EMISSIONS TEST REPORT

Report Number: 3112039BOX-001
Project Number: 3112039

Testing performed on the

Model: GSM Basestation

To

FCC Part 22 Subpart H
And
Industry Canada RSS-132 Issue 2 September 2005

For

Vanu, Inc.

Test Performed by:
Intertek – ETL SEMKO
70 Codman Hill Road
Boxborough, MA 01719

Test Authorized by:
Vanu, Inc.
One Cambridge Center
Cambridge, MA 02142

Prepared by: _____ Date: 1/30/07
Nicholas Abbondante

Reviewed by: _____ Date: 1-30-2007
Roland W. Gubisch

1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company:	Vanu, Inc. One Cambridge Center Cambridge, MA 02142
Contact:	Byron Kubert
Telephone:	617-864-1711 xt.274
Fax:	N/A
Email:	bkubert@vanu.com

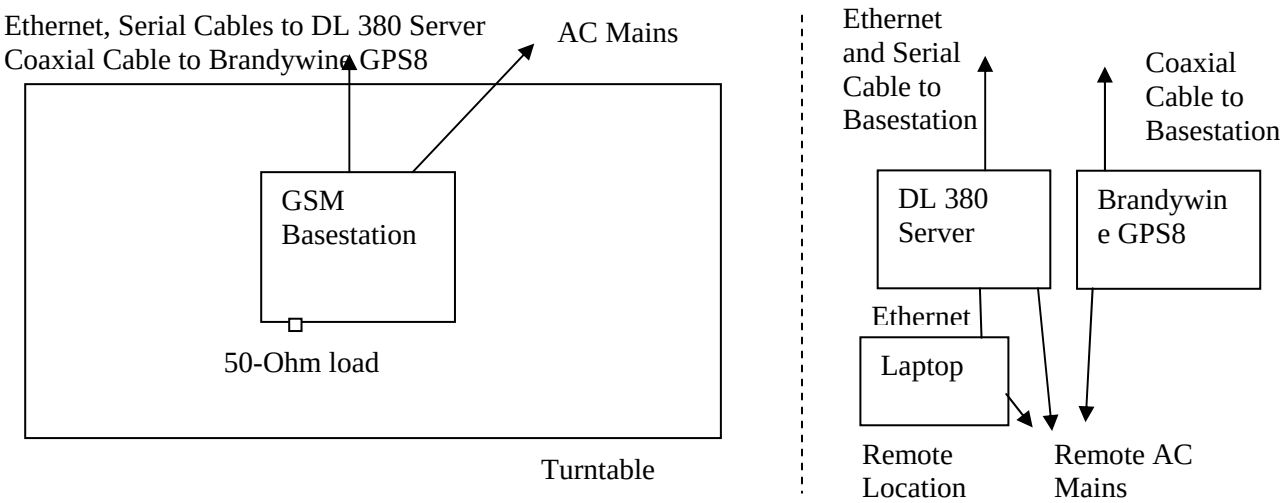
1.2 Equipment Under Test

Equipment Type:	GSM Basestation
Model Number(s):	GSM Basestation
Serial number(s):	1074
Manufacturer:	Vanu, Inc.
EUT receive date:	01/02/2007
EUT received condition:	Prototype in Good Condition
Test start date:	01/02/2007
Test end date:	01/09/2007

1.3 Test Plan Reference: Tested according to the standards listed, IC SRSP-503, RSS-Gen Issue 1 September 2005, and ANSI C63.4:2003.

1.4 Test Configuration

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
EUT AC Mains	None	Plastic/IEEE	2	1
Serial Cable	Braid	Metal/DB9	2	1
Ethernet Cable	None	Plastic RJ-45	10	1
Coaxial Cable	Braid	Metal/BNC	10	1

1.4.3. Support Equipment:

Name: Brandywine Communications
Model No.: GPS8
Serial No.: 1611

Name: Dell Monitor
Model No.: 2001fp
Serial No.: cn0c0646-4663353r0t6L

Name: HP Computer
Model No.: XW3100
Serial No.: usv33805t5

Name: Dell Keyboard
Model No.: RT7D20
Serial No.: CN-D4N4S437172-3c2-1778

Name: Dell Mouse
Model No.: 0w1668
Serial No.: LZE35117935

1.5 Mode(s) of Operation:

The EUT was activated from 120V/60Hz power and transmitted GSM carriers on low, mid, and high channels across the EUT passband. Bursts of random data were fed to the modulator. Three-tone intermodulations were also used during spurious emissions testing.

EUT passband: 869 – 894 MHz

Channels Tested:
Channel A: 869.2 MHz
Channel B: 882.2 MHz
Channel C: 893.8 MHz

2.0 Test Summary

TEST STANDARD	RESULTS	
FCC Part 22 Subpart H IC RSS-132 Issue 2 September 2005		
SUB-TEST	**TEST PARAMETER**	**COMMENT**
Effective Radiated Power FCC 2.1046, 22.913	Effective Radiated Power must not exceed 500 Watts (57 dBm)	Pass
Occupied Bandwidth (26 dB Bandwidth) FCC 2.1049	Emission must stay within assigned band of operation.	Pass
Spurious Conducted Emissions FCC 2.1051, FCC Part 22 Subpart H 22.917, IC RSS-132 Section 4.5	Emissions outside the passband must not exceed –13 dBm when measured in a 100 kHz measurement bandwidth, except in the 1 MHz block edges above and below the band of operation, where compliance is based on a measurement bandwidth equal to 1% of the emission bandwidth.	Pass
Spurious Radiated Emissions FCC 2.1053, FCC Part 22 Subpart H 22.917, IC RSS-132 Section 4.5, 4.6, FCC Part 15 Subpart B 15.109, IC RSS-Gen Sections 4.8, 6.0	Emissions outside the passband must not exceed –13 dBm when measured in a 100 kHz measurement bandwidth, except in the 1 MHz block edges above and below the band of operation, where compliance is based on a measurement bandwidth equal to 1% of the emission bandwidth.	Pass
Frequency Stability FCC 2.1055, FCC Part 22 Subpart H 22.355, IC RSS-132 Section 4.3	The fundamental frequency must not deviate by more than ±1.5 PPM over temperature and voltage.	Pass

REVISION SUMMARY – The following changes have been made to this Report:

Date	Project No.	Project Handler	Page(s)	Item	Description of Change

3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

Level in μV/m = [10(32 dBμV/m)/20] = 39.8 μV/m

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF

Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(48.1\ dB\mu V / 20)}$ = 254 μV/m

3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.
The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be:

±3.5 dB at 10m, ±3.8 dB at 3m

The expanded uncertainty (k = 2) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

±2.6 dB

The expanded uncertainty (k = 2) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

±3.2 for ISN and voltage probe measurements
±3.1 for current probe measurements

3.2 Site Description

Test Site(s): 2

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Test Results: Pass

Test Standard: FCC Part 22 Subpart H 22.913, IC RSS-132 Section 4.4, IC SRSP-503

Test: Effective Radiated Power

Performance Criterion: Effective Radiated Power must not exceed 500 Watts for digital basestations.

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	N/A	Pressure (hPa):	N/A	Ambient (°C):	N/A
Pretest Verification Performed	Yes		Equipment under Test:		GSM Basestation	

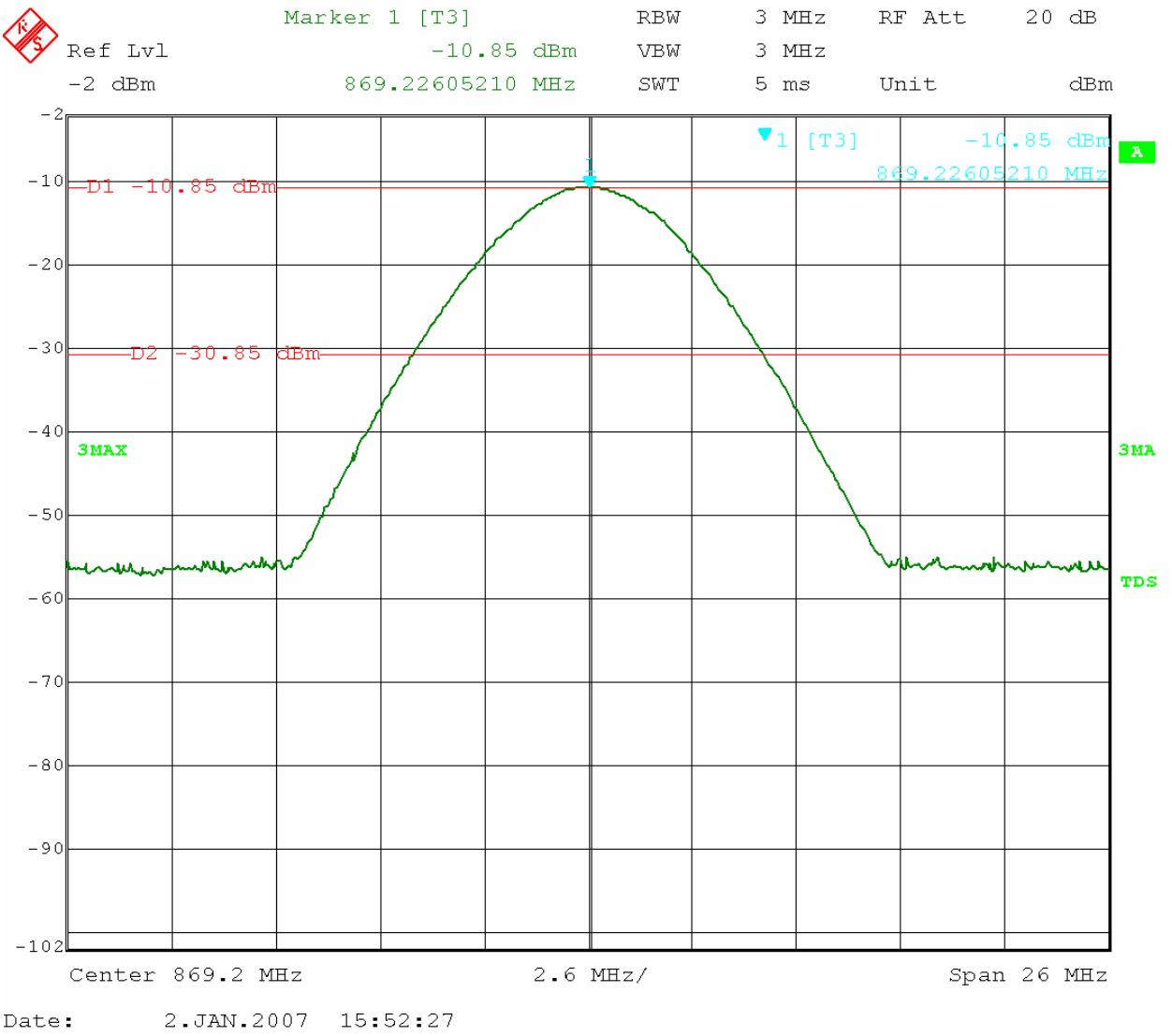
Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007

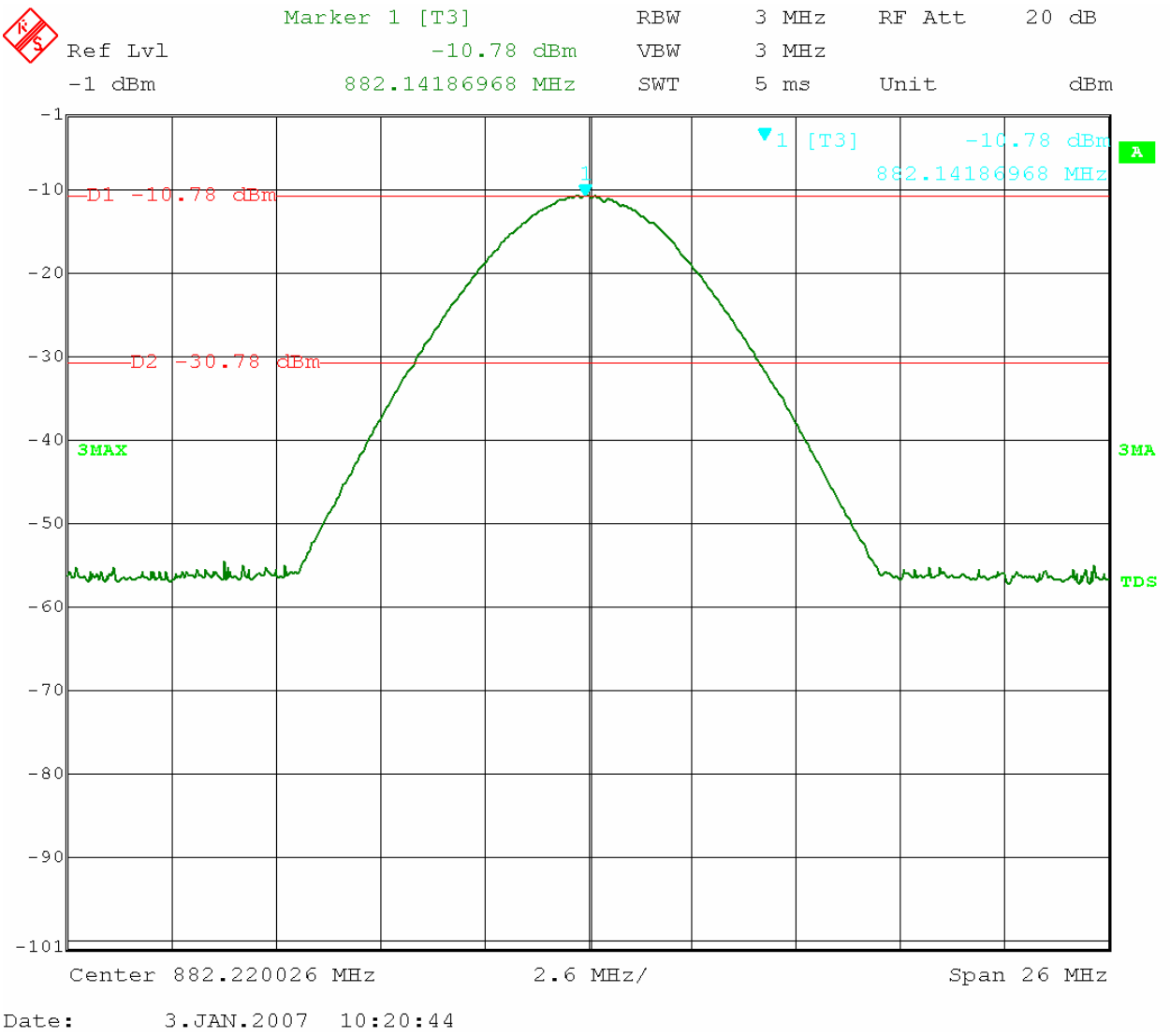
Test Details:

Test	**EUT Reading** dBm	**Standard Limit** 500 Watts – 57 dBm	**Pass Fail**	**COMMENT**
Channel A	-10.85	57 dBm	Pass	
Channel B	-10.78	57 dBm	Pass	
Channel C	-11.21	57 dBm	Pass	

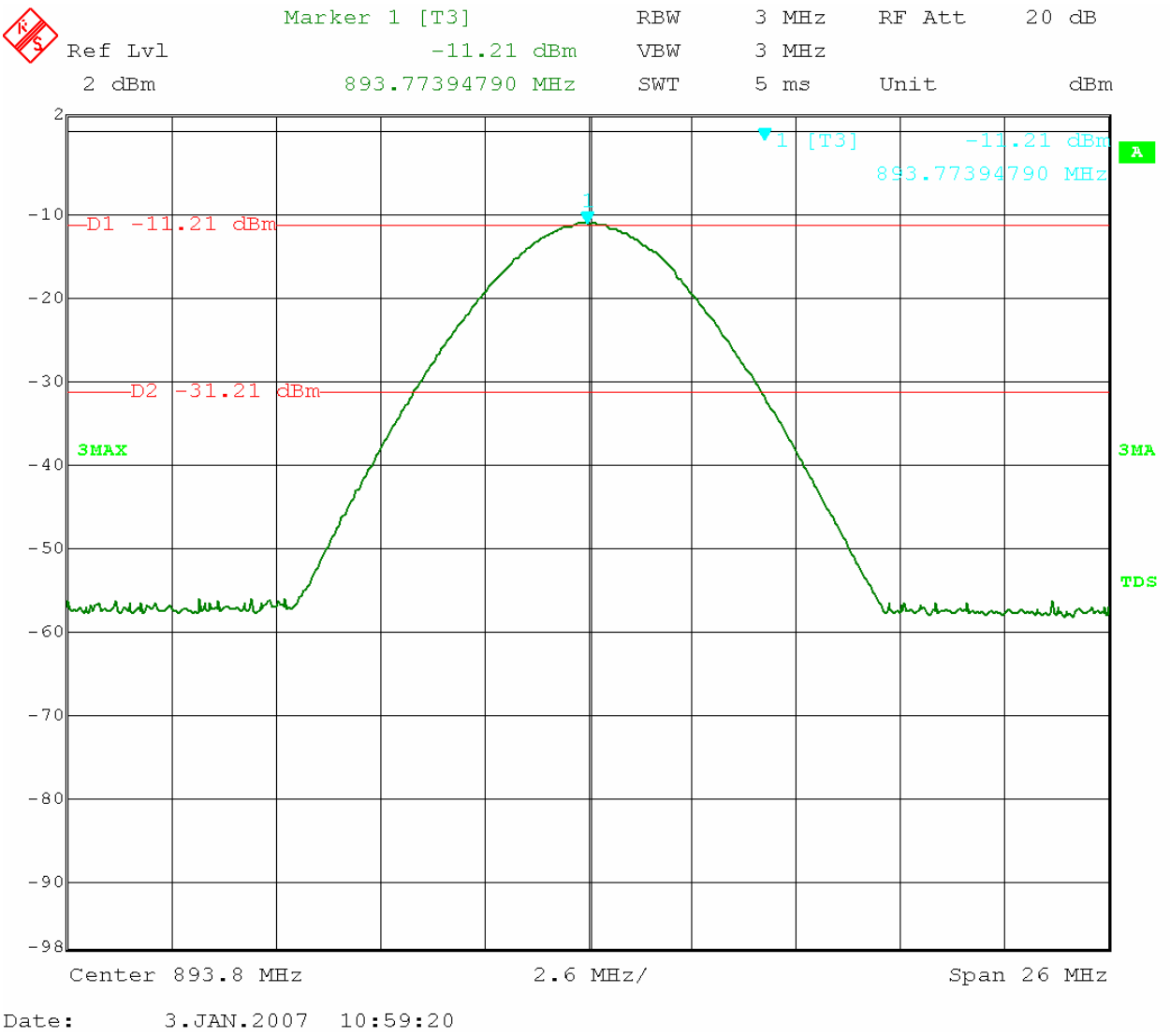
Notes: Transducer factors were programmed into the spectrum analyzer to compensate for cable loss in the test setup.


Marker 1 [T3]
RBW 3 MHz
RF Att 20 dB
Ref Lvl
-10.85 dBm
VBW 3 MHz
-2 dBm
869.22605210 MHz
SWT 5 ms
Unit dBm
1 [T3]
-10.85 dBm
869.22605210 MHz
D1 -10.85 dBm
D2 -30.85 dBm
3MAX
3MA
TDS
A
-2
-10
-20
-30
-40
-50
-60
-70
-80
-90
-102
Center 869.2 MHz
2.6 MHz/
Span 26 MHz
Date: 2.JAN.2007 15:52:27

Channel A


Marker 1 [T3]
RBW 3 MHz
RF Att 20 dB
Ref Lvl
-10.78 dBm
VBW 3 MHz
-1 dBm
882.14186968 MHz
SWT 5 ms
Unit dBm
1 [T3]
-10.78 dBm
882.14186968 MHz
D1 -10.78 dBm
D2 -30.78 dBm
3MAX
3MA
TDS
A
Center 882.220026 MHz
2.6 MHz/
Span 26 MHz
Date: 3.JAN.2007 10:20:44

Channel B


Marker 1 [T3]
RBW 3 MHz
RF Att 20 dB
Ref Lvl
-11.21 dBm
VBW 3 MHz
2 dBm
893.77394790 MHz
SWT 5 ms
Unit dBm
1 [T3] -11.21 dBm
893.77394790 MHz
D1 -11.21 dBm
D2 -31.21 dBm
3MAX
3MA
TDS
Center 893.8 MHz
2.6 MHz/
Span 26 MHz
Date: 3.JAN.2007 10:59:20

Channel C

Test Results: Pass

Test Standard: FCC Part 22 Subpart H, IC RSS-132

Test: Occupied Bandwidth (26 dB Bandwidth)

Performance Criterion: B

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	N/A	Pressure (hPa):	N/A	Ambient (°C):	N/A
Pretest Verification Performed	Yes		Equipment under Test:		GSM Basestation	

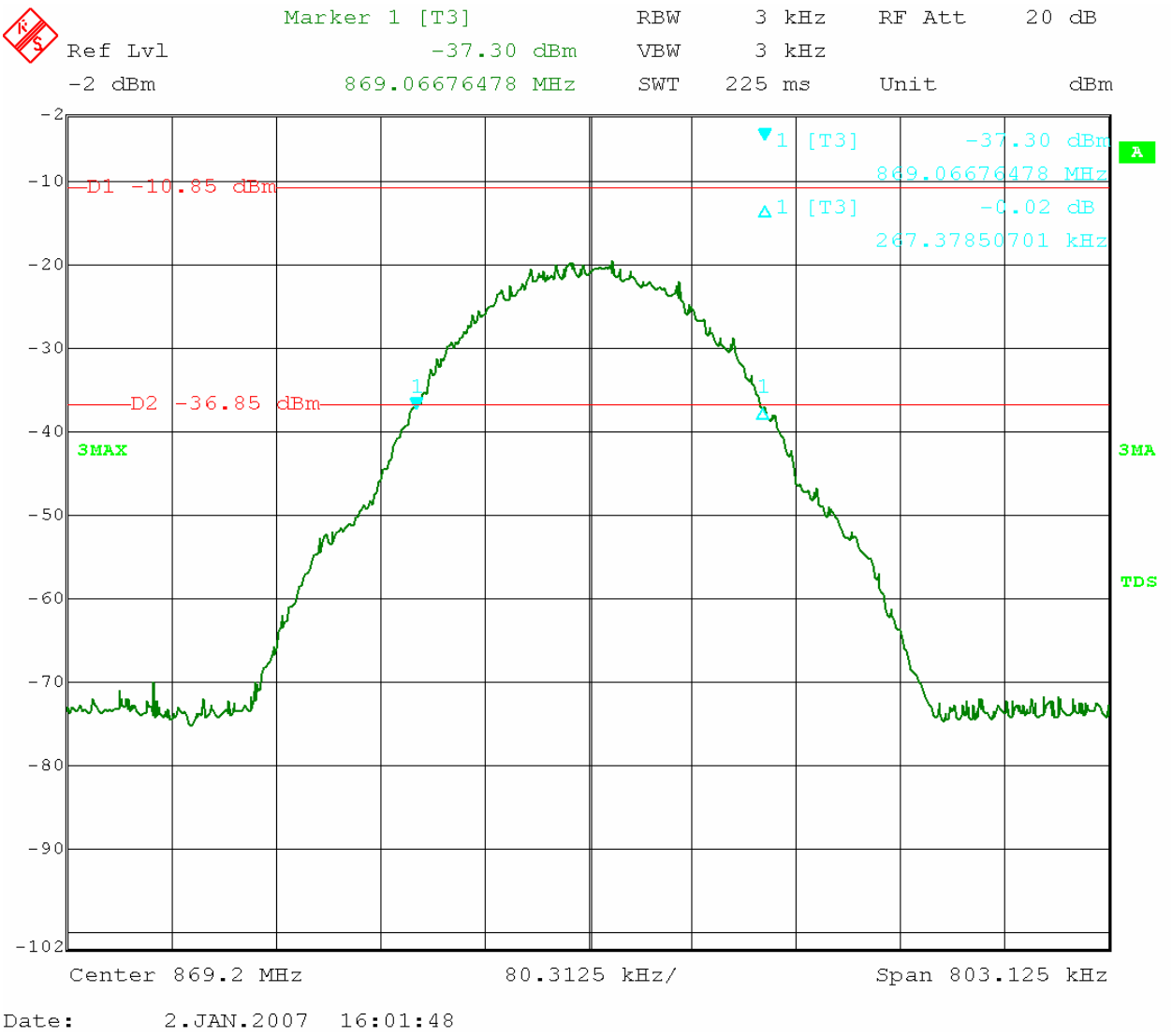
Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007

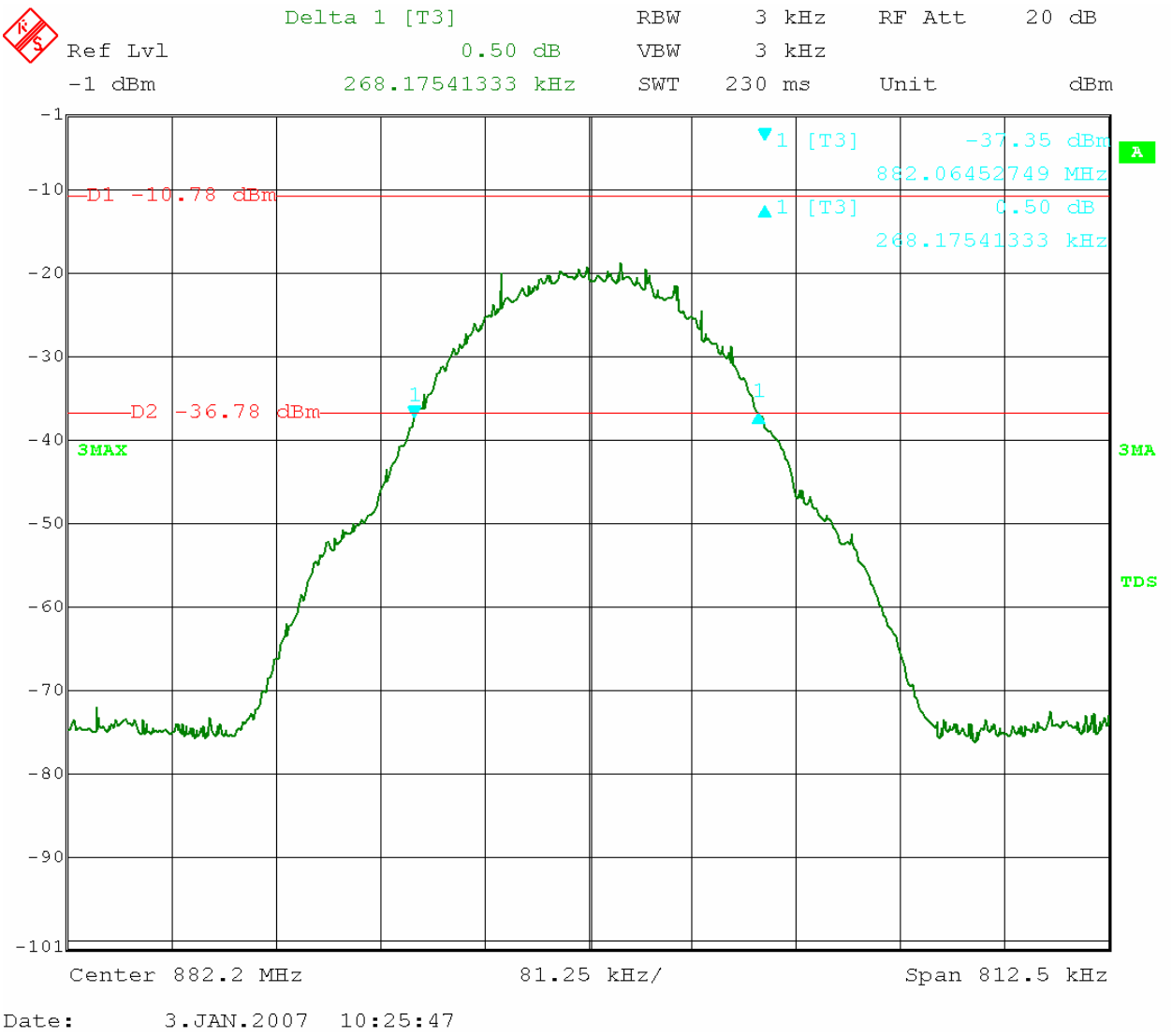
Test Details:

Test	**EUT Reading** kHz	**Standard Limit** No limit	**Pass Fail**	**COMMENT**
Channel A	267.4	No limit	Pass	
Channel B	268.2	No limit	Pass	
Channel C	279.2	No limit	Pass	

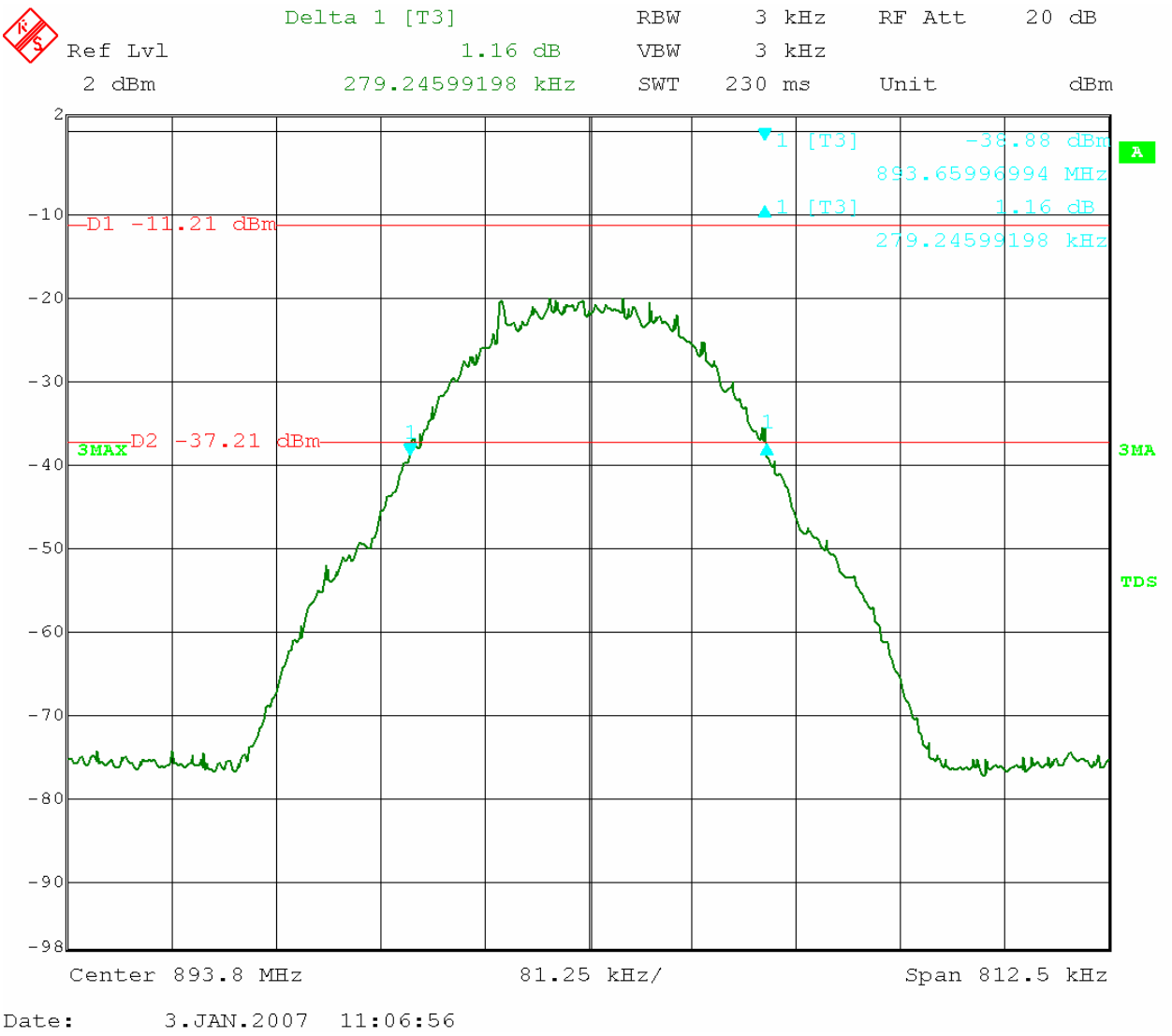
Notes: Transducer factors were programmed into the spectrum analyzer to compensate for cable loss in the test setup.


Marker 1 [T3]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-37.30 dBm
VBW 3 kHz
-2 dBm
869.06676478 MHz
SWT 225 ms
Unit dBm
1 [T3] -37.30 dBm
869.06676478 MHz
Δ1 [T3] -0.02 dB
267.37850701 kHz
D1 -10.85 dBm
D2 -36.85 dBm
3MAX
3MA
TDS
A
-2
-10
-20
-30
-40
-50
-60
-70
-80
-90
-102
Center 869.2 MHz
80.3125 kHz/
Span 803.125 kHz
Date: 2.JAN.2007 16:01:48

Channel A


Delta 1 [T3]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
0.50 dB
VBW 3 kHz
-1 dBm
268.17541333 kHz
SWT 230 ms
Unit dBm
1 [T3] -37.35 dBm
882.06452749 MHz
1 [T3] 0.50 dB
268.17541333 kHz
D1 -10.78 dBm
D2 -36.78 dBm
3MAX
3MA
TDS
Center 882.2 MHz
81.25 kHz/
Span 812.5 kHz
Date: 3.JAN.2007 10:25:47

Channel B


Delta 1 [T3]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
1.16 dB
VBW 3 kHz
2 dBm
279.24599198 kHz
SWT 230 ms
Unit dBm
1 [T3] -38.88 dBm
893.65996994 MHz
1 [T3] 1.16 dB
279.24599198 kHz
D1 -11.21 dBm
3MAX D2 -37.21 dBm
A
3MA
TDS
2
-10
-20
-30
-40
-50
-60
-70
-80
-90
-98
Center 893.8 MHz
81.25 kHz/
Span 812.5 kHz
Date: 3.JAN.2007 11:06:56

Channel C

Test Results: Pass

Test Standard: FCC Part 22 Subpart H 22.917, IC RSS-132 Section 4.5

Test: Spurious Conducted Emissions

Performance Criterion: Emissions outside the passband must not exceed –13 dBm when measured in a 100 kHz measurement bandwidth, except in the 1 MHz block edges above and below the band of operation, where compliance is based on a measurement bandwidth equal to 1% of the emission bandwidth.

Test Environment:

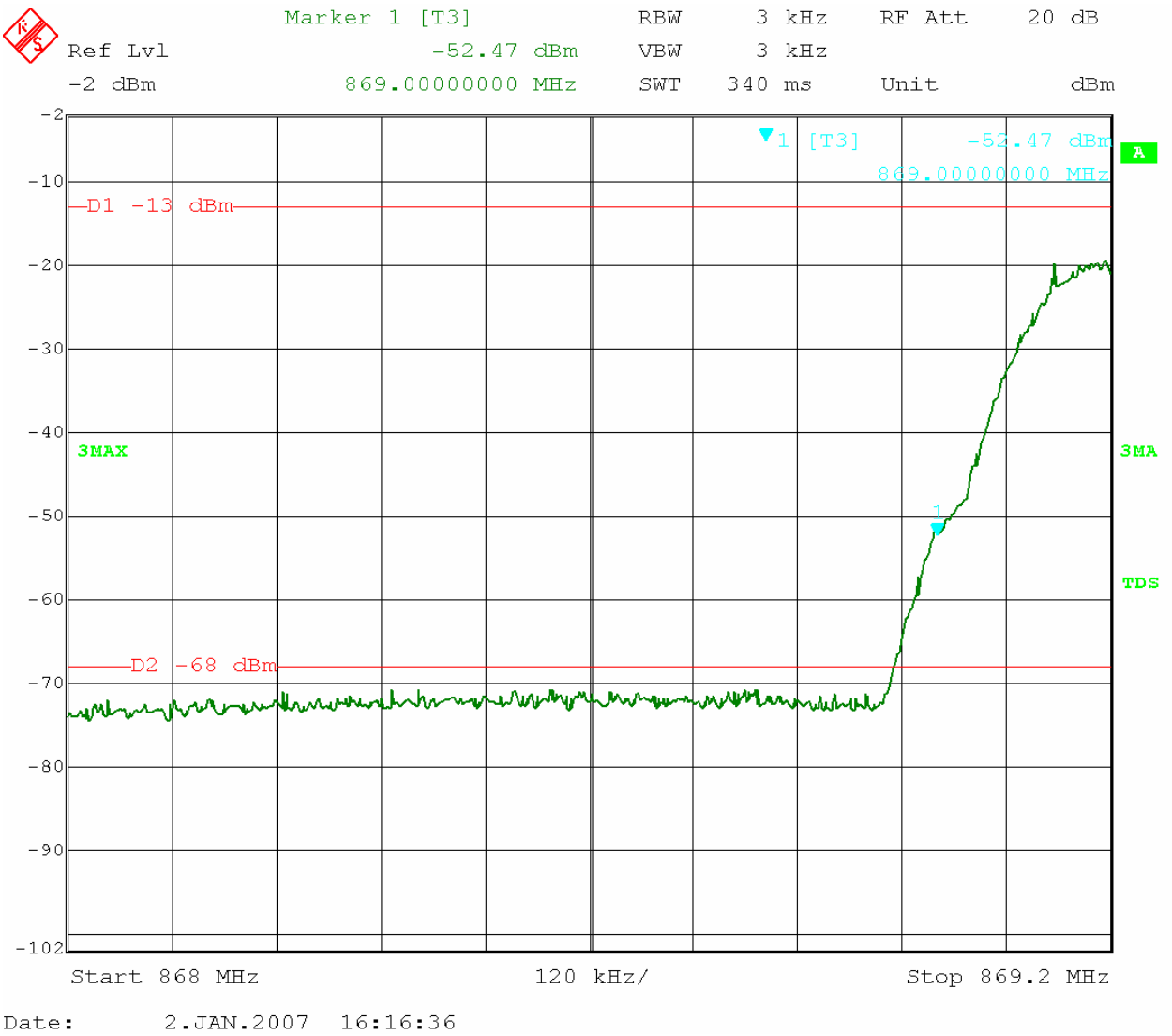
Environmental Conditions During Testing:	Humidity (%):	N/A	Pressure (hPa):	N/A	Ambient (°C):	N/A
Pretest Verification Performed	Yes		Equipment under Test:		GSM Basestation	

Test Equipment Used:

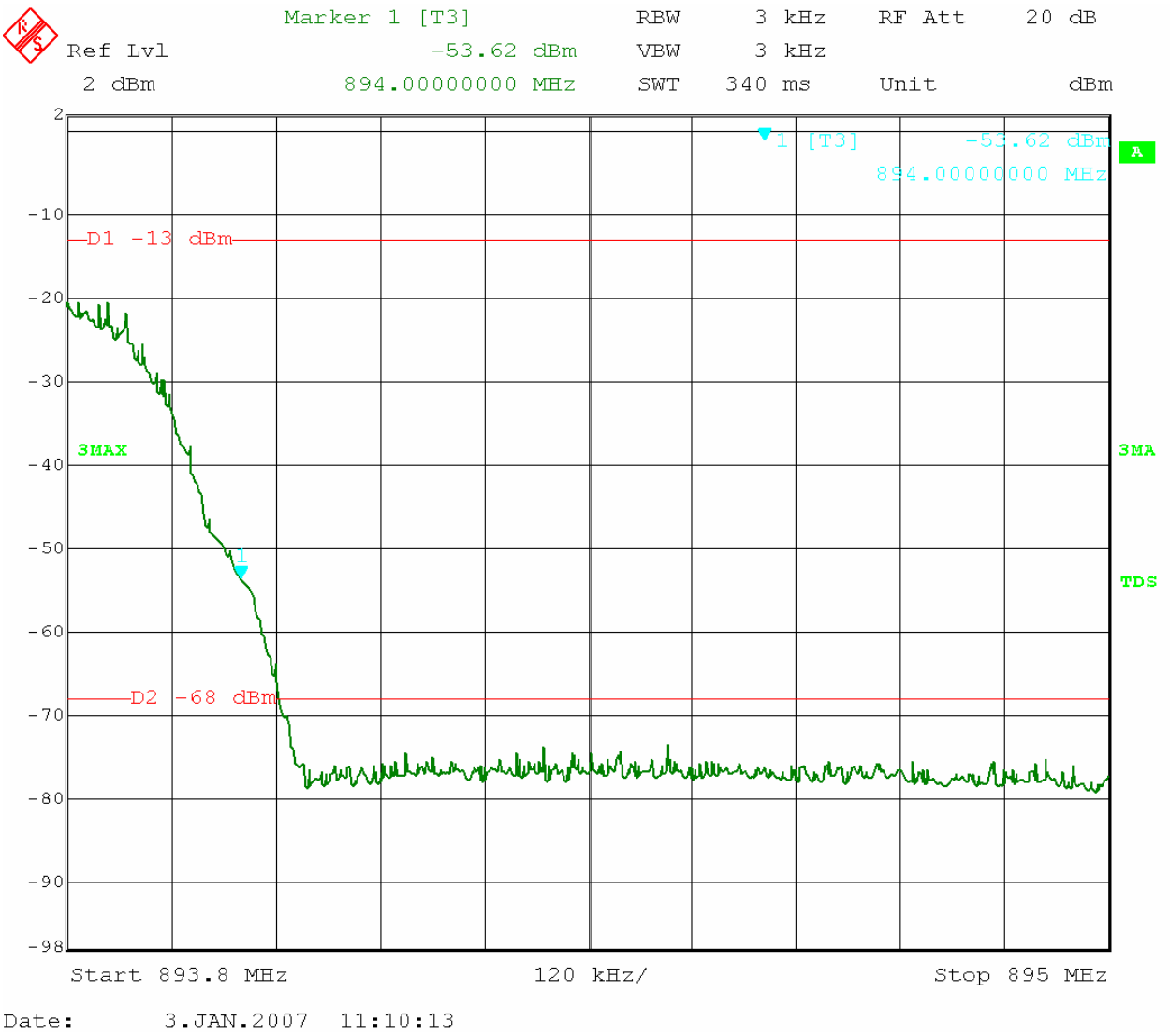
TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007

Test Details:

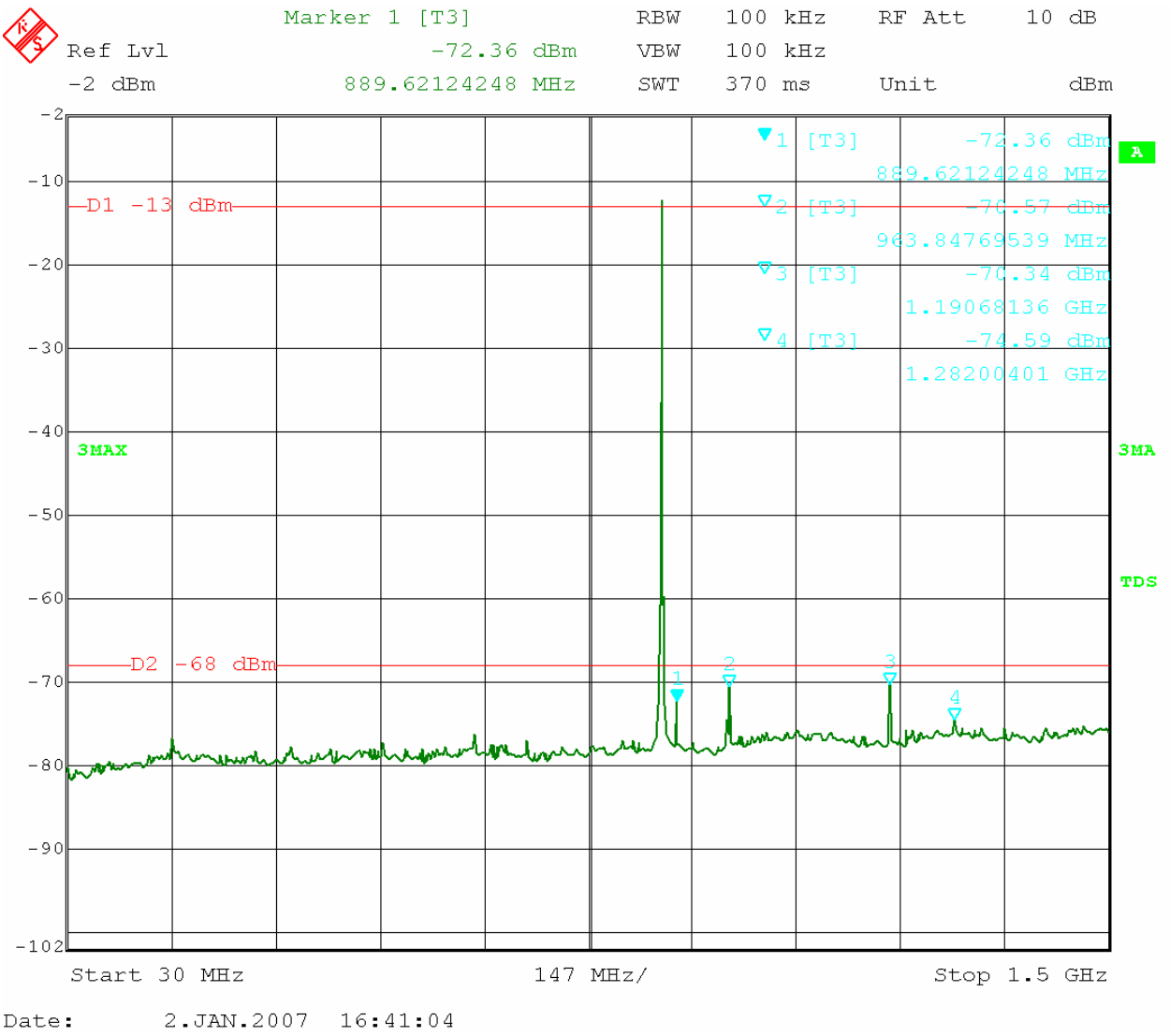
Notes: Transducer factors were programmed into the spectrum analyzer to compensate for cable loss in the test setup.



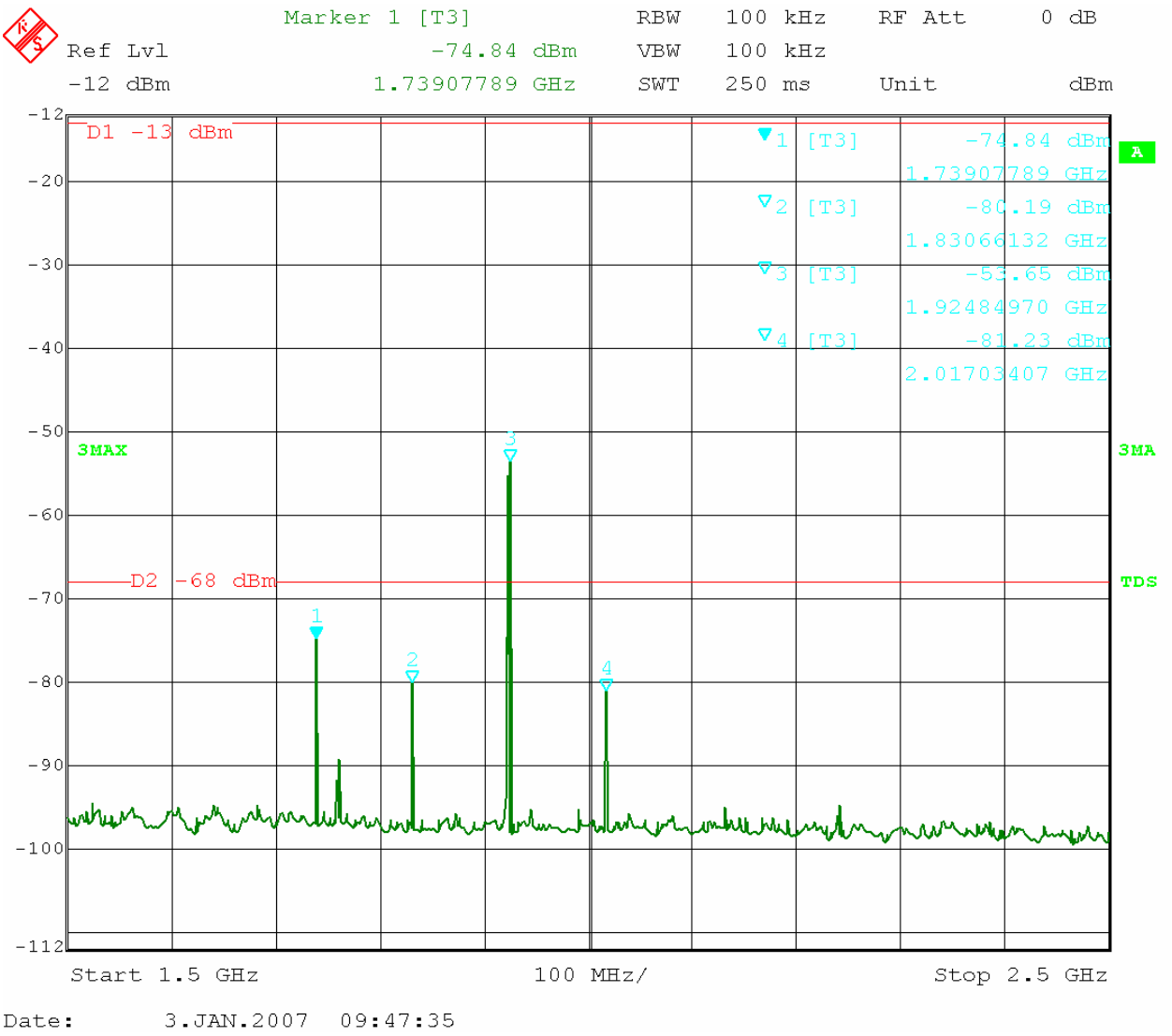
Channel A Lower Band Edge Compliance



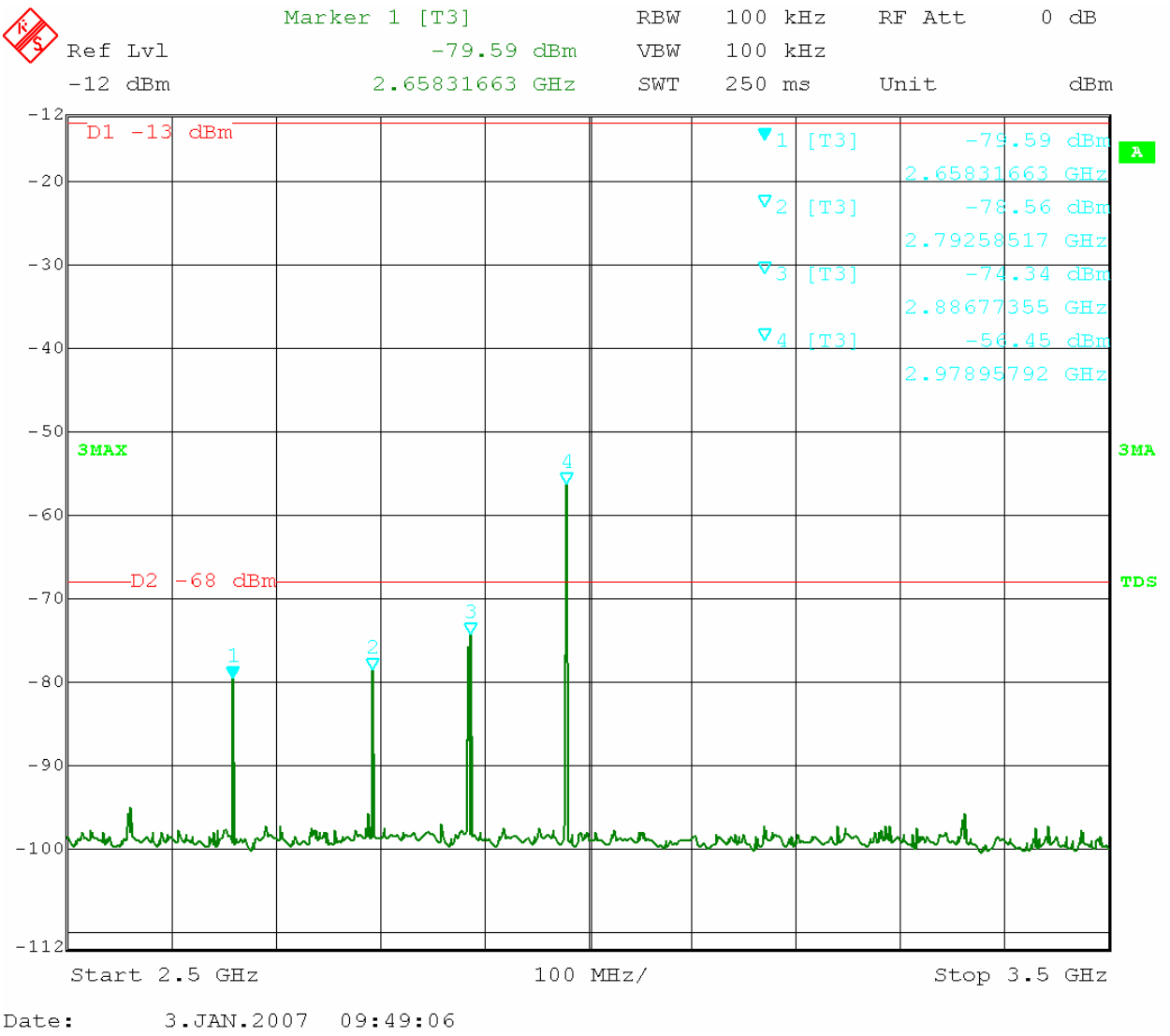
Channel C Upper Band Edge Compliance


Marker 1 [T3]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-72.36 dBm
VBW 100 kHz
-2 dBm
889.62124248 MHz
SWT 370 ms
Unit dBm
1 [T3] -72.36 dBm
889.62124248 MHz
2 [T3] -70.57 dBm
963.84769539 MHz
3 [T3] -70.34 dBm
1.19068136 GHz
4 [T3] -74.59 dBm
1.28200401 GHz
D1 -13 dBm
D2 -68 dBm
3MAX
3MA
TDS
A
Start 30 MHz
147 MHz/
Stop 1.5 GHz
Date: 2.JAN.2007 16:41:04

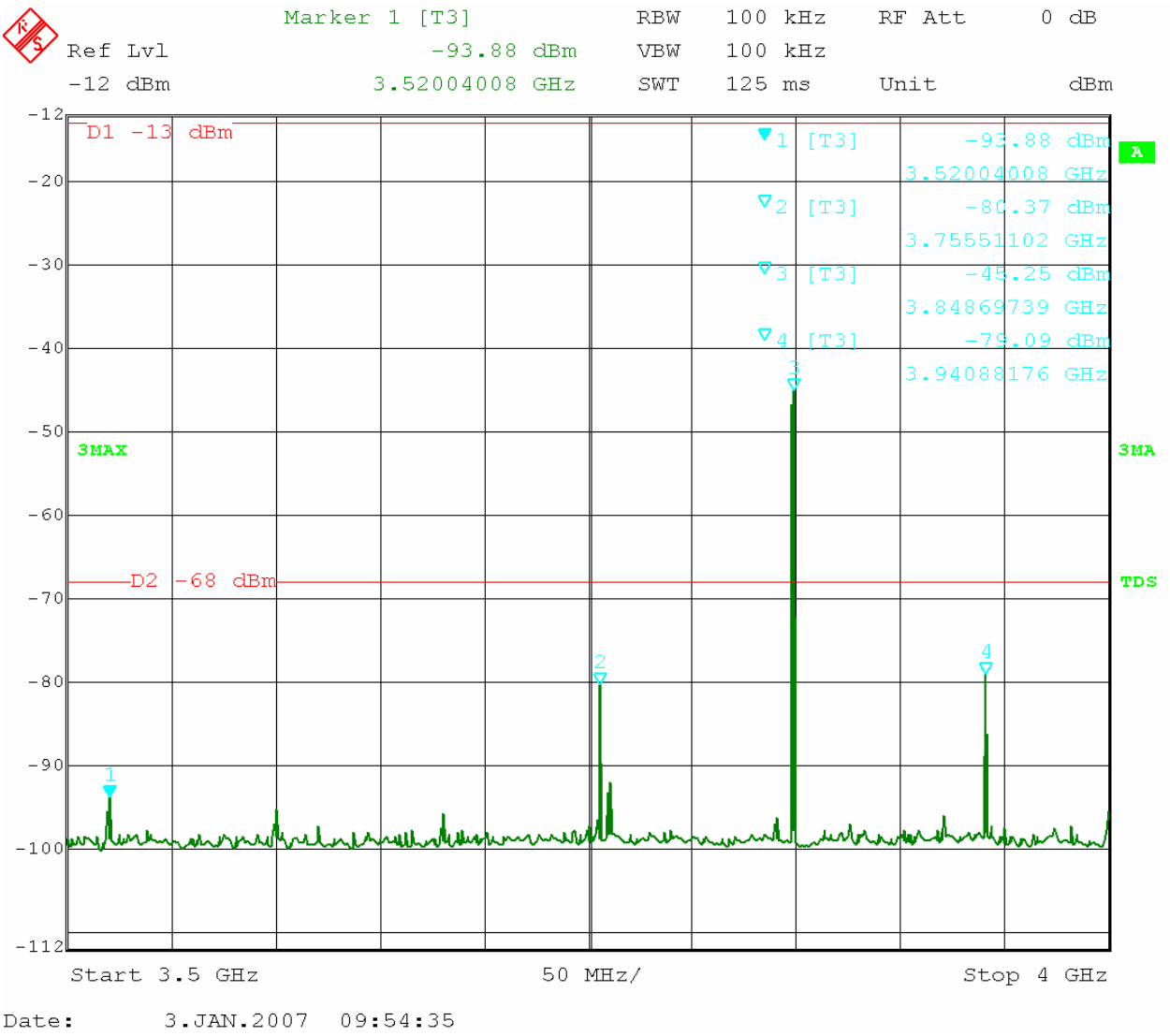
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-74.84 dBm
VBW 100 kHz
-12 dBm
1.73907789 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -74.84 dBm
1.73907789 GHz
2 [T3] -80.19 dBm
1.83066132 GHz
3 [T3] -53.65 dBm
1.92484970 GHz
4 [T3] -81.23 dBm
2.01703407 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
-12
-20
-30
-40
-50
-60
-70
-80
-90
-100
-112
Start 1.5 GHz
100 MHz/
Stop 2.5 GHz
Date: 3.JAN.2007 09:47:35

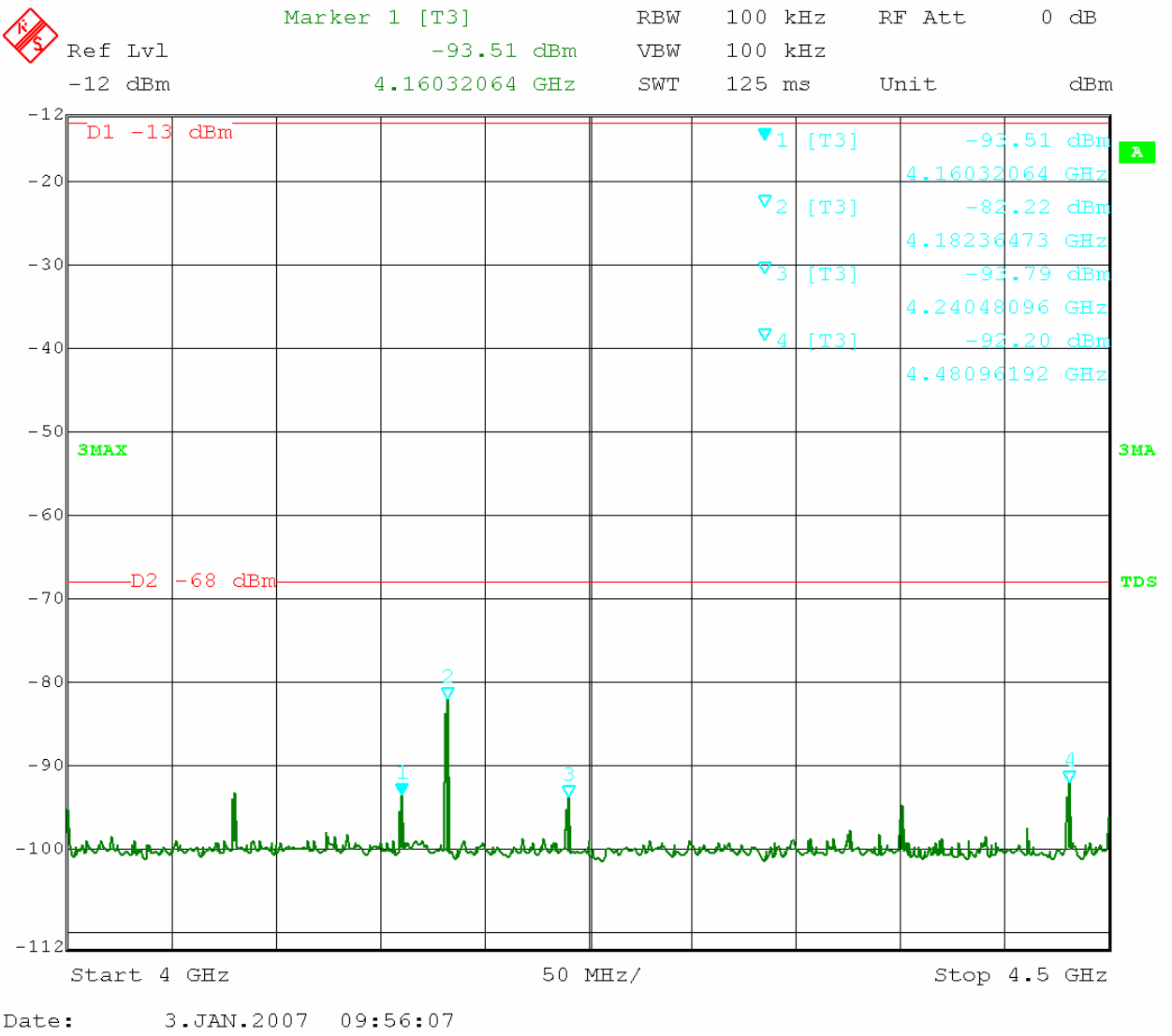
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-79.59 dBm
VBW 100 kHz
-12 dBm
2.65831663 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -79.59 dBm
2.65831663 GHz
2 [T3] -78.56 dBm
2.79258517 GHz
3 [T3] -74.34 dBm
2.88677355 GHz
4 [T3] -56.45 dBm
2.97895792 GHz
3MAX
D2 -68 dBm
TDS
Start 2.5 GHz
100 MHz/
Stop 3.5 GHz
Date: 3.JAN.2007 09:49:06

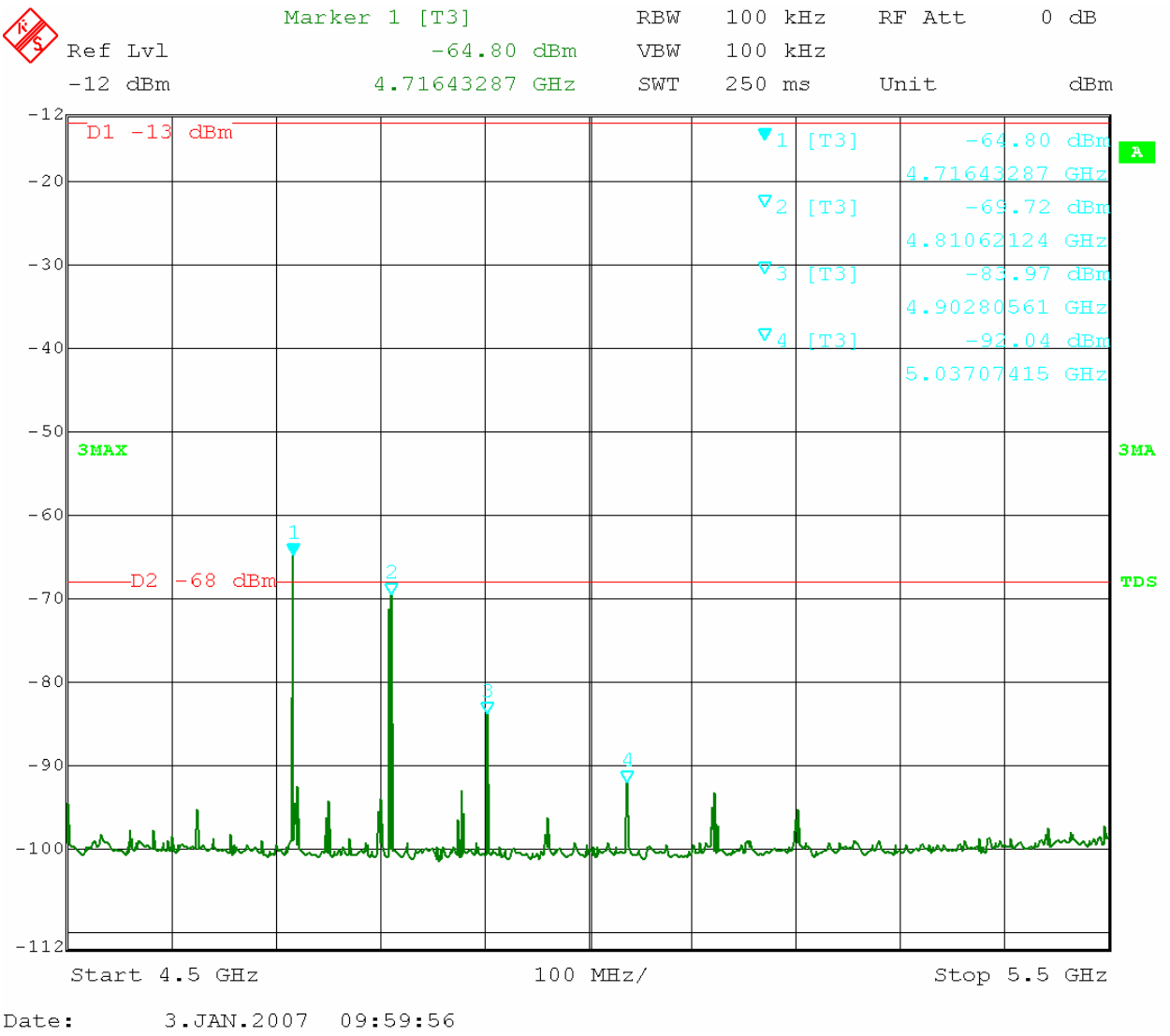
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-93.88 dBm
VBW 100 kHz
-12 dBm
3.52004008 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -93.88 dBm
3.52004008 GHz
2 [T3] -80.37 dBm
3.75551102 GHz
3 [T3] -45.25 dBm
3.84869739 GHz
4 [T3] -79.09 dBm
3.94088176 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
-12
-20
-30
-40
-50
-60
-70
-80
-90
-100
-112
Start 3.5 GHz
50 MHz/
Stop 4 GHz
Date: 3.JAN.2007 09:54:35

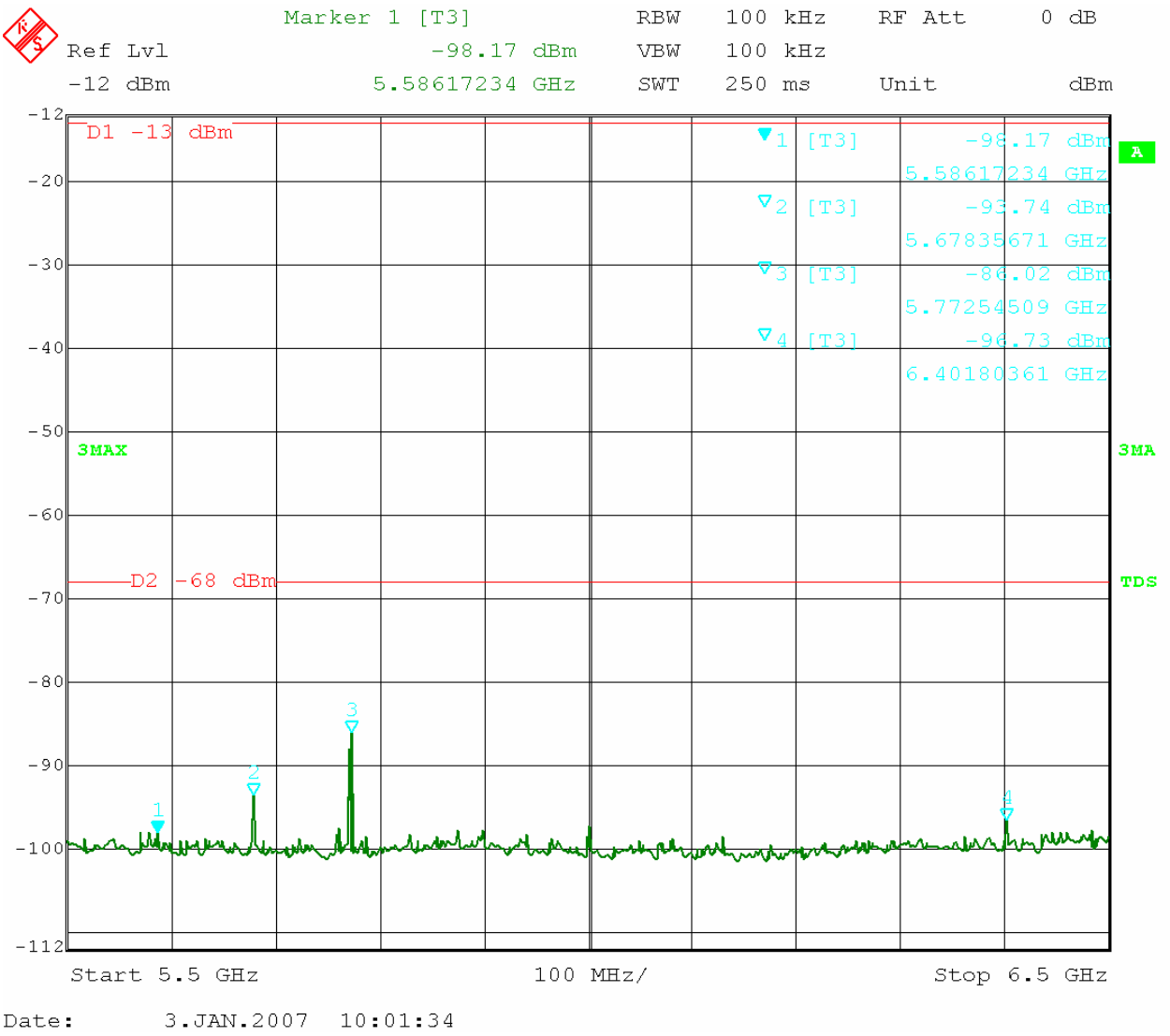
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-93.51 dBm
VBW 100 kHz
-12 dBm
4.16032064 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -93.51 dBm
4.16032064 GHz
2 [T3] -82.22 dBm
4.18236473 GHz
3 [T3] -93.79 dBm
4.24048096 GHz
4 [T3] -92.20 dBm
4.48096192 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 4 GHz
50 MHz/
Stop 4.5 GHz
Date: 3.JAN.2007 09:56:07

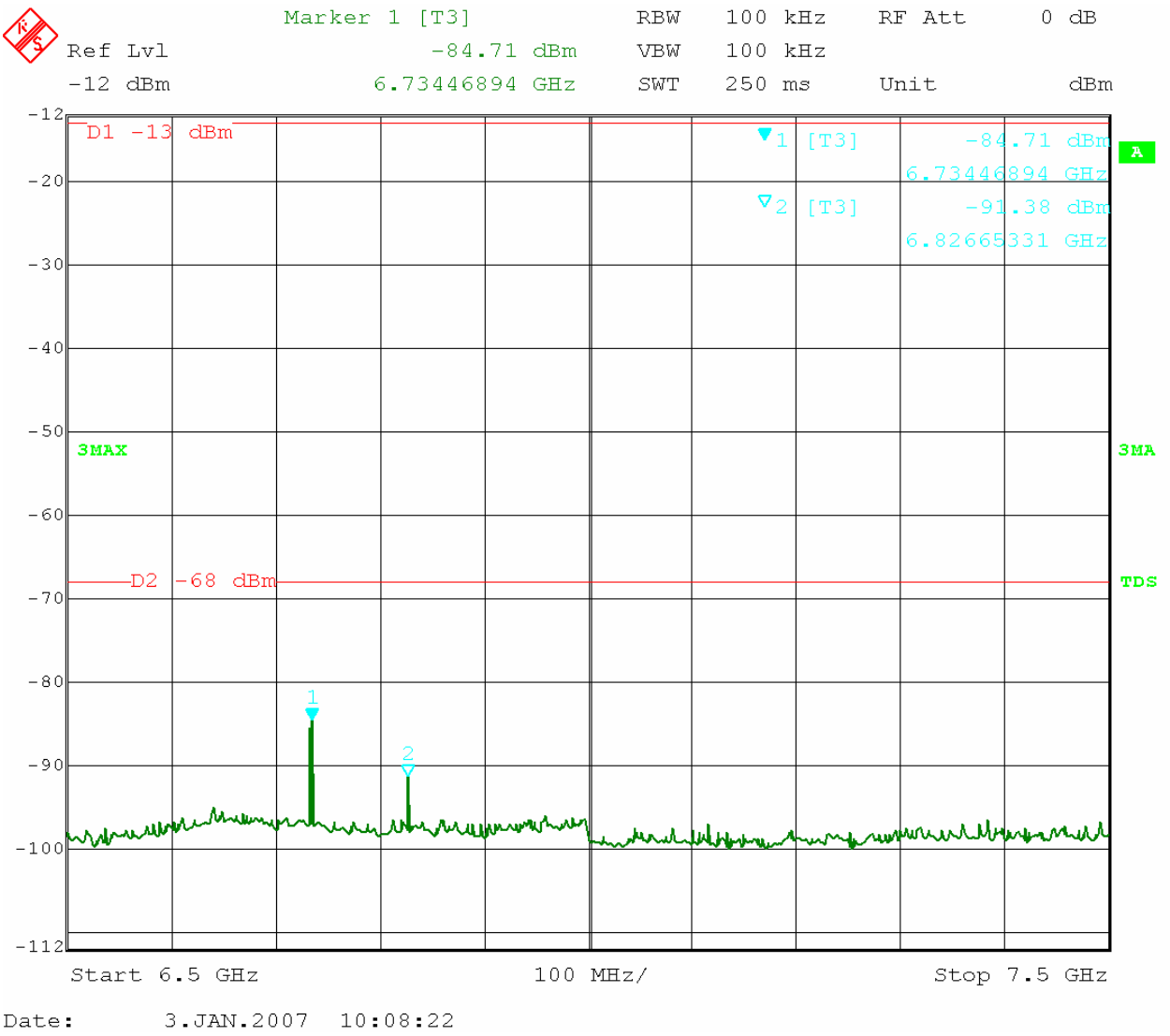
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-64.80 dBm
VBW 100 kHz
-12 dBm
4.71643287 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -64.80 dBm
4.71643287 GHz
2 [T3] -69.72 dBm
4.81062124 GHz
3 [T3] -83.97 dBm
4.90280561 GHz
4 [T3] -92.04 dBm
5.03707415 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 4.5 GHz
100 MHz/
Stop 5.5 GHz
Date: 3.JAN.2007 09:59:56

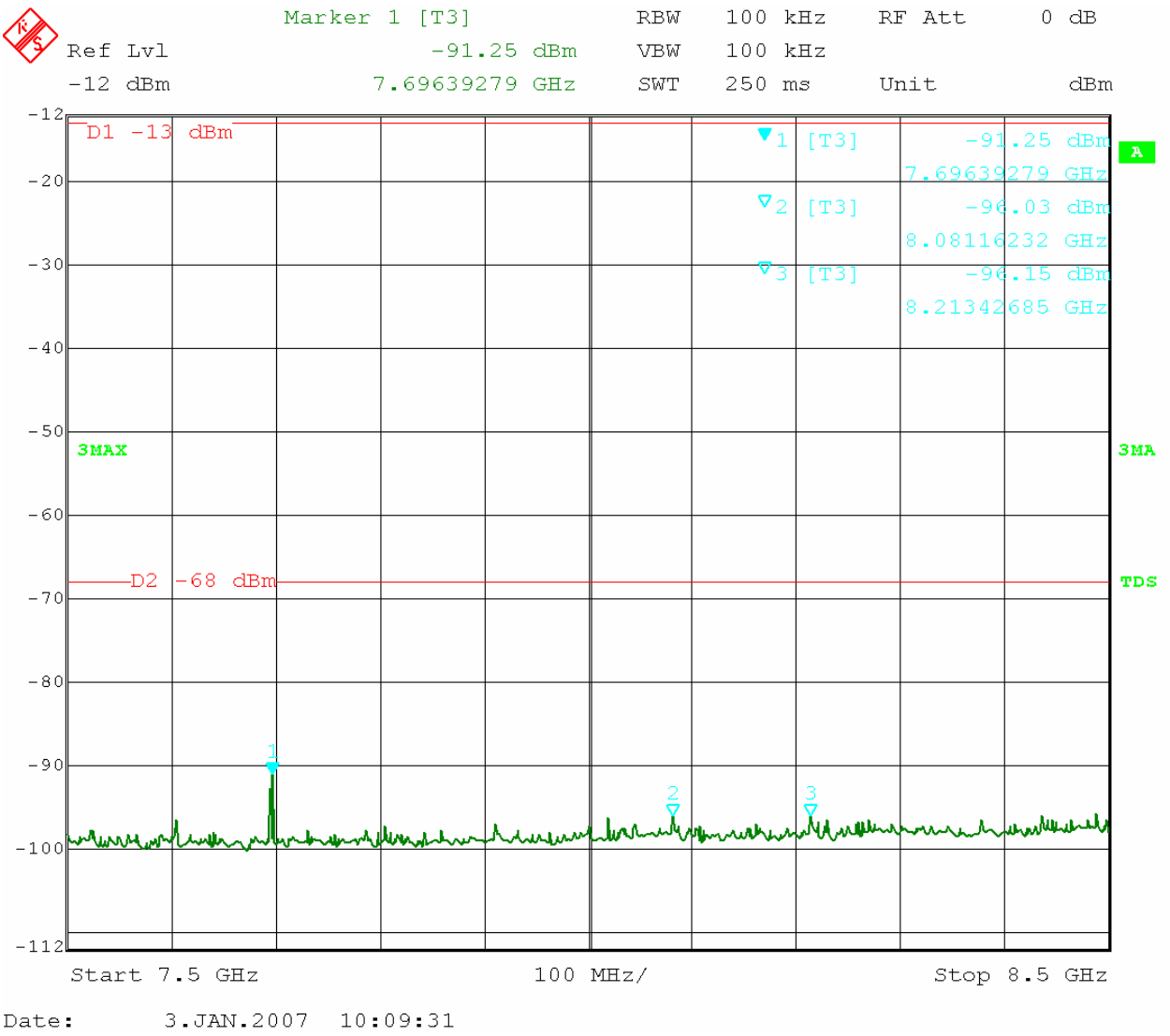
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-98.17 dBm
VBW 100 kHz
-12 dBm
5.58617234 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -98.17 dBm
5.58617234 GHz
2 [T3] -93.74 dBm
5.67835671 GHz
3 [T3] -86.02 dBm
5.77254509 GHz
4 [T3] -96.73 dBm
6.40180361 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 5.5 GHz
100 MHz/
Stop 6.5 GHz
Date: 3.JAN.2007 10:01:34

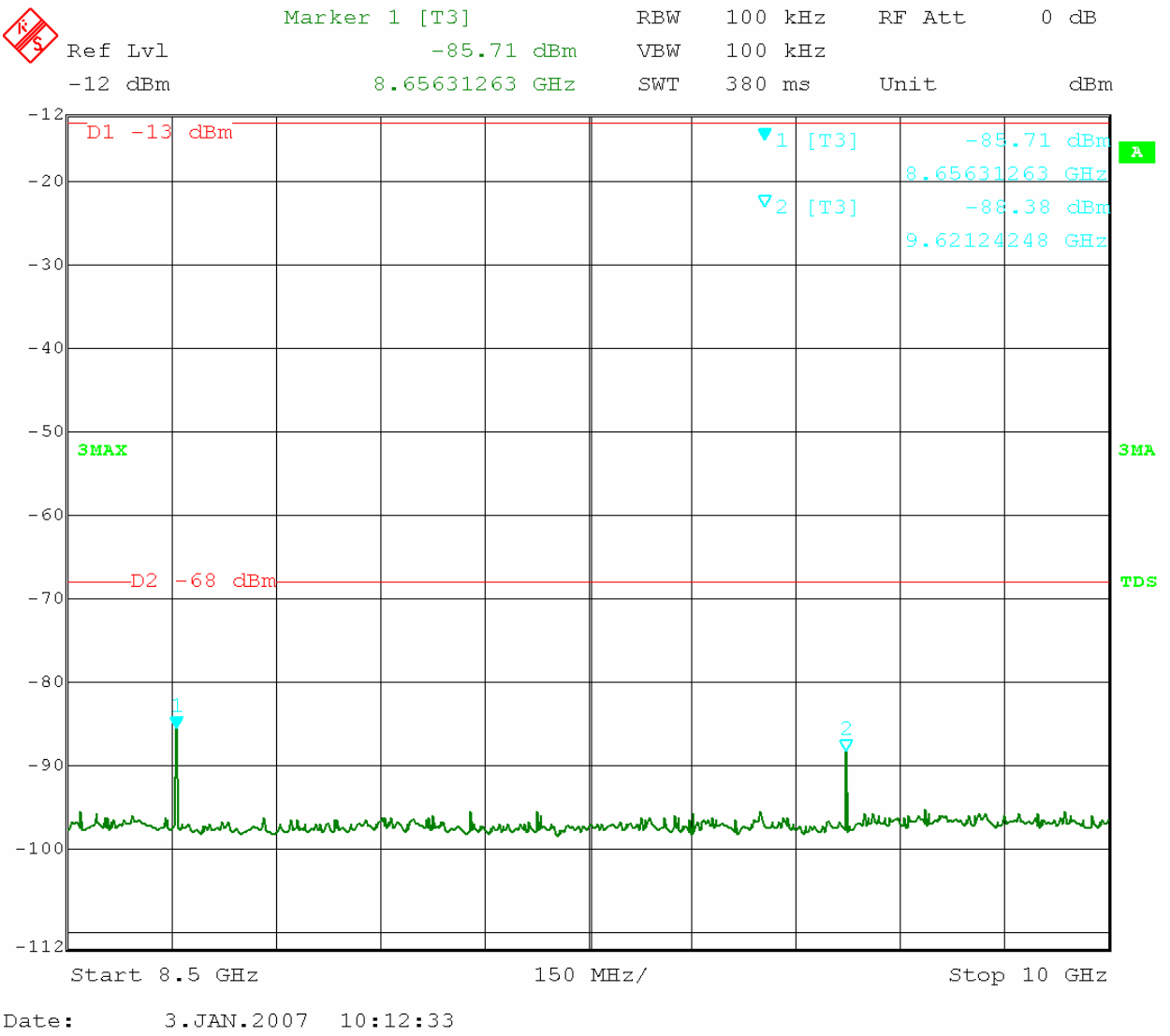
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-84.71 dBm
VBW 100 kHz
-12 dBm
6.73446894 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -84.71 dBm
6.73446894 GHz
2 [T3] -91.38 dBm
6.82665331 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
Start 6.5 GHz
100 MHz/
Stop 7.5 GHz
Date: 3.JAN.2007 10:08:22

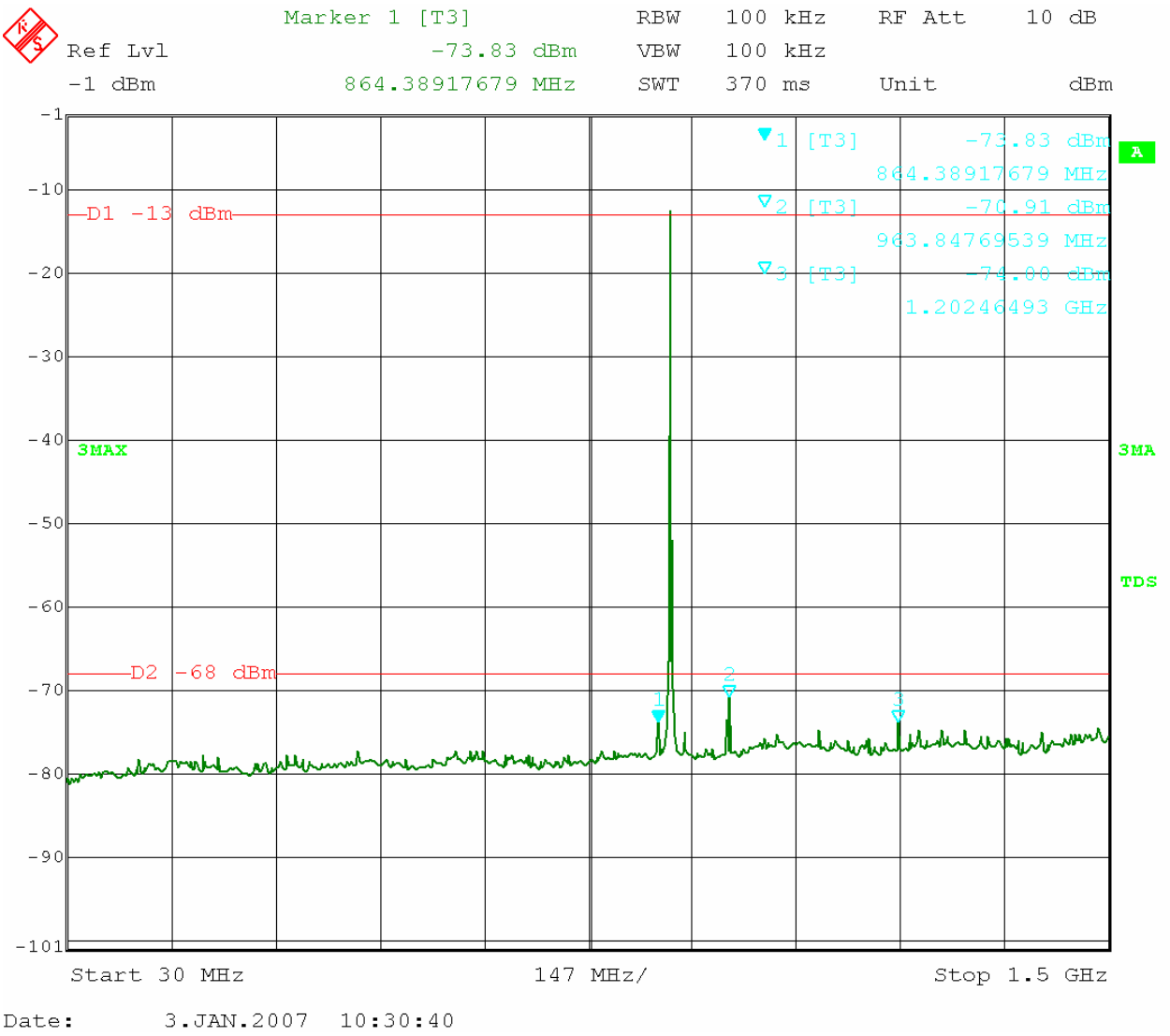
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-91.25 dBm
VBW 100 kHz
-12 dBm
7.69639279 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -91.25 dBm
7.69639279 GHz
2 [T3] -96.03 dBm
8.08116232 GHz
3 [T3] -96.15 dBm
8.21342685 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 7.5 GHz
100 MHz/
Stop 8.5 GHz
Date: 3.JAN.2007 10:09:31

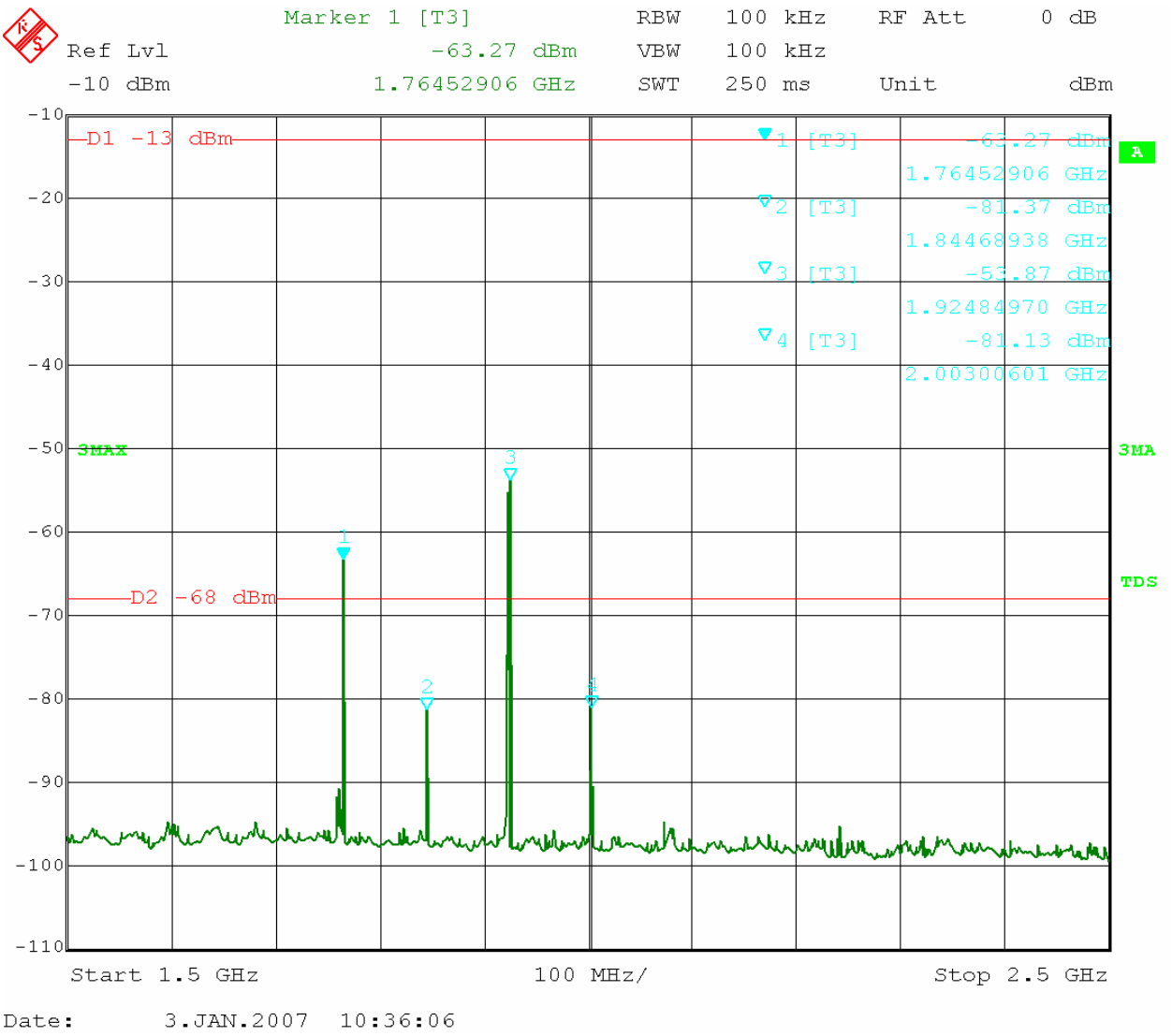
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-85.71 dBm
VBW 100 kHz
-12 dBm
8.65631263 GHz
SWT 380 ms
Unit dBm
D1 -13 dBm
1 [T3]
-85.71 dBm
8.65631263 GHz
2 [T3]
-88.38 dBm
9.62124248 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
Start 8.5 GHz
150 MHz/
Stop 10 GHz
Date: 3.JAN.2007 10:12:33

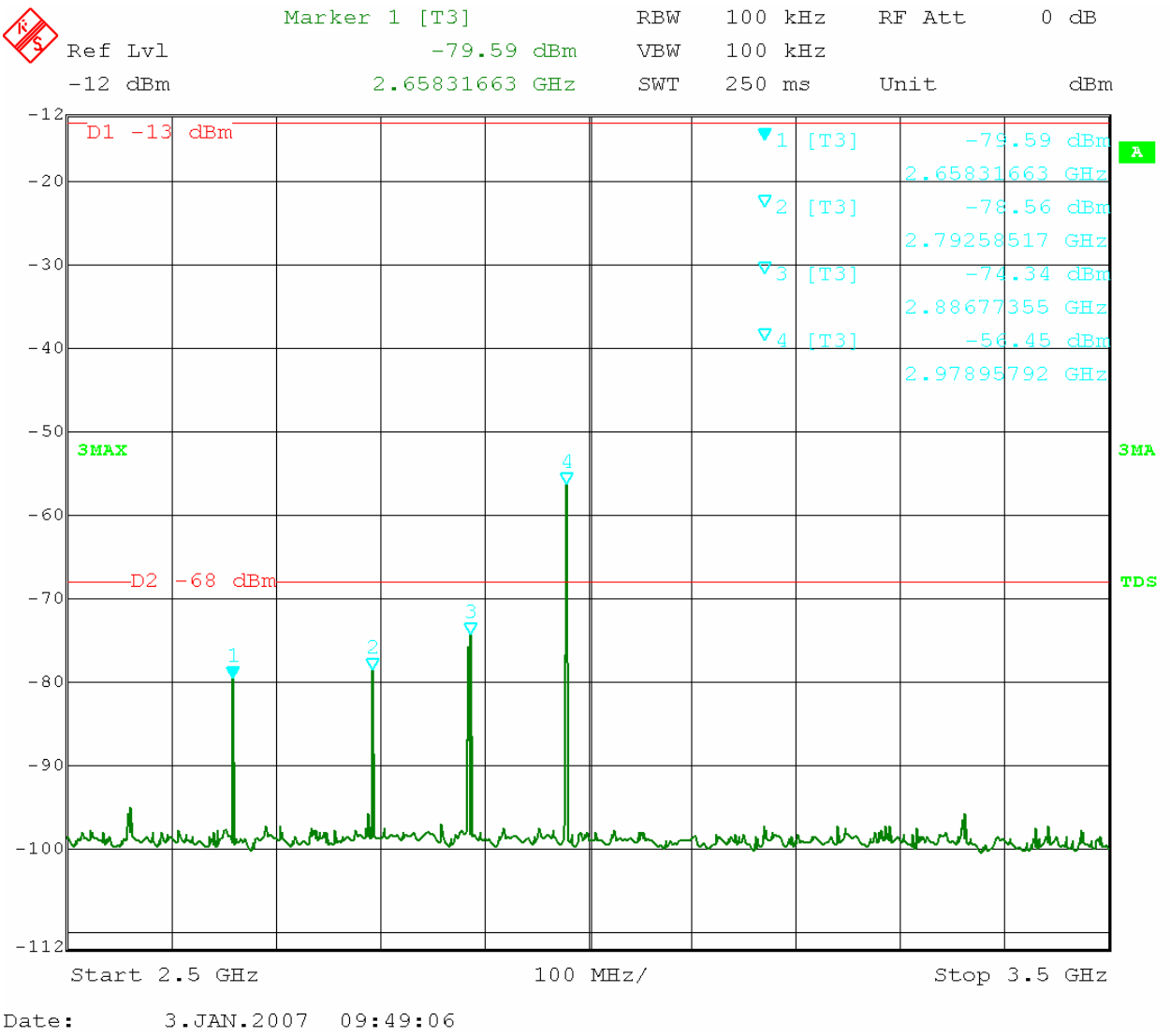
Channel A


Marker 1 [T3]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-73.83 dBm
VBW 100 kHz
-1 dBm
864.38917679 MHz
SWT 370 ms
Unit dBm
1 [T3] -73.83 dBm
864.38917679 MHz
2 [T3] -70.91 dBm
963.84769539 MHz
3 [T3] -74.00 dBm
1.20246493 GHz
D1 -13 dBm
D2 -68 dBm
3MAX
3MA
TDS
A
Start 30 MHz
147 MHz/
Stop 1.5 GHz
Date: 3.JAN.2007 10:30:40

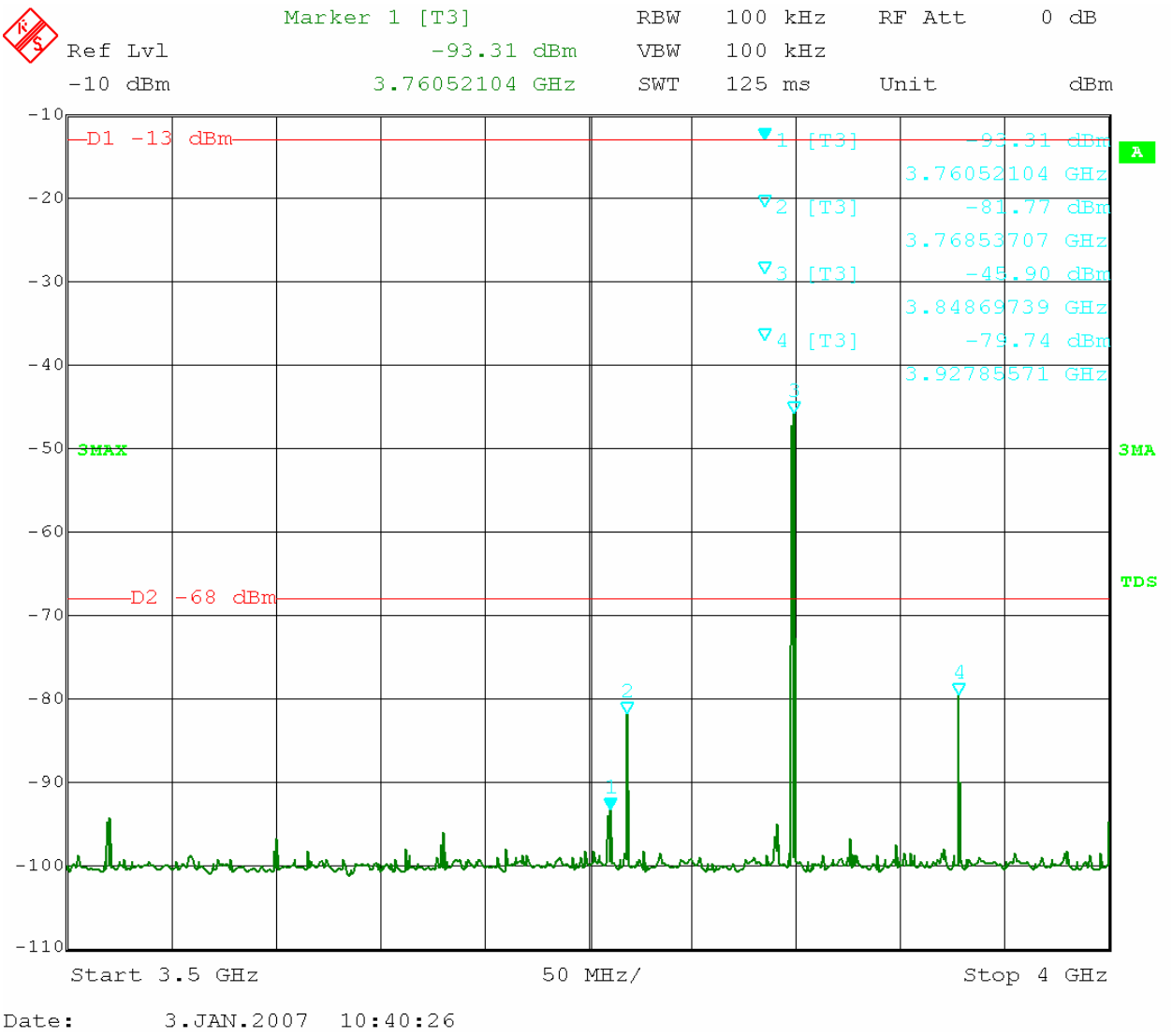
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-63.27 dBm
VBW 100 kHz
-10 dBm
1.76452906 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -63.27 dBm
1.76452906 GHz
2 [T3] -81.37 dBm
1.84468938 GHz
3 [T3] -53.87 dBm
1.92484970 GHz
4 [T3] -81.13 dBm
2.00300601 GHz
A
3MAX
3MA
TDS
D2 -68 dBm
Start 1.5 GHz
100 MHz/
Stop 2.5 GHz
Date: 3.JAN.2007 10:36:06

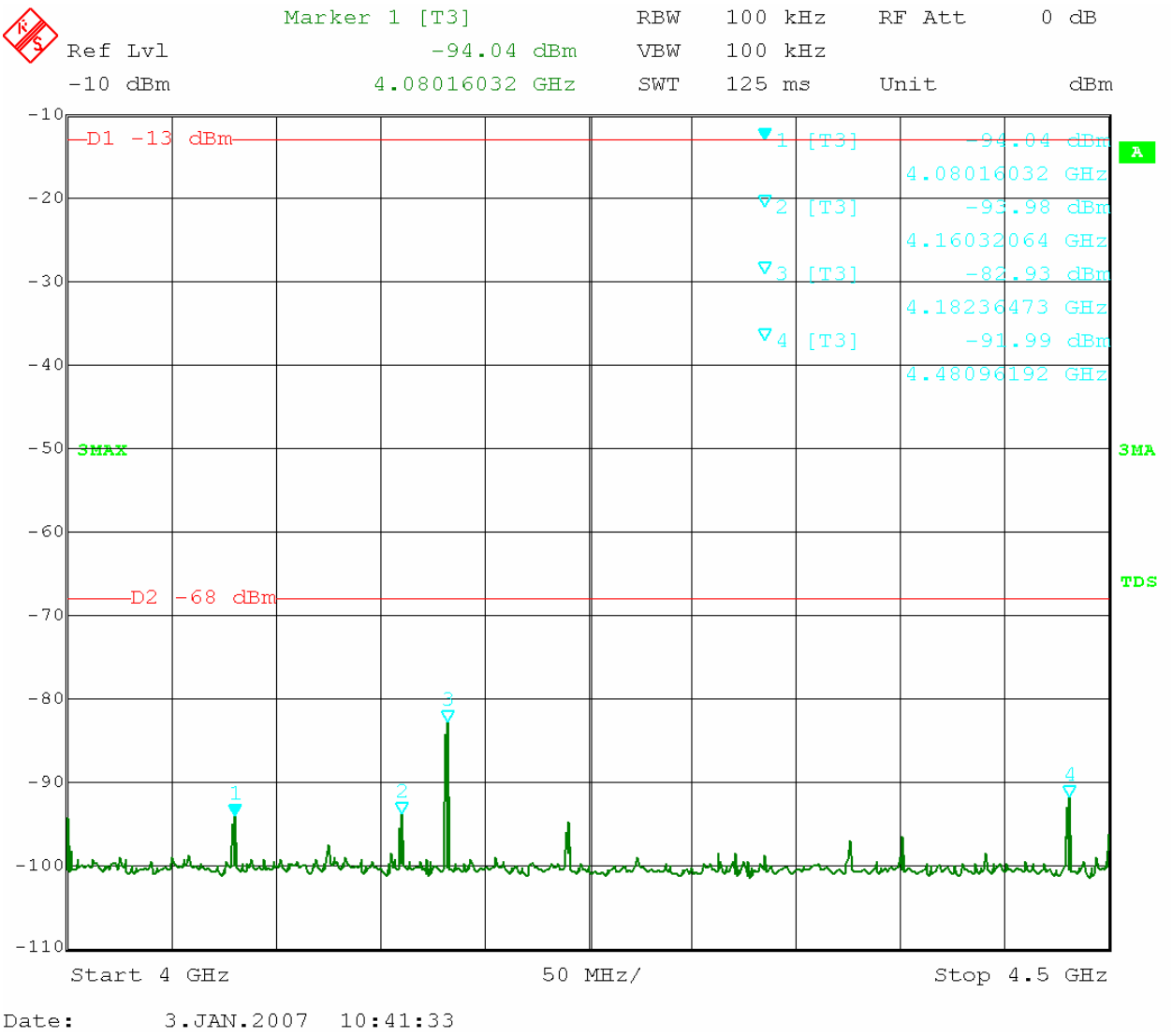
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-79.59 dBm
VBW 100 kHz
-12 dBm
2.65831663 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -79.59 dBm
2.65831663 GHz
2 [T3] -78.56 dBm
2.79258517 GHz
3 [T3] -74.34 dBm
2.88677355 GHz
4 [T3] -56.45 dBm
2.97895792 GHz
3MAX
D2 -68 dBm
TDS
Start 2.5 GHz
100 MHz/
Stop 3.5 GHz
Date: 3.JAN.2007 09:49:06

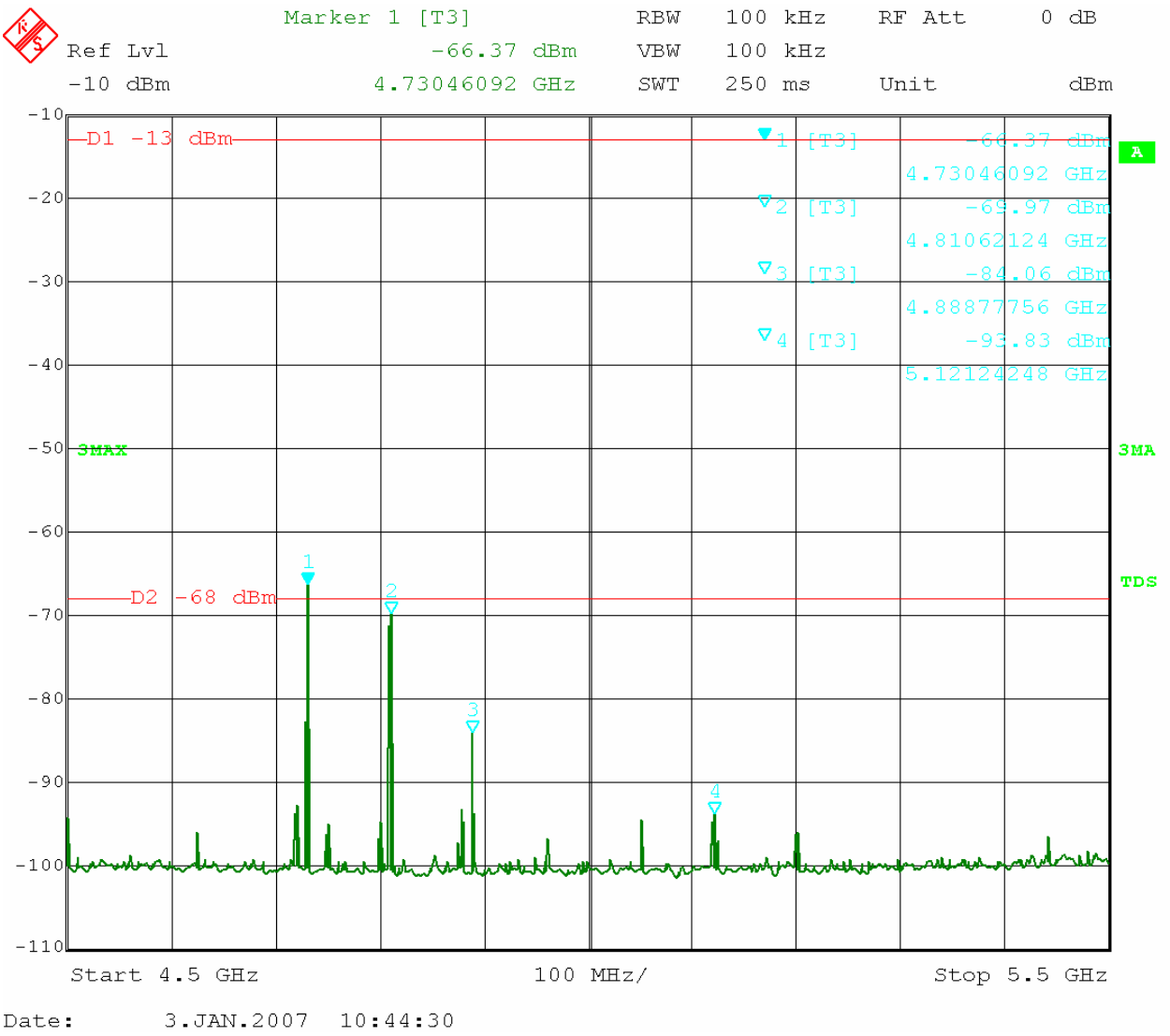
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-93.31 dBm
VBW 100 kHz
-10 dBm
3.76052104 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -93.31 dBm
3.76052104 GHz
2 [T3] -81.77 dBm
3.76853707 GHz
3 [T3] -45.90 dBm
3.84869739 GHz
4 [T3] -79.74 dBm
3.92785571 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 3.5 GHz
50 MHz/
Stop 4 GHz
Date: 3.JAN.2007 10:40:26

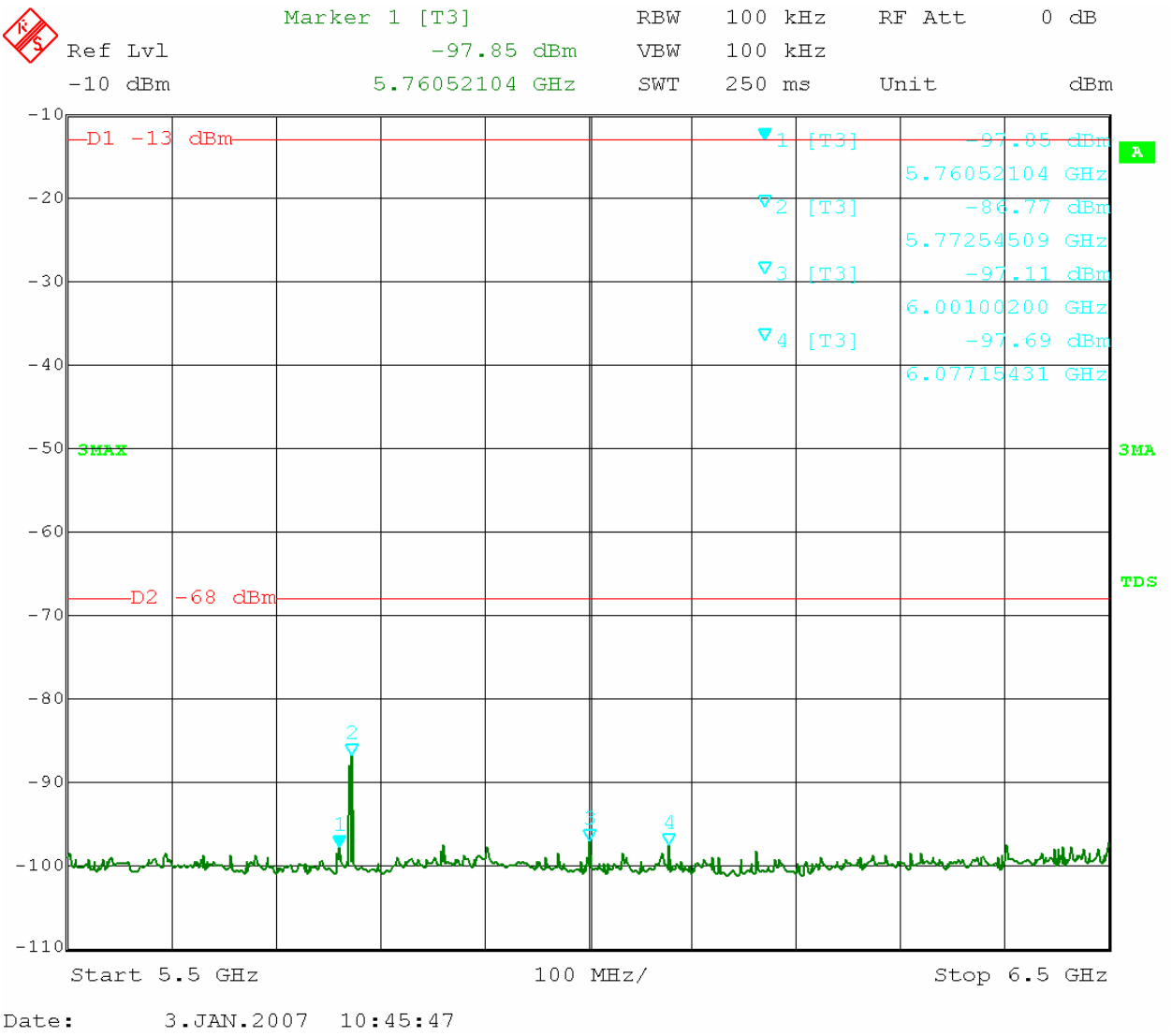
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-94.04 dBm
VBW 100 kHz
-10 dBm
4.08016032 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -94.04 dBm
4.08016032 GHz
2 [T3] -93.98 dBm
4.16032064 GHz
3 [T3] -82.93 dBm
4.18236473 GHz
4 [T3] -91.99 dBm
4.48096192 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 4 GHz
50 MHz/
Stop 4.5 GHz
Date: 3.JAN.2007 10:41:33

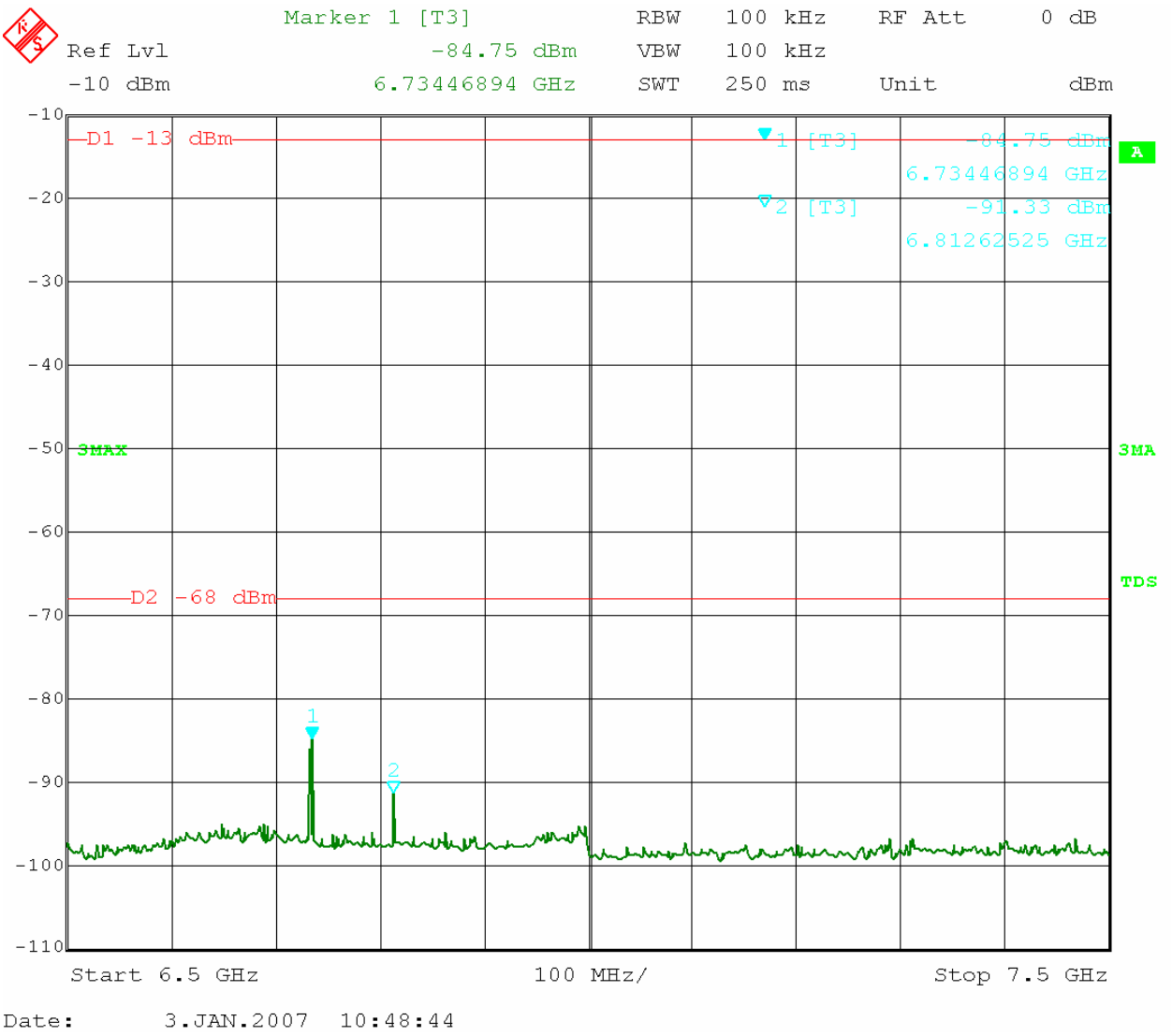
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-66.37 dBm
VBW 100 kHz
-10 dBm
4.73046092 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -66.37 dBm
4.73046092 GHz
2 [T3] -69.97 dBm
4.81062124 GHz
3 [T3] -84.06 dBm
4.88877756 GHz
4 [T3] -93.83 dBm
5.12124248 GHz
A
3MAX
3MA
TDS
D2 -68 dBm
Start 4.5 GHz
100 MHz/
Stop 5.5 GHz
Date: 3.JAN.2007 10:44:30

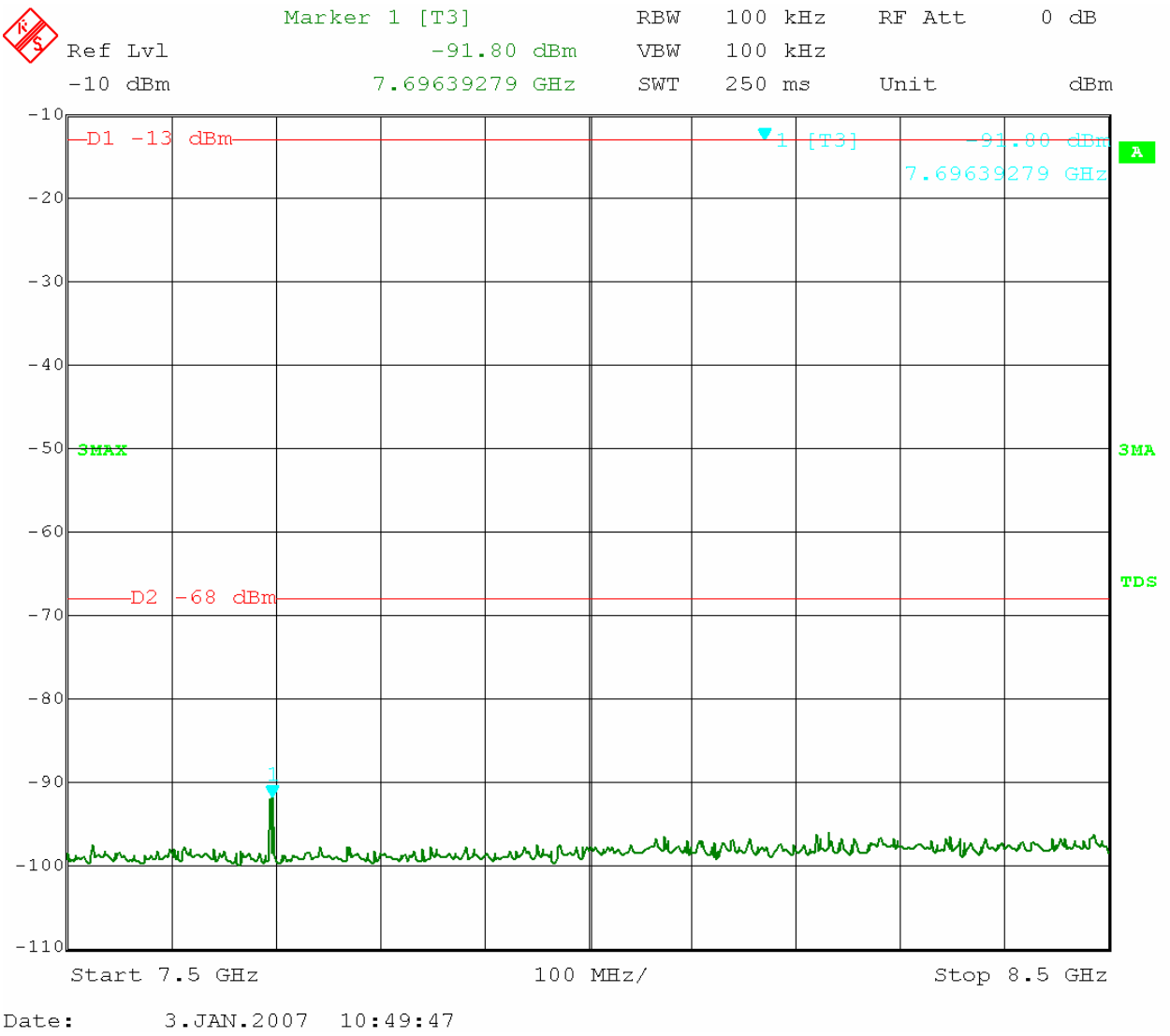
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-97.85 dBm
VBW 100 kHz
-10 dBm
5.76052104 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -97.85 dBm
5.76052104 GHz
2 [T3] -86.77 dBm
5.77254509 GHz
3 [T3] -97.11 dBm
6.00100200 GHz
4 [T3] -97.69 dBm
6.07715431 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 5.5 GHz
100 MHz/
Stop 6.5 GHz
Date: 3.JAN.2007 10:45:47

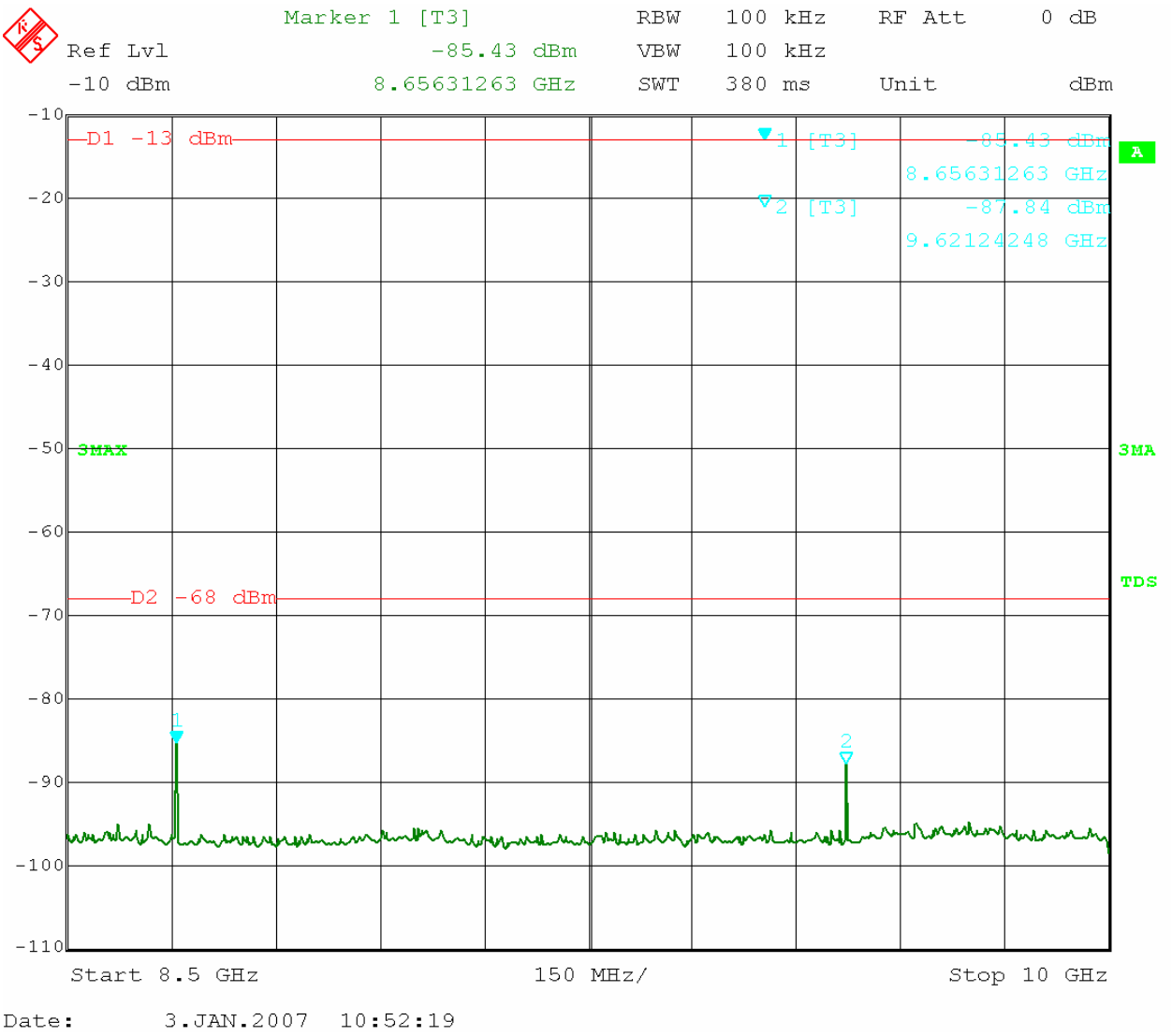
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-84.75 dBm
VBW 100 kHz
-10 dBm
6.73446894 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -84.75 dBm
6.73446894 GHz
2 [T3] -91.33 dBm
6.81262525 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 6.5 GHz
100 MHz/
Stop 7.5 GHz
Date: 3.JAN.2007 10:48:44

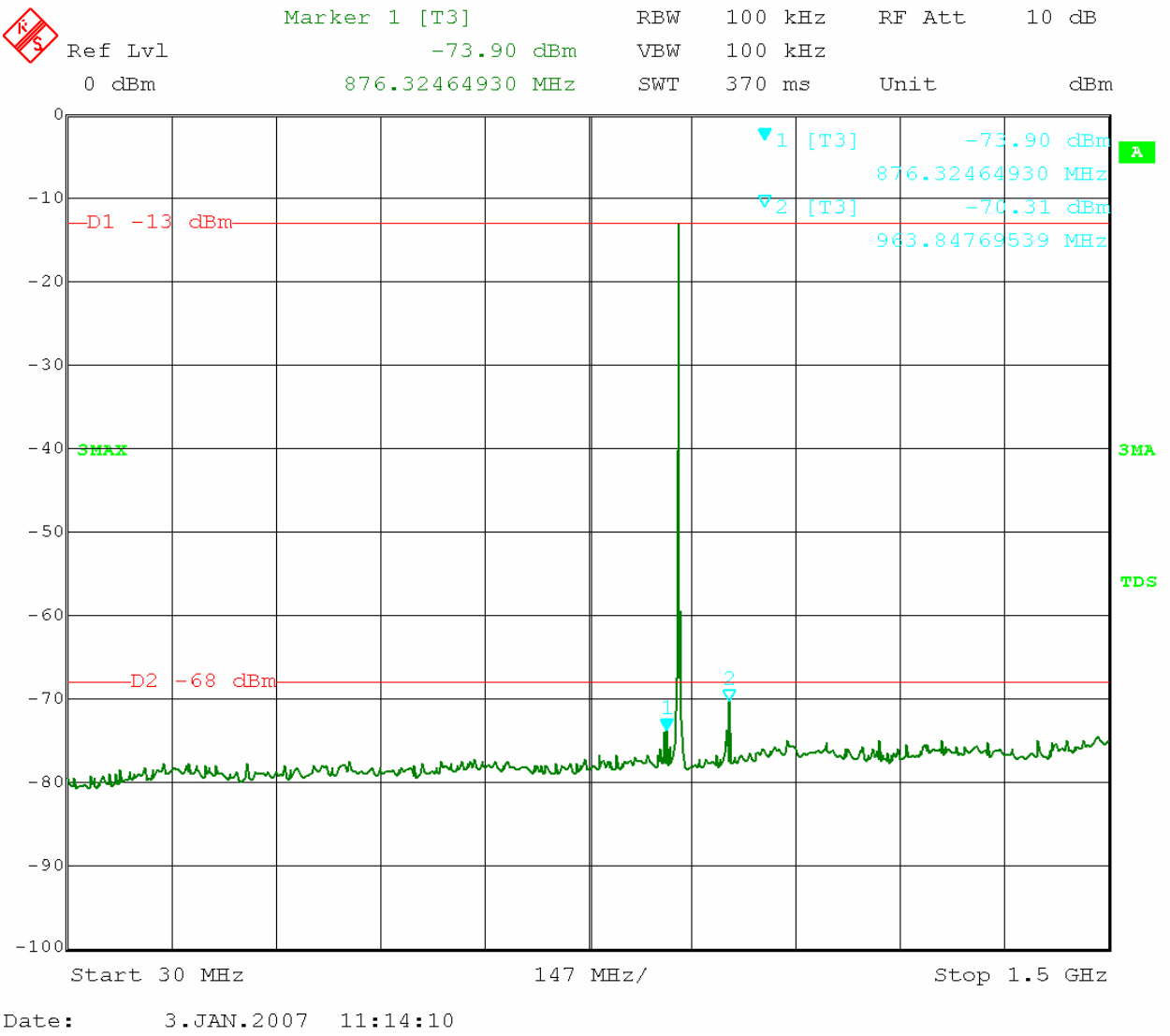
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-91.80 dBm
VBW 100 kHz
-10 dBm
7.69639279 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3]
-91.80 dBm
7.69639279 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
Start 7.5 GHz
100 MHz/
Stop 8.5 GHz
Date: 3.JAN.2007 10:49:47

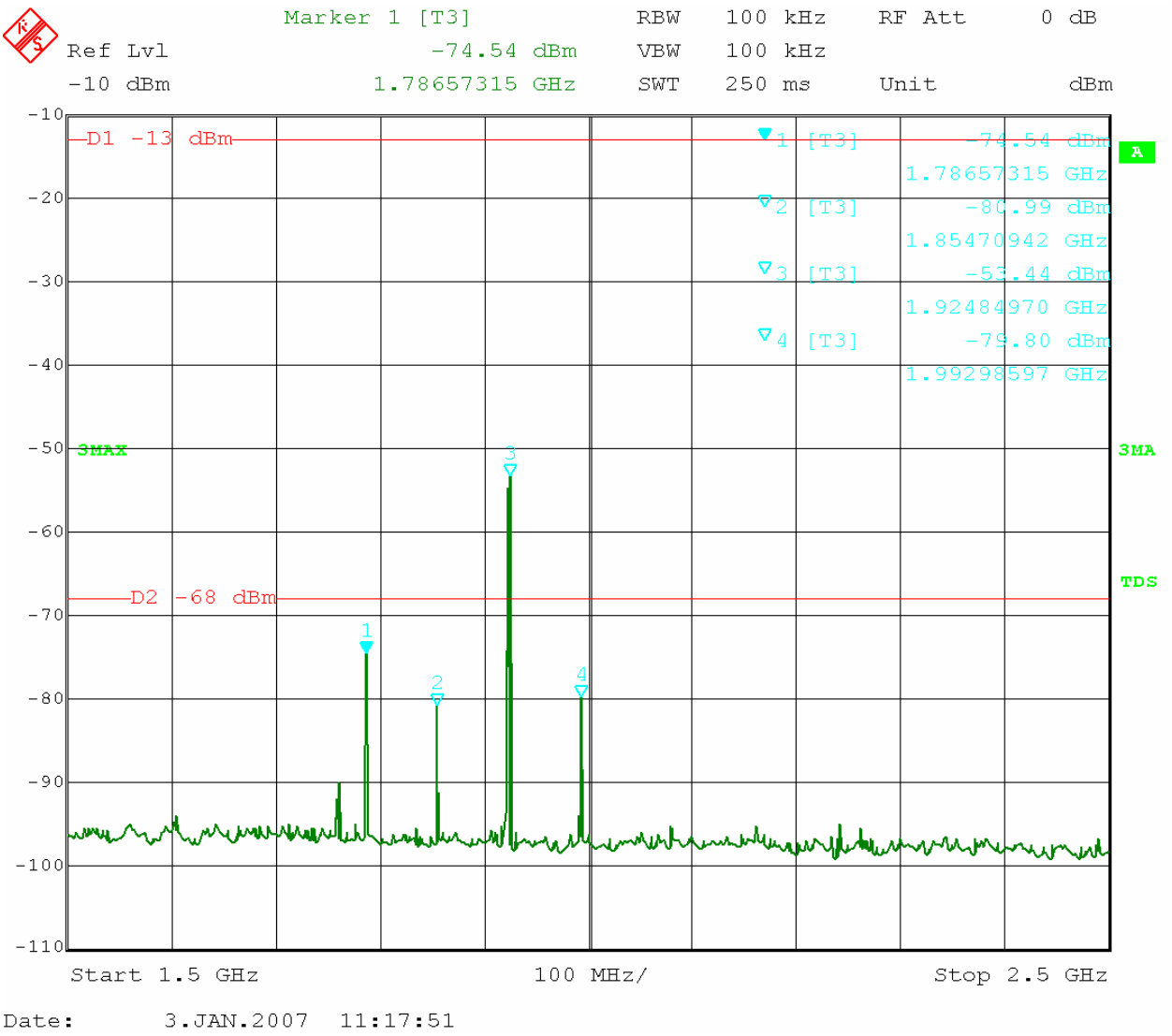
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-85.43 dBm
VBW 100 kHz
-10 dBm
8.65631263 GHz
SWT 380 ms
Unit dBm
D1 -13 dBm
1 [T3] -85.43 dBm
8.65631263 GHz
2 [T3] -87.84 dBm
9.62124248 GHz
A
3MAX
3MA
TDS
D2 -68 dBm
Start 8.5 GHz
150 MHz/
Stop 10 GHz
Date: 3.JAN.2007 10:52:19

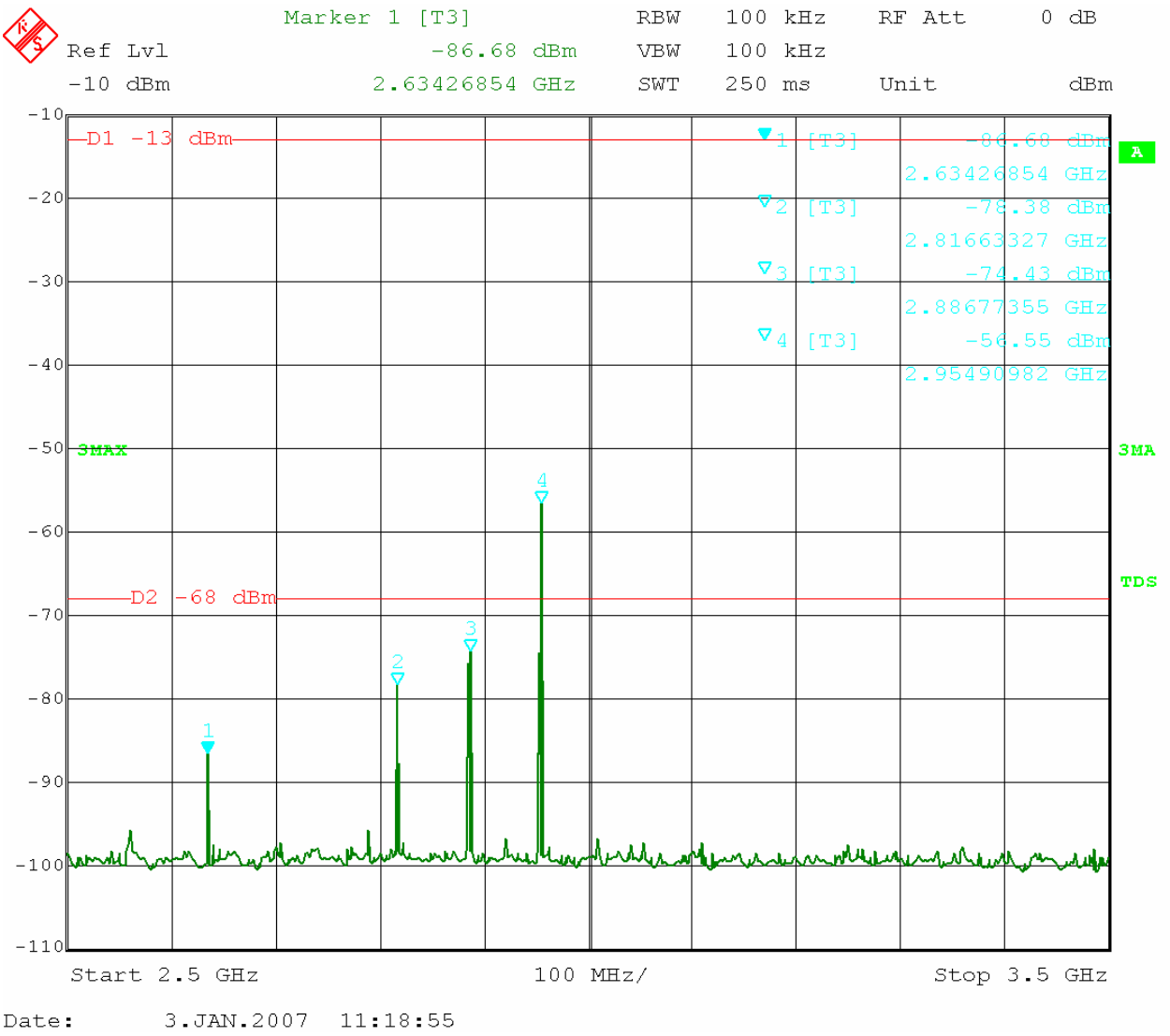
Channel B


Marker 1 [T3]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-73.90 dBm
VBW 100 kHz
0 dBm
876.32464930 MHz
SWT 370 ms
Unit dBm
1 [T3] -73.90 dBm
876.32464930 MHz
2 [T3] -70.31 dBm
963.84769539 MHz
D1 -13 dBm
D2 -68 dBm
3MAX
3MA
TDS
A
Start 30 MHz
147 MHz/
Stop 1.5 GHz
Date: 3.JAN.2007 11:14:10

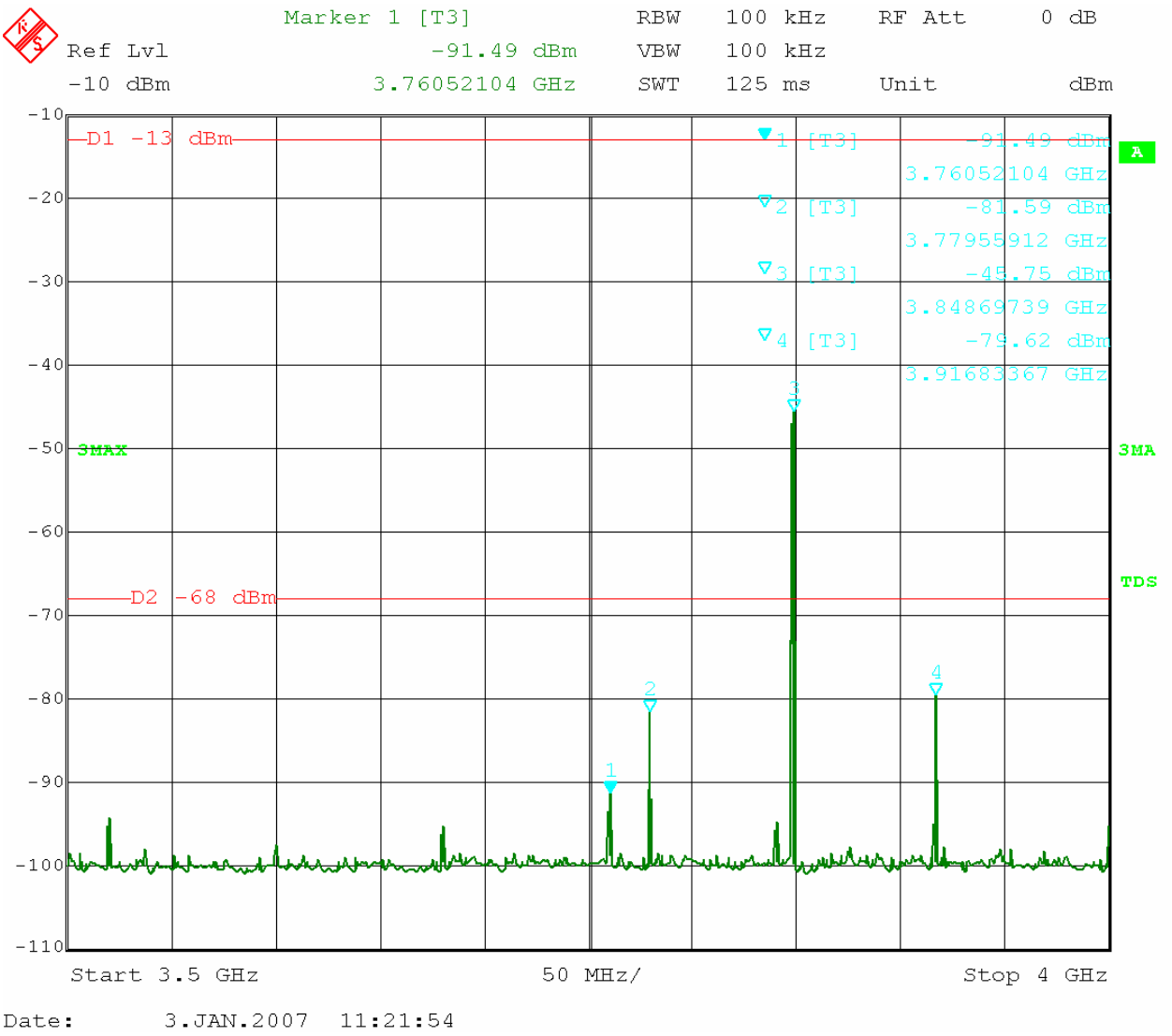
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-74.54 dBm
VBW 100 kHz
-10 dBm
1.78657315 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -74.54 dBm
1.78657315 GHz
2 [T3] -80.99 dBm
1.85470942 GHz
3 [T3] -53.44 dBm
1.92484970 GHz
4 [T3] -79.80 dBm
1.99298597 GHz
A
3MAX
3MA
TDS
D2 -68 dBm
Start 1.5 GHz
100 MHz/
Stop 2.5 GHz
Date: 3.JAN.2007 11:17:51

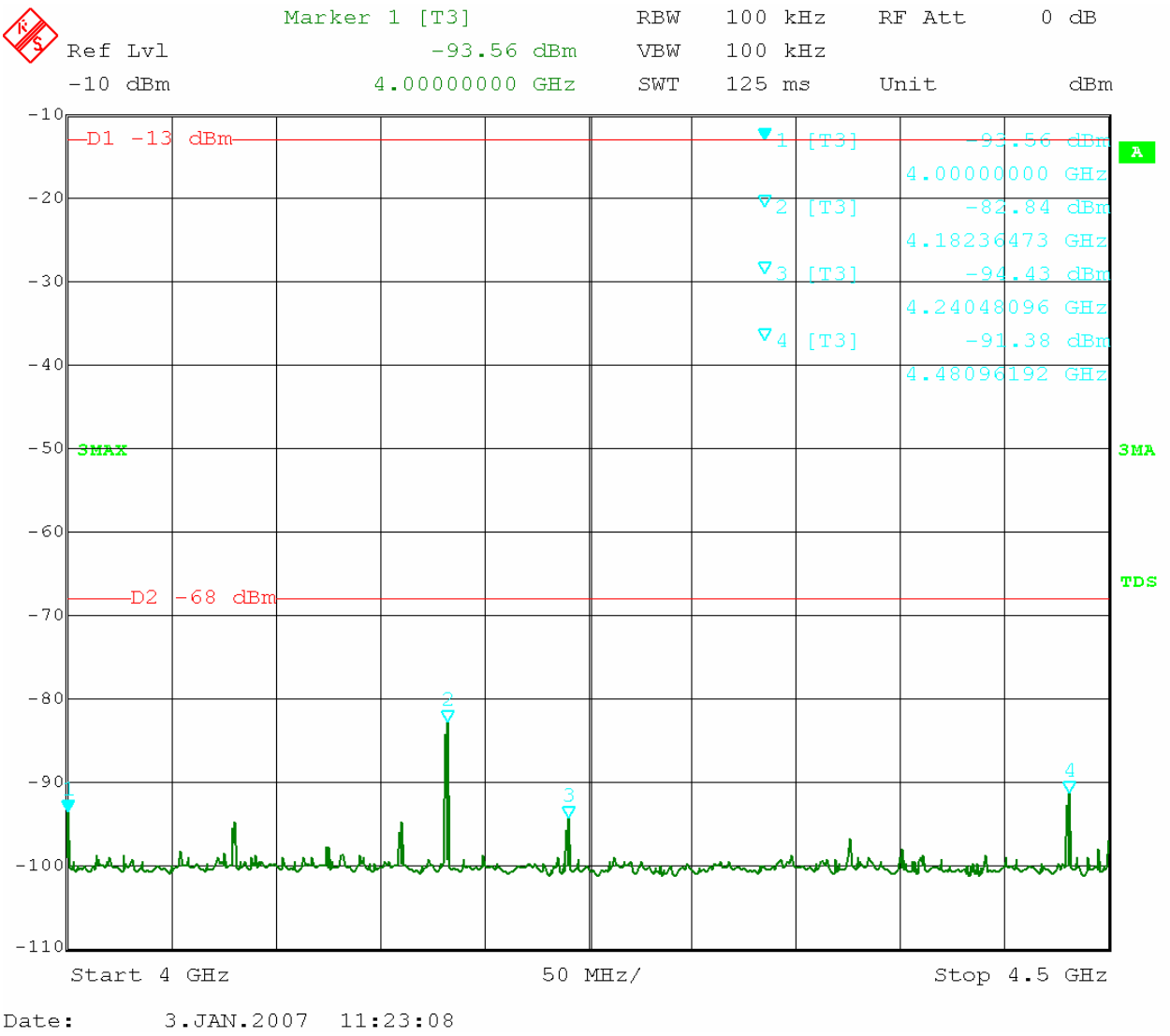
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-86.68 dBm
VBW 100 kHz
-10 dBm
2.63426854 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -86.68 dBm
2.63426854 GHz
2 [T3] -78.38 dBm
2.81663327 GHz
3 [T3] -74.43 dBm
2.88677355 GHz
4 [T3] -56.55 dBm
2.95490982 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
Start 2.5 GHz
100 MHz/
Stop 3.5 GHz
Date: 3.JAN.2007 11:18:55

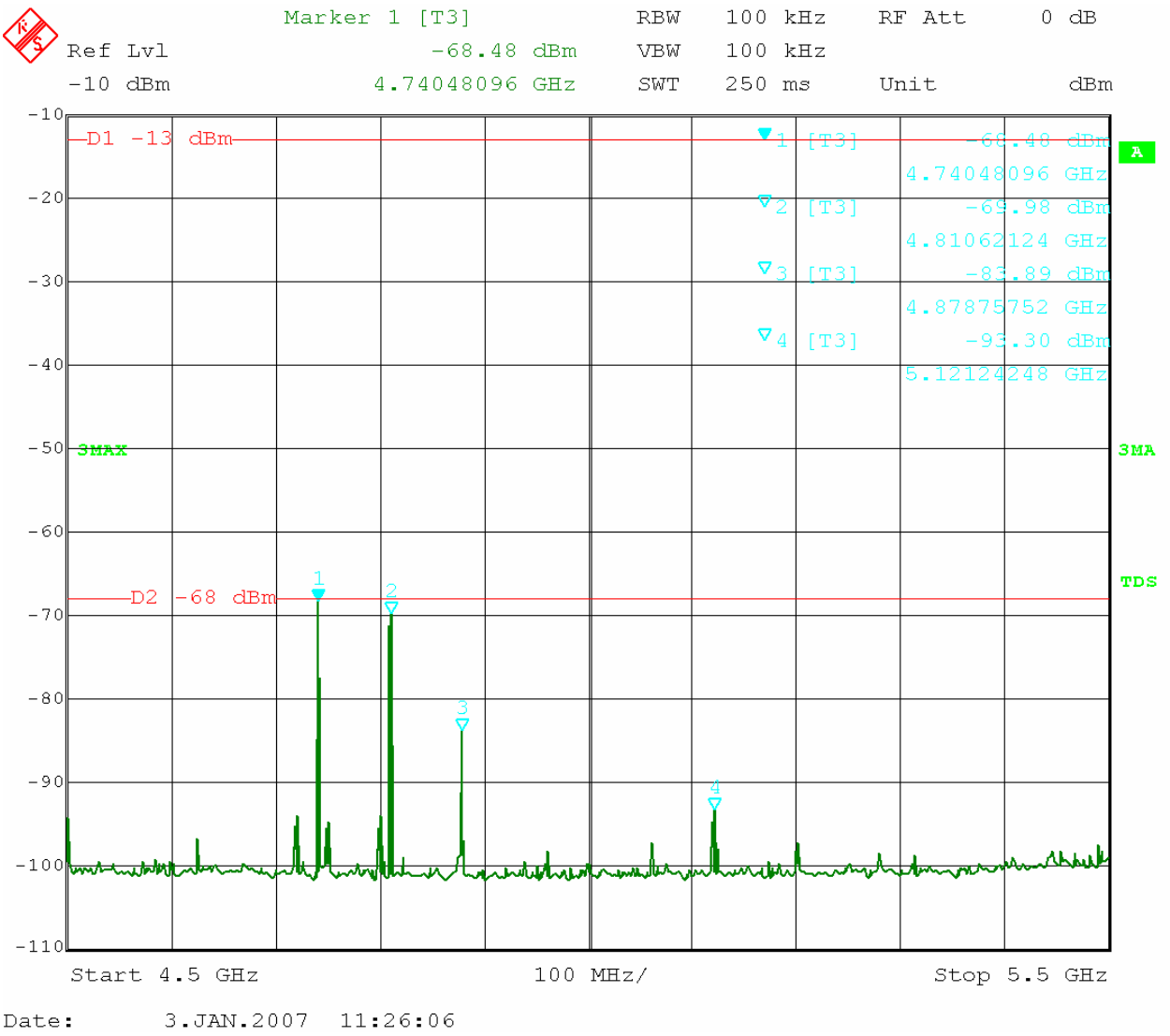
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-91.49 dBm
VBW 100 kHz
-10 dBm
3.76052104 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -91.49 dBm
3.76052104 GHz
2 [T3] -81.59 dBm
3.77955912 GHz
3 [T3] -45.75 dBm
3.84869739 GHz
4 [T3] -79.62 dBm
3.91683367 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 3.5 GHz
50 MHz/
Stop 4 GHz
Date: 3.JAN.2007 11:21:54

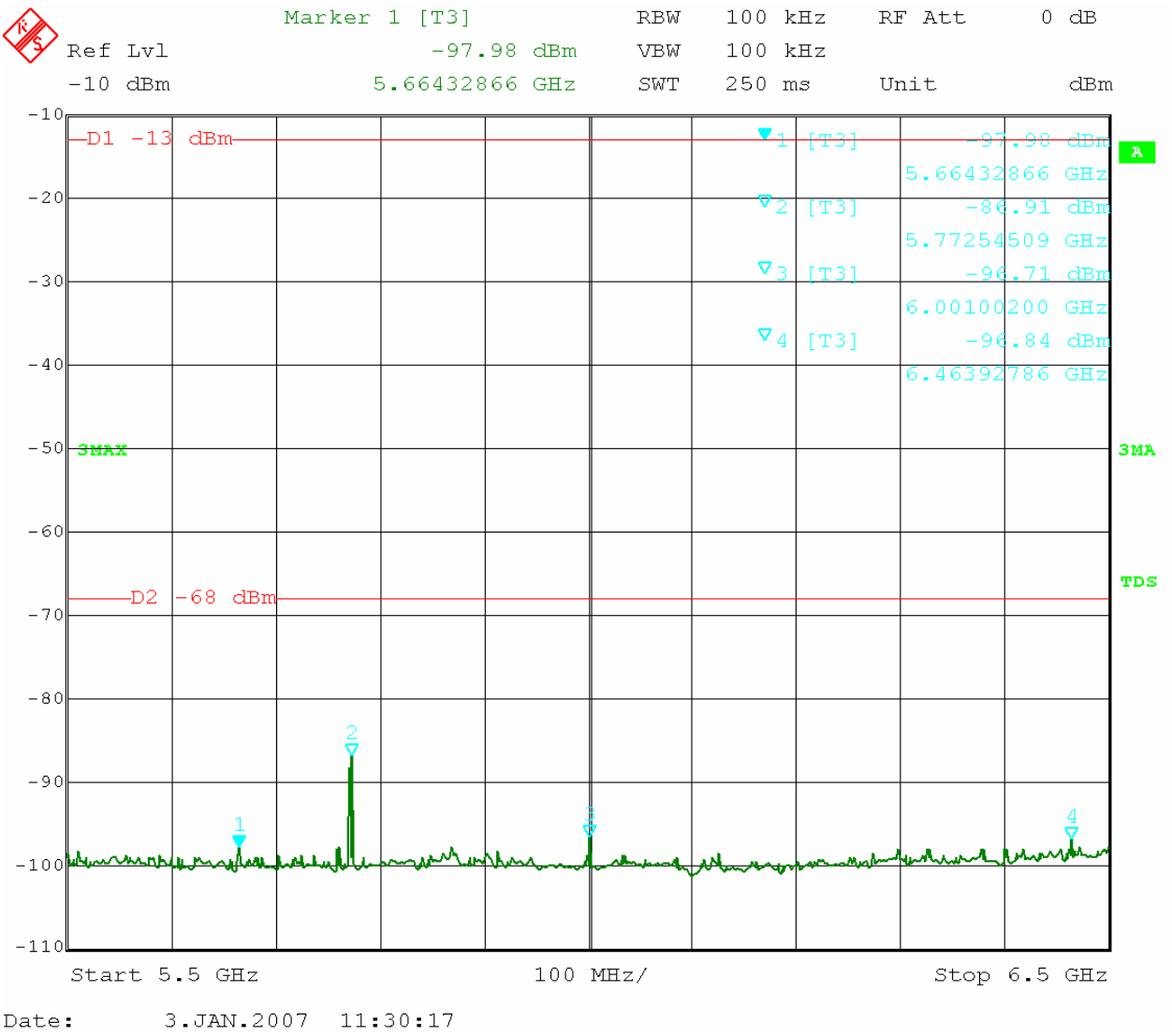
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-93.56 dBm
VBW 100 kHz
-10 dBm
4.00000000 GHz
SWT 125 ms
Unit dBm
D1 -13 dBm
1 [T3] -93.56 dBm
4.00000000 GHz
2 [T3] -82.84 dBm
4.18236473 GHz
3 [T3] -94.43 dBm
4.24048096 GHz
4 [T3] -91.38 dBm
4.48096192 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
Start 4 GHz
50 MHz/
Stop 4.5 GHz
Date: 3.JAN.2007 11:23:08

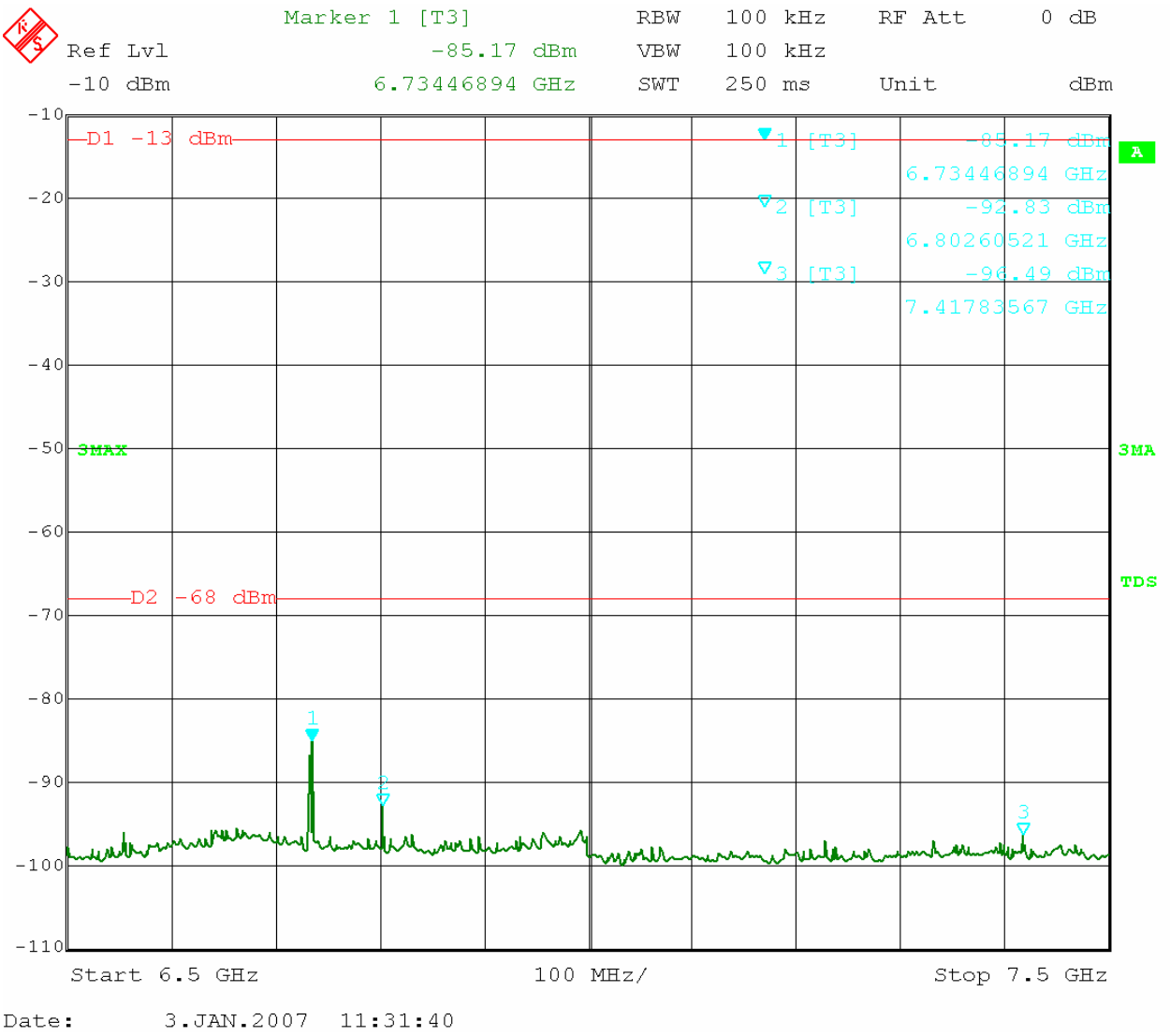
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-68.48 dBm
VBW 100 kHz
-10 dBm
4.74048096 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -68.48 dBm
4.74048096 GHz
2 [T3] -69.98 dBm
4.81062124 GHz
3 [T3] -83.89 dBm
4.87875752 GHz
4 [T3] -93.30 dBm
5.12124248 GHz
A
3MAX
3MA
TDS
D2 -68 dBm
Start 4.5 GHz
100 MHz/
Stop 5.5 GHz
Date: 3.JAN.2007 11:26:06

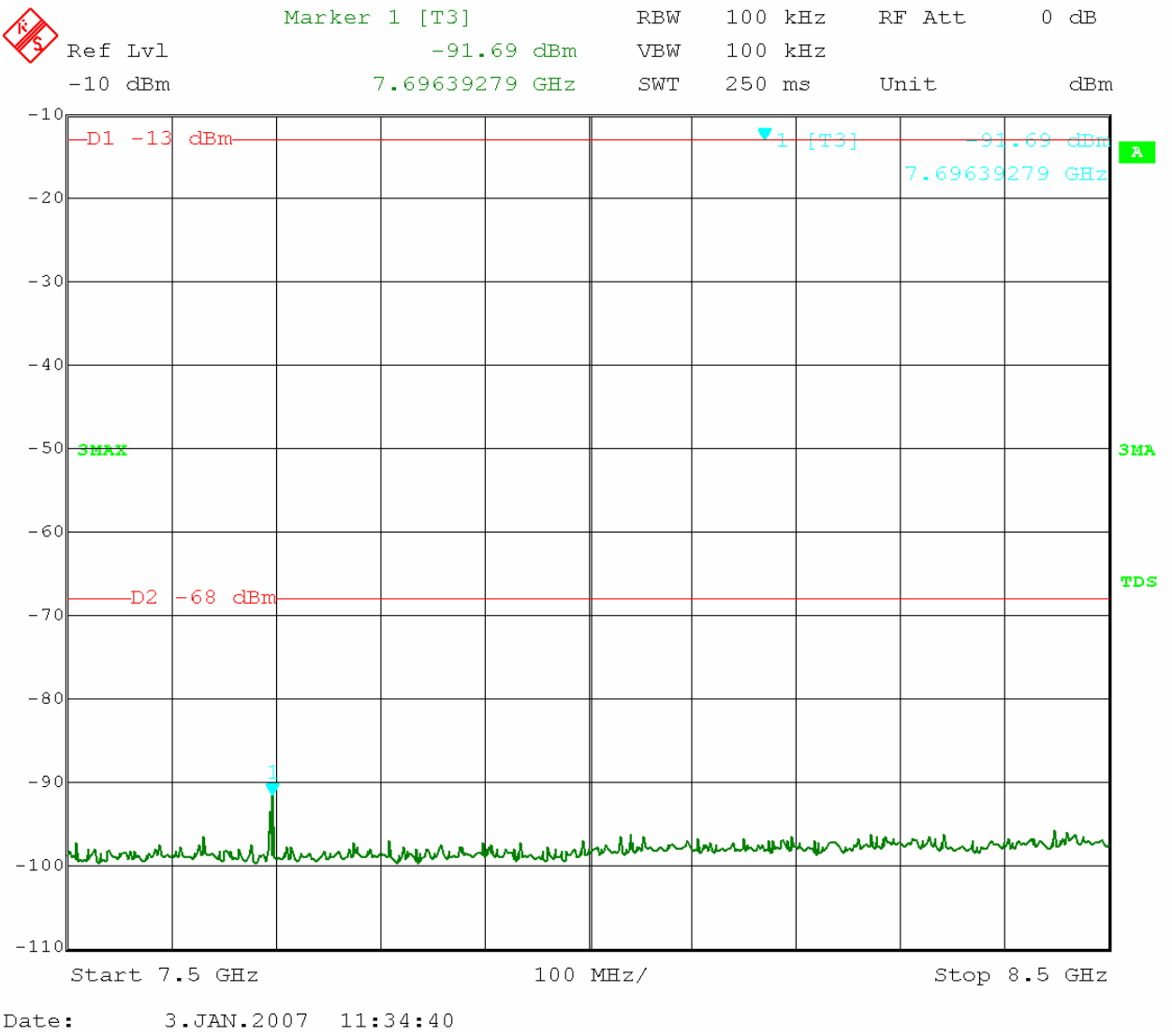
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-97.98 dBm
VBW 100 kHz
-10 dBm
5.66432866 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -97.98 dBm
5.66432866 GHz
2 [T3] -86.91 dBm
5.77254509 GHz
3 [T3] -96.71 dBm
6.00100200 GHz
4 [T3] -96.84 dBm
6.46392786 GHz
3MAX
D2 -68 dBm
A
3MA
TDS
Start 5.5 GHz
100 MHz/
Stop 6.5 GHz
Date: 3.JAN.2007 11:30:17

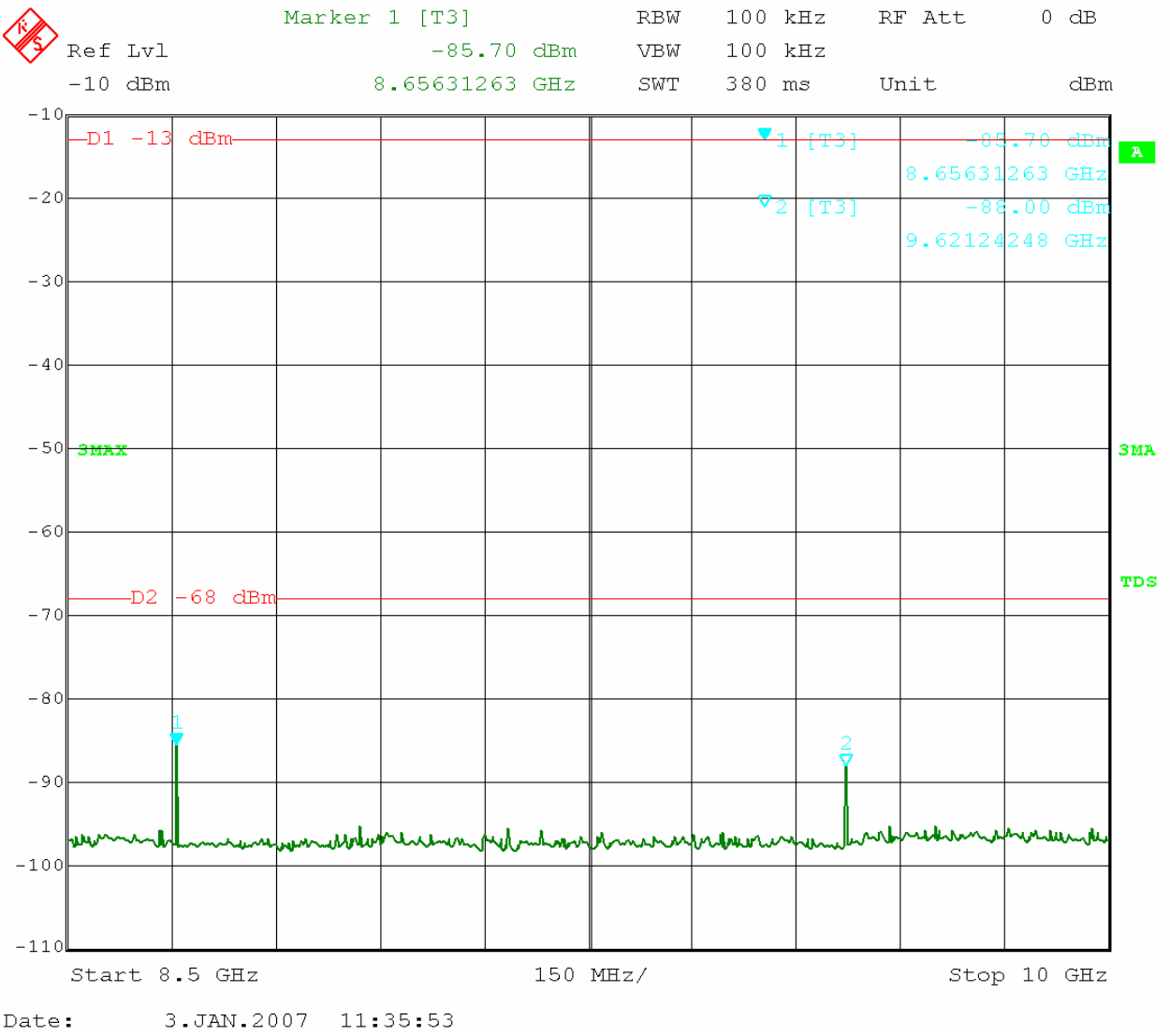
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-85.17 dBm
VBW 100 kHz
-10 dBm
6.73446894 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3] -85.17 dBm
6.73446894 GHz
2 [T3] -92.83 dBm
6.80260521 GHz
3 [T3] -96.49 dBm
7.41783567 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
Start 6.5 GHz
100 MHz/
Stop 7.5 GHz
Date: 3.JAN.2007 11:31:40

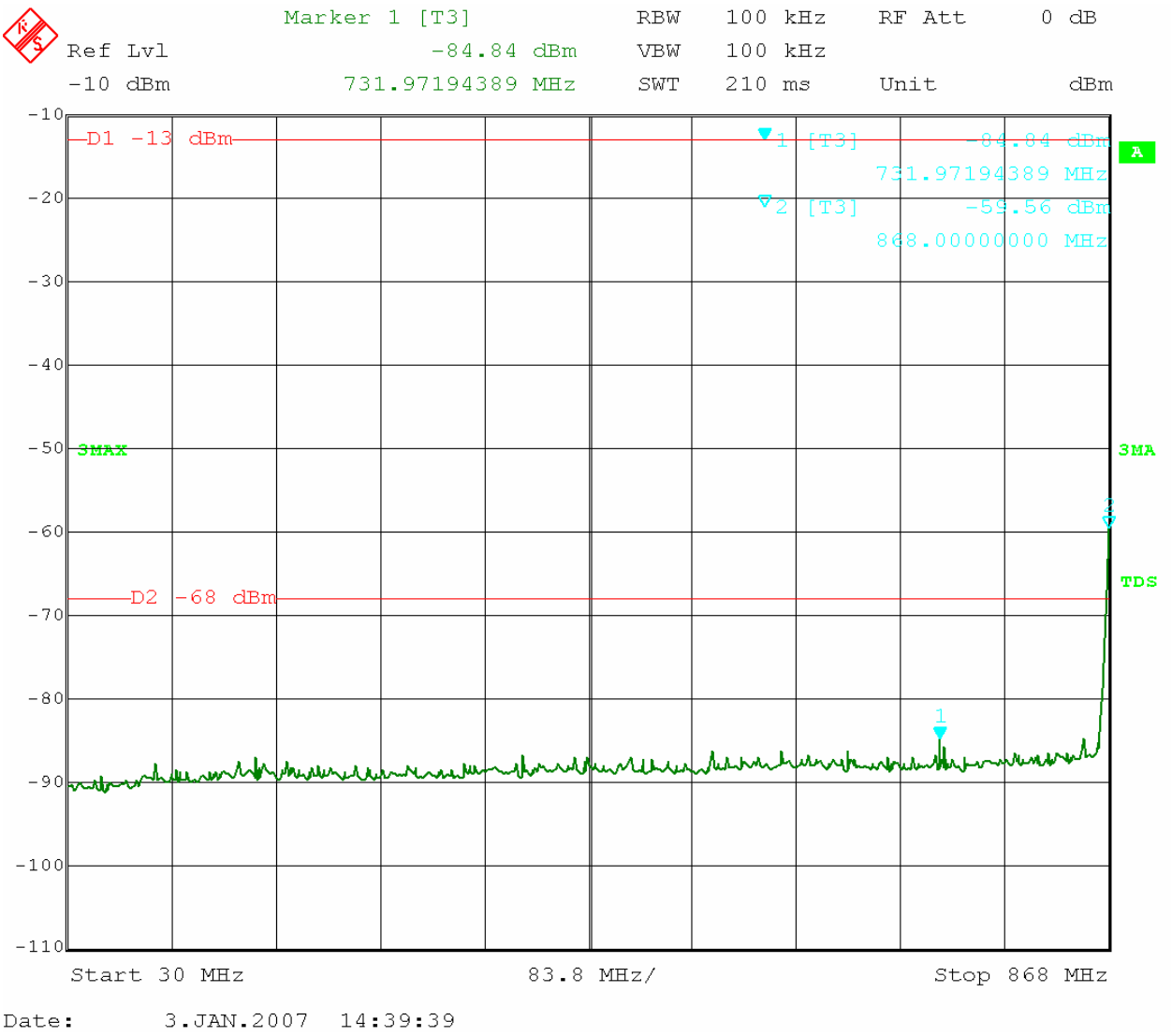
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-91.69 dBm
VBW 100 kHz
-10 dBm
7.69639279 GHz
SWT 250 ms
Unit dBm
D1 -13 dBm
1 [T3]
-91.69 dBm
7.69639279 GHz
A
3MAX
3MA
D2 -68 dBm
TDS
Start 7.5 GHz
100 MHz/
Stop 8.5 GHz
Date: 3.JAN.2007 11:34:40

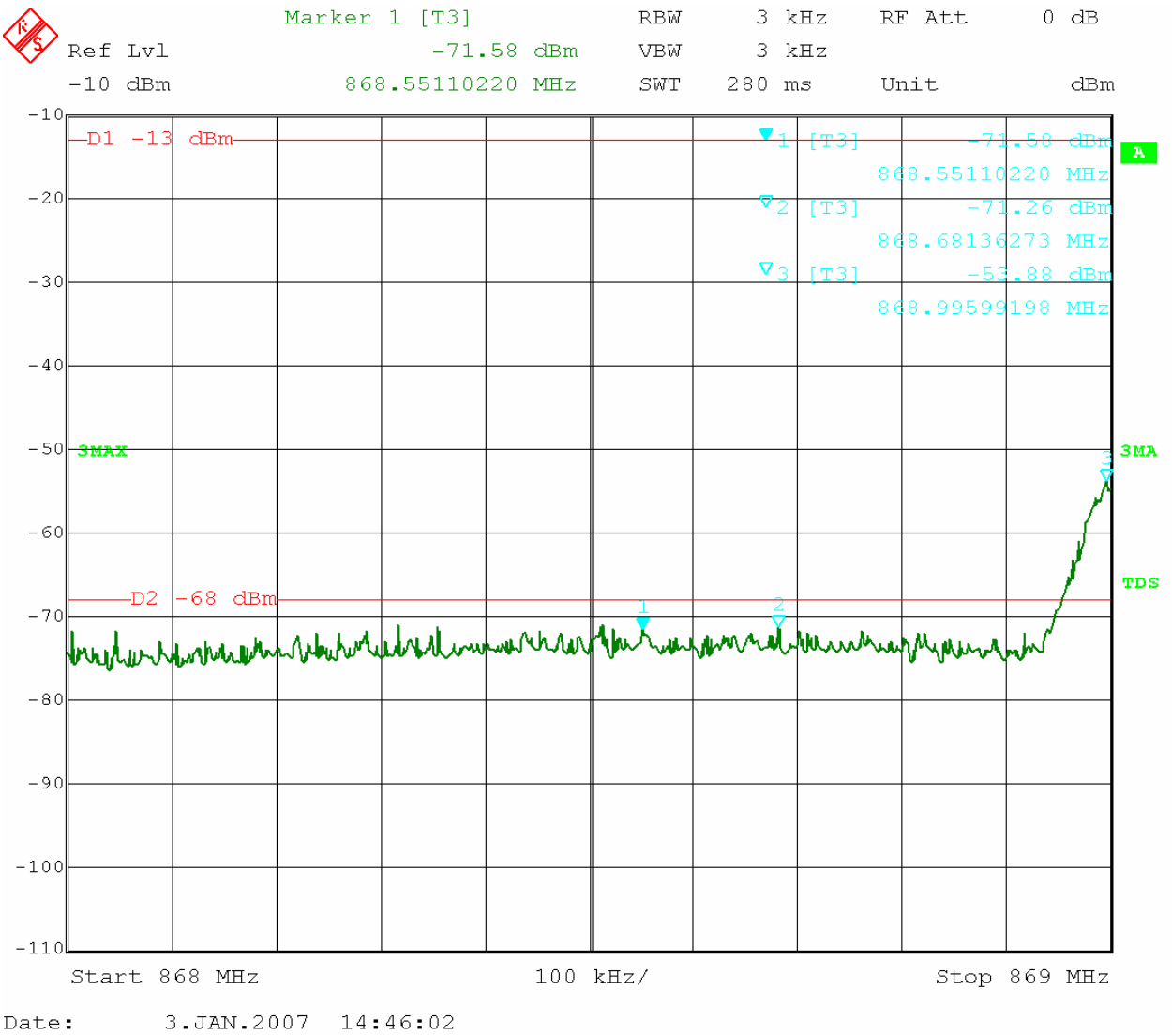
Channel C


Marker 1 [T3]
RBW 100 kHz
RF Att 0 dB
Ref Lvl
-85.70 dBm
VBW 100 kHz
-10 dBm
8.65631263 GHz
SWT 380 ms
Unit dBm
D1 -13 dBm
1 [T3] -85.70 dBm
8.65631263 GHz
2 [T3] -88.00 dBm
9.62124248 GHz
3MAX
D2 -68 dBm
3MA
TDS
Start 8.5 GHz
150 MHz/
Stop 10 GHz
Date: 3.JAN.2007 11:35:53

Channel C



IMD Low Band Edge



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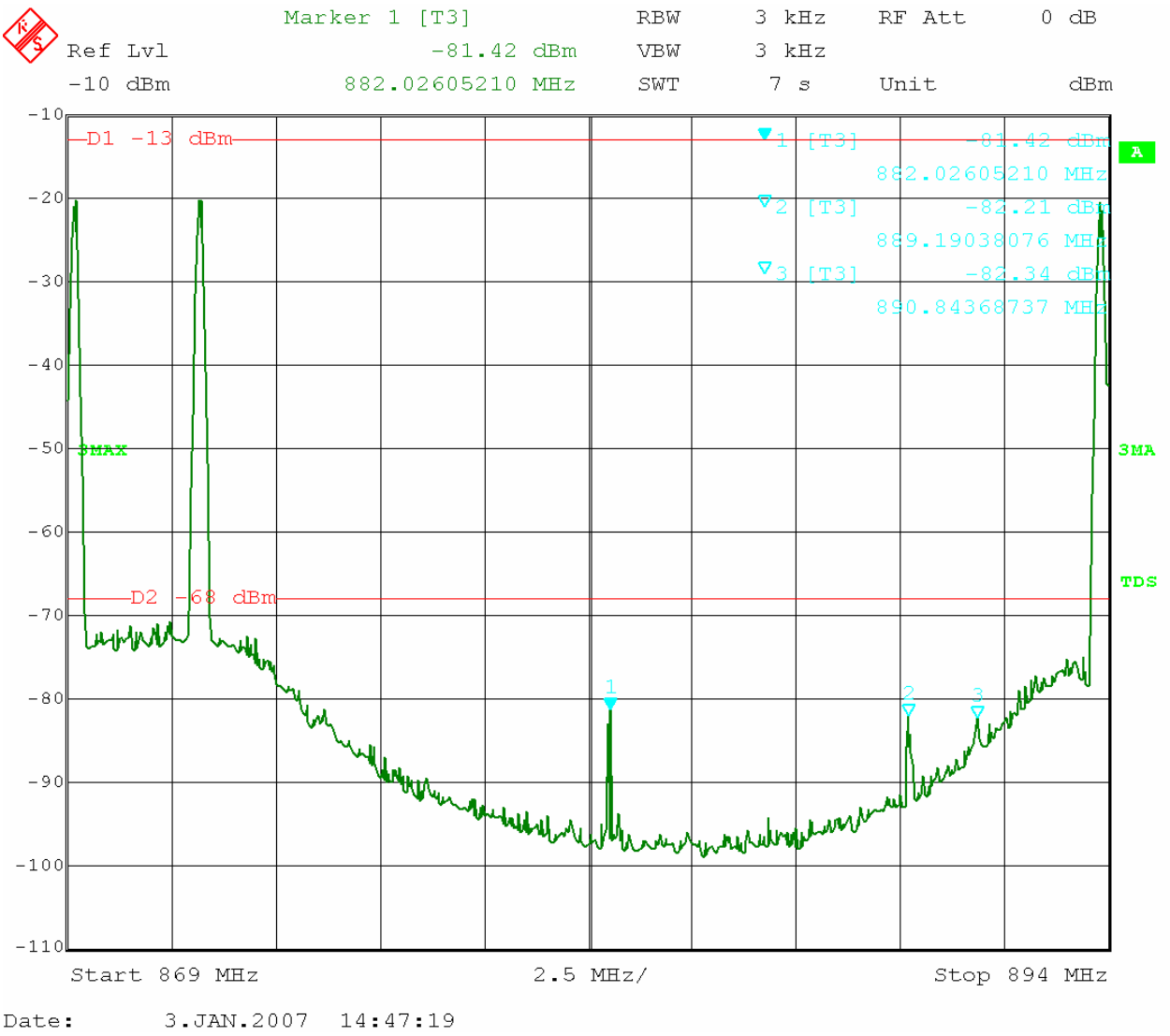

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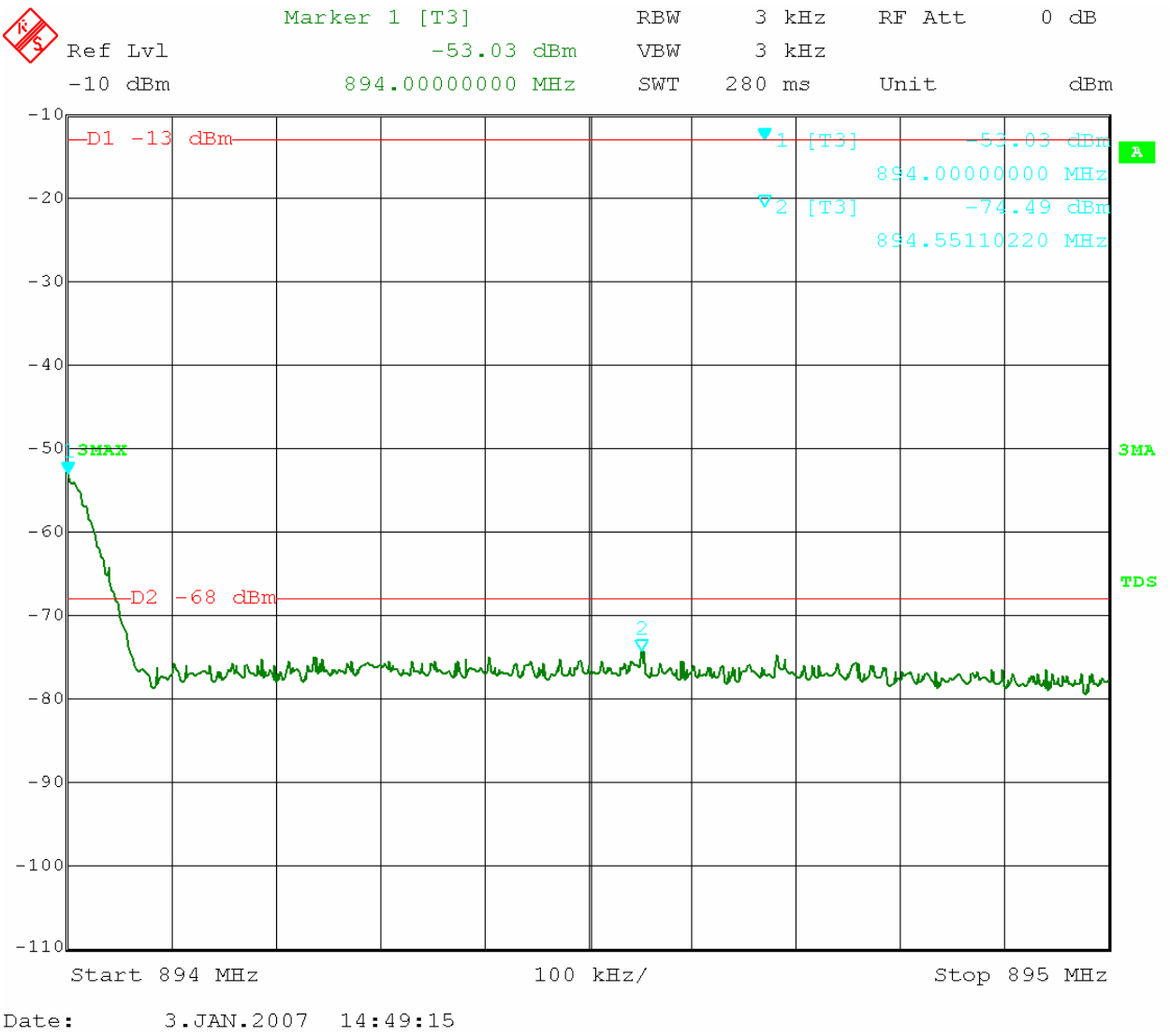

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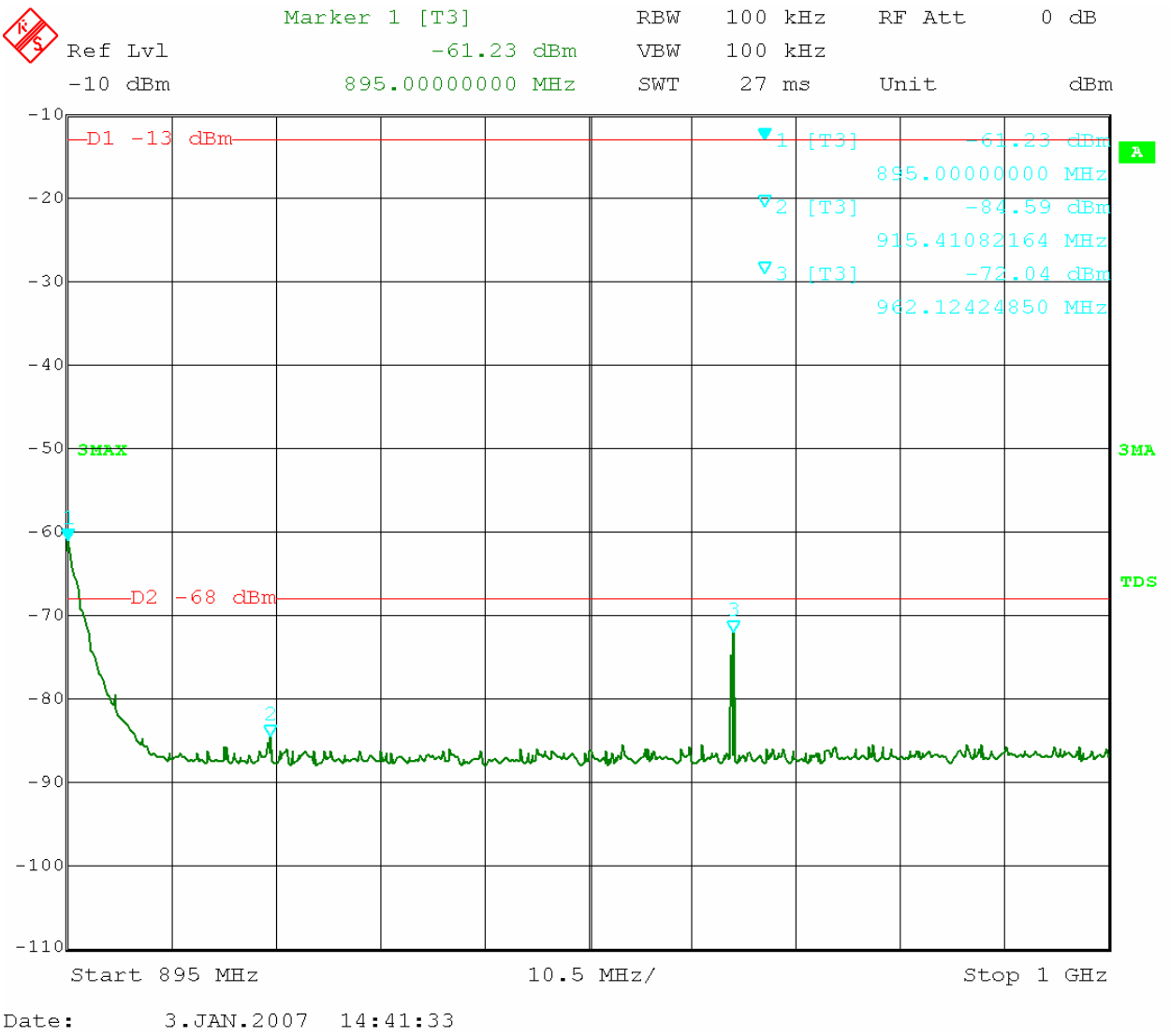

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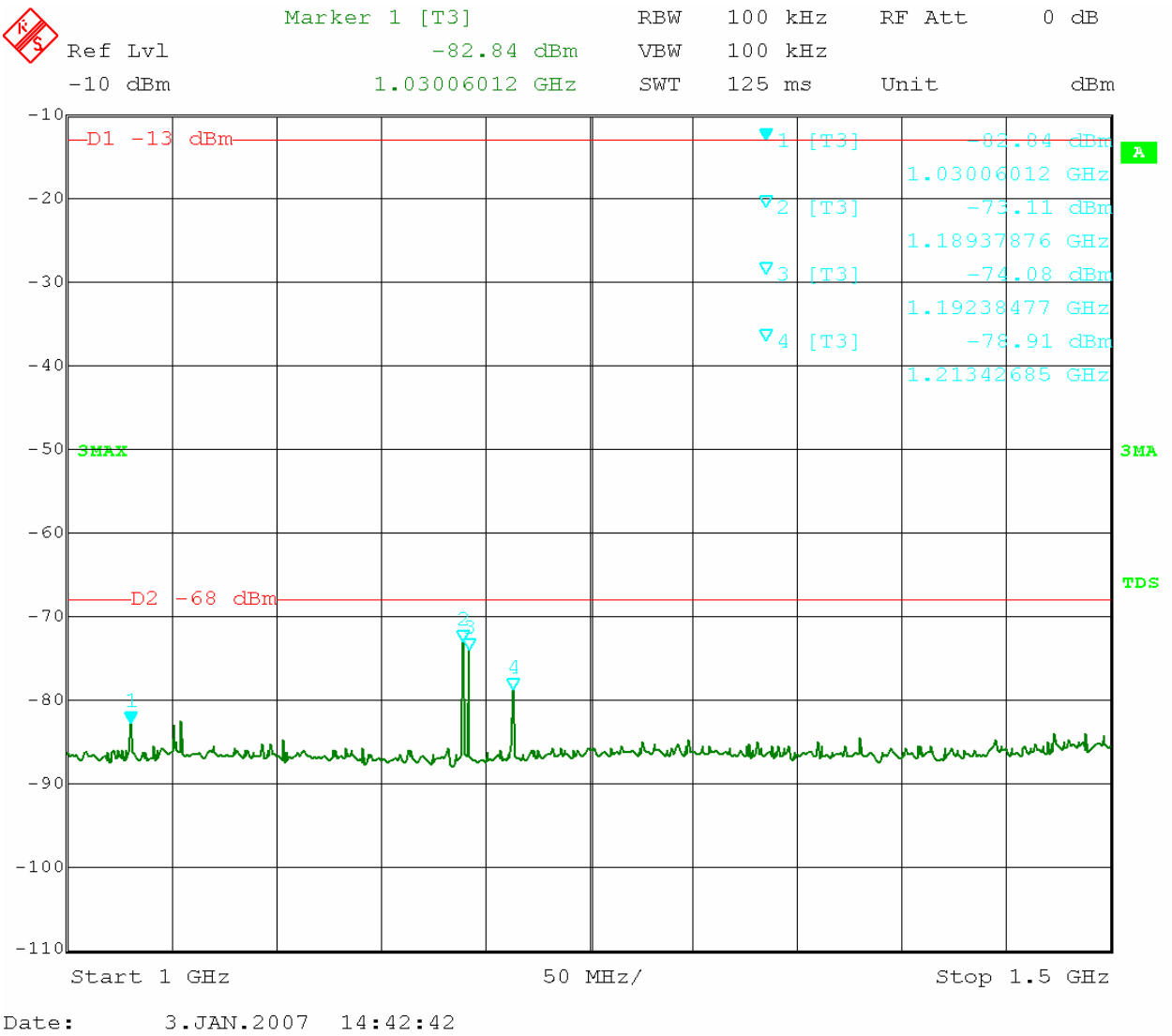

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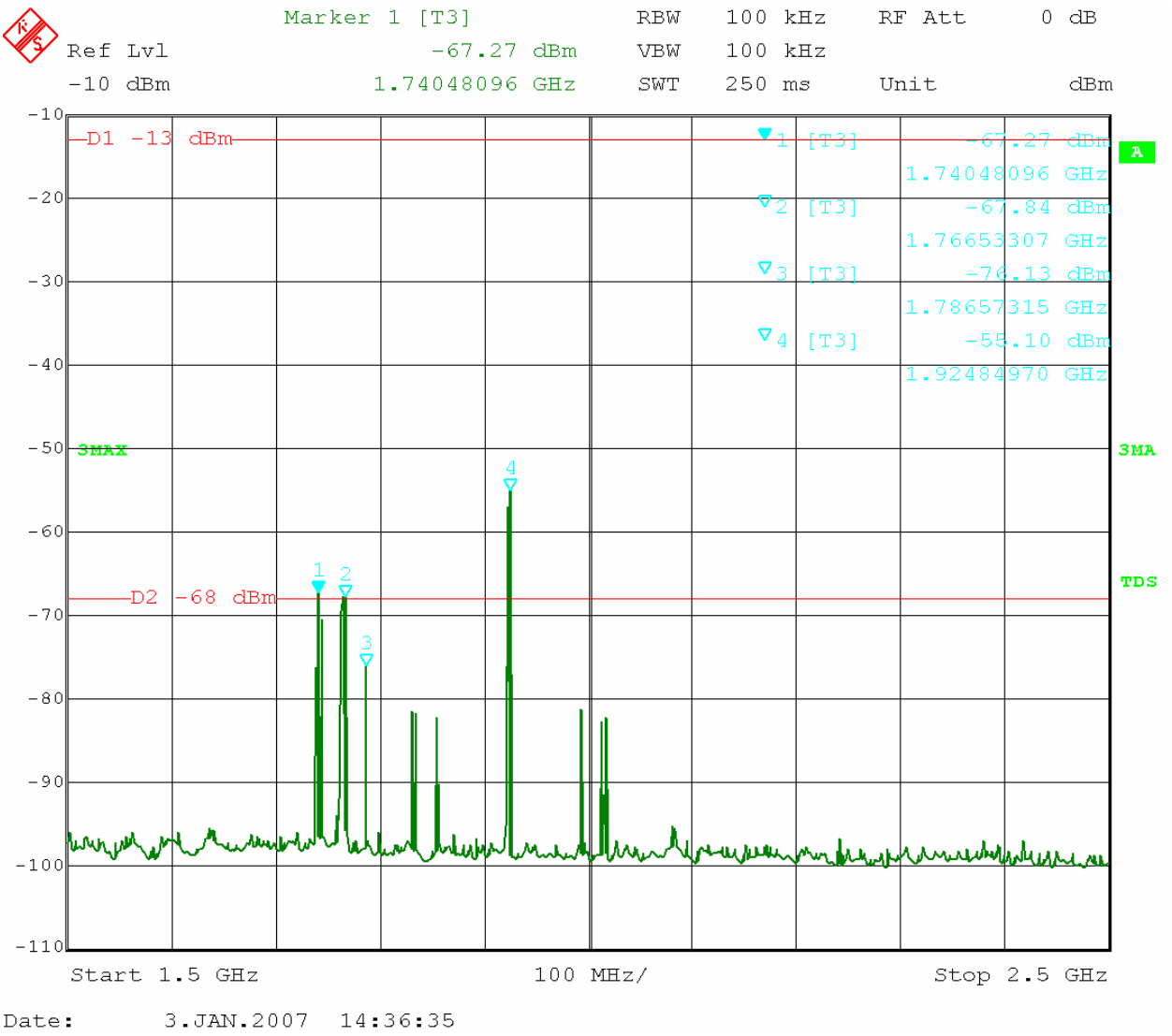

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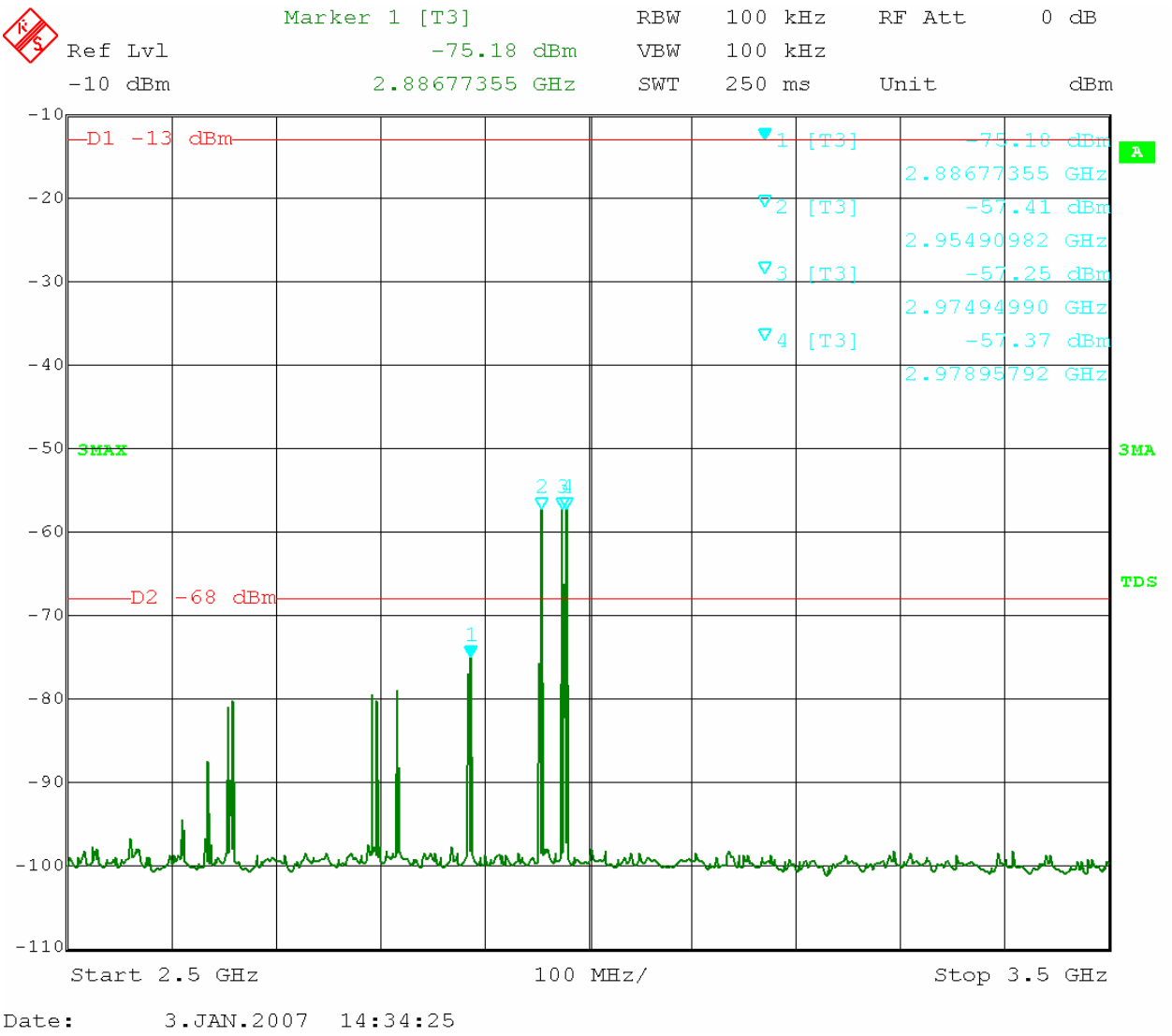

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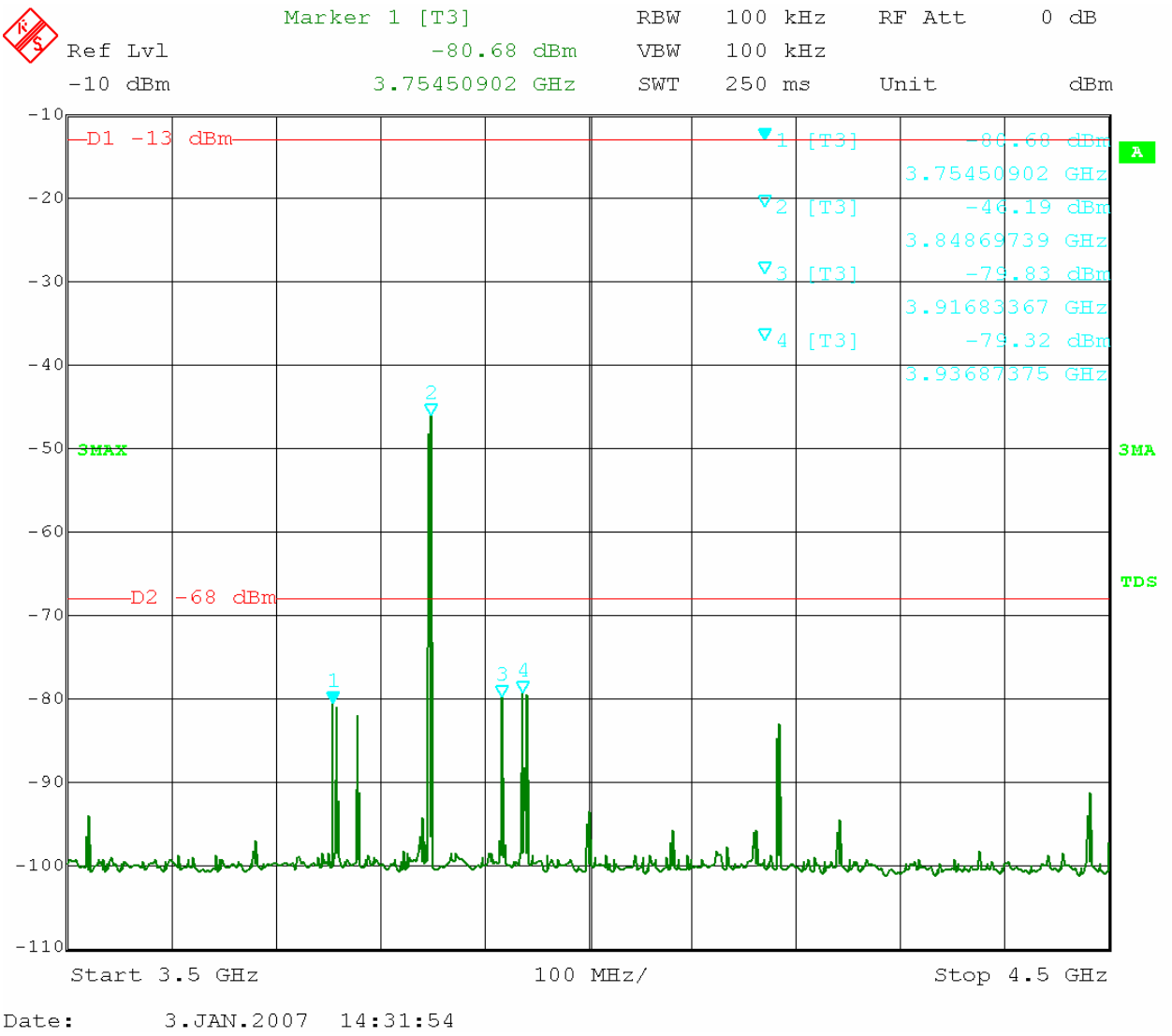

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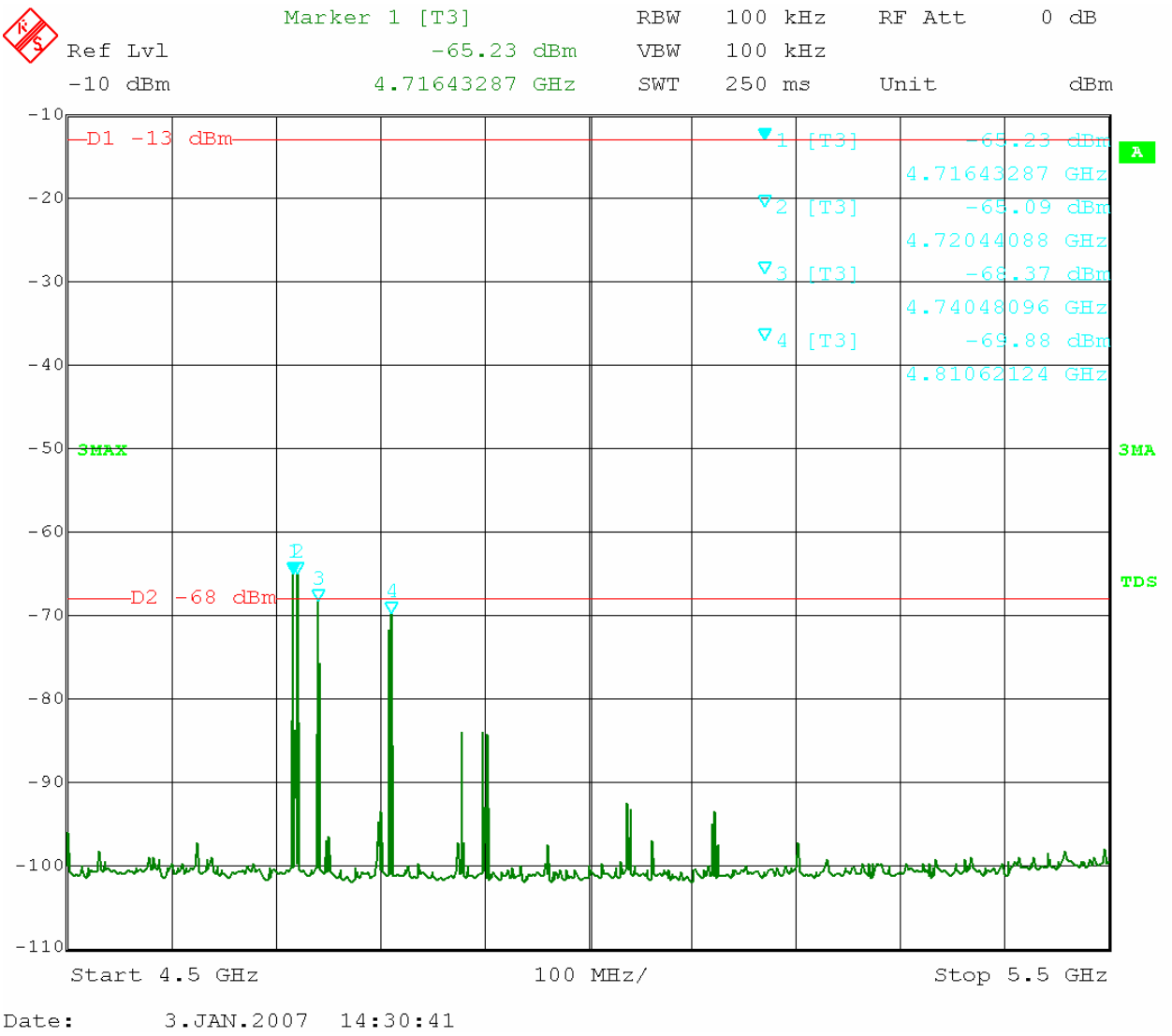

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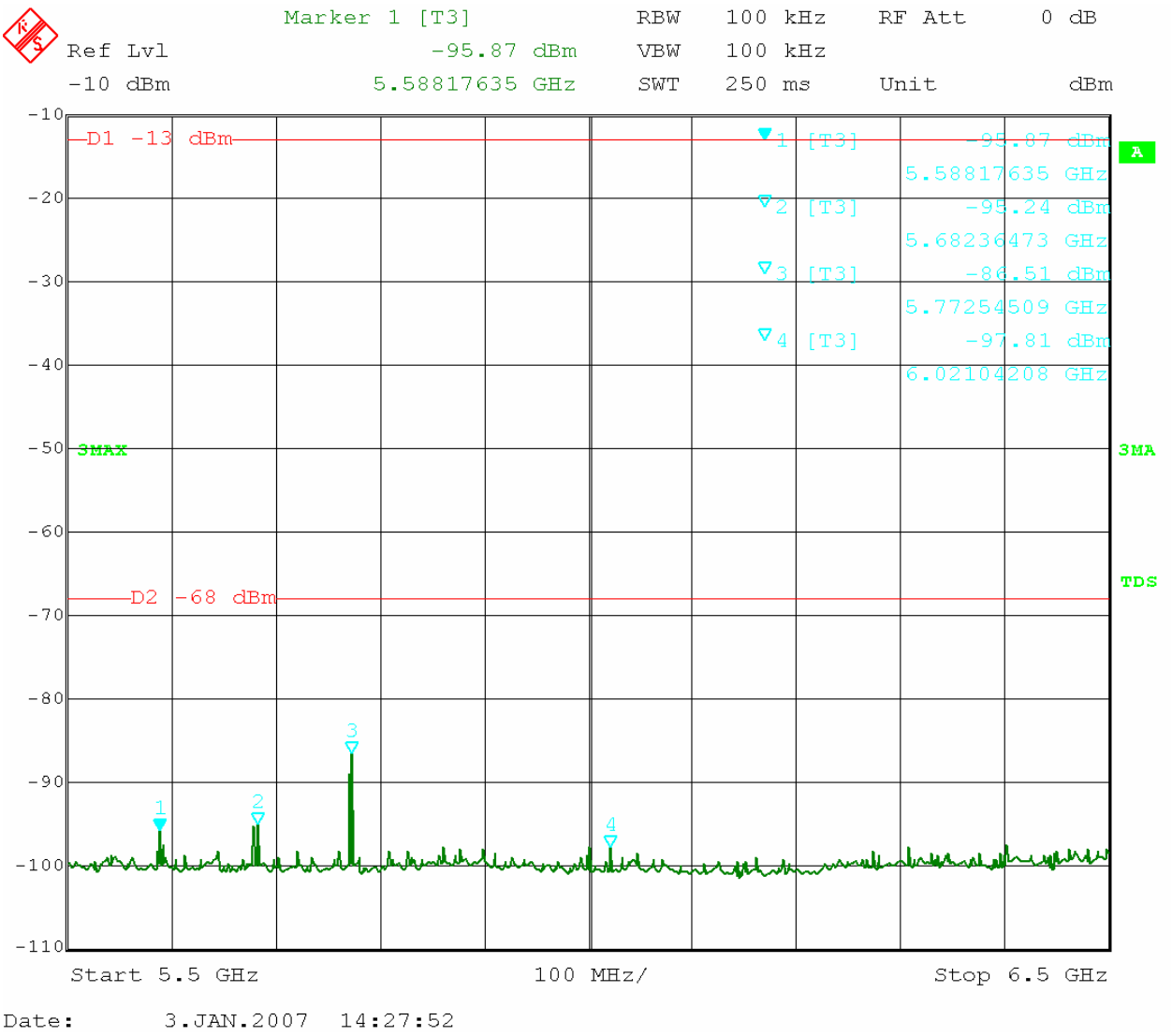

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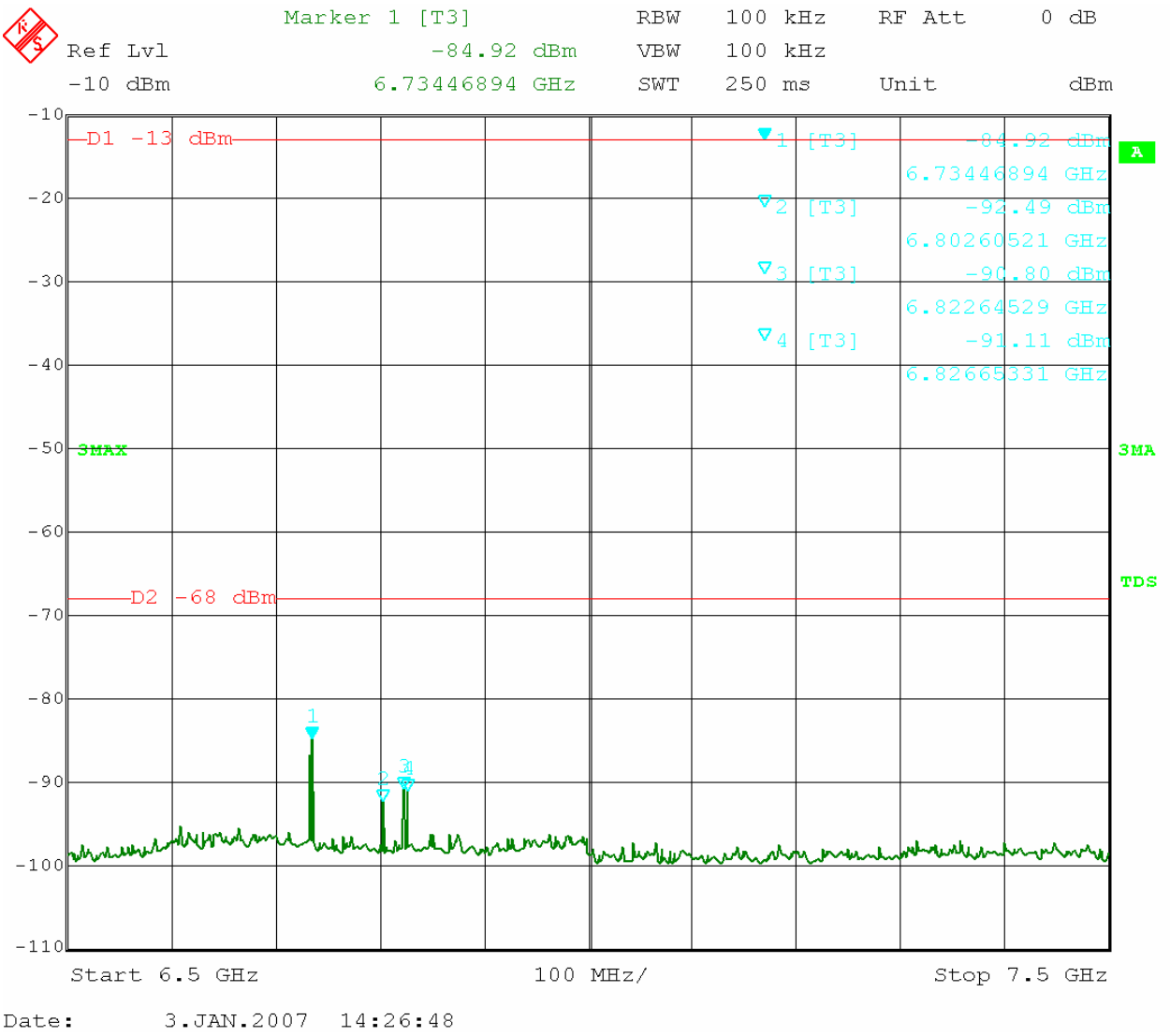
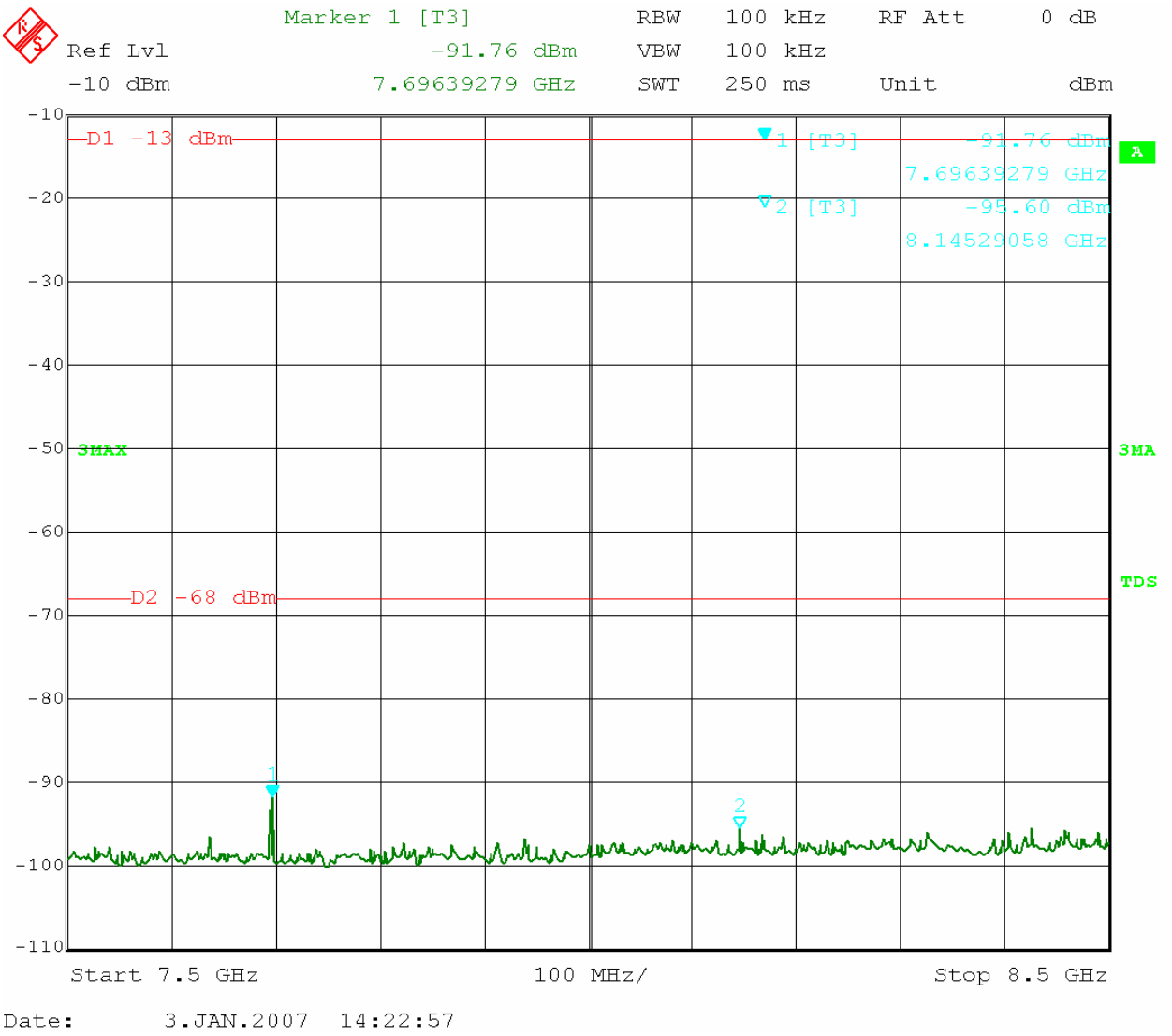


IMD Low Band Edge



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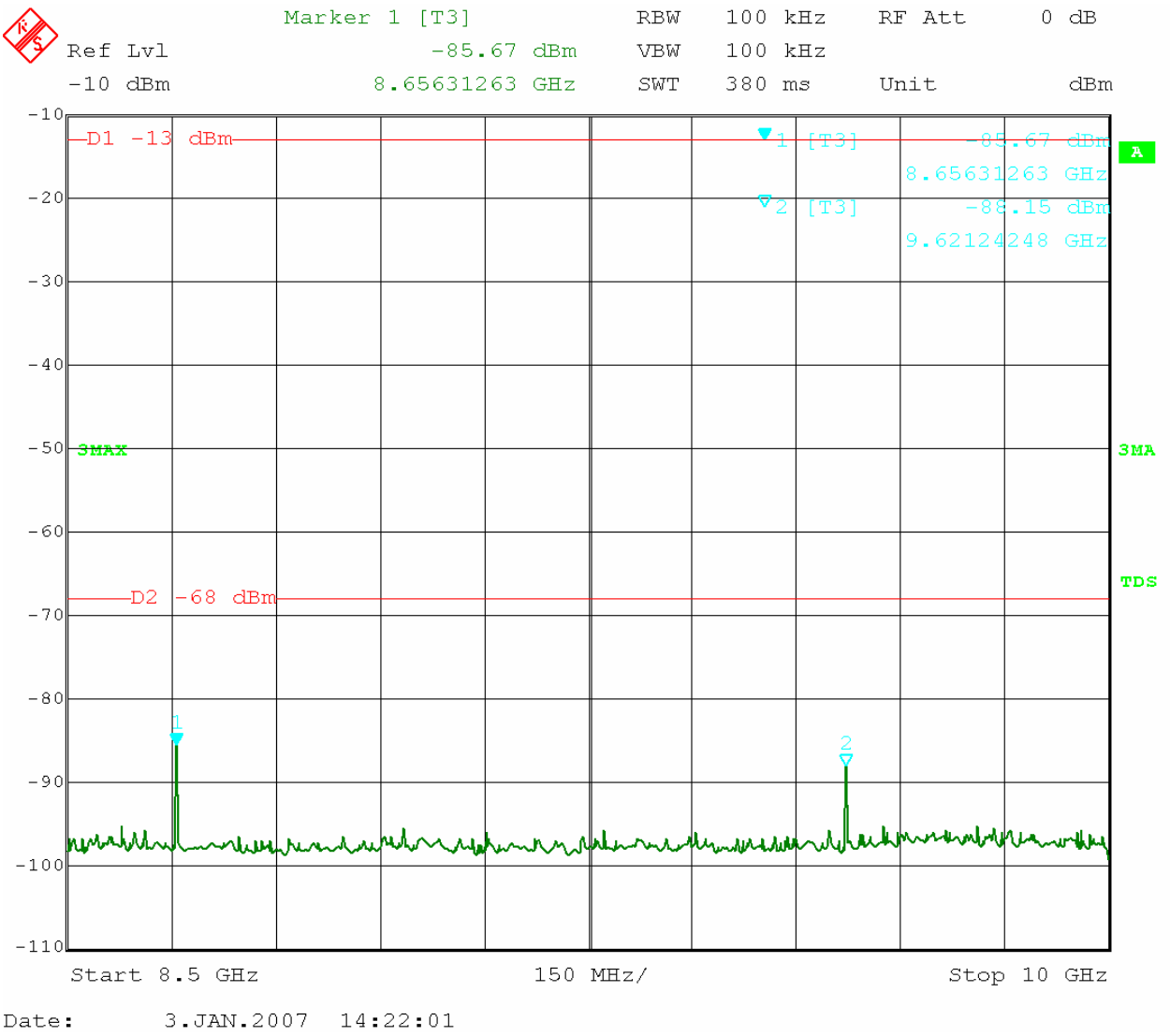
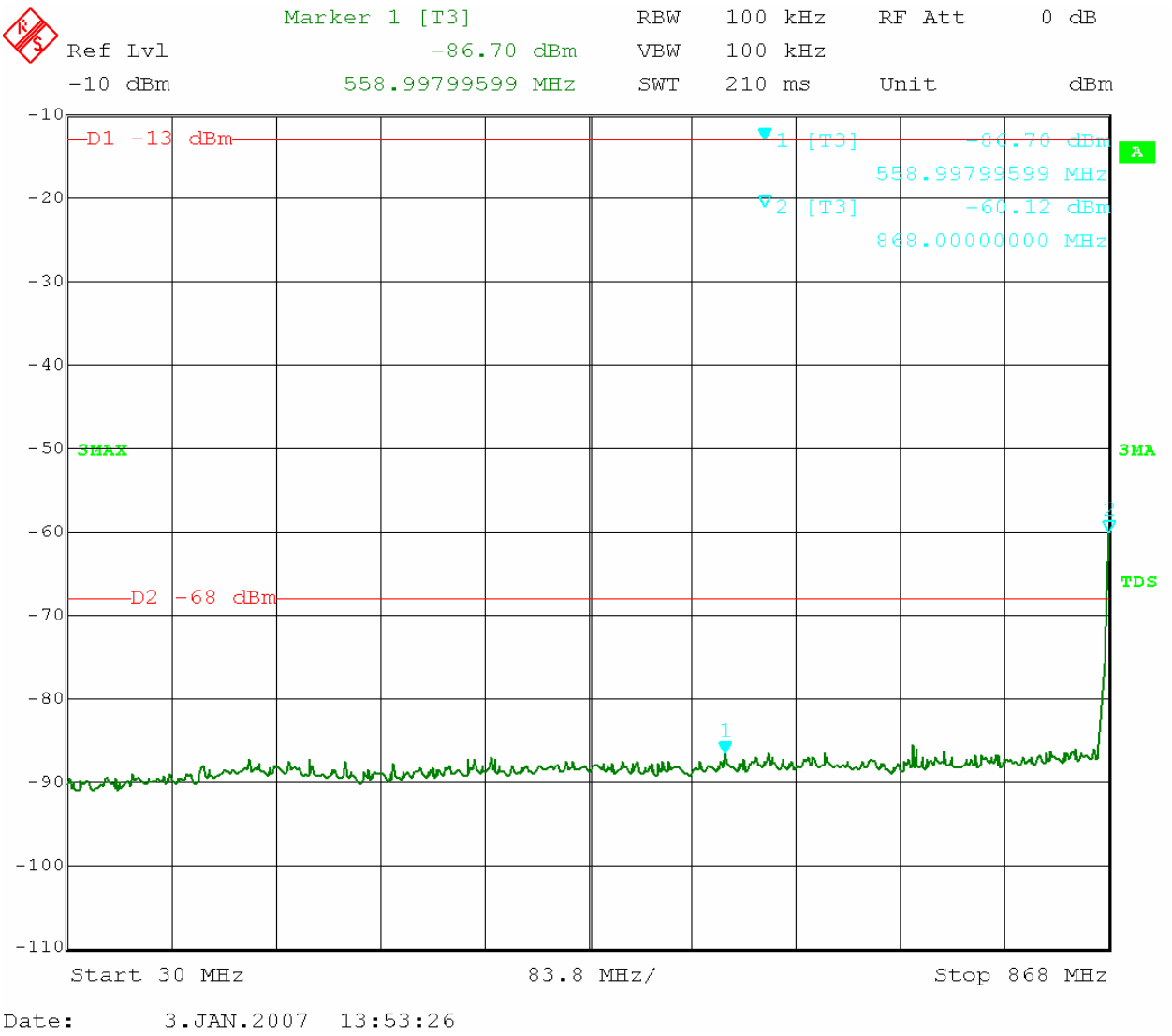
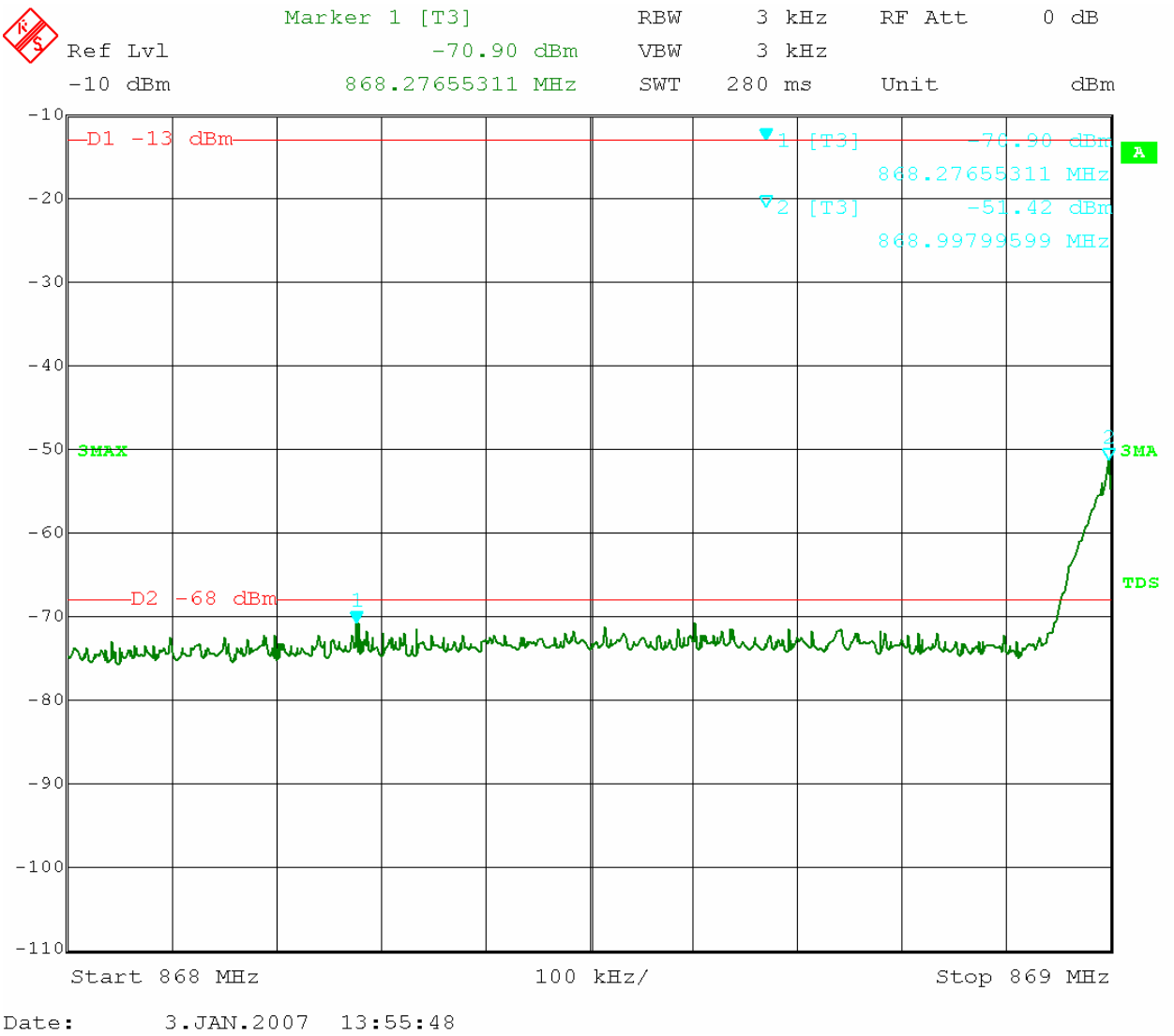


IMD Low Band Edge



IMD High Band Edge



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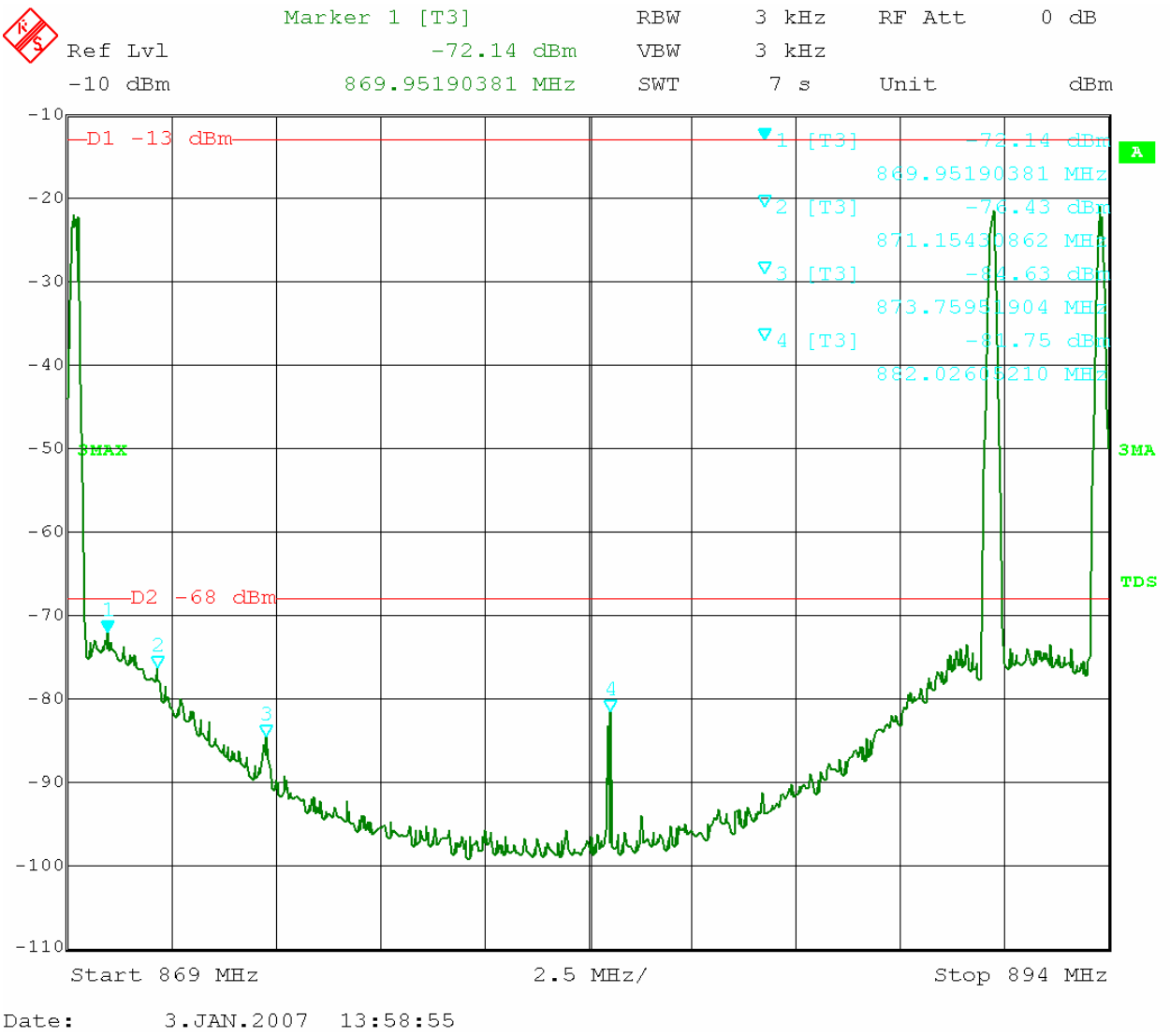

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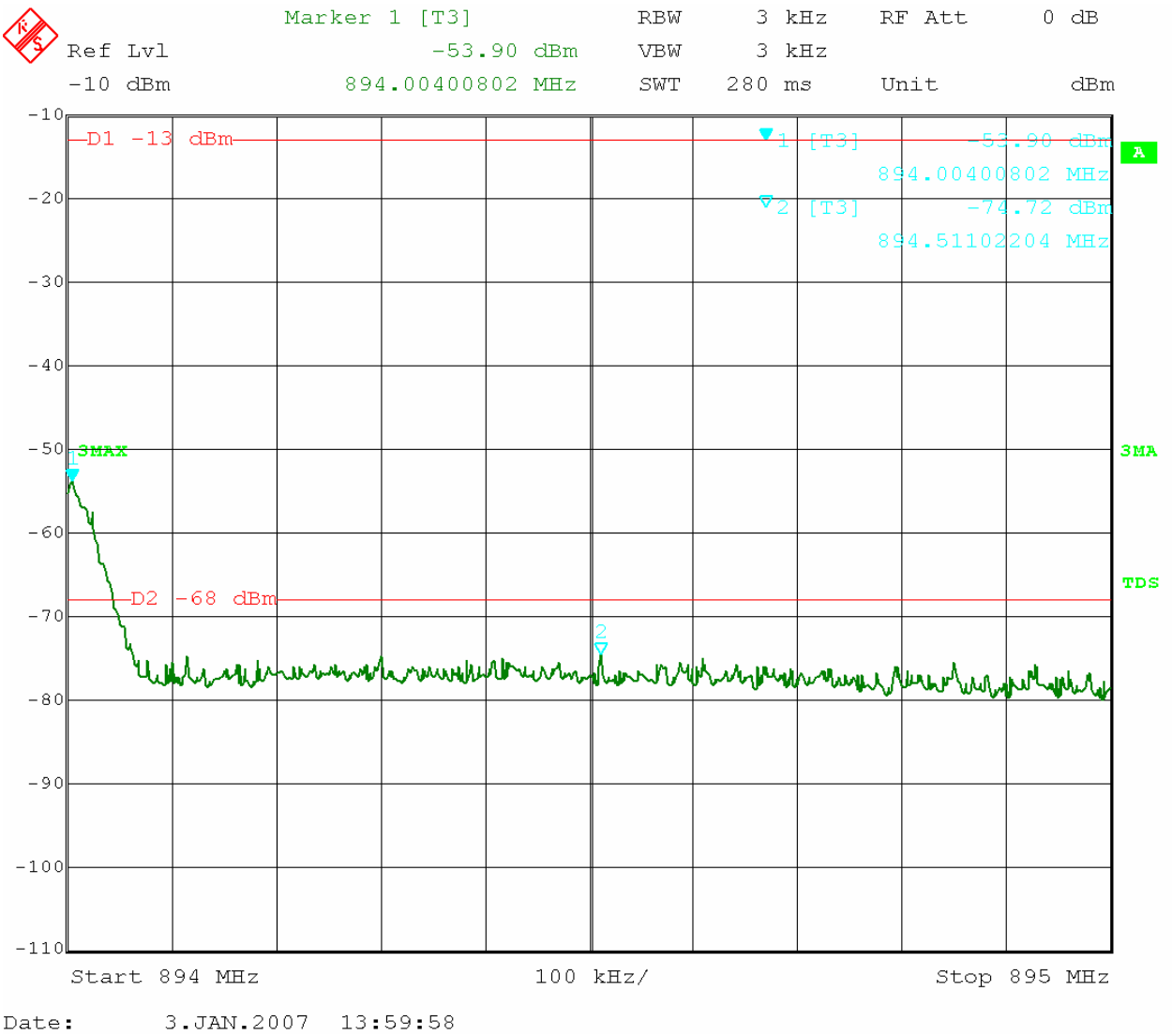

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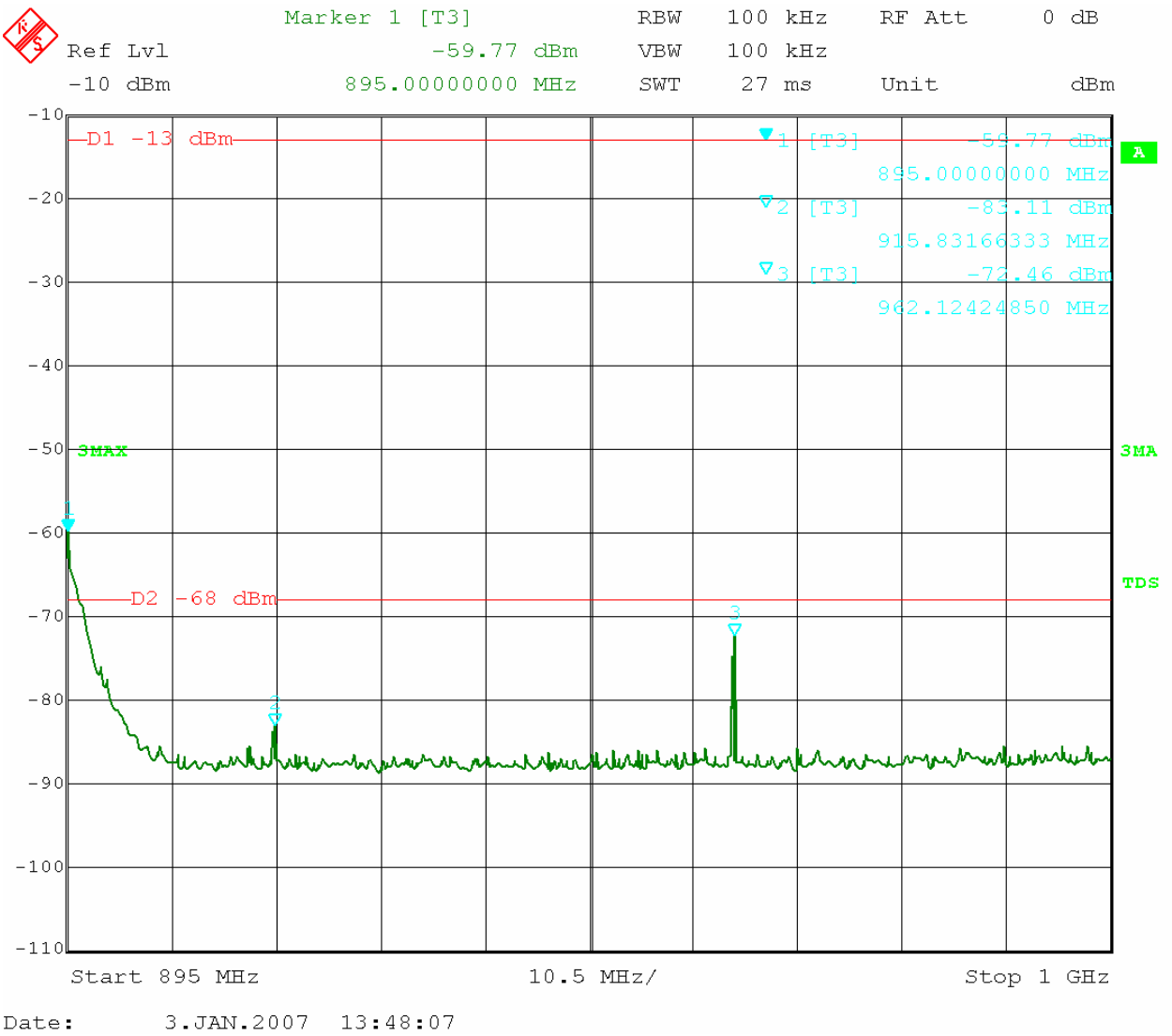

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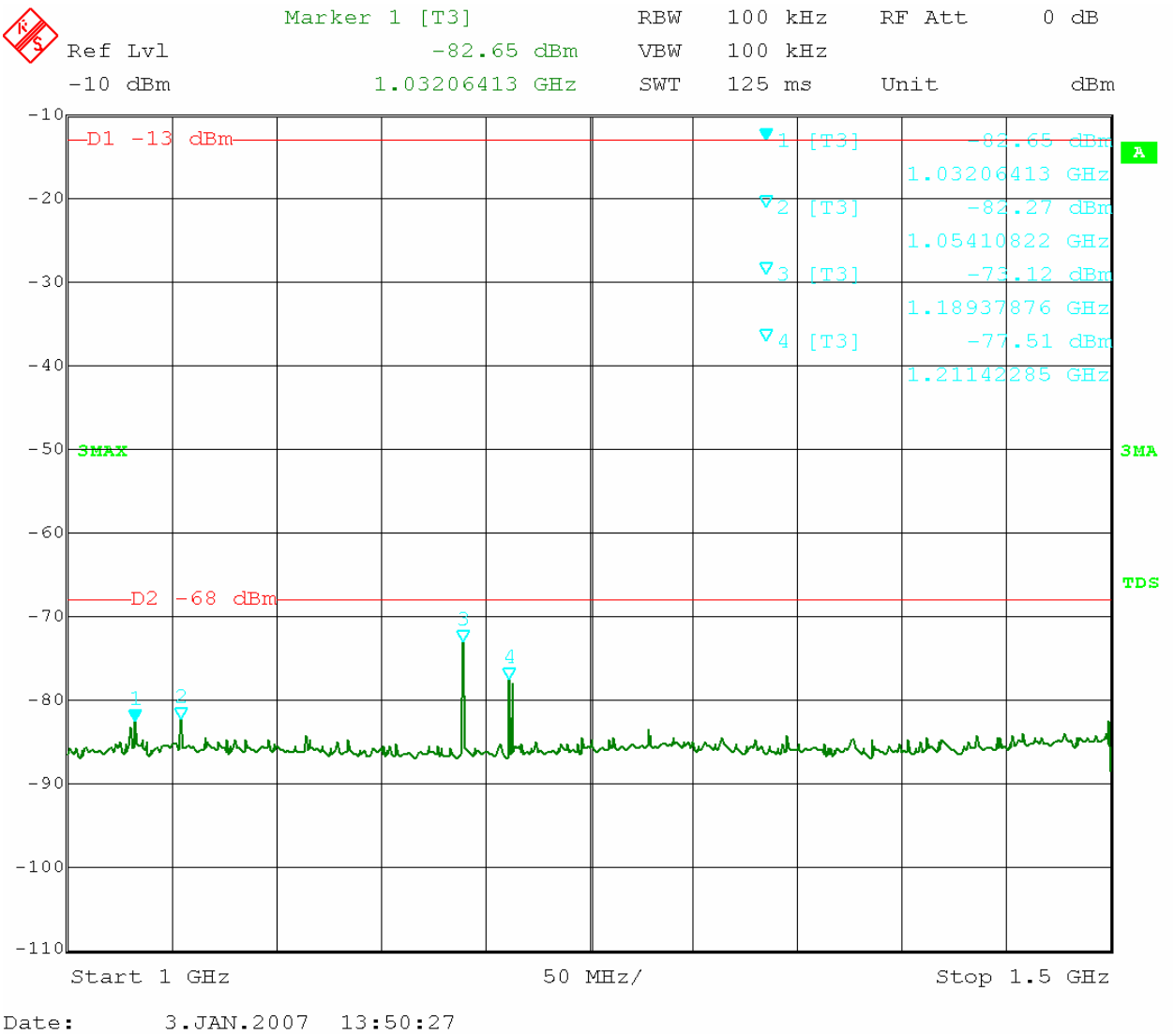

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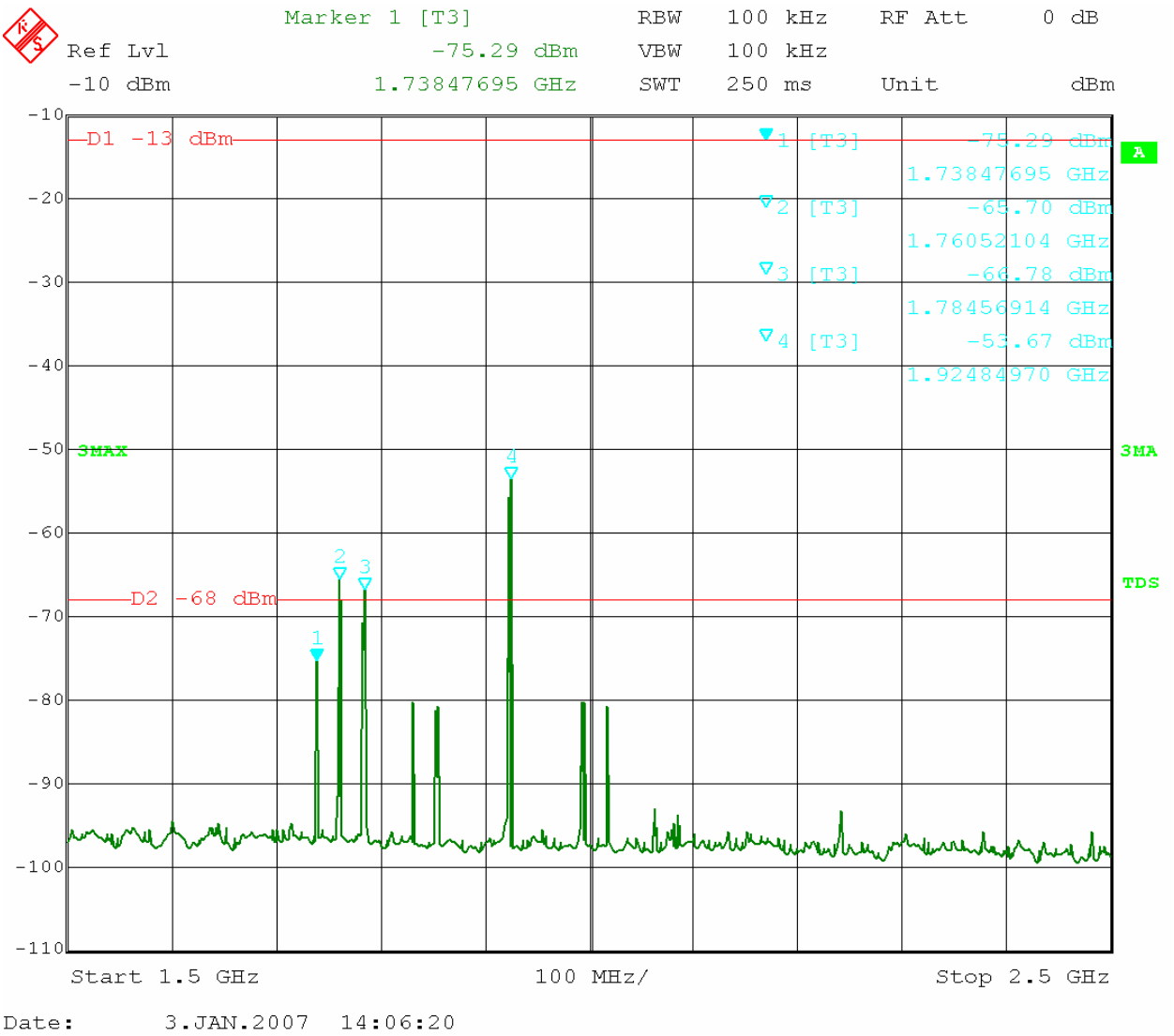

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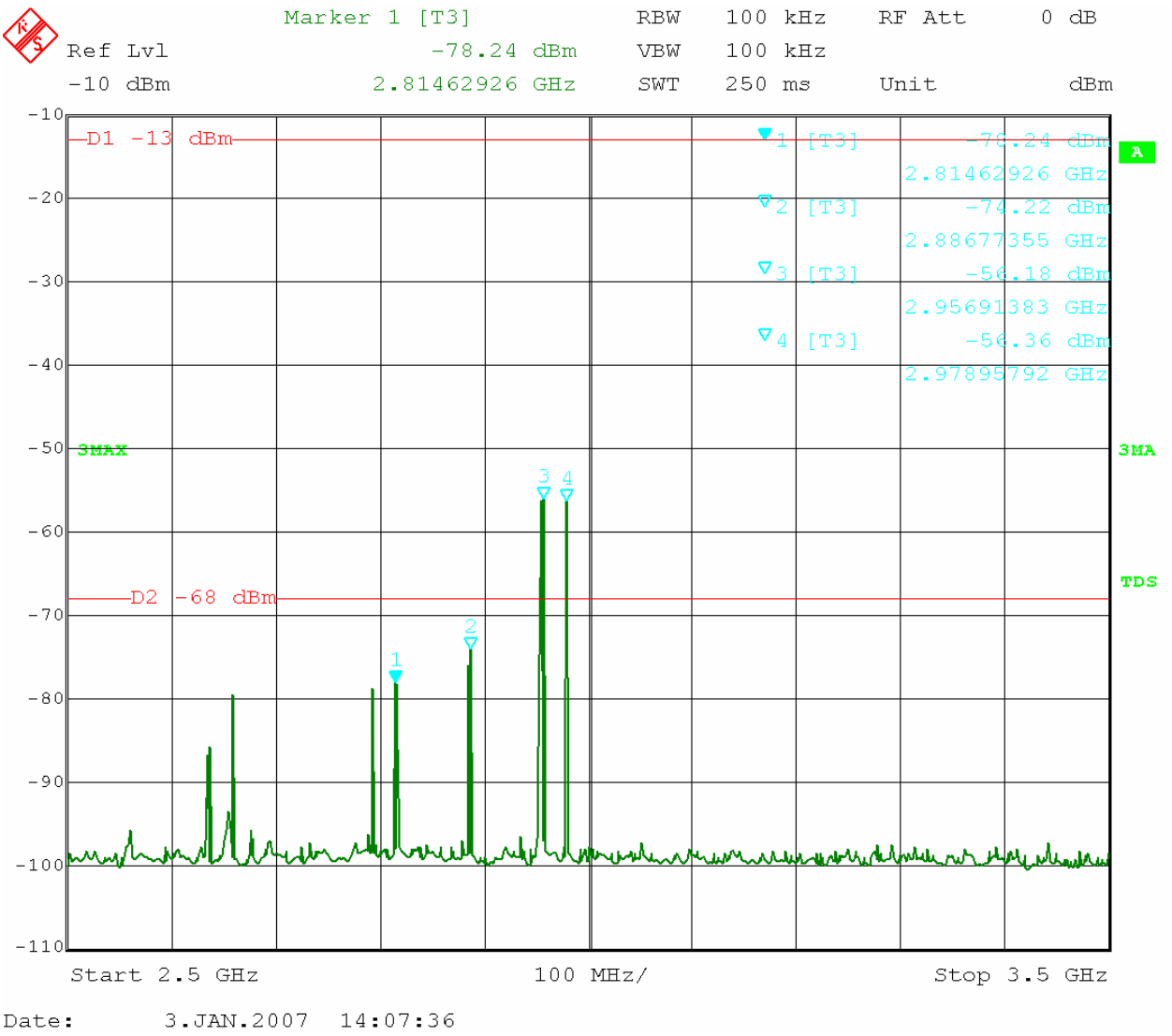

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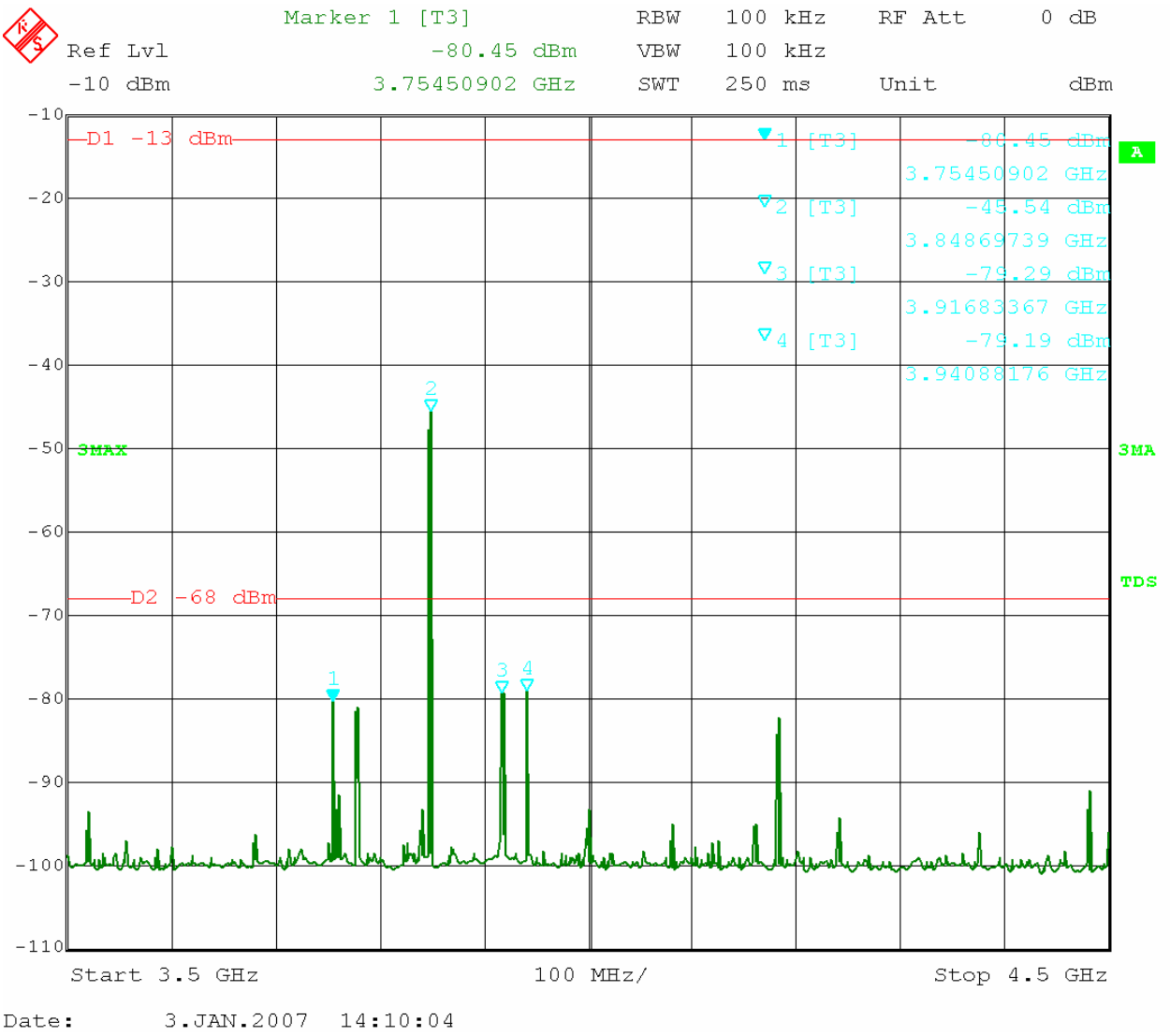

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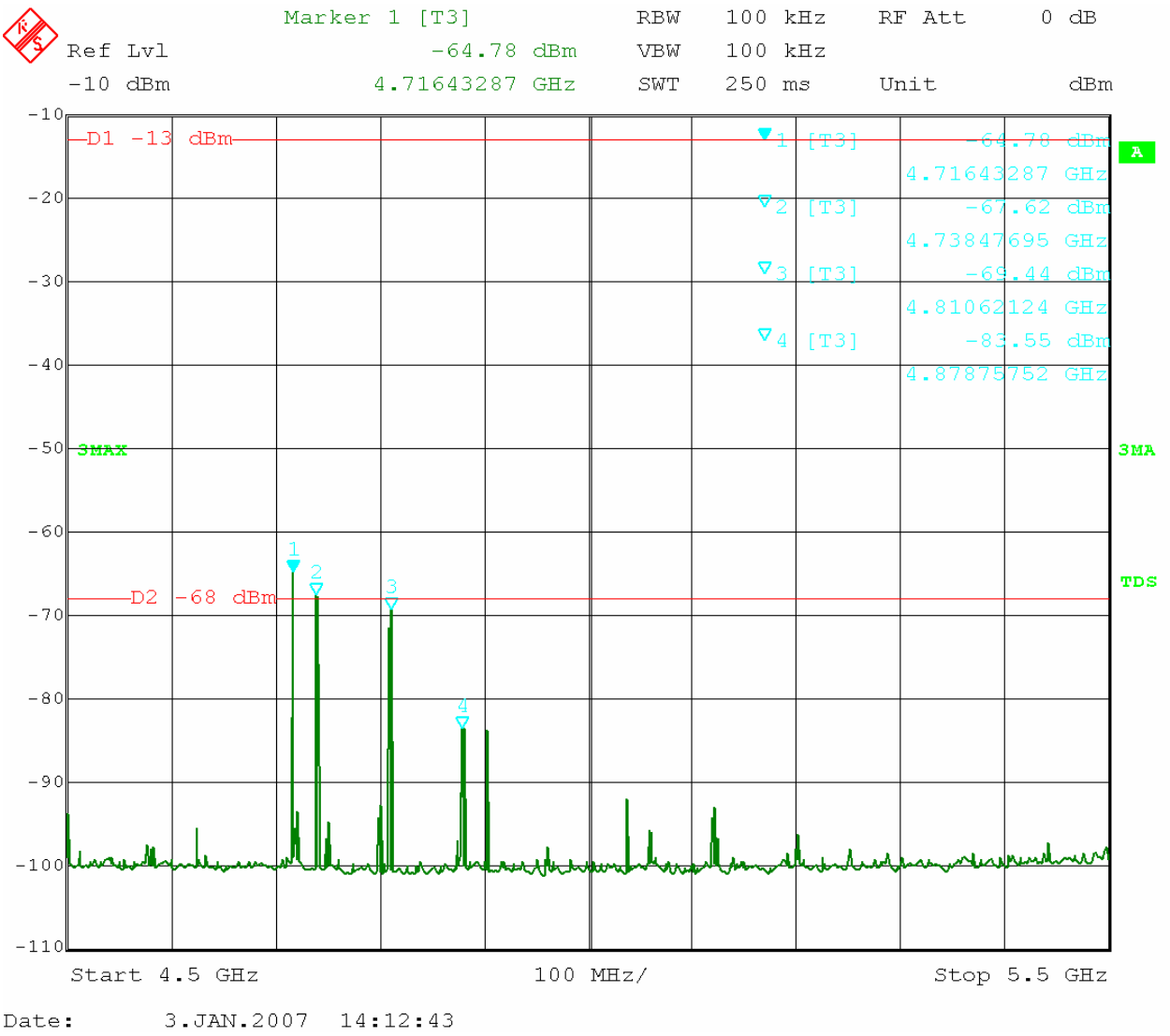

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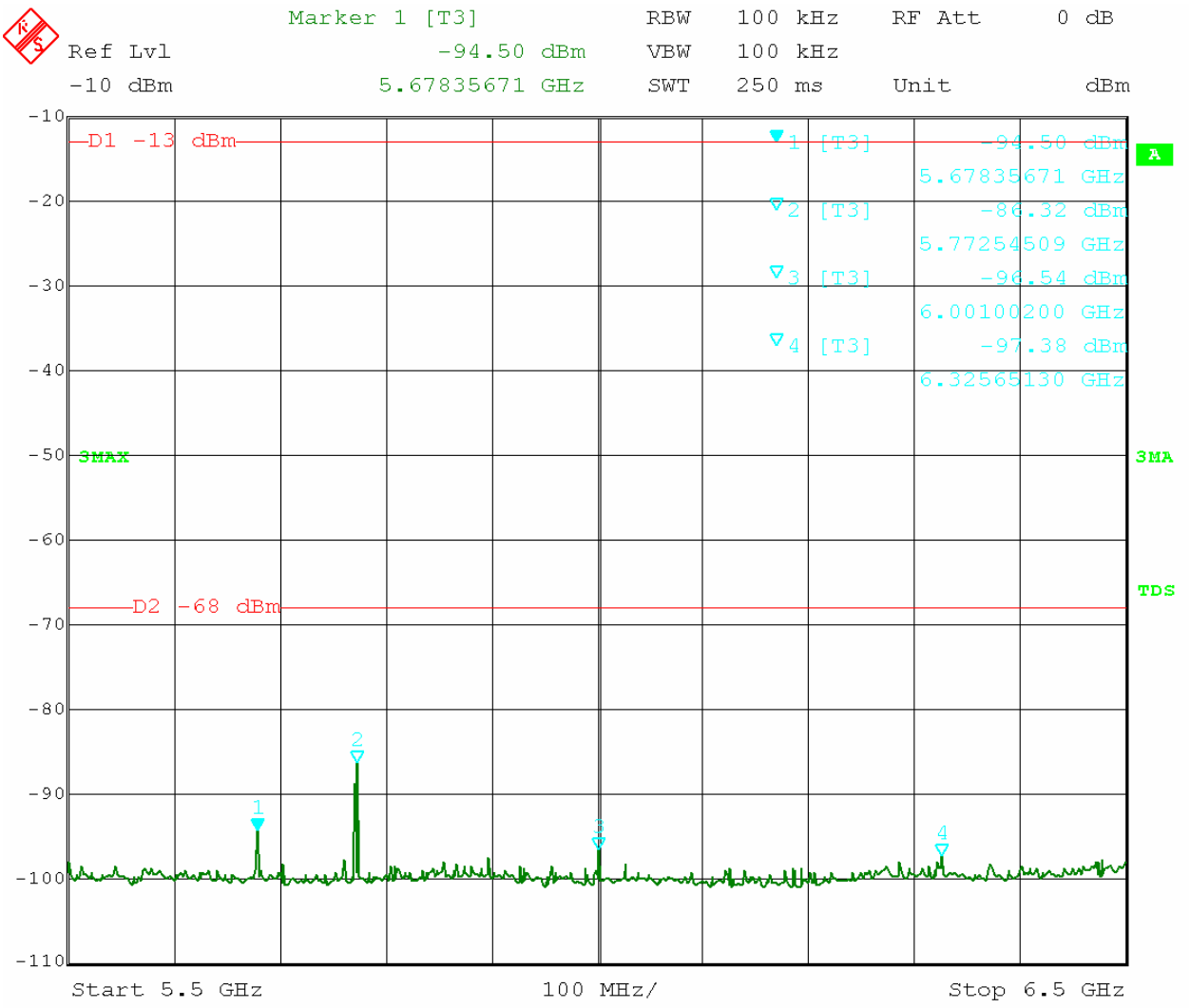

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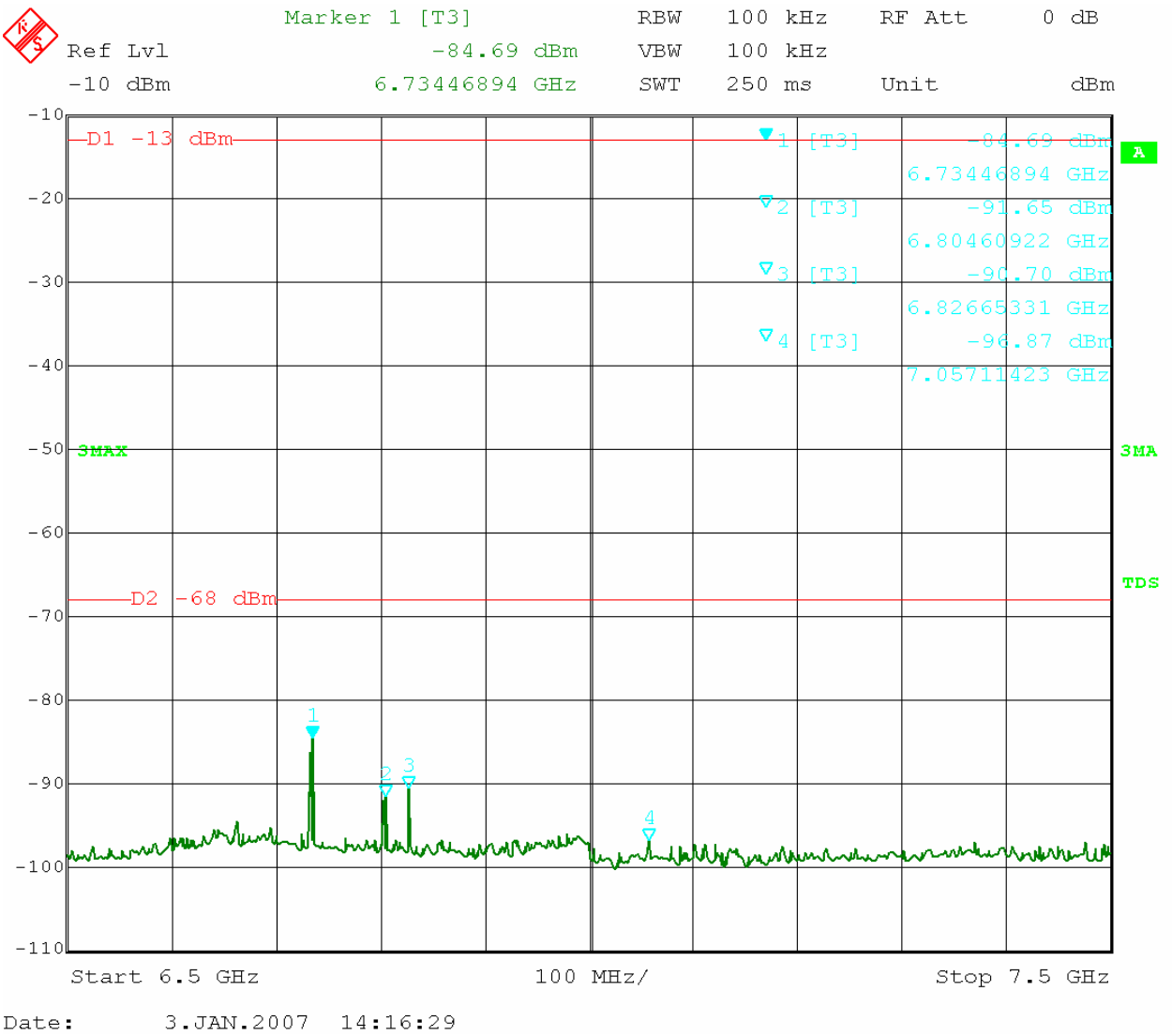

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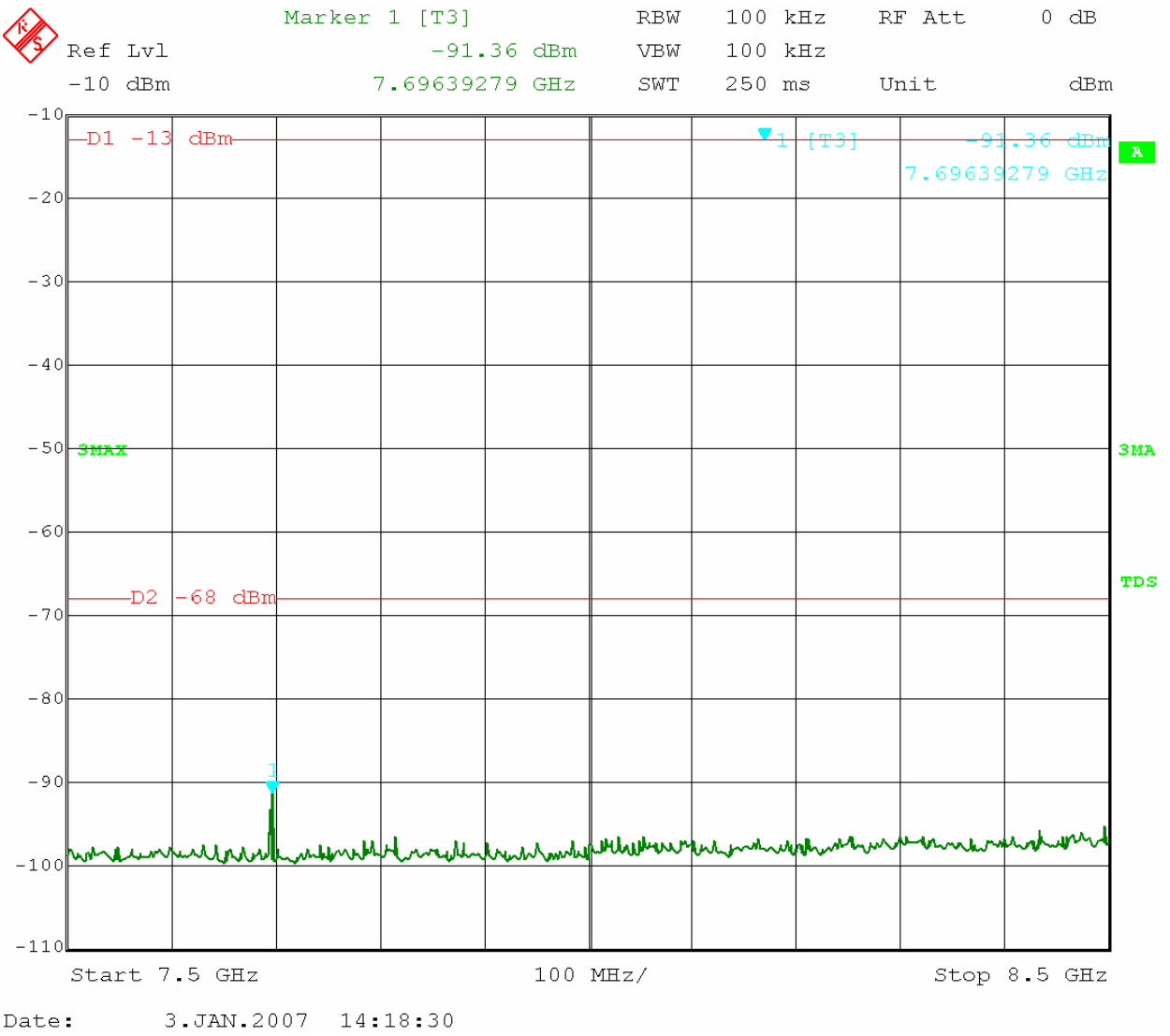

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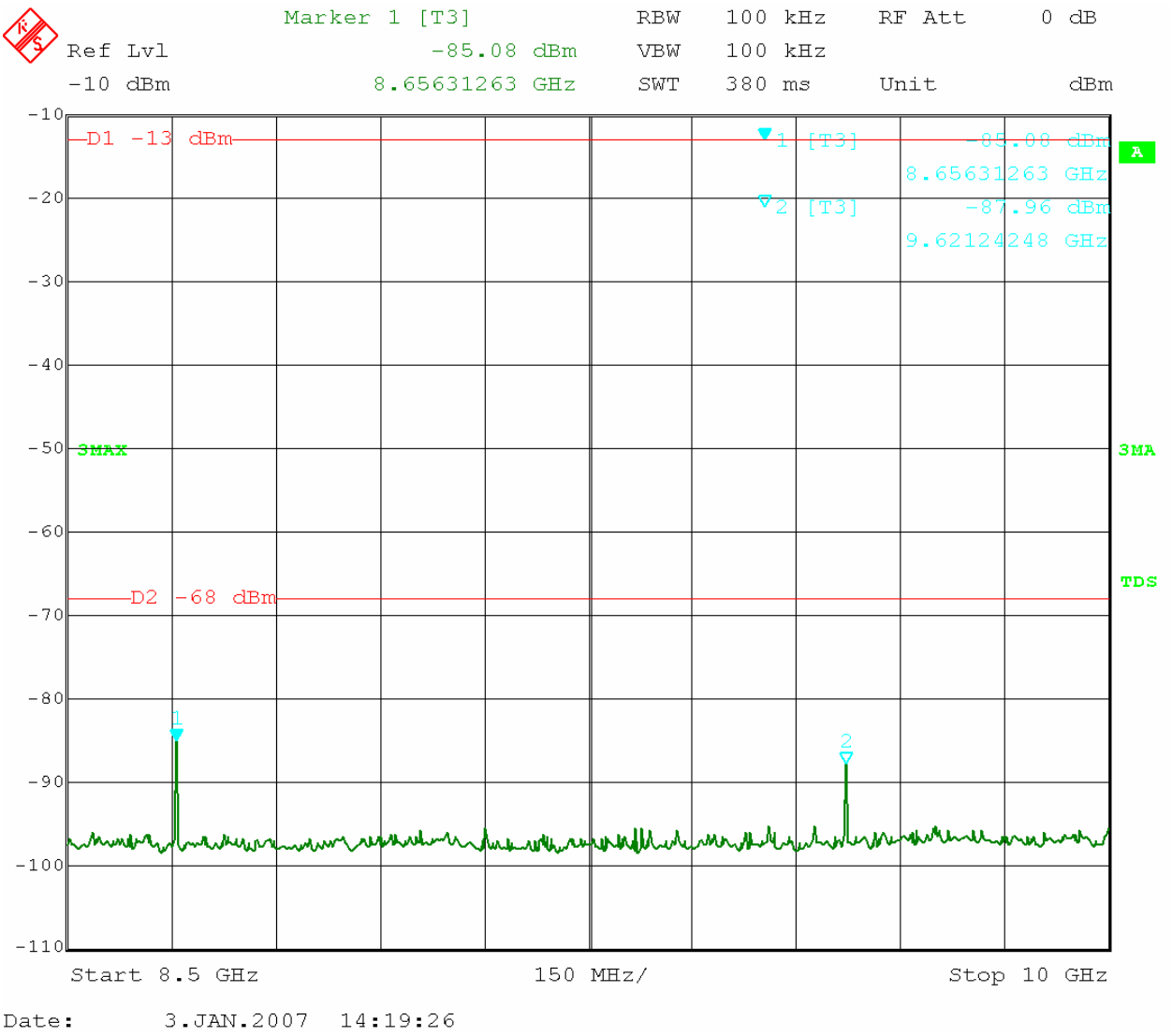


IMD High Band Edge

Test Results: Pass

Test Standard: FCC Part 22 Subpart H 22.917, IC RSS-132 Section 4.5, 4.6, FCC Part 15 Subpart B 15.109, IC RSS-Gen Sections 4.8, 6.0

Test: Radiated Spurious Emissions

Performance Criterion: Emissions outside the passband must not exceed –13 dBm when measured in a 100 kHz measurement bandwidth, except in the 1 MHz block edges above and below the band of operation, where compliance is based on a measurement bandwidth equal to 1% of the emission bandwidth. Receiver spurious emissions must meet the requirements of FCC Part 15 Subpart B 15.109 and IC RSS-Gen Table 1 per Sections 4.8 and 6.0.

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	See Table	Pressure (hPa):	See Table	Ambient (°C):	See Table
Pretest Verification Performed	Yes		Equipment under Test:		GSM Basestation	

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR2	08/02/2007
2	ANTENNA	EMCO	3142	9711-1223	01/25/2007
3	BROADBAND ANTENNA	Compliance Design	B100	3317	10/11/2007
4	BROADBAND ANTENNA	Compliance Design	B200	3245	10/11/2007
5	BROADBAND ANTENNA	Compliance Design	B300	3352	10/11/2007
6	HORN ANTENNA	EMCO	3115	9610-4980	06/12/2007
7	HORN ANTENNA	EMCO	3115	9602-4675	09/11/2007
8	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL028	12/04/2007
9	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL029	12/04/2007
10	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/04/2007
11	3 Meter In floor cable for site 2	ITS	RG214B/U	S2 3M FLR	09/26/2007
12	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	10/23/2007
13	EMI Receiver Set W/RF Filter	Hewlett Packard	8542E	3520A00125	02/28/2007
14	RF FILTER	Hewlett Packard	85420E	3427A00126	02/28/2007
15	PREAMPLFIER 1- 40 GHz	MITEQ	NSP4000-NF	507145	11/14/2007
16	Synthesized Sweep Generator	Hewlett Packard	83620A	3213A01244	01/25/2007

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	9/20/06 Revision

Test Details:

Transmitter Spurious Emissions

Radiated Emissions, Substitution

Company: Vanu, Inc. | Rx Antenna: HORN3 LOG2
Model #: GSM Basestation | Rx Cable(s): CBL029 CBL030 S2 3M FLR
Serial #: 1074 | Rx Preamp: PRE8 | Receiver: ROS001
Engineer(s): Nicholas Abbondante | Location: Site 2 | Tx Antenna: HORN2 ANT4
Project #: 3112039 | Date(s): 01/09/07 | Tx Cable(s): CBL028 REC2/RECFL2 REA005
Standard: FCC Part 22/IC RSS-132 | Tx Signal Generator: HEW62
Barometer: BAR2 | Temp/Humidity/Pressure: 20c 28% 994mB | ERP or EIRP?: ERP
Test Distance (m): 3 | Voltage/Frequency: 120V/60Hz | Frequency Range: 30 MHz - 1 GHz

Net = Generator Level (0.00 dBm) + (EUT reading - Generator reading) - Cable Loss + Antenna Gain (dBi or dBd)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	EUT Reading dB(uV)	Generator Reading dB(uV)	Transmit Cable Loss dB	Transmit Antenna dBi	Generator Level dBm	Net dBm	Limit dBm	Margin dB	Bandwidth
PK	V	34.650	24.4	72.0	0.4	-9.1	0.0	-59.3	-13.0	-46.3	120/300 kHz
PK	V	46.610	25.5	79.2	0.5	-6.9	0.0	-63.2	-13.0	-50.2	120/300 kHz
PK	V	49.980	29.2	81.0	0.5	-6.4	0.0	-60.9	-13.0	-47.9	120/300 kHz
PK	V	63.000	27.5	82.3	0.5	-2.9	0.0	-60.4	-13.0	-47.4	120/300 kHz
PK	V	74.430	22.5	86.6	0.6	1.7	0.0	-65.1	-13.0	-52.1	120/300 kHz
PK	V	109.400	19.0	87.4	0.7	-1.2	0.0	-72.4	-13.0	-59.4	120/300 kHz
PK	V	129.000	21.0	87.7	0.7	-0.1	0.0	-69.7	-13.0	-56.7	120/300 kHz
PK	V	141.500	25.3	88.4	0.7	1.6	0.0	-64.4	-13.0	-51.4	120/300 kHz
PK	H	154.800	17.8	90.0	0.8	1.9	0.0	-73.2	-13.0	-60.2	120/300 kHz
PK	H	196.800	22.3	88.3	0.9	0.9	0.0	-68.1	-13.0	-55.1	120/300 kHz
PK	H	208.000	19.6	88.2	0.9	0.7	0.0	-70.9	-13.0	-57.9	120/300 kHz
PK	H	217.800	17.2	87.2	0.9	0.6	0.0	-72.5	-13.0	-59.5	120/300 kHz
PK	H	234.600	17.1	85.9	0.9	-0.3	0.0	-72.2	-13.0	-59.2	120/300 kHz
PK	H	240.000	29.9	86.2	1.0	-0.6	0.0	-60.0	-13.0	-47.0	120/300 kHz
PK	V	250.000	20.7	71.4	1.0	-0.9	0.0	-54.7	-13.0	-41.7	120/300 kHz
PK	V	256.000	21.0	73.4	1.0	-0.8	0.0	-56.3	-13.0	-43.3	120/300 kHz
PK	V	267.100	18.3	75.7	1.0	-1.1	0.0	-61.7	-13.0	-48.7	120/300 kHz
PK	V	292.000	18.8	74.3	1.0	-0.7	0.0	-59.4	-13.0	-46.4	120/300 kHz
PK	H	320.000	23.1	83.3	1.1	-1.6	0.0	-65.1	-13.0	-52.1	120/300 kHz
PK	V	350.000	21.1	76.1	1.1	-1.5	0.0	-59.8	-13.0	-46.8	120/300 kHz
PK	V	360.000	21.5	77.1	1.2	-1.9	0.0	-60.8	-13.0	-47.8	120/300 kHz
PK	V	375.000	22.7	77.0	1.2	-0.9	0.0	-58.5	-13.0	-45.5	120/300 kHz
PK	H	400.000	16.7	72.9	1.2	0.0	0.0	-59.6	-13.0	-46.6	120/300 kHz
PK	V	405.900	11.9	78.1	1.2	0.6	0.0	-69.0	-13.0	-56.0	120/300 kHz
PK	V	480.000	20.2	76.4	1.3	0.7	0.0	-58.9	-13.0	-45.9	120/300 kHz
PK	V	720.000	19.3	69.2	1.6	0.6	0.0	-53.1	-13.0	-40.1	120/300 kHz
PK	V	869.200	5.7	67.8	1.8	1.3	0.0	-64.7	-13.0	-51.7	120/300 kHz
PK	V	893.800	2.5	67.1	1.8	0.8	0.0	-67.8	-13.0	-54.8	120/300 kHz

Radiated Emissions, Substitution

Company: Vanu, Inc.
Model #: GSM Basestation
Serial #: 1074
Engineer(s): Nicholas Abbondante
Project #: 3112039
Standard: FCC Part 22/IC RSS-132
Barometer: BAR2 Temp/Humidity/Pressure: 20c 28% 994mB
Location: Site 2
Date(s): 01/09/07

Rx Antenna: HORN3 LOG2
Rx Cable(s): CBL029 CBL030 S2 3M FLR
Rx Preamp: PRE8 Receiver: ROS001
Tx Antenna: HORN2 ANT4
Tx Cable(s): CBL028 REC2/RECFL2 REA005
Tx Signal Generator: HEW62
ERP or EIRP?: ERP

Test Distance (m): 3 Voltage/Frequency: 120V/60Hz Frequency Range: 1 - 9 GHz

Net = Generator Level (0.00 dBm) + (EUT reading - Generator reading) - Cable Loss + Antenna Gain (dBi or dBd)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	EUT Reading dB(uV)	Generator Reading dB(uV)	Transmit Cable Loss dB	Transmit Antenna dBi	Generator Level dBm	Net dBm	Limit dBm	Margin dB	Bandwidth
PK	V	1190.680	21.5	70.2	2.1	6.0	0.0	-46.9	-13.0	-33.9	120/300 kHz
PK	V	1282.004	22.4	69.5	2.2	6.6	0.0	-44.8	-13.0	-31.8	120/300 kHz
PK	V	1920.400	26.9	90.0	2.8	8.3	0.0	-59.7	-13.0	-46.7	120/300 kHz
PK	H	2000.000	33.9	84.7	2.8	8.3	0.0	-47.6	-13.0	-34.6	120/300 kHz
PK	V	2560.000	26.4	87.8	3.3	9.4	0.0	-57.3	-13.0	-44.3	120/300 kHz
PK	V	1738.400	21.3	87.0	2.6	8.2	0.0	-62.3	-13.0	-49.3	120/300 kHz
PK	V	2607.600	21.1	86.1	3.3	9.3	0.0	-61.1	-13.0	-48.1	120/300 kHz
PK	V	3476.800	22.8	84.2	4.0	9.5	0.0	-58.0	-13.0	-45.0	120/300 kHz
PK	V	4346.000	21.1	86.8	4.6	10.2	0.0	-62.3	-13.0	-49.3	120/300 kHz
PK	V	5215.200	22.5	86.0	5.3	10.2	0.0	-60.7	-13.0	-47.7	120/300 kHz
PK	V	6084.400	23.4	85.0	5.9	11.1	0.0	-58.5	-13.0	-45.5	120/300 kHz
PK	V	6953.600	24.6	81.4	6.5	11.2	0.0	-54.2	-13.0	-41.2	120/300 kHz
PK	V	7822.800	22.5	77.9	7.3	10.7	0.0	-54.2	-13.0	-41.2	120/300 kHz
PK	V	8692.000	23.0	77.0	7.8	11.0	0.0	-53.0	-13.0	-40.0	120/300 kHz
PK	V	1764.400	21.5	84.8	2.6	8.2	0.0	-59.9	-13.0	-46.9	120/300 kHz
PK	V	2646.600	22.6	86.3	3.3	9.3	0.0	-59.9	-13.0	-46.9	120/300 kHz
PK	V	3528.800	21.6	84.8	4.0	9.5	0.0	-59.9	-13.0	-46.9	120/300 kHz
PK	V	4411.000	21.3	86.2	4.6	10.3	0.0	-61.4	-13.0	-48.4	120/300 kHz
PK	V	5293.200	22.0	85.9	5.3	10.3	0.0	-61.2	-13.0	-48.2	120/300 kHz
PK	V	6175.400	22.2	84.3	6.0	11.2	0.0	-59.0	-13.0	-46.0	120/300 kHz
PK	V	7057.600	22.6	81.8	6.6	11.1	0.0	-56.8	-13.0	-43.8	120/300 kHz
PK	V	7939.800	21.4	76.7	7.4	10.8	0.0	-54.0	-13.0	-41.0	120/300 kHz
PK	V	8822.000	23.1	74.9	7.8	11.0	0.0	-50.8	-13.0	-37.8	120/300 kHz
PK	V	1787.600	21.7	86.5	2.7	8.2	0.0	-61.4	-13.0	-48.4	120/300 kHz
PK	V	2681.400	22.6	86.8	3.4	9.3	0.0	-60.4	-13.0	-47.4	120/300 kHz
PK	V	3575.200	21.6	84.8	4.0	9.5	0.0	-59.9	-13.0	-46.9	120/300 kHz
PK	V	4469.000	21.8	87.0	4.7	10.4	0.0	-61.7	-13.0	-48.7	120/300 kHz
PK	V	5362.800	21.9	85.7	5.3	10.3	0.0	-61.0	-13.0	-48.0	120/300 kHz
PK	V	6256.600	22.7	84.8	6.1	11.2	0.0	-59.1	-13.0	-46.1	120/300 kHz
PK	V	7150.400	21.6	81.3	6.7	11.0	0.0	-57.6	-13.0	-44.6	120/300 kHz
PK	V	8044.200	22.3	78.2	7.5	10.9	0.0	-54.6	-13.0	-41.6	120/300 kHz
PK	V	8938.000	22.7	75.9	7.9	11.0	0.0	-52.2	-13.0	-39.2	120/300 kHz

Receiver Spurious Emissions

Radiated Emissions

Company: Vanu, Inc.
Model #: GSM Basestation
Serial #: 1074
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3112039 Date(s): 01/05/07
Standard: FCC Part 15 Subpart B 15.109/IC RSS-Gen Table 1
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE8 11-14-07.txt Test Distance (m): 3
Barometer: BAR2 Temp/Humidity/Pressure: 20c 44% 1000mB

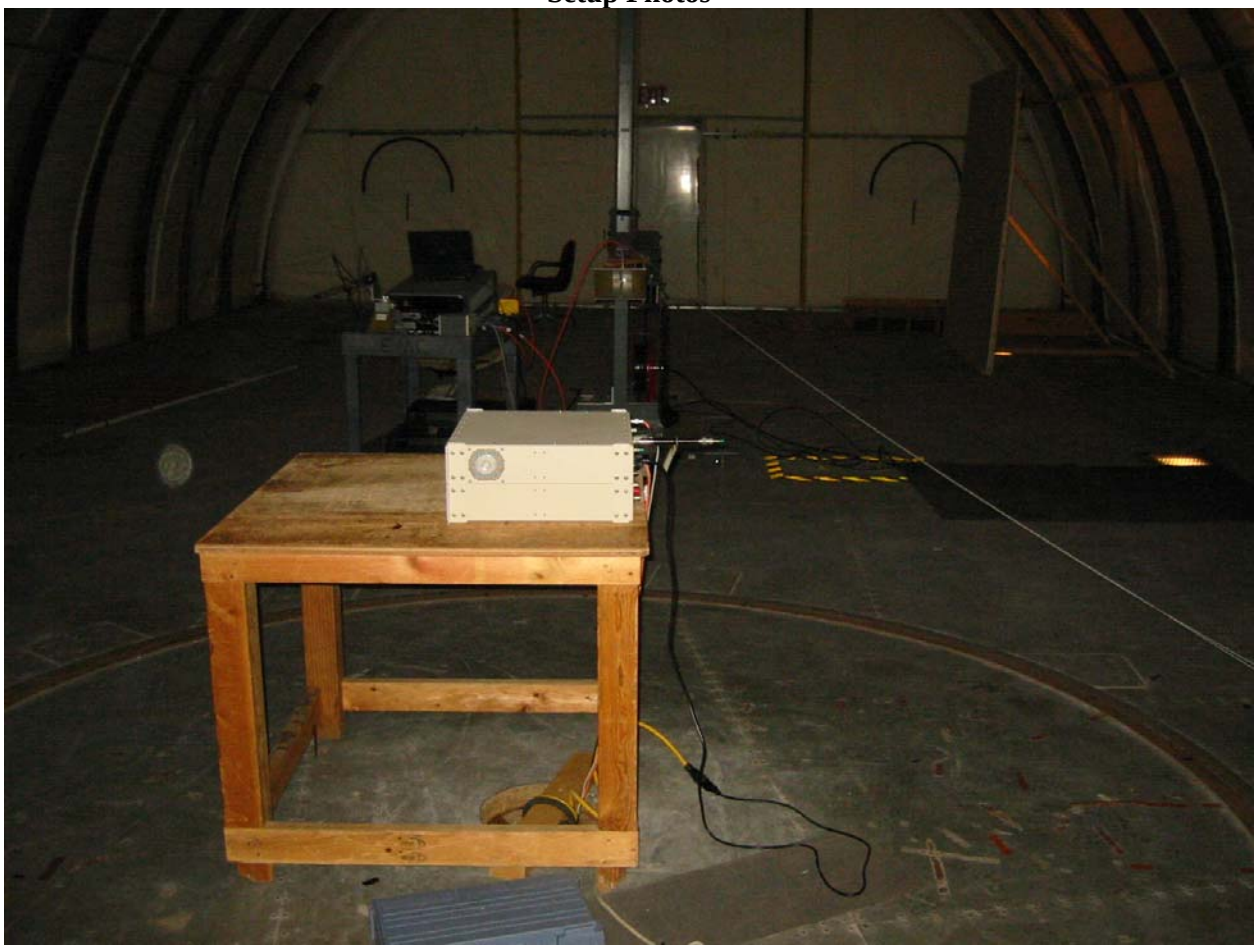
Antenna & Cables: N Bands: N, LF, HF, SHF
LF Antenna: NONE. NONE.
N Antenna: LOG2 1-25-07 V3.txt LOG2 1-25-07 H3.txt
HF Antenna: HORN3 V3m 6-12-07.txt HORN3 H3m 6-12-07.txt
SHF Antenna: HORN3 V3m 6-12-07.txt HORN3 H3m 6-12-07.txt
LF Cable(s): NONE. NONE.
N Cable(s): S2 3M FLR 9-26-07.txt NONE.
HF Cable(s): CBL029 12-04-2007.txt NONE.
SHF Cable(s): CBL029 12-04-2007.txt CBL030 12-04-2007.txt

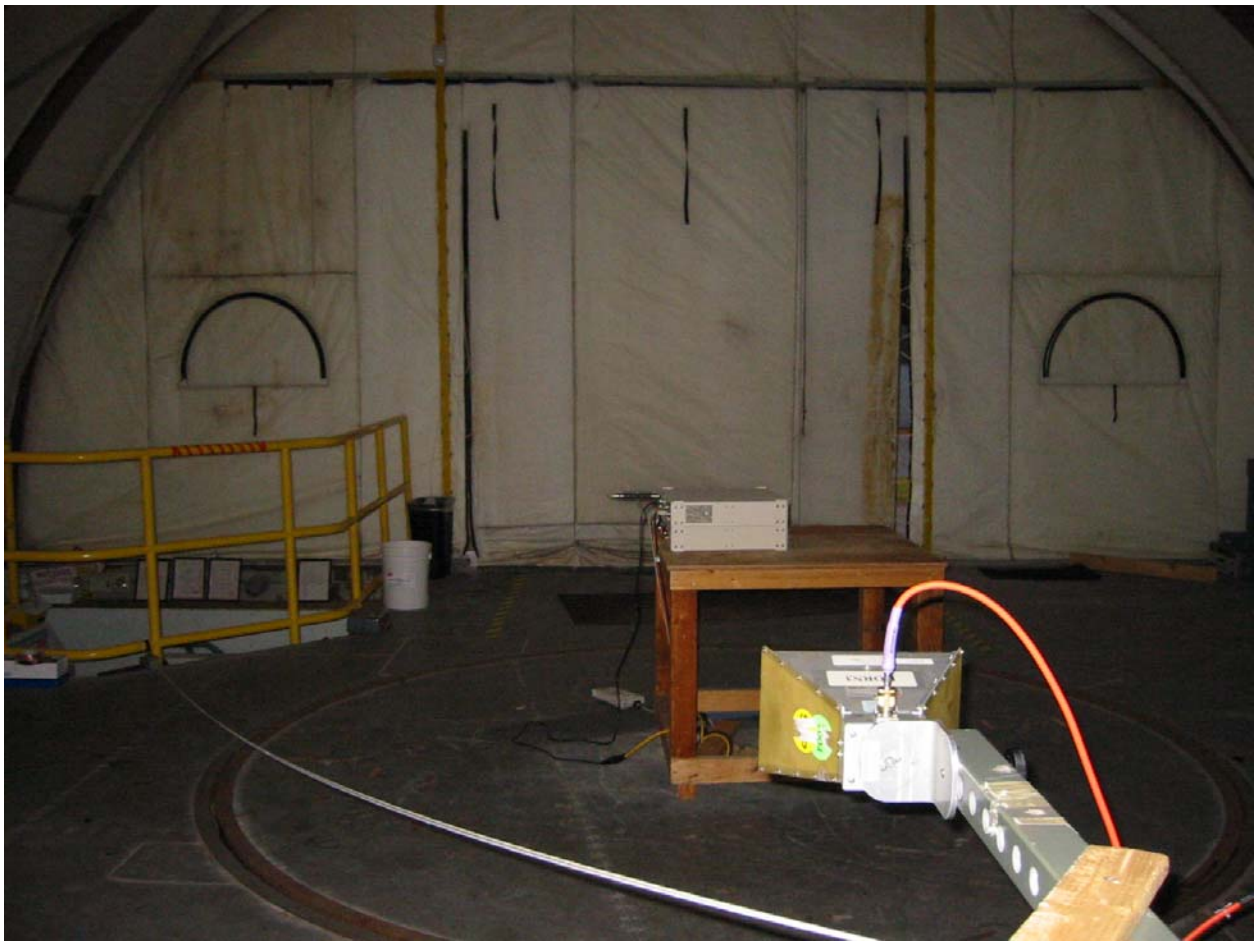
PreAmp Used? (Y or N): N Voltage/Frequency: 120V/60Hz Frequency Range: 30-2500 MHz

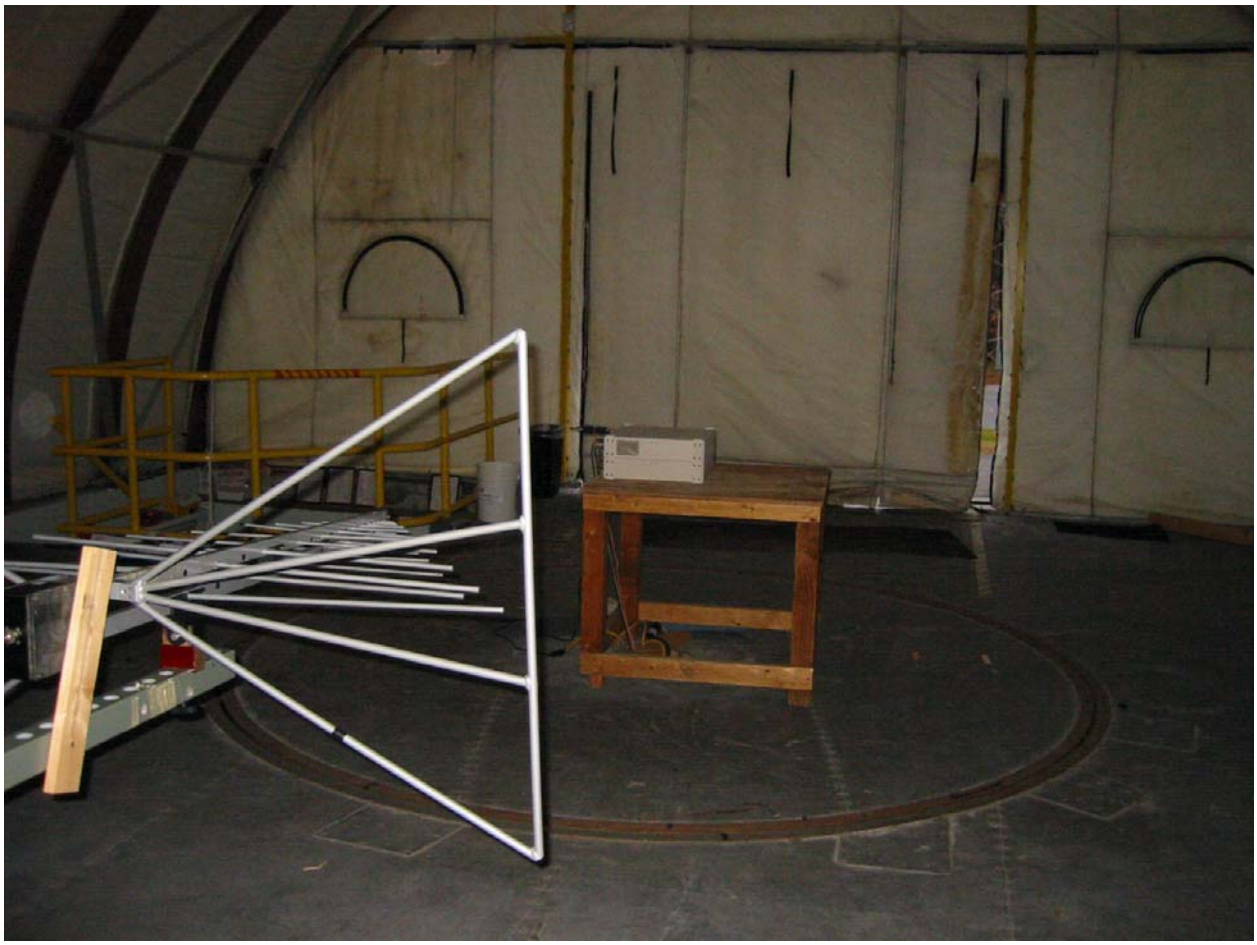
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

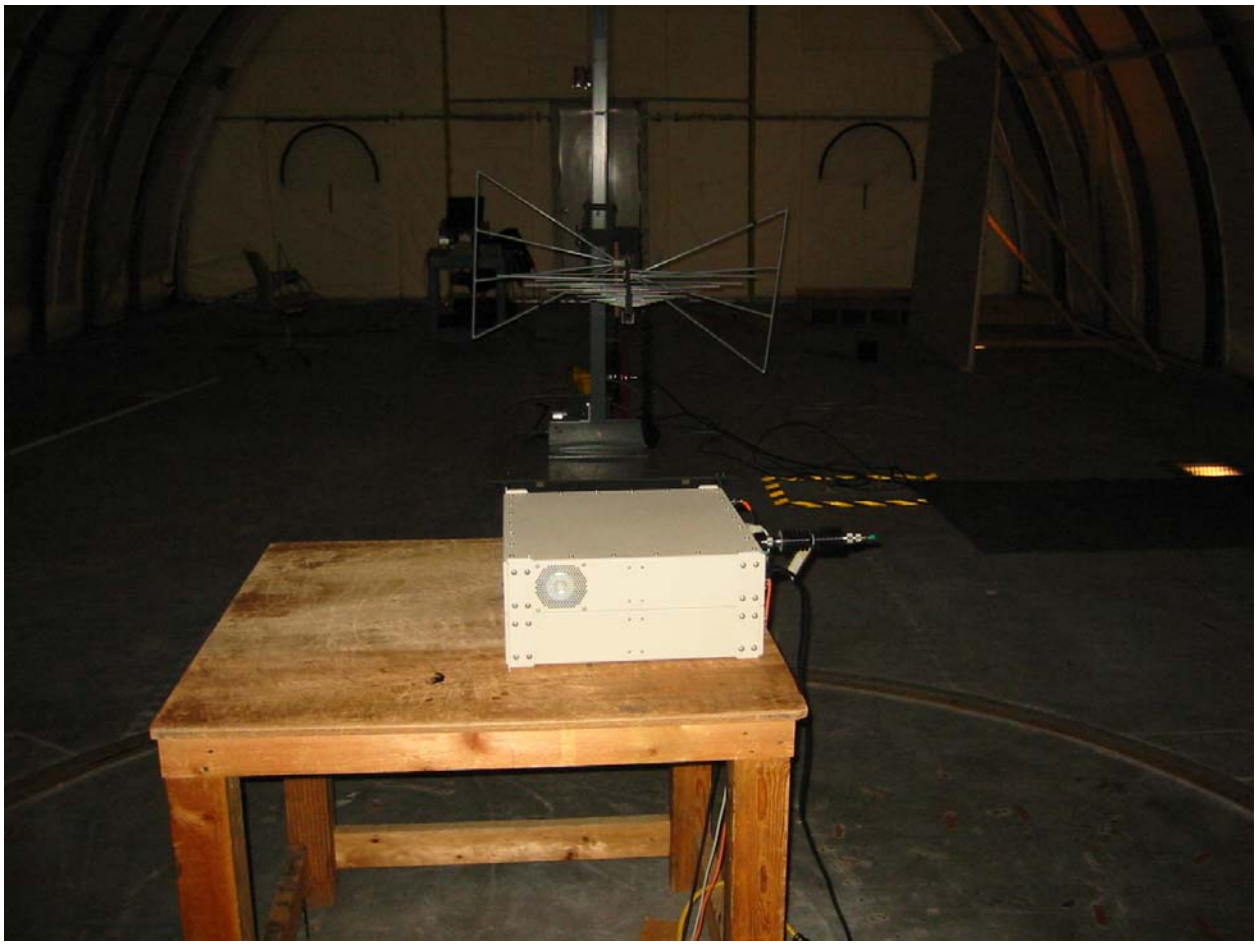
Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
QP	V	34.650	20.1	14.3	1.0	0.0	0.0	35.3	40.0	-4.7	120/300 kHz		
QP	V	46.610	19.9	9.3	0.9	0.0	0.0	30.2	40.0	-9.8	120/300 kHz		
QP	V	49.980	25.1	8.4	1.0	0.0	0.0	34.5	40.0	-5.5	120/300 kHz		
QP	V	63.000	23.5	8.4	1.1	0.0	0.0	33.0	40.0	-7.0	120/300 kHz		
QP	V	74.430	16.9	7.5	1.2	0.0	0.0	25.6	40.0	-14.4	120/300 kHz	RB	RB
QP	V	109.400	13.5	7.9	1.4	0.0	0.0	22.8	43.5	-20.7	120/300 kHz	RB	RB
QP	V	129.000	15.5	6.6	1.4	0.0	0.0	23.5	43.5	-20.0	120/300 kHz	RB	RB
QP	V	141.500	21.3	7.4	1.6	0.0	0.0	30.2	43.5	-13.3	120/300 kHz		
QP	H	154.800	12.5	9.4	1.7	0.0	0.0	23.6	43.5	-19.9	120/300 kHz		
QP	H	196.800	16.0	10.4	2.0	0.0	0.0	28.4	43.5	-15.1	120/300 kHz		
QP	H	208.000	15.4	10.7	2.1	0.0	0.0	28.2	43.5	-15.3	120/300 kHz		
QP	H	217.800	12.6	11.2	2.2	0.0	0.0	26.0	46.0	-20.0	120/300 kHz		
QP	H	234.600	14.2	11.8	2.2	0.0	0.0	28.2	46.0	-17.8	120/300 kHz		
QP	H	240.000	29.2	12.0	2.2	0.0	0.0	43.4	46.0	-2.6	120/300 kHz	RB	RB
QP	V	250.000	17.6	12.6	2.2	0.0	0.0	32.4	46.0	-13.6	120/300 kHz	RB	RB
QP	V	256.000	16.7	12.8	2.4	0.0	0.0	31.9	46.0	-14.1	120/300 kHz	RB	RB
QP	V	267.100	13.9	13.1	2.5	0.0	0.0	29.5	46.0	-16.5	120/300 kHz	RB	RB
QP	V	292.000	15.0	14.0	2.4	0.0	0.0	31.4	46.0	-14.6	120/300 kHz		
QP	H	320.000	21.6	14.8	2.5	0.0	0.0	38.9	46.0	-7.1	120/300 kHz		
QP	V	350.000	19.2	15.2	2.4	0.0	0.0	36.8	46.0	-9.3	120/300 kHz		
QP	V	360.000	19.5	15.2	2.7	0.0	0.0	37.4	46.0	-8.6	120/300 kHz		
QP	V	375.000	20.6	15.3	3.0	0.0	0.0	38.9	46.0	-7.1	120/300 kHz		
QP	H	400.000	12.9	16.5	2.8	0.0	0.0	32.2	46.0	-13.8	120/300 kHz	RB	RB
QP	V	405.900	7.0	15.9	2.7	0.0	0.0	25.6	46.0	-20.4	120/300 kHz	RB	RB
QP	V	480.000	19.1	18.5	3.0	0.0	0.0	40.6	46.0	-5.4	120/300 kHz		
QP	V	720.000	18.4	20.7	3.8	0.0	0.0	42.9	46.0	-3.1	120/300 kHz		

Setup Photos









Test Results: Pass

Test Standard: FCC Part 22 Subpart H 22.355, IC RSS-132 Section 4.3

Test: Frequency Stability

Performance Criterion: The fundamental frequency must not deviate by more than ±1.5 PPM over temperature and voltage.

Test Environment:

Environmental Conditions During Testing:	Humidity (%):	N/A	Pressure (hPa):	N/A	Ambient (°C):	See Table
Pretest Verification Performed	Yes		Equipment under Test:		GSM Basestation	

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Variac, 0-140V	Powerstat	3PN126	N/L	Verified
2	Small Temperature/Humidity Chamber	Bryant Manufacturing	TH-5S	1207	04/06/2007
3	Spectrum Analyzer	Agilent	E7405A	US40240205	08/16/2007
4	Digital Multimeter	Fluke	87	55900169	04/12/2007
5	High Frequency Cable 40GHz	Megaphase	TM40 K1K180	CBL030	12/04/2007

Test Details:

Channels	Freq MHz
Low:	869.2
Mid:	882.2
High:	893.8

Passband: 869-894 MHz

Temp	Channel	Freq MHz	Deviation, Hz	Deviation, MHz	PPM
-30	LOW	869.200040	0	0.000000	0.00
-30	MID	882.200040	0	0.000000	0.00
-30	HIGH	893.800040	0	0.000000	0.00
-20	LOW	869.200040	0	0.000000	0.00
-20	MID	882.200040	0	0.000000	0.00
-20	HIGH	893.800040	0	0.000000	0.00
-10	LOW	869.200040	0	0.000000	0.00
-10	MID	882.200040	0	0.000000	0.00
-10	HIGH	893.800040	0	0.000000	0.00
0	LOW	869.200030	-10	-0.000010	-0.01
0	MID	882.200030	-10	-0.000010	-0.01
0	HIGH	893.800030	-10	-0.000010	-0.01
10	LOW	869.200040	0	0.000000	0.00
10	MID	882.200040	0	0.000000	0.00
10	HIGH	893.800040	0	0.000000	0.00
20	LOW	869.200040	0	0.000000	0.00
20	MID	882.200040	0	0.000000	0.00
20	HIGH	893.800040	0	0.000000	0.00
30	LOW	869.200030	-10	-0.000010	-0.01
30	MID	882.200030	-10	-0.000010	-0.01
30	HIGH	893.800030	-10	-0.000010	-0.01
40	LOW	869.200040	0	0.000000	0.00
40	MID	882.200040	0	0.000000	0.00
40	HIGH	893.800040	0	0.000000	0.00
50	LOW	869.200030	-10	-0.000010	-0.01
50	MID	882.200030	-10	-0.000010	-0.01
50	HIGH	893.800030	-10	-0.000010	-0.01
Voltage	Channel	Freq MHz	Deviation, Hz	Deviation, MHz	PPM
102V	LOW	869.200040	0	0.000000	0.00
102V	MID	882.200040	0	0.000000	0.00
102V	HIGH	893.800040	0	0.000000	0.00
120V	LOW	869.200040	0	0.000000	0.00
120V	MID	882.200040	0	0.000000	0.00
120V	HIGH	893.800040	0	0.000000	0.00
138V	LOW	869.200040	0	0.000000	0.00
138V	MID	882.200040	0	0.000000	0.00
138V	HIGH	893.800040	0	0.000000	0.00