

FCC Part 22/24 Test Report

for

Tracker

Model No.: TR-151A

FCC ID: RID-TR151A

of

Applicant: Globalsat Technology Corporation

Address: 16F., No. 186, Jian Yi Road, Chung Ho City, Taipei Hsien,

Taiwan

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

A2LA Accredited No.: 2732.01

Report No.: W6M20804-9044-P-22/24



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24
FCC ID: RID-TR151A

Certification of Test Report

Applicant : Globalsat Technology Corporation
16F., No. 186, Jian Yi Road, Chung Ho City, Taipei Hsien,
Taiwan

Manufacturer : Globalsat Technology Corporation
10F., No. 16, Jian Ba Road, Chung Ho City, Taipei Hsien,
Taiwan

Tested Equipment :

Type Description	: Tracker
Model Number	: TR-151A
Series Number	: N/A
Brand Name	: N/A
Operation Frequency	: 824.2-848.8MHz / 1850.2 - 1909.8 MHz
RF Output Power	:
DC 3.8 V	1) 824.2 - 848.8 MHz : 27.93 dBm (ERP) 2) 1850.2 - 1909.8 MHz : 28.75 dBm (EIRP)
DC 4.2 V	1) 824.2 - 848.8 MHz : 27.93 dBm (ERP) 2) 1850.2 - 1909.8 MHz : 28.75 dBm (EIRP)
Power Supply	: Adaptor (I/P: AC 100-240 V / 50-60 Hz / 0.2 A, O/P: 5 Vdc / 1.2 A) Battery 3.8V

Regulation Applied : 47CFR Part 22 (2005-10) and Part 24 (2005-10)

Test Method : 47CFR Part 2 (2005), TIA/EIA-603B (2002) and ANSI C63.4(2003)

I HEREBY CERTIFY THAT: The test results written in this report were derived conscientiously in accordance with the requirements and procedures of 47CFR Part 2(2005) and TIA-603-B(2002), and it was found that the device described above is in compliance with the applicable limits specified in 47CFR Part 22 and Part 24.

Note:

1. The result of this test report is valid only in connection to the sample has been tested at the laboratory of Worldwide Testing Services (Taiwan) Co., Ltd.
2. This test report shall always be duplicated in full pages unless the written approval of the testing laboratory is obtained.

Test Engineer:

May 15, 2008

Jay Chaing

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

May 15, 2008

Steven Chuang

Date

WTS

Name

Signature



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1. Summary

1.1 Description of tested equipment

The equipment tested is a Tracker. The operation frequency bands and rated RF output power are listed as follows:

824.2-848.8 MHz (Cellular, Part 22), 0.62086903W (ERP)
1850.2-1909.8 MHz (Cellular, Part 24), 0.74989421 W (EIRP)

This test report only contains test requirements specified in 47CFR Part 22 and Part 24 for Tracker.

1.2 Date of testing processing

Test sample received: April 17, 2008

Test finished: May 15, 2008

Other Information: None

1.3 Modification Information

No modification was made during the all test items been performed.

1.4 Test standards

Technical standard: FCC Part 2 (2005), TIA-603-B (2002), ANSI C63.4 (2003)

Deviation from test standard: None



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1.5 Summary of test result

Band: 850MHz

Section in this Report	Test Item	Relevant Section	Verdict
3.2	RF power output	2.1046(a), 22.913(a)	Pass
4.2	Modulation characteristics	2.1047	Not Required
5.2	Occupied bandwidth	2.1049(h)	Pass
6.2	Spurious emissions at antenna terminals	22.917(a), 2.1051	Pass
7.2	Field strength of spurious radiation	22.917(a), 2.1053	Pass
8.2	Frequency stability	2.1055(a), 2.1055(d)	Pass

Band: 1900MHz

Section in this Report	Test Item	Relevant Section	Verdict
3.2	RF power output	2.1046(a), 24.232(b)	Pass
4.2	Modulation characteristics	2.1047	Not Required
5.2	Occupied bandwidth	2.1049(h)	Pass
6.2	Spurious emissions at antenna terminals	24.238(a), 2.1051	Pass
7.2	Field strength of spurious radiation	24.238(a), 2.1053	Pass
8.2	Frequency stability	2.1055(a), 2.1055(d)	Pass



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2. General Information

2.1 Testing laboratory

2.1.1 Location

OATS
No.5-1, Shuang Sing Village,
LiShuei Rd., Wanli Township,
Taipei County 207, Taiwan (R.O.C.)

Company
Worldwide Testing Services (Taiwan) Co., Ltd.
6F, NO. 58, LANE 188, RUEY-KUANG RD.
NEIHU, TAIPEI 114, TAIWAN R.O.C.
Tel : 886-2-66068877
Fax : 886-2-66068879

2.1.2 Details of accreditation status

Accredited testing laboratory
A2LA-registration number: 2732.01
FCC filed test laboratory Reg. No. 930600
Industry Canada filed test laboratory Reg. No. IC 5679A-1

2.2 Details of approval holder

Name: Globalsat Technology Corporation
Street: 16F., No. 186, Jian Yi Road,
Town: Chung Ho City, Taipei Hsien,
Country: 235, Taiwan
Telephone: ./.
Fax: ./.

Manufacturer: (if applicable)

Name: Globalsat Technology Corporation
Street: 10F., No. 16, Jian Ba Road,
Town: Chung Ho City, Taipei Hsien,
Country: 235, Taiwan



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2.3 Description of Tested System

The EUT was tested alone without the Accessories or Peripherals.

Equipment	Model No.	Series No.	Software	Cable information	Note

Frequency Range:

Band: 850MHz

Band: 1900MHz

Frequencies Selected to be investigated:

Band: 850MHz

Low Frequency (ch 128) : 824.2 MHz

Mid Frequency (ch 188) : 836.2 MHz

High Frequency (ch 251) : 848.8 MHz

Band: 1900MHz

Low Frequency (ch 512) : 1850.2 MHz

Mid Frequency (ch 661) : 1880.0 MHz

High Frequency (ch 810) : 1909.8 MHz

Antenna Type : Internal Antenna

Antenna Gain : -3.32 dBi

Power supply : Adaptor (I/P: AC 100-240 V / 50-60 Hz / 0.2 A,
O/P: 5 Vdc / 1.2 A)
Battery 3.8 V



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2.4 Test environment

Temperature:	27 °C
Relative humidity content:	54 %
Air pressure:	86-103 Kpa

2.5 General Test Requirement

Radiated Emission: For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100 kHz respectively with an appropriate sweep speed.

For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

- (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
- (3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.



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2.6 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2007/10/15	2008/10/14
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2007/10/15	2008/10/14
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2007/10/15	2008/10/14
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2008/5/10	2009/5/09
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2007/10/23	2009/10/22
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2007/8/2	2008/8/1
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2007/11/2	2009/11/1
ETSTW-CE 014	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T2-02	20241	FCC	2005/12/7	2008/12/6
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2006/11/7	2008/11/6
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2007/10/29	2008/10/28
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	2007/10/12	2009/10/11
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2007/12/3	2008/12/2
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2007/10/29	2008/10/28
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2007/10/11	2008/10/12
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2008/5/3	2010/5/2
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2007/11/7	2010/11/6
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2007/10/9	2008/10/8
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2007/6/29	2008/6/28
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2008/4/23	2010/4/22
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2008/4/23	2010/4/22
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2008/3/26	2010/3/25



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ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2007/10/9	2008/10/8
ETSTW-RE 033	WaveRunner 6000A Serie Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2007/7/9	2008/7/8
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2007/10/16	2009/10/15
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2007/1/11	2009/1/10
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2008/5/7	2010/5/6
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2006/5/29	2008/5/28
ETSTW-RE 047	ESA-E SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	2007/7/19	2008/7/18
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2005/3/22	2009/3/21
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2007/5/2	2009/5/1
ETSTW-RE 055	SPECTRUM ANALYZER	FSU-26	200074	R&S	2007/7/16	2008/7/15
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2007/7/2	2009/7/1
ETSTW-GSM 01	SIM Simulator	IT3	B2004-50106	COMPRION	2007/7/23	2008/7/22
ETSTW-GSM 02	Universal Radio Communication Tester	CMU 200	109439	R&S	2007/10/17	2008/10/16
ETSTW-GSM 03	Agilent 8960 Test Set 1	E5515C	GB44052675	Agilent	2006/6/26	2008/6/25
ETSTW-GSM 04	Agilent 8960 Test Set 2	E5515C	GB44052665	Agilent	2006/6/29	2008/6/28
ETSTW-GSM 05	Agilent 8960 Test Set 3	E5515C	GB44052652	Agilent	2006/7/11	2008/7/10
ETSTW-GSM 06	Agilent 8960 Test Set 4	E5515C	GB44052684	Agilent	2006/7/4	2008/6/3
ETSTW-GSM 07	Agilent 8960 Test Set 5	E5515C	GB44052658	Agilent	2006/7/12	2008/7/11
ETSTW-GSM 08	Agilent 8960 Test Set 6	E5515C	GB44052666	Agilent	2006/7/6	2008/7/5
ETSTW-GSM 09	Controller PC	Dell GX 270	700F61J	Dell	Function Test	
ETSTW-GSM 10	Anite Combiner	B4605/100	0053	Wessex / Anite	2006/9/22	2008/9/21
ETSTW-GSM 11	GSM 850,900,1800,1900 Test system	TS8950G	100039	R&S	2008/1/18	2010/1/17
ETSTW-GSM 12	Acoustical Calibrator	4231	2463874	Brüel&Kjær	2007/8/2	2008/8/1
ETSTW-GSM 13	Conditioning Amplifier	2690--0S2	2437856	Brüel&Kjær	2007/8/2	2008/8/1
ETSTW-GSM 14	Telephone Test Head	4602B	2465324	Brüel&Kjær	Function Test	
ETSTW-GSM 15	Mouth Simulator	4227	2462516	Brüel&Kjær	2007/8/2	2008/8/1
ETSTW-GSM 16	TEMP.&HUMIDITY CHAMBER	GTH-120-40-1P-U	MAA0501002	GIANT FORCE	2007/12/28	2008/12/27
ETSTW-GSM 17	ANTENNT COPLER	CMU-Z10	100988	R&S	Function Test	
ETSTW-GSM 18	AUDIO ANALYZER	UPL16	100173	R&S	2007/10/25	2008/10/24
ETSTW-GSM 23	SPLITTER	4901.19.A	None	SUHNER	Function Test	
ETSTW-GSM 24	Vibration Testing System	VS-100V	5494	Vibration	2007/12/11	2008/12/10
ETSTW-GSM 29	Microphone	4185	2463004	Brüel&Kjær	2007/8/2	2008/8/1
ETSTW-GSM 30	Ear Simulator	4195	2457416	Brüel&Kjær	2007/8/2	2008/8/1



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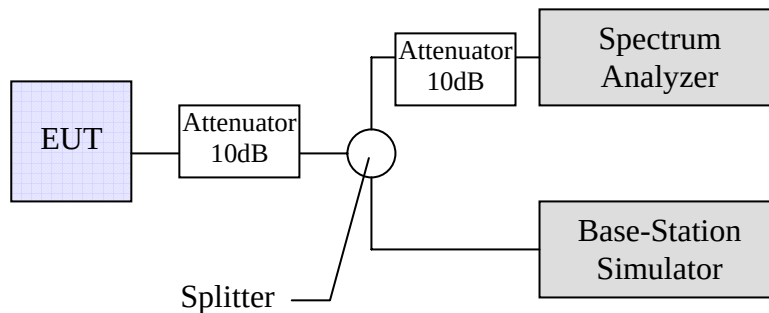
3. RF Power Output

3.1 Test procedure

3.1.1 Conducted Method

Per 47CFR Part 2.1046, the RF power output shall be measured at the RF output terminals and following procedure is employed:

The transmitter output was connected as the following figure:



The whole connection system is calibrated with a standard signal generator. Power on and make a link from simulator to EUT and then set the EUT to maximum output power.

Measure the RF power with the spectrum analyzer in accordance with the following settings:

RBW: 300 kHz for Frequency below 1GHz and 1MHz for Frequency equal to and above 1GHz.

VBW: 300 kHz for Frequency below 1GHz and 1MHz for Frequency equal to and above 1GHz.

Span: 2MHz

Sweep: 3s

The power output at the transmitter antenna terminal is then determined by assigning the value of the corrected factor to the spectrum analyzer reading.

Tests were performed at three frequencies (low, middle and high channels) and operation mode selected.

3.1.2 Radiated Method

If the conducted measurement is not practical due to the integral antenna, the radiated measurement will be performed in accordance with the following procedure:

The EUT was positioned on a non-conductive turntable, 0.8m above the ground on an open test site.



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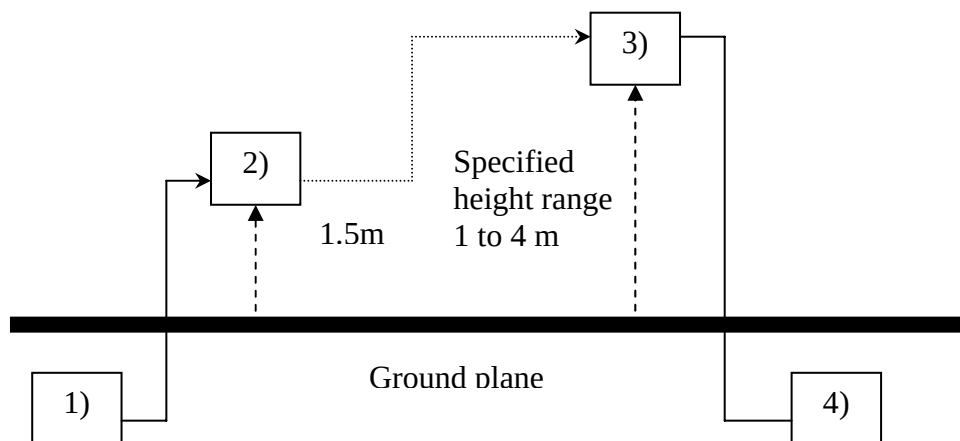
The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer.

Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna.

Substitution RF power Measurement at Worldwide Testing Services (Taiwan) Co., Ltd.
General :

The applied substitution method follows ANSI/TIA/EIA-603, ANSI/TIA/EIA-102.CAAA or the appropriate ETSI rules respectively.

The actual signal generated by the EUT can be determined by means of a substitution measurement in which a known signal source replaces the device to be measured.



- 1) Signal generator;
- 2) Substitution antenna;
- 3) Test antenna;
- 4) Spectrum analyzer or selective voltmeter.

The substitution antenna replaces the transmitter antenna at the same position and in vertical polarization. The frequency of the signal generator shall be adjusted to the measurement frequency.

The test antenna shall be raised or lowered, if necessary, to ensure that the maximum signal is still received. The input signal to the substitution antenna shall be adjusted in level until an equal or a known related level to that detected from the transmitter is obtained in the measurement receiver.

If a fully anechoic chamber is used as test site in order to provide free space conditions there is no need to change the height of the antenna.

The measurement will be repeated in horizontal position.

Calibration:



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In order to make this kind of measurement more effective and to avoid subjective measurement faults ETS has installed automatic computer controlled measurement procedures.

With the above described substitution method a test site is calibrated over the full frequency range which is used in suitable frequency steps. For a certain power level on the substitution antenna the received power over the whole frequency range is documented. All necessary antenna gains, cable losses, filter losses and amplifications of preamplifiers are taken in

consideration. The summary of this calibration measurement performs a transducer factor that is related to the considered test site and a certain measurement distance. Differences of the radiated power levels of different test samples are determined by internal attenuation of measurement receiver. The proper function of such test site will be maintained by short term plausibility checks and periodical re-calibration.

Testing:

The test sample will be putted on the table at the defined position and the radiated power will be receiver and documented by the measurement receiver.

On test sites with ground plane the measurement antenna will be lowered and raised to maximum values at significant frequencies.

For peak power measurements the sample is turned by the turntable over 360 degree in order to find the direction with the maximum radiation or to document the max reading with the MAXHOLD function during the rotation.

3.2 Test Results

- ☒ Conducted Measurement
- ☐ Radiated Measurement

DC 3.8 V

Frequency (MHz)	dBm
842.2	32.56
836.2	32.82
848.8	32.85
1850.2	29.19
1880.0	29.37
1909.8	29.69

DC 4.2 V

Frequency (MHz)	dBm
842.2	32.57
836.2	32.83
848.8	32.85
1850.2	29.20
1880.0	29.38
1909.8	29.70



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- ☐ Conducted Measurement
☒ Radiated Measurement

DC 3.8 V

Frequency (MHz)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Result
824.3246	22.12	24.27	38.45	Pass
836.6152	25.06	27.21	38.45	Pass
848.9760	27.93	30.08	38.45	Pass
1850.1800	26.60	28.75	33	Pass
1879.8200	25.07	27.22	33	Pass
1909.7390	21.97	24.12	33	Pass

DC 4.2 V

Frequency (MHz)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Result
824.1743	22.45	24.60	38.45	Pass
836.2465	25.01	27.16	38.45	Pass
848.9760	27.93	30.08	38.45	Pass
1850.2200	26.60	28.75	33	Pass
1880.0200	24.74	26.89	33	Pass
1909.9400	21.96	24.11	33	Pass

Test equipment: ETSTW-RE 003, ETSTW-RE 043, ETSTW-GSM 02

Note: Please refer to appendix for plot data.



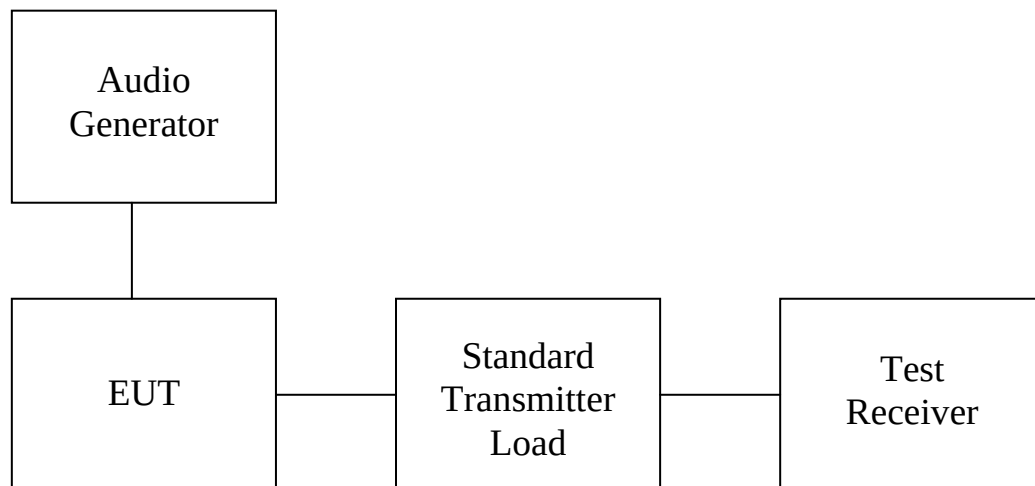
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4. Modulation Characteristics

4.1 Test procedure

- ☐ A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.
The audio signal generator is connected to the audio input of the EUT with its full rating. The modulation response is measured at certain modulation frequencies, related to 1000Hz reference signal. Tests are performed for positive and negative modulation.
- ☐ Equipment which employs modulation Limiting: A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The audio signal generator is connected to the audio input of the EUT with its full rating. The modulation limiting is measured at certain modulation frequencies from 100Hz to 15kHz.



4.2 Test Results

For digital modulation employed, this test item is not applicable.

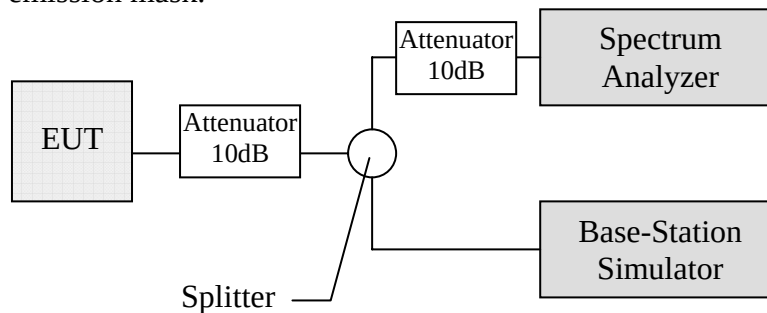
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5. Occupied Bandwidth

The occupied bandwidth, that 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. Near the carrier an Emission Mask is defined by the standard.

5.1 Test procedure

The RF output of the transceiver was connected as the following figure. Occupied Bandwidth was measured with a occupied bandwidth function of the analyzer at 99% power was occupied. Then set the spectrum analyzer to cover the upper and lower band edges to measure emission mask.



5.2 Test Results

Occupied Channel Bandwidth (kHz)	
Channel 128	258.51703407 kHz
Channel 188	256.51302605 kHz
Channel 251	256.51302605 kHz
Channel 512	256.51302605 kHz
Channel 661	258.51703407 kHz
Channel 810	254.50901804 kHz
-26dB Channel Bandwidth (kHz)	
Channel 128	342.68537074 kHz
Channel 188	338.67735471 kHz
Channel 251	342.68537074 kHz
Channel 512	340.68136273 kHz
Channel 661	338.67735471 kHz
Channel 810	338.67735471 kHz

Test equipment: ETSTW-RE 003, ETSTW-RE 043, ETSTW-GSM 02

Note: Please refer to appendix for plot data.



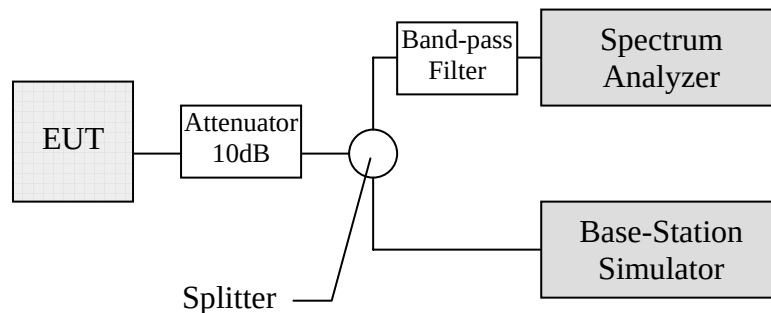
6. Spurious Emissions at Antenna Terminals

6.1 Test procedure

This transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer via a three-port splitter. Please refer to the following figure. Transmitter output was derived with the spectrum analyzer in dBm.

The Spurious Emissions at Antenna Terminals was measured by the spectrum analyzer with a suitable notch filter and/or Band-pass filter.

Tests were performed with an un-modulated carrier at three frequencies (low, middle and high channels) and on all power levels, which can be set-up on the transmitters.



6.2 Test Results

CH128

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
171.666666667	-35.94	-13	-22.94
901.282051282	-35.16	-13	-22.16
1649.038462	-19.90	-13	-6.90
2477.407692	-34.90	-13	-21.90
3296.800000	-37.52	-13	-24.52
4121.000000	-39.33	-13	-26.33
4945.200000	-39.11	-13	-26.11
5769.400000	-38.63	-13	-25.63
6593.600000	-38.67	-13	-25.67
8242.000000	-38.80	-13	-25.80
9066.200000	-36.67	-13	-23.67
9890.400000	-38.05	-13	-25.05
10714.600000	-37.73	-13	-24.73
13187.200000	-38.36	-13	-25.36
14011.400000	-38.05	-13	-25.05
14835.600000	-38.16	-13	-25.16
15659.800000	-37.86	-13	-24.86
18132.400000	-36.89	-13	-23.89
18956.600000	-36.61	-13	-23.61
19780.800000	-37.24	-13	-24.24
20605.000000	-37.40	-13	-24.40



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CH188

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
165.673076923	-36.51	-13	-23.51
796.153846154	-35.79	-13	-22.79
1673.076923	-19.72	-13	-6.72
2508.600000	-34.79	-13	-21.79
3344.800000	-36.11	-13	-23.11
4181.000000	-39.10	-13	-26.10
5.017200000	-38.65	-13	-25.65
5.853400000	-38.25	-13	-25.25
6.689600000	-38.49	-13	-25.49
8.362000000	-38.33	-13	-25.33
9.198200000	-37.96	-13	-24.96
10.034400000	-36.37	-13	-23.37
10.870600000	-38.00	-13	-25.00
13.379200000	-38.14	-13	-25.14
14.215400000	-37.77	-13	-24.77
15.051600000	-37.35	-13	-24.35
15.887800000	-37.41	-13	-24.41
18.396400000	-36.30	-13	-23.30
19232.600000	-36.29	-13	-23.29
20068.800000	-37.95	-13	-24.95
20905.000000	-36.98	-13	-23.98

CH251

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
196.730769231	-35.18	-13	-22.18
626.923076923	-35.37	-13	-22.37
1697.115385	-20.59	-13	-7.59
2546.400000	-35.60	-13	-22.60
3395.200000	-37.05	-13	-24.05
4244.000000	-37.94	-13	-24.94
5092.800000	-38.55	-13	-25.55
5941.600000	-38.81	-13	-25.81
6790.400000	-38.78	-13	-25.78
8488.000000	-38.82	-13	-25.82
9336.800000	-36.64	-13	-23.64
10185.600000	-38.20	-13	-25.20
11034.400000	-36.83	-13	-23.83
13580.800000	-37.81	-13	-24.81
14429.600000	-37.83	-13	-24.83
15278.400000	-36.64	-13	-23.64
16127.200000	-37.61	-13	-24.61
18673.600000	-36.64	-13	-23.64
19522.400000	-37.44	-13	-24.44
20371.200000	-36.66	-13	-23.66
21220.000000	-37.36	-13	-24.36



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Idle mode

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
150.144230769	-44.29	-13	-31.29
783.333333333	-43.84	-13	-30.84
3475.961538	-43.24	-13	-30.24
7403.846154	-45.37	-13	-32.37
12567.307692	-44.37	-13	-31.37
17671.875000	-43.51	-13	-30.51
25001.602564	-43.21	-13	-30.21

CH512

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
107.644230769	-34.87	-13	-21.87
955.128205128	-35.02	-13	-22.02
3700.400000	-38.12	-13	-25.12
5550.600000	-38.03	-13	-25.03
7400.800000	-38.55	-13	-25.55
9251.000000	-38.49	-13	-25.49
11101.200000	-37.39	-13	-24.39
12951.400000	-37.13	-13	-24.13
14801.600000	-37.26	-13	-24.26
16651.800000	-37.83	-13	-24.83
17789.663462	-36.21	-13	-23.21
18502.000000	-37.47	-13	-24.47
20352.200000	-36.89	-13	-23.89
22202.400000	-36.62	-13	-23.62
24052.600000	-36.91	-13	-23.91

CH661

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
171.666666667	-35.52	-13	-22.52
217.948717949	-35.88	-13	-22.88
3760.000000	-38.30	-13	-25.30
5640.000000	-39.38	-13	-26.38
7520.000000	-38.65	-13	-25.65
9400.000000	-38.10	-13	-25.10
11280.000000	-37.91	-13	-24.91
13160.000000	-38.61	-13	-25.61
15040.000000	-37.49	-13	-24.49
16920.000000	-38.10	-13	-25.10
18800.000000	-37.24	-13	-24.24
20680.000000	-36.34	-13	-23.34
22560.000000	-36.42	-13	-23.42
24810.897436	-34.15	-13	-21.15



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CH810

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
161.041666667	-36.35	-13	-23.35
887.179487179	-35.62	-13	-22.62
3819.600000	-38.53	-13	-25.53
5729.400000	-38.62	-13	-25.62
7639.200000	-38.21	-13	-25.21
9549.000000	-38.61	-13	-25.61
11458.800000	-37.30	-13	-24.30
13368.600000	-38.23	-13	-25.23
15278.400000	-37.66	-13	-24.66
17188.200000	-37.06	-13	-24.06
19098.000000	-37.59	-13	-24.59
21007.800000	-36.59	-13	-23.59
22917.600000	-36.93	-13	-23.93
24827.400000	-35.87	-13	-22.87

Idle mode

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
92.932692308	-35.15	-13	-22.15
874.358974359	-36.12	-13	-23.12
3158.653846	-35.90	-13	-22.90
5224.358974	-37.41	-13	-24.41
10930.689103	-36.71	-13	-23.71
17957.932692	-35.42	-13	-22.42
24987.980769	-35.00	-13	-22.00

Test equipment: ETSTW-RE 003, ETSTW-GSM 02, ETSTW-GSM 23

Note: Please refer to appendix for plot data.

6.3 Explanation of test result

All factors like cable loss and external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

6.4 Calculation of Limit for Spurious at Antenna Terminals

Compliance with § 22.917(a) requires that any emission be attenuated below the transmitter power at least $43 + 10 \log_{10} P$ (P = transmitter power in Watts).

The compliance limit was calculated as an example per the following:

Maximum transmitter output power: $P=0.74989421$ Watts

Required attenuation: $A=43 + 10 \log_{10} P$

Limit for Spurious Emissions at Antenna Terminals: $L=P-A=-13\text{dBm}$



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24
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7. Field Strength of Spurious Radiation

7.1 Test procedure

The test procedure for field strength measurement is same as radiated power except for a notch filter or band pass filter is used to avoid the influence of fundamental to the pre-amplifier.

The measurements below 1GHz were performed with a measurement bandwidth of 100kHz, above 1GHz with a bandwidth of 1 MHz.

7.2 Test Results

The measurements of the spurious emission at the upper, center and lower channel.

Active mode

3.8V

Model: TR-151A Date: 2008/4/30
Mode: 850 band (ch128) Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
298.918	-91.82	34.98	-56.84	-13.00	-43.84	105	150
500.601	-46.25	-7.90	-54.15	-13.00	-41.15	115	150
1649.299	-45.67	0.69	-44.98	-13.00	-31.98	85	150
2472.600	-56.12	4.59	-51.53	-13.00	-38.53	80	150
3296.800	-58.23	7.98	-50.25	-13.00	-37.25	85	150
4121.000	-56.94	7.65	-49.29	-13.00	-36.29	85	150
4945.200	-56.14	10.93	-45.21	-13.00	-32.21	80	150
5769.400	-57.41	14.34	-43.07	-13.00	-30.07	80	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.37	38.70	-52.67	-13.00	-39.67	100	150
499.198	-48.27	-6.53	-54.80	-13.00	-41.80	110	150
1649.30	-50.55	0.68	-49.87	-13.00	-36.87	255	150
2472.60	-55.91	5.05	-50.86	-13.00	-37.86	250	150
3296.80	-57.73	7.66	-50.07	-13.00	-37.07	250	150
4121.00	-57.28	7.35	-49.93	-13.00	-36.93	250	150
4945.20	-57.56	10.28	-47.28	-13.00	-34.28	255	150
5769.40	-57.68	10.49	-47.19	-13.00	-34.19	245	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24
FCC ID: RID-TR151A

Mode: 850 band (ch188) Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-90.86	35.20	-55.66	-13.00	-42.66	110	150
333.667	-51.65	-3.49	-55.14	-13.00	-42.14	110	150
1673.347	-43.45	1.17	-42.28	-13.00	-29.28	85	150
2508.600	-55.75	4.46	-51.29	-13.00	-38.29	80	150
3344.800	-57.22	7.78	-49.44	-13.00	-36.44	85	150
4181.000	-56.24	8.07	-48.17	-13.00	-35.17	80	150
5017.200	-57.93	10.60	-47.33	-13.00	-34.33	85	150
5853.400	-57.40	14.77	-42.63	-13.00	-29.63	85	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.79	38.70	-53.09	-13.00	-40.09	100	150
500.601	-46.23	-6.53	-52.76	-13.00	-39.76	115	150
1673.347	-47.15	1.45	-45.70	-13.00	-32.70	255	150
2508.600	-55.39	5.50	-49.89	-13.00	-36.89	250	150
3344.800	-55.82	7.79	-48.03	-13.00	-35.03	250	150
4181.000	-56.10	7.77	-48.33	-13.00	-35.33	250	150
5017.200	-57.55	9.93	-47.62	-13.00	-34.62	255	150
5853.400	-58.51	11.02	-47.49	-13.00	-34.49	250	150

Mode: 850 band (ch251) Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
299.459	-90.03	35.09	-54.94	-13.00	-41.94	105	150
499.198	-47.20	-7.92	-55.12	-13.00	-42.12	120	150
1697.395	-43.47	1.65	-41.82	-13.00	-28.82	85	150
2546.400	-55.57	4.72	-50.85	-13.00	-37.85	80	150
3395.200	-57.17	7.52	-49.65	-13.00	-36.65	80	150
4244.000	-58.05	8.42	-49.63	-13.00	-36.63	85	150
5092.800	-58.22	10.60	-47.62	-13.00	-34.62	85	150
5941.600	-58.14	14.39	-43.75	-13.00	-30.75	80	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

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Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-90.82	38.70	-52.12	-13.00	-39.12	110	150
499.198	-46.93	-6.53	-53.46	-13.00	-40.46	115	150
1697.395	-47.72	2.22	-45.50	-13.00	-32.50	250	150
2546.400	-55.67	5.04	-50.63	-13.00	-37.63	250	150
3395.200	-57.27	7.89	-49.38	-13.00	-36.38	255	150
4244.000	-57.46	7.77	-49.69	-13.00	-36.69	250	150
5092.800	-57.39	10.09	-47.30	-13.00	-34.30	255	150
5941.600	-57.18	11.38	-45.80	-13.00	-32.80	250	150

Mode: 1900band CH512 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.13	35.20	-55.93	-13.00	-42.93	110	150
677.355	-51.44	-2.23	-53.67	-13.00	-40.67	125	150
3705.411	-48.62	6.61	-42.01	-13.00	-29.01	85	150
5547.094	-39.75	12.92	-26.83	-13.00	-13.83	85	150
7406.814	-50.13	13.00	-37.13	-13.00	-24.13	80	150
9251.000	-58.98	14.89	-44.09	-13.00	-31.09	85	150
11101.200	-59.29	19.28	-39.99	-13.00	-26.99	80	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-92.02	38.70	-53.32	-13.00	-40.32	110	150
499.198	-44.63	-6.53	-51.16	-13.00	-38.16	120	150
3705.411	-44.35	6.67	-37.68	-13.00	-24.68	250	150
5547.094	-40.51	10.30	-30.21	-13.00	-17.21	250	150
7406.814	-50.14	13.29	-36.85	-13.00	-23.85	255	150
9251.000	-60.13	15.14	-44.99	-13.00	-31.99	255	150
11101.200	-60.36	19.78	-40.56	-13.00	-27.56	250	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Mode: 1900band CH661 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-90.18	35.20	-54.98	-13.00	-41.98	110	150
594.589	-51.40	-2.19	-53.59	-13.00	-40.59	115	150
3765.531	-50.35	6.73	-43.62	-13.00	-30.62	80	150
5643.287	-40.84	13.80	-27.04	-13.00	-14.04	85	150
7527.054	-50.29	12.92	-37.37	-13.00	-24.37	85	150
9400.000	-59.45	15.40	-44.05	-13.00	-31.05	85	150
11280.000	-59.94	19.38	-40.56	-13.00	-27.56	80	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.85	38.70	-53.15	-13.00	-40.15	110	150
500.601	-43.92	-6.53	-50.45	-13.00	-37.45	120	150
3759.519	-45.03	6.34	-38.69	-13.00	-25.69	250	150
5643.287	-42.03	10.17	-31.86	-13.00	-18.86	255	150
7527.054	-50.96	13.07	-37.89	-13.00	-24.89	250	150
9400.000	-59.57	15.90	-43.67	-13.00	-30.67	250	150
11280.000	-59.76	19.96	-39.80	-13.00	-26.8	245	150

Mode: 1900band CH810 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.59	35.20	-56.39	-13.00	-43.39	105	150
332.265	-49.14	-3.79	-52.93	-13.00	-39.93	115	150
3819.639	-47.48	6.84	-40.64	-13.00	-27.64	85	150
5731.463	-40.99	14.26	-26.73	-13.00	-13.73	80	150
7639.279	-50.73	12.82	-37.91	-13.00	-24.91	85	150
9549.000	-58.88	16.69	-42.19	-13.00	-29.19	85	150
11458.800	-61.15	19.77	-41.38	-13.00	-28.38	80	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.85	38.70	-53.15	-13.00	-40.15	100	150
499.198	-43.49	-6.53	-50.02	-13.00	-37.02	120	150
3819.639	-43.58	6.30	-37.28	-13.00	-24.28	250	150
5731.463	-42.28	10.22	-32.06	-13.00	-19.06	255	150
7639.279	-52.72	12.96	-39.76	-13.00	-26.76	250	150
9549.000	-59.86	16.99	-42.87	-13.00	-29.87	250	150
11458.800	-60.88	20.39	-40.49	-13.00	-27.49	250	150

4.2V

Mode: 850 band (ch128) Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
285.391	-90.23	32.28	-57.95	-13.00	-44.95	100	150
333.667	-52.46	-3.49	-55.95	-13.00	-42.95	115	150
1649.299	-46.42	0.69	-45.73	-13.00	-32.73	85	150
2472.600	-56.69	4.59	-52.10	-13.00	-39.10	80	150
3296.800	-58.45	7.98	-50.47	-13.00	-37.47	80	150
4121.000	-56.88	7.65	-49.23	-13.00	-36.23	85	150
4945.200	-56.49	10.93	-45.56	-13.00	-32.56	80	150
5769.400	-57.07	14.34	-42.73	-13.00	-29.73	80	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
298.918	-92.29	38.30	-53.99	-13.00	-40.99	105	150
500.601	-43.88	-6.53	-50.41	-13.00	-37.41	110	150
1649.299	-50.90	0.68	-50.22	-13.00	-37.22	250	150
2472.600	-54.47	5.05	-49.42	-13.00	-36.42	250	150
3296.800	-58.30	7.66	-50.64	-13.00	-37.64	255	150
4121.000	-56.30	7.35	-48.95	-13.00	-35.95	250	150
4945.200	-56.45	10.28	-46.17	-13.00	-33.17	245	150
5769.400	-57.40	10.49	-46.91	-13.00	-33.91	255	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Mode: 850 band (ch188) Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-90.68	35.20	-55.48	-13.00	-42.48	110	150
333.667	-50.80	-3.49	-54.29	-13.00	-41.29	120	150
1673.347	-44.29	1.17	-43.12	-13.00	-30.12	85	150
2508.600	-54.51	4.46	-50.05	-13.00	-37.05	80	150
3344.800	-56.67	7.78	-48.89	-13.00	-35.89	75	150
4181.000	-55.97	8.07	-47.90	-13.00	-34.90	250	150
5017.200	-57.48	10.60	-46.88	-13.00	-33.88	255	150
5853.400	-58.46	14.77	-43.69	-13.00	-30.69	250	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
299.459	-90.83	38.50	-52.33	-13.00	-39.33	100	150
497.796	-46.79	-6.52	-53.31	-13.00	-40.31	115	150
1673.347	-48.16	1.45	-46.71	-13.00	-33.71	255	150
2508.600	-55.42	5.50	-49.92	-13.00	-36.92	245	150
3344.800	-56.45	7.79	-48.66	-13.00	-35.66	250	150
4181.000	-56.13	7.77	-48.36	-13.00	-35.36	255	150
5017.200	-57.13	9.93	-47.20	-13.00	-34.20	255	150
5853.400	-57.78	11.02	-46.76	-13.00	-33.76	245	150

Mode: 850 band (ch251) Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-89.16	35.20	-53.96	-13.00	-40.96	110	150
332.265	-51.08	-3.79	-54.87	-13.00	-41.87	115	150
1697.395	-43.40	1.65	-41.75	-13.00	-28.75	85	150
2546.400	-55.78	4.72	-51.06	-13.00	-38.06	80	150
3395.200	-57.11	7.52	-49.59	-13.00	-36.59	85	150
4244.000	-57.09	8.42	-48.67	-13.00	-35.67	80	150
5092.800	-57.15	10.60	-46.55	-13.00	-33.55	80	150
5941.600	-58.44	14.39	-44.05	-13.00	-31.05	85	150



Worldwide Testing Services(Taiwan) Co., Ltd.

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FCC ID: RID-TR151A

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.37	38.70	-52.67	-13.00	-39.67	105	150
499.198	-46.75	-6.53	-53.28	-13.00	-40.28	120	150
1697.395	-48.40	2.22	-46.18	-13.00	-33.18	250	150
2546.400	-55.98	5.04	-50.94	-13.00	-37.94	245	150
3395.200	-56.52	7.89	-48.63	-13.00	-35.63	255	150
4244.000	-57.93	7.77	-50.16	-13.00	-37.16	250	150
5092.800	-57.85	10.09	-47.76	-13.00	-34.76	250	150
5941.600	-57.56	11.38	-46.18	-13.00	-33.18	255	150

Mode: 1900band CH512 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
268.076	-88.02	31.80	-56.22	-13.00	-43.22	105	150
835.872	-54.95	0.06	-54.89	-13.00	-41.89	120	150
3705.411	-49.13	6.61	-42.52	-13.00	-29.52	85	150
5547.094	-43.11	12.92	-30.19	-13.00	-17.19	80	150
7406.814	-52.16	13.00	-39.16	-13.00	-26.16	85	150
9251.000	-59.13	14.89	-44.24	-13.00	-31.24	85	150
11101.200	-59.98	19.28	-40.68	-13.00	-27.68	80	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.41	38.70	-52.71	-13.00	-39.71	100	150
500.601	-45.45	-6.53	-51.98	-13.00	-38.98	115	150
3705.411	-44.28	6.67	-37.61	-13.00	-24.61	250	150
5547.094	-42.12	10.30	-31.82	-13.00	-18.82	250	150
7406.814	-52.63	13.29	-39.34	-13.00	-26.34	255	150
9251.000	-60.01	15.14	-44.87	-13.00	-31.87	250	150
11101.200	-60.1	19.78	-40.30	-13.00	-27.3	255	150



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Mode: 1900band CH661 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.38	35.20	-56.18	-13.00	-43.18	100	150
500.601	-47.16	-7.90	-55.06	-13.00	-42.06	110	150
3765.531	-50.81	6.73	-44.08	-13.00	-31.08	80	150
5643.287	-41.58	13.80	-27.78	-13.00	-14.78	80	150
7527.054	-50.55	12.92	-37.63	-13.00	-24.63	85	150
9400.000	-58.85	15.40	-43.45	-13.00	-30.45	85	150
11280.000	-59.03	19.38	-39.65	-13.00	-26.65	85	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.51	38.70	-52.81	-13.00	-39.81	105	150
500.601	-43.92	-6.53	-50.45	-13.00	-37.45	120	150
3759.519	-45.29	6.34	-38.95	-13.00	-25.95	245	150
5643.287	-42.26	10.17	-32.09	-13.00	-19.09	250	150
7527.054	-51.08	13.07	-38.01	-13.00	-25.01	245	150
9400.000	-59.88	15.90	-43.98	-13.00	-30.98	250	150
11280.000	-60.37	19.96	-40.41	-13.00	-27.41	255	150

Mode: 1900band CH810 Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
299.459	-90.78	35.09	-55.69	-13.00	-42.69	105	150
333.667	-51.73	-3.49	-55.22	-13.00	-42.22	115	150
3819.639	-47.39	6.84	-40.55	-13.00	-27.55	85	150
5731.463	-40.59	14.26	-26.33	-13.00	-13.33	80	150
7639.279	-51.23	12.82	-38.41	-13.00	-25.41	80	150
9549.000	-60.54	16.69	-43.85	-13.00	-30.85	80	150
11458.800	-60.73	19.77	-40.96	-13.00	-27.96	85	150



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Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
300.000	-91.19	38.70	-52.49	-13.00	-39.49	100	150
499.198	-46.53	-6.53	-53.06	-13.00	-40.06	110	150
3819.639	-43.58	6.30	-37.28	-13.00	-24.28	255	150
5731.463	-42.73	10.22	-32.51	-13.00	-19.51	255	150
7639.279	-52.35	12.96	-39.39	-13.00	-26.39	250	150
9549.000	-60.07	16.99	-43.08	-13.00	-30.08	250	150
11458.800	-60.77	20.39	-40.38	-13.00	-27.38	250	150

Idle mode

3.8V

Model: TR-151A
Mode: 850band idle mode
Polarization: Horizontal

Date: 2008/4/30
Temperature: 26 °C
Humidity: 60 %
Engineer: Danny

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
96.012	20.08	peak	11.10	31.18	43.50	-12.32	105	150
200.441	21.24	peak	12.15	33.39	43.50	-10.11	110	150
716.633	13.92	peak	23.89	37.81	46.00	-8.19	120	150
913.026	13.85	peak	26.54	40.39	46.00	-5.61	120	150

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV) Peak Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave.	Limit @3m (dBuV/m) Peak Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
1535.070	53.88 ---	-11.66	42.22 ---	74.00 54.00	-31.78	120	150
7767.535	40.62 ---	2.70	43.32 ---	74.00 54.00	-30.68	130	150

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
96.012	22.65	peak	11.10	33.75	43.50	-9.75	100	150
200.441	25.42	peak	12.15	37.57	43.50	-5.93	110	150
716.633	12.76	peak	23.89	36.65	46.00	-9.35	120	150
913.026	10.89	peak	26.54	37.43	46.00	-8.57	115	150



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Mode: 850band idle mode Temperature: 26 °C Engineer: Danny

Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
3951.904	48.95	---	-4.49	44.46	---	74.00	54.00	-29.54	125	150
7519.038	40.22	---	2.70	42.92	---	74.00	54.00	-31.08	135	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
192.325	18.20	peak	12.62	30.82	43.50	-12.68	110	150
200.441	20.27	peak	12.15	32.42	43.50	-11.08	105	150
716.633	14.52	peak	23.89	38.41	46.00	-7.59	125	150
913.026	14.48	peak	26.54	41.02	46.00	-4.98	120	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny

Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1535.070	53.95	---	-11.66	42.29	---	74.00	54.00	-31.71	130	150
7503.006	41.08	---	2.70	43.78	---	74.00	54.00	-30.22	135	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny

Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
96.012	21.98	peak	11.10	33.08	43.50	-10.42	100	150
200.441	25.46	peak	12.15	37.61	43.50	-5.89	105	150
569.339	16.24	peak	21.29	37.53	46.00	-8.47	120	150
913.026	14.32	peak	26.54	40.86	46.00	-5.14	110	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny

Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1535.070	52.42	---	-11.66	40.76	---	74.00	54.00	-33.24	135	150
7583.166	39.90	---	2.70	42.60	---	74.00	54.00	-31.40	130	150



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4.2V

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
96.012	20.32	peak	11.10	31.42	43.50	-12.08	110	150
200.441	20.85	peak	12.15	33.00	43.50	-10.50	100	150
716.633	13.10	peak	23.89	36.99	46.00	-9.01	125	150
913.026	14.68	peak	26.54	41.22	46.00	-4.78	115	150

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1535.070	53.99	---	-11.66	42.33	---	74.00	54.00	-31.67	125	150
7695.391	40.16	---	2.70	42.86	---	74.00	54.00	-31.14	130	150

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.353	19.12	peak	15.15	34.27	43.50	-9.23	100	150
200.441	25.25	peak	12.15	37.40	43.50	-6.10	105	150
489.379	17.07	peak	19.69	36.76	46.00	-9.24	125	150
913.026	12.06	peak	26.54	38.60	46.00	-7.40	120	150

Mode: 850band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
2082.164	52.51	---	-8.30	44.21	---	74.00	54.00	-29.79	135	150
7478.958	39.53	---	2.65	42.18	---	74.00	54.00	-31.82	125	150



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
200.441	20.67	peak	12.15	32.82	43.50	-10.68	115	150
299.459	18.28	peak	15.23	33.51	46.00	-12.49	110	150
716.633	13.99	peak	23.89	37.88	46.00	-8.12	125	150
913.026	12.68	peak	26.54	39.22	46.00	-6.78	120	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1535.070	54.29	---	-11.66	42.63	---	74.00	54.00	-31.37	130	150
7527.054	40.05	---	2.70	42.75	---	74.00	54.00	-31.25	135	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.353	18.75	peak	15.15	33.90	43.50	-9.60	105	150
200.441	24.69	peak	12.15	36.84	43.50	-6.66	110	150
913.026	12.43	peak	26.54	38.97	46.00	-7.03	130	150
952.305	10.29	peak	27.25	37.54	46.00	-8.46	120	150

Mode: 1900band idle mode Temperature: 26 °C Engineer: Danny
Polarization: Vertical Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
3945.892	48.87	---	-4.50	44.37	---	74.00	54.00	-29.63	140	150
7759.519	40.39	---	2.70	43.09	---	74.00	54.00	-30.91	145	150

Note: Please refer to appendix for plot data.

7.3 Explanation of test result

Result Level = Reading Level + Corrected Factor

Corrected Factor = SG level – Received level-Cable loss + substitution antenna gain



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7.4 Calculation of Limit for Field Strength of Spurious

Compliance with § 22.917(a) requires that any emission be attenuated below the transmitter power at least $43 + 10 \log_{10} P$ (P = transmitter power in Watts).

The compliance limit was calculated as an example per the following:

Maximum transmitter radiated power: $P=0.74989421$ watt

Required attenuation: $A=43 + 10 \log_{10} P$

Limit for Spurious Emissions at Antenna Terminals: $L=P-A=-13\text{dBm}$

Test equipment: ETSTW-RE 003, ETSTW-RE 017, ETSTW-RE 042, ETSTW-RE 043,
ETSTW-RE 044, ETSTW-GSM 02



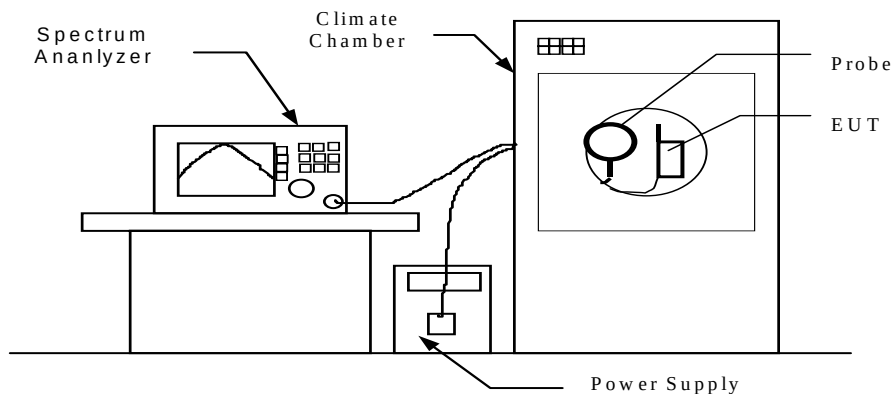
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8. Frequency Stability

8.1 Test procedure

- ☒ The equipment under test was supplied with rated power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable, exited the chamber through an opening made for that purpose.
After the temperature stabilized the frequency output was recorded from the counter.
- ☐ An external variable power supply was used to supply nominal voltage and 85% to 115% of nominal voltage to the EUT under room temperature. Record the frequencies measured from the counter.
- ☒ End point voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer. Then record the frequencies measured from the counter.





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8.2 Test Results

8.2.1 Frequency Stability vs. Temperature

CH128 824.2MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.3	1.58	±2.5
	-20	1.4	1.70	
	-10	1.4	1.70	
	0	1.5	1.82	
	10	1.5	1.82	
	20	1.5	1.82	
	30	1.6	1.94	
	40	1.7	2.06	
	50	1.7	2.06	

CH188 836.2MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.4	1.67	±2.5
	-20	1.4	1.67	
	-10	1.5	1.79	
	0	1.5	1.79	
	10	1.5	1.79	
	20	1.6	1.91	
	30	1.6	1.91	
	40	1.7	2.03	
	50	1.7	2.03	

CH251 848.8MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.2	1.41	±2.5
	-20	1.2	1.41	
	-10	1.3	1.53	
	0	1.3	1.53	
	10	1.3	1.53	
	20	1.4	1.65	
	30	1.4	1.65	
	40	1.5	1.77	
	50	1.6	1.89	



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Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.5	0.81	±2.5
	-20	1.5	0.81	
	-10	1.6	0.86	
	0	1.6	0.86	
	10	1.7	0.92	
	20	1.7	0.92	
	30	1.8	0.97	
	40	1.9	1.03	
	50	2	1.08	

CH661 1880MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.6	0.85	±2.5
	-20	1.7	0.90	
	-10	1.7	0.90	
	0	1.8	0.96	
	10	1.8	0.96	
	20	1.9	1.01	
	30	1.9	1.01	
	40	1.9	1.01	
	50	2	1.06	

CH810 1909.8MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
4.2 VDC	-30	1.4	0.73	±2.5
	-20	1.4	0.73	
	-10	1.5	0.79	
	0	1.6	0.84	
	10	1.7	0.89	
	20	1.7	0.89	
	30	1.8	0.94	
	40	1.8	0.94	
	50	1.9	0.99	



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8.2.2 Frequency Stability vs. Voltage

CH128

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	1.5	1.82	±2.5

CH188

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	1.7	2.03	±2.5

CH251

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	1.6	1.89	±2.5

CH512

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	1.8	0.97	±2.5

CH661

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	2	1.06	±2.5



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CH810

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage 3.8VDC	25	1.9	0.99	±2.5

Test equipment: ETSTW-CE009, ETSTW-RE 003, ETSTW-RE055, ETSTW-GSM 02



Appendix

- A RF Power Output
- B Occupied Bandwidth / Emission Mask
- C Spurious Emissions at Antenna Terminals
- D Filed Strength of Spurious Emission



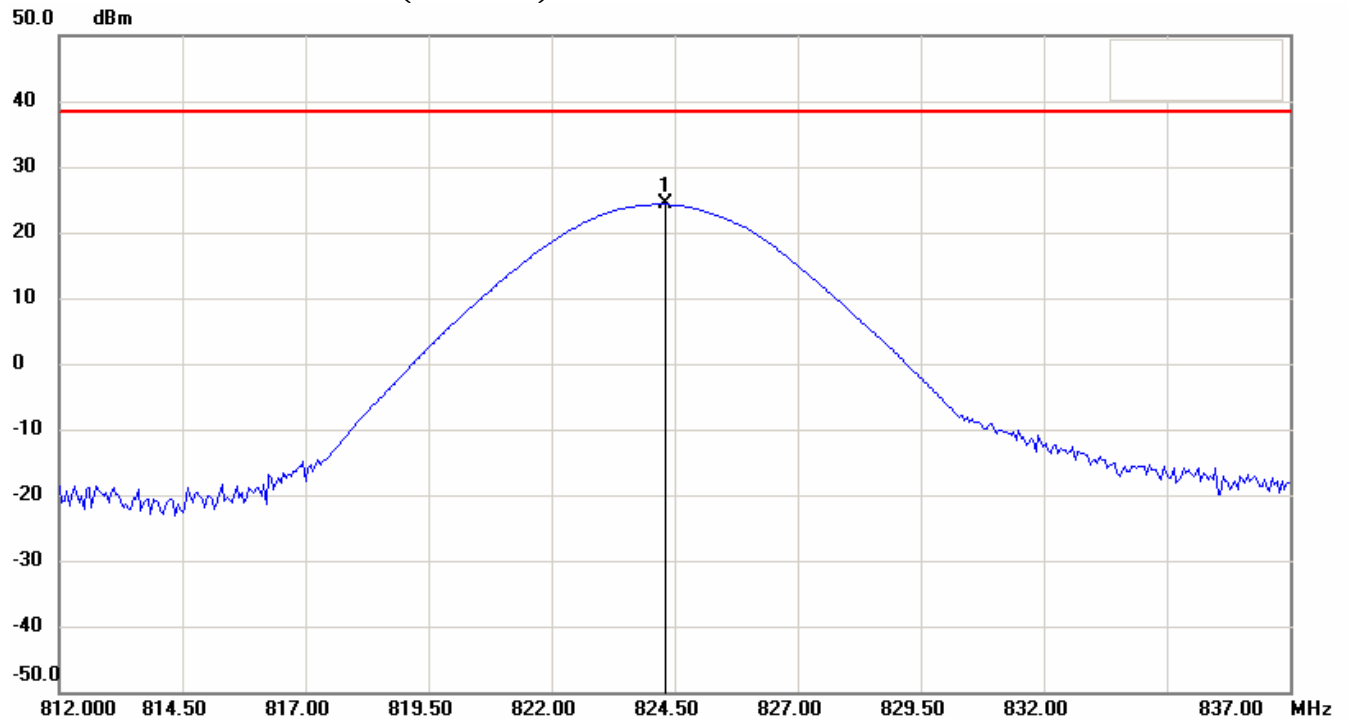
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

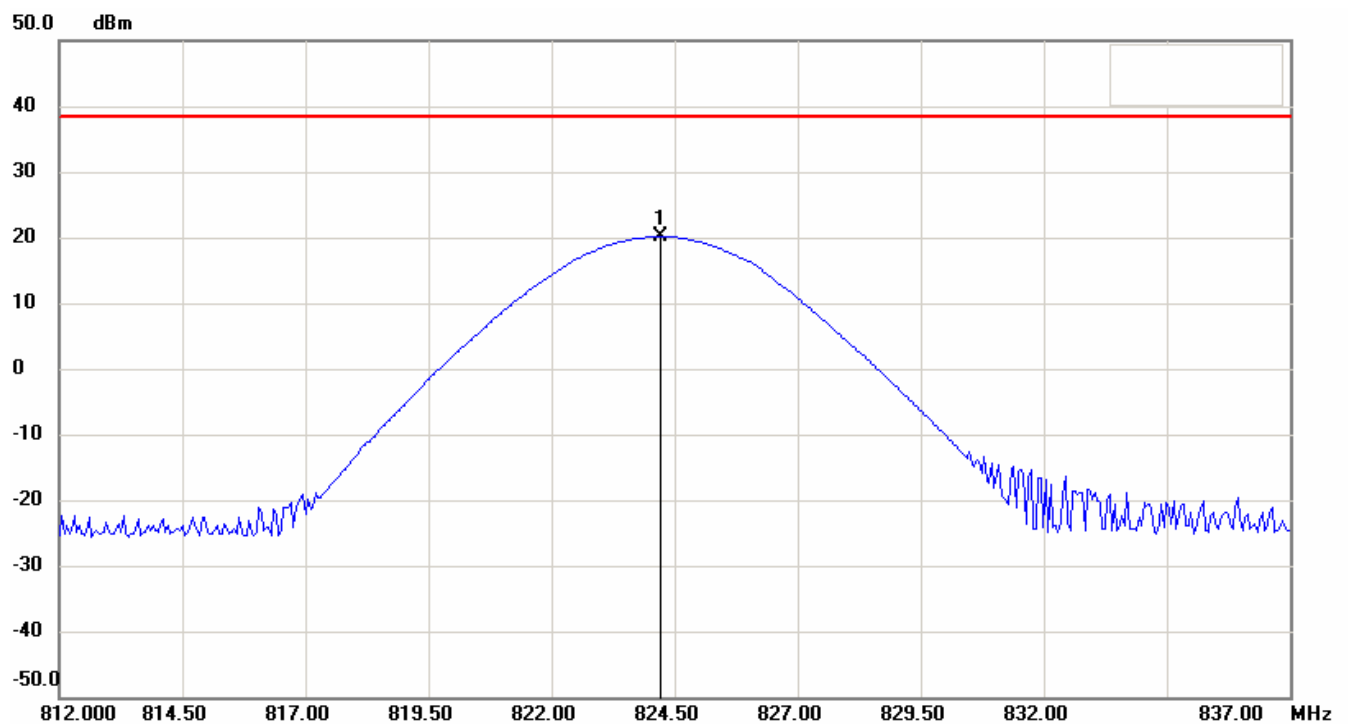
RF Power Output_ Radiated Measurement

850 band_3.8V

Antenna Polarization H (CH 128)



Antenna Polarization V

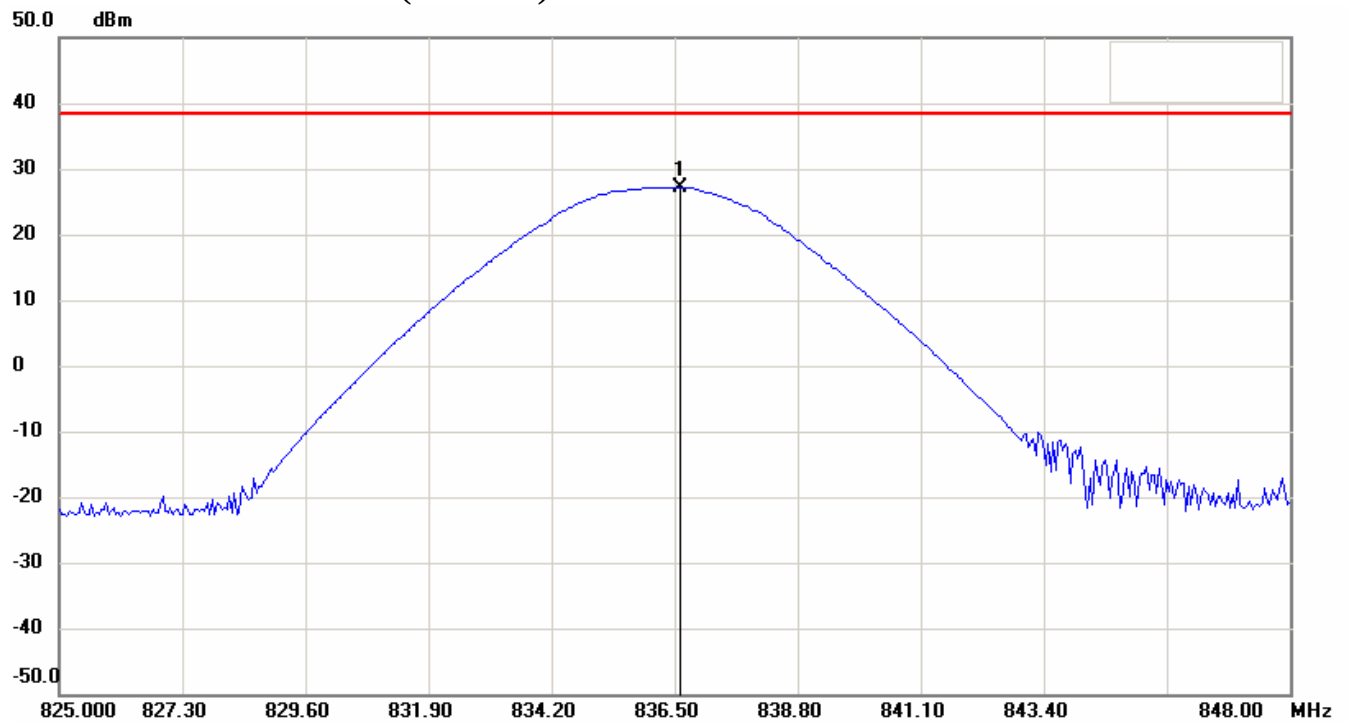




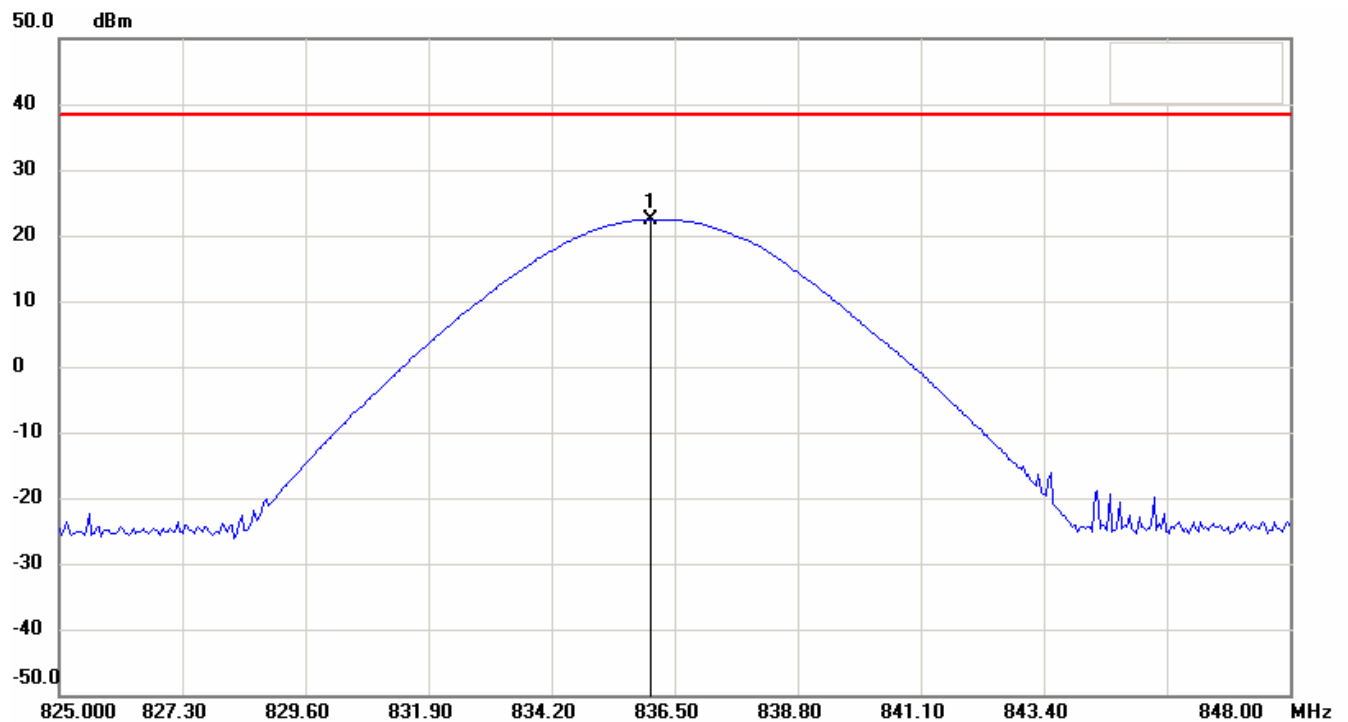
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 188)



Antenna Polarization V

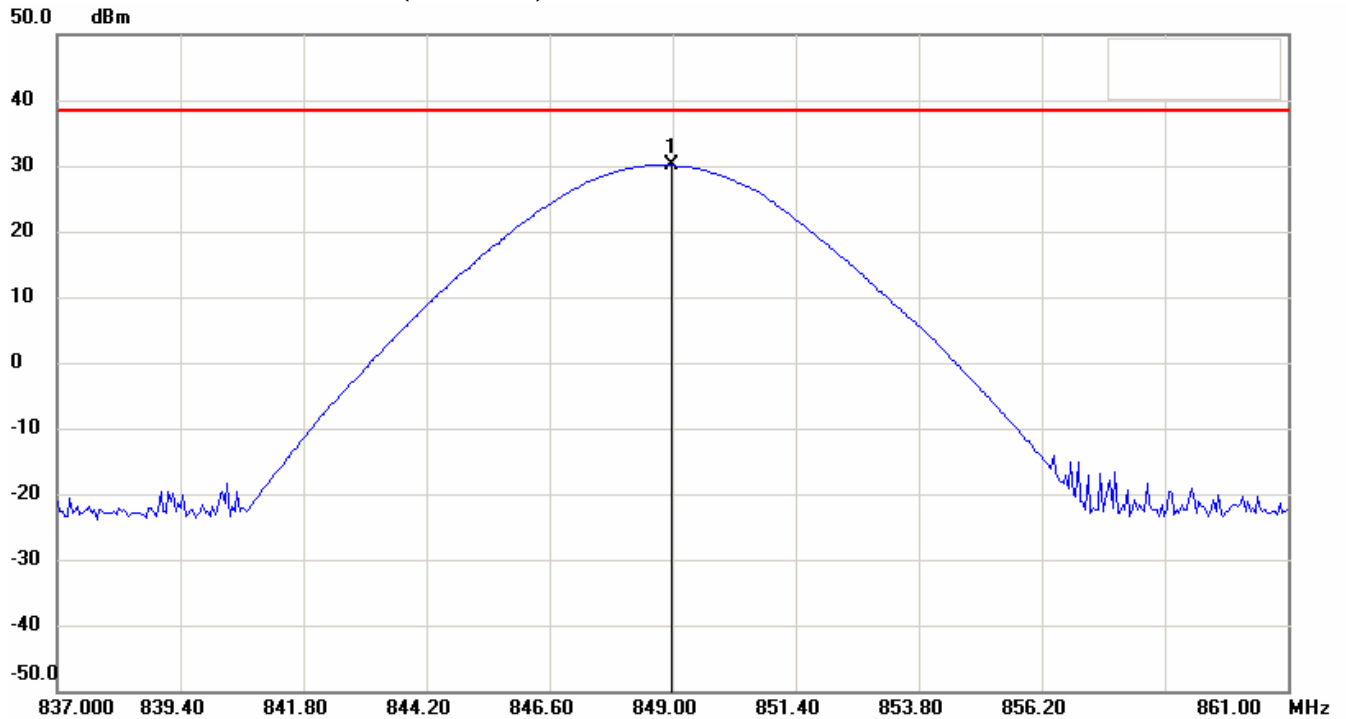




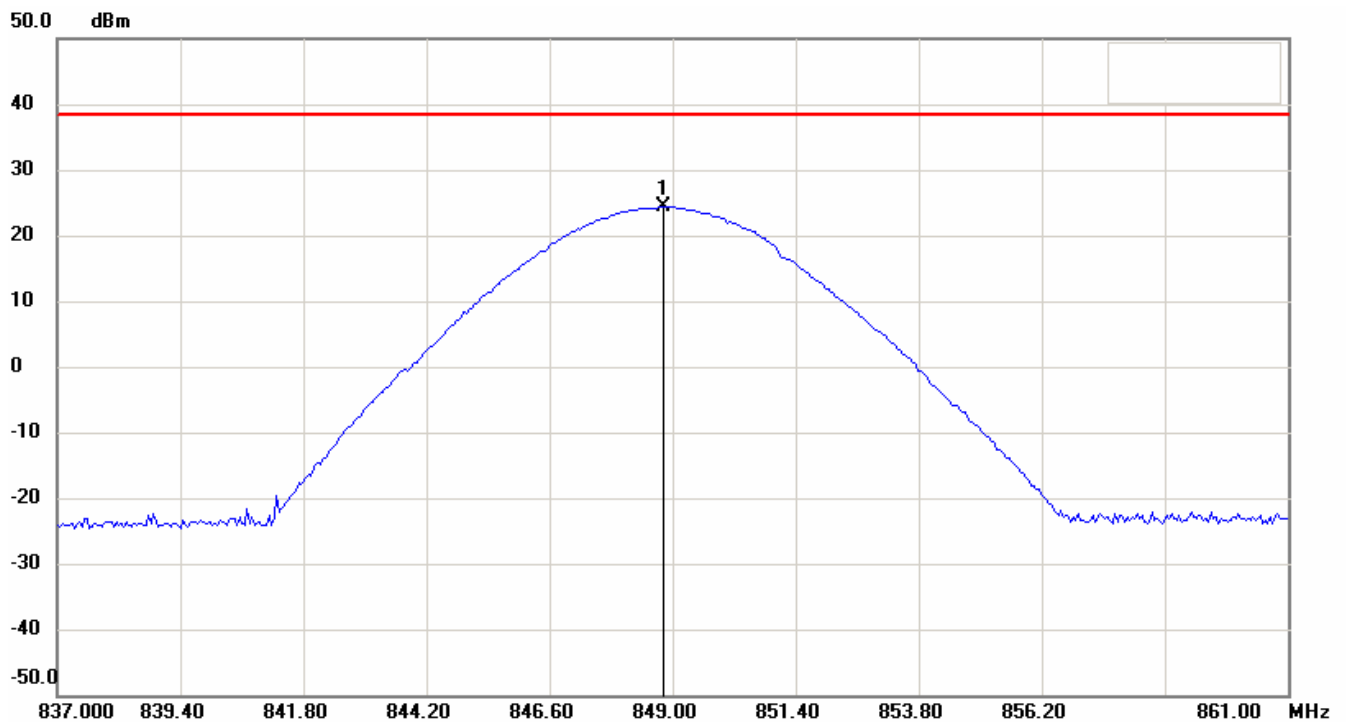
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 251)



Antenna Polarization V



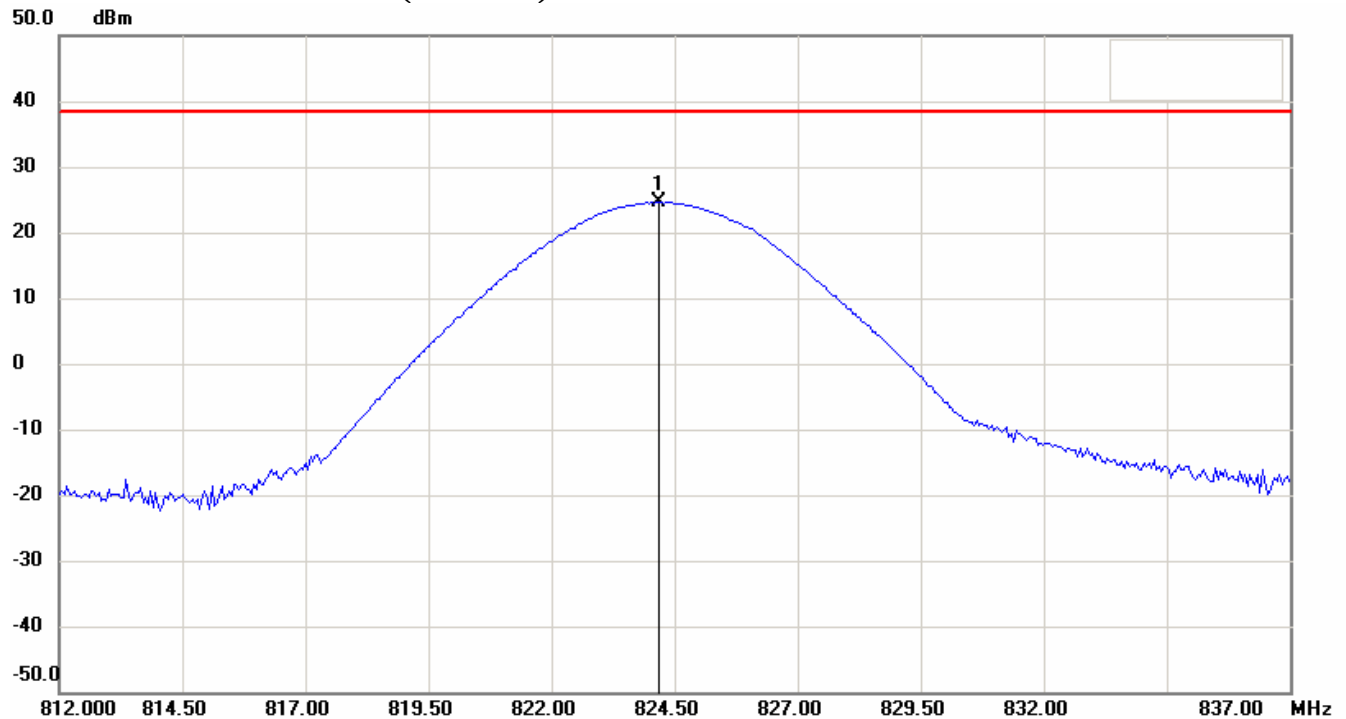


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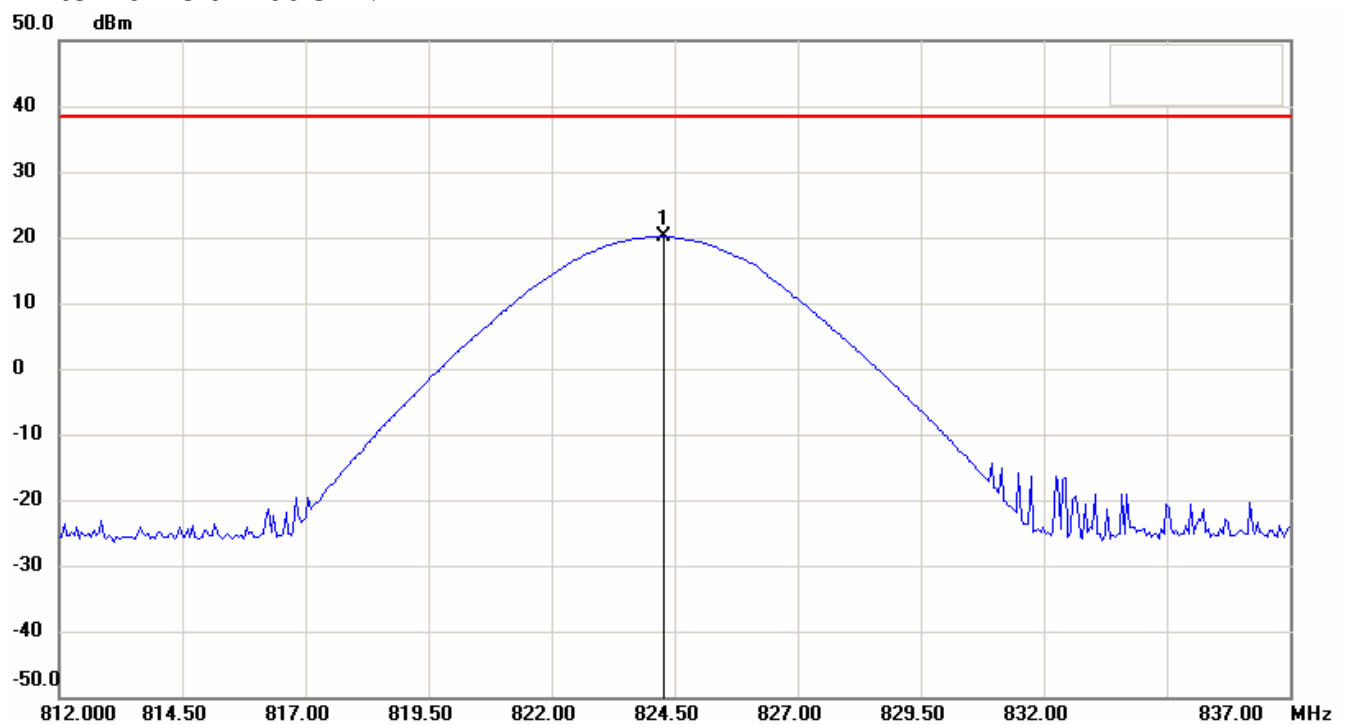
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850 band_4.2V

Antenna Polarization H (CH 128)



Antenna Polarization V

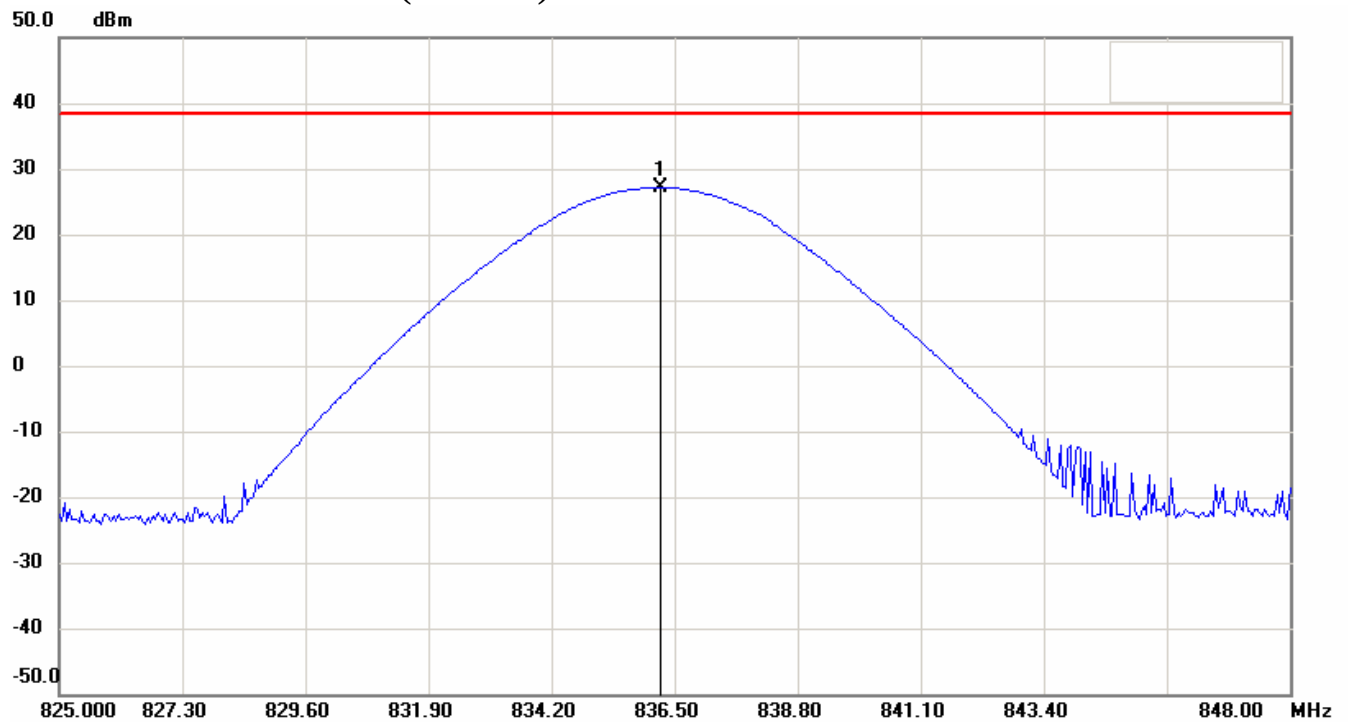




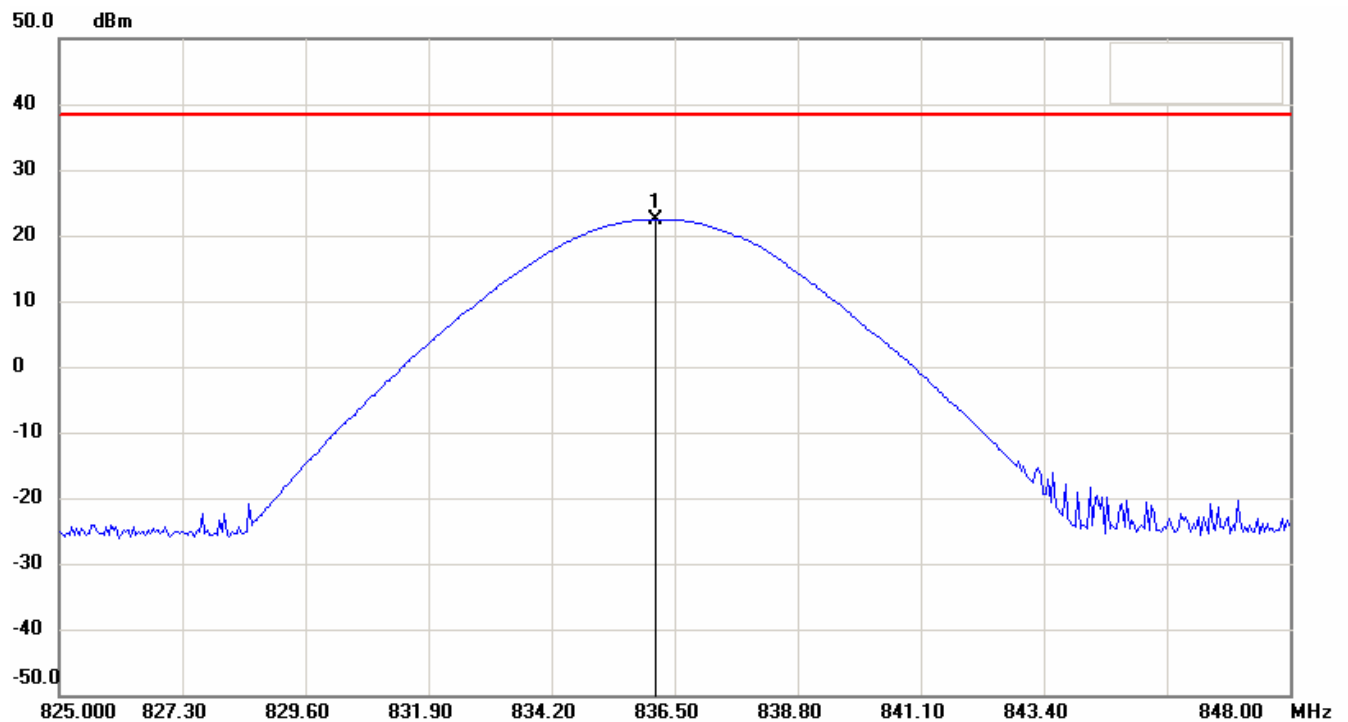
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 188)



Antenna Polarization V

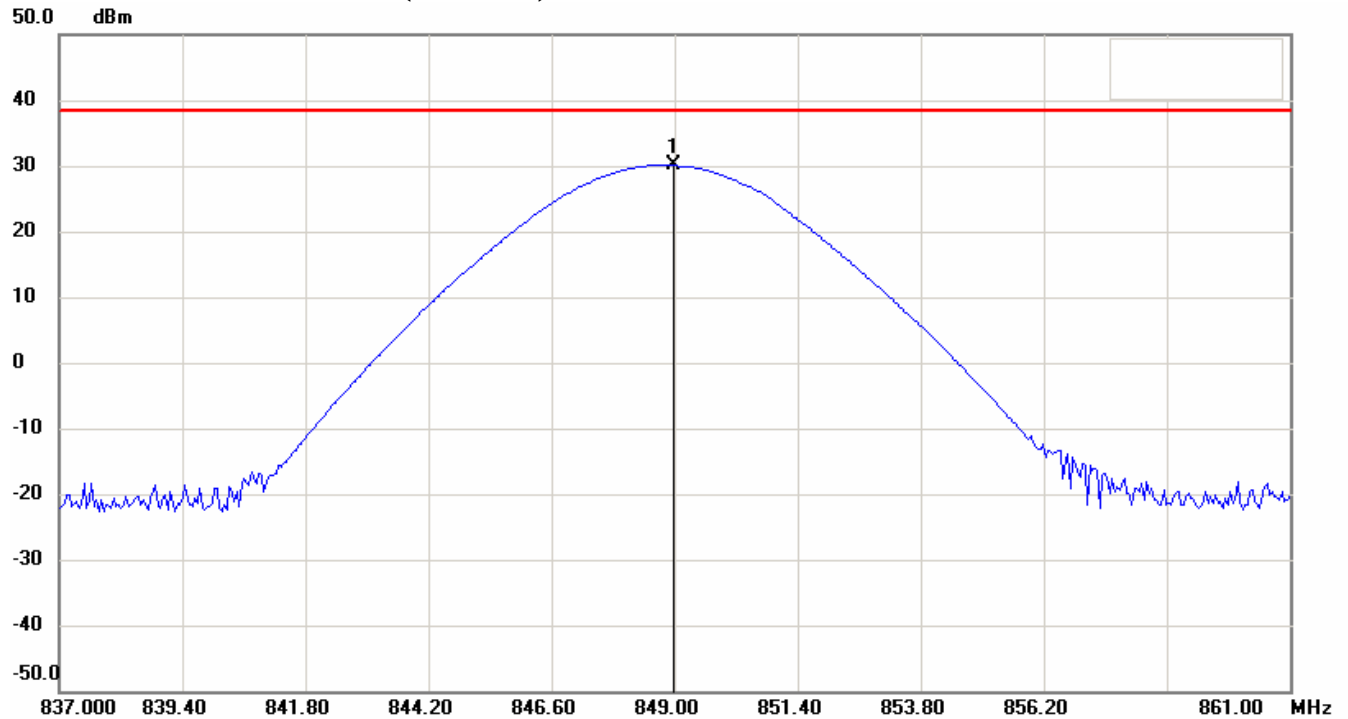




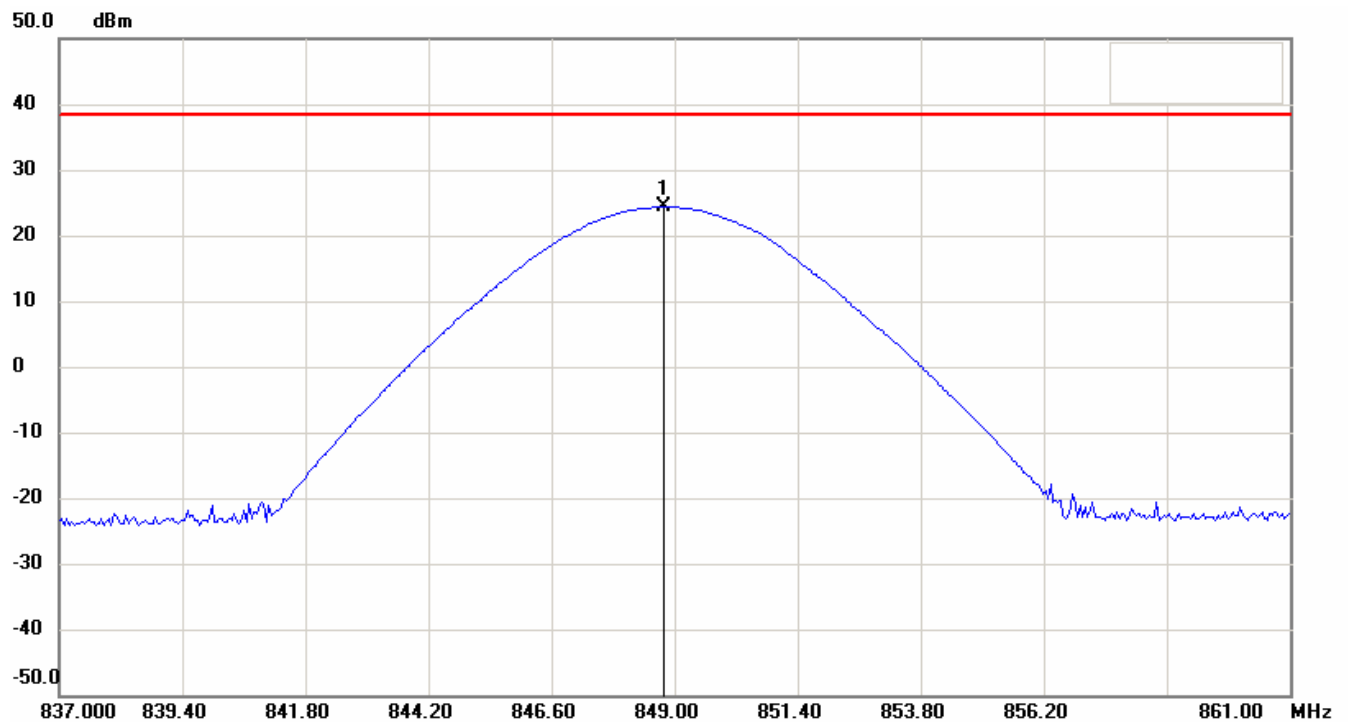
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FCC ID: RID-TR151A

Antenna Polarization H (CH 251)



Antenna Polarization V



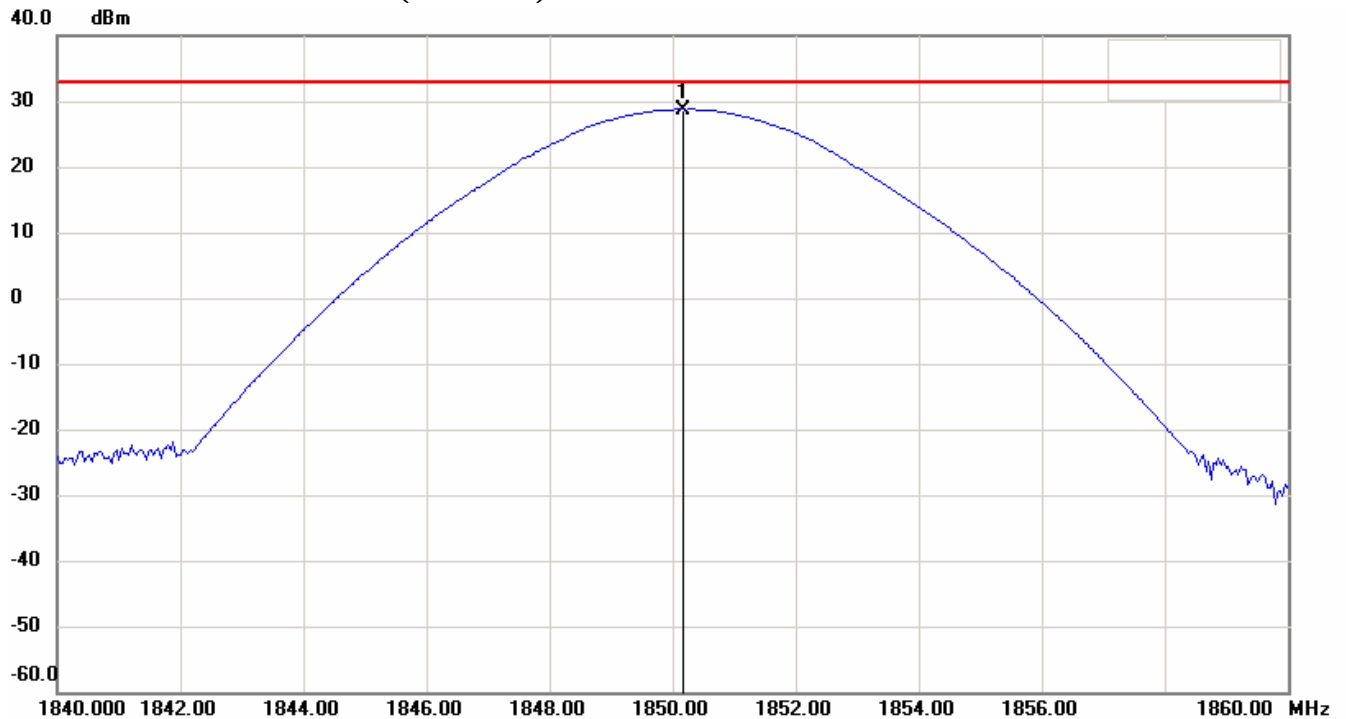


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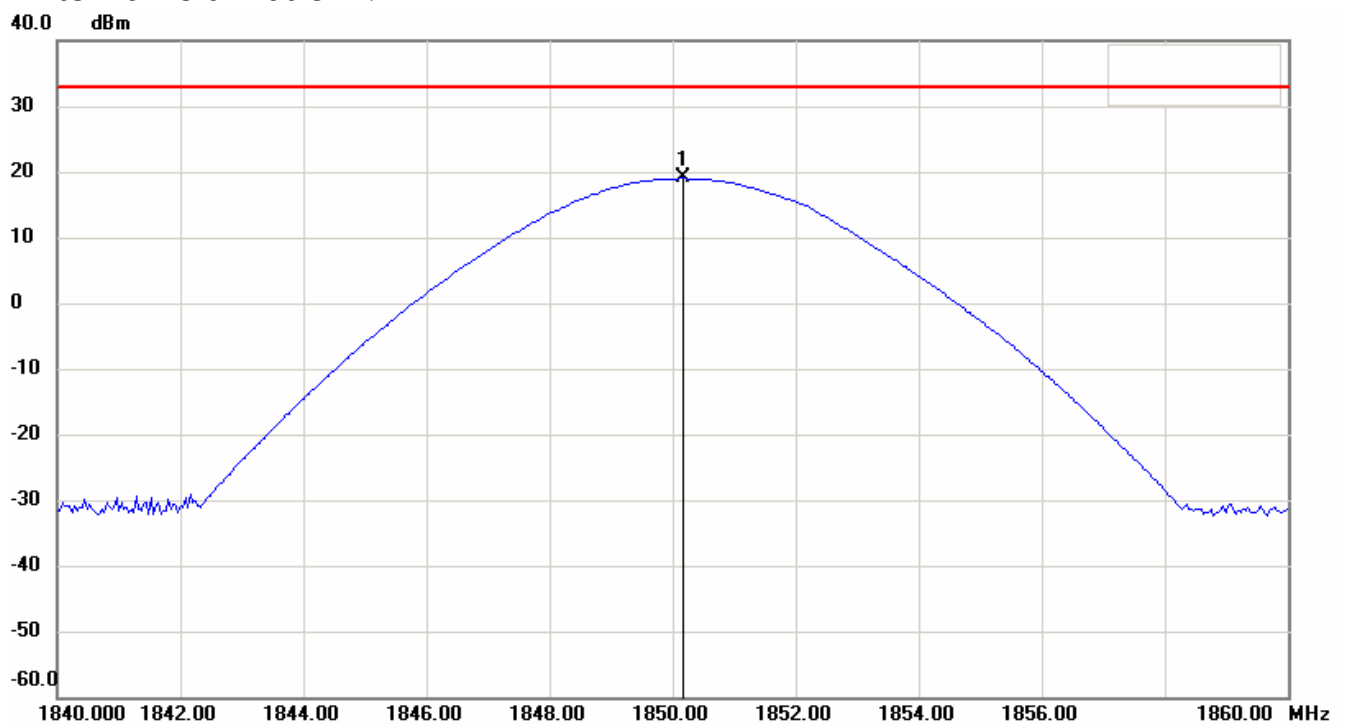
FCC ID: RID-TR151A

1900 band_3.8V

Antenna Polarization H (CH 512)



Antenna Polarization V

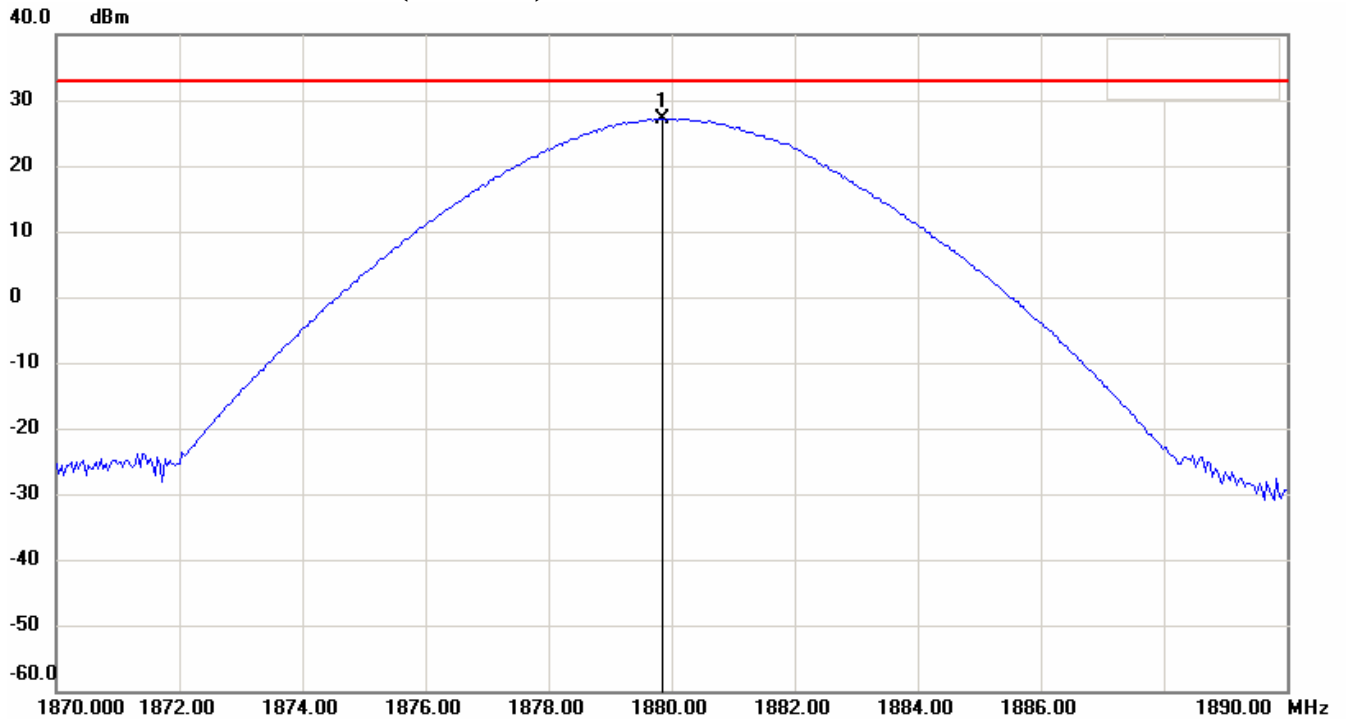




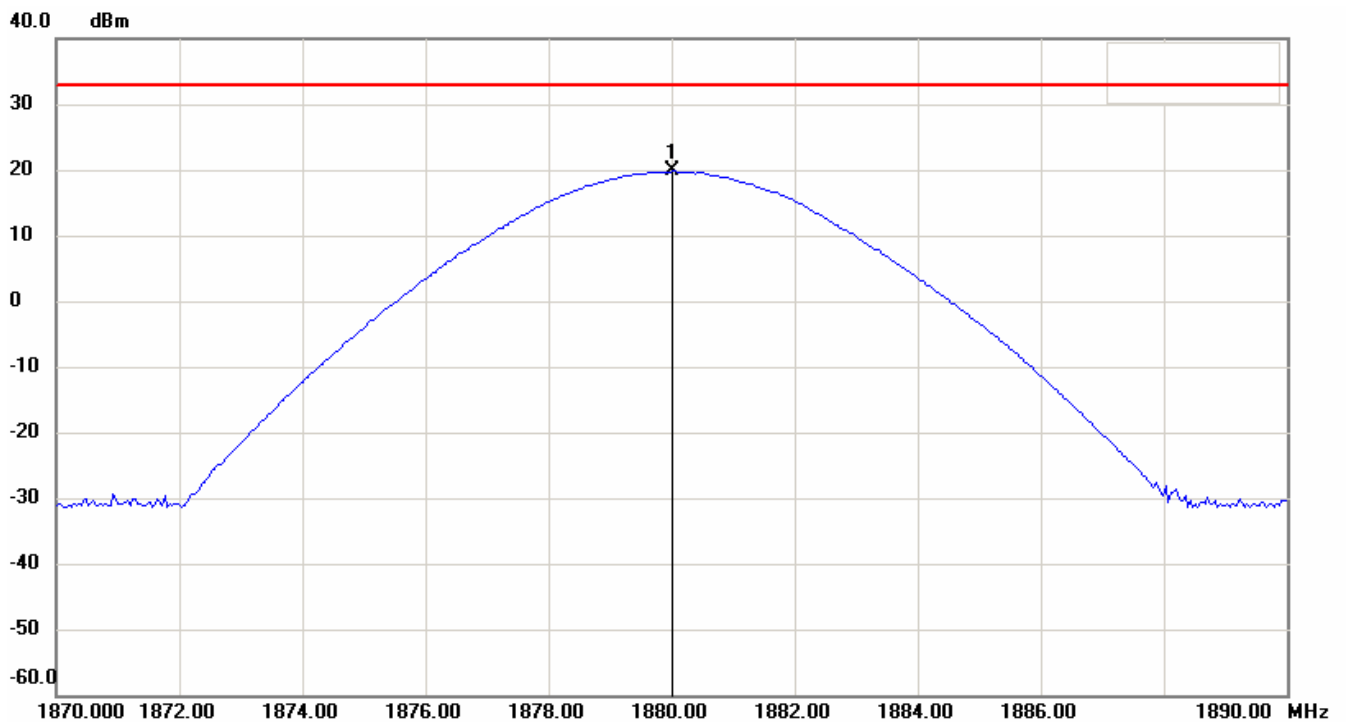
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 661)



Antenna Polarization V

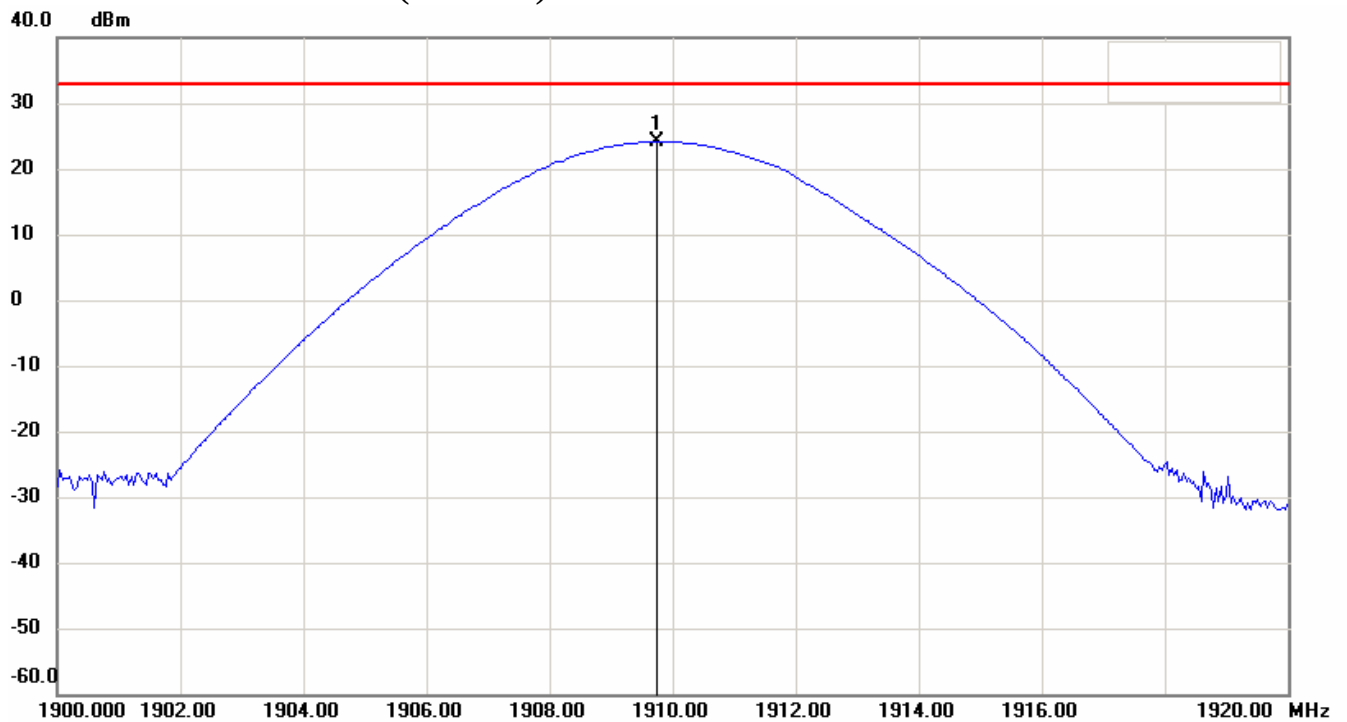




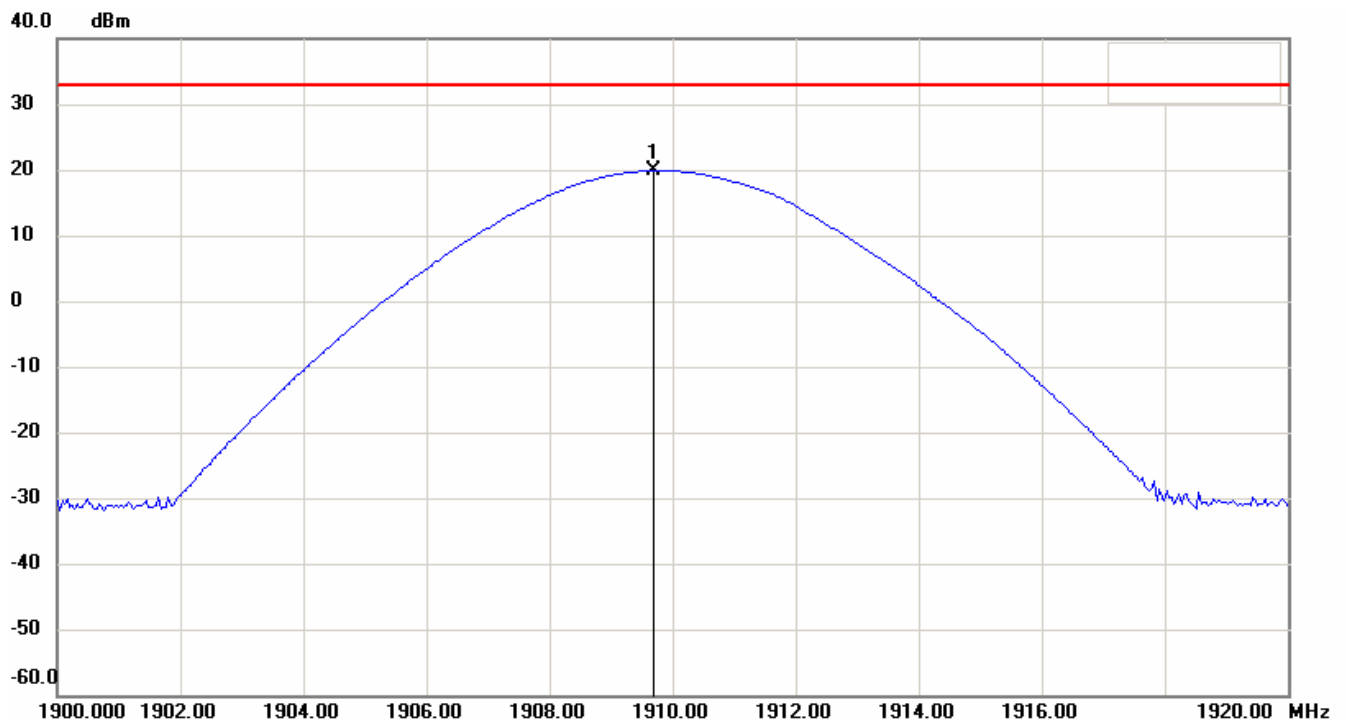
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 810)



Antenna Polarization V



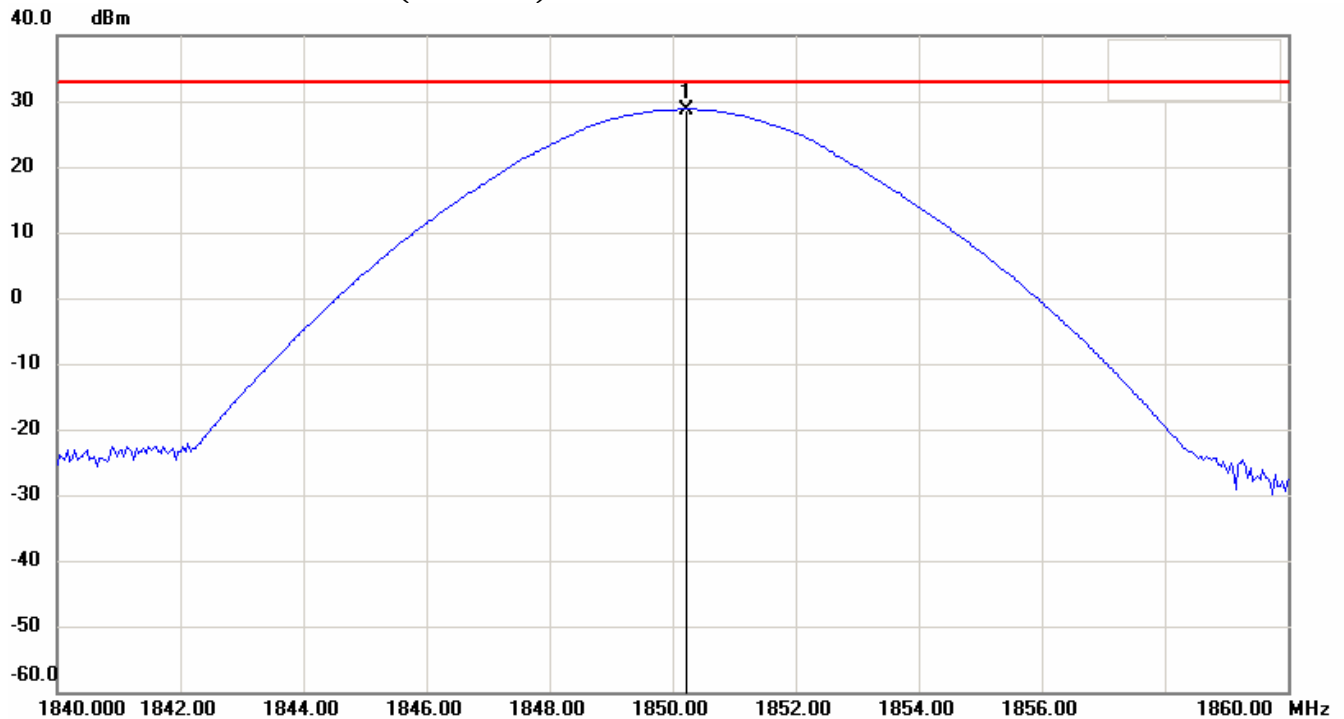


Report Number: W6M20804-9044-P-22/24

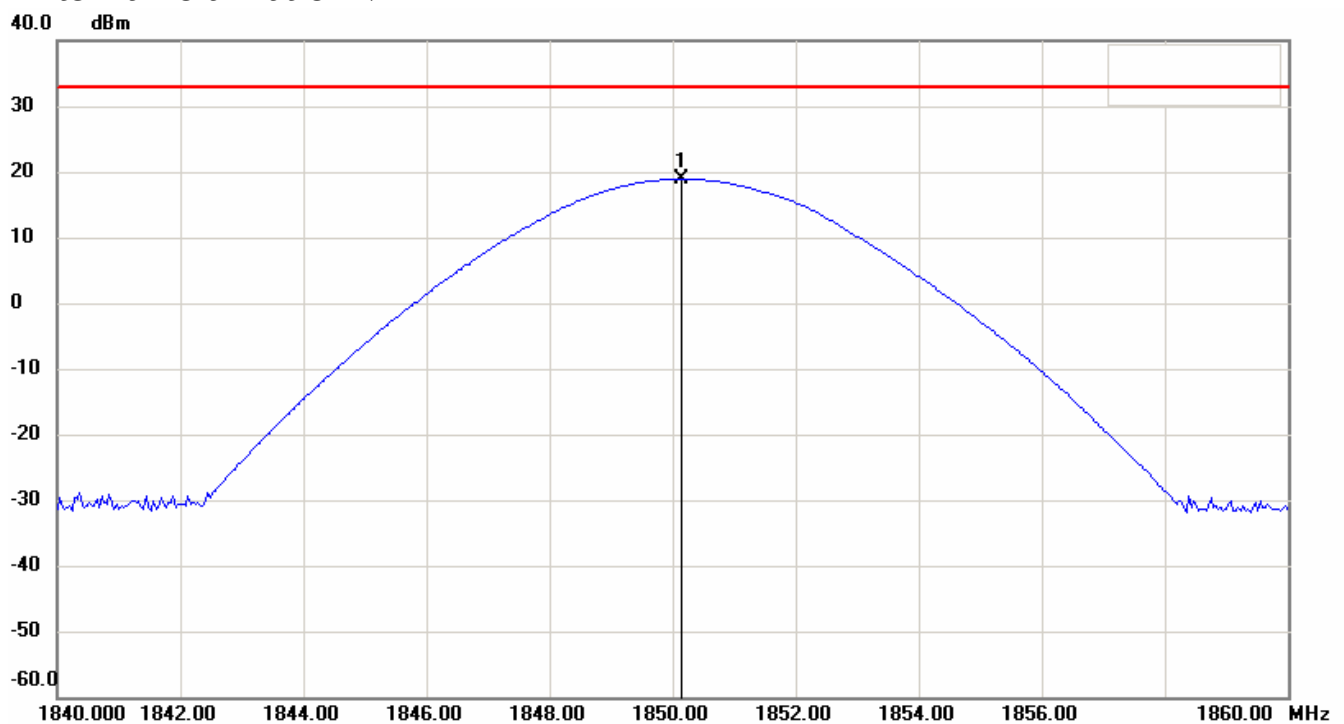
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1900 band_4.2V

Antenna Polarization H (CH 512)



Antenna Polarization V

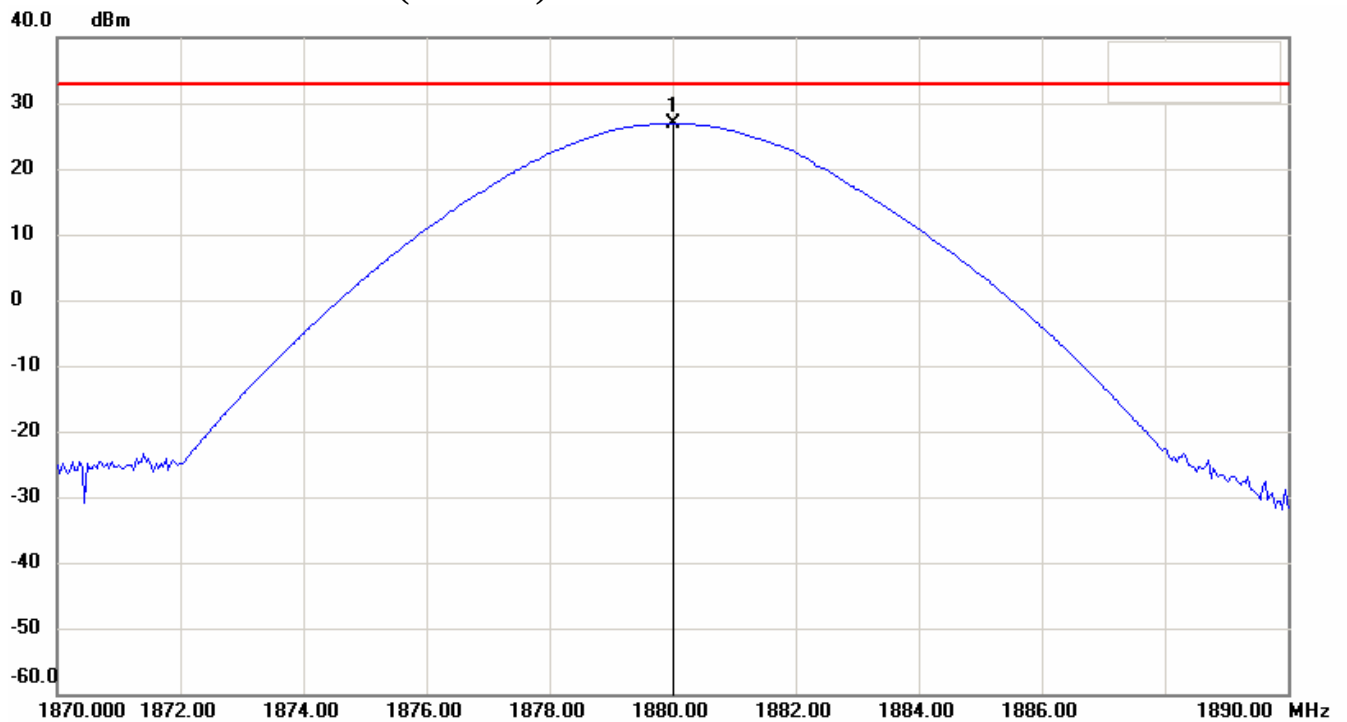




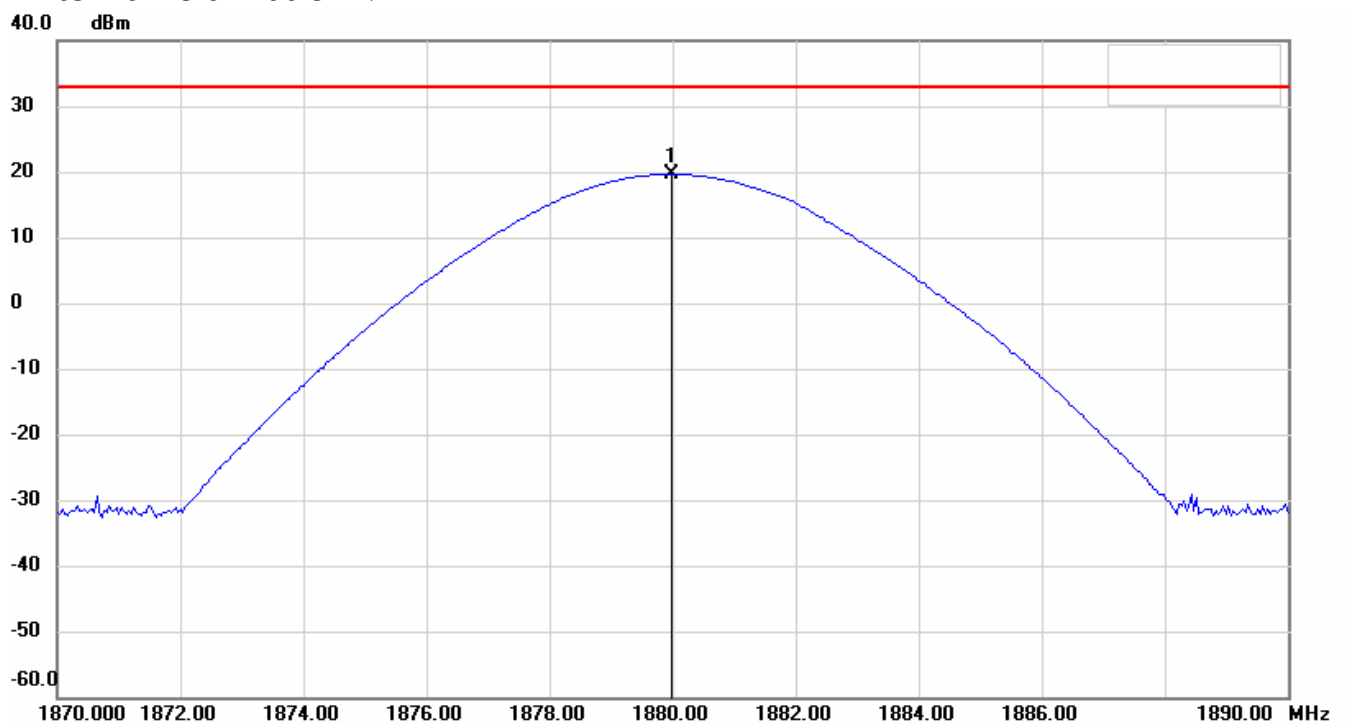
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 661)



Antenna Polarization V

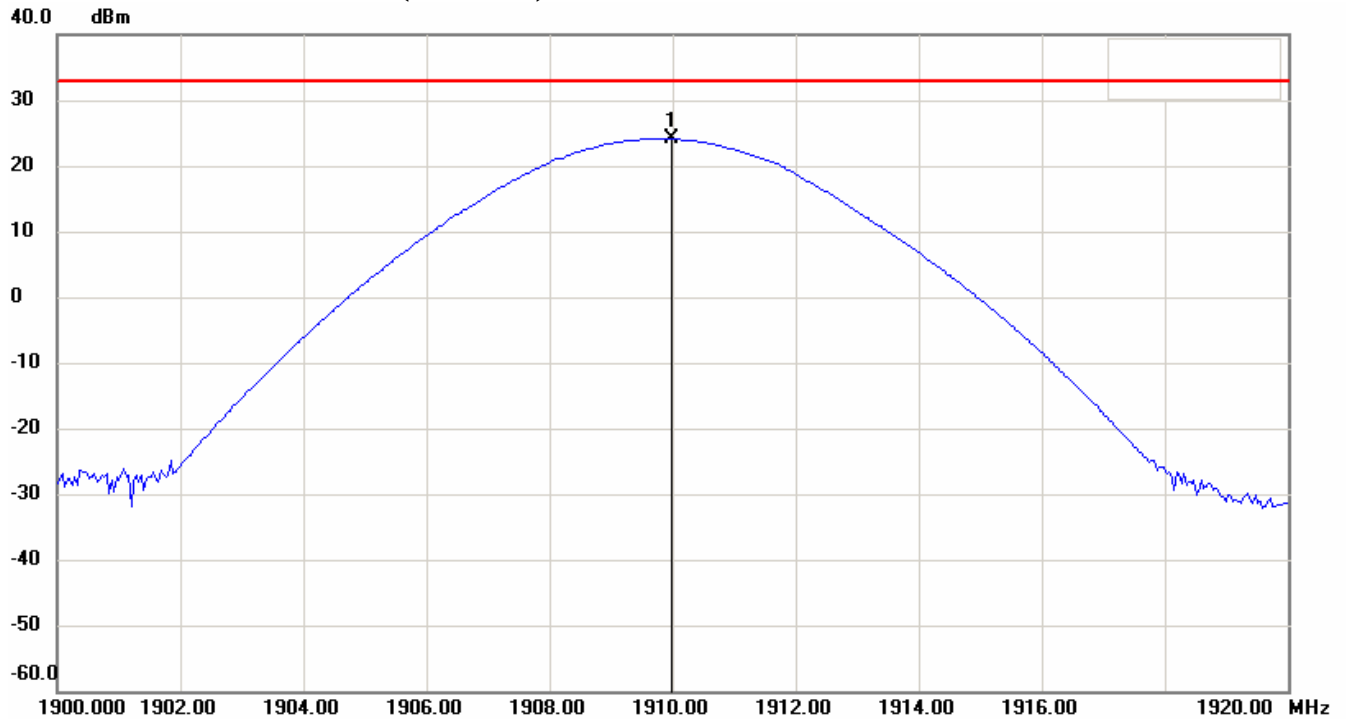




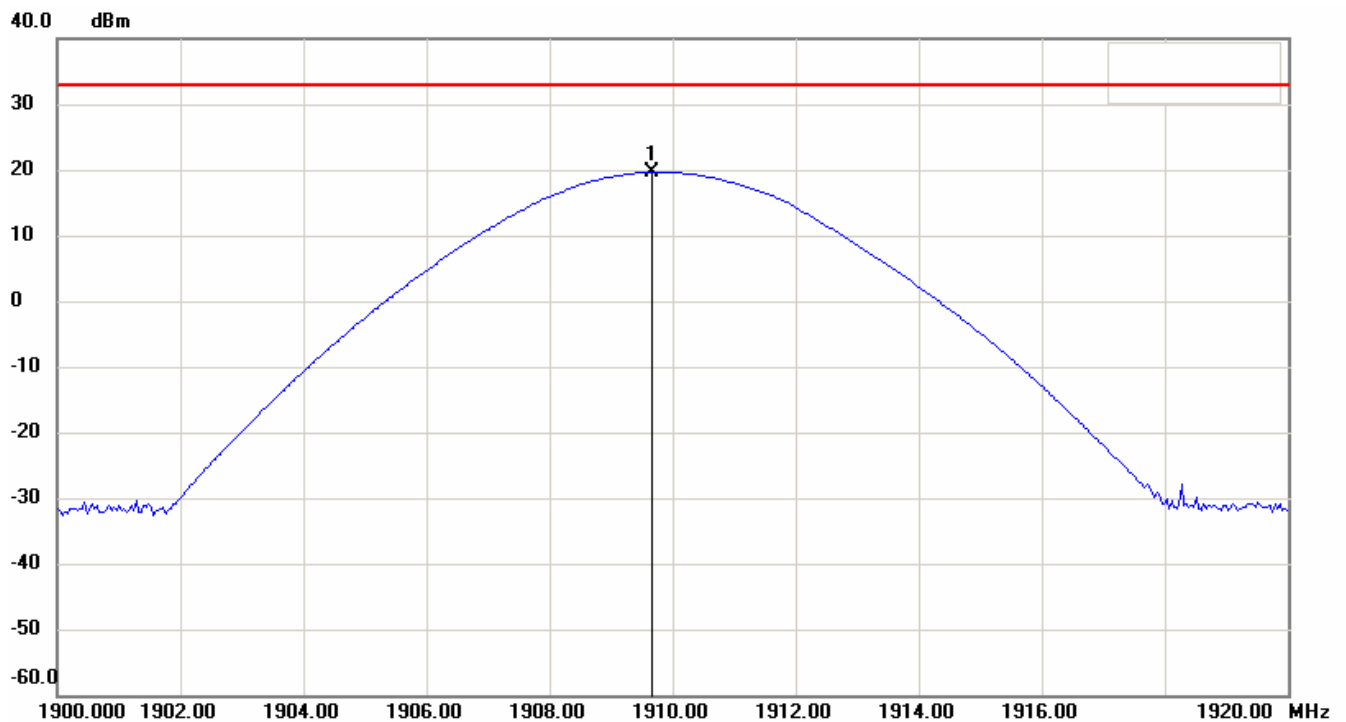
Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

Antenna Polarization H (CH 810)



Antenna Polarization V



Note:

1. The plots are pre-scanned data for determining the tested points and for reference only.
2. The exact test result is shown in the data table of Output Power test of this test report.

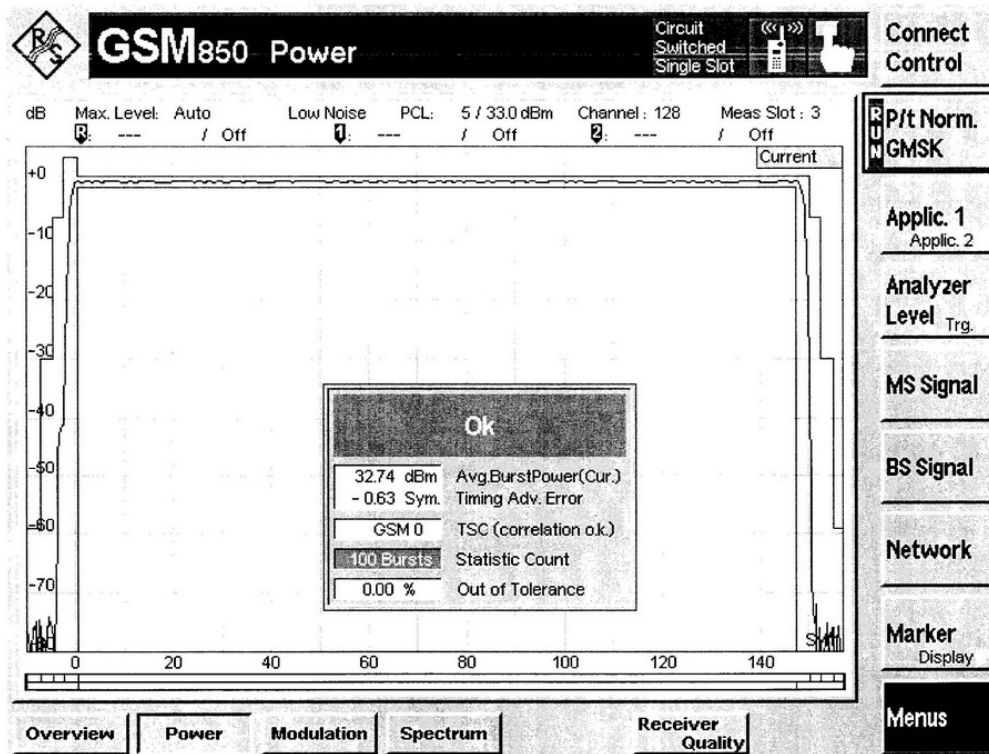


Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

RF Power Output_ Conducted Measurement

850 band_3.8V

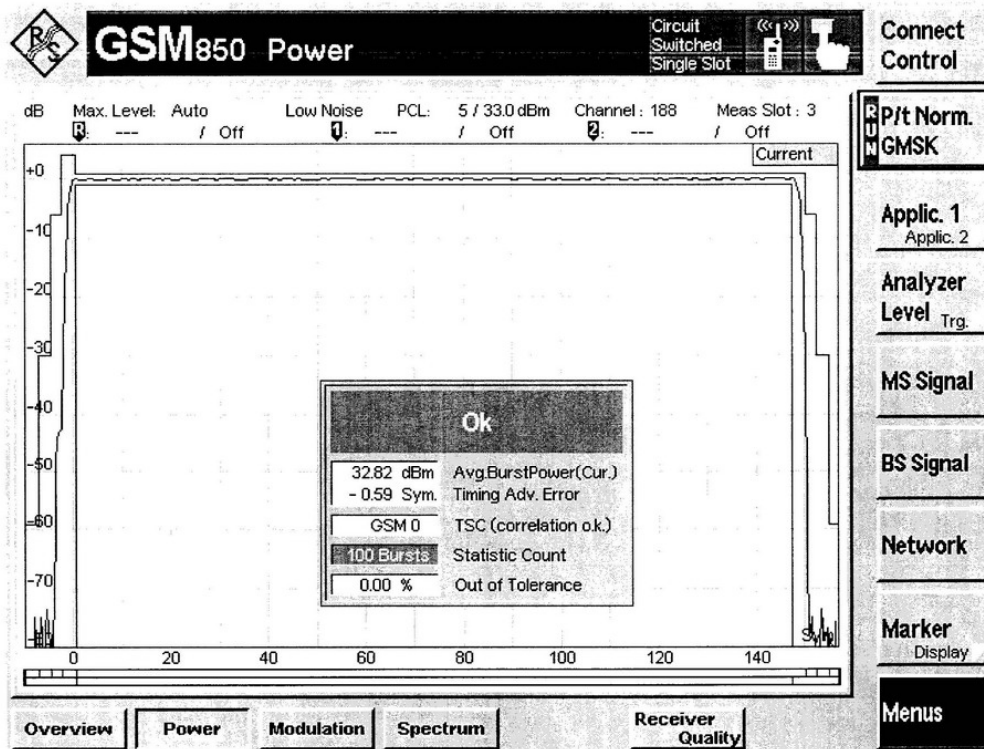


3.8V



Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A



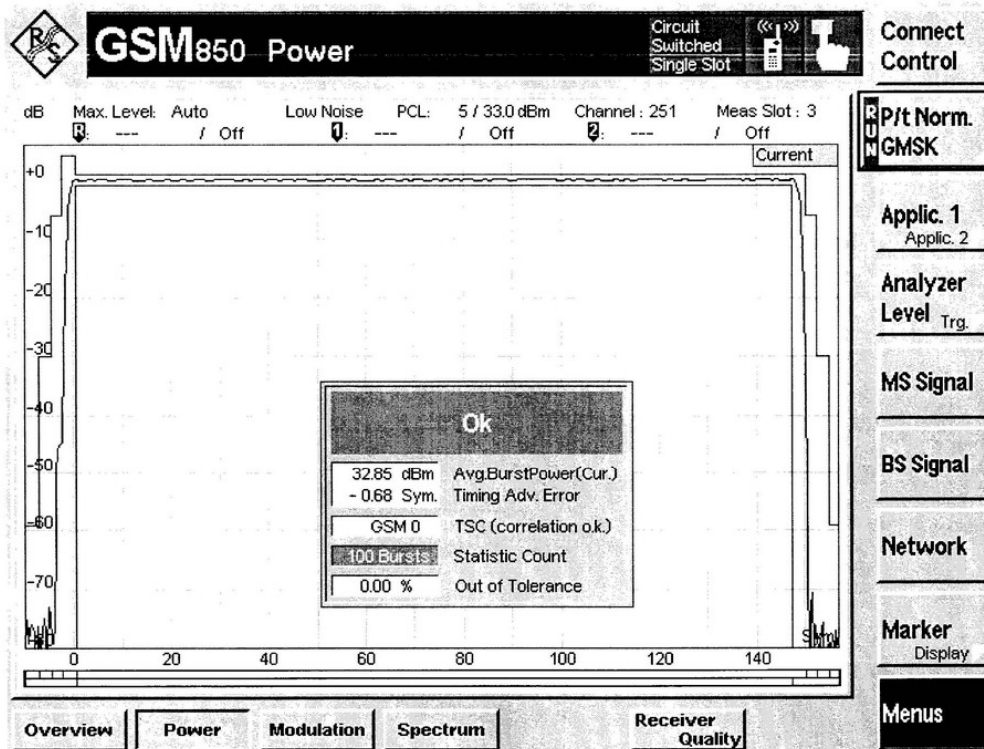
3.8V



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A



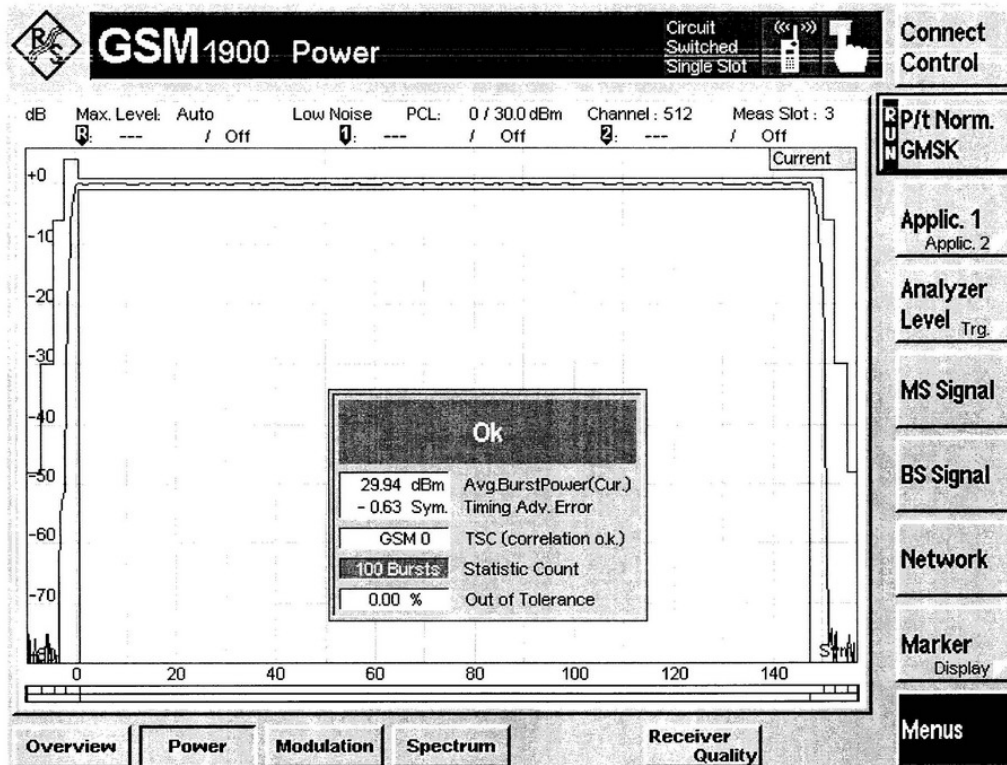
3.8V



Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

1900 band_3.8V

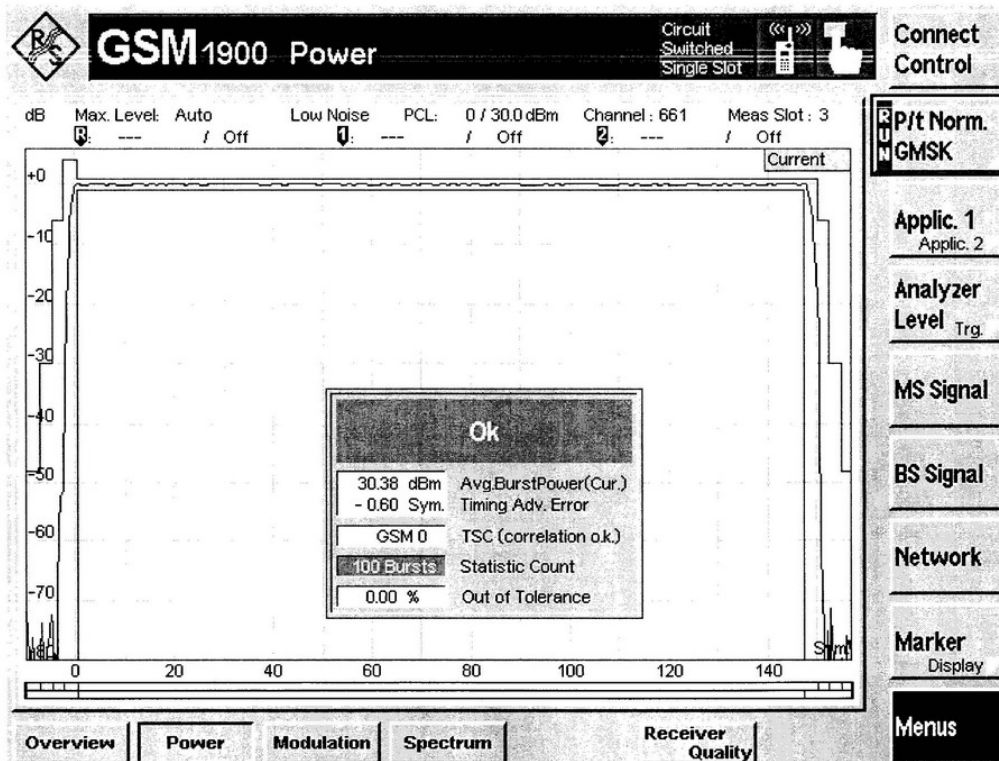


3.8V



Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A



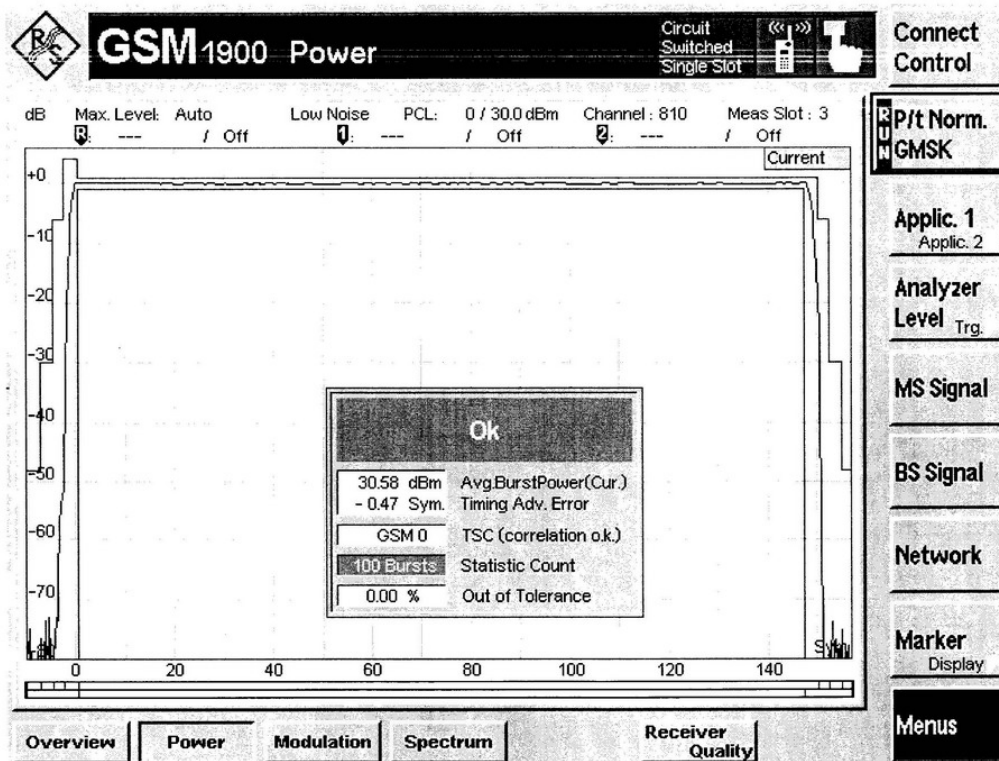
38V



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A

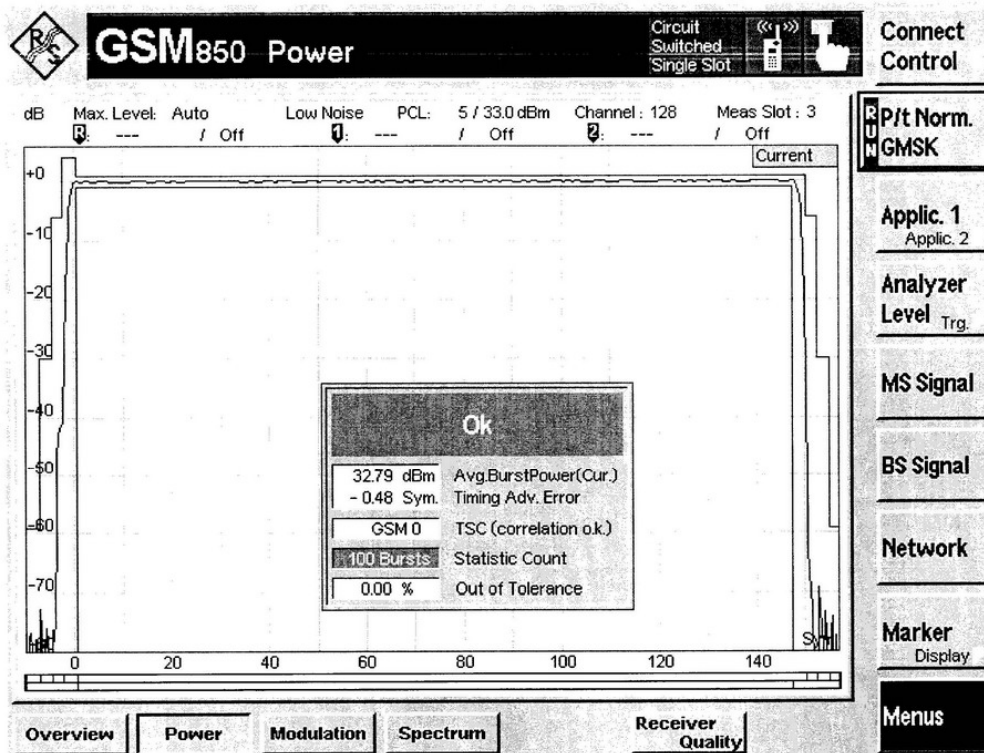


38V



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24
FCC ID: RID-TR151A
850 band_4.2 V

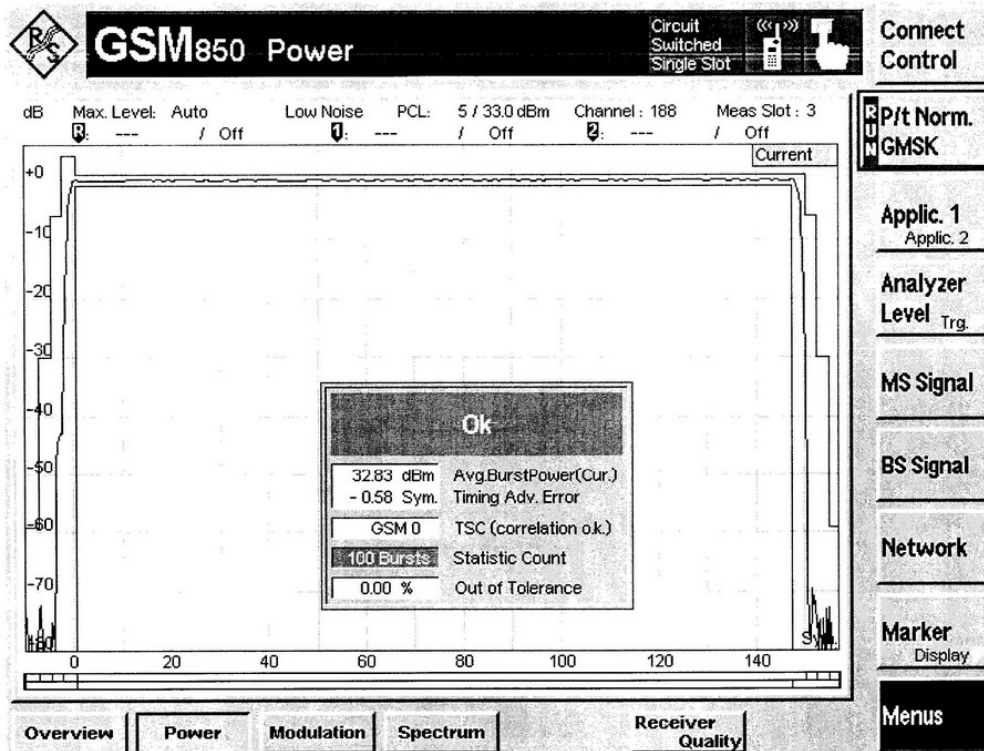


4.2 V



Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A



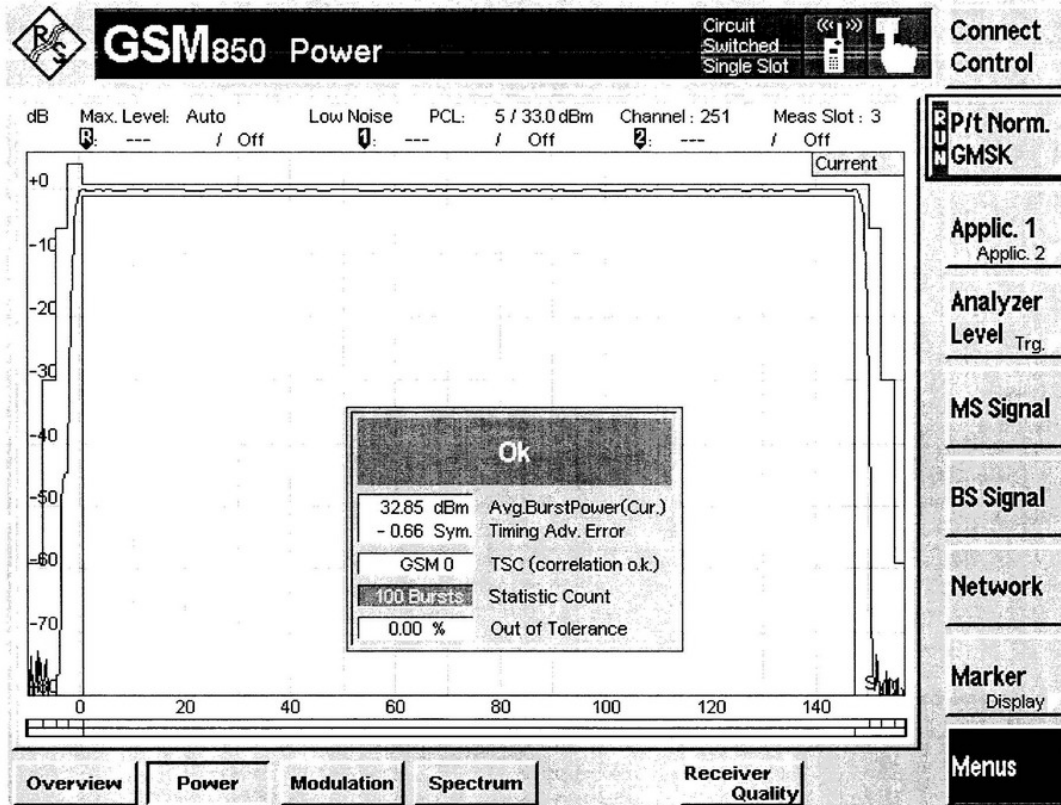
4.2V



Worldwide Testing Services(Taiwan) Co., Ltd.

Report Number: W6M20804-9044-P-22/24

FCC ID: RID-TR151A



#2V