

 MOTOROLA SOLUTIONS	 MS ISO/IEC 17025 TESTING SAMM No. 0825																										
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn Bhd, Innoplex Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.	FCC / ISED TEST REPORT Report Revision : Rev.A																										
<table><tr><td>Date/s Tested</td><td>: 27-Dec-2018 - 23-Jan-2019</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions - Schaumburg</td></tr><tr><td>Requestor</td><td>: HOPKINS, SEAN</td></tr><tr><td>Product Type</td><td>: Hand-held</td></tr><tr><td>Product Version (PMN)</td><td>: P1B</td></tr><tr><td>Model Number (HVIN)</td><td>: H55TGT9PW8AN</td></tr><tr><td>Frequency Band</td><td>: Refer to section 1.4</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions, Inc</td></tr><tr><td>Applicant Address</td><td>: 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>ISED Registrations</td><td>: 109AK</td></tr><tr><td>Firmware Version (FVIN)</td><td>: D00.00.31</td></tr></table> The equipment was tested accordance to the requirement listed below: <table><tr><td>(LTE Band 5) FCC 47 CFR Part 2 / 22 ISED RSS GEN Issue 5, April 2018 ISED RSS 132 Issue 3, January 2013</td><td>PASS</td></tr></table> 		Date/s Tested	: 27-Dec-2018 - 23-Jan-2019	Manufacturer/Location	: Motorola Solutions - Schaumburg	Requestor	: HOPKINS, SEAN	Product Type	: Hand-held	Product Version (PMN)	: P1B	Model Number (HVIN)	: H55TGT9PW8AN	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	: 109AK	Firmware Version (FVIN)	: D00.00.31	(LTE Band 5) FCC 47 CFR Part 2 / 22 ISED RSS GEN Issue 5, April 2018 ISED RSS 132 Issue 3, January 2013	PASS
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Prepared By: _____ Maheshvaran Rajagopal Technician	Approved By: _____ Goh Aik Hong Responsible Engineer																										

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REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	26-Feb-19	Maheshvaran Rajagopal

1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Result	Remark	Serial Number Tested
2.1046	RSS-Gen 6.12 RSS-132 5.4	Conducted RF Output Power	Pass	Meet the requirement of limit	437P1B0011
--	RSS-132 5.4	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	437P1B0011
2.1049 22.917	RSS-Gen 6.7	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit	437P1B0011
2.1055 22.355	RSS-Gen 6.11 RSS-132 5.3	Frequency Stability	Pass	Meet the requirement of limit	437P1B0011
2.1051 22.917	RSS-Gen 6.13 RSS-132 5.5	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	437P1B0011
2.1051 22.917	RSS-Gen 6.13 RSS-132 5.5	Conducted Spurious Emissions	Pass	Meet the requirement of limit	437P1B0011
22.913(a)(2)	RSS-132 5.4	Effective Radiated Power (ERP)	Not Performed.	Not Performed.	Not Performed.
2.1053 22.917	RSS-132 5.5	Radiated Spurious Emissions	Not Performed.	Not Performed.	Not Performed.

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 (Test Software Version : R&S CMWRun 1.8.9)				
Wideband Radio Communication Tester	CMW500	153174	12-Apr-17	12-Apr-19
Signal Analyzer	FSV40	101431	13-Jul-17	12-Jul-19
Chamber	SH-641	92002651	5-Mar-18	5-Mar-19
Power Supply	6623A	3417A03546	15-Nov-17	15-Nov-19

1.3. General Information

General Description of EUT

Product	Hand-held
Brand	Motorola Solutions
Test Model	H55TGT9PW8AN
Power Supply Rating	7.5 Vdc

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. Conducted RF Output Power	LTE Band 5 QPSK	Channel Bandwidth 1.4MHz	22.83dBm (0.192W)	
		Channel Bandwidth 3MHz	22.925dBm (0.196W)	
		Channel Bandwidth 5MHz	22.876dBm (0.194W)	
		Channel Bandwidth 10MHz	22.87dBm (0.194W)	
	LTE Band 5 16QAM	Channel Bandwidth 1.4MHz	22.028dBm (0.160W)	
		Channel Bandwidth 3MHz	22.113dBm (0.162W)	
		Channel Bandwidth 5MHz	22.121dBm (0.163W)	
		Channel Bandwidth 10MHz	22.215dBm (0.167W)	
Emission Designator	LTE Band 5		QPSK	16QAM
		Channel Bandwidth 1.4MHz	1M07G7D	1M07D7W
		Channel Bandwidth 3MHz	2M68G7D	2M70D7W
		Channel Bandwidth 5MHz	4M48G7D	4M48D7W
		Channel Bandwidth 10MHz	8M93G7D	8M95D7W
Antenna Type	LTE Band 5	Stamped metal with -2.34dBi gain		
SW Version	D00.00.31			
HW Version	P1B			

Note:

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

Item	Brand	Model or P/N	Specification
DMR Portable Programming Cable	Motorola Solutions	PMKN4012B	-

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	153174	NA

Note:

- 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 v03r01

ANSI C63.26-2015

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

Deviation from standard

Not applicable as no deviation from standard test method.

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 and antenna ports.

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	Uplink 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	20407, 20643	1.4 MHz	QPSK	6 RB / 0 RB Offset
	20415~ 20635	20415, 20635	3 MHz		15 RB / 0 RB Offset
	20425~ 20625	20425, 20625	5 MHz		25 RB / 0 RB Offset
	20450~ 20600	20450, 20600	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 / 3 RB Offset
	20415~ 20635	20415, 20525, 20635	3 MHz		1 RB / 7 RB Offset
	20425~ 20625	20425, 20525, 20625	5 MHz		1 RB / 0 RB Offset
	20450~ 20600	20450, 20525, 20600	10 MHz		1 RB / 49 RB Offset
Radiated Spurious Emission	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK	Not Performed.
	20415~ 20635	20415, 20525, 20635	3 MHz		
	20425~ 20625	20425, 20525, 20625	5 MHz		
	20450~ 20600	20450, 20525, 20600	10 MHz		
Effective Radiated Power (ERP)	20407~ 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	Not Performed.
	20415~ 20635	20415, 20525, 20635	3 MHz		
	20425~ 20625	20425, 20525, 20625	5 MHz		

	20450~ 20600	20450, 20525, 20600	10 MHz		
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NOTE:

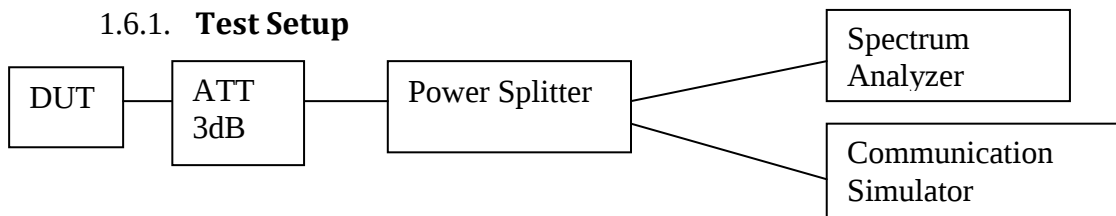
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Conducted Spurious Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. Peak to Average and Occupied Bandwidth were performed with full Resource Block which is the worst case.
4. 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	Maheshvaran
Peak-to-Average Power Ratio	25°C, 50% RH	7.5V DC	Maheshvaran
Occupied Bandwidth	25°C, 50% RH	7.5V DC	Maheshvaran
Frequency Stability	25°C, 50% RH	7.5V DC	Maheshvaran
Band Edge Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Maheshvaran
Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Maheshvaran
Radiated Spurious Emission	Not Performed.		
Effective Radiated Power (ERP)	Not Performed.		

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

ISED: The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.

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

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
			20407	20525	20643	20407	20525	20643
			824.7MHz	836.5MHz	848.3 MHz	824.7 MHz	836.5MHz	848.3 MHz
Band 5 / 1.4 MHz	1	0	22.639	22.762	22.62	21.759	21.794	21.671
	1	3	22.701	22.83	22.631	21.842	21.879	21.685
	1	5	22.647	22.751	22.541	21.813	21.836	21.636
	3	0	22.69	22.744	22.599	21.689	22.009	21.824
	3	2	22.722	22.809	22.64	21.753	22.028	21.872
	3	3	22.668	22.762	22.575	21.712	21.991	21.82
	6	0	21.698	21.686	21.58	20.715	20.826	20.714

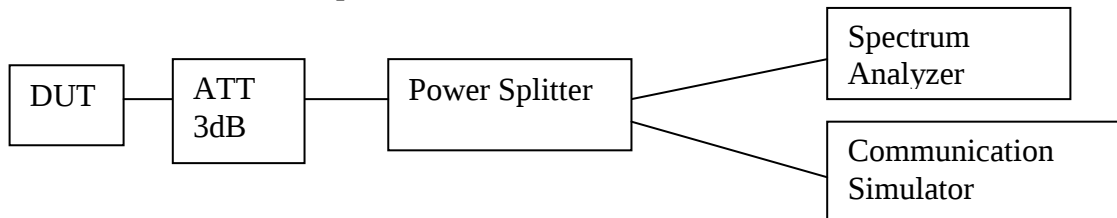
Conducted Output Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			20415	20525	20635	20415	20525	20635
			825.5MHz	836.5MHz	847.5MHz	825.5 MHz	836.5MHz	847.5 MHz
Band 5 / 3MHz	1	0	22.736	22.831	22.704	21.813	21.889	22.113
	1	7	22.781	22.925	22.706	21.94	21.955	22.112
	1	14	22.7	22.875	22.573	21.838	21.889	21.926
	8	0	21.732	21.78	21.75	20.761	20.859	20.944
	8	4	21.769	21.812	21.748	20.791	20.933	20.975
	8	7	21.721	21.786	21.665	20.741	20.885	20.87
	15	0	21.755	21.822	21.77	20.781	20.869	20.829

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
			20425	20525	20625	20425	20525	20625
			826.5MHz	836.5MHz	846.5MHz	826.5 MHz	836.5MHz	846.5 MHz
Band 5 / 5MHz	1	0	22.668	22.729	22.876	21.704	21.881	22.121
	1	13	22.711	22.866	22.78	21.803	22.005	22.085
	1	25	22.611	22.795	22.639	21.663	21.962	21.923
	12	0	21.745	21.813	21.833	20.818	20.817	20.947
	12	6	21.679	21.829	21.806	20.753	20.817	20.857
	12	13	21.714	21.832	21.748	20.723	20.841	20.772
	25	0	21.66	21.801	21.805	20.723	20.889	20.864

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
			20450	20525	20600	20450	20525	20600
			829 MHz	836.5MHz	844 MHz	829 MHz	836.5MHz	844 MHz
Band 5 / 10MHz	1	0	22.732	22.809	22.783	21.839	21.827	22.2
	1	25	22.64	22.826	22.789	21.811	21.843	22.215
	1	49	22.685	22.87	22.576	21.847	21.852	21.949
	25	0	21.678	21.744	21.845	20.818	20.876	20.971
	25	13	21.772	21.817	21.916	20.872	20.963	21.054
	25	25	21.651	21.813	21.823	20.821	20.957	20.94
	50	0	21.732	21.81	21.753	20.788	20.874	20.872

1.7. Peak-to-Average Power Ratio

1.7.1. Test Setup



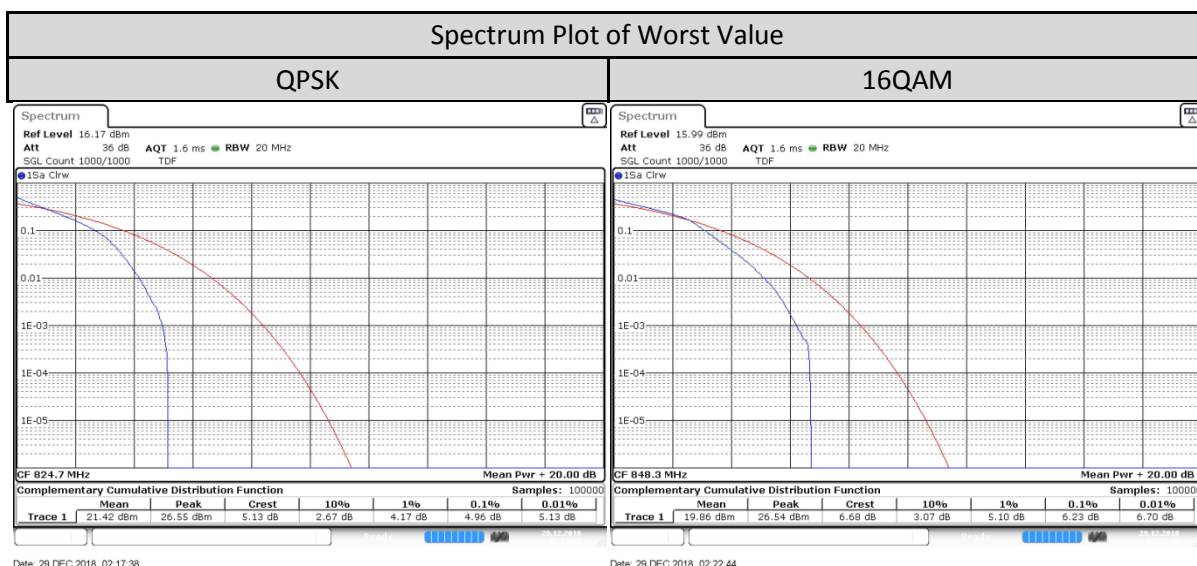
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.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

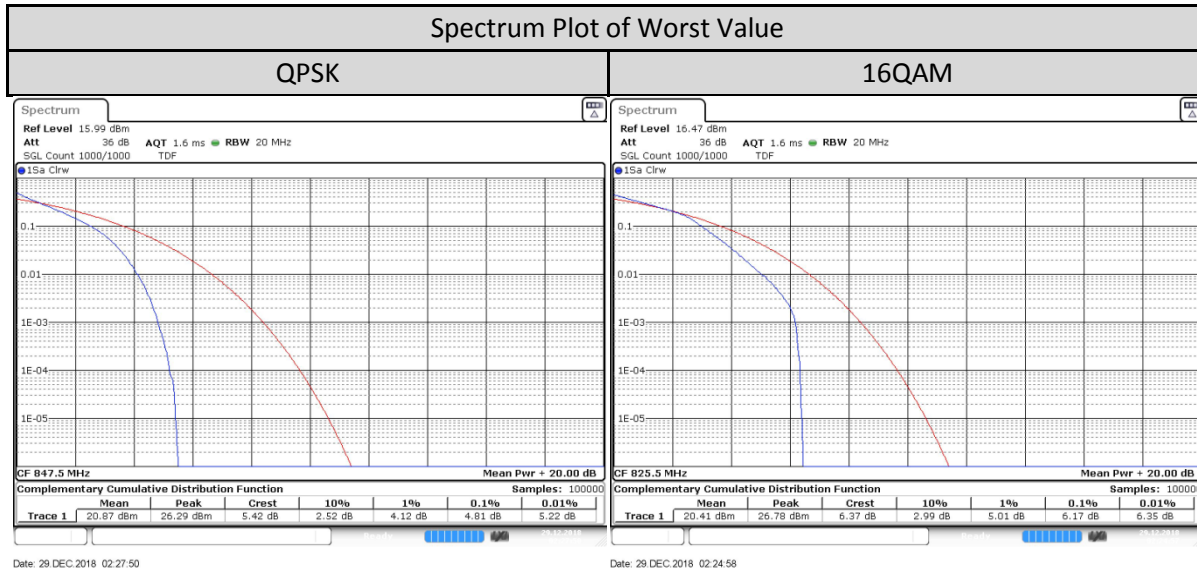
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

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

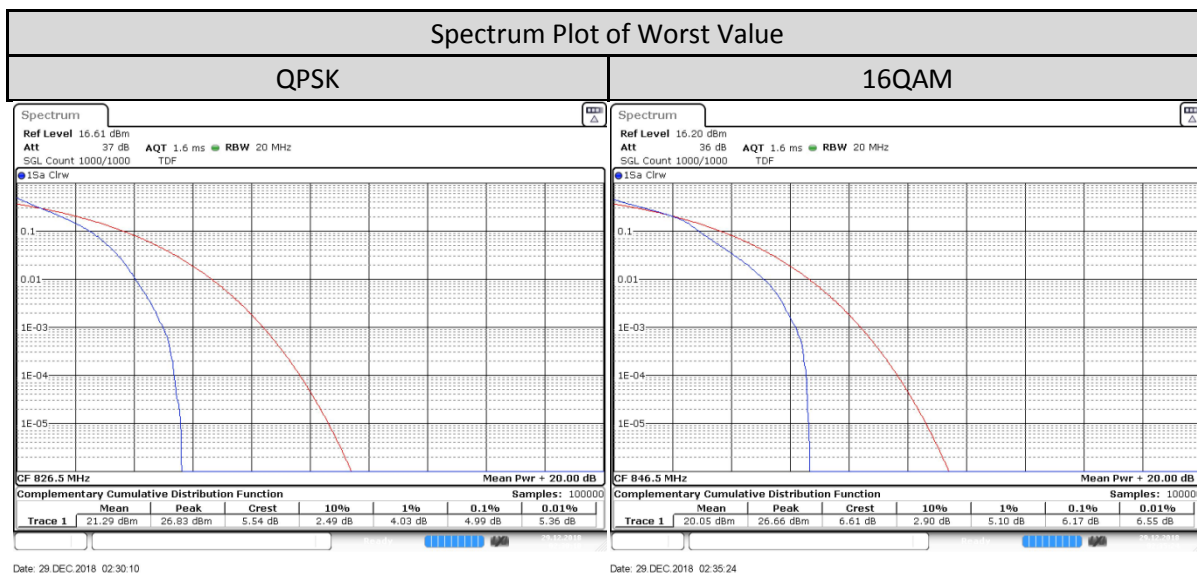
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5/1.4MHz/6/0	Low CH 20407	824.7 MHz	4.957	5.884
	Mid CH 20525	836.5 MHz	4.899	6
	High CH 20643	848.3 MHz	4.928	6.232



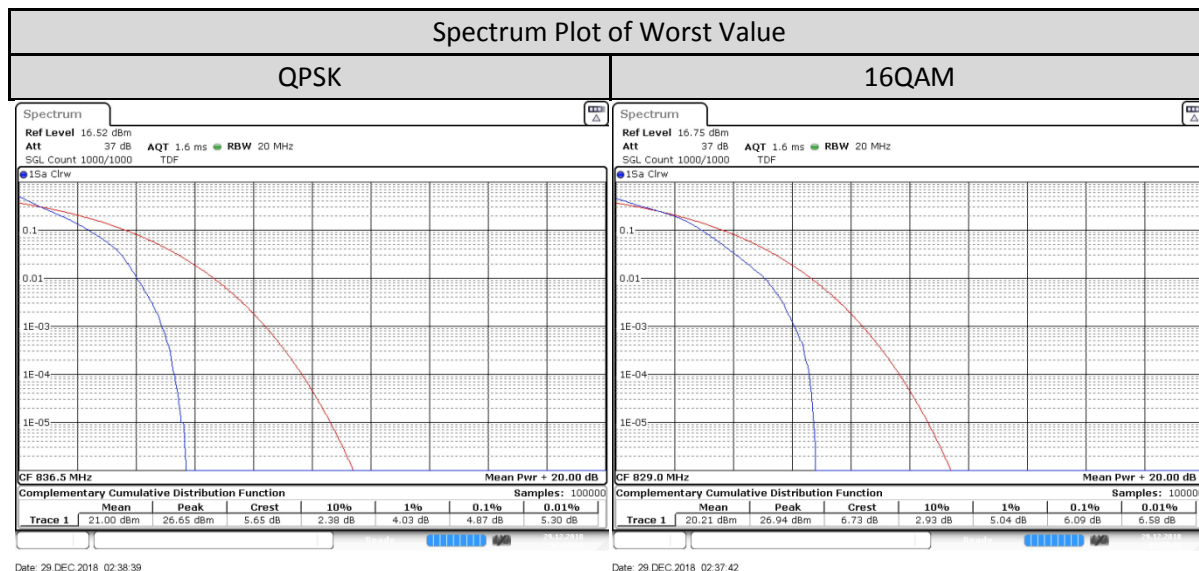
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5/3MHz/15/0	Low CH 20415	825.5 MHz	4.667	6.174
	Mid CH 20525	836.5 MHz	4.754	6.029
	High CH 20635	847.5 MHz	4.812	6.116



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5/5MHz/25/0	Low CH 20425	826.5 MHz	4.986	6.087
	Mid CH 20525	836.5 MHz	4.957	6.058
	High CH 20625	846.5 MHz	4.928	6.174

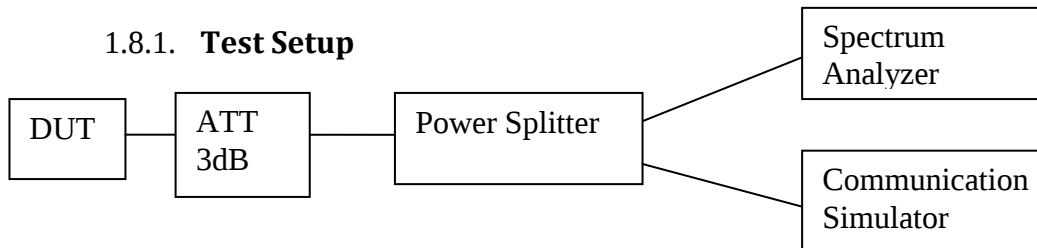


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 5/10MHz/50/0	Low CH 20450	829MHz	4.841	6.087
	Mid CH 20525	836.5 MHz	4.87	6.058
	High CH 20600	844MHz	4.87	6.029



1.8. Occupied Bandwidth

1.8.1. Test Setup



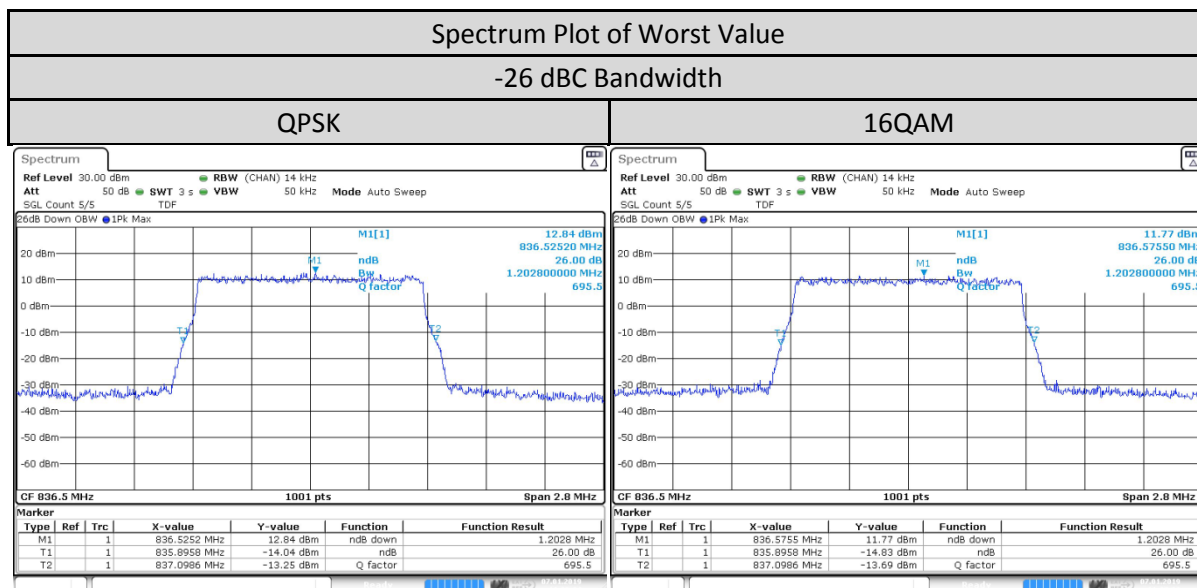
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum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

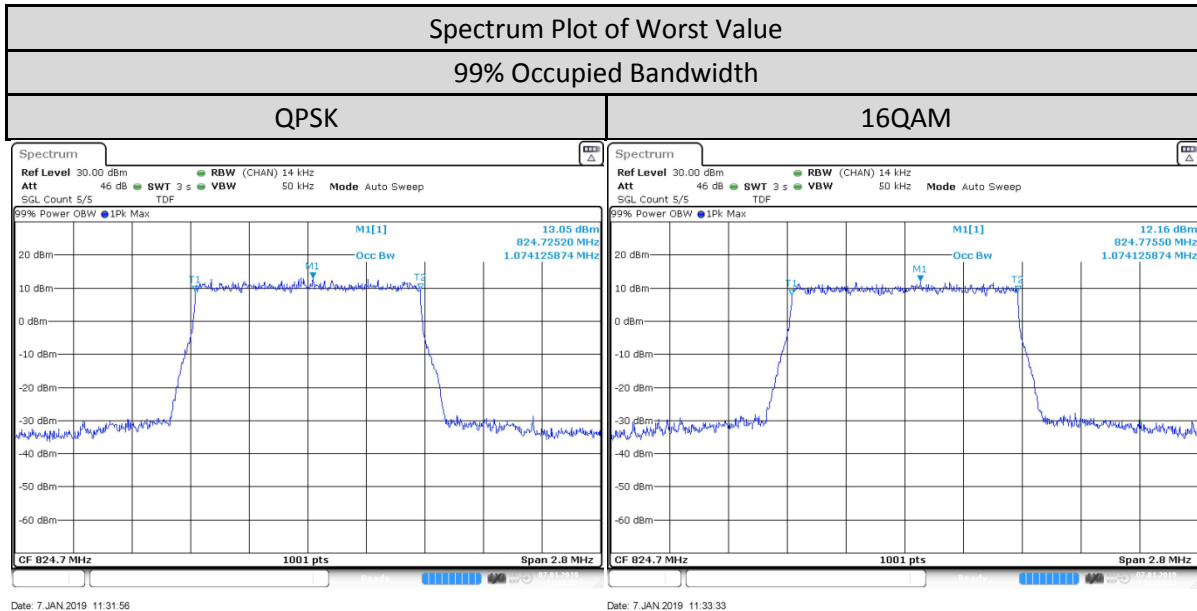
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/1.4MHz/6/0	Low CH 20407	824.7 MHz	1.197	1.197
	Mid CH 20525	836.5 MHz	1.203	1.203
	High CH 20643	848.3 MHz	1.197	1.172



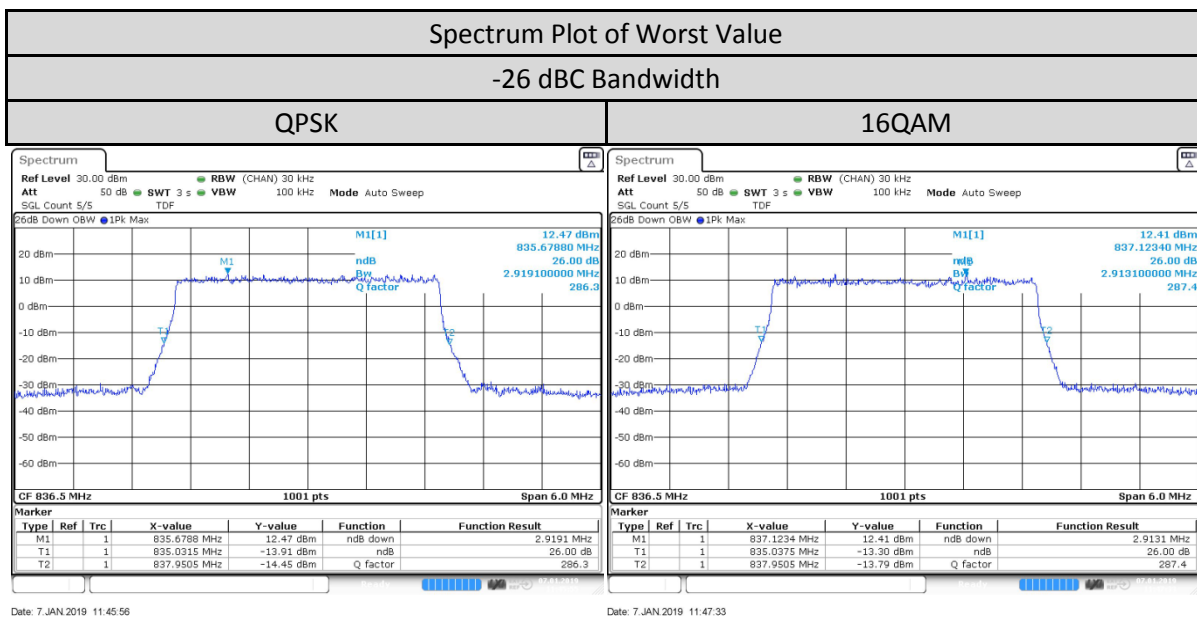
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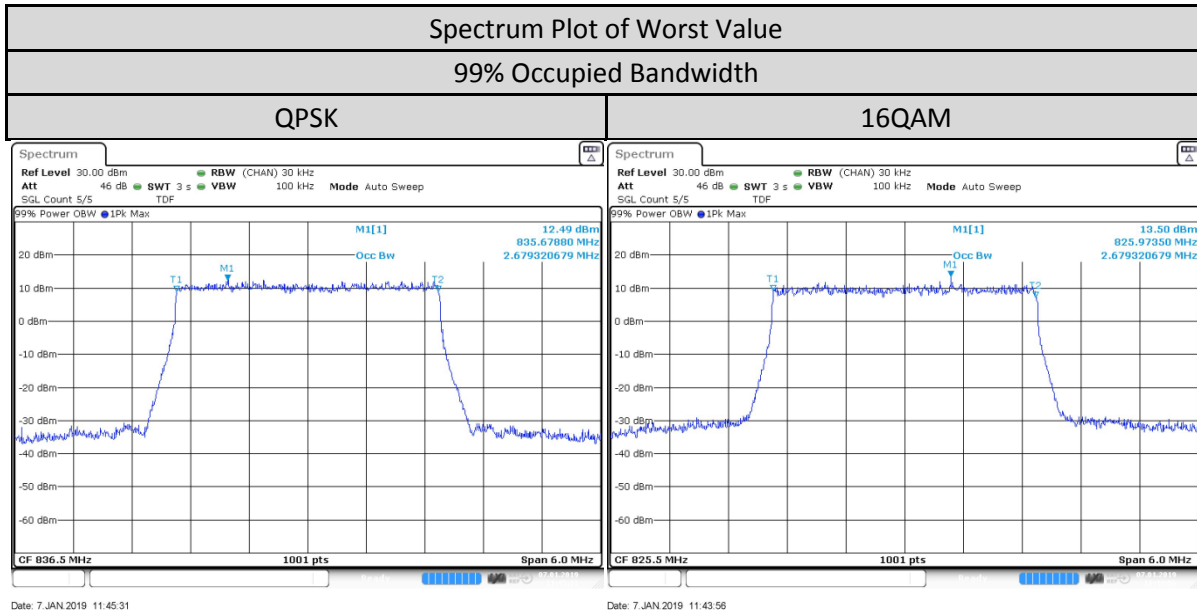
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/1.4MHz/6/0	Low CH 20407	824.7 MHz	1.074	1.074
	Mid CH 20525	836.5 MHz	1.074	1.074
	High CH 20643	848.3 MHz	1.071	1.071



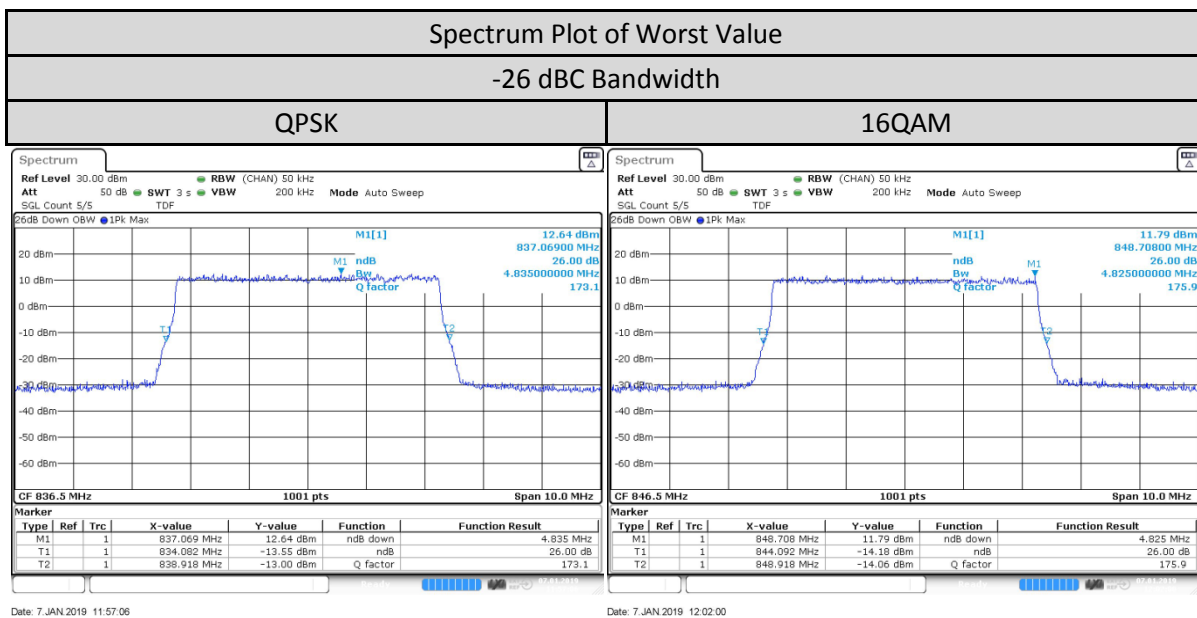
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/3MHz/15/0	Low CH 20415	825.5 MHz	2.877	2.865
	Mid CH 20525	836.5 MHz	2.919	2.913
	High CH 20635	847.5 MHz	2.889	2.901



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/3MHz/15/0	Low CH 20415	825.5 MHz	2.673	2.679
	Mid CH 20525	836.5 MHz	2.679	2.679
	High CH 20635	847.5 MHz	2.673	2.673

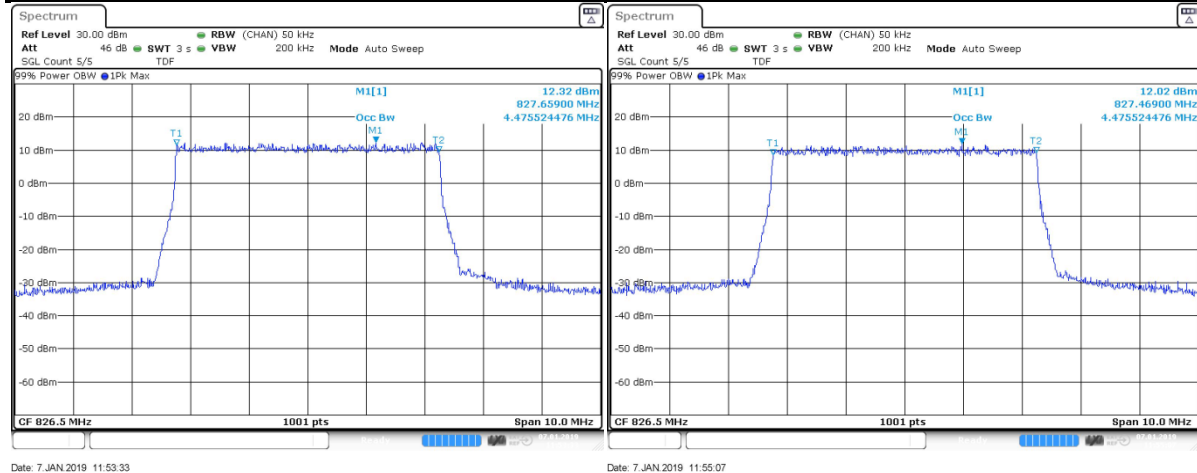


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/5MHz/25/0	Low CH 20425	826.5 MHz	4.805	4.815
	Mid CH 20525	836.5 MHz	4.835	4.785
	High CH 20625	846.5 MHz	4.815	4.825



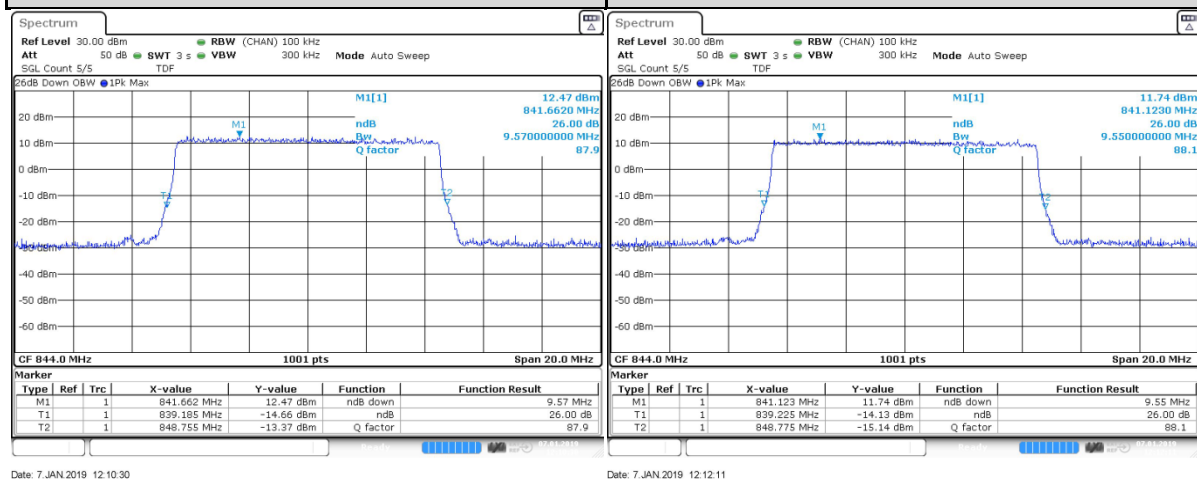
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/5MHz/25/0	Low CH 20425	826.5 MHz	4.476	4.476
	Mid CH 20525	836.5 MHz	4.466	4.466
	High CH 20625	846.5 MHz	4.476	4.476

Spectrum Plot of Worst Value	
99% Occupied Bandwidth	
QPSK	16QAM



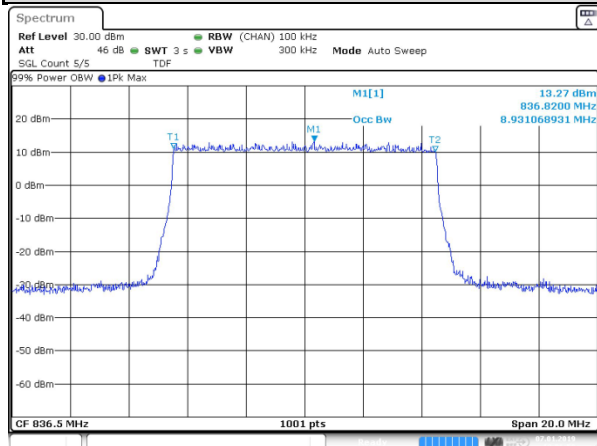
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/10MHz/50/0	Low CH 20450	829MHz	9.491	9.51
	Mid CH 20525	836.5 MHz	9.55	9.53
	High CH 20600	844MHz	9.57	9.55

Spectrum Plot of Worst Value	
-26 dBC Bandwidth	
QPSK	16QAM

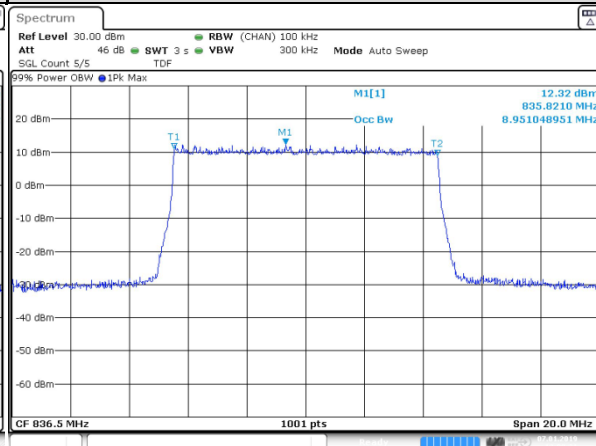


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 5/10MHz/50/0	Low CH 20450	829MHz	8.911	8.911
	Mid CH 20525	836.5 MHz	8.931	8.951
	High CH 20600	844MHz	8.931	8.911

Spectrum Plot of Worst Value	
99% Occupied Bandwidth	
QPSK	16QAM



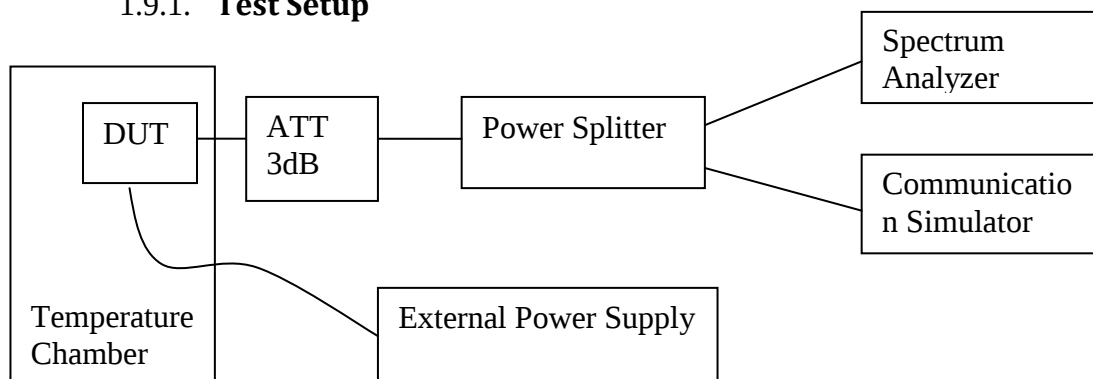
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1.9. Frequency Stability

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 ~ 50 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)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		824.7MHz		848.3MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 5	50	824.699993	-0.00843	848.299991	-0.010371
	40	824.699992	-0.009748	848.299977	-0.027555
	30	824.699991	-0.010442	848.299992	-0.009932
	20	824.700011	0.013859	848.299999	-0.011804
	10	824.700022	0.026227	848.299995	-0.006105
	0	824.699991	-0.010685	848.299979	-0.024469
	-10	824.699979	-0.025429	848.300009	0.010067
	-20	824.699992	-0.009627	848.299993	-0.008263
	-30	824.699994	-0.007094	848.299999	-0.01172

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		824.7MHz		848.3MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	824.699986	-0.017363	848.299992	-0.009376
	7.5	824.69999	-0.011882	848.299991	-0.010202
	6	824.700003	0.003764	848.299993	-0.008786

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		825.5MHz		847.5MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	825.50001	0.011697	847.500008	0.009165
	40	825.500014	0.016809	847.500008	0.009334
	30	825.50001	0.012286	847.500007	0.007714
	20	825.500011	0.013551	847.500008	0.00925
	10	825.500012	0.014123	847.500007	0.008794
	0	825.500012	0.01395	847.500009	0.010263
	-10	825.500012	0.01447	847.500008	0.009165
	-20	825.500011	0.013794	847.499993	-0.007967
	-30	825.50001	0.011905	847.500008	0.009216

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		825.5MHz		847.5MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	825.500011	0.012737	847.500007	0.007748
	7.5	825.500011	0.013257	847.500004	0.004777
	6	825.50001	0.012044	847.500007	0.008305

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		826.5MHz		846.5MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	826.500007	0.008048	846.500009	0.010292
	40	826.500007	0.008654	846.500001	0.011306
	30	826.500008	0.009623	846.500009	0.011204
	20	826.500007	0.008291	846.500001	0.011711
	10	826.499995	-0.005937	846.500009	0.011153
	0	826.500008	0.00971	846.500001	0.011931
	-10	826.500007	0.007979	846.500007	0.008179
	-20	826.500009	0.011146	846.500009	0.010866
	-30	826.500005	0.0063	846.500007	0.008027

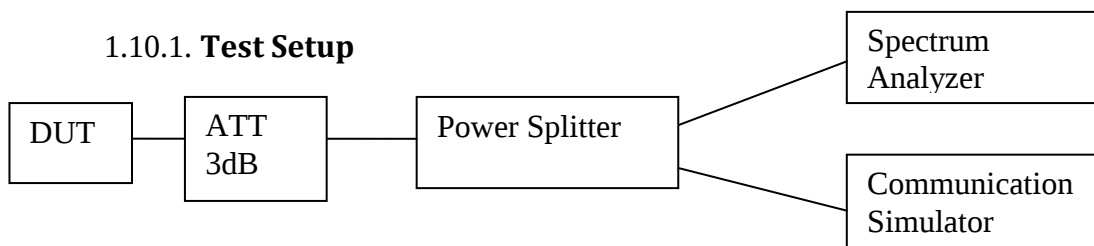
Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		826.5MHz		846.5MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	826.500007	0.009	846.500009	0.010646
	7.5	826.499993	-0.0081	846.500009	0.010292
	6	826.500008	0.010091	846.500008	0.009717

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		829MHz		844MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	828.99999	-0.01163	843.999992	-0.00978
	40	828.999991	-0.010975	843.99999	-0.011322
	30	828.999993	-0.008524	843.999993	-0.008136
	20	828.999991	-0.010388	843.999992	-0.009068
	10	828.999993	-0.008939	843.999993	-0.008458
	0	828.999992	-0.00937	843.999993	-0.00878
	-10	828.999992	-0.010146	844.000003	0.003644
	-20	828.999991	-0.010681	843.999991	-0.011017
	-30	828.999992	-0.009629	843.999991	-0.011085

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		829MHz		844MHz	
LTE Band 5		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	828.999991	-0.010354	843.999991	-0.010322
	7.5	828.999999	-0.011475	843.999991	-0.011186
	6	828.999999	-0.011993	843.999991	-0.010966

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 EBW 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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

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

