FCC Radio Test Report

FCC ID: R9C-CPH1941

This report concerns: Original Grant

Project No.	:	1909C106
Equipment	:	Mobile Phone
Brand Name	:	OPPO
Test Model	:	CPH1941
Series Model	:	N/A
Applicant	:	GuangDong Oppo Mobile Telecommunications Corp., Ltd.
Address	:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City,Guangdong,China.
Manufacturer	:	GuangDong Oppo Mobile Telecommunications Corp., Ltd.
Address	:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City,Guangdong,China.
Factory	:	GuangDong Oppo Mobile Telecommunications Corp., Ltd.
Address	:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City,Guangdong,China.
Date of Receipt	:	Sep. 19, 2019
Date of Test	:	Sep. 19, 2019 ~ Oct. 21, 2019
Issued Date	:	Oct. 24, 2019
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2019091936 for conducted, DG20190920152 for radiated.
Standard(s)	:	47 CFR FCC Part 24 Subpart E 47 CFR FCC Part 2 ANSI/TIA/EIA-603-E-2016 KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Paul . Li

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Certificate #5123.02

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 24, 2019

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 24 Subpart E & Part 2			
Standard(s) Section	**Test Item**	**Judgment**	**Remark**
2.1046 24.232(c)	Equivalent Isotropic Radiated Power	PASS	------
2.1049	Occupied Bandwidth	PASS	------
2.1051 24.238(a)	Conducted Spurious Emissions	PASS	------
2.1053 24.238(a)	Radiated Spurious Emissions	PASS	------
24.238(a)	Band Edge Measurements	PASS	------
24.232(d)	Peak To Average Ratio	PASS	------
2.1055 24.235	Frequency Stability	PASS	------

Note:

(1) “N/A” denotes test is not applicable in this test report.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's Test Firm Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.88
		30MHz ~ 200MHz	H	4.14
		200MHz ~ 1,000MHz	V	4.62
		200MHz ~ 1,000MHz	H	4.80

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 6GHz	4.58
		6GHz ~ 18GHz	5.18

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Output Power & EIRP	23.4°C	41.5%	DC 3.87V	Vegeta Li
Occupied Bandwidth	23.4°C	41.5%	DC 3.87V	Vegeta Li
Conducted Spurious Emissions	23.4°C	41.5%	DC 3.87V	Vegeta Li
Radiated Spurious Emissions	24°C	68%	AC 120V/60Hz	Berton Luo
Band Edge	23.4°C	41.5%	DC 3.87V	Vegeta Li
Peak to Average Ratio	23.4°C	41.5%	DC 3.87V	Vegeta Li
Frequency Stability	Normal and Extreme			Vegeta Li

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Mobile Phone			
Brand Name	OPPO			
Test Model	CPH1941			
Series Model	N/A			
Model Difference(s)	N/A			
Hardware Version	11			
Software Version	ColorOS V6.0.1			
Firmware Version	TBD			
Power Source	1. DC Voltage supplied from AC/DC adapter. 1# Model: OP52KAUH 2# Model: OP52JAUH 3# Model: OP52YAUH 2. Supplied from Li-ion Polymer battery. 1# Factory / Model: NVT / BLP727 (NA-P727-92) 2# Factory / Model: Desay / BLP727 (DA-P727-923) 3# Factory / Model: Sunwoda / BLP727 (XA-P727-922) 4# Factory / Model: Desay / BLP727 (DD-P727-918) 5# Factory / Model: Desay / BLP727 (DA-P727-931) 3. Supplied from USB port.			
Power Rating	1. I/P:100-240V~ 50/60Hz 0.4A O/P:5V⎓2A 2. 3.87Vdc, 5000mAh/19.35Wh 3. DC 5V			
IEMI No.	Radiated	868467040020432		
	Conducted	868467040020648		
Modulation Type	GSM/GPRS	GMSK		
	EDGE	GMSK, 8PSK		
	WCDMA/HSDPA/HSUPA	UL: QPSK DL: QPSK, 16QAM		
	LTE	UL: QPSK,16QAM, 64QAM DL: QPSK,16QAM, 64QAM		
Max. EIRP	GSM 1900 / GPRS 1900	GMSK	31.25	dBm
	EDGE 1900	8PSK	27.19	dBm
	WCDMA Band II	QPSK	22.74	dBm
	HSDPA Band II	QPSK	22.70	dBm
	HSUPA Band II	QPSK	22.74	dBm
	LTE Band 2 (Channel Bandwidth: 1.4MHz)	QPSK	24.97	dBm
		16QAM	24.59	dBm
		64QAM	23.21	dBm
	LTE Band 2 (Channel Bandwidth: 3MHz)	QPSK	25.07	dBm
		16QAM	24.74	dBm
		64QAM	23.16	dBm
	LTE Band 2 (Channel Bandwidth: 5MHz)	QPSK	25.02	dBm
		16QAM	24.83	dBm
		64QAM	23.25	dBm
	LTE Band 2 (Channel Bandwidth: 10MHz)	QPSK	25.07	dBm
		16QAM	24.66	dBm
		64QAM	23.16	dBm
	LTE Band 2 (Channel Bandwidth: 15MHz)	QPSK	25.16	dBm
		16QAM	24.77	dBm
		64QAM	23.53	dBm
	LTE Band 2 (Channel Bandwidth: 20MHz)	QPSK	25.18	dBm
		16QAM	24.82	dBm
		64QAM	23.66	dBm

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

PCS 1900				
Test Frequency ID	UARFCN	Frequency of Uplink (MHz)	UARFCN	Frequency of Downlink (MHz)
Low Range	512	1850.2	528	1930.2
Mid Range	661	1880	677	1960
High Range	810	1909.8	826	1989.8

WCDMA Band II				
Test Frequency ID	UARFCN	Frequency of Uplink (MHz)	UARFCN	Frequency of Downlink (MHz)
Low Range	9262	1852.4	9662	1932.4
Mid Range	9400	1880.0	9800	1960.0
High Range	9538	1907.6	9938	1987.6

LTE Band 2					
Test Frequency ID	Bandwidth (MHz)	N_{UL}	Frequency of Uplink (MHz)	N_{DL}	Frequency of Downlink (MHz)
Low Range	1.4	18607	1850.7	607	1930.7
	3	18615	1851.5	615	1931.5
	5	18625	1852.5	625	1932.5
	10	18650	1855	650	1935
	15	18675	1857.5	675	1937.5
	20	18700	1860	700	1940
Mid Range	1.4/3/5/10/15/20	18900	1880	900	1960
High Range	1.4	19193	1909.3	1193	1989.3
	3	19185	1908.5	1185	1988.5
	5	19175	1907.5	1175	1987.5
	10	19150	1905	1150	1985
	15	19125	1902.5	1125	1982.5
	20	19100	1900	1100	1980

3. Table for Filed Antenna:

Main Antenna

Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
N/A	N/A	Internal	N/A	1.1	PCS 1900
N/A	N/A	Internal	N/A	1.1	WCDMA Band II
N/A	N/A	Internal	N/A	1.1	LTE Band 2

Second Antenna

Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
N/A	N/A	Internal	N/A	1.1	PCS 1900
N/A	N/A	Internal	N/A	1.1	WCDMA Band II
N/A	N/A	Internal	N/A	1.1	LTE Band 2

2.2 DESCRIPTION OF TEST MODES

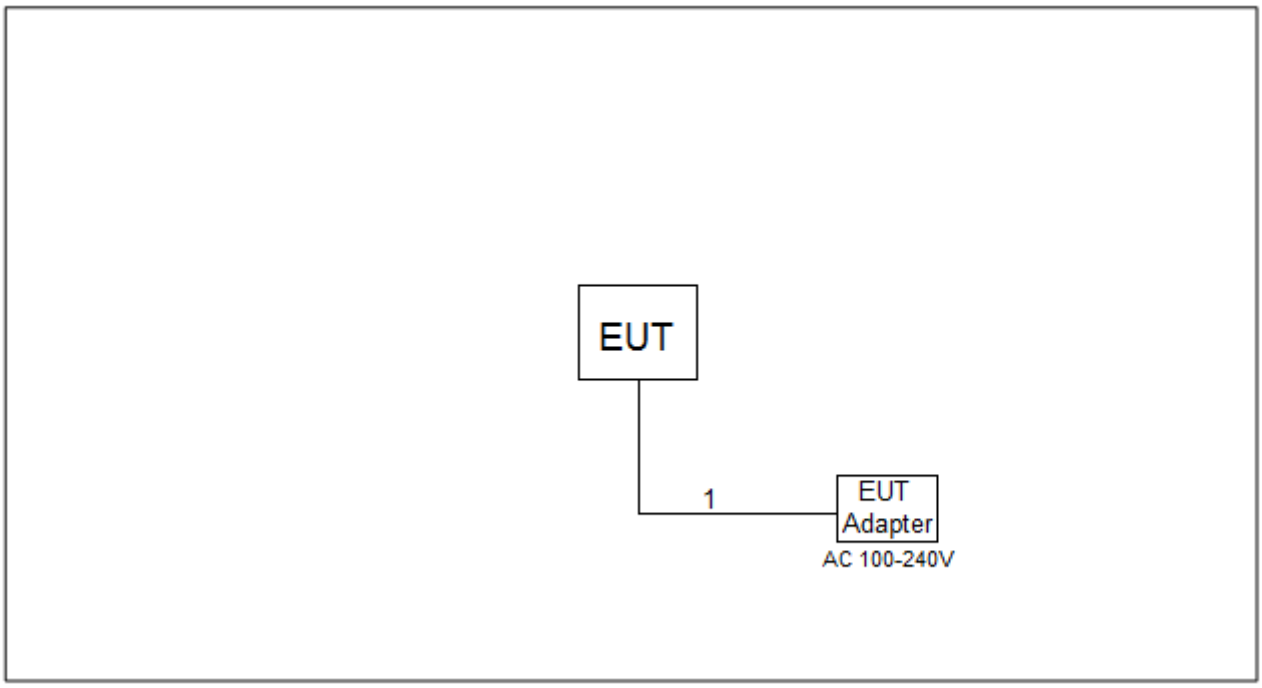
Following mode(s) is (were) found to be the worst case(s) and selected for the final test.

GSM MODE			
Test Item	Available Channel	Tested Channel	Mode
Output Power & EIRP	512 to 810	512, 661, 810	GSM, GPRS, EDGE
Occupied Bandwidth	512 to 810	512, 661, 810	GSM, EDGE
Conducted Spurious Emissions	512 to 810	661	GSM, EDGE
Radiated Spurious Emissions	512 to 810	661	GSM, EDGE
Band Edge	512 to 810	512, 810	GSM, EDGE
Peak to Average Ratio	512 to 810	512, 661, 810	GSM, EDGE
Frequency Stability	512 to 810	661	GSM

WCDMA BAND II MODE			
Test Item	Available Channel	Tested Channel	Mode
Output Power & EIRP	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA,HSUPA
Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA,HSUPA
Conducted Spurious Emissions	9262 to 9538	9400	WCDMA
Radiated Spurious Emissions	9262 to 9538	9400	WCDMA
Band Edge	9262 to 9538	9262, 9538	WCDMA, HSDPA, HSUPA
Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
Frequency Stability	9262 to 9538	9400	WCDMA

LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	1RB/3RB/6RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	1RB/36RB/75RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	1RB/50RB/100RB
Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	6RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	75 RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	100RB
Conducted Spurious Emissions	18607 to 19193	18900	1.4 MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB
Radiated Spurious Emissions	18607 to 19193	18900	1.4 MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB
Band Edge	18607 to 19193	18607, 19193	1.4MHz	QPSK	1RB/6RB
	18615 to 19185	18615, 19185	3MHz	QPSK	1RB/15RB
	18625 to 19175	18625, 19175	5MHz	QPSK	1RB/25RB
	18650 to 19150	18650, 19150	10MHz	QPSK	1RB/50RB
	18675 to 19125	18675, 19125	15MHz	QPSK	1RB/75RB
	18700 to 19100	18700, 19100	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	1RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	1RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	1RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	1RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	1RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	1RB
Frequency Stability	18607 to 19193	18900	1.4MHz	QPSK	1RB
	18615 to 19185	18900	3MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18650 to 19150	18900	10MHz	QPSK	1RB
	18675 to 19125	18900	15MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB

2.3 BLOCKDIGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1m

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

Mobile / Portable station are limited to 2 watts e.i.r.p.

3.1.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.0.

EIRP:

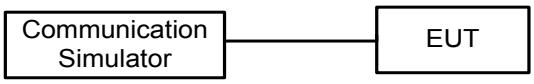
EIRP = Output Power + Antenan gain

Output Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP LAYOUT

Output Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the APPENDIX A.

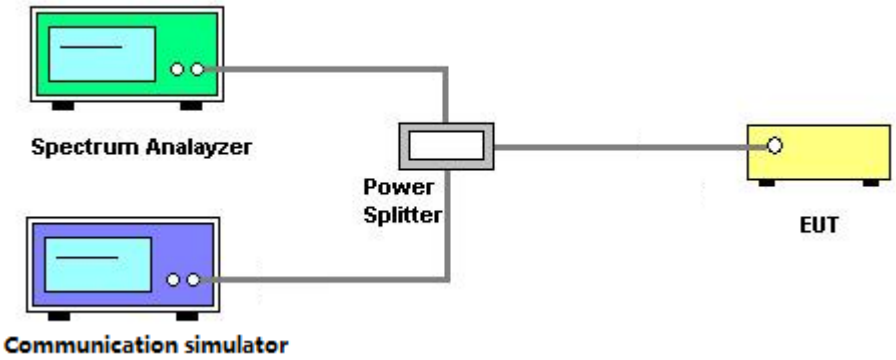
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 4.0.

1. The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. RBW=(1% ~ 5%)*EBW
   VBW⩾3* RBW
4. Set spectrum analyzer with RMS detector.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the APPENDIX B.

3.3 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

3.3.1 LIMIT

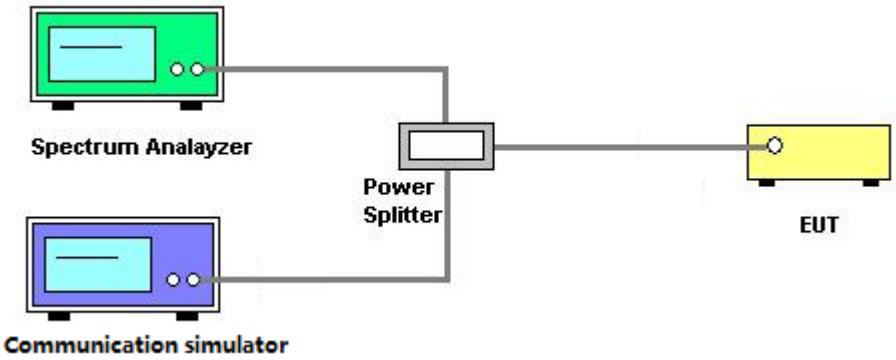
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

3.3.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.0.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>=1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.3.3 TEST SETUP LAYOUT



3.3.4 TEST DEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the APPENDIX C.

3.4 RADIATED SPURIOUS EMISSIONS MEASUREMENT

3.4.1 LIMIT

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. The emission limit equal to -13dBm.

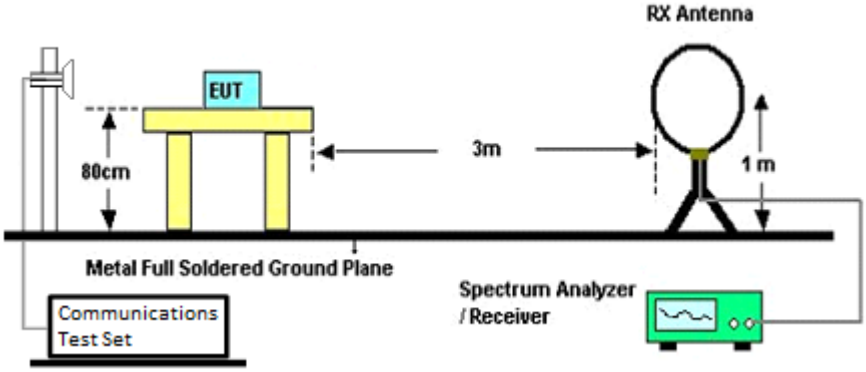
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.8.

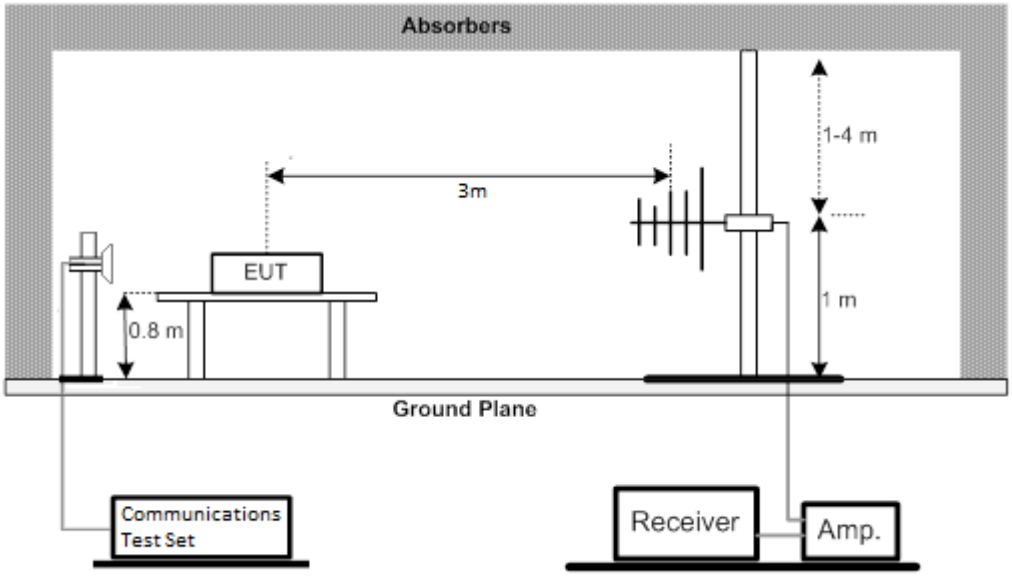
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. 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 a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. ERP can be calculated form EIRP by subtracting the gain of dipole, ERP = EIPR - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.4.3 TEST SETUP LAYOUT

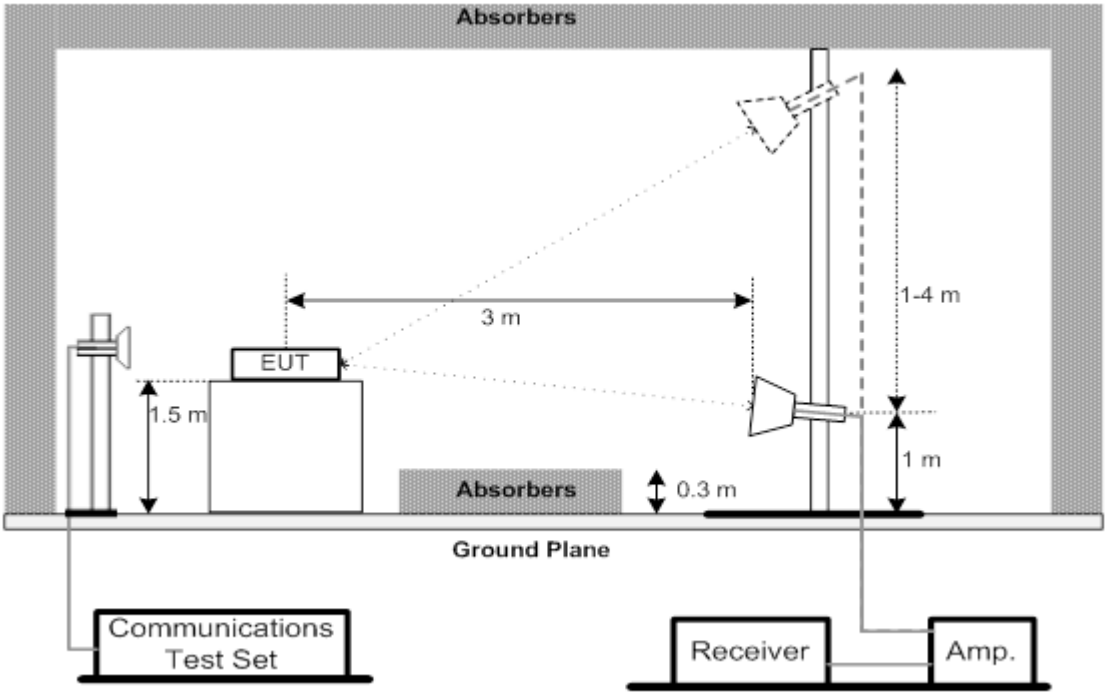
Below 30MHz



30MHz to 1000MHz



Above 1GHz



3.4.4 TEST DEVIATION

No deviation

3.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the APPENDIX D.

3.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the APPENDIX E.

3.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the APPENDIX F.

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMIT

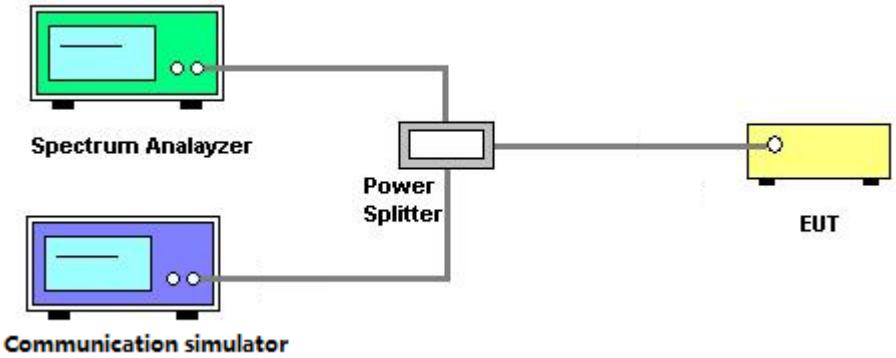
A Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.0.

1. All measurements were done at low and high operational frequency range.
2. Record the max trace plot into the test report.

3.5.3 TEST SETUP LAYOUT



3.5.4 TEST DEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the APPENDIX G.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

3.6.1 LIMIT

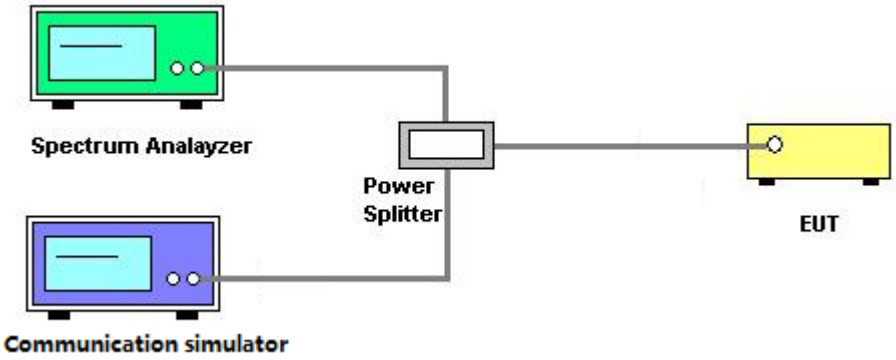
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.7.

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 TEST SETUP LAYOUT



3.6.4 TEST DEVIATION

No deviation

3.6.5 TEST RESULTS

Please refer to the APPENDIX H.

3.7 FREQUENCY STABILITY MEASUREMENT

3.7.1 LIMIT

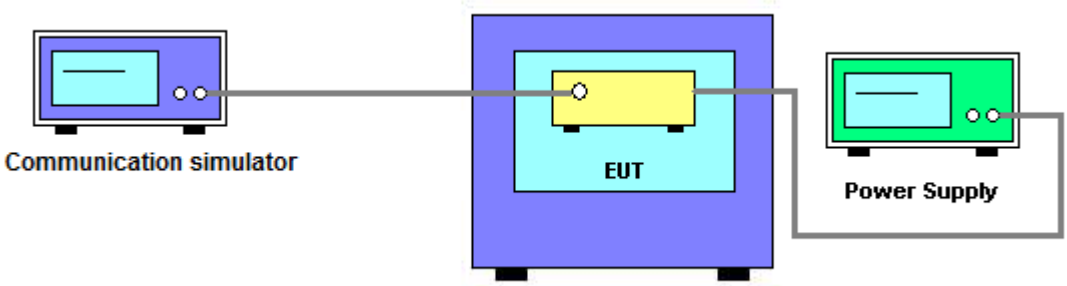
±1.5 ppm is for base and fixed station. ±2.5 ppm is for mobile station.

3.7.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 9.0.

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5°C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

3.7.3 TEST SETUP LAYOUT



3.7.4 TEST DEVIATION

No deviation

3.7.5 TEST RESULTS

Please refer to the APPENDIX I.

5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020
2	Amplifier	Agilent	8449B	3008A02274	Mar. 10, 2020
3	HighPass Filter	Wairrwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Mar. 10, 2020
4	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 1710/1785-1690/1805-60/12SS	38	Mar. 10, 2020
5	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 824/849-810/863-60/9 SS	7	Mar. 10, 2020
6	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 880/915-860/935-60/9 SS	14	Mar. 10, 2020
7	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 1850/1910-1830/1930-60/10SS	17	Mar. 10, 2020
8	HighPass Filter	Wairrwright Instruments Gmbh	WHK3.1/18G-10SS	24	Mar. 10, 2020
9	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
10	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 10, 2020
11	Receiver	Agilent	N9038A	MY52130039	Aug. 03, 2020
12	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
13	High pass filter	KANGMAIWEI	ZHPF-M3-12.75G-386 9	B2015073763	Feb. 12, 2020
14	High pass filter	KANGMAIWEI	ZHPF-M1000-4000-1	B2015073762	Feb. 12, 2020
15	High pass filter	KANGMAIWEI	ZHPF-M6-186-1727	B2015073764	Feb. 12, 2020
16	Cable	emci	LMR-400(30MHz-1GH z)(8m+5m)	N/A	May. 24, 2020
17	Cable	mitron	B10-01-01-12M	18072744	Jun. 29, 2020
18	Controller	ETS-Lindgren	2090	N/A	N/A
19	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
20	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
21	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020
22	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 23, 2020

Conducted Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 10, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Sep. 26, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Const Temp,& Humidity Chamber	Bell	BTH-50C	20170306001	Mar. 10, 2020

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

APPENDIX A - OUTPUT POWER

Output Power (dBm):

PCS1900		512CH	661CH	810CH
		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		29.71	30.14	30.05
GPRS/EDGE (GMSK)	1 Tx Slot	29.73	30.15	30.04
	2 Tx Slot	27.06	27.42	27.38
	3 Tx Slot	25.93	26.34	26.06
	4 Tx Slot	24.04	24.68	24.46
EDGE (8PSK)	1 Tx Slot	25.59	26.07	26.09
	2 Tx Slot	23.86	24.16	24.25
	3 Tx Slot	22.75	22.64	22.88
	4 Tx Slot	21.58	21.71	21.45

Modulation	Band	WCDMA Band II		
	Tx Channel	9262CH	9400CH	9538CH
	Frequency	1852.4MHz	1880MHz	1907.6MHz
QPSK	RMC 12.2K	21.27	21.49	21.6
	RMC 64K	21.29	21.54	21.64
	RMC 144K	21.43	21.53	21.62
	RMC 384K	21.28	21.55	21.61
	HSDPA Subtest-1	21.44	21.53	21.6
	HSDPA Subtest-2	21.37	21.53	21.58
	HSDPA Subtest-3	20.95	21.07	21.15
	HSDPA Subtest-4	20.83	21.11	21.09
	HSUPA Subtest-1	20.65	20.88	20.94
	HSUPA Subtest-2	18.41	18.54	18.74
	HSUPA Subtest-3	19.43	19.52	19.6
	HSUPA Subtest-4	18.33	18.57	18.44
	HSUPA Subtest-5	21.43	21.53	21.64

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18607CH	18900CH	19193CH
				1850.7MHz	1880MHz	1909.3MHz
2 / 1.4M	QPSK	1	0	23.52	23.82	23.73
		1	2	23.61	23.87	23.79
		1	5	23.53	23.82	23.70
		3	0	23.52	23.73	23.72
		3	1	23.60	23.78	23.78
		3	2	23.59	23.77	23.77
		6	0	22.78	23.00	22.95
	16QAM	1	0	22.93	23.39	23.02
		1	2	22.99	23.49	23.06
		1	5	22.94	23.43	23.04
		3	0	22.84	23.24	23.14
		3	1	22.91	23.29	23.17
		3	2	22.91	23.25	23.20
		6	0	22.02	22.03	22.24
	64QAM	1	0	21.78	21.90	22.02
		1	2	21.83	21.96	22.11
		1	5	21.72	21.91	21.99
		3	0	21.74	21.70	21.89
		3	1	21.80	21.70	21.99
		3	2	21.75	21.69	21.89
		6	0	20.93	20.79	20.67

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18615CH	18900CH	19185CH
				1851.5MHz	1880MHz	1908.5MHz
2 / 3M	QPSK	1	0	23.60	23.89	23.76
		1	7	23.74	23.97	23.83
		1	14	23.74	23.85	23.76
		8	0	22.85	23.12	23.03
		8	4	22.88	23.13	23.02
		8	7	22.91	23.09	22.98
		15	0	22.94	23.05	23.04
	16QAM	1	0	22.79	23.54	23.11
		1	7	22.90	23.64	23.19
		1	14	22.85	23.48	23.08
		8	0	22.07	22.30	22.17
		8	4	22.07	22.31	22.20
		8	7	22.09	22.25	22.16
		15	0	22.03	22.23	22.11
	64QAM	1	0	21.97	21.89	21.94
		1	7	22.04	22.02	21.94
		1	14	22.06	21.89	21.83
		8	0	20.78	20.85	20.71
		8	4	20.79	20.86	20.78
		8	7	20.86	20.87	20.73
		15	0	20.73	20.85	20.76

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18625CH	18900CH	19175CH
				1852.5MHz	1880MHz	1907.5MHz
2 / 5M	QPSK	1	0	23.79	23.91	23.91
		1	13	23.91	23.91	23.92
		1	24	23.85	23.86	23.84
		12	0	22.91	23.14	23.09
		12	6	22.97	23.12	23.08
		12	11	22.96	23.10	23.05
		25	0	23.00	23.15	23.06
	16QAM	1	0	23.09	23.68	23.24
		1	13	23.19	23.73	23.27
		1	24	23.12	23.62	23.19
		12	0	22.07	22.36	22.23
		12	6	22.10	22.33	22.18
		12	11	22.12	22.30	22.18
		25	0	22.05	22.24	22.07
	64QAM	1	0	21.65	22.13	21.98
		1	13	21.83	22.15	22.02
		1	24	21.76	22.09	21.95
		12	0	20.79	20.78	20.86
		12	6	20.89	20.77	20.83
		12	11	20.87	20.76	20.81
		25	0	20.78	20.76	20.83

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18650CH	18900CH	19150CH
				1855MHz	1880MHz	1905MHz
2 / 10M	QPSK	1	0	23.71	23.97	23.88
		1	25	23.76	23.92	23.77
		1	49	23.75	23.85	23.76
		25	0	23.01	23.12	23.08
		25	13	23.02	23.14	23.08
		25	25	22.94	23.10	23.08
		50	0	22.96	23.13	23.07
	16QAM	1	0	22.86	23.56	23.21
		1	25	22.91	23.49	23.10
		1	49	22.85	23.48	23.05
		25	0	22.04	22.25	22.28
		25	13	22.03	22.26	22.28
		25	25	22.02	22.20	22.25
		50	0	22.00	22.25	22.15
	64QAM	1	0	22.02	21.94	21.96
		1	25	22.06	21.92	21.89
		1	49	22.05	21.89	21.90
		25	0	20.81	20.88	20.88
		25	13	20.83	20.91	20.88
		25	25	20.78	20.87	20.88
		50	0	20.80	20.87	20.80

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18675CH	18900CH	19125CH
				1857.5MHz	1880MHz	1902.5MHz
2 / 15M	QPSK	1	0	23.77	24.06	24.05
		1	38	23.76	23.93	23.87
		1	74	23.70	23.89	23.88
		36	0	23.03	23.16	23.16
		36	18	22.94	23.16	23.11
		36	39	22.92	23.09	23.08
		75	0	22.99	23.11	23.11
	16QAM	1	0	22.94	23.67	23.61
		1	38	22.90	23.52	23.46
		1	74	22.94	23.48	23.46
		36	0	22.10	22.32	22.22
		36	18	22.02	22.31	22.17
		36	39	21.99	22.23	22.14
		75	0	22.05	22.23	22.17
	64QAM	1	0	22.11	22.07	22.43
		1	38	22.05	21.95	22.32
		1	74	22.04	21.92	22.35
		36	0	20.87	20.94	20.91
		36	18	20.87	20.95	20.85
		36	39	20.83	20.88	20.85
		75	0	20.79	20.85	20.90

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	23.78	24.01	24.08
		1	50	23.77	23.91	23.85
		1	99	23.77	23.89	23.84
		50	0	23.03	23.22	23.25
		50	25	23.01	23.15	23.13
		50	50	23.02	23.10	23.09
		100	0	23.04	23.15	23.19
	16QAM	1	0	23.56	23.72	23.63
		1	50	23.54	23.60	23.46
		1	99	23.52	23.52	23.47
		50	0	22.12	22.34	22.26
		50	25	22.06	22.27	22.21
		50	50	22.15	22.24	22.14
		100	0	22.09	22.24	22.23
	64QAM	1	0	22.03	22.56	22.29
		1	50	22.09	22.47	22.12
		1	99	22.11	22.43	22.13
		50	0	20.87	20.92	21.04
		50	25	20.89	20.90	20.99
		50	50	20.94	20.86	20.97
		100	0	20.87	20.87	20.99

EIRP (dBm):

PCS1900		512CH	661CH	810CH
		1850.2MHz	1880MHz	1909.8MHz
GSM (CS)		30.81	31.24	31.15
GPRS/EDGE (GMSK)	1 Tx Slot	30.83	31.25	31.14
	2 Tx Slot	28.16	28.52	28.48
	3 Tx Slot	27.03	27.44	27.16
	4 Tx Slot	25.14	25.78	25.56
EDGE (8PSK)	1 Tx Slot	26.69	27.17	27.19
	2 Tx Slot	24.96	25.26	25.35
	3 Tx Slot	23.85	23.74	23.98
	4 Tx Slot	22.68	22.81	22.55

Modulation	Band	WCDMA Band II		
	Tx Channel	9262CH	9400CH	9538CH
	Frequency	1852.4MHz	1880MHz	1907.6MHz
QPSK	RMC 12.2K	22.37	22.59	22.70
	RMC 64K	22.39	22.64	22.74
	RMC 144K	22.53	22.63	22.72
	RMC 384K	22.38	22.65	22.71
	HSDPA Subtest-1	22.54	22.63	22.70
	HSDPA Subtest-2	22.47	22.63	22.68
	HSDPA Subtest-3	22.05	22.17	22.25
	HSDPA Subtest-4	21.93	22.21	22.19
	HSUPA Subtest-1	21.75	21.98	22.04
	HSUPA Subtest-2	19.51	19.64	19.84
	HSUPA Subtest-3	20.53	20.62	20.70
	HSUPA Subtest-4	19.43	19.67	19.54
	HSUPA Subtest-5	22.53	22.63	22.74

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18607CH	18900CH	19193CH
				1850.7MHz	1880MHz	1909.3MHz
2 / 1.4M	QPSK	1	0	24.62	24.92	24.83
		1	2	24.71	24.97	24.89
		1	5	24.63	24.92	24.80
		3	0	24.62	24.83	24.82
		3	1	24.70	24.88	24.88
		3	2	24.69	24.87	24.87
		6	0	23.88	24.10	24.05
	16QAM	1	0	24.03	24.49	24.12
		1	2	24.09	24.59	24.16
		1	5	24.04	24.53	24.14
		3	0	23.94	24.34	24.24
		3	1	24.01	24.39	24.27
		3	2	24.01	24.35	24.30
		6	0	23.12	23.13	23.34
	64QAM	1	0	22.88	23.00	23.12
		1	2	22.93	23.06	23.21
		1	5	22.82	23.01	23.09
		3	0	22.84	22.80	22.99
		3	1	22.90	22.80	23.09
		3	2	22.85	22.79	22.99
		6	0	22.03	21.89	21.77

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18615CH	18900CH	19185CH
				1851.5MHz	1880MHz	1908.5MHz
2 / 3M	QPSK	1	0	24.70	24.99	24.86
		1	7	24.84	25.07	24.93
		1	14	24.84	24.95	24.86
		8	0	23.95	24.22	24.13
		8	4	23.98	24.23	24.12
		8	7	24.01	24.19	24.08
		15	0	24.04	24.15	24.14
	16QAM	1	0	23.89	24.64	24.21
		1	7	24.00	24.74	24.29
		1	14	23.95	24.58	24.18
		8	0	23.17	23.40	23.27
		8	4	23.17	23.41	23.30
		8	7	23.19	23.35	23.26
		15	0	23.13	23.33	23.21
	64QAM	1	0	23.07	22.99	23.04
		1	7	23.14	23.12	23.04
		1	14	23.16	22.99	22.93
		8	0	21.88	21.95	21.81
		8	4	21.89	21.96	21.88
		8	7	21.96	21.97	21.83
		15	0	21.83	21.95	21.86

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18625CH	18900CH	19175CH
				1852.5MHz	1880MHz	1907.5MHz
2 / 5M	QPSK	1	0	24.89	25.01	25.01
		1	13	25.01	25.01	25.02
		1	24	24.95	24.96	24.94
		12	0	24.01	24.24	24.19
		12	6	24.07	24.22	24.18
		12	11	24.06	24.20	24.15
		25	0	24.10	24.25	24.16
	16QAM	1	0	24.19	24.78	24.34
		1	13	24.29	24.83	24.37
		1	24	24.22	24.72	24.29
		12	0	23.17	23.46	23.33
		12	6	23.20	23.43	23.28
		12	11	23.22	23.40	23.28
		25	0	23.15	23.34	23.17
	64QAM	1	0	22.75	23.23	23.08
		1	13	22.93	23.25	23.12
		1	24	22.86	23.19	23.05
		12	0	21.89	21.88	21.96
		12	6	21.99	21.87	21.93
		12	11	21.97	21.86	21.91
		25	0	21.88	21.86	21.93

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18650CH	18900CH	19150CH
				1855MHz	1880MHz	1905MHz
2 / 10M	QPSK	1	0	24.81	25.07	24.98
		1	25	24.86	25.02	24.87
		1	49	24.85	24.95	24.86
		25	0	24.11	24.22	24.18
		25	13	24.12	24.24	24.18
		25	25	24.04	24.20	24.18
		50	0	24.06	24.23	24.17
	16QAM	1	0	23.96	24.66	24.31
		1	25	24.01	24.59	24.20
		1	49	23.95	24.58	24.15
		25	0	23.14	23.35	23.38
		25	13	23.13	23.36	23.38
		25	25	23.12	23.30	23.35
		50	0	23.10	23.35	23.25
	64QAM	1	0	23.12	23.04	23.06
		1	25	23.16	23.02	22.99
		1	49	23.15	22.99	23.00
		25	0	21.91	21.98	21.98
		25	13	21.93	22.01	21.98
		25	25	21.88	21.97	21.98
		50	0	21.90	21.97	21.90

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18675CH	18900CH	19125CH
				1857.5MHz	1880MHz	1902.5MHz
2 / 15M	QPSK	1	0	24.87	25.16	25.15
		1	38	24.86	25.03	24.97
		1	74	24.80	24.99	24.98
		36	0	24.13	24.26	24.26
		36	18	24.04	24.26	24.21
		36	39	24.02	24.19	24.18
		75	0	24.09	24.21	24.21
	16QAM	1	0	24.04	24.77	24.71
		1	38	24.00	24.62	24.56
		1	74	24.04	24.58	24.56
		36	0	23.20	23.42	23.32
		36	18	23.12	23.41	23.27
		36	39	23.09	23.33	23.24
		75	0	23.15	23.33	23.27
	64QAM	1	0	23.21	23.17	23.53
		1	38	23.15	23.05	23.42
		1	74	23.14	23.02	23.45
		36	0	21.97	22.04	22.01
		36	18	21.97	22.05	21.95
		36	39	21.93	21.98	21.95
		75	0	21.89	21.95	22.00

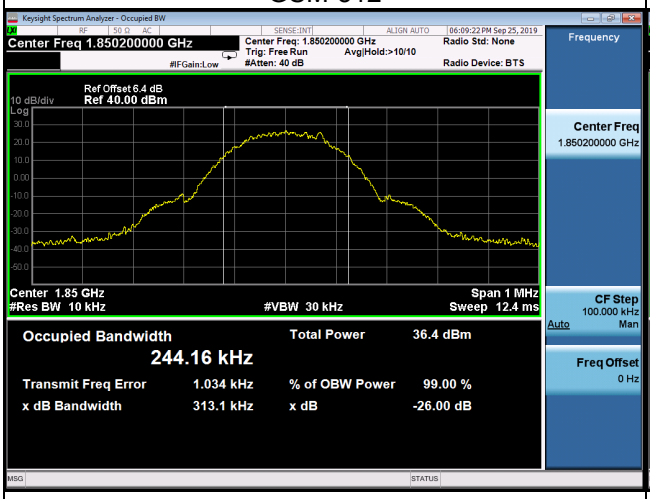
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	24.88	25.11	25.18
		1	50	24.87	25.01	24.95
		1	99	24.87	24.99	24.94
		50	0	24.13	24.32	24.35
		50	25	24.11	24.25	24.23
		50	50	24.12	24.20	24.19
		100	0	24.14	24.25	24.29
	16QAM	1	0	24.66	24.82	24.73
		1	50	24.64	24.70	24.56
		1	99	24.62	24.62	24.57
		50	0	23.22	23.44	23.36
		50	25	23.16	23.37	23.31
		50	50	23.25	23.34	23.24
		100	0	23.19	23.34	23.33
	64QAM	1	0	23.13	23.66	23.39
		1	50	23.19	23.57	23.22
		1	99	23.21	23.53	23.23
		50	0	21.97	22.02	22.14
		50	25	21.99	22.00	22.09
		50	50	22.04	21.96	22.07
		100	0	21.97	21.97	22.09

APPENDIX B - OCCUPIED BANDWIDTH

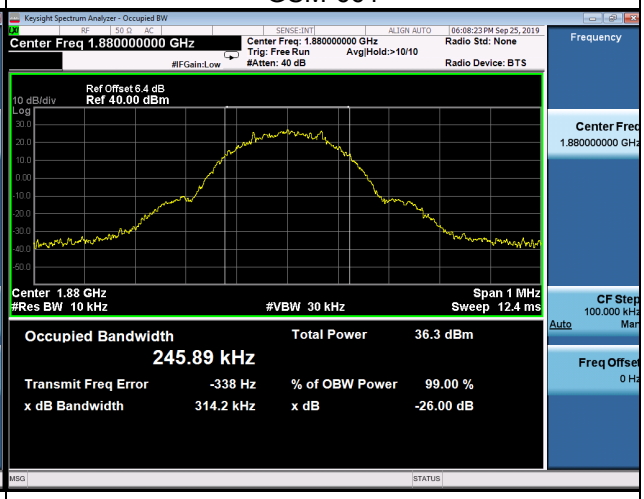
PCS1900					
GSM			EDGE		
CS			8PSK		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
512	1850.2	0.244	512	1850.2	0.248
661	1880	0.246	661	1880	0.247
810	1909.8	0.246	810	1909.8	0.246
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
512	1850.2	0.313	512	1850.2	0.315
661	1880	0.314	661	1880	0.313
810	1909.8	0.321	810	1909.8	0.313

Spectrum Plot

GSM-512

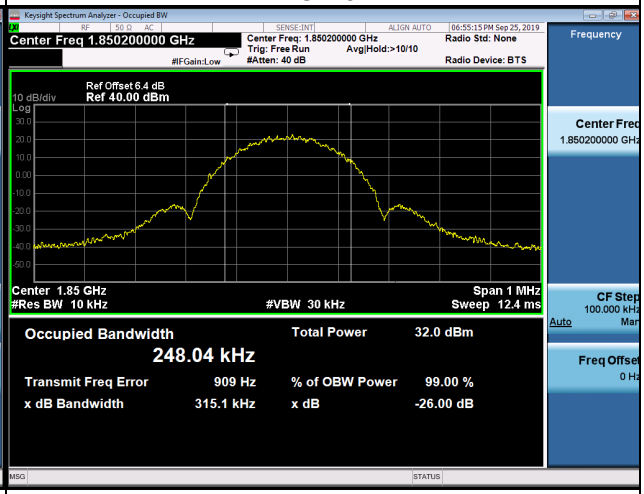


GSM-661

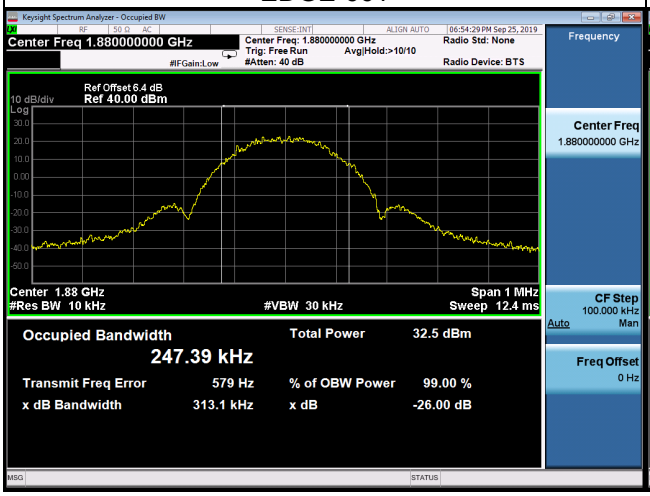


GSM-810

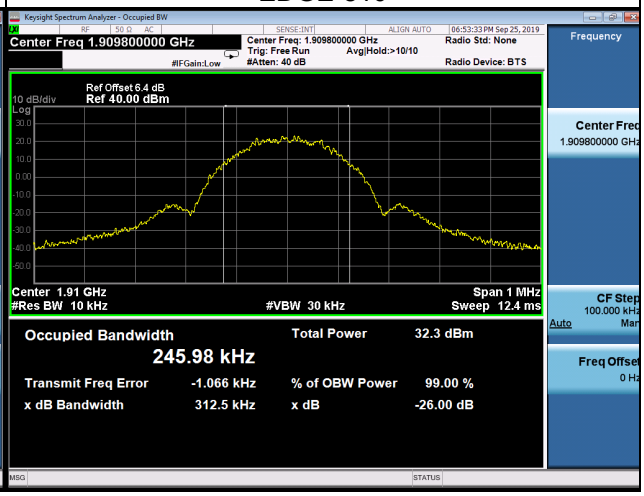
EDGE-512



EDGE-661



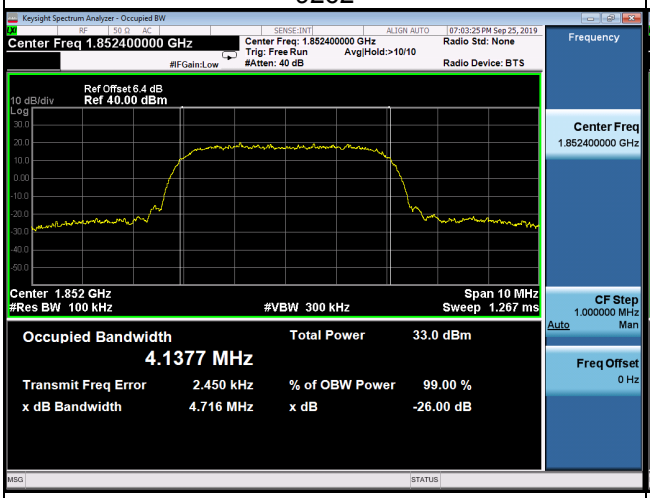
EDGE-810



WCDMA Band II_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.138	9262	1852.4	4.716
9400	1880	4.136	9400	1880	4.707
9538	1907.6	4.132	9538	1907.6	4.716

Spectrum Plot

9262



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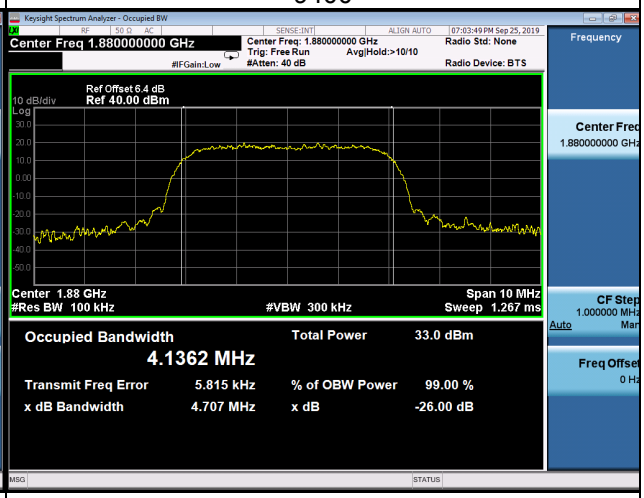

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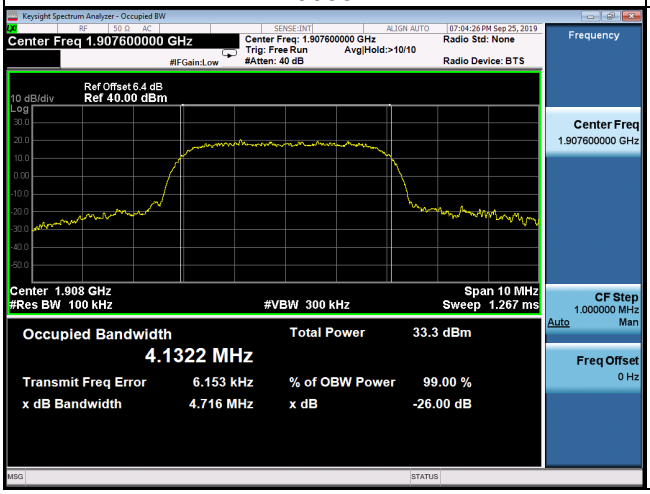

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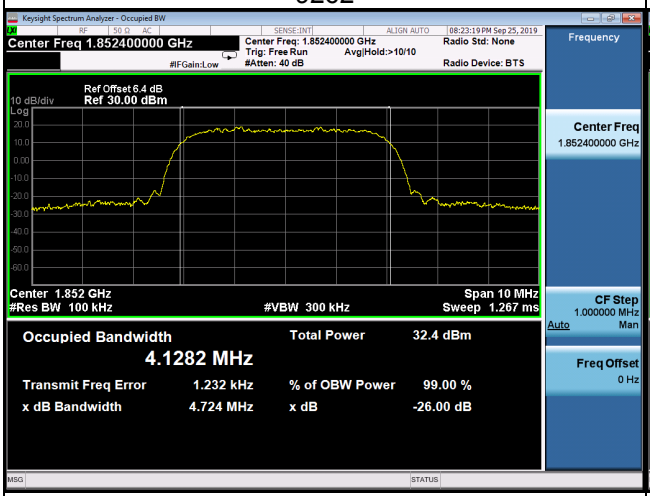
WCDMA Band II _HSDPA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.128	9262	1852.4	4.724
9400	1880	4.134	9400	1880	4.723
9538	1907.6	4.126	9538	1907.6	4.721

Spectrum Plot

9262



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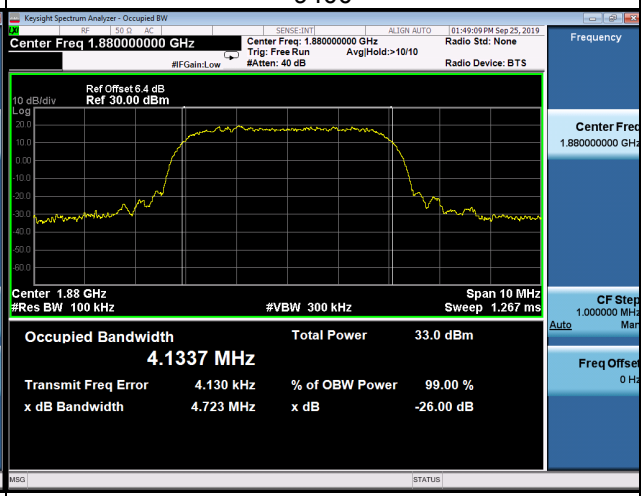

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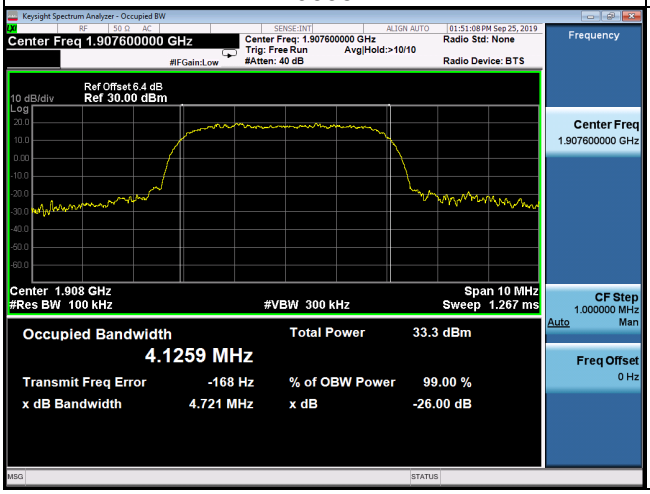

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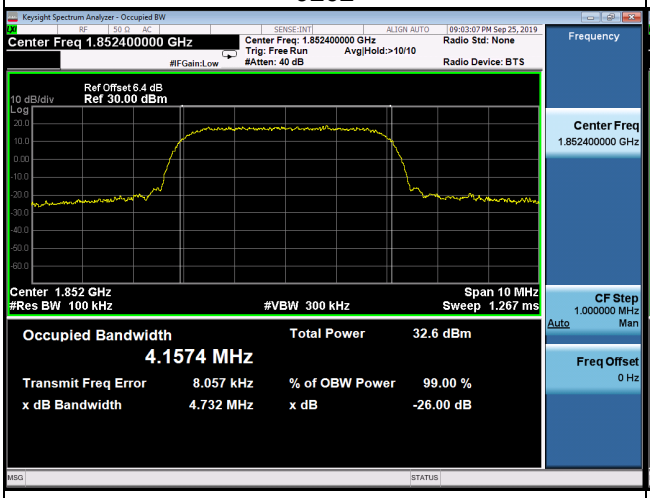
WCDMA Band II _HSUPA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.157	9262	1852.4	4.732
9400	1880	4.157	9400	1880	4.725
9538	1907.6	4.165	9538	1907.6	4.733

Spectrum Plot

9262



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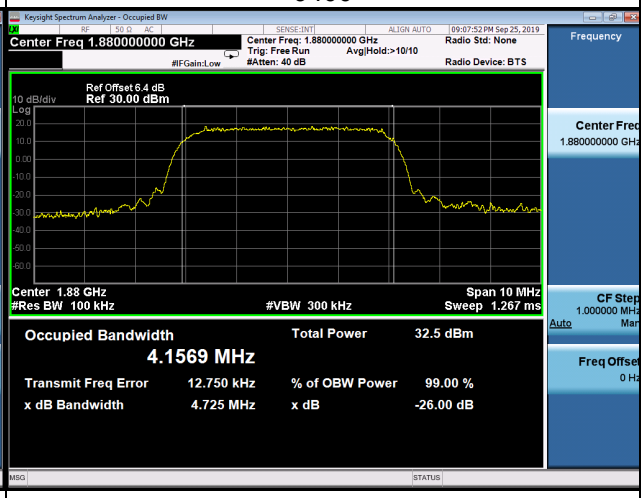

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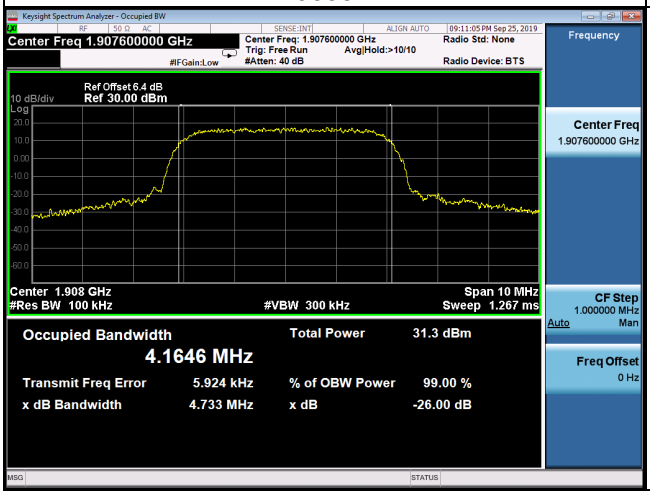

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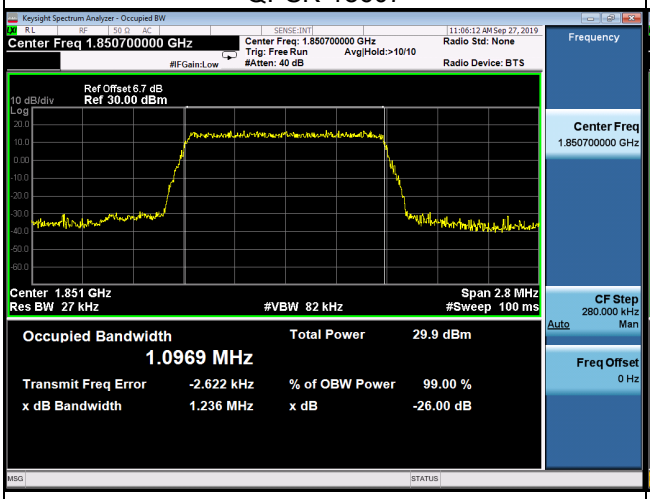
LTE Band 2_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.097	18607	1850.7	1.236
18900	1880	1.085	18900	1880	1.232
19193	1909.3	1.086	19193	1909.3	1.239
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.088	18607	1850.7	1.234
18900	1880	1.092	18900	1880	1.227
19193	1909.3	1.089	19193	1909.3	1.230
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.095	18607	1850.7	1.238
18900	1880	1.092	18900	1880	1.227
19193	1909.3	1.089	19193	1909.3	1.230

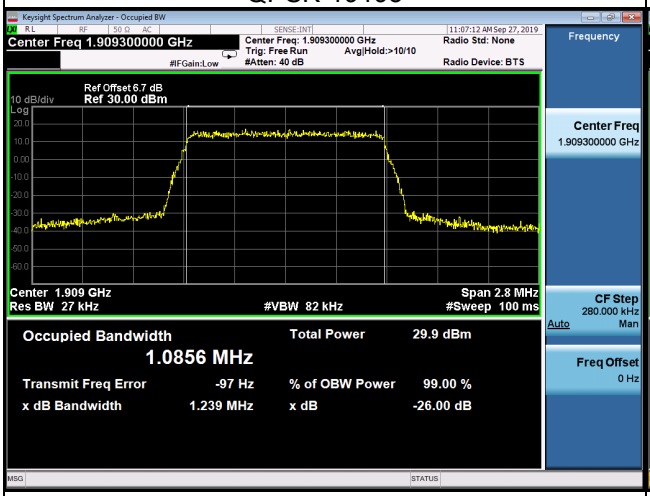
Spectrum Plot

QPSK-18607

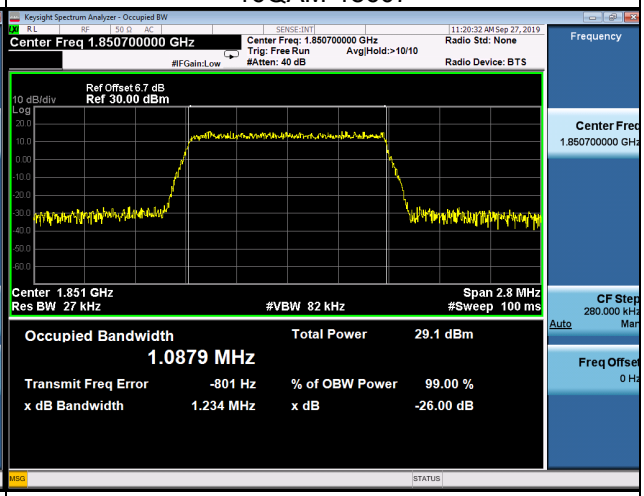


QPSK-18900

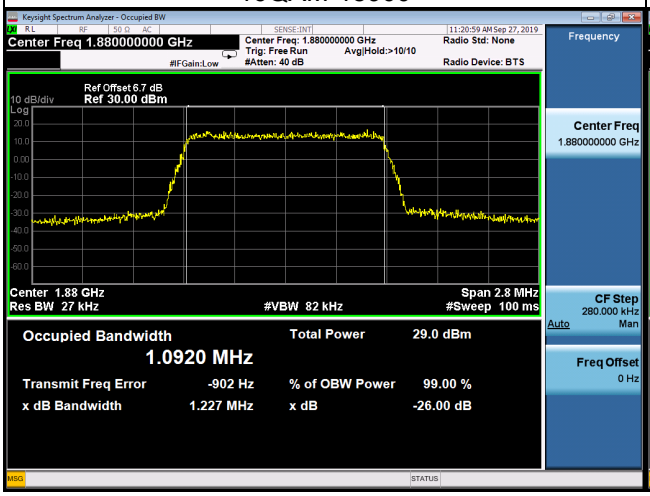
QPSK-19193



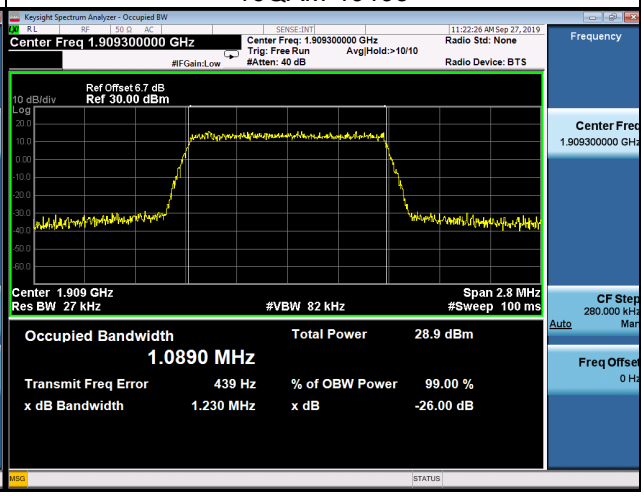
16QAM-18607

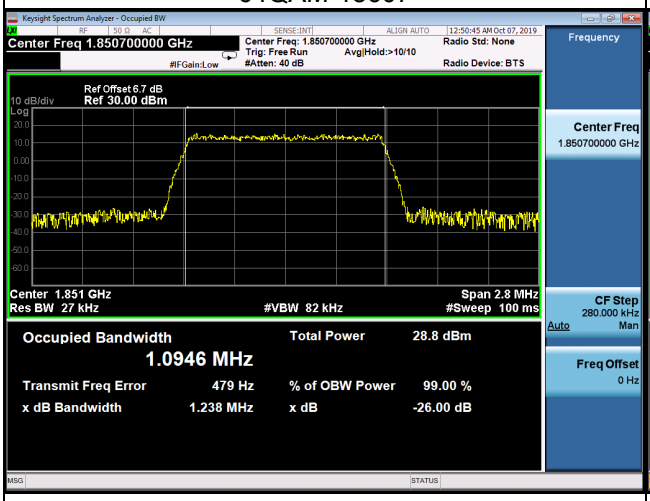
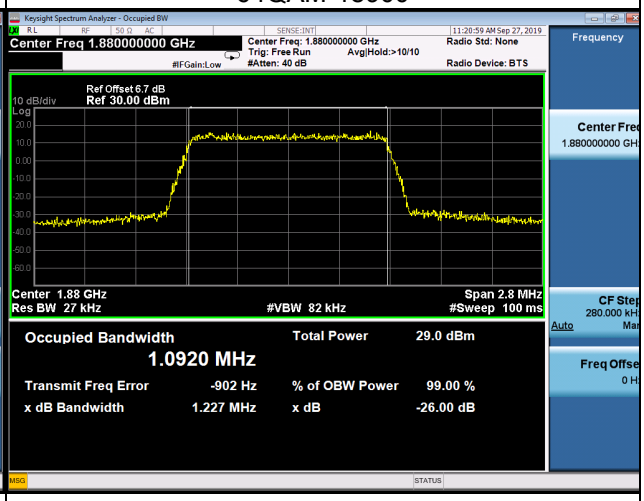
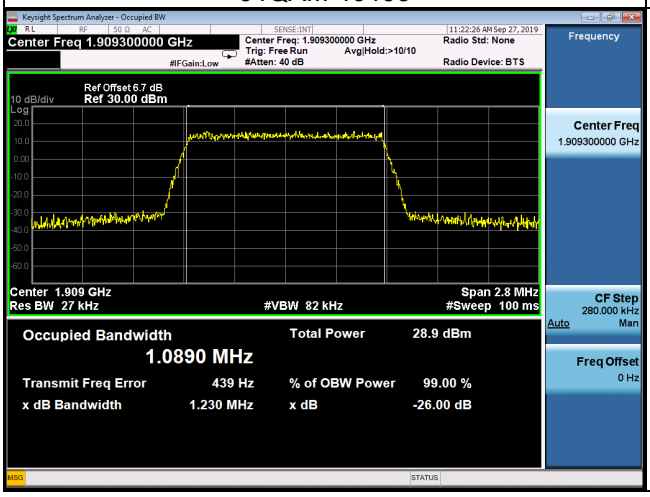


16QAM-18900



16QAM-19193

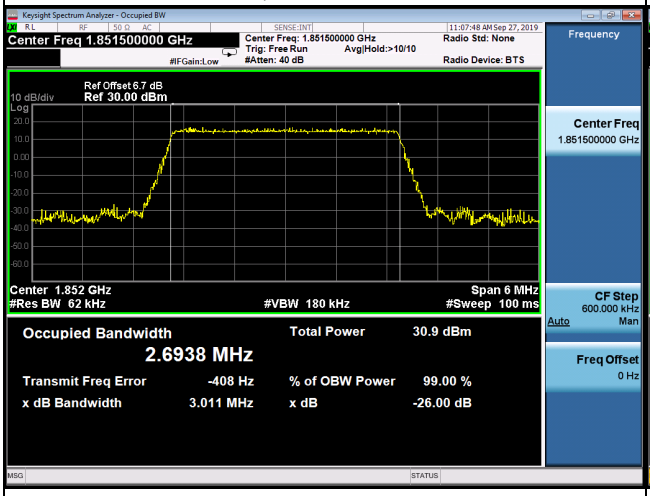


Spectrum Plot	
64QAM-18607	64QAM-18900
	
64QAM-19193	-
	-

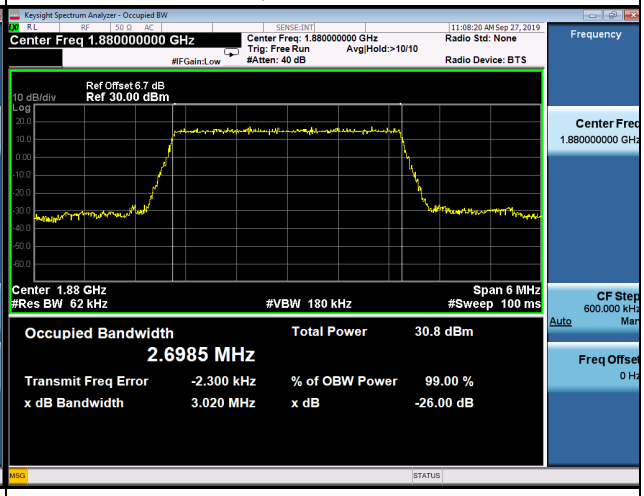
LTE Band 2_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.694	18615	1851.5	3.011
18900	1880	2.699	18900	1880	3.020
19185	1908.5	2.699	19185	1908.5	3.000
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.696	18615	1851.5	3.023
18900	1880	2.694	18900	1880	2.994
19185	1908.5	2.694	19185	1908.5	3.009
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.702	18615	1851.5	2.998
18900	1880	2.696	18900	1880	2.969
19185	1908.5	2.696	19185	1908.5	2.997

Spectrum Plot

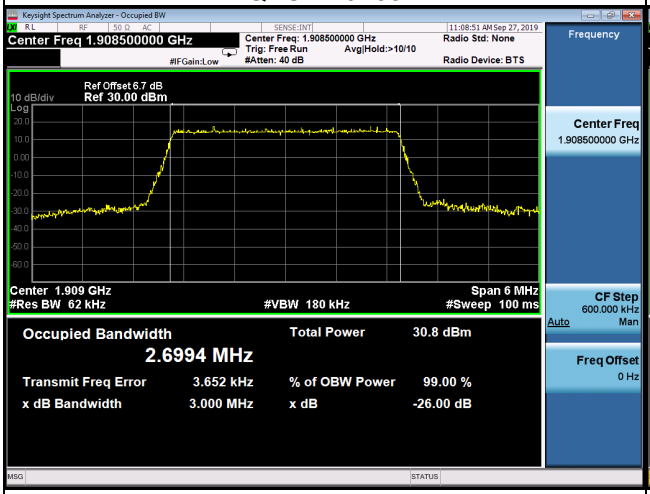
QPSK-18615



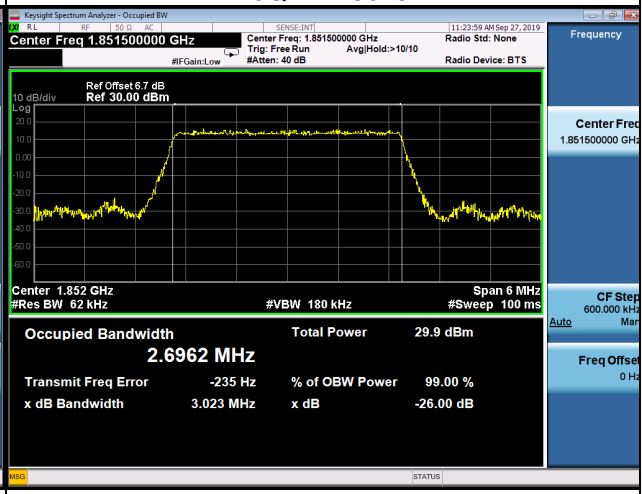
QPSK-18900



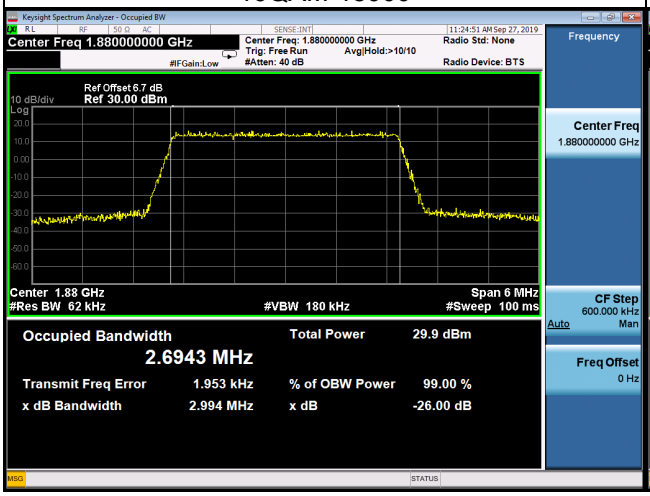
QPSK-19185



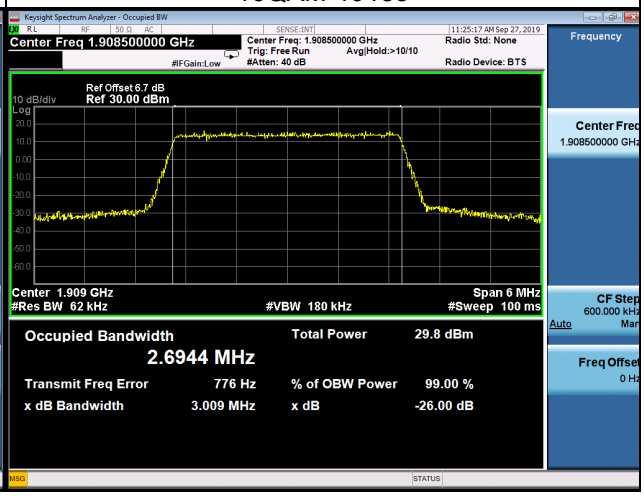
16QAM-18615

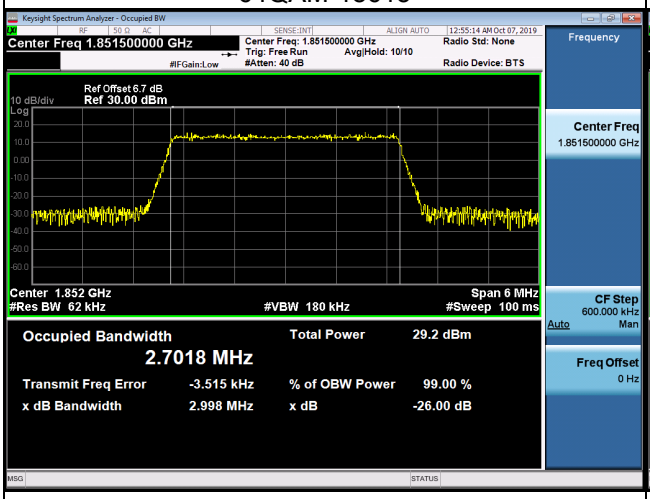
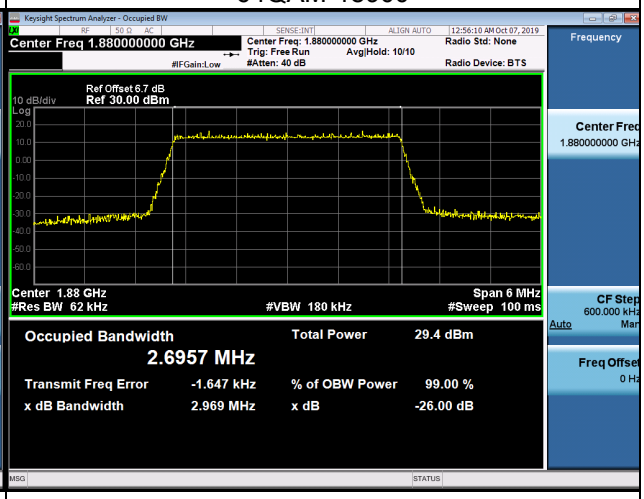
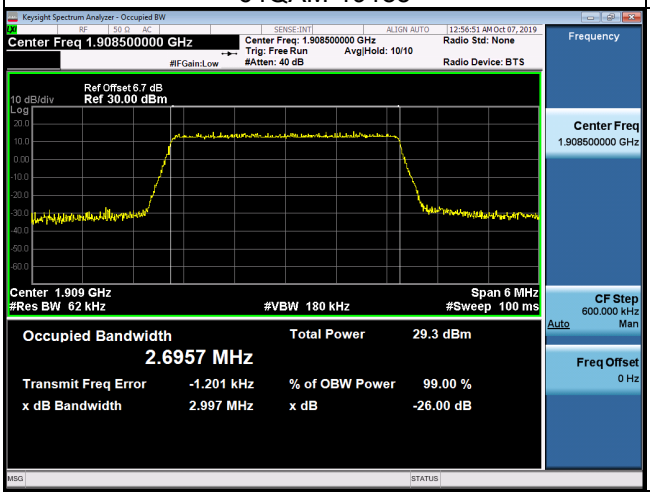


16QAM-18900



16QAM-19185

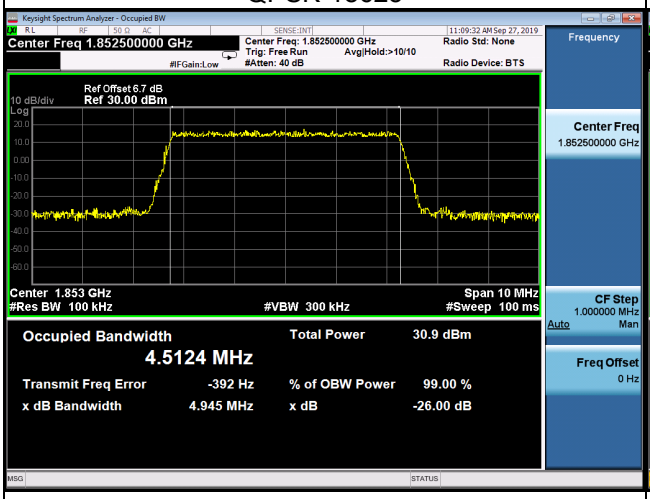


Spectrum Plot	
64QAM-18615	64QAM-18900
	
64QAM-19185	-
	-

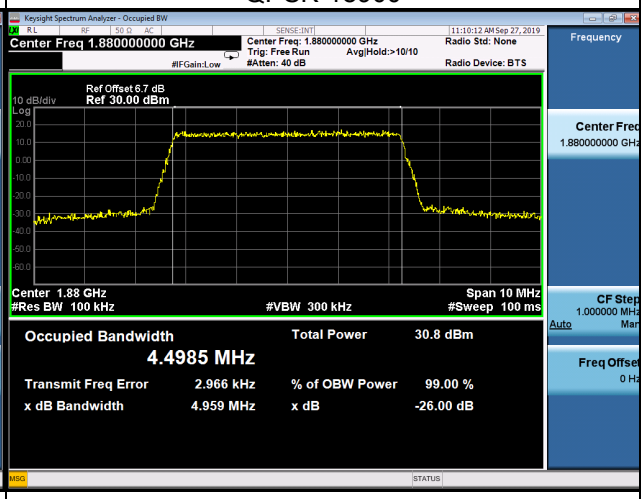
LTE Band 2_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.512	18625	1852.5	4.945
18900	1880	4.499	18900	1880	4.959
19175	1907.5	4.507	19175	1907.5	4.932
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.507	18625	1852.5	4.909
18900	1880	4.504	18900	1880	4.958
19175	1907.5	4.496	19175	1907.5	4.907
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.499	18625	1852.5	4.933
18900	1880	4.508	18900	1880	4.957
19175	1907.5	4.500	19175	1907.5	4.967

Spectrum Plot

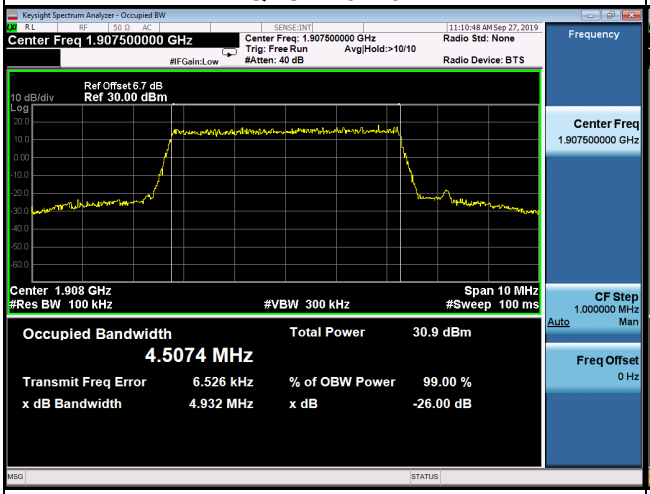
QPSK-18625



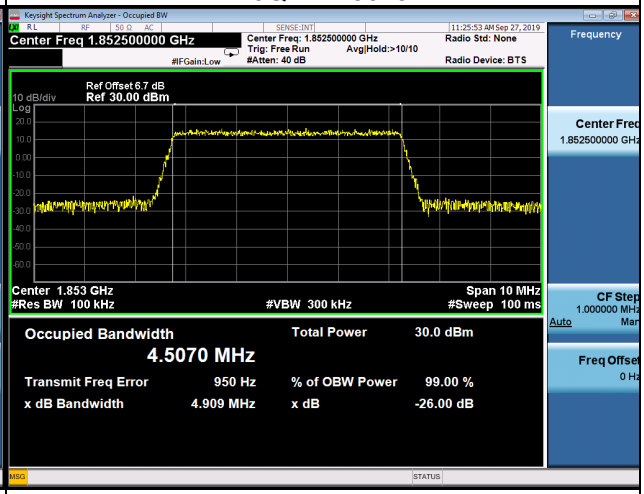
QPSK-18900



QPSK-19175

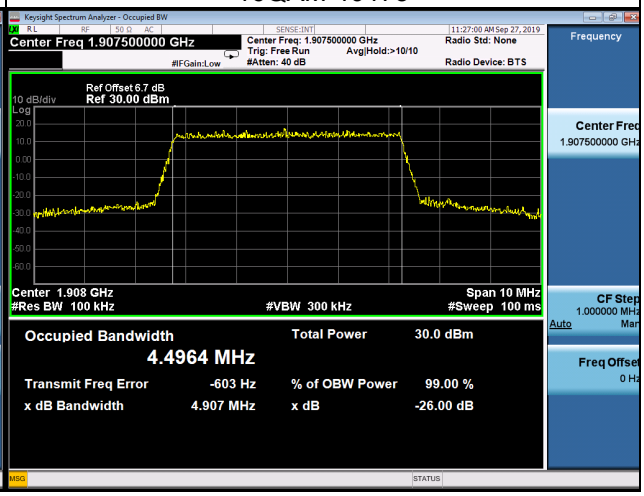


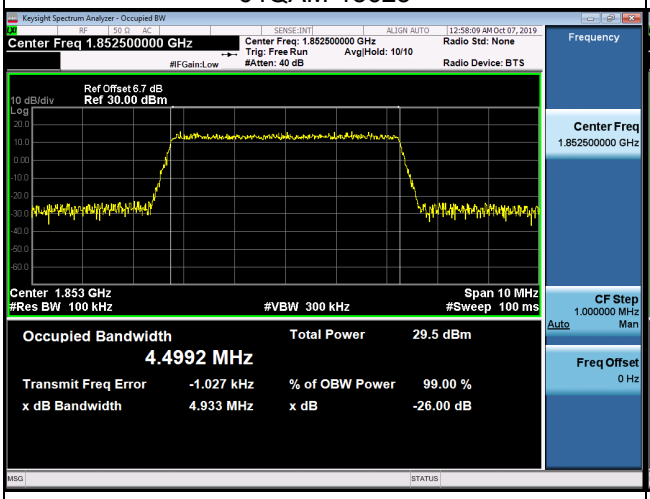
16QAM-18625



16QAM-18900

16QAM-19175

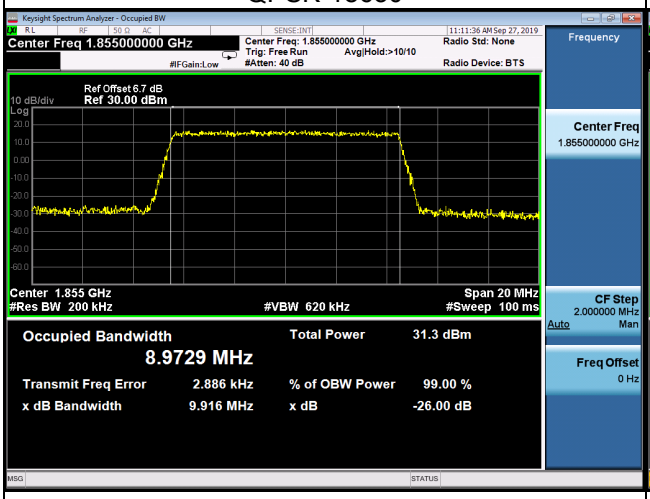


Spectrum Plot	
64QAM-18625	64QAM-18900
	
64QAM-19175	-
	-

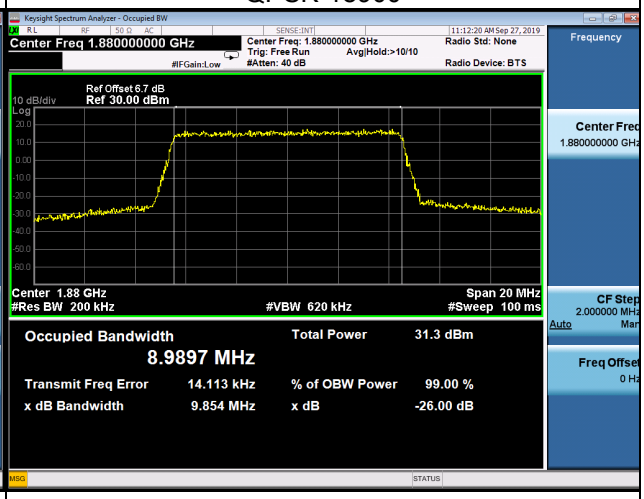
LTE Band 2_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.973	18650	1855	9.916
18900	1880	8.990	18900	1880	9.854
19150	1905	9.018	19150	1905	9.841
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.967	18650	1855	9.802
18900	1880	8.964	18900	1880	9.801
19150	1905	8.988	19150	1905	9.731
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.973	18650	1855	9.750
18900	1880	8.963	18900	1880	9.799
19150	1905	8.977	19150	1905	9.729

Spectrum Plot

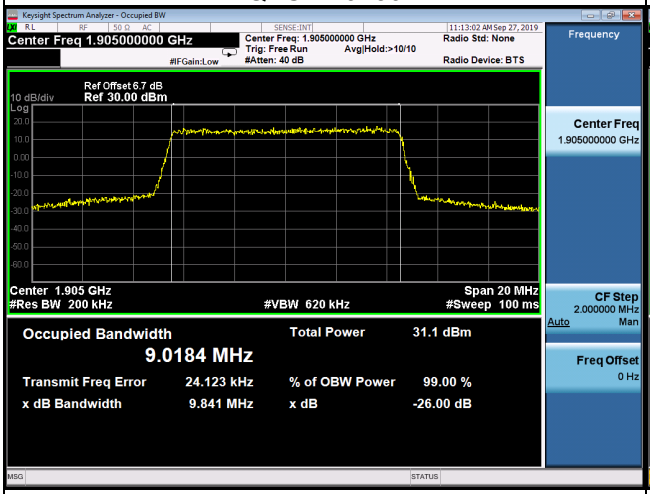
QPSK-18650



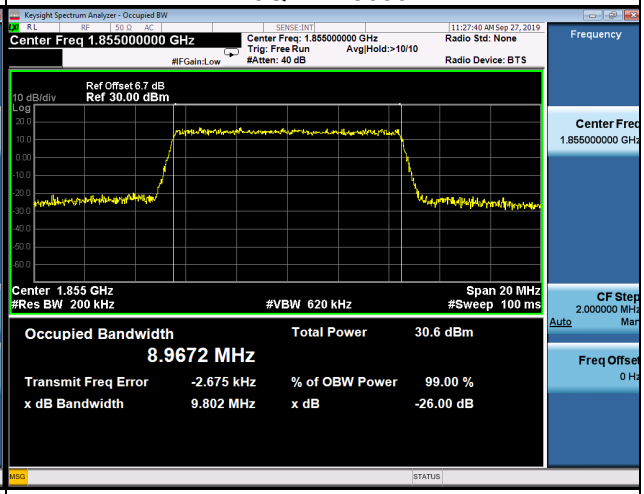
QPSK-18900



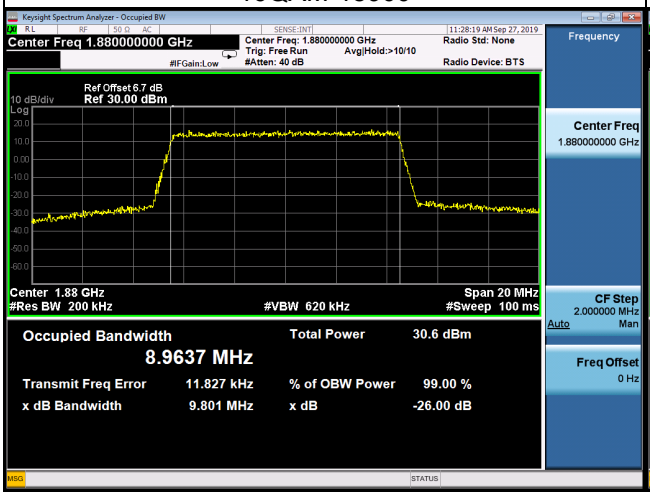
QPSK-19150



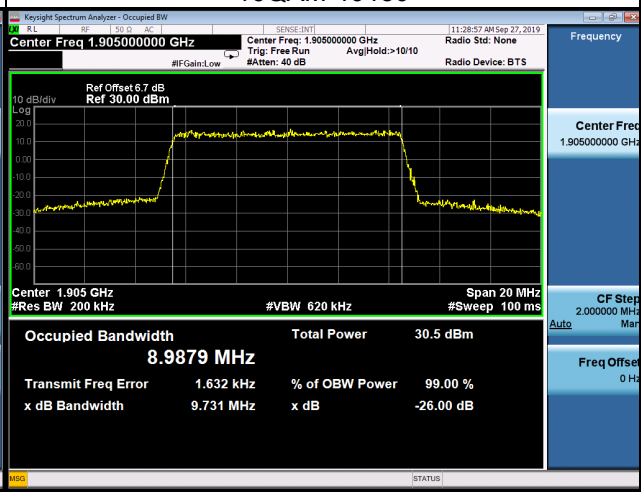
16QAM-18650

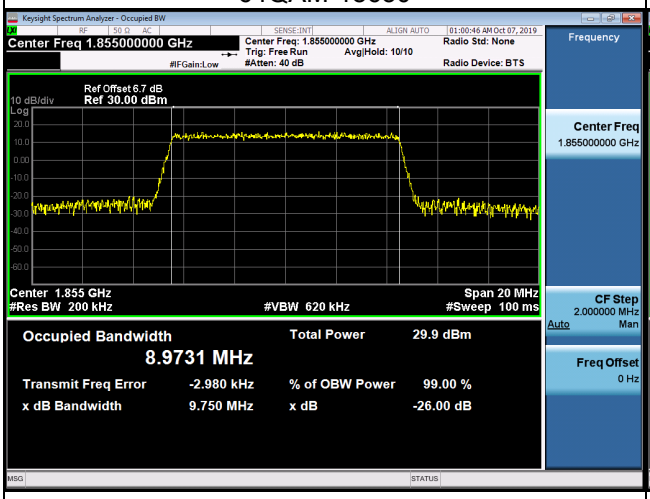


16QAM-18900



16QAM-19150

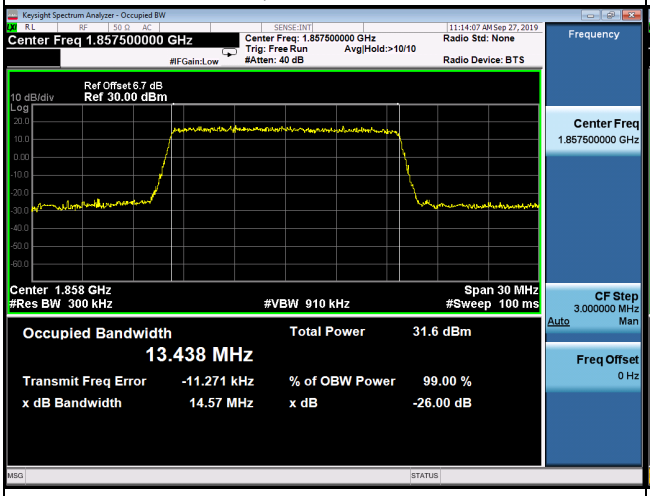


Spectrum Plot	
64QAM-18650	64QAM-18900
	
64QAM-19150	-
	-

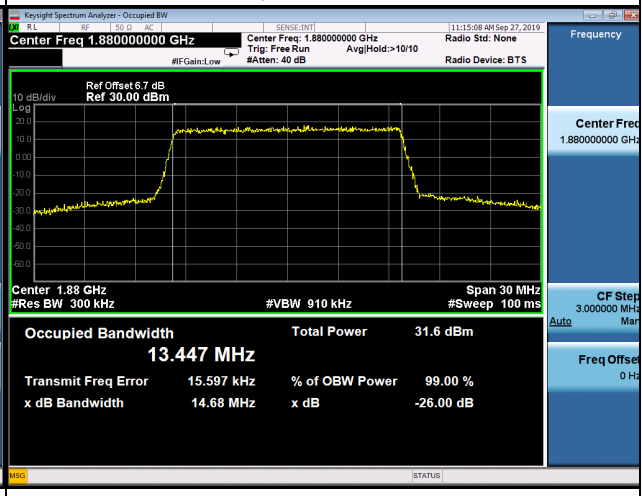
LTE Band 2_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.438	18675	1857.5	14.570
18900	1880	13.447	18900	1880	14.680
19125	1902.5	13.483	19125	1902.5	14.890
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.430	18675	1857.5	14.640
18900	1880	13.439	18900	1880	14.570
19125	1902.5	13.490	19125	1902.5	14.670
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.432	18675	1857.5	14.570
18900	1880	13.460	18900	1880	14.600
19125	1902.5	13.523	19125	1902.5	14.730

Spectrum Plot

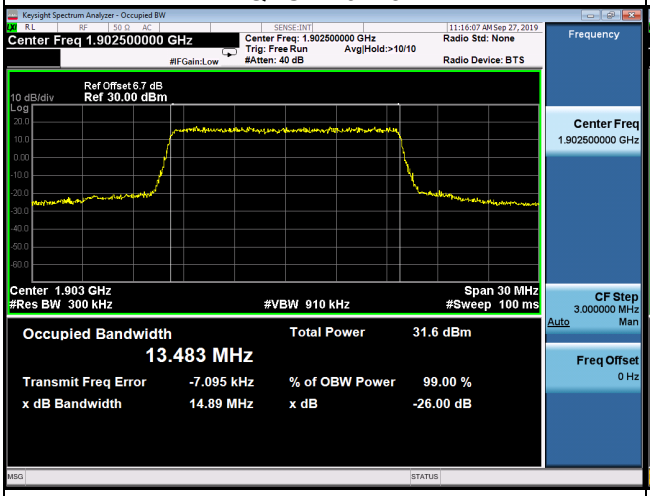
QPSK-18675



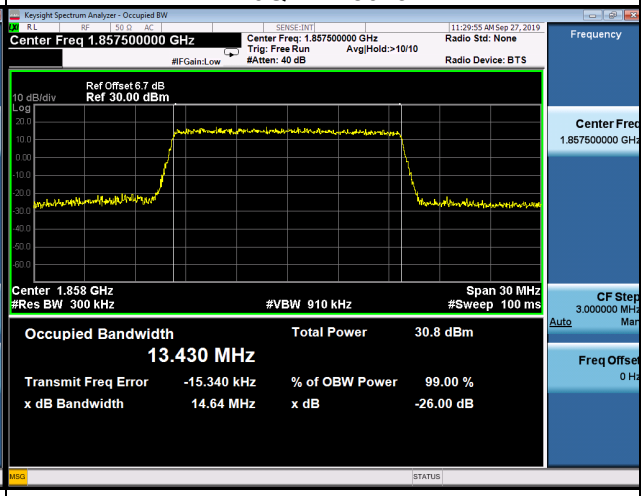
QPSK-18900



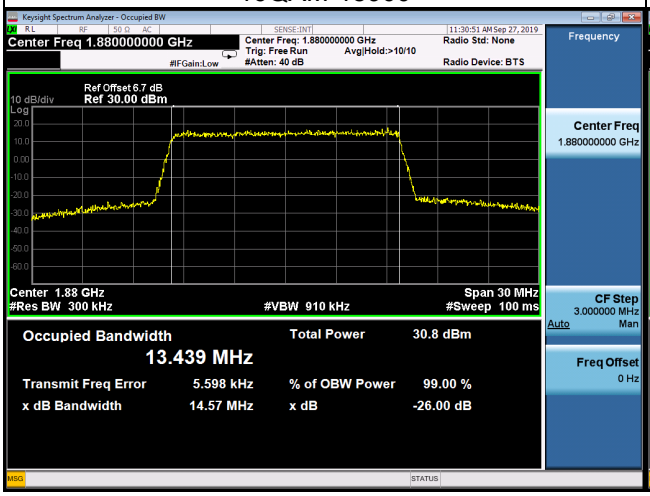
QPSK-19125



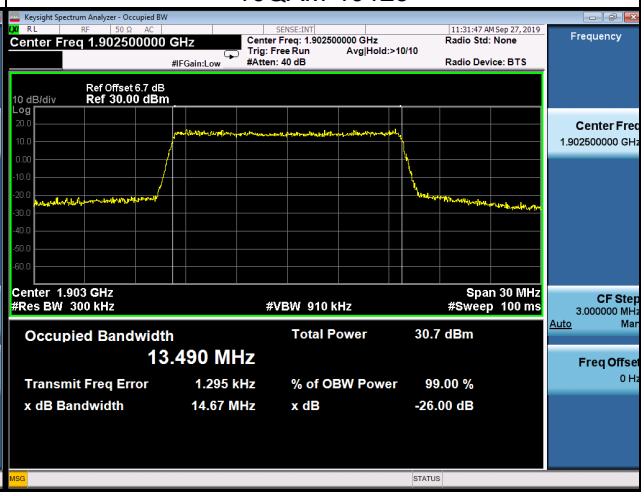
16QAM-18675

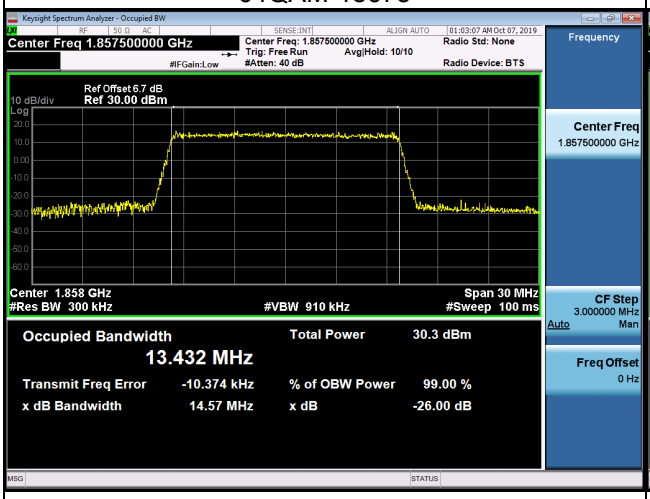


16QAM-18900



16QAM-19125

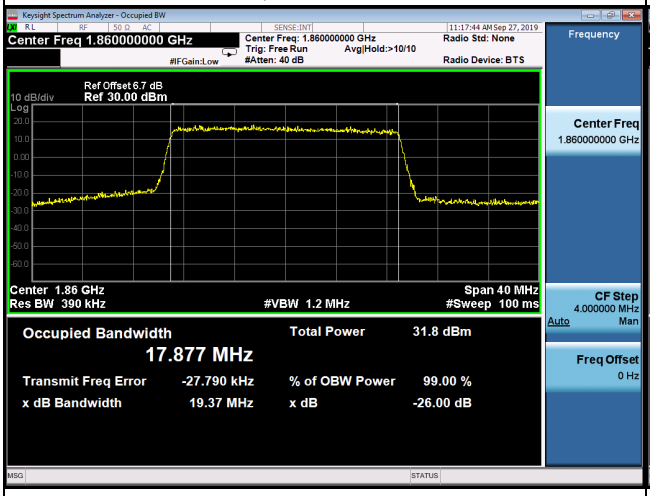


Spectrum Plot	
64QAM-18675	64QAM-18900
	
64QAM-19125	-
	-

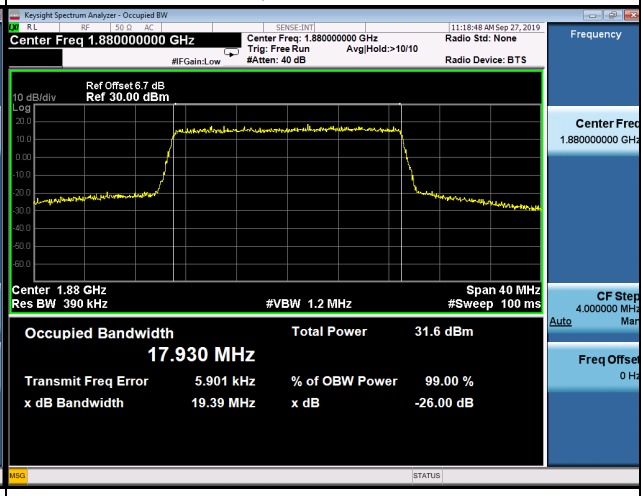
LTE Band 2_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.877	18700	1860	19.370
18900	1880	17.930	18900	1880	19.390
19100	1900	17.982	19100	1900	19.410
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.903	18700	1860	19.400
18900	1880	17.913	18900	1880	19.490
19100	1900	17.963	19100	1900	19.440
64QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.855	18700	1860	19.260
18900	1880	17.932	18900	1880	19.440
19100	1900	17.966	19100	1900	19.450

Spectrum Plot

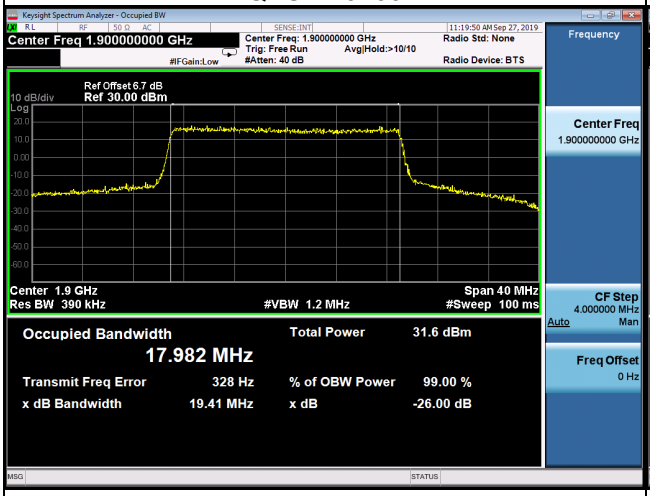
QPSK-18700



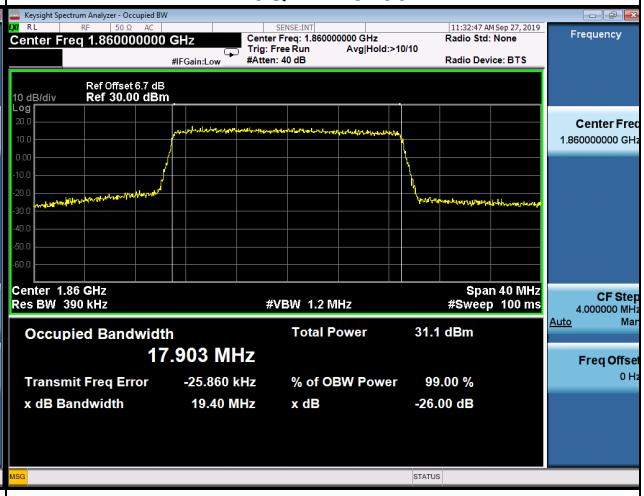
QPSK-18900



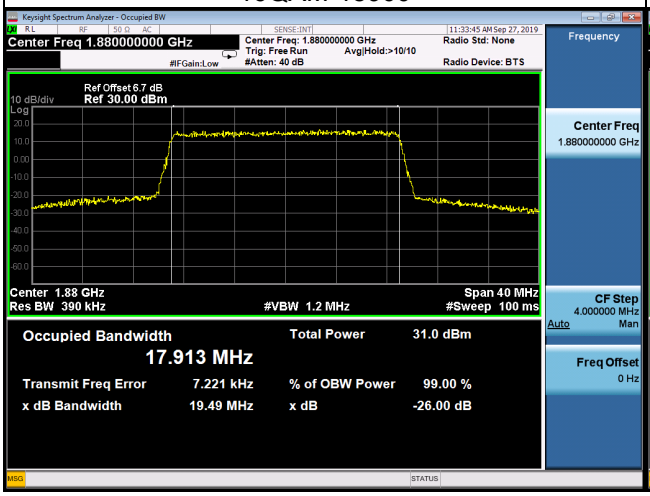
QPSK-19100



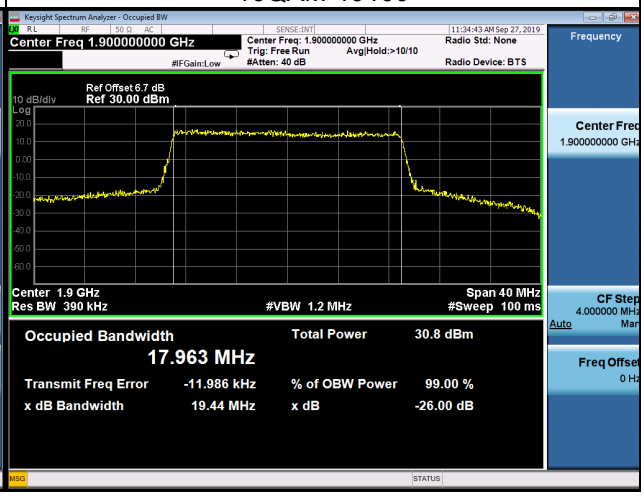
16QAM-18700

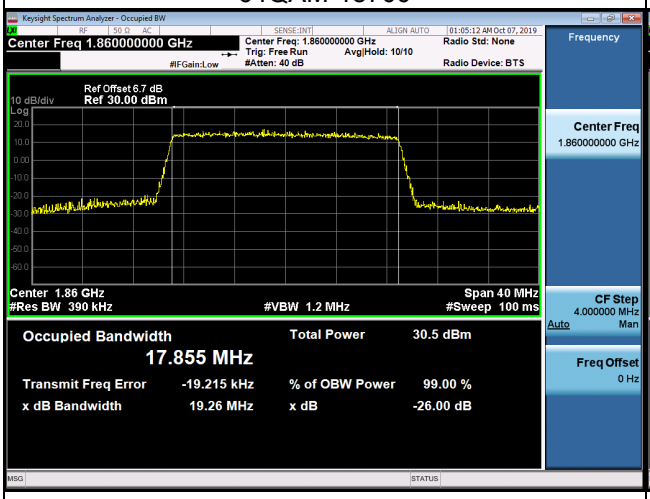
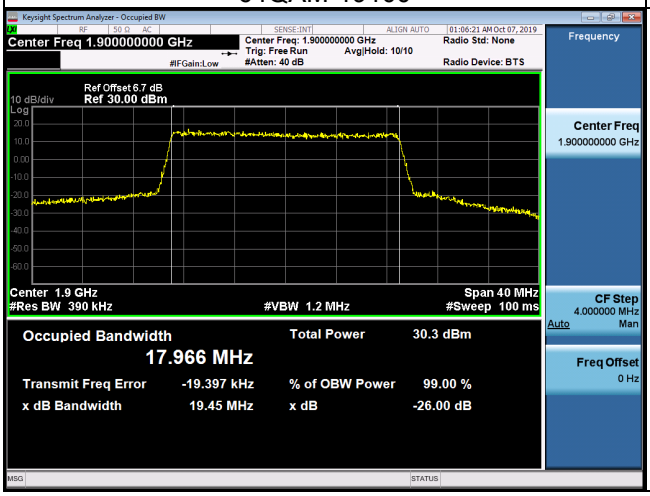


16QAM-18900

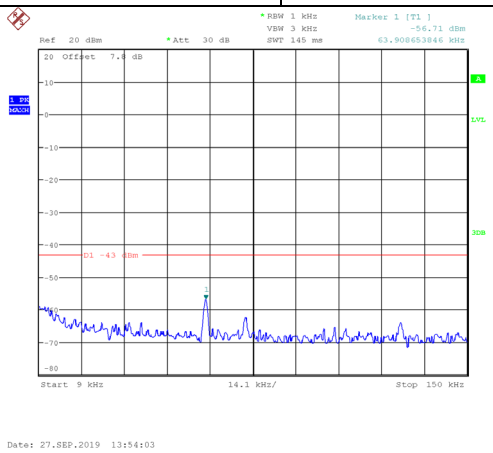
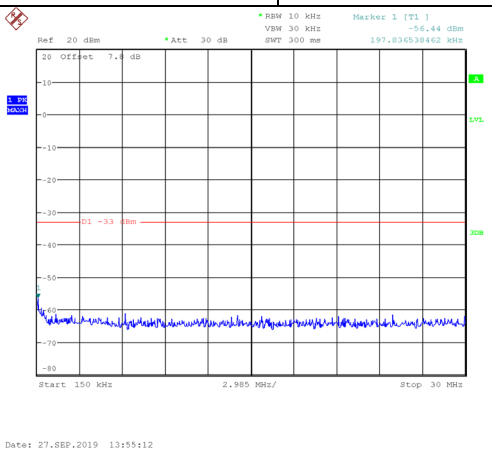
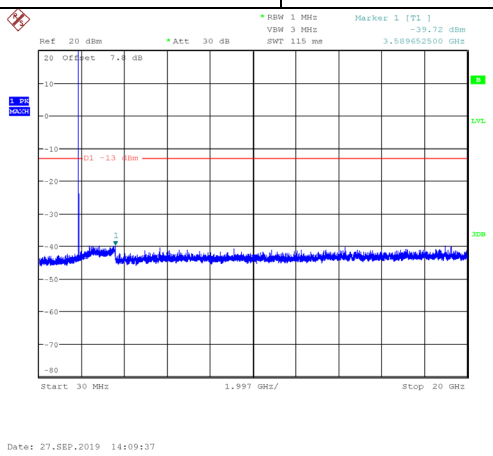
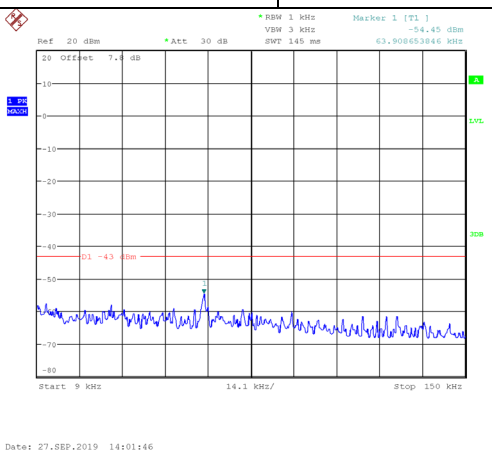
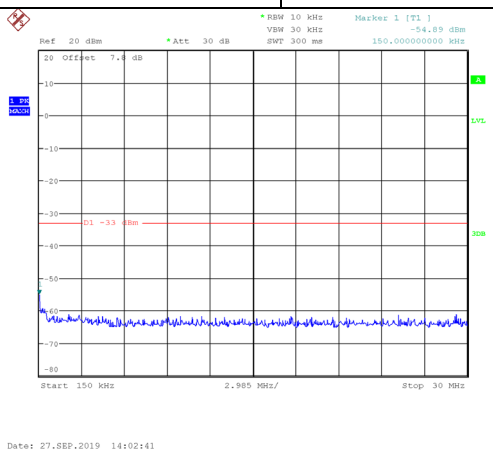
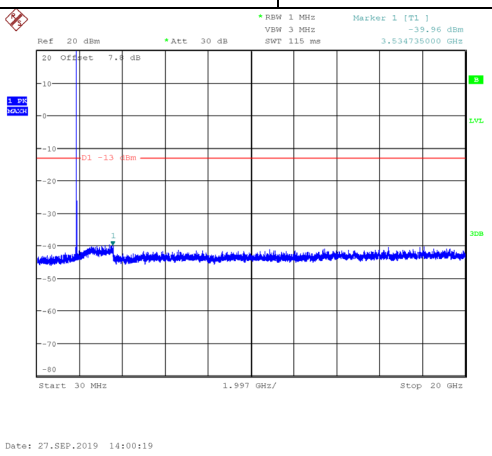


16QAM-19100



Spectrum Plot	
64QAM-18700	64QAM-18900
	
64QAM-19100	-
	-

APPENDIX C - CONDUCTED SPURIOUS EMISSIONS

PCS1900 Spectrum Plot			
GSM		GSM	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880
			
GSM		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880
			
EDGE		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
661	1880	661	1880