

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 24 SUBPART E and PART 27 SUBPART B, C & SUBPART L
REQUIREMENT

OF

Applicant: Quanta Computer Inc.
No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
33377, Taiwan

Product Name: 7 inch POS Terminal

Brand Name: Quanta, CASTLES

Model No.: KI1, SATURN7000

Model Difference: Marketing Prupose

FCC ID: HFS-KI1

Report Number: E2/2018/70095

FCC Rule Part: 2 , 24E & 27B, C & L

Issue Date: Oct. 24, 2018

Date of Test: Aug. 08, 2018 ~ Oct. 19, 2018

Date of EUT Received: Aug. 08, 2018

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Tested By:



Vito Pei / Sr. Enigneer

Approved By:



Jim Chang / Manager



Testing Laboratory
0513

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/70095	Rev.00	Initial creation of document	All	Oct. 24, 2018	Violetta Tang

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1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	7 inch POS Terminal	
Brand Name:	Quanta, CASTLES	
Model No.:	KI1, SATURN7000	
Model Difference:	Marketing Prupose	
Hardware Version:	B2	
Software Version:	01.000	
Power Supply:	3.8Vdc from Rechargeable Li-Polymer Battery or 5V from AC/DC Adapter	
	Battery:	Model No.: KI1, Supplier: Ningbo Veken Battery Co., Ltd.
	Adapter:	Model No.: CYSF12G-050200U, Supplier: JIANGSU CHENYANG ELECTRON Co., LTD
IMEI:	357298070075690	

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1.2. WCDMA / LTE: Cellular Phone Standards Frequency Range

Operating Frequency (MHz)	
WCDMA / HSPA+ Band II	1852.4 - 1907.6
WCDMA / HSPA+ Band IV	1712.4 - 1752.6

LTE Band	BW (MHz)	Operation Frequency (MHz)
2	1.4	1850.7 - 1909.3
	3	1851.5 - 1908.5
	5	1852.5 - 1907.5
	10	1855.0 - 1905.0
	15	1857.5 - 1902.5
	20	1860.0 - 1900.0
4	1.4	1710.7 - 1754.3
	3	1711.5 - 1753.5
	5	1712.5 - 1752.5
	10	1715.0 - 1780.0
	15	1717.5 - 1747.5
	20	1720.0 - 1745.0
12	1.4	699.7 - 715.3
	3	700.5 - 714.5
	5	701.5 - 713.5
	10	704.0 - 711.0

Antenna Designation:

Vendor	Type	Main / Aux	Antenna Part No.	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
Luxshare-ICT	PIFA	Main	L64RF007-CS-H	WCDMA / HSPA Band II	1852.4 ~ 1907.6	-1.1
				WCDMA / HSPA Band IV	1712.4 ~ 1752.6	-2.4
				LTE Band 2	1850 ~ 1910	-0.6
				LTE Band 4	1710 ~ 1755	-1.7
				LTE Band 12	699 ~ 716	-4
	PIFA	Aux	L64RF008-CS-H	WCDMA / HSPA Band II	1852.4 ~ 1907.6	N/A
				WCDMA / HSPA Band IV	1712.4 ~ 1752.6	-8.1
				LTE Band 2	1850 ~ 1910	N/A
				LTE Band 4	1710 ~ 1755	-6.1
				LTE Band 12	699 ~ 716	N/A

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1.3. Type of Emission & Max ERP/EIRP Power Measurement Result:

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band II	22.75	EIRP	0.188	4M07F9W
HSDPA Band II	22.70	EIRP	0.186	4M08F9W
HSUPA Band II	21.19	EIRP	0.132	4M08F9W
WCDMA Band IV	21.54	EIRP	0.143	4M07F9W
HSDPA Band IV	21.43	EIRP	0.139	4M06F9W
HSUPA Band IV	19.97	EIRP	0.099	4M07F9W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
2	1.4	QPSK	22.16	EIRP	0.164	1M10G7D
	1.4	16QAM	21.32	EIRP	0.136	1M10D7W
	1.4	64QAM	21.28	EIRP	0.134	1M11D7W
	3	QPSK	22.08	EIRP	0.161	2M70G7D
	3	16QAM	21.60	EIRP	0.145	2M71D7W
	3	64QAM	21.55	EIRP	0.143	2M71D7W
	5	QPSK	22.12	EIRP	0.163	4M51G7D
	5	16QAM	21.57	EIRP	0.144	4M50D7W
	5	64QAM	21.53	EIRP	0.142	4M50D7W
	10	QPSK	22.13	EIRP	0.163	9M03G7D
	10	16QAM	21.55	EIRP	0.143	8M98D7W
	10	64QAM	21.52	EIRP	0.142	9M02D7W
	15	QPSK	22.21	EIRP	0.166	13M6G7D
	15	16QAM	21.82	EIRP	0.152	13M5D7W
	15	64QAM	21.67	EIRP	0.147	13M6D7W
	20	QPSK	22.36	EIRP	0.172	18M1G7D
20	16QAM	21.69	EIRP	0.148	18M1D7W	
20	64QAM	21.63	EIRP	0.146	18M1D7W	

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
4	1.4	QPSK	21.28	EIRP	0.134	1M10G7D
	1.4	16QAM	20.29	EIRP	0.107	1M11D7W
	1.4	64QAM	20.74	EIRP	0.119	1M11D7W
	3	QPSK	21.14	EIRP	0.130	2M70G7D
	3	16QAM	20.29	EIRP	0.107	2M71D7W
	3	64QAM	20.66	EIRP	0.116	2M71D7W
	5	QPSK	21.20	EIRP	0.132	4M50G7D
	5	16QAM	20.29	EIRP	0.107	4M51D7W
	5	64QAM	20.69	EIRP	0.117	4M50D7W
	10	QPSK	21.37	EIRP	0.137	9M04G7D
	10	16QAM	20.12	EIRP	0.103	8M98D7W
	10	64QAM	20.44	EIRP	0.111	9M01D7W
	15	QPSK	21.47	EIRP	0.140	13M5G7D
	15	16QAM	20.29	EIRP	0.107	13M6D7W
	15	64QAM	20.71	EIRP	0.118	13M6D7W
	20	QPSK	21.51	EIRP	0.142	18M0G7D
20	16QAM	20.61	EIRP	0.115	18M1D7W	
20	64QAM	20.56	EIRP	0.114	18M1D7W	

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LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
12	1.4	QPSK	18.54	ERP	0.071	1M10G7D
	1.4	16QAM	18.33	ERP	0.068	1M12D7W
	1.4	64QAM	18.24	ERP	0.067	1M13D7W
	3	QPSK	18.51	ERP	0.071	2M70G7D
	3	16QAM	18.29	ERP	0.067	2M70D7W
	3	64QAM	18.21	ERP	0.066	2M71D7W
	5	QPSK	18.74	ERP	0.075	4M50G7D
	5	16QAM	18.43	ERP	0.070	4M50D7W
	5	64QAM	18.32	ERP	0.068	4M50D7W
	10	QPSK	18.79	ERP	0.076	9M04G7D
	10	16QAM	18.37	ERP	0.069	9M00D7W
	10	64QAM	18.17	ERP	0.066	9M02D7W

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1.4. Test Methodology of Applied Standards

CC 47 CFR Part 2, 24, 27.

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

TS 151 010-1 is used to set, and measure the output power.

Note: All test items have been performed and record as per the above standards.

1.5. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305 / TW0002

1.6. Special Accessories

No special accessories were used during testing.

1.7. Equipment Modifications

There were no modifications incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port

According to measurement procured ANSI C63.26-2015, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is a placed on as turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

2.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	3.6	10	13.6
High Band (Above 1 GHz)	3.9	10	13.9

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2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
HSDPA B2	3.8	526
WCDMA B4		509
LTE Band 2		468
LTE Band 4		471
LTE Band 12		499

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2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

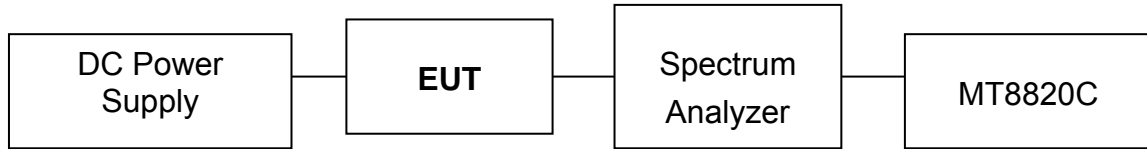
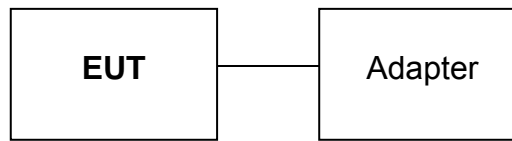


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

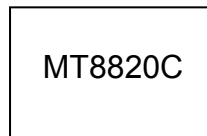


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyzer	Anritsu	MT8820C	6201107337	shielded	Un-shielded

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §24.232(c) §27.50(c)(10) §27.50(d)(4)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §24.238(a) §27.53(g) §27.50(c)(5) §27.53(h) §27.53(m)(4)(6)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §24.238(a) §27.50(c)(5) §27.53(g) §27.53(h) §27.53(m)(4)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.53(d) (5) §27.50(i) (B)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §24.235 §27.54	Frequency Stability	Compliant

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4. DESCRIPTION OF TEST MODES

4.1. The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	ERP/EIRP	RADIATED EMISSION
WCDMA/HSPA Band II	E2-plane	E2-plane
WCDMA/HSPA Band IV	E2-plane	E2-plane
LTE Band 2	E2-plane	E2-plane
LTE Band 4	E2-plane	E2-plane
LTE Band 12	E2-plane	E2-plane

WCDMA/HSPA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
EIRP	9262 to 9538 1312 to 1513	9262, 9400, 9583 1312, 1413, 1513	WCDMA/HSPA Band II WCDMA/HSPA Band IV
FREQUENCY STABILITY	1312 to 1513 9262 to 9538	1413 9400	WCDMA Band II WCDMA Band IV
OCCUPIED BANDWIDTH	1312 to 1513 9262 to 9538	1312, 1413, 1513 9262, 9400, 9583	WCDMA/HSPA Band II WCDMA/HSPA Band IV
PEAK TO AVERAGE RATIO	1312 to 1513 9262 to 9538	1312, 1413, 1513 9262, 9400, 9583	WCDMA/HSPA Band II WCDMA/HSPA Band IV
BAND EDGE	1312 to 1513 9262 to 9538	1312, 1513 9262, 9583	WCDMA Band II WCDMA Band IV
CONDUCTED EMISSION	1312 to 1513 9262 to 9538	1312, 1413, 1513 9262, 9400, 9583	WCDMA Band II WCDMA Band IV
RADIATED EMISSION	1312 to 1513 9262 to 9538	1312, 1413, 1513 9262, 9400, 9583	WCDMA Band II WCDMA Band IV

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LTE Band 2 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,74 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,99 RB Offest
FREQUENCY STABILITY	18650 to 19150	18900	10MHz	QPSK	Full RB
OCCUPIED BAND-WIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	64QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	64QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	64QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	64QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	64QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	64QAM	Full RB
BAND EDGE	18607 to 19193	18607, 19193	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	18615 to 19185	18615, 19185	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
	18625 to 19175	18625, 19175	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	18650 to 19150	18650, 19150	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK	1 RB/ 0,74 RB Offest Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK	1 RB/ 0,99 RB Offest Full RB
CONDCUDED EMISSION	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK	1 RB, 0 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK	1 RB, 0 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK	1 RB, 0 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK	1 RB, 0 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK	1 RB, 0 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	18700 to 19100	18700, 18900, 19100	20MHz	QPSK	1 RB, 0 RB Offest

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LTE Band 4 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,74 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,99 RB Offest
FREQUENCY STABILITY	20000 to 20350	20175	10MHz	QPSK	Full RB
OCCUPIED BAND-WIDTH	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM, 64QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AVERAGE RATIO	19957 to 19393	19957, 20175, 19393	1.4MHz	64QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	64QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	64QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	64QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	64QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	64QAM	Full RB
BAND EDGE	19957 to 19393	19957, 19393	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	19965 to 22385	19965, 22385	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
	19975 to 20375	19975, 20375	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	20000 to 20350	20000, 20350	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
	20025 to 20325	20025, 20325	15MHz	QPSK	1 RB/ 0,74 RB Offest Full RB
	20050 to 20300	20050, 20300	20MHz	QPSK	1 RB/ 0,99 RB Offest Full RB
CONDCUDED EMISSION	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK	1 RB, 0 RB Offest
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK	1 RB, 0 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK	1 RB, 0 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK	1 RB, 0 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK	1 RB, 0 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1 RB, 99 RB Offest

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LTE Band 12 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHAN- NEL BAND- WIDTH	MODULATION	MODE
ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23060 to 23130	23095	10MHz	QPSK	Full RB
OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM, 64QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM, 64QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AV- ERAGE RATIO	23017 to 23173	23017, 23095, 23173	1.4MHz	64QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	64QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	64QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	64QAM	Full RB
BAND EDGE	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCU- DETED EMIS- SION	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB, 0 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB, 0 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB, 0 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB, 25 RB Offest

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization = +/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6. MAXMUM OUTPUT POWER

6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

ERP/EIRP LIMIT

According to FCC §2.1046

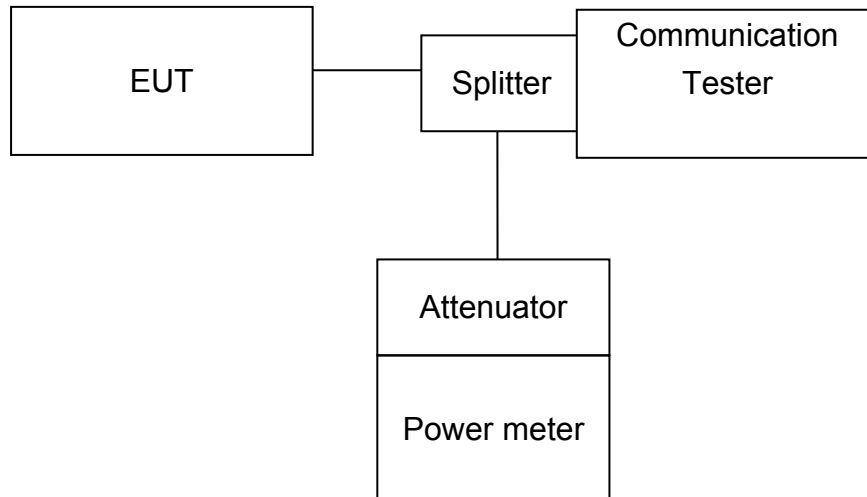
FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

FCC 27.50(c)(10) Portable stations (hand-held devices) are limited to 3W ERP.

FCC 27.50(d)(4) Fixed, mobile, and portable (hand-held) stations are limited to 1W EIRP.

FCC 27, 50(h)(2) Mobile and other user stations. Mobile stations are limited to 2W EIRP

6.2. Test Set-up



Note: Measurement setup for testing on Antenna connector

6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

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The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCD-MA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

All LTE bands conducted average power is obtained from the simulator telecommunication test set.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP.

TEST PROCEDURE:

ANSI C63.26:2015

KDB 971168 Section 5.6

$$ERP/EIRP = P_{Meas} + GT-LC$$

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = 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.

6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/06/19
Radio Communication Analyzer	Anritsu	MT8820C	6201107337	2018/06/15	2019/06/14
DC Power Supply	Agilent	E3640A	MY53130054	2017/09/04	2018/09/03
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25
Splitter	Woken	DOM35LW1A2	RF36	2017/12/26	2018/12/25

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6.5. Measurement Result

RF Conducted Output Power

WCDMA MODE:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

Results:

WCDMA/HSUPA/HSDPA Band II Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	1852.4	9262	23.85	-1.1	22.75	33	-10.25
	1880	9400	23.51	-1.1	22.41	33	-10.59
	1907.6	9538	23.83	-1.1	22.73	33	-10.27
HSDPA	1852.4	9262	23.8	-1.1	22.7	33	-10.3
	1880	9400	23.4	-1.1	22.3	33	-10.7
	1907.6	9538	23.68	-1.1	22.58	33	-10.42
HSUPA	1852.4	9262	22.29	-1.1	21.19	33	-11.81
	1880	9400	21	-1.1	19.9	33	-13.1
	1907.6	9538	21.96	-1.1	20.86	33	-12.14

WCDMA/HSUPA/HSDPA Band IV Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	1712.4	1312	23.94	-2.4	21.54	30	-8.46
	1732.6	1413	23.78	-2.4	21.38	30	-8.62
	1752.6	1513	23.73	-2.4	21.33	30	-8.67
HSDPA	1712.4	1312	23.83	-2.4	21.43	30	-8.57
	1732.6	1413	23.69	-2.4	21.29	30	-8.71
	1752.6	1513	23.63	-2.4	21.23	30	-8.77
HSUPA	1712.4	1312	22.37	-2.4	19.97	30	-10.03
	1732.6	1413	20.93	-2.4	18.53	30	-11.47
	1752.6	1513	22.01	-2.4	19.61	30	-10.39

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HSDPA Release 6 MODE:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

HSPA (HSDPA & HSUPA) Release 6 MODE

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

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Results:

Mode	Sub test	Avg. Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		9262	9400	9538		
HSDPA II	1	23.80	23.40	23.68	20.3dBm – 25.7dBm	Pass
	2	23.28	22.92	23.22	20.3dBm – 25.7dBm	Pass
	3	22.80	22.46	22.75	19.8dBm – 25.7dBm	Pass
	4	22.56	22.20	22.50	19.8dBm – 25.7dBm	Pass

Mode	Sub test	Avg. Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		1312	1413	1513		
HSDPA IV	1	23.83	23.69	23.63	20.3dBm – 25.7dBm	Pass
	2	23.29	23.15	23.10	20.3dBm – 25.7dBm	Pass
	3	22.80	22.65	22.59	19.8dBm – 25.7dBm	Pass
	4	22.55	22.41	22.36	19.8dBm – 25.7dBm	Pass

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Mode	Sub test	Avg. Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		9262	9400	9538		
HSUPA II	1	22.29	21.00	21.96	18.8dBm – 25.7dBm	Pass
	2	21.26	23.20	21.96	16.8dBm – 25.7dBm	Pass
	3	20.67	21.64	20.91	17.8dBm – 25.7dBm	Pass
	4	22.80	22.30	20.97	16.8dBm – 25.7dBm	Pass
	5	21.88	21.22	23.20	18.8dBm – 25.7dBm	Pass

Mode	Sub test	Avg. Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		1312	1413	1513		
HSDPA IV	1	22.37	20.93	22.01	20.3dBm – 25.7dBm	Pass
	2	21.27	23.20	22.13	20.3dBm – 25.7dBm	Pass
	3	20.70	21.87	21.15	19.8dBm – 25.7dBm	Pass
	4	23.10	22.16	20.71	19.8dBm – 25.7dBm	Pass
	5	21.88	21.13	23.10	19.8dBm – 25.7dBm	Pass

WCDMA/HSDPA/HSUPA band II, IV

The EUT output power was controlled by simulator. Set Communication Tester MT8820C function key “UE Power Control” and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. Then record the read (see page 15 for measurement data). The min. power was measures by a function key “minimum power” then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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LTE Result:

Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	18607	1850.7	QPSK	1	0	22.66	22.06	33	-10.94
				1	5	22.61	22.01	33	-10.99
				3	2	22.45	21.85	33	-11.15
				6	0	21.67	21.07	33	-11.93
	18900	1880	QPSK	1	0	22.76	22.16	33	-10.84
				1	5	22.7	22.1	33	-10.9
				3	2	22.44	21.84	33	-11.16
				6	0	21.75	21.15	33	-11.85
	19193	1909.3	QPSK	1	0	22.49	21.89	33	-11.11
				1	5	22.48	21.88	33	-11.12
				3	2	22.35	21.75	33	-11.25
				6	0	21.58	20.98	33	-12.02
	18607	1850.7	16QAM	1	0	21.88	21.28	33	-11.72
				1	5	21.63	21.03	33	-11.97
				3	2	21.32	20.72	33	-12.28
				6	0	20.7	20.1	33	-12.9
	18900	1880	16QAM	1	0	21.84	21.24	33	-11.76
				1	5	21.92	21.32	33	-11.68
				3	2	21.41	20.81	33	-12.19
				6	0	20.8	20.2	33	-12.8
	19193	1909.3	16QAM	1	0	21.73	21.13	33	-11.87
				1	5	21.7	21.1	33	-11.9
				3	2	21.08	20.48	33	-12.52
				6	0	20.67	20.07	33	-12.93
	18607	1850.7	64QAM	1	0	21.84	21.24	33	-11.76
				1	5	21.59	20.99	33	-12.01
				3	2	21.32	20.72	33	-12.28
				6	0	20.66	20.06	33	-12.94
	18900	1880	64QAM	1	0	21.8	21.2	33	-11.8
				1	5	21.88	21.28	33	-11.72
				3	2	21.41	20.81	33	-12.19
				6	0	20.76	20.16	33	-12.84
	19193	1909.3	64QAM	1	0	21.69	21.09	33	-11.91
				1	5	21.66	21.06	33	-11.94
				3	2	21.08	20.48	33	-12.52
				6	0	20.63	20.03	33	-12.97

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Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	18615	1851.5	QPSK	1	0	22.68	22.08	33	-10.92
				1	14	22.64	22.04	33	-10.96
				8	4	21.6	21	33	-12
				15	0	21.69	21.09	33	-11.91
	18900	1880	QPSK	1	0	22.64	22.04	33	-10.96
				1	14	22.59	21.99	33	-11.01
				8	4	21.65	21.05	33	-11.95
				15	0	21.71	21.11	33	-11.89
	19185	1908.5	QPSK	1	0	22.47	21.87	33	-11.13
				1	14	22.35	21.75	33	-11.25
				8	4	21.49	20.89	33	-12.11
				15	0	21.52	20.92	33	-12.08
	18615	1851.5	16QAM	1	0	22.09	21.49	33	-11.51
				1	14	22.03	21.43	33	-11.57
				8	4	20.78	20.18	33	-12.82
				15	0	20.8	20.2	33	-12.8
	18900	1880	16QAM	1	0	22.2	21.6	33	-11.4
				1	14	21.6	21	33	-12
				8	4	20.74	20.14	33	-12.86
				15	0	20.8	20.2	33	-12.8
	19185	1908.5	16QAM	1	0	21.94	21.34	33	-11.66
				1	14	21.85	21.25	33	-11.75
				8	4	20.64	20.04	33	-12.96
				15	0	20.73	20.13	33	-12.87
	18615	1851.5	64QAM	1	0	22.04	21.44	33	-11.56
				1	14	21.98	21.38	33	-11.62
				8	4	20.73	20.13	33	-12.87
				15	0	20.75	20.15	33	-12.85
	18900	1880	64QAM	1	0	22.15	21.55	33	-11.45
				1	14	21.55	20.95	33	-12.05
				8	4	20.69	20.09	33	-12.91
				15	0	20.75	20.15	33	-12.85
	19185	1908.5	64QAM	1	0	21.89	21.29	33	-11.71
				1	14	21.8	21.2	33	-11.8
				8	4	20.59	19.99	33	-13.01
				15	0	20.68	20.08	33	-12.92

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Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	18625	1852.5	QPSK	1	0	22.72	22.12	33	-10.88
				1	24	22.5	21.9	33	-11.1
				12	6	21.59	20.99	33	-12.01
				25	0	21.62	21.02	33	-11.98
	18900	1880	QPSK	1	0	22.69	22.09	33	-10.91
				1	24	22.64	22.04	33	-10.96
				12	6	21.68	21.08	33	-11.92
				25	0	21.72	21.12	33	-11.88
	19175	1907.5	QPSK	1	0	22.52	21.92	33	-11.08
				1	24	22.46	21.86	33	-11.14
				12	6	21.53	20.93	33	-12.07
				25	0	21.57	20.97	33	-12.03
	18625	1852.5	16QAM	1	0	22.17	21.57	33	-11.43
				1	24	22.09	21.49	33	-11.51
				12	6	20.75	20.15	33	-12.85
				25	0	20.7	20.1	33	-12.9
	18900	1880	16QAM	1	0	21.67	21.07	33	-11.93
				1	24	22.11	21.51	33	-11.49
				12	6	20.85	20.25	33	-12.75
				25	0	20.93	20.33	33	-12.67
	19175	1907.5	16QAM	1	0	21.72	21.12	33	-11.88
				1	24	21.82	21.22	33	-11.78
				12	6	20.67	20.07	33	-12.93
				25	0	20.66	20.06	33	-12.94
	18625	1852.5	64QAM	1	0	22.13	21.53	33	-11.47
				1	24	22.05	21.45	33	-11.55
				12	6	20.71	20.11	33	-12.89
				25	0	20.66	20.06	33	-12.94
	18900	1880	64QAM	1	0	21.63	21.03	33	-11.97
				1	24	22.07	21.47	33	-11.53
				12	6	20.81	20.21	33	-12.79
				25	0	20.89	20.29	33	-12.71
	19175	1907.5	64QAM	1	0	21.68	21.08	33	-11.92
				1	24	21.78	21.18	33	-11.82
				12	6	20.63	20.03	33	-12.97
				25	0	20.62	20.02	33	-12.98

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Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	18650	1855	QPSK	1	0	22.72	22.12	33	-10.88
				1	24	22.49	21.89	33	-11.11
				12	6	21.52	20.92	33	-12.08
				25	0	21.58	20.98	33	-12.02
	18900	1880	QPSK	1	0	22.73	22.13	33	-10.87
				1	24	22.61	22.01	33	-10.99
				12	6	21.69	21.09	33	-11.91
				25	0	21.71	21.11	33	-11.89
	19150	1905	QPSK	1	0	22.71	22.11	33	-10.89
				1	24	22.51	21.91	33	-11.09
				12	6	21.62	21.02	33	-11.98
				25	0	21.57	20.97	33	-12.03
	18650	1855	16QAM	1	0	21.78	21.18	33	-11.82
				1	24	21.92	21.32	33	-11.68
				12	6	20.76	20.16	33	-12.84
				25	0	20.79	20.19	33	-12.81
	18900	1880	16QAM	1	0	22.01	21.41	33	-11.59
				1	24	21.84	21.24	33	-11.76
				12	6	20.83	20.23	33	-12.77
				25	0	20.83	20.23	33	-12.77
	19150	1905	16QAM	1	0	22.15	21.55	33	-11.45
				1	24	21.74	21.14	33	-11.86
				12	6	20.71	20.11	33	-12.89
				25	0	20.73	20.13	33	-12.87
	18650	1855	64QAM	1	0	21.75	21.15	33	-11.85
				1	24	21.89	21.29	33	-11.71
				12	6	20.73	20.13	33	-12.87
				25	0	20.76	20.16	33	-12.84
	18900	1880	64QAM	1	0	21.98	21.38	33	-11.62
				1	24	21.81	21.21	33	-11.79
				12	6	20.8	20.2	33	-12.8
				25	0	20.8	20.2	33	-12.8
	19150	1905	64QAM	1	0	22.12	21.52	33	-11.48
				1	24	21.71	21.11	33	-11.89
				12	6	20.68	20.08	33	-12.92
				25	0	20.7	20.1	33	-12.9

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Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	18675	1857.5	QPSK	1	0	22.81	22.21	33	-10.79
				1	74	22.27	21.67	33	-11.33
				36	19	21.6	21	33	-12
				75	0	21.7	21.1	33	-11.9
	18900	1880	QPSK	1	0	22.68	22.08	33	-10.92
				1	74	22.42	21.82	33	-11.18
				36	19	21.71	21.11	33	-11.89
				75	0	21.82	21.22	33	-11.78
	19125	1902.5	QPSK	1	0	22.72	22.12	33	-10.88
				1	74	22.31	21.71	33	-11.29
				36	19	21.71	21.11	33	-11.89
				75	0	21.68	21.08	33	-11.92
	18675	1857.5	16QAM	1	0	22.42	21.82	33	-11.18
				1	74	21.82	21.22	33	-11.78
				36	19	20.77	20.17	33	-12.83
				75	0	20.74	20.14	33	-12.86
	18900	1880	16QAM	1	0	22.38	21.78	33	-11.22
				1	74	21.73	21.13	33	-11.87
				36	19	20.77	20.17	33	-12.83
				75	0	20.86	20.26	33	-12.74
	19125	1902.5	16QAM	1	0	22.12	21.52	33	-11.48
				1	74	21.49	20.89	33	-12.11
				36	19	20.67	20.07	33	-12.93
				75	0	20.83	20.23	33	-12.77
	18675	1857.5	64QAM	1	0	22.27	21.67	33	-11.33
				1	74	21.67	21.07	33	-11.93
				36	19	20.62	20.02	33	-12.98
				75	0	20.59	19.99	33	-13.01
	18900	1880	64QAM	1	0	22.23	21.63	33	-11.37
				1	74	21.58	20.98	33	-12.02
				36	19	20.62	20.02	33	-12.98
				75	0	20.71	20.11	33	-12.89
	19125	1902.5	64QAM	1	0	21.97	21.37	33	-11.63
				1	74	21.34	20.74	33	-12.26
				36	19	20.52	19.92	33	-13.08
				75	0	20.68	20.08	33	-12.92

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Antenna gain (dBi) -0.6

LTE Band 2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	18700	1860	QPSK	1	0	22.96	22.36	33	-10.64
				1	99	22.29	21.69	33	-11.31
				50	25	21.66	21.06	33	-11.94
				100	0	21.77	21.17	33	-11.83
	18900	1880	QPSK	1	0	22.83	22.23	33	-10.77
				1	99	22.54	21.94	33	-11.06
				50	25	21.67	21.07	33	-11.93
				100	0	21.77	21.17	33	-11.83
	19100	1900	QPSK	1	0	22.89	22.29	33	-10.71
				1	99	22.3	21.7	33	-11.3
				50	25	21.63	21.03	33	-11.97
				100	0	21.74	21.14	33	-11.86
	18700	1860	16QAM	1	0	22.12	21.52	33	-11.48
				1	99	21.47	20.87	33	-12.13
				50	25	20.68	20.08	33	-12.92
				100	0	20.77	20.17	33	-12.83
	18900	1880	16QAM	1	0	22.29	21.69	33	-11.31
				1	99	21.86	21.26	33	-11.74
				50	25	20.76	20.16	33	-12.84
				100	0	20.85	20.25	33	-12.75
	19100	1900	16QAM	1	0	21.93	21.33	33	-11.67
				1	99	21.86	21.26	33	-11.74
				50	25	20.67	20.07	33	-12.93
				100	0	20.84	20.24	33	-12.76
	18700	1860	64QAM	1	0	22.06	21.46	33	-11.54
				1	99	21.41	20.81	33	-12.19
				50	25	20.62	20.02	33	-12.98
				100	0	20.71	20.11	33	-12.89
	18900	1880	64QAM	1	0	22.23	21.63	33	-11.37
				1	99	21.8	21.2	33	-11.8
				50	25	20.7	20.1	33	-12.9
				100	0	20.79	20.19	33	-12.81
	19100	1900	64QAM	1	0	21.87	21.27	33	-11.73
				1	99	21.8	21.2	33	-11.8
				50	25	20.61	20.01	33	-12.99
				100	0	20.78	20.18	33	-12.82

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	19957	1710.7	QPSK	1	0	22.98	21.28	30	-8.72
				1	5	22.98	21.28	30	-8.72
				3	2	22.96	21.26	30	-8.74
				6	0	21.82	20.12	30	-9.88
	20175	1732.5	QPSK	1	0	22.73	21.03	30	-8.97
				1	5	22.82	21.12	30	-8.88
				3	2	22.76	21.06	30	-8.94
				6	0	21.88	20.18	30	-9.82
	20393	1754.3	QPSK	1	0	22.8	21.1	30	-8.9
				1	5	22.73	21.03	30	-8.97
				3	2	22.89	21.19	30	-8.81
				6	0	21.87	20.17	30	-9.83
	19957	1710.7	16QAM	1	0	21.73	20.03	30	-9.97
				1	5	21.5	19.8	30	-10.2
				3	2	20.96	19.26	30	-10.74
				6	0	20.95	19.25	30	-10.75
	20175	1732.5	16QAM	1	0	21.52	19.82	30	-10.18
				1	5	21.57	19.87	30	-10.13
				3	2	20.79	19.09	30	-10.91
				6	0	20.8	19.1	30	-10.9
	20393	1754.3	16QAM	1	0	21.52	19.82	30	-10.18
				1	5	21.99	20.29	30	-9.71
				3	2	20.7	19	30	-11
				6	0	20.95	19.25	30	-10.75
	19957	1710.7	64QAM	1	0	22.18	20.48	30	-9.52
				1	5	21.95	20.25	30	-9.75
				3	2	22.12	20.42	30	-9.58
				6	0	20.91	19.21	30	-10.79
	20175	1732.5	64QAM	1	0	21.97	20.27	30	-9.73
				1	5	22.02	20.32	30	-9.68
				3	2	21.95	20.25	30	-9.75
				6	0	20.76	19.06	30	-10.94
	20393	1754.3	64QAM	1	0	21.97	20.27	30	-9.73
				1	5	22.44	20.74	30	-9.26
				3	2	21.86	20.16	30	-9.84
				6	0	20.91	19.21	30	-10.79

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	19965	1711.5	QPSK	1	0	22.84	21.14	30	-8.86
				1	14	22.8	21.1	30	-8.9
				8	4	21.88	20.18	30	-9.82
				15	0	21.93	20.23	30	-9.77
	20175	1732.5	QPSK	1	0	22.72	21.02	30	-8.98
				1	14	22.57	20.87	30	-9.13
				8	4	21.74	20.04	30	-9.96
				15	0	21.7	20	30	-10
	20385	1753.5	QPSK	1	0	22.79	21.09	30	-8.91
				1	14	22.52	20.82	30	-9.18
				8	4	21.85	20.15	30	-9.85
				15	0	21.75	20.05	30	-9.95
	19965	1711.5	16QAM	1	0	21.99	20.29	30	-9.71
				1	14	21.71	20.01	30	-9.99
				8	4	20.88	19.18	30	-10.82
				15	0	20.95	19.25	30	-10.75
	20175	1732.5	16QAM	1	0	21.57	19.87	30	-10.13
				1	14	21.48	19.78	30	-10.22
				8	4	20.76	19.06	30	-10.94
				15	0	20.82	19.12	30	-10.88
	20385	1753.5	16QAM	1	0	21.37	19.67	30	-10.33
				1	14	21.51	19.81	30	-10.19
				8	4	20.72	19.02	30	-10.98
				15	0	20.75	19.05	30	-10.95
	19965	1711.5	64QAM	1	0	22.36	20.66	30	-9.34
				1	14	22.08	20.38	30	-9.62
				8	4	20.86	19.16	30	-10.84
				15	0	20.93	19.23	30	-10.77
	20175	1732.5	64QAM	1	0	21.94	20.24	30	-9.76
				1	14	21.85	20.15	30	-9.85
				8	4	20.74	19.04	30	-10.96
				15	0	20.8	19.1	30	-10.9
	20385	1753.5	64QAM	1	0	21.74	20.04	30	-9.96
				1	14	21.88	20.18	30	-9.82
				8	4	20.7	19	30	-11
				15	0	20.73	19.03	30	-10.97

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	19975	1712.5	QPSK	1	0	22.9	21.2	30	-8.8
				1	24	22.76	21.06	30	-8.94
				12	6	21.9	20.2	30	-9.8
				25	0	21.94	20.24	30	-9.76
	20175	1732.5	QPSK	1	0	22.8	21.1	30	-8.9
				1	24	22.63	20.93	30	-9.07
				12	6	21.78	20.08	30	-9.92
				25	0	21.79	20.09	30	-9.91
	20375	1752.5	QPSK	1	0	22.62	20.92	30	-9.08
				1	24	22.42	20.72	30	-9.28
				12	6	21.75	20.05	30	-9.95
				25	0	21.77	20.07	30	-9.93
	19975	1712.5	16QAM	1	0	21.9	20.2	30	-9.8
				1	24	21.99	20.29	30	-9.71
				12	6	20.95	19.25	30	-10.75
				25	0	20.89	19.19	30	-10.81
	20175	1732.5	16QAM	1	0	21.87	20.17	30	-9.83
				1	24	21.19	19.49	30	-10.51
				12	6	20.75	19.05	30	-10.95
				25	0	20.85	19.15	30	-10.85
	20375	1752.5	16QAM	1	0	21.76	20.06	30	-9.94
				1	24	21.73	20.03	30	-9.97
				12	6	20.74	19.04	30	-10.96
				25	0	20.68	18.98	30	-11.02
	19975	1712.5	64QAM	1	0	22.3	20.6	30	-9.4
				1	24	22.39	20.69	30	-9.31
				12	6	20.88	19.18	30	-10.82
				25	0	20.82	19.12	30	-10.88
	20175	1732.5	64QAM	1	0	22.27	20.57	30	-9.43
				1	24	21.59	19.89	30	-10.11
				12	6	20.68	18.98	30	-11.02
				25	0	20.78	19.08	30	-10.92
	20375	1752.5	64QAM	1	0	22.16	20.46	30	-9.54
				1	24	22.13	20.43	30	-9.57
				12	6	20.67	18.97	30	-11.03
				25	0	20.61	18.91	30	-11.09

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20000	1715	QPSK	1	0	23.07	21.37	30	-8.63
				1	24	22.71	21.01	30	-8.99
				12	6	21.93	20.23	30	-9.77
				25	0	21.99	20.29	30	-9.71
	20175	1732.5	QPSK	1	0	22.71	21.01	30	-8.99
				1	24	22.42	20.72	30	-9.28
				12	6	21.74	20.04	30	-9.96
				25	0	21.78	20.08	30	-9.92
	20375	1750	QPSK	1	0	22.73	21.03	30	-8.97
				1	24	22.34	20.64	30	-9.36
				12	6	21.71	20.01	30	-9.99
				25	0	21.8	20.1	30	-9.9
	20000	1715	16QAM	1	0	21.77	20.07	30	-9.93
				1	24	21.82	20.12	30	-9.88
				12	6	20.87	19.17	30	-10.83
				25	0	20.87	19.17	30	-10.83
	20175	1732.5	16QAM	1	0	21.73	20.03	30	-9.97
				1	24	21.2	19.5	30	-10.5
				12	6	20.75	19.05	30	-10.95
				25	0	20.75	19.05	30	-10.95
	20375	1750	16QAM	1	0	21.68	19.98	30	-10.02
				1	24	21.22	19.52	30	-10.48
				12	6	20.87	19.17	30	-10.83
				25	0	20.76	19.06	30	-10.94
	20000	1715	64QAM	1	0	22.09	20.39	30	-9.61
				1	24	22.14	20.44	30	-9.56
				12	6	20.74	19.04	30	-10.96
				25	0	20.74	19.04	30	-10.96
	20175	1732.5	64QAM	1	0	22.05	20.35	30	-9.65
				1	24	21.52	19.82	30	-10.18
				12	6	20.62	18.92	30	-11.08
				25	0	20.62	18.92	30	-11.08
	20375	1750	64QAM	1	0	22	20.3	30	-9.7
				1	24	21.54	19.84	30	-10.16
				12	6	20.74	19.04	30	-10.96
				25	0	20.63	18.93	30	-11.07

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	20025	1717.5	QPSK	1	0	23.17	21.47	30	-8.53
				1	74	22.65	20.95	30	-9.05
				36	19	22	20.3	30	-9.7
				75	0	21.97	20.27	30	-9.73
	20175	1732.5	QPSK	1	0	22.83	21.13	30	-8.87
				1	74	22.45	20.75	30	-9.25
				36	19	21.85	20.15	30	-9.85
				75	0	21.82	20.12	30	-9.88
	20325	1747.5	QPSK	1	0	22.81	21.11	30	-8.89
				1	74	22.52	20.82	30	-9.18
				36	19	21.71	20.01	30	-9.99
				75	0	21.83	20.13	30	-9.87
	20025	1717.5	16QAM	1	0	21.99	20.29	30	-9.71
				1	74	21.54	19.84	30	-10.16
				36	19	20.91	19.21	30	-10.79
				75	0	20.92	19.22	30	-10.78
	20175	1732.5	16QAM	1	0	21.62	19.92	30	-10.08
				1	74	21.53	19.83	30	-10.17
				36	19	20.76	19.06	30	-10.94
				75	0	20.92	19.22	30	-10.78
	20325	1747.5	16QAM	1	0	21.91	20.21	30	-9.79
				1	74	21.59	19.89	30	-10.11
				36	19	20.72	19.02	30	-10.98
				75	0	20.79	19.09	30	-10.91
	20025	1717.5	64QAM	1	0	22.41	20.71	30	-9.29
				1	74	21.96	20.26	30	-9.74
				36	19	20.71	19.01	30	-10.99
				75	0	20.72	19.02	30	-10.98
	20175	1732.5	64QAM	1	0	22.04	20.34	30	-9.66
				1	74	21.95	20.25	30	-9.75
				36	19	20.56	18.86	30	-11.14
				75	0	20.72	19.02	30	-10.98
	20325	1747.5	64QAM	1	0	22.33	20.63	30	-9.37
				1	74	22.01	20.31	30	-9.69
				36	19	20.52	18.82	30	-11.18
				75	0	20.59	18.89	30	-11.11

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Antenna gain (dBi) -1.7

LTE Band 4_Uplink frequency band : 1710 to 1755 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	20050	1720	QPSK	1	0	23.07	21.37	30	-8.63
				1	99	23.21	21.51	30	-8.49
				50	25	21.87	20.17	30	-9.83
				100	0	21.87	20.17	30	-9.83
	20175	1732.5	QPSK	1	0	22.86	21.16	30	-8.84
				1	99	22.16	20.46	30	-9.54
				50	25	21.69	19.99	30	-10.01
				100	0	21.8	20.1	30	-9.9
	20300	1745	QPSK	1	0	22.66	20.96	30	-9.04
				1	99	22.25	20.55	30	-9.45
				50	25	21.71	20.01	30	-9.99
				100	0	21.74	20.04	30	-9.96
	20050	1720	16QAM	1	0	22.31	20.61	30	-9.39
				1	99	21.86	20.16	30	-9.84
				50	25	20.76	19.06	30	-10.94
				100	0	20.85	19.15	30	-10.85
	20175	1732.5	16QAM	1	0	21.97	20.27	30	-9.73
				1	99	21.39	19.69	30	-10.31
				50	25	20.68	18.98	30	-11.02
				100	0	20.75	19.05	30	-10.95
	20300	1745	16QAM	1	0	22.16	20.46	30	-9.54
				1	99	22.06	20.36	30	-9.64
				50	25	20.71	19.01	30	-10.99
				100	0	20.68	18.98	30	-11.02
	20050	1720	64QAM	1	0	22.26	20.56	30	-9.44
				1	99	21.81	20.11	30	-9.89
				50	25	20.71	19.01	30	-10.99
				100	0	20.8	19.1	30	-10.9
	20175	1732.5	64QAM	1	0	21.92	20.22	30	-9.78
				1	99	21.34	19.64	30	-10.36
				50	25	20.63	18.93	30	-11.07
				100	0	20.7	19	30	-11
	20300	1745	64QAM	1	0	22.11	20.41	30	-9.59
				1	99	22.01	20.31	30	-9.69
				50	25	20.66	18.96	30	-11.04
				100	0	20.63	18.93	30	-11.07

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Antenna gain (dBi) -4

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	22.54	18.54	34.77	-16.23
				1	5	22.49	18.49	34.77	-16.28
				3	2	22.31	18.31	34.77	-16.46
				6	0	21.79	17.79	34.77	-16.98
	23095	707.5	QPSK	1	0	22.43	18.43	34.77	-16.34
				1	5	22.42	18.42	34.77	-16.35
				3	2	22.41	18.41	34.77	-16.36
				6	0	21.69	17.69	34.77	-17.08
	23173	715.5	QPSK	1	0	22.38	18.38	34.77	-16.39
				1	5	22.5	18.5	34.77	-16.27
				3	2	22.41	18.41	34.77	-16.36
				6	0	21.68	17.68	34.77	-17.09
	23017	699.7	16QAM	1	0	21.99	17.99	34.77	-16.78
				1	5	21.92	17.92	34.77	-16.85
				3	2	21.44	17.44	34.77	-17.33
				6	0	20.97	16.97	34.77	-17.8
	23095	707.5	16QAM	1	0	22.33	18.33	34.77	-16.44
				1	5	21.69	17.69	34.77	-17.08
				3	2	21.37	17.37	34.77	-17.4
				6	0	20.78	16.78	34.77	-17.99
	23173	715.5	16QAM	1	0	21.77	17.77	34.77	-17
				1	5	22.15	18.15	34.77	-16.62
				3	2	21.24	17.24	34.77	-17.53
				6	0	20.88	16.88	34.77	-17.89
	23017	699.7	64QAM	1	0	22.19	18.19	34.77	-16.58
				1	5	22.03	18.03	34.77	-16.74
				3	2	21.45	17.45	34.77	-17.32
				6	0	20.88	16.88	34.77	-17.89
	23095	707.5	64QAM	1	0	22.24	18.24	34.77	-16.53
				1	5	22.06	18.06	34.77	-16.71
				3	2	21.38	17.38	34.77	-17.39
				6	0	20.69	16.69	34.77	-18.08
	23173	715.5	64QAM	1	0	22.08	18.08	34.77	-16.69
				1	5	22.16	18.16	34.77	-16.61
				3	2	21.25	17.25	34.77	-17.52
				6	0	20.79	16.79	34.77	-17.98

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Antenna gain (dBi) -4

LTE Band 12_Uplink frequency band : 699 to 716 MHz												
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)			
3	23025	700.5	QPSK	1	0	22.44	18.44	34.77	-16.33			
				1	14	22.51	18.51	34.77	-16.26			
				8	4	21.79	17.79	34.77	-16.98			
				15	0	21.76	17.76	34.77	-17.01			
	23095	707.5	QPSK	1	0	22.39	18.39	34.77	-16.38			
				1	14	22.31	18.31	34.77	-16.46			
				8	4	21.77	17.77	34.77	-17			
				15	0	21.7	17.7	34.77	-17.07			
	23165	714.5	QPSK	1	0	22.27	18.27	34.77	-16.5			
				1	14	22.5	18.5	34.77	-16.27			
				8	4	21.6	17.6	34.77	-17.17			
				15	0	21.53	17.53	34.77	-17.24			
	23025	700.5	16QAM	1	0	22.29	18.29	34.77	-16.48			
				1	14	21.91	17.91	34.77	-16.86			
				8	4	20.91	16.91	34.77	-17.86			
				15	0	21	17	34.77	-17.77			
				23095	707.5	16QAM	1	0	22.12	18.12	34.77	-16.65
							1	14	21.46	17.46	34.77	-17.31
	8	4	20.81				16.81	34.77	-17.96			
				15	0	20.79	16.79	34.77	-17.98			
				23165	714.5	16QAM	1	0	21.68	17.68	34.77	-17.09
							1	14	21.95	17.95	34.77	-16.82
	8	4	20.75				16.75	34.77	-18.02			
	15	0	20.97				16.97	34.77	-17.8			
	23025	700.5	64QAM	1	0	22.21	18.21	34.77	-16.56			
				1	14	21.83	17.83	34.77	-16.94			
				8	4	20.83	16.83	34.77	-17.94			
				15	0	20.92	16.92	34.77	-17.85			
	23095	707.5	64QAM	1	0	22.04	18.04	34.77	-16.73			
				1	14	21.38	17.38	34.77	-17.39			
				8	4	20.73	16.73	34.77	-18.04			
				15	0	20.71	16.71	34.77	-18.06			
	23165	714.5	64QAM	1	0	21.6	17.6	34.77	-17.17			
				1	14	21.87	17.87	34.77	-16.9			
				8	4	20.67	16.67	34.77	-18.1			
				15	0	20.79	16.79	34.77	-17.98			

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Antenna gain (dBi) -4

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	22.58	18.58	34.77	-16.19
				1	24	22.74	18.74	34.77	-16.03
				12	6	21.96	17.96	34.77	-16.81
				25	0	21.85	17.85	34.77	-16.92
	23095	707.5	QPSK	1	0	22.66	18.66	34.77	-16.11
				1	24	22.63	18.63	34.77	-16.14
				12	6	21.87	17.87	34.77	-16.9
				25	0	21.86	17.86	34.77	-16.91
	23155	713.5	QPSK	1	0	22.42	18.42	34.77	-16.35
				1	24	22.61	18.61	34.77	-16.16
				12	6	21.73	17.73	34.77	-17.04
				25	0	21.75	17.75	34.77	-17.02
	23035	701.5	16QAM	1	0	22.21	18.21	34.77	-16.56
				1	24	22.37	18.37	34.77	-16.4
				12	6	20.92	16.92	34.77	-17.85
				25	0	20.82	16.82	34.77	-17.95
	23095	707.5	16QAM	1	0	22.43	18.43	34.77	-16.34
				1	24	22	18	34.77	-16.77
				12	6	20.79	16.79	34.77	-17.98
				25	0	20.82	16.82	34.77	-17.95
	23155	713.5	16QAM	1	0	22.22	18.22	34.77	-16.55
				1	24	21.66	17.66	34.77	-17.11
				12	6	20.73	16.73	34.77	-18.04
				25	0	20.71	16.71	34.77	-18.06
	23035	701.5	64QAM	1	0	22.1	18.1	34.77	-16.67
				1	24	22.26	18.26	34.77	-16.51
				12	6	20.81	16.81	34.77	-17.96
				25	0	20.71	16.71	34.77	-18.06
	23095	707.5	64QAM	1	0	22.32	18.32	34.77	-16.45
				1	24	22.09	18.09	34.77	-16.68
				12	6	20.68	16.68	34.77	-18.09
				25	0	20.71	16.71	34.77	-18.06
	23155	713.5	64QAM	1	0	22.11	18.11	34.77	-16.66
				1	24	22.05	18.05	34.77	-16.72
				12	6	20.62	16.62	34.77	-18.15
				25	0	20.6	16.6	34.77	-18.17

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Antenna gain (dBi) -4

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
Bandwidth	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	22.77	18.77	34.77	-16
				1	49	22.79	18.79	34.77	-15.98
				25	12	21.88	17.88	34.77	-16.89
				50	0	21.88	17.88	34.77	-16.89
	23095	707.5	QPSK	1	0	22.71	18.71	34.77	-16.06
				1	49	22.53	18.53	34.77	-16.24
				25	12	21.85	17.85	34.77	-16.92
				50	0	21.79	17.79	34.77	-16.98
	23130	711	QPSK	1	0	22.7	18.7	34.77	-16.07
				1	49	22.6	18.6	34.77	-16.17
				25	12	21.73	17.73	34.77	-17.04
				50	0	21.73	17.73	34.77	-17.04
	23060	704	16QAM	1	0	22.22	18.22	34.77	-16.55
				1	49	22.37	18.37	34.77	-16.4
				25	12	20.89	16.89	34.77	-17.88
				50	0	20.93	16.93	34.77	-17.84
	23095	707.5	16QAM	1	0	22.02	18.02	34.77	-16.75
				1	49	21.89	17.89	34.77	-16.88
				25	12	20.76	16.76	34.77	-18.01
				50	0	20.78	16.78	34.77	-17.99
	23130	711	16QAM	1	0	22.16	18.16	34.77	-16.61
				1	49	21.87	17.87	34.77	-16.9
				25	12	20.7	16.7	34.77	-18.07
				50	0	20.76	16.76	34.77	-18.01
	23060	704	64QAM	1	0	22.02	18.02	34.77	-16.75
				1	49	22.17	18.17	34.77	-16.6
				25	12	20.69	16.69	34.77	-18.08
				50	0	20.73	16.73	34.77	-18.04
	23095	707.5	64QAM	1	0	21.82	17.82	34.77	-16.95
				1	49	21.69	17.69	34.77	-17.08
				25	12	20.56	16.56	34.77	-18.21
				50	0	20.58	16.58	34.77	-18.19
	23130	711	64QAM	1	0	21.96	17.96	34.77	-16.81
				1	49	21.67	17.67	34.77	-17.1
				25	12	20.5	16.5	34.77	-18.27
				50	0	20.56	16.56	34.77	-18.21

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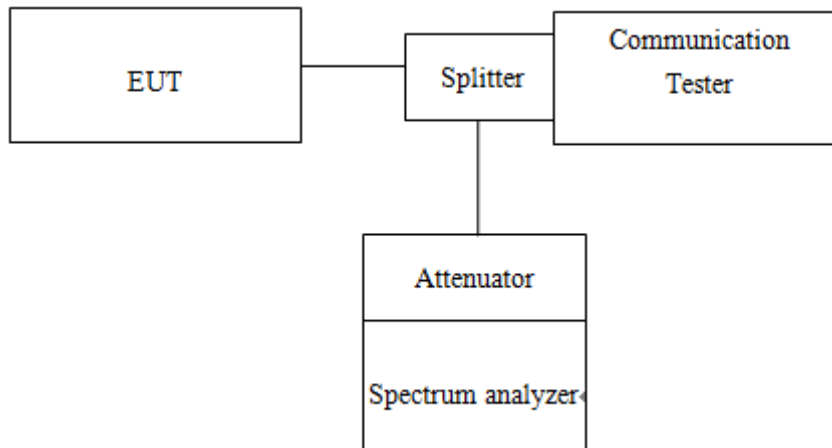
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7. OCCUPIED BANDWIDTH MEASUREMENT

7.1. Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

7.2. Test Set-up



7.3. Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

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7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/06/19
Radio Communication Analyzer	Anritsu	MT8820C	6201107337	2018/06/15	2019/06/14
DC Power Supply	Agilent	E3640A	MY53130054	2017/09/04	2018/09/03
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25
Splitter	Woken	DOM35LW1A2	RF36	2017/12/26	2018/12/25

7.5. Measurement Result

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA II	HSDPA II	HSUPA II	WCDMA II	HSDPA II	HSUPA II
1852.40	9262	4.06740	4.07420	4.06290	4.61560	4.61310	4.61600
1880.00	9400	4.07320	4.06890	4.07180	4.61960	4.62970	4.62730
1907.60	9538	4.07300	4.07550	4.07650	4.63630	4.65500	4.64740

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA IV	HSDPA IV	HSUPA IV	WCDMA IV	HSDPA IV	HSUPA IV
1712.40	1312	4.06256	4.06130	4.05851	4.60900	4.60700	4.61100
1732.60	1413	4.05791	4.06415	4.06749	4.63100	4.62600	4.63600
1752.60	1513	4.06828	4.06471	4.06941	4.60400	4.60600	4.61300

LTE BAND 2 Channel bandwidth: 1.4MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1850.7	18607	1.1024	1.1025	1.1061	1.3200	1.3595	1.3728
1880.0	18900	1.1029	1.1023	1.1032	1.3492	1.3473	1.3454
1909.3	19193	1.1042	1.1030	1.1061	1.3717	1.3228	1.3486

LTE BAND 2 Channel bandwidth: 3MHz								
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)			
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
1851.5	18615	2.7022	2.7085	2.7117	2.9853	3.0222	3.0219	
1880.0	18900	2.7041	2.7081	2.7119	2.9816	3.0351	3.0172	
1908.5	19185	2.7020	2.7058	2.7140	2.9927	3.0165	3.0295	

LTE BAND 2 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1852.5	18625	4.4967	4.5003	4.4963	5.0569	5.0786	5.0595
1880.0	18900	4.5026	4.5002	4.4900	5.1232	5.0630	5.0397
1907.5	19175	4.5079	4.5016	4.4915	5.1370	5.0449	5.0743

LTE BAND 2 Channel bandwidth: 10MHz								
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)			
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
1855.0	18650	9.0253	8.9797	9.0181	10.312	10.069	10.251	
1880.0	18900	9.0295	8.9829	9.0080	10.306	10.180	10.247	
1905.0	19150	9.0300	8.9743	9.0074	10.391	10.178	10.300	

LTE BAND 2 Channel bandwidth: 15MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1857.5	18675	13.500	13.505	13.507	15.537	15.845	15.929
1880.0	18900	13.564	13.539	13.560	15.790	16.066	15.961
1902.5	19125	13.531	13.515	13.515	15.513	15.901	15.826

LTE BAND 2 Channel bandwidth: 20MHz								
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)			
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
1860.0	18700	17.949	17.968	17.986	20.466	20.530	20.226	
1880.0	18900	18.075	18.066	18.064	20.830	20.615	20.665	
1900.0	19100	17.971	17.976	17.953	20.641	20.393	20.467	

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LTE BAND 4 Channel bandwidth: 1.4MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1710.7	19957	1.1035	1.1013	1.1066	1.3501	1.3613	1.3226
1732.5	20175	1.1045	1.1053	1.1054	1.3883	1.3965	1.3243
1754.3	20393	1.1018	1.1041	1.1053	1.3267	1.3936	1.3244

LTE BAND 4 Channel bandwidth: 3MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1711.5	19965	2.7030	2.7032	2.7121	3.0020	3.0195	3.0171
1732.5	20175	2.7033	2.7062	2.7141	2.9962	3.0414	3.0508
1753.5	20385	2.7034	2.7082	2.7112	2.9979	3.0359	3.0537

LTE BAND 4 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1712.5	19957	4.5020	4.5023	4.4999	5.0616	5.1096	5.0282
1732.5	20175	4.5005	4.5091	4.4947	5.0826	5.0853	5.0229
1752.5	20375	4.5030	4.5060	4.4940	5.0768	5.0555	5.0541

LTE BAND 4 Channel bandwidth: 10MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1715.0	20000	9.0201	8.9760	9.0112	10.395	10.123	10.268
1732.5	20175	9.0196	8.9702	8.9982	10.264	10.047	10.263
1750.0	20350	9.0389	8.9798	9.0116	10.365	10.175	10.223

LTE BAND 4 Channel bandwidth: 15MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1717.5	20025	13.541	13.553	13.558	15.886	15.838	15.785
1732.5	20175	13.473	13.485	13.507	15.481	15.729	15.735
1747.5	20325	13.549	13.547	13.590	15.786	15.829	15.890

LTE BAND 4 Channel bandwidth: 20MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1720.0	20050	18.046	18.057	18.066	20.661	20.659	20.598
1732.5	20175	17.931	17.931	17.942	20.182	20.040	20.360
1745.0	20300	17.989	18.014	17.998	20.252	20.362	20.390

LTE BAND 12 Channel bandwidth: 1.4MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
699.7	23017	1.1003	1.1171	1.1256	1.3142	1.2811	1.3360
707.5	23095	1.1022	1.1023	1.1011	1.3368	1.3633	1.3570
715.3	23173	1.1035	1.1046	1.1028	1.3228	1.3612	1.3491

LTE BAND 12 Channel bandwidth: 3MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
700.5	23025	2.7011	2.7041	2.7096	2.9927	3.0238	3.0246
707.5	23095	2.7000	2.7014	2.7136	3.0069	3.0123	3.0279
714.5	23165	2.6990	2.6986	2.7095	3.0021	2.9920	3.0154

LTE BAND 12 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
701.5	23035	4.4976	4.4975	4.4949	5.0664	5.0641	5.0444
707.5	23095	4.5013	4.5018	4.4960	5.0416	5.0761	5.0324
713.5	23155	4.4959	4.4996	4.4910	5.0413	5.0304	5.0184

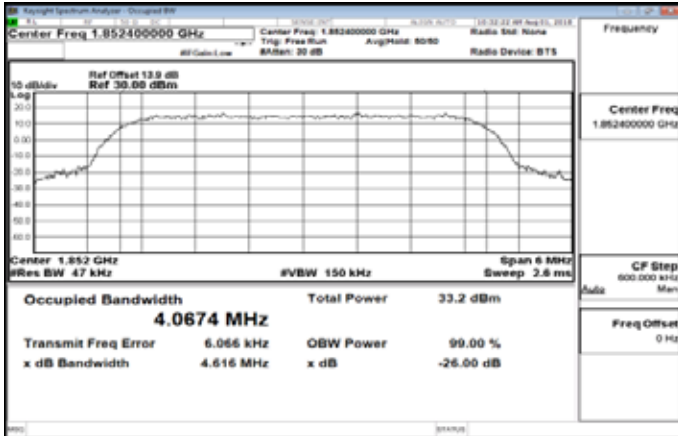
LTE BAND 12 Channel bandwidth: 10MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
704.0	23060	9.0157	8.9669	8.9855	10.205	10.096	10.233
707.5	23095	9.0384	8.9981	9.0202	10.307	10.201	10.309
711.0	23130	9.0291	8.9858	9.0117	10.199	10.065	10.247

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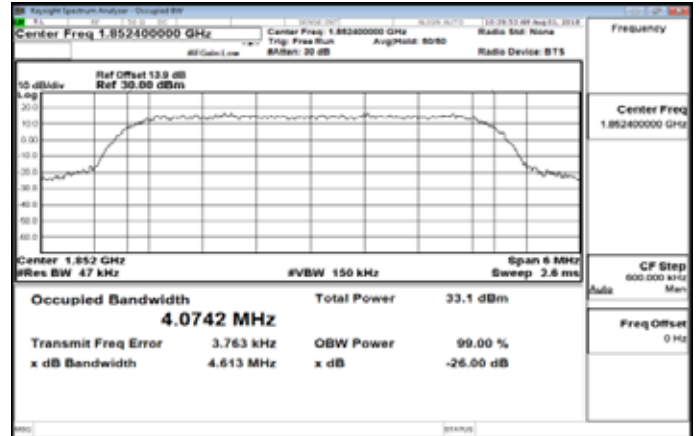
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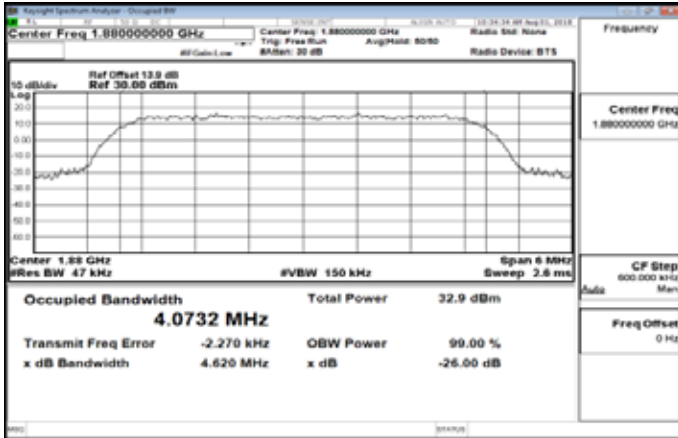
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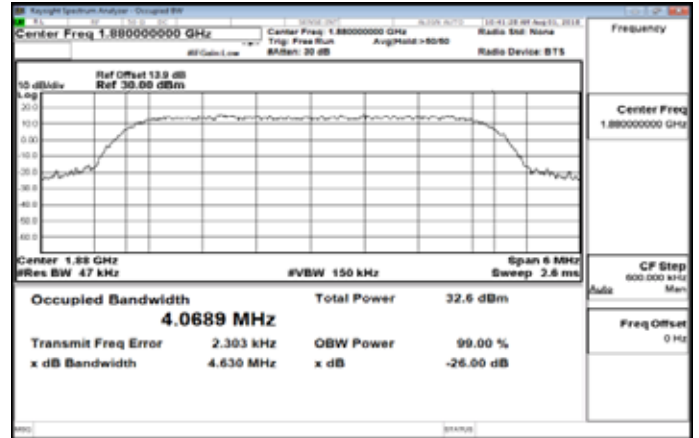
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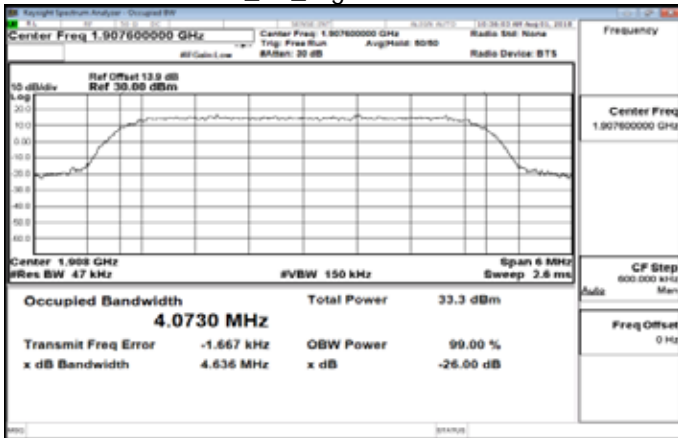
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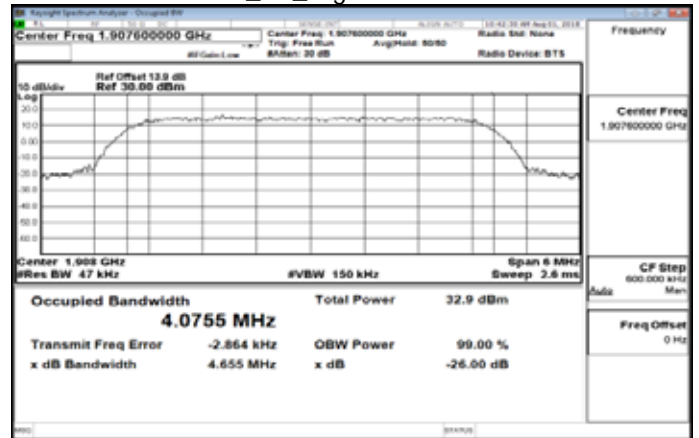
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HSDPA_B2_HighCH9538-1907.6



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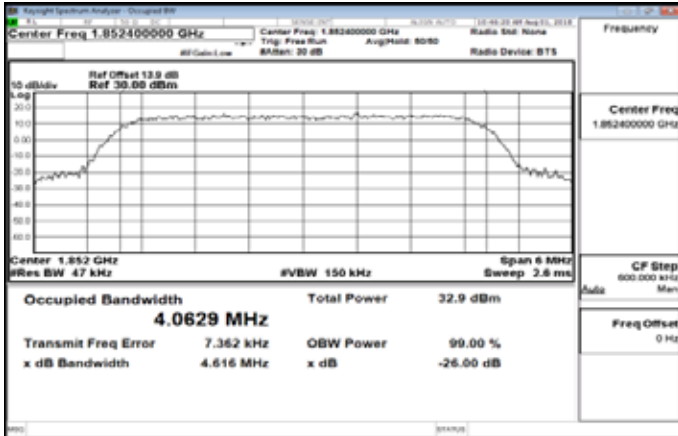
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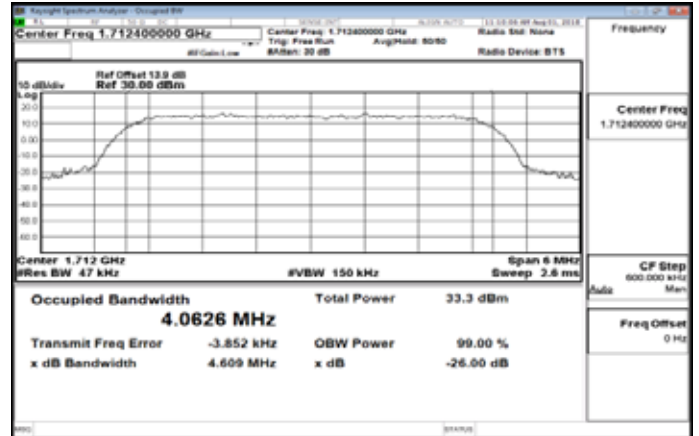
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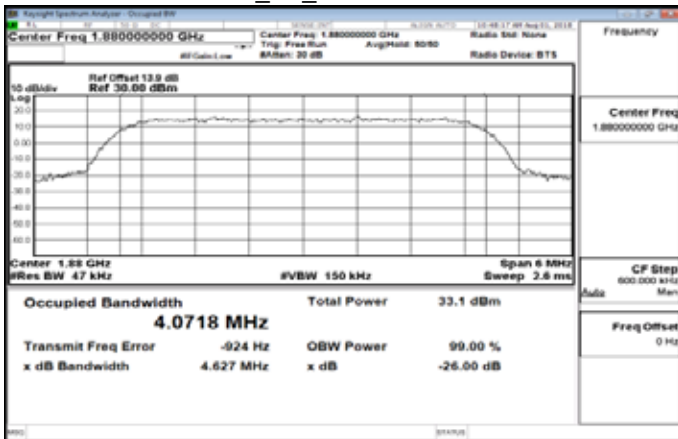
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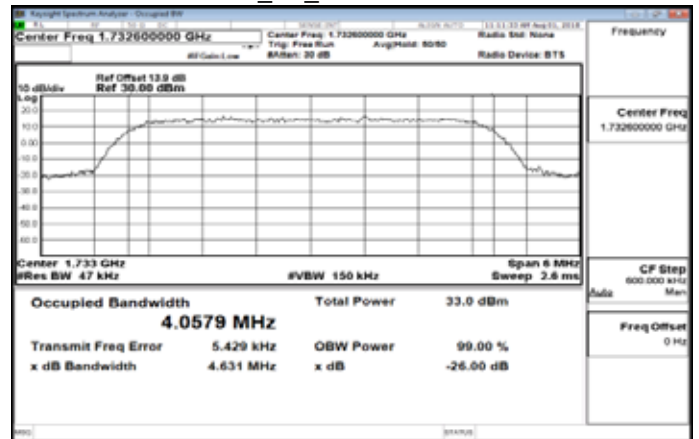
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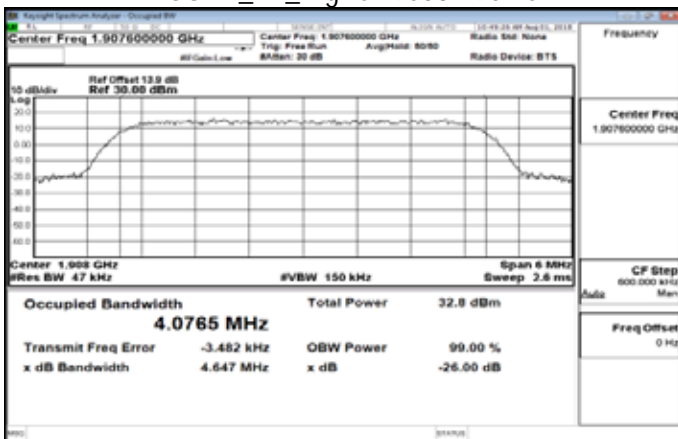
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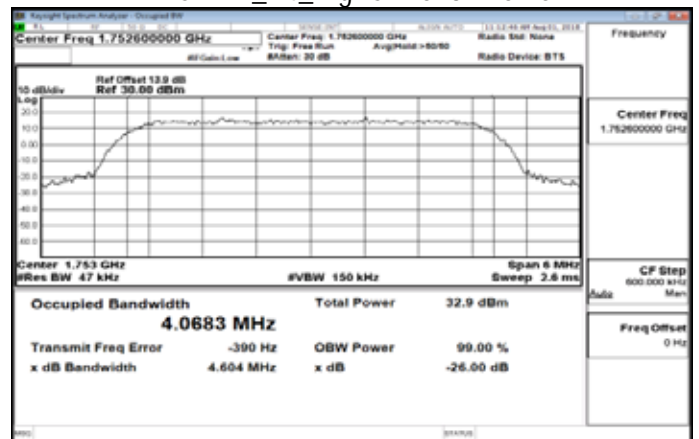
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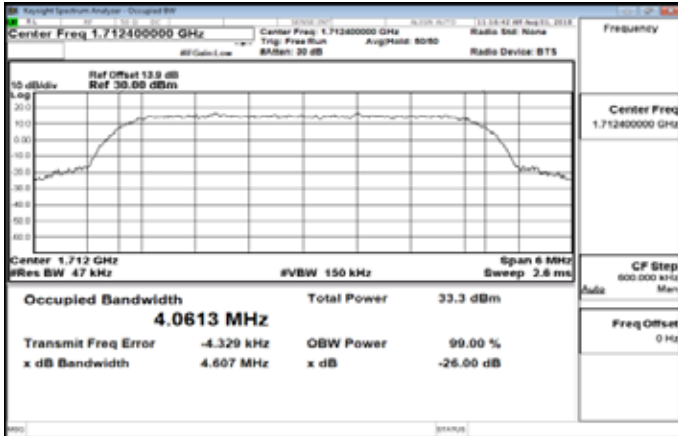
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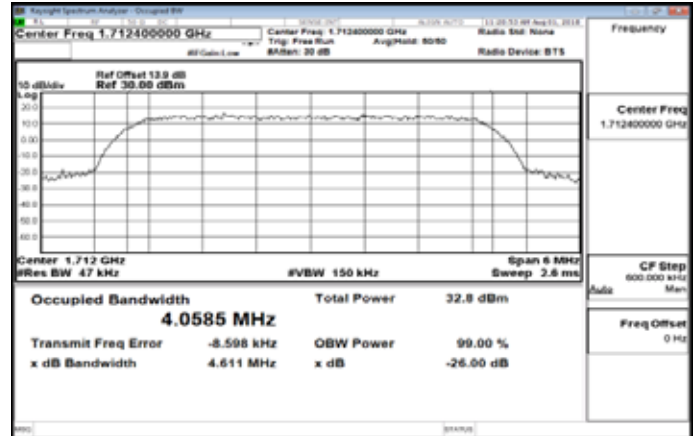
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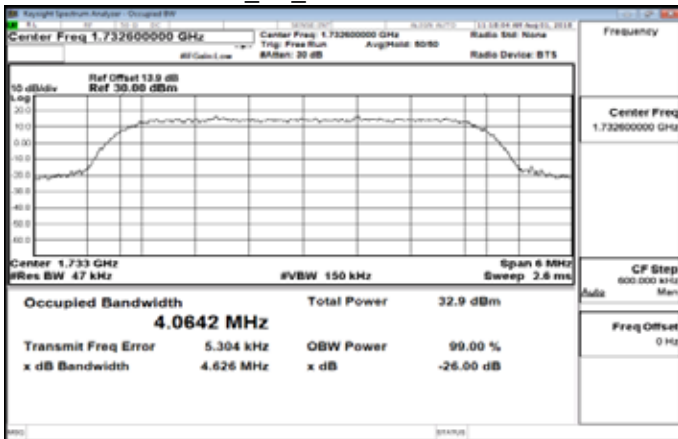
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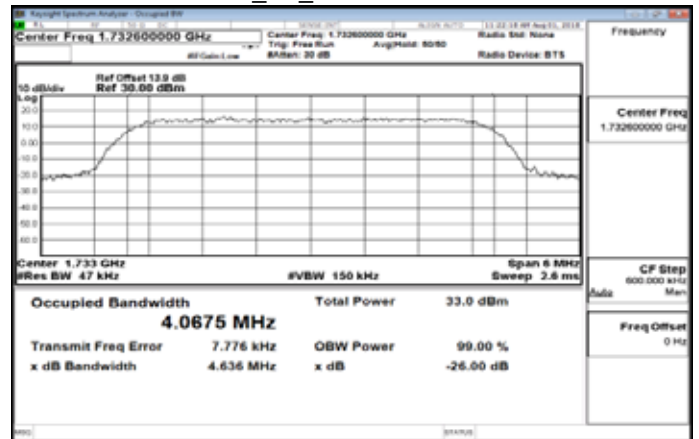
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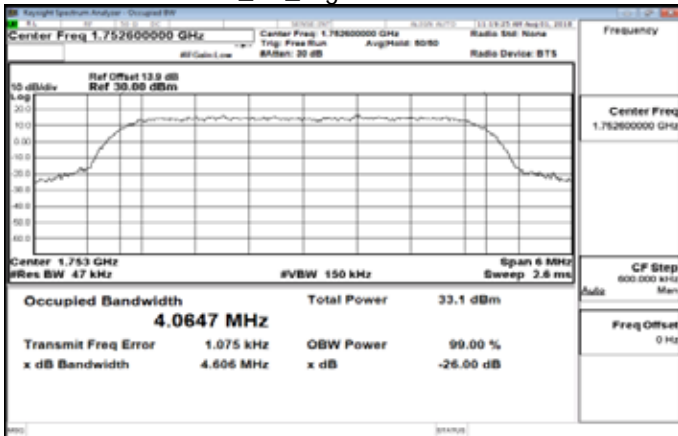
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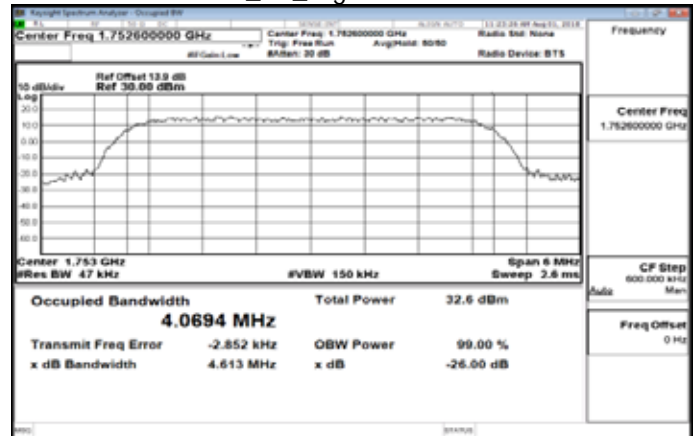
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HSUPA_B4_HighCH1513-1752.6



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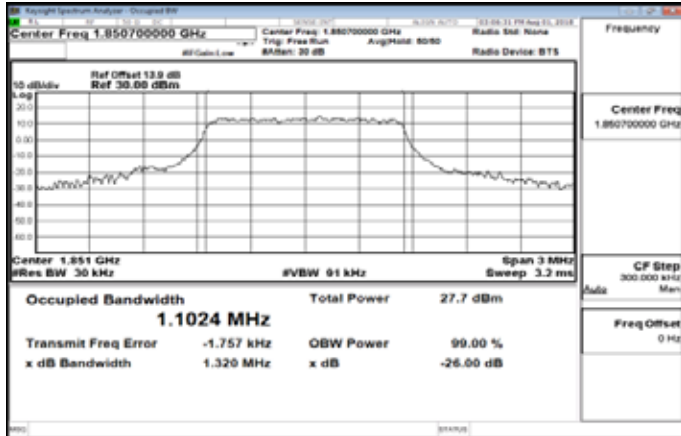
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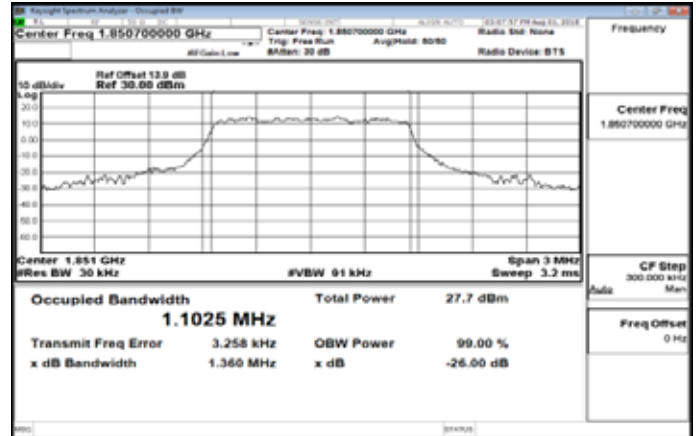
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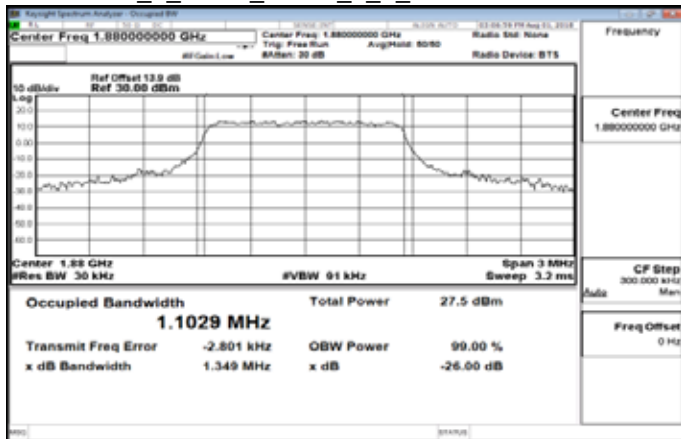
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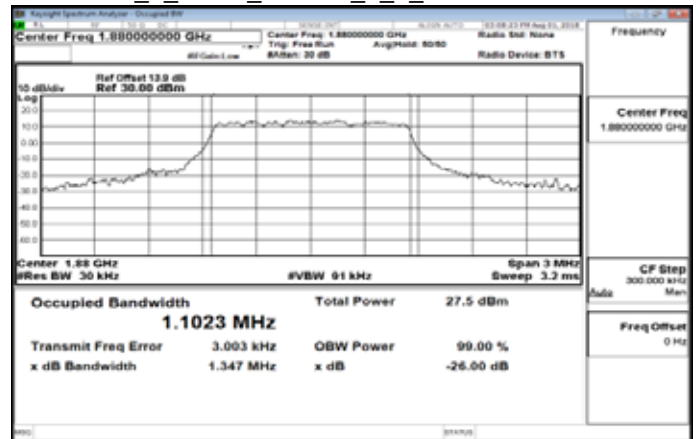
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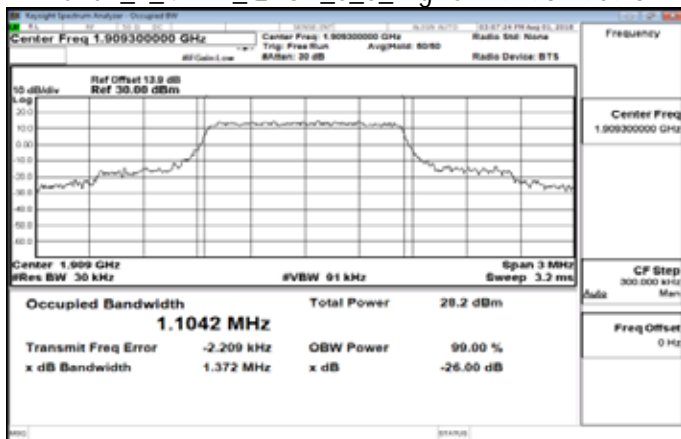
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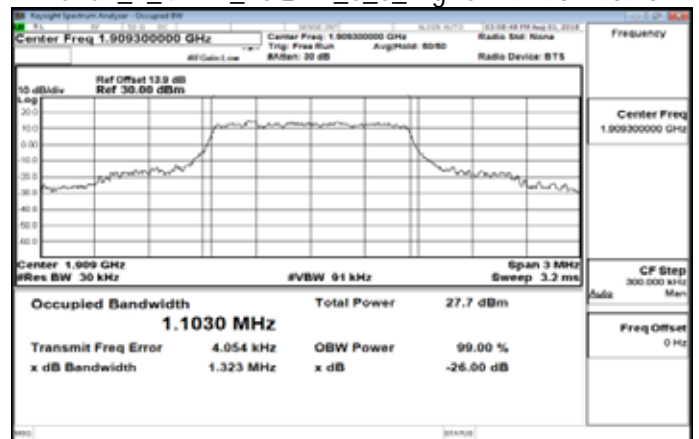
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Band2_1_4MHz_16QAM_6_0_HighCH19193-1909.3



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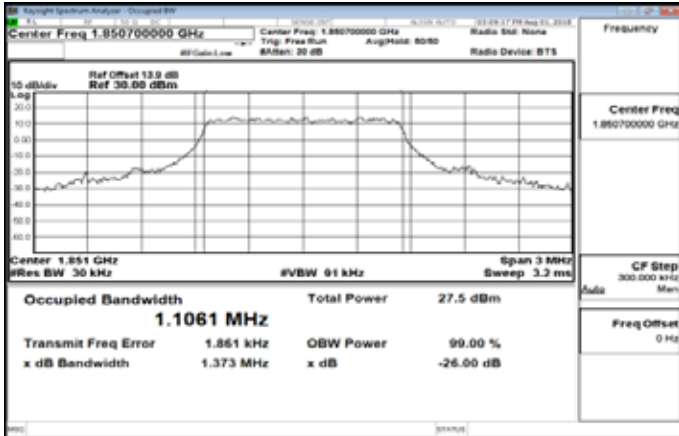
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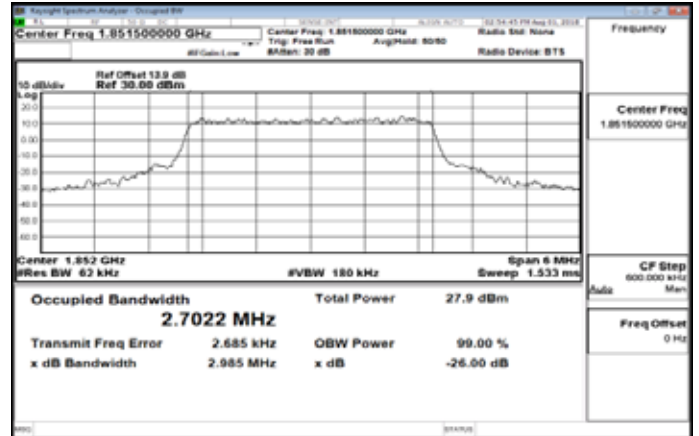
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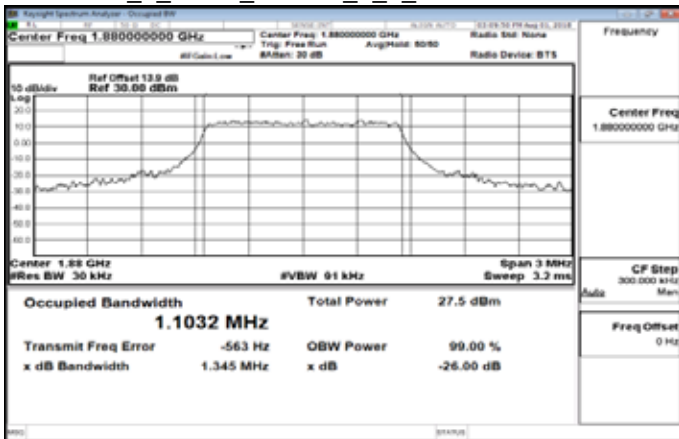
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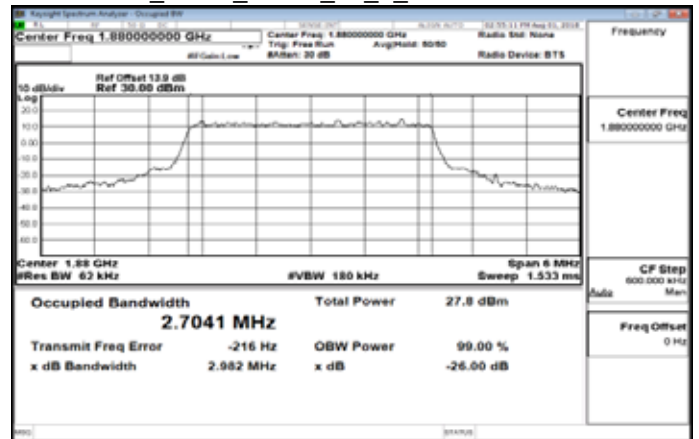
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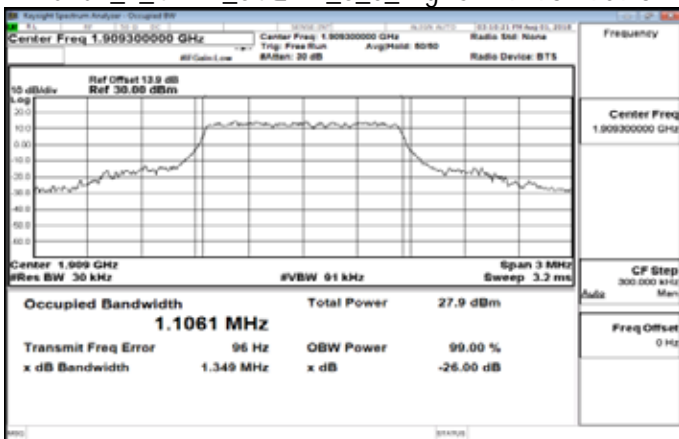
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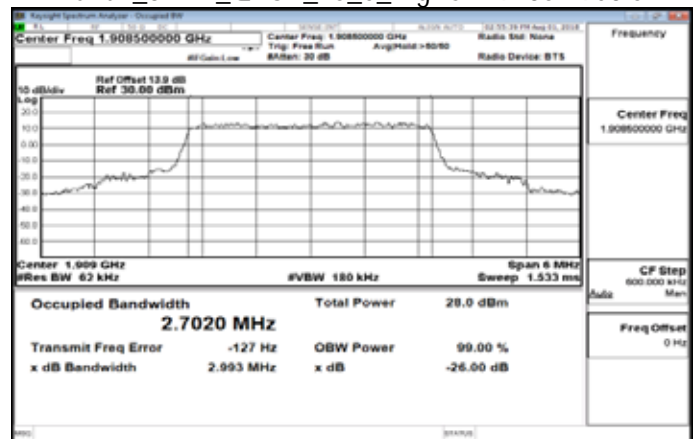
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Band2_3MHz_QPSK_15_0_HighCH19185-1908.5



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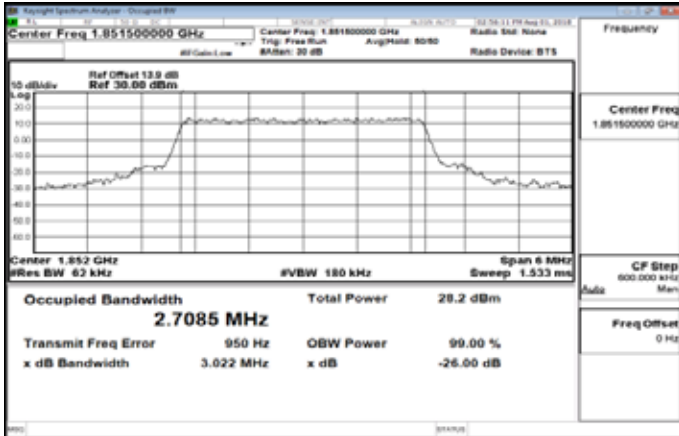
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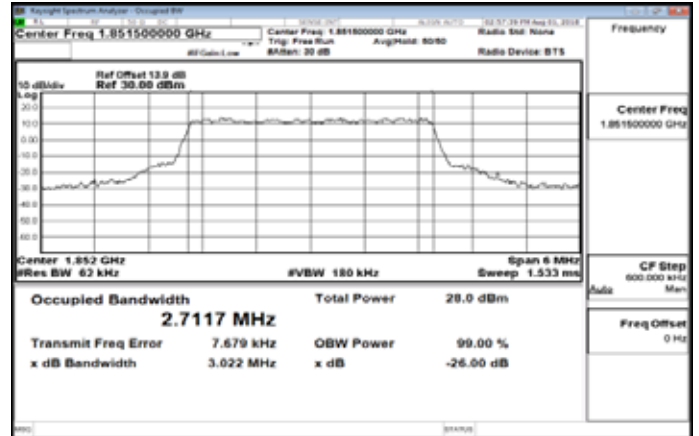
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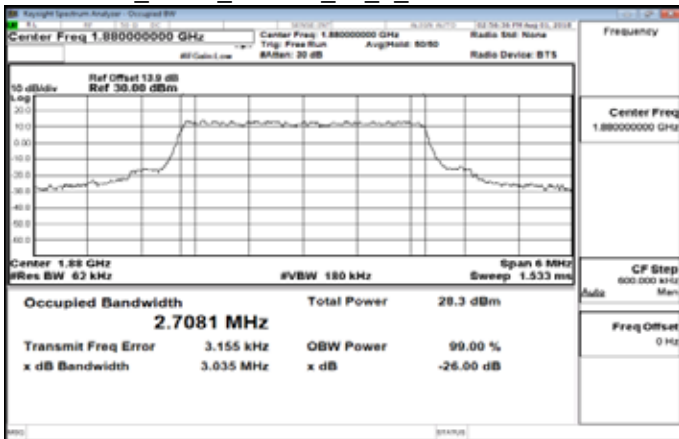
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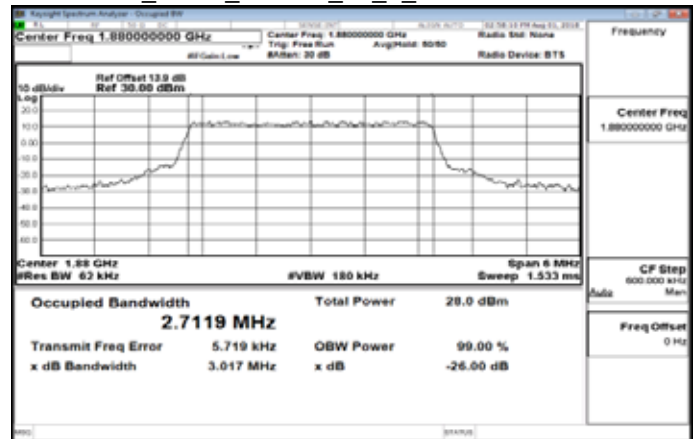
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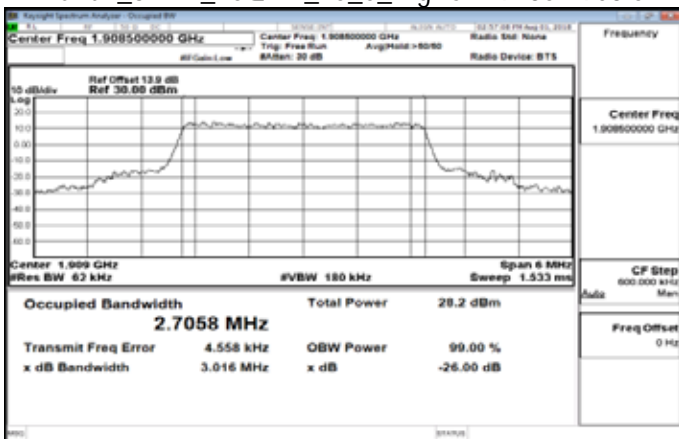
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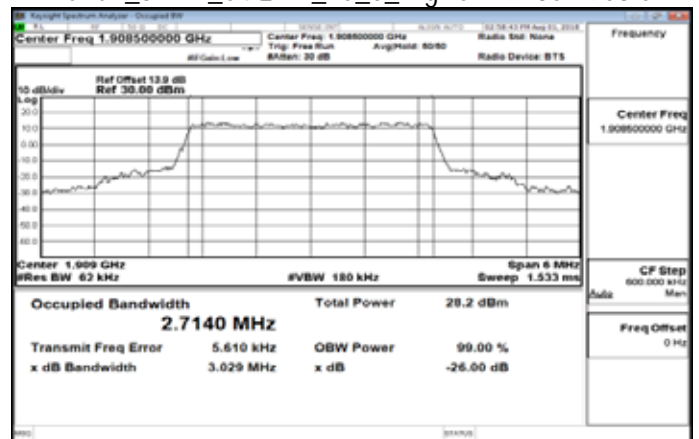
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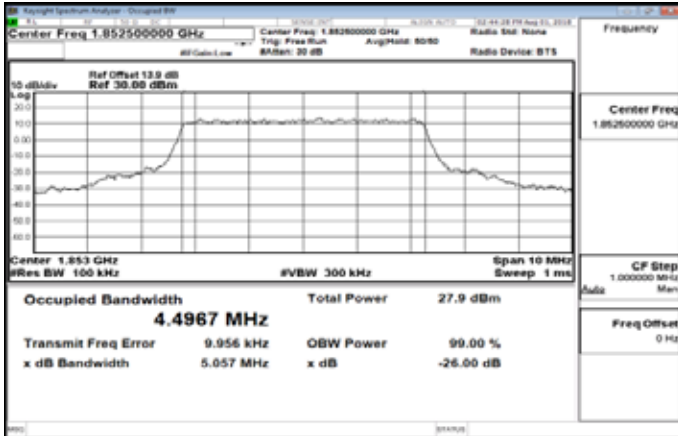
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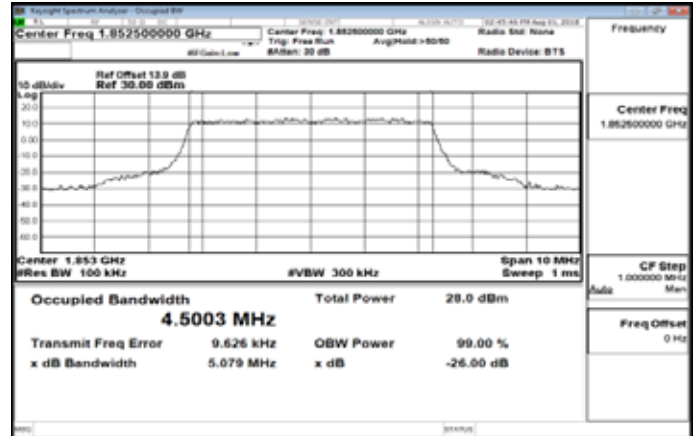
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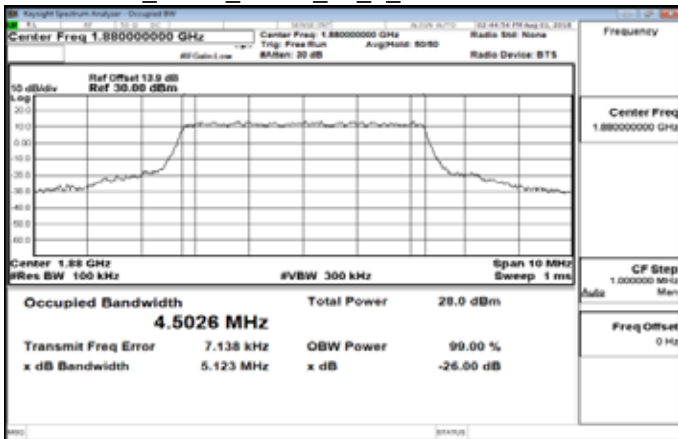
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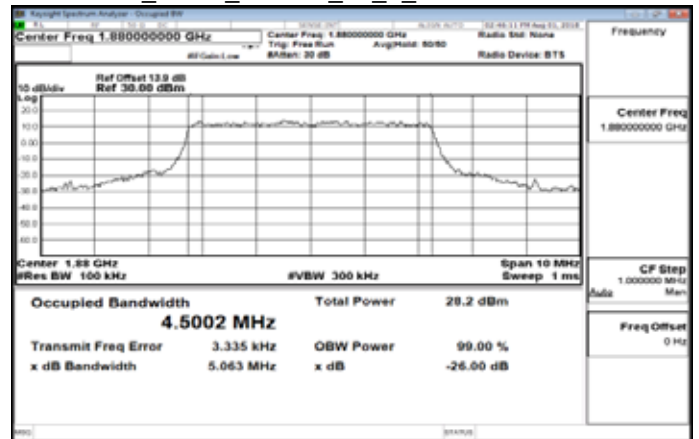
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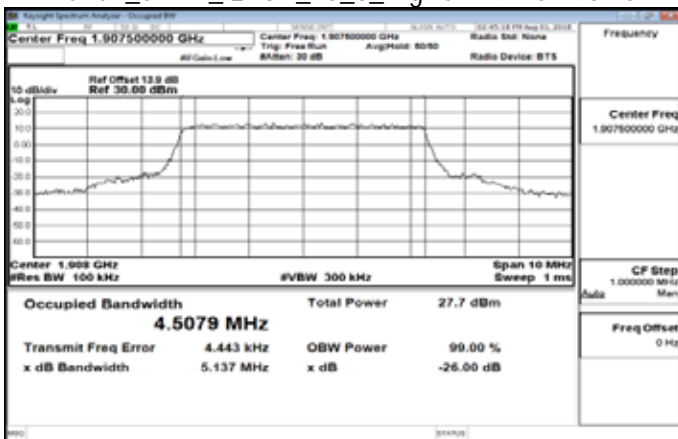
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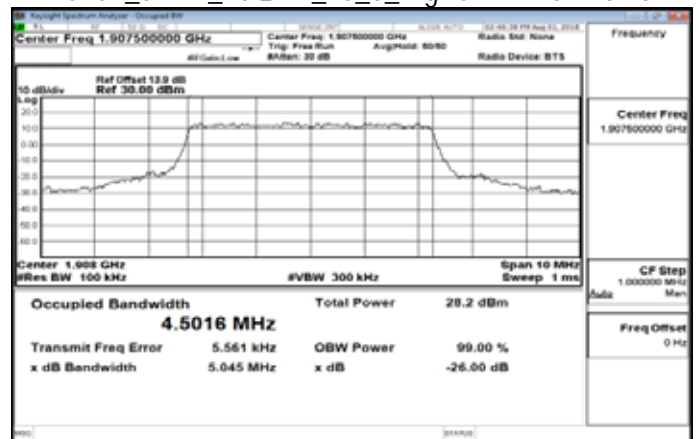
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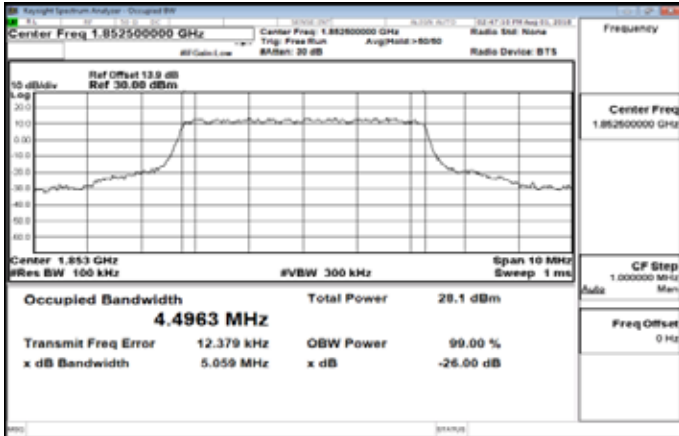
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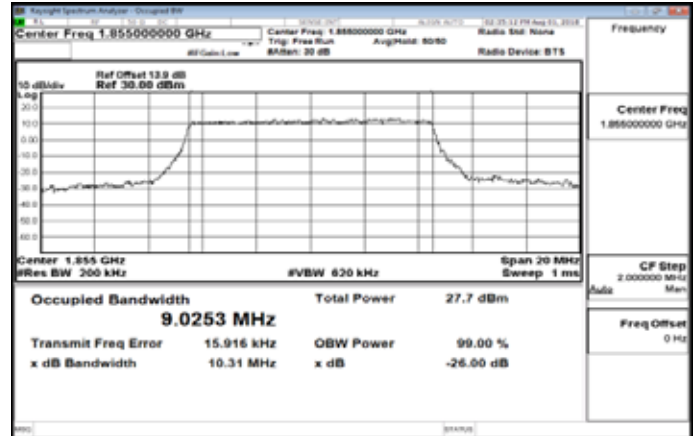
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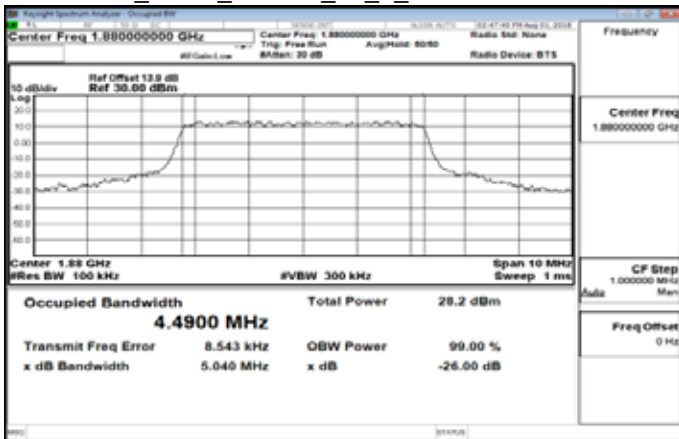
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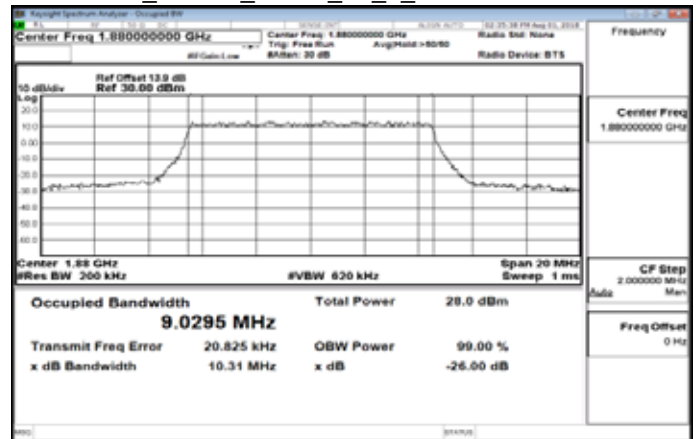
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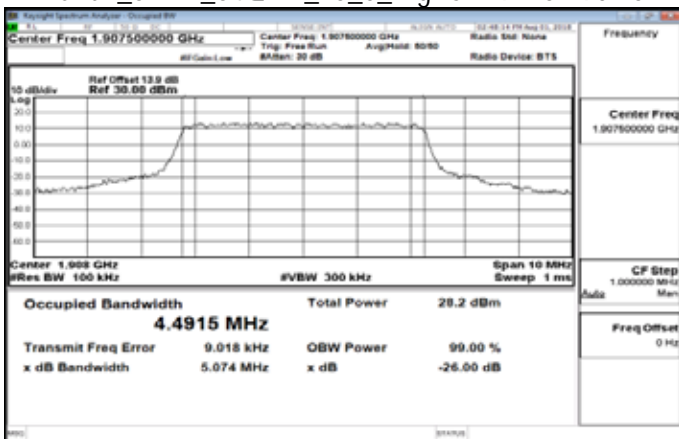
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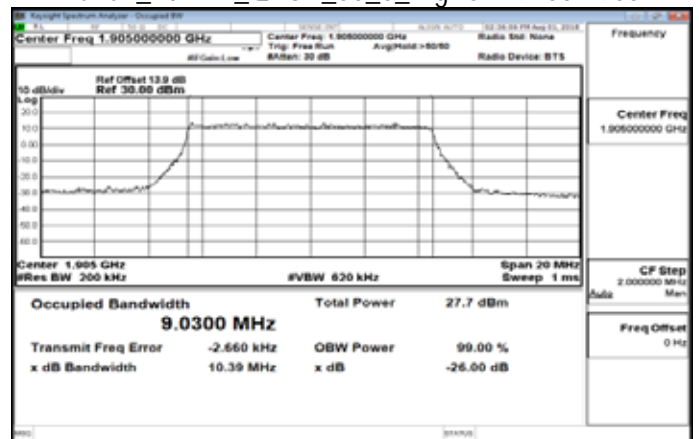
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Band2_10MHz_QPSK_50_0_HighCH19150-1905



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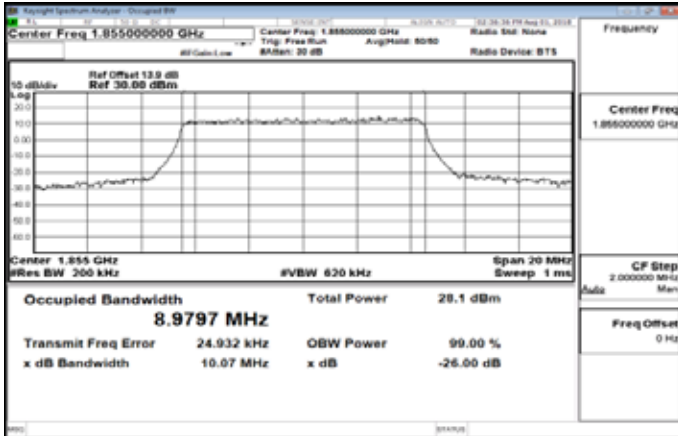
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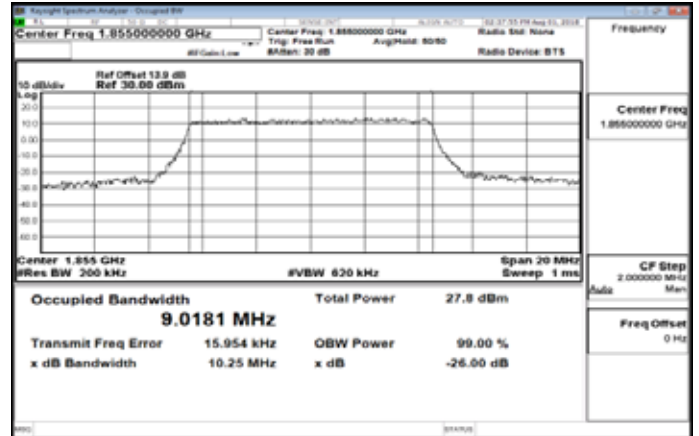
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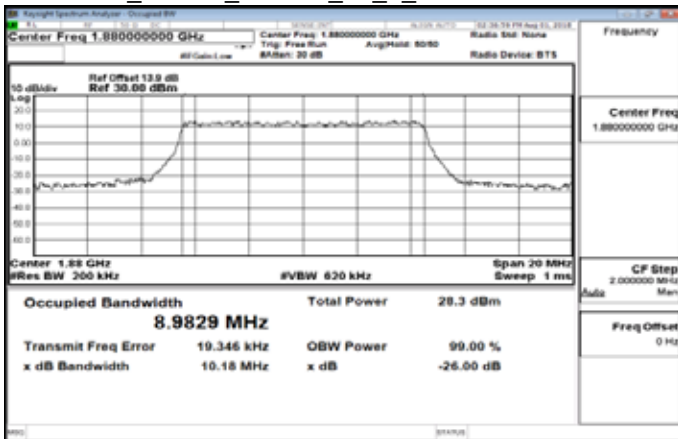
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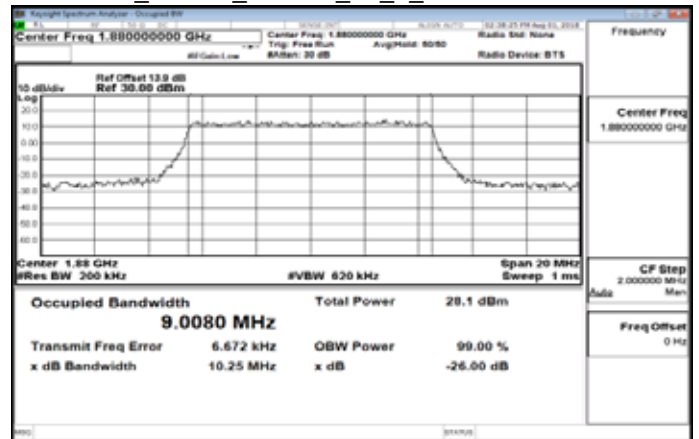
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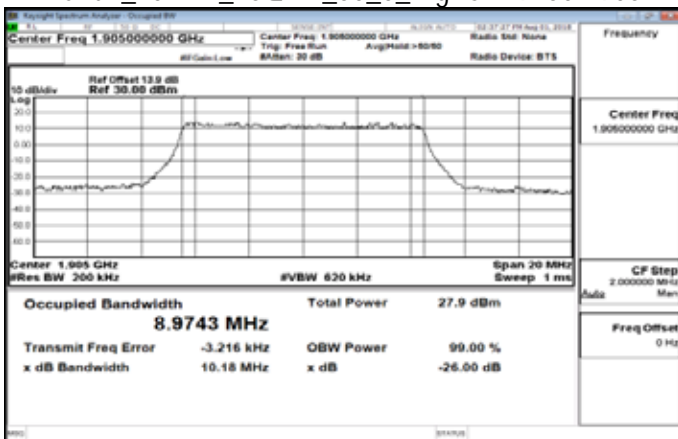
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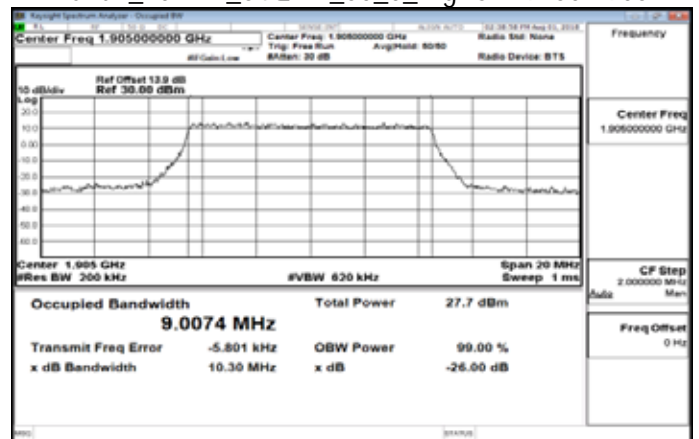
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Band2_10MHz_16QAM_50_0_HighCH19150-1905



Band2_10MHz_64QAM_50_0_HighCH19150-1905



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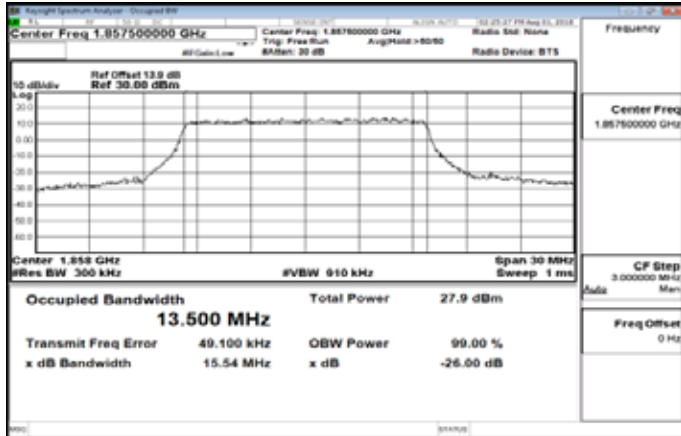
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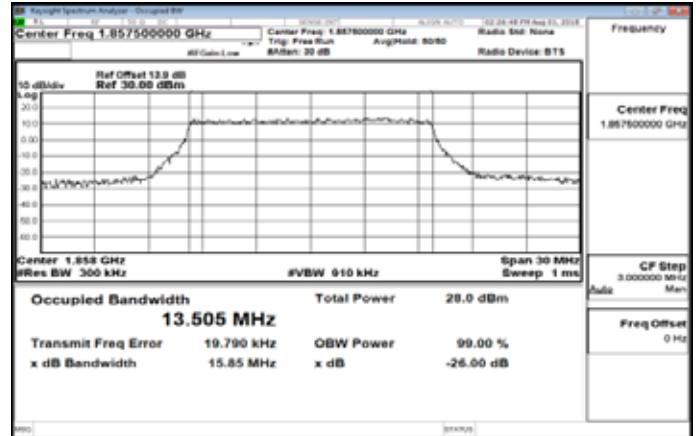
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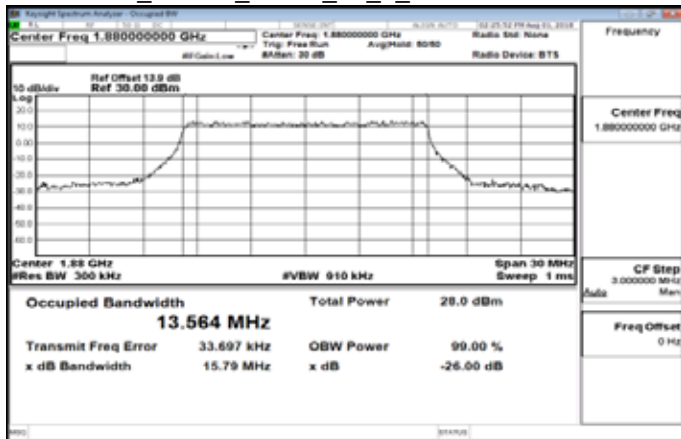
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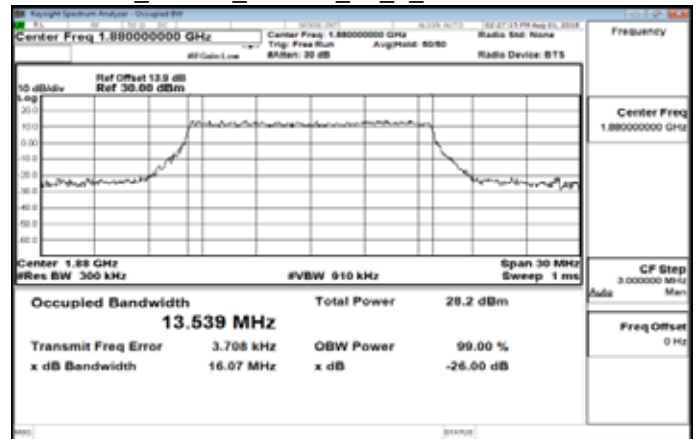
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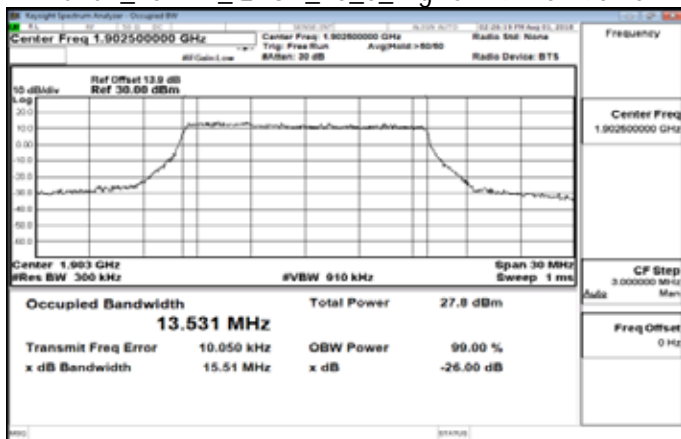
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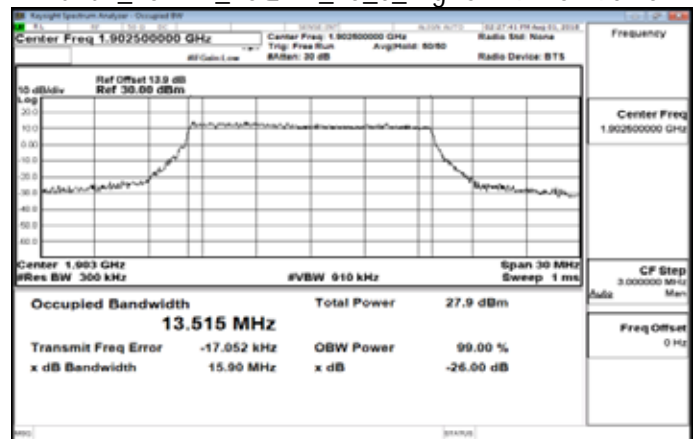
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Band2_15MHz_QPSK_75_0_HighCH19125-1902.5



Band2_15MHz_16QAM_75_0_HighCH19125-1902.5



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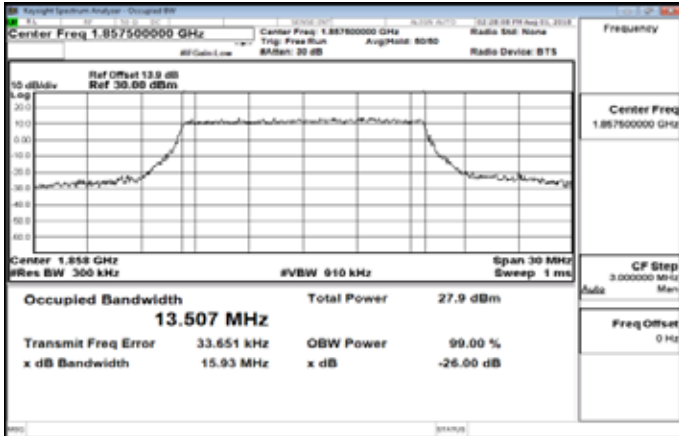
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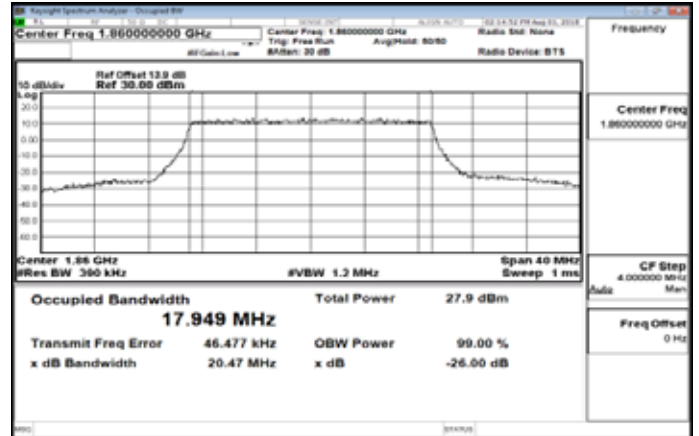
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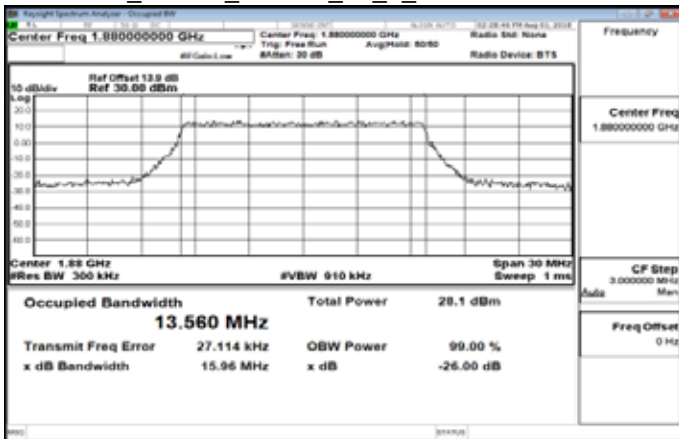
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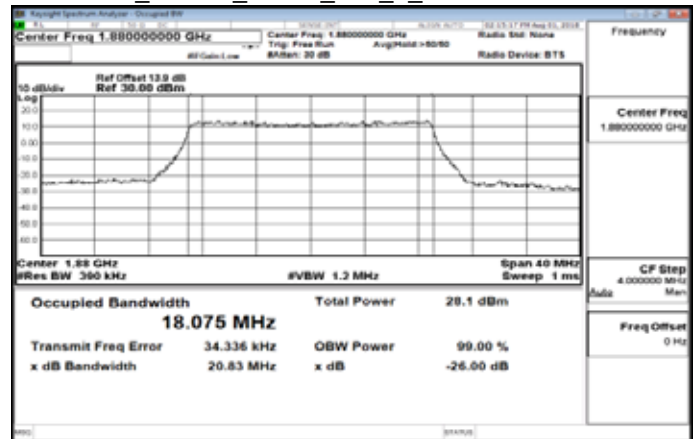
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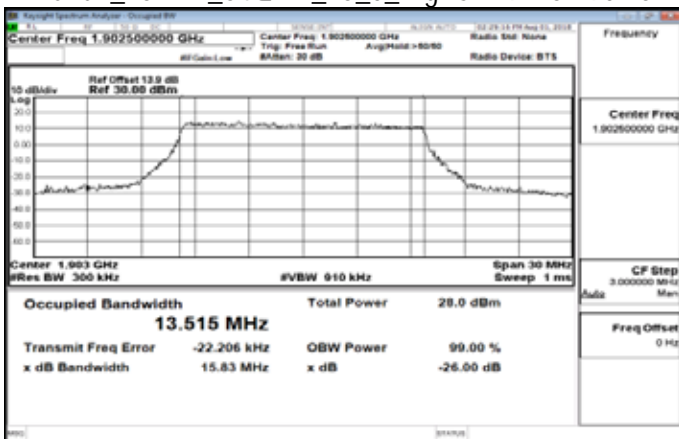
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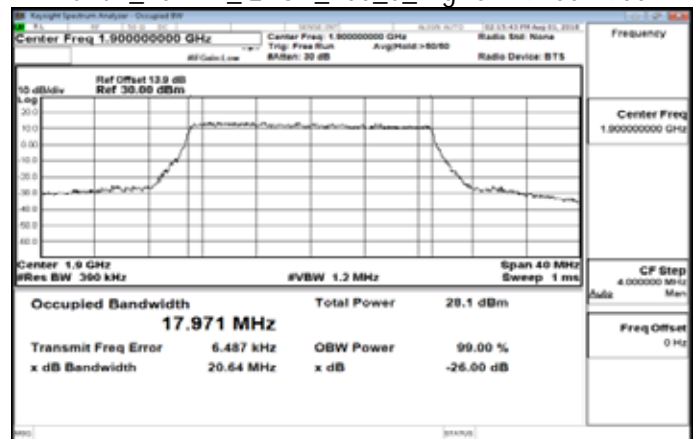
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Band2_15MHz_64QAM_75_0_HighCH19125-1902.5



Band2_20MHz_QPSK_100_0_HighCH19100-1900



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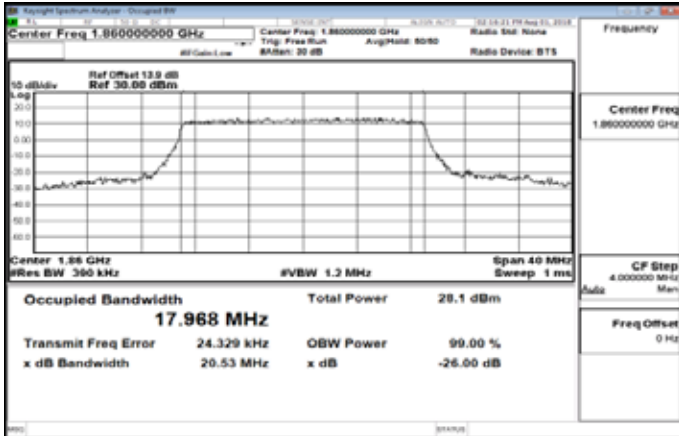
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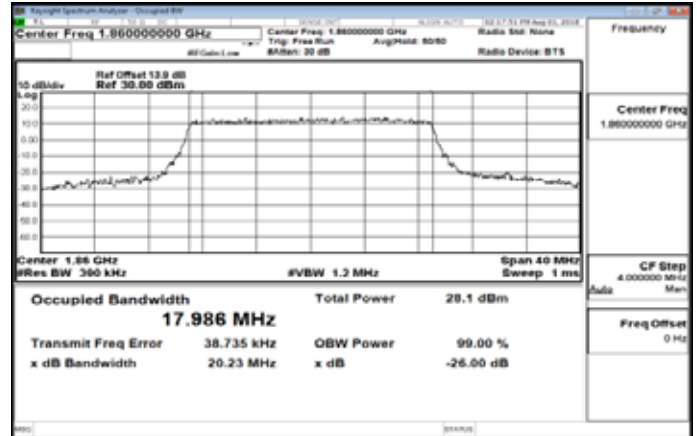
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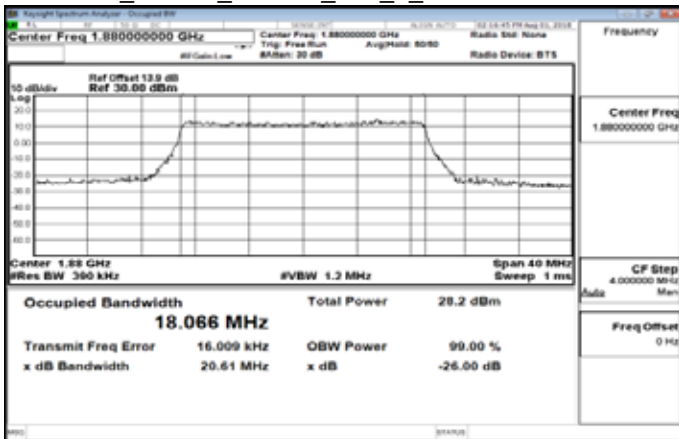
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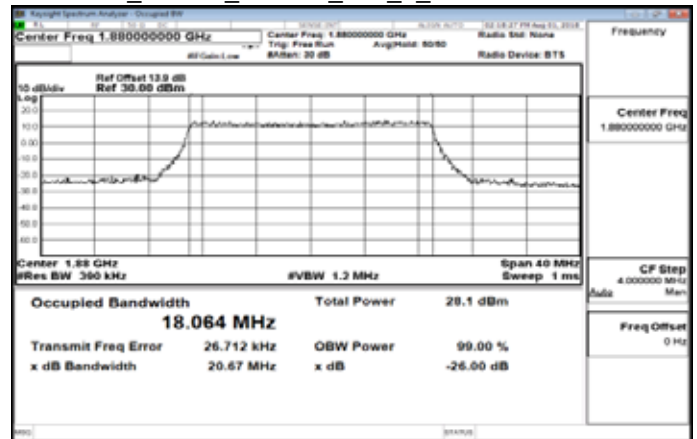
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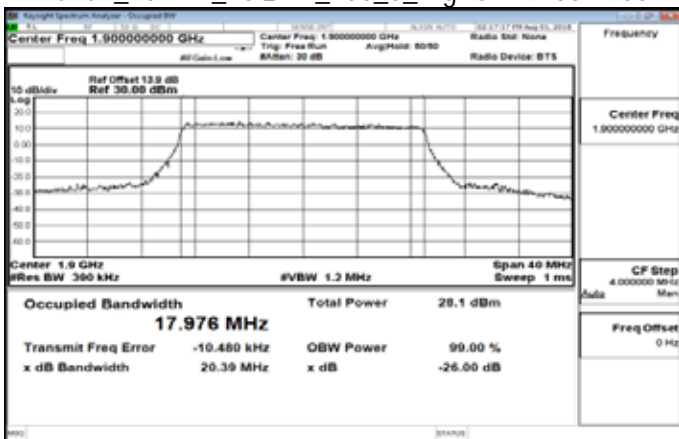
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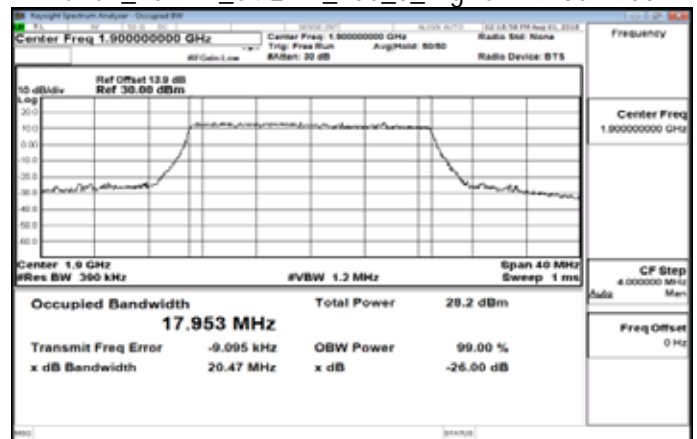
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Band2_20MHz_16QAM_100_0_HighCH19100-1900



Band2_20MHz_64QAM_100_0_HighCH19100-1900



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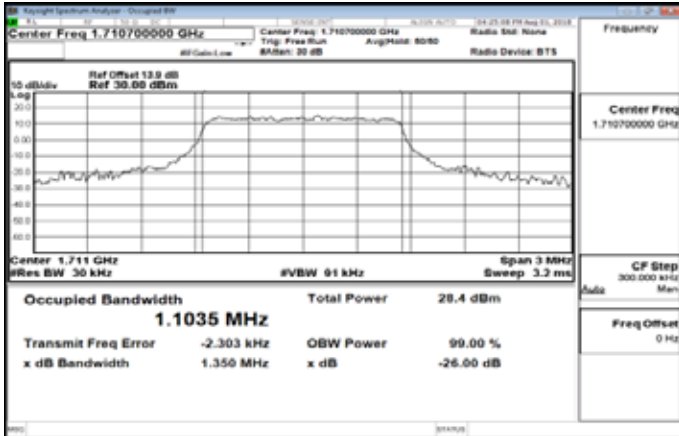
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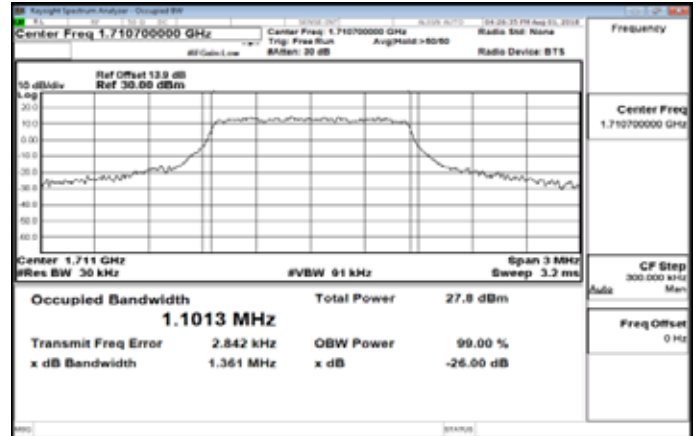
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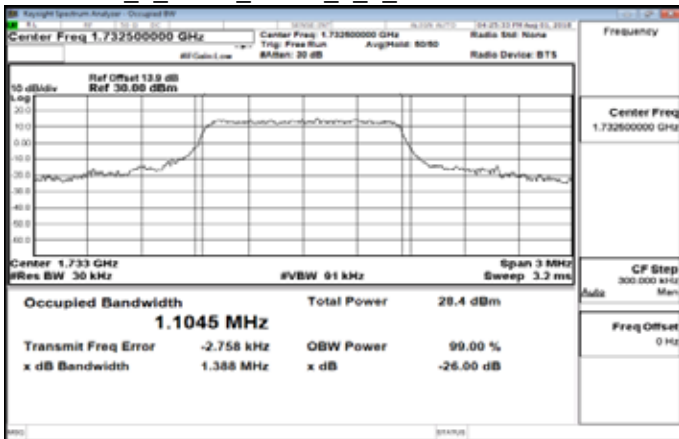
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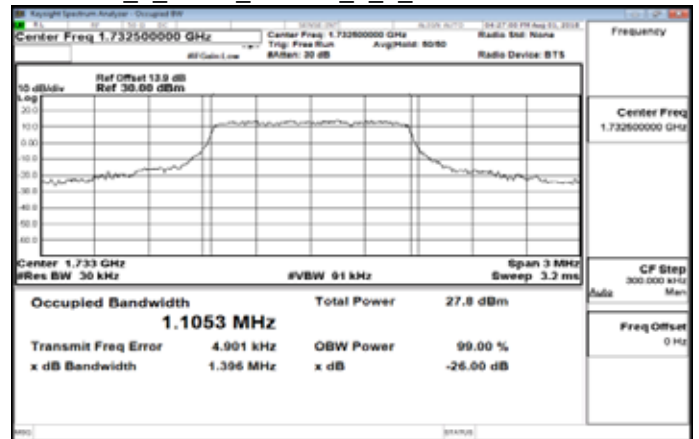
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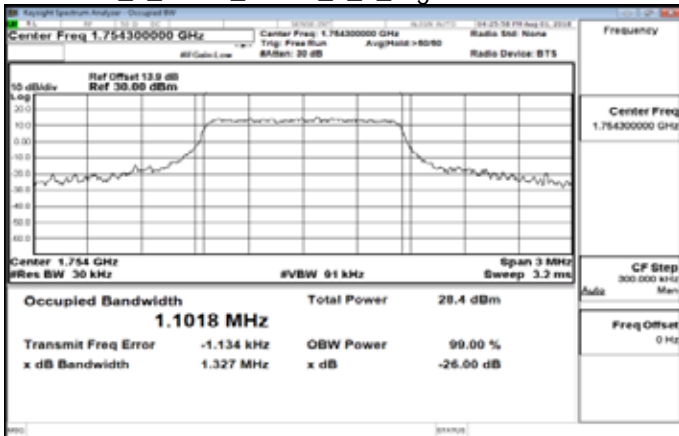
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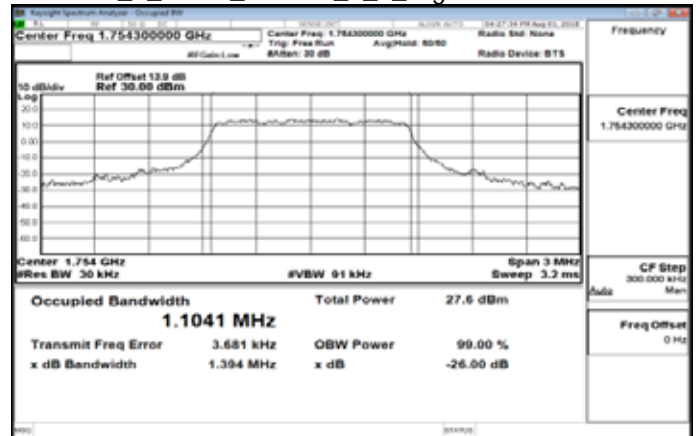
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Band4_1_4MHz_QPSK_6_0_HighCH20393-1754.3



Band4_1_4MHz_16QAM_6_0_HighCH20393-1754.3



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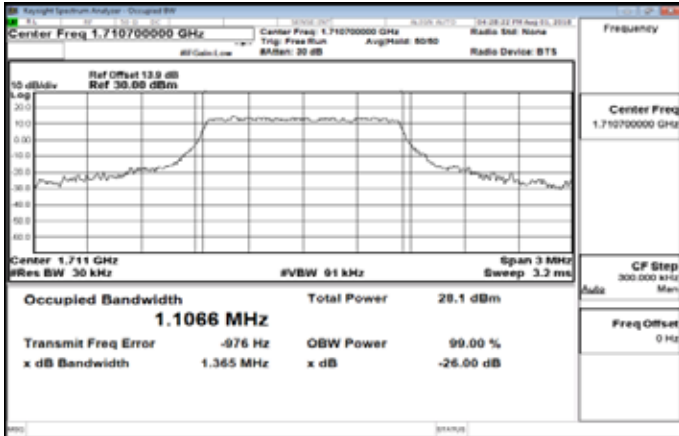
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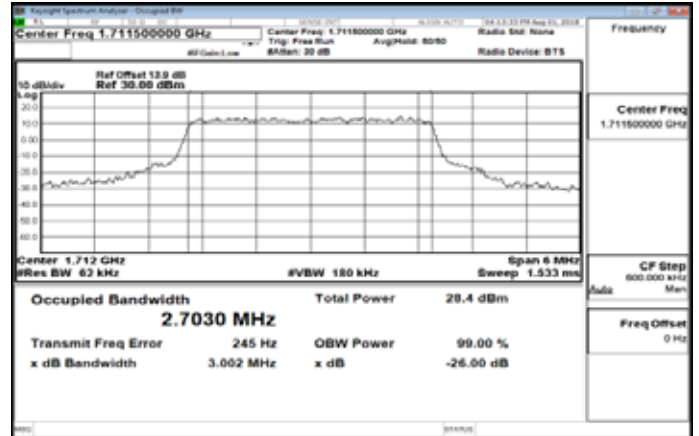
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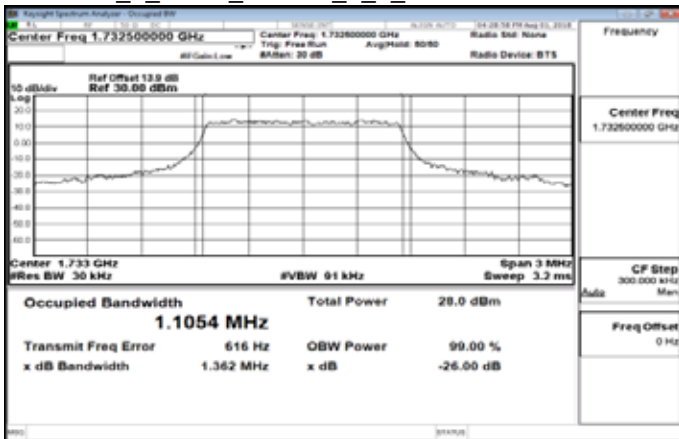
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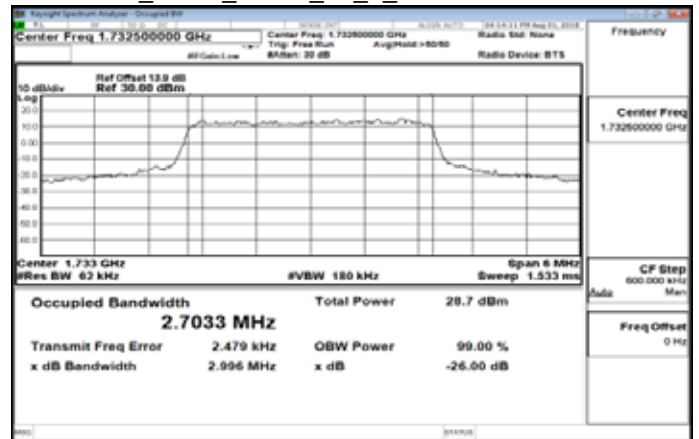
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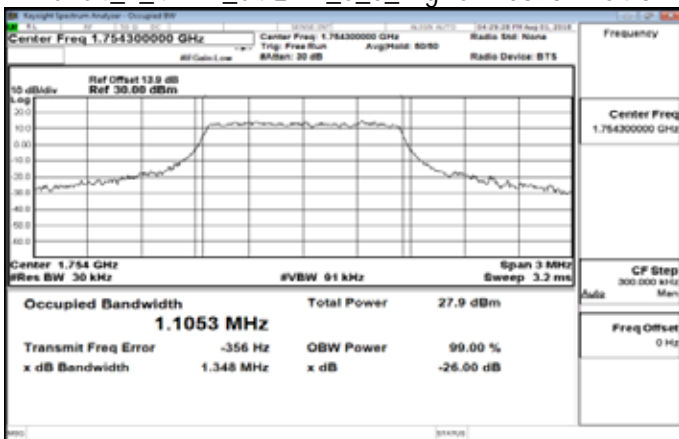
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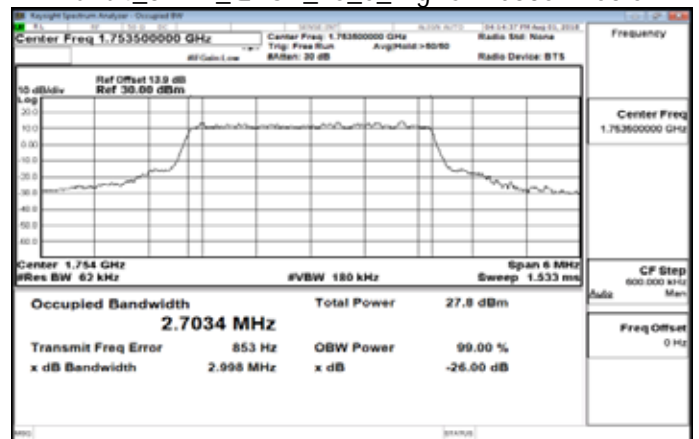
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Band4_1_4MHz_64QAM_6_0_HighCH20393-1754.3



Band4_3MHz_QPSK_15_0_HighCH20385-1753.5



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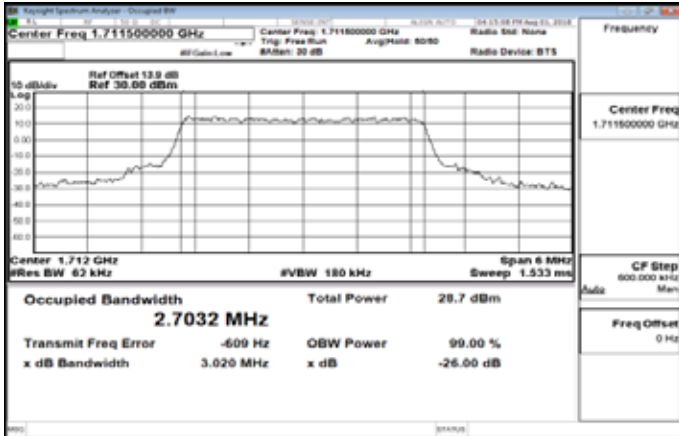
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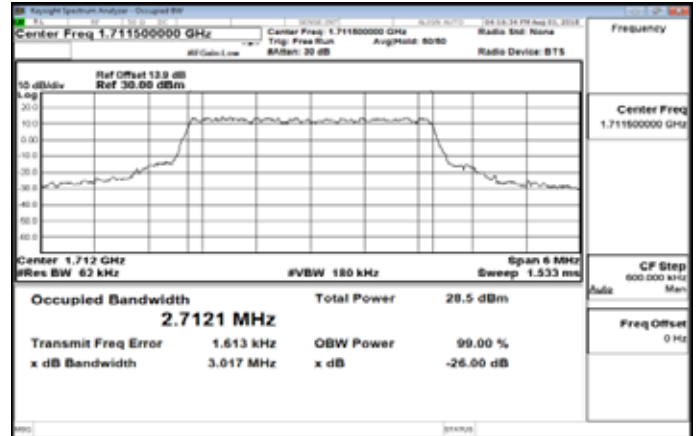
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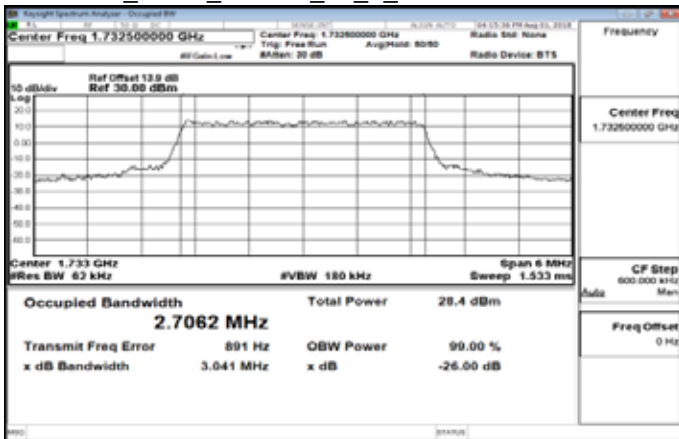
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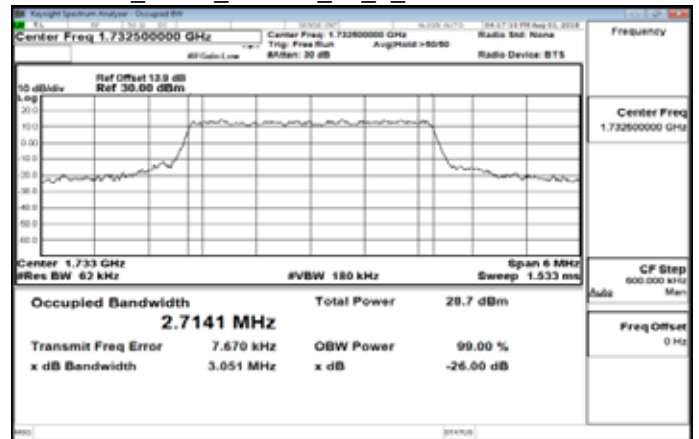
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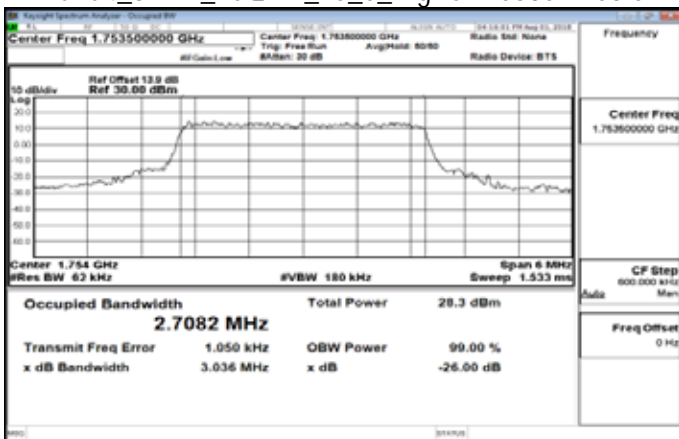
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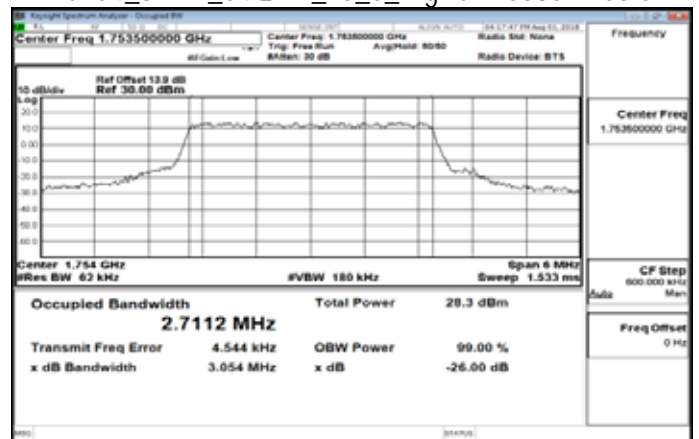
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Band4_3MHz_64QAM_15_0_HighCH20385-1753.5



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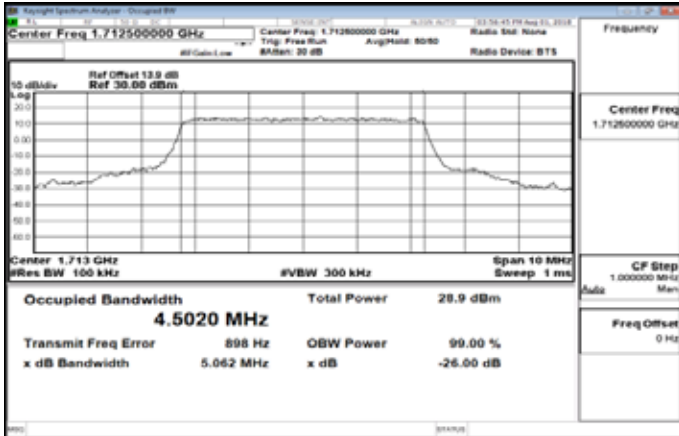
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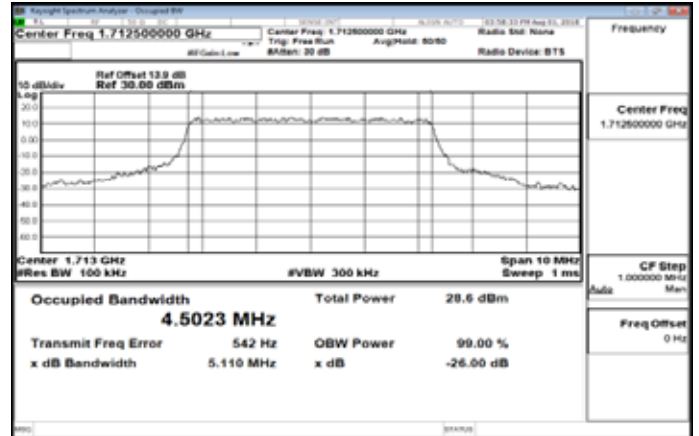
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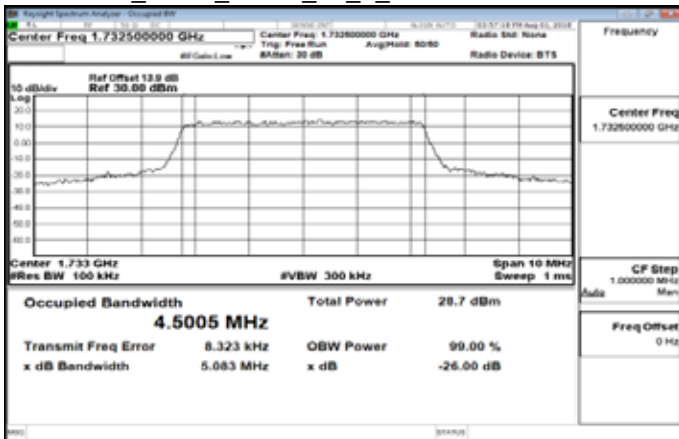
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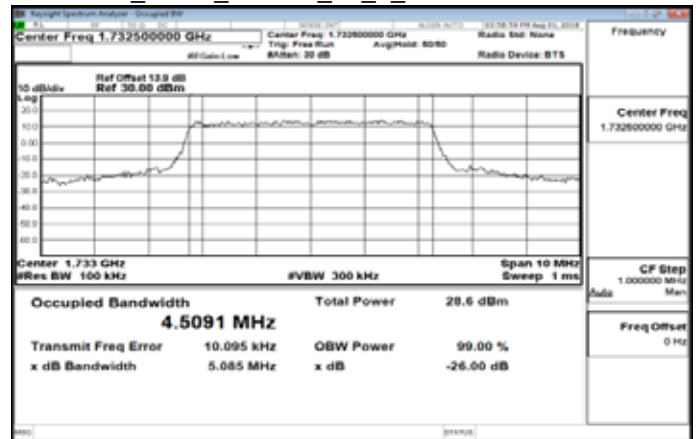
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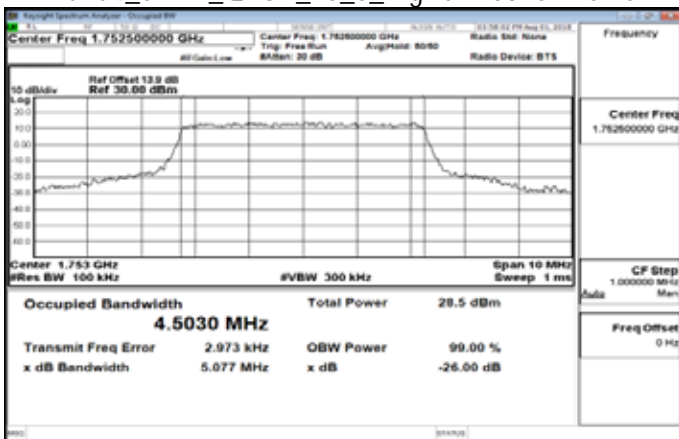
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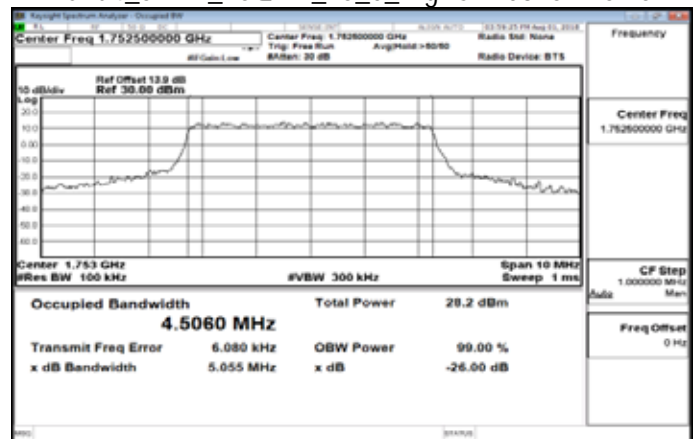
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Band4_5MHz_QPSK_25_0_HighCH20375-1752.5



Band4_5MHz_16QAM_25_0_HighCH20375-1752.5



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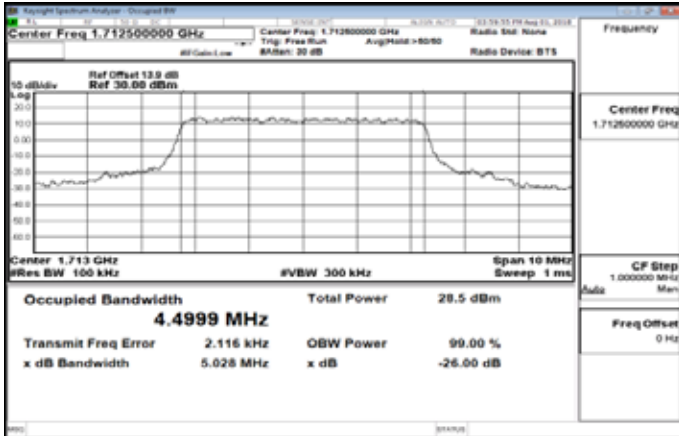
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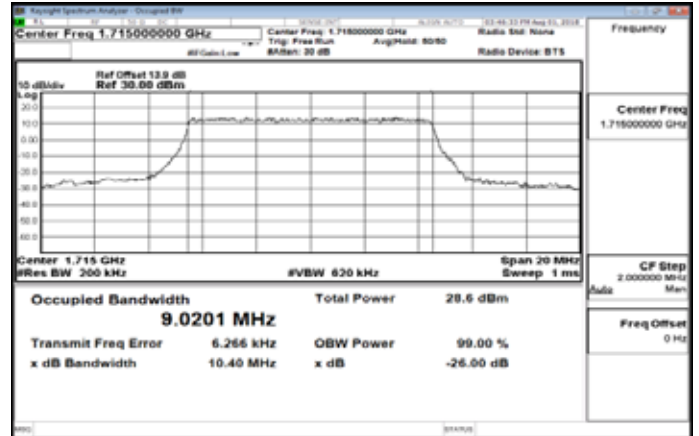
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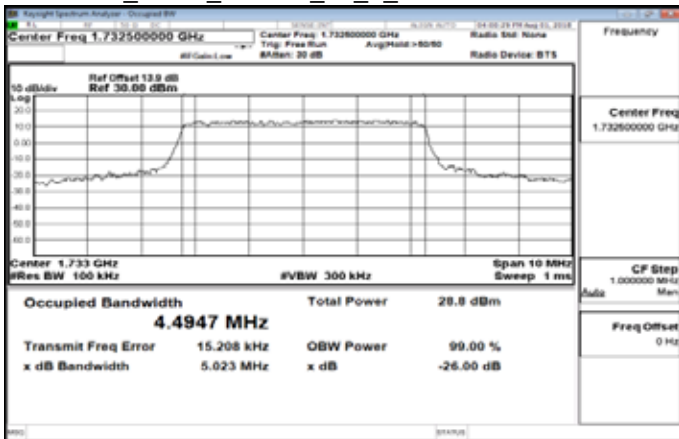
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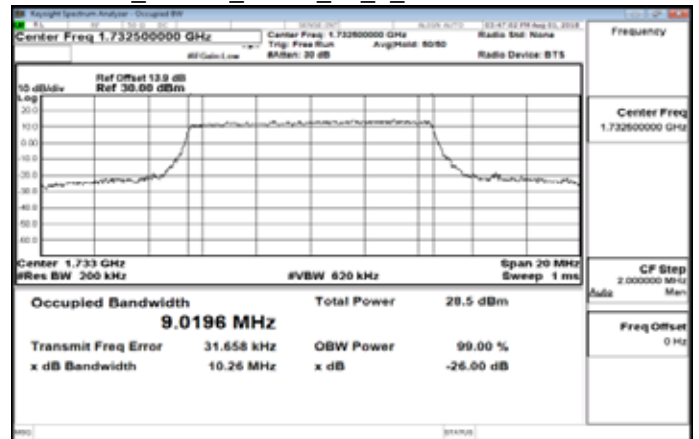
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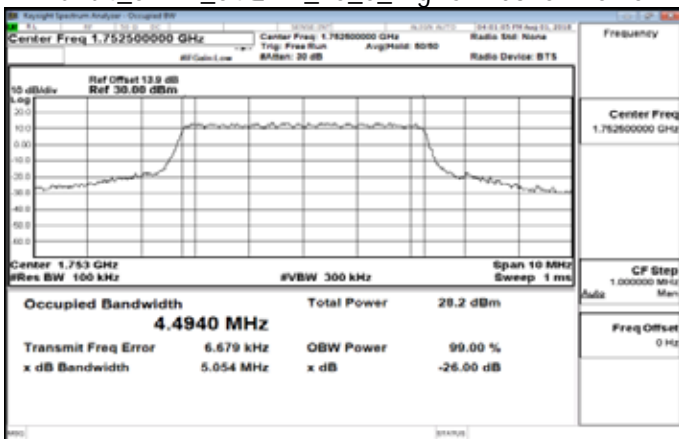
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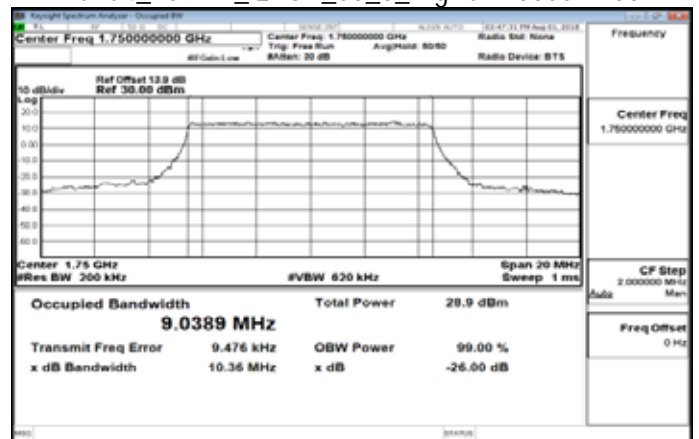
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Band4_10MHz_QPSK_50_0_HighCH20350-1750



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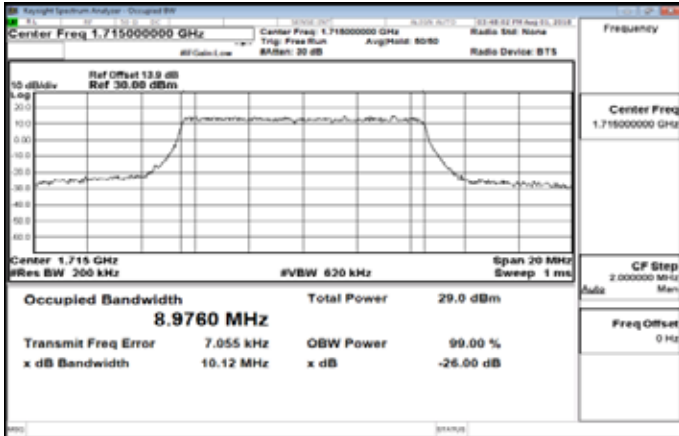
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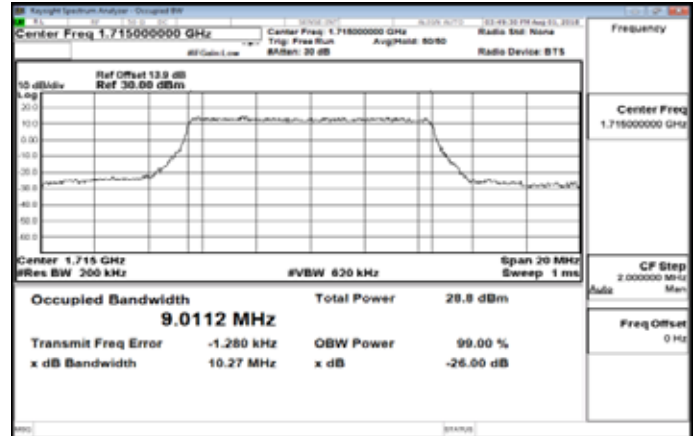
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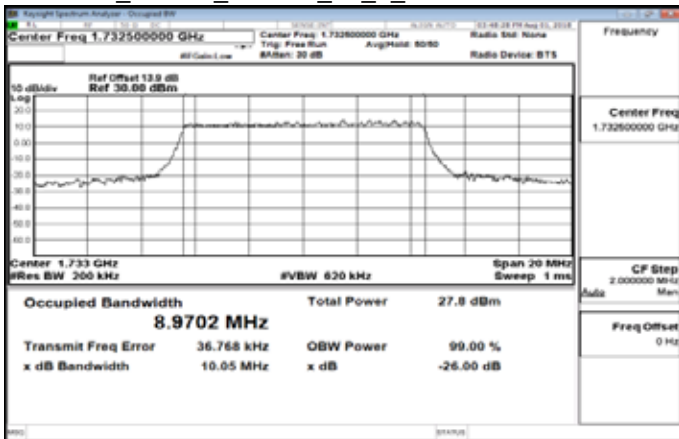
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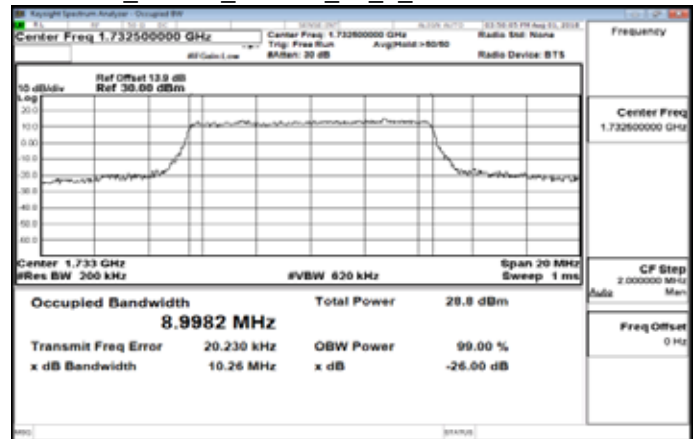
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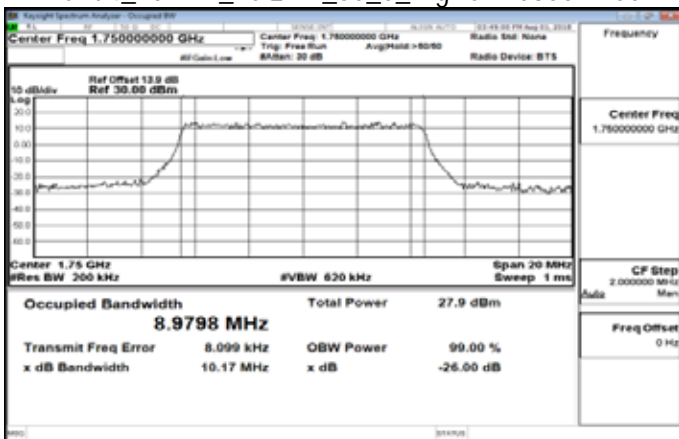
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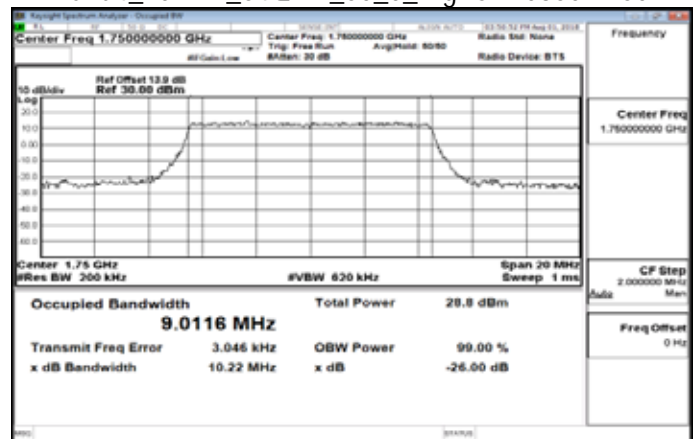
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Band4_10MHz_16QAM_50_0_HighCH20350-1750



Band4_10MHz_64QAM_50_0_HighCH20350-1750



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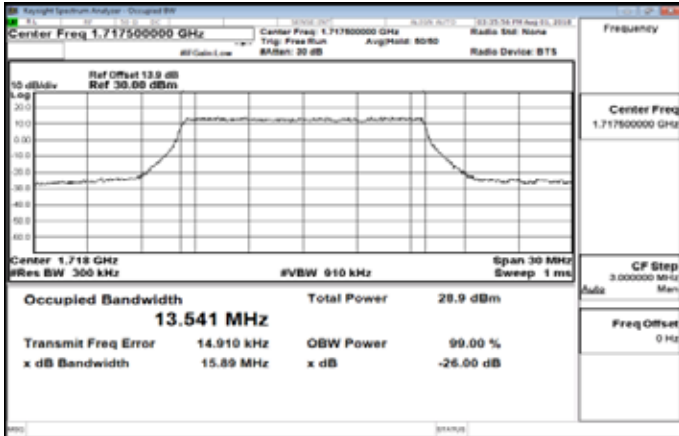
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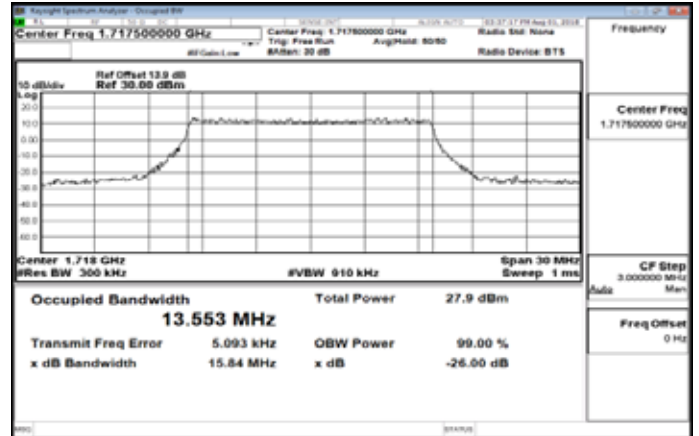
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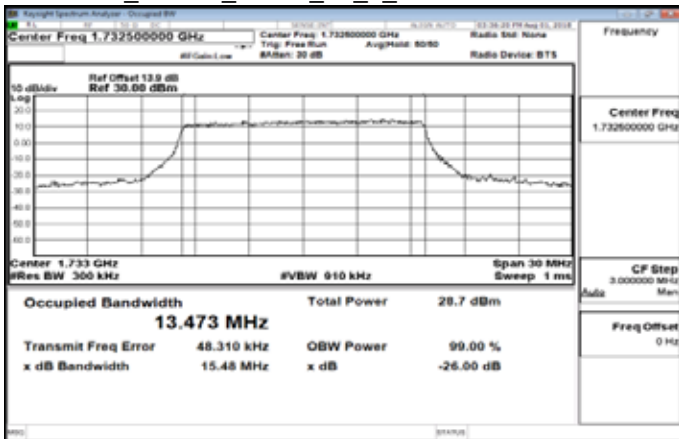
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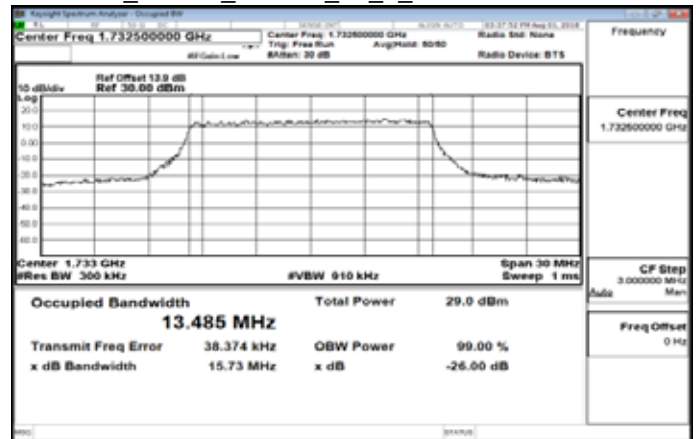
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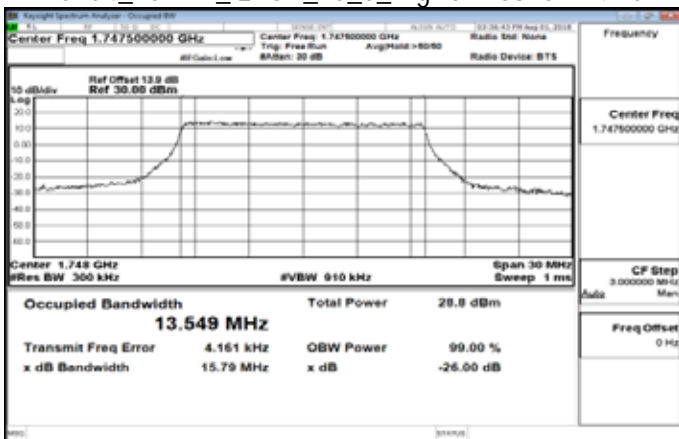
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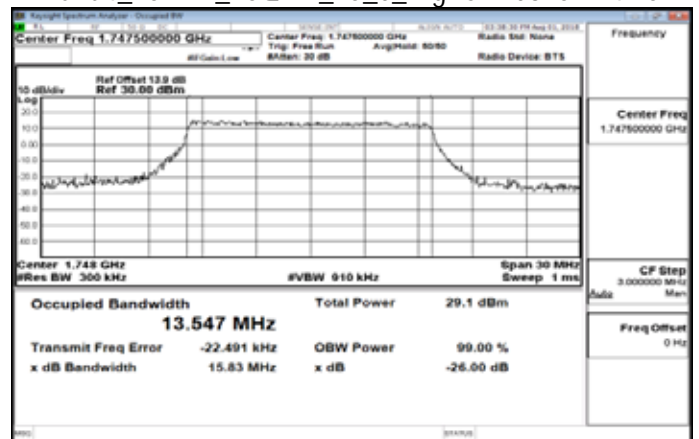
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Band4_15MHz_16QAM_75_0_HighCH20325-1747.5



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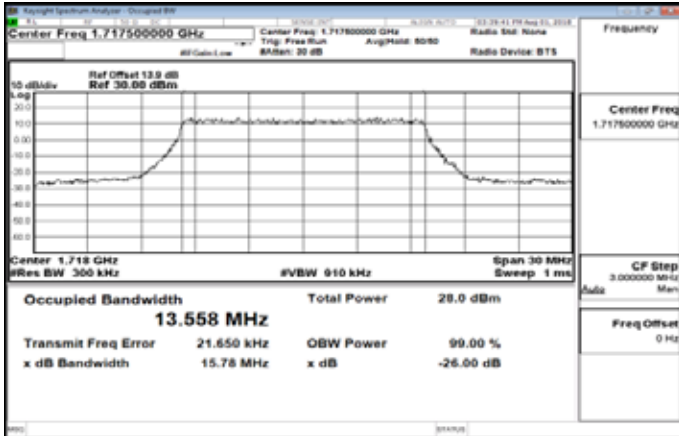
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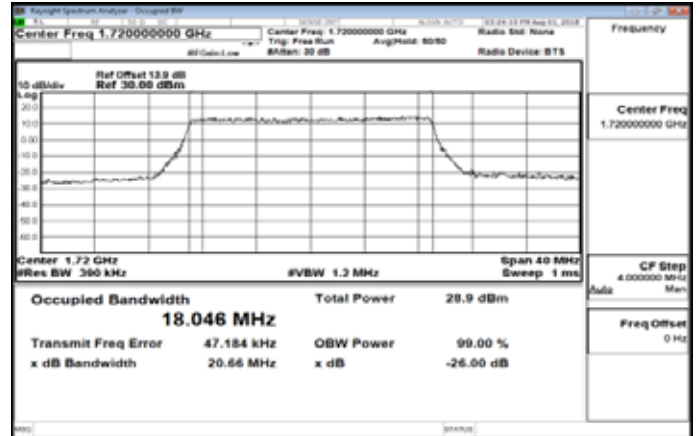
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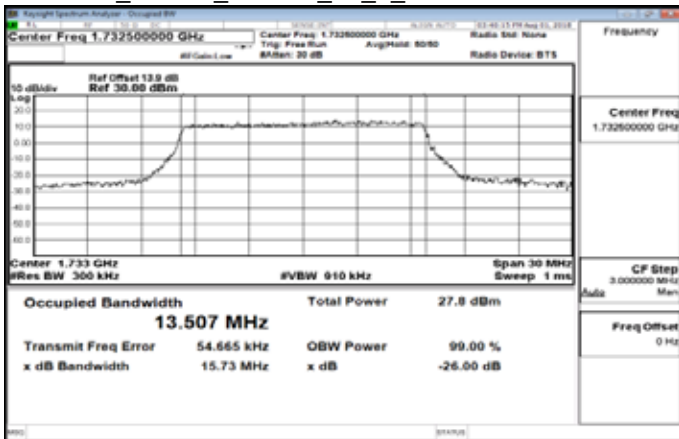
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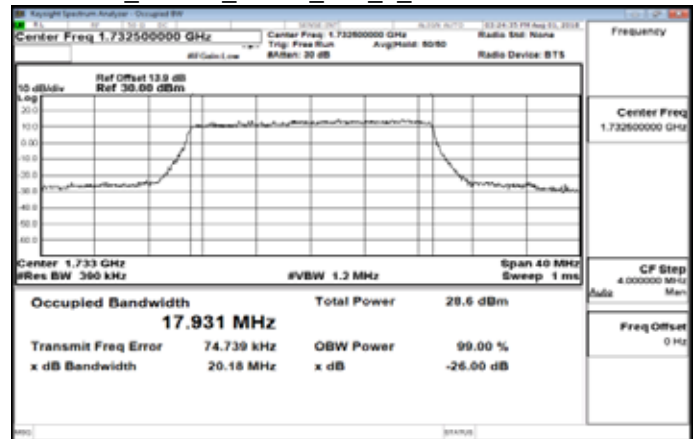
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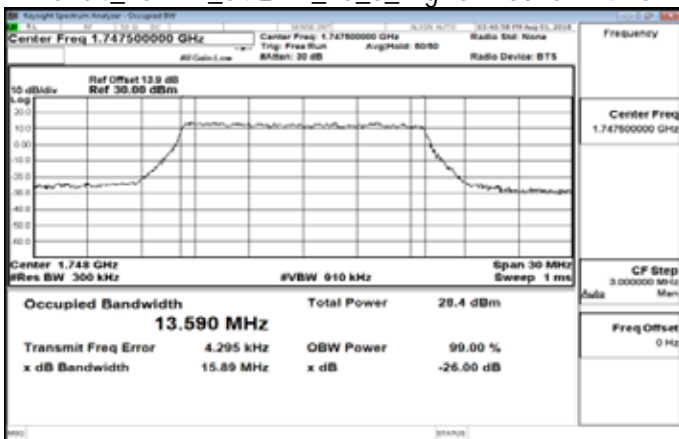
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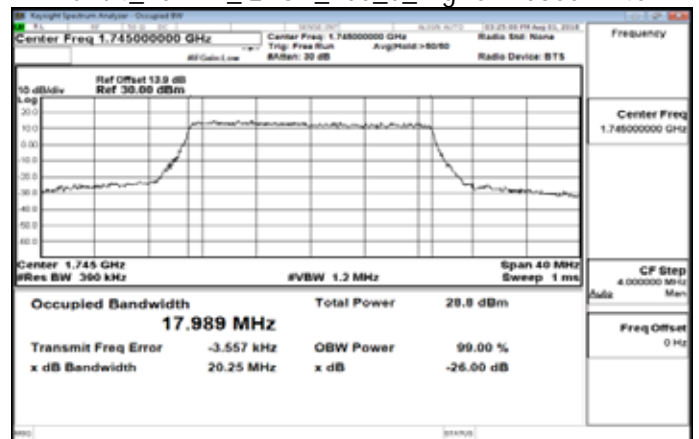
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Band4_15MHz_64QAM_75_0_HighCH20325-1747.5



Band4_20MHz_QPSK_100_0_HighCH20300-1745



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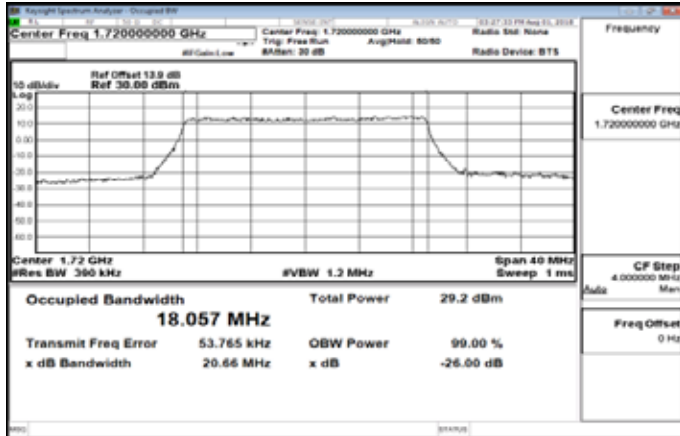
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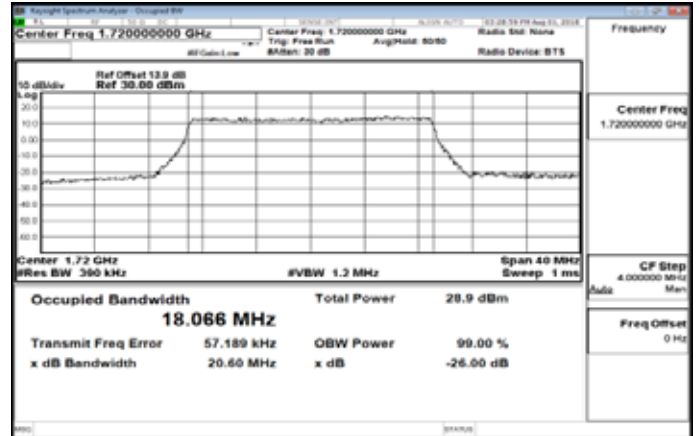
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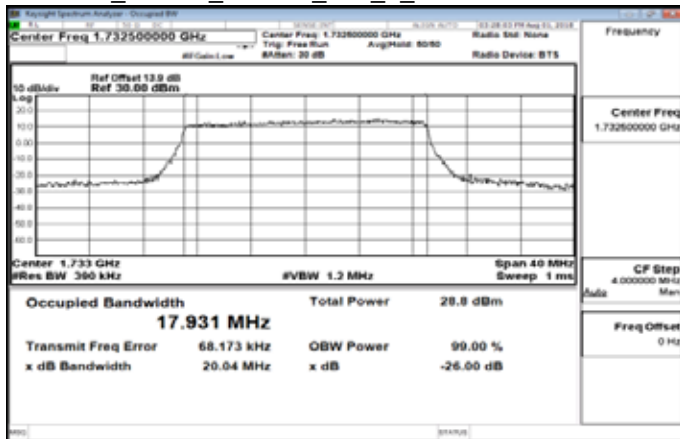
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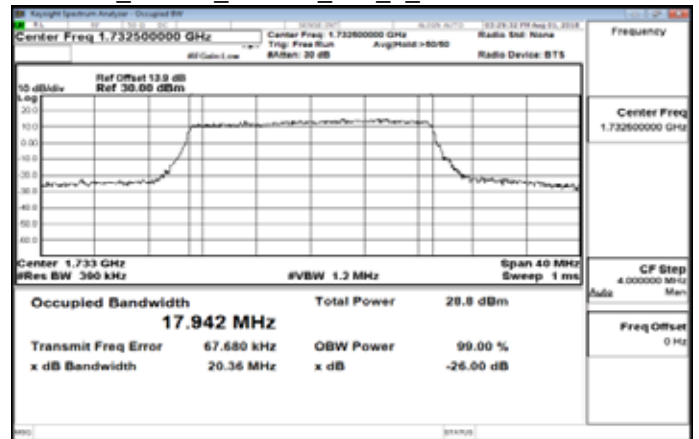
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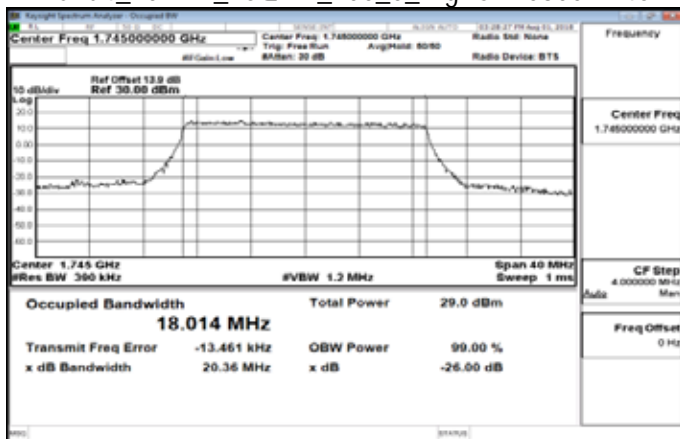
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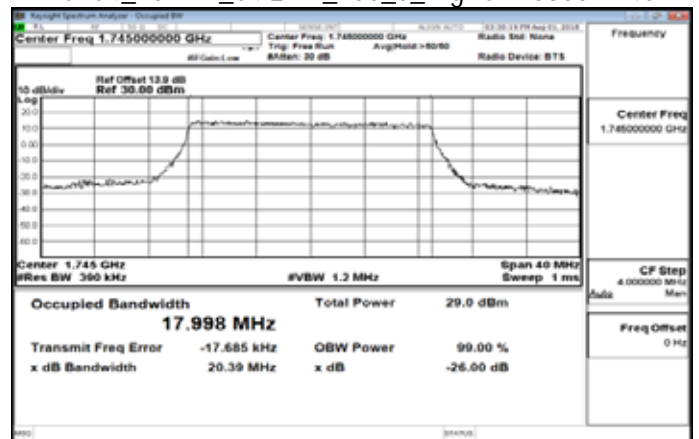
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Band4_20MHz_16QAM_100_0_HighCH20300-1745



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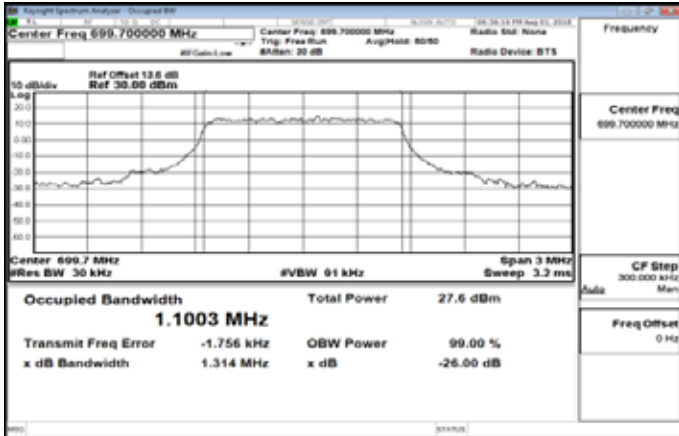
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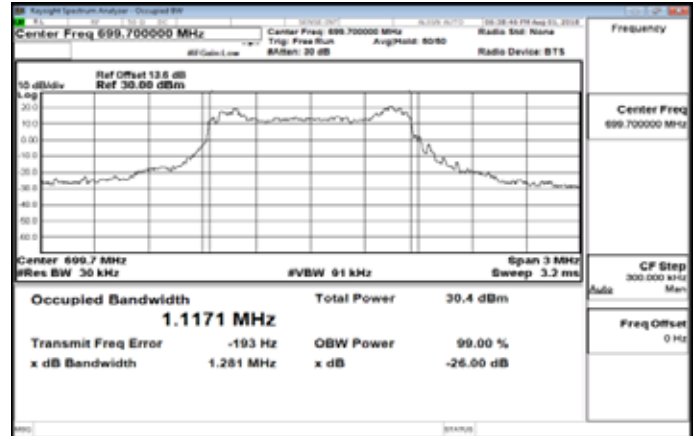
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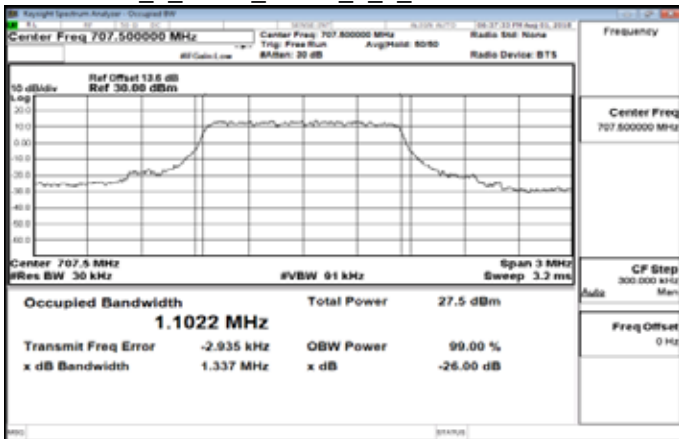
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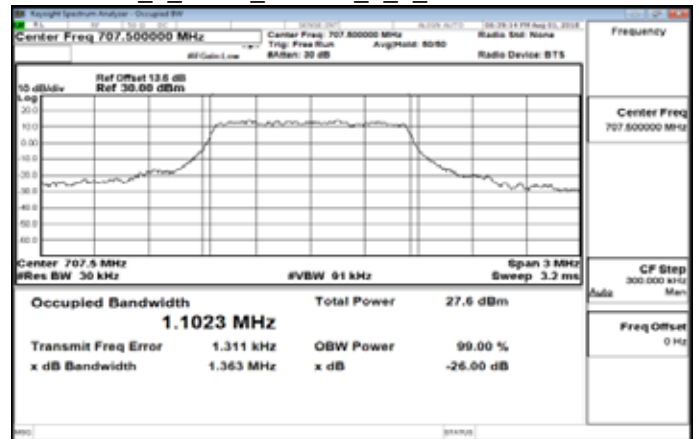
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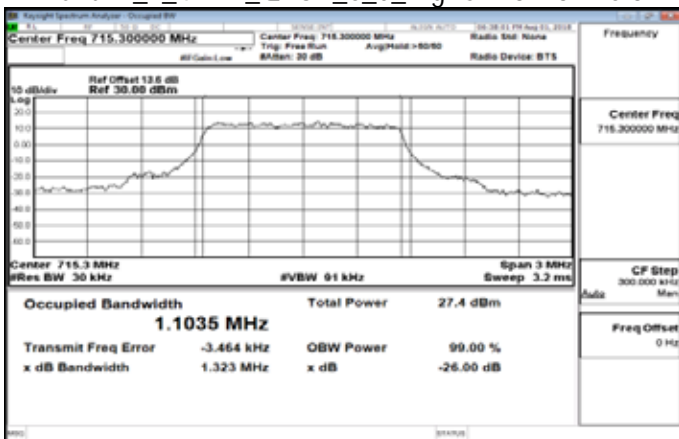
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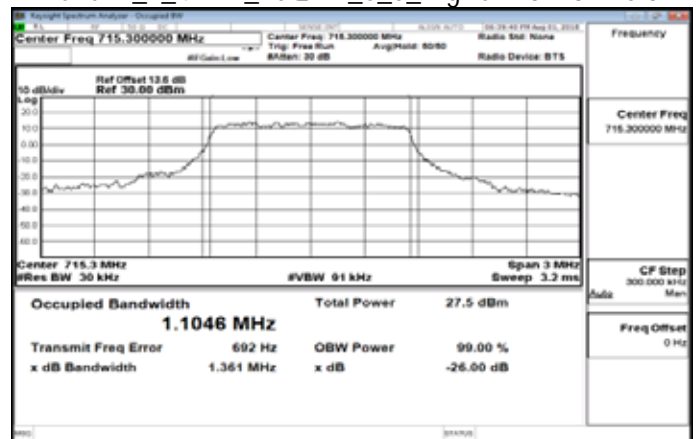
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Band12_1_4MHz_QPSK_6_0_HighCH23173-715.3



Band12_1_4MHz_16QAM_6_0_HighCH23173-715.3



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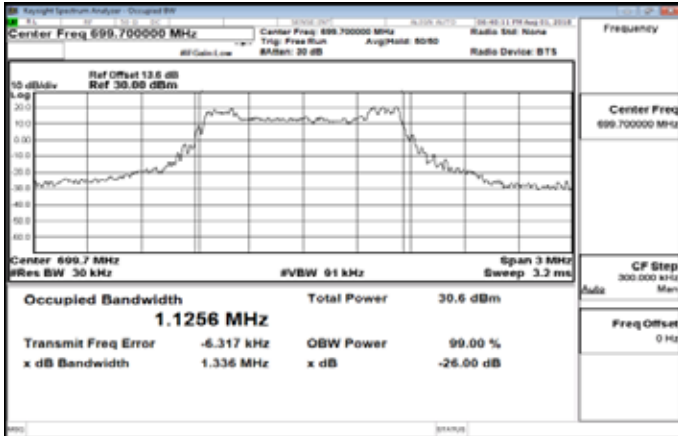
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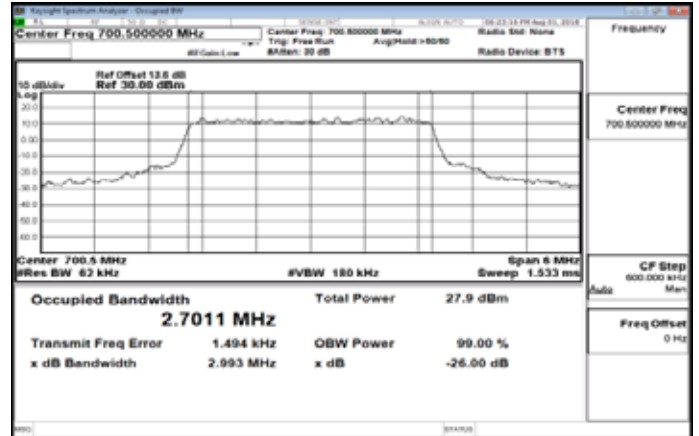
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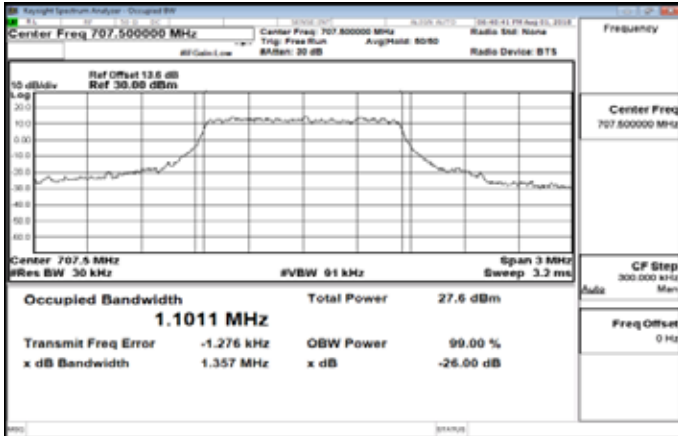
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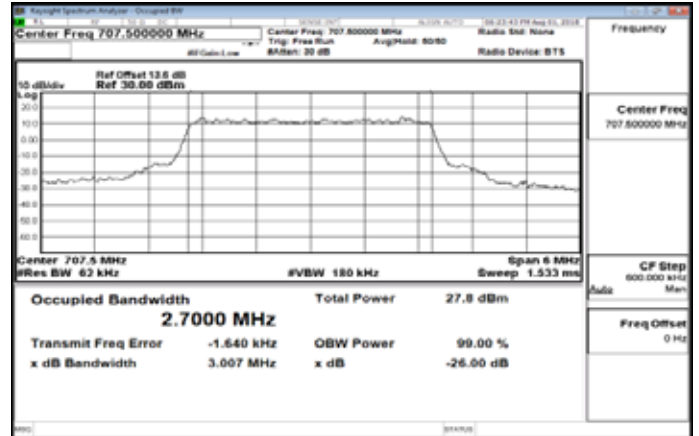
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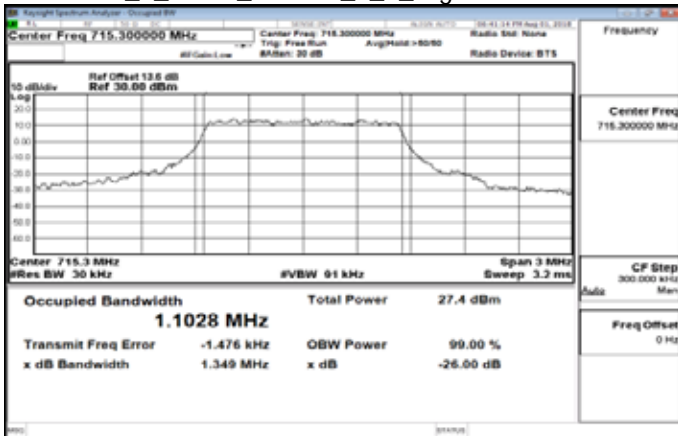
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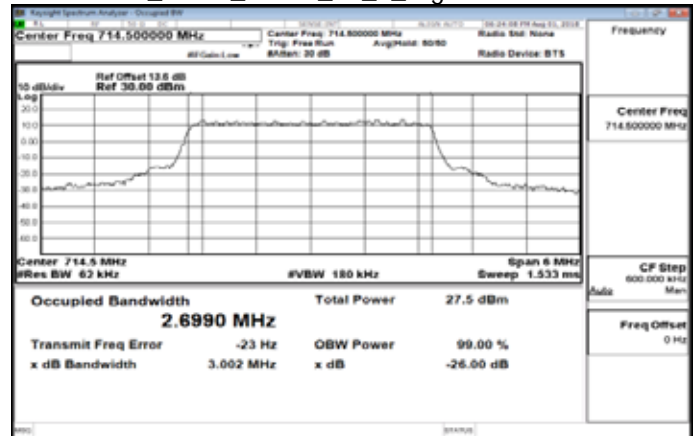
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Band12_3MHz_QPSK_15_0_HighCH23165-714.5



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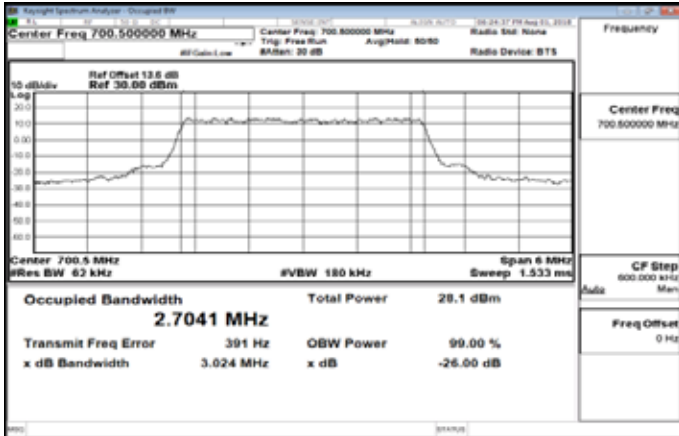
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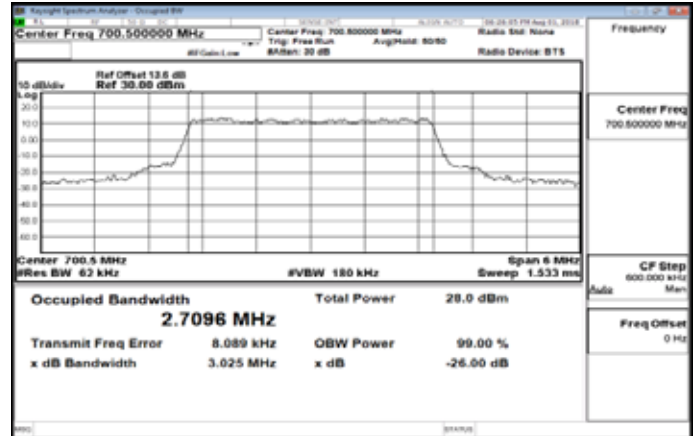
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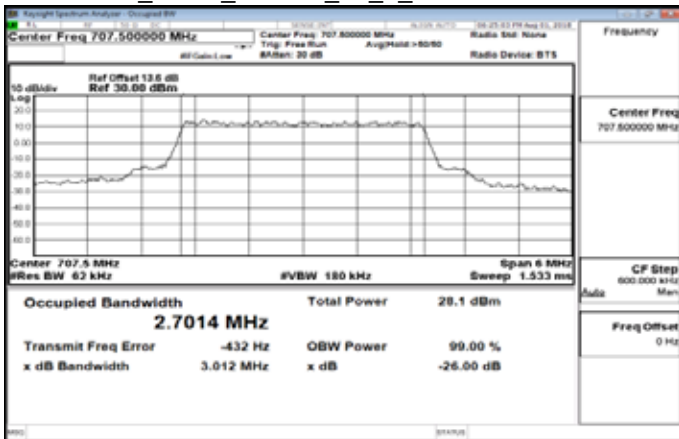
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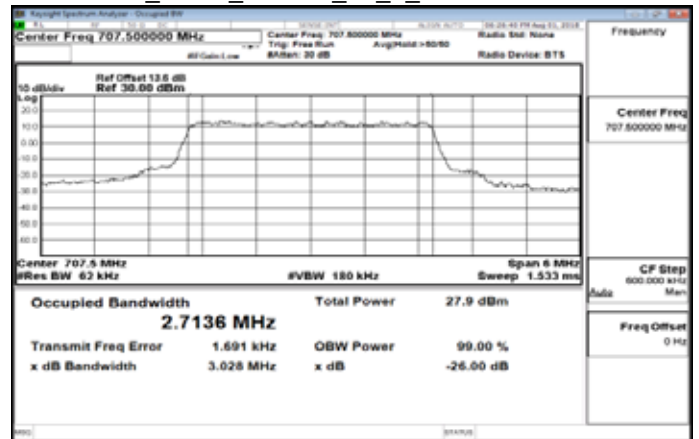
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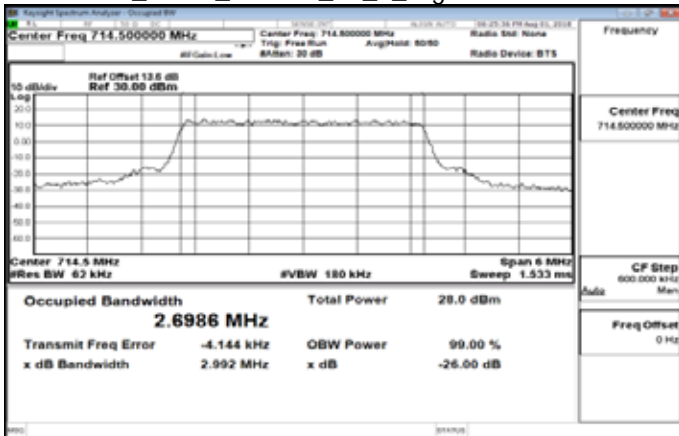
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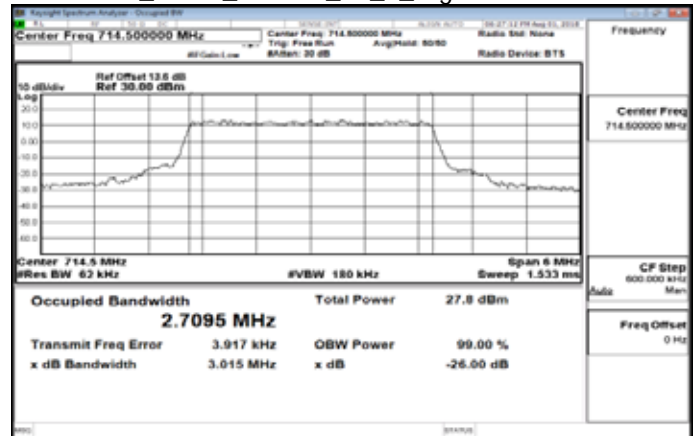
Band12_3MHz_64QAM_15_0_MidCH23095-707.5



Band12_3MHz_16QAM_15_0_HighCH23165-714.5



Band12_3MHz_64QAM_15_0_HighCH23165-714.5



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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