FCC PART 22/24 TEST REPORT

for

Tracker

Model No.: SPT10

FCC ID: SRKWPSPT10

of

Applicant: WONDE PROUD Technology Co., Ltd.

Address: 1F, No. 61, Lane 8, Zhong 1st Street, Xizhi City,

Taipei County 221, Taiwan (R.O.C.)

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.: W6M20812-9477-P-2224

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com

Report Number: W6M20812-9477-P-2224
FCC ID: SRKWPSPT10

Certification of Test Report

Applicant : WONDE PROUD Technology Co., Ltd.
1F, No. 61, Lane 8, Zhong 1st Street, Xizhi City,
Taipei County 221, Taiwan (R.O.C.)

Manufacturer : WONDE PROUD Technology Co., Ltd.
1F, No. 61, Lane 8, Zhong 1st Street, Xizhi City,
Taipei County 221, Taiwan (R.O.C.)

Tested Equipment :

Type Description	: Tracker
Model Number	: SPT10
Series Number	: N/A
Brand Name	: N/A
Operation Frequency	: 824.2-848.8MHz / 1850.2 - 1909.8 MHz
RF Output Power	1)824.2 - 848.8MHz :20.82 dBm (ERP) 2)1850.2 - 1909.8 : 24.79 dBm (EIRP)
Power Supply	: Adaptor (I/P: AC 100-240 V / 50-60 Hz / 0.2 A, O/P: 5.3 Vdc / 0.5 A) Battery (3.7 V, Li-ion)

Regulation Applied : 47CFR Part 22 (2007-10) and Part 24 (2007-10)

Test Method : 47CFR Part 2 (2007), 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(2007) 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:

Date	WTS-Lab.	Name	Signature
December 30, 2008		Jeff	Jeff

Technical responsibility for area of testing:

Date	WTS	Name	Signature
December 30, 2008		Chang Tse-Ming	Chang Tse-ming

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1. Summary

1.1 Description of tested equipment

This equipment under tested, SPT10, is a GSM/GPRS tracking device. SPT10 is suitable for many applications such as human body or vehicle security etc. Instantly locate and report your position by using GSM/GPRS solution.

The operation frequency bands and rated RF output power are listed as follows:

824.2-848.8MHz (Cellular, Part 22), 0.1208 W (ERP)
1850.2-1909.8MHz (Cellular, Part 24), 0.3013 W (EIRP)

This test report only contains test requirements specified in 47CFR Part 22 and Part 24 for GSM function, for other functions, please refer to separate test report with respect to the relevant test standard and specification.

1.2 Date of testing processing

Test sample received: December 08, 2008

Test finished: December 29, 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(2007), TIA-603-B(2002), ANSI C63.4(2003) 47CFR Part 22 (2007-10), and Part 24 (2007-10)**

Deviation from test standard: None

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

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:	WONDE PROUD Technology Co., Ltd.
Street:	1F, No. 61, Lane 8, Zhong 1st Street, Xizhi City,
Town:	Taipei County 221,
Country:	Taiwan (R.O.C.)
Telephone:	+886-2-2696-8498
Fax:	+886-2-2696-8499

Manufacturer: (if different from applicant)

Name:	./.
Street:	./.
Town:	./.
Country:	./.

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
No accessories were used with this EUT.					

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: PIFA Antenna

Antenna Gain: 1.187 dBi

Power supply: Adaptor (I/P: AC 100-240 V / 50-60 Hz / 0.2 A,
O/P: 5.3 Vdc / 0.5 A)
Battery (3.7 V, Li-ion)

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.

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	2008/9/18	2009/9/17
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	2008/9/15	2009/9/14
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2008/9/15	2009/9/14
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	2008/9/18	2009/9/17
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2008/7/25	2009/7/24
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2008/9/22	2009/9/21
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2008/9/24	2009/9/23
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2008/10/8	2009/10/7
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2008/9/22	2009/9/21
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2008/9/18	2009/9/17
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2008/5/5	2009/5/4
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2008/10/27	2009/10/26
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2008/8/27	2009/8/26
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2008/4/23	2009/4/22
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2008/4/23	2009/4/22
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2008/3/26	2009/3/25
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2008/9/1	2009/8/31
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2008/6/27	2009/6/26
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2008/9/1	2009/8/31
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	2008/5/2	2009/5/1
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2008/5/22	2009/5/21
ETSTW-RE 047	ESA-E SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	2008/6/26	2009/6/25
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2008/9/1	2009/8/31
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	2008/7/1	2009/6/30
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	2008/9/1	2009/8/31

ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2008/10/28	2009/10/27
ETSTW-RE 105	Match Pad	MDCS1500	None	WOKEN	2008/10/9	2009/10/8
ETSTW-RE 106	Match Pad	MDCS1510	None	WOKEN	2008/10/9	2009/10/8
ETSTW-GSM 02	Universal Radio Communication Tester	CMU 200	109439	R&S	2008/9/23	2009/9/22
ETSTW-GSM 23	SPLITTER	4901.19.A	None	SUHNER	2008/9/22	2009/9/21

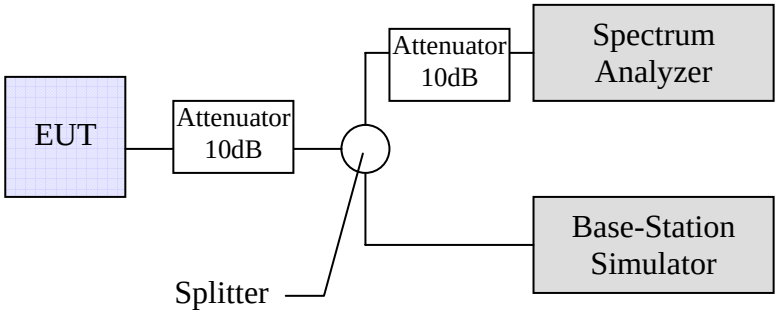
3. RF Power Output

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 form simulator to EUT and then set the EUT to maximum output power.
Measure the RF power with the spectrum analyzer in accordance 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 assign 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

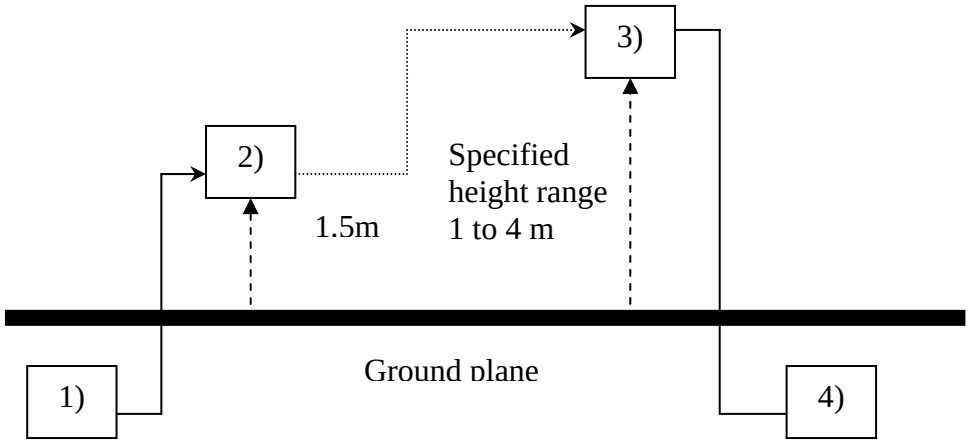
If the conducted measurement is not practical due to the integral antenna, the radiated measurement will be performed in accordance the following procedure:

The EUT was positioned on a non-conductive turntable, 0.8mabove the ground on an open test site.
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 ETS Taiwan
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:
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

3.7 V

Frequency (MHz)	Test result (dBm)
824.2	29.34
836.2	29.05
848.8	28.57
1850.2	26.83
1880.0	27.46
1909.8	28.14

3.6 V

Frequency (MHz)	Test result (dBm)
824.2	29.35
836.2	28.99
848.8	28.62
1850.2	26.79
1880.0	27.51
1909.8	28.11

☐ Conducted Measurement
☑ Radiated Measurement

3.7 V

Frequency (MHz)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Result
824.070	20.66	22.81	38.45	Pass
836.313	20.47	22.62	38.45	Pass
848.720	19.25	21.40	38.45	Pass
1850.170	19.24	21.39	33	Pass
1879.910	19.41	21.56	33	Pass
1909.850	22.68	24.83	33	Pass

3.6 V

Frequency (MHz)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Result
824.134	20.82	22.97	38.45	Pass
836.287	20.40	22.55	38.45	Pass
848.752	19.47	21.62	38.45	Pass
1850.210	18.94	21.09	33	Pass
1879.950	19.44	21.59	33	Pass
1909.850	22.64	24.79	33	Pass

Test equipment: ETSTW-RE 003, ETSTW-RE 017, ETSTW-RE 028, ETSTW-RE 030, ETSTW-RE 043, ETSTW-GSM 02

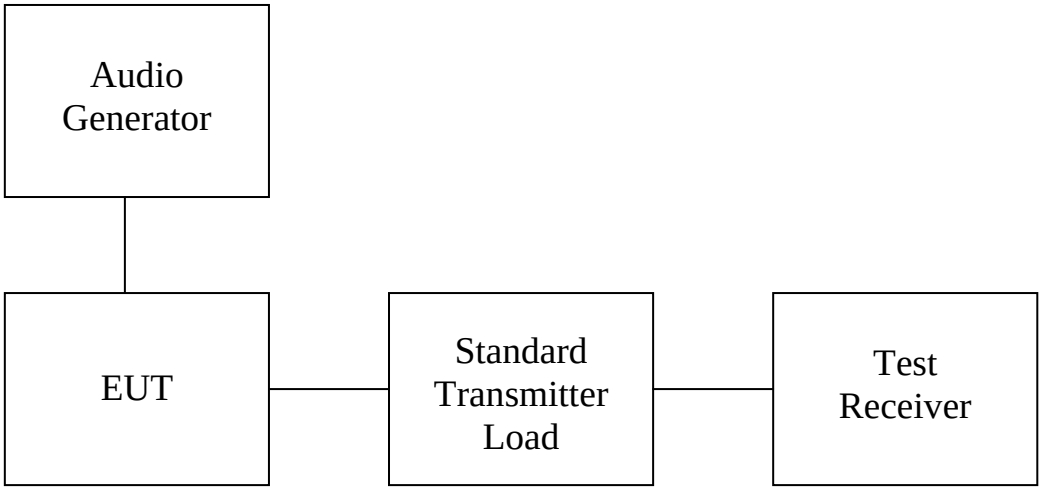
Note: Please refer to appendix for plot data.

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

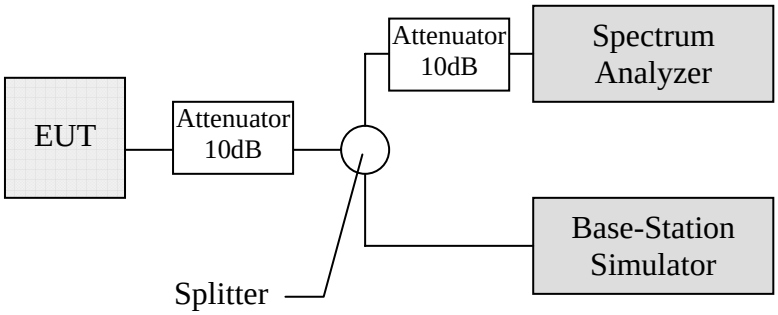
For digital modulation employed, this test item is not applicable.

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	253.205128205
Channel 188	253.205128205
Channel 251	248.397435897
Channel 512	251.602564103
Channel 661	250.000000000
Channel 810	251.602564103
-26dB Channel Bandwidth (kHz)	
Channel 128	352.564102564
Channel 188	352.564102564
Channel 251	342.948717949
Channel 512	344.551282051
Channel 661	352.564102564
Channel 810	360.576923077

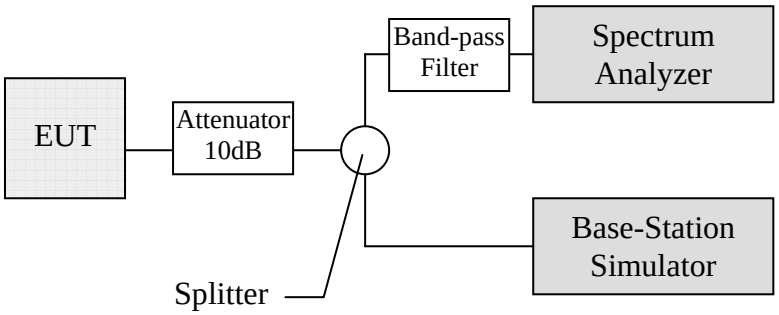
Test equipment: ETSTW-RE 055, ETSTW-GSM 02

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 unmodulated 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)
161.314	-36.44	-13	-23.44
800.000	-36.01	-13	-23.01
1649.038	-19.01	-13	-6.01
2475.962	-21.09	-13	-8.09
3302.885	-34.73	-13	-21.73
4121.000	-36.22	-13	-23.22
4945.200	-38.38	-13	-25.38
5769.400	-38.15	-13	-25.15
6593.600	-37.98	-13	-24.98
8242.000	-38.67	-13	-25.67
9066.200	-38.45	-13	-25.45
9890.400	-36.41	-13	-23.41
10714.600	-37.77	-13	-24.77
13187.200	-37.80	-13	-24.80
14011.400	-37.25	-13	-24.25
14835.600	-37.78	-13	-24.78
15659.800	-37.56	-13	-24.56
18132.400	-37.02	-13	-24.02
18956.600	-37.64	-13	-24.64
19780.800	-37.21	-13	-24.21
20605.000	-36.87	-13	-23.87

CH188

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
185.561	-36.68	-13	-23.68
451.282	-35.58	-13	-22.58
1673.077	-20.24	-13	-7.24
2509.615	-25.40	-13	-12.40
3346.154	-32.91	-13	-19.91
4181.000	-34.78	-13	-21.78
5017.200	-37.51	-13	-24.51
5853.400	-38.42	-13	-25.42
6689.600	-38.48	-13	-25.48
8362.000	-36.66	-13	-23.66
9198.200	-37.19	-13	-24.19
10034.400	-37.38	-13	-24.38
10870.600	-37.11	-13	-24.11
13379.200	-37.95	-13	-24.95
14215.400	-37.26	-13	-24.26
15051.600	-36.93	-13	-23.93
15887.800	-36.91	-13	-23.91
18396.400	-36.73	-13	-23.73
19232.600	-36.42	-13	-23.42
20068.800	-36.94	-13	-23.94
20905.000	-36.36	-13	-23.36

CH251

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
53.157	-35.99	-13	-22.99
621.795	-36.13	-13	-23.13
1697.115	-23.03	-13	-10.03
2548.077	-26.96	-13	-13.96
3399.038	-32.76	-13	-19.76
4244.000	-37.25	-13	-24.25
5092.800	-38.20	-13	-25.20
5941.600	-38.10	-13	-25.10
6790.400	-37.57	-13	-24.57
8488.000	-38.51	-13	-25.51
9336.800	-36.74	-13	-23.74
10185.600	-37.75	-13	-24.75
11034.400	-37.54	-13	-24.54
13580.800	-37.18	-13	-24.18
14429.600	-37.68	-13	-24.68
15278.400	-37.23	-13	-24.23
16127.200	-37.18	-13	-24.18
18673.600	-37.17	-13	-24.17
19522.400	-37.98	-13	-24.98
20371.200	-37.03	-13	-24.03
21220.000	-37.33	-13	-24.33

850 Band Idle

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
82.035	-44.14	-13	-31.14
747.436	-43.20	-13	-30.20
3600.962	-44.11	-13	-31.11
5397.436	-44.99	-13	-31.99
11052.484	-44.37	-13	-31.37
15669.471	-44.34	-13	-31.34
26404.647	-43.24	-13	-30.24

CH512

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
128.349	-36.06	-13	-23.06
935.897	-35.73	-13	-22.73
3706.731	-26.37	-13	-13.37
5551.282	-33.71	-13	-20.71
7400.800	-38.33	-13	-25.33
9251.000	-35.93	-13	-22.93
11101.200	-38.54	-13	-25.54
12951.400	-37.62	-13	-24.62
14801.600	-35.89	-13	-22.89
16651.800	-37.16	-13	-24.16
17789.600	-37.40	-13	-24.40
18502.000	-36.56	-13	-23.56
20352.200	-35.80	-13	-22.80
22202.400	-36.31	-13	-23.31
24052.600	-35.99	-13	-22.99

CH661

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
121.811	-35.61	-13	-22.61
603.846	-35.34	-13	-22.34
3764.423	-27.20	-13	-14.20
5641.026	-31.74	-13	-18.74
7539.231	-36.57	-13	-23.57
9400.000	-31.38	-13	-18.38
11280.000	-35.20	-13	-22.20
13160.000	-36.89	-13	-23.89
15040.000	-37.29	-13	-24.29
16920.000	-36.80	-13	-23.80
18800.000	-36.42	-13	-23.42
20680.000	-36.75	-13	-23.75
22560.000	-36.50	-13	-23.50
24810.000	-35.17	-13	-22.17

CH810

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
147.965	-35.53	-13	-22.53
782.051	-34.87	-13	-21.87
3822.115	-31.03	-13	-18.03
5730.769	-32.40	-13	-19.40
7639.200	-38.36	-13	-25.36
9549.000	-38.45	-13	-25.45
11458.000	-36.93	-13	-23.93
13368.600	-36.25	-13	-23.25
15278.400	-37.15	-13	-24.15
17188.200	-36.36	-13	-23.36
19098.000	-37.46	-13	-24.46
21007.800	-37.11	-13	-24.11
22917.600	-35.65	-13	-22.65
24827.400	-35.52	-13	-22.52

1900 Band Idle

Frequency (MHz)	Power Measured (dBm)	Compliance Limit (dBm)	Margin (dB)
171.122	-36.19	-13	-23.19
943.590	-36.03	-13	-23.03
3596.154	-35.49	-13	-22.49
5993.590	-37.66	-13	-24.66
11219.952	-36.06	-13	-23.06
16342.548	-35.59	-13	-22.59
24688.301	-34.92	-13	-21.92

Test equipment: ETSTW-RE 055, ETSTW-GSM 02
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 P (P = transmitter power in Watts).

The compliance limit was calculated as an example per the following:
Maximum transmitter output power: P=0.86099375 Watts
Required attenuation: A=43 + 10 log P
Limit for Spurious Emissions at Antenna Terminals: L=P-A=-13dBm

7. Field Strength of Spurious Radiation

7.1 Test procedure

The test procedure for filed 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.

CH128_ DC 3.7 V

Model: SPT10 Date: 2008/12/18
Mode: Active ch128 Temperature: 24 ˚C Engineer: Jeff
Polarization: Horizontal Humidity: 51 %

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
84.649	-91.35	25.32	-66.03	-13.00	-53.03	174	150
579.158	-102.78	33.47	-69.31	-13.00	-56.31	274	150
1649.299	-35.84	4.05	-31.79	-13.00	-18.79	230	150
2472.946	-46.07	6.75	-39.32	-13.00	-26.32	106	150
3296.593	-59.08	11.26	-47.82	-13.00	-34.82	114	150
4120.240	-48.36	10.37	-37.99	-13.00	-24.99	244	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
73.828	-87.33	24.31	-63.02	-13.00	-50.02	107	150
709.619	-102.30	33.27	-69.03	-13.00	-56.03	174	150
1649.299	-29.15	3.60	-25.55	-13.00	-12.55	247	150
2472.946	-48.22	4.66	-43.56	-13.00	-30.56	156	150
3296.800	-61.61	9.04	-52.57	-13.00	-39.57	334	150
4120.240	-49.38	8.59	-40.79	-13.00	-27.79	231	150

CH128_ DC 3.6 V

Mode: Active ch128

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
89.519	-90.01	24.87	-65.14	-13.00	-52.14	214	150
565.130	-102.99	33.16	-69.83	-13.00	-56.83	197	150
1649.299	-36.70	4.05	-32.65	-13.00	-19.65	247	150
2472.946	-44.55	6.75	-37.80	-13.00	-24.80	152	150
3296.593	-57.33	11.26	-46.07	-13.00	-33.07	112	150
4120.240	-53.16	10.37	-42.79	-13.00	-29.79	224	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
73.828	-87.33	24.31	-63.02	-13.00	-50.02	241	150
645.090	-103.68	31.74	-71.94	-13.00	-58.94	107	150
1649.299	-29.76	3.60	-26.16	-13.00	-13.16	124	150
2472.946	-48.62	4.66	-43.96	-13.00	-30.96	310	150
3296.800	-61.97	9.04	-52.93	-13.00	-39.93	226	150
4120.240	-49.42	8.59	-40.83	-13.00	-27.83	321	150

CH188_ DC 3.7 V

Mode: Active ch188

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
83.026	-90.75	25.48	-65.27	-13.00	-52.27	317	150
597.395	-102.34	33.10	-69.24	-13.00	-56.24	204	150
1673.347	-30.64	5.09	-25.55	-13.00	-12.55	134	150
2509.800	-62.66	7.23	-55.43	-13.00	-42.43	331	150
3344.689	-47.61	11.52	-36.09	-13.00	-23.09	206	150
4176.353	-49.81	10.07	-39.74	-13.00	-26.74	138	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
103.587	-90.34	23.80	-66.54	-13.00	-53.54	347	150
649.299	-102.36	31.97	-70.39	-13.00	-57.39	107	150
1673.347	-26.47	4.33	-22.14	-13.00	-9.14	237	150
2509.800	-62.15	4.86	-57.29	-13.00	-44.29	304	150
3344.689	-54.00	9.38	-44.62	-13.00	-31.62	109	150
4176.353	-47.10	8.36	-38.74	-13.00	-25.74	241	150

CH188_ DC 3.6 V

Mode: Active ch188

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
84.108	-91.85	25.37	-66.48	-13.00	-53.48	247	150
559.519	-101.92	33.01	-68.91	-13.00	-55.91	184	150
1673.347	-30.77	5.09	-25.68	-13.00	-12.68	106	150
2509.800	-62.65	7.23	-55.42	-13.00	-42.42	226	150
3344.689	-46.20	11.52	-34.68	-13.00	-21.68	341	150
4176.353	-48.07	10.07	-38.00	-13.00	-25.00	138	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
64.629	-91.33	23.88	-67.45	-13.00	-54.45	207	150
493.587	-103.35	29.51	-73.84	-13.00	-60.84	297	150
1673.347	-25.34	4.33	-21.01	-13.00	-8.01	234	150
2509.800	-63.12	4.86	-58.26	-13.00	-45.26	337	150
3344.689	-52.84	9.38	-43.46	-13.00	-30.46	147	150
4176.353	-45.64	8.36	-37.28	-13.00	-24.28	127	150

CH251_ DC 3.7 V

Mode: Active ch 251

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
92.766	-90.63	24.44	-66.19	-13.00	-53.19	317	150
567.936	-103.79	33.22	-70.57	-13.00	-57.57	307	150
1697.395	-30.26	6.13	-24.13	-13.00	-11.13	244	150
2472.946	-50.97	6.75	-44.22	-13.00	-31.22	127	150
3398.798	-47.16	11.76	-35.40	-13.00	-22.40	334	150
4240.481	-56.90	9.64	-47.26	-13.00	-34.26	234	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
117.655	-89.75	22.93	-66.82	-13.00	-53.82	241	150
500.601	-101.82	29.54	-72.28	-13.00	-59.28	244	150
1697.395	-25.05	5.07	-19.98	-13.00	-6.98	127	150
2546.400	-63.87	5.32	-58.55	-13.00	-45.55	244	150
3398.798	-53.86	9.77	-44.09	-13.00	-31.09	331	150
4240.481	-58.18	7.33	-50.85	-13.00	-37.85	271	150

CH251_ DC 3.6 V

Mode: Active ch251

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
91.142	-91.01	24.66	-66.35	-13.00	-53.35	167	150
573.547	-102.67	33.35	-69.32	-13.00	-56.32	154	150
1697.395	-27.05	6.13	-20.92	-13.00	-7.92	225	150
2546.400	-64.14	8.07	-56.07	-13.00	-43.07	331	150
3398.798	-47.72	11.76	-35.96	-13.00	-22.96	109	150
4240.481	-59.42	9.64	-49.78	-13.00	-36.78	341	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
93.848	-91.10	24.65	-66.45	-13.00	-53.45	147	150
517.435	-102.38	29.43	-72.95	-13.00	-59.95	274	150
1697.395	-25.55	5.07	-20.48	-13.00	-7.48	127	150
2509.800	-62.43	4.86	-57.57	-13.00	-44.57	204	150
3398.798	-54.52	9.77	-44.75	-13.00	-31.75	314	150
4240.481	-57.11	7.33	-49.78	-13.00	-36.78	127	150

850 Band Idle Mode_ DC 3.7 V

Mode: Idle

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
90.060	3.60	peak	10.58	14.18	43.50	-29.32	325	150
221.002	6.33	peak	12.58	18.91	46.00	-27.09	110	150
416.433	7.20	peak	18.13	25.33	46.00	-20.67	297	150
631.062	7.36	peak	22.41	29.77	46.00	-16.23	310	150
806.413	5.24	peak	25.24	30.48	46.00	-15.52	245	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
3146.293	49.21	---	-2.35	46.86	---	74.00	54.00	-27.14	124	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
36.493	8.39	peak	13.33	21.72	40.00	-18.28	241	150
152.285	1.10	peak	15.41	16.51	43.50	-26.99	107	150
466.934	7.61	peak	19.28	26.89	46.00	-19.11	209	150
692.786	8.20	peak	23.29	31.49	46.00	-14.51	341	150
802.204	7.09	peak	25.17	32.26	46.00	-13.74	334	150

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)
3146.293	45.17	---	-2.35	42.82	---	74.00	54.00	-31.18	112	150

850 Band Idle Mode_ DC 3.6 V

Mode: Idle

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
90.060	3.80	peak	10.58	14.38	43.50	-29.12	355	150
268.617	7.83	peak	14.41	22.24	46.00	-23.76	114	150
445.892	7.22	peak	18.85	26.07	46.00	-19.93	316	150
633.868	8.45	peak	22.46	30.91	46.00	-15.09	247	150
807.816	5.56	peak	25.26	30.82	46.00	-15.18	153	150

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)
3146.293	49.03	---	-2.35	46.68	---	74.00	54.00	-27.32	234	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
35.952	9.17	peak	13.30	22.47	40.00	-17.53	132	150
186.373	5.81	peak	13.21	19.02	43.50	-24.48	314	150
458.517	7.75	peak	19.08	26.83	46.00	-19.17	237	150
701.202	9.34	peak	23.46	32.80	46.00	-13.20	164	150
875.150	7.91	peak	25.74	33.65	46.00	-12.35	334	150

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)
1841.683	44.24	---	-8.33	35.91	---	74.00	54.00	-38.09	241	150

CH512_ DC 3.7 V

Mode: Active ch 512

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
95.471	-91.23	24.08	-67.15	-13.00	-54.15	174	150
618.437	-101.79	32.89	-68.90	-13.00	-55.90	307	150
3705.411	-54.16	11.63	-42.53	-13.00	-29.53	124	150
5547.094	-56.09	12.76	-43.33	-13.00	-30.33	103	150
7406.814	-51.10	11.59	-39.51	-13.00	-26.51	366	150
9251.000	-81.46	31.06	-50.40	-13.00	-37.40	247	150
11101.200	-81.14	34.61	-46.53	-13.00	-33.53	109	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
121.984	-89.52	22.75	-66.77	-13.00	-53.77	214	150
544.088	-102.03	29.43	-72.60	-13.00	-59.60	109	150
3705.411	-55.62	9.98	-45.64	-13.00	-32.64	230	150
5547.094	-55.28	10.90	-44.38	-13.00	-31.38	352	150
7406.814	-59.88	10.97	-48.91	-13.00	-35.91	153	150
9251.000	-81.76	30.20	-51.56	-13.00	-38.56	214	150
11101.200	-81.29	33.48	-47.80	-13.00	-34.80	112	150

CH512_ DC 3.6 V

Mode: Active ch 512

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
101.964	-90.83	23.29	-67.54	-13.00	-54.54	247	150
855.511	-102.97	35.79	-67.18	-13.00	-54.18	317	150
3705.411	-50.53	11.63	-38.90	-13.00	-25.90	164	150
5547.094	-54.56	12.76	-41.80	-13.00	-28.80	230	150
7406.814	-51.04	11.59	-39.45	-13.00	-26.45	169	150
9251.000	-81.92	31.06	-50.86	-13.00	-37.86	287	150
11101.200	-81.13	34.61	-46.52	-13.00	-33.52	331	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
127.395	-89.60	22.63	-66.97	-13.00	-53.97	241	150
702.605	-102.68	33.48	-69.20	-13.00	-56.20	197	150
3705.411	-54.72	9.98	-44.74	-13.00	-31.74	211	150
5547.094	-54.00	10.90	-43.10	-13.00	-30.10	106	150
7406.814	-60.20	10.97	-49.23	-13.00	-36.23	341	150
9251.000	-81.46	30.20	-51.26	-13.00	-38.26	214	150
11101.2.00	-77.59	33.48	-44.10	-13.00	-31.10	329	150

CH661_ DC 3.7 V

Mode: Active ch 661

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
218.297	-89.90	25.68	-64.22	-13.00	-51.22	145	150
597.395	-101.82	33.10	-68.72	-13.00	-55.72	234	150
3765.531	-52.92	11.91	-41.01	-13.00	-28.01	214	150
5643.287	-51.98	12.40	-39.58	-13.00	-26.58	241	150
7527.054	-50.29	11.94	-38.35	-13.00	-25.35	344	150
9400.000	-81.33	30.09	-51.25	-13.00	-38.25	214	150
11280.000	-78.17	34.51	-43.66	-13.00	-30.66	351	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
75.992	-91.03	24.74	-66.29	-13.00	-53.29	335	150
769.940	-101.10	32.16	-68.94	-13.00	-55.94	109	150
3759.519	-53.83	9.65	-44.18	-13.00	-31.18	234	150
5635.270	-52.81	10.50	-42.31	-13.00	-29.31	354	150
7527.054	-57.58	11.33	-46.25	-13.00	-33.25	125	150
9400.000	-80.84	29.88	-50.96	-13.00	-37.96	235	150
11280.000	-76.05	32.93	-43.12	-13.00	-30.12	156	150

CH661_ DC 3.6 V

Mode: Active ch 661

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
198.277	-89.56	24.97	-64.59	-13.00	-51.59	113	150
583.367	-103.04	33.41	-69.63	-13.00	-56.63	237	150
3759.519	-54.83	11.89	-42.94	-13.00	-29.94	315	150
5643.287	-50.24	12.40	-37.84	-13.00	-24.84	323	150
7519.038	-49.83	11.92	-37.91	-13.00	-24.91	106	150
9400.000	-81.14	30.09	-51.06	-13.00	-38.06	234	150
11280.000	-81.22	34.51	-46.71	-13.00	-33.71	137	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
129.559	-89.23	22.58	-66.65	-13.00	-53.65	297	150
549.699	-102.68	29.46	-73.22	-13.00	-60.22	347	150
3759.519	-53.34	9.65	-43.69	-13.00	-30.69	241	150
5643.287	-49.99	10.50	-39.49	-13.00	-26.49	234	150
7519.038	-57.78	11.33	-46.45	-13.00	-33.45	106	150
9400.000	-81.39	29.88	-51.51	-13.00	-38.51	232	150
11280.000	-80.56	32.93	-47.63	-13.00	-34.63	331	150

CH810_ DC 3.7 V

Mode: Active ch 810

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
175.010	-89.13	24.93	-64.20	-13.00	-51.20	162	150
632.465	-102.31	32.78	-69.53	-13.00	-56.53	145	150
3819.639	-53.52	12.20	-41.32	-13.00	-28.32	241	150
5731.463	-54.84	13.15	-41.69	-13.00	-28.69	234	150
7639.279	-62.83	11.58	-51.25	-13.00	-38.25	167	150
9542.084	-76.38	31.58	-44.80	-13.00	-31.80	234	150
11464.930	-74.80	34.80	-40.00	-13.00	-27.00	167	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
177.174	-89.54	25.82	-63.72	-13.00	-50.72	107	150
584.770	-102.14	29.40	-72.74	-13.00	-59.74	234	150
3819.639	-52.76	9.77	-42.99	-13.00	-29.99	210	150
5731.463	-51.44	10.88	-40.56	-13.00	-27.56	324	150
7639.200	-65.50	11.08	-54.42	-13.00	-41.42	106	150
9551.603	-74.10	29.21	-44.89	-13.00	-31.89	234	150
11464.930	-76.59	33.12	-43.47	-13.00	-30.47	169	150

CH810_ DC 3.6 V

Mode: Active ch 810

Polarization: Horizontal

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
93.848	-90.25	24.30	-65.95	-13.00	-52.95	103	150
615.631	-102.14	32.91	-69.23	-13.00	-56.23	106	150
3819.639	-53.47	12.20	-41.27	-13.00	-28.27	217	150
5731.463	-49.83	13.15	-36.68	-13.00	-23.68	324	150
7639.200	-65.19	11.58	-53.61	-13.00	-40.61	314	150
9551.603	-73.05	31.71	-41.34	-13.00	-28.34	349	150
11458.800	-80.74	34.86	-45.88	-13.00	-32.88	314	150

Polarization: Vertical

Frequency (MHz)	Reading (dBm) Peak	Factor (dB) Corr.	Result (dBm)	Limit (dBm)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
100.882	-90.03	23.97	-66.06	-13.00	-53.06	174	150
510.421	-102.22	29.47	-72.75	-13.00	-59.75	167	150
3819.639	-53.00	9.77	-43.23	-13.00	-30.23	234	150
5731.463	-54.30	10.88	-43.42	-13.00	-30.42	310	150
7639.279	-62.48	11.07	-51.41	-13.00	-38.41	264	150
9542.084	-74.38	29.28	-45.10	-13.00	-32.10	234	150
11464.930	-71.32	33.12	-38.20	-13.00	-25.20	103	150

1900 Band Idle Mode_ DC 3.7 V

Mode: Idle

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
43.527	0.23	peak	13.65	13.88	40.00	-26.12	237	150
207.475	6.42	peak	12.29	18.71	43.50	-24.79	112	150
500.601	6.70	peak	19.82	26.52	46.00	-19.48	237	150
698.397	7.25	peak	23.40	30.65	46.00	-15.35	341	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
1943.888	57.55	---	-7.92	49.63	---	74.00	54.00	-24.37	249	150
3146.293	49.76	---	-2.35	47.41	---	74.00	54.00	-26.59	230	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
35.952	9.20	peak	13.30	22.50	40.00	-17.50	247	150
199.900	6.15	peak	12.15	18.30	43.50	-25.20	325	150
475.351	7.92	peak	19.48	27.40	46.00	-18.60	237	150
837.275	6.88	peak	25.56	32.44	46.00	-13.56	108	150

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
1943.888	46.01	---	-7.92	38.09	---	74.00	54.00	-35.91	167	150
3146.293	44.79	---	-2.35	42.44	---	74.00	54.00	-31.56	341	150

1900 Band Idle Mode_ DC 3.6 V

Mode: Idle
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
115.491	2.85	peak	12.94	15.79	43.50	-27.71	109	150
184.750	5.41	peak	13.42	18.83	43.50	-24.67	331	150
532.866	6.24	peak	20.36	26.60	46.00	-19.40	274	150
828.858	4.37	peak	25.54	29.91	46.00	-16.09	106	150

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)
1943.888	57.25	---	-7.92	49.33	---	74.00	54.00	-24.67	214	150
3146.293	49.24	---	-2.35	46.89	---	74.00	54.00	-27.11	237	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
36.493	8.73	peak	13.33	22.06	40.00	-17.94	241	150
212.886	7.41	peak	12.39	19.80	43.50	-23.70	106	150
476.754	8.03	peak	19.51	27.54	46.00	-18.46	267	150
793.788	7.22	peak	25.05	32.27	46.00	-13.73	106	150

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)
1943.888	44.92	---	-7.92	37.00	---	74.00	54.00	-37.00	334	150
3146.293	44.40	---	-2.35	42.05	---	74.00	54.00	-31.95	120	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

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 P (P = transmitter power in Watts).

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

Maximum transmitter radiated power: P=0.3013 watt

Required attenuation: A=43 + 10 log P

Limit for Spurious Emissions at Antenna Terminals: L=P-A=-13dBm

Test equipment: ETSTW-RE 003, ETSTW-RE 017, ETSTW-RE 018, ETSTW-RE 042, ETSTW-RE 043, ETSTW-GSM 02

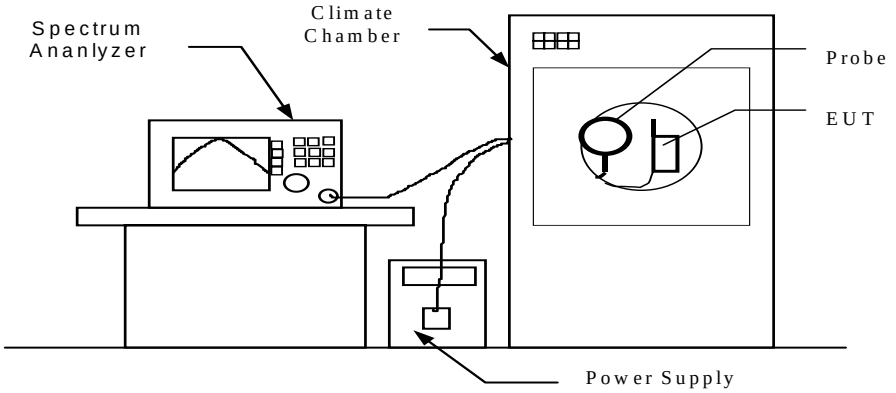
8. Frequency Stability

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.



8.2 Test Results

8.2.1 Frequency Stability vs. Temperature

CH128 824.2 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	-0.025	-0.0303	±2.5
	-20	-0.023	-0.0279	
	-10	-0.030	-0.0364	
	0	-0.029	-0.0352	
	10	-0.010	-0.0121	
	20	-0.014	-0.0170	
	30	-0.019	-0.0231	
	40	-0.015	-0.0182	
	50	-0.020	-0.0243	

CH188 836.2 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	-0.018	-0.0215	±2.5
	-20	-0.019	-0.0227	
	-10	-0.018	-0.0215	
	0	0.015	0.0179	
	10	0.013	0.0155	
	20	0.017	0.0203	
	30	0.015	0.0179	
	40	0.014	0.0167	
	50	0.009	0.0108	

CH251 848.8 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	-0.017	-0.0200	±2.5
	-20	-0.014	-0.0165	
	-10	-0.020	-0.0236	
	0	0.017	0.0200	
	10	0.017	0.0200	
	20	0.043	0.0507	
	30	0.013	0.0153	
	40	-0.017	-0.0200	
	50	-0.016	-0.0189	

CH512 1850.2 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	0.036	0.0195	±2.5
	-20	-0.032	-0.0173	
	-10	-0.025	-0.0135	
	0	-0.034	-0.0184	
	10	0.035	0.0189	
	20	0.026	0.0141	
	30	0.022	0.0119	
	40	-0.026	-0.0141	
	50	-0.032	-0.0173	

CH661 1880.0 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	-0.044	-0.0234	±2.5
	-20	0.025	0.0133	
	-10	0.033	0.0176	
	0	0.026	0.0138	
	10	0.024	0.0128	
	20	-0.041	-0.0218	
	30	-0.029	-0.0154	
	40	-0.033	-0.0176	
	50	-0.035	-0.0186	

CH810 1909.8 MHz

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
DC 3.7 V	-30	-0.035	-0.0183	±2.5
	-20	0.019	0.0099	
	-10	0.024	0.0126	
	0	-0.045	-0.0236	
	10	-0.042	-0.0220	
	20	-0.054	-0.0283	
	30	-0.064	-0.0335	
	40	-0.056	-0.0293	
	50	-0.053	-0.0278	

8.2.2 Frequency Stability vs. Voltage

CH128

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	0.019	0.0231	±2.5

CH188

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	0.013	0.0155	±2.5

CH251

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	0.013	0.0153	±2.5

CH512

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	0.064	0.0346	±2.5

CH661

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	-0.03	-0.0160	±2.5

CH810

Supplied Voltage	Temperature (°C)	Frequency Drift (kHz)	Frequency Drift (ppm)	Limit (ppm)
End Point Voltage DC 3.6 V	25	-0.061	-0.0319	±2.5

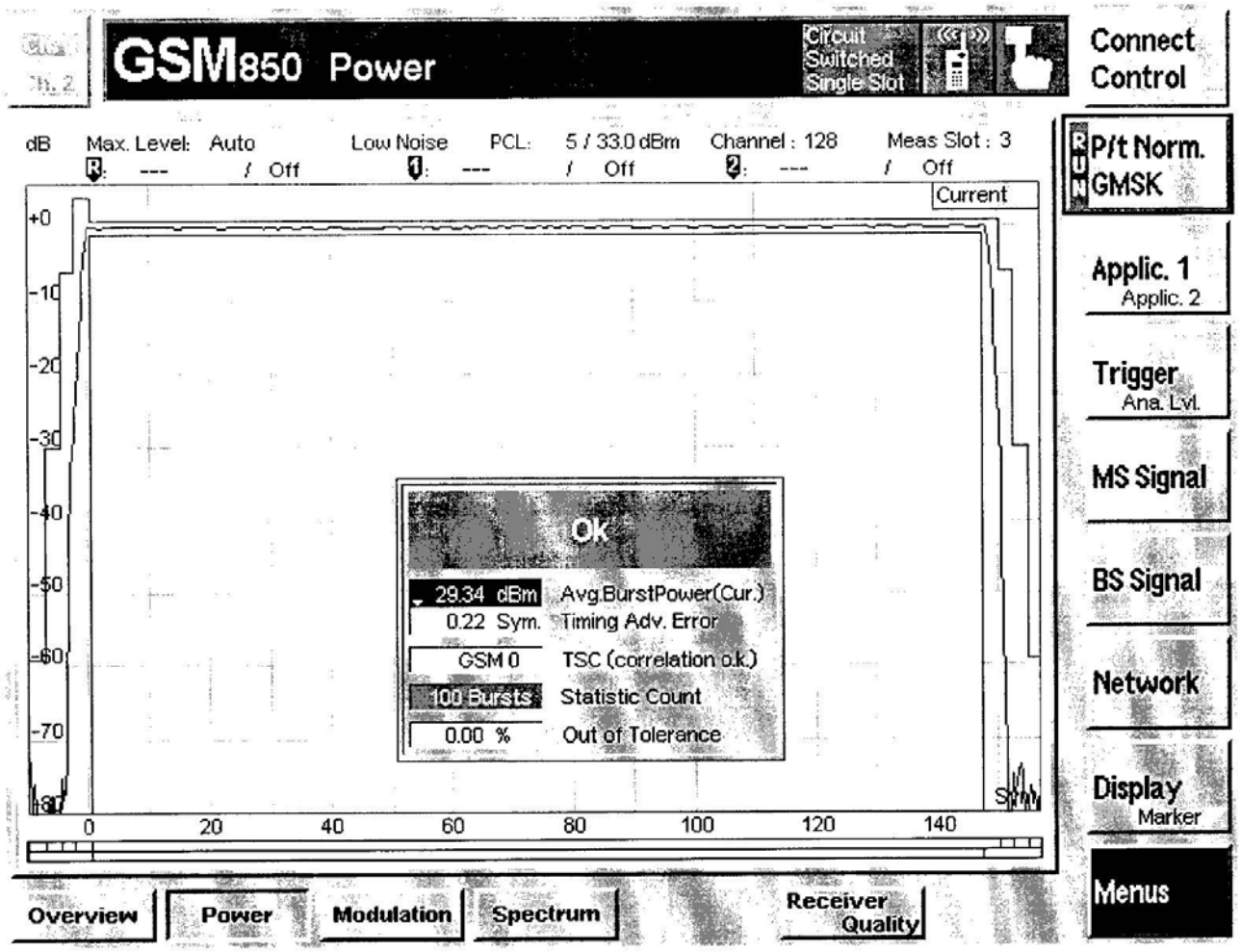
Test equipment: ETSTW-CE009, ETSTW-RE055, ETSTW-GSM 02

Appendix

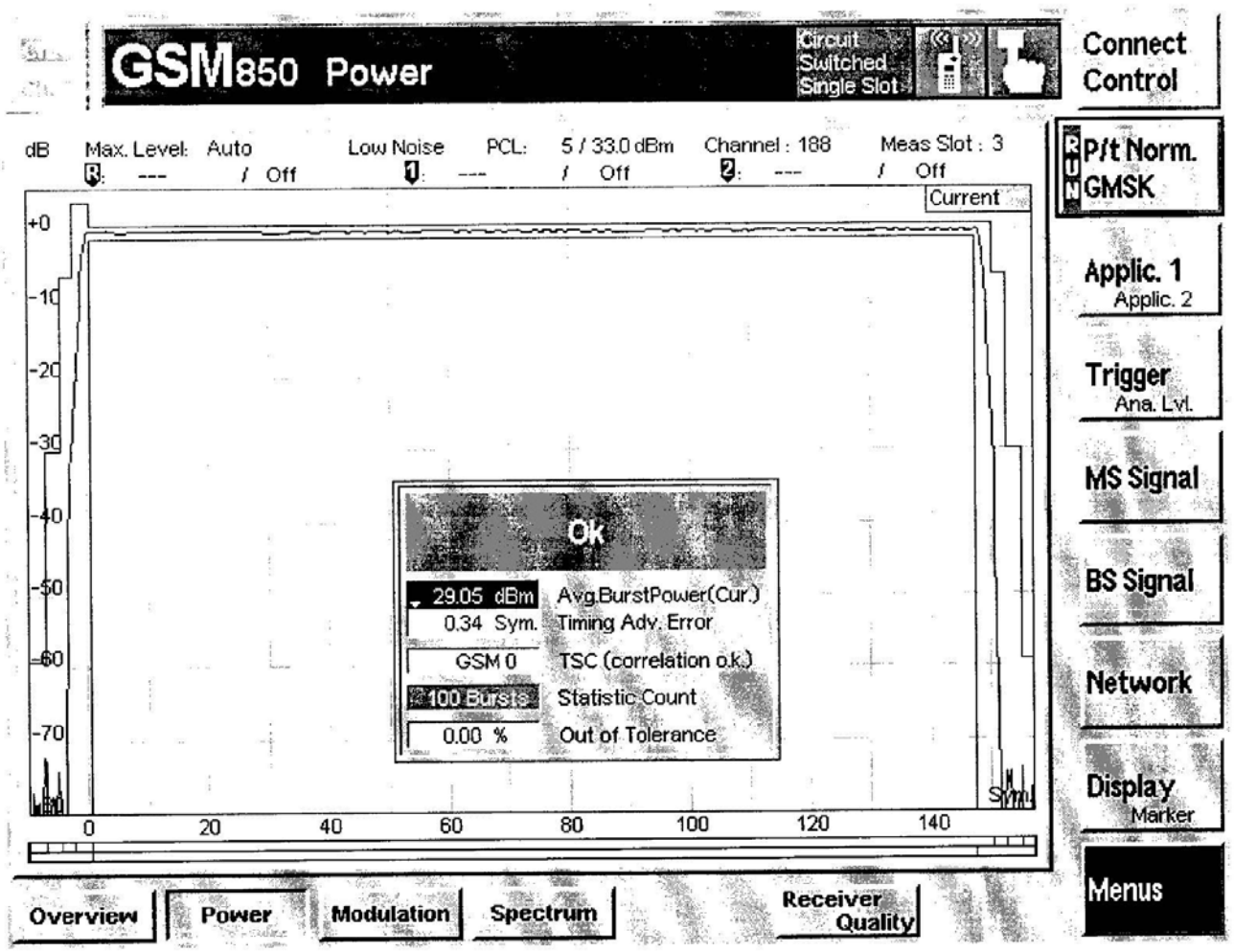
Measurement diagrams

1. RF Power Output
2. Occupied Bandwidth / Emission Mask
3. Spurious Emissions at Antenna Terminals
4. Filed Strength of Spurious Emission

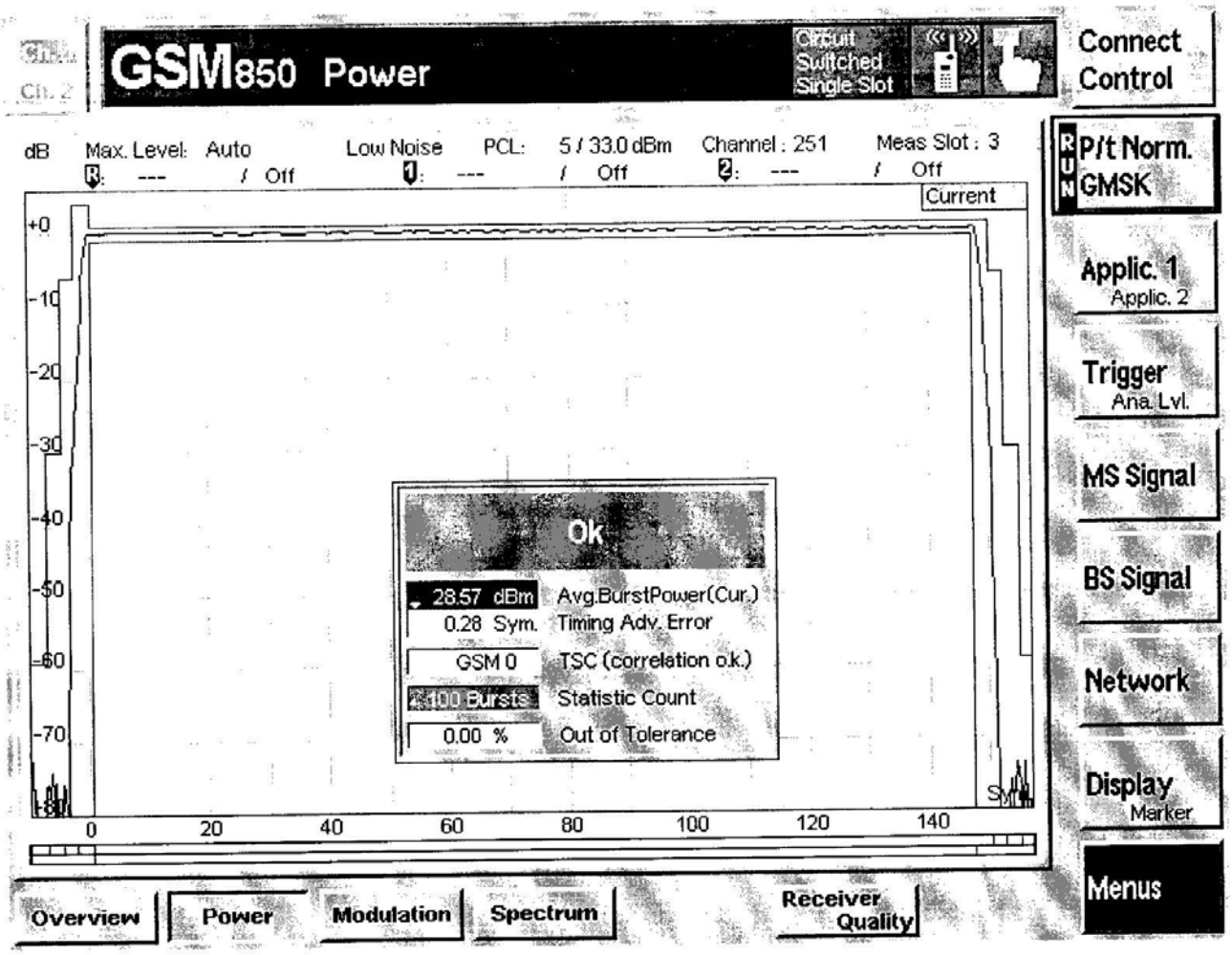
RF Power Output
Conducted Measurement
850 band_ CH 128_3.7 V



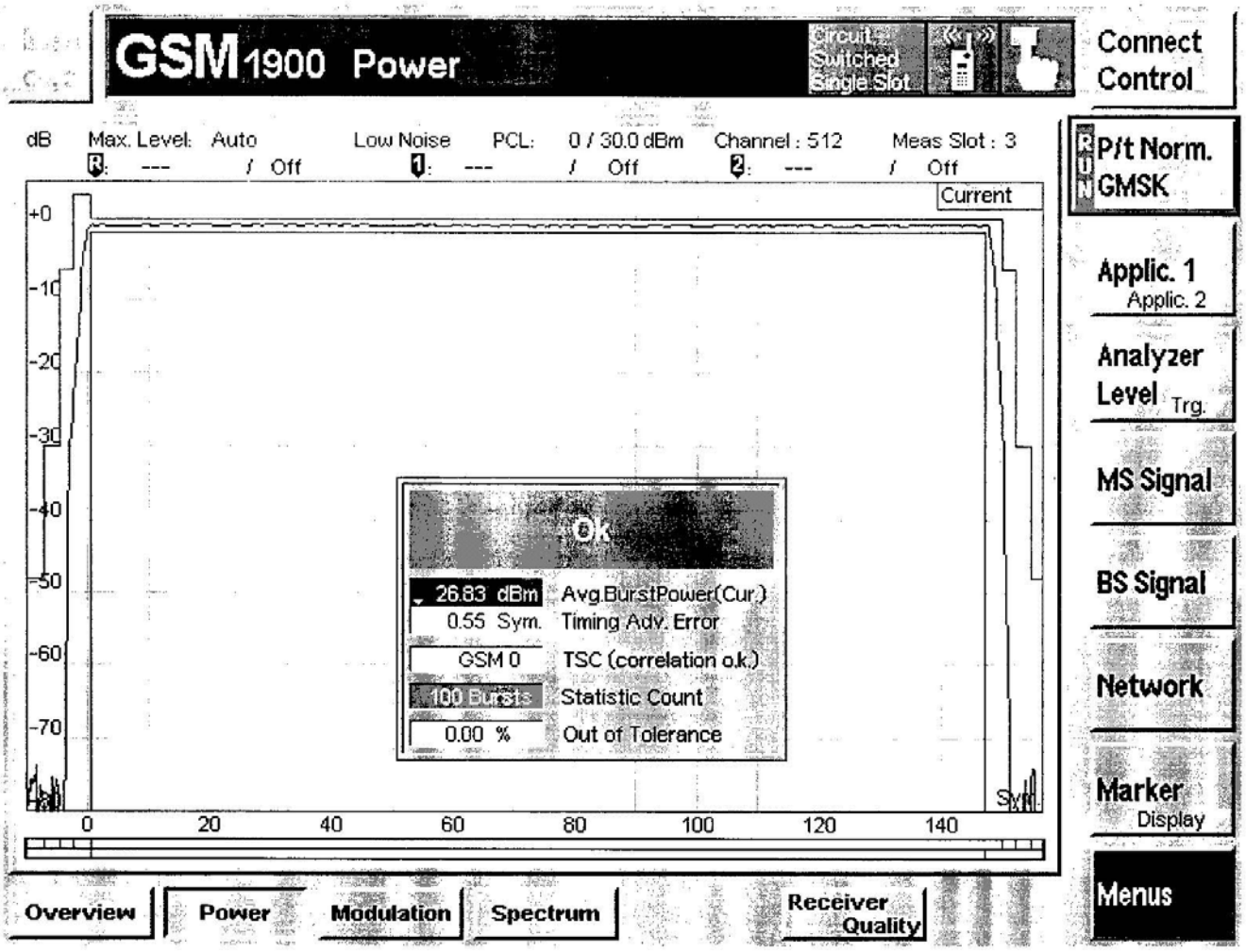
850 band_ CH 188_3.7 V



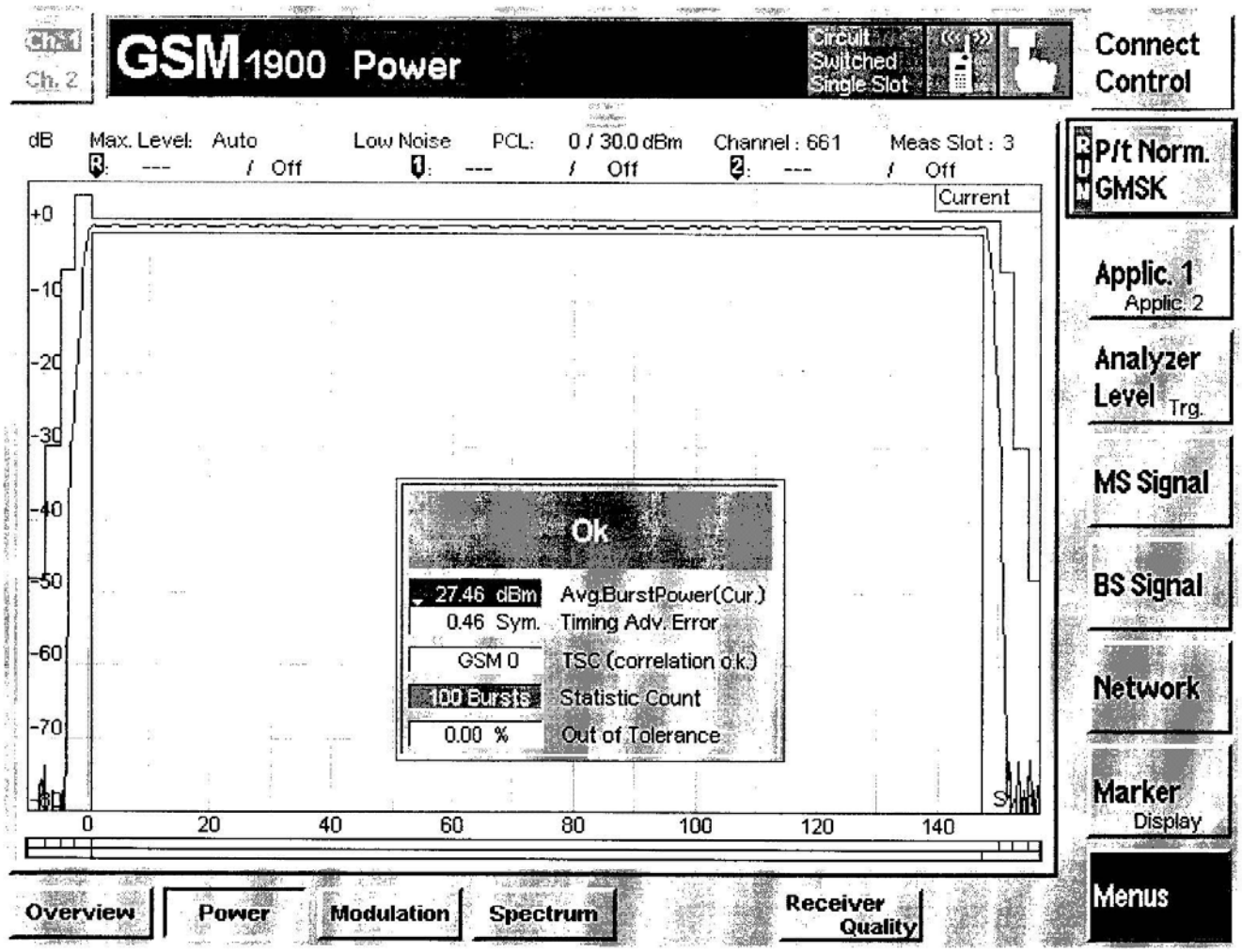
850 band_ CH 251_3.7 V



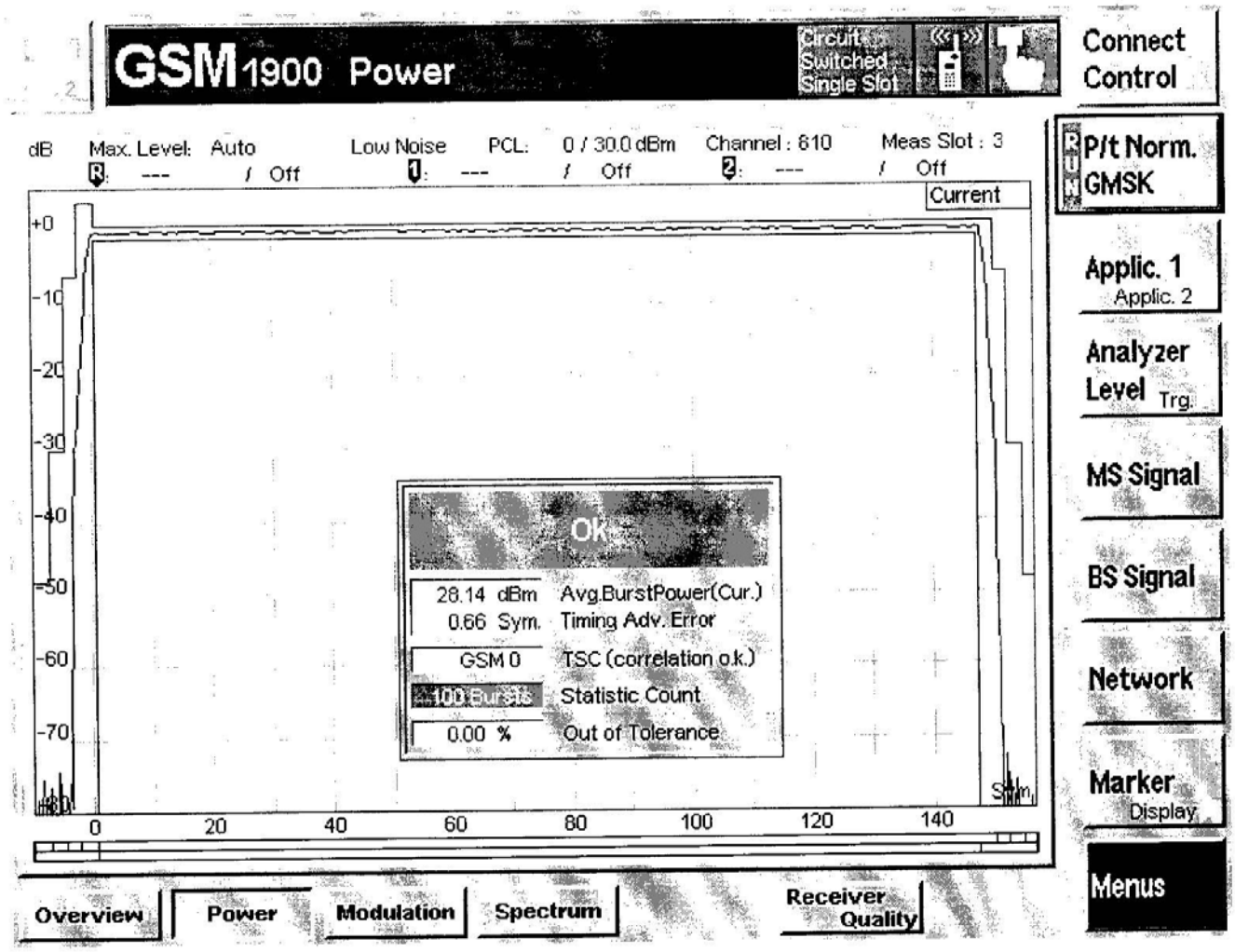
1900 band_ CH 512_3.7 V



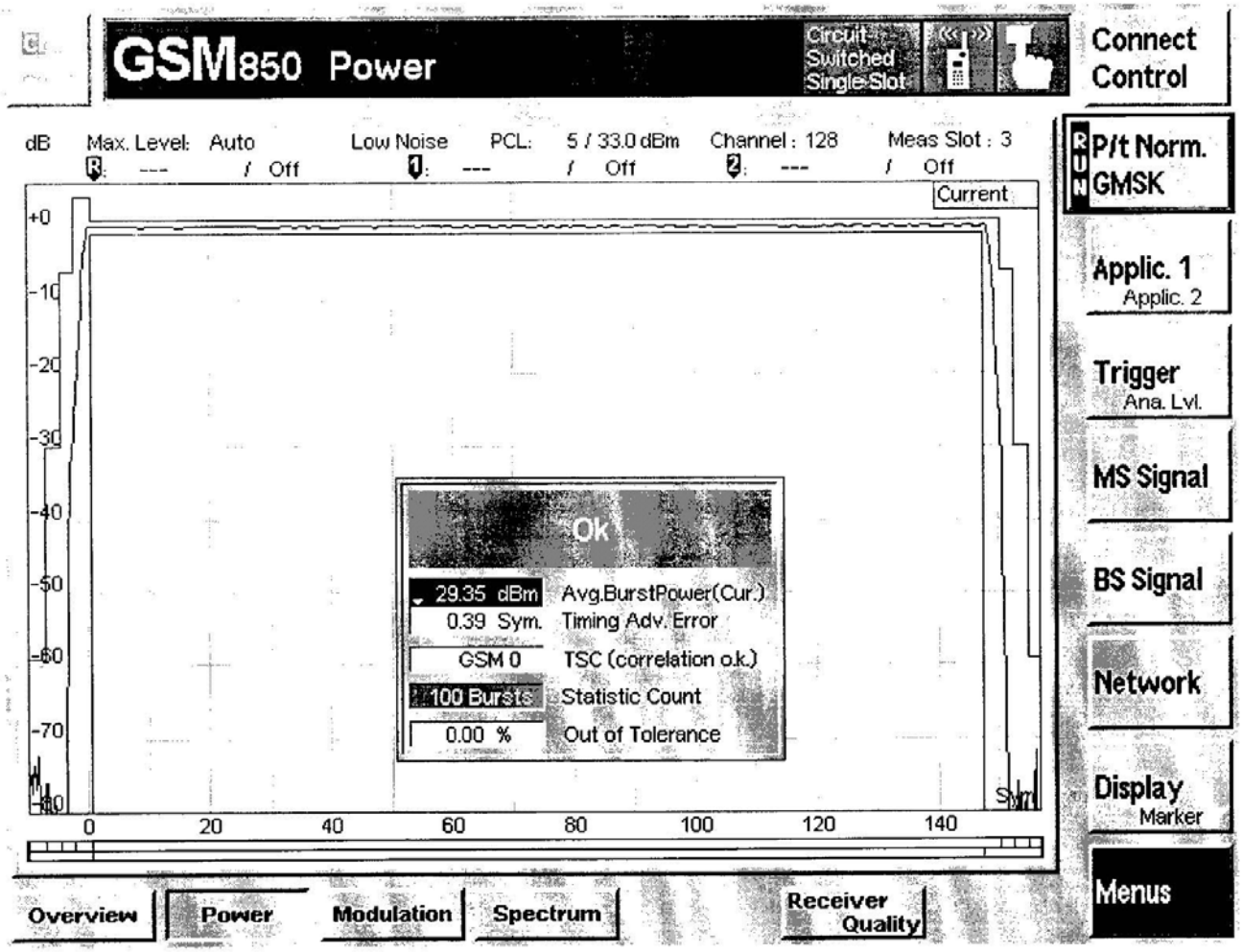
1900 band_ CH 661_3.7 V



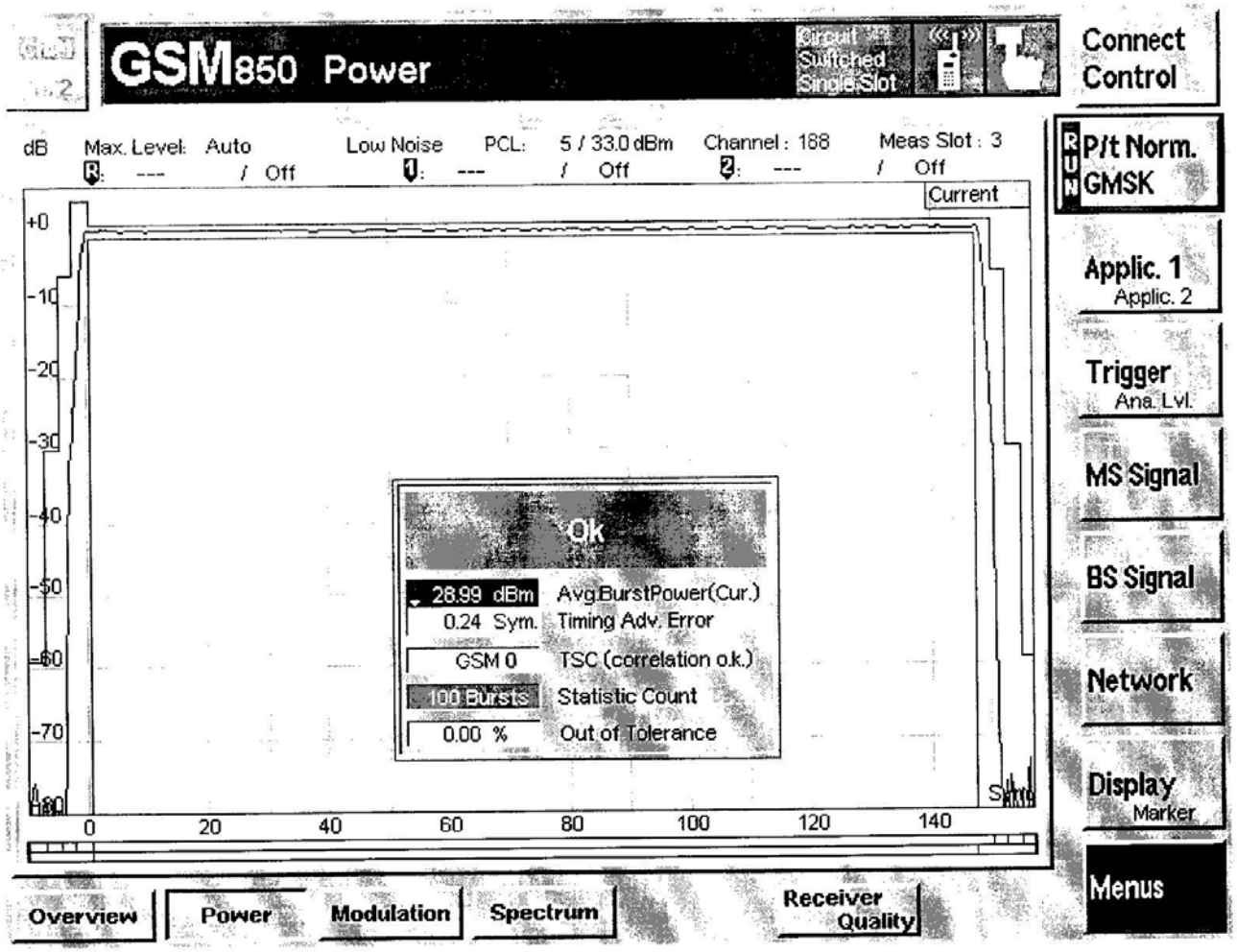
1900 band_ CH 810_3.7 V



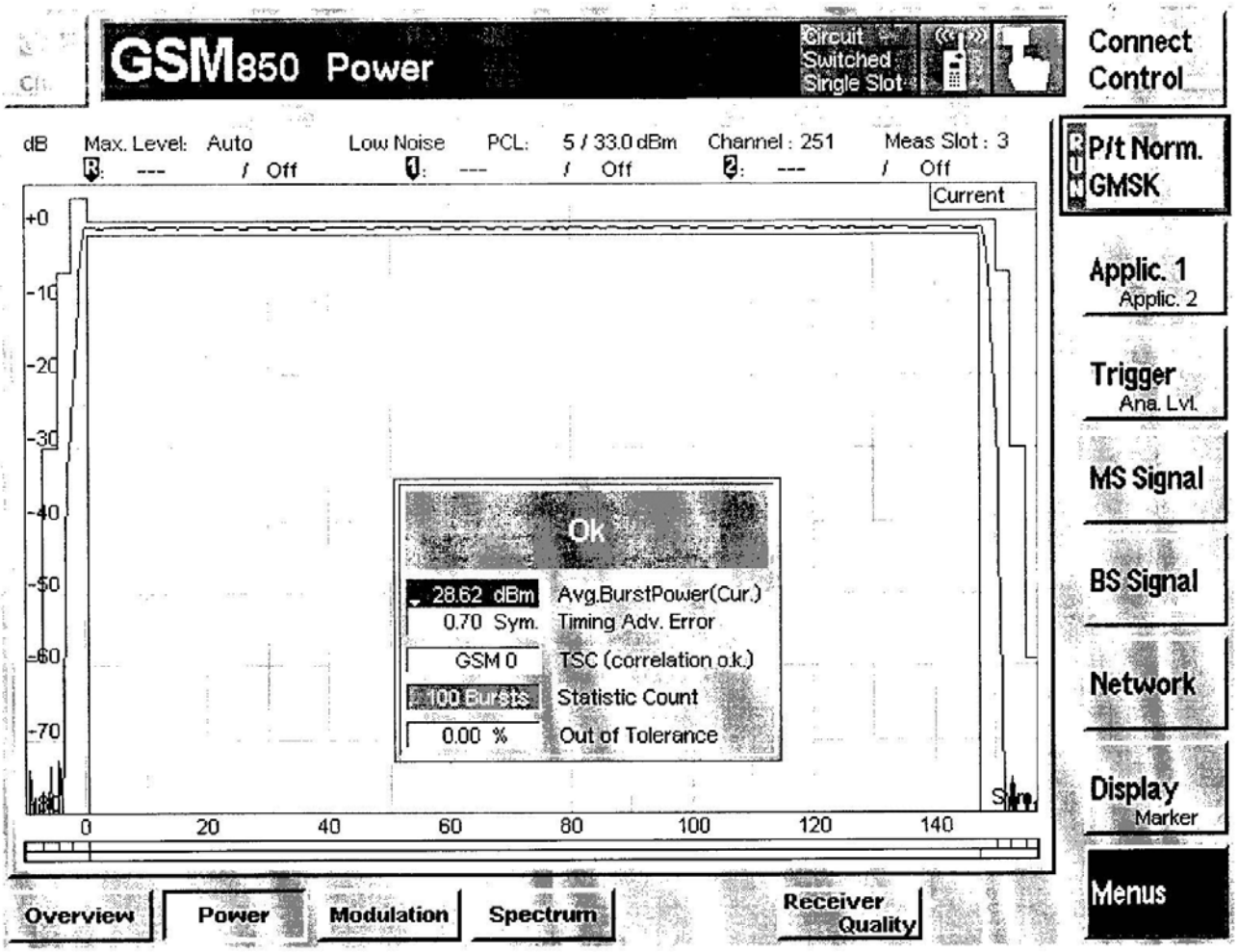
850 band_ CH 128_3.6 V



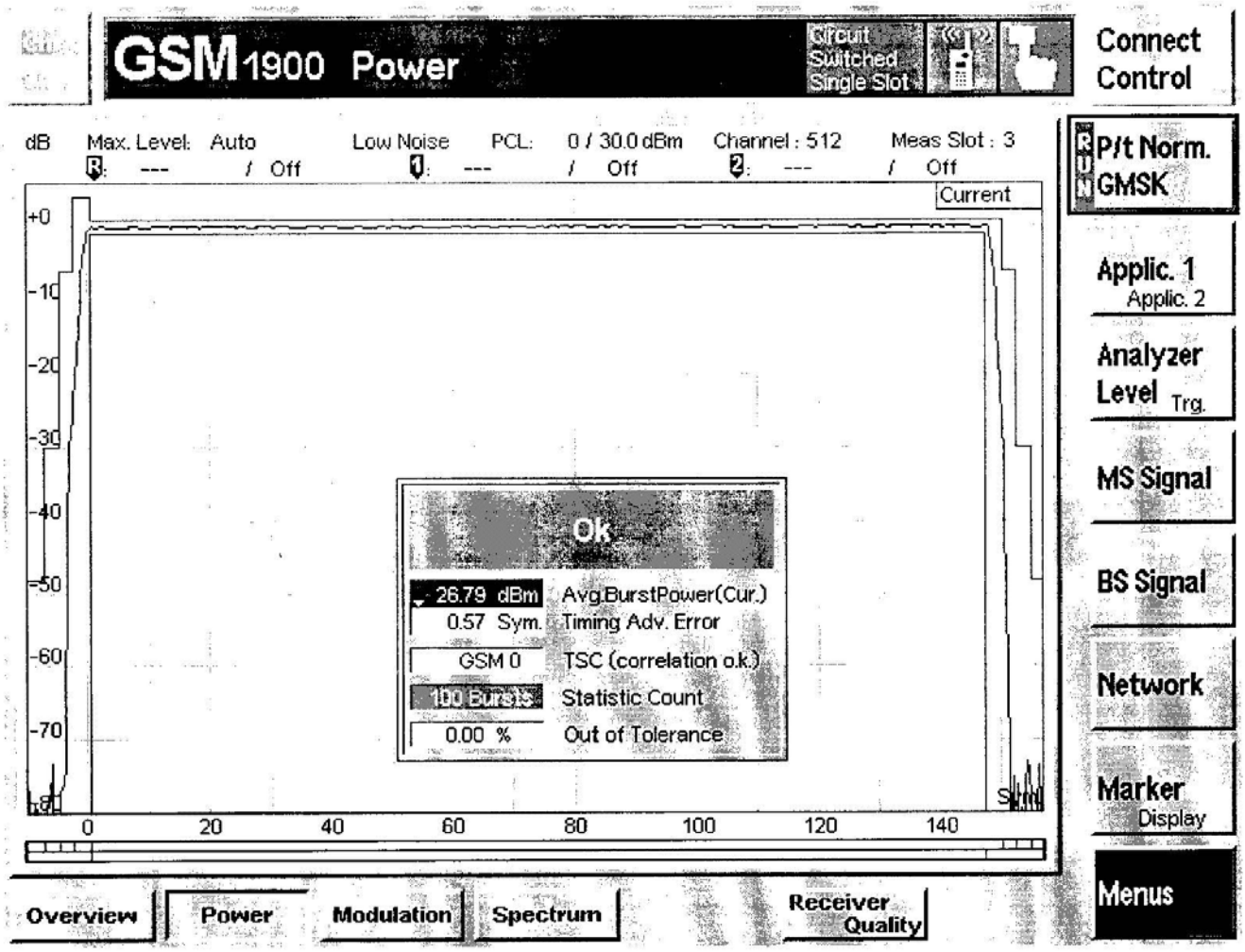
850 band_ CH 188_3.6 V



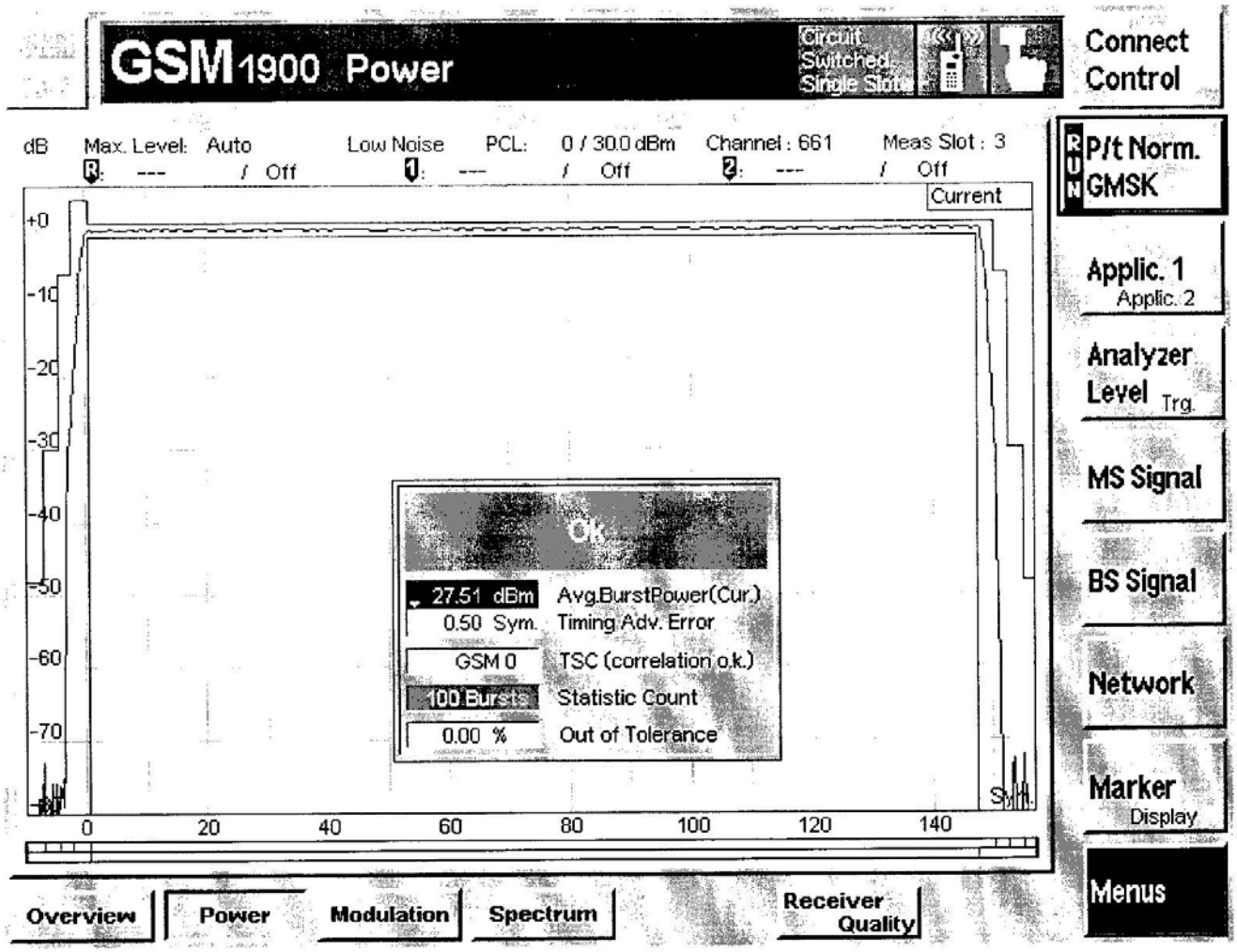
850 band_ CH 251_3.6 V



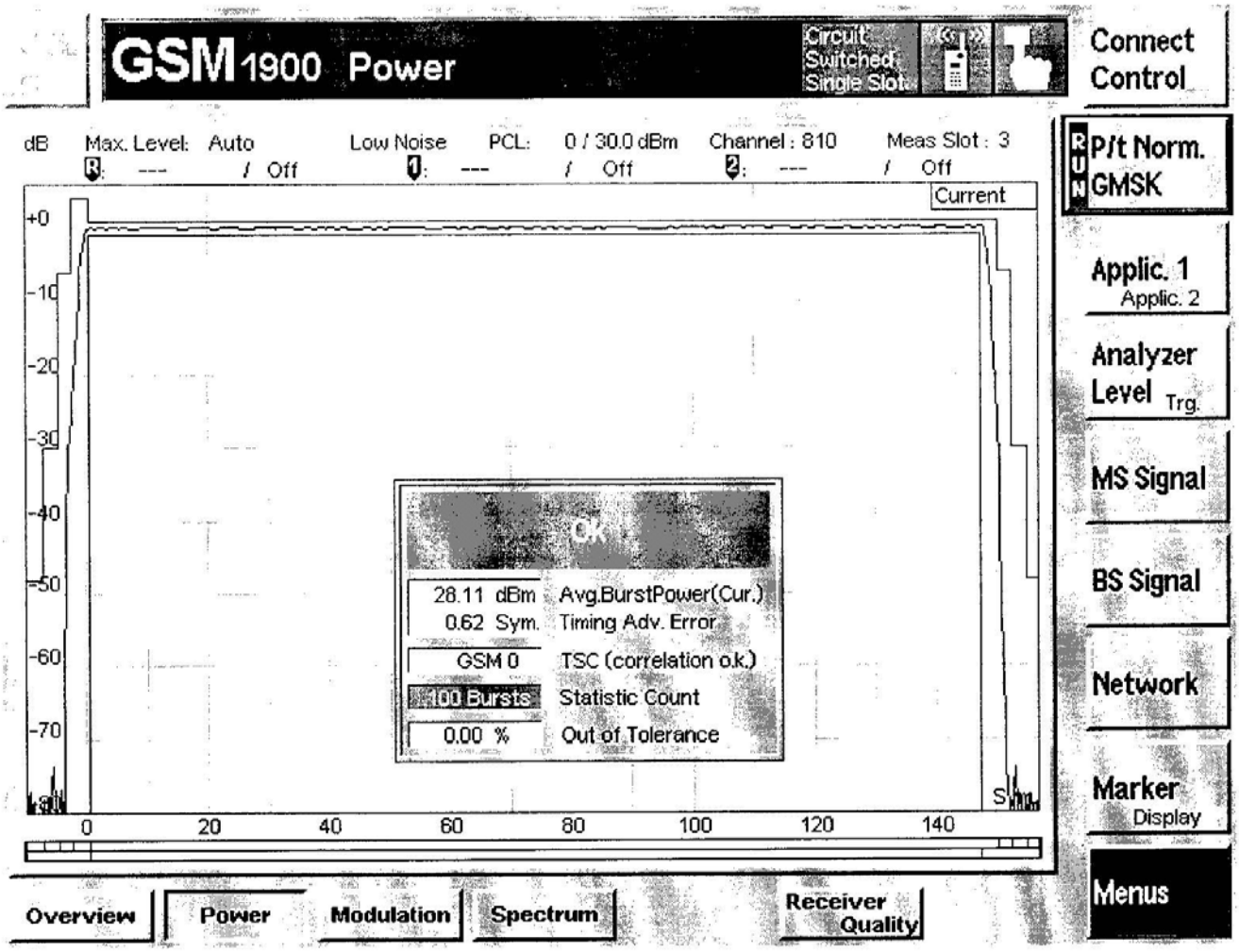
1900 band_ CH 512_3.6 V



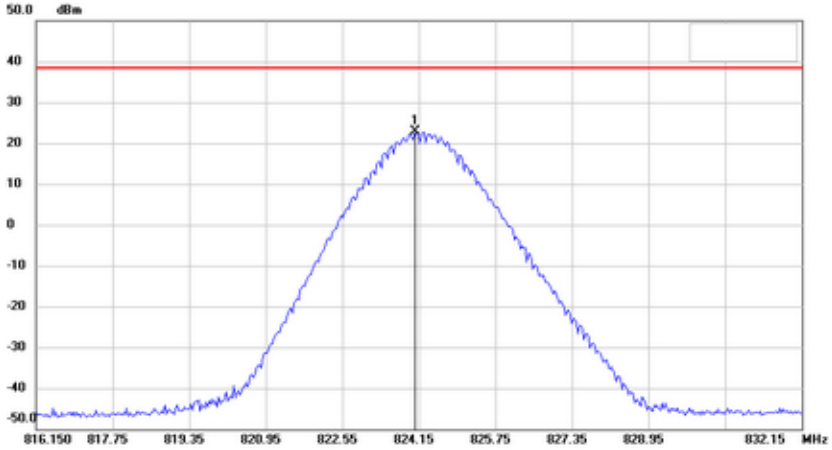
1900 band_ CH 661_3.6 V



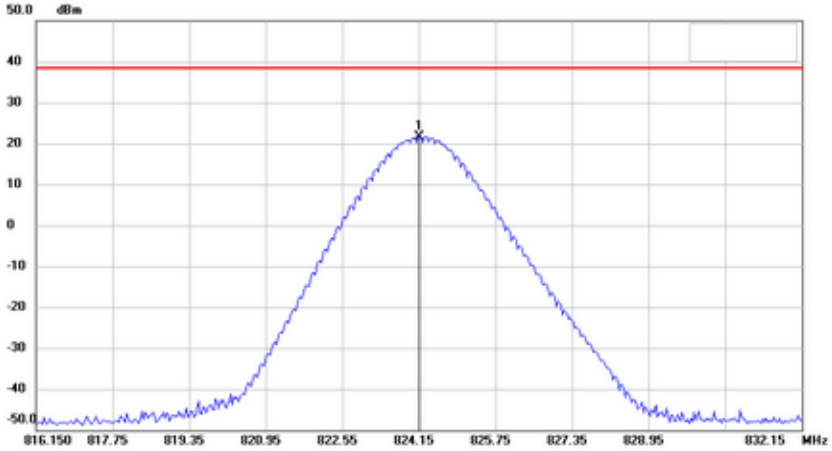
1900 band_ CH 810_3.6 V



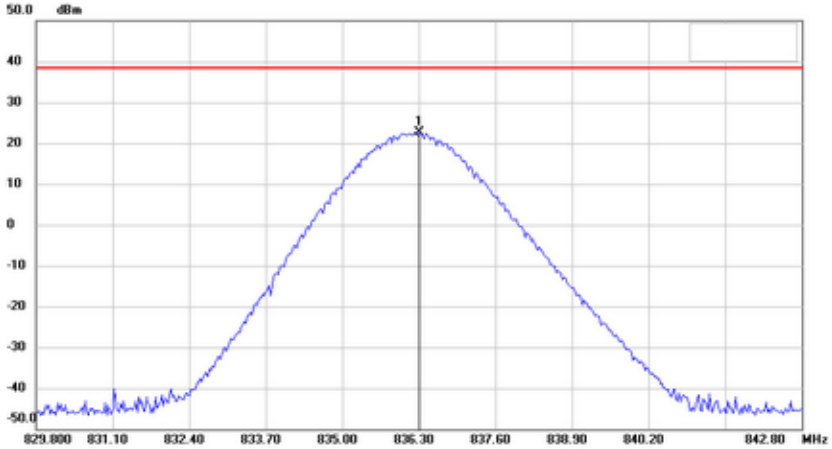
Radiated Measurement
850 band_ CH 128_3.7 V
Antenna Polarization H



Antenna Polarization V

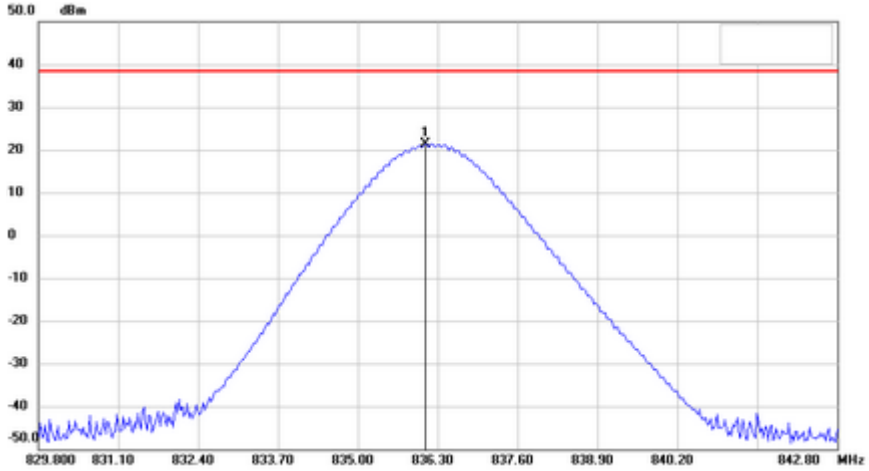


850 band_ CH 188_3.7 V
Antenna Polarization H



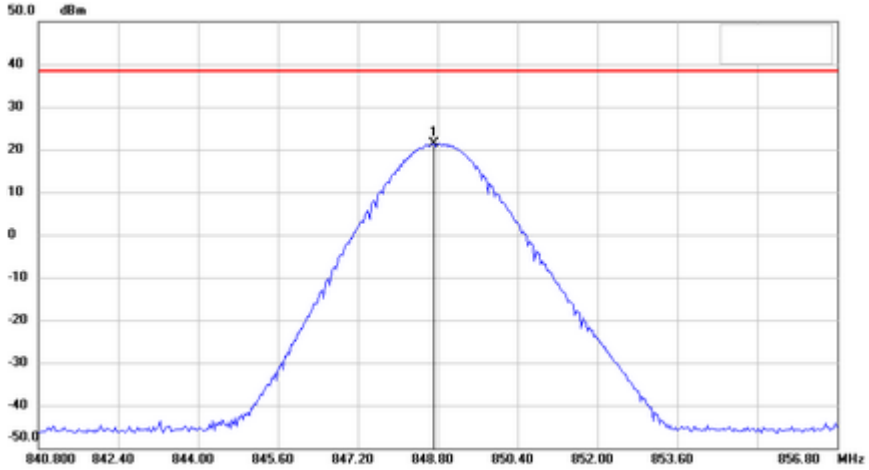
Note:
1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Antenna Polarization V

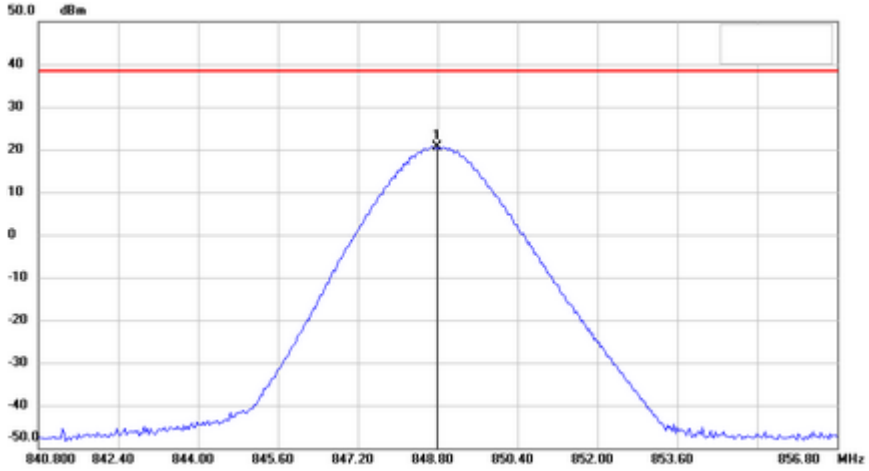


850 band_ CH 251_3.7 V

Antenna Polarization H



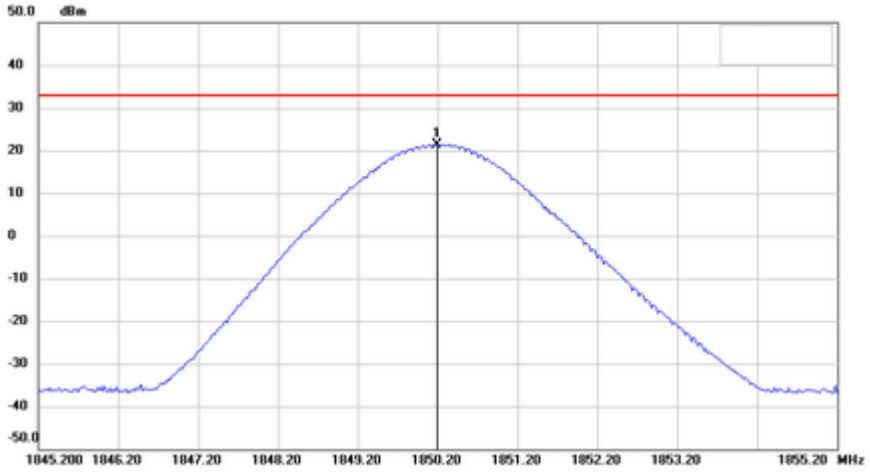
Antenna Polarization V



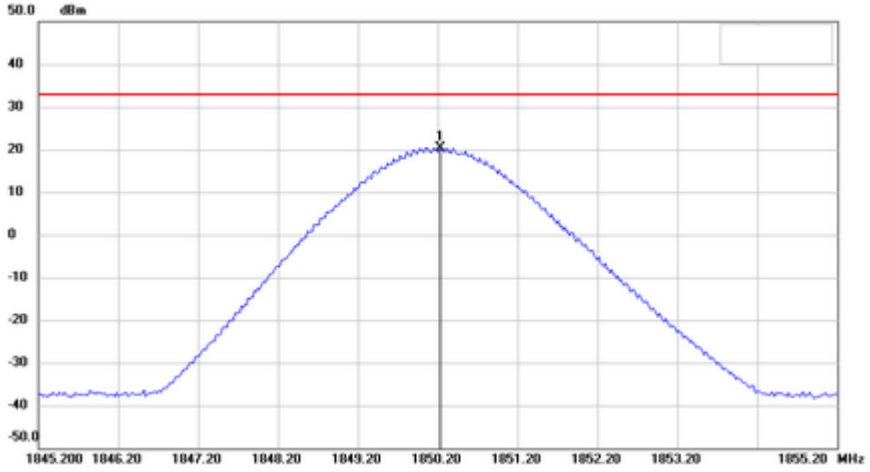
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

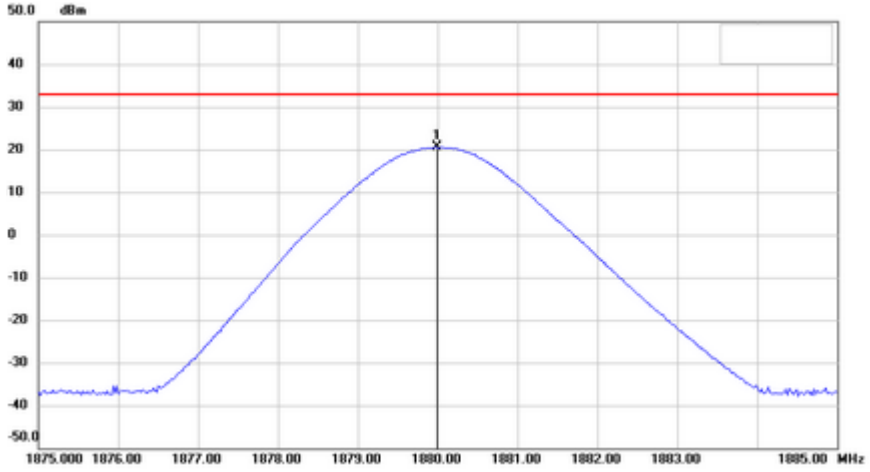
1900 band_ CH 512_3.7 V
Antenna Polarization H



Antenna Polarization V



1900 band_ CH 661_3.7 V
Antenna Polarization H



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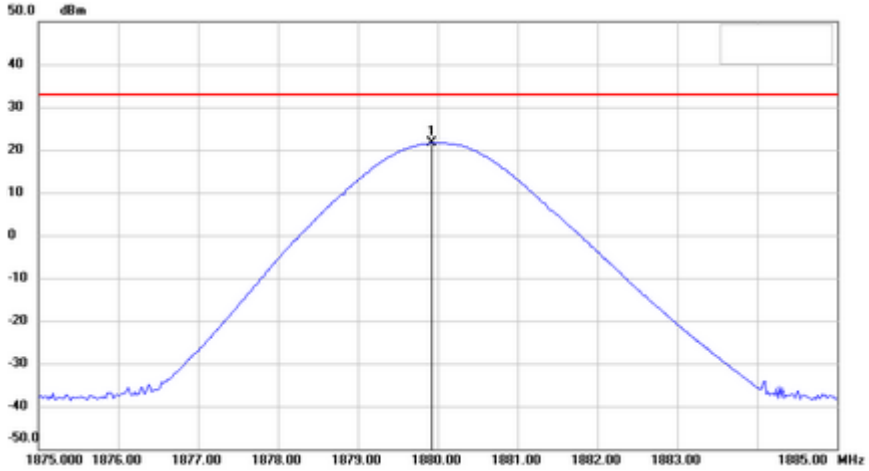
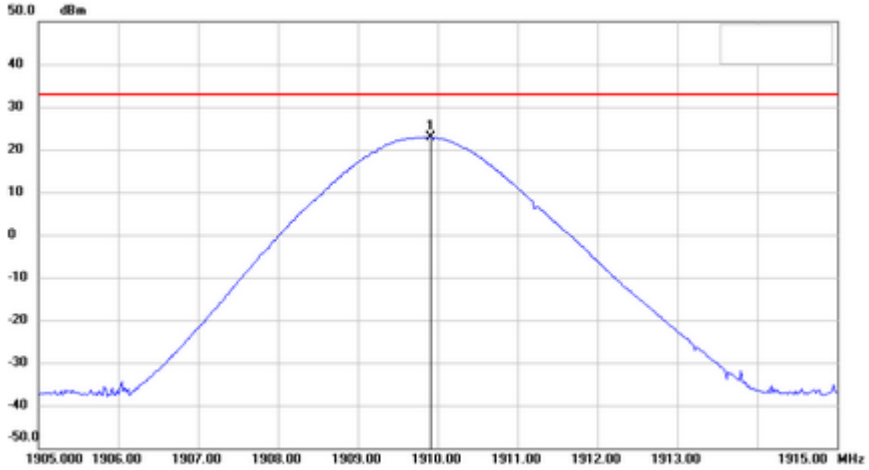
Antenna Polarization V

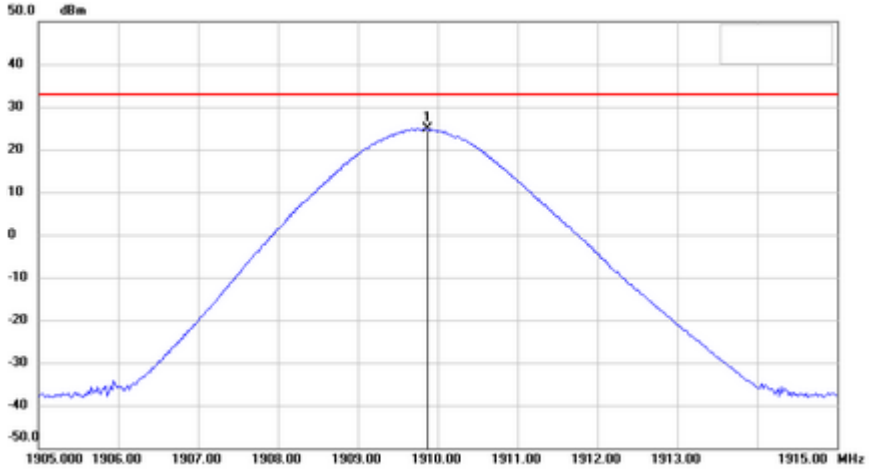


1900 band_ CH 810_3.7 V

Antenna Polarization H



Antenna Polarization V



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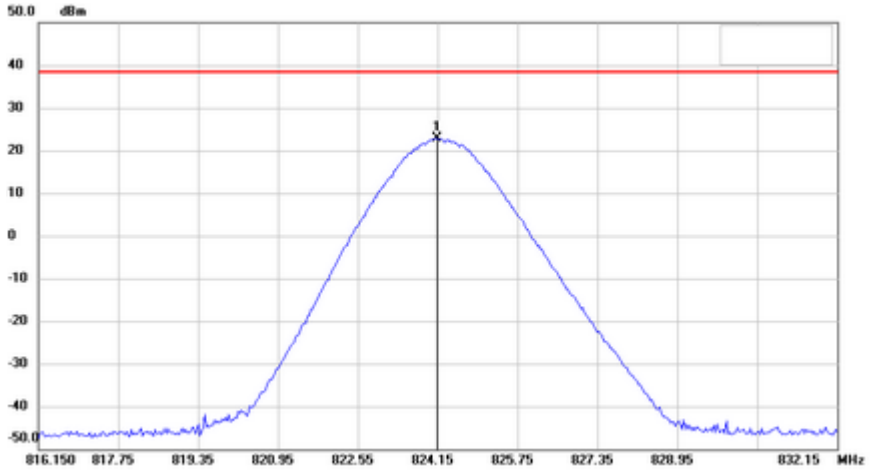
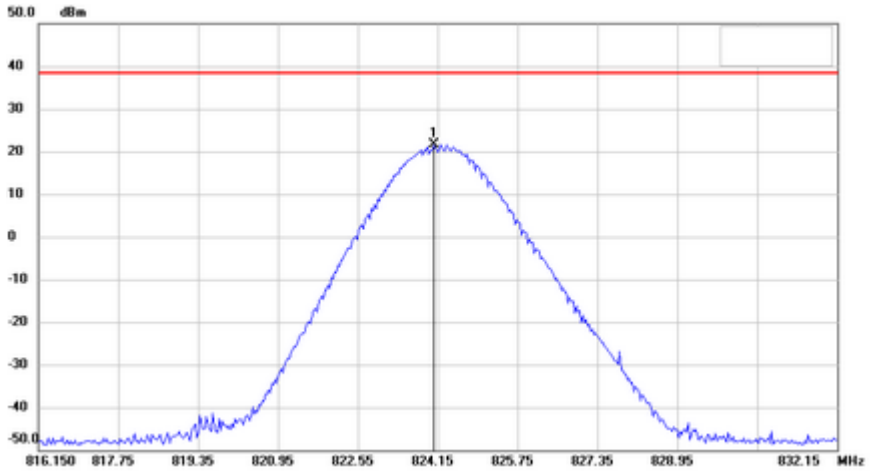
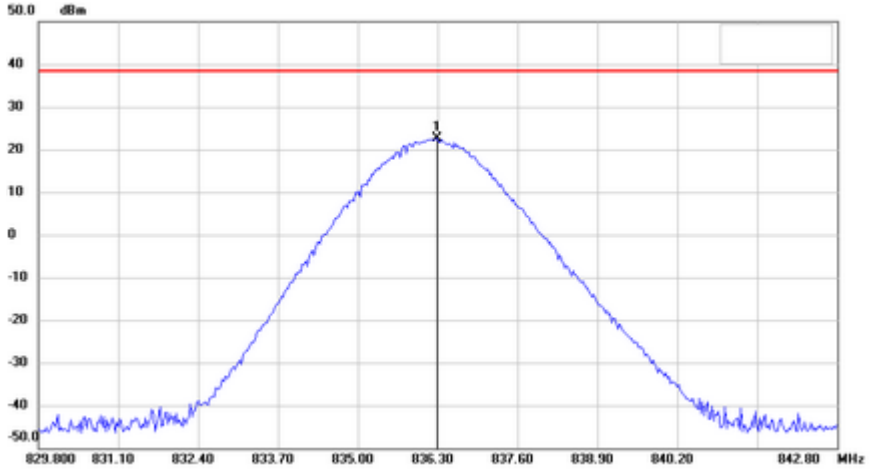
850 band_ CH 128_3.6 V
Antenna Polarization H



Antenna Polarization V



850 band_ CH 188_3.6 V
Antenna Polarization H



Note:
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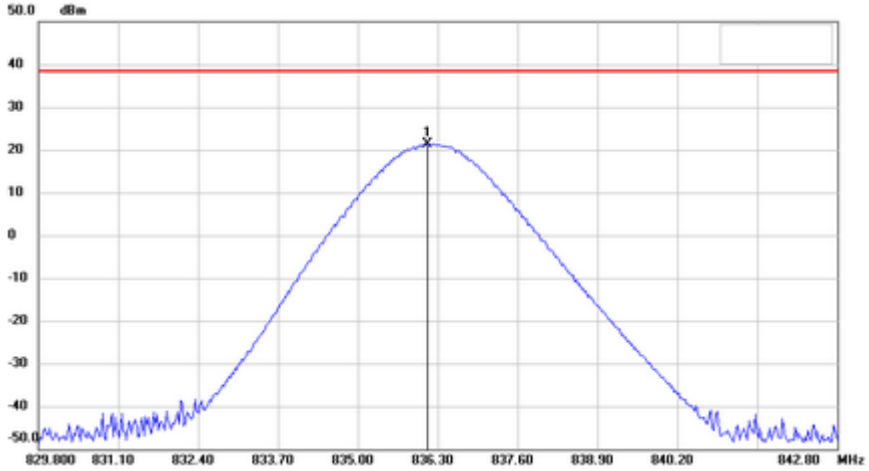
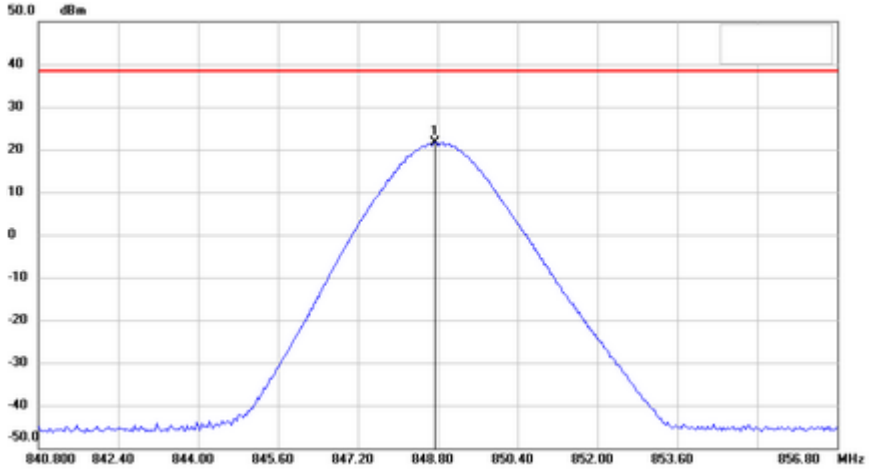
Antenna Polarization V

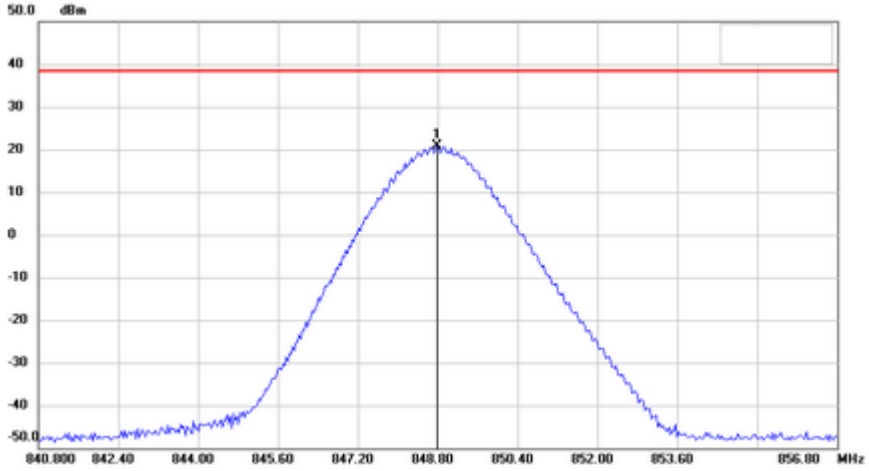


850 band_ CH 251_3.6 V

Antenna Polarization H



Antenna Polarization V



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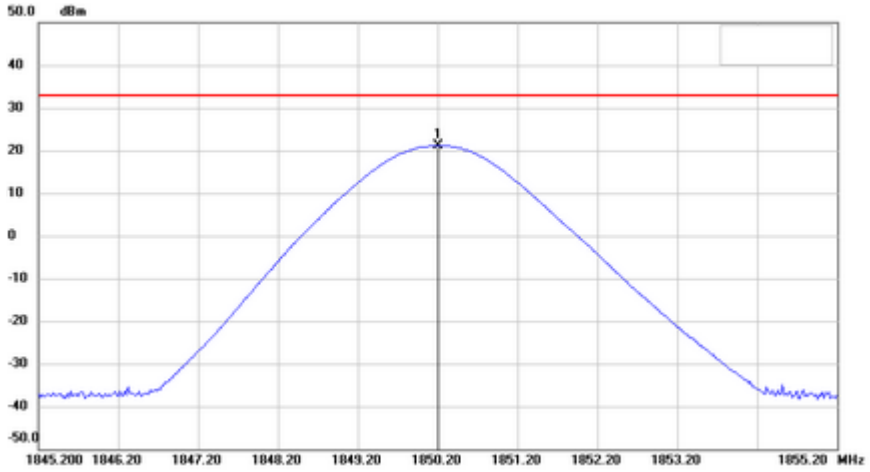
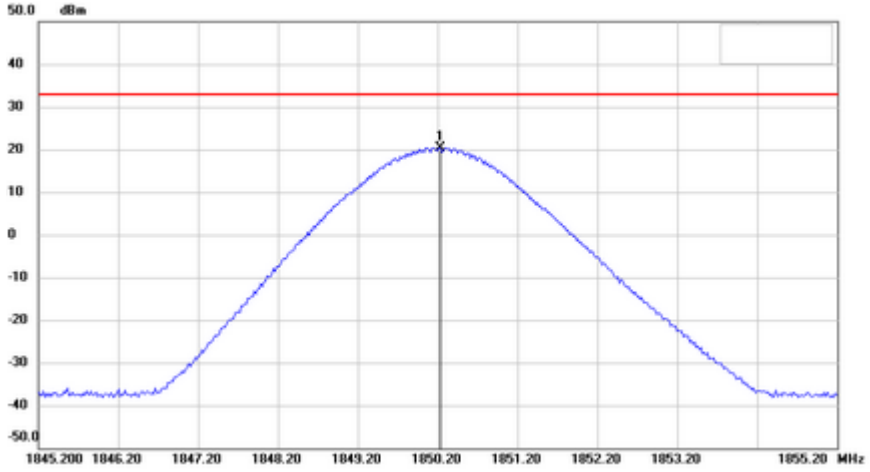
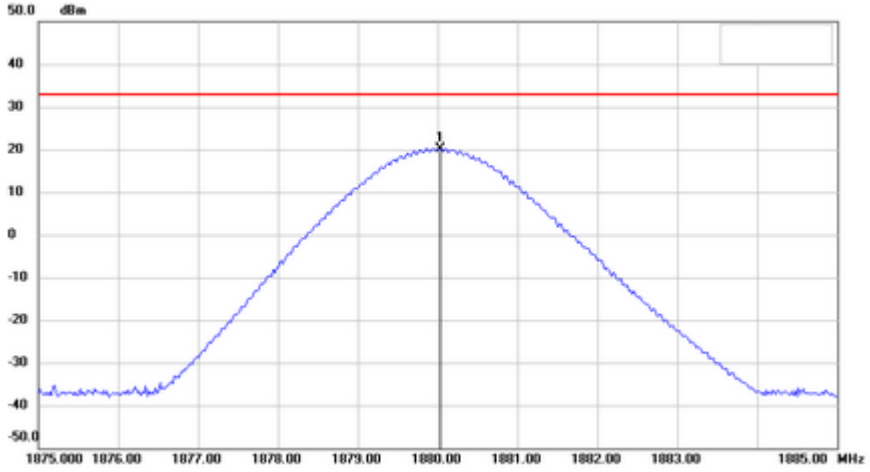
1900 band_ CH 512_3.6 V
Antenna Polarization H



Antenna Polarization V



1900 band_ CH 661_3.6 V
Antenna Polarization H



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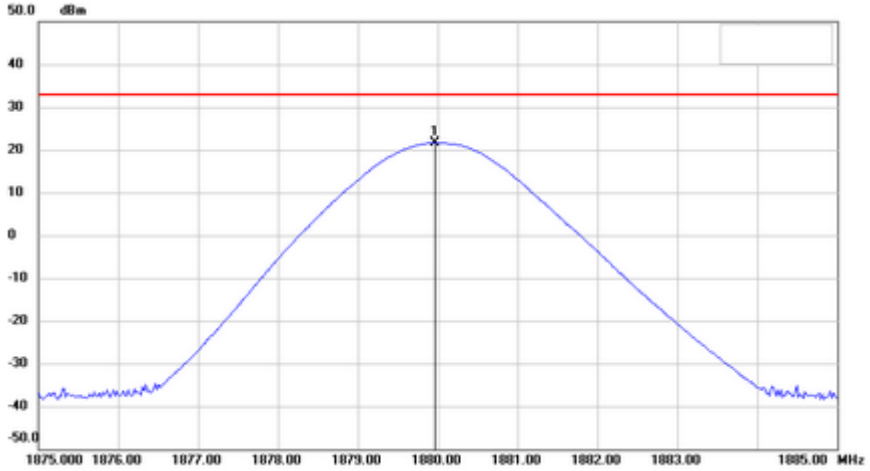
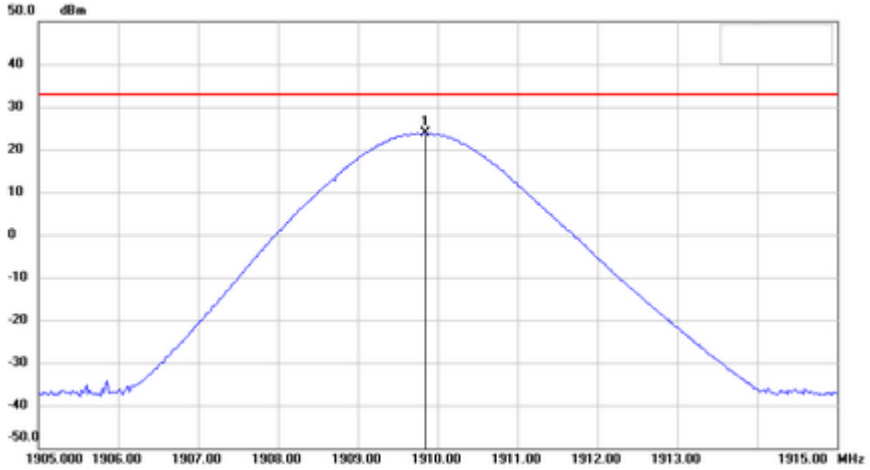
Antenna Polarization V

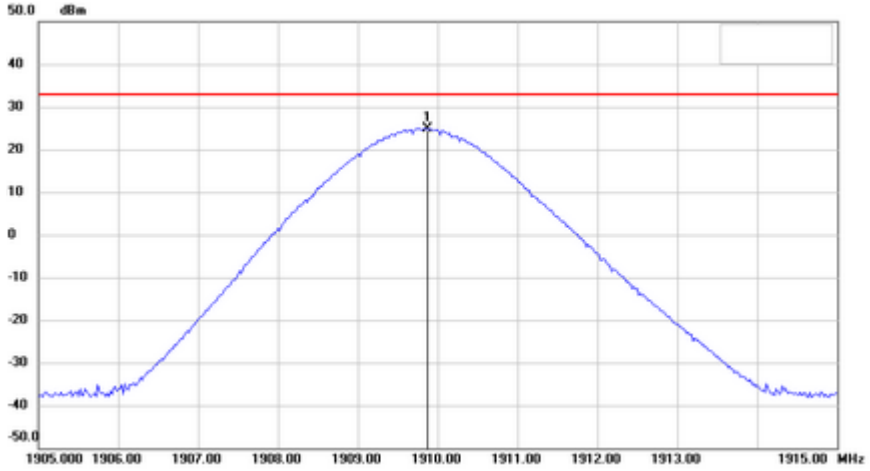


1900 band_ CH 810_3.6 V

Antenna Polarization H



Antenna Polarization V



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