1701 E. Plano Parkway, Suite 150
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Certification Test Report

CFR 47 FCC Part 22 and Part 24

Model: GSM0308-10 B2BRF
GSM0308-11 B2BRF w/sim
GSM0308-70 coax RF
GSM0308-71 coax RF w/sim

FCC ID NO. MIVGSM0308

Report Code: W7005-1

Revision: 2

Prepared for:	Enfora, Inc. 661 E. 18th St. Plano, TX 75074-5601
Author:	Tom Tidwell, Manager of Wireless Services
Issued:	9 February 2007

Report Summary

NTS Plano

Accreditation Numbers: FCC: 101741
IC: 46405-4319 File # IC-4319A

Applicant: Enfora, Inc.
661 E. 18th St.
Plano, TX 75074-5601

Customer Representative: Rob Holden

EUT Description:

EUT Description	Manufacturer	Model	Revision	Serial Number
The EUT is a wireless transceiver that operates in the GSM 850 and GSM1900 bands in North America	Enfora, Inc.	GSM0308-10 B2BRF GSM0308-11 B2BRF w/sim GSM0308-70 coax RF GSM0308-71 coax RF w/sim	X	X

Test Summary

Appendix	Test/Requirement Description	Deviations from:			Pass / Fail	Applicable Rule Parts
		Base Standard	Test Basis	NTS Procedure		
A	RF Power Output	No	No	No	PASS	CFR 47, Part 2, Para. 2.1046 CFR 47, Part 22, Para. 22.913 CFR 47, Part 24, Para.24.232
B	Modulation Characteristics	No	No	No	PASS	CFR 47, Part 2, Para. 2.1047
C	Occupied Bandwidth	No	No	No	PASS	CFR 47, Part 2, Para. 2.1049 CFR 47, Part 22, Para. 22.917 CFR 47, Part 24, Para. 24.238
D	Spurious Emissions at Antenna Terminals	No	No	No	PASS	CFR 47, Part 2, Para. 2.1051 CFR 47, Part 22, Para. 22.917 CFR 47, Part 24, Para. 24.238
E	Field Strength of Spurious Radiation	No	No	No	PASS	CFR 47, Part 2, Para. 2.1053 CFR 47, Part 22, Para. 22.917 CFR 47, Part 24, Para. 24.238
F	Frequency Stability	No	No	No	PASS	CFR 47, Part 2, Para. 2.1055 CFR 47, Part 22, Para. 22.355 CFR 47, Part 24, Para. 24.235

Test Result: The product presented for testing complied with test requirements as shown above.

This is to certify that the preceding report is true and correct to the best of my knowledge.

Robert Stevens,
Quality Assurance Manager

Tom Tidwell,
Wireless Test Engineer

Table of Contents

Register of revisions

Revision	Reason for Revision	Release Date
0	Original	19 Jan., 2007
1	Changed Enfora L.P. to Enfora, Inc. throughout report	2 Feb., 2007
2	Changed rf exposure details and antenna details on pg. 6. Changed FS of Spurious results to reflect erp instead of eirp.	9 Feb., 2007

INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the tests applied by NTS Plano to demonstrate compliance of the GSM0308 to FCC Part 22 and FCC Part 24 in accordance with the certification requirements of CFR 47, Part 2.

2.0 EUT DESCRIPTION

2.1 CONFIGURATION

Description of EUT

	Name	Model	Revision	Serial Number
EUT	"Matterhorn"	GSM0308	-	-
RF Exposure Classification	Mobile (separation > 20 cm.) and Fixed (separation > 2 m)			
Channels/Frequency Range	824 – 849 MHz (GSM850) 1850 1910 MHz (GSM1900)			
Rated RF Power	+32 dBm (GSM850) +31 dBm (GSM1900)			
Emission Designator	270KG7W			
TX antenna details	Not provided. This is a licensed device. The antenna used is chosen according to the application. Antenna characteristics are taken into account at the time of licensing. The gain of antenna is limited by the rf exposure configuration and is detailed in the integration manual.			
Functional Description	The GSM0308 is a wireless data transceiver. The device is used in a variety of applications and may be mounted inside a host enclosure.			

2.1.1 EUT POWER

Voltage	4.5 Vdc

2.2 EUT CABLES

Quantity	Model/Type	Routing		Shielded / Unshielded	Description	Cable Length (m)
		From	To			
1	RS232C	Test Platform	Support PC	Shielded	9 pin RS232 connection for test mode	1.5

2.3 MODE OF OPERATION DURING TESTS

The device was tested in the following operating modes:

- GSM850 (824 – 849 MHz band) – CFR 47, Part 22
- GSM1900 (1850 – 1910 MHz band) – CFR 47, Part 24

A mobile test set was used to set the operating band and rf power output.

Testing was performed at the following frequencies:

GSM850
Channel 128 – 824.2 MHz
Channel 189 – 836.4 MHz
Channel 251 – 848.8 MHz

GSM1900
Channel 4 – 1850.2 MHz
Channel 600 – 1880.0 MHz
Channel 1196 – 1909.8 MHz

3.0 SUPPORT EQUIPMENT

3.1 CONFIGURATION

The radio was activated using customer-supplied test software. The software allowed the test engineer to change modulation modes and data rates as well as transmit. channel.

3.2 TEST BED CONFIGURATION

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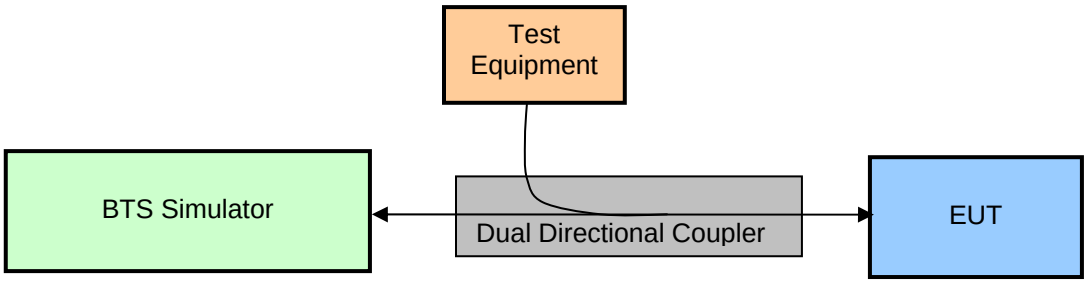


APPENDICES

APPENDIX A: 2.1046 RF POWER OUTPUT

A.1. Base Standard & Test Basis

Base Standard	FCC PART 2.1046
Test Basis	TIA 603-C, 2004
Test Method	TIA 603-C, 2004

A.2. Specifications

22.913(a) *Maximum ERP.* In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. However, for those systems operating in areas more than 72 km (45 miles) from international borders that:
(1) Are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census; or,
(2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232 Power and antenna height limits.

(a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph 24.232(b).

(b) Base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, are limited to 3280 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

(c) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

Applicable RF Power Limit from Above:
Part 22: 7 watts ERP
Part 24: 2 watts EIRP

A.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
None						

A.4. Test Procedure

TIA 603-C, 2004

A.5. Test Results

The EUT is in compliance with the limits as specified above. The maximum rf output power at the antenna terminals is 1.7 watts.

A.6. Operating Mode During Test

The transmitter was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel in both the GSM850 and GSM1900 modes.

A.7. Sample Calculation

Rf power(watts) = $10^{(\text{rf power(dBm)}/10)}$ x 1000

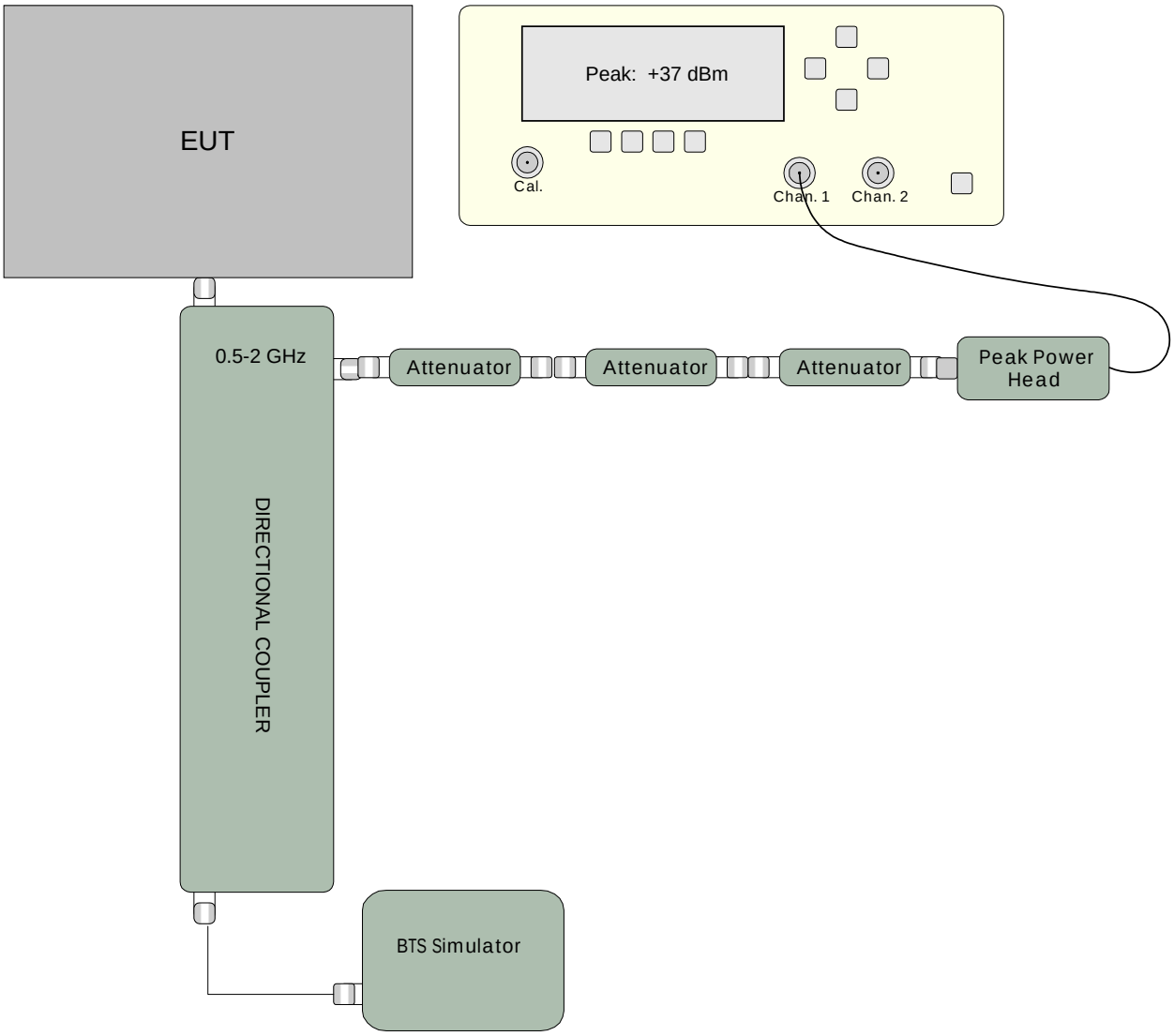
A.8. Test Data

Channel	Modulation Mode	RF Power Output at Antenna Terminals (dBm)
128	GSM850	32.30
189	GSM850	31.93
251	GSM850	31.90
4	GSM1900	30.58
600	GSM1900	31.06
1196	GSM1900	31.17

Note: RF power output was measured using a peak rf power meter designed to quantify the true peak power using a high number of samples.

Test Date: 9 January, 2007

A.9. Test Diagram



A.10. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX B: 2.1047 MODULATION CHARACTERISTICS

B.1. Base Standard & Test Basis

Base Standard	FCC 2.1047
Test Basis	FCC 2.1047 Modulation Characteristics
Test Method	TIA 603-C, 2004

B.2. Specifications

2.1047 – Modulation Characteristics

(a) *Voice modulated communication equipment.* 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. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
(b) *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 information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.
(c) *Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power.* A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.
(d) *Other types of equipment.* A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

B.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

B.4. Test Results

The EUT is digitally modulated (GMSK). The device transmits data only.

Test Data Summary

Emission Designator
270KG7W

B.5. Test Diagram

N/A

B.6. Tested By

Name: Tom Tidwell
Function: Manager of Wireless Services

APPENDIX C: 2.10.49 OCCUPIED BANDWIDTH

C.1. Base Standard & Test Basis

Base Standard	FCC 2.1049
Test Basis	FCC 2.1049 Occupied Bandwidth
Test Method	TIA 603-C, 2004

C.2. Specifications

22.917

(b) The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

24.238 Emission limitations for Broadband PCS equipment

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

C.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

C.4. Test Method

TIA 603-C, 2004

The rf carrier is modulated with a pseudo-random modulation signal generated internal to the EUT.

C.5. Test Results

Compliant. The rf output of the device was plotted to demonstrate the 99% Power Occupied Bandwidth

C.6. Deviations from Normal Operating Mode During Test

None.

C.7. Sample Calculation

None.

C.8. Test Data

See plots following.

Figure 1 99% Power Occupied Bandwidth – GSM850 – Channel 128

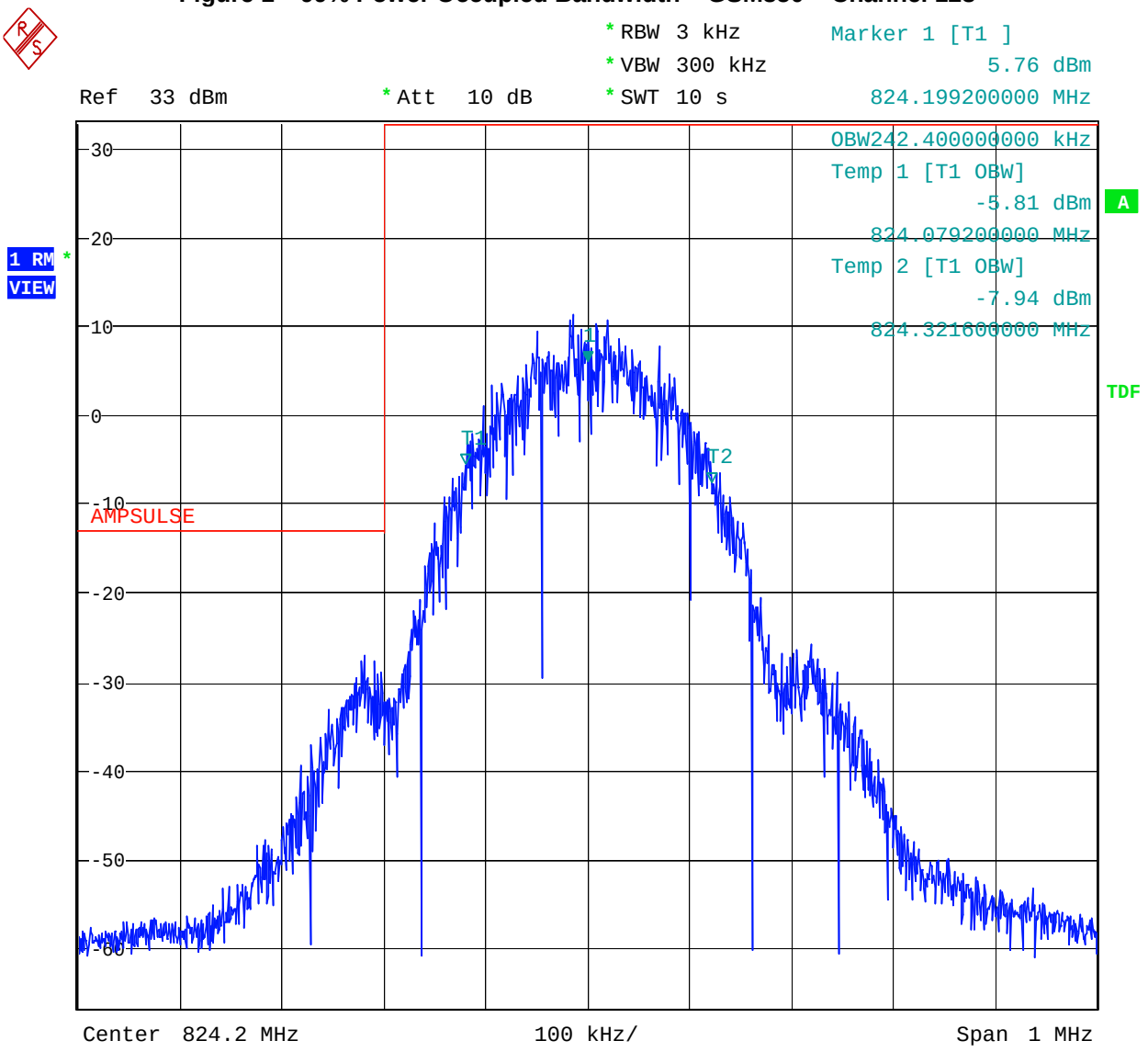


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Figure 2 99% Power Occupied Bandwidth – GSM850 – Channel 189

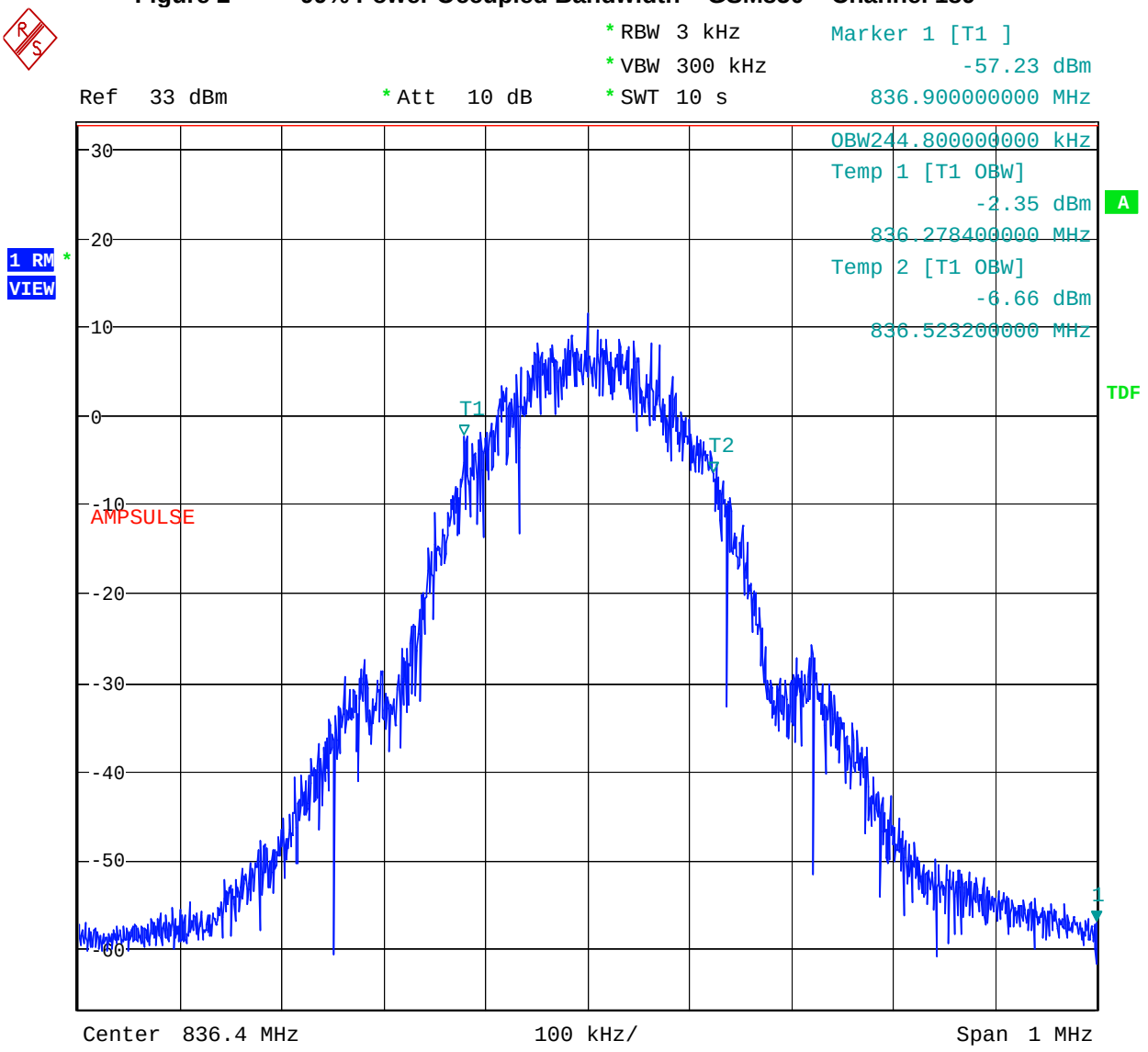

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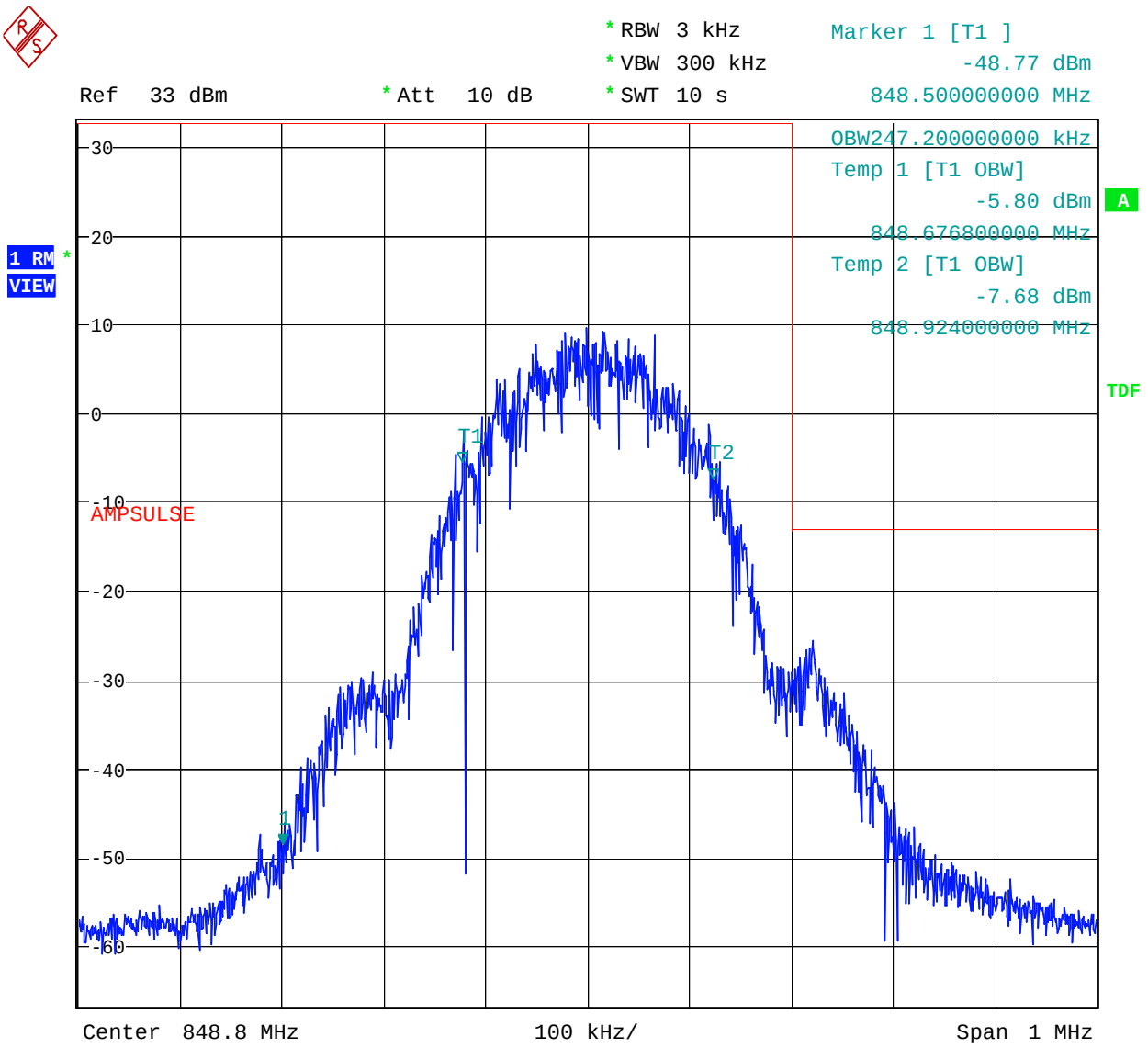
Figure 3 99% Power Occupied Bandwidth – GSM850 – Channel 251



Date: 9.JAN.2007 16:43:04

Figure 4 99% Power Occupied Bandwidth – GSM1900 – Channel 4

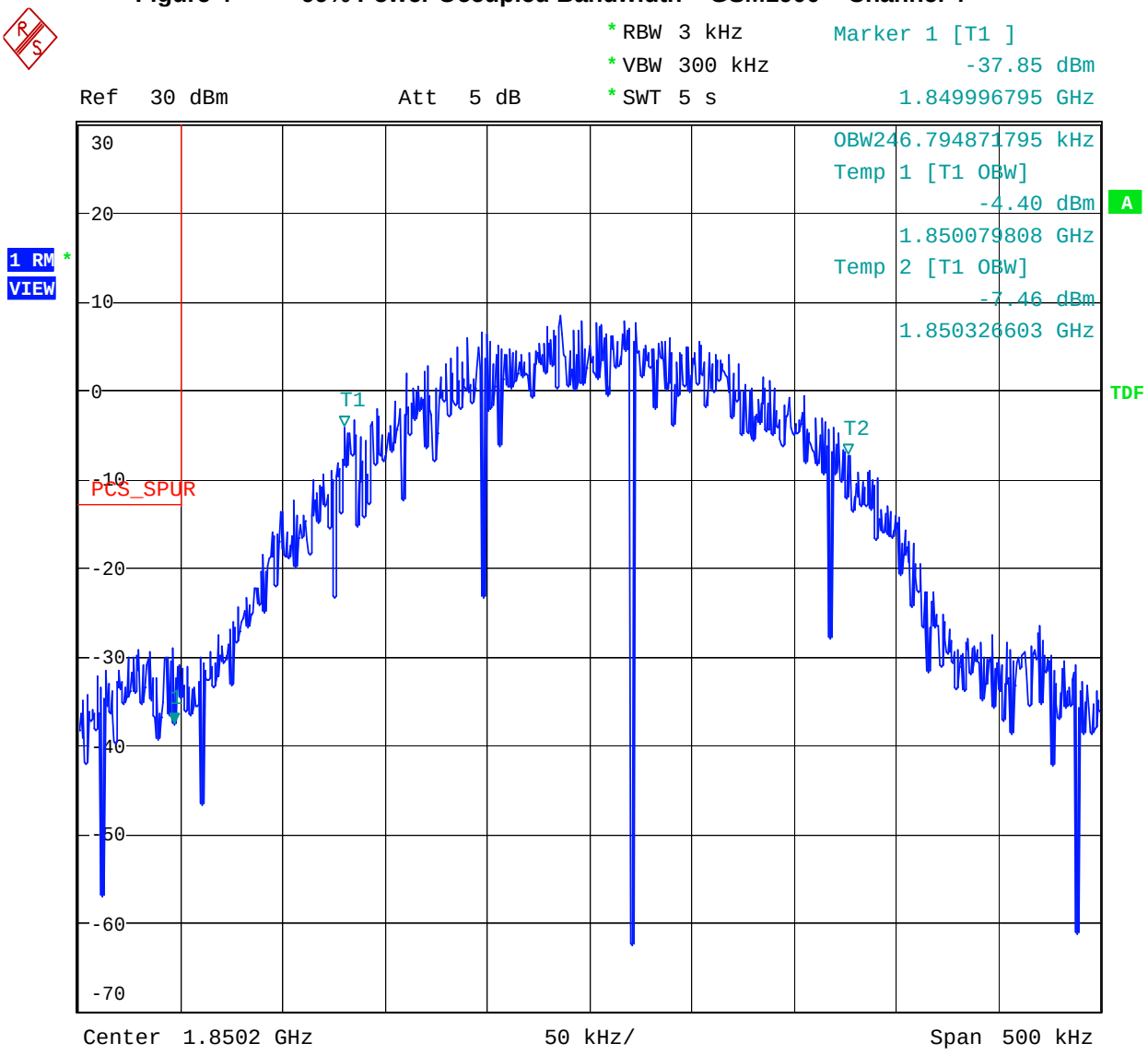


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Figure 5 99% Power Occupied Bandwidth – GSM1900 – Channel 600

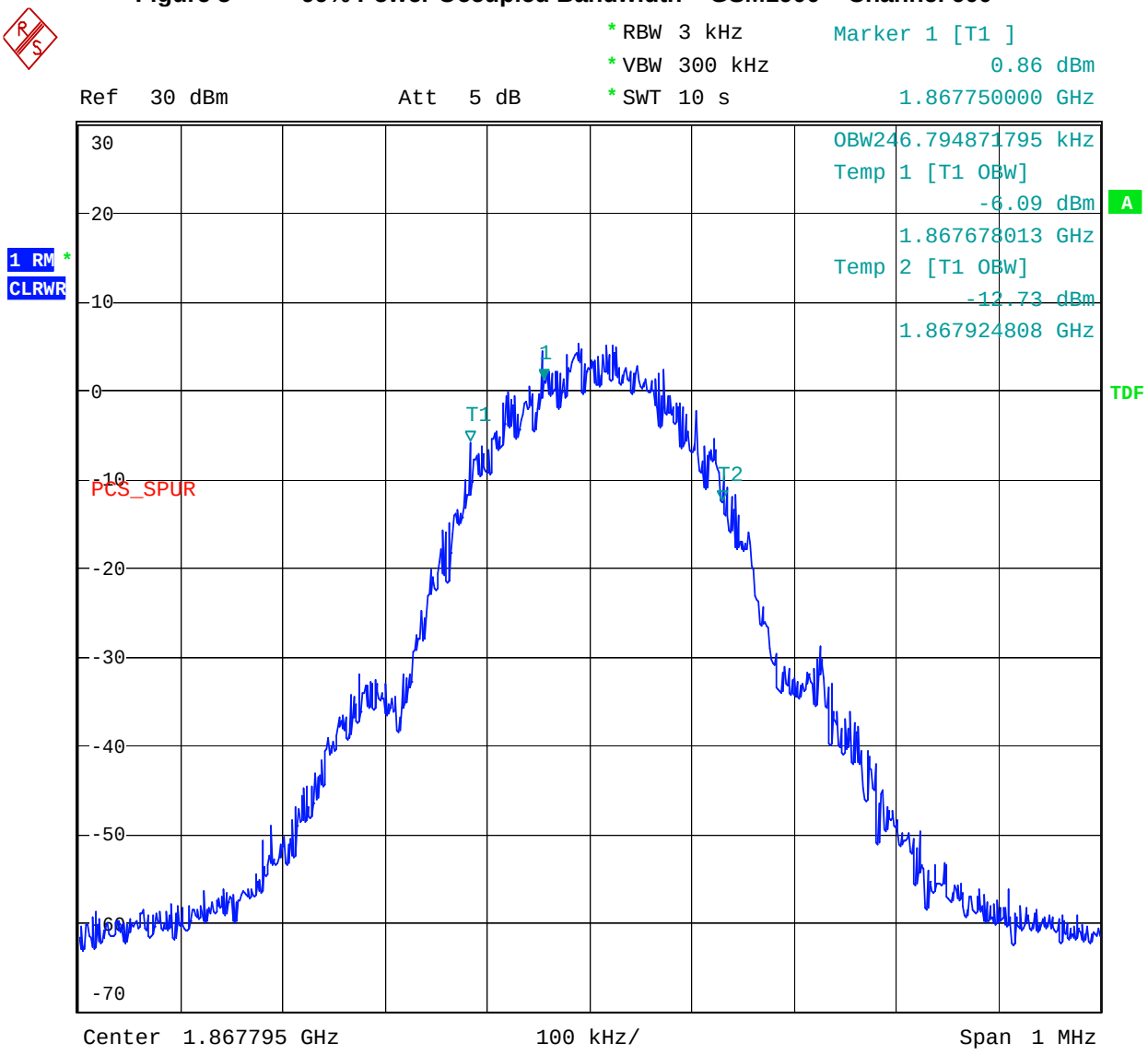

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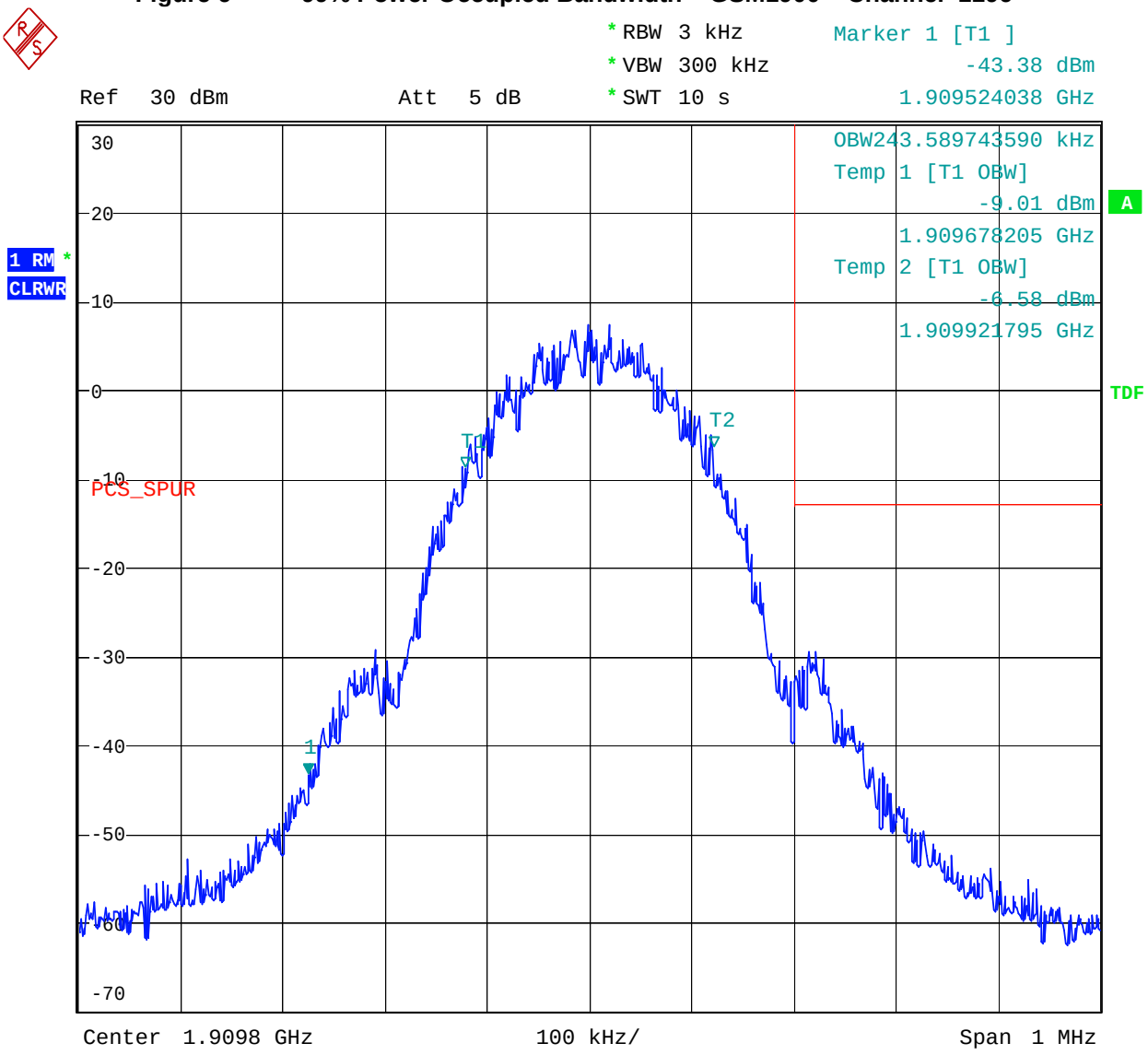
Figure 6 99% Power Occupied Bandwidth – GSM1900 – Channel 1196



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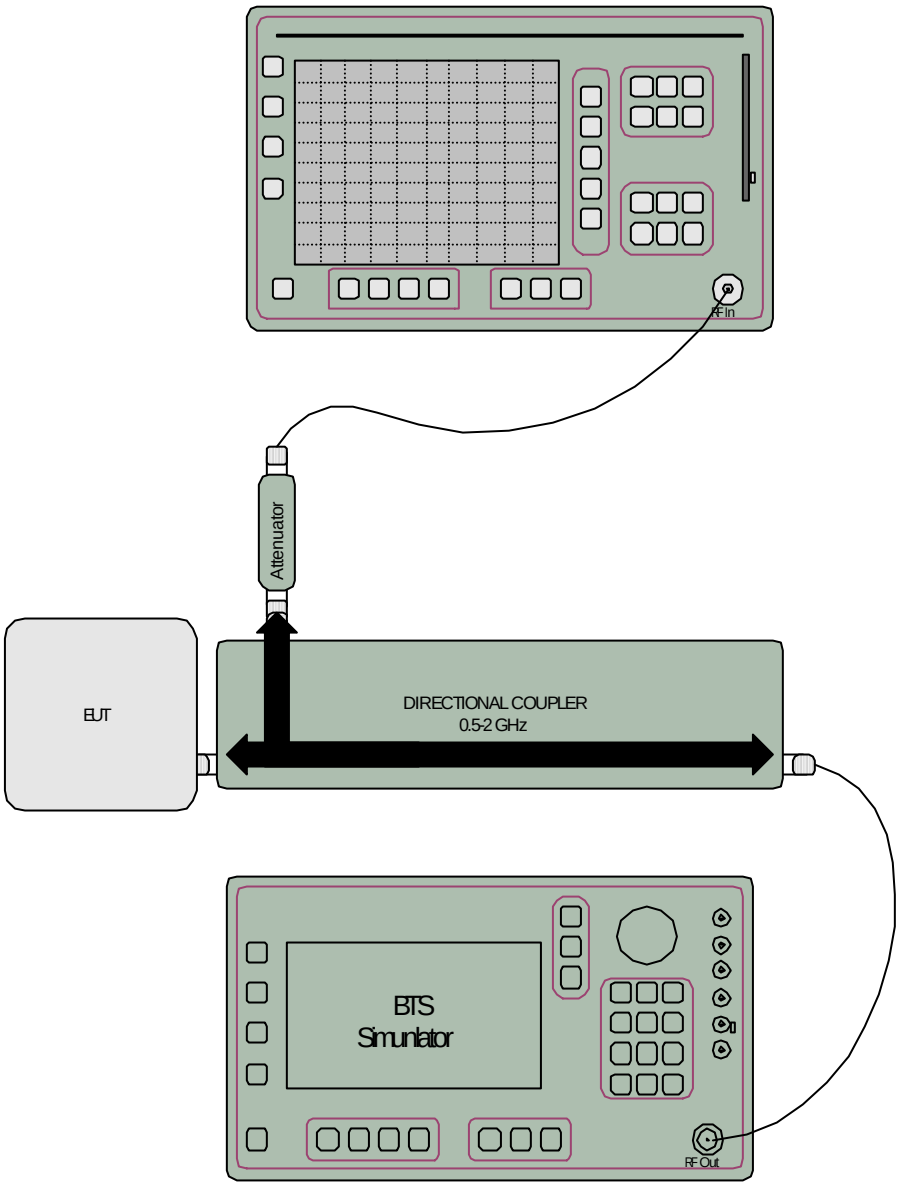
C.9. Test Diagram



C.10. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX D: 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

D.1. Base Standard & Test Basis

Base Standard	FCC 2.1051
Test Basis	FCC 2.1051 Spurious Emissions at Antenna Terminals
Test Method	TIA 603-C, 2004

D.2. Specifications

22.917

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

24.238 Emission limitations for Broadband PCS equipment

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

D.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+1.11/-1.22

D.4. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

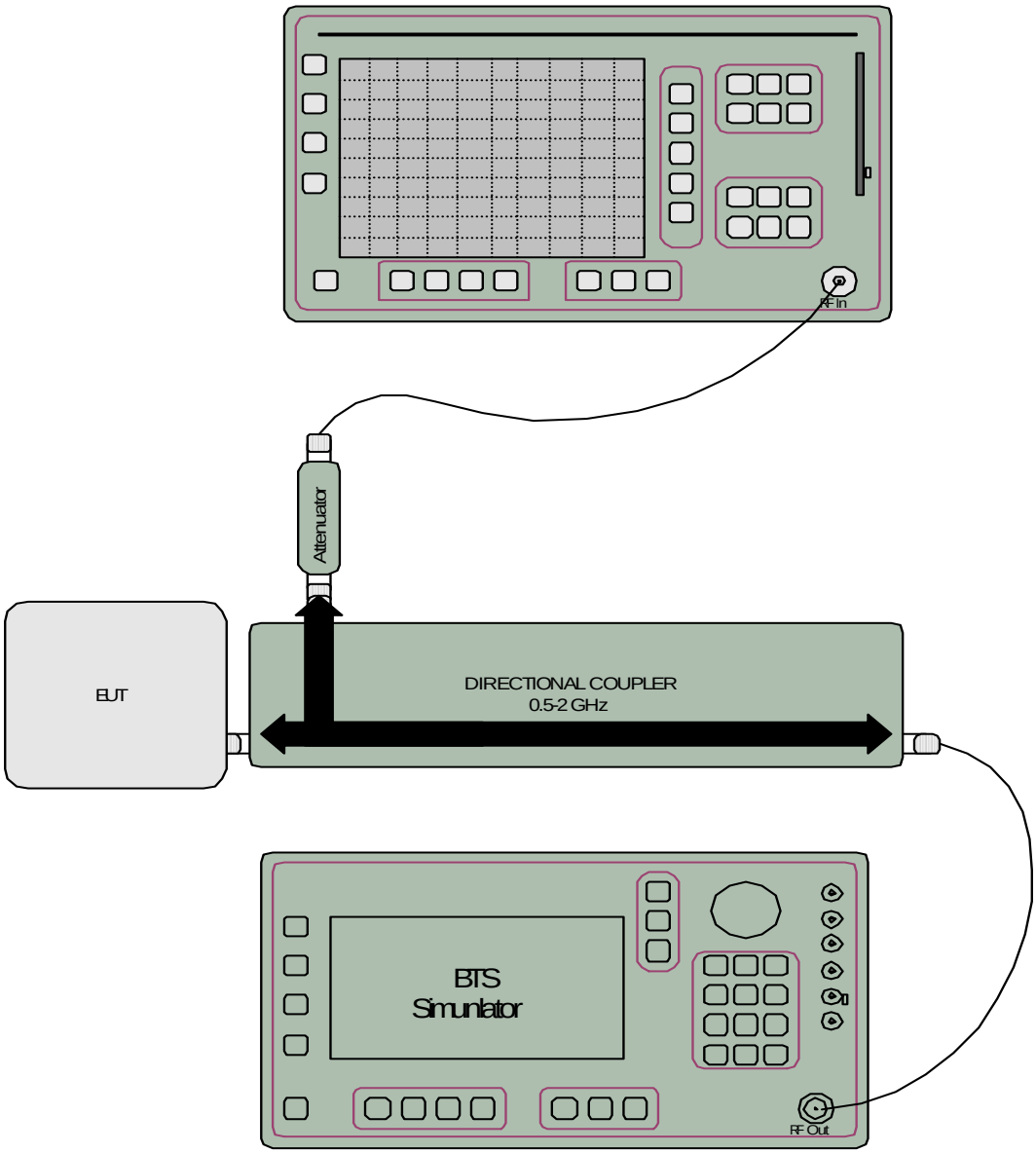
D.5. Test Results

Complies. All emissions meet the out of band limits.

Out-of-Band Emissions limit is 43 + 10 log(P) which relates to -13 dBm absolute power.

Attenuation limit = 43 + 10 log(1.6) = 45 dB

D.6. Test Diagram



D.7. Test Data

See following pages.

Figure 7 Spurious Emissions - GSM850 – Channel 128

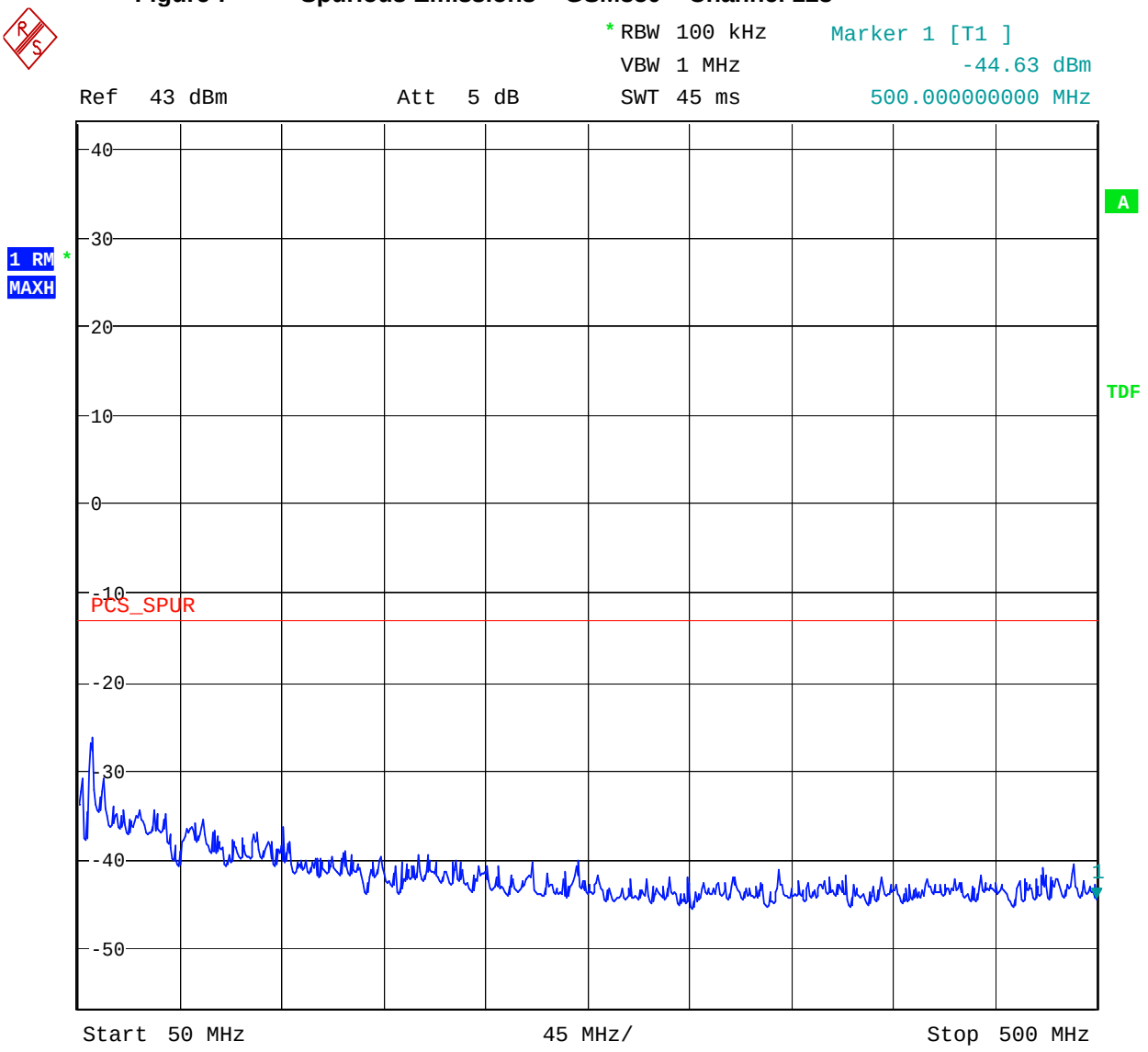


Figure 8 Spurious Emissions - GSM850 – Channel 128

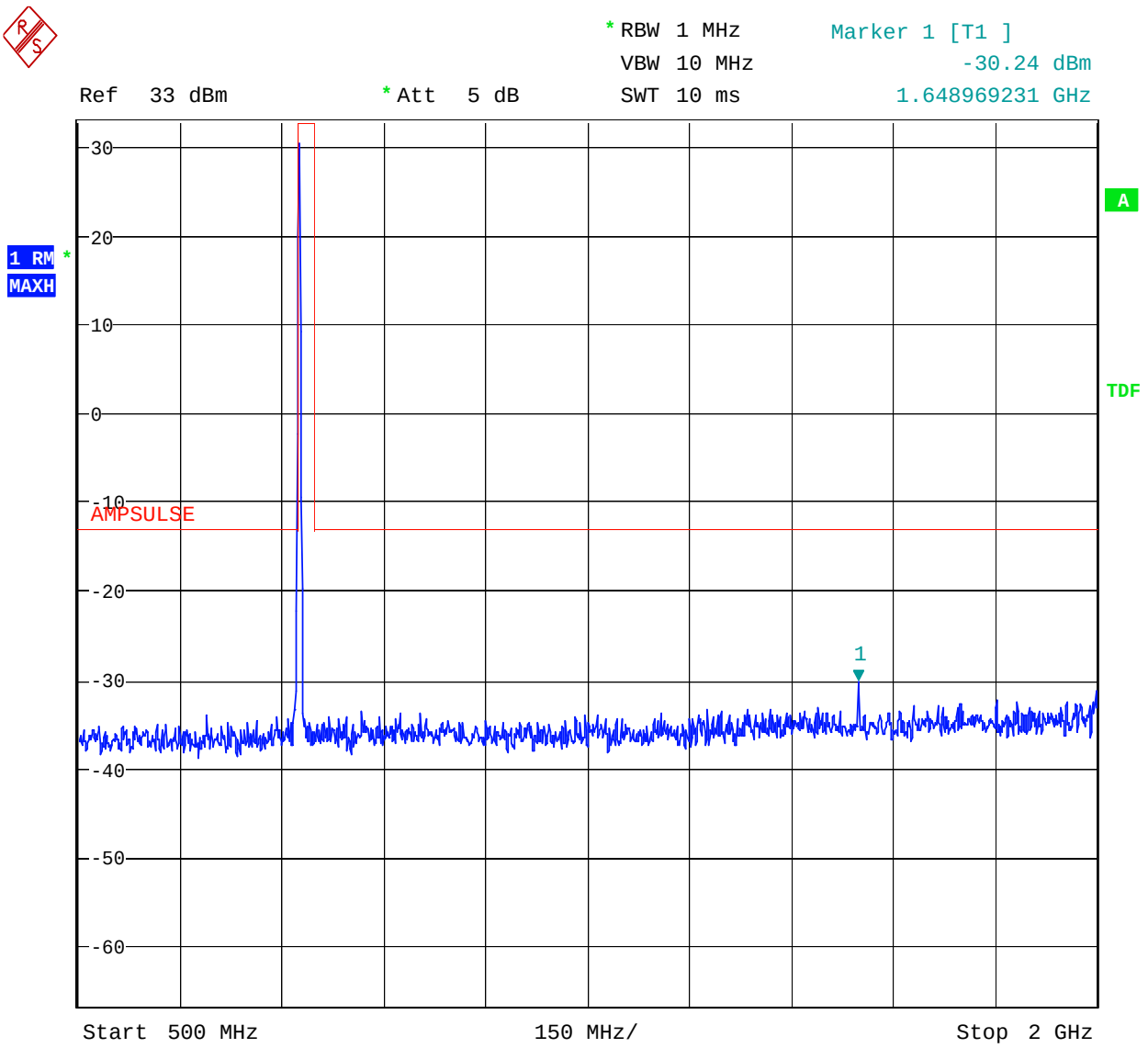


Figure 9 Spurious Emissions - GSM850 – Channel 128

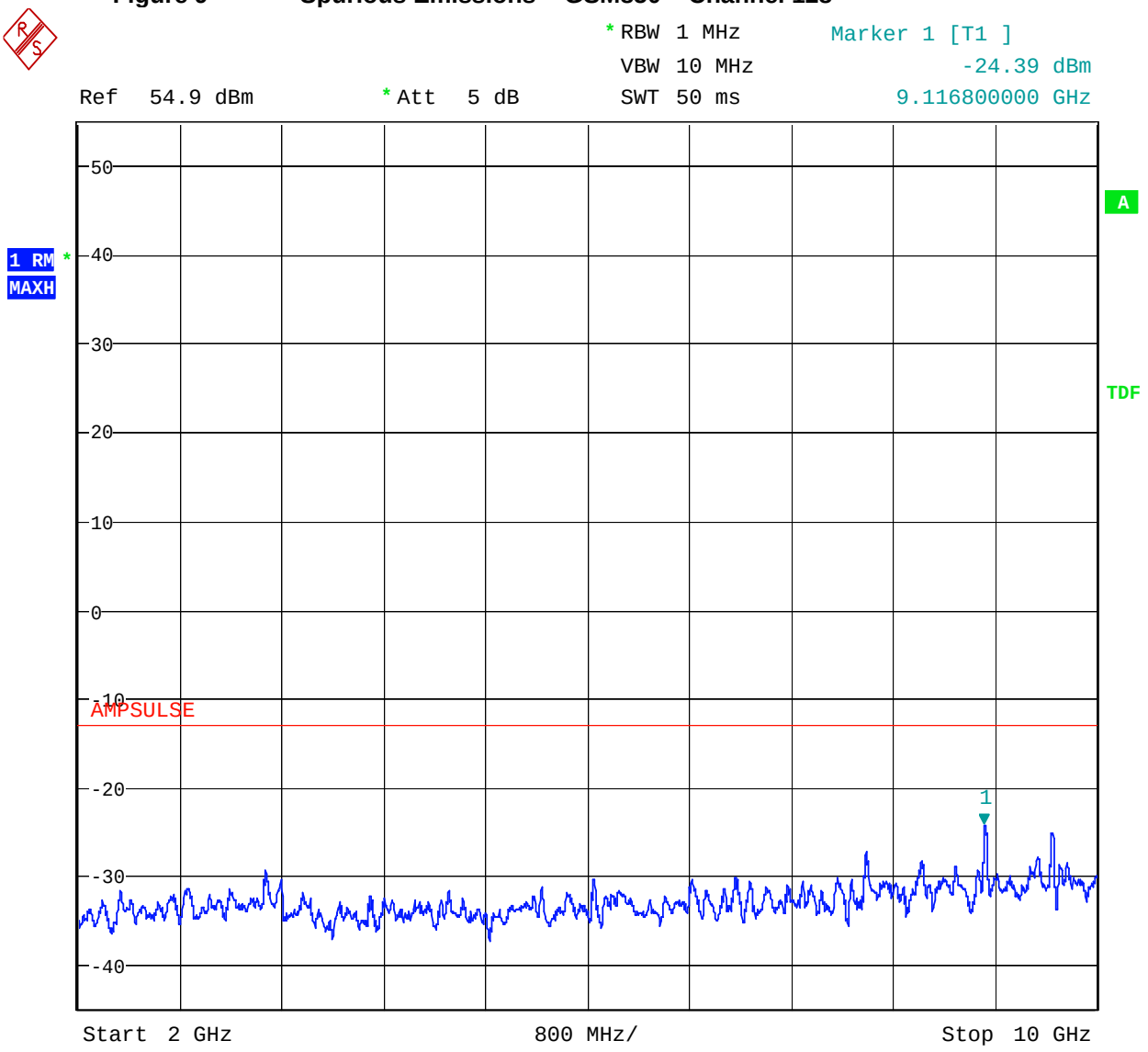


Figure 10 Spurious Emissions - GSM850 – Channel 189

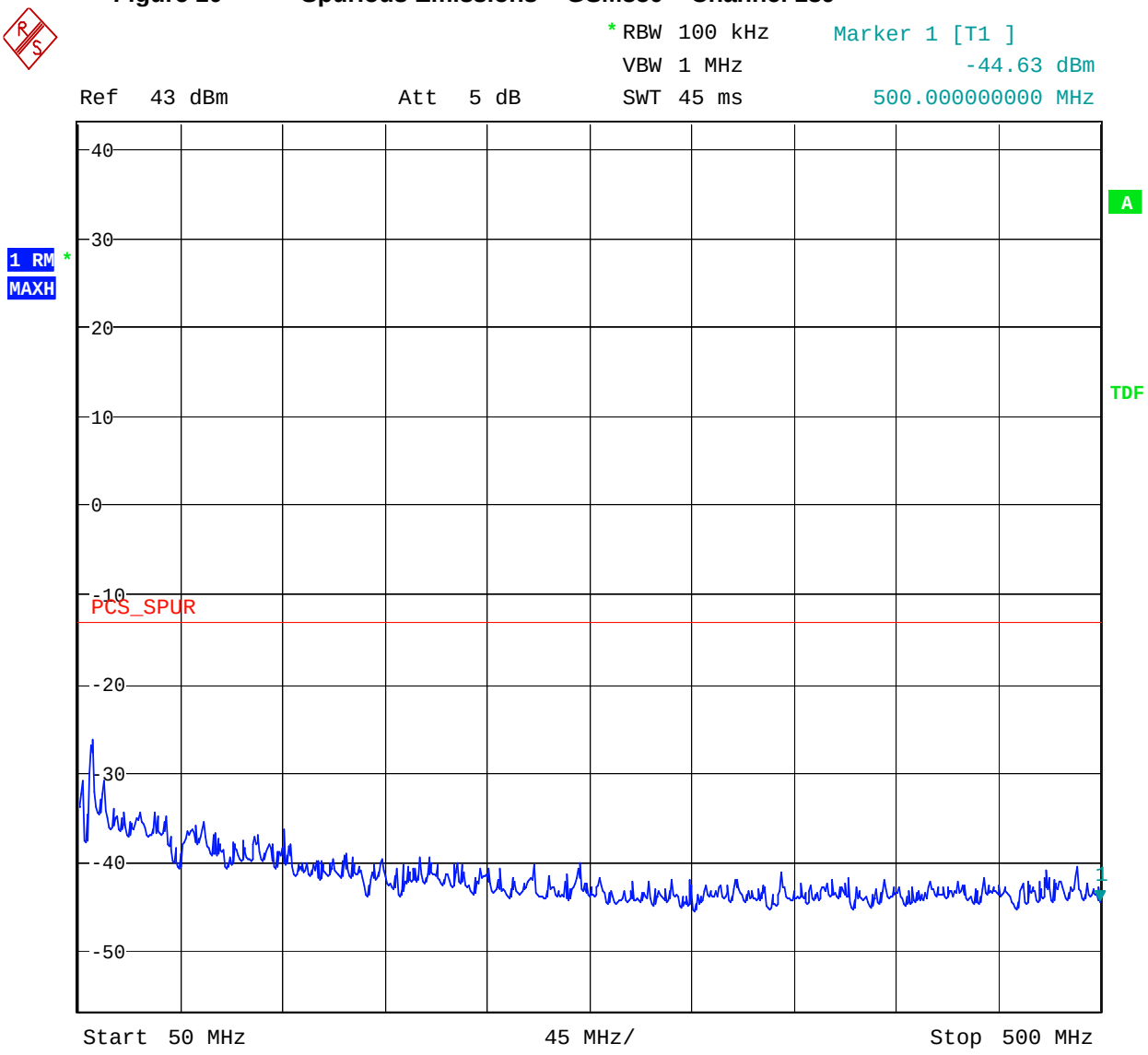


Figure 11 Spurious Emissions - GSM850 – Channel 189

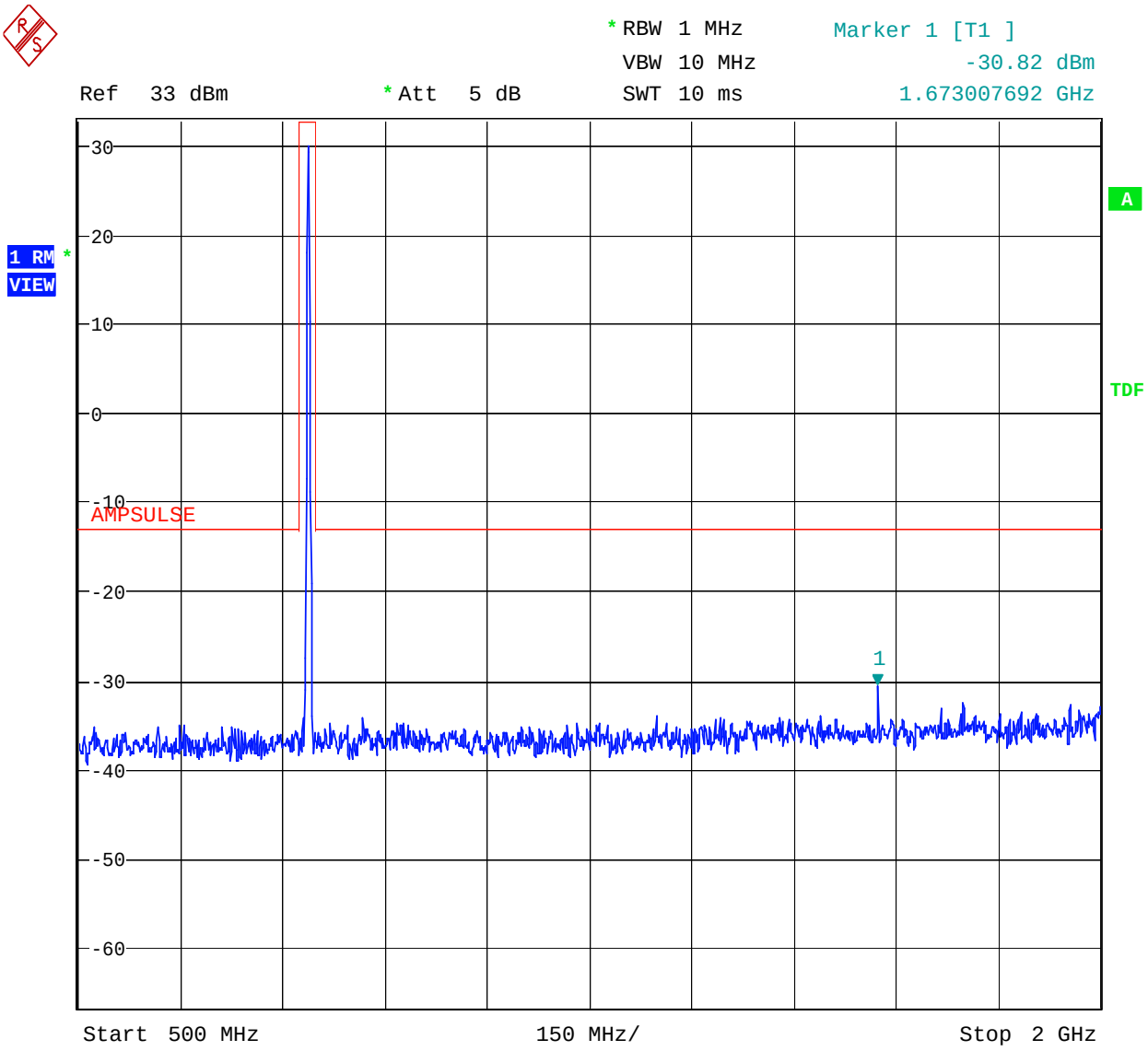


Figure 12 Spurious Emissions - GSM850 – Channel 189

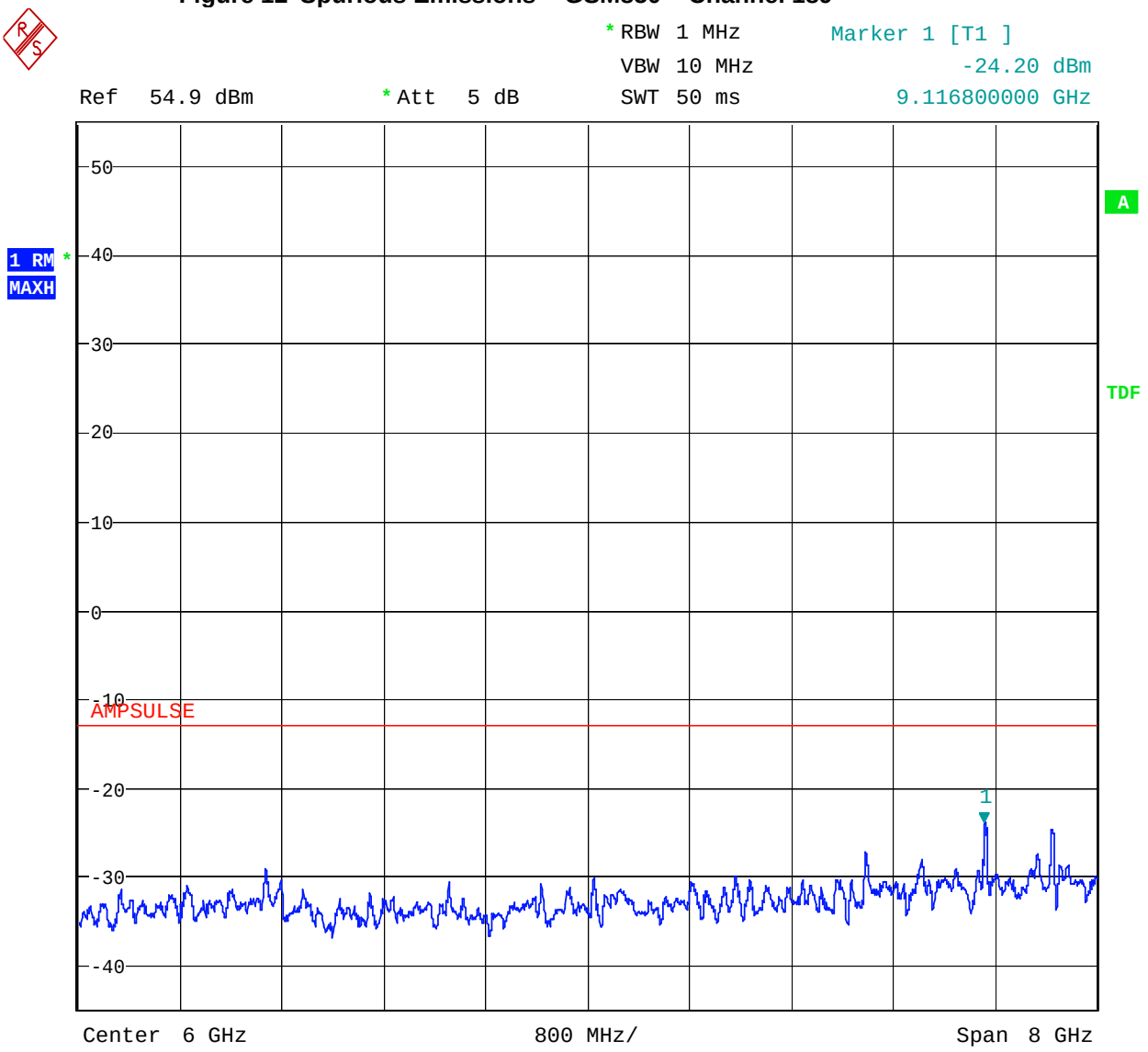


Figure 13 Spurious Emissions - GSM850 – Channel 251

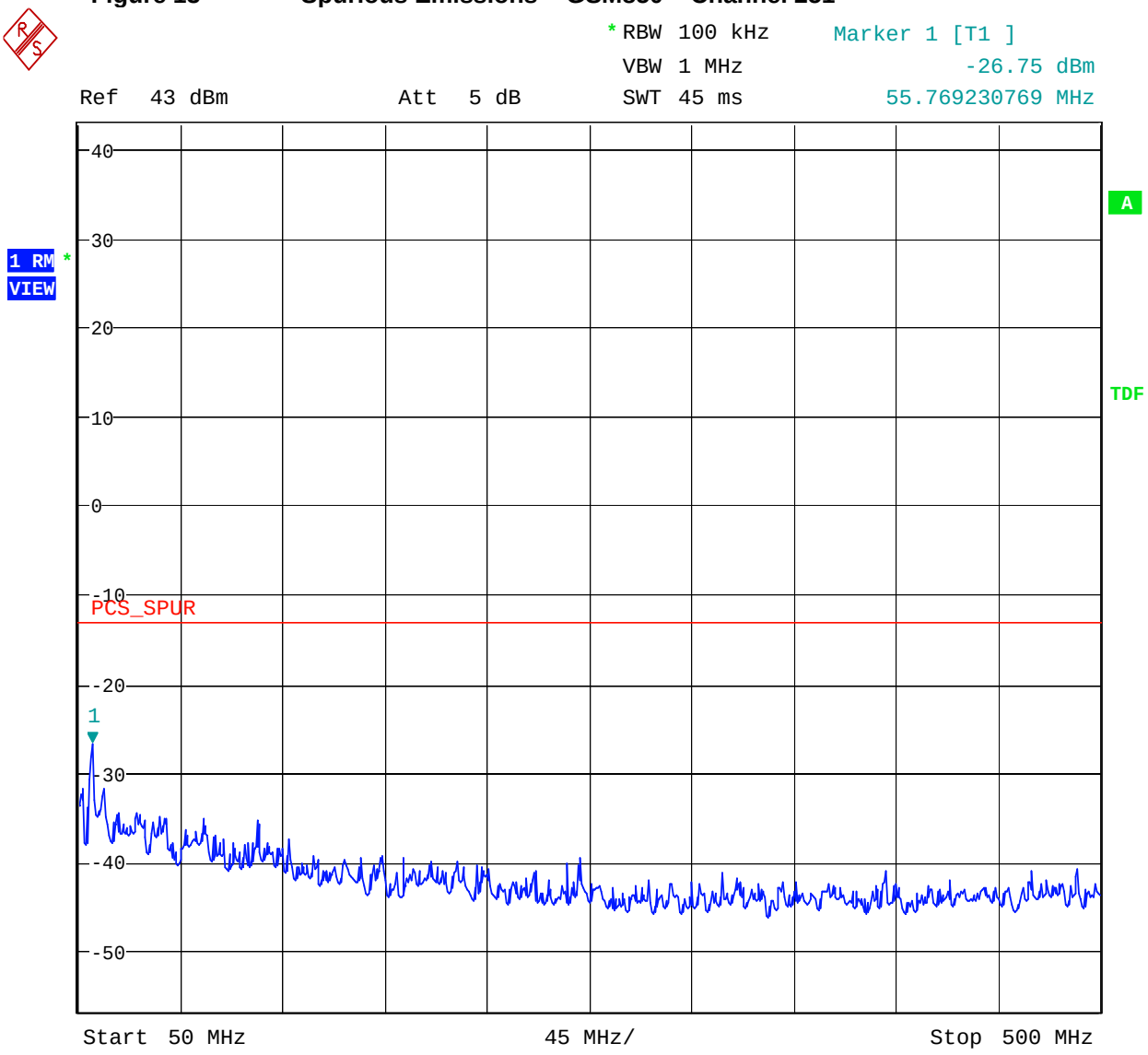


Figure 14 Spurious Emissions - GSM850 – Channel 251

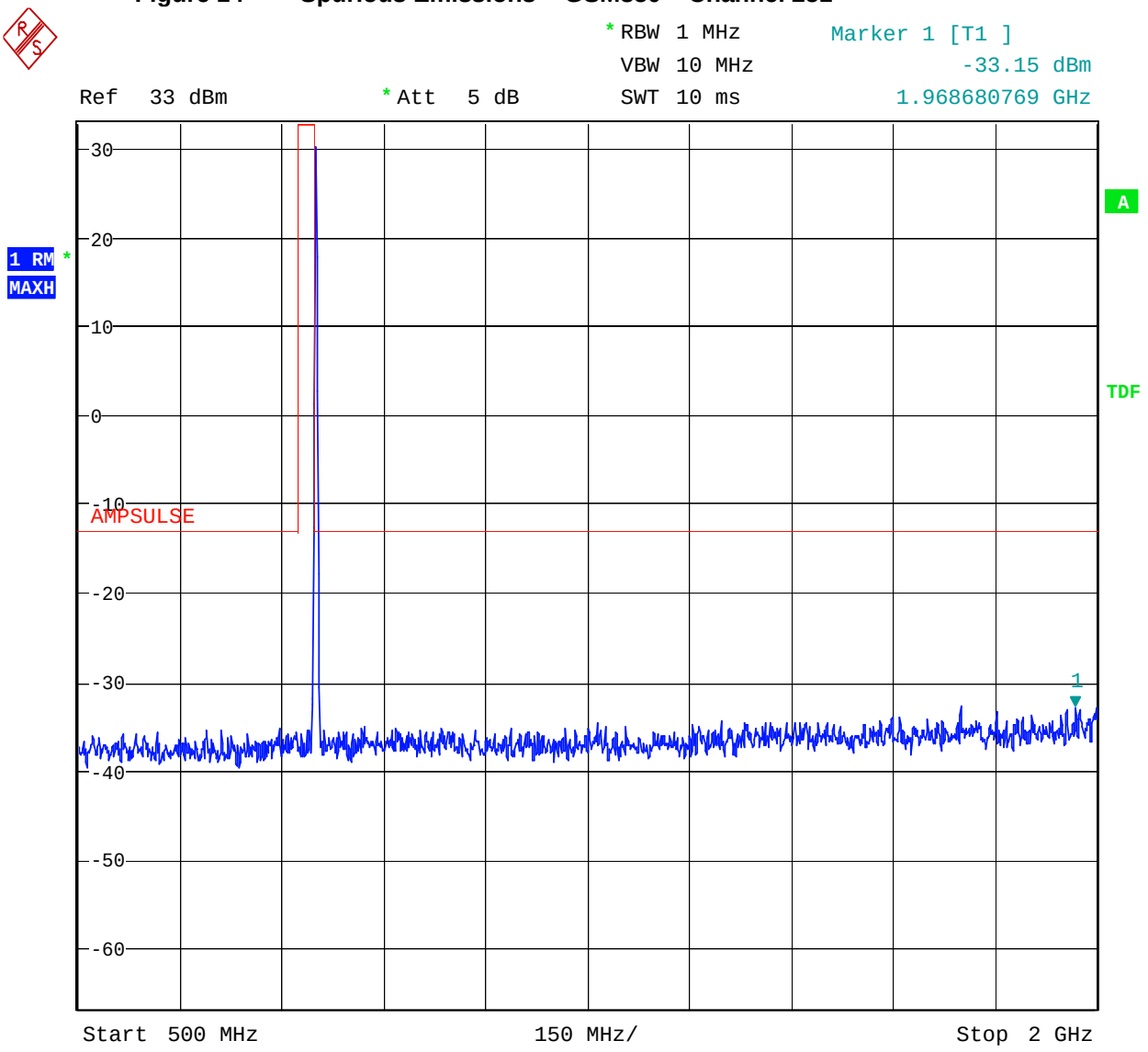


Figure 15 Spurious Emissions - GSM850 – Channel 251

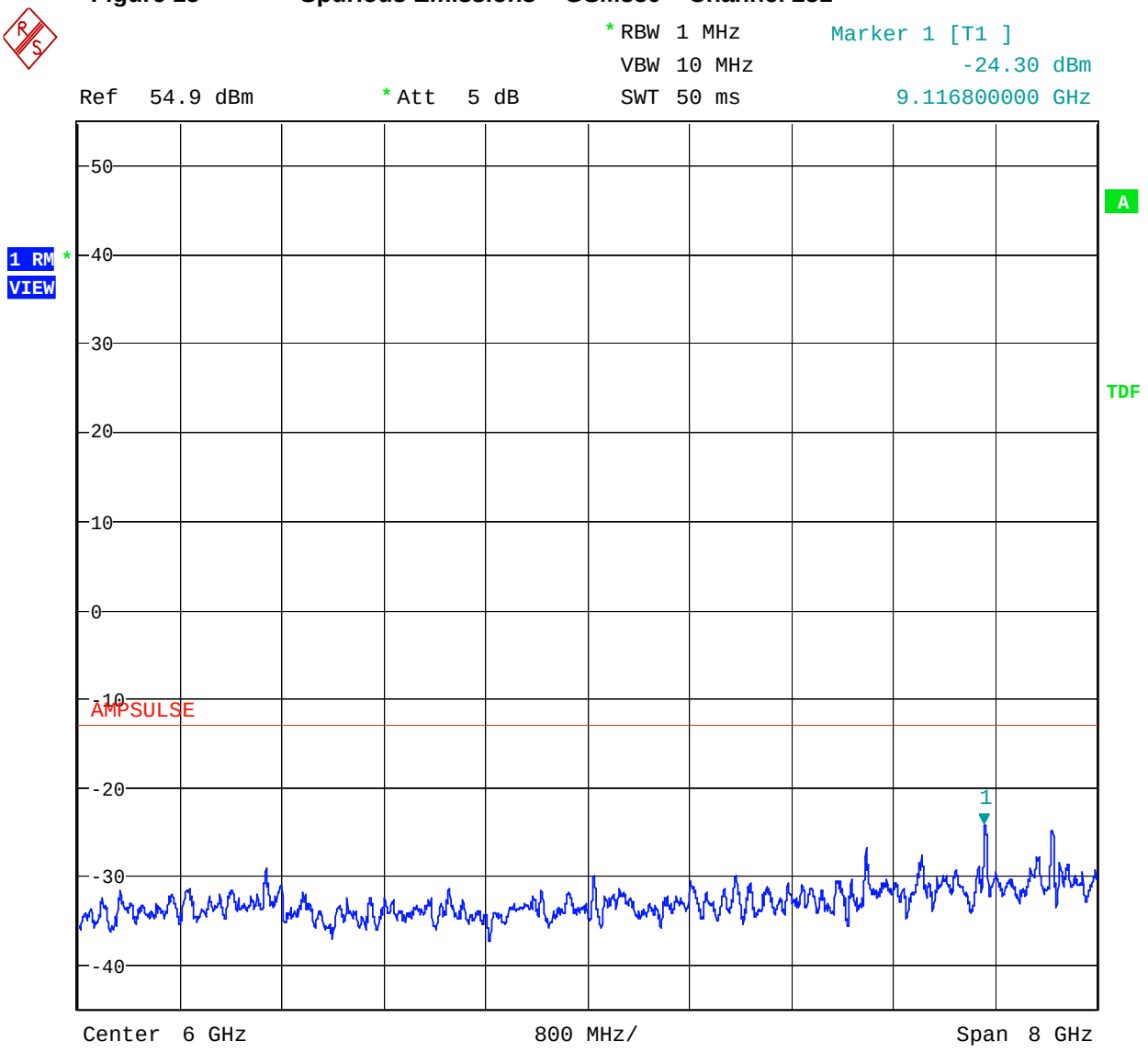


Figure 16 Spurious Emissions - GSM1900 – Channel 4

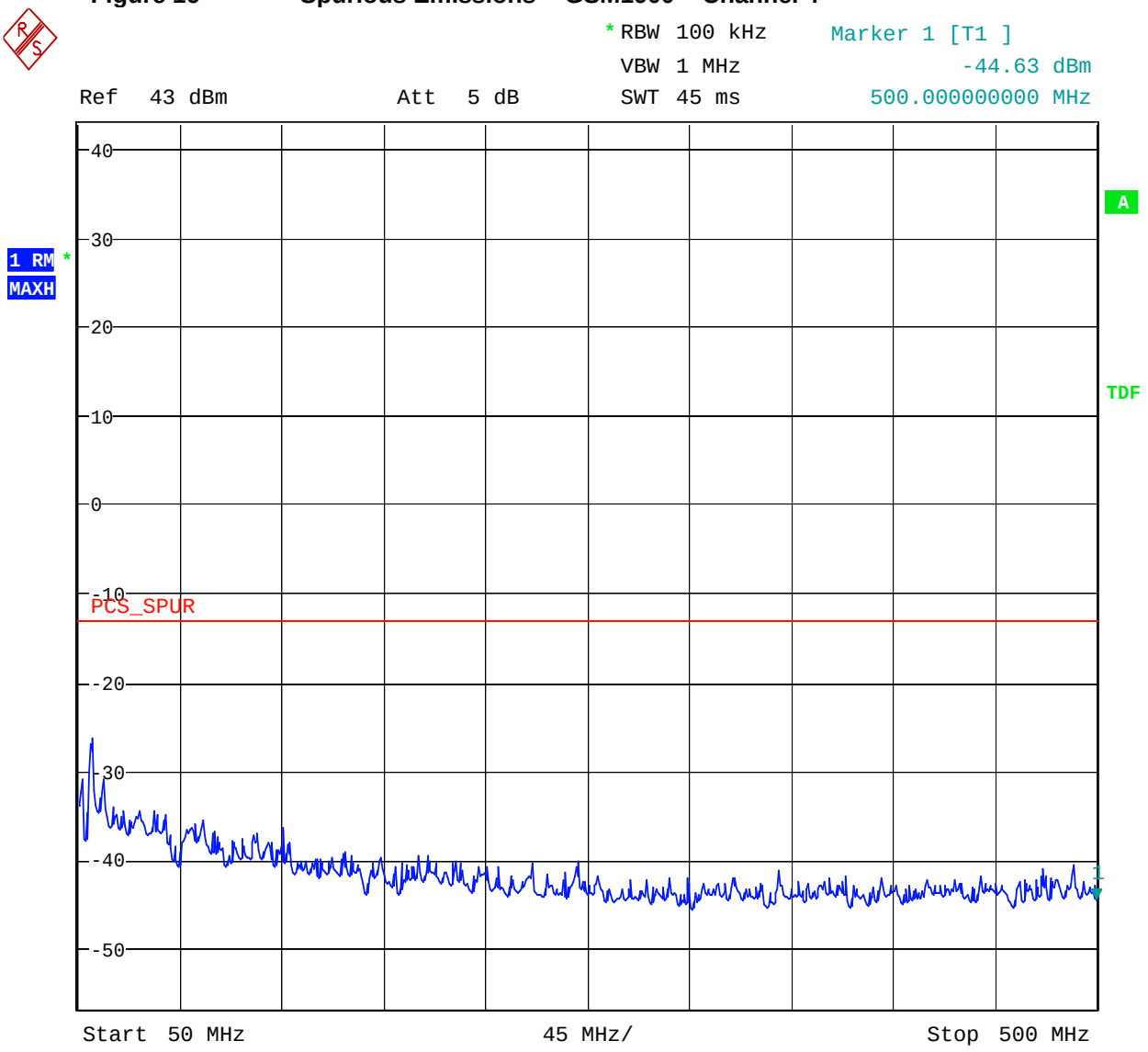


Figure 17 Spurious Emissions - GSM1900 – Channel 4

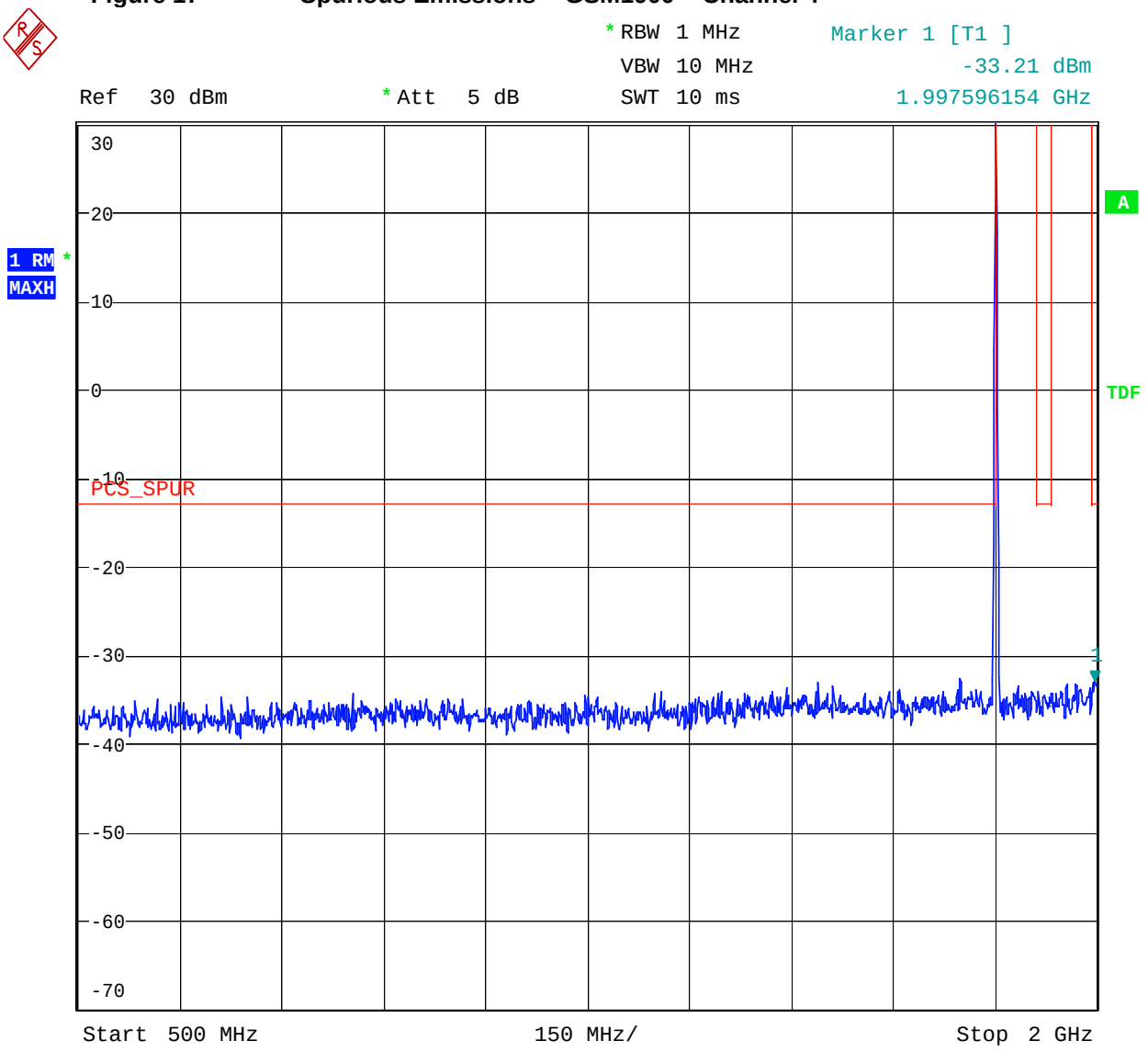


Figure 18 Spurious Emissions - GSM1900 – Channel 4

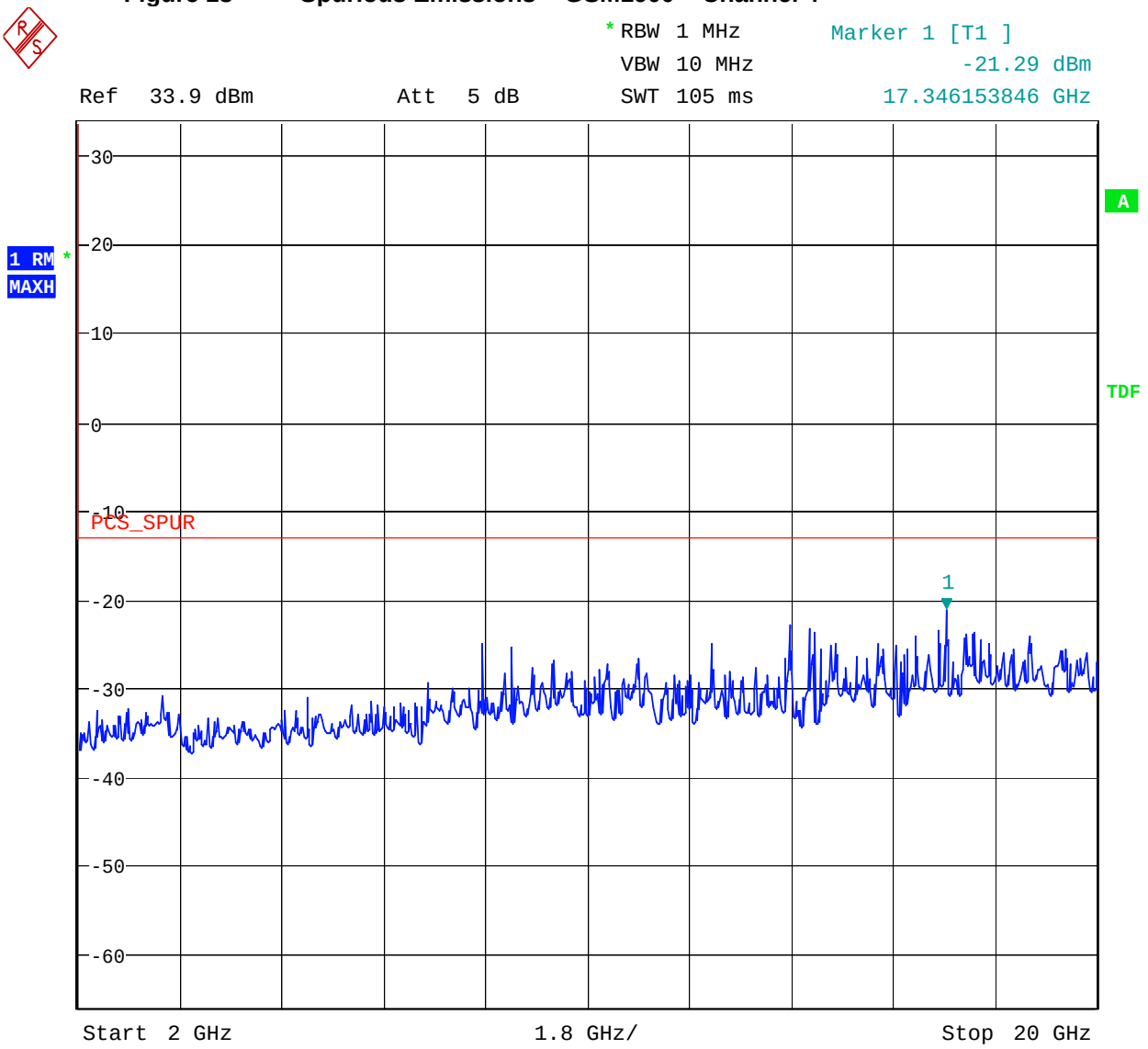


Figure 19 Spurious Emissions - GSM1900 – Channel 600

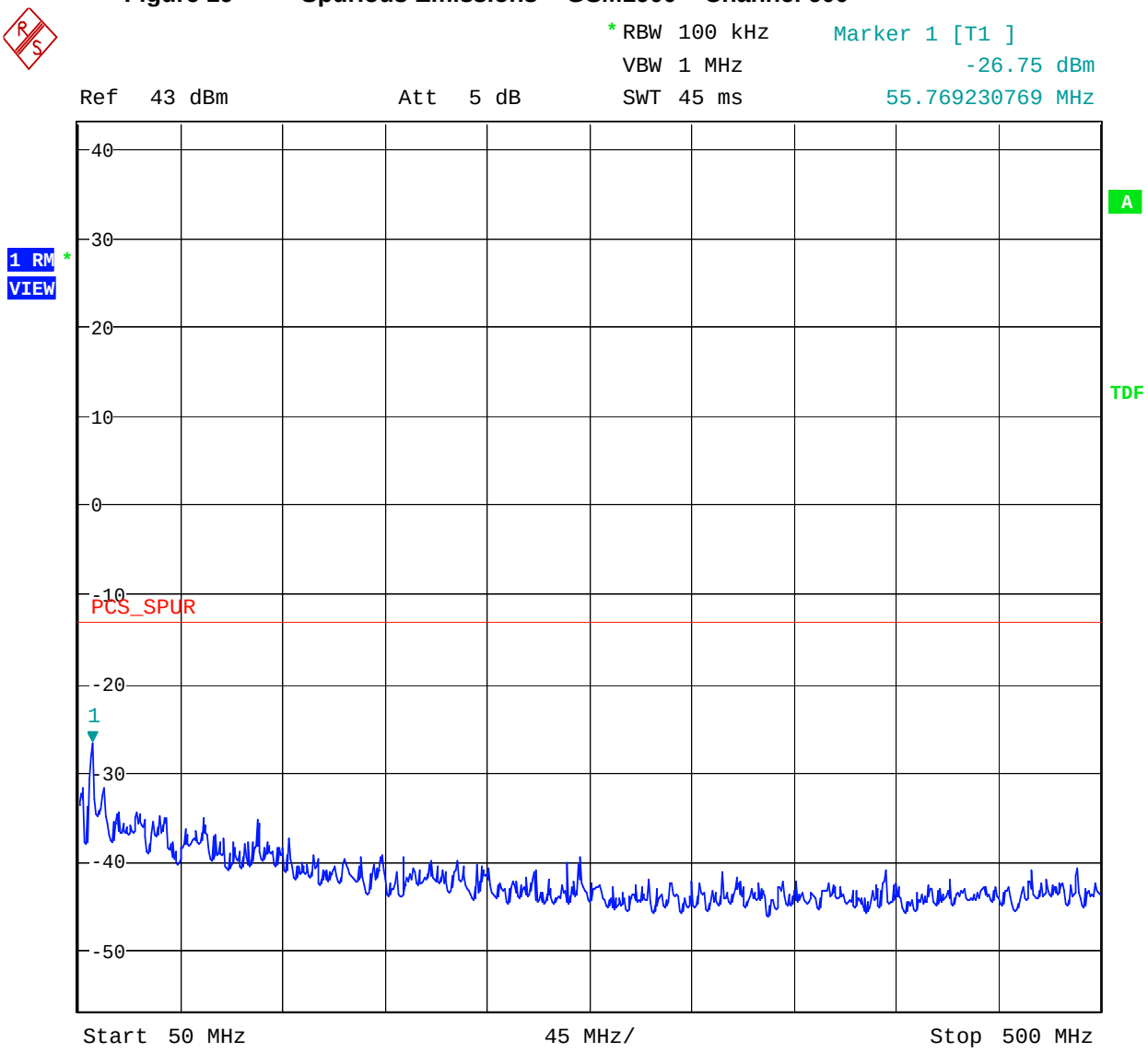


Figure 20 Spurious Emissions - GSM1900 – Channel 600

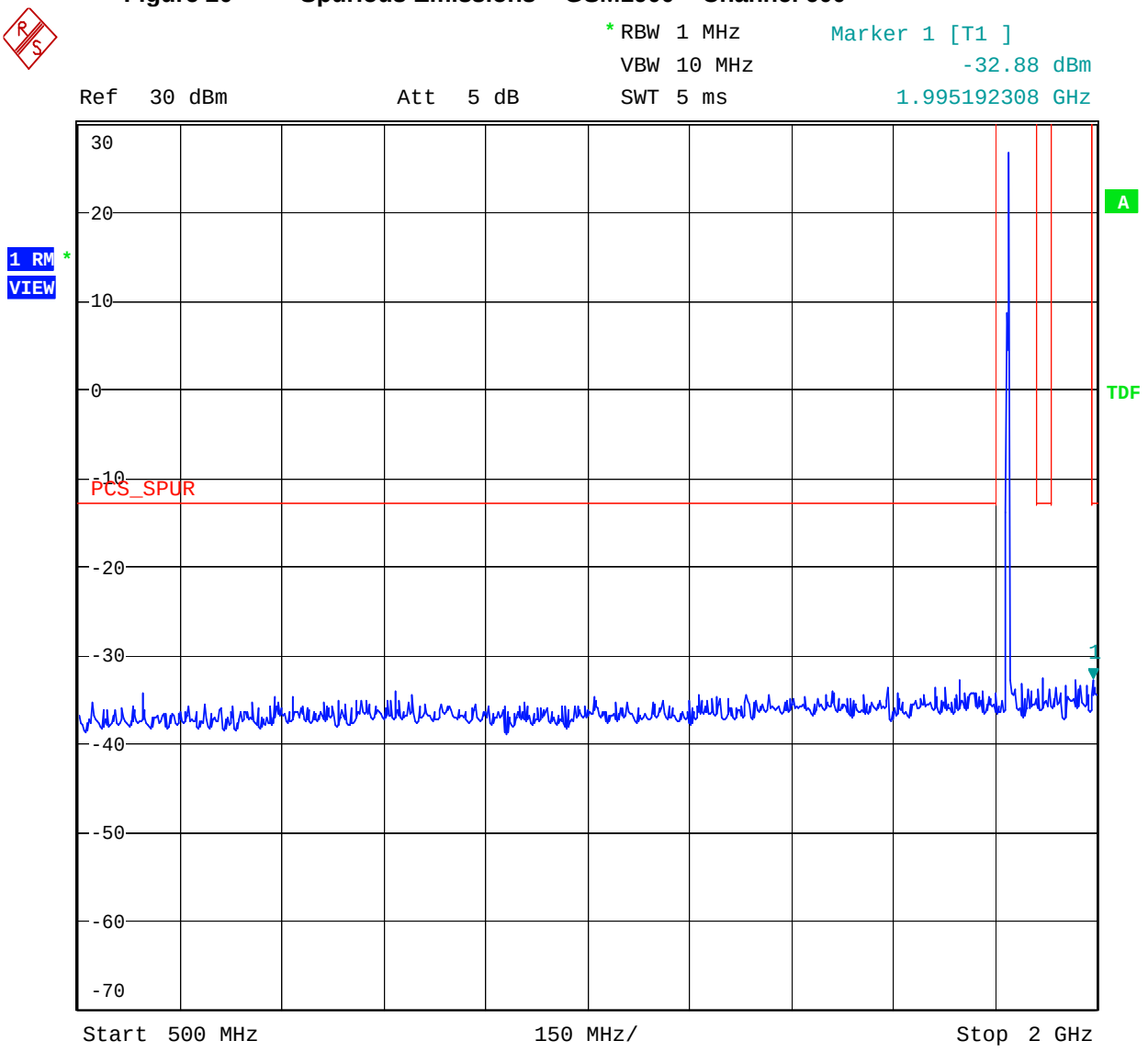


Figure 21 Spurious Emissions - GSM1900 – Channel 600

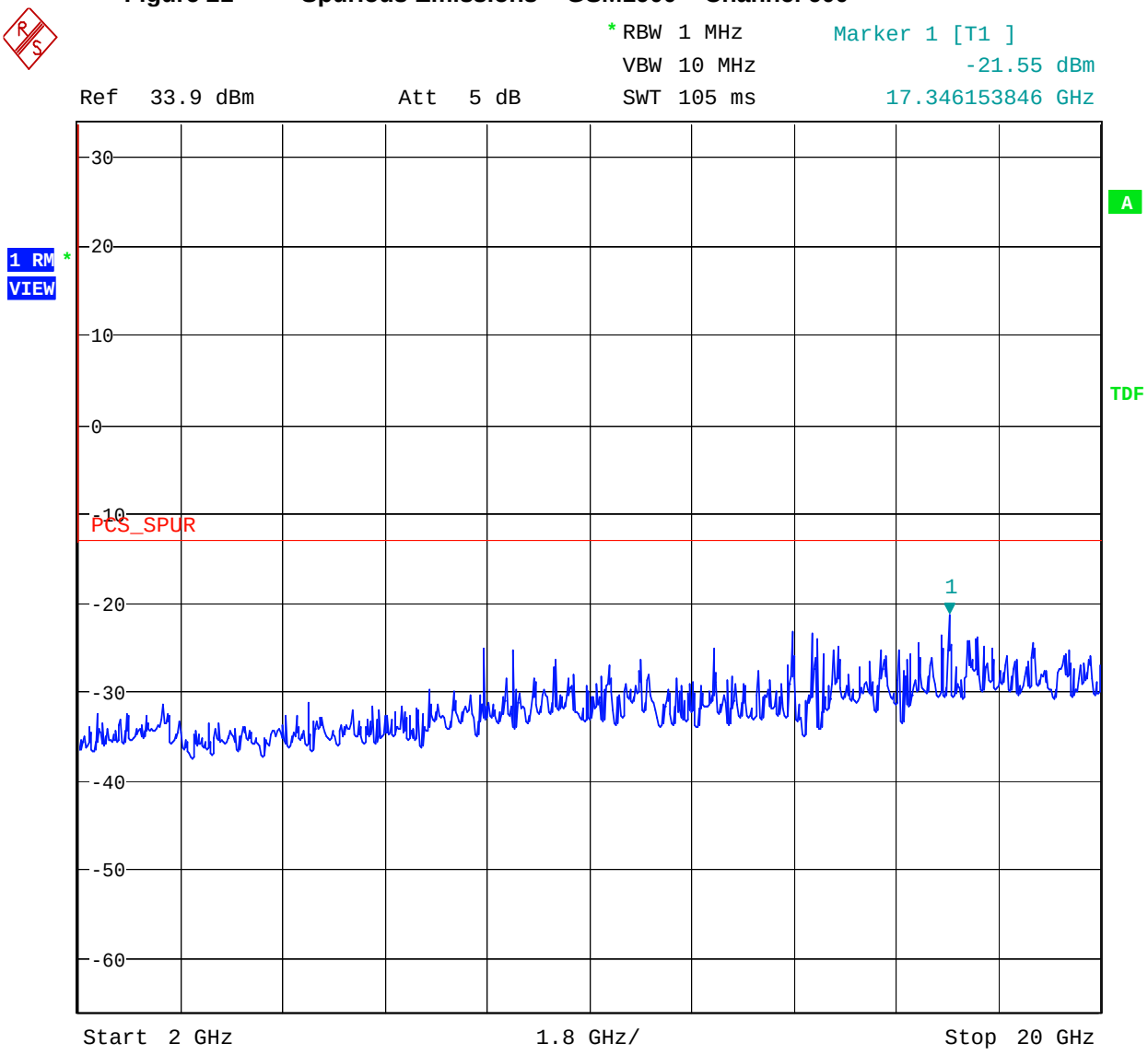


Figure 22 Spurious Emissions - GSM1900 – Channel 1196

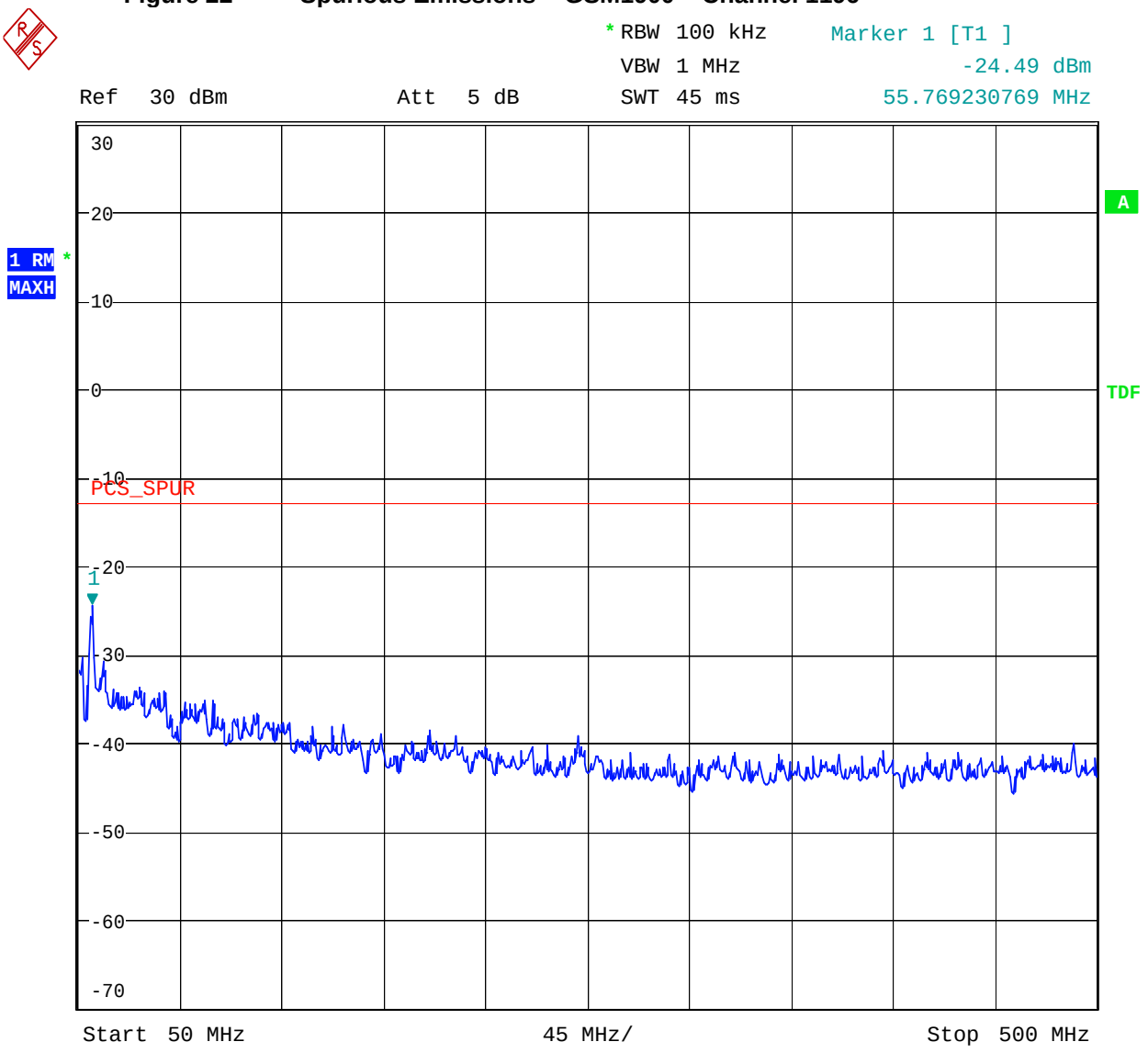


Figure 23 Spurious Emissions - GSM1900 – Channel 1196

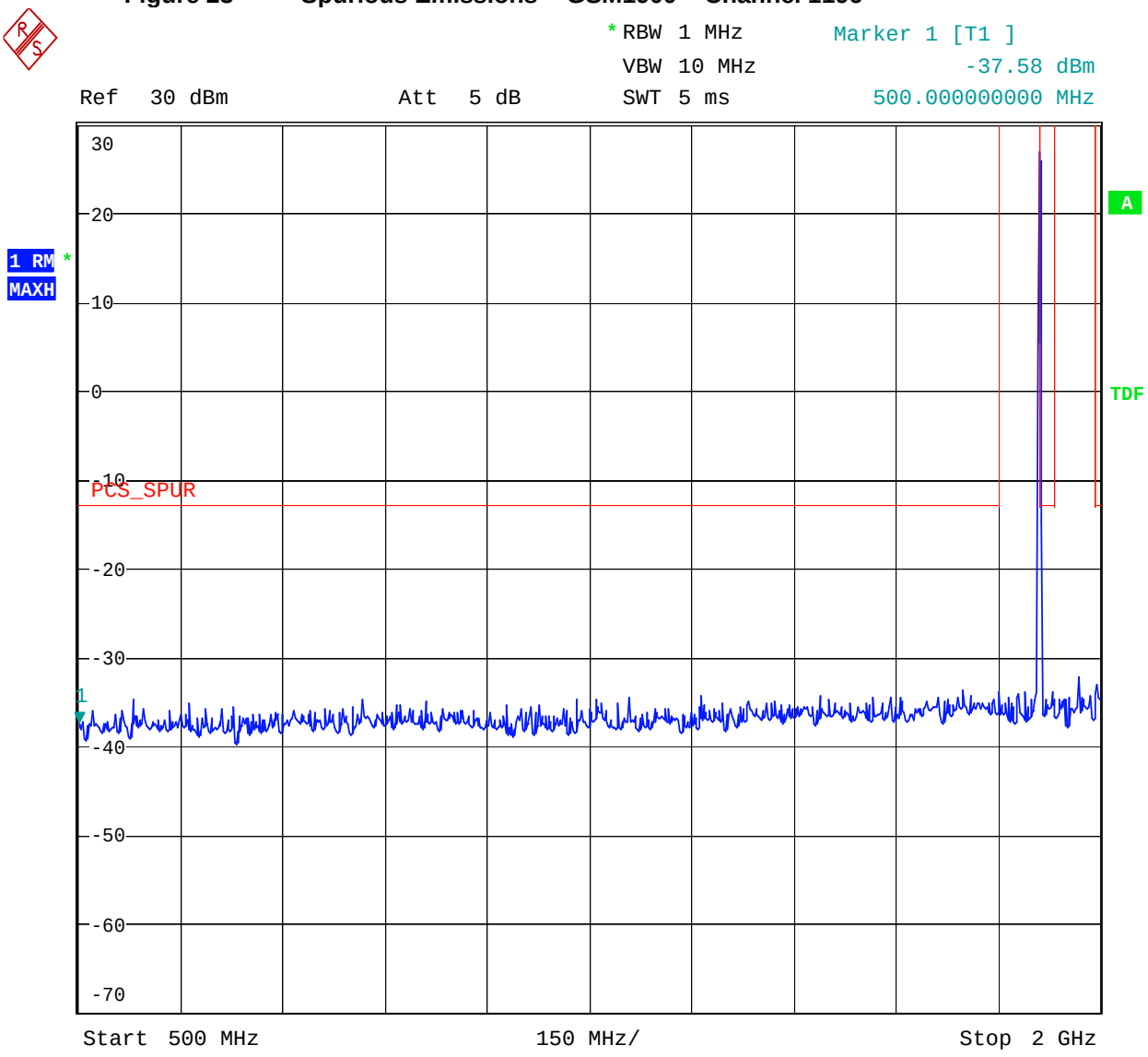


Figure 24 Spurious Emissions - GSM1900 – Channel 1196

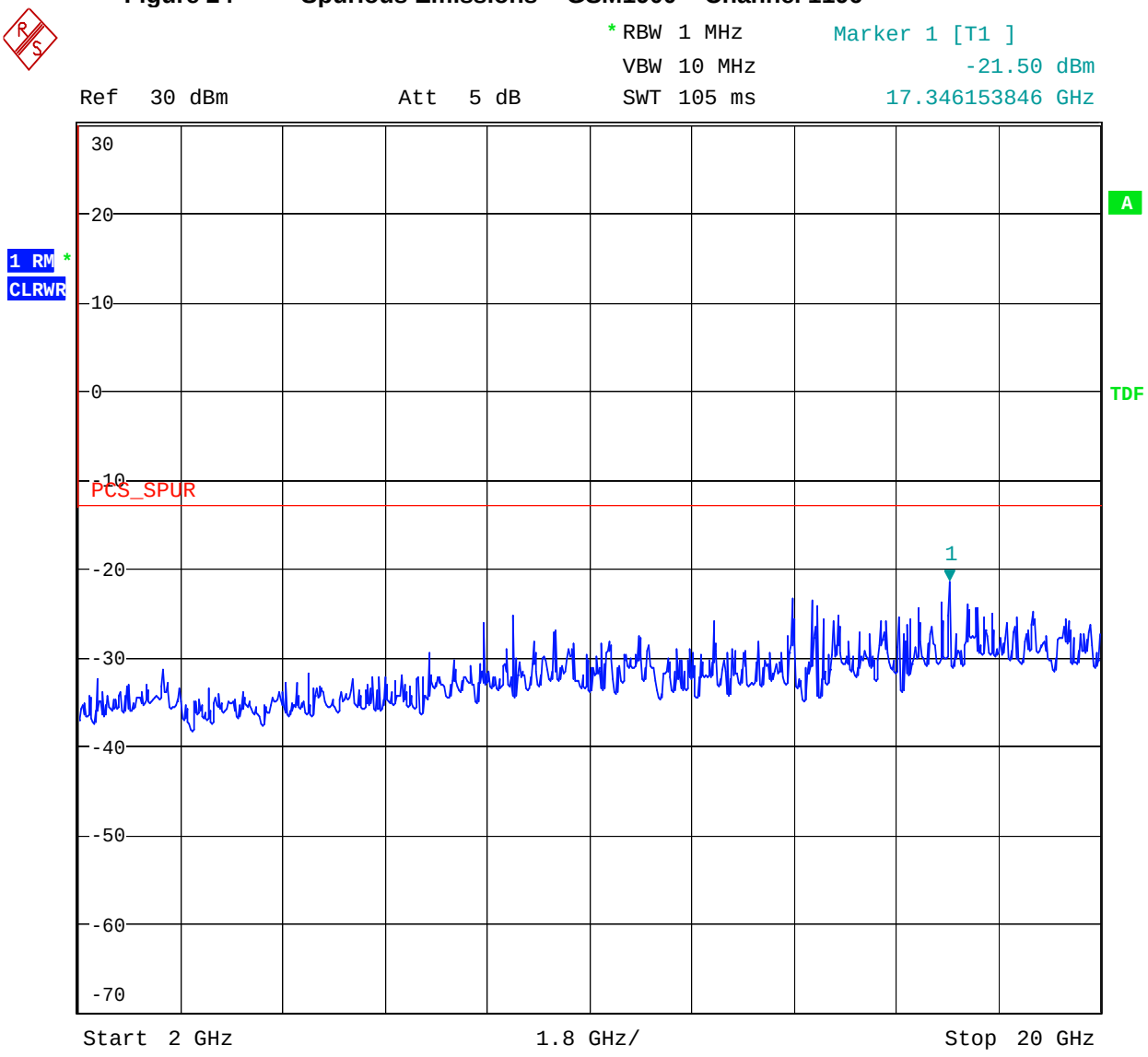
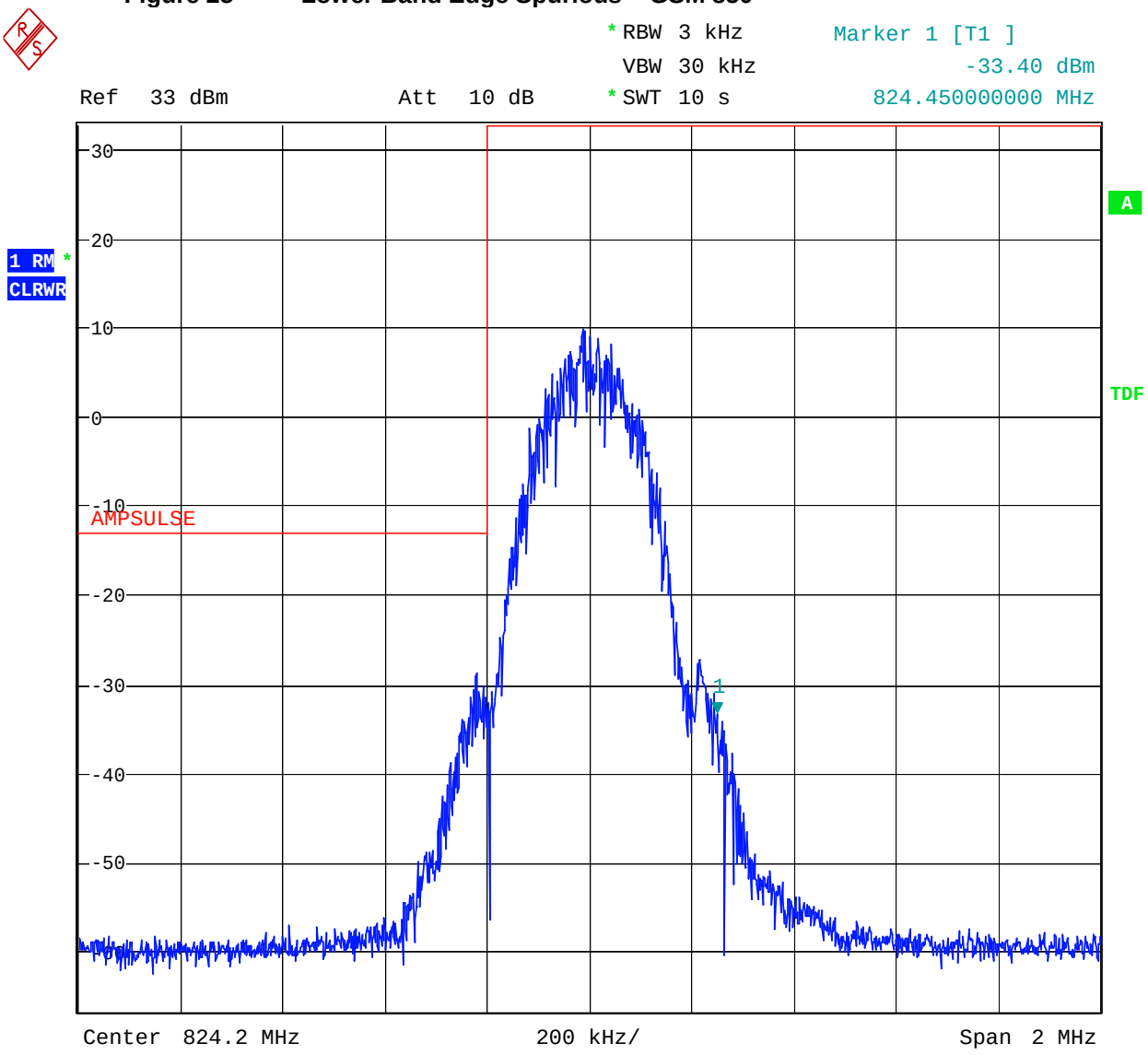
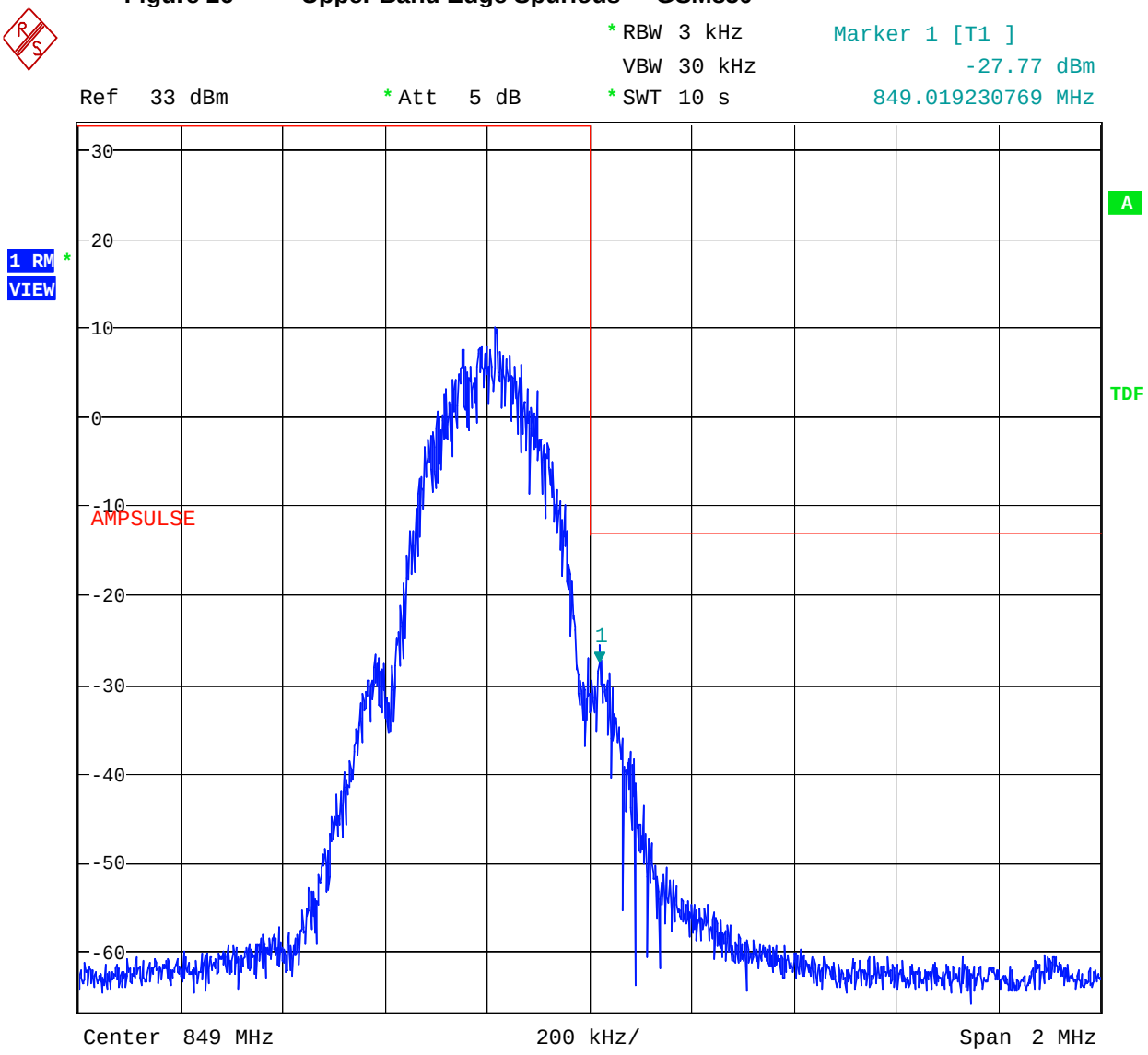


Figure 25 Lower Band Edge Spurious – GSM 850



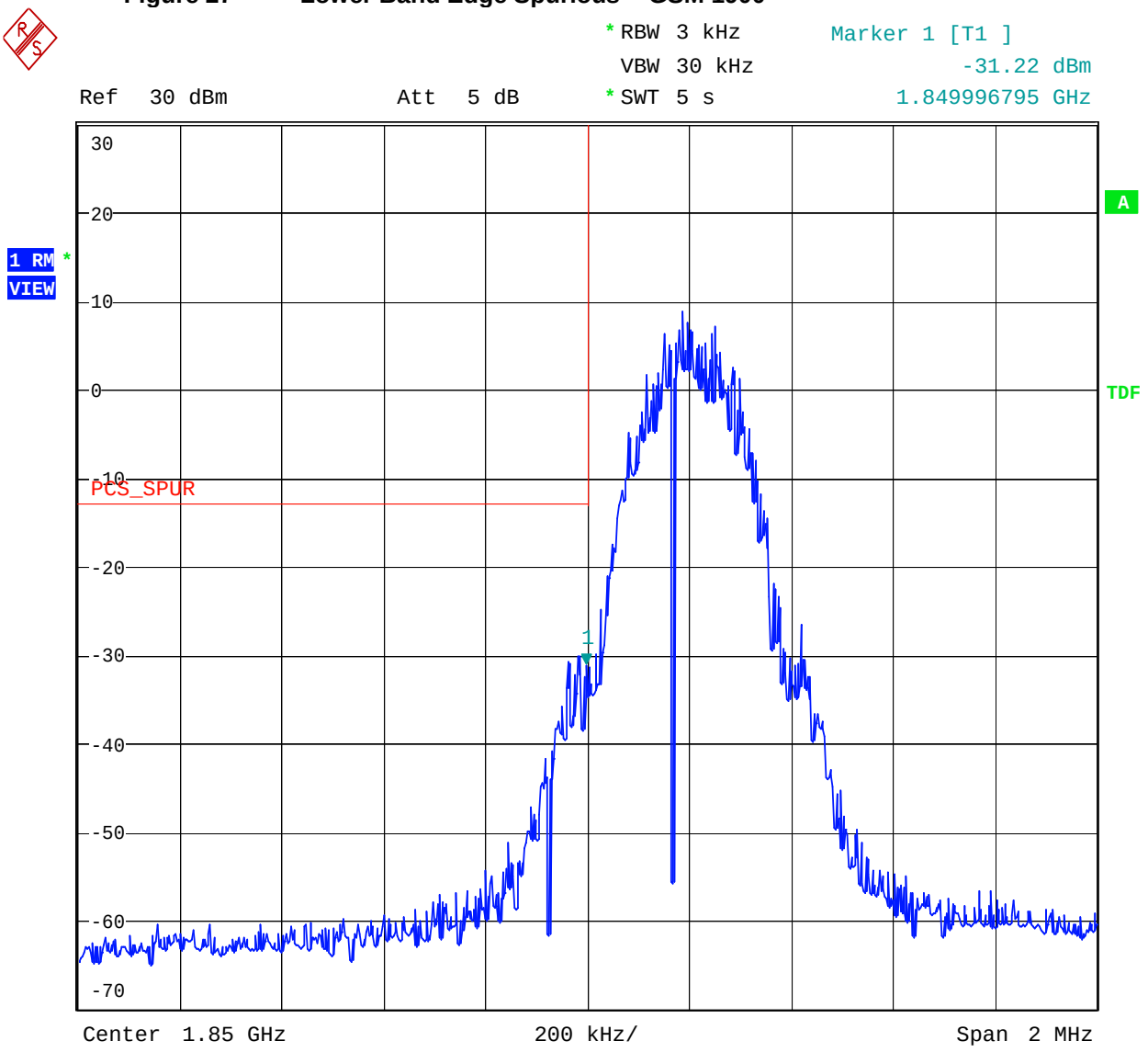
Date: 9.JAN.2007 15:47:23

Figure 26 Upper Band Edge Spurious - GSM850



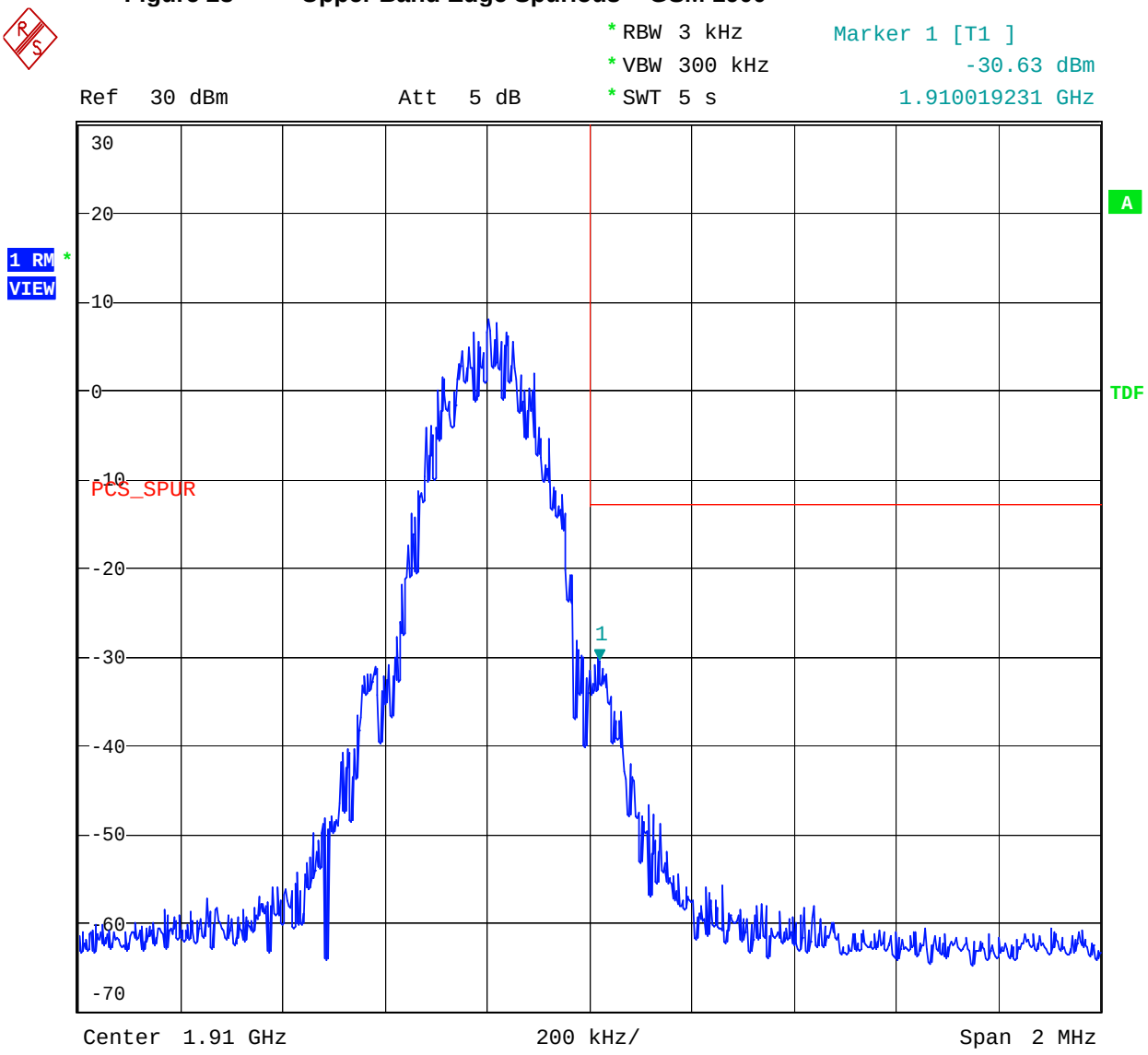
Date: 9.JAN.2007 16:12:38

Figure 27 Lower Band Edge Spurious - GSM 1900



Date: 9.JAN.2007 16:54:26

Figure 28 Upper Band Edge Spurious - GSM 1900



Date: 9.JAN.2007 17:29:44

D.8. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX E: 2.1053 FIELD STRENGTH OF SPURIOUS RADIATION

E.1. Base Standard & Test Basis

Base Standard	FCC 2.1053
Test Basis	FCC 2.1053 Field Strength of Spurious Radiation
Test Method	TIA 603-C, 2004 Substitution Antenna Method

E.2. Limits

22.917

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

24.238 Emission limitations for Broadband PCS equipment

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

E.3. Test Results

Compliant. The worst-case spurious emission level was -18.8 dBm at 1908.2 MHz. This level is 5.8 dB below the specification limit of -13 dBm. The spectrum was searched up to 20 GHz.

E.4. Deviations from Normal Operating Mode During Test

None.

E.5. Sample Calculation

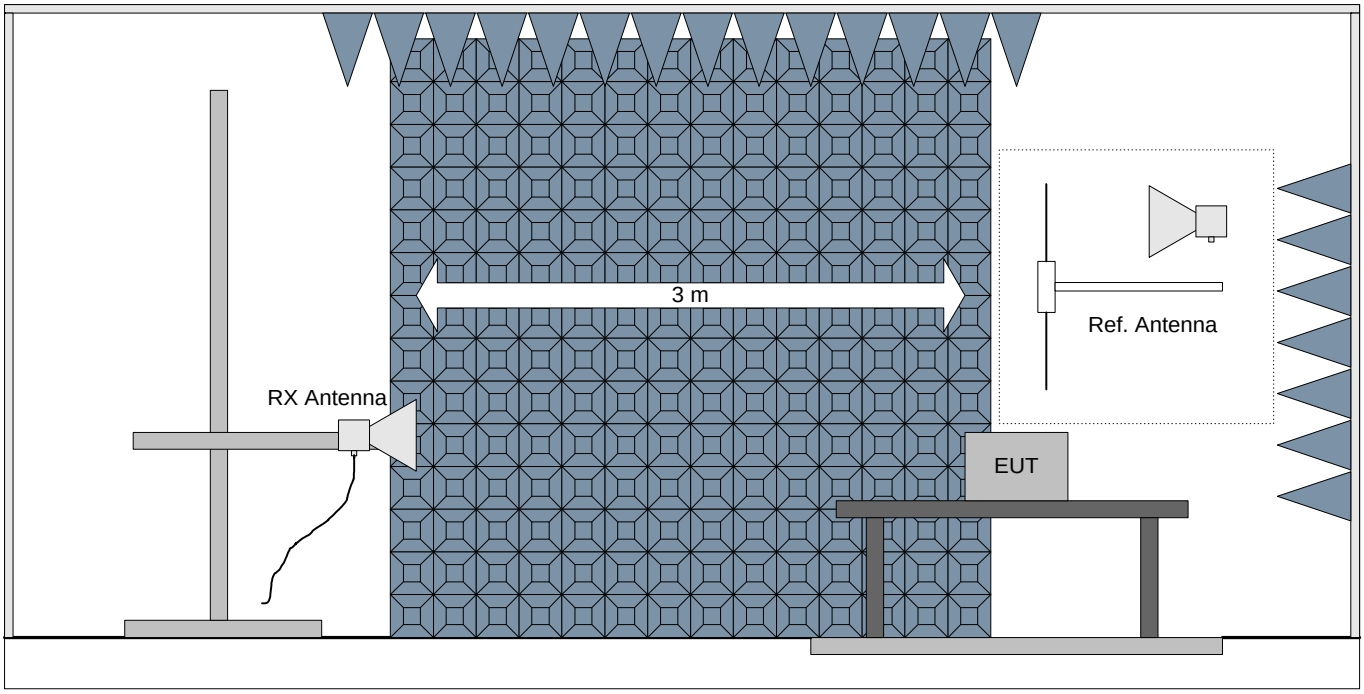
Final measured value (dBm) = Substitution level (dBm) + Antenna Gain (dBd)

Minimum attenuation limit (dB) = 43 + 10 log(P) where P = Peak power of the carrier in watts.

Min. Atten. Limit (dB) = 43 + 10 * log(1.6 watts)
= 43 + 10 * .204
= 43 + 2.04
= 45.04 dB

32 dBm – 45 dB = -13 dBm

E.6. Test Diagram



Note: The EUT is set to repeat a signal at maximum rf output power into a coaxial load for this testing.

E.7. Test Data

GSM850 Mode

Project No:	Enfora L.P.
Model:	GSM0308-10 B2BRF
Comments:	Transmit CW at full rf output power (2 watts), Ch. 128
Date:	1/9/2007

Distance: 3 m	Standard: RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz VBW: (unless noted) Peak = RBW Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBd)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1248	-25.1	1.63	-23.5	4.50E-06	32	2	45	10.5
	H	1248	-29.1	1.63	-27.5	1.79E-06	32	2	45	14.5
	V	1649	-23.3	4.18	-19.1	1.22E-05	32	2	45	6.1
	H	1649	-30.4	4.18	-26.2	2.39E-06	32	2	45	13.2
	V	2471.8	-26.2	4.52	-21.7	6.79E-06	32	2	45	8.7
	H	2471.8	-26.9	4.52	-22.4	5.78E-06	32	2	45	9.4
	V	4103.1	-33	5.27	-27.7	1.69E-06	32	2	45	14.7
	H	4103.1	-30.2	5.27	-24.9	3.21E-06	32	2	45	11.9
	V	5730	-34.1	6.53	-27.6	1.75E-06	32	2	45	14.6
	H	5730	-34.7	6.53	-28.2	1.52E-06	32	2	45	15.2
	V	7418.00	-32.2	7.62	-24.6	3.48E-06	32	2	45	11.6
	H	7418.00	-34.5	7.62	-26.9	2.05E-06	32	2	45	13.9
	V	10117.00	-33.9	7.77	-26.1	2.44E-06	32	2	45	13.1
	H	10117.00	-34.3	7.77	-26.5	2.22E-06	32	2	45	13.5

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 18 GHz

Project No:	Enfora L.P.
Model:	GSM0308-10 B2BRF
Comments:	Transmit CW at full rf output power (2 watts), Ch. 189
Date:	1/9/2007

Distance: 3 m	Standard: RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz VBW: (unless noted) Peak = RBW Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBd)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1248.14	-25.5	1.63	-23.9	4.10E-06	32	2	45	10.9
	H	1248.14	-27.6	1.63	-26.0	2.53E-06	32	2	45	13.0
	V	1673.8	-23.7	4.18	-19.5	1.12E-05	32	2	45	6.5
	H	1673.8	-26	4.18	-21.8	6.58E-06	32	2	45	8.8
	V	2508.2	-26.6	5.23	-21.4	7.29E-06	32	2	45	8.4
	H	2508.2	-28.2	5.23	-23.0	5.05E-06	32	2	45	10.0
	V	3344.7	-29.1	5.37	-23.7	4.24E-06	32	2	45	10.7
	H	3344.7	-32.9	5.37	-27.5	1.77E-06	32	2	45	14.5
	V	5736	-33.6	6.53	-27.1	1.96E-06	32	2	45	14.1
	H	5736	-34.3	6.53	-27.8	1.67E-06	32	2	45	14.8
	V	7541.00	-32.4	7	-25.4	2.88E-06	32	2	45	12.4
	H	7541.00	-34	7	-27.0	2.00E-06	32	2	45	14.0
	V	9992.50	-35.1	7.7	-27.4	1.82E-06	32	2	45	14.4
	H	9992.50	-33.6	7.7	-25.9	2.57E-06	32	2	45	12.9

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 18 GHz

Project No:	Enfora L.P.
Model:	GSM0308-10 B2BRF
Comments:	Transmit CW at full rf output power (2 watts), Ch. 251
Date:	1/9/2007

Distance:	3 m
Standard:	RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz; VBW: (unless noted) Peak = RBW, Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBd)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1248.1	-23.6	1.63	-22.0	6.35E-06	32	2	45	9.0
	H	1248.1	-28.1	1.63	-26.5	2.25E-06	32	2	45	13.5
	V	1699.1	-25.8	4.18	-21.6	6.89E-06	32	2	45	8.6
	H	1699.1	-26.9	4.18	-22.7	5.35E-06	32	2	45	9.7
	V	1908.2	-23	4.18	-18.8	1.31E-05	32	2	45	5.8
	H	1908.2	-30	4.18	-25.8	2.62E-06	32	2	45	12.8
	V	2545	-29	5.23	-23.8	4.20E-06	32	2	45	10.8
	H	2545	-33	5.23	-27.8	1.67E-06	32	2	45	14.8
	V	3252	-31.7	5.37	-26.3	2.33E-06	32	2	45	13.3
	H	3252	-32.2	5.37	-26.8	2.07E-06	32	2	45	13.8
	V	5773.00	-34.7	6.53	-28.2	1.52E-06	32	2	45	15.2
	H	5773.00	-34.7	6.53	-28.2	1.52E-06	32	2	45	15.2
	V	1020.00	-34.6	1.63	-33.0	5.05E-07	32	2	45	20.0
	H	1020.00	-34.6	1.63	-33.0	5.05E-07	32	2	45	20.0

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 18 GHz

GSM1900 Mode

Project No: Enfora L.P.
Model: GSM0308-10 B2BRF
Comments: Transmit CW at full rf output power (2 watts), Ch. 4
Date: 1/9/2007

Distance: 3 m

Standard:

RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz

VBW: (unless noted) Peak = RBW, Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBi)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1247.8	-25.9	3.78	-22.1	6.14E-06	32	2	45	9.1
	H	1247.8	-27.1	3.78	-23.3	4.66E-06	32	2	45	10.3
	V	3701.2	-32.2	7.71	-24.5	3.56E-06	32	2	45	11.5
	H	3701.2	-34.6	7.71	-26.9	2.05E-06	32	2	45	13.9
	V	7401	-31.7	9.77	-21.9	6.41E-06	32	2	45	8.9
	H	7401	-33.2	9.77	-23.4	4.54E-06	32	2	45	10.4
Noise Floor	V	9962	-34.3	9.85	-24.5	3.59E-06	32	2	45	11.5
Noise Floor	H	9962	-35.1	9.85	-25.3	2.99E-06	32	2	45	12.3
Noise Floor	V	12940	-35.5	11.31	-24.2	3.81E-06	32	2	45	11.2
Noise Floor	H	12940	-37.5	11.31	-26.2	2.40E-06	32	2	45	13.2
Noise Floor	V	16177.00	-38.3	15.01	-23.3	4.69E-06	32	2	45	10.3
Noise Floor	H	16177.00	-37.8	15.01	-22.8	5.26E-06	32	2	45	9.8
Noise Floor	V	20000.00	-39.1	5.7	-33.4	4.57E-07	32	2	45	20.4
Noise Floor	H	20000.00	-39	5.7	-33.3	4.68E-07	32	2	45	20.3

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 20 GHz

Project No: Enfora L.P.
Model: GSM0308-10 B2BRF
Comments: Transmit CW at full rf output power (2 watts), Ch. 600
Date: 1/9/2007

Distance: 3 m

Standard:

RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz

VBW: (unless noted) Peak = RBW, Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBi)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1099.7	-28.1	3.78	-24.3	3.70E-06	32	2	45	11.3
	H	1099.7	-27	3.78	-23.2	4.76E-06	32	2	45	10.2
	V	3761.3	-27.7	7.71	-20.0	1.00E-05	32	2	45	7.0
	H	3761.3	-27.1	7.71	-19.4	1.15E-05	32	2	45	6.4
	V	7534	-33.9	9.15	-24.8	3.35E-06	32	2	45	11.8
	H	7534	-32.8	9.15	-23.7	4.32E-06	32	2	45	10.7
Noise Floor	V	9665	-35.1	9.85	-25.3	2.99E-06	32	2	45	12.3
Noise Floor	H	9665	-34.8	9.85	-25.0	3.20E-06	32	2	45	12.0
Noise Floor	V	13222	-37.6	10.91	-26.7	2.14E-06	32	2	45	13.7
Noise Floor	H	13222	-37.3	10.91	-26.4	2.30E-06	32	2	45	13.4
Noise Floor	V	16250.00	-37.4	15.01	-22.4	5.77E-06	32	2	45	9.4
Noise Floor	H	16250.00	-37.5	15.01	-22.5	5.64E-06	32	2	45	9.5
Noise Floor	V	20000.00	-39.1	5.7	-33.4	4.57E-07	32	2	45	20.4
Noise Floor	H	20000.00	-38.8	5.7	-33.1	4.90E-07	32	2	45	20.1

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 20 GHz

Project No:	Enfora L.P.
Model:	GSM0308-10 B2BRF
Comments:	Transmit CW at full rf output power (2 watts), Ch. 1196
Date:	1/9/2007

Distance:	3 m
Standard:	RBW: (unless noted) < 1 GHz = 120 kHz, > 1 GHz = 1 MHz; VBW: (unless noted) Peak = RBW, Avg. = RBW

Comment	Polarization	Frequency	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Minimum Attenuation Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBi)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	V	1099.7	-24.5	3.78	-20.7	8.47E-06	32	2	45	7.7
	H	1099.7	-29.1	3.78	-25.3	2.94E-06	32	2	45	12.3
	V	1169.8	-23	3.78	-19.2	1.20E-05	32	2	45	6.2
	H	1169.8	-26.2	3.78	-22.4	5.73E-06	32	2	45	9.4
	V	1199.8	-23.8	3.78	-20.0	9.95E-06	32	2	45	7.0
	H	1199.8	-27.5	3.78	-23.7	4.25E-06	32	2	45	10.7
	V	3821.5	-28.6	7.71	-20.9	8.15E-06	32	2	45	7.9
	H	3821.5	-30.3	7.71	-22.6	5.51E-06	32	2	45	9.6
	V	7634	-25.7	9.15	-16.6	2.21E-05	32	2	45	3.5
	H	7634	-32	9.15	-22.9	5.19E-06	32	2	45	9.8
	V	16262.00	-36.3	15.01	-21.3	7.43E-06	32	2	45	8.3
	H	16262.00	-37.9	15.01	-22.9	5.14E-06	32	2	45	9.9
Noise Floor	V	20000.00	-39.4	5.7	-33.7	4.27E-07	32	2	45	20.7
Noise Floor	H	20000.00	-39.5	5.7	-33.8	4.17E-07	32	2	45	20.8

Notes:
(1) A positive margin indicates a passing result
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.
(3) The spectrum was searched from 30 MHz up to 20 GHz

E.8. Test Photo

E.9. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX F: 2.1055 FREQUENCY STABILITY

F.1. Base Standard & Test Basis

Base Standard	FCC 2.1055
Test Method	TIA 603-C, 2004

Specifications

22.355 Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C–1 of this section.

Frequency range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile < 3 watts (ppm)
25 to 50.....	20.0	20.0	50.0
50 to 450.....	5.0	5.0	50.0
450 to 512.....	2.5	5.0	5.0
821 to 896.....	1.5	2.5	2.5
928 to 929.....	5.0	n/a	n/a
929 to 960.....	1.5	n/a	n/a
2110 to 2220.....	10.0	n/a	n/a

24.235 Frequency Stability
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

F.2. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

F.3. Test Results

Complies. The worst-case frequency drift was -0.051 ppm. The required limit is 2.5 ppm.

F.4. Observations

None

F.5. Deviations from Normal Operating Mode During Test

None.

F.6. Sample Calculation

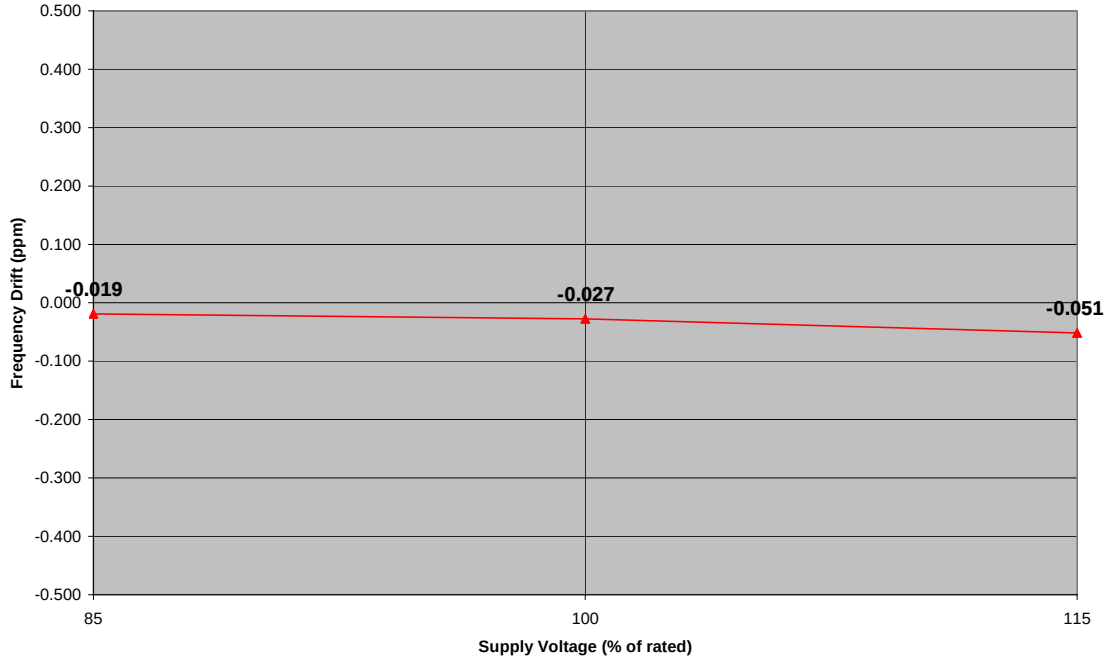
Frequency drift (ppm) = Frequency Drift (Hz)/Authorized frequency (MHz)

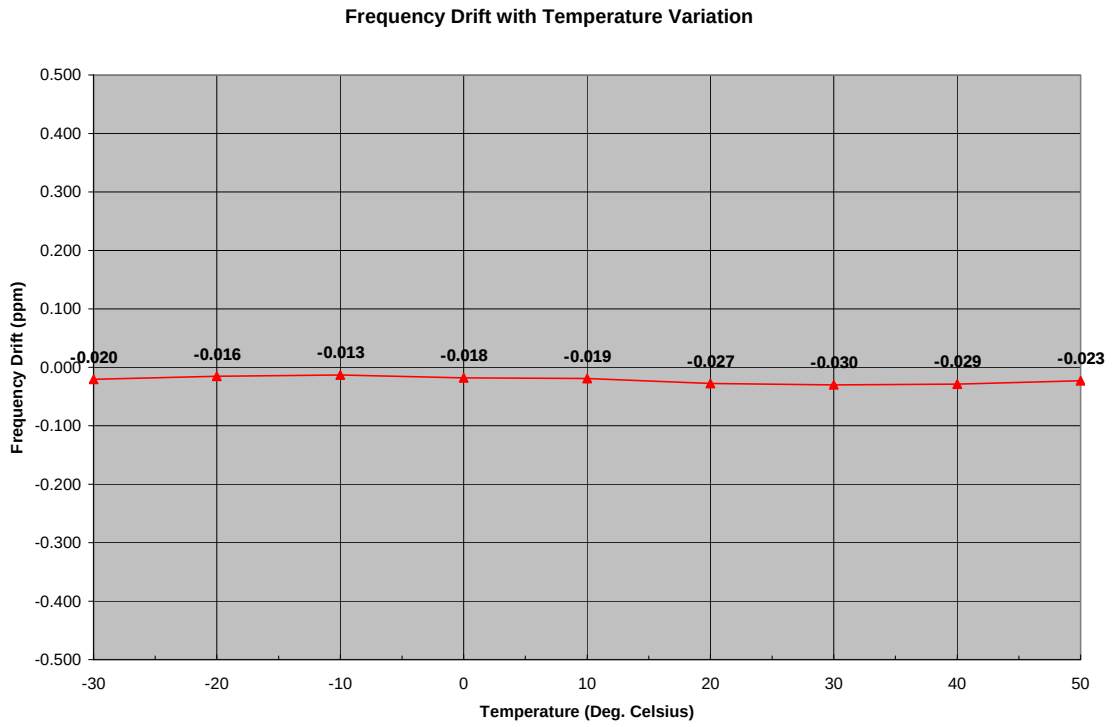
F.7. Test Data

GSM850 Mode

Supply Voltage % of rated	Ambient temperature Deg. Celsius	Assigned Transmit Frequency MHz	Frequency Drift (Hz)	Frequency Drift (ppm)
85	20	836.400000	-16	-0.019
100	20	836.400000	-23	-0.027
115	20	836.400000	-43	-0.051
100	-30	836.400000	-17	-0.020
100	-20	836.400000	-13	-0.016
100	-10	836.400000	-11	-0.013
100	0	836.400000	-15	-0.018
100	10	836.400000	-16	-0.019
100	20	836.400000	-23	-0.027
100	30	836.400000	-25	-0.030
100	40	836.400000	-24	-0.029
100	50	836.400000	-19	-0.023

Frequency Drift with Supply Voltage Variation

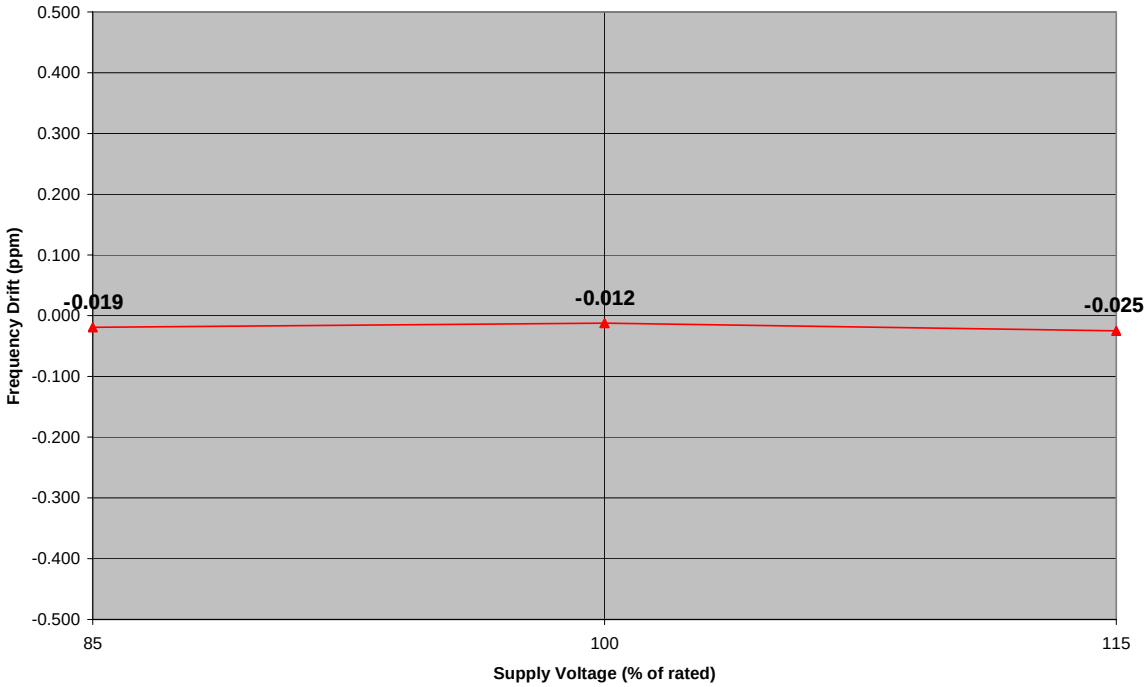




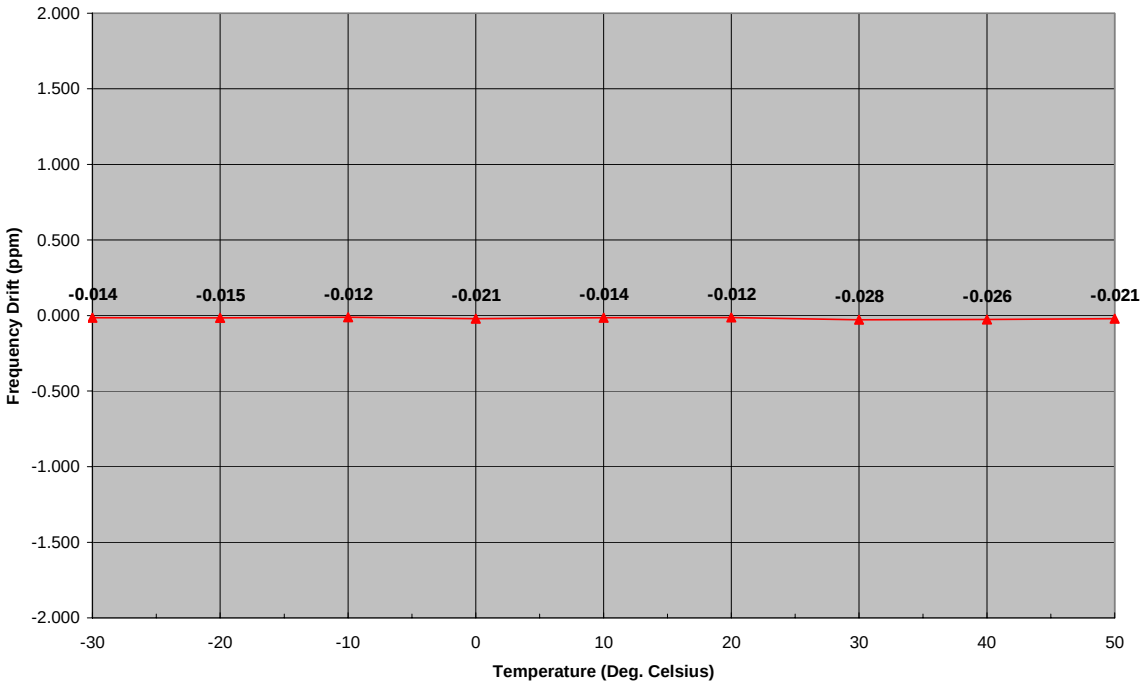
GSM1900 Mode

Ambient temperature Deg. Celsius	Assigned Transmit Frequency MHz	Frequency Drift (Hz)	Frequency Drift (ppm)
20	1883.000000	-36	-0.019
20	1883.000000	-23	-0.012
20	1883.000000	-47	-0.025
-30	1883.000000	-27	-0.014
-20	1883.000000	-29	-0.015
-10	1883.000000	-22	-0.012
0	1883.000000	-40	-0.021
10	1883.000000	-26	-0.014
20	1883.000000	-23	-0.012
30	1883.000000	-53	-0.028
40	1883.000000	-49	-0.026
50	1883.000000	-40	-0.021

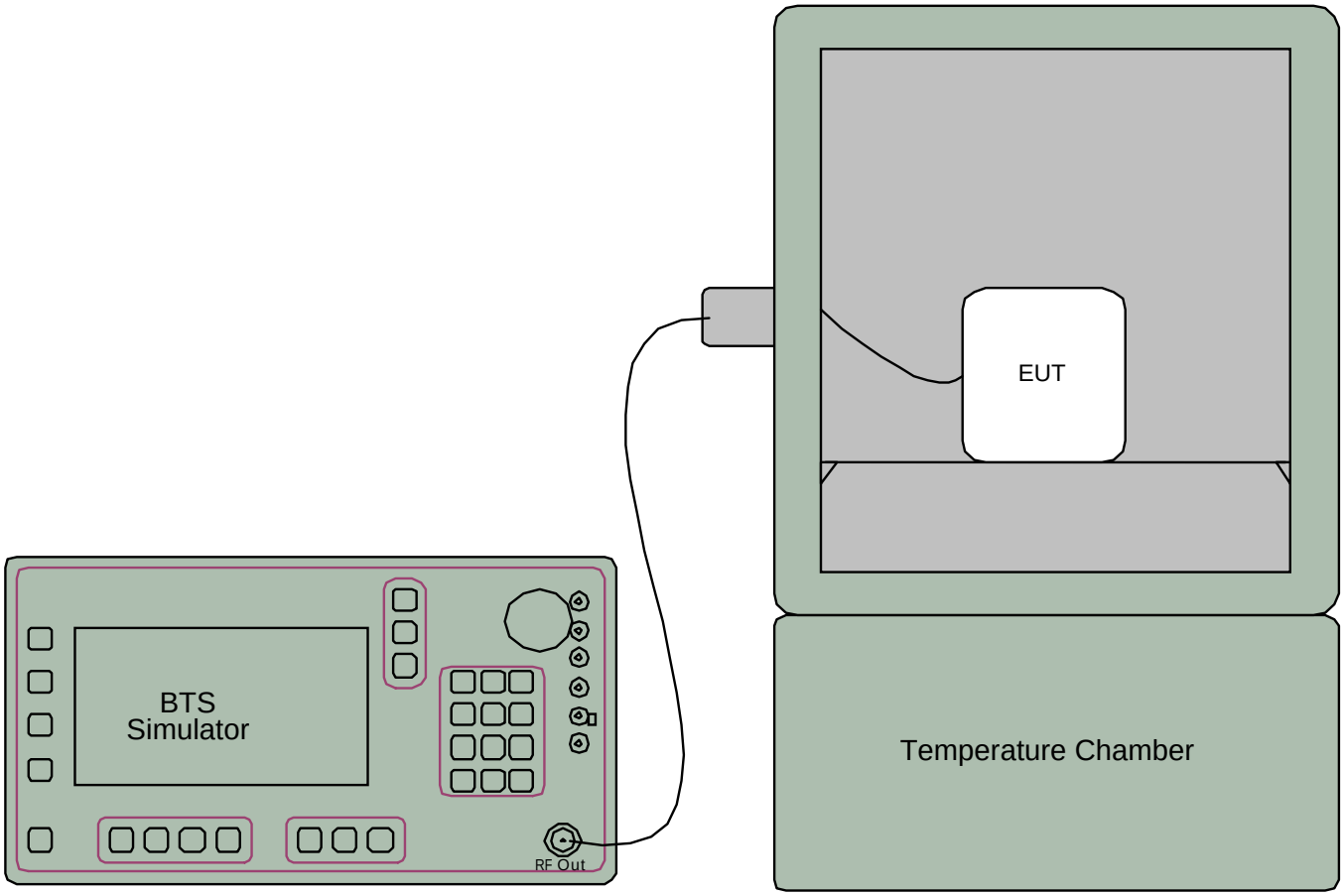
Frequency Drift with Supply Voltage Variation



Frequency Drift with Temperature Variation



F.8. Test Diagram



F.9. Tested By

.

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX G: TEST EQUIPMENT LIST

G.1. Field Strength of Spurious Emissions 30 MHz – 26.5 GHz Measurement Equipment

Description	Manufacturer	Type/Model	Calibration Frequency	Cal Due	NTS Control No.
3m ANECHOIC CHAMBER					
RX Bilog Antenna	ETS	3142C	12 Months	8/17/07	E1288P
Ref. Horn Antenna	ETS	3115	12 Months	11/1/07	E1019P
RX Horn Antenna	ETS	3115	12 Months	8/8/07	E1022P
High Frequency - Cable 1	MegaPhase	TM26-3135-144	12 Months	8/23/07	W1010P
Reference Antenna	ETS	3121 Dipole Set	12 months	8/8/07	S/N. 274
CONTROL ROOM					
Test Receiver	Rohde & Schwarz	FSQ 26	12 Months	9/21/07	W1020P
High Frequency - Cable 2	MegaPhase	NA	12 Months	8/23/07	W1011P
Amplifier	HP	8449B	12 Months	5/4/07	E1010P

G.2. Antenna Conducted Emissions Measurement Equipment

Instrument	Manufacturer	Model	Calibration Frequency	Calibration Due
ANTENNA CONDUCTED EMISSIONS				
Spectrum Analyzer	Rohde & Schwarz	FSQ 26	12 Months	9/21/07
High Frequency - Cable 1	MegaPhase	TM26-3135-144	12 Months	8/23/07
Directional Coupler	Narda	3020A	12 Months	8/28/07
Directional Coupler	Narda	4242-10	12 Months	8/28/07
50 ohm loads	Amphenol	50R	12 Months	8/28/07

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