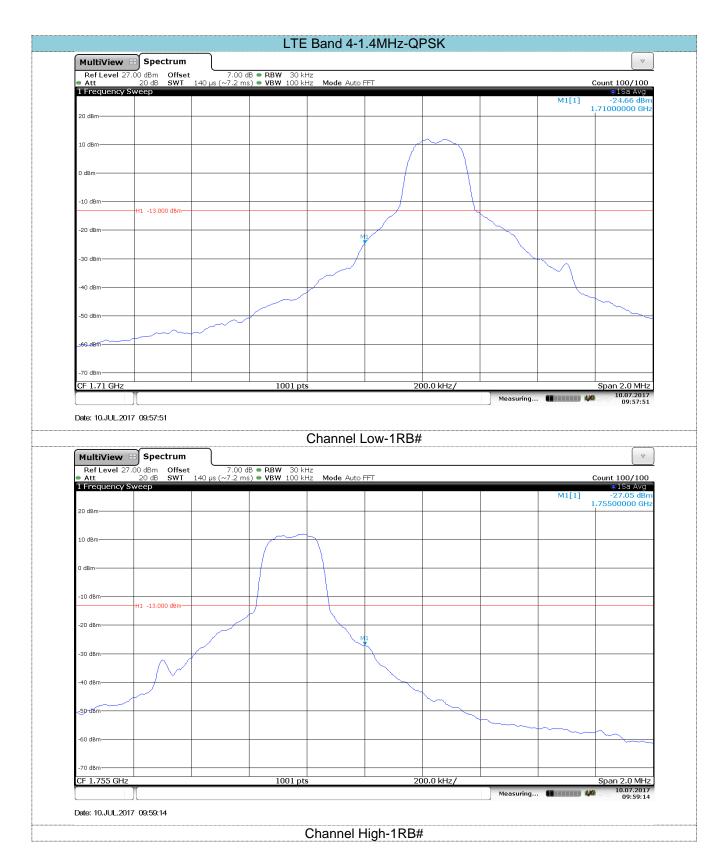
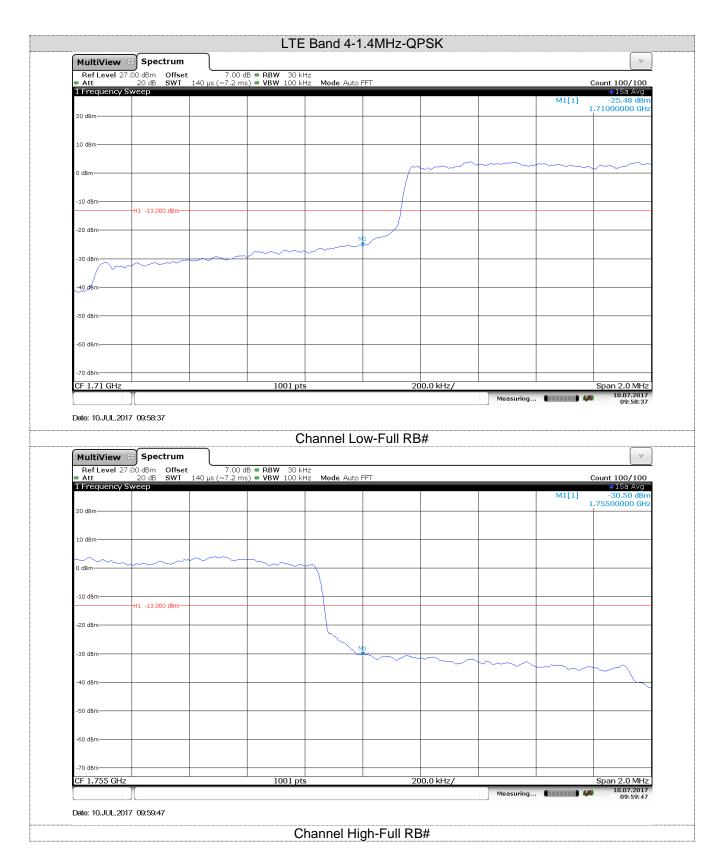
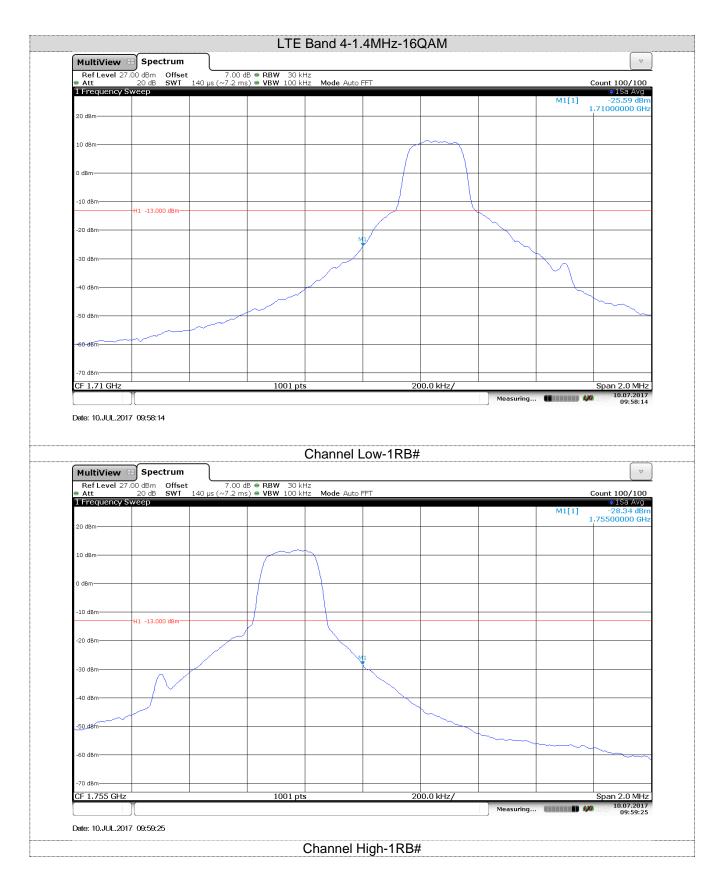
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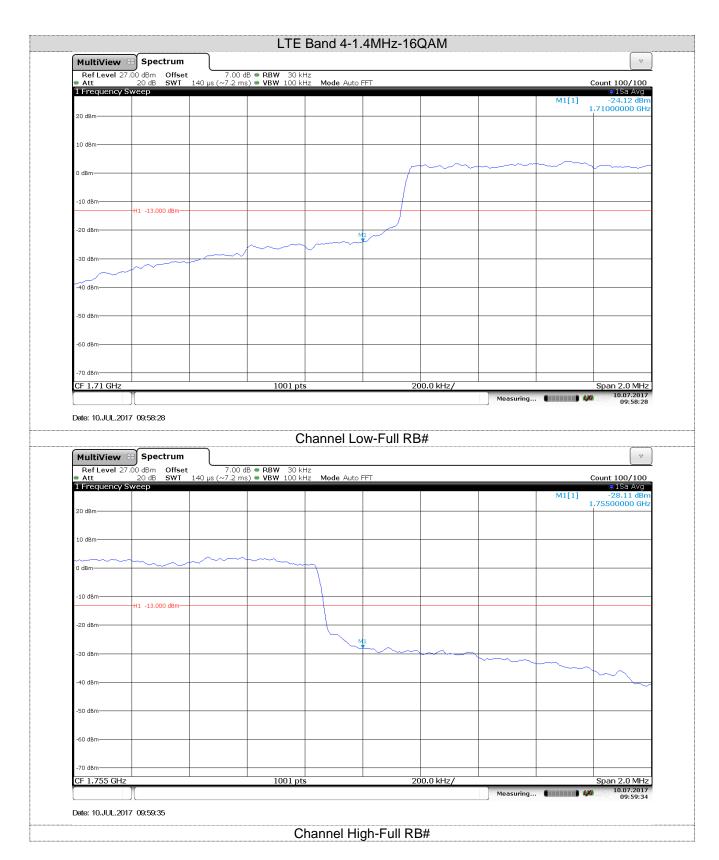


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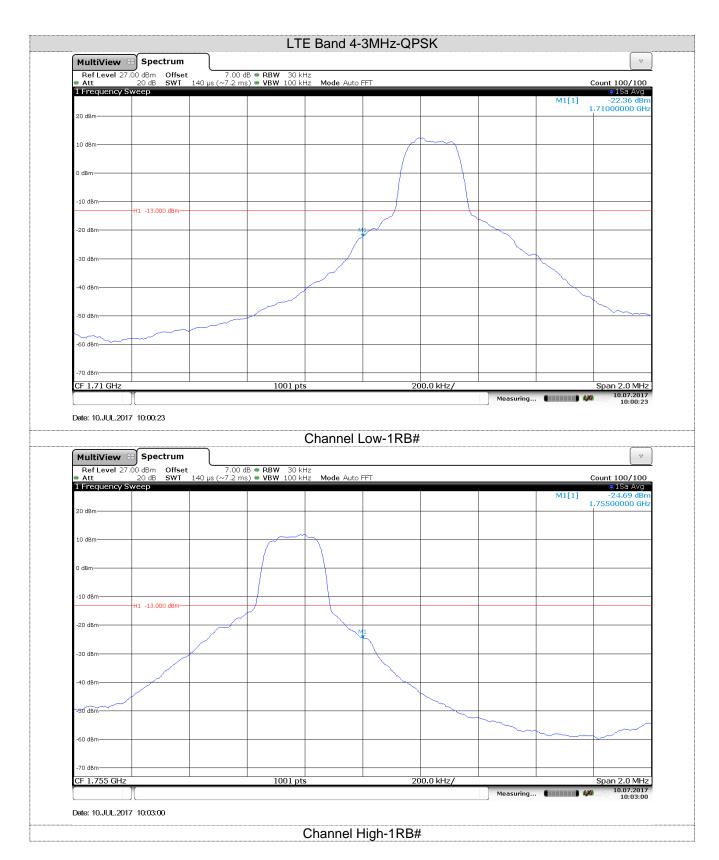




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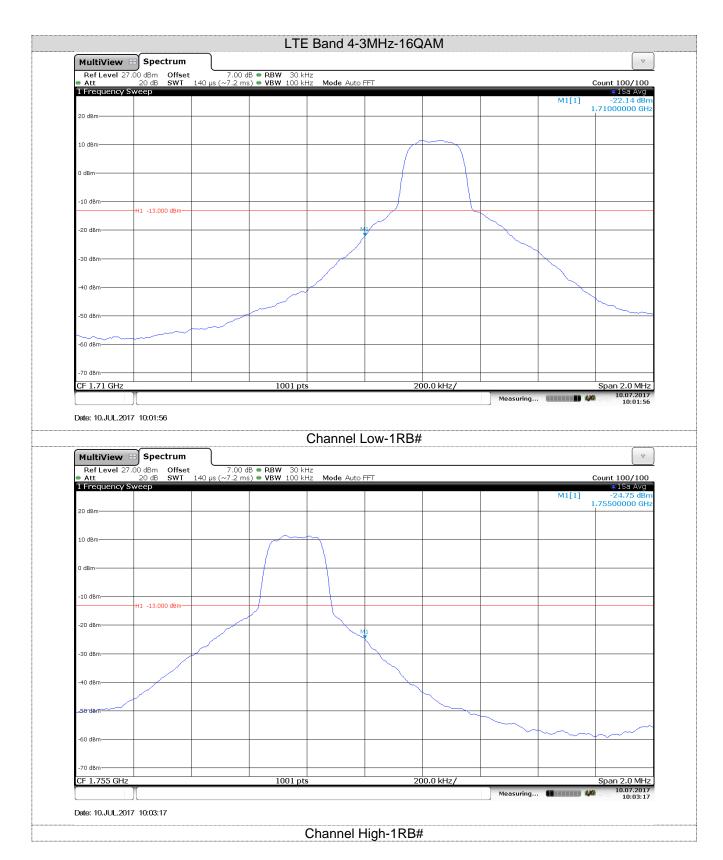
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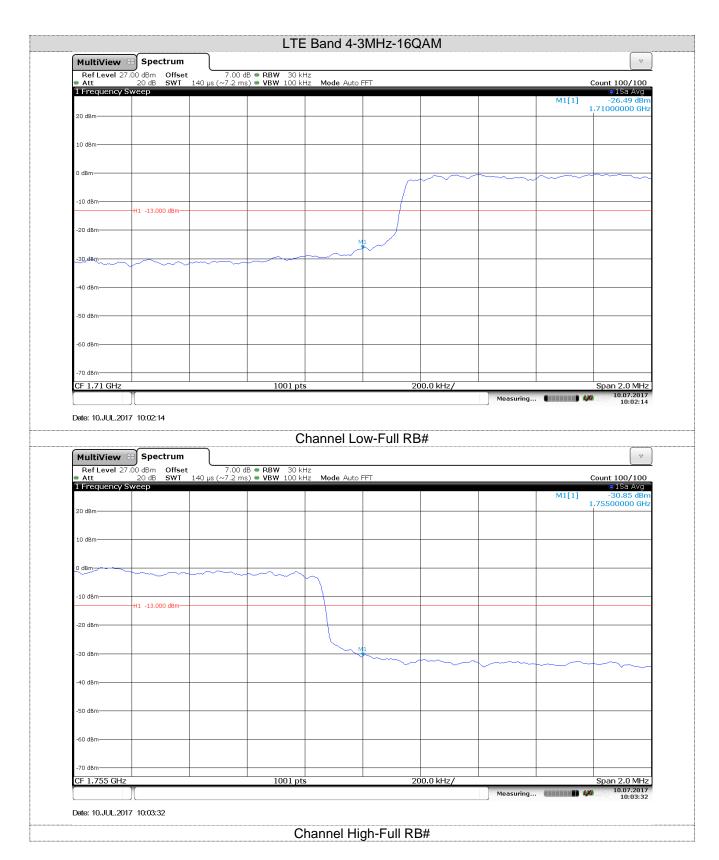
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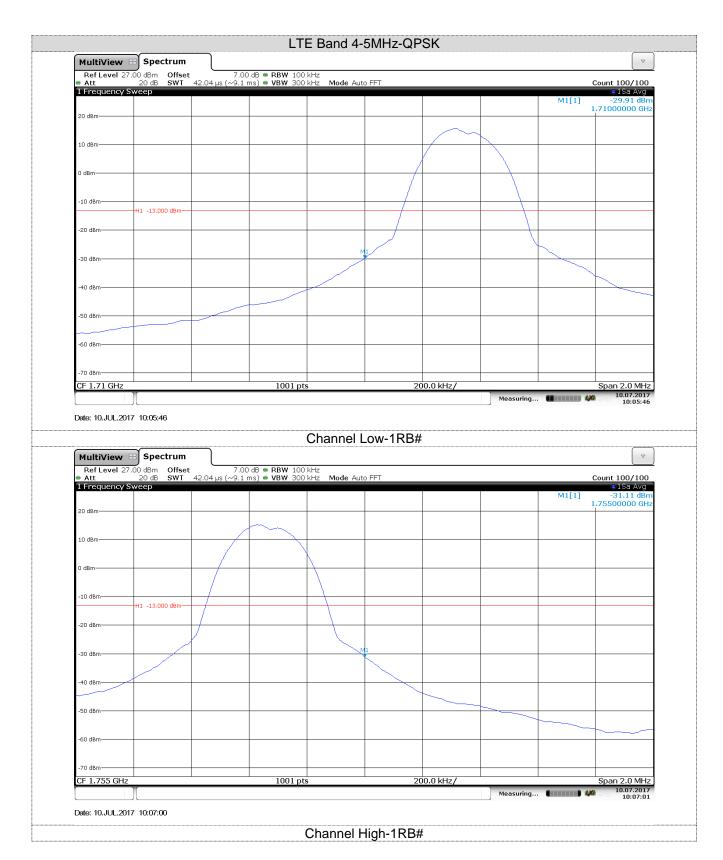
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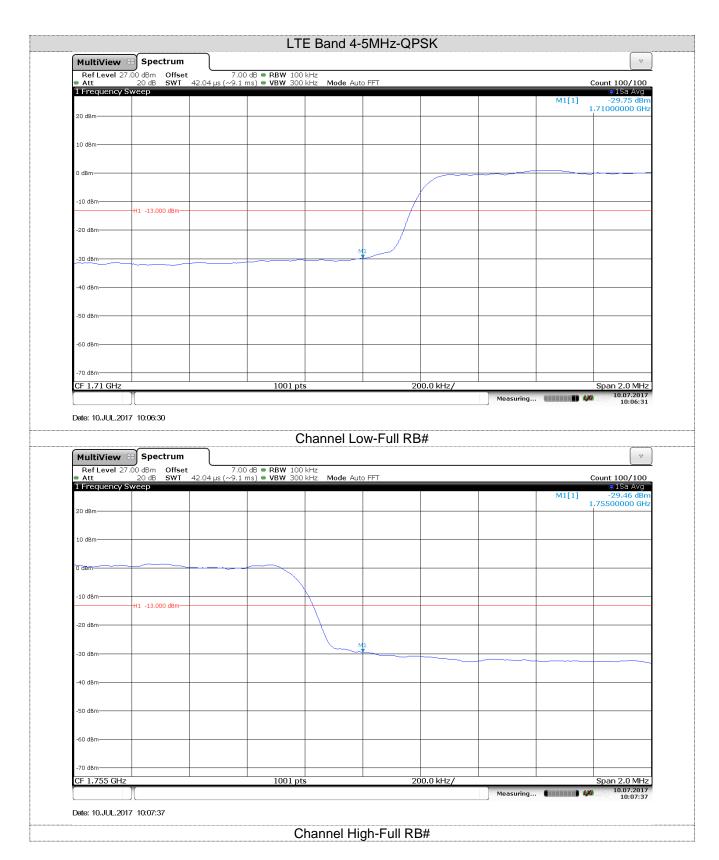
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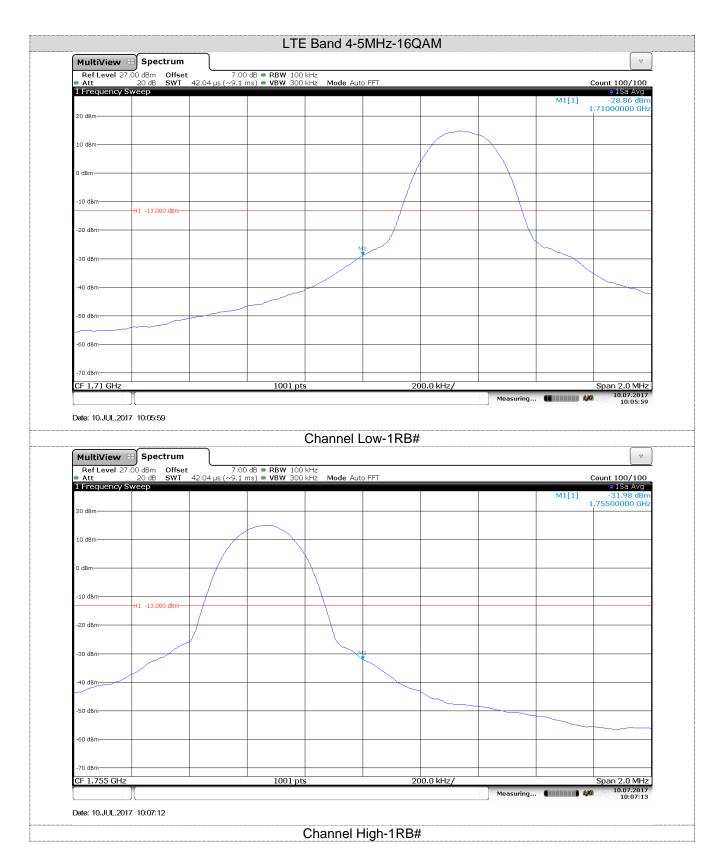
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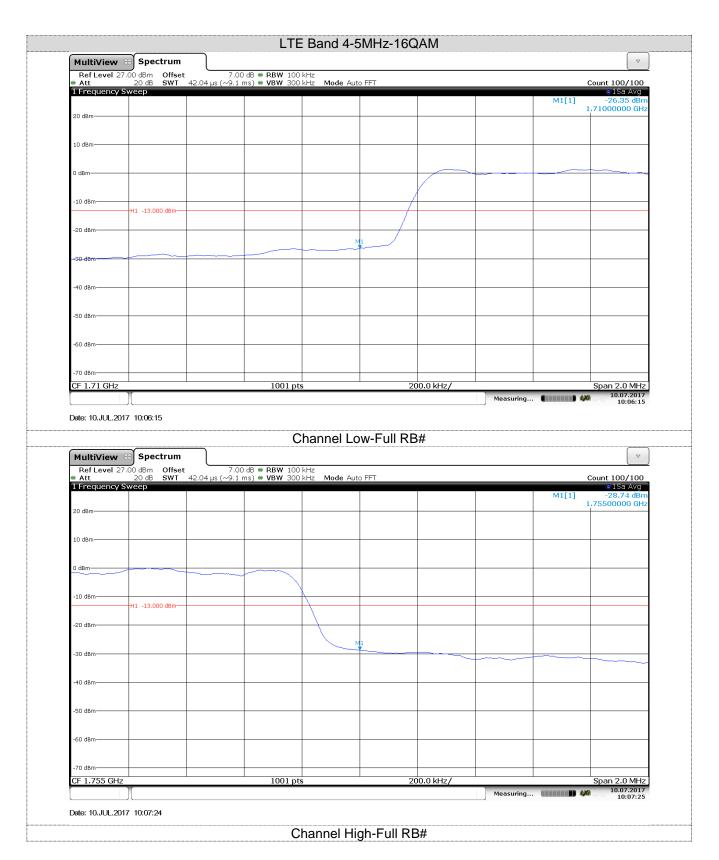
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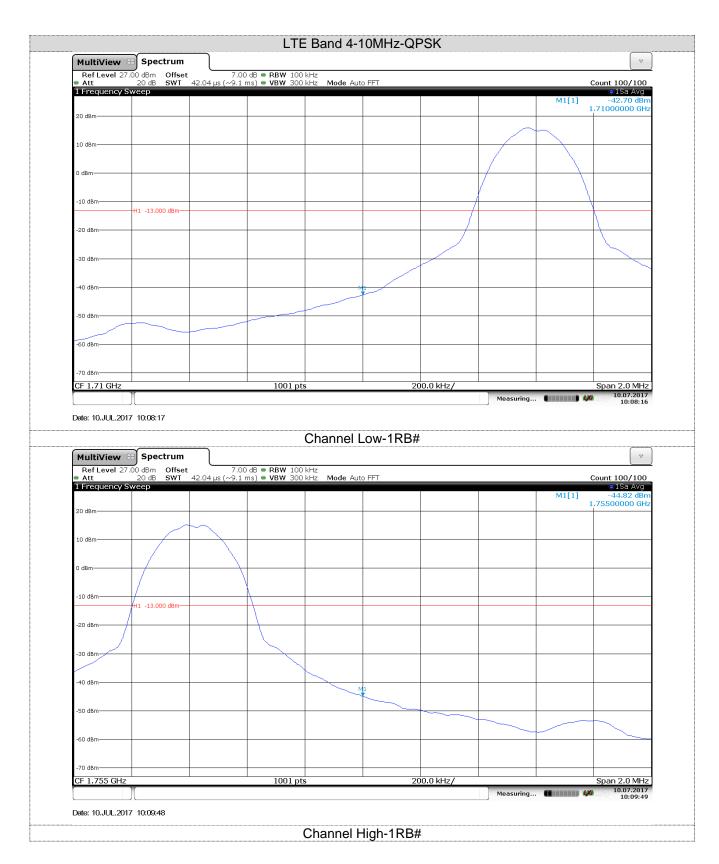
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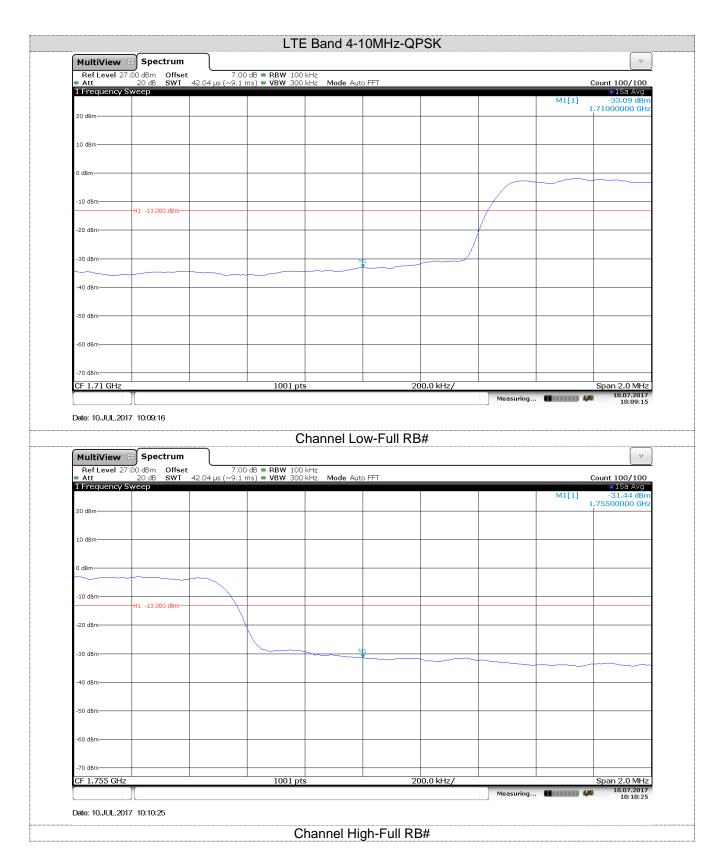
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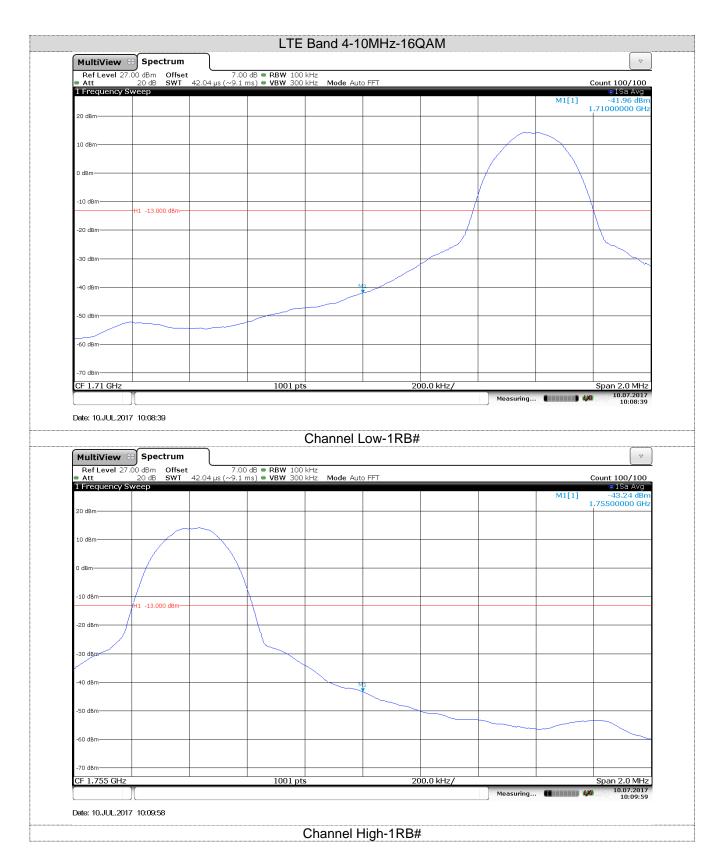
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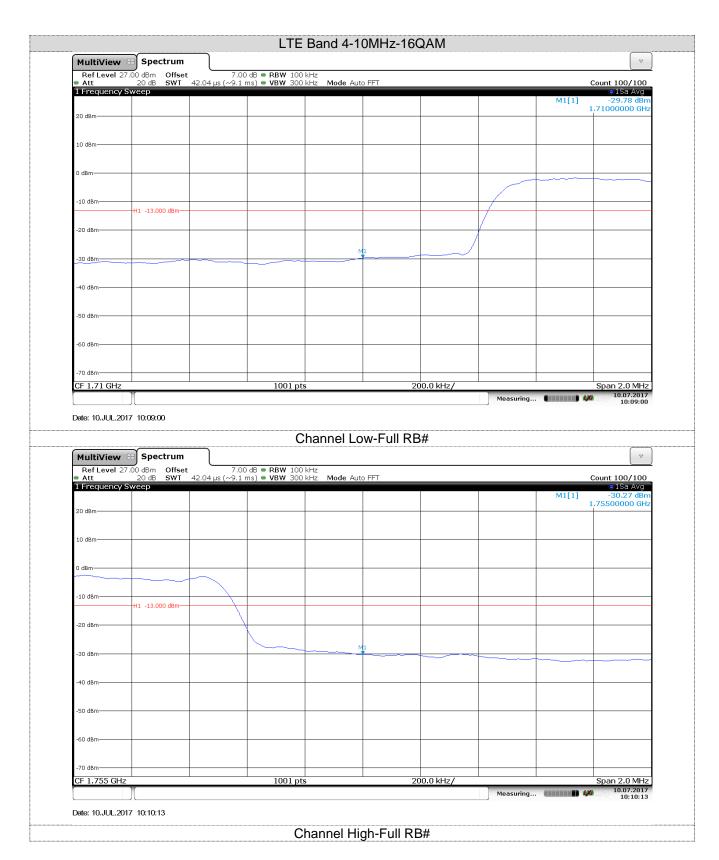
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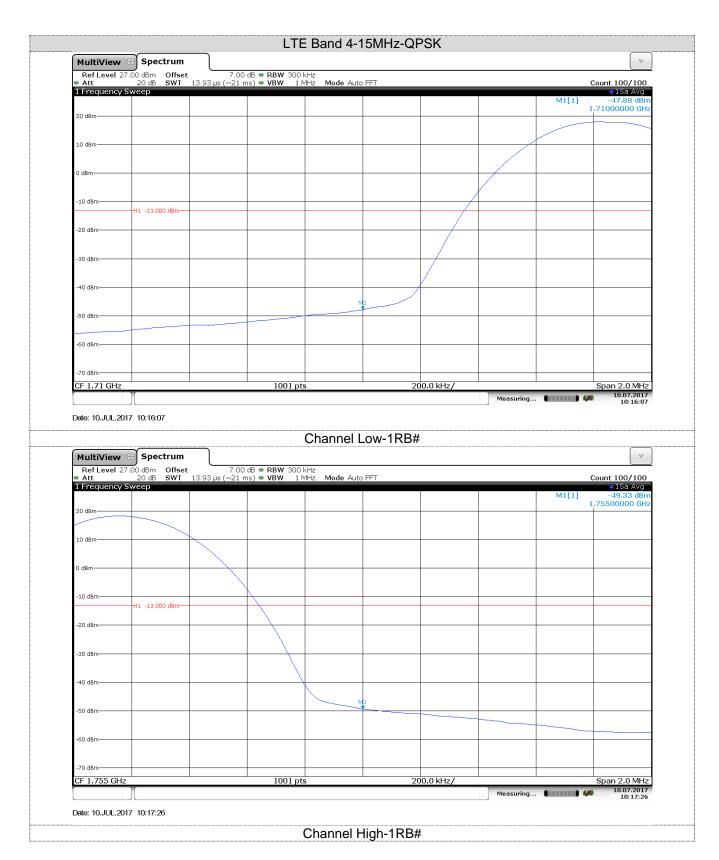
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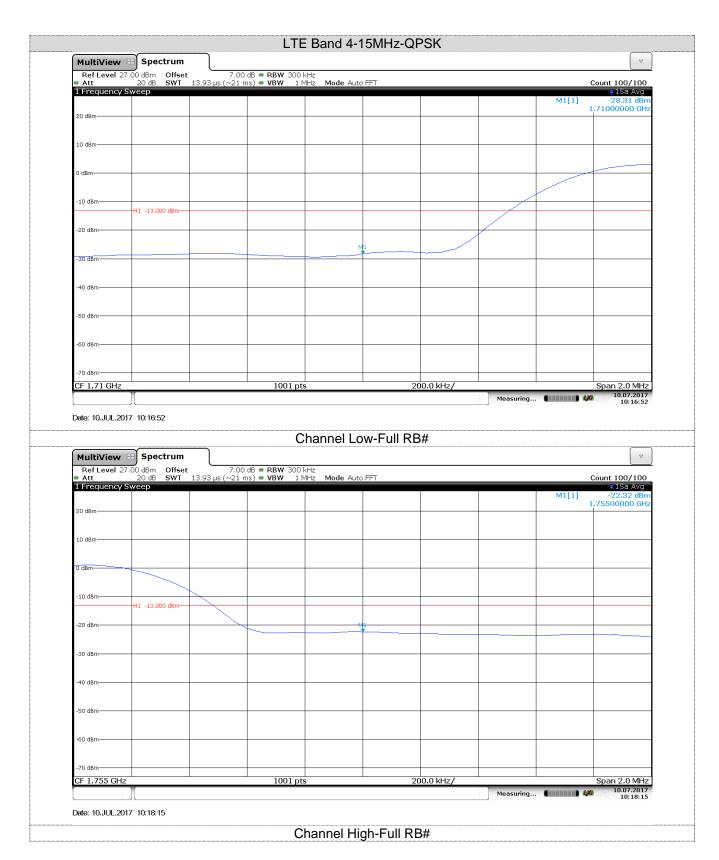
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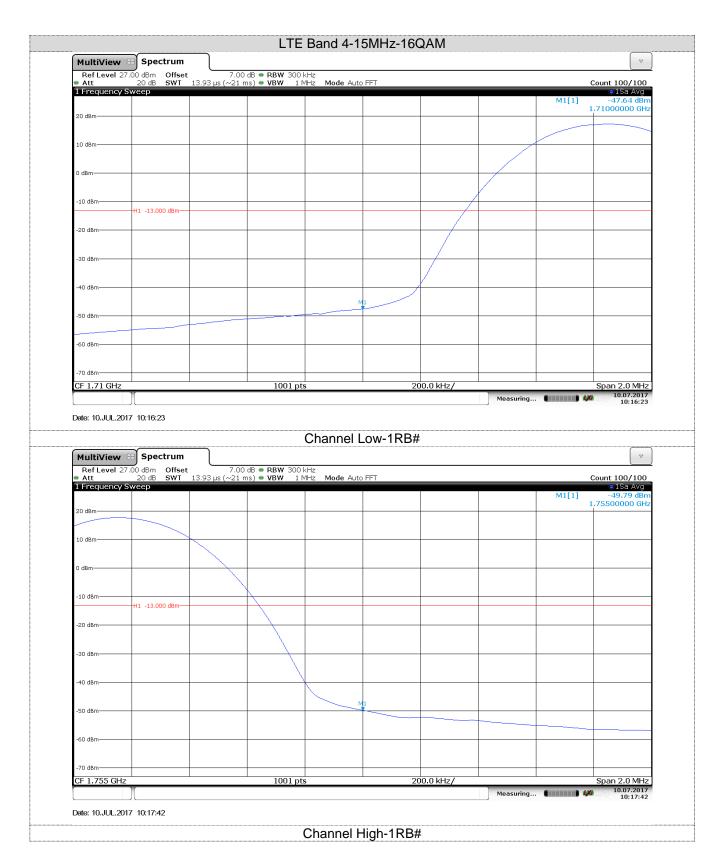
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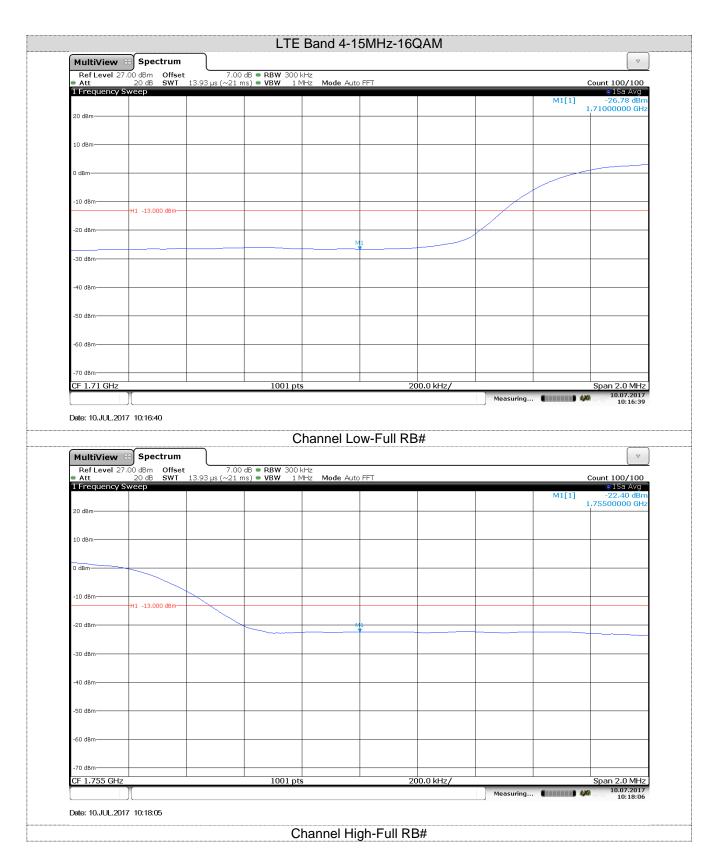
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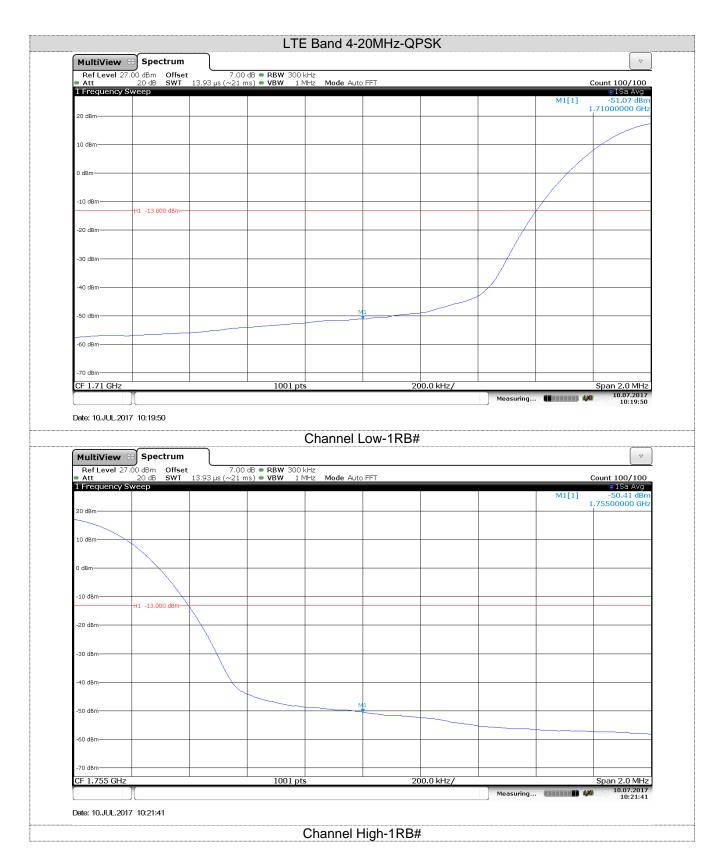
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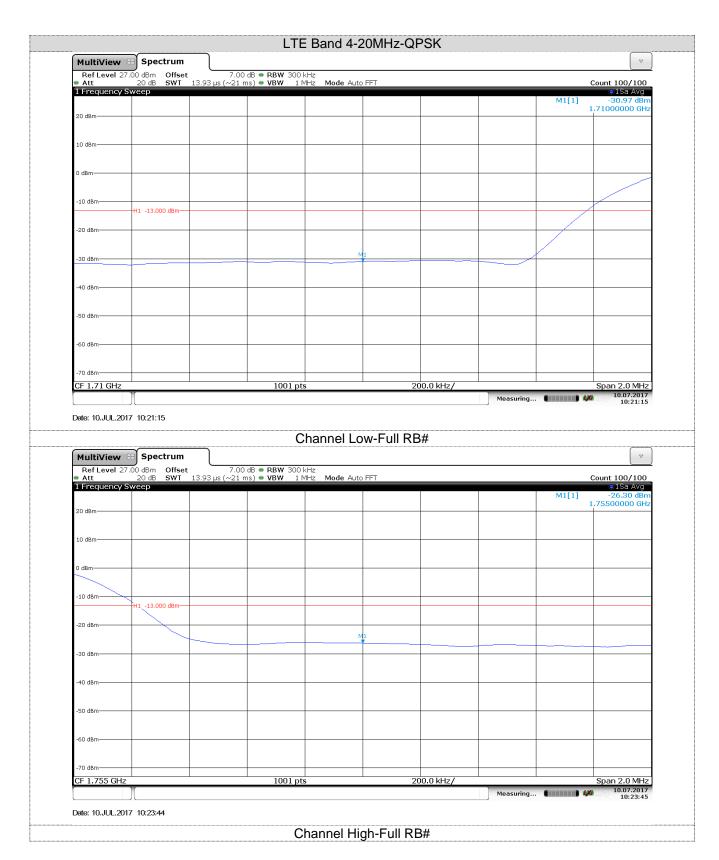
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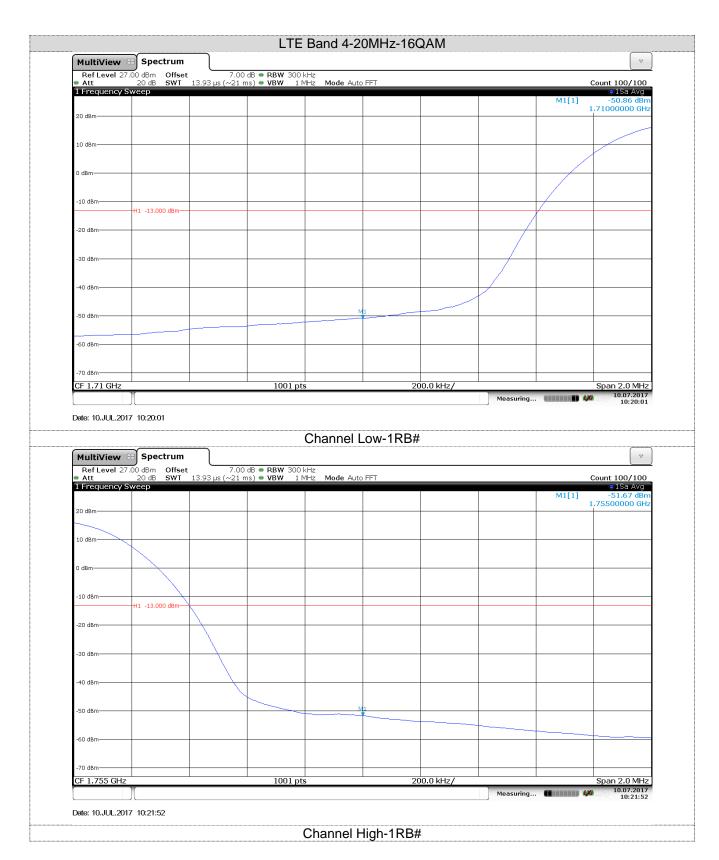
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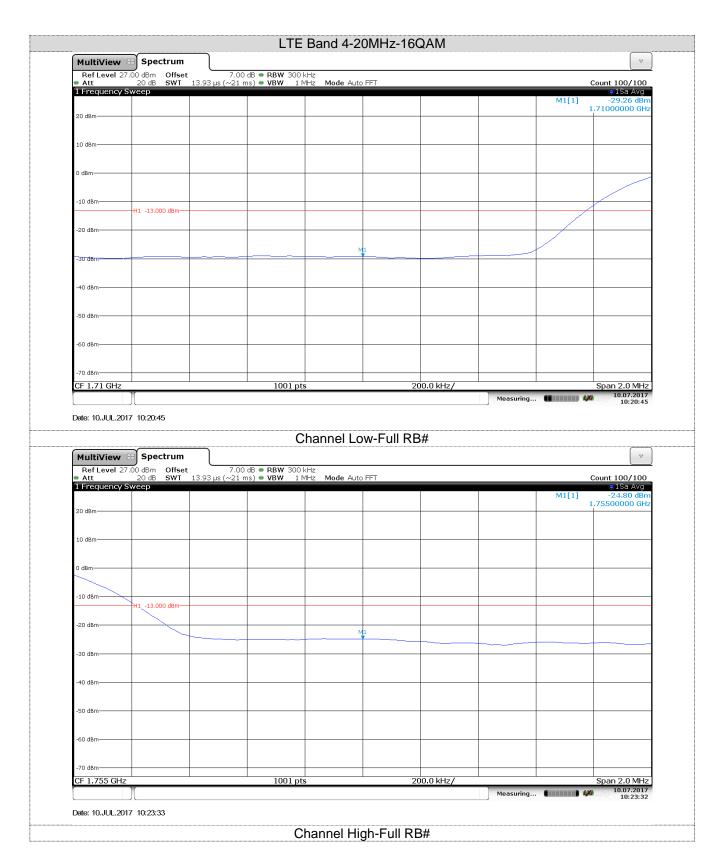
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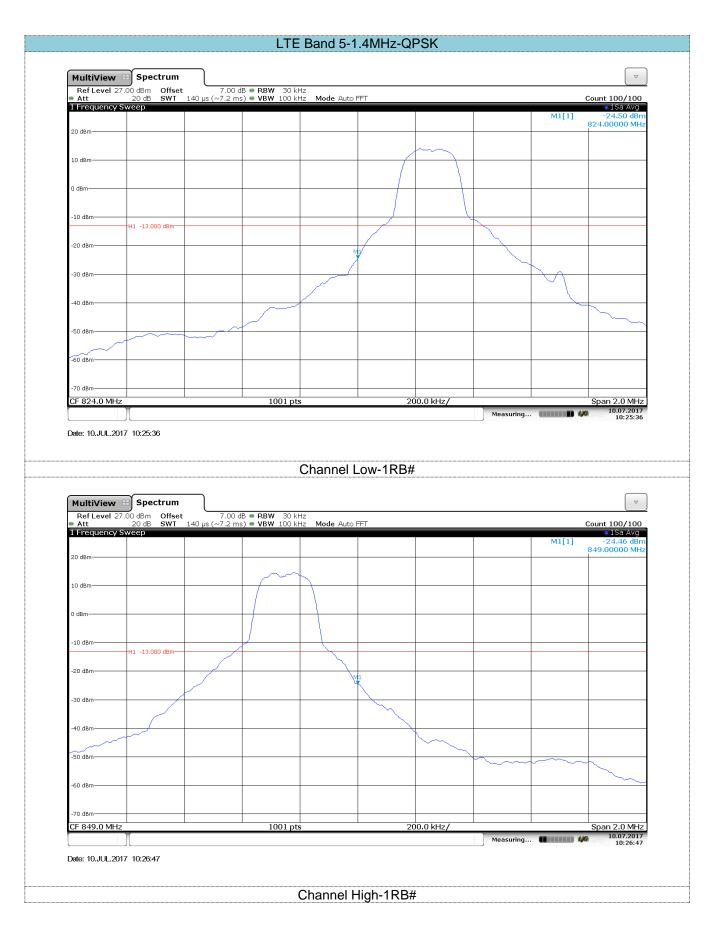


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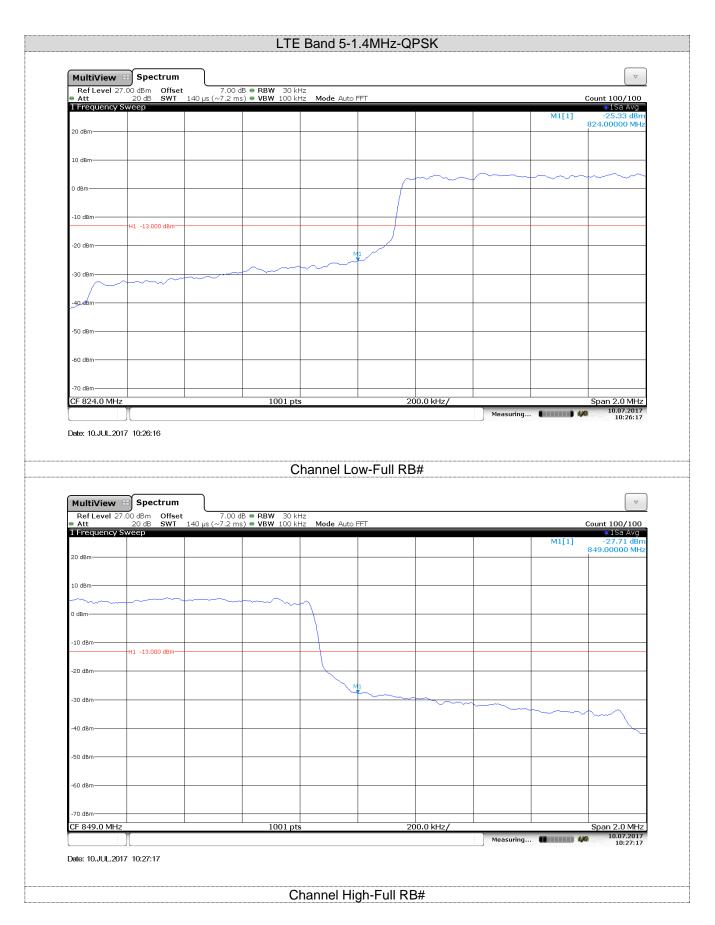


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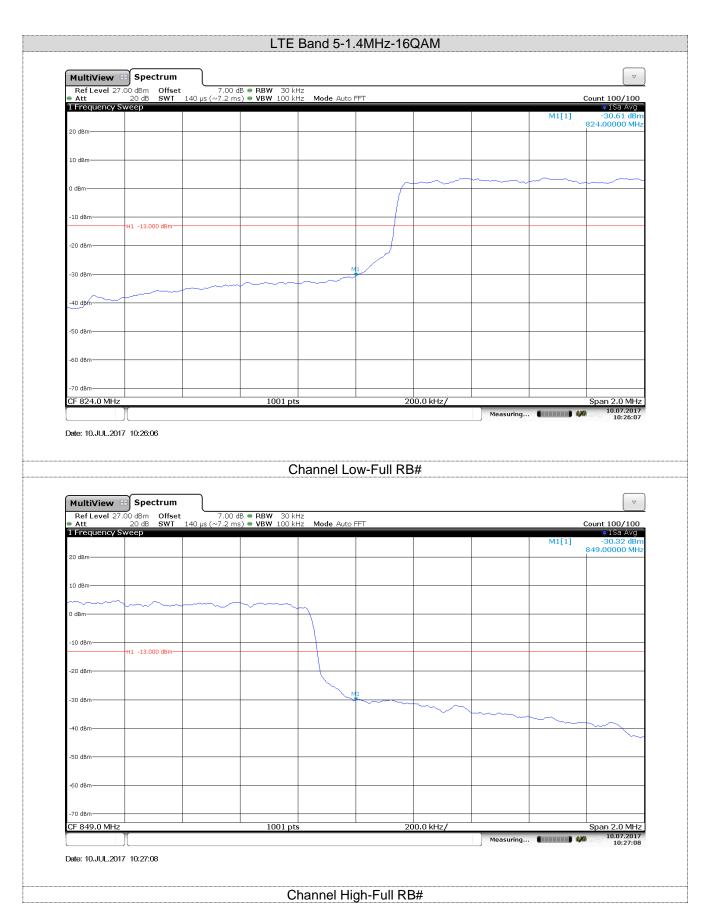


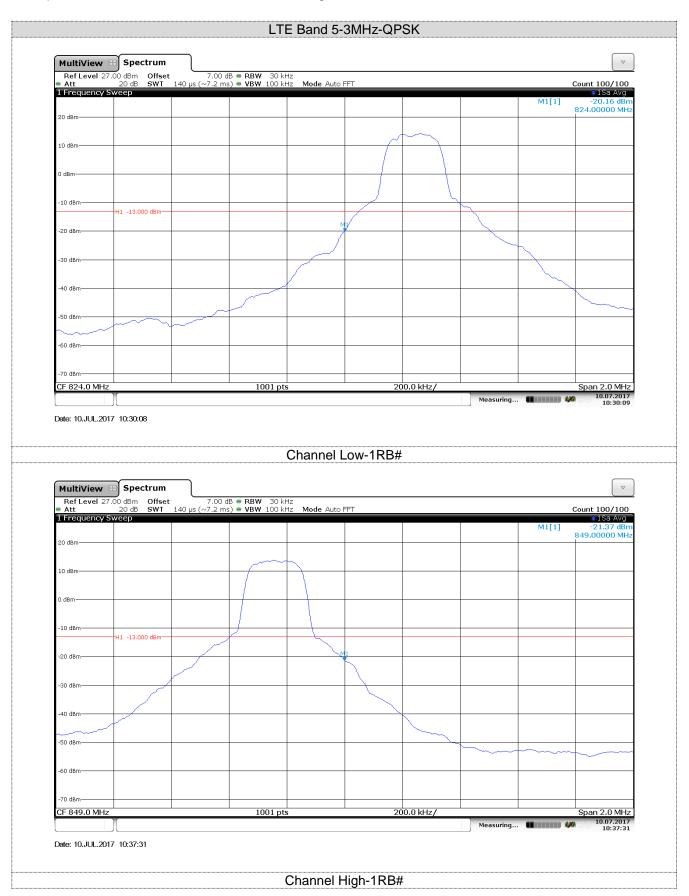
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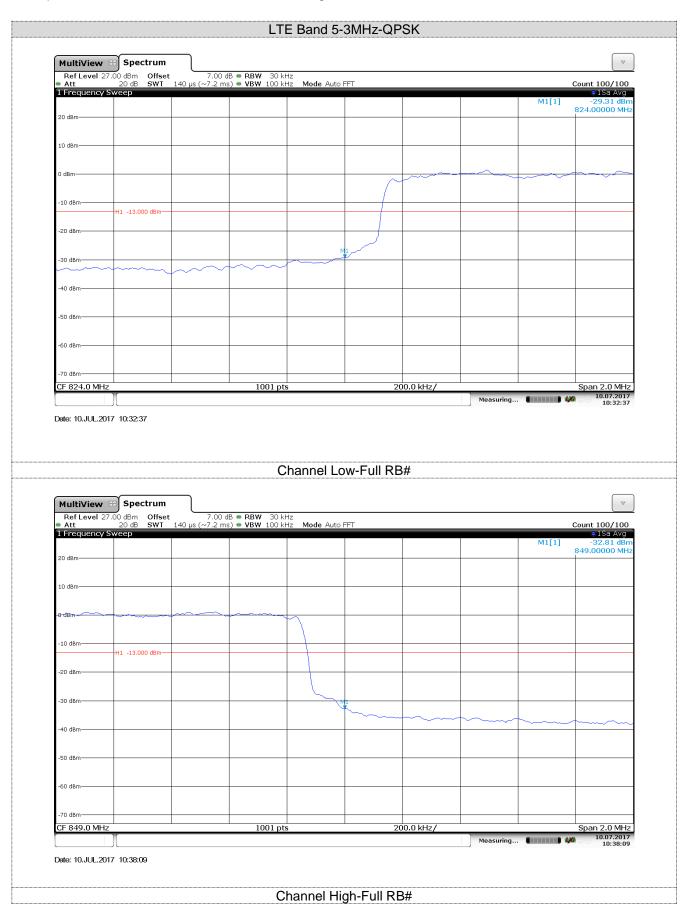


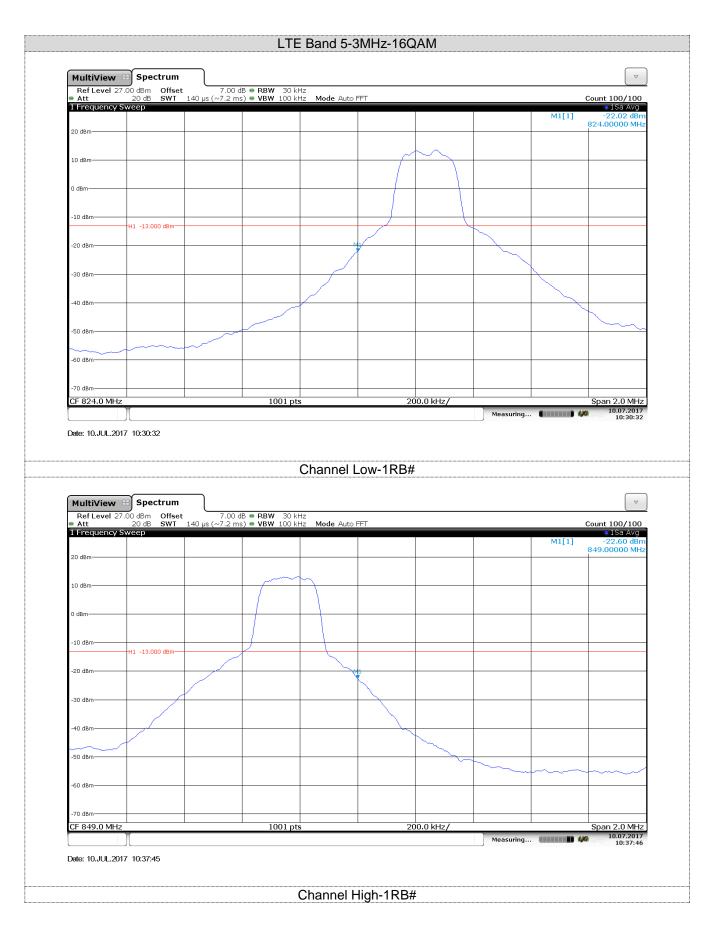


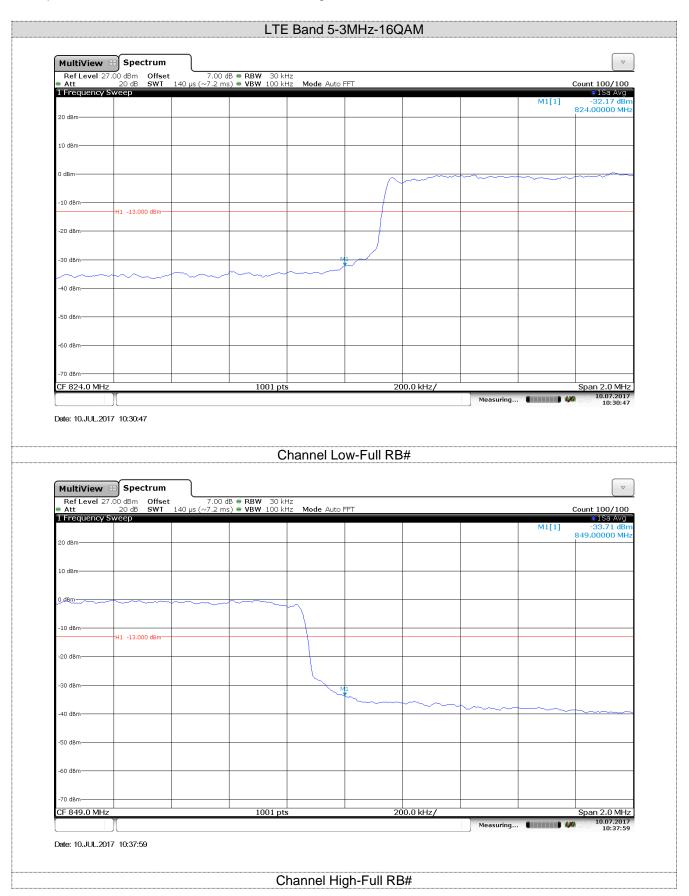
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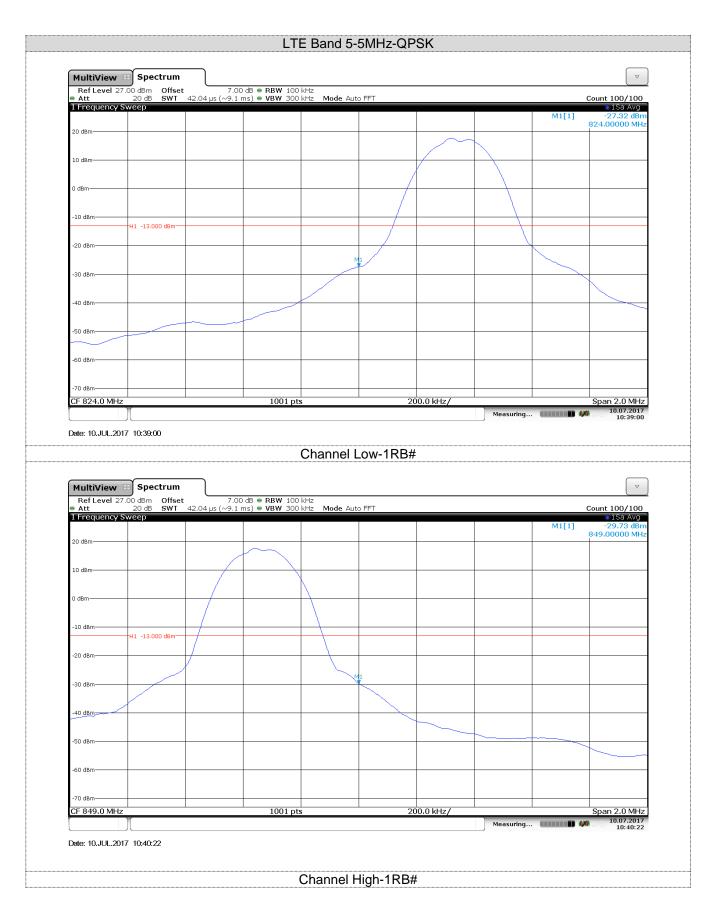




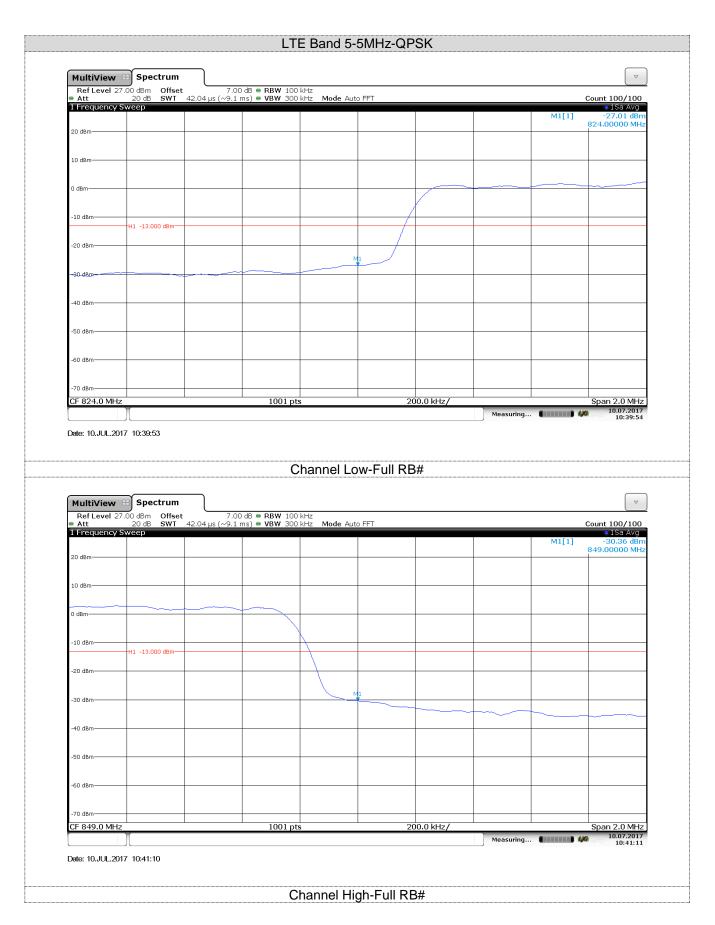


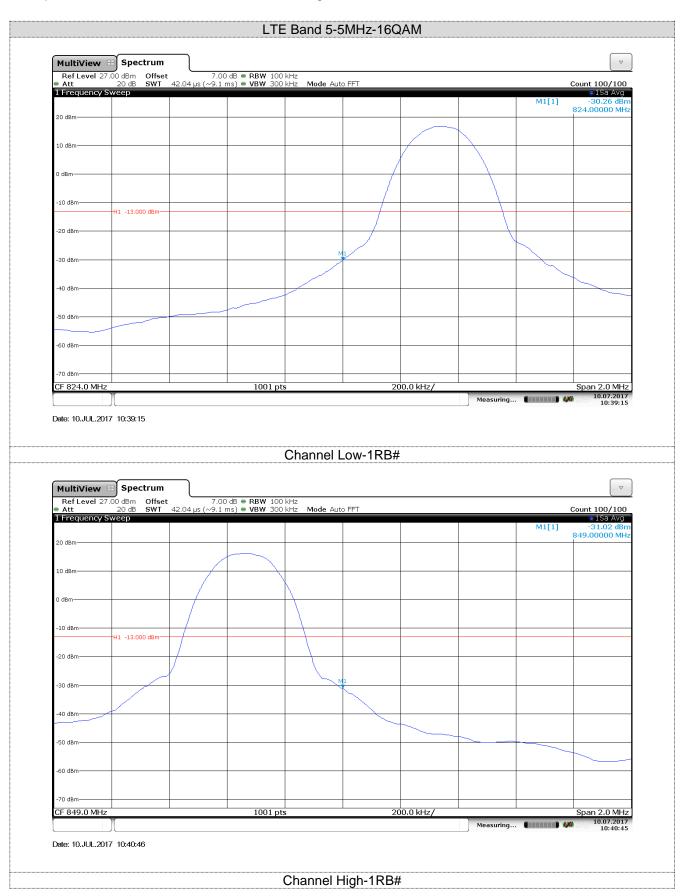


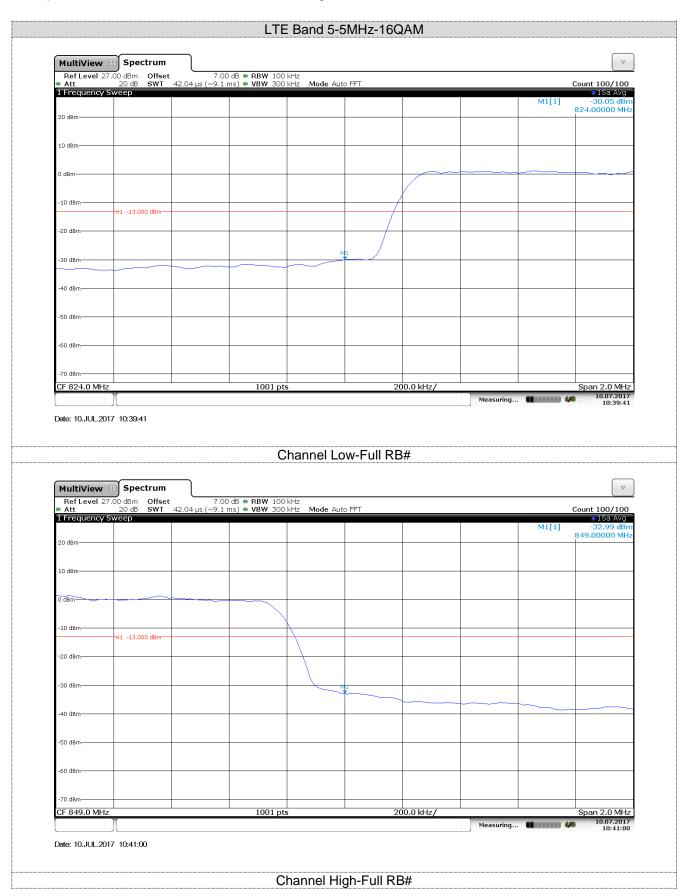


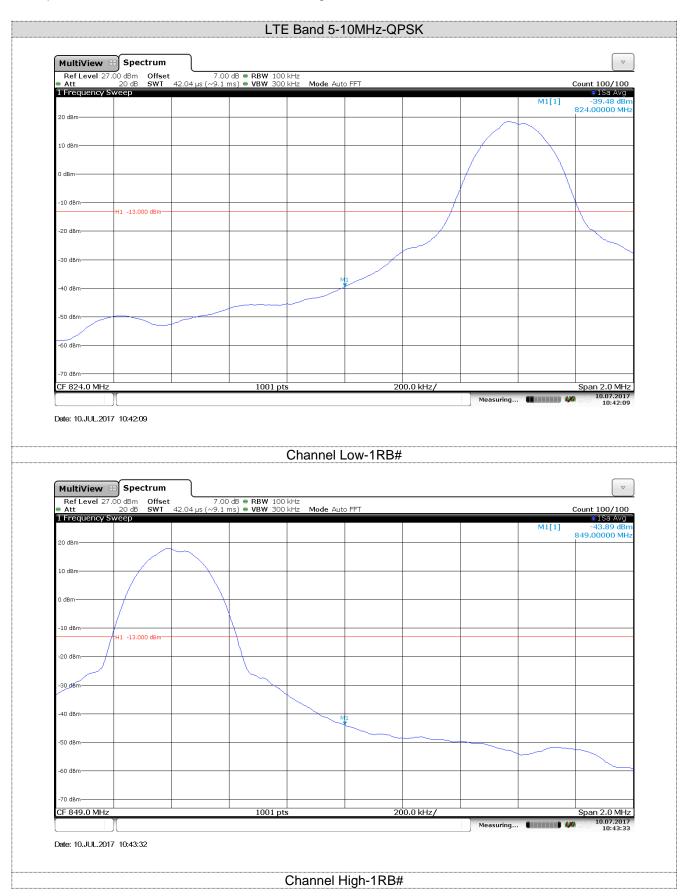


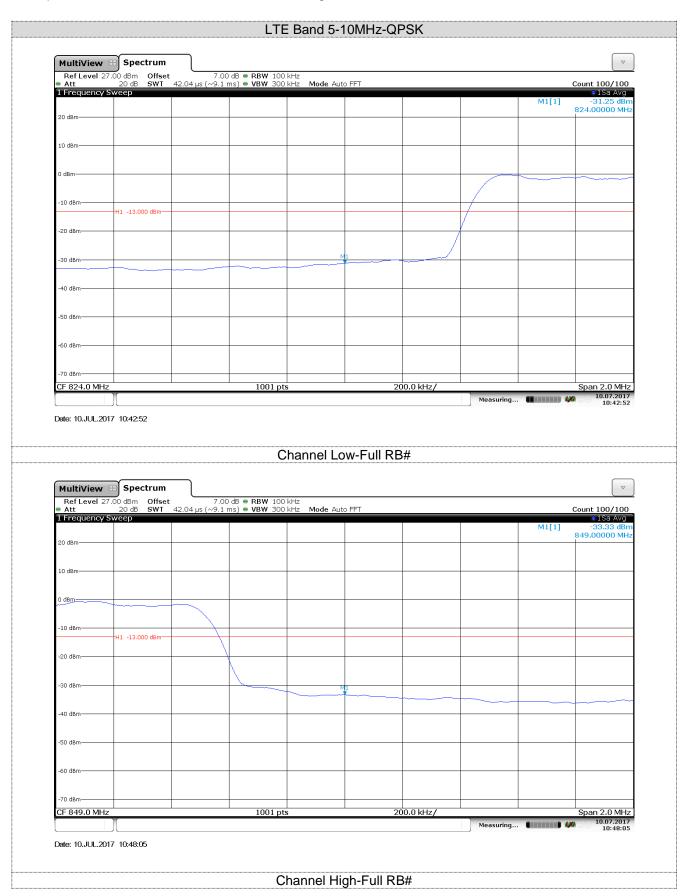
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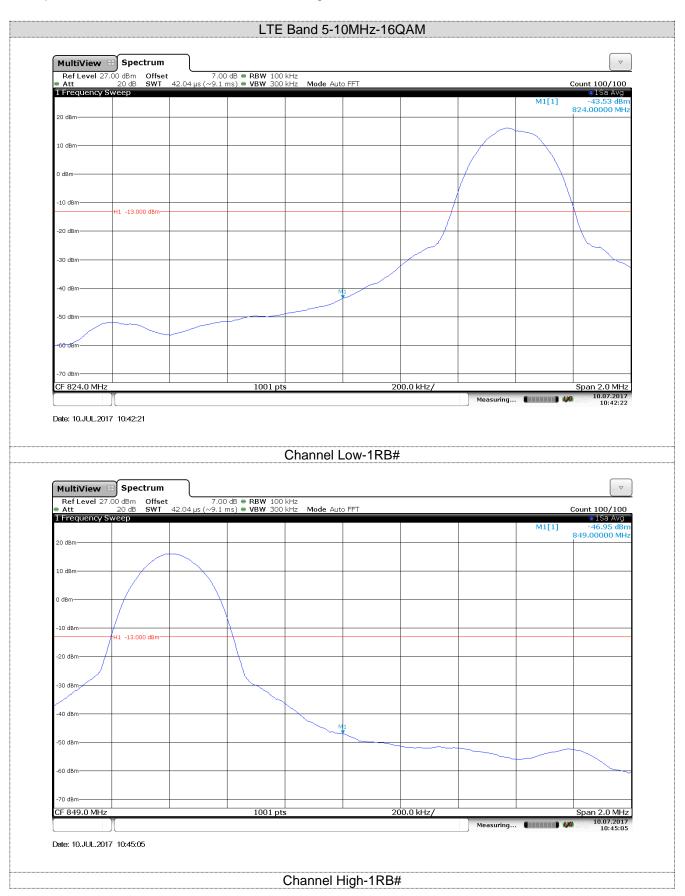


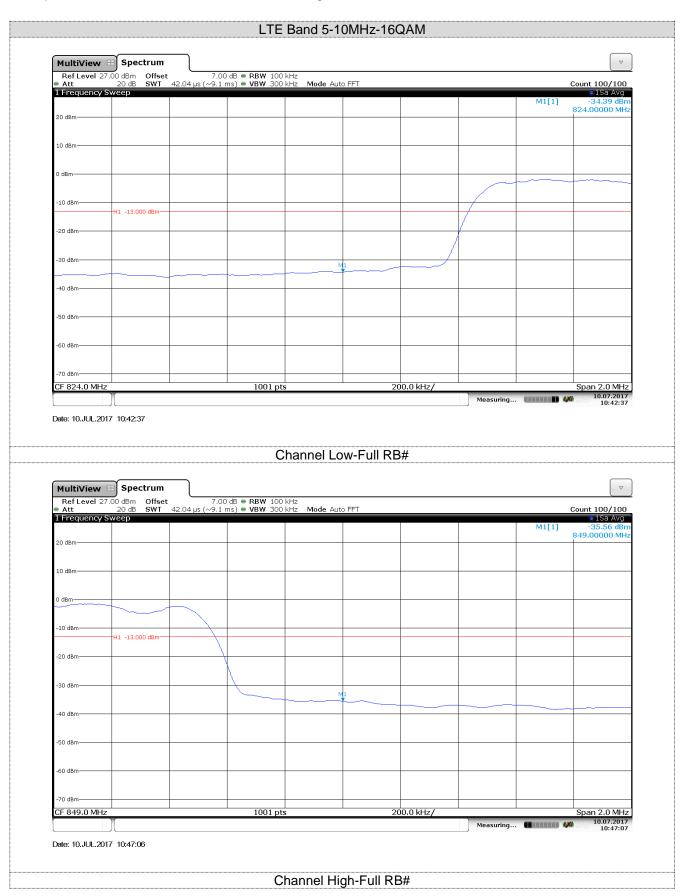




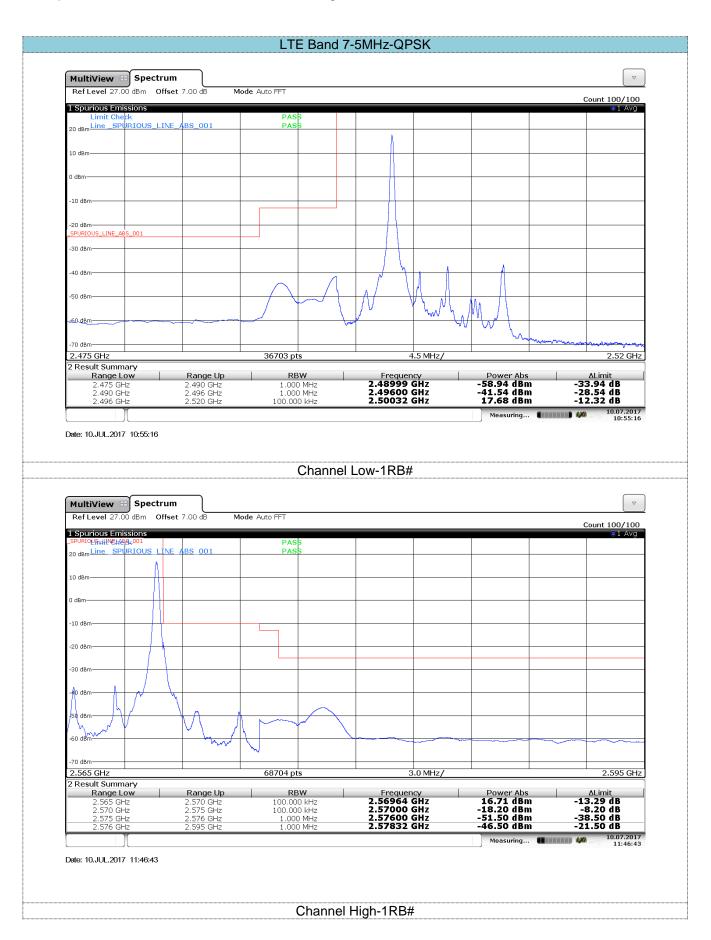


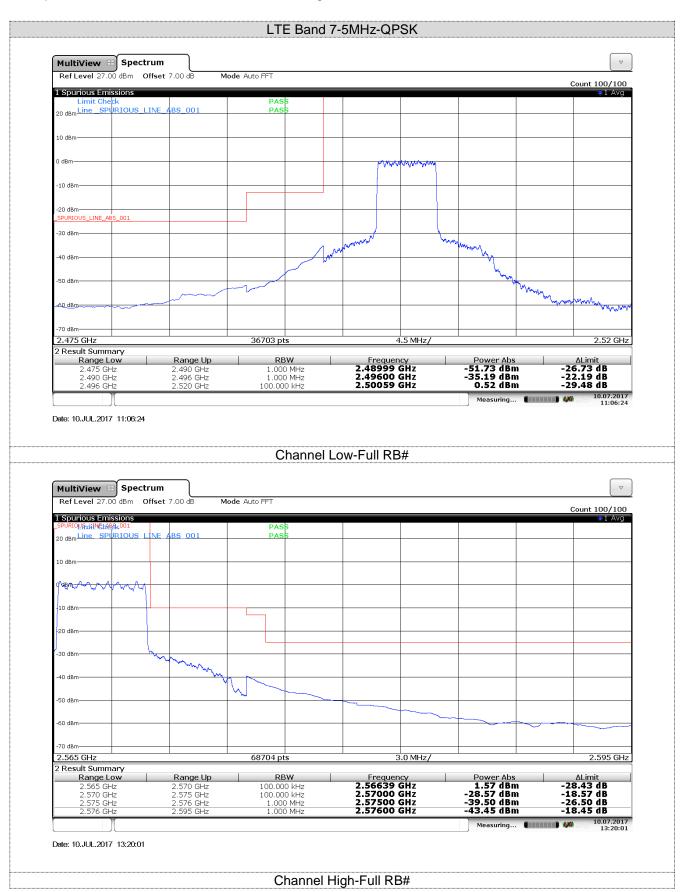




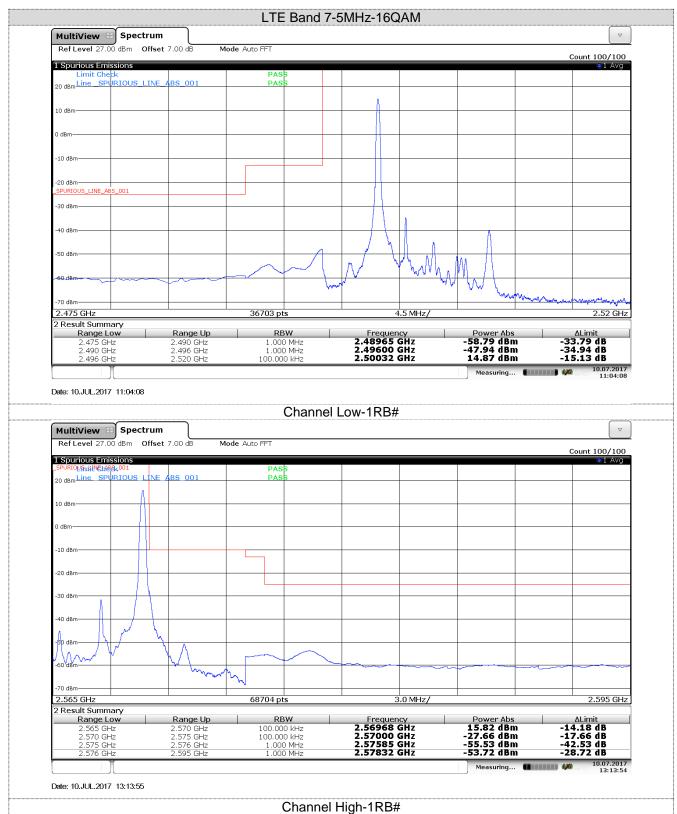


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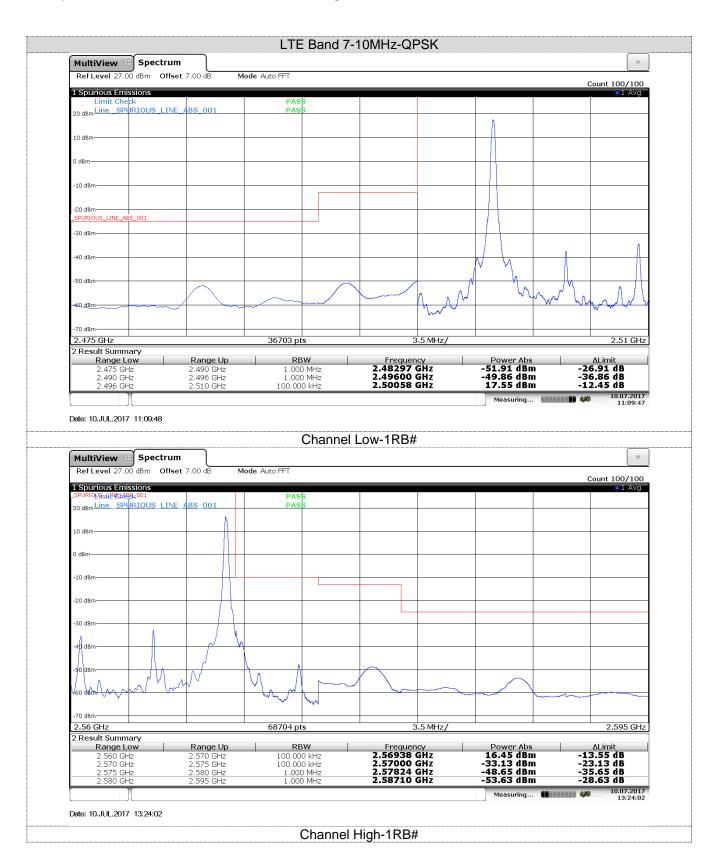


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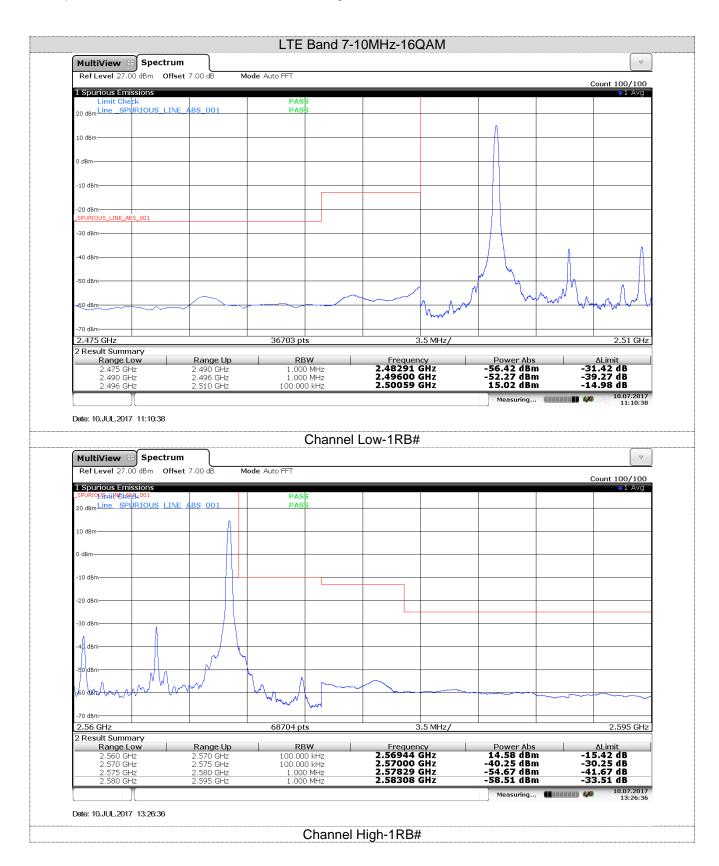




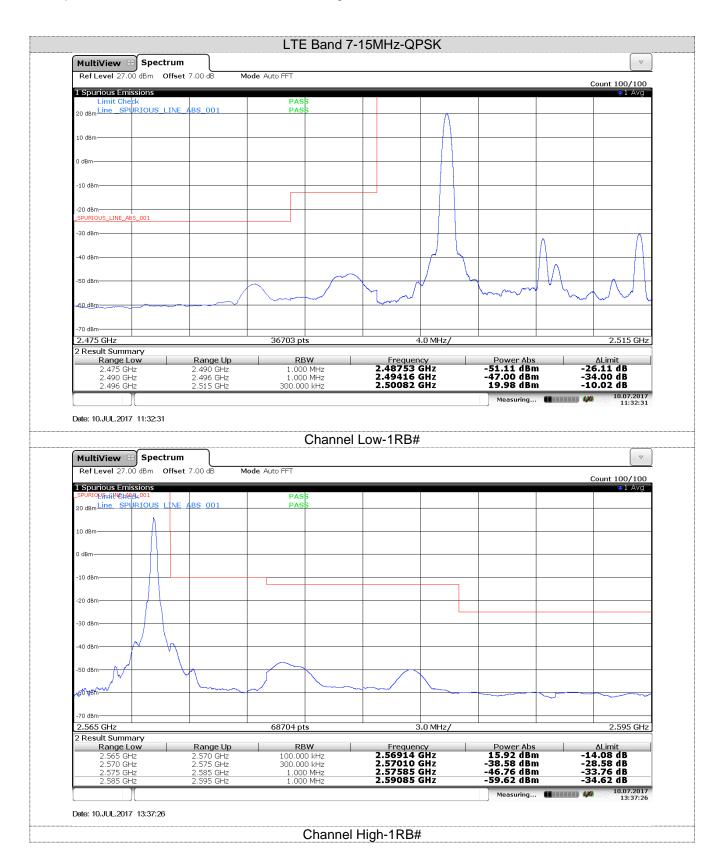
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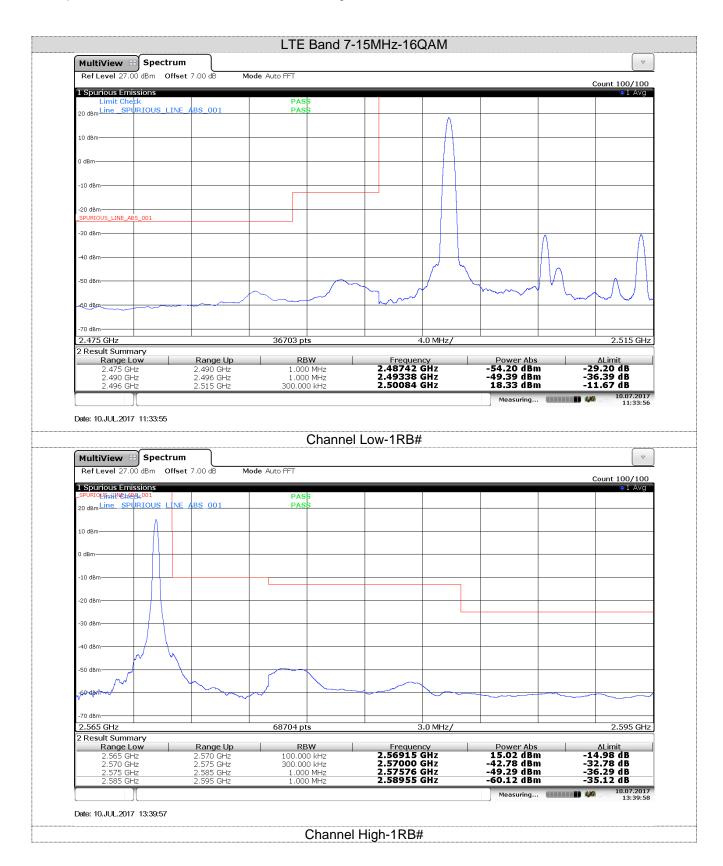






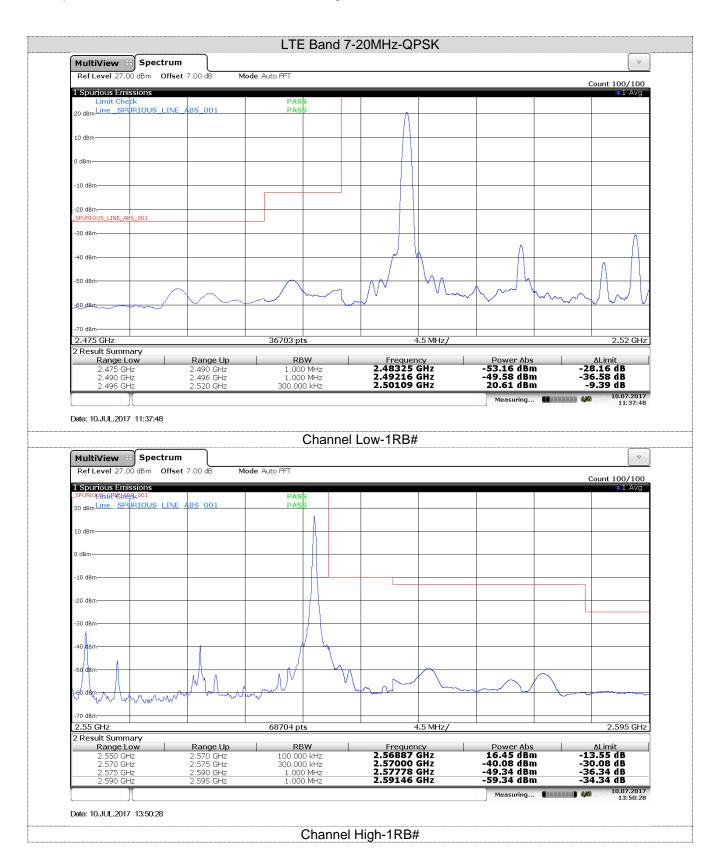
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Report No.: TRE1706030402 Page: 176 of 204 Issued: 2017-07-17 LTE Band 7-20MHz-16QAM MultiView 🖽 Spectrum ∇ Ref Level 27.00 dBm Offset 7.00 dB Mode Auto FFT Count 100/100 • 1 Avg Limit Check 20 dBm Line SPURIOUS LINE -20 dBm OUS_LINE_ABS_001 -30 dBm -50 dBr -70 dBm 2.475 GHz 36703 pts 4.5 MHz/ 2.52 GHz 2 Result Summary Range Low 2.475 GHz 2.490 GHz 2.496 GHz RBW 1.000 MHz 1.000 MHz 300.000 kHz Power Abs -56.53 dBm -52.01 dBm 18.26 dBm ΔLimit -31.53 dB -39.01 dB -11.74 dB Range Up Frequency 2.48314 GHz 2.49208 GHz 2.50111 GHz 2.490 GHz 2.496 GHz 2.520 GHz Date: 10.JUL.2017 11:39:05 Channel Low-1RB# MultiView 🖽 Spectrum Ref Level 27.00 dBm Offset 7.00 dB Count 100/100 1 Spurious Emissions 20 dBm Line SPURIOUS LINE ABS 001 PAS 0 dBn -10 dBr -20 dBr -30 dBr

68704 pts

100.000 kHz 300.000 kHz 1.000 MHz 1.000 MHz

Range Up

2.570 GHz 2.575 GHz 2.590 GHz 2.595 GHz 4.5 MHz/

Power Abs 14.72 dBm -44.88 dBm -50.95 dBm -59.96 dBm

Frequency 2.56887 GHz 2.57000 GHz 2.57781 GHz 2.59148 GHz

Channel High-1RB#

-70 dBm

2.55 GHz

2 Result Summary

Range Low

2.550 GHz 2.570 GHz 2.575 GHz 2.590 GHz

Date: 10.JUL.2017 13:53:02

2.595 GHz

10.07.2017 13:53:02

∆Limit -15.28 dB -34.88 dB -37.95 dB -34.96 dB Report No.: TRE1706030402 Page: 177 of 204 Issued: 2017-07-17



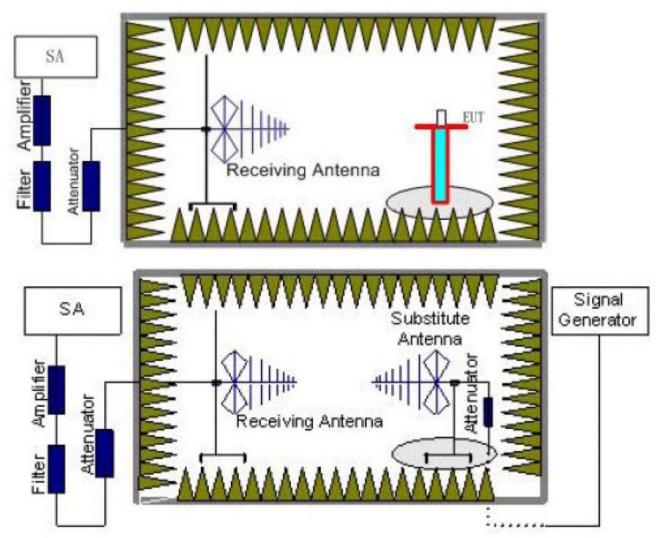
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5.5. ERP AND EIRP

LIMIT

LTE Band 2: EIRP<2W ,LTE Band 4:EIRP<1W,LTE Band 5:ERP<7W,LTE Band 7:EIPR<2W

TEST CONFIGURATION



TEST PROCEDURE

- 1. EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna shall be moved from 1m to 4m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz,, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver

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reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (PcI) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
- 6. The measurement results are obtained as described below:

Power(EIRP)=PMea- PAg - Pcl + Ga

We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:

Power(EIRP)=PMea- Pcl + Ga

7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

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LTE Band 2-1.4MHz									
Madulation	Channel	EIRP (dBm)		Limit (dBm)	Result				
Modulation	Chamilei	Vertical	Horizontal	Limit (dbin)	Result				
	Low	20.25	18.36						
QPSK	Mid	20.16	18.15		PASS				
	High	20.43	18.22	22.00					
	Low	19.81	18.44	33.00					
16QAM	Mid	19.83	18.08		PASS				
	High	20.14	18.15						

	LTE Band 2-3MHz								
Modulation	Channel	EIRP	(dBm)	Limit (dDm)	Result				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	20.25	18.37						
QPSK	Mid	20.33	18.52		PASS				
	High	20.46	18.43						
	Low	19.92	18.30	33.00					
16QAM	Mid	19.84	18.40		PASS				
	High	20.49	18.44						

	LTE Band 2-5MHz									
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result					
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result					
	Low	20.22	18.25							
QPSK	Mid	20.36	18.33	00.00	PASS					
	High	20.43	18.42							
	Low	19.80	18.25	33.00						
16QAM	Mid	19.94	18.33		PASS					
	High	20.77	18.49							

LTE Band 2-10MHz								
Modulation	Channel	EIRP	(dBm)	Limit (dRm)	Result			
iviodulation	Channel	Vertical	Horizontal	Limit (dBm)	Resuit			
	Low	20.22	18.17					
QPSK	Mid	20.15	18.52		PASS			
	High	20.08	18.36	22.00				
	Low	20.18	17.83	33.00				
16QAM	Mid	20.28	18.59		PASS			
	High	19.97	18.23					

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	LTE Band 2-15MHz									
Modulation	Channel	EIRP	EIRP (dBm)		Result					
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result					
	Low	19.52	17.88							
QPSK	Mid	19.74	17.85	00.00	PASS					
	High	19.58	17.64							
	Low	19.14	17.88	33.00						
16QAM	Mid	19.74	17.85		PASS					
	High	19.48	17.64]						

LTE Band 2-20MHz									
Modulation	Channal	EIRP (dBm)		Limit (dDm)	Dogult				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	19.66	17.74						
QPSK	Mid	19.43	17.35		PASS				
	High	19.38	17.26						
	Low	19.31	17.67	33.00					
16QAM	Mid	18.91	17.22		PASS				
	High	19.42	17.27						

LTE Band 4-1.4MHz									
Modulation	Channel	EIRP (dBm)		Limit (dRm)	Result				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Resuit				
	Low	20.15	18.21						
QPSK	Mid	20.36	18.32	30.00	PASS				
	High	20.14	18.16						
	Low	20.01	18.29						
16QAM	Mid	20.03	18.25		PASS				
	High	20.34	18.09						

	LTE Band 4-3MHz									
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result					
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result					
	Low	20.22	18.22							
QPSK	Mid	20.18	18.02		PASS					
	High	20.38	18.33							
	Low	19.89	18.15	30.00						
16QAM	Mid	19.69	17.90		PASS					
	High	20.41	18.34							

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	LTE Band 4-5MHz									
Modulation	Channel	EIRP	EIRP (dBm)		Result					
Modulation	Chamer	Vertical	Horizontal	Limit (dBm)	Result					
	Low	20.43	18.22							
QPSK	Mid	20.15	18.12	00.00	PASS					
	High	20.33	18.20							
	Low	19.92	18.11	30.00						
16QAM	Mid	20.66	18.21		PASS					
	High	19.93	18.11							

LTE Band 4-10MHz									
Modulation	Channel	EIRP	(dBm)	Limit (dDm)	Popult				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	19.84	17.35						
QPSK	Mid	19.52	17.25		PASS				
	High	19.65	17.31	20.00					
	Low	19.47	17.36	30.00					
16QAM	Mid	19.51	17.24		PASS				
	High	19.52	17.30						

LTE Band 4-15MHz								
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result			
iviodulation	Chamilei	Vertical	Horizontal	Lilliit (ubili)	Result			
	Low	19.88	17.69					
QPSK	Mid	19.76	17.58	00.00	PASS			
	High	19.52	17.46					
	Low	19.37	17.69	30.00				
16QAM	Mid	19.76	17.58		PASS			
	High	19.39	17.46					

	LTE Band 4-20MHz								
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	19.66	17.42						
QPSK	Mid	19.52	17.35		PASS				
	High	19.77	17.88						
	Low	19.18	17.32	30.00					
16QAM	Mid	18.81	17.17		PASS				
	High	20.44	18.03						

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LTE Band 5-1.4MHz									
Modulation	Channel	ERP (dBm)		Limit (dBm)	Result				
Modulation	Channel	Vertical	Horizontal	LIIIII (UDIII)	Result				
	Low	21.36	19.37						
QPSK	Mid	21.47	19.86		PASS				
	High	21.52	19.43						
	Low	21.45	19.30	38.50					
16QAM	Mid	21.40	19.93		PASS				
	High	21.84	19.36						

	LTE Band 5-3MHz								
Modulation	Channel	ERP (dBm)		Limit (dDm)	Dogult				
Modulation	Channel	Vertical	Horizontal 19.58	Limit (dBm)	Result				
	Low	21.52	19.58						
QPSK	Mid	21.33	19.47		PASS				
	High	21.46	19.52						
	Low	21.83	19.65	38.50					
16QAM	Mid	21.80	19.59		PASS				
	High	21.49	19.53						

LTE Band 5-5MHz								
Mashalatian	Channel	ERP (dBm)		Limit (dBm)	Result			
Modulation	Channel	Vertical	Horizontal	Limit (abin)	Result			
	Low	20.88	18.66	20.50				
QPSK	Mid	20.69	18.47		PASS			
	High	20.82	18.65					
	Low	21.19	18.59	38.50				
16QAM	Mid	20.45	18.52		PASS			
	High	20.59	18.60					

	LTE Band 5-10MHz								
Modulation	Channel	ERP	(dBm)	Limit (dPm)	Popult				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	20.55	18.38	-					
QPSK	Mid	20.48	18.34		PASS				
	High	20.36	18.25						
	Low	20.21	18.51	38.50					
16QAM	Mid	20.24	18.58		PASS				
	High	20.00	18.55						

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LTE Band 7-5MHz									
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result				
Modulation	Channel	Vertical	Horizontal	LIIIII (UDIII)	Result				
	Low	20.88	18.75	00.00					
QPSK	Mid	20.47	18.64		PASS				
	High	20.52	18.68						
	Low	21.04	18.62	33.00					
16QAM	Mid	20.35	18.76		PASS				
	High	21.08	18.56						

LTE Band 7-10MHz								
Modulation	Channel	EIRP (dBm)		Limit (dDm)	Popult			
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result			
	Low	20.36	18.16					
QPSK	Mid	20.25	18.05		PASS			
	High	20.47	18.36					
	Low	20.92	18.28	33.00				
16QAM	Mid	21.08	18.26		PASS			
	High	20.57	18.38					

	LTE Band 7-15MHz								
Modulation	Channal	EIRP (dBm)		Limit (dBm)	Dogult				
Modulation	Channel	Vertical	Horizontal	Limit (abin)	Result				
	Low	20.25	18.21	00.00					
QPSK	Mid	20.14	18.15		PASS				
	High	19.77	17.63						
	Low	20.75	18.10	33.00					
16QAM	Mid	19.75	18.24		PASS				
	High	19.40	17.55						

	LTE Band 7-20MHz								
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result				
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result				
	Low	19.86	17.55						
QPSK	Mid	19.47	17.46		PASS				
	High	19.52	17.47						
	Low	19.31	17.97	33.00					
16QAM	Mid	19.08	18.32		PASS				
	High	18.94	17.47						

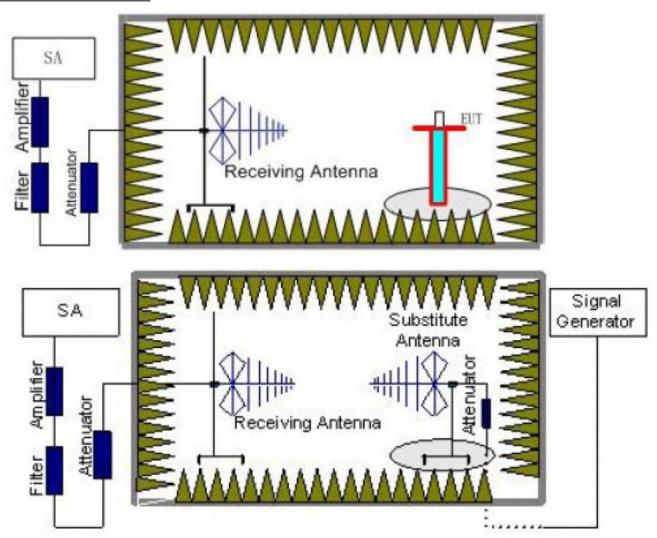
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5.6. Radiated Spurious Emssion

LIMIT

LTE Band 2/4/17:<-13dBm;LTE Band 7<-25dBm

TEST CONFIGURATION



TEST RESULTS

- 1. EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna shall be moved from 1m to 4m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the

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substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
- 6. The measurement results are obtained as described below:

Power(EIRP)=PMea- PAg - Pcl + Ga

We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below: Power(EIRP)=PMea- Pcl + Ga

7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

Please refer to the clause 3.3

TEST RESULTS

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LTE Band 2-1.4MHz								
Channel	Frequency	Spurious I	Emission	Limit (dDm)	Dooult			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result			
	3701.4	Vertical	-43.52					
	5552.1	V	-45.75	-13.00	Pass			
Low	7402.8	V						
LOW	3701.4	Horizontal	-46.47					
	5552.1	Н	-47.88	-13.00	Pass			
	7402.8	Н						
	3760	Vertical	-43.21	-13.00	Pass			
	5640	V	-45.81					
Mid	7520	V						
iviiu	3760	Horizontal	-46.40					
	5640	Н	-47.81	-13.00	Pass			
	7520	Н						
	3818.6	Vertical	-43.33					
	5727.9	V	-45.92	-13.00	Pass			
High	7637.2	V						
nign	3818.6	Horizontal	-46.41					
	5727.9	Н	-47.81	-13.00	Pass			
	7637.2	Н						

Remark:

- Remark"---" means that the emission level is too low to be measured
- The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 2-3MHz								
Channel	Frequency	Spurious Emission		Limit (dDm)	Result			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result			
	3703	Vertical	-43.81					
	5554.5	V	-45.67	-13.00	Pass			
Low	7406	V						
LOW	3703	Horizontal	-44.15					
	5554.5	Н	-45.60	-13.00	Pass			
	7406	Н						
	3760	Vertical	-44.10		Pass			
	5640	V	-45.38	-13.00				
Mid	7520	V						
IVIIU	3760	Horizontal	-43.95		Pass			
	5640	Н	-44.84	-13.00				
	7520	Н						
	3817	Vertical	-44.87					
	5725.5	V	-45.02	-13.00	Pass			
Lliah	7634	V						
High	3817	Horizontal	-44.47					
	5725.5	Н	-44.93	-13.00	Pass			
	7634	Н						

- Remark"---" means that the emission level is too low to be measured The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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	LTE Band 2-5MHz								
Channel	Frequency	Spurious Emission		Limit (dPm)	Dooult				
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result				
	3705	Vertical	-44.05						
	5557.5	V	-45.85	-13.00	Pass				
Low	7410	V							
LOW	3705	Horizontal	-43.26						
	5557.5	Н	-46.01	-13.00	Pass				
	7410	Н							
	3760	Vertical	-43.39	-13.00	Pass				
	5640	V	-46.54						
Mid	7520	V							
iviiu	3760	Horizontal	-42.87						
	5640	Н	-45.65	-13.00	Pass				
	7520	Н							
	3815	Vertical	-44.41						
	5722.5	V	-45.94	-13.00	Pass				
Lliah	7630	V							
High	3815	Horizontal	-44.97						
	5722.5	Н	-46.05	-13.00	Pass				
	7630	Н							

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 2-10MHz						
Channel	Frequency Spurious		Emission	Lineit (dDne)	Desult	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3710	Vertical	-43.50			
	5565	V	-46.15	-13.00	Pass	
Low	7420	V				
LOW	3710	Horizontal	-42.15		Pass	
	5565	Н	-46.42	-13.00		
	7420	Н				
	3760	Vertical	-42.37	-13.00	Pass	
	5640	V	-47.32			
Mid	7520	V				
IVIIG	3760	Horizontal	-41.47		Pass	
	5640	Н	-48.40	-13.00		
	7520	Н				
	3810	Vertical	-39.60		Pass	
	5715	V	-48.05	-13.00		
High	7620	V				
riigii	3810	Horizontal	-38.84			
	5715	Н	-47.89	-13.00	Pass	
	7620	Н		1		

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 2-15MHz						
Channal	Frequency	Spurious I	Emission	Lineit (dDae)	Result	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)		
	3705	Vertical	-42.54			
	5557.5	V	-46.54	-13.00	Pass	
Low	7410	V				
LOW	3705	Horizontal	-40.76		Pass	
	5557.5	Н	-46.91	-13.00		
	7410	Н				
	3760	Vertical	-41.06	-13.00	Pass	
	5640	V	-48.09			
Mid	7520	V				
IVIIQ	3760	Horizontal	-39.88		Pass	
	5640	Н	-48.36	-13.00		
	7520	Н				
	3815	Vertical	-39.40			
	5722.5	V	-48.27	-13.00	Pass	
Lliab	7630	V				
High	3815	Horizontal	-39.65			
	5722.5	Н	-48.32	-13.00	Pass	
	7630	Н				

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 2-20MHz						
Channal	Frequency	Spurious	Emission	Limit (dDm)	Danult	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3720	Vertical	-41.29			
	5580	V	-46.98	-13.00	Pass	
Low	7440	V				
LOW	3720	Horizontal	-39.28		Pass	
	5580	Н	-47.39	-13.00		
	7440	Н				
	3760	Vertical	-39.61	-13.00	Pass	
	5640	V	-48.73			
Mid	7520	V				
iviiu	3760	Horizontal	-38.27		Pass	
	5640	Н	-49.51	-13.00		
	7520	Н				
	3800	Vertical	-36.93			
	5700	V	-49.25	-13.00	Pass	
High	7600	V				
riigii	3800	Horizontal	-38.35			
	5700	Н	-49.54	-13.00	Pass	
	7600	Н		1		

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 4-1.4MHz						
Channel	Frequency	Spurious I	Emission	Limit (dBm)	Result	
Channel	(MHz)	Polarization	Level (dBm)			
	3421.4	Vertical	-35.78			
	5132.1	V	-40.65	-13.00	Pass	
Low	6842.8	V				
LOW	3421.4	Horizontal	-37.85		Pass	
	5132.1	Н	-43.38	-13.00		
	6842.8	Н				
	3465	Vertical	-35.90	-13.00	Pass	
	5197.5	V	-40.54			
Mid	6930	V				
iviiu	3465	Horizontal	-37.71		Pass	
	5197.5	Н	-43.26	-13.00		
	6930	Н				
	3508.6	Vertical	-36.08			
	5262.9	V	-40.72	-13.00	Pass	
Lliab	7017.2	V				
High	3508.6	Horizontal	-37.73			
	5262.9	Н	-43.28	-13.00	Pass	
	7017.2	Н				

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-3MHz						
Channal	Frequency Spurio		Emission	Lineit (dDee)	D 14	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3423	Vertical	-36.28			
	5134.5	V	-40.49	-13.00	Pass	
Low	6846	V				
LOW	3423	Horizontal	-37.54		Pass	
	5134.5	Н	-43.23	-13.00		
	6846	Н				
	3465	Vertical	-36.41	-13.00	Pass	
	5197.5	V	-40.60			
Mid	6930	V				
IVIIU	3465	Horizontal	-37.36		Pass	
	5197.5	Н	-43.37	-13.00		
	6930	Н				
	3507	Vertical	-36.66		Pass	
	5260.5	V	-40.37	-13.00		
High	7014	V				
riigii	3423	Horizontal	-37.20			
	5134.5	Н	-43.52	-13.00	Pass	
	6846	Н				

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 4-5MHz						
Channel	Frequency	Spurious I	Emission	Limit (dDm)	Result	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)		
	3425	Vertical	-36.81			
	5137.5	V	-40.66	-13.00	Pass	
Low	6850	V				
LOW	3425	Horizontal	-37.37		Pass	
	5137.5	Н	-43.69	-13.00		
	6850	Н				
	3465	Vertical	-36.68	-13.00	Pass	
	5197.5	V	-40.54			
Mid	6930	V	-			
iviiu	3465	Horizontal	-37.20		Pass	
	5197.5	Н	-43.55	-13.00		
	6930	Н				
	3505	Vertical	-36.92		Pass	
	5257.5	V	-40.75	-13.00		
Lliab	7010	V	-			
High	3505	Horizontal	-37.33			
	5257.5	Н	-43.66	-13.00	Pass	
	7010	Н				

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-10MHz						
Channal	Frequency	Spurious	Emission	Lineit (dDae)	D !!	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3430	Vertical	-36.25			
	5145	V	-40.96	-13.00	Pass	
Low	6860	V				
LOW	3430	Horizontal	-36.91		Pass	
	5145	Н	-43.31	-13.00		
	6860	Н				
	3465	Vertical	-36.47	-13.00	Pass	
	5197.5	V	-41.17			
Mid	6930	V				
IVIIU	3465	Horizontal	-37.01		Pass	
	5197.5	Н	-43.39	-13.00		
	6930	Н	-			
	3500	Vertical	-36.33		Pass	
	5250	V	-41.04	-13.00		
Lliab	7000	V	-			
High	3500	Horizontal	-36.84			
	5250	Н	-43.24	-13.00	Pass	
	7000	Н				

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 4-15MHz						
Channel	Frequency	Spurious I	Emission	Lineit (dDne)	Result	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)		
	3435	Vertical	-35.30			
	5152.5	V	-41.35	-13.00	Pass	
Low	6870	V				
LOW	3435	Horizontal	-37.23		Pass	
	5152.5	Н	-42.87	-13.00		
	6870	Н				
	3465	Vertical	-35.59	-13.00	Pass	
	5197.5	V	-41.62			
Mid	6930	V				
IVIIU	3465	Horizontal	-37.42		Pass	
	5197.5	Н	-43.02	-13.00		
	6930	Н				
	3490	Vertical	-35.33		Pass	
	5235	V	-41.39	-13.00		
Lligh	6980	V				
High	3490	Horizontal	-37.36			
	5235	Н	-42.97	-13.00	Pass	
	6980	Н				

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-20MHz						
Channel	Frequency Spurio		Emission	Lineit (dDne)	Desult	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3440	Vertical	-34.04			
	5160	V	-41.83	-13.00	Pass	
Low	6880	V				
LOW	3440	Horizontal	-36.95		Pass	
	5160	Н	-43.32	-13.00		
	6880	Н				
	3465	Vertical	-33.73	-13.00	Pass	
	5197.5	V	-42.02			
Mid	6930	V				
iviiu	3465	Horizontal	-37.14		Pass	
	5197.5	Н	-43.17	-13.00		
	6930	Н				
	3490	Vertical	-33.46		Pass	
	5235	V	-43.08	-13.00		
High	6980	V				
High	3490	Horizontal	-36.63		_	
	5235	Н	-43.03	-13.00	Pass	
	6980	Н		1		

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 5-1.4MHz								
Channel	Frequency	Spurious	Emission	Limit (dDm)	Dooult			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result			
	1649.4	Vertical	-43.35					
	2474.1	V	-44.68	-13.00	Pass			
Low	3298.8	V						
Low	1649.4	Horizontal	-40.84		Pass			
	2474.1	Н	-40.98	-13.00				
	3298.8	Н						
	1673	Vertical	-43.19					
	2509.5	V	-44.53	-13.00	Pass			
Mid	3346	V						
iviiu	1673	Horizontal	-40.68					
	2509.5	Н	-40.85	-13.00	Pass			
	3346	Н						
	1696.6	Vertical	-43.42					
	2544.9	V	-44.74	-13.00	Pass			
Lligh	3393.2	V	-					
High	1696.6	Horizontal	-40.72					
	2544.9	Н	-40.89	-13.00	Pass			
	3393.2	Н						

Remark:

- 1.
- Remark"---" means that the emission level is too low to be measured The emission levels of below 1 GHz are very lower than the limit and not show in test report.

	LTE Band 5-3MHz								
Channal	Frequency	Spurious	Emission	Linnit (dDnn)	Daguit				
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result				
	1651	Vertical	-43.40						
	2476.5	V	-44.63	-13.00	Pass				
Low	3302	V							
Low	1651	Horizontal	-41.04						
	2476.5	Н	-41.02	-13.00	Pass				
	3302	Н							
	1673	Vertical	-43.56		Pass				
	2509.5	V	-44.78	-13.00					
Mid	3346	V							
IVIIU	1673	Horizontal	-40.79						
	2509.5	Н	-41.23	-13.00	Pass				
	3346	Н							
	1696.6	Vertical	-44.45						
	2544.9	V	-46.25	-13.00	Pass				
High	3393.2	V							
High	1696.6	Horizontal	-42.26						
	2544.9	Н	-42.63	-13.00	Pass				
	3393.2	Н							

- Remark"---" means that the emission level is too low to be measured 1.
- The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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	LTE Band 5-5MHz								
Channal	Frequency	Spurious I	Emission	Limit (dPm)	Popult				
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result				
	1653	Vertical	ıl -43.23						
	2479.5	V	-44.80	-13.00	Pass				
Low	3306	V							
LOW	1653	Horizontal	-40.31						
	2479.5	Н	-40.86	-13.00	Pass				
	3306	Н							
	1673	Vertical	-42.64		Pass				
	2509.5	V	-44.29	-13.00					
Mid	3346	V							
IVIIU	1673	Horizontal	-40.69						
	2509.5	Н	-42.97	-13.00	Pass				
	3346	Н							
	1695	Vertical	-41.33						
	2542.5	V	-42.12	-13.00	Pass				
Lliah	3390	V							
High	1695	Horizontal	-41.77		_				
	2542.5	Н	-43.99	-13.00	Pass				
	3390	Н							

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

	LTE Band 5-10MHz								
Channal	Frequency	Spurious	Emission	Lineit (dDne)	Danult				
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result				
	1658	Vertical	-43.49						
	2487	V	-44.54	-13.00	Pass				
Low	3316	V							
LOW	1658	Horizontal	-41.43						
	2487	Н	-41.11	-13.00	Pass				
	3316	Н							
	1673	Vertical	-44.39						
	2509.5	V	-45.33	-13.00	Pass				
Mid	3346	V							
IVIIG	1673	Horizontal	-40.22						
	2509.5	Н	-40.89	-13.00	Pass				
	3346	Н							
	1688	Vertical	-44.01						
	2532	V	-45.67	-13.00	Pass				
High	3376	V	-						
riigii	1688	Horizontal	-40.10						
	2532	Н	-41.01	-13.00	Pass				
	3376	Н							

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 7-5MHz								
Channel	Frequency	Spurious I	Emission	Limit (dDm)	Dooult			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result			
	5005	Vertical	-40.47					
	7507.5	V	-36.58	-25.00	Pass			
Low	10010	V						
LOW	5005	Horizontal	-42.45		Pass			
	7507.5	Н	-40.76	-25.00				
	10010	Н						
	5070	Vertical	-39.65					
	7605	V	-35.86	-25.00	Pass			
Mid	10140	V						
iviiu	5070	Horizontal	-41.61					
	7605	Н	-36.51	-25.00	Pass			
	10140	Н						
	5135	Vertical	-40.30					
	7702.5	V	-36.93	-25.00	Pass			
Lliah	10270	V						
High	5135	Horizontal	-41.34					
	7702.5	Н	-36.99	-25.00	Pass			
	10270	Н						

Remark:

- Remark"---" means that the emission level is too low to be measured The emission levels of below 1 GHz are very lower than the limit and not show in test report.

		LTE Ban	d 7-10MHz			
Channel	Frequency	Spurious	Emission	Limit (dDm)	Limit (dBm) Result	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	5010	Vertical	-40.52			
	7515	V	-36.53	-25.00	Pass	
Low	10020	V				
Low	5010	Horizontal	-42.65			
	7515	Н	-40.80	-25.00	Pass	
	10020	Н				
	5070	Vertical	-40.67			
	7605	V	-36.67	-25.00	Pass	
Mid	10140	V				
IVIIU	5070	Horizontal	-41.78			
	7605	Н	-37.34	-25.00	Pass	
	10140	Н				
	5130	Vertical	-41.34			
	7695	V	-37.77	-25.00	Pass	
High	10260	V				
riigii	5130	Horizontal	-41.51			
	7695	Н	-37.83	-25.00	Pass	
	10260	Н				

- Remark"---" means that the emission level is too low to be measured 1.
- The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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		LTE Band	d 7-15MHz		
Channal	Frequency	Spurious I	Emission	Limit (dPm)	Popult
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
	5015	Vertical	-40.45		
	7522.5	V	-36.60	-25.00	Pass
Low	10030	V			
LOW	5015	Horizontal	-42.39		
	7522.5	Н	-40.75	-25.00	Pass
	10030	Н			
	5070	Vertical	-40.25		Pass
	7605	V	-36.41	-25.00	
Mid	10140	V			
IVIIQ	5070	Horizontal	-43.49		
	7605	Н	-35.57	-25.00	Pass
	10140	Н			
	5125	Vertical	-39.40		
	7687.5	V	-35.01	-25.00	Pass
Lligh	10250	V			
High	5125	Horizontal	-43.04		
	7687.5	Н	-35.11	-25.00	Pass
	10250	Н			

Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

	LTE Band 7-20MHz								
Channal	Frequency	Spurious	Emission	Limait (dDma)	Danult				
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result				
	5015	Vertical	-40.56						
	7522.5	V	-36.49	-25.00	Pass				
Low	10030	V							
LOW	5015	Horizontal	-42.83						
	7522.5	Н	-40.84	-25.00	Pass				
	10030	Н							
	5070	Vertical	-40.92						
	7605	V	-36.81	-25.00	Pass				
Mid	10140	V							
IVIIG	5070	Horizontal	-41.66						
	7605	Н	-37.71	-25.00	Pass				
	10140	Н							
	5125	Vertical	-41.82						
	7687.5	V	-38.30	-25.00	Pass				
High	10250	V							
riigri	5125	Horizontal	-41.16						
	7687.5	Н	-38.40	-25.00	Pass				
	10250	Н							

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

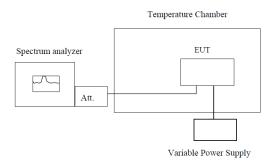
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5.7. Frequency stability V.S. Temperature measurement

LIMIT

2.5ppm

TEST CONFIGURATION



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

- 1. The equipment under test was connected to an external DC power supply and input rated voltage.
- 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
- 3. The EUT was placed inside the temperature chamber.
- Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
- 5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
- Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

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Re	ference Frequency	/: LTE Band	d 2 Middle ch	annel=188	0MHz,20MHz	Bandwidth	
			Freque	ncy error			
Power supplied (Vdc)	Temperature (°C)	QF	PSK	16	6QAM	Limit (ppm)	Result
(vuc)	(0)	Hz	ppm	Hz	ppm	(ppiii)	
	-30	6	0.0032	10	0.0053		
	-20	8	0.0043	11	0.0059		
	-10	5	0.0027	13	0.0069		
	0	7	0.0037	12	0.0064		
3.70	10	6	0.0032	11	0.0059	2.50	Pass
	20	8	0.0043	10	0.0053		
	30	5	0.0027	12	0.0064		
	40	6	0.0032	11	0.0059		
	50	7	0.0037	13	0.0069	_	
Ref	erence Frequency:	: LTE Band	4 Middle cha	ınnel=1732	2.5MHz,20MHz	Bandwidth	
	_		Freque	ncy error			
Power supplied	Temperature	QF	SK	16	6QAM	Limit	Result
(Vdc)	(°C)	Hz	ppm	Hz	ppm	(ppm)	
	-30	18	0.0104	16	0.0092		
	-20	19	0.0110	17	0.0098		
	-10	16	0.0092	15	0.0087		
	0	18	0.0104	18	0.0104	1	
3.70	10	17	0.0098	16	0.0092	2.50	Pass
-	20	16	0.0092	17	0.0098	_	
-	30	18	0.0104	15	0.0087	_	
	40	19	0.0110	14	0.0081		
	50	17	0.0098	16	0.0092	_	
Re ⁱ	ference Frequency				<u> </u>	Bandwidth	
				ncy error	, , , , , , , , , , , , , , , , , , , ,		
Power supplied	Temperature	QF	PSK .		6QAM	Limit	Result
(Vdc)	(°C)	Hz	ppm	Hz	ppm	(ppm)	
	-30	8	0.0096	8	0.0096		
-	-20	7	0.0084	9	0.0108		
ļ	-10	9	0.0108	10	0.0120		
3.70	0	8	0.0096	11	0.0132		
	10	7	0.0084	8	0.0096	2.50	Pass
	20	9	0.0108	9	0.0108		
	30	6	0.0072	11	0.0132		
		<u> </u>				-	
	40	7	0.0084	10	0.0120		

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Re	eference Frequenc	y: LTE Ban	d 7 Middle c	hannel=253	5MHz,20MHz	Bandwidth	
D	T	Frequency error				1.29	
Power supplied (Vdc)	Temperature (°C)	QF	PSK	16	QAM	Limit (ppm)	Result
(vac)	(0)	Hz	ppm	Hz	ppm	(ррііі)	
	-30	13	0.0051	26	0.0103		
	-20	11	0.0043	23	0.0091		
	-10	12	0.0047	24	0.0095		
	0	13	0.0051	25	0.0099		
3.70	10	15	0.0059	27	0.0107	2.50	Pass
	20	16	0.0063	26	0.0103		
	30	12	0.0047	22	0.0087		
	40	16	0.0063	25	0.0099		
	50	17	0.0067	23	0.0091		

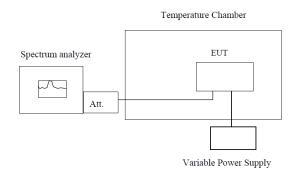
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5.8. Frequency stability V.S. Voltagemeasurement

LIMIT

2.5ppm

TEST CONFIGURATION



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

- 1. Set chamber temperature to 25°C. Use a variable DC power source topower the EUT and set the voltage to rated voltage.
- 2. Set the spectrum analyzer RBW lowenough to obtain the desired frequency resolution and recorded the frequency.
- 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, recordthe maximum frequency change.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

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Refe	erence Frequenc	y: LTE Ban	d 2 Middle c	hannel=1880	OMHz,20MHz	Bandwidth	
	Power		Frequ	ency error		Limit	
Temperature (°C)	supplied	QF	PSK	16QAM		(ppm)	Result
	(Vdc)	Hz	ppm	Hz	ppm	(PPIII)	
	4.20	8	0.0043	6	0.0032		
25	3.70	9	0.0048	7	0.0037	2.50	Pass
	3.50	8	0.0043	9	0.0048		
Refe	rence Frequency	: LTE Band	4 Middle ch	annel=1732	.5MHz,20MHz	Bandwidth	
	Power		Frequ	ency error		1.1	
Temperature (°C)	supplied	QF	PSK	16	QAM	Limit (ppm)	Result
	(Vdc)	Hz	ppm	Hz	ppm	(ррііі)	
	4.20	13	0.0075	17	0.0098		
25	3.70	12	0.0069	18	0.0104	2.50	Pass
	3.50	14	0.0081	16	0.0092		
Refe	rence Frequency	: LTE Band	d 5 Middle cl	hannel=836.	5MHz,10MHz	Bandwidth	
	Power	Frequency error			1		
Temperature (°C)	supplied	QPSK		16	QAM	Limit (ppm)	Result
	(Vdc)	Hz	ppm	Hz	ppm	(ppiii)	
	4.20	14	0.0167	21	0.0251		
25	3.70	16	0.0191	22	0.0263	2.50	Pass
	3.50	15	0.0179	21	0.0251		
Refe	erence Frequenc	y: LTE Ban	d 7 Middle c	hannel=253	5MHz,20MHz	Bandwidth	
	Power		Frequ	ency error			
Temperature (°C)	supplied	QF	PSK	16	QAM	Limit (ppm)	I RECIIIT
	(Vdc)	Hz	ppm	Hz	ppm	(ppiii)	
	4.20	16	0.0063	19	0.0075		
25	3.70	17	0.0067	20	0.0079	2.50	Pass
	3.50	16	0.0063	21	0.0083	1	

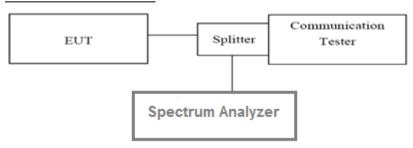
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5.9. Peak-Average Ratio

LIMIT

13dB

TEST CONFIGURATION



TEST PROCEDURE

According with KDB 971168

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. Forcontinuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burstransmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that issynced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

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LTE Band 2-20MHz								
Modulation	QPS	SK	16QAM		Limit/dD\ Danult			
Channel	1RB#	Full RB#	1RB#	Full RB#	Limit(dB)	Result		
Low	3.36	5.06	4.34	5.80	13.00	Pass		
Mid	3.78	5.08	4.46	5.82	13.00	Pass		
High	2.88	5.32	3.88	6.08	13.00	Pass		

LTE Band 4-20MHz						
Modulation	QPSK		16QAM		Limit/dD\	Docult
Channel	1RB#	Full RB#	1RB#	Full RB#	Limit(dB)	Result
Low	3.68	5.22	3.80	5.54	13.00	Pass
Mid	4.84	5.23	5.06	5.66	13.00	Pass
High	4.24	4.64	4.36	4.92	13.00	Pass

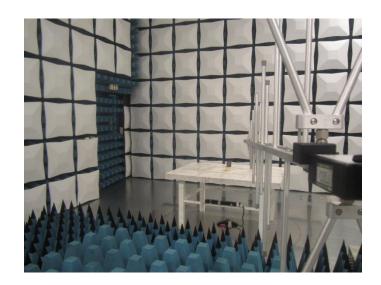
LTE Band 5-10MHz						
Modulation	QPSK		16QAM		::::::::::::::::::::::::::::::::::::	Desuit
Channel	1RB#	Full RB#	1RB#	Full RB#	Limit(dB)	Result
Low	3.54	4.50	4.50	5.32	13.00	Pass
Mid	4.20	4.82	5.10	5.60	13.00	Pass
High	4.14	4.74	4.88	5.58	13.00	Pass

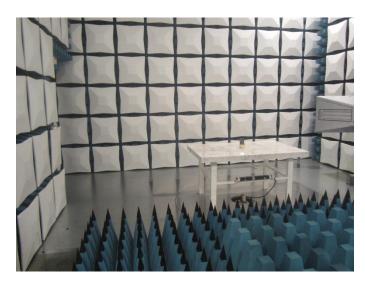
LTE Band 7-20MHz						
Modulation	QPSK		16QAM		l :: t/- D\	Dooult
Channel	1RB#	Full RB#	1RB#	Full RB#	Limit(dB)	Result
Low	1.80	4.68	2.82	5.56	13.00	Pass
Mid	2.26	4.76	3.36	5.66	13.00	Pass
High	1.76	4.44	2.52	5.26	13.00	Pass

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6. Test Setup Photos of the EUT

Radiated emission:





7. External and Internal Photos of the EUT

Reference to the test report	
	End of Report