 <p>CERTIFICATE 2518.08</p> <p>MS ISO/IEC 17025 TESTING SAMM NO. 0825</p>
<p>MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn Bhd, Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.</p>	<p>FCC / ISED TEST REPORT Report Revision : Rev.B</p>
<p>Date/s Tested : 02-August-2022 - 17-August-2022 Manufacturer/Location : Motorola Solutions Malaysia Sdn Bhd Manufacturer Address : Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia Requestor : CADOGAN SEAN Product Type : Hand-held Product Version (PMN) : APX N70 Model Number (HVIN) : H35UCT9PW8AN Frequency Band : Refer to section 1.4 Applicant Name : Motorola Solutions Inc Applicant Address : 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322. FCC Registrations : 461337 ISED Registrations : MY0001 Firmware Version (FVIN) : D00.00.45</p> <p>The equipment was tested accordance to the requirement listed below:</p> <p>(LTE Band 2) FCC 47 CFR Part 2 / 24 PASS ISED RSS GEN / 133</p>	
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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
- Test Mode Applicability and Tested Channel Detail 6
- 1.5. Conducted RF Output Power 9
 - 1.5.1. Test Setup..... 9
 - 1.5.2. Limits 9
 - 1.5.3. Conducted RF Output Power – LTE Band 2(1850-1910MHz) 9
 - 1.5.4. Equivalent Isotropically Radiated Power (EIRP) – LTE Band 2(1850-1910MHz)..... 12
- 1.1. Peak-to-Average Power Ratio..... 15
 - 1.1.1. Test Setup..... 15
 - 1.1.2. Test Limit 15
 - 1.1.3. Peak-to-Average Power Ratio – LTE Band 2(1850-1910MHz)..... 15
- 1.2. Occupied Bandwidth..... 19
 - 1.2.1. Test Setup..... 19
 - 1.2.2. Test Limit 19
 - 1.2.3. Occupied Bandwidth – LTE Band 2 (1850 -1910 MHz) 20
- 1.3. Frequency Stability 30
 - 1.3.1. Test Setup..... 30
 - 1.3.2. Test Limit 30
 - 1.3.3. Frequency Stability – LTE Band 2 (1850 -1910 MHz) 31
- 1.4. Band Edge Conducted Spurious Emission 37
 - 1.4.1. Test Setup..... 37
 - 1.4.2. Test Limit 37
 - 1.4.3. Band Edge Conducted Spurious Emission – LTE Band 2 (1850 -1910 MHz)..... 37
- 1.5. Conducted Spurious Emission 50
 - 1.5.1. Test Setup..... 50
 - 1.5.2. Test Limit 50
 - 1.5.3. Conducted Spurious Emissions – LTE Band 2 (1850 -1910 MHz)..... 51
- 1.6. Radiated Spurious Emission 69
 - 1.6.1. Test Setup..... 69
 - 1.6.2. Test Limit 69
 - 1.6.3. Radiated Spurious Emission – LTE Band 2 (1850-1910MHz) 70
- 1.7. Equivalent Isotropically Radiated Power (EIRP) 79
 - 1.7.1. Test Setup..... 79
 - 1.7.2. Test Limit 79
 - 1.7.3. Equivalent Isotropically Radiated Power (EIRP) - LTE Band 2 (1850-1910MHz) 79

REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	25-August-2022	Lim Khay Kwang
Rev B.	Updated EIRP table description B4 to B2	23-September-2022	Lim Khay Kwang

1.0 Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks	Serial Number Tested
2.1046 24.232(e)	RSS-Gen 6.12 RSS-133 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit	022TYP0011
24.232(d)	RSS-133 6.4	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	022TYP0011
2.1049 24.238(b)	RSS-Gen 6.6 RSS-133 2.3	Occupied Bandwidth (26dBc, 20dBc, 99%)	Pass	Meet the requirement of limit	022TYP0011
2.1055 24.235	RSS-Gen 6.11 RSS-133 6.3	Frequency Stability	Pass	Meet the requirement of limit	022TYP0011
2.1051 24.238(a)(b)	RSS-Gen 6.13 RSS-133 6.5	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	022TYP0011
2.1051 24.238(a)(b)	RSS-Gen 6.13 RSS-133 6.5	Conducted Spurious Emissions	Pass	Meet the requirement of limit	022TYP0011
2.1053 24.236, 24.238	RSS-133 6.5	Radiated Spurious Emission: -32.1101 dBm (NF)	Pass	Meet the requirement of limit	022TYP0004
24.232 (c)	RSS-133 6.4	Equivalent Isotropically Radiated Power (EIRP)	NA	NA	NA

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 v1.9.8				
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	3541A02565	29-Jun-22	29-Jun-23
Radiated Spurious Emission (EMC Chamber 1); Test Software Version: EMC_FCC_RE_v1.6.4				
Drg Horn Freq.	SAS-571	720	06-Apr-21	06-Apr-23
Drg Horn Freq.	SAS-571	719	13-Sep-21	13-Sep-22
Advanced Power System - Dynamic Dc Power Supply, 120v, 16.7a, 2000w	N7976A	MY53410110	30-Jun-22	30-Jun-23

Signal Generator	SMB 100A	182511	04-Jun-21	04-Jun-24
Emi Test Receiver	ESW44	101731	05-Nov-21	05-Nov-22
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
Bilog Antenna	CBL6112B	2863	22-Jun-22	22-Jun-23
Bilog Antenna	CBL6112D	30991	05-Oct-21	05-Oct-22
Data Logger Thermohyrometer	SDL500	A.016785	23-Jun-22	23-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	BBHA9170255	18-Feb-22	18-Feb-23
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	08-Oct-21	08-Oct-22
Test Software	EMC_FCC_IC_BLUETOOTH_RE_TEST			

1.3. General Information

General Description of EUT

Product	ALOHA		
Brand	Motorola Solutions		
Test Model	H35UCT9PW8AN		
Power Supply Rating	7.5Vdc		
Mode of operation	LTE Band 2		
Modulation Type	QPSK, 16QAM		
Operating Frequency	LTE Band 2	Channel Bandwidth 1.4MHz	1850.7MHz~1909.3MHz
		Channel Bandwidth 3MHz	1851.5MHz~1908.5MHz
		Channel Bandwidth 5MHz	1852.5MHz~1907.5MHz
		Channel Bandwidth 10MHz	1855.0MHz~1905.0MHz
		Channel Bandwidth 15MHz	1857.5MHz~1902.5MHz
		Channel Bandwidth 20MHz	1860.0MHz~1900.0MHz
Max. Conducted Power	LTE Band 2 QPSK	Channel Bandwidth 1.4MHz	23.148dBm (0.206W)
		Channel Bandwidth 3MHz	23.128dBm (0.205W)
		Channel Bandwidth 5MHz	23.133dBm (0.206W)
		Channel Bandwidth 10MHz	23.346dBm (0.216W)
		Channel Bandwidth 15MHz	23.246dBm (0.211W)
		Channel Bandwidth 20MHz	23.169dBm (0.207W)
	LTE Band 2 16QAM	Channel Bandwidth 1.4MHz	22.268dBm (0.169W)
		Channel Bandwidth 3MHz	22.275dBm (0.169W)
		Channel Bandwidth 5MHz	22.281dBm (0.169W)
		Channel Bandwidth 10MHz	22.438dBm (0.175W)
		Channel Bandwidth 15MHz	22.522dBm (0.179W)
		Channel Bandwidth 20MHz	22.557dBm (0.180W)
Emission Designator	LTE Band 2		QPSK 16QAM
		Channel Bandwidth 1.4MHz	1M07G7D 1M07D7W

		Channel Bandwidth 3MHz	2M68G7D	2M68D7W
		Channel Bandwidth 5MHz	4M47G7D	4M47D7W
		Channel Bandwidth 10MHz	8M93G7D	8M93D7W
		Channel Bandwidth 15MHz	13M4G7D	13M4D7W
		Channel Bandwidth 20MHz	17M9G7D	17M8D7W
Antenna Type	LTE Band 2	LTE MID-HIGH BAND MAIN ANTENNA (1.1dBi)		
SW Version	D00.00.45			
HW Version	P1			

Note:

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

Item	Brand	Model or P/N	Specification
Li-Ion	Motorola	PMNN4817A	Hi Cap 4400mAH (using RN 2170 Li-Ion cell) Non-UL battery

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 24**
- KDB 971168 D01 Power Meas License Digital Systems v03r01**
- ANSI C63.26-2015**

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 2	1.4 MHz	18607 ~ 19193	18607	18900	19193	1850.7	1880.0	1909.3
	3 MHz	18615 ~ 19185	18615	18900	19185	1851.5	1880.0	1908.5
	5 MHz	18625 ~ 19175	18625	18900	19175	1852.5	1880.0	1907.5
	10 MHz	18650 ~ 19150	18650	18900	19150	1855.0	1880.0	1905.0
	15 MHz	18675 ~ 19125	18675	18900	19125	1857.5	1880.0	1902.5
	20 MHz	18700 ~ 19100	18700	18900	19100	1860.0	1880.0	1900.0

Test Mode Applicability and Tested Channel Detail

LTE Band 2

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Uplink Modulation	Mode
Conducted RF Output Power	18607 ~ 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	As per table 1.6.3
	18615 ~ 19185	18615, 18900, 19185	3 MHz		
	18625 ~ 19175	18625, 18900, 19175	5 MHz		
	18650 ~ 19150	18650, 18900, 19150	10 MHz		
	18675 ~ 19125	18675, 18900, 19125	15 MHz		
	18700 ~ 19100	18700, 18900, 19100	20 MHz		
Peak to Average Power Ratio	18607 ~ 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	18615 ~ 19185	18615, 18900, 19185	3 MHz		15 RB / 0 RB Offset
	18625 ~ 19175	18625, 18900, 19175	5 MHz		25 RB / 0 RB Offset
	18650 ~ 19150	18650, 18900, 19150	10 MHz		50 RB / 0 RB Offset
	18675 ~ 19125	18675, 18900, 19125	15 MHz		75 RB / 0 RB Offset
	18700 ~ 19100	18700, 18900, 19100	20 MHz		100 RB / 0 RB Offset
Occupied Bandwidth	18607 ~ 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	18615 ~ 19185	18615, 18900, 19185	3 MHz		15 RB / 0 RB Offset
	18625 ~ 19175	18625, 18900, 19175	5 MHz		25 RB / 0 RB Offset
	18650 ~ 19150	18650, 18900, 19150	10 MHz		50 RB / 0 RB Offset
	18675 ~ 19125	18675, 18900, 19125	15 MHz		75 RB / 0 RB Offset
	18700 ~ 19100	18700, 18900, 19100	20 MHz		100 RB / 0 RB Offset
Frequency Stability	18607 ~ 19193	18607, 19193	1.4 MHz	QPSK	6 RB / 0 RB Offset
	18615 ~ 19185	18615, 19185	3 MHz		15 RB / 0 RB Offset
	18625 ~ 19175	18625, 19175	5 MHz		25 RB / 0 RB Offset
	18650 ~ 19150	18650, 19150	10 MHz		50 RB / 0 RB Offset
	18675 ~ 19125	18675, 19125	15 MHz		75 RB / 0 RB Offset
	18700 ~ 19100	18700, 19100	20 MHz		100 RB / 0 RB Offset
Band Edge Conducted Spurious Emission	18607 ~ 19193	18607, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	18615 ~ 19185	18615, 19185	3 MHz		1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset

	18625 ~ 19175	18625, 19175	5 MHz		1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	18650 ~ 19150	18650, 19150	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
	18675 ~ 19125	18675, 19125	15 MHz		1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
	18700 ~ 19100	18700, 19100	20 MHz		1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
Conducted Spurious Emission	18607 ~ 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 3 RB Offset
	18615 ~ 19185	18615, 18900, 19185	3 MHz		1 RB / 0 RB Offset
	18625 ~ 19175	18625, 18900, 19175	5 MHz		1 RB / 0 RB Offset
	18650 ~ 19150	18650, 18900, 19150	10 MHz		1 RB / 0 RB Offset
	18675 ~ 19125	18675, 18900, 19125	15 MHz		1 RB / 0 RB Offset
	18700 ~ 19100	18700, 18900, 19100	20 MHz		1 RB / 0 RB Offset
Radiated Spurious Emission	18650 ~ 19150	18650	10 MHz	QPSK	1 RB / 0 RB Offset
	18700 ~ 19100	18900	5 MHz		1 RB / 0 RB Offset
	18675 ~ 19125	19125	10 MHz		1 RB / 0 RB Offset
Equivalent Isotropically Radiated Power (EIRP)	18607 ~ 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	As per table 1.6.4
	18615 ~ 19185	18615, 18900, 19185	3 MHz		
	18625 ~ 19175	18625, 18900, 19175	5 MHz		
	18650 ~ 19150	18650, 18900, 19150	10 MHz		
	18675 ~ 19125	18675, 18900, 19125	15 MHz		
	18700 ~ 19100	18700, 18900, 19100	20 MHz		

NOTE:

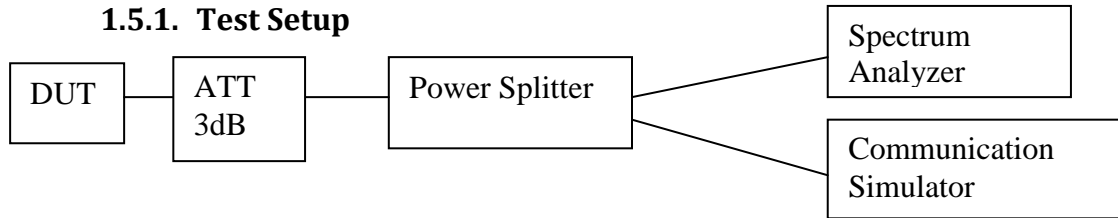
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating 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.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
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	Qawiman&Nazrin
Equivalent Isotropically Radiated Power (EIRP)	25°C, 50% RH	7.5V DC	Khay Kwang

1.5. Conducted RF Output Power

1.5.1. 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.

1.5.2. Limits

FCC: Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

ISED: Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

1.5.3. Conducted RF Output Power – LTE Band 2(1850-1910MHz)

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
			18607	18900	19193	18607	18900	19193
			1850.7 MHz	1880.0 MHz	1909.3 MHz	1850.7 MHz	1880.0 MHz	1909.3 MHz
Band 2 / 1.4 MHz	1	0	22.524	23.03	23.123	21.498	21.985	22.102
	1	3	22.562	23.054	23.148	21.525	21.984	22.135
	1	5	22.499	22.965	23.103	21.492	21.914	22.07
	3	0	22.471	22.984	23.08	21.661	21.838	22.257
	3	2	22.514	22.981	23.095	21.713	21.852	22.268
	3	3	22.499	22.905	23.074	21.695	21.801	22.249
	6	0	21.45	21.866	22.02	20.521	20.786	21.097

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
			18615	18900	19185	18615	18900	19185
			1851.5 MHz	1880.0 MHz	1908.5 MHz	1851.5 MHz	1880.0 MHz	1908.5 MHz
Band 2 / 3MHz	1	0	22.572	22.897	23.128	21.58	22.275	22.125
	1	7	22.562	22.843	23.04	21.495	22.261	22.121
	1	14	22.51	22.857	23.007	21.472	22.139	22.019
	8	0	21.539	21.922	22.036	20.57	21.063	20.974
	8	4	21.53	21.877	22.007	20.589	21.017	20.963
	8	7	21.52	21.842	21.978	20.544	20.968	20.957
	15	0	21.526	21.918	21.986	20.554	20.913	20.966

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
			18625	18900	19175	18625	18900	19175
			1852.5MHz	1880.0MHz	1907.5MHz	1852.5MHz	1880.0MHz	1907.5MHz
Band 2 / 5MHz	1	0	22.678	23.097	23.133	21.7	22.281	22.119
	1	13	22.534	22.968	23.024	21.608	22.184	22.002
	1	25	22.569	23.046	22.988	21.637	22.233	21.972
	12	0	21.635	22.03	22.114	20.61	21.019	21.113
	12	6	21.563	21.947	22.065	20.541	20.931	21.054
	12	13	21.498	21.97	22.008	20.473	20.935	21.013
	25	0	21.589	21.944	22.085	20.579	20.905	21.049

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
			18650	18900	19150	18650	18900	19150
			1855.0MHz	1880.0MHz	1905.0MHz	1855.0MHz	1880.0MHz	1905.0MHz
Band 2 / 10MHz	1	0	22.858	23.057	23.346	21.805	22.438	22.395
	1	25	22.773	22.881	23.231	21.644	22.272	22.248
	1	49	22.82	23.005	23.19	21.692	22.334	22.308
	25	0	21.569	21.907	22.182	20.683	20.916	21.253
	25	13	21.601	21.883	22.15	20.672	20.9	21.195
	25	25	21.514	21.972	22.175	20.59	21.022	21.204
	50	0	21.604	21.883	22.129	20.657	20.863	21.111

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
			18675	18900	19125	18675	18900	19125
			1857.5MHz	1880.0MHz	1902.5MHz	1857.5MHz	1880.0MHz	1902.5MHz
Band 2 / 15MHz	1	0	22.762	23.034	23.246	21.791	22.385	22.518
	1	38	22.654	22.8	22.979	21.61	22.143	22.274
	1	74	22.802	23.058	23.234	21.77	22.388	22.522
	36	0	21.586	21.904	21.949	20.668	20.907	20.975
	36	19	21.589	21.883	22.036	20.666	20.88	21.069
	36	39	21.607	21.913	22.088	20.687	20.952	21.117
	75	0	21.601	21.882	22.012	20.682	20.946	21.046

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
			18700	18900	19100	18700	18900	19100
			1860.0MHz	1880.0MHz	1900.0MHz	1860.0MHz	1880.0MHz	1900.0MHz
Band 2 / 20MHz	1	0	22.7	22.93	23.169	21.675	22.503	22.557
	1	49	22.601	22.841	22.986	21.57	22.378	22.359
	1	99	22.48	22.703	22.847	21.418	22.247	22.253
	50	0	21.705	21.904	22.115	20.695	20.862	21.101
	50	25	21.629	21.91	22.141	20.613	20.887	21.151
	50	50	21.573	21.83	22.054	20.559	20.853	21.058
	100	0	21.626	21.885	22.111	20.646	20.887	21.148

1.5.4. Equivalent Isotropically Radiated Power (EIRP) – LTE Band 2(1850-1910MHz)

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18607	18900	19193	18607	18900	19193
			1850.7 MHz	1880.0 MHz	1909.3 MHz	1850.7 MHz	1880.0 MHz	1909.3 MHz
Band 2 / 1.4 MHz	1	0	23.624	24.13	24.223	22.598	23.085	23.202
	1	3	23.662	24.154	24.248	22.625	23.084	23.235
	1	5	23.599	24.065	24.203	22.592	23.014	23.17
	3	0	23.571	24.084	24.18	22.761	22.938	23.357
	3	2	23.614	24.081	24.195	22.813	22.952	23.368
	3	3	23.599	24.005	24.174	22.795	22.901	23.349
	6	0	22.55	22.966	23.12	21.621	21.886	22.197

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18615	18900	19185	18615	18900	19185
			1851.5 MHz	1880.0 MHz	1908.5 MHz	1851.5 MHz	1880.0 MHz	1908.5 MHz
Band 2 / 3MHz	1	0	23.672	23.997	24.228	22.68	23.375	23.225
	1	7	23.662	23.943	24.14	22.595	23.361	23.221
	1	14	23.61	23.957	24.107	22.572	23.239	23.119
	8	0	22.639	23.022	23.136	21.67	22.163	22.074
	8	4	22.63	22.977	23.107	21.689	22.117	22.063
	8	7	22.62	22.942	23.078	21.644	22.068	22.057
	15	0	22.626	23.018	23.086	21.654	22.013	22.066

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18625	18900	19175	18625	18900	19175
			1852.5MHz	1880.0MHz	1907.5MHz	1852.5MHz	1880.0MHz	1907.5MHz
Band 2 / 5MHz	1	0	23.778	24.197	24.233	22.8	23.381	23.219
	1	13	23.634	24.068	24.124	22.708	23.284	23.102
	1	25	23.669	24.146	24.088	22.737	23.333	23.072
	12	0	22.735	23.13	23.214	21.71	22.119	22.213
	12	6	22.663	23.047	23.165	21.641	22.031	22.154
	12	13	22.598	23.07	23.108	21.573	22.035	22.113
	25	0	22.689	23.044	23.185	21.679	22.005	22.149

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18650	18900	19150	18650	18900	19150
			1855.0MHz	1880.0MHz	1905.0MHz	1855.0MHz	1880.0MHz	1905.0MHz
Band 2 / 10MHz	1	0	23.958	24.157	24.446	22.905	23.538	23.495
	1	25	23.873	23.981	24.331	22.744	23.372	23.348
	1	49	23.92	24.105	24.29	22.792	23.434	23.408
	25	0	22.669	23.007	23.282	21.783	22.016	22.353
	25	13	22.701	22.983	23.25	21.772	22	22.295
	25	25	22.614	23.072	23.275	21.69	22.122	22.304
	50	0	22.704	22.983	23.229	21.757	21.963	22.211

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18675	18900	19125	18675	18900	19125
			1857.5MHz	1880.0MHz	1902.5MHz	1857.5MHz	1880.0MHz	1902.5MHz
Band 2 / 15MHz	1	0	23.862	24.134	24.346	22.891	23.485	23.618
	1	38	23.754	23.9	24.079	22.71	23.243	23.374
	1	74	23.902	24.158	24.334	22.87	23.488	23.622
	36	0	22.686	23.004	23.049	21.768	22.007	22.075
	36	19	22.689	22.983	23.136	21.766	21.98	22.169
	36	39	22.707	23.013	23.188	21.787	22.052	22.217
	75	0	22.701	22.982	23.112	21.782	22.046	22.146

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			18700	18900	19100	18700	18900	19100
			1860.0MHz	1880.0MHz	1900.0MHz	1860.0MHz	1880.0MHz	1900.0MHz
Band 2 / 20MHz	1	0	23.8	24.03	24.269	22.775	23.603	23.657
	1	49	23.701	23.941	24.086	22.67	23.478	23.459
	1	99	23.58	23.803	23.947	22.518	23.347	23.353
	50	0	22.805	23.004	23.215	21.795	21.962	22.201
	50	25	22.729	23.01	23.241	21.713	21.987	22.251
	50	50	22.673	22.93	23.154	21.659	21.953	22.158
	100	0	22.726	22.985	23.211	21.746	21.987	22.248

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

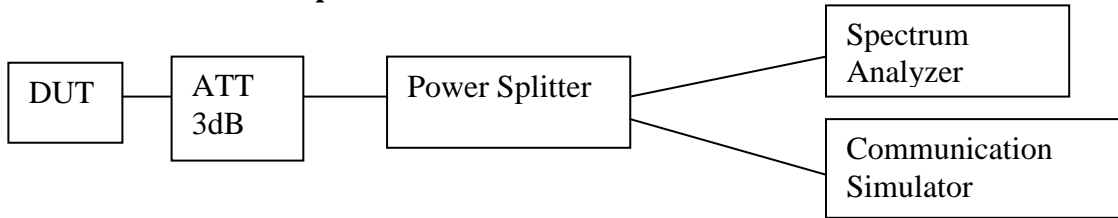
(Expressed in the same units as P_{Meas}, e.g., dBm)

P_{Meas} measured transmitter output power, in dBm

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

1.1. Peak-to-Average Power Ratio

1.1.1. Test Setup



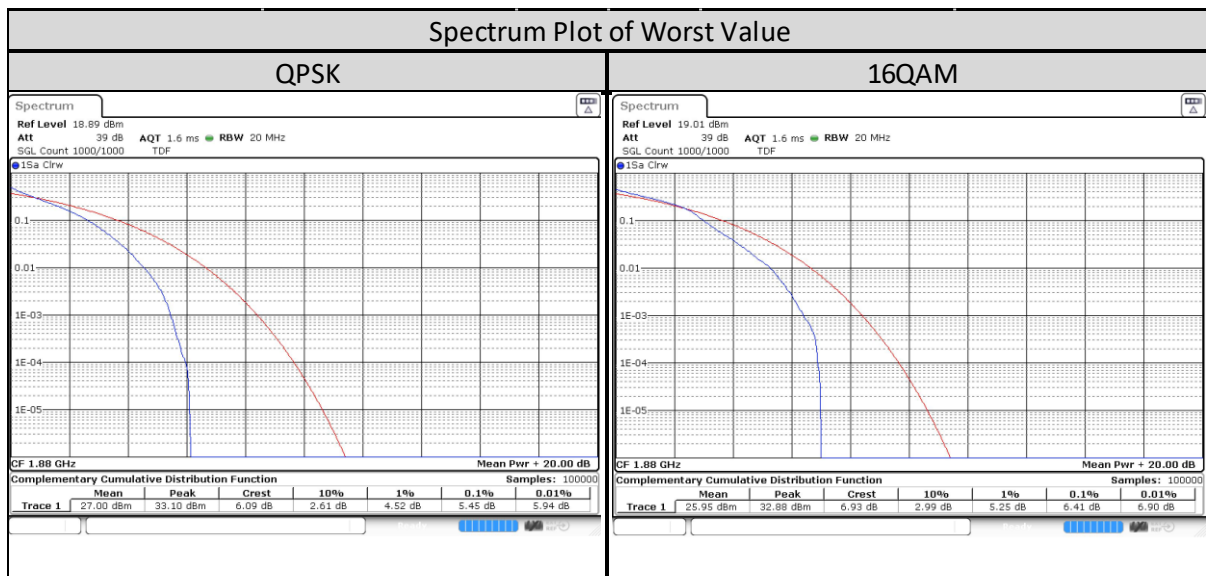
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.
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.

1.1.2. Test Limit

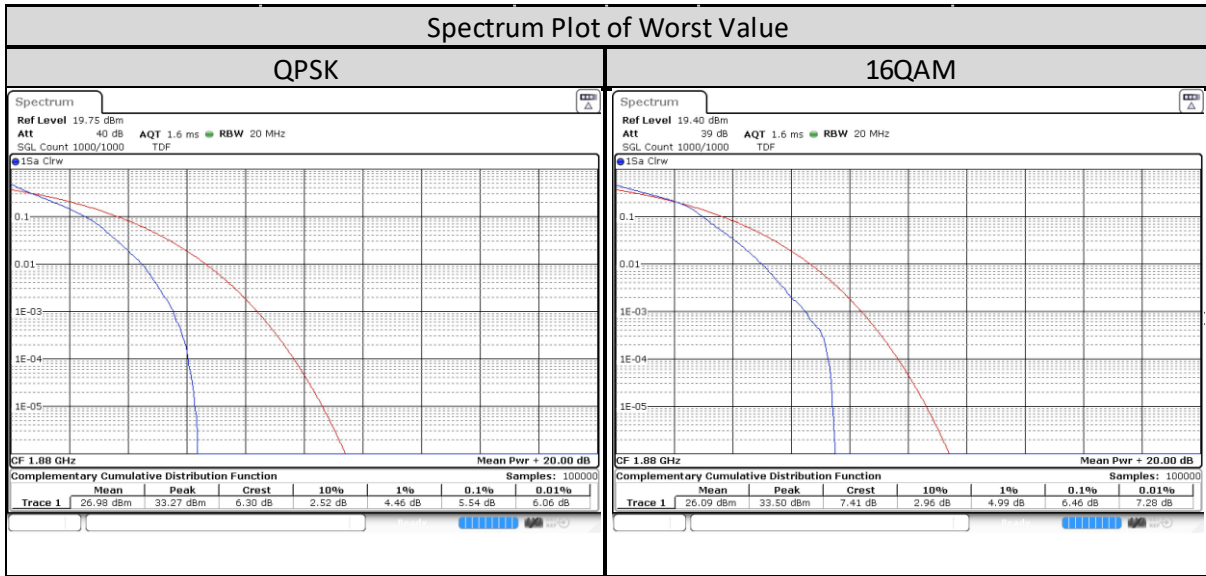
In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

1.1.3. Peak-to-Average Power Ratio - LTE Band 2(1850-1910MHz)

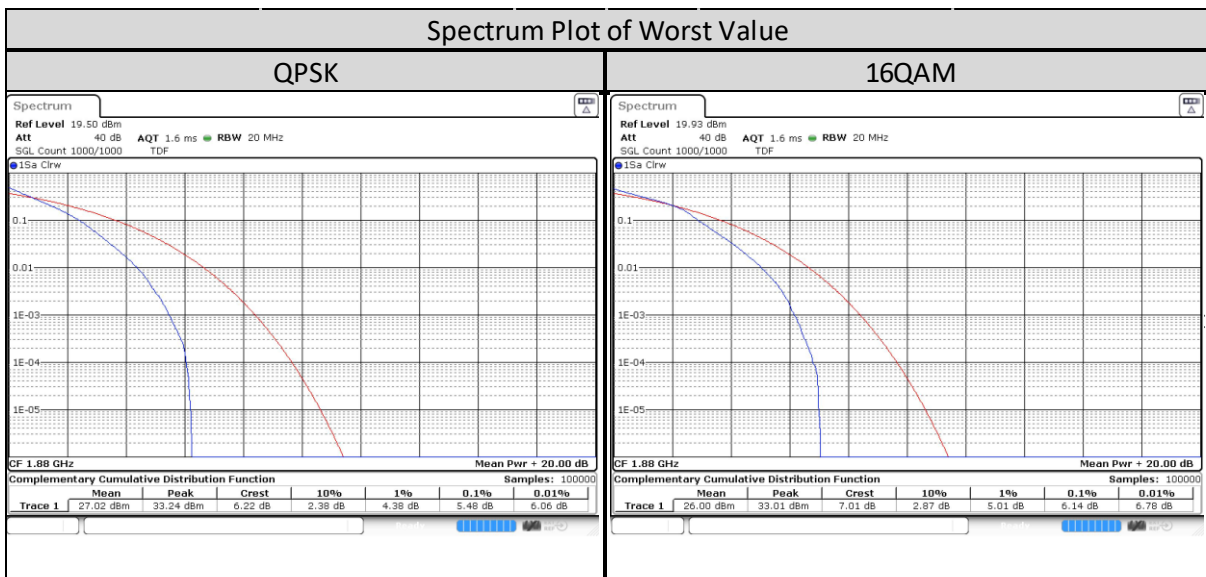
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/1.4MHz/6/0	Low CH 18607	1850.7 MHz	5.159	6
	Mid CH 18900	1880 MHz	5.449	6.406
	High CH 19193	1909.3 MHz	5.275	6.087



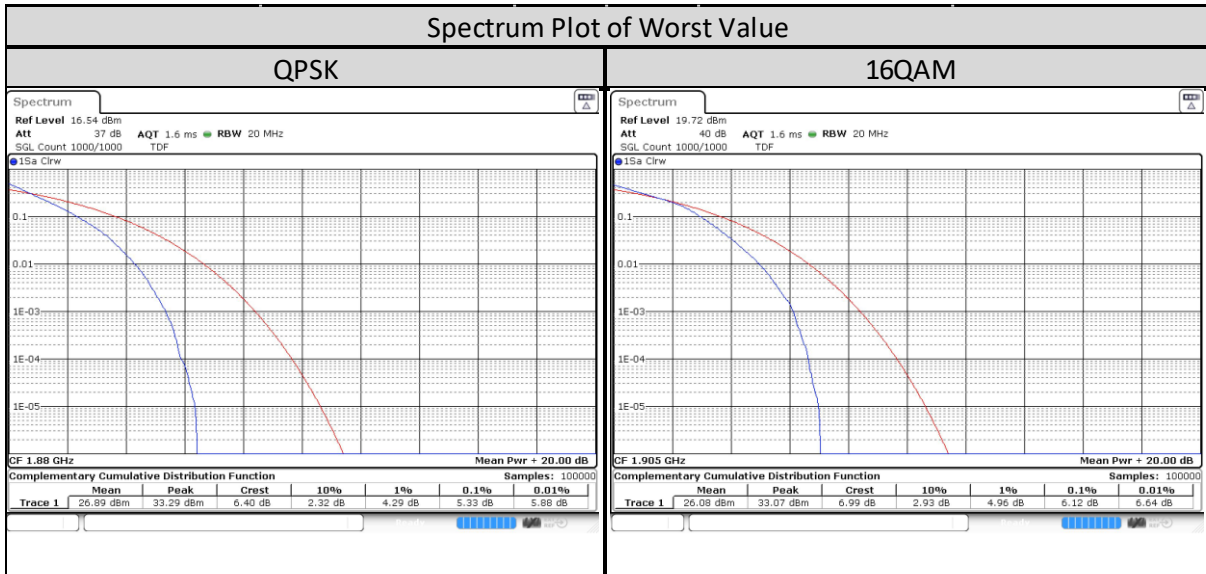
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/3MHz/15/0	Low CH 18615	1851.5 MHz	5.449	6
	Mid CH 18900	1880 MHz	5.536	6.464
	High CH 19185	1908.5 MHz	5.275	6.232



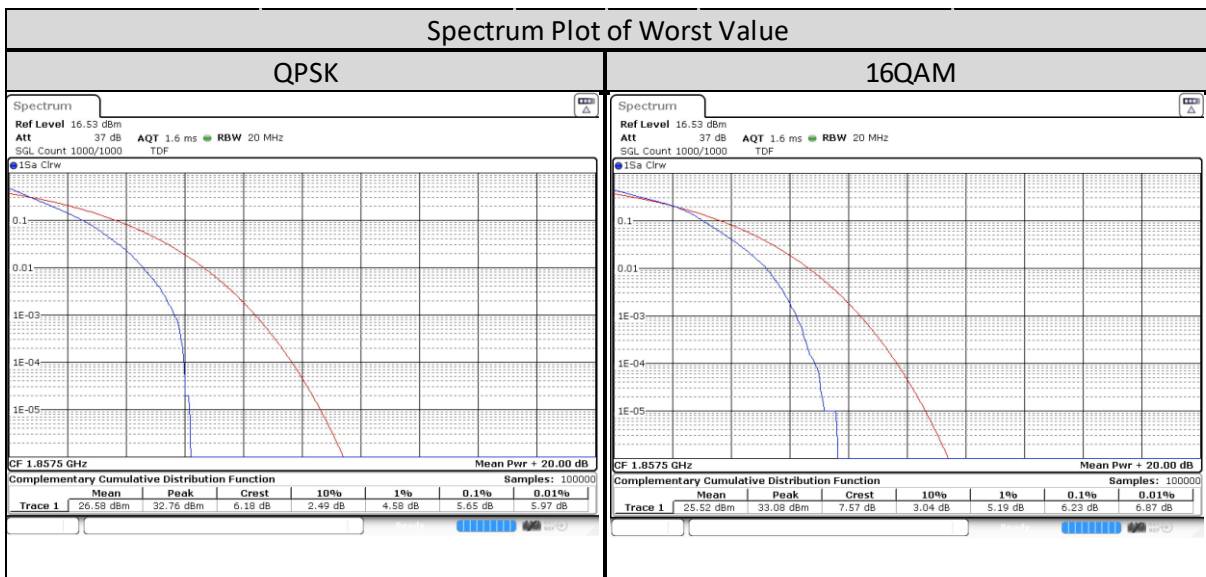
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/5MHz/25/0	Low CH 18625	1852.5 MHz	5.188	5.913
	Mid CH 18900	1880 MHz	5.478	6.145
	High CH 19175	1907.5 MHz	5.246	5.942



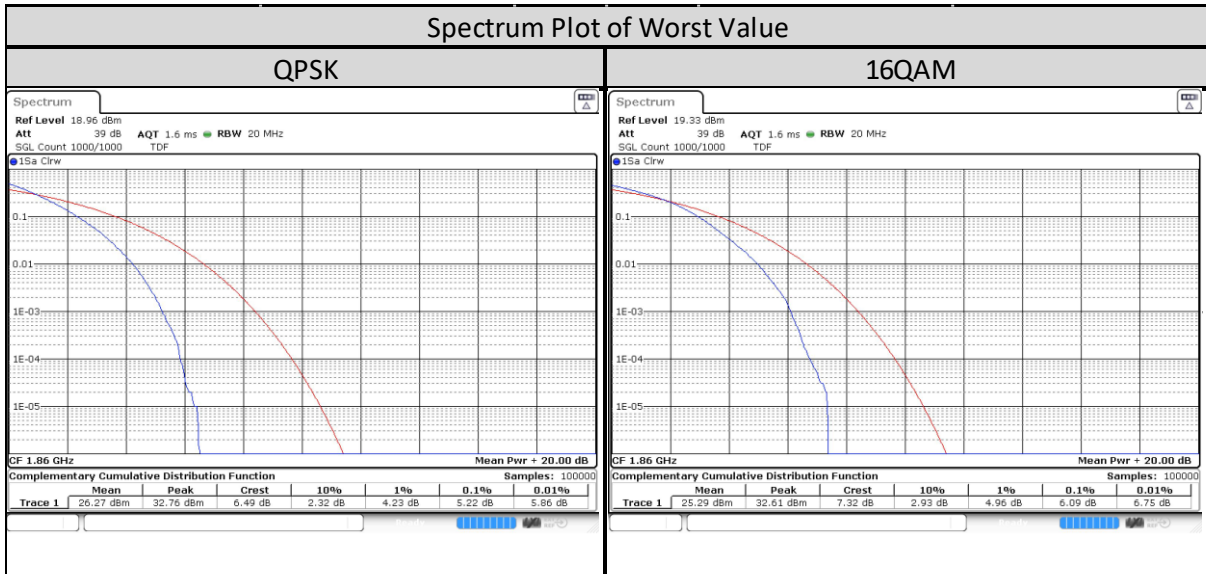
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/10MHz/50/0	Low CH 18650	1855 MHz	5.304	6
	Mid CH 18900	1880 MHz	5.333	6.087
	High CH 19150	1905 MHz	5.188	6.116



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/15MHz/75/0	Low CH 18675	1857.5 MHz	5.652	6.232
	Mid CH 18900	1880 MHz	5.536	6.174
	High CH 19125	1902.5 MHz	5.565	6.116

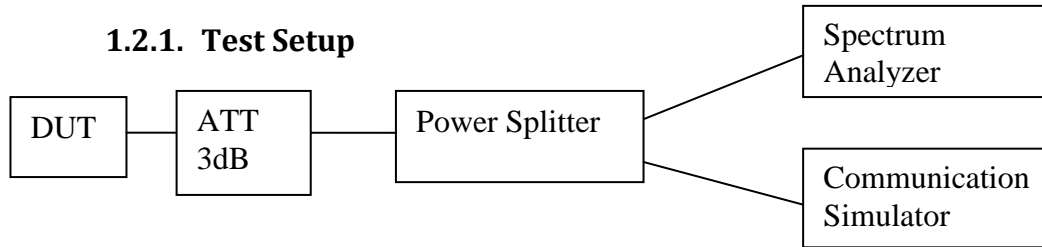


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 2/ 20MHz/100/0	Low CH 18700	1860 MHz	5.217	6.087
	Mid CH 18900	1880 MHz	5.188	6.058
	High CH 19100	1900 MHz	5.13	6.058



1.2. Occupied Bandwidth

1.2.1. 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.

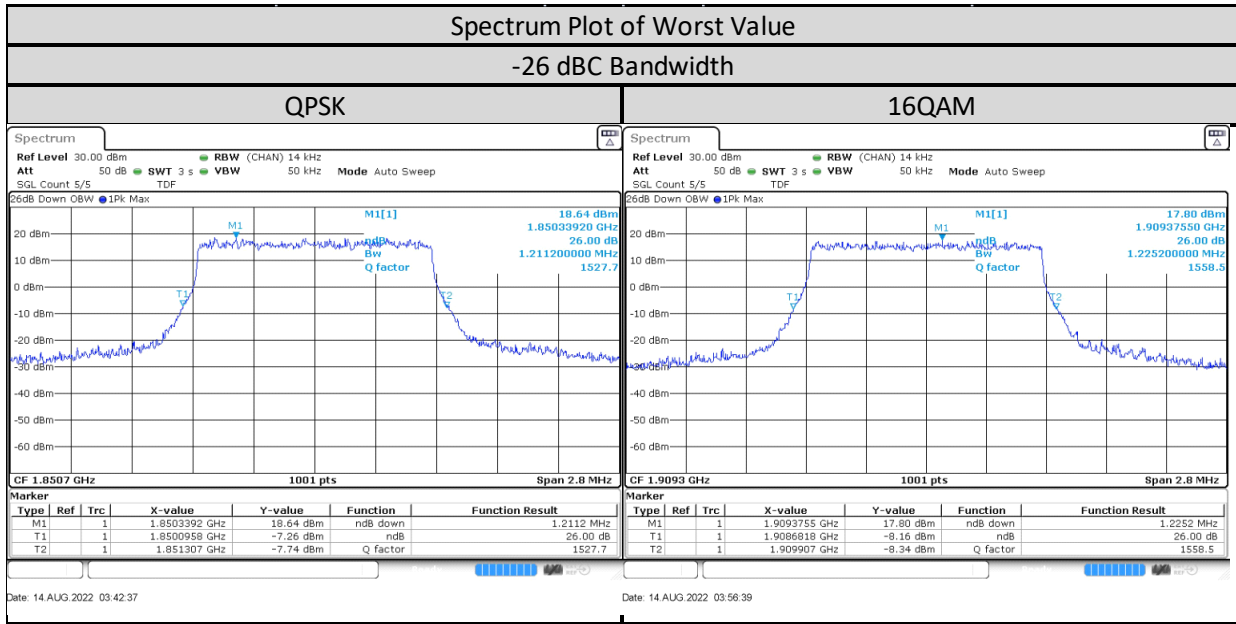
1.2.2. Test Limit

FCC: 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.

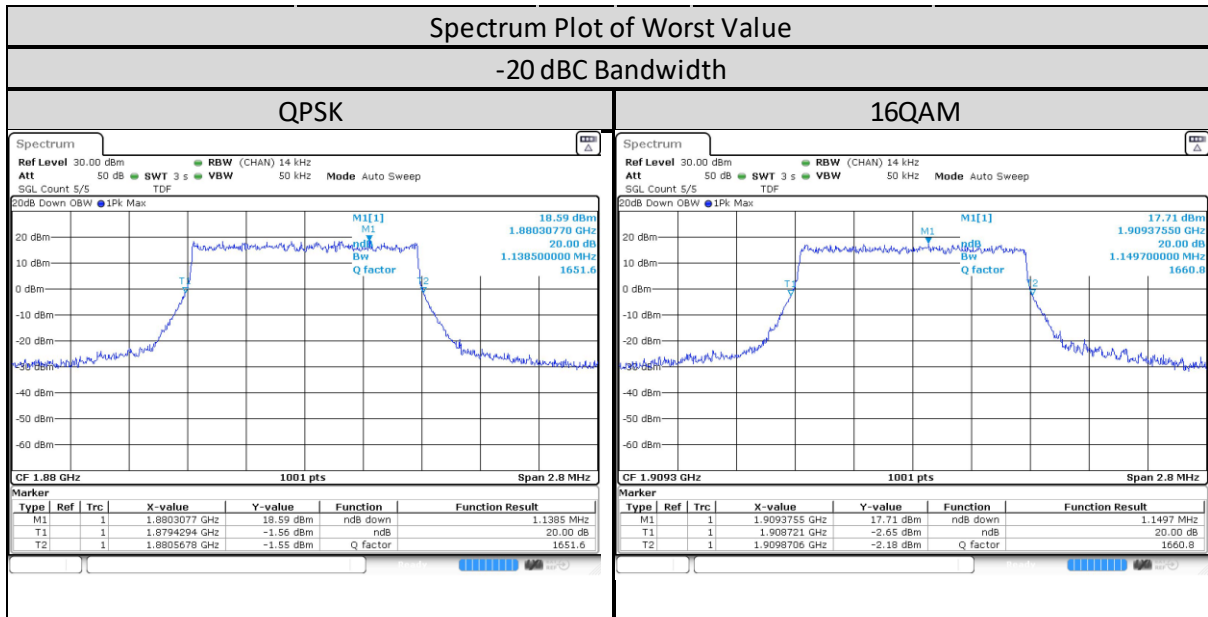
ISED: Emission bandwidth is, for the purpose of this document, defined as the width of the signal between two points, one below the carrier frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 20 dB below the transmitter power (i.e. -20 dBc), when measured with a resolution bandwidth of approximately 1% of the occupied bandwidth. In lieu of the -20 dBc bandwidth, the occupied bandwidth may be used.

1.2.3. Occupied Bandwidth - LTE Band 2 (1850 -1910 MHz)

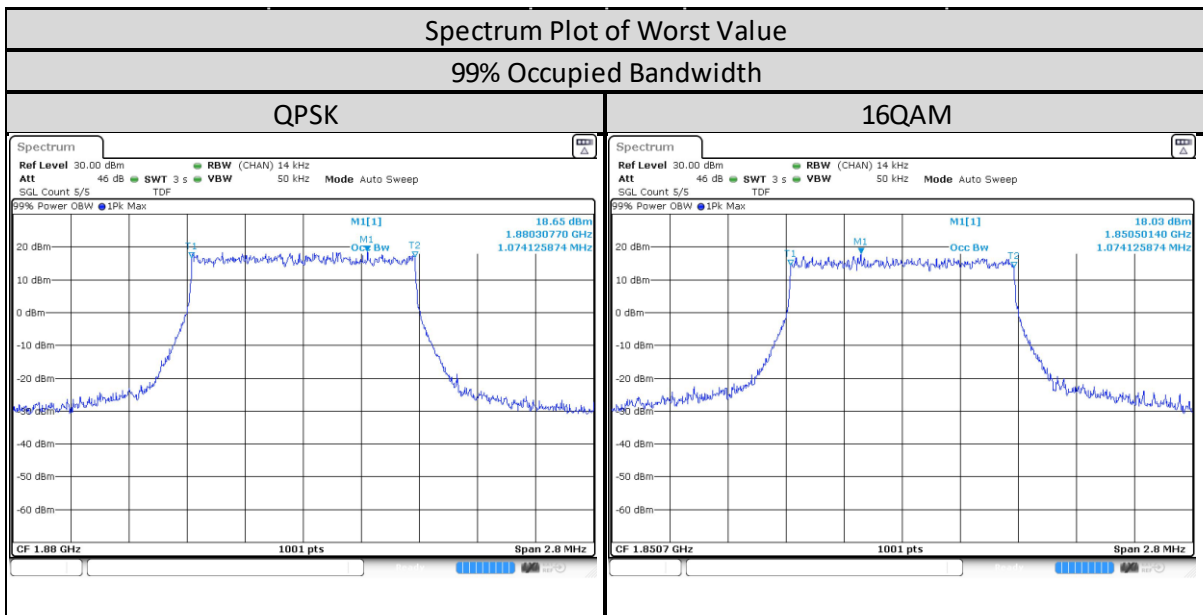
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/1.4MHz/6/0	Low CH 18607	1850.7 MHz	1.211	1.211
	Mid CH 18900	1880 MHz	1.208	1.186
	High CH 19193	1909.3 MHz	1.197	1.225



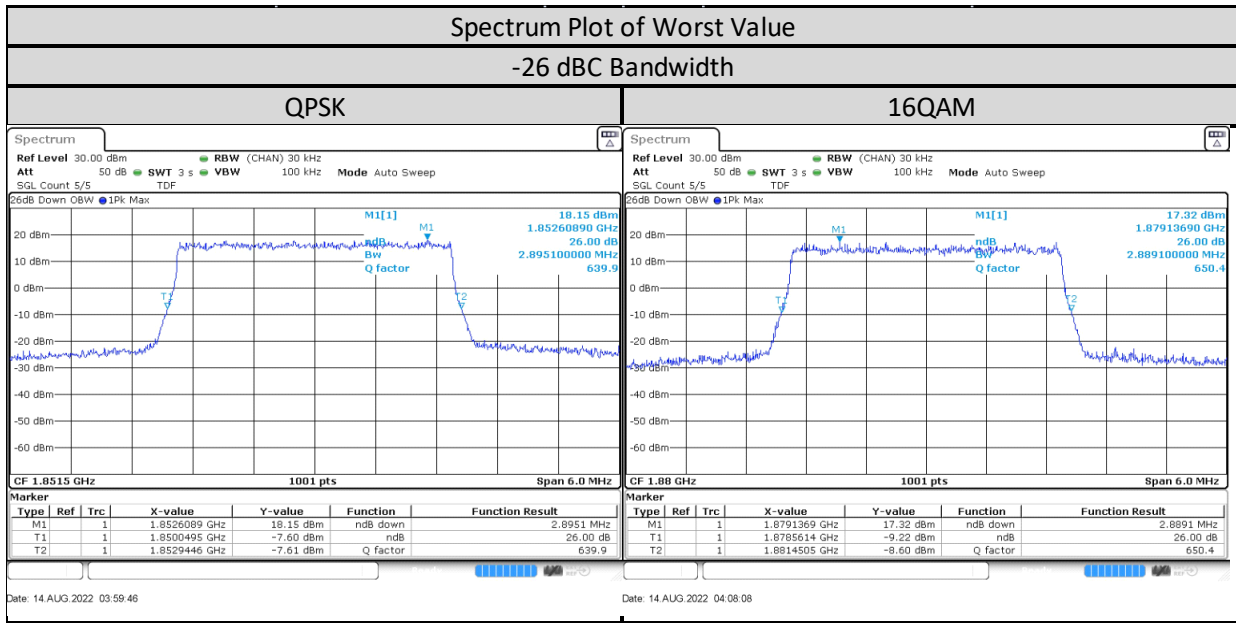
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/1.4MHz/6/0	Low CH 18607	1850.7 MHz	1.133	1.127
	Mid CH 18900	1880 MHz	1.139	1.125
	High CH 19193	1909.3 MHz	1.127	1.15



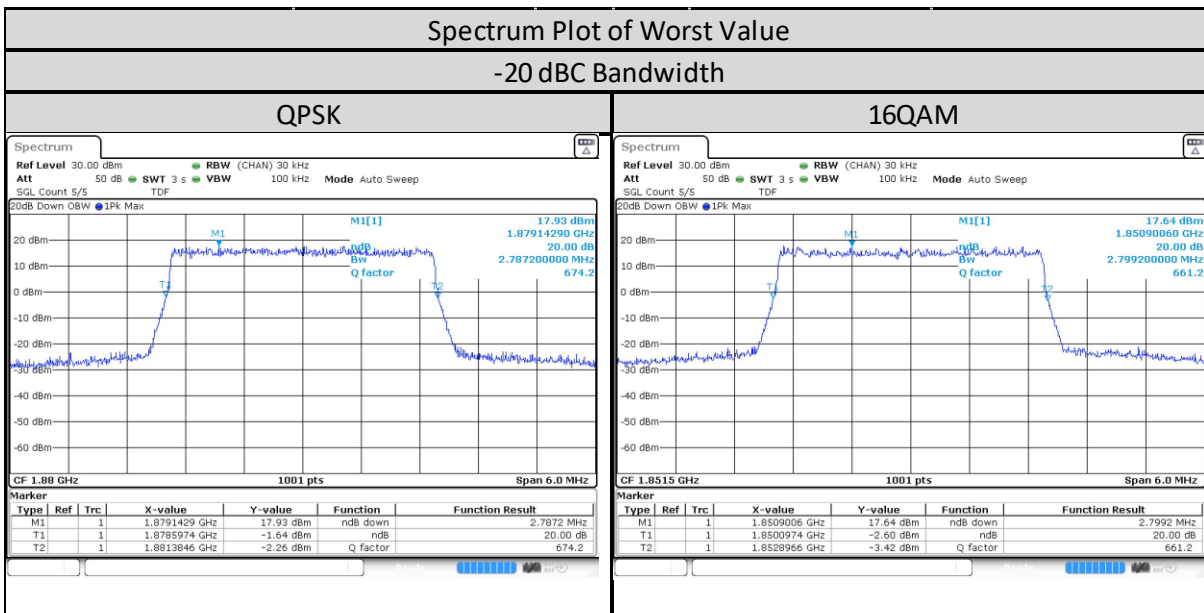
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/1.4MHz/6/0	Low CH 18607	1850.7 MHz	1.071	1.074
	Mid CH 18900	1880 MHz	1.074	1.071
	High CH 19193	1909.3 MHz	1.074	1.074



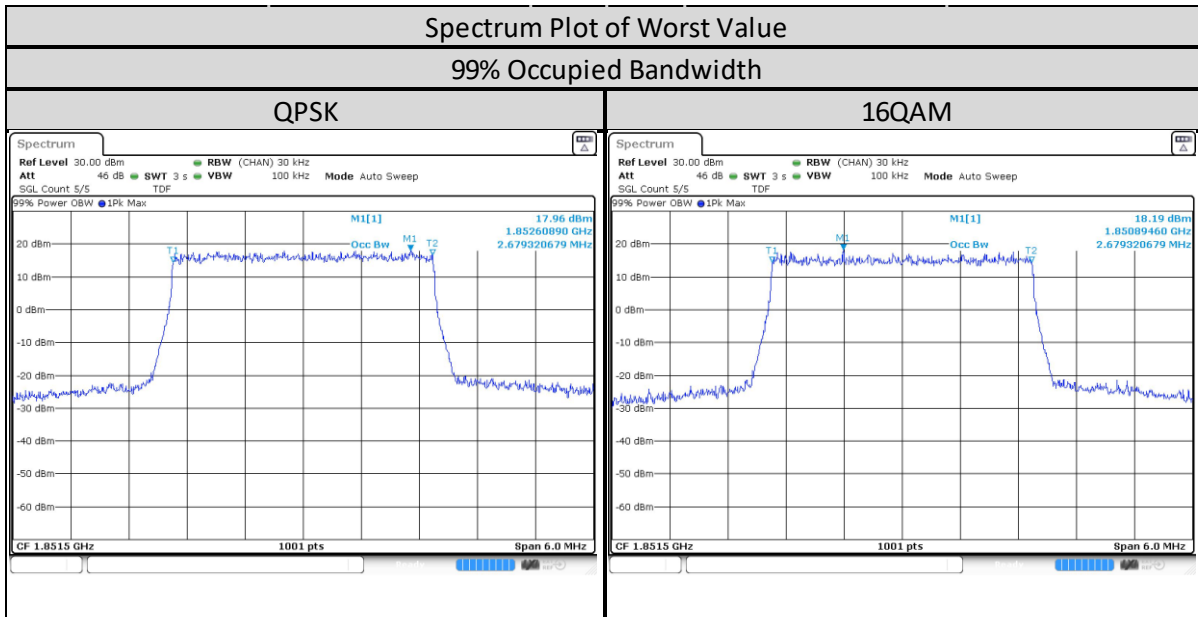
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/3MHz/15/0	Low CH 18615	1851.5 MHz	2.895	2.871
	Mid CH 18900	1880 MHz	2.889	2.889
	High CH 19185	1908.5 MHz	2.877	2.889



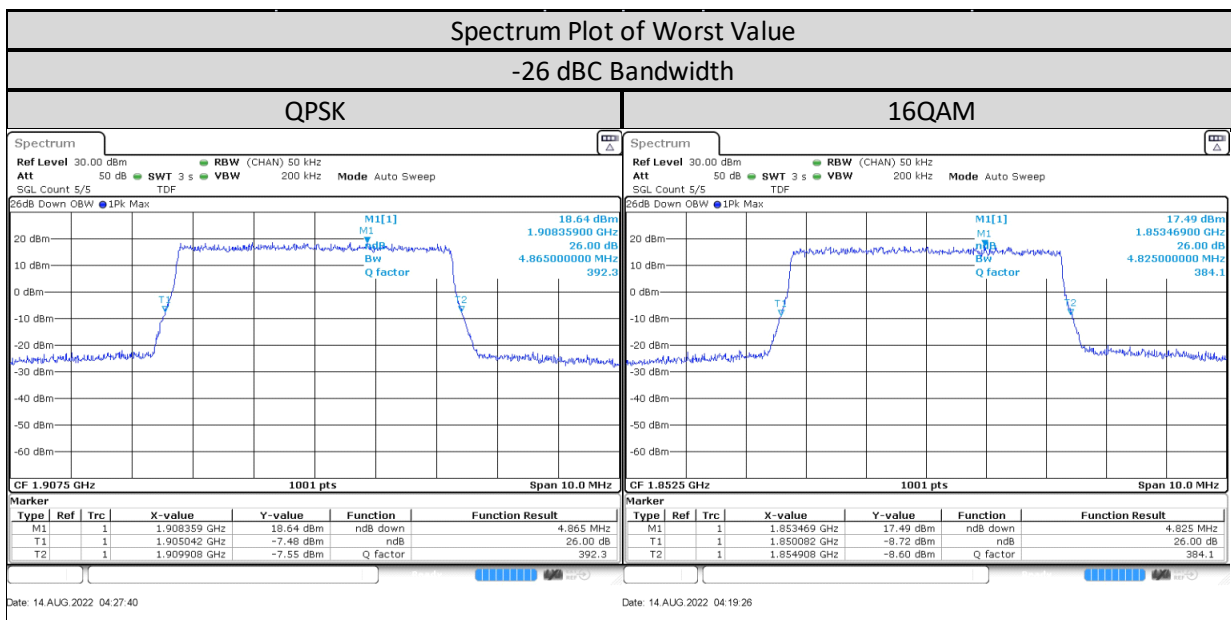
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/3MHz/15/0	Low CH 18615	1851.5 MHz	2.781	2.799
	Mid CH 18900	1880 MHz	2.787	2.793
	High CH 19185	1908.5 MHz	2.781	2.793



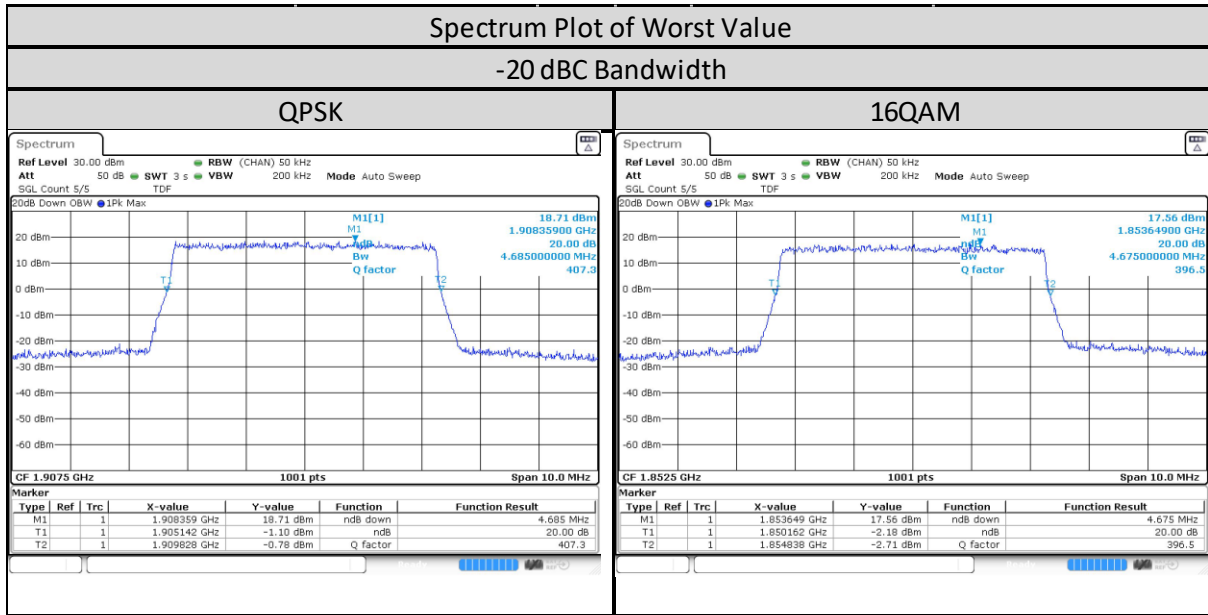
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/3MHz/15/0	Low CH 18615	1851.5 MHz	2.679	2.679
	Mid CH 18900	1880 MHz	2.673	2.679
	High CH 19185	1908.5 MHz	2.673	2.673



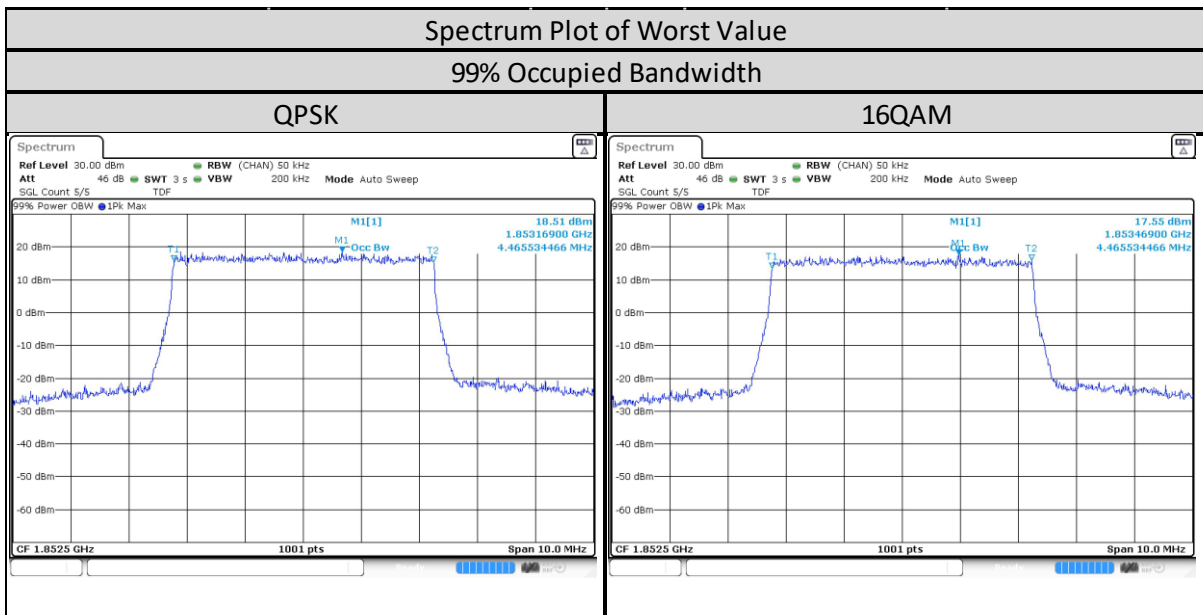
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/5MHz/25/0	Low CH 18625	1852.5 MHz	4.825	4.825
	Mid CH 18900	1880 MHz	4.805	4.805
	High CH 19175	1907.5 MHz	4.865	4.825



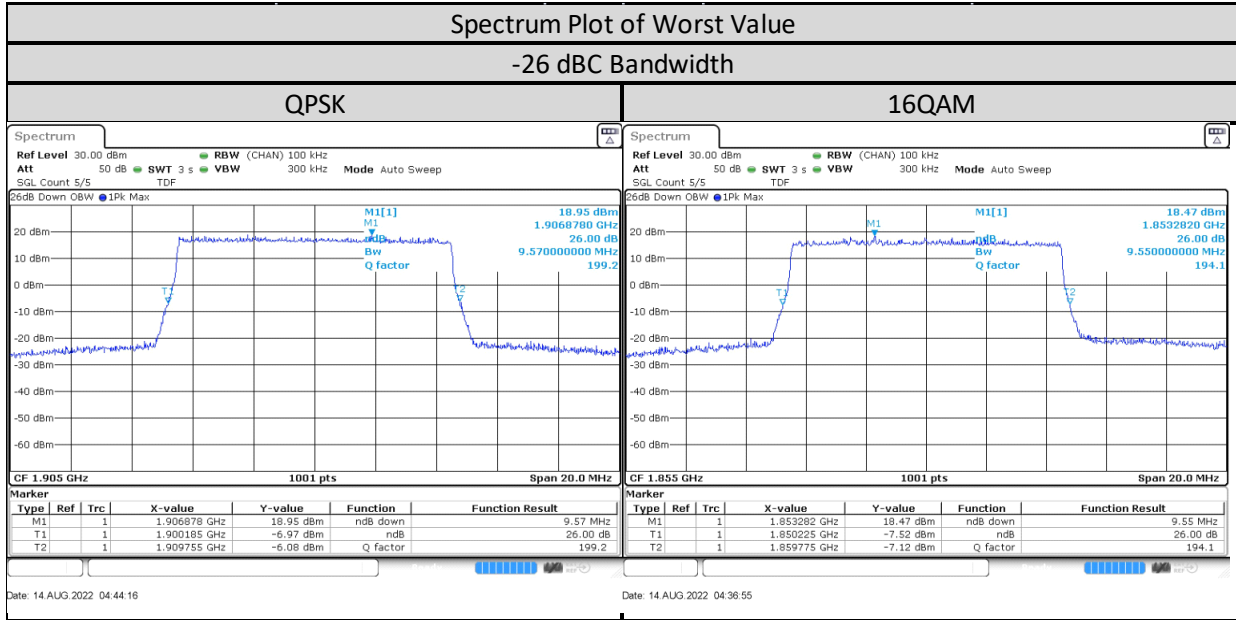
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/5MHz/25/0	Low CH 18625	1852.5 MHz	4.675	4.675
	Mid CH 18900	1880 MHz	4.625	4.645
	High CH 19175	1907.5 MHz	4.685	4.655



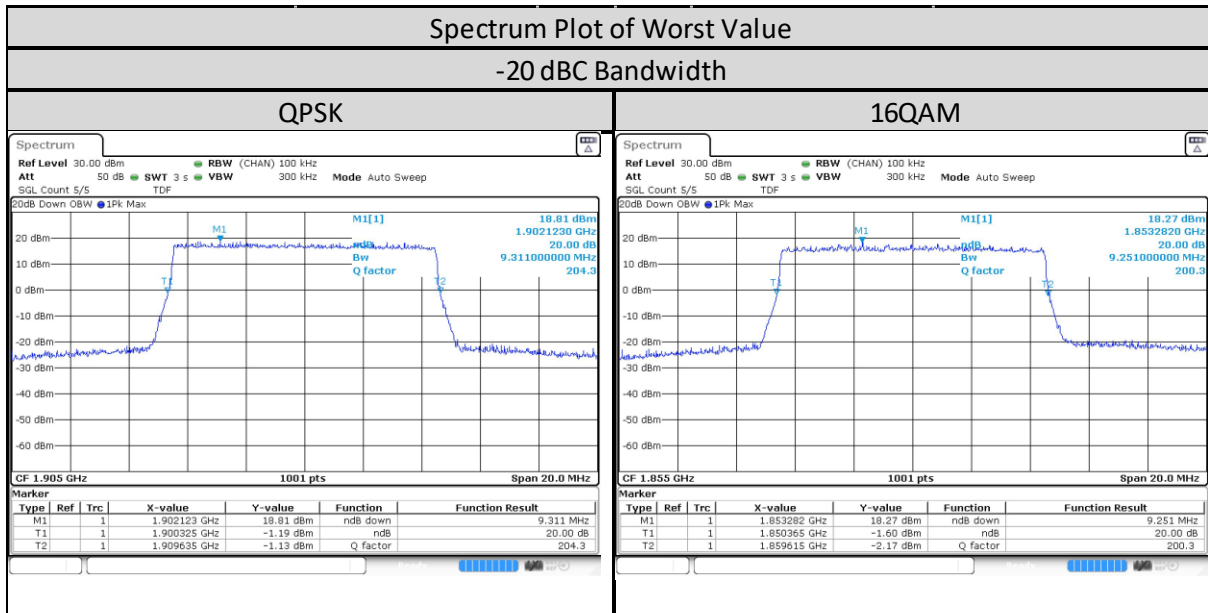
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/5MHz/25/0	Low CH 18625	1852.5 MHz	4.466	4.466
	Mid CH 18900	1880 MHz	4.456	4.456
	High CH 19175	1907.5 MHz	4.466	4.466



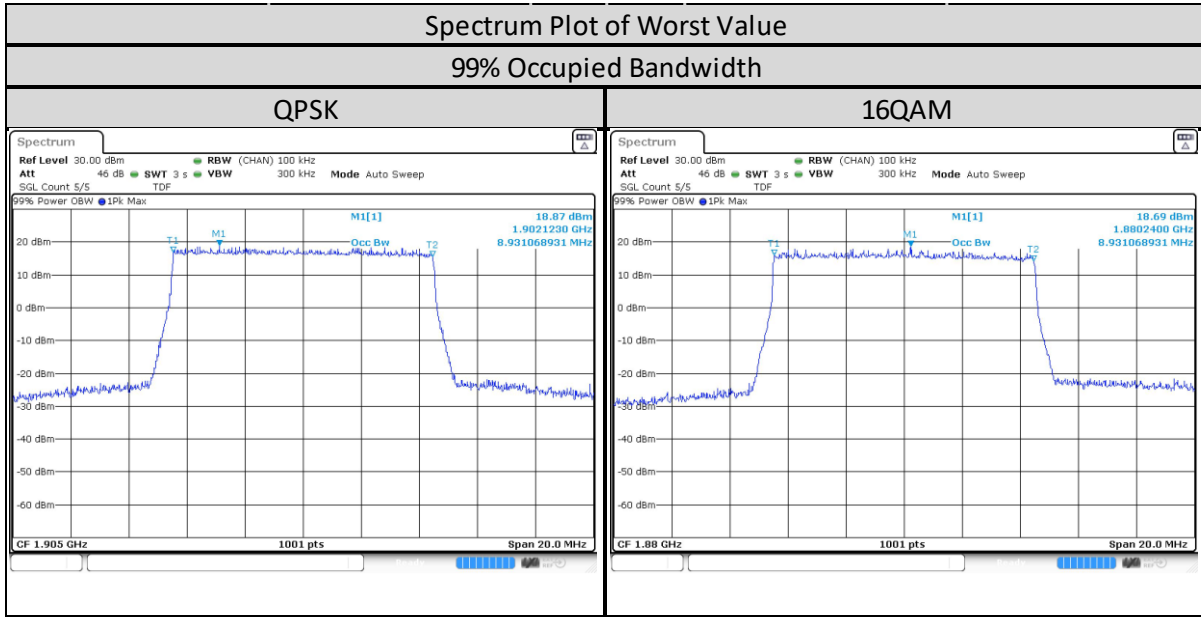
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/10MHz/50/0	Low CH 18650	1855 MHz	9.55	9.55
	Mid CH 18900	1880 MHz	9.53	9.491
	High CH 19150	1905 MHz	9.57	9.471



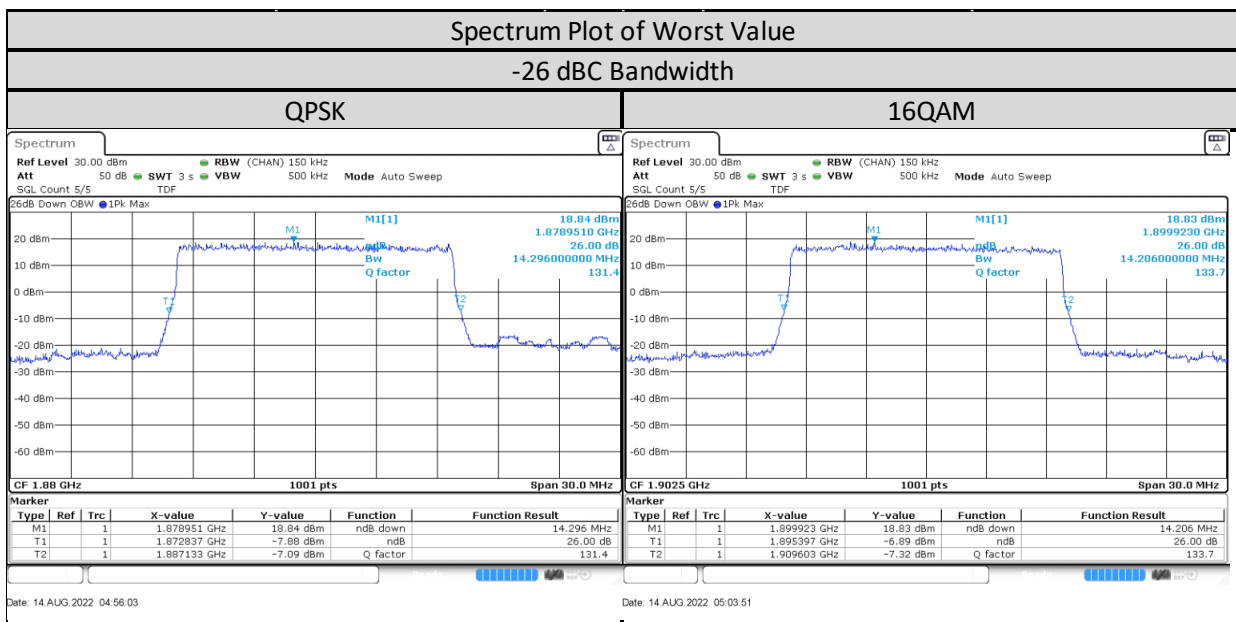
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/10MHz/50/0	Low CH 18650	1855 MHz	9.291	9.251
	Mid CH 18900	1880 MHz	9.251	9.211
	High CH 19150	1905 MHz	9.311	9.231



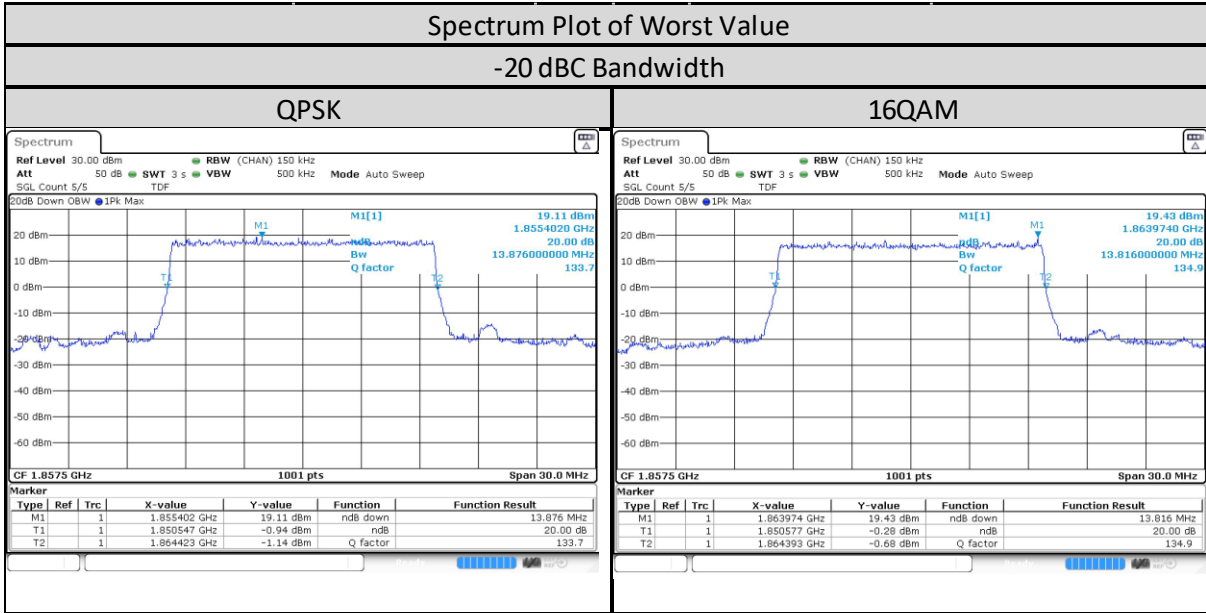
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/10MHz/50/0	Low CH 18650	1855 MHz	8.911	8.911
	Mid CH 18900	1880 MHz	8.911	8.931
	High CH 19150	1905 MHz	8.931	8.911



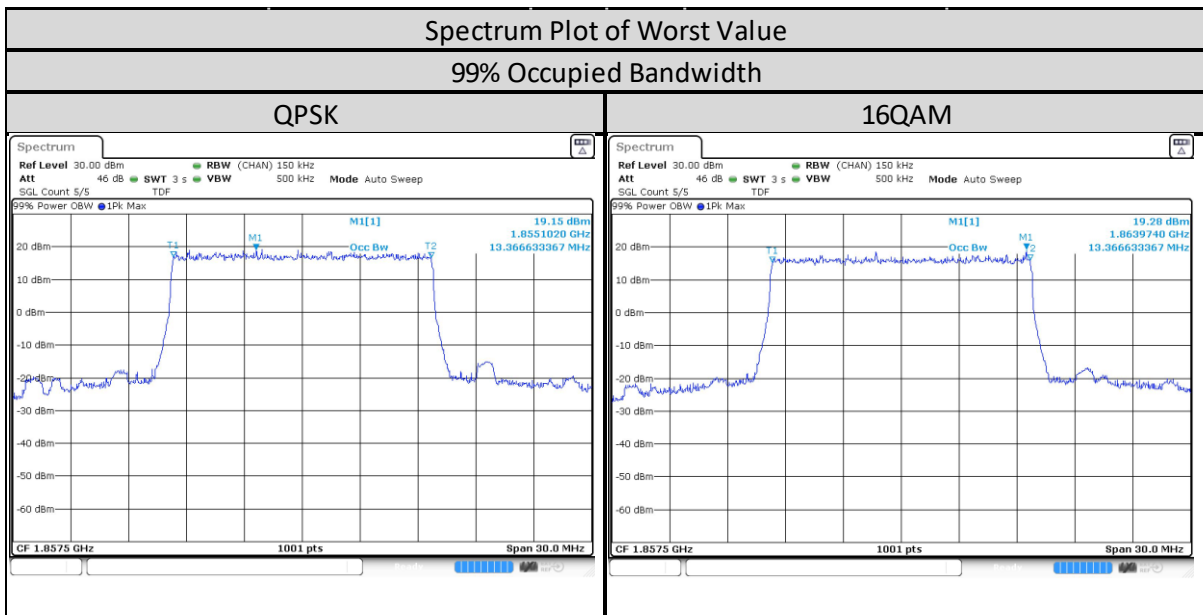
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/15MHz/75/0	Low CH 18675	1857.5 MHz	14.236	14.176
	Mid CH 18900	1880 MHz	14.296	14.176
	High CH 19125	1902.5 MHz	14.236	14.206



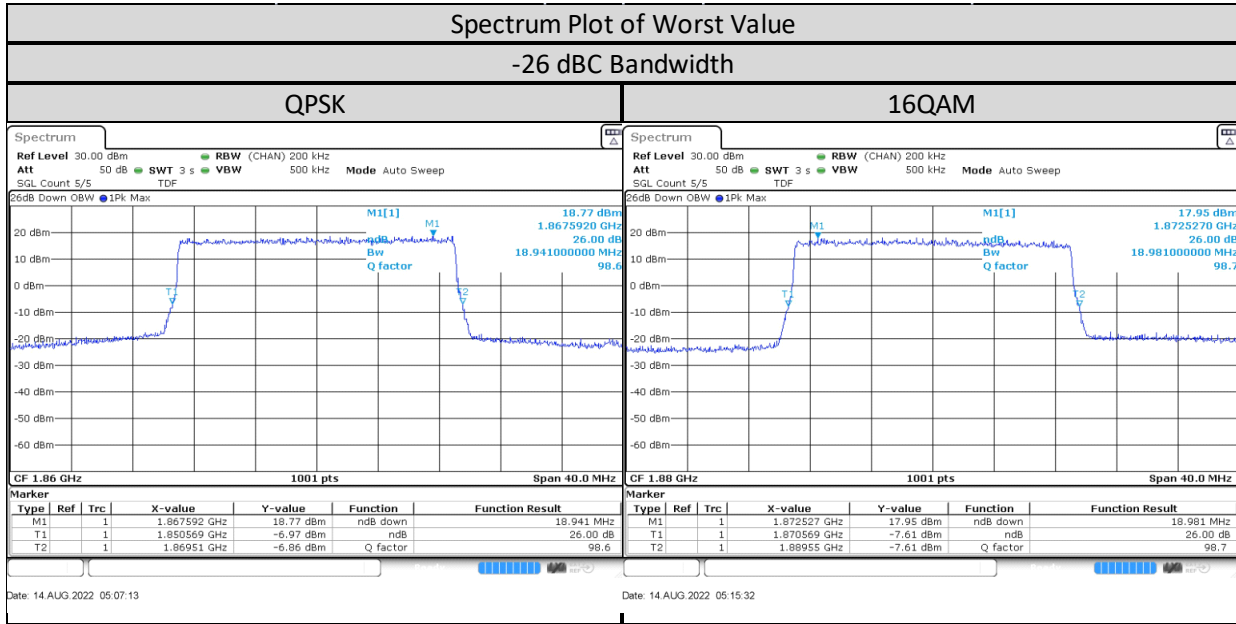
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/15MHz/75/0	Low CH 18675	1857.5 MHz	13.876	13.816
	Mid CH 18900	1880 MHz	13.876	13.816
	High CH 19125	1902.5 MHz	13.846	13.816



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/15MHz/75/0	Low CH 18675	1857.5 MHz	13.367	13.367
	Mid CH 18900	1880 MHz	13.367	13.367
	High CH 19125	1902.5 MHz	13.367	13.367



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/20MHz/100/0	Low CH 18700	1860 MHz	18.941	18.901
	Mid CH 18900	1880 MHz	18.901	18.981
	High CH 19100	1900 MHz	18.901	18.901



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-20 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 2/20MHz/100/0	Low CH 18700	1860 MHz	18.422	18.422
	Mid CH 18900	1880 MHz	18.462	18.501
	High CH 19100	1900 MHz	18.501	18.462

