ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART B, C & SUBPART L REQUIREMENT

OF

Applicant:	Sharp Corporation, Mobile Communication B.U. 2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi, Hiroshima 739-0192, Japan
Manufacturer:	Sharp Corporation 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan
Product Name:	Smart Phone
Report Number:	ER/2018/30014
FCC ID:	APYHRO00259
FCC Rule Part:	2 , 22H & 24E & 27B, C & L
Issue Date:	Mar. 28, 2018
Date of Test:	Mar. 05, 2018 ~ Mar. 21, 2018
Date of EUT Received:	Mar. 05, 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: Marcus Tseng

Marcus Tseng / Sr. Engineer

Approved By: Jim Chang

Jim Chang / Manager

Testing Laboratory
0513

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/30014	Rev.00	Initial creation of document	All	Mar. 28, 2018	Violetta Tang

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司
No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號
t (886-2) 2299-3279 f (886-2) 2298-0488 www.tw.sgs.com

1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	Smart Phone	
Hardware Version:	DVT	
Software Version:	N/A	
Power Supply:	3.85V from Rechargeable Li-ion Battery	
	Battery:	Model No.: UBATIA286AFN2, Supplier: SCUD (FUJIAN) Electronics Co., Ltd.
IMEI:	004401116310802 / 004401116310786 / 004401116310810 004401116311081 / 004401116311099 / 004401116311198 004401116310851	

1.2. GSM / WCDMA / LTE: Cellular Phone Standards Frequency Range

Operating Frequency (MHz)			
GSM/GPRS 850	824.2	-	848.8
GSM/GPRS 1900	1850.2	-	1909.8

Operating Frequency (MHz)			
WCDMA / HSPA+ Band V	826.4	-	846.6

LTE Band	BW (MHz)	Operation Frequency (MHz)		
5	1.4	824.7	-	848.3
	3	825.5	-	847.5
	5	826.5	-	846.5
	10	829.0	-	844.0
12	1.4	699.7	-	715.3
	3	700.5	-	714.5
	5	701.5	-	713.5
	10	704.0	-	711.0
17	5	706.5	-	713.5
	10	709.0	-	711.0

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

	ERP / EIRP (dBm)		(W)	Type of Emission
GSM 850	25.11	ERP	0.324	250KGXW
GPRS 850	26.83	ERP	0.482	244KGXW
GSM 1900	25.90	EIRP	0.389	246KGXW
GPRS 1900	28.04	EIRP	0.637	248KGXW

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band V	23.15	ERP	0.207	4M13F9W
HSDPA Band V	21.83	ERP	0.152	4M13F9W
HSUPA Band V	19.52	ERP	0.09	4M12F9W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
5	1.4	QPSK	20.76	ERP	0.119	1M10G7D
	1.4	16QAM	21.29	ERP	0.135	1M10D7W
	1.4	64QAM	22.51	ERP	0.178	1M10D7W
	3	QPSK	20.45	ERP	0.111	2M70G7D
	3	16QAM	21.61	ERP	0.145	2M70D7W
	3	64QAM	22.54	ERP	0.179	2M71D7W
	5	QPSK	20.71	ERP	0.118	4M51G7D
	5	16QAM	21.80	ERP	0.151	4M55D7W
	5	64QAM	22.11	ERP	0.163	4M51D7W
	10	QPSK	20.76	ERP	0.119	9M00G7D
	10	16QAM	21.66	ERP	0.147	8M98D7W
	10	64QAM	21.77	ERP	0.15	8M98D7W
17	5	QPSK	22.67	ERP	0.185	4M52G7D
	5	16QAM	23.83	ERP	0.242	4M60D7W
	5	64QAM	24.45	ERP	0.279	4M58D7W
	10	QPSK	22.57	ERP	0.181	9M00G7D
	10	16QAM	23.80	ERP	0.24	8M97D7W
	10	64QAM	24.53	ERP	0.284	8M99D7W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
12	1.4	QPSK	23.21	ERP	0.209	1M11G7D
	1.4	16QAM	24.31	ERP	0.27	1M10D7W
	1.4	64QAM	24.41	ERP	0.276	1M12D7W
	3	QPSK	22.84	ERP	0.192	2M70G7D
	3	16QAM	24.04	ERP	0.254	2M71D7W
	3	64QAM	24.66	ERP	0.292	2M71D7W
	5	QPSK	22.81	ERP	0.191	4M51G7D
	5	16QAM	23.94	ERP	0.248	4M50D7W
	5	64QAM	24.85	ERP	0.305	4M51D7W
	10	QPSK	22.79	ERP	0.19	9M00G7D
	10	16QAM	23.95	ERP	0.248	8M99D7W
	10	64QAM	24.68	ERP	0.294	8M98D7W

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1.4. Test Methodology of Applied Standards

CC 47 CFR Part 2, 22, 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.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

(TAF code 0513)

FCC Registration Numbers are: 509634 / TW0001

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.

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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)	0.2	21	21.2
High Band (Above 1 GHz)	0.44	21.36	21.8

2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.85	0.61
GSM 1900		0.72
WCDMA B5		0.72
LTE Band 5		0.750
LTE Band 12		0.750
LTE Band 17		0.750

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2.6. Configuration of Tested System

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

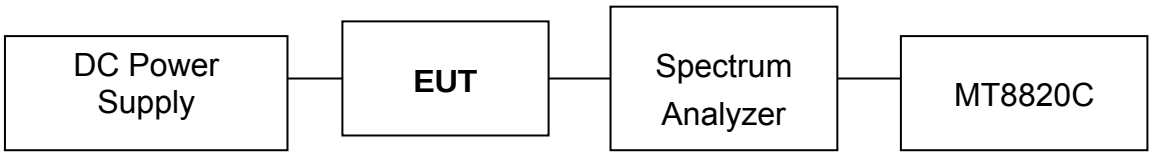
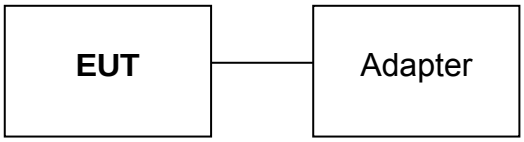


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

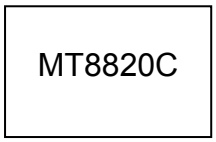


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8820C	6201465317	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) §22.913(a)(5) §24.232(c) §27.50(c)(10) §27.50(h)(2)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occuupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)(4)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §22.917(a) §24.238(a) §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) §22.355 §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
GSM/GPRS 850	H-plan	H-plan
GSM/GPRS 1900	H-plan	H-plan
WCDMA/HSPA Band V	H-plan	H-plan
LTE Band 5	H-plan	H-plan
LTE Band 12	H-plan	H-plan
LTE Band 17	H-plan	H-plan

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GSM/GPRS MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	128 to 251	128, 190, 251	GSM/GPRS 850
EIRP	512 to 810	512, 661, 810	GSM/GPRS 1900
FREQUENCY STABILITY	128 to 251 512 to 810	190 661	GPRS 850 GPRS 1900
OCCUPIED BANDWIDTH	128 to 251 512 to 810	190 661	GSM/GPRS 850 GSM/GPRS 1900
PEAK TO AVERAGE RATIO	128 to 251 512 to 810	128, 190, 251 512, 661, 810	GSM/GPRS 850 GSM/GPRS 1900
BAND EDGE	128 to 251 512 to 810	128, 251 512, 810	GSM/GPRS 850 GSM/GPRS 1900
CONDCUDETED EMISSION	128 to 251 512 to 810	128, 190, 251 512, 661, 810	GSM/GPRS 850 GSM/GPRS 1900
RADIATED EMISSION	128 to 251 512 to 810	128, 190, 251 512, 661, 810	GPRS 850 GPRS 1900

WCDMA/HSPA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
FREQUENCY STABILITY	4132 to 4233	4183	WCDMA Band V
OCCUPIED BANDWIDTH	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
PEAK TO AVERAGE RATIO	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
BAND EDGE	4132 to 4233	4132, 4233	WCDMA Band V
CONDCUDETED EMISSION	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
RADIATED EMISSION	4132 to 4233	4132, 4183, 4233	WCDMA Band V

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LTE Band 5 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	20450 to 20600	20525	10MHz	QPSK	Full RB
OCCUPIED BAND-WIDTH	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM, 64QAM	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM, 64QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AVERAGE RATIO	20470 to 20643	20470, 20525, 20643	1.4MHz	64QAM	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	64QAM	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	64QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	64QAM	Full RB
BAND EDGE	20470 to 20643	20470, 20643	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED EMISSION	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK	1 RB, 0 RB Offest
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB, 0 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB, 0 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	20415 to 20635	20415, 20525, 20635	3MHz	64QAM	1 RB, 0 RB Offest

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LTE Band 12 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	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	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	1 RB, 0 RB Offest

LTE Band 17 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23780 to 23800	23790	10MHz	QPSK	Full RB
OCCUPIED BAND-WIDTH	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM, 64QAM	Full RB
	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AVERAGE RATIO	23755 to 23825	23755, 23790, 23825	5MHz	64QAM	Full RB
	23780 to 23800	23780, 23790, 23800	10MHz	64QAM	Full RB
BAND EDGE	23755 to 23825	23755, 23825	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	23780 to 23800	23780, 23800	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED EMISSION	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB, 0 RB Offest
	23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23755 to 23825	23755, 23790, 23825	5MHz	16QAM	1 RB, 0 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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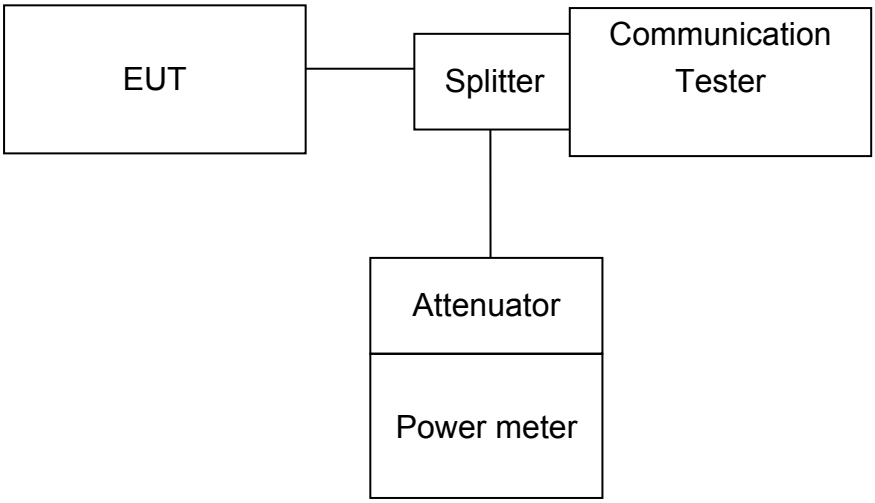
6. RF CONDUCTED OUTPUT POWER MEASUREMENT

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.

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.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/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

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6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8820C	6201465317	2018/01/17	2019/01/16
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cables	N/A	WK CE Cable	N/A	2018/01/02	2019/01/01

6.5. Measurement Result

RF Conducted Output Power

GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) Class 8 (dBm)
GSM 850	824.2	128	33.18
	836.6	190	33.08
	848.8	251	32.83
GSM 1900	1850.2	512	30.1
	1880.0	661	29.92
	1909.8	810	30.09

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EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)	Average Burst Power (1DN 3UP) Class 12 (dBm)	Average Burst Power (1DN 4UP) Class 12 (dBm)
GPRS 850	824.2	128	**33.18**	31.08	29.09	28.14
	836.6	190	33.08	31.07	29.17	28.2
	848.8	251	32.83	31.02	29.2	28.38
GPRS 1900	1850.2	512	**30.1**	27.98	26.34	25.73
	1880.0	661	29.92	27.76	25.92	25.41
	1909.8	810	30.09	27.77	25.95	25.42

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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:

BNAD V	Avg. Power (dBm) Channel		
	4132	4183	4233
WCDMA	**24.12**	23.98	24.01
HSDPA	23.05	23.03	23.05
HSUPA	23.09	22.98	22.96

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LTE Result:

LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 20407	CH (Mid) 20525	CH (High) 20643	CH (Low) 20407	CH (Mid) 20525	CH (High) 20643	CH (Low) 20407	CH (Mid) 20525	CH (High) 20643
1.4	1	0	22.59	22.65	22.41	21.77	21.83	21.57	20.93	21.00	20.72
	1	5	22.53	22.59	22.42	21.70	21.74	21.62	20.88	20.92	20.79
	3	2	22.60	22.64	22.59	21.79	21.78	21.75	20.95	20.97	20.93
	6	0	21.60	21.65	21.51	20.79	20.80	20.70	19.95	19.98	19.87

LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 20415	CH (Mid) 20525	CH (High) 20635	CH (Low) 20415	CH (Mid) 20525	CH (High) 20635	CH (Low) 20415	CH (Mid) 20525	CH (High) 20635
3	1	0	22.63	22.60	22.49	21.79	21.74	21.64	20.96	20.90	20.83
	1	14	22.63	22.65	22.55	21.83	21.83	21.72	21.03	20.97	20.90
	8	4	22.16	22.20	22.17	21.31	21.36	21.32	20.39	20.41	20.44
	15	0	21.68	21.68	21.62	20.86	20.82	20.82	20.00	19.96	19.92

LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 20425	CH (Mid) 20525	CH (High) 20625	CH (Low) 20425	CH (Mid) 20525	CH (High) 20625	CH (Low) 20425	CH (Mid) 20525	CH (High) 20625
5	1	0	22.57	22.57	22.56	21.73	21.76	21.71	20.88	20.91	20.89
	1	24	22.66	22.67	22.45	21.80	21.82	21.64	20.99	20.98	20.83
	12	6	22.18	22.24	22.13	21.34	21.39	21.27	20.47	20.42	20.42
	25	0	21.69	21.72	21.56	20.87	20.88	20.75	19.95	19.97	19.91

LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 20450	CH (Mid) 20525	CH (High) 20600	CH (Low) 20450	CH (Mid) 20525	CH (High) 20600	CH (Low) 20450	CH (Mid) 20525	CH (High) 20600
10	1	0	22.49	22.81	22.71	21.65	21.99	21.89	20.82	21.13	21.07
	1	49	22.61	22.50	22.64	21.80	21.66	21.80	20.97	20.81	20.98
	25	12	22.31	22.22	22.15	21.36	21.36	21.31	20.46	20.38	20.37
	50	0	21.75	21.67	21.63	20.91	20.82	20.82	19.83	19.95	19.85

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LTE Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23017	CH (Mid) 23095	CH (High) 23173	CH (Low) 23017	CH (Mid) 23095	CH (High) 23173	CH (Low) 23017	CH (Mid) 23095	CH (High) 23173
1.4	1	0	22.40	22.54	22.48	21.57	21.72	21.63	20.72	20.91	20.77
	1	5	22.37	22.46	22.36	21.55	21.62	21.52	20.71	20.80	20.72
	3	2	22.44	22.58	22.43	21.59	21.75	21.56	20.73	20.94	20.75
	6	0	21.46	21.52	21.42	20.65	20.68	20.59	19.79	19.81	19.74

LTE Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23025	CH (Mid) 23095	CH (High) 23165	CH (Low) 23025	CH (Mid) 23095	CH (High) 23165	CH (Low) 23025	CH (Mid) 23095	CH (High) 23165
3	1	0	22.42	22.43	22.46	21.60	21.60	21.64	20.74	20.74	20.81
	1	14	22.32	22.60	22.41	21.45	21.77	21.59	20.65	20.91	20.76
	8	4	22.16	22.35	22.22	21.16	21.34	21.21	20.33	20.47	20.40
	15	0	21.44	21.55	21.59	20.63	20.75	20.77	19.78	19.94	19.91

LTE Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23035	CH (Mid) 23095	CH (High) 23155	CH (Low) 23035	CH (Mid) 23095	CH (High) 23155	CH (Low) 23035	CH (Mid) 23095	CH (High) 23155
5	1	0	22.33	22.57	22.38	21.51	21.76	21.54	20.64	20.93	20.71
	1	24	22.44	22.64	22.47	21.61	21.82	21.62	20.80	21.02	20.80
	12	6	22.18	22.37	22.26	21.12	21.33	21.19	20.32	20.48	20.33
	25	0	21.41	21.56	21.60	20.57	20.74	20.74	19.77	19.90	19.93

LTE Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23060	CH (Mid) 23095	CH (High) 23130	CH (Low) 23060	CH (Mid) 23095	CH (High) 23130	CH (Low) 23060	CH (Mid) 23095	CH (High) 23130
10	1	0	22.58	22.57	22.44	21.77	21.75	21.62	20.94	20.94	20.80
	1	49	22.62	22.60	22.65	21.80	21.74	21.83	21.00	20.93	21.00
	25	12	22.31	22.29	22.28	21.30	21.29	21.26	20.46	20.44	20.44
	50	0	21.17	21.45	21.08	20.32	20.62	20.26	19.49	19.80	19.45

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LTE Band 17_Uplink frequency band : 704 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23755	CH (Mid) 23790	CH (High) 23825	CH (Low) 23755	CH (Mid) 23790	CH (High) 23825	CH (Low) 23755	CH (Mid) 23790	CH (High) 23825
5	1	0	22.50	22.51	22.49	21.67	21.65	21.64	20.81	20.85	20.82
	1	24	22.47	22.48	22.47	21.61	21.66	21.65	20.80	20.80	20.78
	12	6	22.29	22.27	22.30	21.13	21.17	21.19	20.27	20.30	20.37
	25	0	21.46	21.50	21.47	20.60	20.64	20.61	19.75	19.83	19.76

LTE Band 17_Uplink frequency band : 704 to 716 MHz											
BW (MHz)	RB Size	RB Offset	Conducted power (dBm)								
			QPSK			16QAM			64QAM		
			CH (Low) 23780	CH (Mid) 23790	CH (High) 23800	CH (Low) 23780	CH (Mid) 23790	CH (High) 23800	CH (Low) 23780	CH (Mid) 23790	CH (High) 23800
10	1	0	22.97	22.84	22.93	21.90	21.83	21.89	20.96	20.91	20.93
	1	49	22.90	22.86	22.92	21.85	21.82	21.91	20.89	20.91	20.94
	25	12	22.39	22.38	22.46	21.39	21.44	21.49	20.39	20.34	20.49
	50	0	21.93	21.85	21.96	20.36	20.34	20.41	19.50	19.50	19.59

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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} *(Note1, 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.

Results:

Mode	**Sub-test**	**Avg. Power (dBm) Channel**			**Power Class 3 Limitation (dBm)**	**Comments**
		4132	**4183**	**4233**		
HSDPA V	**1**	23.05	23.03	**23.05**	20.3dBm – 25.7dBm	**Pass**
	2	22.65	22.53	22.52	20.3dBm – 25.7dBm	**Pass**
	3	22.64	22.56	22.50	19.8dBm – 25.7dBm	**Pass**
	4	22.62	22.59	22.58	19.8dBm – 25.7dBm	**Pass**

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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} (Codes)	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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.

Results:

Mode	Sub test	Avg. Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		4132	4183	4233		
HSUPA V	1	23.09	**22.98**	22.96	18.8dBm – 25.7dBm	**Pass**
	2	20.05	19.99	20.06	16.8dBm – 25.7dBm	**Pass**
	3	21.11	20.99	20.99	17.8dBm – 25.7dBm	**Pass**
	4	20.08	20.01	19.99	16.8dBm – 25.7dBm	**Pass**
	5	23.10	23.00	23.00	18.8dBm – 25.7dBm	**Pass**

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Minimum Communications Power Measurement

PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.54	27.36	25.4	23.69	21.55	19.48	17.63	15.52	13.39

PCL	9	10	11	12	13	14	15
Output power (dBm)	11.66	9.52	7.36	5.34	3.5	1.68	-1.01

Note: The EUT output power was controlled by simulator. Set Communication Tester MT8820C PCL as above, and get the mobile phone output power reading.

WCDMA/HSDPA/HSUPA band V

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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7. EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

7.1. Standard Applicable

According to FCC §2.1046

FCC 22.913(a) Mobile station is limited to 7W ERP.

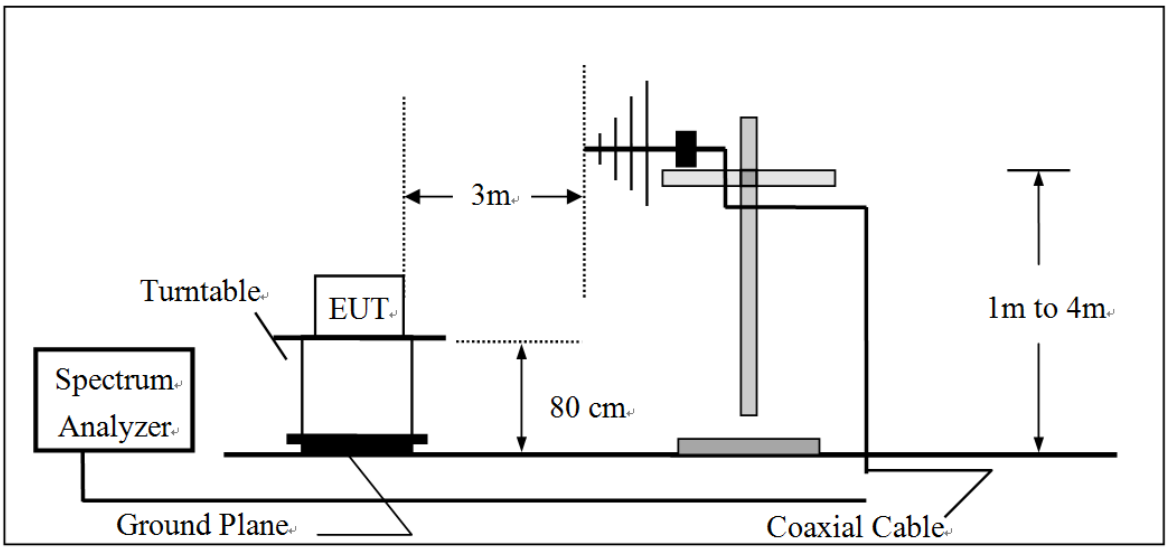
FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

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

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

7.2. Test SET-UP

(A) Radiated Power Test Set-Up, Frequency Below1000MHz



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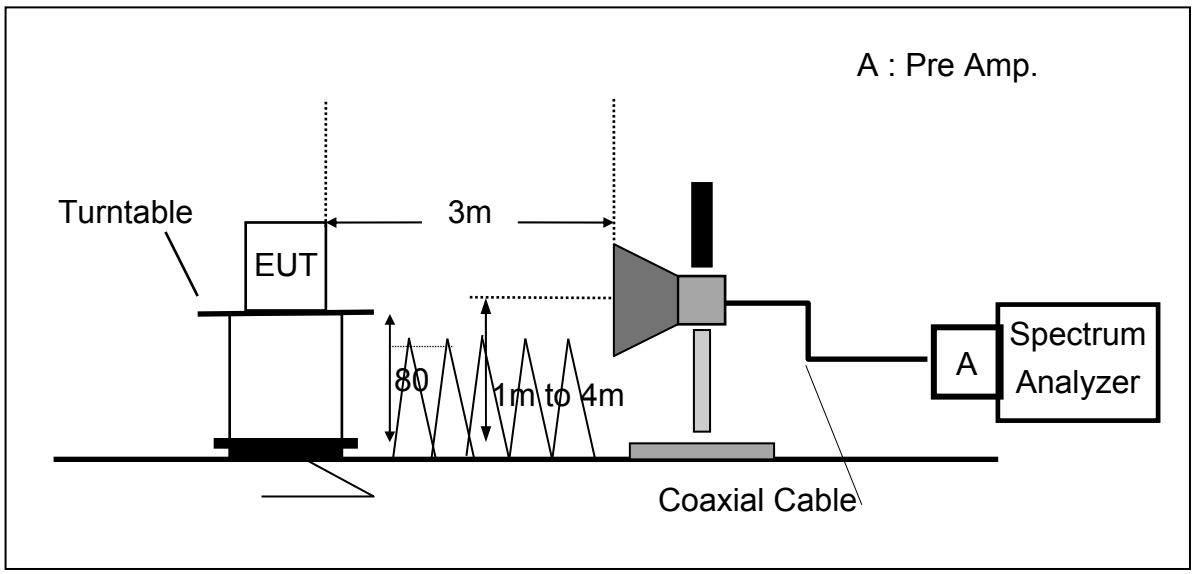
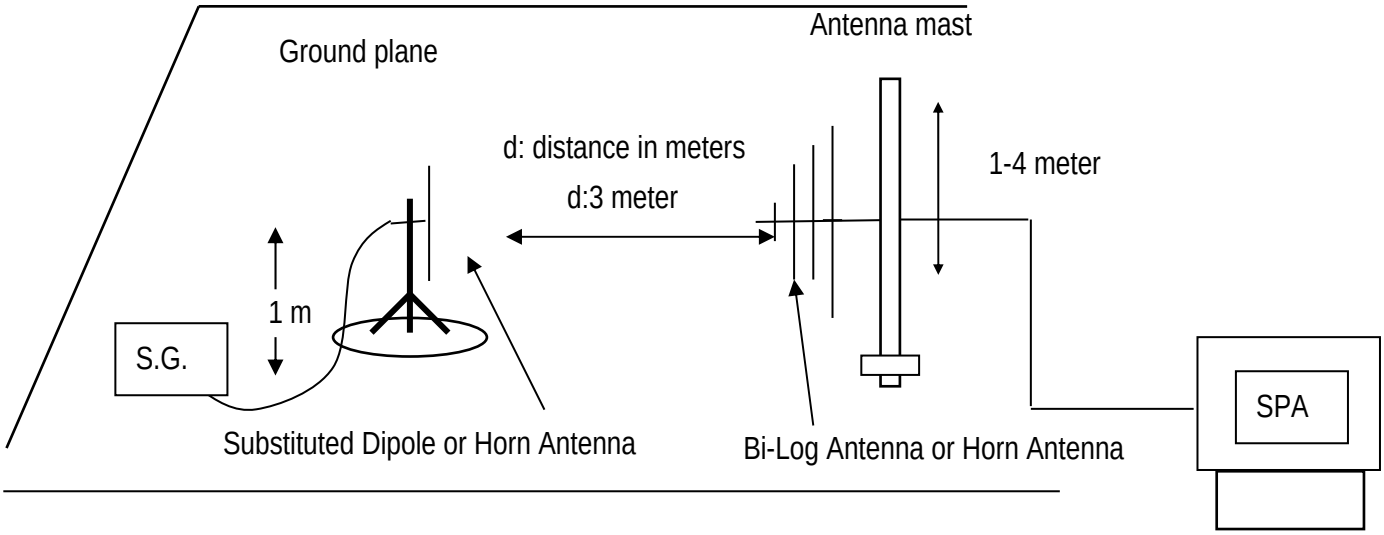
(B) Radiated Power Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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7.3. Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 971168 D01
2. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
3. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated
4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
5. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G.
6. ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)
7. EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
8. Spectrum setting:
   (1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and VBW > =3xRBW.
   (2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.
   Set frequency = nominal signal center frequency;
   Set span = 2 X occupied BW;
   Set RBW ≈ 1~5% of the span, not to exceed 1 MHz
   Set VBW = 3 x RBW;
   Select average power (RMS) detector
   Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601points, then sweet time = 601*10^-3 = 6s.

   Activate trace averaging routine over a minimum of 10 sweeps;
   Activate marker/span pair and set span = signal or channel bandwidth;
   Activate the band/interval power marker function;
   Record the band power level;
   Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.
   The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of 10*log (TBW/RBW), where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

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7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Bi-log Antenna	SCHWAZBECK	VULB9168	300	2017/12/20	2018/12/19
Horn Antenna	Schwarzbeck	BBHA9120D	309	2018/01/04	2019/01/03
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2018/08/03
Spectrum Analyzer	Agilent	E4446A	MY51100003	2017/05/10	2018/05/09
EMI Test Receiver	R&S	ESCI7	100760	2017/06/06	2018/06/05
Network Analyzer	Anritsu	MS4644A	1216312	2017/05/25	2018/05/24
Radio Communication Analyer	Anritsu	MT8820C	6201465317	2018/01/15	2019/01/14
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Attenuator	Mini-Circuit	BW-S10W2+	N/A	2018/01/02	2019/01/01
Filter 800-1000	Micro-Tronics	EWT	M1	2018/01/02	2019/01/01
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966 TX	1	2018/01/02	2019/01/01

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7.5. Measurement Result: (Peak) –using option of peak measurement

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
GSM 850	824.2	128	V	20.64	3.45	-3.11	20.98	38.45
			H	19.72	3.45	-3.11	20.06	38.45
	836.6	190	V	17.82	3.45	-3.32	17.96	38.45
			H	22.58	3.45	-3.32	22.72	38.45
	848.8	251	V	24.82	3.46	-3.17	**25.11**	38.45
			H	22.84	3.46	-3.17	23.13	38.45
GPRS 850	824.2	128	V	22.79	3.45	-3.11	23.13	38.45
			H	20.99	3.45	-3.11	21.33	38.45
	836.6	190	V	22.08	3.45	-3.32	22.22	38.45
			H	25.33	3.45	-3.32	25.47	38.45
	848.8	251	V	26.53	3.46	-3.16	**26.83**	38.45
			H	25.41	3.46	-3.16	25.71	38.45

Remark: The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		**V/H**	**dBm**	**dBd**	**dB**	**dBm**	**dBm**
GSM 1900	1850.2	512	V	18.07	9.77	-4.66	23.18	33.00
			H	18.59	9.77	-4.66	23.69	33.00
	1880.0	661	V	16.24	9.86	-4.7	21.40	33.00
			H	20.74	9.86	-4.7	**25.90**	33.00
	1909.8	810	V	18.53	9.94	-4.72	23.75	33.00
			H	20.33	9.94	-4.72	25.55	33.00
GPRS 1900	1850.2	512	V	21.26	9.77	-4.66	26.36	33.00
			H	22.94	9.77	-4.66	**28.04**	33.00
	1880.0	661	V	20.53	9.86	-4.7	25.69	33.00
			H	22.61	9.86	-4.7	27.77	33.00
	1909.8	810	V	20.01	9.94	-4.72	25.23	33.00
			H	21.86	9.94	-4.72	27.08	33.00

Remark: The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		**V/H**	**dBm**	**dBd**	**dB**	**dBm**	**dBm**
WCDMA Band V	826.4	4132	V	22.88	3.45	-3.17	**23.15**	38.45
			H	22.35	3.45	-3.19	22.62	38.45
	836.6	4183	V	22.33	3.45	-3.31	22.47	38.45
			H	21.03	3.45	-3.31	21.17	38.45
	846.6	4233	V	20.49	3.46	-3.34	20.61	38.45
			H	19.74	3.46	-3.34	19.86	38.45
HSDPA Band V	826.4	4132	V	21.56	3.45	-3.18	**21.83**	38.45
			H	18.38	3.45	-3.18	18.65	38.45
	836.6	4183	V	18.45	3.45	-3.3	18.60	38.45
			H	17.88	3.45	-3.31	18.02	38.45
	846.6	4233	V	18.12	3.46	-3.34	18.25	38.45
			H	17.58	3.46	-3.33	17.71	38.45
HSUPA Band V	826.4	4132	V	19.25	3.45	-3.19	**19.52**	38.45
			H	17.83	3.45	-3.18	18.10	38.45
	836.6	4183	V	17.57	3.46	-3.34	17.68	38.45
			H	16.46	3.45	-3.31	16.61	38.45
	846.6	4233	V	17.37	3.46	-3.32	17.51	38.45
			H	16.48	3.46	-3.32	16.62	38.45

Remark: The RBW,VBW of SPA for frequency RBW=5 MHz, VBW=8 MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 5 BW: 1.4M QPSK RB: 1,0	824.7	20407	V	20.36	3.45	-3.17	20.64	38.45
			H	16.6	3.45	-3.17	16.88	38.45
	836.5	20525	V	20.6	3.45	-3.29	20.76	38.45
			H	17.89	3.45	-3.28	18.06	38.45
	848.3	20643	V	19.88	3.46	-3.35	19.99	38.45
			H	17.73	3.46	-3.36	17.83	38.45
LTE BAND 5 BW: 1.4M QPSK RB: 1,5	824.7	20407	V	20.37	3.45	-3.11	20.71	38.45
			H	16.75	3.45	-3.11	17.09	38.45
	836.5	20525	V	20.56	3.45	-3.3	20.71	38.45
			H	17.81	3.45	-3.29	17.97	38.45
	848.3	20643	V	19.95	3.46	-3.3	20.11	38.45
			H	17.8	3.46	-3.3	17.96	38.45
LTE BAND 5 BW: 1.4M 16QAM RB: 1,0	824.7	20407	V	21.01	3.45	-3.17	21.29	38.45
			H	17.28	3.45	-3.17	17.56	38.45
	836.5	20525	V	21.66	3.45	-3.29	21.83	38.45
			H	18.85	3.45	-3.29	19.02	38.45
	848.3	20643	V	20.55	3.46	-3.35	20.66	38.45
			H	18.4	3.46	-3.35	18.51	38.45
LTE BAND 5 BW: 1.4M 16QAM RB: 1,5	824.7	20407	V	20.6	3.45	-3.1	20.94	38.45
			H	16.95	3.45	-3.1	17.3	38.45
	836.5	20525	V	21.64	3.45	-3.3	21.8	38.45
			H	18.9	3.45	-3.3	19.05	38.45
	848.3	20643	V	20.63	3.46	-3.27	20.83	38.45
			H	18.49	3.46	-3.28	18.68	38.45
LTE BAND 5 BW: 1.4M 64QAM RB: 1,0	824.7	20407	V	21.56	3.45	-3.17	21.84	38.45
			H	17.09	3.45	-3.17	17.37	38.45
	836.5	20525	V	22.34	3.45	-3.29	22.51	38.45
			H	18.81	3.45	-3.29	18.98	38.45
	848.3	20643	V	21.17	3.46	-3.34	21.29	38.45
			H	18.26	3.46	-3.36	18.36	38.45
LTE BAND 5 BW: 1.4M 64QAM RB: 1,5	824.7	20407	V	21.15	3.45	-3.11	21.49	38.45
			H	16.72	3.45	-3.1	17.06	38.45
	836.5	20525	V	22.18	3.45	-3.3	22.33	38.45
			H	18.79	3.45	-3.3	18.94	38.45
	848.3	20643	V	21.28	3.46	-3.3	21.44	38.45
			H	18.32	3.46	-3.27	18.51	38.45

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 5 BW: 3M QPSK RB: 1,0	825.5	20415	V	20.12	3.45	-3.17	20.4	38.45
			H	16.31	3.45	-3.17	16.59	38.45
	836.5	20525	V	20.27	3.45	-3.28	20.45	38.45
			H	17.43	3.45	-3.28	17.6	38.45
	847.5	20635	V	19.61	3.46	-3.42	19.65	38.45
			H	17.48	3.46	-3.42	17.52	38.45
LTE BAND 5 BW: 3M QPSK RB: 1,14	825.5	20415	V	19.91	3.45	-3.16	20.2	38.45
			H	16.31	3.45	-3.16	16.6	38.45
	836.5	20525	V	20.12	3.45	-3.31	20.27	38.45
			H	17.58	3.45	-3.31	17.72	38.45
	847.5	20635	V	19.62	3.46	-3.29	19.79	38.45
			H	17.44	3.46	-3.3	17.6	38.45
LTE BAND 5 BW: 3M 16QAM RB: 1,0	825.5	20415	V	21.06	3.45	-3.17	21.34	38.45
			H	17.34	3.45	-3.17	17.61	38.45
	836.5	20525	V	21.44	3.45	-3.28	21.61	38.45
			H	18.53	3.45	-3.28	18.71	38.45
	847.5	20635	V	20.35	3.46	-3.43	20.38	38.45
			H	18.22	3.46	-3.42	18.26	38.45
LTE BAND 5 BW: 3M 16QAM RB: 1,14	825.5	20415	V	19.94	3.45	-3.15	20.24	38.45
			H	16.37	3.45	-3.16	16.66	38.45
	836.5	20525	V	21.2	3.45	-3.31	21.35	38.45
			H	18.65	3.45	-3.31	18.79	38.45
	847.5	20635	V	20.72	3.46	-3.3	20.88	38.45
			H	18.54	3.46	-3.29	18.72	38.45
LTE BAND 5 BW: 3M 64QAM RB: 1,0	825.5	20415	V	21.58	3.45	-3.17	21.87	38.45
			H	17.16	3.45	-3.17	17.44	38.45
	836.5	20525	V	22.37	3.45	-3.27	22.54	38.45
			H	18.9	3.45	-3.28	19.08	38.45
	847.5	20635	V	20.92	3.46	-3.43	20.95	38.45
			H	18.01	3.46	-3.43	18.04	38.45
LTE BAND 5 BW: 3M 64QAM RB: 1,14	825.5	20415	V	20.53	3.45	-3.16	20.83	38.45
			H	16.18	3.45	-3.16	16.46	38.45
	836.5	20525	V	22.04	3.45	-3.31	22.19	38.45
			H	18.77	3.45	-3.31	18.91	38.45
	847.5	20635	V	21.41	3.46	-3.3	21.58	38.45
			H	18.4	3.46	-3.29	18.57	38.45

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 5 BW: 5M QPSK RB: 1,0	826.5	20425	V	20.21	3.45	-3.18	20.48	38.45
			H	16.36	3.45	-3.18	16.63	38.45
	836.5	20525	V	20.52	3.45	-3.26	20.71	38.45
			H	17.39	3.45	-3.27	17.57	38.45
	846.5	20625	V	19.72	3.46	-3.4	19.77	38.45
			H	17.44	3.46	-3.4	17.49	38.45
LTE BAND 5 BW: 5M QPSK RB: 1,24	826.5	20425	V	19.96	3.45	-3.19	20.22	38.45
			H	16.36	3.45	-3.18	16.63	38.45
	836.5	20525	V	20.01	3.45	-3.32	20.15	38.45
			H	17.35	3.45	-3.32	17.48	38.45
	846.5	20625	V	19.73	3.46	-3.28	19.91	38.45
			H	17.67	3.46	-3.3	17.83	38.45
LTE BAND 5 BW: 5M 16QAM RB: 1,0	826.5	20425	V	21.29	3.45	-3.17	21.57	38.45
			H	17.46	3.45	-3.17	17.74	38.45
	836.5	20525	V	21.62	3.45	-3.27	21.8	38.45
			H	18.54	3.45	-3.26	18.73	38.45
	846.5	20625	V	20.23	3.46	-3.4	20.29	38.45
			H	18	3.46	-3.4	18.06	38.45
LTE BAND 5 BW: 5M 16QAM RB: 1,24	826.5	20425	V	19.96	3.45	-3.18	20.22	38.45
			H	16.38	3.45	-3.18	16.65	38.45
	836.5	20525	V	21.29	3.45	-3.32	21.42	38.45
			H	18.71	3.45	-3.32	18.84	38.45
	846.5	20625	V	20.89	3.46	-3.29	21.06	38.45
			H	18.61	3.46	-3.29	18.79	38.45
LTE BAND 5 BW: 5M 64QAM RB: 1,0	826.5	20425	V	21.27	3.45	-3.17	21.55	38.45
			H	12.14	3.45	-3.18	12.41	38.45
	836.5	20525	V	21.92	3.45	-3.26	22.11	38.45
			H	11.81	3.45	-3.26	12	38.45
	846.5	20625	V	20.31	3.46	-3.4	20.37	38.45
			H	10.34	3.46	-3.4	10.4	38.45
LTE BAND 5 BW: 5M 64QAM RB: 1,24	826.5	20425	V	19.91	3.45	-3.19	20.17	38.45
			H	12.38	3.45	-3.19	12.65	38.45
	836.5	20525	V	21.42	3.45	-3.32	21.56	38.45
			H	10.48	3.45	-3.32	10.61	38.45
	846.5	20625	V	13.94	3.46	-3.3	14.09	38.45
			H	9.51	3.46	-3.32	9.65	38.45

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 5 BW: 10M QPSK RB: 1,0	829.0	20450	V	20.35	3.45	-3.18	20.62	38.45
			H	-4.34	3.45	-3.18	-4.07	38.45
	836.5	20525	V	20.54	3.45	-3.23	20.76	38.45
			H	16.82	3.45	-3.24	17.03	38.45
	844.0	20600	V	20.06	3.46	-3.33	20.18	38.45
			H	17.08	3.46	-3.33	17.2	38.45
LTE BAND 5 BW: 10M QPSK RB: 1,49	829.0	20450	V	20.4	3.45	-3.25	20.6	38.45
			H	16.81	3.45	-3.25	17.01	38.45
	836.5	20525	V	19.94	3.46	-3.35	20.05	38.45
			H	17.11	3.46	-3.35	17.21	38.45
	844.0	20600	V	19.03	3.46	-3.33	19.16	38.45
			H	17.09	3.46	-3.32	17.23	38.45
LTE BAND 5 BW: 10M 16QAM RB: 1,0	829.0	20450	V	21.38	3.45	-3.18	21.65	38.45
			H	17.11	3.45	-3.18	17.39	38.45
	836.5	20525	V	16.11	3.45	-3.23	16.33	38.45
			H	17.71	3.45	-3.23	17.92	38.45
	844.0	20600	V	21.16	3.46	-3.33	21.28	38.45
			H	18.2	3.46	-3.34	18.32	38.45
LTE BAND 5 BW: 10M 16QAM RB: 1,49	829.0	20450	V	21.46	3.45	-3.25	21.66	38.45
			H	17.92	3.45	-3.25	18.12	38.45
	836.5	20525	V	20.94	3.46	-3.35	21.04	38.45
			H	18.08	3.46	-3.35	18.18	38.45
	844.0	20600	V	18.51	3.46	-3.28	18.68	38.45
			H	18.24	3.46	-3.31	18.38	38.45
LTE BAND 5 BW: 10M 64QAM RB: 1,0	829.0	20450	V	14.35	3.45	-3.23	14.57	38.45
			H	17.25	3.45	-3.17	17.52	38.45
	836.5	20525	V	15.22	3.45	-3.23	15.44	38.45
			H	17.79	3.45	-3.24	18	38.45
	844.0	20600	V	18.53	3.46	-3.34	18.65	38.45
			H	18.58	3.46	-3.33	18.7	38.45
LTE BAND 5 BW: 10M 64QAM RB: 1,49	829.0	20450	V	21.57	3.45	-3.25	21.77	38.45
			H	15.83	3.45	-3.25	16.03	38.45
	836.5	20525	V	20.65	3.46	-3.35	20.75	38.45
			H	18.22	3.46	-3.35	18.33	38.45
	844.0	20600	V	20.8	3.46	-3.28	20.97	38.45
			H	18.54	3.46	-3.31	18.69	38.45

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 12 BW: 1.4M QPSK RB: 1,0	699.7	23017	V	20.55	3.67	-2.1	22.12	34.77
			H	14.83	3.67	-2.09	16.41	34.77
	707.5	23095	V	21.38	3.65	-1.82	23.21	34.77
			H	15.71	3.65	-1.83	17.54	34.77
	715.3	23173	V	21.19	3.62	-2.3	22.51	34.77
			H	15.84	3.62	-2.31	17.16	34.77
LTE BAND 12 BW: 1.4M QPSK RB: 1,5	699.7	23017	V	20.93	3.68	-2.26	22.35	34.77
			H	15.1	3.67	-2.03	16.75	34.77
	707.5	23095	V	21.44	3.65	-1.88	23.21	34.77
			H	15.81	3.65	-1.87	17.59	34.77
	715.3	23173	V	21.14	3.62	-2.36	22.4	34.77
			H	15.86	3.62	-2.37	17.11	34.77
LTE BAND 12 BW: 1.4M 16QAM RB: 1,0	699.7	23017	V	20.64	3.67	-2.11	22.2	34.77
			H	14.98	3.67	-2.09	16.56	34.77
	707.5	23095	V	22.47	3.65	-1.81	24.31	34.77
			H	16.8	3.65	-1.81	18.65	34.77
	715.3	23173	V	21.85	3.62	-2.31	23.16	34.77
			H	16.53	3.62	-2.3	17.85	34.77
LTE BAND 12 BW: 1.4M 16QAM RB: 1,5	699.7	23017	V	21.13	3.68	-2.26	22.55	34.77
			H	15.22	3.67	-2.04	16.85	34.77
	707.5	23095	V	22.07	3.65	-1.87	23.85	34.77
			H	16.54	3.65	-1.89	18.3	34.77
	715.3	23173	V	21.32	3.62	-2.36	22.58	34.77
			H	16.05	3.62	-2.37	17.3	34.77
LTE BAND 12 BW: 1.4M 64QAM RB: 1,0	699.7	23017	V	20.59	3.67	-2.11	22.16	34.77
			H	14.91	3.67	-2.1	16.47	34.77
	707.5	23095	V	22.58	3.65	-1.82	24.41	34.77
			H	16.91	3.65	-1.82	18.75	34.77
	715.3	23173	V	21.94	3.62	-2.3	23.26	34.77
			H	16.66	3.62	-2.32	17.96	34.77
LTE BAND 12 BW: 1.4M 64QAM RB: 1,5	699.7	23017	V	21.12	3.68	-2.26	22.54	34.77
			H	15.13	3.67	-2.02	16.78	34.77
	707.5	23095	V	22.16	3.65	-1.87	23.94	34.77
			H	16.51	3.65	-1.87	18.29	34.77
	715.3	23173	V	21.4	3.62	-2.36	22.65	34.77
			H	16.19	3.62	-2.36	17.45	34.77

Remark： (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 12 BW: 3M QPSK RB: 1,0	700.5	23025	V	20.51	3.67	-2.12	22.07	34.77
			H	14.86	3.67	-2.11	16.42	34.77
	707.5	23095	V	21.01	3.66	-1.83	22.84	34.77
			H	15.36	3.66	-1.83	17.19	34.77
	714.5	23165	V	20.9	3.63	-2.21	22.31	34.77
			H	15.48	3.63	-2.23	16.88	34.77
LTE BAND 12 BW: 3M QPSK RB: 1,14	700.5	23025	V	20.86	3.68	-2.19	22.35	34.77
			H	15.12	3.67	-2.16	16.63	34.77
	707.5	23095	V	20.96	3.65	-1.92	22.69	34.77
			H	15.42	3.65	-1.94	17.13	34.77
	714.5	23165	V	20.74	3.62	-2.35	22	34.77
			H	15.46	3.62	-2.35	16.72	34.77
LTE BAND 12 BW: 3M 16QAM RB: 1,0	700.5	23025	V	20.6	3.67	-2.11	22.17	34.77
			H	15.04	3.67	-2.11	16.6	34.77
	707.5	23095	V	22.21	3.66	-1.82	24.04	34.77
			H	16.5	3.66	-1.83	18.33	34.77
	714.5	23165	V	21.93	3.63	-2.21	23.34	34.77
			H	16.49	3.63	-2.21	17.91	34.77
LTE BAND 12 BW: 3M 16QAM RB: 1,14	700.5	23025	V	21.95	3.67	-2.18	23.45	34.77
			H	16.22	3.67	-2.17	17.73	34.77
	707.5	23095	V	21.81	3.65	-1.93	23.52	34.77
			H	16.26	3.65	-1.93	17.98	34.77
	714.5	23165	V	21.33	3.62	-2.37	22.58	34.77
			H	16.05	3.62	-2.37	17.29	34.77
LTE BAND 12 BW: 3M 64QAM RB: 1,0	700.5	23025	V	20.61	3.67	-2.11	22.17	34.77
			H	14.86	3.67	-2.1	16.43	34.77
	707.5	23095	V	22.83	3.66	-1.82	24.66	34.77
			H	17.29	3.66	-1.83	19.11	34.77
	714.5	23165	V	21.91	3.63	-2.21	23.33	34.77
			H	16.73	3.63	-2.21	18.15	34.77
LTE BAND 12 BW: 3M 64QAM RB: 1,14	700.5	23025	V	21.97	3.67	-2.17	23.47	34.77
			H	16.07	3.66	-1.89	17.84	34.77
	707.5	23095	V	21.84	3.65	-1.93	23.56	34.77
			H	16.47	3.65	-1.93	18.19	34.77
	714.5	23165	V	21.4	3.62	-2.37	22.65	34.77
			H	16.32	3.62	-2.37	17.57	34.77

Remark： (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 12 BW: 5M QPSK RB: 1,0	701.5	23035	V	20.5	3.67	-2.11	22.06	34.77
			H	14.84	3.67	-2.08	16.42	34.77
	707.5	23095	V	21.03	3.66	-1.89	22.81	34.77
			H	15.39	3.66	-1.89	17.16	34.77
	713.5	23155	V	20.98	3.64	-2.08	22.53	34.77
			H	15.5	3.63	-2.1	17.04	34.77
LTE BAND 12 BW: 5M QPSK RB: 1,24	701.5	23035	V	20.77	3.67	-2.03	22.41	34.77
			H	15.12	3.67	-2.05	16.74	34.77
	707.5	23095	V	20.95	3.64	-1.97	22.63	34.77
			H	15.47	3.64	-2	17.11	34.77
	713.5	23155	V	20.8	3.62	-2.35	22.06	34.77
			H	15.47	3.62	-2.36	16.72	34.77
LTE BAND 12 BW: 5M 16QAM RB: 1,0	701.5	23035	V	20.6	3.67	-2.1	22.17	34.77
			H	14.99	3.67	-2.09	16.57	34.77
	707.5	23095	V	22.18	3.66	-1.9	23.94	34.77
			H	16.49	3.66	-1.9	18.25	34.77
	713.5	23155	V	21.67	3.64	-2.09	23.21	34.77
			H	16.17	3.64	-2.09	17.71	34.77
LTE BAND 12 BW: 5M 16QAM RB: 1,24	701.5	23035	V	22.02	3.67	-2.02	23.67	34.77
			H	16.24	3.65	-1.82	18.07	34.77
	707.5	23095	V	21.6	3.64	-1.99	23.26	34.77
			H	16.09	3.64	-1.99	17.74	34.77
	713.5	23155	V	21.37	3.62	-2.36	22.63	34.77
			H	16.09	3.62	-2.37	17.34	34.77
LTE BAND 12 BW: 5M 64QAM RB: 1,0	701.5	23035	V	20.57	3.67	-2.1	22.14	34.77
			H	15.01	3.67	-2.08	16.59	34.77
	707.5	23095	V	23.1	3.66	-1.9	24.85	34.77
			H	17.41	3.66	-1.9	19.17	34.77
	713.5	23155	V	21.66	3.64	-2.09	23.2	34.77
			H	16.3	3.64	-2.08	17.86	34.77
LTE BAND 12 BW: 5M 64QAM RB: 1,24	701.5	23035	V	22.93	3.67	-2.04	24.56	34.77
			H	17.11	3.65	-1.82	18.95	34.77
	707.5	23095	V	21.64	3.64	-1.98	23.3	34.77
			H	16.28	3.64	-1.98	17.94	34.77
	713.5	23155	V	21.45	3.62	-2.37	22.7	34.77
			H	16.34	3.62	-2.35	17.6	34.77

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 12 BW: 10M QPSK RB: 1,0	704.0	23060	V	20.42	3.67	-2.09	22.01	34.77
			H	14.74	3.67	-2.07	16.34	34.77
	707.5	23095	V	20.81	3.67	-2.09	22.39	34.77
			H	14.96	3.65	-1.8	16.81	34.77
	711.0	23130	V	20.94	3.65	-1.8	22.79	34.77
			H	15.31	3.65	-1.8	17.17	34.77
LTE BAND 12 BW: 10M QPSK RB: 1,49	704.0	23060	V	20.7	3.65	-1.9	22.44	34.77
			H	15.17	3.65	-1.9	16.92	34.77
	707.5	23095	V	20.76	3.63	-2.12	22.27	34.77
			H	15.28	3.63	-2.13	16.78	34.77
	711.0	23130	V	20.65	3.62	-2.34	21.94	34.77
			H	14.34	3.62	-2.37	15.59	34.77
LTE BAND 12 BW: 10M 16QAM RB: 1,0	704.0	23060	V	20.54	3.67	-2.08	22.14	34.77
			H	15	3.67	-2.07	16.6	34.77
	707.5	23095	V	21.94	3.67	-2.07	23.54	34.77
			H	16.11	3.65	-1.82	17.95	34.77
	711.0	23130	V	22.12	3.66	-1.83	23.95	34.77
			H	16.53	3.66	-1.83	18.36	34.77
LTE BAND 12 BW: 10M 16QAM RB: 1,49	704.0	23060	V	21.88	3.65	-1.91	23.63	34.77
			H	16.31	3.65	-1.9	18.05	34.77
	707.5	23095	V	21.75	3.63	-2.12	23.26	34.77
			H	16.25	3.63	-2.13	17.76	34.77
	711.0	23130	V	21.56	3.62	-2.34	22.84	34.77
			H	15.53	3.62	-2.34	16.81	34.77
LTE BAND 12 BW: 10M 64QAM RB: 1,0	704.0	23060	V	20.69	3.67	-2.09	22.27	34.77
			H	15.11	3.67	-2.07	16.72	34.77
	707.5	23095	V	22.75	3.67	-2.06	24.35	34.77
			H	16.89	3.65	-1.8	18.74	34.77
	711.0	23130	V	22.83	3.65	-1.8	24.68	34.77
			H	17.26	3.65	-1.8	19.11	34.77
LTE BAND 12 BW: 10M 64QAM RB: 1,49	704.0	23060	V	22.04	3.65	-1.9	23.79	34.77
			H	16.54	3.65	-1.9	18.28	34.77
	707.5	23095	V	21.82	3.63	-2.13	23.32	34.77
			H	16.4	3.63	-2.12	17.91	34.77
	711.0	23130	V	21.74	3.62	-2.35	23.01	34.77
			H	16.56	3.62	-2.35	17.83	34.77

Remark : (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 17 BW: 5M QPSK RB: 1,0	706.5	23755	V	20.59	3.65	-1.86	22.38	34.77
			H	15.12	3.65	-1.86	16.92	34.77
	710.0	23790	V	20.88	3.65	-1.87	22.67	34.77
			H	15.24	3.65	-1.88	17.01	34.77
	713.5	23825	V	21.03	3.64	-2.09	22.57	34.77
			H	15.45	3.64	-2.08	17.01	34.77
LTE BAND 17 BW: 5M QPSK RB: 1,24	706.5	23755	V	20.93	3.65	-1.92	22.66	34.77
			H	15.39	3.65	-1.94	17.1	34.77
	710.0	23790	V	20.97	3.63	-2.14	22.46	34.77
			H	15.49	3.63	-2.15	16.97	34.77
	713.5	23825	V	20.91	3.62	-2.36	22.16	34.77
			H	15.57	3.62	-2.36	16.83	34.77
LTE BAND 17 BW: 5M 16QAM RB: 1,0	706.5	23755	V	21.76	3.65	-1.85	23.56	34.77
			H	16.24	3.65	-1.87	18.03	34.77
	710.0	23790	V	22.05	3.65	-1.87	23.83	34.77
			H	16.42	3.65	-1.87	18.2	34.77
	713.5	23825	V	21.56	3.64	-2.09	23.12	34.77
			H	16.04	3.64	-2.09	17.59	34.77
LTE BAND 17 BW: 5M 16QAM RB: 1,24	706.5	23755	V	21.72	3.65	-1.93	23.44	34.77
			H	16.18	3.65	-1.92	17.91	34.77
	710.0	23790	V	21.64	3.63	-2.14	23.13	34.77
			H	16.13	3.63	-2.15	17.61	34.77
	713.5	23825	V	21.28	3.62	-2.35	22.55	34.77
			H	15.97	3.62	-2.37	17.22	34.77
LTE BAND 17 BW: 5M 64QAM RB: 1,0	706.5	23755	V	22.64	3.65	-1.84	24.45	34.77
			H	17.21	3.65	-1.85	19.01	34.77
	710.0	23790	V	22.14	3.65	-1.86	23.93	34.77
			H	16.6	3.65	-1.87	18.38	34.77
	713.5	23825	V	21.58	3.64	-2.09	23.13	34.77
			H	15.97	3.64	-2.09	17.53	34.77
LTE BAND 17 BW: 5M 64QAM RB: 1,24	706.5	23755	V	21.76	3.65	-1.91	23.5	34.77
			H	16.23	3.65	-1.93	17.94	34.77
	710.0	23790	V	21.68	3.63	-2.14	23.18	34.77
			H	16.11	3.63	-2.15	17.6	34.77
	713.5	23825	V	21.4	3.62	-2.35	22.66	34.77
			H	15.97	3.62	-2.36	17.23	34.77

Remark： (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
LTE BAND 17 BW: 10M QPSK RB: 1,0	709.0	23780	V	2.58	3.65	-1.88	4.35	34.77
			H	15.02	3.65	-1.87	16.81	34.77
	710.0	23790	V	20.78	3.66	-1.87	22.57	34.77
			H	15.21	3.66	-1.86	17	34.77
	711.0	23800	V	20.75	3.65	-1.81	22.6	34.77
			H	15.22	3.66	-1.81	17.06	34.77
LTE BAND 17 BW: 10M QPSK RB: 1,49	709.0	23780	V	20.77	3.63	-2.21	22.18	34.77
			H	15.26	3.63	-2.22	16.67	34.77
	710.0	23790	V	20.73	3.62	-2.27	22.08	34.77
			H	15.31	3.62	-2.29	16.64	34.77
	711.0	23800	V	20.72	3.62	-2.34	22.01	34.77
			H	15.31	3.62	-2.35	16.58	34.77
LTE BAND 17 BW: 10M 16QAM RB: 1,0	709.0	23780	V	15.73	3.65	-1.86	17.52	34.77
			H	16.22	3.65	-1.9	17.96	34.77
	710.0	23790	V	21.98	3.66	-1.88	23.76	34.77
			H	16.26	3.66	-1.87	18.05	34.77
	711.0	23800	V	21.97	3.66	-1.83	23.8	34.77
			H	16.35	3.65	-1.8	18.2	34.77
LTE BAND 17 BW: 10M 16QAM RB: 1,49	709.0	23780	V	21.84	3.63	-2.2	23.27	34.77
			H	15.41	3.62	-2.25	16.78	34.77
	710.0	23790	V	21.87	3.62	-2.27	23.23	34.77
			H	16.45	3.62	-2.29	17.78	34.77
	711.0	23800	V	21.51	3.62	-2.35	22.78	34.77
			H	15.43	3.62	-2.34	16.72	34.77
LTE BAND 17 BW: 10M 64QAM RB: 1,0	709.0	23780	V	22.65	3.65	-1.85	24.44	34.77
			H	17.14	3.65	-1.88	18.91	34.77
	710.0	23790	V	22.82	3.66	-1.87	24.6	34.77
			H	17.19	3.66	-1.87	18.98	34.77
	711.0	23800	V	22.68	3.65	-1.81	24.53	34.77
			H	17.13	3.66	-1.83	18.96	34.77
LTE BAND 17 BW: 10M 64QAM RB: 1,49	709.0	23780	V	21.9	3.63	-2.21	23.32	34.77
			H	16.37	3.63	-2.23	17.77	34.77
	710.0	23790	V	21.96	3.62	-2.28	23.3	34.77
			H	16.49	3.62	-2.29	17.82	34.77
	711.0	23800	V	21.6	3.62	-2.34	22.88	34.77
			H	16.19	3.62	-2.35	17.46	34.77

Remark： (1)The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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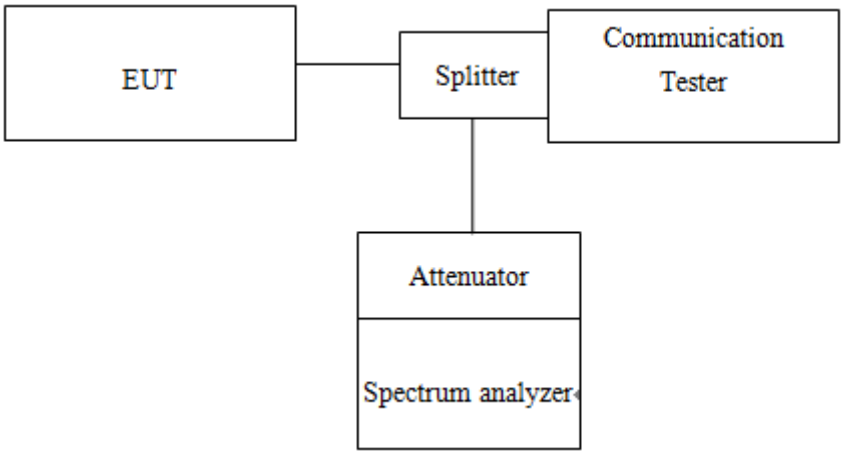
8. OCCUPIED BANDWIDTH MEASUREMENT

8.1. 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.

8.2. Test Set-up



8.3. 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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8.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY54200716	2017/10/16	2018/10/15
Radio Communication Analyer	Anritsu	MT8820C	6201465317	2018/01/17	2019/01/16
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cables	N/A	WK CE Cable	N/A	2018/01/02	2019/01/01

8.5. Measurement Result

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		GSM 850	GPRS 850	GSM 850	GPRS 850
824.2	128	0.24625	0.24434	0.31780	0.31540
836.6	190	0.24931	0.24358	0.31900	0.31970
848.8	251	0.25014	0.24202	0.32610	0.31610

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		GSM 1900	GPRS 1900	GSM 1900	GPRS 1900
1850.2	512	0.24243	0.24657	0.32210	0.31640
1880.0	661	0.24361	0.24354	0.31470	0.31180
1909.8	810	0.24619	0.24838	0.31660	0.32210

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		WCDMA V	HSDPA V	HSUPA V	WCDMA V	HSDPA V	HSUPA V
826.40	4132	4.1267	4.1288	4.1232	4.6760	4.6810	4.6680
836.60	4183	4.1251	4.1118	4.1224	4.6720	4.6730	4.6740
846.60	4233	4.1189	4.1242	4.1090	4.6730	4.6780	4.6760

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LTE BAND 5 Channel bandwidth: 1.4MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
824.7	20407	1.0927	1.0963	1.0998	1.2343	1.2410	1.2421
836.5	20525	1.0933	1.0965	1.0917	1.2358	1.2448	1.2357
848.3	20643	1.0970	1.0977	1.0957	1.2393	1.2468	1.2336

LTE BAND 5 Channel bandwidth: 3MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
825.5	20415	2.6948	2.6955	2.7097	2.9693	2.9725	3.0113
836.5	20525	2.7007	2.7025	2.6980	2.9809	2.9885	2.9993
847.5	20635	2.7033	2.6985	2.7026	2.9885	3.0016	2.9862

LTE BAND 5 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
826.5	20425	4.5141	4.5127	4.5122	4.9182	4.9268	4.9328
836.5	20525	4.5079	4.5103	4.4969	4.9396	4.9438	4.9739
846.5	20625	4.5029	4.5507	4.4976	4.9171	4.7789	4.8628

LTE BAND 5 Channel bandwidth: 10MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
829.0	20450	8.9878	8.9154	8.9604	9.805	9.604	9.736
836.5	20525	9.0017	8.9767	8.9665	9.726	9.831	9.740
844.0	20600	8.9835	8.9800	8.9824	9.719	9.828	9.810

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	1.1063	1.0950	1.1233	1.2229	1.2392	1.2019
707.5	23095	1.0927	1.0981	1.0918	1.2421	1.2430	1.2086
715.3	23173	1.0859	1.0966	1.0949	1.2077	1.2384	1.2453

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	2.6946	2.7067	2.7041	2.9662	2.9802	2.9900
707.5	23095	2.6915	2.7027	2.7061	3.0289	2.9888	3.0001
714.5	23165	2.6981	2.7043	2.7009	2.9913	3.0025	2.9781

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	4.5118	4.4871	4.4892	4.9831	4.9439	4.9130
707.5	23095	4.4967	4.5042	4.5070	4.9605	4.9419	4.9780
713.5	23155	4.4975	4.5046	4.5027	4.9694	4.9703	4.9712

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	8.9896	8.9784	8.9647	9.747	9.806	9.754
707.5	23095	8.9982	8.9940	8.9765	9.681	9.811	9.663
711.0	23130	9.0011	8.9940	8.9737	9.799	9.450	9.707

LTE BAND 17 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
706.5	23755	4.4991	4.5058	4.5808	4.9369	4.9844	7.4436
710.0	23790	4.5126	4.4883	4.5130	4.9518	4.7079	4.8460
713.5	23825	4.5174	4.5991	4.4902	5.0070	4.8532	4.7767

LTE BAND 17 Channel bandwidth: 10MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
709.0	23780	8.9872	8.9398	8.9707	9.877	9.835	9.690
710.0	23790	8.9820	8.9660	8.9873	9.772	9.711	9.737
711.0	23780	9.0042	8.9677	8.9710	9.842	9.703	9.691

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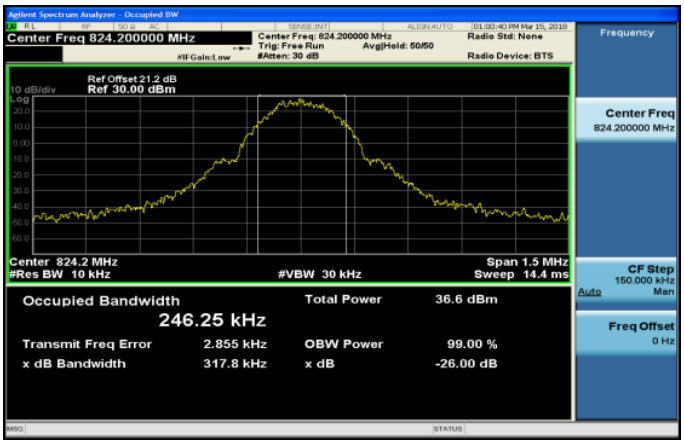
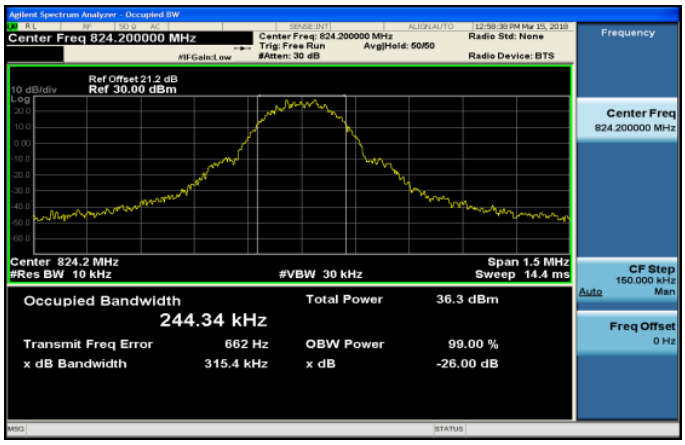
GSM_850MHz_LowCH128-824.2



GPRS_850MHz_LowCH128-824.2



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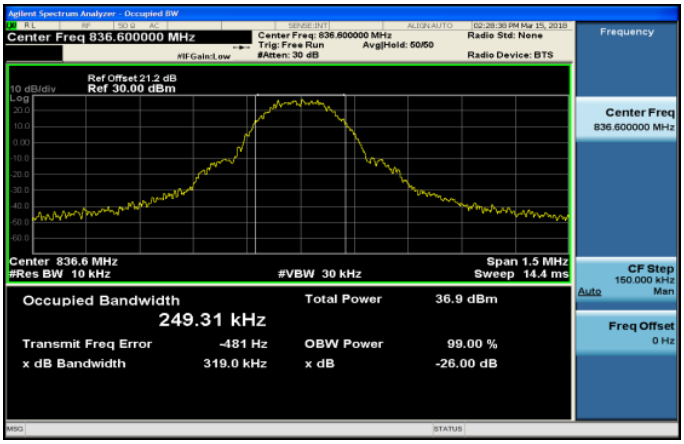

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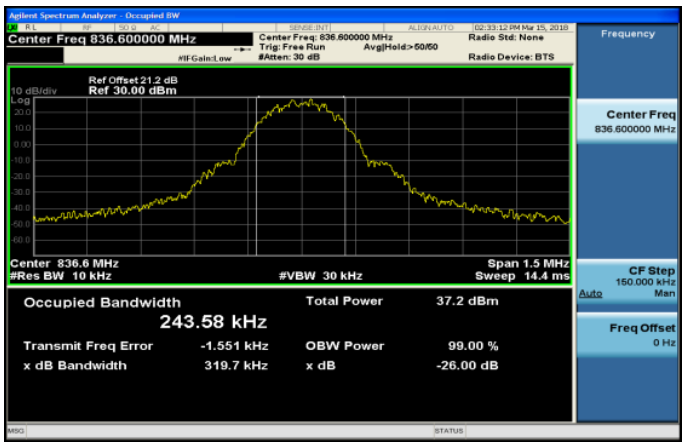

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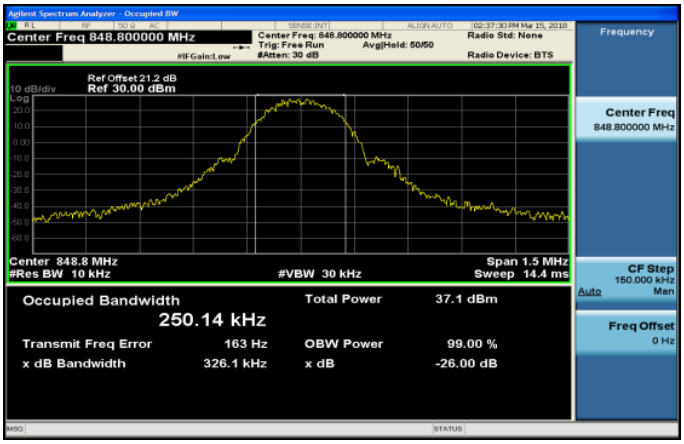

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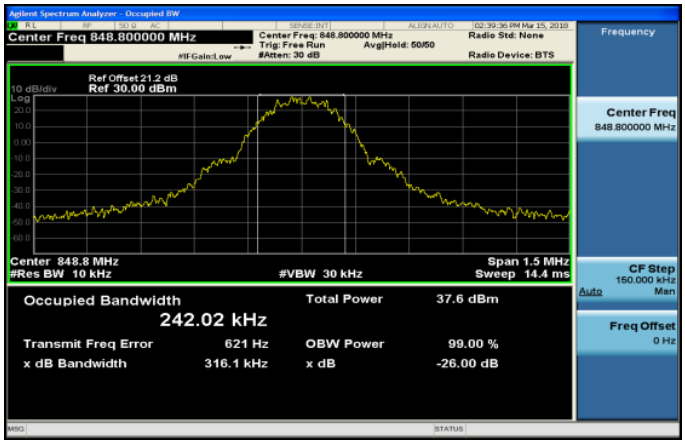

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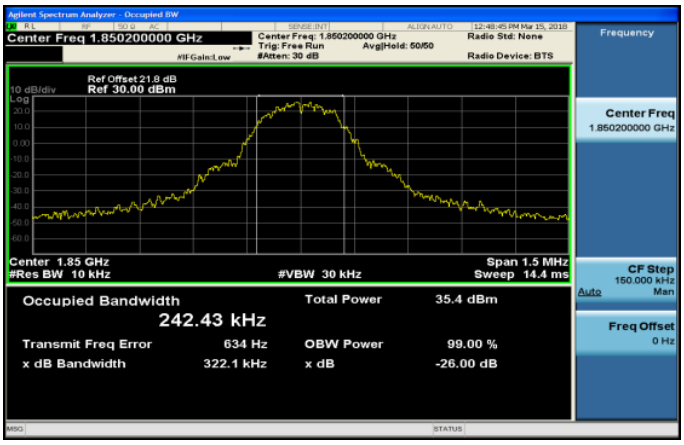
GSM_1900MHz_LowCH512-1850.2



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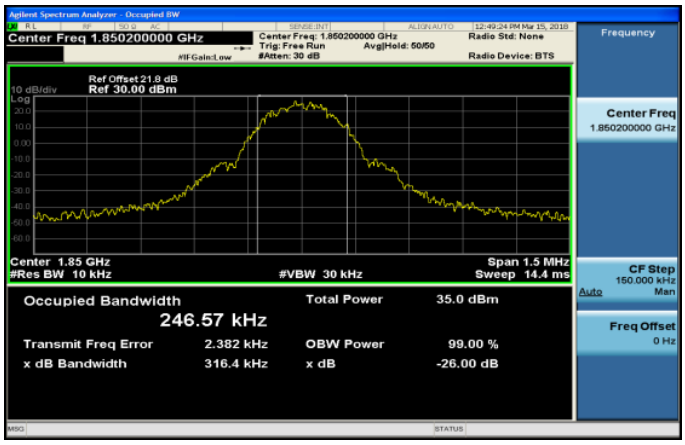

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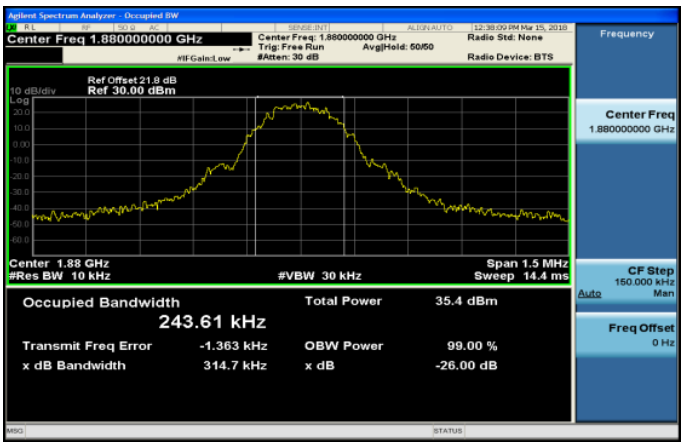

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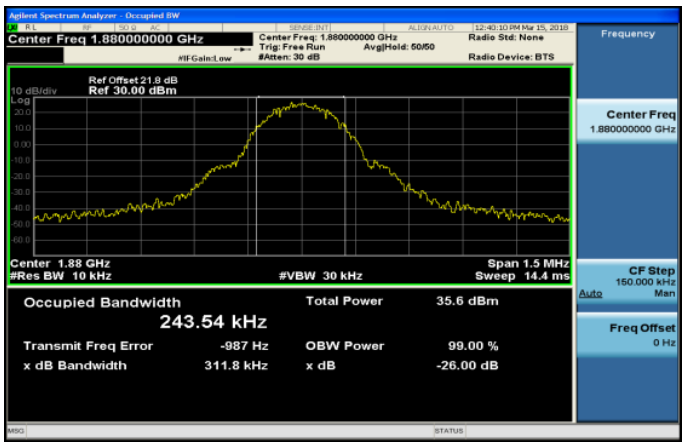

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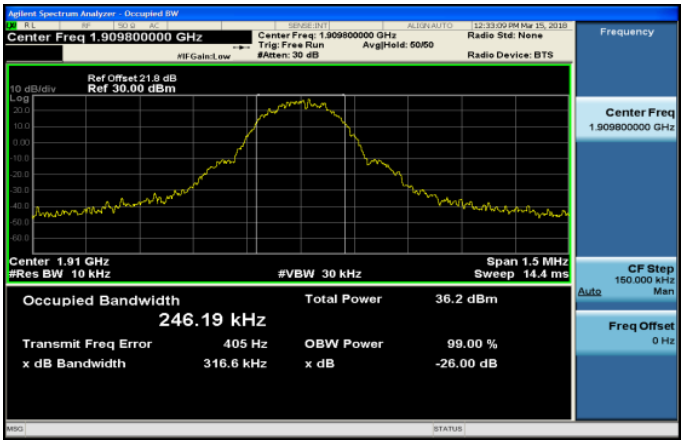
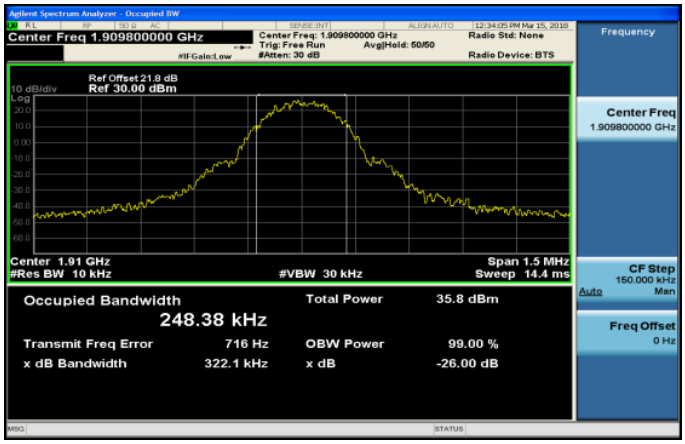


GPRS_1900MHz_HighCH810-1909.8



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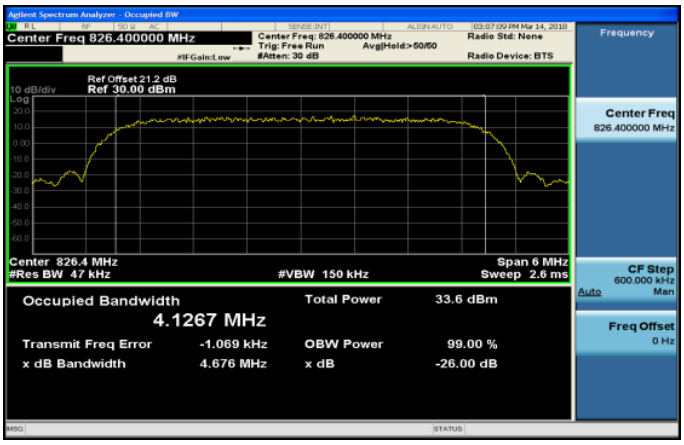
WCDMA_B5_LowCH4132-826.4



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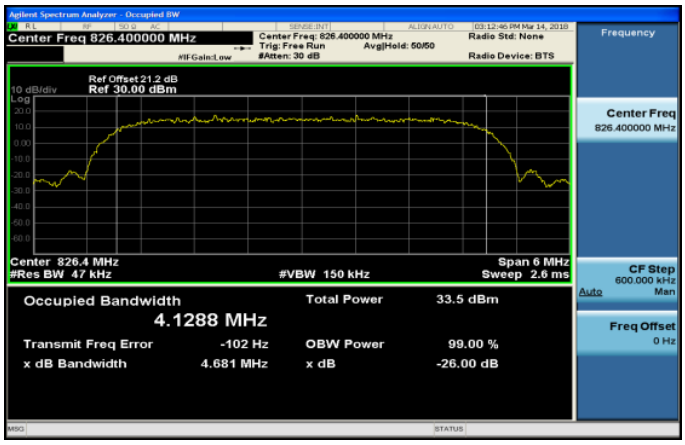
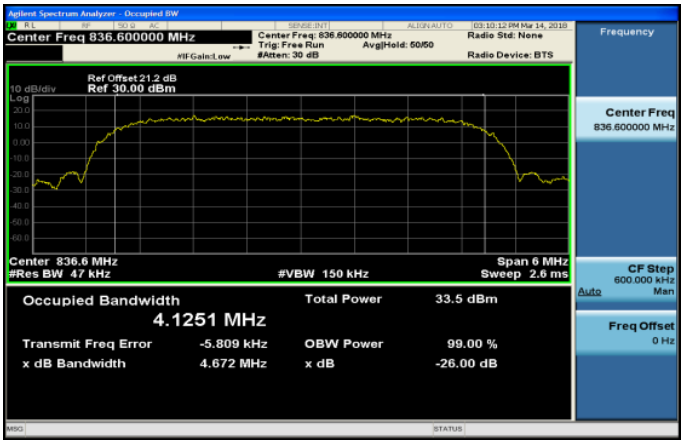


WCDMA_B5_MidCH4183-836.6



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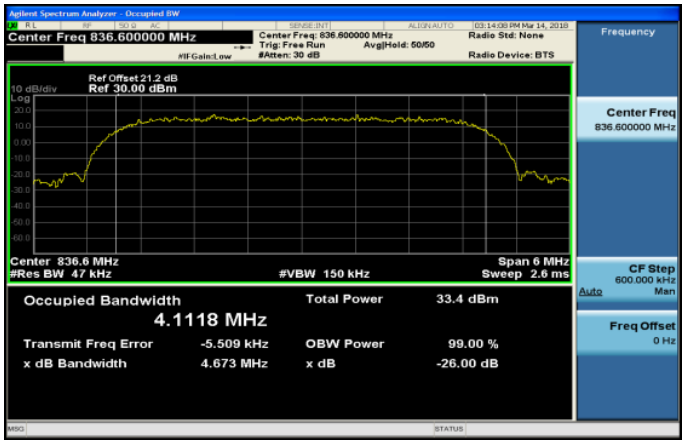

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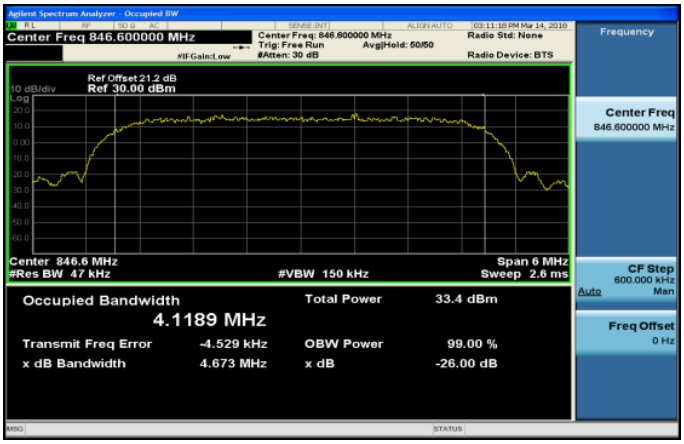

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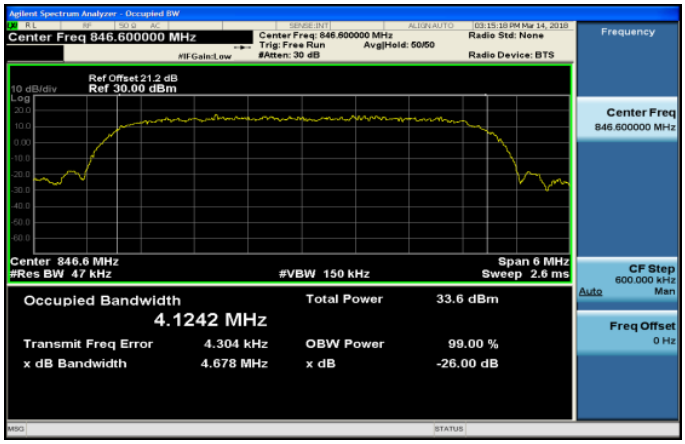

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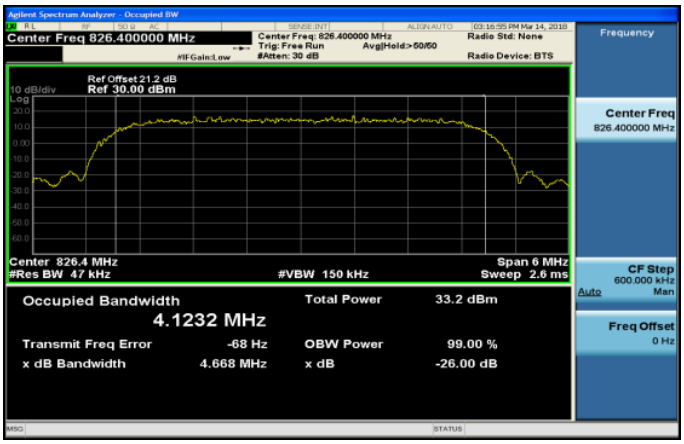
HSUPA_B5_LowCH4132-826.4



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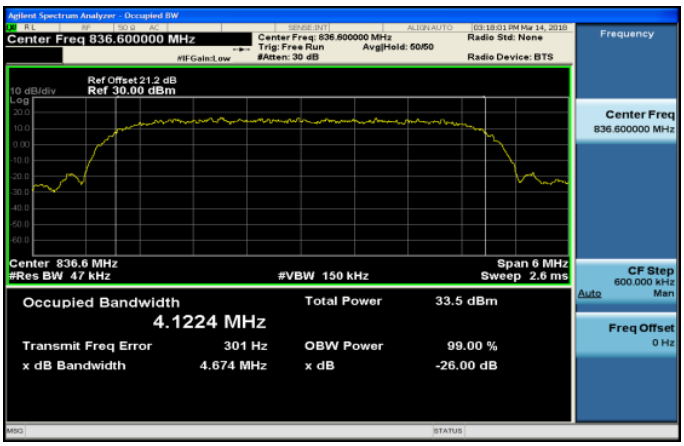

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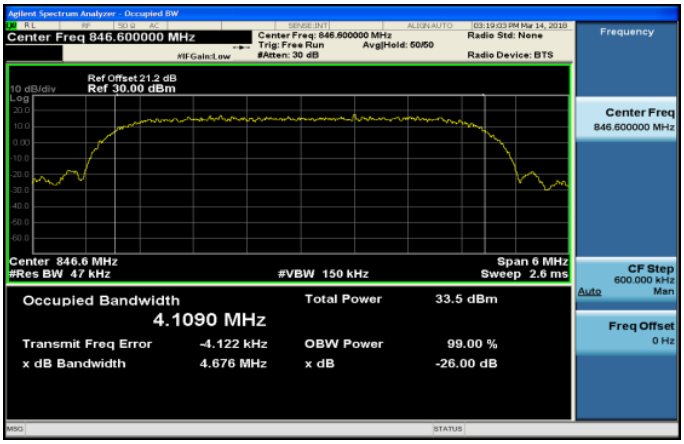

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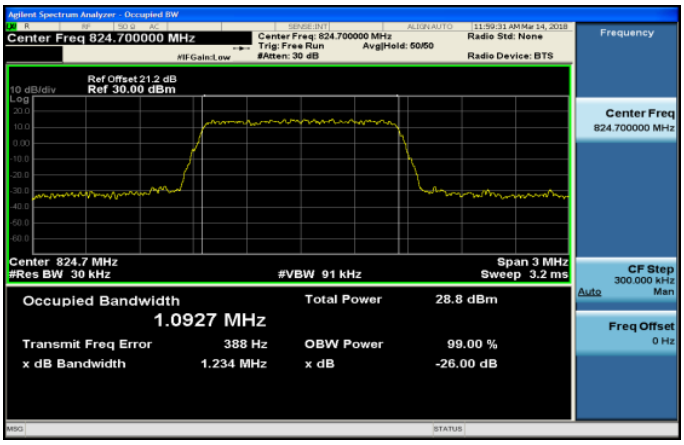
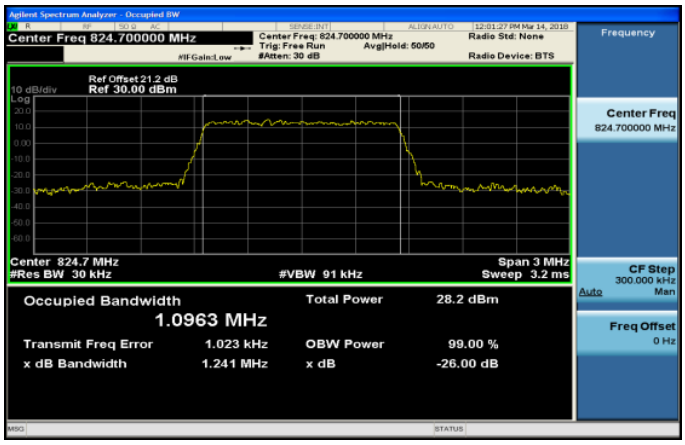
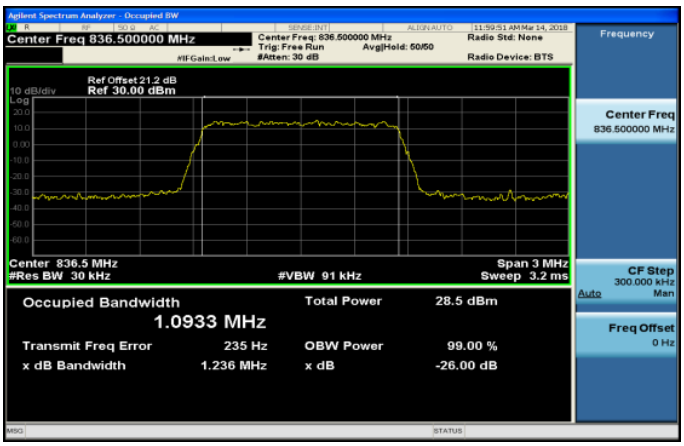
Band5_1_4MHz_QPSK_6_0_LowCH20407-824.7



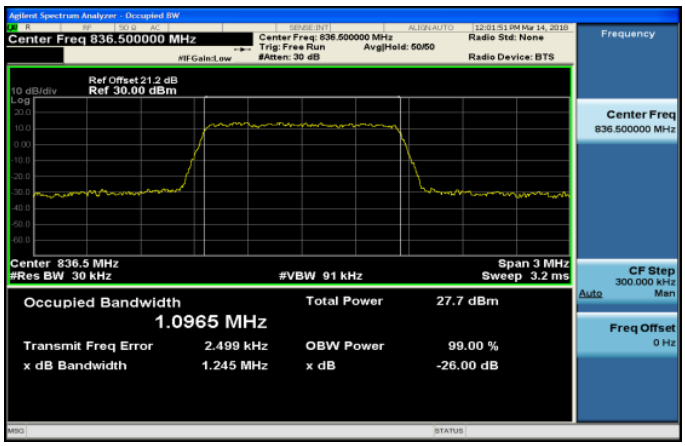
Band5_1_4MHz_16QAM_6_0_LowCH20407-824.7



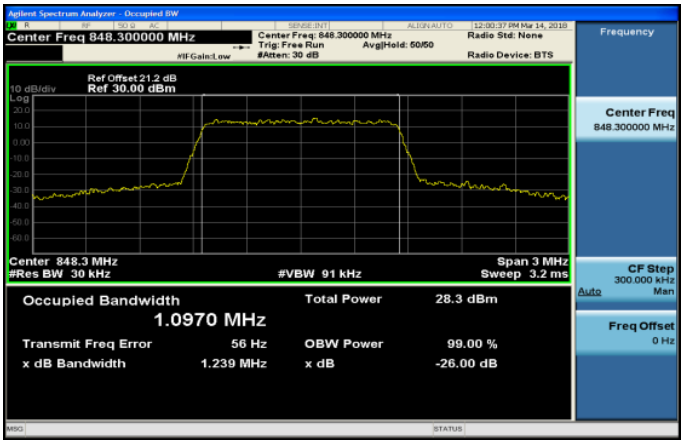
Band5_1_4MHz_QPSK_6_0_MidCH20525-836.5



Band5_1_4MHz_16QAM_6_0_MidCH20525-836.5



Band5_1_4MHz_QPSK_6_0_HighCH20643-848.3



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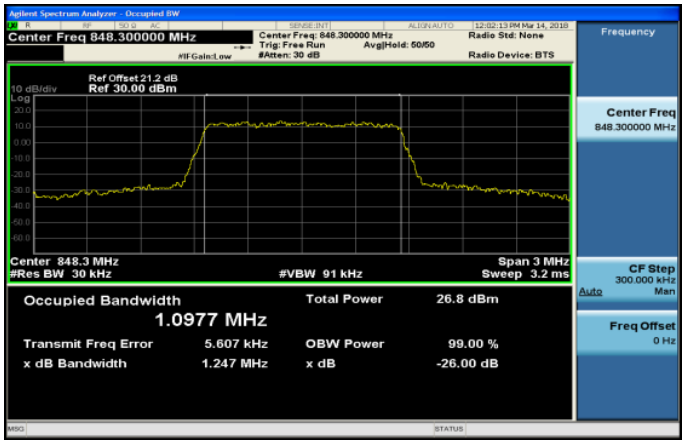

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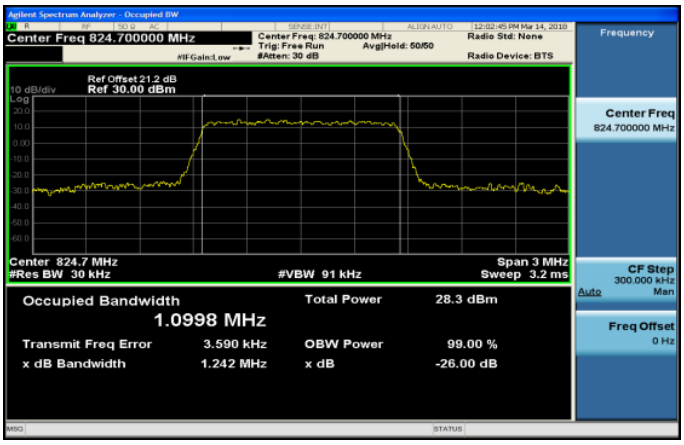
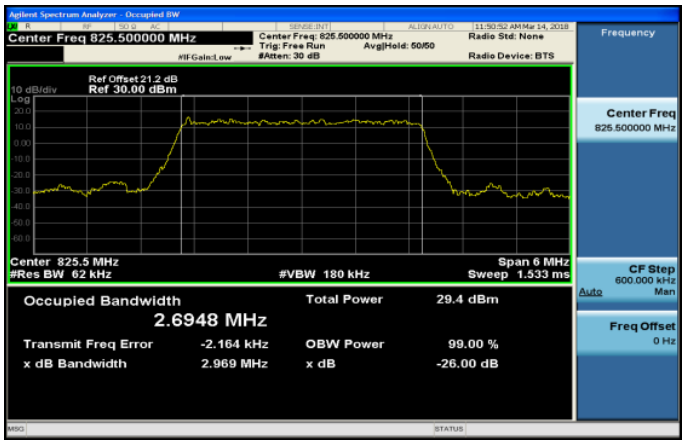
Band5_1_4MHz_64QAM_6_0_LowCH20407-824.7



Band5_3MHz_QPSK_15_0_LowCH20415-825.5



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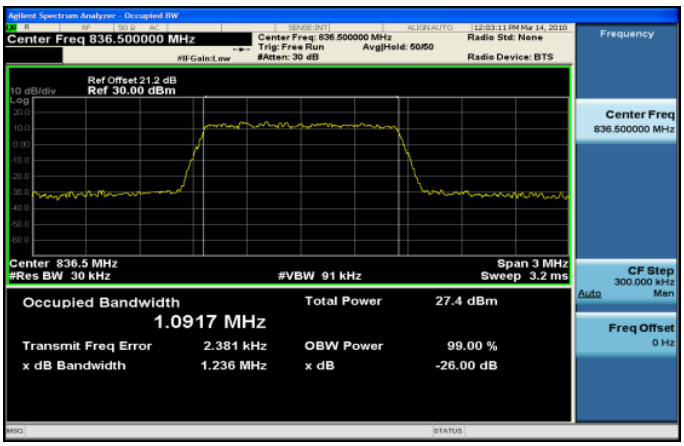

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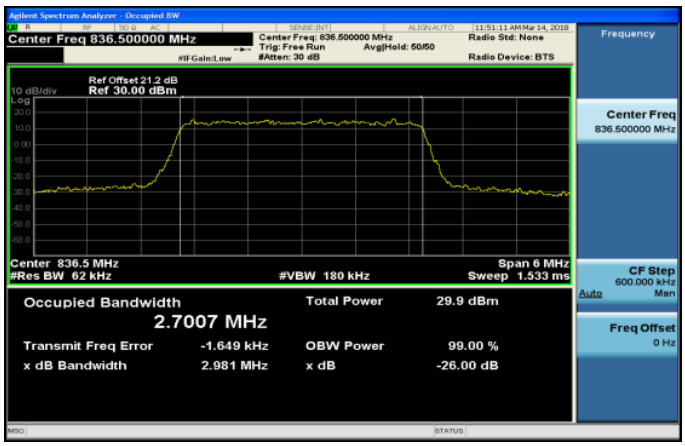
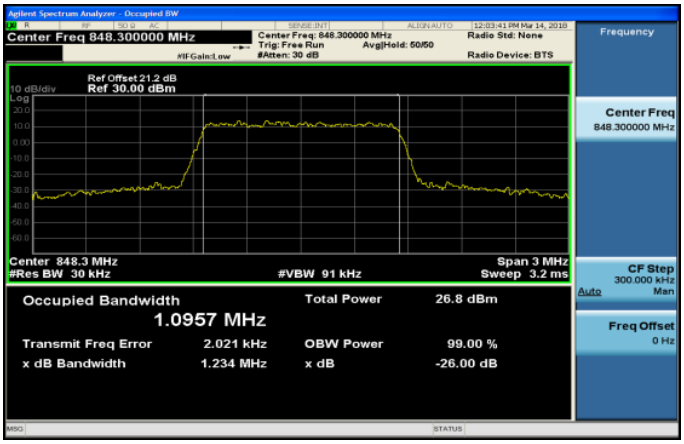
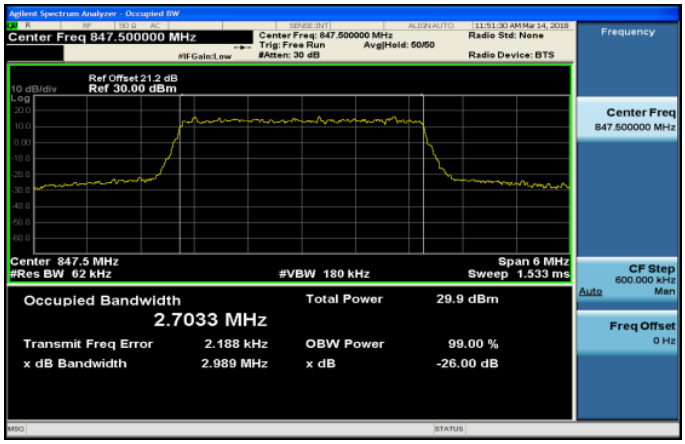


Band5_1_4MHz_64QAM_6_0_HighCH20643-848.3



Band5_3MHz_QPSK_15_0_HighCH20635-847.5



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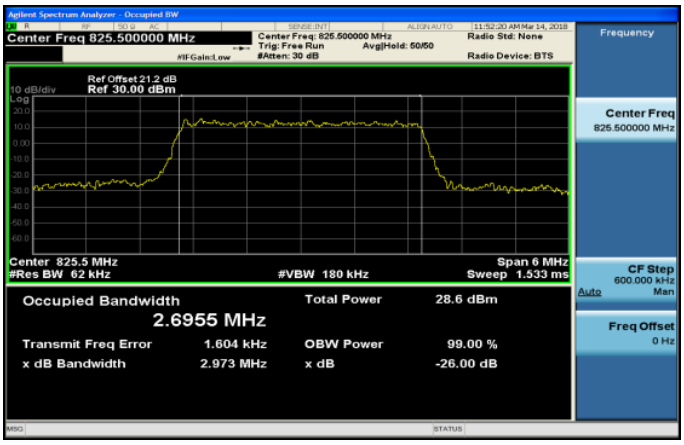
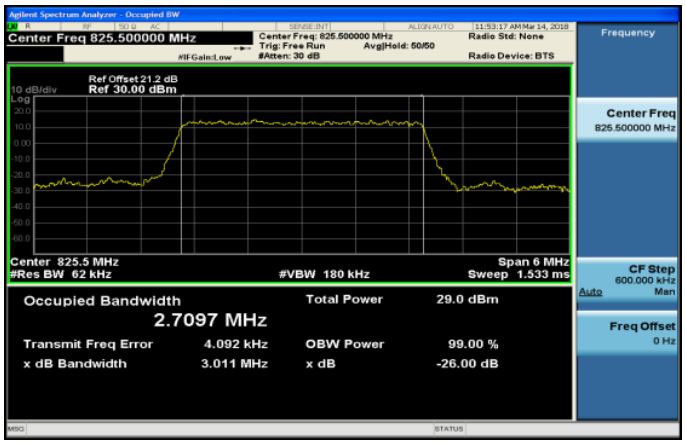
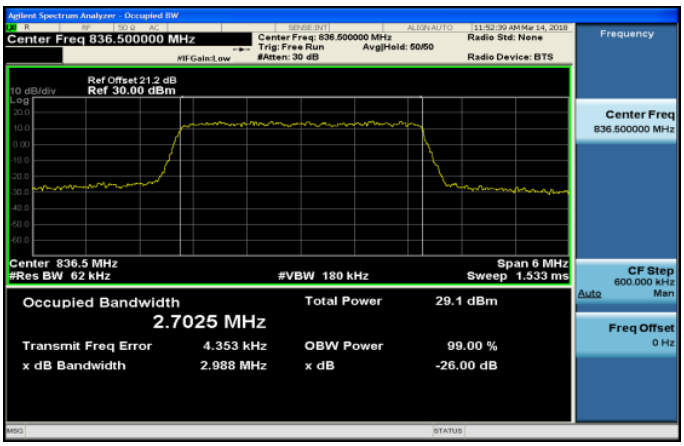
Band5_3MHz_16QAM_15_0_LowCH20415-825.5



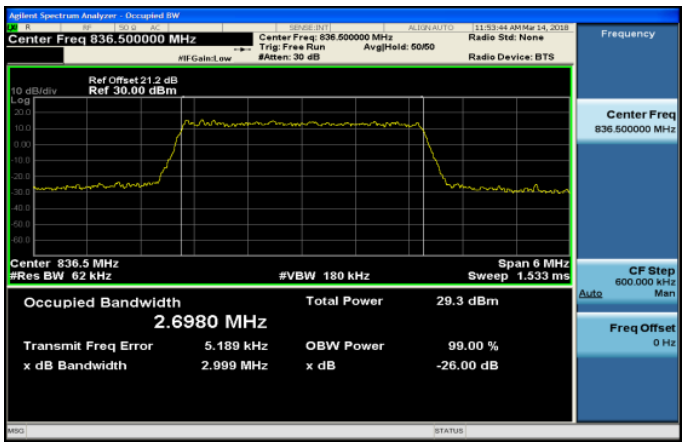
Band5_3MHz_64QAM_15_0_LowCH20415-825.5



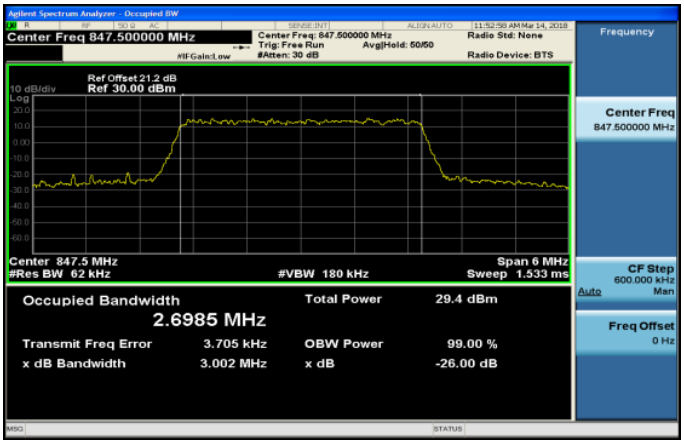
Band5_3MHz_16QAM_15_0_MidCH20525-836.5



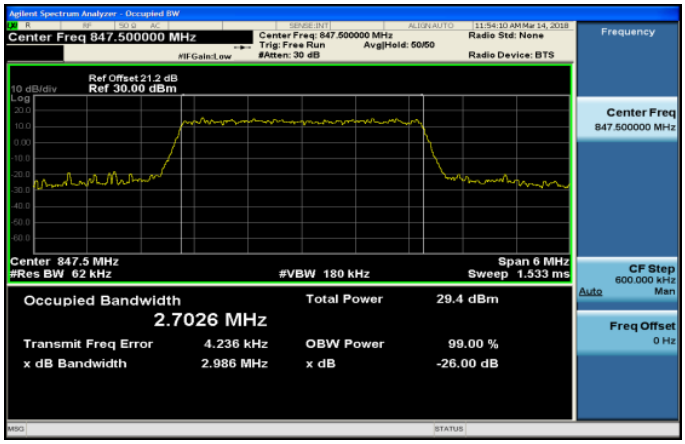
Band5_3MHz_64QAM_15_0_MidCH20525-836.5



Band5_3MHz_16QAM_15_0_HighCH20635-847.5



Band5_3MHz_64QAM_15_0_HighCH20635-847.5



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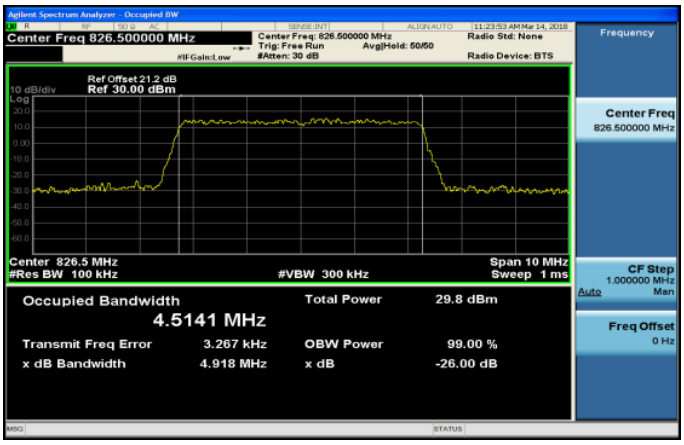
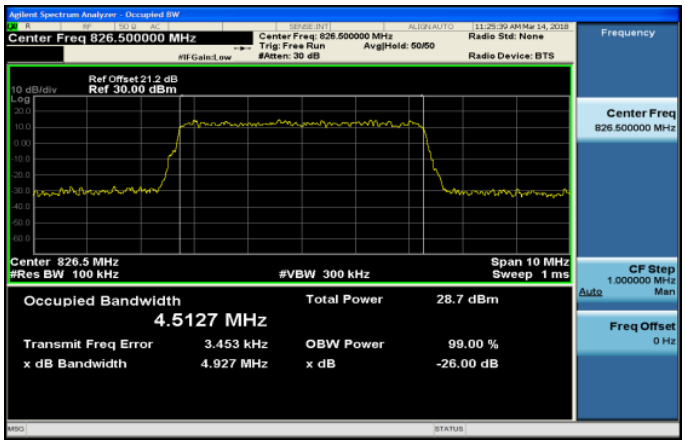
Band5_5MHz_QPSK_25_0_LowCH20425-826.5



Band5_5MHz_16QAM_25_0_LowCH20425-826.5



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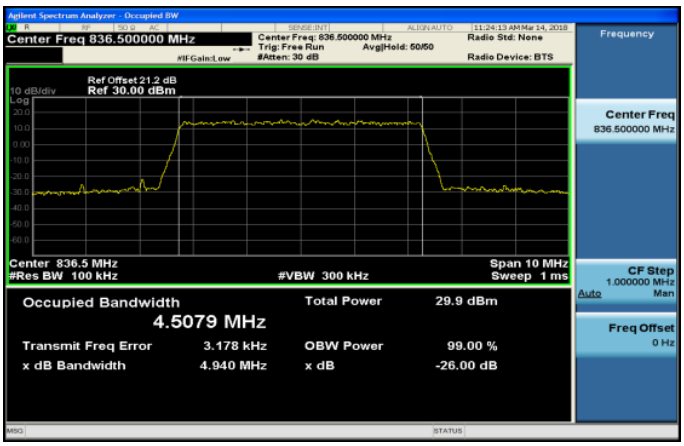

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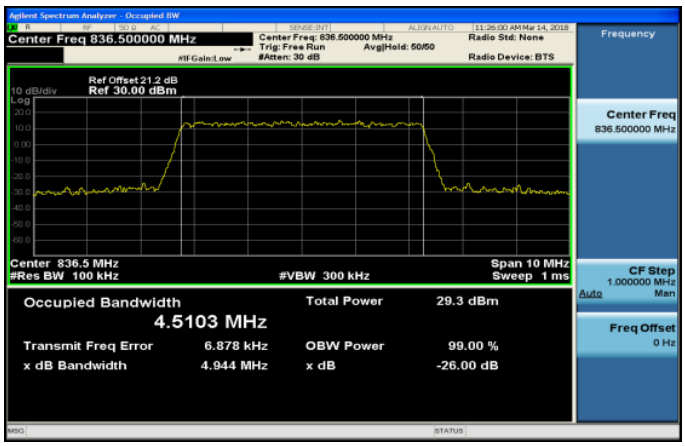
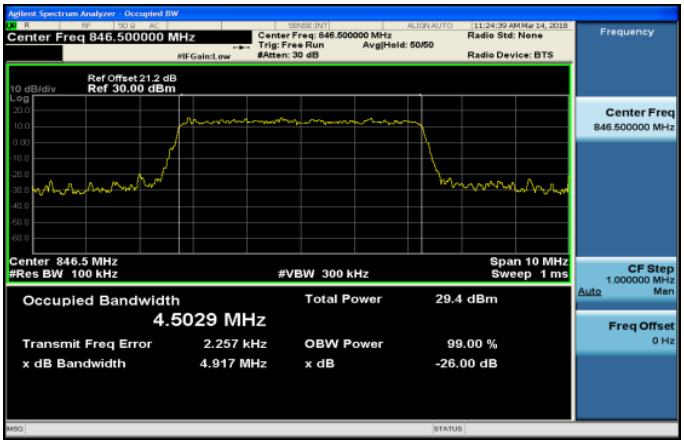


Band5_5MHz_QPSK_25_0_HighCH20625-846.5



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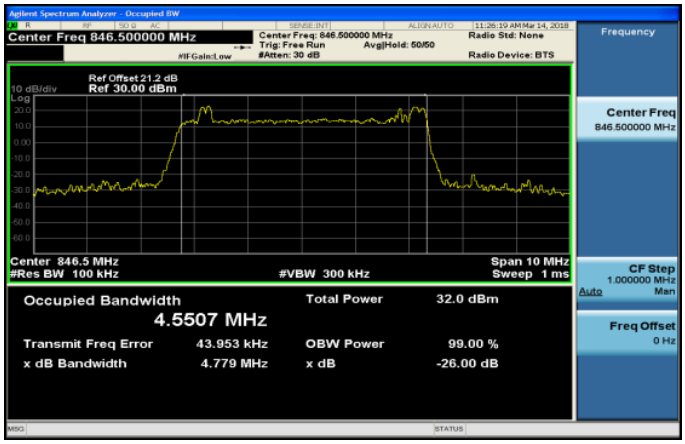

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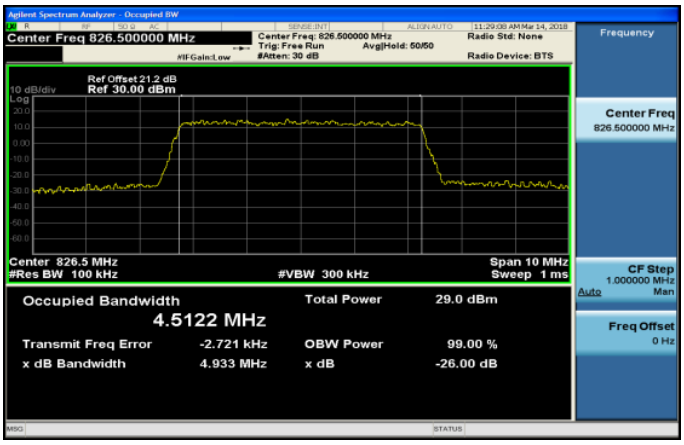
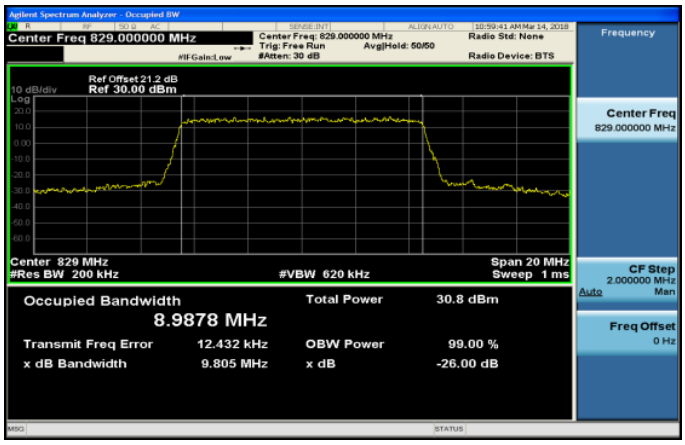
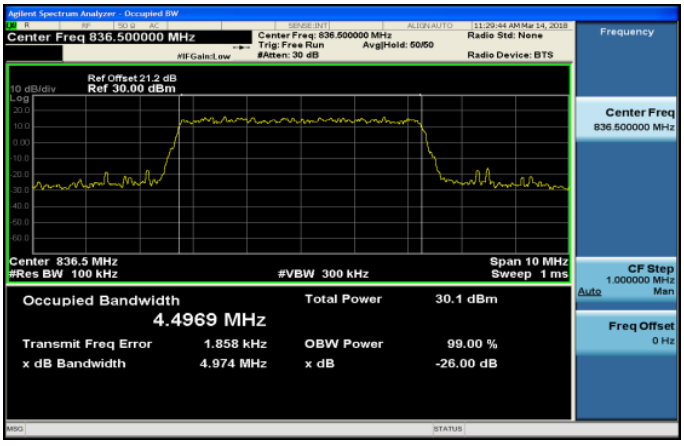
Band5_5MHz_64QAM_25_0_LowCH20425-826.5



Band5_10MHz_QPSK_50_0_LowCH20450-829



Band5_5MHz_64QAM_25_0_MidCH20525-836.5



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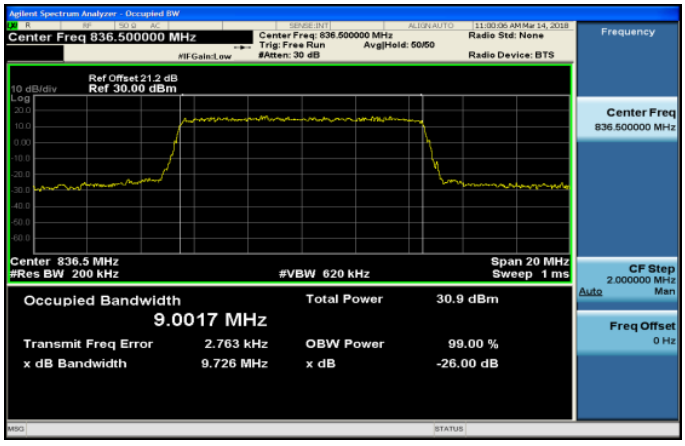

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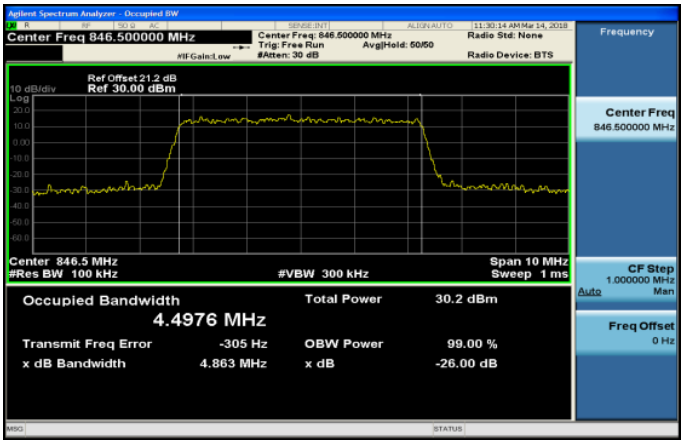

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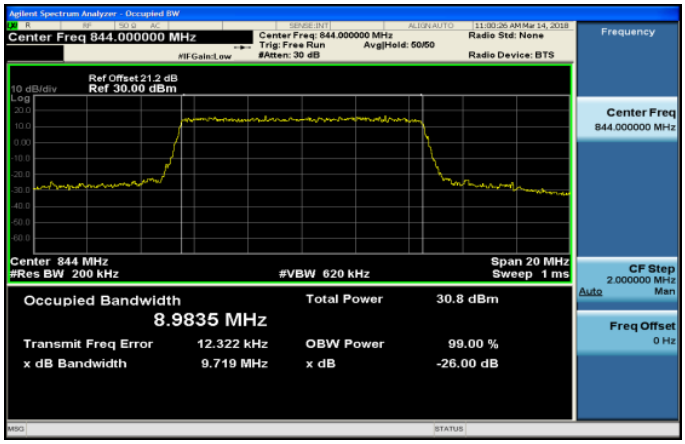

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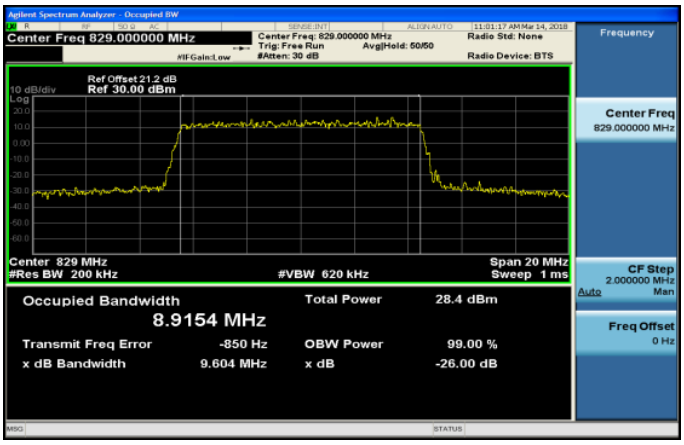
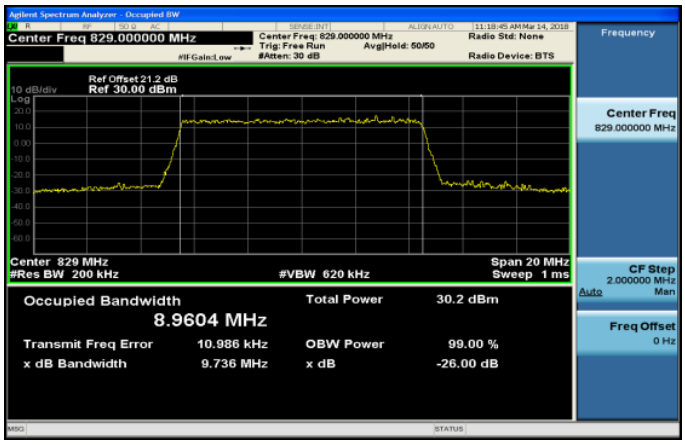
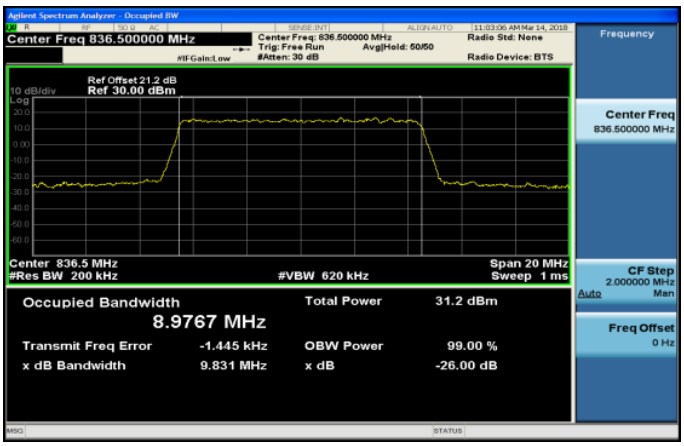
Band5_10MHz_16QAM_50_0_LowCH20450-829



Band5_10MHz_64QAM_50_0_LowCH20450-829



Band5_10MHz_16QAM_50_0_MidCH20525-836.5



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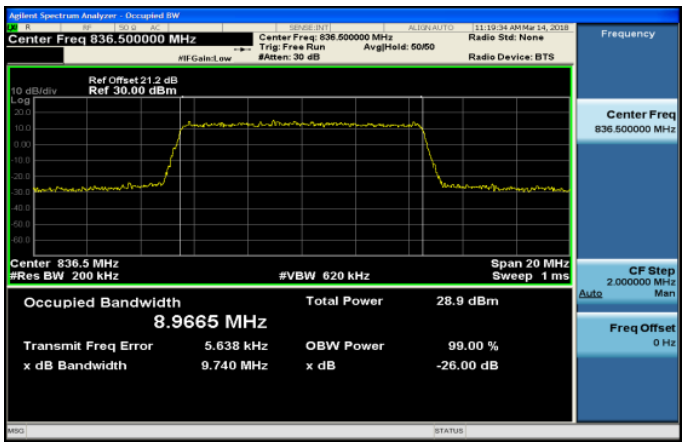
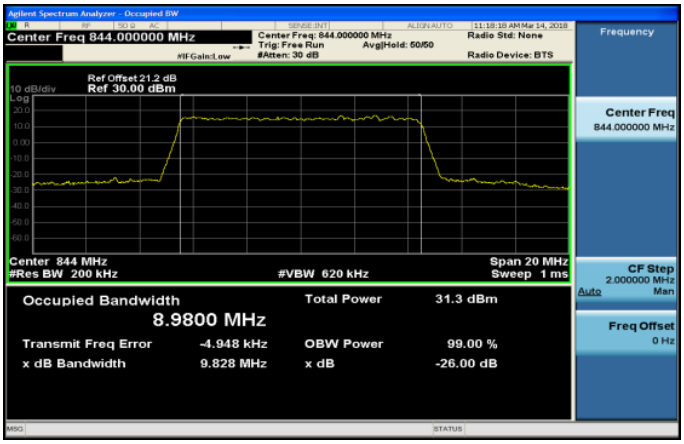


Band5_10MHz_16QAM_50_0_HighCH20600-844



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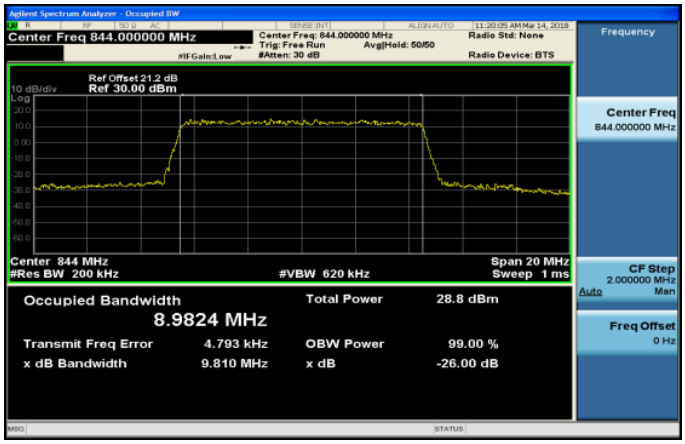

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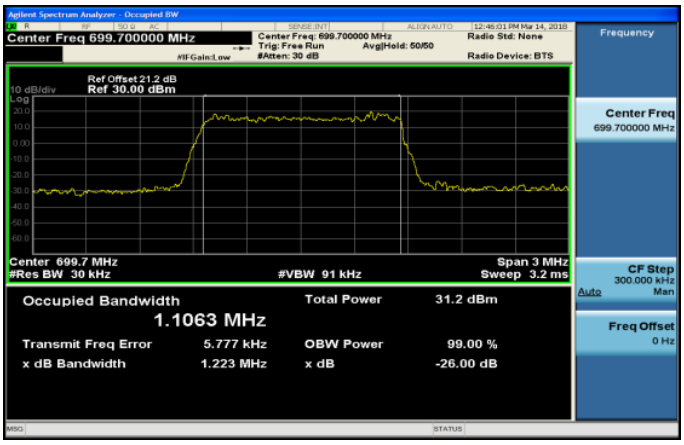
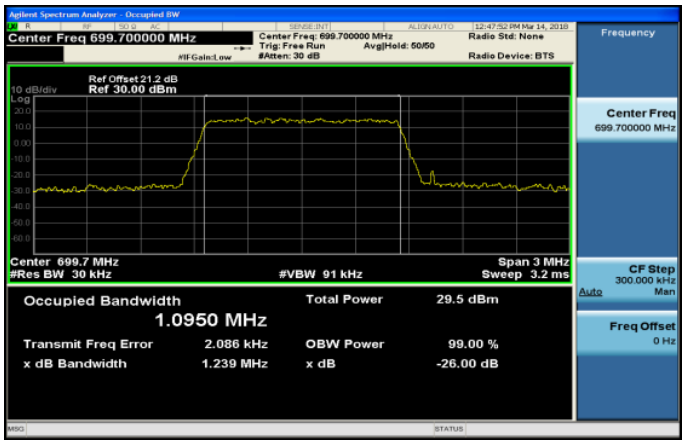
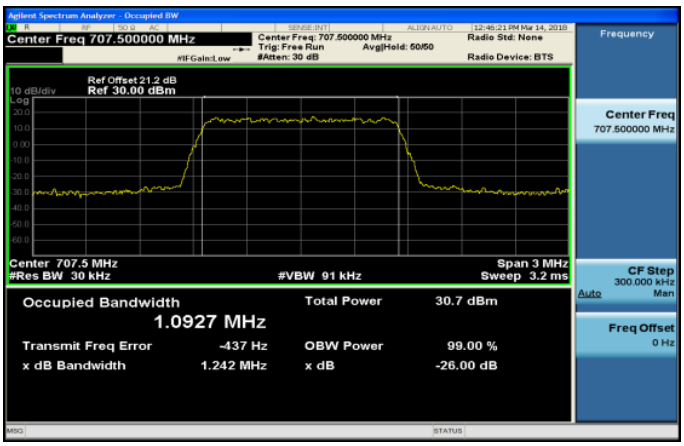
Band12_1_4MHz_QPSK_6_0_LowCH23017-699.7



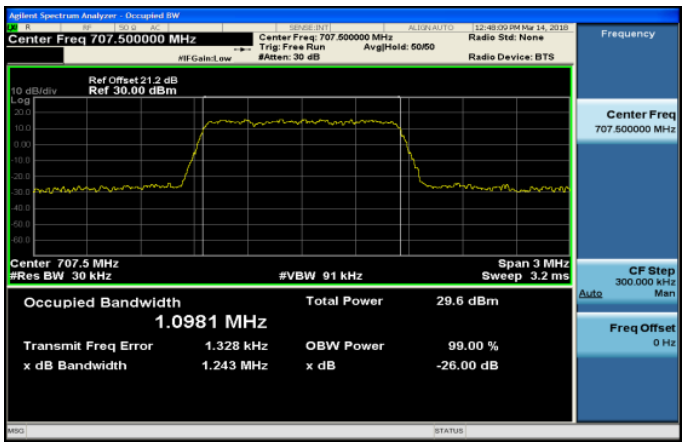
Band12_1_4MHz_16QAM_6_0_LowCH23017-699.7



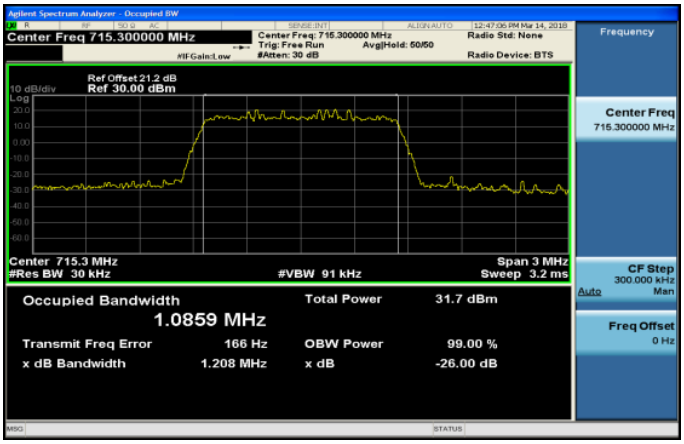
Band12_1_4MHz_QPSK_6_0_MidCH23095-707.5



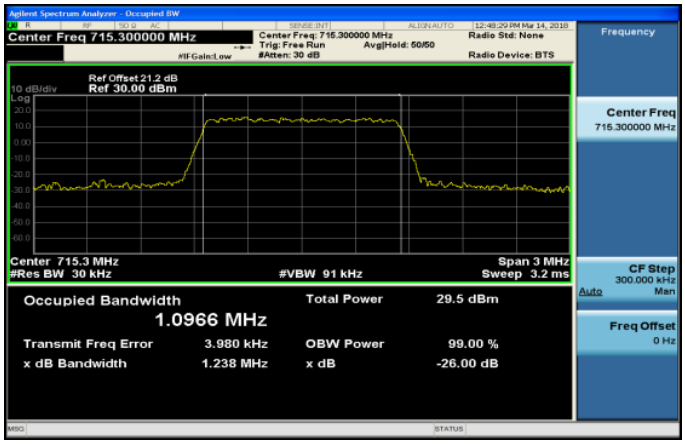
Band12_1_4MHz_16QAM_6_0_MidCH23095-707.5



Band12_1_4MHz_QPSK_6_0_HighCH23173-715.3



Band12_1_4MHz_16QAM_6_0_HighCH23173-715.3



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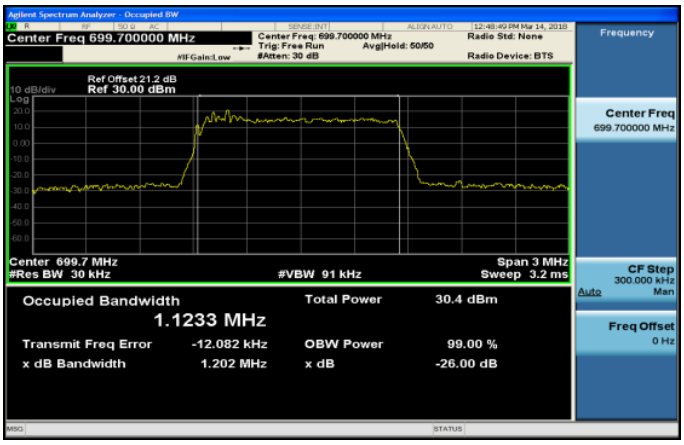
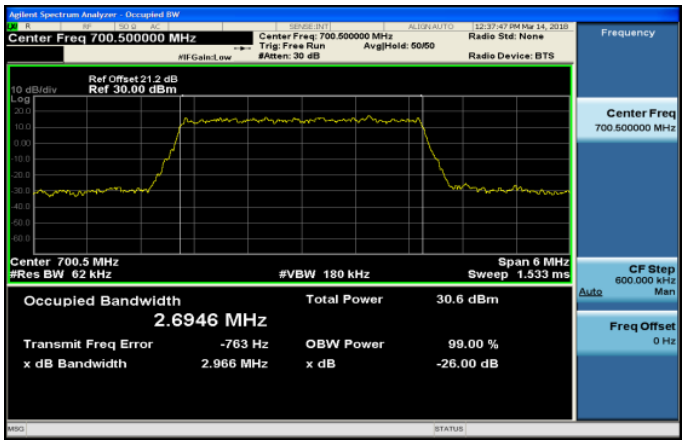
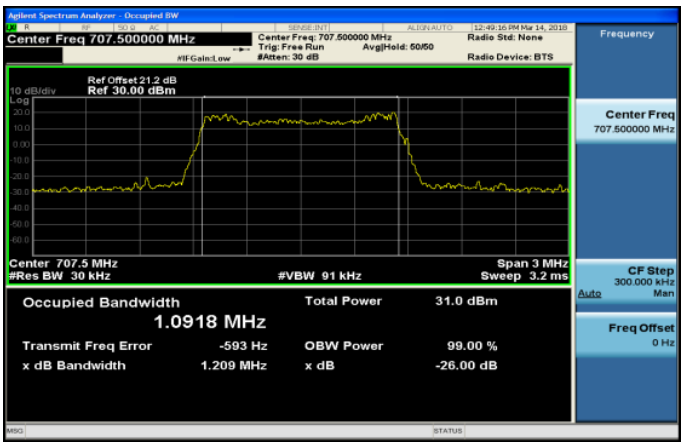
Band12_1_4MHz_64QAM_6_0_LowCH23017-699.7



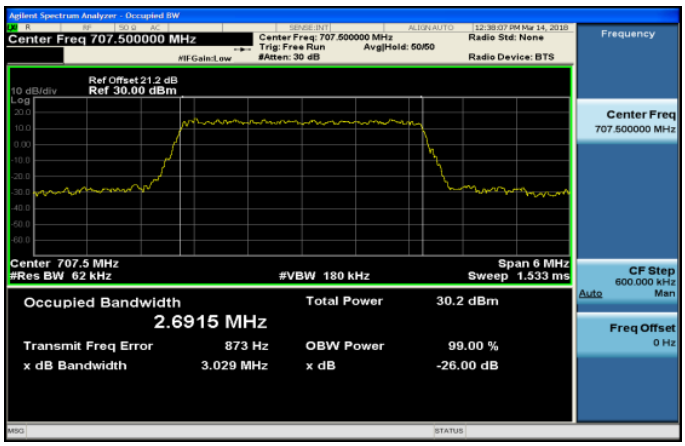
Band12_3MHz_QPSK_15_0_LowCH23025-700.5



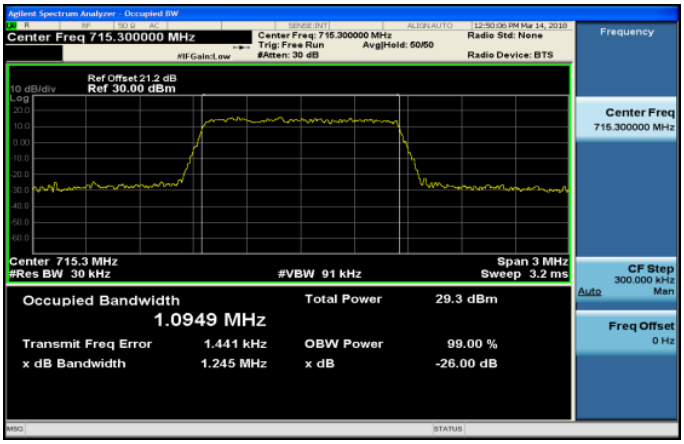
Band12_1_4MHz_64QAM_6_0_MidCH23095-707.5



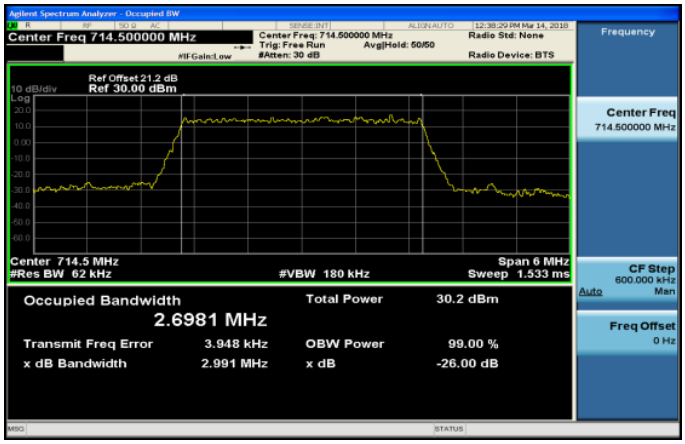
Band12_3MHz_QPSK_15_0_MidCH23095-707.5



Band12_1_4MHz_64QAM_6_0_HighCH23173-715.3



Band12_3MHz_QPSK_15_0_HighCH23165-714.5



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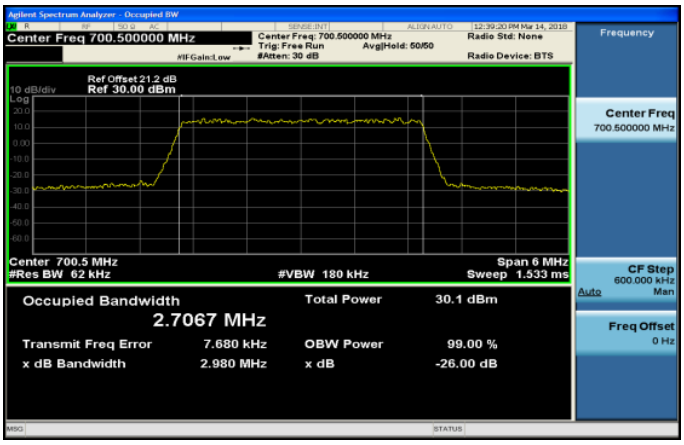
Band12_3MHz_16QAM_15_0_LowCH23025-700.5



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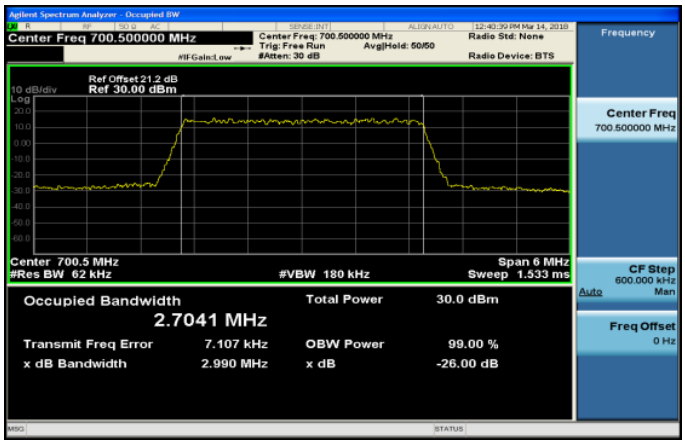
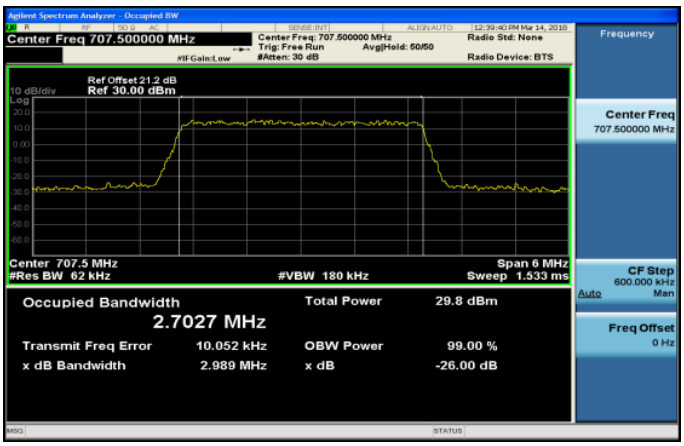
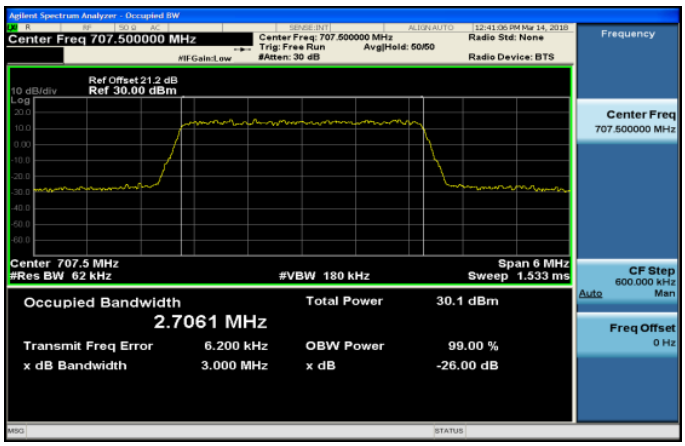


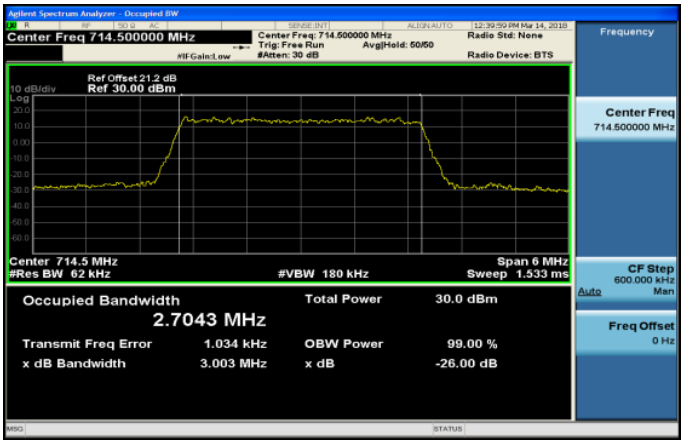
Band12_3MHz_16QAM_15_0_MidCH23095-707.5



Band12_3MHz_64QAM_15_0_MidCH23095-707.5



Band12_3MHz_16QAM_15_0_HighCH23165-714.5



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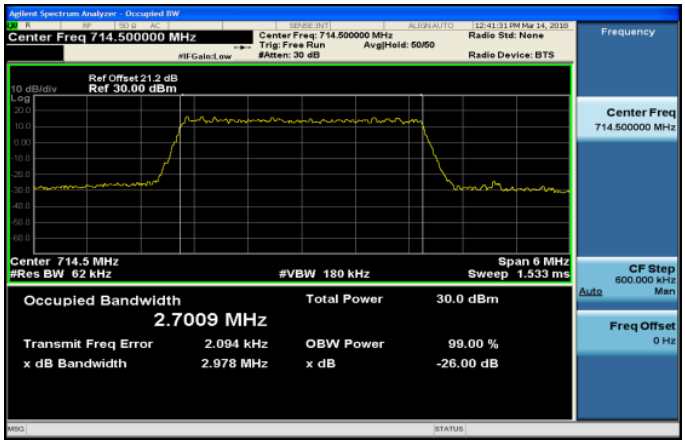

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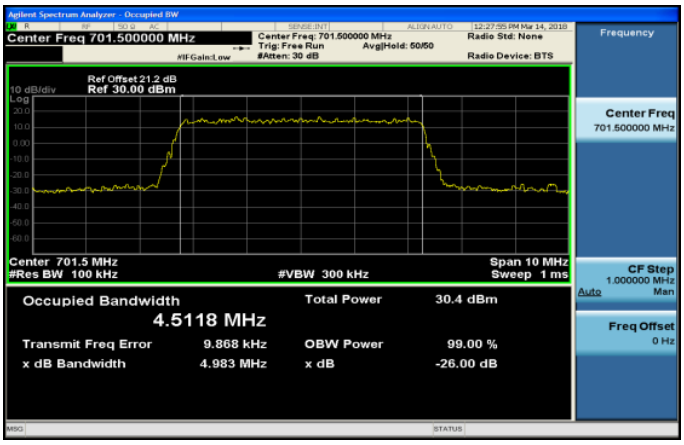
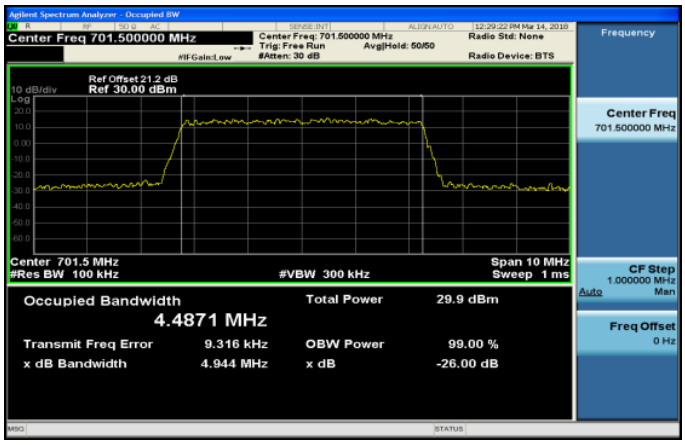
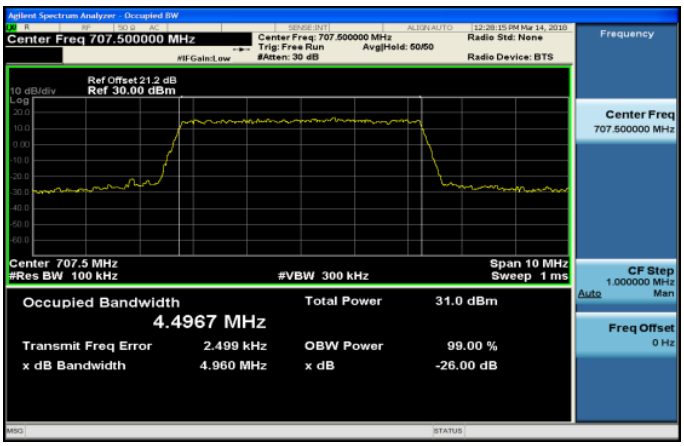
Band12_5MHz_QPSK_25_0_LowCH23035-701.5



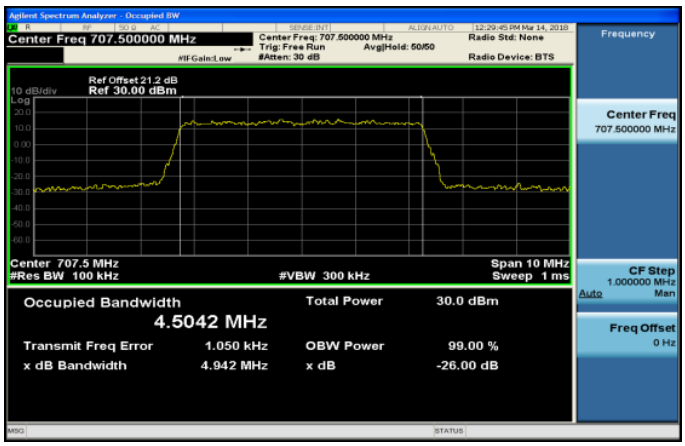
Band12_5MHz_16QAM_25_0_LowCH23035-701.5



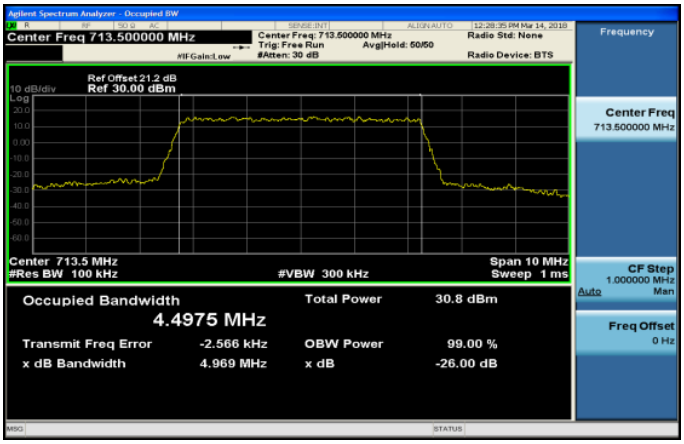
Band12_5MHz_QPSK_25_0_MidCH23095-707.5



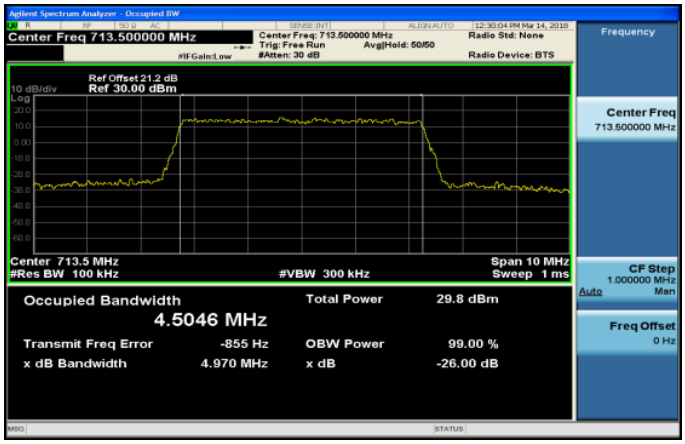
Band12_5MHz_16QAM_25_0_MidCH23095-707.5



Band12_5MHz_QPSK_25_0_HighCH23155-713.5



Band12_5MHz_16QAM_25_0_HighCH23155-713.5



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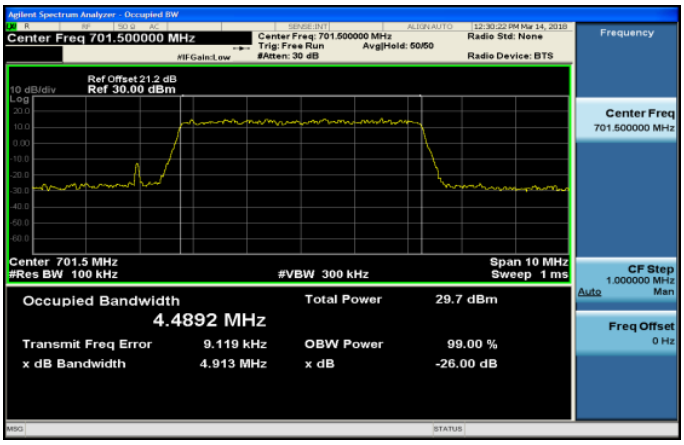
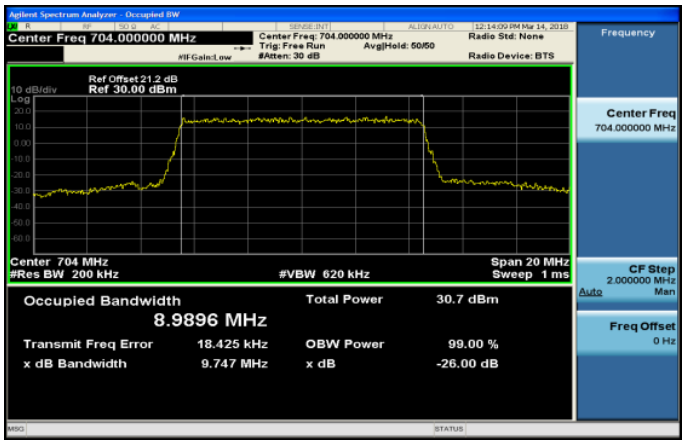
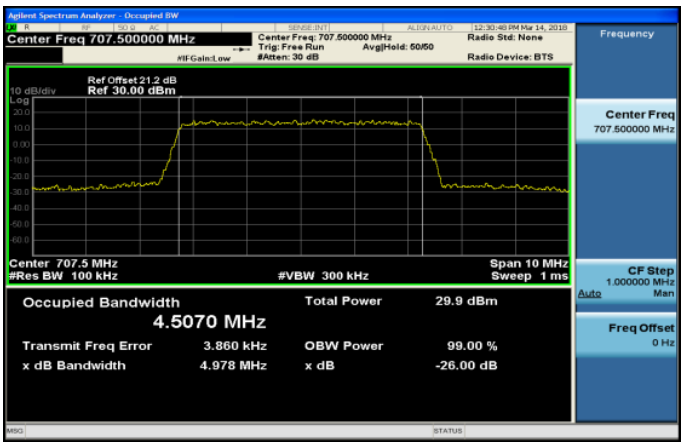
Band12_5MHz_64QAM_25_0_LowCH23035-701.5



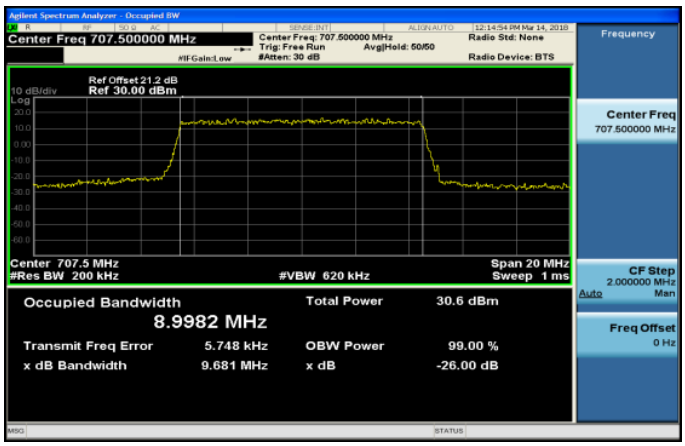
Band12_10MHz_QPSK_50_0_LowCH23060-704



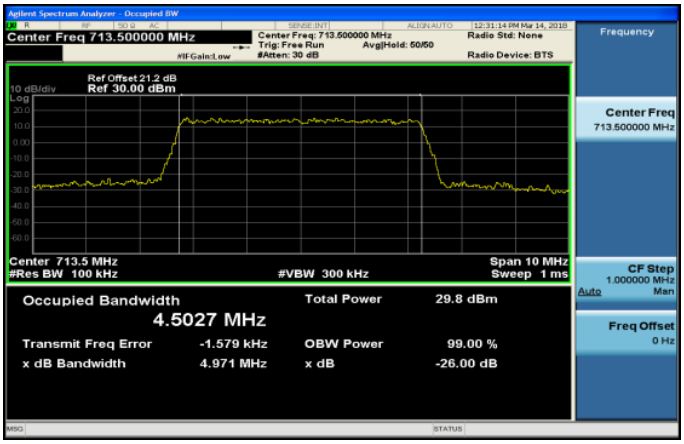
Band12_5MHz_64QAM_25_0_MidCH23095-707.5



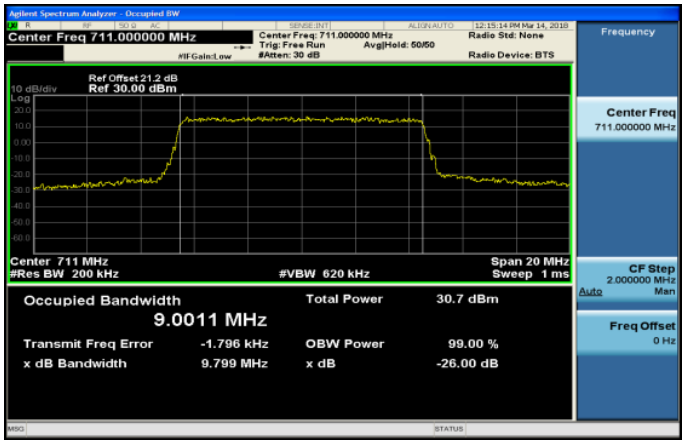
Band12_10MHz_QPSK_50_0_MidCH23095-707.5



Band12_5MHz_64QAM_25_0_HighCH23155-713.5



Band12_10MHz_QPSK_50_0_HighCH23130-711



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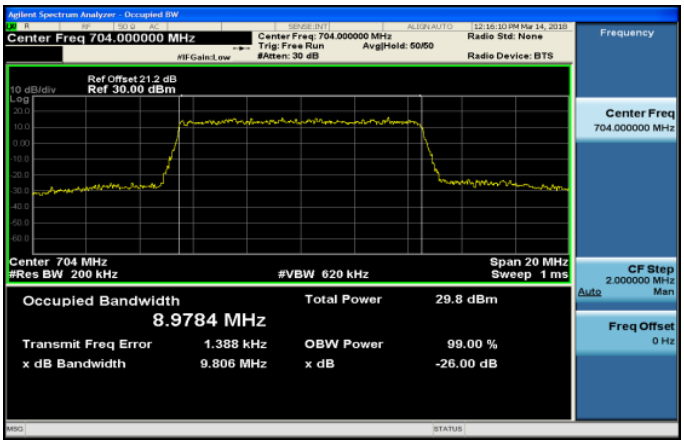
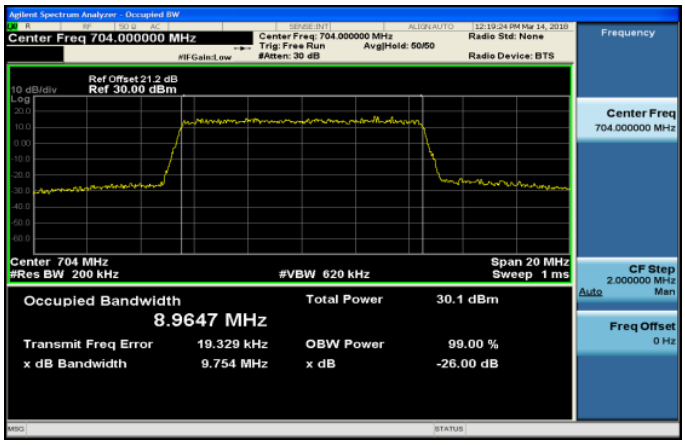
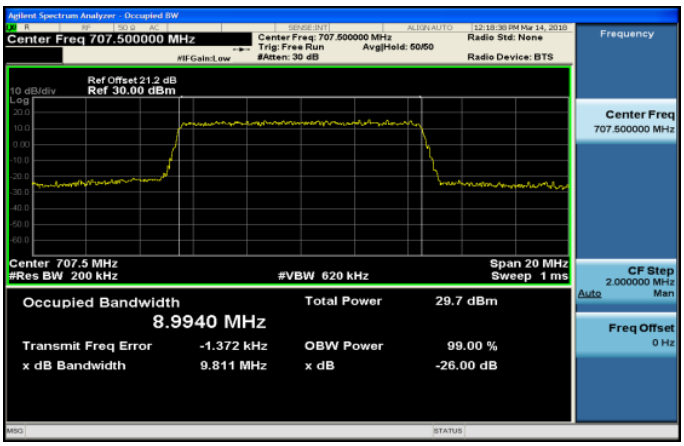
Band12_10MHz_16QAM_50_0_LowCH23060-704



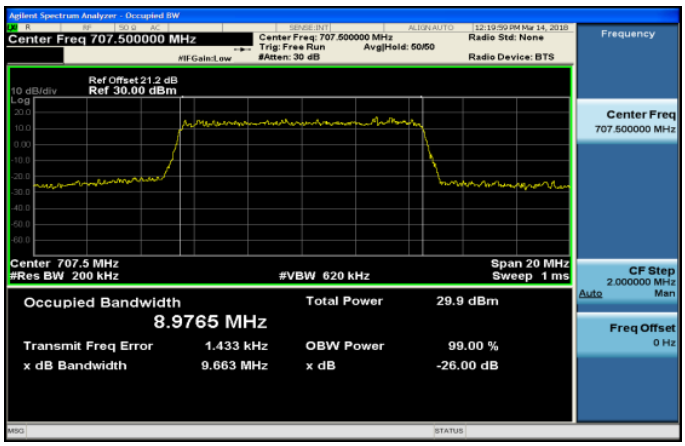
Band12_10MHz_64QAM_50_0_LowCH23060-704



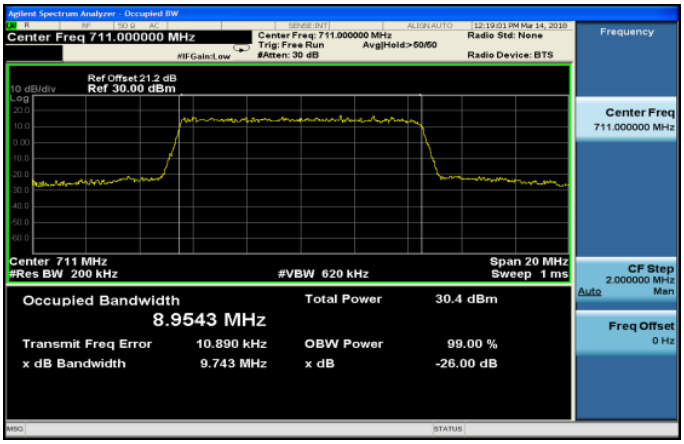
Band12_10MHz_16QAM_50_0_MidCH23095-707.5



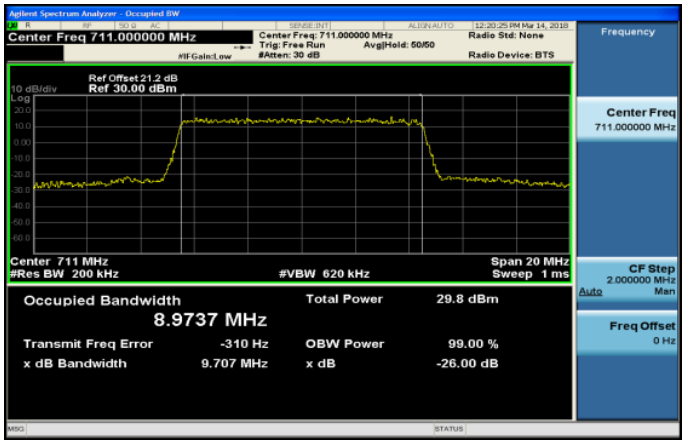
Band12_10MHz_64QAM_50_0_MidCH23095-707.5



Band12_10MHz_16QAM_50_0_HighCH23130-711



Band12_10MHz_64QAM_50_0_HighCH23130-711



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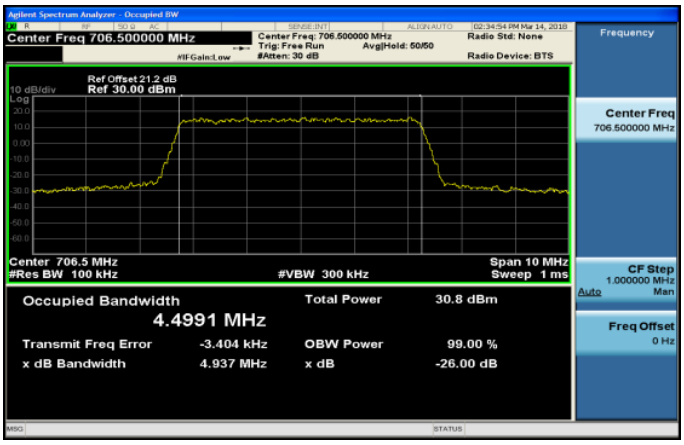
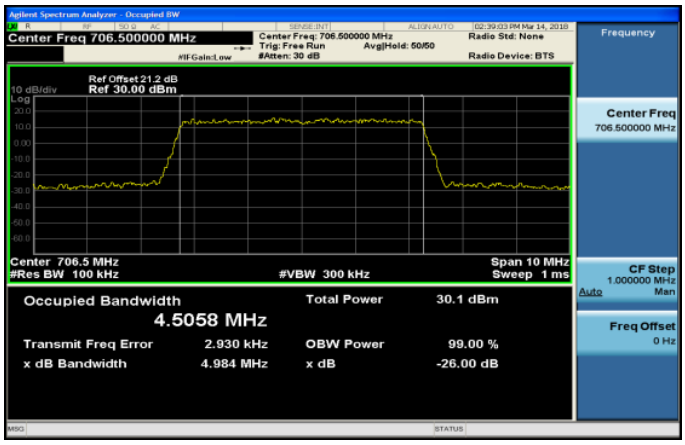
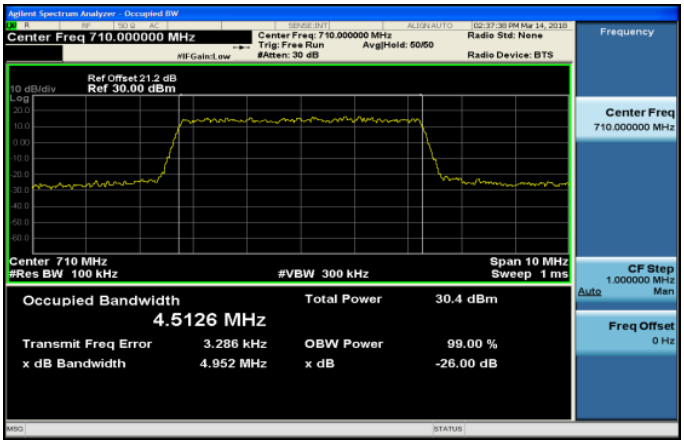
Band17_5MHz_QPSK_25_0_LowCH23755-706.5



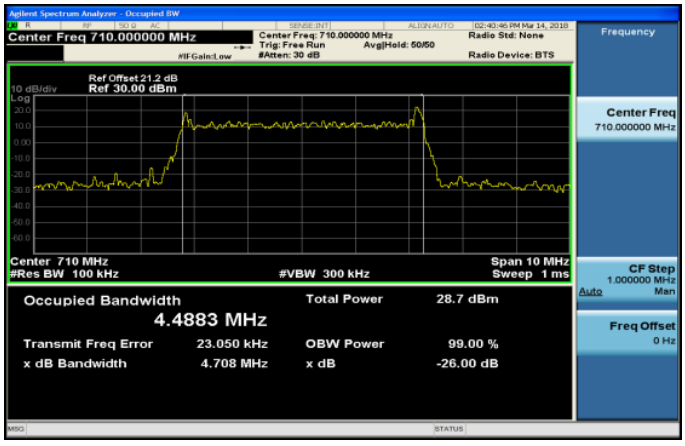
Band17_5MHz_16QAM_25_0_LowCH23755-706.5



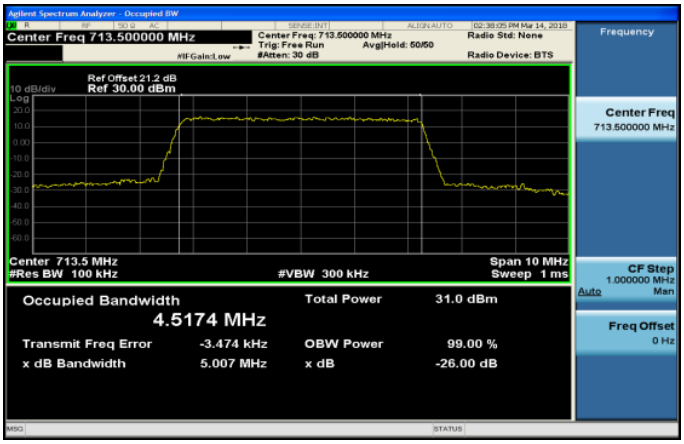
Band17_5MHz_QPSK_25_0_MidCH23790-710



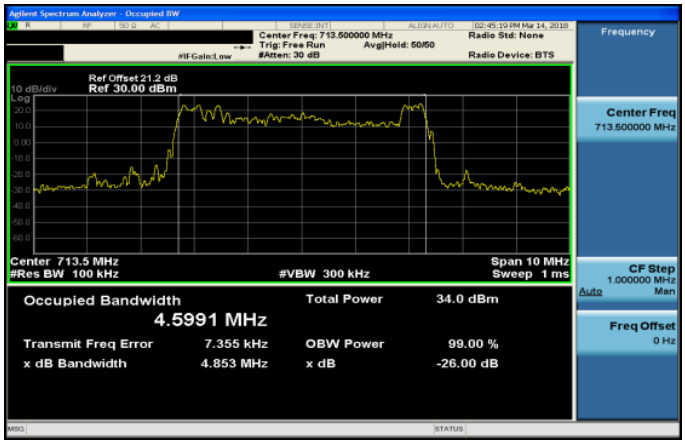
Band17_5MHz_16QAM_25_0_MidCH23790-710



Band17_5MHz_QPSK_25_0_HighCH23825-713.5



Band17_5MHz_16QAM_25_0_HighCH23825-713.5



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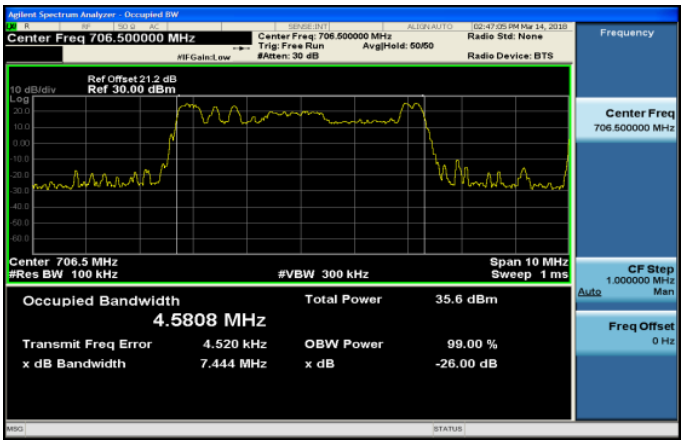
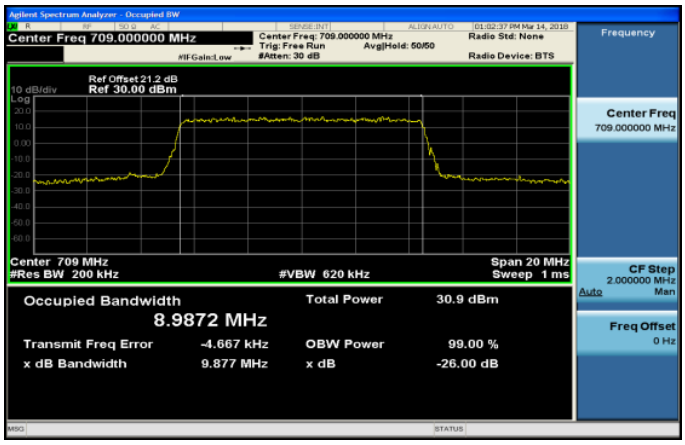
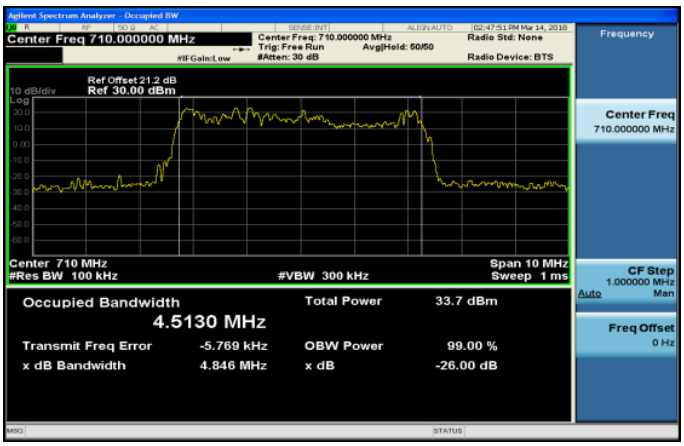
Band17_5MHz_64QAM_25_0_LowCH23755-706.5



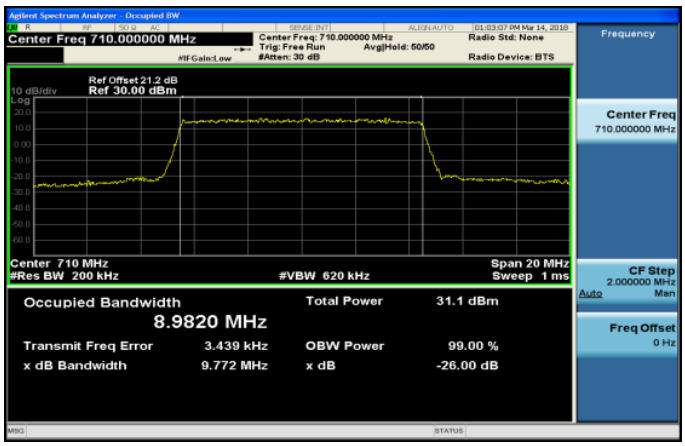
Band17_10MHz_QPSK_50_0_LowCH23780-709



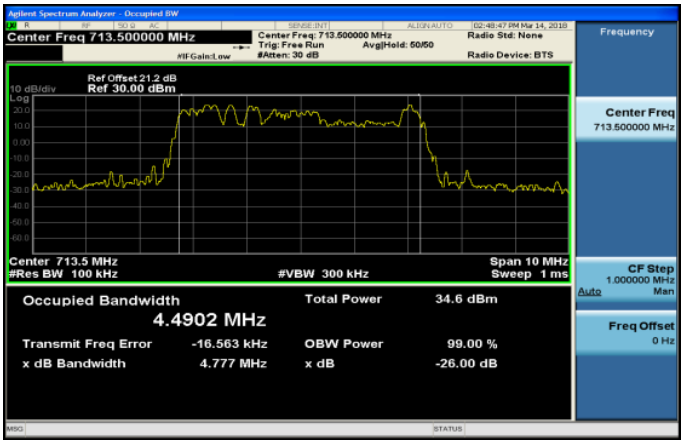
Band17_5MHz_64QAM_25_0_MidCH23790-710



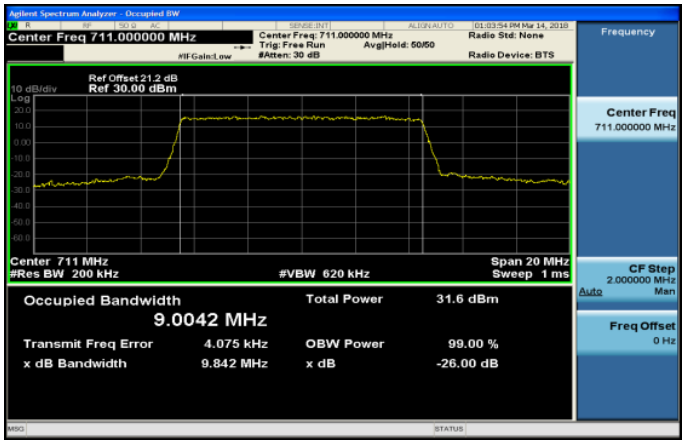
Band17_10MHz_QPSK_50_0_MidCH23790-710



Band17_5MHz_64QAM_25_0_HighCH23825-713.5



Band17_10MHz_QPSK_50_0_HighCH23800-711



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