 <p>CERTIFICATE 2518.08</p> <p>MS ISO/IEC 17025 TESTING SAMM NO. 0825</p>
<p><b>MOTOROLA PENANG ADV. COMM. LABORATORY</b> Motorola Solutions Malaysia Sdn Bhd, Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.</p>	<p><b>FCC / ISED TEST REPORT</b> <b>Report Revision : Rev.C</b></p>
<p><b>Date/s Tested</b> : 31-March-2022 - 25-June-2022 <b>Manufacturer/Location</b> : Motorola Solutions Malaysia Sdn Bhd <b>Manufacturer Address</b> : Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia <b>Requestor</b> : SIEW KHENG TAN <b>Product Type</b> : Hand-held <b>Product Version (PMN)</b> : MSLB-MKZ920 <b>Model Number (HVIN)</b> : AAH90UCU9RH1AN <b>Frequency Band</b> : Refer to section 1.4 <b>Applicant Name</b> : Motorola Solutions Inc <b>Applicant Address</b> : 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322. <b>FCC Registrations</b> : 461337 <b>ISED Registrations</b> : MY0001 <b>Firmware Version (FVIN)</b> : D02.22.01.0103 (BP), D00.01.86 (AP)</p> <p><b>The equipment was tested accordance to the requirement listed below:</b></p> <p><b>(LTE Band 30)</b> <b>FCC 47 CFR Part 2 / 27</b> <b>PASS</b> <b>ISED RSS GEN / 195</b></p>	
<p>This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.</p>	
<p>Prepared By:</p> <p>_____</p> <p><b>Lim Khay Kwang</b> <b>Technician</b></p>	<p>Approve Signatory:</p> <p>_____</p> <p><b>Ho Sze Khian</b> <b>Technical Manager</b></p>

## Table of Contents

1.0.	Summary of Test Results .....	3
1.1.	Measurement Uncertainty .....	3
1.2.	Equipment List.....	3
1.3.	General Information.....	4
1.4.	Channel number and frequency info.....	6
1.5.	Test Mode Applicability and Tested Channel Detail.....	7
1.6.	Conducted RF Output Power .....	9
1.6.1.	Test Setup.....	9
1.6.2.	Limits .....	9
1.6.3.	Conducted RF Output Power – LTE Band 30 (2305-2315MHz) .....	9
1.6.4.	Equivalent Isotropically Radiated Power (EIRP) - LTE Band 30 (2305-2315MHz).....	10
	Peak-to-Average Power Ratio .....	12
1.6.4.	Test Setup.....	12
1.6.5.	Test Limit .....	12
1.6.6.	Peak-to-Average Power Ratio – LTE Band 30 (2305-2315MHz).....	12
1.7.	Occupied Bandwidth.....	14
1.7.1.	Test Setup.....	14
1.7.2.	Test Limit .....	14
1.7.3.	Occupied Bandwidth – LTE Band 30 (2305-2315MHz).....	15
1.8.	Frequency Stability .....	19
1.8.1.	Test Setup.....	19
1.8.2.	Test Limit .....	19
1.8.3.	Frequency Stability – LTE Band 30 (2305-2315MHz) .....	20
1.9.	Band Edge Conducted Spurious Emission .....	22
1.9.1.	Test Setup.....	22
1.9.2.	Test Limit .....	22
1.9.3.	Band Edge Conducted Spurious Emission – LTE Band 30 (2305-2315MHz).....	23
1.10.	Conducted Spurious Emission .....	39
1.10.1.	Test Setup .....	39
1.10.2.	Test Limit .....	39
1.10.3.	Conducted Spurious Emissions – LTE Band 30 (2305-2315MHz) .....	40
1.11.	Radiated Spurious Emission .....	44
1.11.1.	Test Setup .....	44
1.11.2.	Test Limit .....	44
1.11.3.	Radiated Spurious Emission – LTE Band 30 (2305-2315MHz).....	45
1.12.	Equivalent Isotropically Radiated Power (EIRP) .....	48
1.12.1.	Test Setup .....	48
1.12.2.	Test Limit .....	48
1.12.3.	Equivalent Isotropically Radiated Power (EIRP) - LTE Band 30 (2305-2315MHz).....	48

### REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	29-June-2022	Lim Khay Kwang

Rev B.	Corrected max eirp values for General Description of EUT	7-July-2022	Lim Khay Kwang
Rev C.	Revise General Information Test Model	26-Aug-20022	Lim Khay Kwang

### 1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks	Serial Number Tested
2.1046	RSS-Gen 6.12 RSS -195 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit	734TYF0012
27.50	RSS-195 5.5.1	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	734TYF0012
2.1049 27.53(a)(5)	RSS-Gen 6.7	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit	734TYF0012
2.1055 27.54	RSS-195 5.4	Frequency Stability	Pass	Meet the requirement of limit	734TYF0012
2.1051 27.53(a)(4)	RSS-Gen 6.13 RSS-195 5.6	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	734TYF0012
2.1051 27.53(a)(4)	RSS-Gen 6.13 RSS-195 5.6	Conducted Spurious Emissions	Pass	Meet the requirement of limit	734TYF0012
2.1053 27.53(a)(4)	RSS-195 5.6	Radiated Spurious Emission	Pass	Meet the requirement of limit	734TYF0069
2.1049 27.50(a)(3)	RSS-195 5.5	Equivalent Isotropically Radiated Power (EIRP)	Pass	Meet the requirement of limit	734TYF0012

### 1.1. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±dB)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

### 1.2. Equipment List

Description	Model	Serial Number	Calibration Date	Calibration Due Date
Broadband ATE 1 (RF Conducted Tests); Test Software Version: CMWRun v1.8.9				
Signal Analyzer	FSV40	101431	02-Dec-21	02-Dec-23
Chamber	SH-641	92003150	17-Sep-21	17-Sep-22
Wideband Radio Communication Tester	CMW500	154550	07-Mar-21	07-Mar-23

Power Supply	6652A	MY40001437	26-Aug-21	26-Aug-22
Radiated Spurious Emission (EMC Chamber 1); Test Software Version: EMC_FCC_RE_v1.6.2				
Drg Horn Freq.	SAS-571	720	06-Apr-21	06-Apr-23
Drg Horn Freq.	SAS-571	719	13-Sep-21	13-Sep-22
Power Supply	N7977A	MY54420118	17-Aug-21	17-Aug-22
Signal Generator	SMB 100A	182511	4-Jun-21	4-Jun-24
Emi Test Receiver	ESW44	101731	5-Nov-21	5-Nov-22
5m Semi-Anechoic Chamber	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
Bilog Antenna	CBL6112D	2950	30-Jul-21	30-Jul-22
Bilog Antenna	CBL6112D	30991	05-Oct-21	05-Oct-22
Data Logger Thermohyrometer	SDL500	A.016800	13-Jun-21	13-Jun-23
System Controller	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
Turntable Flush Mount 2m	FM2011	NA	No Cal. Req'd	No Cal. Req'd
Antenna Positioning Tower	TLT2	NA	No Cal. Req'd	No Cal. Req'd
Broad-Band Horn Antenna	BBHA9170	BBHA9170143	3-Aug-21	3-Aug-22
Preamplifier 18-40ghz	BBV9721	9721-007	No Cal. Req'd	No Cal. Req'd
Preamplifier	PAM-0118P	361	11-Sep-20	11-Sep-23
Loop Antenna	6502	00208416	8-Oct-21	8-Oct-22

### 1.3. General Information

#### General Description of EUT

<b>Product</b>	MACKENZIE 8/900 NAG MODEL			
<b>Brand</b>	Motorola Solutions			
<b>Test Model</b>	AAH90UCU9RH1AN			
<b>Power Supply Rating</b>	7.5VDC			
<b>Mode of operation</b>	LTE Band 30			
<b>Modulation Type</b>	QPSK, 16QAM			
<b>Operating Frequency</b>	LTE Band 30	Channel Bandwidth 5MHz	2307.5MHz~2312.5MHz	
		Channel Bandwidth 10MHz	2310.0MHz	
<b>Max. EIRP Power</b>	LTE Band 30 QPSK	Channel Bandwidth 5MHz	<b>25.833dBm (0.383W)</b>	
		Channel Bandwidth 10MHz	25.751dBm (0.376W)	
	LTE Band 30 16QAM	Channel Bandwidth 5MHz	<b>25.095dBm (0.323W)</b>	
		Channel Bandwidth 10MHz	24.913dBm (0.310W)	
<b>Emission Designator</b>	LTE Band 30		<b>QPSK</b>	<b>16QAM</b>
		Channel Bandwidth 5MHz	4M48G7D	4M48D7W
		Channel Bandwidth 10MHz	8M91G7D	8M93D7W
<b>Antenna Type</b>	LTE Band 30	LTE MID-HIGH BAND MAIN ANTENNA (2.81dBi)		
<b>SW Version</b>	D02.22.01.0103 (BP), D00.01.86 (AP)			
<b>HW Version</b>	P2			

Note:

1. The EUT contains following accessory devices and data cable.

<b>Item</b>	<b>Brand</b>	<b>Model or P/N</b>	<b>Specification</b>
Li-Ion	MOTOROLA	PMNN4805A	BATTERY PACK,BATTERY PACK,IMPRES GEN2, LIION,IP68, 4400T

**Description of Support Units**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	Product	Brand	Model No.	Serial No.	FCC ID
1	Wideband Radio Communication Tester	R&S	CMW500	154550	NA

NO.	Signal Cable Description of The Above Support Units
1	NA

Note:

1. All power cords of the above support units are non-shielded.
2. Item 1 acted as a communication partner to transfer data.

**EUT Operating Conditions**

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

**General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

- FCC 47 CFR Part 2**
- FCC 47 CFR Part 27**
- KDB 971168 D01 Power Meas License Digital Systems v03r01**
- KDB 971168 D02 Misc OOBE License Digital Systems v02r01**
- ANSI C63.26**

**NOTE:** All test items have been performed and recorded as per the above standards.

**1.4. Channel number and frequency info.**

Band	Bandwidth supported	Available Channel Number	Test Channel Number			Test Channel Frequency (MHz)		
			Low Channel	Mid Channel	High Channel	Low Channel	Mid Channel	High Channel
LTE Band 30	5 MHz	27685 ~ 27735	27685	27710	27735	2307.5	2310.0	2312.5
	10 MHz	27710	-	27710	-	-	2310.0	-

### 1.5. Test Mode Applicability and Tested Channel Detail.

#### LTE Band 30

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
<b>Conducted RF Output Power/ Equivalent Isotropically Radiated Power (EIRP)</b>	27685 ~ 27735	27685, 27710, 27735	5 MHz	QPSK, 16QAM	As per table 1.6.2 & 1.6.4
	27710	27710	10 MHz		
<b>Peak to Average Power Ratio</b>	27685 ~ 27735	27685, 27710, 27735	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
	27710	27710	10 MHz		50 RB / 0 RB Offset
<b>Occupied Bandwidth</b>	27685 ~ 27735	27685, 27710, 27735	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
	27710	27710	10 MHz		50 RB / 0 RB Offset
<b>Frequency Stability</b>	27685 ~ 27735	27710	5 MHz	QPSK	25 RB / 0 RB Offset
	27710	27710	10 MHz		50 RB / 0 RB Offset
<b>Band Edge Conducted Spurious Emission</b>	27685 ~ 27735	27685, 27735	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	27710	27710	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
<b>Conducted Spurious Emission</b>	27685 ~ 27735	27685, 27710, 27735	5 MHz	QPSK	1 RB / 0 RB Offset
	27710	27710	10 MHz		1 RB / 0 RB Offset
<b>Radiated Spurious Emission</b>	27685 ~ 27735	27735	5 MHz	QPSK	1 RB / 0 RB Offset

**NOTE:**

1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Equivalent Isotropically Radiated Power (EIRP) was calculated from Conducted RF Output Power results in QPSK and 16QAM modulation.
4. Peak to Average and Occupied Bandwidth were performed with full Resource Block which is the worst case.
5. Frequency stability was performed with full Resource Block in QPSK modulation.
6. The LTE chipset is identical to FCC ID AZ489FT7133/IC 109U-89FT7133. Only worst case configuration of radiated emission based on FCC ID AZ489FT7151/ IC 109U-89FT7151 is tested. Spot check results showing radiated emissions is comparable. As per KDB 484596 D01v01, the applicant takes full responsibility that data referenced represents compliance to the relevant rules for this current FCC ID.

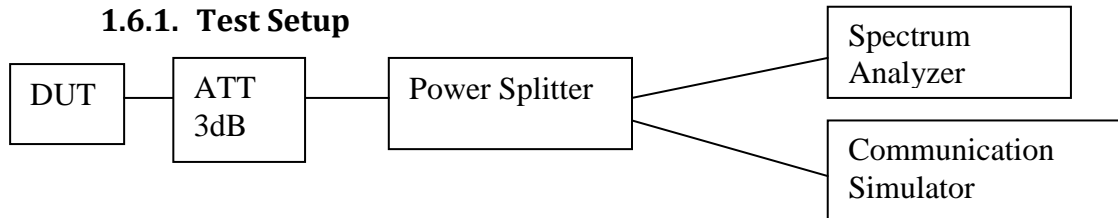
**Test Condition:**

<b>Test Item</b>	<b>Environmental Conditions</b>	<b>Input Power</b>	<b>Tested By</b>
Conducted RF Output Power	25°C, 50% RH	7.5V DC	Khay Kwang
Peak-to-Average Power Ratio	25°C, 50% RH	7.5V DC	Khay Kwang
Occupied Bandwidth	25°C, 50% RH	7.5V DC	Khay Kwang
Frequency Stability	-30°C ~ 60°C	7.5V DC	Khay Kwang
Band Edge Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Khay Kwang
Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Khay Kwang
Radiated Spurious Emission	25°C, 63.7% RH	7.5V DC	Azil&Qawiman
Equivalent Isotropically Radiated Power (EIRP)	25°C, 50% RH	7.5V DC	Khay Kwang



## 1.6. Conducted RF Output Power

### 1.6.1. Test Setup



1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. All the measurement was done at low, mid, high channel for each band and different modulation.
5. Record the average power into the test report.

### 1.6.2. Limits

FCC: Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.  
 ISED: The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt.

### 1.6.3. Conducted RF Output Power – LTE Band 30 (2305-2315MHz)

Conducted Output Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			27685	27710	27735	27685	27710	27735
			2307.5MHz	2310.0 MHz	2312.5 MHz	2307.5 MHz	2310.0 MHz	2312.5 MHz
Band 30 / 5MHz	1	0	22.919	22.974	23.023	21.953	22.116	22.285
	1	13	22.959	23.017	22.935	22.001	22.132	22.184
	1	24	22.901	22.91	22.905	21.943	22.029	22.162
	12	0	21.989	21.988	22.01	21.021	20.966	21.066
	12	6	22	21.987	22.002	21.058	20.975	21.057
	12	13	21.995	21.956	21.87	21.022	20.96	20.946
	25	0	21.964	21.967	22.028	21.033	21.042	21.078

Conducted Output Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
				27710			27710	
				2310.0 MHz			2310.0 MHz	
Band 30 / 10MHz	1	0		22.941			22.103	
	1	25		22.907			22.055	
	1	49		22.869			21.917	
	25	0		22.005			21.125	
	25	13		21.985			21.123	
	25	25		21.986			21.127	
	50	0		22.003			21.086	

#### 1.6.4 Equivalent Isotropically Radiated Power (EIRP) - LTE Band 30 (2305-2315MHz)

Equivalent Isotropically Radiated Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			27685	27710	27735	27685	27710	27735
			2307.5MHz	2310.0 MHz	2312.5 MHz	2307.5 MHz	2310.0 MHz	2312.5 MHz
Band 30 / 5MHz	1	0	25.729	25.784	25.833	24.763	24.926	25.095
	1	13	25.769	25.827	25.745	24.811	24.942	24.994
	1	24	25.711	25.72	25.715	24.753	24.839	24.972
	12	0	24.799	24.798	24.82	23.831	23.776	23.876
	12	6	24.81	24.797	24.812	23.868	23.785	23.867
	12	13	24.805	24.766	24.68	23.832	23.77	23.756
	25	0	24.774	24.777	24.838	23.843	23.852	23.888

Equivalent Isotropically Radiated Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
				27710			27710	
				2310.0 MHz			2310.0 MHz	
Band 30 / 10MHz	1	0		25.751			24.913	
	1	25		25.717			24.865	
	1	49		25.679			24.727	
	25	0		24.815			23.935	
	25	13		24.795			23.933	
	25	25		24.796			23.937	
	50	0		24.813			23.896	

The maximum ERP/EIRP from the measured RF output power is given in Equation as follows:

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

$$\mathbf{ERP = EIRP - 2.15}$$

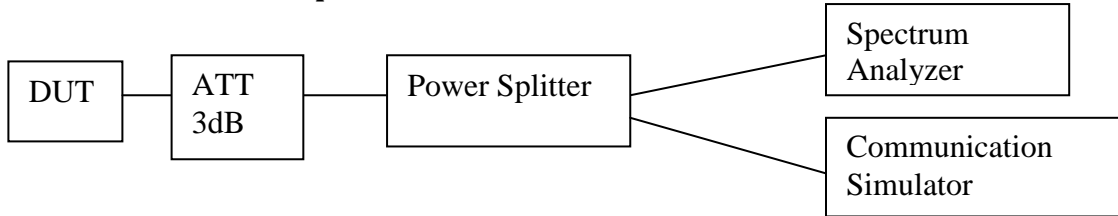
Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (Expressed in the same units as P<sub>Meas</sub>, e.g., dBm)

**P<sub>Meas</sub>** measured transmitter output power, in dBm

**G<sub>T</sub>** gain of the transmitting antenna, in dBi (EIRP)

## Peak-to-Average Power Ratio

### 1.6.4. Test Setup



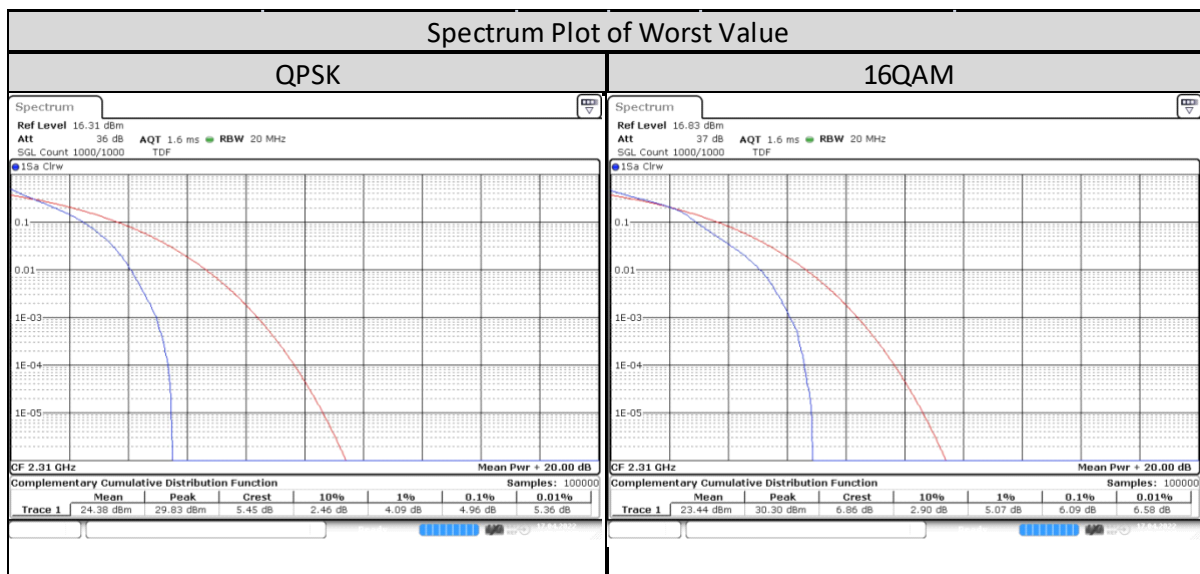
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.
5. Spectrum Analyzer setting, RBW = 20MHz.
6. Recorded the maximum PAR level associated with a probability of 0.1% as Peak to Average Ratio.
7. All the measurement was done at low, mid, high channel for each band and different modulation.

### 1.6.5. Test Limit

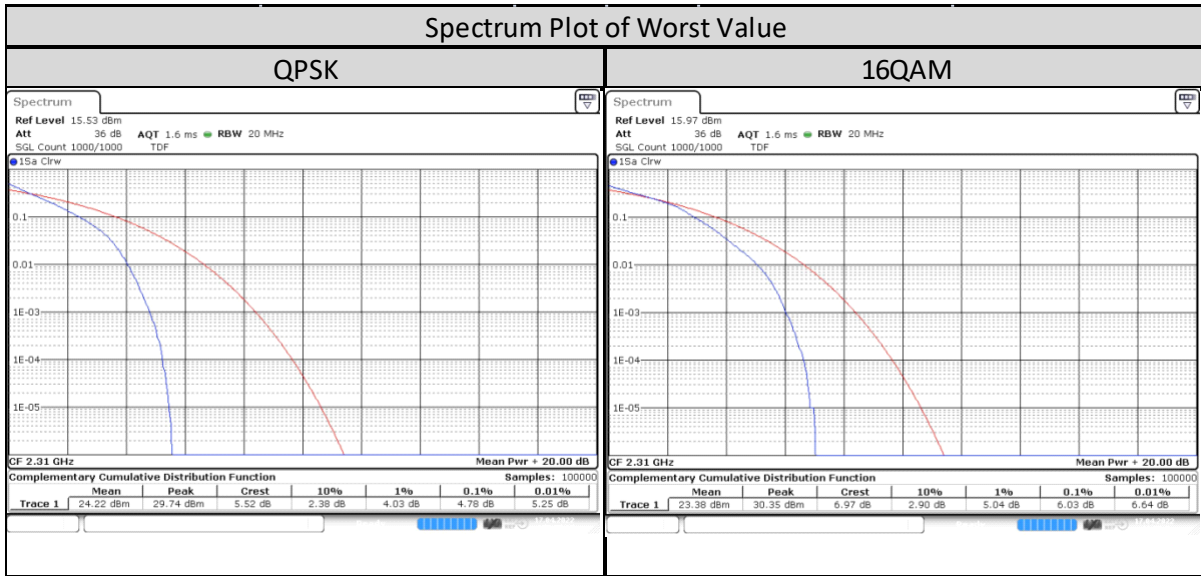
In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 1.6.6. Peak-to-Average Power Ratio - LTE Band 30 (2305-2315MHz)

LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 30/5MHz/25/0	Low CH 27685	2307.5 MHz	4.928	5.913
	Mid CH 27710	2310 MHz	<b>4.957</b>	<b>6.087</b>
	High CH 27735	2312.5 MHz	4.87	6.058

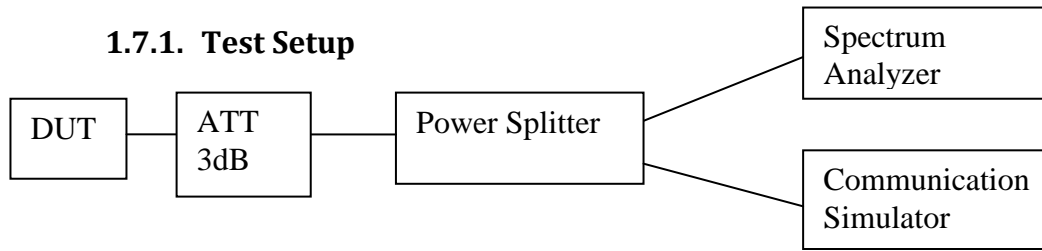


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 30/10MHz/50/0	Low CH			
	Mid CH 27710	2310 MHz	4.783	6.029
	High CH			



## 1.7. Occupied Bandwidth

### 1.7.1. Test Setup



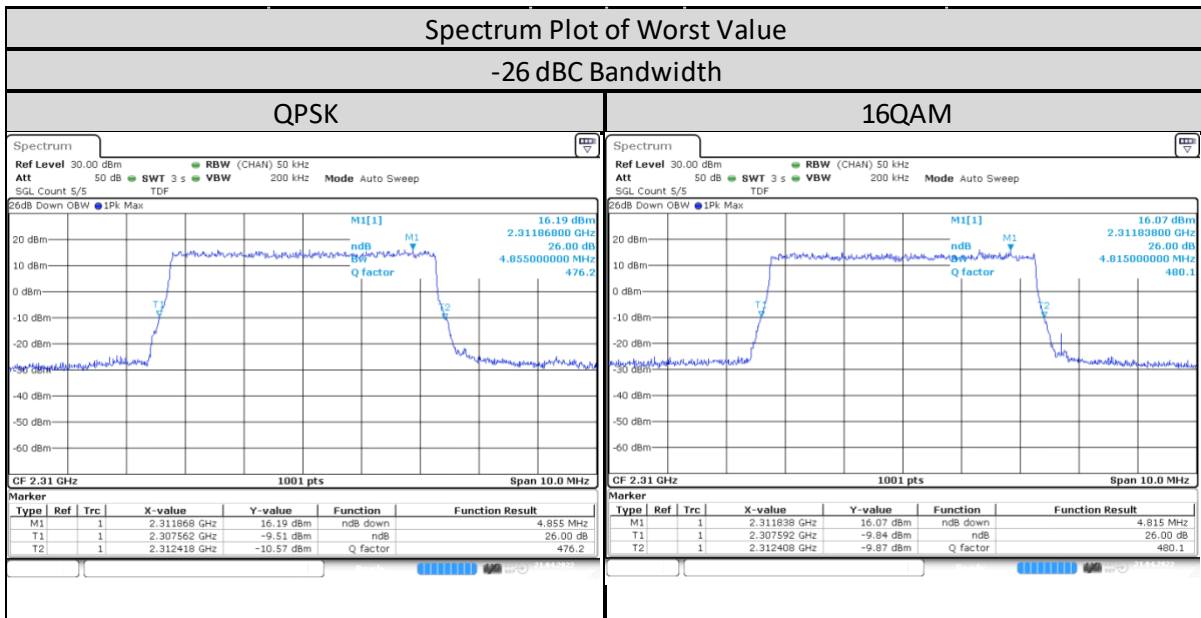
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum power through communication simulator.
- 5) Spectrum Analyzer setting, RBW is 1% of OBW and VBW is 3 times of RBW.
- 6) Measure & record -26dBc and 99% occupied bandwidth (BW).
- 7) All the measurement was done at low, mid, high channel for each band and different modulation.

### 1.7.2. Test Limit

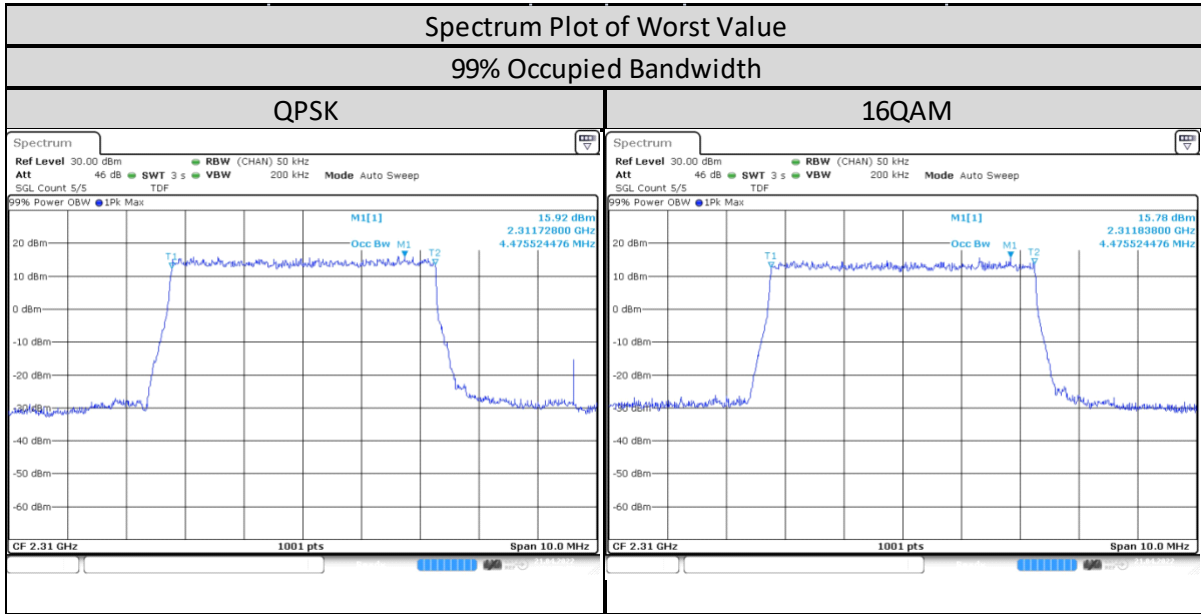
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### 1.7.3. Occupied Bandwidth - LTE Band 30 (2305-2315MHz)

LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 30/5MHz/25/0	Low CH 27685	2307.5 MHz	4.795	4.775
	Mid CH 27710	2310 MHz	<b>4.855</b>	<b>4.815</b>
	High CH 27735	2312.5 MHz	4.805	4.805

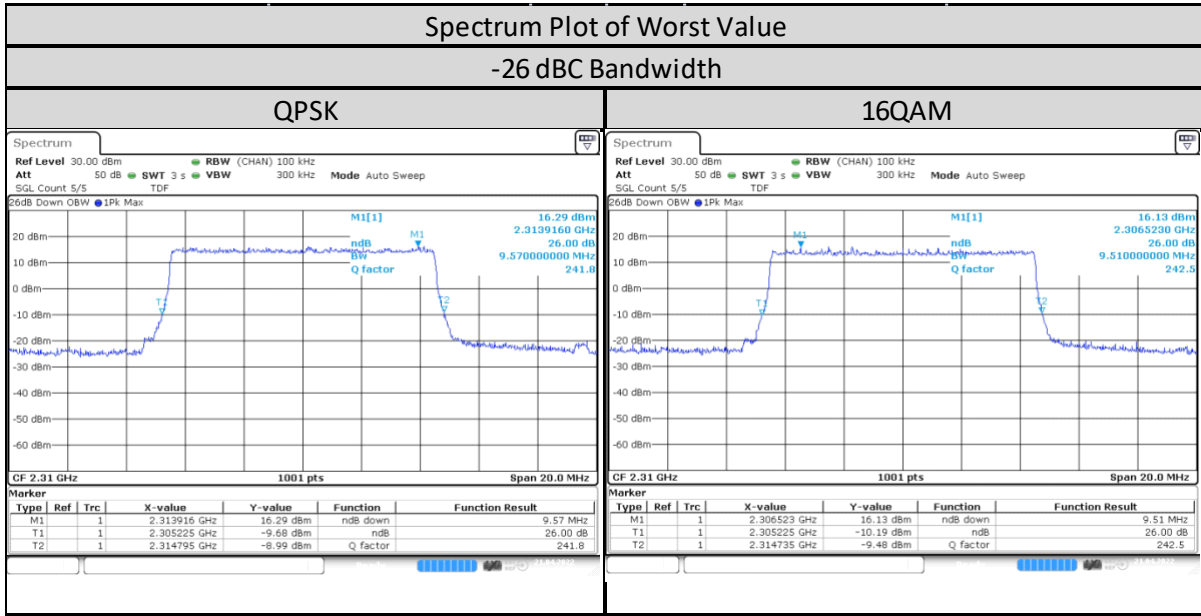


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 30/5MHz/25/0	Low CH 27685	2307.5 MHz	4.456	4.466
	Mid CH 27710	2310 MHz	<b>4.476</b>	<b>4.476</b>
	High CH 27735	2312.5 MHz	4.466	4.466

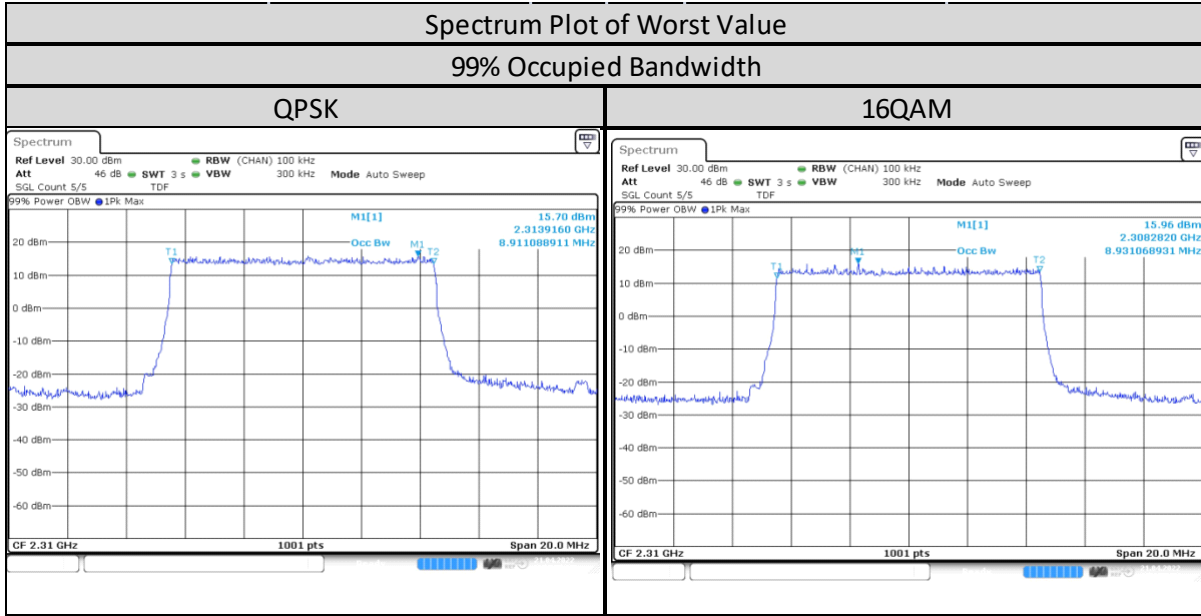




LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
<b>Band 30/10MHz/50/0</b>	Low CH			
	Mid CH 27710	2310 MHz	9.57	9.51
	High CH			

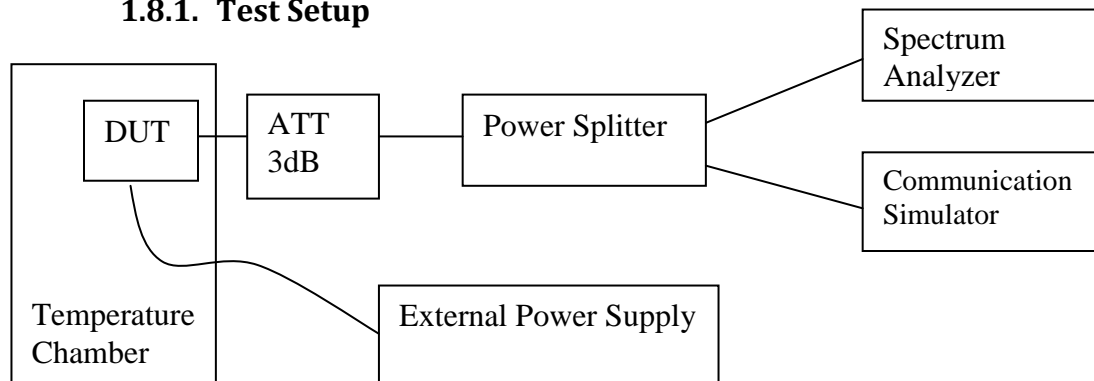


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
<b>Band 30/10MHz/50/0</b>	Low CH			
	Mid CH 27710	2310 MHz	8.911	8.931
	High CH			



## 1.8. Frequency Stability

### 1.8.1. Test Setup



- 1) The DUT is placed in the temperature chamber and DUT is power up by external power supply to control the DC input voltage.
- 2) The temperature chamber could control the temperature and humidity and external power supply could control the test voltage range from minimum to maximum operating voltage.
- 3) Measured frequency error from the communication simulator by vary below step :
  - i. Vary temperature of the temperature chamber from -30 ~ 60 deg C (10 deg C / Step) and set external supply voltage constant at nominal voltage.
  - ii. Vary external supply voltage from minimum to maximum operation voltage support by DUT and set temperature chamber constant at room temp.
- 4) All the measurement was done at mid channel for each band.

### 1.8.2. Test Limit

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

### 1.8.3. Frequency Stability – LTE Band 30 (2305-2315MHz)

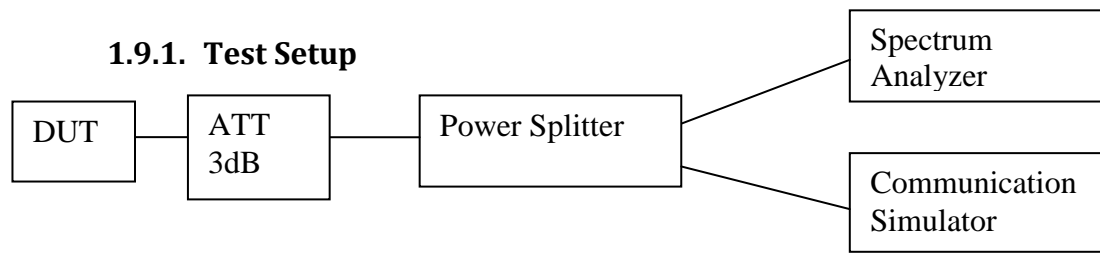
Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		2307.5MHz		2312.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 30	60	2307.499976	-0.010551	2312.500022	0.009366
	50	2307.499976	-0.010551	2312.500022	0.009421
	40	2307.499976	-0.010217	2312.500024	0.010219
	30	2307.499981	-0.008047	2312.500023	0.010021
	20	2307.499972	-0.011934	2312.500022	0.009539
	10	2307.500022	0.009386	2312.500025	0.01085
	0	2307.499985	-0.006299	2312.500023	0.009997
	-10	2307.499982	-0.007681	2312.500021	0.009161
	-20	2307.499984	-0.006838	2312.500024	0.010324
	-30	2307.499973	-0.011636	2312.500022	0.009471

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		2307.5MHz		2312.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 30	9V	2307.499977	-0.009975	2312.500021	0.009242
	7.5V	2307.499978	-0.009572	2312.500027	0.011704
	6V	2307.499972	-0.012145	2312.50003	0.01312

Band	Temp ( Deg C)	Frequency Error VS Temperature	
		Channel Bandwidth: 10 MHz	
		Mid Channel	
		2310MHz	
		Frequency (MHz)	Frequency Error (ppm)
LTE Band 30	60	2309.999976	-0.010428
	50	2310.000018	0.007976
	40	2309.999981	-0.008286
	30	2309.999982	-0.007759
	20	2310.000025	0.010819
	10	2310.000018	0.007685
	0	2310.000017	0.007258
	-10	2310.000018	0.007982
	-20	2309.999978	-0.009735
	-30	2310.000018	0.007716

Band	Voltage (V)	Frequency Error VS Voltage	
		Channel Bandwidth: 10 MHz	
		Mid Channel	
		2310MHz	
LTE Band 30		Frequency (MHz)	Frequency Error (ppm)
	9V	2309.999985	-0.006546
	7.5V	2309.999983	-0.007338
	6V	2310.000021	0.009023

## 1.9. Band Edge Conducted Spurious Emission



- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 5) The center frequency of spectrum is the band edge frequency, span is 3MHz, RBW is 1~3% of EBW and VBW is at least 3 times of RBW
- 6) Record the maximum trace plot into the test report.

### 1.9.2. Test Limit

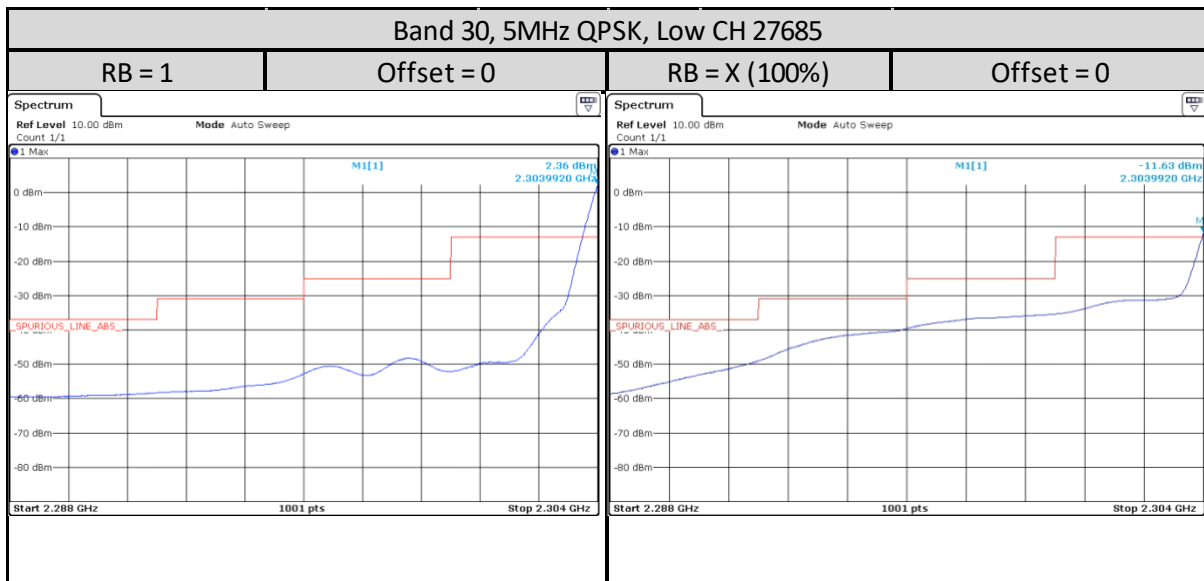
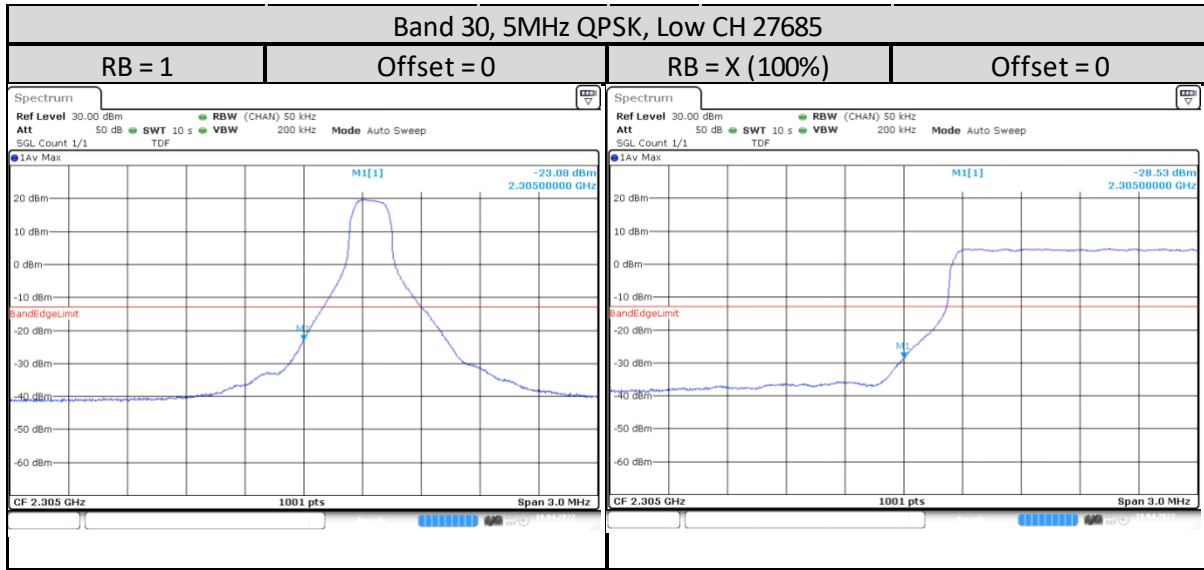
a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

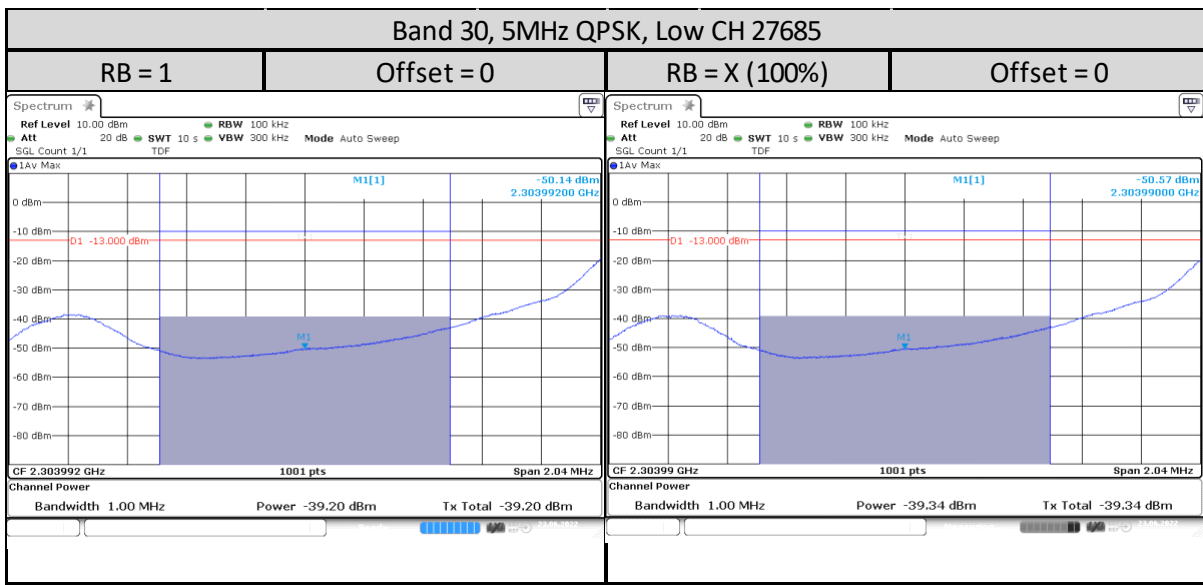
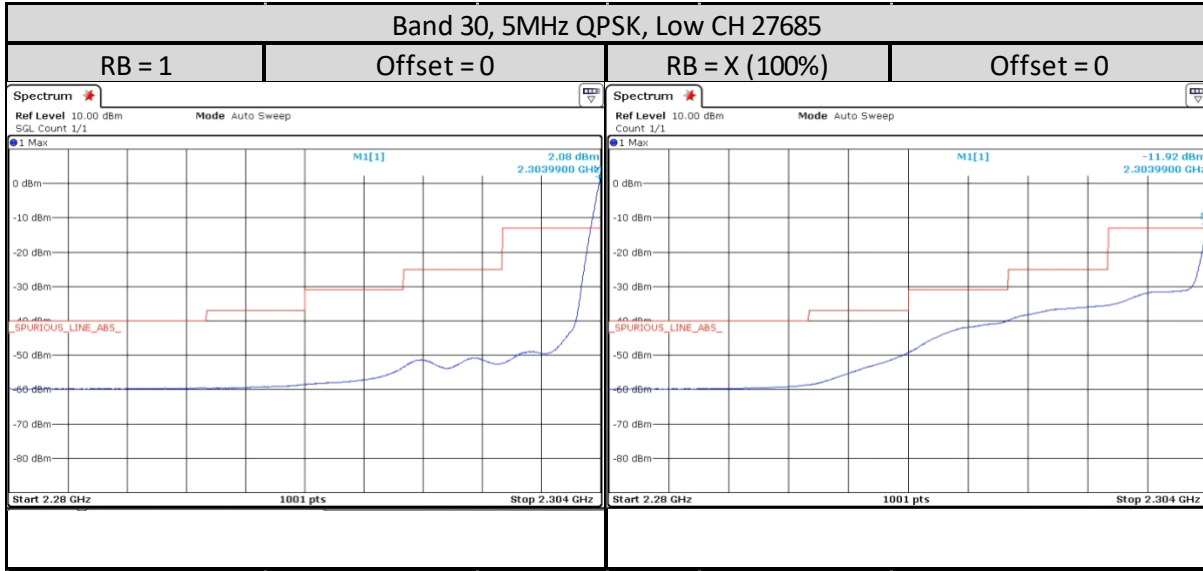
- (i) By a factor of not less than:  $43 + 10 \log (P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log (P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log (P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log (P)$  dB on all frequencies between 2328 and 2337 MHz;
- (ii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log (P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log (P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log (P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log (P)$  dB below 2288 MHz;
- (iii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log (P)$  dB above 2365MHz.

(5) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 1 MHz).

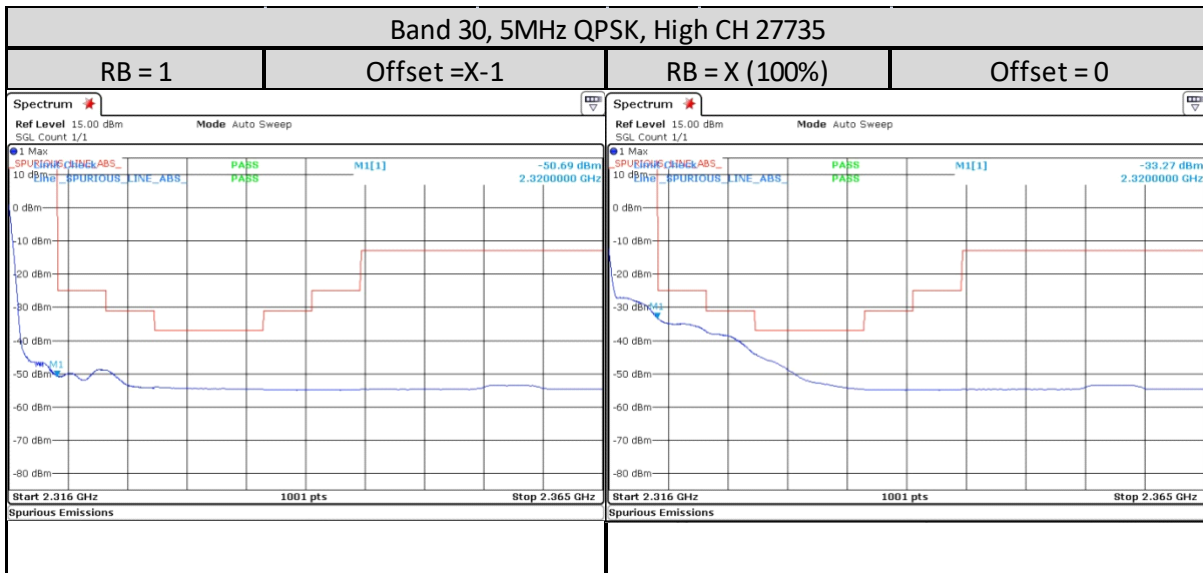
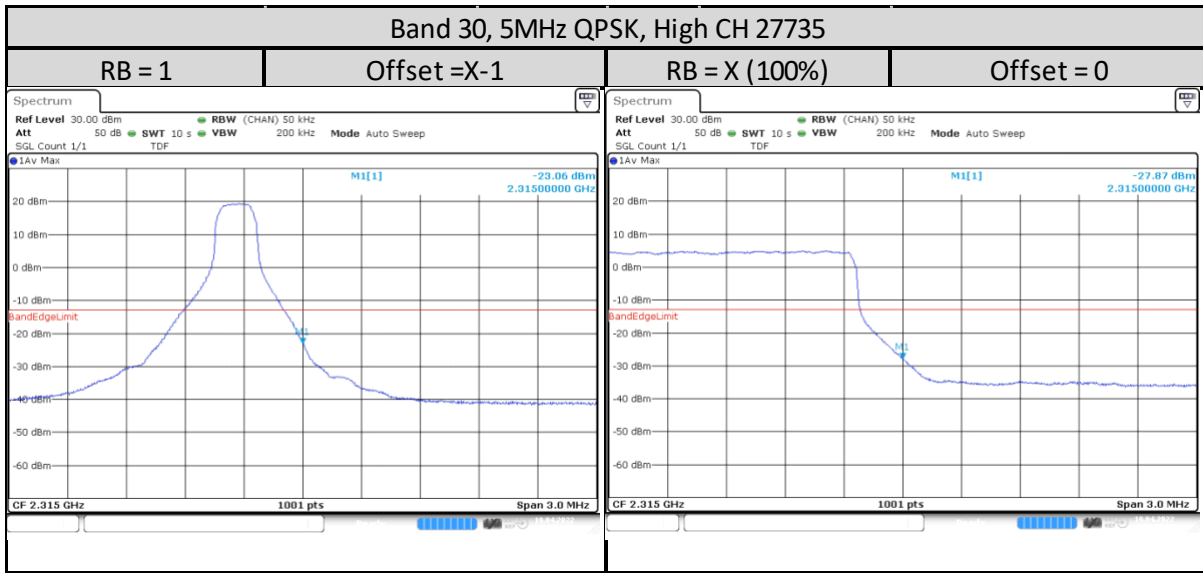
### 1.9.3. Band Edge Conducted Spurious Emission - LTE Band 30 (2305-2315MHz)



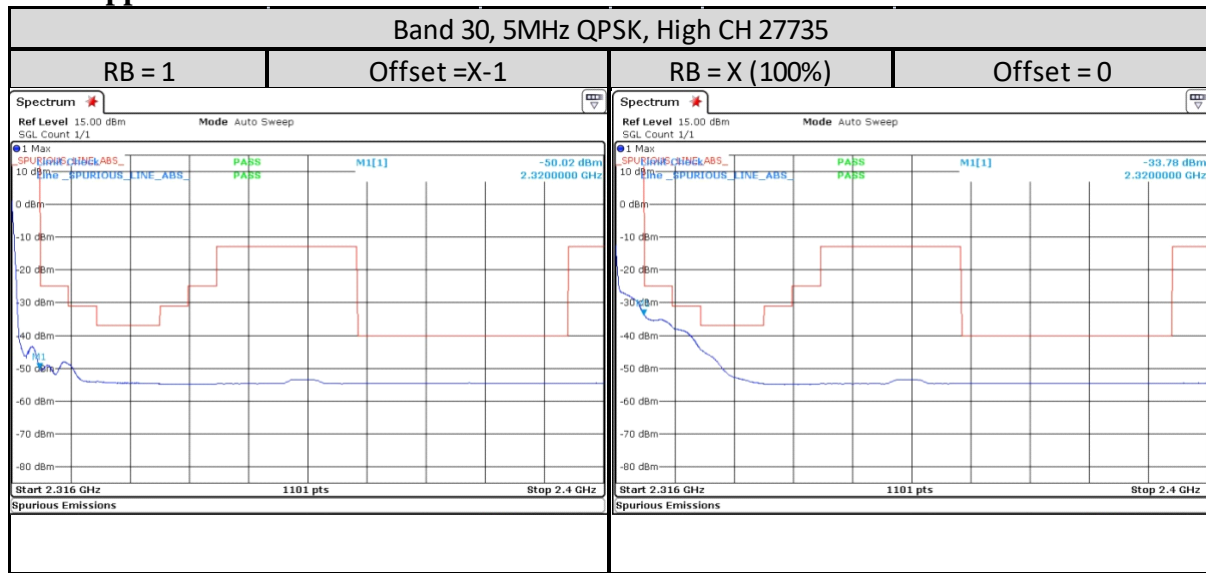
**ISED lower extended BE limit**

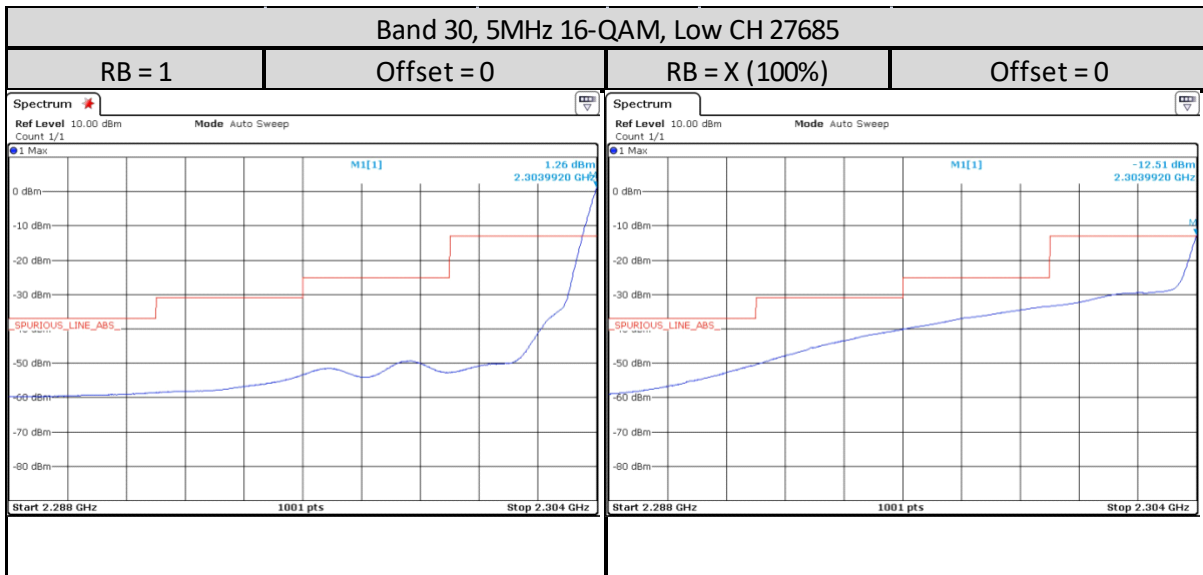
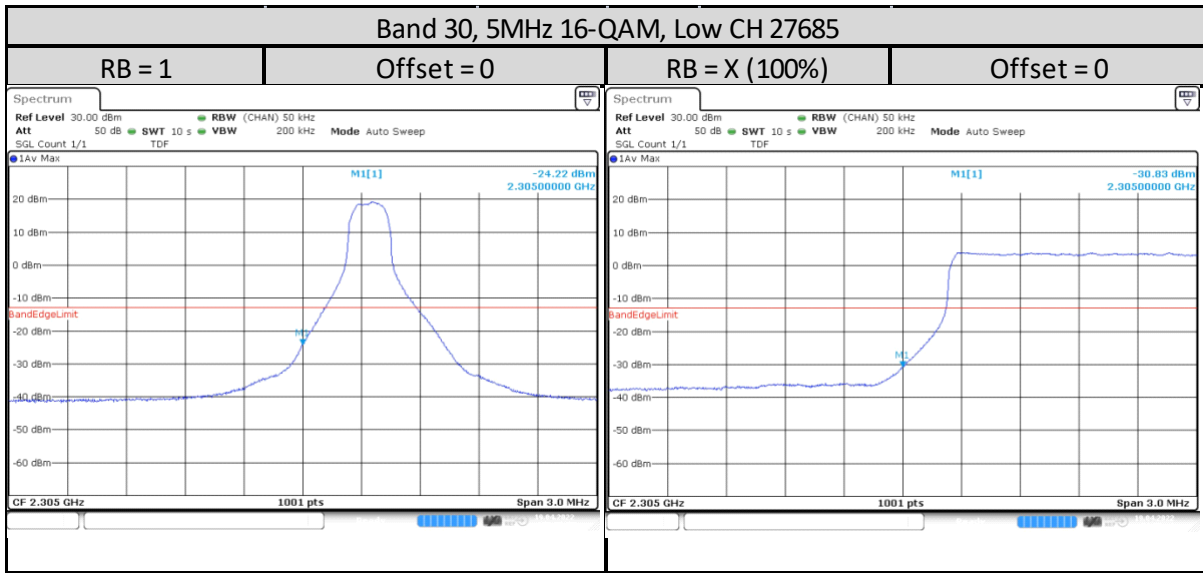




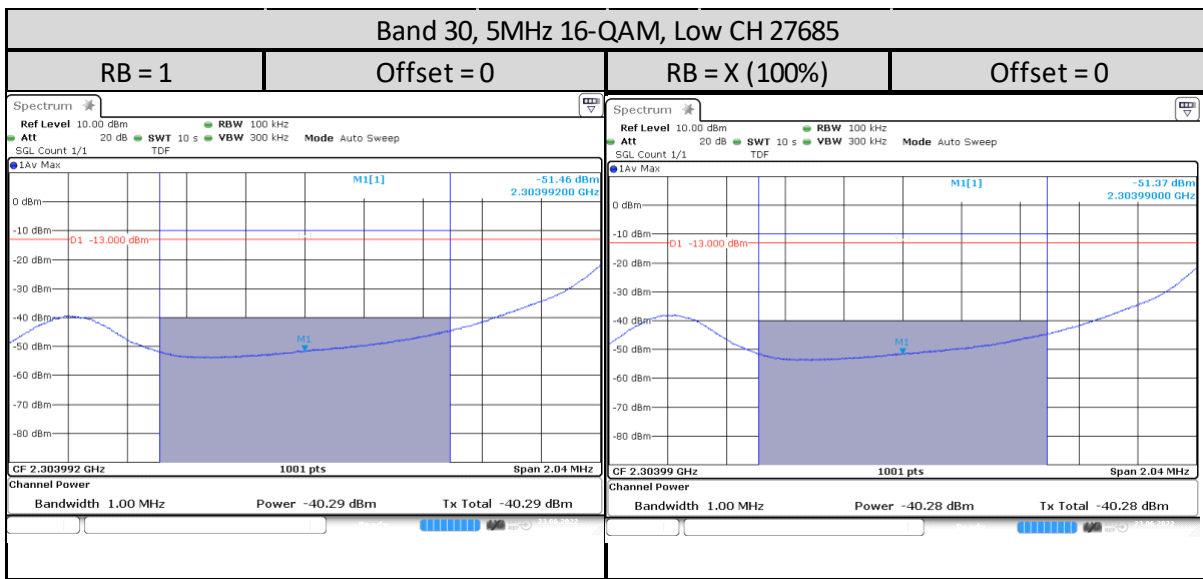
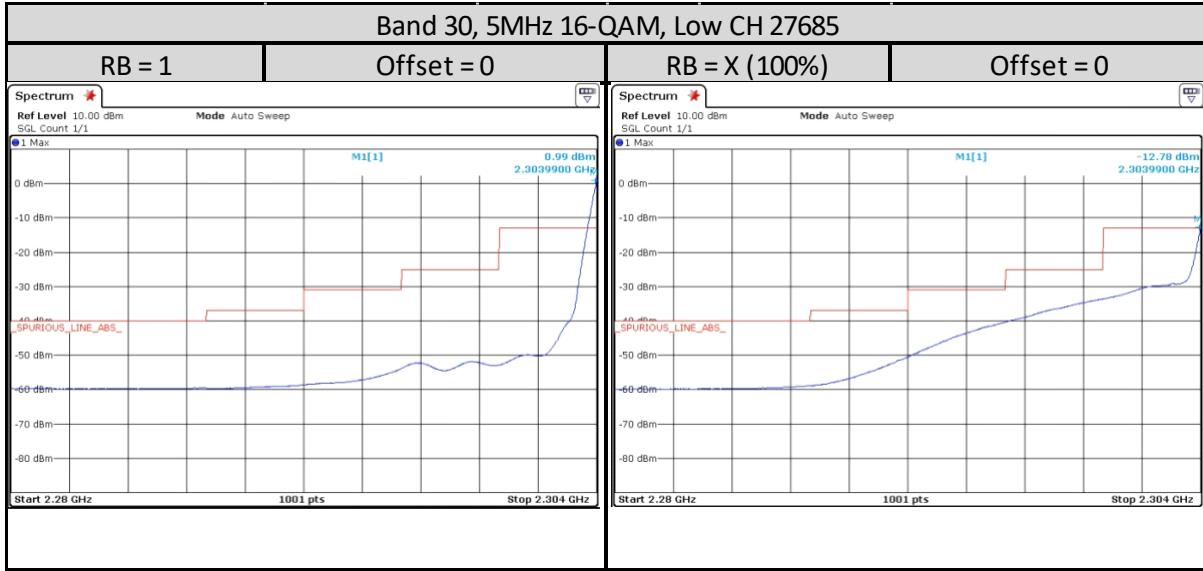


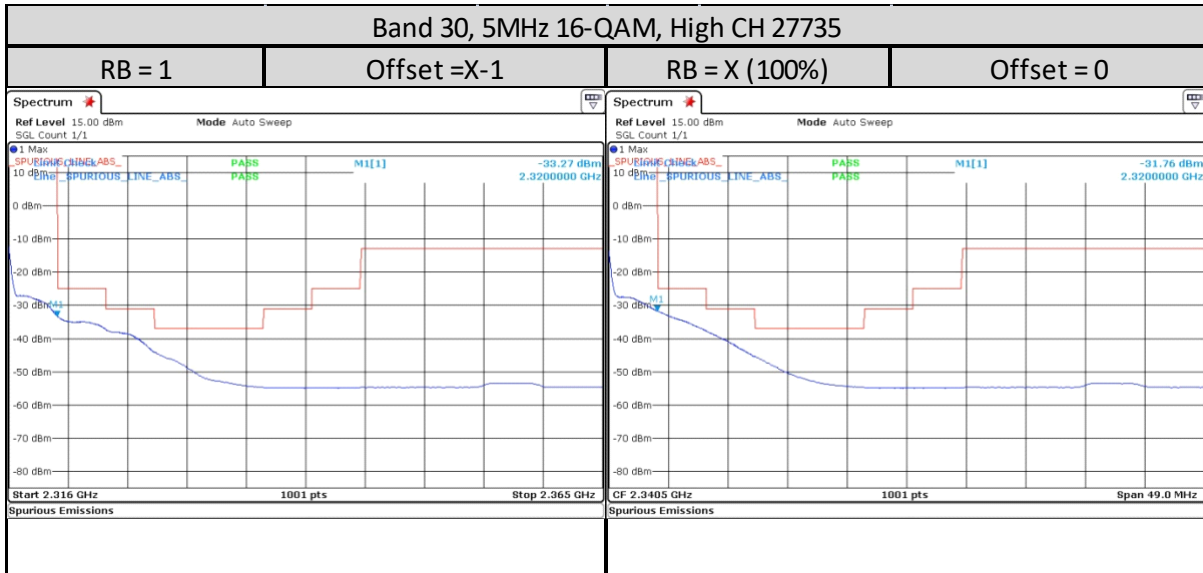
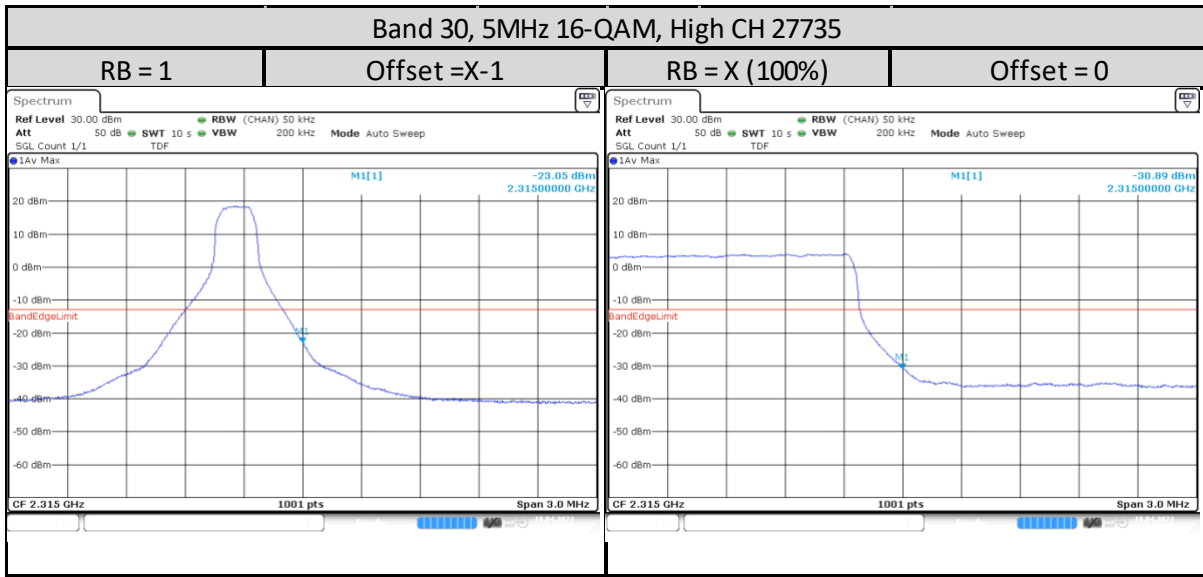
### ISED upper extended BE limit



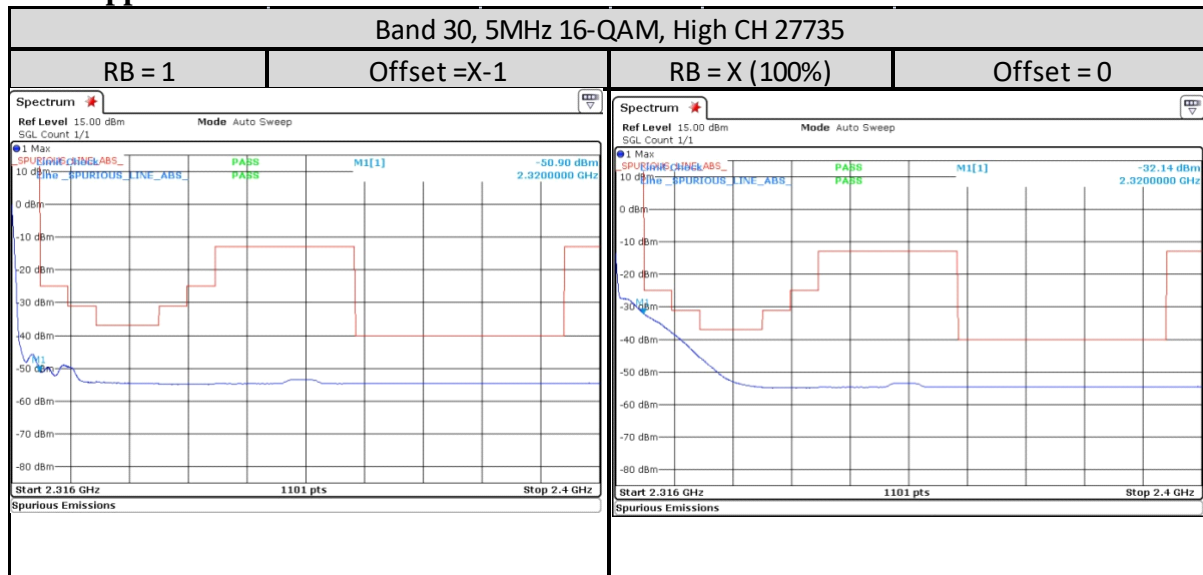


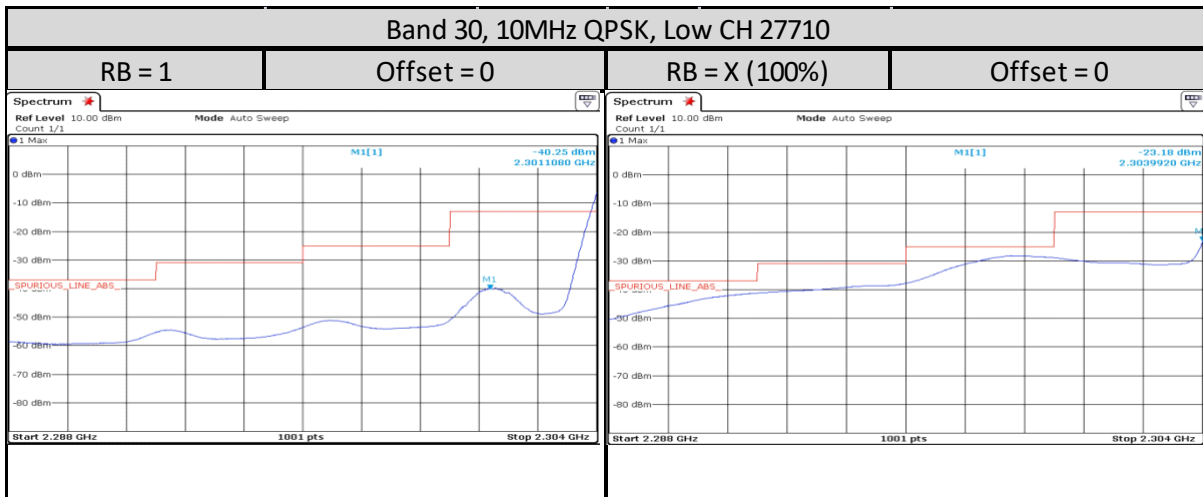
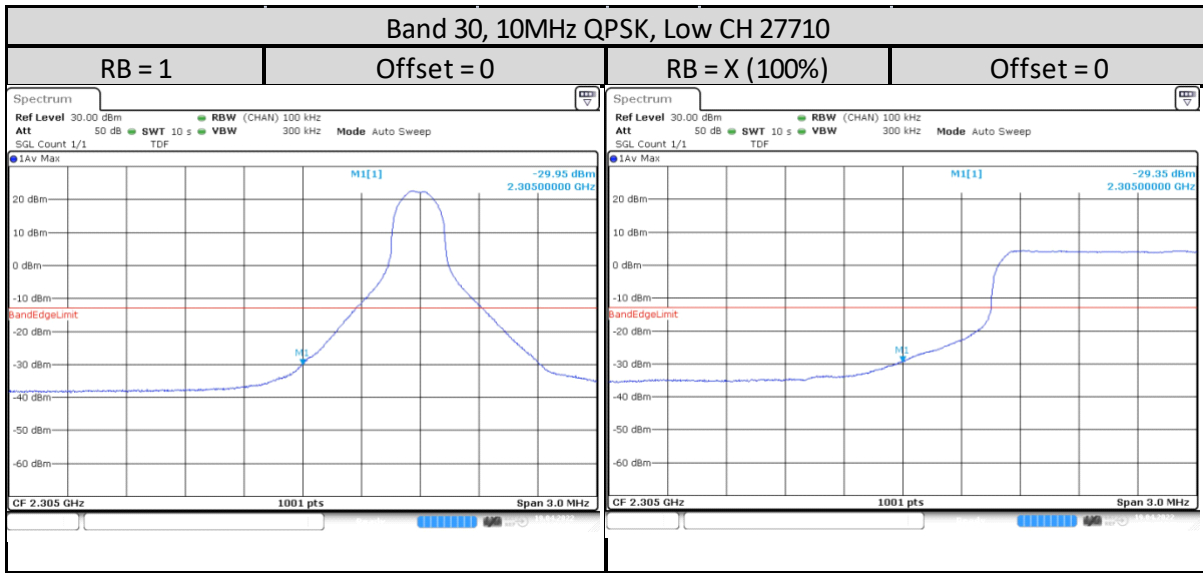
### ISED lower extended BE limit



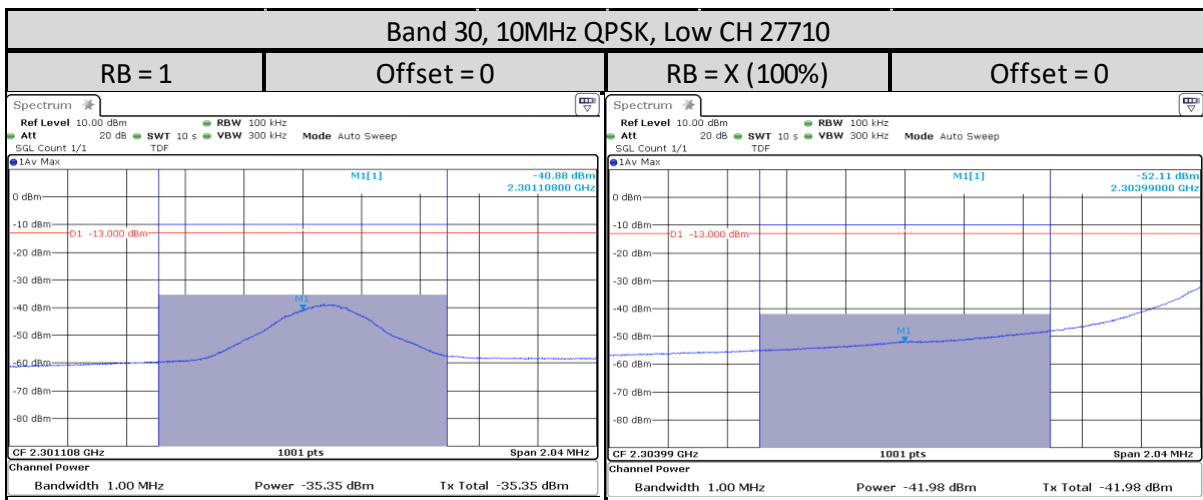
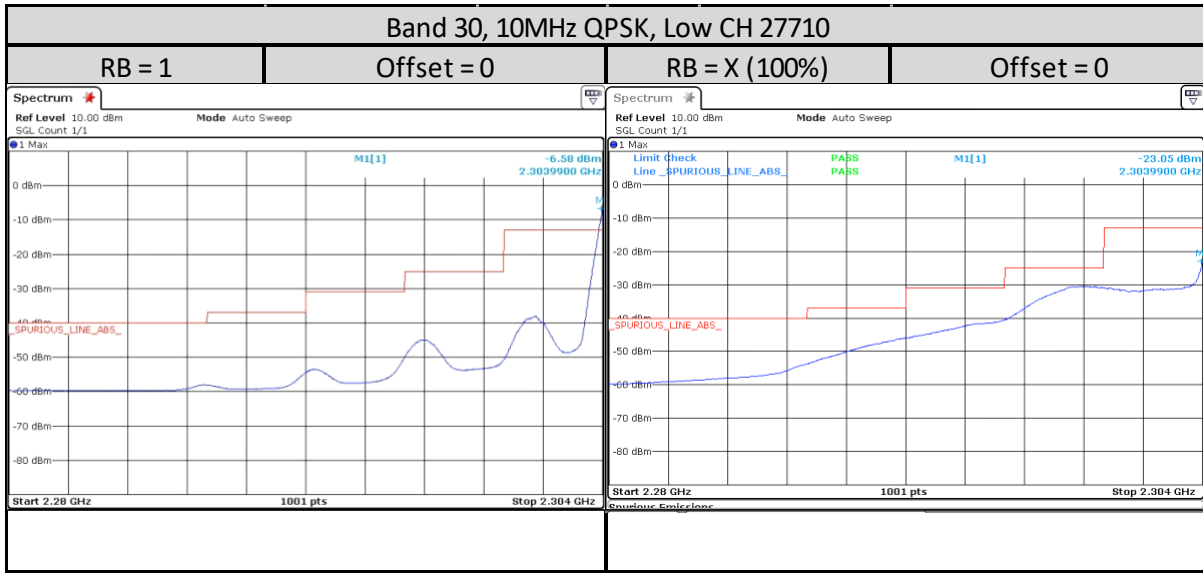


### ISED upper extended BE limit

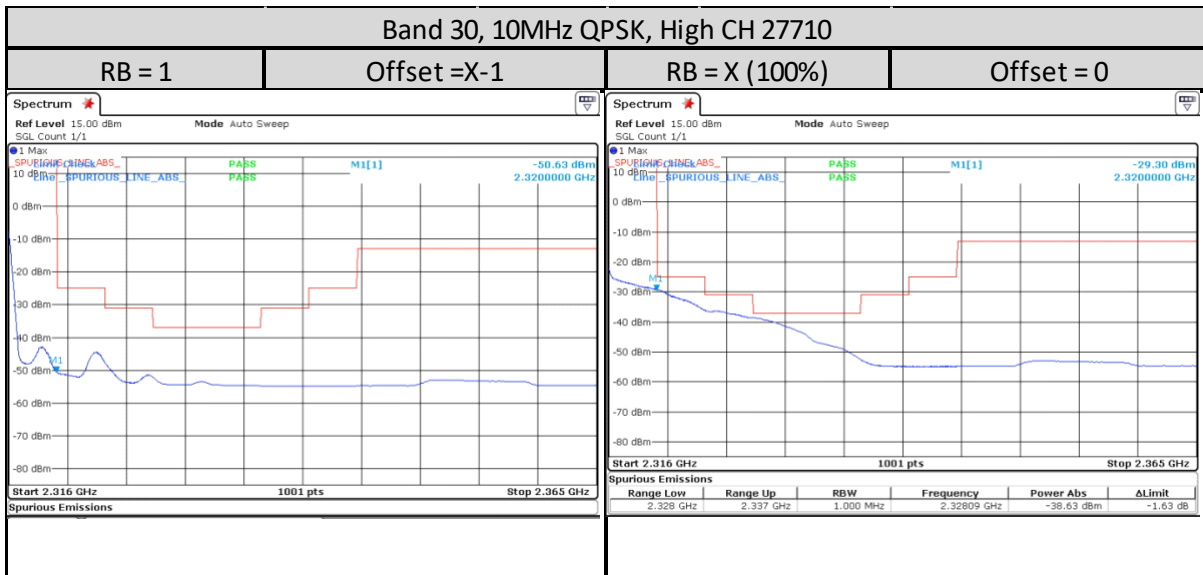
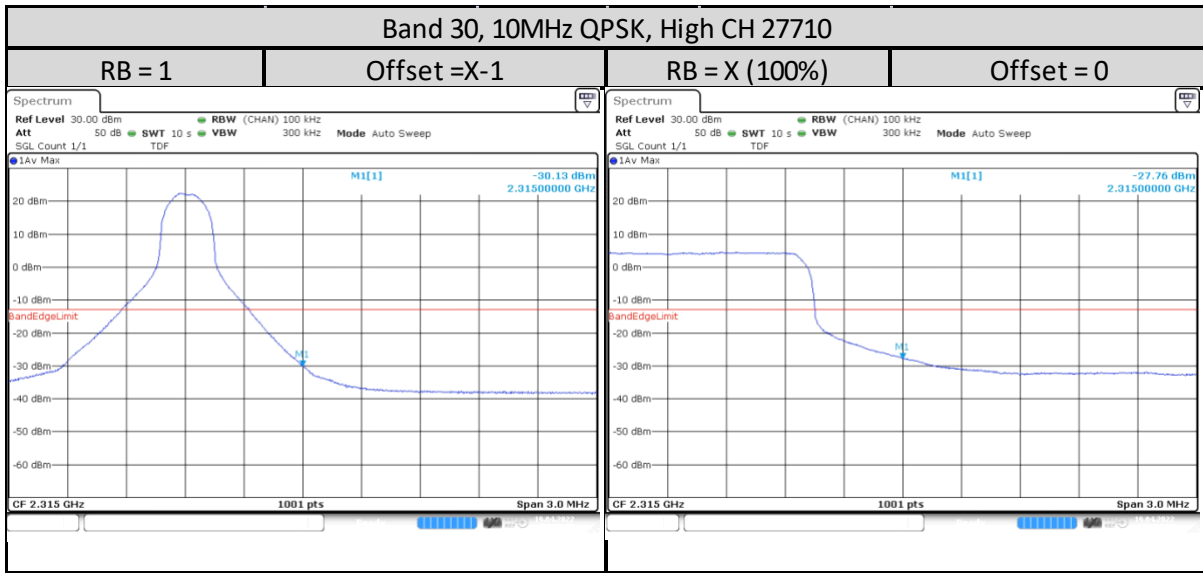




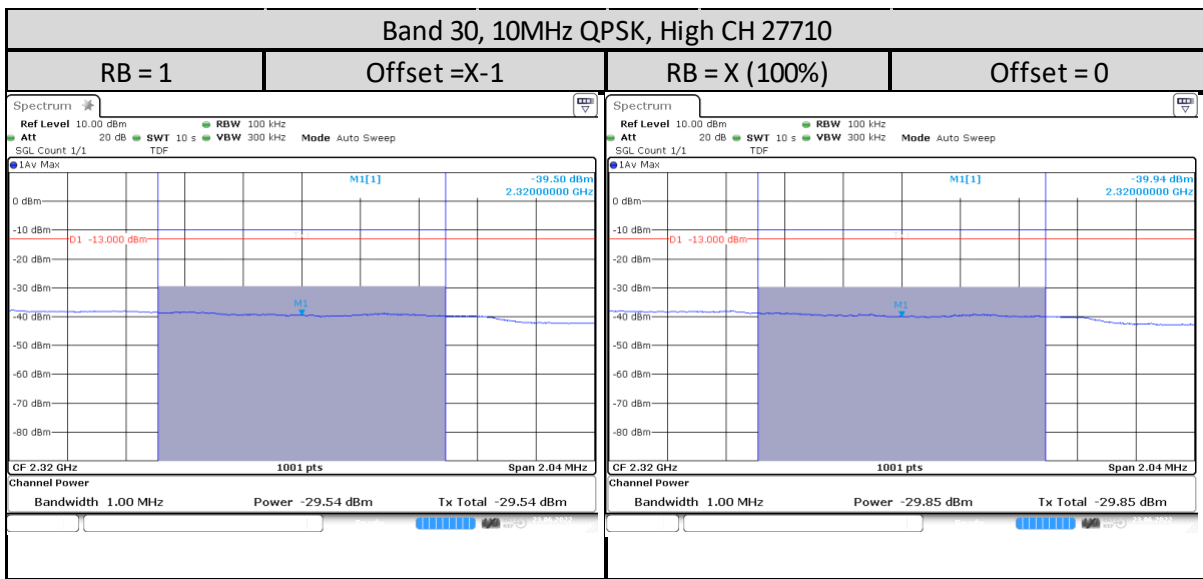
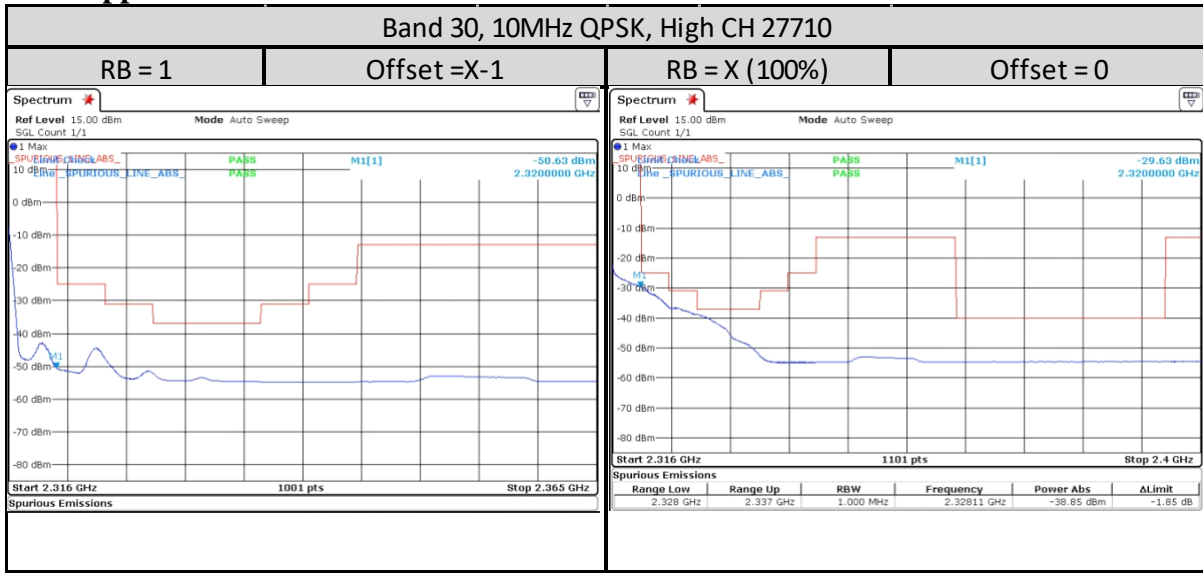
### ISED lower extended BE limit

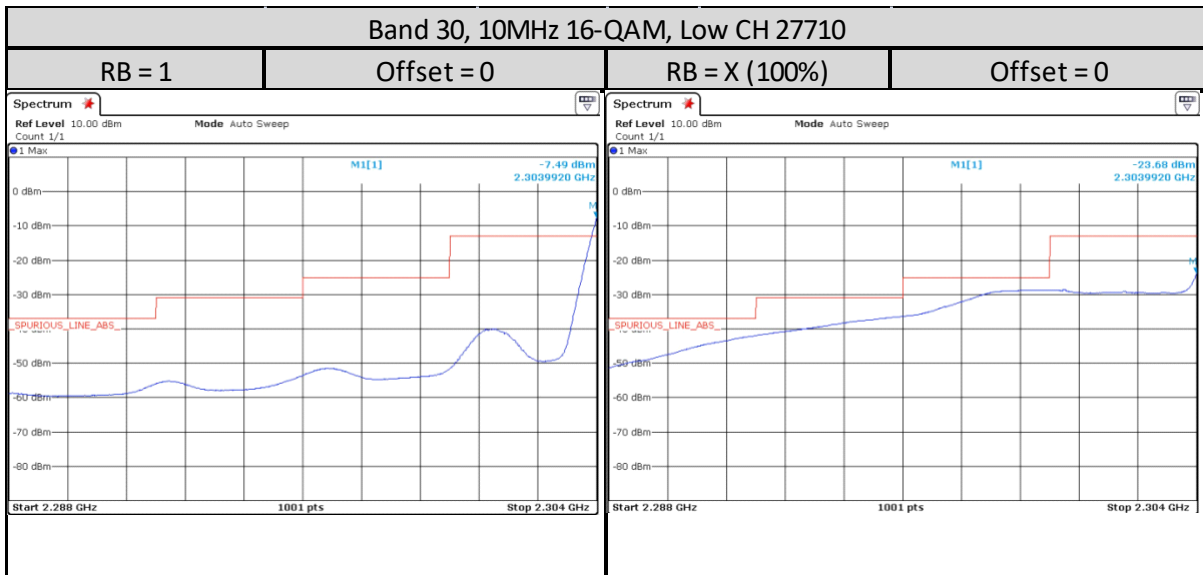
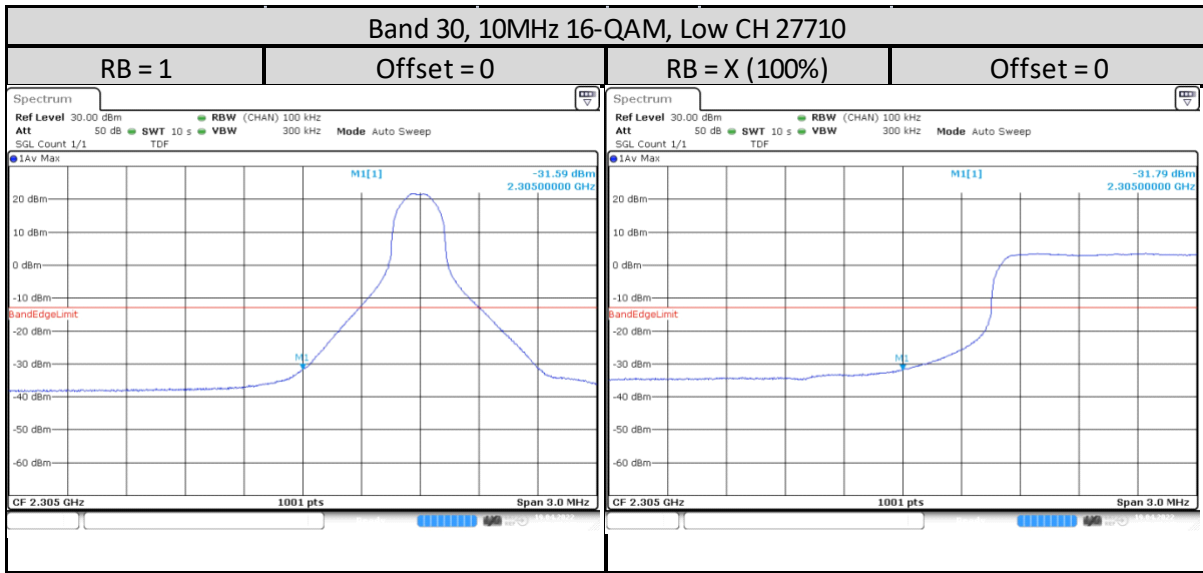




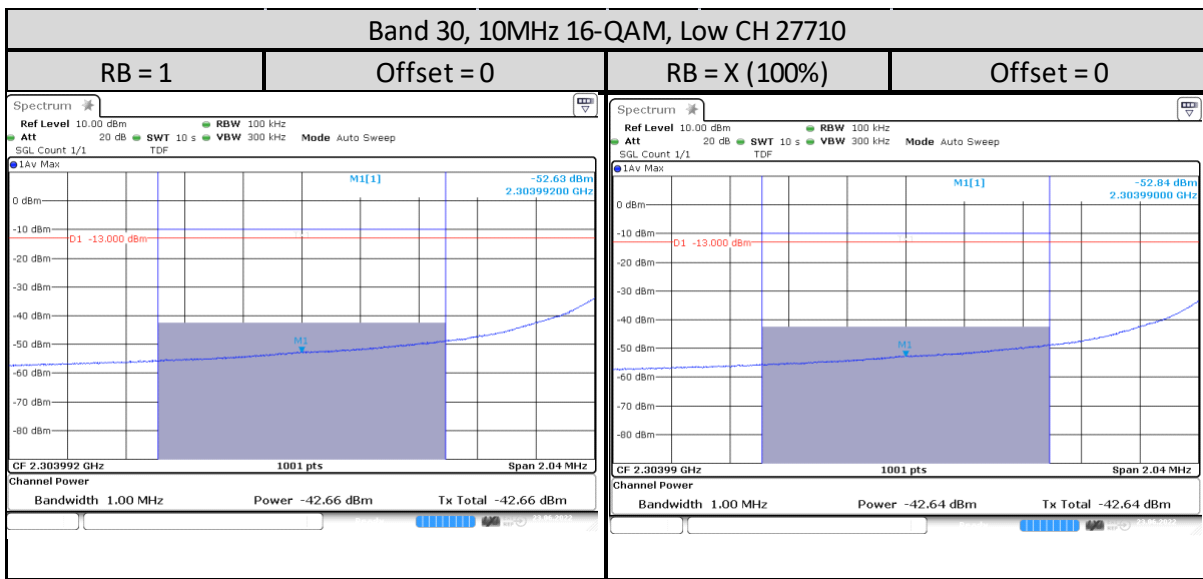
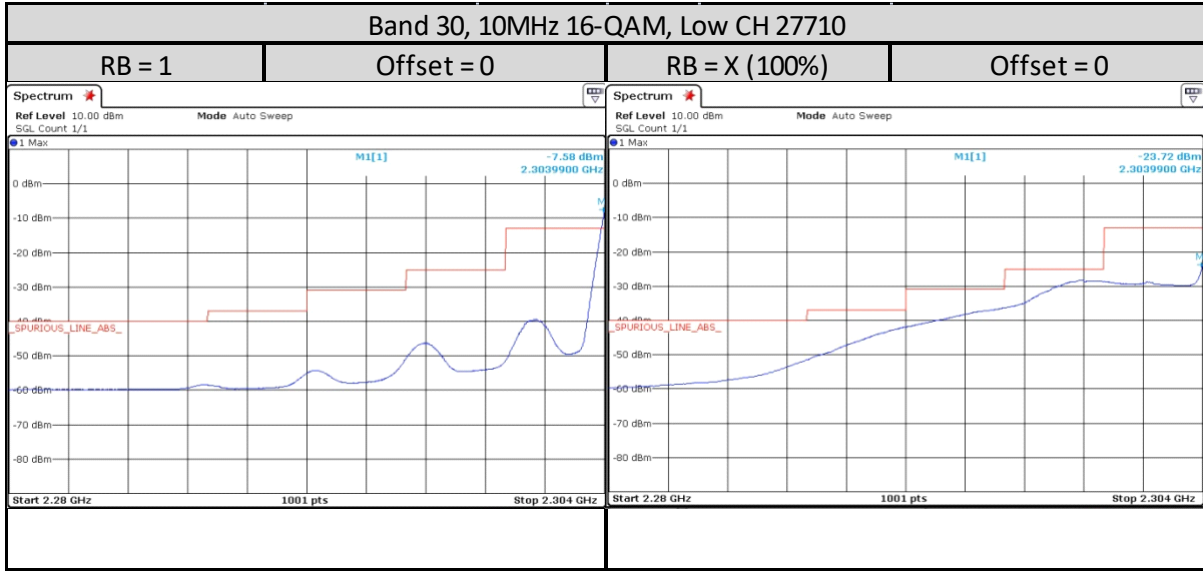


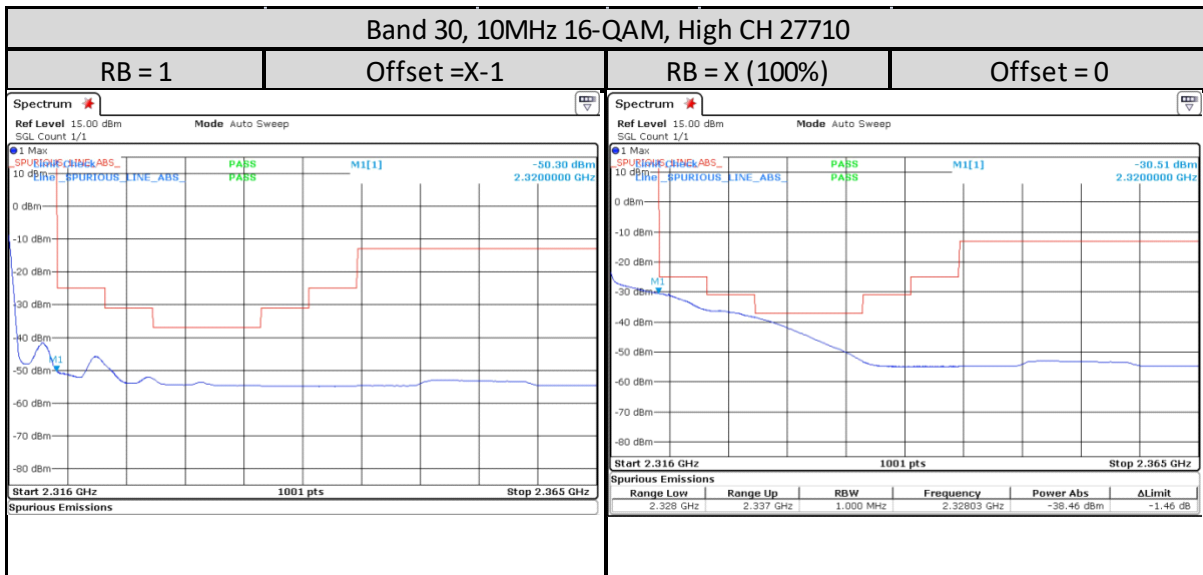
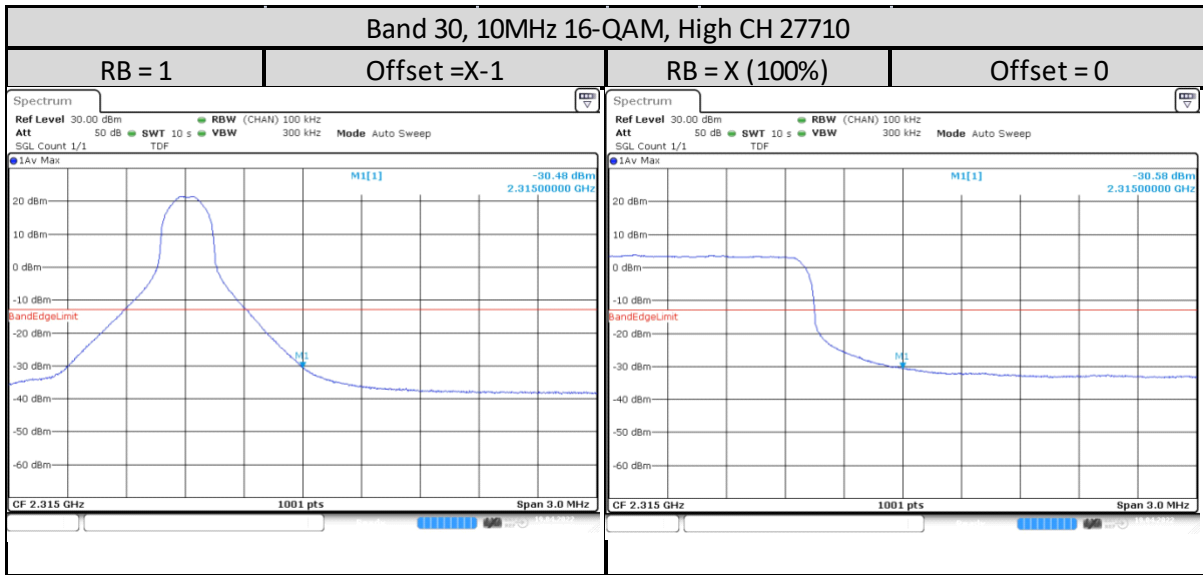
### ISED upper extended BE limit



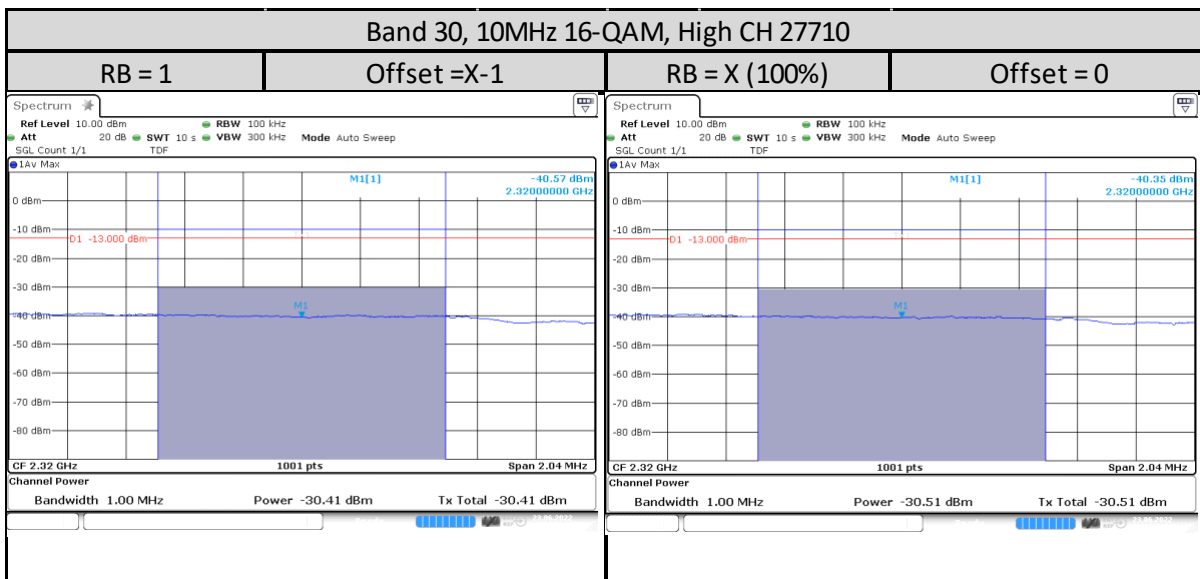
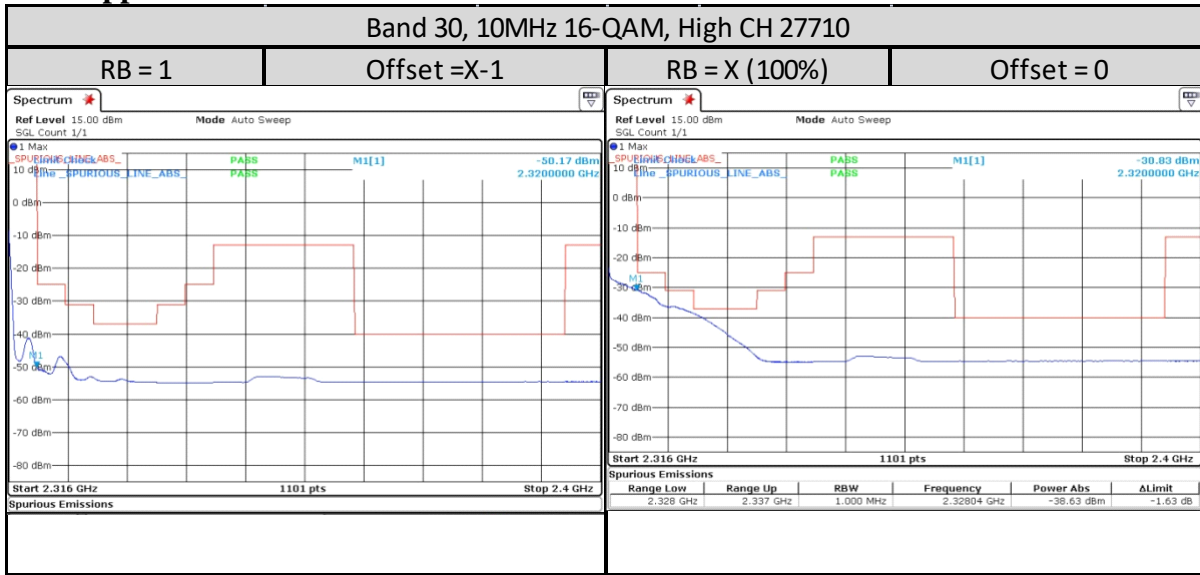


### ISED lower extended BE limit



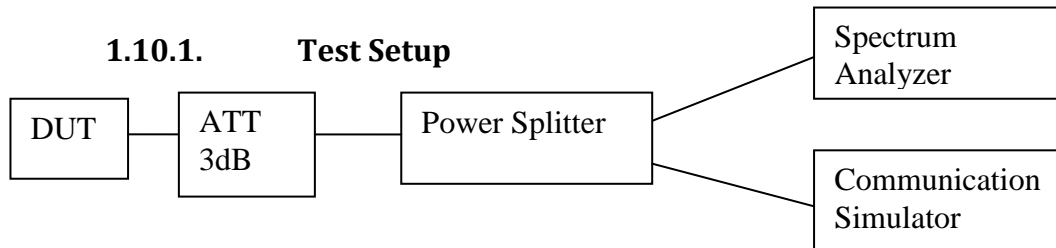


### ISED upper extended BE limit



## 1.10. Conducted Spurious Emission

### 1.10.1. Test Setup



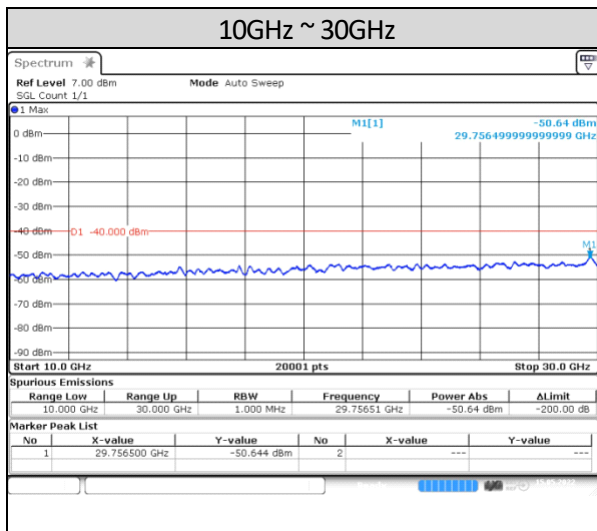
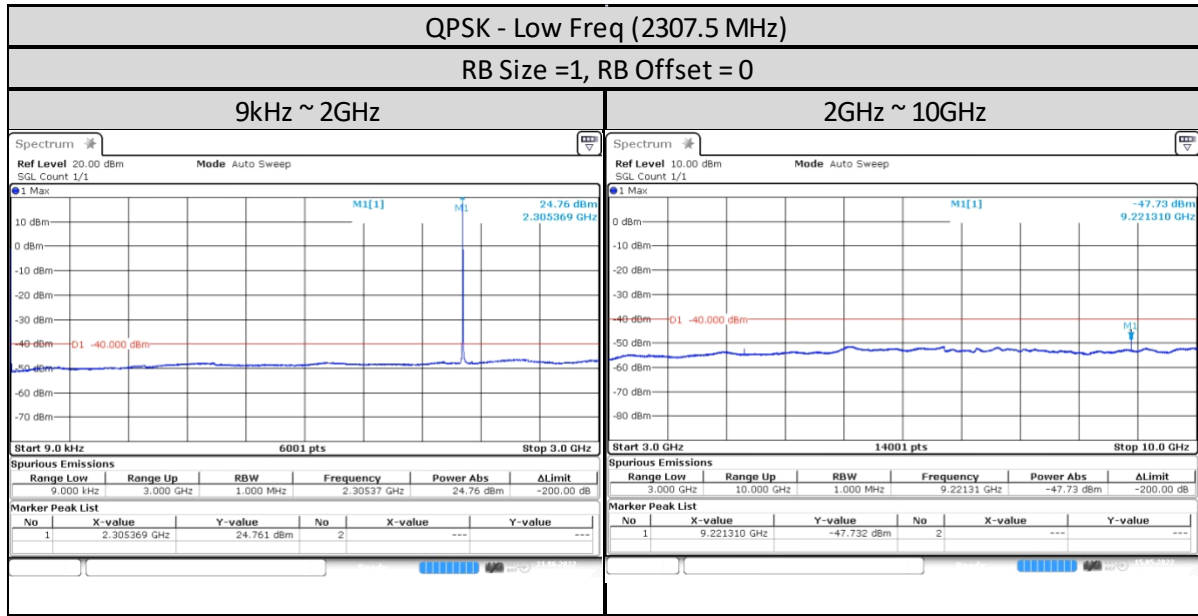
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of lowest, middle and highest channels with the highest RF powers were measured.
- 6) Record the maximum trace plot into the test report.

### 1.10.2. Test Limit

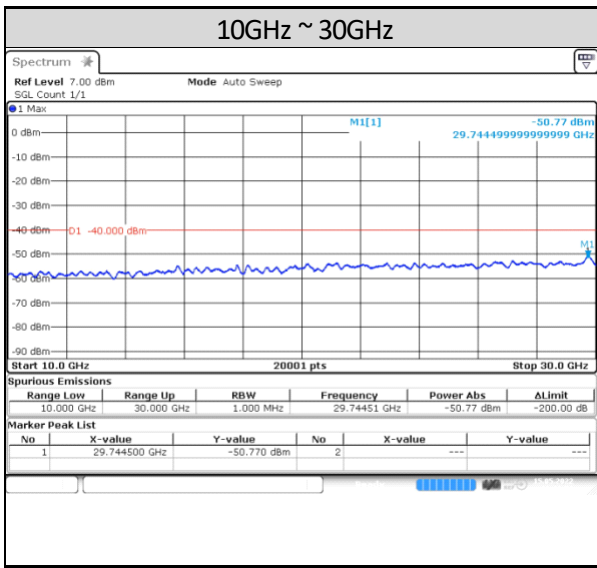
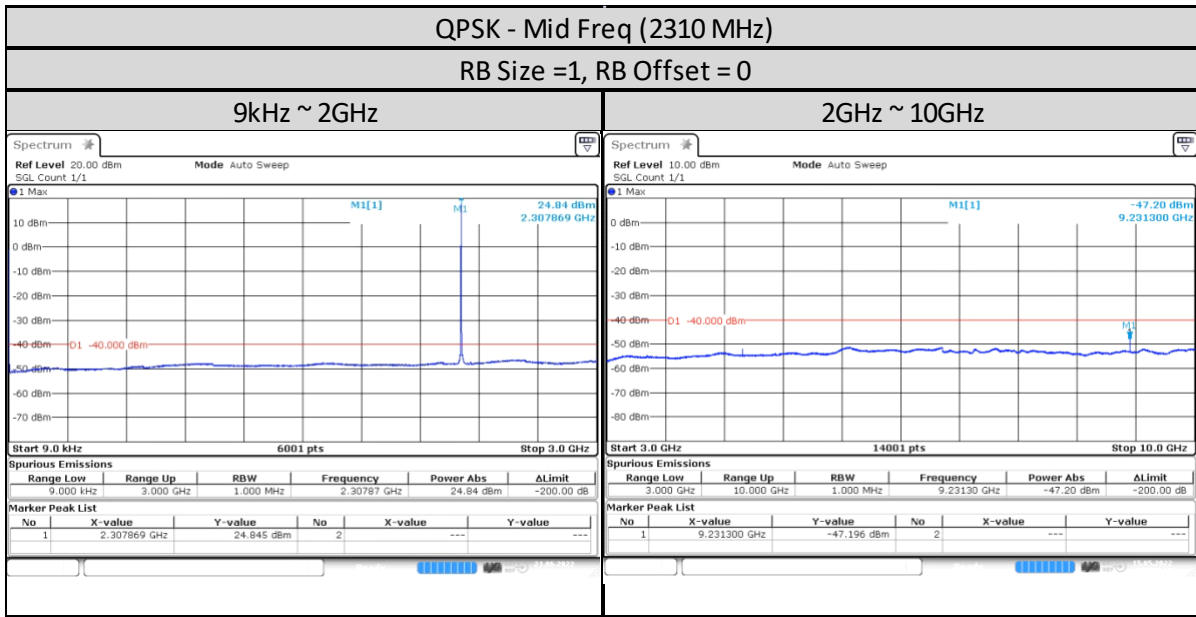
For operations in the 1710-1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB. The measurement instrumentation is employing a resolution bandwidth of 1 megahertz or greater.

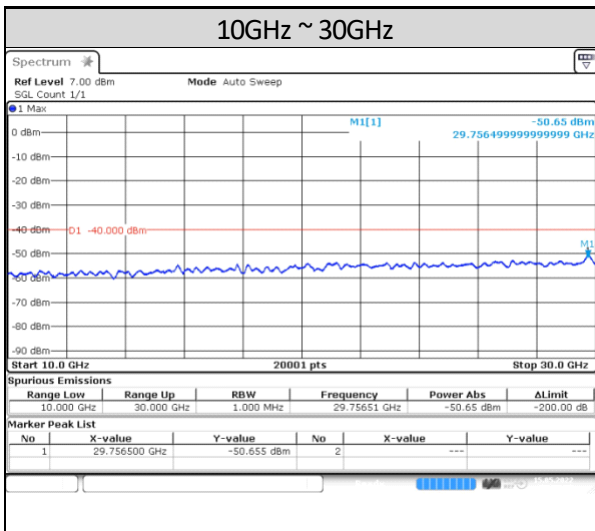
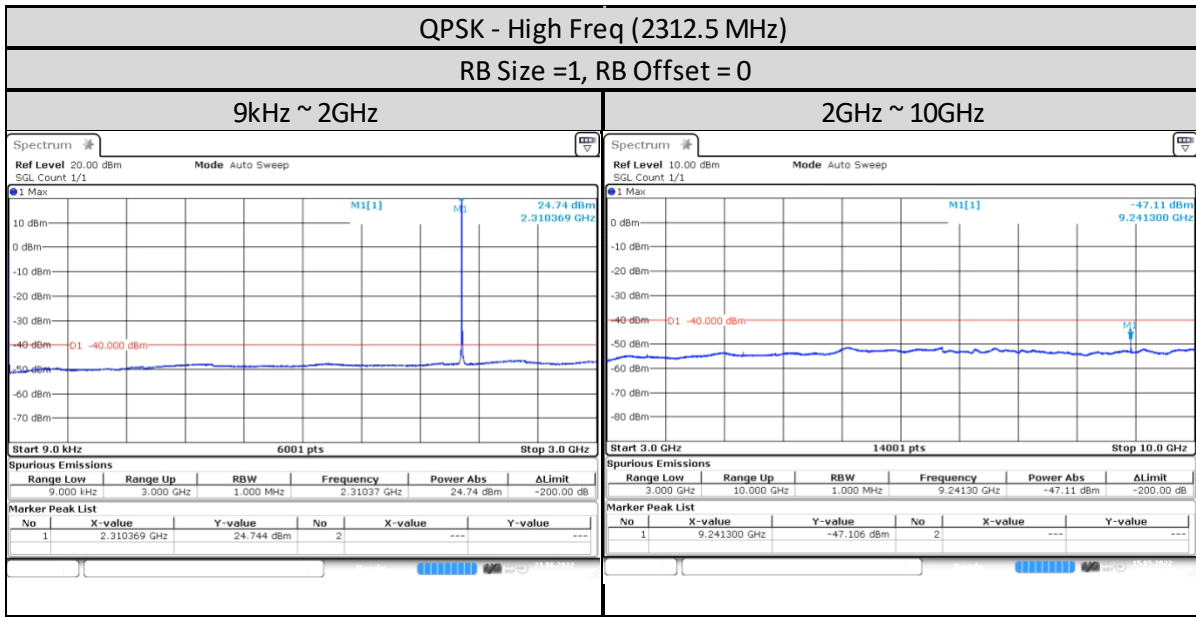
### 1.10.3. Conducted Spurious Emissions – LTE Band 30 (2305-2315MHz)

**5MHz**

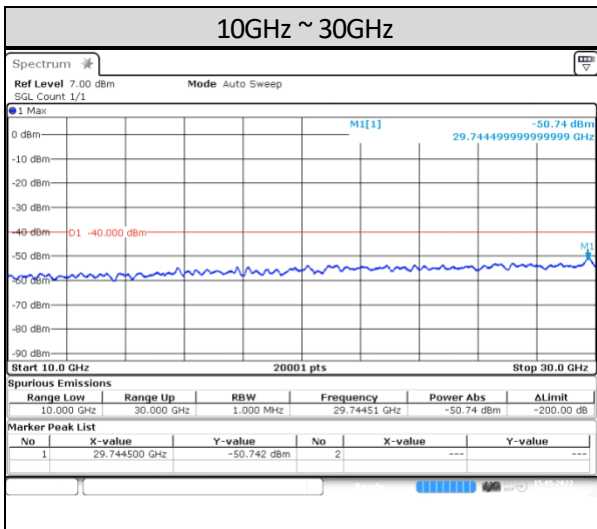
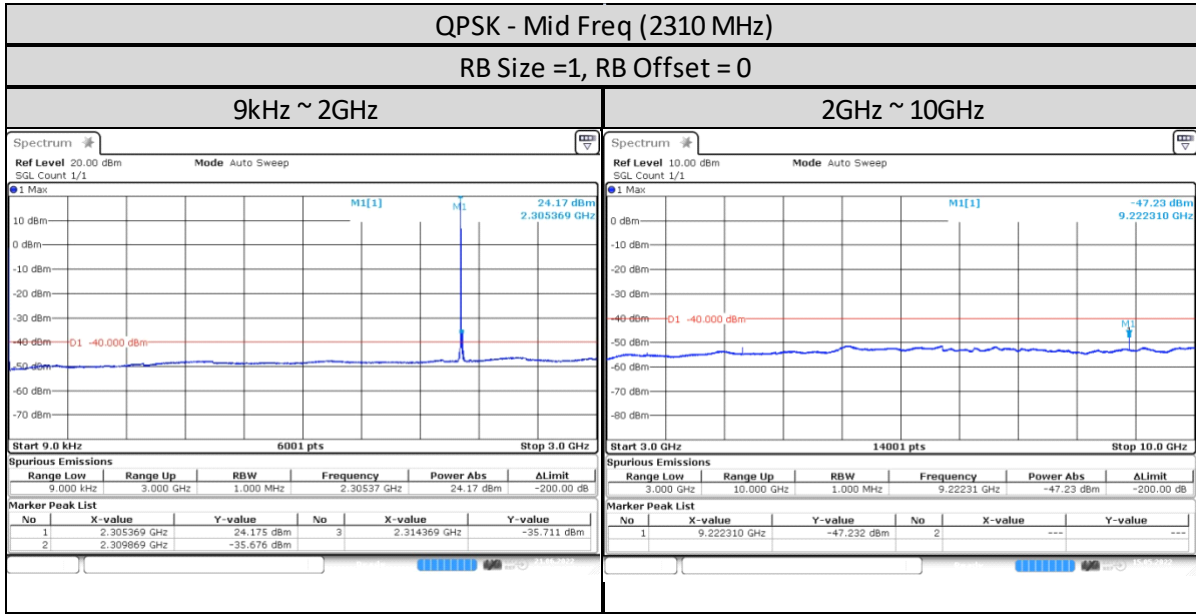






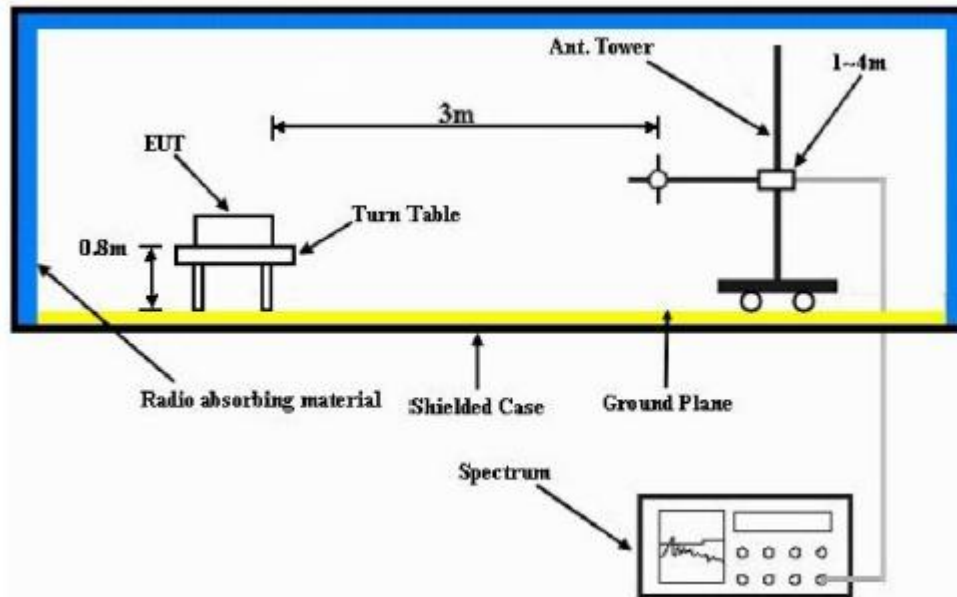


**10MHz**



## 1.11. Radiated Spurious Emission

### 1.11.1. Test Setup



- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the Turn Table at 0.8m height for below 1Ghz measurement and at 1.5m height for above 1GHz measurement, 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 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

### 1.11.2. Test Limit

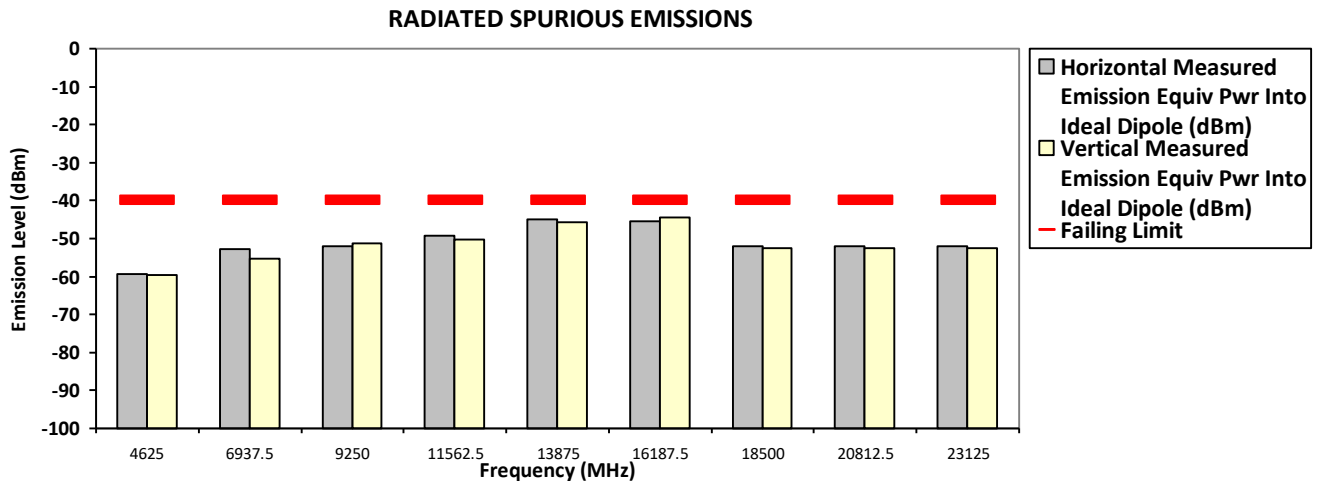
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB. The emission limit equal to -13dBm.

### 1.11.3. Radiated Spurious Emission – LTE Band 30 (2305-2315MHz)

**SAC Transmitter Radiated Emission:**

Model Number: AAH90UCU9RH1AN      S/N: 734TYF0069      SR:27331-EMC-00035  
 Battery Part No: PMNN4805A      Accy Part No: AN000415A01  
 Test Mode: TX LTE (Band 30) X-Plane  
 2312.500000 MHz (High)      Bandwidth 5MHz      0.252 Watt(s) /Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
4625.0000	-40.0000	-59.3148 **	-59.7035 **
6937.5000	-40.0000	-52.8590 **	-55.2335 **
9250.0000	-40.0000	-51.9236 **	-51.1578 **
11562.5000	-40.0000	-49.1358 **	-50.2801 **
13875.0000	-40.0000	-44.9137 **	-45.7632 **
16187.5000	-40.0000	-45.5527 **	-44.5145 **
18500.0000	-40.0000	-52.0117 **	-52.4381 **
20812.5000	-40.0000	-52.0117 **	-52.4381 **
23125.0000	-40.0000	-52.0117 **	-52.4381 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.  
 Motorola Penang EMC Lab - Test Performed by: Azil&Qawiman      Sat, 23 Apr, 2022

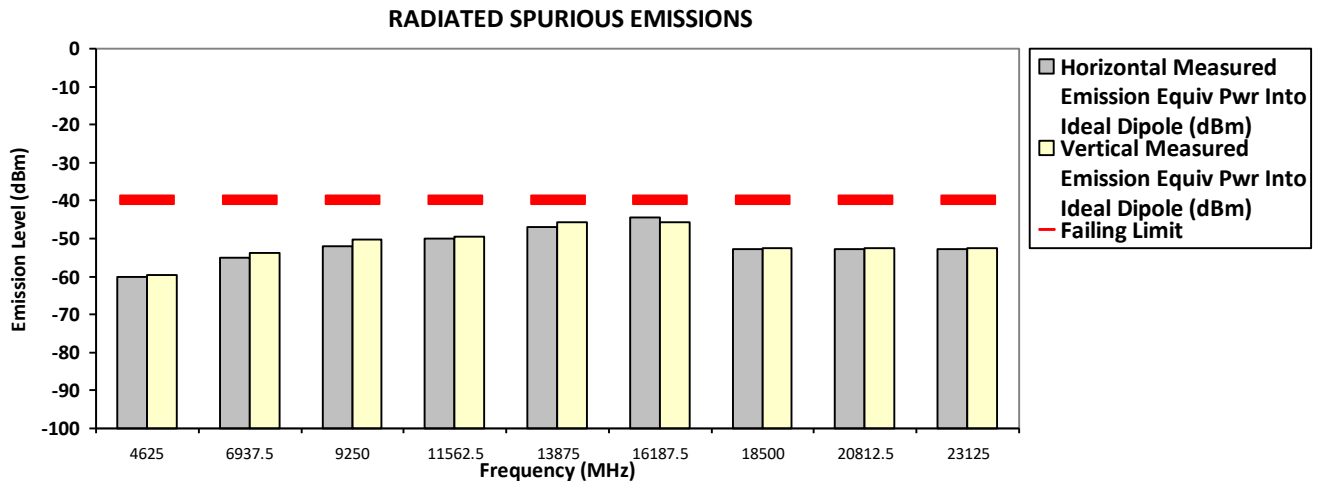
Remarks: \*\* Indicates the spurious emission could not be detected due to noise limitations or ambient.  
 \*Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported  
 Temp(Deg): 23.3 Hum(%RH): 69.3

System MU: 4.03 dB

Remarks: Passed Results Marginal Results Failed Results

**SAC Transmitter Radiated Emission:**  
**Model Number: AAH90UCU9RH1AN**      **S/N: 734TYF0069**      **SR:27331-EMC-00035**  
**Battery Part No: PMNN4805A**      **Accy Part No: AN000415A01**  
**Test Mode: TX LTE (Band 30) Y-Plane**  
**2312.500000 MHz (High)**      **Bandwidth 5MHz**      **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
4625.0000	-40.0000	-60.0008 **	-59.6986 **
6937.5000	-40.0000	-55.1001 **	-53.9048 **
9250.0000	-40.0000	-52.0195 **	-50.2654 **
11562.5000	-40.0000	-50.0270 **	-49.3808 **
13875.0000	-40.0000	-47.0579 **	-45.8235 **
16187.5000	-40.0000	-44.3739 **	-45.8314 **
18500.0000	-40.0000	-52.8518 **	-52.6098 **
20812.5000	-40.0000	-52.8518 **	-52.6098 **
23125.0000	-40.0000	-52.8518 **	-52.6098 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.  
 Motorola Penang EMC Lab - Test Performed by: Azil&Qawiman      Sat, 23 Apr, 2022

Remarks: \*\* Indicates the spurious emission could not be detected due to noise limitations or ambient.  
 \*Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported  
 Temp(Deg): 23.3 Hum(%RH): 69.3

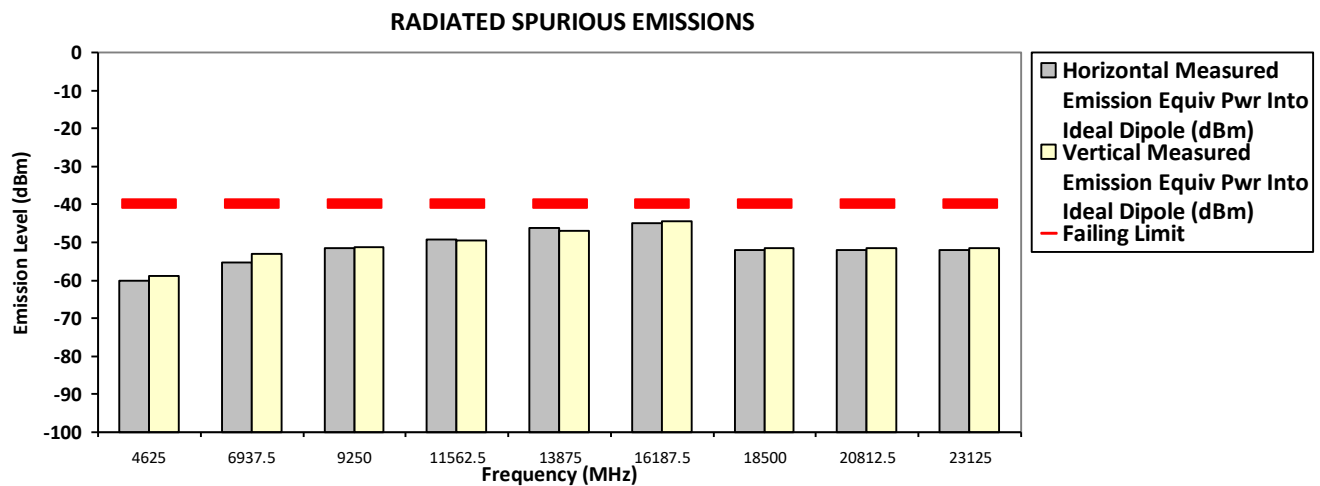
System MU: 4.03 dB

Remarks: 

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

**SAC Transmitter Radiated Emission:**  
**Model Number: AAH90UCU9RH1AN**      **S/N: 734TYF0069**      **SR:27331-EMC-00035**  
**Battery Part No: PMNN4805A**      **Accy Part No: AN000415A01**  
**Test Mode: TX LTE (Band 30) Z-Plane**  
**2312.500000 MHz (High)**      **Bandwidth 5MHz**      **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
4625.0000	-40.0000	-60.1417 **	-58.7161 **
6937.5000	-40.0000	-55.3093 **	-53.0959 **
9250.0000	-40.0000	-51.4200 **	-51.3868 **
11562.5000	-40.0000	-49.3502 **	-49.4594 **
13875.0000	-40.0000	-46.3298 **	-46.9361 **
16187.5000	-40.0000	-44.9503 **	-44.5582 **
18500.0000	-40.0000	-52.1315 **	-51.5880 **
20812.5000	-40.0000	-52.1315 **	-51.5880 **
23125.0000	-40.0000	-52.1315 **	-51.5880 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.  
 Motorola Penang EMC Lab - Test Performed by: Azil&Qawiman      Sat, 23 Apr, 2022

Remarks: \*\* Indicates the spurious emission could not be detected due to noise limitations or ambient.  
 \*Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported  
 Temp(Deg): 23.3 Hum(%RH): 69.3

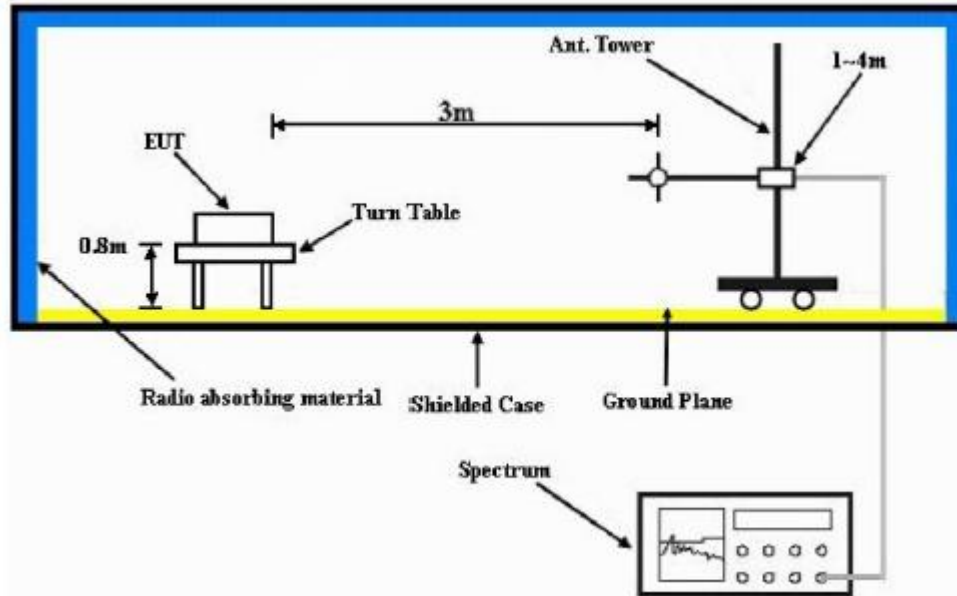
System MU: 4.03 dB

Remarks: 

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

## 1.12. Equivalent Isotropically Radiated Power (EIRP)

### 1.12.1. Test Setup



- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the Turn Table at 0.8m height for below 1GHz measurement and at 1.5m height for above 1GHz measurement, 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 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4)  $EIRP = \text{“Read Value”} + \text{Measured substitution value.}$

### 1.12.2. Test Limit

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

### 1.12.3. Equivalent Isotropically Radiated Power (EIRP) - LTE Band 30 (2305-2315MHz)

**Not Performed.**

--End of Test Report--