Certificate Number: 5055.02

TEST REPORT FOR RF TESTING

Report No.: SRTC2020-9004(F)-20051501(C)

Product Name: Smartphone

Marketing Name: Hisense E40

Product Model: HLTE229E.10

Applicant: Hisense International Co., Ltd.

Manufacturer: Hisense Communications Co., Ltd.

Specification: FCC Part 2, Part 24E, Part 22H, Part 27 (2019)

FCC ID: 2ADOBLTE229E10

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30, Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183   Fax: 86-10-57996388

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
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Email:	liujiaf@srtc.org.cn

1.3 Applicant's details

Company:	Hisense International Co., Ltd.
Address:	Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
City:	Qingdao
Country or Region:	China
Contacted person:	Geng Ruifeng
Tel:	+86-532-80877742
Fax:	---
Email:	gengruifeng@hisense.com

1.4 Manufacturer's details

Company:	Hisense Communications Co., Ltd.
Address:	No.218 Qianwangang Road, Economic & Technological Development Zone, Qingdao, China
City:	Qingdao
Country or Region:	China
Contacted person:	Deng Tingting
Tel:	+86-532-55753708
Fax:	---
Email:	dengtingting@hisense.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2020-05-15
Testing Start Date:	2020-05-15
Testing End Date:	2020-05-29

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	30
Maximum Extreme	55	---
Minimum Extreme	0	---

Normal Supply Voltage (V d.c.):	3.80
Maximum Extreme Supply Voltage (V d.c.):	4.35
Minimum Extreme Supply Voltage (V d.c.):	3.50

2 DESCRIPTION OF THE EQUIPMENT UNDER TEST

2.1 Final Equipment Build Status

Frequency Range	LTE Band 2: Tx:1850~1910MHz Rx:1930~1990MHz LTE Band 4: Tx:1710~1755MHz Rx:2110~2155MHz LTE Band 5: Tx:824~849 MHz Rx:869 ~894MHz LTE Band 7: Tx:2500~2570MHz Rx:2620~2690MHz LTE Band 12: Tx:699~716MHz Rx:729~746MHz LTE Band 66: Tx:1710~1780MHz Rx:2110~2180MHz
Modulation Type	QPSK/16QAM/64QAM
Antenna Type	Fixed Internal Antenna
Antenna Gain	LTE 2/4/66: -0.2dBi LTE 5/12: -1.5dBi LTE 7: -1.0dBi
Power Supply	Battery/Charger
Hardware Version	V0.1
Software Version	Hisense_HLTE229E_10_S01_01_04
IMEI	867400020316612

Note:
1.The difference between the modified product and the variant product is that Changed the software version and added LTE66 and do not affect the RF parameters, so the modified product supply evaluates all test for WCDMA band VI,LTE4 and LTE66.For other band, evaluates conduct power and the other test results refer to FCC ID:2ADOBHLTE229E.
2.The equipments have two supplies, is different on the supplier of Memory/Camera/LCD.
Main Supply

Part Name	Model	Supplier(Brand)	Description
Memory	UNMEN05GC1C31AS12T00	UNIC	eMMC5.1 Module,32GB,FBGA-153Ball
Memory	SU512M32Z11ND2DNP-053 BT	SPETECK(SPREADTRUM)	LPDDR4X,16Gb(512 Meg x 32 (2 channels x 16 I/O)),VFBGA-200Ball
Camera	H8B8-KS229FF	Kingcome	HI-846,CSP,S0876A
Camera	BM15907V2	CXT	GC5035,COM,PC5401-65HD-60
Camera	H9B13-KS230BA	Kingcome	HI1336,COB,3933C-400
Camera	BC12903V0	CXT	GC02M1B,CSP,HX-M0207B-H201
LCD+TP	HTF065H029	HOLITECH	ICNL9911S,MLAF065WE51
fingerprint	TW-SW331B-KS230-V1	TOWO	SW331B
Battery	LPN385400A	ShenzhenAerospaceElectronicCo.,Ltd	

Secondary Supply

Part Name	Model Name	supplier	Remark
Memory	NCEMASLD-32G	FORESEE	eMMC5.1 Module,32GB,FBGA-153Ball
Memory	SU512M32Z11ND2DNP-053BT	SPETECK(SPREADTRUM)	LPDDR4X,16Gb(512 Meg x 32 (2 channels x 16 I/O)),VFBGA-200Ball
Camera	TW-08GC34-KS229-V1	TOWO	GC8034,COB,S0876A
Camera	ST-CFLS051BF-V1.0	Union Image co.,ltd	GC5035,COM
Camera	TW-13OV53-KS230B-V1	TOWO	OV13853,COB,50064B17
Camera	ST-CFKS230-JSBF-V1	Union Image co.,ltd	GC2375H,CSP,DL2002B10-BP
LCD+TP	EQT651WKF003G	easyquick	FT8006, 华 佳 彩 MLAF065WE51X
fingerprint	FS22483BJN	HOLITECH	ICNF7332-A2
Battery	LPN385400A	Shenzhen Tianjin New Energy Technology Co., Ltd.	

2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

Equipment	Battery 1
Manufacturer	ShenzhenAerospaceElectronicCo.,Ltd
Model Number	PLV436190

Equipment	Battery 2
Manufacturer	Shenzhen Tianjin New Energy Technology Co., Ltd.
Model Number	436191P

Equipment	Charger
Manufacturer	SHENZHENTIANYIN ELECTRONICS CO., LTD.
Model Number	TPA-46050200UU

Equipment	USB Cable
Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS230B

Equipment	Headset
Manufacturer	kelinDongguan Keling Electronic Technology Co., Ltd
Model Number	KS230B

2.3 Summary table

FCC Rule Part	Frequency Range(MHz)	EIRP/ERP (W)	Frequency Tolerance (ppm)	Emission Designator	Emission Bandwidth (MHz)	Measured 26dBC Bandwidth (MHz)	Communication Type
LTE BAND2							
24E	1850.7-1909.3	0.045	0.067	1M08G7D	1.4M	1.241	QPSK
	1850.7-1909.3	0.047	0.067	1M08D7W	1.4M	1.243	16QAM
	1850.7-1909.3	0.042	0.067	1M08W7D	1.4M	1.233	64QAM
	1851.5-1908.5	0.049	0.055	2M71G7D	3M	3.067	QPSK
	1851.5-1908.5	0.040	0.055	2M71D7W	3M	3.071	16QAM
	1851.5-1908.5	0.038	0.055	2M71W7D	3M	3.075	64QAM
	1852.5-1907.5	0.050	0.050	4M48G7D	5M	5.048	QPSK
	1852.5-1907.5	0.040	0.050	4M48D7W	5M	5.050	16QAM
	1852.5-1907.5	0.040	0.050	4M48W7D	5M	5.059	64QAM
	1855-1905	0.045	-0.064	8M94G7D	10M	10.090	QPSK
	1855-1905	0.042	-0.064	8M94D7W	10M	10.090	16QAM
	1855-1905	0.041	-0.064	8M94W7D	10M	10.080	64QAM
	1857.5-1902.5	0.043	-0.078	13M4G7D	15M	14.720	QPSK
	1857.5-1902.5	0.039	-0.078	13M4D7W	15M	14.560	16QAM
	1857.5-1902.5	0.037	-0.078	13M5W7D	15M	14.750	64QAM
	1860-1900	0.050	0.066	17M9G7D	20M	19.700	QPSK
	1860-1900	0.042	0.066	17M9D7W	20M	19.800	16QAM
	1860-1900	0.043	0.066	17M9W7D	20M	19.780	64QAM
LTE BAND4							
27	1710.7-1754.3	0.045	0.054	1M08G7D	1.4M	1.246	QPSK
	1710.7-1754.3	0.036	0.054	1M08D7W	1.4M	1.247	16QAM
	1710.7-1754.3	0.041	0.054	1M09W7D	1.4M	1.253	64QAM
	1711.5-1753.5	0.034	0.074	2M69G7D	3M	3.007	QPSK
	1711.5-1753.5	0.044	0.074	2M69D7W	3M	3.014	16QAM
	1711.5-1753.5	0.040	0.074	2M69W7D	3M	3.013	64QAM
	1712.5-1752.5	0.044	0.064	4M48G7D	5M	4.941	QPSK
	1712.5-1752.5	0.041	0.064	4M47D7W	5M	5.135	16QAM
	1712.5-1752.5	0.033	0.064	4M49W7D	5M	5.074	64QAM
	1715-1750	0.042	0.068	8M96G7D	10M	9.794	QPSK
	1715-1750	0.038	0.068	8M97D7W	10M	9.815	16QAM
	1715-1750	0.036	0.068	8M97W7D	10M	9.911	64QAM
	1717.5-1747.5	0.039	0.073	13M4G7D	15M	14.760	QPSK
	1717.5-1747.5	0.041	0.073	13M4D7W	15M	15.050	16QAM
	1717.5-1747.5	0.042	0.073	13M4W7D	15M	14.780	64QAM
	1720-1745	0.042	0.067	18M0G7D	20M	19.730	QPSK
	1720-1745	0.038	0.067	18M0D7W	20M	19.900	16QAM
	1720-1745	0.039	0.067	17M9W7D	20M	19.430	64QAM
LTE BAND5							
22H	824.7-848.3	0.191	0.096	1M08G7D	1.4M	1.264	QPSK
	824.7-848.3	0.199	0.096	1M08D7W	1.4M	1.244	16QAM
	824.7-848.3	0.188	0.096	1M09W7D	1.4M	1.228	64QAM
	825.5-847.5	0.220	-0.095	2M71G7D	3M	3.041	QPSK
	825.5-847.5	0.207	-0.095	2M71D7W	3M	3.040	16QAM
	825.5-847.5	0.195	-0.095	2M70W7D	3M	3.056	64QAM
	826.5-846.5	0.231	-0.100	4M49G7D	5M	5.122	QPSK
	826.5-846.5	0.173	-0.100	4M48D7W	5M	5.155	16QAM
	826.5-846.5	0.200	-0.100	4M48W7D	5M	5.054	64QAM
	829-844	0.232	0.099	8M97G7D	10M	9.968	QPSK
	829-844	0.202	0.099	8M96D7W	10M	10.060	16QAM
	829-844	0.195	0.099	8M97W7D	10M	9.832	64QAM

LTE BAND7							
27	2502.5-2567.5	0.259	0.096	4M48G7D	5M	5.177	QPSK
	2502.5-2567.5	0.249	0.096	4M48D7W	5M	5.216	16QAM
	2502.5-2567.5	0.249	0.096	4M48W7D	5M	5.258	64QAM
	2505-2565	0.243	0.098	8M98G7D	10M	10.020	QPSK
	2505-2565	0.245	0.098	8M97D7W	10M	9.980	16QAM
	2505-2565	0.228	0.098	8M97W7D	10M	9.936	64QAM
	2507.5-2562.5	0.248	-0.095	13M5G7D	15M	14.570	QPSK
	2507.5-2562.5	0.235	-0.095	13M5D7W	15M	14.580	16QAM
	2507.5-2562.5	0.239	-0.095	13M4W7D	15M	14.650	64QAM
	2510-2560	0.265	-0.096	17M9G7D	20M	19.640	QPSK
	2510-2560	0.253	-0.096	17M9D7W	20M	19.670	16QAM
	2510-2560	0.229	-0.096	17M9W7D	20M	19.590	64QAM
LTE BAND12							
27	699.7-715.3	0.217	-0.100	1M08G7D	1.4M	1.254	QPSK
	699.7-715.3	0.203	-0.100	1M08D7W	1.4M	1.264	16QAM
	699.7-715.3	0.168	-0.100	1M08W7D	1.4M	1.261	64QAM
	700.5-714.5	0.193	0.098	2M71G7D	3M	3.028	QPSK
	700.5-714.5	0.196	0.098	2M70D7W	3M	3.018	16QAM
	700.5-714.5	0.202	0.098	2M71W7D	3M	3.031	64QAM
	701.5-713.5	0.229	0.100	4M48G7D	5M	5.087	QPSK
	701.5-713.5	0.188	0.100	4M49D7W	5M	5.151	16QAM
	701.5-713.5	0.204	0.100	4M48W7D	5M	5.132	64QAM
	704-711	0.220	-0.100	8M99G7D	10M	9.874	QPSK
	704-711	0.201	-0.100	8M97D7W	10M	9.882	16QAM
	704-711	0.199	-0.100	8M97W7D	10M	9.925	64QAM
LTE BAND66							
27	1710.7-1779.3	0.035	0.066	1M08G7D	1.4M	1.245	QPSK
	1710.7-1754.3	0.034	0.066	1M08D7W	1.4M	1.256	16QAM
	1710.7-1754.3	0.033	0.066	1M09W7D	1.4M	1.251	64QAM
	1711.5-1778.5	0.030	0.078	2M70G7D	3M	3.014	QPSK
	1711.5-1778.5	0.029	0.078	2M69D7W	3M	3.003	16QAM
	1711.5-1778.5	0.029	0.078	2M69W7D	3M	3.036	64QAM
	1712.5-1777.5	0.027	0.076	4M48G7D	5M	4.975	QPSK
	1712.5-1777.5	0.024	0.076	4M47D7W	5M	5.049	16QAM
	1712.5-1777.5	0.028	0.076	4M48W7D	5M	5.058	64QAM
	1715-1775	0.036	0.070	8M96G7D	10M	9.775	QPSK
	1715-1775	0.032	0.070	8M95D7W	10M	9.873	16QAM
	1715-1775	0.036	0.070	8M96W7D	10M	9.765	64QAM
	1717.5-1772.5	0.026	0.074	13M4G7D	15M	15.010	QPSK
	1717.5-1772.5	0.027	0.074	13M5D7W	15M	15.060	16QAM
	1717.5-1772.5	0.028	0.074	13M5W7D	15M	15.920	64QAM
	1720-1780	0.027	0.078	17M9G7D	20M	19.550	QPSK
	1720-1780	0.027	0.078	17M9D7W	20M	19.840	16QAM
	1720-1780	0.028	0.078	17M9W7D	20M	19.450	64QAM

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part 2	2019	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part 22	2019	Public mobile services
FCC Part 24	2019	Personal communications services
FCC Part 27	2019	Miscellaneous wireless communications services
ANSI C63.26	2015	American national standard for compliance testing of transmitters used in licensed radio services
KDB 971168 D01	April 9, 2018	Measurement guidance for certification of licensed digital transmitters
TIA-603-E-2016	March 2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

4 KEY TO NOTES AND RESULT CODES

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NT	Normal Temperature
NV	Nominal voltage
HV	High voltage
LV	Low voltage

5 RESULT SUMMARY

No.	Test case	FCC reference	Verdict
1	RF Power Output	2.1046	Pass
2	Effective Radiated Power and Effective Isotropic Radiated Power	22.913(a)(5), 24.232(c), 27.50(b)(10), 27.50(c)(10), 27.50(h)(2), 27.50(d)(4), 27.50(a)(3)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Peak-Average Ratio	24.232(d), 27.50(d)(5)	Pass
5	Emission Bandwidth	2.1049	Pass
6	Spurious Emissions at antenna terminals	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a)	Pass
7	Band Edges Compliance	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a)	Pass
8	Frequency Stability	2.1055, 22.355, 24.235, 27.54	Pass
9	Radiated Spurious Emissions	2.1053, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(f), 27.53(a), 27.53(m)	Pass

This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Tong Daocheng	Issued date: 20200528

6 TEST RESULT

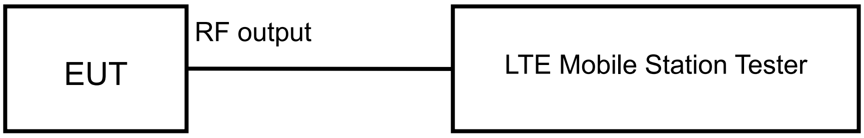
6.1 RF Power Output

Rule Part(s)
FCC: 2.1046

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

Limits: No RF Power Output requirements in part 2.1046.

Test result:
The test results are shown in Appendix A.

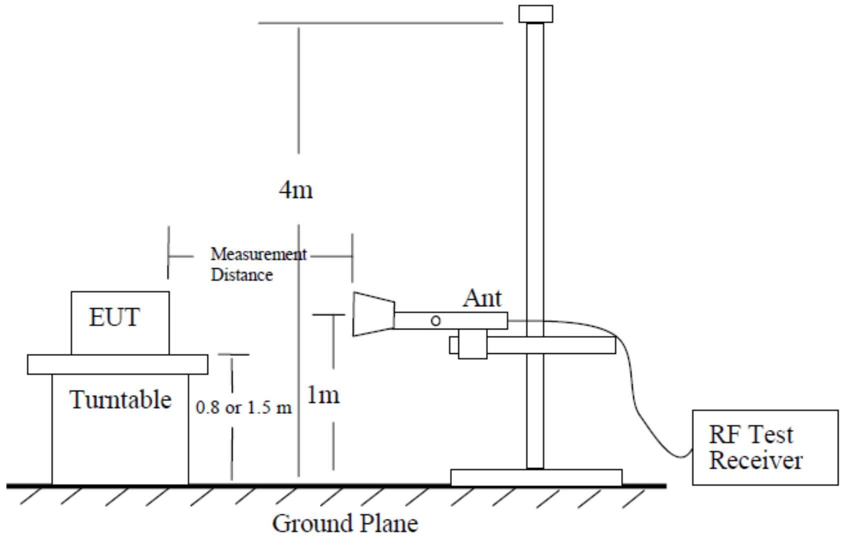
6.2 Effective Radiated Power and Effective Isotropic Radiated Power

Rule Part(s)
FCC: 22.913(a) (5), 24.232(c), 27.50(b) (10), 27.50(c) (10), 27.50(h) (2), 27.50(d) (4), 27.50(a) (3)

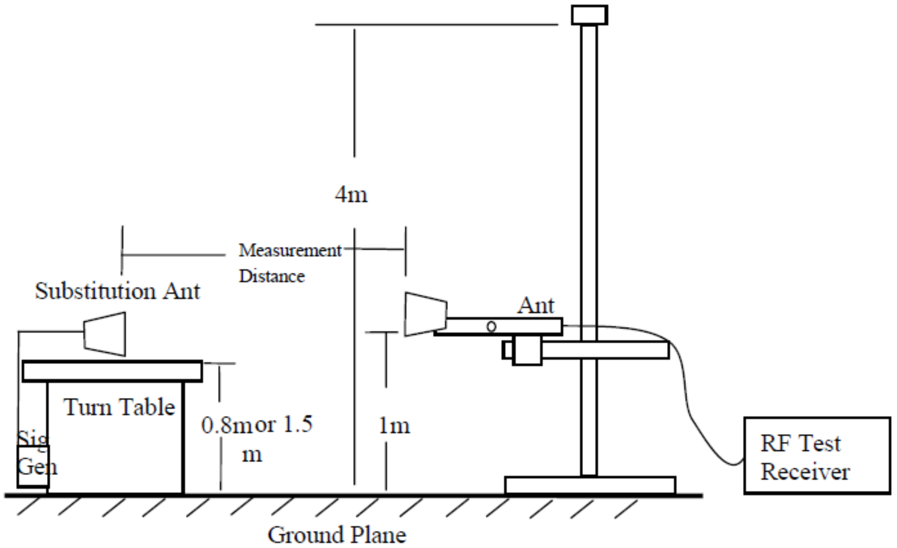
Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test setup:



Step 1



Step 2

Test procedure:
The measurements procedures in TIA-603-E-2016 are used.
Step 1:
The measurement is carried out in the chamber. EUT was placed on a 0.8m (f<1GHz)/ 1.5m (f>1GHz) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100KHz(f<1GHz)/1MHz (f>1GHz). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. And the maximum value of the receiver should be recorded as (Pr).
Step 2:
A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator. To repeat the same procedure as step1 and the level of signal generator will be adjusted till the same power value on the spectrum analyzer or receiver. The ERP/EIRP of the EUT can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna.
A power (Pmea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (Pmea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
A “reference path loss” should be calculated after test. The attenuation of “reference path loss” is the cable loss between the Signal Source with the Substitution Antenna (Pca) and the Substitution Antenna Gain (Ga).
The measurement results are obtained as described below:
Power (EIRP) = Pmea+ Pca+ Ga

ERP/EIRP LIMIT

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP – 2.15 (dB).
22.913(a) (5)
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
24.232(c)
Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.
27.50(b) (10)
Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.
27.50(c) (10)
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.
27.50(h) (2)
Mobile and other user stations.Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

27.50(d) (4)
Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.
27.50(a) (3)
Mobile and portable stations (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

Test result:
The test results are shown in Appendix B.

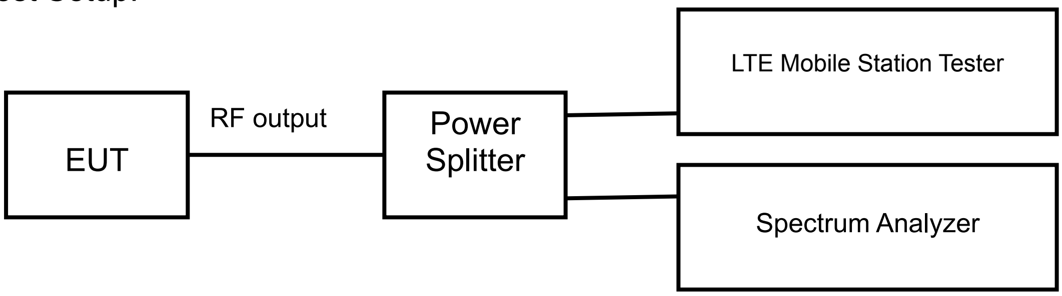
6.3 Occupied Bandwidth

Rule Part(s)
FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:
1. The signal analyzer’s automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:
The test results are shown in Appendix A.

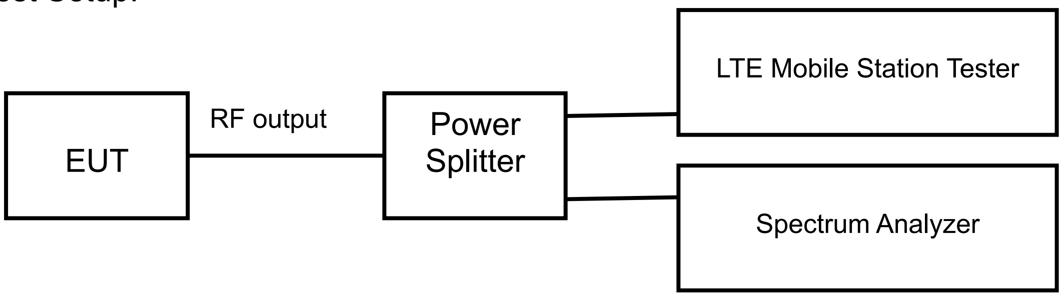
6.4 Emission Bandwidth

Rule Part(s)
FCC: 2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of 26dB bandwidth observed in Step 7

Limits: No specific emission bandwidth requirements in part 2.1049.

Test result:
The test results are shown in Appendix A.

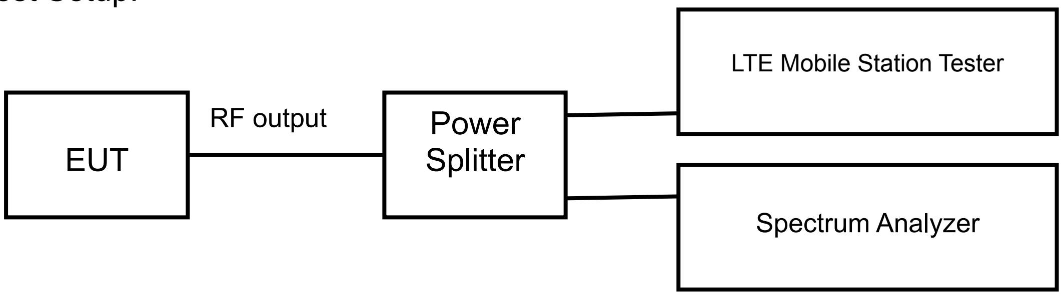
6.5 Peak-Average Ratio

Rule Part(s)
FCC: 24.232(d), 27.50(d) (5)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 5.7.1

Test Setting:
1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Limits
24.232(d), 27.50(d) (5)
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.

Test result:
The test results are shown in Appendix A.

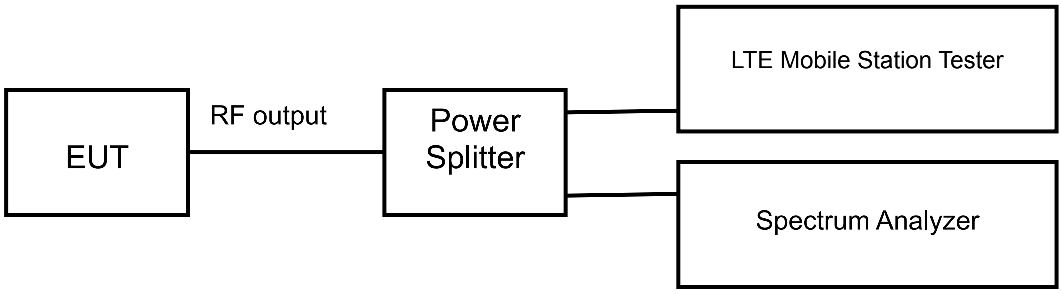
6.6 Spurious Emissions at antenna terminal

Rule Part(s)
FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 6.0

Test Setting:
1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency
2. Detector = RMS
3. RBW=1MHz
4. VBW=3MHz
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Limits
The minimum permissible attenuation level of any spurious emission is 43 + log10 (P [Watts]), where P is the transmitter power in Watts.
For Band 30, the minimum permissible attenuation level of any spurious emission <2288MHz and >2365MHz is 70 + log10 (P [Watts]).
For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is 55 + log10 (P [Watts]).

Test result:
The test results are shown in Appendix A.

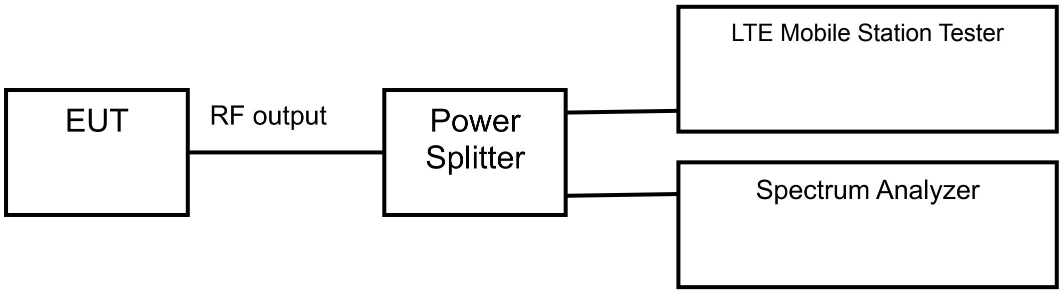
6.7 Band Edges Compliance

Rule Part(s)
FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a)

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 6.0

Test Setting:
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limits
The minimum permissible attenuation level of any spurious emission is 43 + log10 (P [Watts]), where P is the transmitter power in Watts.
The minimum permissible attenuation level for Band 30 is > 43 + 10log10 (P [Watts] at 2300-2305MHz & 2345-2360MHz, > 55 + 10log10 (P [Watts]) at 2320-2324MHz & 2341-2345MHz, > 61 + 10log10 (P [Watts]) at 2324-2328MHz & 2337-2341MHz, > 67 + 10log10 (P [Watts]) at 2288-2292MHz & 2328- 2337MHz, and > 70 + 10log10 (P [Watts]) at frequencies < 2288MHz & >2365MHz.
Per 22.917(b) 24.238(a) 27.53(h) 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 to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.

Per 27.53(a)(5) in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter 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 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.

Per 27.53(m) for operations in the BRS/EBS bands, 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. 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 2490.5MHz.

Test result:

The test results are shown in Appendix A.

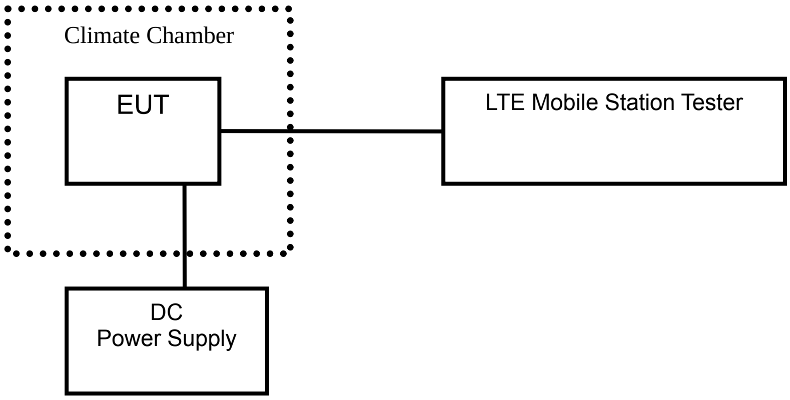
6.8 Frequency Stability

Rule Part(s)
FCC: 2.1055, 22.355, 24.235, 27.54

Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test setup:



Test Procedure:
ANSI/TIA-603-E-2016

Test Settings
1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limits: For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:
The test results are shown in Appendix A.

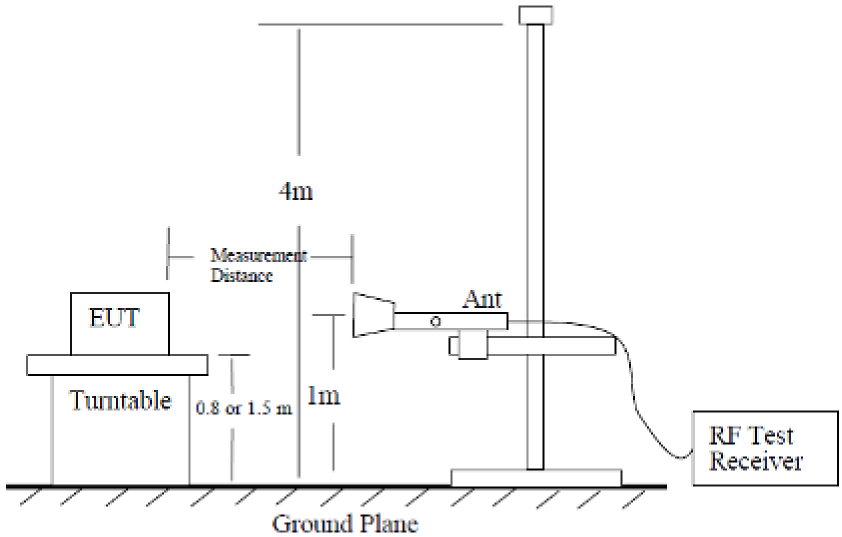
6.9 Radiated Spurious Emissions

Rule Part(s)
FCC: 2.1053, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(f), 27.53(a), 27.53(m)

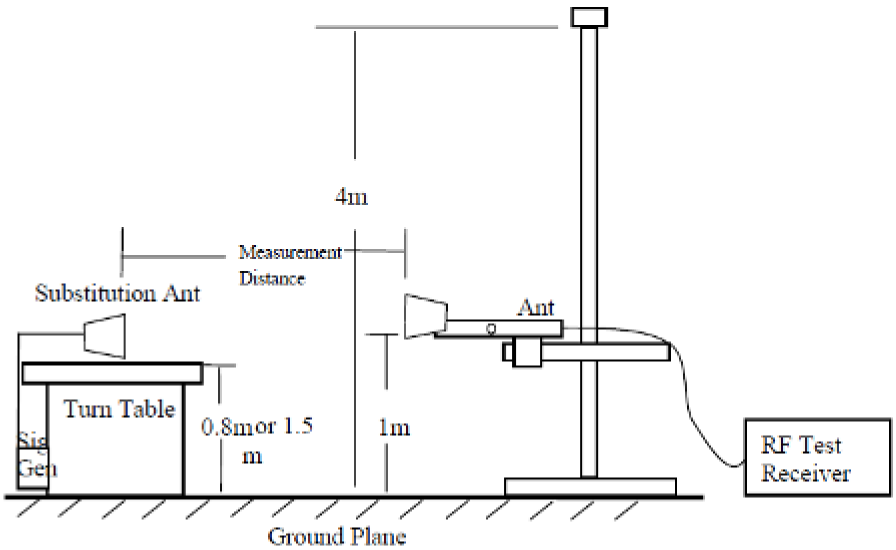
Ambient condition:

Temperature	Relative humidity	Pressure
25°C	30%	101.9kPa

Test Setup:



Step 1



Step 2

Test procedure:
The measurements procedures in TIA-603-E-2016 are used.
The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the equipment.
Step 1:
The measurement is carried out in the chamber. EUT was placed on a 0.8m (f<1GHz)/ 1.5m (f>1GHz) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100 kHz (f<1GHz)/1MHz (f>1GHz). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 10th harmonic of the carrier. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.
Step 2:
A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
A power (Pmea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (Pmea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
A “reference path loss” should be calculated after test. The attenuation of “reference path loss” is the cable loss between the Signal Source with the Substitution Antenna (Pca) and the Substitution Antenna Gain (Ga).
Calculation procedure:
The data of cable loss and antenna gain has been calibrated in full testing frequency range before the testing.
The power of the Radiated Spurious Emissions is calculated by adding the cable loss and antenna gain. The basic equation with a sample calculation is as followed:
Power (EIRP) = Pmea+ Pca + Ga
This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP – 2.15 (dB).
Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.
P=Pmea+Pca+Ga=(-20dBm)+(-30dB)+(11dB)= -39dBm

Test result:
The test results are shown in Appendix B.

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
RF Power Output	0.6 dB	
Occupied Bandwidth	3 kHz	
Spurious Emissions	30MHz～1GHz	2.83 dB
	1GHz～12.75GHz	2.50 dB
	12.75GHz～25GHz	2.75 dB
Band Edges Compliance	1.2dB	
Frequency Stability	4 Hz	

8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	MT8820C Mobile Station Tester	Anritsu	6201300660	2019.08.20	2020.08.19
2	FSV40 Spectrum Analyzer	R&S	101065	2019.08.20	2020.08.19
2	N9020A Spectrum Analyzer	Agilent	MY48010771	2019.08.20	2020.08.19
3	6007 Power Divider	Weinschel	6007-GJ-1	2019.08.20	2020.08.19
4	DC Power Supply E3645A	Agilent	MY40000741	2020.03.01	2021.02.28
5	Temperature chamber SH241	ESPEC	92013758	2019.08.20	2020.08.19
6	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	-----	-----	-----
7	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	-----	-----
8	Turn table Diameter:1m	FRANKONIA	-----	-----	-----
9	Turn table Diameter:5m	FRANKONIA	-----	-----	-----
10	Antenna master FAC(MA4.0)	MATURO	-----	-----	-----
11	Antenna master SAC(MA4.0)	MATURO	-----	-----	-----
12	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	-----	-----
13	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2019.08.20	2020.08.19
14	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100513	2019.08.20	2020.08.19
15	HL562 Ultra log antenna	R&S	100016	2019.08.20	2020.08.19
16	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2019.08.20	2020.08.19
17	ESI 40 EMI test receiver	R&S	100015	2019.08.20	2020.08.19
18	ESCS30 EMI test receiver	R&S	100029	2019.08.20	2020.08.19
19	HL562 Receive antenna	R&S	100167	2019.08.20	2020.08.19
20	ENV216 AMN	R&S	3560.6550.12	2019.08.20	2020.08.19

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

LTE Band 2

1 RF Power Output

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1850.7	18607	1.4	1	0	16.35
				1	5	16.20
				3	2	15.70
				6	0	15.61
	1880	18900		1	0	16.35
				1	5	16.44
				3	2	15.70
				6	0	15.68
	1909.3	19193		1	0	16.35
				1	5	16.41
				3	2	15.70
				6	0	15.49
16QAM	1850.7	18607	1.4	1	0	16.15
				1	5	16.26
				3	2	14.93
				6	0	14.73
	1880	18900		1	0	15.76
				1	5	15.88
				3	2	15.09
				6	0	14.76
	1909.3	19193		1	0	16.13
				1	5	16.16
				3	2	14.70
				6	0	14.70
64QAM	1850.7	18607	1.4	1	0	16.02
				1	5	16.24
				3	2	15.13
				6	0	14.95
	1880	18900		1	0	15.64
				1	5	15.47
				3	2	14.77
				6	0	14.97
	1909.3	19193		1	0	16.20
				1	5	16.03
				3	2	14.75
				6	0	14.87

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1851.5	18615	3	1	0	16.30
				1	14	16.23
				8	4	15.58
				15	0	15.64
	1880	18900		1	0	16.50
				1	14	16.48
				8	4	15.77
				15	0	15.65
	1908.5	19185		1	0	16.36
				1	14	16.33
				8	4	15.49
				15	0	15.55
16QAM	1851.5	18615	3	1	0	16.10
				1	14	16.13
				8	4	14.77
				15	0	14.70
	1880	18900		1	0	15.84
				1	14	15.92
				8	4	14.85
				15	0	15.03
	1908.5	19185		1	0	16.41
				1	14	16.04
				8	4	14.92
				15	0	14.63
64QAM	1851.5	18615	3	1	0	16.14
				1	14	16.11
				8	4	15.07
				15	0	14.75
	1880	18900		1	0	15.64
				1	14	15.84
				8	4	14.65
				15	0	14.75
	1908.5	19185		1	0	15.92
				1	14	15.99
				8	4	14.82
				15	0	14.72

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1852.5	18625	5	1	0	16.26
				1	24	16.30
				12	6	15.68
				25	0	15.56
	1880	18900		1	0	16.37
				1	24	16.45
				12	6	15.76
				25	0	15.67
	1907.5	19175		1	0	16.34
				1	24	16.28
				12	6	15.68
				25	0	15.52
16QAM	1852.5	18625	5	1	0	16.34
				1	24	16.33
				12	6	14.97
				25	0	14.97
	1880	18900		1	0	15.71
				1	24	15.68
				12	6	14.83
				25	0	14.90
	1907.5	19175		1	0	16.36
				1	24	16.33
				12	6	14.94
				25	0	14.71
64QAM	1852.5	18625	5	1	0	16.03
				1	24	16.13
				12	6	15.07
				25	0	14.71
	1880	18900		1	0	15.57
				1	24	15.76
				12	6	14.67
				25	0	14.96
	1907.5	19175		1	0	16.08
				1	24	16.09
				12	6	14.82
				25	0	14.72

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1855	18650	10	1	0	16.14
				1	49	16.36
				24	12	15.74
				50	0	15.65
	1880	18900		1	0	16.35
				1	49	16.54
				24	12	15.65
				50	0	15.62
	1905	19150		1	0	16.42
				1	49	16.60
				24	12	15.60
				50	0	15.54
16QAM	1855	18650	10	1	0	16.34
				1	49	16.09
				24	12	14.81
				50	0	14.66
	1880	18900		1	0	15.96
				1	49	15.67
				24	12	15.00
				50	0	14.95
	1905	19150		1	0	16.10
				1	49	16.33
				24	12	14.62
				50	0	14.84
64QAM	1855	18650	10	1	0	16.20
				1	49	16.28
				24	12	15.22
				50	0	14.85
	1880	18900		1	0	15.80
				1	49	15.57
				24	12	14.97
				50	0	14.81
	1905	19150		1	0	16.09
				1	49	16.13
				24	12	14.71
				50	0	14.80

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1857.5	18675	15	1	0	16.22
				1	74	16.21
				40	18	15.60
				75	0	15.73
	1880	18900		1	0	16.44
				1	74	16.51
				40	18	15.66
				75	0	15.72
	1902.5	19125		1	0	16.44
				1	74	16.22
				40	18	15.44
				75	0	15.50
16QAM	1857.5	18675	15	1	0	16.16
				1	74	16.11
				40	18	14.82
				75	0	14.78
	1880	18900		1	0	15.81
				1	74	15.68
				40	18	14.64
				75	0	14.98
	1902.5	19125		1	0	16.23
				1	74	16.20
				40	18	14.76
				75	0	14.76
64QAM	1857.5	18675	15	1	0	16.30
				1	74	16.23
				40	18	14.85
				75	0	14.94
	1880	18900		1	0	15.64
				1	74	15.78
				40	18	14.79
				75	0	14.88
	1902.5	19125		1	0	15.94
				1	74	16.24
				40	18	14.93
				75	0	14.62

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1860	18700	20	1	0	16.38
				1	99	16.37
				50	25	15.80
				100	0	15.75
	1880	18900		1	0	16.53
				1	99	16.53
				50	25	15.81
				100	0	15.75
	1900	19100		1	0	16.47
				1	99	16.50
				50	25	15.62
				100	0	15.50
16QAM	1860	18700	20	1	0	16.27
				1	99	16.22
				50	25	14.91
				100	0	14.91
	1880	18900		1	0	15.82
				1	99	15.81
				50	25	14.91
				100	0	14.86
	1900	19100		1	0	16.25
				1	99	16.37
				50	25	14.99
				100	0	14.83
64QAM	1860	18700	20	1	0	16.05
				1	99	16.20
				50	25	15.14
				100	0	14.97
	1880	18900		1	0	15.75
				1	99	15.62
				50	25	15.05
				100	0	14.85
	1900	19100		1	0	16.19
				1	99	15.93
				50	25	14.93
				100	0	14.95

2 Occupied Bandwidth

Test result

Band	Carrier frequency (MHz)	Channel	BW (MHz)	RB Size	RB Offset	Bandwidth of 99% Power (MHz)					
						QPSK		16-QAM		64-QAM	
2	1850.7	18607	1.4	6	0	1.0778	Fig.1	1.0764	Fig.2	1.0780	Fig.3
	1880.0	18900		6	0	1.0764	Fig.4	1.0773	Fig.5	1.0773	Fig.6
	1909.3	19193		6	0	1.0776	Fig.7	1.0766	Fig.8	1.0761	Fig.9
	1851.5	18615	3	15	0	2.7045	Fig.10	2.7052	Fig.11	2.7072	Fig.12
	1880.0	18900		15	0	2.7056	Fig.13	2.7016	Fig.14	2.7070	Fig.15
	1908.5	19185		15	0	2.7015	Fig.16	2.7034	Fig.17	2.7035	Fig.18
	1852.5	18625	5	25	0	4.4755	Fig.19	4.4797	Fig.20	4.4779	Fig.21
	1880.0	18900		25	0	4.4791	Fig.22	4.4722	Fig.23	4.4727	Fig.24
	1907.5	19175		25	0	4.4766	Fig.25	4.4758	Fig.26	4.4674	Fig.27
	1855	18650	10	50	0	8.9432	Fig.28	8.9444	Fig.29	8.9390	Fig.30
	1880	18900		50	0	8.9330	Fig.31	8.9372	Fig.32	8.9343	Fig.33
	1905	19150		50	0	8.9448	Fig.34	8.9430	Fig.35	8.9402	Fig.36
	1857.5	18675	15	75	0	13.408	Fig.37	13.387	Fig.38	13.453	Fig.39
	1880.0	18900		75	0	13.425	Fig.40	13.390	Fig.41	13.401	Fig.42
	1902.5	19125		75	0	13.382	Fig.43	13.420	Fig.44	13.398	Fig.45
	1860	18700	20	100	0	17.897	Fig.46	17.904	Fig.47	17.878	Fig.48
	1880	18900		100	0	17.906	Fig.49	17.890	Fig.50	17.885	Fig.51
	1900	19100		100	0	17.895	Fig.52	17.880	Fig.53	17.882	Fig.54

Band	Carrier frequency (MHz)	Channel	BW (MHz)	RB Size	RB Offset	Bandwidth of -26dB transmitter power (MHz)					
						QPSK		16-QAM		64-QAM	
2	1850.7	18607	1.4	6	0	1.234	Fig.1	1.238	Fig.2	1.226	Fig.3
	1880.0	18900		6	0	1.238	Fig.4	1.239	Fig.5	1.233	Fig.6
	1909.3	19193		6	0	1.241	Fig.7	1.243	Fig.8	1.219	Fig.9
	1851.5	18615	3	15	0	3.065	Fig.10	3.042	Fig.11	3.044	Fig.12
	1880.0	18900		15	0	3.057	Fig.13	3.069	Fig.14	3.075	Fig.15
	1908.5	19185		15	0	3.067	Fig.16	3.071	Fig.17	3.030	Fig.18
	1852.5	18625	5	25	0	5.026	Fig.19	4.961	Fig.20	4.907	Fig.21
	1880.0	18900		25	0	5.028	Fig.22	5.028	Fig.23	5.009	Fig.24
	1907.5	19175		25	0	5.048	Fig.25	5.050	Fig.26	5.059	Fig.27
	1855	18650	10	50	0	9.935	Fig.28	10.09	Fig.29	10.08	Fig.30
	1880	18900		50	0	10.09	Fig.31	9.933	Fig.32	9.819	Fig.33
	1905	19150		50	0	10.01	Fig.34	10.07	Fig.35	9.833	Fig.36
	1857.5	18675	15	75	0	14.64	Fig.37	14.52	Fig.38	14.75	Fig.39
	1880.0	18900		75	0	14.72	Fig.40	14.56	Fig.41	14.75	Fig.42
	1902.5	19125		75	0	14.65	Fig.43	14.52	Fig.44	14.45	Fig.45
	1860	18700	20	100	0	19.67	Fig.46	19.43	Fig.47	19.43	Fig.48
	1880	18900		100	0	19.70	Fig.49	19.66	Fig.50	19.58	Fig.51
	1900	19100		100	0	19.65	Fig.52	19.80	Fig.53	19.78	Fig.54

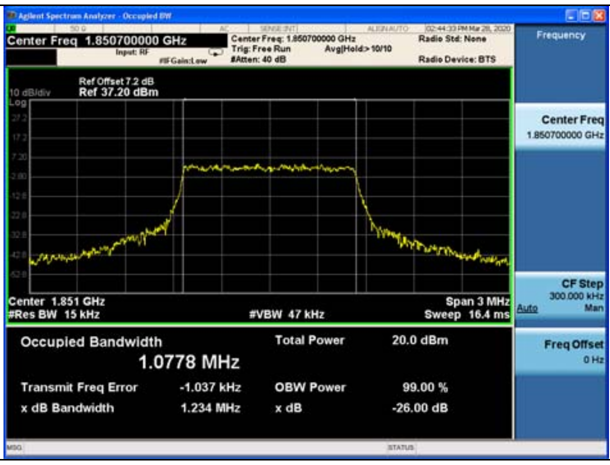


Fig.1

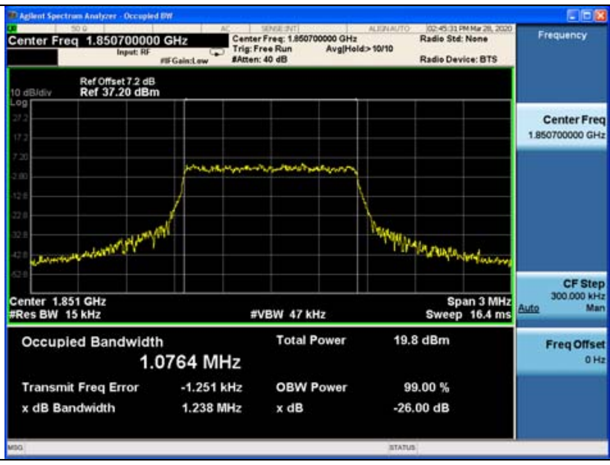


Fig.2

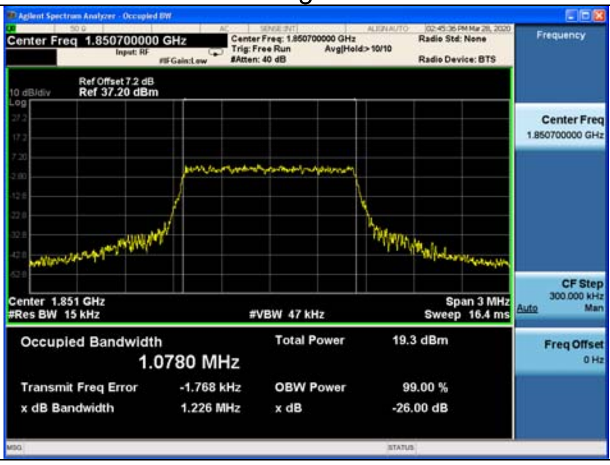


Fig.3

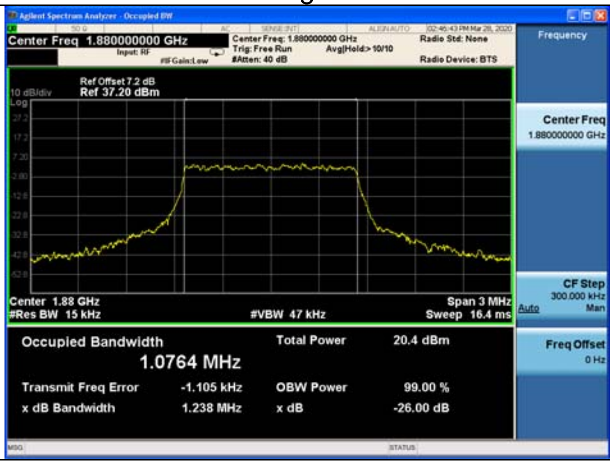


Fig.4

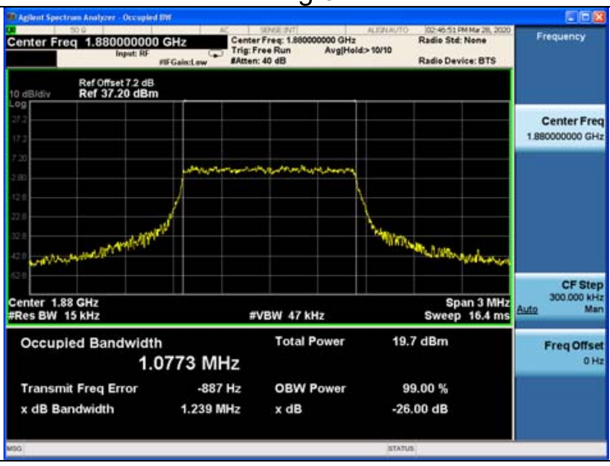


Fig.5

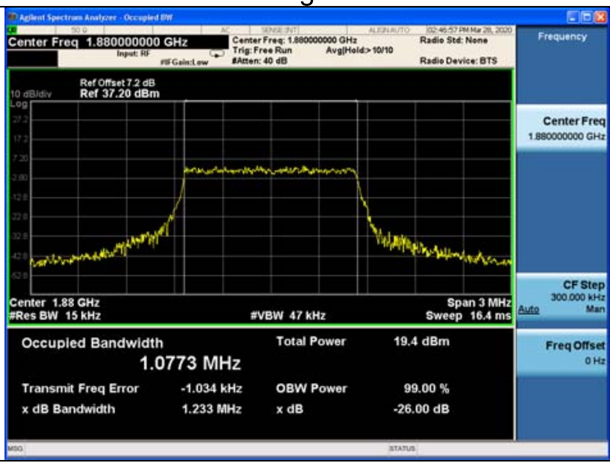


Fig.6

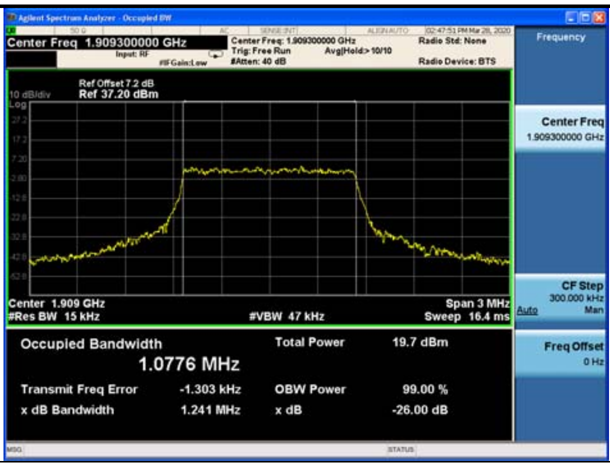


Fig.7

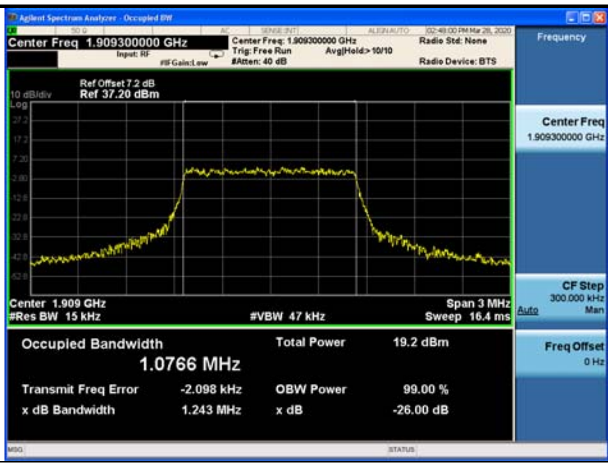


Fig.8

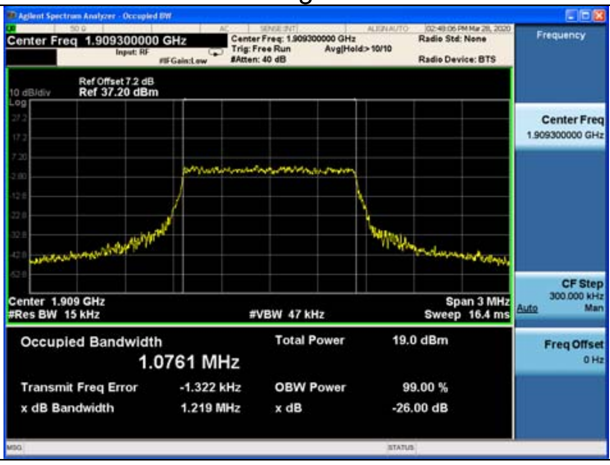


Fig.9

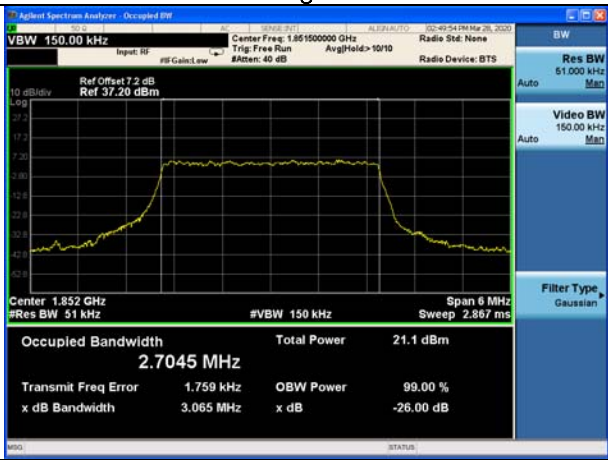


Fig.10

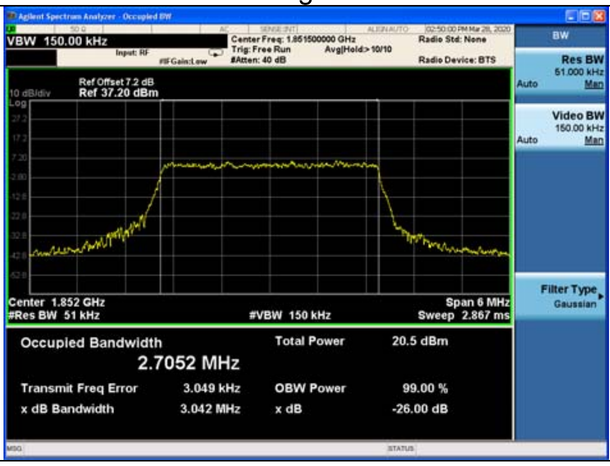


Fig.11

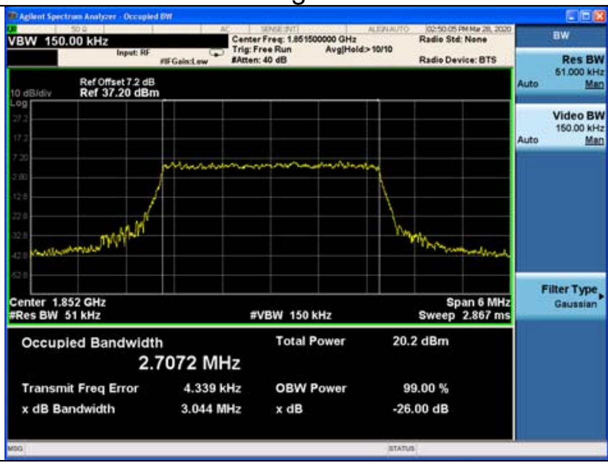


Fig.12

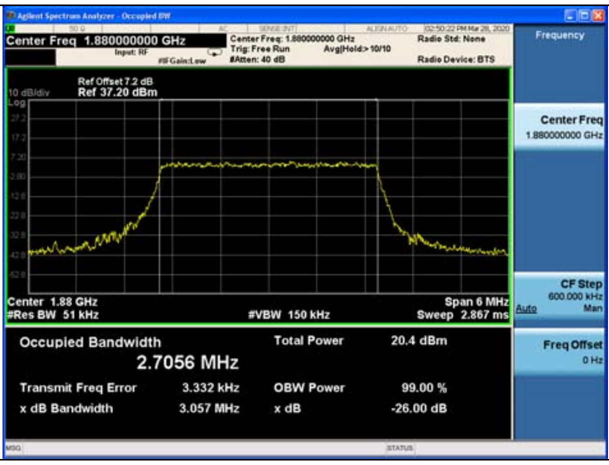


Fig.13

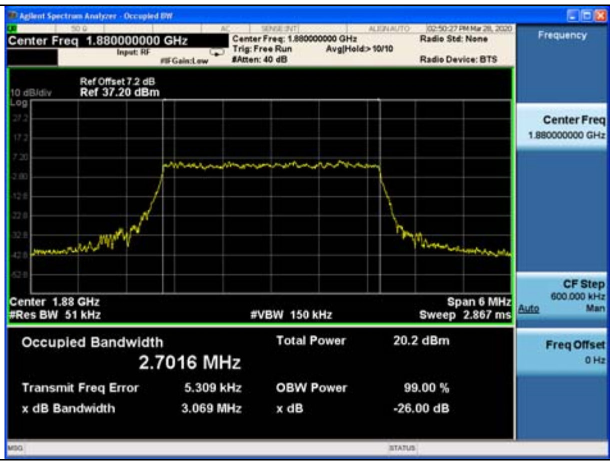


Fig.14

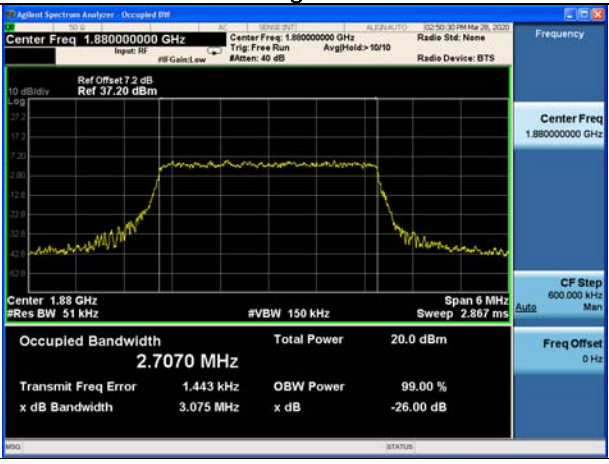


Fig.15

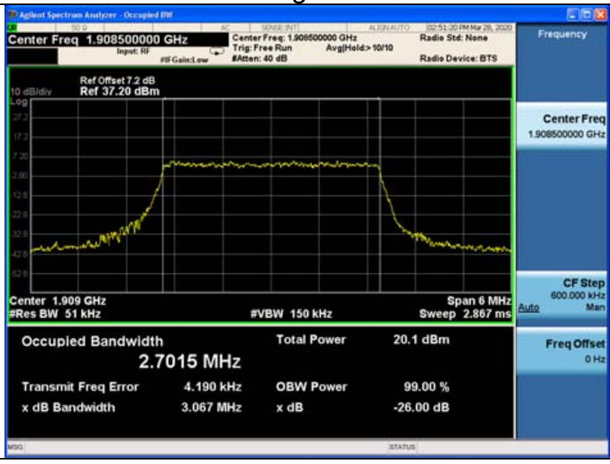


Fig.16

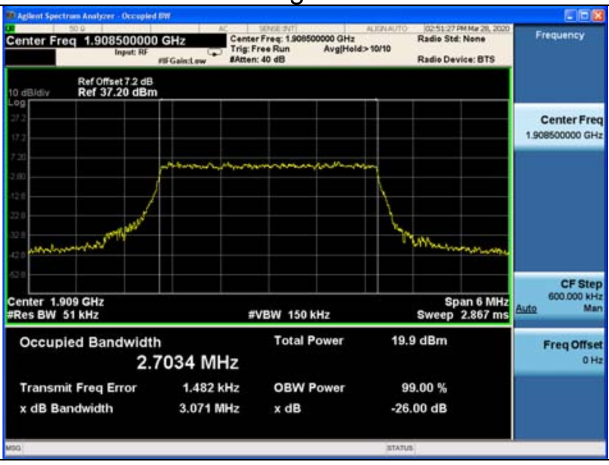


Fig.17

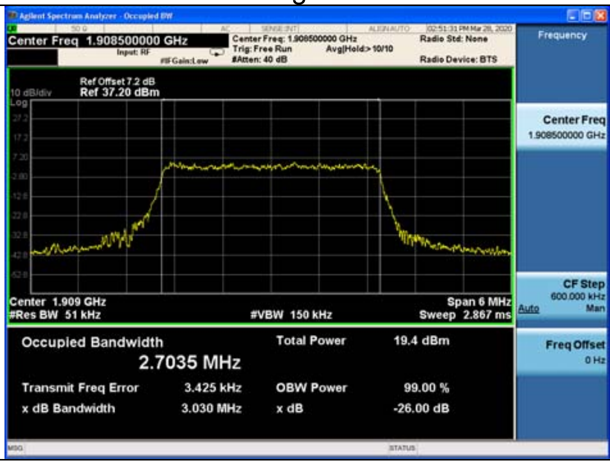


Fig.18

Fig.19

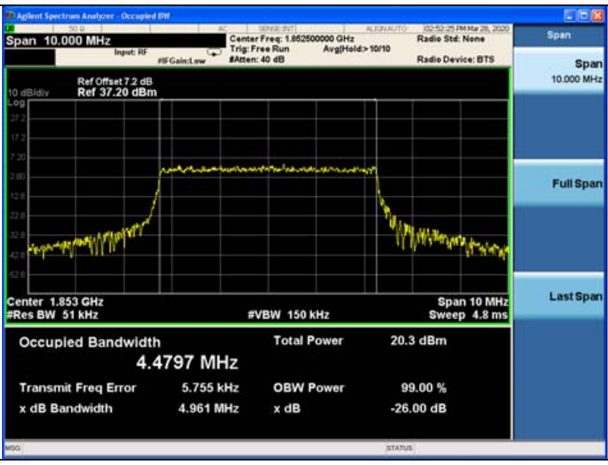


Fig.20

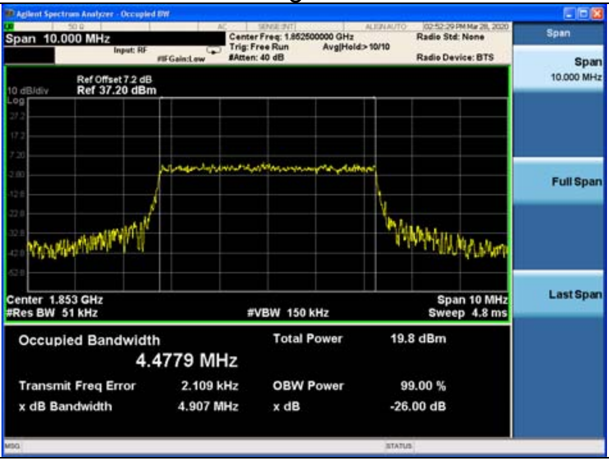


Fig.21

Fig.22

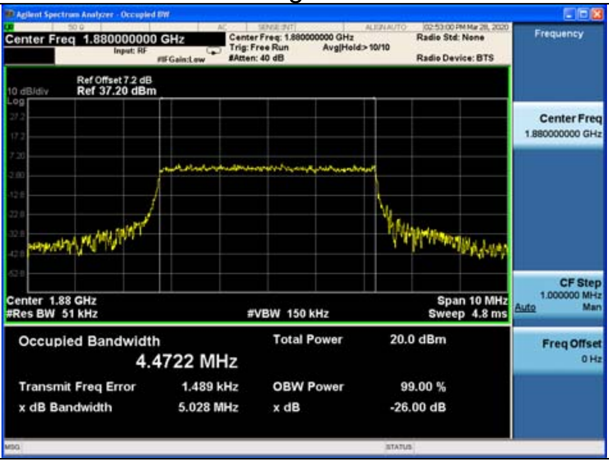


Fig.23

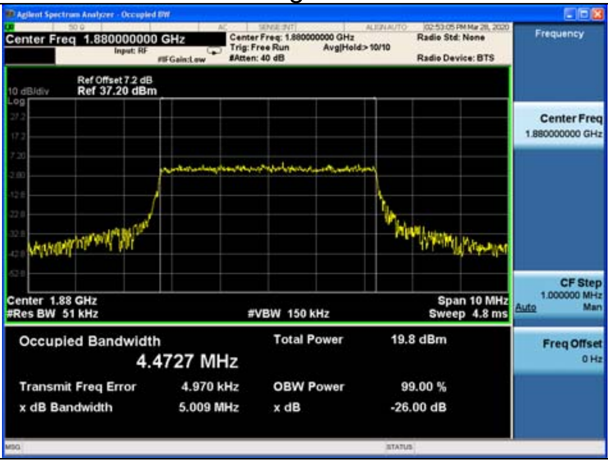


Fig.24

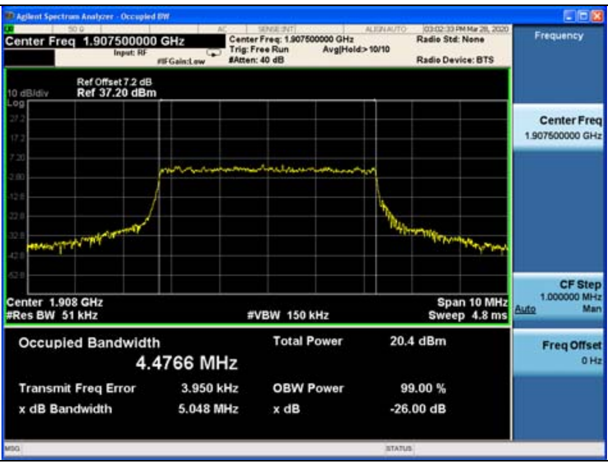


Fig.25

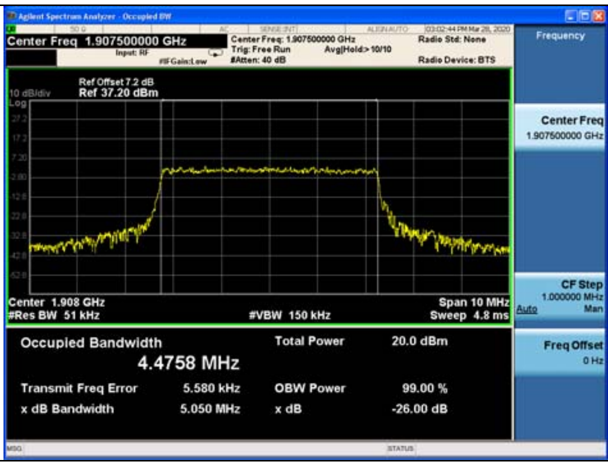


Fig.26

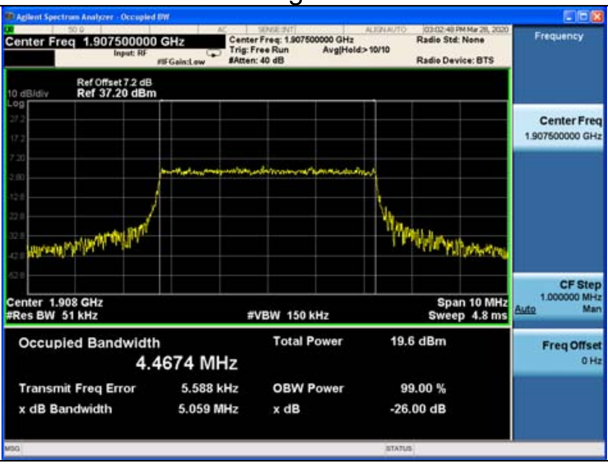


Fig.27

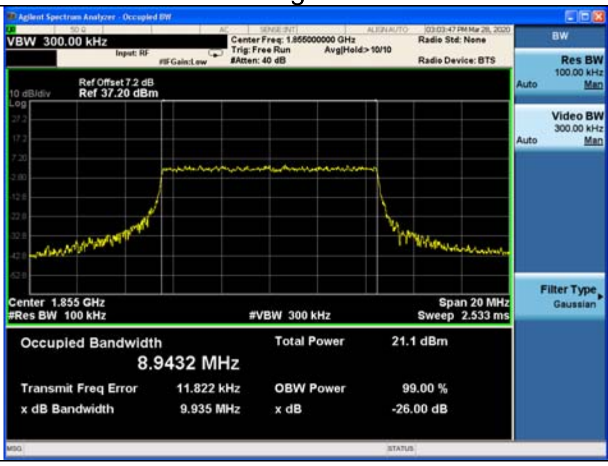


Fig.28

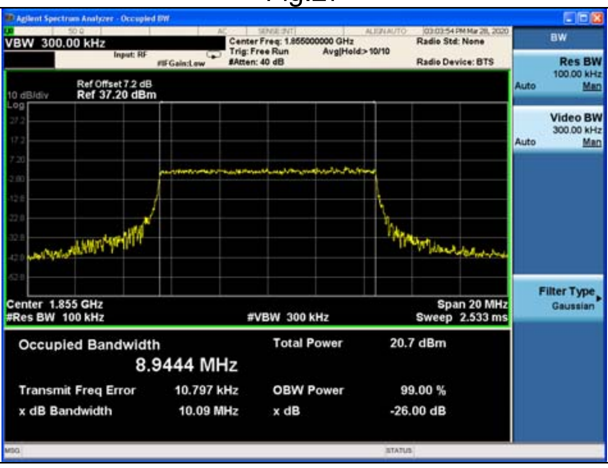


Fig.29

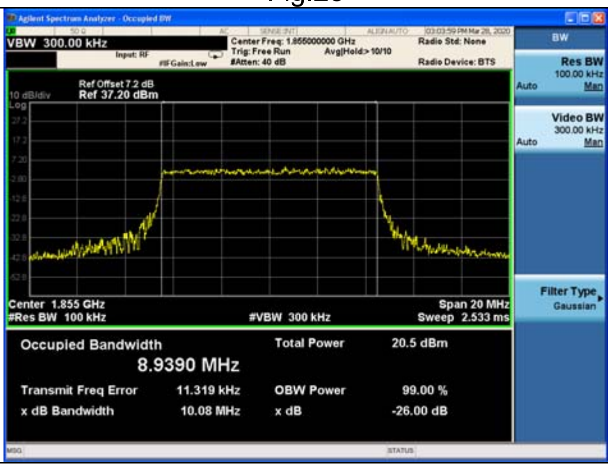


Fig.30

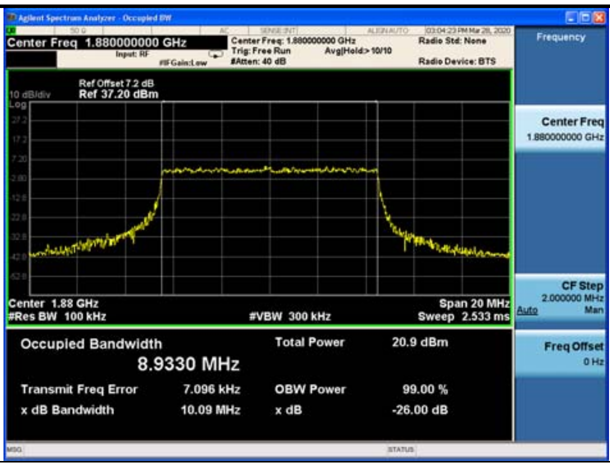


Fig.31

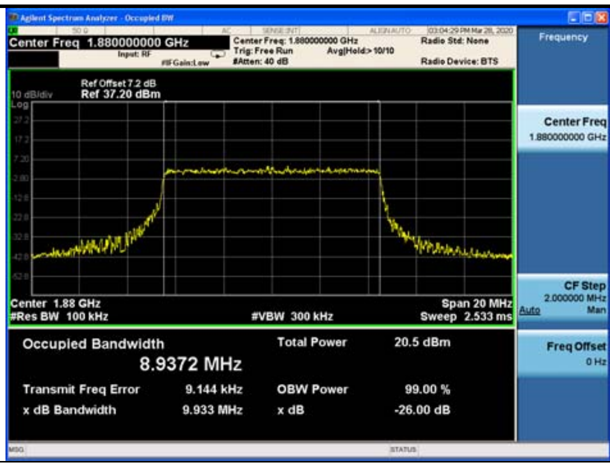


Fig.32

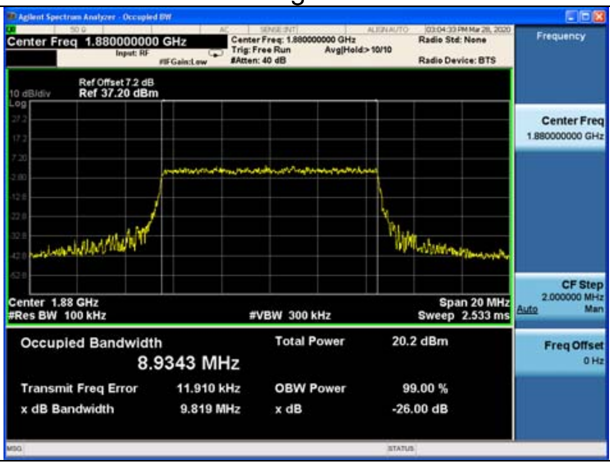


Fig.33

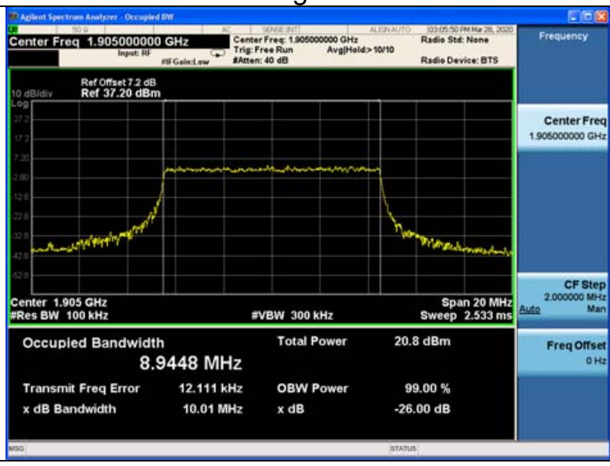


Fig.34

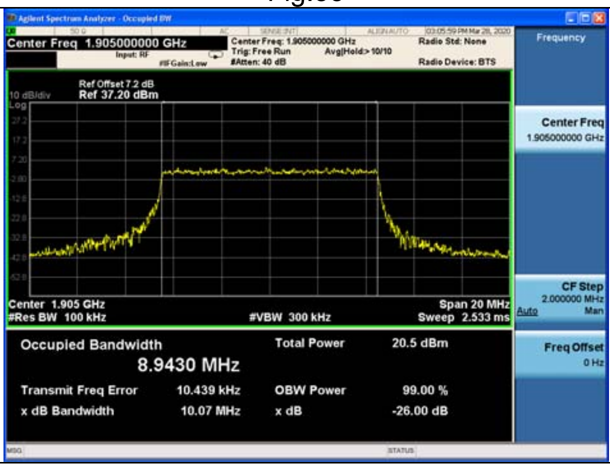


Fig.35

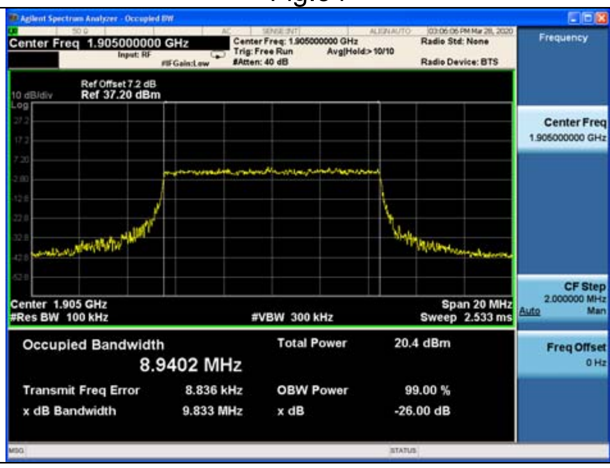


Fig.36

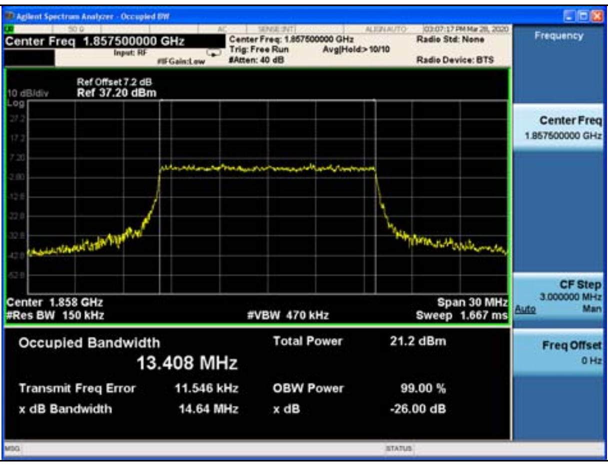


Fig.37

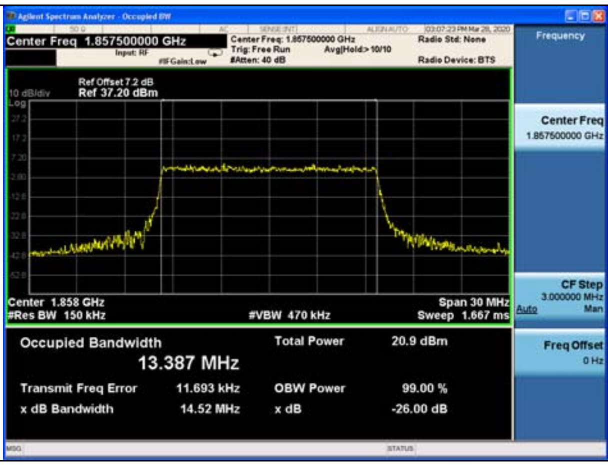


Fig.38

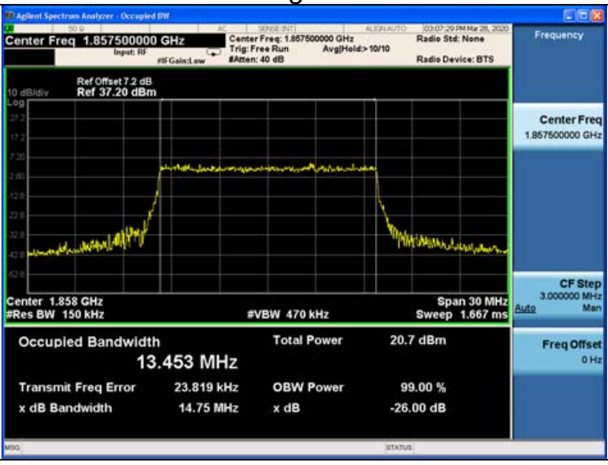


Fig.39

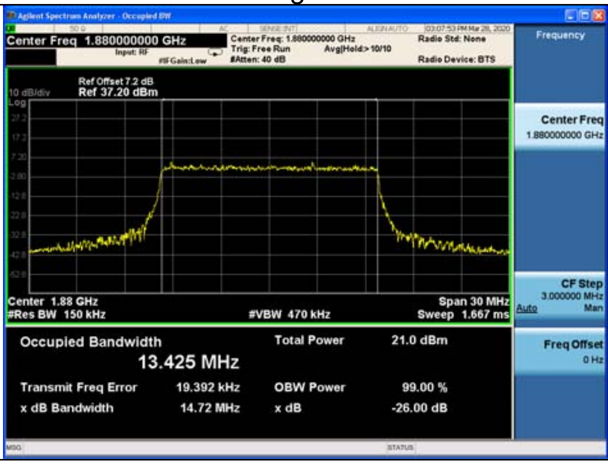


Fig.40

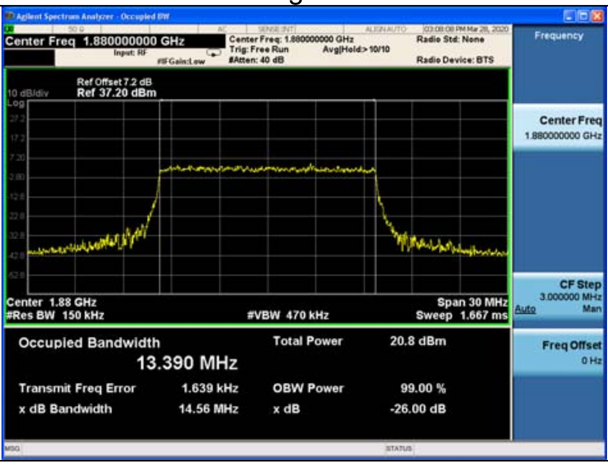


Fig.41

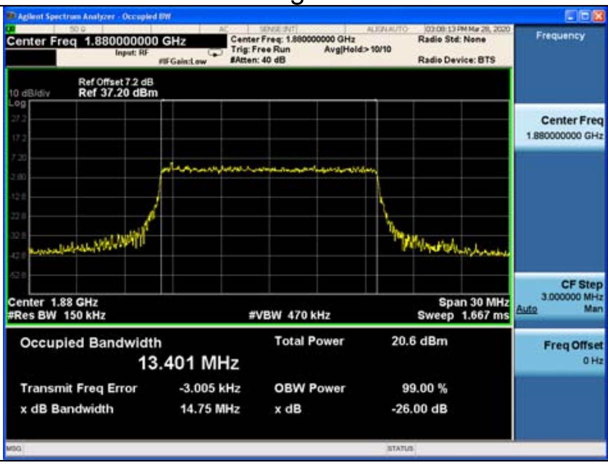


Fig.42

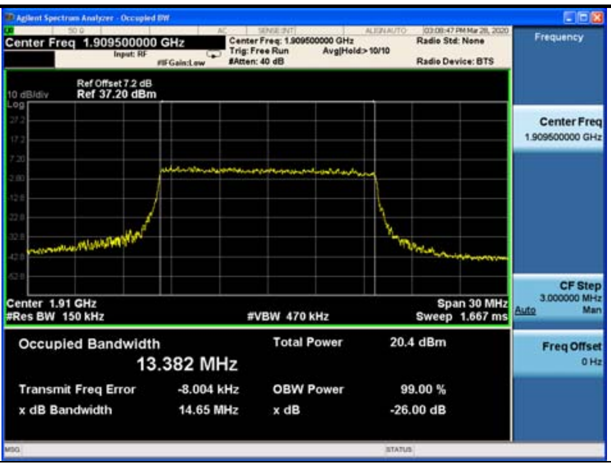


Fig.43

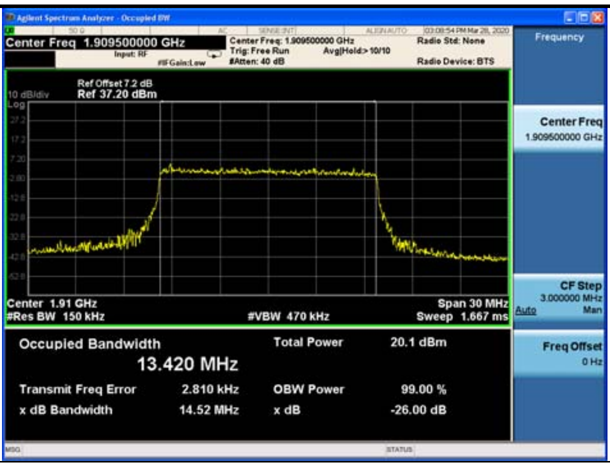


Fig.44

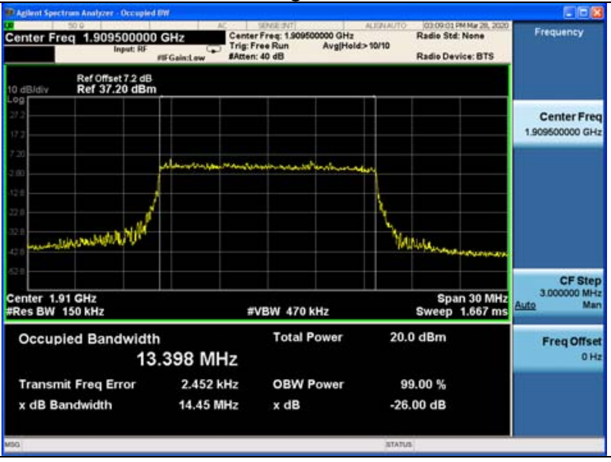


Fig.45

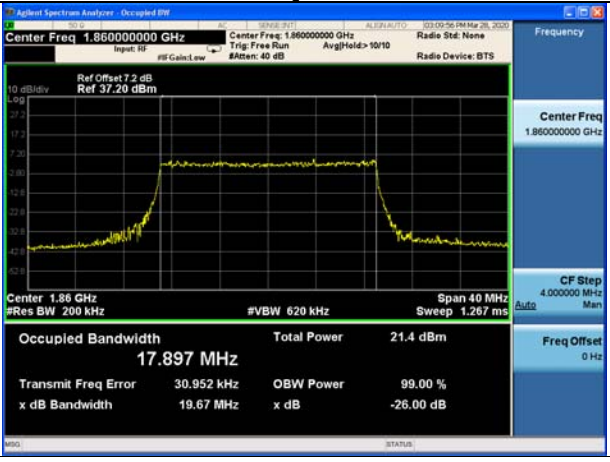


Fig.46

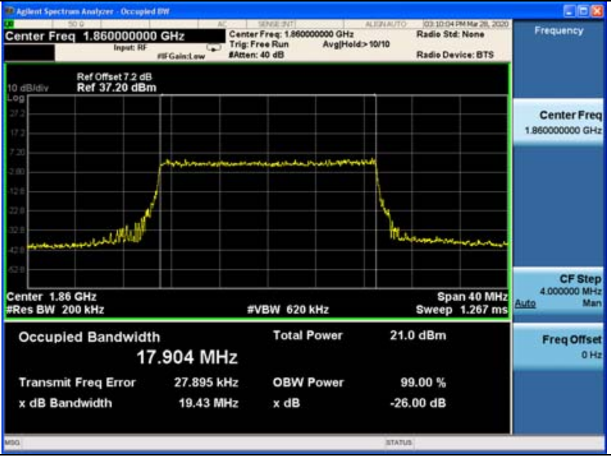


Fig.47

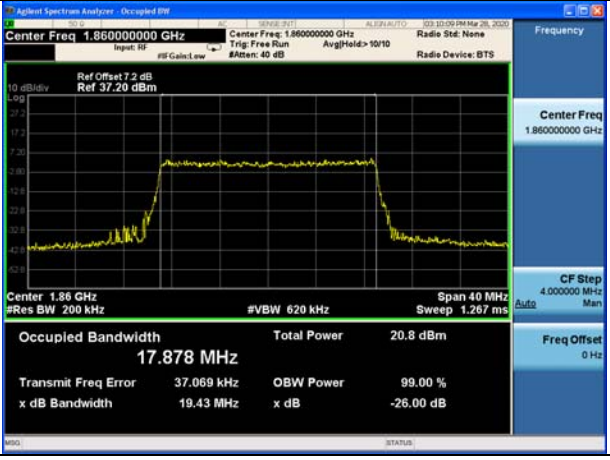


Fig.48

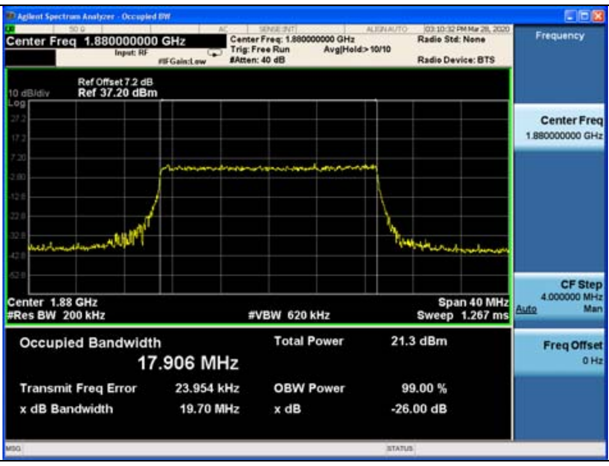


Fig.49

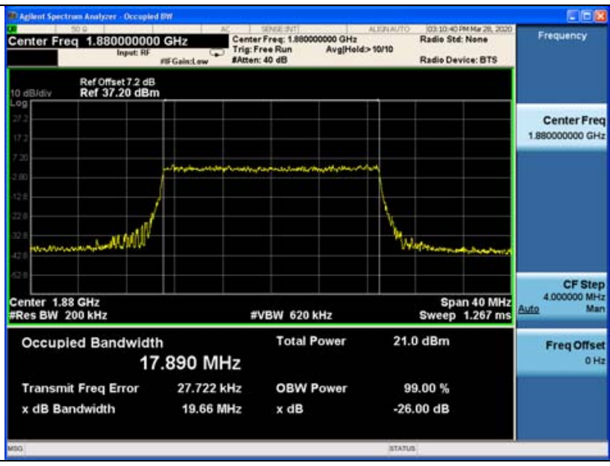


Fig.50

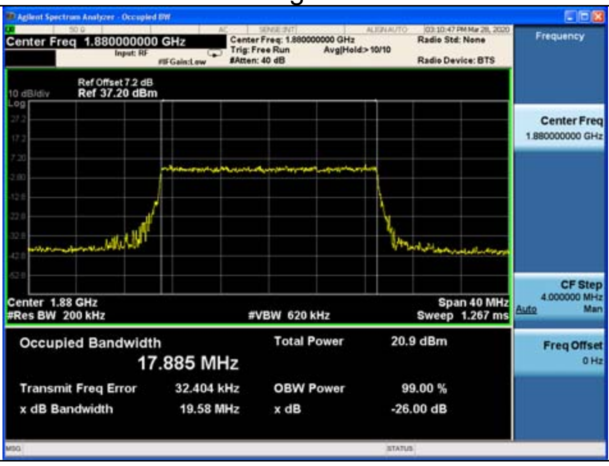


Fig.51

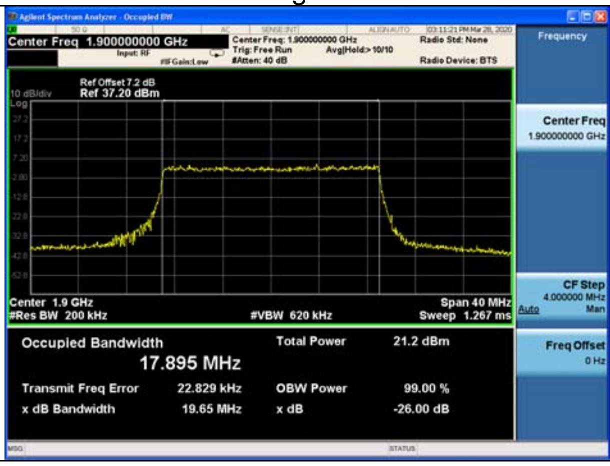


Fig.52

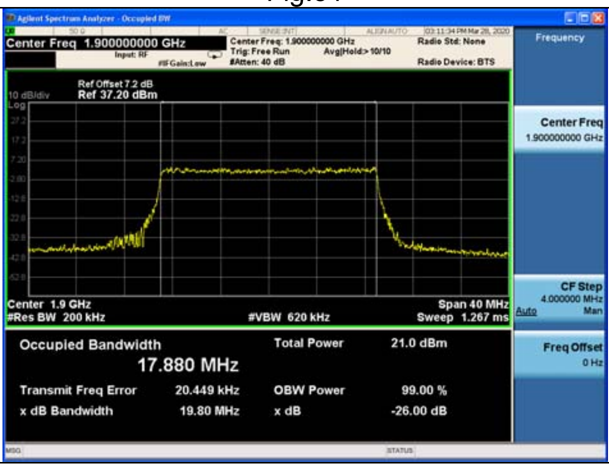


Fig.53

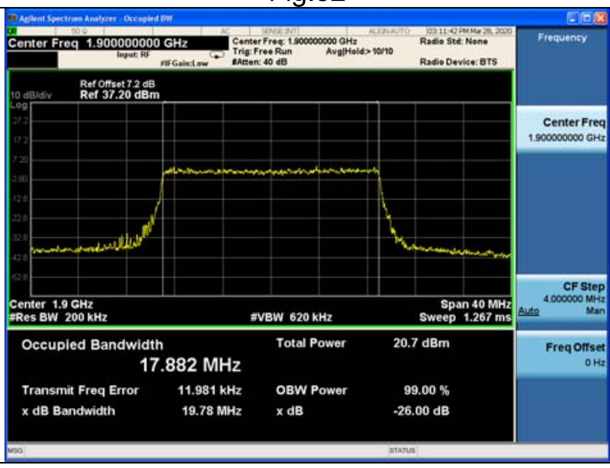


Fig.54

3 Peak-Average Ratio

Band	Carrier frequency (MHz)	Channel	BW (MHz)	RB Size	RB Offset	QPSK	16-QAM	64-QAM
2	1880.0	18900	1.4	1	0	Fig.1	Fig.2	Fig.3
			3	1	0	Fig.4	Fig.5	Fig.6
			5	1	0	Fig.7	Fig.8	Fig.9
			10	1	0	Fig.10	Fig.11	Fig.12
			15	1	0	Fig.13	Fig.14	Fig.15
			20	1	0	Fig.16	Fig.17	Fig.18

Fig.1

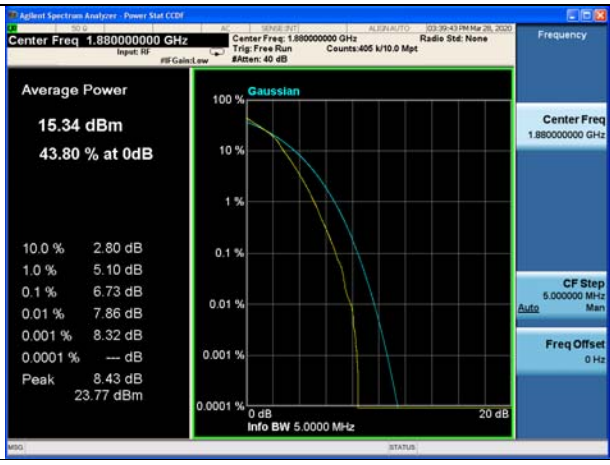


Fig.2

Fig.3

Fig.4

Fig.5

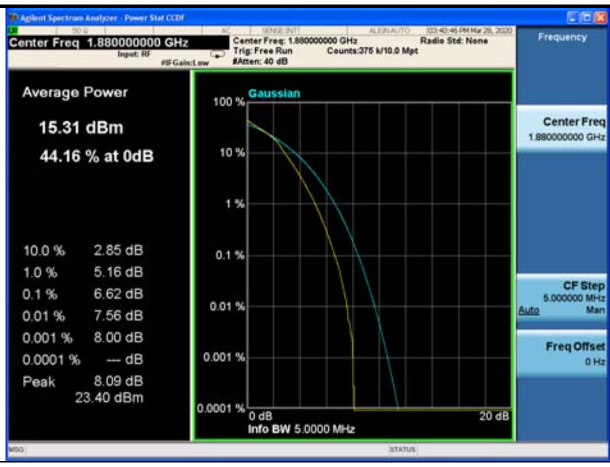


Fig.6

Fig.7

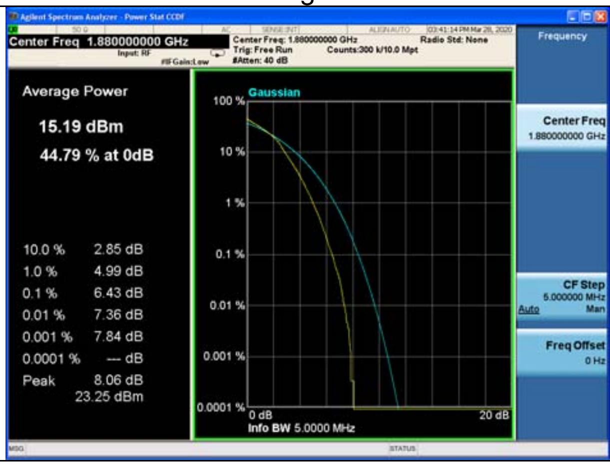


Fig.8

Fig.9

Fig.10

Fig.11

Fig.12

Fig.13

Fig.14

Fig.15

Fig.16

Center Freq 1.880000000 GHz
Average Power
16.79 dBm
41.91 % at 0dB
10.0 % 2.79 dB
1.0 % 5.41 dB
0.1 % 7.15 dB
0.01 % 8.04 dB
0.001 % 8.25 dB
0.0001 % --- dB
Peak 8.53 dB
25.32 dBm
Gaussian
Info BW 25.000 MHz
Frequency
Center Freq
CF Step
Freq Offset	Center Freq 1.880000000 GHz
Average Power
16.58 dBm
42.36 % at 0dB
10.0 % 2.76 dB
1.0 % 5.61 dB
0.1 % 7.74 dB
0.01 % 8.02 dB
0.001 % 8.30 dB
0.0001 % --- dB
Peak 8.86 dB
25.44 dBm
Gaussian
Info BW 25.000 MHz
Frequency
Center Freq
CF Step
Freq Offset
Fig.17	Fig.18

4 Spurious Emissions at antenna terminal

Band	Carrier frequency (MHz)	Channel	BW	RB Size	RB Offset	Conducted Spurious Plot
						QPSK
2	1860	18700	20	1	0	Fig.1-2
	1880	18900	20	1	0	Fig.3-4
	1900	19100	20	1	0	Fig.5-6

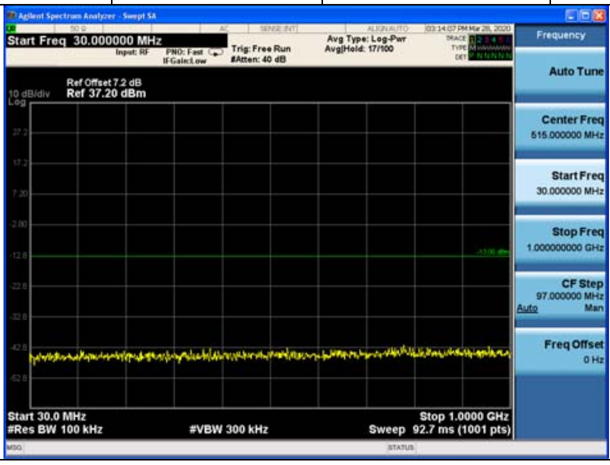


Fig.1

Fig.2

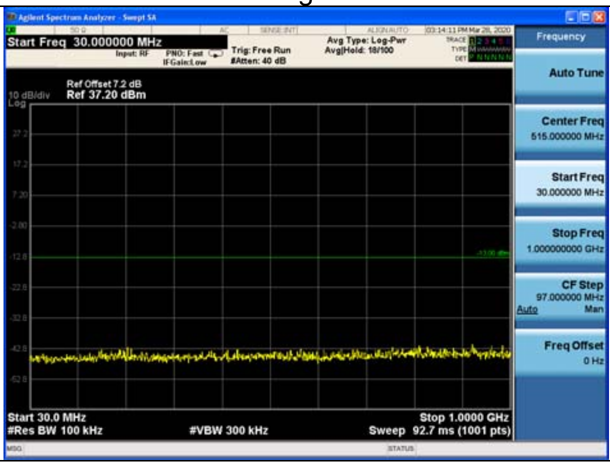


Fig3

Fig4

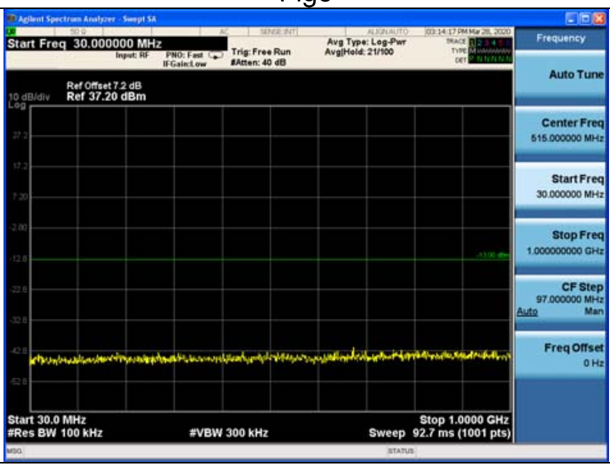


Fig5

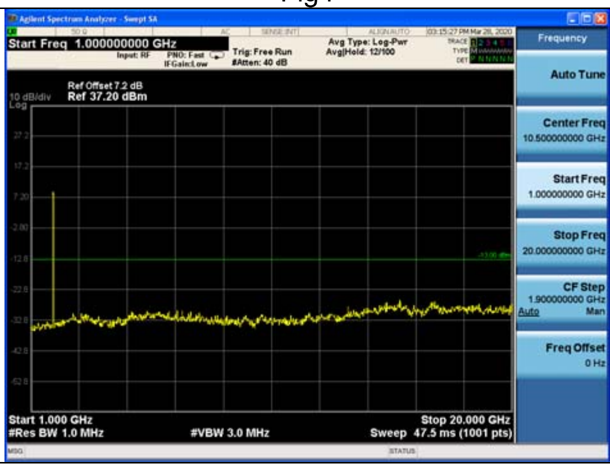


Fig6

5 Band Edges Compliance

Test result

<table>
<tr><th rowspan="2">Band</th><th rowspan="2">Carrier frequency (MHz)</th><th rowspan="2">Channel</th><th rowspan="2">BW</th><th rowspan="2">RB Size</th><th rowspan="2">RB Offset</th><th>Band Edges Plot</th></tr>
<tr><th>QPSK</th></tr>
<tr><td rowspan="24">2</td><td rowspan="2">1850.7</td><td rowspan="2">18607</td><td rowspan="4">1.4</td><td>1</td><td>0</td><td>Fig.1</td></tr>
<tr><td>6</td><td>0</td><td>Fig.2</td></tr>
<tr><td rowspan="2">1909.3</td><td rowspan="2">19193</td><td>1</td><td>5</td><td>Fig.3</td></tr>
<tr><td>6</td><td>0</td><td>Fig.4</td></tr>
<tr><td rowspan="2">1851.5</td><td rowspan="2">18615</td><td rowspan="4">3</td><td>1</td><td>0</td><td>Fig.5</td></tr>
<tr><td>15</td><td>0</td><td>Fig.6</td></tr>
<tr><td rowspan="2">1908.5</td><td rowspan="2">19185</td><td>1</td><td>14</td><td>Fig.7</td></tr>
<tr><td>15</td><td>0</td><td>Fig.8</td></tr>
<tr><td rowspan="2">1852.5</td><td rowspan="2">18625</td><td rowspan="4">5</td><td>1</td><td>0</td><td>Fig.9</td></tr>
<tr><td>25</td><td>0</td><td>Fig.10</td></tr>
<tr><td rowspan="2">1907.5</td><td rowspan="2">19175</td><td>1</td><td>24</td><td>Fig.11</td></tr>
<tr><td>25</td><td>0</td><td>Fig.12</td></tr>
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<tr><td>50</td><td>0</td><td>Fig.14</td></tr>
<tr><td rowspan="2">1905</td><td rowspan="2">19150</td><td>1</td><td>49</td><td>Fig.15</td></tr>
<tr><td>50</td><td>0</td><td>Fig.16</td></tr>
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<tr><td>75</td><td>0</td><td>Fig.18</td></tr>
<tr><td rowspan="2">1902.5</td><td rowspan="2">19125</td><td>1</td><td>74</td><td>Fig.19</td></tr>
<tr><td>75</td><td>0</td><td>Fig.20</td></tr>
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<tr><td>100</td><td>0</td><td>Fig.22</td></tr>
<tr><td rowspan="2">1900</td><td rowspan="2">19100</td><td>1</td><td>99</td><td>Fig.23</td></tr>
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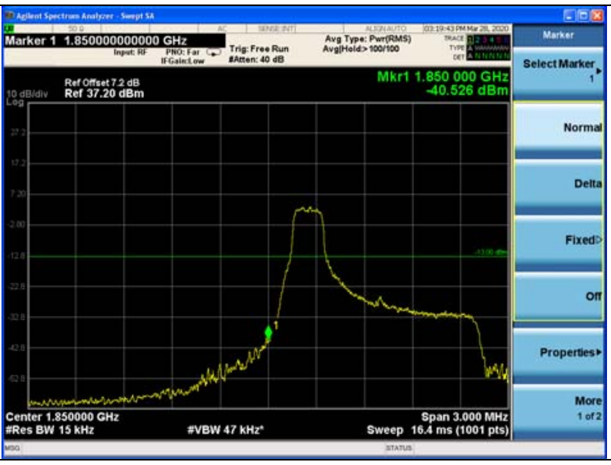


Fig.1

Fig.2

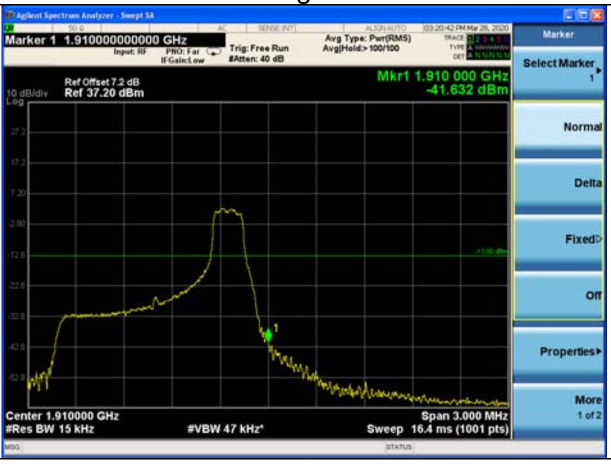


Fig.3

Fig.4

Fig.5

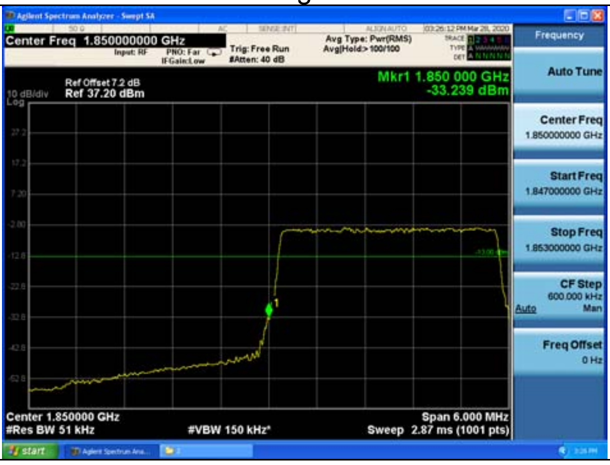


Fig.6

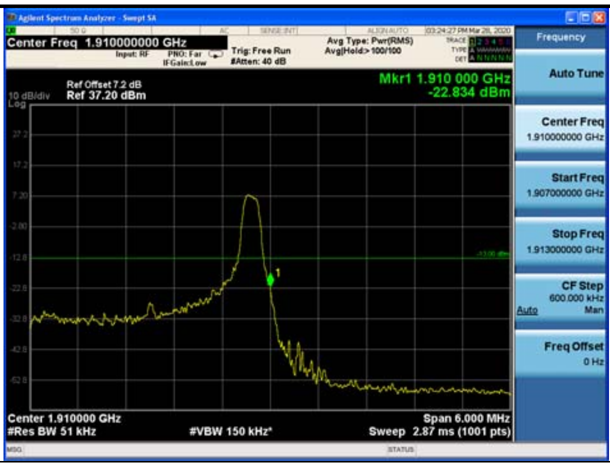


Fig.7

Fig.8

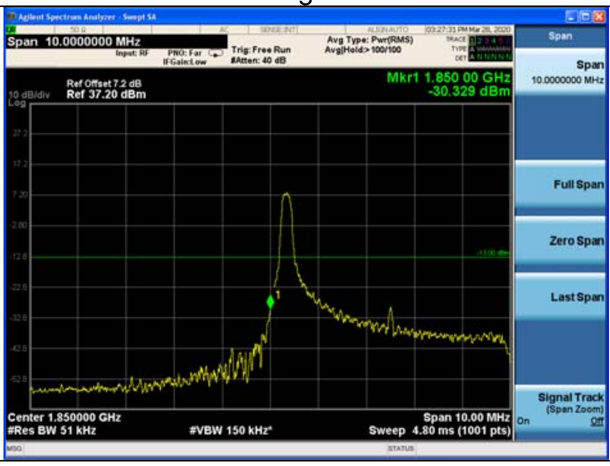


Fig.9

Fig.10

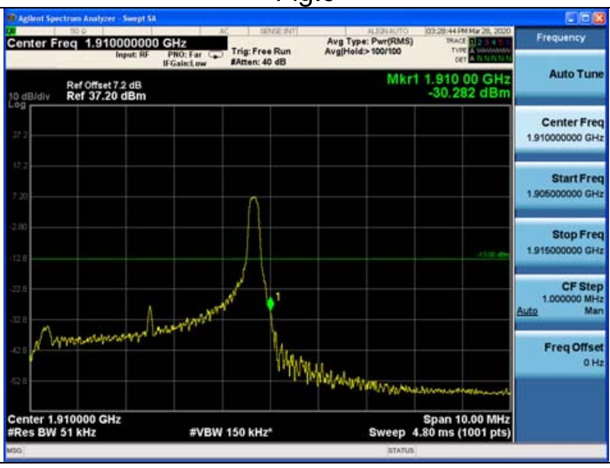


Fig.11

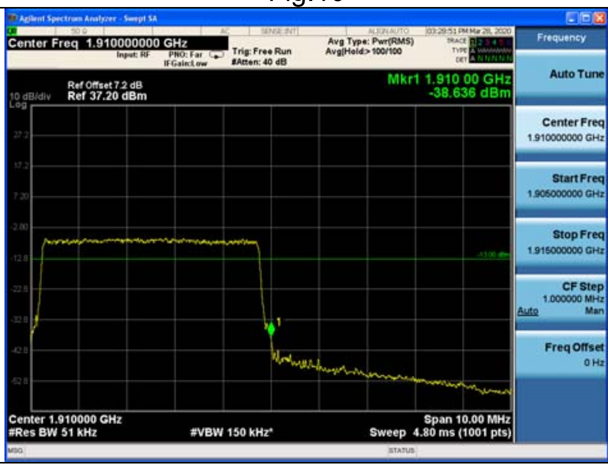


Fig.12

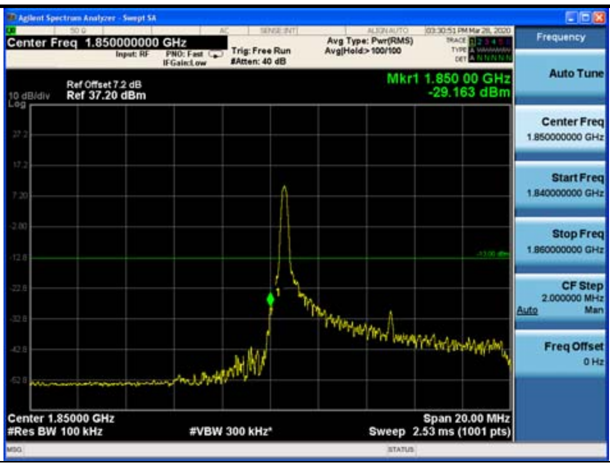
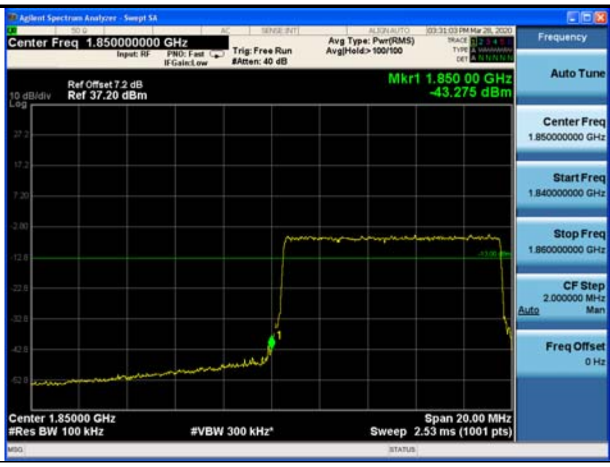


Fig.13



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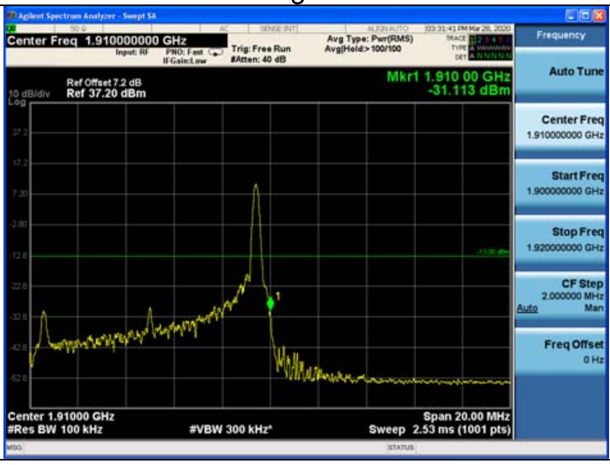


Fig.15

Fig.16

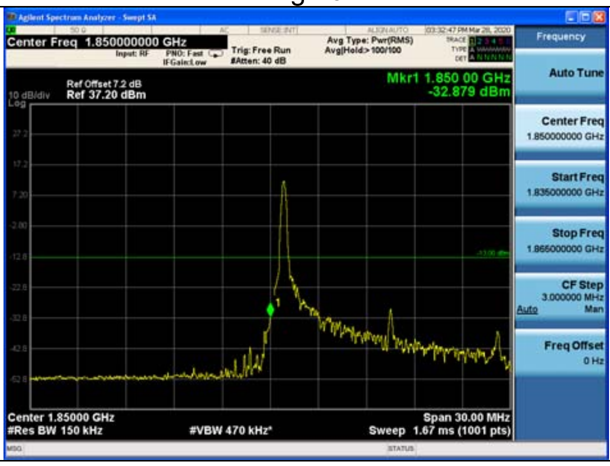


Fig.17

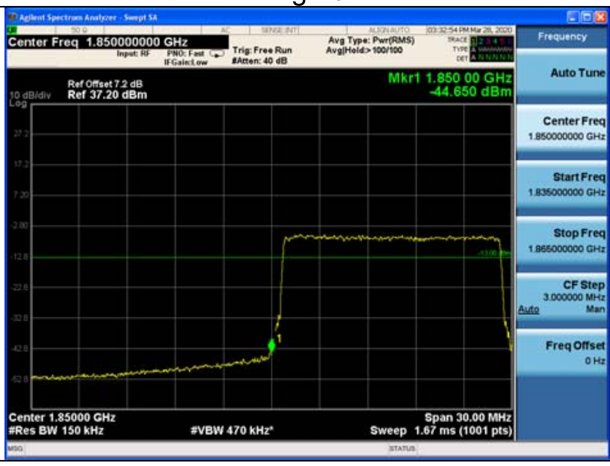


Fig.18

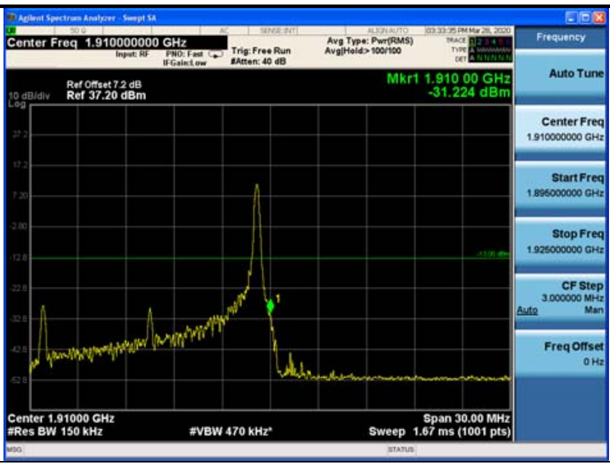


Fig.19

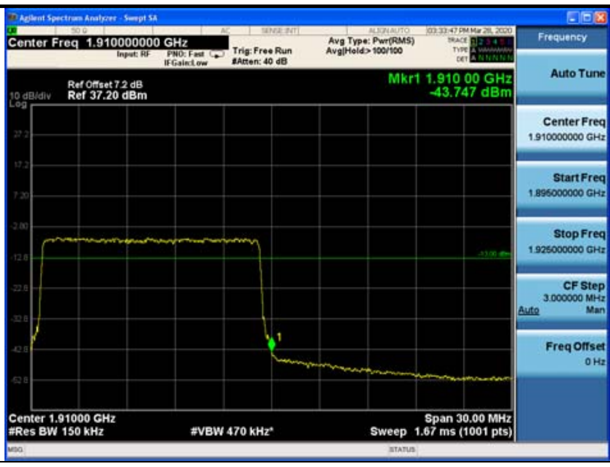


Fig.20

Fig.21

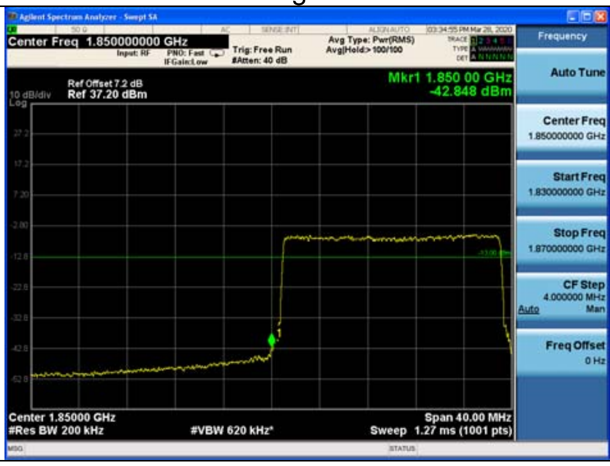


Fig.22

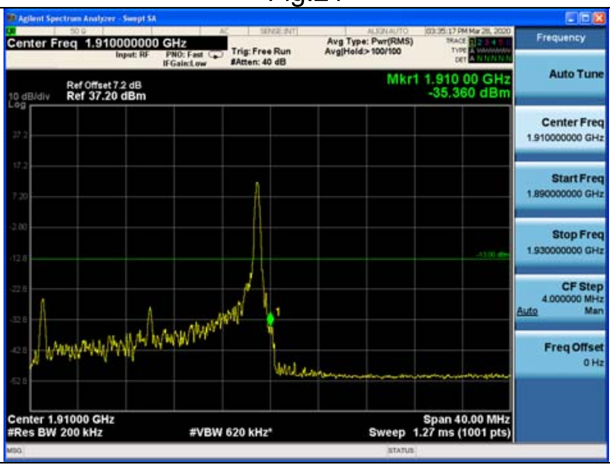


Fig.23

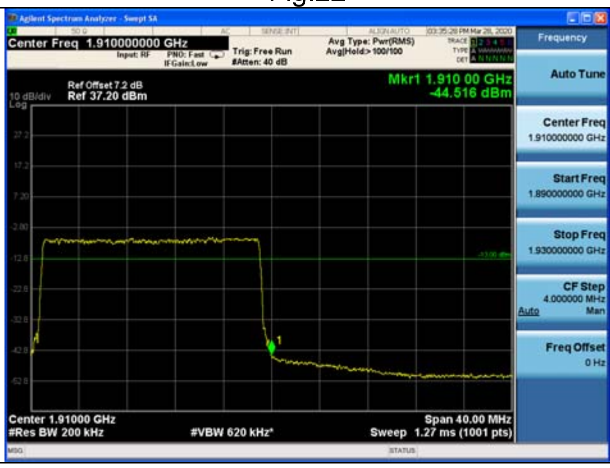


Fig.24

6 Frequency Stability

Test result:

Temperature(°C)	Voltage	Test Result (ppm) Band2 Low Channel					
		1.4M	3M	5M	10M	15M	20M
0	NV	-0.005	-0.003	0.000	0.011	-0.010	-0.025
+10	NV	0.039	0.024	0.003	0.059	-0.012	-0.024
+20	NV	0.000	0.000	0.000	0.000	0.000	0.000
+30	NV	0.040	0.055	0.050	0.002	0.028	-0.003
+40	NV	0.057	-0.015	0.011	-0.023	-0.025	0.026
+50	NV	-0.033	-0.019	-0.045	0.032	0.026	-0.036
+55	NV	-0.001	-0.020	-0.005	0.041	0.051	0.008
+20	LV	-0.002	0.024	0.023	0.019	-0.078	0.034
+20	HV	0.014	-0.001	0.041	0.003	0.051	0.030

Temperature(°C)	Voltage	Test Result (ppm) Band2 High Channel					
		1.4M	3M	5M	10M	15M	20M
0	NV	-0.047	-0.039	-0.046	-0.035	0.045	0.066
+10	NV	0.027	-0.029	0.009	-0.015	-0.046	0.003
+20	NV	0.000	0.000	0.000	0.000	0.000	0.000
+30	NV	0.033	0.009	-0.009	-0.034	-0.012	0.056
+40	NV	-0.023	-0.037	0.005	-0.018	0.023	0.020
+50	NV	-0.043	-0.003	0.012	0.020	0.007	-0.030
+55	NV	0.067	0.041	0.046	-0.043	0.013	0.036
+20	LV	-0.015	-0.038	0.045	-0.064	0.015	0.003
+20	HV	0.024	0.007	-0.023	0.043	0.028	0.045

LTE Band 4
1 RF Power Output

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1710.7	19957	1.4	1	0	16.42
				1	5	16.37
				3	2	15.44
				6	0	15.39
	1732.5	20175		1	0	16.35
				1	5	16.40
				3	2	15.34
				6	0	15.32
	1754.3	20393		1	0	16.09
				1	5	16.16
				3	2	15.50
				6	0	15.43
16QAM	1710.7	19957	1.4	1	0	16.11
				1	5	15.90
				3	2	14.47
				6	0	14.62
	1732.5	20175		1	0	16.11
				1	5	16.10
				3	2	14.48
				6	0	14.50
	1754.3	20393		1	0	15.81
				1	5	15.73
				3	2	14.65
				6	0	14.65
64QAM	1710.7	19957	1.4	1	0	15.93
				1	5	15.91
				3	2	14.35
				6	0	14.55
	1732.5	20175		1	0	15.85
				1	5	16.11
				3	2	14.49
				6	0	14.42
	1754.3	20393		1	0	15.86
				1	5	15.88
				3	2	14.61
				6	0	14.67

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1711.5	19965	3	1	0	16.46
				1	14	16.40
				8	4	15.55
				15	0	15.43
	1732.5	20175		1	0	16.38
				1	14	16.37
				8	4	15.41
				15	0	15.30
	1753.5	20385		1	0	16.08
				1	14	15.93
				8	4	15.51
				15	0	15.25
16QAM	1711.5	19965	3	1	0	16.08
				1	14	16.07
				8	4	14.43
				15	0	14.40
	1732.5	20175		1	0	16.02
				1	14	15.91
				8	4	14.73
				15	0	14.45
	1753.5	20385		1	0	15.82
				1	14	15.86
				8	4	14.56
				15	0	14.65
64QAM	1711.5	19965	3	1	0	16.02
				1	14	15.92
				8	4	14.26
				15	0	14.49
	1732.5	20175		1	0	15.81
				1	14	15.87
				8	4	14.57
				15	0	14.41
	1753.5	20385		1	0	15.97
				1	14	15.82
				8	4	14.53
				15	0	14.52

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1712.5	19975	5	1	0	16.32
				1	24	16.30
				12	6	15.51
				25	0	15.43
	1732.5	20175		1	0	16.33
				1	24	16.44
				12	6	15.29
				25	0	15.26
	1752.5	20375		1	0	16.05
				1	24	16.26
				12	6	15.29
				25	0	15.37
16QAM	1712.5	19975	5	1	0	16.02
				1	24	15.74
				12	6	14.41
				25	0	14.53
	1732.5	20175		1	0	15.93
				1	24	16.04
				12	6	14.63
				25	0	14.44
	1752.5	20375		1	0	15.84
				1	24	15.89
				12	6	14.44
				25	0	14.51
64QAM	1712.5	19975	5	1	0	16.01
				1	24	15.83
				12	6	14.30
				25	0	14.21
	1732.5	20175		1	0	15.82
				1	24	16.12
				12	6	14.54
				25	0	14.40
	1752.5	20375		1	0	16.01
				1	24	16.01
				12	6	14.52
				25	0	14.51

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1715	20000	10	1	0	16.38
				1	49	16.46
				24	12	15.45
				50	0	15.41
	1732.5	20175		1	0	16.32
				1	49	16.34
				24	12	15.37
				50	0	15.27
	1750	20350		1	0	15.98
				1	49	16.00
				24	12	15.56
				50	0	15.24
16QAM	1715	20000	10	1	0	15.91
				1	49	15.89
				24	12	14.49
				50	0	14.45
	1732.5	20175		1	0	16.20
				1	49	15.97
				24	12	14.43
				50	0	14.59
	1750	20350		1	0	16.11
				1	49	15.96
				24	12	14.71
				50	0	14.40
64QAM	1715	20000	10	1	0	16.05
				1	49	15.93
				24	12	14.47
				50	0	14.39
	1732.5	20175		1	0	15.97
				1	49	16.02
				24	12	14.63
				50	0	14.59
	1750	20350		1	0	15.92
				1	49	15.97
				24	12	14.47
				50	0	14.69

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1717.5	20025	15	1	0	16.35
				1	74	16.40
				40	18	15.57
				75	0	15.37
	1732.5	20175		1	0	16.39
				1	74	16.33
				40	18	15.34
				75	0	15.28
	1747.5	20325		1	0	16.06
				1	74	16.19
				40	18	15.34
				75	0	15.44
16QAM	1717.5	20025	15	1	0	15.83
				1	74	15.82
				40	18	14.37
				75	0	14.37
	1732.5	20175		1	0	16.06
				1	74	16.01
				40	18	14.59
				75	0	14.54
	1747.5	20325		1	0	15.94
				1	74	16.05
				40	18	14.64
				75	0	14.45
64QAM	1717.5	20025	15	1	0	15.95
				1	74	15.90
				40	18	14.49
				75	0	14.53
	1732.5	20175		1	0	15.94
				1	74	16.17
				40	18	14.63
				75	0	14.28
	1747.5	20325		1	0	16.07
				1	74	15.98
				40	18	14.38
				75	0	14.31

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1720	20050	20	1	0	16.50
				1	99	16.46
				50	25	15.60
				100	0	15.49
	1732.5	20175		1	0	16.49
				1	99	16.44
				50	25	15.47
				100	0	15.38
	1745	20300		1	0	16.09
				1	99	16.05
				50	25	15.39
				100	0	15.34
16QAM	1720	20050	20	1	0	16.01
				1	99	16.00
				50	25	14.63
				100	0	14.53
	1732.5	20175		1	0	16.09
				1	99	16.08
				50	25	14.50
				100	0	14.52
	1745	20300		1	0	15.97
				1	99	15.87
				50	25	14.53
				100	0	14.83
64QAM	1720	20050	20	1	0	15.85
				1	99	16.08
				50	25	14.59
				100	0	14.28
	1732.5	20175		1	0	16.18
				1	99	16.04
				50	25	14.40
				100	0	14.76
	1745	20300		1	0	16.12
				1	99	15.88
				50	25	14.74
				100	0	14.71

2 Occupied Bandwidth

Test result

Band	Carrier frequency (MHz)	Channel	BW (MHz)	RB Size	RB Offset	Bandwidth of 99% Power (MHz)					
						QPSK		16-QAM		64-QAM	
	1710.7	19957		6	0	1.0805	Fig.1	1.0820	Fig.2	1.0801	Fig.3
	1732.5	20175	1.4	6	0	1.0811	Fig.4	1.0789	Fig.5	1.0816	Fig.6
	1754.3	20393		6	0	1.0873	Fig.7	1.0872	Fig.8	1.0860	Fig.9
	1711.5	19965		15	0	2.6857	Fig.10	2.6939	Fig.11	2.6829	Fig.12
	1732.5	20175	3	15	0	2.6928	Fig.13	2.6915	Fig.14	2.6891	Fig.15
	1753.5	20385		15	0	2.6849	Fig.16	2.6906	Fig.17	2.6826	Fig.18
	1712.5	19975		25	0	4.4797	Fig.19	4.4609	Fig.20	4.4765	Fig.21
	1732.5	20175	5	25	0	4.4718	Fig.22	4.4741	Fig.23	4.4706	Fig.24
	1752.5	20375		25	0	4.4932	Fig.25	4.4680	Fig.26	4.4813	Fig.27
4	1715	20000		50	0	8.9552	Fig.28	8.9429	Fig.29	8.9472	Fig.30
	1732.5	20175	10	50	0	8.9569	Fig.31	8.9702	Fig.32	8.9691	Fig.33
	1750	20350		50	0	8.9570	Fig.34	8.9656	Fig.35	8.9559	Fig.36
	1717.5	20025		75	0	13.410	Fig.37	13.436	Fig.38	13.417	Fig.39
	1732.5	20175	15	75	0	13.433	Fig.40	13.439	Fig.41	13.432	Fig.42
	1747.5	20325		75	0	13.446	Fig.43	13.444	Fig.44	13.435	Fig.45
	1720	20050		100	0	17.926	Fig.46	17.879	Fig.47	17.953	Fig.48
	1732.5	20175	20	100	0	17.956	Fig.49	17.900	Fig.50	17.903	Fig.51
	1745	20300		100	0	17.895	Fig.52	17.882	Fig.53	17.905	Fig.54

Band	Carrier frequency (MHz)	Channel	BW (MHz)	RB Size	RB Offset	Bandwidth of -26dB transmitter power (MHz)					
						QPSK		16-QAM		64-QAM	
	1710.7	19957		6	0	1.246	Fig.1	1.237	Fig.2	1.238	Fig.3
	1732.5	20175	1.4	6	0	1.247	Fig.4	1.243	Fig.5	1.233	Fig.6
	1754.3	20393		6	0	1.253	Fig.7	1.239	Fig.8	1.245	Fig.9
	1711.5	19965		15	0	3.007	Fig.10	2.990	Fig.11	2.966	Fig.12
	1732.5	20175	3	15	0	2.988	Fig.13	2.976	Fig.14	3.014	Fig.15
	1753.5	20385		15	0	2.973	Fig.16	3.013	Fig.17	2.960	Fig.18
	1712.5	19975		25	0	4.940	Fig.19	4.941	Fig.20	4.910	Fig.21
	1732.5	20175	5	25	0	4.955	Fig.22	5.135	Fig.23	5.111	Fig.24
	1752.5	20375		25	0	5.074	Fig.25	4.984	Fig.26	5.005	Fig.27
4	1715	20000		50	0	9.794	Fig.28	9.742	Fig.29	9.766	Fig.30
	1732.5	20175	10	50	0	9.811	Fig.31	9.774	Fig.32	9.815	Fig.33
	1750	20350		50	0	9.837	Fig.34	9.911	Fig.35	9.694	Fig.36
	1717.5	20025		75	0	14.76	Fig.37	14.59	Fig.38	14.58	Fig.39
	1732.5	20175	15	75	0	15.00	Fig.40	14.90	Fig.41	15.05	Fig.42
	1747.5	20325		75	0	14.71	Fig.43	14.62	Fig.44	14.78	Fig.45
	1720	20050		100	0	19.73	Fig.46	19.42	Fig.47	19.17	Fig.48
	1732.5	20175	20	100	0	19.69	Fig.49	19.90	Fig.50	19.21	Fig.51
	1745	20300		100	0	19.43	Fig.52	19.26	Fig.53	19.25	Fig.54

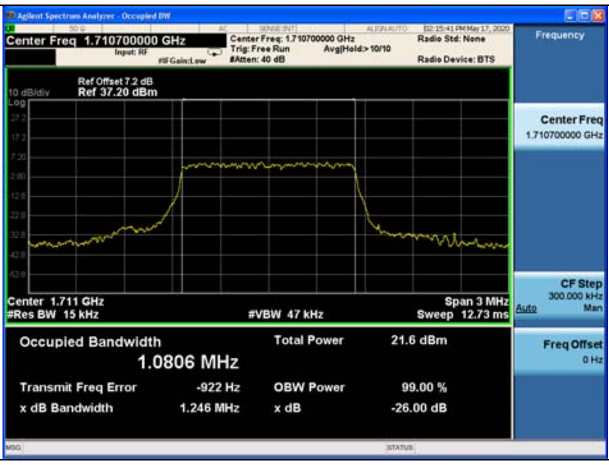
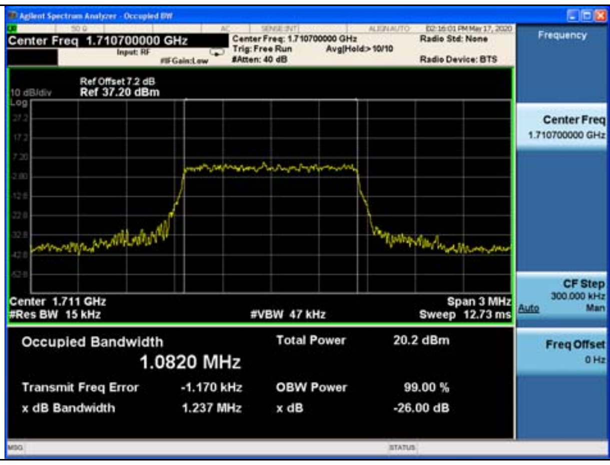
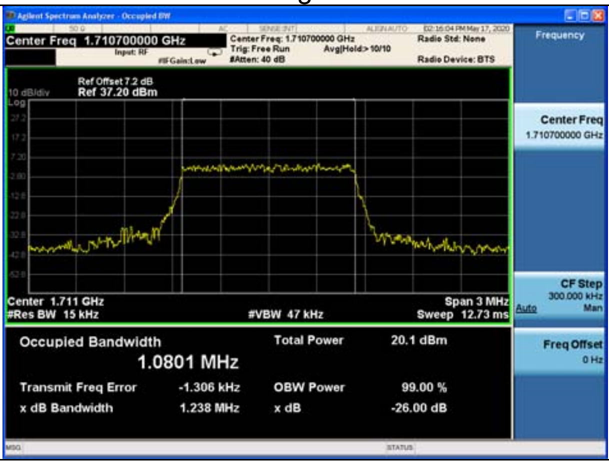
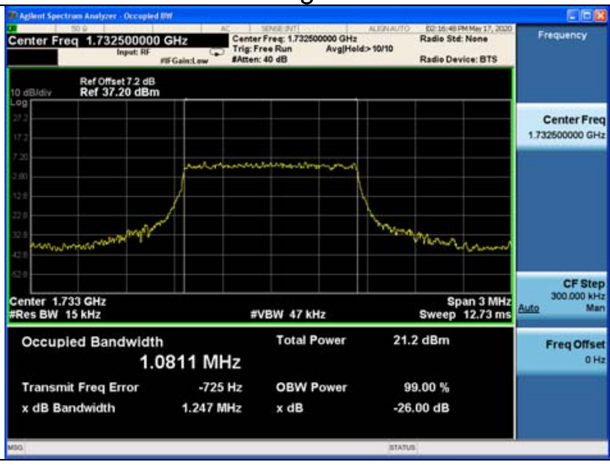
	

Fig.1	Fig.2
	
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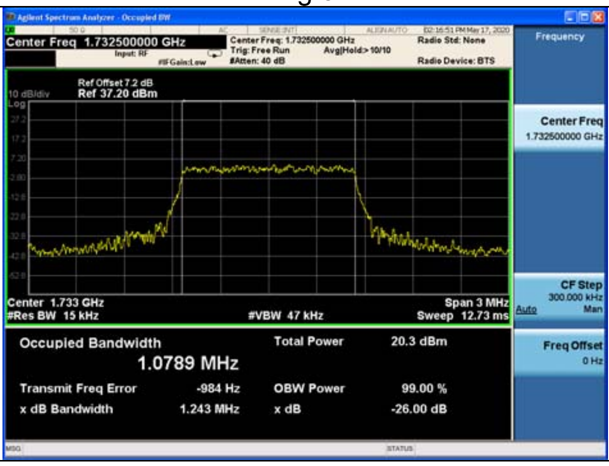
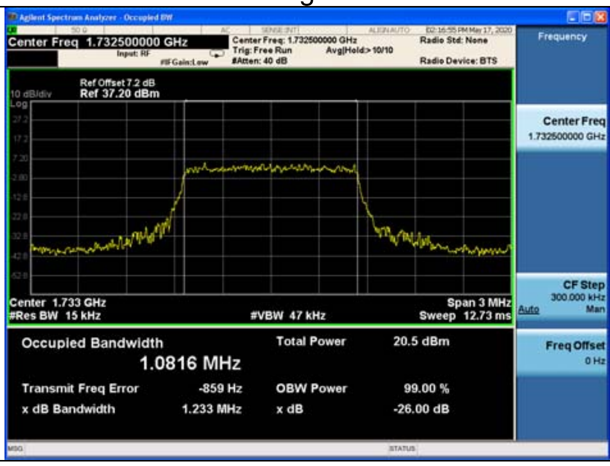
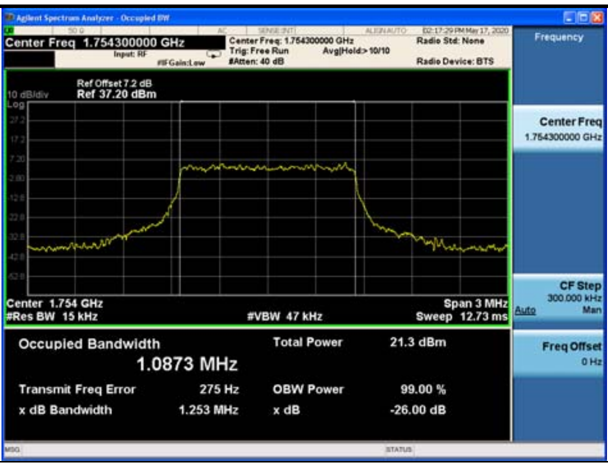
	

Fig.5	Fig.6



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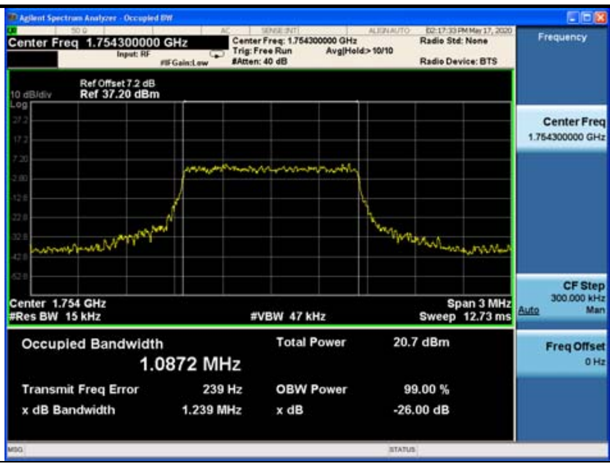

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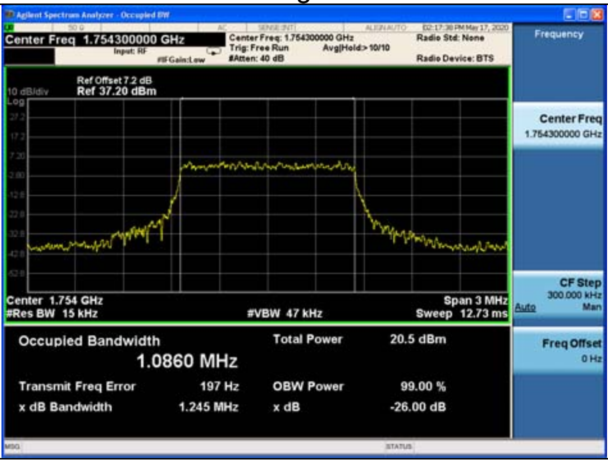

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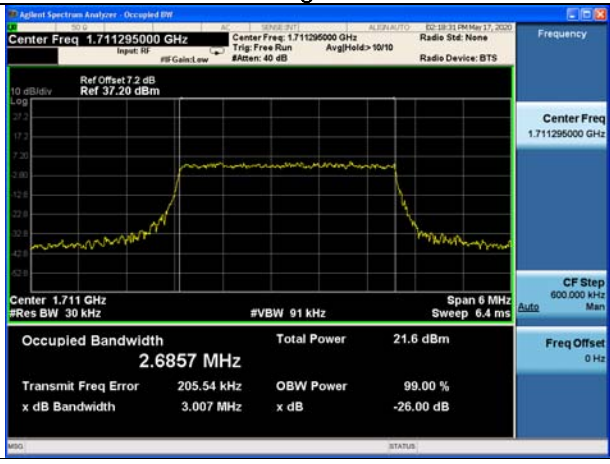

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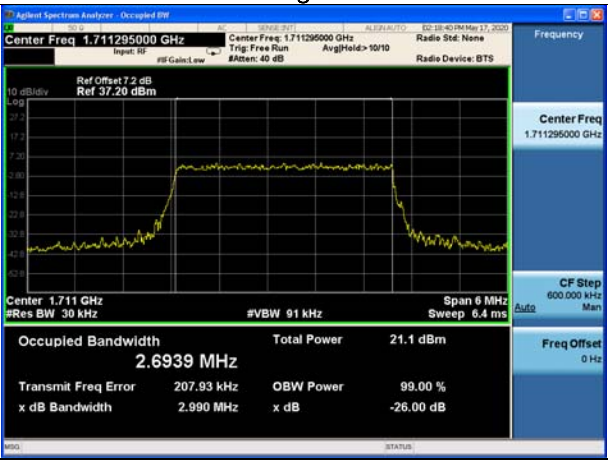

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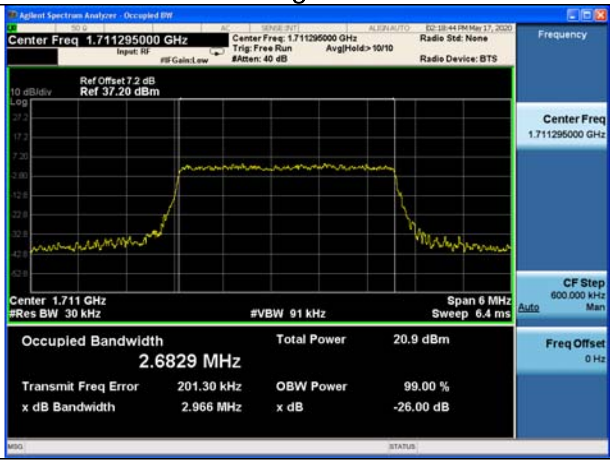
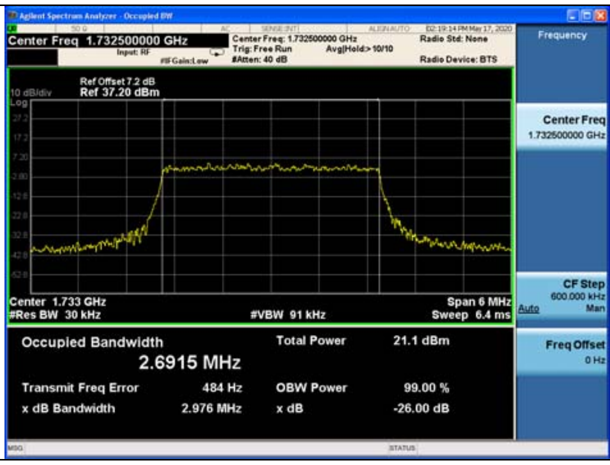


Fig.12

Fig.13



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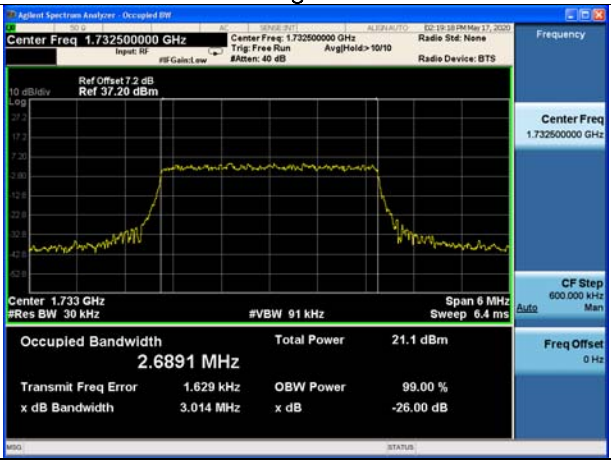

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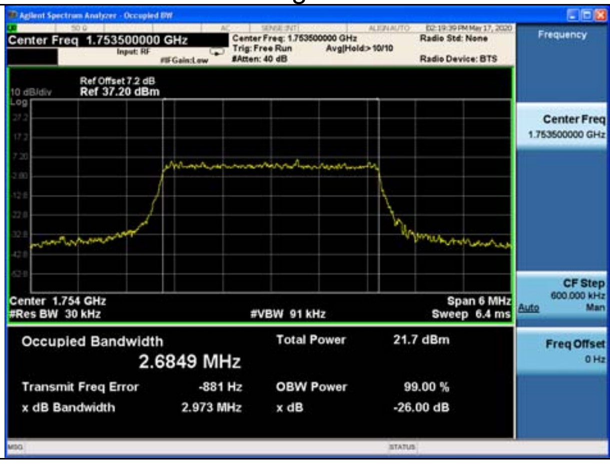

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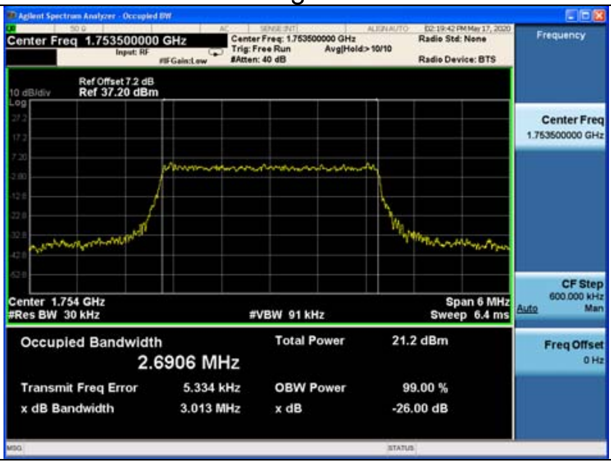

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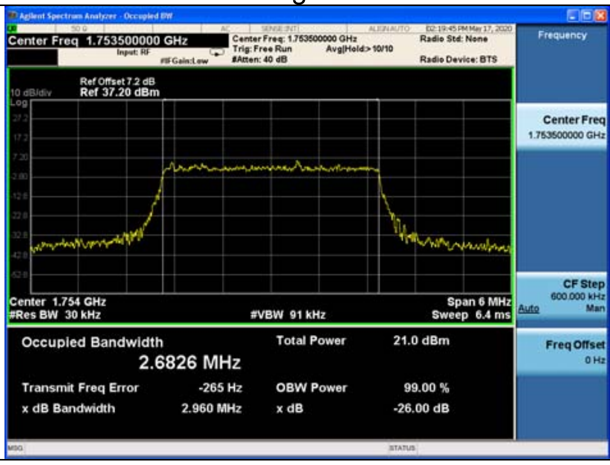

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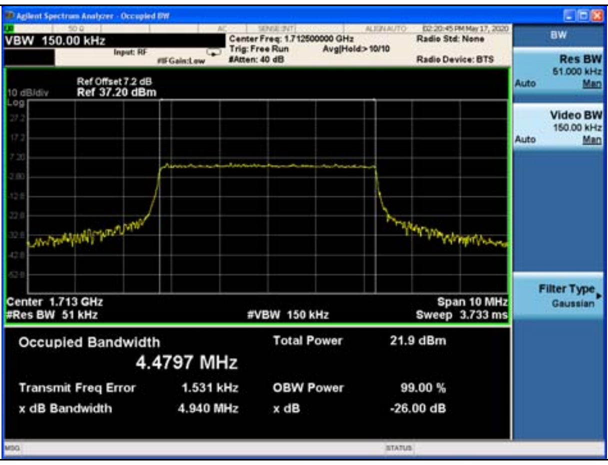

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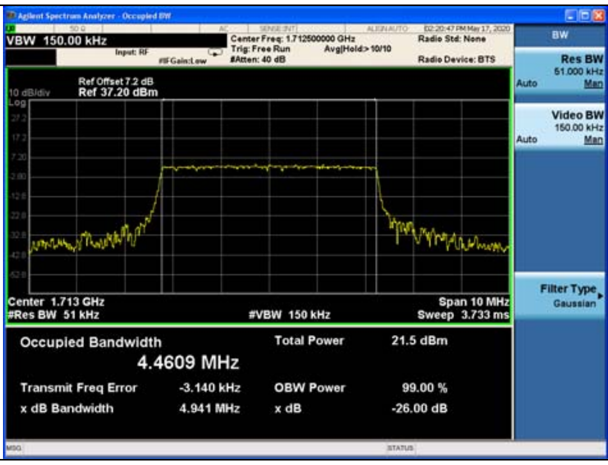

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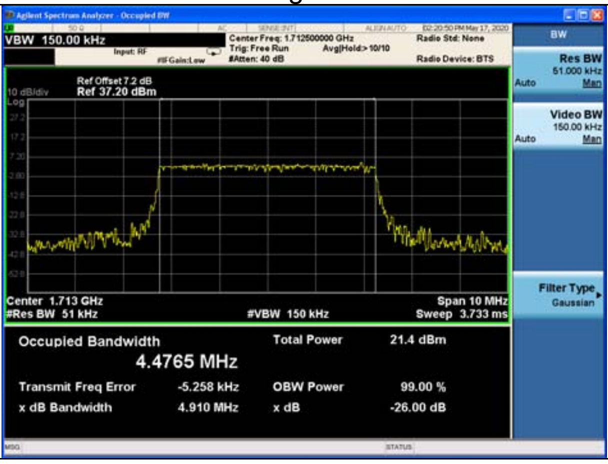

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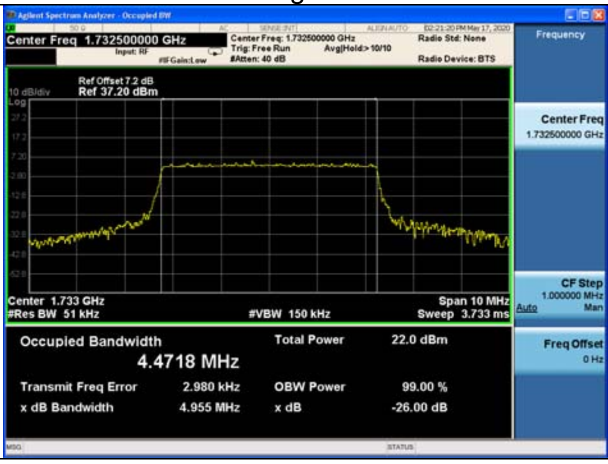

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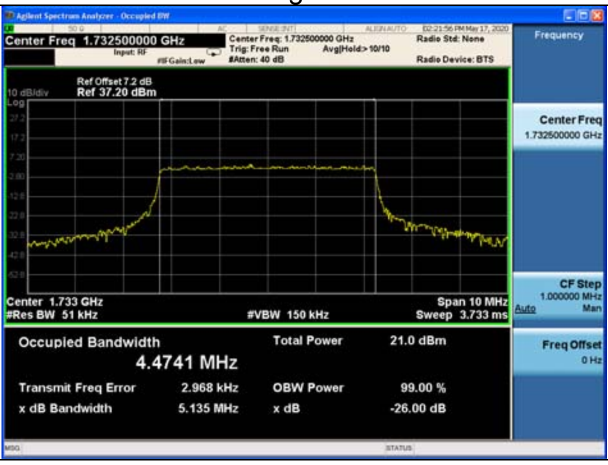

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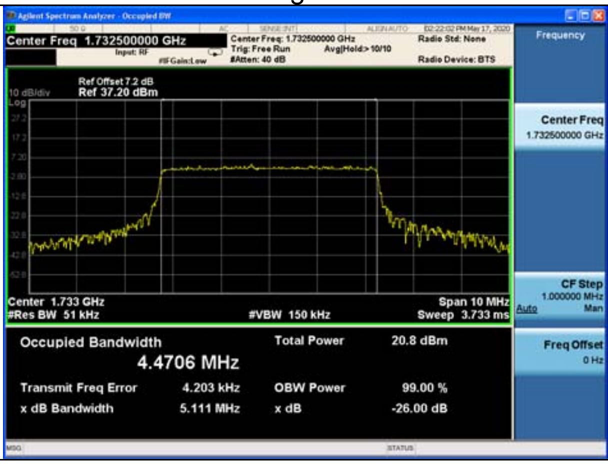

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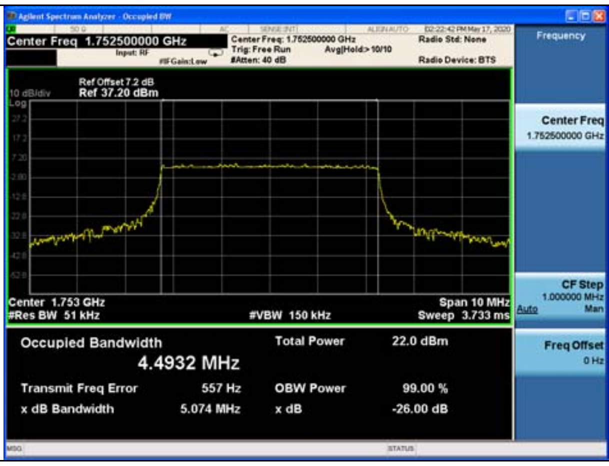

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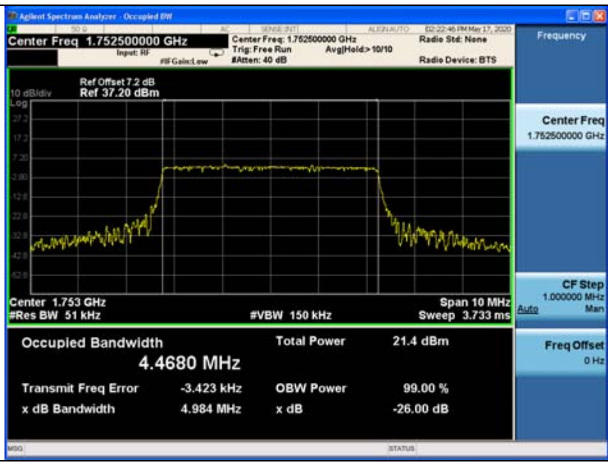

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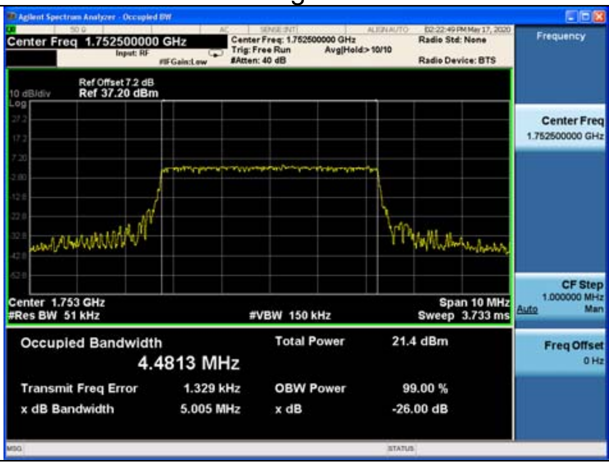

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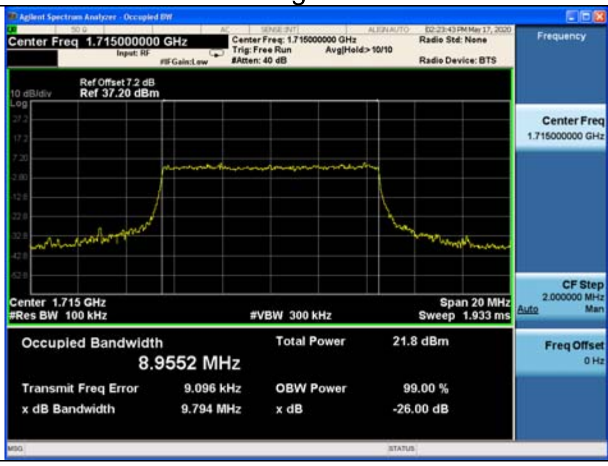

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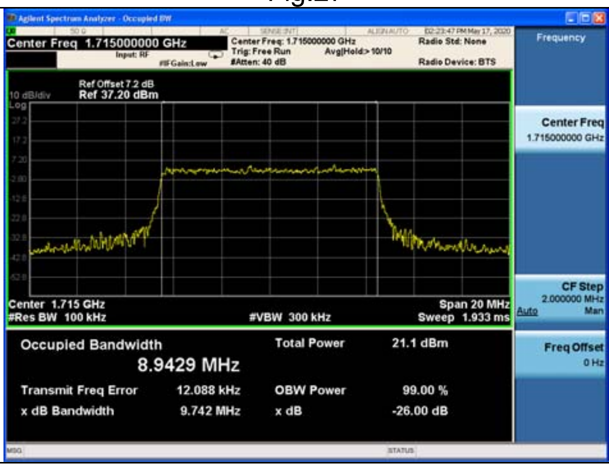

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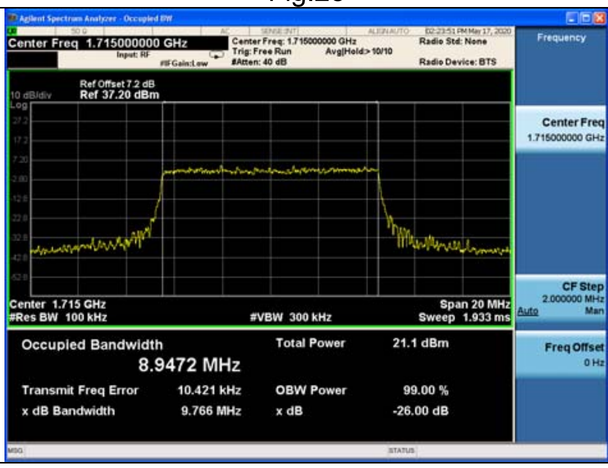

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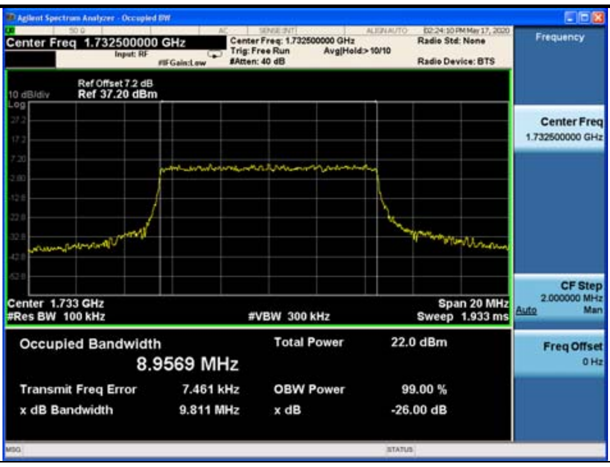

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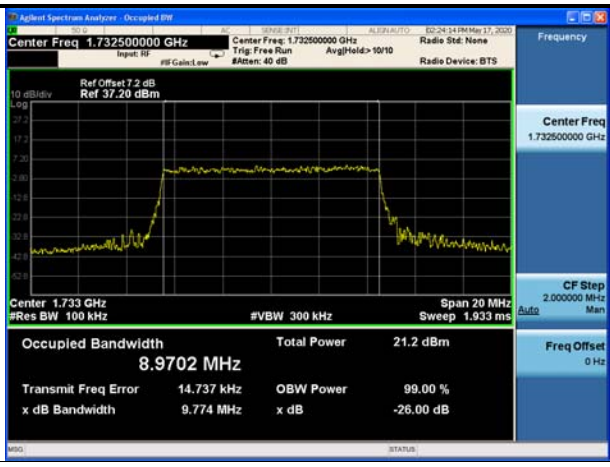

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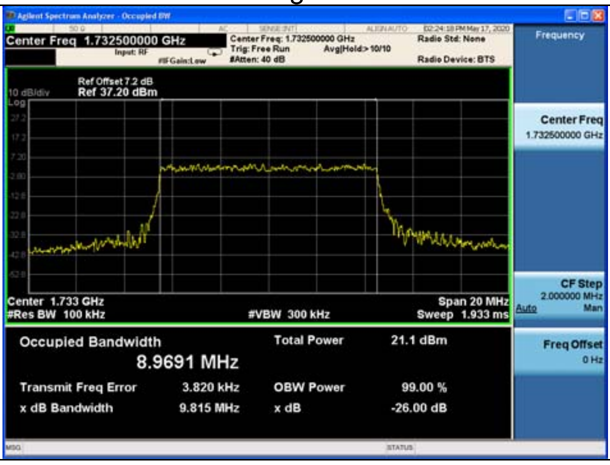
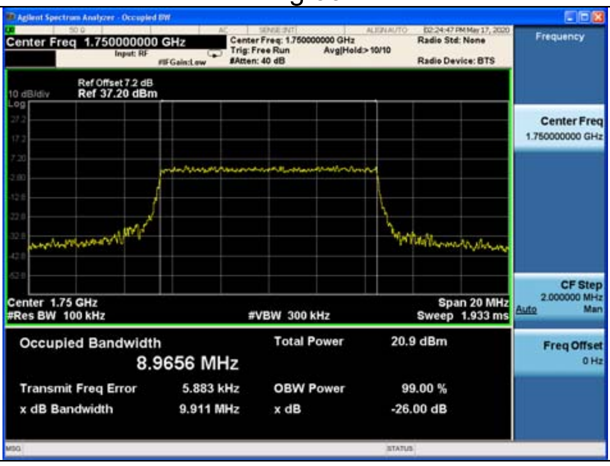


Fig.33

Fig.34



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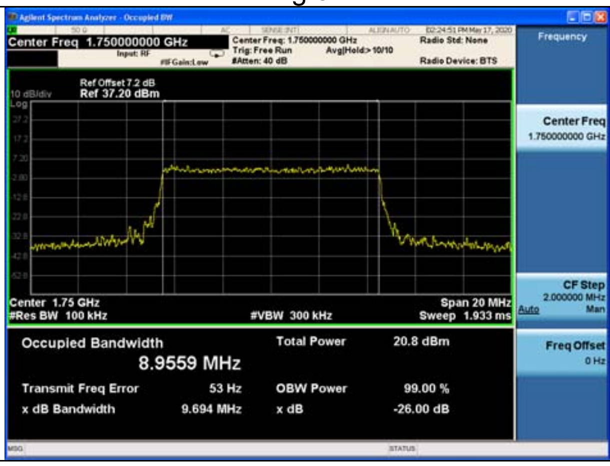

Fig.36