

FCC Test Report - LTE Band 5

Report ID : 03360-RF-00020

FCC ID : AZ489FT7078

Tested Model : LEX L10i

Test Date : Nov 16, 2015 ~ Feb 25, 2016

Issued Date : 2 Mar, 2016

Applicant : Motorola Solution Malaysia Sdn Bhd

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Testing Lab : Motorola Penang Adv. Comm. Laboratory

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FCC Registration: 772092



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1.0. Summary of Test Results

FCC Clause	Test Item	Result	Remark
2.1046	Conducted RF Output Power	Pass	Meet the requirement of limit
--	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit
2.1049 22.917	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit
2.1051 22.917	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit
22.913(a)(2)	Effective Radiated Power (ERP)	Pass	Meet the requirement of limit
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit

1.1. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
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
POWER SUPPLY	6623A	2916A01428	3-Apr-15	3-Apr-16
Wideband Radio Communication Tester	CMW500	154550	23-Jun-15	23-Jun-16
SIGNAL ANALYZER	FSV40	101431	29-Apr-15	29-Apr-16
CHAMBER	SH-641	92002651	15-Mar-15	15-Mar-16
DRG HORN FREQ.	SAS-571	566	2-Aug-15	2-Aug-16
PREAMPLIFIER	PAM-0118P	361	NA	NA
BILOG ANTENNA	CBL6112B	2964	23-Apr-14	23-Apr-16
POWER SUPPLY	6031A	3121A02341	12-Jun-14	12-Jun-16
EMI TEST RECEIVER	ESIB26	100336	17-Jun-15	17-Jun-16
MICROWAVE SIGNAL GENERATOR	SMP04	100131	25-Jun-15	25-Jun-16
SYSTEM CONTROLLER	SC104V	050806-1	NA	NA
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	NA	NA
ANTENNA POSITIONING TOWER	TLT2	NA	NA	NA
TEST RECEIVER	ESIB26	827769/009	16-Jun-15	16-Jun-16
SIGNAL ANALYZER	FSV40	101103	25-Jun-15	25-Jun-16
5m Semi-anechoic Chamber	S800-HX	J2308	29-Apr-15	29-Apr-16
BILOG ANTENNA	CBL6112B	2863	24-Jul-15	24-Jul-16
DATA LOGGER	TM320	12249289	12-Apr-15	12-Apr-16
BILOG ANTENNA	CBL6112D	25516	23-Apr-15	23-Apr-16

1.3. General Information

General Description of EUT

Product	Smart phone		
Brand	Motorola Solutions		
Test Model	LEX L10i		
Power Supply Rating	3.7Vdc (Battery), 5Vdc (Adapter)		
Mode of operation	LTE Band 5		
Modulation Type	QPSK, 16QAM		
Operating Frequency	LTE Band 5	Channel Bandwidth 1.4MHz	824.7MHz~848.3MHz
		Channel Bandwidth 3MHz	825.5MHz~847.5MHz
		Channel Bandwidth 5MHz	826.5MHz~846.5MHz
		Channel Bandwidth 10MHz	829.0MHz~844.0MHz
Max. ERP Power	LTE Band 5 QPSK	Channel Bandwidth 1.4MHz	13.76dBm
		Channel Bandwidth 3MHz	15.85dBm
		Channel Bandwidth 5MHz	16.06dBm
		Channel Bandwidth 10MHz	17.39dBm
	LTE Band 5 16QAM	Channel Bandwidth 1.4MHz	14.25dBm
		Channel Bandwidth 3MHz	14.66dBm
		Channel Bandwidth 5MHz	15.62dBm
		Channel Bandwidth 10MHz	16.54dBm
Antenna Type	LTE Band 5	Inverted-L Monopole with -0.4 to -2.2dBi gain	
SW Version	LEXL10-INT-D17		
HW Version	Rev A		

Note:

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

Item	Brand	Model or P/N	Specification
Rechargeable Lithium ion battery	MOTOROLA	PMNN4472A	3.7Vdc, 2340mAh, 8.7Wh
Rechargeable Lithium ion battery	MOTOROLA	PMNN4475A	3.7Vdc, 4560mAh, 16.9Wh
ITE Power Supply	MOTOROLA	HKTN4009A	I/P: 100-240Vac, 50-60Hz, 0.2A O/P: 5Vdc, 1.2A
USB cable (CABLE: LEX USB SYNC AND CHARGE)	N/A	CB000262A01	-
Holster	N/A	HKLN4618A	-

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 22

KDB 971168 D01 Power Meas License Digital Systems v02r02

ANSI/TIA/-603-D

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 5	1.4 MHz	20407~ 20643	20407	20525	20643	824.7	836.5	848.3
	3 MHz	20415~ 20635	20415	20525	20635	825.5	836.5	847.5
	5 MHz	20425~20625	20425	20525	20625	826.5	836.5	846.5
	10 MHz	20450~ 20600	20450	20525	20600	829	836.5	844

1.5. Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The Radiated Emission and Effective Radiated Power (ERP) worst case was found when positioned on Z-Plane for LTE band 5. The following channel(s) was (were) selected for the final test as listed below:

LTE Band 5

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Conducted RF Output Power	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	As per table 1.6.2
	20415~ 20635	20415, 20525, 20635	3 MHz		
	20425~ 20625	20425, 20525, 20625	5 MHz		
	20450~ 20600	20450, 20525, 20600	10 MHz		
Peak to Average Power Ratio	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		15 RB / 0 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		25 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		50 RB / 0 RB Offset
Occupied Bandwidth	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		15 RB / 0 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		25 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		50 RB / 0 RB Offset
Frequency Stability	20407~ 20643	20525	1.4 MHz	QPSK	6 RB / 0 RB Offset
	20415~ 20635	20525	3 MHz		15 RB / 0 RB Offset
	20425~ 20625	20525	5 MHz		25 RB / 0 RB Offset
	20450~ 20600	20525	10 MHz		50 RB / 0 RB Offset
Band Edge Conducted Spurious Emission	20407~ 20643	20407, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	20415~ 20635	20415, 20635	3 MHz		1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
	20425~ 20625	20425, 20625	5 MHz		1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	20450~ 20600	20450, 20600	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
Conducted Spurious Emission	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 5 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		1 RB / 0 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		1 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		1 RB / 0 RB Offset
Radiated Emission	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 5 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		1 RB / 0 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		1 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		1 RB / 0 RB Offset
Effective Radiated Power (ERP)	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		1 RB / 0 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		1 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		1 RB / 0 RB Offset

NOTE:

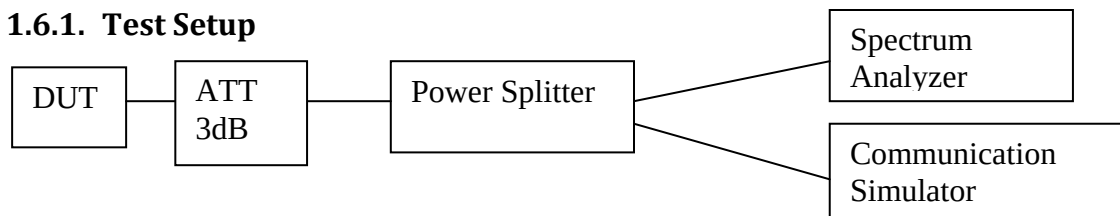
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Effective Radiated Power (ERP) was performed based on worst case mode from Conducted RF Output Power 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	3.7V DC	ckchan
Peak-to-Average Power Ratio	25°C, 50% RH	3.7V DC	ckchan
Occupied Bandwidth	25°C, 50% RH	3.7V DC	ckchan
Frequency Stability	25°C, 50% RH	3.7V DC	ckchan
Band Edge Conducted Spurious Emission	25°C, 50% RH	3.7V DC	ckchan
Conducted Spurious Emission	25°C, 50% RH	3.7V DC	ckchan
Radiated Spurious Emission	25°C, 63.7% RH	3.7V DC	Nazrin/Qawiman
Effective Radiated Power (ERP)	25°C, 63.7% RH	3.7V DC	Nazrin/Qawiman

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.

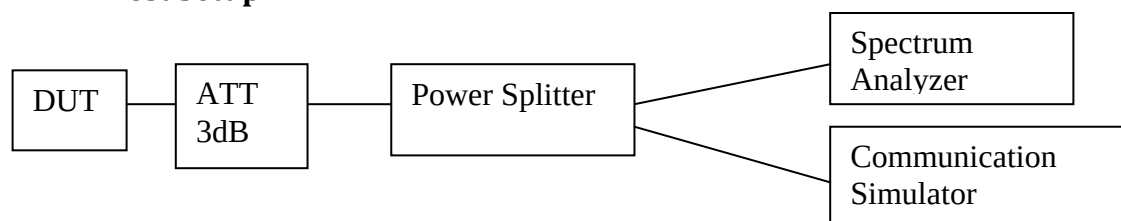
1.6.2. Conducted RF Output Power – LTE Band 5 (824-849MHz)

LTE BW	RB Size	RB Offset	Conducted Output Power (dBm)					
			QPSK Modulation			16QAM Modulation		
			Low CH 20407	Mid CH 20525	High CH 20643	Low CH 20407	Mid CH 20525	High CH 20643
			824.7MHz	836.5MHz	848.3 MHz	824.7 MHz	836.5MHz	848.3 MHz
1.4MHz	1	0	23.088	22.784	22.605	21.841	21.952	21.709
	1	3	23.088	22.796	22.577	21.832	21.877	21.696
	1	5	23.149	22.757	22.600	21.903	21.920	21.751
	3	0	23.040	22.717	22.637	22.213	21.755	21.579
	3	2	23.000	22.661	22.612	22.175	21.687	21.561
	3	3	22.975	22.710	22.681	22.196	21.694	21.615
	6	0	22.082	21.758	21.652	21.106	20.546	21.714
LTE BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH 20415	Mid CH 20525	High CH 20635	Low CH 20415	Mid CH 20525	High CH 20635
			825.5MHz	836.5MHz	847.5MHz	825.5 MHz	836.5MHz	847.5 MHz
3MHz	1	0	23.055	22.780	22.871	21.837	21.896	21.539
	1	7	22.992	22.730	22.587	21.741	21.865	21.421
	1	14	23.025	21.782	22.612	21.776	21.891	21.462
	8	0	21.990	21.718	21.706	20.905	21.736	20.717
	8	4	21.990	21.724	21.722	20.882	20.710	20.694
	8	7	21.982	21.766	21.610	20.903	20.726	20.645
	15	0	21.971	21.719	21.763	20.911	20.702	20.721
LTE BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH 20425	Mid CH 20525	High CH 20625	Low CH 20425	Mid CH 20525	High CH 20625
			826.5MHz	836.5MHz	846.5MHz	826.5 MHz	836.5MHz	846.5 MHz
5MHz	1	0	23.021	22.789	22.427	21.910	21.900	21.337
	1	13	22.911	22.728	22.595	21.850	21.788	21.413

	1	24	22.962	22.722	22.484	21.849	21.788	21.415
	12	0	21.998	21.694	21.713	20.893	20.742	20.642
	12	6	21.978	21.707	21.698	20.891	20.712	20.623
	12	13	21.951	21.676	21.726	20.883	20.684	20.658
	25	0	21.957	21.669	21.669	20.882	20.690	20.733
LTE BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH 20450	Mid CH 20525	High CH 20600	Low CH 20450	Mid CH 20525	High CH 20600
			829 MHz	836.5MHz	844 MHz	829 MHz	836.5MHz	844 MHz
10MHz	1	0	23.005	22.792	22.714	21.813	21.911	21.544
	1	25	22.943	22.714	22.575	21.715	21.823	21.378
	1	49	22.736	22.675	22.618	21.572	21.806	21.423
	25	0	21.996	21.765	21.713	21.012	20.750	20.649
	25	13	21.935	21.675	21.668	20.948	20.683	20.625
	25	25	21.776	21.720	21.642	20.845	20.671	20.615
	50	0	21.801	21.740	21.687	20.784	20.720	20.680

1.7. Peak-to-Average Power Ratio

1.7.1. Test Setup



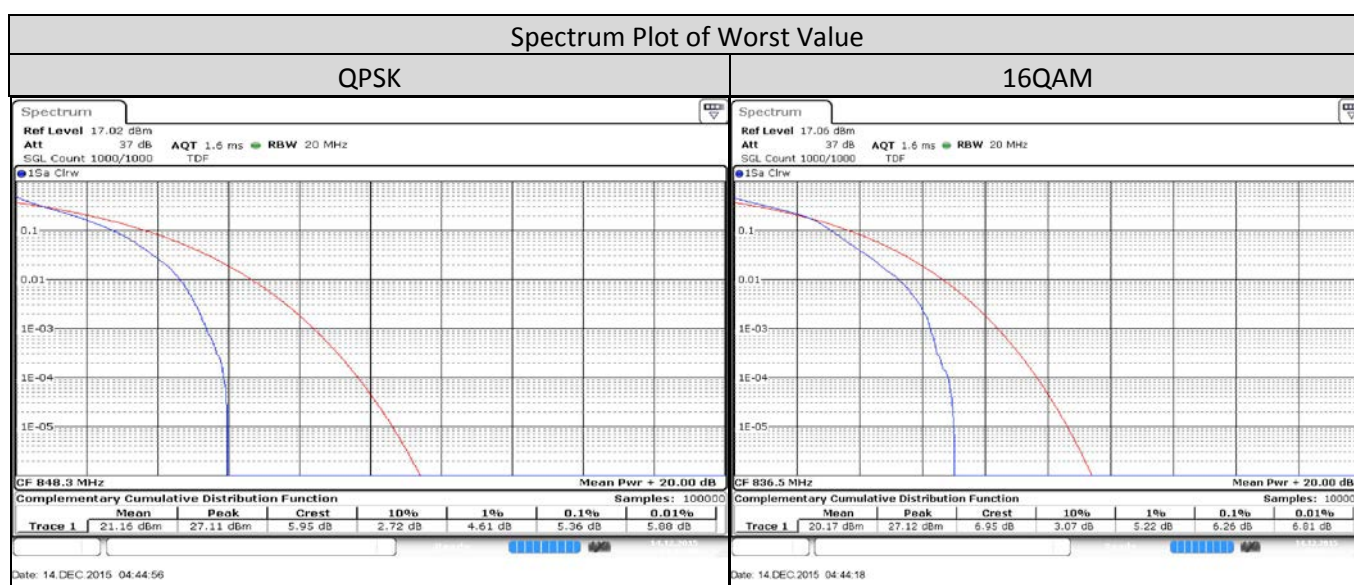
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.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

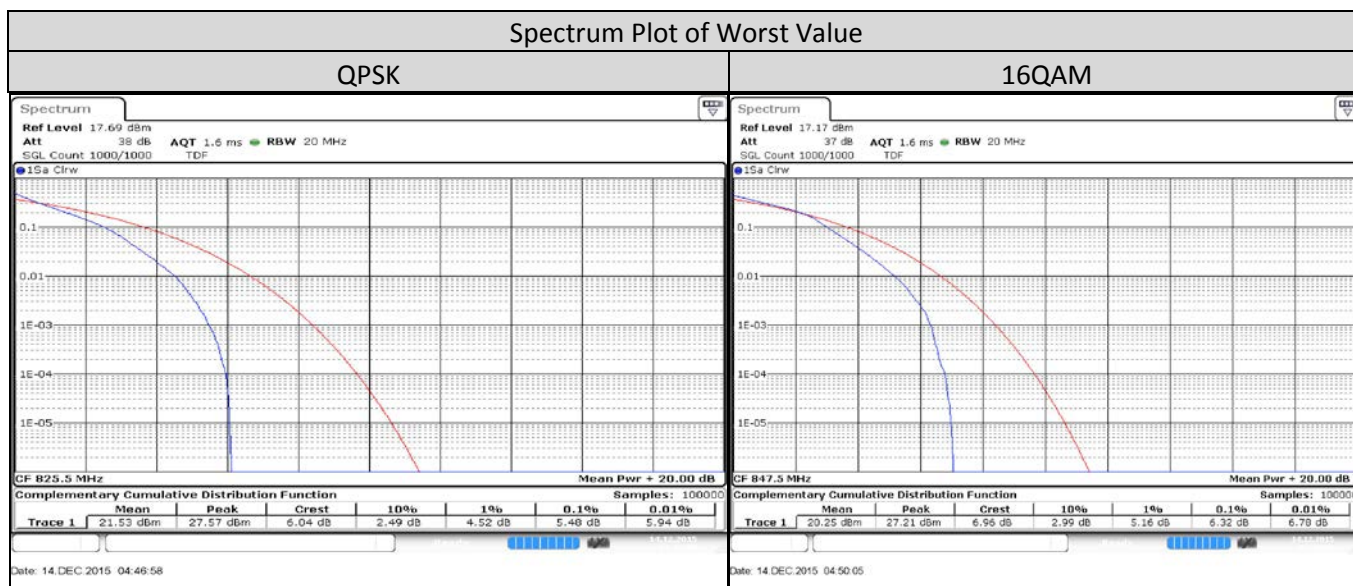
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

1.7.3. Peak To Average Power Ratio - LTE Band 5 (824-849MHz)

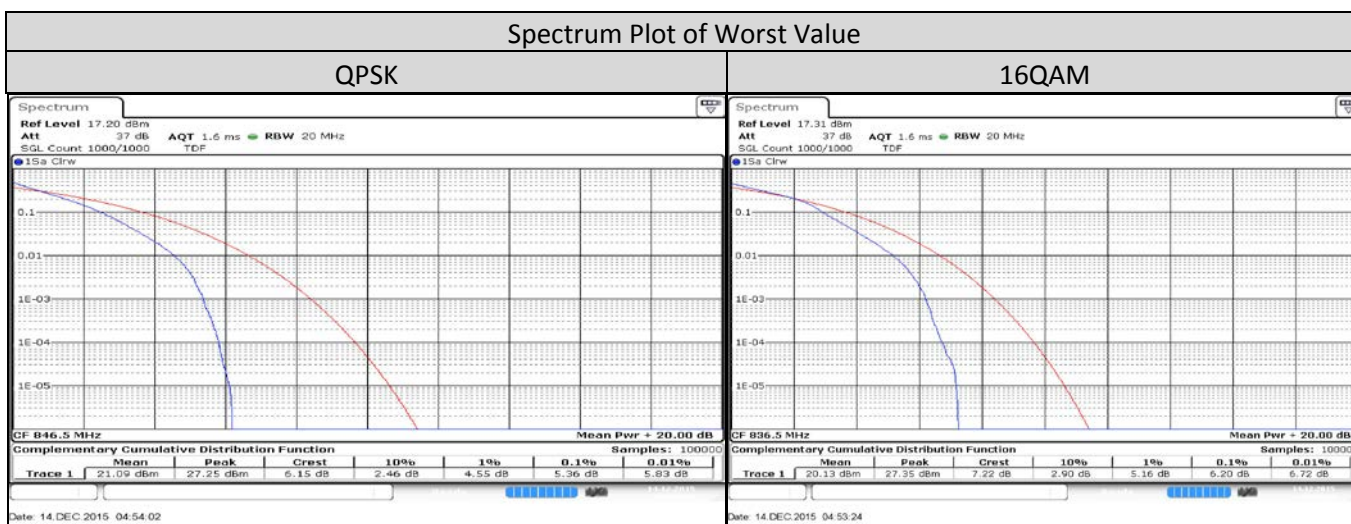
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5 / 1.4MHz/6/0	Low CH 20407	824.7 MHz	5.28	6.12
	Mid CH 20525	836.5 MHz	5.22	6.26
	High CH 20643	848.3 MHz	5.36	6.17



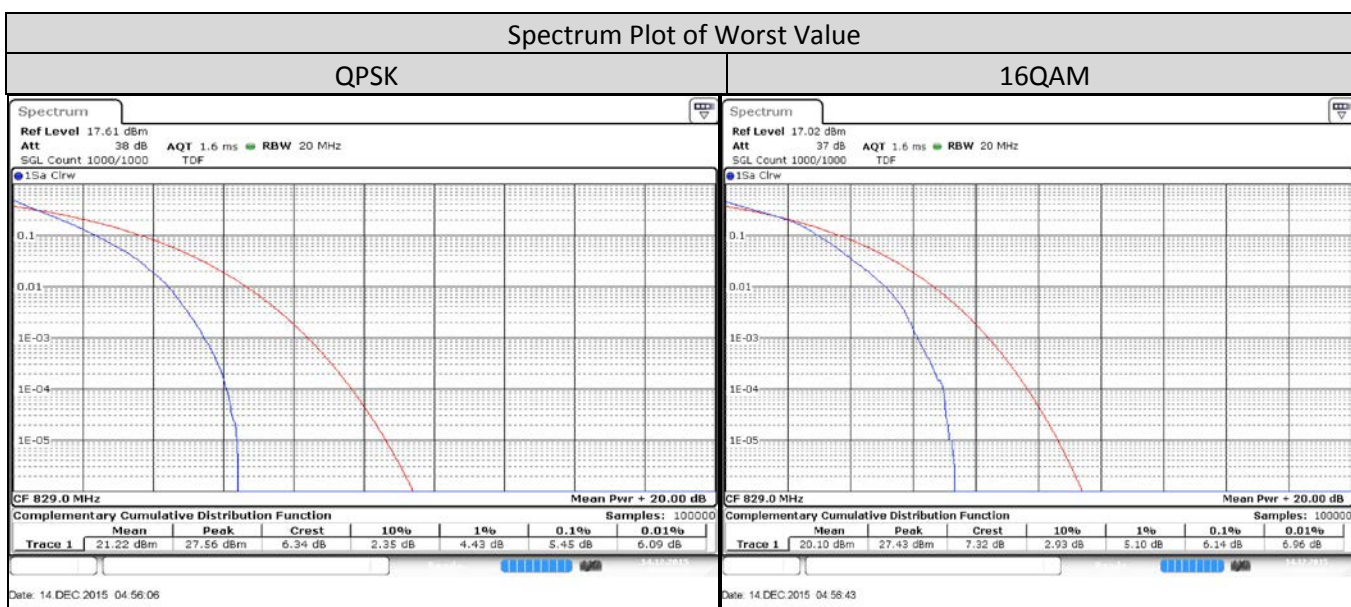
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5 / 3MHz/15/0	Low CH 20415	825.5 MHz	5.48	6.09
	Mid CH 20525	836.5 MHz	5.42	6.14
	High CH 20635	847.5 MHz	5.42	6.32



LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5 / 5MHz/25/0	Low CH 20425	826.5 MHz	5.28	6.14
	Mid CH 20525	836.5 MHz	5.33	6.20
	High CH 20625	846.5 MHz	5.36	6.09

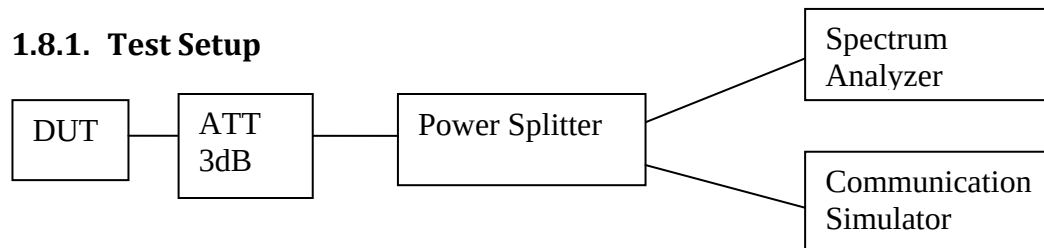


LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5 / 10MHz/50/0	Low CH 20450	829.0 MHz	5.45	6.14
	Mid CH 20525	836.5 MHz	5.30	6.14
	High CH 20600	844.0 MHz	5.36	6.14



1.8. Occupied Bandwidth

1.8.1. Test Setup



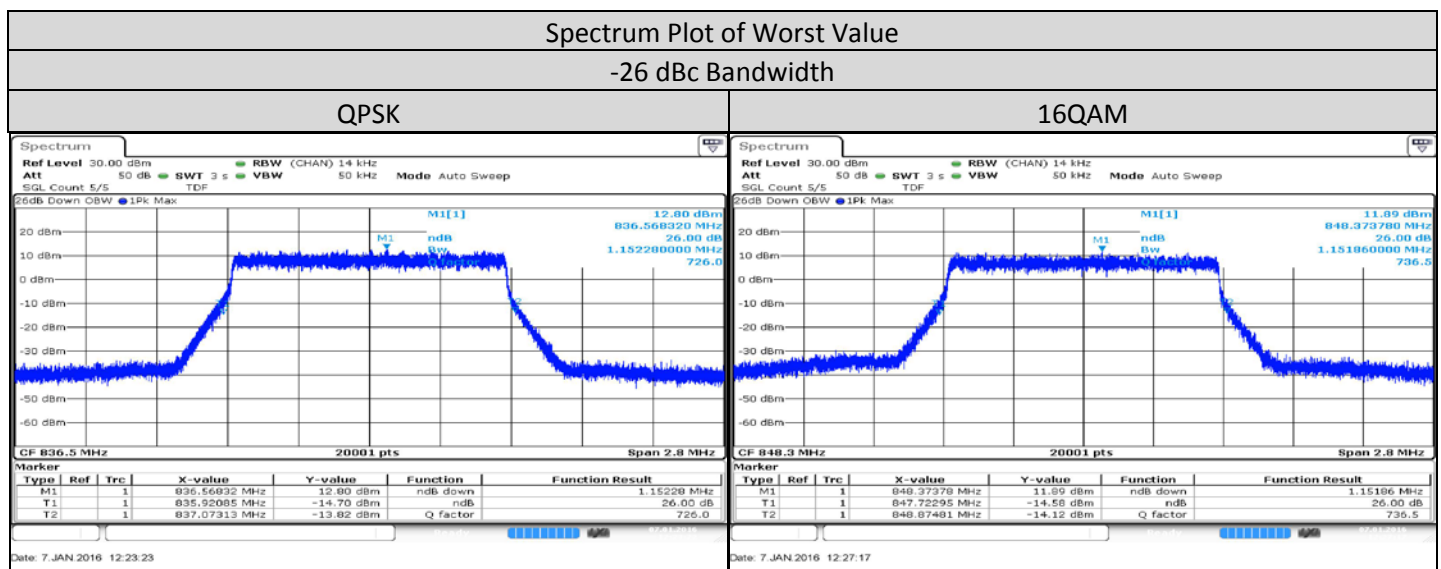
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum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

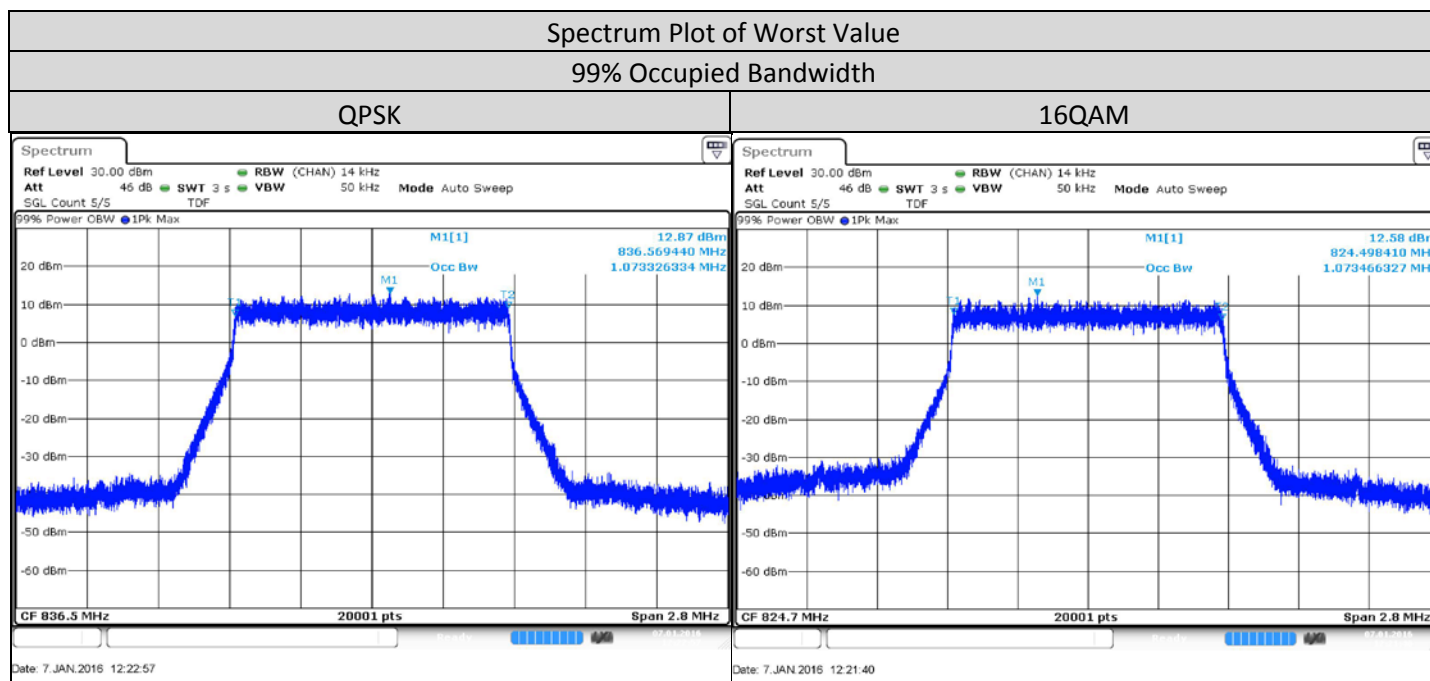
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

1.8.3. Occupied Bandwidth - LTE Band 5 (824-849MHz)

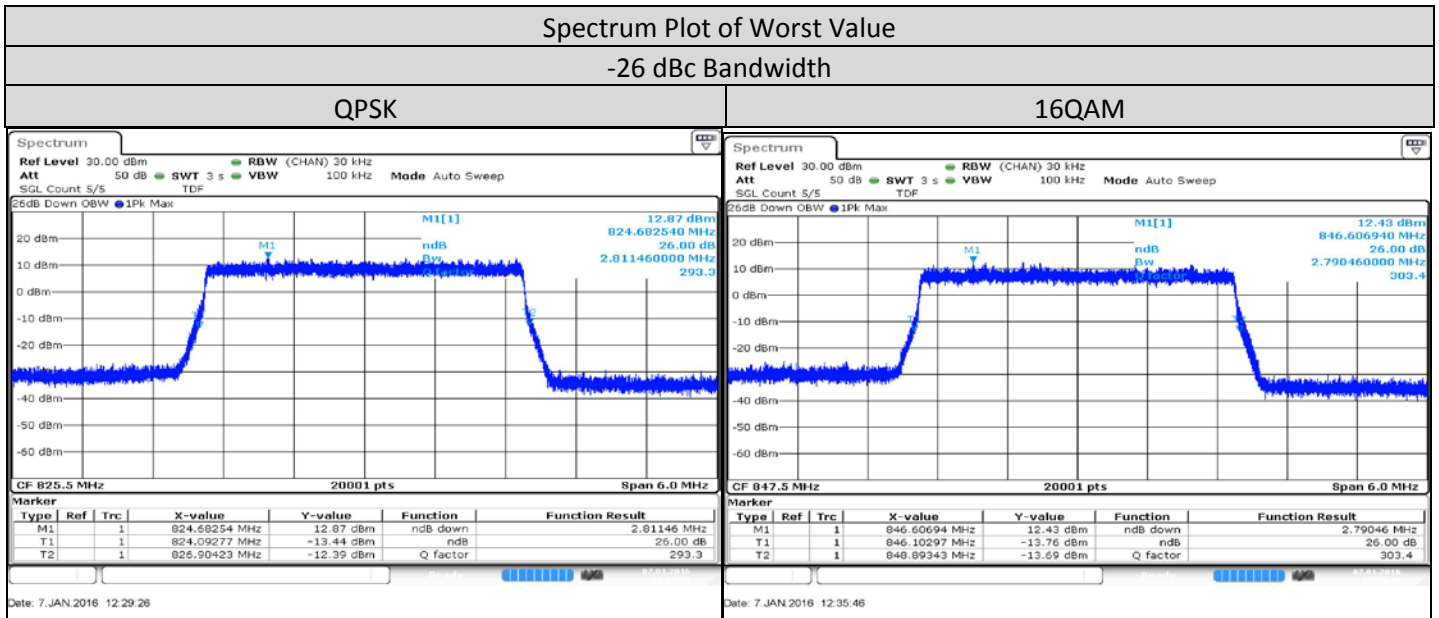
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 1.4MHz/6/0	Low CH 20407	824.7 MHz	1.1303	1.1464
	Mid CH 20525	836.5 MHz	1.1523	1.1446
	High CH 20643	848.3 MHz	1.1407	1.1519



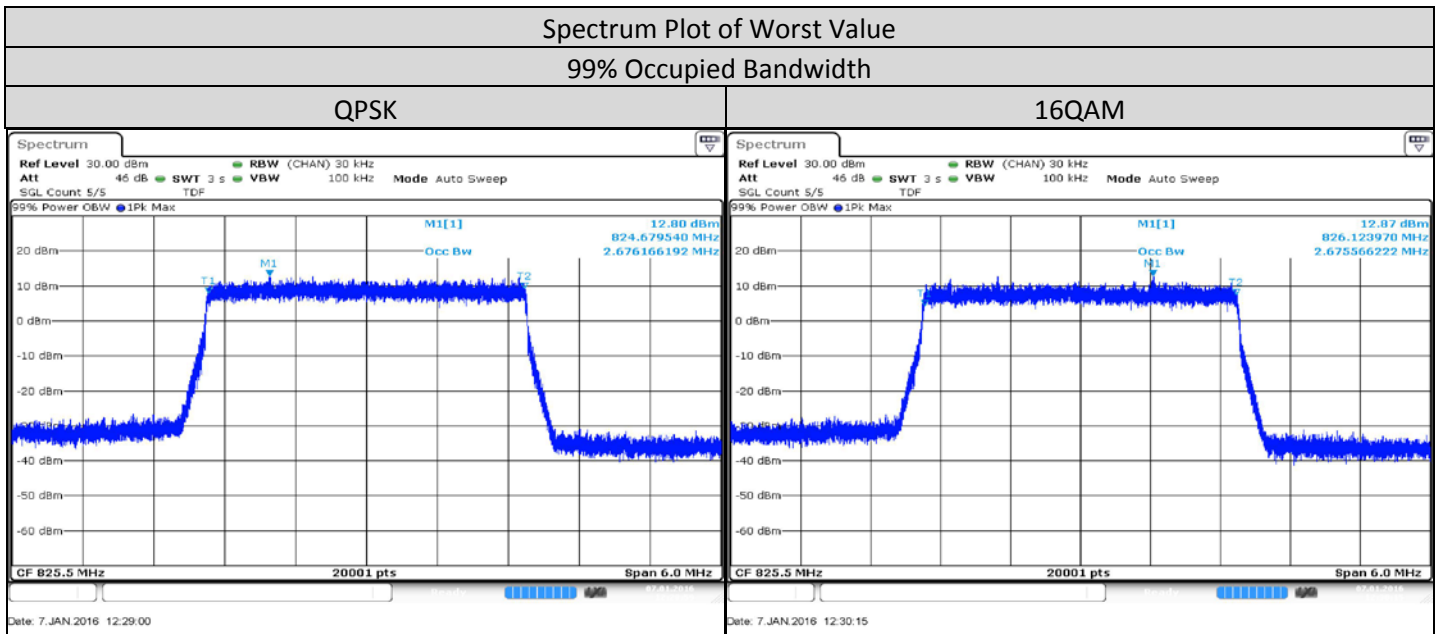
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 1.4MHz/6/0	Low CH 20407	824.7 MHz	1.0702	1.0735
	Mid CH 20525	836.5 MHz	1.0733	1.0716
	High CH 20643	848.3 MHz	1.0719	1.0729



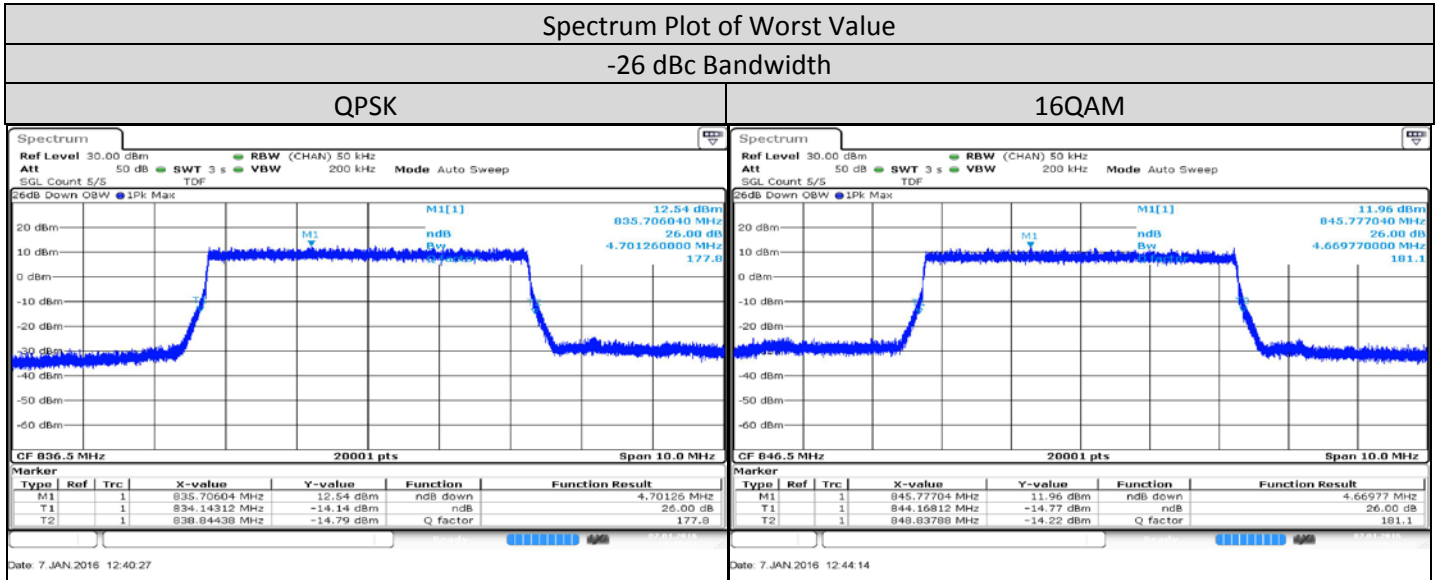
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 3MHz/15/0	Low CH 20415	825.5 MHz	2.8115	2.7887
	Mid CH 20525	836.5 MHz	2.7803	2.7806
	High CH 20635	847.5 MHz	2.8040	2.7905



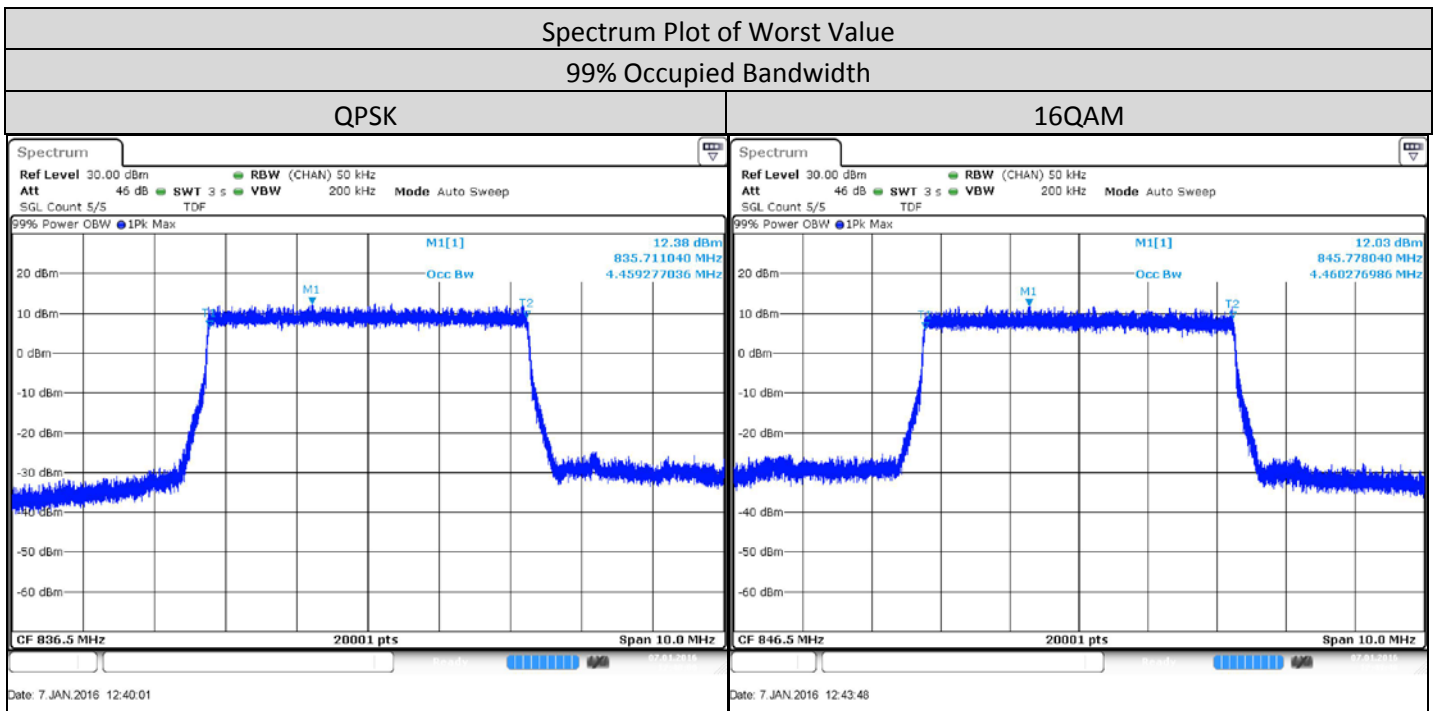
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 3MHz/15/0	Low CH 20415	825.5 MHz	2.6762	2.6756
	Mid CH 20525	836.5 MHz	2.6720	2.6756
	High CH 20635	847.5 MHz	2.6747	2.6729



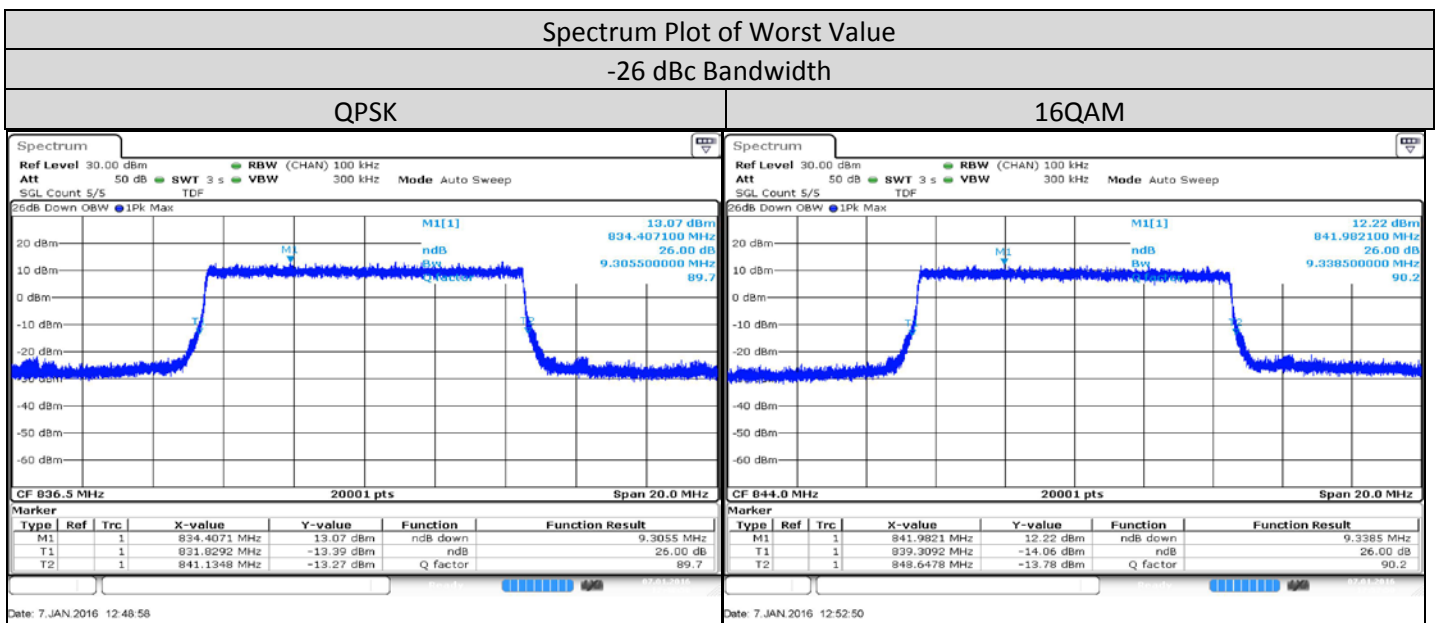
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 5MHz/25/0	Low CH 20425	826.5 MHz	4.6693	4.6463
	Mid CH 20525	836.5 MHz	4.7013	4.6643
	High CH 20625	846.5 MHz	4.6698	4.6698



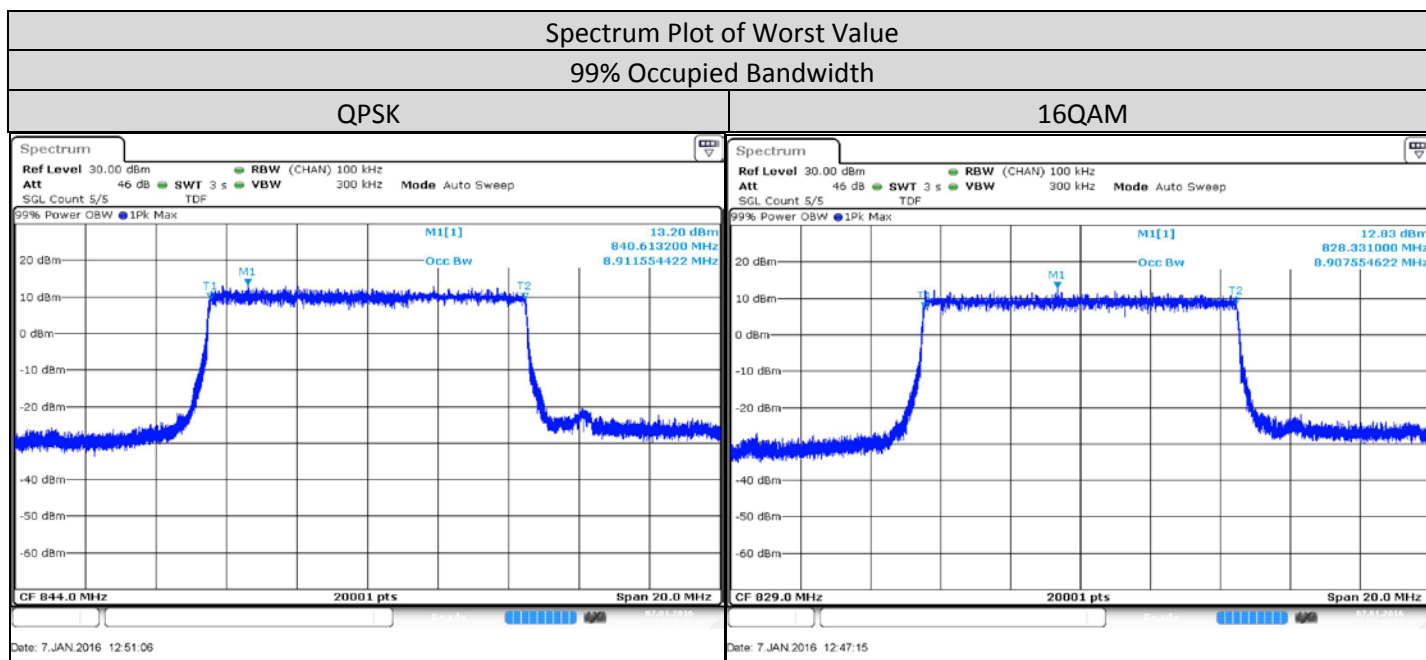
LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 5MHz/25/0	Low CH 20425	826.5 MHz	4.4553	4.4563
	Mid CH 20525	836.5 MHz	4.4593	4.4568
	High CH 20625	846.5 MHz	4.4588	4.4603



LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 10MHz/50/0	Low CH 20450	829 MHz	9.2435	9.2965
	Mid CH 20525	836.5 MHz	9.3055	9.2475
	High CH 20600	844 MHz	9.2625	9.3385

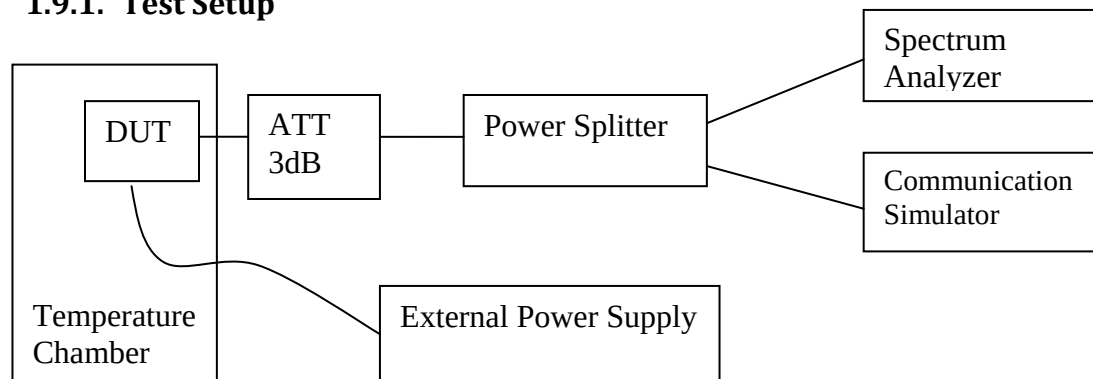


LTE Band/BW/RB size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5 / 10MHz/50/0	Low CH 20450	829 MHz	8.9036	8.9076
	Mid CH 20525	836.5 MHz	8.9056	8.9006
	High CH 20600	844 MHz	8.9116	8.9056



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 -10 ~ 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

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations and ± 1.5 ppm for base stations.

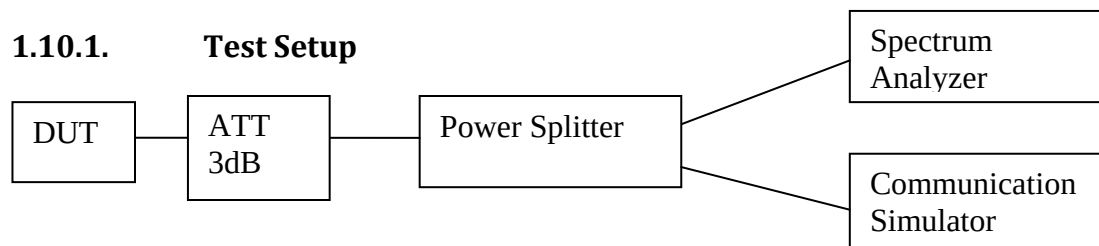
1.9.3. Frequency Stability - LTE Band 5 (824-849MHz)

LTE Band/ Modulation/ RB Size/ RB Offset	Frequency Error VS Temperature				
	Temp (Deg C)	Frequency Error (ppm)			
		1.4MHz	3MHz	5MHz	10MHz
Band 5 QPSK RB Size= 100% RB Offset = 0	60	-0.0065	-0.0065	-0.0061	-0.0056
	50	-0.0059	-0.0052	-0.0046	-0.0071
	40	-0.0056	-0.0065	-0.0052	-0.0056
	30	-0.0055	-0.0056	-0.0055	-0.0060
	20	0.0048	0.0045	0.0051	-0.0041
	10	0.0053	-0.0043	0.0038	0.0044
	0	-0.0051	-0.0053	-0.0043	-0.0048
	-10	-0.0046	-0.0048	-0.0050	-0.0048
	-20	-0.0047	-0.0046	-0.0044	-0.0045
	-30	-0.0062	-0.0053	-0.0048	-0.0058

LTE Band/ Modulation/ RB Size/ RB Offset	Frequency Error VS Voltage				
	Voltage (V)	Frequency Error (ppm)			
		1.4MHz	3MHz	5MHz	10MHz
Band 5 QPSK RB Size= 100% RB Offset = 0	4.1	-0.0049	0.0050	-0.0052	-0.0053
	3.7	-0.0049	-0.0050	0.0054	-0.0058
	3.5	0.0051	-0.0049	-0.0054	-0.0056

1.10. Band Edge Conducted Spurious Emission

1.10.1. Test Setup

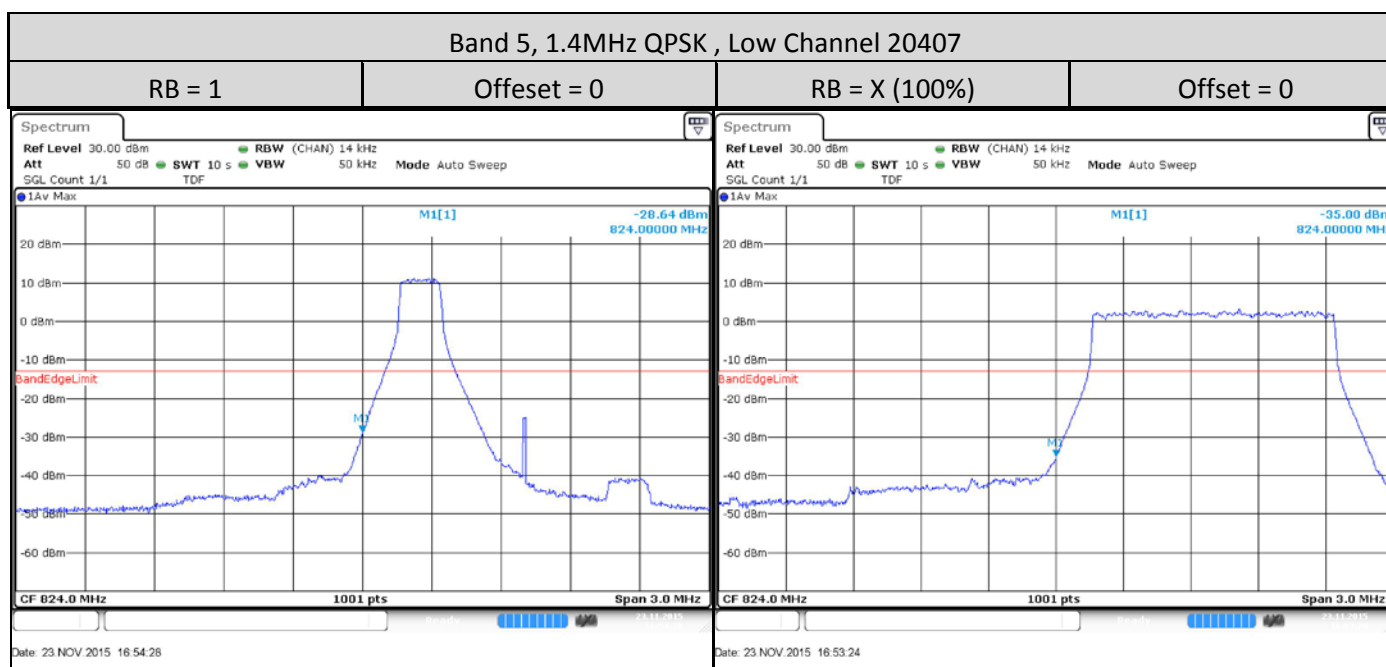


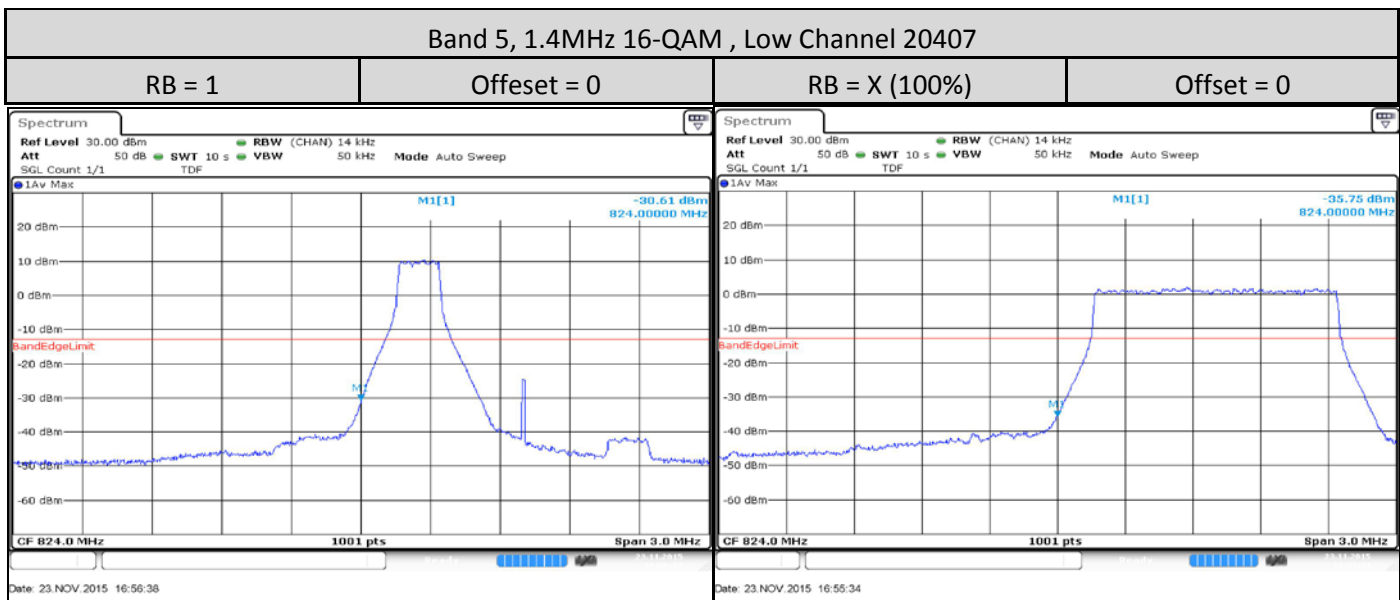
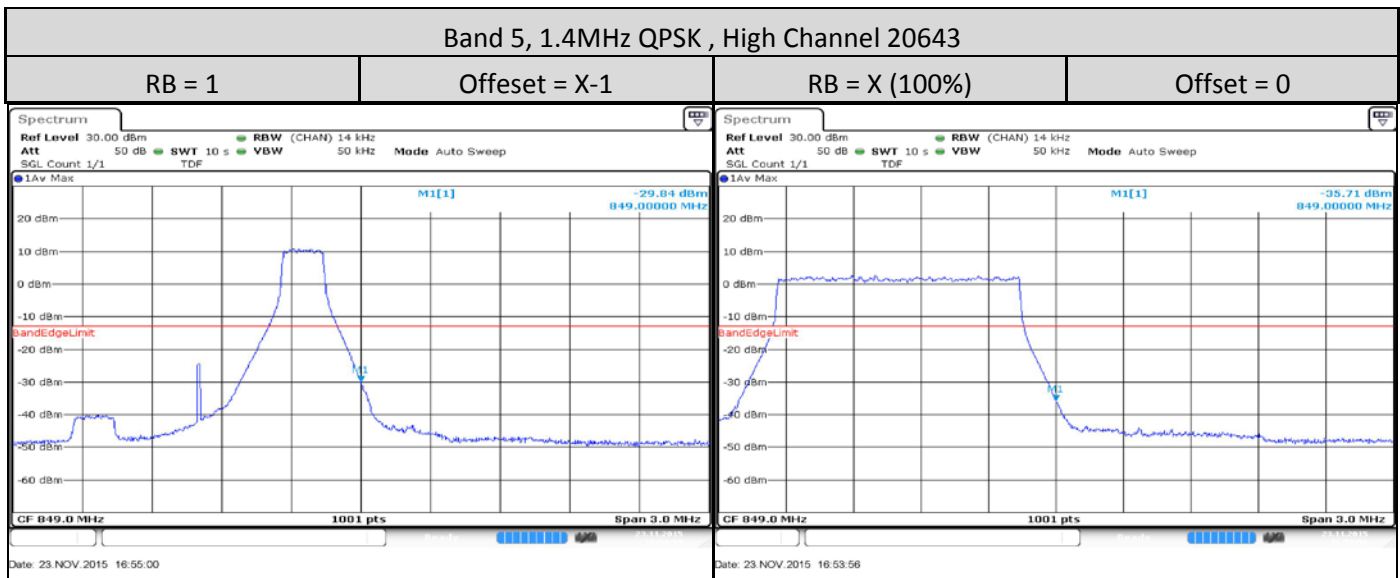
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.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

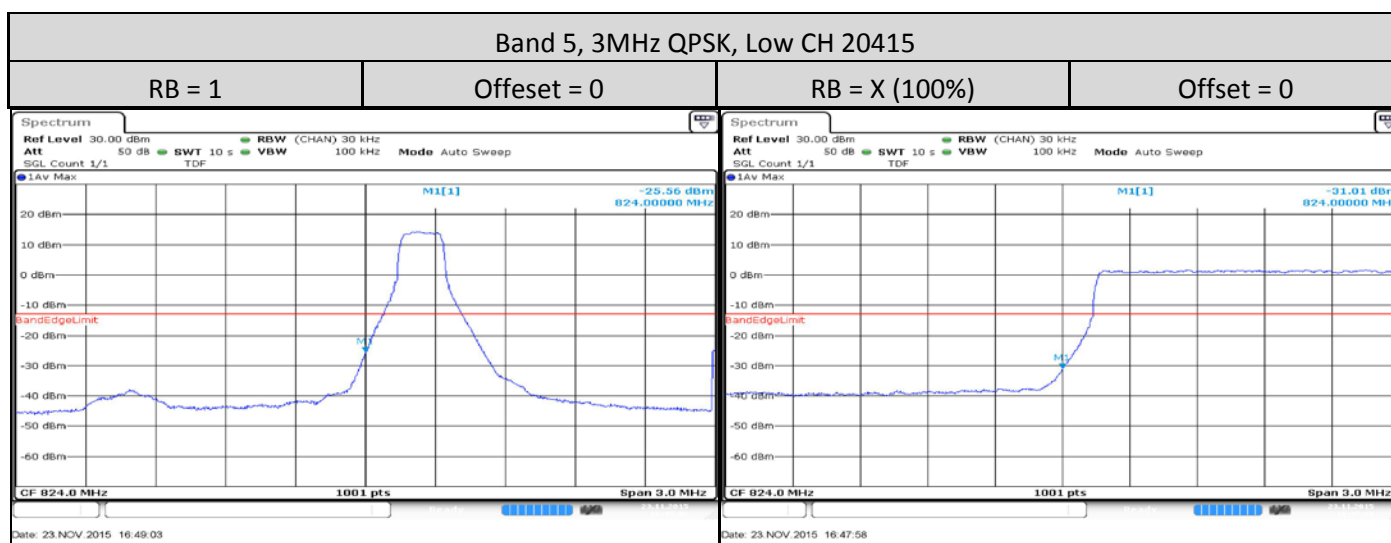
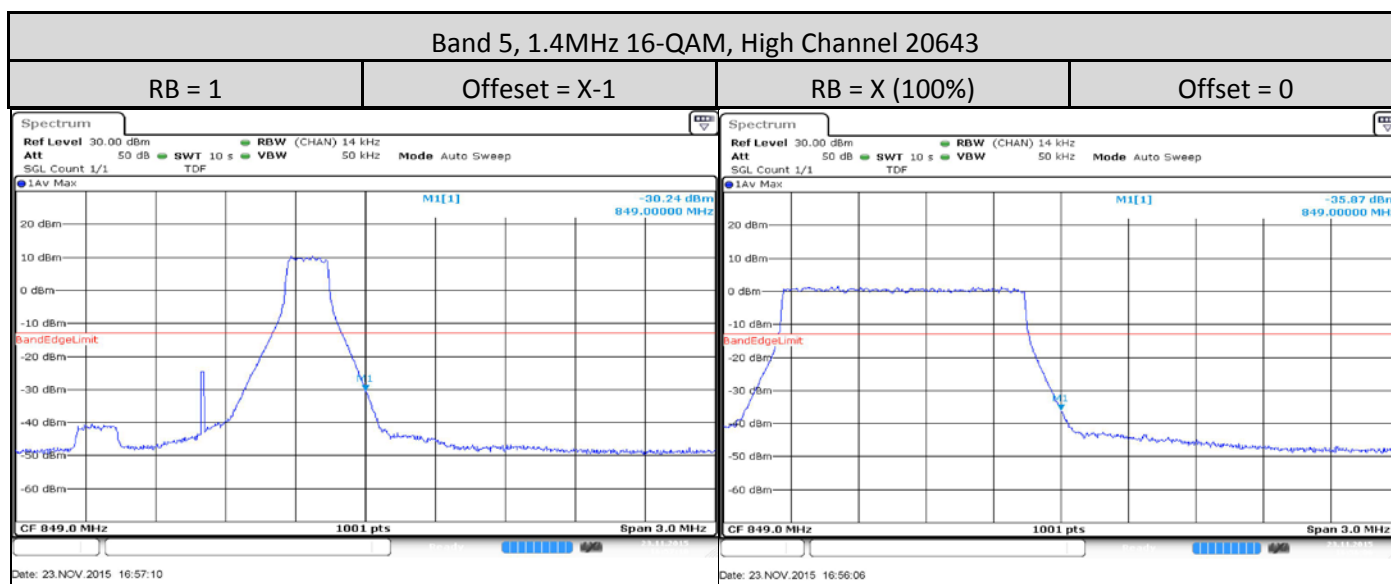
1.10.2. Test Limit

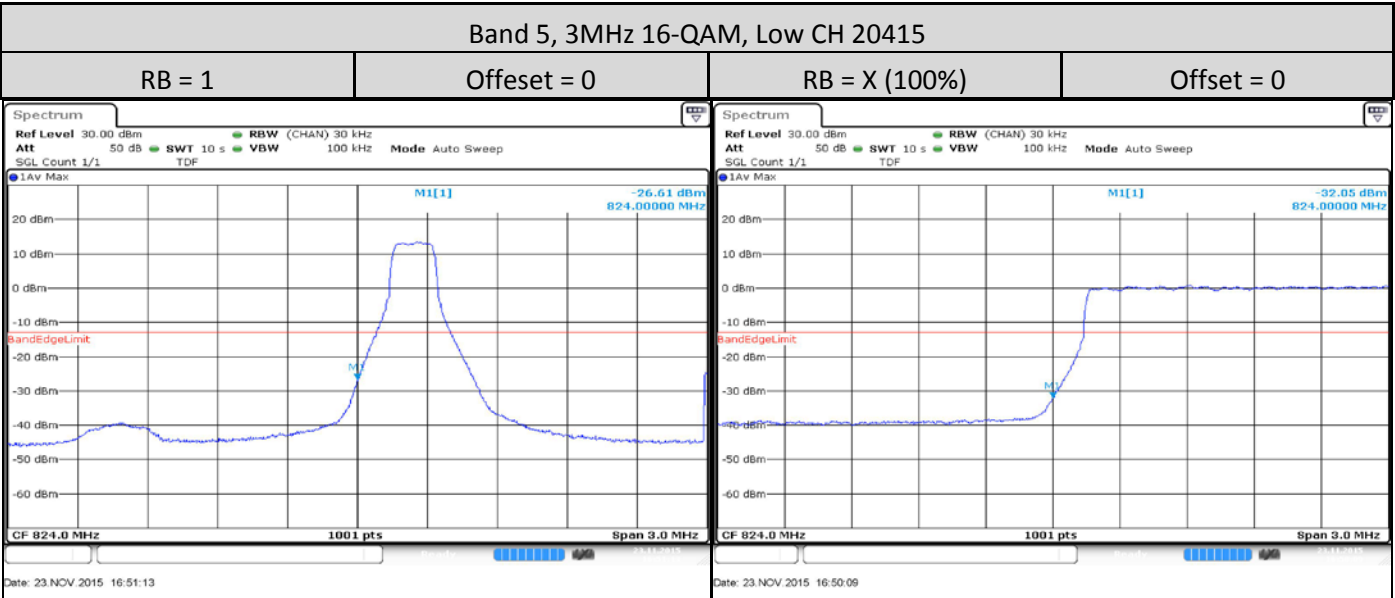
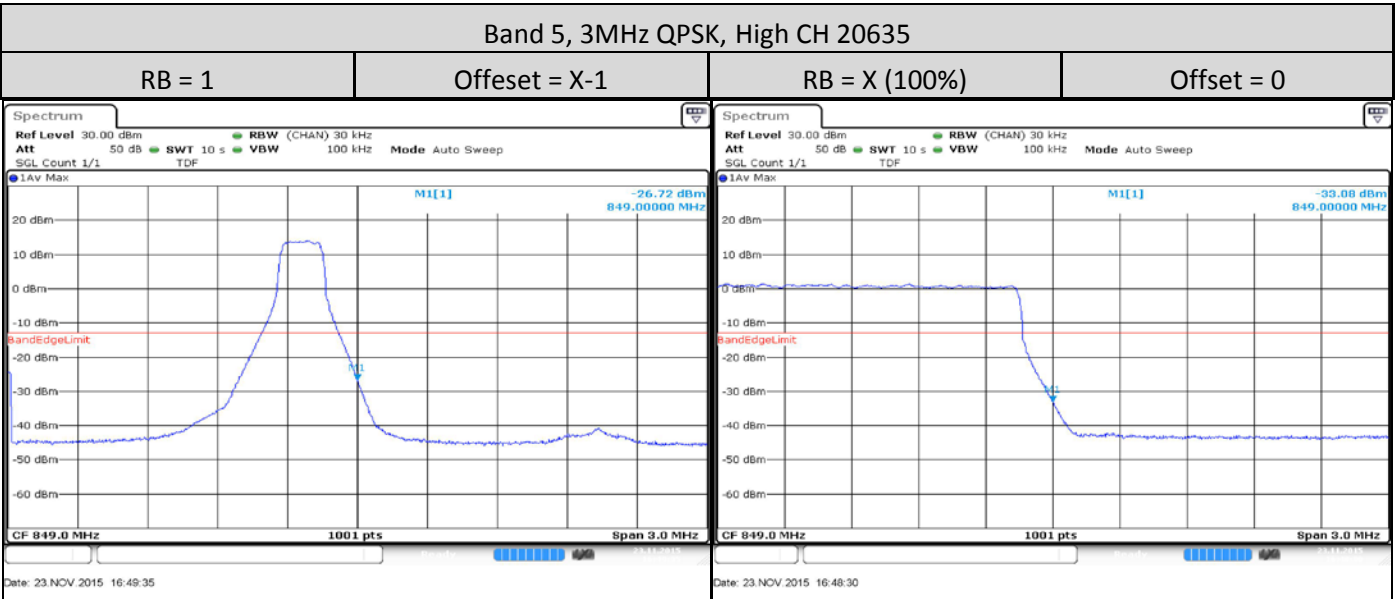
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

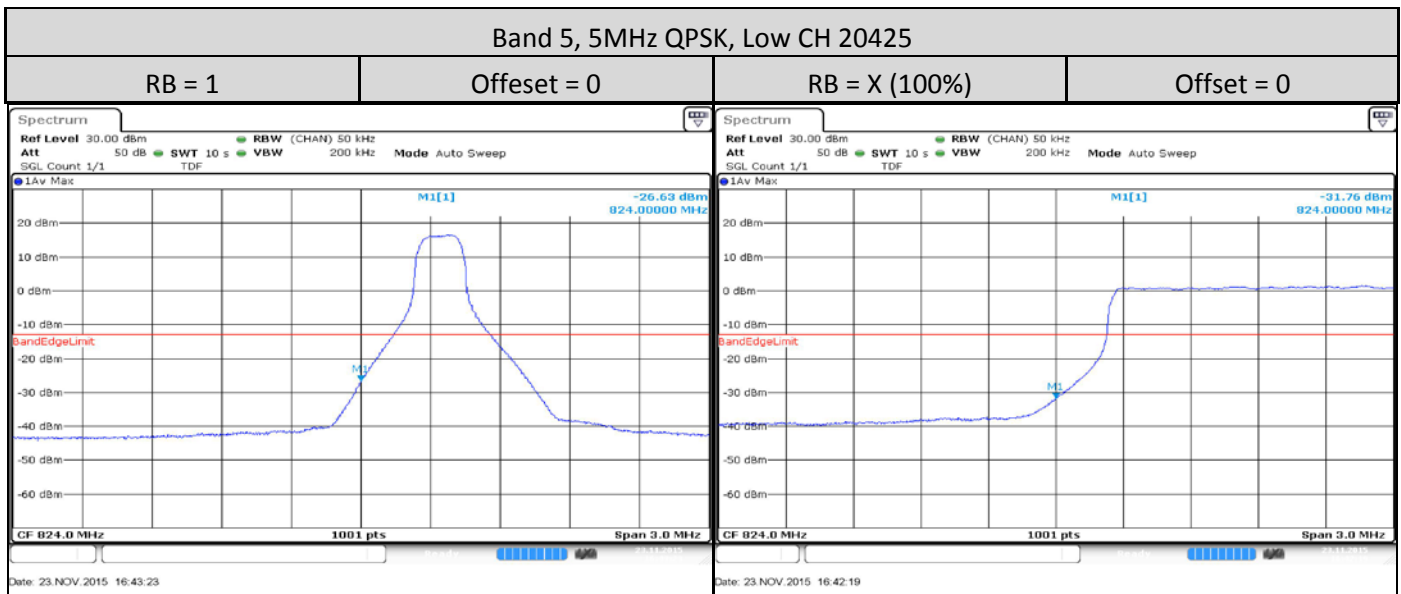
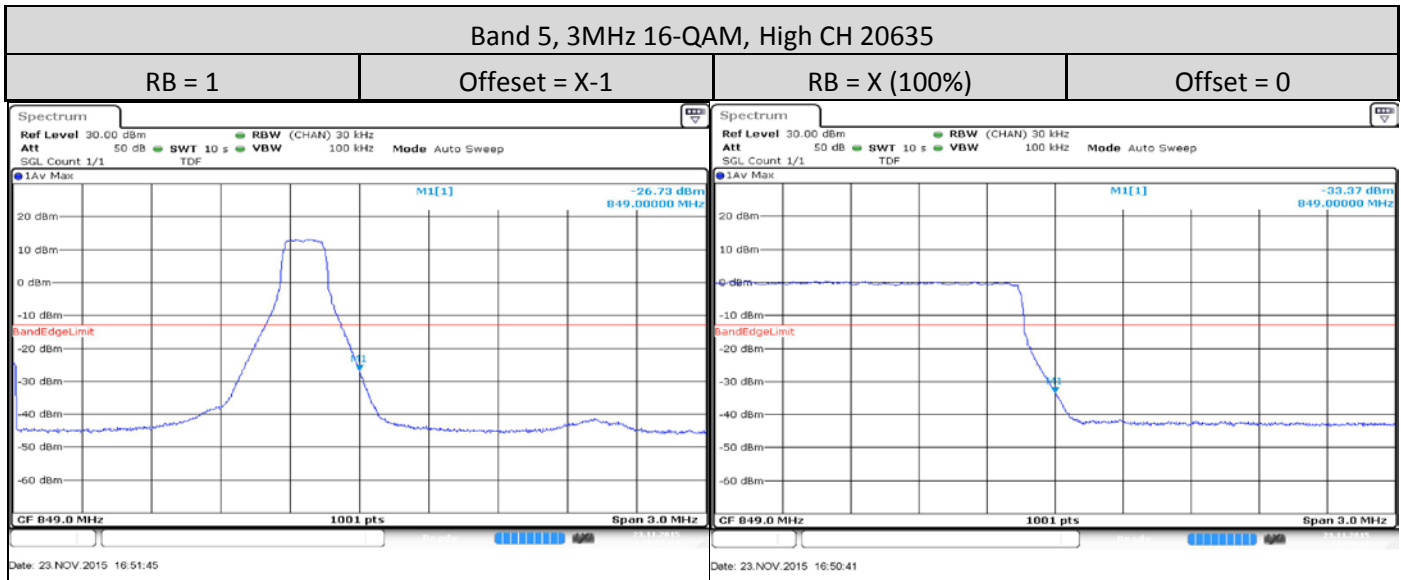
1.10.3. Band Edge Conducted Spurious Emission - LTE Band 5 (824-849MHz)

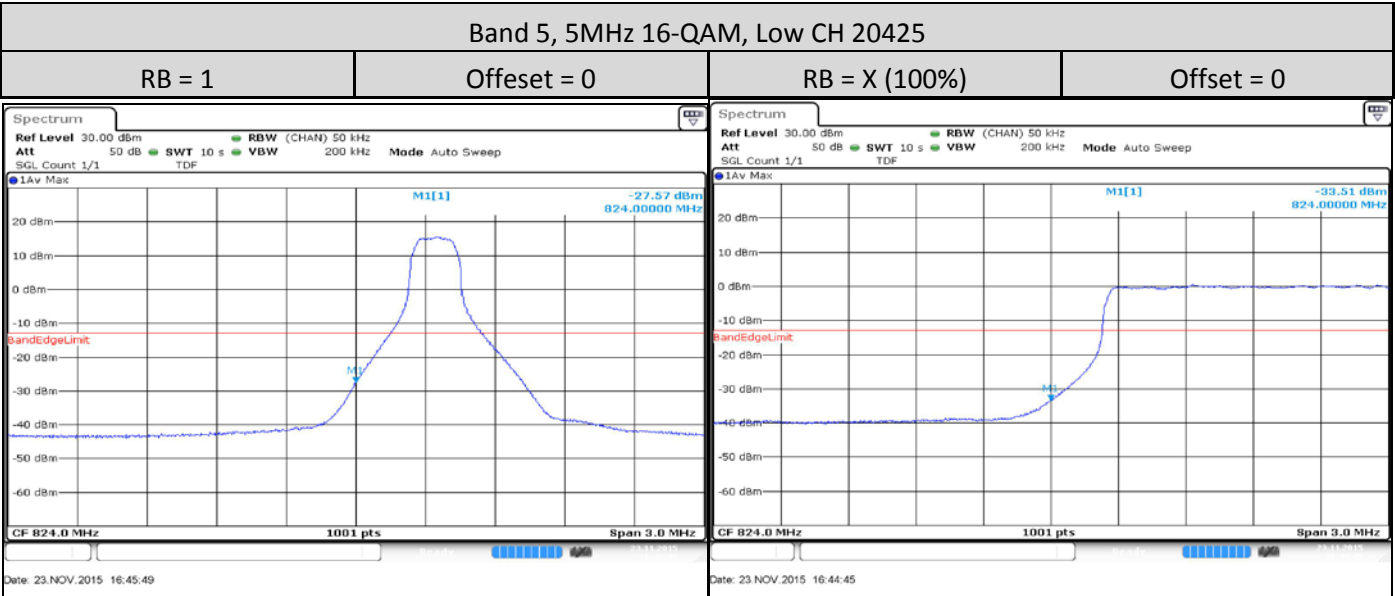
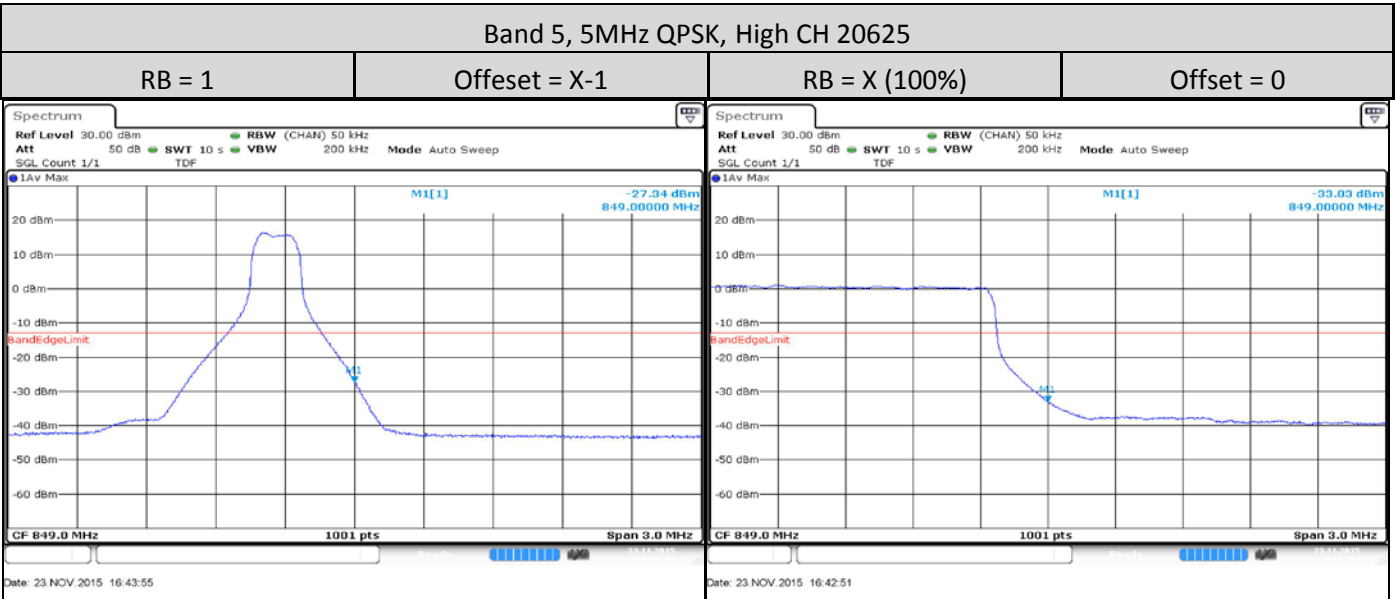


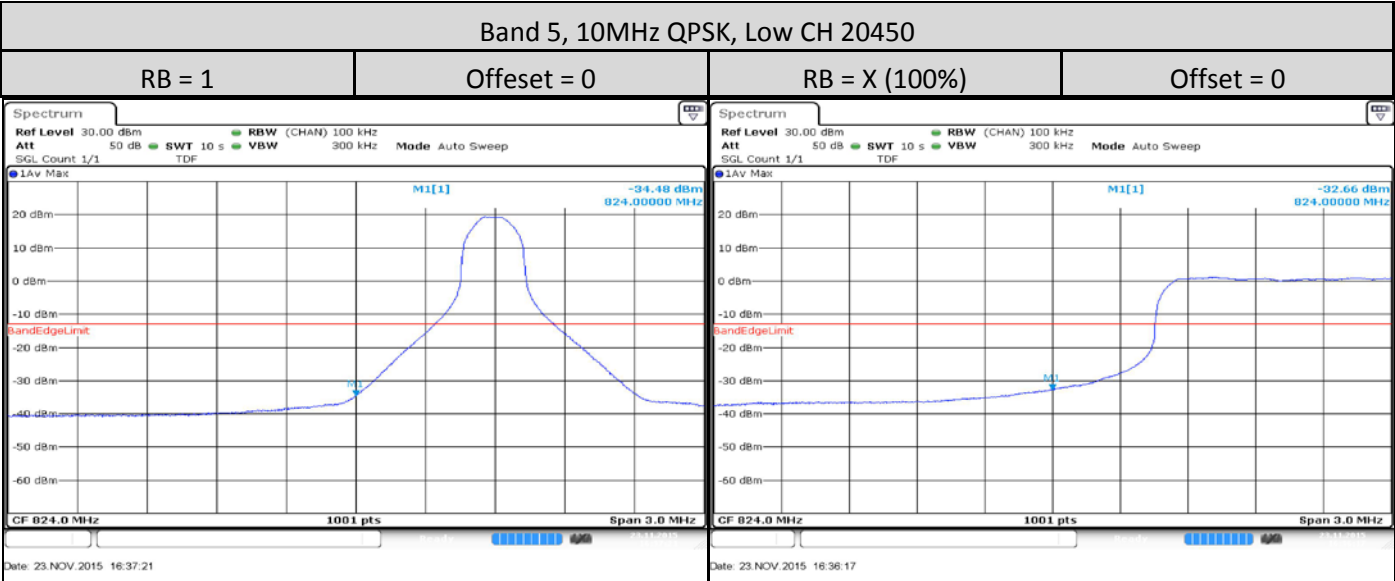
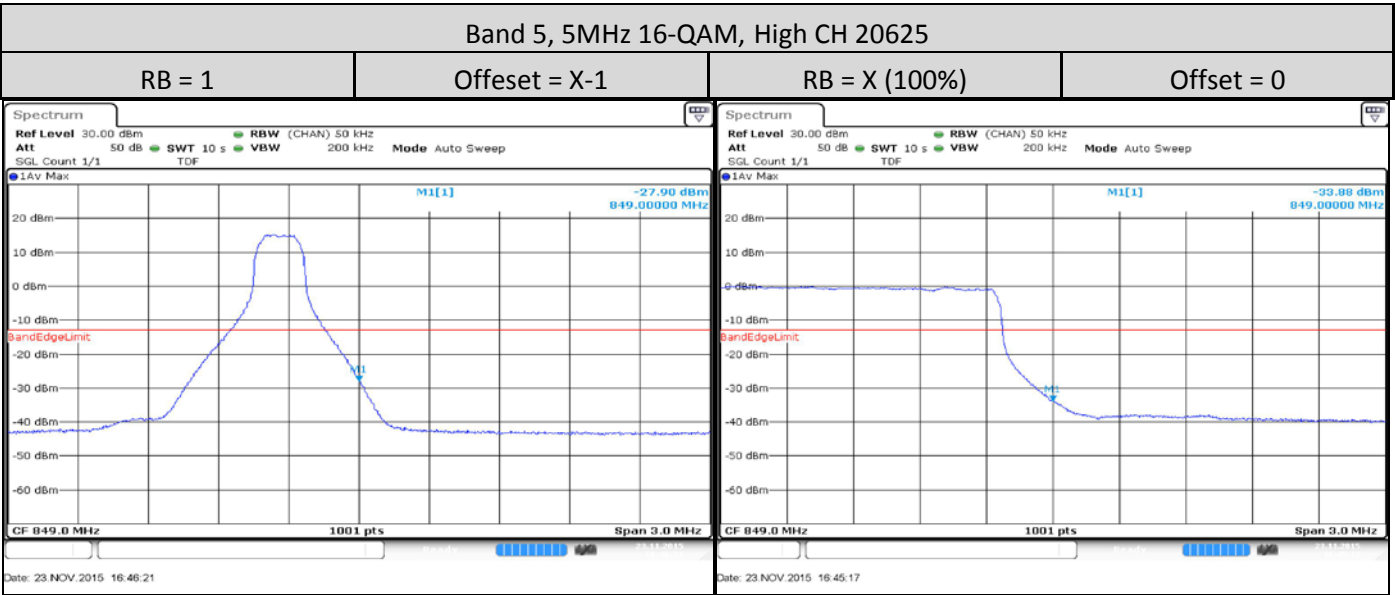




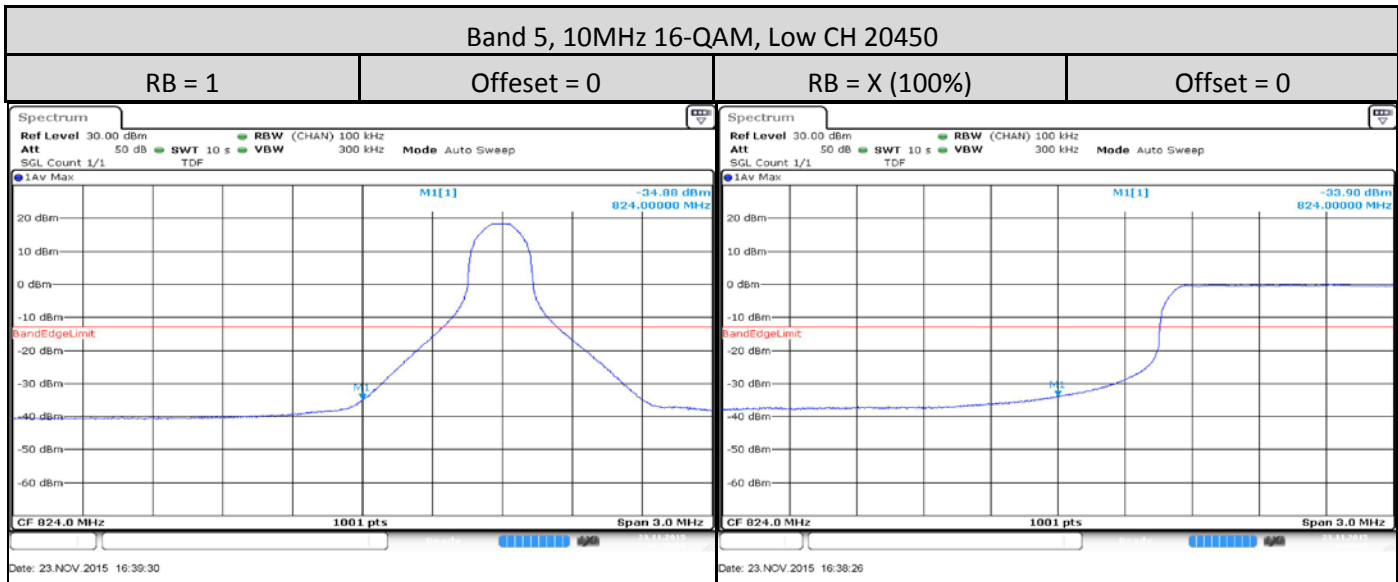
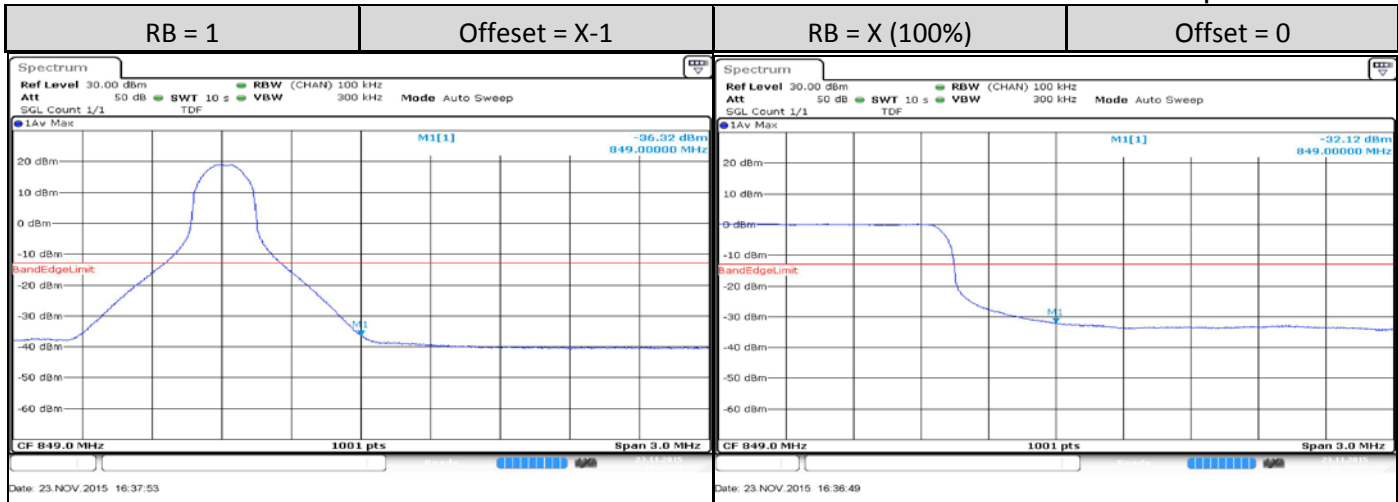




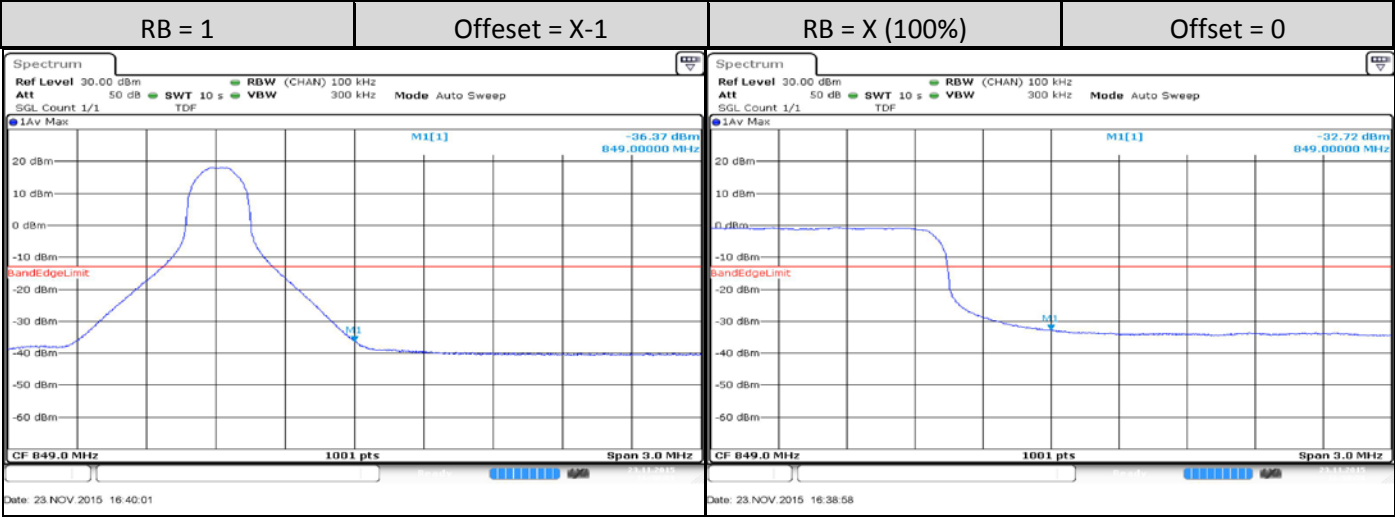




Band 5, 10MHz QPSK, High CH 20600

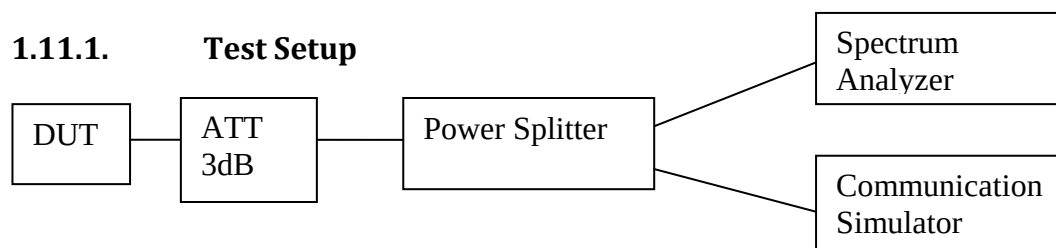


Band 5, 10MHz 16-QAM, High CH 20600



1.11. Conducted Spurious Emission

1.11.1. Test Setup



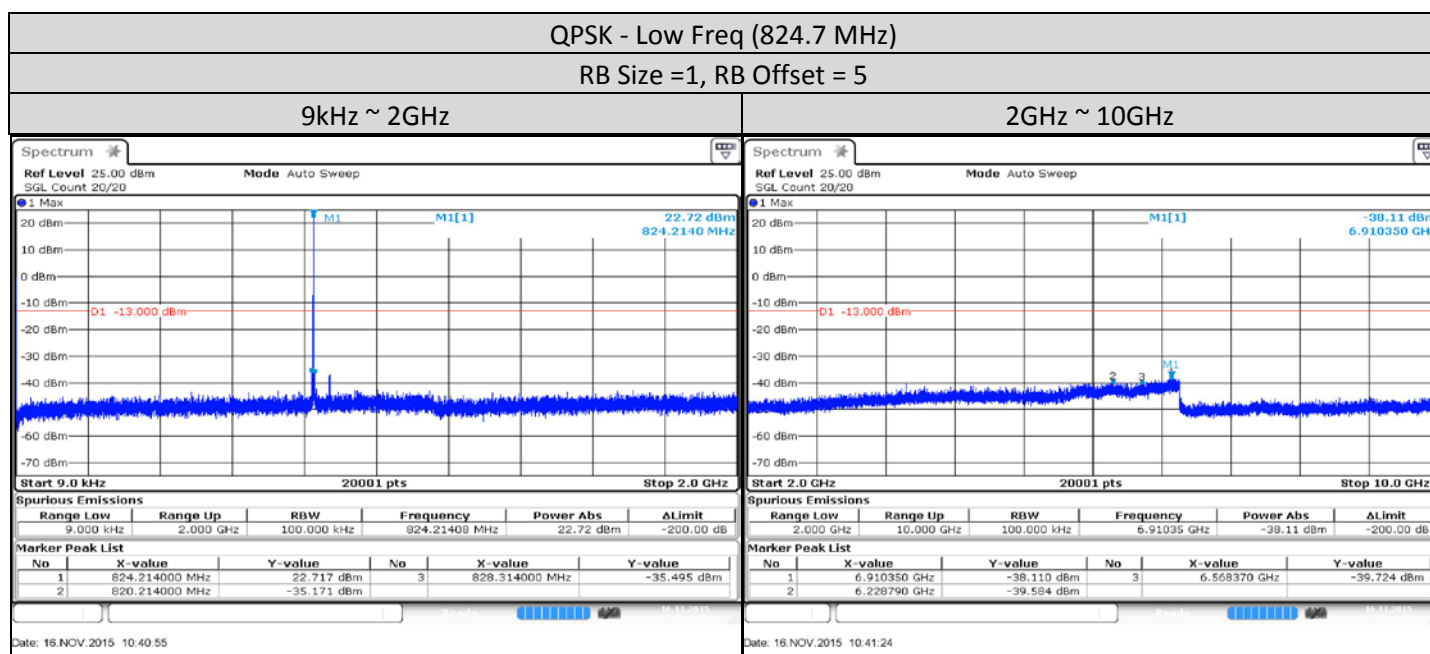
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of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

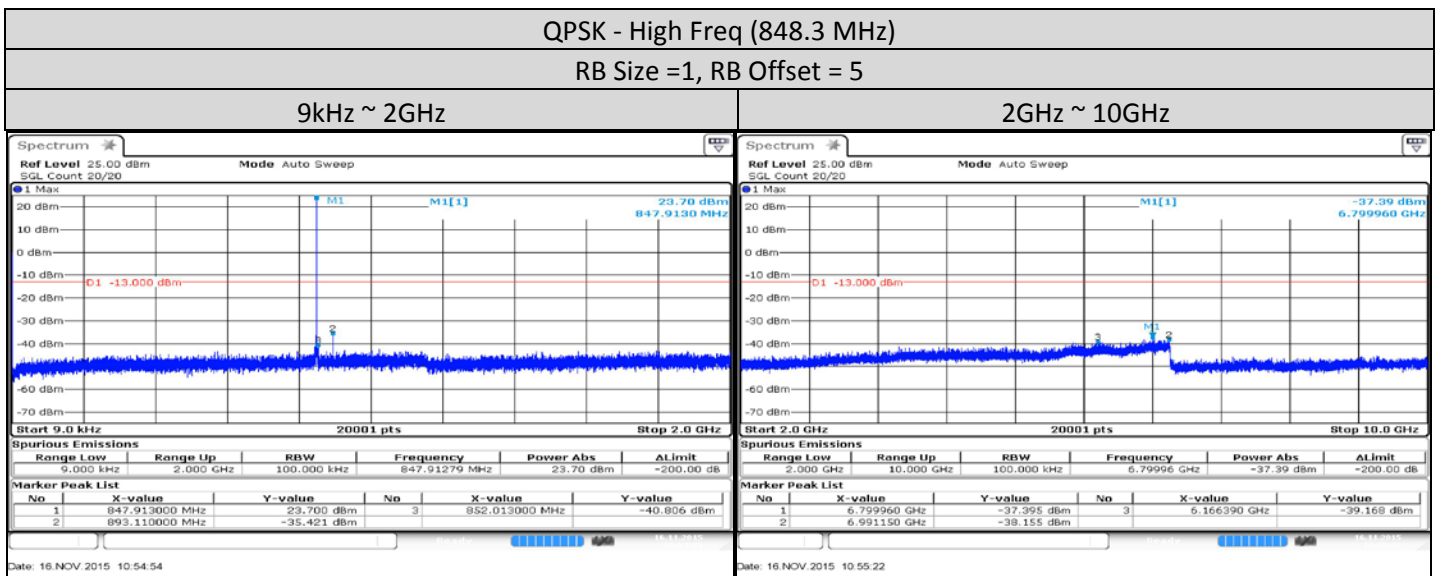
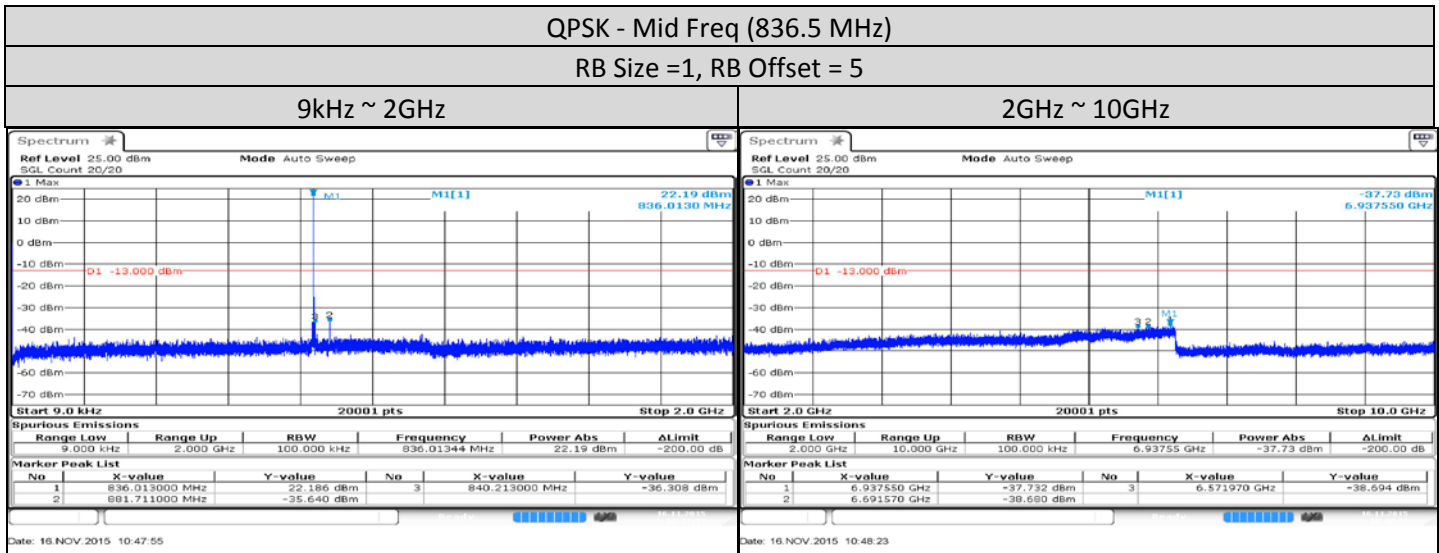
1.11.2. Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

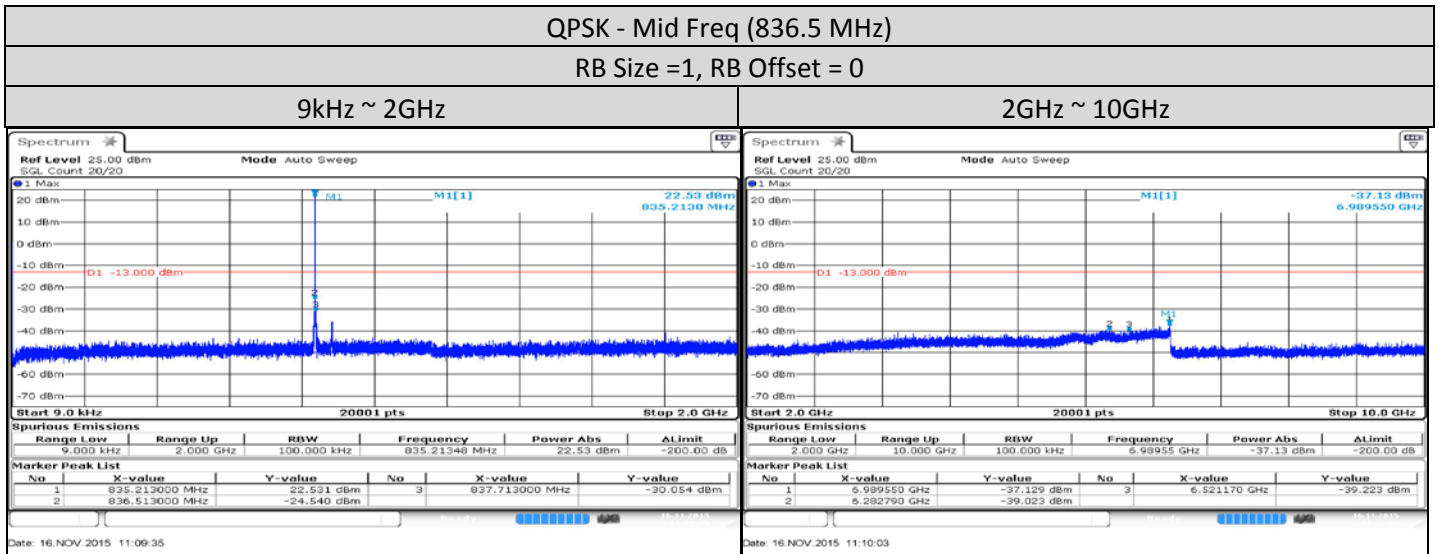
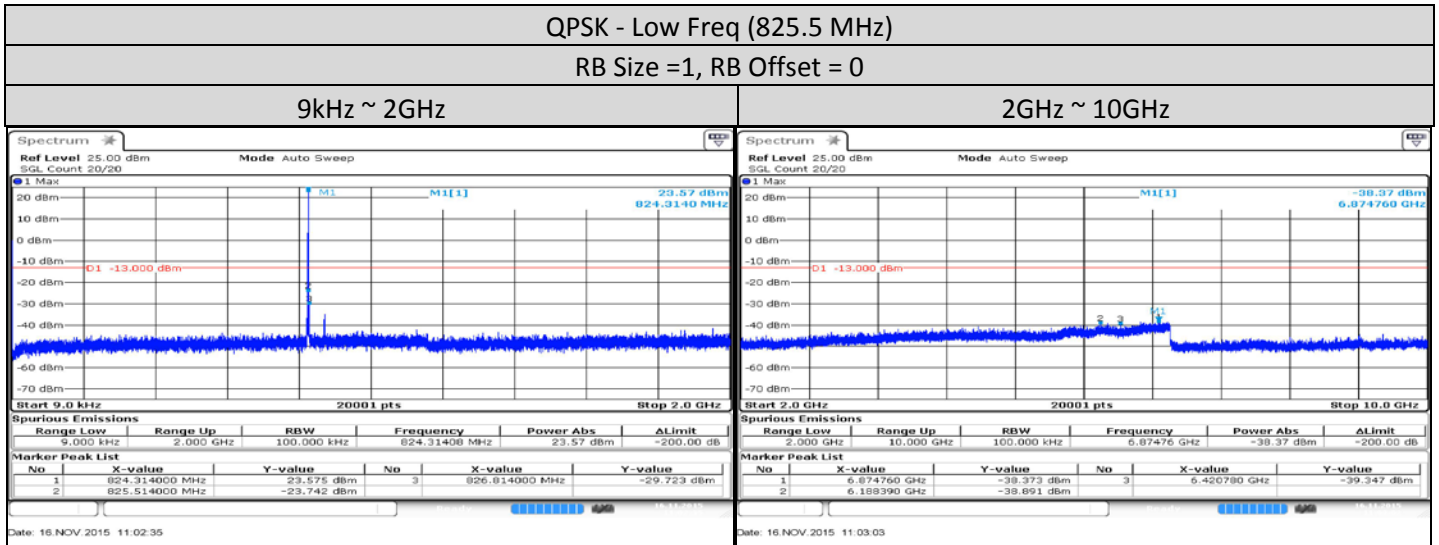
1.11.3. Conducted Spurious Emission - LTE Band 5 (824-849MHz)

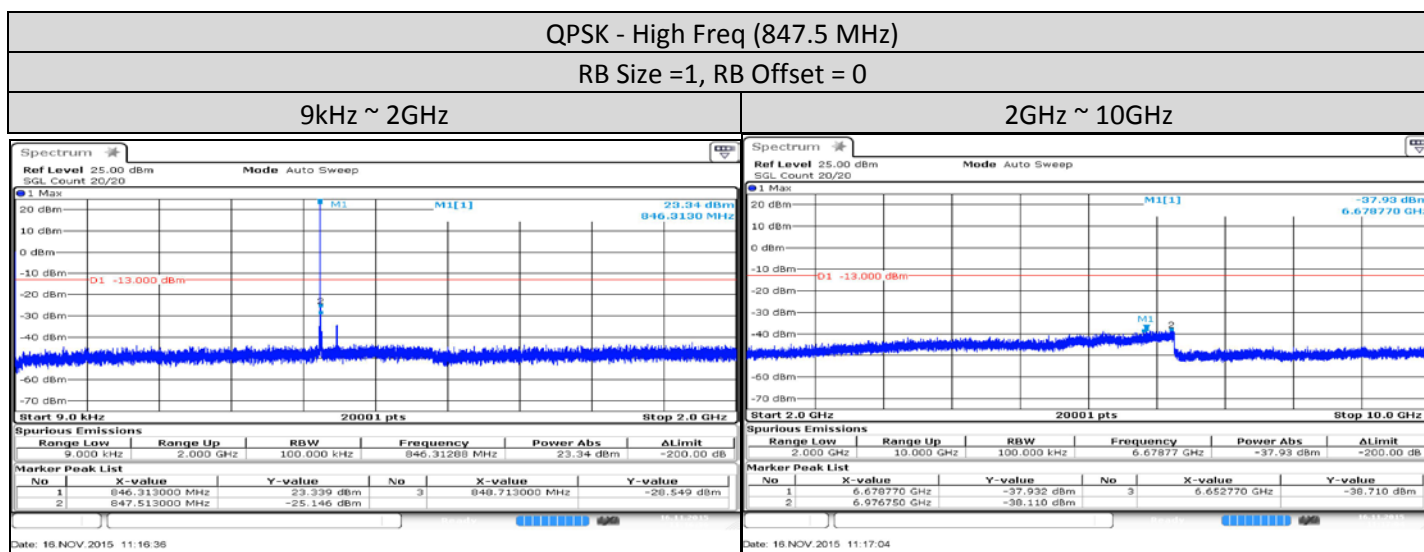
1.4MHz



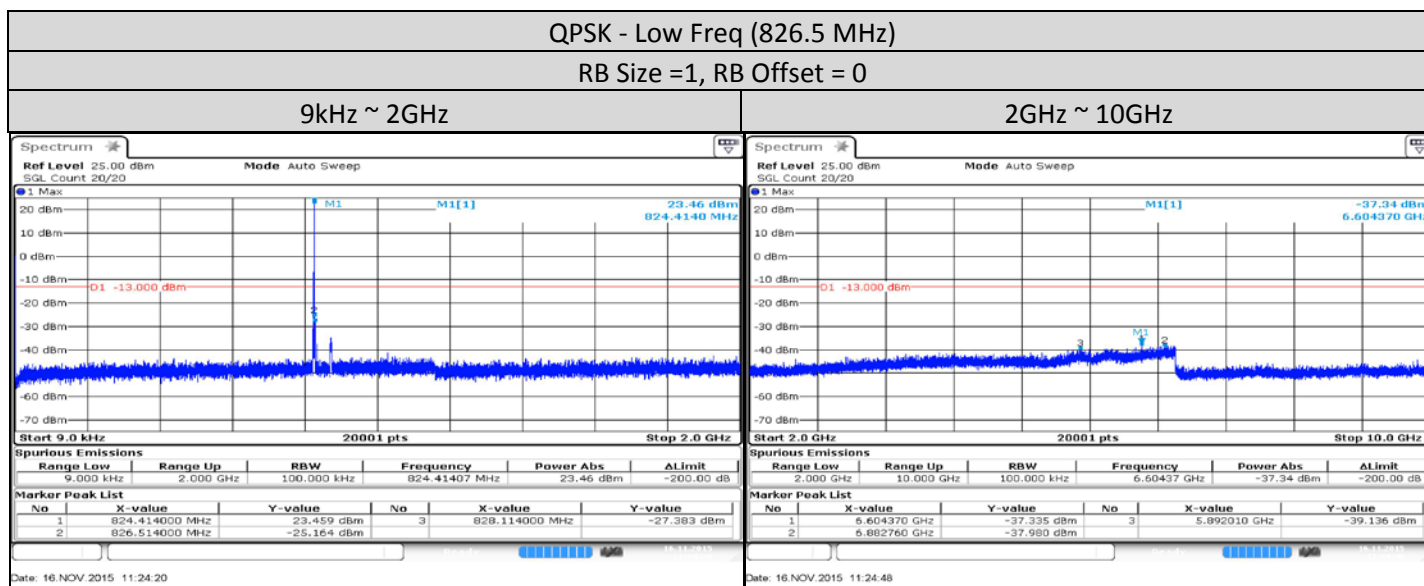


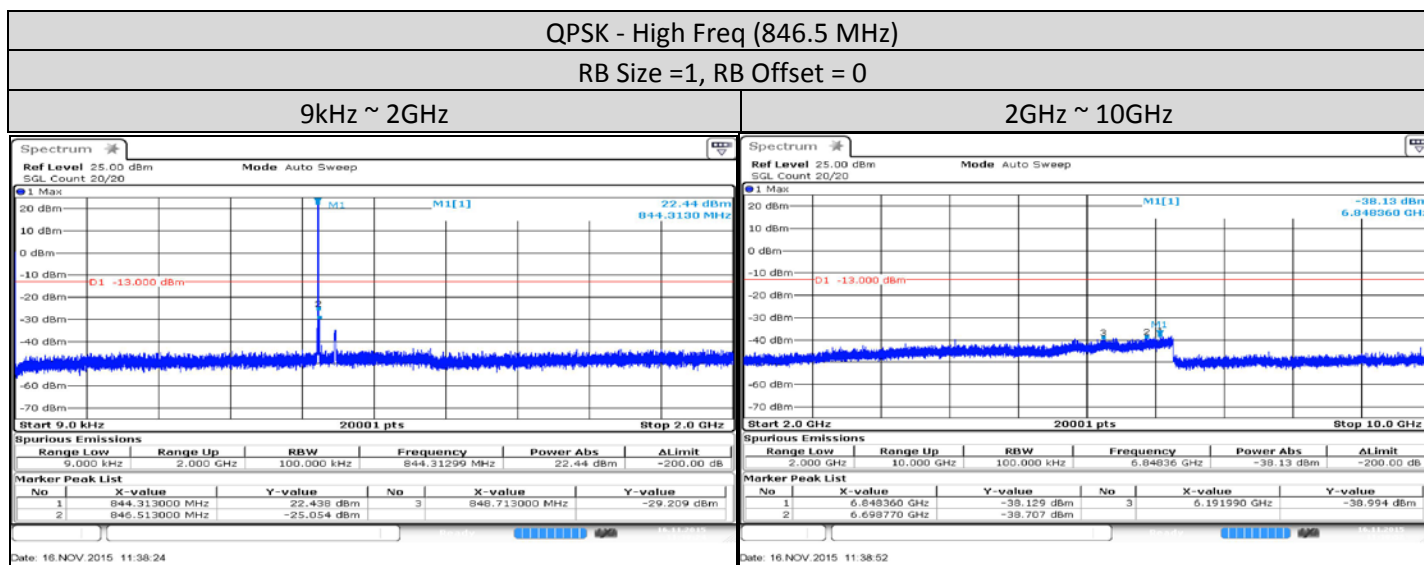
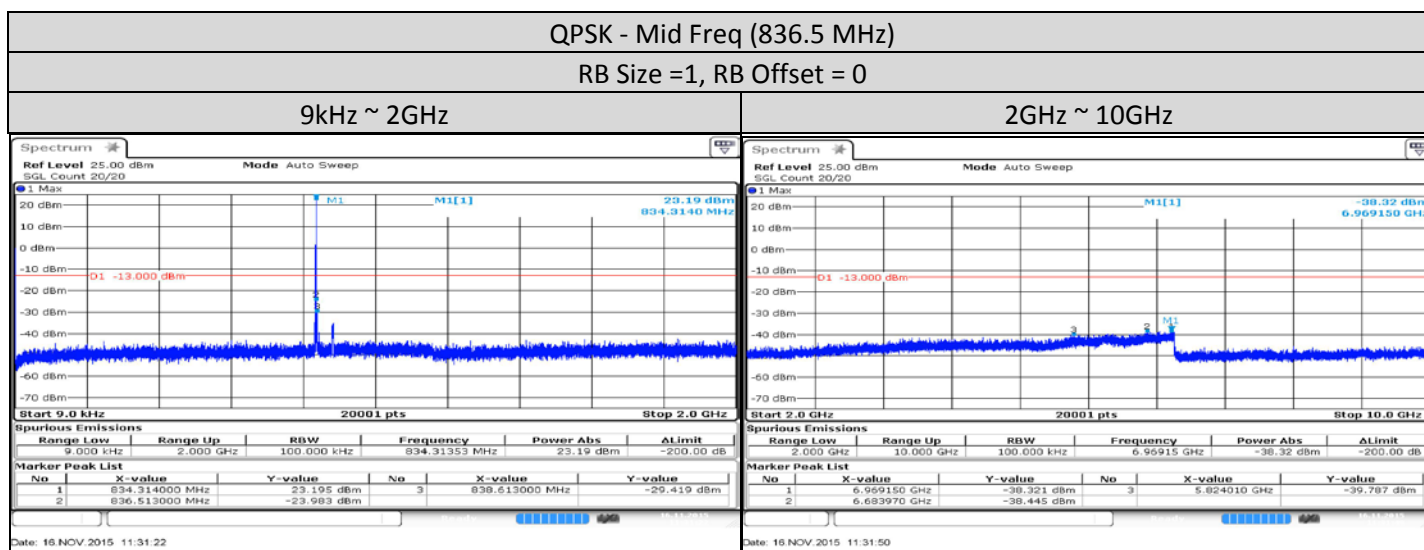
3MHz



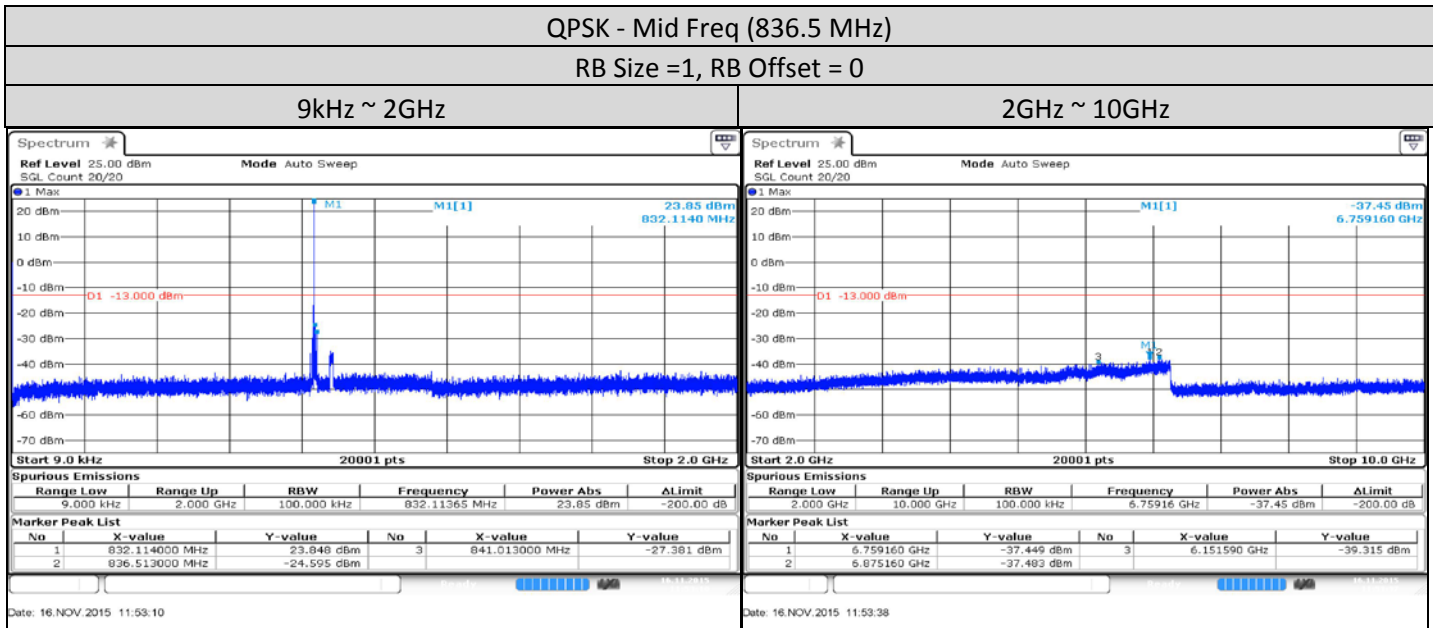
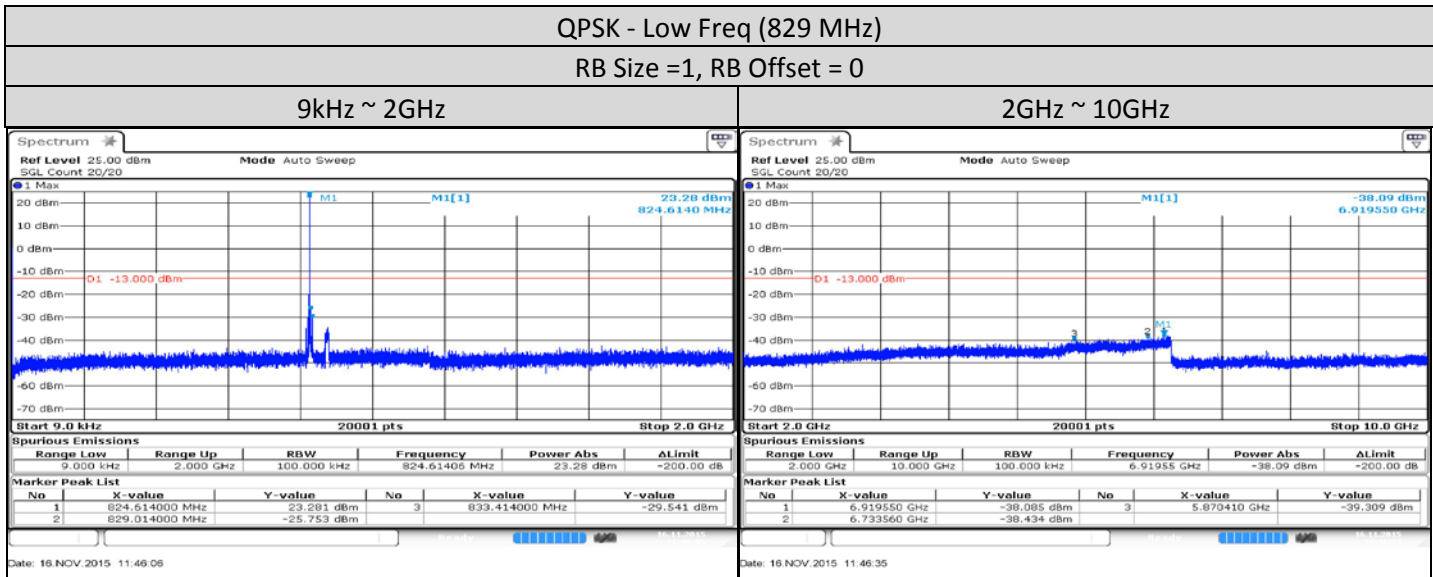


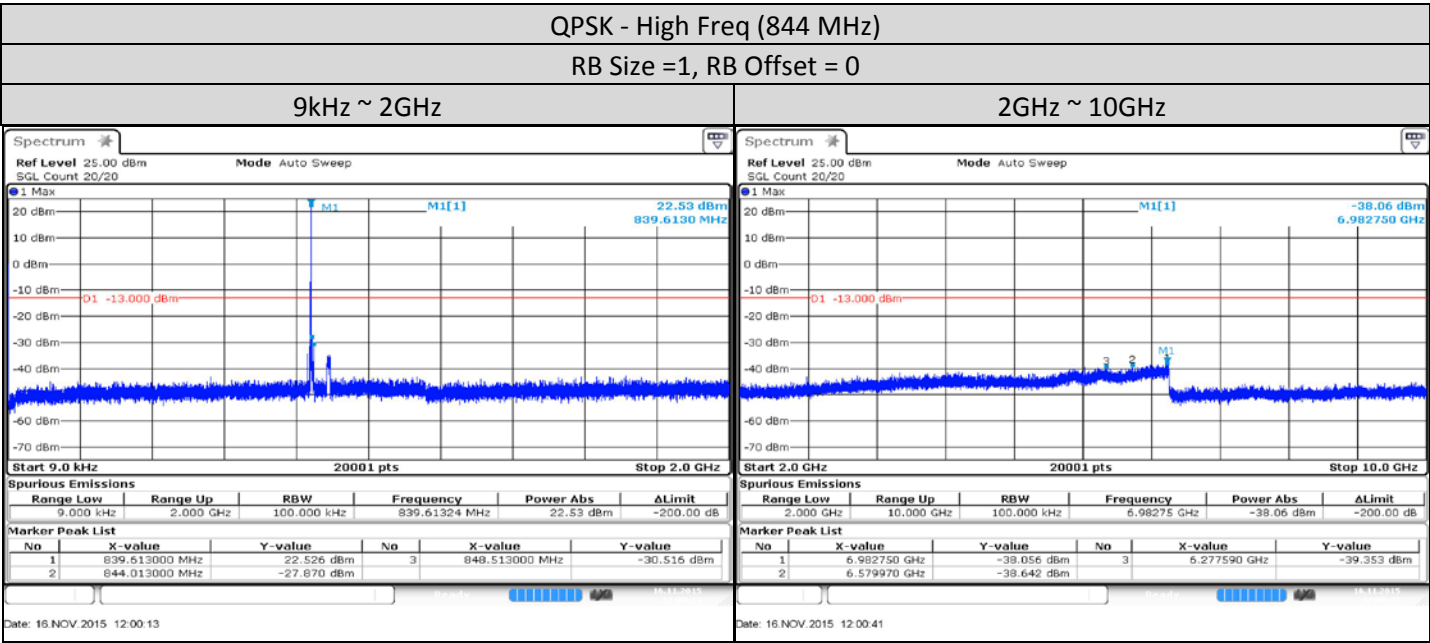
5MHz





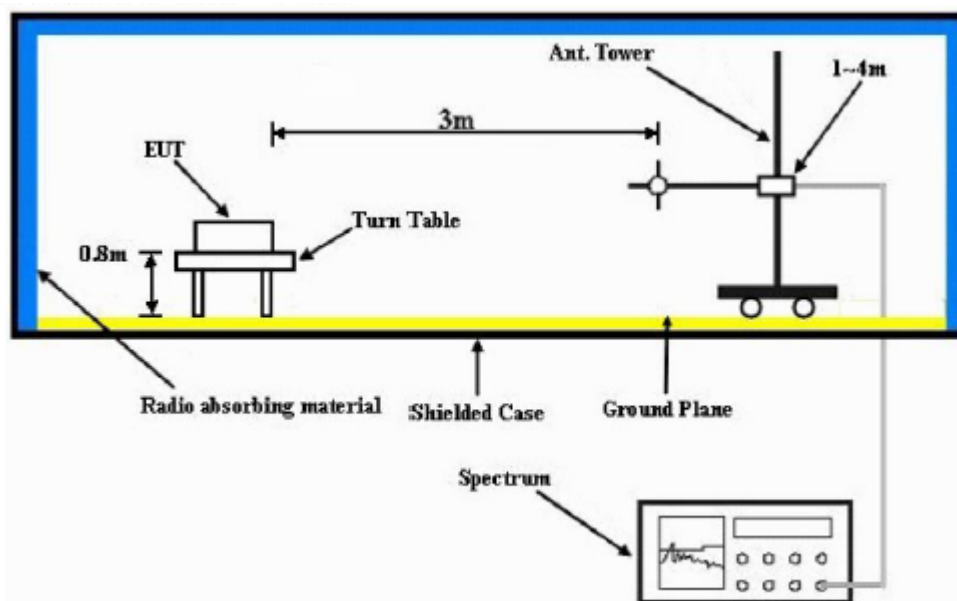
10MHz





1.12. Radiated Spurious Emission

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 positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.

1.12.2. Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Battery : PMNN4472A, Accy : 3360-HKTN4009A-3, 3360-CB000262A01-3

S/N: 171PRQ1569

RADIATED SPURIOUS EMISSIONS

Frequency (MHz)	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	FCC Failing Limit (dBm)
1649.4000	-13	-40	-13
2474.1000	-13	-40	-13
3298.8000	-13	-40	-13
4123.5000	-13	-40	-13
4948.2000	-13	-40	-13
5772.9000	-13	-40	-13
6597.6000	-13	-40	-13
7422.3000	-13	-40	-13
8247.0000	-13	-40	-13

Remarks:39

LINK MODE RADIATED SPURIOUS EMISSIONS

MODEL #: LEX L10i

Battery : PMNN4472A, Accy : 3360-HKTN4009A-3, 3360-CB000262A01-3

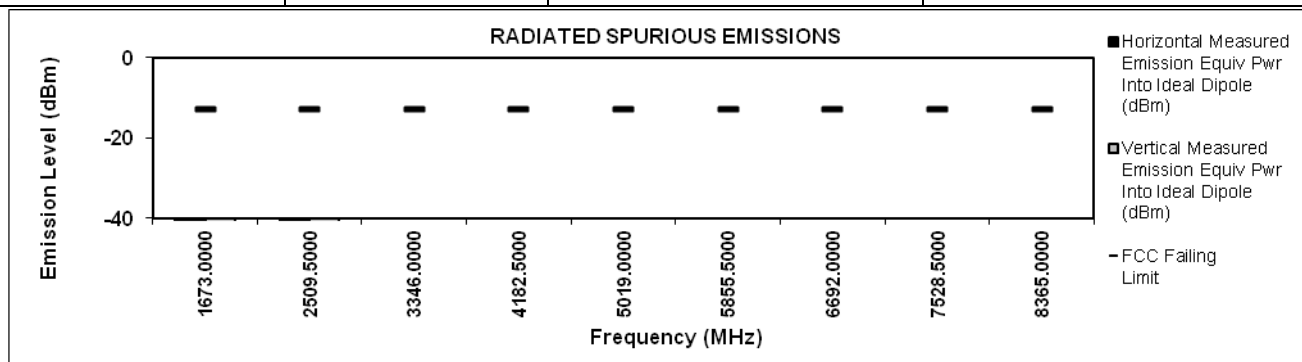
836.5 MHz

Band 5 (Mid)

Bandwidth 5 Mhz

0.2512 Watt(s)/Max Power

S/N: 171PRQ1569

[illegible]

The data presented here was taken using the substitution method as found in the TIA/EIA-603 document.

Motorola Penang EMC Lab - Test Performed by: Qawiman/Nazrin

January 2, 2016

FCC Registration: 772092

Industry Canada: 109AK

Remarks:** Indicates the spurious emission could not be detected due to noise limitations or ambients.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported

Temp(Deg): 24.8 Hum(%RH): 63.7

Remarks:

Passed Results

Marginal Results

Failed Results

LINK MODE RADIATED SPURIOUS EMISSIONS

MODEL #: LEX L10i

Battery : PMNN4472A, Accy : 3360-HKTN4009A-3, 3360-CB000262A01-3

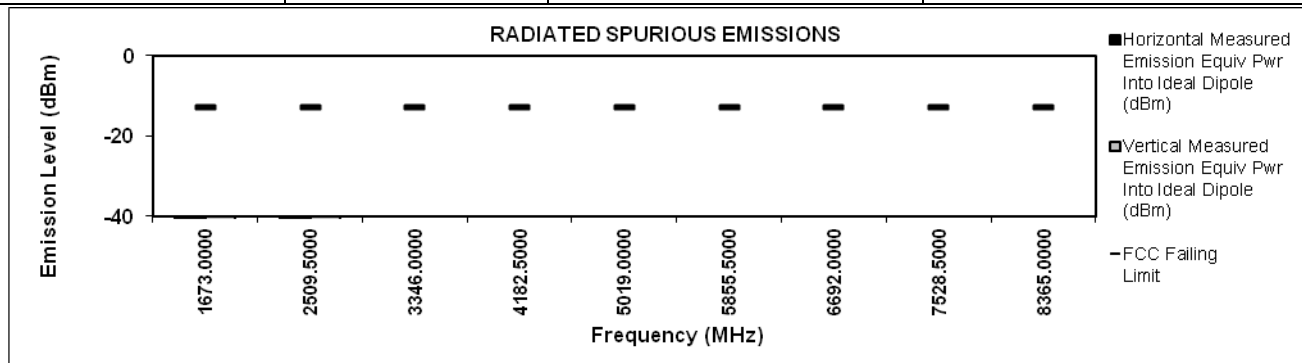
836.5 MHz

Band 5 (Mid)

Bandwidth 10 Mhz

0.2512 Watt(s)/Max Power

S/N: 171PRQ1569

[illegible]

The data presented here was taken using the substitution method as found in the TIA/EIA-603 document.

Motorola Penang EMC Lab - Test Performed by: Qawiman/Nazrin

January 2, 2016

FCC Registration: 772092

Industry Canada: 109AK

Remarks:** Indicates the spurious emission could not be detected due to noise limitations or ambients.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported

Temp(Deg): 24.8 Hum(%RH): 63.7

Remarks:

Passed Results

Marginal Results

Failed Results

LINK MODE RADIATED SPURIOUS EMISSIONS

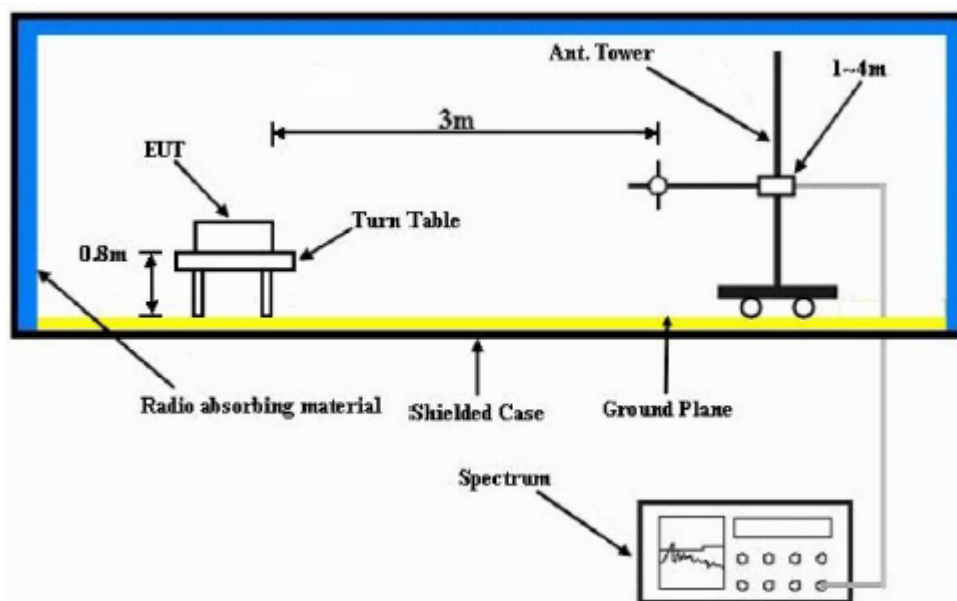
MODEL #: LEX L10i

Battery : PMNN4472A, Accy : 3360-HKTN4009A-3, 3360-

Failed Results

1.13. Effective Radiated Power (ERP)

1.13.1. Test Setup



- 1) The spectrum setting for Effective Radiated Power (ERP) is RBW = 100 kHz, VBW = 300 kHz. Detector Mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval 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 for each degree interval. The “Read Value” is the spectrum reading of 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) $ERP = \text{“Read Value”} + \text{Measured substitution value.}$

1.13.2. Test Limit

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

1.13.3. Effective Radiated Power (ERP) - LTE Band 5 (824-849MHz)

Band 5, 1.4MHz QPSK, Low CH 20407	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	824.7	13.38	11.23
Vert.	824.7	11.90	9.75

Band 5, 1.4MHz QPSK, Mid CH 20525	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	15.91	13.76
Vert.	836.5	4.08	1.93

Band 5, 1.4MHz QPSK, High CH 20643	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	848.3	15.10	12.95
Vert.	848.3	12.03	9.88

Band 5, 3MHz QPSK, Low CH 20415	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	825.5	15.76	13.61
Vert.	825.5	11.76	9.61

Band 5, 3MHz QPSK, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	18.00	15.85
Vert.	836.5	11.94	9.79

Band 5, 3MHz QPSK, High CH 20635	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	847.5	16.40	14.25
Vert.	847.5	10.64	8.49

Band 5, 5MHz QPSK, Low CH 20425	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	826.5	14.92	12.77
Vert.	826.5	12.18	10.03

Band 5, 5MHz QPSK, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	16.05	13.9
Vert.	836.5	12.53	10.38

Band 5, 5MHz QPSK, High CH 20625	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	846.5	18.21	16.06
Vert.	846.5	12.47	10.32

Band 5, 10MHz QPSK, Low CH 20450	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	829	16.20	14.05
Vert.	829	13.82	11.67

Band 5, 10MHz QPSK, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	16.52	14.37
Vert.	836.5	12.27	10.12

Band 5, 10MHz QPSK, High CH 20600	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: QPSK

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	844	19.54	17.39
Vert.	844	13.42	11.27

Band 5, 1.4MHz 16QAM, Low CH 20407	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	824.7	15.33	13.18
Vert.	824.7	10.04	7.89

Band 5, 1.4MHz 16QAM, Mid CH 20525	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	15.34	13.19
Vert.	836.5	9.09	6.94

Band 5, 1.4MHz 16QAM, High CH 20643	
RB = 1	Offset = 5

EIRP/ERP

Bandwidth : 1.4MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	848.3	16.40	14.25
Vert.	848.3	12.19	10.04

Band 5, 3MHz 16QAM, Low CH 20415	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	825.5	16.81	14.66
Vert.	825.5	8.15	6.0

Band 5, 3MHz 16QAM, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	16.72	14.57
Vert.	836.5	12.22	10.07

Band 5, 3MHz 16QAM, High CH 20635	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 3 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	847.5	16.61	14.46
Vert.	847.5	13.34	11.19

Band 5, 5MHz 16QAM, Low CH 20425	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	826.5	17.77	15.62
Vert.	826.5	11.38	9.23

Band 5, 5MHz 16QAM, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	13.38	11.23
Vert.	836.5	8.28	6.13

Band 5, 5MHz 16QAM, High CH 20625	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 5 MHz
S/N: 171PRQ1568

Tx Power: 0.2512 Watts
Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	846.5	17.10	14.95
Vert.	846.5	10.94	8.79

Band 5, 10MHz 16QAM, Low CH 20450	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	829	12.70	10.55
Vert.	829	8.43	6.28

Band 5, 10MHz 16QAM, Mid CH 20525	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	836.5	16.47	14.32
Vert.	836.5	12.77	10.62

Band 5, 10MHz 16QAM, High CH 20600	
RB = 1	Offset = 0

EIRP/ERP

Bandwidth : 10 MHz

S/N: 171PRQ1568

Tx Power: 0.2512 Watts

Modulation: 16QAM

Accessory: 3360-HKTN4009A-3, 3360-CB000262A01-3

Antenna Polarization	Frequency (MHz)	EIRP (dBm)	ERP (dBm)
Horiz.	844	18.69	16.54
Vert.	844	7.92	5.77