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/2018/80112
FCC ID:	APYHRO00266
FCC Rule Part:	2 , 22H & 24E & 27B, C & L
Issue Date:	Oct. 02, 2018
Date of Test:	Aug. 01, 2018 ~ Sep. 05, 2018
Date of EUT Received:	Aug. 01, 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: CHUN-CHIEH, CHEN

CHUN-CHIEH, CHEN / Asst. Supervisor

Testing Laboratory
0513

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/80112	Rev.00	Initial creation of document	All	Oct. 02, 2018	Yuri Tsai

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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
IMEI:	004401116493012 / 004401116492501

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	23.66	ERP	0.232	243KGXW
GPRS 850	24.83	ERP	0.304	243KGXW
GSM 1900	24.42	EIRP	0.277	241KGXW
GPRS 1900	26.19	EIRP	0.416	244KGXW

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band V	21.14	ERP	0.130	4M13F9W
HSDPA Band V	22.45	ERP	0.176	4M12F9W
HSUPA Band V	22.22	ERP	0.167	4M13F9W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
5	1.4	QPSK	23.28	ERP	0.213	1M09G7D
	1.4	16QAM	22.42	ERP	0.175	1M09D7W
	3	QPSK	23.11	ERP	0.205	2M70G7D
	3	16QAM	22.35	ERP	0.172	2M70D7W
	5	QPSK	24.63	ERP	0.290	4M50G7D
	5	16QAM	23.93	ERP	0.247	4M50D7W
	10	QPSK	23.16	ERP	0.207	9M01G7D
	10	16QAM	22.36	ERP	0.172	8M97D7W
17	5	QPSK	23.2	ERP	0.209	4M50G7D
	5	16QAM	22.47	ERP	0.177	4M51D7W
	10	QPSK	23.29	ERP	0.213	9M01G7D
	10	16QAM	22.75	ERP	0.188	8M96D7W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
12	1.4	QPSK	23.27	ERP	0.212	1M09G7D
	1.4	16QAM	22.27	ERP	0.169	1M10D7W
	3	QPSK	22.99	ERP	0.199	2M70G7D
	3	16QAM	22.26	ERP	0.168	2M77D7W
	5	QPSK	22.92	ERP	0.196	4M50G7D
	5	16QAM	22.25	ERP	0.168	4M50D7W
	10	QPSK	23.52	ERP	0.225	8M98G7D
	10	16QAM	22.08	ERP	0.161	8M96D7W

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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 code 0513)

FCC Registration Numbers are: 509634 / TW0001

1.6. Special Accessories

1.7. E

No special accessories were used during testing.

q

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)	0.5	21.36	21.86

2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.85	324
GSM 1900		375
WCDMA B5		634
LTE Band 5		609.380
LTE Band 12		615.670
LTE Band 17		618.160

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2.6. Configuration of Tested System

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

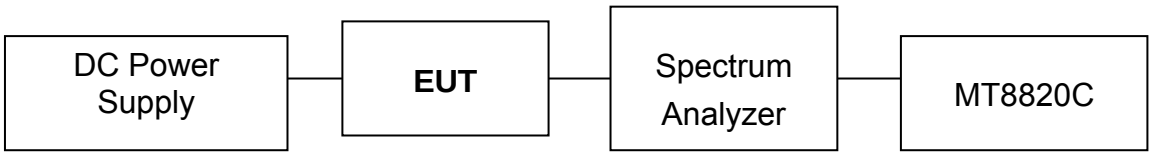
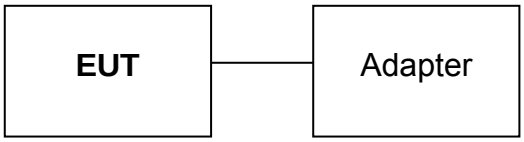


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

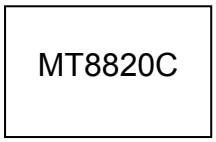


Table 2-1 Equipment Used in

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(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

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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,	1 RB/ 0,5 RB Offest
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	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,	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	Full RB
PEAK TO AVERAGE RATIO	20470 to 20643	20470, 20525, 20643	1.4MHz	16QAM	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	16QAM	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	16QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	16QAM	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	16QAM	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,	1 RB/ 0,5 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	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,	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	Full RB
PEAK TO AV-ERAGE RATIO	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	16QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	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,	1 RB/ 0,24 RB Offest
	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	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,	Full RB
	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	Full RB
PEAK TO AVERAGE RATIO	23755 to 23825	23755, 23790, 23825	5MHz	16QAM	Full RB
	23780 to 23800	23780, 23790, 23800	10MHz	16QAM	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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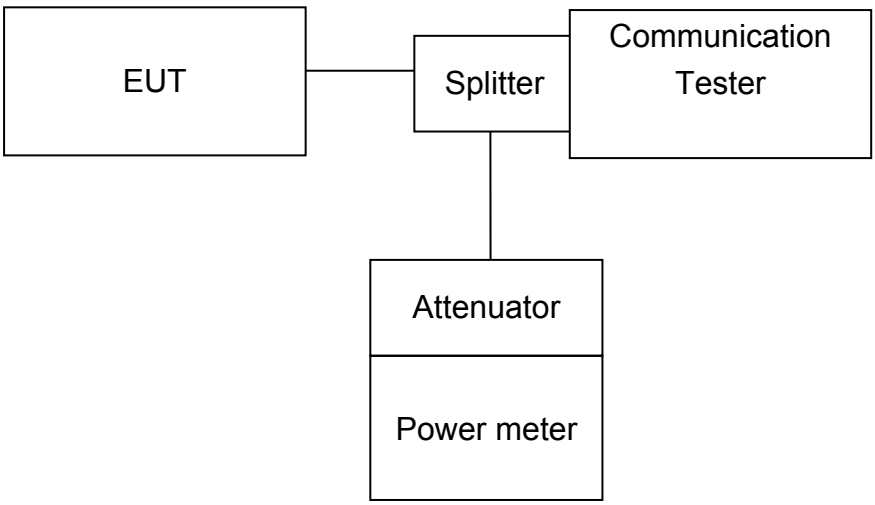
6. RF CONDUCTED OUTPUT POWER MEASUREMENT

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 NUM-BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communi-cation Analyer	Anritsu	MT8820C	6201107337	2018/06/15	2019/06/14
Radio Communi-cation Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
DC Power Supply	DHA	DPS-3003	9411005787	2018/08/14	2019/08/13
Attenuator	Marvelous	MVE2213-10	RF31	2017/12/26	2018/12/25
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25
Coaxial Cables	Woken	00100A1F1A185C	RF231	2017/12/26	2018/12/25

6.5. Measurement Result

RF Conducted Output Power

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

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

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	ERP /EIRP (dBm)	Limit (dBm)	Margin (dB)
GSM 850	824.2	128	32.61	32.61	38.50	-5.89
	836.6	190	32.57	32.57	38.50	-5.93
	848.8	251	32.59	32.59	38.50	-5.91
GSM 1900	1850.2	512	28.87	28.87	33.00	-4.13
	1880.0	661	28.88	28.88	33.00	-4.12
	1909.8	810	28.77	28.77	33.00	-4.23

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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	32.61	31.16	29.22	28.10
	836.6	190	32.57	31.07	29.20	27.79
	848.8	251	32.59	30.88	28.89	27.76
GPRS 1900	1850.2	512	28.87	26.51	24.60	23.84
	1880.0	661	28.88	26.50	24.63	23.91
	1909.8	810	28.77	26.48	24.52	23.77

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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:

WCDMA/HSUPA/HSDPA
Band V Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	826.4	4132	22.96	22.96	38.50	-15.54
	836.6	4183	22.83	22.83	38.50	-15.67
	846.6	4233	22.90	22.90	38.50	-15.60
HSDPA	826.4	4132	22.27	22.27	38.50	-16.23
	836.6	4183	22.22	22.22	38.50	-16.28
	846.6	4233	22.38	22.38	38.50	-16.12
HSUPA	826.4	4132	22.35	22.35	38.50	-16.15
	836.6	4183	22.31	22.31	38.50	-16.19
	846.6	4233	22.35	22.35	38.50	-16.15

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LTE Result:

FDD Band 5

Antenna gain (dBi) 0

LTE Band 5_Uplink frequency band : 824 to 849 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	20407	824.7	QPSK	1	0	23.16	23.16	38.45	-15.29
				1	5	23.23	23.23	38.45	-15.22
				3	2	22.35	22.35	38.45	-16.1
				6	0	22.39	22.39	38.45	-16.06
	20525	836.5	QPSK	1	0	23.00	23.00	38.45	-15.45
				1	5	23.10	23.10	38.45	-15.35
				3	2	22.34	22.34	38.45	-16.11
				6	0	22.36	22.36	38.45	-16.09
	20643	848.3	QPSK	1	0	23.28	23.28	38.45	-15.17
				1	5	22.44	22.44	38.45	-16.01
				3	2	22.43	22.43	38.45	-16.02
				6	0	22.14	22.14	38.45	-16.31
	20407	824.7	16QAM	1	0	22.42	22.42	38.45	-16.03
				1	5	22.22	22.22	38.45	-16.23
				3	2	21.55	21.55	38.45	-16.9
				6	0	21.35	21.35	38.45	-17.1
	20525	836.5	16QAM	1	0	22.26	22.26	38.45	-16.19
				1	5	22.18	22.18	38.45	-16.27
				3	2	21.26	21.26	38.45	-17.19
				6	0	21.28	21.28	38.45	-17.17
	20643	848.3	16QAM	1	0	22.36	22.36	38.45	-16.09
				1	5	21.92	21.92	38.45	-16.53
				3	2	21.15	21.15	38.45	-17.3
				6	0	21.16	21.16	38.45	-17.29

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Antenna gain (dBi) 0

LTE Band 5_Uplink frequency band : 824 to 849 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	20415	825.5	QPSK	1	0	22.83	22.83	38.45	-15.62
				1	14	22.94	22.94	38.45	-15.51
				8	4	22.40	22.40	38.45	-16.05
				15	0	22.30	22.30	38.45	-16.15
	20525	836.5	QPSK	1	0	22.98	22.98	38.45	-15.47
				1	14	22.98	22.98	38.45	-15.47
				8	4	22.34	22.34	38.45	-16.11
				15	0	22.36	22.36	38.45	-16.09
	20635	847.5	QPSK	1	0	23.11	23.11	38.45	-15.34
				1	14	22.16	22.16	38.45	-16.29
				8	4	22.31	22.31	38.45	-16.14
				15	0	22.38	22.38	38.45	-16.07
	20415	825.5	16QAM	1	0	22.32	22.32	38.45	-16.13
				1	14	22.35	22.35	38.45	-16.1
				8	4	21.33	21.33	38.45	-17.12
				15	0	21.38	21.38	38.45	-17.07
	20525	836.5	16QAM	1	0	22.25	22.25	38.45	-16.2
				1	14	21.87	21.87	38.45	-16.58
				8	4	21.25	21.25	38.45	-17.2
				15	0	21.12	21.12	38.45	-17.33
	20635	847.5	16QAM	1	0	22.28	22.28	38.45	-16.17
				1	14	21.70	21.70	38.45	-16.75
				8	4	21.26	21.26	38.45	-17.19
				15	0	21.11	21.11	38.45	-17.34

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Antenna gain (dBi) 0

LTE Band 5_Uplink frequency band : 824 to 849 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	20425	826.5	QPSK	1	0	24.55	24.55	38.45	-13.9
				1	24	24.52	24.52	38.45	-13.93
				12	6	23.38	23.38	38.45	-15.07
				25	0	23.39	23.39	38.45	-15.06
	20525	836.5	QPSK	1	0	24.57	24.57	38.45	-13.88
				1	24	24.46	24.46	38.45	-13.99
				12	6	23.46	23.46	38.45	-14.99
				25	0	23.49	23.49	38.45	-14.96
	20625	846.5	QPSK	1	0	24.59	24.59	38.45	-13.86
				1	24	24.63	24.63	38.45	-13.82
				12	6	23.57	23.57	38.45	-14.88
				25	0	23.58	23.58	38.45	-14.87
	20425	826.5	16QAM	1	0	23.82	23.82	38.45	-14.63
				1	24	23.83	23.83	38.45	-14.62
				12	6	22.47	22.47	38.45	-15.98
				25	0	22.43	22.43	38.45	-16.02
	20525	836.5	16QAM	1	0	23.80	23.80	38.45	-14.65
				1	24	23.73	23.73	38.45	-14.72
				12	6	22.51	22.51	38.45	-15.94
				25	0	22.49	22.49	38.45	-15.96
	20625	846.5	16QAM	1	0	23.91	23.91	38.45	-14.54
				1	24	23.93	23.93	38.45	-14.52
				12	6	22.66	22.66	38.45	-15.79
				25	0	22.62	22.62	38.45	-15.83

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Antenna gain (dBi) 0

LTE Band 5_Uplink frequency band : 824 to 849 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20450	829	QPSK	1	0	23.05	23.05	38.45	-15.4
				1	49	23.03	23.03	38.45	-15.42
				25	12	22.36	22.36	38.45	-16.09
				50	0	22.37	22.37	38.45	-16.08
	20525	836.5	QPSK	1	0	23.13	23.13	38.45	-15.32
				1	49	23.16	23.16	38.45	-15.29
				25	12	22.35	22.35	38.45	-16.1
				50	0	22.27	22.27	38.45	-16.18
	20600	844	QPSK	1	0	22.91	22.91	38.45	-15.54
				1	49	22.27	22.27	38.45	-16.18
				25	12	22.47	22.47	38.45	-15.98
				50	0	22.27	22.27	38.45	-16.18
	20450	829	16QAM	1	0	22.30	22.30	38.45	-16.15
				1	49	22.34	22.34	38.45	-16.11
				25	12	21.53	21.53	38.45	-16.92
				50	0	21.06	21.06	38.45	-17.39
	20525	836.5	16QAM	1	0	22.35	22.35	38.45	-16.1
				1	49	22.36	22.36	38.45	-16.09
				25	12	21.29	21.29	38.45	-17.16
				50	0	21.40	21.40	38.45	-17.05
	20600	844	16QAM	1	0	22.23	22.23	38.45	-16.22
				1	49	21.83	21.83	38.45	-16.62
				25	12	21.29	21.29	38.45	-17.16
				50	0	21.36	21.36	38.45	-17.09

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FDD Band 12

Antenna gain (dBi) 0

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	22.70	22.70	34.77	-12.07
				1	5	22.70	22.70	34.77	-12.07
				3	2	22.76	22.76	34.77	-12.01
				6	0	21.99	21.99	34.77	-12.78
	23095	707.5	QPSK	1	0	23.11	23.11	34.77	-11.66
				1	5	22.86	22.86	34.77	-11.91
				3	2	22.99	22.99	34.77	-11.78
				6	0	22.02	22.02	34.77	-12.75
	23173	715.5	QPSK	1	0	22.83	22.83	34.77	-11.94
				1	5	22.70	22.70	34.77	-12.07
				3	2	23.27	23.27	34.77	-11.5
				6	0	21.94	21.94	34.77	-12.83
	23017	699.7	16QAM	1	0	21.63	21.63	34.77	-13.14
				1	5	21.68	21.68	34.77	-13.09
				3	2	21.87	21.87	34.77	-12.9
				6	0	20.47	20.47	34.77	-14.3
	23095	707.5	16QAM	1	0	22.27	22.27	34.77	-12.5
				1	5	21.82	21.82	34.77	-12.95
				3	2	22.03	22.03	34.77	-12.74
				6	0	20.88	20.88	34.77	-13.89
	23173	715.5	16QAM	1	0	21.73	21.73	34.77	-13.04
				1	5	21.85	21.85	34.77	-12.92
				3	2	21.97	21.97	34.77	-12.8
				6	0	20.69	20.69	34.77	-14.08

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Antenna gain (dBi) 0

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	22.49	22.49	34.77	-12.28
				1	14	22.58	22.58	34.77	-12.19
				8	4	21.90	21.90	34.77	-12.87
				15	0	21.84	21.84	34.77	-12.93
	23095	707.5	QPSK	1	0	22.99	22.99	34.77	-11.78
				1	14	22.65	22.65	34.77	-12.12
				8	4	22.16	22.16	34.77	-12.61
				15	0	22.12	22.12	34.77	-12.65
	23165	714.5	QPSK	1	0	22.63	22.63	34.77	-12.14
				1	14	22.92	22.92	34.77	-11.85
				8	4	22.09	22.09	34.77	-12.68
				15	0	21.92	21.92	34.77	-12.85
	23025	700.5	16QAM	1	0	21.99	21.99	34.77	-12.78
				1	14	22.12	22.12	34.77	-12.65
				8	4	20.94	20.94	34.77	-13.83
				15	0	20.93	20.93	34.77	-13.84
	23095	707.5	16QAM	1	0	22.26	22.26	34.77	-12.51
				1	14	22.07	22.07	34.77	-12.7
				8	4	21.07	21.07	34.77	-13.7
				15	0	20.89	20.89	34.77	-13.88
	23165	714.5	16QAM	1	0	21.88	21.88	34.77	-12.89
				1	14	22.00	22.00	34.77	-12.77
				8	4	20.86	20.86	34.77	-13.91
				15	0	20.60	20.60	34.77	-14.17

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Antenna gain (dBi) 0

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	22.72	22.72	34.77	-12.05
				1	24	22.89	22.89	34.77	-11.88
				12	6	22.09	22.09	34.77	-12.68
				25	0	21.87	21.87	34.77	-12.9
	23095	707.5	QPSK	1	0	22.92	22.92	34.77	-11.85
				1	24	22.55	22.55	34.77	-12.22
				12	6	22.09	22.09	34.77	-12.68
				25	0	22.10	22.10	34.77	-12.67
	23155	713.5	QPSK	1	0	22.49	22.49	34.77	-12.28
				1	24	22.89	22.89	34.77	-11.88
				12	6	22.02	22.02	34.77	-12.75
				25	0	22.03	22.03	34.77	-12.74
	23035	701.5	16QAM	1	0	21.47	21.47	34.77	-13.3
				1	24	22.05	22.05	34.77	-12.72
				12	6	20.98	20.98	34.77	-13.79
				25	0	20.93	20.93	34.77	-13.84
	23095	707.5	16QAM	1	0	22.25	22.25	34.77	-12.52
				1	24	21.85	21.85	34.77	-12.92
				12	6	21.03	21.03	34.77	-13.74
				25	0	21.09	21.09	34.77	-13.68
	23155	713.5	16QAM	1	0	21.95	21.95	34.77	-12.82
				1	24	21.59	21.59	34.77	-13.18
				12	6	21.02	21.02	34.77	-13.75
				25	0	21.11	21.11	34.77	-13.66

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Antenna gain (dBi) 0

LTE Band 12_Uplink frequency band : 699 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	23.21	23.21	34.77	-11.56
				1	49	23.52	23.52	34.77	-11.25
				25	12	22.10	22.10	34.77	-12.67
				50	0	22.04	22.04	34.77	-12.73
	23095	707.5	QPSK	1	0	23.04	23.04	34.77	-11.73
				1	49	23.31	23.31	34.77	-11.46
				25	12	22.14	22.14	34.77	-12.63
				50	0	21.95	21.95	34.77	-12.82
	23130	711	QPSK	1	0	23.11	23.11	34.77	-11.66
				1	49	23.25	23.25	34.77	-11.52
				25	12	22.10	22.10	34.77	-12.67
				50	0	22.05	22.05	34.77	-12.72
	23060	704	16QAM	1	0	21.98	21.98	34.77	-12.79
				1	49	22.08	22.08	34.77	-12.69
				25	12	21.09	21.09	34.77	-13.68
				50	0	21.03	21.03	34.77	-13.74
	23095	707.5	16QAM	1	0	21.91	21.91	34.77	-12.86
				1	49	21.91	21.91	34.77	-12.86
				25	12	21.25	21.25	34.77	-13.52
				50	0	21.14	21.14	34.77	-13.63
	23130	711	16QAM	1	0	22.06	22.06	34.77	-12.71
				1	49	22.04	22.04	34.77	-12.73
				25	12	21.32	21.32	34.77	-13.45
				50	0	21.17	21.17	34.77	-13.6

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FDD Band 17

Antenna gain (dBi) 0

LTE Band 17_Uplink frequency band : 704 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23755	706.5	QPSK	1	0	22.78	22.78	34.77	-11.99
				1	24	22.37	22.37	34.77	-12.4
				12	6	21.66	21.66	34.77	-13.11
				25	0	21.65	21.65	34.77	-13.12
	23790	710	QPSK	1	0	22.21	22.21	34.77	-12.56
				1	24	22.43	22.43	34.77	-12.34
				12	6	21.69	21.69	34.77	-13.08
				25	0	21.61	21.61	34.77	-13.16
	23825	713.5	QPSK	1	0	22.14	22.14	34.77	-12.63
				1	24	23.20	23.20	34.77	-11.57
				12	6	21.71	21.71	34.77	-13.06
				25	0	21.61	21.61	34.77	-13.16
	23755	706.5	16QAM	1	0	22.20	22.20	34.77	-12.57
				1	24	21.51	21.51	34.77	-13.26
				12	6	20.99	20.99	34.77	-13.78
				25	0	21.06	21.06	34.77	-13.71
	23790	710	16QAM	1	0	21.61	21.61	34.77	-13.16
				1	24	21.64	21.64	34.77	-13.13
				12	6	21.09	21.09	34.77	-13.68
				25	0	20.87	20.87	34.77	-13.9
	23825	713.5	16QAM	1	0	21.66	21.66	34.77	-13.11
				1	24	22.47	22.47	34.77	-12.3
				12	6	20.96	20.96	34.77	-13.81
				25	0	21.35	21.35	34.77	-13.42

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Antenna gain (dBi) 0

LTE Band 17_Uplink frequency band : 704 to 716 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23780	709	QPSK	1	0	22.80	22.80	34.77	-11.97
				1	49	23.29	23.29	34.77	-11.48
				25	12	21.74	21.74	34.77	-13.03
				50	0	21.68	21.68	34.77	-13.09
	23790	710	QPSK	1	0	22.69	22.69	34.77	-12.08
				1	49	23.11	23.11	34.77	-11.66
				25	12	21.56	21.56	34.77	-13.21
				50	0	21.62	21.62	34.77	-13.15
	23800	711	QPSK	1	0	22.34	22.34	34.77	-12.43
				1	49	23.21	23.21	34.77	-11.56
				25	12	21.48	21.48	34.77	-13.29
				50	0	21.87	21.87	34.77	-12.9
	23780	709	16QAM	1	0	22.15	22.15	34.77	-12.62
				1	49	22.75	22.75	34.77	-12.02
				25	12	21.10	21.10	34.77	-13.67
				50	0	21.31	21.31	34.77	-13.46
	23790	710	16QAM	1	0	21.96	21.96	34.77	-12.81
				1	49	22.15	22.15	34.77	-12.62
				25	12	20.98	20.98	34.77	-13.79
				50	0	21.13	21.13	34.77	-13.64
	23800	711	16QAM	1	0	21.44	21.44	34.77	-13.33
				1	49	22.63	22.63	34.77	-12.14
				25	12	20.92	20.92	34.77	-13.85
				50	0	20.99	20.99	34.77	-13.78

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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
		4132.00	4183.00	4233.00		
HSDPA V	1	22.27	22.22	22.38	20.3dBm – 25.7dBm	Pass
	2	21.79	21.75	21.98	20.3dBm – 25.7dBm	Pass
	3	21.79	21.78	21.98	19.8dBm – 25.7dBm	Pass
	4	21.78	21.75	21.97	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	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			Power Class 3 Limitation (dBm)	Comments
		4132.00	4183.00	4233.00		
HSUPA V	1	22.35	22.31	22.35	18.8dBm – 25.7dBm	Pass
	2	20.38	20.21	20.31	16.8dBm – 25.7dBm	Pass
	3	21.32	21.32	21.32	17.8dBm – 25.7dBm	Pass
	4	20.40	20.28	20.30	16.8dBm – 25.7dBm	Pass
	5	22.20	22.19	22.23	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)	29.17	27.25	25.34	23.74	21.62	19.87	17.34	15.28	13.22

PCL	9	10	11	12	13	14	15
Output power (dBm)	11.19	9.83	7.51	5.22	3.71	1.52	-1.29

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.

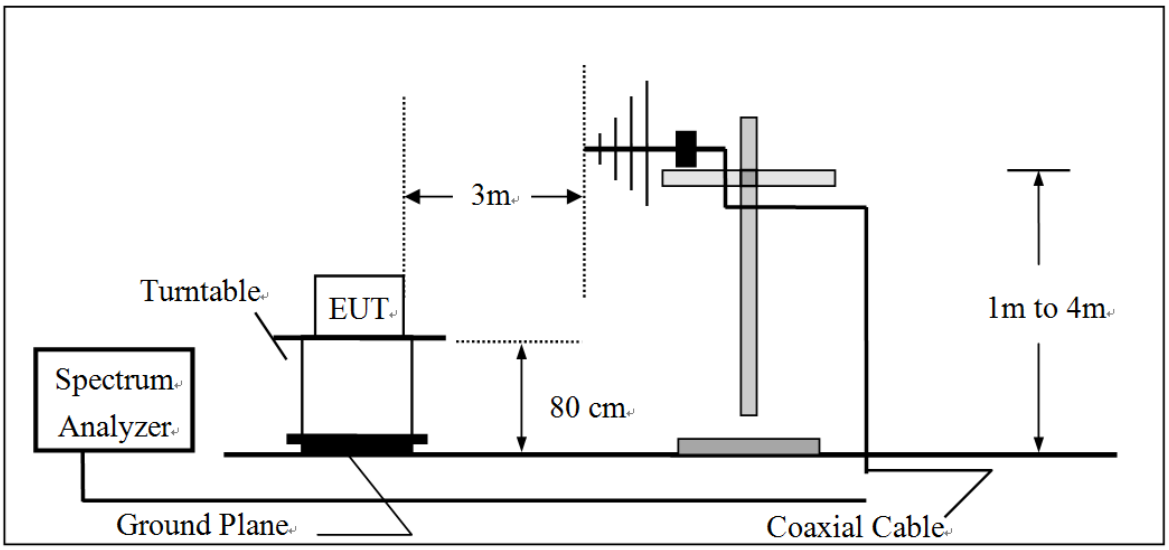
FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

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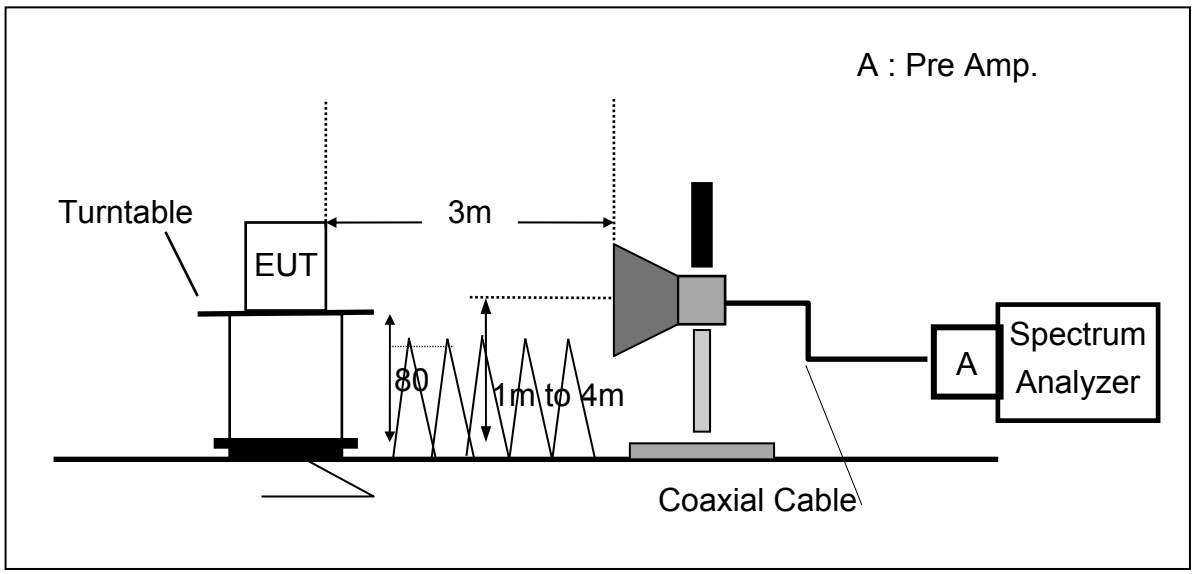
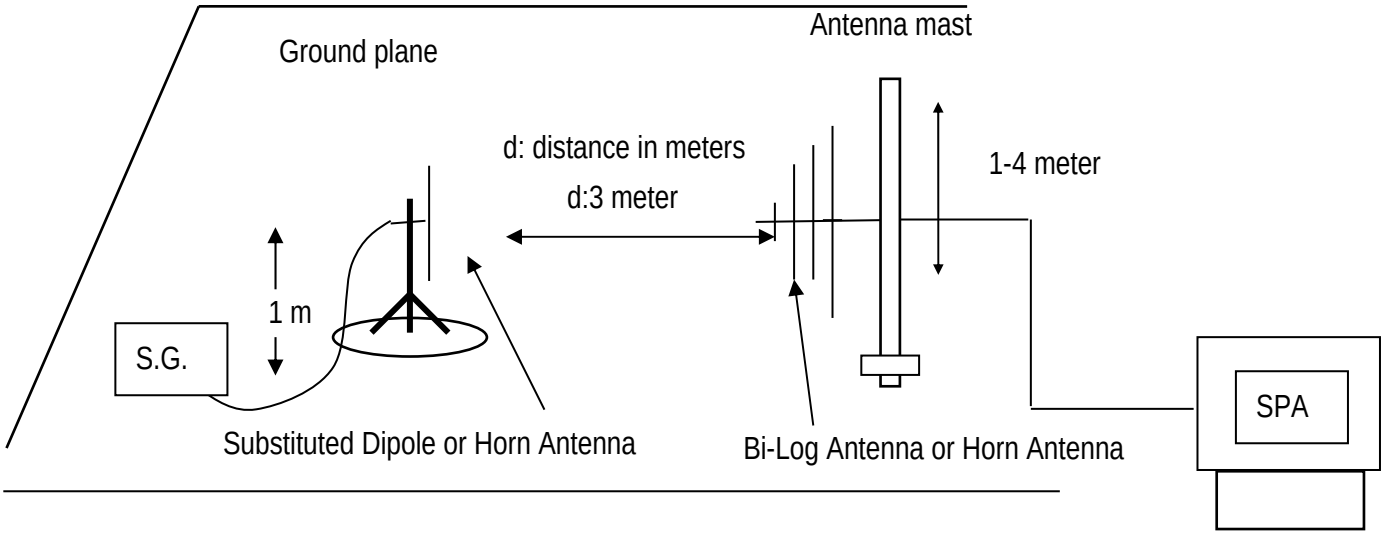
(B) Radiated Power Test Set-UP Frequency Over 1 GHz



(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
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2019/08/03
Horn Antenna	Schwarzbeck	BBHA9170	184	2017/12/12	2018/12/11
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/09/25
Loop Antenna	ETS.LINDGREN	6502	148045	2018/09/26	2019/09/25
3m Site NSA	SGS	966 chamber	N/A	2018/01/02	2019/01/01
Spectrum Analyzer	Agilent	E4446A	MY51100003	2018/05/15	2019/05/14
EMI Test Receiver	R&S	ESCI7	100335	2018/02/02	2019/02/01
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Pre-Amplifier	EMC Instru-ments	EMC184045B	980135	2017/10/27	2018/10/26
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	2018/01/02	2019/01/01
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	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	18.44	3.45	-3.11	18.78	38.45
			H	17.26	3.45	-3.11	17.6	38.45
	836.6	190	V	15.49	3.45	-3.32	15.62	38.45
			H	21.04	3.45	-3.32	21.17	38.45
	848.8	251	V	23.37	3.46	-3.17	23.66	38.45
			H	20.39	3.46	-3.17	20.68	38.45
GPRS 850	824.2	128	V	20.5	3.45	-3.11	20.84	38.45
			H	19.82	3.45	-3.11	20.16	38.45
	836.6	190	V	20.52	3.45	-3.32	20.65	38.45
			H	23.93	3.45	-3.32	24.06	38.45
	848.8	251	V	24.53	3.46	-3.16	24.83	38.45
			H	22.83	3.46	-3.16	23.13	38.45

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

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
GSM 1900	1850.2	512	V	16.33	9.77	-4.66	21.44	33.00
			H	16.62	9.77	-4.66	21.73	33.00
	1880.0	661	V	14.8	9.86	-4.7	19.96	33.00
			H	19.26	9.86	-4.7	24.42	33.00
	1909.8	810	V	17.3	9.94	-4.72	22.52	33.00
			H	19.11	9.94	-4.72	24.33	33.00
GPRS 1900	1850.2	512	V	20.38	9.77	-4.66	25.49	33.00
			H	21.07	9.77	-4.66	26.18	33.00
	1880.0	661	V	18.4	9.86	-4.7	23.56	33.00
			H	19.79	9.86	-4.7	24.95	33.00
	1909.8	810	V	19.5	9.94	-4.72	24.72	33.00
			H	20.97	9.94	-4.72	26.19	33.00

Remark： (1)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	20.86	3.45	-3.17	21.14	38.45
			H	19.7	3.45	-3.19	19.96	38.45
	836.6	4183	V	20.31	3.45	-3.31	20.45	38.45
			H	18.63	3.45	-3.31	18.77	38.45
	846.6	4233	V	18.68	3.46	-3.34	18.8	38.45
			H	18.07	3.46	-3.34	18.19	38.45
HSDPA Band V	826.4	4132	V	22.17	3.45	-3.17	22.45	38.45
			H	20.61	3.45	-3.19	20.87	38.45
	836.6	4183	V	21.99	3.45	-3.31	22.13	38.45
			H	19.86	3.45	-3.31	20	38.45
	846.6	4233	V	19.67	3.46	-3.34	19.79	38.45
			H	18.48	3.46	-3.34	18.6	38.45
HSUPA Band V	826.4	4132	V	21.94	3.45	-3.17	22.22	38.45
			H	19.88	3.45	-3.19	20.14	38.45
	836.6	4183	V	21.76	3.45	-3.31	21.9	38.45
			H	19.86	3.45	-3.31	20	38.45
	846.6	4233	V	19.31	3.46	-3.34	19.43	38.45
			H	17.69	3.46	-3.34	17.81	38.45

Remark： (1)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
LTE BAND 5 BW: 1.4M QPSK RB: 1,0	824.7	20407	V	19.2	3.45	-3.17	19.48	38.45
			H	15.4	3.45	-3.17	15.68	38.45
	836.5	20525	V	20.21	3.45	-3.29	20.37	38.45
			H	15.76	3.45	-3.28	15.93	38.45
	848.3	20643	V	18.64	3.46	-3.35	18.75	38.45
			H	15.49	3.46	-3.36	15.59	38.45
LTE BAND 5 BW: 1.4M QPSK RB: 1,5	824.7	20407	V	18.3	3.45	-3.11	18.64	38.45
			H	14.63	3.45	-3.11	14.97	38.45
	836.5	20525	V	19.09	3.45	-3.3	19.24	38.45
			H	15.84	3.45	-3.29	16	38.45
	848.3	20643	V	18.7	3.46	-3.3	18.86	38.45
			H	16.95	3.46	-3.3	17.11	38.45
LTE BAND 5 BW: 1.4M 16QAM RB: 1,0	824.7	20407	V	19.33	3.45	-3.17	19.61	38.45
			H	15.91	3.45	-3.17	16.19	38.45
	836.5	20525	V	19.72	3.45	-3.29	19.88	38.45
			H	17.47	3.45	-3.29	17.63	38.45
	848.3	20643	V	19.41	3.46	-3.35	19.52	38.45
			H	15.85	3.46	-3.35	15.96	38.45
LTE BAND 5 BW: 1.4M 16QAM RB: 1,5	824.7	20407	V	18.83	3.45	-3.1	19.18	38.45
			H	14.39	3.45	-3.1	14.74	38.45
	836.5	20525	V	20.87	3.45	-3.3	21.02	38.45
			H	17.15	3.45	-3.3	17.3	38.45
	848.3	20643	V	19.82	3.46	-3.27	20.01	38.45
			H	16.88	3.46	-3.28	17.06	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	19.97	3.45	-3.17	20.25	38.45
			H	14.48	3.45	-3.17	14.76	38.45
	836.5	20525	V	19.22	3.45	-3.28	19.39	38.45
			H	17.03	3.45	-3.28	17.2	38.45
	847.5	20635	V	18.29	3.46	-3.42	18.33	38.45
			H	17.33	3.46	-3.42	17.37	38.45
LTE BAND 5 BW: 3M QPSK RB: 1,14	825.5	20415	V	18.99	3.45	-3.16	19.28	38.45
			H	15.19	3.45	-3.16	15.48	38.45
	836.5	20525	V	19.49	3.45	-3.31	19.63	38.45
			H	16.78	3.45	-3.31	16.92	38.45
	847.5	20635	V	18.43	3.46	-3.29	18.6	38.45
			H	16.22	3.46	-3.3	16.38	38.45
LTE BAND 5 BW: 3M 16QAM RB: 1,0	825.5	20415	V	20.08	3.45	-3.17	20.36	38.45
			H	15.91	3.45	-3.17	16.19	38.45
	836.5	20525	V	21.34	3.45	-3.28	21.51	38.45
			H	17.26	3.45	-3.28	17.43	38.45
	847.5	20635	V	19.04	3.46	-3.43	19.07	38.45
			H	17.12	3.46	-3.42	17.16	38.45
LTE BAND 5 BW: 3M 16QAM RB: 1,14	825.5	20415	V	19.12	3.45	-3.15	19.42	38.45
			H	15.07	3.45	-3.16	15.36	38.45
	836.5	20525	V	20.78	3.45	-3.31	20.92	38.45
			H	18.13	3.45	-3.31	18.27	38.45
	847.5	20635	V	20.08	3.46	-3.3	20.24	38.45
			H	17.83	3.46	-3.29	18	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	19.5	3.45	-3.18	19.77	38.45
			H	15.25	3.45	-3.18	15.52	38.45
	836.5	20525	V	20.19	3.45	-3.26	20.38	38.45
			H	16.24	3.45	-3.27	16.42	38.45
	846.5	20625	V	18.85	3.46	-3.4	18.91	38.45
			H	17.32	3.46	-3.4	17.38	38.45
LTE BAND 5 BW: 5M QPSK RB: 1,24	826.5	20425	V	18.31	3.45	-3.19	18.57	38.45
			H	16.22	3.45	-3.18	16.49	38.45
	836.5	20525	V	18.87	3.45	-3.32	19	38.45
			H	16.5	3.45	-3.32	16.63	38.45
	846.5	20625	V	19.29	3.46	-3.28	19.47	38.45
			H	16.59	3.46	-3.3	16.75	38.45
LTE BAND 5 BW: 5M 16QAM RB: 1,0	826.5	20425	V	20.39	3.45	-3.17	20.67	38.45
			H	16.62	3.45	-3.17	16.9	38.45
	836.5	20525	V	20.62	3.45	-3.27	20.8	38.45
			H	16.98	3.45	-3.26	17.17	38.45
	846.5	20625	V	18.85	3.46	-3.4	18.91	38.45
			H	17.3	3.46	-3.4	17.36	38.45
LTE BAND 5 BW: 5M 16QAM RB: 1,24	826.5	20425	V	19.22	3.45	-3.18	19.49	38.45
			H	14.61	3.45	-3.18	14.88	38.45
	836.5	20525	V	20.51	3.45	-3.32	20.64	38.45
			H	18.03	3.45	-3.32	18.16	38.45
	846.5	20625	V	19.71	3.46	-3.29	19.88	38.45
			H	17.08	3.46	-3.29	17.25	38.45

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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	19.44	3.45	-3.18	19.71	38.45
			H	-5.8	3.45	-3.18	-5.53	38.45
	836.5	20525	V	19.99	3.45	-3.23	20.21	38.45
			H	16.18	3.45	-3.24	16.39	38.45
	844.0	20600	V	19.05	3.46	-3.33	19.18	38.45
			H	16.33	3.46	-3.33	16.46	38.45
LTE BAND 5 BW: 10M QPSK RB: 1,49	829.0	20450	V	19.02	3.45	-3.25	19.22	38.45
			H	16.68	3.45	-3.25	16.88	38.45
	836.5	20525	V	18.68	3.46	-3.35	18.79	38.45
			H	15.69	3.46	-3.35	15.8	38.45
	844.0	20600	V	17.27	3.46	-3.33	17.4	38.45
			H	16.64	3.46	-3.32	16.78	38.45
LTE BAND 5 BW: 10M 16QAM RB: 1,0	829.0	20450	V	19.76	3.45	-3.18	20.03	38.45
			H	16.69	3.45	-3.18	16.96	38.45
	836.5	20525	V	15.06	3.45	-3.23	15.28	38.45
			H	17.25	3.45	-3.23	17.47	38.45
	844.0	20600	V	20.7	3.46	-3.33	20.83	38.45
			H	17.58	3.46	-3.34	17.7	38.45
LTE BAND 5 BW: 10M 16QAM RB: 1,49	829.0	20450	V	20.2	3.45	-3.25	20.4	38.45
			H	16.77	3.45	-3.25	16.97	38.45
	836.5	20525	V	20.42	3.46	-3.35	20.53	38.45
			H	16.79	3.46	-3.35	16.9	38.45
	844.0	20600	V	17.67	3.46	-3.28	17.85	38.45
			H	17.15	3.46	-3.31	17.3	38.45

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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	19.82	3.67	-2.1	21.39	24.77
			H	13.13	3.67	-2.09	14.71	24.77
	707.5	23095	V	19.89	3.65	-1.82	21.72	24.77
			H	14.97	3.65	-1.83	16.79	24.77
	715.3	23173	V	20.12	3.62	-2.3	21.44	24.77
			H	14.96	3.62	-2.31	16.27	24.77
LTE BAND 12 BW: 1.4M QPSK RB: 1,5	699.7	23017	V	19.43	3.68	-2.26	20.85	24.77
			H	14.32	3.67	-2.03	15.96	24.77
	707.5	23095	V	20.43	3.65	-1.88	22.2	24.77
			H	15.21	3.65	-1.87	16.99	24.77
	715.3	23173	V	20.43	3.62	-2.36	21.69	24.77
			H	14.78	3.62	-2.37	16.03	24.77
LTE BAND 12 BW: 1.4M 16QAM RB: 1,0	699.7	23017	V	19.67	3.67	-2.11	21.23	24.77
			H	14.24	3.67	-2.09	15.82	24.77
	707.5	23095	V	21.26	3.65	-1.81	23.1	24.77
			H	16.65	3.65	-1.81	18.49	24.77
	715.3	23173	V	21.31	3.62	-2.31	22.62	24.77
			H	15.35	3.62	-2.3	16.67	24.77
LTE BAND 12 BW: 1.4M 16QAM RB: 1,5	699.7	23017	V	20.26	3.68	-2.26	21.68	24.77
			H	14.48	3.67	-2.04	16.11	24.77
	707.5	23095	V	21.04	3.65	-1.87	22.82	24.77
			H	15.26	3.65	-1.89	17.02	24.77
	715.3	23173	V	20.67	3.62	-2.36	21.93	24.77
			H	14.83	3.62	-2.37	16.08	24.77

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

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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	18.82	3.67	-2.12	20.37	24.77
			H	14.27	3.67	-2.11	15.83	24.77
	707.5	23095	V	20.76	3.66	-1.83	22.59	24.77
			H	15.08	3.66	-1.83	16.91	24.77
	714.5	23165	V	20.57	3.63	-2.21	21.99	24.77
			H	14.57	3.63	-2.23	15.97	24.77
LTE BAND 12 BW: 3M QPSK RB: 1,14	700.5	23025	V	19.4	3.68	-2.19	20.89	24.77
			H	14.34	3.67	-2.16	15.85	24.77
	707.5	23095	V	20.54	3.65	-1.92	22.27	24.77
			H	14.54	3.65	-1.94	16.25	24.77
	714.5	23165	V	19.74	3.62	-2.35	21.01	24.77
			H	13.67	3.62	-2.35	14.94	24.77
LTE BAND 12 BW: 3M 16QAM RB: 1,0	700.5	23025	V	20.1	3.67	-2.11	21.66	24.77
			H	14.68	3.67	-2.11	16.24	24.77
	707.5	23095	V	21.4	3.66	-1.82	23.24	24.77
			H	14.58	3.66	-1.83	16.41	24.77
	714.5	23165	V	20.07	3.63	-2.21	21.49	24.77
			H	15.51	3.63	-2.21	16.93	24.77
LTE BAND 12 BW: 3M 16QAM RB: 1,14	700.5	23025	V	20.84	3.67	-2.18	22.33	24.77
			H	15.19	3.67	-2.17	16.69	24.77
	707.5	23095	V	20.91	3.65	-1.93	22.63	24.77
			H	15.29	3.65	-1.93	17.01	24.77
	714.5	23165	V	19.9	3.62	-2.37	21.15	24.77
			H	15.65	3.62	-2.37	16.9	24.77

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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	19.24	3.67	-2.11	20.8	24.77
			H	13.95	3.67	-2.08	15.54	24.77
	707.5	23095	V	20.41	3.66	-1.89	22.18	24.77
			H	14.56	3.66	-1.89	16.33	24.77
	713.5	23155	V	20.03	3.64	-2.08	21.59	24.77
			H	14.43	3.63	-2.1	15.96	24.77
LTE BAND 12 BW: 5M QPSK RB: 1,24	701.5	23035	V	20.14	3.67	-2.03	21.78	24.77
			H	14.02	3.67	-2.05	15.64	24.77
	707.5	23095	V	19.43	3.64	-1.97	21.1	24.77
			H	14.66	3.64	-2	16.3	24.77
	713.5	23155	V	19.78	3.62	-2.35	21.05	24.77
			H	14.7	3.62	-2.36	15.96	24.77
LTE BAND 12 BW: 5M 16QAM RB: 1,0	701.5	23035	V	19.83	3.67	-2.1	21.4	24.77
			H	13.92	3.67	-2.09	15.5	24.77
	707.5	23095	V	20.77	3.66	-1.9	22.53	24.77
			H	15.45	3.66	-1.9	17.21	24.77
	713.5	23155	V	19.97	3.64	-2.09	21.52	24.77
			H	14.81	3.64	-2.09	16.36	24.77
LTE BAND 12 BW: 5M 16QAM RB: 1,24	701.5	23035	V	20.84	3.67	-2.02	22.49	24.77
			H	14.55	3.65	-1.82	16.38	24.77
	707.5	23095	V	20.22	3.64	-1.99	21.87	24.77
			H	14.67	3.64	-1.99	16.32	24.77
	713.5	23155	V	20.76	3.62	-2.36	22.02	24.77
			H	15.65	3.62	-2.37	16.9	24.77

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	18.86	3.67	-2.09	20.44	24.77
			H	13.9	3.67	-2.07	15.5	24.77
	707.5	23095	V	19.03	3.67	-2.09	20.61	24.77
			H	13.04	3.65	-1.8	14.89	24.77
	711.0	23130	V	19.39	3.65	-1.8	21.24	24.77
			H	13.27	3.65	-1.8	15.12	24.77
LTE BAND 12 BW: 10M QPSK RB: 1,49	704.0	23060	V	19.65	3.65	-1.9	21.4	24.77
			H	13.67	3.65	-1.9	15.42	24.77
	707.5	23095	V	20.04	3.63	-2.12	21.55	24.77
			H	14.38	3.63	-2.13	15.88	24.77
	711.0	23130	V	18.4	3.62	-2.34	19.68	24.77
			H	12.95	3.62	-2.37	14.2	24.77
LTE BAND 12 BW: 10M 16QAM RB: 1,0	704.0	23060	V	20.1	3.67	-2.08	21.69	24.77
			H	13.57	3.67	-2.07	15.17	24.77
	707.5	23095	V	20.42	3.67	-2.07	22.02	24.77
			H	14.09	3.65	-1.82	15.92	24.77
	711.0	23130	V	21.19	3.66	-1.83	23.02	24.77
			H	15.02	3.66	-1.83	16.85	24.77
LTE BAND 12 BW: 10M 16QAM RB: 1,49	704.0	23060	V	19.76	3.65	-1.91	21.5	24.77
			H	15.38	3.65	-1.9	17.13	24.77
	707.5	23095	V	19.82	3.63	-2.12	21.33	24.77
			H	15.3	3.63	-2.13	16.8	24.77
	711.0	23130	V	19.42	3.62	-2.34	20.7	24.77
			H	13.83	3.62	-2.34	15.11	24.77

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	18.79	3.65	-1.86	20.58	34.77
			H	14.05	3.65	-1.86	15.84	34.77
	710.0	23790	V	19.67	3.65	-1.87	21.45	34.77
			H	14.03	3.65	-1.88	15.8	34.77
	713.5	23825	V	19.23	3.64	-2.09	20.78	34.77
			H	14.09	3.64	-2.08	15.65	34.77
LTE BAND 17 BW: 5M QPSK RB: 1,24	706.5	23755	V	19.37	3.65	-1.92	21.1	34.77
			H	13.68	3.65	-1.94	15.39	34.77
	710.0	23790	V	19.67	3.63	-2.14	21.16	34.77
			H	13.82	3.63	-2.15	15.3	34.77
	713.5	23825	V	19.73	3.62	-2.36	20.99	34.77
			H	14.24	3.62	-2.36	15.5	34.77
LTE BAND 17 BW: 5M 16QAM RB: 1,0	706.5	23755	V	20.3	3.65	-1.85	22.1	34.77
			H	15.1	3.65	-1.87	16.88	34.77
	710.0	23790	V	20.22	3.65	-1.87	22	34.77
			H	14.34	3.65	-1.87	16.12	34.77
	713.5	23825	V	20.02	3.64	-2.09	21.57	34.77
			H	15.04	3.64	-2.09	16.59	34.77
LTE BAND 17 BW: 5M 16QAM RB: 1,24	706.5	23755	V	19.58	3.65	-1.93	21.3	34.77
			H	15.18	3.65	-1.92	16.91	34.77
	710.0	23790	V	19.77	3.63	-2.14	21.26	34.77
			H	14.94	3.63	-2.15	16.42	34.77
	713.5	23825	V	20.12	3.62	-2.35	21.39	34.77
			H	14.74	3.62	-2.37	15.99	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	1.11	3.65	-1.88	2.88	34.77
			H	14.59	3.65	-1.87	16.37	34.77
	710.0	23790	V	19.42	3.66	-1.87	21.21	34.77
			H	13.46	3.66	-1.86	15.26	34.77
	711.0	23800	V	19.68	3.65	-1.81	21.52	34.77
			H	13.79	3.66	-1.81	15.64	34.77
LTE BAND 17 BW: 10M QPSK RB: 1,49	709.0	23780	V	19.83	3.63	-2.21	21.25	34.77
			H	14.9	3.63	-2.22	16.31	34.77
	710.0	23790	V	20.58	3.62	-2.27	21.93	34.77
			H	13.81	3.62	-2.29	15.14	34.77
	711.0	23800	V	19.5	3.62	-2.34	20.78	34.77
			H	13.66	3.62	-2.35	14.93	34.77
LTE BAND 17 BW: 10M 16QAM RB: 1,0	709.0	23780	V	15.06	3.65	-1.86	16.85	34.77
			H	14.91	3.65	-1.9	16.66	34.77
	710.0	23790	V	20.98	3.66	-1.88	22.76	34.77
			H	15.37	3.66	-1.87	17.16	34.77
	711.0	23800	V	21.55	3.66	-1.83	23.38	34.77
			H	15.6	3.65	-1.8	17.45	34.77
LTE BAND 17 BW: 10M 16QAM RB: 1,49	709.0	23780	V	21.65	3.63	-2.2	23.08	34.77
			H	13.71	3.62	-2.25	15.08	34.77
	710.0	23790	V	21.47	3.62	-2.27	22.82	34.77
			H	15.44	3.62	-2.29	16.77	34.77
	711.0	23800	V	19.88	3.62	-2.35	21.15	34.77
			H	14.37	3.62	-2.34	15.65	34.77

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

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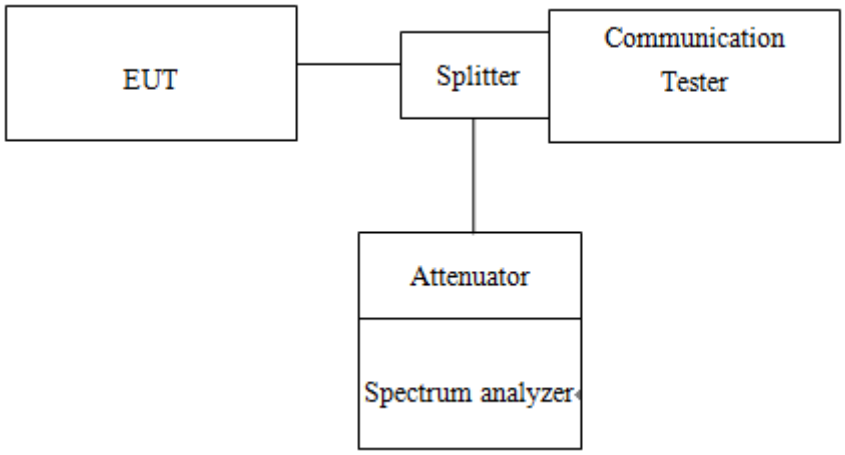
8. OCCUPIED BANDWIDTH MEASUREMENT

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	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

8.5. Measurement Result

Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 850	GPRS 850	GSM 850	GPRS 850
824.2	128	0.24143	0.24282	0.30617	0.31427
836.6	190	0.24044	0.24270	0.30539	0.32576
848.8	251	0.24314	0.24134	0.30568	0.31634

Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 1900	GPRS 1900	GSM 1900	GPRS 1900
1850.2	512	0.24108	0.24286	0.31160	0.31392
1880.0	661	0.24084	0.24424	0.31016	0.31651
1909.8	810	0.24087	0.24382	0.30644	0.32098

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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	4.13300	4.11570	4.13030	4.67670	4.67040	4.69690
836.60	4183	4.10190	4.11040	4.11400	4.67590	4.68440	4.67000
846.60	4233	4.06570	4.07020	4.06510	4.62680	4.64430	4.63350

LTE BAND 5 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
824.7	20407	1.0977	1.0997	1.2763	1.2908
836.5	20525	1.0987	1.1005	1.2923	1.2877
848.3	20643	1.0983	1.1029	1.2764	1.3043

LTE BAND 5 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
825.5	20415	2.7051	2.7016	2.9857	3.0045
836.5	20525	2.6975	2.7010	2.9899	2.9826
847.5	20635	2.6986	2.6975	2.9837	2.9676

LTE BAND 5 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
826.5	20425	4.5011	4.5047	5.0157	5.0306
836.5	20525	4.4986	4.4984	4.9908	5.0020
846.5	20625	4.4756	4.4688	4.9694	4.9619

LTE BAND 5 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
829.0	20450	8.9885	8.9407	9.834	9.744
836.5	20525	8.9587	8.9277	9.843	9.740
844.0	20600	8.9215	8.8777	9.753	9.710

LTE BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.0965	1.1039	1.2922	1.2931
707.5	23095	1.0980	1.0990	1.2827	1.2587
715.3	23173	1.0950	1.1085	1.2585	1.2571

LTE BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	2.7002	2.7018	2.9812	3.0028
707.5	23095	2.6936	2.6767	2.9866	2.8861
714.5	23165	2.7009	2.7037	2.9906	2.9979

LTE BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	4.5049	4.5004	5.0173	5.0303
707.5	23095	4.4750	4.4911	4.9849	4.9994
713.5	23155	4.5055	4.5073	5.0488	5.0221

LTE BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	8.9924	8.9492	9.841	9.741
707.5	23095	8.9380	8.8759	9.748	9.711
711.0	23130	9.0050	8.9513	9.857	9.818

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LTE BAND 17 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
706.5	23755	4.4775	4.4721	4.9887	4.8196
710.0	23790	4.4912	4.4926	4.9999	4.9841
713.5	23825	4.5144	4.5170	5.0540	5.0504

LTE BAND 17 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
709.0	23780	8.9473	8.8942	9.790	9.742
710.0	23790	8.9694	8.9164	9.785	9.780
711.0	23800	8.9953	8.9577	9.863	9.824

Please refer to next page.

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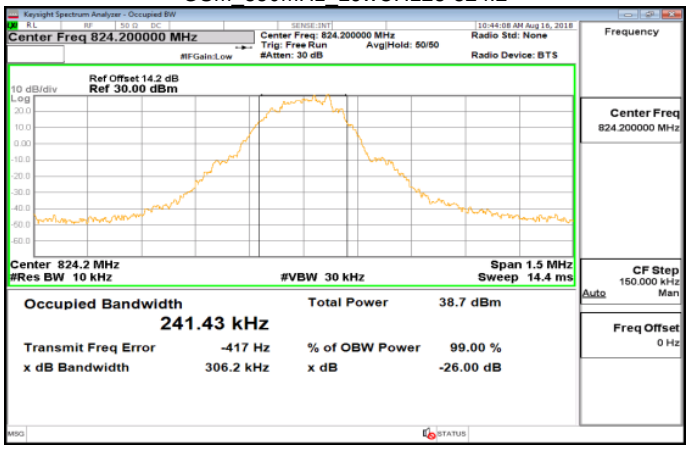
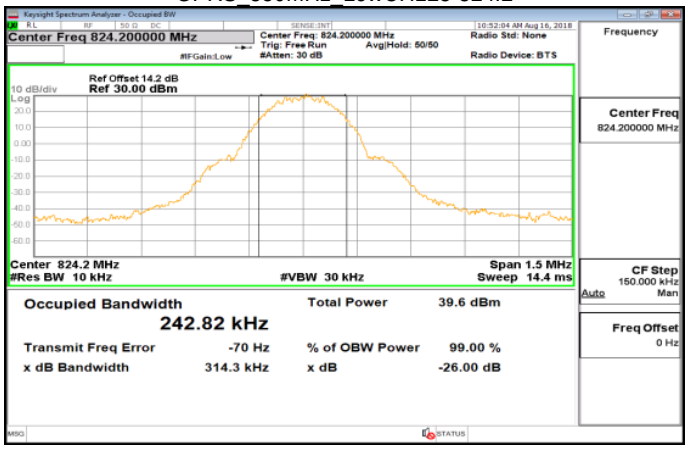
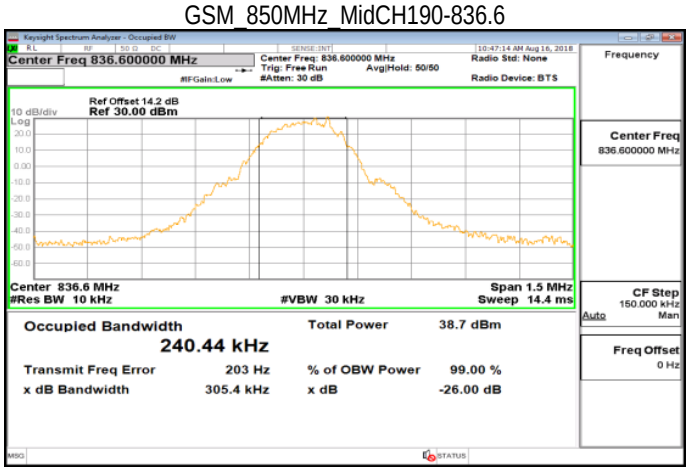
GSM_850MHz_LowCH128-824.2



GPRS_850MHz_LowCH128-824.2



GSM_850MHz_MidCH190-836.6



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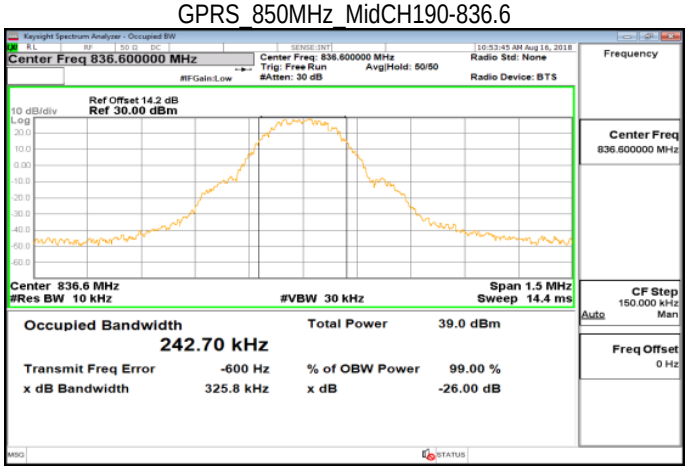
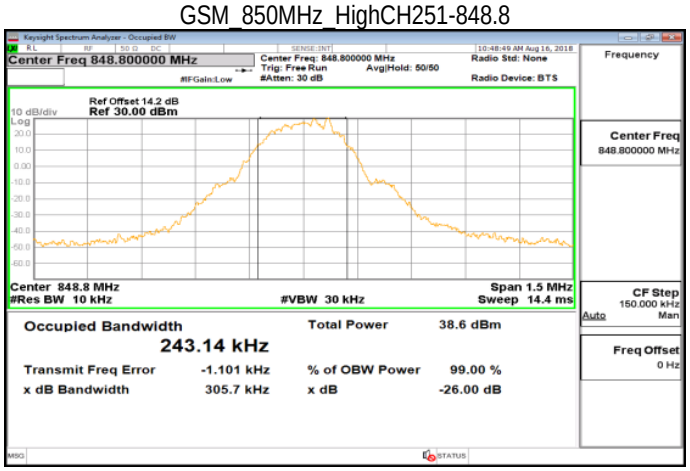
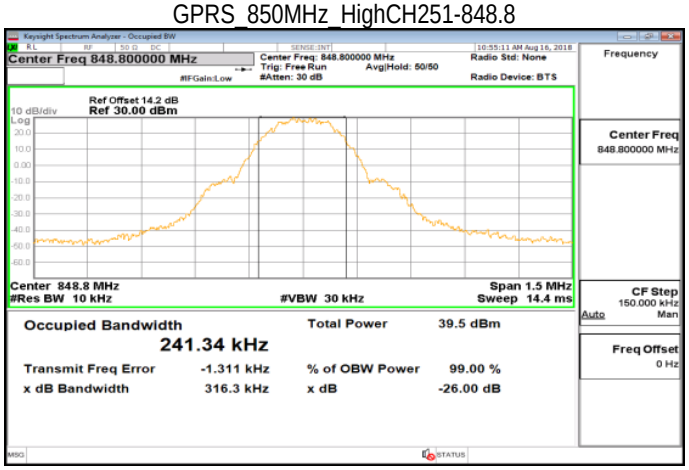


GSM_850MHz_HighCH251-848.8



GPRS_850MHz_HighCH251-848.8



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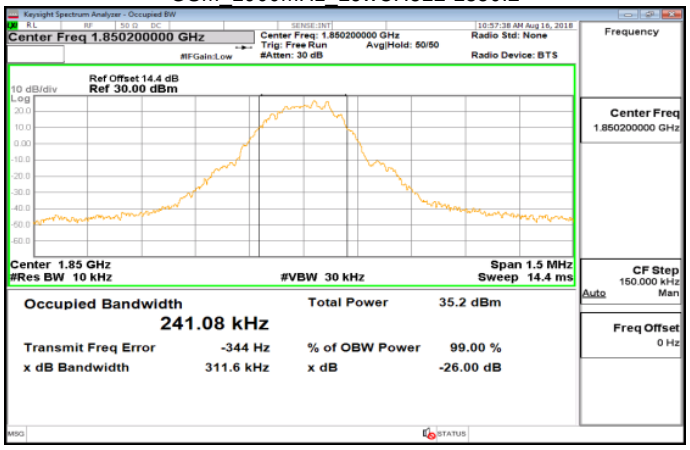
GSM_1900MHz_LowCH512-1850.2



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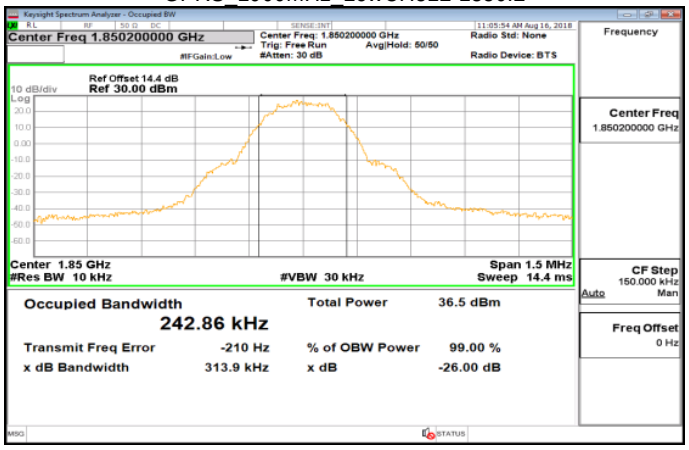
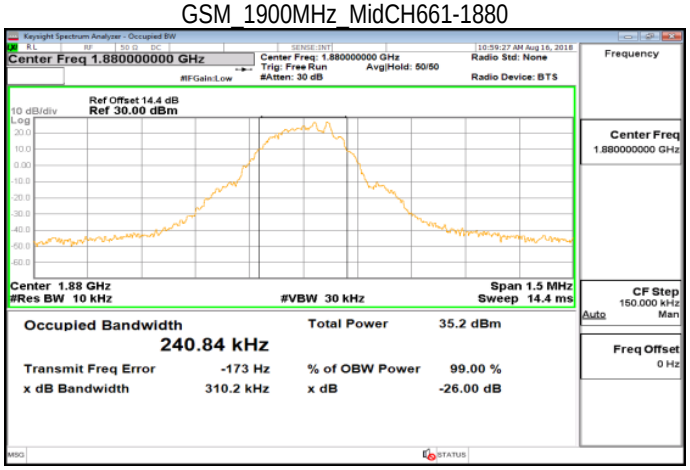
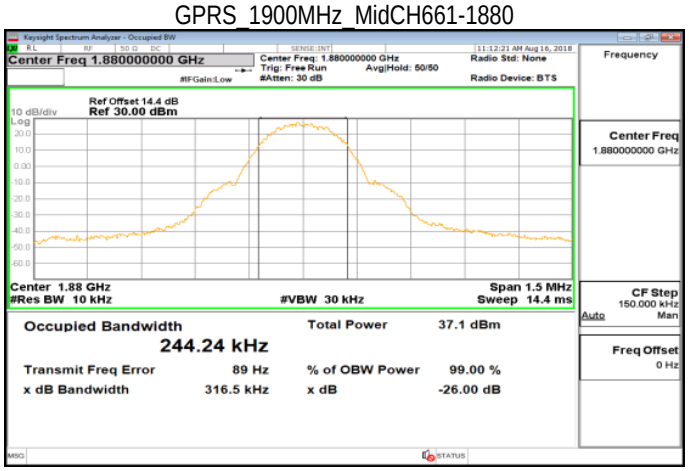


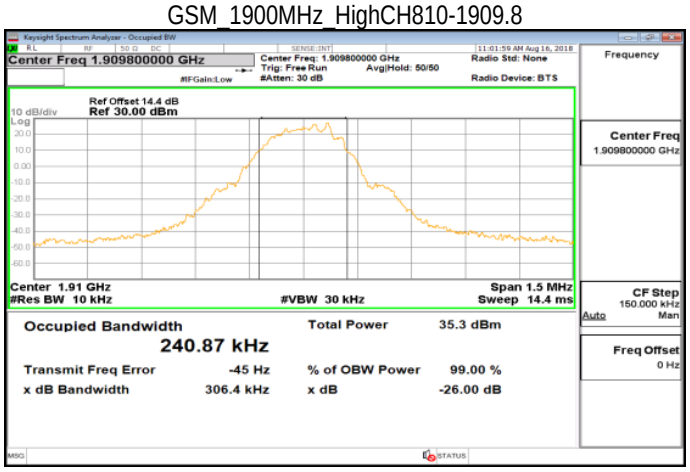
GSM_1900MHz_MidCH661-1880



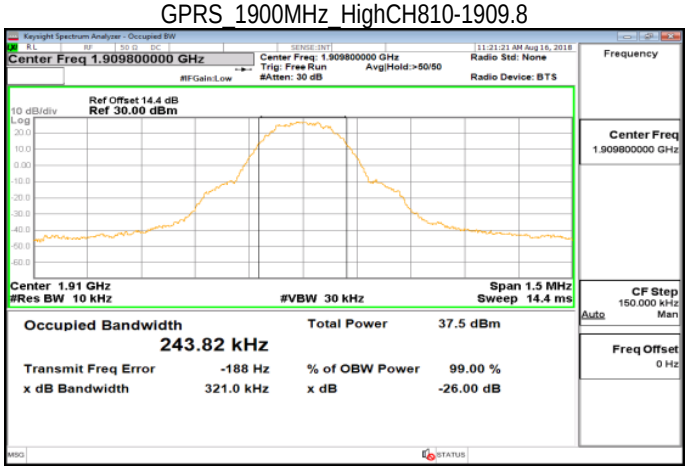
GPRS_1900MHz_MidCH661-1880



GSM_1900MHz_HighCH810-1909.8



GPRS_1900MHz_HighCH810-1909.8



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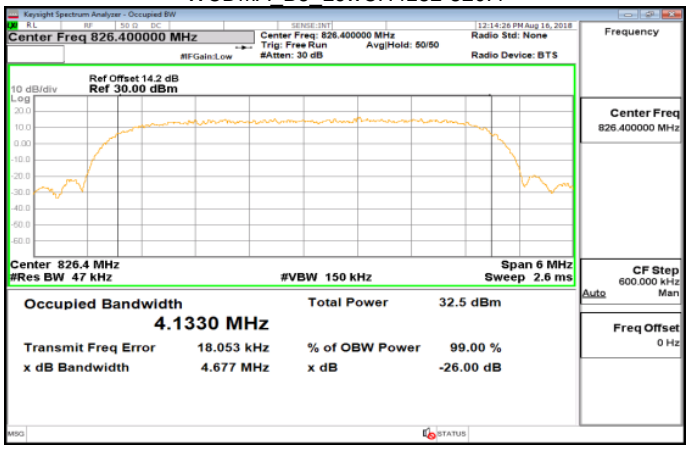
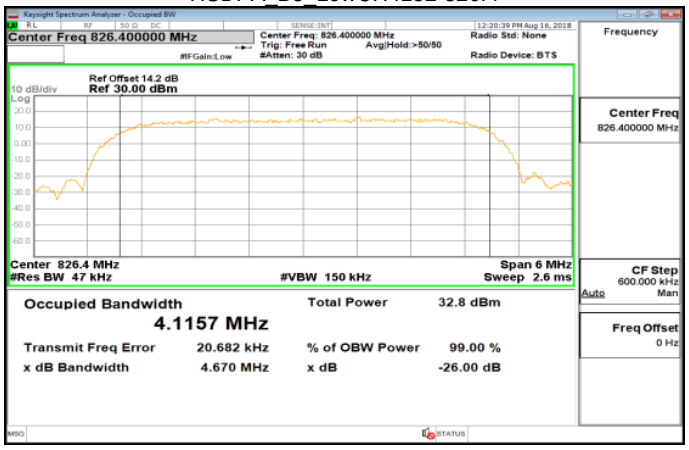
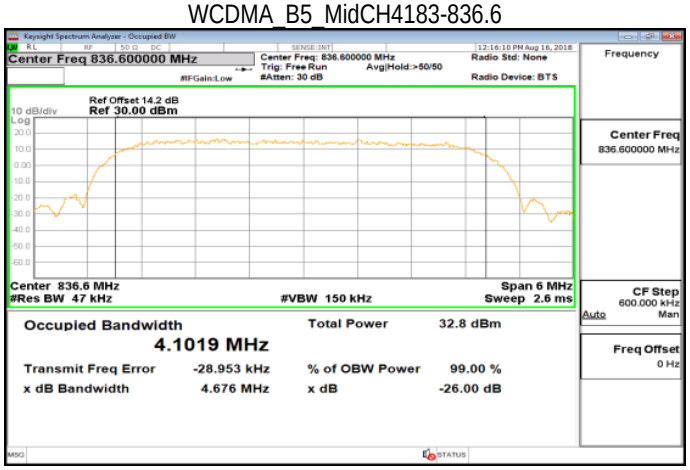
WCDMA_B5_LowCH4132-826.4



HSDPA_B5_LowCH4132-826.4



WCDMA_B5_MidCH4183-836.6



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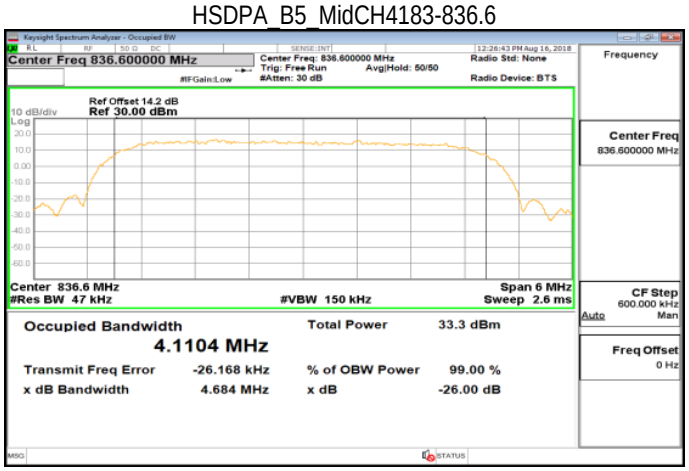
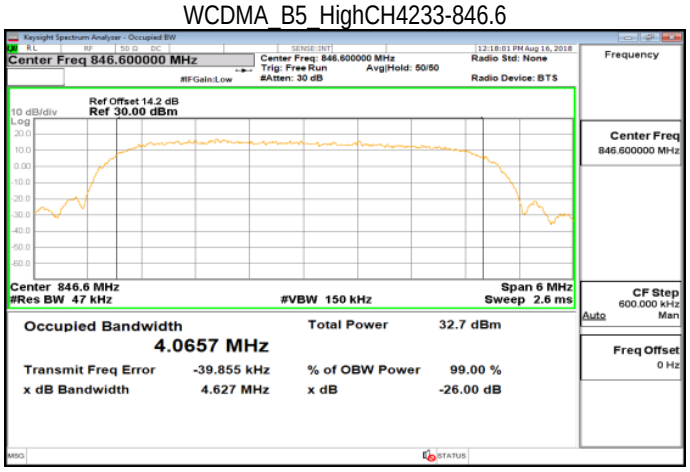


WCDMA_B5_HighCH4233-846.6



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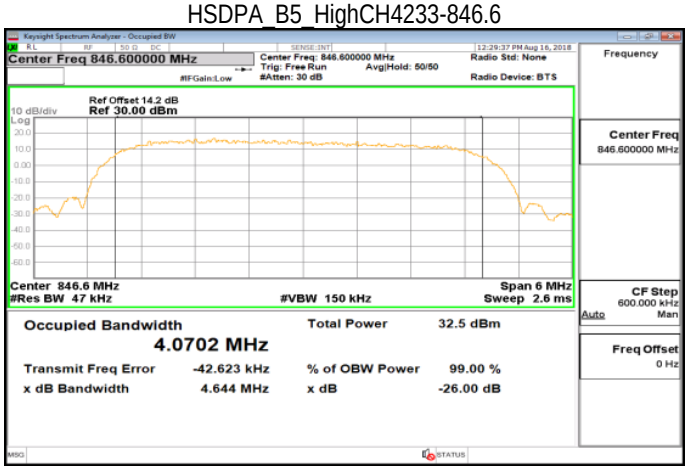

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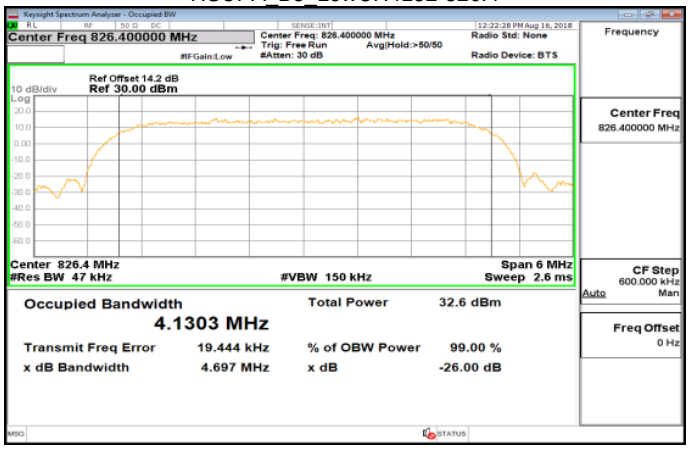
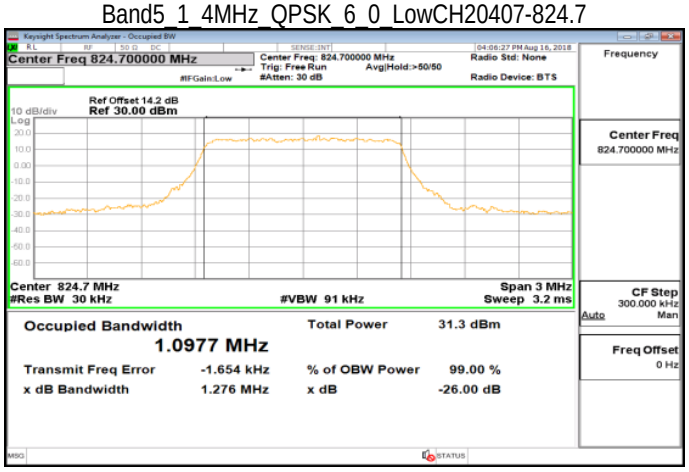
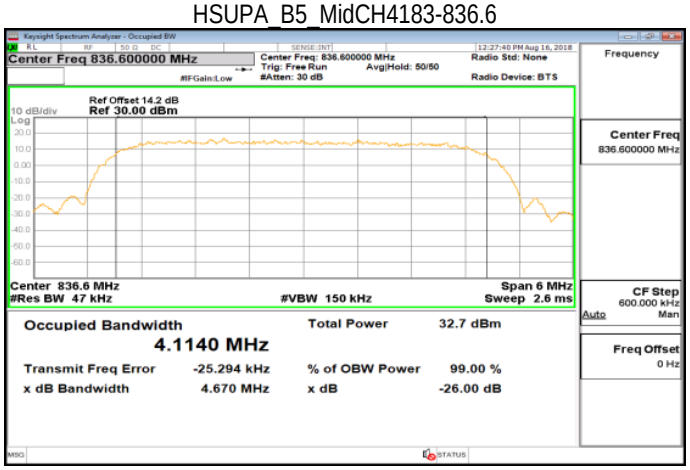
HSUPA_B5_LowCH4132-826.4



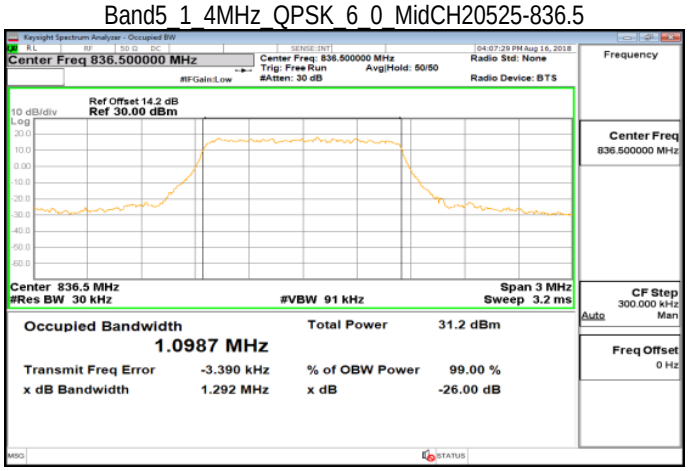
Band5_1_4MHz_QPSK_6_0_LowCH20407-824.7



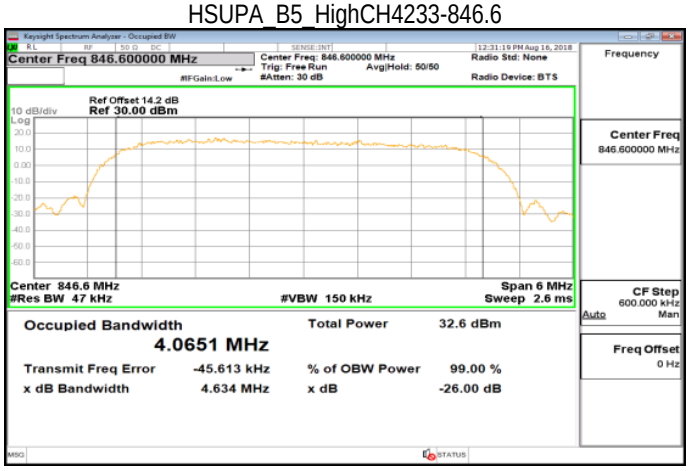
HSUPA_B5_MidCH4183-836.6



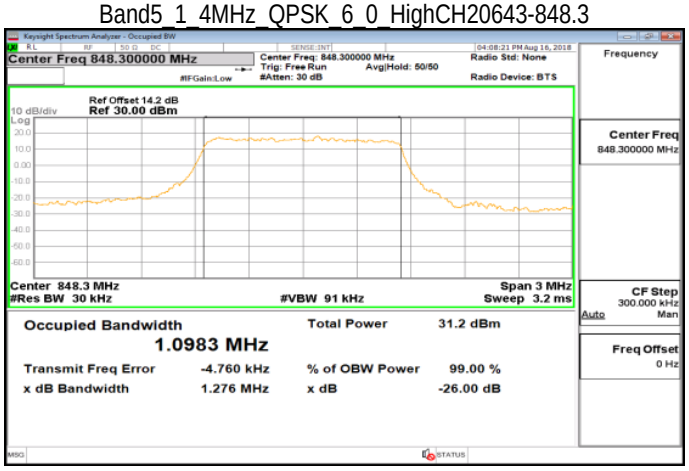
Band5_1_4MHz_QPSK_6_0_MidCH20525-836.5



HSUPA_B5_HighCH4233-846.6



Band5_1_4MHz_QPSK_6_0_HighCH20643-848.3



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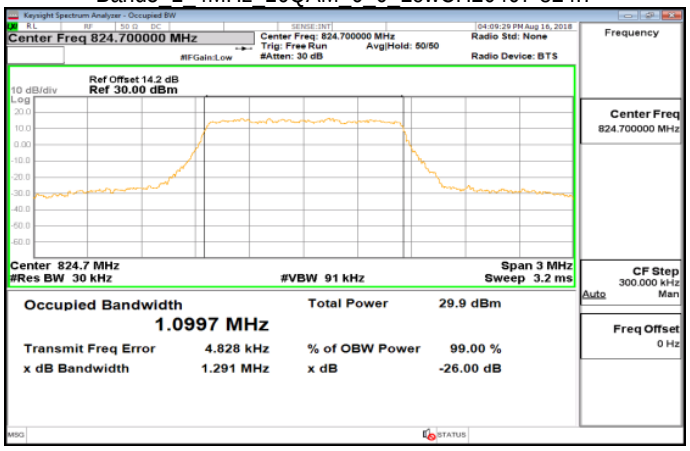
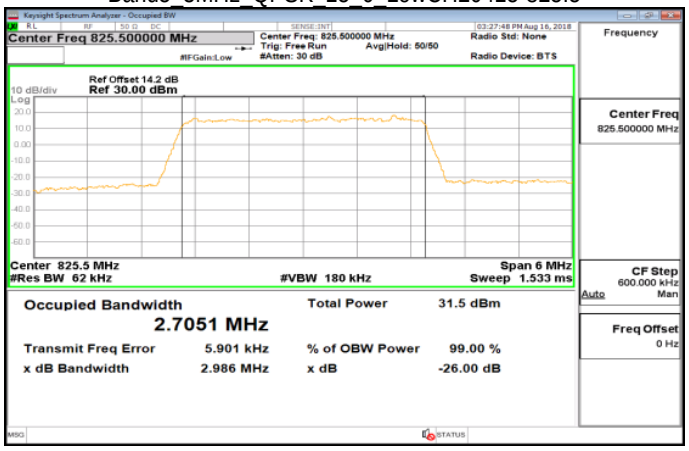
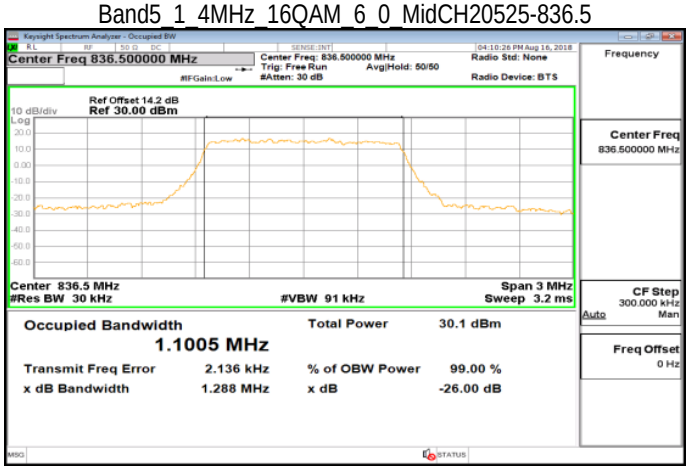
Band5_1_4MHz_16QAM_6_0_LowCH20407-824.7



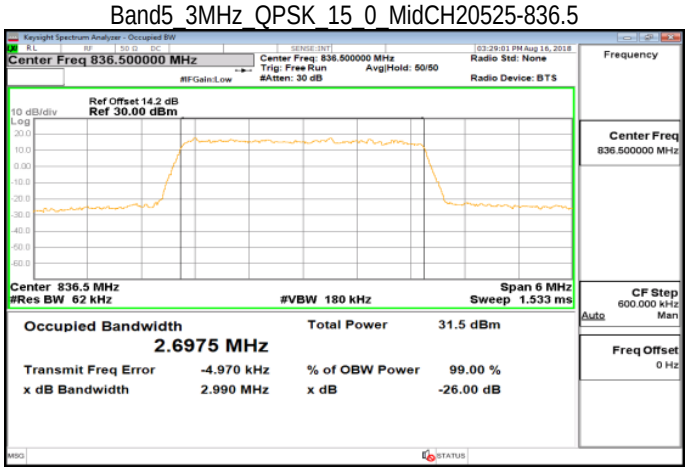
Band5_3MHz_QPSK_15_0_LowCH20415-825.5



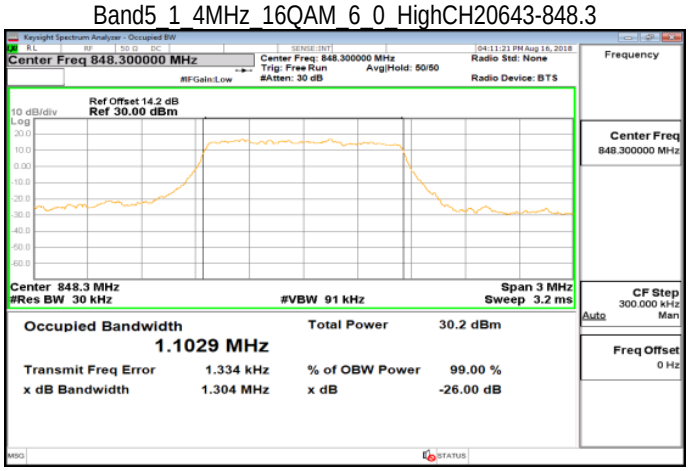
Band5_1_4MHz_16QAM_6_0_MidCH20525-836.5



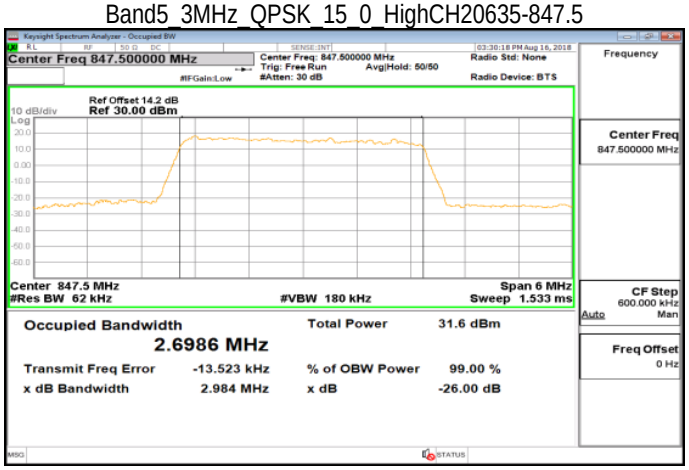
Band5_3MHz_QPSK_15_0_MidCH20525-836.5



Band5_1_4MHz_16QAM_6_0_HighCH20643-848.3



Band5_3MHz_QPSK_15_0_HighCH20635-847.5



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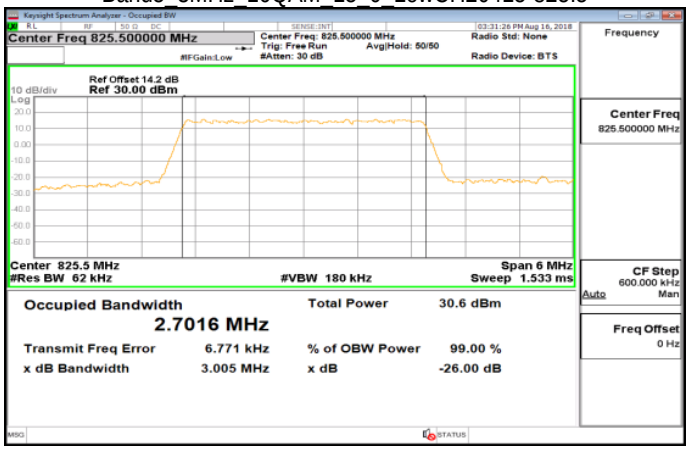
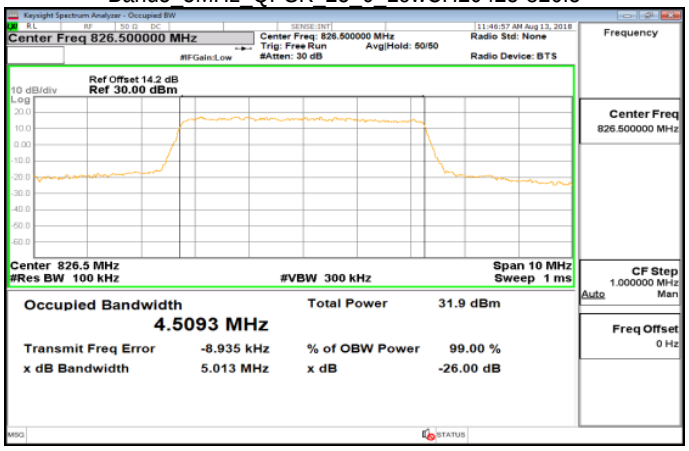
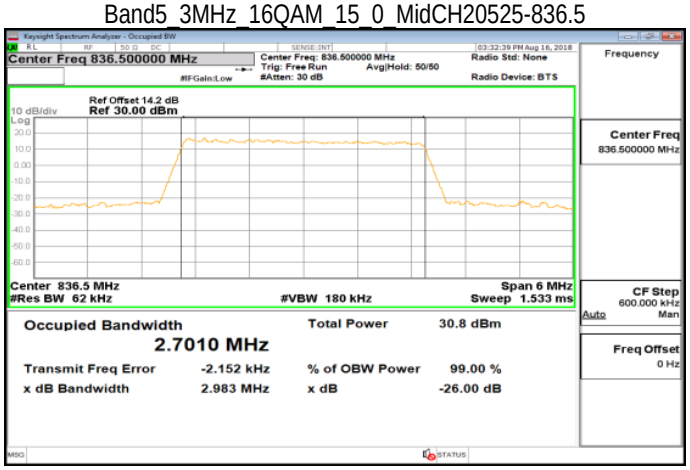
Band5_3MHz_16QAM_15_0_LowCH20415-825.5



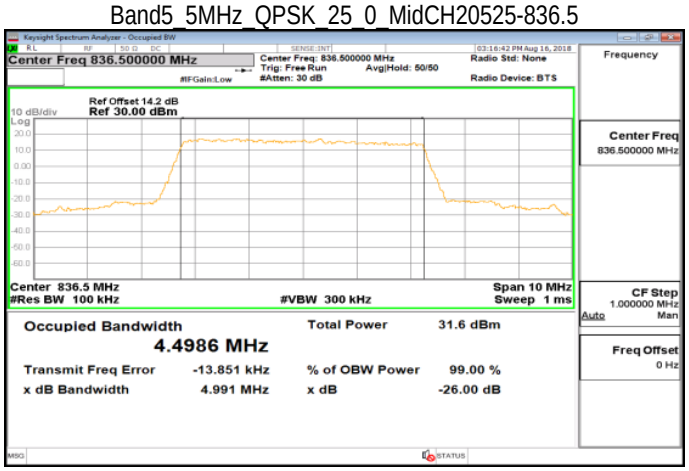
Band5_5MHz_QPSK_25_0_LowCH20425-826.5



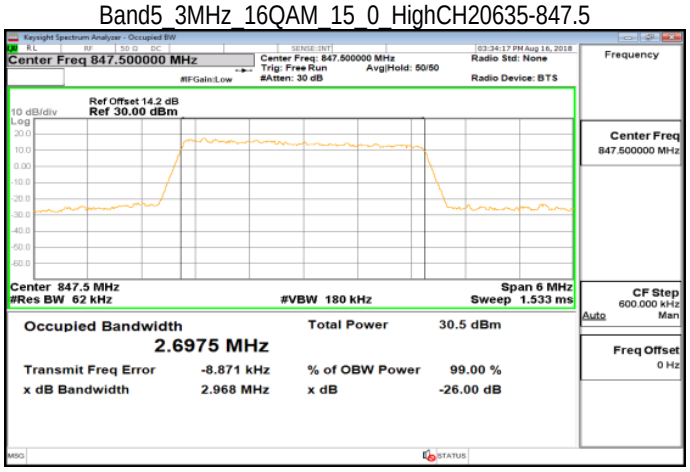
Band5_3MHz_16QAM_15_0_MidCH20525-836.5



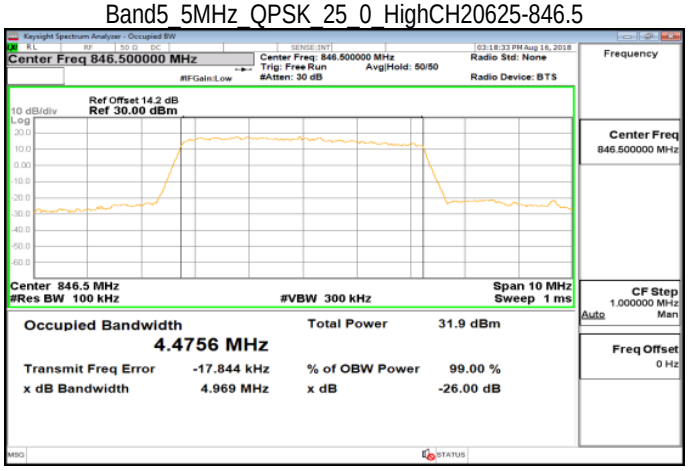
Band5_5MHz_QPSK_25_0_MidCH20525-836.5



Band5_3MHz_16QAM_15_0_HighCH20635-847.5



Band5_5MHz_QPSK_25_0_HighCH20625-846.5



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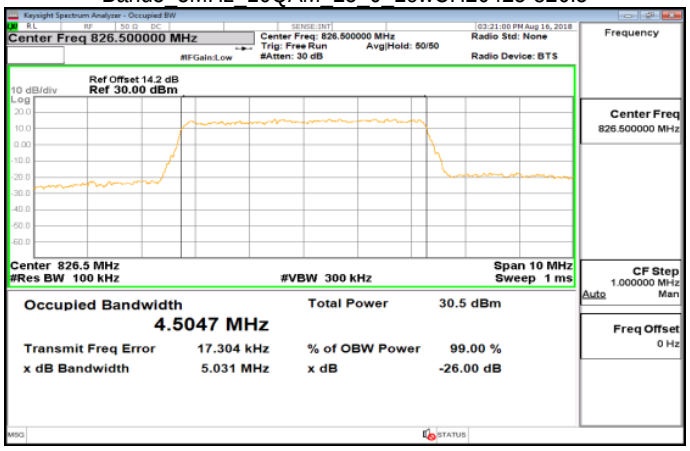
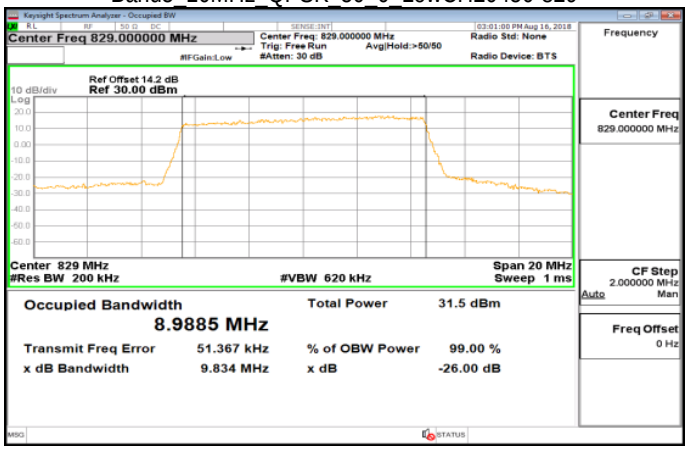
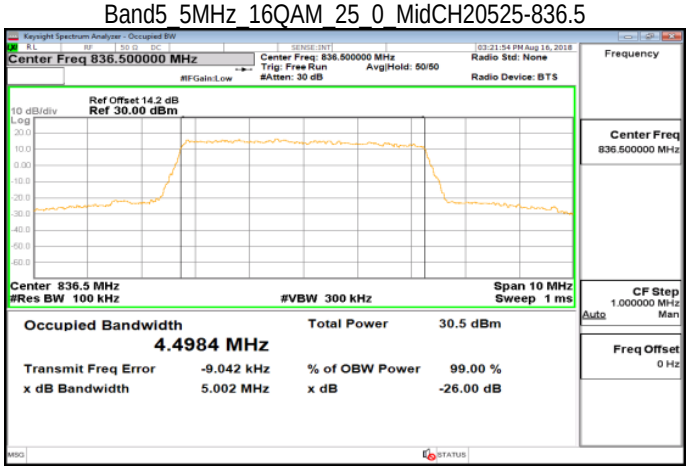
Band5_5MHz_16QAM_25_0_LowCH20425-826.5



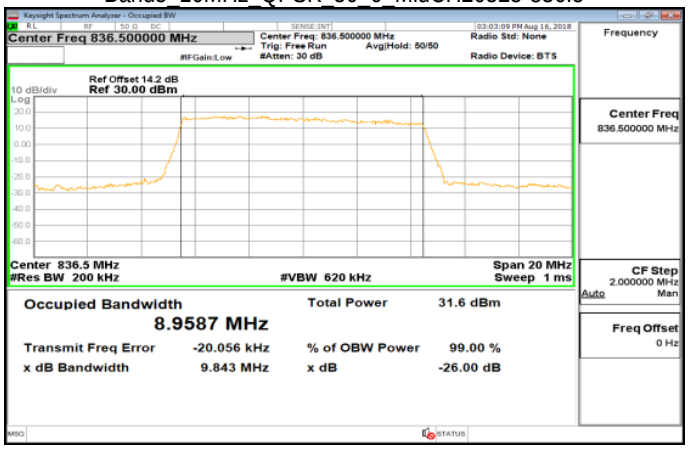
Band5_10MHz_QPSK_50_0_LowCH20450-829



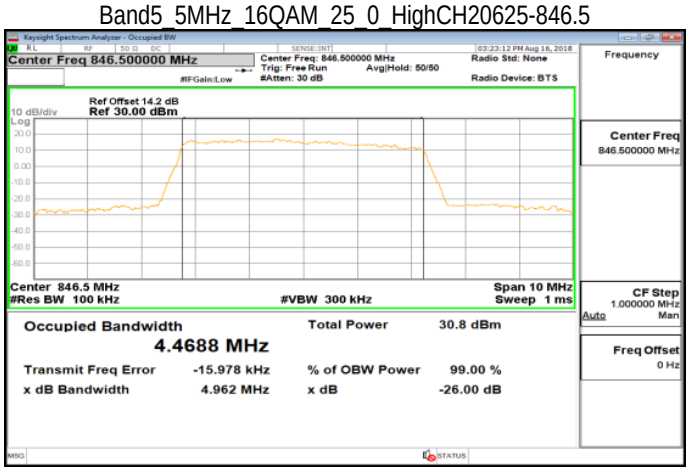
Band5_5MHz_16QAM_25_0_MidCH20525-836.5



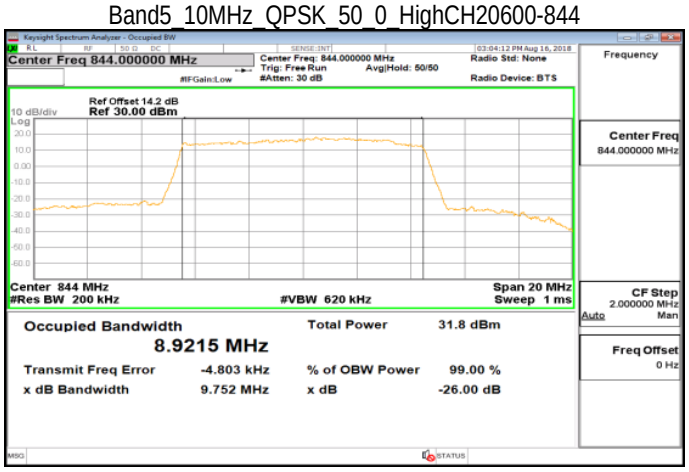
Band5_10MHz_QPSK_50_0_MidCH20525-836.5



Band5_5MHz_16QAM_25_0_HighCH20625-846.5



Band5_10MHz_QPSK_50_0_HighCH20600-844



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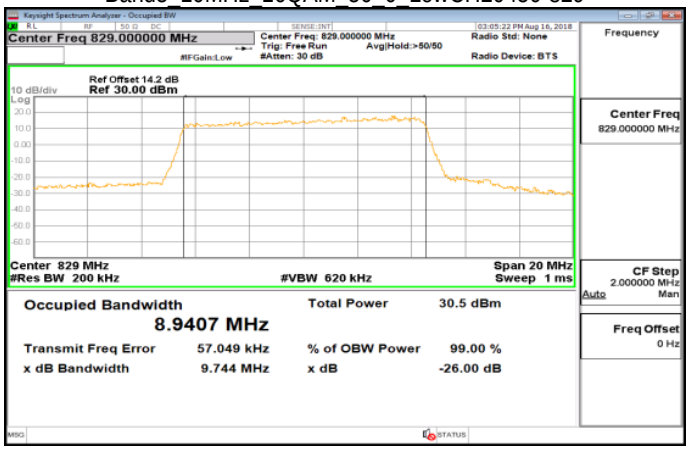
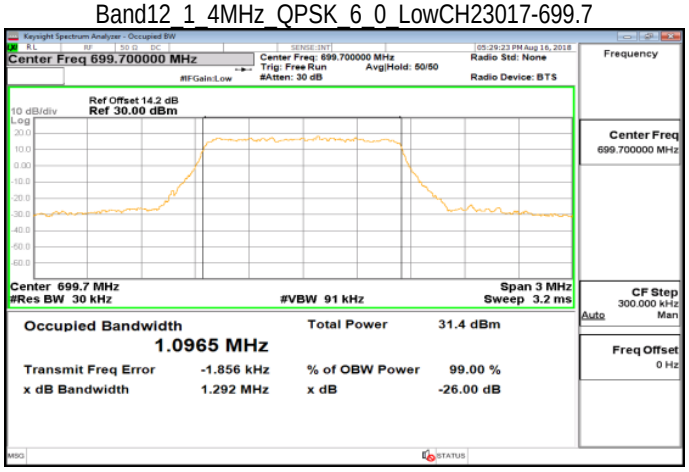
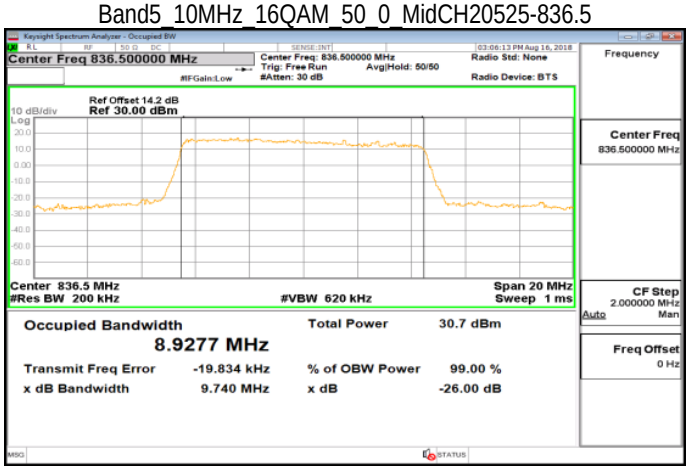
Band5_10MHz_16QAM_50_0_LowCH20450-829



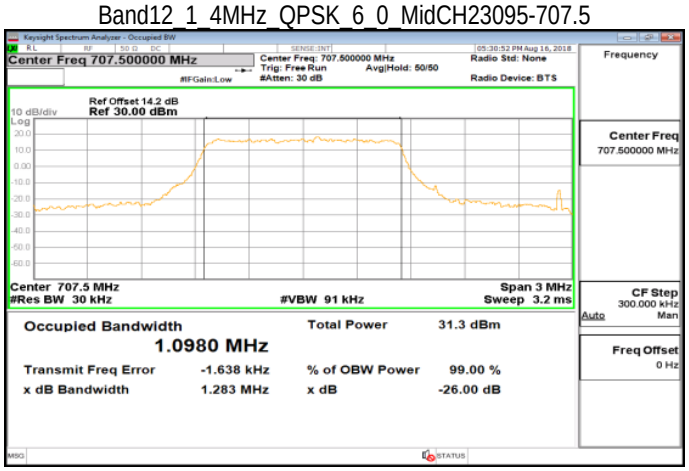
Band12_1_4MHz_QPSK_6_0_LowCH23017-699.7



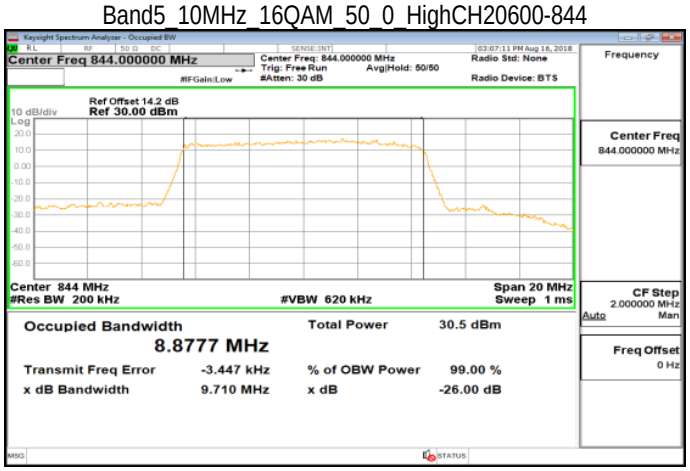
Band5_10MHz_16QAM_50_0_MidCH20525-836.5



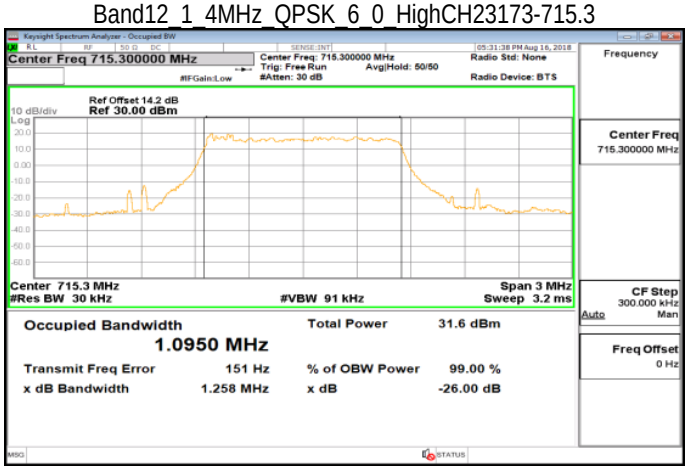
Band12_1_4MHz_QPSK_6_0_MidCH23095-707.5



Band5_10MHz_16QAM_50_0_HighCH20600-844



Band12_1_4MHz_QPSK_6_0_HighCH23173-715.3



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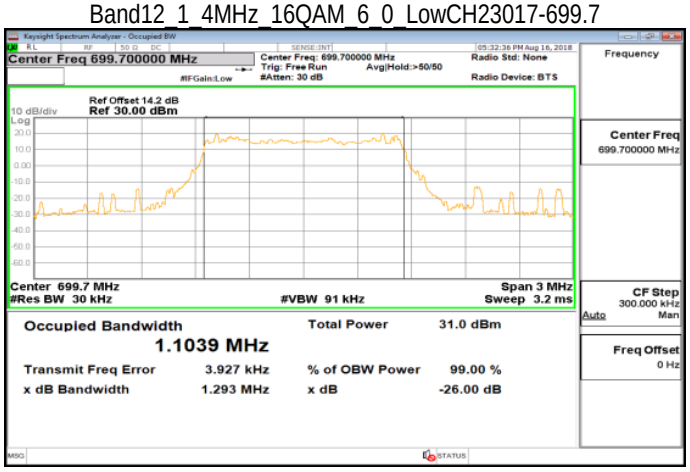
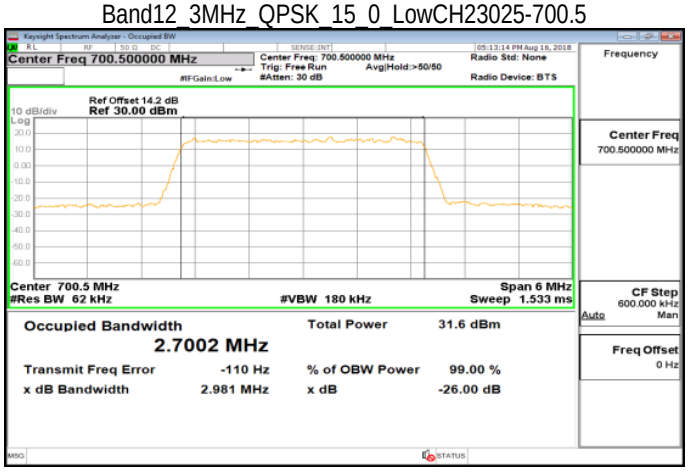
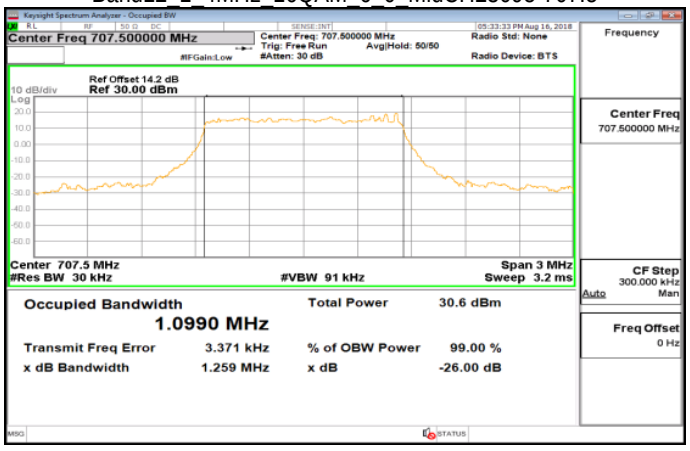
Band12_1_4MHz_16QAM_6_0_LowCH23017-699.7



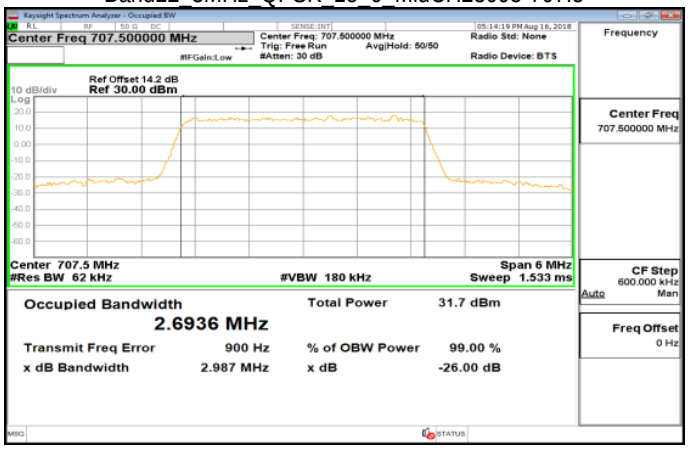
Band12_3MHz_QPSK_15_0_LowCH23025-700.5



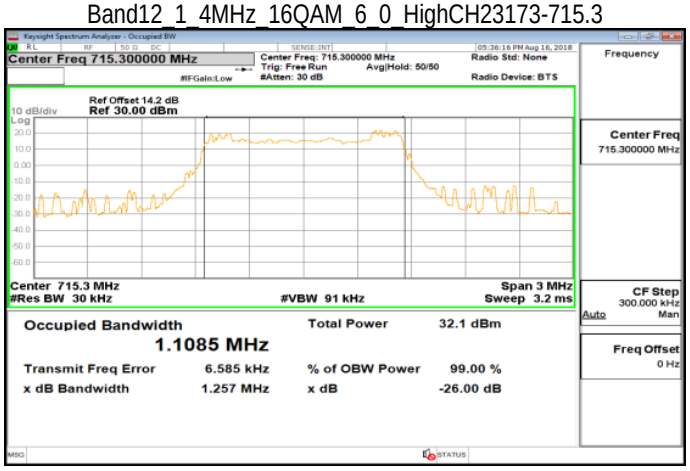
Band12_1_4MHz_16QAM_6_0_MidCH23095-707.5



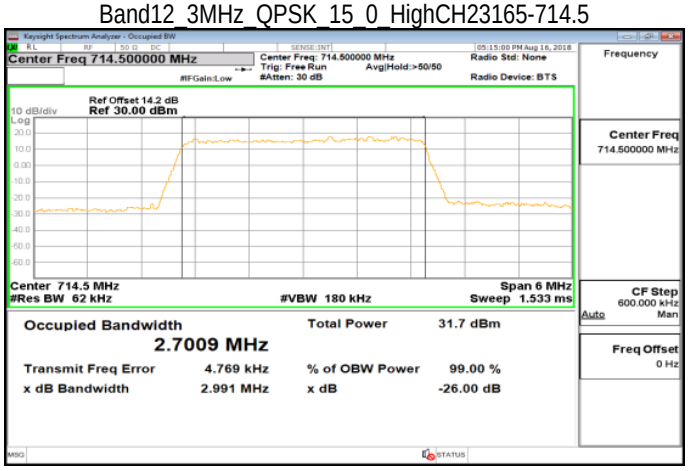
Band12_3MHz_QPSK_15_0_MidCH23095-707.5



Band12_1_4MHz_16QAM_6_0_HighCH23173-715.3



Band12_3MHz_QPSK_15_0_HighCH23165-714.5



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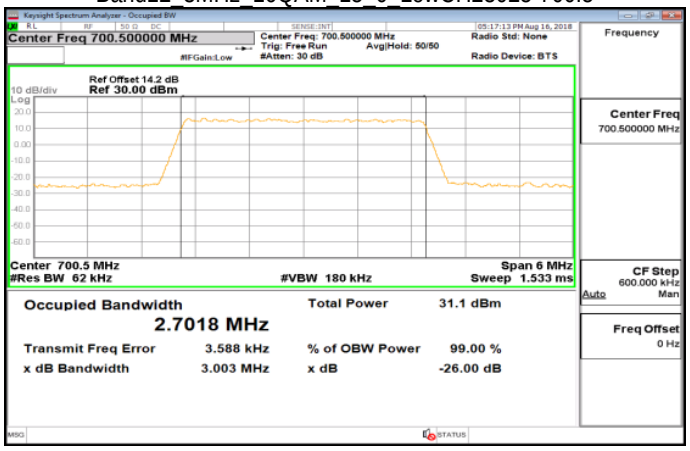
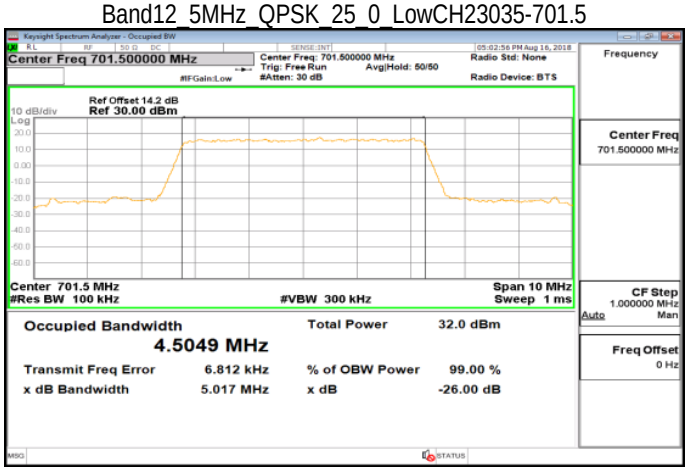
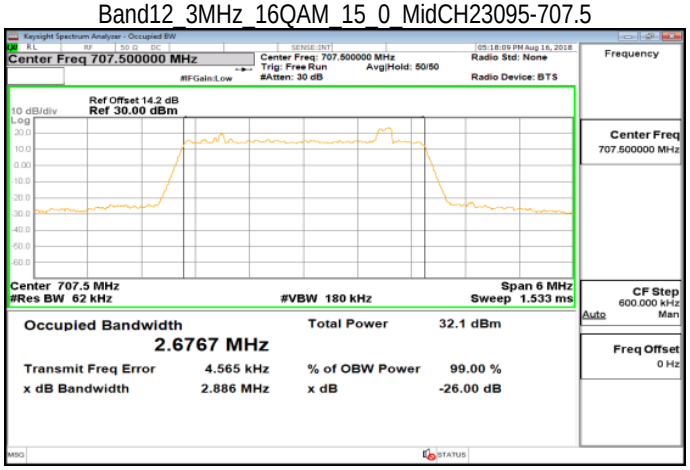
Band12_3MHz_16QAM_15_0_LowCH23025-700.5



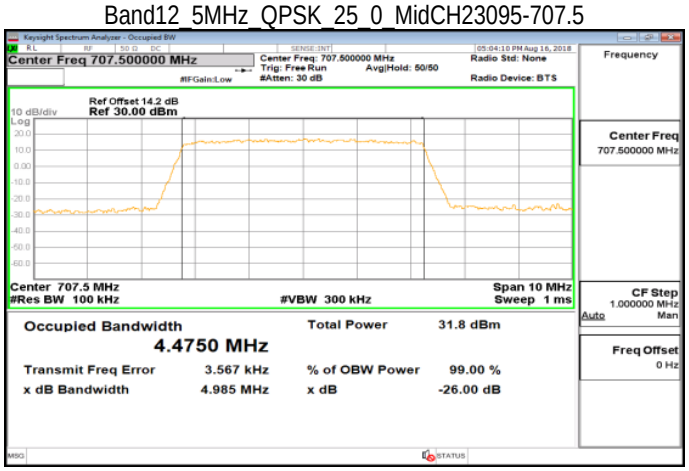
Band12_5MHz_QPSK_25_0_LowCH23035-701.5



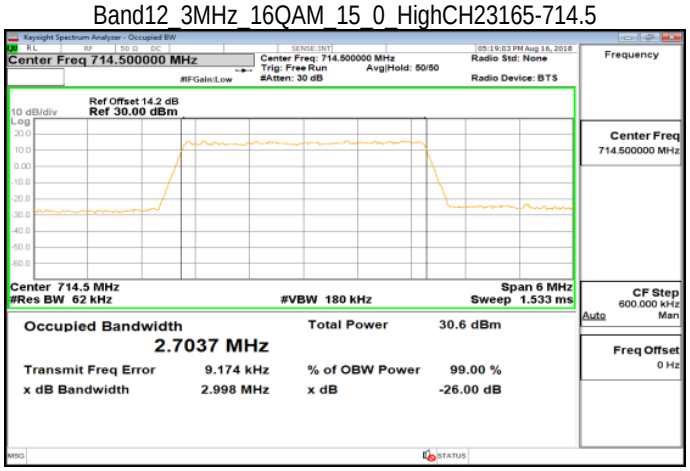
Band12_3MHz_16QAM_15_0_MidCH23095-707.5



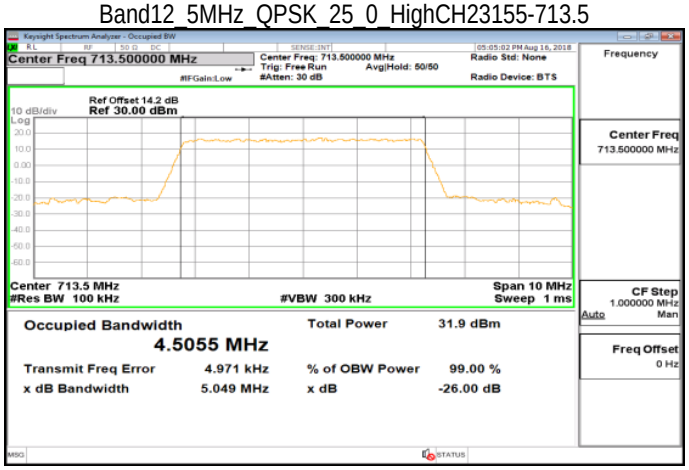
Band12_5MHz_QPSK_25_0_MidCH23095-707.5



Band12_3MHz_16QAM_15_0_HighCH23165-714.5



Band12_5MHz_QPSK_25_0_HighCH23155-713.5



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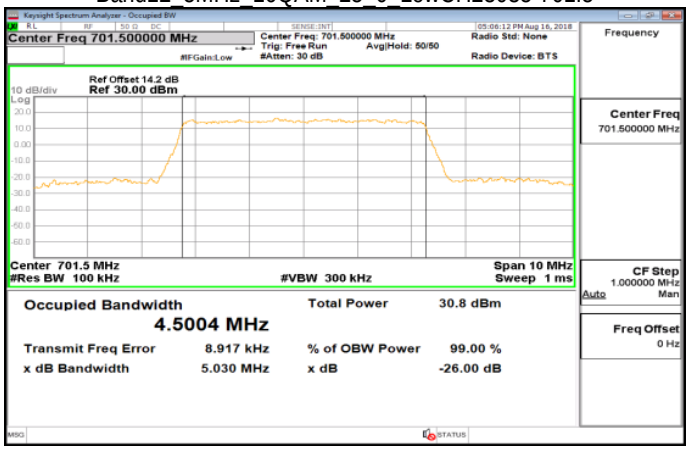
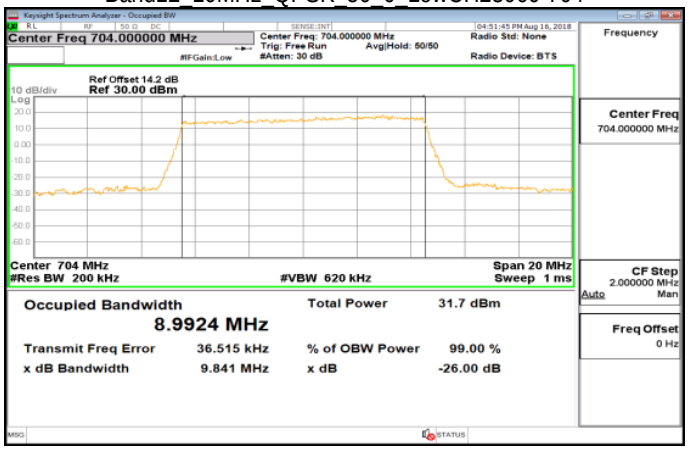
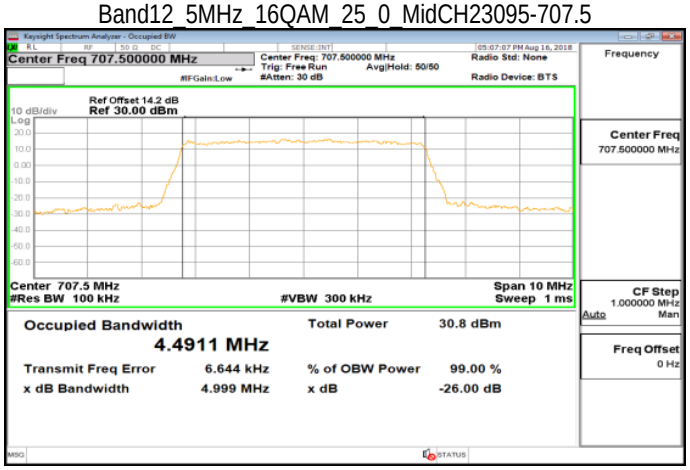
Band12_5MHz_16QAM_25_0_LowCH23035-701.5



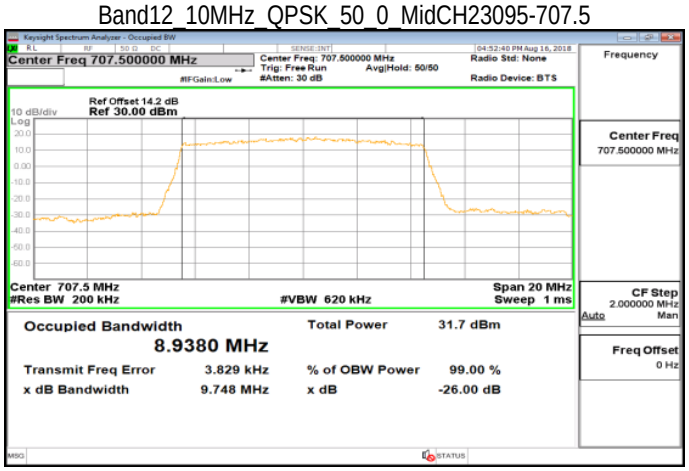
Band12_10MHz_QPSK_50_0_LowCH23060-704



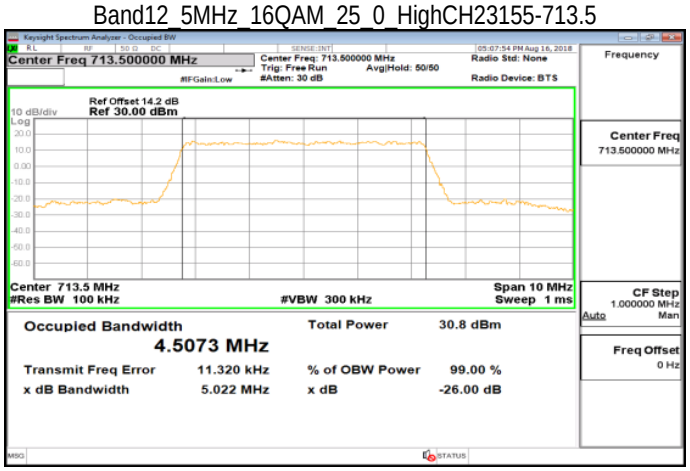
Band12_5MHz_16QAM_25_0_MidCH23095-707.5



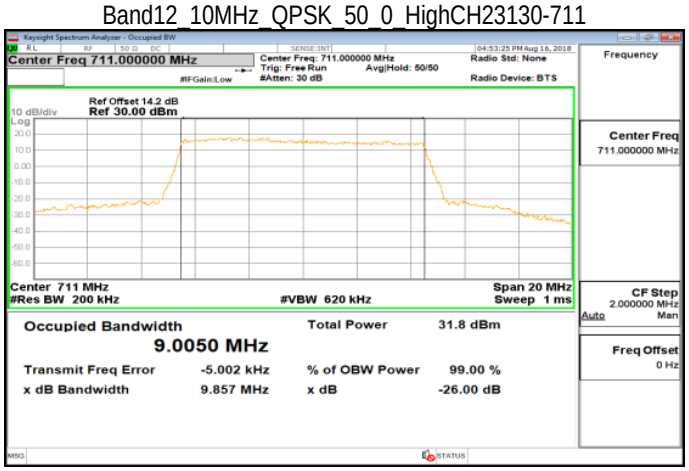
Band12_10MHz_QPSK_50_0_MidCH23095-707.5



Band12_5MHz_16QAM_25_0_HighCH23155-713.5



Band12_10MHz_QPSK_50_0_HighCH23130-711



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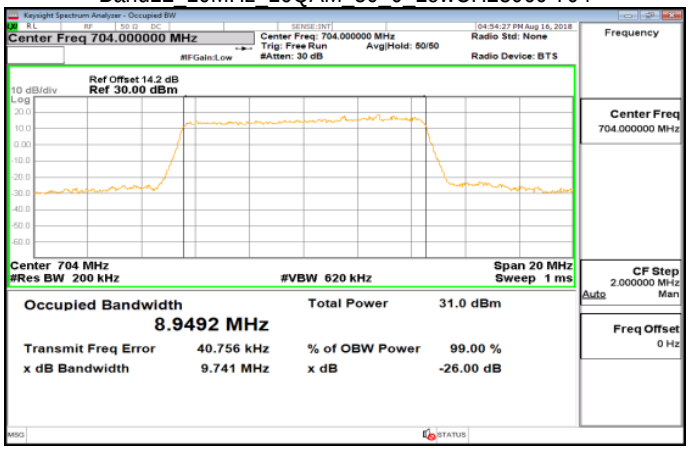
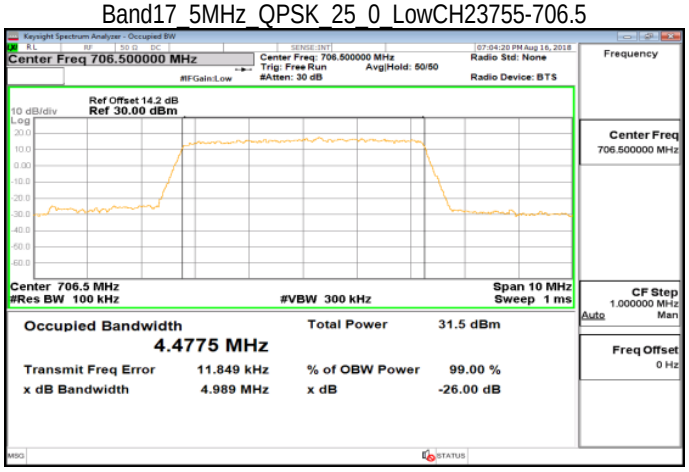
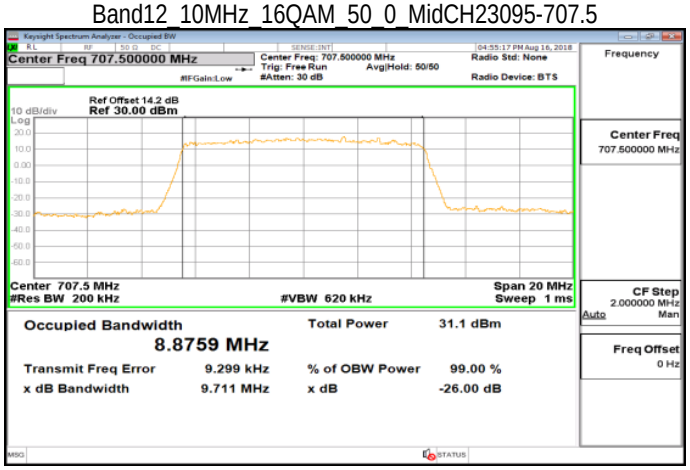
Band12_10MHz_16QAM_50_0_LowCH23060-704



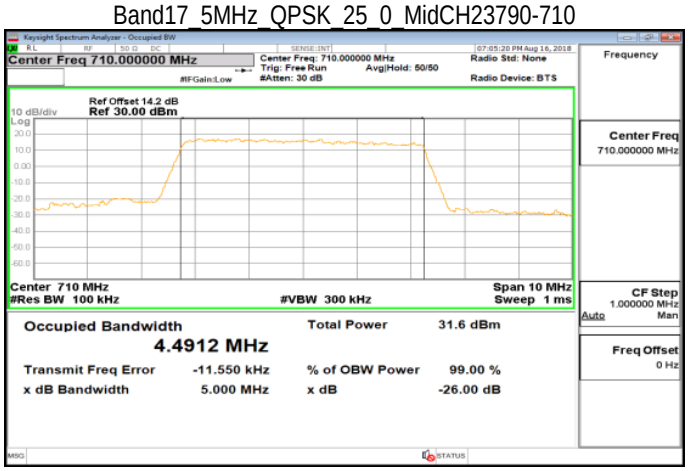
Band17_5MHz_QPSK_25_0_LowCH23755-706.5



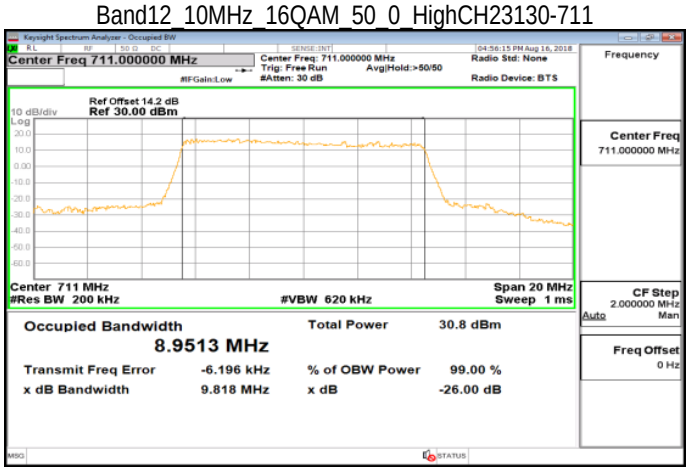
Band12_10MHz_16QAM_50_0_MidCH23095-707.5



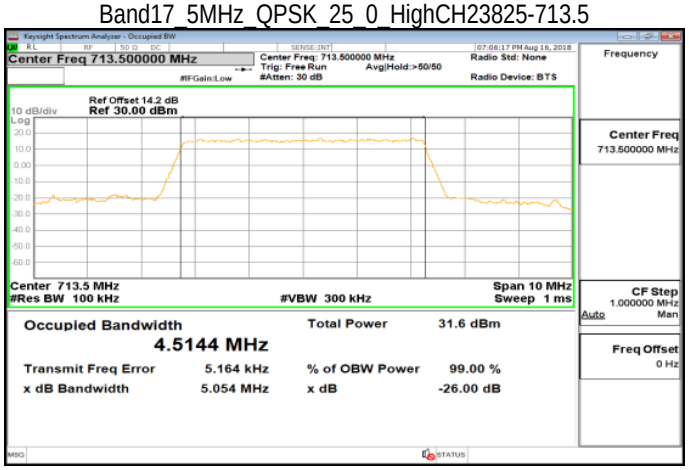
Band17_5MHz_QPSK_25_0_MidCH23790-710



Band12_10MHz_16QAM_50_0_HighCH23130-711



Band17_5MHz_QPSK_25_0_HighCH23825-713.5



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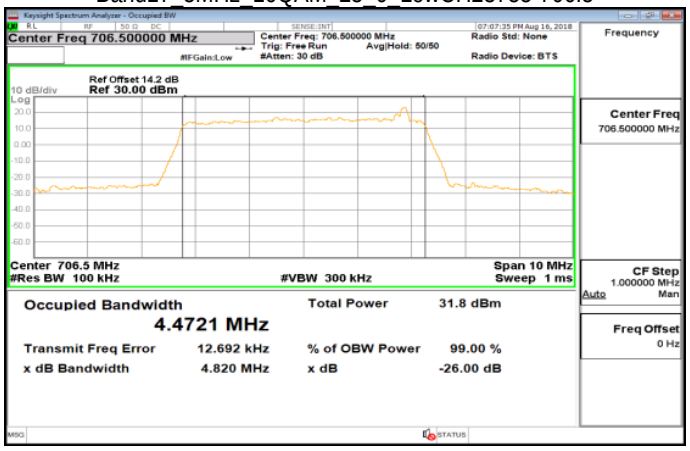
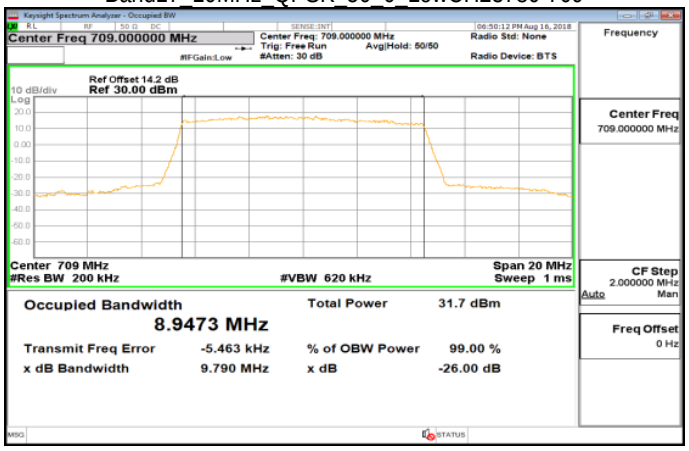
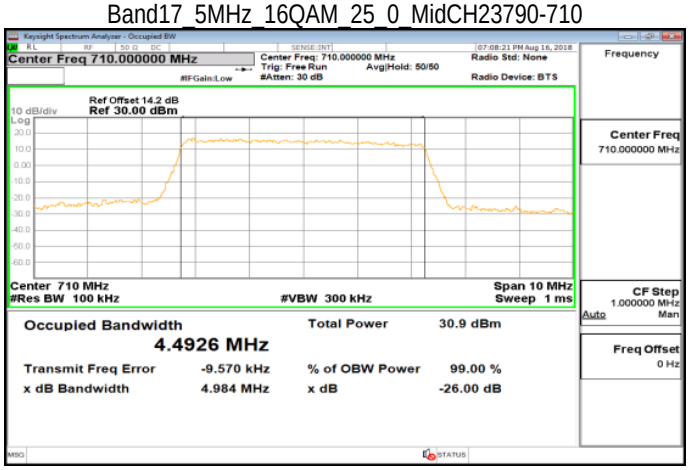
Band17_5MHz_16QAM_25_0_LowCH23755-706.5



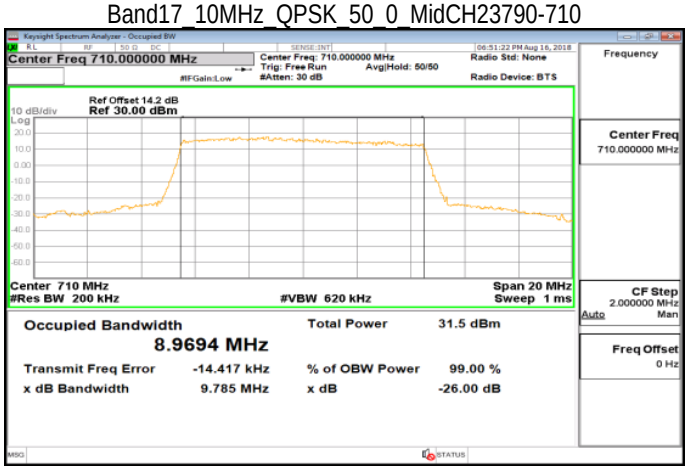
Band17_10MHz_QPSK_50_0_LowCH23780-709



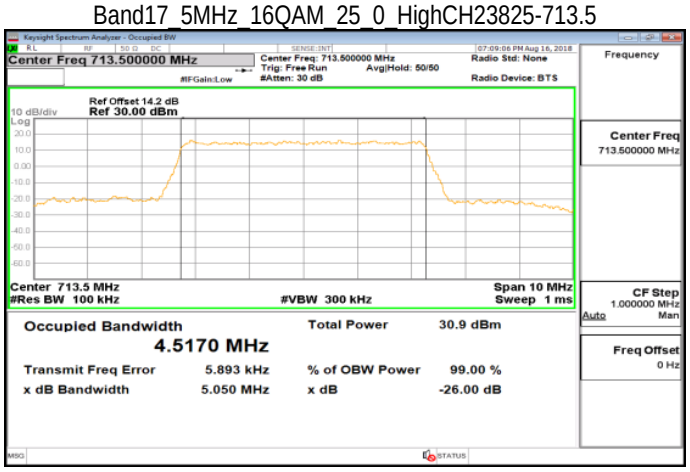
Band17_5MHz_16QAM_25_0_MidCH23790-710



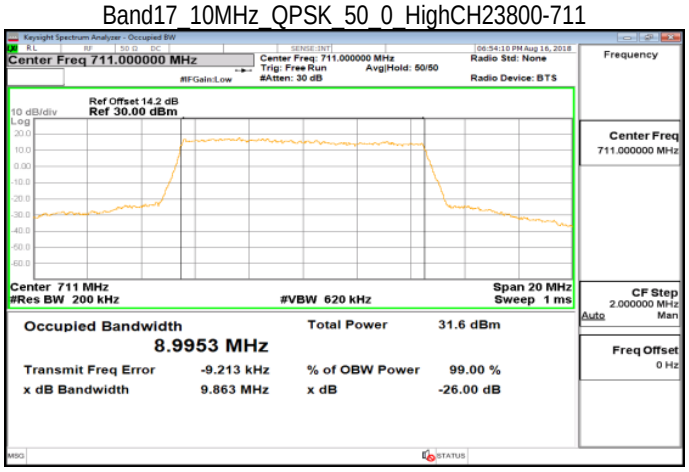
Band17_10MHz_QPSK_50_0_MidCH23790-710



Band17_5MHz_16QAM_25_0_HighCH23825-713.5



Band17_10MHz_QPSK_50_0_HighCH23800-711



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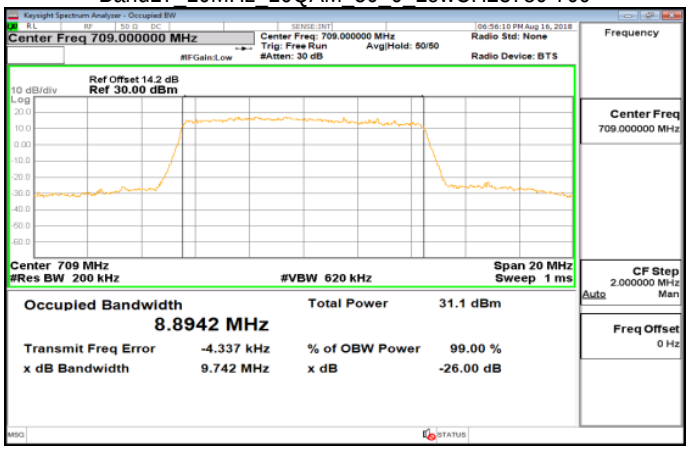
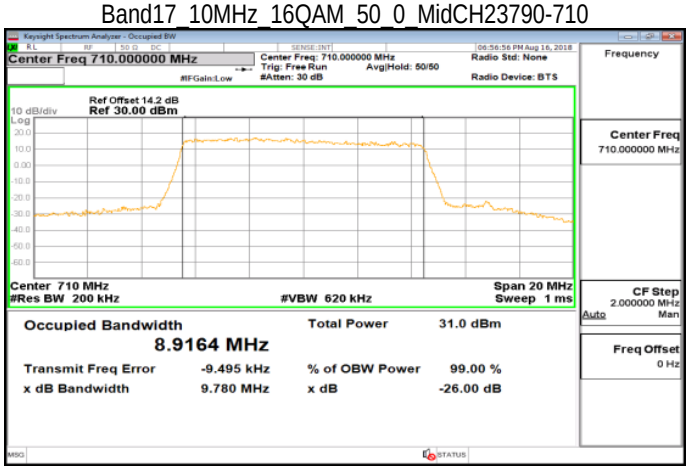
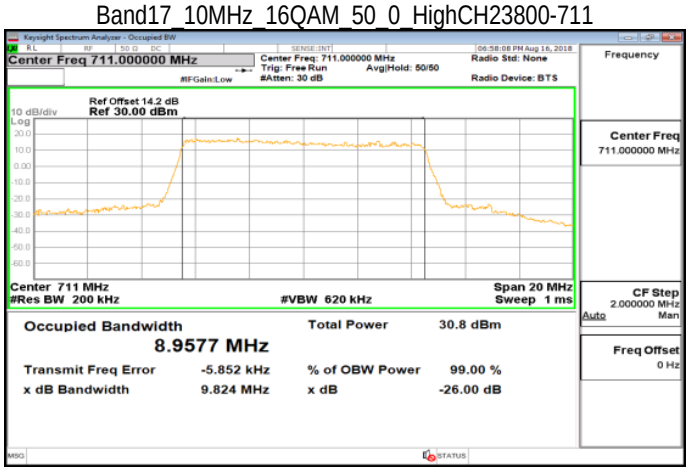
Band17_10MHz_16QAM_50_0_LowCH23780-709



Band17_10MHz_16QAM_50_0_MidCH23790-710



Band17_10MHz_16QAM_50_0_HighCH23800-711



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9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1. Standard Applicable

FCC §22.917(a), §24.238(a), Out of band emissions.The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53(g)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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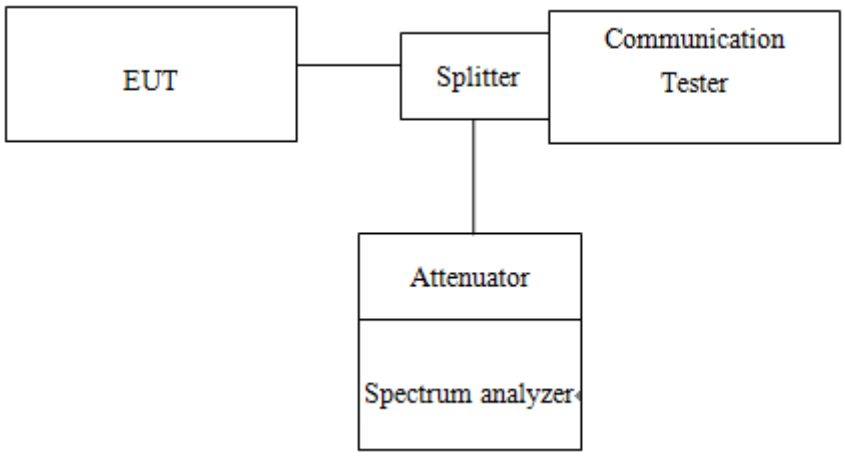
FCC §27.53(m) (4)

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

Measurement procedure. Compliance with these rules is based on the use of measurement nstrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

9.2. Test SET-UP



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9.3. Measurement Procedure

Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

9.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

9.5. Measurement Result:

Refer to next pages.

NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

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