

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: RFBGDY-WTW-P25120682-2

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-P25120682-2	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 -1.59 dB at 178.41 MHz
Part 2.1053 Part 96.41(e)	Radiated Spurious Emissions above 1GHz	Pass	Minimum passing margin is -1.54 dB at 7250.00 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	LTE: QPSK, 16QAM, 64QAM, 256QAM
LTE support SISO bands	B48
LTE support MIMO bands	-
PC3 for Power Class	B48
PC2 for Power Class	-
PC1.5 for Power Class	-

Note:

1. EUT Overview

LTE Band 48

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
5 MHz	3552.5 ~ 3697.5	QPSK	0.115	20.62	4M50G7D
		16QAM	0.105	20.21	4M50D7W
		64QAM	0.087	19.42	4M50D7W
		256QAM	0.034	15.3	4M50D7W
10 MHz	3555 ~ 3695	QPSK	0.124	20.95	8M98G7D
		16QAM	0.108	20.33	8M98D7W
		64QAM	0.08	19.03	8M98D7W
		256QAM	0.039	15.89	8M98D7W

LTE Band 48, Output Power: dBm/10 MHz

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
15 MHz	3557.5 ~ 3692.5	QPSK	0.117	20.67	13M5G7D
		16QAM	0.107	20.29	13M5D7W
		64QAM	0.073	18.63	13M5D7W
		256QAM	0.037	15.73	13M5D7W
20 MHz	3560 ~ 3690	QPSK	0.127	21.03	18M0G7D
		16QAM	0.102	20.07	18M0D7W
		64QAM	0.074	18.72	18M0D7W
		256QAM	0.037	15.73	18M0D7W

LTE Band 48, Output Power: Full Power

Bandwidth	TX Frequency Range (MHz)	Modulation	Max. EIRP (W)	Max. EIRP (dBm)	Emission Designator
15 MHz	3557.5 ~ 3692.5	QPSK	0.118	20.73	13M5G7D
		16QAM	0.107	20.31	13M5D7W
		64QAM	0.074	18.7	13M5D7W
		256QAM	0.038	15.79	13M5D7W
20 MHz	3560 ~ 3690	QPSK	0.128	21.06	18M0G7D
		16QAM	0.104	20.15	18M0D7W
		64QAM	0.076	18.82	18M0D7W
		256QAM	0.039	15.94	18M0D7W

- 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)
LTE B48	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 not be held responsible.

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 LTE Band 48

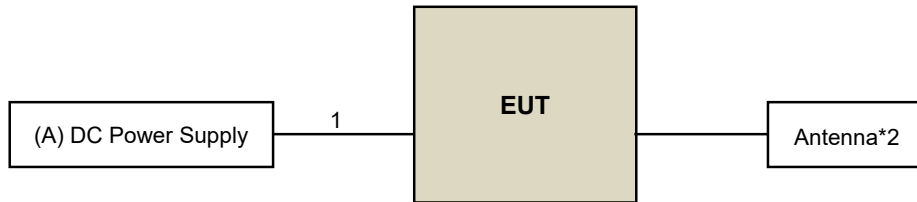
Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Maximum EIRP	55265(3552.50 MHz) 55990(3625.00 MHz) 56715(3697.50 MHz)	5 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	55290(3555.00 MHz) 55990(3625.00 MHz) 56690(3695.00 MHz)	10 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	55315(3557.50 MHz) 55990(3625.00 MHz) 56665(3692.50 MHz)	15 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
	55340(3560.00 MHz) 55990(3625.00 MHz) 56640(3690.00 MHz)	20 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Modulation Characteristics	55990(3625.00 MHz)	20 MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	55265(3552.50 MHz) 55990(3625.00 MHz) 56715(3697.50 MHz)	5 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
	55290(3555.00 MHz) 55990(3625.00 MHz) 56690(3695.00 MHz)	10 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
	55315(3557.50 MHz) 55990(3625.00 MHz) 56665(3692.50 MHz)	15 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
	55340(3560.00 MHz) 55990(3625.00 MHz) 56640(3690.00 MHz)	20 MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Bandwidth	55265(3552.50 MHz) 55990(3625.00 MHz) 56715(3697.50 MHz)	5 MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
	55290(3555.00 MHz) 55990(3625.00 MHz) 56690(3695.00 MHz)	10 MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
	55315(3557.50 MHz) 55990(3625.00 MHz) 56665(3692.50 MHz)	15 MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
	55340(3560.00 MHz) 55990(3625.00 MHz) 56640(3690.00 MHz)	20 MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Conducted Spurious Emissions	55265(3552.50 MHz) 55990(3625.00 MHz) 56715(3697.50 MHz)	5 MHz	QPSK	1 RB Full RB
	55290(3555.00 MHz) 55990(3625.00 MHz) 56690(3695.00 MHz)	10 MHz	QPSK	1 RB Full RB
	55315(3557.50 MHz) 55990(3625.00 MHz) 56665(3692.50 MHz)	15 MHz	QPSK	1 RB Full RB
	55340(3560.00 MHz) 55990(3625.00 MHz) 56640(3690.00 MHz)	20 MHz	QPSK	1 RB Full RB
Radiated Spurious Emissions below 1GHz	55990(3625.00 MHz)	20 MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	55265(3552.50 MHz) 55990(3625.00 MHz) 56715(3697.50 MHz)	5 MHz	QPSK	1 RB
	55340(3560.00 MHz) 55990(3625.00 MHz) 56640(3690.00 MHz)	20 MHz	QPSK	1 RB
Frequency Stability	55340(3560.00 MHz) 56640(3690.00 MHz)	20 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
Radio Communication Analyzer Anritsu	MT8821C	6261806803	2026/2/12	2027/2/11
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in HY - Oven room(Hwaya).
2. Tested Date: 2026/5/6 ~ 2026/6/26

4.2 Modulation Characteristics

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
Radio Communication Analyzer Anritsu	MT8821C	6261806803	2026/2/12	2027/2/11
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in HY - Oven room(Hwaya).
2. Tested Date: 2026/5/6 ~ 2026/6/28

4.3 Peak to Average Ratio

Refer to section 4.2 to get the tested date and information of the instruments.

4.4 Bandwidth

Refer to section 4.2 to get the tested date and information of the instruments.

4.5 Conducted Spurious Emissions

Refer to section 4.2 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	2026/4/23
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

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
Signal & Spectrum Analyzer R&S	FSV3044	101505	2026/6/15	2027/6/14
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A
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 LTE Band 48:

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 LTE Band 48:

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 LTE Band 48:

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 LTE Band 48:

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

5.8 Frequency Stability

For LTE Band 48:

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

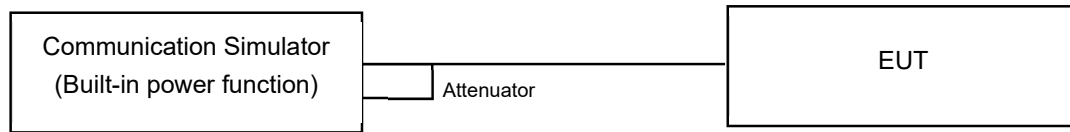
6 Test Arrangements

6.1 Maximum EIRP

6.1.1 Test Setup

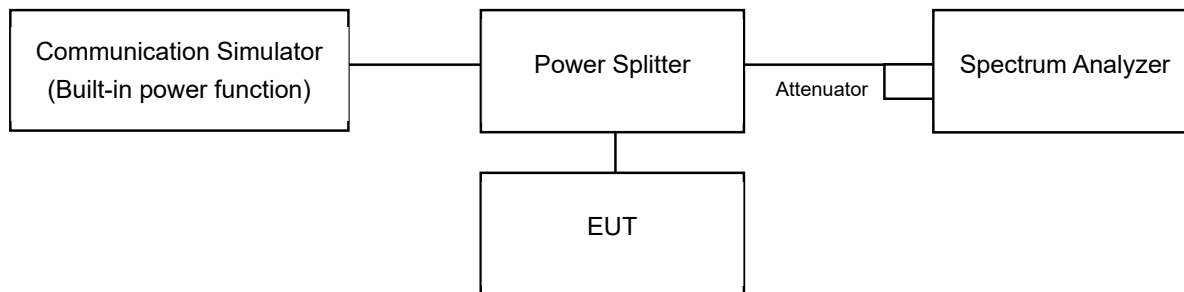
Conducted Power Measurement:

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

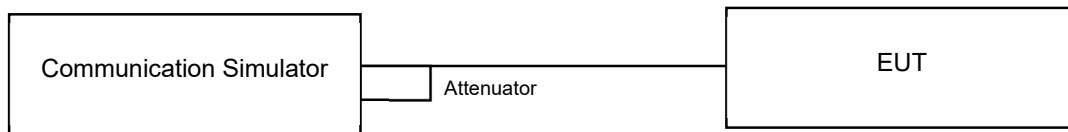
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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



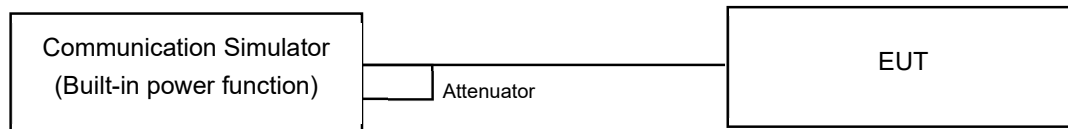
Note: The correction factor has already been compensated by the instrument.

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



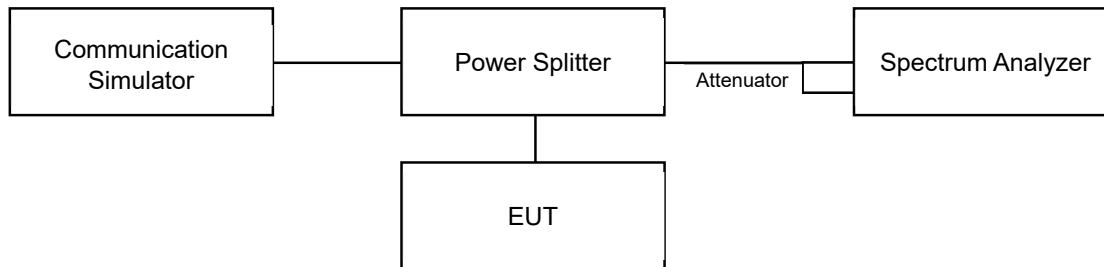
Note: The correction factor has already been compensated by the instrument.

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.

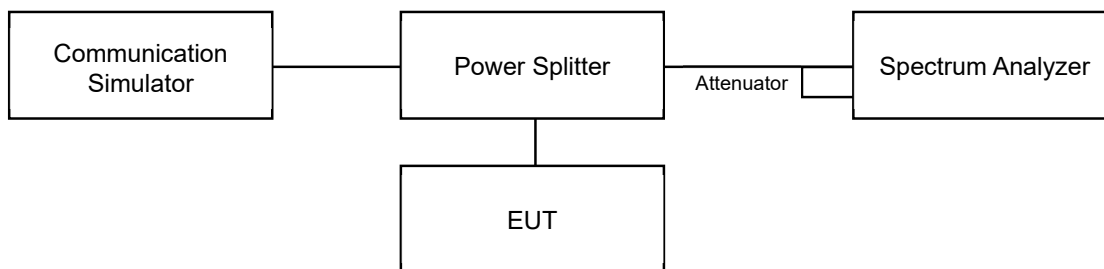
- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and 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.

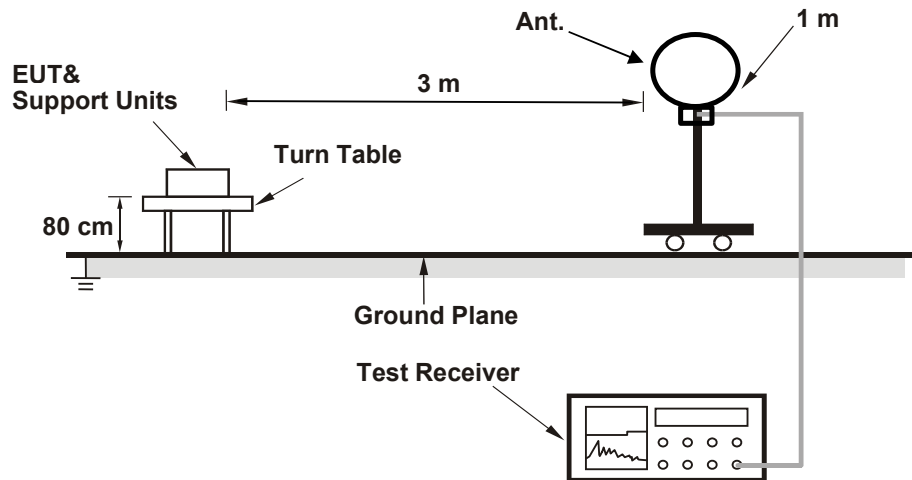
6.5.2 Test Procedure

- 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.

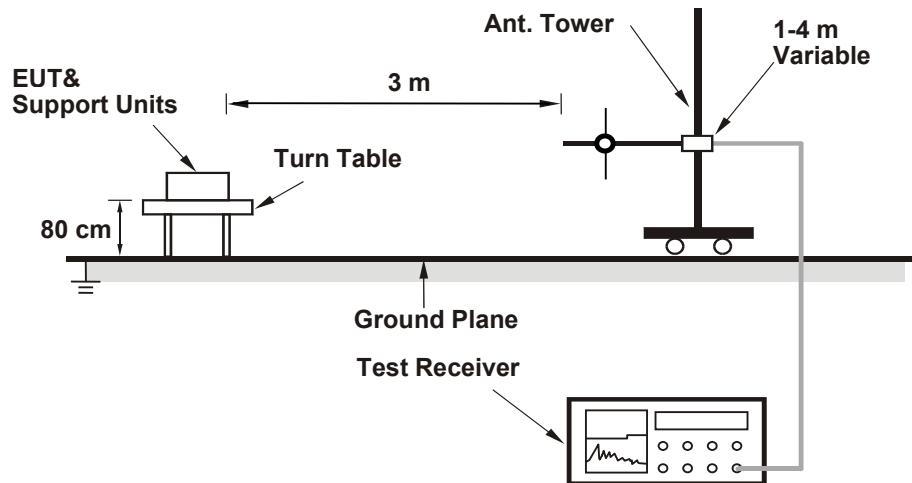
6.6 Radiated Spurious Emissions below 1GHz

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.

- 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.
- 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.

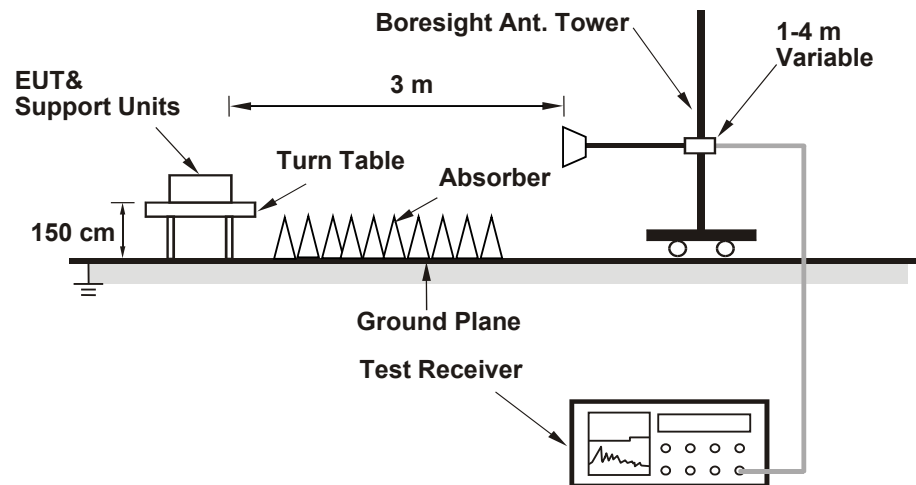
Note:

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

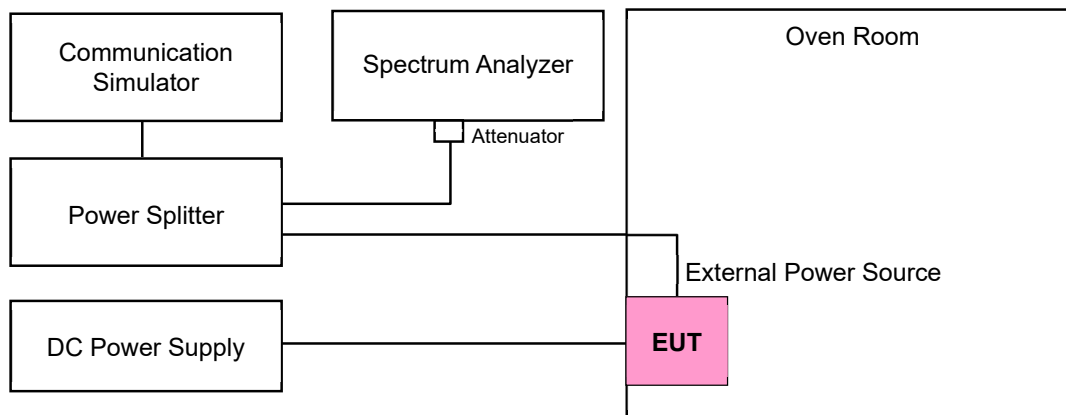
The EUT is configured to set data modulation and maximum power using WWAN technology.

- 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
- $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- $ERP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8 - 2.15$; 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

Environmental Conditions:	23°C, 74% RH	Tested By:	Willy Cheng
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7.1.1 LTE Band 48

LTE Band 48, Channel Bandwidth: 5 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55265	CH 55990	CH 56715
			3552.5 MHz	3625 MHz	3697.5 MHz
QPSK	1	0	18.31	18.78	18.71
	1	12	18.38	18.80	18.73
	1	24	18.34	18.89	18.92
	12	0	17.36	17.81	17.81
	12	6	17.38	17.78	17.85
	12	13	17.33	17.75	17.79
	25	0	17.35	17.81	17.93
16QAM	1	0	17.91	18.17	18.29
	1	12	17.57	18.51	18.22
	1	24	17.47	18.37	18.15
	12	0	16.34	16.86	16.81
	12	6	16.45	16.98	17.01
	12	13	16.26	16.95	16.91
	25	0	16.55	17.84	16.74
64QAM	1	0	16.62	16.59	16.87
	1	12	16.54	16.39	17.72
	1	24	16.59	16.84	16.95
	12	0	15.33	15.36	15.88
	12	6	15.47	15.52	15.92
	12	13	15.33	15.53	15.77
	25	0	15.47	15.39	15.87
256QAM	1	0	12.93	13.31	13.31
	1	12	13.24	13.60	13.46
	1	24	12.88	13.55	13.33
	12	0	13.00	13.42	13.54
	12	6	13.17	13.52	13.53
	12	13	13.07	13.60	13.44
	25	0	13.09	13.35	13.56

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	17.33	18.92	19.03	20.62	23.00
16QAM	16.26	18.51	17.96	20.21	23.00
64QAM	15.33	17.72	17.03	19.42	23.00
256QAM	12.88	13.6	14.58	15.3	23.00

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

LTE Band 48, Channel Bandwidth: 10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55290	CH 55990	CH 56690
			3555 MHz	3625 MHz	3695 MHz
QPSK	1	0	18.77	18.80	18.73
	1	24	18.25	18.63	18.73
	1	49	18.43	19.25	19.17
	25	0	17.35	17.85	17.90
	25	12	17.40	17.80	17.82
	25	25	17.40	17.82	17.93
	50	0	17.33	17.77	17.75
16QAM	1	0	17.75	17.69	17.94
	1	24	17.62	18.00	18.00
	1	49	17.65	17.99	18.63
	25	0	16.33	16.91	16.82
	25	12	16.44	16.78	16.91
	25	25	16.41	16.83	16.85
	50	0	16.45	16.87	17.03
64QAM	1	0	16.78	17.09	17.06
	1	24	16.43	17.06	17.02
	1	49	16.42	17.19	17.33
	25	0	15.32	15.73	15.83
	25	12	15.39	15.98	15.93
	25	25	15.42	15.92	15.96
	50	0	15.55	16.12	15.83
256QAM	1	0	13.54	13.70	13.90
	1	24	13.68	14.10	13.82
	1	49	13.51	14.10	13.75
	25	0	13.37	13.94	13.91
	25	12	13.22	13.81	13.86
	25	25	13.40	13.87	13.93
	50	0	13.39	14.19	13.74

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	17.33	19.25	19.03	20.95	23.00
16QAM	16.33	18.63	18.03	20.33	23.00
64QAM	15.32	17.33	17.02	19.03	23.00
256QAM	13.22	14.19	14.92	15.89	23.00

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

LTE Band 48, Channel Bandwidth: 15 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55315	CH 55990	CH 56665
			3557.5 MHz	3625 MHz	3692.5 MHz
QPSK	1	0	18.13	18.83	18.78
	1	37	18.22	18.57	19.02
	1	74	18.17	18.63	19.03
	36	0	17.28	17.73	17.84
	36	19	17.40	17.73	17.84
	36	39	17.33	17.81	17.92
	75	0	17.20	17.74	17.79
16QAM	1	0	17.86	17.95	18.27
	1	37	17.33	18.12	17.87
	1	74	17.60	18.61	18.06
	36	0	16.28	16.73	16.84
	36	19	16.42	16.81	16.74
	36	39	16.33	16.90	16.86
	75	0	16.36	16.78	17.01
64QAM	1	0	16.58	16.78	16.79
	1	37	16.73	16.89	16.66
	1	74	16.29	16.91	17.00
	36	0	15.44	15.82	15.82
	36	19	15.38	15.73	15.85
	36	39	15.34	15.82	15.87
	75	0	15.38	15.79	15.88
256QAM	1	0	13.54	14.09	13.78
	1	37	13.07	13.99	13.75
	1	74	13.59	13.47	14.01
	36	0	13.41	13.87	13.79
	36	19	13.39	13.78	13.75
	36	39	13.36	13.83	13.71
	75	0	13.47	13.94	13.99

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	17.2	19.03	18.9	20.73	23.00
16QAM	16.28	18.61	17.98	20.31	23.00
64QAM	15.34	17	17.04	18.7	23.00
256QAM	13.07	14.09	14.77	15.79	23.00

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

LTE Band 48, Channel Bandwidth: 20 MHz, Output Power: Full Power

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55340	CH 55990	CH 56640
			3560 MHz	3625 MHz	3690 MHz
QPSK	1	0	18.53	19.36	18.93
	1	50	18.27	18.76	19.04
	1	99	18.55	18.84	18.72
	50	0	17.29	17.70	17.74
	50	25	17.45	17.77	17.82
	50	50	17.46	17.87	17.84
	100	0	17.43	17.77	17.81
16QAM	1	0	17.61	18.11	18.45
	1	50	17.65	18.16	18.03
	1	99	17.69	18.41	18.11
	50	0	16.42	16.85	16.87
	50	25	16.36	16.80	16.88
	50	50	16.49	16.86	16.86
	100	0	16.41	16.82	16.86
64QAM	1	0	16.32	17.02	16.91
	1	50	16.35	16.97	16.98
	1	99	16.76	17.12	16.70
	50	0	15.38	15.81	15.87
	50	25	15.45	15.85	15.83
	50	50	15.38	15.94	15.83
	100	0	15.48	15.67	15.93
256QAM	1	0	13.52	13.68	13.59
	1	50	13.23	14.06	14.01
	1	99	13.63	13.88	14.04
	50	0	13.39	13.69	13.72
	50	25	13.57	13.79	13.78
	50	50	13.49	13.94	13.91
	100	0	13.67	14.06	14.24

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	17.29	19.36	18.99	21.06	23.00
16QAM	16.36	18.45	18.06	20.15	23.00
64QAM	15.38	17.12	17.08	18.82	23.00
256QAM	13.23	14.24	14.93	15.94	23.00

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

LTE Band 48, Channel Bandwidth: 15 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55315	CH 55990	CH 56665
			3557.5 MHz	3625 MHz	3692.5 MHz
QPSK	1	0	18.04	18.77	18.73
	1	37	18.13	18.51	18.92
	1	74	18.12	18.54	18.97
	36	0	17.26	17.65	17.77
	36	19	17.36	17.65	17.74
	36	39	17.25	17.76	17.90
	75	0	15.19	15.70	15.71
16QAM	1	0	17.82	17.91	18.20
	1	37	17.28	18.04	17.77
	1	74	17.50	18.59	17.97
	36	0	16.25	16.63	16.78
	36	19	16.36	16.77	16.73
	36	39	16.32	16.86	16.79
	75	0	14.31	14.70	14.93
64QAM	1	0	16.53	16.68	16.77
	1	37	16.72	16.88	16.65
	1	74	16.25	16.86	16.93
	36	0	15.36	15.79	15.80
	36	19	15.37	15.71	15.81
	36	39	15.33	15.80	15.81
	75	0	13.35	13.70	13.79
256QAM	1	0	13.46	14.03	13.70
	1	37	13.05	13.90	13.73
	1	74	13.50	13.46	13.99
	36	0	13.31	13.77	13.71
	36	19	13.35	13.70	13.72
	36	39	13.31	13.75	13.70
	75	0	11.43	11.93	11.99

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	15.19	18.97	16.89	20.67	23.00
16QAM	14.31	18.59	16.01	20.29	23.00
64QAM	13.35	16.93	15.05	18.63	23.00
256QAM	11.43	14.03	13.13	15.73	23.00

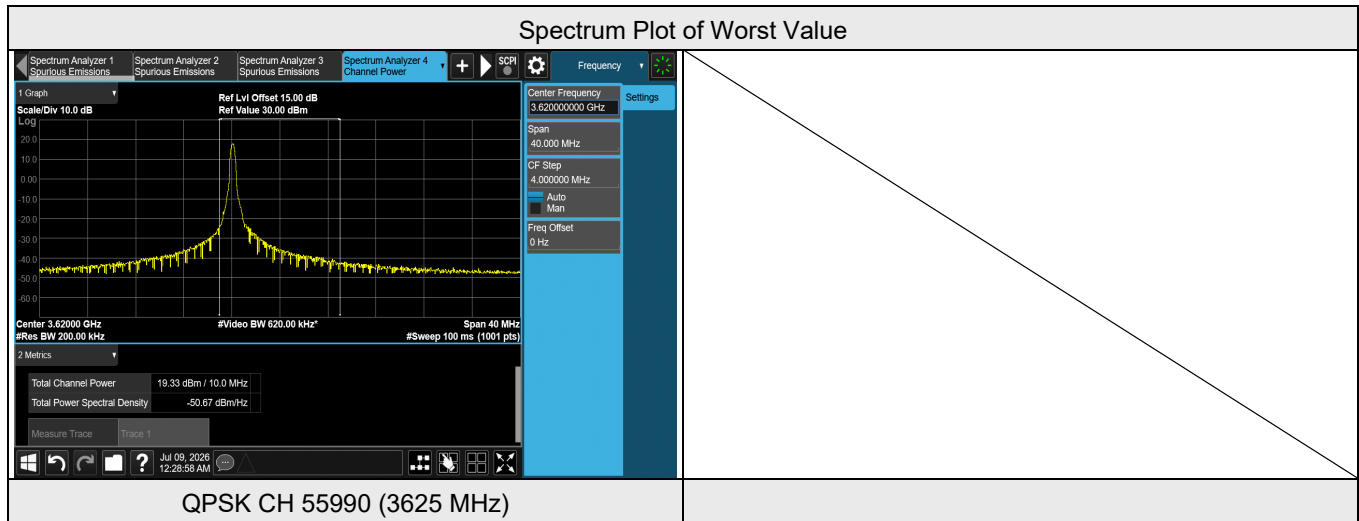
Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

LTE Band 48, Channel Bandwidth: 20 MHz, Output Power: dBm/10 MHz

Modulation	RB Size	RB Offset	Measurement Conducted Power (dBm)		
			CH 55340	CH 55990	CH 56640
			3560 MHz	3625 MHz	3690 MHz
QPSK	1	0	18.50	19.33	18.89
	1	50	18.17	18.73	18.99
	1	99	18.49	18.80	18.67
	50	0	17.21	17.66	17.65
	50	25	17.36	17.68	17.80
	50	50	17.38	17.81	17.81
	100	0	14.42	14.78	14.86
16QAM	1	0	17.57	18.01	18.37
	1	50	17.55	18.15	18.01
	1	99	17.60	18.32	18.10
	50	0	16.36	16.84	16.79
	50	25	16.31	16.77	16.80
	50	50	16.41	16.78	16.80
	100	0	13.45	13.78	13.85
64QAM	1	0	16.26	16.93	16.82
	1	50	16.30	16.88	16.92
	1	99	16.67	17.02	16.62
	50	0	15.28	15.79	15.81
	50	25	15.43	15.83	15.79
	50	50	15.32	15.91	15.77
	100	0	12.49	12.71	12.97
256QAM	1	0	13.46	13.62	13.53
	1	50	13.19	14.00	13.99
	1	99	13.62	13.86	14.03
	50	0	13.34	13.67	13.64
	50	25	13.50	13.75	13.76
	50	50	13.39	13.85	13.89
	100	0	10.70	11.03	11.20

Output Power					
Modulation	Minimum Cond. Power (dBm)	Maximum Cond. Power (dBm)	Minimum EIRP (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
QPSK	14.42	19.33	16.12	21.03	23.00
16QAM	13.45	18.37	15.15	20.07	23.00
64QAM	12.49	17.02	14.19	18.72	23.00
256QAM	10.7	14.03	12.4	15.73	23.00

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



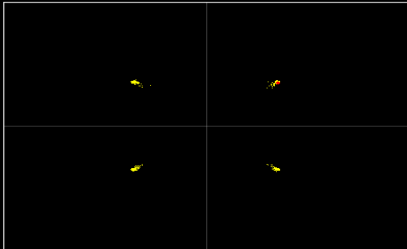
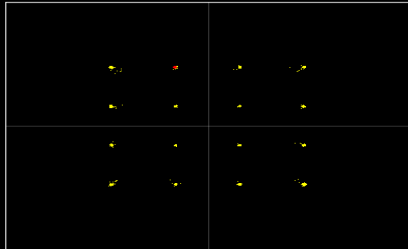
Note: For the channel bandwidth is less than or equal to 10 MHz, the full power test data please refer to the power per 10 MHz corresponding to the channel bandwidth.

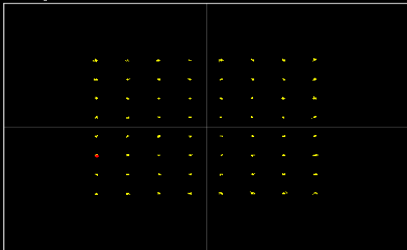
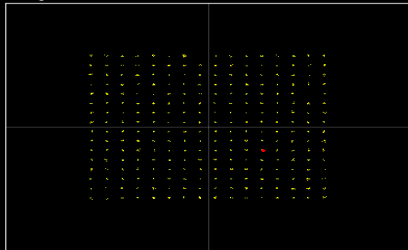
7.2 Modulation Characteristics

Environmental Conditions:	25°C, 67% RH	Tested By:	Noah Chang
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7.2.1 LTE Band 48

LTE Band 48, Channel Bandwidth: 20 MHz

FundamentalConstellation 0 Symbol I 0.7131 Q 0.6955 Meas. Count : 1/ 1  <table><thead><tr><th></th><th>Avg.</th><th>Max.</th><th>Min.</th><th>Limit</th></tr></thead><tbody><tr><td>EVM</td><td>2.68</td><td>2.68</td><td>2.68 %(rms)</td><td>≤ 17.5 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>30.60</td><td>30.60</td><td>30.60 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-71.98</td><td>-71.98</td><td>-71.98 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>100.50</td><td>100.50</td><td>100.50 %(I/Q)</td><td></td></tr></tbody></table>		Avg.	Max.	Min.	Limit	EVM	2.68	2.68	2.68 %(rms)	≤ 17.5 %(rms)	Peak Vector Error	30.60	30.60	30.60 %		Carrier Leakage	-71.98	-71.98	-71.98 dBc		IQ Imbalance	100.50	100.50	100.50 %(I/Q)		FundamentalConstellation 0 Symbol I -0.3196 Q 0.9551 Meas. Count : 1/ 1  <table><thead><tr><th></th><th>Avg.</th><th>Max.</th><th>Min.</th><th>Limit</th></tr></thead><tbody><tr><td>EVM</td><td>1.96</td><td>1.96</td><td>1.96 %(rms)</td><td>≤ 12.5 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>34.02</td><td>34.02</td><td>34.02 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-63.45</td><td>-63.45</td><td>-63.45 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>100.48</td><td>100.48</td><td>100.48 %(I/Q)</td><td></td></tr></tbody></table>		Avg.	Max.	Min.	Limit	EVM	1.96	1.96	1.96 %(rms)	≤ 12.5 %(rms)	Peak Vector Error	34.02	34.02	34.02 %		Carrier Leakage	-63.45	-63.45	-63.45 dBc		IQ Imbalance	100.48	100.48	100.48 %(I/Q)	
	Avg.	Max.	Min.	Limit																																															
EVM	2.68	2.68	2.68 %(rms)	≤ 17.5 %(rms)																																															
Peak Vector Error	30.60	30.60	30.60 %																																																
Carrier Leakage	-71.98	-71.98	-71.98 dBc																																																
IQ Imbalance	100.50	100.50	100.50 %(I/Q)																																																
	Avg.	Max.	Min.	Limit																																															
EVM	1.96	1.96	1.96 %(rms)	≤ 12.5 %(rms)																																															
Peak Vector Error	34.02	34.02	34.02 %																																																
Carrier Leakage	-63.45	-63.45	-63.45 dBc																																																
IQ Imbalance	100.48	100.48	100.48 %(I/Q)																																																
QPSK CH 55990 (3625 MHz)	16QAM CH 55990 (3625 MHz)																																																		

FundamentalConstellation 0 Symbol I -1.0793 Q -0.4781 Meas. Count : 1/ 1  <table><thead><tr><th></th><th>Avg.</th><th>Max.</th><th>Min.</th><th>Limit</th></tr></thead><tbody><tr><td>EVM</td><td>1.18</td><td>1.18</td><td>1.18 %(rms)</td><td>≤ 8.0 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>16.24</td><td>16.24</td><td>16.24 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-63.23</td><td>-63.23</td><td>-63.23 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>100.45</td><td>100.45</td><td>100.45 %(I/Q)</td><td></td></tr></tbody></table>		Avg.	Max.	Min.	Limit	EVM	1.18	1.18	1.18 %(rms)	≤ 8.0 %(rms)	Peak Vector Error	16.24	16.24	16.24 %		Carrier Leakage	-63.23	-63.23	-63.23 dBc		IQ Imbalance	100.45	100.45	100.45 %(I/Q)		FundamentalConstellation 0 Symbol I 0.5490 Q -0.3842 Meas. Count : 1/ 1  <table><thead><tr><th></th><th>Avg.</th><th>Max.</th><th>Min.</th><th>Limit</th></tr></thead><tbody><tr><td>EVM</td><td>1.01</td><td>1.01</td><td>1.01 %(rms)</td><td></td></tr><tr><td>Peak Vector Error</td><td>9.59</td><td>9.59</td><td>9.59 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-61.05</td><td>-61.05</td><td>-61.05 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>100.52</td><td>100.52</td><td>100.52 %(I/Q)</td><td></td></tr></tbody></table>		Avg.	Max.	Min.	Limit	EVM	1.01	1.01	1.01 %(rms)		Peak Vector Error	9.59	9.59	9.59 %		Carrier Leakage	-61.05	-61.05	-61.05 dBc		IQ Imbalance	100.52	100.52	100.52 %(I/Q)	
	Avg.	Max.	Min.	Limit																																															
EVM	1.18	1.18	1.18 %(rms)	≤ 8.0 %(rms)																																															
Peak Vector Error	16.24	16.24	16.24 %																																																
Carrier Leakage	-63.23	-63.23	-63.23 dBc																																																
IQ Imbalance	100.45	100.45	100.45 %(I/Q)																																																
	Avg.	Max.	Min.	Limit																																															
EVM	1.01	1.01	1.01 %(rms)																																																
Peak Vector Error	9.59	9.59	9.59 %																																																
Carrier Leakage	-61.05	-61.05	-61.05 dBc																																																
IQ Imbalance	100.52	100.52	100.52 %(I/Q)																																																
64QAM CH 55990 (3625 MHz)	256QAM CH 55990 (3625 MHz)																																																		

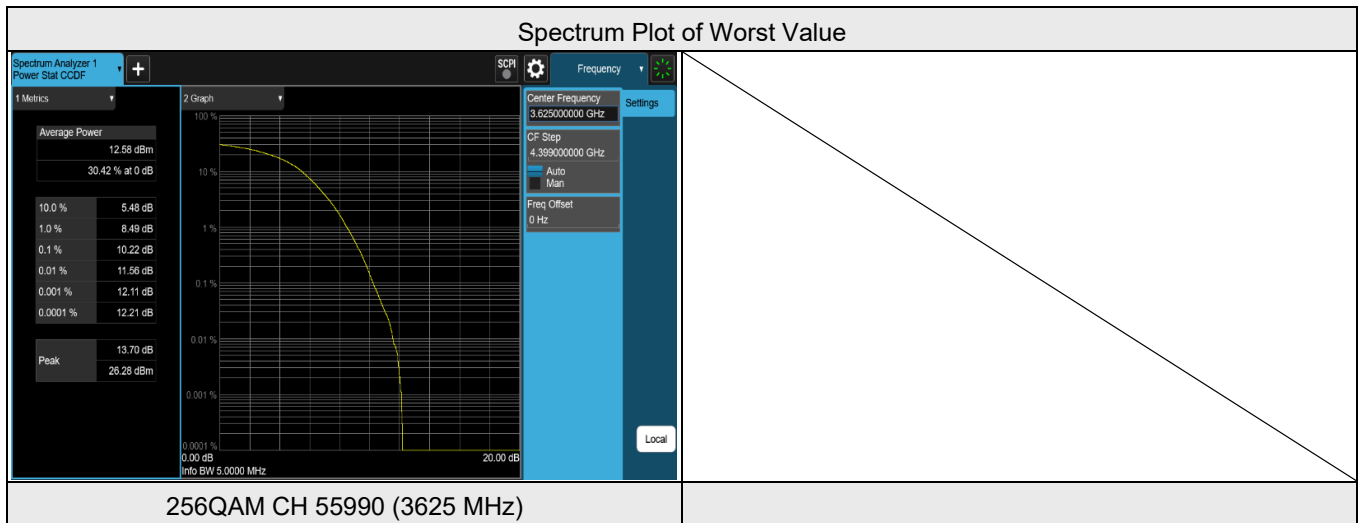
7.3 Peak to Average Ratio

Environmental Conditions:	25°C, 67% RH	Tested By:	Noah Chang
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7.3.1 LTE Band 48

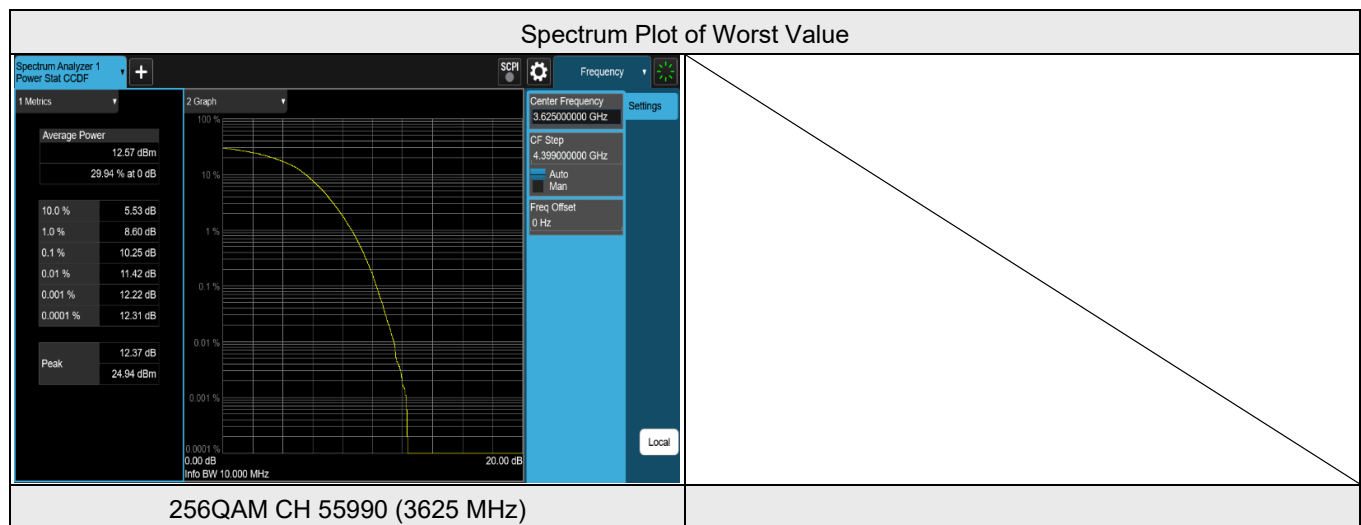
LTE Band 48, Channel Bandwidth: 5 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
QPSK	55265	3552.5	7.61	13	PASS
QPSK	55990	3625	7.77	13	PASS
QPSK	56715	3697.5	7.76	13	PASS
16QAM	55265	3552.5	8.45	13	PASS
16QAM	55990	3625	8.82	13	PASS
16QAM	56715	3697.5	8.63	13	PASS
64QAM	55265	3552.5	9.12	13	PASS
64QAM	55990	3625	9.15	13	PASS
64QAM	56715	3697.5	9.21	13	PASS
256QAM	55265	3552.5	9.99	13	PASS
256QAM	55990	3625	10.22	13	PASS
256QAM	56715	3697.5	10.09	13	PASS



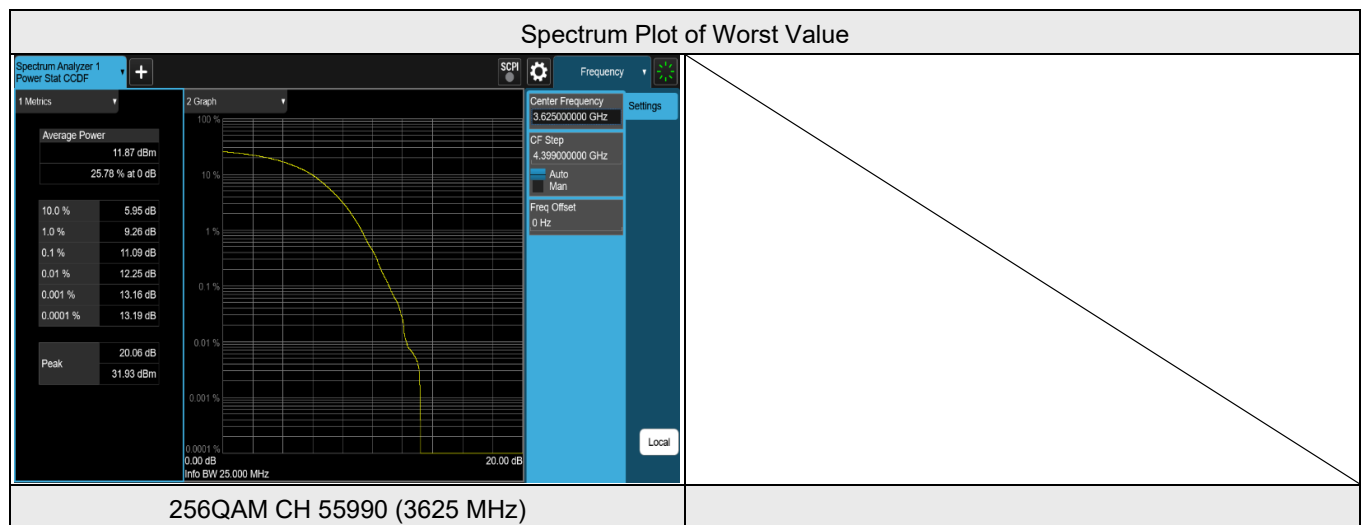
LTE Band 48, Channel Bandwidth: 10 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
QPSK	55290	3555	7.57	13	PASS
QPSK	55990	3625	7.74	13	PASS
QPSK	56690	3695	8.09	13	PASS
16QAM	55290	3555	8.78	13	PASS
16QAM	55990	3625	8.37	13	PASS
16QAM	56690	3695	9.17	13	PASS
64QAM	55290	3555	8.87	13	PASS
64QAM	55990	3625	9.30	13	PASS
64QAM	56690	3695	9.08	13	PASS
256QAM	55290	3555	10.15	13	PASS
256QAM	55990	3625	10.25	13	PASS
256QAM	56690	3695	10.12	13	PASS



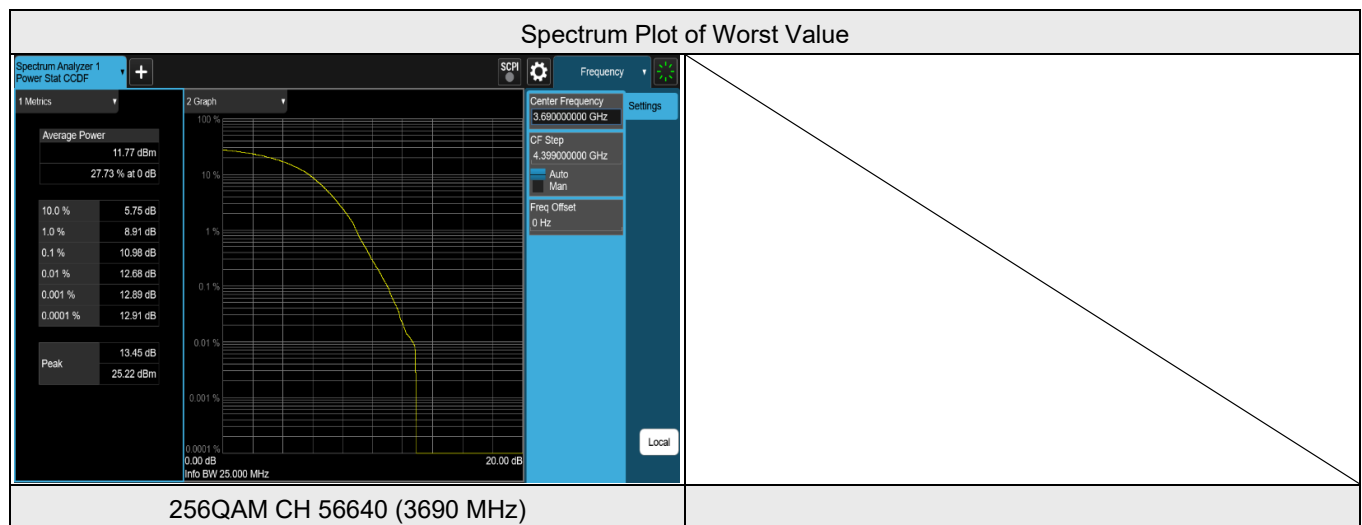
LTE Band 48, Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
QPSK	55315	3557.5	8.02	13	PASS
QPSK	55990	3625	7.27	13	PASS
QPSK	56665	3692.5	7.97	13	PASS
16QAM	55315	3557.5	10.17	13	PASS
16QAM	55990	3625	8.05	13	PASS
16QAM	56665	3692.5	7.74	13	PASS
64QAM	55315	3557.5	8.47	13	PASS
64QAM	55990	3625	9.23	13	PASS
64QAM	56665	3692.5	8.67	13	PASS
256QAM	55315	3557.5	10.10	13	PASS
256QAM	55990	3625	11.09	13	PASS
256QAM	56665	3692.5	10.78	13	PASS



LTE Band 48, Channel Bandwidth: 20 MHz

Modulation	Channel	Frequency (MHz)	Measurement Value(dB)	Limit (dB)	Result
QPSK	55340	3560	6.25	13	PASS
QPSK	55990	3625	7.29	13	PASS
QPSK	56640	3690	7.07	13	PASS
16QAM	55340	3560	9.45	13	PASS
16QAM	55990	3625	8.46	13	PASS
16QAM	56640	3690	8.90	13	PASS
64QAM	55340	3560	8.32	13	PASS
64QAM	55990	3625	9.37	13	PASS
64QAM	56640	3690	9.47	13	PASS
256QAM	55340	3560	10.27	13	PASS
256QAM	55990	3625	10.41	13	PASS
256QAM	56640	3690	10.98	13	PASS



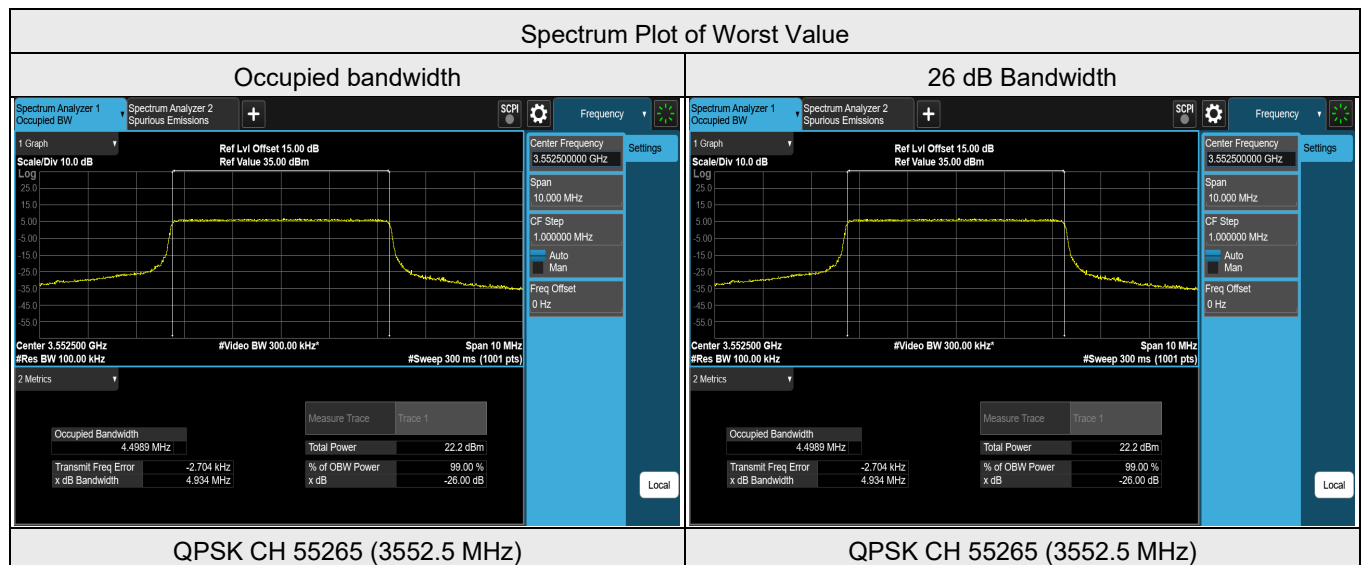
7.4 Bandwidth

Environmental Conditions:	25°C, 67% RH	Tested By:	Noah Chang
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7.4.1 LTE Band 48

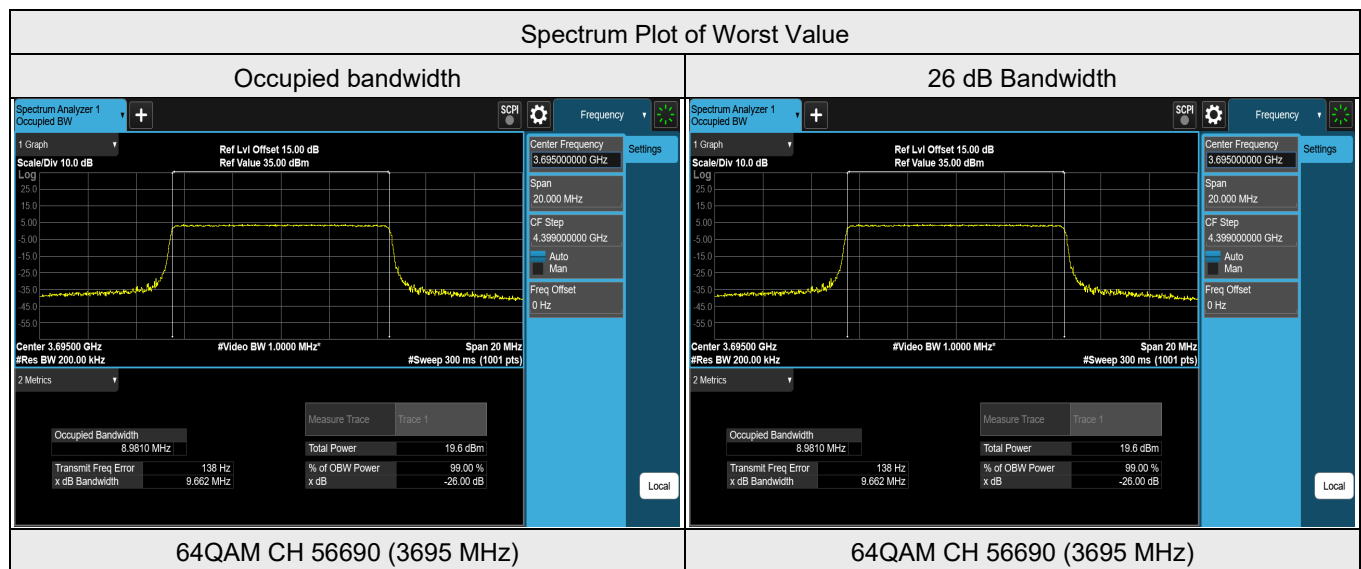
LTE Band 48, Channel Bandwidth: 5 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	55265	3552.5	4.4989	4.934
QPSK	55990	3625	4.4889	4.859
QPSK	56715	3697.5	4.4938	4.889
16QAM	55265	3552.5	4.4898	4.874
16QAM	55990	3625	4.4963	4.857
16QAM	56715	3697.5	4.4928	4.852
64QAM	55265	3552.5	4.4977	4.919
64QAM	55990	3625	4.4895	4.860
64QAM	56715	3697.5	4.4931	4.883
256QAM	55265	3552.5	4.4905	4.861
256QAM	55990	3625	4.4875	4.859
256QAM	56715	3697.5	4.4954	4.852



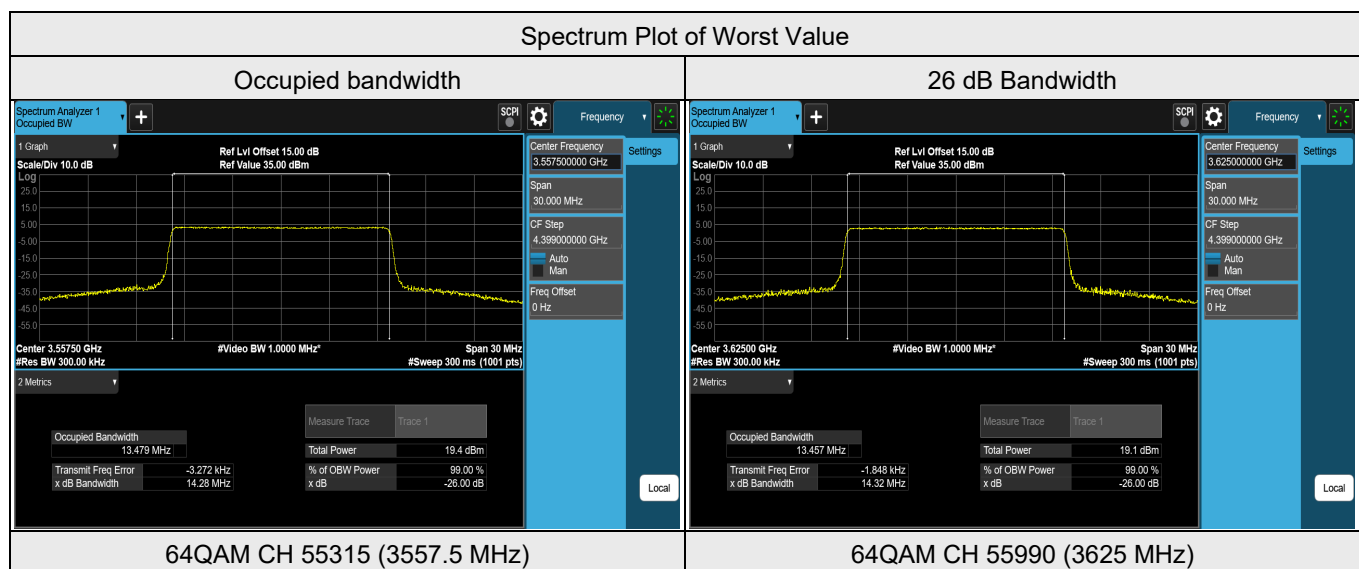
LTE Band 48, Channel Bandwidth: 10 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	55290	3555	8.9721	9.550
QPSK	55990	3625	8.9726	9.532
QPSK	56690	3695	8.9798	9.575
16QAM	55290	3555	8.9752	9.547
16QAM	55990	3625	8.9727	9.512
16QAM	56690	3695	8.9679	9.525
64QAM	55290	3555	8.9679	9.536
64QAM	55990	3625	8.9767	9.511
64QAM	56690	3695	8.9810	9.662
256QAM	55290	3555	8.9780	9.607
256QAM	55990	3625	8.9615	9.514
256QAM	56690	3695	8.9780	9.564



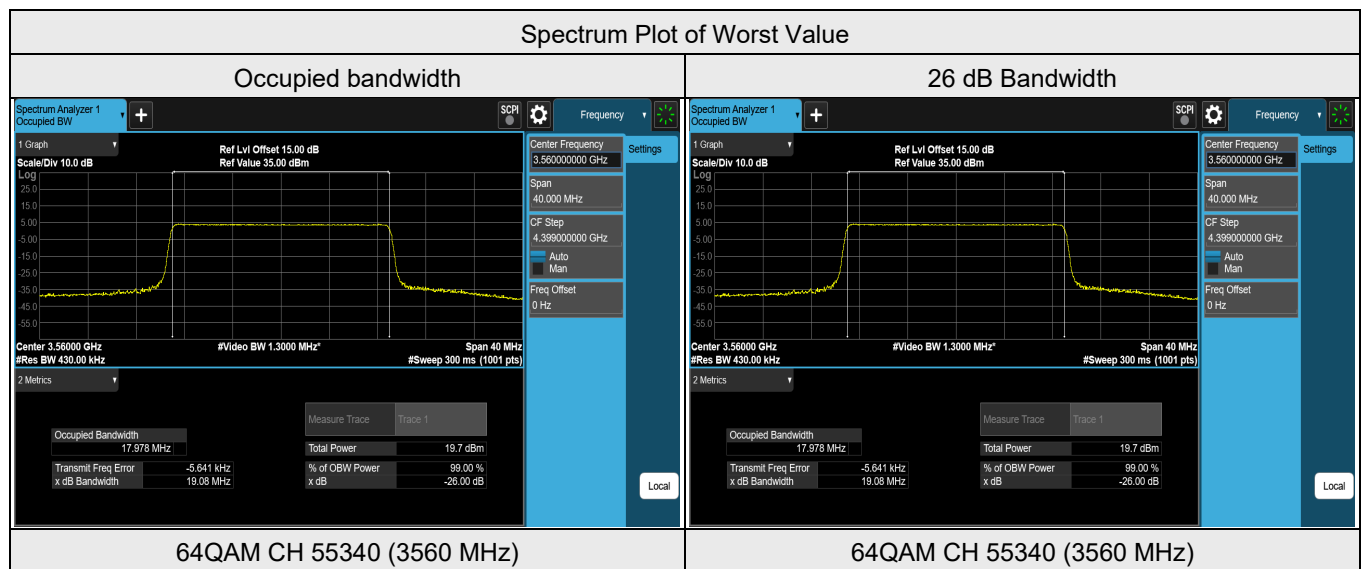
LTE Band 48, Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	55315	3557.5	13.4723	14.266
QPSK	55990	3625	13.4670	14.244
QPSK	56665	3692.5	13.4574	14.267
16QAM	55315	3557.5	13.4676	14.240
16QAM	55990	3625	13.4579	14.249
16QAM	56665	3692.5	13.4556	14.271
64QAM	55315	3557.5	13.4789	14.278
64QAM	55990	3625	13.4575	14.317
64QAM	56665	3692.5	13.4666	14.270
256QAM	55315	3557.5	13.4586	14.270
256QAM	55990	3625	13.4664	14.268
256QAM	56665	3692.5	13.4730	14.288



LTE Band 48, Channel Bandwidth: 20 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	55340	3560	17.9605	19.064
QPSK	55990	3625	17.9625	19.066
QPSK	56640	3690	17.9639	19.035
16QAM	55340	3560	17.9702	19.053
16QAM	55990	3625	17.9617	19.046
16QAM	56640	3690	17.9625	19.058
64QAM	55340	3560	17.9783	19.077
64QAM	55990	3625	17.9722	19.042
64QAM	56640	3690	17.9525	19.045
256QAM	55340	3560	17.9704	19.056
256QAM	55990	3625	17.9679	19.016
256QAM	56640	3690	17.9526	19.037

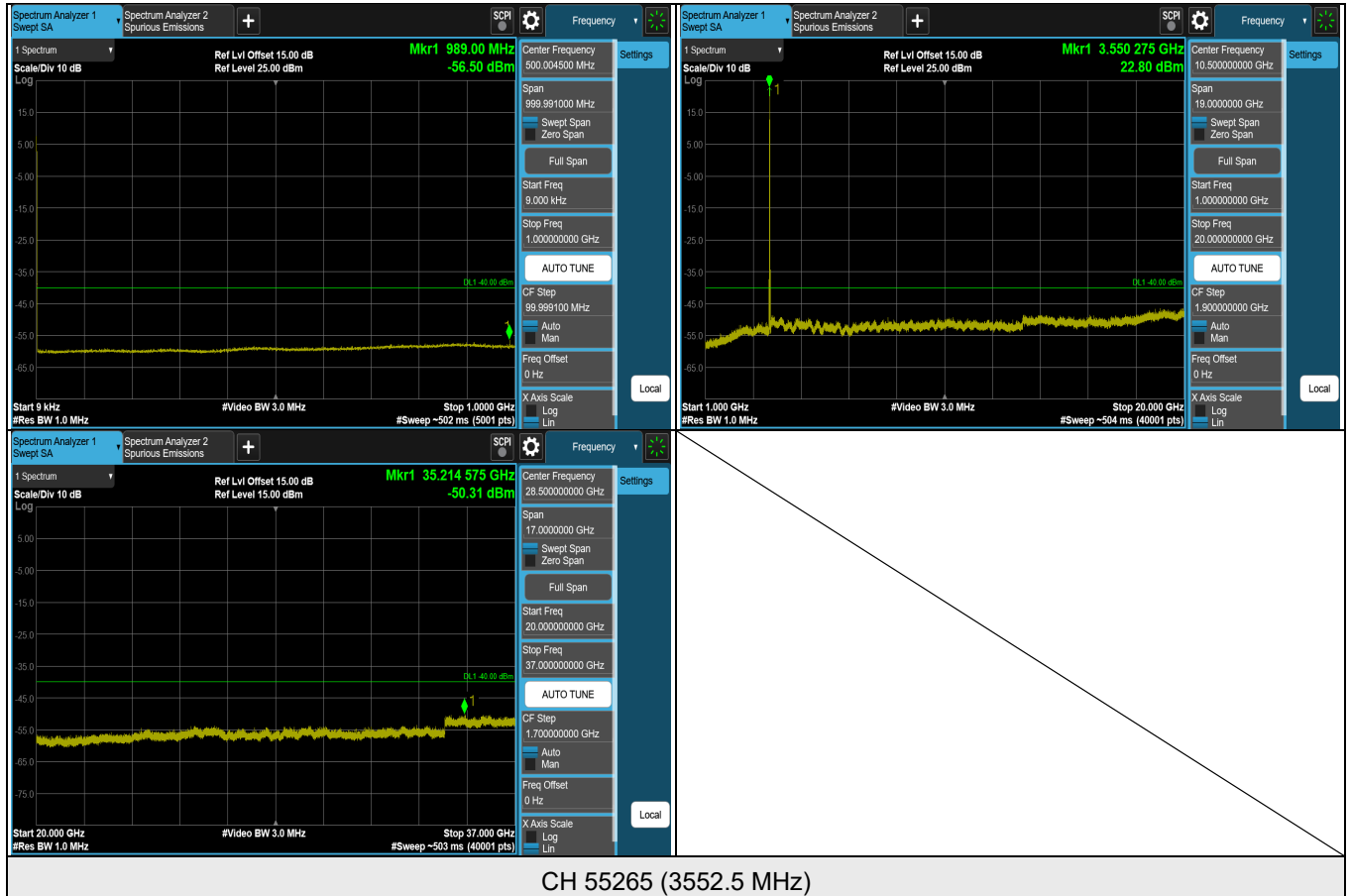


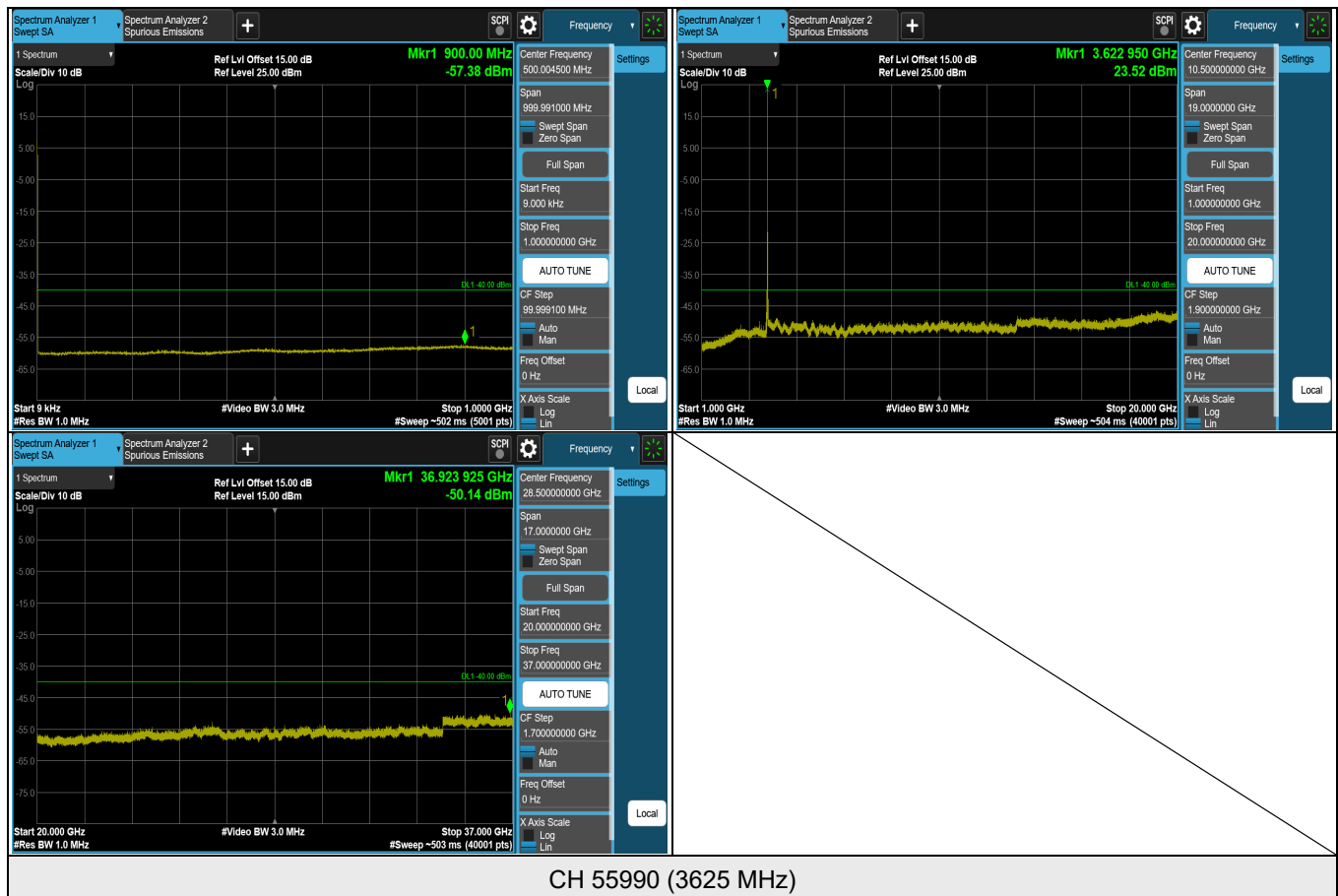
7.5 Conducted Spurious Emissions

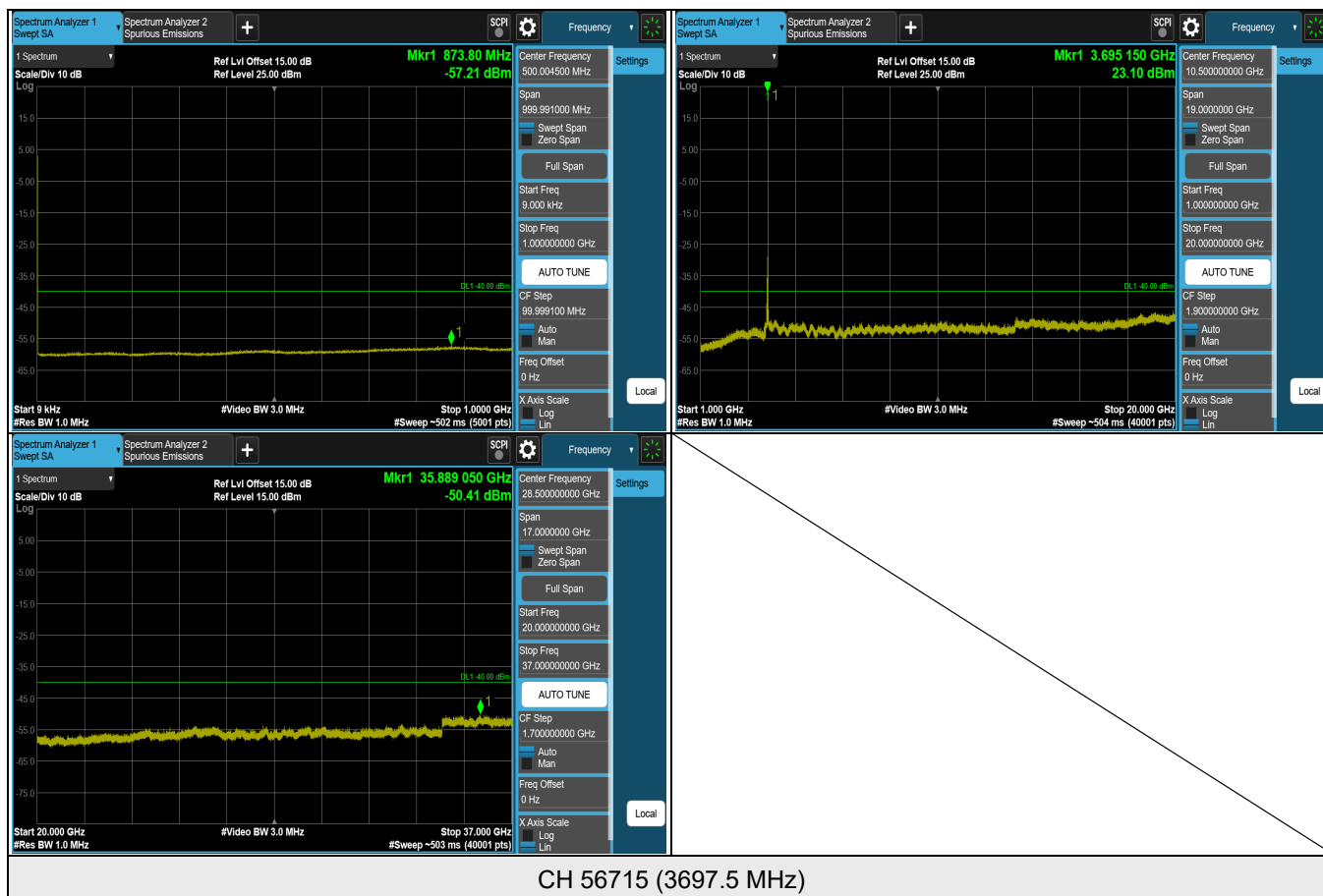
Environmental Conditions:	25°C, 67% RH	Tested By:	Noah Chang
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7.5.1 LTE Band 48

LTE Band 48, Channel Bandwidth: 5 MHz

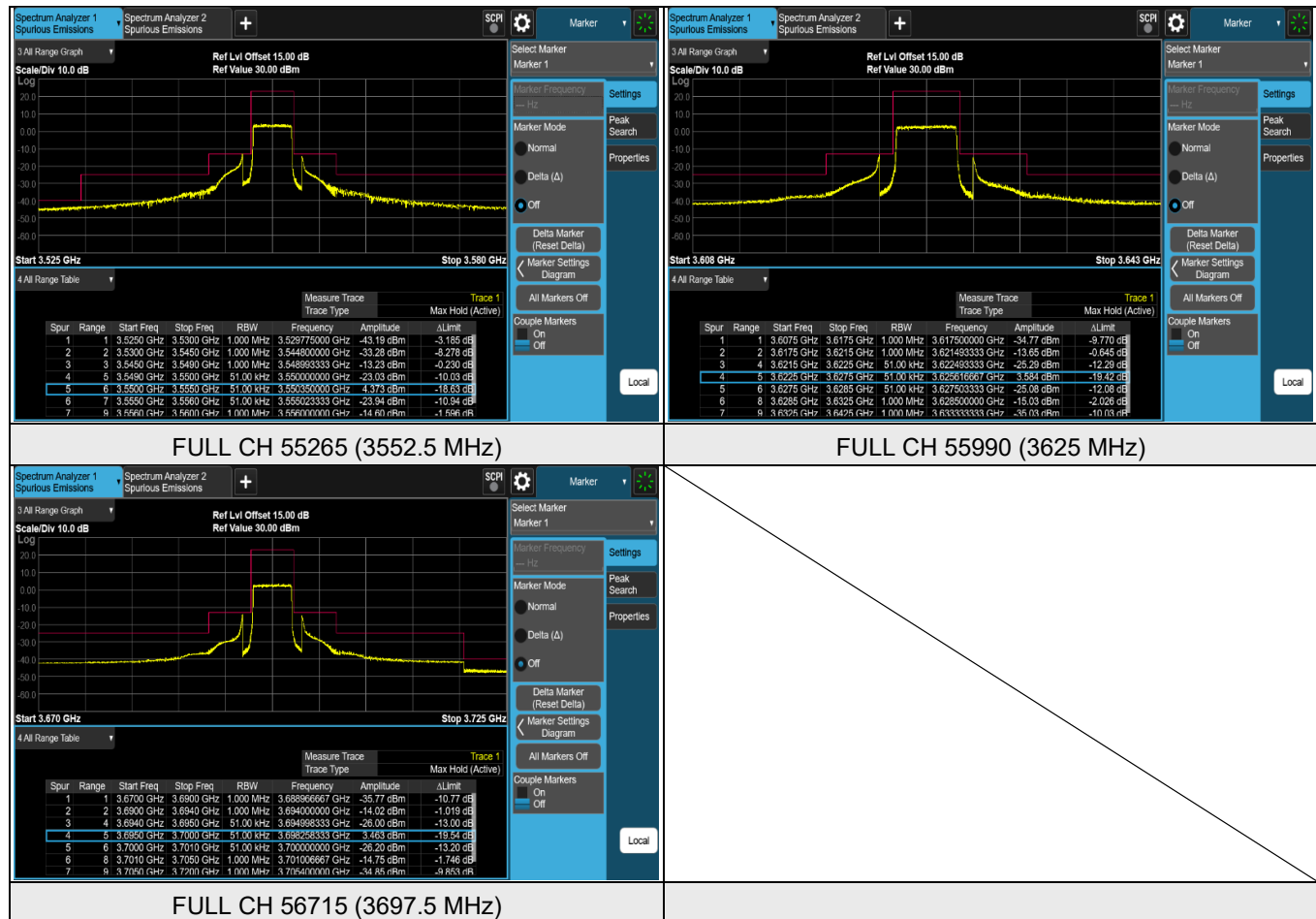


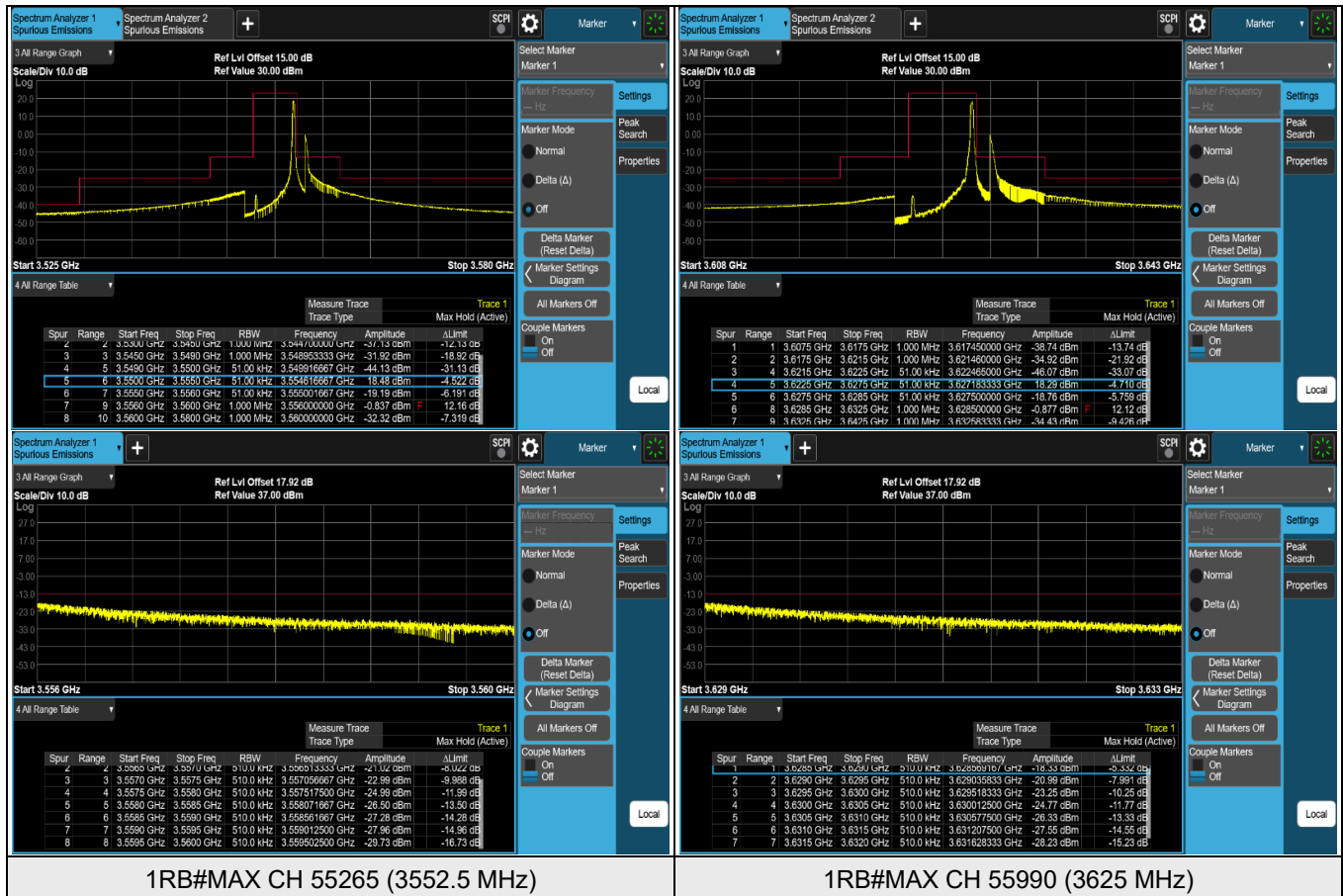




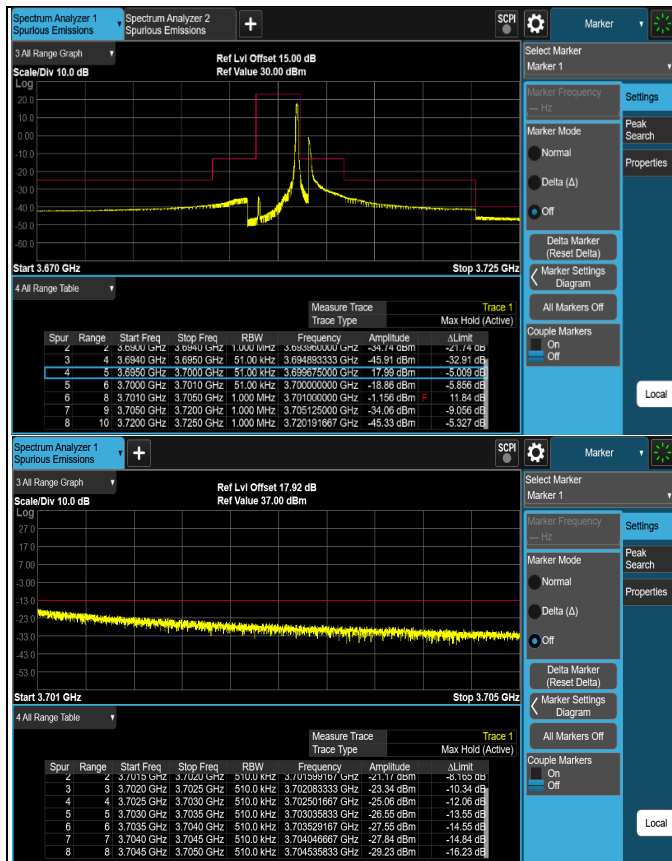
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

LTE Band 48, Channel Bandwidth: 5 MHz





[RBW = 510 kHz / Reference RBW = 1 MHz]
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=510kHz] + 10log(1000/510)
To compensate for this integration before comparison to the limit, 2.92 dB was added to Ref Lvl Offset.
i.e. 15.00 dB CF + 2.92 dB integration compensation factor = 17.92 dB Ref Lvl Offset



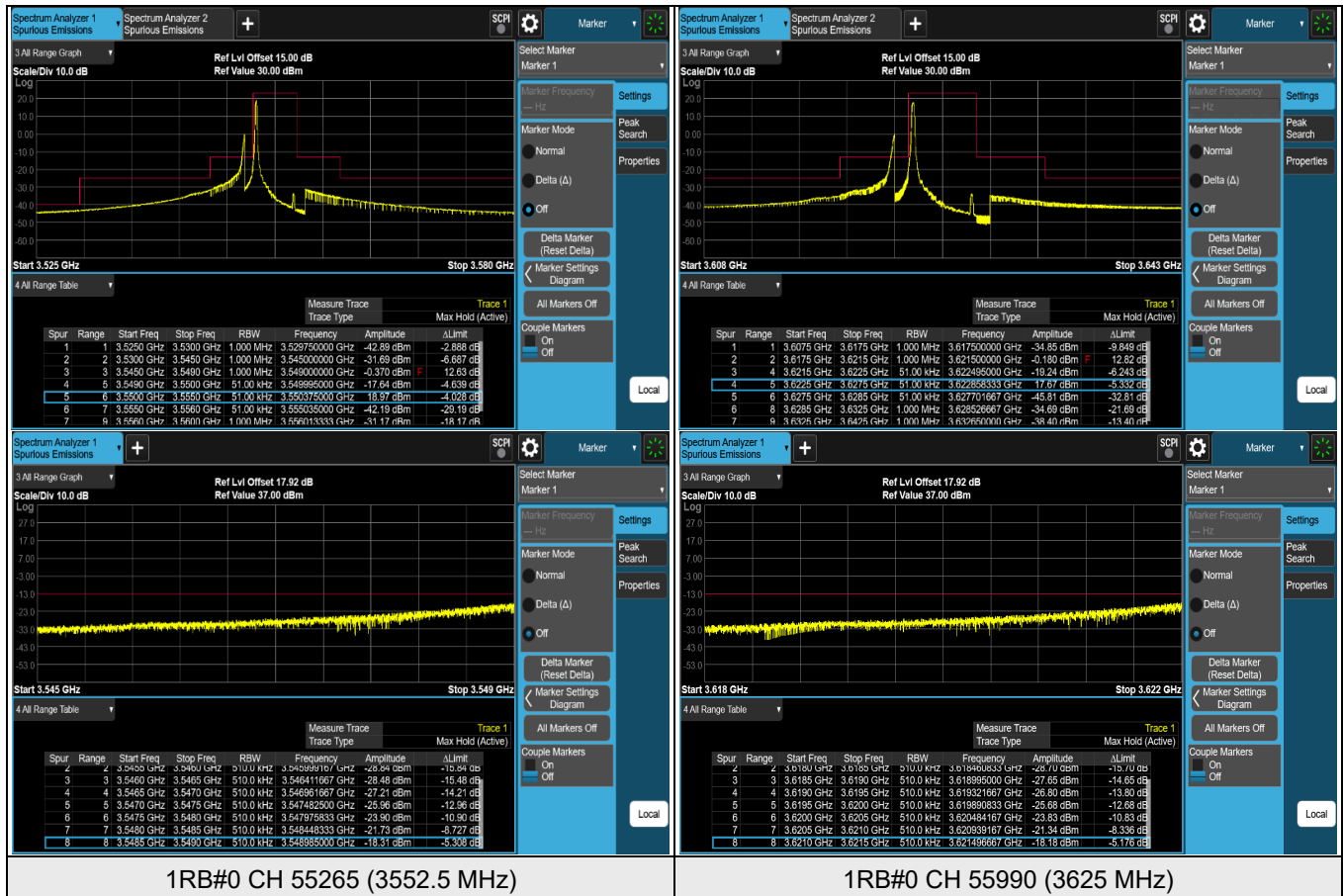
1RB#MAX CH 56715 (3697.5 MHz)

[RBW = 510 kHz / Reference RBW = 1 MHz]

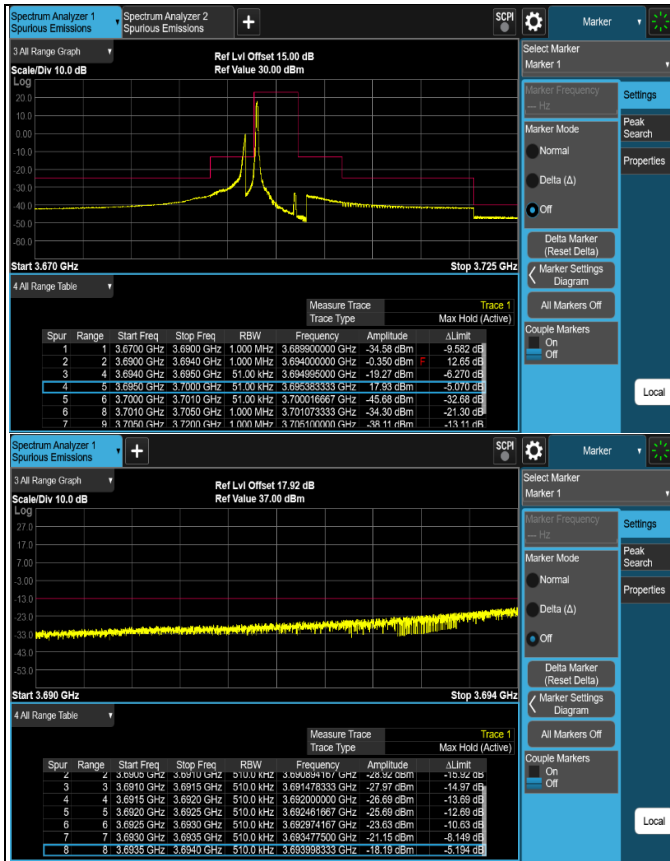
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=510kHz] + 10log(1000/510)

To compensate for this integration before comparison to the limit, 2.92 dB was added to Ref Lvl Offset.

i.e. 15.00 dB CF + 2.92 dB integration compensation factor = 17.92 dB Ref Lvl Offset



[RBW = 510 kHz / Reference RBW = 1 MHz]
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=510kHz] + 10log(1000/510)
To compensate for this integration before comparison to the limit, 2.92 dB was added to Ref Lvl Offset.
i.e. 15.00 dB CF + 2.92 dB integration compensation factor = 17.92 dB Ref Lvl Offset



1RB#0 CH 56715 (3697.5 MHz)

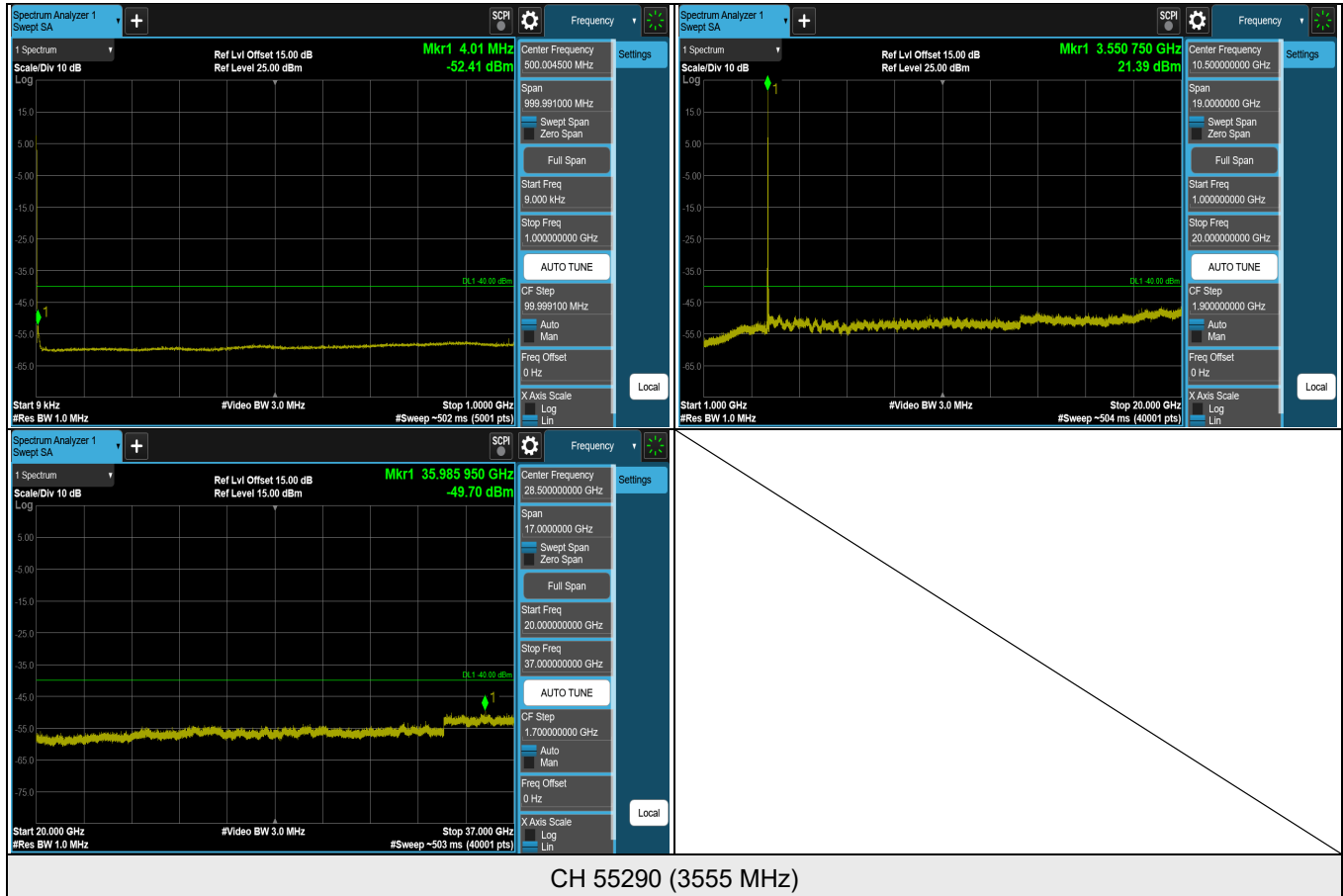
[RBW = 510 kHz / Reference RBW = 1 MHz]

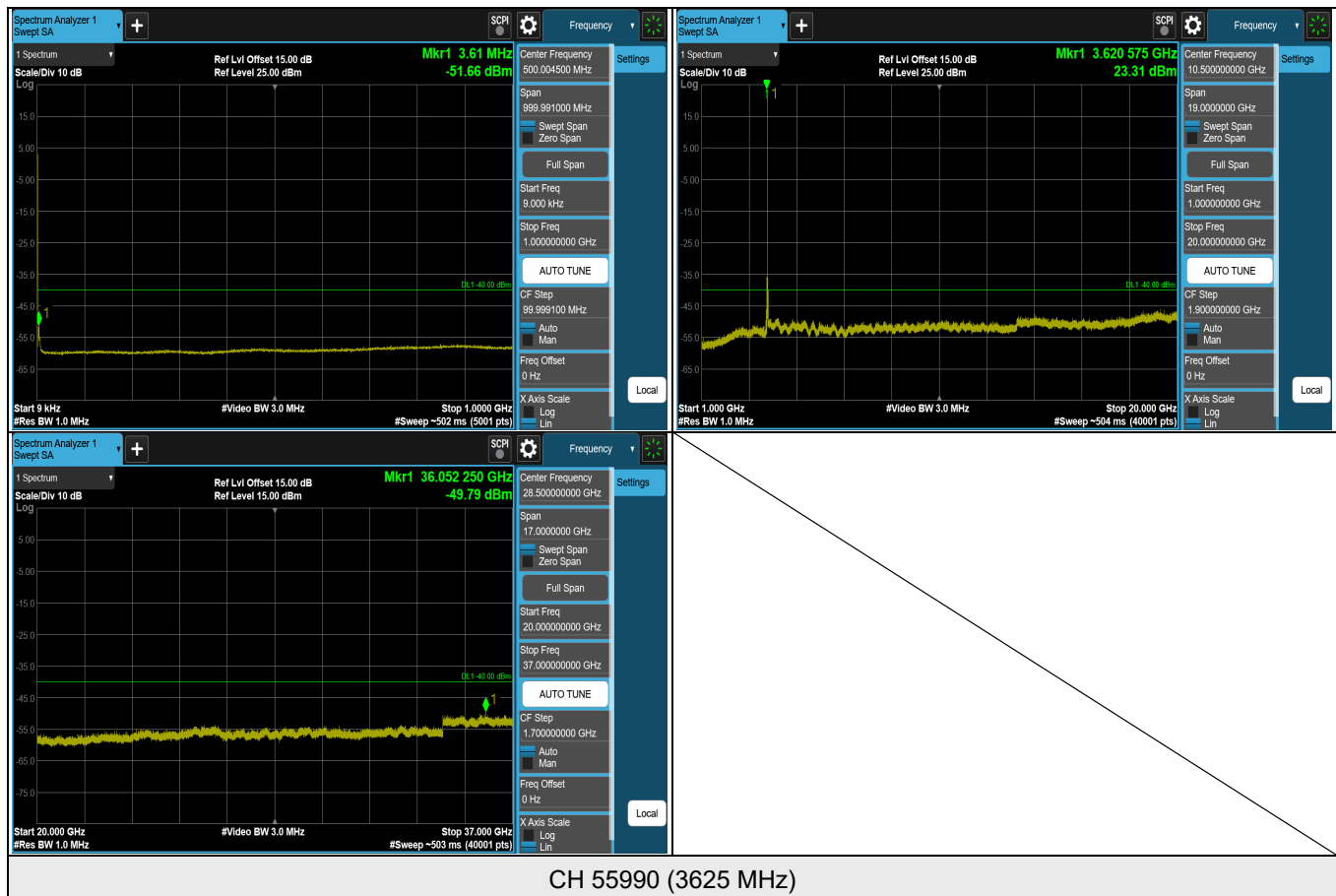
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=510kHz] + 10log(1000/510)

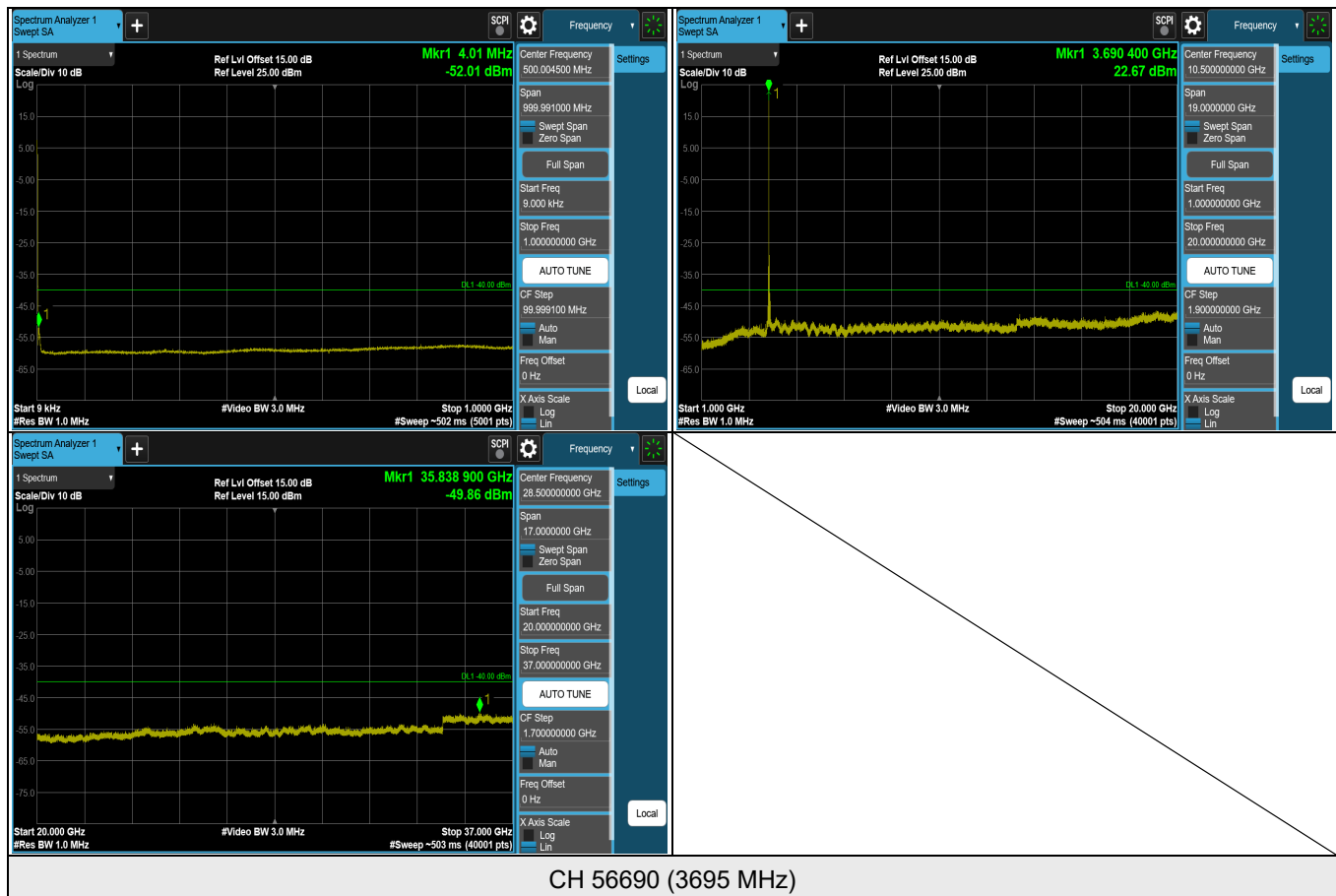
To compensate for this integration before comparison to the limit, 2.92 dB was added to Ref Lvl Offset.

i.e. 15.00 dB CF + 2.92 dB integration compensation factor = 17.92 dB Ref Lvl Offset

LTE Band 48, Channel Bandwidth: 10 MHz

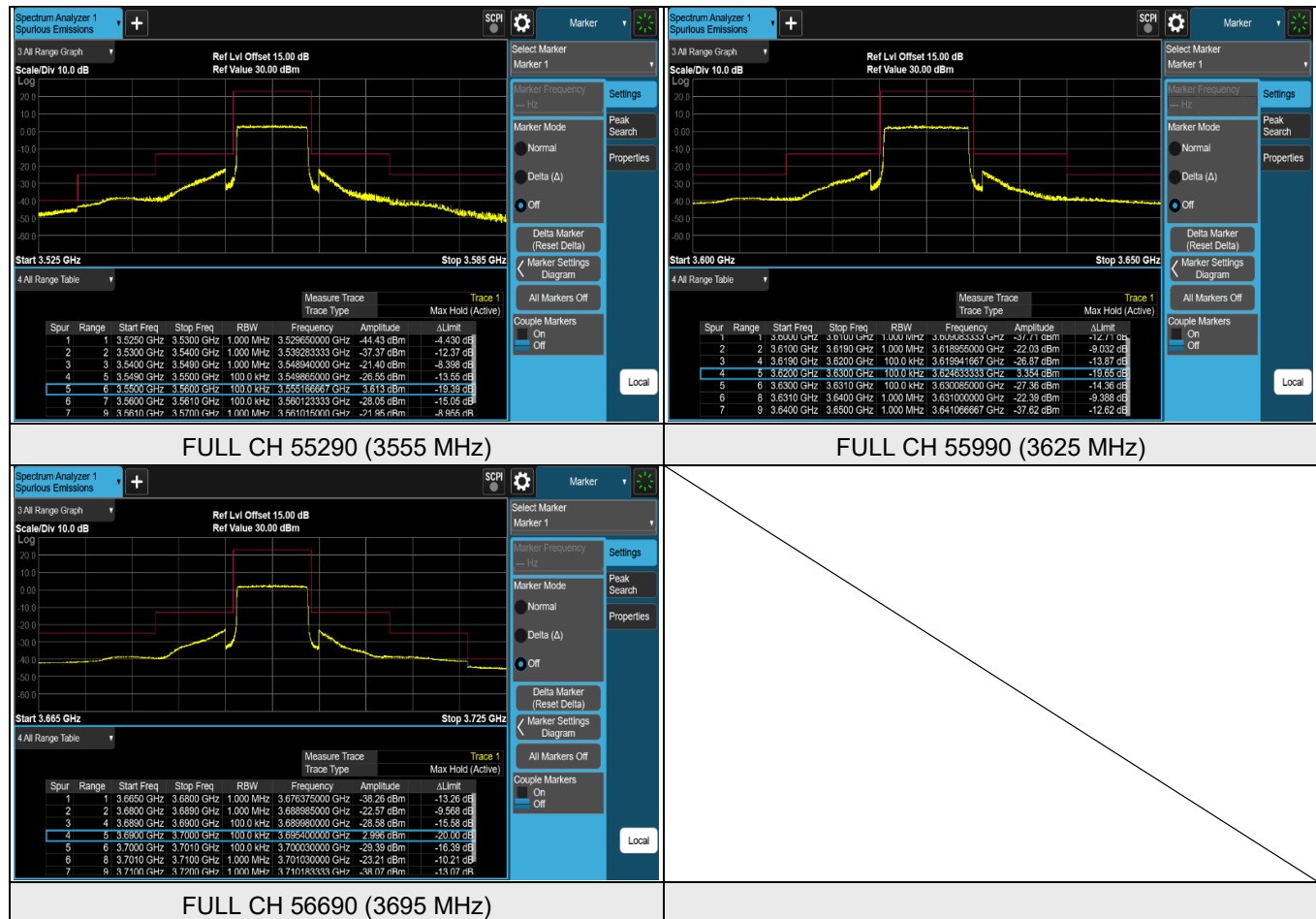


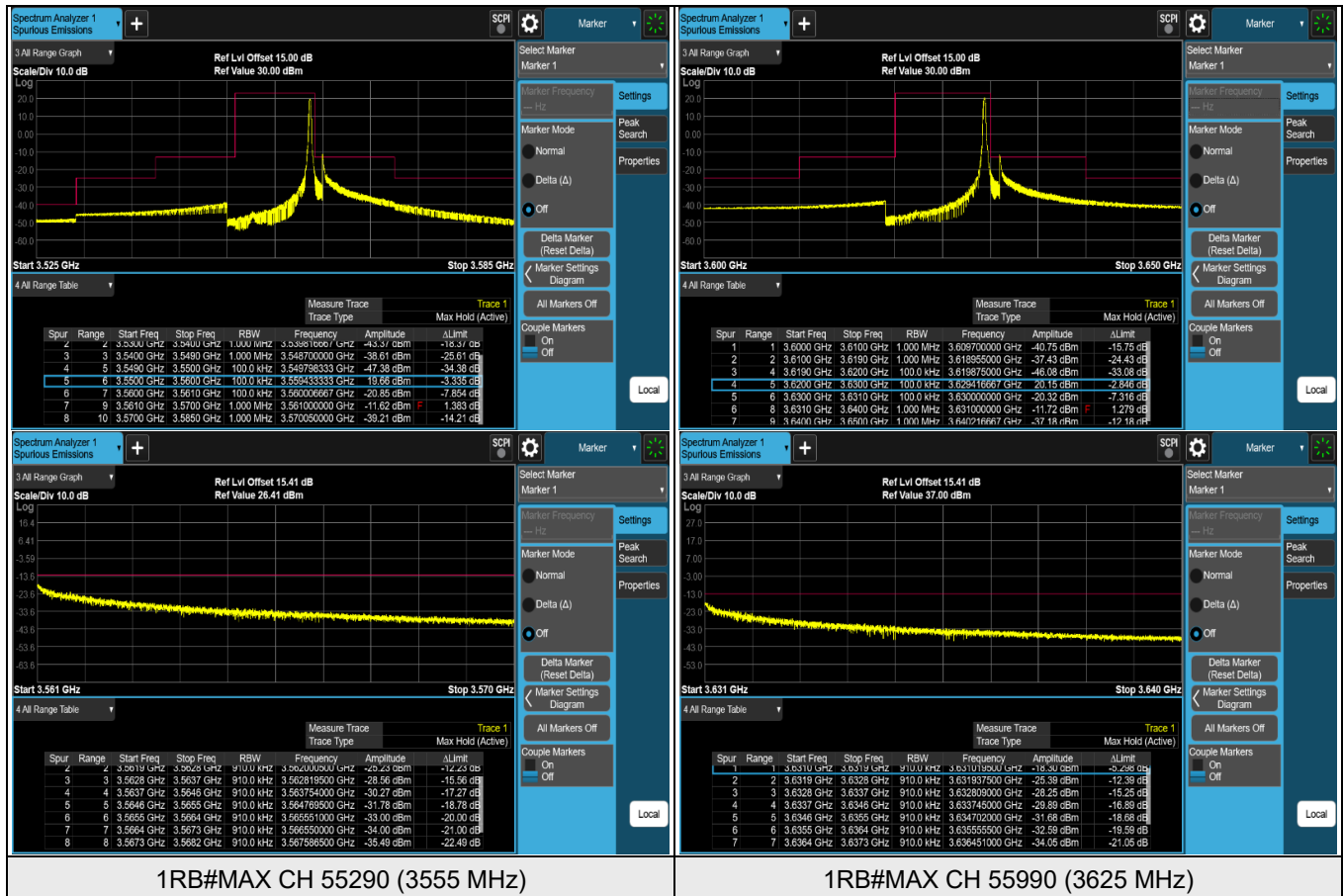




Note: The signal at 9 kHz is IF signal from spectrum analyzer.

LTE Band 48, Channel Bandwidth: 10 MHz





1RB#MAX CH 55290 (3555 MHz)

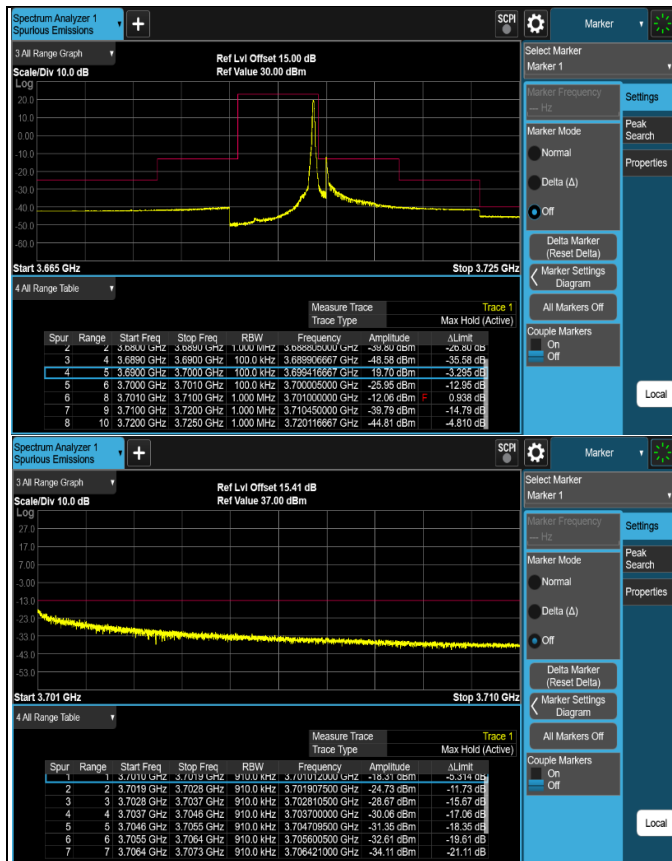
1RB#MAX CH 55990 (3625 MHz)

[RBW = 910 kHz / Reference RBW = 1 MHz]

Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=910kHz] + 10log(1000/910)

To compensate for this integration before comparison to the limit, 0.41 dB was added to Ref Lvl Offset.

i.e. 15.00 dB CF + 0.41 dB integration compensation factor = 15.41 dB Ref Lvl Offset



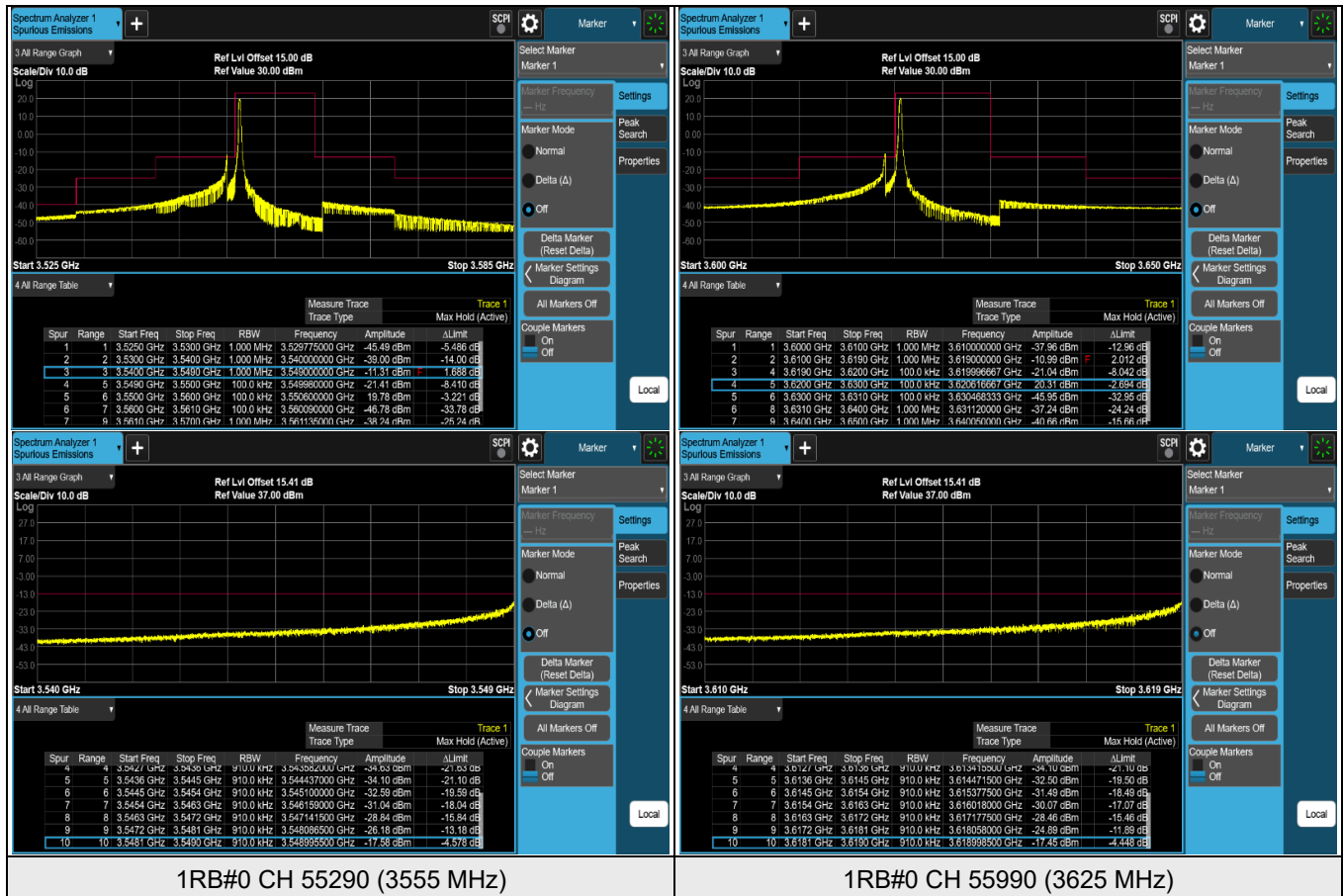
1RB#MAX CH 56690 (3695 MHz)

[RBW = 910 kHz / Reference RBW = 1 MHz]

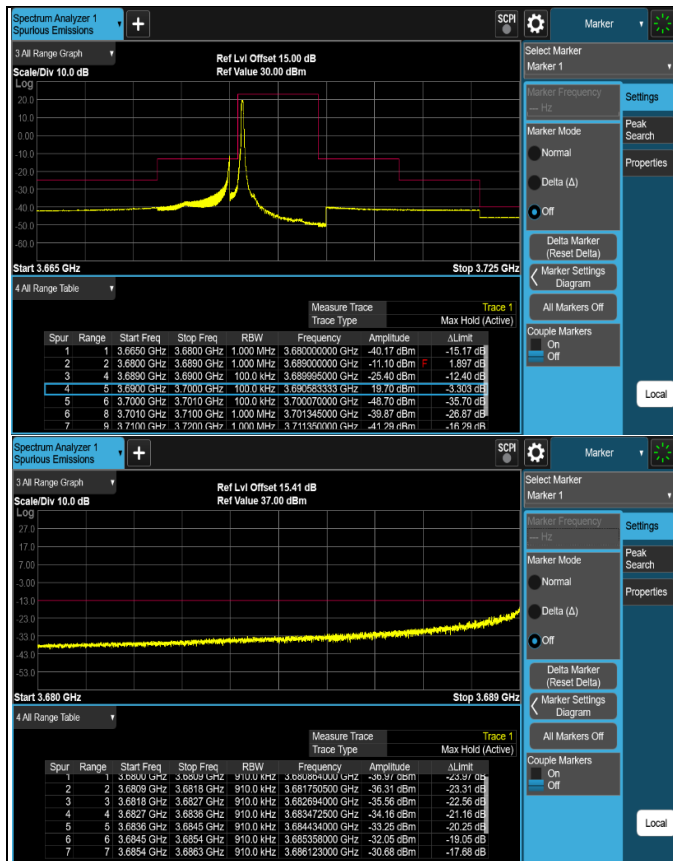
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=910kHz] + 10log(1000/910)

To compensate for this integration before comparison to the limit, 0.41 dB was added to Ref Lvl Offset.

i.e. 15.00 dB CF + 0.41 dB integration compensation factor = 15.41 dB Ref Lvl Offset



[RBW = 910 kHz / Reference RBW = 1 MHz]
Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=910kHz] + 10log(1000/910)
To compensate for this integration before comparison to the limit, 0.41 dB was added to Ref Lvl Offset.
i.e. 15.00 dB CF + 0.41 dB integration compensation factor = 15.41 dB Ref Lvl Offset



1RB#0 CH 56690 (3695 MHz)

[RBW = 910 kHz / Reference RBW = 1 MHz]

Worst-case integrated BW power = [Max Measured Value (dBm) with RBW=910kHz] + 10log(1000/910)

To compensate for this integration before comparison to the limit, 0.41 dB was added to Ref Lvl Offset.

i.e. 15.00 dB CF + 0.41 dB integration compensation factor = 15.41 dB Ref Lvl Offset

LTE Band 48, Channel Bandwidth: 15 MHz

