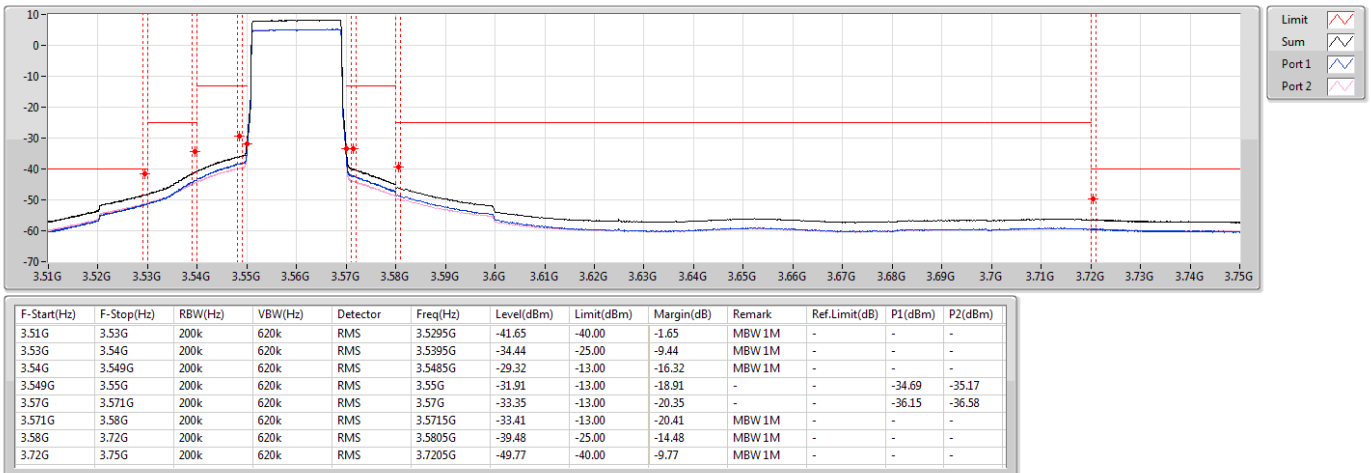
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3695MHz_64QAM_RB 50,#RB 0

CSE-TX-Sum



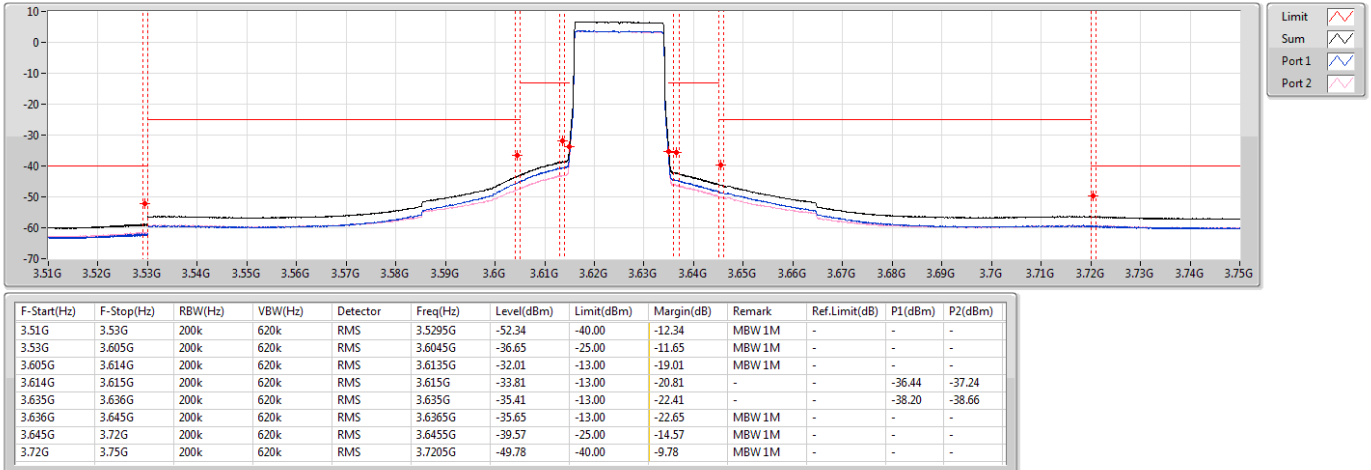
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CSE-TX-Sum



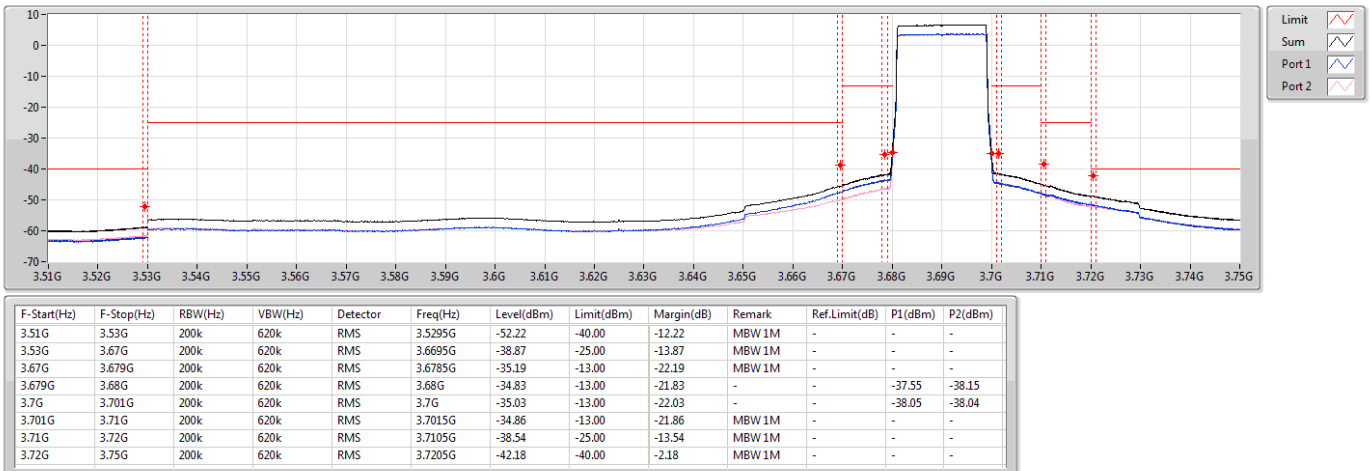
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3625MHz_QPSK_RB 100,#RB 0

CSE-TX-Sum



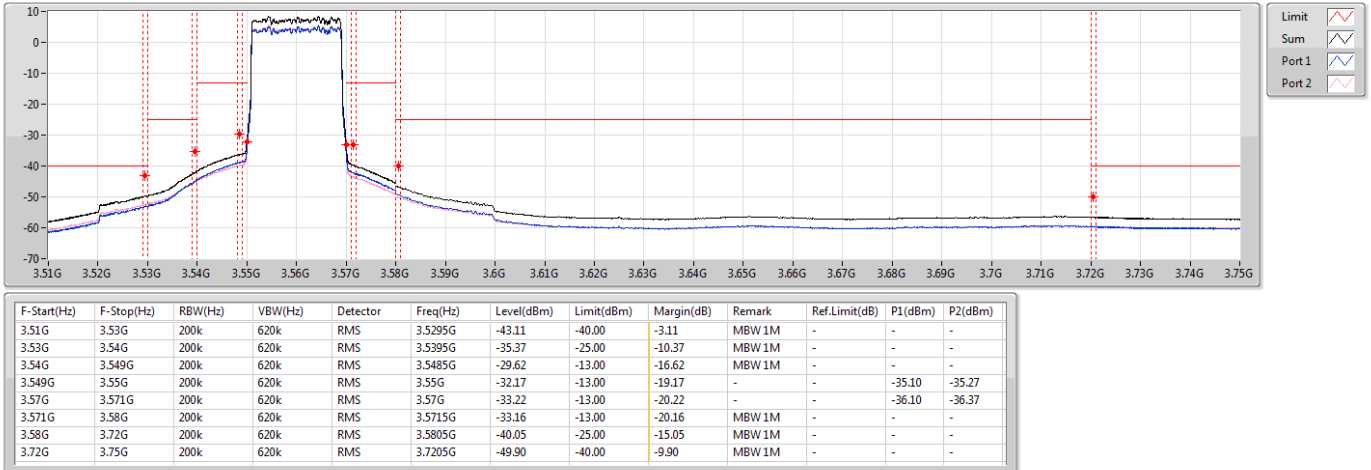
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3690MHz_QPSK_RB 100,#RB 0

CSE-TX-Sum



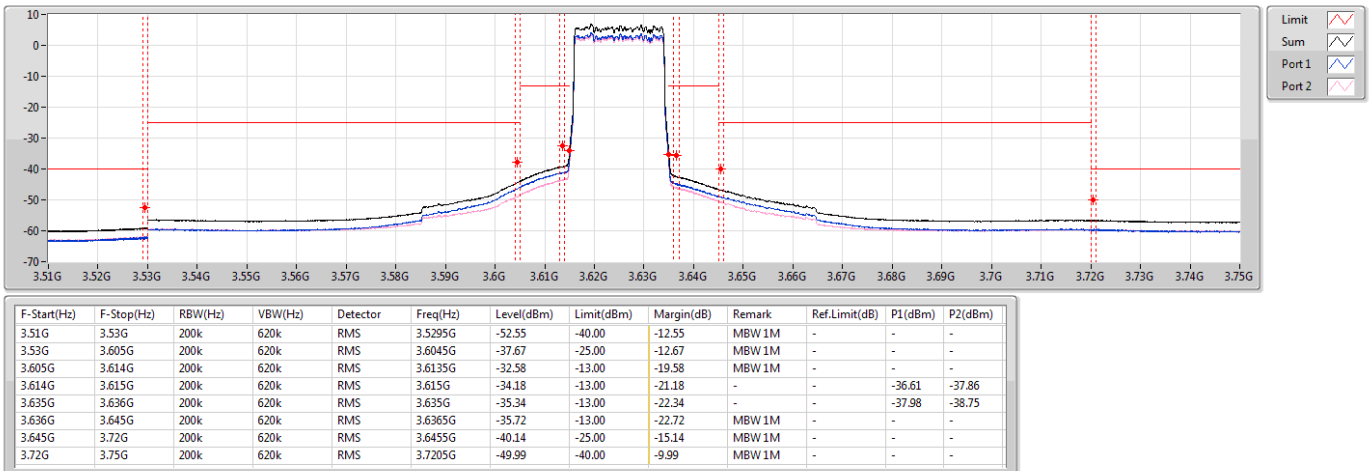
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3560MHz_16QAM_RB 100,#RB 0

CSE-TX-Sum



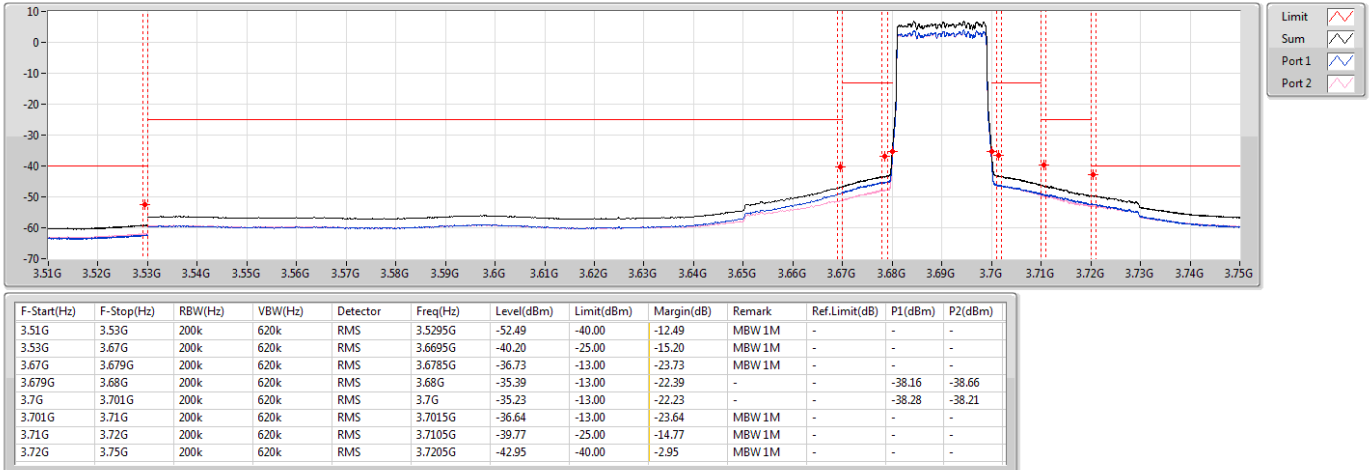
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CSE-TX-Sum



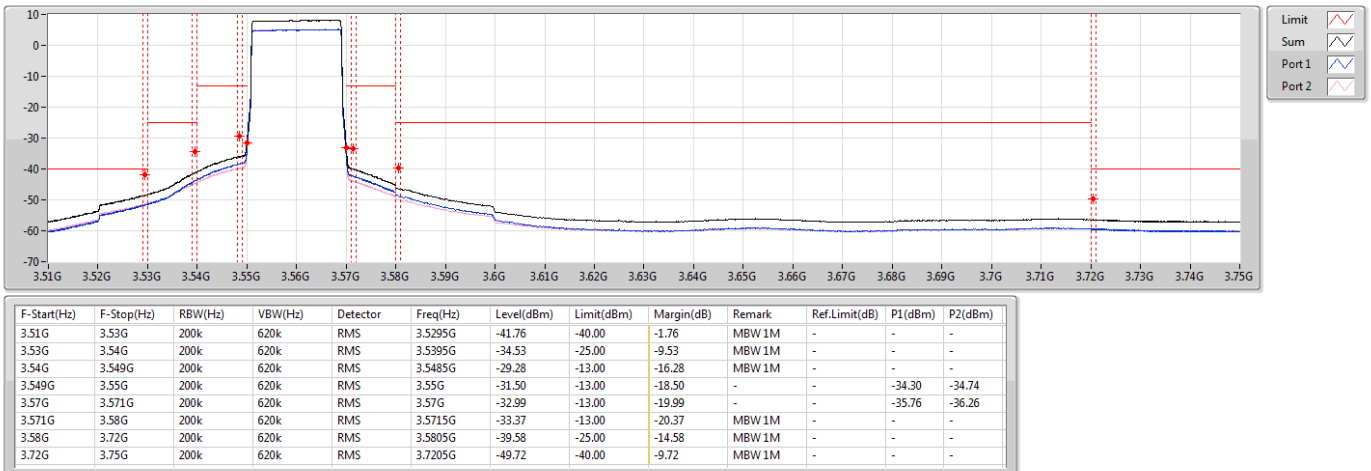
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CSE-TX-Sum



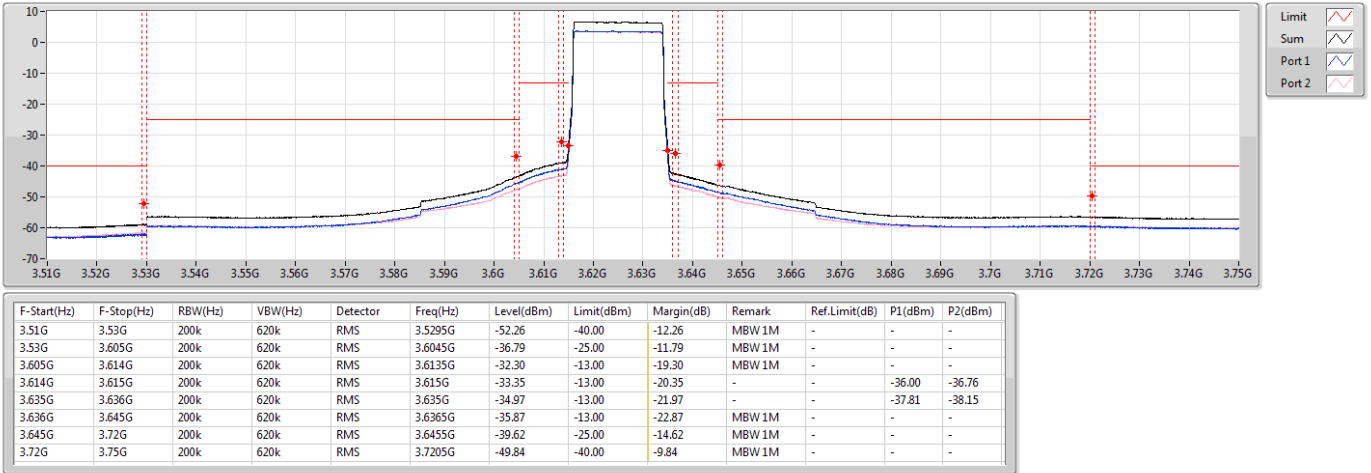
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3560MHz_64QAM_RB 100,#RB 0

CSE-TX-Sum



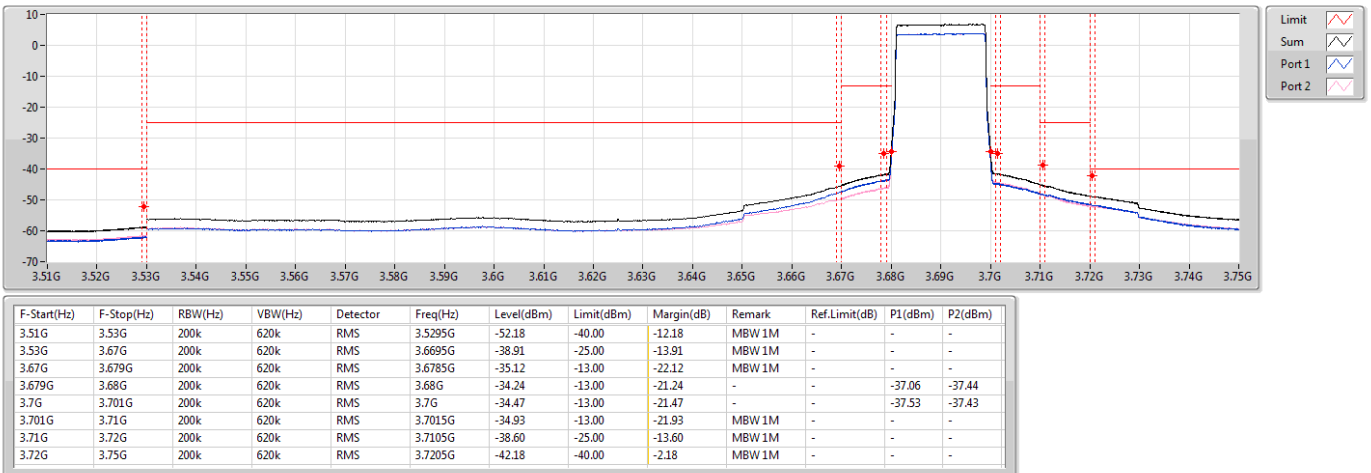
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3625MHz_64QAM_RB 100,#RB 0

CSE-TX-Sum



Band 48 LTE_20MHz_Nss1,64QAM_2TX
3690MHz_64QAM_RB 100,#RB 0

CSE-TX-Sum

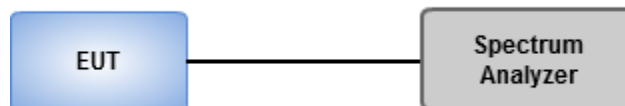


3.4 Emission Bandwidth

3.4.1 Test Procedures

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26dB relative to the maximum level measured in the fundamental emission.
5. Measure the occupied bandwidth.

3.4.2 Test Setup



3.4.3 Test Result of Occupied Bandwidth

Summary

Mode	Max-NdB (Hz)	Max-OBW (Hz)	ITU-Code	Min-NdB (Hz)	Min-OBW (Hz)
Band 48	-	-	-	-	-
LTE_10MHz_Nss1,QPSK_2TX	9.788M	8.954M	8M95G7D	9.75M	8.938M
LTE_10MHz_Nss1,16QAM_2TX	9.738M	8.949M	8M95W7D	9.663M	8.943M
LTE_10MHz_Nss1,64QAM_2TX	9.813M	8.951M	8M95W7D	9.7M	8.942M
LTE_20MHz_Nss1,QPSK_2TX	19.6M	17.882M	17M9G7D	19.4M	17.858M
LTE_20MHz_Nss1,16QAM_2TX	19.35M	17.867M	17M9W7D	19.225M	17.828M
LTE_20MHz_Nss1,64QAM_2TX	19.5M	17.891M	17M9W7D	19.375M	17.864M

Max-N dB = Maximum 26dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 26dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

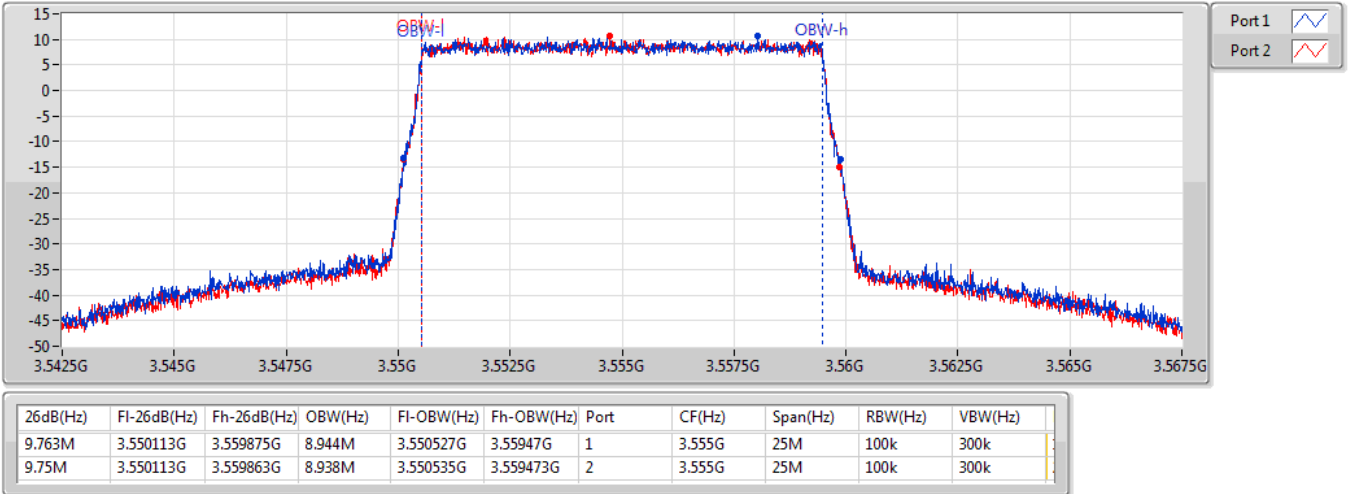
Mode	Result	Limit (Hz)	Port 1-NdB (Hz)	Port 1-OBW (Hz)	Port 2-NdB (Hz)	Port 2-OBW (Hz)
Band 48_LTE_10MHz_Nss1_2TX	-	-	-	-	-	-
3555MHz_QPSK_RB 50,#RB 0	Pass	Inf	9.763M	8.944M	9.75M	8.938M
3625MHz_QPSK_RB 50,#RB 0	Pass	Inf	9.763M	8.938M	9.775M	8.942M
3695MHz_QPSK_RB 50,#RB 0	Pass	Inf	9.788M	8.94M	9.75M	8.954M
3555MHz_16QAM_RB 50,#RB 0	Pass	Inf	9.7M	8.949M	9.738M	8.943M
3625MHz_16QAM_RB 50,#RB 0	Pass	Inf	9.663M	8.949M	9.688M	8.943M
3695MHz_16QAM_RB 50,#RB 0	Pass	Inf	9.688M	8.943M	9.675M	8.949M
3555MHz_64QAM_RB 50,#RB 0	Pass	Inf	9.8M	8.945M	9.813M	8.942M
3625MHz_64QAM_RB 50,#RB 0	Pass	Inf	9.7M	8.946M	9.7M	8.949M
3695MHz_64QAM_RB 50,#RB 0	Pass	Inf	9.75M	8.951M	9.763M	8.95M
Band 48_LTE_20MHz_Nss1_2TX	-	-	-	-	-	-
3560MHz_QPSK_RB 100,#RB 0	Pass	Inf	19.475M	17.871M	19.475M	17.882M
3625MHz_QPSK_RB 100,#RB 0	Pass	Inf	19.575M	17.867M	19.5M	17.868M
3690MHz_QPSK_RB 100,#RB 0	Pass	Inf	19.4M	17.858M	19.6M	17.879M
3560MHz_16QAM_RB 100,#RB 0	Pass	Inf	19.225M	17.851M	19.275M	17.867M
3625MHz_16QAM_RB 100,#RB 0	Pass	Inf	19.275M	17.862M	19.35M	17.856M
3690MHz_16QAM_RB 100,#RB 0	Pass	Inf	19.325M	17.841M	19.275M	17.828M
3560MHz_64QAM_RB 100,#RB 0	Pass	Inf	19.425M	17.864M	19.375M	17.873M
3625MHz_64QAM_RB 100,#RB 0	Pass	Inf	19.4M	17.889M	19.4M	17.879M
3690MHz_64QAM_RB 100,#RB 0	Pass	Inf	19.5M	17.891M	19.4M	17.89M

Port X-N dB = Port X 26dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

Band 48_LTE_10MHz_Nss1,QPSK_2TX

EBW

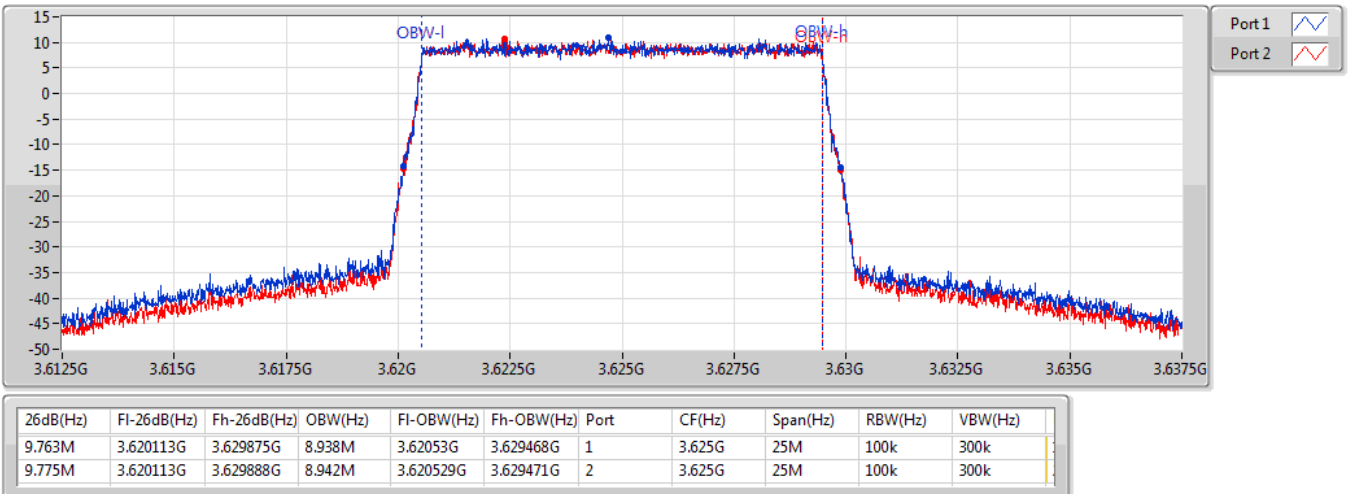
3555MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

EBW

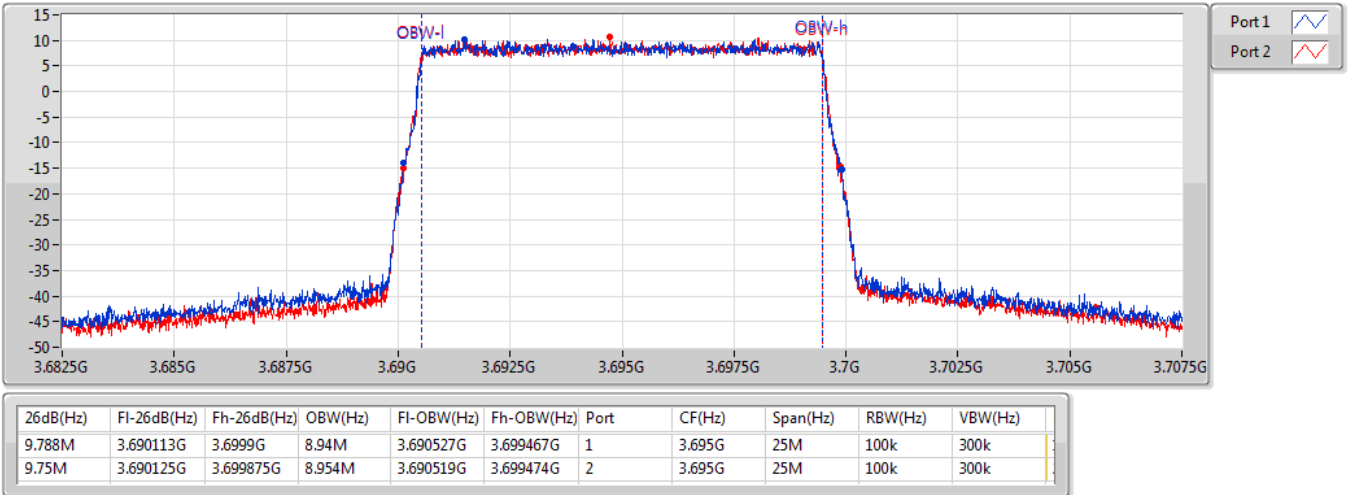
3625MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

EBW

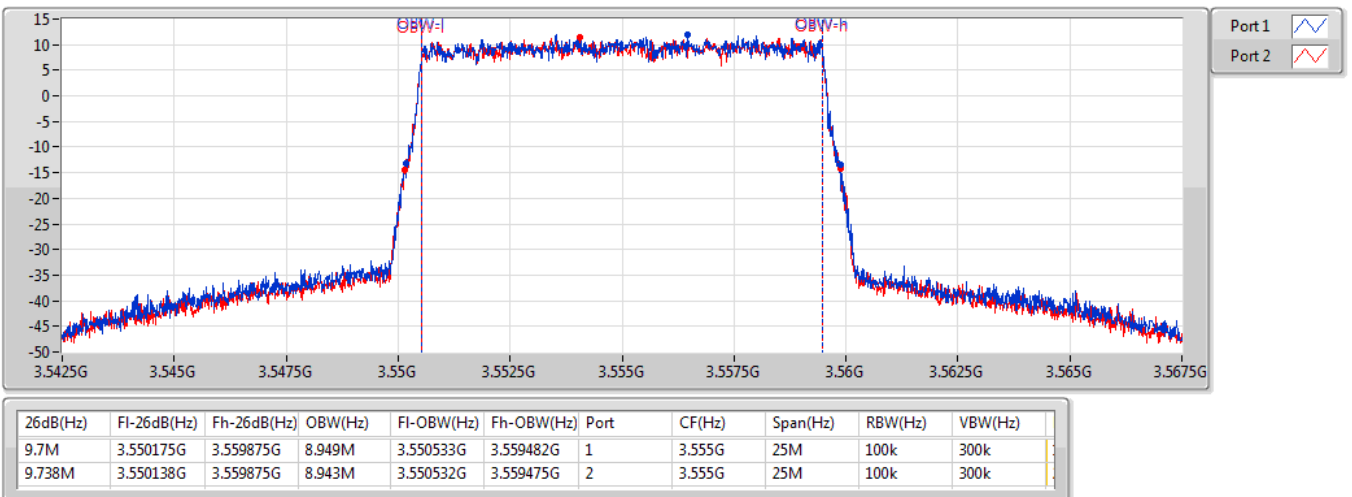
3695MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

EBW

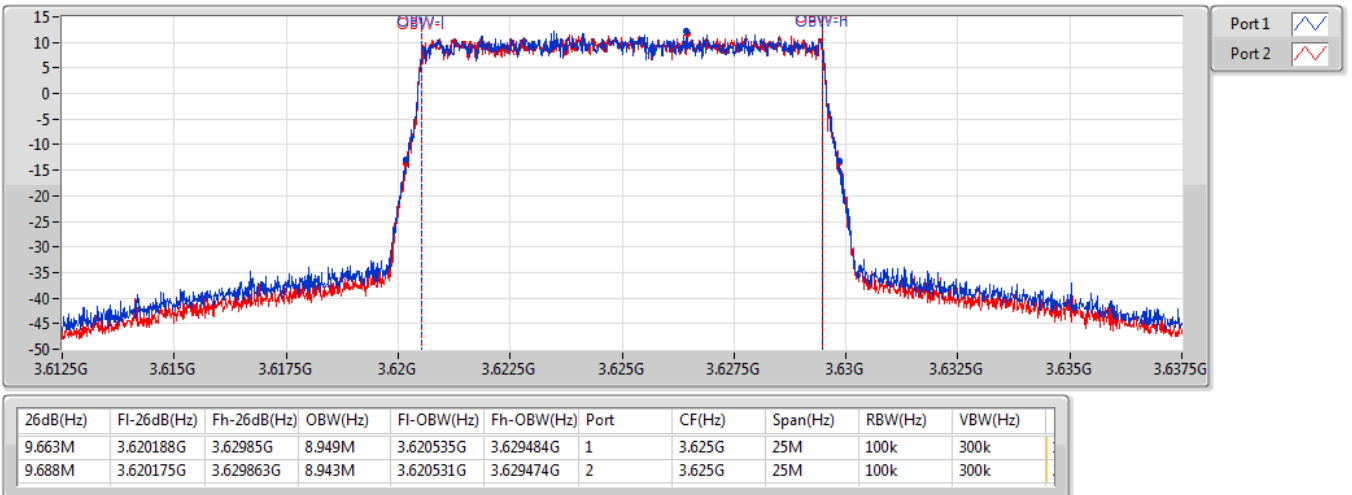
3555MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

EBW

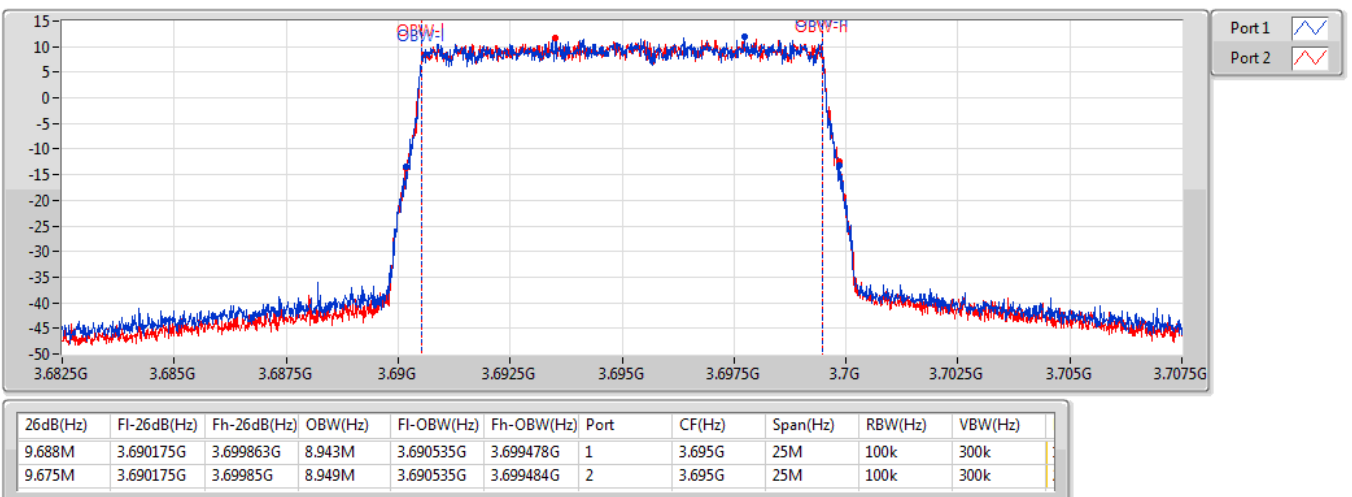
3625MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

EBW

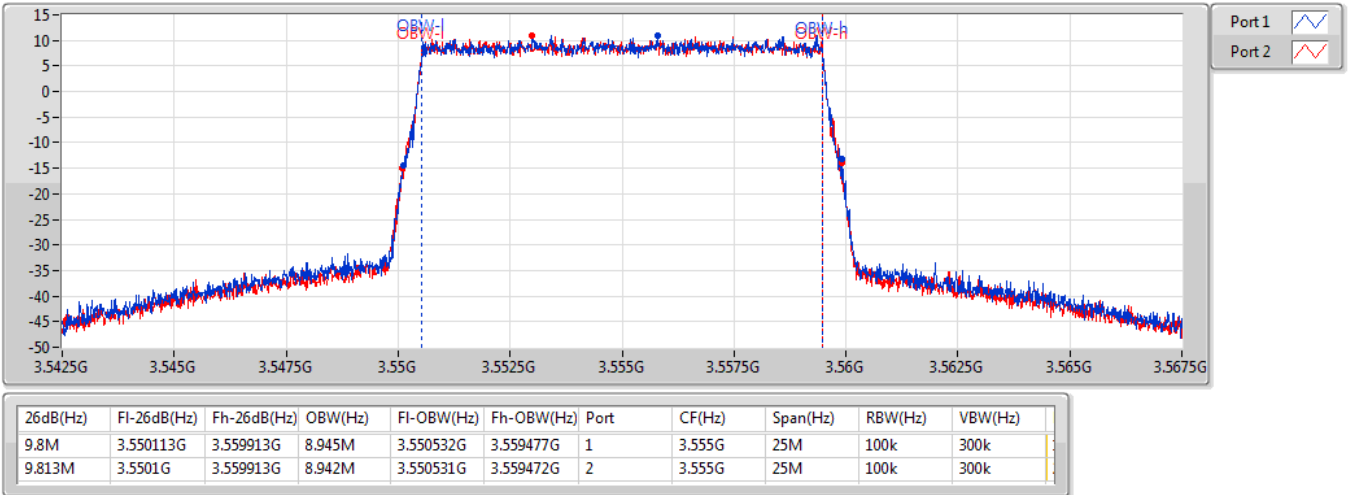
3695MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

EBW

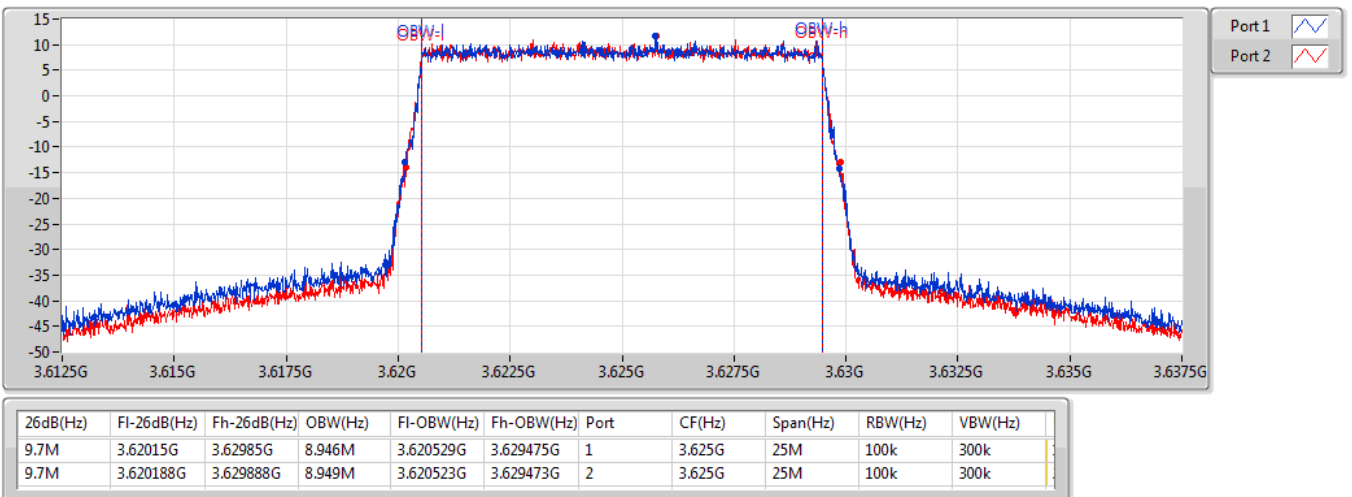
3555MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

EBW

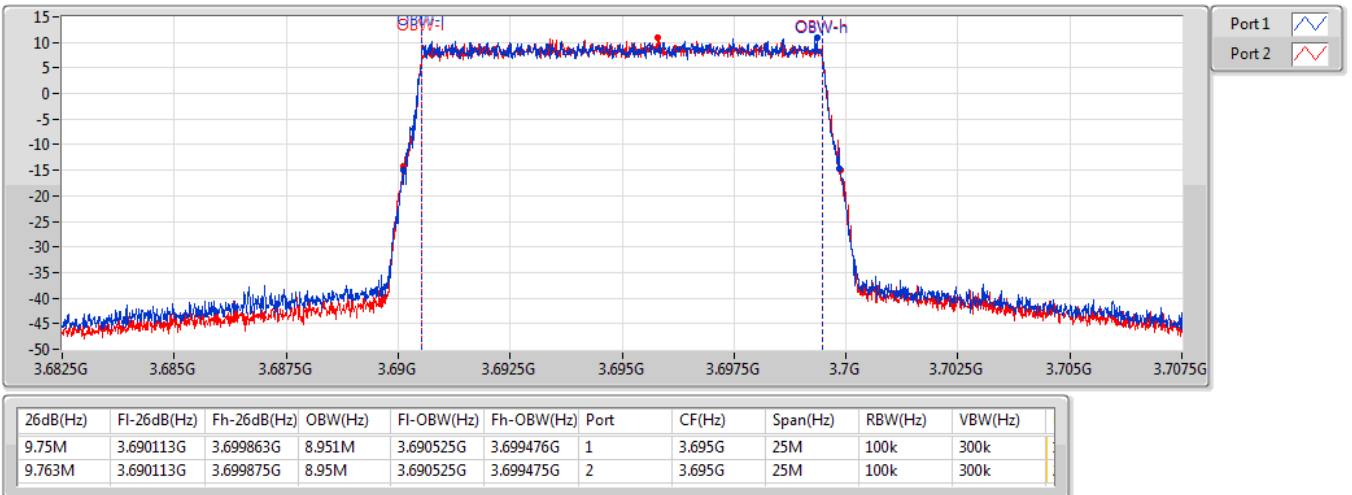
3625MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

EBW

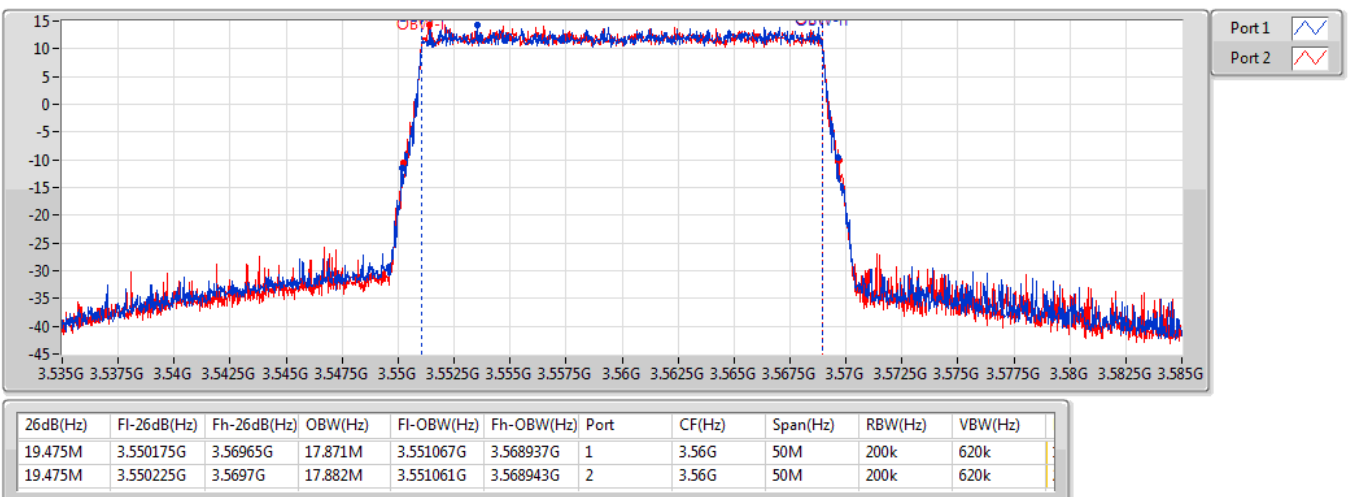
3695MHz_64QAM_RB 50,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

EBW

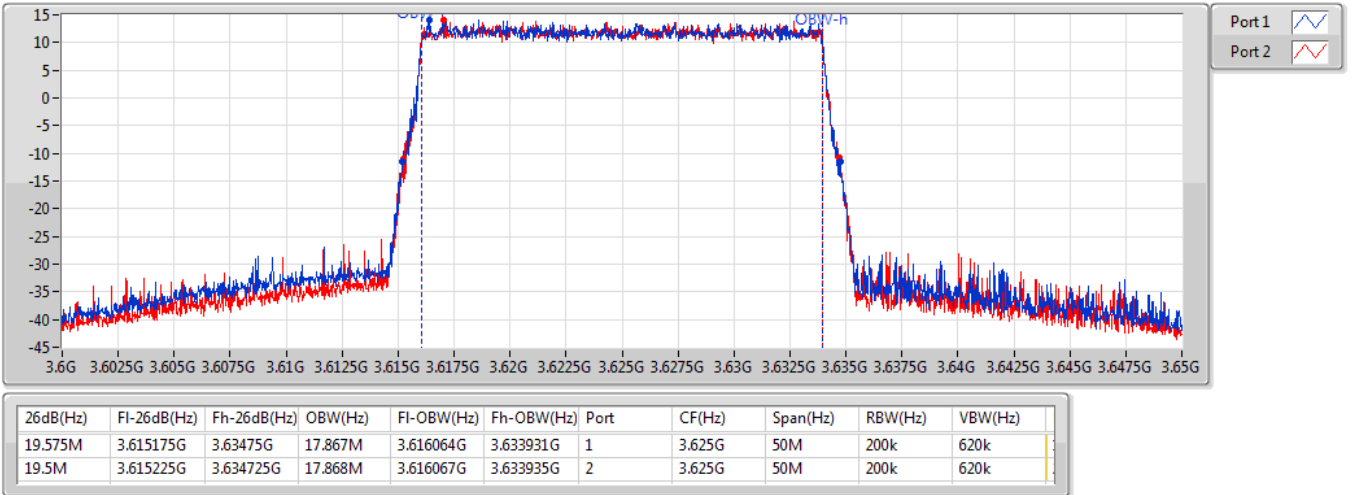
3560MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

EBW

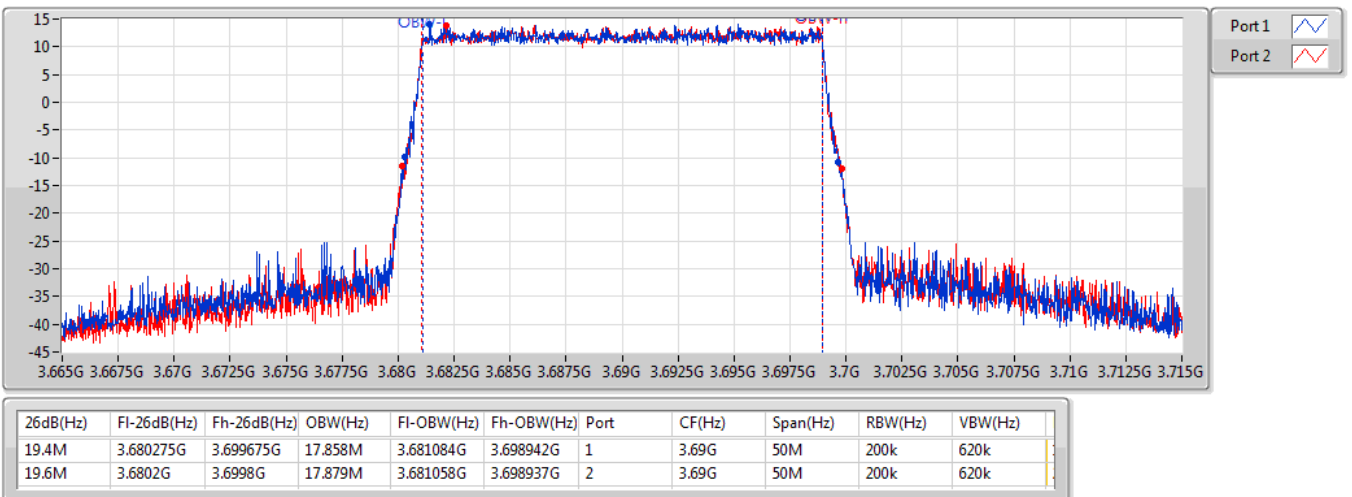
3625MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

EBW

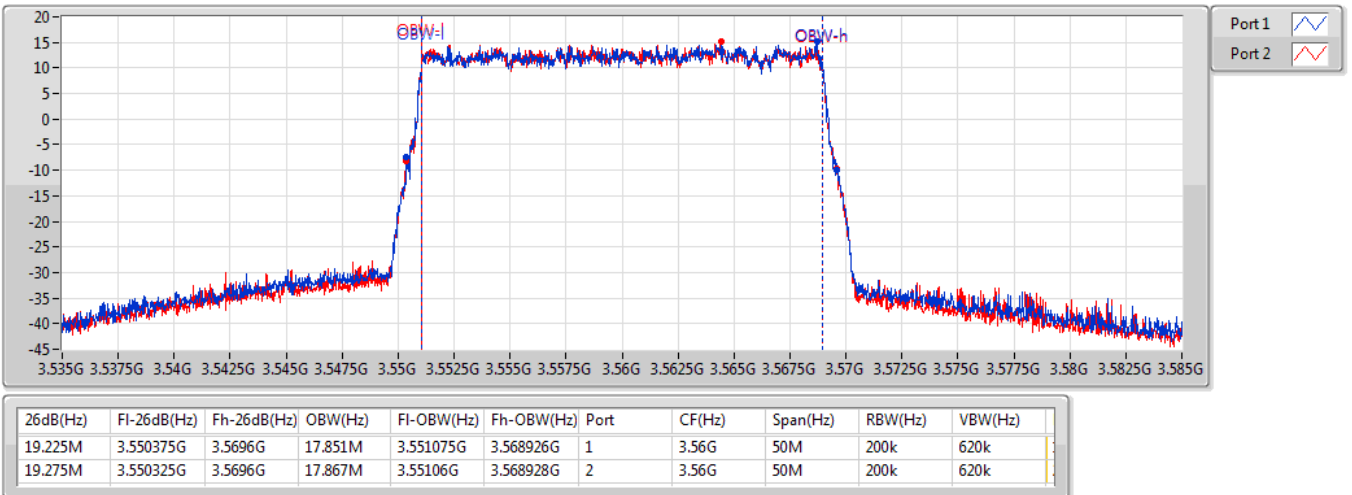
3690MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

EBW

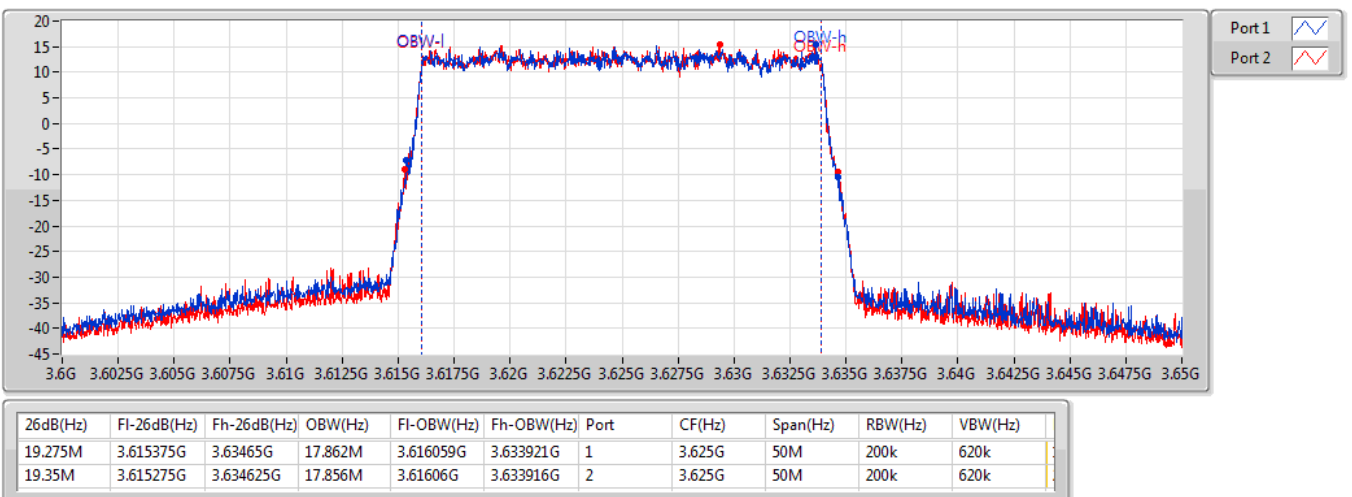
3560MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

EBW

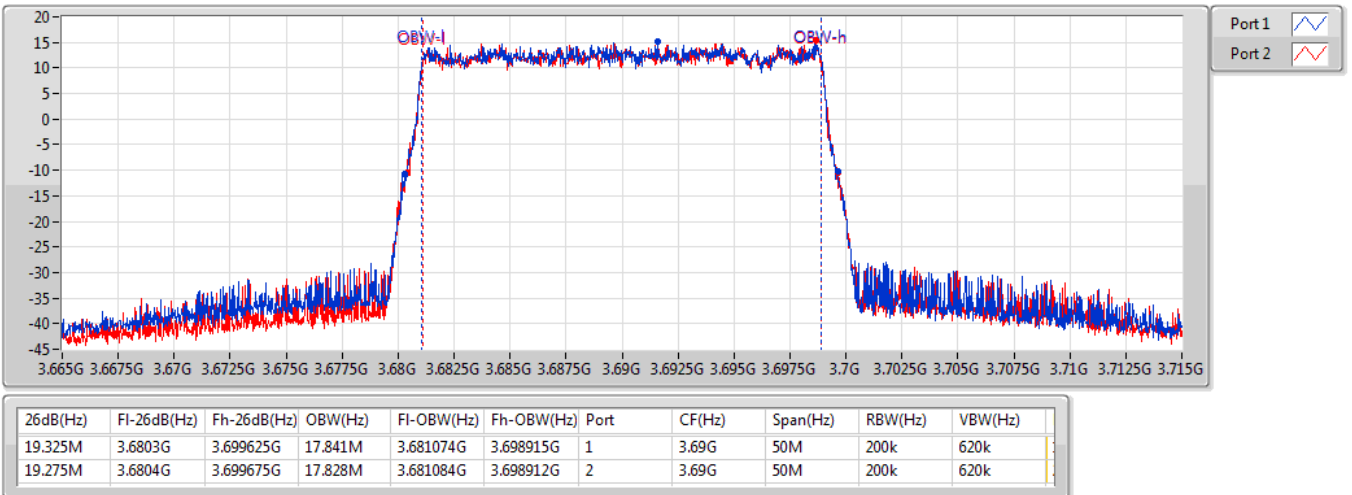
3625MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

EBW

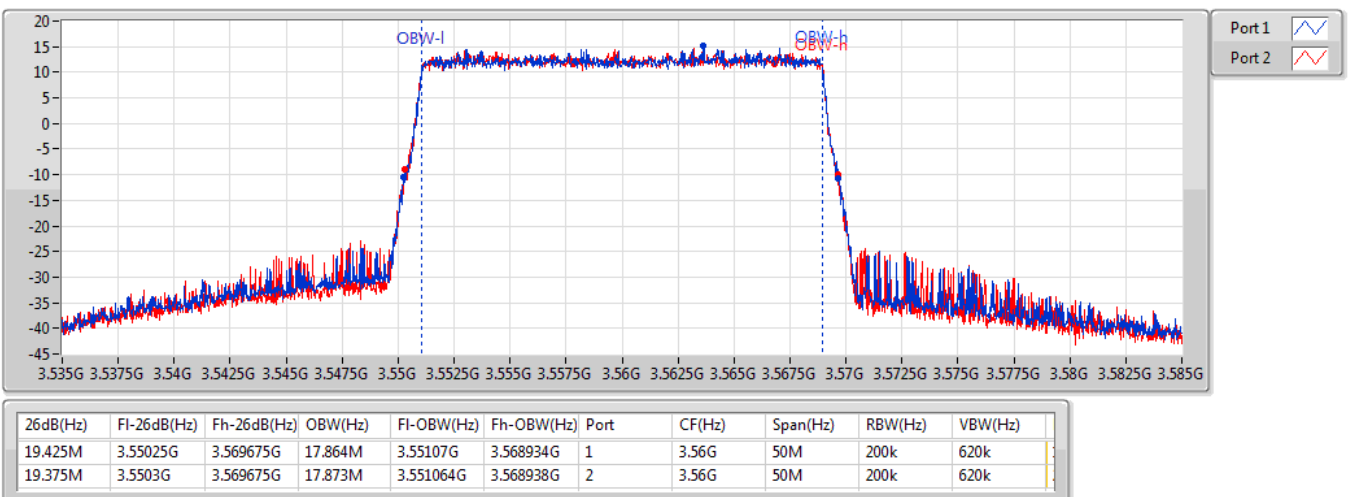
3690MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

EBW

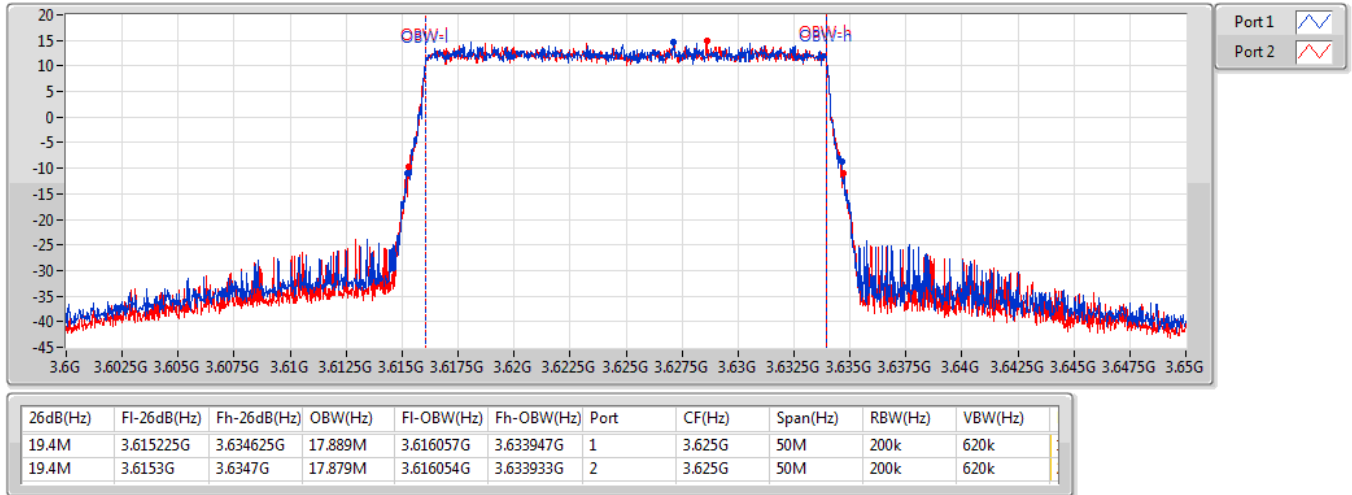
3560MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

EBW

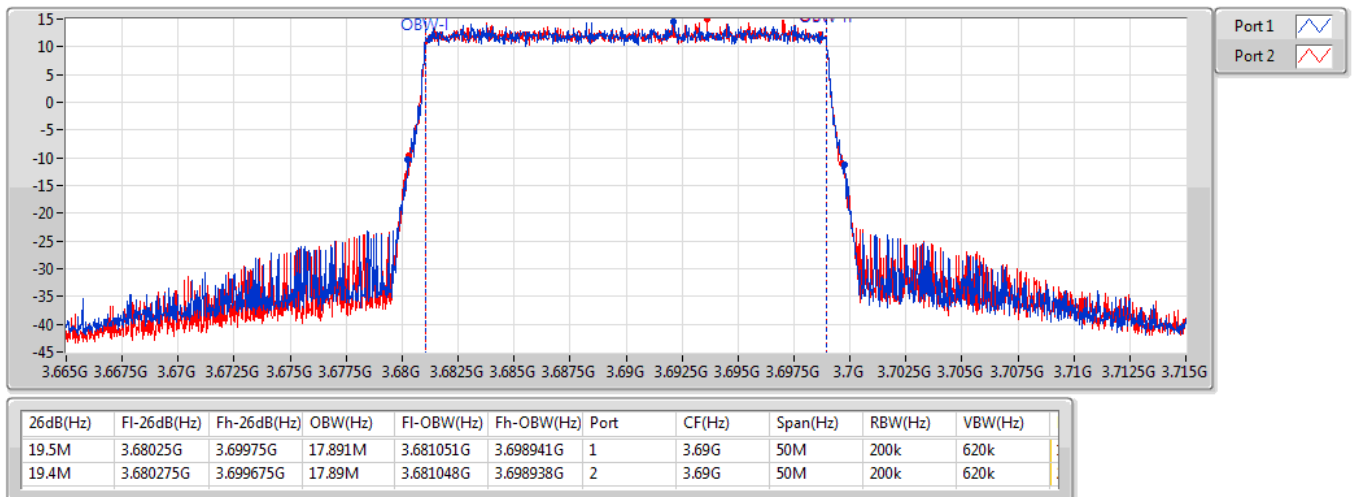
3625MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

EBW

3690MHz_64QAM_RB 100,#RB 0



3.5 Peak to Average Ratio

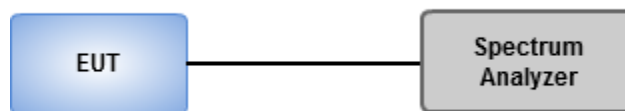
3.5.1 Limit of Peak to Average Ratio

Peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

3.5.2 Test Procedures

1. Enable CCDF function of spectrum analyzer and set RBW=10MHz.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.5.3 Test Setup



3.5.4 Test Result of Peak to Average Ratio

Summary

Mode	Result	Freq (MHz)	Limit (dB)	0.1%	Port
Band 48	-	-	-	-	-
LTE_10MHz_Nss1,QPSK_2TX	Pass	3555	13.00	8.62	2
LTE_10MHz_Nss1,16QAM_2TX	Pass	3555	13.00	8.77	2
LTE_10MHz_Nss1,64QAM_2TX	Pass	3555	13.00	8.60	1
LTE_20MHz_Nss1,QPSK_2TX	Pass	3560	13.00	8.48	1
LTE_20MHz_Nss1,16QAM_2TX	Pass	3560	13.00	8.45	1
LTE_20MHz_Nss1,64QAM_2TX	Pass	3560	13.00	8.38	1

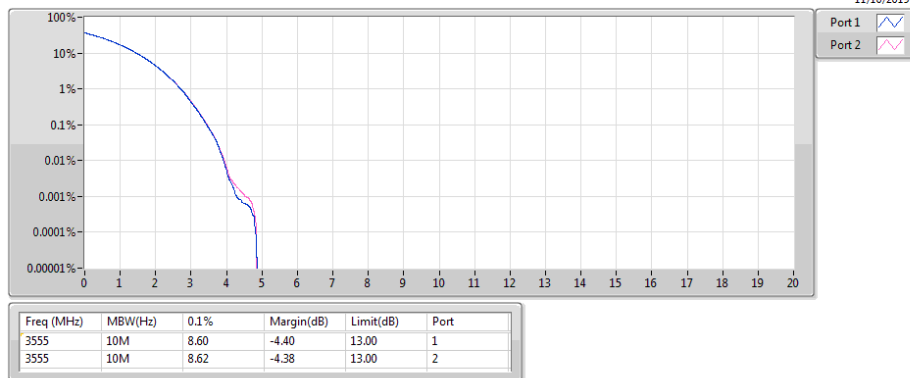
Result

Mode	Result	Freq (MHz)	Limit (dB)	0.1%	Port
Band 48_LTE_10MHz_Nss1_2TX	-	-	-	-	-
3555MHz_QPSK_RB 50,#RB 0	Pass	3555	13.00	8.60	1
3555MHz_QPSK_RB 50,#RB 0	Pass	3555	13.00	8.62	2
3625MHz_QPSK_RB 50,#RB 0	Pass	3625	13.00	8.60	1
3625MHz_QPSK_RB 50,#RB 0	Pass	3625	13.00	8.58	2
3695MHz_QPSK_RB 50,#RB 0	Pass	3695	13.00	8.55	1
3695MHz_QPSK_RB 50,#RB 0	Pass	3695	13.00	8.53	2
3555MHz_16QAM_RB 50,#RB 0	Pass	3555	13.00	8.76	1
3555MHz_16QAM_RB 50,#RB 0	Pass	3555	13.00	8.77	2
3625MHz_16QAM_RB 50,#RB 0	Pass	3625	13.00	8.76	1
3625MHz_16QAM_RB 50,#RB 0	Pass	3625	13.00	8.71	2
3695MHz_16QAM_RB 50,#RB 0	Pass	3695	13.00	8.67	1
3695MHz_16QAM_RB 50,#RB 0	Pass	3695	13.00	8.64	2
3555MHz_64QAM_RB 50,#RB 0	Pass	3555	13.00	8.60	1
3555MHz_64QAM_RB 50,#RB 0	Pass	3555	13.00	8.58	2
3625MHz_64QAM_RB 50,#RB 0	Pass	3625	13.00	8.58	1
3625MHz_64QAM_RB 50,#RB 0	Pass	3625	13.00	8.55	2
3695MHz_64QAM_RB 50,#RB 0	Pass	3695	13.00	8.51	1
3695MHz_64QAM_RB 50,#RB 0	Pass	3695	13.00	8.47	2
Band 48_LTE_20MHz_Nss1_2TX	-	-	-	-	-
3560MHz_QPSK_RB 100,#RB 0	Pass	3560	13.00	8.48	1
3560MHz_QPSK_RB 100,#RB 0	Pass	3560	13.00	8.44	2
3625MHz_QPSK_RB 100,#RB 0	Pass	3625	13.00	8.44	1
3625MHz_QPSK_RB 100,#RB 0	Pass	3625	13.00	8.45	2
3690MHz_QPSK_RB 100,#RB 0	Pass	3690	13.00	8.37	1
3690MHz_QPSK_RB 100,#RB 0	Pass	3690	13.00	8.38	2
3560MHz_16QAM_RB 100,#RB 0	Pass	3560	13.00	8.45	1
3560MHz_16QAM_RB 100,#RB 0	Pass	3560	13.00	8.44	2
3625MHz_16QAM_RB 100,#RB 0	Pass	3625	13.00	8.45	1
3625MHz_16QAM_RB 100,#RB 0	Pass	3625	13.00	8.45	2
3690MHz_16QAM_RB 100,#RB 0	Pass	3690	13.00	8.37	1
3690MHz_16QAM_RB 100,#RB 0	Pass	3690	13.00	8.36	2
3560MHz_64QAM_RB 100,#RB 0	Pass	3560	13.00	8.38	1
3560MHz_64QAM_RB 100,#RB 0	Pass	3560	13.00	8.36	2
3625MHz_64QAM_RB 100,#RB 0	Pass	3625	13.00	8.34	1
3625MHz_64QAM_RB 100,#RB 0	Pass	3625	13.00	8.37	2
3690MHz_64QAM_RB 100,#RB 0	Pass	3690	13.00	8.30	1
3690MHz_64QAM_RB 100,#RB 0	Pass	3690	13.00	8.33	2

Band 48_LTE_10MHz_Nss1,QPSK_2TX

PAR

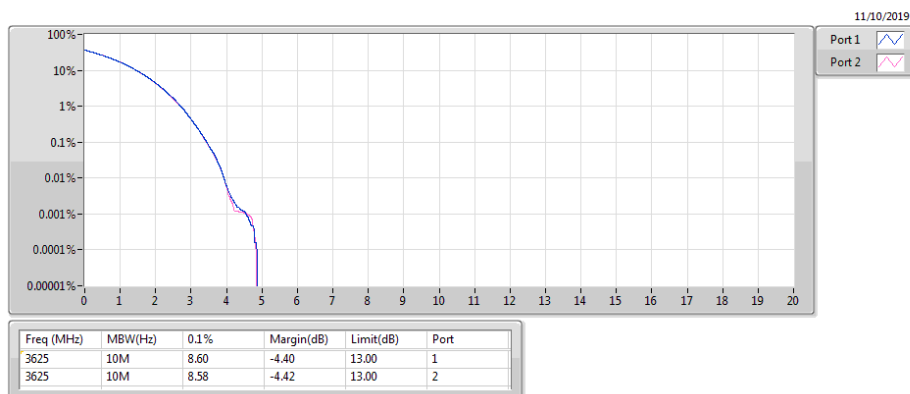
3555MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PAR

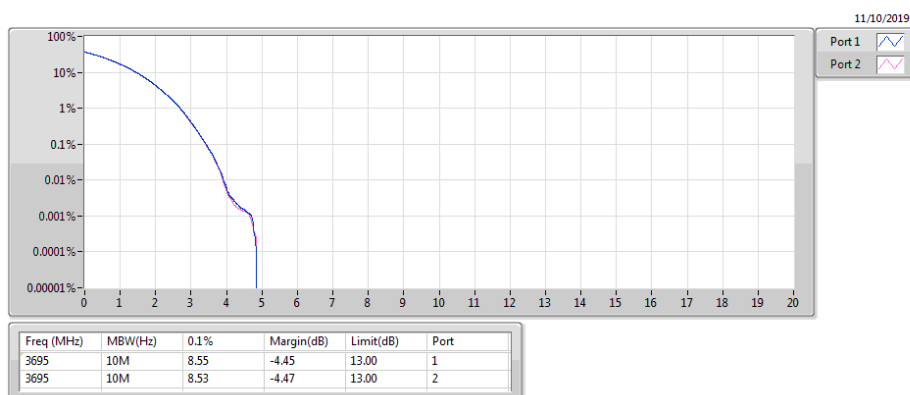
3625MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,QPSK_2TX

PAR

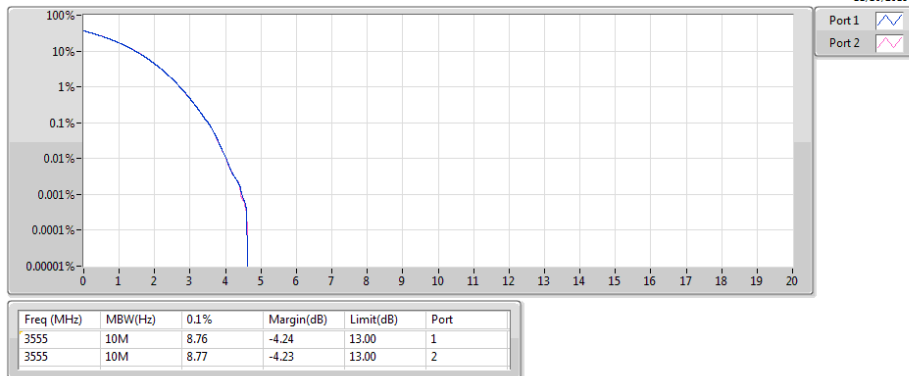
3695MHz_QPSK_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PAR

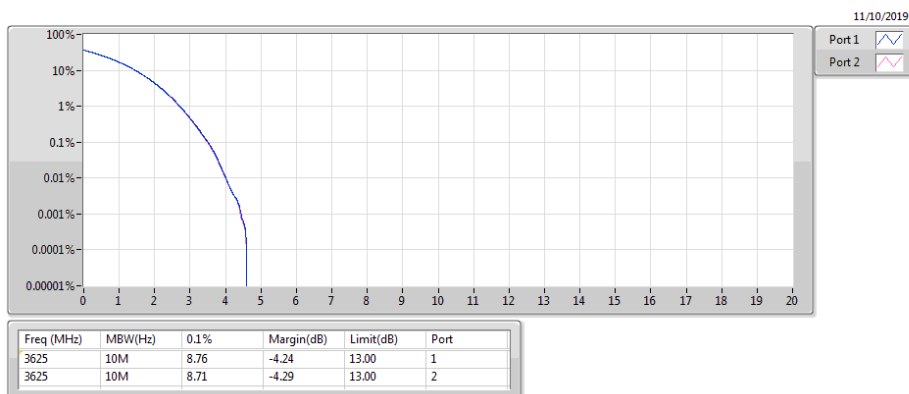
3555MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PAR

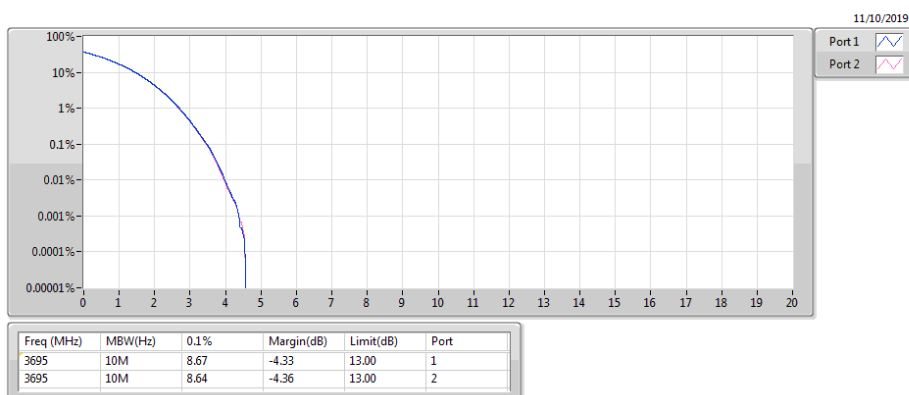
3625MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,16QAM_2TX

PAR

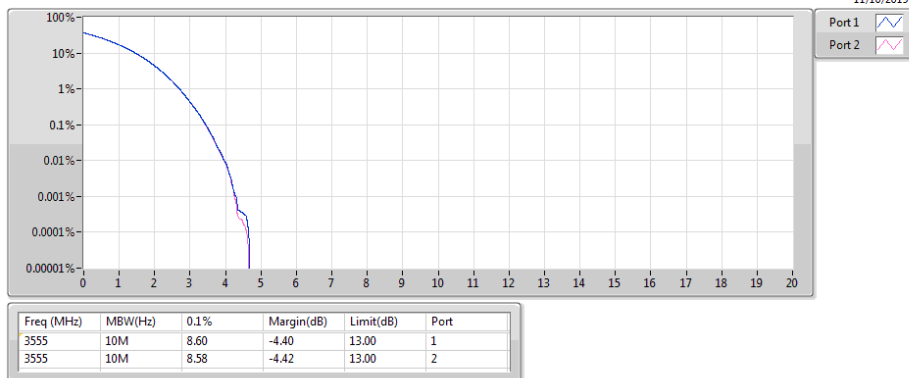
3695MHz_16QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PAR

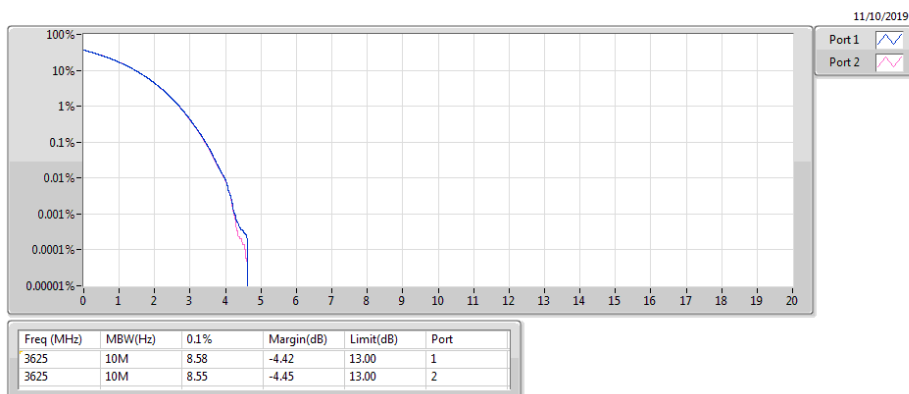
3555MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PAR

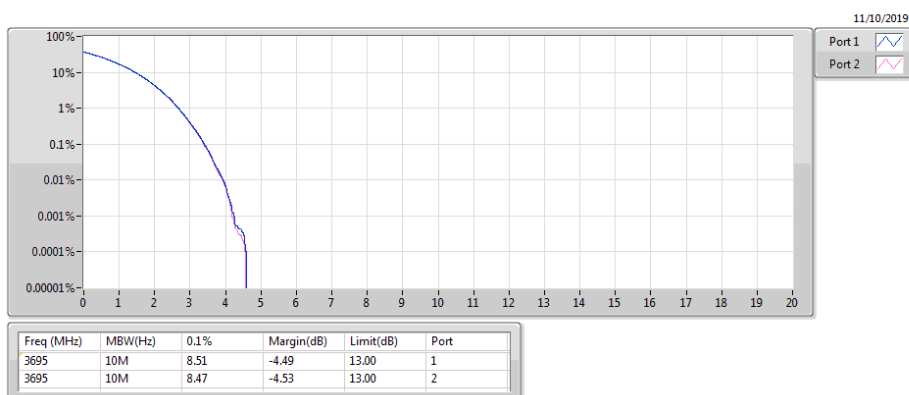
3625MHz_64QAM_RB 50,#RB 0



Band 48_LTE_10MHz_Nss1,64QAM_2TX

PAR

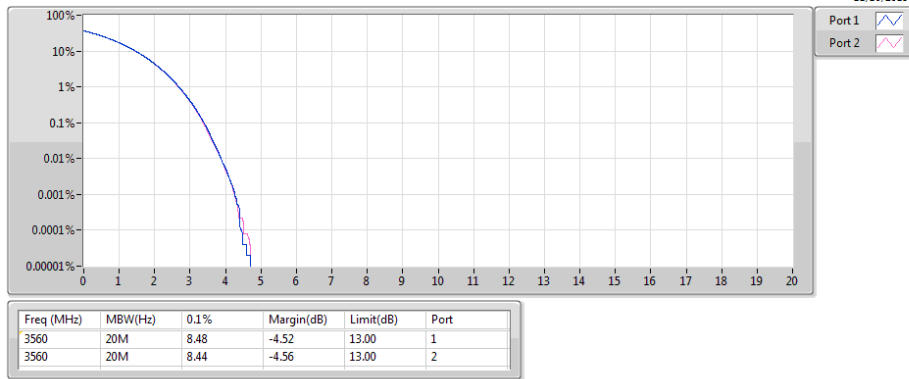
3695MHz_64QAM_RB 50,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PAR

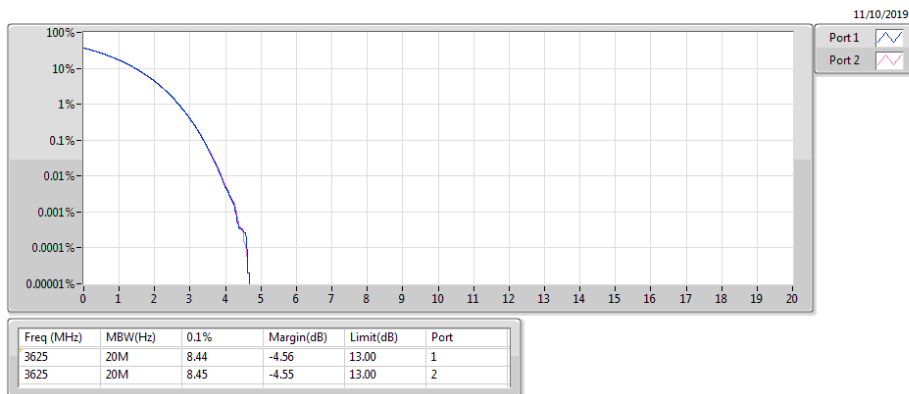
3560MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PAR

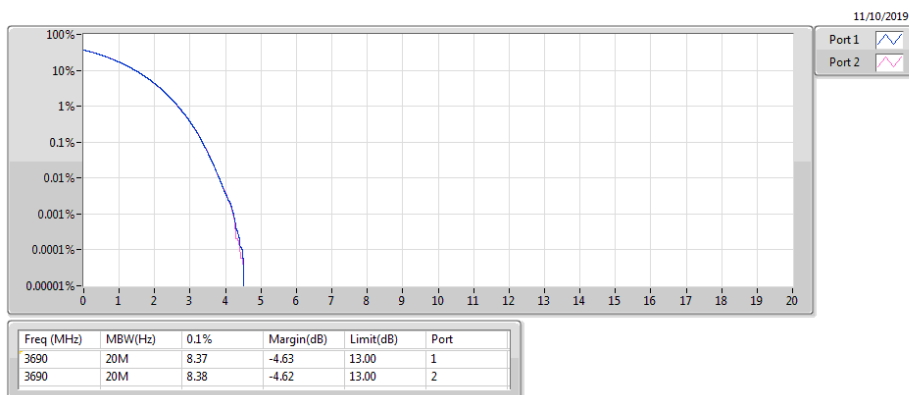
3625MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,QPSK_2TX

PAR

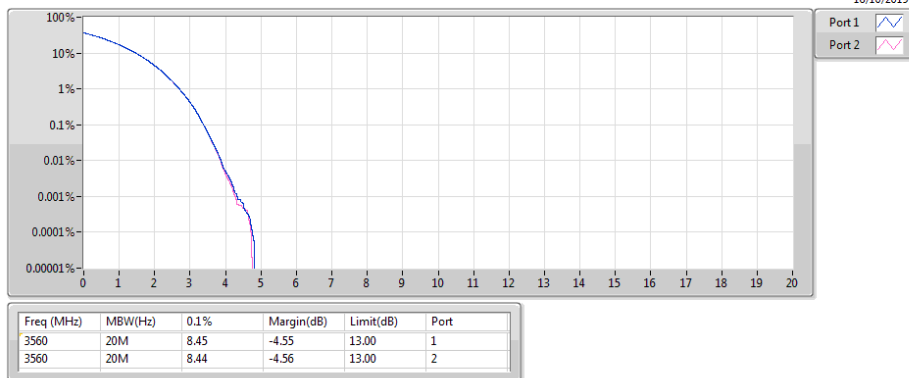
3690MHz_QPSK_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PAR

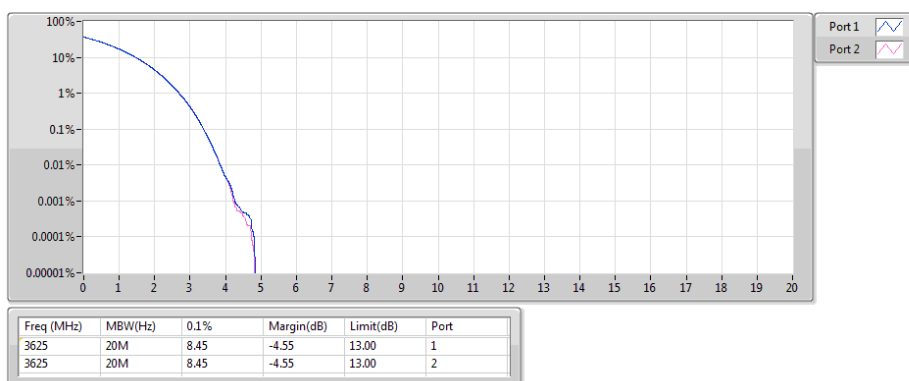
3560MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PAR

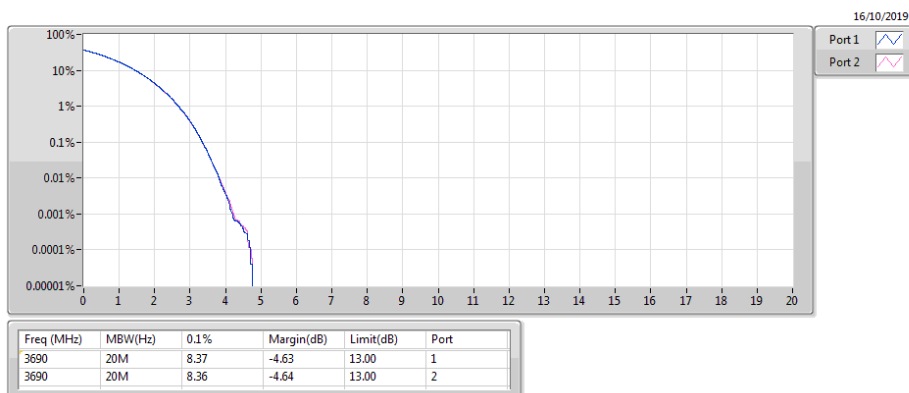
3625MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,16QAM_2TX

PAR

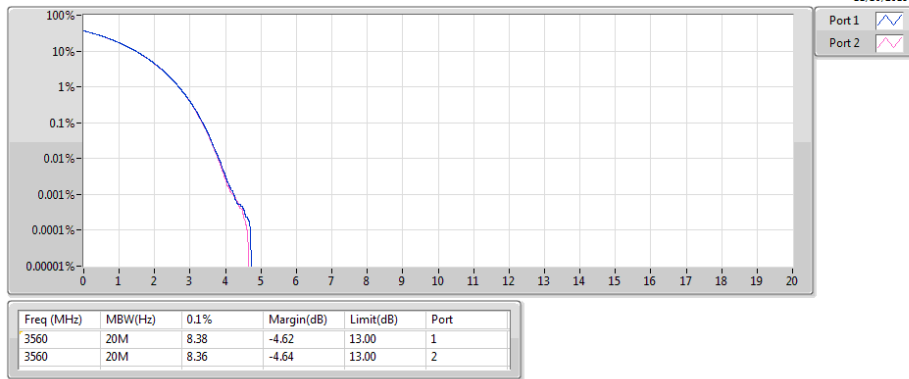
3690MHz_16QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PAR

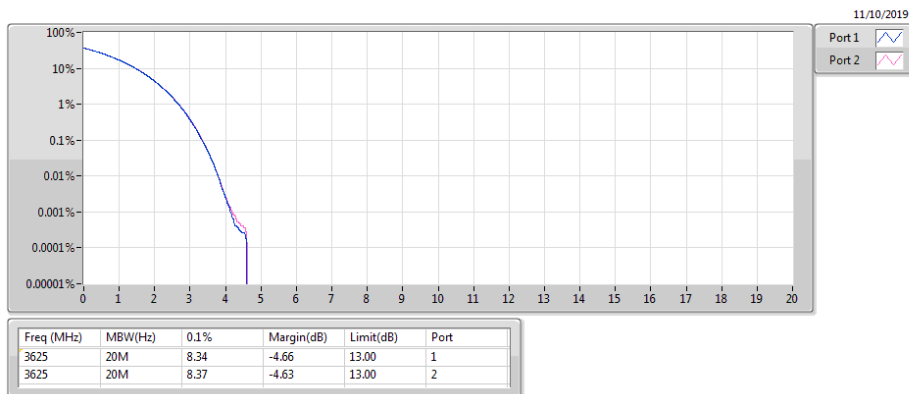
3560MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PAR

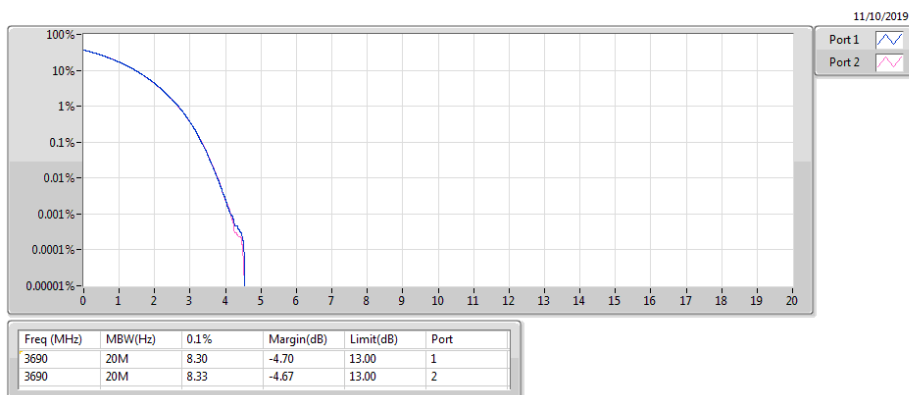
3625MHz_64QAM_RB 100,#RB 0



Band 48_LTE_20MHz_Nss1,64QAM_2TX

PAR

3690MHz_64QAM_RB 100,#RB 0



3.6 Frequency Stability

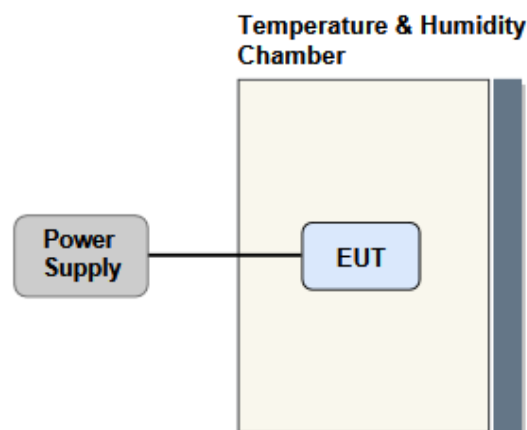
3.6.1 Limit of Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation

3.6.2 Test Procedures

1. EUT was placed at temperature chamber and connected to an external power supply.
2. Temperature and voltage condition shall be tested to confirm frequency stability.
3. Temperature range is from -40 ~ 50 °C and voltage range is from lowest to highest working voltage.
4. Tem Link up EUT and simulator. Confirm frequency drift value of simulator and record it.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Channel Bandwidth: 10MHz

Frequency: 3625 MHz	Frequency Drift (ppm)
Temperature (°C)	
T20°C Vmax	-0.22
T20°C Vmin	-0.22
T50°C Vnom	-0.16
T40°C Vnom	-0.16
T30°C Vnom	-0.21
T20°C Vnom	-0.23
T10°C Vnom	-0.25
T0°C Vnom	-0.28
T-10°C Vnom	-0.3
T-20°C Vnom	-0.32
T-30°C Vnom	-0.33
T-40°C Vnom	-0.34
Vnom [V]: 120	Vmax [V]: 138
	Vmin [V]: 102
Tnom [°C]: 20	Tmax [°C]: 50
	Tmin [°C]: -40

Channel Bandwidth: 20MHz

Frequency: 3625 MHz	Frequency Drift (ppm)
Temperature (°C)	
T20°C Vmax	-0.23
T20°C Vmin	-0.22
T50°C Vnom	-0.17
T40°C Vnom	-0.16
T30°C Vnom	-0.2
T20°C Vnom	-0.22
T10°C Vnom	-0.24
T0°C Vnom	-0.27
T-10°C Vnom	-0.29
T-20°C Vnom	-0.31
T-30°C Vnom	-0.32
T-40°C Vnom	-0.34
Vnom [V]: 120	Vmax [V]: 138
	Vmin [V]: 102
Tnom [°C]: 20	Tmax [°C]: 50
	Tmin [°C]: -40

3.7 Reception Limits

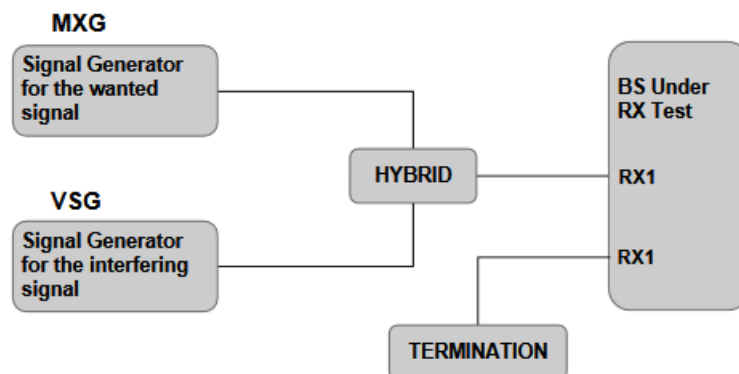
3.7.1 Description of Reception Limits

Priority Access Licensees must accept adjacent channel and in-band blocking interference (emissions from other authorized Priority Access or GAA CBSDs transmitting between 3550 and 3700 MHz) up to a power spectral density level not to exceed -40dBm in any direction with greater than 99% probability when integrated over a 10 megahertz reference bandwidth.

3.7.2 Test Procedures

1. Generate the wanted signal and adjust the input level to specified power level.
2. Select low, middle and high channels for each modulation.
3. For adjacent channel interference, set up the interfering signals at the adjacent channel frequency and adjust the interfering signal level to -40dBm at receiver antenna ports.
4. For in-band blocking interference, set up the interfering signal in the frequency range from 3550MHz to 3700MHz and adjust the interfering signal level to -40dBm at receiver antenna ports.
5. Measure and check the throughput of the EUT greater than 99% probability.

3.7.3 Test Setup



3.7.4 Test Result of Reception Limits

Mode	Interference Power Level (dBm)	Port 1 wanted signal power Level (dBm)	Port 1 Adjacent Channel selectivity Throughput (%)	Port 1 In-Band blocking Throughput (%)	Port 2 wanted signal power Level (dBm)	Port 2 Adjacent Channel selectivity Throughput (%)	Port 2 In-Band blocking Throughput (%)	Limit (%)
CB:10MHz,3625MHz RB offset=0	-40	-87.5	100	100	-87.5	100	100	99
CB:10MHz,3625MHz RB offset=25	-40	-87.5	100	100	-87.5	100	100	99

Mode	Interference Power Level (dBm)	Port 1 wanted signal power Level (dBm)	Port 1 Adjacent Channel selectivity Throughput (%)	Port 1 In-Band blocking Throughput (%)	Port 2 wanted signal power Level (dBm)	Port 2 Adjacent Channel selectivity Throughput (%)	Port 2 In-Band blocking Throughput (%)	Limit (%)
CB:20MHz,3625MHz RB offset=0	-40	-84.5	100	100	-84.5	100	100	99
CB:20MHz,3625MHz RB offset=25	-40	-84.5	100	100	-84.5	100	100	99
CB:20MHz,3625MHz RB offset=50	-40	-84.5	100	100	-84.5	100	100	99
CB:20MHz,3625MHz RB offset=75	-40	-84.5	100	100	-84.5	100	100	99

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

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If you have any suggestion, please feel free to contact us as below information

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