CERTIFICATION TEST REPORT

Report Number. : 12563708-E11V3

Applicant : Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeongtong-Gu,
Suwon-Si, Gyeonggi-Do, 16677, Korea

Model : SM-G975F/DS and SM-G975F

FCC ID : A3LSMG975F

EUT Description : GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax HE 20/40/80, ANT+ and NFC

Test Standard(s) : FCC CFR47 PART 27 SUBPART M

Date Of Issue:
JANUARY 28, 2019

Prepared by:
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NVLAP Lab code: 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	1/15/2019	Initial Issue	--
V2	1/24/2019	Removed Previous Section 2, Updated Section 5.1, 5.2, and 5.4	Steven Tran
V3	1/28/2019	Updated Section 5.2, 5.4, and 5.5	Steven Tran

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	SM-G975F/DS AND SM-G975F
FCC ID	A3LSMG975F
EUT Description	GSM/WCDMA/LTE PHONE WITH BT, DTS/UNII A/B/G/N/AC/11AX HE 20/40/80, ANT+ AND NFC
Serial Number	R38KA0L98YA (Conducted); R38KA0L95XE, R38KA0L973P (Glass Radiated) R38KA092MAP. R38KA092LJB (Ceramic Radiated)
Date Tested	OCTOBER 24, 2018 to JANUARY 23, 2019
Applicable Standards	FCC CFR 47 PART 27M
Test Results	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For UL Verification Services Inc. By:	Reviewed By:
Dan Coronia Operations Leader Consumer Technology Division UL Verification Services Inc.	Steven Tran Project Engineer Consumer Technology Division UL Verification Services Inc.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26:2015, TIA-603-E, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90, FCC KDB 971168 D01 v3r1.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd
☒ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED:2324A-5)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☐ Chamber J (ISED:2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED:2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED:2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax HE 20/40/80, ANT+ and NFC. The model SM-G975F was used for final testing and is representative of the test results in this report.

5.2. MAXIMUM OUTPUT POWER

ERP/EIRP LIMIT

FCC: §2.1046, §22.913, §24.232, §27.50, §90.635

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015/ TIA-603-E Clause 2.2.17
KDB 971168 D01Section 5.6
KDB 412172 D01

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

The transmitter has a maximum average conducted and ERP / EIRP output powers as follows:

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LTE BAND BAND 7

RSS 199	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-0.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
15+10	QPSK	2507.5	2564.7	23.1	22.90	0.195	22419	22M4G7W
	16QAM			22.5	22.30	0.170	22553	22M6D7W
	64QAM			20.1	19.90	0.098		
10+20	QPSK	2505.5	2560.0	23.1	22.90	0.195	26480	26M5G7W
	16QAM			22.8	22.60	0.182	26479	26M5D7W
	64QAM			20.2	20.00	0.100		
20+10	QPSK	2510.0	2564.5	23.1	22.90	0.195	27171	27M2G7W
	16QAM			22.3	22.10	0.162	27166	27M2D7W
	64QAM			20.0	19.80	0.095		
15+15	QPSK	2507.5	2562.5	23.0	22.80	0.191	27005	27M0D7W
	16QAM			22.8	22.60	0.182	27052	27M1D7W
	64QAM			20.2	20.00	0.100		
15+20	QPSK	2507.8	2560.0	23.1	22.90	0.195	31103	31M1G7W
	16QAM			22.7	22.50	0.178	31149	31M1D7W
	64QAM			20.2	20.00	0.100		
20+15	QPSK	2510.0	2562.2	23.1	22.90	0.195	31333	31M3G7W
	16QAM			22.9	22.70	0.186	31373	31M4D7W
	64QAM			20.1	19.90	0.098		
20+20	QPSK	2510.0	2560.0	23.0	22.80	0.191	35672	35M7G7W
	16QAM			22.3	22.10	0.162	35666	35M7D7W
	64QAM			20.1	19.90	0.098		

LTE BAND BAND 38

RSS 199	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-1.40

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
15+15	QPSK	2577.5	2612.5	22.7	21.30	0.135	27170	27M2G7W
	16QAM			22.1	20.70	0.117	27116	27M1D7W
	64QAM			19.9	18.50	0.071		
20+20	QPSK	2580.0	2610.0	22.7	21.30	0.135	35728	35M7G7W
	16QAM			22.2	20.80	0.120	35737	35M7D7W
	64QAM			19.9	18.50	0.071		

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5.3. SOFTWARE AND FIRMWARE

The EUT firmware and software version installed during testing was G975F.001

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

LTE Bands	Antenna Gain (dBi)
LTE BAND 7, 2500 - 2570 MHz	-0.2
LTE BAND 38 , 2570 - 2620 MHz	-1.4

Note: The antenna gain listed above is the highest gain between the glass and ceramic samples.

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5.5. WORST-CASE CONFIGURATION AND MODE

WORST-CASE CONFIGURATION AND MODE FOR FINAL TEST

This device may be formed with two different exterior materials: Glass and Ceramic. Glass model was set for full test and additional spot check verification was done with Ceramic model for radiated harmonic spurious as documented.

The EUT supports LTE Uplink Carrier Aggregation Bands of:
Band 7C and, Band 38C

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, and 64QAM modulations. All testing was performed using QPSK, and 16QAM modulations to represent the worst case. Out of band emissions and spurious radiation were only performed on bandwidth and RB offset(with RB size 1) with the highest power for both QPSK and 16QAM.

Highest Power for Each Band				
LTE Band	Component Carrier	Bandwidth (MHz)	RB Size	RB Offset
7 (Uplink CA)	PCC	20	1	99
	SCC	15	1	0
38 (Uplink CA)	PCC	20	1	99
	SCC	20	1	0

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, & Z, and it was determined that X-Axis for 2500MHz with AC/DC Adapter and headset was worst-case orientation.

All radios that can be transmitted simultaneously have been evaluated for radiated for all possible combinations of transmission and found to be in compliance.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	EP-TA300	R3KB5B01S1SE3	N/A
USB Data Cabe	Samsung	N/A	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

I/O CABLES (RF Conducted Test)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF Out	1	Spectrum Analyzer	Shielded	None	NA
2	Antenna Port	1	EUT	Shielded	0.1m	NA
3	RF In/Out	1	Communication Test Set	Shielded	1m	NA

I/O CABLES (RF Radiated Test)

I/O Cable List						
Cable No	Port	# of identic	Connector Type	Cable Type	Cable Length	Remarks
1	USB	1	AC Adapter	Un-shielded	1.2m	No
2	Earphone	1	USB	Un-shielded	1m	No
3	RF In/out	1	Communication Test Set	Un-shielded	2m	No

TEST SETUP

The EUT is continuously communicated to the call box during the tests

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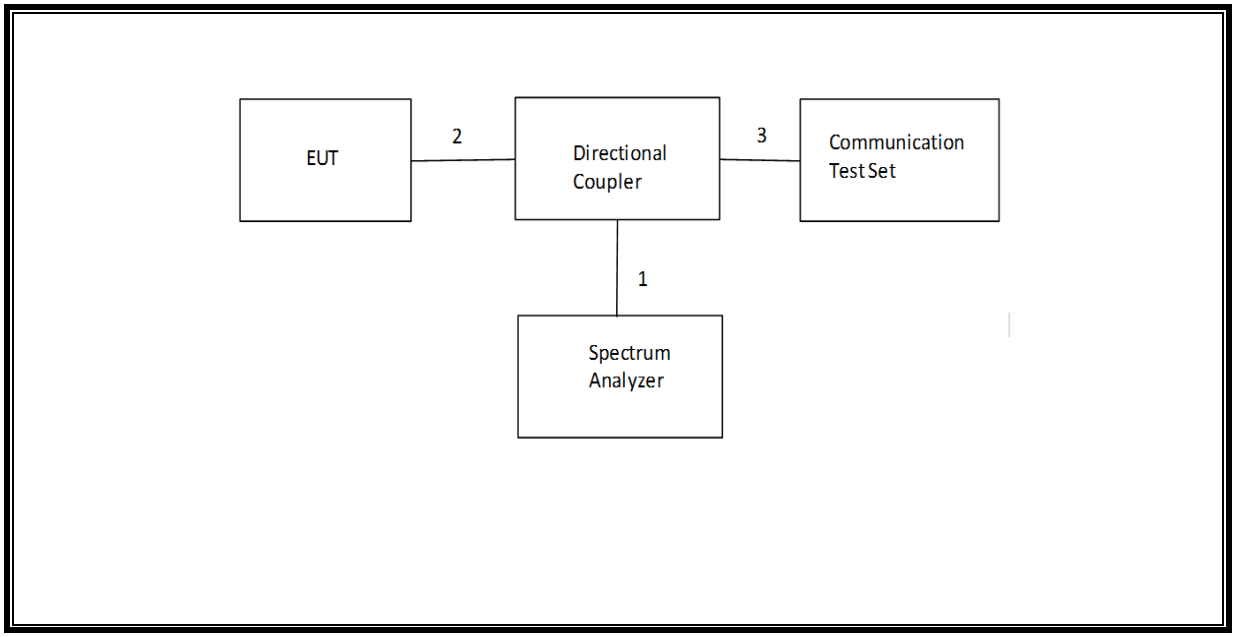
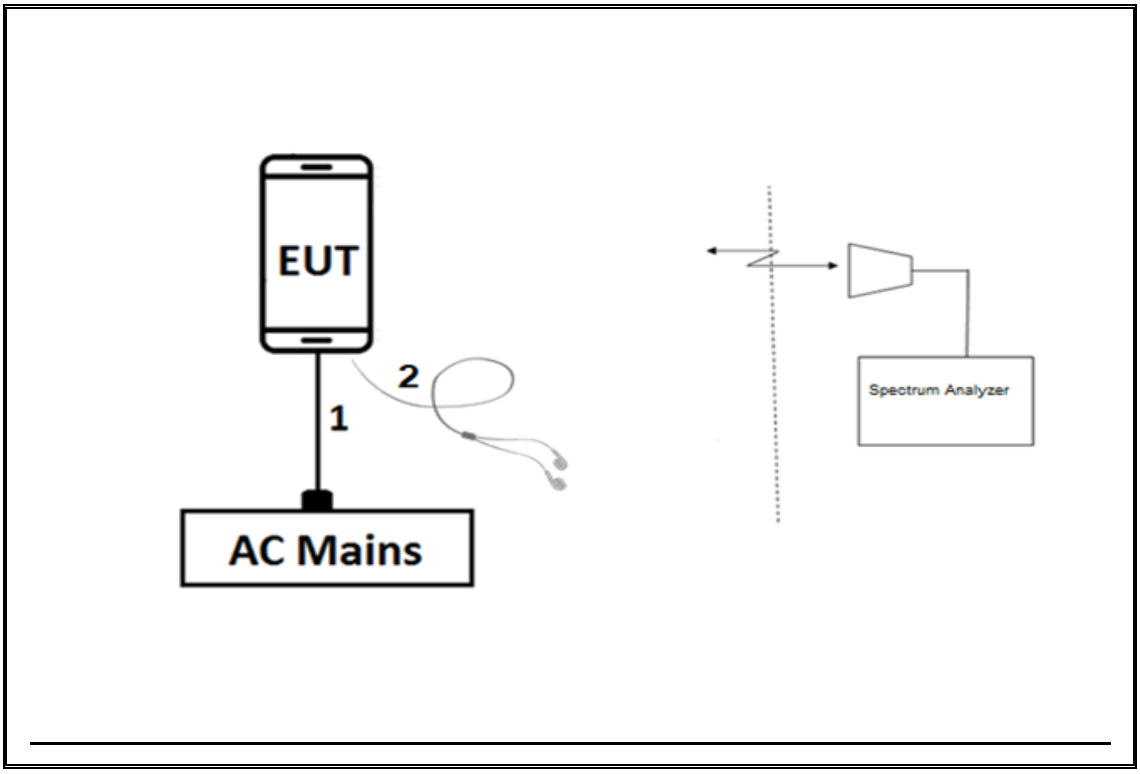
CONDUCTED TEST SETUP DIAGRAM



RADIATED TEST SETUP DIAGRAM



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Highpass Filter, 2.7 GHz	Micro-Circuits	H2G518G6	T772	07/05/19	07/05/18
Highpass Filter, 1 GHz	Micro-Tronics	HPM18129	T889	02/21/19	02/21/18
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM50114	T1852	07/16/19	07/16/18
Highpass Filter, 4GHz	Micro-Tronics	HPM13351	T1241	07/19/19	07/19/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	04/25/19	04/25/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	06/21/19	06/21/18
18 - 26.5 GHz Horn Antenna	ARA	MWH-1826/B	T477	06/16/2019	06/16/2018
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T1165	06/12/19	06/12/18
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T493	04/03/19	04/03/18
Directional Coupler	Mini-Circuits	ZUDC10-183+	T1136	06/18/19	06/18/18
Wideband Communication Test Set, Call Box	R&S	CMW500	T972	05/29/19	05/29/18
Wideband Communication Test Set, Call Box	R&S	CMW500	T1872	02/15/19	02/15/18
Wideband Communication Test Set, Call Box	R&S	CMW500	T949	02/21/19	02/21/18
Chamber, Environmental	Thermotron	SE-600-10-10	T80	02/22/19	02/22/18
Spectrum Analyzer	Agilent (Keysight) Technologies	E4446A	T146	07/18/19	07/18/18
Spectrum Analyzer	Agilent	CCS01178-1C	T200	09/11/19	09/11/18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1450	02/05/19	02/05/18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	04/16/19	04/16/18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/19	01/08/18
DC power supply, 8 V @ 3 A or 15 V @ 2 A	Agilent / HP	E3610A	None	CNR	CNR
DC power supply 15V	Sprensen	XT15-4	T463	CNR	CNR

UL AUTOMATION SOFTWARE			
CLT Software	UL	UL RF	Ver 7.6, November 11, 2017
Power Measurement Software	UL	UL RF	Ver 2.2, June 2017

NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

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7. RF OUTPUT POWER VERIFICATION

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows.

7.1. CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE

All LTE bands conducted average power is obtained from the CMW500 telecommunication test set.
The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.
UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.3.

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Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

MODES TESTED

- LTE 7
- LTE 38

RESULTS

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

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7.1.1. LTE BAND 7

ID:	44351	Date:	1/2/19

OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
15MHz / 10MHz	2507.5	2519.5	1	74	1	0	**23.1**	**22.5**	**20.1**
			1	0	1	49	14.8	15.3	14.9
			75	0	50	0	20.9	20.0	19.9
	2530.1	2542.1	1	74	1	0	22.9	22.1	20.1
			1	0	1	49	14.7	15.1	14.9
			75	0	50	0	20.7	19.7	19.8
	2552.7	2564.7	1	74	1	0	22.9	22.3	20.0
			1	0	1	49	14.6	15.0	14.9
			75	0	50	0	20.6	19.6	19.8

OUTPUT POWER FOR LTE BAND 7 (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
10MHz / 20MHz	2505.5	2519.9	1	49	1	0	**23.1**	**22.8**	**20.2**
			50	0	100	0	21.0	20.1	19.8
	2525.6	2540.0	1	49	1	0	23.0	22.5	20.2
			50	0	100	0	21.0	20.0	19.8
	2545.6	2560.0	1	49	1	0	23.0	22.6	20.2
			50	0	100	0	21.0	20.1	19.8

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
20MHz / 10MHz	2510.0	2524.4	1	99	1	0	**23.1**	**22.3**	**20.0**
			1	0	1	49	15.1	15.4	15.0
			100	0	50	0	20.9	19.9	19.9
	2530.1	2544.5	1	99	1	0	22.9	22.1	**20.0**
			1	0	1	49	14.6	15.0	14.9
			100	0	50	0	20.6	19.6	19.9
	2550.1	2564.5	1	99	1	0	22.8	22.1	**20.0**
			1	0	1	49	14.6	15.0	14.9
			100	0	50	0	20.6	19.6	19.9

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OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
15MHz / 15MHz	2507.5	2522.5	1	74	1	0	**23.0**	**22.8**	20.1
			75	0	75	0	21.0	20.1	19.8
	2527.5	2542.5	1	74	1	0	23.0	22.4	**20.2**
			75	0	75	0	21.0	20.0	19.8
	2547.5	2562.5	1	74	1	0	22.9	22.7	20.0
			75	0	75	0	20.9	20.0	19.8

OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
15MHz / 20MHz	2507.8	2524.9	1	74	1	0	**23.1**	**22.7**	20.1
			75	0	100	0	21.0	20.1	19.9
	2525.3	2542.4	1	74	1	0	22.9	22.4	**20.2**
			75	0	100	0	20.8	19.9	20.0
	2542.9	2560.0	1	74	1	0	22.9	22.7	20.1
			75	0	100	0	20.9	20.0	19.9

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
20MHz / 15MHz	2510.0	2527.1	1	99	1	0	**23.1**	**22.9**	**20.1**
			100	0	75	0	21.0	20.1	19.8
	2527.6	2544.7	1	99	1	0	22.9	22.4	**20.1**
			100	0	75	0	20.8	19.9	19.7
	2545.1	2562.2	1	99	1	0	22.9	22.7	**20.1**
			100	0	75	0	20.9	20.0	19.7

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
20MHz/ 20MHz	2510.0	2529.8	1	99	1	0	**23.0**	**22.3**	**20.1**
			1	0	1	99	14.9	15.3	14.9
			100	0	100	0	20.9	19.9	19.8
	2525.1	2544.9	1	99	1	0	**23.0**	**22.3**	**20.1**
			1	0	1	99	14.9	15.3	14.9
			100	0	100	0	20.9	19.9	19.8
	2540.2	2560.0	1	99	1	0	22.8	22.1	20.0
			1	0	1	99	14.6	15.0	14.9
			100	0	100	0	20.6	19.6	19.8

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7.1.2. LTE BAND 38

ID:	44351	Date:	11/14/18

OUTPUT POWER FOR LTE BAND 38 (15.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
15MHz / 15MHz	2577.5	2592.5	1	74	1	0	**22.7**	22.1	**19.9**
			1	0	1	74	14.3	14.8	14.5
			75	0	75	0	20.5	19.6	19.7
	2587.5	2602.5	1	74	1	0	22.7	**22.1**	**19.9**
			1	0	1	74	14.3	14.9	14.3
			75	0	75	0	20.5	19.6	19.7
	2597.5	2612.5	1	74	1	0	22.6	**22.1**	19.5
			1	0	1	74	14.3	14.8	14.2
			75	0	75	0	20.5	19.6	19.4

OUTPUT POWER FOR LTE BAND 38 (20.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power		
			Size	Offset	Size	Offset	QPSK	16QAM	64QAM
20MHz/ 20MHz	2580.0	2599.8	1	99	1	0	22.7	**22.2**	19.8
			1	0	1	99	14.5	14.9	14.5
			100	0	100	0	20.5	19.5	19.4
	2585.1	2604.9	1	99	1	0	**22.7**	22.0	**19.9**
			1	0	1	99	14.5	14.9	14.5
			100	0	100	0	20.5	19.5	19.4
	2590.2	2610.0	1	99	1	0	22.6	22.0	19.5
			1	0	1	99	14.4	14.8	14.4
			100	0	100	0	20.5	19.5	19.5

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8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only.

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

MODES TESTED

- LTE Band 7
- LTE Band 38
-

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

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LTE7

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 7	10 MHz +20 MHz, QPSK	50/0 +100/0	2535.0	26.480	29.94
	10 MHz +20 MHz, 16QAM			26.479	29.89
	15 MHz + 10 MHz, QPSK	75/0 + 50/0		22.419	25.60
	15 MHz + 10 MHz, 16QAM			22.553	25.51
	15 MHz + 15 MHz, QPSK	75/0 +75/0		27.005	30.67
	15 MHz + 15 MHz, 16QAM			27.052	30.63
	15MHz + 20 MHz, QPSK	75/0 + 100/0		31.103	35.05
	15MHz + 20 MHz, 16QAM			31.149	35.09
	20MHz + 10 MHz, QPSK	100/0 + 50/0		27.171	30.24
	20MHz + 10 MHz, 16QAM			27.166	30.10
	20MHz + 15 MHz, QPSK	100/0 +75/0		31.333	35.11
	20MHz + 15 MHz, 16QAM			31.373	35.09
	20MHz + 20 MHz, QPSK	100/0 +100/0		35.672	35.90
	20MHz + 20 MHz, 16QAM			35.666	39.98

LTE38

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 38	15 +15 MHz, QPSK	75/0 + 75/0	2595	27.170	30.83
	15 +15 MHz, 16QAM			27.116	30.75
	20 +20 MHz, QPSK	100/0 + 100/0		35.728	39.94
	20 +20 MHz, 16QAM			35.737	40.01

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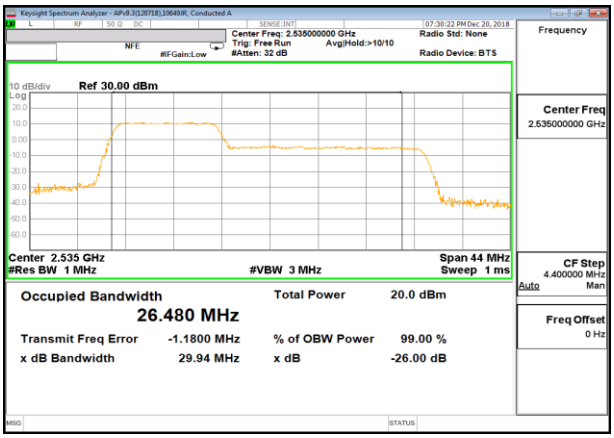
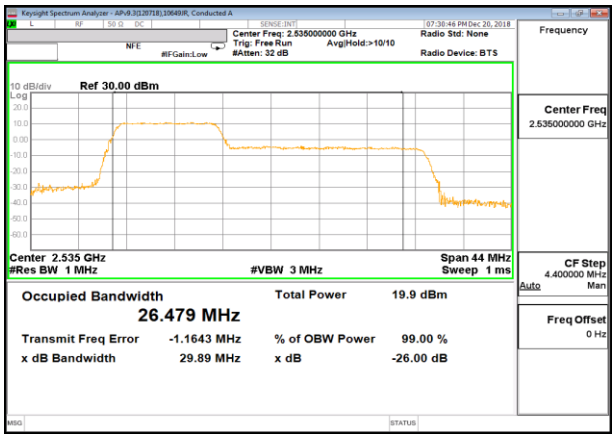
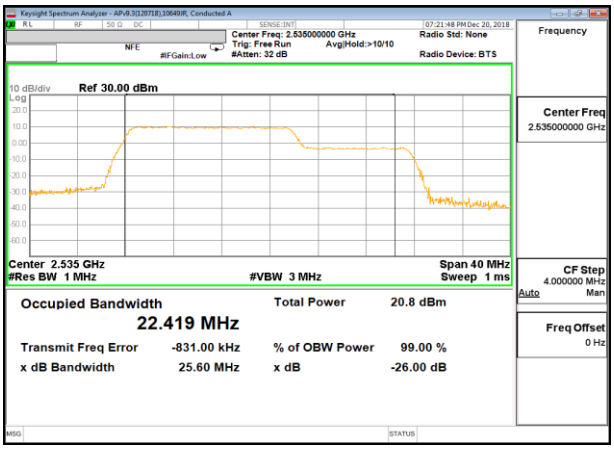
8.1.1. LTE BAND 7



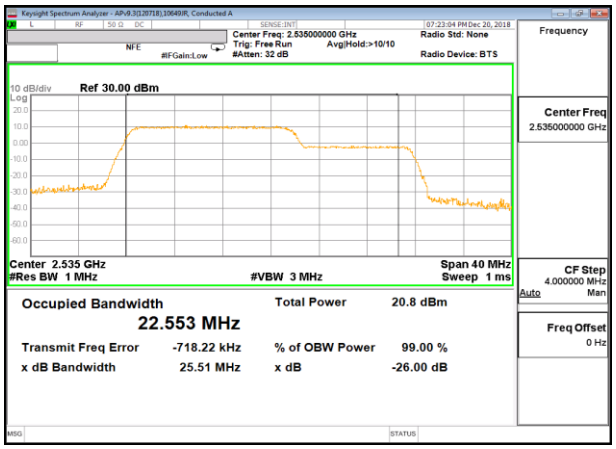
LTE B7 10MHz +20MHz QPSK Mid Channel
RB 50/0 + RB 100/0



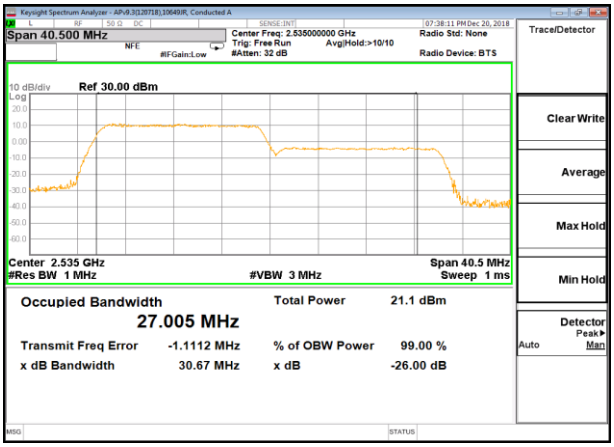
LTE B7 10MHz +20MHz 16QAM Mid Channel
RB 50/0 + RB 100/0



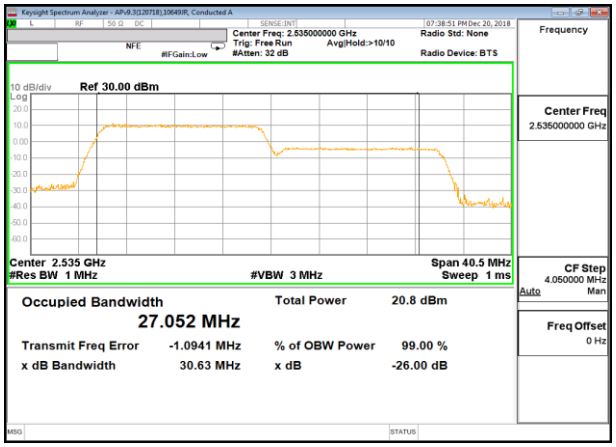
LTE B7 15MHz +10MHz QPSK Mid Channel
RB 75/0 + RB 50/0



LTE B7 15MHz +10MHz 16QAM Mid Channel
RB 75/0 + RB 50/0



LTE B7 15MHz +15MHz QPSK Mid Channel
RB 75/0 + RB 75/0



LTE B7 15MHz +15MHz 16QAM Mid Channel
RB 75/0 + RB 75/0

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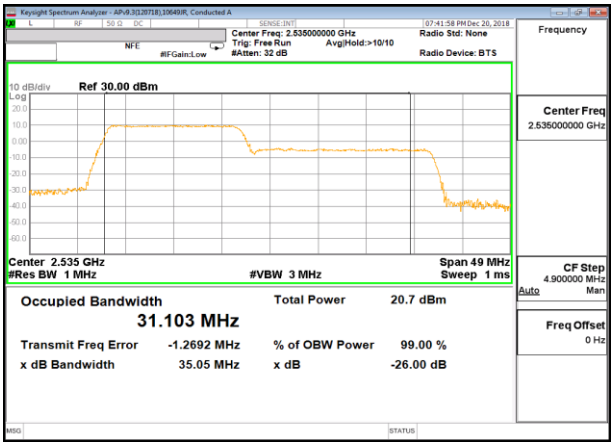
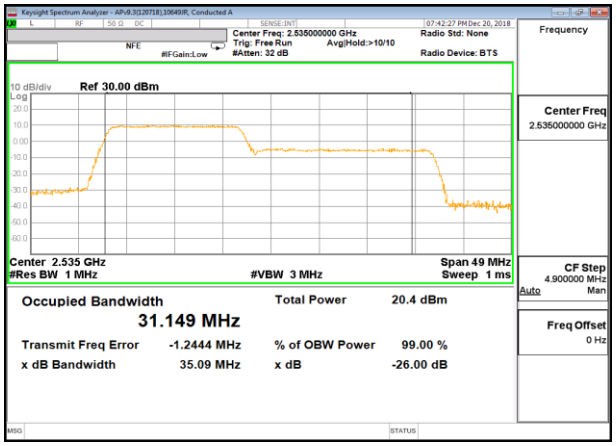
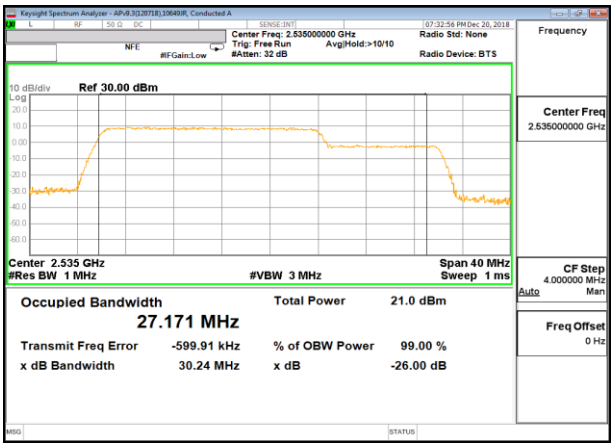


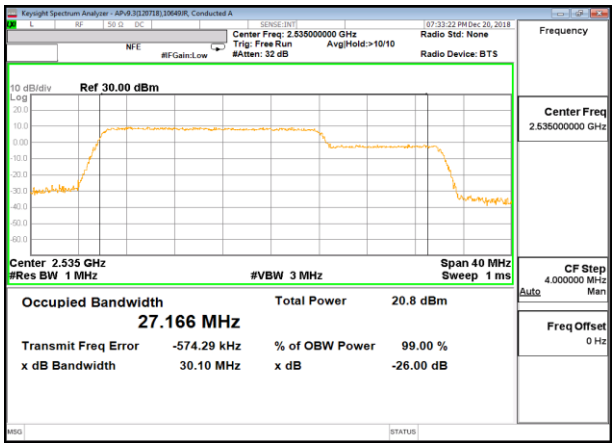
LTE B7 15MHz +20MHz QPSK Mid Channel
RB 75/0 + RB 100/0



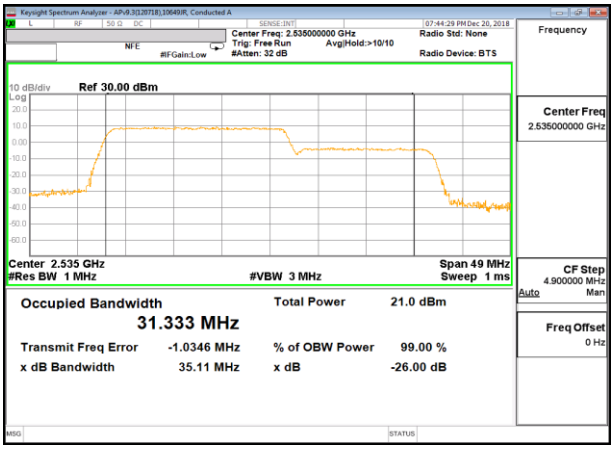
LTE B7 15MHz +20MHz 16QAM Mid Channel
RB 75/0 + RB 100/0



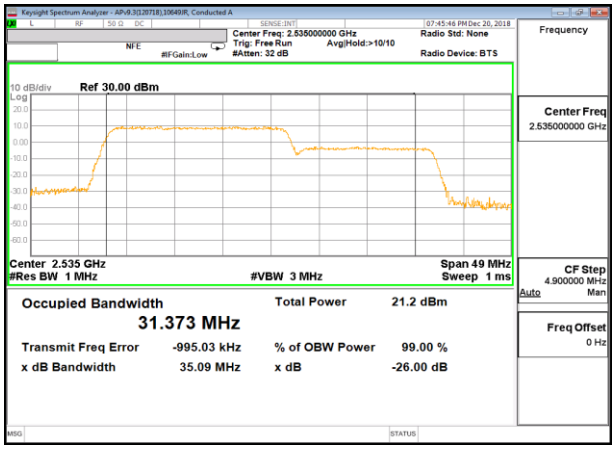
LTE B7 20MHz +10MHz QPSK Mid Channel
RB 100/0 + RB 50/0



LTE B7 20MHz +10MHz 16QAM Mid Channel
RB 100/0 + RB 50/0



LTE B7 20MHz +15MHz QPSK Mid Channel
RB 100/0 + RB 75/0



LTE B7 20MHz +15MHz 16QAM Mid Channel
RB 100/0 + RB 75/0

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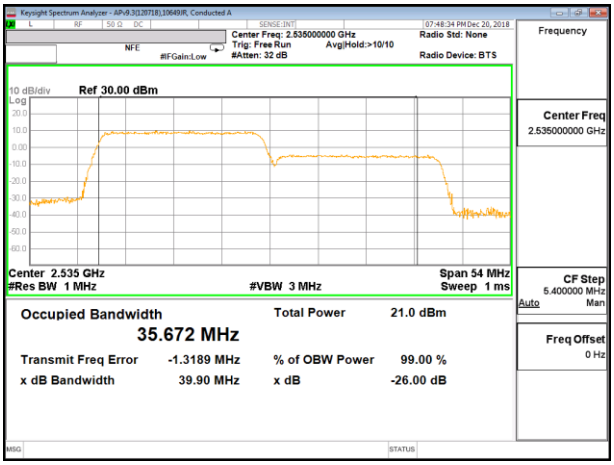
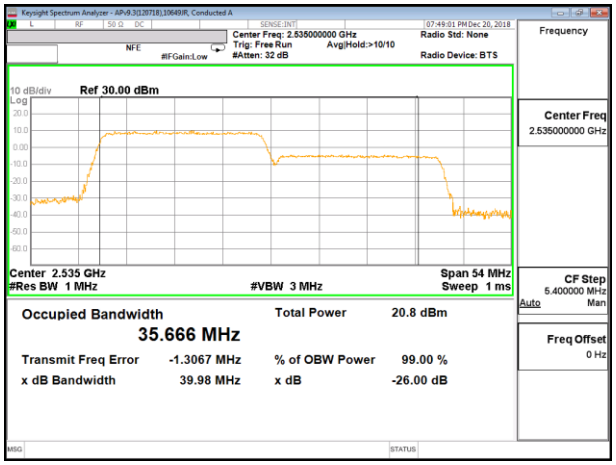


LTE B7 20MHz +20MHz QPSK Mid Channel
RB 100/0 + RB 100/0



LTE B7 20MHz +20MHz 16QAM Mid Channel
RB 100/0 + RB 100/0

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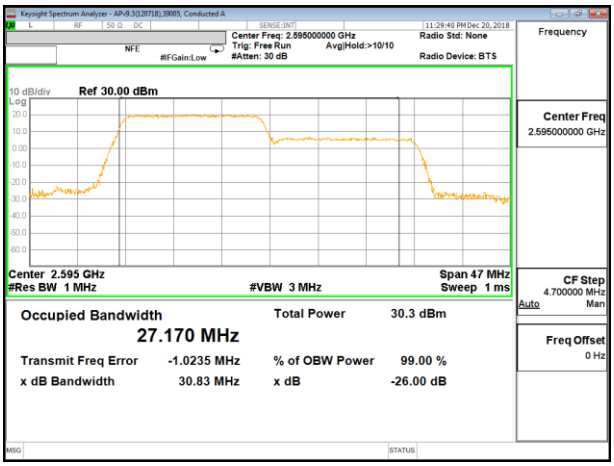
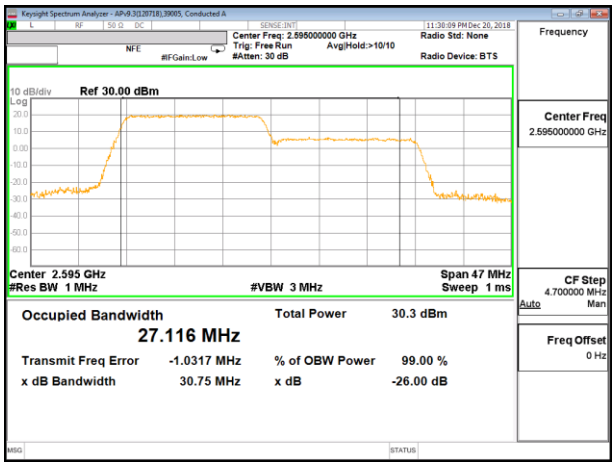
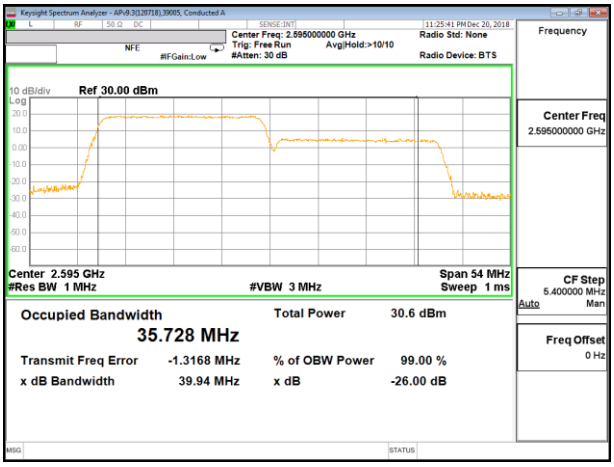
8.1.2. LTE BAND 38



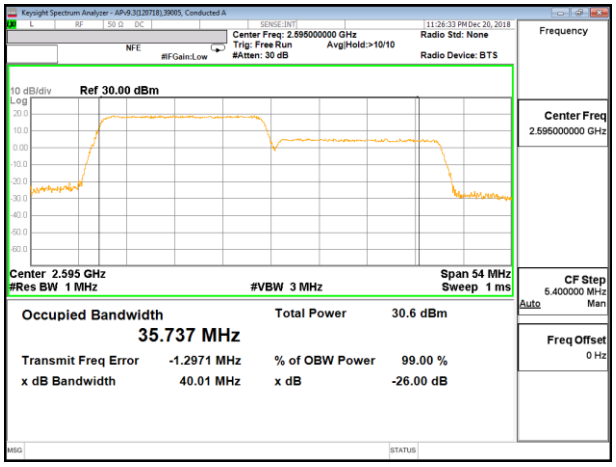
LTE B38 15MHz +15MHz QPSK Mid Channel RB 75/0 + RB 75/0



LTE B38 15MHz +15MHz 16QAM Mid Channel RB 75/0 + RB 75/0



LTE B38 20MHz +20MHz QPSK Mid Channel RB 100/0 + RB 100/0



LTE B38 20MHz +20MHz 16QAM Mid Channel RB 100/0 + RB 1000

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8.2. BAND EDGE AND EMISSION MASK

RULE PART(S)
FCC: §2.1051 and §27.53

LIMITS
FCC: §27.53 (Band 7, 41)
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE
The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

- LTE Band 7
- LTE Band 38

RESULTS

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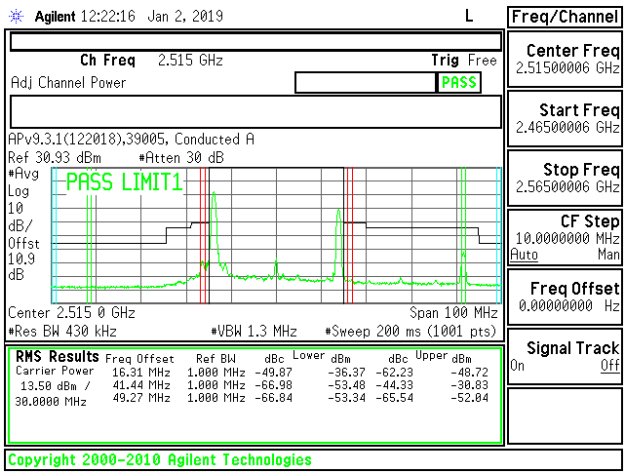
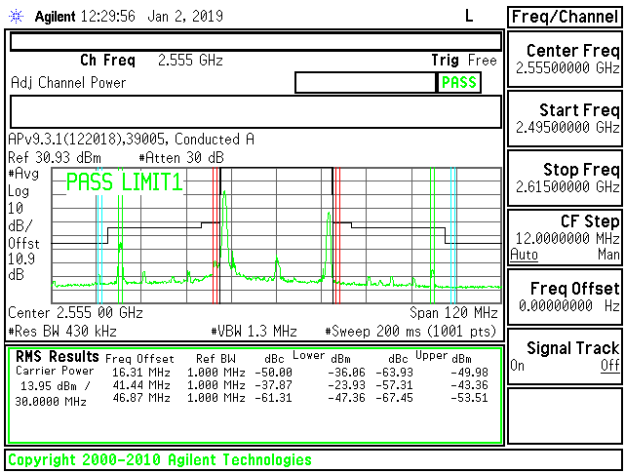
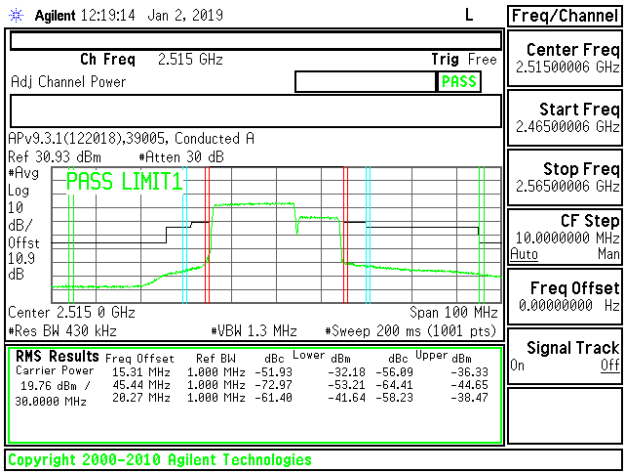
8.2.1. LTE BAND 7 ADJACENT CHANNEL POWER



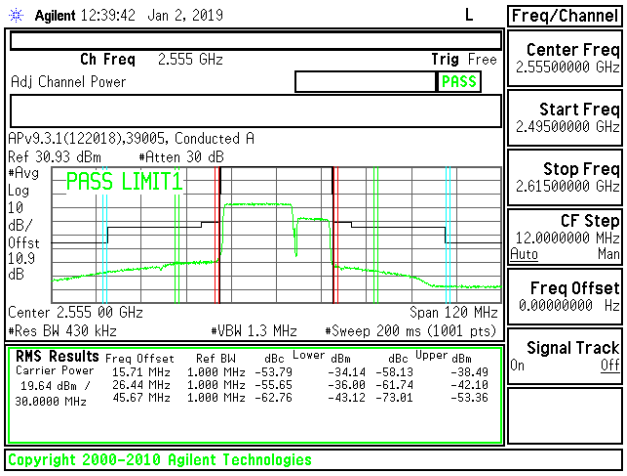
LTE B7 20MHz + 10MHz QPSK Low Ch RB1-0 + RB1-49



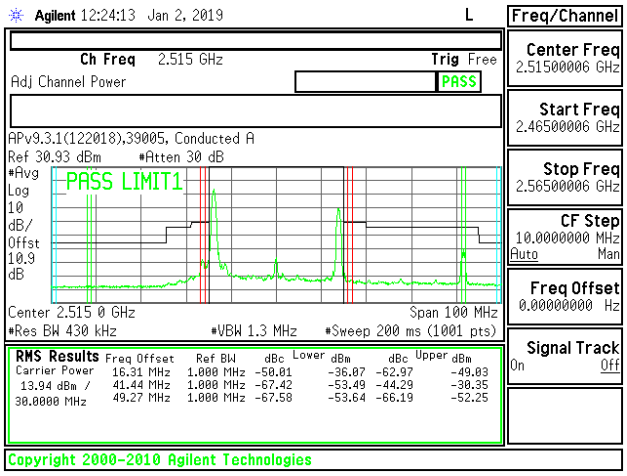
LTE B7 20MHz + 10MHz QPSK High Ch RB1-0 + RB1-49



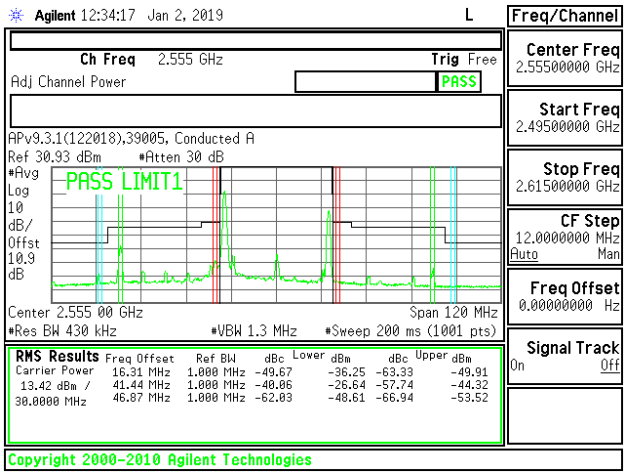
LTE B7 20MHz + 10MHz QPSK Low Ch RB100-0 + RB50-0



LTE B7 20MHz + 10MHz QPSK High Ch RB100-0 + RB50-0



LTE B7 20MHz + 10MHz 16QAM Low Ch RB1-0 + RB1-49



LTE B7 20MHz + 10MHz 16QAM High Ch RB1-0 + RB1-49

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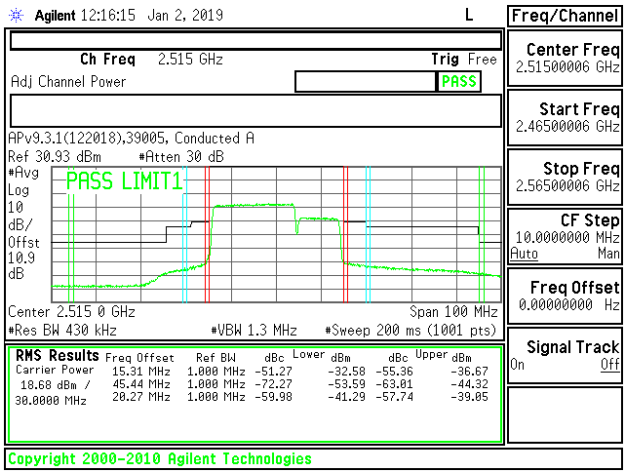
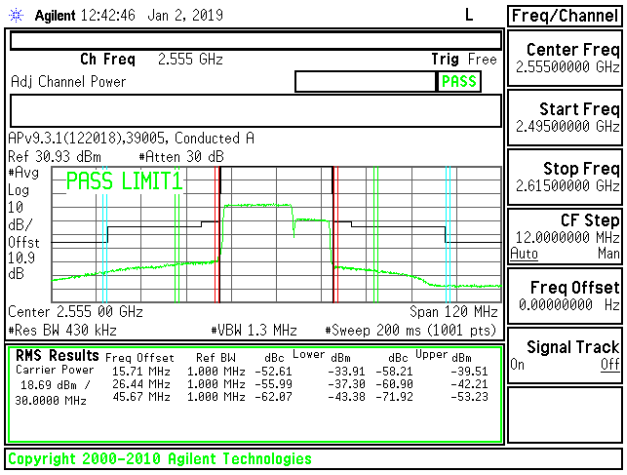


LTE B7 20MHz + 10MHz 16QAM Low Ch RB100-0 + RB50-0



LTE B7 20MHz + 10MHz 16QAM High Ch RB100-0 + RB50-0

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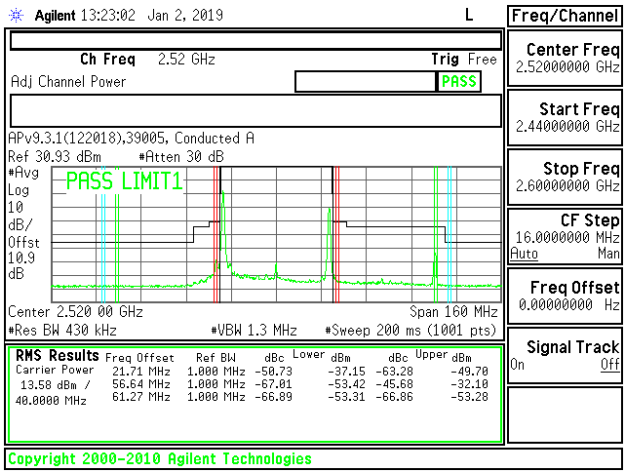
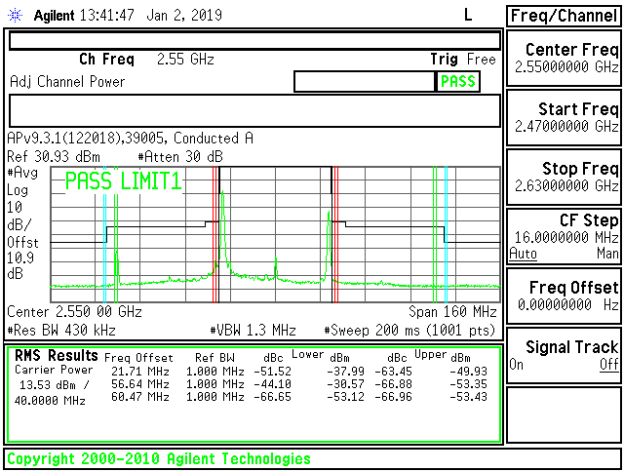


LTE B7 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



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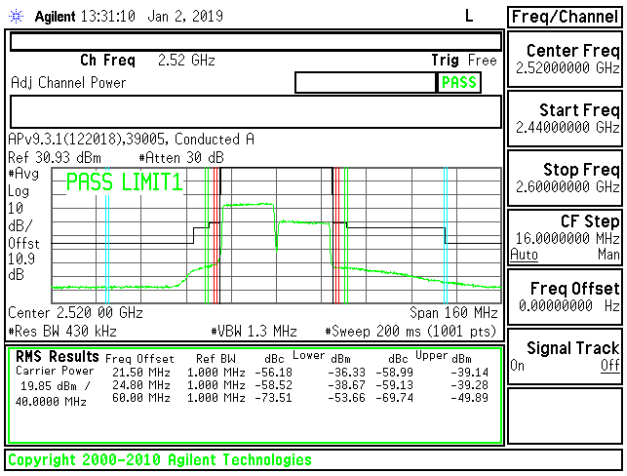

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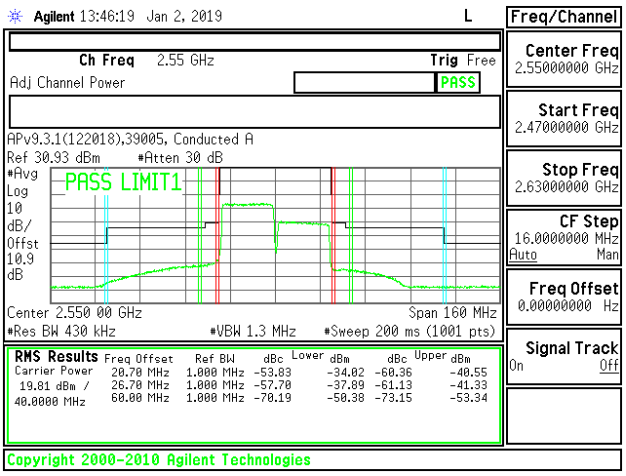

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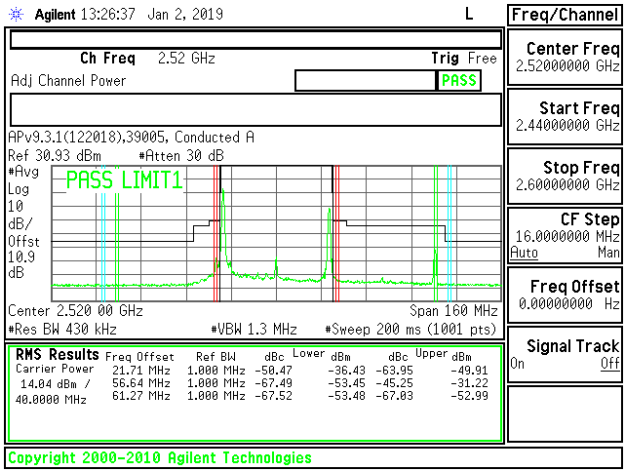
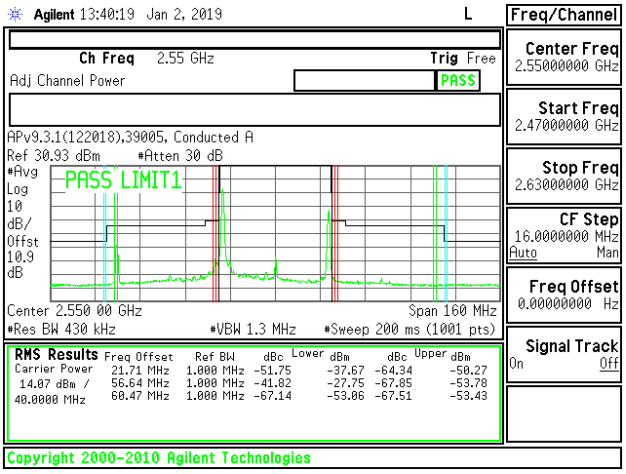


LTE B7 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



LTE B7 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99

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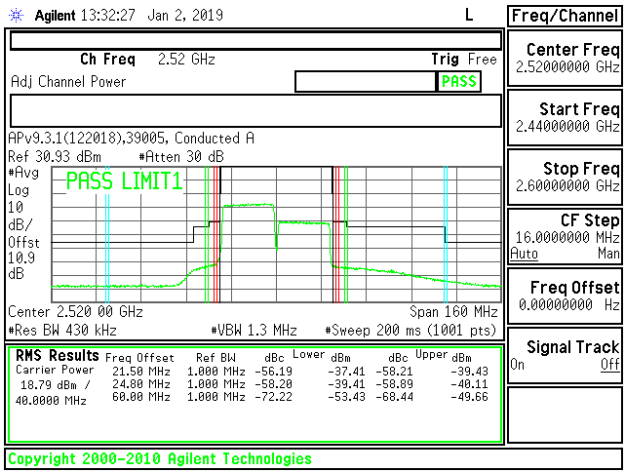
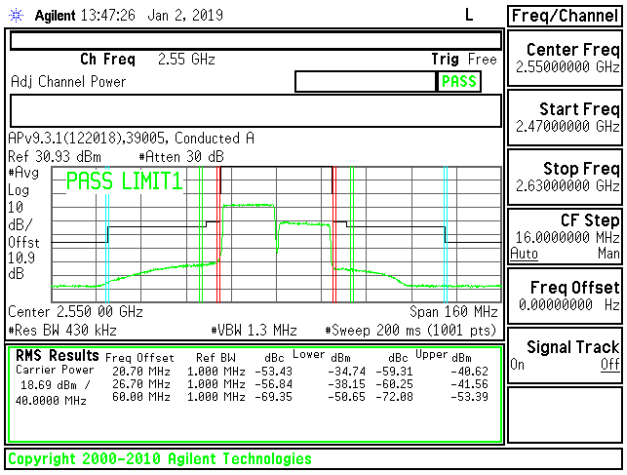


LTE B7 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



LTE B7 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

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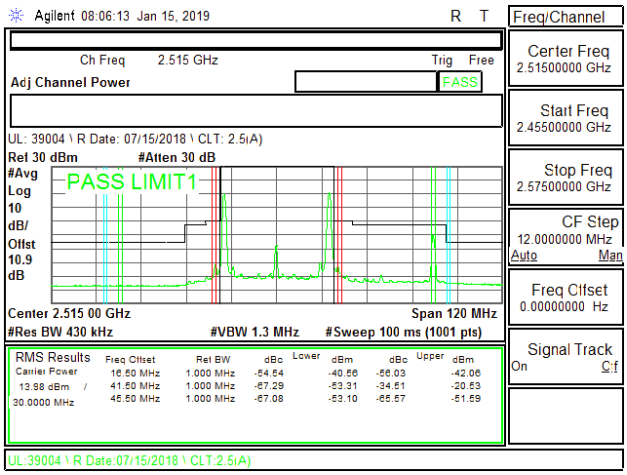
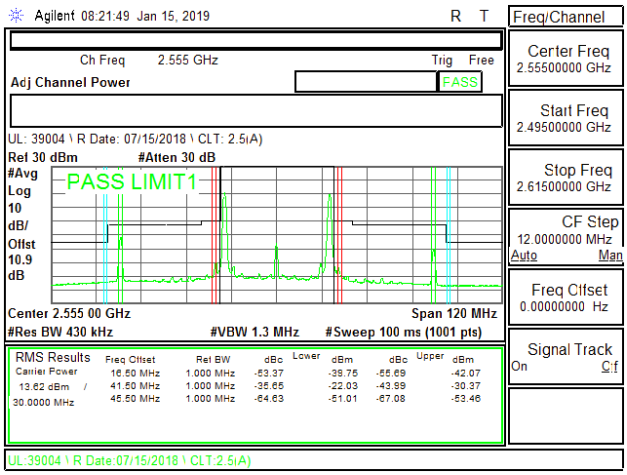
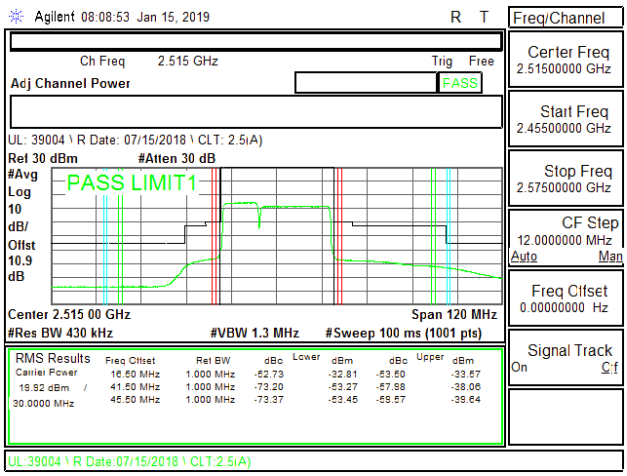


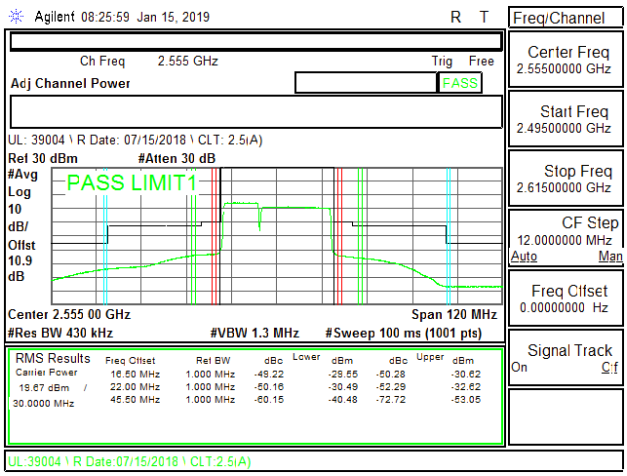
LTE B7 10MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



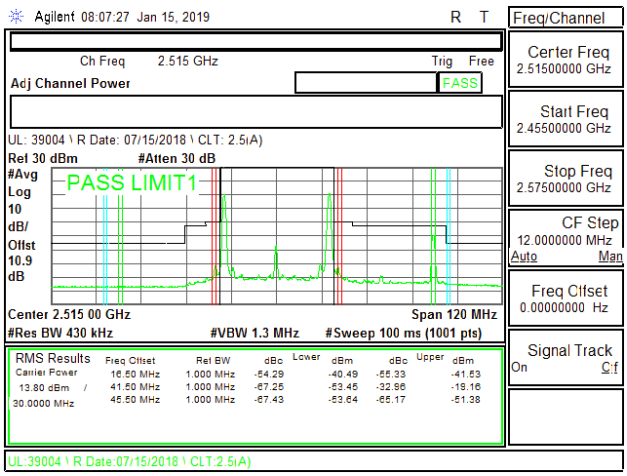
LTE B7 10MHz + 20MHz QPSK High Ch RB1-0 + RB1-9



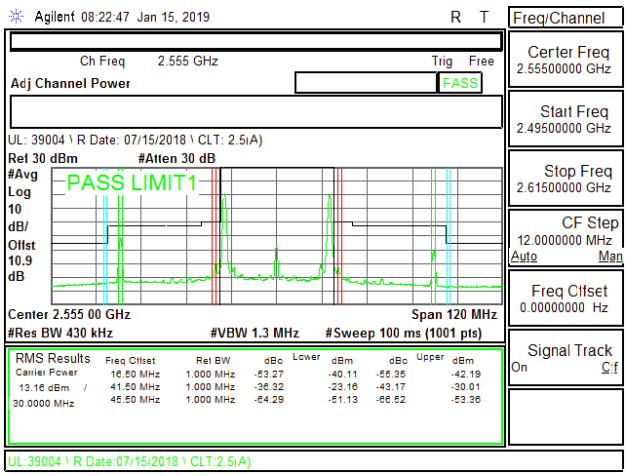
LTE B7 10MHz + 20MHz QPSK Low Ch RB50-0 + RB100-0



LTE B7 10MHz + 20MHz QPSK High Ch RB50-0 + RB100-0



LTE B7 10MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



LTE B7 10MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99

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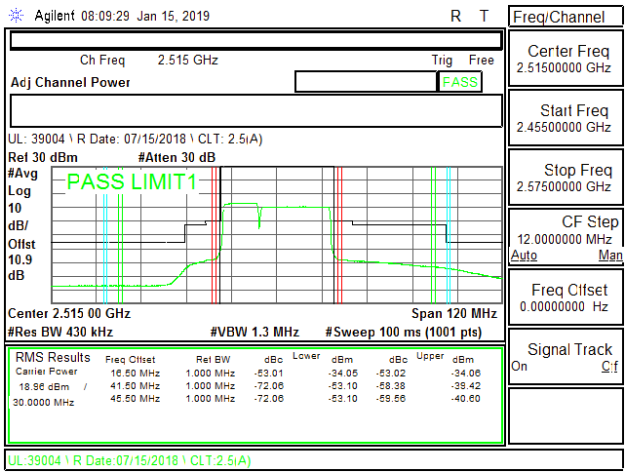
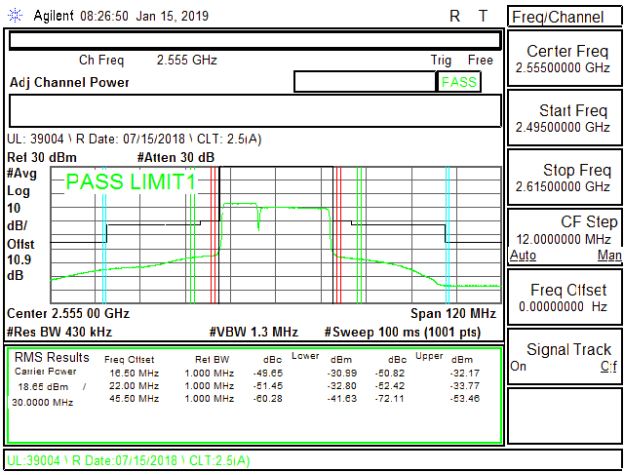


LTE B7 10MHz + 20MHz 16QAM Low Ch RB50-0 + RB100-0



LTE B7 10MHz + 20MHz 16QAM High Ch RB50-0 + RB100-0

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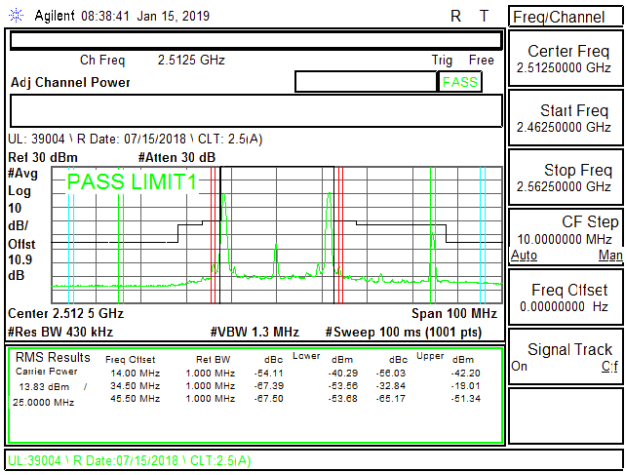
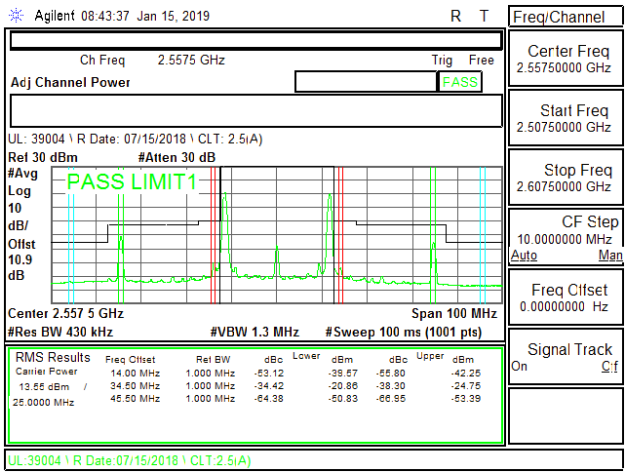
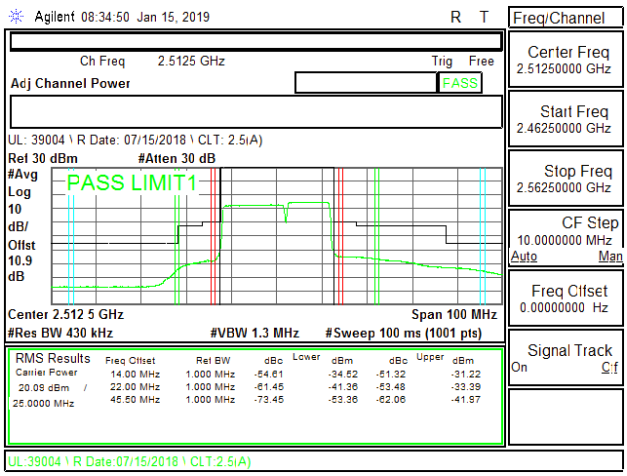


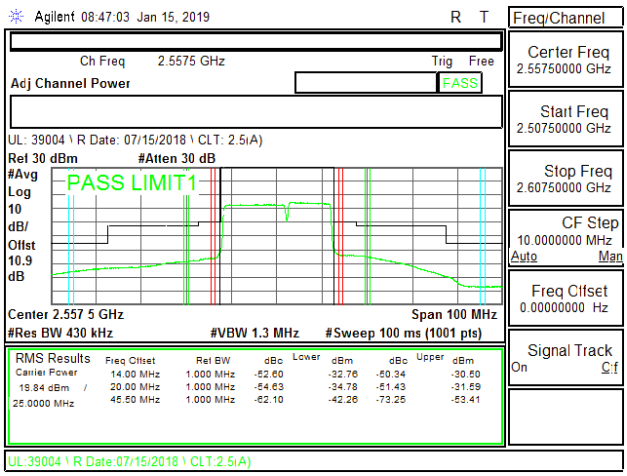
LTE B7 15MHz + 10MHz QPSK Low Ch RB1-0 + RB1-49



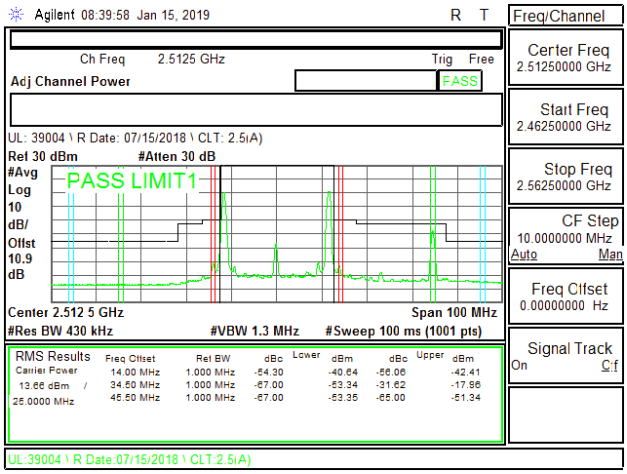
LTE B7 15MHz + 10MHz QPSK High Ch RB1-0 + RB1-49



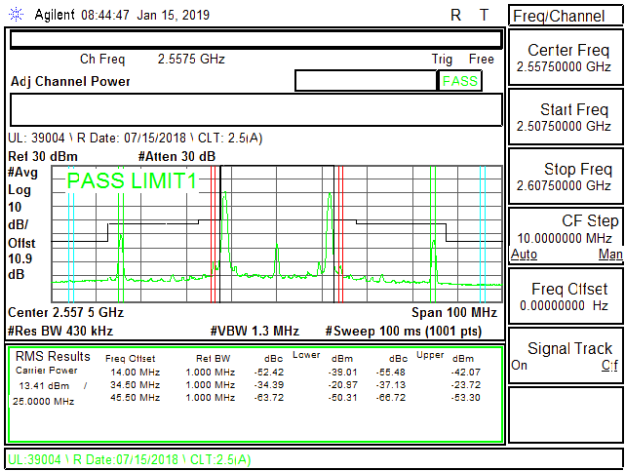
LTE B7 15MHz + 10MHz QPSK Low Ch RB75-0 + RB50-0



LTE B7 15MHz + 10MHz QPSK High Ch RB75-0 + RB50-0



LTE B7 15MHz + 10MHz 16QAM Low Ch RB1-0 + RB1-49



LTE B7 15MHz + 10MHz 16QAM High Ch RB1-0 + RB1-49

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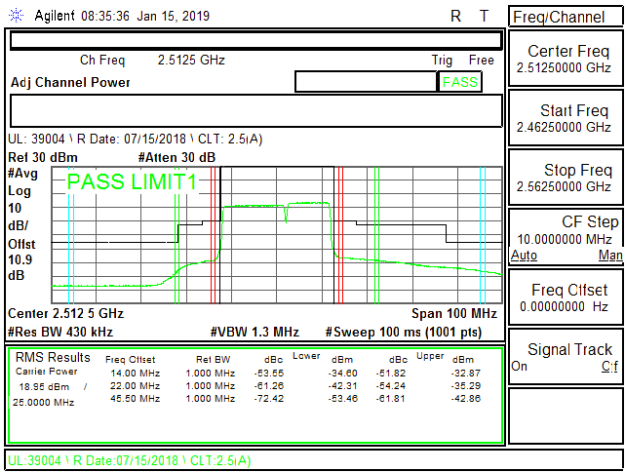
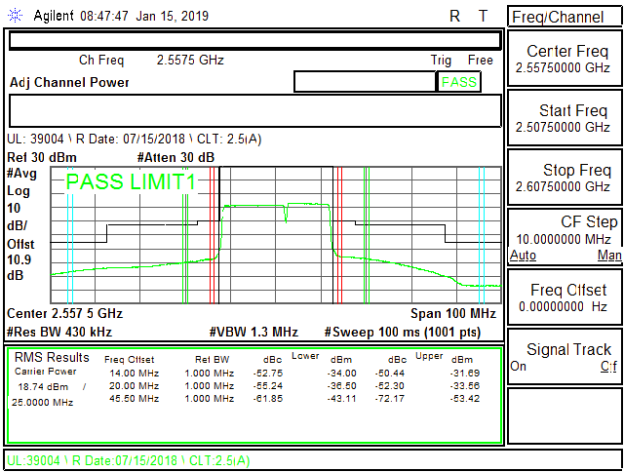


LTE B7 15MHz + 10MHz 16QAM Low Ch RB75-0 + RB50-0



LTE B7 15MHz + 10MHz 16QAM High Ch RB75-0 + RB50-0

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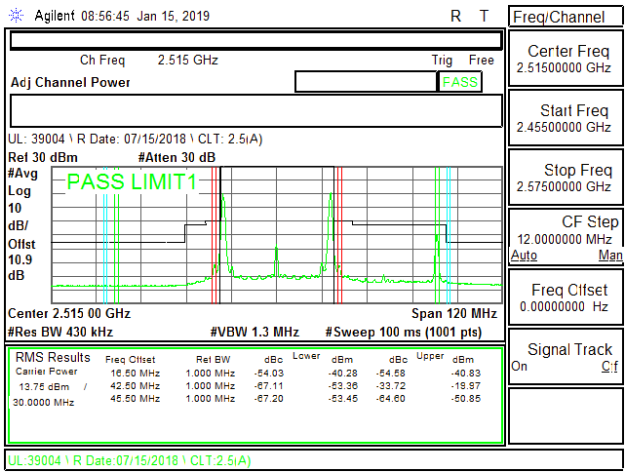
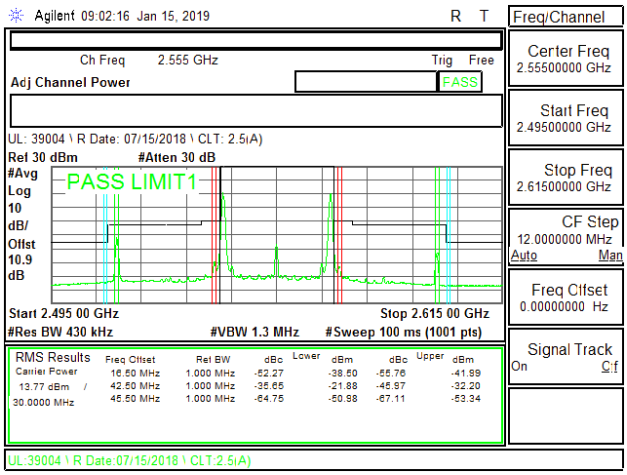
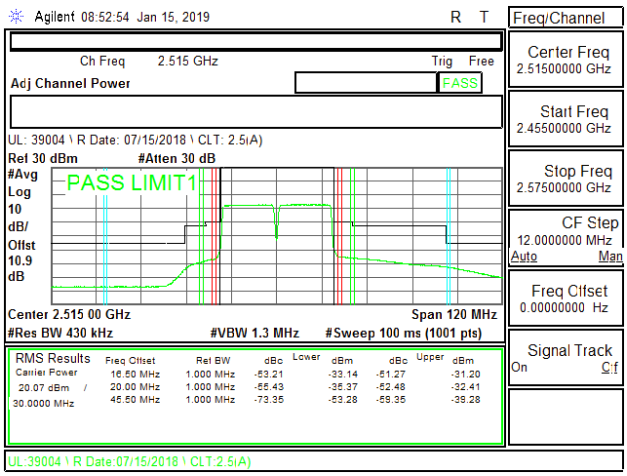


LTE B7 15MHz + 15MHz QPSK Low Ch RB1-0 + RB1-74



LTE B7 15MHz + 15MHz QPSK High Ch RB1-0 + RB1-74



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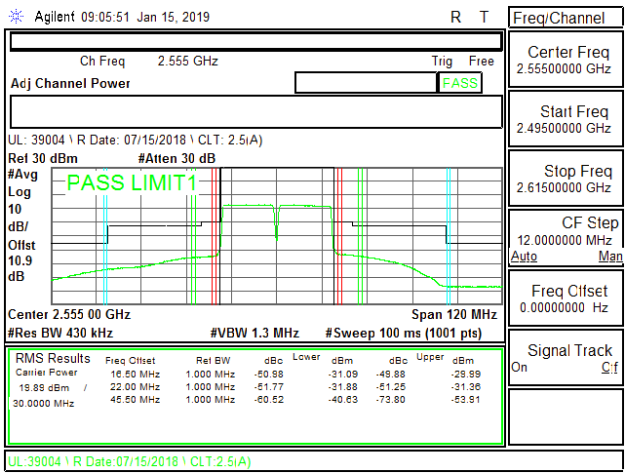

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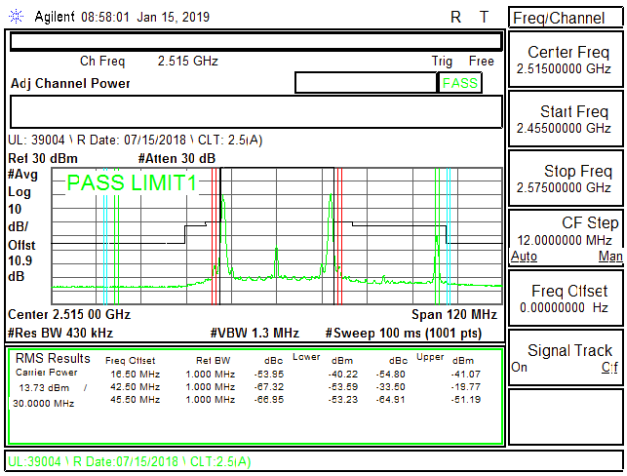
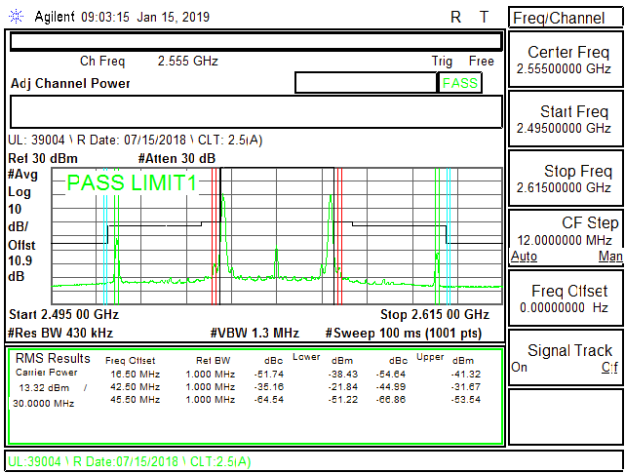


LTE B7 15MHz + 15MHz 16QAM Low Ch RB1-0 + RB1-74



LTE B7 15MHz + 15MHz 16QAM High Ch RB1-0 + RB1-74

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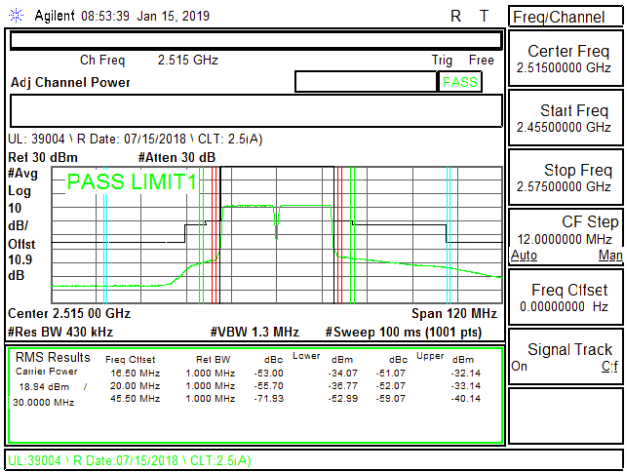
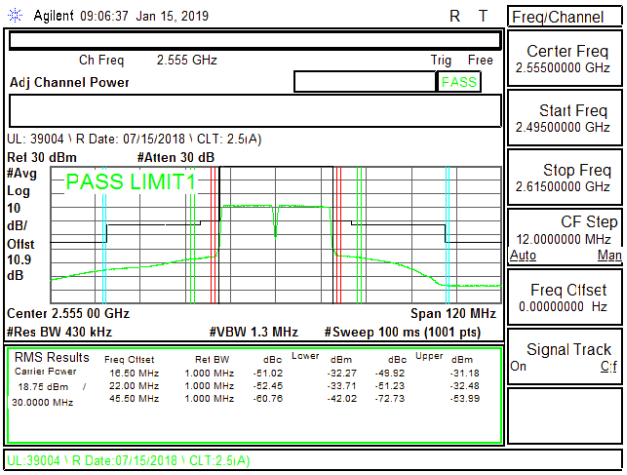


LTE B7 15MHz + 15MHz 16QAM Low Ch RB75-0 + RB75-0



LTE B7 15MHz + 15MHz 16QAM High Ch RB75-0 + RB75-0

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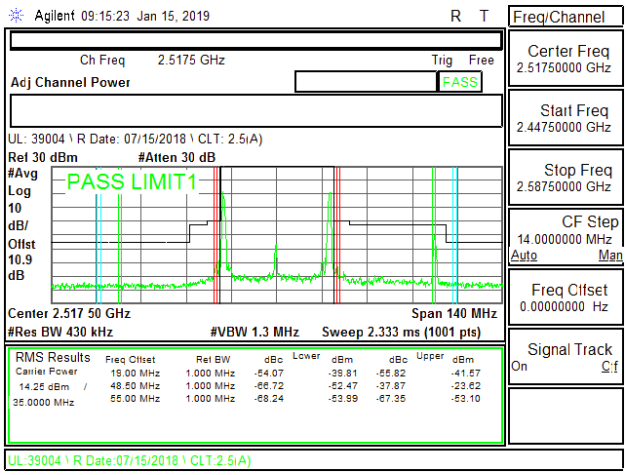
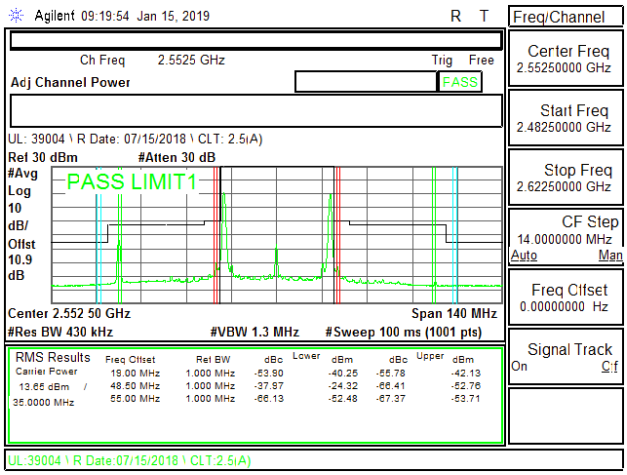
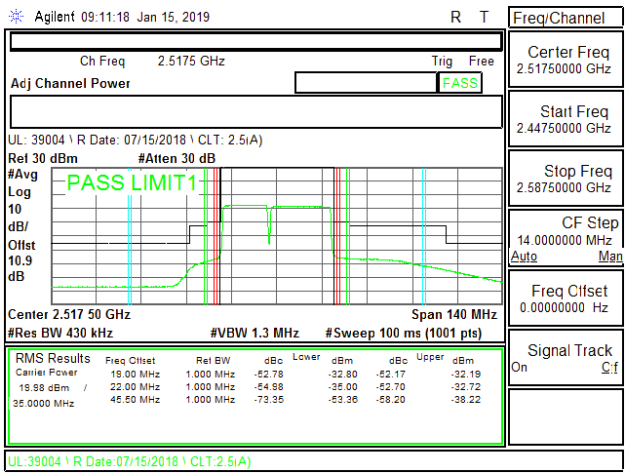


LTE B7 15MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



LTE B7 15MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



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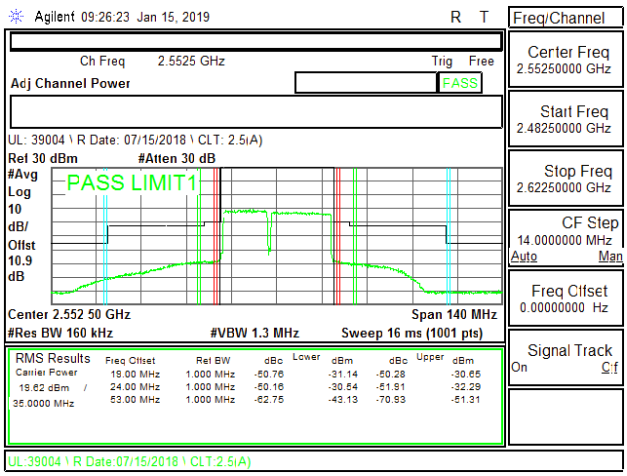
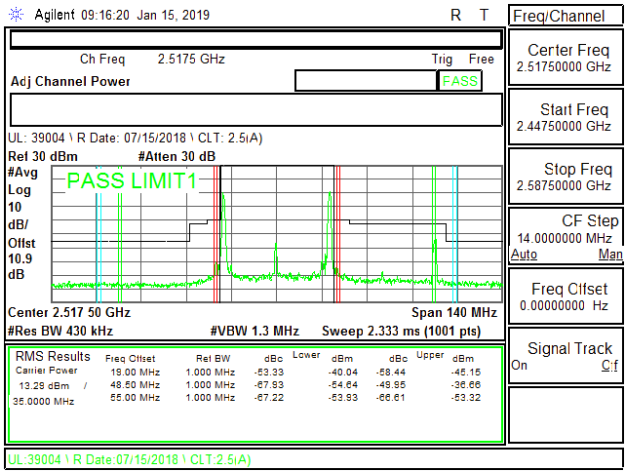
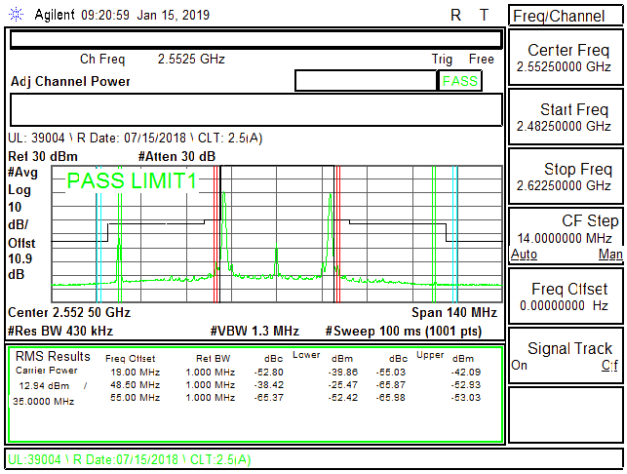


LTE B7 15MHz + 20MHz QPSK High Ch RB75-0 + RB100-0



LTE B7 15MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



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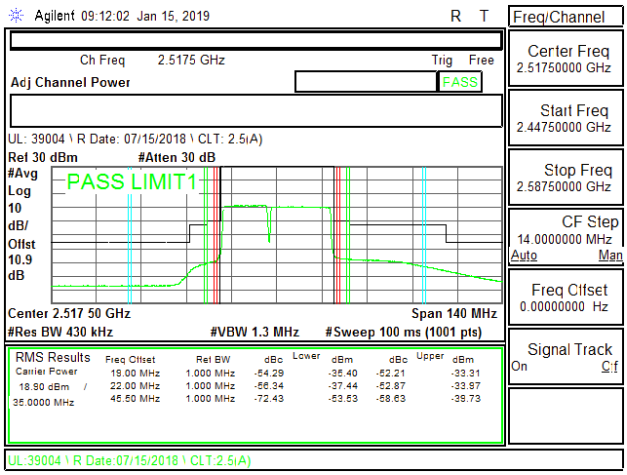
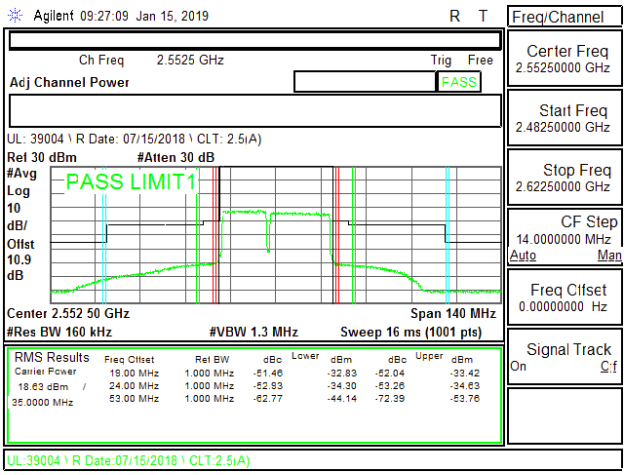


LTE B7 15MHz + 20MHz 16QAM Low Ch RB75-0 + RB100-0



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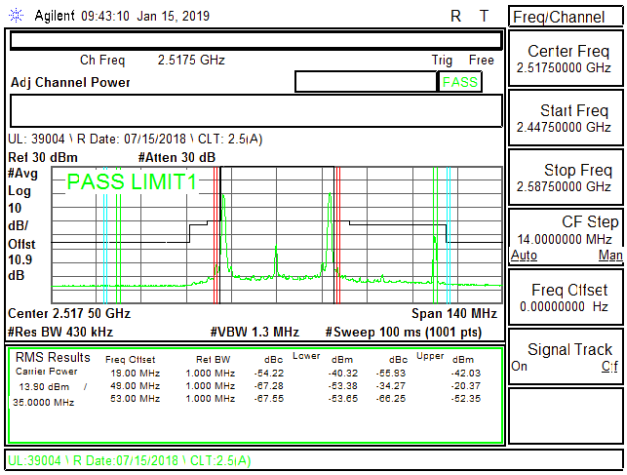
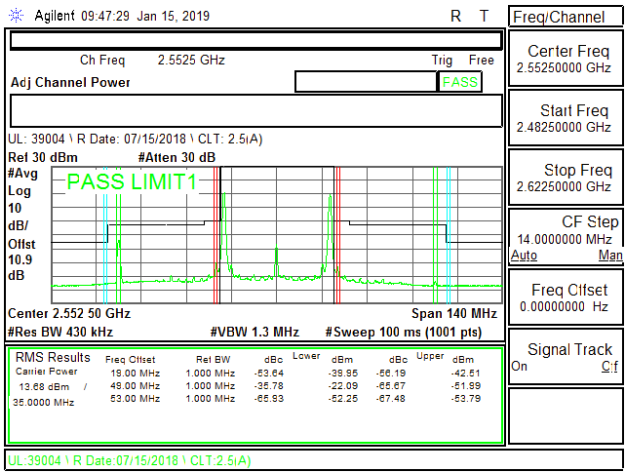
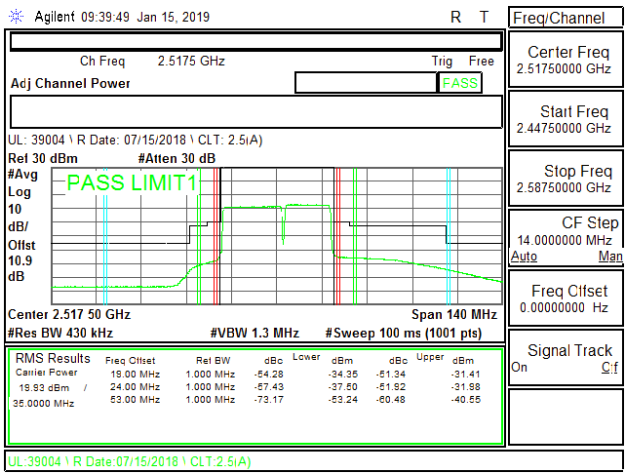


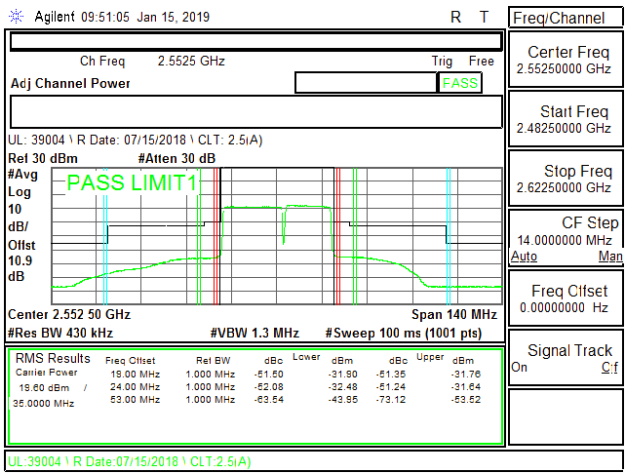
LTE B7 20MHz + 15MHz QPSK Low Ch RB1-0 + RB1-74



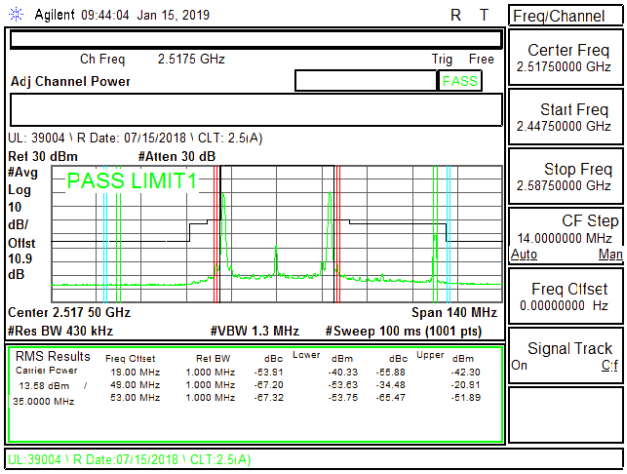
LTE B7 20MHz + 15MHz QPSK High Ch RB1-0 + RB1-74



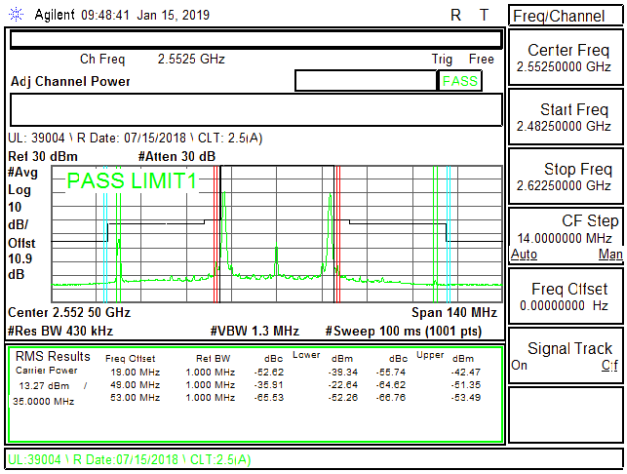
LTE B7 20MHz + 15MHz QPSK Low Ch RB100-0 + RB75-0



LTE B7 20MHz + 15MHz QPSK High Ch RB100-0 + RB75-0



LTE B7 20MHz + 15MHz 16QAM Low Ch RB1-0 + RB1-74



LTE B7 20MHz + 15MHz 16QAM High Ch RB1-0 + RB1-74

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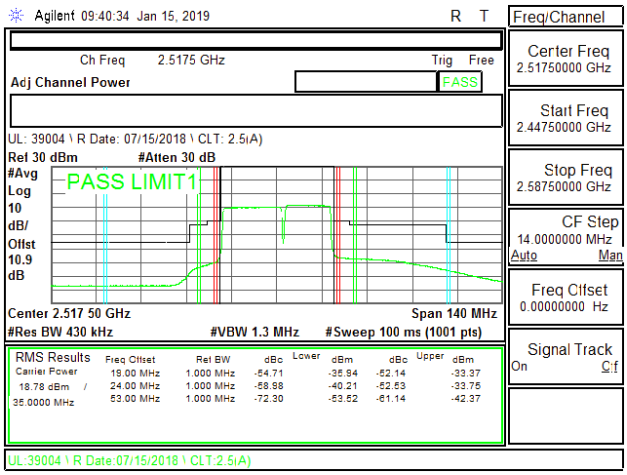
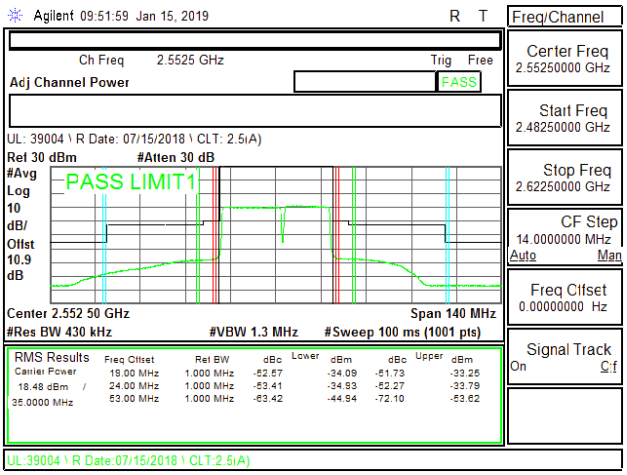


LTE B7 20MHz + 15MHz 16QAM Low Ch RB100-0 + RB75-0



LTE B7 20MHz + 15MHz 16QAM High Ch RB100-0 + RB75-0

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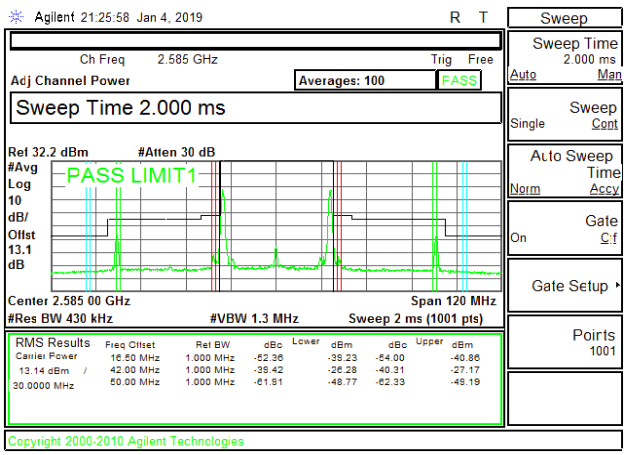
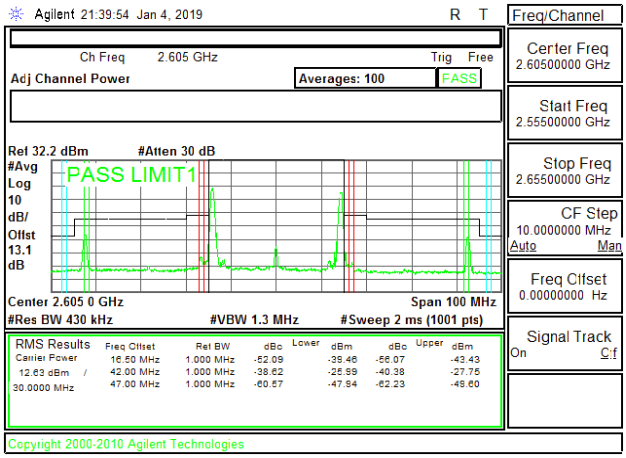
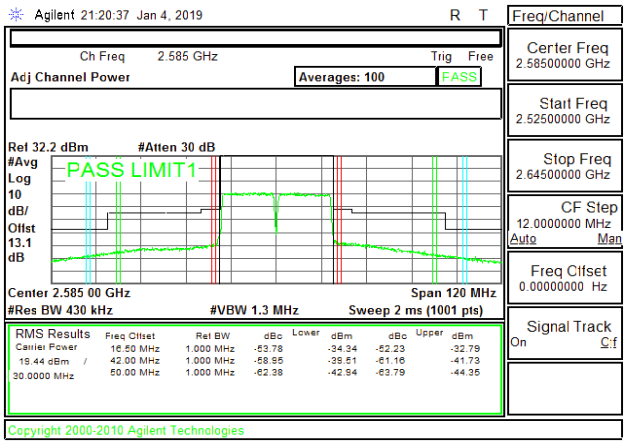
8.2.2. LTE BAND 38 ADJACENT CHANNEL POWER



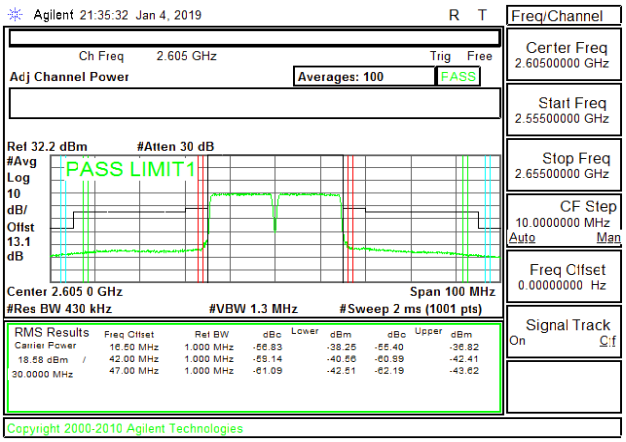
LTE B38 15MHz + 15MHz QPSK Low Ch RB1-0 + RB1-74



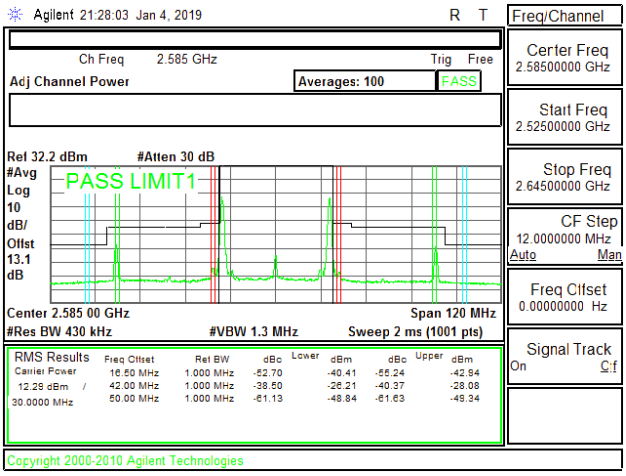
LTE B38 15MHz + 15MHz QPSK High Ch RB1-0 + RB1-74



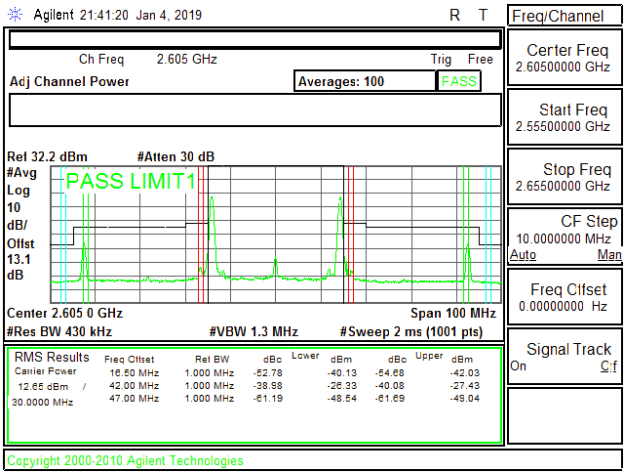
LTE B38 15MHz + 15MHz QPSK Low Ch RB75-0 + RB75-0



LTE B38 15MHz + 15MHz QPSK High Ch RB75-0 + RB75-0



LTE B38 15MHz + 15MHz 16QAM Low Ch RB1-0 + RB1-74



LTE B38 15MHz + 15MHz 16QAM High Ch RB1-0 + RB1-74

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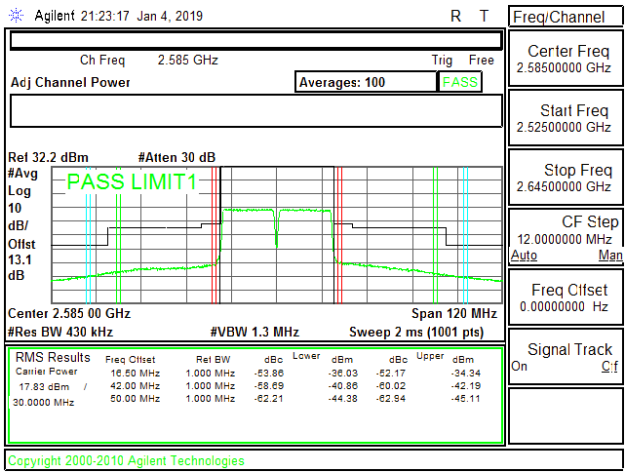
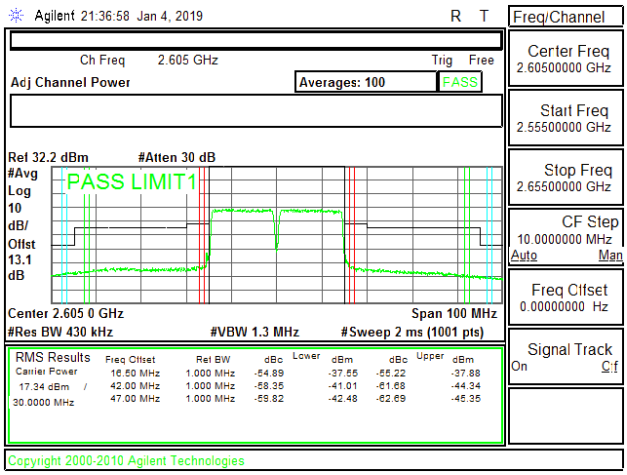


LTE B38 15MHz + 15MHz 16QAM Low Ch RB75-0 + RB75-0



LTE B38 15MHz + 15MHz 16QAM High Ch RB75-0 + RB75-0

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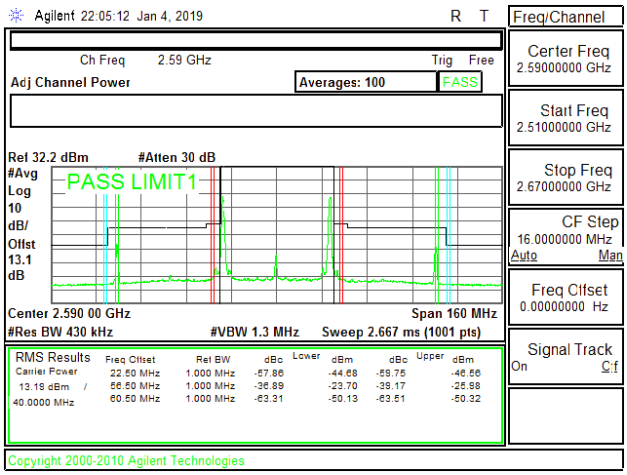
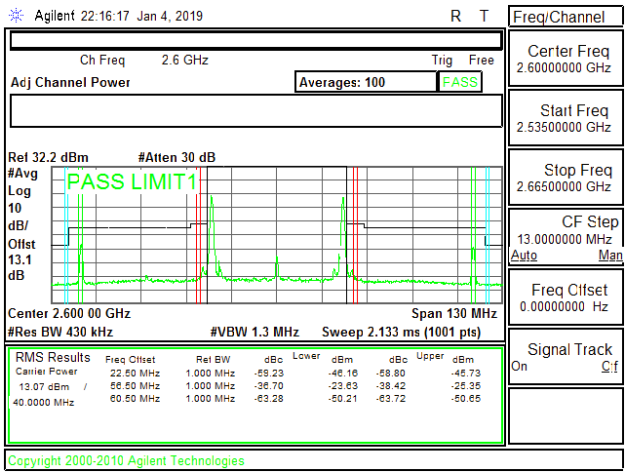
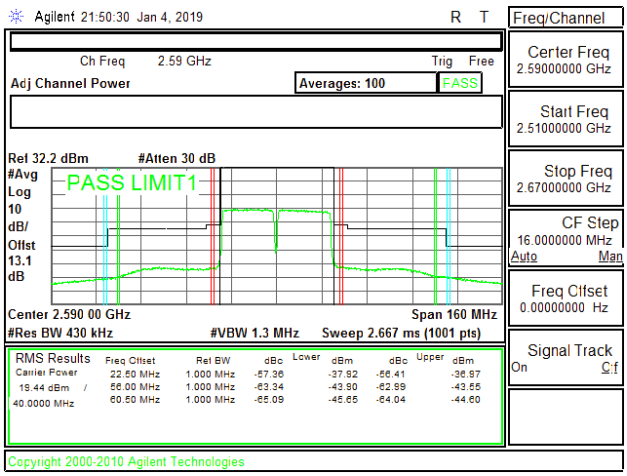


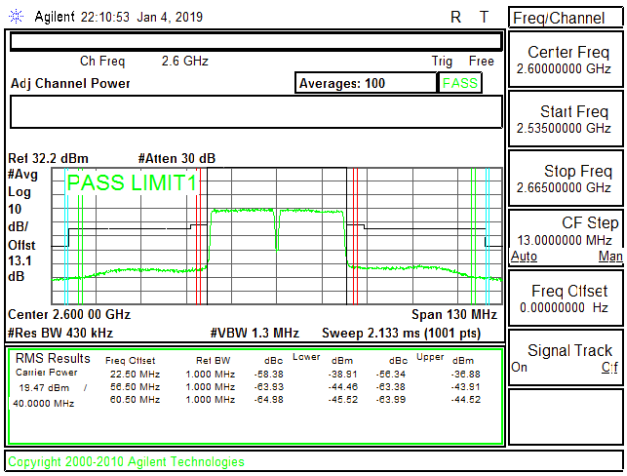
LTE B38 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



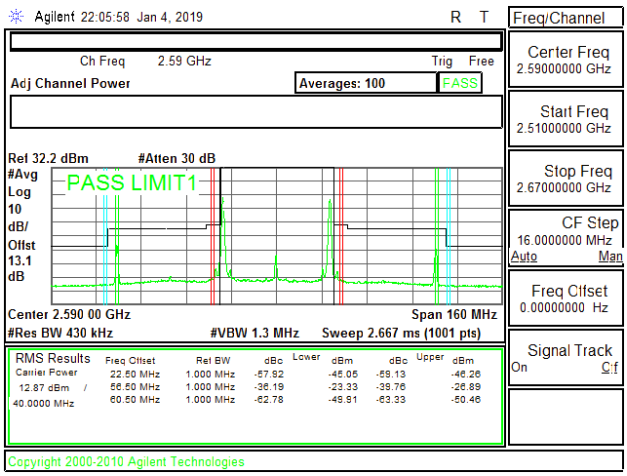
LTE B38 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



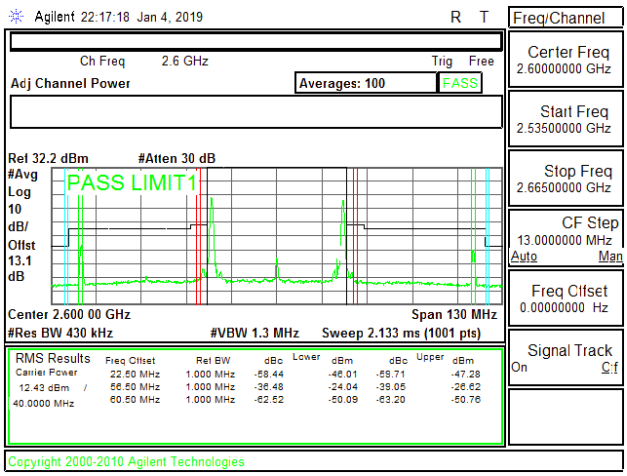
LTE B38 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



LTE B38 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0



LTE B38 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



LTE B38 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99

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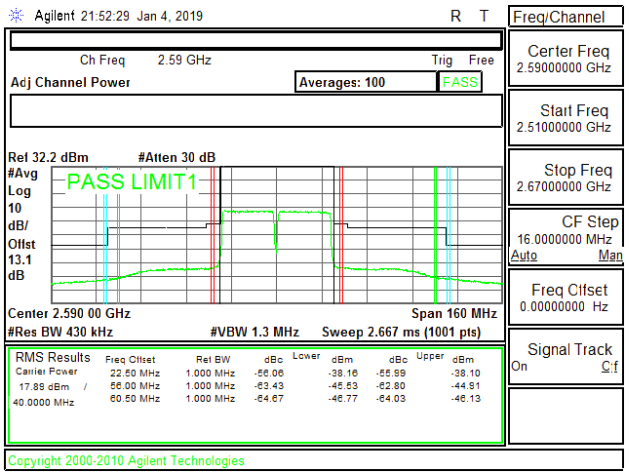
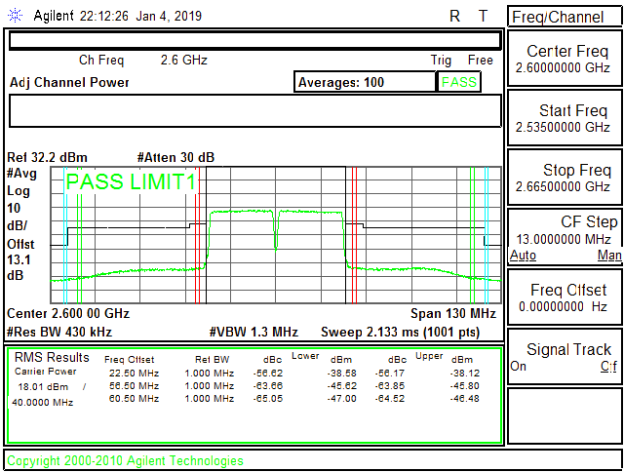


LTE B38 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



LTE B38 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

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8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051 and §27.53

LIMITS

FCC: §27.53 (m) (7 andd 38)
The minimum permissible attenuation level of any spurious emissions is 55 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm, -25dBm and -40dBm according to the band Limit
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

MODES TESTED

- LTE Band 7
- LTE Band 38

RESULTS

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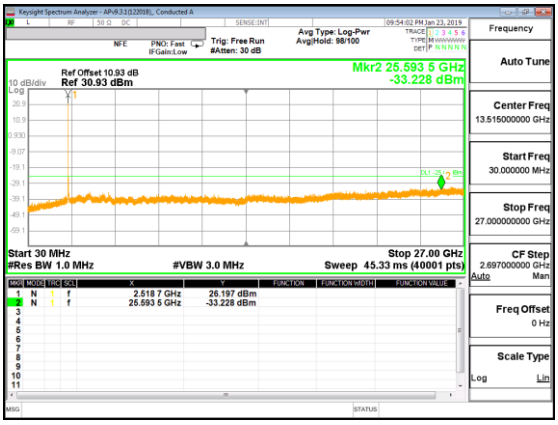
8.3.1. LTE BAND 7

LTE BAND 7 (20.0MHz + 15.0MHz)

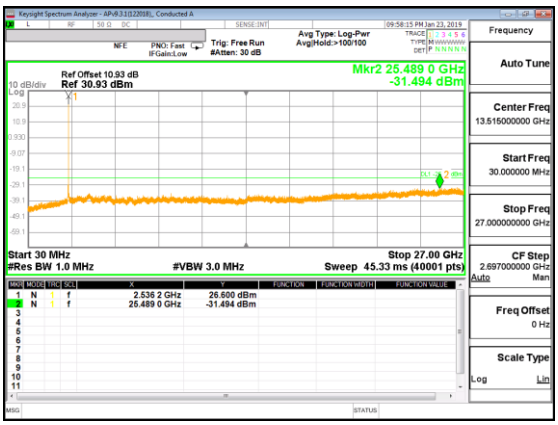


LTE B7 20.0MHz + 15.0MHz QPSK Low Channel RB1/99 + 1/0

LTE B7 20.0MHz + 15.0MHz QPSK Mid Channel RB1/99 + 1/0

LTE B7 20.0MHz + 15.0MHz QPSK High Channel RB1/99 + 1/0

LTE B7 20.0MHz + 15.0MHz 16QAM Low Channel RB1/99 + 1/0



LTE B7 20.0MHz + 15.0MHz 16QAM Mid Channel RB1/99 + 1/0

LTE B7 20.0MHz + 15.0MHz 16QAM High Channel RB1/99 + 1/0

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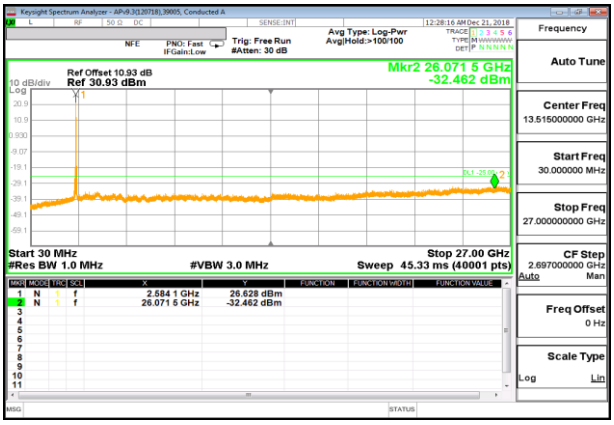
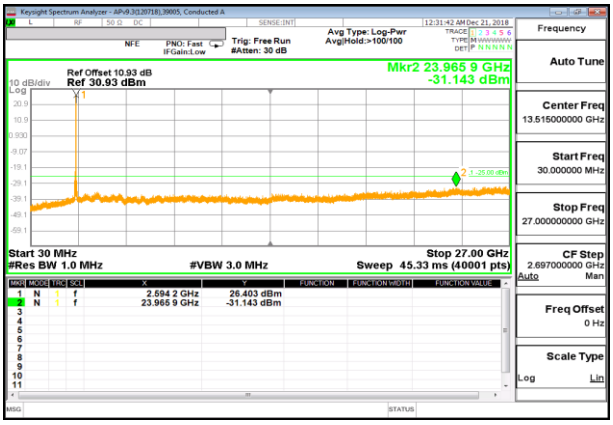
8.3.2. LTE BAND 38

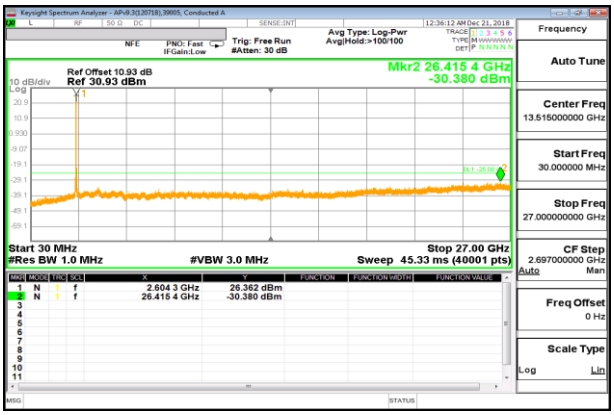
LTE BAND 38 (20.0MHz + 20.0MHz)



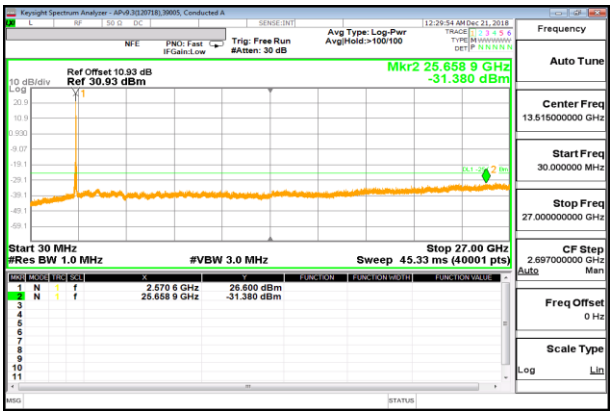
LTE B38 20.0MHz + 20.0MHz QPSK Low Channel RB 1/99 + 1/0



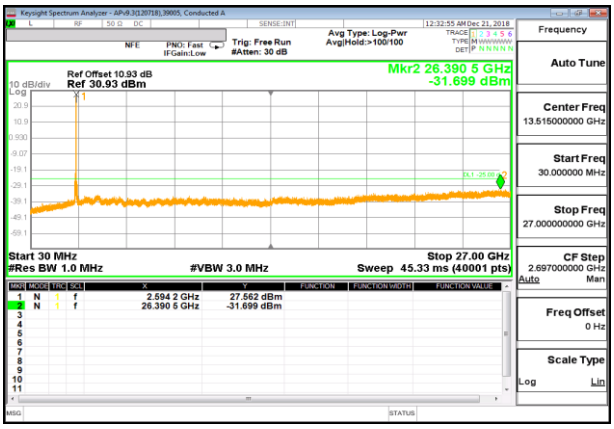
LTE B38 20.0MHz + 20.0MHz QPSK Mid Channel RB 1/99 + 1/0



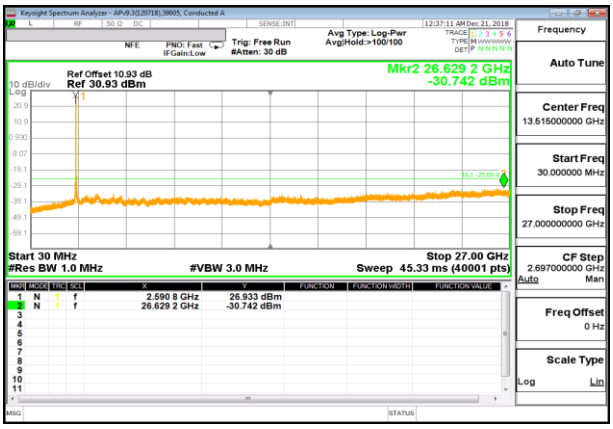
LTE B38 20.0MHz + 20.0MHz QPSK High Channel RB 1/99 + 1/0



LTE B38 20.0MHz + 20.0MHz 16QAM Low Channel RB 1/99 + 1/0



LTE B38 20.0MHz + 20.0MHz 16QAM Mid Channel RB 1/99 + 1/0



LTE B38 20.0MHz + 20.0MHz 16QAM High Channel RB 1/99 + 1/0

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9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053 and §27.53

LIMITS

FCC: §27.53 (m) (Band 7, 41)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

TEST PROCEDURE
KDB 971168 D01 v02r02/D02 v01
TIA-603-E, Section 2.2.12.

MODES TESTED

- LTE Band 7
- LTE Band 38

RESULTS

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9.1.1. LTE BAND 7

Company:	Samsung
Project #:	12563708-
Date:	12/31/18
Test Engineer:	19480 BS
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 15 MHz QPSK 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2510MHz + 2527.1MHz											
1	5.04	-68.92	Pk	34.6	-30.2	8.9	-55.62	-25	-30.62	0-360	149	H
2	5.043	-71.31	Pk	34.6	-30.2	9.1	-57.81	-25	-32.81	0-360	149	V
3	7.559	-72.57	Pk	36.3	-27.3	7.3	-56.27	-25	-31.27	0-360	149	H
4	7.564	-72.24	Pk	36.3	-27.4	7.4	-55.94	-25	-30.94	0-360	149	V
5	10.079	-73.28	Pk	37.6	-23.5	7.9	-51.28	-25	-26.28	0-360	149	H
6	10.08	-74.5	Pk	37.6	-23.5	7.9	-52.5	-25	-27.5	0-360	149	V
	2527.6MHz + 2544.7MHz											
1	5.074	-71.3	Pk	34.5	-30	8.5	-58.3	-25	-33.3	0-360	149	H
2	5.075	-71.93	Pk	34.5	-30.1	8.4	-59.13	-25	-34.13	0-360	149	V
3	7.61	-71.82	Pk	36.4	-26.9	7.5	-54.82	-25	-29.82	0-360	149	H
4	7.61	-72.31	Pk	36.4	-26.9	7.4	-55.41	-25	-30.41	0-360	149	V
5	10.149	-73.77	Pk	37.8	-23.8	6.4	-53.37	-25	-28.37	0-360	149	H
6	10.149	-74.42	Pk	37.8	-23.7	6.4	-53.92	-25	-28.92	0-360	149	V
	2545.1MHz + 2562.2MHz											
1	5.109	-70.15	Pk	34.5	-29.8	9.3	-56.15	-25	-31.15	0-360	149	H
2	5.109	-70.51	Pk	34.5	-29.8	9.3	-56.51	-25	-31.51	0-360	149	V
3	7.665	-72.53	Pk	36.4	-26.8	7.8	-55.13	-25	-30.13	0-360	149	H
4	7.666	-73.24	Pk	36.4	-26.8	7.9	-55.74	-25	-30.74	0-360	149	V
5	10.218	-74.13	Pk	37.8	-23.3	7.4	-52.23	-25	-27.23	0-360	149	H
6	10.219	-73.72	Pk	37.8	-23.3	7.5	-51.72	-25	-26.72	0-360	149	V

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Company:	Samsung
Project #:	12563708-
Date:	12/31/18
Test Engineer:	19480 BS
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 15 MHz 16QAM 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2510MHz + 2527.1MHz											
1	5.04	-71.21	Pk	34.6	-30.2	8.9	-57.91	-25	-32.91	0-360	149	H
2	5.041	-70.94	Pk	34.6	-30.1	9.1	-57.34	-25	-32.34	0-360	149	V
4	7.56	-72.37	Pk	36.3	-27.4	7.3	-56.17	-25	-31.17	0-360	149	V
3	7.566	-71.63	Pk	36.3	-27.4	7.4	-55.33	-25	-30.33	0-360	149	H
6	10.074	-73.8	Pk	37.6	-23.6	7.9	-51.9	-25	-26.9	0-360	149	V
5	10.079	-73.65	Pk	37.6	-23.5	7.9	-51.65	-25	-26.65	0-360	149	H
	2527.6MHz + 2544.7MHz											
1	5.074	-69.43	Pk	34.5	-30	8.5	-56.43	-25	-31.43	0-360	149	H
2	5.076	-69.6	Pk	34.5	-30.1	8.3	-56.9	-25	-31.9	0-360	149	V
3	7.61	-72.93	Pk	36.4	-26.9	7.5	-55.93	-25	-30.93	0-360	149	H
4	7.613	-72.09	Pk	36.4	-26.9	7.3	-55.29	-25	-30.29	0-360	149	V
6	10.15	-73.98	Pk	37.8	-23.8	6.5	-53.48	-25	-28.48	0-360	149	V
5	10.151	-73.93	Pk	37.8	-23.8	6.5	-53.43	-25	-28.43	0-360	149	H
	2545.1MHz + 2562.2MHz											
1	5.112	-70.27	Pk	34.5	-29.8	9.3	-56.27	-25	-31.27	0-360	149	H
2	5.112	-69.93	Pk	34.5	-29.8	9.2	-56.03	-25	-31.03	0-360	149	V
3	7.662	-72.82	Pk	36.4	-26.7	7.8	-55.32	-25	-30.32	0-360	149	H
4	7.663	-74.03	Pk	36.4	-26.7	7.8	-56.53	-25	-31.53	0-360	149	V
5	10.219	-74.95	Pk	37.8	-23.3	7.5	-52.95	-25	-27.95	0-360	149	H
6	10.22	-74.71	Pk	37.8	-23.3	7.5	-52.71	-25	-27.71	0-360	149	V

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9.1.2. LTE BAND 38

Company:	Samsung
Project #:	12563708-
Date:	12/31/18
Test Engineer:	19480 BS
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 20 MHz QPSK 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2580MHz + 2599.8MHz											
1	5.179	-70.3	Pk	34.7	-29.8	8.9	-56.5	-25	-31.5	0-360	149	H
2	5.179	-71.31	Pk	34.7	-29.8	8.5	-57.91	-25	-32.91	0-360	149	V
3	7.713	-60.46	Pk	36.5	-26.9	7.5	-43.36	-25	-18.36	0-360	149	H
4	7.713	-65.15	Pk	36.5	-26.9	7.4	-48.15	-25	-23.15	0-360	149	V
5	10.284	-69.41	Pk	37.8	-23.5	7.2	-47.91	-25	-22.91	0-360	149	H
6	10.362	-73.15	Pk	37.8	-22.8	7.5	-50.65	-25	-25.65	0-360	149	V
	2585.1MHz + 2604.7MHz											
1	5.19	-67.71	Pk	34.7	-29.7	9	-53.71	-25	-28.71	0-360	149	H
2	5.19	-68.82	Pk	34.7	-29.7	8.6	-55.22	-25	-30.22	0-360	149	V
3	7.728	-60.43	Pk	36.5	-27.1	7.4	-43.63	-25	-18.63	0-360	149	H
4	7.786	-67.91	Pk	36.4	-26.7	7.8	-50.41	-25	-25.41	0-360	149	V
5	10.305	-69.2	Pk	37.8	-23.4	7.2	-47.6	-25	-22.6	0-360	149	H
6	10.38	-73.45	Pk	37.8	-22.7	7.9	-50.45	-25	-25.45	0-360	149	V
	2590.2MHz + 2610MHz											
2	5.195	-66.05	Pk	34.7	-29.8	8.9	-52.25	-25	-27.25	0-360	149	V
1	5.2	-66.85	Pk	34.7	-29.8	9.3	-52.65	-25	-27.65	0-360	149	H
4	7.744	-67.27	Pk	36.4	-26.8	7.4	-50.27	-25	-25.27	0-360	149	V
3	7.797	-60.59	Pk	36.4	-26.7	7.6	-43.29	-25	-18.29	0-360	149	H
5	10.399	-70.24	Pk	37.9	-22.9	7.3	-47.94	-25	-22.94	0-360	149	H
6	10.401	-69.87	Pk	37.9	-23	7.1	-47.87	-25	-22.87	0-360	149	V

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Company:	Samsung
Project #:	12563708-
Date:	12/31/18
Test Engineer:	19480 BS
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 20 MHz 16QAM 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2580MHz + 2599.8MHz											
1	5.18	-70.04	Pk	34.7	-29.8	8.9	-56.24	-25	-31.24	0-360	149	H
2	5.181	-70.47	Pk	34.7	-29.8	8.6	-56.97	-25	-31.97	0-360	149	V
3	7.713	-60.74	Pk	36.5	-26.9	7.5	-43.64	-25	-18.64	0-360	149	H
4	7.713	-65.49	Pk	36.5	-26.9	7.4	-48.49	-25	-23.49	0-360	149	V
5	10.357	-73.84	Pk	37.8	-22.8	7.2	-51.64	-25	-26.64	0-360	149	H
6	10.36	-72.69	Pk	37.8	-22.8	7.3	-50.39	-25	-25.39	0-360	149	V
	2585.1MHz + 2604.7MHz											
1	5.189	-71.12	Pk	34.7	-29.7	9	-57.12	-25	-32.12	0-360	149	H
2	5.189	-68.96	Pk	34.7	-29.7	8.6	-55.36	-25	-30.36	0-360	149	V
4	7.782	-66.52	Pk	36.4	-26.7	7.8	-49.02	-25	-24.02	0-360	149	V
3	7.784	-62.24	Pk	36.4	-26.7	7.7	-44.84	-25	-19.84	0-360	149	H
5	10.378	-73.57	Pk	37.8	-22.7	7.9	-50.57	-25	-25.57	0-360	149	H
6	10.38	-72.76	Pk	37.8	-22.7	7.9	-49.76	-25	-24.76	0-360	149	V
	2590.2MHz + 2610MHz											
1	5.201	-67.81	Pk	34.7	-29.8	9.4	-53.51	-25	-28.51	0-360	149	H
2	5.202	-68.49	Pk	34.7	-29.8	9.3	-54.29	-25	-29.29	0-360	149	V
3	7.744	-60.05	Pk	36.4	-26.8	7.3	-43.15	-25	-18.15	0-360	149	H
4	7.744	-65.13	Pk	36.4	-26.8	7.4	-48.13	-25	-23.13	0-360	149	V
6	10.399	-70.1	Pk	37.9	-22.9	7.2	-47.9	-25	-22.9	0-360	149	V
5	10.402	-69.9	Pk	37.9	-23	7.1	-47.9	-25	-22.9	0-360	149	H

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1.1.1. HARMONICS AND SPURIOUS EMISSIONS (SPOTCHECK)

LTE BAND 7

Company:	Samsung
Project #:	12563708
Date:	1/10/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 15 MHz QPSK 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2510MHz + 2527.1MHz												
1	10.079	-77.09	Pk	37.6	-23.5	7.9	-55.09	-25	-30.09	0-360	149	H
2	10.079	-76.24	Pk	37.6	-23.5	7.9	-54.24	-25	-29.24	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	1/10/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 15 MHz 16QAM 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2510MHz + 2527.1MHz												
1	10.079	-75.52	Pk	37.6	-23.5	7.9	-53.52	-25	-28.52	0-360	149	H
2	10.079	-76.15	Pk	37.6	-23.5	7.9	-54.15	-25	-29.15	0-360	149	V

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LTE BAND 38

Company:	Samsung
Project #:	12563708
Date:	1/2/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 20 MHz QPSK 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2590.2MHz + 2610MHz												
3	7.798	-68.77	Pk	36.4	-26.7	7.6	-51.47	-25	-26.47	0-360	149	H
4	7.801	-68.9	Pk	36.4	-26.7	7.7	-51.5	-25	-26.5	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	1/2/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	20 MHz + 20 MHz 16QAM 1RB + 1RB
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2590.2MHz + 2610MHz												
1	7.744	-67.9	Pk	36.4	-26.8	7.3	-51	-25	-26	0-360	149	H
2	7.744	-69.49	Pk	36.4	-26.8	7.4	-52.49	-25	-27.49	0-360	149	V

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