



TEST REPORT

APPLICANT : Great Talent Technology Limited

PRODUCT NAME : Mobile Hotspot

MODEL NAME : RA312

BRAND NAME : N/A

FCC ID : 2ALZM-RA312

STANDARD(S) : 47 CFR Part 2
: 47 CFR Part 27

RECEIPT DATE : 2022-10-09

TEST DATE : 2022-10-26 to 2022-11-06

ISSUE DATE : 2022-12-12

Edited by: Li Huaijie
Li Huaijie (Rapporteur)

Approved by: Shen Junsheng
Shen Junsheng (Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2022-12-12	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Great Talent Technology Limited
Applicant Address:	35F, HBC HuiLong Center Building-II Minzhi Street Longhua, Shenzhen, P.R. China
Manufacturer:	Great Talent Technology Limited
Manufacturer Address:	35F, HBC HuiLong Center Building-II Minzhi Street Longhua, Shenzhen, P.R. China



1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Hotspot	
Hardware Version:	SUB_V1.0_0530	
Software Version:	L13_v1.0.8_RLK	
IMEI:	352328320002430	
Modulation Type:	QPSK, 16QAM,64QAM	
Operation Band:	Uplink: 7C; 41C	
Frequency Range:	LTE Band 7	Tx: 2500MHz–2570MHz
		Rx: 2620MHz–2690MHz
	LTE Band 41	Tx: 2496 MHz– 2690 MHz
		Rx: 2496 MHz– 2690 MHz
Channel Bandwidth:	LTE Band 7	5MHz, 10MHz, 15MHz, 20MHz
	LTE Band 41	5MHz, 10MHz, 15MHz, 20MHz
Antenna Type:	PIFA Antenna	
Antenna Gain:	LTE Band 7	1.77dBi
	LTE Band 41	2.67dBi
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	BTE-3401
	Serial No.:	N/A
	Capacity:	3400mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	Phenix New Energy (Hui Zhou) Co., Ltd.
	AC Adapter	
	Brand Name:	N/A
	Model No.:	TPA-5950100UU
	Serial No.:	N/A
	Rated Output:	5V=1A
	Rated Input:	100-240V~50/60Hz, 0.2A
	Manufacturer:	Shenzhen kingfulin Technology Co.,Ltd

Note1: For a more detailed description, please refer to Specification or User’s Manual supplied by the applicant and/or manufacturer.



1.3. Maximum ERP/EIRP and Emission Designator

Channel bandwidth	Maximum ERP/EIRP (W)		
LTE CA_7C	QPSK	16QAM	64QAM
20+20	0.129	0.114	0.111
LTE CA_41C	QPSK	16QAM	64QAM
20+20	0.161	0.145	0.142

Channel bandwidth	Emission Designator (99%OBW)		
LTE 7C	QPSK	16QAM	64QAM
10+20	27M6G7D	27M6G7D	27M6G7D
15+10	23M1G7D	23M1G7D	23M1G7D
15+15	28M2G7D	28M2G7D	28M2G7D
15+20	32M5G7D	32M6G7D	32M5G7D
20+10	27M7G7D	27M7G7D	27M7G7D
20+15	32M6G7D	32M6G7D	32M8G7D
20+20	37M4G7D	37M4G7D	37M4G7D
LTE CA_41C	QPSK	16QAM	64QAM
5+20	22M8G7D	22M8G7D	22M8G7D
10+15	23M1G7D	23M1W7D	23M1D7W
10+20	27M7G7D	27M8W7D	27M6D7W
15+10	23M1G7D	23M1W7D	23M1D7W
15+15	28M3G7D	28M3W7D	28M3D7W
15+20	32M6G7D	32M6W7D	32M6D7W
20+5	22M8G7D	22M9W7D	22M9D7W
20+10	27M8G7D	27M7W7D	27M7D7W
20+15	32M5G7D	32M6W7D	32M6D7W
20+20	37M5G7D	37M3W7D	37M5D7W



1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 27	Miscellaneous Wireless Communications Services



Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
2.1046, 27.50(h)(2)	Transmitter Conducted Output Power and ERP/EIRP	Nov. 06,2022	Shen Biaohong Li Huaijie	PASS	No deviation
2.1049	Occupied Bandwidth	Oct 27, 2022 to Oct 28, 2022	Li Huaijie	PASS	No deviation
2.1051, 27.53(m)(4)	Conducted Spurious Emissions	Oct 27, 2022 to Oct 28, 2022	Li Huaijie	PASS	No deviation
2.1051, 27.53(m)(4)	Band Edge	Oct 26, 2022 to Oct 27, 2022	Li Huaijie	PASS	No deviation
2.1051, 27.53(m)(4)	Radiated Spurious Emissions	Nov. 06,2022	Gao jianrou	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipment. The ref offset 8dB contains two parts that cable loss 5dB and Attenuator 3dB.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 2 and Part 27 Requirements

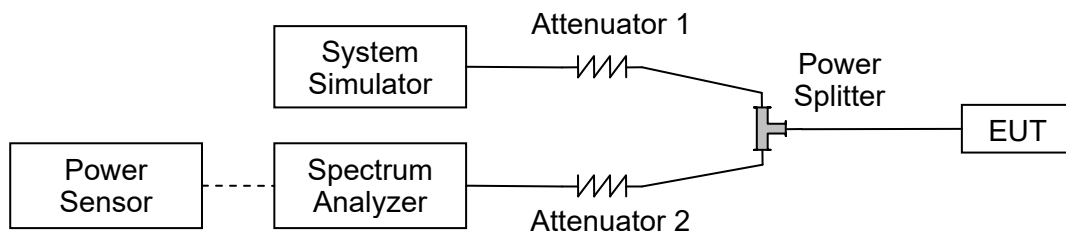
2.1. Transmitter Conducted Output Power And ERP/EIPR

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 27.50 (h)(2) for LTE Band7 and 41, Mobile and other user stations. Mobile stations are limited to 2 watts E.I.R.P. All user stations are limited to 2 watts transmitter output power.

2.1.1. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.1.2. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

$EIRP \text{ (dBm)} = \text{Conducted Output Power (dBm)} + \text{Antenna Gain (dBi)}$

$ERP \text{ (dBm)} = EIPR \text{ (dBm)} - 2.15$



2.1.3. Result

Conducted Output Power

LTE CA_7C								
Combination:20MHz+20MHz(100RB+100RB)								
PCC Channel (3GPP)	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)
			RB Size	RB Offset	RB Size	RB Offset		
20850	21048	QPSK	1	0	0	0	1	19.15
21001	21199	QPSK	1	0	0	0	1	19.32
21152	21350	QPSK	1	0	0	0	1	19.19

LTE CA_41C								
Combination:20MHz+20MHz(100RB+100RB)								
PCC Channel (3GPP)	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)
			RB Size	RB Offset	RB Size	RB Offset		
39750	39948	QPSK	1	0	0	0	1	19.20
40521	40719	QPSK	1	0	0	0	1	19.39
41292	41490	QPSK	1	0	0	0	1	19.15



Effective Radiated Power and Effective Isotropic Radiated Power

LTE CA_7C									
Combination:20MHz+20MHz(100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)	Measured EIRP(W)
			RB Size	RB Offset	RB Size	RB Offset			
20850	21048	QPSK	1	0	0	0	1	20.92	0.124
21001	21199	QPSK	1	0	0	0	1	21.09	0.129
21152	21350	QPSK	1	0	0	0	1	20.96	0.125
20850	21048	16QAM	1	0	0	0	1	20.52	0.113
21001	21199	16QAM	1	0	0	0	1	20.56	0.114
21152	21350	16QAM	1	0	0	0	1	20.40	0.110
20850	21048	64QAM	1	0	0	0	1	20.41	0.110
21001	21199	64QAM	1	0	0	0	1	20.47	0.111
21152	21350	64QAM	1	0	0	0	1	20.43	0.110
20850	21048	QPSK	50	0	0	0	1	20.46	0.111
21001	21199	QPSK	50	0	0	0	1	20.58	0.114
21152	21350	QPSK	50	0	0	0	1	20.49	0.112

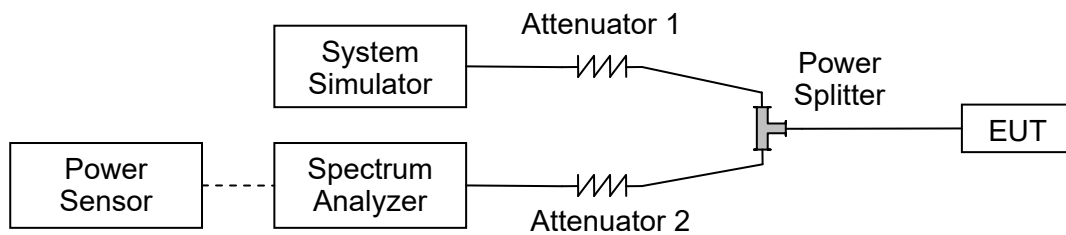
LTE CA_41C									
Combination:20MHz+20MHz(100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)	Measured EIRP(W)
			RB Size	RB Offset	RB Size	RB Offset			
39750	39948	QPSK	1	0	0	0	1	21.87	0.154
40521	40719	QPSK	1	0	0	0	1	22.06	0.161
41292	41490	QPSK	1	0	0	0	1	21.82	0.152
39750	39948	16QAM	1	0	0	0	1	21.36	0.137
40521	40719	16QAM	1	0	0	0	1	21.62	0.145
41292	41490	16QAM	1	0	0	0	1	21.41	0.138
39750	39948	64QAM	1	0	0	0	1	21.39	0.138
40521	40719	64QAM	1	0	0	0	1	21.52	0.142
41292	41490	64QAM	1	0	0	0	1	21.47	0.140
39750	39948	QPSK	50	0	0	0	1	21.33	0.136
40521	40719	QPSK	50	0	0	0	1	21.42	0.139
41292	41490	QPSK	50	0	0	0	1	21.37	0.137

2.2. Occupied Bandwidth

2.2.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.2.3. Test procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4. Test Result



LTE Band 7C				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
10M+20MHz	Low	QPSK	27.51	28.88
	Low	16QAM	27.61	28.75
	Low	64QAM	27.60	28.69
	Mid	QPSK	27.63	28.84
	Mid	16QAM	27.58	28.90
	Mid	64QAM	27.59	28.72
	High	QPSK	27.54	28.81
	High	16QAM	27.49	28.75
	High	64QAM	27.54	28.83
15M+10MHz	Low	QPSK	23.08	24.10
	Low	16QAM	23.08	24.06
	Low	64QAM	23.03	24.24
	Mid	QPSK	23.00	24.15
	Mid	16QAM	22.99	24.21
	Mid	64QAM	23.05	24.24
	High	QPSK	23.03	24.27
	High	16QAM	22.98	24.14
	High	64QAM	23.07	24.25
15M+15MHz	Low	QPSK	28.22	29.33
	Low	16QAM	28.15	29.39
	Low	64QAM	28.14	29.52
	Mid	QPSK	28.24	29.61
	Mid	16QAM	28.22	29.51
	Mid	64QAM	28.22	29.50
	High	QPSK	28.19	29.47
	High	16QAM	28.22	29.47
	High	64QAM	28.17	29.60
15M+20MHz	Low	QPSK	32.53	33.84
	Low	16QAM	32.63	38.57
	Low	64QAM	32.37	33.89
	Mid	QPSK	32.52	33.96
	Mid	16QAM	32.51	33.91
	Mid	64QAM	32.53	33.86
	High	QPSK	32.43	33.97
	High	16QAM	32.42	33.90
	High	64QAM	32.41	33.87



20M+10MHz	Low	QPSK	27.61	28.82
	Low	16QAM	27.66	29.00
	Low	64QAM	27.64	28.99
	Mid	QPSK	27.67	29.05
	Mid	16QAM	27.64	29.02
	Mid	64QAM	27.67	29.10
	High	QPSK	27.68	29.01
	High	16QAM	27.62	29.03
	High	64QAM	27.55	28.94
20M+15MHz	Low	QPSK	32.50	34.08
	Low	16QAM	32.45	33.98
	Low	64QAM	32.81	59.82
	Mid	QPSK	32.62	48.77
	Mid	16QAM	32.51	34.03
	Mid	64QAM	32.59	33.93
	High	QPSK	32.47	34.05
	High	16QAM	32.56	34.03
	High	64QAM	32.49	34.22
20M+20MHz	Low	QPSK	37.30	39.00
	Low	16QAM	37.38	39.04
	Low	64QAM	37.36	39.21
	Mid	QPSK	37.44	39.11
	Mid	16QAM	37.43	39.12
	Mid	64QAM	37.41	39.06
	High	QPSK	37.39	39.07
	High	16QAM	37.36	39.18
	High	64QAM	37.39	39.08



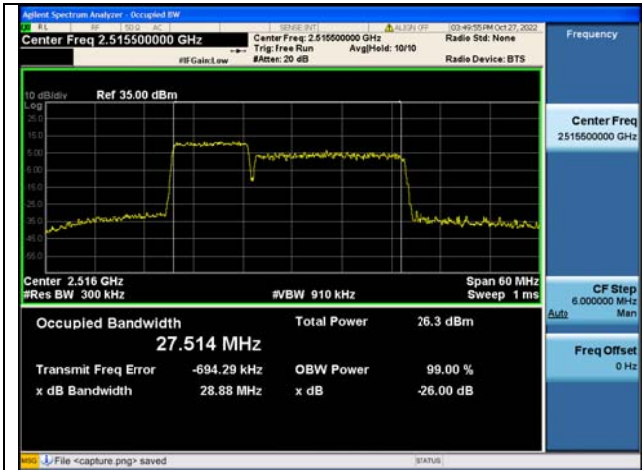
LTE CA 41C				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
5M+20MHz	Low	QPSK	22.70	23.60
	Low	16QAM	22.72	23.73
	Low	64QAM	22.80	23.60
	Mid	QPSK	22.75	23.59
	Mid	16QAM	22.78	23.68
	Mid	64QAM	22.81	23.64
	High	QPSK	22.72	23.56
	High	16QAM	22.76	23.66
	High	64QAM	22.70	23.60
10M+15MHz	Low	QPSK	23.04	24.10
	Low	16QAM	23.03	24.03
	Low	64QAM	22.95	24.08
	Mid	QPSK	23.13	24.17
	Mid	16QAM	23.05	24.08
	Mid	64QAM	23.05	24.01
	High	QPSK	23.06	23.99
	High	16QAM	23.04	24.03
	High	64QAM	23.09	24.06
10M+20MHz	Low	QPSK	27.59	28.69
	Low	16QAM	27.59	28.68
	Low	64QAM	27.59	28.75
	Mid	QPSK	27.65	28.67
	Mid	16QAM	27.75	28.68
	Mid	64QAM	27.61	28.79
	High	QPSK	27.50	28.65
	High	16QAM	27.63	28.75
	High	64QAM	27.62	28.73
15M+10MHz	Low	QPSK	23.07	24.13
	Low	16QAM	23.04	24.11
	Low	64QAM	23.03	24.26
	Mid	QPSK	23.08	24.25
	Mid	16QAM	23.00	24.12
	Mid	64QAM	23.07	24.20
	High	QPSK	23.07	24.27
	High	16QAM	23.06	24.21
	High	64QAM	23.09	24.21



15M+15MHz	Low	QPSK	28.16	29.44
	Low	16QAM	28.25	29.34
	Low	64QAM	28.11	29.38
	Mid	QPSK	28.19	29.31
	Mid	16QAM	28.26	29.57
	Mid	64QAM	28.24	29.44
	High	QPSK	28.31	29.24
	High	16QAM	28.28	29.54
	High	64QAM	28.31	29.51
15M+20MHz	Low	QPSK	32.50	33.92
	Low	16QAM	32.40	33.79
	Low	64QAM	32.50	33.89
	Mid	QPSK	32.55	33.95
	Mid	16QAM	32.58	33.85
	Mid	64QAM	32.61	33.86
	High	QPSK	32.50	33.77
	High	16QAM	32.54	33.98
	High	64QAM	32.49	33.85
20M+5MHz	Low	QPSK	22.76	23.78
	Low	16QAM	22.79	23.77
	Low	64QAM	22.80	23.70
	Mid	QPSK	22.81	23.83
	Mid	16QAM	22.82	23.85
	Mid	64QAM	22.77	23.93
	High	QPSK	22.80	23.86
	High	16QAM	22.88	23.96
	High	64QAM	22.94	24.18
20M+10MHz	Low	QPSK	27.59	28.93
	Low	16QAM	27.63	28.95
	Low	64QAM	27.64	28.96
	Mid	QPSK	27.69	28.93
	Mid	16QAM	27.72	29.07
	Mid	64QAM	27.68	28.88
	High	QPSK	27.76	28.93
	High	16QAM	27.64	29.01
	High	64QAM	27.73	29.01
	Low	QPSK	32.45	33.84
	Low	16QAM	32.44	33.86
	Low	64QAM	32.49	33.96



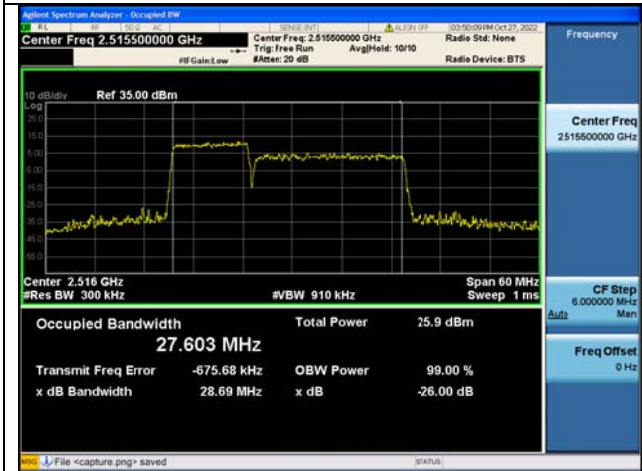
20M+15MHz	Mid	QPSK	32.54	34.06
	Mid	16QAM	32.57	34.16
	Mid	64QAM	32.62	33.94
	High	QPSK	32.48	34.09
	High	16QAM	32.51	33.91
	High	64QAM	32.56	34.15
20M+20MHz	Low	QPSK	37.40	38.90
	Low	16QAM	37.29	38.97
	Low	64QAM	37.36	38.83
	Mid	QPSK	37.45	39.04
	Mid	16QAM	37.29	39.07
	Mid	64QAM	37.46	39.14
	High	QPSK	37.38	38.99
	High	16QAM	37.29	38.73
High	64QAM	37.41	39.09	



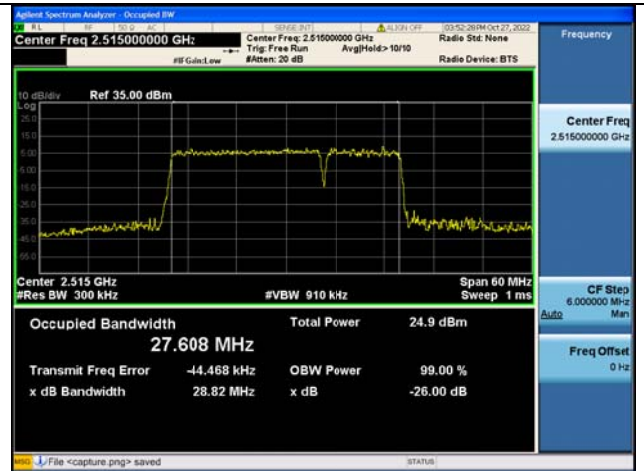
Band7C / 10MHz+20MHz / QPSK/ Low CH



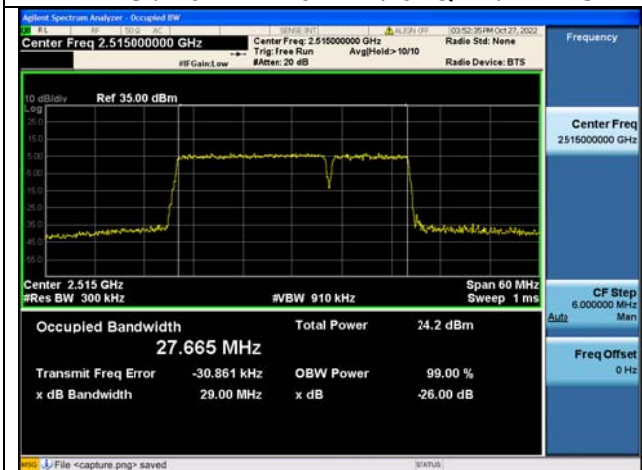
Band7C / 10MHz+20MHz / 16QAM/ Low CH



Band7C / 10MHz+20MHz / 64QAM/ Low CH



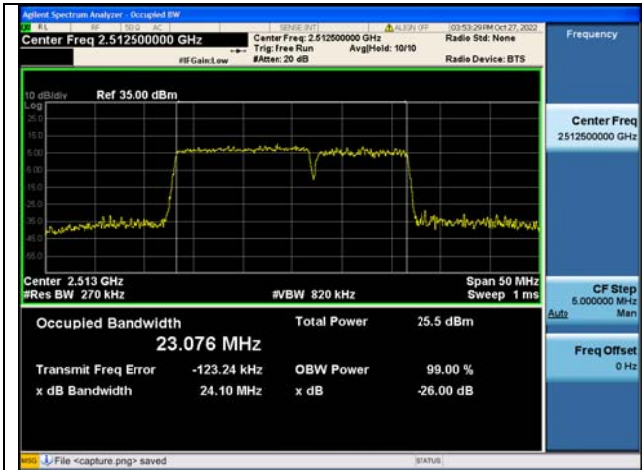
Band7C / 20MHz+10MHz / QPSK/ Low CH



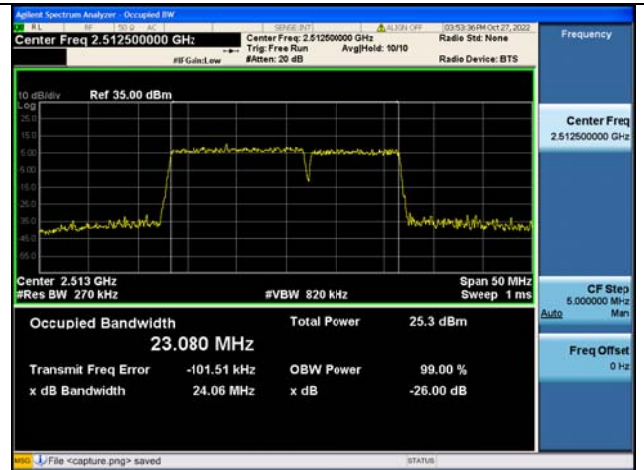
Band7C / 20MHz+10MHz / 16QAM/ Low CH



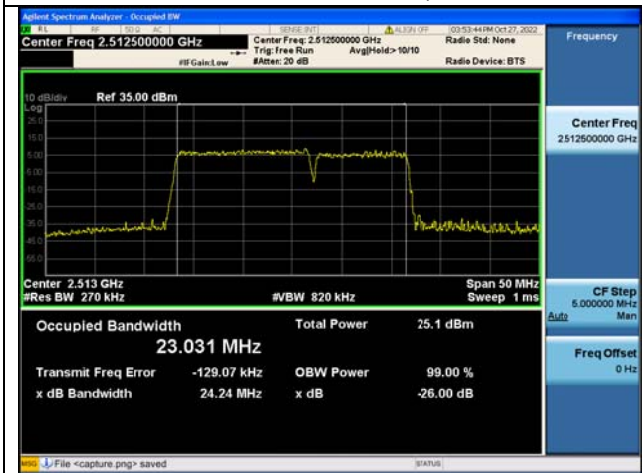
Band7C / 20MHz+10MHz / 64QAM/ Low CH



Band7C / 15MHz+10MHz / QPSK/ Low CH



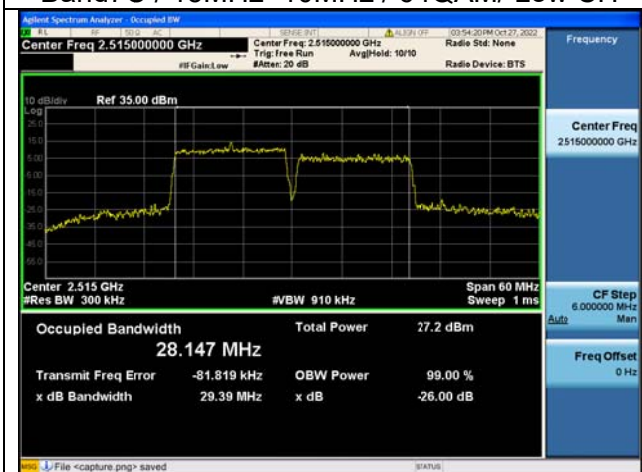
Band7C / 15MHz+10MHz / 16QAM/ Low CH



Band7C / 15MHz+10MHz / 64QAM/ Low CH



Band7C / 15MHz+15MHz / QPSK/ Low CH



Band7C / 15MHz+15MHz / 16QAM/ Low CH



Band7C / 15MHz+15MHz / 64QAM/ Low CH