



FCC RADIO TEST REPORT

FCC ID : S9GQ950US02
Equipment : LTE Access Point
Brand Name : RUCKUS
Model Name : Q950-US02
Marketing Name : Q950
Applicant : Ruckus Wireless Inc.
350 W. Java Dr., Sunnyvale CA 94089
Manufacturer : Ruckus Wireless Inc.
350 W. Java Dr., Sunnyvale CA 94089
Standard : FCC 47 CFR Part 2, 96

The product was received on Oct. 14, 2020 and testing was started from Oct. 27, 2020 and completed on Dec. 19, 2022. We, Sporton International (USA) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (USA) Inc., the test report shall not be reproduced except in full.

Approved by: Neil Kao

Sporton International (USA) Inc.
1175 Montague Expressway, Milpitas, CA 95035



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History of this test report

Report No.	Version	Description	Issue Date
FG200510001A	01	Initial issue of report	Dec. 17, 2020
FG200510001A	02	Revised Appendix A	Nov. 23, 2022
FG200510001A	03	Revised Appendix A	Dec. 20, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.3	§96.41	Peak-to-Average Ratio	Pass	
3.4	§96.41	Effective Isotropic Radiated Power	Pass	-
		Power Density	Pass	-
3.5	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.6	§2.1051 §96.41	Conducted Band Edge Measurement	Pass	-
3.7	§2.1051 §96.41	Conducted Spurious Emission	Pass	
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 0.50 dB at 10665.000 MHz

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 Product Feature of Equipment Under Test

This device is an LTE Class B CBSD.

It supports two cross-polarized antenna set that the transmitter outputs is a 90-degree phase-shifted replica of the other and the phase centers of the two antennas are co-located.

Antenna 1 and Antenna 2 always transmit on the same radio carrier frequency Fa.

Antenna 3 and Antenna 4 always transmit on the same radio carrier frequency Fb.

Ant. 1 and Ant. 3 are horizontal polarized and Ant. 2 and Ant. 4 are vertical polarized.

These two radio carrier frequencies, Fa and Fb, do not overlap to each other.

Product Specification subjective to this standard	
Antenna Type	<Ant. 1>: Internal BeamFlex Antenna <Ant. 2>: Internal BeamFlex Antenna <Ant. 3>: Internal BeamFlex Antenna <Ant. 4>: Internal BeamFlex Antenna
Antenna Gain, polarity	<Ant. 1>: 13dBi, H <Ant. 2>: 13dBi, V <Ant. 3>: 13dBi, H <Ant. 4>: 13dBi, V

Remark: The above specification is declared by manufacturer.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL (USA) INC.	
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL: (408) 904-3300	
Test Site No.	Sporton Site No.	
	TH01-CA	03CH02-CA
Test Engineer	Peter and Kaying Xiong	Peter Liao
Temperature (°C)	21~25	20~23
Relative Humidity (%)	42~53	56~63



1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 96
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
- ♦ FCC KDB 662911 D02 MIMO with Cross Polarized Antenna v01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

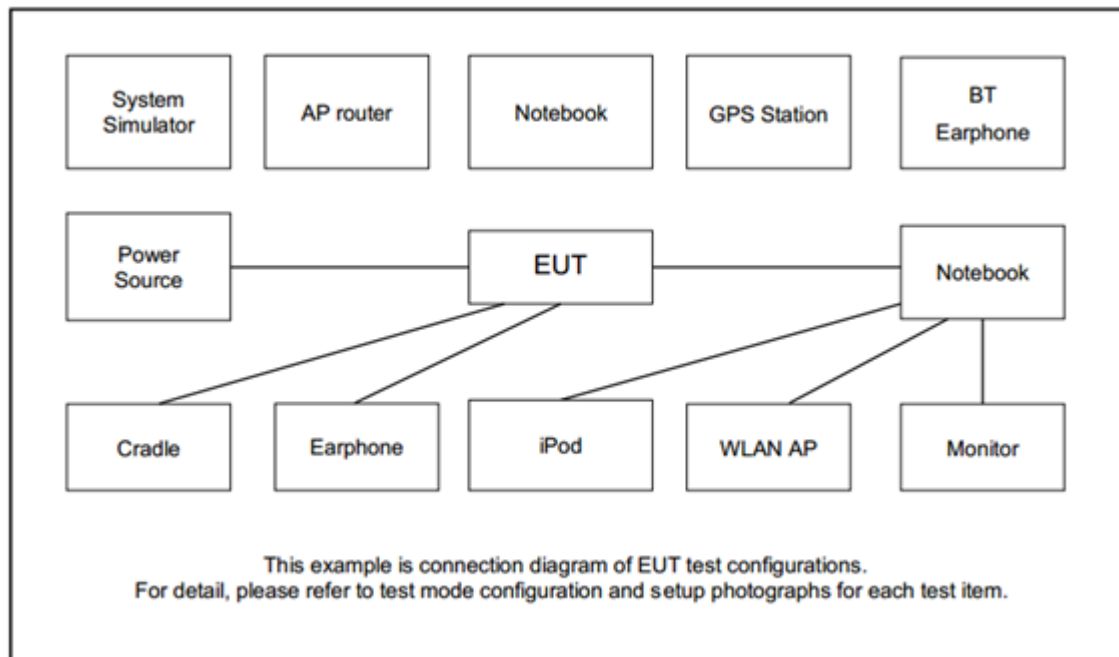
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

Test Items	Band	Bandwidth (MHz)			Modulation				RB	Test Channel		
		10	20	20+20	QPSK	16QAM	64QAM	256QAM	Full	L	M	H
Max. Output Power	48	V	V	V	V	V	V	V	V	V	V	V
E.I.R.P	48	V	V	V	V	V	V	V	V	V	V	V
EIRP Density	48	V	V	V	V	V	V	V	V	V	V	V
26dB and 99% Bandwidth	48	V	V	V	V	V	V	V	V		V	
Conducted Band Edge	48	V	V	V	V	V	V	V	V	V	V	V
Peak-to-Average Ratio	48		V		V	V	V	V	V		V	
Conducted Spurious Emission	48	V	V	V	V	V	V		V	V	V	V
Radiated Spurious Emission	48	Worst Case								V	V	V
Remark	1. The mark “v ” means that this configuration is chosen for testing 2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different bandwidth and modulations in exploratory test. Subsequently, only the worst case emissions are reported.											

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Adaptor	MW	HLG-100H-48	N/A	N/A	AC I/P : Unshielded, 0.2m DC O/P : Unshielded, 0.2m with core

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$

2.5 Frequency List of Low/Middle/High Channels

LTE Band 48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	55340	55990	56640
	Frequency	3560	3625	3690
10	Channel	55290	55990	56690
	Frequency	3555	3625	3695

LTE Band 48_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
20 + 20	PCC	Channel	55340	55890	56440
		Frequency	3560	3615	3670
	SCC	Channel	55540	56090	56640
		Frequency	3580	3635	3690

3 Conducted Test Items

3.1 Measuring Instruments

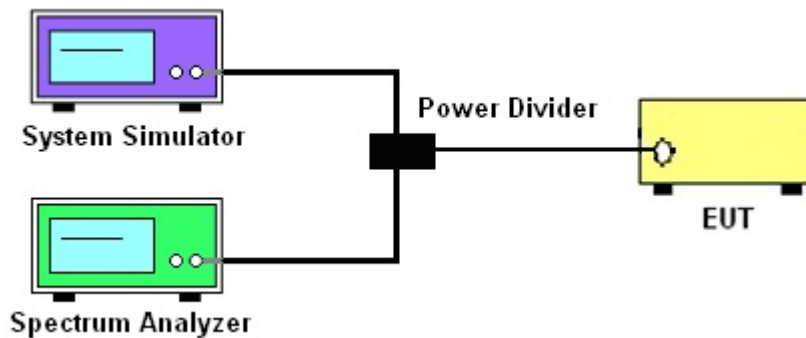
See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 EIRP, Power Density, Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, and Conducted Spurious Emission



3.1.4 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power

3.2.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio

3.4 EIRP and Power Density

3.4.1 Description of the EIRP and Power Density Measurement

The EIRP of mobile transmitters must not exceed 23 dBm /10 megahertz for LTE Band 42 and Band 43, and Band 48.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

EIRP and PSD limits for CBRS equipment as below tabel:

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

3.4.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.4.5

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 1.5 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW $\geq 3 \times$ RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

The occupied bandwidth shall not exceed the equipment's channel bandwidth, which is declared by the manufacturer.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
4. Set the detection mode to peak, and the trace mode to max hold.
5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
(this is the reference value)
6. Determine the "-26 dB down amplitude" as equal to (Reference Value – X).
7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "-X dB down amplitude" determined in step 6. If a marker is below this "-X dB down amplitude" value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.6 Conducted Band Edge

3.6.1 Description of Conducted Band Edge Measurement

The power of any emission outside outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz

3.7 Conducted Spurious Emission

3.7.1 Description of Conducted Spurious Emission Measurement

96.41 (e)(2)

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is -40dBm/MHz.

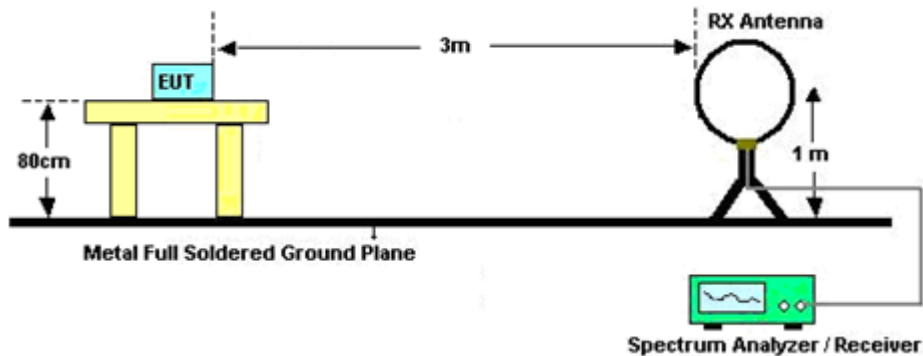
4 Radiated Test Items

4.1 Measuring Instruments

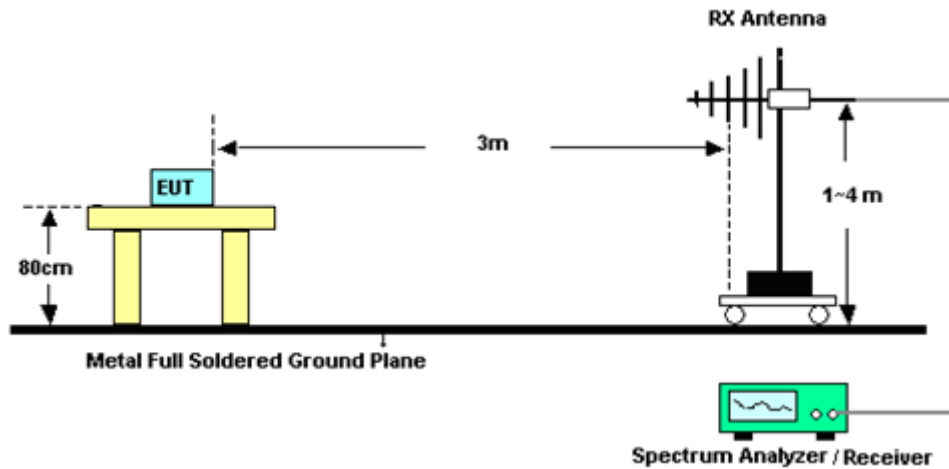
See list of measuring instruments of this test report.

4.2 Test Setup

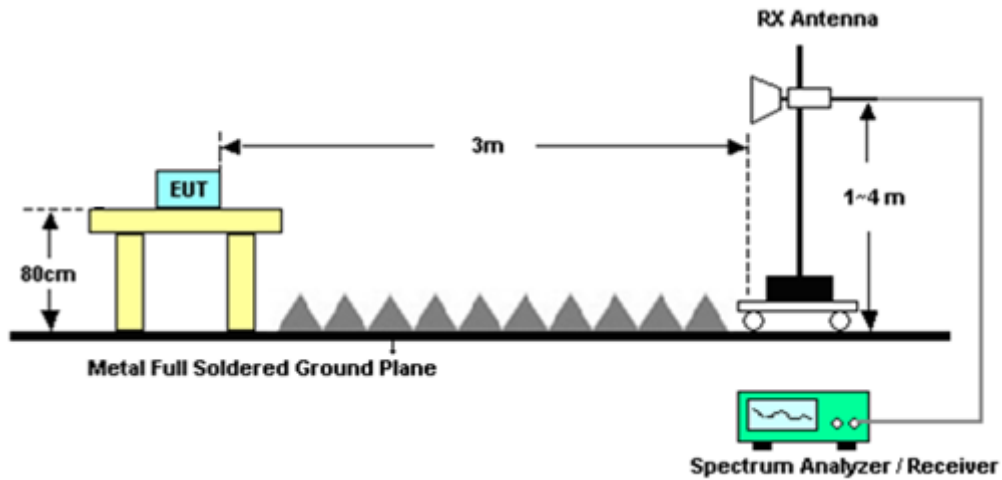
<For radiated emissions below 30MHz>



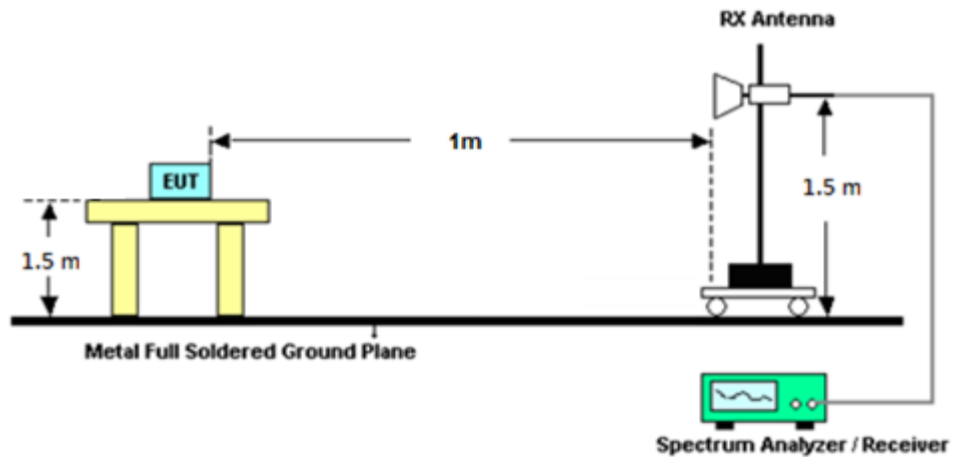
<For radiated emissions from 30MHz to 1GHz>



<For radiated emissions from 1 ~ 18GHz>



<For radiated emissions from 18 ~ 40GHz>



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least -40dBm / MHz .

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$
$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
The limit line is -40dBm/MHz



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSV40	101089	10Hz~40GHz	Sep. 14, 2020	Oct. 27, 2020 ~ Dec. 02, 2020	Sep. 13, 2021	Conducted (TH01-CA)
Spectrum Analyzer	Keysight	N9010A	MY57420221	10Hz~44GHz	Sep. 11, 2019	Oct. 27, 2020 ~ Dec. 02, 2020	Sep. 10, 2021	Conducted (TH01-CA)
Power Sensor	DARE!!	RPR3006W	RPR6W-1901027	N/A	Jun. 24, 2020	Oct. 27, 2020 ~ Dec. 02, 2020	Jun. 23, 2021	Conducted (TH01-CA)
Hygrometer	TESTO	608-H1	45141354	N/A	Aug. 05, 2020	Oct. 27, 2020 ~ Dec. 02, 2020	Aug. 04, 2021	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV13	101089	10Hz~13.6GHz	Jul. 05, 2022	Dec. 19, 2022	Jul. 04, 2023	Conducted (TH01-CA)
Bilog Antenna	TESEQ	6111D	50392	30MHz~1GHz	Jul. 29, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Jul. 28, 2021	Radiation (03CH02-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	01895	1GHz~18GHz	Aug. 28, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Aug. 27, 2021	Radiation (03CH02-CA)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00842	18GHz~40GHz	Jul. 27, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Jul. 26, 2021	Radiation (03CH02-CA)
Preamplifier	SONOMA	310N	372240	N/A	Aug. 12, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Aug. 11, 2021	Radiation (03CH02-CA)
Preamplifier	Keysight	83017A	MY53270323	1GHz~26.5GHz	Jul. 28, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Jul. 27, 2021	Radiation (03CH02-CA)
Preamplifier	E-instrument	ERA-100M-18G-56-01-A70	EC1900251	N/A	Nov. 26, 2019	Nov. 25, 2020 ~ Dec. 04, 2020	Nov. 25, 2021	Radiation (03CH02-CA)
Preamplifier	EMEC	EMC18G40G	060725	18G-40G	Aug. 07, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Aug. 06, 2021	Radiation (03CH02-CA)
Spectrum Analyzer	Keysight	N9010A	MY57420221	10Hz~44GHz	Sep. 11, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Sep. 10, 2021	Radiation (03CH02-CA)
Hygrometer	TESTO	608-H1	45142602	N/A	Aug. 05, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Aug. 04, 2021	Radiation (03CH02-CA)
Signal Generator	Rohde & Schwarz	SMF100A	105544	9kHz~44GHz	Jun. 09, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Jun. 08, 2021	Radiation (03CH02-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	02140	N/A	Aug. 28, 2020	Nov. 25, 2020 ~ Dec. 04, 2020	Aug. 27, 2021	Radiation (03CH02-CA)
Software	Audix	E3	N/A	N/A	N/A	Nov. 25, 2020 ~ Dec. 04, 2020	N/A	Radiation (03CH02-CA)

6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.84
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.53
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.41
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Appendix A. Test Results of Conducted of EIRP Test

<Single Carrier Mode>

EIRP Power (dBm/10MHz)									
Carrier1	Mode	Channel	Frequency (MHz)	DG (dBi)	Port 1-H (dBm/10MHz)	Port 2-V (dBm/10MHz)	Port 1 EIRP-H (dbm/10MHz)	Port 2 EIRP-V (dBm/10MHz)	Limit (dBm/10MHz)
	LTE 10MHz QPSK 2TX	55290	3555	13	31.85	30.54	44.85	43.54	< 47 dBm
	LTE 10MHz QPSK 2TX	55990	3625	13	32.12	31.14	45.12	44.14	
	LTE 10MHz QPSK 2TX	56690	3695	13	31.82	32.08	44.82	45.08	
	LTE 20MHz QPSK 2TX	55340	3560	13	30.36	29.65	43.36	42.65	
	LTE 20MHz QPSK 2TX	55990	3625	13	32.04	31.22	45.04	44.22	
	LTE 20MHz QPSK 2TX	56640	3690	13	30.51	30.37	43.51	43.37	
	LTE 10MHz 16QAM 2TX	55290	3555	13	31.77	31.62	44.77	44.62	
	LTE 10MHz 16QAM 2TX	55990	3625	13	31.91	31.48	44.91	44.48	
	LTE 10MHz 16QAM 2TX	56690	3695	13	31.77	31.85	44.77	44.85	
	LTE 20MHz 16QAM 2TX	55340	3560	13	31.96	31.34	44.96	44.34	
	LTE 20MHz 16QAM 2TX	55990	3625	13	31.74	31.13	44.74	44.13	
	LTE 20MHz 16QAM 2TX	56640	3690	13	31.47	32.05	44.47	45.05	
	LTE 10MHz 64QAM 2TX	55290	3555	13	32.56	30.85	45.56	43.85	
	LTE 10MHz 64QAM 2TX	55990	3625	13	32.32	31.51	45.32	44.51	
	LTE 10MHz 64QAM 2TX	56690	3695	13	31.81	31.92	44.81	44.92	
	LTE 20MHz 64QAM 2TX	55340	3560	13	30.91	30.28	43.91	43.28	
	LTE 20MHz 64QAM 2TX	55990	3625	13	31.77	30.98	44.77	43.98	
	LTE 20MHz 64QAM 2TX	56640	3690	13	30.96	30.80	43.96	43.80	
	LTE 10MHz 256QAM 2TX	55290	3555	13	32.39	31.33	45.39	44.33	
	LTE 10MHz 256QAM 2TX	55990	3625	13	32.72	32.05	45.72	45.05	
	LTE 10MHz 256QAM 2TX	56690	3695	13	31.87	32.19	44.87	45.19	
	LTE 20MHz 256QAM 2TX	55340	3560	13	31.09	30.48	44.09	43.48	
	LTE 20MHz 256QAM 2TX	55990	3625	13	32.43	31.36	45.43	44.36	
	LTE 20MHz 256QAM 2TX	56640	3690	13	30.74	30.97	43.74	43.97	

Carrier2	Mode	Channel	Frequency (MHz)	DG (dBi)	Port 3-H (dBm/10MHz)	Port 4-V (dBm/10MHz)	Port 3 EIRP-H (dbm/10MHz)	Port 4 EIRP-V (dBm/10MHz)	Limit (dBm/10MHz)
	LTE 10MHz QPSK 2TX	55290	3555	13	31.80	31.40	44.80	44.40	< 47 dBm
	LTE 10MHz QPSK 2TX	55990	3625	13	32.01	31.85	45.01	44.85	
	LTE 10MHz QPSK 2TX	56690	3695	13	31.16	32.05	44.16	45.05	
	LTE 20MHz QPSK 2TX	55340	3560	13	32.37	31.87	45.37	44.87	
	LTE 20MHz QPSK 2TX	55990	3625	13	32.27	31.97	45.27	44.97	
	LTE 20MHz QPSK 2TX	56640	3690	13	29.37	29.23	42.37	42.23	
	LTE 10MHz 16QAM 2TX	55290	3555	13	31.75	30.37	44.75	43.37	
	LTE 10MHz 16QAM 2TX	55990	3625	13	31.85	31.76	44.85	44.76	
	LTE 10MHz 16QAM 2TX	56690	3695	13	31.54	32.05	44.54	45.05	
	LTE 20MHz 16QAM 2TX	55340	3560	13	32.18	32.12	45.18	45.12	
	LTE 20MHz 16QAM 2TX	55990	3625	13	31.90	31.70	44.90	44.70	
	LTE 20MHz 16QAM 2TX	56640	3690	13	30.24	30.37	43.24	43.37	
	LTE 10MHz 64QAM 2TX	55290	3555	13	31.78	31.16	44.78	44.16	
	LTE 10MHz 64QAM 2TX	55990	3625	13	32.38	32.25	45.38	45.25	
	LTE 10MHz 64QAM 2TX	56690	3695	13	31.89	32.29	44.89	45.29	
	LTE 20MHz 64QAM 2TX	55340	3560	13	31.89	31.87	44.89	44.87	
	LTE 20MHz 64QAM 2TX	55990	3625	13	31.77	31.69	44.77	44.69	
	LTE 20MHz 64QAM 2TX	56640	3690	13	29.96	30.59	42.96	43.59	
	LTE 10MHz 256QAM 2TX	55290	3555	13	32.31	31.29	45.31	44.29	
	LTE 10MHz 256QAM 2TX	55990	3625	13	32.77	32.22	45.77	45.22	
	LTE 10MHz 256QAM 2TX	56690	3695	13	32.44	32.62	45.44	45.62	
	LTE 20MHz 256QAM 2TX	55340	3560	13	32.51	31.62	45.51	44.62	
	LTE 20MHz 256QAM 2TX	55990	3625	13	32.34	31.61	45.34	44.61	
	LTE 20MHz 256QAM 2TX	56640	3690	13	31.87	31.97	44.87	44.97	

Remark: The reported test results are within the scope of the declared tolerances by the Manufacturer.

EIRP PSD (dBm/MHz)									
Carrier1	Mode	Channel	Frequency (MHz)	DG (dBi)	Port 1-H (dBm/MHz)	Port 2-V (dBm/MHz)	Port 1 EIRP-H (dBm/MHz)	Port 2 EIRP-V (dBm/MHz)	Limit
	LTE_10MHz_QPSK_2TX	55290	3555	13	23.77	22.40	36.77	35.40	< 37 dBm
	LTE_10MHz_QPSK_2TX	55990	3625	13	23.89	23.04	36.89	36.04	
	LTE_10MHz_QPSK_2TX	56690	3695	13	23.68	23.84	36.68	36.84	
	LTE_20MHz_QPSK_2TX	55340	3560	13	22.20	21.62	35.20	34.62	
	LTE_20MHz_QPSK_2TX	55990	3625	13	23.22	22.27	36.22	35.27	
	LTE_20MHz_QPSK_2TX	56640	3690	13	21.71	21.49	34.71	34.49	
	LTE_10MHz_16QAM_2TX	55290	3555	13	23.87	23.55	36.87	36.55	
	LTE_10MHz_16QAM_2TX	55990	3625	13	23.89	23.40	36.89	36.40	
	LTE_10MHz_16QAM_2TX	56690	3695	13	23.72	23.77	36.72	36.77	
	LTE_20MHz_16QAM_2TX	55340	3560	13	23.23	22.92	36.23	35.92	
	LTE_20MHz_16QAM_2TX	55990	3625	13	23.12	22.40	36.12	35.40	
	LTE_20MHz_16QAM_2TX	56640	3690	13	22.81	23.52	35.81	36.52	
	LTE_10MHz_64QAM_2TX	55290	3555	13	23.95	22.13	36.95	35.13	
	LTE_10MHz_64QAM_2TX	55990	3625	13	23.50	22.55	36.50	35.55	
	LTE_10MHz_64QAM_2TX	56690	3695	13	23.31	23.27	36.31	36.27	
	LTE_20MHz_64QAM_2TX	55340	3560	13	22.48	21.81	35.48	34.81	
	LTE_20MHz_64QAM_2TX	55990	3625	13	23.23	22.57	36.23	35.57	
	LTE_20MHz_64QAM_2TX	56640	3690	13	22.60	22.28	35.60	35.28	
	LTE_10MHz_256QAM_2TX	55290	3555	13	23.74	22.66	36.74	35.66	
	LTE_10MHz_256QAM_2TX	55990	3625	13	23.82	23.10	36.82	36.10	
	LTE_10MHz_256QAM_2TX	56690	3695	13	23.18	23.71	36.18	36.71	
	LTE_20MHz_256QAM_2TX	55340	3560	13	22.76	21.91	35.76	34.91	
	LTE_20MHz_256QAM_2TX	55990	3625	13	23.93	22.87	36.93	35.87	
LTE_20MHz_256QAM_2TX	56640	3690	13	22.04	22.59	35.04	35.59		
Carrier2	Mode	Channel	Frequency (MHz)	DG (dBi)	Port 3-H (dBm/MHz)	Port 4-V (dBm/MHz)	Port 3 EIRP-H (dBm/MHz)	Port 4 EIRP-V (dBm/MHz)	Limit
	LTE_10MHz_QPSK_2TX	55290	3555	13	23.82	23.53	36.82	36.53	< 37 dBm
	LTE_10MHz_QPSK_2TX	55990	3625	13	23.77	23.48	36.77	36.48	
	LTE_10MHz_QPSK_2TX	56690	3695	13	23.44	23.91	36.44	36.91	
	LTE_20MHz_QPSK_2TX	55340	3560	13	23.53	22.95	36.53	35.95	
	LTE_20MHz_QPSK_2TX	55990	3625	13	23.21	23.09	36.21	36.09	
	LTE_20MHz_QPSK_2TX	56640	3690	13	20.65	20.62	33.65	33.62	
	LTE_10MHz_16QAM_2TX	55290	3555	13	23.85	22.79	36.85	35.79	
	LTE_10MHz_16QAM_2TX	55990	3625	13	23.83	23.65	36.83	36.65	
	LTE_10MHz_16QAM_2TX	56690	3695	13	23.61	23.93	36.61	36.93	
	LTE_20MHz_16QAM_2TX	55340	3560	13	23.48	23.39	36.48	36.39	
	LTE_20MHz_16QAM_2TX	55990	3625	13	23.15	23.03	36.15	36.03	
	LTE_20MHz_16QAM_2TX	56640	3690	13	21.65	21.67	34.65	34.67	
	LTE_10MHz_64QAM_2TX	55290	3555	13	23.02	22.37	36.02	35.37	
	LTE_10MHz_64QAM_2TX	55990	3625	13	23.41	23.34	36.41	36.34	
	LTE_10MHz_64QAM_2TX	56690	3695	13	23.13	23.62	36.13	36.62	
	LTE_20MHz_64QAM_2TX	55340	3560	13	23.32	23.35	36.32	36.35	
	LTE_20MHz_64QAM_2TX	55990	3625	13	23.26	23.30	36.26	36.30	
	LTE_20MHz_64QAM_2TX	56640	3690	13	21.38	22.45	34.38	35.45	
	LTE_10MHz_256QAM_2TX	55290	3555	13	23.68	22.36	36.68	35.36	
	LTE_10MHz_256QAM_2TX	55990	3625	13	23.85	23.25	36.85	36.25	
	LTE_10MHz_256QAM_2TX	56690	3695	13	23.79	23.96	36.79	36.96	
	LTE_20MHz_256QAM_2TX	55340	3560	13	23.98	23.07	36.98	36.07	
	LTE_20MHz_256QAM_2TX	55990	3625	13	23.85	23.17	36.85	36.17	
LTE_20MHz_256QAM_2TX	56640	3690	13	23.77	23.72	36.77	36.72		

Remark: The reported test results are within the scope of the declared tolerances by the Manufacturer.

Total EIRP Power (dBm) for certificate								
	Mode	Channel	Frequency (MHz)	DG (dBi)	Port 1-H (dBm)	Port 2-V (dBm)	Port 1 EIRP-H (dBm)	Port 2 EIRP-V (dBm)
Carrier1	LTE_10MHz_QPSK_2TX	55290	3555	13	32.10	30.80	45.10	43.80
	LTE_10MHz_QPSK_2TX	55990	3625	13	32.40	31.30	45.40	44.30
	LTE_10MHz_QPSK_2TX	56690	3695	13	32.10	32.30	45.10	45.30
	LTE_20MHz_QPSK_2TX	55340	3560	13	33.80	32.90	46.80	45.90
	LTE_20MHz_QPSK_2TX	55990	3625	13	34.80	34.10	47.80	47.10
	LTE_20MHz_QPSK_2TX	56640	3690	13	32.70	33.40	45.70	46.40
	LTE_10MHz_16QAM_2TX	55290	3555	13	32.20	31.90	45.20	44.90
	LTE_10MHz_16QAM_2TX	55990	3625	13	31.90	31.40	44.90	44.40
	LTE_10MHz_16QAM_2TX	56690	3695	13	31.60	31.80	44.60	44.80
	LTE_20MHz_16QAM_2TX	55340	3560	13	34.50	34.00	47.50	47.00
	LTE_20MHz_16QAM_2TX	55990	3625	13	34.20	33.80	47.20	46.80
	LTE_20MHz_16QAM_2TX	56640	3690	13	33.60	34.60	46.60	47.60
	LTE_10MHz_64QAM_2TX	55290	3555	13	32.50	30.80	45.50	43.80
	LTE_10MHz_64QAM_2TX	55990	3625	13	32.30	31.40	45.30	44.40
	LTE_10MHz_64QAM_2TX	56690	3695	13	31.50	31.90	44.50	44.90
	LTE_20MHz_64QAM_2TX	55340	3560	13	33.70	32.90	46.70	45.90
	LTE_20MHz_64QAM_2TX	55990	3625	13	34.20	33.50	47.20	46.50
	LTE_20MHz_64QAM_2TX	56640	3690	13	33.50	33.20	46.50	46.20
	LTE_10MHz_256QAM_2TX	55290	3555	13	32.60	31.70	45.60	44.70
	LTE_10MHz_256QAM_2TX	55990	3625	13	32.70	32.40	45.70	45.40
	LTE_10MHz_256QAM_2TX	56690	3695	13	32.20	32.40	45.20	45.40
	LTE_20MHz_256QAM_2TX	55340	3560	13	33.70	33.00	46.70	46.00
	LTE_20MHz_256QAM_2TX	55990	3625	13	35.10	34.30	48.10	47.30
	LTE_20MHz_256QAM_2TX	56640	3690	13	33.20	33.40	46.20	46.40
Carrier2	LTE_10MHz_QPSK_2TX	55290	3555	13	32.00	31.60	45.00	44.60
	LTE_10MHz_QPSK_2TX	55990	3625	13	32.30	32.20	45.30	45.20
	LTE_10MHz_QPSK_2TX	56690	3695	13	31.30	32.00	44.30	45.00
	LTE_20MHz_QPSK_2TX	55340	3560	13	34.90	34.40	47.90	47.40
	LTE_20MHz_QPSK_2TX	55990	3625	13	35.00	34.50	48.00	47.50
	LTE_20MHz_QPSK_2TX	56640	3690	13	32.10	32.50	45.10	45.50
	LTE_10MHz_16QAM_2TX	55290	3555	13	31.80	31.30	44.80	44.30
	LTE_10MHz_16QAM_2TX	55990	3625	13	31.80	31.80	44.80	44.80
	LTE_10MHz_16QAM_2TX	56690	3695	13	31.50	32.00	44.50	45.00
	LTE_20MHz_16QAM_2TX	55340	3560	13	34.40	34.50	47.40	47.50
	LTE_20MHz_16QAM_2TX	55990	3625	13	34.30	34.20	47.30	47.20
	LTE_20MHz_16QAM_2TX	56640	3690	13	32.40	32.60	45.40	45.60
	LTE_10MHz_64QAM_2TX	55290	3555	13	31.70	31.10	44.70	44.10
	LTE_10MHz_64QAM_2TX	55990	3625	13	32.40	32.20	45.40	45.20
	LTE_10MHz_64QAM_2TX	56690	3695	13	31.70	32.20	44.70	45.20
	LTE_20MHz_64QAM_2TX	55340	3560	13	34.20	34.40	47.20	47.40
	LTE_20MHz_64QAM_2TX	55990	3625	13	34.30	34.20	47.30	47.20
	LTE_20MHz_64QAM_2TX	56640	3690	13	32.20	32.50	45.20	45.50
	LTE_10MHz_256QAM_2TX	55290	3555	13	32.50	31.50	45.50	44.50
	LTE_10MHz_256QAM_2TX	55990	3625	13	33.10	32.40	46.10	45.40
	LTE_10MHz_256QAM_2TX	56690	3695	13	32.50	32.60	45.50	45.60
	LTE_20MHz_256QAM_2TX	55340	3560	13	35.10	34.40	48.10	47.40
	LTE_20MHz_256QAM_2TX	55990	3625	13	35.10	34.40	48.10	47.40
	LTE_20MHz_256QAM_2TX	56640	3690	13	34.80	34.50	47.80	47.50

Note:

The device has two cross-polarized antenna set that the transmitter outputs is a 90-degree phase-shifted replica of the other and the phase centers of the two antennas are co-located.

Refer to KDB 662911 D02, EIRP and EIRP PSD of each polarization should be individually be below the limit.

Antenna 1 and antenna 3 are horizontal polarized while antenna 2 and antenna 4 are vertical polarized.

Antenna 1 and Antenna 2 always transmit on the same radio carrier frequency Fa.

Antenna 3 and Antenna 4 always transmit on the same radio carrier frequency Fb.

(Fa and Fb do not overlap to each other.)

Therefore EIRP PSD of each antenna should be individually be below the limit.

Carrier 1 EIRP total power of horizontal = DG + conducted power (Port 1)

Carrier 1 EIRP total power of vertical = DG + total conducted power (Port 2)

Carrier 2 EIRP total power of horizontal = DG + conducted power (Port 3)

Carrier 2 EIRP total power of vertical = DG + total conducted power (Port 4)

Remark: The reported test results are within the scope of the declared tolerances by the Manufacturer.

<Multi Carrier Mode>

EIRP Power (dBm/10MHz)												Limit
Mode	Channel	Frequency (MHz)	DG (dB)	Port 1-H (dBm/10MHz)	Port 2-V (dBm/10MHz)	Port 3-H (dBm/10MHz)	Port 4-V (dBm/10MHz)	Port 1 EIRP-H (dBm/10MHz)	Port 2 EIRP-V (dBm/10MHz)	Port 3 EIRP-H (dBm/10MHz)	Port 4 EIRP-V (dBm/10MHz)	
Multi Carrier	LTE_20MHz+20MHz_QPSK_4TX	55340 + 55540	3560 + 3580	13	31.50	30.74	31.56	31.57	44.50	43.74	44.56	44.57
	LTE_20MHz+20MHz_QPSK_4TX	55890 + 56090	3615 + 3635	13	31.91	31.03	31.57	31.57	44.91	44.03	44.57	44.57
	LTE_20MHz+20MHz_QPSK_4TX	56440 + 56640	3670 + 3690	13	30.41	30.18	30.95	30.95	43.41	43.18	43.95	43.95
	LTE_20MHz+20MHz_QPSK_4TX	55340 + 56640	3560 + 3690	13	31.15	30.34	30.89	30.79	44.15	43.34	43.89	43.79
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 55540	3560 + 3580	13	31.03	30.18	31.19	30.41	44.03	43.18	44.19	43.41
	LTE_20MHz+20MHz_16QAM_4TX	55890 + 56090	3615 + 3635	13	30.73	30.08	32.47	32.22	43.73	43.08	45.47	45.22
	LTE_20MHz+20MHz_16QAM_4TX	56440 + 56640	3670 + 3690	13	29.48	29.56	31.92	31.84	42.48	42.56	44.92	44.64
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 56640	3560 + 3690	13	30.81	30.37	31.86	31.67	43.81	43.37	44.86	44.67
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 55540	3560 + 3580	13	30.85	30.17	31.07	30.86	43.85	43.17	44.07	43.86
	LTE_20MHz+20MHz_64QAM_4TX	55890 + 56090	3615 + 3635	13	30.66	30.10	30.60	30.82	43.66	43.10	43.60	43.82
	LTE_20MHz+20MHz_64QAM_4TX	56440 + 56640	3670 + 3690	13	30.12	30.87	31.97	31.78	43.12	43.87	44.97	44.78
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 56640	3560 + 3690	13	30.42	30.28	31.73	31.72	43.42	43.28	44.73	44.72
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 55540	3560 + 3580	13	30.83	29.06	30.99	30.77	43.83	42.06	43.99	43.77
	LTE_20MHz+20MHz_256QAM_4TX	55890 + 56090	3615 + 3635	13	30.72	29.95	30.64	30.85	43.72	42.95	43.64	43.85
	LTE_20MHz+20MHz_256QAM_4TX	56440 + 56640	3670 + 3690	13	30.05	30.67	31.41	30.31	43.05	43.67	44.41	43.31
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 56640	3560 + 3690	13	31.07	29.24	31.53	31.52	44.07	42.24	44.53	44.52

EIRP PSD (dBm/MHz)												Limit (dBm/MHz)
Mode	Channel	Frequency (MHz)	DG (dB)	Port 1-H (dBm/MHz)	Port 2-V (dBm/MHz)	Port 3-H (dBm/MHz)	Port 4-V (dBm/MHz)	Port 1 EIRP-H (dBm/MHz)	Port 2 EIRP-V (dBm/MHz)	Port 3 EIRP-H (dBm/MHz)	Port 4 EIRP-V (dBm/MHz)	
Multi Carrier	LTE_20MHz+20MHz_QPSK_4TX	55340 + 55540	3560 + 3580	13	22.71	22.23	22.73	22.76	35.71	35.23	35.73	35.76
	LTE_20MHz+20MHz_QPSK_4TX	55890 + 56090	3615 + 3635	13	23.01	21.88	22.52	23.00	36.01	34.88	35.52	36.00
	LTE_20MHz+20MHz_QPSK_4TX	56440 + 56640	3670 + 3690	13	21.77	21.39	22.16	22.17	34.77	34.39	35.16	35.17
	LTE_20MHz+20MHz_QPSK_4TX	55340 + 56640	3560 + 3690	13	22.18	21.51	22.23	22.18	35.18	34.51	35.23	35.18
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 55540	3560 + 3580	13	22.18	21.55	22.32	21.67	35.18	34.55	35.32	34.67
	LTE_20MHz+20MHz_16QAM_4TX	55890 + 56090	3615 + 3635	13	22.16	21.48	23.90	23.51	35.16	34.48	36.90	36.51
	LTE_20MHz+20MHz_16QAM_4TX	56440 + 56640	3670 + 3690	13	20.88	21.17	23.31	23.20	33.88	34.17	36.31	36.20
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 56640	3560 + 3690	13	22.18	21.70	22.92	23.13	35.18	34.70	35.92	36.13
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 55540	3560 + 3580	13	22.45	22.02	22.52	22.53	35.45	35.02	35.52	35.53
	LTE_20MHz+20MHz_64QAM_4TX	55890 + 56090	3615 + 3635	13	22.38	21.61	22.03	22.47	35.38	34.61	35.03	35.47
	LTE_20MHz+20MHz_64QAM_4TX	56440 + 56640	3670 + 3690	13	21.75	22.25	23.48	22.53	34.75	35.25	36.48	36.53
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 56640	3560 + 3690	13	21.96	21.98	23.56	23.24	34.96	34.98	36.56	36.24
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 55540	3560 + 3580	13	22.37	20.90	22.68	22.35	35.37	33.90	35.68	35.35
	LTE_20MHz+20MHz_256QAM_4TX	55890 + 56090	3615 + 3635	13	22.45	21.39	22.32	22.47	35.45	34.39	35.32	35.47
	LTE_20MHz+20MHz_256QAM_4TX	56440 + 56640	3670 + 3690	13	21.37	22.23	23.08	22.93	34.37	35.23	36.08	35.93
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 56640	3560 + 3690	13	22.54	20.75	23.18	23.06	35.54	33.75	36.18	36.06

Total EIRP Power (dBm) for certificate													
Mode	Channel	Frequency (MHz)	DG (dB)	Port 1-H (dBm)	Port 2-V (dBm)	Port 3-H (dBm)	Port 4-V (dBm)	Port 1 EIRP-H (dBm)	Port 2 EIRP-V (dBm)	Port 3 EIRP-H (dBm)	Port 4 EIRP-V (dBm)	Total EIRP-H (dBm)	Total EIRP-V (dBm)
Multi Carrier	LTE_20MHz+20MHz_QPSK_4TX	55340 + 55540	3560 + 3580	13	33.80	33.20	34.10	34.00	46.80	46.20	47.10	47.00	49.96
	LTE_20MHz+20MHz_QPSK_4TX	55890 + 56090	3615 + 3635	13	34.40	33.50	34.30	34.30	47.40	46.50	47.30	47.30	50.36
	LTE_20MHz+20MHz_QPSK_4TX	56440 + 56640	3670 + 3690	13	33.00	32.80	33.30	33.20	46.00	45.80	46.30	46.20	49.16
	LTE_20MHz+20MHz_QPSK_4TX	55340 + 56640	3560 + 3690	13	33.70	32.80	33.00	32.90	46.70	45.80	46.00	45.90	49.37
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 55540	3560 + 3580	13	34.00	33.20	33.80	33.80	47.00	46.20	46.80	46.80	49.91
	LTE_20MHz+20MHz_16QAM_4TX	55890 + 56090	3615 + 3635	13	32.90	32.50	35.20	35.30	45.90	45.50	48.20	48.30	50.21
	LTE_20MHz+20MHz_16QAM_4TX	56440 + 56640	3670 + 3690	13	32.40	32.50	34.50	34.30	45.40	45.50	47.50	47.30	49.59
	LTE_20MHz+20MHz_16QAM_4TX	55340 + 56640	3560 + 3690	13	33.50	32.90	34.50	34.10	46.50	45.90	47.50	47.10	50.04
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 55540	3560 + 3580	13	33.90	33.00	33.60	33.80	46.90	46.00	46.80	46.80	49.76
	LTE_20MHz+20MHz_64QAM_4TX	55890 + 56090	3615 + 3635	13	33.00	32.80	33.00	33.40	46.00	45.90	46.00	46.40	49.01
	LTE_20MHz+20MHz_64QAM_4TX	56440 + 56640	3670 + 3690	13	32.90	32.60	34.50	34.30	45.90	45.60	47.50	47.30	49.78
	LTE_20MHz+20MHz_64QAM_4TX	55340 + 56640	3560 + 3690	13	33.30	32.80	34.30	34.30	46.30	45.80	47.30	47.30	49.84
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 55540	3560 + 3580	13	33.00	32.40	33.40	33.40	46.00	45.40	46.40	46.40	49.21
	LTE_20MHz+20MHz_256QAM_4TX	56440 + 56640	3670 + 3690	13	32.80	33.40	33.70	33.00	45.80	46.40	46.70	46.00	49.28
	LTE_20MHz+20MHz_256QAM_4TX	55340 + 56640	3560 + 3690	13	33.90	32.20	34.30	34.40	46.90	45.20	47.30	47.40	50.11

Note:

The device has two cross-polarized antenna set that the transmitter outputs is a 90-degree phase-shifted replica of the other and the phase centers of the two antennas are co-located.

Refer to KDB 662911 D02, EIRP and EIRP PSD of each polarization should be individually be below the limit.

Antenna 1 and antenna 3 are horizontal polarized while antenna 2 and antenna 4 are vertical polarized.

Antenna 1 and Antenna 2 always transmit on the same radio carrier frequency Fa.

Antenna 3 and Antenna 4 always transmit on the same radio carrier frequency Fb.

(Fa and Fb do not overlap to each other.)

Therefore EIRP PSD of each antenna should be individually be below the limit.

EIRP total power of horizontal = DG + total conducted power (Port 1+ Port 3)

EIRP total power of vertical = DG + total conducted power (Port 2+ Port 4)

Remark: The reported test results are within the scope of the declared tolerances by the Manufacturer.



LTE Band 48

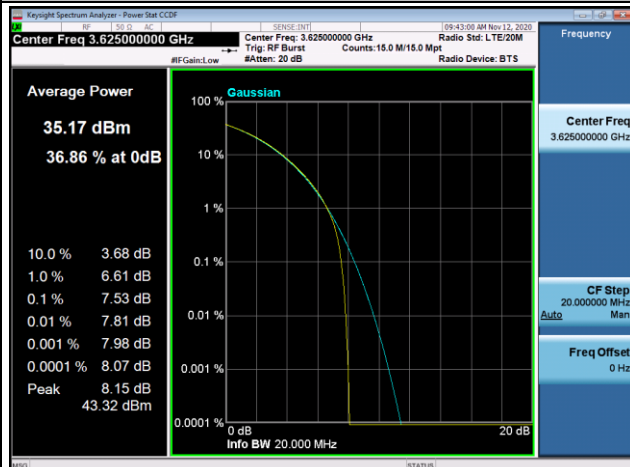
Peak-to-Average Ratio

Mode	LTE Band 48 / 20MHz				
Channel	Middle CH				Limit: 13dB
Conducted Port	1	2	3	4	
Mod. QPSK	7.81	8.08	7.95	7.92	PASS
Mod. 16QAM	7.95	8.16	7.92	7.92	PASS
Mod. 64QAM	7.94	8.08	8.02	7.94	PASS
Mod. 256QAM	8.06	8.08	8.05	7.95	PASS

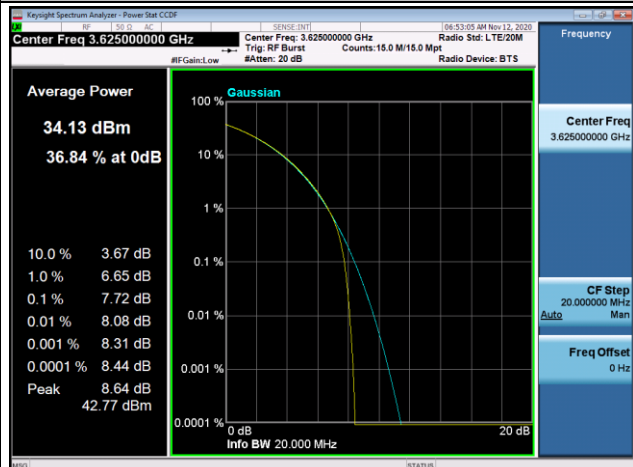


LTE Band 48 / 20MHz / QPSK

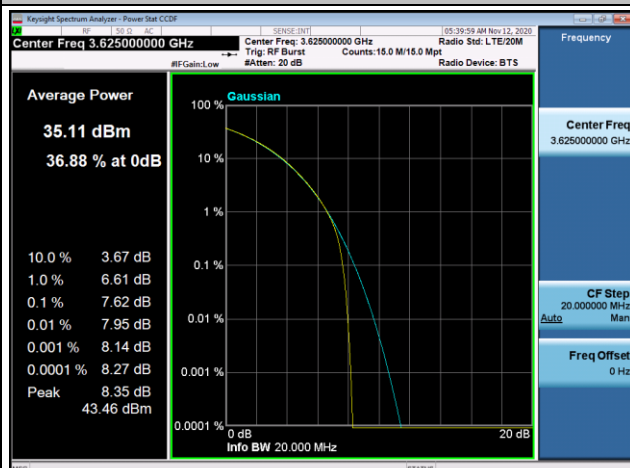
Port 1



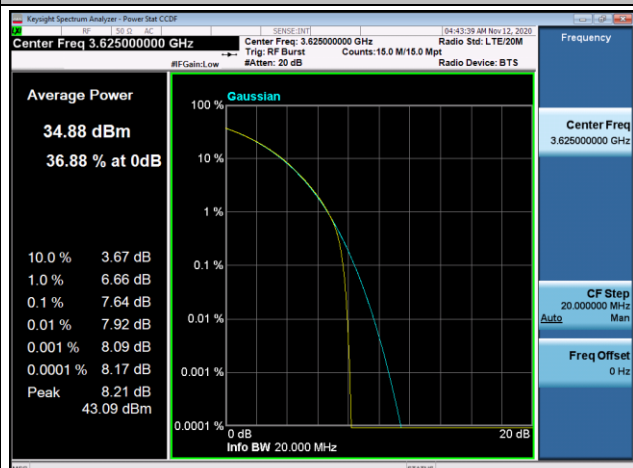
Port 2



Port 3



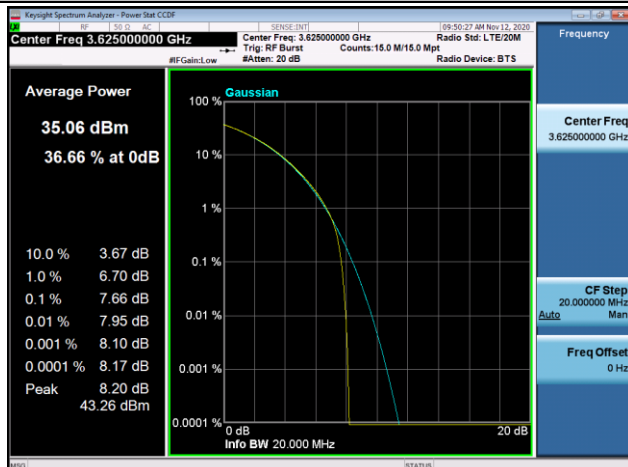
Port 4



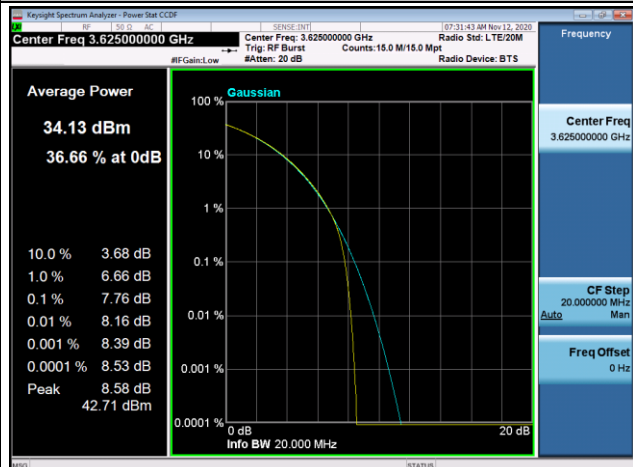


LTE Band 48 / 20MHz / 16QAM

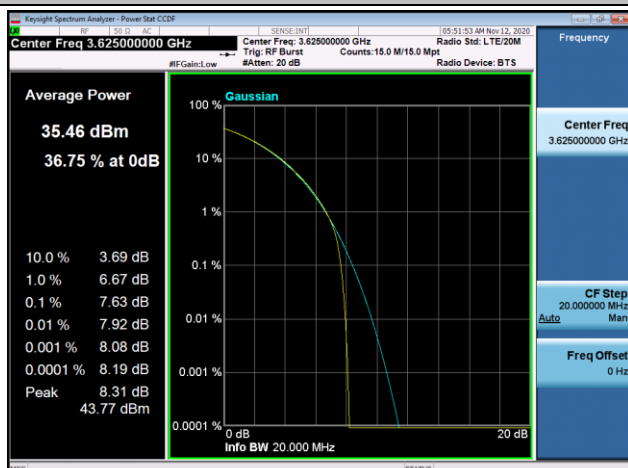
Port 1



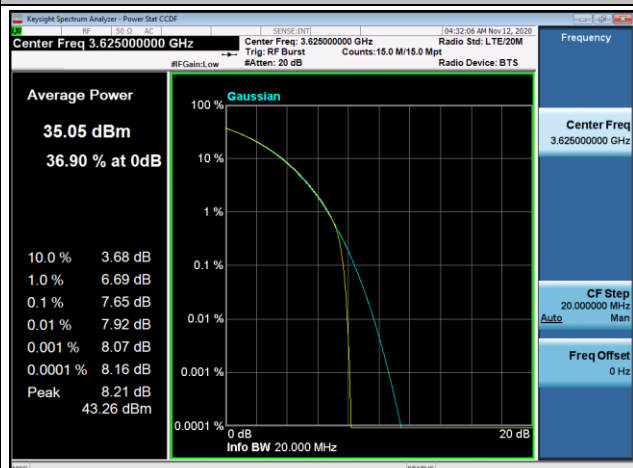
Port 2



Port 3



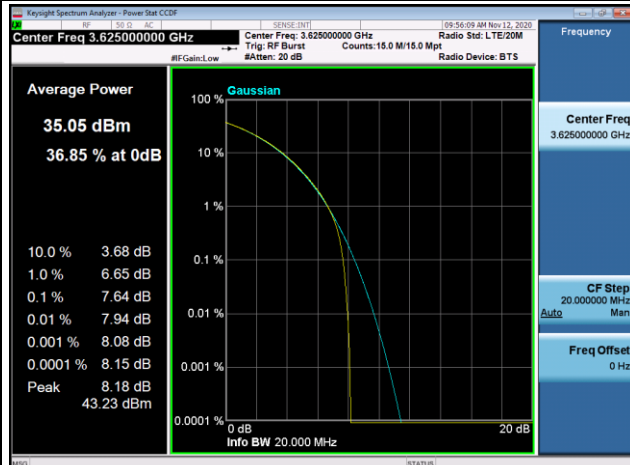
Port 4



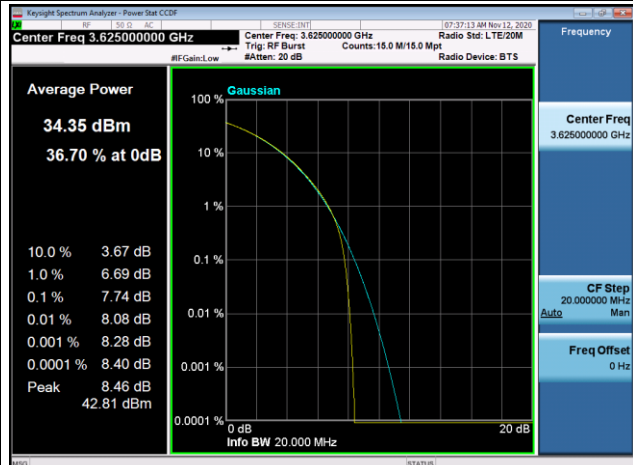


LTE Band 48 / 20MHz / 64QAM

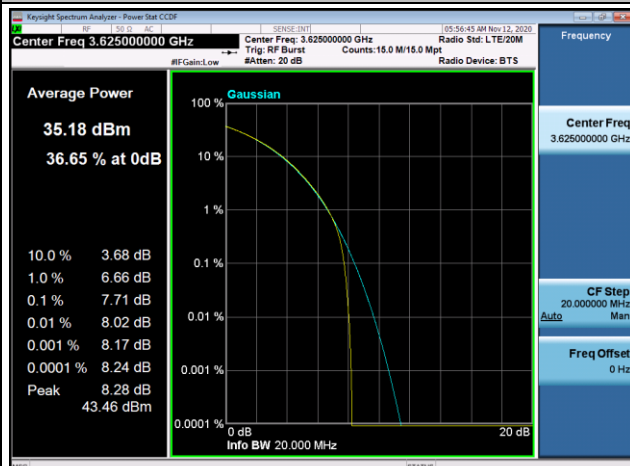
Port 1



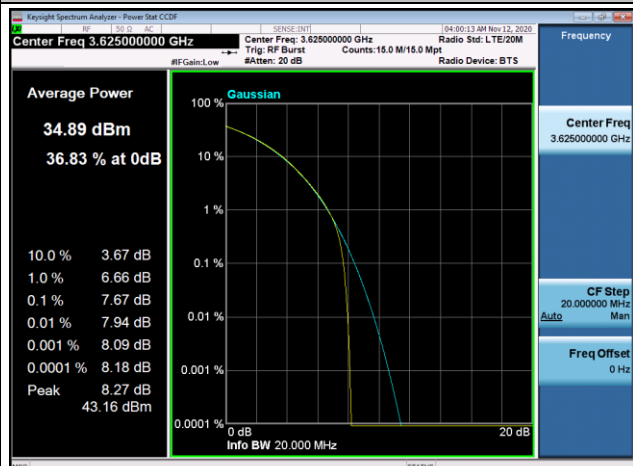
Port 2



Port 3



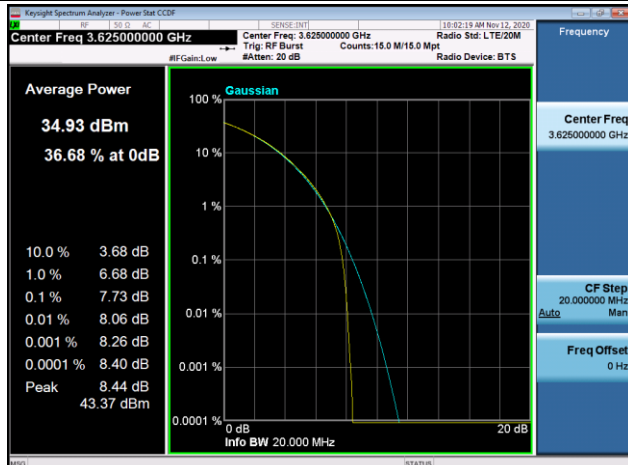
Port 4



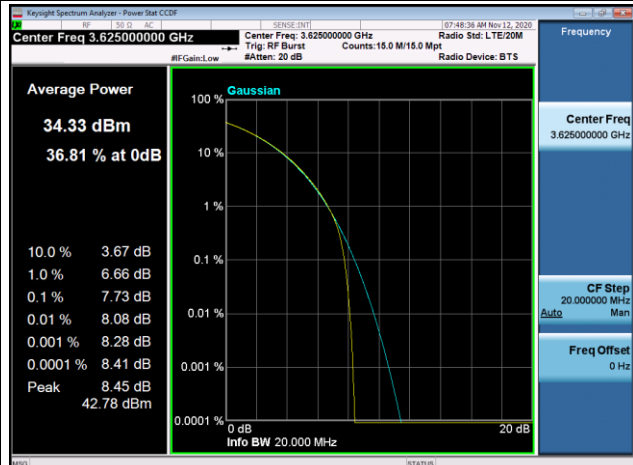


LTE Band 48 / 20MHz / 256QAM

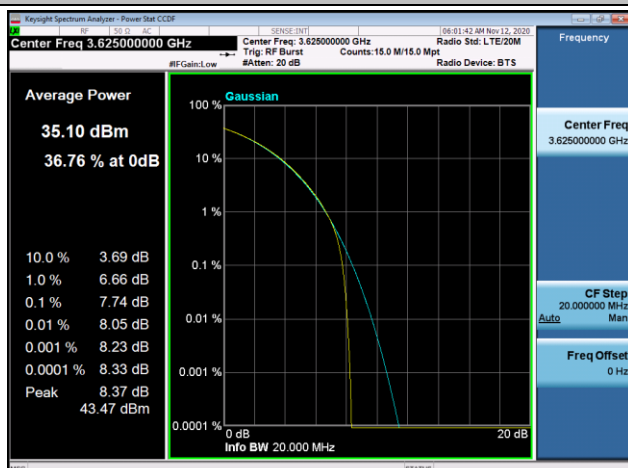
Port 1



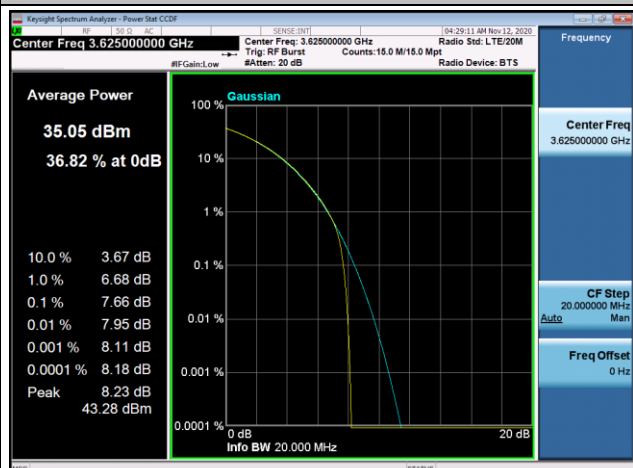
Port 2



Port 3



Port 4



26dB Bandwidth

Mode	LTE Band 48 : 26dB BW(MHz)			
Bandwidth	10 MHz			
Conducted Port	1	2	3	4
Mod. QPSK	9.63	9.65	9.63	9.63
Mod. 16QAM	9.69	9.63	9.59	9.59
Mod. 64QAM	9.61	9.67	9.67	9.63
Mod. 256QAM	9.75	9.73	9.73	9.71

Mode	LTE Band 48 : 26dB BW(MHz)			
Bandwidth	20 MHz			
Conducted Port	1	2	3	4
Mod. QPSK	18.701	18.781	18.741	18.741
Mod. 16QAM	18.781	18.661	18.701	18.661
Mod. 64QAM	18.701	18.621	18.701	18.741
Mod. 256QAM	18.661	18.821	18.781	18.981

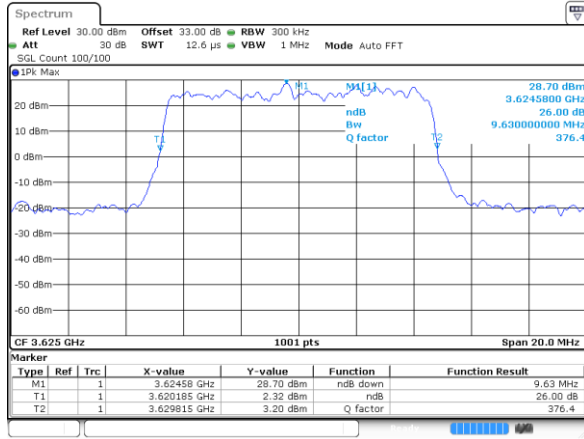
Mode	LTE Band 48 : 26dB BW(MHz)	
Bandwidth	20MHz + 20MHz	
Conducted Port	Port 1 + Port 3	
Mod. QPSK	39.161	
Mod. 16QAM	39.001	
Mod. 64QAM	39.081	
Mod. 256QAM	39.161	

Mode	LTE Band 48 : 26dB BW(MHz)	
Bandwidth	20MHz + 20MHz	
Conducted Port	Port 2 + Port 4	
Mod. QPSK	39.241	
Mod. 16QAM	39.161	
Mod. 64QAM	39.161	
Mod. 256QAM	39.161	

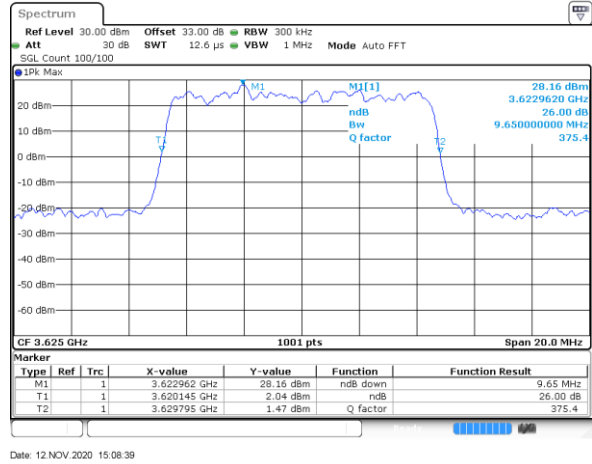


LTE Band 48 / 10MHz / QPSK

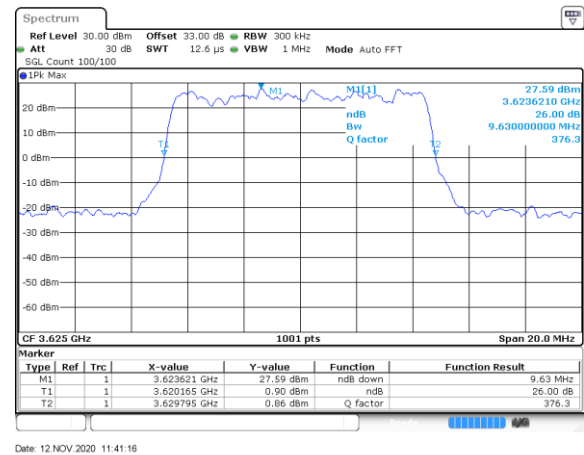
Port 1



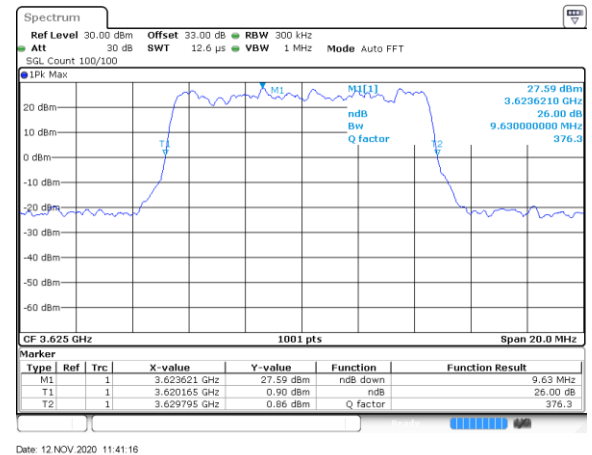
Port 2



Port 3



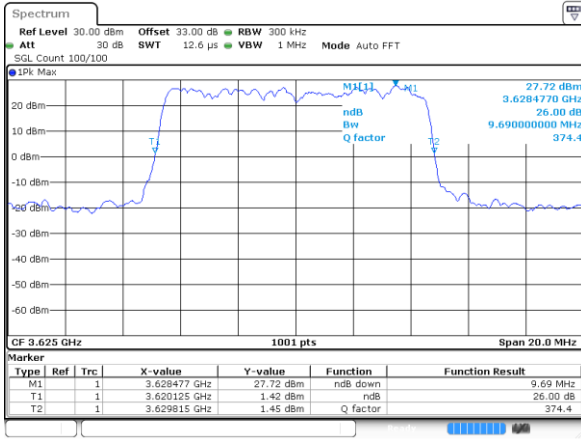
Port 4



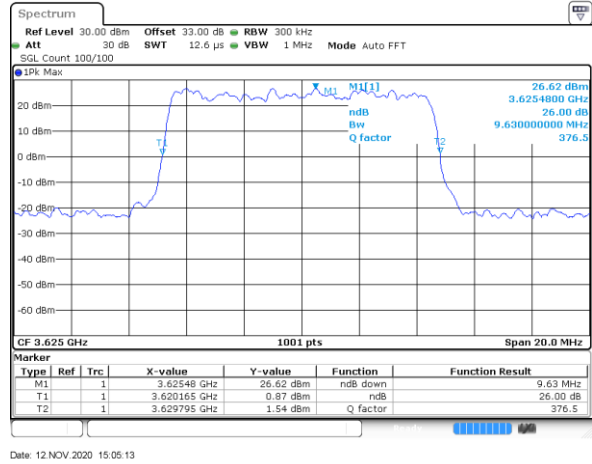


LTE Band 48 / 10MHz / 16QAM

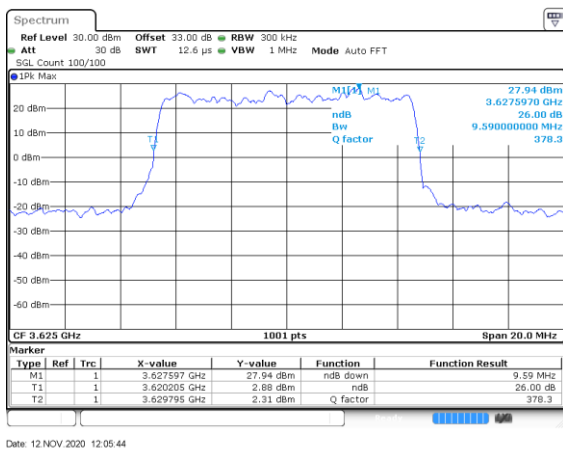
Port 1



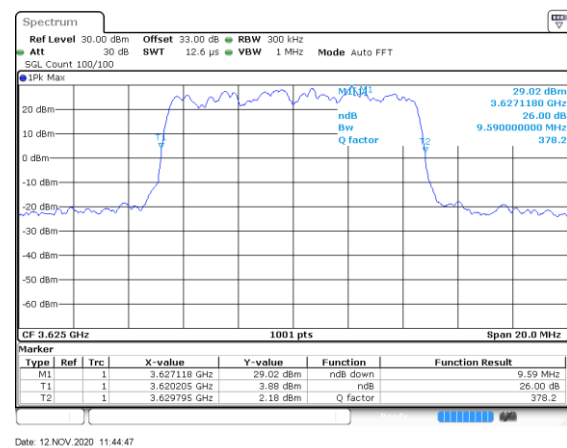
Port 2



Port 3



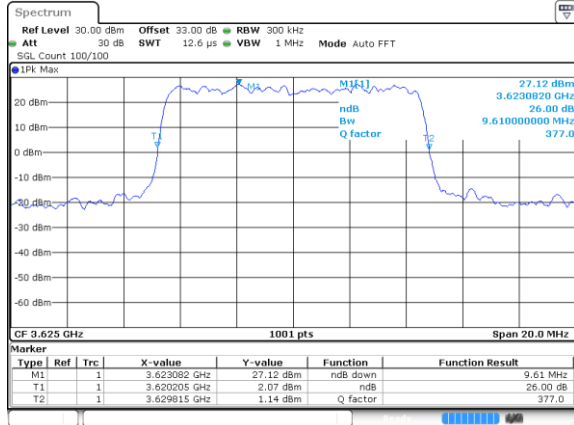
Port 4



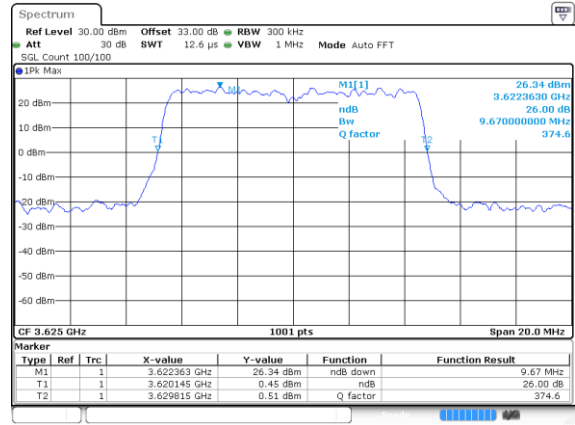


LTE Band 48 / 10MHz / 64QAM

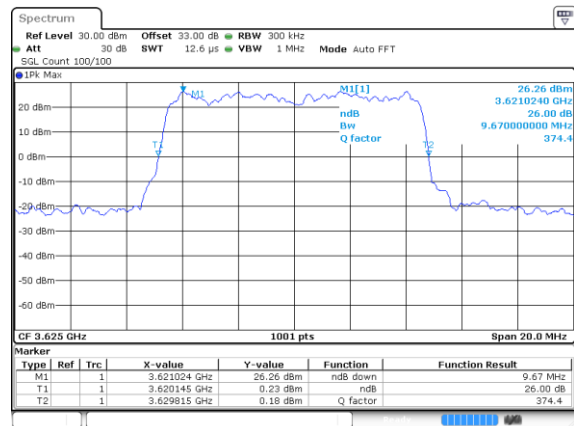
Port 1



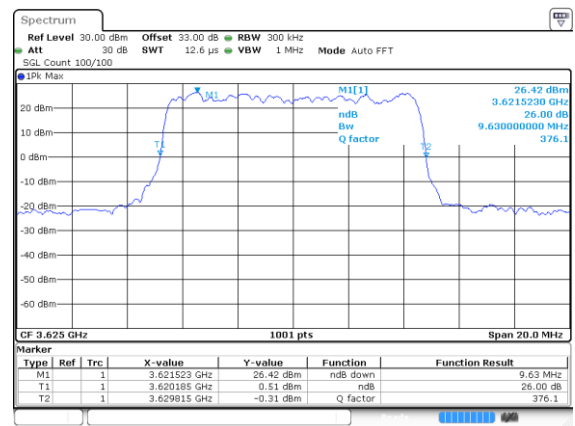
Port 2



Port 3

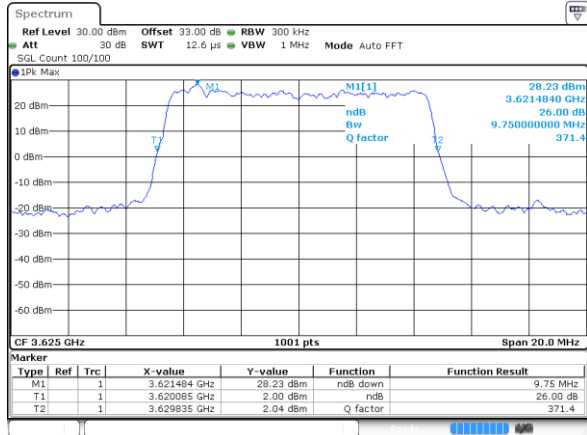


Port 4

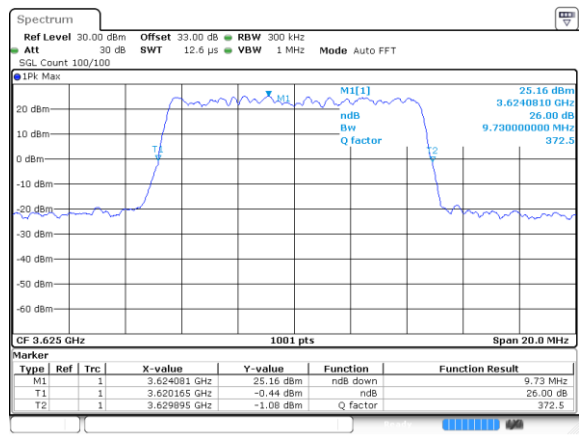


LTE Band 48 / 10MHz / 256QAM

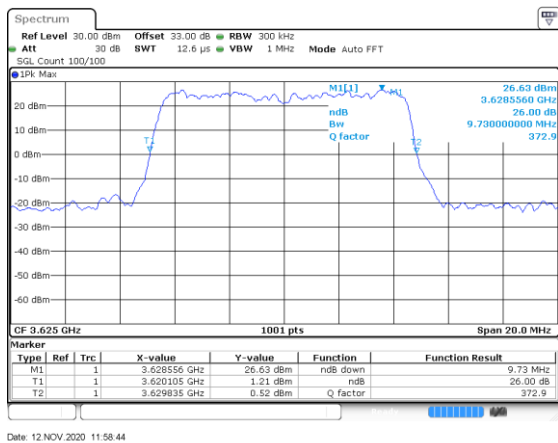
Port 1



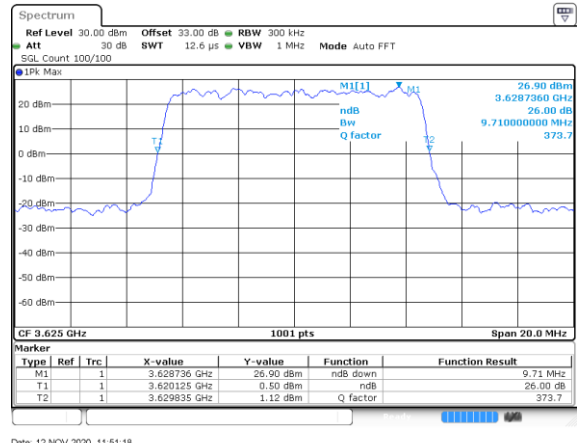
Port 2



Port 3



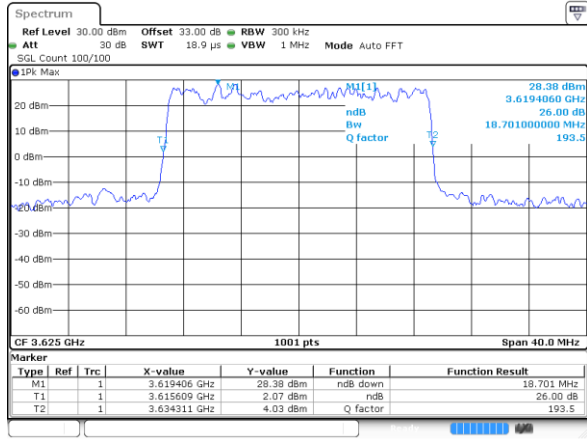
Port 4



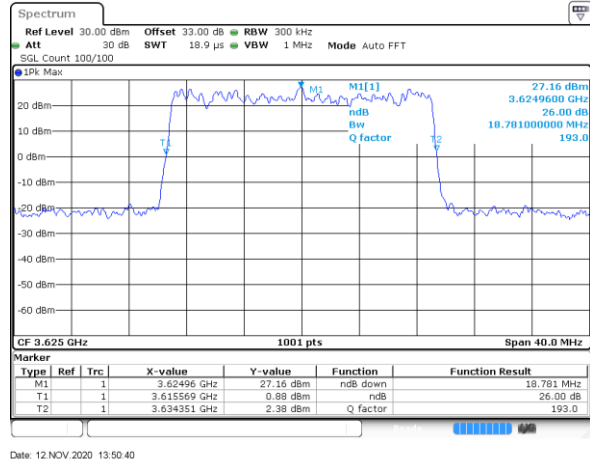


LTE Band 48 / 20MHz / QPSK

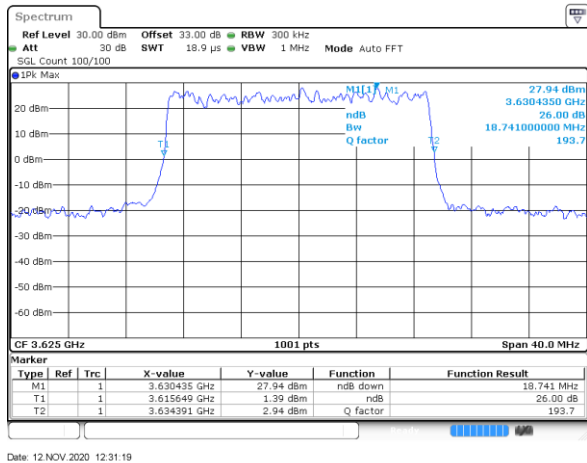
Port 1



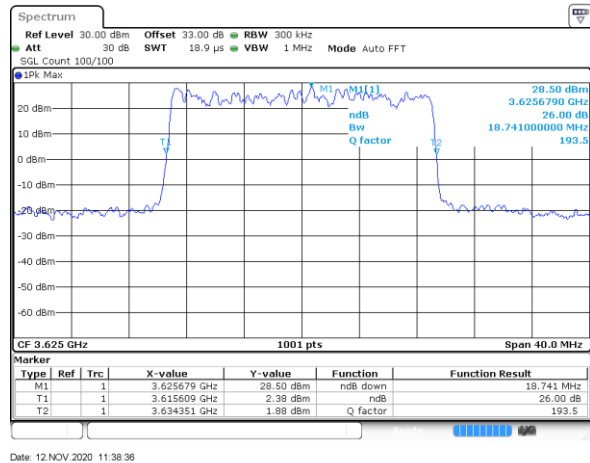
Port 2



Port 3



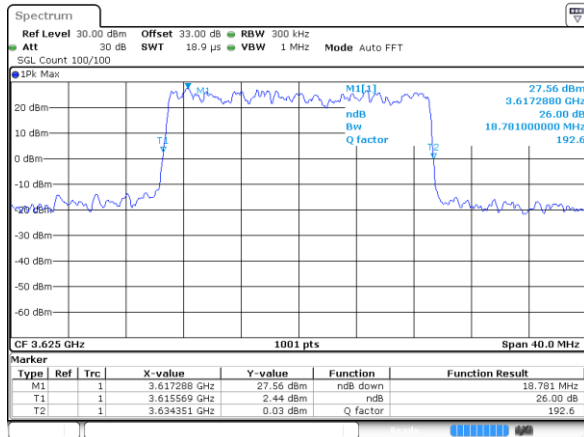
Port 4



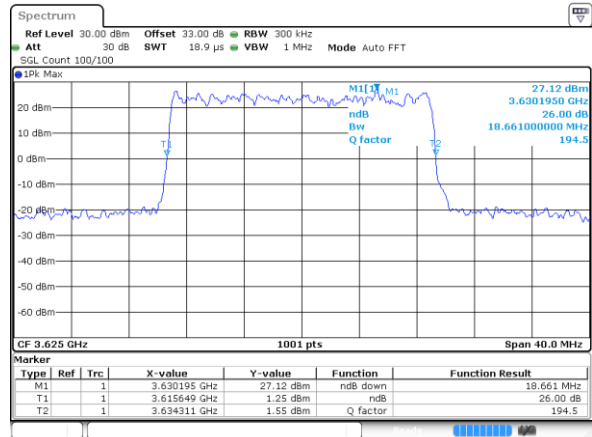


LTE Band 48 / 20MHz / 16QAM

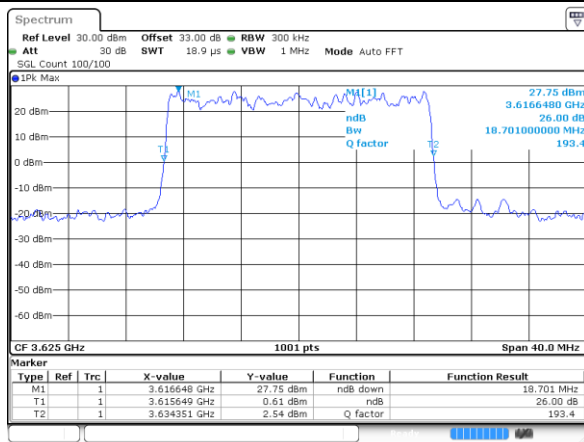
Port 1



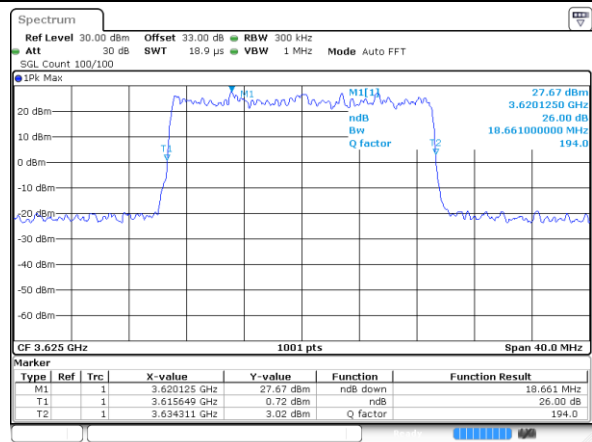
Port 2



Port 3



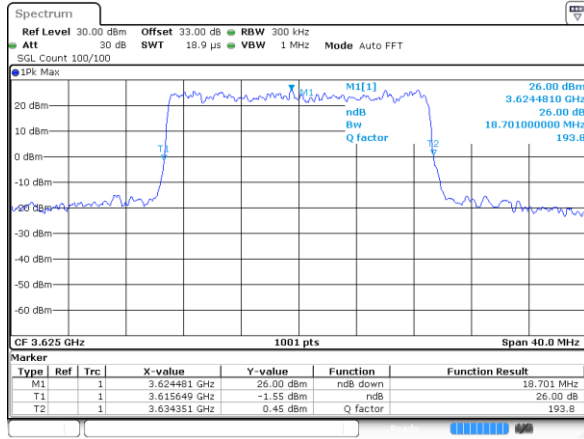
Port 4



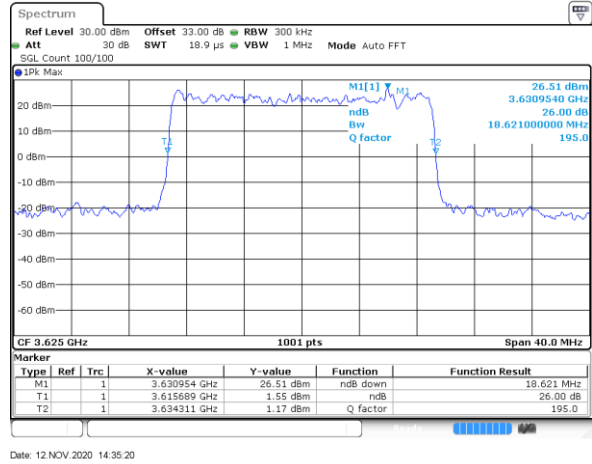


LTE Band 48 / 20MHz / 64QAM

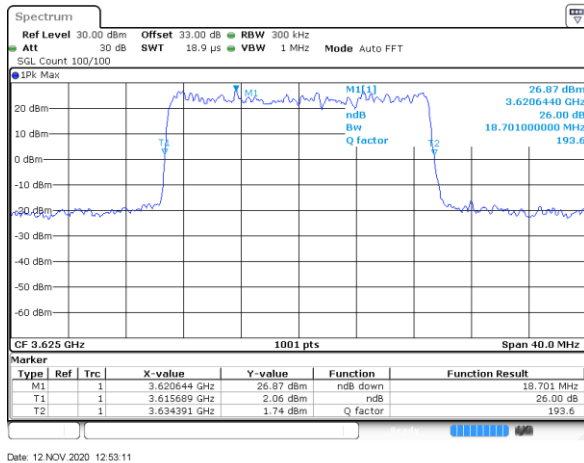
Port 1



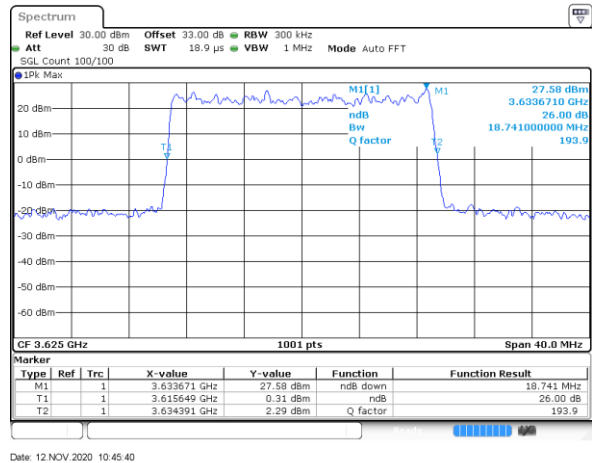
Port 2



Port 3



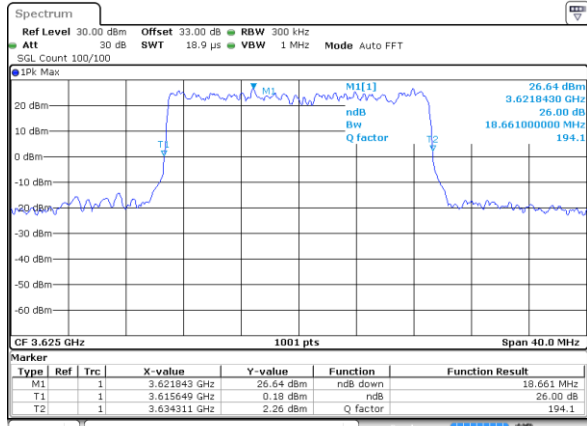
Port 4





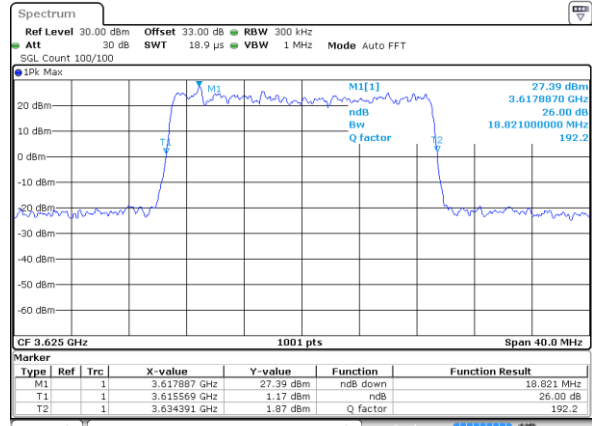
LTE Band 48 / 20MHz / 256QAM

Port 1



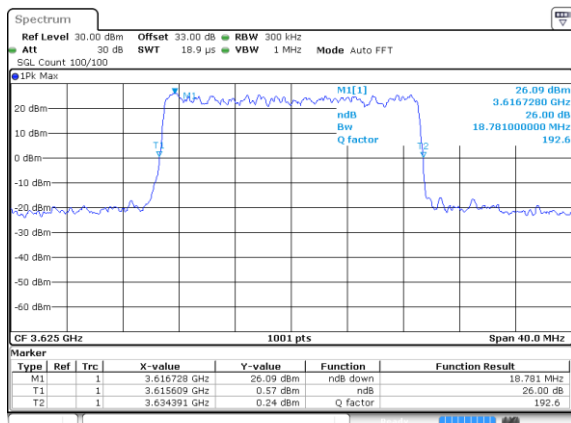
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Port 2



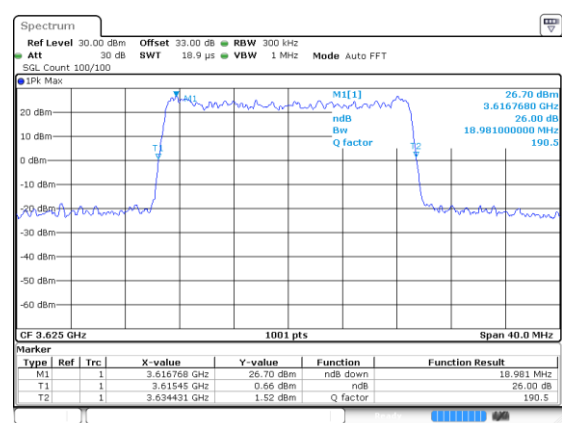
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Port 3



Date: 12 NOV 2020 12:57:58

Port 4

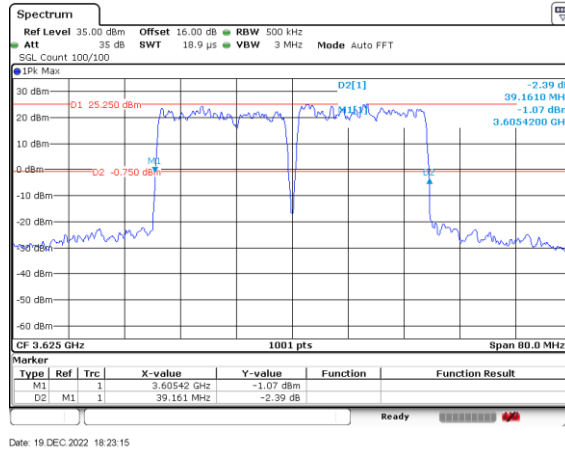


Date: 12 NOV 2020 10:39:32



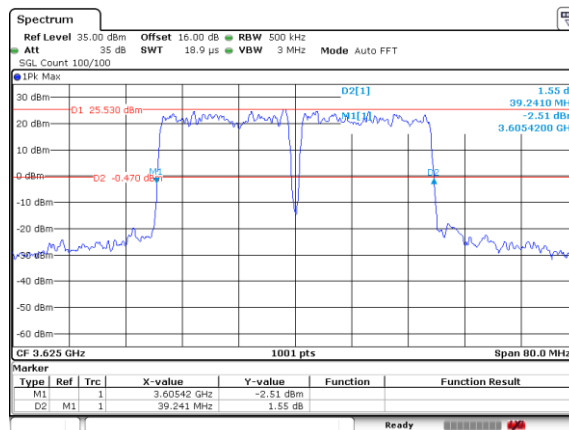
LTE Band 48 / QPSK

20MHz + 20MHz (Port 1 + Port 3)



Date: 19 DEC 2022 18:23:15

20MHz + 20MHz (Port 2 + Port 4)

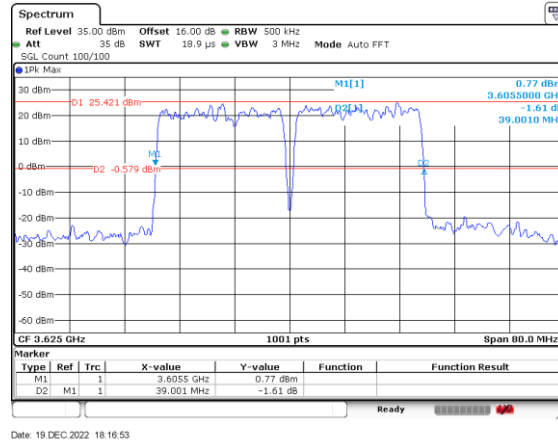


Date: 19 DEC 2022 18:35:25



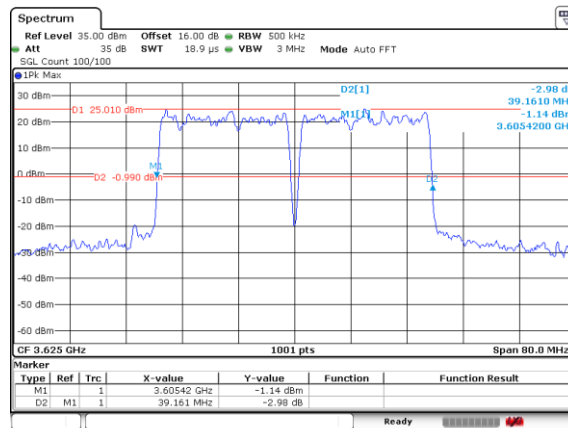
LTE Band 48 / 16QAM

20MHz + 20MHz (Port 1 + Port 3)



Date: 19 DEC 2022 18:16:53

20MHz + 20MHz (Port 2 + Port 4)

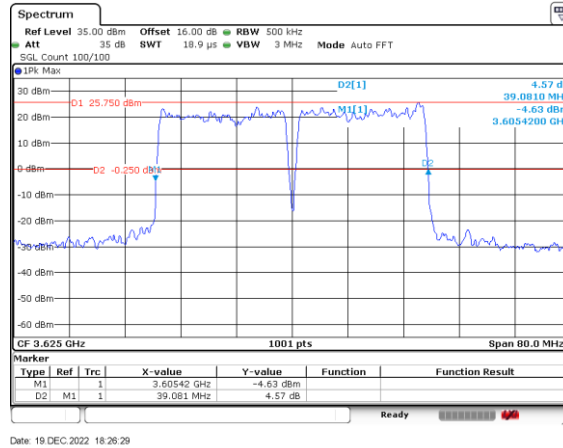


Date: 19 DEC 2022 18:41:27

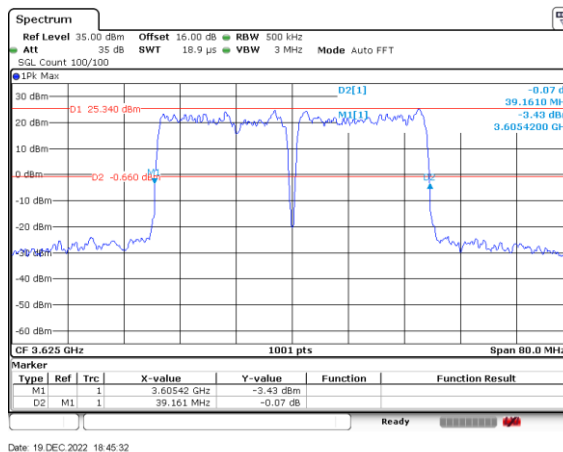


LTE Band 48 / 64QAM

20MHz + 20MHz (Port 1 + Port 3)



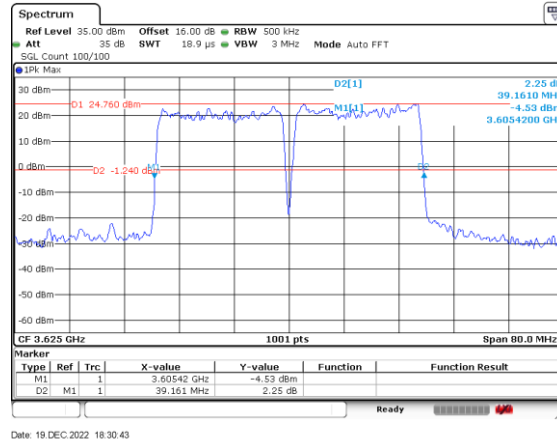
20MHz + 20MHz (Port 2 + Port 4)



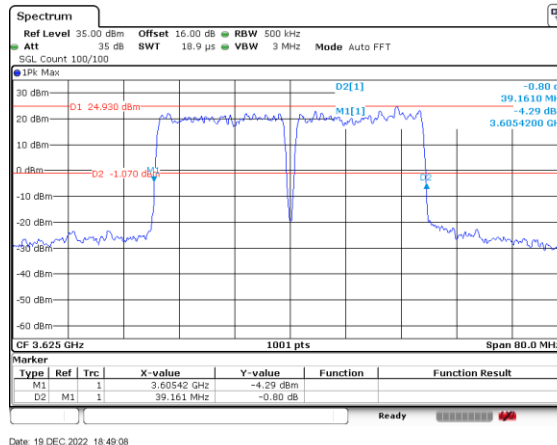


LTE Band 48 / 256QAM

20MHz + 20MHz (Port 1 + Port 3)



20MHz + 20MHz (Port 2 + Port 4)



Occupied Bandwidth

Mode	LTE Band 48 : 99% OBW(MHz)			
Bandwidth	10 MHz			
Conducted Port	1	2	3	4
Mod. QPSK	8.991	8.951	8.991	8.931
Mod. 16QAM	8.991	9.031	8.951	8.951
Mod. 64QAM	8.991	8.971	8.971	9.011
Mod. 256QAM	9.011	8.951	9.011	9.031

Mode	LTE Band 48 : 99% OBW(MHz)			
Bandwidth	20 MHz			
Conducted Port	1	2	3	4
Mod. QPSK	17.902	17.982	17.902	17.902
Mod. 16QAM	17.942	17.942	17.902	17.862
Mod. 64QAM	17.982	17.982	17.942	17.902
Mod. 256QAM	17.902	17.862	17.902	17.942

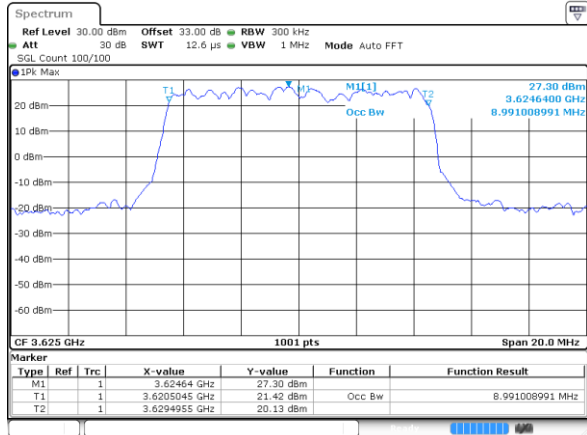
Mode	LTE Band 48 : 99% OBW(MHz)	
Bandwidth	20MHz + 20MHz	
Conducted Port	Port 1 + Port 3	
Mod. QPSK	38.121	
Mod. 16QAM	38.201	
Mod. 64QAM	38.201	
Mod. 256QAM	38.041	

Mode	LTE Band 48 : 99% OBW(MHz)	
Bandwidth	20MHz + 20MHz	
Conducted Port	Port 2 + Port 4	
Mod. QPSK	37.962	
Mod. 16QAM	38.121	
Mod. 64QAM	38.361	
Mod. 256QAM	38.041	

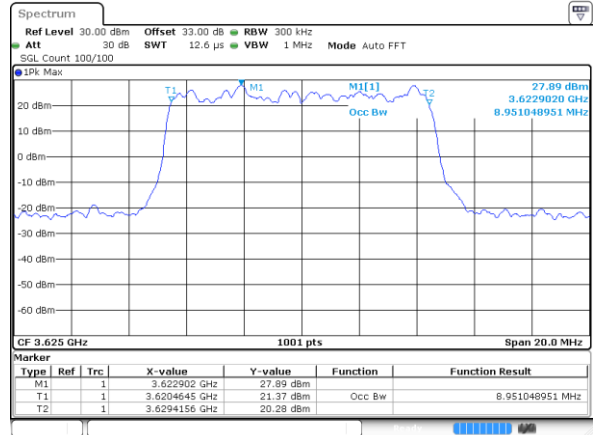


LTE Band 48 / 10MHz / QPSK

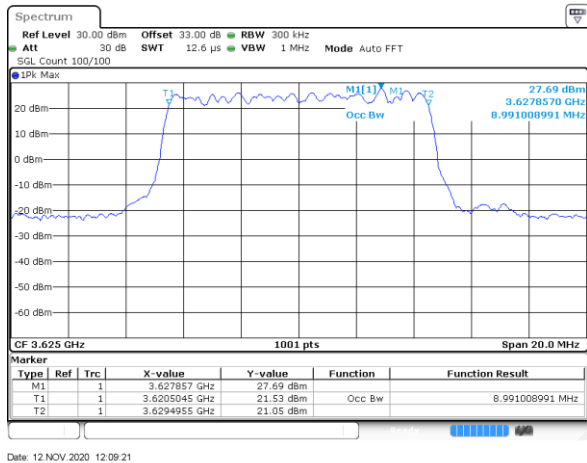
Port 1



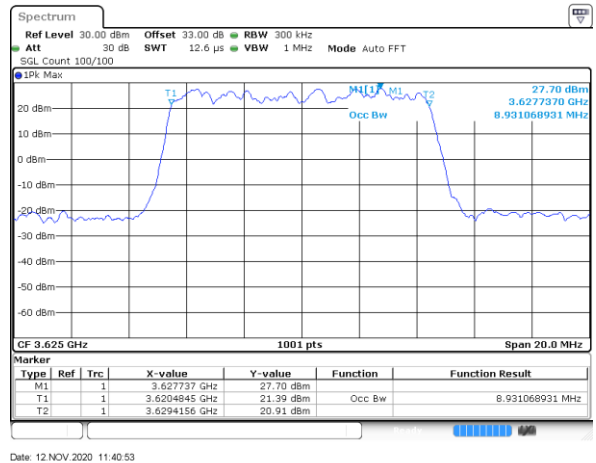
Port 2



Port 3



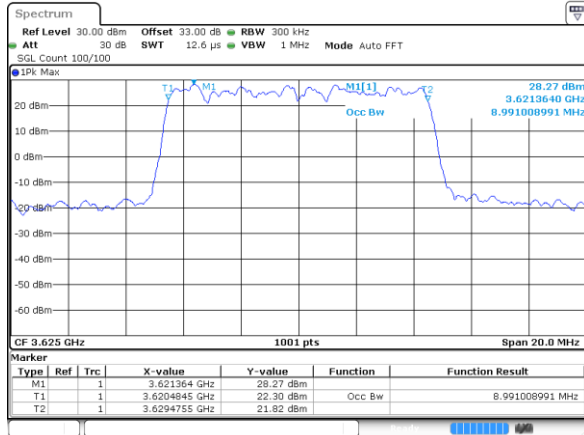
Port 4



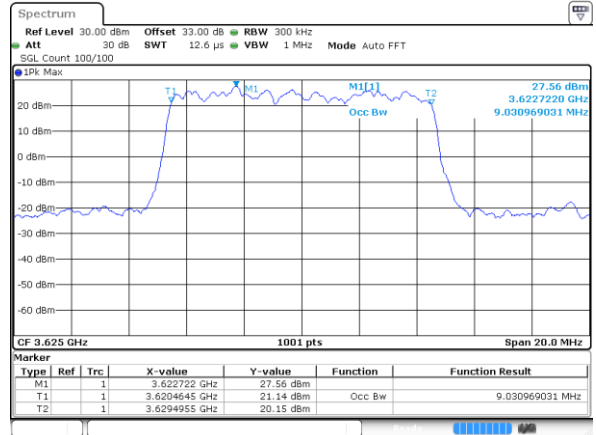


LTE Band 48 / 10MHz / 16QAM

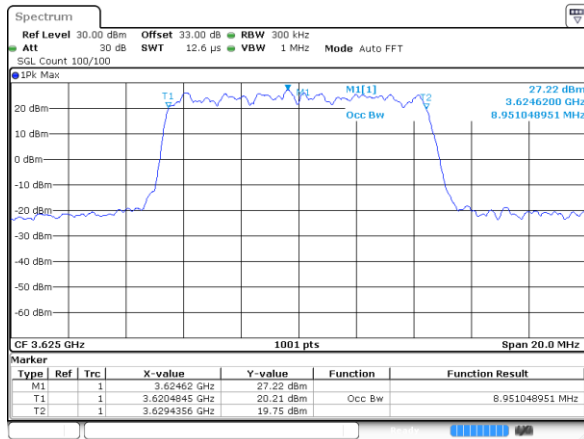
Port 1



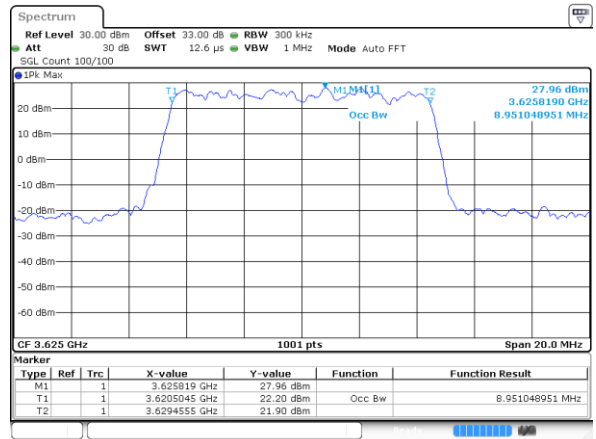
Port 2



Port 3



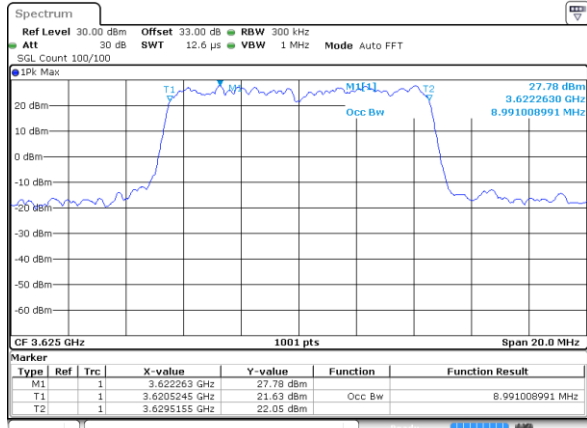
Port 4





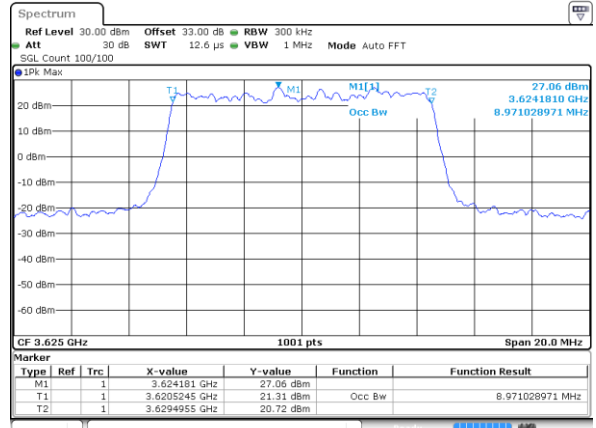
LTE Band 48 / 10MHz / 64QAM

Port 1



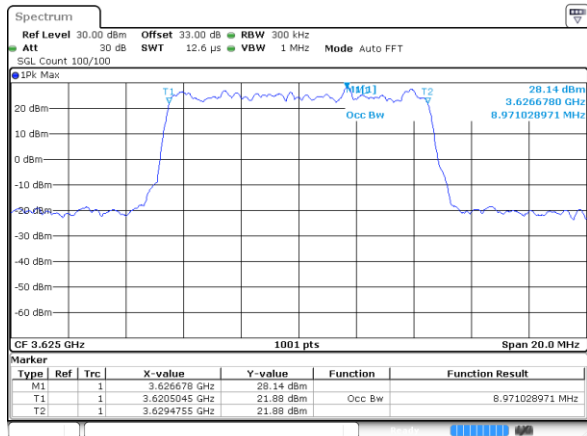
Date: 12 NOV 2020 16:21:30

Port 2



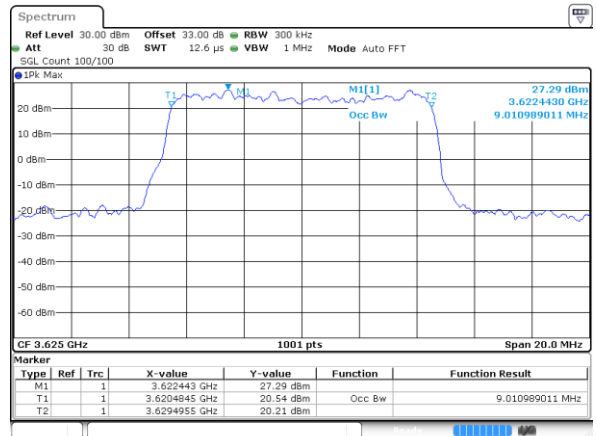
Date: 12 NOV 2020 14:55:58

Port 3



Date: 12 NOV 2020 12:00:57

Port 4

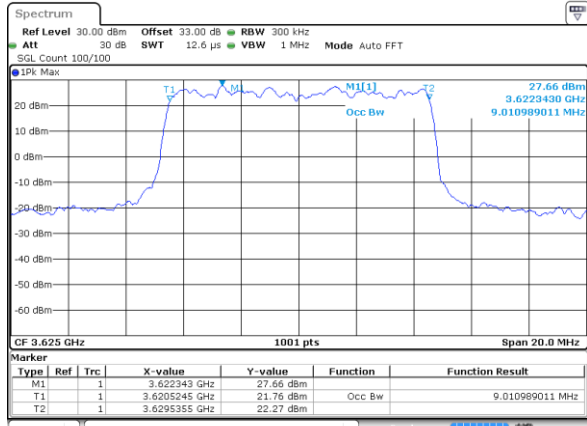


Date: 12 NOV 2020 11:48:08

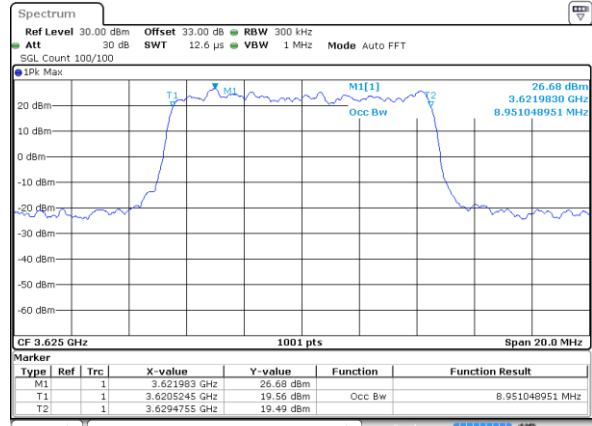


LTE Band 48 / 10MHz / 256QAM

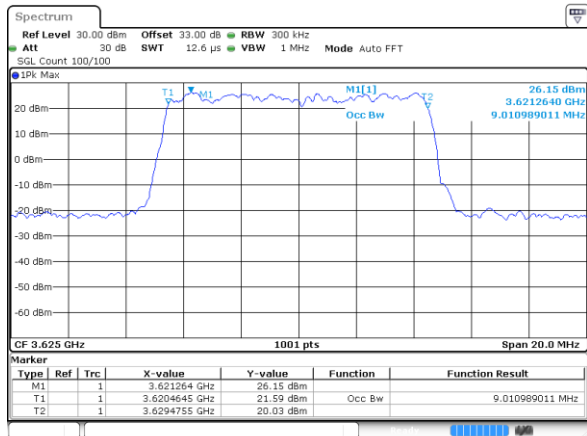
Port 1



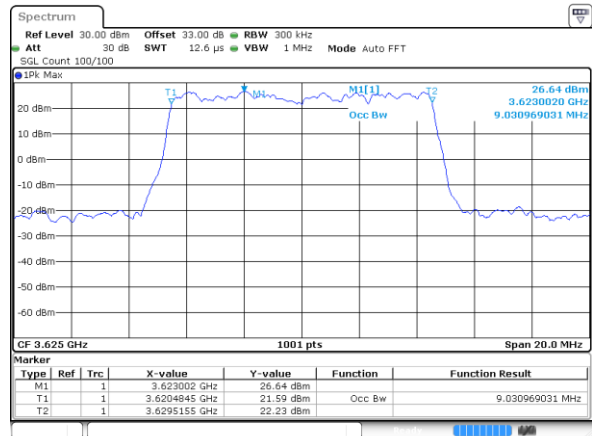
Port 2



Port 3



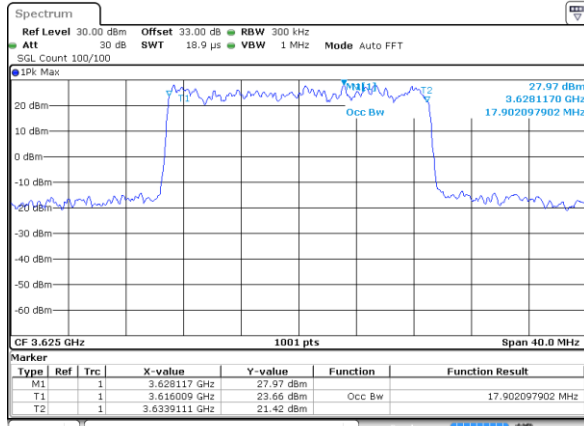
Port 4





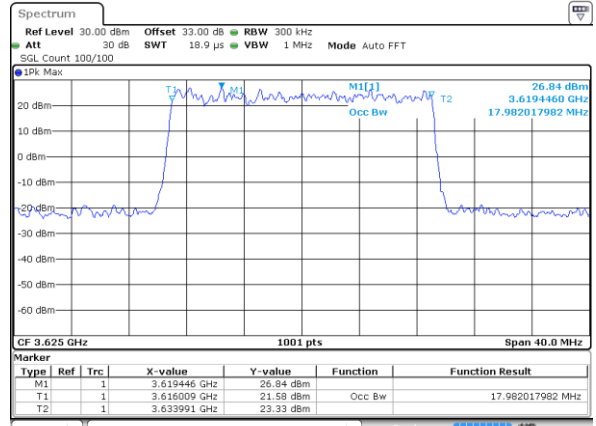
LTE Band 48 / 20MHz / QPSK

Port 1



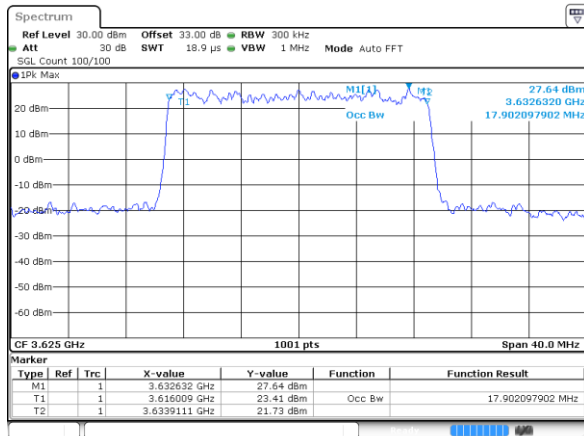
Date: 12 NOV 2020 16:37:12

Port 2



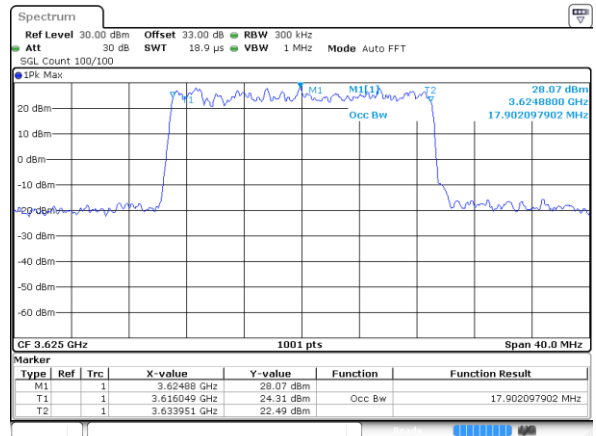
Date: 12 NOV 2020 13:48:06

Port 3



Date: 12 NOV 2020 12:30:44

Port 4

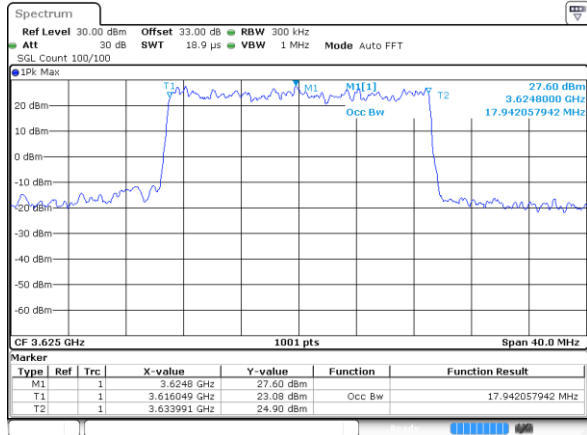


Date: 12 NOV 2020 11:38:23



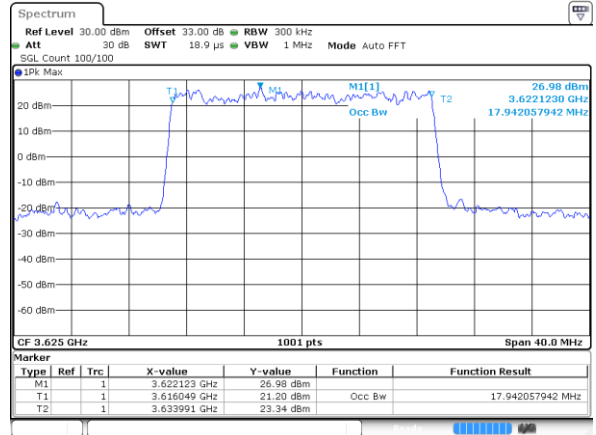
LTE Band 48 / 20MHz / 16QAM

Port 1



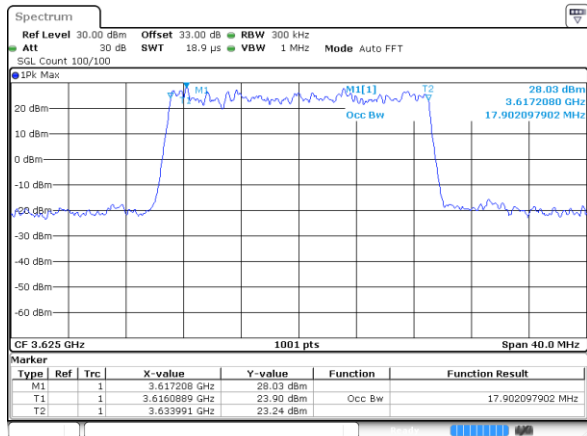
Date: 12 NOV 2020 16:45:05

Port 2



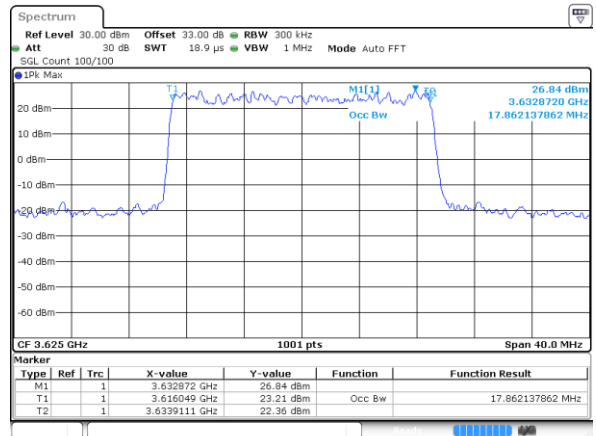
Date: 12 NOV 2020 14:27:48

Port 3



Date: 12 NOV 2020 12:49:14

Port 4

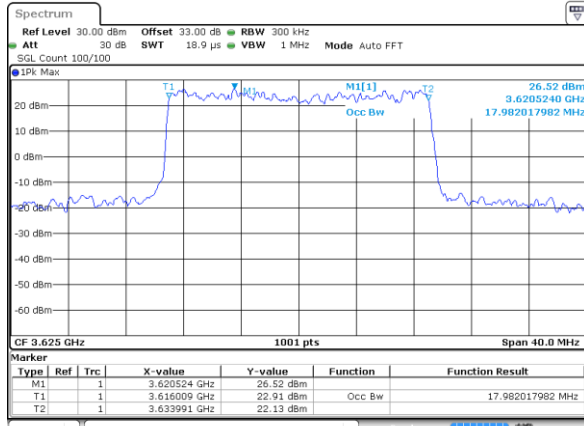


Date: 12 NOV 2020 11:28:14



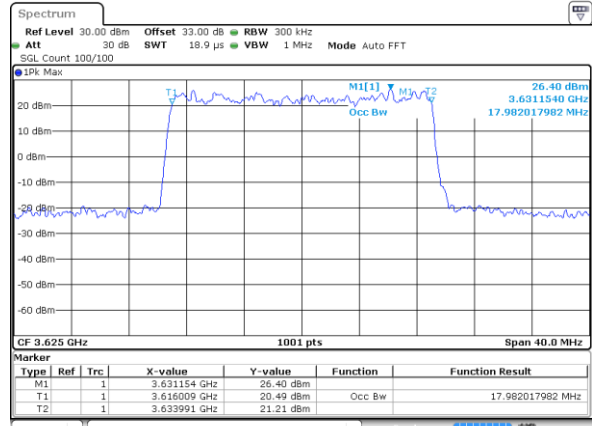
LTE Band 48 / 20MHz / 64QAM

Port 1



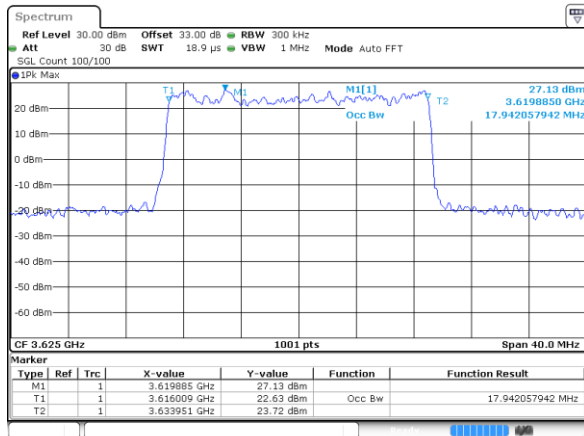
Date: 12 NOV 2020 16:48:56

Port 2



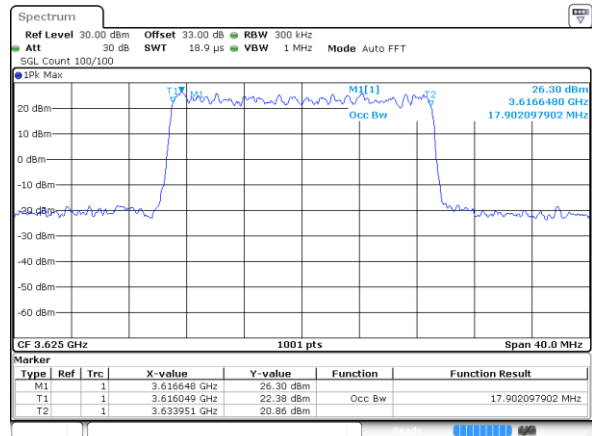
Date: 12 NOV 2020 14:34:48

Port 3



Date: 12 NOV 2020 12:52:55

Port 4

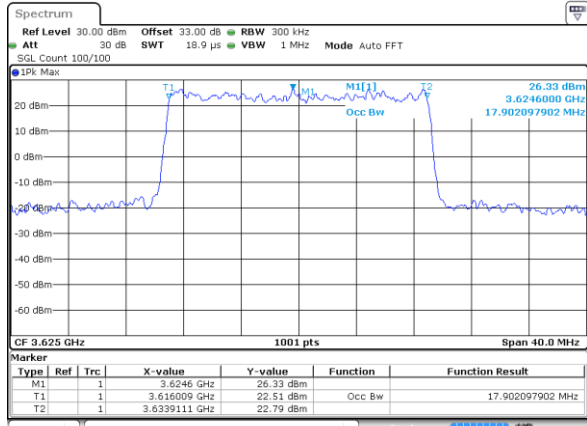


Date: 12 NOV 2020 10:45:17



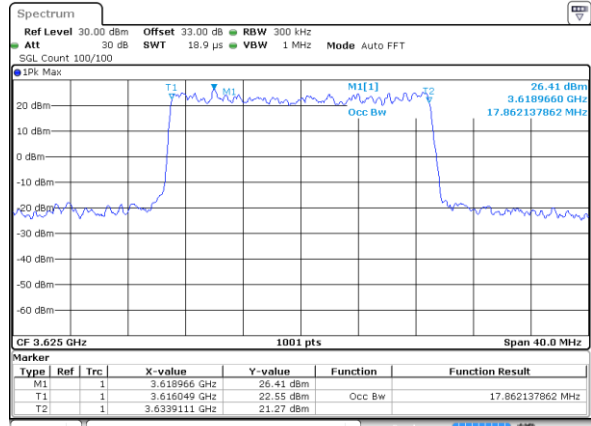
LTE Band 48 / 20MHz / 256QAM

Port 1



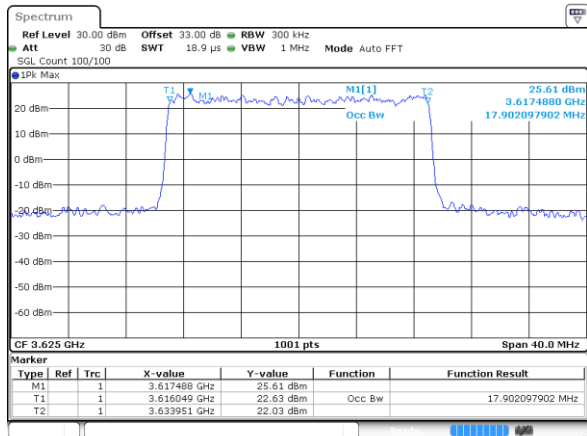
Date: 12 NOV 2020 16:59:21

Port 2



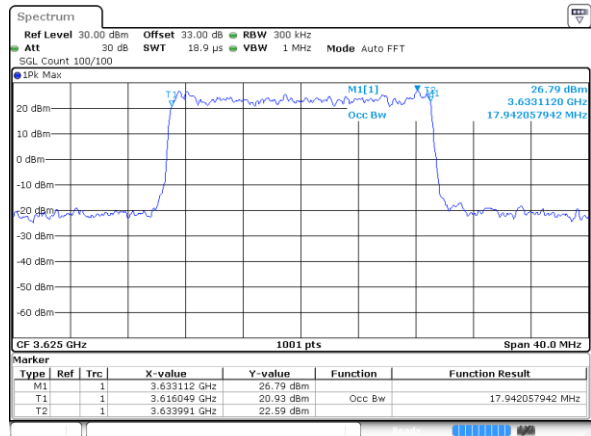
Date: 12 NOV 2020 14:44:38

Port 3



Date: 12 NOV 2020 12:57:32

Port 4

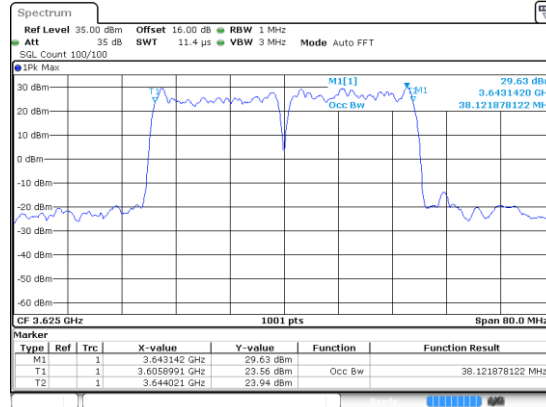


Date: 12 NOV 2020 10:38:30



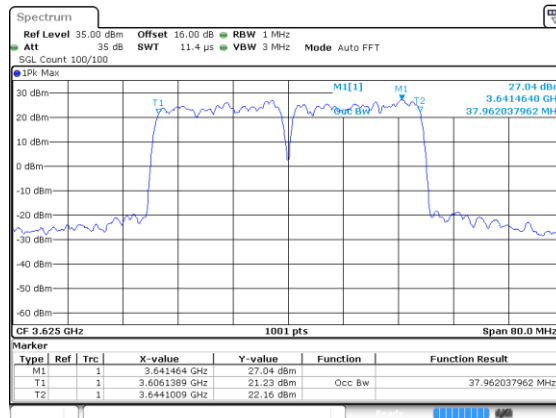
LTE Band 48 / QPSK

20MHz + 20MHz (Port 1 + Port 3)



Date: 19 DEC 2022 19:22:12

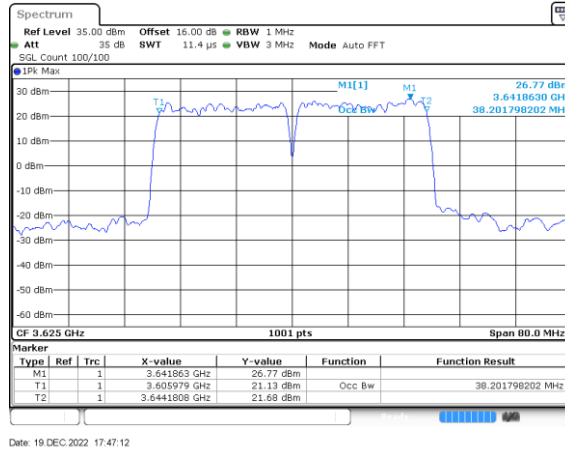
20MHz + 20MHz (Port 2 + Port 4)



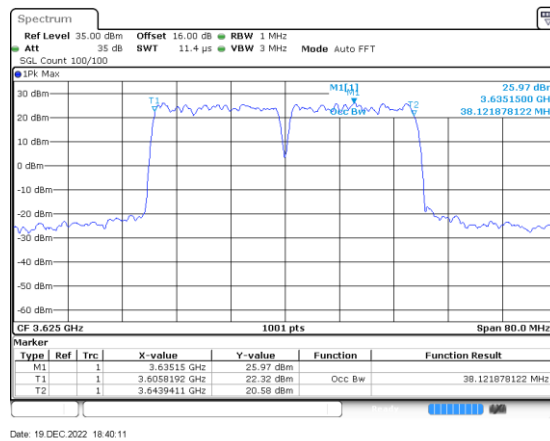
Date: 19 DEC 2022 18:37:56

LTE Band 48 / 16QAM

20MHz + 20MHz (Port 1 + Port 3)



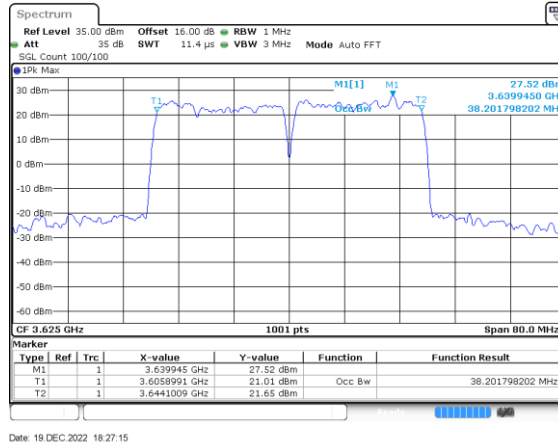
20MHz + 20MHz (Port 2 + Port 4)





LTE Band 48 / 64QAM

20MHz + 20MHz (Port 1 + Port 3)



20MHz + 20MHz (Port 2 + Port 4)

