

<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 : 01-March-2024 - 27-May-2024 Report Issue Date : 30-May-2024 Manufacturer/Location : Motorola Solutions Malaysia Sdn Bhd Manufacturer Address : Plot 2A, Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia Requestor : HOMICIL HARLY Product Type : Hand-held Product Version (PMN) : APX N70 Model Number (HVIN) : H35XDT9PW8AN & H35XDT9PW8AN-H Frequency Band : Refer to section 1.4 Rated / Max RF Output Power : 199.53mW / 252mW Applicant Name : Motorola Solutions Inc Applicant Address : Plot 2A, Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia FCC Registrations : 461337 ISED Registrations : MY0001 Firmware Version (FVIN) : D02.75.76 (BP), R02.00.00 (AP)</p> <p>The equipment was tested accordance to the requirement listed below:</p> <p>(LTE Band 12) FCC 47 CFR Part 2 / 27 ISED RSS GEN / 130 PASS</p>	
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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	07-March-2024	Awatif Rahman
Rev. B	Include additional test data (Peak-to-Average Power Ratio, Frequency Stability, Band Edge Conducted Spurious Emission, and Conducted Spurious Emission).	27-May-2024	Awatif Rahman

1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks	Serial Number Tested
2.1046	RSS-Gen 6.12 RSS-130 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit	022TAB0501
-	RSS-130 4.4	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	022TAB0501
2.1046	RSS-Gen 6.7	Occupied Bandwidth (99%)	Pass	Meet the requirement of limit	022TAB0501
2.1055 27.54	RSS-130 4.3	Frequency Stability	Pass	Meet the requirement of limit	022TAB0501
2.1051 27.53(g)	RSS-Gen 6.13 RSS-130 4.6	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	022TAB0501
2.1051 27.53(g)	RSS-Gen 6.13 RSS-130 4.6	Conducted Spurious Emissions	Pass	Meet the requirement of limit	022TAB0501
2.1053 27.53(g)	RSS-130 4.6	Radiated Spurious Emission	Pass	-42.2765 dBm (Margin: 29.2765 dBm, Noise Floor)	022TAB0346
2.1049 27.50(c)(9)(10)	RSS-130 4.4	Effective Radiated Power (ERP)	Pass	Meet the requirement of limit	022TAB0501

1.1. Measurement Uncertainty

Measurement	Frequency	Expanded 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)				
Wideband Radio Communication Tester	CMW500	154550	09-Aug-23	08-Aug-24
Signal Analyzer	FSV40	101431	07-Aug-23	06-Aug-24
Chamber	SH-641	92003150	15-Sep-23	15-Sep-24
Power Supply	6652A	3640A02967	15-Oct-23	15-Oct-24
Test Software	R&S CMWrun			
Version	V.1.9.8			
RADIATED SPURIOUS EMISSION (EMC CHAMBER 1)				
Drg Horn Freq.	SAS-571	1143	08-Mar-23	08-Mar-25
Drg Horn Freq.	SAS-571	720	18-Apr-23	18-Apr-25
Power Supply	NR973A	MY54180189	30-Aug-23	30-Aug-24
Signal Generator	SMB 100A	182511	04-Jun-21	04-Jun-24
Emi Test Receiver	ESW44	101731	11-Aug-23	11-Aug-24
Bilog Antenna	CBL6112B	2950	14-Dec-23	14-Dec-24
Bilog Antenna	CBL6112B	2964	25-Sep-23	25-Sep-24
Data Logger Thermohyrometer	SDL500	A.016800	21-Jun-23	21-Jun-24
Broad-Band Horn Antenna	BBHA9170	BBHA9170143	28-Aug-23	28-Aug-24
Preamplifier	PAM-0118P	361	29-Sep-23	29-Sep-26
Loop Antenna	6502	00208416	26-Oct-23	26-Oct-24
5m Semi-Anechoic Chamber	S800-HX	J2308	Not Required	Not Required
System Controller	SC104V	050806-1	Not Required	Not Required
Turntable Flush Mount 2m	FM2011	NA	Not Required	Not Required
Antenna Positioning Tower	TLT2	NA	Not Required	Not Required
Preamplifier 18-40Ghz	Miteq Hi Gain Sucoflex	002	Not Required	Not Required
Test Software	EMC_FCC_IC_BLUETOOTH_RE_TEST			
Version	EMC_FCC_RE_v1.6.5			

1.3. General Information

General Description of EUT

Product	ALOHA UHF			
Brand	Motorola Solutions			
Test Model	H35XDT9PW8AN, H35XDT9PW8AN-H			
Power Supply Rating	7.5 Vdc			
Mode of Operation	LTE Band 12			
Modulation Type	QPSK, 16QAM			
Operating Frequency	LTE Band 12	Channel Bandwidth 1.4MHz	699.7MHz~715.3MHz	
		Channel Bandwidth 3MHz	700.5MHz~714.5MHz	
		Channel Bandwidth 5MHz	701.5MHz~713.5MHz	
		Channel Bandwidth 10MHz	704.0MHz~711.0MHz	
Max. Conducted RF Output Power	LTE Band 12 QPSK	Channel Bandwidth 1.4MHz	23.545dBm (0.226W)	
		Channel Bandwidth 3MHz	23.374dBm (0.217W)	
		Channel Bandwidth 5MHz	23.441dBm (0.221W)	
		Channel Bandwidth 10MHz	23.705dBm (0.235W)	
	LTE Band 12 16QAM	Channel Bandwidth 1.4MHz	22.475dBm (0.177W)	
		Channel Bandwidth 3MHz	22.581dBm (0.181W)	
		Channel Bandwidth 5MHz	22.620dBm (0.183W)	
		Channel Bandwidth 10MHz	22.724dBm (0.187W)	
Emission Designator	LTE Band 12		QPSK	16QAM
		Channel Bandwidth 1.4MHz	2M77G7D	1M08D7W
		Channel Bandwidth 3MHz	2M68G7D	2M67D7W
		Channel Bandwidth 5MHz	4M47G7D	4M46D7W
		Channel Bandwidth 10MHz	8M93G7D	8M93D7W
Antenna Type	LTE Band 12	Antenna LTE Low Band 699 – 716MHz (-2.9dBi)		
SW Version	D02.75.76 (BP), R02.00.00 (AP)			
HW Version	P2			

Note:

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

Item	Brand	Model or P/N	Specification
Li-Ion Battery	MOTOROLA	PMNN4818A	UL 3650mAH (using RN 2170 Li-Ion cell)

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 OOB 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 12	1.4 MHz	23017 ~ 23173	23017	23095	23173	699.7	707.5	715.3
	3 MHz	23025 ~ 23165	23025	23095	23165	700.5	707.5	714.5
	5 MHz	23035 ~ 23155	23035	23095	23155	701.5	707.5	713.5
	10 MHz	23060 ~ 23130	23060	23095	23130	704.0	707.5	711.0

1.5. Test Mode Applicability and Tested Channel Detail

Pre-scan also have been conducted with the accessory devices listed in section table 1.3, only the worst case radiated emission results of the combination test configuration is reported in this report. The following channel(s) was (were) selected for the final test as listed below:

LTE Band 12

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Uplink Modulation	Mode
Conducted RF Output Power	23017 ~ 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	As per table 1.6.3
	23025 ~ 23165	23025, 23095, 23165	3 MHz		
	23035 ~ 23155	23035, 23095, 23155	5 MHz		
	23060 ~ 23130	23060, 23095, 23130	10 MHz		
Peak to Average Power Ratio	23017 ~ 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	23025 ~ 23165	23025, 23095, 23165	3 MHz		15 RB / 0 RB Offset
	23035 ~ 23155	23035, 23095, 23155	5 MHz		25 RB / 0 RB Offset
	23060 ~ 23130	23060, 23095, 23130	10 MHz		50 RB / 0 RB Offset
Occupied Bandwidth	23017 ~ 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	23025 ~ 23165	23025, 23095, 23165	3 MHz		15 RB / 0 RB Offset
	23035 ~ 23155	23035, 23095, 23155	5 MHz		25 RB / 0 RB Offset
	23060 ~ 23130	23060, 23095, 23130	10 MHz		50 RB / 0 RB Offset
Frequency Stability	23017 ~ 23173	23017, 23173	1.4 MHz	QPSK	6 RB / 0 RB Offset
	23025 ~ 23165	23025, 23165	3 MHz		15 RB / 0 RB Offset
	23035 ~ 23155	23035, 23155	5 MHz		25 RB / 0 RB Offset
	23060 ~ 23130	23060, 23130	10 MHz		50 RB / 0 RB Offset

Band Edge Conducted Spurious Emission	23017 ~ 23173	23017, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
					1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	23025 ~ 23165	23025, 23165	3 MHz		1 RB / 0 RB Offset
					1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	23035 ~ 23155	23035, 23155	5 MHz		1 RB / 0 RB Offset
					1 RB / 24 RB Offset
					25 RB / 0 RB Offset
	23060 ~ 23130	23060, 23130	10 MHz		1 RB / 0 RB Offset
					1 RB / 49 RB Offset
					50 RB / 0 RB Offset
Conducted Spurious Emission	23017 ~ 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 3 RB Offset
	23025 ~ 23165	23025, 23095, 23165	3 MHz		1 RB / 14 RB Offset
	23035 ~ 23155	23035, 23095, 23155	5 MHz		1 RB / 13 RB Offset
	23060 ~ 23130	23060, 23095, 23130	10 MHz		1 RB / 25 RB Offset
Radiated Spurious Emission	23035 ~ 23155	23035	5 MHz	QPSK	1 RB / 13 RB Offset
	23060 ~ 23130	23095	10 MHz		1 RB / 0 RB Offset
	23060 ~ 23130	23130	10 MHz		1 RB / 49 RB Offset
Effective Radiated Power (ERP)	23017 ~ 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	As per table 1.6.4
	23025 ~ 23165	23025, 23095, 23165	3 MHz		
	23035 ~ 23155	23035, 23095, 23155	5 MHz		
	23060 ~ 23130	23060, 23095, 23130	10 MHz		

NOTE:

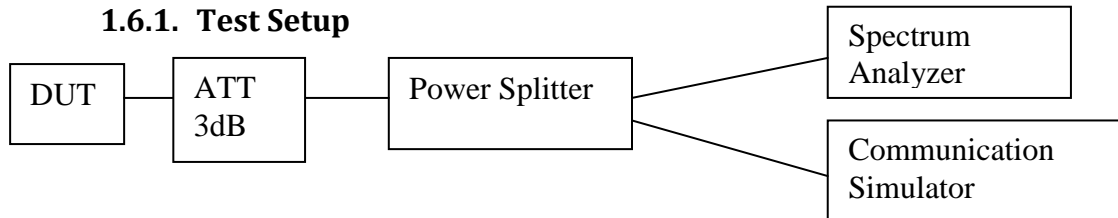
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Effective Radiated Power (ERP) 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	7.5 Vdc	Awatif Rahman
Peak-to-Average Power Ratio	25°C, 50% RH	7.5 Vdc	Awatif Rahman
Occupied Bandwidth	25°C, 50% RH	7.5 Vdc	Awatif Rahman
Frequency Stability	-30°C ~ 60°C	7.5 Vdc	Awatif Rahman
Band Edge Conducted Spurious Emission	25°C, 50% RH	7.5 Vdc	Awatif Rahman
Conducted Spurious Emission	25°C, 50% RH	7.5 Vdc	Awatif Rahman
Radiated Spurious Emission	23.4°C, 69.3% RH	7.5 Vdc	Nazrin & Fuad
Effective Radiated Power (ERP)	25°C, 50% RH	7.5 Vdc	Awatif Rahman

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. Test Limits

FCC: Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

ISED: The e.i.r.p. shall not exceed 50 watts for mobile equipment or for outdoor fixed subscriber equipment, nor shall it exceed 5 watts for portable equipment or for indoor fixed subscriber equipment.

1.6.3. Conducted RF Output Power - LTE Band 12 (699-716MHz)

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
			23017	23095	23173	23017	23095	23173
			699.7 MHz	707.5 MHz	715.3 MHz	699.7 MHz	707.5 MHz	715.3 MHz
Band 12 / 1.4 MHz	1	0	23.146	23.299	23.44	22.105	22.301	22.436
	1	3	23.141	23.444	23.545	22.174	22.316	22.475
	1	5	23.06	23.408	23.46	22.165	22.418	22.403
	3	0	23.176	23.306	23.291	22.266	22.324	22.293
	3	2	23.187	23.235	23.377	22.326	22.458	22.3
	3	3	23.174	23.294	23.304	22.267	22.429	22.291
	6	0	22.065	22.226	22.318	21.161	21.259	21.25

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
			23025	23095	23165	23025	23095	23165
			700.5 MHz	707.5 MHz	714.5 MHz	700.5 MHz	707.5 MHz	714.5 MHz
Band 12 / 3MHz	1	0	23.267	23.282	23.374	22.134	22.564	22.405
	1	7	23.147	23.293	23.302	22.138	22.581	22.401
	1	14	23.354	23.302	23.312	22.168	22.546	22.357
	8	0	22.193	22.358	22.357	21.188	21.487	21.316
	8	4	22.138	22.313	22.408	21.141	21.459	21.343
	8	7	22.149	22.34	22.38	21.164	21.475	21.338
	15	0	22.118	22.299	22.371	21.132	21.325	21.331

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
			23035	23095	23155	23035	23095	23155
			701.5 MHz	707.5 MHz	713.5 MHz	701.5 MHz	707.5 MHz	713.5 MHz
Band 12 / 5MHz	1	0	23.179	23.351	23.239	22.362	22.562	22.263
	1	13	23.22	23.289	23.332	22.322	22.62	22.523
	1	25	23.196	23.441	23.321	22.237	22.573	22.501
	12	0	22.134	22.343	22.405	21.079	21.371	21.414
	12	6	22.189	22.298	22.384	21.154	21.319	21.44
	12	13	22.178	22.304	22.392	21.125	21.347	21.455
	25	0	22.228	22.324	22.427	21.228	21.323	21.343

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
			23060	23095	23130	23060	23095	23130
			704.0 MHz	707.5 MHz	711.0 MHz	704.0 MHz	707.5MHz	711.0 MHz
Band 12 / 10MHz	1	0	23.591	23.314	23.705	22.384	22.724	22.679
	1	25	23.21	23.23	23.296	22.193	22.53	22.329
	1	49	23.584	23.421	23.497	22.439	22.699	22.624
	25	0	22.306	22.353	22.401	21.421	21.368	21.496
	25	13	22.223	22.365	22.388	21.282	21.388	21.44
	25	25	22.338	22.359	22.555	21.409	21.375	21.527
	50	0	22.385	22.405	22.41	21.366	21.41	21.392

1.6.4. Effective Radiated Power - LTE Band 12 (699-716MHz)

ERP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23017	23095	23173	23017	23095	23173
			699.7 MHz	707.5 MHz	715.3 MHz	699.7 MHz	707.5 MHz	715.3 MHz
Band 12 / 1.4 MHz	1	0	18.096	18.249	18.39	17.055	17.251	17.386
	1	3	18.091	18.394	18.495	17.124	17.266	17.425
	1	5	18.01	18.358	18.41	17.115	17.368	17.353
	3	0	18.126	18.256	18.241	17.216	17.274	17.243
	3	2	18.137	18.185	18.327	17.276	17.408	17.25
	3	3	18.124	18.244	18.254	17.217	17.379	17.241
	6	0	17.015	17.176	17.268	16.111	16.209	16.2

ERP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23025	23095	23165	23025	23095	23165
			700.5 MHz	707.5 MHz	714.5 MHz	700.5 MHz	707.5 MHz	714.5 MHz
Band 12 / 3MHz	1	0	18.217	18.232	18.324	17.084	17.514	17.355
	1	7	18.097	18.243	18.252	17.088	17.531	17.351
	1	14	18.304	18.252	18.262	17.118	17.496	17.307
	8	0	17.143	17.308	17.307	16.138	16.437	16.266
	8	4	17.088	17.263	17.358	16.091	16.409	16.293
	8	7	17.099	17.29	17.33	16.114	16.425	16.288
	15	0	17.068	17.249	17.321	16.082	16.275	16.281

ERP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23035	23095	23155	23035	23095	23155
			701.5 MHz	707.5 MHz	713.5 MHz	701.5 MHz	707.5 MHz	713.5 MHz
Band 12 / 5MHz	1	0	18.129	18.301	18.189	17.312	17.512	17.213
	1	13	18.17	18.239	18.282	17.272	17.57	17.473
	1	25	18.146	18.391	18.271	17.187	17.523	17.451
	12	0	17.084	17.293	17.355	16.029	16.321	16.364
	12	6	17.139	17.248	17.334	16.104	16.269	16.39
	12	13	17.128	17.254	17.342	16.075	16.297	16.405
	25	0	17.178	17.274	17.377	16.178	16.273	16.293

ERP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23060	23095	23130	23060	23095	23130
			704.0 MHz	707.5 MHz	711.0 MHz	704.0 MHz	707.5MHz	711.0 MHz
Band 12 / 10MHz	1	0	18.541	18.264	18.655	17.334	17.674	17.629
	1	25	18.16	18.18	18.246	17.143	17.48	17.279
	1	49	18.534	18.371	18.447	17.389	17.649	17.574
	25	0	17.256	17.303	17.351	16.371	16.318	16.446
	25	13	17.173	17.315	17.338	16.232	16.338	16.39
	25	25	17.288	17.309	17.505	16.359	16.325	16.477
	50	0	17.335	17.355	17.36	16.316	16.36	16.342

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

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

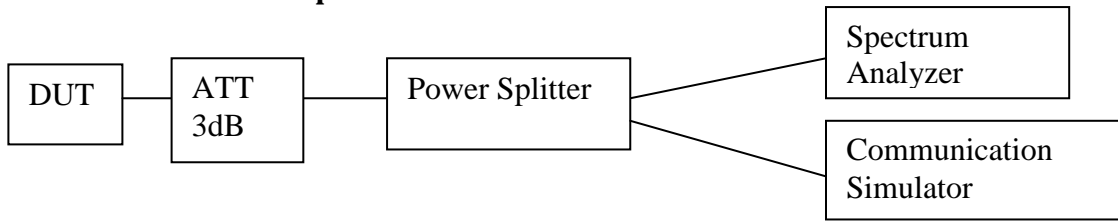
$$\mathbf{ERP = EIRP - 2.15}$$

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

1.7. Peak-to-Average Power Ratio

1.7.1. Test Setup



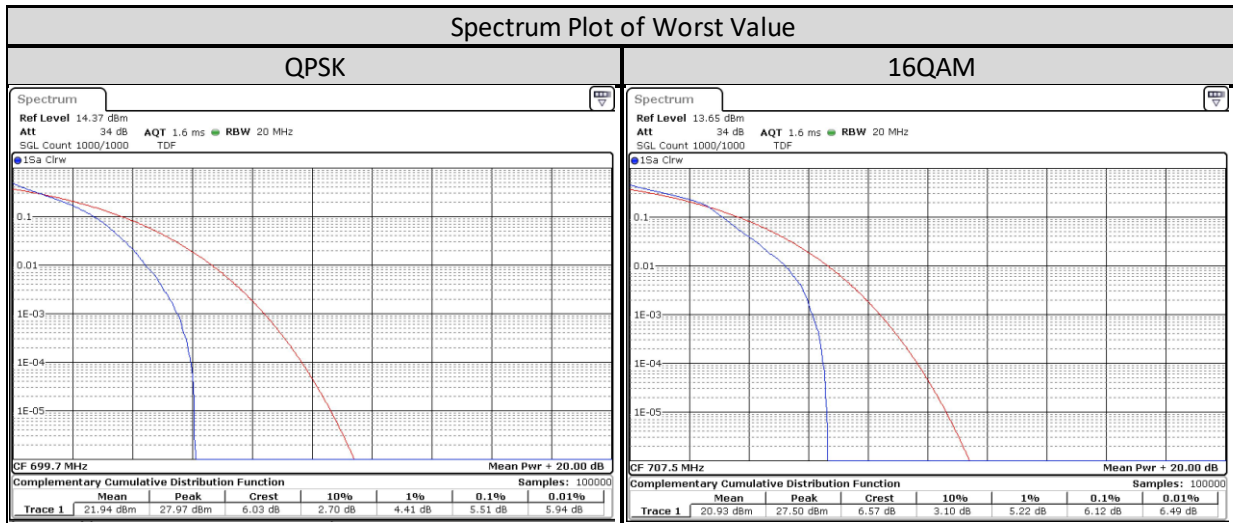
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.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

1.7.2. Test Limit

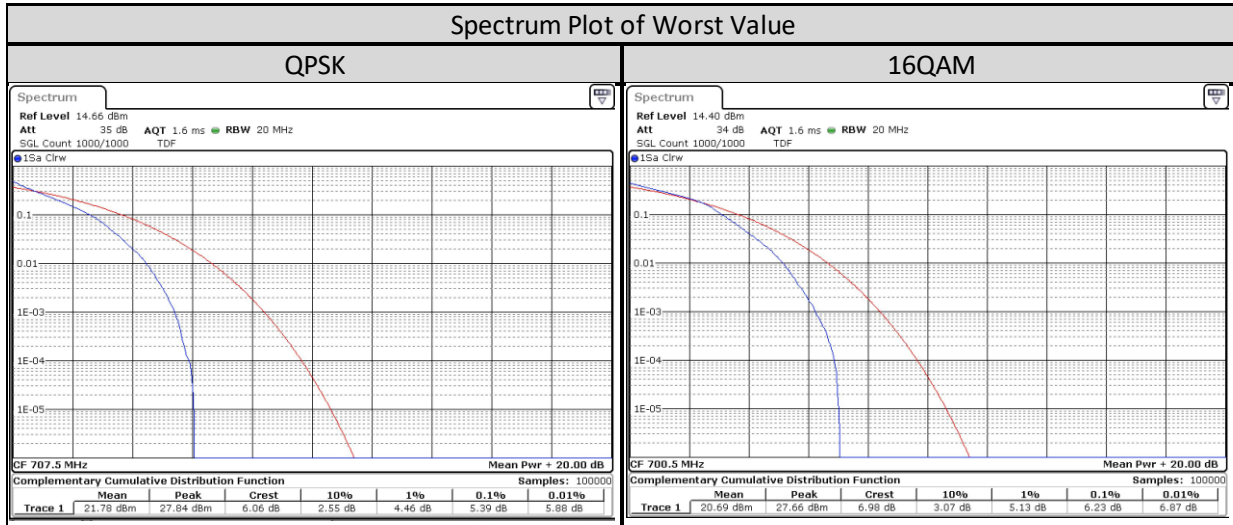
In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

1.7.3. Peak-to-Average Power Ratio - LTE Band 12 (699-716MHz)

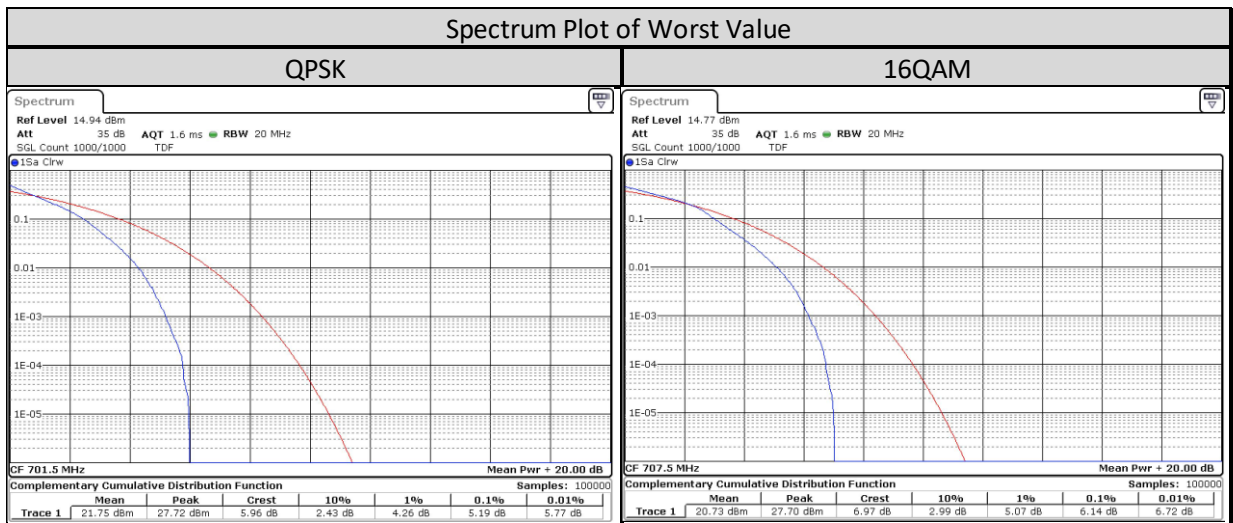
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 12/1.4MHz/6/0	Low CH 23017	699.7 MHz	5.507	6
	Mid CH 23095	707.5 MHz	5.159	6.116
	High CH 23173	715.3 MHz	5.072	5.797



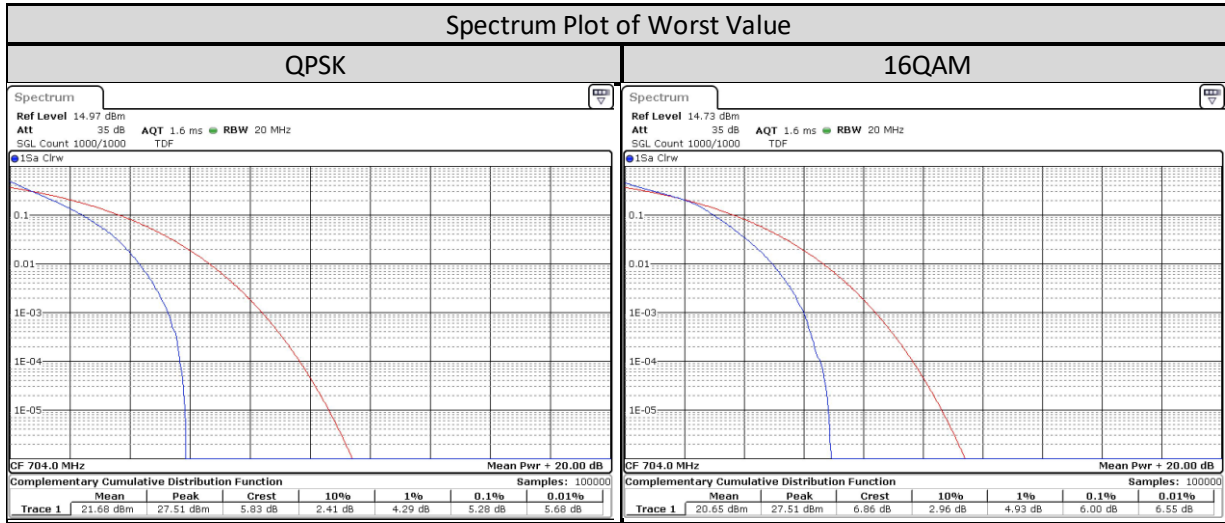
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 12/3MHz/15/0	Low CH 23025	700.5 MHz	5.333	6.232
	Mid CH 23095	707.5 MHz	5.391	6.087
	High CH 23165	714.5 MHz	4.783	5.739



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 12/5MHz/25/0	Low CH 23035	701.5 MHz	5.188	6
	Mid CH 23095	707.5 MHz	5.159	6.145
	High CH 23155	713.5 MHz	4.812	5.768

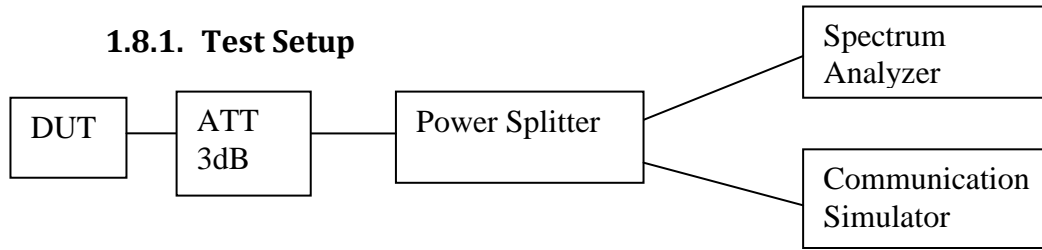


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 12/10MHz/50/0	Low CH 23060	704 MHz	5.275	6
	Mid CH 23095	707.5 MHz	4.899	5.797
	High CH 23130	711 MHz	4.783	5.913



1.8. Occupied Bandwidth

1.8.1. Test Setup



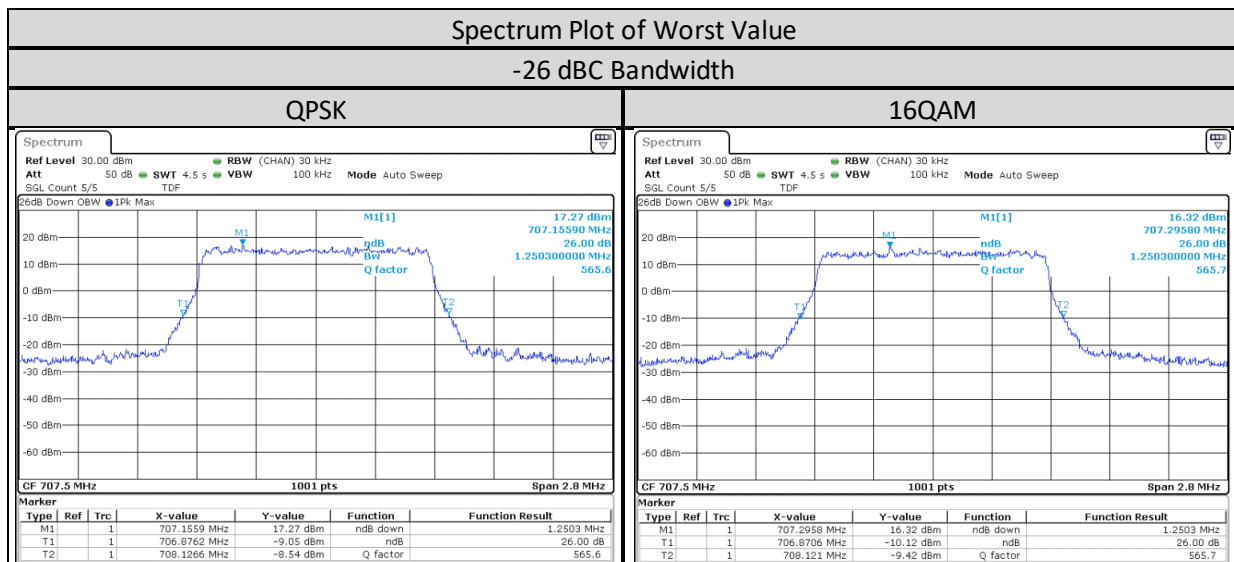
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum 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.

1.8.2. Test Limit

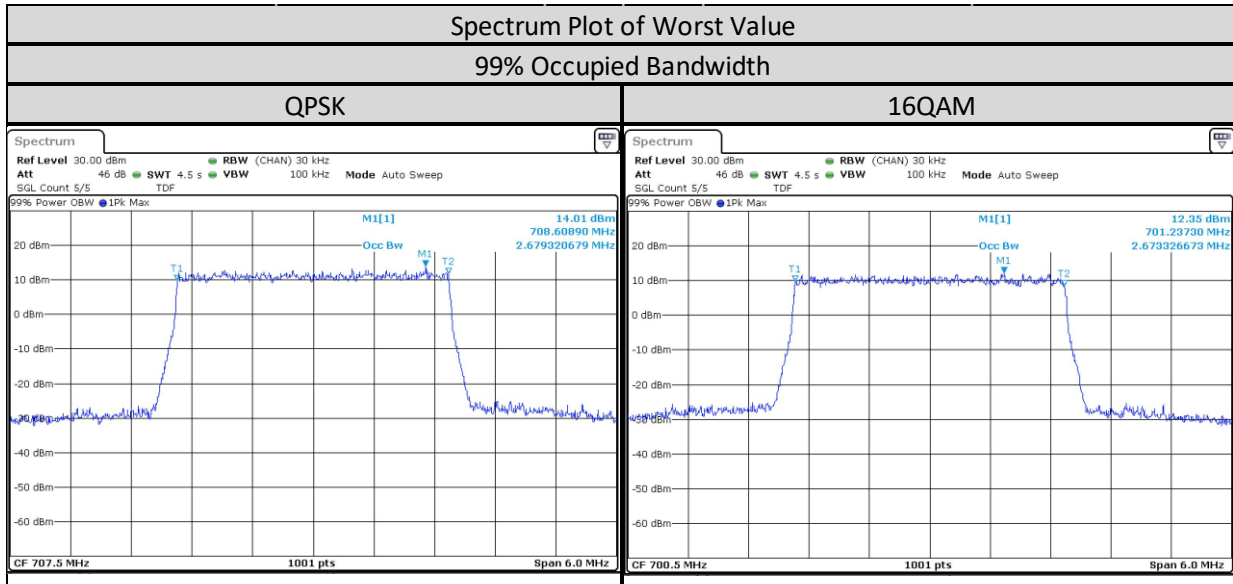
For measurement 99% of occupied bandwidth that is required by FCC 2.1046 and RSS Gen 6.7.

1.8.3. Occupied Bandwidth - LTE Band 12 (699-716MHz)

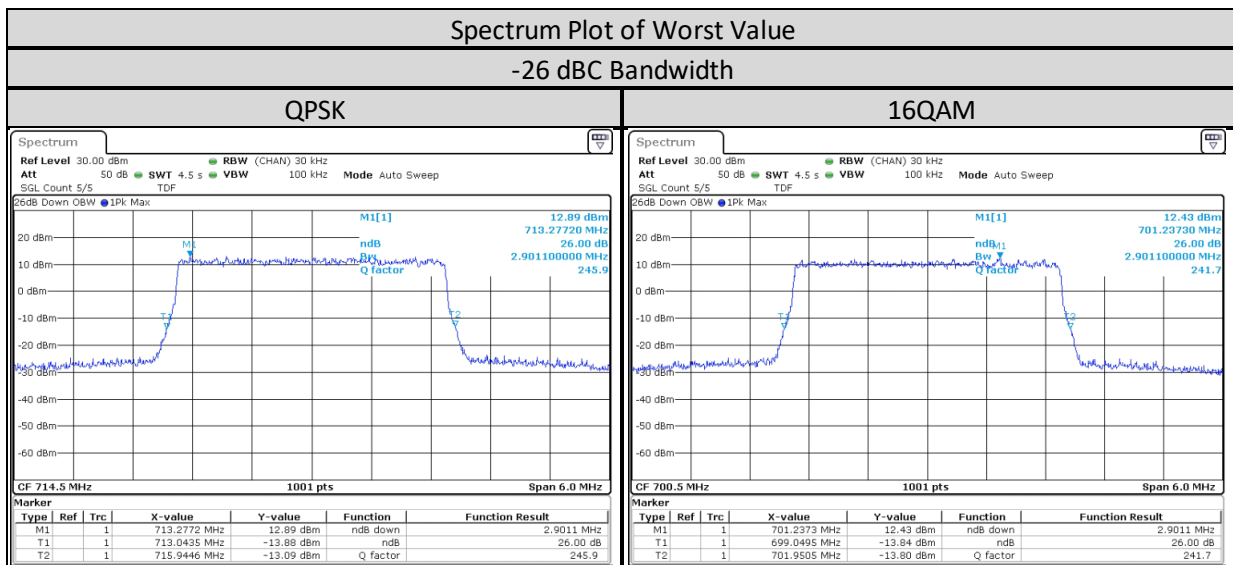
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/1.4MHz/6/0	Low CH 23017	699.7 MHz	1.242	1.236
	Mid CH 23095	707.5 MHz	1.25	1.25
	High CH 23173	715.3 MHz	1.242	1.242



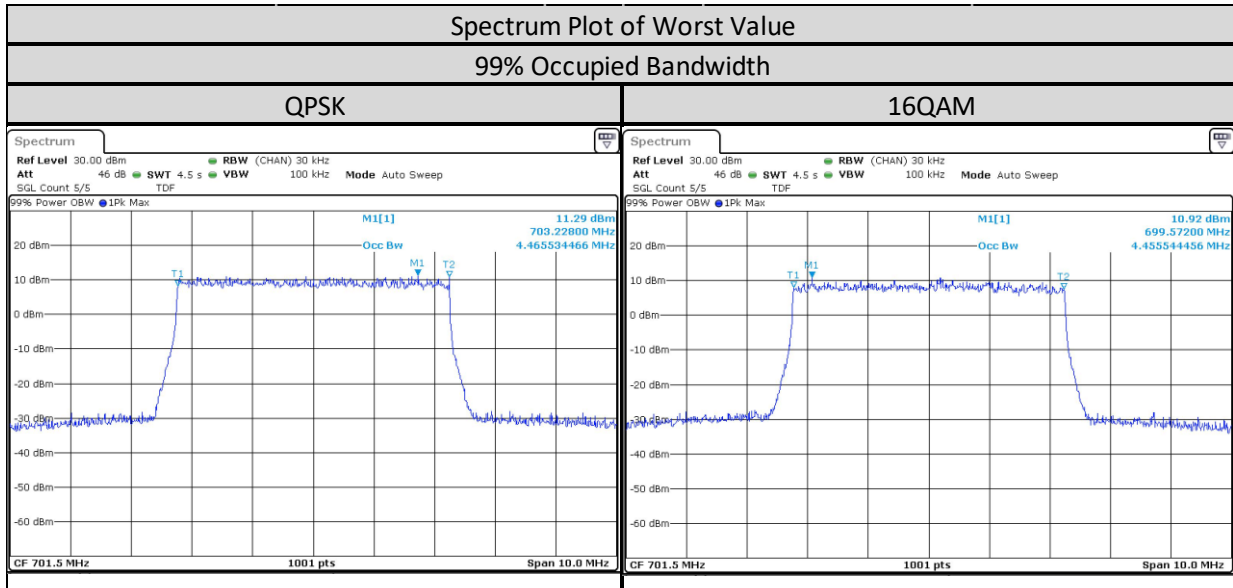
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/3MHz/15/0	Low CH 23025	700.5 MHz	2.673	2.673
	Mid CH 23095	707.5 MHz	2.679	2.673
	High CH 23165	714.5 MHz	2.679	2.673



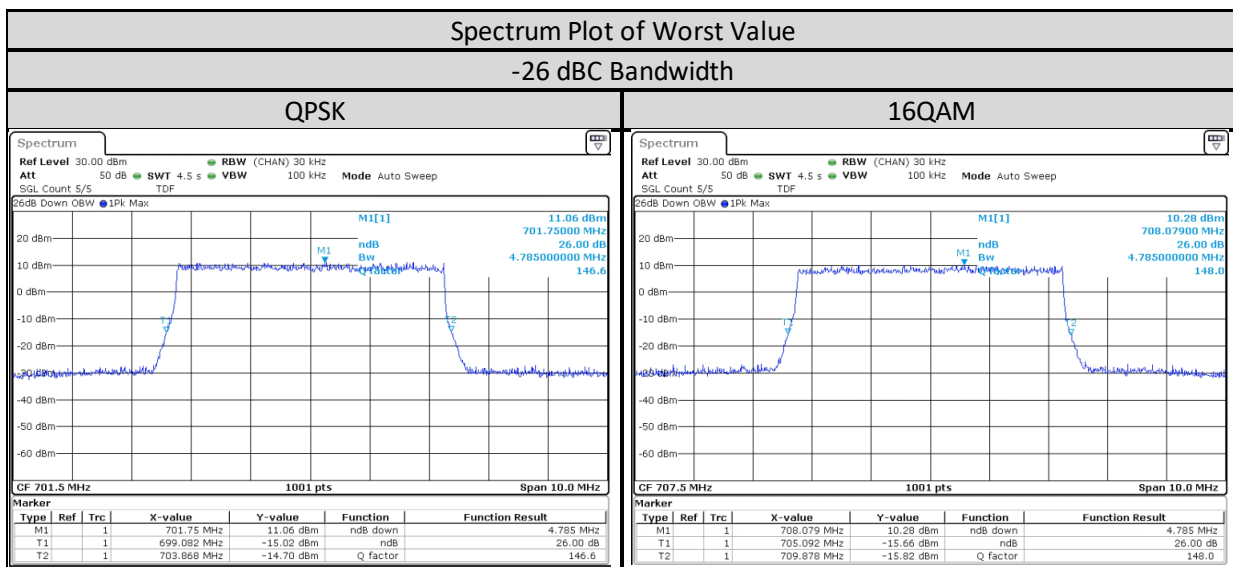
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/3MHz/15/0	Low CH 23025	700.5 MHz	2.871	2.901
	Mid CH 23095	707.5 MHz	2.883	2.883
	High CH 23165	714.5 MHz	2.901	2.901



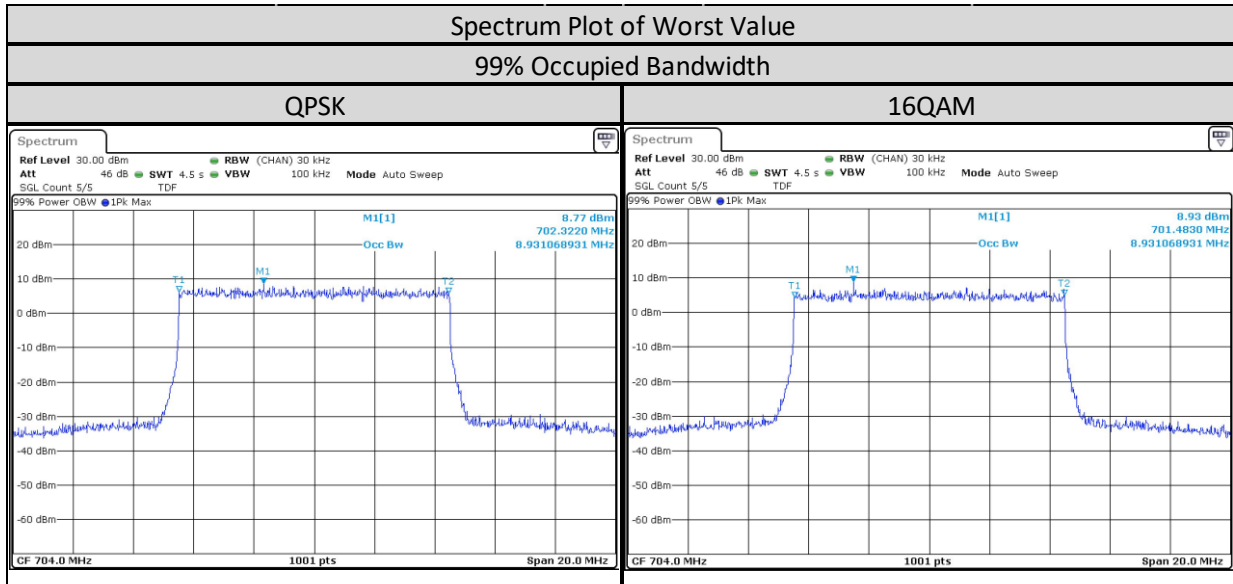
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/5MHz/25/0	Low CH 23035	701.5 MHz	4.466	4.456
	Mid CH 23095	707.5 MHz	4.466	4.456
	High CH 23155	713.5 MHz	4.456	4.456



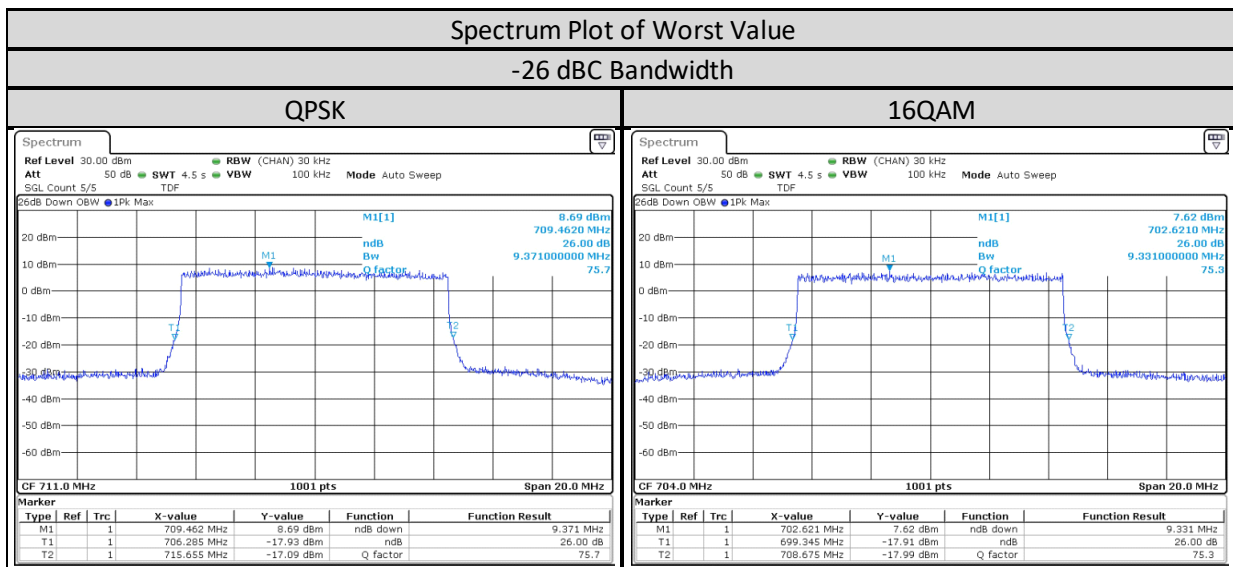
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/5MHz/25/0	Low CH 23035	701.5 MHz	4.785	4.745
	Mid CH 23095	707.5 MHz	4.735	4.785
	High CH 23155	713.5 MHz	4.765	4.745



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/10MHz/50/0	Low CH 23060	704 MHz	8.931	8.931
	Mid CH 23095	707.5 MHz	8.911	8.931
	High CH 23130	711 MHz	8.911	8.931

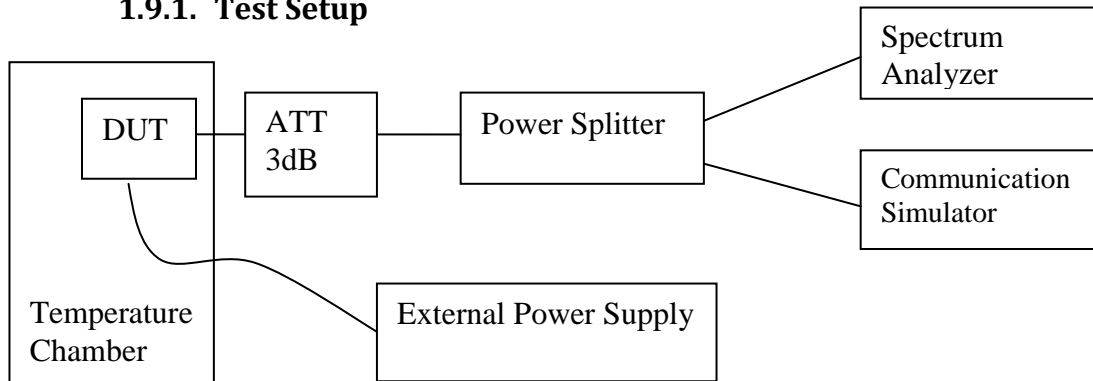


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 12/10MHz/50/0	Low CH 23060	704 MHz	9.311	9.331
	Mid CH 23095	707.5 MHz	9.311	9.271
	High CH 23130	711 MHz	9.371	9.311



1.9. Frequency Stability

1.9.1. 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.

1.9.2. Test Limit

As per manufacturer declared product operating at -30 to 60 deg C with spec of +/- 0.1ppm.

1.9.3. Frequency Stability – LTE Band 12 (699-716MHz)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		699.7MHz		715.3MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	60	699.699997	-0.004866	715.299995	-0.00646
	50	699.700004	0.005786	715.299995	-0.0065
	40	699.699995	-0.006767	715.299995	-0.00656
	30	699.699995	-0.007217	715.299995	-0.00682
	20	699.699994	-0.008321	715.299995	-0.00706
	10	699.699995	-0.007544	715.299995	-0.00756
	0	699.700045	0.007544	715.299983	-0.023119
	-10	699.700005	0.007442	715.300008	0.010639
	-20	699.700005	0.007851	715.299995	-0.00632
	-30	699.699996	-0.005888	715.299996	-0.0057

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		699.7MHz		715.3MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	9	699.700005	0.005581	715.299995	-0.008419
	7.5	699.700005	-0.007953	715.299983	-0.0078
	6	699.699996	-0.007217	715.299996	-0.00506

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		700.5MHz		714.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	60	700.500004	0.006392	714.500007	0.00915
	50	700.500007	0.009312	714.500006	0.008989
	40	700.500006	0.008026	714.500006	0.008609
	30	700.500005	0.007433	714.500005	0.006567
	20	700.500006	0.008638	714.500007	0.00941
	10	700.500005	0.007597	714.500006	0.007708
	0	700.500007	0.007352	714.500006	0.008269
	-10	700.500005	0.007801	714.500007	0.00973
	-20	700.500004	0.005759	714.500016	0.021763
	-30	700.500002	0.028304	714.500019	0.026288

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		700.5MHz		714.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	9	700.500005	0.007638	714.500007	0.00933
	7.5	700.500007	0.006657	714.500007	0.009991
	6	700.500005	0.009128	714.500019	0.005706

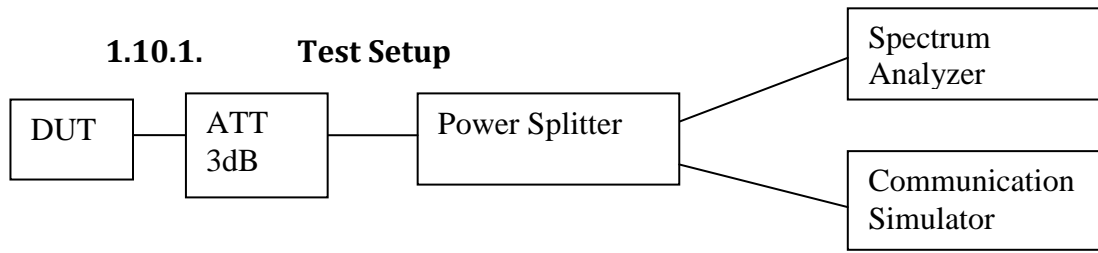
Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		701.5MHz		713.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	60	701.500006	0.007912	713.500005	0.006937
	50	701.500004	0.005812	713.500026	0.037111
	40	701.500006	0.008809	713.500005	0.007699
	30	701.500005	0.006709	713.500004	0.005594
	20	701.500006	0.008259	713.500006	0.00808
	10	701.500005	0.007402	713.500006	0.008561
	0	701.500009	0.011685	713.500012	0.009704
	-10	701.500006	0.008728	713.500023	0.032339
	-20	701.500005	0.007749	713.500009	0.01209
	-30	701.500005	0.006485	713.500008	0.011328

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		701.5MHz		713.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	9	701.500005	0.009299	713.500023	0.009904
	7.5	701.500005	0.007484	713.500009	0.007719
	6	701.500005	0.007178	713.500008	0.007178

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		704MHz		711MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	60	704.000005	0.006401	710.999995	-0.006338
	50	704.000005	0.006584	710.999996	-0.005452
	40	704.000004	0.006218	710.999996	-0.006137
	30	704.000005	0.006909	710.999996	-0.005855
	20	704.000005	0.006482	710.999996	-0.005634
	10	704.000005	0.006401	710.999998	-0.027584
	0	704.000026	0.005913	711.000366	0.005955
	-10	704.000005	0.007051	711.000005	0.006438
	-20	704.000006	0.008189	711.000005	0.006921
	-30	704.000005	0.006401	711.000004	0.006217

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		704MHz		711MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 12	9	704.000005	-0.035621	710.999996	0.006458
	7.5	704.000005	0.00699	710.999998	-0.006177
	6	704.000005	-0.005832	710.999998	0.005613

1.10. Band Edge Conducted Spurious Emission

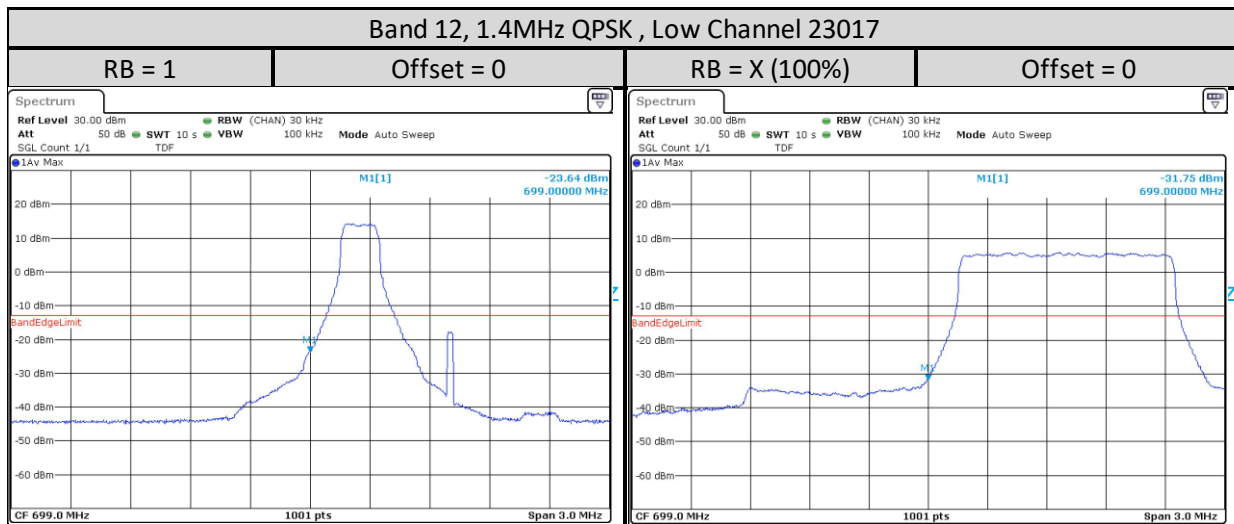


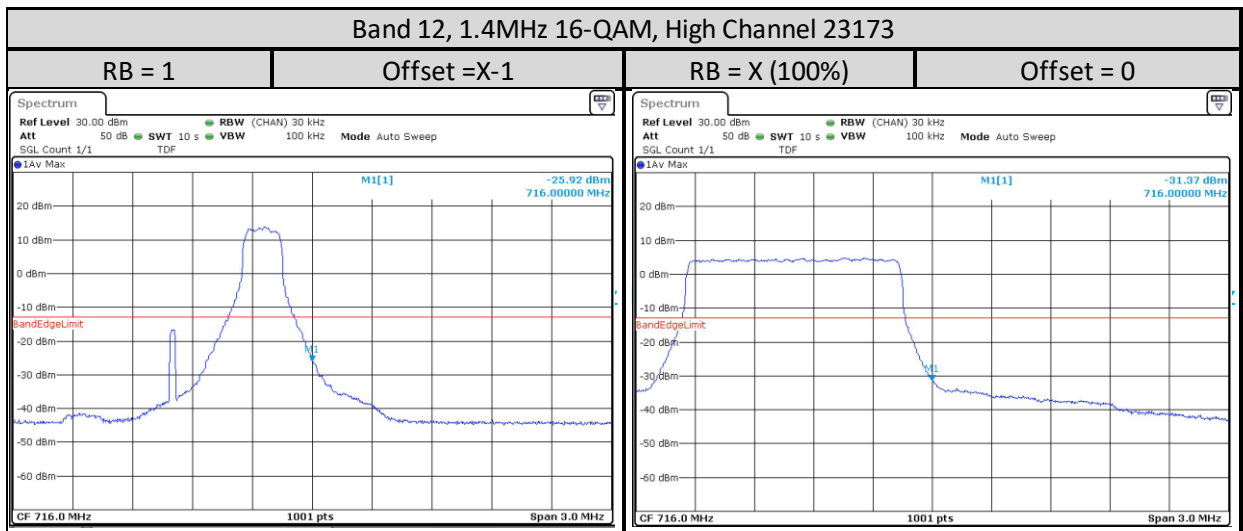
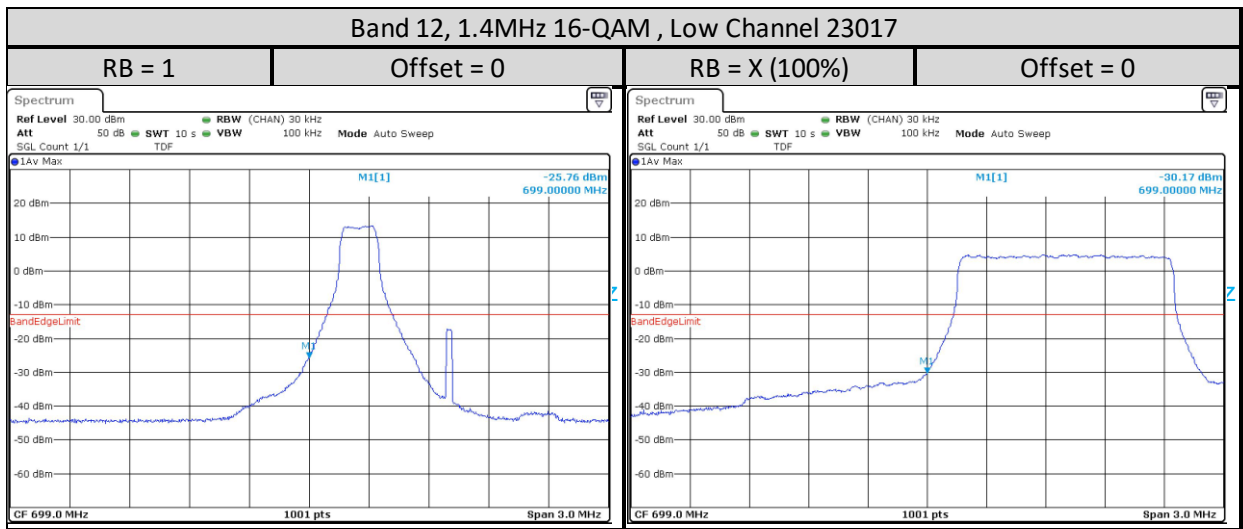
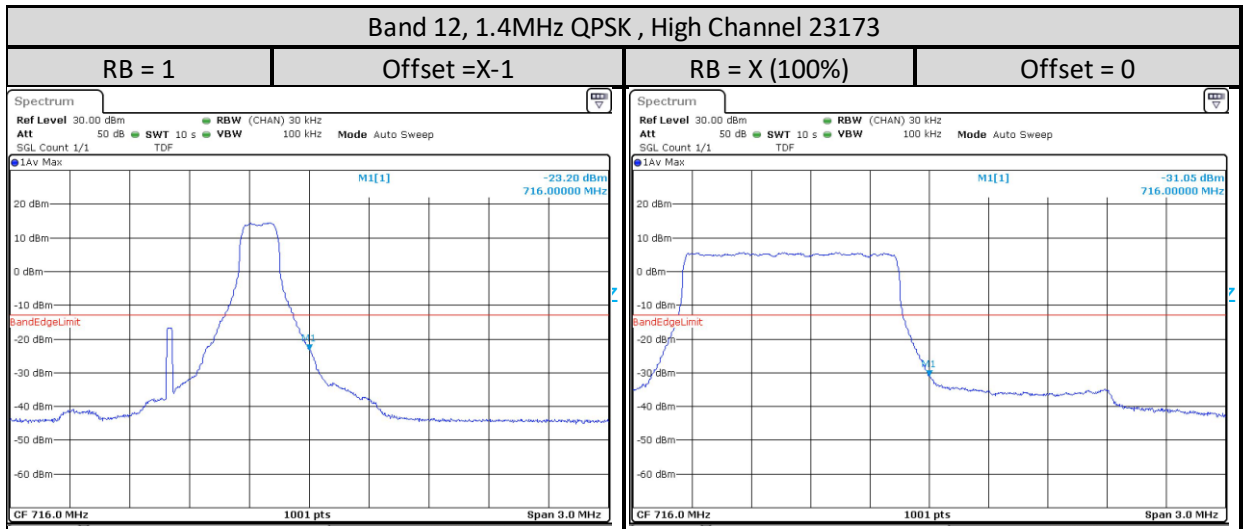
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 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.

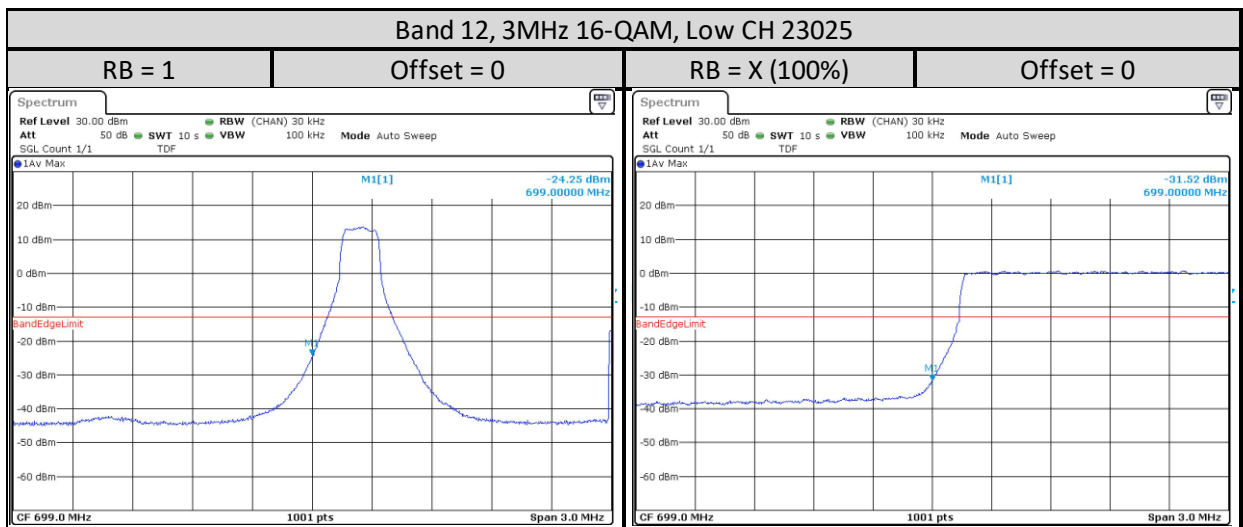
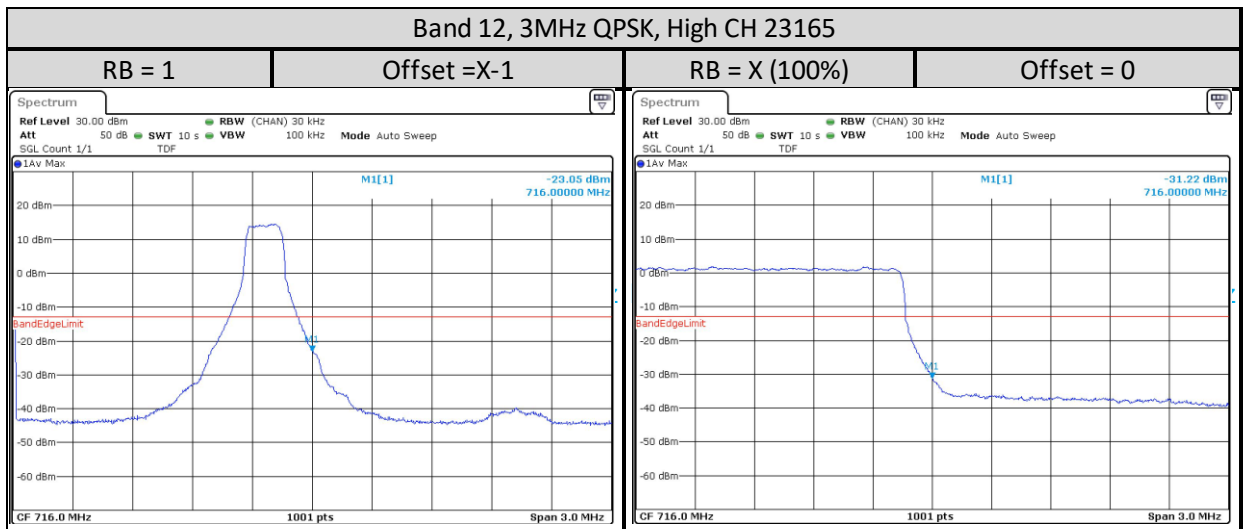
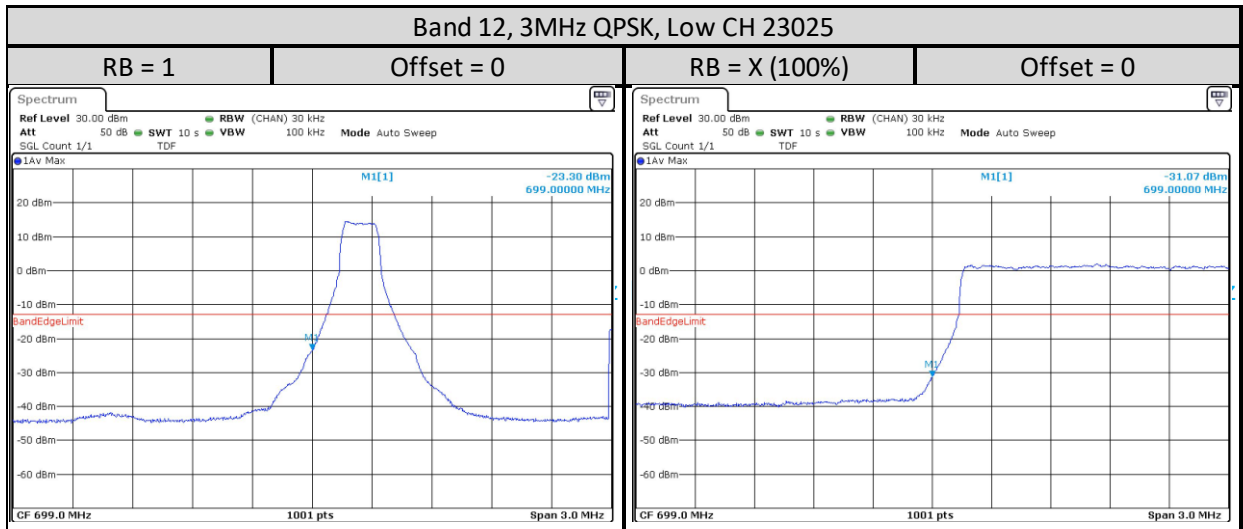
1.10.2. Test Limit

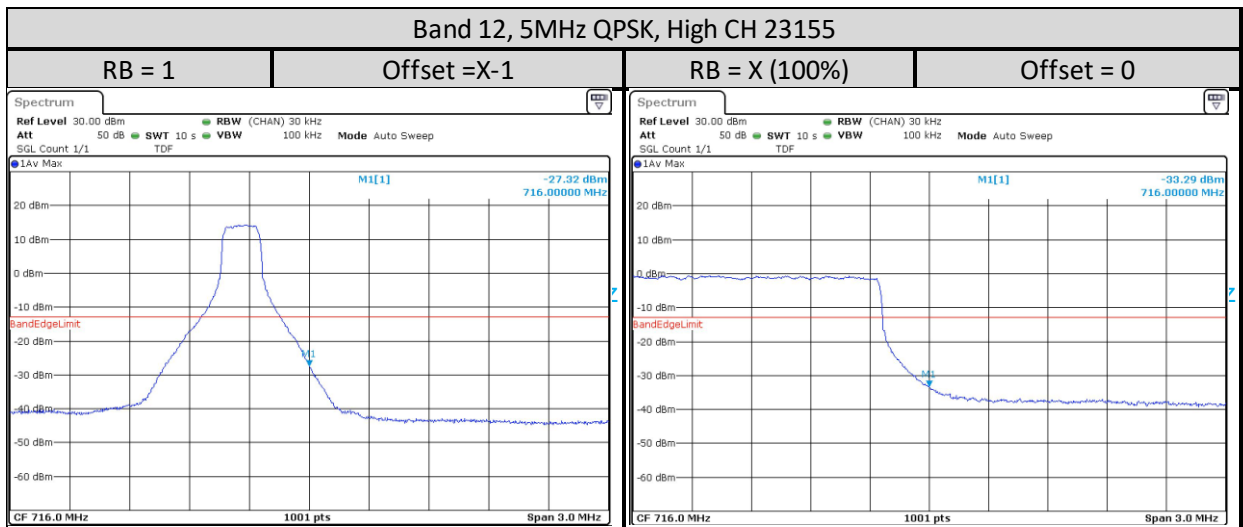
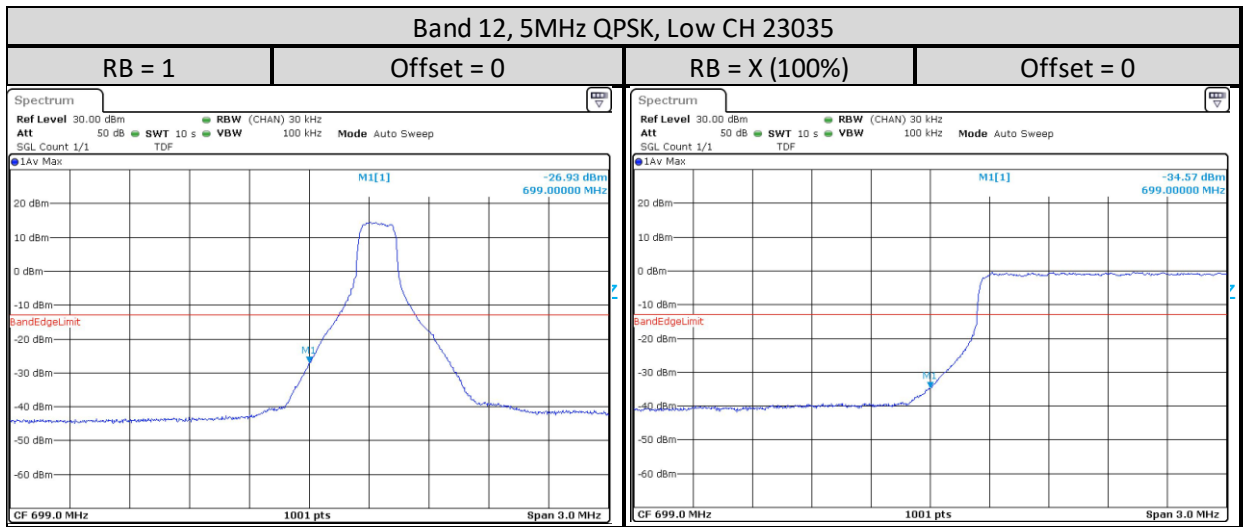
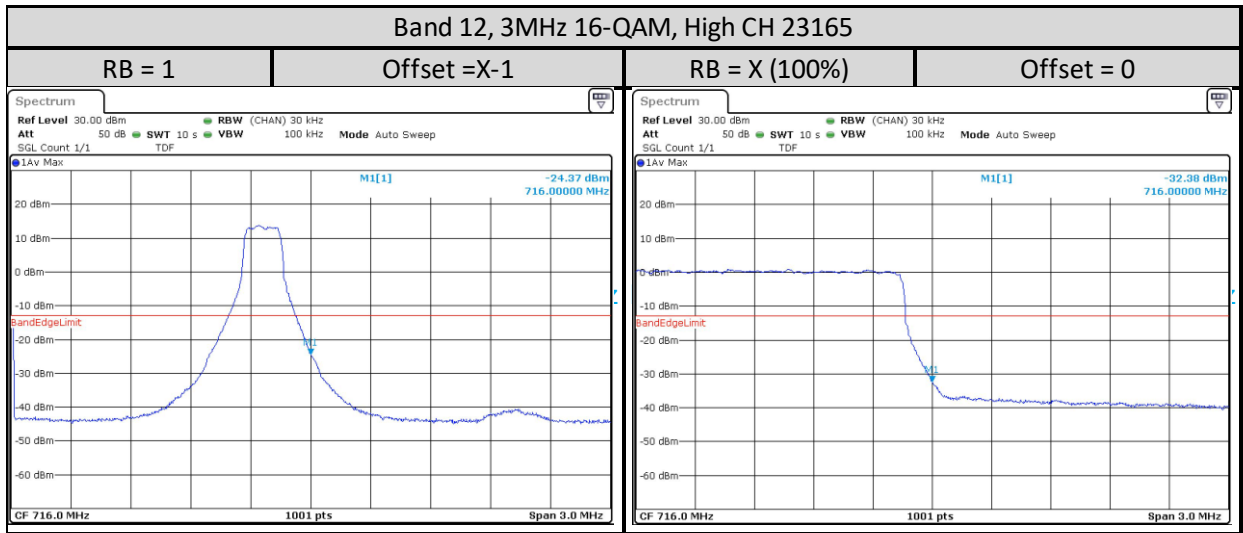
For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

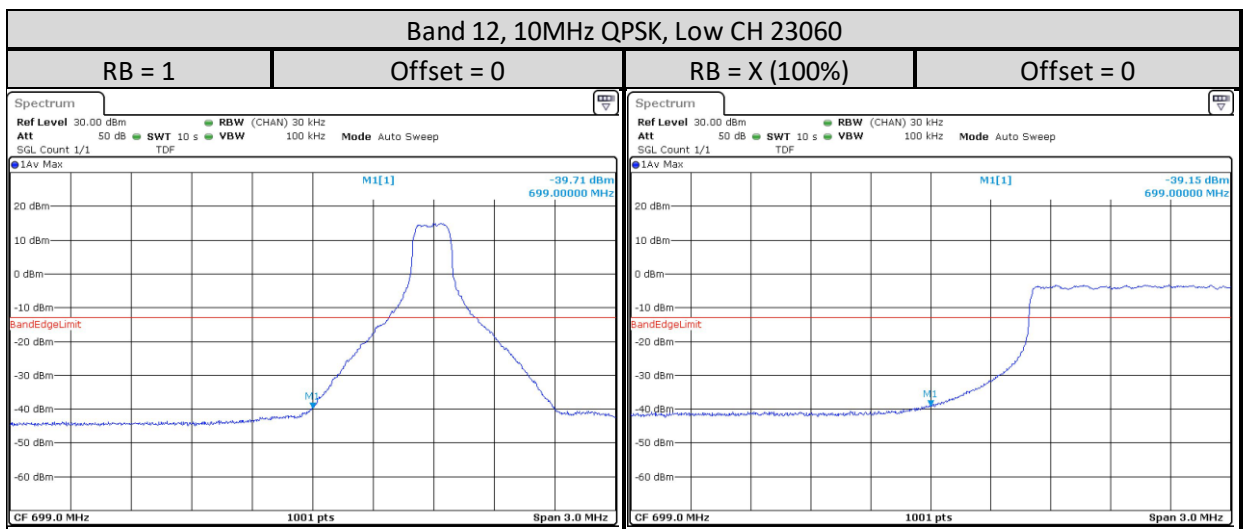
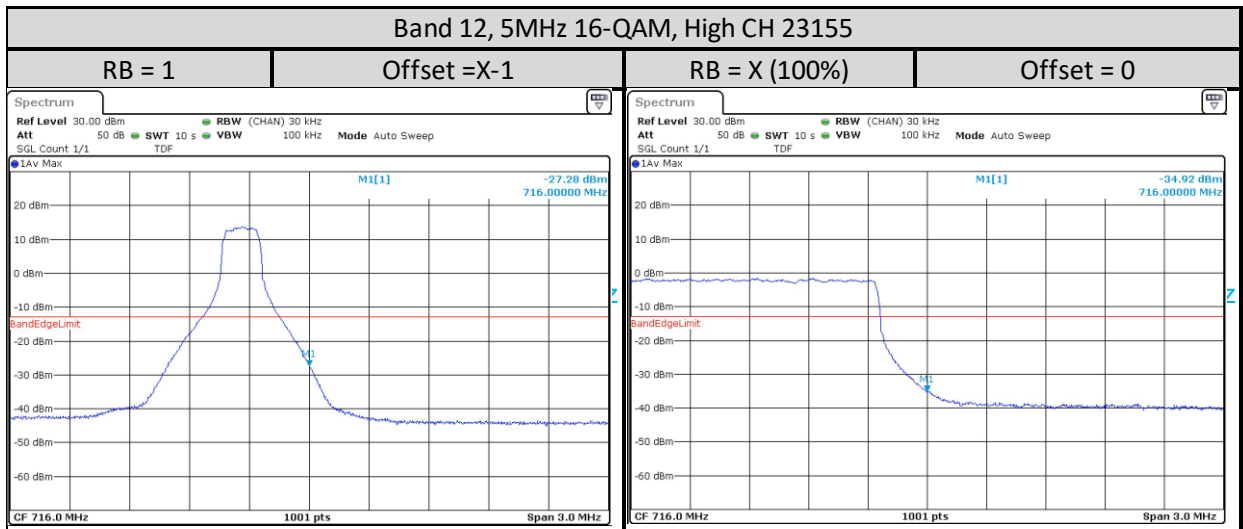
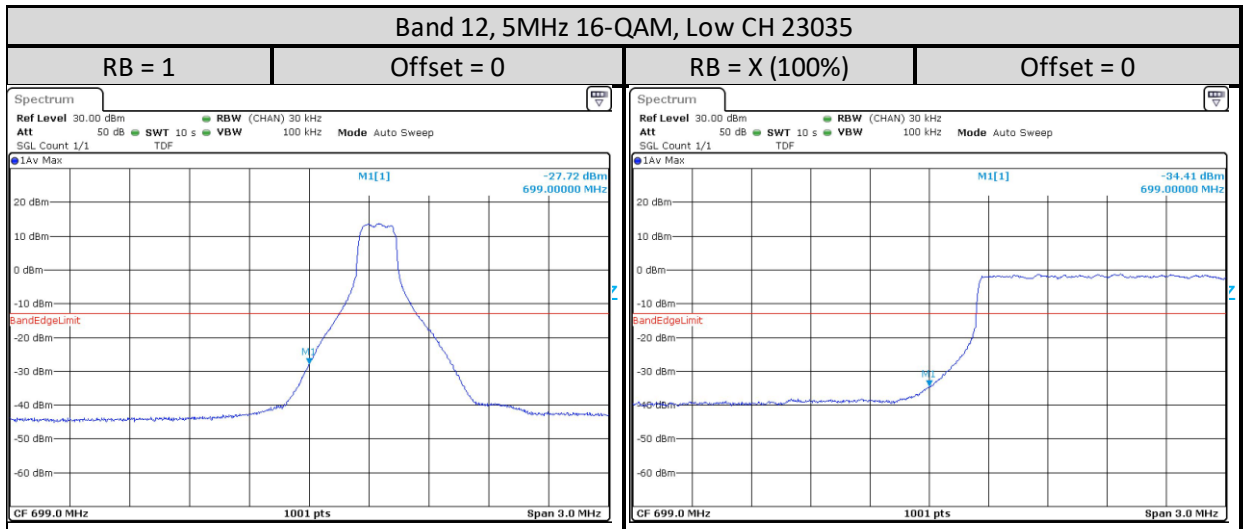
1.10.3. Band Edge Conducted Spurious Emission – LTE Band 12 (699-716MHz)

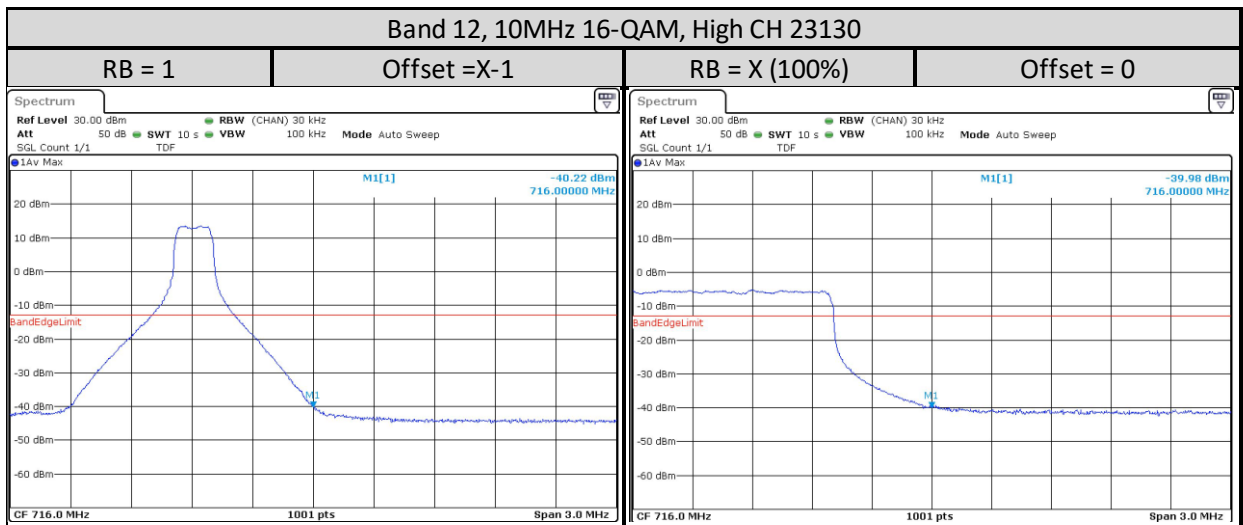
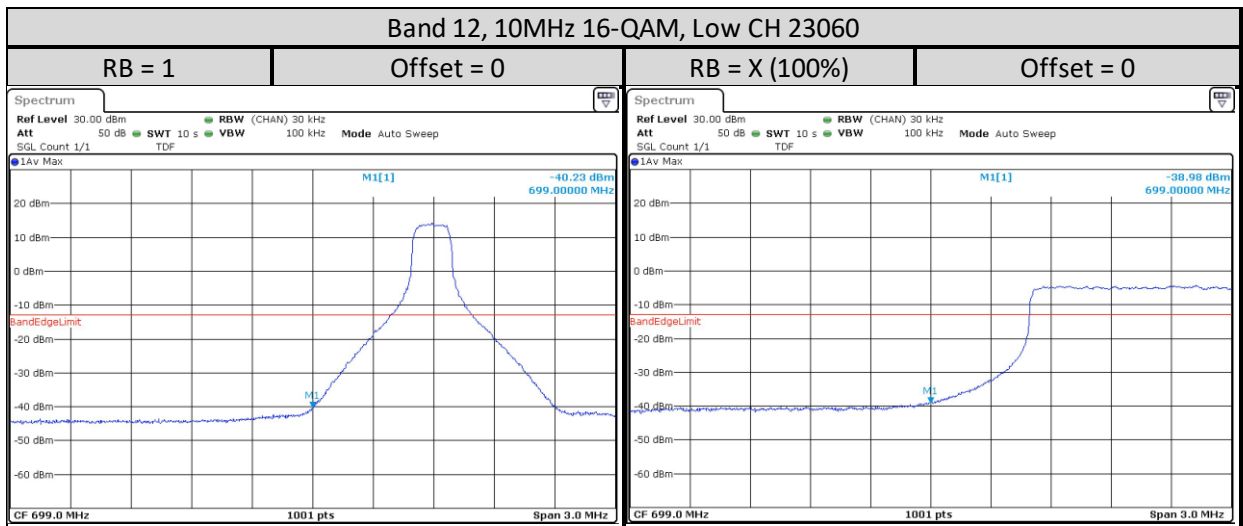
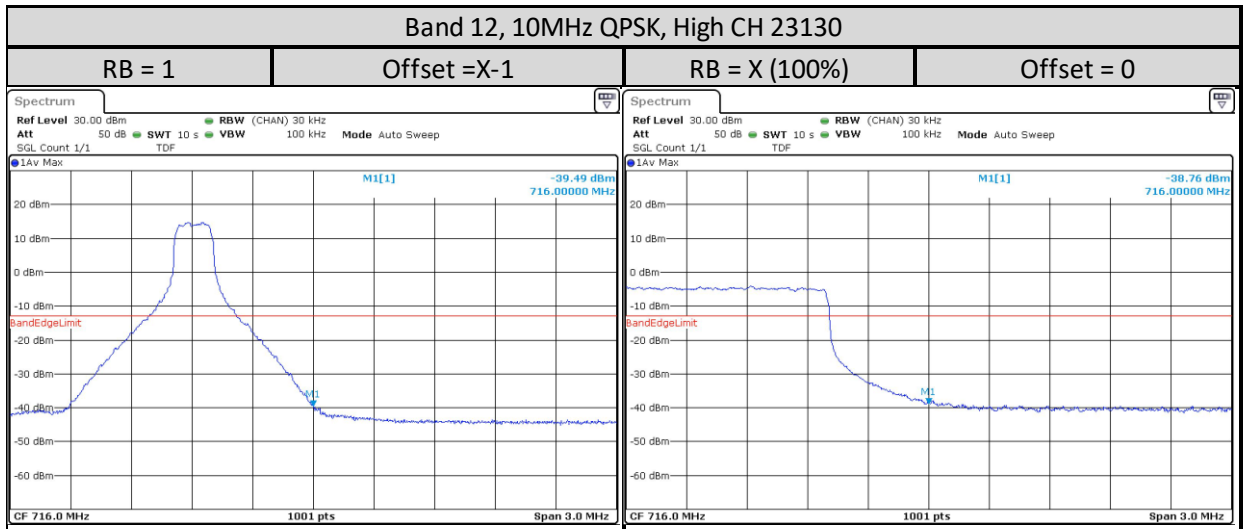




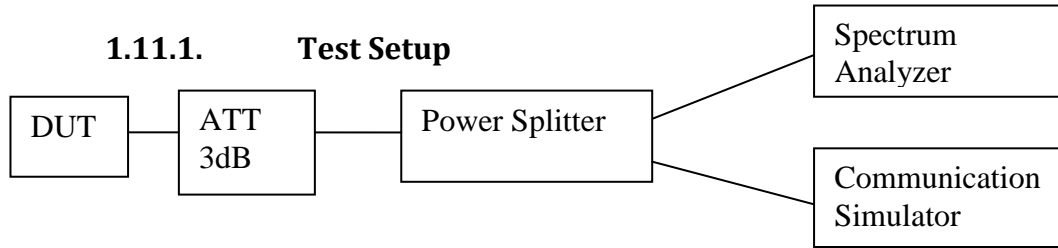








1.11. Conducted Spurious Emission



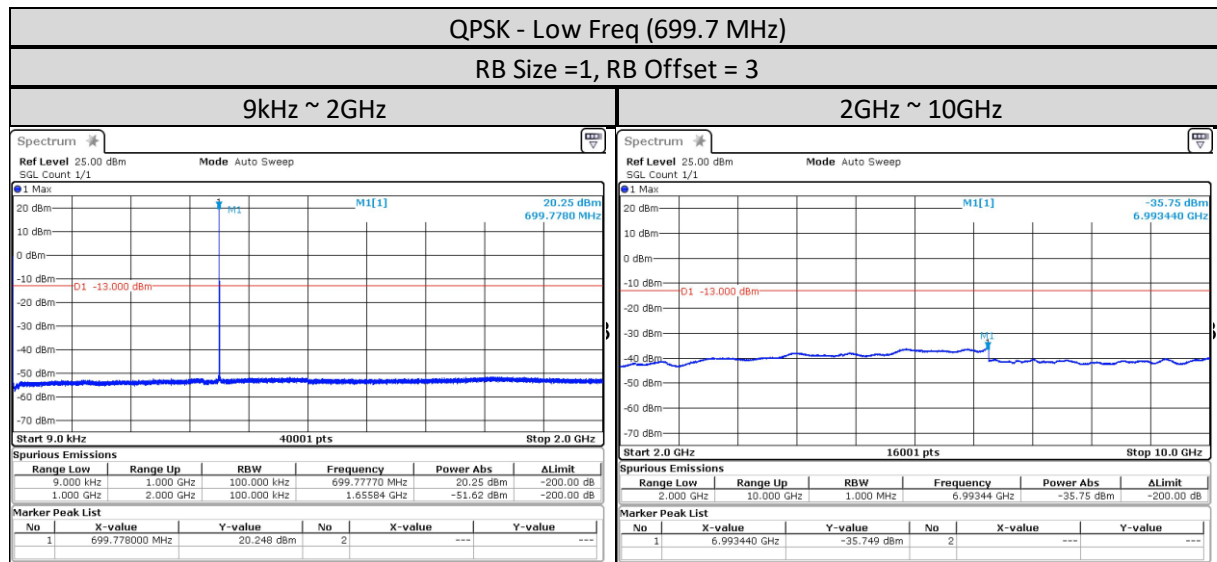
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of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

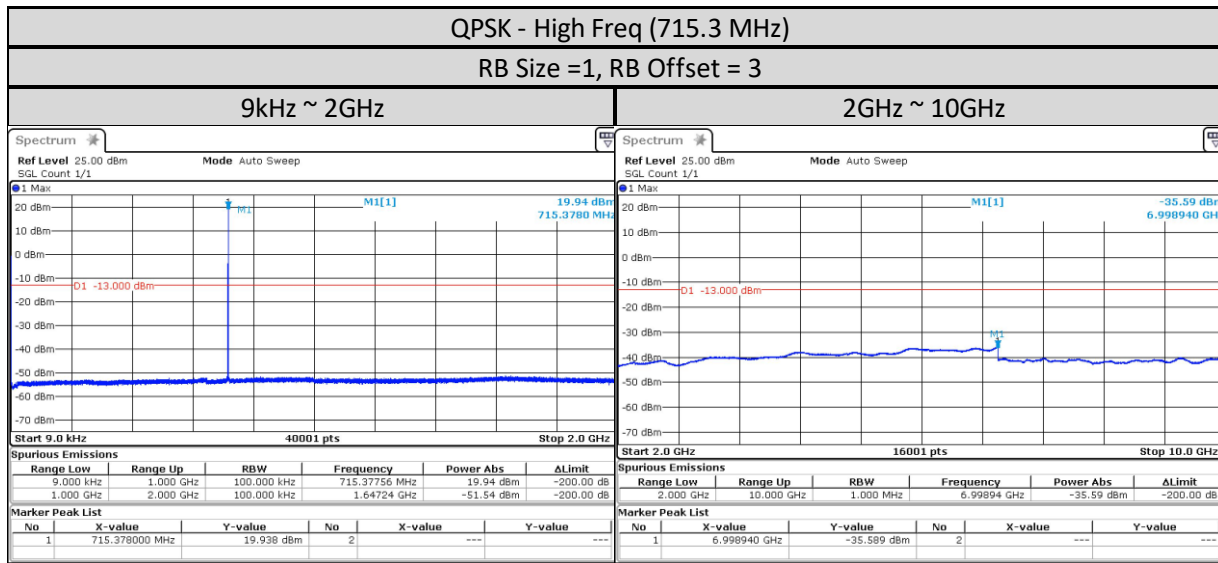
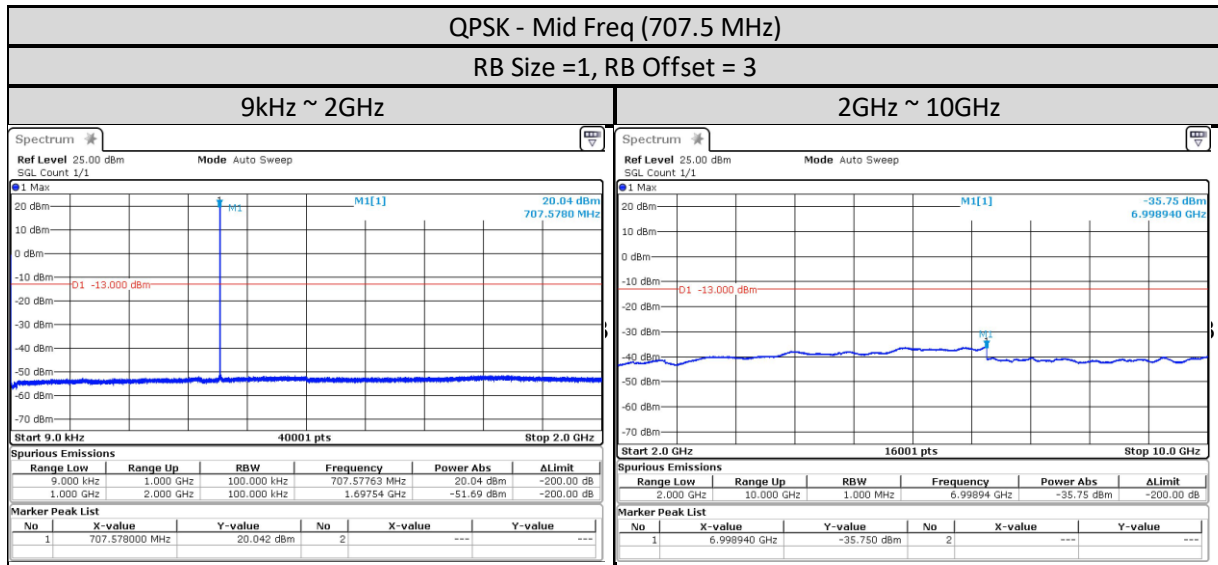
1.11.2. Test Limit

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

1.11.3. Conducted Spurious Emissions – LTE Band 12 (699-716MHz)

1.4MHz





3MHz

