TESTREPORT

Applicant Name :	Teleworld FZCO
Address :	C16 Warehouse Dubai Airport Free Zone
Report Number :	SZNS220908-40742E-RF-00B
FCC ID:	2A8I7DG10

Test Standard (s)

FCC PART 96

Sample Description

Product Type:	CBRS USB Dongle
Model No.:	DG10
Multiple Model(s) No.:	N/A
Trade Mark:	Horizon
Date Received:	2022/09/08
Report Date:	2022/11/12

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Andy Yu
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Shenzhen Accurate Technology Co., Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".
This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	LTE Band 48: 3550-3700MHz (TX/RX)
Modulation Technique	4G: QPSK, 16QAM
Carrier Aggregation	Only Downlink Carrier Aggregation Support
Antenna Specification*	LTE Band 48: 2.8dBi(provided by the applicant)
Voltage Range	DC 5V from USB
Sample serial number	SZNS220908-40742E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J and Part 96 of the Federal Communication Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 96 –Citizens Broadband Radio Service

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.73dB
Unwanted Emission, conducted		±1.6dB
RF Frequency		±0.082*10^{-7}
Emissions, Radiated	30MHz - 1GHz	±4.28dB
	1GHz - 18GHz	±4.98dB
	18GHz - 26.5GHz	±5.06dB
Temperature		±1℃
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358,the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Test was performed as below table:

Frequency band	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
LTE B48	5	3552.5	3625.0	3697.5
	10	3555	3625.0	3695
	15	3557.5	3625	3692.5
	20	3560	3625	3690

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

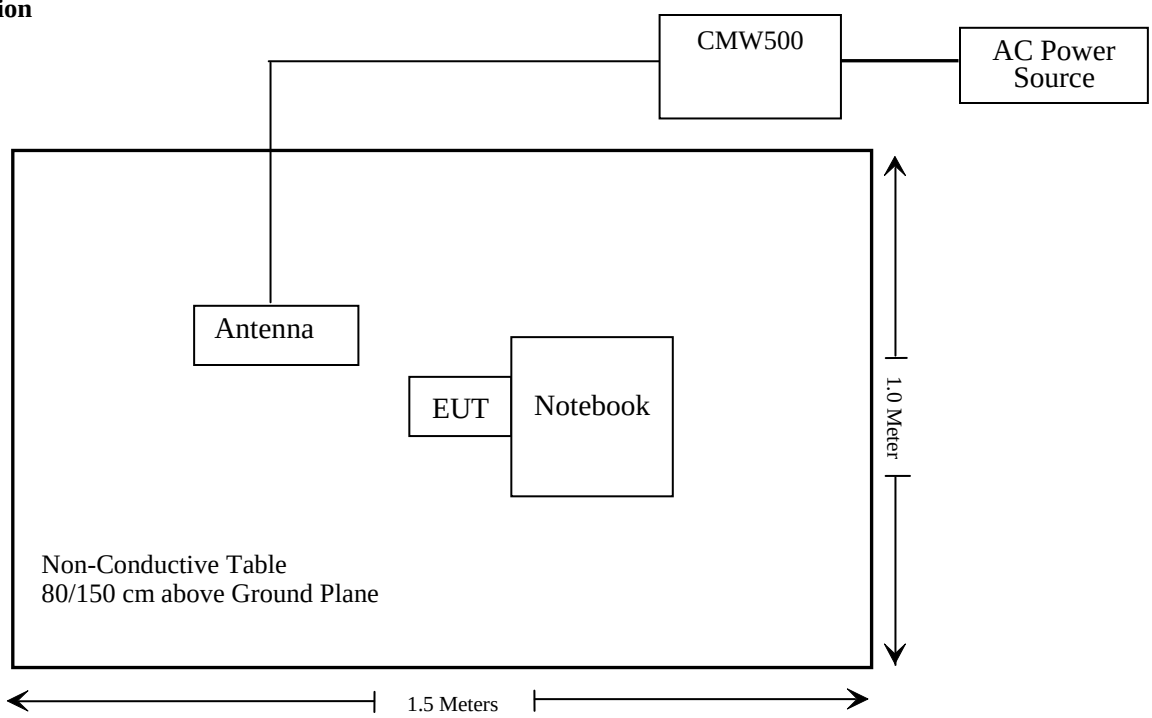
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Dell	Notbook	15md-4528s	1

Support Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded Un-detachable AC cable	1.2	AC Power	CMW500

Block Diagram of Test Setup

For Radiation



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliant*
§2.1046; §96.41 (b) (g)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; §96.41	Occupied Bandwidth	Compliant
§ 2.1051; §96.41	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; §96.41	Field Strength of Spurious Radiation	Compliant
§2.1049, §96.41(e)	Out-Of-Band Emissions and Band Edge	Compliant
§ 2.1055; §96.41	Frequency stability	Compliant

Note: * Please refer to SAR report number: SZNS220908-40742E-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2020/01/05	2023/01/04
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
PASTERNACK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-024-1)	2020/01/05	2023/01/04
PASTERNACK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-025-1)	2020/01/05	2023/01/04
PASTERNACK	Horn Antenn	PE9850/2F-20	720 (ATC-BA-024)	2020/01/05	2023/01/04
PASTERNACK	Horn Antenn	PE9850/2F-20	720 (ATC-BA-025)	2020/01/05	2023/01/04
Agilent	Signal Generator	N5183A	MY51040755	2021/12/13	2022/12/12

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12
SPECTRUM ANALYZER	Rohde & Schwarz	FSU26	200982	2022/07/05	2023/07/04
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2021/12/13	2022/12/12
Mini-Circuits	Power Splitter	DC-18000MHz	SF10944151S	2021/12/14	2022/12/13
WEINSCHEL	10dB Attenuator	5324	AU 3842	2021/12/14	2022/12/13
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2022/10/14	2023/10/13
Fluke	Multi Meter	45	7664009	2021/12/14	2022/12/13
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
Unknown	RF Cable	Unknown	1	Each time	/

* Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b)& §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: SZNS220908-40742E-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC §2.1047(d), Part 96, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046& §96.41(b) (g)- RF OUTPUT POWER

Applicable Standard

According to §96.41

(b)Power limits:Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD[1]	47	37

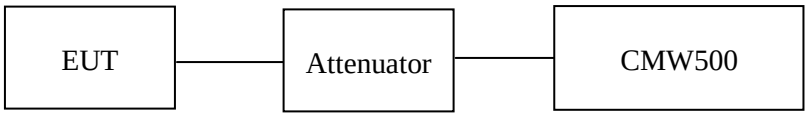
1Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

(g)Power measurement:The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500 through sufficient attenuation.



Note: the path loss (cable loss and attenuator) was included to the test result.

Test Data

Environmental Conditions

Temperature:	26.1-26.5℃
Relative Humidity:	56.2-62.5 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-10-09 and 2022-11-11.

LTE Band 48

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	18.95	18.38	17.37	21.75	21.18	20.17
		RB1#13	18.48	18.15	17.09	21.28	20.95	19.89
		RB1#24	18.49	18.29	17.05	21.29	21.09	19.85
		RB15#0	18.73	18.28	17.23	21.53	21.08	20.03
		RB15#10	18.59	18.24	17.18	21.39	21.04	19.98
		RB25#0	18.51	18.19	17.13	21.31	20.99	19.93
	16QAM	RB1#0	19.05	18.72	17.33	21.85	21.52	20.13
		RB1#13	18.49	18.55	17.07	21.29	21.35	19.87
		RB1#24	18.63	18.65	17.03	21.43	21.45	19.83
		RB15#0	18.82	18.43	17.15	21.62	21.23	19.95
		RB15#10	18.69	18.40	17.09	21.49	21.20	19.89
		RB25#0	18.65	18.28	17.13	21.45	21.08	19.93
10.0	QPSK	RB1#0	19.40	18.73	17.45	22.20	21.53	20.25
		RB1#25	18.79	18.54	17.10	21.59	21.34	19.90
		RB1#49	18.98	18.72	17.04	21.78	21.52	19.84
		RB25#0	18.61	18.47	17.01	21.41	21.27	19.81
		RB25#25	18.63	18.39	16.88	21.43	21.19	19.68
		RB50#0	18.73	18.41	17.08	21.53	21.21	19.88
	16QAM	RB1#0	19.31	18.90	17.77	22.11	21.70	20.57
		RB1#25	18.61	18.64	17.47	21.41	21.44	20.27
		RB1#49	18.82	18.81	17.43	21.62	21.61	20.23
		RB25#0	18.73	18.46	17.13	21.53	21.26	19.93
		RB25#25	18.62	18.39	17.02	21.42	21.19	19.82
		RB50#0	18.70	18.4	17.05	21.50	21.20	19.85

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	19.21	18.46	18.17	22.01	21.26	20.97
		RB1#38	18.38	17.75	17.35	21.18	20.55	20.15
		RB1#74	18.96	18.40	17.64	21.76	21.20	20.44
		RB36#0	18.42	17.77	17.50	21.22	20.57	20.30
		RB36#39	18.29	17.73	17.34	21.09	20.53	20.14
		RB75#0	18.28	17.80	17.44	21.08	20.60	20.24
	16QAM	RB1#0	19.39	18.43	18.48	22.19	21.23	21.28
		RB1#38	18.62	17.76	17.71	21.42	20.56	20.51
		RB1#74	19.04	18.23	18.05	21.84	21.03	20.85
		RB36#0	18.31	17.75	17.55	21.11	20.55	20.35
		RB36#39	18.20	17.65	17.38	21.00	20.45	20.18
		RB75#0	18.30	17.75	17.42	21.10	20.55	20.22
20.0	QPSK	RB1#0	19.33	18.77	17.80	22.13	21.57	20.60
		RB1#50	18.46	18.00	17.25	21.26	20.80	20.05
		RB1#99	19.08	18.72	17.55	21.88	21.52	20.35
		RB50#0	18.39	18.19	17.45	21.19	20.99	20.25
		RB50#50	18.42	18.07	17.25	21.22	20.87	20.05
		RB100#0	18.54	18.13	17.35	21.34	20.93	20.15
	16QAM	RB1#0	19.23	18.93	17.83	22.03	21.73	20.63
		RB1#50	18.41	18.33	17.32	21.21	21.13	20.12
		RB1#99	19.01	18.94	17.60	21.81	21.74	20.40
		RB50#0	18.54	18.18	17.44	21.34	20.98	20.24
		RB50#50	18.56	18.04	17.24	21.36	20.84	20.04
		RB100#0	18.51	18.09	17.33	21.31	20.89	20.13

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)- Cable Loss(dB)
For Band48: Antenna Gain = 2.8dBi
The Cable Loss has included in the antenna gain
Limit: EIRP≤23dBm/10MHz

For 5MHz mode, the reference bandwidth(10MHz) is greater than the channel bandwidth(5MHz), so the channel power is equal to the test result in dBm/10MHz
For 10MHz mode, the channel power is equal to the test result in dBm/10MHz
For 15MHz/20MHz mode, the channel power is sum of 15MHz/20MHz bandwidth, the result is less than 23dBm, so in any 10MHz bandwidth, it will not exceed the limit

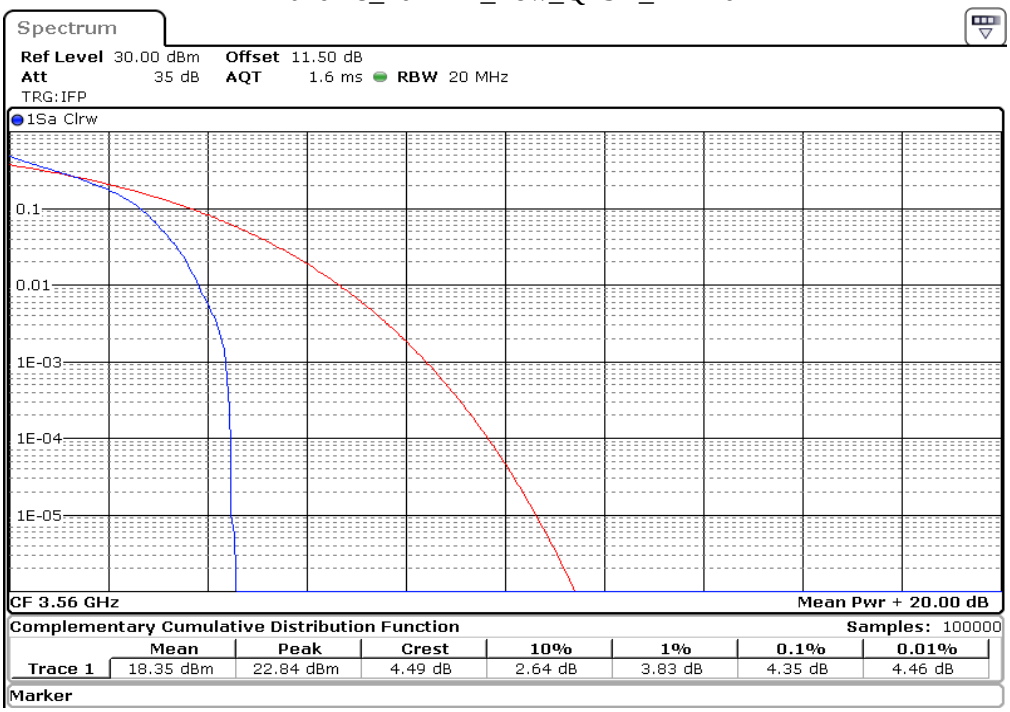
Peak-to-average ratio (PAR)

Note: Pre-scan all bandwidth, the worst case test data as below:

LTE Band 48 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.35	4.75	5.42	13	Pass
QPSK (100RB Size)	4.90	5.19	5.51	13	Pass
16QAM (1RB Size)	4.55	4.70	6.23	13	Pass
16QAM (100RB Size)	5.36	5.80	5.77	13	Pass

Band 48_20 MHz_Low_QPSK_RB1#0



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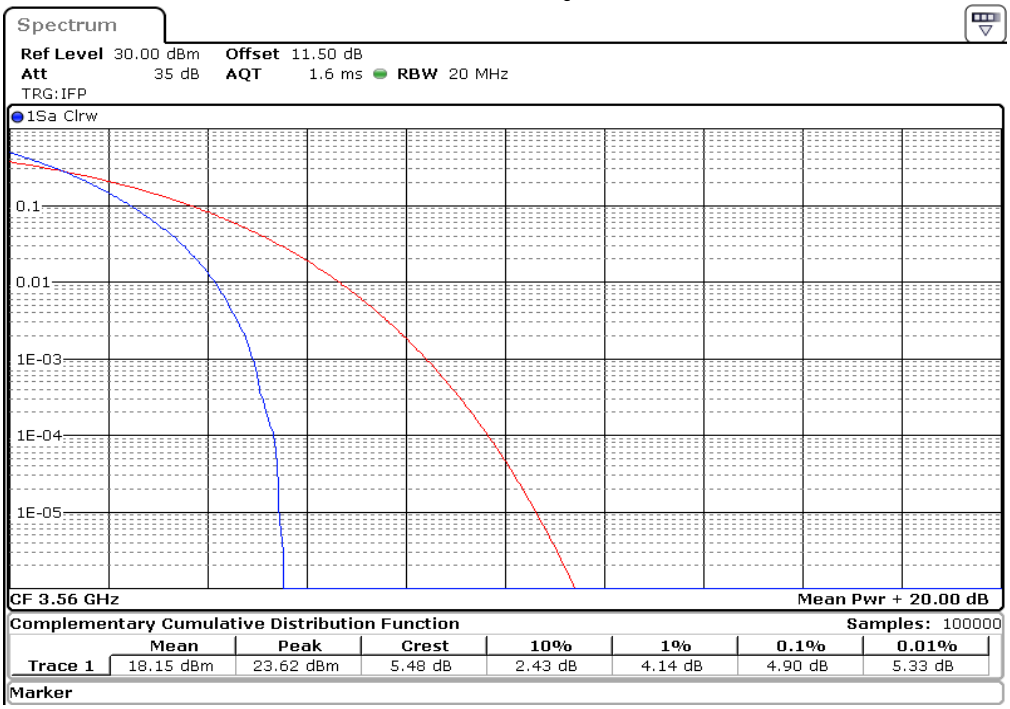

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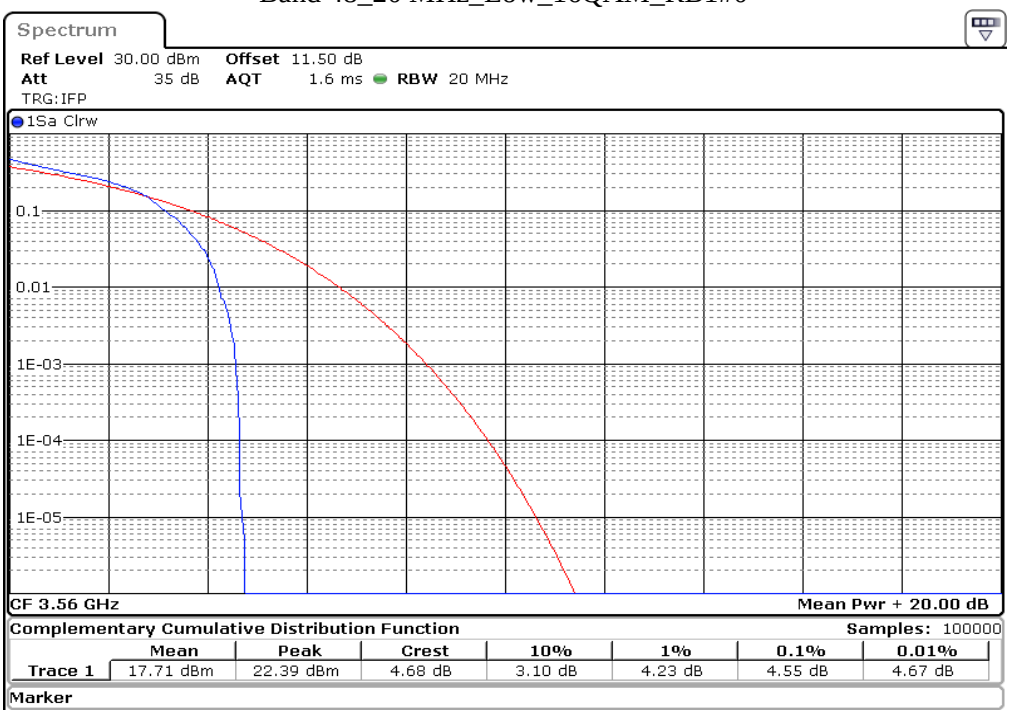

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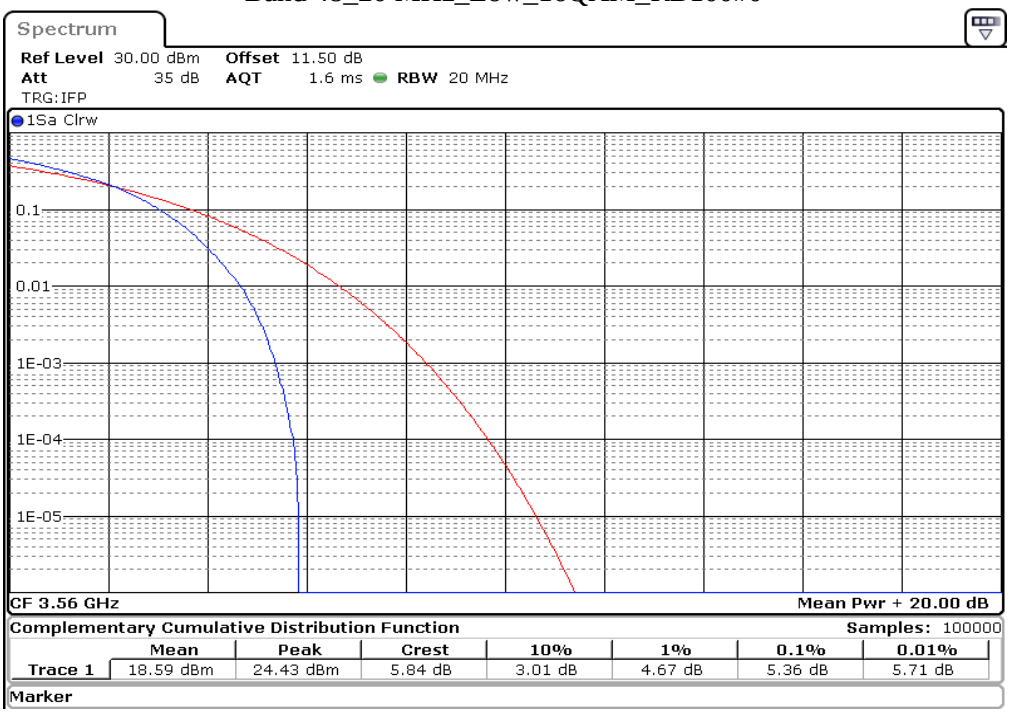

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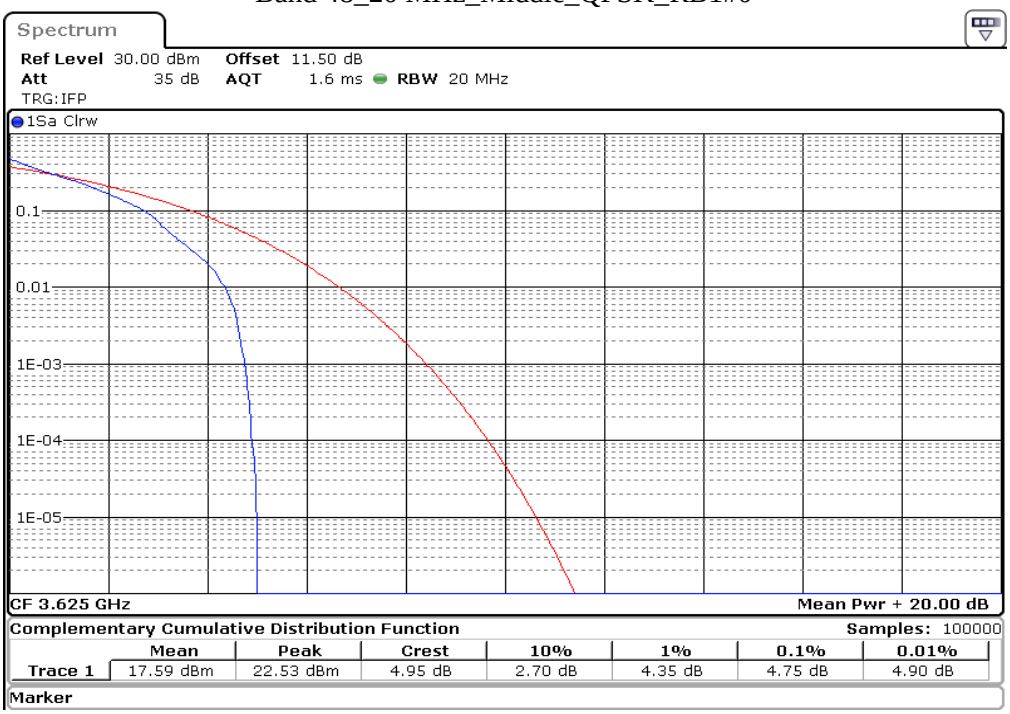
Band 48_20 MHz_Middle_QPSK_RB1#0



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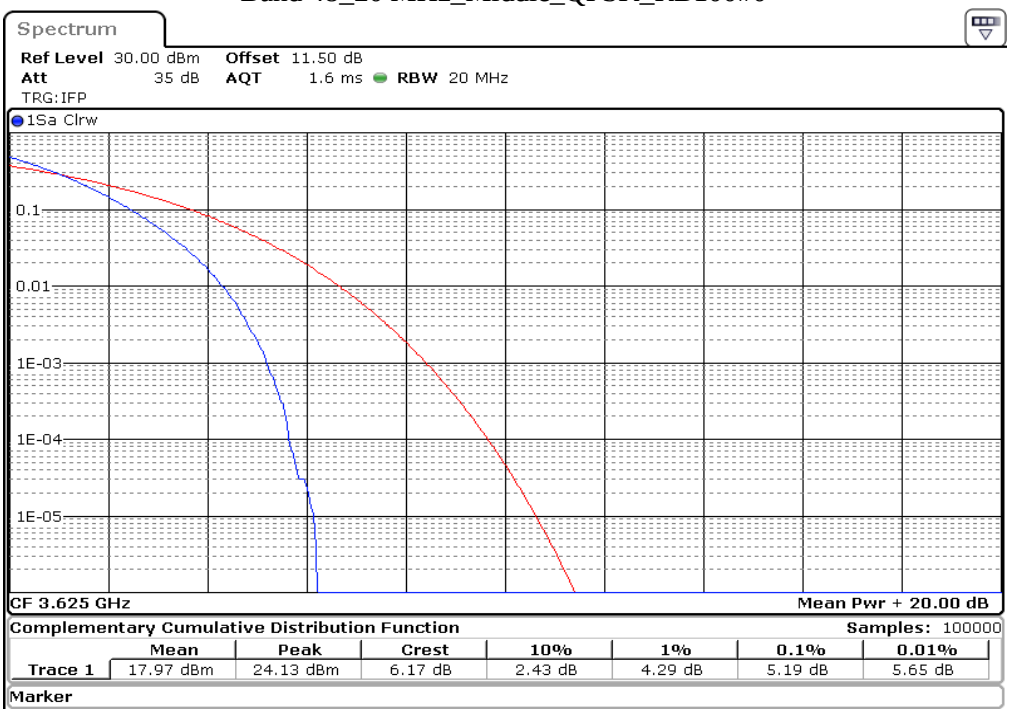

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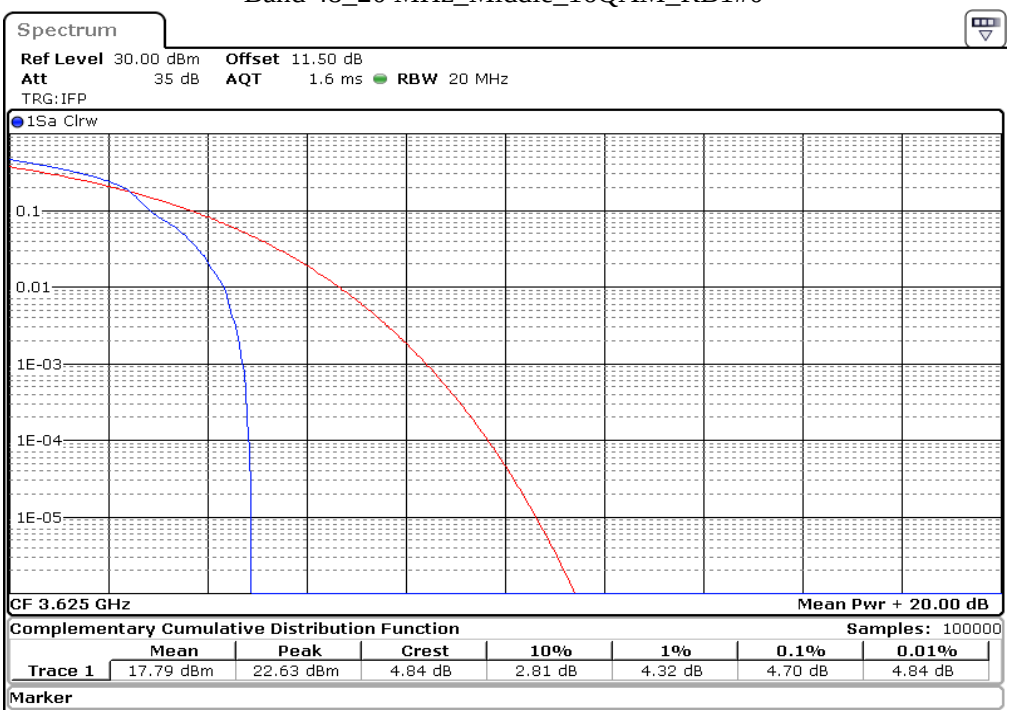

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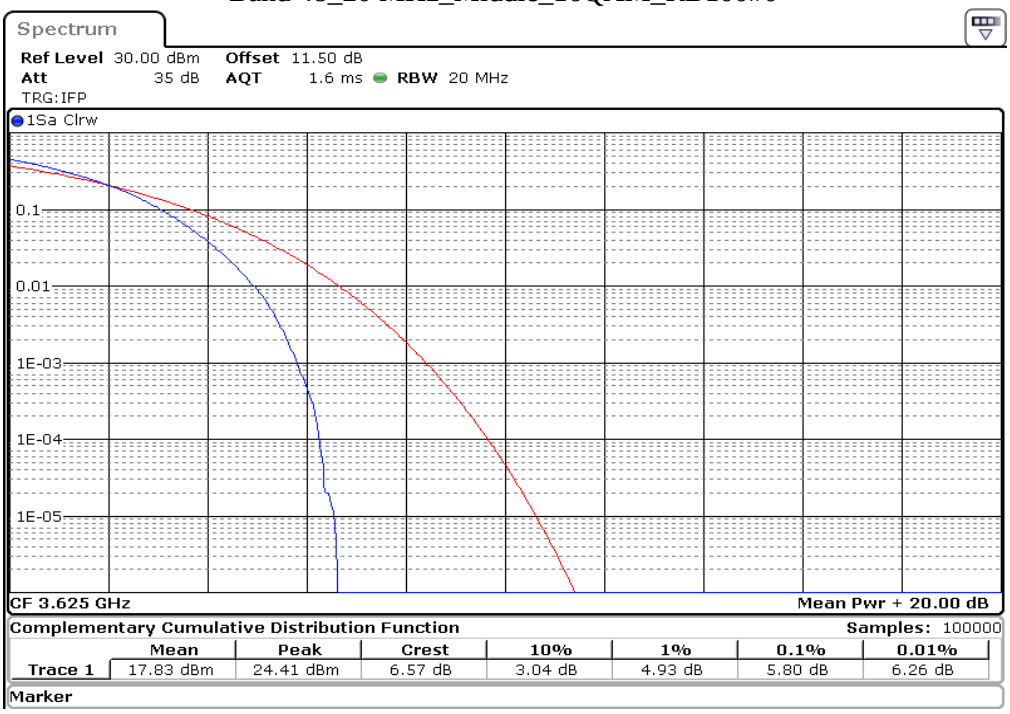

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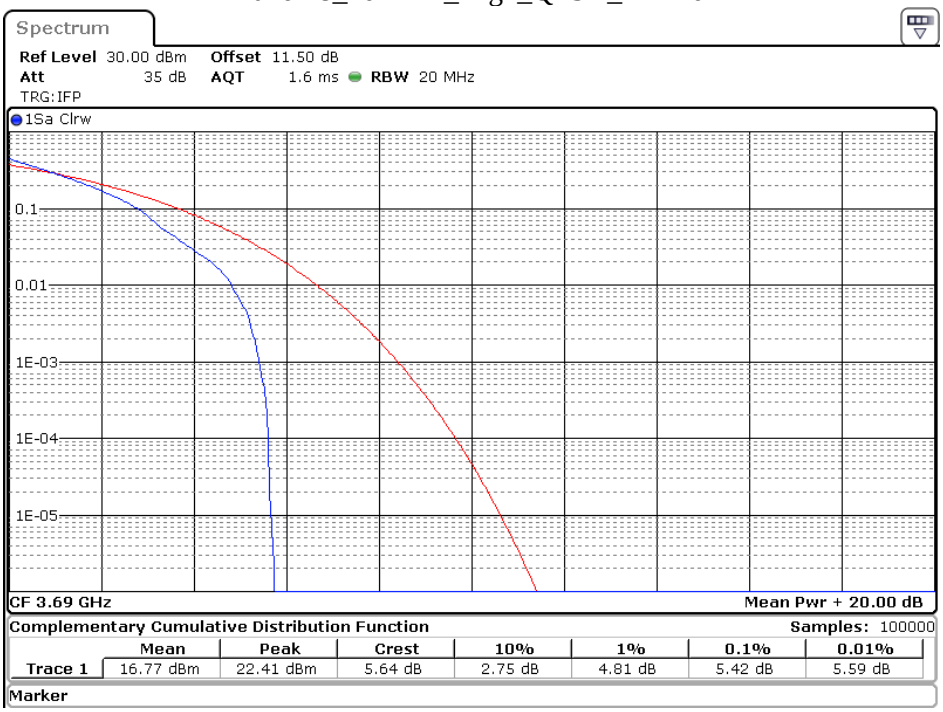

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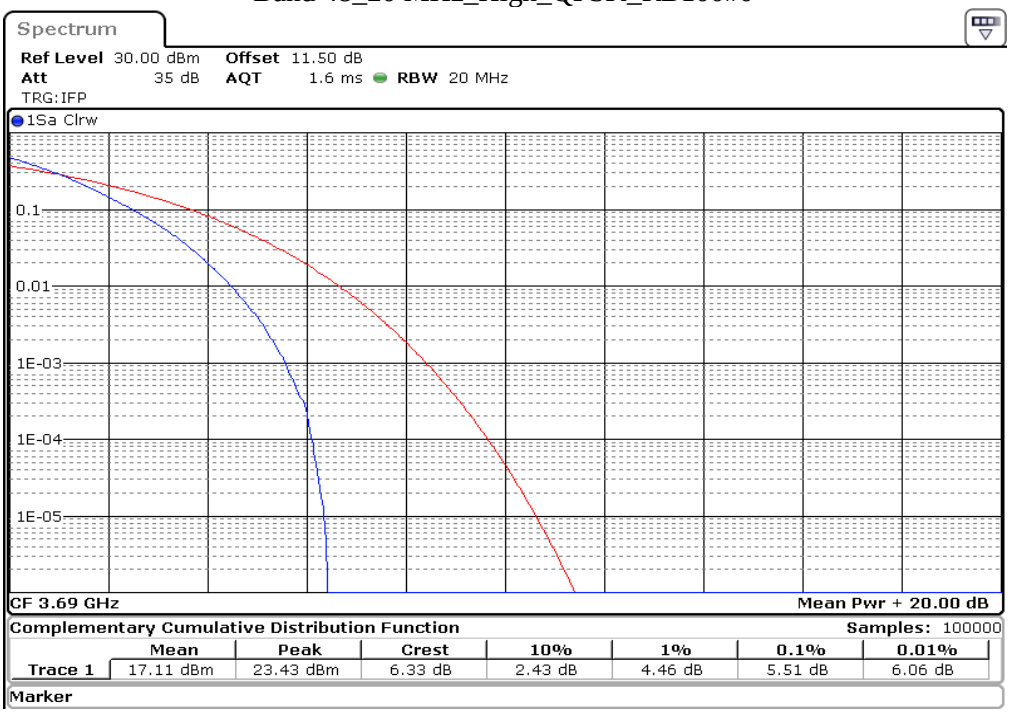

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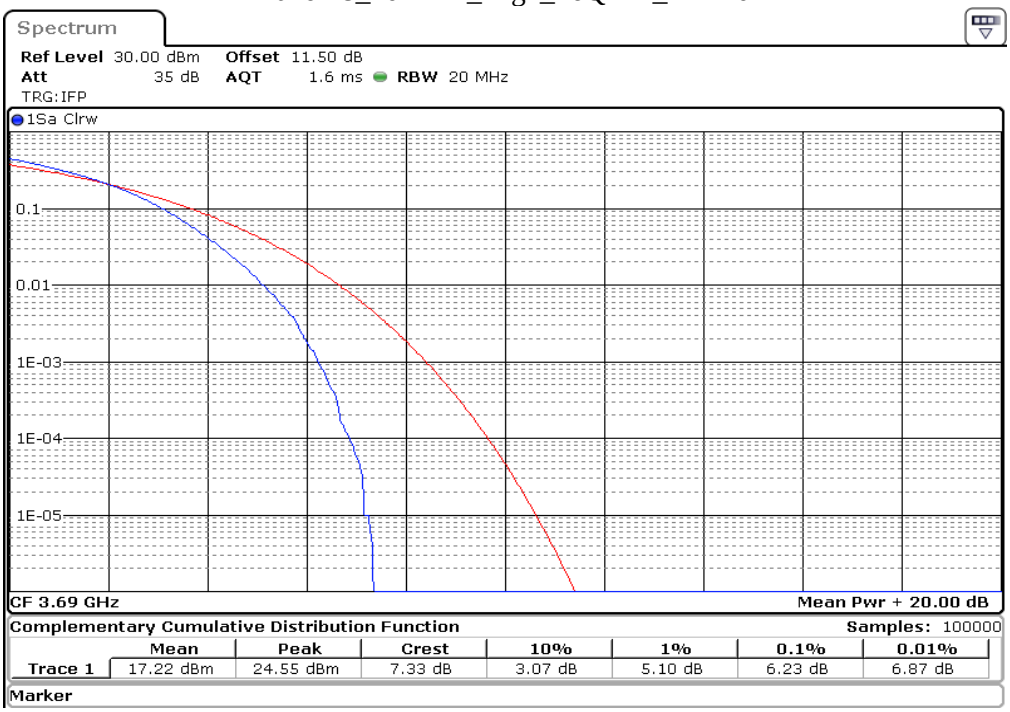

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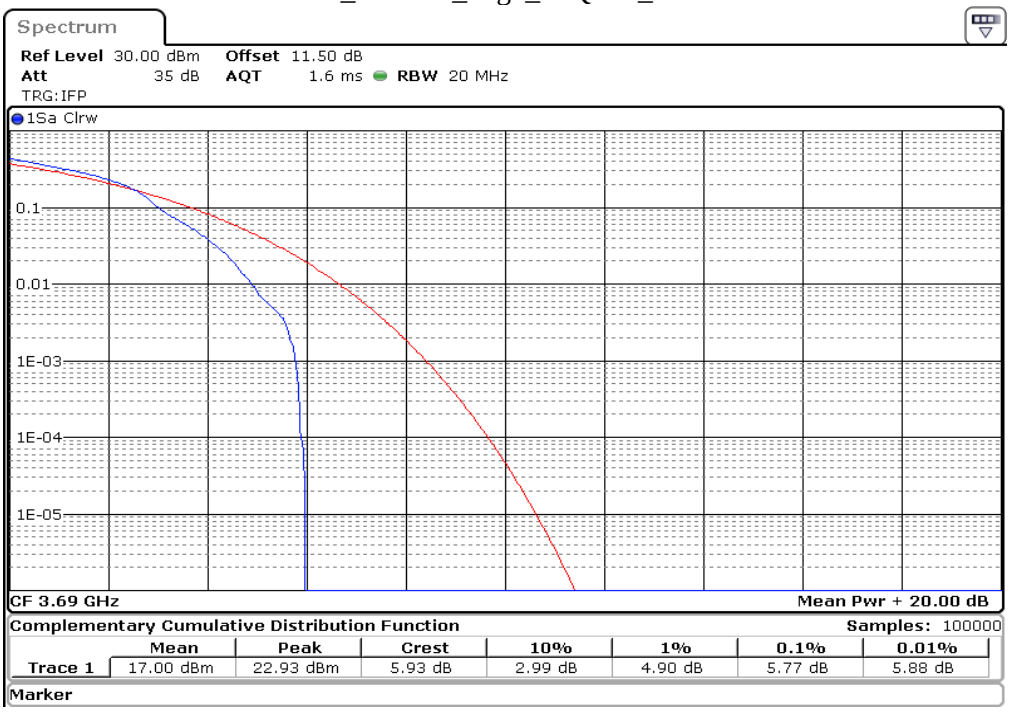

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FCC §2.1049& §96.41(e)(3)- OCCUPIED BANDWIDTH

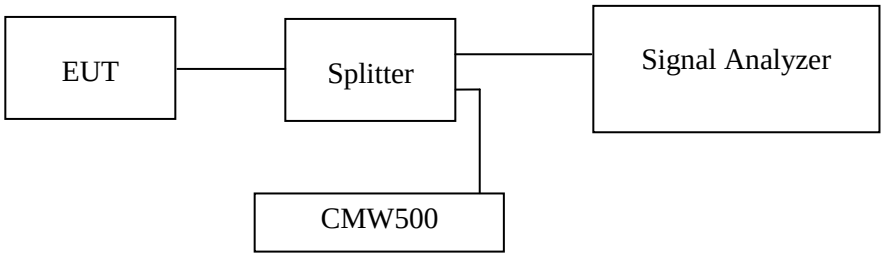
Applicable Standard

FCC 47 §2.1049, §96.41(e) (3).

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Note: the path loss (cable loss and splitter inset loss) was included to the plots.

Test Data

Environmental Conditions

Temperature:	26.5℃
Relative Humidity:	56.2 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-09-20.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables and plots.

LTE Band 48(FCC Part 96)

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.537	5.550	4.537	5.445	4.559	5.895
	16QAM	4.537	5.370	4.559	5.400	4.559	5.760
10 MHz	QPSK	8.944	9.960	8.944	10.320	8.987	10.800
	16QAM	8.944	9.840	8.944	9.870	8.944	9.750
15 MHz	QPSK	13.480	16.020	13.546	16.065	13.546	14.895
	16QAM	13.546	15.750	13.546	15.660	13.611	16.605
20 MHz	QPSK	17.974	19.800	17.974	19.200	17.887	20.820
	16QAM	17.887	19.320	17.974	19.620	17.887	20.160

The test plots please refer to the Appendix D.

FCC §2.1051& §96.41(e) (2) (3) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

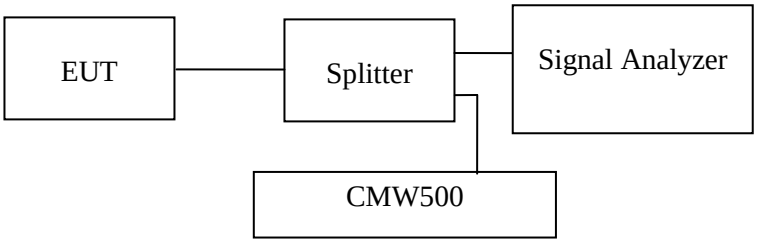
Applicable Standard

FCC §2.1051and §96.41(e) (2) (3).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in §2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Note: the worst path loss (cable loss and splitter inset loss) among the test frequency range was included to the plots.

Test Data

Environmental Conditions

Temperature:	26.5℃
Relative Humidity:	56.2 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-09-20.

EUT operation mode: Transmitting

Test result: Pass

The test plots please refer to the Appendix E.

FCC §2.1053& §96.41(e) (2) (3)- SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC §2.1051 and §96.41(e) (2) (3).

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Test Data

Environmental Conditions

Temperature:	28.3 ℃
Relative Humidity:	46%
ATM Pressure:	101.1 kPa

The testing was performed by Level Li on 2022-09-21.

Test mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Pre-scan all bandwidth, modulation and RB size/RB offset, the worst case is as below:

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band48								
Test frequency range: 30MHz-37GHz								
5MHz bandwidth, QPSK, RB1#13, Low Channel								
955.5	-74.6	250	1.6	H	10	-64.6	-40	24.6
955.5	-74.7	64	1.3	V	11.7	-63	-40	23
7105.00	-61.6	232	2	H	16.8	-44.8	-40	4.8
7105.00	-62.1	53	2.2	V	16.8	-45.3	-40	5.3
5MHz bandwidth, QPSK, RB1#13, Middle Channel								
952.2	-74.9	168	1.5	H	10	-64.9	-40	24.9
952.2	-75.8	335	1.6	V	11.7	-64.1	-40	24.1
7250.00	-63.2	179	1.6	H	18.9	-44.3	-40	4.3
7250.00	-63.4	98	1.2	V	18.5	-44.9	-40	4.9
5MHz bandwidth, QPSK, RB1#13, High Channel								
949.3	-74.5	7	1.7	H	10	-64.5	-40	24.5
949.3	-76	66	1.5	V	11.7	-64.3	-40	24.3
7395.00	-63	334	1.8	H	19.6	-43.4	-40	3.4
7395.00	-63.2	309	1.9	V	18.9	-44.3	-40	4.3

Note:
Absolute Level = Reading Level + Substituted Factor
Substituted Factor contains: SG Level - Cable loss+ Antenna Gain
Margin = Limit - Absolute Level

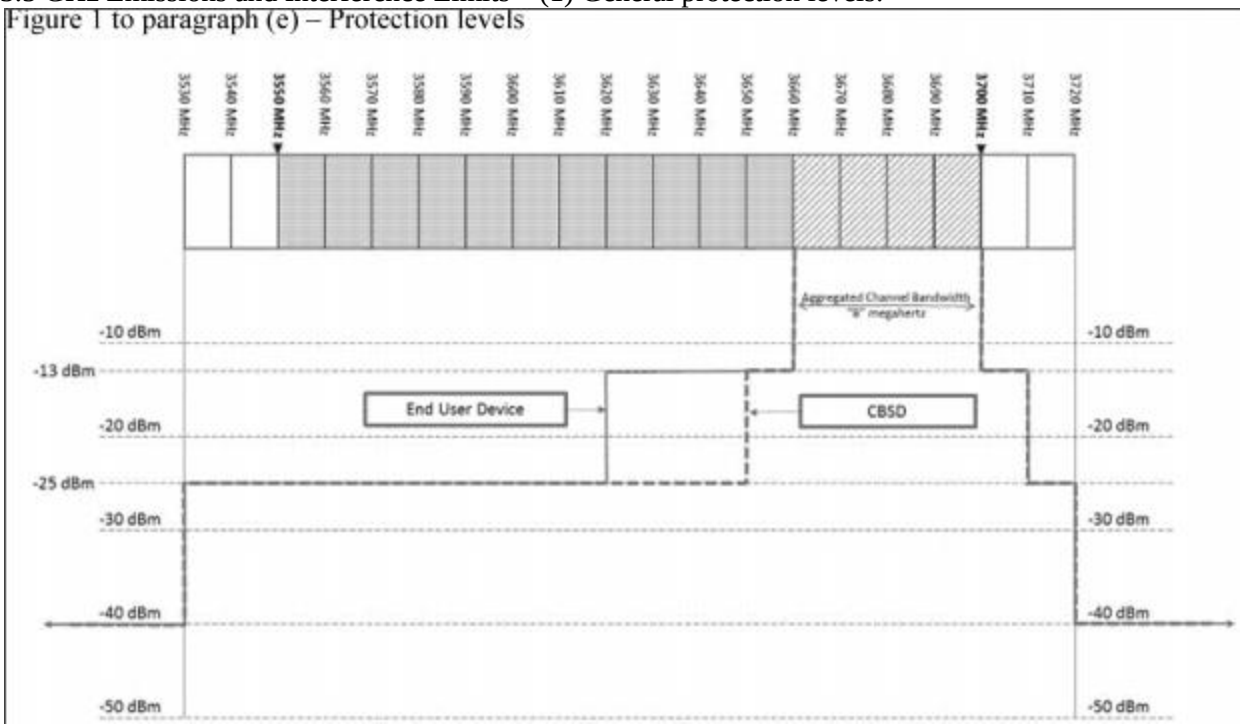
FCC §2.1049& §96.41(e)(2)(3)- OUT-OF-BAND EMISSIONS AND BAND EDGE

Applicable Standard

According to §96.41(e)

3.5 GHz Emissions and Interference Limits—(1) General protection levels.

Figure 1 to paragraph (e) – Protection levels



(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside 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 CBSD emission shall not exceed −25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB

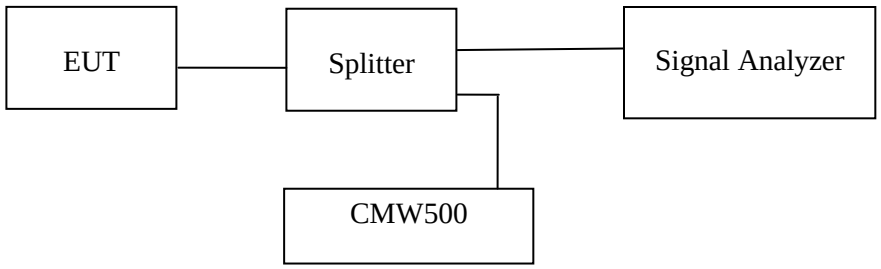
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

(3) Measurement procedure. (i) Compliance with this provision is based on the use of easurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Note: the path loss (cable loss and splitter inset loss) was included to the plots.

Test Data

Environmental Conditions

Temperature:	26.5℃
Relative Humidity:	56.2 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-09-20.

EUT operation mode: Transmitting (Worst case)
Test Result: Pass

Out-of Band emission and band edge test plots please refer to the Appendix F.

Adjacent Channel Leakage Ratio:

Bandwidth	Modulation	RB	Adjacent Channel Leakage Ratio(dB)						
			Low channel		Middle channel		High channel		Limit
			Lower	Upper	Lower	Upper	Lower	Upper	
5 MHz	QPSK	RB1#0	30.73	52.76	31.26	53.88	31.24	53.87	30
		RB1#24	53.15	31.09	53.68	31.09	53.61	30.64	30
		RB25#0	38.60	39.03	37.38	37.86	35.67	36.58	30
	16QAM	RB1#0	30.40	53.34	31.46	53.59	31.02	54.03	30
		RB1#24	53.54	30.36	53.39	30.26	53.54	30.36	30
		RB25#0	37.62	38.50	37.33	37.40	35.68	36.25	30
10 MHz	QPSK	RB1#0	37.60	51.10	36.88	52.10	37.55	52.18	30
		RB1#49	51.72	37.12	52.35	36.94	52.03	37.29	30
		RB50#0	39.78	40.24	39.19	39.74	36.92	37.48	30
	16QAM	RB1#0	37.57	51.05	36.04	52.06	37.41	52.18	30
		RB1#49	51.75	37.33	51.73	36.72	52.15	37.24	30
		RB50#0	39.30	39.78	38.64	38.95	36.46	36.92	30
15 MHz	QPSK	RB1#0	40.97	47.76	41.25	48.33	41.40	48.70	30
		RB1#74	48.63	41.13	48.81	41.06	48.82	41.82	30
		RB75#0	39.04	39.87	38.24	38.90	36.47	37.25	30
	16QAM	RB1#0	40.39	47.44	41.39	48.11	41.71	48.44	30
		RB1#74	48.72	40.25	49.23	41.54	48.62	41.89	30
		RB75#0	38.91	39.72	37.70	38.30	35.86	36.67	30
20 MHz	QPSK	RB1#0	44.96	45.72	43.87	46.19	45.15	46.45	30
		RB1#99	46.57	45.02	46.33	43.84	45.49	45.30	30
		RB100#0	39.73	40.74	39.20	40.01	37.06	38.02	30
	16QAM	RB1#0	44.85	45.02	43.78	45.75	44.18	46.20	30
		RB1#99	45.88	44.72	45.98	44.17	45.21	44.65	30
		RB100#0	39.72	40.74	38.52	39.36	36.63	37.56	30

The test plots please refer to the Appendix G.

FCC §2.1055& §27.54 - FREQUENCY STABILITY

Applicable Standard

FCC §2.1055, §27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

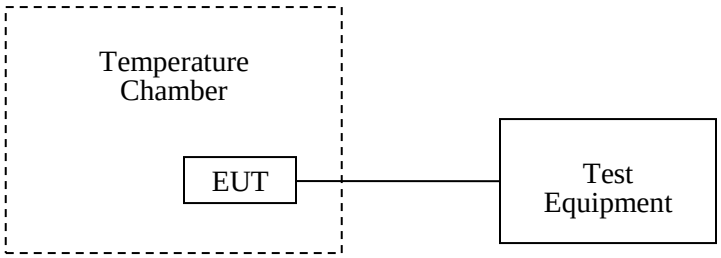
According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	26.5℃
Relative Humidity:	56.2 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-10-09.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

QPSK:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	5	3550.9758	3699.9871	3550	3700
-20		3550.8678	3699.8852	3550	3700
-10		3550.7565	3699.7766	3550	3700
0		3550.6425	3699.6652	3550	3700
10		3550.5327	3699.5556	3550	3700
20		3550.4228	3699.4438	3550	3700
30		3550.3159	3699.3351	3550	3700
40		3550.2157	3699.2237	3550	3700
50		3550.2939	3699.1065	3550	3700

16QAM:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	5	3550.9456	3699.9655	3550	3700
-20		3550.8442	3699.8582	3550	3700
-10		3550.7372	3699.7486	3550	3700
0		3550.6266	3699.6375	3550	3700
10		3550.5138	3699.5284	3550	3700
20		3550.4175	3699.4182	3550	3700
30		3550.2988	3699.3587	3550	3700
40		3550.1882	3699.1986	3550	3700
50		3550.1829	3699.1882	3550	3700

Note: The device is powered from USB port, which normally has a steady DC 5V output voltage, so extreme voltage condition was not tested.

******* END OF REPORT *******