

CETECOM ICT Services GmbH

Radio Satellite Communication

Untertürkheimer Straße 6-10 . D-66117 Saarbrücken

Telefon: +49 (0)681 598-9100

Telefax: -9075

RSC14

issue test report consist of 40 Pages

Page 1 (40)

Recognized by the
Federal Communications Commission
FCC-Identification Number: 90462
TCB ID: DE 0001



Accredited by the
German Accreditation Council
DAR-Registration Number
TTI-P-G 166/98



Independent ETSI
compliance test house



Accredited Bluetooth™ Test Facility (BQTF)

Test report no.: 2_3148-01-03/03

Additional measurements

Sony-Ericsson AAB-1021011-BV

FCC ID: PY7AAB-1021011

IC: 4170B-A1021011

CETECOM – ICT Services GmbH

Untertürkheimerstr. 6-10

66117 Saarbrücken, Germany

Telephone: + 49 (0) 681 / 598-0

Fax: + 49 (0) 681 / 9075

Table of Contents

1 General information

- 1.1 Notes
- 1.2 Testing laboratory
- 1.3 Details of applicant
- 1.4 Application details
- 1.5 Test item
- 1.6 Test standards

2 Technical test

- 2.1 Summary of test results
- 2.2 Test report

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

66117 Saarbrücken

Germany

Telephone : + 49 681 598 - 9100

Telefax : + 49 681 598 - 9075

E-mail : Harro.Ames@ict.cetecom.de

Internet : www.cetecom-ict.de

Accredited testing laboratory

DAR-registration number : TTI-P-G-166/98-30

Accredited Bluetooth™ Test Facility (BQTF)

BLUETOOTH™ is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM

1.3 Details of applicant

Name : Sony Ericsson Mobile Communication AB
Street : Nya Vattentorget
City : 22188 Lund
Country : Sweden
Telephone : +46-46-193-242
Telefax : +46-46-193-295
Contact : Mr. Bo Johansson
Telephone : +46-46-193-242
e-mail :

1.4 Application details

Date of receipt of application : 2003-05-16
Date of receipt of test item : 2003-05-16
Date of test : 2003-05-16

1.5 Test item

Type of equipment : **GSM Mobile Phone (PCS 1900 MHz)**
Type designation : AAB-1021011-BV
Manufacturer : Applicant
Street :
City :
Country :
Serial number : IMEI : 004601-01-351592-0

Additional informations:

Frequency : 1850.2 – 1909.8 MHz
Type of modulation : 300KGXW (PCS1900)
Number of channels : 300 (PCS1900)
Antenna : Integral antenna
Power supply : 3,8V DC Li-Ion and AC adapter

Output power GSM 1900 : cond : 29.7 dBm Peak , EIRP: 29.36 dBm/ 863.0 mW(Burst);

Type of equipment : Temperature range : -30°C - +60°C
FCC – ID : PY7AAB-1021011
FCC registration number :
Hardware : FP1/C2
Software : R1A047

1.6 Test standards: **FCC Part 24, FCC Part 15, CANADA: RSS-133**

2 Technical test

For Part 24 we use the substitution method (TIA/EIA 603).

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

FINAL VERDICT: PASS

Technical responsibility for area of testing :

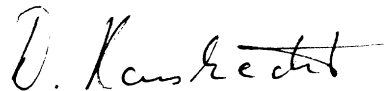
2003-05-16 RSC 8414 Ames H.



Date	Section	Name	Signature
------	---------	------	-----------

Technical responsibility for area of testing :

2003-05-16 RSC8412 Hausknecht D.



Date	Section	Name	Signature
------	---------	------	-----------

2.2 Testreport

TEST REPORT

Test report no. : 2_3148-01-03/03

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

PARAMETER TO BE MEASURED

PAGE

Part PCS 1900

POWER OUTPUT SUBCLAUSE § 24.232 **7**

CONDUCTED SPURIOUS EMISSIONS **9**

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS **30**

Test site **47**

Photographs of the equipment **50**

POWER OUTPUT

SUBCLAUSE § 24.232

Summary:

This paragraph contains both average , peak output powers and EIRP measurements for the mobile station.

In all cases, the peak output power is within the required mask (this mask is specified in the JTC standards, TIA PN3389 Vol. 1 Chap 7, and is no FCC requirement).

Method of Measurements:

The mobile was set up for the max. output power with pseudo random data modulation.

The power was measured with R&S Signal Analyzer FSIQ 26 (peak and average)

This measurements were done at 3 frequencies, 1850,2 MHz, 1880,0 MHz and 1909,8 MHz (bottom, middle and top of operational frequency range)

Remark:

For this additional measurement we used the RF-adapter delivered by the customer.

Limits:

Power Step	Nominal Peak Output Power (dBm)	Tolerance (dB)
0	+30	± 2

Power Measurements:

Conducted:

Frequency (MHz)	Power Step	Peak Output Power (dBm)	Average Output Power (dBm)
1850.2	0	29.70	29.50
1880.0	0	29.40	29.20
1909.8	0	29.50	29.30
Measurement uncertainty		±0.5 dB	

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

EIRP Measurements

Description: This is the test for the maximum radiated power from the phone.

Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts e.i.r.p. peak power..." and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Method of Measurement:

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference center of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as $Pin + 2.1 - Pr$.
3. The EUT is substituted for the dipole at the reference centre of the chamber. The EUT is put into CW test mode and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs is identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the co-ordinates determined in Step 3 to determine the output power as defined in FCC Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.1 dBi) and known input power (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.1\text{dBi}$.

Limits:

Power Step	Burst Average EIRP (dBm)
0	<33

Power Measurements:

Radiated:

Frequency (MHz)	Power Step	BURST AVERAGE (dBm)		MODULATION AVERAGE (dBm)	
		EIRP	ERP	EIRP	ERP
1850.2	0	28.82	26.72	19.82	17.72
1880.0	0	29.36	27.26	20.36	18.26
1909.8	0	29.11	27.01	20.11	18.01
Measurement uncertainty		±3 dB			

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

CONDUCTED SPURIOUS EMISSIONS

Measurement Procedure:

The following steps outline the procedure used to measure the conducted emissions from the mobile station.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.

For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 19.1 GHz, data taken from 10 MHz to 20 GHz.

2. Determine mobile station transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

USPCS Transmitter

Channel Frequency

512 1850.2 MHz

661 1880.0 MHz

810 1909.8 MHz

Measurement Limit:

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

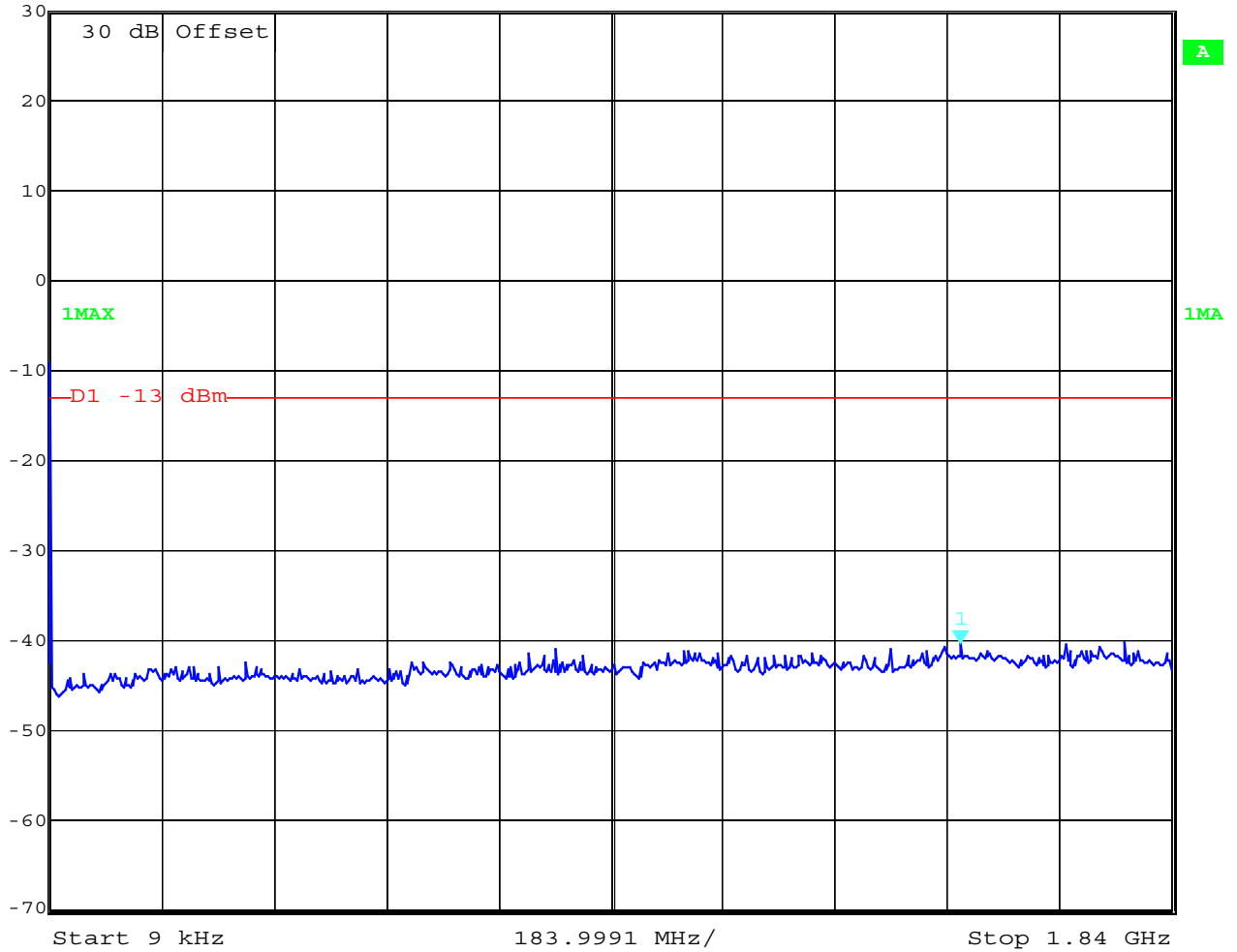
EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBm)	limit max. allowed emission power (dBm)	actual attenuation below frequency of operation (dBc)	results
CH 512					
1850.2		29.80	-13.0 (42.80 dBc)		carrier
CH 661					
1880.0		29.50	-13.0 (42.50 dBc)		carrier
CH 810					
1909.8		29.60	-13.0 (42.60 dBc)		carrier
Measurement uncertainty		± 0.5dB			

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

Measurements:

Channel: 512

	Marker 1 [T1]	RBW	100 kHz	RF Att	10 dB
	Ref Lvl	-40.40 dBm	VBW	100 kHz	
	30 dBm	1.49338847 GHz	SWT	460 ms	Unit dBm

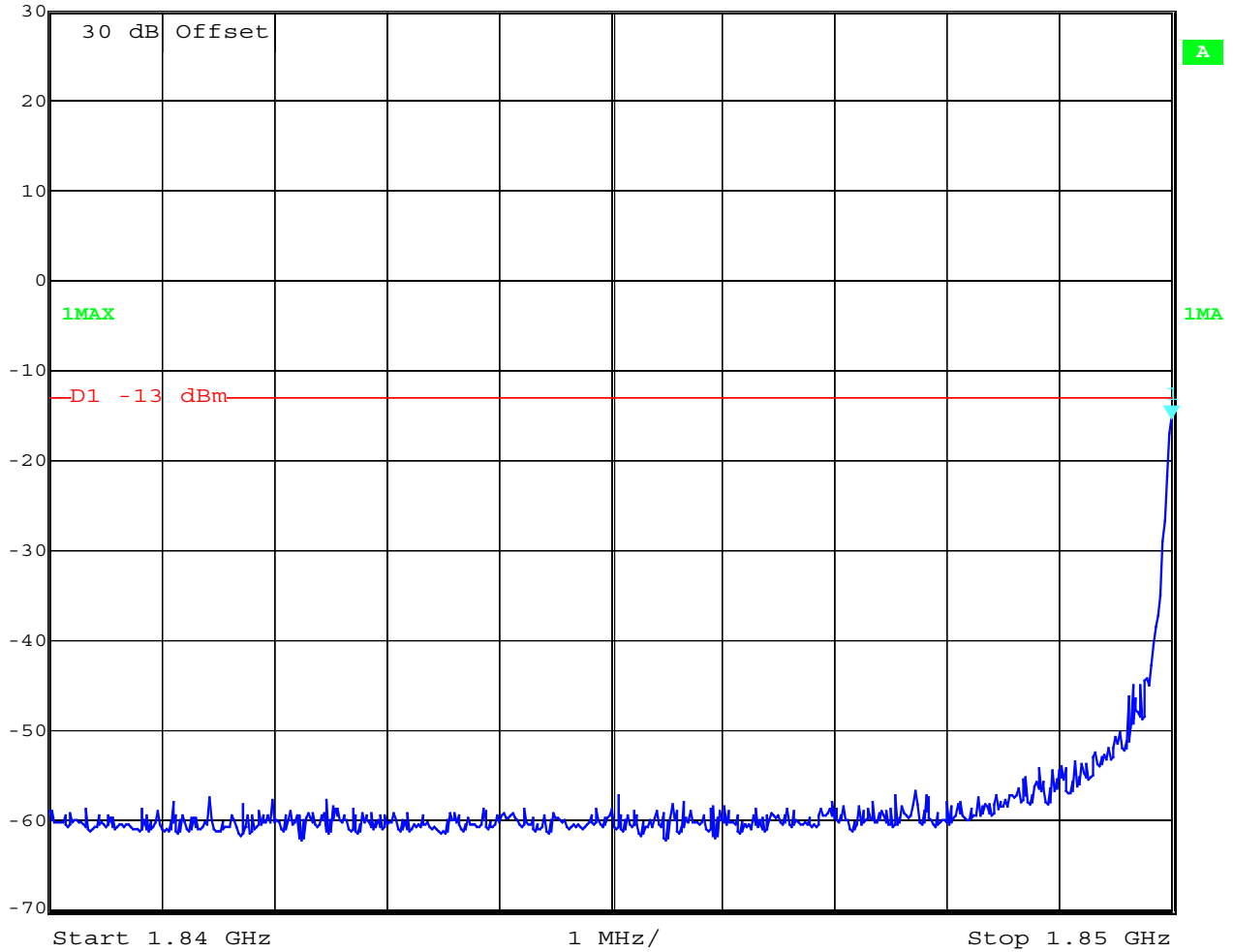


Date: 28.FEB.2003 08:17:18

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

Channel 512


	Marker 1 [T1]	RBW	3 kHz	RF Att	20 dB
	Ref Lvl	-15.26 dBm	VBW	3 kHz	
	30 dBm	1.8500000 GHz	SWT	2.8 s	Unit dBm

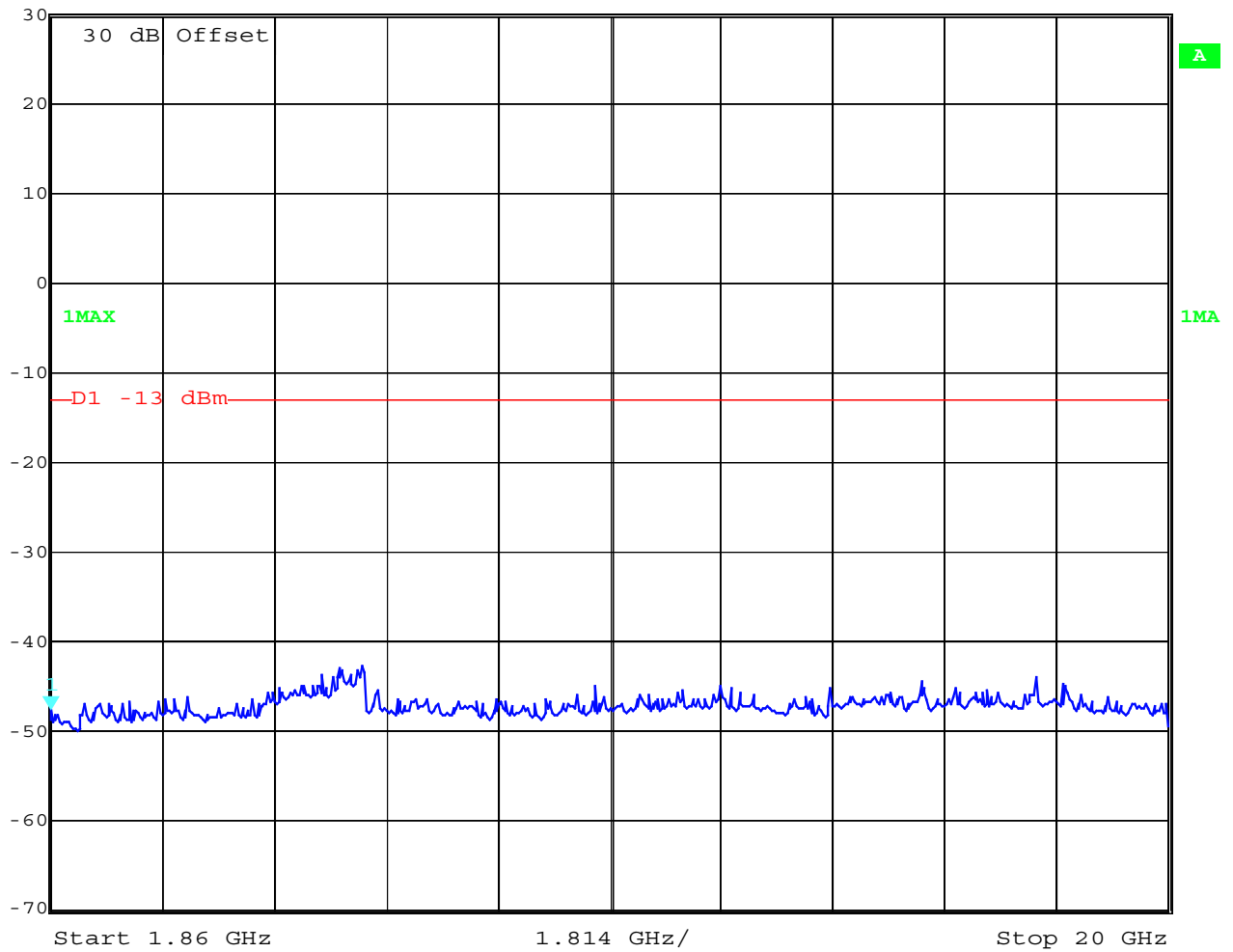


Date: 28.FEB.2003 08:18:46

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

Channel 512

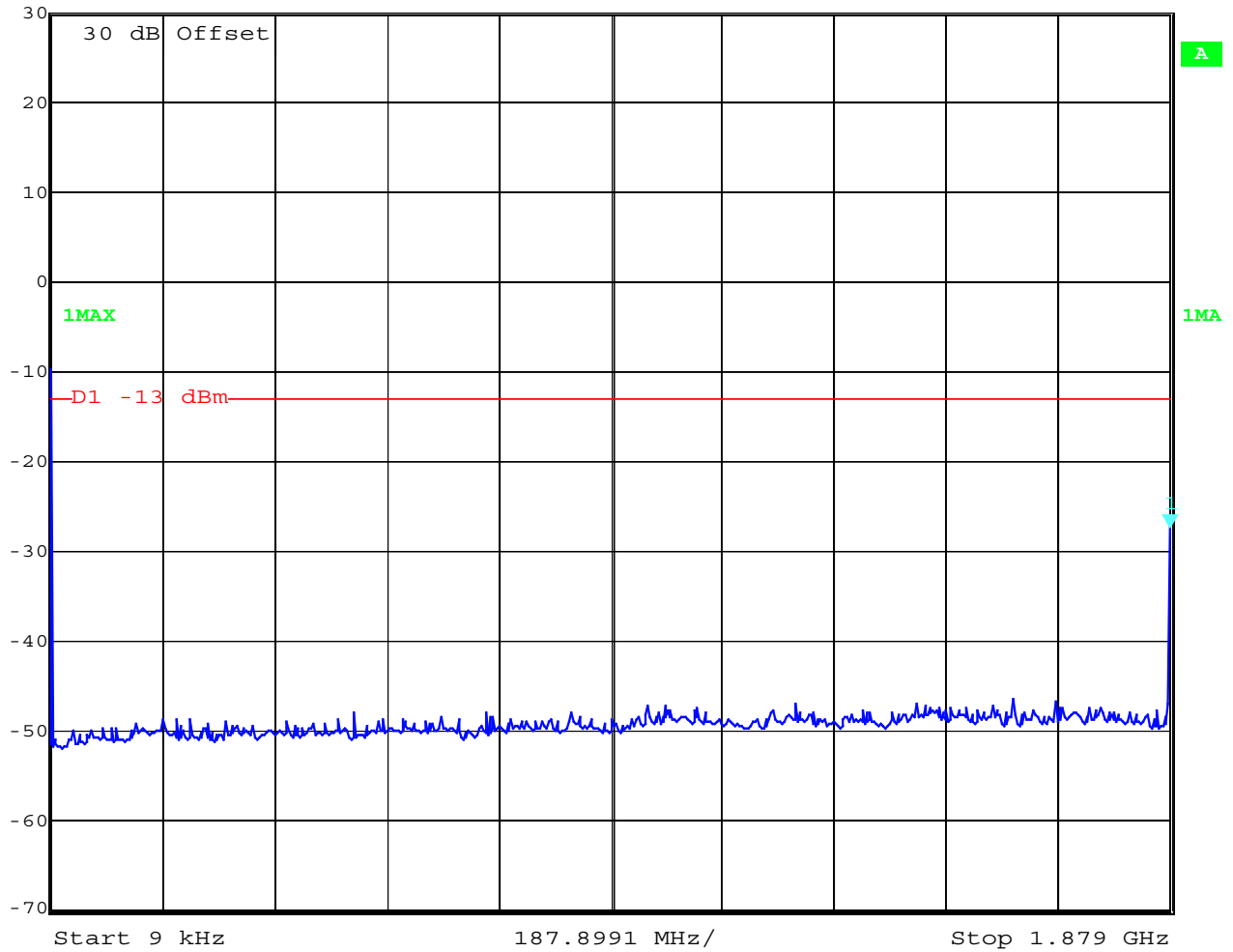
	Marker 1 [T1]	RBW	100 kHz	RF Att	10 dB
	Ref Lvl	-47.64 dBm	VBW	100 kHz	
	30 dBm	1.86000000 GHz	SWT	4.6 s	Unit dBm



Date: 28.FEB.2003 08:19:50

Channel 661

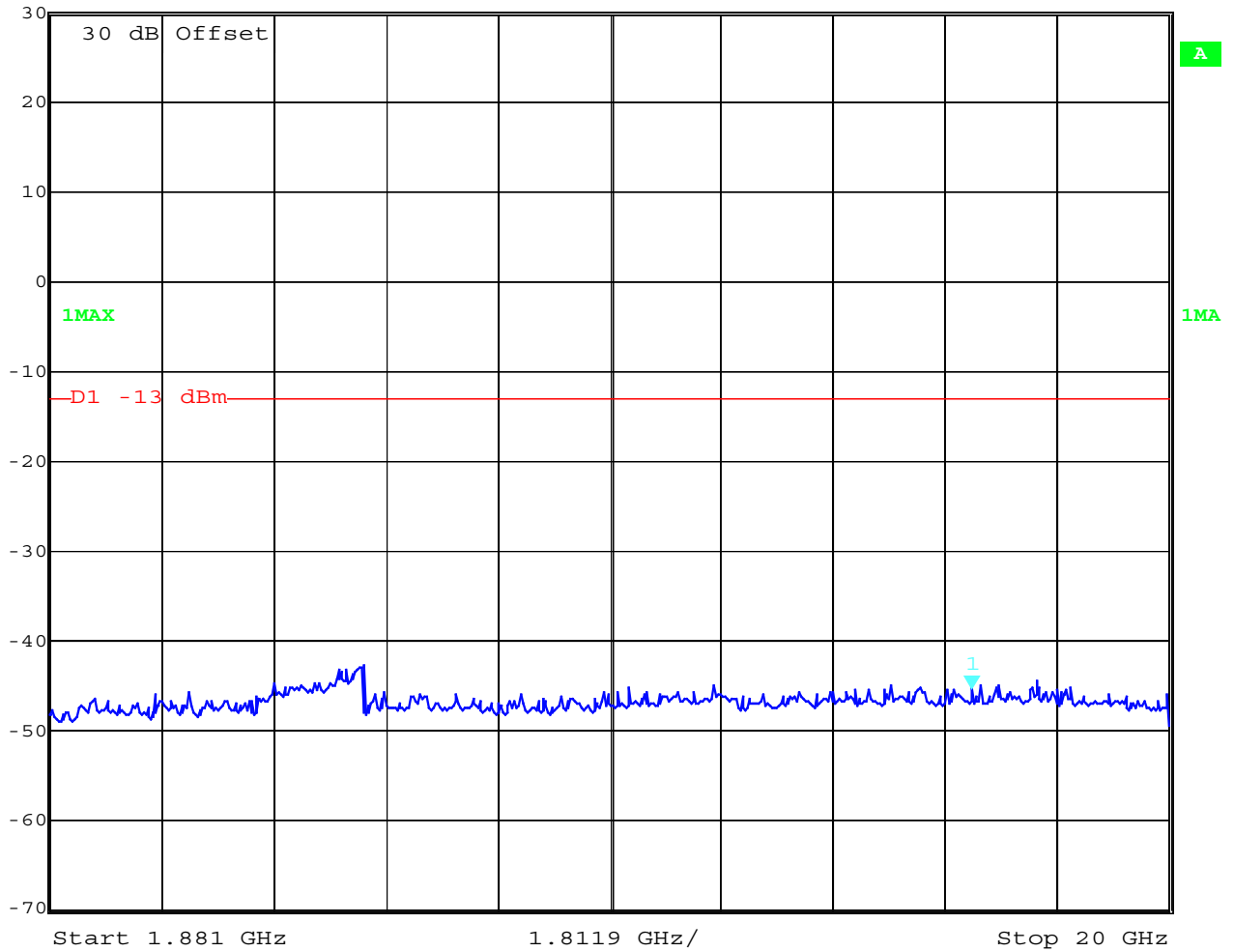
	Ref Lvl	Marker 1 [T1]	RBW	100 kHz	RF Att	10 dB
	30 dBm	-27.41 dBm	VBW	100 kHz		
		1.87900000 GHz	SWT	470 ms	Unit	dBm



Date: 28.FEB.2003 08:21:08


Channel 661

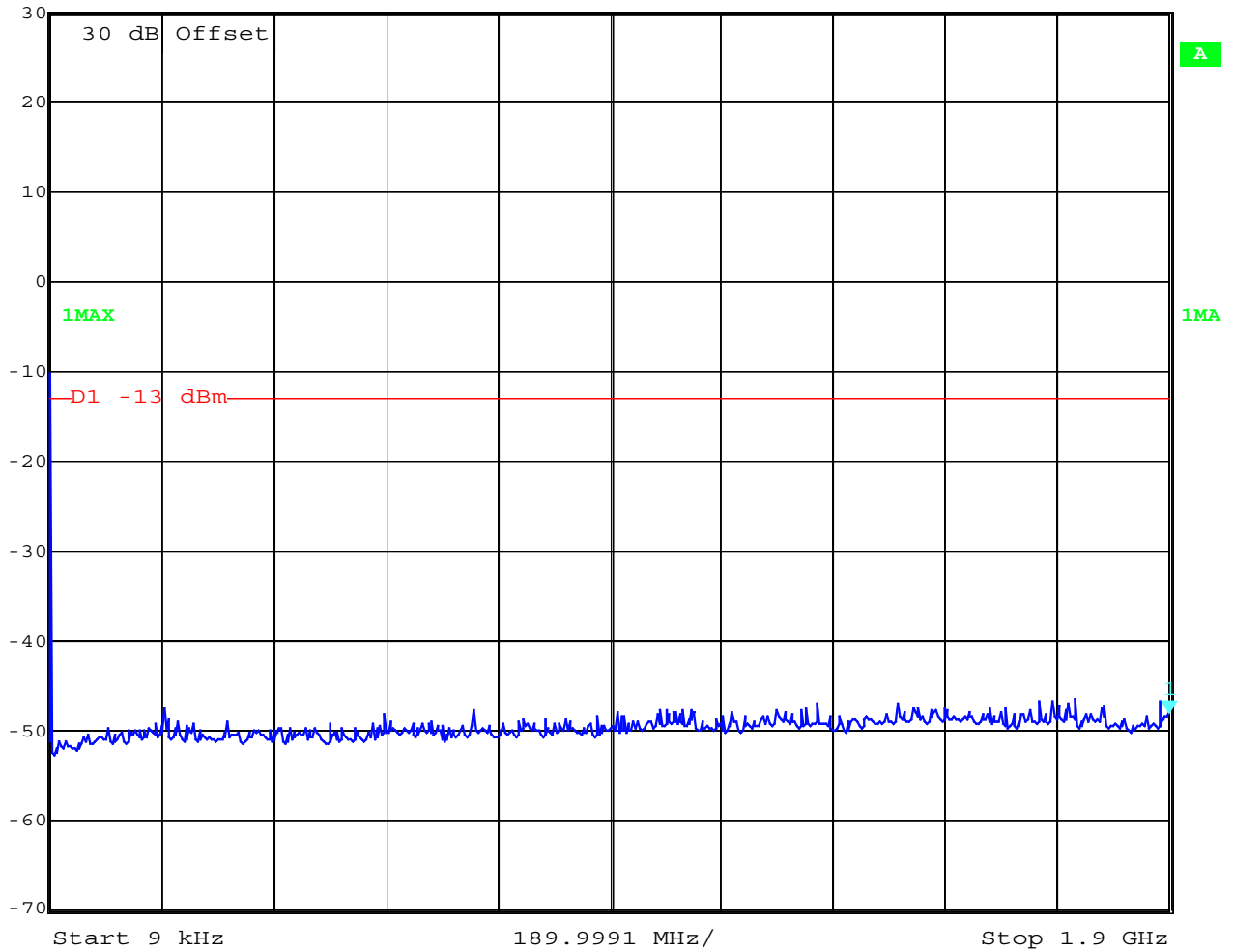
	Marker 1 [T1]	RBW	100 kHz	RF Att	10 dB
	Ref Lvl	-45.41 dBm	VBW	100 kHz	
	30 dBm	16.80466533 GHz	SWT	4.6 s	Unit dBm



Date: 28.FEB.2003 08:50:22

Channel 810

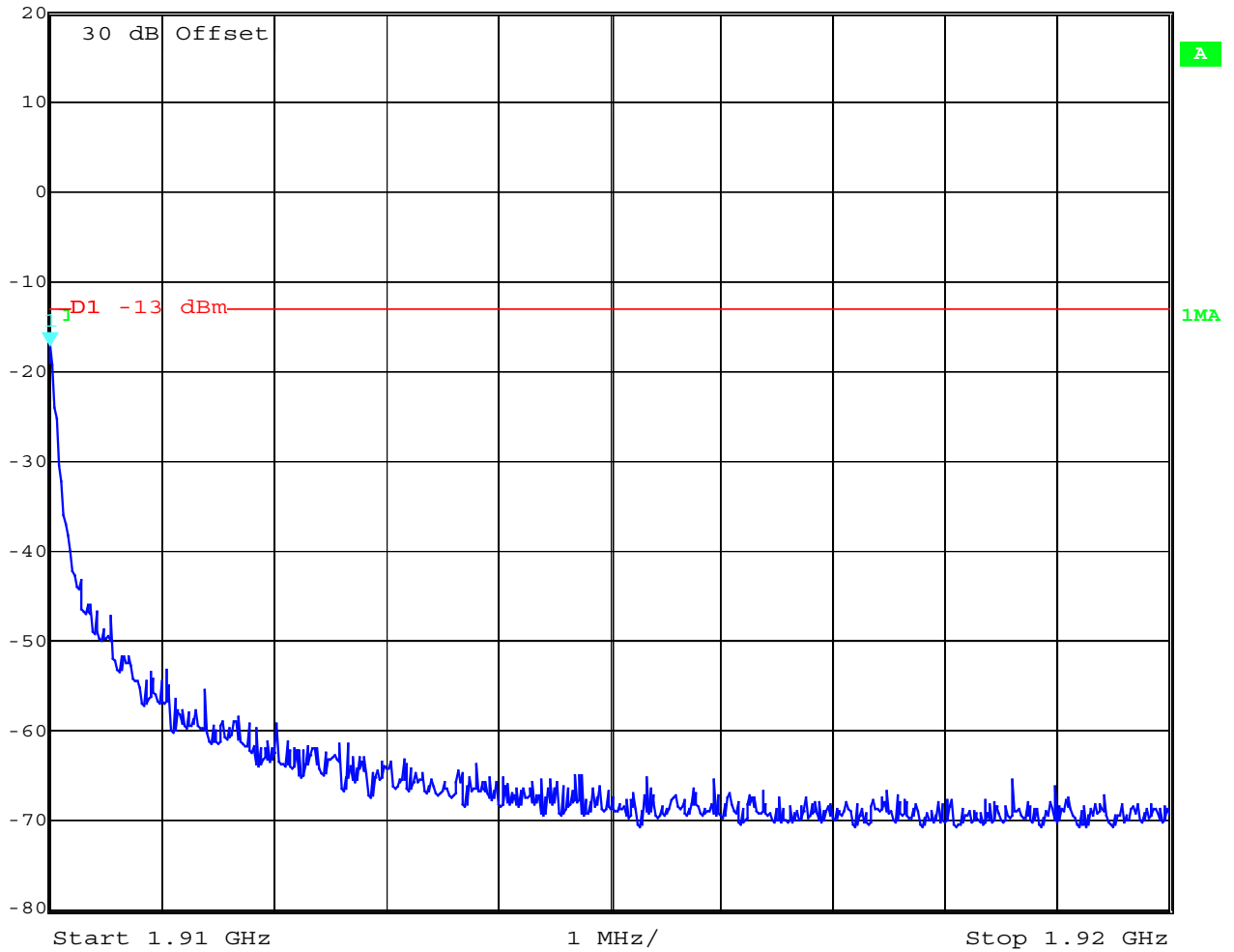
 Marker 1 [T1] RBW 100 kHz RF Att 10 dB
Ref Lvl -48.05 dBm VBW 100 kHz
30 dBm 1.90000000 GHz SWT 480 ms Unit dBm



Date: 28.FEB.2003 08:51:13

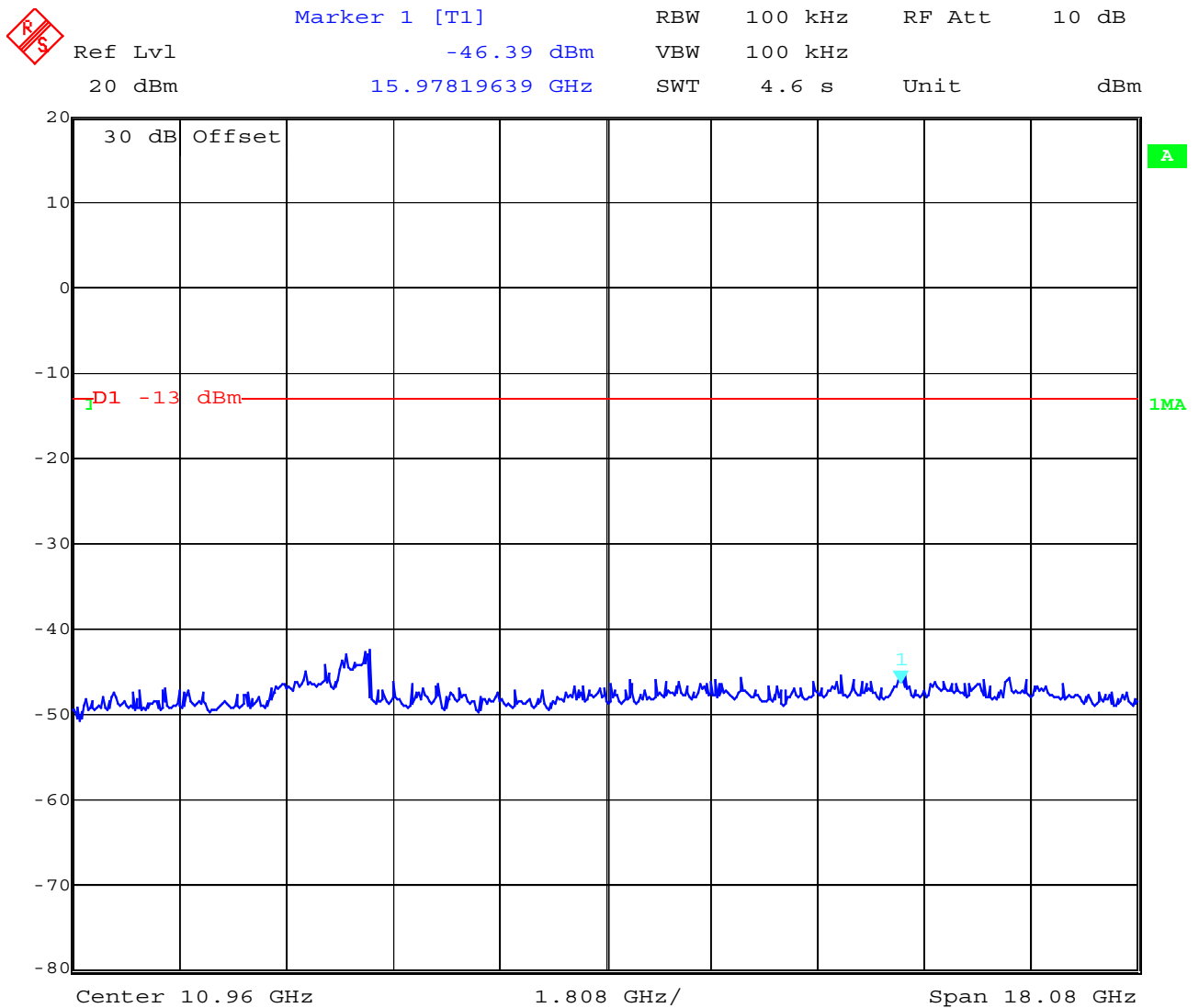
Channel 810

	Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
	Ref Lvl	-17.08 dBm	VBW	3 kHz	
	20 dBm	1.91000000 GHz	SWT	2.8 s	Unit dBm



Date: 28.FEB.2003 08:52:56

Channel 810



Date: 28.FEB.2003 08:54:07

Remark:

Additional measurements to show compliance to each of the six frequency blocks.

BLOCK EDGE COMPLIANCE FOR BLOCK A, B, C, D, E AND F

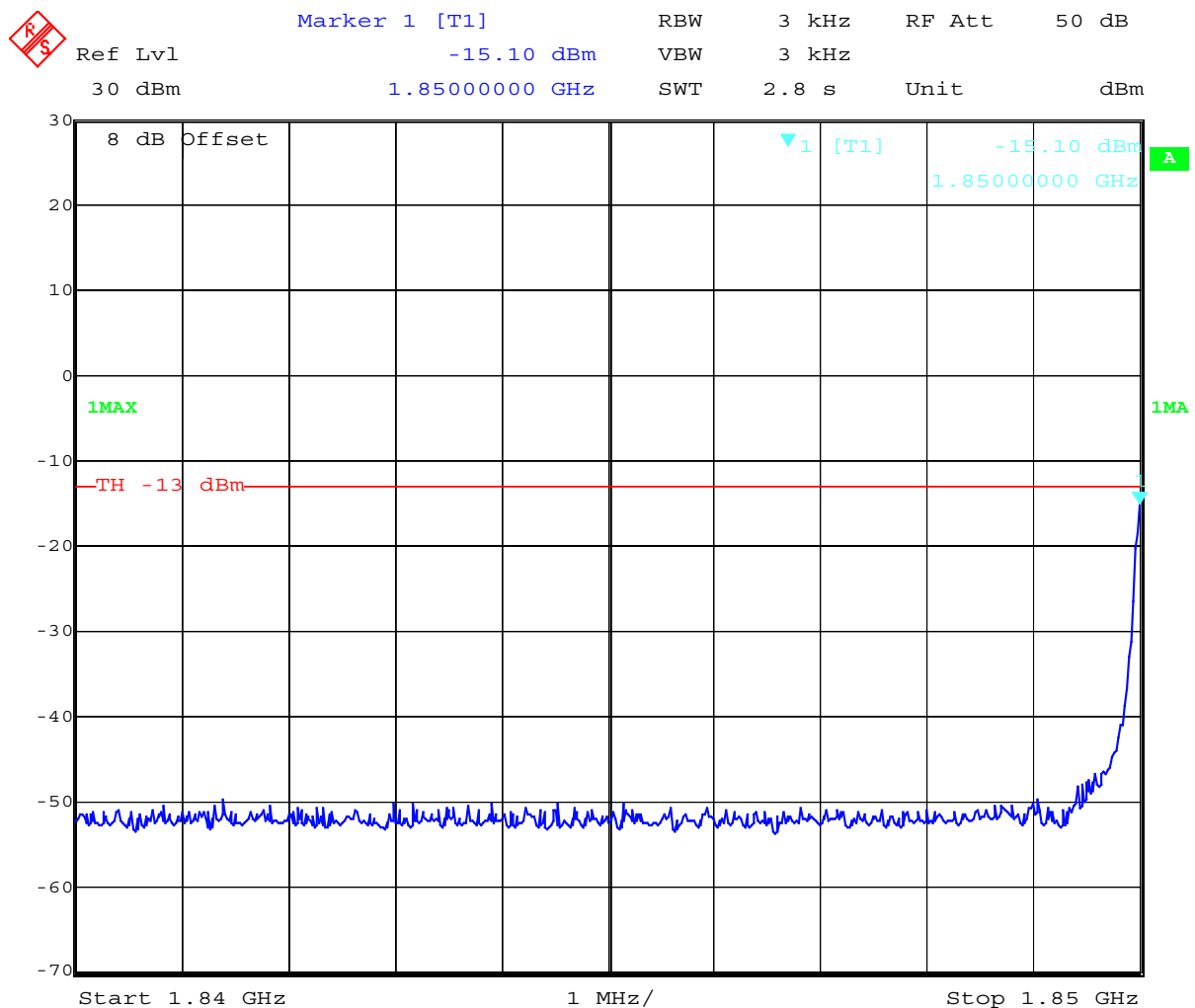
Measurement Limit:

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least $43+10\text{Log}(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Measurements:

Block A Channel 512



Date: 16.MAY.2003 08:09:54

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

17 – 24, 64

Block A Channel 585

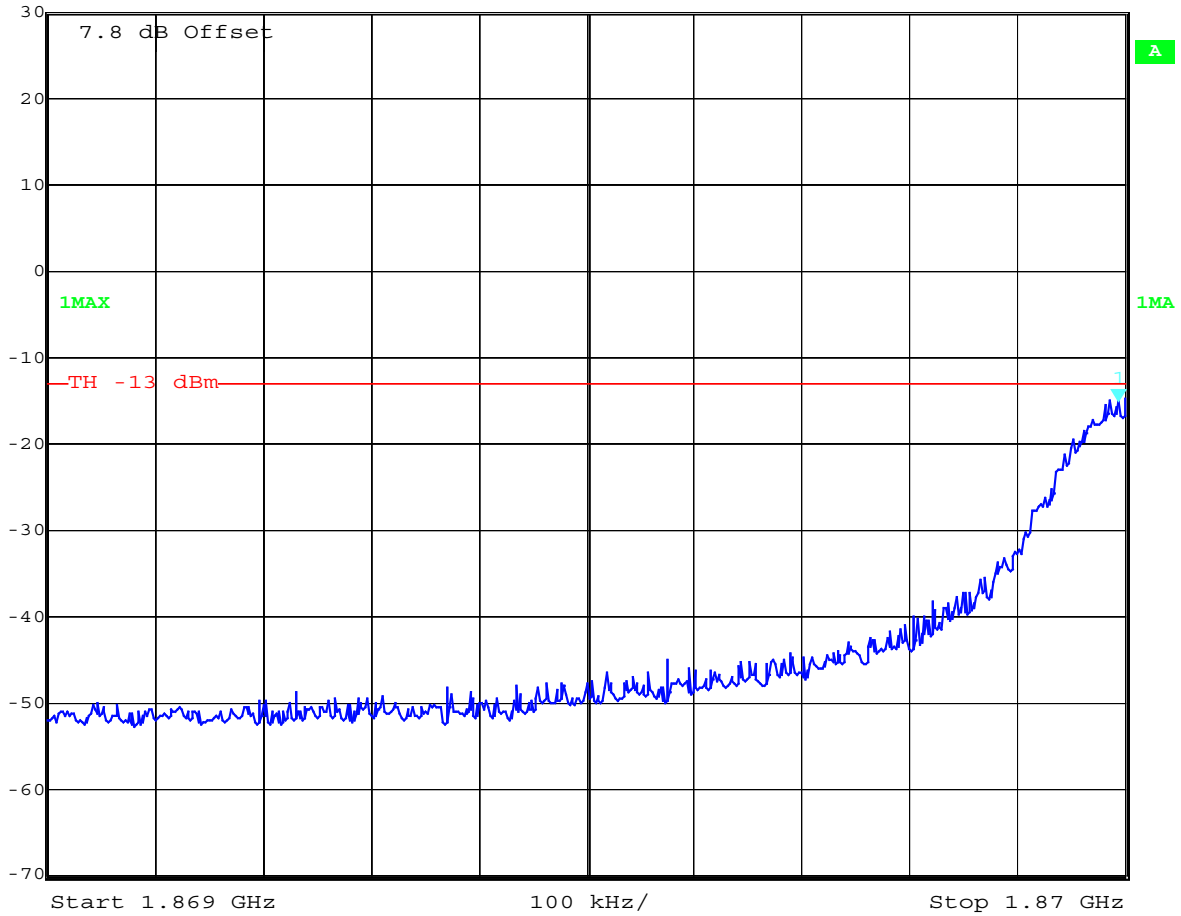


Date: 16.MAY.2003 08:11:00

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

Block B Channel 612

	Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	30 dBm	-15.14 dBm	VBW	3 kHz		
		1.86999399 GHz	SWT	280 ms	Unit	dBm

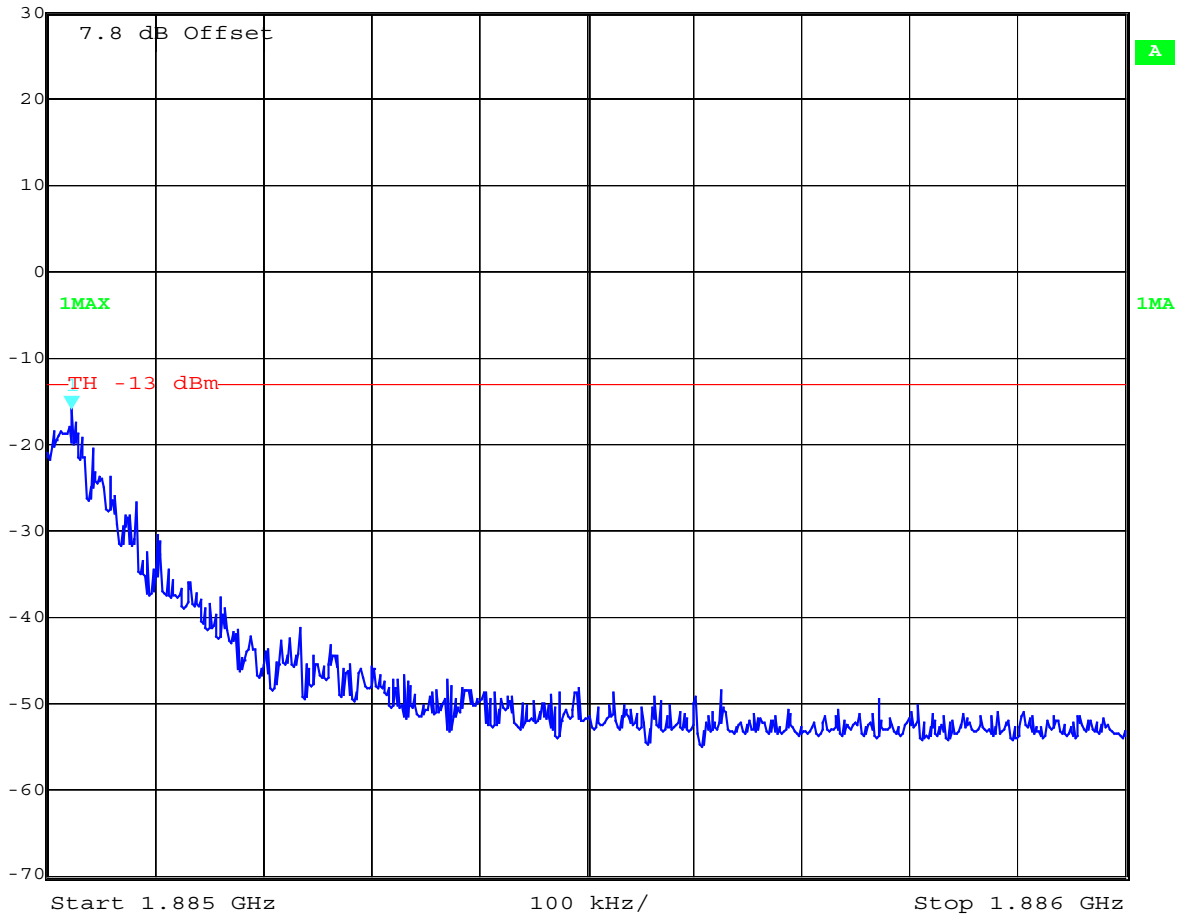


Date: 16.MAY.2003 08:14:51

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 - 24, 64

Block B Channel 685


	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	Ref Lvl	-15.90 dBm	VBW	3 kHz	
	30 dBm	1.88502204 GHz	SWT	280 ms	Unit dBm

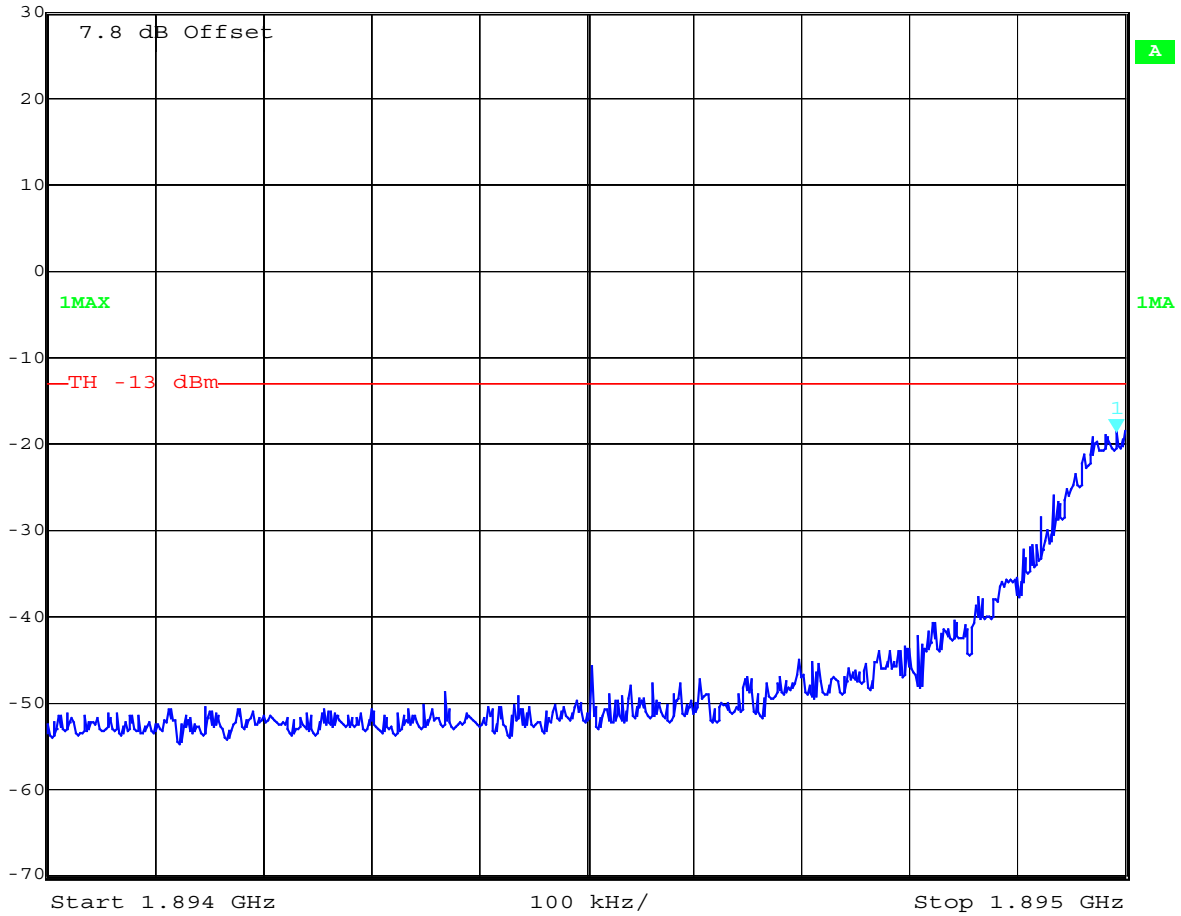


Date: 16.MAY.2003 08:15:33

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

Block C Channel 737


 Marker 1 [T1] RBW 3 kHz RF Att 50 dB
Ref Lvl -18.50 dBm VBW 3 kHz
30 dBm 1.89499198 GHz SWT 280 ms Unit dBm

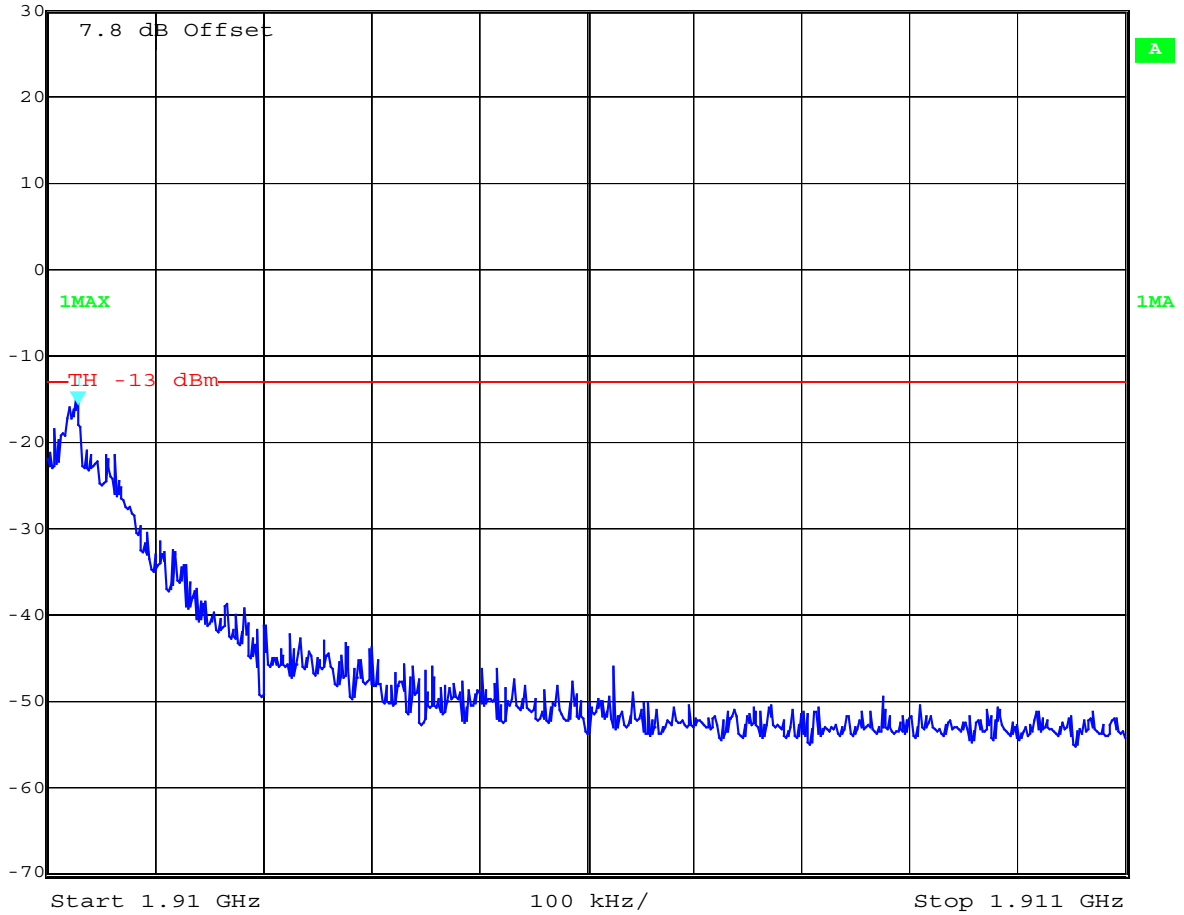


Date: 16.MAY.2003 08:16:25

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Block C Channel 810


	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	Ref Lvl	-15.59 dBm	VBW	3 kHz	
	30 dBm	1.91002806 GHz	SWT	280 ms	Unit

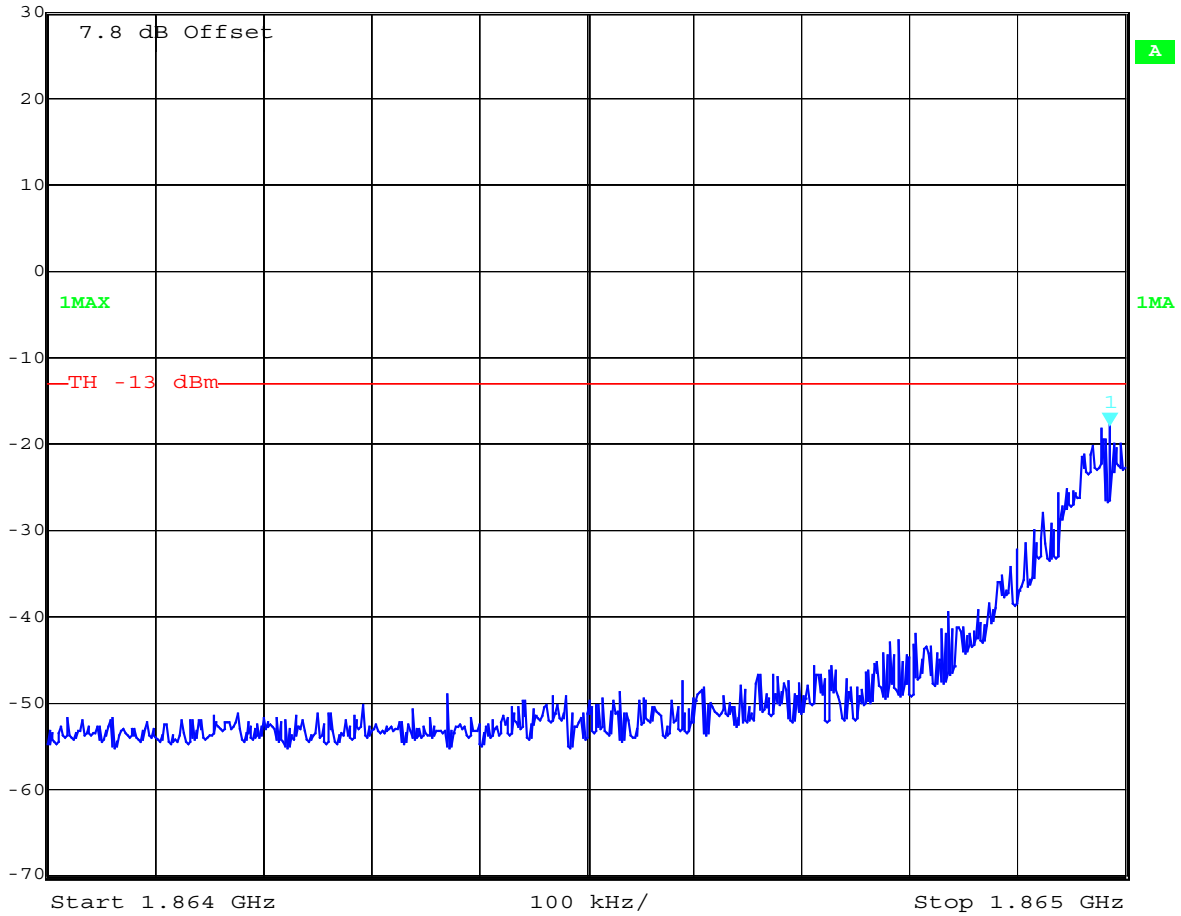


Date: 16.MAY.2003 08:17:01

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

Block D Channel 587

 Marker 1 [T1] RBW 3 kHz RF Att 50 dB
Ref Lvl -17.84 dBm VBW 3 kHz
30 dBm 1.86498597 GHz SWT 280 ms Unit dBm

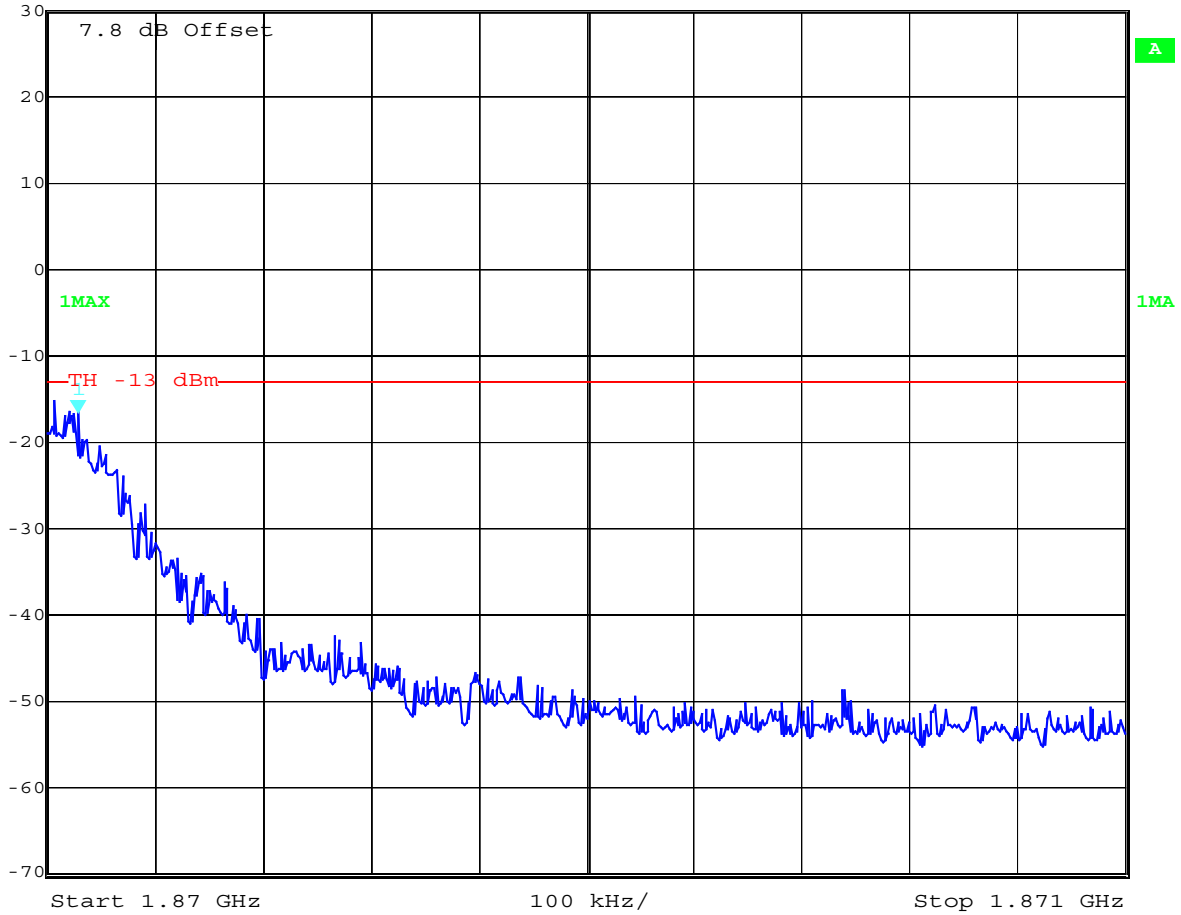


Date: 16.MAY.2003 08:17:39

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24, 64

Block D Channel 610

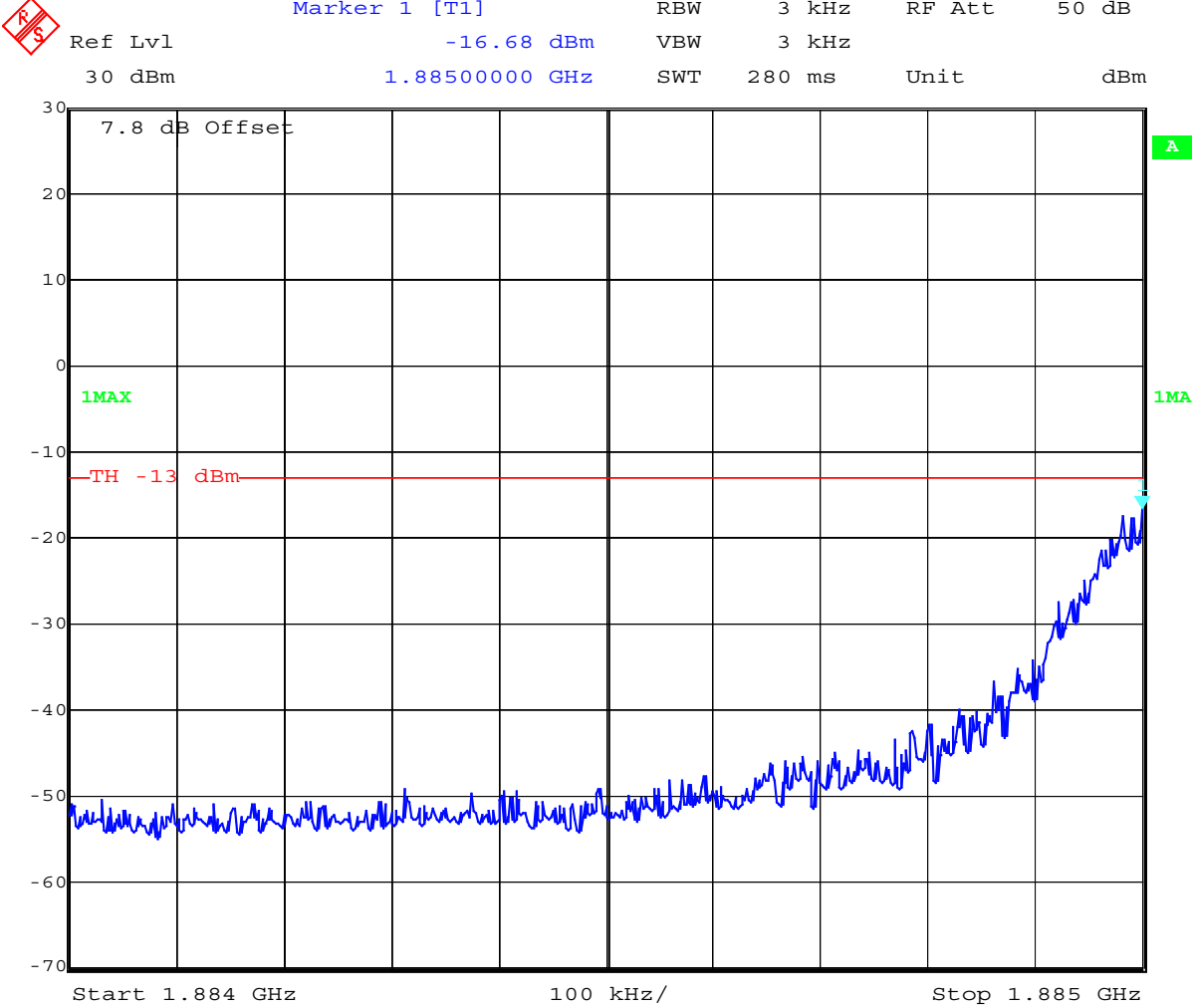
	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	Ref Lvl	-16.74 dBm	VBW	3 kHz	
	30 dBm	1.87002806 GHz	SWT	280 ms	Unit dBm



Date: 16.MAY.2003 08:18:18

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64


Block E Channel 687

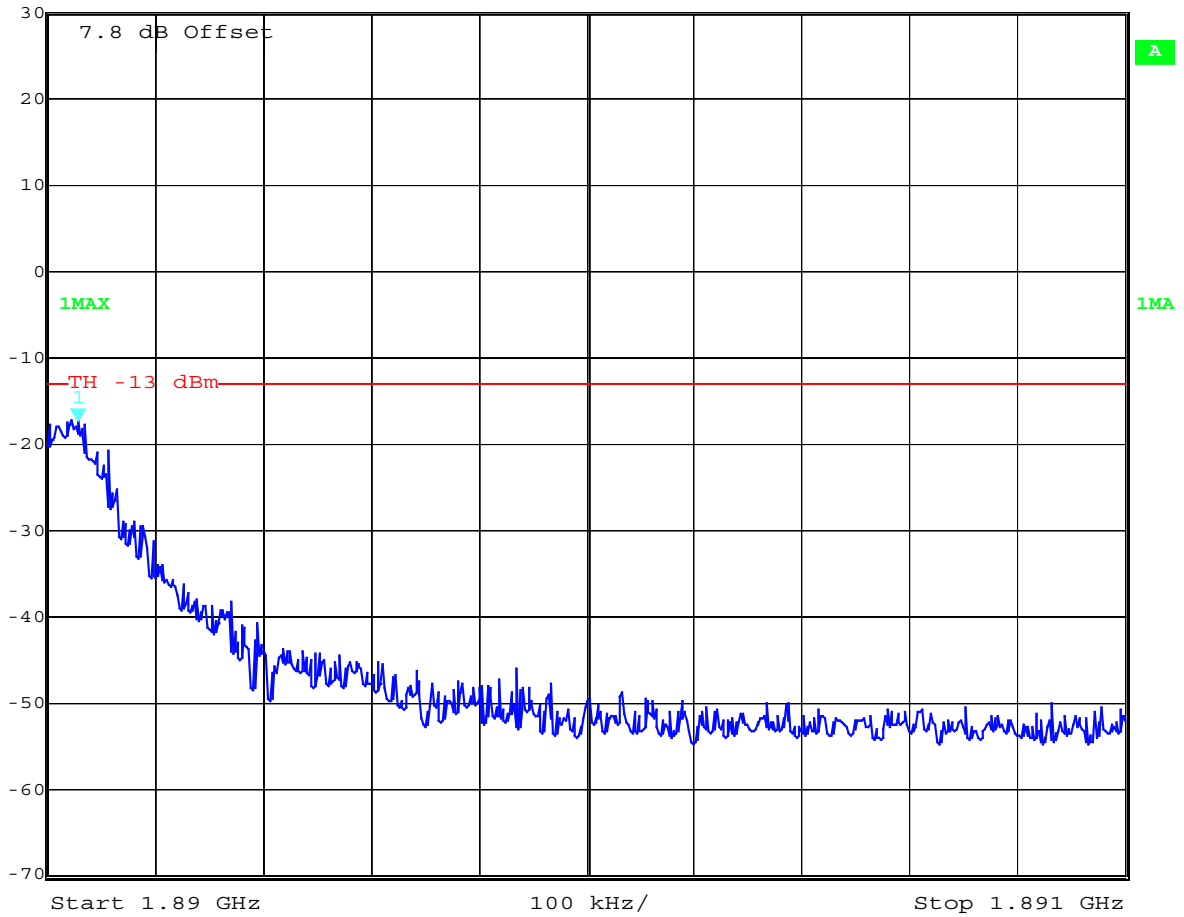


Date: 16.MAY.2003 08:18:58

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Block E Channel 710

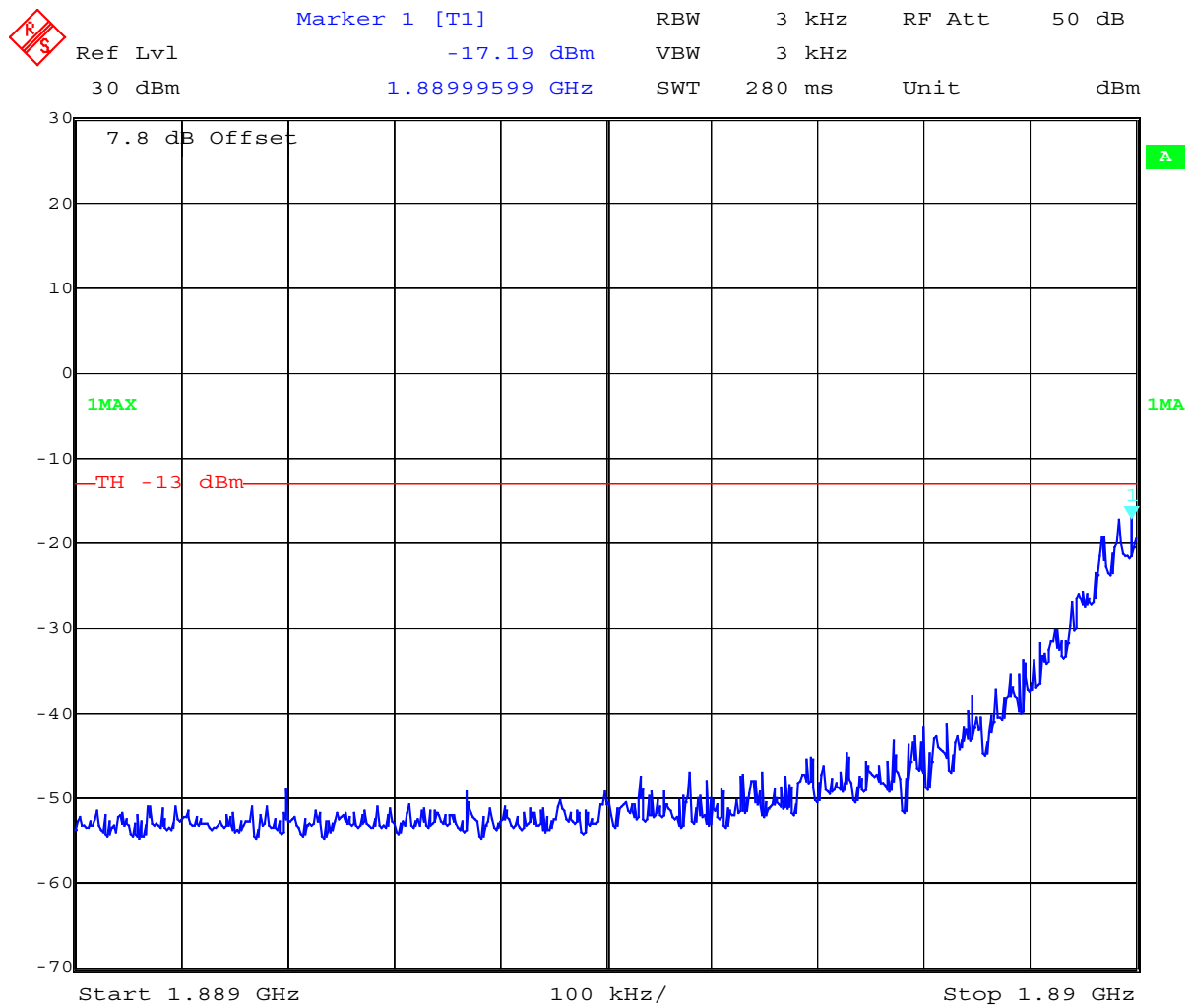
	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	Ref Lvl	-17.38 dBm	VBW	3 kHz	
	30 dBm	1.89002806 GHz	SWT	280 ms	Unit



Date: 16.MAY.2003 08:19:41

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 - 24, 64

Block F Channel 712



Date: 16.MAY.2003 08:20:25

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

Block F Channel 735



Date: 16.MAY.2003 08:21:00

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 17 – 24, 64

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

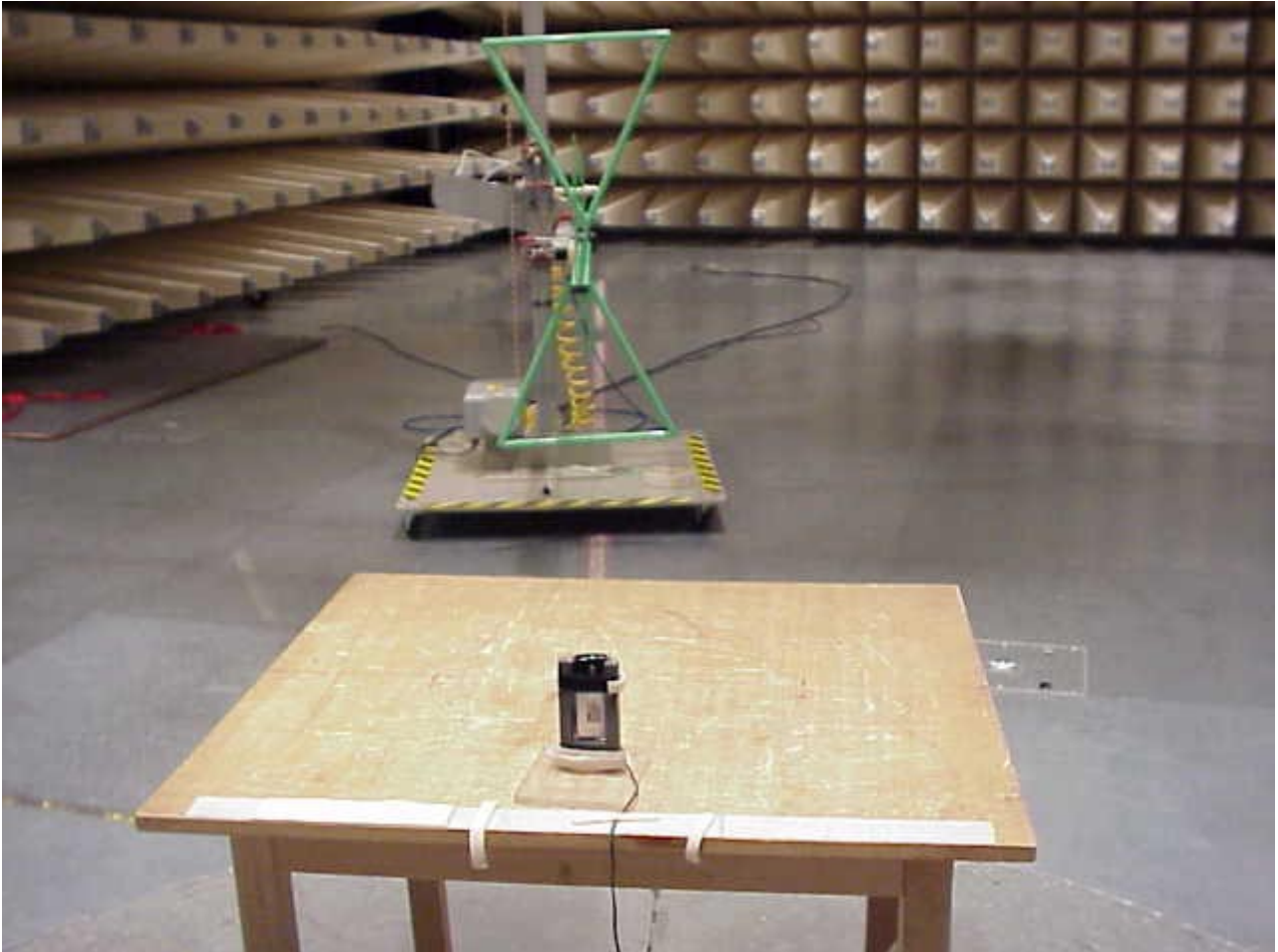
No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Communication Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Function Generator	AFGU	Rohde & Schwarz	862 480/032
09	Regulating Transformer	MPL	Erfi	91350
10	LISN	NNLA 8120	Schwarzbeck	8120331
11	Relay-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulation Meter	9008	Racal-Dana	2647
16	Frequency Counter	5340 A	Hewlett-Packard	1532A03899
17	Anechoic Chamber	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenna	3104	Emco	3758
23	Log. Per. Antenna	3146	Emco	2130
24	Double Ridged Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenna	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenna	HL 223	Rohde & Schwarz	825 584/002
29	Relay-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Anechoic Chamber		Frankonia	
33	Control Computer	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Receiver	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

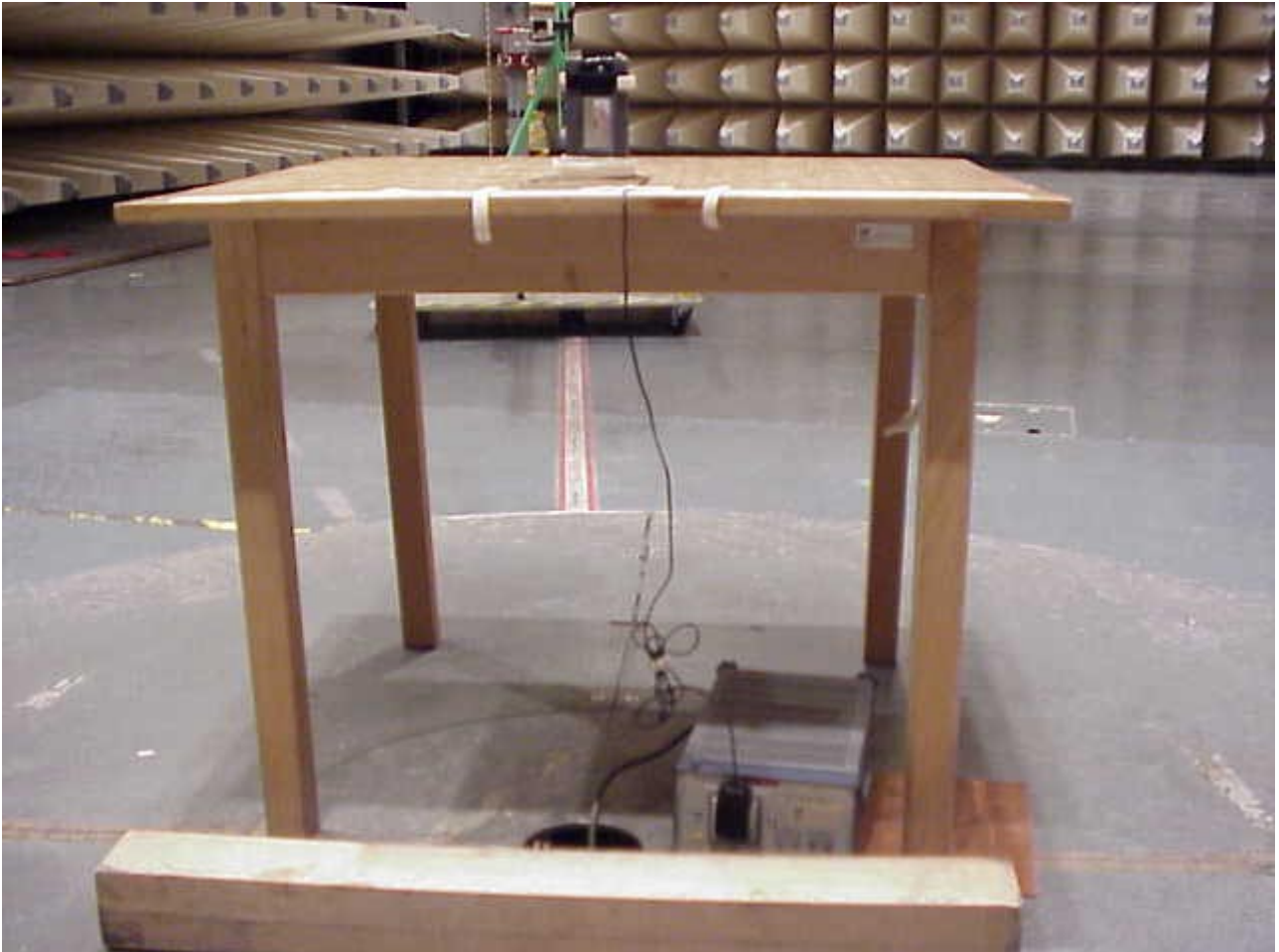
To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Control Computer	HD 100	Deisel	100/322/93
37	Relay Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relay Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Measuring Receiver	ESH 3	Rohde & Schwarz	890 174/002
43	Measuring Receiver	ESVP	Rohde & Schwarz	891 752/005
44	Bicon Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisation Network	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridged Horn Antenna 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Controler	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phase V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Power Supply	6032A	Rohde & Schwarz	2933A05441
59	RF-Test Receiver	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	RF-Test Receiver	ESH3	Rohde & Schwarz	881 515/002
62	Relay Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relay Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773
66				
67				
68				

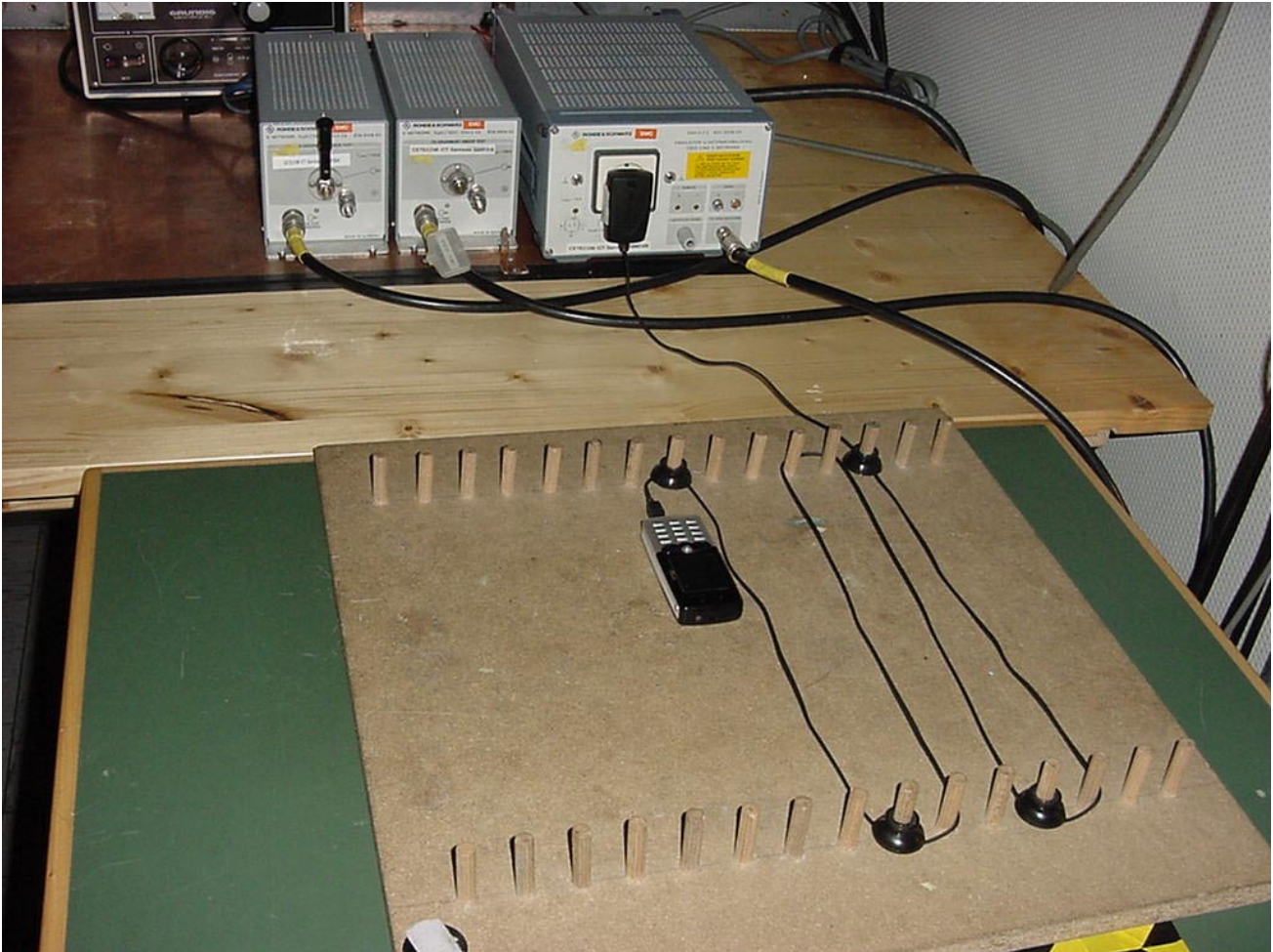
TEST SITE RADIATED EMISSIONS



Test setup radiated emissions



Test setup conducted emissions



Photographs of the equipment



Photographs of the equipment



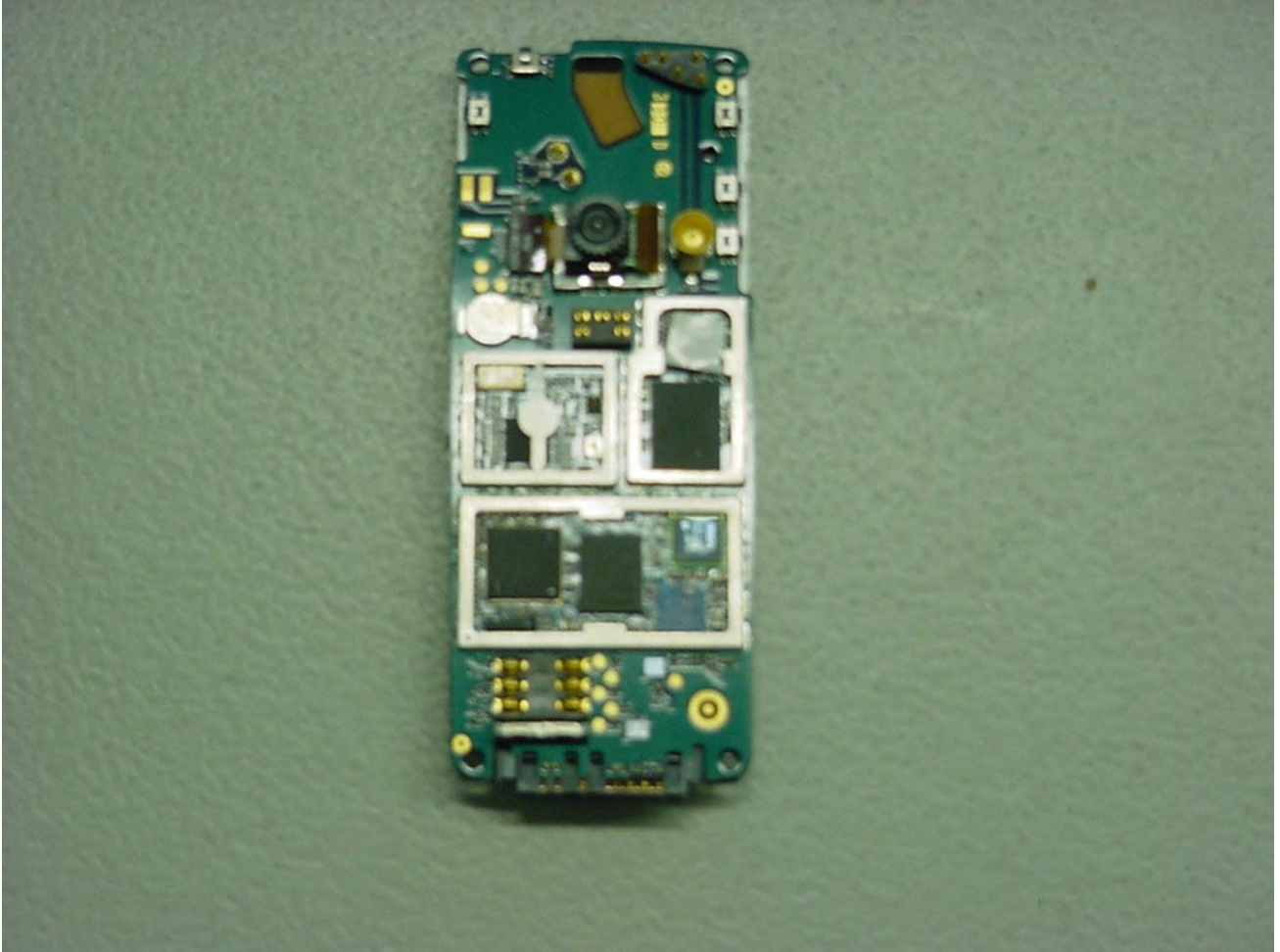
Photographs of the equipment



Photographs of the equipment



Photographs of the equipment



Photographs of the equipment

