FCC RF Test Report

FCC ID	:	UZ7ET45BB
EQUIPMENT	:	Tablet
BRAND NAME	:	Zebra
Model Name	:	ET45BB
APPLICANT	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
MANUFACTURER	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
STANDARD	:	47 CFR Part 2, 90(R)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)
TEST DATE(S)	:	Jun. 03, 2022 ~ Jul. 31, 2022

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 and shown 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 Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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APPENDIX A. TEST RESULTS OF CONDUCTED TEST

APPENDIX B. TEST RESULTS OF RADIATED TEST

APPENDIX C. TEST SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG230405I	Rev. 01	Initial issue of report	Aug. 03, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.2	§2.1046	Conducted Output Power	—	Reporting only	-
	§90.542 (a)(7)	Effective Radiated Power	ERP < 3Watt	PASS	-
3.3	-	Peak-to-Average Ratio	—	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	—	Reporting only	-
3.5	§2.1053 §90.543 (e)(2)(3)	Conducted Band Edge Measurement	Refer standard	PASS	-
3.6	§2.1051 §90.210(n)	Emission Mask	Mask B	PASS	-
3.7	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	< $43+10\log_{10}$(P[Watts])	PASS	-
3.8	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	< ±1.25 ppm	PASS	-
4.4	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 21.40 dB at 1576.000 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 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Brand Name	Zebra
Model Name	ET45BB
FCC ID	UZ7ET45BB
Tx Frequency	5G NR n14 : 788 MHz ~ 798 MHz
Rx Frequency	5G NR n14 : 758 MHz ~ 768 MHz
SCS / Bandwidth	15kHz : 5MHz / 10MHz
Maximum Output Power to Antenna	23.09 dBm
Antenna Gain	-0.5 dBi
Type of Modulation	DFT-s-OFDM (PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM)
HW Version	EV2-2
SW Version	ET45USERDEBUG 11 11-10-12.00-RG-U00-PRD-GSE MXJ release-keys
MFD	07MAY22
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Specification of Accessory				
Battery	**Brand Name**	Zebra	**Model Number**	BT-000456

Supported Unit Used in Test Configuration and System				
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-WUA5V12W0US
Earphone 1	**Brand Name**	Zebra	**Part Number**	HDST-35MM-PTVP-01
Earphone 2	**Brand Name**	Zebra	**Part Number**	HDST-USBC-PTT1-01
USB Cable (Type C to Type A)	**Brand Name**	Zebra	**Part Number**	CBL-TC5X-USBC2A-01
Type C-Audio Cable (Type C to 3.5mm)	**Brand Name**	Zebra	**Part Number**	ADP-USBC-35MM1-01

1.2 Maximum ERP Power, and Emission Designator

5G NR n14		PI/2 BPSK/QPSK		16QAM/64QAM/256QAM	
BW (MHz)	**Frequency Range (MHz)**	**Maximum ERP(W)**	**Emission Designator (99%OBW)**	**Maximum ERP(W)**	**Emission Designator (99%OBW)**
5	**790.5~795.5**	0.1096	4M47G7D	0.0933	4M49W7D
10	**793**	0.1107	9M01G7D	0.0877	9M07W7D

1.3 Testing Site

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.4 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

1.5 Applied Standards

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

- 47 CFR Part 2, Part 90(R)
- ANSI C63.26
- KDB 971168 D01 Power Meas License Digital Systems v03r01
- KDB 412172 D01 Determining ERP and EIRP 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

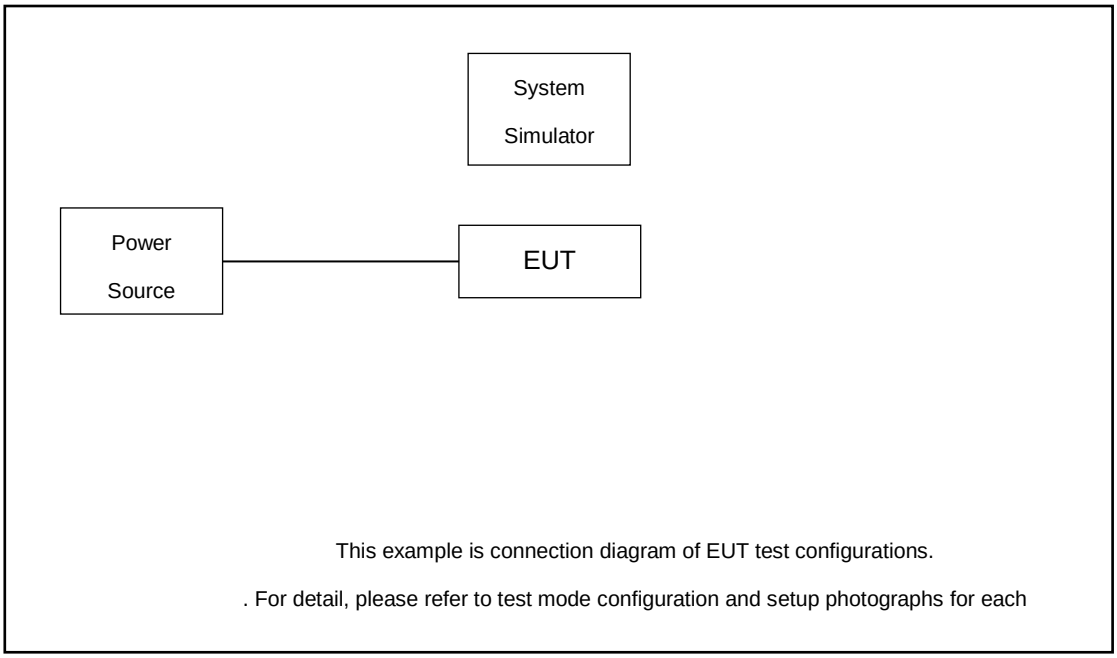
2.1 Test Mode

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.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation					RB #			Test Channel		
		1.4	3	5	10	15	20	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n14	-	-	v		-	-	v	v	v	v	v	v	v	v	v	v	v
	n14	-	-		v	-	-	v	v	v	v	v	v	v	v		v	
Peak-to-Average Ratio	n14	-	-		v	-	-	v	v				v		v		v	
26dB and 99% Bandwidth	n14	-	-	v	v	-	-		v	v	v	v			v		v	
Conducted Band Edge	n14	-	-	v		-	-	v	v				v		v	v		v
	n14	-	-		v	-	-	v	v				v		v		v	
Emission Mask	n14	-	-	v		-	-	v	v				v		v	v	v	v
	n14	-	-		v	-	-	v	v				v		v		v	
Conducted Spurious Emission	n14	-	-	v		-	-	v	v				v			v	v	v
	n14	-	-		v	-	-	v	v				v				v	
Frequency Stability	n14	-	-	v	v	-	-		v						v		v	
E.R.P	n14	-	-	v		-	-	v	v	v	v	v	v		v	v	v	v
	n14	-	-		v	-	-	v	v	v	v	v	v		v		v	
Radiated Spurious Emission	n14	Worst Case														v	v	v
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. **3.** The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset 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 and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820/8821	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

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 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.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 4.8 dB.

Example :

Offset(dB) = RF cable loss(dB).

= 4.8 (dB)

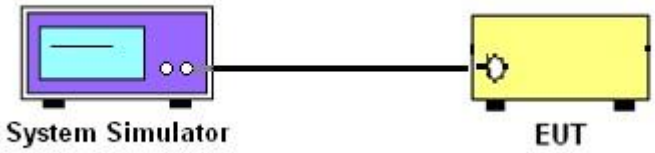
3 Conducted Test Items

3.1 Measuring Instruments

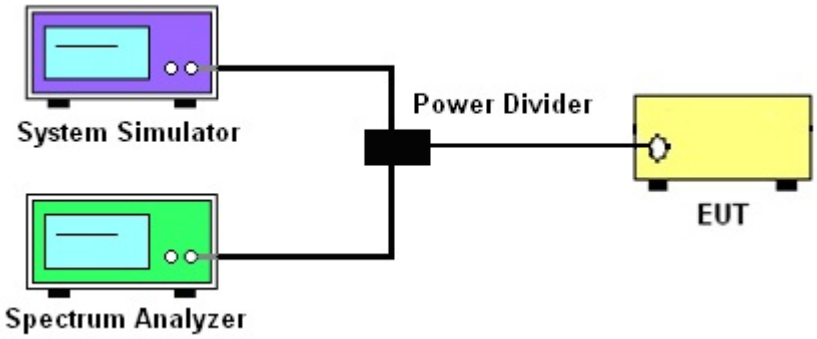
See list of measuring instruments of this test report.

3.1.1 Test Setup

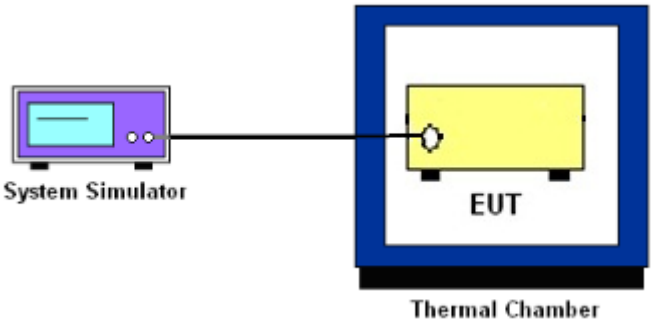
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, Emission Mask, and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and ERP

3.2.1 Description of the Conducted Output Power Measurement and ERP

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

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, 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

3.2.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. 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

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 Occupied Bandwidth

3.4.1 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.

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. 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.
5. Set the detection mode to peak, and the trace mode to max hold.
6. 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)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. 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.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.5 Conducted Band Edge Measurement

3.5.1 Description of Conducted Band Edge Measurement

For operations in the 758-768 MHz and the 788-798 MHz bands

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

   Example:

   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.

3.6 Emission Mask

3.6.1 Description of Emission Mask

<Emission Mask B>.

For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
5. Set spectrum analyzer with RMS detector.
6. Taking the record of maximum spurious emission.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.7 Conducted Spurious Emission Measurement

3.7.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10th harmonic.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and base station via power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's, for under 1GHz RBW = 100kHz, VBW = 300kHz and for above 1GHz RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. Set spectrum analyzer with RMS detector.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±1.25 ppm of the center frequency.

3.8.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5.
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

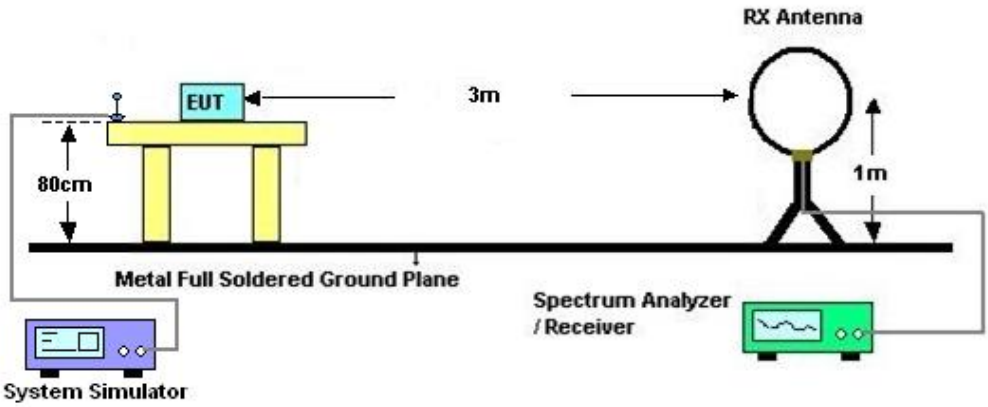
4 Radiated Test Items

4.1 Measuring Instruments

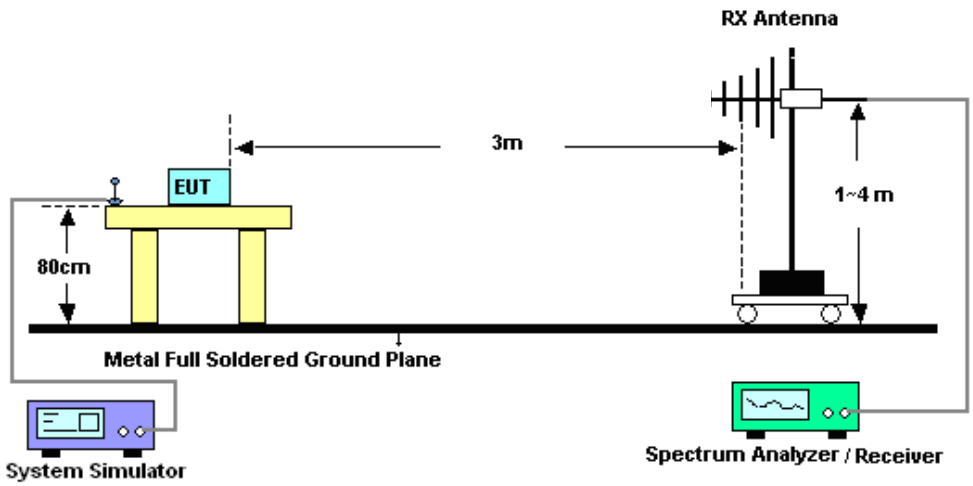
See list of measuring instruments of this test report.

4.2 Test Setup

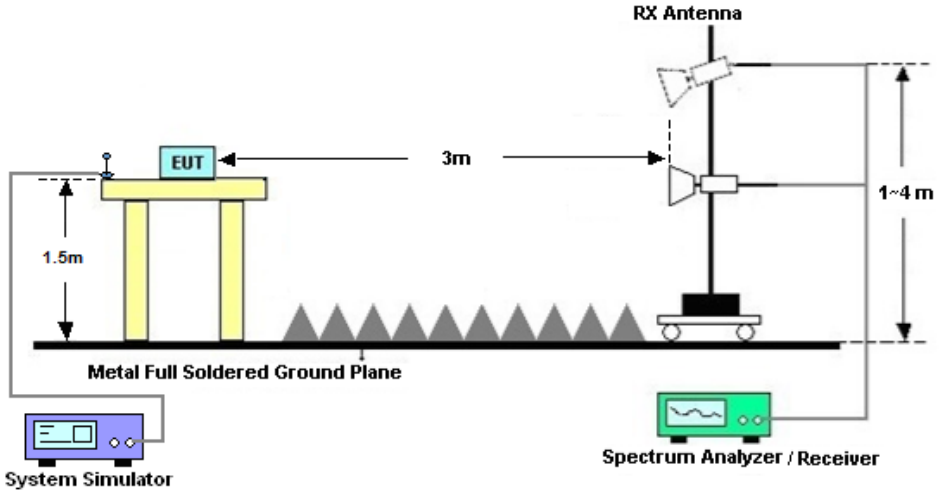
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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.

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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 43 + 10 log (P) dB.

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. 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.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Jun. 03, 2022~ Jul. 31, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 26, 2021	Jun. 03, 2022~ Jul. 31, 2022	Aug. 25, 2022	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 12, 2021	Jun. 03, 2022~ Jul. 31, 2022	Jul. 11, 2022	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 11, 2022		Jul. 10, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57541079	10Hz-44G,MAX 30dB	Oct. 14, 2021	Jun. 24, 2022	Oct. 13, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Jun. 24, 2022	Oct. 29, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 30, 2022	Jun. 24, 2022	May 29, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 18, 2021	Jun. 24, 2022	Oct. 18, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Jun. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 05, 2022	Jun. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2022	Jun. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jul. 30, 2021	Jun. 24, 2022	Jul. 29, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 13, 2021	Jun. 24, 2022	Oct. 12, 2022	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jun. 24, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jun. 24, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jun. 24, 2022	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.3dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.8dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.8dB**

Appendix A. Test Results of Conducted Test

Test Engineer :	Simle Wang	Temperature :	22~23℃
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and ERP

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	ERP	ERP	ERP
Channel					158600			L	M	H
Frequency (MHz)					793					
10	PI/2 BPSK	1	1		23.02		-0.5		0.1089	
10	QPSK	1	1		23.09		-0.5		0.1107	
10	QPSK	1	0		22.12		-0.5		0.0885	
10	QPSK	1	51		22.03		-0.5		0.0867	
10	QPSK	50	0		22.03		-0.5		0.0867	
10	16QAM	1	1		22.08		-0.5		0.0877	
10	64QAM	1	1		20.39		-0.5		0.0594	
10	256QAM	1	1		18.27		-0.5		0.0365	
Channel				158100	158600	159100	Gain	ERP	ERP	ERP
Frequency (MHz)				790.5	793	795.5				
5	QPSK	1	1	23.03	22.97	23.05	-0.5	0.1091	0.1076	0.1096
5	16QAM	1	1	22.17	22.01	22.35	-0.5	0.0895	0.0863	0.0933

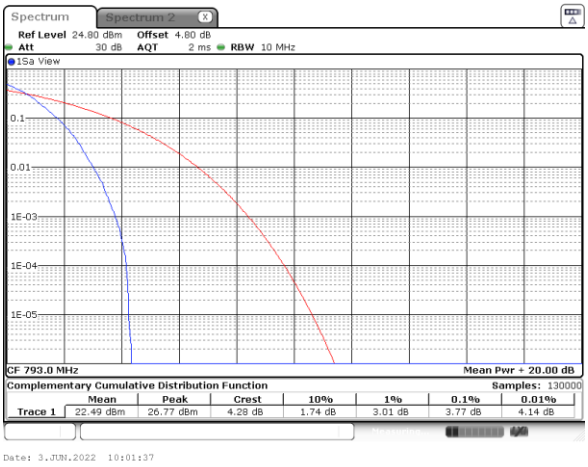
5GNR n14

Peak-to-Average Ratio

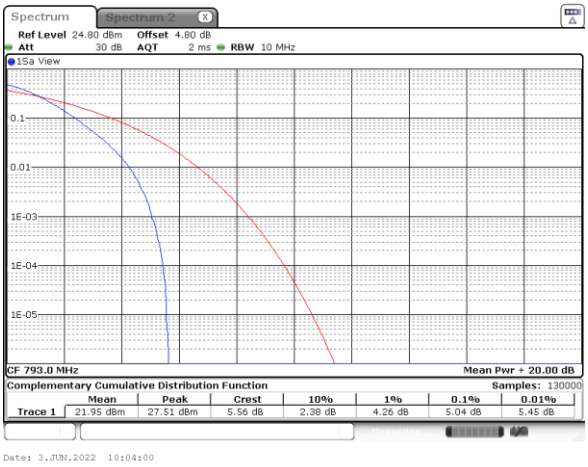
Mode	N14 / 10MHz			
Mod.	BPSK	QPSK		Limit: 13dB
RB Size	Full RB	Full RB		Result
Middle CH	3.77	5.04		PASS

N14 / 10MHz

Middle Channel / Full RB/BPSK



Middle Channel / Full RB/ QPSK

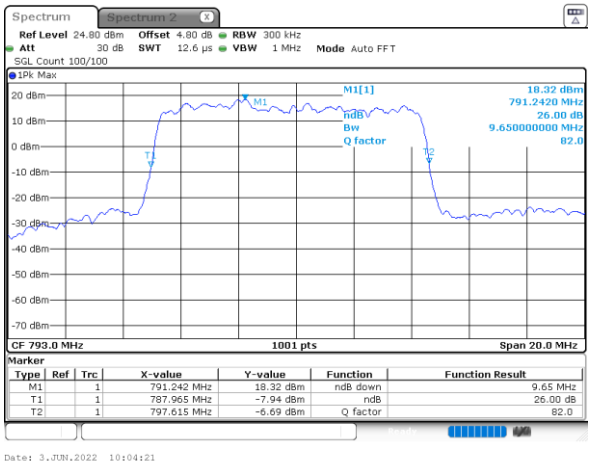


26dB Bandwidth

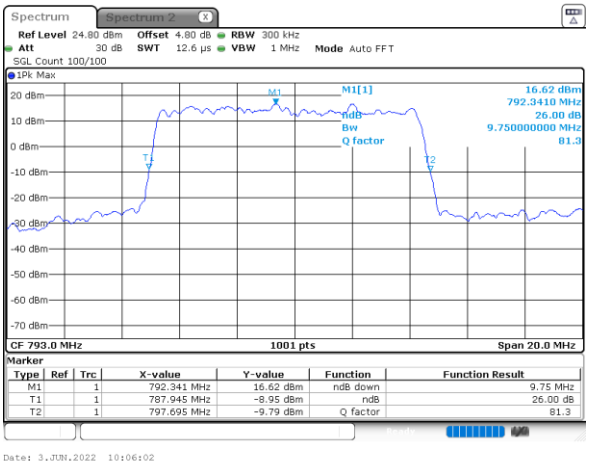
Mode	N14 : 26dB BW(MHz)			
BW	10MHz			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	9.65	9.75	9.75	9.73

N14

Middle Channel /10MHz / QPSK

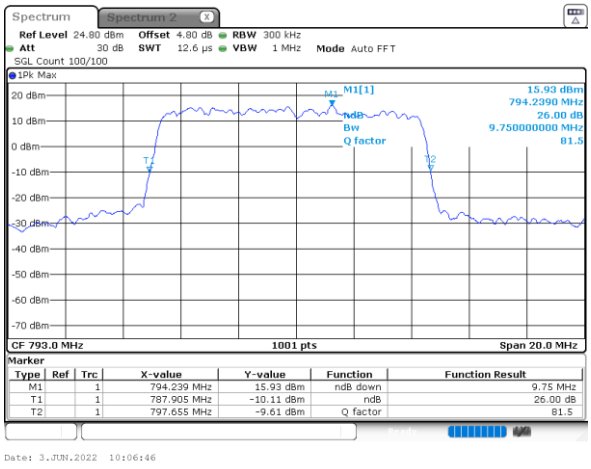


Middle Channel / 10MHz / 16QAM

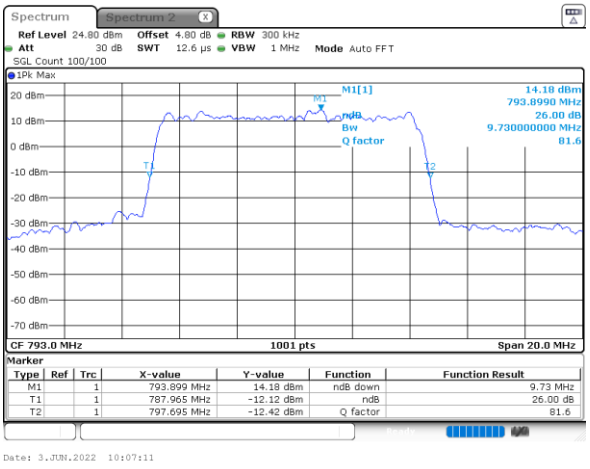


N14

Middle Channel / 10MHz / 64QAM



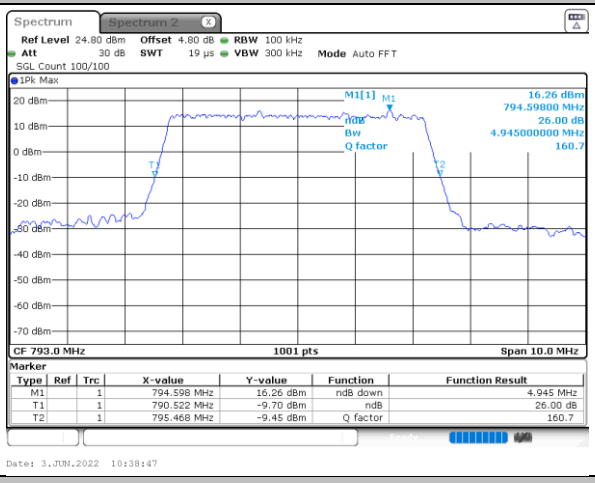
Middle Channel / 10MHz / 256QAM



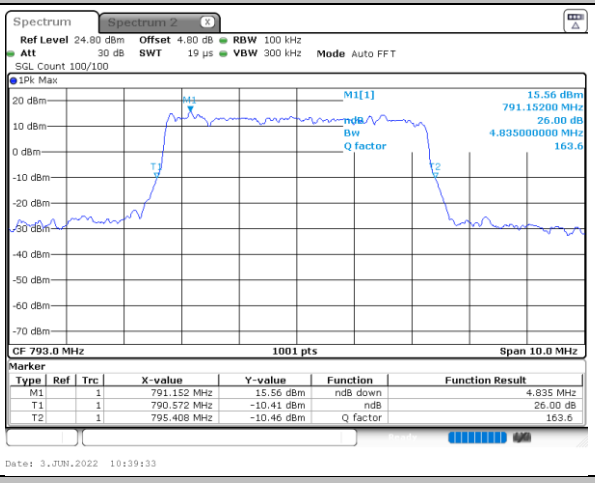
Mode	N14 : 26dB BW(MHz)			
BW	5MHz			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	4.95	4.84	4.96	**4.91**

N14

Middle Channel /5MHz / QPSK

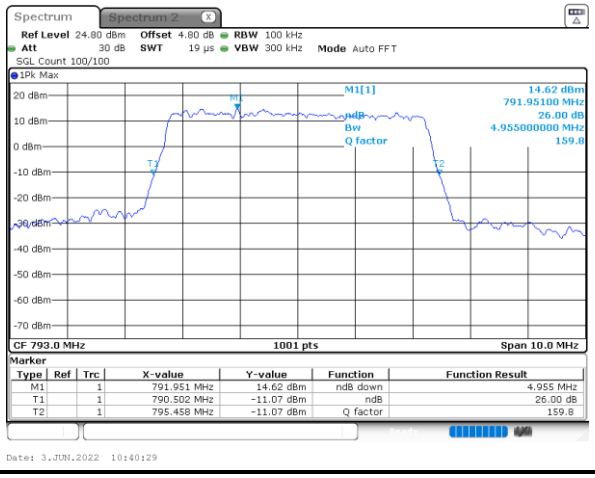


Middle Channel / 5MHz / 16QAM

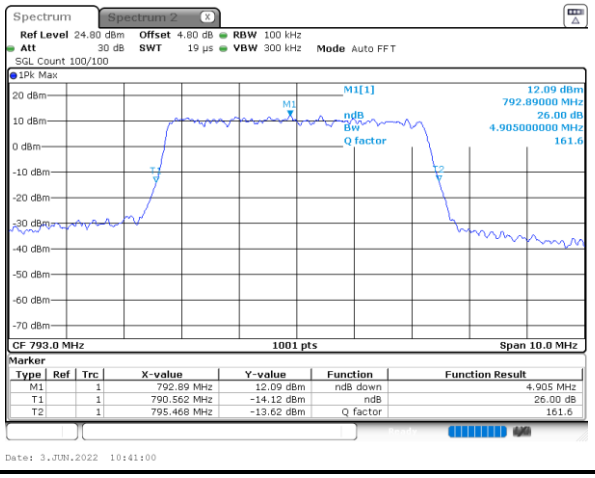


N14

Middle Channel /5MHz / 64QAM



Middle Channel / 5MHz /256QAM

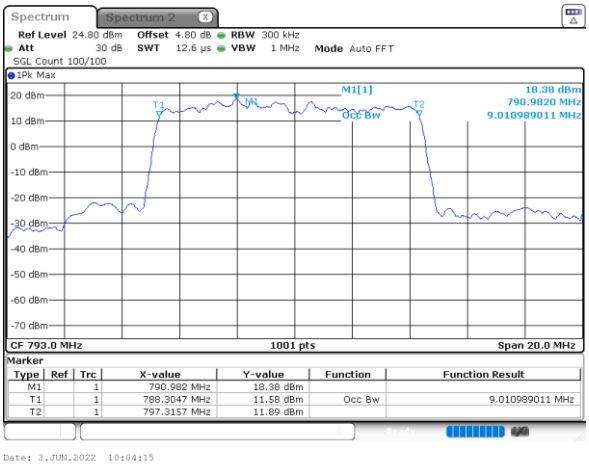


Occupied Bandwidth

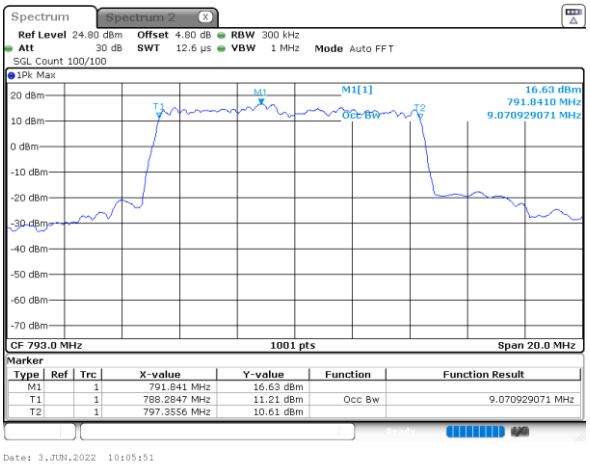
Mode	N14 : 99%OBW(MHz)			
BW	10MHz			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	9.01	9.07	9.01	8.99

N14

Middle Channel /10MHz / QPSK

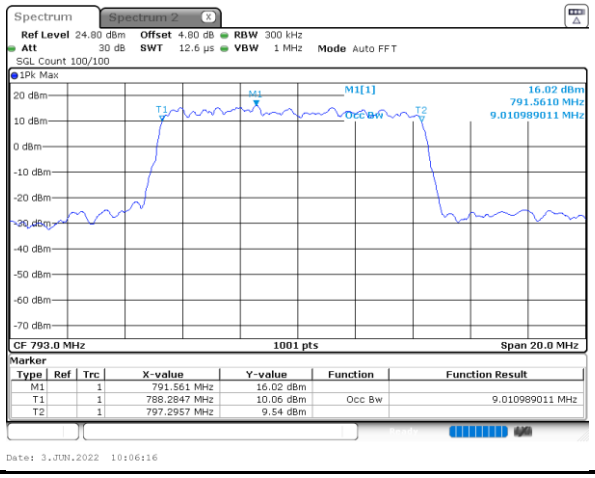


Middle Channel / 10MHz / 16QAM

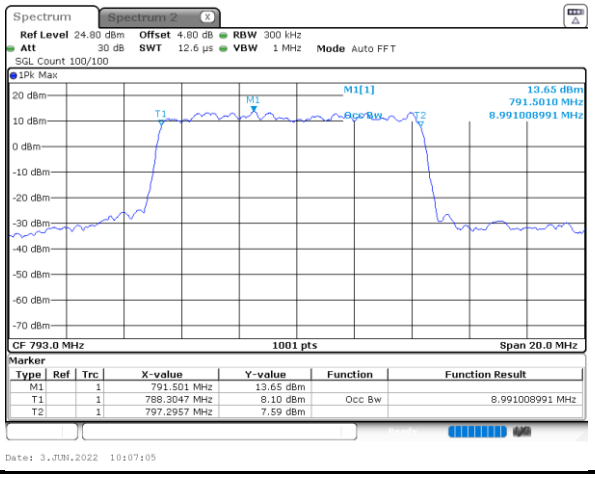


N14

Middle Channel / 10MHz / 64QAM



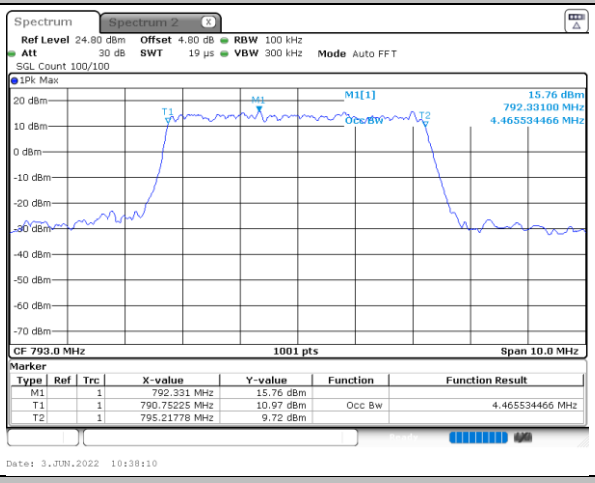
Middle Channel / 10MHz / 256QAM



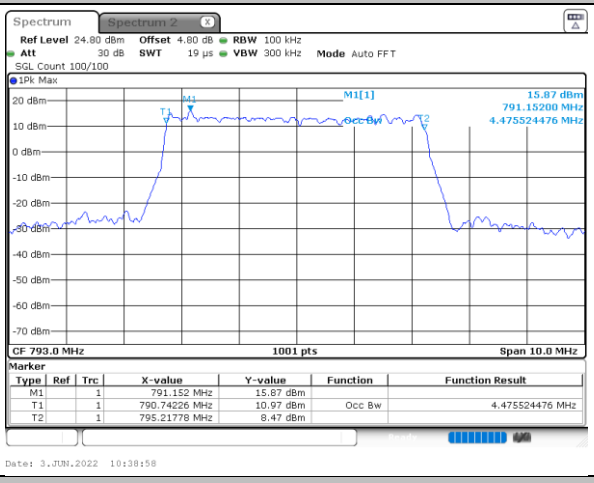
Mode	N14 : 99%OBW(MHz)			
BW	5MHz			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	4.47	4.48	4.49	**4.47**

N14

Middle Channel /5MHz / BPSK

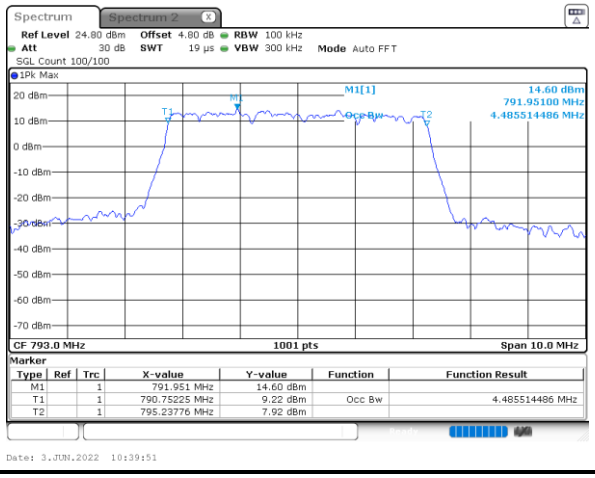


Middle Channel / 5MHz / QPSK

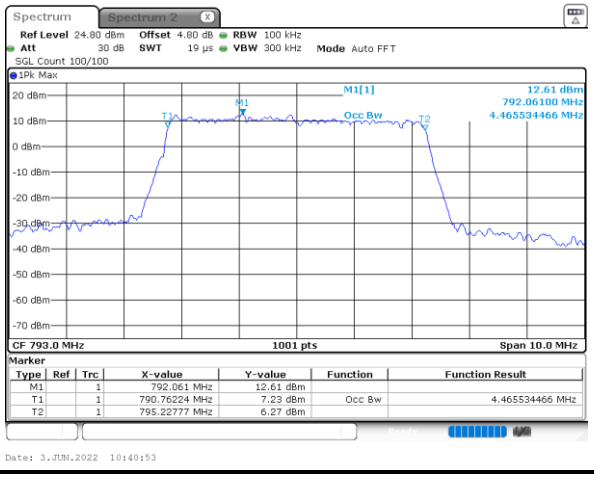


N14

Middle Channel / 5MHz / 16QAM



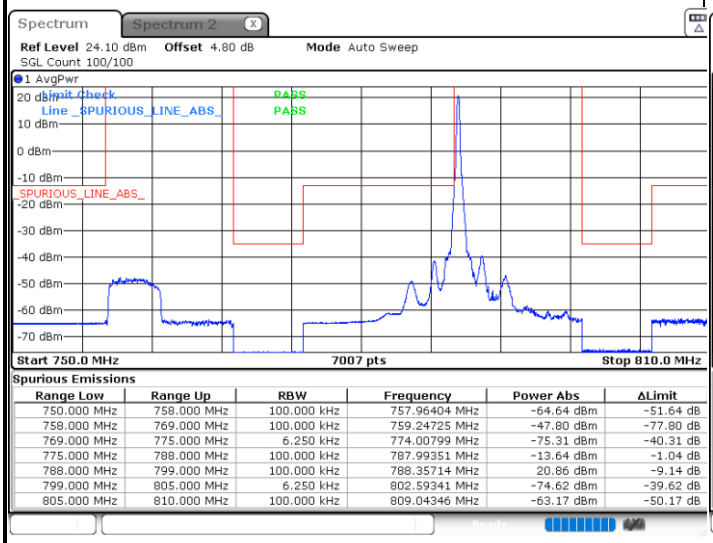
Middle Channel / 5MHz / 64QAM



Conducted Band Edge

N14 / 5MHz / BPSK

Lowest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.96404 MHz	-64.64 dBm	-51.64 dB
758.000 MHz	769.000 MHz	100.000 kHz	759.24725 MHz	-47.80 dBm	-77.80 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.00799 MHz	-75.31 dBm	-40.31 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-13.64 dBm	-1.04 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.35714 MHz	20.86 dBm	-9.14 dB
799.000 MHz	805.000 MHz	6.250 kHz	802.59341 MHz	-74.62 dBm	-39.62 dB
805.000 MHz	810.000 MHz	100.000 kHz	809.04346 MHz	-63.17 dBm	-50.17 dB

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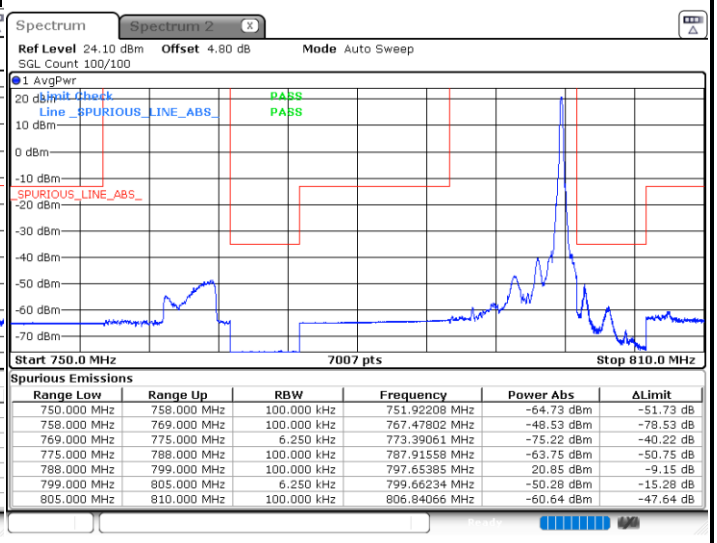
Highest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.92208 MHz	-64.73 dBm	-51.73 dB
758.000 MHz	769.000 MHz	100.000 kHz	767.47802 MHz	-48.53 dBm	-78.53 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.39061 MHz	-75.22 dBm	-40.22 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.91558 MHz	-63.75 dBm	-50.75 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.65385 MHz	20.85 dBm	-9.15 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.66234 MHz	-50.28 dBm	-15.28 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.84066 MHz	-60.64 dBm	-47.64 dB

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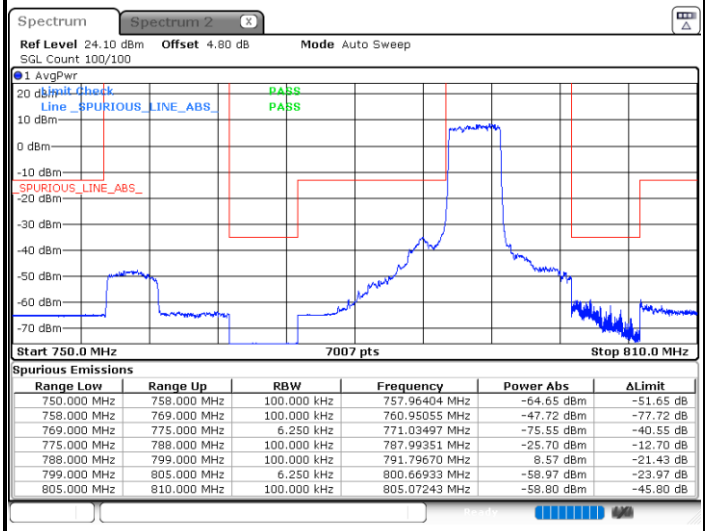
Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.96404 MHz	-64.65 dBm	-51.65 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.95055 MHz	-47.72 dBm	-77.72 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.03497 MHz	-75.55 dBm	-40.55 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-25.70 dBm	-12.70 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.79670 MHz	8.57 dBm	-21.43 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.66933 MHz	-58.97 dBm	-23.97 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.07243 MHz	-58.80 dBm	-45.80 dB

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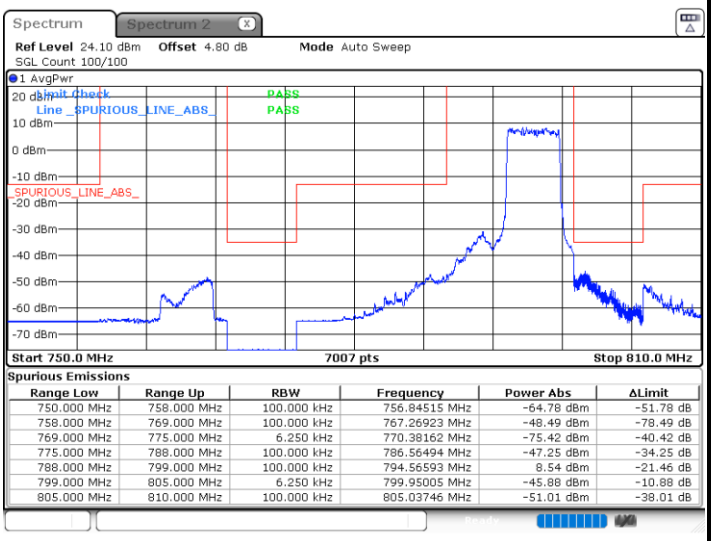
Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	756.84515 MHz	-64.78 dBm	-51.78 dB
758.000 MHz	769.000 MHz	100.000 kHz	767.26923 MHz	-48.49 dBm	-78.49 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.38162 MHz	-75.42 dBm	-40.42 dB
775.000 MHz	788.000 MHz	100.000 kHz	786.56494 MHz	-47.25 dBm	-34.25 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.56593 MHz	8.54 dBm	-21.46 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.95005 MHz	-45.88 dBm	-10.88 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.03746 MHz	-51.01 dBm	-38.01 dB

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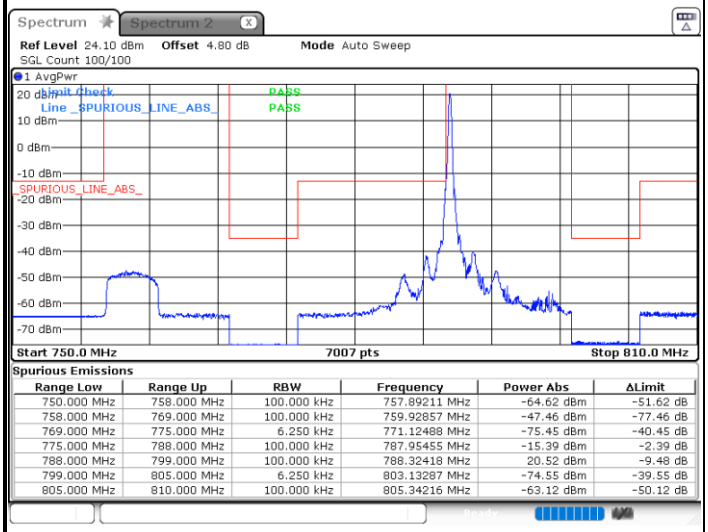
N14 / 5MHz / QPSK

Lowest Band Edge / 1RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.89211 MHz	-64.62 dBm	-51.62 dB
758.000 MHz	769.000 MHz	100.000 kHz	759.92857 MHz	-47.46 dBm	-77.46 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.12488 MHz	-75.45 dBm	-40.45 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.95455 MHz	-15.39 dBm	-2.39 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.32418 MHz	20.52 dBm	-9.48 dB
799.000 MHz	805.000 MHz	6.250 kHz	803.13287 MHz	-74.55 dBm	-39.55 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.34216 MHz	-63.12 dBm	-50.12 dB

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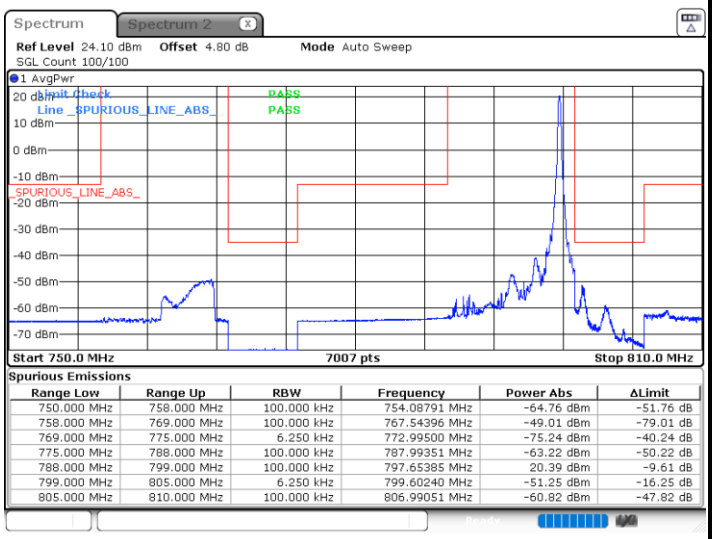
Highest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	754.08791 MHz	-64.76 dBm	-51.76 dB
758.000 MHz	769.000 MHz	100.000 kHz	767.54396 MHz	-49.01 dBm	-79.01 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.99500 MHz	-75.24 dBm	-40.24 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-63.22 dBm	-50.22 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.65385 MHz	20.39 dBm	-9.61 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.60240 MHz	-51.25 dBm	-16.25 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.99051 MHz	-60.82 dBm	-47.82 dB

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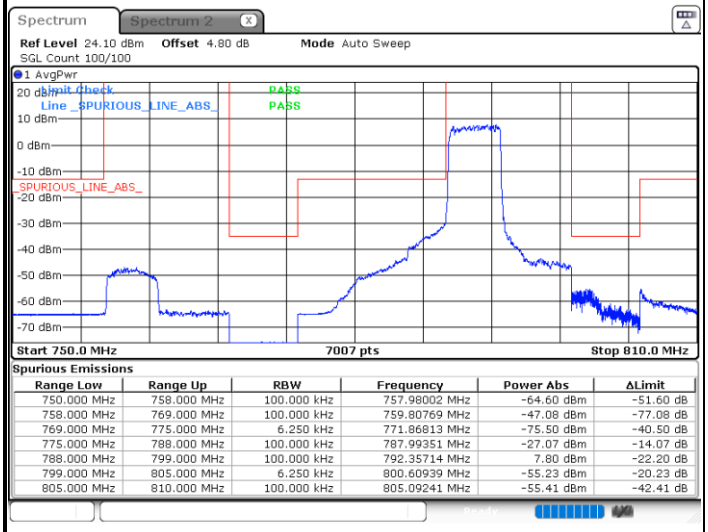
Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.98002 MHz	-64.60 dBm	-51.60 dB
758.000 MHz	769.000 MHz	100.000 kHz	759.80769 MHz	-47.08 dBm	-77.08 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.86813 MHz	-75.50 dBm	-40.50 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-27.07 dBm	-14.07 dB
788.000 MHz	799.000 MHz	100.000 kHz	792.35714 MHz	7.80 dBm	-22.20 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.60939 MHz	-55.23 dBm	-20.23 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.09241 MHz	-55.41 dBm	-42.41 dB

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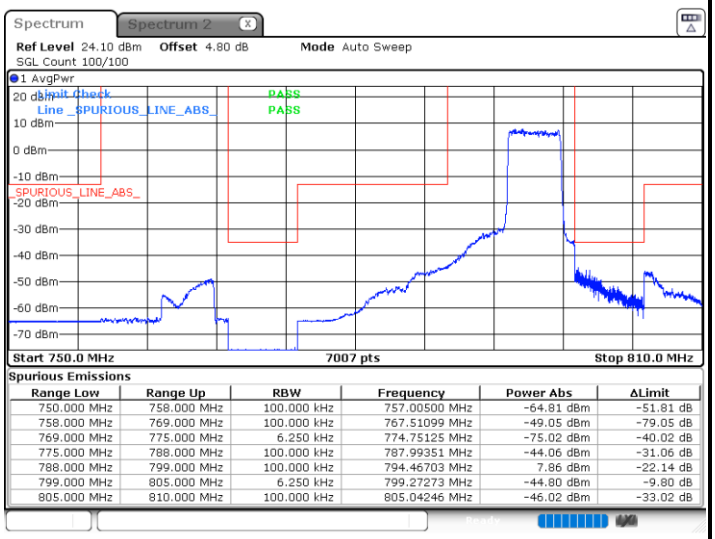
Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.00500 MHz	-64.81 dBm	-51.81 dB
758.000 MHz	769.000 MHz	100.000 kHz	767.51099 MHz	-49.05 dBm	-79.05 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.75125 MHz	-75.02 dBm	-40.02 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-44.06 dBm	-31.06 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.46703 MHz	7.86 dBm	-22.14 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.27273 MHz	-44.80 dBm	-9.80 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.04246 MHz	-46.02 dBm	-33.02 dB

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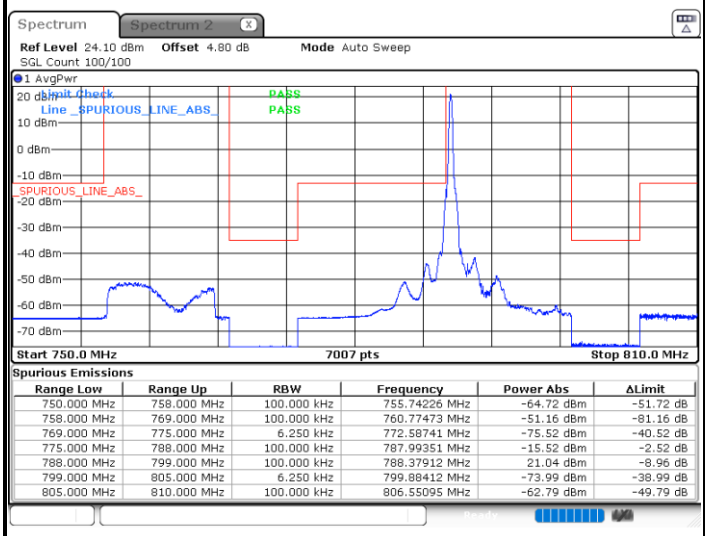
N14 / 10MHz / BPSK

middle Band Edge / 1 RB

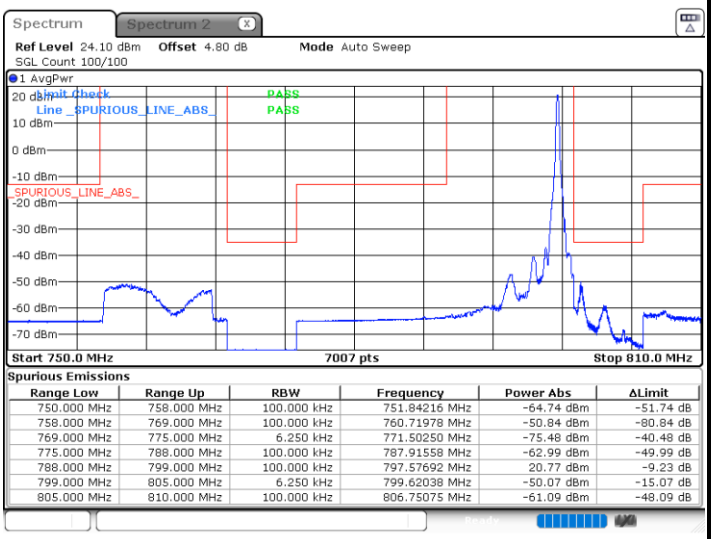


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	755.74226 MHz	-64.72 dBm	-51.72 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.77473 MHz	-51.16 dBm	-81.16 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.58741 MHz	-75.52 dBm	-40.52 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-15.52 dBm	-2.52 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.37912 MHz	21.04 dBm	-8.96 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.88412 MHz	-73.99 dBm	-38.99 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.55095 MHz	-62.79 dBm	-49.79 dB

Date: 3.JUN.2022 10:09:33

middle Band Edge / 1 RB

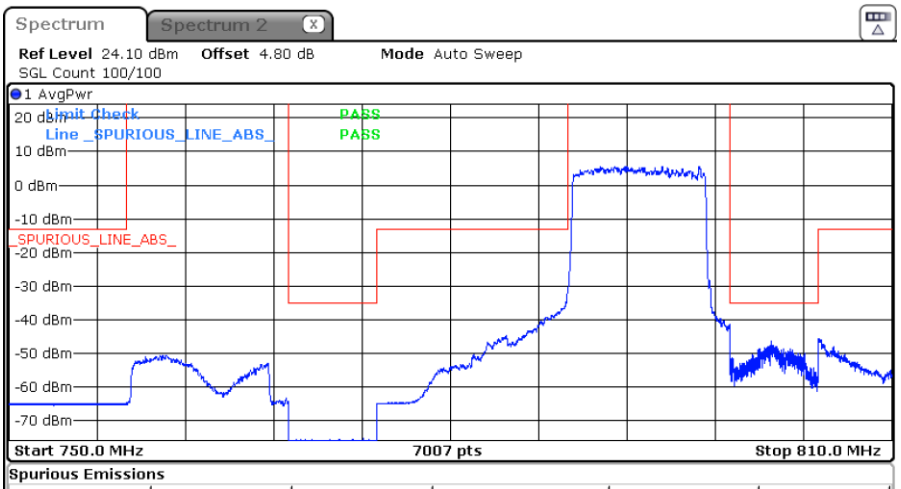


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.84216 MHz	-64.74 dBm	-51.74 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.71978 MHz	-50.84 dBm	-80.84 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.50250 MHz	-75.48 dBm	-40.48 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.91558 MHz	-62.99 dBm	-49.99 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.57692 MHz	20.77 dBm	-9.23 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.62038 MHz	-50.07 dBm	-15.07 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.75075 MHz	-61.09 dBm	-48.09 dB

Date: 3.JUN.2022 10:24:33

Middle Band Edge / Full RB



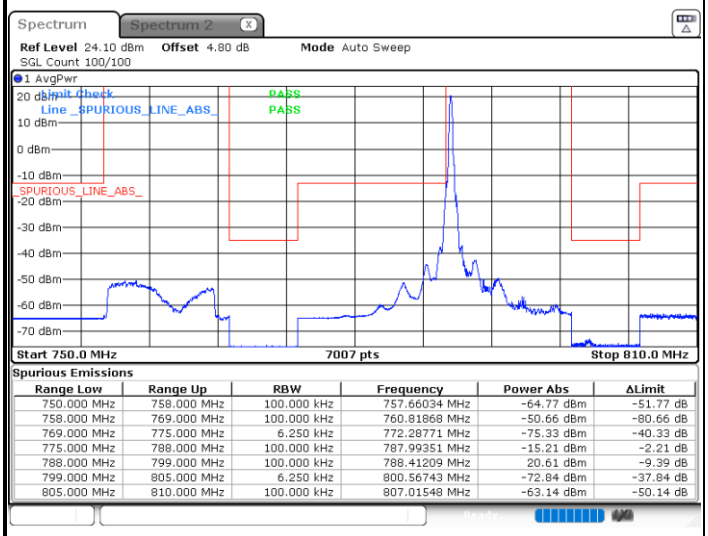
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.96404 MHz	-64.70 dBm	-51.70 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.44505 MHz	-50.59 dBm	-80.59 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.09790 MHz	-75.18 dBm	-40.18 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-30.42 dBm	-17.42 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.13736 MHz	5.66 dBm	-24.34 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.82018 MHz	-46.24 dBm	-11.24 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.08242 MHz	-45.62 dBm	-32.62 dB

Date: 3.JUN.2022 10:20:26

N14 / 10MHz / QPSK

middle Band Edge / 1 RB

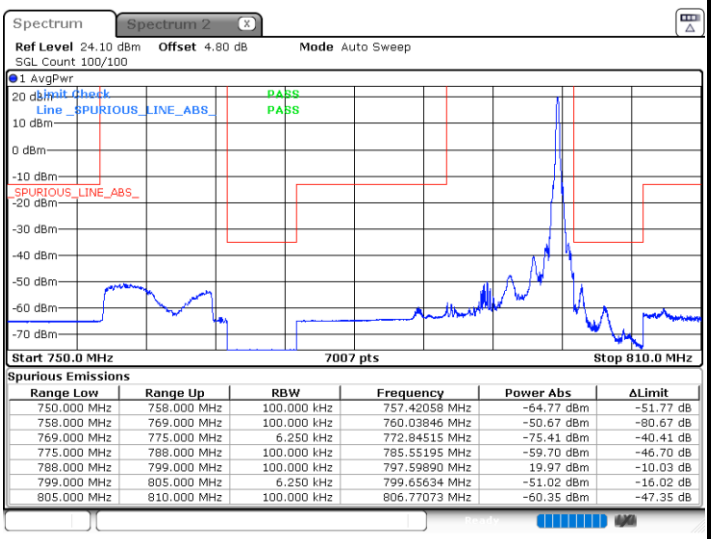


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.66034 MHz	-64.77 dBm	-51.77 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.81868 MHz	-50.66 dBm	-80.66 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.28771 MHz	-75.33 dBm	-40.33 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-15.21 dBm	-2.21 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.41209 MHz	20.61 dBm	-9.39 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.56743 MHz	-72.84 dBm	-37.84 dB
805.000 MHz	810.000 MHz	100.000 kHz	807.01548 MHz	-63.14 dBm	-50.14 dB

Date: 3.JUN.2022 10:11:19

middle Band Edge / 1 RB

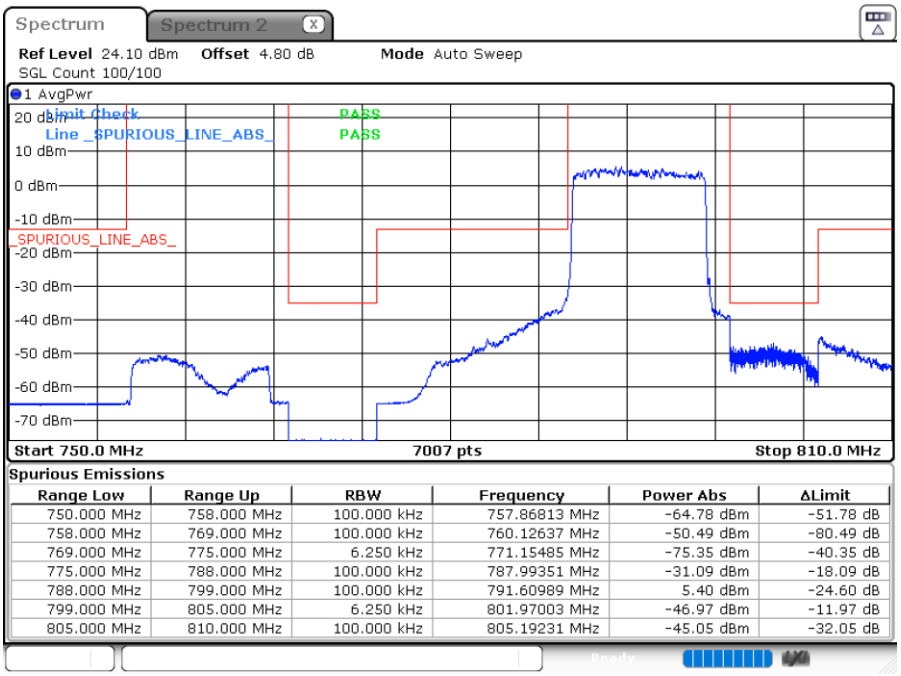


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.42058 MHz	-64.77 dBm	-51.77 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.03846 MHz	-50.67 dBm	-80.67 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.84515 MHz	-75.41 dBm	-40.41 dB
775.000 MHz	788.000 MHz	100.000 kHz	785.55195 MHz	-59.70 dBm	-46.70 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.59890 MHz	19.97 dBm	-10.03 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.65634 MHz	-51.02 dBm	-16.02 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.77073 MHz	-60.35 dBm	-47.35 dB

Date: 3.JUN.2022 10:23:18

Middle Band Edge / Full RB



Spurious Emissions

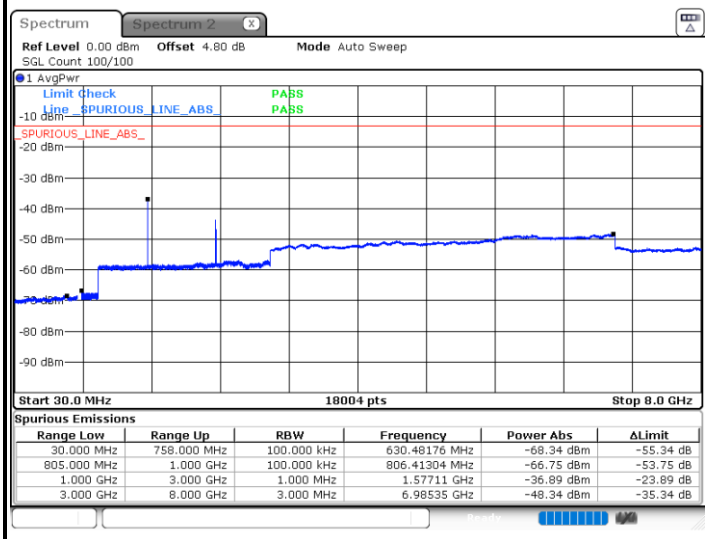
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.86813 MHz	-64.78 dBm	-51.78 dB
758.000 MHz	769.000 MHz	100.000 kHz	760.12637 MHz	-50.49 dBm	-80.49 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.15485 MHz	-75.35 dBm	-40.35 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-31.09 dBm	-18.09 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.60989 MHz	5.40 dBm	-24.60 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.97003 MHz	-46.97 dBm	-11.97 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.19231 MHz	-45.05 dBm	-32.05 dB

Date: 3.JUN.2022 10:21:42

Conducted Spurious Emission

N14 / 5MHz

Lowest Channel / BPSK

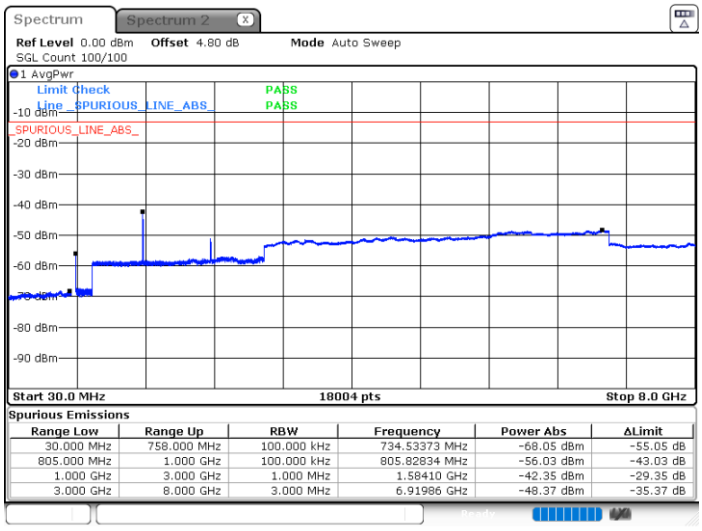


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	630.48176 MHz	-68.34 dBm	-55.34 dB
805.000 MHz	1.000 GHz	100.000 kHz	806.41304 MHz	-66.75 dBm	-53.75 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-36.89 dBm	-23.89 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.98535 GHz	-48.34 dBm	-35.34 dB

Date: 3.JUN.2022 10:30:40

Middle Channel / BPSK

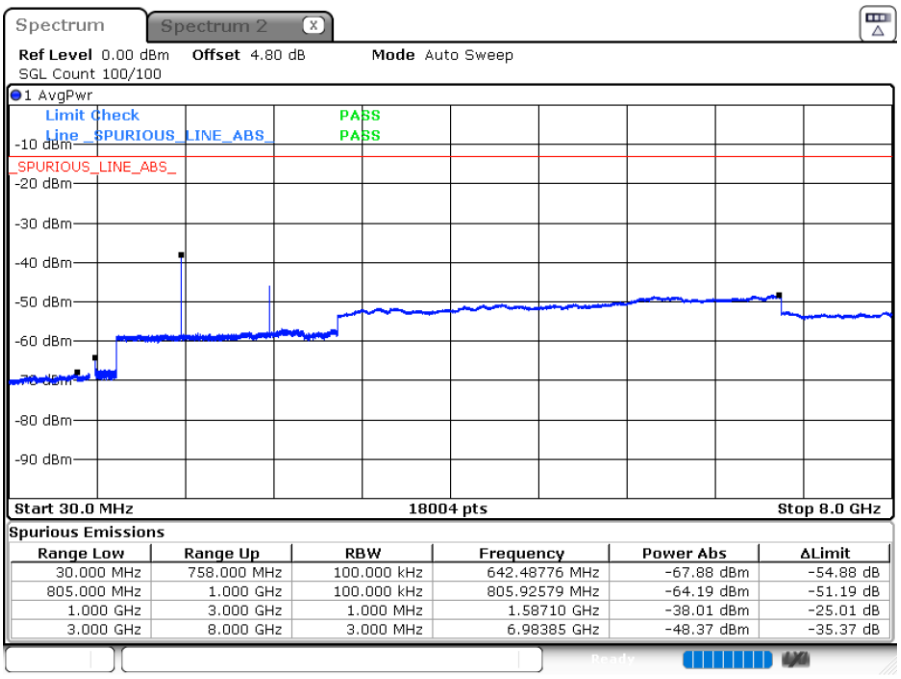


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	734.53373 MHz	-68.05 dBm	-55.05 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.82834 MHz	-56.03 dBm	-43.03 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58410 GHz	-42.35 dBm	-29.35 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.91986 GHz	-48.37 dBm	-35.37 dB

Date: 3.JUN.2022 10:27:50

Highest Channel / BPSK



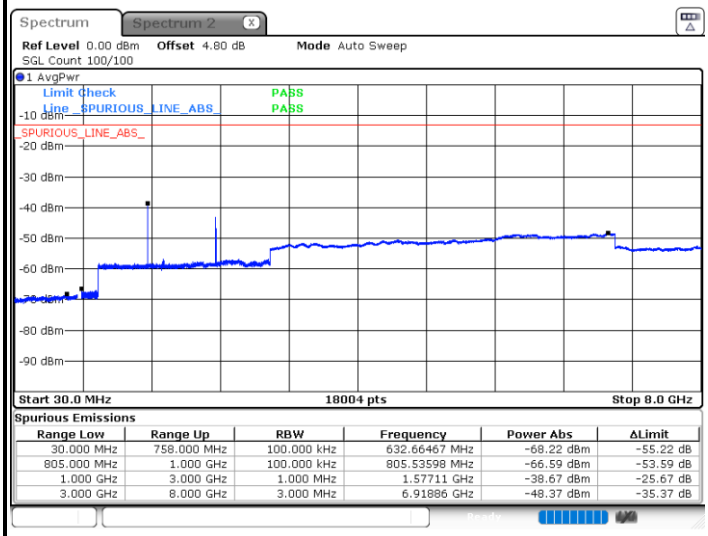
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	642.48776 MHz	-67.88 dBm	-54.88 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.92579 MHz	-64.19 dBm	-51.19 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58710 GHz	-38.01 dBm	-25.01 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.98385 GHz	-48.37 dBm	-35.37 dB

Date: 3.JUN.2022 11:44:43

N14 / 5MHz

Lowest Channel / QPSK

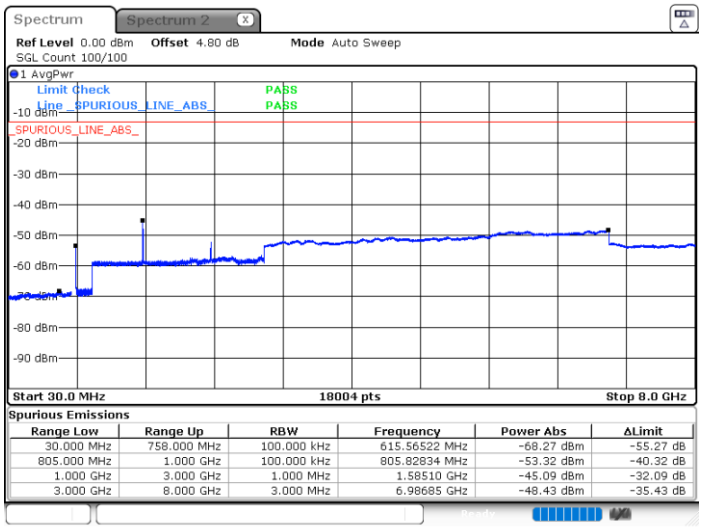


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	632.66467 MHz	-68.22 dBm	-55.22 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.53598 MHz	-66.59 dBm	-53.59 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-38.67 dBm	-25.67 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.91886 GHz	-48.37 dBm	-35.37 dB

Date: 3.JUN.2022 10:30:03

Middle Channel / QPSK

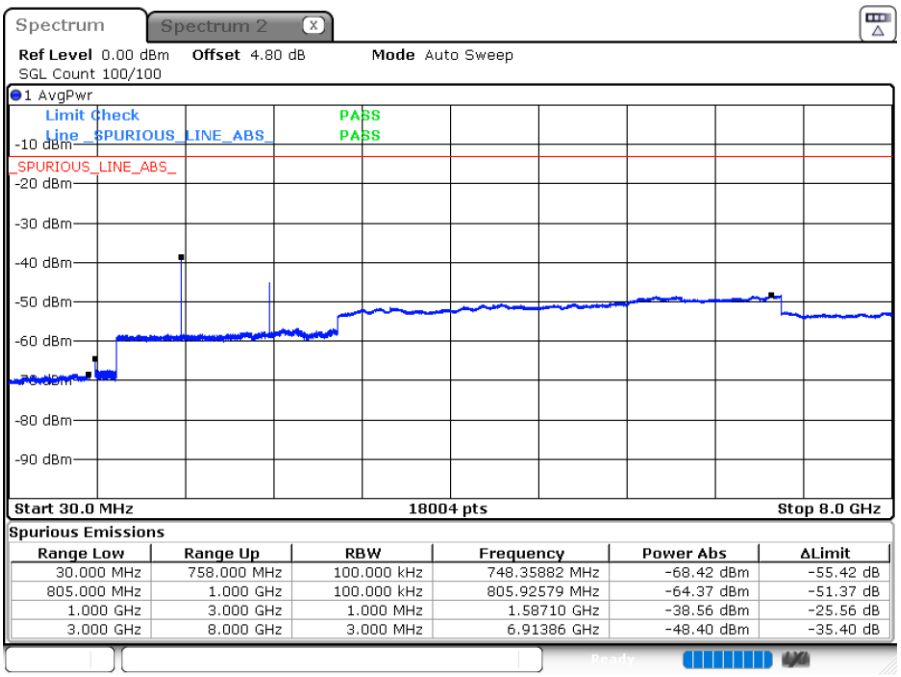


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	615.56522 MHz	-68.27 dBm	-55.27 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.82834 MHz	-53.32 dBm	-40.32 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58510 GHz	-45.09 dBm	-32.09 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.98685 GHz	-48.43 dBm	-35.43 dB

Date: 3.JUN.2022 10:28:49

Highest Channel / QPSK



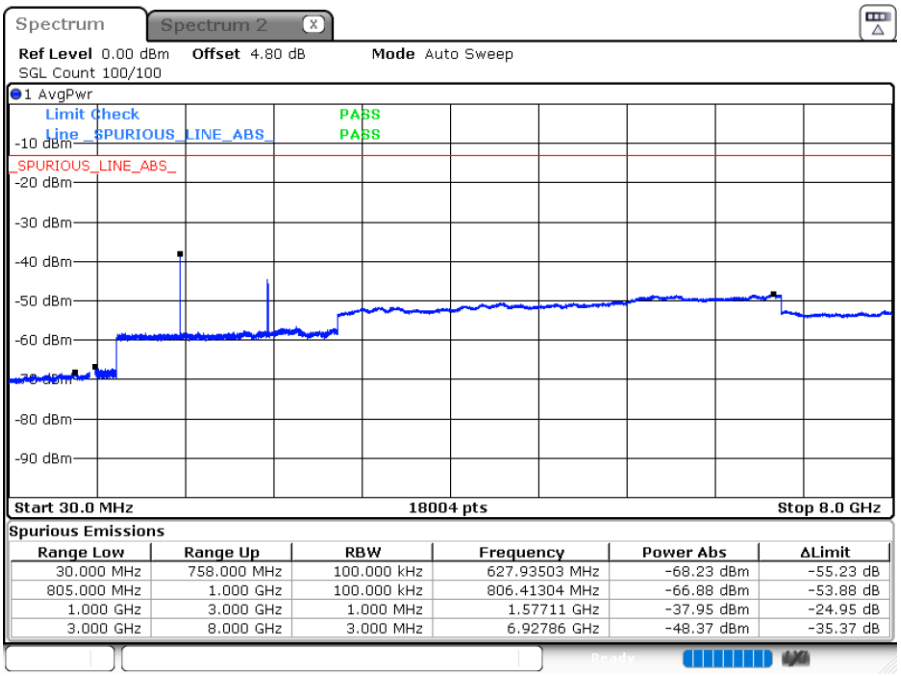
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	748.35882 MHz	-68.42 dBm	-55.42 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.92579 MHz	-64.37 dBm	-51.37 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58710 GHz	-38.56 dBm	-25.56 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.91386 GHz	-48.40 dBm	-35.40 dB

Date: 3.JUN.2022 11:45:14

N14 / 10MHz

Middle Channel / BPSK



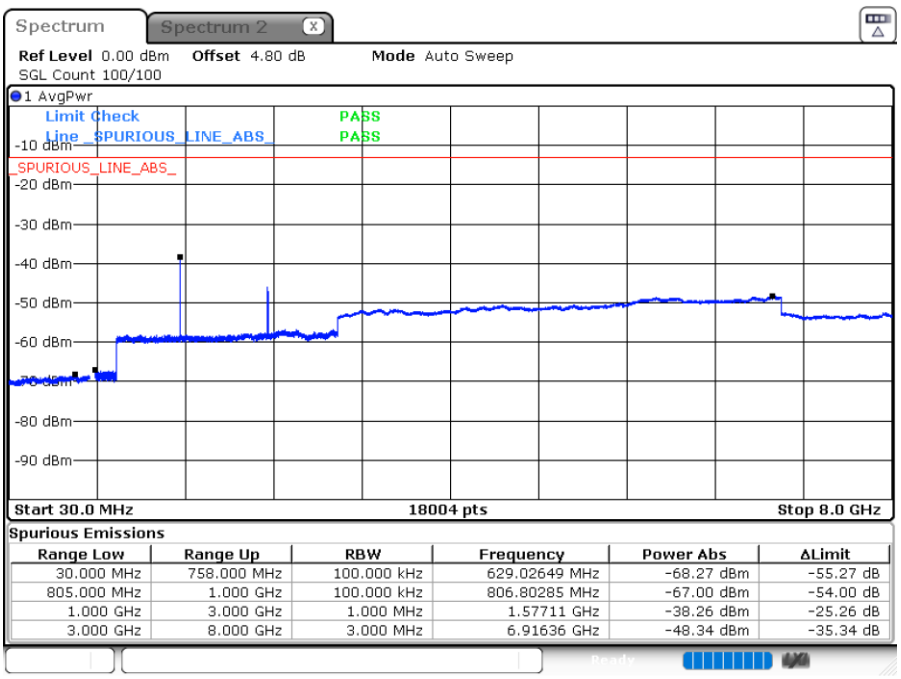
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	627.93503 MHz	-68.23 dBm	-55.23 dB
805.000 MHz	1.000 GHz	100.000 kHz	806.41304 MHz	-66.88 dBm	-53.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-37.95 dBm	-24.95 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.92786 GHz	-48.37 dBm	-35.37 dB

Date: 3.JUN.2022 10:26:07

N14 / 10MHz

Middle Channel / QPSK



Spurious Emissions

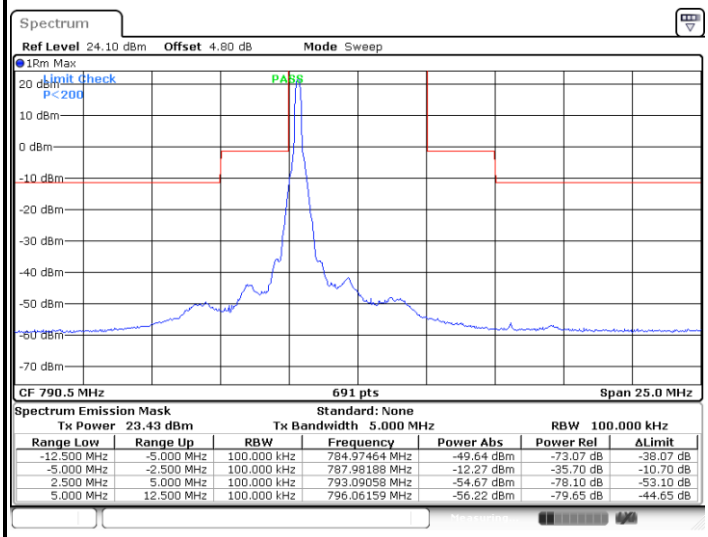
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	629.02649 MHz	-68.27 dBm	-55.27 dB
805.000 MHz	1.000 GHz	100.000 kHz	806.80285 MHz	-67.00 dBm	-54.00 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-38.26 dBm	-25.26 dB
3.000 GHz	8.000 GHz	3.000 MHz	6.91636 GHz	-48.34 dBm	-35.34 dB

Date: 3.JUN.2022 10:26:47

Mask

N 14 / 5MHz

Lowest Channel / BPSK

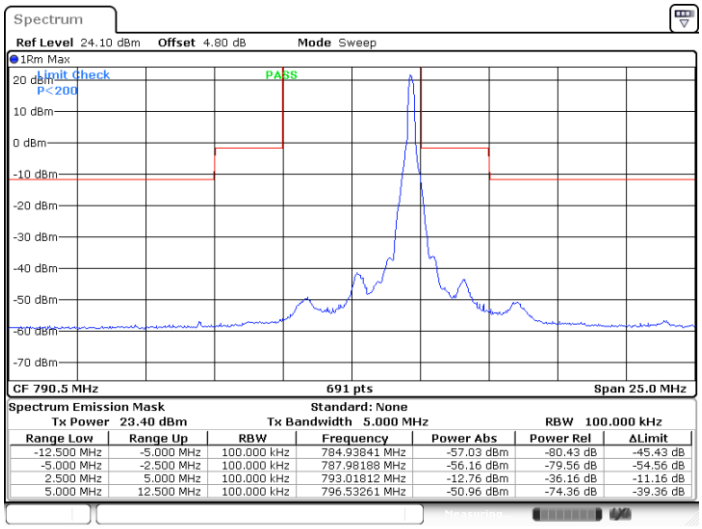


Spectrum Emission Mask Standard: None
Tx Power 23.43 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	784.97464 MHz	-49.64 dBm	-73.07 dB	-38.07 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.98188 MHz	-12.27 dBm	-35.70 dB	-10.70 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.09058 MHz	-54.67 dBm	-78.10 dB	-53.10 dB
5.000 MHz	12.500 MHz	100.000 kHz	796.06159 MHz	-56.22 dBm	-79.65 dB	-44.65 dB

Date: 31.JUL.2022 00:53:11

Lowest Channel / BPSK

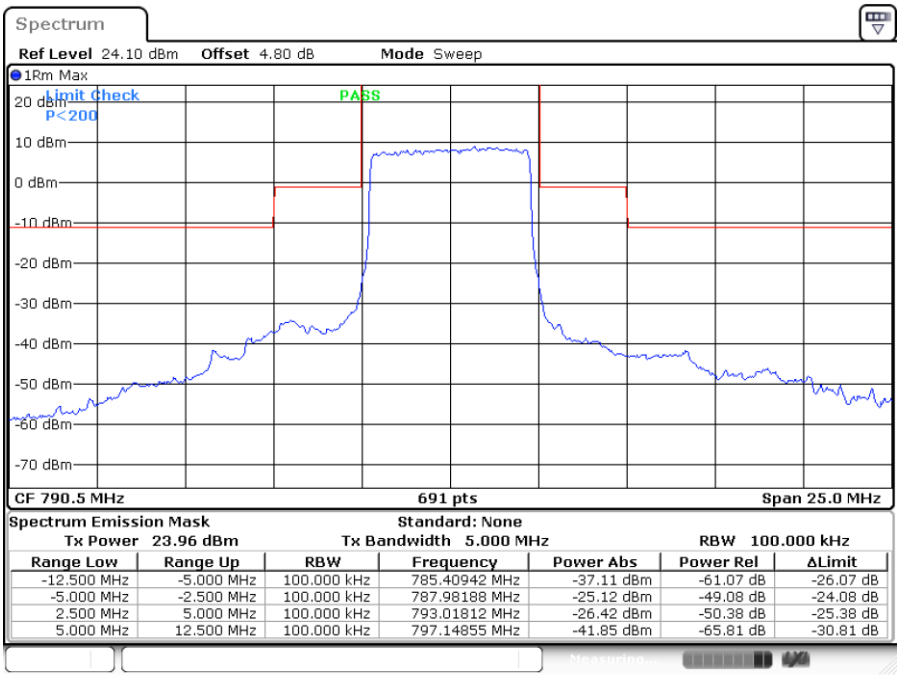


Spectrum Emission Mask Standard: None
Tx Power 23.40 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	784.93841 MHz	-57.03 dBm	-80.43 dB	-45.43 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.98188 MHz	-56.16 dBm	-79.56 dB	-54.56 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.01812 MHz	-12.76 dBm	-36.16 dB	-11.16 dB
5.000 MHz	12.500 MHz	100.000 kHz	796.53261 MHz	-50.96 dBm	-74.36 dB	-39.36 dB

Date: 31.JUL.2022 00:53:52

Lowest Channel /BPSK



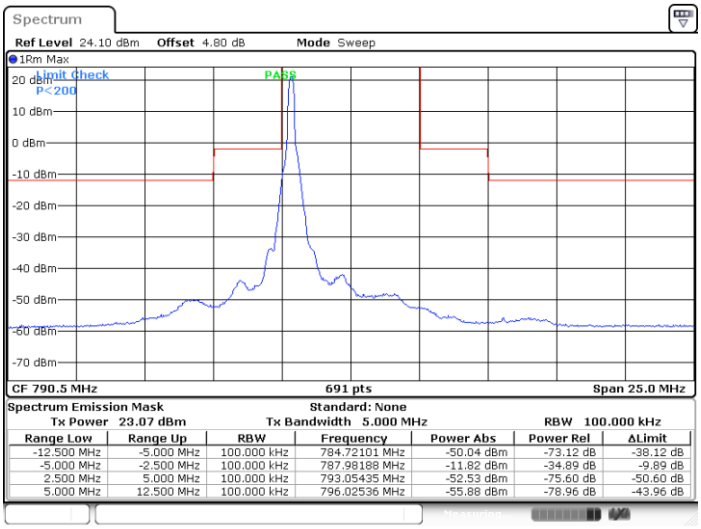
Spectrum Emission Mask Standard: None
Tx Power 23.96 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	785.40942 MHz	-37.11 dBm	-61.07 dB	-26.07 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.98188 MHz	-25.12 dBm	-49.08 dB	-24.08 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.01812 MHz	-26.42 dBm	-50.38 dB	-25.38 dB
5.000 MHz	12.500 MHz	100.000 kHz	797.14855 MHz	-41.85 dBm	-65.81 dB	-30.81 dB

Date: 31.JUL.2022 00:59:49

N 14 / 5MHz

Lowest Channel / QPSK

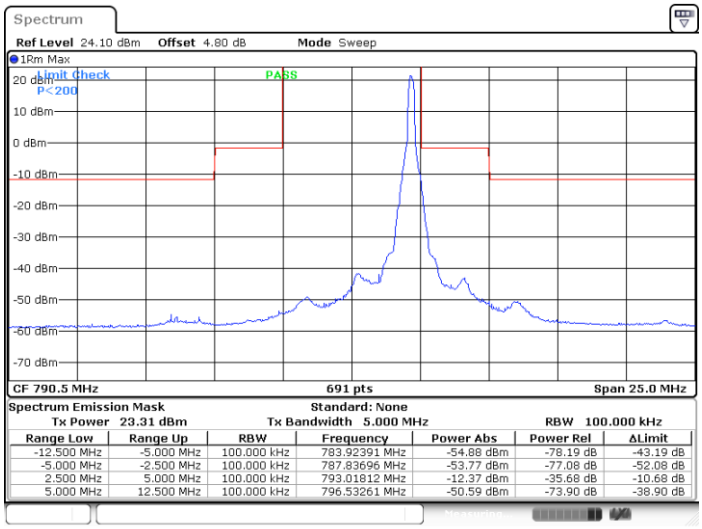


Spectrum Emission Mask Standard: None
Tx Power 23.07 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	784.72101 MHz	-50.04 dBm	-73.12 dB	-38.12 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.98188 MHz	-11.82 dBm	-34.89 dB	-9.89 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.05435 MHz	-52.53 dBm	-75.60 dB	-50.60 dB
5.000 MHz	12.500 MHz	100.000 kHz	796.02536 MHz	-55.88 dBm	-78.96 dB	-43.96 dB

Date: 31.JUL.2022 00:52:29

Lowest Channel / QPSK

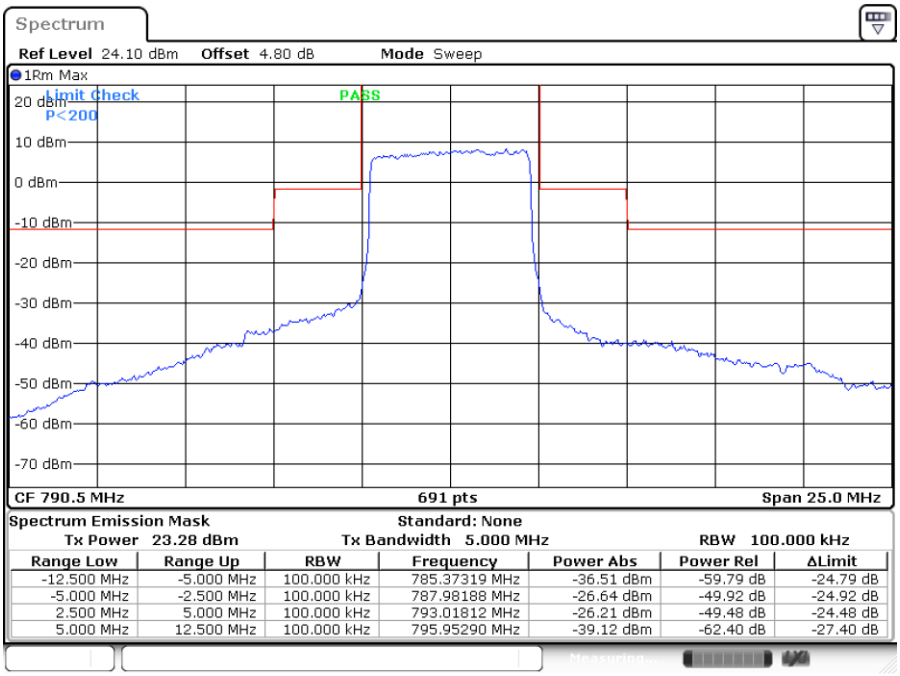


Spectrum Emission Mask Standard: None
Tx Power 23.31 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	783.92391 MHz	-54.88 dBm	-78.19 dB	-43.19 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.83696 MHz	-53.77 dBm	-77.08 dB	-52.08 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.01812 MHz	-12.37 dBm	-35.68 dB	-10.68 dB
5.000 MHz	12.500 MHz	100.000 kHz	796.53261 MHz	-50.59 dBm	-73.90 dB	-38.90 dB

Date: 31.JUL.2022 00:57:08

Lowest Channel / QPSK



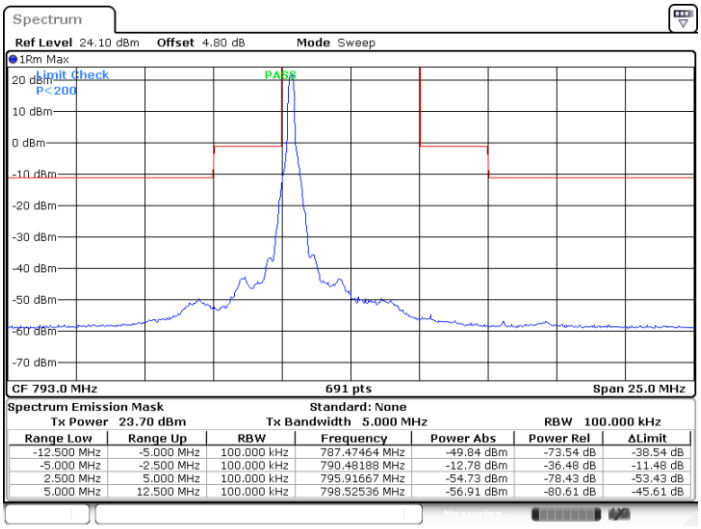
Spectrum Emission Mask Standard: None
Tx Power 23.28 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	785.37319 MHz	-36.51 dBm	-59.79 dB	-24.79 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	787.98188 MHz	-26.64 dBm	-49.92 dB	-24.92 dB
2.500 MHz	5.000 MHz	100.000 kHz	793.01812 MHz	-26.21 dBm	-49.48 dB	-24.48 dB
5.000 MHz	12.500 MHz	100.000 kHz	795.95290 MHz	-39.12 dBm	-62.40 dB	-27.40 dB

Date: 31.JUL.2022 00:58:15

N 14 / 5MHz

Middle Channel / BPSK

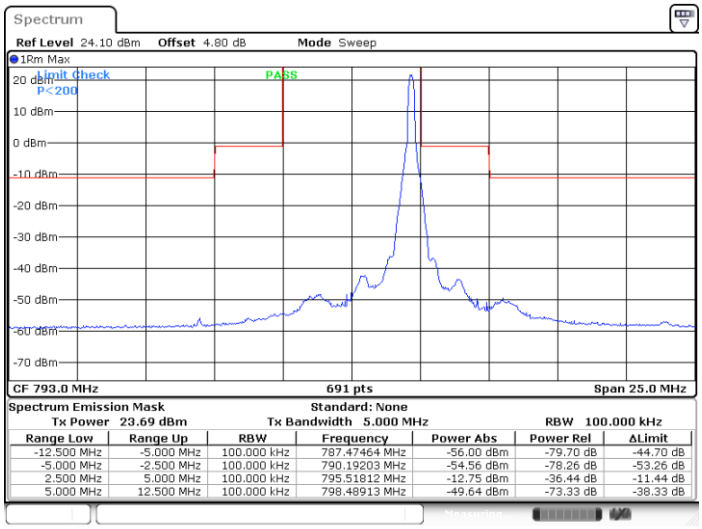


Spectrum Emission Mask Standard: None
Tx Power 23.70 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	787.47464 MHz	-49.84 dBm	-73.54 dB	-38.54 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.48188 MHz	-12.78 dBm	-36.48 dB	-11.48 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.91667 MHz	-54.73 dBm	-78.43 dB	-53.43 dB
5.000 MHz	12.500 MHz	100.000 kHz	798.52536 MHz	-56.91 dBm	-80.61 dB	-45.61 dB

Date: 31.JUL.2022 01:29:42

Middle Channel / BPSK

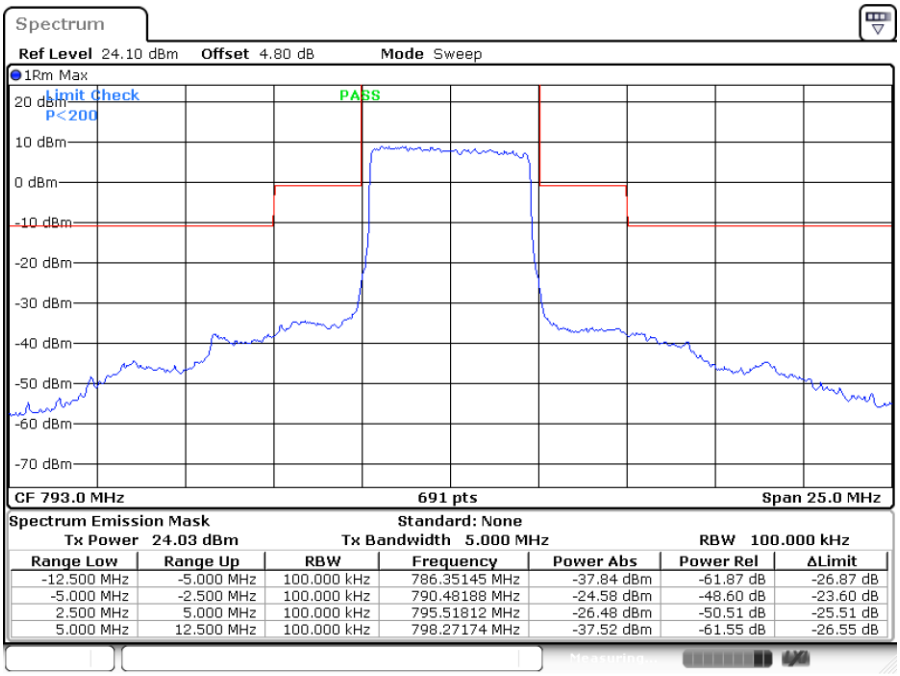


Spectrum Emission Mask Standard: None
Tx Power 23.69 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	787.47464 MHz	-56.00 dBm	-79.70 dB	-44.70 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.19203 MHz	-54.56 dBm	-78.26 dB	-53.26 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.51812 MHz	-12.75 dBm	-36.44 dB	-11.44 dB
5.000 MHz	12.500 MHz	100.000 kHz	798.48913 MHz	-49.64 dBm	-73.33 dB	-38.33 dB

Date: 31.JUL.2022 01:29:13

Middle Channel / BPSK



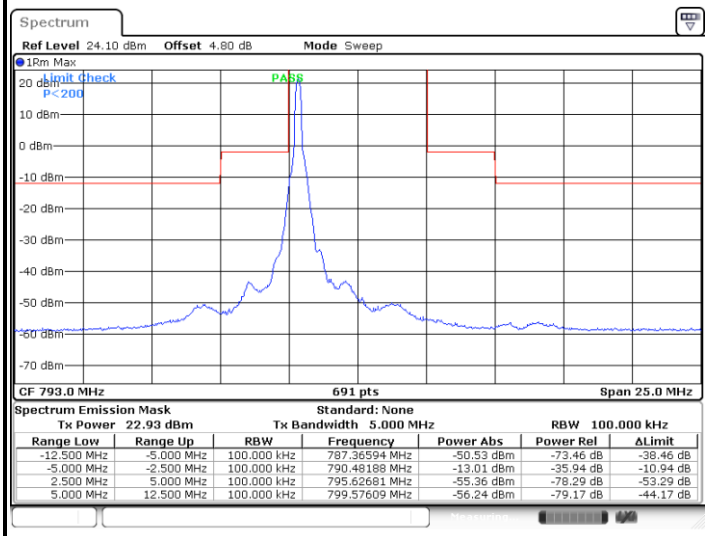
Spectrum Emission Mask Standard: None
Tx Power 24.03 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	786.35145 MHz	-37.84 dBm	-61.87 dB	-26.87 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.48188 MHz	-24.58 dBm	-48.60 dB	-23.60 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.51812 MHz	-26.48 dBm	-50.51 dB	-25.51 dB
5.000 MHz	12.500 MHz	100.000 kHz	798.27174 MHz	-37.52 dBm	-61.55 dB	-26.55 dB

Date: 31.JUL.2022 01:27:34

N 14 / 5MHz

Middle Channel / QPSK

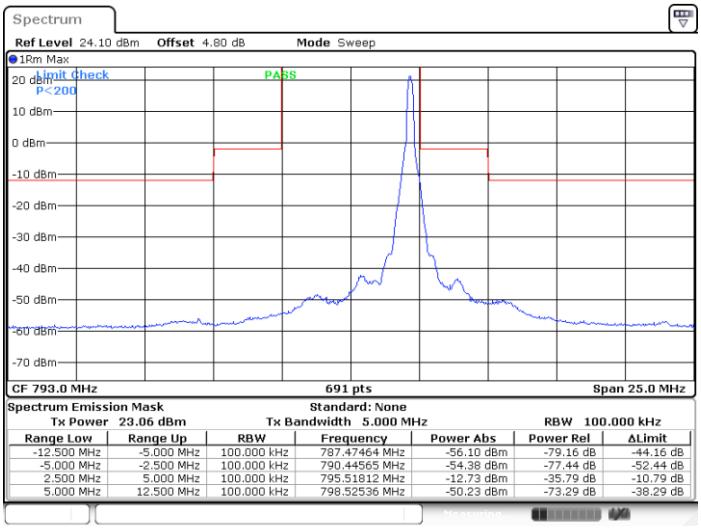


Spectrum Emission Mask Standard: None
Tx Power 22.93 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	787.36594 MHz	-50.53 dBm	-73.46 dB	-38.46 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.48188 MHz	-13.01 dBm	-35.94 dB	-10.94 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.62681 MHz	-55.36 dBm	-78.29 dB	-53.29 dB
5.000 MHz	12.500 MHz	100.000 kHz	799.57609 MHz	-56.24 dBm	-79.17 dB	-44.17 dB

Date: 31.JUL.2022 01:30:16

Middle Channel / QPSK

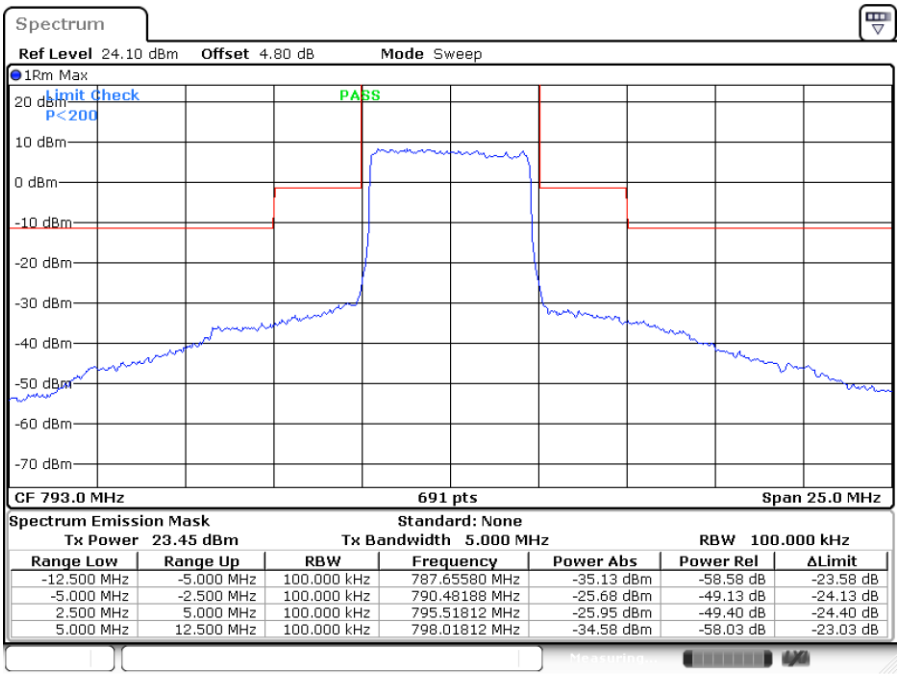


Spectrum Emission Mask Standard: None
Tx Power 23.06 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	787.47464 MHz	-56.10 dBm	-79.16 dB	-44.16 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.44565 MHz	-54.38 dBm	-77.44 dB	-52.44 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.51812 MHz	-12.73 dBm	-35.79 dB	-10.79 dB
5.000 MHz	12.500 MHz	100.000 kHz	798.52536 MHz	-50.23 dBm	-73.29 dB	-38.29 dB

Date: 31.JUL.2022 01:28:40

Middle Channel / QPSK



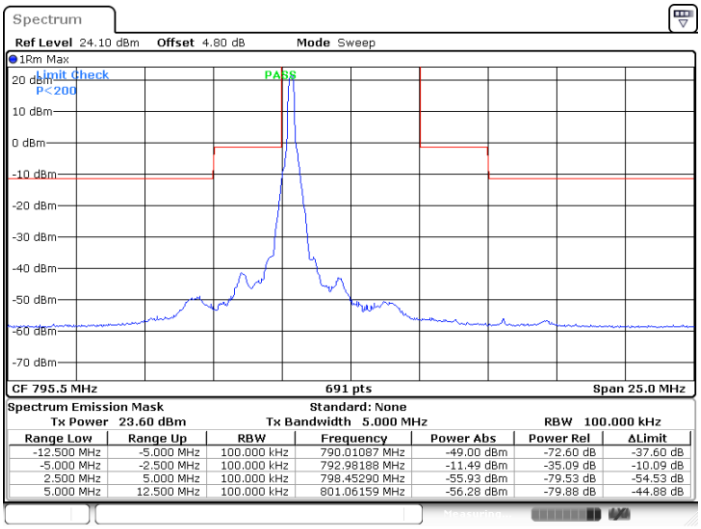
Spectrum Emission Mask Standard: None
Tx Power 23.45 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	787.65580 MHz	-35.13 dBm	-58.58 dB	-23.58 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	790.48188 MHz	-25.68 dBm	-49.13 dB	-24.13 dB
2.500 MHz	5.000 MHz	100.000 kHz	795.51812 MHz	-25.95 dBm	-49.40 dB	-24.40 dB
5.000 MHz	12.500 MHz	100.000 kHz	798.01812 MHz	-34.58 dBm	-58.03 dB	-23.03 dB

Date: 31.JUL.2022 01:28:07

N 14 / 5MHz

Highest Channel / BPSK

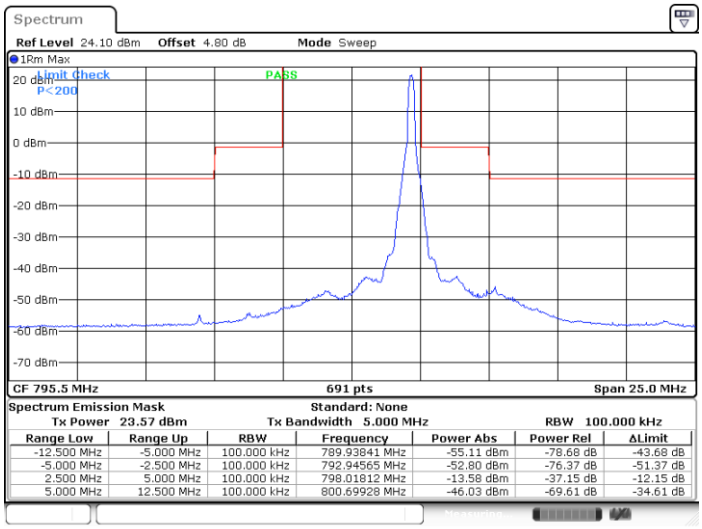


Spectrum Emission Mask Standard: None
Tx Power 23.60 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	790.01087 MHz	-49.00 dBm	-72.60 dB	-37.60 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	792.98188 MHz	-11.49 dBm	-35.09 dB	-10.09 dB
2.500 MHz	5.000 MHz	100.000 kHz	798.45290 MHz	-55.93 dBm	-79.53 dB	-54.53 dB
5.000 MHz	12.500 MHz	100.000 kHz	801.06159 MHz	-56.28 dBm	-79.88 dB	-44.88 dB

Date: 31.JUL.2022 01:33:16

Highest Channel / BPSK

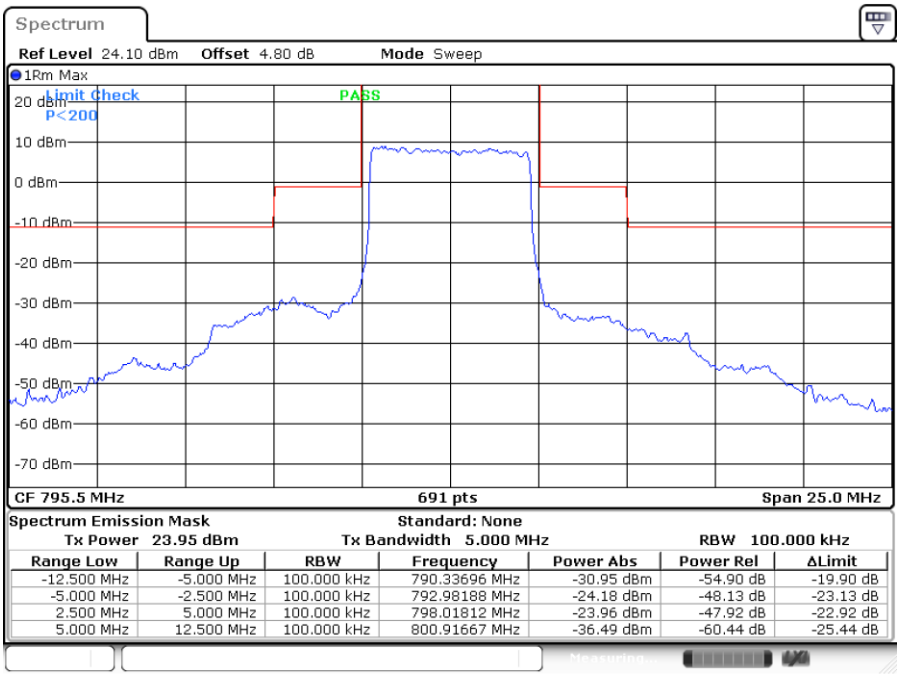


Spectrum Emission Mask Standard: None
Tx Power 23.57 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	789.93841 MHz	-55.11 dBm	-78.68 dB	-43.68 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	792.94565 MHz	-52.80 dBm	-76.37 dB	-51.37 dB
2.500 MHz	5.000 MHz	100.000 kHz	798.01812 MHz	-13.58 dBm	-37.15 dB	-12.15 dB
5.000 MHz	12.500 MHz	100.000 kHz	800.69928 MHz	-46.03 dBm	-69.61 dB	-34.61 dB

Date: 31.JUL.2022 01:35:14

Highest Channel / BPSK



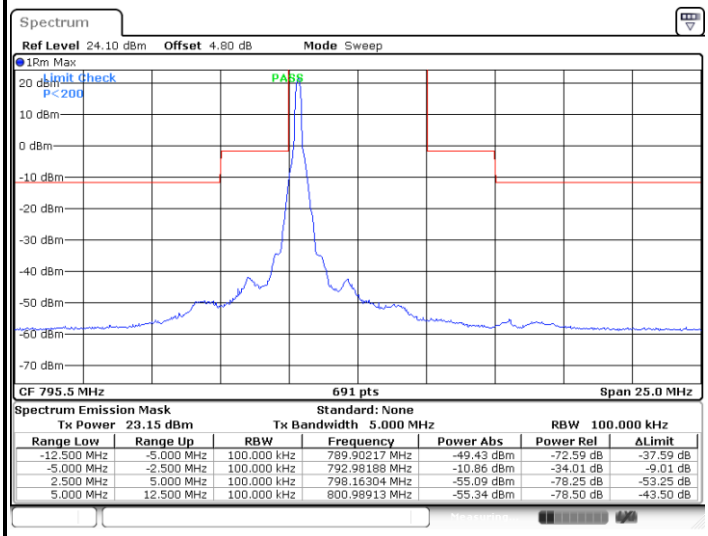
Spectrum Emission Mask Standard: None
Tx Power 23.95 dBm Tx Bandwidth 5.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-12.500 MHz	-5.000 MHz	100.000 kHz	790.33696 MHz	-30.95 dBm	-54.90 dB	-19.90 dB
-5.000 MHz	-2.500 MHz	100.000 kHz	792.98188 MHz	-24.18 dBm	-48.13 dB	-23.13 dB
2.500 MHz	5.000 MHz	100.000 kHz	798.01812 MHz	-23.96 dBm	-47.92 dB	-22.92 dB
5.000 MHz	12.500 MHz	100.000 kHz	800.91667 MHz	-36.49 dBm	-60.44 dB	-25.44 dB

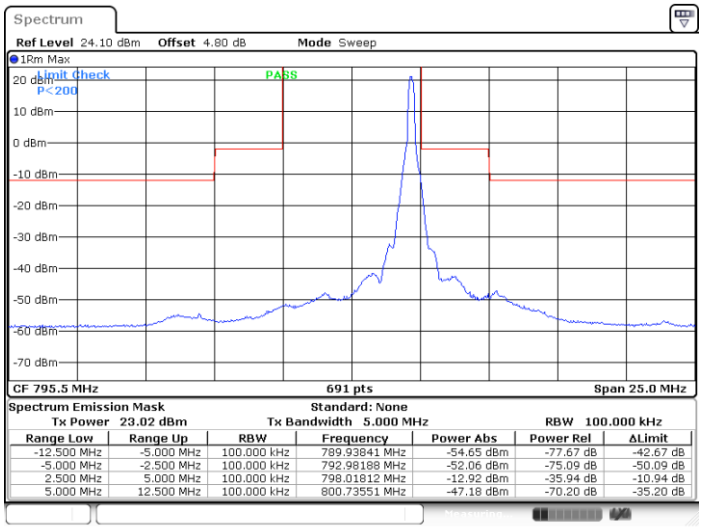
Date: 31.JUL.2022 01:38:39

N 14 / 5MHz

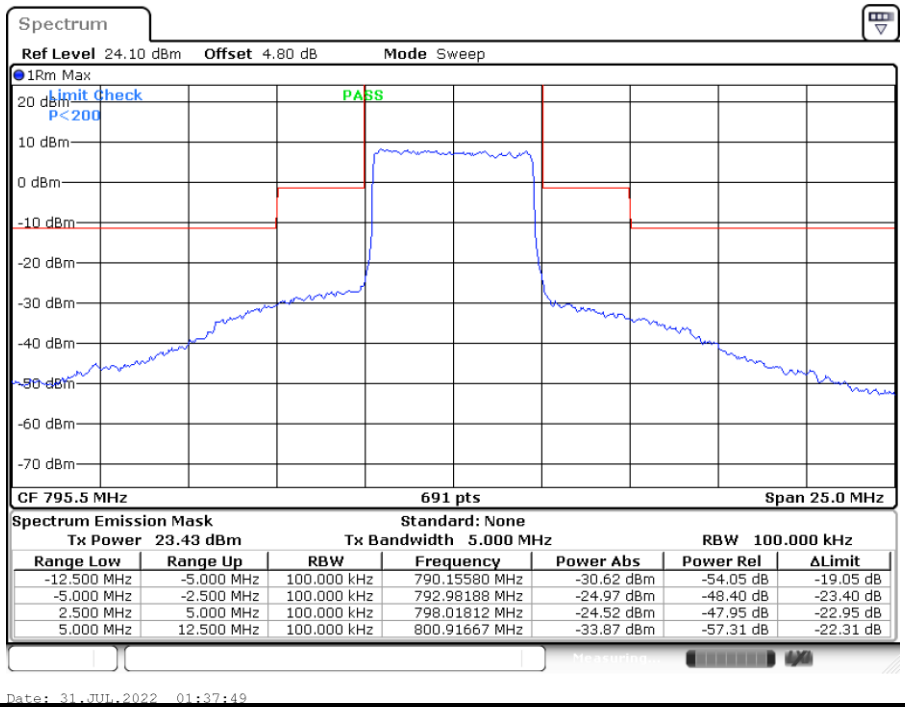
Highest Channel / QPSK



Highest Channel / QPSK

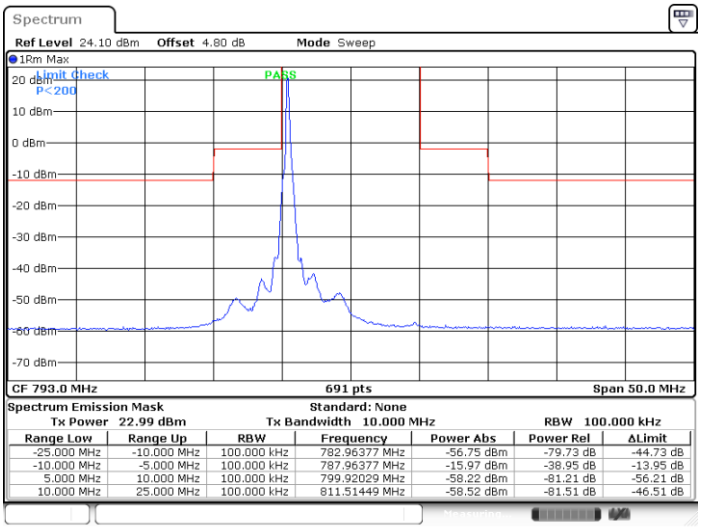


Highest Channel / QPSK



N 14 / 10MHz

Middle Channel / BPSK

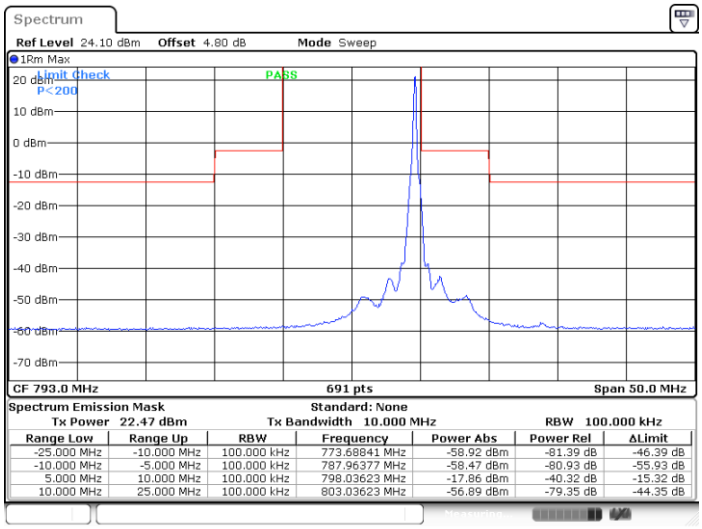


Spectrum Emission Mask Standard: None
Tx Power 22.99 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	782.96377 MHz	-56.75 dBm	-79.73 dB	-44.73 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	787.96377 MHz	-15.97 dBm	-38.95 dB	-13.95 dB
5.000 MHz	10.000 MHz	100.000 kHz	799.92029 MHz	-58.22 dBm	-81.21 dB	-56.21 dB
10.000 MHz	25.000 MHz	100.000 kHz	811.51449 MHz	-58.52 dBm	-81.51 dB	-46.51 dB

Date: 31.JUL.2022 00:39:18

Middle Channel / BPSK

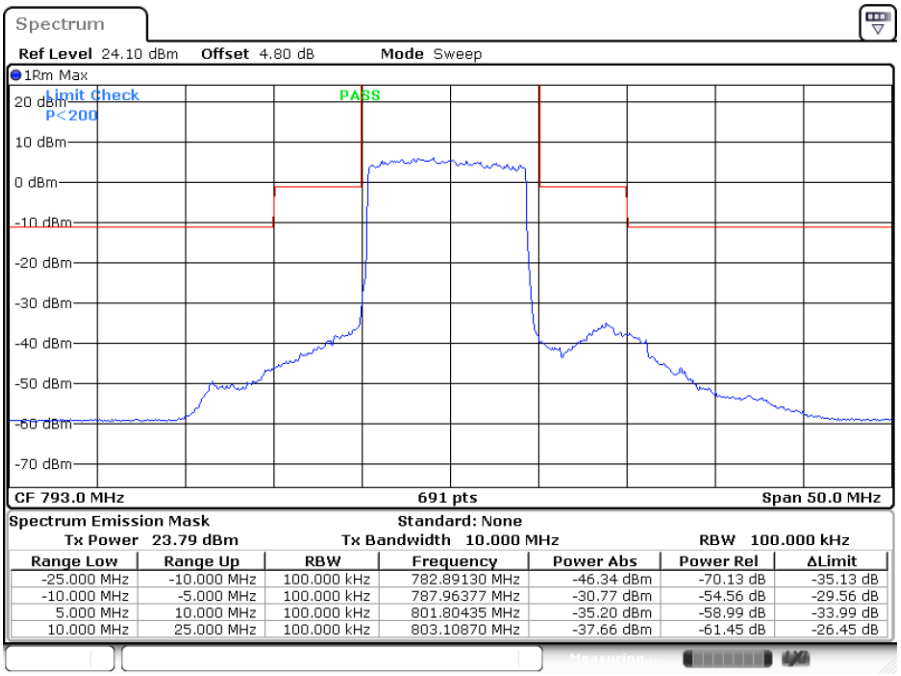


Spectrum Emission Mask Standard: None
Tx Power 22.47 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	773.68841 MHz	-58.92 dBm	-81.39 dB	-46.39 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	787.96377 MHz	-58.47 dBm	-80.93 dB	-55.93 dB
5.000 MHz	10.000 MHz	100.000 kHz	798.03623 MHz	-17.86 dBm	-40.32 dB	-15.32 dB
10.000 MHz	25.000 MHz	100.000 kHz	803.03623 MHz	-56.89 dBm	-79.35 dB	-44.35 dB

Date: 31.JUL.2022 00:42:22

Middle Channel / BPSK



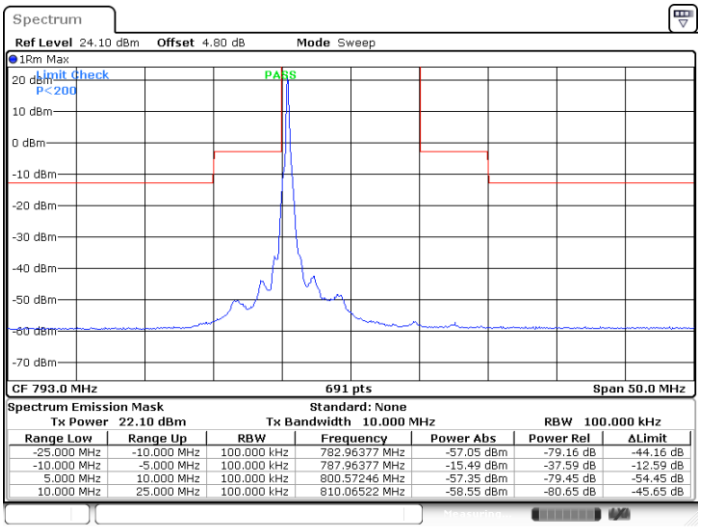
Spectrum Emission Mask Standard: None
Tx Power 23.79 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	782.89130 MHz	-46.34 dBm	-70.13 dB	-35.13 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	787.96377 MHz	-30.77 dBm	-54.56 dB	-29.56 dB
5.000 MHz	10.000 MHz	100.000 kHz	801.80435 MHz	-35.20 dBm	-58.99 dB	-33.99 dB
10.000 MHz	25.000 MHz	100.000 kHz	803.10870 MHz	-37.66 dBm	-61.45 dB	-26.45 dB

Date: 31.JUL.2022 00:44:52

N 14 / 10MHz

Middle Channel / QPSK

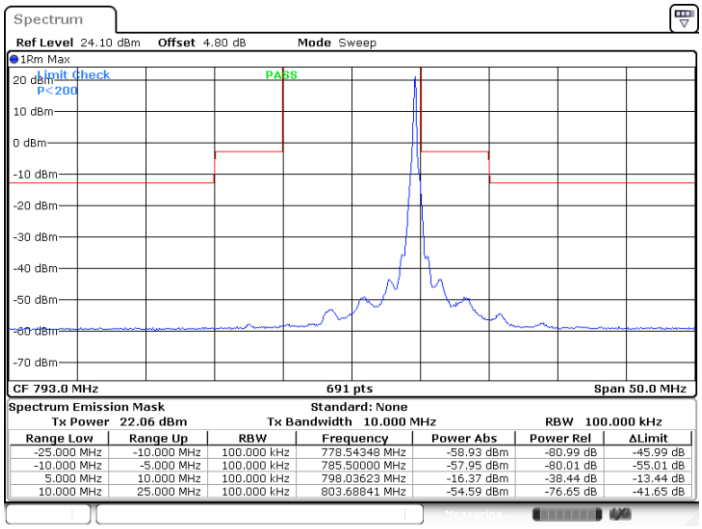


Spectrum Emission Mask Standard: None
Tx Power 22.10 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	782.96377 MHz	-57.05 dBm	-79.16 dB	-44.16 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	787.96377 MHz	-15.49 dBm	-37.59 dB	-12.59 dB
5.000 MHz	10.000 MHz	100.000 kHz	800.57246 MHz	-57.35 dBm	-79.45 dB	-54.45 dB
10.000 MHz	25.000 MHz	100.000 kHz	810.06522 MHz	-58.55 dBm	-80.65 dB	-45.65 dB

Date: 31.JUL.2022 00:40:47

Middle Channel / QPSK

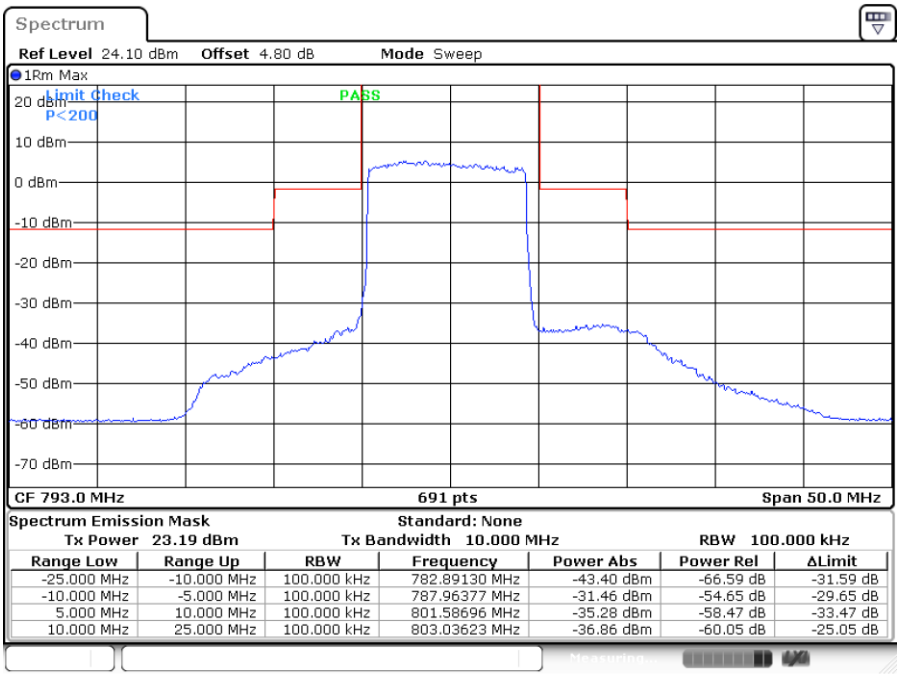


Spectrum Emission Mask Standard: None
Tx Power 22.06 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	778.54348 MHz	-58.93 dBm	-80.99 dB	-45.99 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	785.50000 MHz	-57.95 dBm	-80.01 dB	-55.01 dB
5.000 MHz	10.000 MHz	100.000 kHz	798.03623 MHz	-16.37 dBm	-38.44 dB	-13.44 dB
10.000 MHz	25.000 MHz	100.000 kHz	803.68841 MHz	-54.59 dBm	-76.65 dB	-41.65 dB

Date: 31.JUL.2022 00:41:39

Middle Channel / QPSK



Spectrum Emission Mask Standard: None
Tx Power 23.19 dBm Tx Bandwidth 10.000 MHz RBW 100.000 kHz

Range Low	Range Up	RBW	Frequency	Power Abs	Power Rel	ΔLimit
-25.000 MHz	-10.000 MHz	100.000 kHz	782.89130 MHz	-43.40 dBm	-66.59 dB	-31.59 dB
-10.000 MHz	-5.000 MHz	100.000 kHz	787.96377 MHz	-31.46 dBm	-54.65 dB	-29.65 dB
5.000 MHz	10.000 MHz	100.000 kHz	801.58696 MHz	-35.28 dBm	-58.47 dB	-33.47 dB
10.000 MHz	25.000 MHz	100.000 kHz	803.03623 MHz	-36.86 dBm	-60.05 dB	-25.05 dB

Date: 31.JUL.2022 00:50:06

Frequency Stability

Test Conditions		N14 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0012	PASS
40	Normal Voltage	0.0023	
30	Normal Voltage	0.0015	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0022	
0	Normal Voltage	0.0024	
-10	Normal Voltage	0.0019	
-20	Normal Voltage	0.0011	
-30	Normal Voltage	0.0013	
20	Maximum Voltage	0.0024	
20	Normal Voltage	0.0035	
20	Battery End Point	0.0005	

Note:

1. Normal Voltage =3.87 V. ; Battery End Point (BEP) =3.55 V. ; Maximum Voltage =4.45 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of Radiated Test

Field Strength of Spurious Radiated

SA 5G NR n14 / 10MHz / QPSK / ANT0								
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1576	-65.23	-42.15	-23.08	-67.86	1.09	5.87	H
	2368	-61.61	-13	-48.61	-64.01	1.37	5.92	H
	3152	-59.96	-13	-46.96	-63.85	1.64	7.68	H
	1576	-63.55	-42.15	-21.40	-66.18	1.09	5.87	V
	2368	-60.10	-13	-47.10	-62.50	1.37	5.92	V
	3152	-59.99	-13	-46.99	-63.88	1.64	7.68	V
	Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.							
Test Result				PASS				