



REPORT No.: SZ19050138W01

TEST REPORT

APPLICANT : Shenzhen Jimi IOT Co.,Ltd

PRODUCT NAME : ASSET GPS TRACKER

MODEL NAME : AT6

BRAND NAME : Jimi

FCC ID : 2AMLFAT6

STANDARD(S) : 47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E

RECEIPT DATE : 2019-05-14

TEST DATE : 2019-05-15 to 2019-06-11

ISSUE DATE : 2019-06-12

Edited by:

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DIRECTORY

1. Technical Information	4
1.1. Applicant and Manufacturer Information	4
1.2. Equipment Under Test (EUT) Description	4
1.3. Maximum ERP/EIRP and Emission Designator	6
1.4. Test Standards and Results	7
1.5. Environmental Conditions	8
2. 47 CFR Part 2, Part 22H , 24E Requirements	9
2.1. Conducted RF Output Power	9
2.2. Peak to Average Ratio	12
2.3. 99% Occupied Bandwidth	20
2.4. Frequency Stability	25
2.5. Conducted Out of Band Emissions	29
2.6. Band Edge	36
2.7. Transmitter Radiated Power (EIRP/ERP)	39
2.8. Radiated Out of Band Emissions	44
Annex A Test Uncertainty	65
Annex B Testing Laboratory Information	66



REPORT No.: SZ19050138W01

Change History		
Version	Date	Reason for change
1	2019-06-12	Initail Version

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1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Jimi IOT Co.,Ltd
Applicant Address:	Floor 4th, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, District 67, Bao'an, Shenzhen, China
Manufacturer:	Shenzhen Jimi IOT Co.,Ltd
ManufacturerAddress:	Floor 4th, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, District 67, Bao'an, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

Product Name:	ASSET GPS TRACKER	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	NFC112_V4.0	
Software Version:	GT370W_30_S1G15U8_D23_R0_V01_WM_20181115_1136	
Modulation Type:	GSM/GPRS Mode with GMSK Modulation EDGE Mode with 8PSK Modulation WCDMA Mode with QPSK Modulation HSDPA Mode with QPSK Modulation	
Operating Frequency Range:	GSM 850MHz: Tx: 824.20 - 848.80MHz Rx: 869.20 - 893.80MHz GSM 1900MHz: Tx: 1850.20 - 1909.80MHz Rx: 1930.20 - 1989.80MHz WCDMA Band V Tx: 826.4 - 846.6MHz Rx: 871.4 - 891.6MHz WCDMA Band II Tx: 1852.4 - 1907.6MHz Rx: 1932.4 - 1987.6MHz	
Antenna Type:	FPC Antenna	
Antenna Gain:	GSM 850: GSM1900:	-1.5dBi -1.5dBi



	WCDMA Band V:	-1.5dBi
	WCDMA Band II:	-1.5dBi
Accessory Information:	Battery	
	Brand Name:	Weishi
	Model No.:	PL805182
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	10000mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V
	AC Adapter	
	Brand Name:	Huajin
	Model No.:	HJ-050200N1-EU
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz 0.3A
	Rated Output:	5V= 2A

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; the lowest, middle, highest channel numbers (ARFCNs) used and tested in this report are separately 128 (824.2MHz), 190(836.6MHz) and 251 (848.8MHz).

Note 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula $F(n)=1850.2+0.2*(n-512)$, $512 \leq n \leq 810$; the lowest, middle and highest channel numbers (ARFCNs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).

Note 3: The transmitter (Tx) frequency arrangement of the WCDMA Band V used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; the lowest, middle and highest channel numbers (ARFCNs) used and tested in this report are separately 4132 (826.4MHz), 4182(836.4MHz) and 4233 (846.6MHz).

Note 4: The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula $F(n)=1852.4+0.2*(n-9262)$, $9262 \leq n \leq 9538$; the lowest, middle and highest channel numbers (ARFCNs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

Note 5: All modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:

GRPS mode and EDGE mode for GSM 850;
GRPS mode and EDGE mode for GSM 1900;
WCDMA mode for WCDMA band V;
WCDMA mode for WCDMA band II;



REPORT No.: SZ19050138W01

Note 6: 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

System	Maximum ERP/EIRP (W)	Emission Designator
GPRS850	0.723	249KGXW
EDGE850	0.182	248KG7W
GPRS1900	0.655	247KGXW
EDGE1900	0.279	240KG7W
WCDMA Band V	0.076	4M11F9W
WCDMA Band II	0.114	4M11F9W



1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2(10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22(10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24(10-1-12 Edition)	Personal Communications Services

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

No.	Section	Description	Test Date	Test Engineer	Result
1	2.1046	Conducted RF Output Power	May15, 2019	Gao Mingzhou	PASS
2	24.232(d)	Peak -Average Ratio	May22, 2019	Gao Mingzhou	PASS
3	2.1049	99% Occupied Bandwidth	May22, 2019	Gao Mingzhou	PASS
4	2.1055,22.355, 24.235	Frequency Stability	May23, 2019	Gao Mingzhou	PASS
5	2.1051,22.917(a),2 4.238(a)	Conducted Out of Band Emissions	May22, 2019	Gao Mingzhou	PASS
6	2.1051,22.917(a),2 4.238(a)	Band Edge	May22, 2019	Gao Mingzhou	PASS
7	22.913(a),24.232(a)	Transmitter Radiated Power (EIPR/ERP)	Jun11, 2019	Wu Zhongwen	PASS
8	2.1051,22.917(a),2 4.238(a)	Radiated Out of Band Emissions	Jun11, 2019	Wu Zhongwen	PASS

Note 1: The tests were performed according to the method of measurements prescribed in KDB 971168 D01 V03R01 (Oct 27, 2017) and ANSI C63.26 2015 section 5.2.5.5.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.



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, Part 22H , 24E Requirements

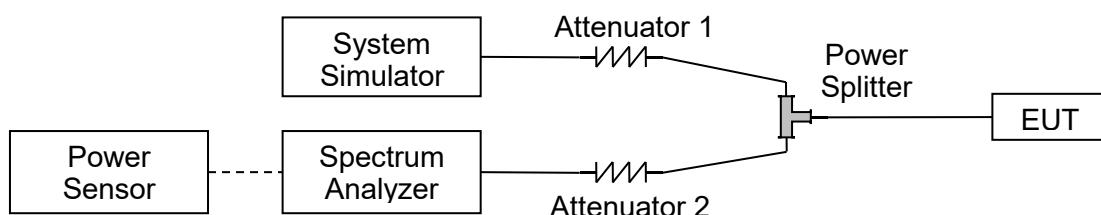
2.1. Conducted RF Output Power

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).

2.1.2. Test Description

Test Setup:



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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.



2.1.3. Test Results

GSM850		Average Power (dBm)	
TX Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GPRS 1 Tx slot	32.24	31.96	32.07
GPRS 2 Tx slots	29.84	30.01	30.18
GPRS 3 Tx slots	28.72	28.83	28.97
GPRS 4 Tx slots	26.62	26.67	26.88
EDGE 1 Tx slot	26.14	26.13	26.24
EDGE 2 Tx slots	25.84	25.85	25.94
EDGE 3 Tx slots	24.70	24.58	24.71
EDGE 4 Tx slots	21.94	21.99	22.13

GSM1900		Average Power (dBm)	
TX Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GPRS 1 Tx slot	29.66	29.45	29.59
GPRS 2 Tx slots	28.45	28.24	27.91
GPRS 3 Tx slots	26.84	26.59	26.25
GPRS 4 Tx slots	24.70	24.47	24.16
EDGE 1 Tx slot	25.96	25.93	25.68
EDGE 2 Tx slots	25.62	25.53	25.39
EDGE 3 Tx slots	23.97	23.95	23.65
EDGE 4 Tx slots	21.23	21.14	21.14



WCDMA Band V	Average Power (dBm)		
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2Kbps	22.32	22.46	22.24
HSDPA Subtest-1	21.78	21.54	21.57
HSDPA Subtest-2	21.62	21.46	21.41
HSDPA Subtest-3	21.57	21.44	21.41
HSDPA Subtest-4	21.48	21.36	21.32

WCDMA Band II	Average Power (dBm)		
TX Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2Kbps	22.07	21.95	21.96
HSDPA Subtest-1	21.76	21.79	21.91
HSDPA Subtest-2	21.76	21.68	21.87
HSDPA Subtest-3	21.81	21.84	21.73
HSDPA Subtest-4	21.75	21.80	21.66

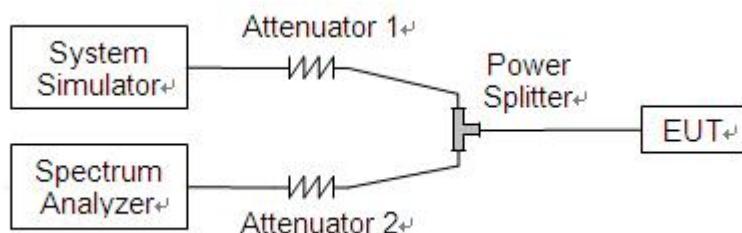
2.2. Peak to Average Ratio

2.2.1. Requirement

According to FCC 24.232(d) the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2. Test Description

Test Setup:



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 50 Ohm; 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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.2.3. Test procedure

- 1 .For GSM/EDGE operating mode:
 - a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
 - b. Set EUT in maximum output power, and triggered the burst signal.
 - c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.
2. For UMTS operating mode:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.



2.2.4. Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

Band	Channel	Frequency (MHz)	Peak to Average ratio	Limit dB	Verdict
GPRS850 MHz	128	824.2	0.046	13	PASS
	190	836.6	0.072		PASS
	251	848.8	0.092		PASS
GPRS 1900MHz	512	1850.2	0.069	13	PASS
	661	1880.0	0.029		PASS
	810	1909.8	0.033		PASS
EDGE850 MHz	128	824.2	1.167	13	PASS
	190	836.6	1.168		PASS
	251	848.8	1.366		PASS
EDGE 1900MHz	512	1850.2	0.022	13	PASS
	661	1880.0	0.272		PASS
	810	1909.8	0.012		PASS

Band	Channel	Frequency (MHz)	Peak to Average ratio	Limit dB	Verdict
WCDMA Band V	4132	826.4	3.39	13	PASS
	4182	836.4	3.32		PASS
	4233	846.6	3.34		PASS
WCDMA Band II	9262	1852.4	3.07	13	PASS
	9400	1880.0	3.40		PASS
	9538	1907.6	3.30		PASS



REPORT No.: SZ19050138W01

GPRS 850MHz CH128 824.2MHz



GPRS 850MHz CH190 836.6MHz



GPRS 850MHz CH251 848.8MHz

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GPRS 1900MHz CH512 1850.2MHz



GPRS 1900MHz CH661 1880.0MHz



GPRS 1900MHz CH810 1909.8MHz

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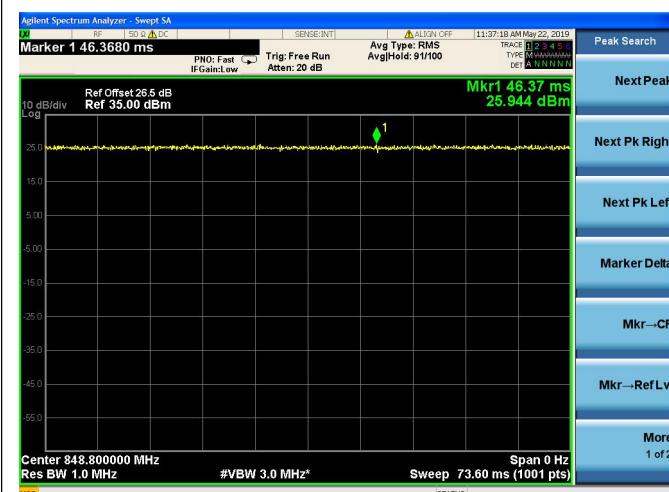
EDGE 850MHz CH128 824.2MHz



EDGE 850MHz CH190 836.6MHz



EDGE 850MHz CH251 848.8MHz

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EDGE 1900MHz CH512 1850.2MHz



EDGE 1900MHz CH661 1880.0MHz



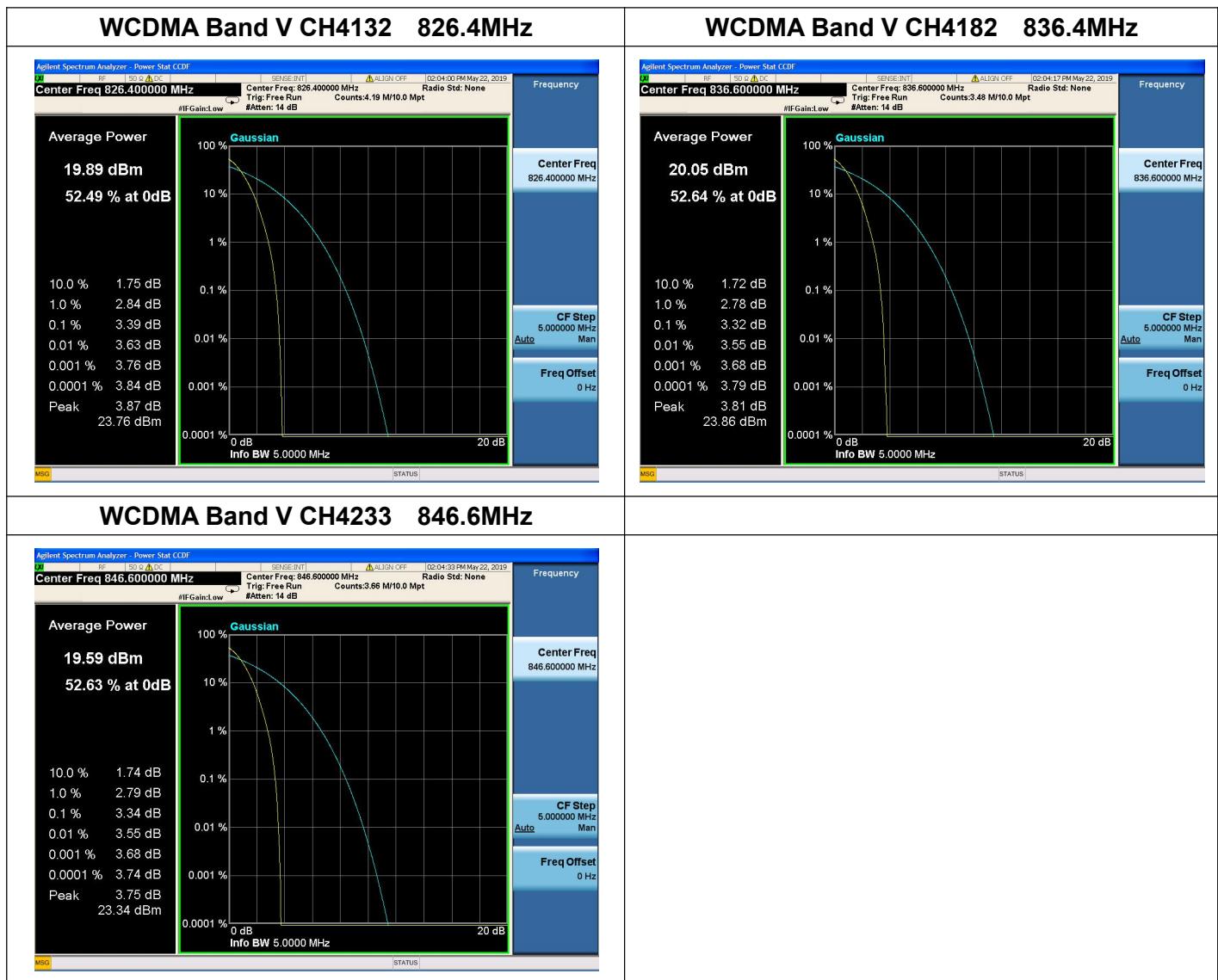
EDGE 1900MHz CH810 1909.8MHz



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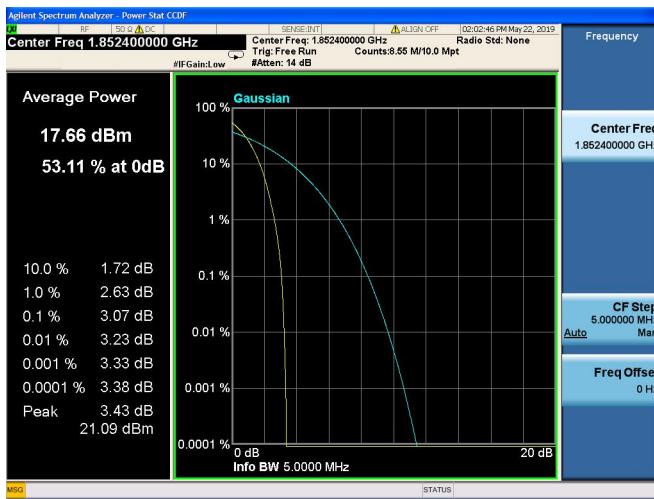
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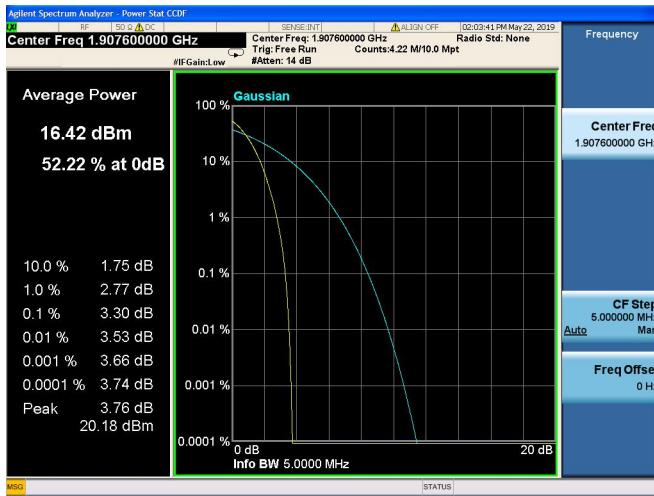
WCDMA Band II CH9262 1852.4MHz



WCDMA Band II CH9400 1880.0MHz



WCDMA Band II CH9538 1907.6MHz



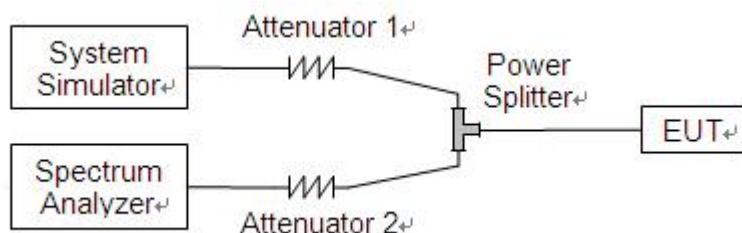
2.3.99% Occupied Bandwidth

2.3.1. 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.

2.3.2. Test Description

Test Setup:



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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.



2.3.3. Test Result

The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

GSM Test Verdict:

Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)
GPRS 850MHz	128	824.2	244.88	307.0
	190	836.6	248.97	316.1
	251	848.8	240.51	313.0
GPRS 1900MHz	512	1850.2	243.68	318.4
	661	1880.0	245.77	309.5
	810	1909.8	247.27	321.3
EDGE 850MHz	128	824.2	238.60	297.6
	190	836.6	238.98	306.7
	251	848.8	248.13	312.0
EDGE 1900MHz	512	1850.2	226.29	295.1
	661	1880.0	240.37	300.6
	810	1909.8	237.40	307.1

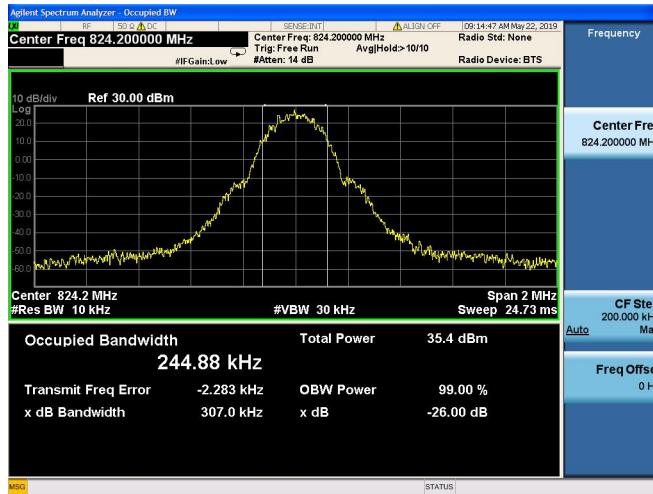
WCDMA Test Verdict:

Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA Band V	4132	826.4	4.091	4.650
	4182	836.4	4.089	4.660
	4233	846.6	4.106	4.642
WCDMA Band II	9262	1852.4	4.110	4.638
	9400	1880.0	4.101	4.655
	9538	1907.6	4.096	4.676

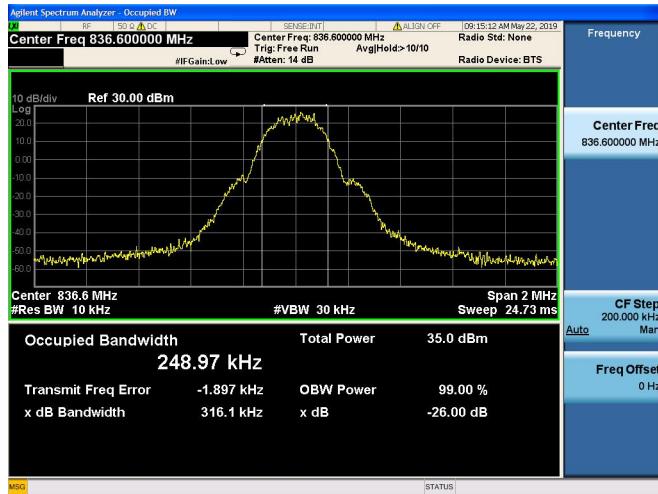


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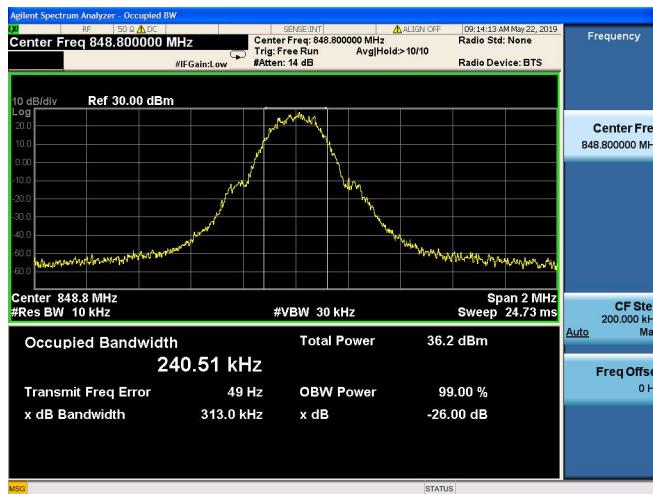
GPRS 850MHz CH128 824.2MHz



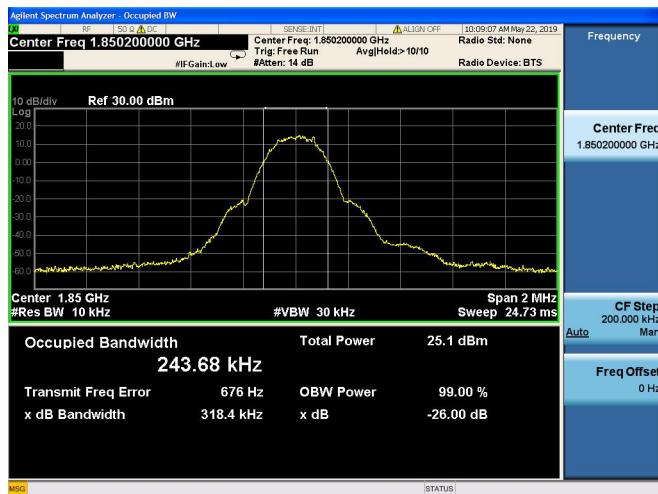
GPRS 850MHz CH190 836.6MHz



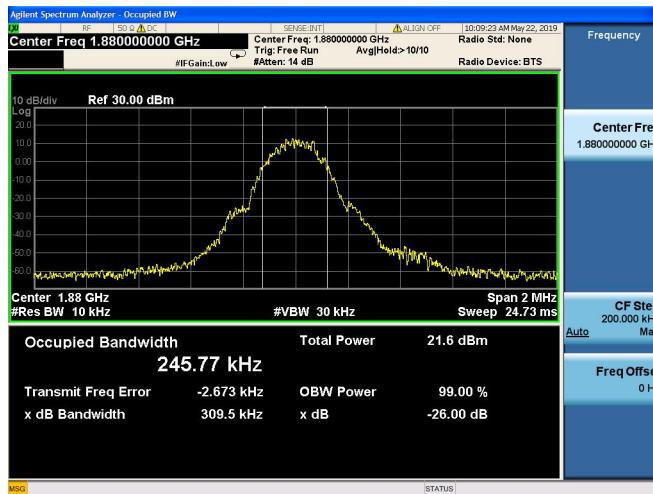
GPRS 850MHz CH251 848.8MHz



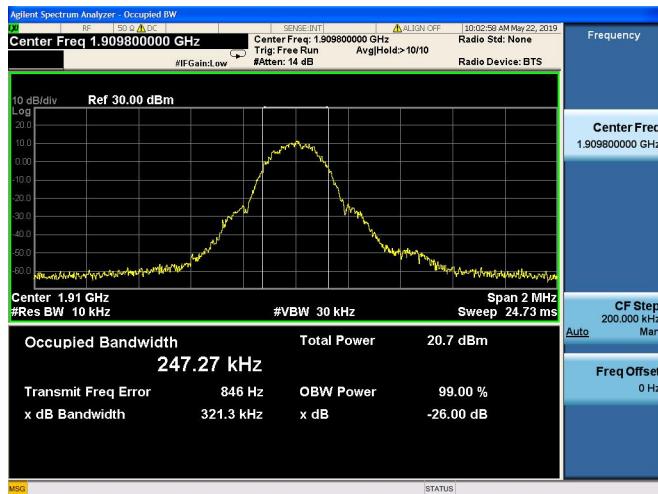
GPRS 1900MHz CH512 1850.2MHz



GPRS 1900MHz CH661 1880.0MHz



GPRS 1900MHz CH810 1909.8MHz

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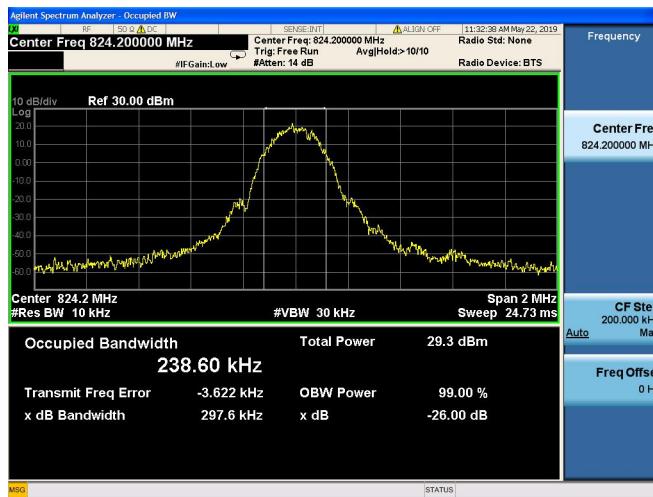
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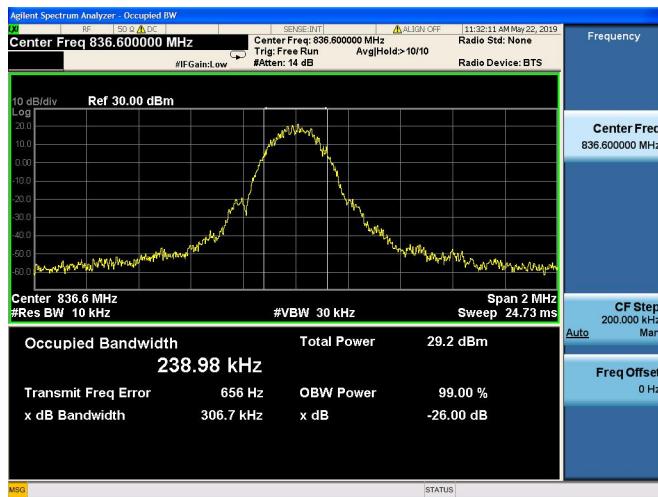


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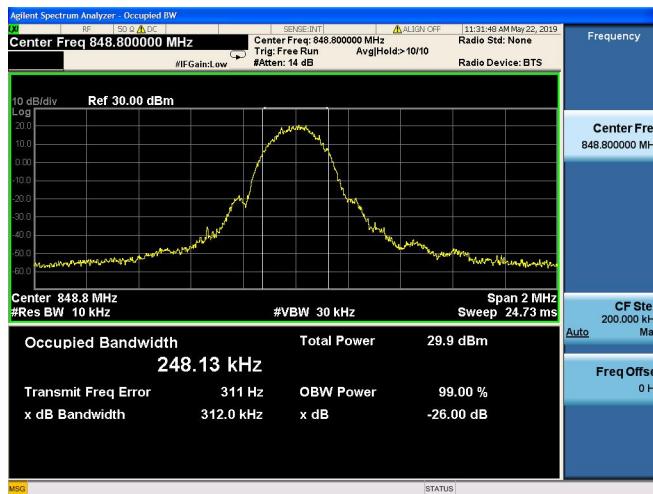
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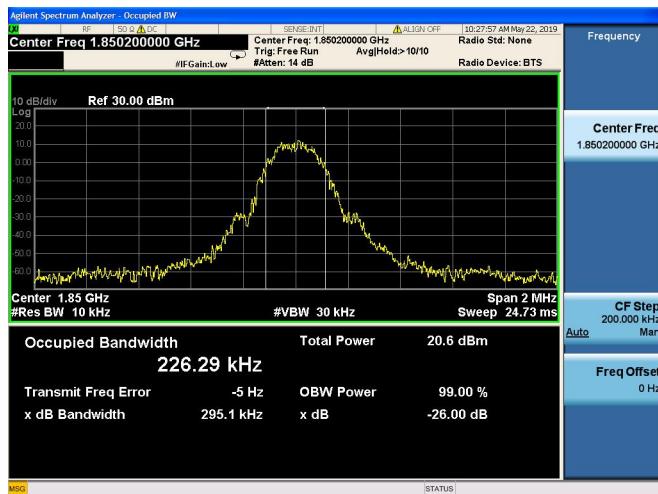
EDGE 850MHz CH190 836.6MHz



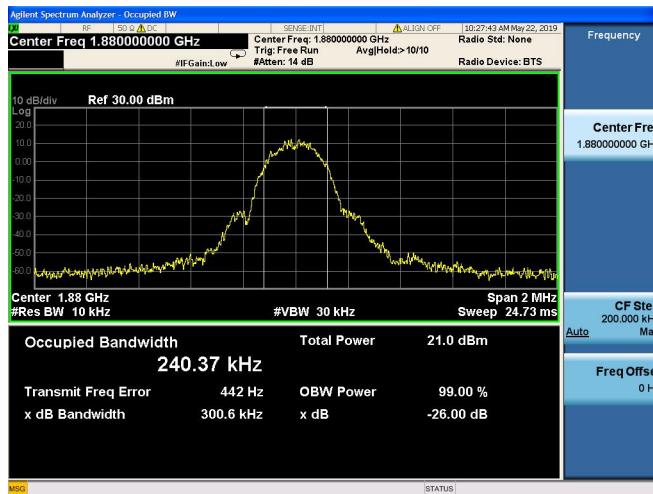
EDGE 850MHz CH251 848.8MHz



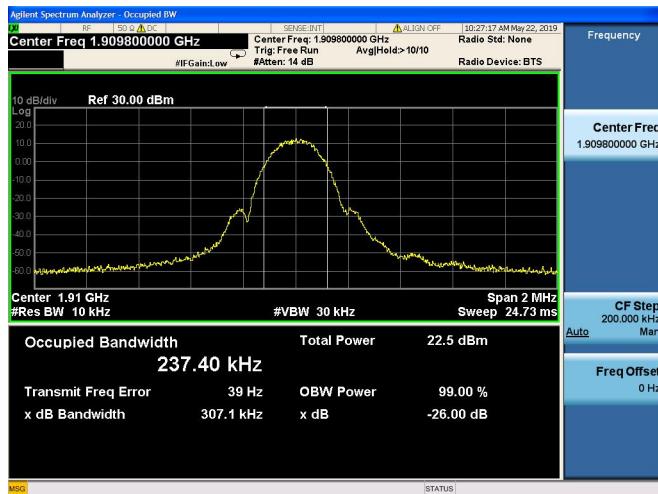
EDGE 1900MHz CH512 1850.2MHz



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