ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART H 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 City, Osaka 590-8522, Japan
Product Name:	Smart Phone
Report Number:	T190304W03-RP1
FCC ID:	APYHRO00272
FCC Rule Part:	2 , 22H & 24E & 27H
Issue Date:	Mar. 29, 2019
Date of Test:	Mar. 05, 2019~Mar. 28, 2019
Date of EUT Received:	Mar. 05, 2019
Issued by:	Compliance Certification Services Inc.Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) service@ccsrf.com

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.
The test results of this report relate only to the tested sample (EUT) identified in this report
The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By: _____
Kane Tseng / Engineer

Approved By: _____
Kevin Tsai / Deputy Manager

Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190304W03-RP1	Rev.00	Initial creation of document	All	Mar. 28, 2019	Violetta Tang
T190304W03-RP1	Rev.01	Updated Bandedge data and Radiated Equipement list	Page 60, 89	Mar. 29, 2019	Violetta Tang

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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
Antenna Designation:	Inverted-F Antenna, Gain: -4.6dBi (GSM/GPRS 850, WCDMA B5, LTE B5), -1.5dBi (GSM/GPRS 1900) -8.9dBi (LTE B12, LTE B17)
IMEI:	004401116720919 / 004401116720786 / 004401116720851 004401116721131 / 004401116721156 / 004401116721164

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

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

	ERP / EIRP (dBm)		(W)	Type of Emission
GSM 850	25.82	ERP	0.382	240KGXW
GPRS 850	25.77	ERP	0.378	240KGXW
GSM 1900	27.27	EIRP	0.533	241KGXW
GPRS 1900	27.24	EIRP	0.530	240KGXW

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band V	19.00	ERP	0.079	4M14F9W
HSDPA Band V	18.00	ERP	0.063	4M16F9W
HSUPA Band V	18.00	ERP	0.063	4M15F9W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
5	1.4	QPSK	15.49	ERP	0.035	1M10G7D
	1.4	16QAM	14.73	ERP	0.030	1M10D7W
	1.4	64QAM	14.08	ERP	0.026	1M09D7W
	3	QPSK	15.45	ERP	0.035	2M70G7D
	3	16QAM	14.76	ERP	0.030	2M70D7W
	3	64QAM	14.13	ERP	0.026	2M70D7W
	5	QPSK	15.47	ERP	0.035	4M51G7D
	5	16QAM	14.72	ERP	0.030	4M50D7W
	5	64QAM	14.06	ERP	0.025	4M51D7W
	10	QPSK	15.53	ERP	0.036	9M01G7D
	10	16QAM	14.78	ERP	0.030	8M98D7W
	10	64QAM	14.12	ERP	0.026	8M99D7W
17	5	QPSK	11.16	ERP	0.013	4M51G7D
	5	16QAM	10.36	ERP	0.011	4M51D7W
	5	64QAM	9.75	ERP	0.009	4M51D7W
	10	QPSK	11.27	ERP	0.013	9M01G7D
	10	16QAM	10.56	ERP	0.011	8M97D7W
	10	64QAM	9.94	ERP	0.010	8M96D7W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
12	1.4	QPSK	11.23	ERP	0.013	1M10G7D
	1.4	16QAM	10.44	ERP	0.011	1M10D7W
	1.4	64QAM	9.82	ERP	0.010	1M10D7W
	3	QPSK	11.20	ERP	0.013	2M70G7D
	3	16QAM	10.51	ERP	0.011	2M70D7W
	3	64QAM	9.82	ERP	0.010	2M70D7W
	5	QPSK	11.24	ERP	0.013	4M50G7D
	5	16QAM	10.55	ERP	0.011	4M52D7W
	5	64QAM	9.91	ERP	0.010	4M51D7W
	10	QPSK	11.29	ERP	0.013	9M02G7D
	10	16QAM	10.58	ERP	0.011	8M97D7W
	10	64QAM	9.91	ERP	0.010	8M97D7W

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.

KDB648474 D03 Wireless Chargers Battery Cover

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

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd.,

Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

1.6. Special Accessories

No special accessories were used during testing.

1.7. Equipment Modifications

There were no modifications incorporated into the EUT.

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

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

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port

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

2.3.2 Radiated Emissions (ERP/EIRP)

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

2.4. Measurement Results Explanation Example

For all conducted test items:

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

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	0.2	14.8	15
High Band (Above 1 GHz)	0.5	14.5	15

2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.85	667
GSM 1900		697
WCDMA B5		686
LTE Band 5		688
LTE Band 12		692
LTE Band 17		677

2.6. Configuration of Tested System

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

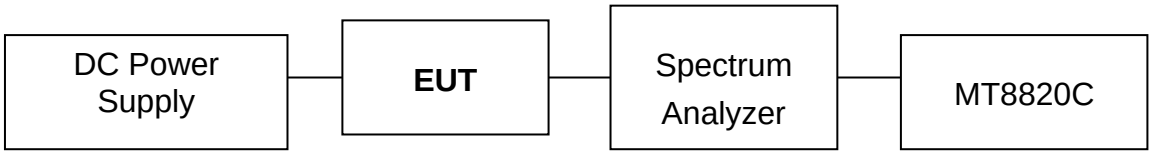
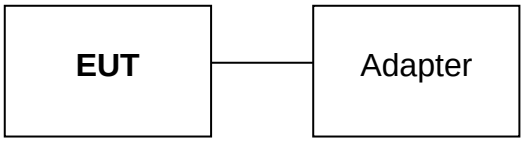


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

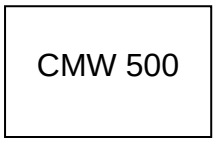
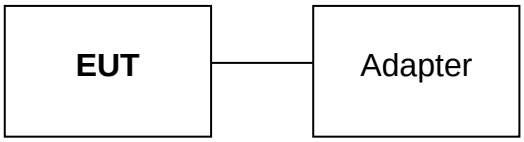


Fig. 2-3 Configuration of Tested System (Fixed Channel-Radiated, Wireless Charging Mode)



Remote Side

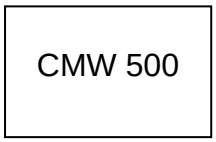


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Wideband Radio Communication Tester	R&S	CMW 500	116875	shielded	Un-shielded
2.	DC Power Supply	Anritsu	E3640A	MY52410006	N/A	Unshielded

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(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(m)(4)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §22.913	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant

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 and Wireless charging Cover
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

Note: Additional emissions testing were performed per KDB 648474 D03 and reported herein and identified as WPC. Per KDB 648474 D03, spurious emissions measurement data was also investigated with the wireless charging battery cover.

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 Band V
RADIATED EMISSION	4132 to 4233	4132, 4183, 4233	WCDMA Band V

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	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB, 0 RB Offest

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	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB, 49 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 BANDWIDTH	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 AV-ERAGE 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	23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB, 49 RB Offest

5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Output Power	+/- 1.15 dB
99% Occupied Bandwidth	+/- 0.89%
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.89 dB
Frequency Stability vs. Temperature	+/- 2.64 Hz
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200MHz ~ 1GHz	+/- 4.68
3M Semi Anechoic Chamber / 1GHz ~ 8GHz	+/- 5.18
3M Semi Anechoic Chamber / 8GHz ~ 18GHz	+/- 5.47
3M Semi Anechoic Chamber / 18GHz ~ 26GHz	+/- 3.81
3M Semi Anechoic Chamber / 26GHz ~ 40GHz	+/- 3.87

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.
3. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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.

ERP/EIRP LIMIT

According to FCC §2.1046

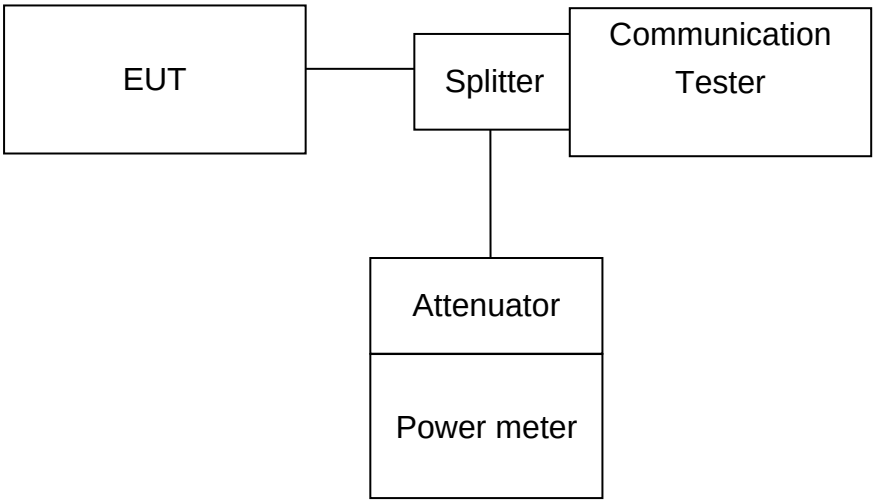
FCC 22.913(a) (5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

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

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

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

6.2. Test Set-up



Note: *Measurement setup for testing on Antenna connector*

6.3. Measurement Procedure

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

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

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

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

TEST PROCEDURE:

ANSI C63.26:2015

KDB 971168 Section 5.6

ERP/EIRP = PMeas + GT-LC

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

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2

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

6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM-BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Digital Radio Communication Tester	R&S	CMU200	100535	09/17/2018	09/16/2019
DC Power Supply	Agilent	E3640A	KR93300208	08/15/2018	08/14/2019
Attenuator	Mini-Circuit	BW-S10W2+	1	02/26/2019	02/25/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	04/20/2018	04/19/2019

6.5. Measurement Result

RF Conducted Output Power

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

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
GSM 850	824.2	128	32.46	-4.60	25.71	27.86	38.50	-10.64
	836.6	190	32.41	-4.60	25.66	27.81	38.50	-10.69
	848.8	251	32.57	-4.60	25.82	27.97	38.50	-10.53
GSM 1900	1850.2	512	28.64	-1.50	24.99	27.14	33.00	-5.86
	1880.0	661	28.77	-1.50	25.12	27.27	33.00	-5.73
	1909.8	810	28.70	-1.50	25.05	27.20	33.00	-5.80
GPRS 850	824.2	128	32.43	-4.60	25.68	27.83	38.50	-10.67
	836.6	190	32.42	-4.60	25.67	27.82	38.50	-10.68
	848.8	251	32.52	-4.60	25.77	27.92	38.50	-10.58
GPRS 1900	1850.2	512	28.65	-1.50	25.00	27.15	33.00	-5.85
	1880.0	661	28.74	-1.50	25.09	27.24	33.00	-5.76
	1909.8	810	28.71	-1.50	25.06	27.21	33.00	-5.79

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	32.43	30.21	28.20	27.21
	836.6	190	32.42	30.08	28.05	27.15
	848.8	251	32.52	30.33	27.95	27.10
GPRS 1900	1850.2	512	28.65	26.77	25.14	24.22
	1880.0	661	28.74	26.61	25.03	24.10
	1909.8	810	28.71	26.66	25.07	24.05

WCDMA MODE:

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

Results:

WCDMA/HSUPA/HSDPA Band V Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	826.4	4132	23.60	-4.60	19.00	38.50	-19.50
	836.6	4183	23.58	-4.60	18.98	38.50	-19.52
	846.6	4233	23.59	-4.60	18.99	38.50	-19.51
HSDPA	826.4	4132	22.57	-4.60	17.97	38.50	-20.53
	836.6	4183	22.60	-4.60	18.00	38.50	-20.50
	846.6	4233	22.59	-4.60	17.99	38.50	-20.51
HSUPA	826.4	4132	22.57	-4.60	17.97	38.50	-20.53
	836.6	4183	22.60	-4.60	18.00	38.50	-20.50
	846.6	4233	22.52	-4.60	17.92	38.50	-20.58

LTE Result:

FDD Band 5

Antenna gain (dBi) -4.6

LTE Band 5_Uplink frequency band : 824 to 849 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	20407	824.7	QPSK	1	0	22.13	15.38	17.53	38.45	-20.92
				1	5	22.15	15.40	17.55	38.45	-20.9
				3	2	22.22	15.47	17.62	38.45	-20.83
				6	0	21.27	14.52	16.67	38.45	-21.78
	20525	836.5	QPSK	1	0	22.13	15.38	17.53	38.45	-20.92
				1	5	22.18	15.43	17.58	38.45	-20.87
				3	2	22.24	15.49	17.64	38.45	-20.81
				6	0	21.22	14.47	16.62	38.45	-21.83
	20643	848.3	QPSK	1	0	22.13	15.38	17.53	38.45	-20.92
				1	5	22.13	15.38	17.53	38.45	-20.92
				3	2	22.21	15.46	17.61	38.45	-20.84
				6	0	21.29	14.54	16.69	38.45	-21.76
	20407	824.7	16QAM	1	0	21.41	14.66	16.81	38.45	-21.64
				1	5	21.45	14.70	16.85	38.45	-21.6
				3	2	21.30	14.55	16.70	38.45	-21.75
				6	0	20.34	13.59	15.74	38.45	-22.71
	20525	836.5	16QAM	1	0	21.41	14.66	16.81	38.45	-21.64
				1	5	21.48	14.73	16.88	38.45	-21.57
				3	2	21.32	14.57	16.72	38.45	-21.73
				6	0	20.27	13.52	15.67	38.45	-22.78
	20643	848.3	16QAM	1	0	21.44	14.69	16.84	38.45	-21.61
				1	5	21.41	14.66	16.81	38.45	-21.64
				3	2	21.29	14.54	16.69	38.45	-21.76
				6	0	20.32	13.57	15.72	38.45	-22.73
	20407	824.7	64QAM	1	0	20.78	14.03	16.18	38.45	-22.27
				1	5	20.76	14.01	16.16	38.45	-22.29
				3	2	20.68	13.93	16.08	38.45	-22.37
				6	0	19.69	12.94	15.09	38.45	-23.36
	20525	836.5	64QAM	1	0	20.78	14.03	16.18	38.45	-22.27
				1	5	20.83	14.08	16.23	38.45	-22.22
				3	2	20.67	13.92	16.07	38.45	-22.38
				6	0	19.67	12.92	15.07	38.45	-23.38
	20643	848.3	64QAM	1	0	20.83	14.08	16.23	38.45	-22.22
				1	5	20.72	13.97	16.12	38.45	-22.33
				3	2	20.68	13.93	16.08	38.45	-22.37
				6	0	19.64	12.89	15.04	38.45	-23.41

Antenna gain (dBi) -4.6

LTE Band 5_Uplink frequency band : 824 to 849 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	20415	825.5	QPSK	1	0	22.15	15.40	17.55	38.45	-20.9
				1	14	22.19	15.44	17.59	38.45	-20.86
				8	4	21.38	14.63	16.78	38.45	-21.67
				15	0	21.35	14.60	16.75	38.45	-21.7
	20525	836.5	QPSK	1	0	22.17	15.42	17.57	38.45	-20.88
				1	14	22.20	15.45	17.60	38.45	-20.85
				8	4	21.36	14.61	16.76	38.45	-21.69
				15	0	21.30	14.55	16.70	38.45	-21.75
	20635	847.5	QPSK	1	0	22.10	15.35	17.50	38.45	-20.95
				1	14	22.13	15.38	17.53	38.45	-20.92
				8	4	21.37	14.62	16.77	38.45	-21.68
				15	0	21.27	14.52	16.67	38.45	-21.78
	20415	825.5	16QAM	1	0	21.44	14.69	16.84	38.45	-21.61
				1	14	21.49	14.74	16.89	38.45	-21.56
				8	4	20.44	13.69	15.84	38.45	-22.61
				15	0	20.35	13.60	15.75	38.45	-22.7
	20525	836.5	16QAM	1	0	21.48	14.73	16.88	38.45	-21.57
				1	14	21.51	14.76	16.91	38.45	-21.54
				8	4	20.41	13.66	15.81	38.45	-22.64
				15	0	20.29	13.54	15.69	38.45	-22.76
	20635	847.5	16QAM	1	0	21.48	14.73	16.88	38.45	-21.57
				1	14	21.44	14.69	16.84	38.45	-21.61
				8	4	20.45	13.70	15.85	38.45	-22.6
				15	0	20.33	13.58	15.73	38.45	-22.72
	20415	825.5	64QAM	1	0	20.80	14.05	16.20	38.45	-22.25
				1	14	20.88	14.13	16.28	38.45	-22.17
				8	4	19.77	13.02	15.17	38.45	-23.28
				15	0	19.69	12.94	15.09	38.45	-23.36
	20525	836.5	64QAM	1	0	20.80	14.05	16.20	38.45	-22.25
				1	14	20.87	14.12	16.27	38.45	-22.18
				8	4	19.72	12.97	15.12	38.45	-23.33
				15	0	19.63	12.88	15.03	38.45	-23.42
	20635	847.5	64QAM	1	0	20.79	14.04	16.19	38.45	-22.26
				1	14	20.80	14.05	16.20	38.45	-22.25
				8	4	19.76	13.01	15.16	38.45	-23.29
				15	0	19.69	12.94	15.09	38.45	-23.36

Antenna gain (dBi) -4.6

LTE Band 5_Uplink frequency band : 824 to 849 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	20425	826.5	QPSK	1	0	22.16	15.41	17.56	38.45	-20.89
				1	24	22.03	15.28	17.43	38.45	-21.02
				12	6	21.38	14.63	16.78	38.45	-21.67
				25	0	21.29	14.54	16.69	38.45	-21.76
	20525	836.5	QPSK	1	0	22.18	15.43	17.58	38.45	-20.87
				1	24	22.05	15.30	17.45	38.45	-21
				12	6	21.31	14.56	16.71	38.45	-21.74
				25	0	21.20	14.45	16.60	38.45	-21.85
	20625	846.5	QPSK	1	0	22.12	15.37	17.52	38.45	-20.93
				1	24	22.22	15.47	17.62	38.45	-20.83
				12	6	21.33	14.58	16.73	38.45	-21.72
				25	0	21.24	14.49	16.64	38.45	-21.81
	20425	826.5	16QAM	1	0	21.31	14.56	16.71	38.45	-21.74
				1	24	21.38	14.63	16.78	38.45	-21.67
				12	6	20.38	13.63	15.78	38.45	-22.67
				25	0	20.32	13.57	15.72	38.45	-22.73
	20525	836.5	16QAM	1	0	21.28	14.53	16.68	38.45	-21.77
				1	24	21.31	14.56	16.71	38.45	-21.74
				12	6	20.30	13.55	15.70	38.45	-22.75
				25	0	20.24	13.49	15.64	38.45	-22.81
	20625	846.5	16QAM	1	0	21.08	14.33	16.48	38.45	-21.97
				1	24	21.47	14.72	16.87	38.45	-21.58
				12	6	20.33	13.58	15.73	38.45	-22.72
				25	0	20.27	13.52	15.67	38.45	-22.78
	20425	826.5	64QAM	1	0	20.64	13.89	16.04	38.45	-22.41
				1	24	20.74	13.99	16.14	38.45	-22.31
				12	6	19.75	13.00	15.15	38.45	-23.3
				25	0	19.63	12.88	15.03	38.45	-23.42
	20525	836.5	64QAM	1	0	20.59	13.84	15.99	38.45	-22.46
				1	24	20.71	13.96	16.11	38.45	-22.34
				12	6	19.61	12.86	15.01	38.45	-23.44
				25	0	19.61	12.86	15.01	38.45	-23.44
	20625	846.5	64QAM	1	0	20.44	13.69	15.84	38.45	-22.61
				1	24	20.81	14.06	16.21	38.45	-22.24
				12	6	19.65	12.90	15.05	38.45	-23.4
				25	0	19.65	12.90	15.05	38.45	-23.4

Antenna gain (dBi) -4.6

LTE Band 5_Uplink frequency band : 824 to 849 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20450	829	QPSK	1	0	22.14	15.39	17.54	38.45	-20.91
				1	49	22.21	15.46	17.61	38.45	-20.84
				25	12	21.23	14.48	16.63	38.45	-21.82
				50	0	21.02	14.27	16.42	38.45	-22.03
	20525	836.5	QPSK	1	0	22.16	15.41	17.56	38.45	-20.89
				1	49	22.12	15.37	17.52	38.45	-20.93
				25	12	21.22	14.47	16.62	38.45	-21.83
				50	0	21.03	14.28	16.43	38.45	-22.02
	20600	844	QPSK	1	0	22.28	15.53	17.68	38.45	-20.77
				1	49	22.08	15.33	17.48	38.45	-20.97
				25	12	21.28	14.53	16.68	38.45	-21.77
				50	0	21.05	14.30	16.45	38.45	-22
	20450	829	16QAM	1	0	21.49	14.74	16.89	38.45	-21.56
				1	49	21.53	14.78	16.93	38.45	-21.52
				25	12	20.24	13.49	15.64	38.45	-22.81
				50	0	20.03	13.28	15.43	38.45	-23.02
	20525	836.5	16QAM	1	0	21.52	14.77	16.92	38.45	-21.53
				1	49	21.45	14.70	16.85	38.45	-21.6
				25	12	20.24	13.49	15.64	38.45	-22.81
				50	0	20.02	13.27	15.42	38.45	-23.03
	20600	844	16QAM	1	0	21.48	14.73	16.88	38.45	-21.57
				1	49	21.43	14.68	16.83	38.45	-21.62
				25	12	20.27	13.52	15.67	38.45	-22.78
				50	0	20.06	13.31	15.46	38.45	-22.99
	20450	829	64QAM	1	0	20.85	14.10	16.25	38.45	-22.2
				1	49	20.87	14.12	16.27	38.45	-22.18
				25	12	19.55	12.80	14.95	38.45	-23.5
				50	0	19.42	12.67	14.82	38.45	-23.63
	20525	836.5	64QAM	1	0	20.86	14.11	16.26	38.45	-22.19
				1	49	20.83	14.08	16.23	38.45	-22.22
				25	12	19.56	12.81	14.96	38.45	-23.49
				50	0	19.37	12.62	14.77	38.45	-23.68
	20600	844	64QAM	1	0	20.80	14.05	16.20	38.45	-22.25
				1	49	20.76	14.01	16.16	38.45	-22.29
				25	12	19.64	12.89	15.04	38.45	-23.41
				50	0	19.41	12.66	14.81	38.45	-23.64

FDD Band 12

Antenna gain (dBi) -8.9

LTE Band 12_Uplink frequency band : 699 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	22.02	10.97	13.12	34.77	-21.65
				1	5	22.12	11.07	13.22	34.77	-21.55
				3	2	22.19	11.14	13.29	34.77	-21.48
				6	0	21.20	10.15	12.30	34.77	-22.47
	23095	707.5	QPSK	1	0	22.08	11.03	13.18	34.77	-21.59
				1	5	22.16	11.11	13.26	34.77	-21.51
				3	2	22.23	11.18	13.33	34.77	-21.44
				6	0	21.28	10.23	12.38	34.77	-22.39
	23173	715.5	QPSK	1	0	22.17	11.12	13.27	34.77	-21.5
				1	5	22.21	11.16	13.31	34.77	-21.46
				3	2	22.28	11.23	13.38	34.77	-21.39
				6	0	21.32	10.27	12.42	34.77	-22.35
	23017	699.7	16QAM	1	0	21.26	10.21	12.36	34.77	-22.41
				1	5	21.37	10.32	12.47	34.77	-22.3
				3	2	21.23	10.18	12.33	34.77	-22.44
				6	0	20.29	9.24	11.39	34.77	-23.38
	23095	707.5	16QAM	1	0	21.40	10.35	12.50	34.77	-22.27
				1	5	21.48	10.43	12.58	34.77	-22.19
				3	2	21.29	10.24	12.39	34.77	-22.38
				6	0	20.34	9.29	11.44	34.77	-23.33
	23173	715.5	16QAM	1	0	21.44	10.39	12.54	34.77	-22.23
				1	5	21.49	10.44	12.59	34.77	-22.18
				3	2	21.34	10.29	12.44	34.77	-22.33
				6	0	20.39	9.34	11.49	34.77	-23.28
	23017	699.7	64QAM	1	0	20.59	9.54	11.69	34.77	-23.08
				1	5	20.77	9.72	11.87	34.77	-22.9
				3	2	20.55	9.50	11.65	34.77	-23.12
				6	0	19.64	8.59	10.74	34.77	-24.03
	23095	707.5	64QAM	1	0	20.76	9.71	11.86	34.77	-22.91
				1	5	20.82	9.77	11.92	34.77	-22.85
				3	2	20.63	9.58	11.73	34.77	-23.04
				6	0	19.65	8.60	10.75	34.77	-24.02
	23173	715.5	64QAM	1	0	20.79	9.74	11.89	34.77	-22.88
				1	5	20.87	9.82	11.97	34.77	-22.8
				3	2	20.73	9.68	11.83	34.77	-22.94
				6	0	19.77	8.72	10.87	34.77	-23.9

Antenna gain (dBi) -8.9

LTE Band 12_Uplink frequency band : 699 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	22.04	10.99	13.14	34.77	-21.63
				1	14	22.14	11.09	13.24	34.77	-21.53
				8	4	21.29	10.24	12.39	34.77	-22.38
				15	0	21.26	10.21	12.36	34.77	-22.41
	23095	707.5	QPSK	1	0	22.14	11.09	13.24	34.77	-21.53
				1	14	22.21	11.16	13.31	34.77	-21.46
				8	4	21.36	10.31	12.46	34.77	-22.31
				15	0	21.35	10.30	12.45	34.77	-22.32
	23165	714.5	QPSK	1	0	22.16	11.11	13.26	34.77	-21.51
				1	14	22.25	11.20	13.35	34.77	-21.42
				8	4	21.40	10.35	12.50	34.77	-22.27
				15	0	21.33	10.28	12.43	34.77	-22.34
	23025	700.5	16QAM	1	0	21.31	10.26	12.41	34.77	-22.36
				1	14	21.42	10.37	12.52	34.77	-22.25
				8	4	20.38	9.33	11.48	34.77	-23.29
				15	0	20.29	9.24	11.39	34.77	-23.38
	23095	707.5	16QAM	1	0	21.34	10.29	12.44	34.77	-22.33
				1	14	21.51	10.46	12.61	34.77	-22.16
				8	4	20.44	9.39	11.54	34.77	-23.23
				15	0	20.37	9.32	11.47	34.77	-23.3
	23165	714.5	16QAM	1	0	21.47	10.42	12.57	34.77	-22.2
				1	14	21.56	10.51	12.66	34.77	-22.11
				8	4	20.46	9.41	11.56	34.77	-23.21
				15	0	20.32	9.27	11.42	34.77	-23.35
	23025	700.5	64QAM	1	0	20.67	9.62	11.77	34.77	-23
				1	14	20.78	9.73	11.88	34.77	-22.89
				8	4	19.73	8.68	10.83	34.77	-23.94
				15	0	19.59	8.54	10.69	34.77	-24.08
	23095	707.5	64QAM	1	0	20.66	9.61	11.76	34.77	-23.01
				1	14	20.82	9.77	11.92	34.77	-22.85
				8	4	19.78	8.73	10.88	34.77	-23.89
				15	0	19.74	8.69	10.84	34.77	-23.93
	23165	714.5	64QAM	1	0	20.80	9.75	11.90	34.77	-22.87
				1	14	20.87	9.82	11.97	34.77	-22.8
				8	4	19.78	8.73	10.88	34.77	-23.89
				15	0	19.66	8.61	10.76	34.77	-24.01

Antenna gain (dBi) -8.9

LTE Band 12_Uplink frequency band : 699 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	22.15	11.10	13.25	34.77	-21.52
				1	24	22.04	10.99	13.14	34.77	-21.63
				12	6	21.32	10.27	12.42	34.77	-22.35
				25	0	21.22	10.17	12.32	34.77	-22.45
	23095	707.5	QPSK	1	0	22.22	11.17	13.32	34.77	-21.45
				1	24	22.07	11.02	13.17	34.77	-21.6
				12	6	21.38	10.33	12.48	34.77	-22.29
				25	0	21.28	10.23	12.38	34.77	-22.39
	23155	713.5	QPSK	1	0	22.16	11.11	13.26	34.77	-21.51
				1	24	22.29	11.24	13.39	34.77	-21.38
				12	6	21.36	10.31	12.46	34.77	-22.31
				25	0	21.31	10.26	12.41	34.77	-22.36
	23035	701.5	16QAM	1	0	21.15	10.10	12.25	34.77	-22.52
				1	24	21.30	10.25	12.40	34.77	-22.37
				12	6	20.35	9.30	11.45	34.77	-23.32
				25	0	20.25	9.20	11.35	34.77	-23.42
	23095	707.5	16QAM	1	0	21.21	10.16	12.31	34.77	-22.46
				1	24	21.36	10.31	12.46	34.77	-22.31
				12	6	20.38	9.33	11.48	34.77	-23.29
				25	0	20.28	9.23	11.38	34.77	-23.39
	23155	713.5	16QAM	1	0	21.46	10.41	12.56	34.77	-22.21
				1	24	21.60	10.55	12.70	34.77	-22.07
				12	6	20.35	9.30	11.45	34.77	-23.32
				25	0	20.28	9.23	11.38	34.77	-23.39
	23035	701.5	64QAM	1	0	20.50	9.45	11.60	34.77	-23.17
				1	24	20.62	9.57	11.72	34.77	-23.05
				12	6	19.74	8.69	10.84	34.77	-23.93
				25	0	19.62	8.57	10.72	34.77	-24.05
	23095	707.5	64QAM	1	0	20.60	9.55	11.70	34.77	-23.07
				1	24	20.69	9.64	11.79	34.77	-22.98
				12	6	19.78	8.73	10.88	34.77	-23.89
				25	0	19.59	8.54	10.69	34.77	-24.08
	23155	713.5	64QAM	1	0	20.83	9.78	11.93	34.77	-22.84
				1	24	20.96	9.91	12.06	34.77	-22.71
				12	6	19.68	8.63	10.78	34.77	-23.99
				25	0	19.67	8.62	10.77	34.77	-24

Antenna gain (dBi) -8.9

LTE Band 12_Uplink frequency band : 699 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	22.09	11.04	13.19	34.77	-21.58
				1	49	22.34	11.29	13.44	34.77	-21.33
				25	12	21.19	10.14	12.29	34.77	-22.48
				50	0	21.00	9.95	12.10	34.77	-22.67
	23095	707.5	QPSK	1	0	22.11	11.06	13.21	34.77	-21.56
				1	49	22.27	11.22	13.37	34.77	-21.4
				25	12	21.25	10.20	12.35	34.77	-22.42
				50	0	21.04	9.99	12.14	34.77	-22.63
	23130	711	QPSK	1	0	22.13	11.08	13.23	34.77	-21.54
				1	49	22.31	11.26	13.41	34.77	-21.36
				25	12	21.27	10.22	12.37	34.77	-22.4
				50	0	21.06	10.01	12.16	34.77	-22.61
	23060	704	16QAM	1	0	21.39	10.34	12.49	34.77	-22.28
				1	49	21.57	10.52	12.67	34.77	-22.1
				25	12	20.20	9.15	11.30	34.77	-23.47
				50	0	20.01	8.96	11.11	34.77	-23.66
	23095	707.5	16QAM	1	0	21.46	10.41	12.56	34.77	-22.21
				1	49	21.63	10.58	12.73	34.77	-22.04
				25	12	20.25	9.20	11.35	34.77	-23.42
				50	0	20.03	8.98	11.13	34.77	-23.64
	23130	711	16QAM	1	0	21.39	10.34	12.49	34.77	-22.28
				1	49	21.58	10.53	12.68	34.77	-22.09
				25	12	20.27	9.22	11.37	34.77	-23.4
				50	0	20.07	9.02	11.17	34.77	-23.6
	23060	704	64QAM	1	0	20.70	9.65	11.80	34.77	-22.97
				1	49	20.93	9.88	12.03	34.77	-22.74
				25	12	19.54	8.49	10.64	34.77	-24.13
				50	0	19.41	8.36	10.51	34.77	-24.26
	23095	707.5	64QAM	1	0	20.83	9.78	11.93	34.77	-22.84
				1	49	20.96	9.91	12.06	34.77	-22.71
				25	12	19.57	8.52	10.67	34.77	-24.1
				50	0	19.38	8.33	10.48	34.77	-24.29
	23130	711	64QAM	1	0	20.70	9.65	11.80	34.77	-22.97
				1	49	20.96	9.91	12.06	34.77	-22.71
				25	12	19.60	8.55	10.70	34.77	-24.07
				50	0	19.38	8.33	10.48	34.77	-24.29

FDD Band 17

Antenna gain (dBi) -8.9

LTE Band 17_Uplink frequency band : 704 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23755	706.5	QPSK	1	0	22.15	11.10	13.25	34.77	-21.52
				1	24	22.06	11.01	13.16	34.77	-21.61
				12	6	21.35	10.30	12.45	34.77	-22.32
				25	0	21.27	10.22	12.37	34.77	-22.4
	23790	710	QPSK	1	0	22.21	11.16	13.31	34.77	-21.46
				1	24	22.08	11.03	13.18	34.77	-21.59
				12	6	21.39	10.34	12.49	34.77	-22.28
				25	0	21.26	10.21	12.36	34.77	-22.41
	23825	713.5	QPSK	1	0	22.15	11.10	13.25	34.77	-21.52
				1	24	22.10	11.05	13.20	34.77	-21.57
				12	6	21.33	10.28	12.43	34.77	-22.34
				25	0	21.25	10.20	12.35	34.77	-22.42
	23755	706.5	16QAM	1	0	21.13	10.08	12.23	34.77	-22.54
				1	24	21.39	10.34	12.49	34.77	-22.28
				12	6	20.37	9.32	11.47	34.77	-23.3
				25	0	20.28	9.23	11.38	34.77	-23.39
	23790	710	16QAM	1	0	21.19	10.14	12.29	34.77	-22.48
				1	24	21.41	10.36	12.51	34.77	-22.26
				12	6	20.42	9.37	11.52	34.77	-23.25
				25	0	20.27	9.22	11.37	34.77	-23.4
	23825	713.5	16QAM	1	0	21.31	10.26	12.41	34.77	-22.36
				1	24	21.40	10.35	12.50	34.77	-22.27
				12	6	20.37	9.32	11.47	34.77	-23.3
				25	0	20.27	9.22	11.37	34.77	-23.4
	23755	706.5	64QAM	1	0	20.47	9.42	11.57	34.77	-23.2
				1	24	20.73	9.68	11.83	34.77	-22.94
				12	6	19.72	8.67	10.82	34.77	-23.95
				25	0	19.67	8.62	10.77	34.77	-24
	23790	710	64QAM	1	0	20.57	9.52	11.67	34.77	-23.1
				1	24	20.80	9.75	11.90	34.77	-22.87
				12	6	19.78	8.73	10.88	34.77	-23.89
				25	0	19.59	8.54	10.69	34.77	-24.08
	23825	713.5	64QAM	1	0	20.63	9.58	11.73	34.77	-23.04
				1	24	20.74	9.69	11.84	34.77	-22.93
				12	6	19.71	8.66	10.81	34.77	-23.96
				25	0	19.63	8.58	10.73	34.77	-24.04

Antenna gain (dBi) -8.9

LTE Band 17_Uplink frequency band : 704 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23780	709	QPSK	1	0	22.04	10.99	13.14	34.77	-21.63
				1	49	22.32	11.27	13.42	34.77	-21.35
				25	12	21.29	10.24	12.39	34.77	-22.38
				50	0	21.08	10.03	12.18	34.77	-22.59
	23790	710	QPSK	1	0	22.11	11.06	13.21	34.77	-21.56
				1	49	22.28	11.23	13.38	34.77	-21.39
				25	12	21.28	10.23	12.38	34.77	-22.39
				50	0	21.06	10.01	12.16	34.77	-22.61
	23800	711	QPSK	1	0	22.10	11.05	13.20	34.77	-21.57
				1	49	22.19	11.14	13.29	34.77	-21.48
				25	12	21.28	10.23	12.38	34.77	-22.39
				50	0	21.08	10.03	12.18	34.77	-22.59
	23780	709	16QAM	1	0	21.37	10.32	12.47	34.77	-22.3
				1	49	21.61	10.56	12.71	34.77	-22.06
				25	12	20.28	9.23	11.38	34.77	-23.39
				50	0	20.08	9.03	11.18	34.77	-23.59
	23790	710	16QAM	1	0	21.43	10.38	12.53	34.77	-22.24
				1	49	21.59	10.54	12.69	34.77	-22.08
				25	12	20.27	9.22	11.37	34.77	-23.4
				50	0	20.07	9.02	11.17	34.77	-23.6
	23800	711	16QAM	1	0	21.44	10.39	12.54	34.77	-22.23
				1	49	21.52	10.47	12.62	34.77	-22.15
				25	12	20.28	9.23	11.38	34.77	-23.39
				50	0	20.07	9.02	11.17	34.77	-23.6
	23780	709	64QAM	1	0	20.73	9.68	11.83	34.77	-22.94
				1	49	20.99	9.94	12.09	34.77	-22.68
				25	12	19.65	8.60	10.75	34.77	-24.02
				50	0	19.43	8.38	10.53	34.77	-24.24
	23790	710	64QAM	1	0	20.79	9.74	11.89	34.77	-22.88
				1	49	20.91	9.86	12.01	34.77	-22.76
				25	12	19.65	8.60	10.75	34.77	-24.02
				50	0	19.46	8.41	10.56	34.77	-24.21
	23800	711	64QAM	1	0	20.80	9.75	11.90	34.77	-22.87
				1	49	20.88	9.83	11.98	34.77	-22.79
				25	12	19.61	8.56	10.71	34.77	-24.06
				50	0	19.45	8.40	10.55	34.77	-24.22

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		
		4132.00	4183.00	4233.00
HSDPA V	1	22.57	22.60	22.59
	2	22.08	22.08	22.07
	3	22.10	22.04	22.06
	4	22.07	22.07	22.05

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	β_{ed}1: 47/15 β_{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		
		4132.00	4183.00	4233.00
HSUPA V	1	22.57	22.60	22.52
	2	20.62	20.64	20.65
	3	21.60	21.66	21.53
	4	20.65	20.53	20.55
	5	22.50	22.60	22.60

Minimum Communications Power Measurement

PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.45	27.31	24.9	22.97	21.03	19.07	17.26	14.8	13.1

PCL	9	10	11	12	13	14	15
Output power (dBm)	11.19	9.24	7.19	5.04	2.93	0.88	-1.17

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

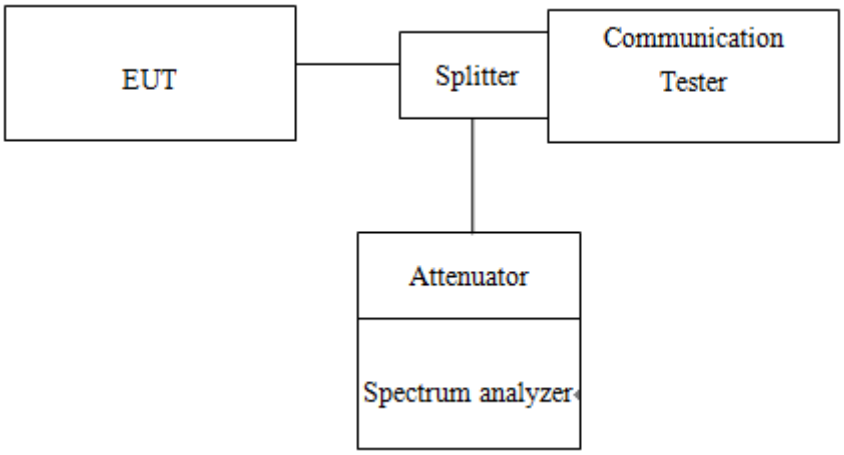
The EUT output power was controlled by simulator. Set Communication Tester MT8820C function key “UE Power Control” and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. Then record the read (see page 15 for measurement data). The min. power was measures by a function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

7. OCCUPIED BANDWIDTH MEASUREMENT

7.1. Standard Applicable

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

7.2. Test Set-up



7.3. Measurement Procedure

99% &26dB Bandwidth with detector peak

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

99% Bandwidth with detector sample

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

7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019
Digital Radio Communication Tester	R&S	CMU200	100535	09/17/2018	09/16/2019
DC Power Supply	Agilent	E3640A	KR93300208	08/15/2018	08/14/2019
Attenuator	Mini-Circuit	BW-S10W2+	1	02/26/2019	02/25/2020
DC Block	Mini-Circuits	BLK-18-S+	31129(1)	02/26/2019	02/25/2020
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPD022-013	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF12	02/26/2019	02/25/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	04/20/2018	04/19/2019

7.5. Measurement Result

Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 850	GPRS 850	GPRS 850	GPRS 850
824.2	128	0.23998	0.23691	0.302	0.301
836.6	190	0.23951	0.24015	0.308	0.306
848.8	251	0.23860	0.23716	0.304	0.301
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 1900	GPRS 1900	GSM 1900	GPRS 1900
1850.2	512	0.24110	0.23954	0.302	0.300
1880.0	661	0.23638	0.24030	0.305	0.304
1909.8	810	0.23894	0.23743	0.304	0.302

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA V	HSDPA V	HSUPA V	WCDMA V	HSDPA V	HSUPA V
826.40	4132	4.13670	4.15590	4.14850	4.714	4.682	4.685
836.60	4183	4.13310	4.11940	4.12220	4.683	4.687	4.667
846.60	4233	4.12910	4.11350	4.13530	4.655	4.704	4.702

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	1.0959	1.0933	1.0944	1.236	1.234	1.237
836.5	20525	1.0916	1.0961	1.0921	1.233	1.236	1.232
848.3	20643	1.0933	1.0958	1.0923	1.245	1.233	1.225

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	2.6972	2.7008	2.6943	2.998	3.014	2.991
836.5	20525	2.7031	2.7027	2.7016	2.992	3.009	2.995
847.5	20635	2.6934	2.6996	2.6947	2.985	3.011	3.004

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	4.5055	4.4994	4.5073	4.959	4.946	4.964
836.5	20525	4.4969	4.4930	4.5101	4.974	4.940	4.918
846.5	20625	4.4861	4.4985	4.4930	4.963	4.930	4.932

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	8.9846	8.9822	8.9866	9.820	9.809	9.742
836.5	20525	8.9779	8.9582	8.9636	9.755	9.730	9.737
844.0	20600	9.0103	8.9846	8.9880	9.829	9.765	9.749

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	1.0922	1.0976	1.0945	1.216	1.244	1.229
707.5	23095	1.0929	1.0950	1.0989	1.239	1.229	1.228
715.3	23173	1.0957	1.0954	1.0990	1.233	1.248	1.243

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	2.6987	2.7027	2.6956	2.997	3.013	3.009
707.5	23095	2.6999	2.7013	2.6973	2.987	2.990	3.009
714.5	23165	2.7041	2.7011	2.7001	2.975	3.002	3.003

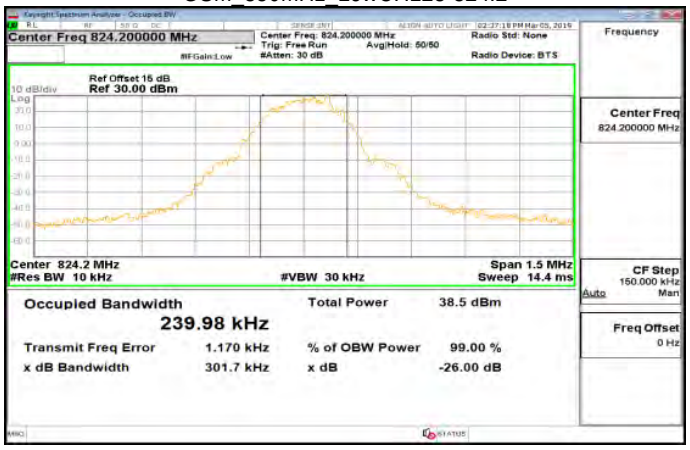
LTE BAND 12 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
701.5	23035	4.4973	4.5009	4.5008	4.963	4.973	4.949
707.5	23095	4.5023	4.5102	4.4950	4.967	4.962	4.965
713.5	23155	4.4985	4.5182	4.5144	4.997	4.817	4.987

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	8.9988	8.9722	8.9732	9.815	9.734	9.749
707.5	23095	8.9883	8.9722	8.9521	9.752	9.773	9.764
711.0	23130	9.0202	8.9697	8.9654	9.801	9.784	9.759

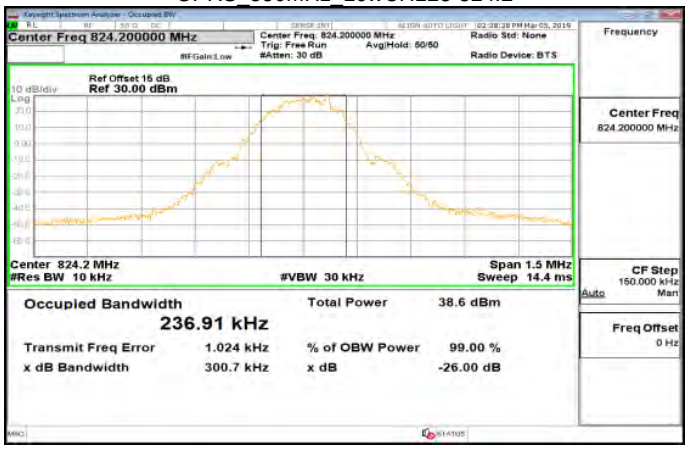
LTE BAND 17 Channel bandwidth: 5MHz							
Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
706.5	23755	4.5040	4.5056	4.5132	4.947	4.940	4.947
710.0	23790	4.5088	4.5005	4.5039	4.992	4.973	4.938
713.5	23825	4.4941	4.5082	4.5047	4.956	4.947	4.915

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	8.9995	8.9663	8.9585	9.779	9.771	9.716
710.0	23790	9.0117	8.9693	8.9642	9.814	9.817	9.746
711.0	23800	9.0015	8.9664	8.9606	9.774	9.698	9.764

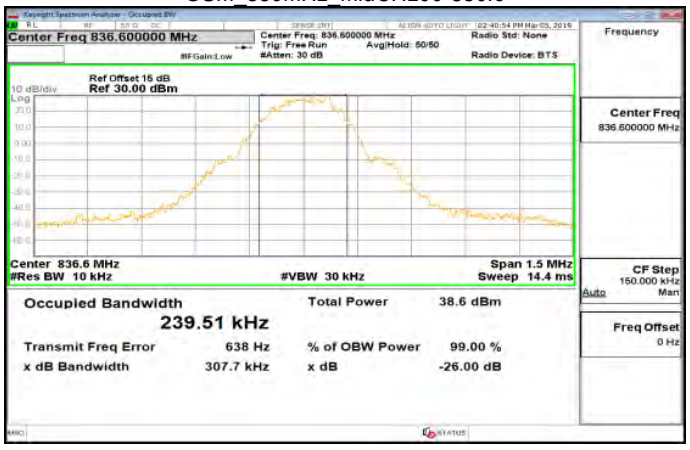
GSM_850MHz_LowCH128-824.2



GPRS_850MHz_LowCH128-824.2



GSM_850MHz_MidCH190-836.6



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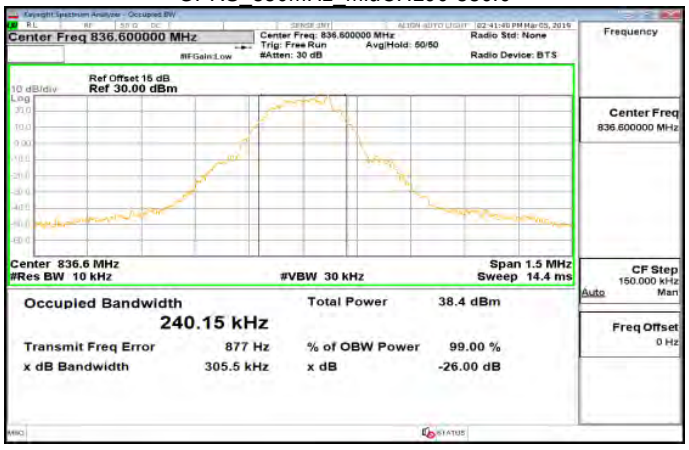
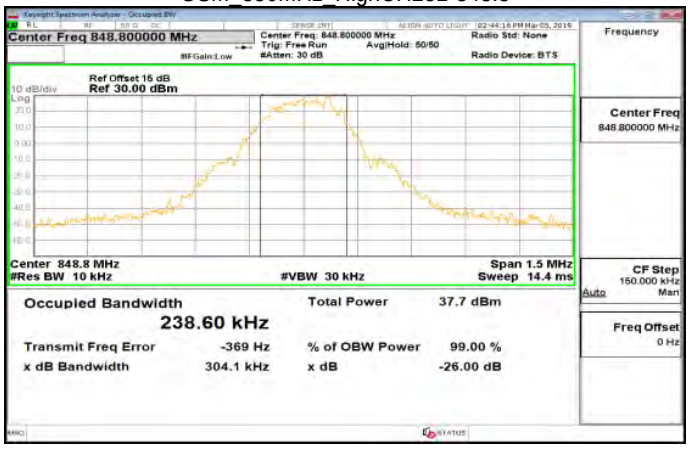


GSM_850MHz_HighCH251-848.8



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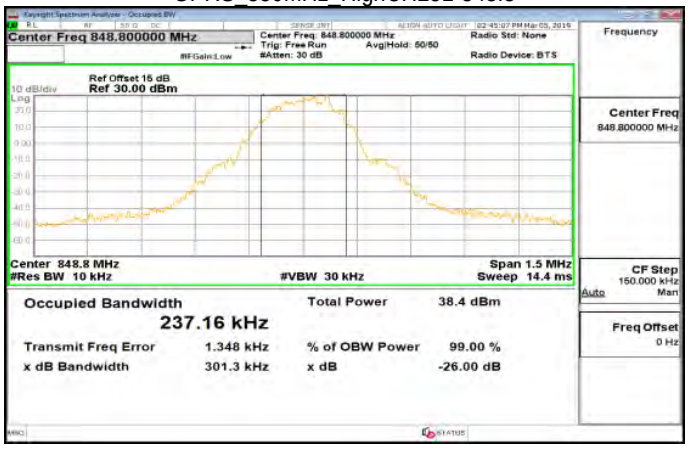
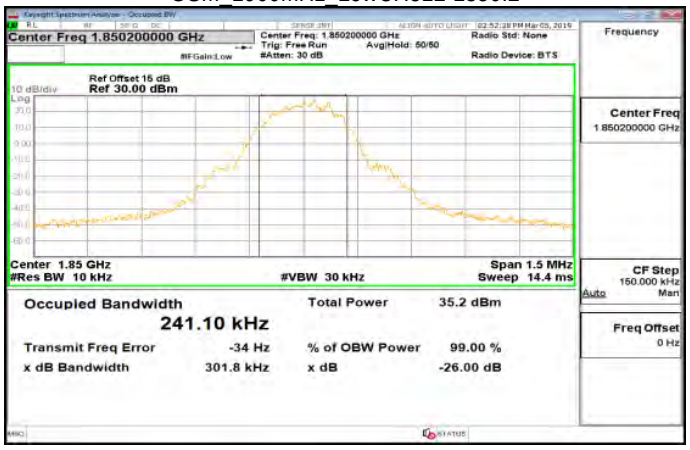


GSM_1900MHz_LowCH512-1850.2



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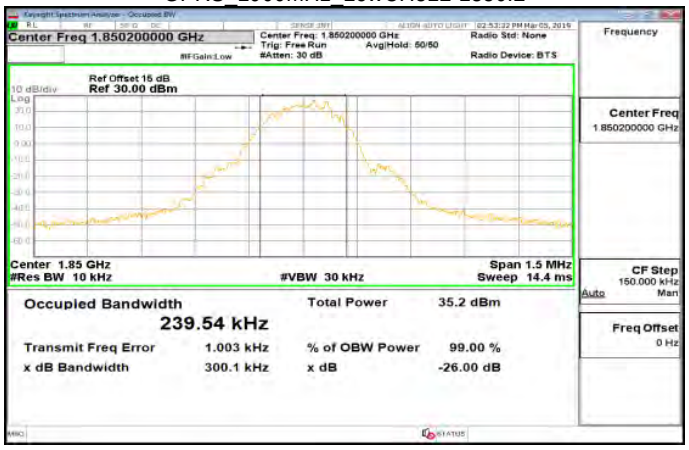
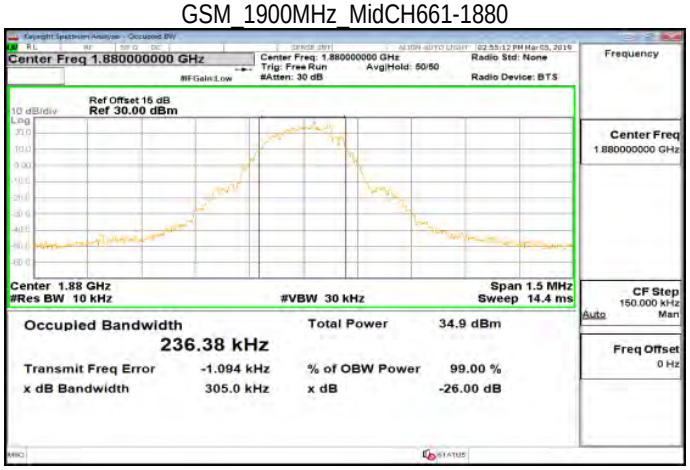
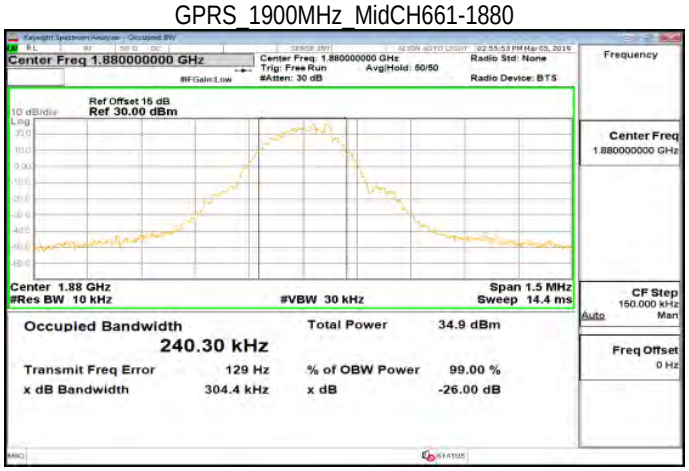


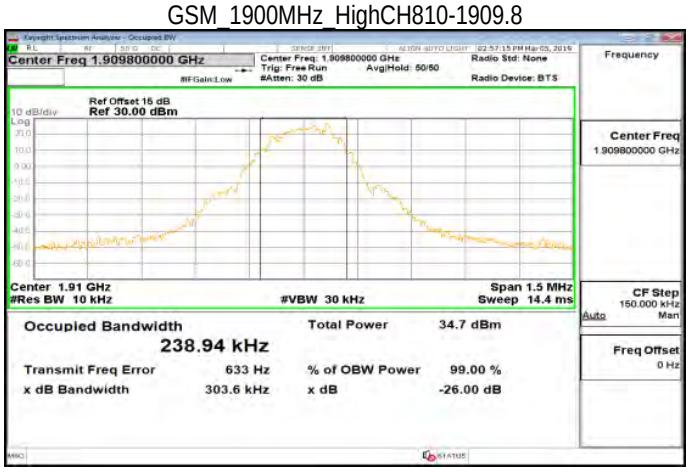
GSM_1900MHz_MidCH661-1880



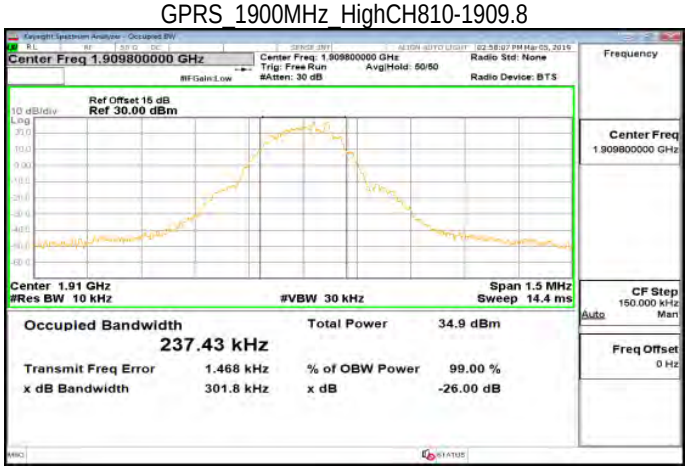
GPRS_1900MHz_MidCH661-1880



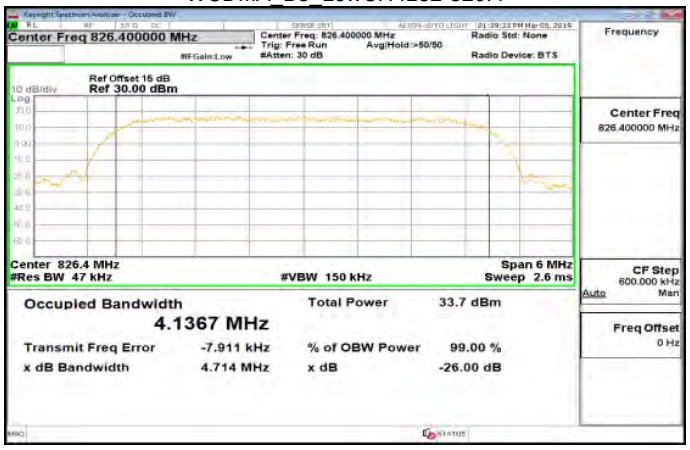
GSM_1900MHz_HighCH810-1909.8



GPRS_1900MHz_HighCH810-1909.8



WCDMA_B5_LowCH4132-826.4



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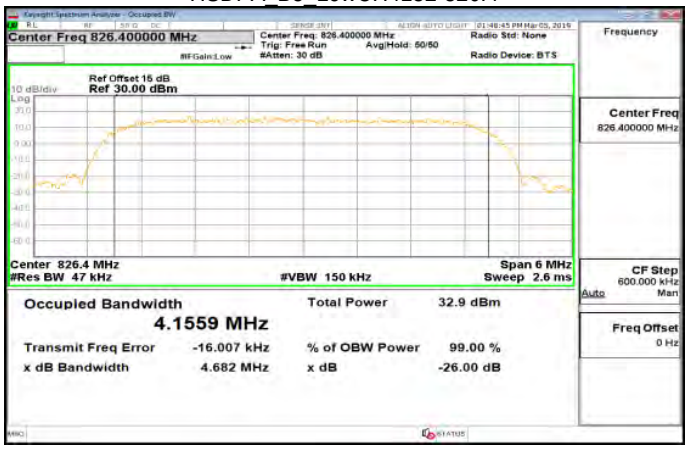

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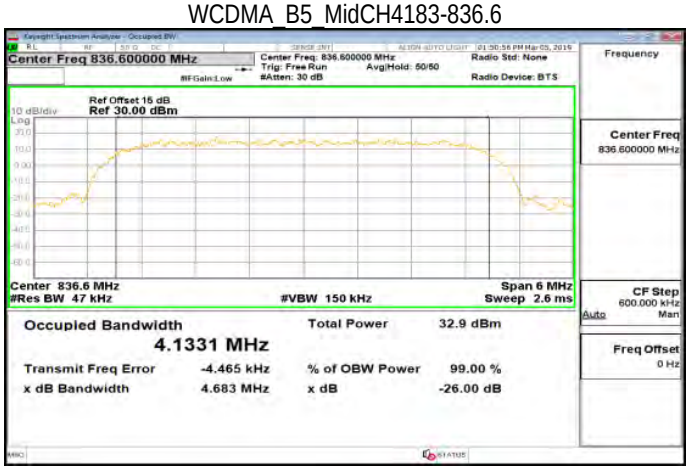

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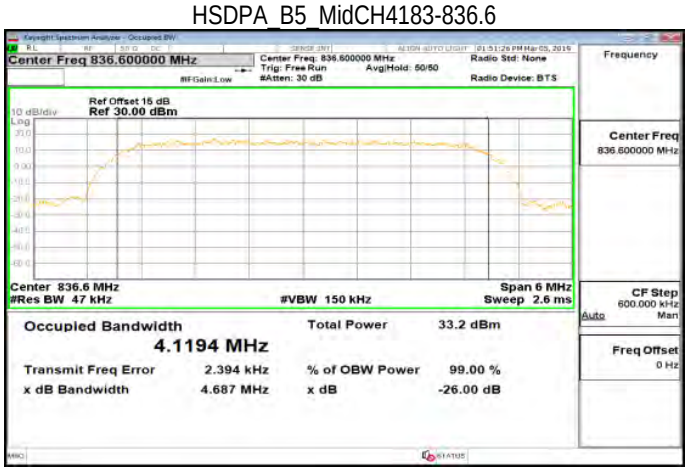

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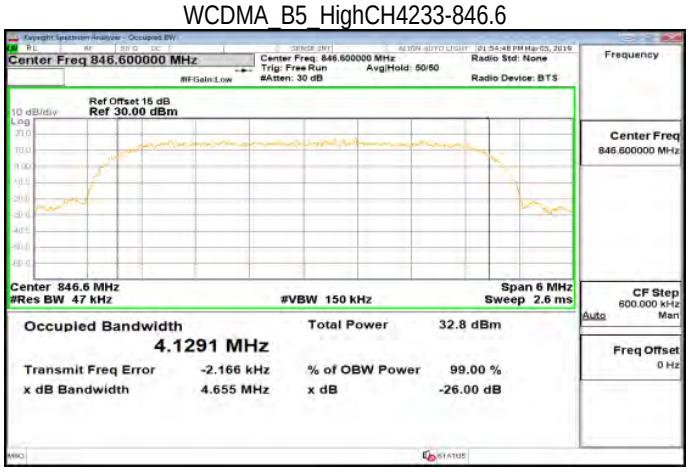

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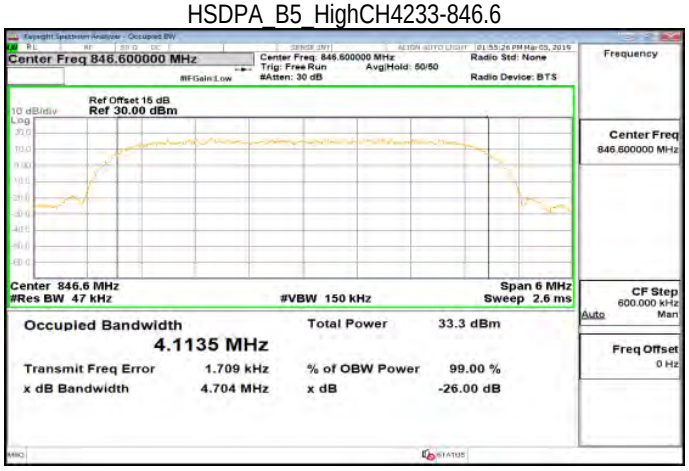

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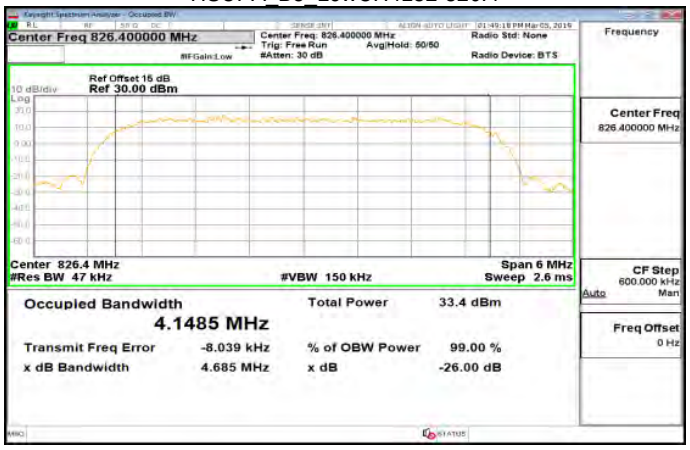
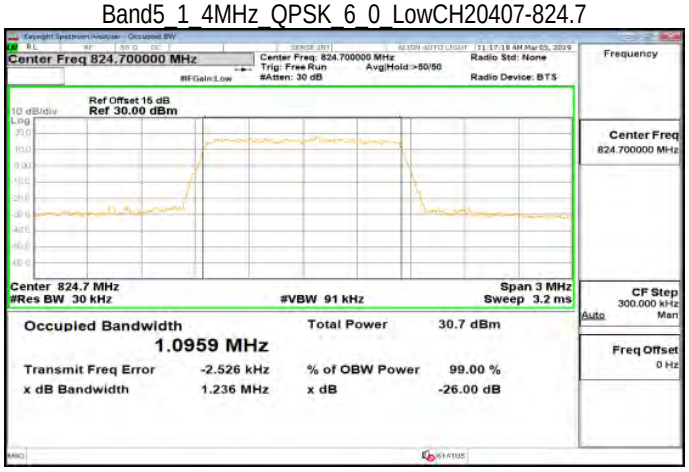
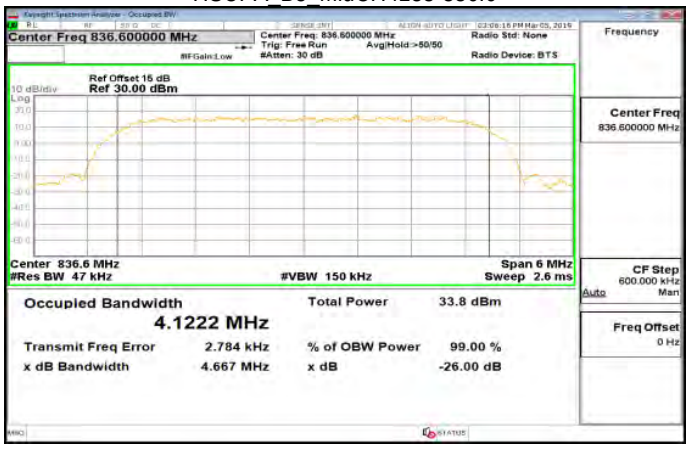


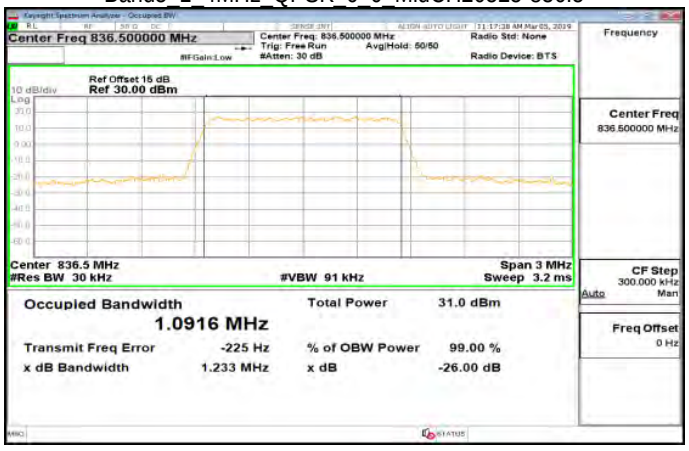
Band5_1_4MHz_QPSK_6_0_LowCH20407-824.7



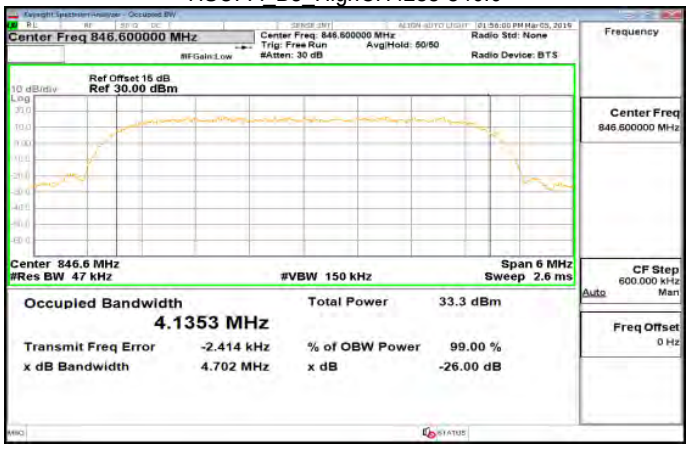
HSUPA_B5_MidCH4183-836.6



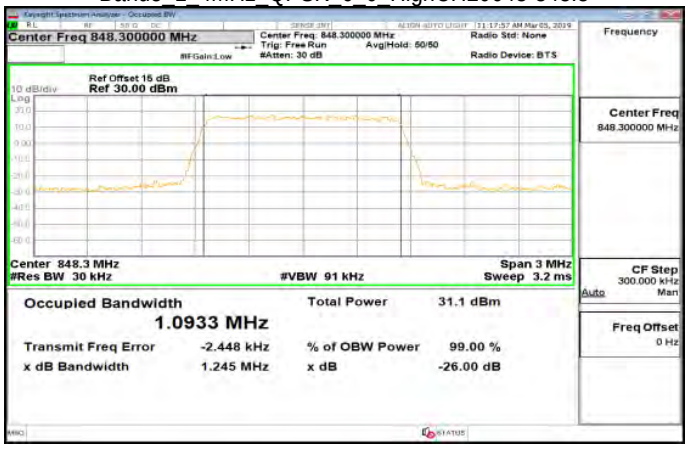
Band5_1_4MHz_QPSK_6_0_MidCH20525-836.5



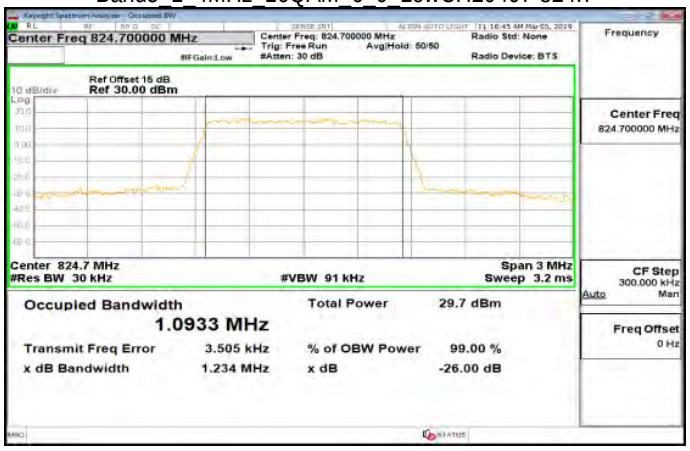
HSUPA_B5_HighCH4233-846.6



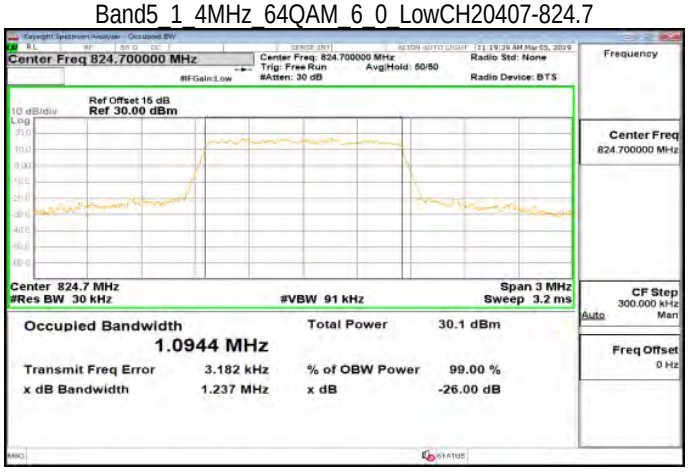
Band5_1_4MHz_QPSK_6_0_HighCH20643-848.3



Band5_1_4MHz_16QAM_6_0_LowCH20407-824.7



Band5_1_4MHz_64QAM_6_0_LowCH20407-824.7



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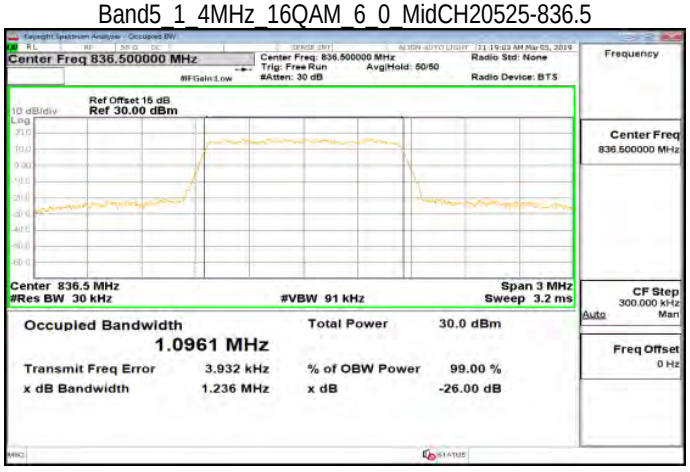

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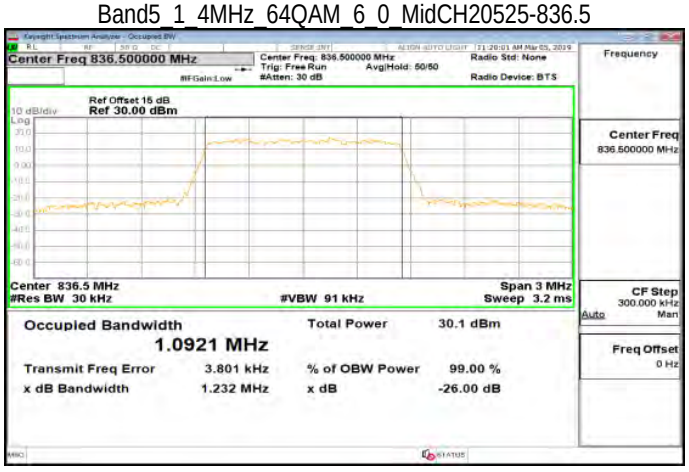

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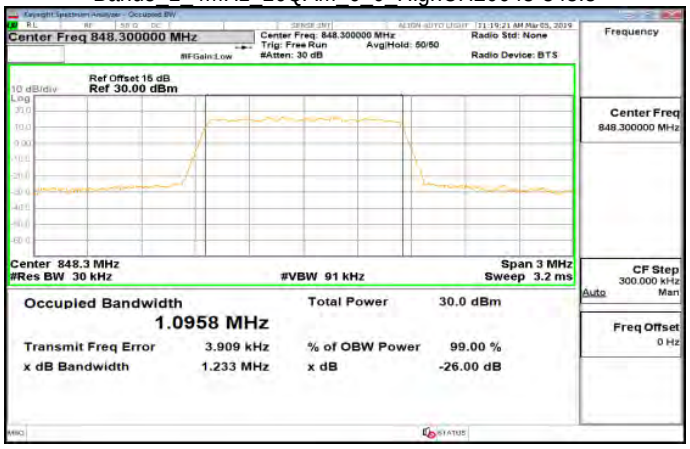
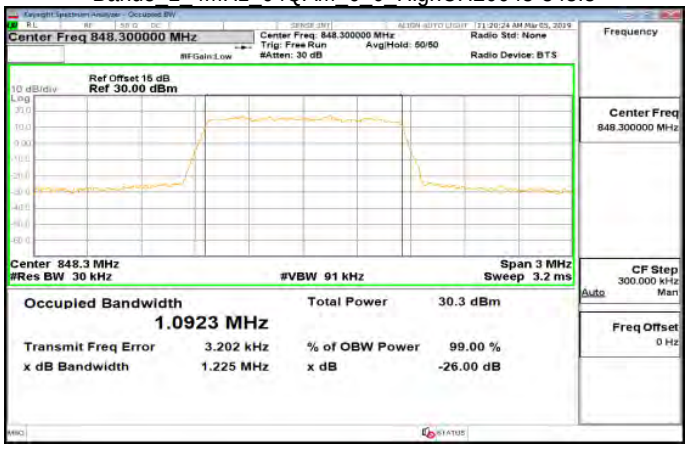
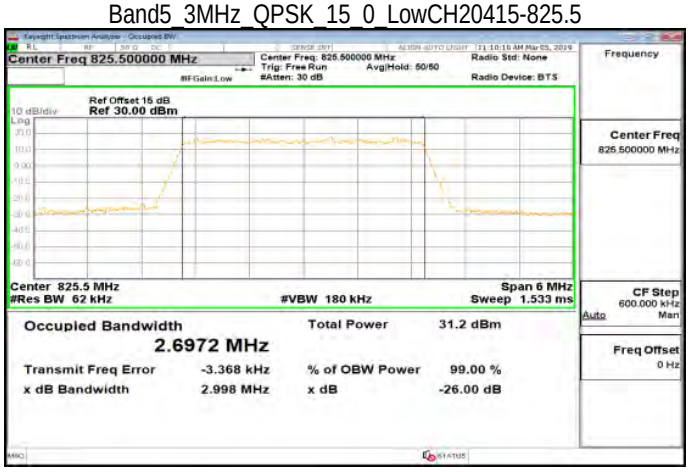


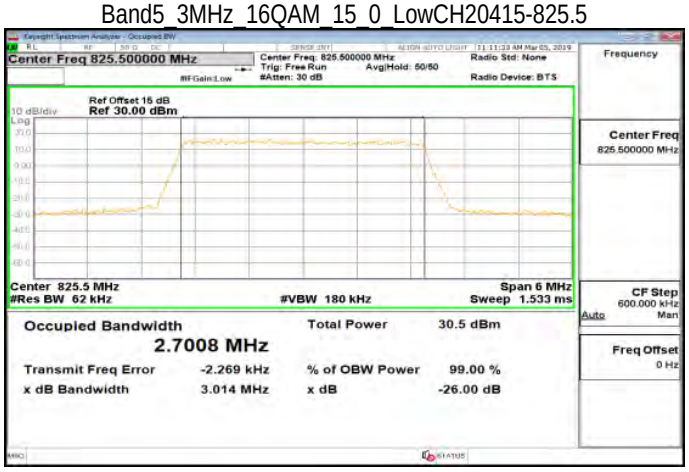
Band5_1_4MHz_64QAM_6_0_HighCH20643-848.3



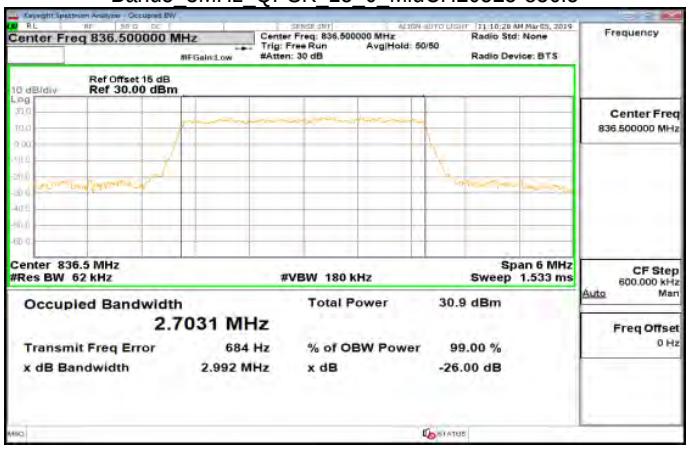
Band5_3MHz_QPSK_15_0_LowCH20415-825.5



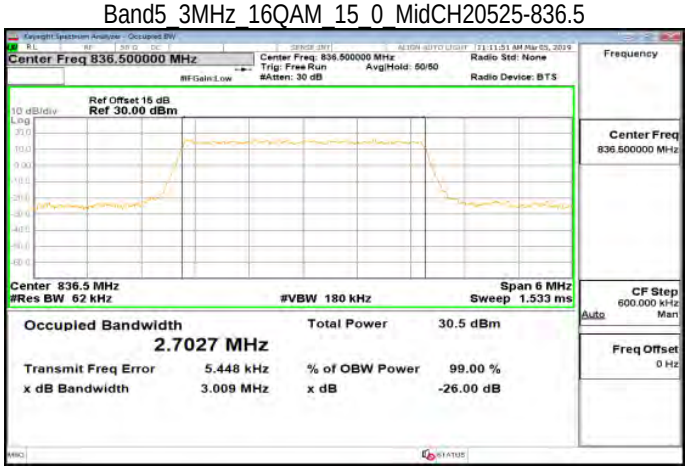
Band5_3MHz_16QAM_15_0_LowCH20415-825.5



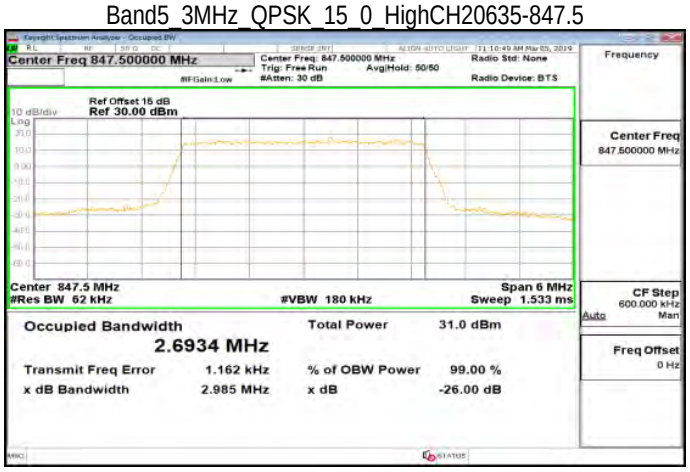
Band5_3MHz_QPSK_15_0_MidCH20525-836.5



Band5_3MHz_16QAM_15_0_MidCH20525-836.5



Band5_3MHz_QPSK_15_0_HighCH20635-847.5



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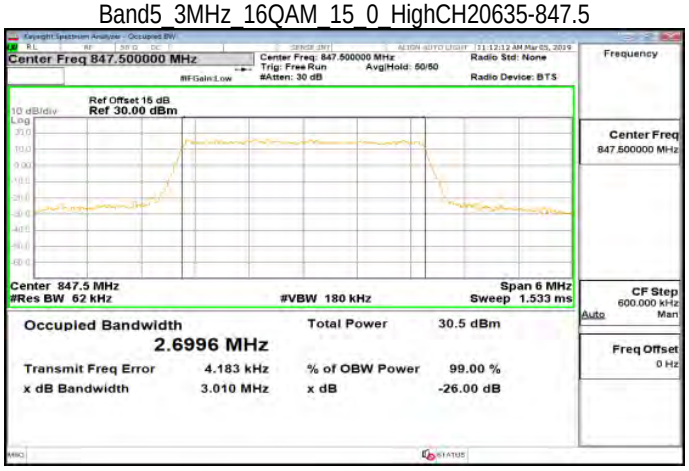
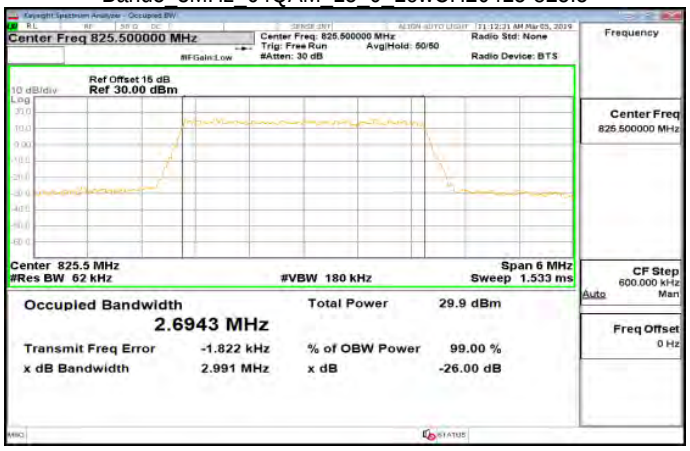
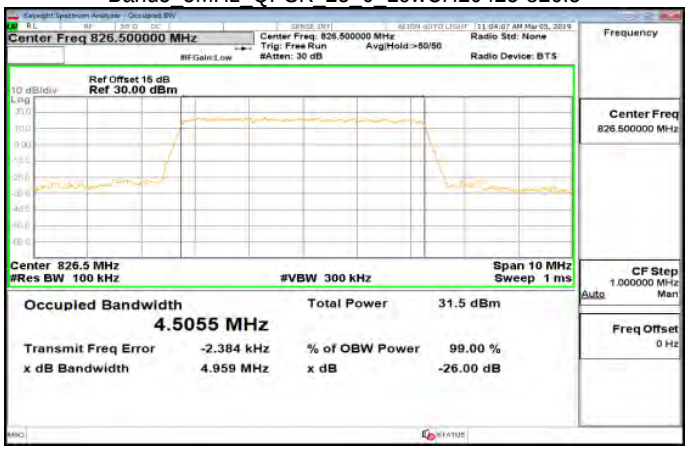


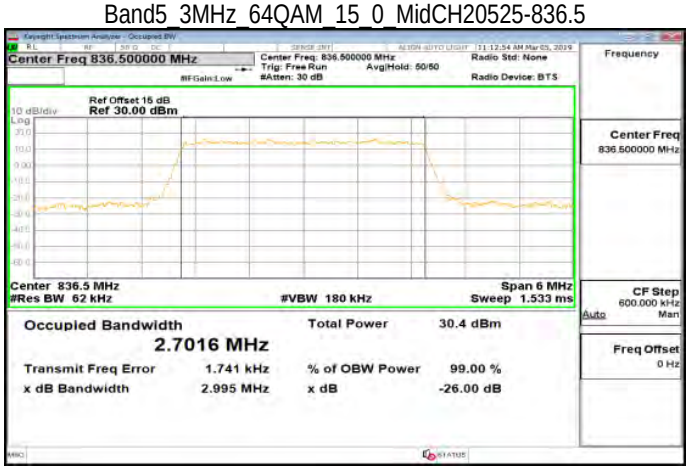
Band5_3MHz_64QAM_15_0_LowCH20415-825.5



Band5_5MHz_QPSK_25_0_LowCH20425-826.5



Band5_3MHz_64QAM_15_0_MidCH20525-836.5



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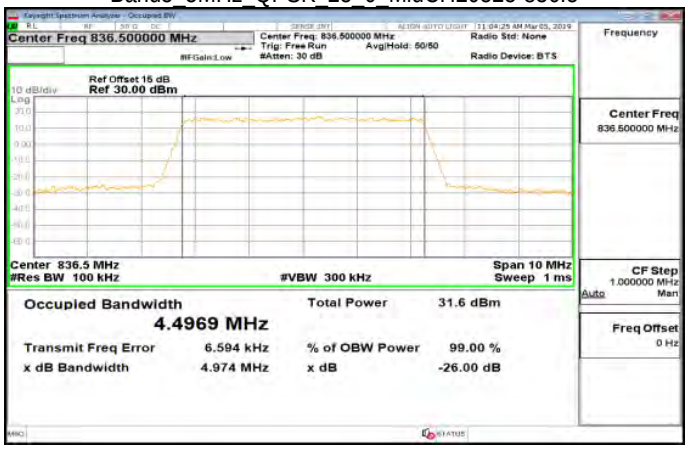
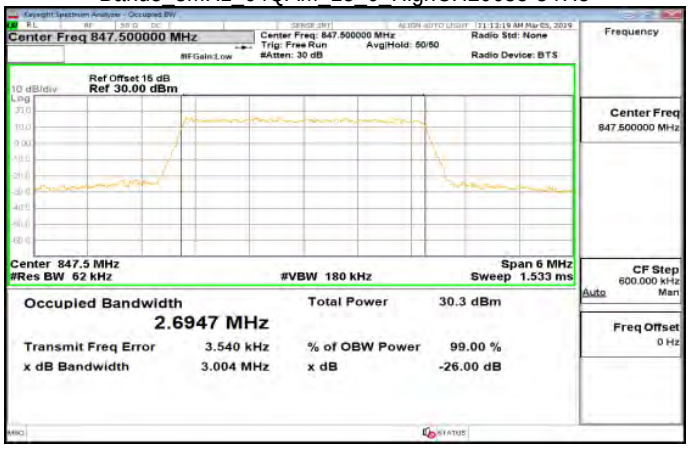
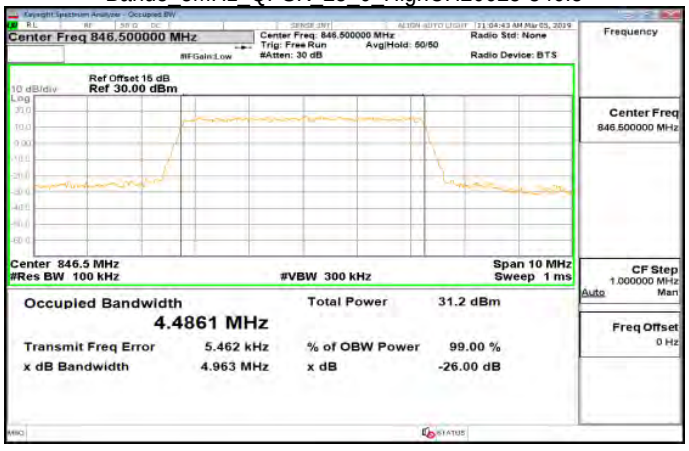


Band5_3MHz_64QAM_15_0_HighCH20635-847.5



Band5_5MHz_QPSK_25_0_HighCH20625-846.5



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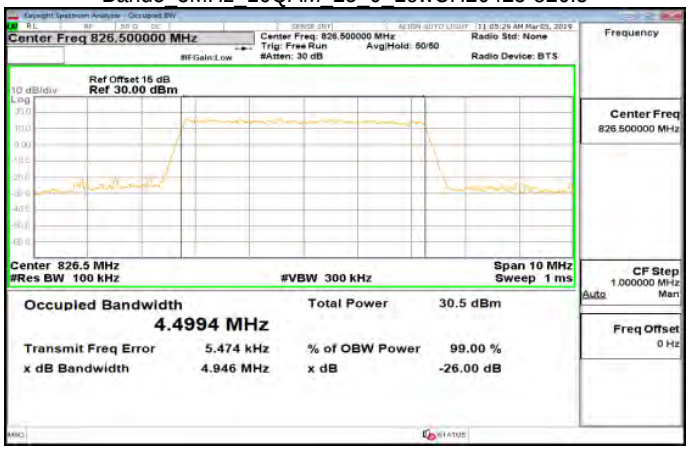
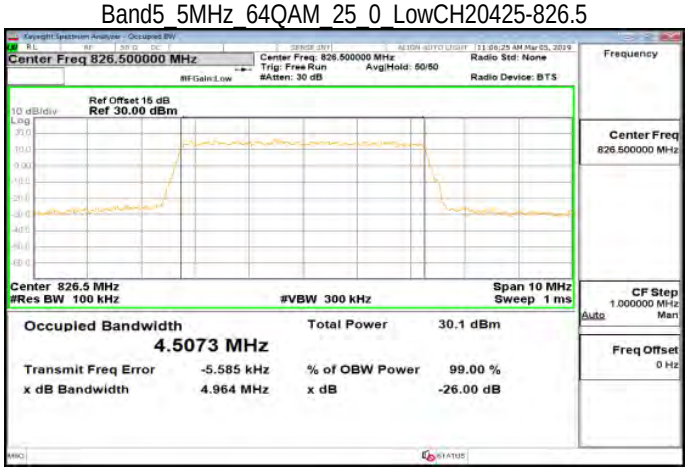


Band5_5MHz_64QAM_25_0_LowCH20425-826.5



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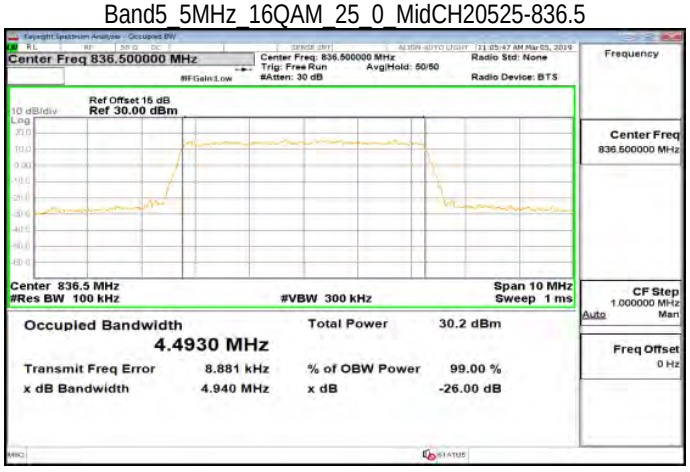

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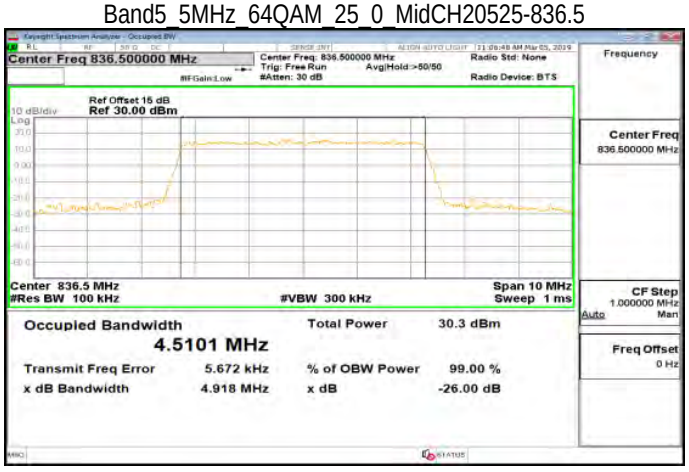

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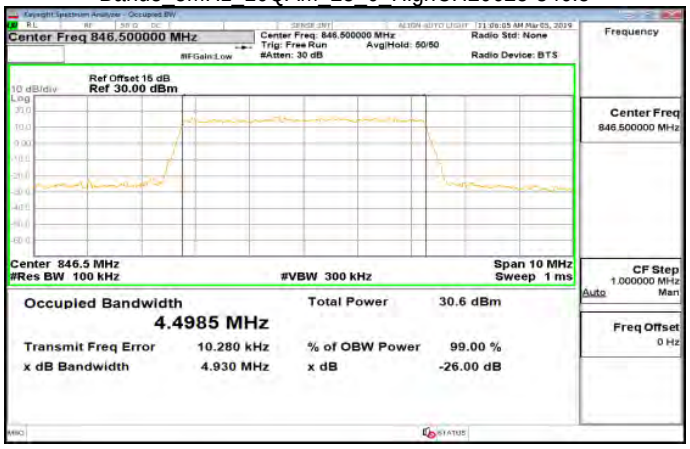

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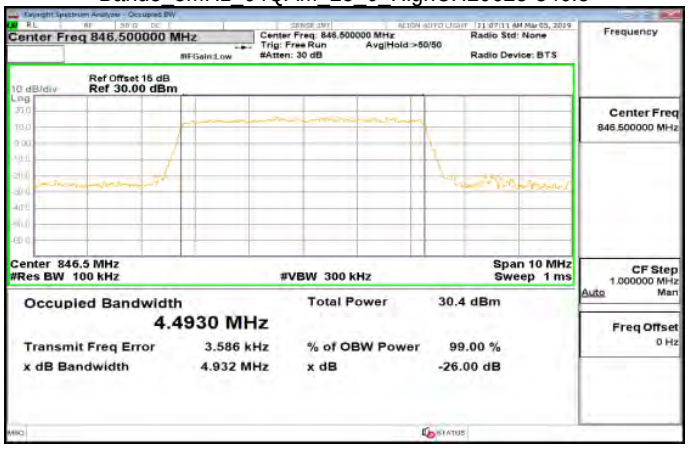
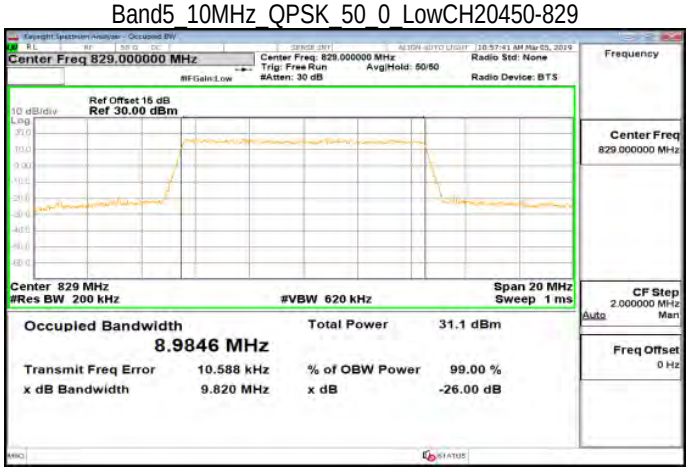


Band5_10MHz_QPSK_50_0_LowCH20450-829



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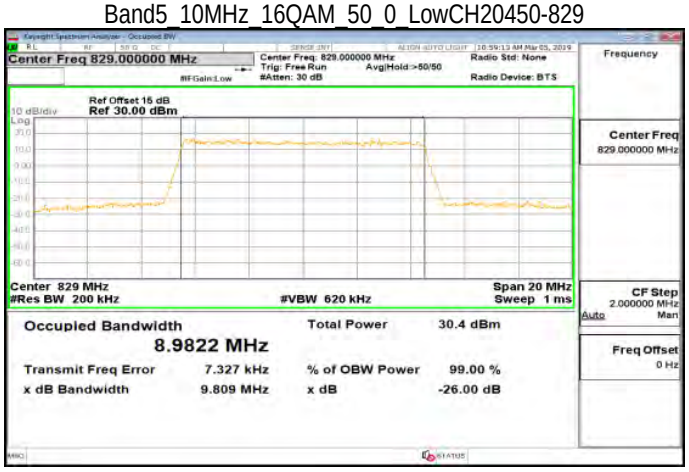

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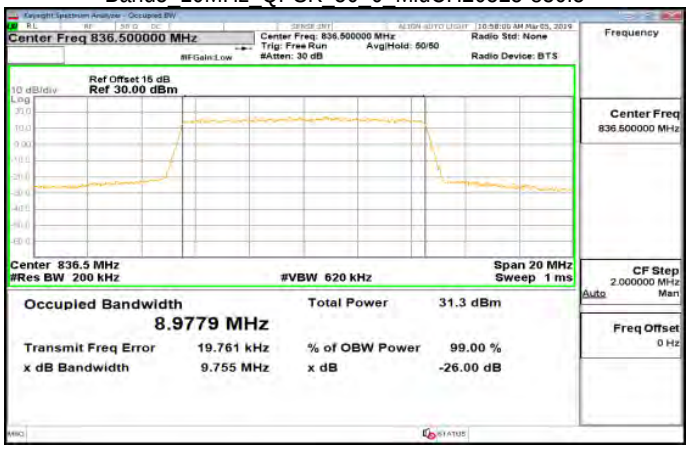

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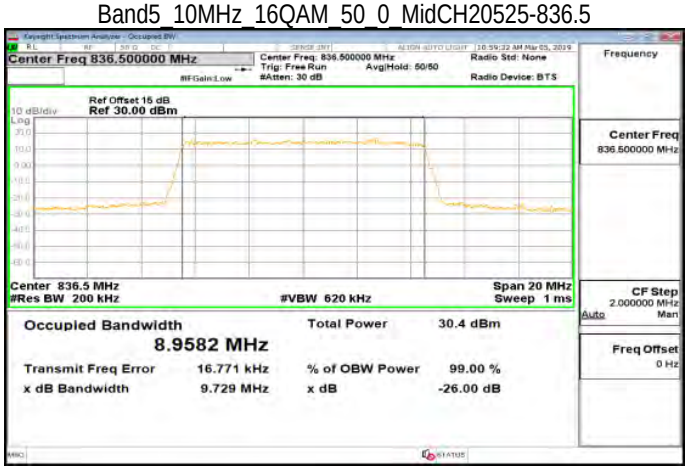

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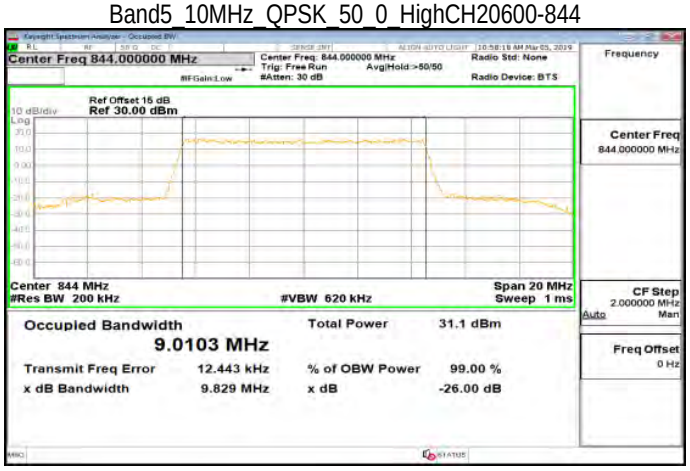

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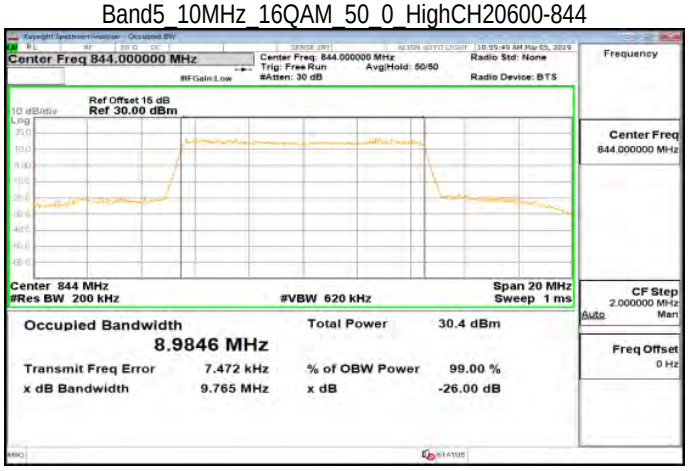
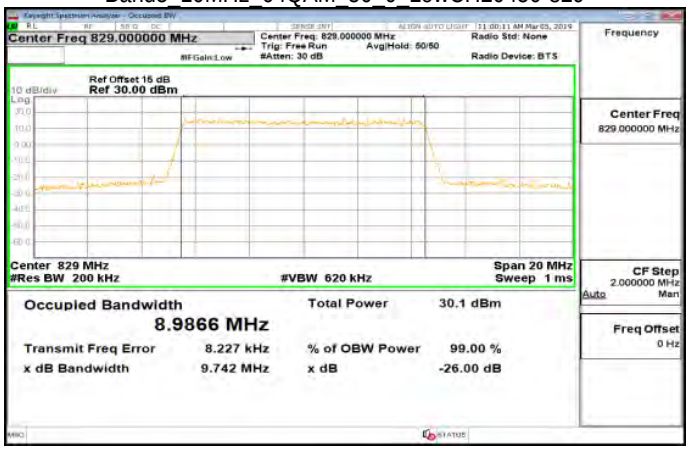
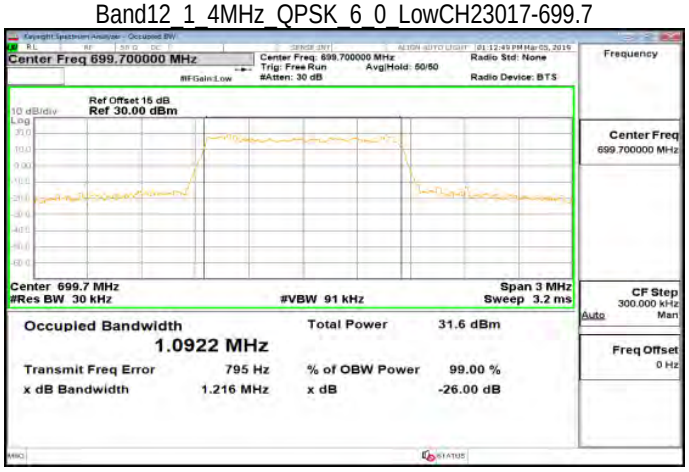


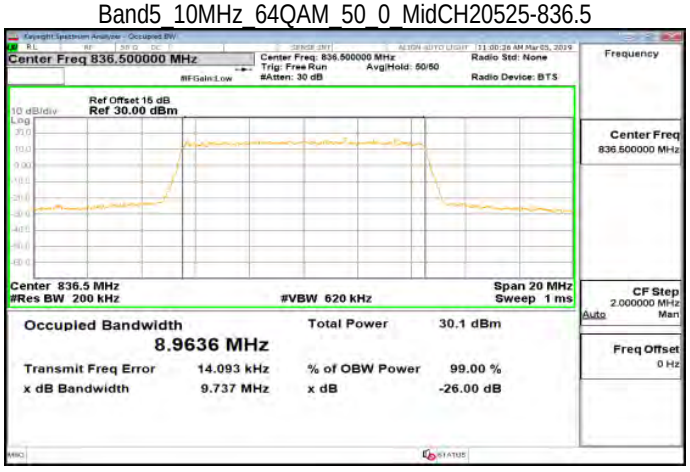
Band5_10MHz_64QAM_50_0_LowCH20450-829



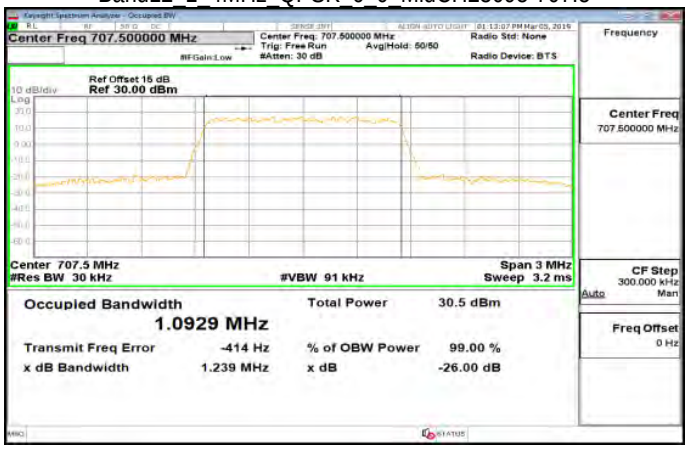
Band12_1_4MHz_QPSK_6_0_LowCH23017-699.7



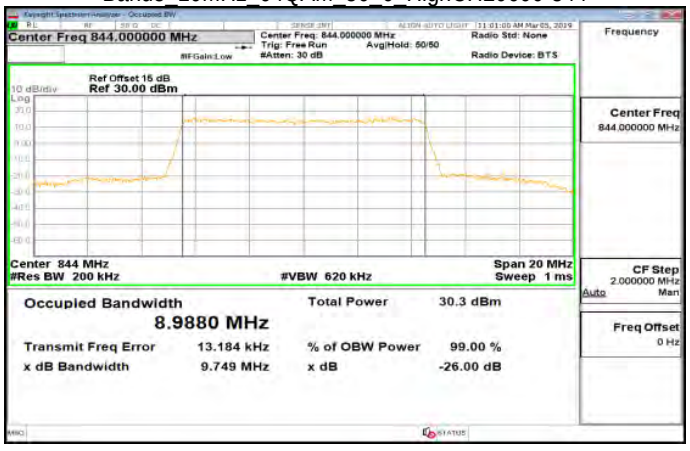
Band5_10MHz_64QAM_50_0_MidCH20525-836.5



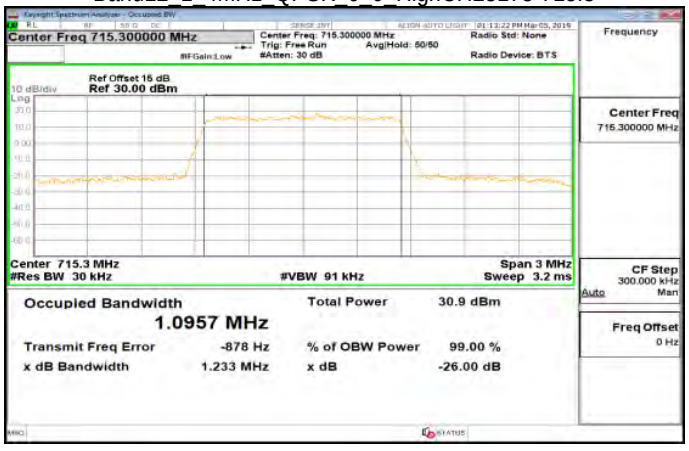
Band12_1_4MHz_QPSK_6_0_MidCH23095-707.5



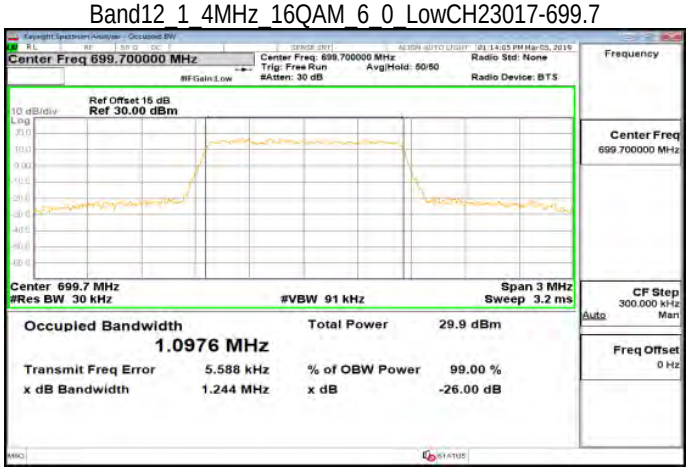
Band5_10MHz_64QAM_50_0_HighCH20600-844



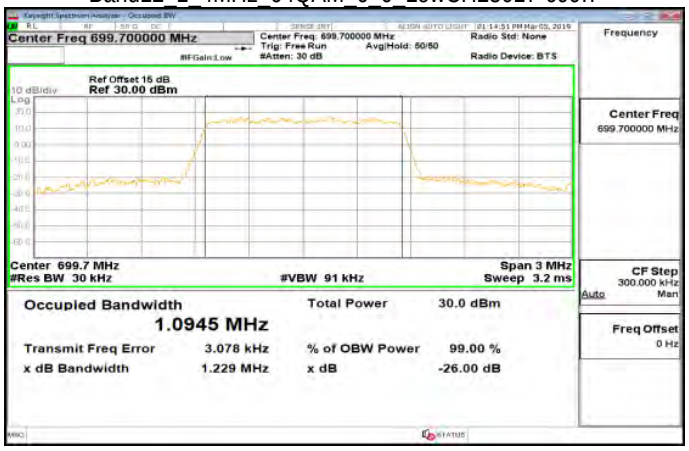
Band12_1_4MHz_QPSK_6_0_HighCH23173-715.3



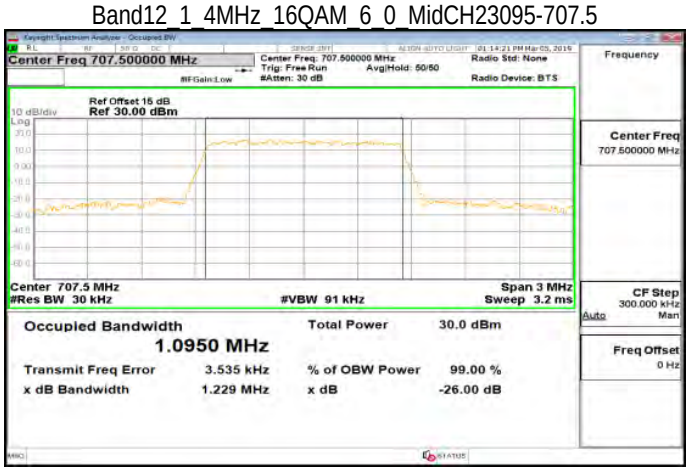
Band12_1_4MHz_16QAM_6_0_LowCH23017-699.7



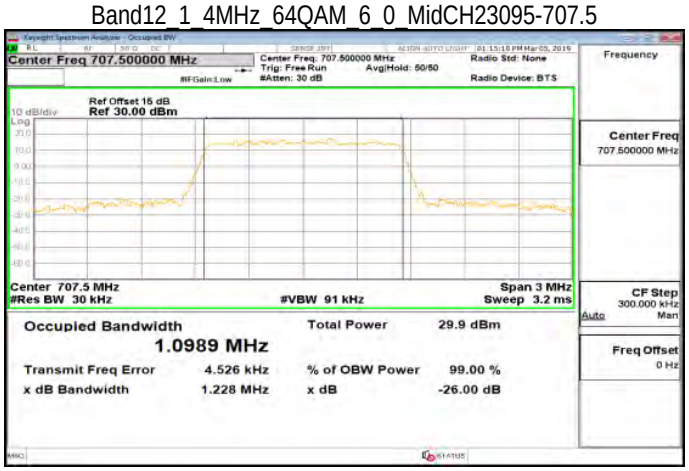
Band12_1_4MHz_64QAM_6_0_LowCH23017-699.7



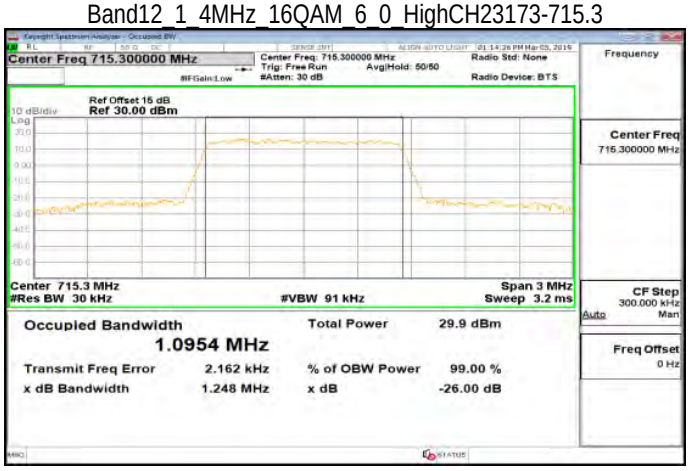
Band12_1_4MHz_16QAM_6_0_MidCH23095-707.5



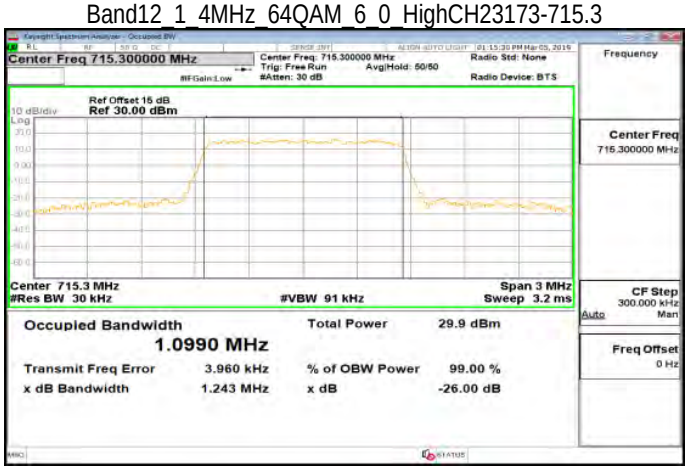
Band12_1_4MHz_64QAM_6_0_MidCH23095-707.5



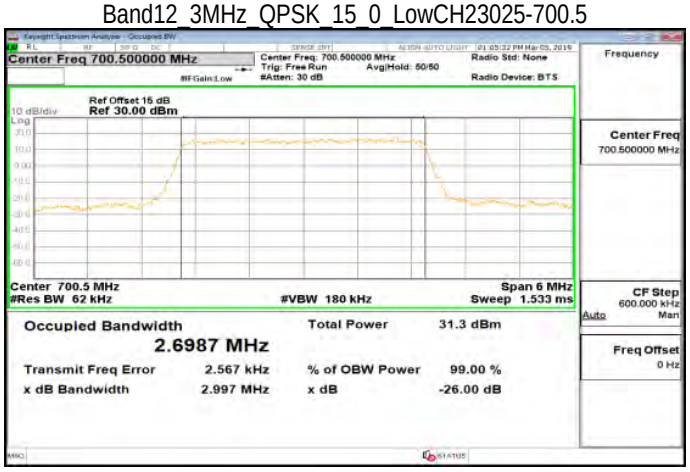
Band12_1_4MHz_16QAM_6_0_HighCH23173-715.3



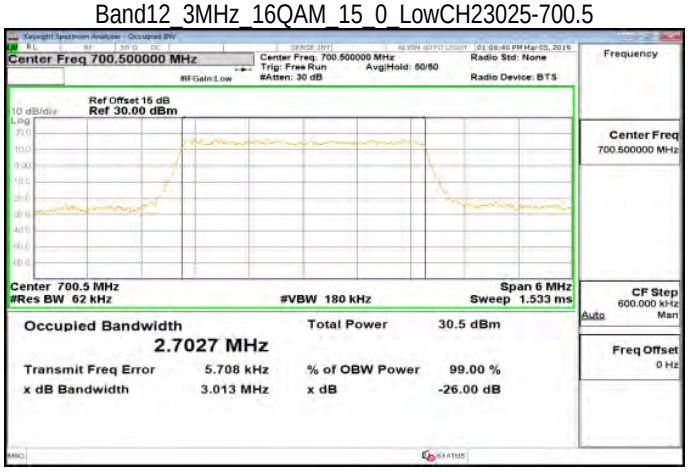
Band12_1_4MHz_64QAM_6_0_HighCH23173-715.3



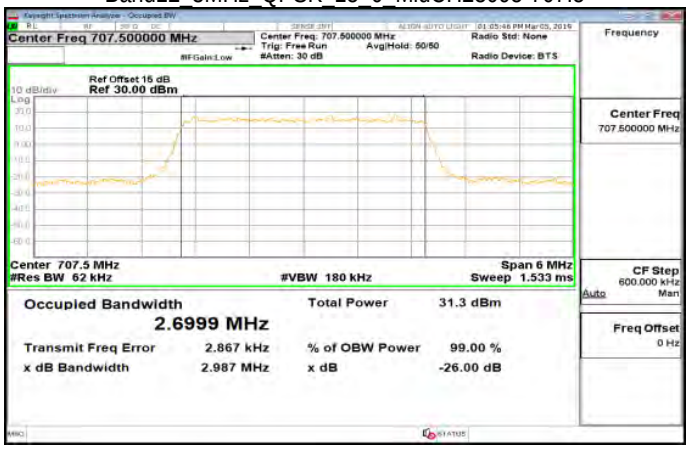
Band12_3MHz_QPSK_15_0_LowCH23025-700.5



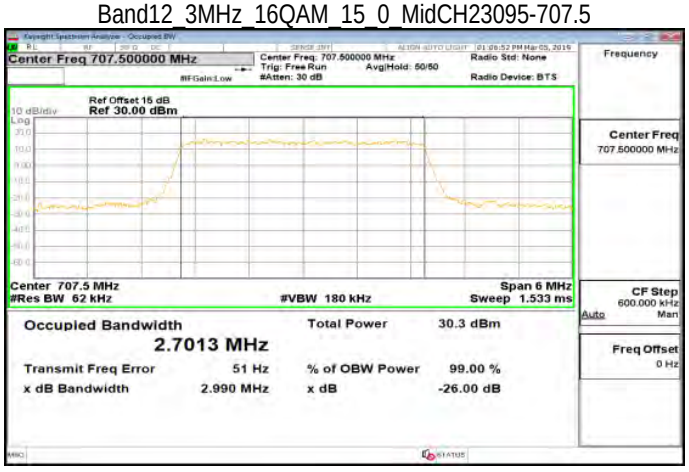
Band12_3MHz_16QAM_15_0_LowCH23025-700.5



Band12_3MHz_QPSK_15_0_MidCH23095-707.5



Band12_3MHz_16QAM_15_0_MidCH23095-707.5



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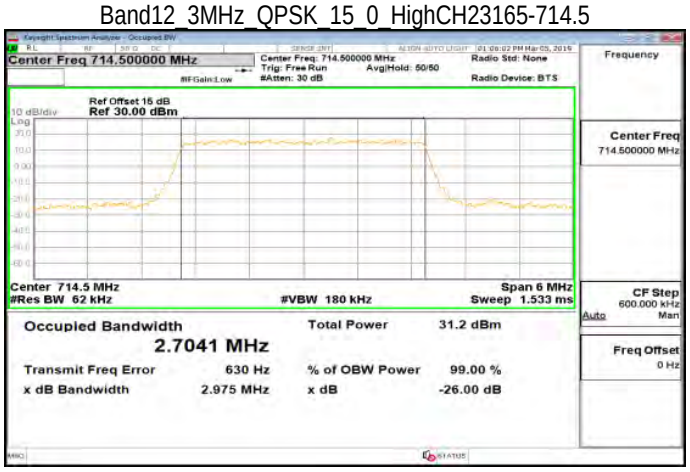
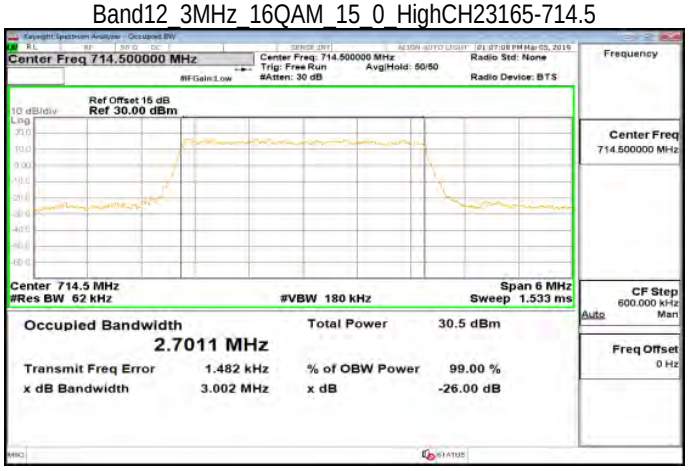
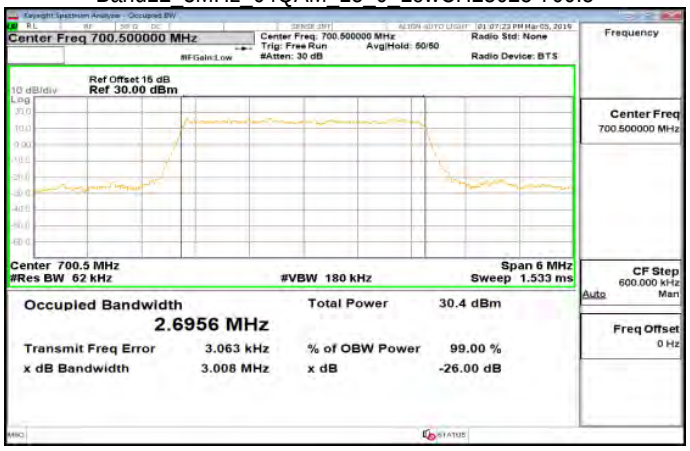


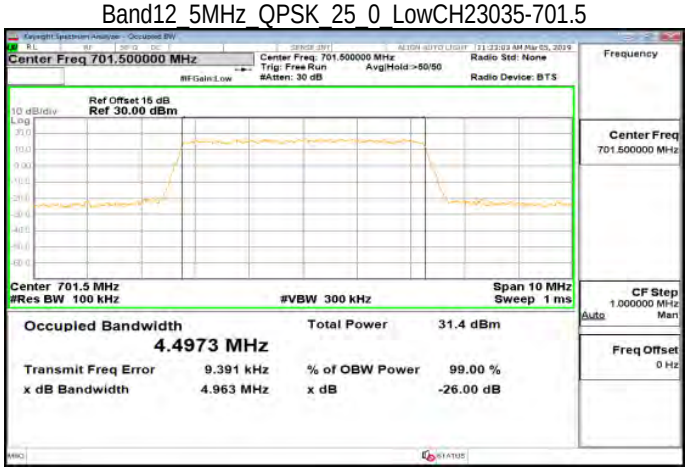
Band12_3MHz_16QAM_15_0_HighCH23165-714.5



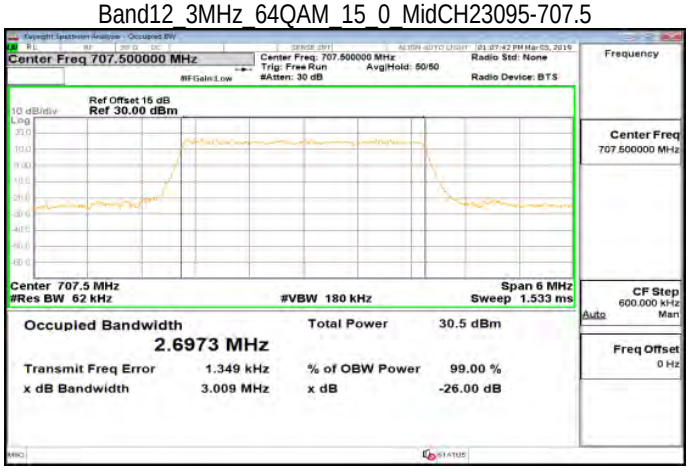
Band12_3MHz_64QAM_15_0_LowCH23025-700.5



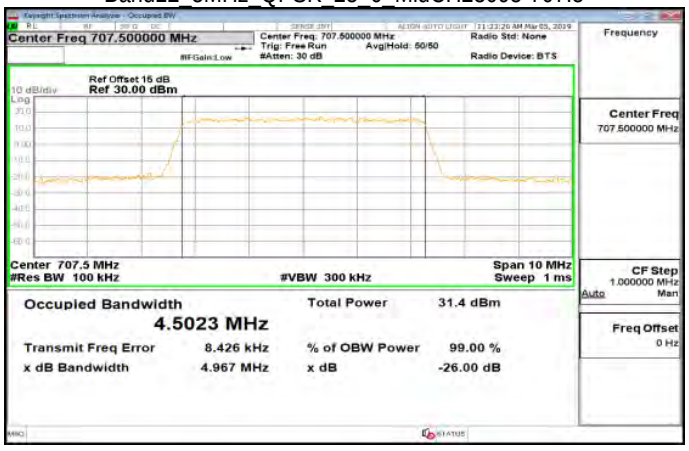
Band12_5MHz_QPSK_25_0_LowCH23035-701.5



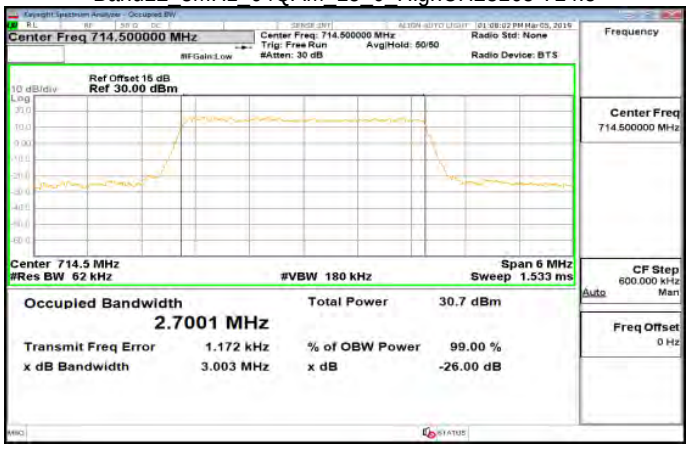
Band12_3MHz_64QAM_15_0_MidCH23095-707.5



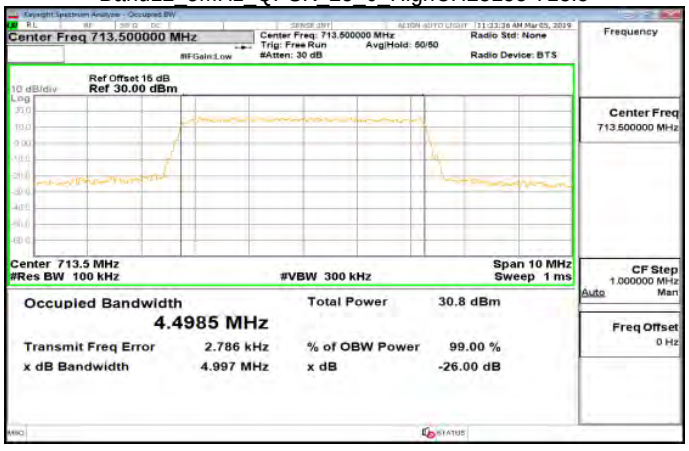
Band12_5MHz_QPSK_25_0_MidCH23095-707.5



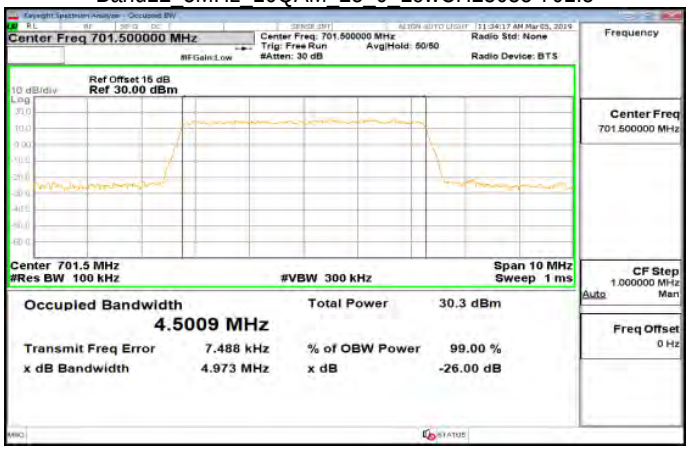
Band12_3MHz_64QAM_15_0_HighCH23165-714.5



Band12_5MHz_QPSK_25_0_HighCH23155-713.5



Band12_5MHz_16QAM_25_0_LowCH23035-701.5



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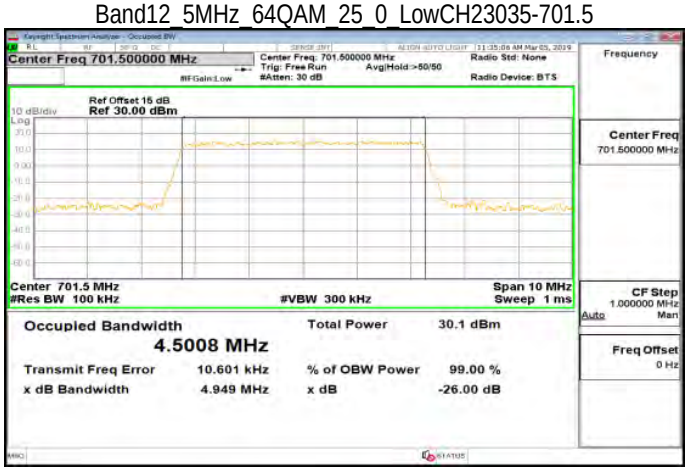
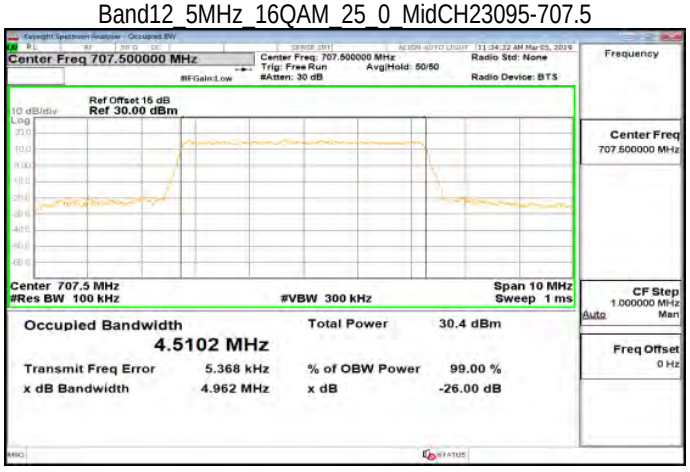
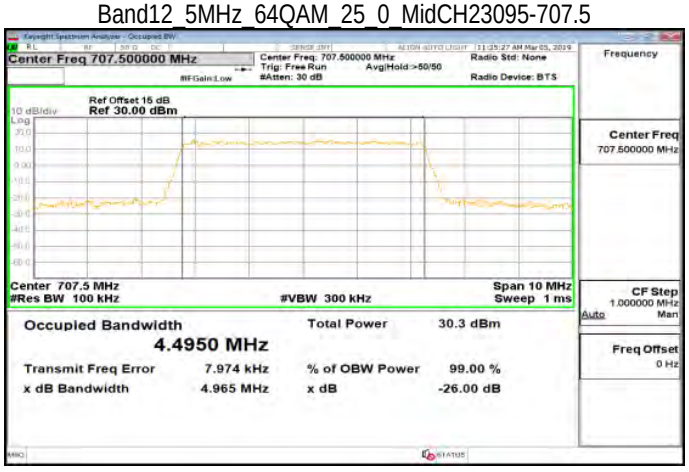


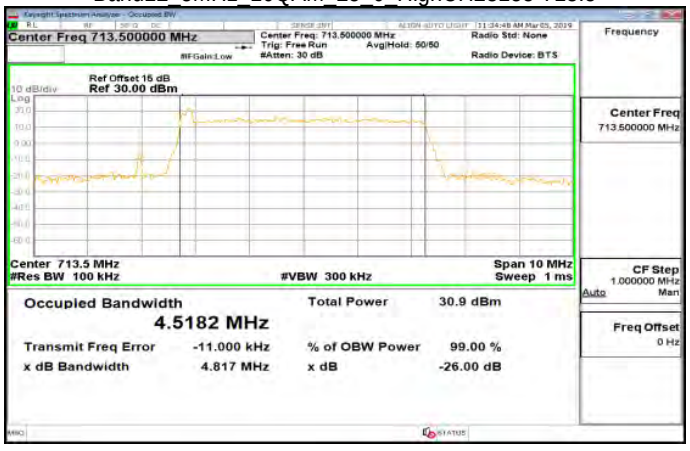
Band12_5MHz_16QAM_25_0_MidCH23095-707.5



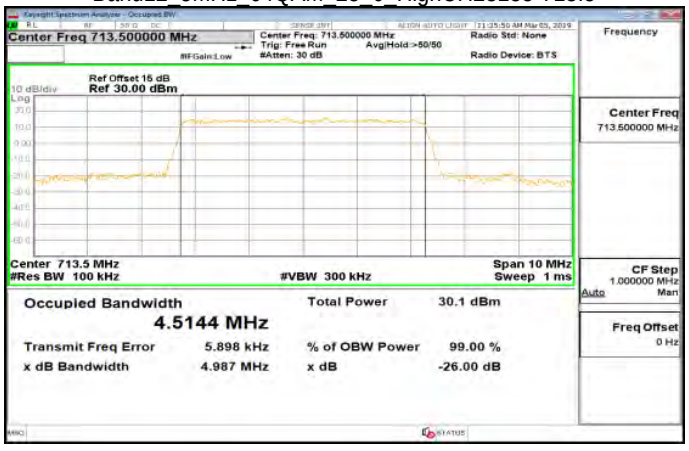
Band12_5MHz_64QAM_25_0_MidCH23095-707.5



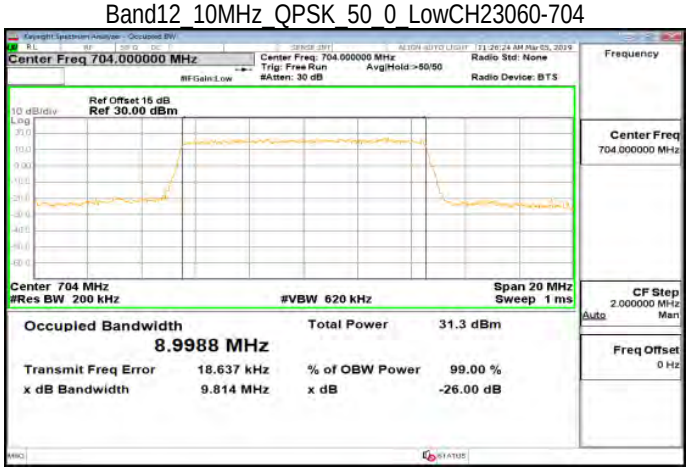
Band12_5MHz_16QAM_25_0_HighCH23155-713.5



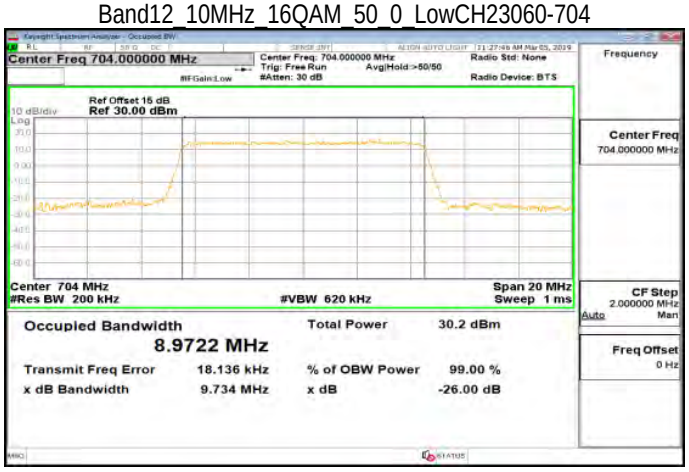
Band12_5MHz_64QAM_25_0_HighCH23155-713.5



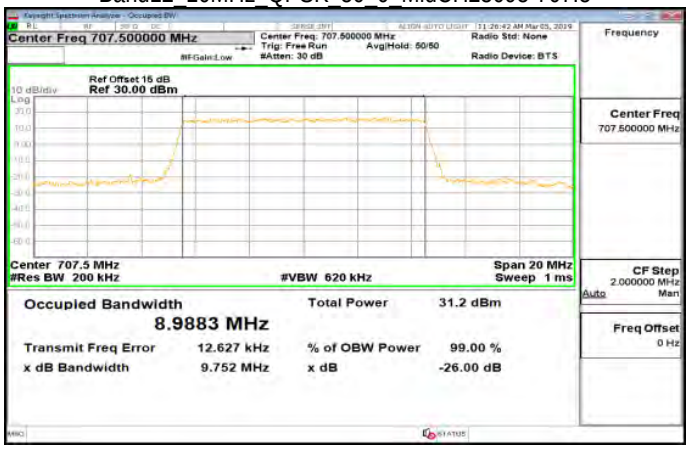
Band12_10MHz_QPSK_50_0_LowCH23060-704



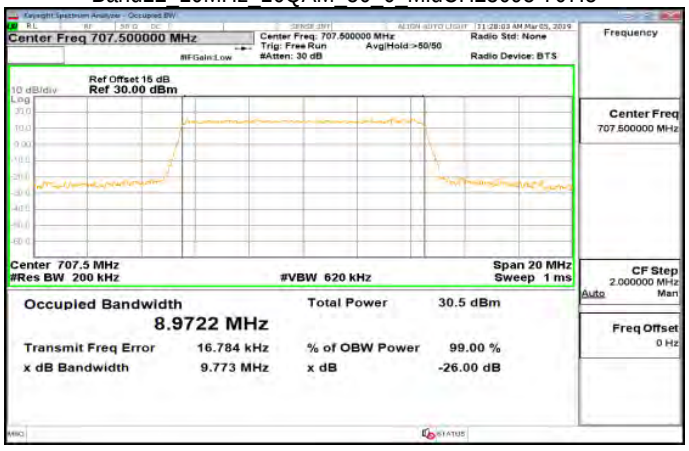
Band12_10MHz_16QAM_50_0_LowCH23060-704



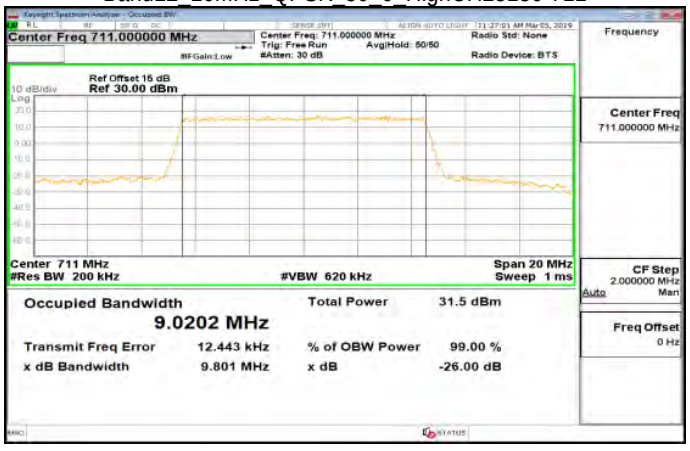
Band12_10MHz_QPSK_50_0_MidCH23095-707.5



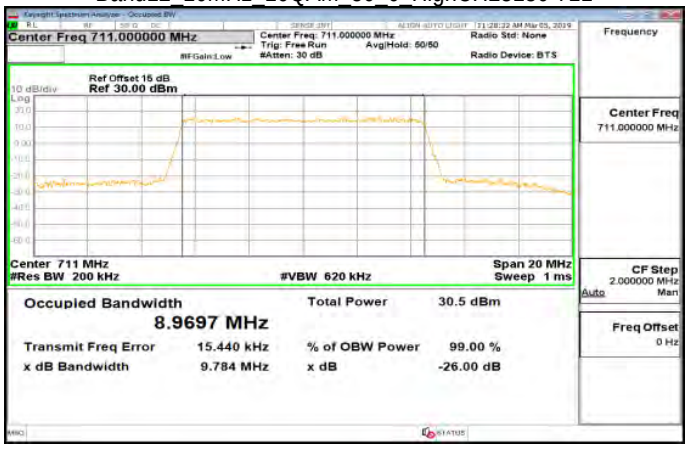
Band12_10MHz_16QAM_50_0_MidCH23095-707.5



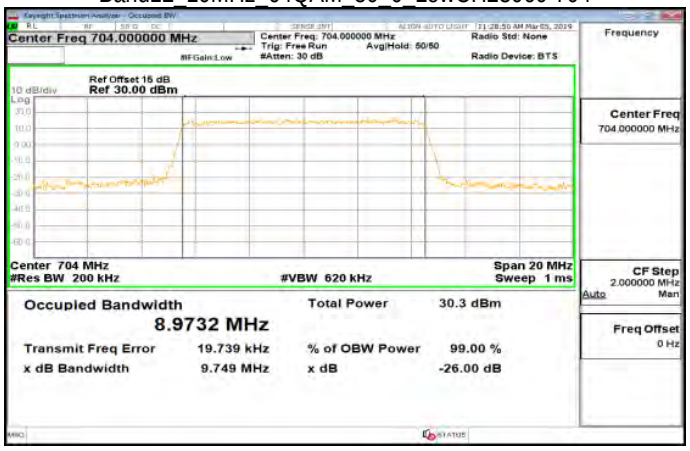
Band12_10MHz_QPSK_50_0_HighCH23130-711



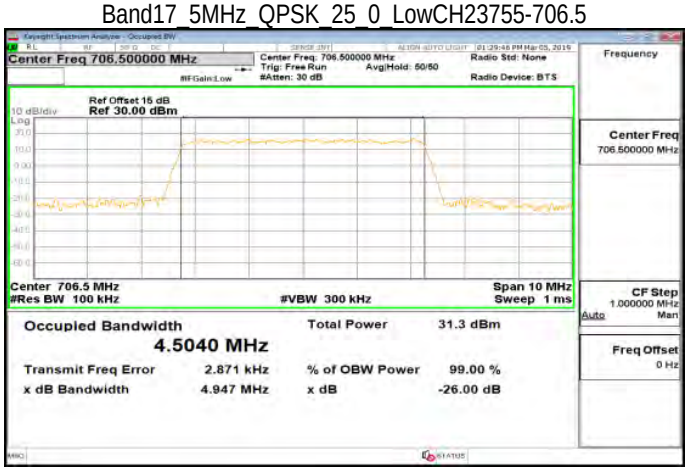
Band12_10MHz_16QAM_50_0_HighCH23130-711



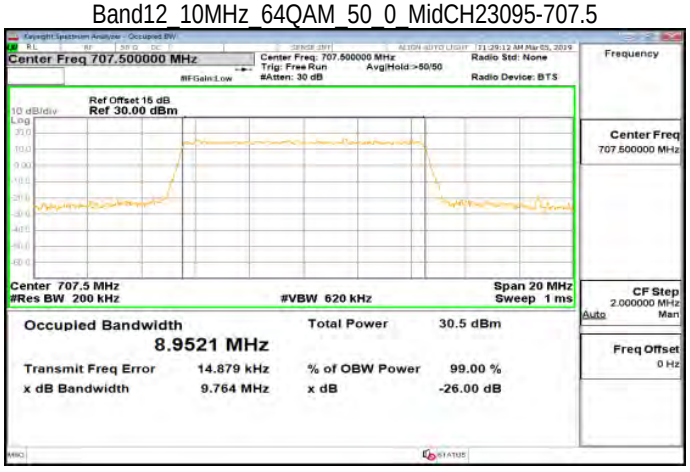
Band12_10MHz_64QAM_50_0_LowCH23060-704



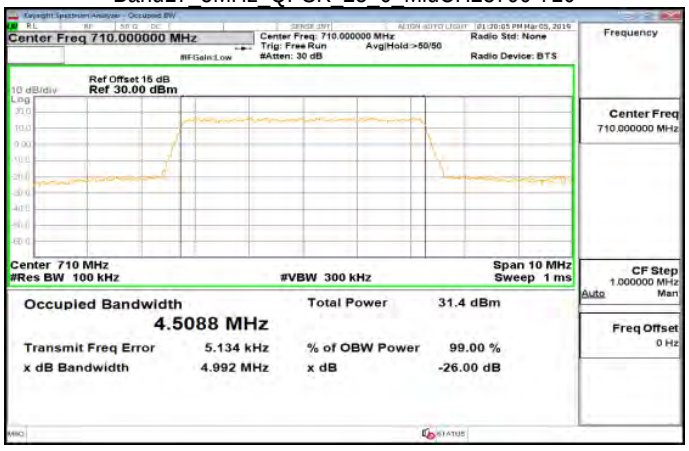
Band17_5MHz_QPSK_25_0_LowCH23755-706.5



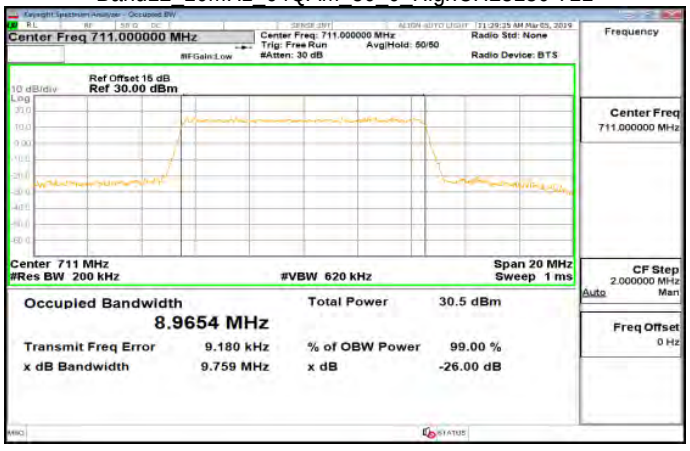
Band12_10MHz_64QAM_50_0_MidCH23095-707.5



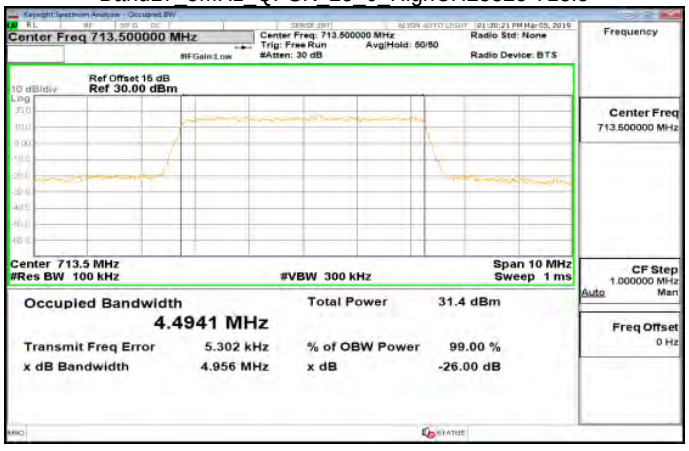
Band17_5MHz_QPSK_25_0_MidCH23790-710



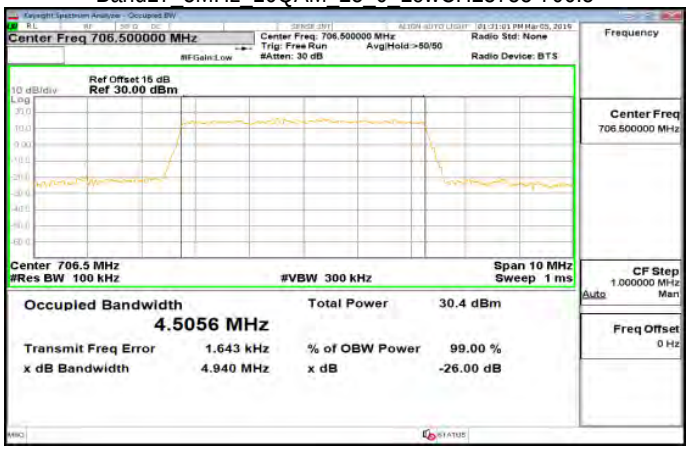
Band12_10MHz_64QAM_50_0_HighCH23130-711



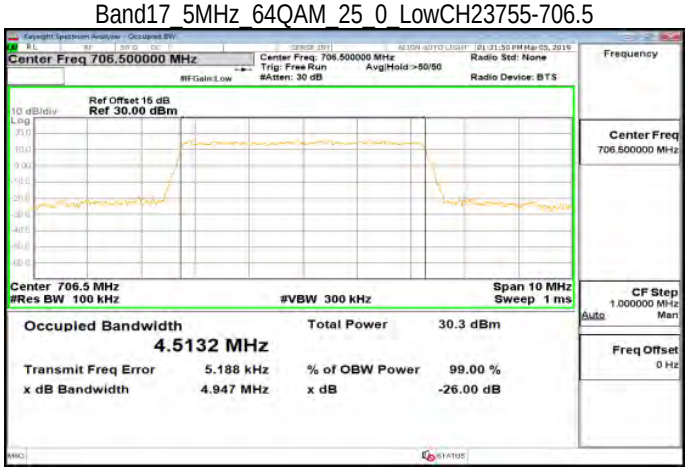
Band17_5MHz_QPSK_25_0_HighCH23825-713.5



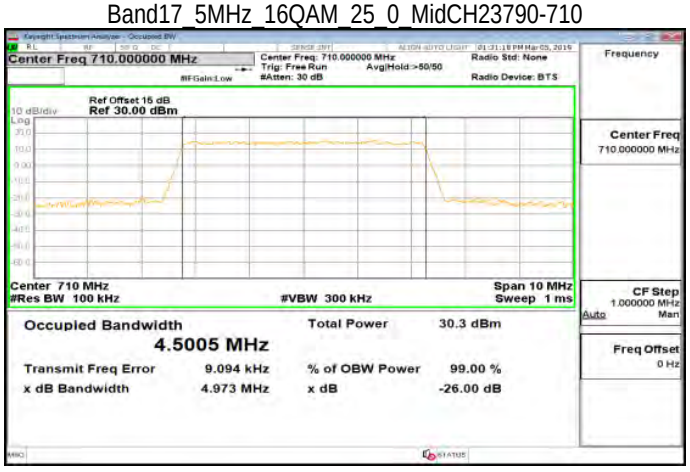
Band17_5MHz_16QAM_25_0_LowCH23755-706.5



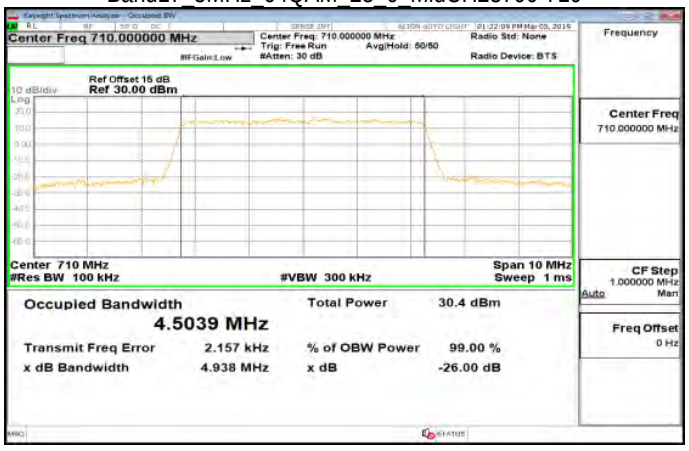
Band17_5MHz_64QAM_25_0_LowCH23755-706.5



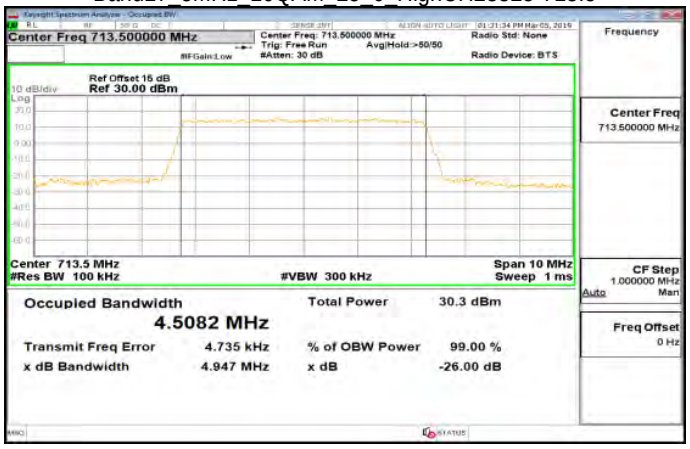
Band17_5MHz_16QAM_25_0_MidCH23790-710



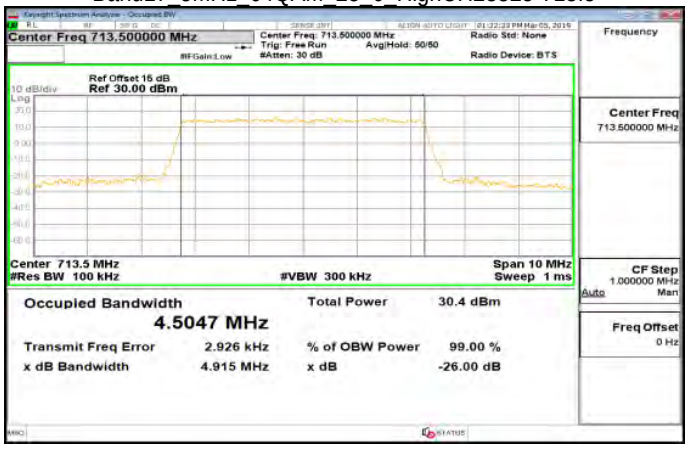
Band17_5MHz_64QAM_25_0_MidCH23790-710



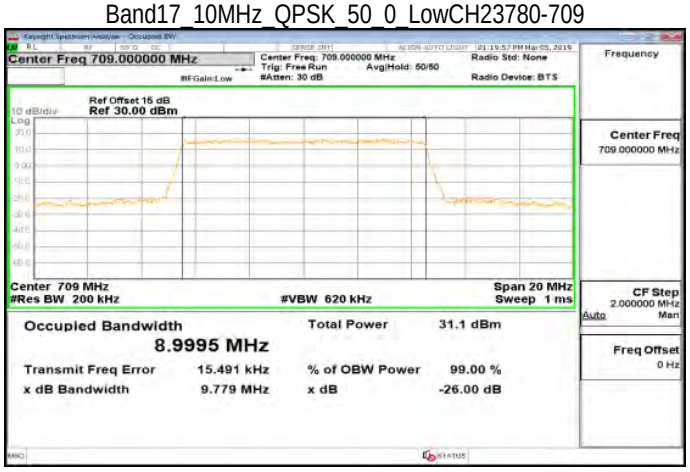
Band17_5MHz_16QAM_25_0_HighCH23825-713.5



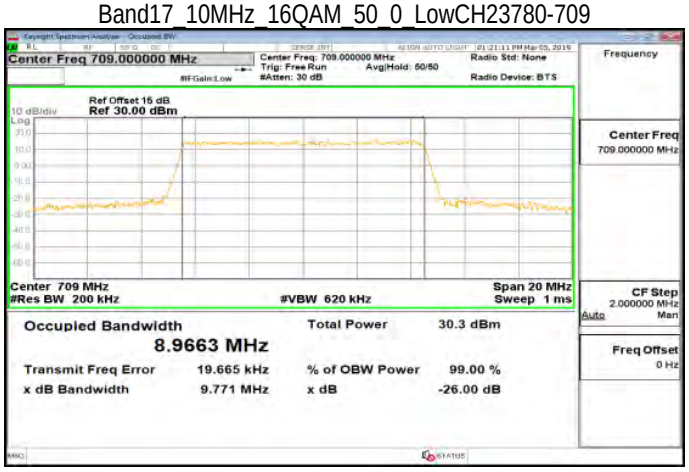
Band17_5MHz_64QAM_25_0_HighCH23825-713.5



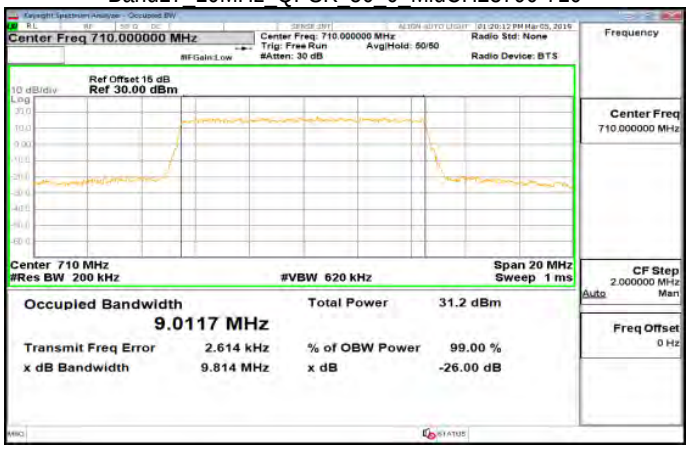
Band17_10MHz_QPSK_50_0_LowCH23780-709



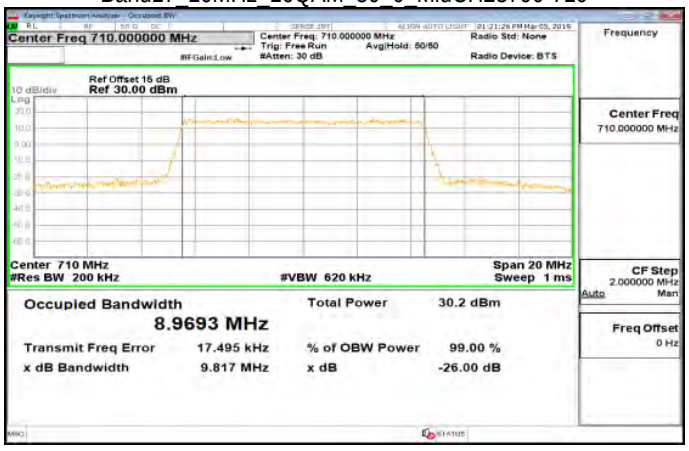
Band17_10MHz_16QAM_50_0_LowCH23780-709



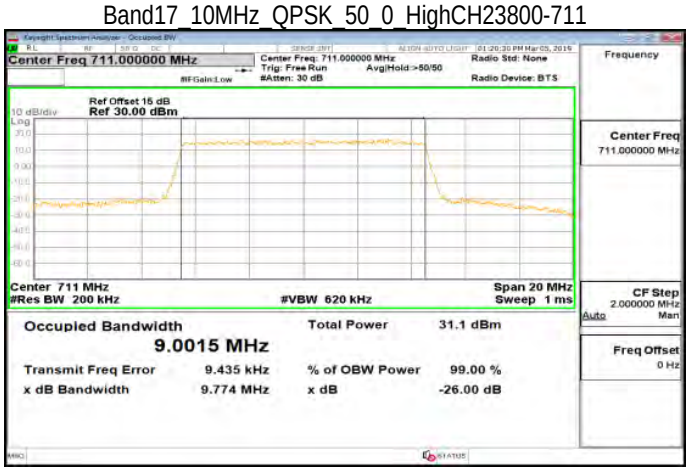
Band17_10MHz_QPSK_50_0_MidCH23790-710



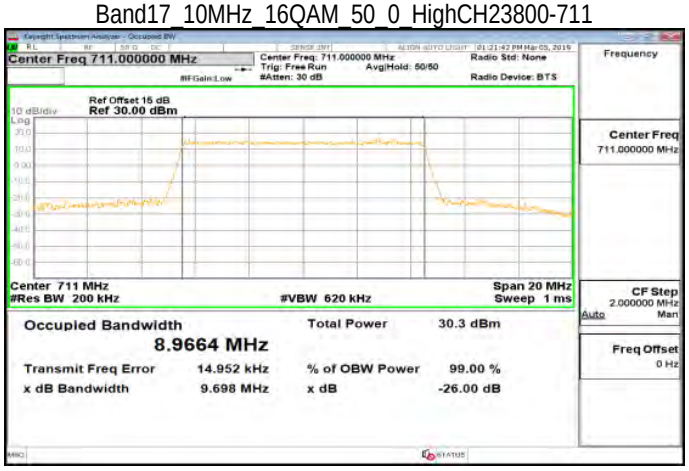
Band17_10MHz_16QAM_50_0_MidCH23790-710



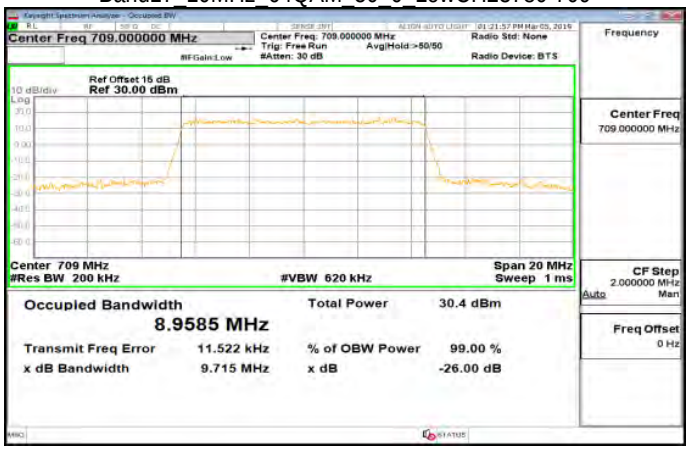
Band17_10MHz_QPSK_50_0_HighCH23800-711



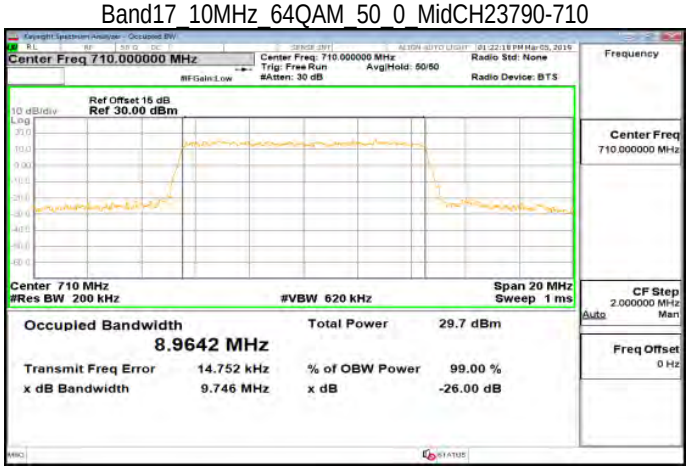
Band17_10MHz_16QAM_50_0_HighCH23800-711



Band17_10MHz_64QAM_50_0_LowCH23780-709



Band17_10MHz_64QAM_50_0_MidCH23790-710



Band17_10MHz_64QAM_50_0_HighCH23800-711