

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 96
47 CFR FCC Part 2

Report No.: RFBGDY-WTW-P25120682-3

FCC ID: 2AATHAV62MB-X

Product: Kontron AV62MB-X (5G Rel.16 automotive NAD)

Brand: KONTRON

Model No.: AV62MB-X

Received Date: 2025/12/30

Test Date: 2026/3/27 ~ 2026/7/21

Issued Date: 2026/8/31

Applicant: Kontron Europe GmbH

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration /
Designation Number: 788550 / TW0003

Approved by: Jeremy Lin

Jeremy Lin / Project Engineer

, Date: 2026/8/31

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Prepared by : Pettie Chen / Senior Specialist



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Release Control Record

Issue No.	Description	Date Issued
RFBGDY-WTW-P25120682-3	Original release.	2026/8/31

1 Certificate

Product: Kontron AV62MB-X (5G Rel.16 automotive NAD)

Brand: KONTRON

Test Model: AV62MB-X

Sample Status: Engineering sample

Applicant: Kontron Europe GmbH

Test Date: 2026/3/27 ~ 2026/7/21

Standard: 47 CFR FCC Part 96

47 CFR FCC Part 2

Measurement procedure: ANSI/TIA/EIA-603-E 2016

ANSI C63.26-2015

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v03

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

Standard / Clause	Test Item	Result	Remark
Part 2.1046 Part 96.41(b)	Maximum EIRP	Pass	Meet the requirement of limit.
Part 2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
Part 2.1046 Part 96.41(b)	Maximum Power Spectral Density	N/A	This device is End User Device.
Part 96.41(g)	Peak to Average Ratio	Pass	Meet the requirement of limit.
Part 2.1049	Bandwidth	Pass	Meet the requirement of limit.
Part 2.1051 Part 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
Part 2.1053 Part 96.41(e)	Radiated Spurious Emissions below 1GHz	Pass	Minimum passing margin is -1.18 dB at 238.55 MHz
Part 2.1053 Part 96.41(e)	Radiated Spurious Emissions above 1GHz	Pass	Minimum passing margin is -0.78 dB at 7380.00 MHz
Part 2.1055	Frequency Stability	Pass	Meet the requirement of limit.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Specification	Uncertainty (±)
Effective Radiated Power and Equivalent Isotropically Radiated Power	-	1.371 dB
Peak to Average Ratio	-	0.920 dB
Bandwidth	-	960 Hz
Conducted Spurious Emissions	-	2.12 dB
Radiated Spurious Emissions below 1GHz	9 kHz ~ 30 MHz	2.44 dB
	30 MHz ~ 1 GHz	2.95 dB
Radiated Spurious Emissions above 1GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB
Frequency Stability	-	0.176 ppm

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Kontron AV62MB-X (5G Rel.16 automotive NAD)
Brand	KONTRON
Test Model	AV62MB-X
Status of EUT	Engineering sample
Power Supply Rating	3.8Vdc
EUT Category	End User Device
Modulation Type	DFT-s-OFDM, CP-OFDM
5G NR support deployment modes	SA mode: n48 NSA mode: -
5G NR support SISO bands	n48
5G NR support MIMO bands	-
5G NR bands support CA mode	-
PC3 for Power Class	n48
PC2 for Power Class	-
PC1.5 for Power Class	-

Note:

1. EUT Overview

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
10 MHz	3555 ~ 3694.98	BPSK	0.142	21.53	8M58G7D
		QPSK	0.146	21.64	8M59G7D
		16QAM	0.086	19.32	8M59D7W
		64QAM	0.077	18.89	8M59D7W
		256QAM	0.047	16.76	8M59D7W

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Output Power: dBm/10 MHz

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
15 MHz	3557.52 ~ 3692.49	BPSK	0.141	21.49	12M9G7D
		QPSK	0.144	21.57	13M6G7D
		16QAM	0.082	19.16	13M6D7W
		64QAM	0.076	18.83	13M6D7W
		256QAM	0.045	16.56	13M6D7W
20 MHz	3560.01 ~ 3690	BPSK	0.141	21.48	17M9G7D
		QPSK	0.143	21.55	18M2G7D
		16QAM	0.084	19.24	18M2D7W
		64QAM	0.076	18.82	18M2D7W
		256QAM	0.047	16.72	18M2D7W
30 MHz	3565.02 ~ 3684.99	BPSK	0.14	21.45	26M8G7D
		QPSK	0.143	21.55	27M9G7D
		16QAM	0.084	19.26	27M9D7W
		64QAM	0.077	18.84	27M9D7W
		256QAM	0.046	16.63	27M9D7W
40 MHz	3570 ~ 3679.98	BPSK	0.145	21.62	35M7G7D
		QPSK	0.148	21.71	37M9G7D
		16QAM	0.088	19.44	37M9D7W
		64QAM	0.078	18.9	37M9D7W
		256QAM	0.047	16.76	37M9D7W

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Output Power: Full Power

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
15 MHz	3557.52 ~ 3692.49	BPSK	0.142	21.51	12M9G7D
		QPSK	0.144	21.58	13M6G7D
		16QAM	0.084	19.26	13M6D7W
		64QAM	0.077	18.85	13M6D7W
		256QAM	0.046	16.66	13M6D7W
20 MHz	3560.01 ~ 3690	BPSK	0.144	21.58	17M9G7D
		QPSK	0.145	21.62	18M2G7D
		16QAM	0.086	19.33	18M2D7W
		64QAM	0.078	18.91	18M2D7W
		256QAM	0.047	16.75	18M2D7W
30 MHz	3565.02 ~ 3684.99	BPSK	0.142	21.53	26M8G7D
		QPSK	0.145	21.62	27M9G7D
		16QAM	0.086	19.32	27M9D7W
		64QAM	0.077	18.88	27M9D7W
		256QAM	0.047	16.72	27M9D7W
40 MHz	3570 ~ 3679.98	BPSK	0.147	21.66	35M7G7D
		QPSK	0.149	21.72	37M9G7D
		16QAM	0.088	19.45	37M9D7W
		64QAM	0.079	19.00	37M9D7W
		256QAM	0.048	16.85	37M9D7W

- For detailed information about each WWAN bands frequency range, bandwidth mode of the product, please refer to section 3.3 of the report.
- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

Antenna Type		Dipole
Antenna Connector		SMA
Brand		Panorama Antennas Ltd
Model		LPBEM-6-60
Band	Freq. Range (MHz)	Peak Gain (dBi)
5GNR n48	3550 ~ 3700	1.7

*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall n

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. EUT can be used in the following ways: X-axis / Y-axis / Z-axis. Pre-scan these ways and find the worst case as a representative test condition. 2. For LTE bands, this device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only EIRP/ERP, modulation characteristics, bandwidth and peak to average ratio items had been tested under QPSK, 16QAM, 64QAM and 256QAM mode, the other items were performed under QPSK mode only. For radiated spurious emissions, choose the maximum EIRP/ERP power and 1RB offset worst case for final test. 5. For radiated spurious emissions below 1 GHz, the worst case radiated emissions mode above 1 GHz is selected for final testing.
Worst Case:	1. X-axis / Y-axis / Z-axis Worst Condition: EUT: X-axis, Ant.: Z-axis

3.3.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

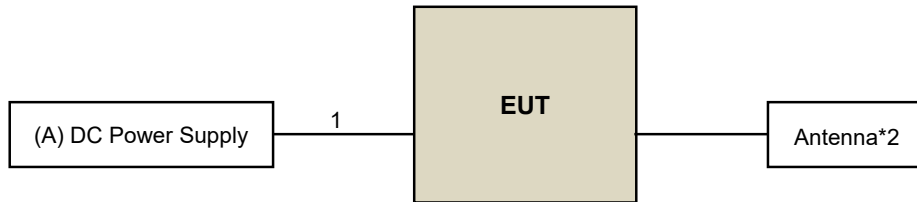
Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Maximum EIRP	637000(3555.00 MHz) 641666(3624.99 MHz) 646332(3694.98 MHz)	10 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	637168(3557.52 MHz) 641666(3624.99 MHz) 646166(3692.49 MHz)	15 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	637334(3560.01 MHz) 641666(3624.99 MHz) 646000(3690.00 MHz)	20 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	637668(3565.02 MHz) 641666(3624.99 MHz) 645666(3684.99 MHz)	30 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	638000(3570.00 MHz) 641666(3624.99 MHz) 645332(3679.98 MHz)	40 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Modulation Characteristics	641666(3624.99 MHz)	40 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	637000(3555.00 MHz) 641666(3624.99 MHz) 646332(3694.98 MHz)	10 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB
	637168(3557.52 MHz) 641666(3624.99 MHz) 646166(3692.49 MHz)	15 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB
	637334(3560.01 MHz) 641666(3624.99 MHz) 646000(3690.00 MHz)	20 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB
	637668(3565.02 MHz) 641666(3624.99 MHz) 645666(3684.99 MHz)	30 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB
	638000(3570.00 MHz) 641666(3624.99 MHz) 645332(3679.98 MHz)	40 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Bandwidth	637000(3555.00 MHz) 641666(3624.99 MHz) 646332(3694.98 MHz)	10 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
	637168(3557.52 MHz) 641666(3624.99 MHz) 646166(3692.49 MHz)	15 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
	637334(3560.01 MHz) 641666(3624.99 MHz) 646000(3690.00 MHz)	20 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
	637668(3565.02 MHz) 641666(3624.99 MHz) 645666(3684.99 MHz)	30 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
	638000(3570.00 MHz) 641666(3624.99 MHz) 645332(3679.98 MHz)	40 MHz	BPSK / QPSK / 16QAM / 64QAM / 256QAM	Full RB
Conducted Spurious Emissions	637000(3555.00 MHz) 641666(3624.99 MHz) 646332(3694.98 MHz)	10 MHz	QPSK	1 RB Full RB
	637168(3557.52 MHz) 641666(3624.99 MHz) 646166(3692.49 MHz)	15 MHz	QPSK	1 RB Full RB
	637334(3560.01 MHz) 641666(3624.99 MHz) 646000(3690.00 MHz)	20 MHz	QPSK	1 RB Full RB
	637668(3565.02 MHz) 641666(3624.99 MHz) 645666(3684.99 MHz)	30 MHz	QPSK	1 RB Full RB
	638000(3570.00 MHz) 641666(3624.99 MHz) 645332(3679.98 MHz)	40 MHz	QPSK	1 RB Full RB
Radiated Spurious Emissions below 1GHz	646000(3690.00 MHz)	20 MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	637000(3555.00 MHz) 641666(3624.99 MHz) 646332(3694.98 MHz)	10 MHz	QPSK	1 RB
	637334(3560.01 MHz) 641666(3624.99 MHz) 646000(3690.00 MHz)	20 MHz	QPSK	1 RB
	638000(3570.00 MHz) 641666(3624.99 MHz) 645332(3679.98 MHz)	40 MHz	QPSK	1 RB
Frequency Stability	638000(3570.00 MHz) 645332(3679.98 MHz)	40 MHz	QPSK	Full RB

3.4 Test Program Used and Operation Descriptions

EUT link Radio Communication Analyzer has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.5 Connection Diagram of EUT and Peripheral Devices



Under Table

Remote Site



3.6 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	DC Power Supply	OWON	ODP3122	ODP31222137036	NA	Provided by Lab
B	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	NA	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	No	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Maximum EIRP

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fixed Attenuator Woken	00800A1K01A-10	00800A1K01A-10-01	2025/5/23 2026/5/21	2026/5/22 2027/5/20
PXA Signal Analyzer Keysight	N9030B	MY57140953	2025/7/31	2026/7/30
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A
UXM 5G Wireless Test Platform Keysight	E7515B	MY58300759	2025/8/27	2026/8/26

Notes:

1. The test was performed in HY - Oven room(Hwaya).
2. Tested Date: 2026/4/20 ~ 2026/7/21

4.2 Modulation Characteristics

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fixed Attenuator Woken	00800A1K01A-10	00800A1K01A-10-01	2026/5/21	2027/5/20
PXA Signal Analyzer Keysight	N9030B	MY57140953	2025/7/31	2026/7/30
Radio Communication Test Station Anritsu	MT8000A	6272278595	2025/07/25	2026/07/24
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A
UXM 5G Wireless Test Platform Keysight	E7515B	MY58300759	2025/8/27	2026/8/26

Notes:

1. The test was performed in HY - Oven room(Hwaya).
2. Tested Date: 2026/6/30 ~ 2026/7/21

4.3 Peak to Average Ratio

Refer to section 4.1 to get the tested date and information of the instruments.

4.4 Bandwidth

Refer to section 4.1 to get the tested date and information of the instruments.

4.5 Conducted Spurious Emissions

Refer to section 4.1 to get the tested date and information of the instruments.

4.6 Radiated Spurious Emissions below 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Max-Full	MFA-440H	AT93021705	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-472	2025/9/16	2026/9/15
Loop Antenna TESEQ	HLA 6121	45745	2025/9/1	2026/8/31
MXE EMI Receiver Agilent	N9038A	MY51210203	2025/8/27	2026/8/26
Preamplifier EMCI	EMC 330H	980112	2025/9/21	2026/9/20
	EMC001340	980201	2025/9/21	2026/9/20
RF Coaxial Cable Woken	8D-FB	Cable-Ch10-01	2025/9/21	2026/9/20
Signal & Spectrum Analyzer R&S	FSVA3044	100904	2025/7/1	2026/6/30
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MFT-201SS	N/A	N/A	N/A
Turn Table Controller Max-Full	MG-7802	N/A	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 5(Hwaya).
2. Tested Date: 2026/3/30

4.7 Radiated Spurious Emissions above 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Max-Full	MFA-440H	AT93021705	N/A	N/A
Boresight antenna tower fixture BV	BAF-02	7	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-969	2025/11/9	2026/11/8
	BBHA 9170	148	2025/11/9	2026/11/8
MXE EMI Receiver Agilent	N9038A	MY51210203	2025/8/27	2026/8/26
Preamplifier EMCI	EMC 184045	980116	2025/9/21	2026/9/20
	EMC118A45SE	980809	2025/4/24 2026/4/18	2026/4/23 2027/4/17
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	2025/6/30	2026/6/29
	EMC102-KM-KM-3000	150929	2025/6/30	2026/6/29
	EMC104-SM-SM- 8000+3000	171005	2025/9/21	2026/9/20
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	EMC104-SM-SM- 1000(140807)	2025/9/21	2026/9/20
Signal & Spectrum Analyzer R&S	FSVA3044	100904	2025/7/1	2026/6/30
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MFT-201SS	N/A	N/A	N/A
Turn Table Controller Max-Full	MG-7802	N/A	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 5(Hwaya).
2. Tested Date: 2026/3/27 ~ 2026/5/4

4.8 Frequency Stability

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
3-channel DC power supply OWON	ODP3033	ODP30332128138	N/A	N/A
Digital Multimeter Fluke	8050A	4660081	2026/6/5	2027/6/4
Fixed Attenuator Woken	00800A1K01A-10	00800A1K01A-10-01	2026/5/21	2027/5/20
MXA Signal Analyzer Keysight	N9020B	MY60110462	2026/5/5	2027/5/4
Signal & Spectrum Analyzer R&S	FSV3044	101505	2026/6/15	2027/6/14
	FSW26	102023	2025/11/14	2026/11/13
	FSW43	101582	2026/5/2	2027/5/1
Signal Analyzer R&S	FSV40	100980	2026/5/14	2027/5/13
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A
Spectrum Analyzer R&S	FSU26	101645	2025/7/28	2026/7/27
	FSU43	101261	2026/5/4	2027/5/3
Temperature & Humidity Chamber Terchy	MHU-225AU	920842	2026/7/2	2027/7/1

Notes:

1. The test was performed in HY - Oven room(Hwaya).
2. Tested Date: 2026/7/21

5 Limits of Test Items

5.1 Maximum EIRP

For NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz):

Device Category	Maximum EIRP (dBm/10 MHz)
End User Device	23
Category A CBSD	30
Category B CBSD	47

5.2 Modulation Characteristics

Systems operating in the Citizens Broadband Radio Service must use digital modulation techniques.

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

5.3 Peak to Average Ratio

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.

5.4 Bandwidth

According to FCC 47 CFR part 2.1049, the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

5.5 Conducted Spurious Emissions

For NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz):

The conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B MHz (where B is the bandwidth in MHz 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 MHz below the lower CBSD-assigned channel edge. At all frequencies greater than B MHz above the upper CBSD assigned channel edge and less than B MHz below the lower CBSD-assigned channel edge, the conducted power of any end user device emission shall not exceed -25 dBm/MHz.

Additional protection levels: 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 -40 dBm/MHz.

5.6 Radiated Spurious Emissions below 1GHz

For NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz):

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

5.7 Radiated Spurious Emissions above 1GHz

For NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz):

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

5.8 Frequency Stability

For NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz):

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

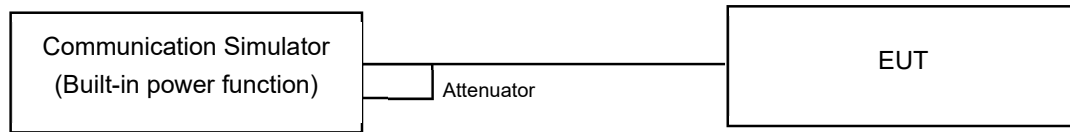
6 Test Arrangements

6.1 Maximum EIRP

6.1.1 Test Setup

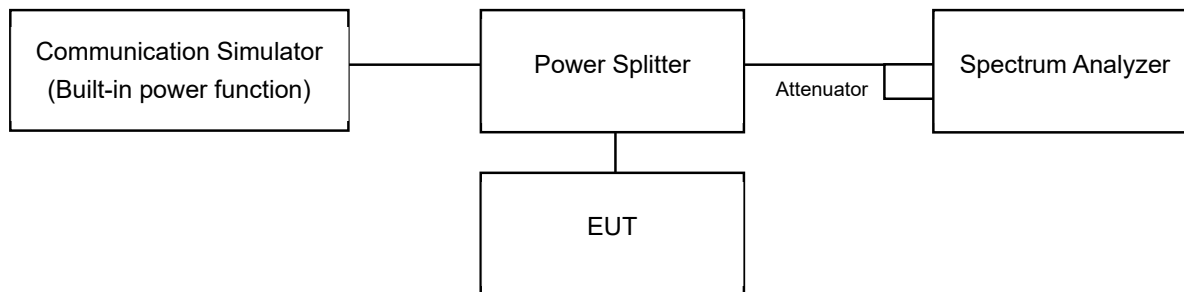
Conducted Power Measurement:

For full power measurement:



Note: The correction factor has already been compensated by the instrument.

For per 10 MHz power measurement:



Note: The correction factor has already been compensated by the instrument.

6.1.2 Test Procedure

Conducted Power Measurement:

For full power measurement:

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology. The average (rms) power measurement was performed on emulator and power value was measured from power function on emulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

For per 10 MHz power measurement:

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology and link to spectrum analyzer measurements. Set the EUT to transmit under low, middle and high channel and record the power level shown on spectrum analyzer. Power measurements use detector average (rms).

Measurement method refers to ANSI C63.26 section 5.2.4.4.

- Set span to $2 \times$ to $3 \times$ the OBW.
- Set RBW = 1% to 5% of the OBW.
- Set VBW $\geq 3 \times$ RBW.
- Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
- Set Sweep time = auto-couple.
- Detector = power averaging (rms).
- Set sweep trigger to "free run."
- Trace average at least 100 traces in power averaging (rms) mode.
- Use the Band/Channel Power function to determine the integrated power per 10 MHz bandwidth, according to the 47 CFR FCC Part 96 standard.
- If Duty cycle $< 98\%$, Add $10 \log (1/\text{duty cycle})$ to the measured power level to compute the average power during continuous transmission.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

$$\text{ERP} = P_{\text{Meas}} + G_T - 2.15$$

where

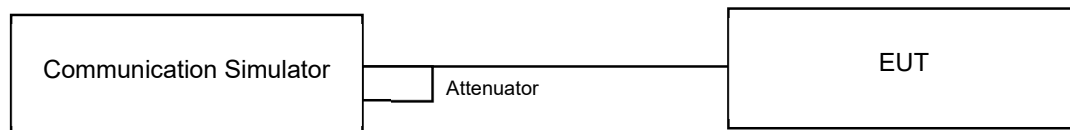
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

6.2 Modulation Characteristics

6.2.1 Test Setup



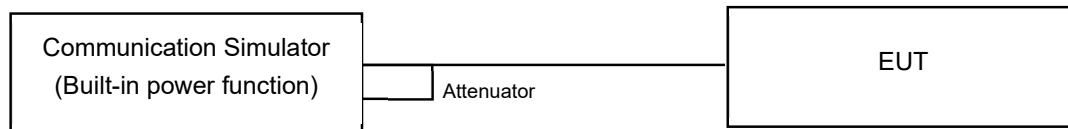
Note: The correction factor has already been compensated by the instrument.

6.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

6.3 Peak to Average Ratio

6.3.1 Test Setup



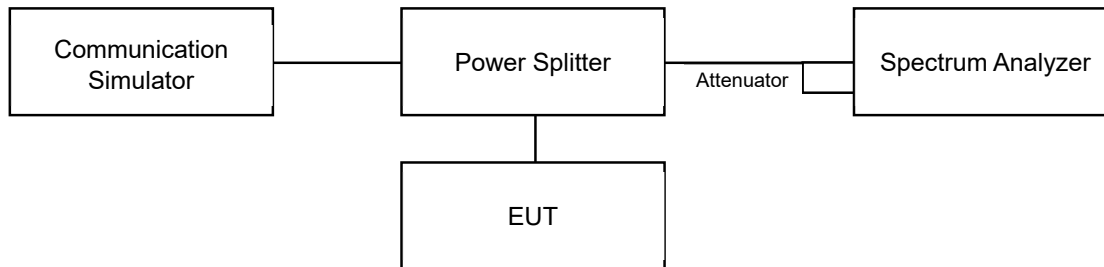
Note: The correction factor has already been compensated by the instrument.

6.3.2 Test Procedure

- a. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- b. Set the number of counts to a value that stabilizes the measured CCDF curve;
- c. Record the maximum PAPR level associated with a probability of 0.1%.

6.4 Bandwidth

6.4.1 Test Setup



Note: The correction factor has already been compensated by the instrument.

6.4.2 Test Procedure

For the 26 dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

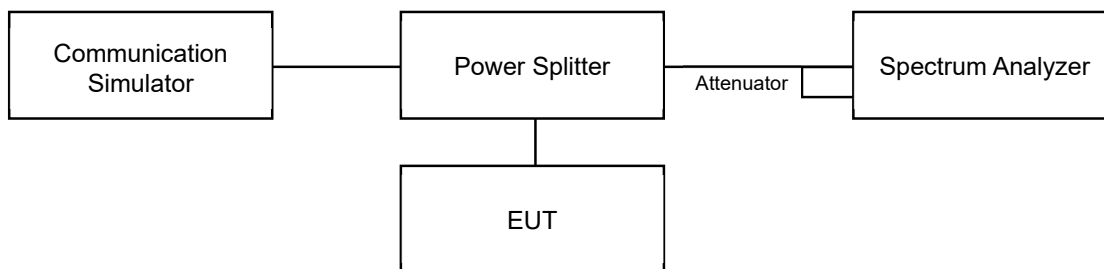
- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times$ RBW.
- Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- Determine the following reference values: 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).
- Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- 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 amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times$ RBW.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- e. If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the upper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.
- f. The OBW shall be reported by providing plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

6.5 Conducted Spurious Emissions

6.5.1 Test Setup



Note: The correction factor has already been compensated by the instrument.

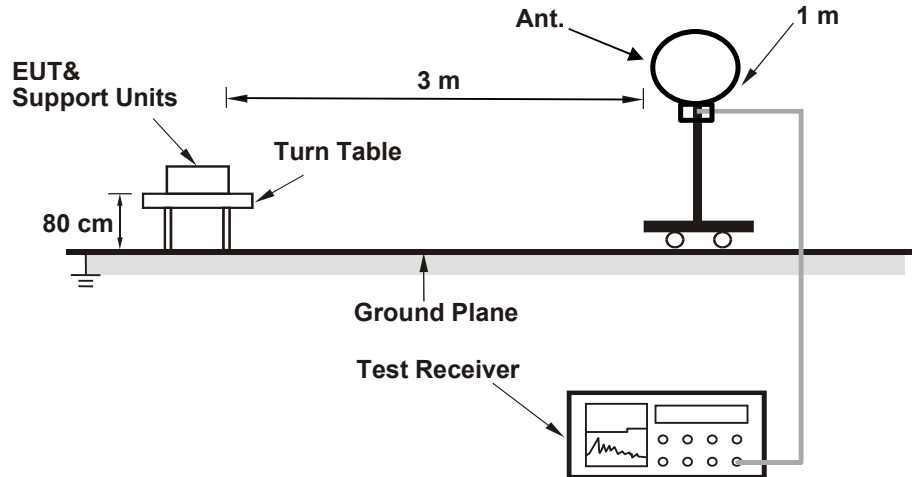
6.5.2 Test Procedure

- a. Measurement refer to ANSI C63.26 section 5.7.
- b. All measurements were done at 3 channels: low, middle and high operational frequency range.
- c. Measuring frequency range is from 9 kHz up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. 10 dB attenuation pad is connected with spectrum.
- d. The fundamental frequency above 1 GHz, the spectrum set RBW = 1 MHz, VBW = 3 MHz, Detector = Average.
- e. The fundamental frequency below 1 GHz, the spectrum set RBW ≥ 100 kHz, VBW $\geq 3 \times$ RBW, Detector = Average.
- f. Measuring frequency band edge, narrow RBW (no less than 1% of the OBW) is used for conducted emission measurement.
- g. For the emissions measurement method, certain channel BW modes demonstrate compliance by integrating with the smaller RBW allowed by the rule.
For example: Where Reference RBW = 1 MHz and a smaller RBW = 100 kHz is used, worst-case integrated BW power = [Max Measured Value (dBm) with RBW = 100 kHz] + $10 \times \log(1000/100)$. To compensate for this integration before comparison to the value, the adjusted reference level offset was increase by 10 dB accordingly.
- h. Record the maximum power value test plot.

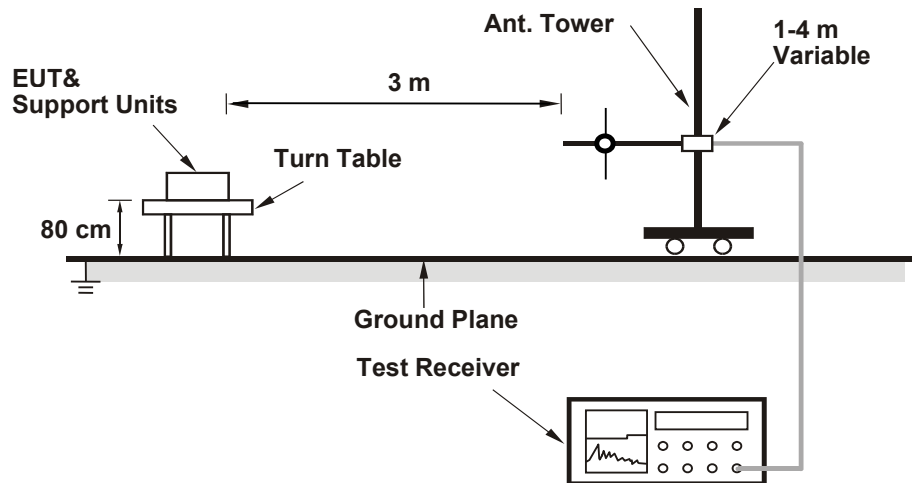
6.6 Radiated Spurious Emissions below 1GHz

6.6.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.6.2 Test Procedure

The EUT is configured to set data modulation and maximum power using WWAN technology.

- a. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- d. Following ANSI C63.26 section 5.5 and 5.2.7
- e. $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- f. $ERP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

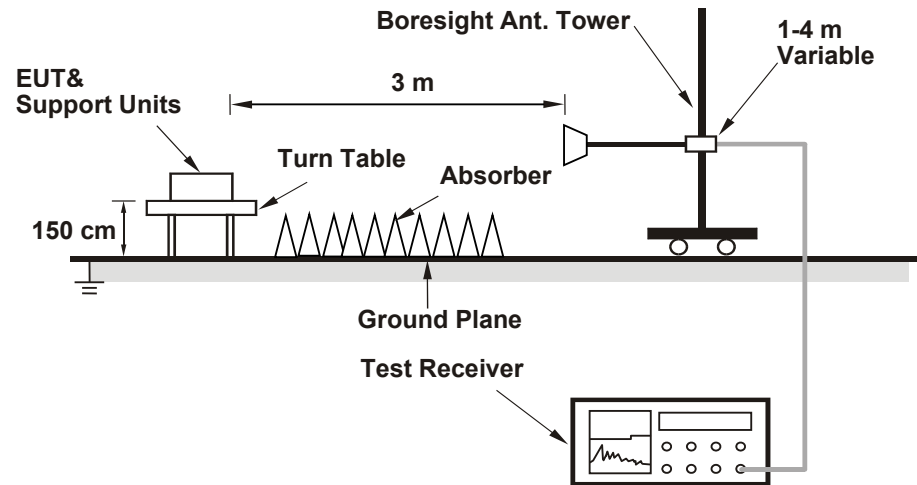
Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector = average.
2. The amplitude of spurious emissions in the range 9 kHz to 30 MHz which are attenuated more than 20 dB below the permissible value need not be reported.

6.7 Radiated Spurious Emissions above 1GHz

6.7.1 Test Setup

For radiated emission above 1 GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.7.2 Test Procedure

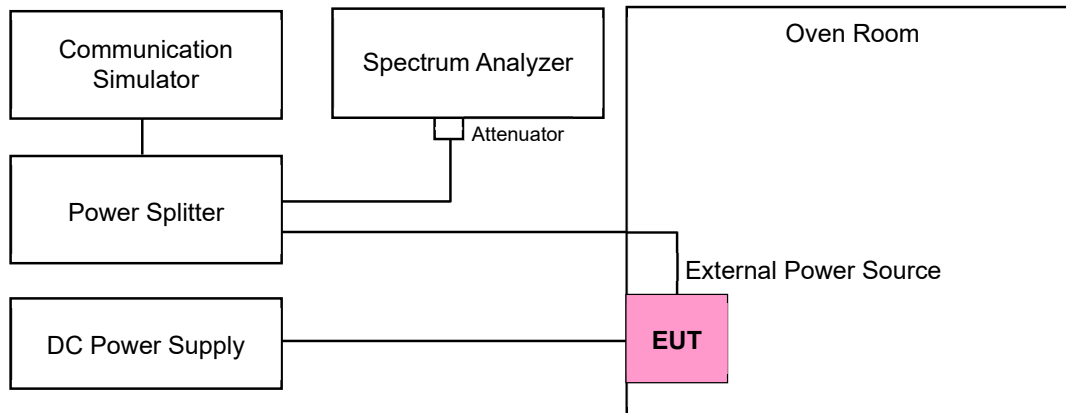
The EUT is configured to set data modulation and maximum power using WWAN technology.

- In the semi-anechoic chamber, EUT placed on the 1.5 m height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- Following ANSI C63.26 section 5.5 and 5.2.7
- $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- $ERP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector = average.

6.8 Frequency Stability

6.8.1 Test Setup



6.8.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

7 Test Results of Test Item

7.1 Maximum EIRP

Input Power:	3.8 Vdc	Environmental Conditions:	23°C, 62% RH	Tested By:	Charles Hsiao
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7.1.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637000	CH 641666	CH 646332
			3555 MHz	3624.99 MHz	3694.98 MHz
BPSK	1	1	19.75	19.83	19.71
	1	0	19.02	19.14	18.99
QPSK	1	1	19.81	19.94	19.74
	1	0	18.46	18.61	18.44
	1	11	19.59	19.74	19.56
	1	22	19.62	19.72	19.57
	1	23	18.52	18.65	18.55
	12	0	18.77	18.91	18.76
	12	6	19.75	19.88	19.76
	12	12	18.72	18.86	18.72
	24	0	18.77	18.91	18.80
16QAM	1	0	17.54	17.62	17.51
64QAM	1	0	17.04	17.19	17.04
256QAM	1	0	14.89	15.06	14.92

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.99	19.83	20.69	21.53	23
QPSK	18.44	19.94	20.14	21.64	23
16QAM	17.51	17.62	19.21	19.32	23
64QAM	17.04	17.19	18.74	18.89	23
256QAM	14.89	15.06	16.59	16.76	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 15 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637168	CH 641666	CH 646166
			3557.52 MHz	3624.99 MHz	3692.49 MHz
BPSK	1	1	19.67	19.81	19.65
	1	0	18.98	19.09	18.98
QPSK	1	1	19.75	19.88	19.70
	1	0	18.40	18.57	18.39
	1	19	19.52	19.70	19.51
	1	36	19.60	19.72	19.54
	1	37	18.46	18.64	18.51
	18	0	18.67	18.80	18.68
	18	10	19.68	19.82	19.75
	18	20	18.71	18.76	18.67
	36	0	18.75	18.90	18.75
	38	0	16.75	16.88	16.74
16QAM	1	0	17.45	17.56	17.44
64QAM	1	0	17.00	17.15	17.07
256QAM	1	0	14.83	14.96	14.86

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.98	19.81	20.68	21.51	23
QPSK	16.74	19.88	18.44	21.58	23
16QAM	17.44	17.56	19.14	19.26	23
64QAM	17.00	17.15	18.70	18.85	23
256QAM	14.83	14.96	16.53	16.66	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 20 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637334	CH 641666	CH 646000
			3560.01 MHz	3624.99 MHz	3690 MHz
BPSK	1	1	19.76	19.88	19.72
	1	0	19.00	19.13	19.00
QPSK	1	1	19.80	19.92	19.76
	1	0	18.46	18.58	18.44
	1	26	19.59	19.74	19.61
	1	49	19.62	19.74	19.58
	1	50	18.53	18.66	18.53
	25	0	18.73	18.90	18.75
	25	13	19.76	19.85	19.74
	25	26	18.70	18.86	18.72
	50	0	18.76	18.91	18.79
	51	0	16.76	16.90	16.77
16QAM	1	0	17.54	17.63	17.53
64QAM	1	0	17.06	17.21	17.05
256QAM	1	0	14.89	15.05	14.92

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	19.00	19.88	20.70	21.58	23
QPSK	16.76	19.92	18.46	21.62	23
16QAM	17.53	17.63	19.23	19.33	23
64QAM	17.05	17.21	18.75	18.91	23
256QAM	14.89	15.05	16.59	16.75	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 30 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637668	CH 641666	CH 645666
			3565.02 MHz	3624.99 MHz	3684.99 MHz
BPSK	1	1	19.76	19.83	19.76
	1	0	18.98	19.13	19.00
QPSK	1	1	19.80	19.92	19.74
	1	0	18.44	18.59	18.44
	1	39	19.58	19.71	19.61
	1	76	19.58	19.74	19.58
	1	77	18.52	18.64	18.56
	36	0	18.77	18.88	18.73
	36	21	19.76	19.88	19.74
	36	42	18.70	18.86	18.75
	75	0	18.77	18.93	18.76
	78	0	16.77	16.87	16.78
16QAM	1	0	17.54	17.62	17.52
64QAM	1	0	17.05	17.18	17.05
256QAM	1	0	14.93	15.02	14.91

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.98	19.83	20.68	21.53	23
QPSK	16.77	19.92	18.47	21.62	23
16QAM	17.52	17.62	19.22	19.32	23
64QAM	17.05	17.18	18.75	18.88	23
256QAM	14.91	15.02	16.61	16.72	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 40 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 638000	CH 641666	CH 645332
			3570 MHz	3624.99 MHz	3679.98 MHz
BPSK	1	1	19.84	19.96	19.84
	1	0	19.10	19.22	19.08
QPSK	1	1	19.89	20.02	19.87
	1	0	18.55	18.69	18.55
	1	53	19.69	19.83	19.69
	1	104	19.71	19.84	19.70
	1	105	18.63	18.75	18.64
	50	0	18.85	18.99	18.84
	50	28	19.84	19.97	19.85
	50	56	18.81	18.95	18.84
	100	0	18.87	19.01	18.88
	106	0	16.87	17.00	16.86
16QAM	1	0	17.64	17.75	17.62
64QAM	1	0	17.17	17.30	17.17
256QAM	1	0	15.01	15.15	15.01

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	19.08	19.96	20.78	21.66	23
QPSK	16.86	20.02	18.56	21.72	23
16QAM	17.62	17.75	19.32	19.45	23
64QAM	17.17	17.30	18.87	19.00	23
256QAM	15.01	15.15	16.71	16.85	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 15 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637168	CH 641666	CH 646166
			3557.52 MHz	3624.99 MHz	3692.49 MHz
BPSK	1	1	19.59	19.79	19.58
	1	0	18.93	19.06	18.94
QPSK	1	1	19.69	19.87	19.67
	1	0	18.37	18.54	18.31
	1	19	19.42	19.60	19.41
	1	36	19.59	19.68	19.52
	1	37	18.36	18.57	18.47
	18	0	18.61	18.70	18.65
	18	10	19.63	19.80	19.74
	18	20	18.65	18.75	18.60
	36	0	16.87	17.04	16.93
	38	0	14.93	15.01	14.89
16QAM	1	0	17.42	17.46	17.39
64QAM	1	0	16.96	17.13	16.99
256QAM	1	0	14.82	14.86	14.78

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.93	19.79	20.63	21.49	23
QPSK	14.89	19.87	16.59	21.57	23
16QAM	17.39	17.46	19.09	19.16	23
64QAM	16.96	17.13	18.66	18.83	23
256QAM	14.78	14.86	16.48	16.56	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 20 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637334	CH 641666	CH 646000
			3560.01 MHz	3624.99 MHz	3690 MHz
BPSK	1	1	19.66	19.78	19.65
	1	0	18.94	19.09	18.93
QPSK	1	1	19.77	19.85	19.75
	1	0	18.45	18.50	18.40
	1	26	19.56	19.66	19.55
	1	49	19.59	19.73	19.57
	1	50	18.48	18.57	18.45
	25	0	18.68	18.81	18.67
	25	13	19.74	19.76	19.65
	25	26	18.69	18.82	18.64
	50	0	15.77	15.93	15.84
	51	0	13.86	14.00	13.80
16QAM	1	0	17.51	17.54	17.51
64QAM	1	0	17.02	17.12	17.03
256QAM	1	0	14.88	15.02	14.89

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.93	19.78	20.63	21.48	23
QPSK	13.8	19.85	15.5	21.55	23
16QAM	17.51	17.54	19.21	19.24	23
64QAM	17.02	17.12	18.72	18.82	23
256QAM	14.88	15.02	16.58	16.72	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 30 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 637668	CH 641666	CH 645666
			3565.02 MHz	3624.99 MHz	3684.99 MHz
BPSK	1	1	19.71	19.75	19.70
	1	0	18.91	19.05	18.93
QPSK	1	1	19.77	19.85	19.68
	1	0	18.38	18.52	18.43
	1	39	19.57	19.63	19.60
	1	76	19.53	19.69	19.57
	1	77	18.48	18.54	18.49
	36	0	17.36	17.43	17.26
	36	21	18.35	18.43	18.27
	36	42	17.27	17.46	17.29
	75	0	14.26	14.43	14.20
	78	0	12.19	12.36	12.23
16QAM	1	0	17.53	17.56	17.49
64QAM	1	0	16.97	17.14	16.97
256QAM	1	0	14.87	14.93	14.89

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	18.91	19.75	20.61	21.45	23
QPSK	12.19	19.85	13.89	21.55	23
16QAM	17.49	17.56	19.19	19.26	23
64QAM	16.97	17.14	18.67	18.84	23
256QAM	14.87	14.93	16.57	16.63	23

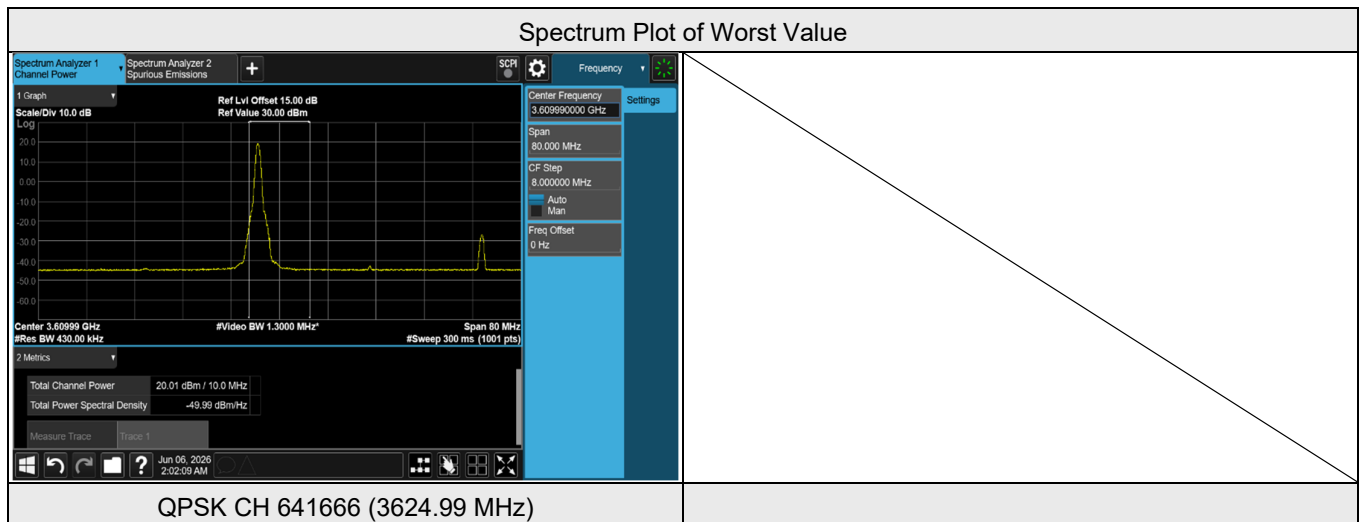
Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 40 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 638000	CH 641666	CH 645332
			3570 MHz	3624.99 MHz	3679.98 MHz
BPSK	1	1	19.80	19.92	19.79
	1	0	19.04	19.19	19.07
QPSK	1	1	19.86	20.01	19.82
	1	0	18.46	18.62	18.46
	1	53	19.64	19.78	19.62
	1	104	19.67	19.77	19.69
	1	105	18.61	18.71	18.62
	50	0	16.17	16.25	16.17
	50	28	17.15	17.24	17.14
	50	56	16.09	16.23	16.17
	100	0	12.95	13.02	12.93
	106	0	11.03	11.11	11.03
16QAM	1	0	17.59	17.74	17.55
64QAM	1	0	17.10	17.20	17.13
256QAM	1	0	14.93	15.06	14.95

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
BPSK	19.04	19.92	20.74	21.62	23
QPSK	11.03	20.01	12.73	21.71	23
16QAM	17.55	17.74	19.25	19.44	23
64QAM	17.1	17.2	18.8	18.9	23
256QAM	14.93	15.06	16.63	16.76	23

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

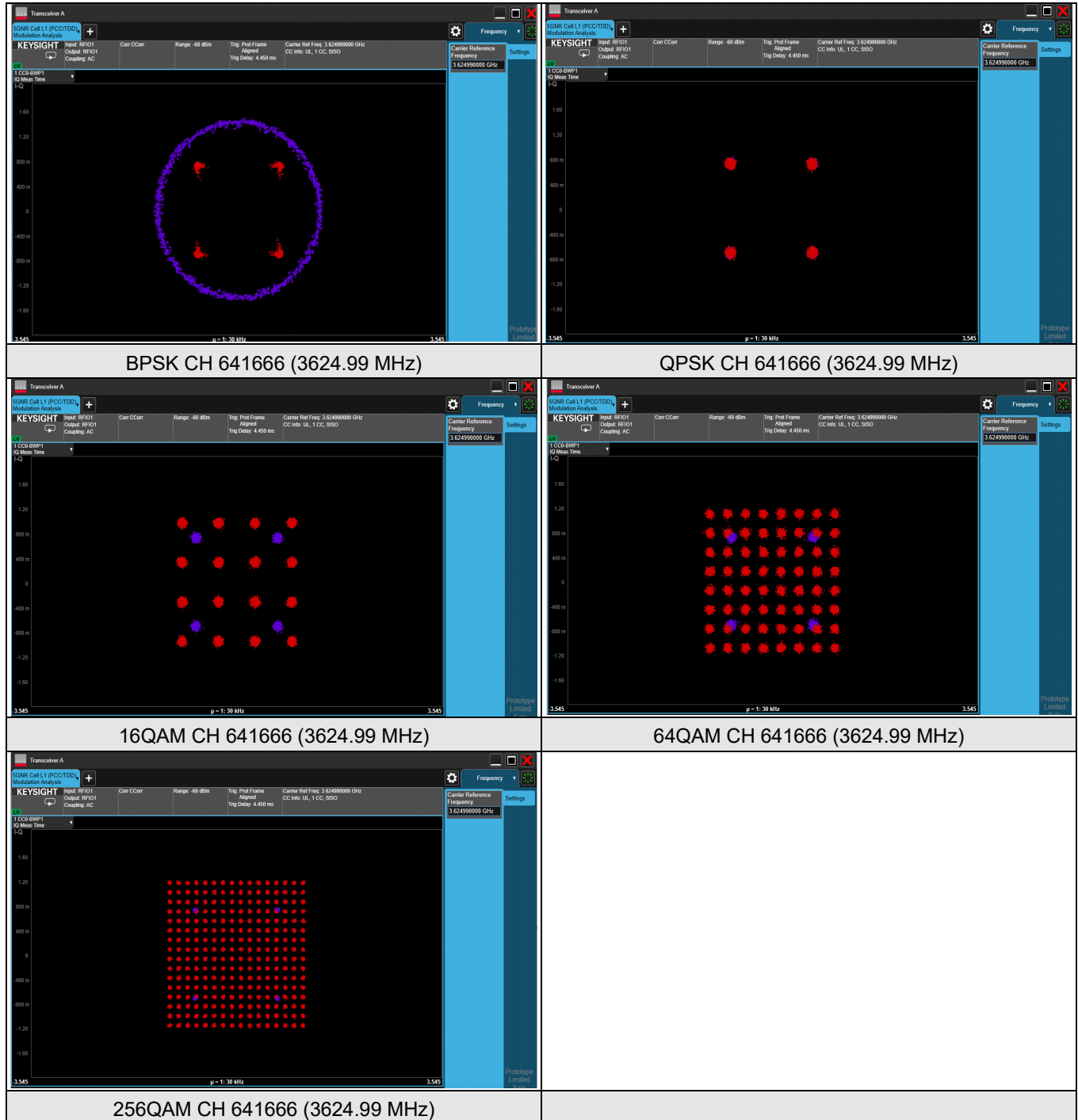


7.2 Modulation Characteristics

Input Power:	3.8 Vdc	Environmental Conditions:	22°C, 73% RH	Tested By:	Charles Hsiao
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7.2.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 40 MHz



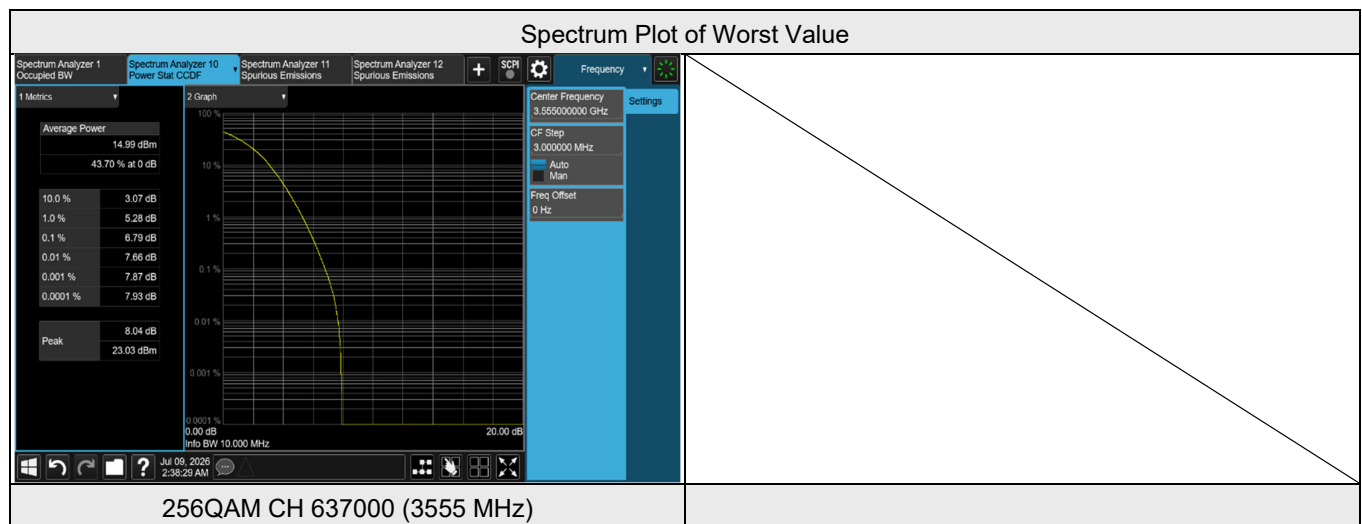
7.3 Peak to Average Ratio

Input Power:	3.8 Vdc	Environmental Conditions:	25°C, 66% RH	Tested By:	James Yang
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7.3.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

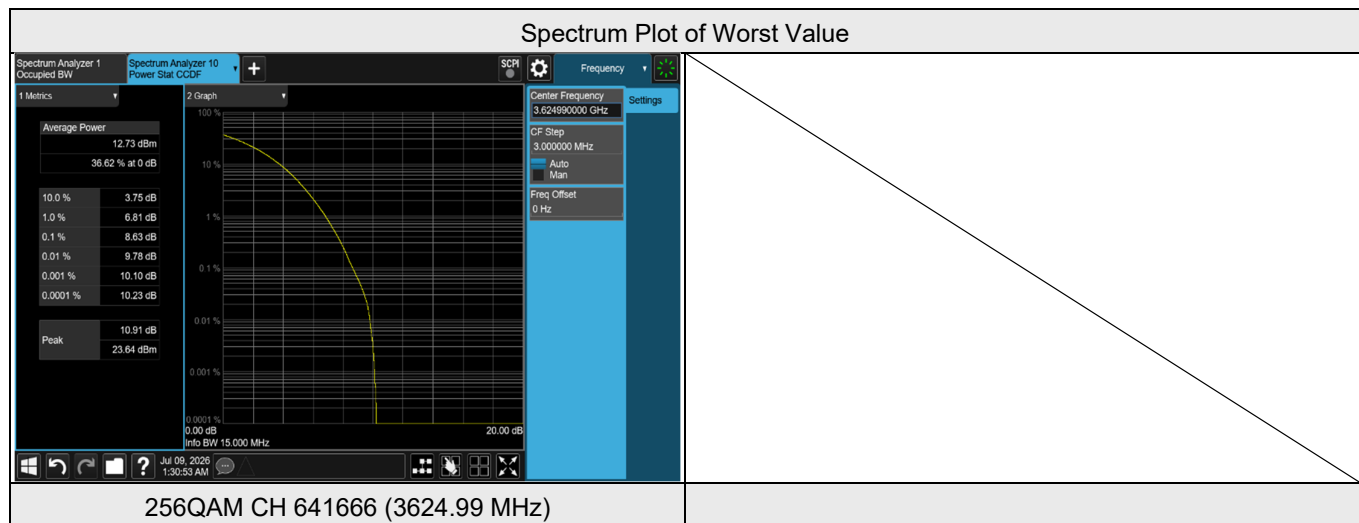
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 10 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
BPSK	637000	3555	3.73	13	PASS
BPSK	641666	3624.99	3.94	13	PASS
BPSK	646332	3694.98	3.89	13	PASS
QPSK	637000	3555	4.53	13	PASS
QPSK	641666	3624.99	4.59	13	PASS
QPSK	646332	3694.98	4.63	13	PASS
16QAM	637000	3555	5.62	13	PASS
16QAM	641666	3624.99	5.59	13	PASS
16QAM	646332	3694.98	5.62	13	PASS
64QAM	637000	3555	5.97	13	PASS
64QAM	641666	3624.99	6.07	13	PASS
64QAM	646332	3694.98	6.09	13	PASS
256QAM	637000	3555	6.79	13	PASS
256QAM	641666	3624.99	6.75	13	PASS
256QAM	646332	3694.98	6.76	13	PASS



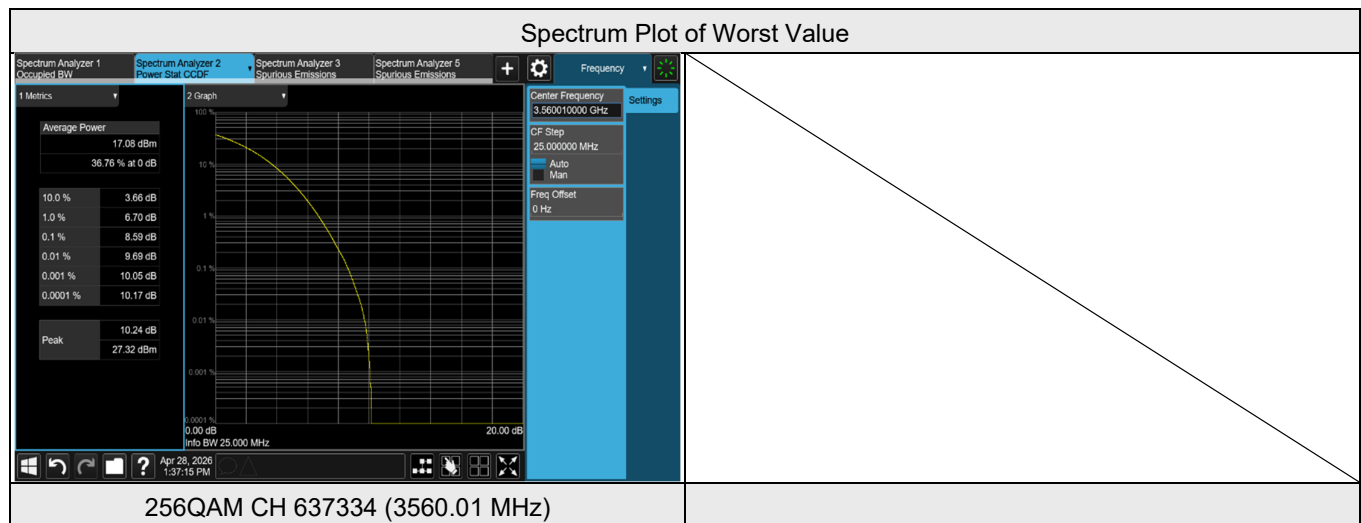
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
BPSK	637168	3557.52	3.77	13	PASS
BPSK	641666	3624.99	3.96	13	PASS
BPSK	646166	3692.49	3.94	13	PASS
QPSK	637168	3557.52	6.61	13	PASS
QPSK	641666	3624.99	6.68	13	PASS
QPSK	646166	3692.49	6.78	13	PASS
16QAM	637168	3557.52	6.61	13	PASS
16QAM	641666	3624.99	6.65	13	PASS
16QAM	646166	3692.49	6.73	13	PASS
64QAM	637168	3557.52	7.23	13	PASS
64QAM	641666	3624.99	7.33	13	PASS
64QAM	646166	3692.49	7.36	13	PASS
256QAM	637168	3557.52	8.60	13	PASS
256QAM	641666	3624.99	8.63	13	PASS
256QAM	646166	3692.49	8.60	13	PASS



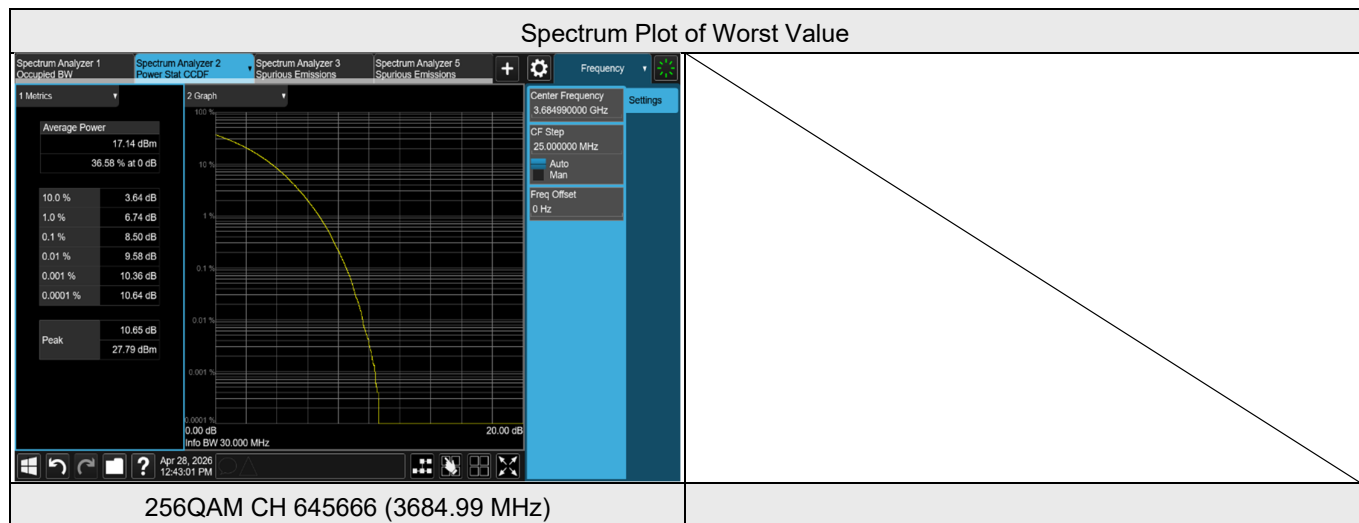
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 20 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
BPSK	637334	3560.01	3.72	13	PASS
BPSK	641666	3624.99	3.80	13	PASS
BPSK	646000	3690	3.94	13	PASS
QPSK	637334	3560.01	6.49	13	PASS
QPSK	641666	3624.99	6.52	13	PASS
QPSK	646000	3690	6.92	13	PASS
16QAM	637334	3560.01	6.51	13	PASS
16QAM	641666	3624.99	6.52	13	PASS
16QAM	646000	3690	6.54	13	PASS
64QAM	637334	3560.01	7.10	13	PASS
64QAM	641666	3624.99	7.41	13	PASS
64QAM	646000	3690	7.11	13	PASS
256QAM	637334	3560.01	8.59	13	PASS
256QAM	641666	3624.99	8.58	13	PASS
256QAM	646000	3690	8.51	13	PASS



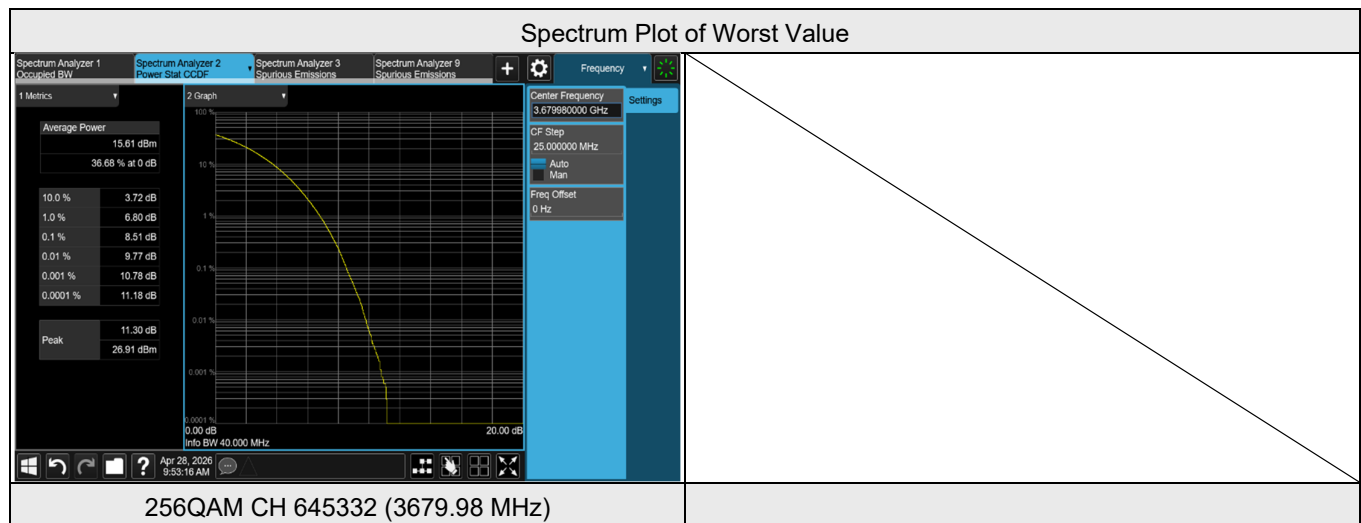
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 30 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
BPSK	637668	3565.02	4.22	13	PASS
BPSK	641666	3624.99	3.87	13	PASS
BPSK	645666	3684.99	4.05	13	PASS
QPSK	637668	3565.02	7.24	13	PASS
QPSK	641666	3624.99	7.17	13	PASS
QPSK	645666	3684.99	7.46	13	PASS
16QAM	637668	3565.02	7.27	13	PASS
16QAM	641666	3624.99	7.31	13	PASS
16QAM	645666	3684.99	7.74	13	PASS
64QAM	637668	3565.02	7.57	13	PASS
64QAM	641666	3624.99	7.56	13	PASS
64QAM	645666	3684.99	7.97	13	PASS
256QAM	637668	3565.02	8.48	13	PASS
256QAM	641666	3624.99	8.48	13	PASS
256QAM	645666	3684.99	8.50	13	PASS



NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 40 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
BPSK	638000	3570	5.15	13	PASS
BPSK	641666	3624.99	5.06	13	PASS
BPSK	645332	3679.98	5.06	13	PASS
QPSK	638000	3570	7.91	13	PASS
QPSK	641666	3624.99	7.87	13	PASS
QPSK	645332	3679.98	7.91	13	PASS
16QAM	638000	3570	7.96	13	PASS
16QAM	641666	3624.99	8.21	13	PASS
16QAM	645332	3679.98	8.03	13	PASS
64QAM	638000	3570	8.10	13	PASS
64QAM	641666	3624.99	8.05	13	PASS
64QAM	645332	3679.98	7.98	13	PASS
256QAM	638000	3570	8.36	13	PASS
256QAM	641666	3624.99	8.35	13	PASS
256QAM	645332	3679.98	8.51	13	PASS



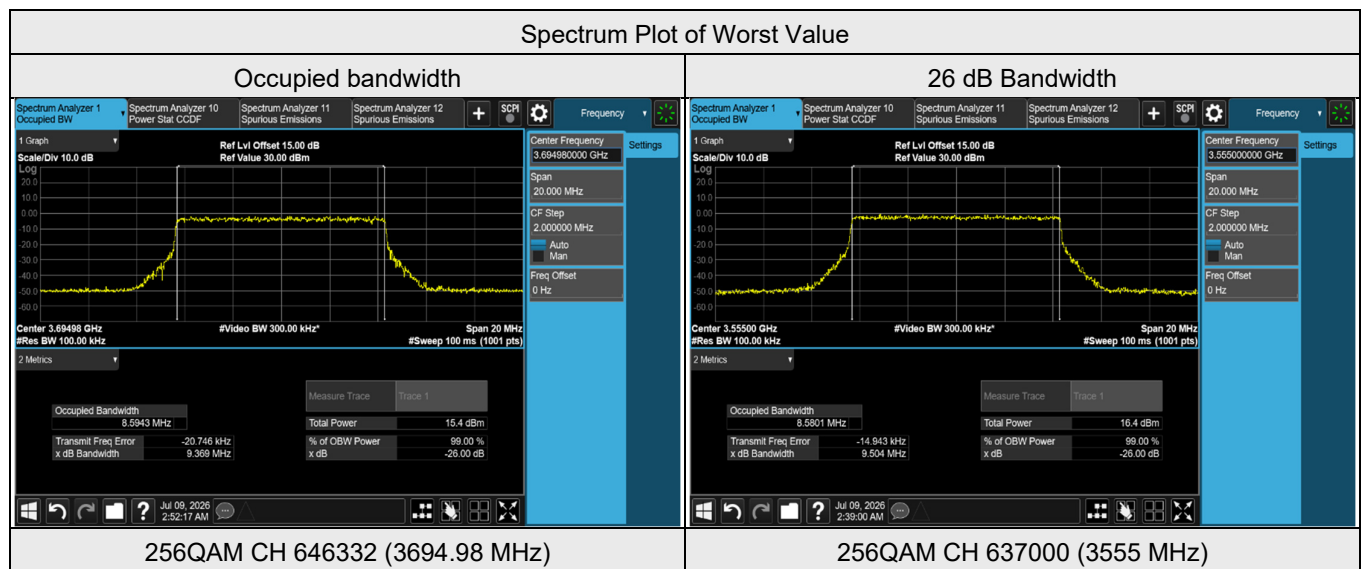
7.4 Bandwidth

Input Power:	3.8 Vdc	Environmental Conditions:	25°C, 66% RH	Tested By:	James Yang
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7.4.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

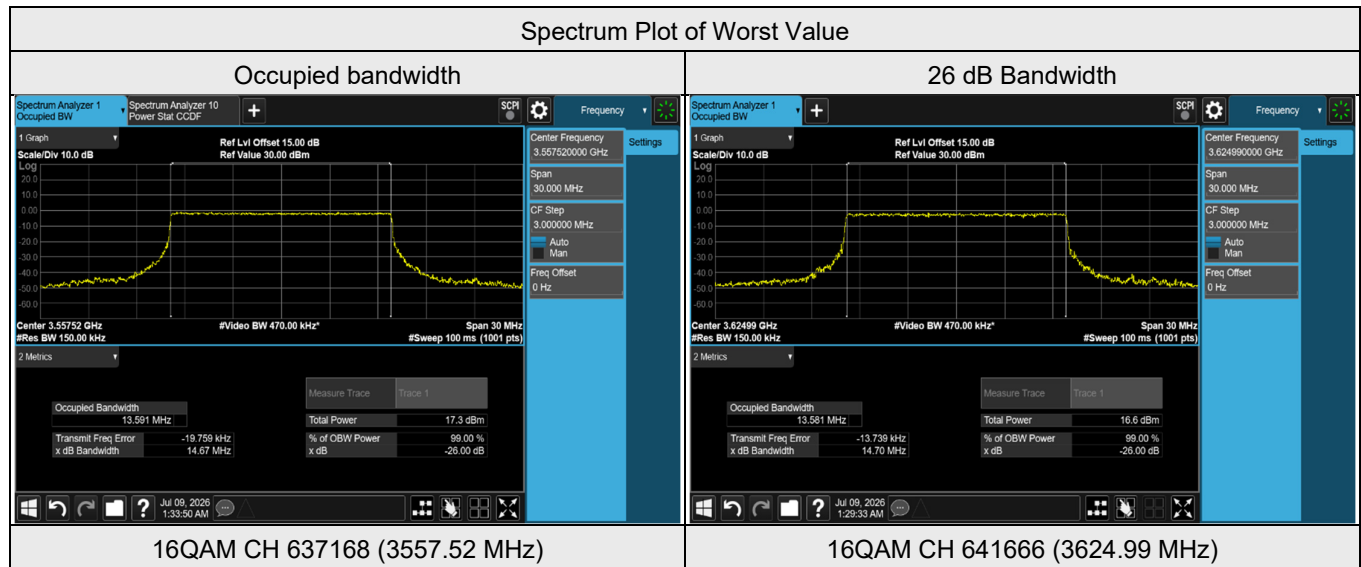
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 10 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
BPSK	637000	3555	8.5802	9.328
BPSK	641666	3624.99	8.5842	9.263
BPSK	646332	3694.98	8.5847	9.195
QPSK	637000	3555	8.5741	9.339
QPSK	641666	3624.99	8.5776	9.191
QPSK	646332	3694.98	8.5880	9.255
16QAM	637000	3555	8.5855	9.454
16QAM	641666	3624.99	8.5923	9.335
16QAM	646332	3694.98	8.5746	9.227
64QAM	637000	3555	8.5859	9.229
64QAM	641666	3624.99	8.5752	9.206
64QAM	646332	3694.98	8.5900	9.385
256QAM	637000	3555	8.5801	9.504
256QAM	641666	3624.99	8.5618	9.415
256QAM	646332	3694.98	8.5943	9.369



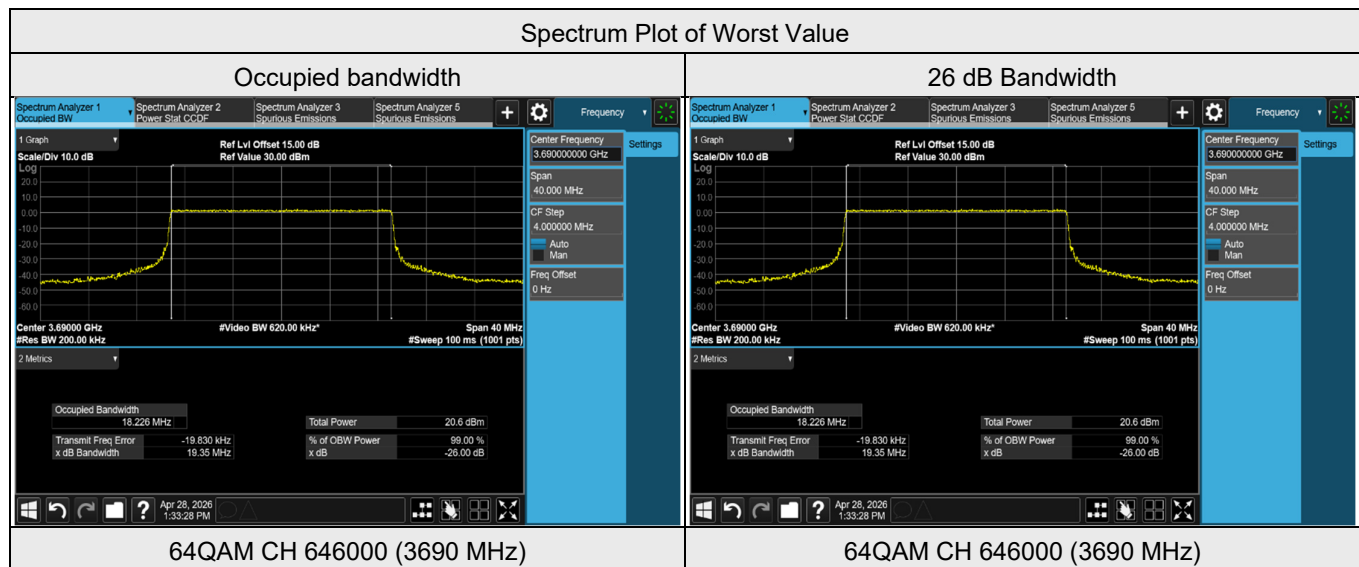
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
BPSK	637168	3557.52	12.872	13.68
BPSK	641666	3624.99	12.870	13.76
BPSK	646166	3692.49	12.856	13.69
QPSK	637168	3557.52	13.577	14.64
QPSK	641666	3624.99	13.576	14.60
QPSK	646166	3692.49	13.581	14.62
16QAM	637168	3557.52	13.591	14.67
16QAM	641666	3624.99	13.581	14.70
16QAM	646166	3692.49	13.573	14.42
64QAM	637168	3557.52	13.571	14.43
64QAM	641666	3624.99	13.572	14.45
64QAM	646166	3692.49	13.581	14.51
256QAM	637168	3557.52	13.589	14.39
256QAM	641666	3624.99	13.568	14.42
256QAM	646166	3692.49	13.567	14.41



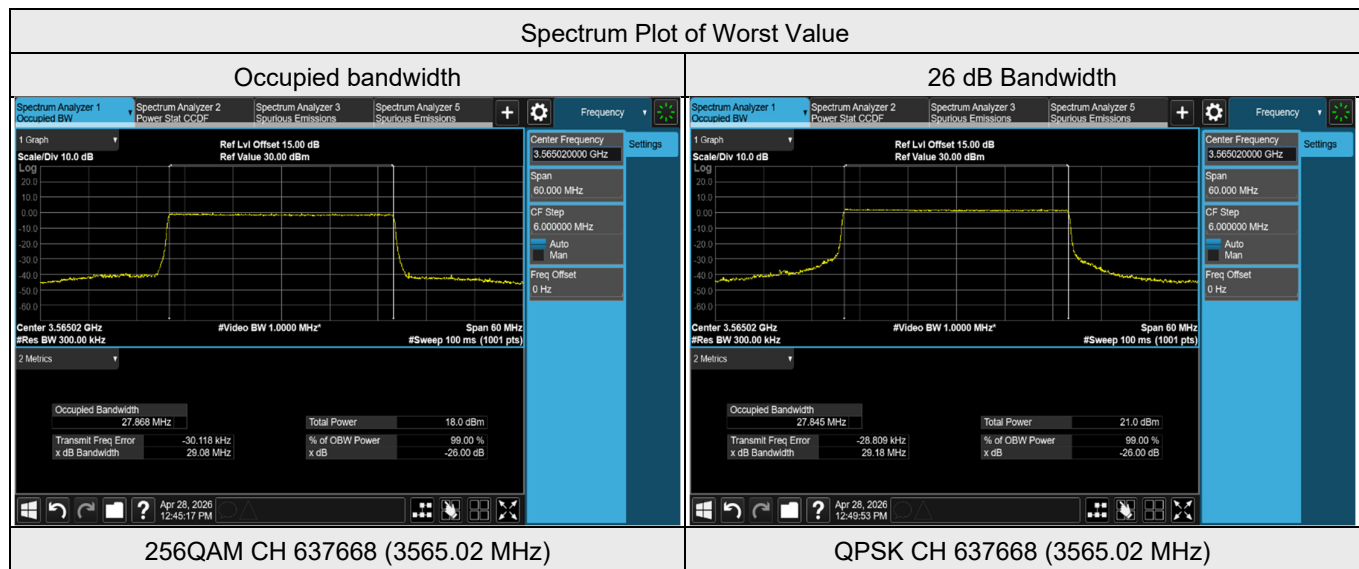
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 20 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
BPSK	637334	3560.01	17.863	18.76
BPSK	641666	3624.99	17.846	18.90
BPSK	646000	3690	17.860	18.86
QPSK	637334	3560.01	18.208	19.23
QPSK	641666	3624.99	18.211	19.35
QPSK	646000	3690	18.210	19.26
16QAM	637334	3560.01	18.208	19.33
16QAM	641666	3624.99	18.225	19.15
16QAM	646000	3690	18.208	19.27
64QAM	637334	3560.01	18.226	19.28
64QAM	641666	3624.99	18.212	19.13
64QAM	646000	3690	18.226	19.35
256QAM	637334	3560.01	18.219	19.26
256QAM	641666	3624.99	18.207	19.28
256QAM	646000	3690	18.201	19.24



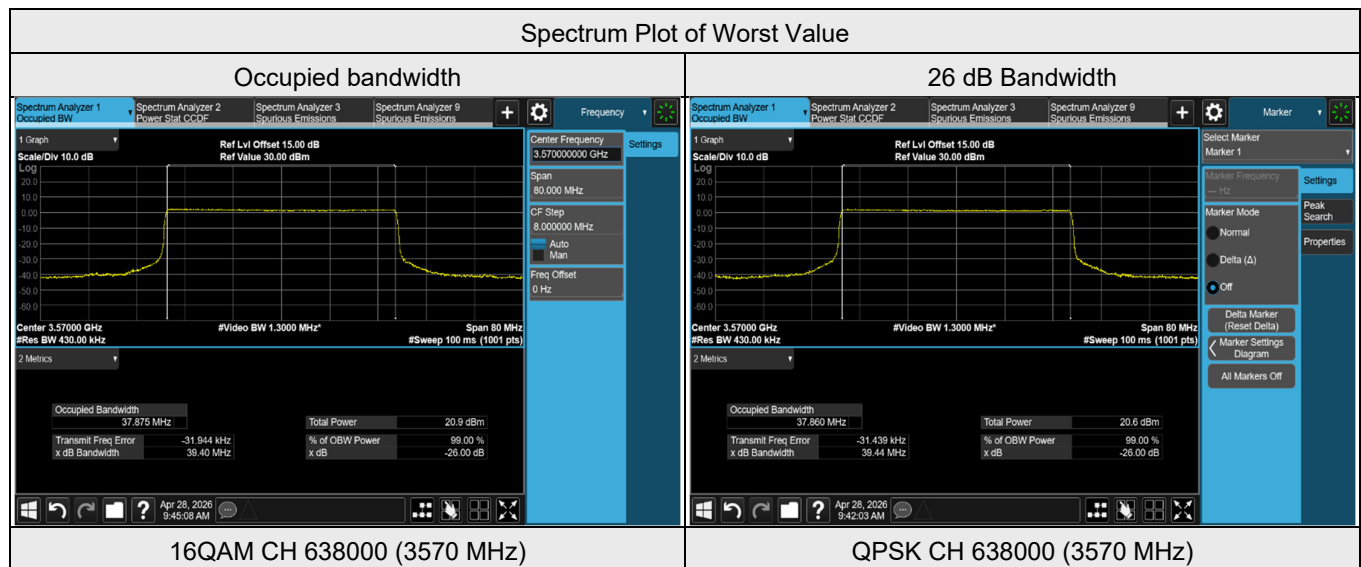
NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 30 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
BPSK	637668	3565.02	26.805	28.08
BPSK	641666	3624.99	26.818	27.89
BPSK	645666	3684.99	26.804	27.95
QPSK	637668	3565.02	27.845	29.18
QPSK	641666	3624.99	27.856	29.08
QPSK	645666	3684.99	27.853	29.03
16QAM	637668	3565.02	27.859	29.14
16QAM	641666	3624.99	27.847	29.04
16QAM	645666	3684.99	27.856	28.94
64QAM	637668	3565.02	27.858	29.14
64QAM	641666	3624.99	27.852	29.11
64QAM	645666	3684.99	27.840	28.99
256QAM	637668	3565.02	27.868	29.08
256QAM	641666	3624.99	27.863	28.91
256QAM	645666	3684.99	27.867	29.13



NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 40 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
BPSK	638000	3570	35.718	37.10
BPSK	641666	3624.99	35.744	37.15
BPSK	645332	3679.98	35.734	37.15
QPSK	638000	3570	37.860	39.44
QPSK	641666	3624.99	37.834	39.26
QPSK	645332	3679.98	37.853	39.30
16QAM	638000	3570	37.875	39.40
16QAM	641666	3624.99	37.851	39.37
16QAM	645332	3679.98	37.857	39.33
64QAM	638000	3570	37.870	39.33
64QAM	641666	3624.99	37.857	39.35
64QAM	645332	3679.98	37.863	39.35
256QAM	638000	3570	37.848	39.24
256QAM	641666	3624.99	37.857	39.26
256QAM	645332	3679.98	37.862	39.30



7.5 Conducted Spurious Emissions

Input Power:	3.8 Vdc	Environmental Conditions:	25°C, 69% RH	Tested By:	Duke Wu
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7.5.1 NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz)

NR n48 SCS 30 kHz (3.55 GHz ~ 3.7 GHz), Channel Bandwidth: 10 MHz

