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REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	29-March-2018	Maheshvaran Rajagopal
Rev B.	i. Applicant name and address has been added.	30-May-2018	Maheshvaran Rajagopal

	ii. The battery model number has been revised. iii. AC adapter accessories devices information has been added. iv. The Test report number of page format is corrected. v. RSSs version standard have been added to the cover page. vi. Justification statement of accessory devices is included at section 1.5.		
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1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks
2.1046 27.50(d)(6)	RSS-Gen 6.12 RSS-139 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit
27.50(d)(5)	RSS-139 6.5	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit
2.1049 27.53(h)(3)	RSS-Gen 6.6	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit
2.1055 27.54	RSS-139 6.4	Frequency Stability	Pass	Meet the requirement of limit
2.1051 27.53(h)(1)(3)	RSS-Gen 6.13 RSS-139 6.6	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit
2.1051 27.53(h)(1)	RSS-Gen 6.13 RSS-139 6.6	Conducted Spurious Emissions	Pass	Meet the requirement of limit
2.1053 27.53 (h)	RSS-139 6.6	Radiated Spurious Emission	Pass	Meet the requirement of limit
2.1049 27.50(d)(4)	RSS-139 6.5	Equivalent Isotropically Radiated Power (EIRP)	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
Broadband ATE 1				
Wideband Radio Communication Tester	CMW500	154550	14-Feb-17	14-Feb-19
Signal Analyzer	FSV40	101431	13-Jul-17	12-Jul-19
Chamber	SH-641	92002651	6-Mar-17	6-Mar-18
Power Supply	6621A	US37370810	5-Jun-17	5-Jun-18
Radiated Emission				

Drg Horn Freq.	SAS-571	719	18-Jul-17	18-Jul-19
Drg Horn Freq.	SAS-571	720	2-Mar-17	2-Mar-19
Power Supply	6032A	2615A01178	6-Jun-17	6-Jun-18
Microwave Signal Generator	SMP04	100127	19-Jul-17	18-Jul-18
Emi Test Receiver	ESIB26	100336	13-Jul-17	12-Jul-18
Signal Analyzer	FSV40	101103	18-Jul-17	17-Jul-18
5m Semi-Anechoic Chamber	S800-HX	J2308	Not Required	Not Required
Bilog Antenna	CBL6112B	2950	23-Feb-16	23-Feb-18
BILOG ANTENNA	CBL6112B	2964	3-Feb-17	3-Feb-18
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	20-Mar-17	10-Apr-18
DATA LOGGER	SDL500	A.016776	18-Mar-17	18-Mar-18
LOOP ANTENNA	6502	208416	27-Jul-17	27-Jul-18
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
18 - 40GHz PREAMPLIFIER	BBV9721	9721-007	Not Required	Not Required
PREAMPLIFIER	PAM-0118P	361	Not Required	Not Required
Wideband Radio Communication Tester	CMW500	153174	9-Jan-2017	9-Jan-2019

1.3. General Information

General Description of EUT

Product	LEX L11 Mission Critical LTE Device		
Brand	Motorola Solutions		
Test Model	LEX L11n		
Power Supply Rating	3.7Vdc (Battery), 5Vdc (Adapter)		
Mode of operation	LTE Band 4		
Modulation Type	QPSK, 16QAM		
Operating Frequency	LTE Band 4	Channel Bandwidth 1.4MHz	1710.7MHz~1754.3MHz
		Channel Bandwidth 3MHz	1711.5MHz~1753.5MHz
		Channel Bandwidth 5MHz	1712.5MHz~1752.5MHz
		Channel Bandwidth 10MHz	1715.0MHz~1750.0MHz
		Channel Bandwidth 15MHz	1717.5MHz~1747.5MHz
		Channel Bandwidth 20MHz	1720.0MHz~1745.0MHz
Max. EIRP Power	LTE Band 4 QPSK	Channel Bandwidth 1.4MHz	25.104dBm (0.324W)
		Channel Bandwidth 3MHz	25.24dBm (0.334W)
		Channel Bandwidth 5MHz	25.161dBm (0.328W)
		Channel Bandwidth 10MHz	25.189dBm (0.330W)
		Channel Bandwidth 15MHz	25.419dBm (0.348W)
		Channel Bandwidth 20MHz	25.44dBm (0.349W)
	LTE Band 4 16QAM	Channel Bandwidth 1.4MHz	24.286dBm (0.268W)
		Channel Bandwidth 3MHz	24.413dBm (0.276W)
		Channel Bandwidth 5MHz	24.421dBm (0.277W)

		Channel Bandwidth 10MHz	24.387dBm (0.275W)
		Channel Bandwidth 15MHz	24.573dBm (0.287W)
		Channel Bandwidth 20MHz	24.45dBm (0.279W)
Antenna Type	LTE Band 4	Monopole with 1.59dBi gain	
SW Version	L11_D01.00.28		
HW Version	P3a		

Note:

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

Item	Brand	Model or P/N	Specification
Rechargeable Lithium ion battery	Motorola Solutions	PMNN4545A	2500mAH 3.7V LI-ION STD
Rechargeable Lithium ion battery	Motorola Solutions	PMNN4546A	5000mAH 3.7V LI-ION HICAP
Charger Vehicular Adapter VPA	Motorola Solutions	PMLN7779A	18W
Power Supply Adaptor, Power supply Wall cube, AC, DC (USB type A-C)	Motorola Solutions	PS000150A31 - US/JPN plug	7.5W, 100V-240V
Power Supply Adaptor (USB type C-C)	Motorola Solutions	PS000278A01 - US/JPN plug	27W
Detachable Power/Data Cable USB-A to USB-C	Motorola Solutions	CB000756A01	-
Detachable Power/Data Cable USB-C to USB-C	Motorola Solutions	CB000754A01	-

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 C63.26-2015

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

1.4. Channel number and frequency info

Band	Bandwidth supported	Available Channel Number	Test Channel Number			Test Channel Frequency (MHz)		
			Low Channel	Mid Channel	High Channel	Low Channel	Mid Channel	High Channel
LTE Band 4	1.4 MHz	19957 ~ 20393	19957	20175	20393	1710.7	1732.5	1754.3
	3 MHz	19965 ~ 20386	19965	20175	20385	1711.5	1732.5	1753.5
	5 MHz	19975 ~ 20375	19975	20175	20375	1712.5	1732.5	1752.5
	10 MHz	20000 ~ 20350	20000	20175	20350	1715.0	1732.5	1750.0
	15 MHz	20025 ~ 20325	20025	20175	20325	1717.5	1732.5	1747.5
	20 MHz	20050 ~ 20300	20050	20175	20300	1720.0	1732.5	1745.0

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 worst case was found when positioned on X-Plane for LTE band 4.

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 4

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Uplink Modulation	Mode
Conducted RF Output Power/ Equivalent Isotropically Radiated Power (EIRP)	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	As per table 1.6.2 & 1.6.4
	19965 ~ 20386	19965, 20175, 20385	3 MHz		
	19975 ~ 20375	19975, 20175, 20375	5 MHz		
	20000 ~ 20350	20000, 20175, 20350	10 MHz		
	20025 ~ 20325	20025, 20175, 20325	15 MHz		
	20050 ~ 20300	20050, 20175, 20300	20 MHz		
Peak to Average Power Ratio	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		100 RB / 0 RB Offset
Occupied Bandwidth	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		100 RB / 0 RB Offset
Frequency Stability	19957 ~ 20393	20175	1.4 MHz	QPSK	6 RB / 0 RB Offset
	19965 ~ 20386	20175	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	20175	5 MHz		25 RB / 0 RB Offset

	20000 ~ 20350	20175	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20175	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20175	20 MHz		100 RB / 0 RB Offset
Band Edge Conducted Spurious Emission	19957 ~ 20393	19957, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20385	3 MHz		1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20375	5 MHz		1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20350	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20325	15 MHz		1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20300	20 MHz		1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
Conducted Spurious Emission	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 3 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		1 RB / 7 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		1 RB / 24 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		1 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		1 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		1 RB / 0 RB Offset
Radiated Spurious Emission	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 3 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		1 RB / 7 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		1 RB / 24 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		1 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		1 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		1 RB / 0 RB Offset

NOTE:

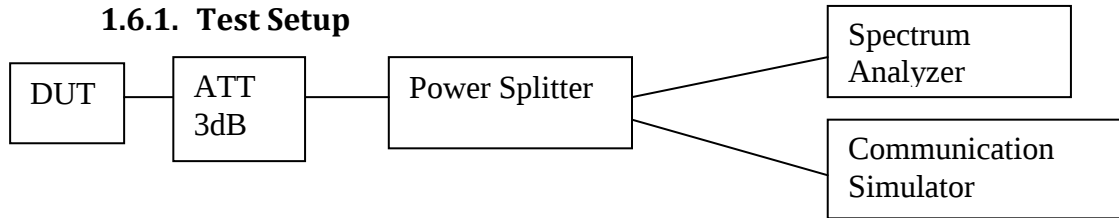
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Equivalent Isotropically Radiated Power (EIRP) was calculated from Conducted RF Output Power results in QPSK and 16QAM modulation.
4. Peak to Average and Occupied Bandwidth were performed with full Resource Block which is the worst case.
5. Frequency stability was performed with full Resource Block in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Conducted RF Output Power/ Equivalent Isotropically Radiated Power (EIRP)	25°C, 50% RH	3.7V DC	Maheshvaran
Peak-to-Average Power Ratio	25°C, 50% RH	3.7V DC	Maheshvaran
Occupied Bandwidth	25°C, 50% RH	3.7V DC	Maheshvaran
Frequency Stability	25°C, 50% RH	3.7V DC	Maheshvaran
Band Edge Conducted Spurious Emission	25°C, 50% RH	3.7V DC	Maheshvaran
Conducted Spurious Emission	25°C, 50% RH	3.7V DC	Maheshvaran
Radiated Spurious Emission	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. Limits

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

1.6.3. Conducted RF Output Power – LTE Band 4(1710-1755MHz)

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
			19957	20175	20393	19957	20175	20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
Band 4 / 1.4 MHz	1	0	23.447	23.401	23.331	22.621	22.433	22.237
	1	3	23.514	23.448	23.379	22.696	22.567	22.311
	1	5	23.453	23.415	23.31	22.626	22.523	22.277
	3	0	23.457	23.327	23.267	22.63	22.393	22.433
	3	2	23.493	23.401	23.332	22.662	22.461	22.494
	3	3	23.431	23.44	23.303	22.628	22.442	22.457
	6	0	22.418	22.475	22.262	21.444	21.452	21.308

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
			19965	20175	20385	19965	20175	20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
Band 4 / 3MHz	1	0	23.543	23.331	23.33	22.533	22.674	22.393
	1	7	23.65	23.516	23.435	22.554	22.823	22.491
	1	14	23.525	23.475	23.344	22.43	22.714	22.367
	8	0	22.509	22.454	22.364	21.525	21.686	21.288
	8	4	22.515	22.494	22.338	21.519	21.755	21.31

	8	7	22.483	22.563	22.332	21.493	21.746	21.273
	15	0	22.507	22.498	22.352	21.49	21.633	21.325

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
			19975	20175	20375	19975	20175	20375
			1712.5MHz	1732.5MHz	1752.5MHz	1712.5MHz	1732.5MHz	1752.5MHz
Band 4 / 5MHz	1	0	23.511	23.396	23.31	22.619	22.638	22.273
	1	13	23.553	23.562	23.37	22.632	22.831	22.336
	1	24	23.46	23.571	23.329	22.548	22.819	22.292
	12	0	22.512	22.449	22.339	21.427	21.535	21.347
	12	6	22.547	22.514	22.346	21.451	21.559	21.361
	12	13	22.493	22.605	22.362	21.409	21.599	21.331
	25	0	22.496	22.537	22.325	21.486	21.527	21.328

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
			20000	20175	20350	20000	20175	20350
			1715MHz	1732.5MHz	1750MHz	1715MHz	1732.5MHz	1750MHz
Band 4 / 10MHz	1	0	23.599	23.46	23.319	22.557	22.797	22.376
	1	25	23.509	23.367	23.275	22.429	22.77	22.293
	1	49	23.453	23.47	23.338	22.401	22.757	22.365
	25	0	22.515	22.402	22.324	21.566	21.545	21.418
	25	13	22.493	22.524	22.357	21.56	21.583	21.402
	25	25	22.42	22.559	22.34	21.508	21.655	21.401
	50	0	22.48	22.373	22.354	21.519	21.504	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
			20025	20175	20325	20025	20175	20325
			1717.5MHz	1732.5MHz	1747.5MHz	1717.5MHz	1732.5MHz	1747.5MHz
Band 4 / 15MHz	1	0	23.738	23.829	23.702	22.983	22.818	22.638
	1	38	23.526	23.612	23.434	22.805	22.569	22.358
	1	74	23.668	23.659	23.53	22.836	22.693	22.469
	36	0	22.639	22.513	22.464	21.652	21.642	21.448
	36	19	22.603	22.516	22.447	21.6	21.635	21.453
	36	39	22.632	22.575	22.469	21.646	21.64	21.433
	75	0	22.571	22.399	22.439	21.59	21.588	21.419

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
			20050	20175	20300	20050	20175	20300
			1720MHz	1732.5MHz	1745MHz	1720MHz	1732.5MHz	1745MHz
Band 4 / 20MHz	1	0	23.641	23.85	23.515	22.86	22.766	23.061
	1	49	23.429	23.512	23.361	22.836	22.488	22.906
	1	99	23.414	23.501	23.425	22.825	22.498	22.906
	50	0	22.661	22.637	22.564	21.603	21.731	21.557
	50	25	22.57	22.499	22.445	21.582	21.582	21.451
	50	50	22.605	22.636	22.451	21.628	21.615	21.435
	100	0	22.606	22.458	22.47	21.569	21.555	21.498

1.6.4. Equivalent Isotropically Radiated Power (EIRP) - LTE Band 4(1710-1755MHz)

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			19957	20175	20393	19957	20175	20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
Band 4 / 1.4 MHz	1	0	25.037	24.991	24.921	24.211	24.023	23.827
	1	3	25.104	25.038	24.969	24.286	24.157	23.901
	1	5	25.043	25.005	24.9	24.216	24.113	23.867
	3	0	25.047	24.917	24.857	24.22	23.983	24.023
	3	2	25.083	24.991	24.922	24.252	24.051	24.084
	3	3	25.021	25.03	24.893	24.218	24.032	24.047
	6	0	24.008	24.065	23.852	23.034	23.042	22.898

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			19965	20175	20385	19965	20175	20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
Band 4 / 3MHz	1	0	25.133	24.921	24.92	24.123	24.264	23.983
	1	7	25.24	25.106	25.025	24.144	24.413	24.081
	1	14	25.115	25.065	24.934	24.02	24.304	23.957
	8	0	24.099	24.044	23.954	23.115	23.276	22.878
	8	4	24.105	24.084	23.928	23.109	23.345	22.9

	8	7	24.073	24.153	23.922	23.083	23.336	22.863
	15	0	24.097	24.088	23.942	23.08	23.223	22.915

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			19975	20175	20375	19975	20175	20375
			1712.5MHz	1732.5MHz	1752.5MHz	1712.5MHz	1732.5MHz	1752.5MHz
Band 4 / 5MHz	1	0	25.101	24.986	24.9	24.209	24.228	23.863
	1	13	25.143	25.152	24.96	24.222	24.421	23.926
	1	24	25.05	25.161	24.919	24.138	24.409	23.882
	12	0	24.102	24.039	23.929	23.017	23.125	22.937
	12	6	24.137	24.104	23.936	23.041	23.149	22.951
	12	13	24.083	24.195	23.952	22.999	23.189	22.921
	25	0	24.086	24.127	23.915	23.076	23.117	22.918

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			20000	20175	20350	20000	20175	20350
			1715MHz	1732.5MHz	1750MHz	1715MHz	1732.5MHz	1750MHz
Band 4 / 10MHz	1	0	25.189	25.05	24.909	24.147	24.387	23.966
	1	25	25.099	24.957	24.865	24.019	24.36	23.883
	1	49	25.043	25.06	24.928	23.991	24.347	23.955
	25	0	24.105	23.992	23.914	23.156	23.135	23.008
	25	13	24.083	24.114	23.947	23.15	23.173	22.992
	25	25	24.01	24.149	23.93	23.098	23.245	22.991
	50	0	24.07	23.963	23.944	23.109	23.094	22.933

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			20025	20175	20325	20025	20175	20325
			1717.5MHz	1732.5MHz	1747.5MHz	1717.5MHz	1732.5MHz	1747.5MHz
Band 4 / 15MHz	1	0	25.328	25.419	25.292	24.573	24.408	24.228
	1	38	25.116	25.202	25.024	24.395	24.159	23.948
	1	74	25.258	25.249	25.12	24.426	24.283	24.059
	36	0	24.229	24.103	24.054	23.242	23.232	23.038
	36	19	24.193	24.106	24.037	23.19	23.225	23.043
	36	39	24.222	24.165	24.059	23.236	23.23	23.023
	75	0	24.161	23.989	24.029	23.18	23.178	23.009

EIRP (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			20050	20175	20300	20050	20175	20300
			1720MHz	1732.5MHz	1745MHz	1720MHz	1732.5MHz	1745MHz
Band 4 / 20MHz	1	0	25.231	25.44	25.105	24.45	24.356	24.5
	1	49	25.019	25.102	24.951	24.426	24.078	24.496
	1	99	25.004	25.091	25.015	24.415	24.088	24.496
	50	0	24.251	24.227	24.154	23.193	23.321	23.147
	50	25	24.16	24.089	24.035	23.172	23.172	23.041
	50	50	24.195	24.226	24.041	23.218	23.205	23.025
	100	0	24.196	24.048	24.06	23.159	23.145	23.088

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

$$\text{EIRP} = \text{P}_{\text{Meas}} + \text{G}_T$$

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

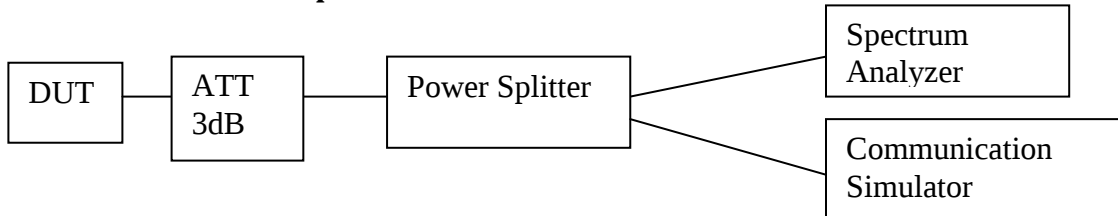
Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(Expressed in the same units as P_{Meas}, e.g., dBm)

P_{Meas} measured transmitter output power, in dBm

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

1.7. Peak-to-Average Power Ratio

1.7.1. Test Setup



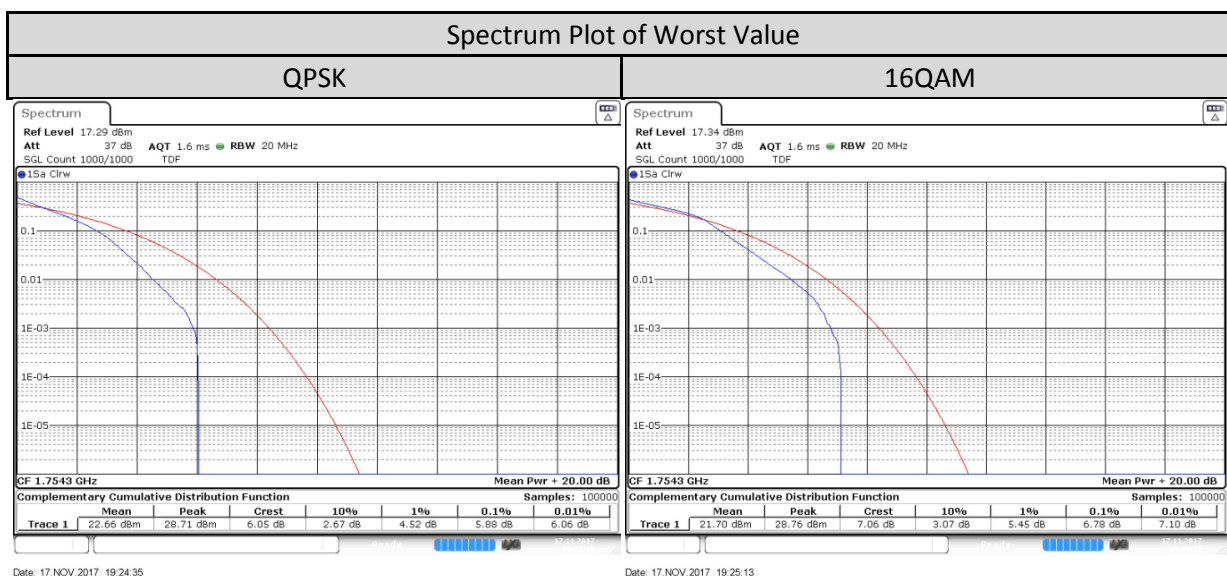
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.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

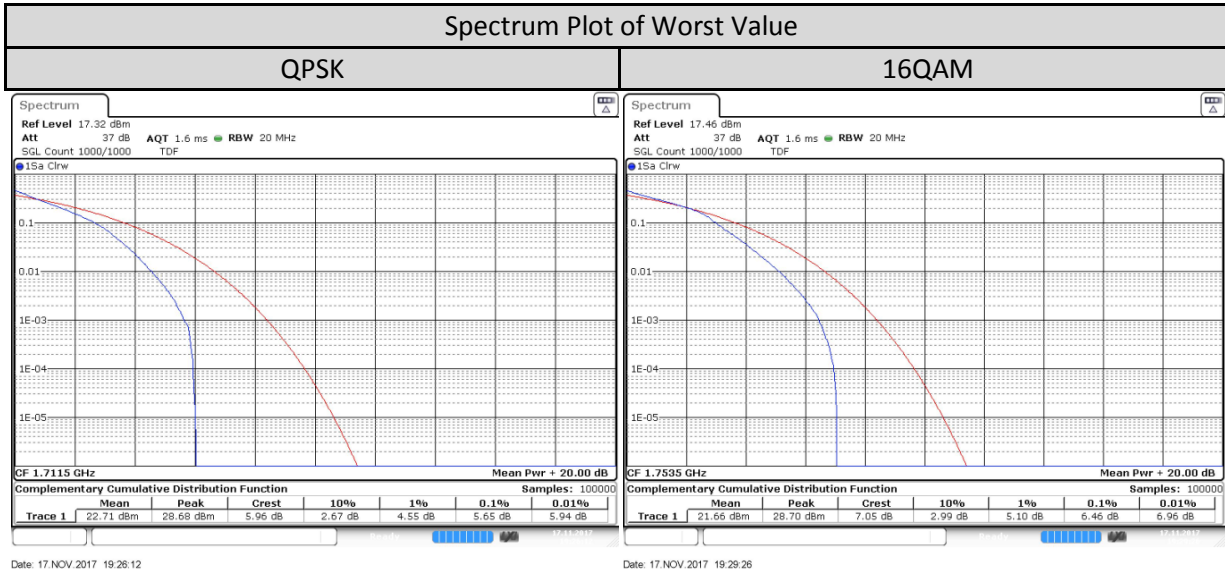
In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

1.7.3. Peak-to-Average Power Ratio - LTE Band 4 (1710-1755MHz)

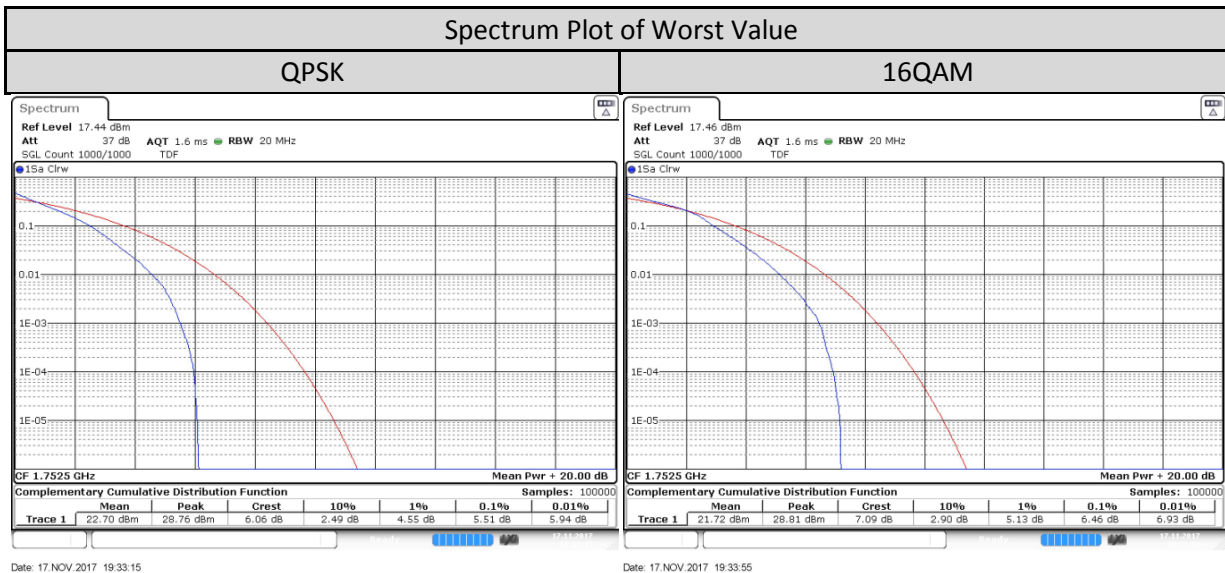
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/1.4MHz/6/0	Low CH 19957	1710.7 MHz	5.768	5.536
	Mid CH 20175	1732.5 MHz	4.406	5.362
	High CH 20393	1754.3 MHz	5.884	6.783



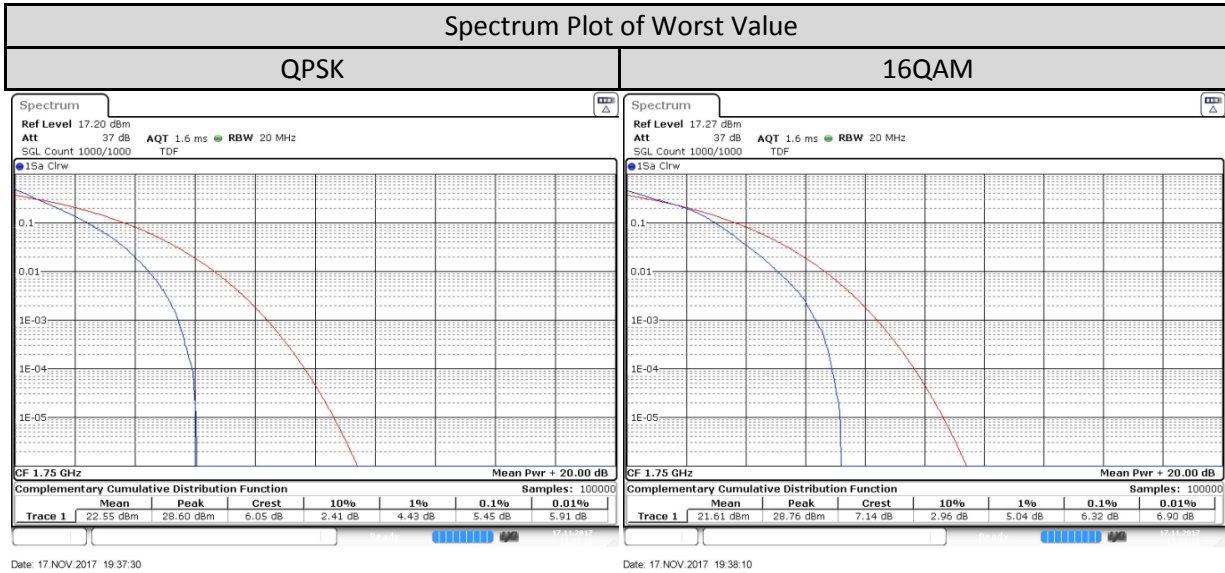
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	5.652	5.478
	Mid CH 20175	1732.5 MHz	4.348	5.362
	High CH 20385	1753.5 MHz	5.565	6.464



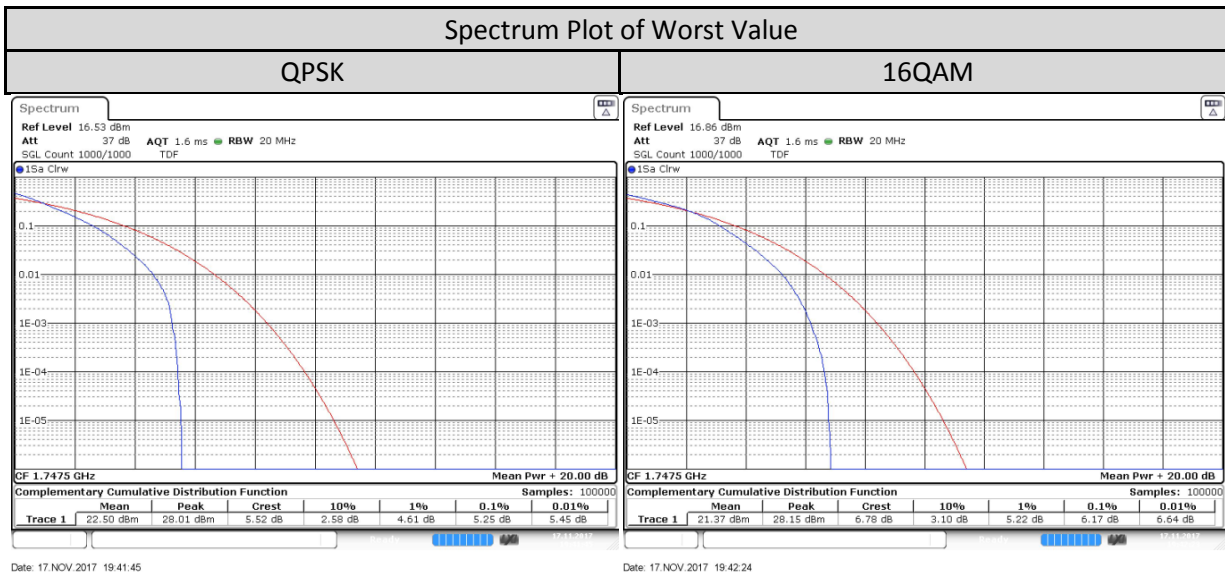
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	4.464	5.507
	Mid CH 20175	1732.5 MHz	4.29	5.304
	High CH 20375	1752.5 MHz	5.507	6.464



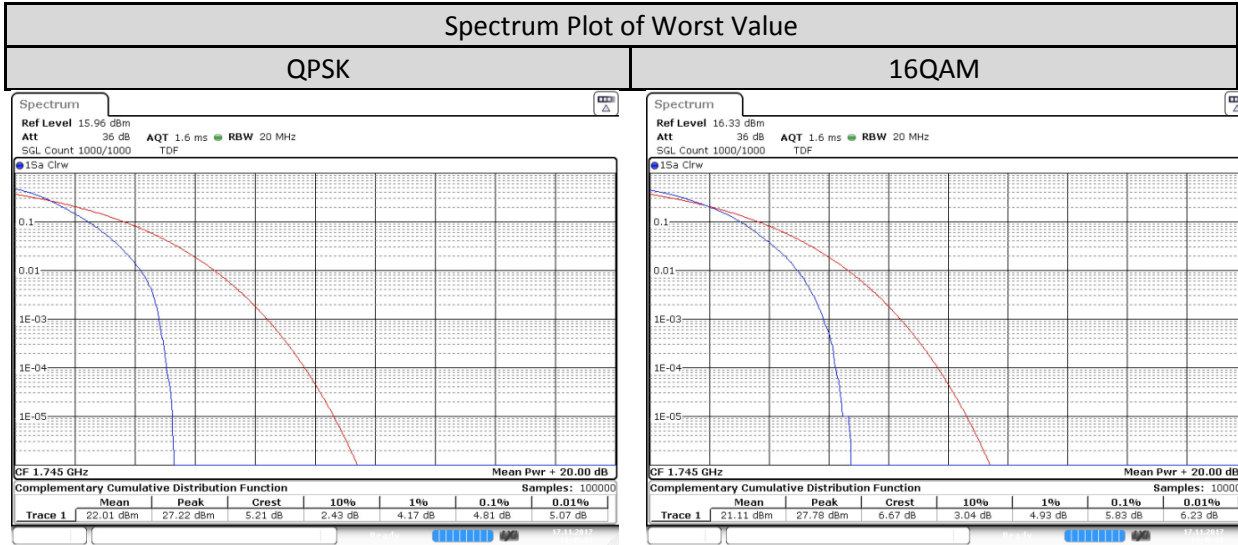
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	5.391	6.203
	Mid CH 20175	1732.5 MHz	4.464	5.449
	High CH 20350	1750 MHz	5.449	6.319



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	5.188	6.087
	Mid CH 20175	1732.5 MHz	4.464	5.42
	High CH 20325	1747.5 MHz	5.246	6.174

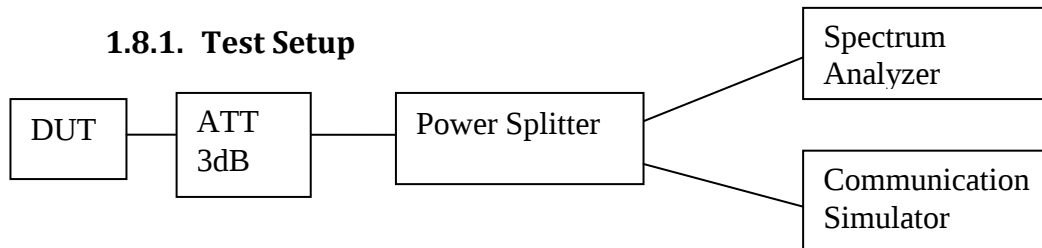


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/ 20MHz/100/0	Low CH 20050	1720 MHz	4.406	5.623
	Mid CH 20175	1732.5 MHz	4.058	5.275
	High CH 20300	1745 MHz	4.812	5.826



1.8. Occupied Bandwidth

1.8.1. Test Setup



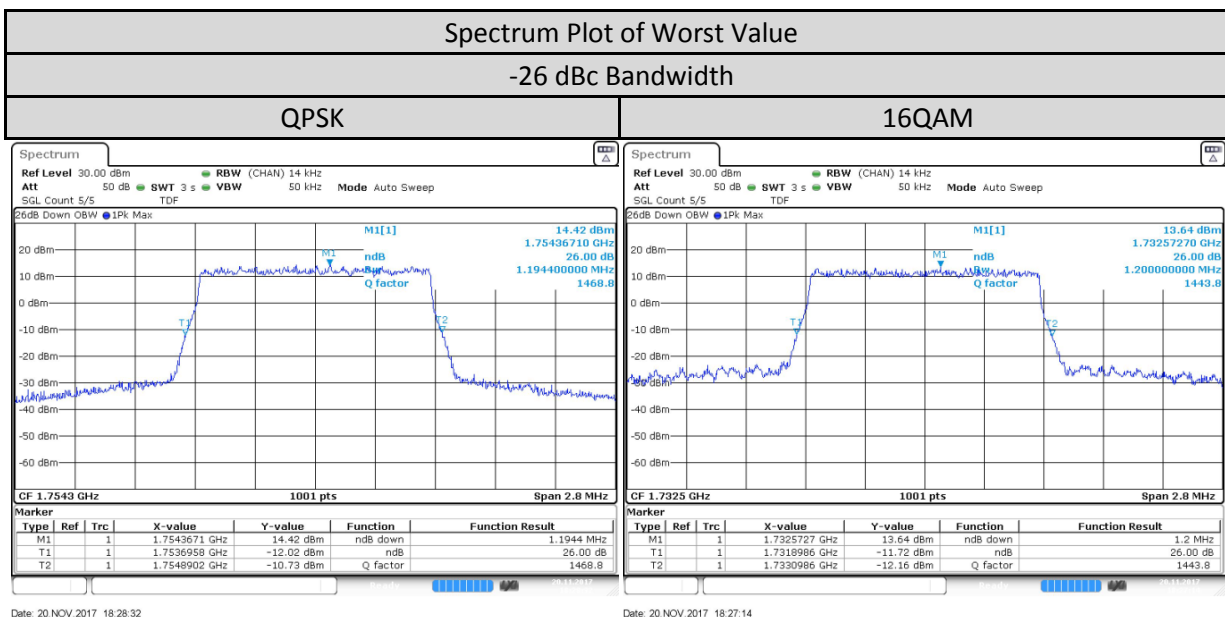
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum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

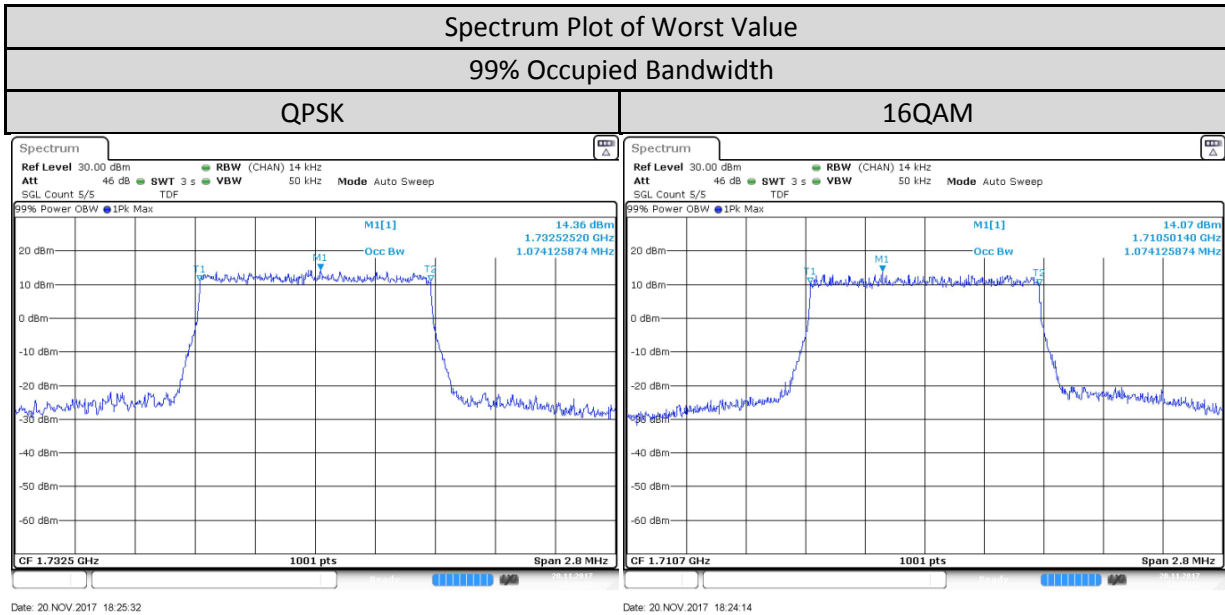
1.8.3. Occupied Bandwidth – LTE Band 4 (1710-1755MHz)

LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/1.4MHz/6/0	Low CH 19957	1710.7 MHz	1.183	1.192
	Mid CH 20175	1732.5 MHz	1.192	1.2
	High CH 20393	1754.3 MHz	1.194	1.175

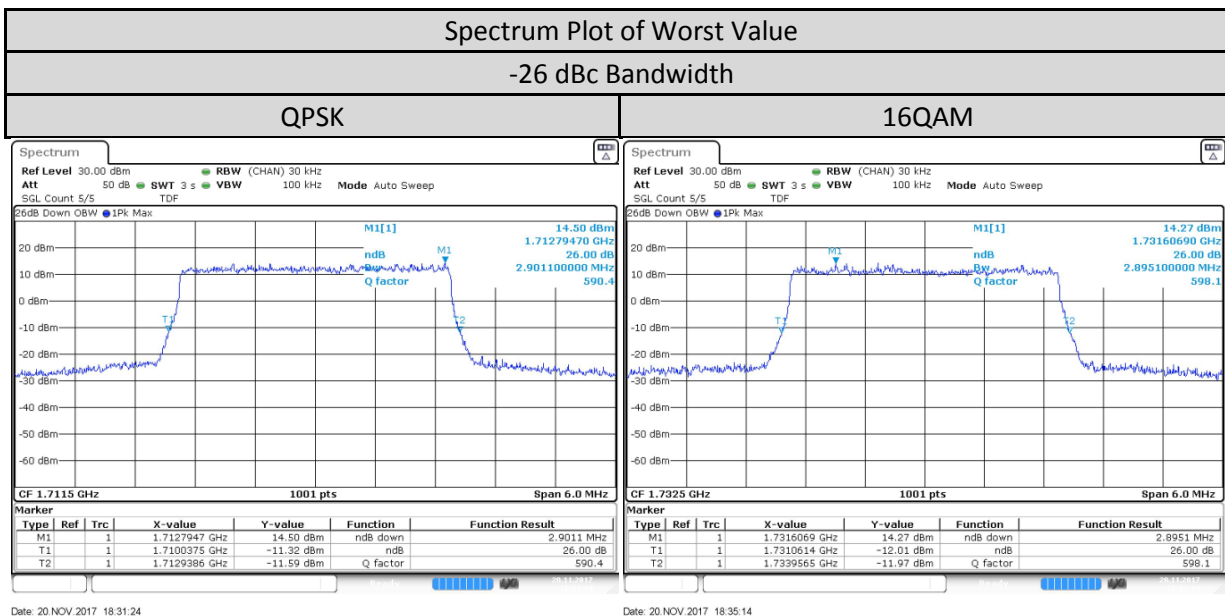


LTE Band/BW/RB	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)
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Size/RB Offset			QPSK Modulation	16QAM Modulation
Band 4/1.4MHz/6/0	Low CH 19957	1710.7 MHz	1.071	1.074
	Mid CH 20175	1732.5 MHz	1.074	1.074
	High CH 20393	1754.3 MHz	1.074	1.071

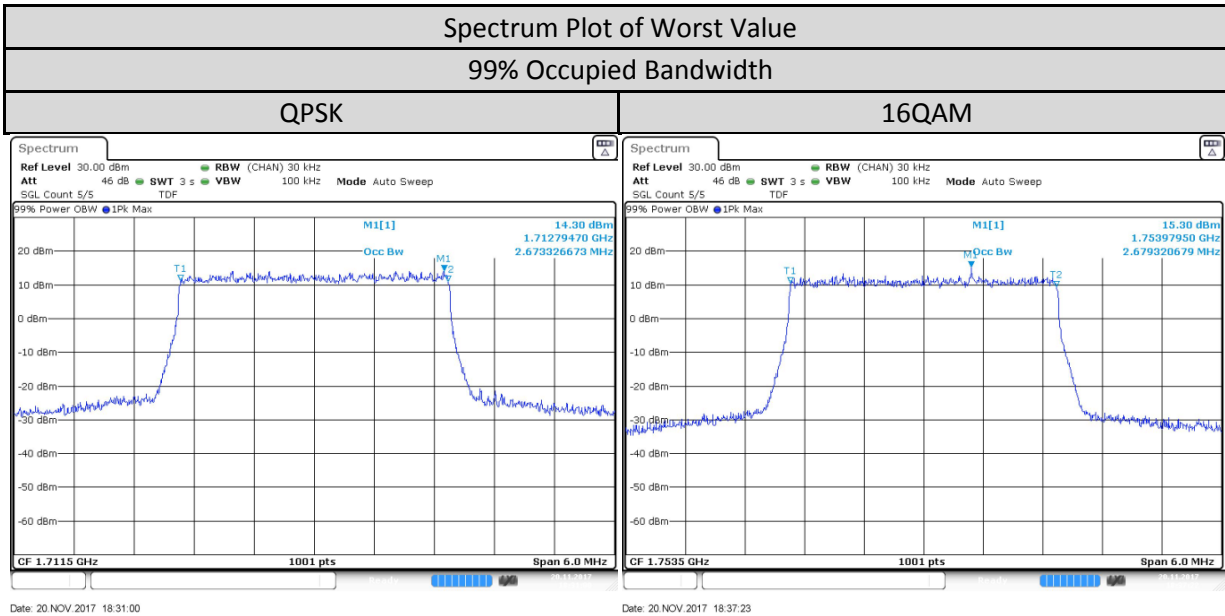


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	2.901	2.889
	Mid CH 20175	1732.5 MHz	2.889	2.895
	High CH 20385	1753.5 MHz	2.889	2.865

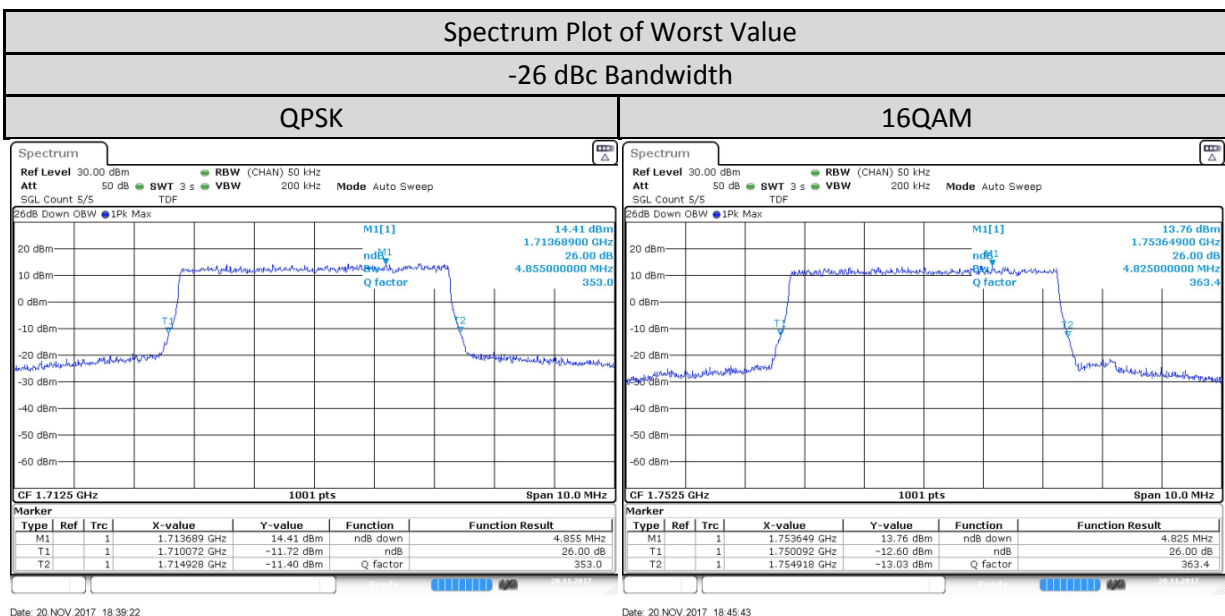


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation

Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	2.673	2.673
	Mid CH 20175	1732.5 MHz	2.673	2.673
	High CH 20385	1753.5 MHz	2.673	2.679

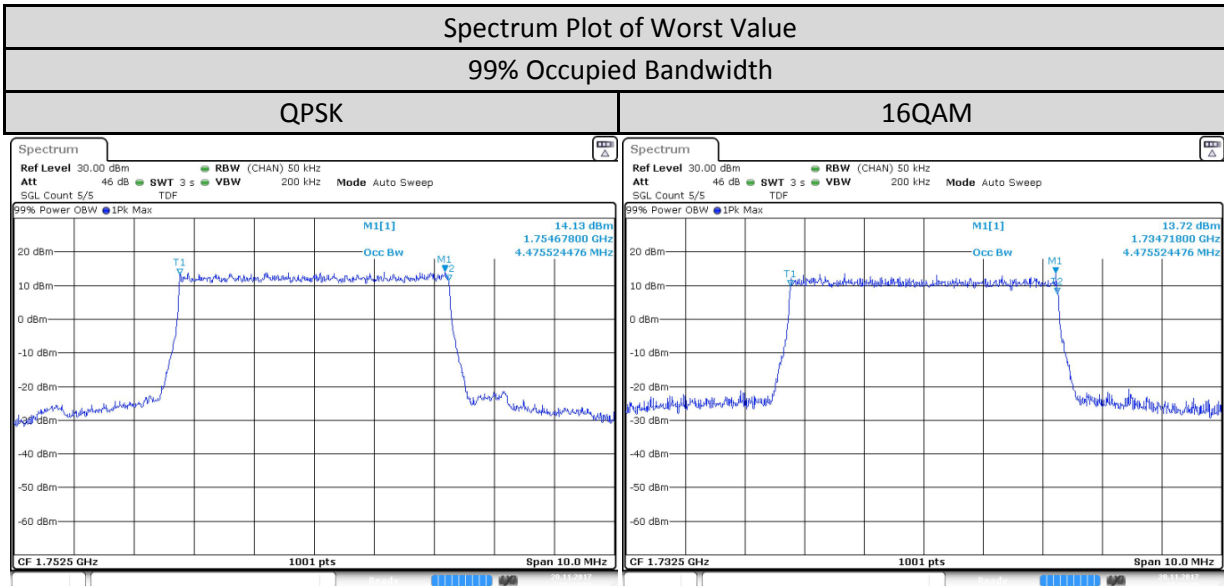


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	4.855	4.765
	Mid CH 20175	1732.5 MHz	4.825	4.795
	High CH 20375	1752.5 MHz	4.815	4.825



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	4.466	4.466

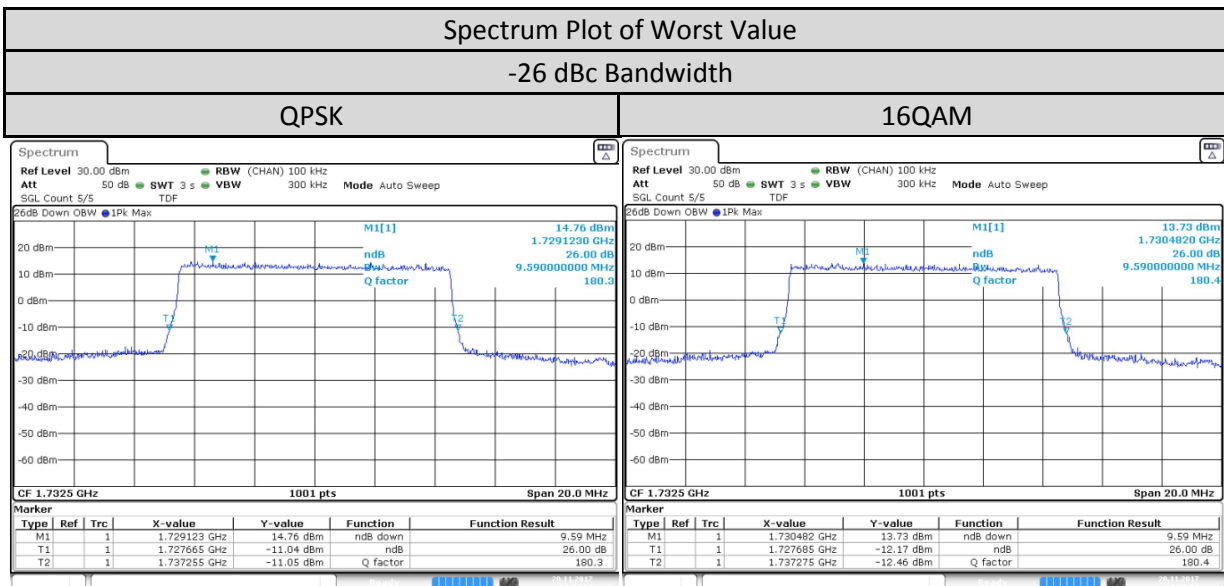
	Mid CH 20175	1732.5 MHz	4.466	4.476
	High CH 20375	1752.5 MHz	4.476	4.466



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LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	9.53	9.55
	Mid CH 20175	1732.5 MHz	9.59	9.59
	High CH 20350	1750 MHz	9.53	9.53

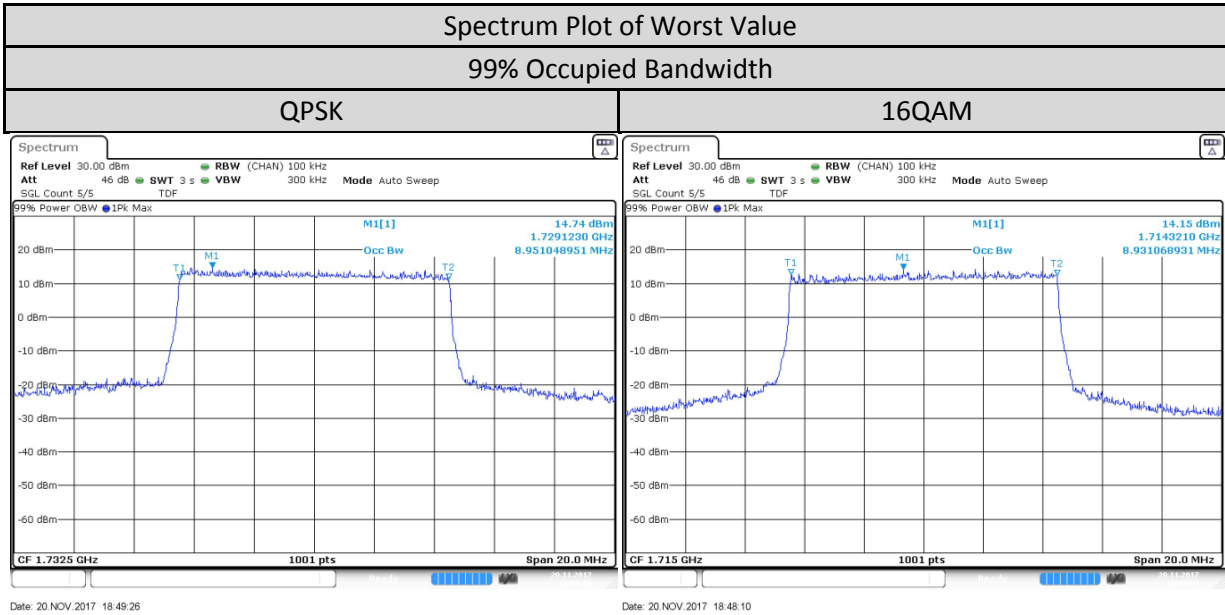


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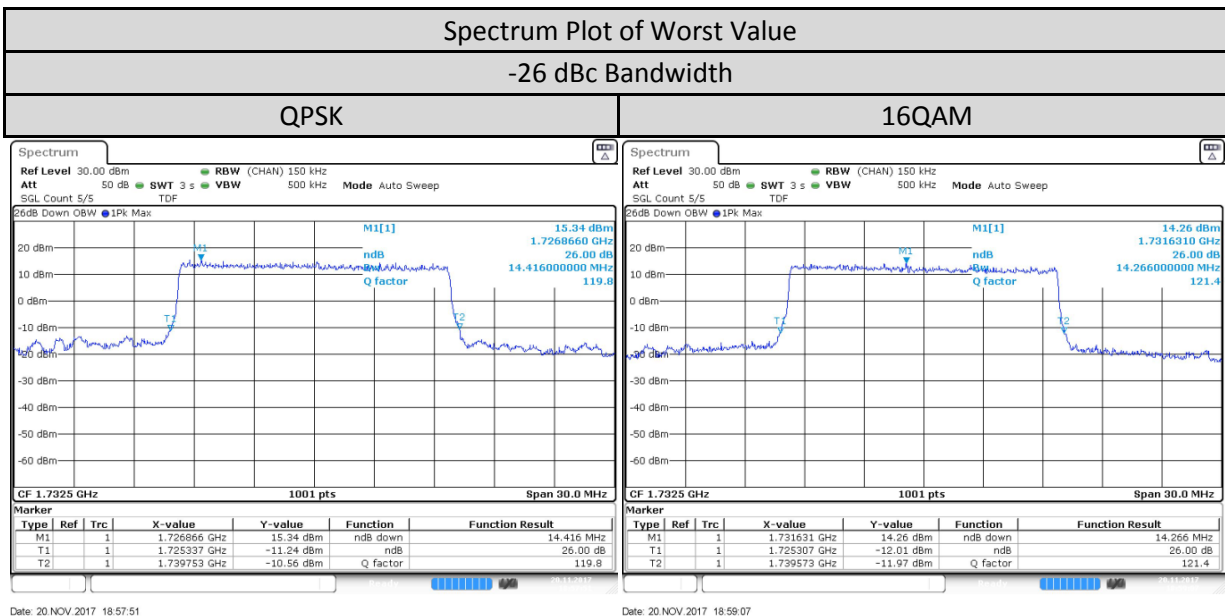
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LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	8.931	8.931
	Mid CH 20175	1732.5 MHz	8.951	8.931

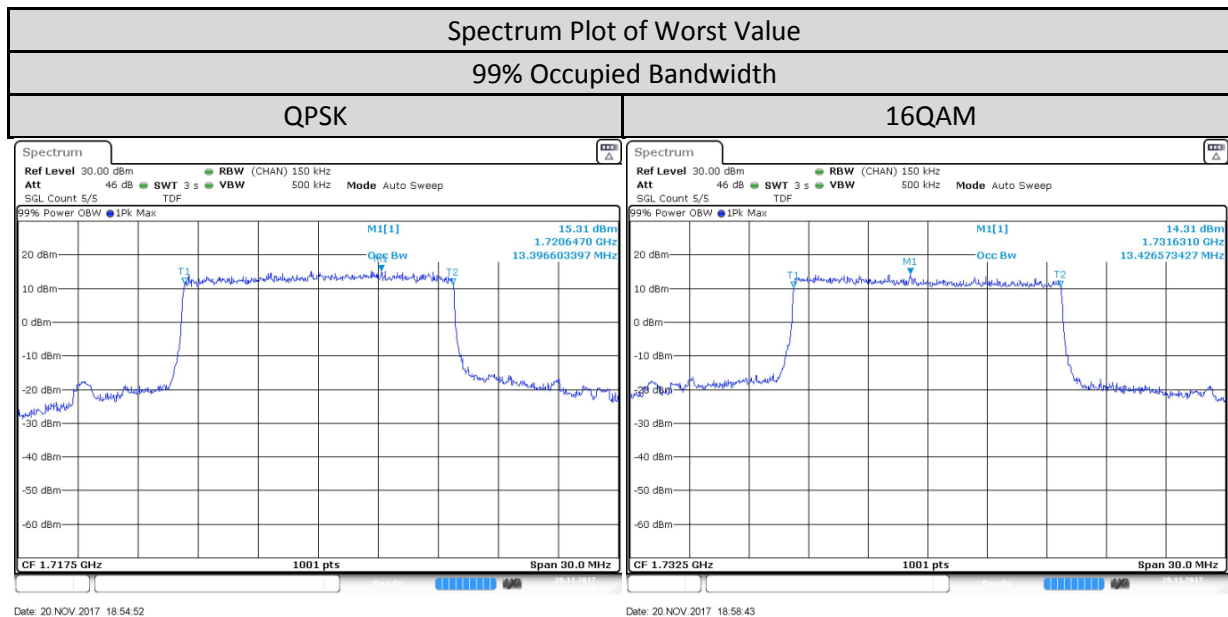
High CH 20350	1750 MHz	8.931	8.891
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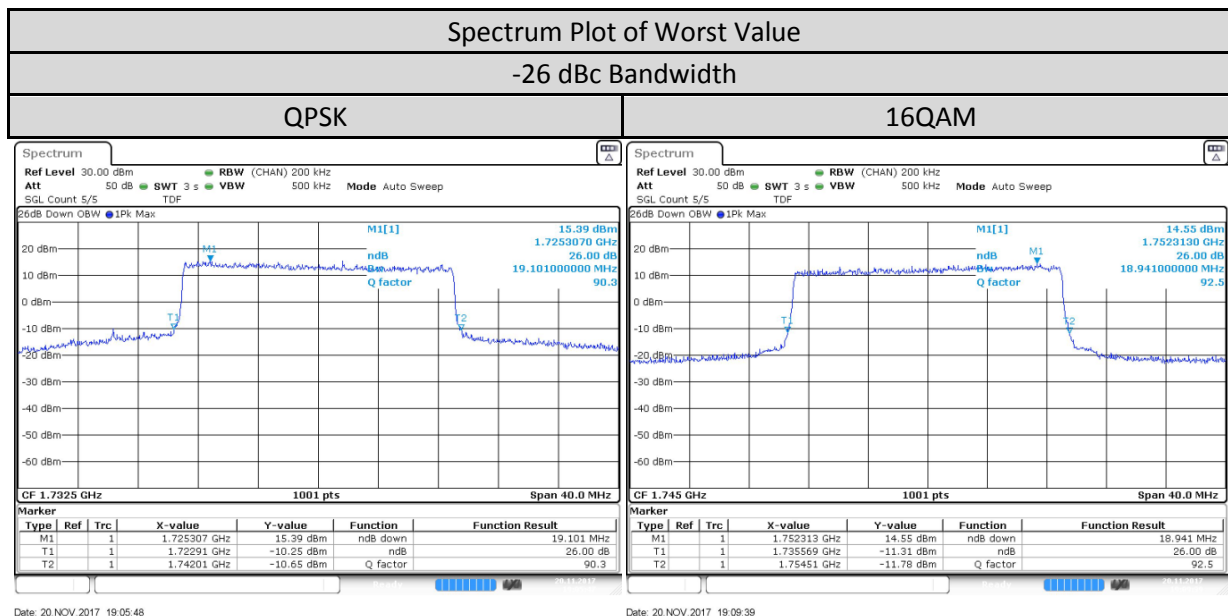
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	14.206	14.176
	Mid CH 20175	1732.5 MHz	14.416	14.266
	High CH 20325	1747.5 MHz	14.176	14.266



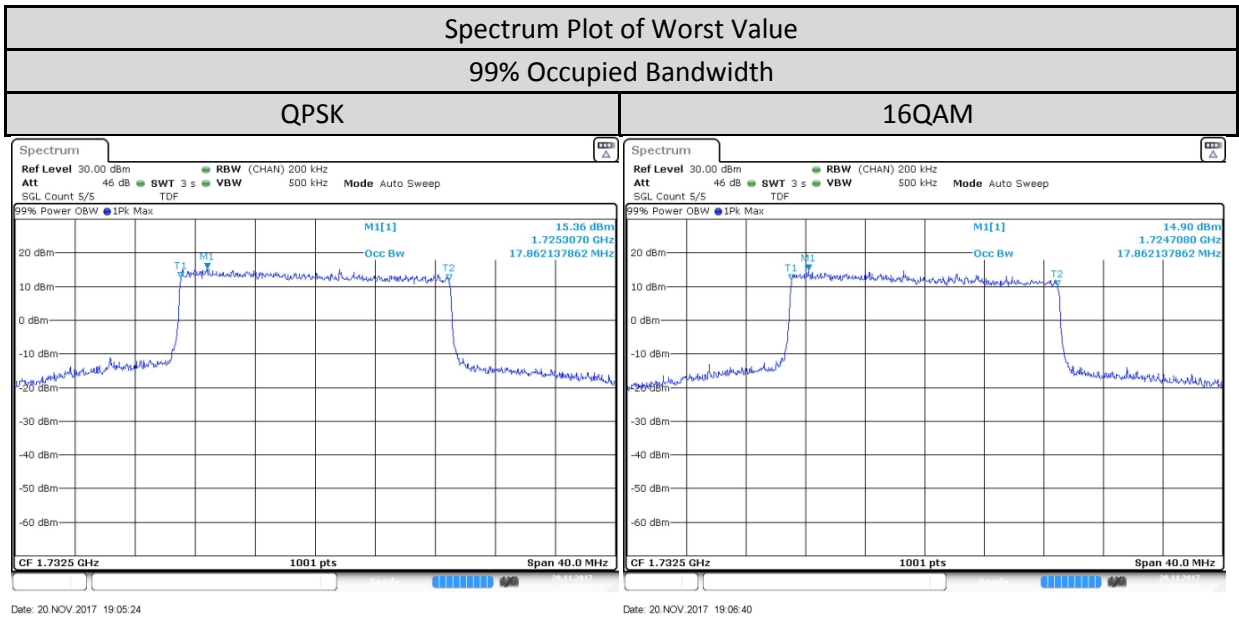
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	13.397	13.367
	Mid CH 20175	1732.5 MHz	13.397	13.427
	High CH 20325	1747.5 MHz	13.397	13.367



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/20MHz/100/0	Low CH 20050	1720 MHz	19.021	18.861
	Mid CH 20175	1732.5 MHz	19.101	18.861
	High CH 20300	1745 MHz	18.901	18.941

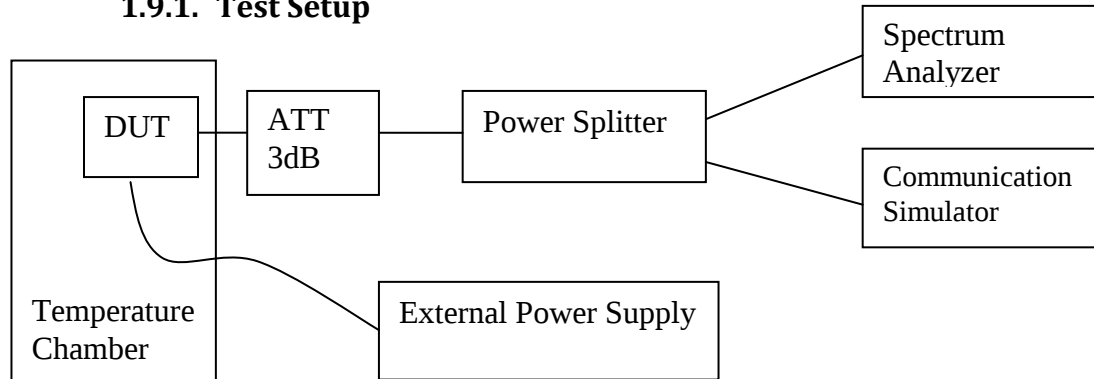


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/20MHz/100/0	Low CH 20050	1720 MHz	17.822	17.822
	Mid CH 20175	1732.5 MHz	17.862	17.862
	High CH 20300	1745 MHz	17.822	17.862



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

1.9.3. Frequency Stability – LTE Band 4 (1710-1755MHz)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 4	50	1710.700013	0.007526	1754.299974	-0.014759
	40	1710.699968	-0.018522	1754.300017	0.009965
	30	1710.700014	0.008128	1754.300013	0.007184
	20	1710.699989	-0.006439	1754.300013	0.007412
	10	1710.70002	0.01169	1754.299972	-0.015722
	0	1710.700019	0.011398	1754.29997	-0.017034
	-10	1710.700006	0.003495	1754.299986	-0.00773
	-20	1710.700021	0.012435	1754.300015	0.008627
	-30	1710.699969	-0.018255	1754.300025	0.013976
Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 1.4 MHz			

		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1710.699975	-0.014542	1754.300017	0.009736
	3.7	1710.699966	-0.019735	1754.300026	0.014743
	3.2	1710.70002	0.011548	1754.299989	-0.006181

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1711.500019	0.010882	1753.500018	0.010467
	40	1711.500019	0.011033	1753.500018	0.010124
	30	1711.500019	0.011016	1753.500019	0.010785
	20	1711.500019	0.011342	1753.50002	0.011193
	10	1711.500024	0.013733	1753.500018	0.010508
	0	1711.500018	0.010431	1753.500016	0.009186
	-10	1711.500021	0.012145	1753.500022	0.012408
	-20	1711.500021	0.012019	1753.500022	0.01258
	-30	1711.500021	0.012044	1753.500021	0.011829

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1711.500019	0.01115	1753.500008	0.004601
	3.7	1711.500019	0.011008	1753.500022	0.0124
	3.2	1711.500016	0.009119	1753.500017	0.009504

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1712.499984	-0.009381	1752.500015	0.008359
	40	1712.499981	-0.011043	1752.499988	-0.00684
	30	1712.499982	-0.010492	1752.500014	0.007722
	20	1712.499984	-0.009356	1752.500013	0.007379
	10	1712.499984	-0.009105	1752.500014	0.008146
	0	1712.499986	-0.008153	1752.500016	0.009273
	-10	1712.500001	0.005739	1752.500006	0.003469
	-20	1712.499983	-0.010149	1752.500014	0.007991
	-30	1712.499983	-0.010149	1752.500015	0.008579

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1712.499985	-0.008829	1752.500013	0.007257
	3.7	1712.499984	-0.009189	1752.500013	0.007355
	3.2	1712.499984	-0.009406	1752.500013	0.007208

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1715.000014	0.007957	1749.999981	-0.010905
	40	1714.999986	-0.007899	1749.999983	-0.009678
	30	1715.000013	0.007357	1749.999984	-0.009204
	20	1715.000013	0.007557	1749.999983	-0.009981
	10	1715.000015	0.008541	1749.999985	-0.008673
	0	1715.000013	0.007866	1749.999984	-0.009212
	-10	1715.000011	0.006481	1749.999983	-0.009842
	-20	1715.000013	0.007324	1749.999983	-0.009646
	-30	1715.000015	0.008666	1749.999983	-0.009654

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1714.999984	-0.009092	1749.999985	-0.008714
	3.7	1715.000012	0.006815	1749.999982	-0.010063
	3.2	1715.000013	0.007465	1749.999984	-0.008926

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1717.500017	0.009645	1747.500017	0.009971
	40	1717.500024	0.014026	1747.500018	0.01029
	30	1717.500018	0.010503	1747.500018	0.010404
	20	1717.500017	0.010028	1747.500017	0.009881
	10	1717.500018	0.010361	1747.500017	0.009995
	0	1717.500018	0.010336	1747.500018	0.010478
	-10	1717.500015	0.008454	1747.50002	0.011411
	-20	1717.500019	0.011336	1747.500021	0.012009
	-30	1717.500019	0.011161	1747.500019	0.011084

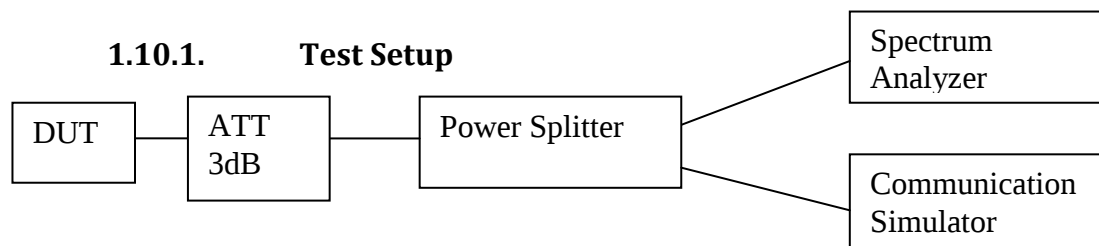
Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1717.500008	0.004406	1747.500016	0.009013
	3.7	1717.500017	0.009853	1747.500018	0.010527
	3.2	1717.500018	0.01022	1747.500011	0.006516

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1719.999983	-0.010014	1744.999988	-0.007009
	40	1719.999981	-0.01082	1744.999987	-0.007362
	30	1719.999984	-0.00954	1745.000013	0.007198
	20	1719.999984	-0.00944	1745.000013	0.007567
	10	1719.999984	-0.009515	1744.999987	-0.007353
	0	1719.999983	-0.01003	1744.999985	-0.008698
	-10	1719.999984	-0.009149	1745.000009	0.005115
	-20	1719.99998	-0.01176	1745.000015	0.008681
	-30	1719.999982	-0.010429	1745.000014	0.008091

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1719.999983	-0.01003	1745.000013	0.007542
	3.7	1719.999984	-0.009174	1745.000014	0.008083
	3.2	1719.999981	-0.011095	1745.000013	0.00764

1.10. Band Edge Conducted Spurious Emission

1.10.1. Test Setup

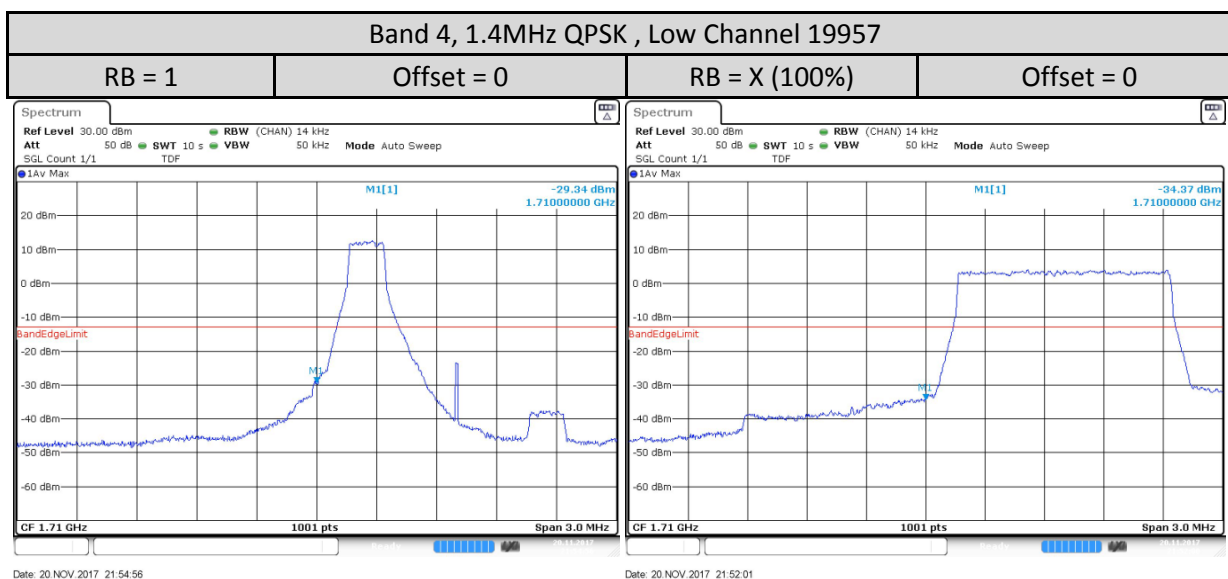


- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 5) The center frequency of spectrum is the band edge frequency, span is 3MHz, RBW is 1~3% of EBW and VBW is 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 1710-1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB. In the 1 megahertz bands immediately outside and adjacent to the licensee's 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 4 (1710-1755MHz)



Band 4, 1.4MHz QPSK , High Channel 20393

