TEST REPORT

of the accredited test laboratory

TÜV Nr.:M/FG-07/110

Applicant:	Siemens AG Österreich Erdberger Lände 26 A-1031 Wien
Tested Product:	GSM transceiver
Type:	Ay (FCC-ID: NXWAYTERMINAL)
Manufacturer:	Siemens AG Österreich Erdberger Lände 26 A-1031 Wien
Output power / field strength:	2 W @ 850 and 1 W @ 1900
power supply:	3,7 VDC
Frequency range:	824 – 849 and 1850 - 1910 MHz
Channel separation:	200 kHz
Standard:	FCC: 47 CFR 22 (RSS-128) and 47 CFR 24 (RSS-133)

TÜV AUSTRIA SERVICES GMBH
Test laboratory for EMC

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10. 7. 2007

checked by:

Ing. Michael Emminger

Copy Nbr.: 01

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The results of this test report only refer to the provided equipment.

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DVR 3002476

LIST OF MEASUREMENTS

The complete list of measurements called for in the standards is given below.

SUBCLAUSE	PARAMETER TO BE MEASURED	PAGE
	Intentional Radiators	
	Test object data	3
22.913 – 7.1 (RSS-128) 24.232 – 6.2 (RSS-133)	Power Output	4-5
22.355 – 8. (RSS-128) 24.235 – 7. (RSS-133)	Frequency stability	6-7
22.917 – 7.5 (RSS-128) 24.238 – 6.3 (RSS-133) 15.209 – 9. (RSS-128/133)	Emissions Limits	8-11
2.989 – 7.5 (RSS-128) – 6.3 (RSS-133)	Occupied Bandwidth	12-23

To make the documentation of the measurements easier, on the measurement related pages only the FCC requirements are referenced and are equal to the canadian requirements as referenced in the matrix above.

TEST OBJECT DATA

General EUT Description

The product Ay will be used in a way like other mobile phones for cellular networks are used in PTT mode. It consist of a previous certified GSM module, but the authorization of the module is limited to use at distances not closer than 20cm from persons. So for the Ay there is a new certification needed.

The GSM Modem used is capable of operation in the relevant bands 850 MHz and 1900 MHz.

Power Output **§ 22.913**

850 MHz

ERP Measurement

Frequency (MHz)	Power Step	Burst Average (dBm)	Modulation Average (dBm)
824,2	5	24,1	14,4
836,6	5	26,2	16,7
848,8	5	28,2	18,5
Measurement uncertainty	± 4 dB		

LIMIT

Power Step	Burst Average ERP (dBm)
5	≤ 38,5

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-208

Power Output **§ 24.232**

1900 MHz

EIRP Measurement

Frequency (MHz)	Power Step	Burst Average (dBm)	Modulation Average (dBm)
1850,2	0	31,3	21,8
1880,0	0	30,2	20,6
1909,8	0	27,3	17,5
Measurement uncertainty	± 4 dB		

LIMIT

Power Step	Burst Average EIRP (dBm)
0	≤ 33

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-208

Frequency stability **§ 22.355**

850 MHz

Frequency error vs. Supply voltage

Supply voltage V	Frequency Error Hz	Frequency Error ppm
3,7	+15	+0,018
3,3	+15	+0,018
4,1	+15	+0,018

Frequency error vs. Temperature

The transceiver switches off below a certain temperature, so at minus 30 degrees C there was no possibility to measure the frequency error. It was tested that the transceiver switches off at minus 21 degrees C.

Temperature °C	Frequency Error Hz	Frequency Error ppm
-30	x	x
-20	+10	+0,012
-10	+18	+0,022
±0	+19	+0,023
+10	+20	+0,024
+20	+15	+0,018
+30	+20	+0,024
+40	+19	+0,023
+50	+16	+0,019

LIMIT

According to GSM standards the frequency stability of the carrier shall be accurate to within 0,1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 22.355, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Frequency stability **§ 24.235**

1900 MHz

Frequency error vs. Supply voltage

Supply voltage V	Frequency Error Hz	Frequency Error ppm
3,7	+44	+0,023
3,3	+44	+0,023
4,1	+44	+0,023

Frequency error vs. Temperature

The transceiver switches off below a certain temperature, so at minus 30 degrees C there was no possibility to measure the frequency error. It was tested that the transceiver switches off at minus 21 degrees C.

Temperature °C	Frequency Error Hz	Frequency Error ppm
-30	x	x
-20	+22	+0,012
-10	+32	+0,017
±0	+42	+0,022
+10	+43	+0,023
+20	+44	+0,023
+30	+38	+0,020
+40	+37	+0,020
+50	+34	+0,018

LIMIT

According to GSM standards the frequency stability of the carrier shall be accurate to within 0,1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 22.355, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Emissions Limits **§ 22.917**

850 MHz **§ 15.209**

LIMIT
22.917:
The power of any emission outside the authorized operating frequency ranges must be attenuated below the transmitter power (P, in watts) by at least 43+10log(P) dB. In the used power range this means a constant absolute limit of –13 dBm. Although the Limits of 15.209 are in field strength levels, the limits are far below that one of 22.917. So for all radiated measurements the 15.209 limit was taken to show compliance as digital device also.

Conducted Emissions

Not applicable because the equipment has integral antenna.

Test Equipment used: NT-207; NT-208

Emissions Limits **§ 24.238**

1900 MHz **§ 15.209**

LIMIT
24.238:
On any frequency outside a licensee's frequency block within 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. In the used power range this means a constant absolute limit of –13 dBm. Although the Limits of 15.209 are in field strength levels, the limits are far below that one of 24.238. So for all radiated measurements the 15.209 limit was taken to show compliance as digital device also.

Conducted Emissions

Not applicable because the equipment has integral antenna.

Test Equipment used: NT-207; NT-208

Emissions Limits **§ 22.917**

850 MHz **§ 15.209**

Radiated Emissions

CHANNEL					
128 (824,2 MHz)		190 (836,6 MHz)		251 (848,8 MHz)	
Frequency (MHz)	Level (dBµV/m)	Frequency (MHz)	Level (dBµV/m)	Frequency (MHz)	Level (dBµV/m)
≤ 500	< 35 QP	≤ 500	< 35 QP	≤ 500	< 35 QP
≤ 1000	< 40 QP	≤ 1000	< 40 QP	≤ 1000	< 40 QP
> 1000	< 45 AV	> 1000	< 45 AV	> 1000	< 45 AV

At frequencies above 1 GHz all emissions except the harmonics of the transmitter were below the level stated above. The harmonics were more than 20 dB below the applicable limit and for this reason the levels were not recorded but are visible in the measurement diagrams in Annex 2.

LIMIT 15.209

Frequency (MHz)	Limit (dBµV/m)	Measurement distance (m)
30 - 88	40	3
88 - 216	43,5	3
216 - 960	46	3
Above 960	54	3

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-208

Emissions Limits **§ 24.238**

1900 MHz **§ 15.209**

Radiated Emissions

CHANNEL					
512 (1850,2 MHz)		661 (1880 MHz)		810 (1909,8 MHz)	
Frequency (MHz)	Level (dBµV/m)	Frequency (MHz)	Level (dBµV/m)	Frequency (MHz)	Level (dBµV/m)
≤ 500	< 35 QP	≤ 500	< 35 QP	≤ 500	< 35 QP
≤ 1000	< 40 QP	≤ 1000	< 40 QP	≤ 1000	< 40 QP
> 1000	< 50 AV	> 1000	< 50 AV	> 1000	< 50 AV

At frequencies above 1 GHz all emissions except the harmonics of the transmitter were below the level stated above. The harmonics were more than 20 dB below the applicable limit and for this reason the levels were not recorded but are visible in the measurement diagrams in Annex 2.

LIMIT 15.209

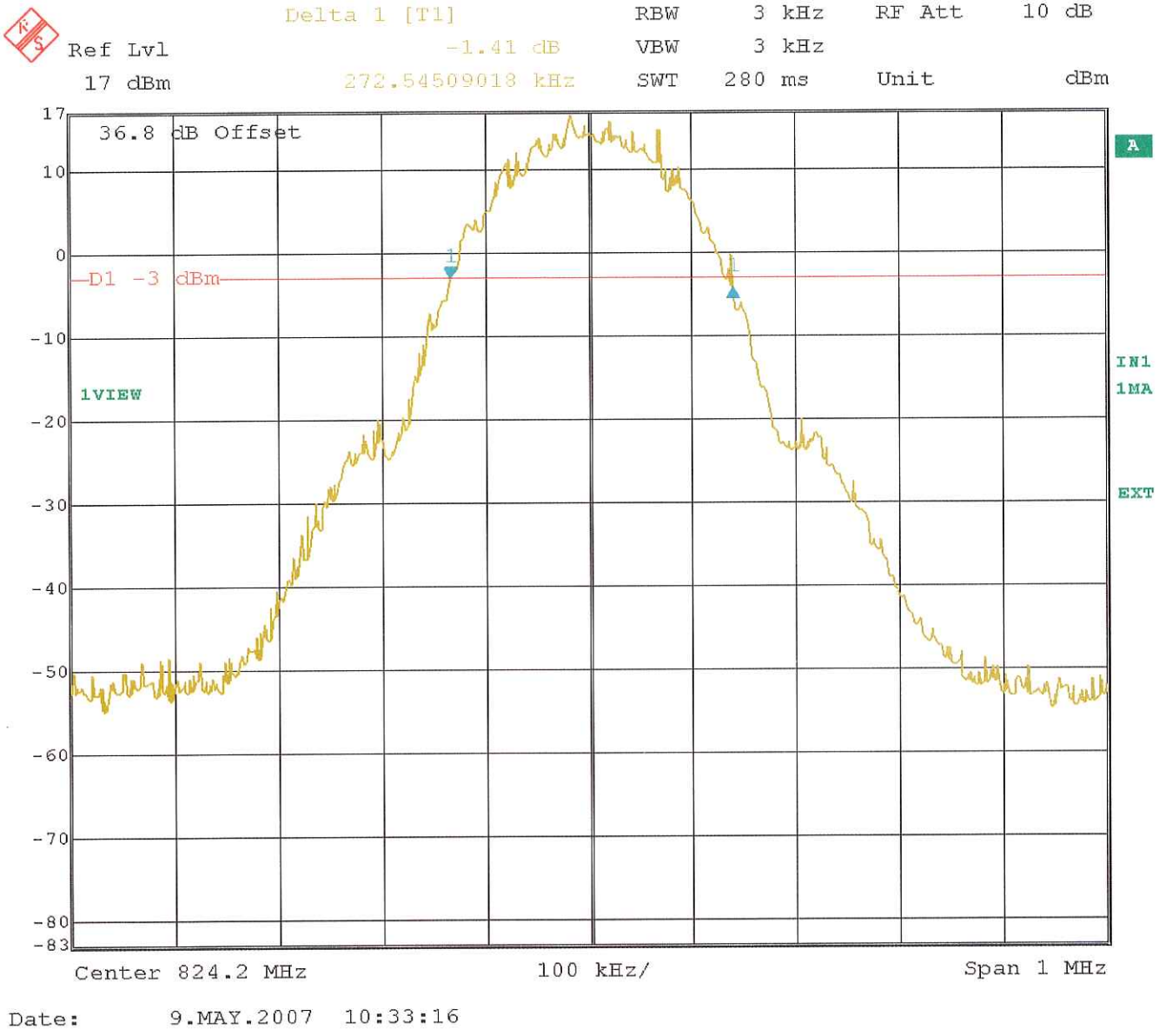
Frequency (MHz)	Limit (dBµV/m)	Measurement distance (m)
30 - 88	40	3
88 - 216	43,5	3
216 - 960	46	3
Above 960	54	3

Test Equipment used: NT-100; NT-110; NT-111; NT-112; NT-125; NT-207; NT-208

Although the measurements were made up to the 10th harmonic, the diagrams only show the frequency range up to 18 GHz. This is because the measurements above 18 GHz are not yet automatized and we were not able to plot the Spectrum analyzer display.

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

850 MHz



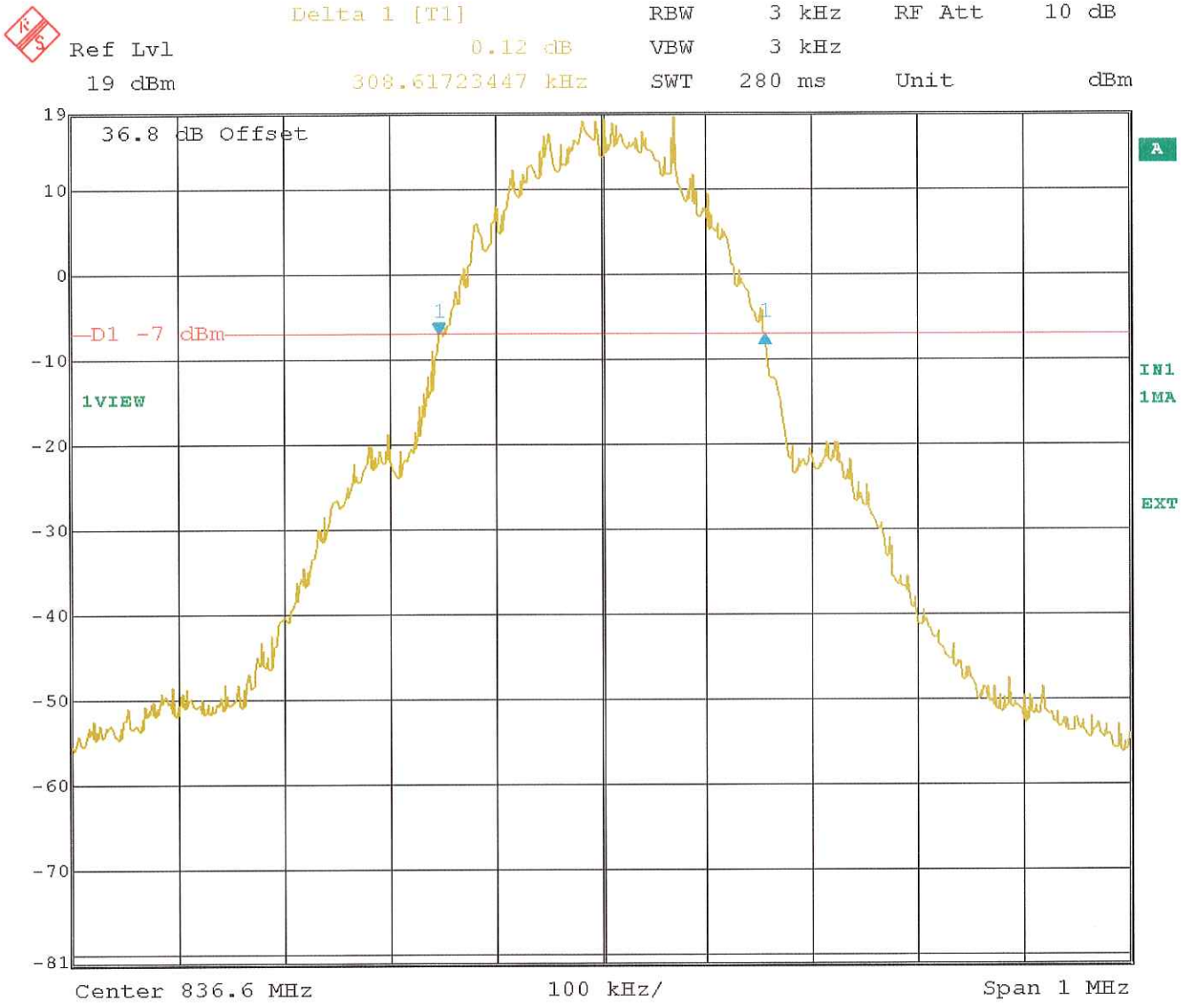
channel 128 Bandwidth: 272,54 kHz

TEST EQUIPMENT USED: NT-207; NT-208

Ambient temperature: 22°C Relative humidity: 52%

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

850 MHz



Date: 9.MAY.2007 10:37:40

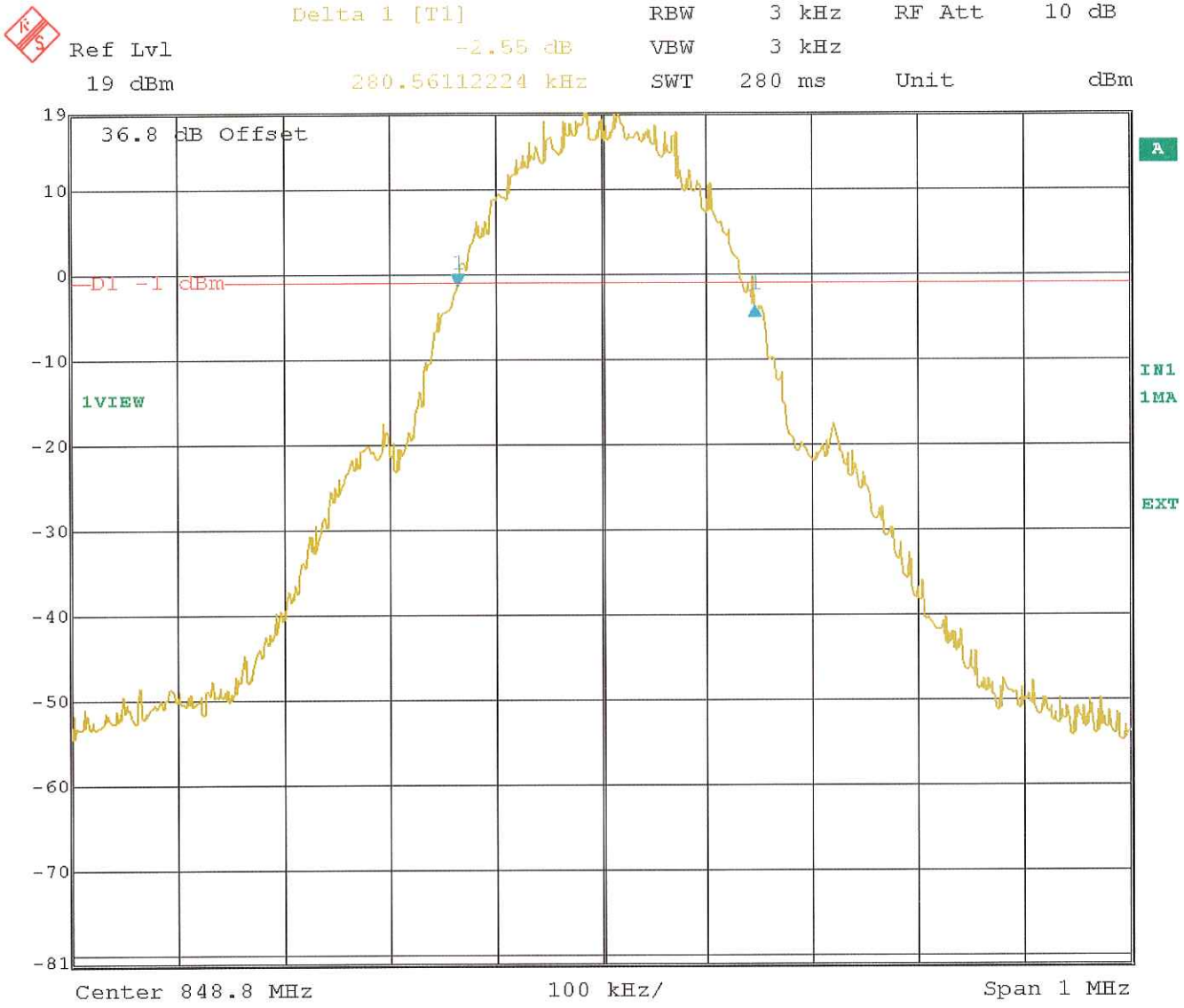
channel 190 Bandwidth: 308,62 kHz

TEST EQUIPMENT USED: NT-207; NT-208

Ambient temperature: 22°C Relative humidity: 52%

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

850 MHz



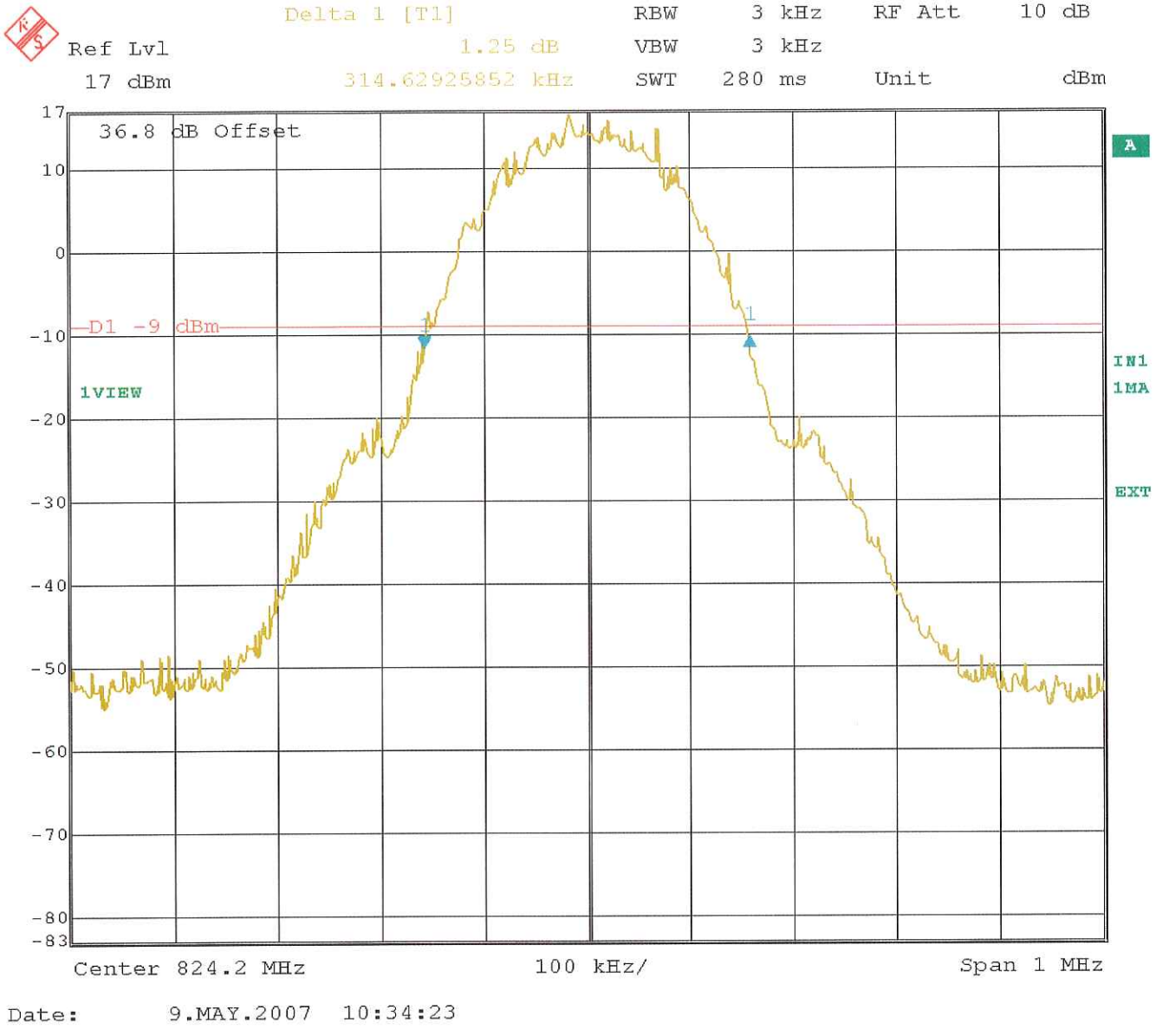
Date: 9.MAY.2007 10:40:05

channel 251 Bandwidth: 280,56 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

850 MHz

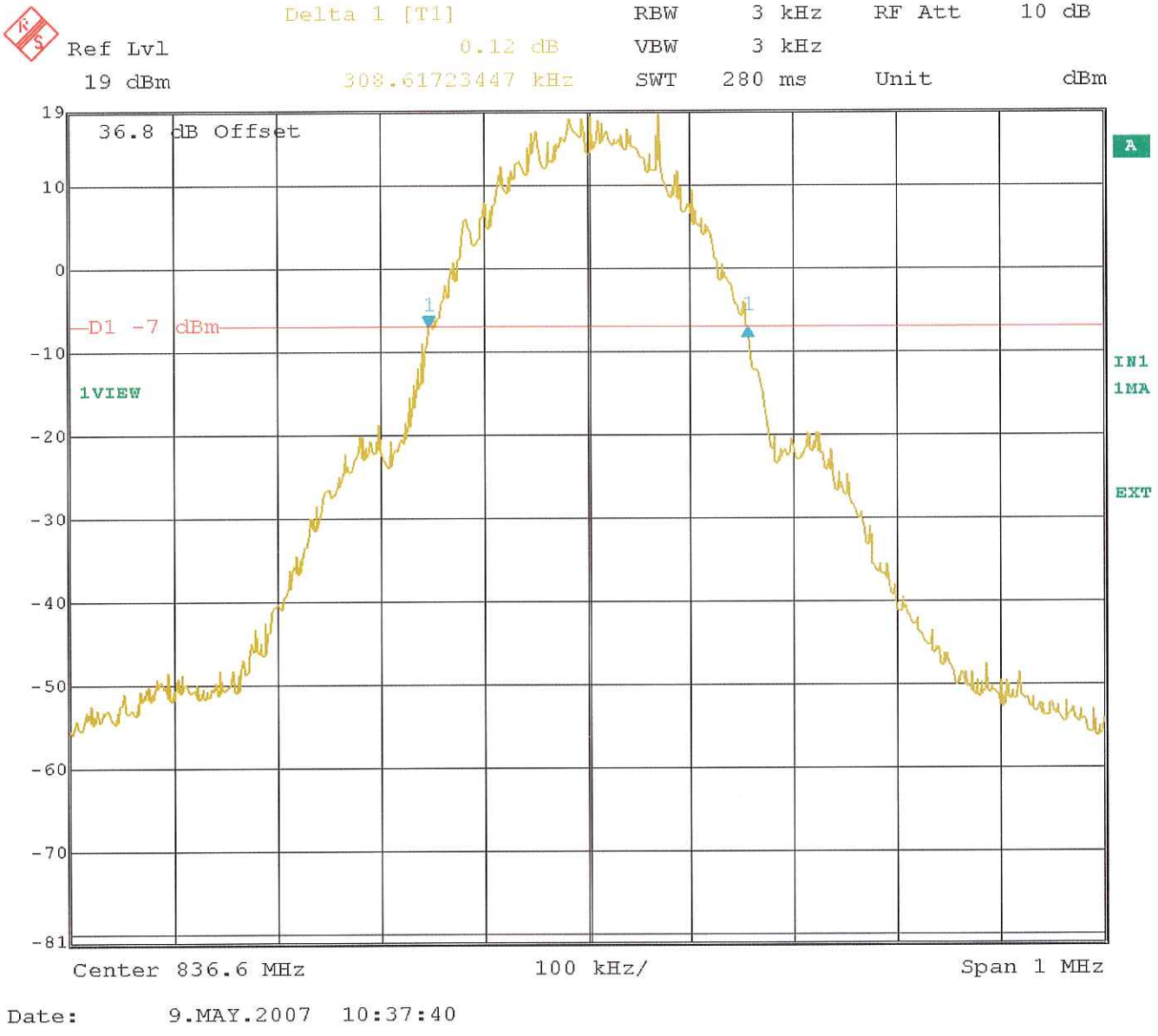


channel 128 Bandwidth: 314,62 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

850 MHz

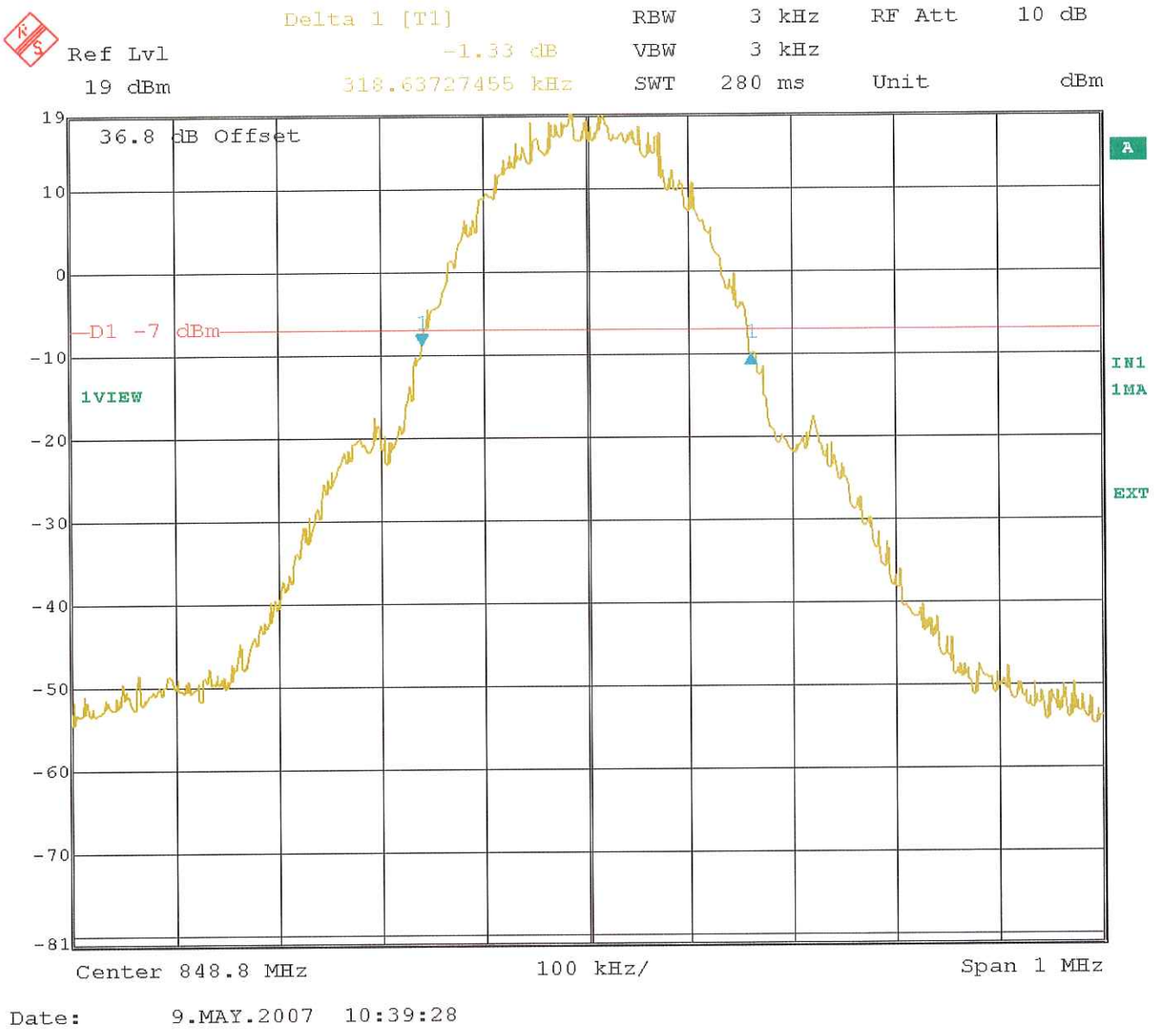


channel 190 Bandwidth: 308,62 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

850 MHz

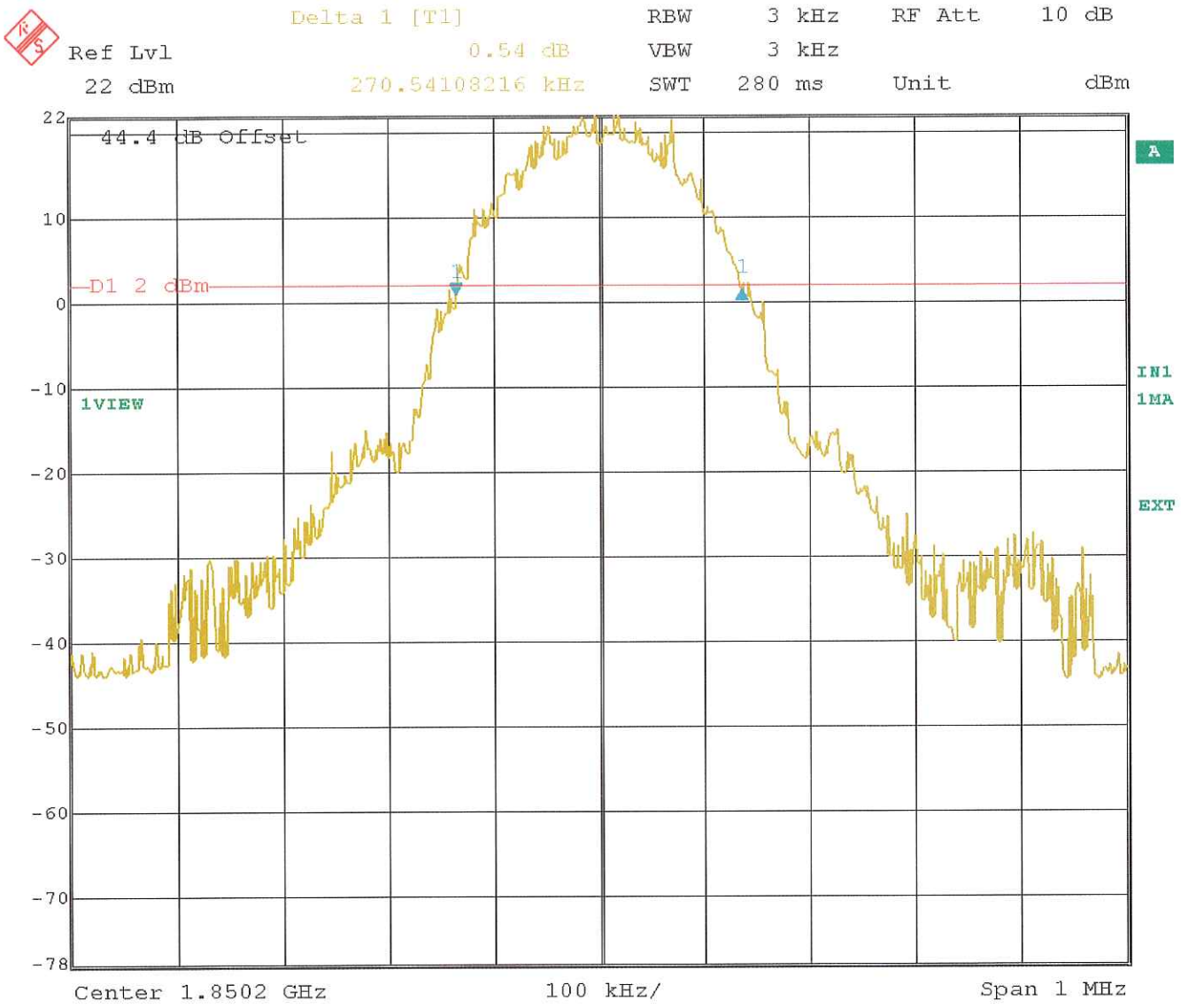


channel 251 Bandwidth: 318,64 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

1900 MHz



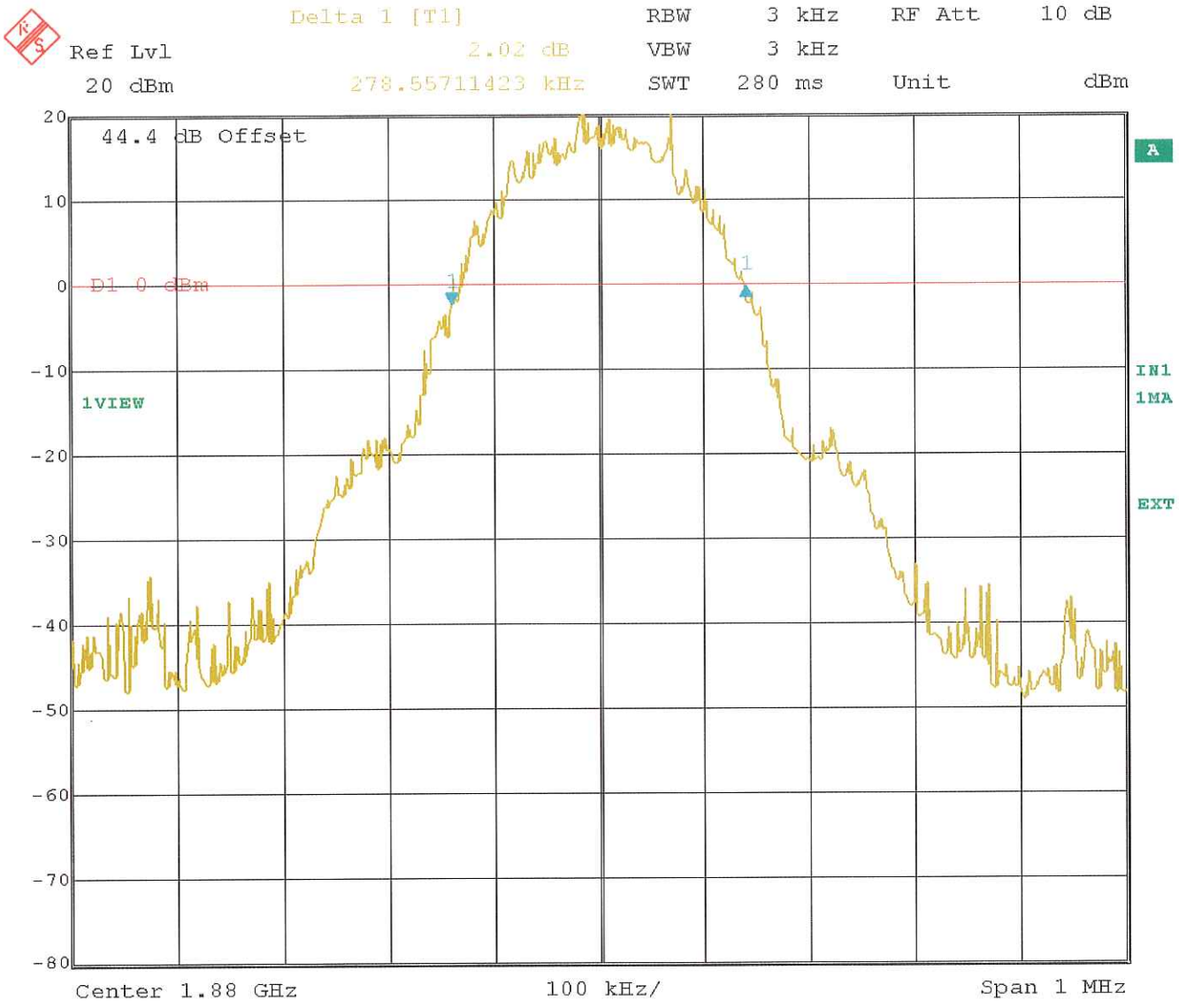
channel 512 Bandwidth: 270,54 kHz

TEST EQUIPMENT USED: NT-207; NT-208

Ambient temperature: 22°C Relative humidity: 52%

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

1900 MHz



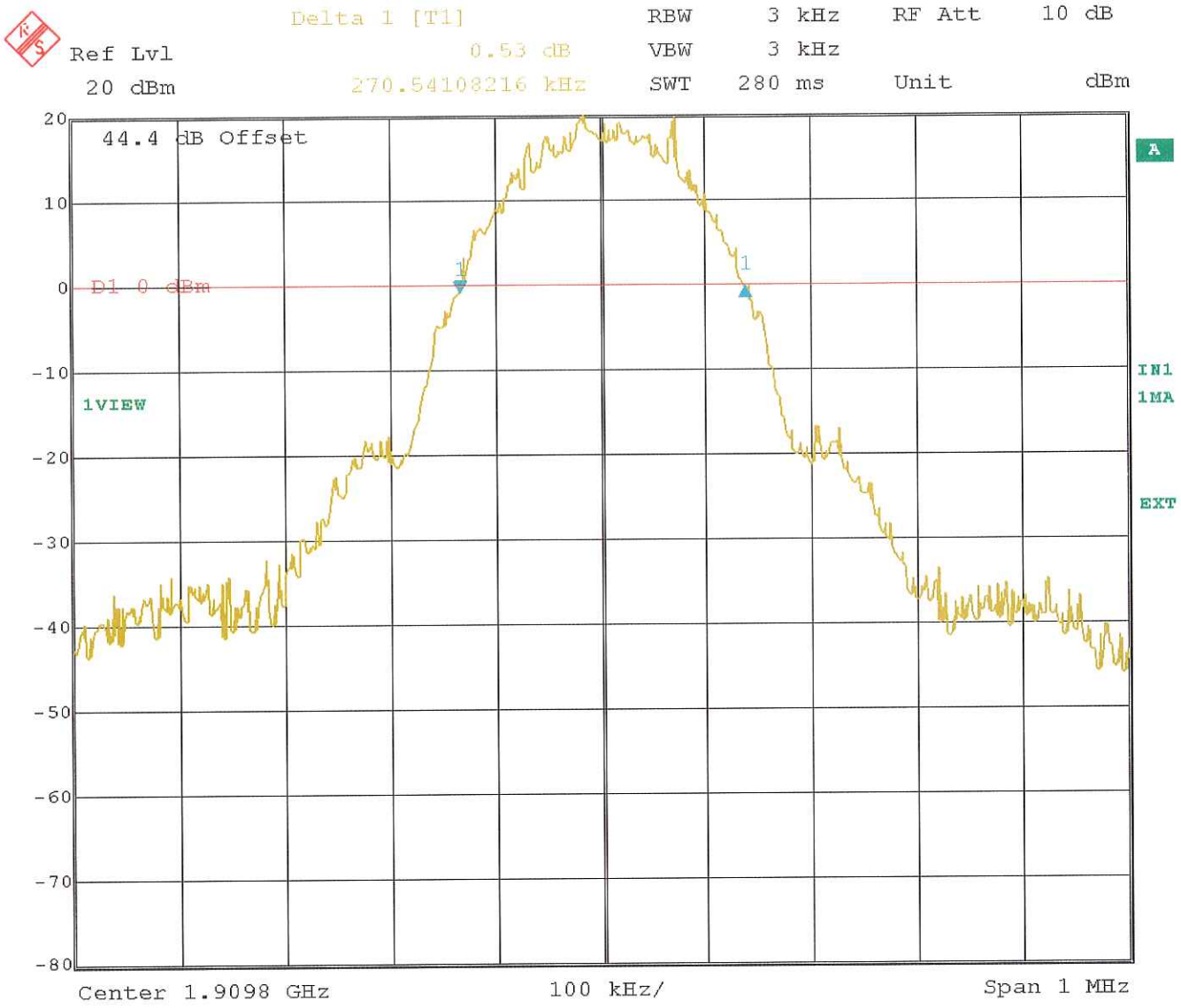
channel 661 Bandwidth: 278,56 kHz

TEST EQUIPMENT USED: NT-207; NT-208

Ambient temperature: 22°C Relative humidity: 52%

OCCUPIED BANDWIDTH – 20 dB BANDWIDTH § 2.989

1900 MHz

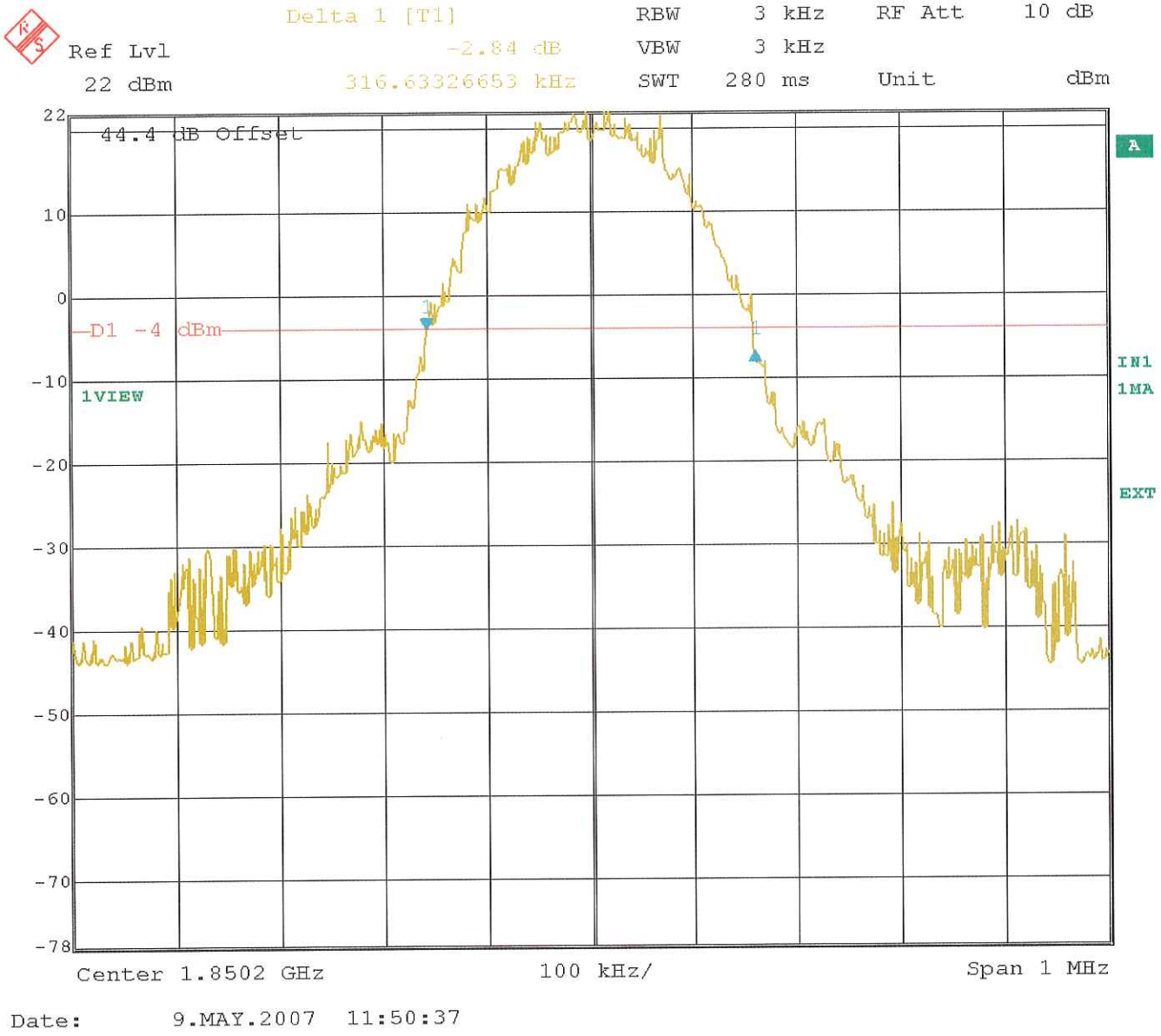


channel 810 Bandwidth: 270,54 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

1900 MHz



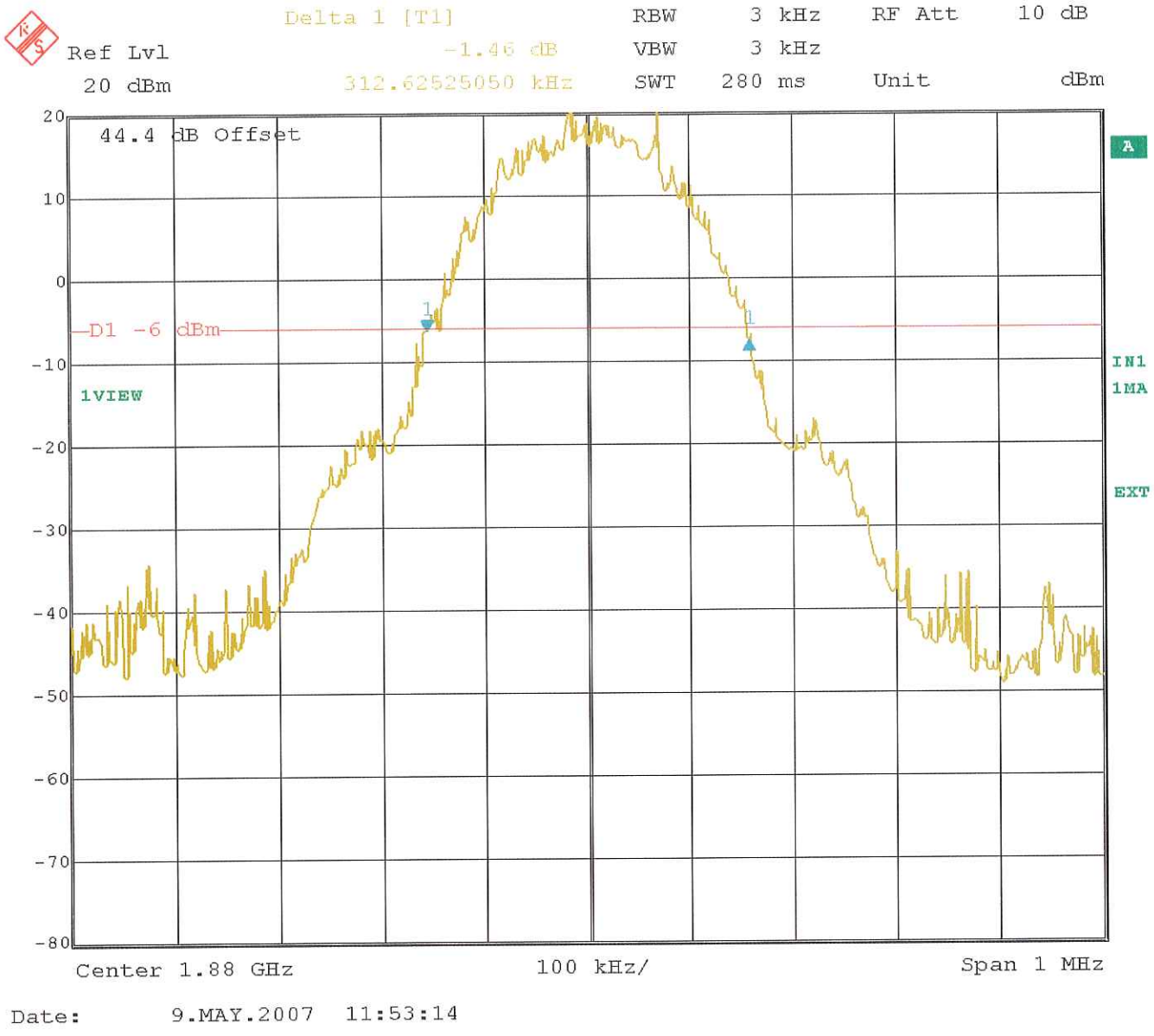
channel 512

Bandwidth: 316,63 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

1900 MHz



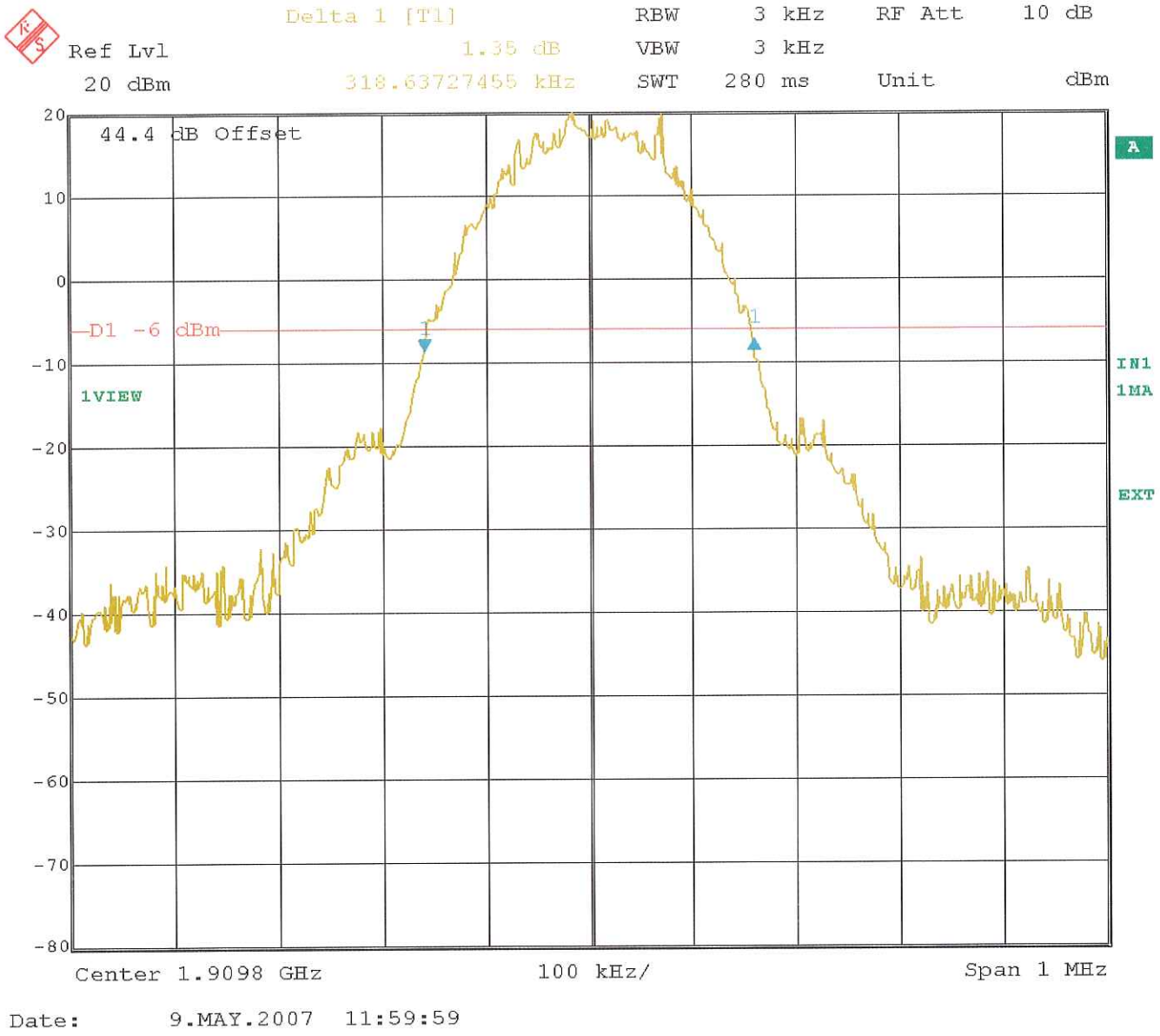
channel 661

Bandwidth: 312,63 kHz

TEST EQUIPMENT USED: NT-207; NT-208

OCCUPIED BANDWIDTH – 26 dB BANDWIDTH § 2.989

1900 MHz



channel 810 Bandwidth: 318,64 kHz

TEST EQUIPMENT USED: NT-207; NT-208