ACD-RPT-000380

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GLAST ACD
Gamma-ray Large Area Space Telescope
Anti-Coincidence Detector
Electromagnetic Compatibility (EMC) Test Report

ManTech Document No.

22-07-1298

April 2005

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Table of Contents

Table of Contents (cont.)

Tables

Appendix

ABSTRACT

Electromagnetic compatibility (EMC) retests were performed on the Gamma ray Large Area Telescope (GLAST), Anti Coincidence Detector (ACD) Electronic Chassis at the NASA Goddard Space Flight Center (GSFC) from November 23 – December 9, 2004 in accordance with the requirements in *ACD-PLAN-000215 B,* dated July 2004 and in *MIL-STD-461C* and *MIL-STD-461E.*

Radiated Emissions Results

Electric Field

The worst-case narrowband emission measured 28.2 dB above the limit at 27.96 MHz, while operating in the GSE ON, DUT OFF, and LOADBOX OFF. However there was only one emission of 8 dB above the limit at 27.96 MHz in test mode GSE ON, DUT ON, and LOADBOX ON. In this case the box and cables were foil covered. There were worst-case narrowband emissions in the 2 MHz to 70 MHz range. The highest was 20 dB at 18.27 MHz in the horizontal orientation.

Magnetic Field

The test measurements revealed that the DUT was in compliance with the RE101 test limits.

1 SCOPE

This document summarizes the results of the electromagnetic compatibility (EMC) tests performed on the Gamma-ray Large Area Space Telescope (GLAST) Anti-Coincidence Detector (ACD) Electronic Chassis at the NASA Goddard Space Flight Center (GSFC). The tests were performed from April 18 through April 20, 2005. Tests were conducted in accordance with the requirements in *ACD-PLAN-000215 B,* dated July 2004 and in *MIL-STD-461C* and *MIL-STD-461E*. Some tests were custom tailored to specific requirements as defined by LAT Environmental Specification, LAT-SS-00778-02 B, dated June 22, 2004

Any performance degradation, malfunction or deviations beyond the specified performance limits experienced by ACD will be discussed in detail herein. The ACD Electronic Chassis will hereafter be called the Device Under Test (DUT).

The following EMC tests were conducted:

- Grounding and Bonding
- RE102 Electric Field Radiated Emissions, 10 kHz to 1 GHz
- RE101 Magnetic Field Radiated Emissions, 30 Hz to 50 kHz

2 TEST FACILITY

Testing was performed at the Small EMC Test Facility in Building 7, Room 8. The facility is designed for EMC testing of NASA's flight hardware, subsystems and small payloads. Also, the facility is designed for the following EMC tests:

- **Emissions** - radiated and conducted electromagnetic interference levels generated by specific flight hardware.

- **Susceptibility** - the inability of specific flight hardware to function properly when subjected to specific levels of radiated and conducted electromagnetic interference.

3 APPLICABLE DOCUMENTS

The following documents pertain to this EMC test report to the extent specified herein:

3.1	ACD-PLAN-000215	ACD-PLAN-000215 GLAST ACD Electronic Chassis EMI/EMC Test Plan; July 2004 (Appendix B)
3.2	MIL-STD-461E	Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment, Aug 20, 1999
3.3	MIL-STD-461C	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference (Part 3); Aug. 4, 1986
3.4	MIL-STD-462, Notice 1	Electromagnetic Interference Characteristics, Measurement of; Aug. 1, 1968
3.5	NASA/GSFC	Code 549.3 Revised Safety Requirements for Testing in the EMI Shielded Enclosures; April 22, 1998 (Appendix A)
3.6	NASA/GSFC	Waiver for EMC Testing Under Severe Weather Conditions (see Appendix A)
3.7	NASA/GSFC P-303-840	Electrostatic Discharge (ESD) Control Program, Flight Assurance Procedure, Revision A; October 27, 1993

4 DESCRIPTION OF DUT

The DUT is the GLAST ACD ELECTRONIC CHASSIS. For this series of EMC tests, the GASU was an integral component of the DUT Photographs in Appendix A depict the DUT.

5 TEST DATA

All data of primary importance are provided in Appendix A. The boldface data in the tables provided in this report indicate the worst-case emissions from the DUT. All other data may be obtained from Mark Branch, Code 549.3, if the need arises.

6 TEST ENVIRONMENT

The EMC tests were conducted with the DUT operating under room-ambient atmospheric pressure, temperature and humidity in accordance with the electrostatic discharge ESD protection requirements in Section 3.2 of NASA/GSFC P-442-3441.

7 TEST PERSONNEL

The following is a list of personnel who participated in the EMC tests:

• EMC Supervisor	Nicholas Hovaker, ManTech-ATAC
• EMC Test Engineer	Mark Branch, Code 549.3
• EMC Test Engineer	Nathan Block, ManTech-ATAC
• EMC Test Engineering Technician	Vaughn Nelson, ManTech-ATAC
• Integration Test Manager	Raymond Jungo
• ACD Project Design Lead	Dave
• ACD I & T Engineer, Code 568	George Moore
• Quality Control, Code 300	Al Lacks

8 DEFINITION OF TERMS

The following terms are provided to ensure consistency between the terminology used in this report and which was used during the EMC tests:

8.1 **DUT** - Device Under Test.

8.2 **GSE** (Ground Support Equipment) - This is the support equipment used by the project to exercise the DUT through all its operational modes.

8.3 **GSE OFF DUT OFF** - This is one of two ambient tests performed before the actual EMC tests. In this mode, the GSE and the DUT have no power applied to them.

8.4 **GSE ON DUT OFF** - This is one of two ambient tests performed before the actual EMC tests. In this mode, the GSE is powered on but the DUT has no power supplying it (i.e., the DUT is electrically isolated from the power supply). This measurement helps to characterize those emissions contributed by the GSE.

8.5 **GSE ON DUT ON** - In this mode, both the GSE and the DUT have power supplied to them. The DUT is undergoing an actual EMC test, while it is commanded through all of its modes.

8.6 **Noisiest Mode** - All of the DUT's subsystems are operating and gathering data. All subsystems are exercised such that they generate the maximum possible emissions. This corresponds to the DUT operating in its flight (max load) mode.

9 WORK DIRECTIVE (W/D) AND JOB ORDER NUMBER (JON)

9.1 W/D No: 6275

9.2 Fiscal JON: 556848403369

10 TEST NO. 1: GROUNDING AND BONDING

10.1 Purpose

The purpose of this test is to measure the DC bond impedance between all metal enclosures, including the DUT, to ensure a low-impedance bond at all frequencies.

10.2 Results

The DUT was bonded to the Small EMC Test Facility's reference ground via the copper bench. DC resistance measurements were performed between all metal structures. Table 10-1 summarizes the results of the grounding and bonding measurements performed during the test, which show that the DC bond resistance did not exceed the specification limit of 2.5 milliohms (mΩ).

Table 10-1. Grounding/Bonding Measurement Results

Test Number	Measurement Type	mΩ
5	DUT to Copper Bench	1.2

10.3 Test Configuration

The DUT was grounded to the facility quiet ground inside the small shield room via the copper bench. The DUT was turned off with no voltage applied to its power input.

11 TEST NO. 8: METHOD RE102-ELECTRIC FIELD RADIATED EMISSIONS, 10 kHz TO 1 GHz

11.1 Purpose

The purpose of this test is to demonstrate that the levels of narrowband and broadband radiated electric field emissions from the DUT's equipment or interconnecting cables do not exceed the specified test limits from 10 kHz to 1 GHz. This test excludes antenna port emissions that may contain high-level transmitter spurious emissions and receiver oscillator spurious emissions.

11.2 Results

The antenna was placed 1 meter from the body of the DUT and oriented at 45° for measurements to 30 MHz. At frequencies above 30 MHz the antenna was oriented in both the horizontal and vertical positions. The test was performed with the DUT operating as shown in Table 11-1. The worst-case narrowband emission measured 28.2 dB above the limit at 27.96 MHz, while operating in the GSE ON, DUT OFF, and LOADBOX OFF. However there was only one emission of 8 dB above the limit at 27.96 MHz in test mode GSE ON, DUT ON, and LOADBOX ON. In this case the box and cables were foil covered. See Table 11-1. The 1 to 18 GHz and ambient measurements revealed no above limit emissions. Both horizontal and vertical antenna orientations revealed emissions above the limits in the 10 kHz to 1 GHz frequency range.

Table 11-1. RE102 Test Result Summary

Test Number	Test Type	Antenna Position	Test Mode	Test Results
6	Narrowband 10 kHz - 1 GHz	1 m Vertical	GSE OFF DUT OFF Room Ambient Test	18 NB emissions above the limits. The 3 highest: 23.7 dB @ 7.89 MHz, 14.0 dB @ 5.524 MHz & 14.0 dB @ 1.455 MHz.
8	Narrowband 10 kHz - 1 GHz	1 m Vertical	GSE ON DUT OFF LOAD BOX OFF	37 NB emissions above the limits. The 3 highest **28.2 dB @ 27.96 MHz, 26.3 dB @ 139.91 MHz, & 21.3 dB @ 331.5 MHz**
9 - 11	Narrowband 2 MHz – 70 MHz	1 m Vertical	GSE ON DUT OFF LOAD BOX OFF	The 3 highest emissions above the limits of the 3 test respectively: 29.6 dB @ 27.96 MHz, 31.5 dB @ 20.03 MHz, & 30.5 dB @ 20.03 MHz
12	Narrowband 2 MHz – 70 MHz	1 m Vertical	GSE ON DUT ON LOAD BOX ON (box & cables covered with foil)	1 NB emission above the limits. 8.0 dB @ 27.96 MHz,

Table 11-1. RE102 Test Result Summary (Continued)

Test Number	Test Type	Antenna Position	Test Mode	Test Results
15	Narrowband 2 MHz – 70 MHz	1 m Vertical	GSE ON DUT ON LOAD BOX ON/VME OFF (foil removed)	1 NB emission above the limits. 8.0 dB @ 27.96 MHz,
19	Narrowband 2 MHz – 70 MHz	1 m Vertical	GSE ON DUT ON LOAD BOX ON/VME ON	4 NB emissions above the limits. **19.4 dB @ 18,27 MHz** 12.8 dB @ 20.03 MHz 5.3 dB @ 28.28 MHz 5.2 dB @ 40.40 MHz
20	Narrowband 2 MHz – 70 MHz	1 m Horizontal	GSE ON DUT ON LOAD BOX ON	5 NB emissions above the limits. The 3 highest: **20.0 dB @ 18,27 MHz** 16.0 dB @ 20.03 MHz 6.4 dB @ 27.96 MHz
21	Narrowband 1.5 GHz – 1.6 GHz	1 m Vertical	GSE ON DUT OFF LOAD BOX ON/VME ON	2 NB emissions above the limits. 5.0 dB @ 1560.2 MHz, 4.2 dB @ 1580.2 MHz
22	Narrowband 1.5 GHz – 1.6 GHz	1 m Vertical	GSE ON DUT ON (Shield on everything)	No emissions above the limits.
26	Narrowband 1.5 GHz – 1.6 GHz	1 m Vertical	GSE ON DUT ON VME ON	No emissions above the limits.
29	Narrowband 1.5 GHz – 1.6 GHz	1 m Horizontal	GSE ON DUT ON VME ON (Shield connectors)	No emissions above the limits.
30	Narrowband 1.5 GHz – 1.6 GHz	1 m Horizontal	GSE ON DUT ON VME ON (Removed foil)	1 NB emission above the limits. 3.6 dB @ 1580 MHz
34	Narrowband & Broadband 1.5 GHz – 1.6 GHz	1 m Horizontal	GSE ON ADC ON (Non-metallic Capacitor)	1 NB emission above the limits. 1.8 dB @ 1560 MHz,
35	Narrowband 1.5 GHz – 1.6 GHz	1 m Vertical	GSE ON ADC ON (Non-metallic Capacitor)	1 NB emission above the limits. 5.8 dB @ 1560.1 MHz,
38	Narrowband 10 kHz - 1 GHz	1 m Vertical	GSE ON ADC ON (Non-metallic Capacitor)	23 NB emissions above the limits. The 3 highest: **25.2 dB @ 80.56 MHz** 24.0 dB @ 180.2 MHz 20.5 dB @ 160.2 MHz
39	Narrowband 10 kHz - 1 GHz	1 m Horizontal	GSE ON ADC ON (Non-metallic Capacitor)	14 NB emissions above the limits. The 3 highest: **33.4 dB @ 40.4 MHz** 22.6 dB @ 20.03 MHz 19.7 dB @ 80.56 MHz

Data plots of the narrowband measurements are provided in Appendix A.

11.3 Test Configuration

The test was performed with the DUT operating in the modes listed in Table 11-1. In earlier test numbers, the Loadbox simulated the ADC. Later test were conducted with the ADC in place. See Photos 1-6 in Appendix A for the antenna placement relative to the DUT.

12 TEST NO. 10: METHOD RE101-MAGNETIC FIELD RADIATED EMISSIONS, 30 Hz TO 50 kHz

12.1 Purpose

The purpose of this test is to measure narrowband radiated magnetic fields emitted from the DUT from 30 Hz to 50 kHz.

12.2 Results

The antenna was placed 7cm from the body of the DUT for the magnetic field radiated emissions measurements. The test data revealed no above limit narrowband emissions when compared to the GSE ON/DUT OFF plots. The 60 Hz fundamental and associated harmonic components can be noted on the plots provided. This is facility noise. Table 12-1 summarizes the test results. The data plots of the narrowband measured test results are provided in Appendix A.

Table 12-1. RE101 Test Result Summary

Test Number	Test Type	Antenna Location	Test Mode	Test Results
40	Narrowband 30 Hz - 50 kHz		Cal check	End-to-end calibration check ok
41	Narrowband 30 Hz - 50 kHz	7 cm from DUT	GSE ON DUT ON	No emissions above the specification limits.
42	Narrowband 30 Hz - 50 kHz	7 cm from DUT	GSE ON DUT OFF	No emissions above the specification limits.
43	Narrowband 30 Hz - 50 kHz.	7 cm from DUT	GSE OFF DUT OFF	No emissions above the specification limits.
44	Narrowband 30 Hz - 50 kHz	7 cm from DUT	GSE OFF DUT OFF (lights on)	No emissions above the specification limits.
45	Narrowband 30 Hz - 50 kHz	7 cm from DUT	GSE OFF DUT OFF (lights off)	Room Ambient

12.3 Test Configuration

The test was performed with the DUT in the GSE ON DUT ON (noisiest) mode. See Photo 7 in Appendix A for the antenna placement relative to the DUT.

13 CONCLUSION

13.1 Radiated Emissions Results

13.1.1 *Electric Field Radiated Emissions*

The test measurements revealed that the DUT exceeded the RE102 test limits. The worst-case narrowband emission measured 28.2 dB above the limit at 27.96 MHz, while operating in the GSE ON, DUT OFF, and LOADBOX OFF. However there was only one emission of 8 dB above the limit at 27.96 MHz in test mode GSE ON, DUT ON, and LOADBOX ON. In this case the box and cables were foil covered. There were worst-case narrowband emissions in the 2 MHz to 70 MHz range. The highest was 20 dB at 18.27 MHz in the horizontal orientation.

13.1.2 Magnetic Field Radiated Emissions

The DUT revealed no emissions above the limit during the RE101 measurements.

Appendix A

EMC Test Data & Test Setup Photos

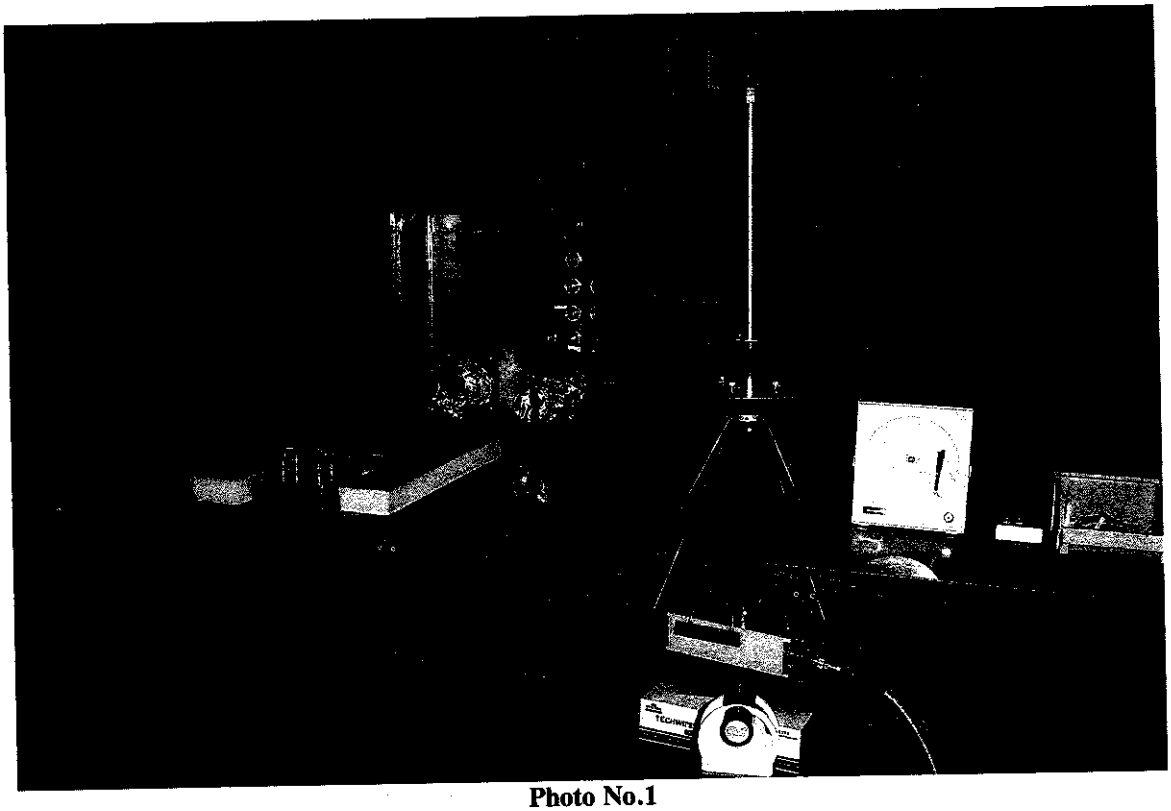

Photo No.1
April 18, 2005
GLAST / ACD, WD No.6275
RE102, 10 kHz - 1 GHz
1 meter, Vertical
Test No.6, Load Box

Photo No.2
April 19, 2005
GLAST / ACD, WD No.6275
RE102, 1.55 GHz - 1.6 GHz
1 meter, Vertical
Test No.21, Load Box

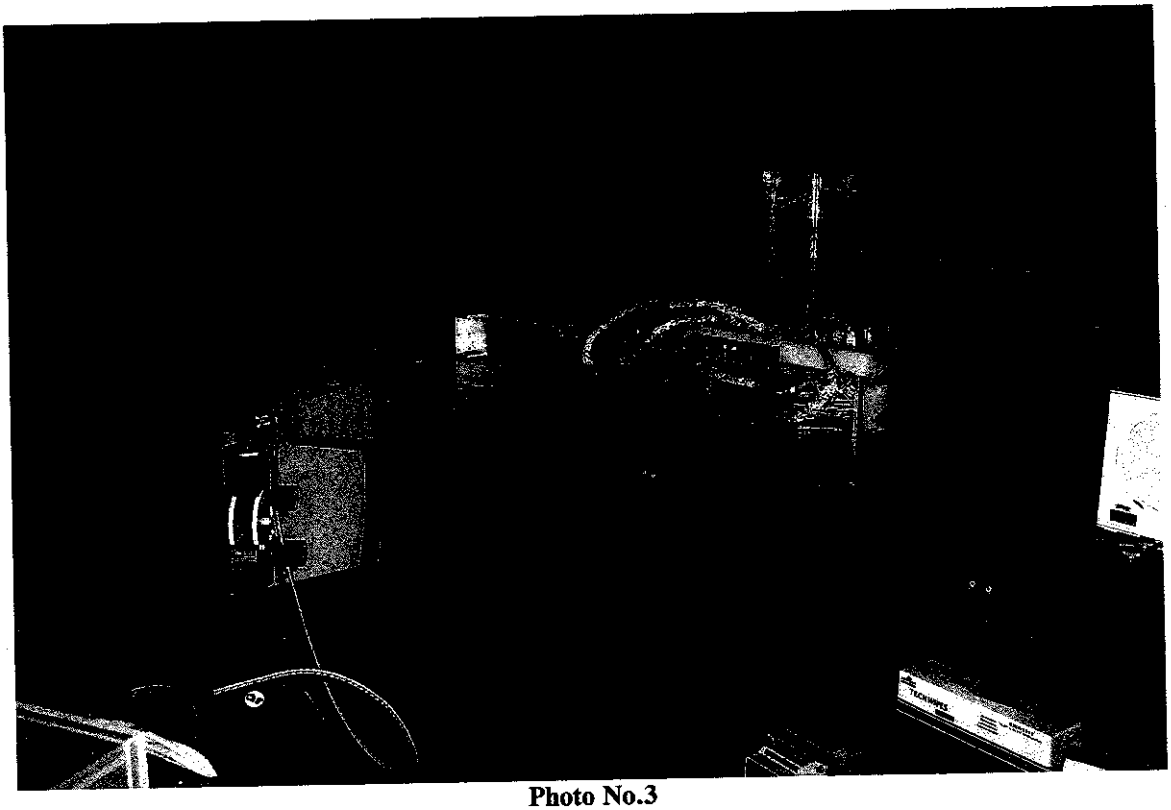

Photo No.3
April 19, 2005
GLAST / ACD, WD No.6275
RE102, 1.55 GHz – 1.6 GHz
1 meter, Vertical
Test No.32, ACD Unit

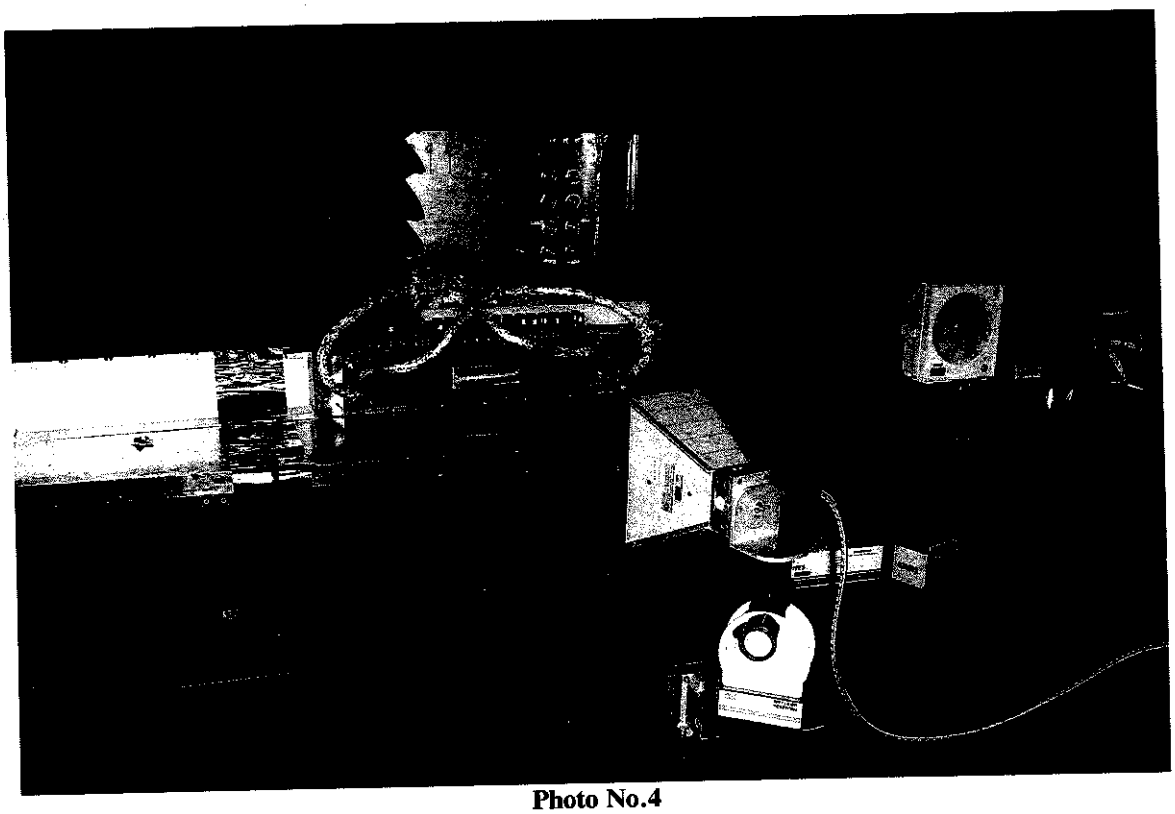

Photo No.4
April 19, 2005
GLAST / ACD, WD No.6275
RE102, 1.55 GHz – 1.6 GHz
1 meter, Horizontal
Test No.33, ACD Unit

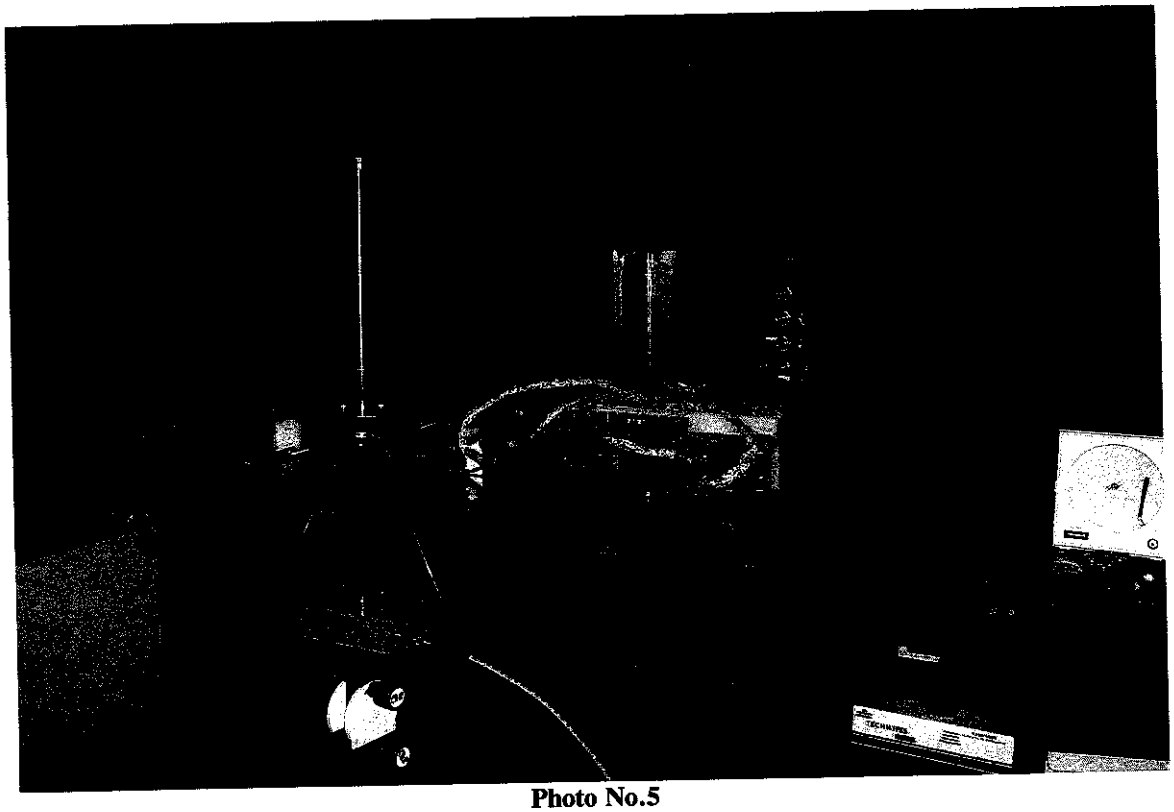

Photo No.5
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GLAST / ACD, WD No.6275
RE102, 10 kHz - 1 GHz
1 meter, Vertical
Test No.38, ACD Unit

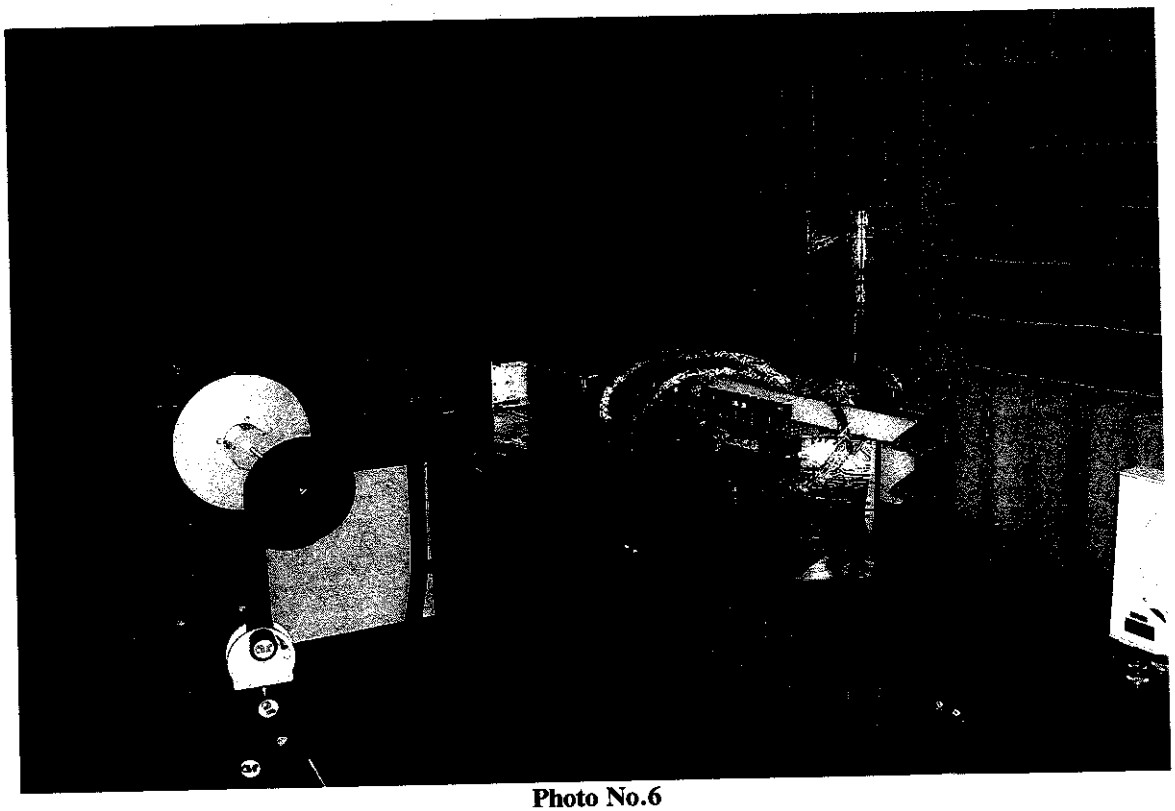

Photo No.6
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GLAST / ACD, WD No.6275
RE102, 10 kHz - 1 GHz
1 meter, Horizontal
Test No.39, ACD Unit

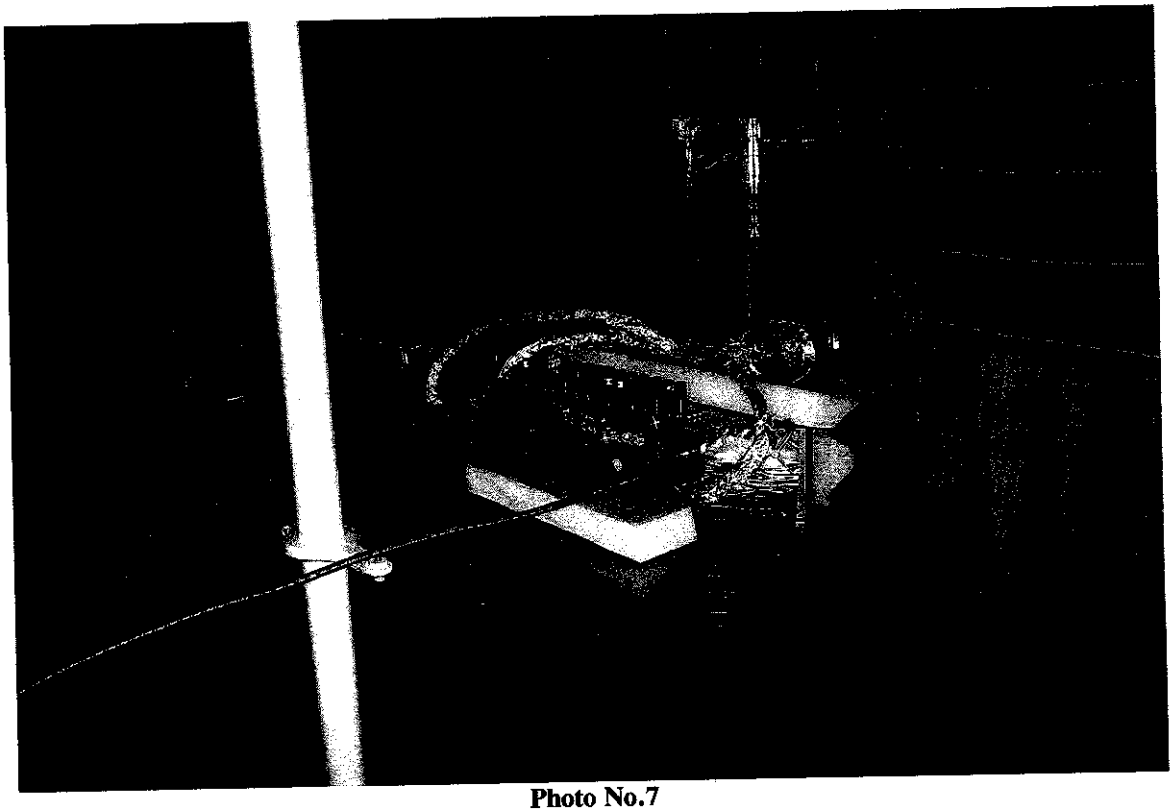
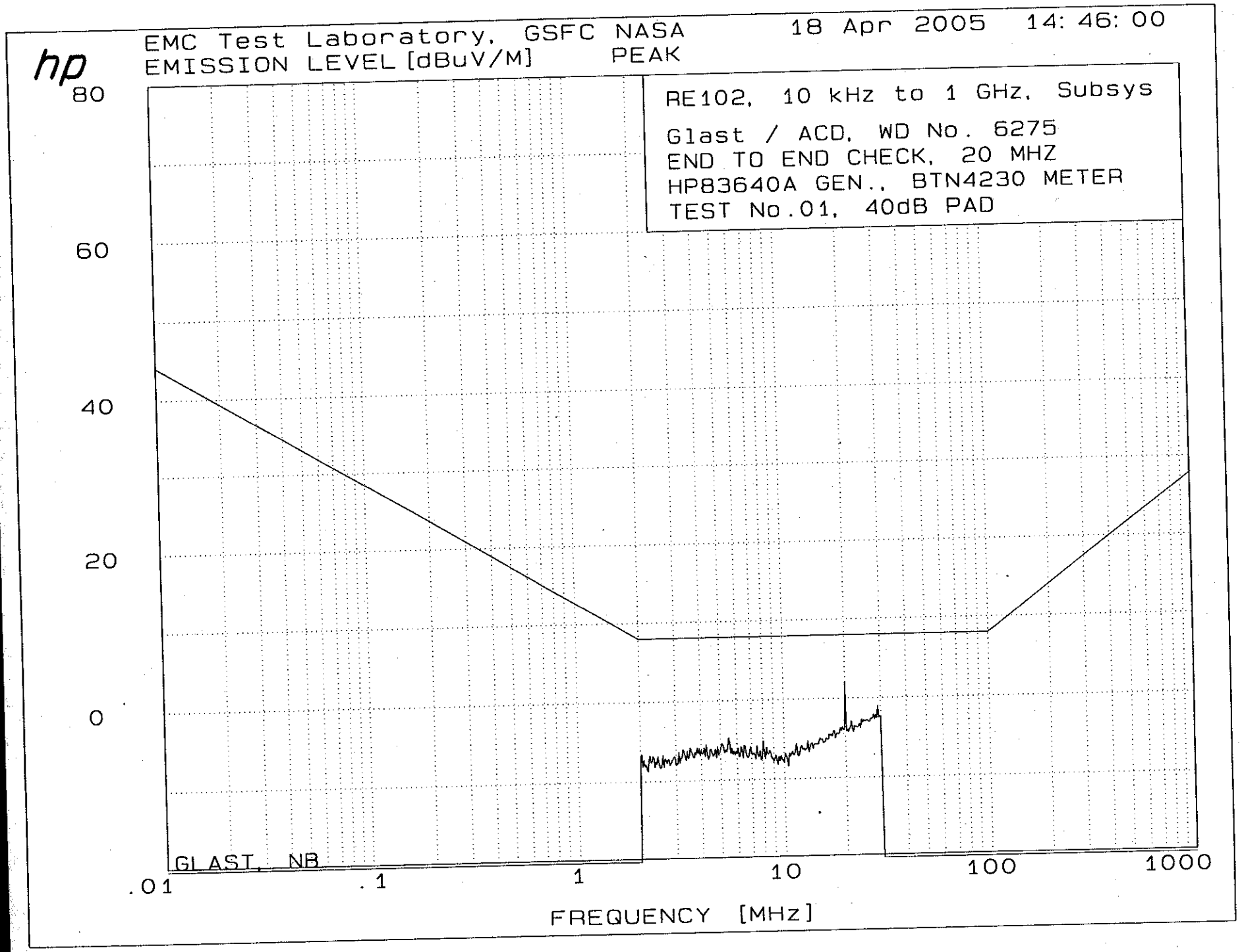


Photo No.7
April 19, 2005
GLAST / ACD, WD No.6275
RE101, 20 Hz - 50 kHz
7 cm, DUT
Test No.41, ACD Unit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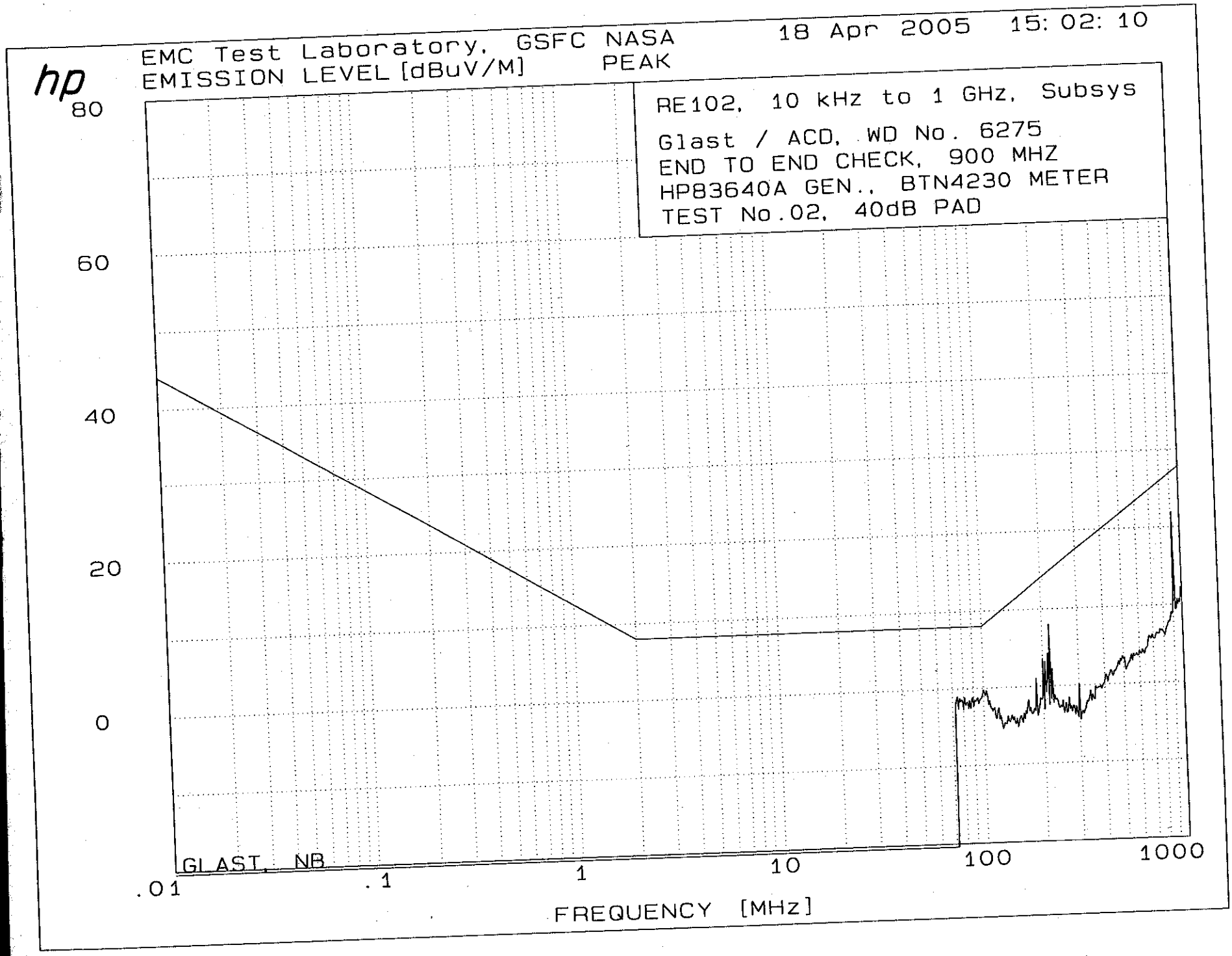
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
END TO END CHECK, 20 MHZ
HP83640A GEN., BTN4230 METER
TEST No.01, 40dB PAD
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]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Glast / ACD, WD No. 6275
END TO END CHECK, 900 MHZ
HP83640A GEN., BTN4230 METER
TEST No.02, 40dB PAD
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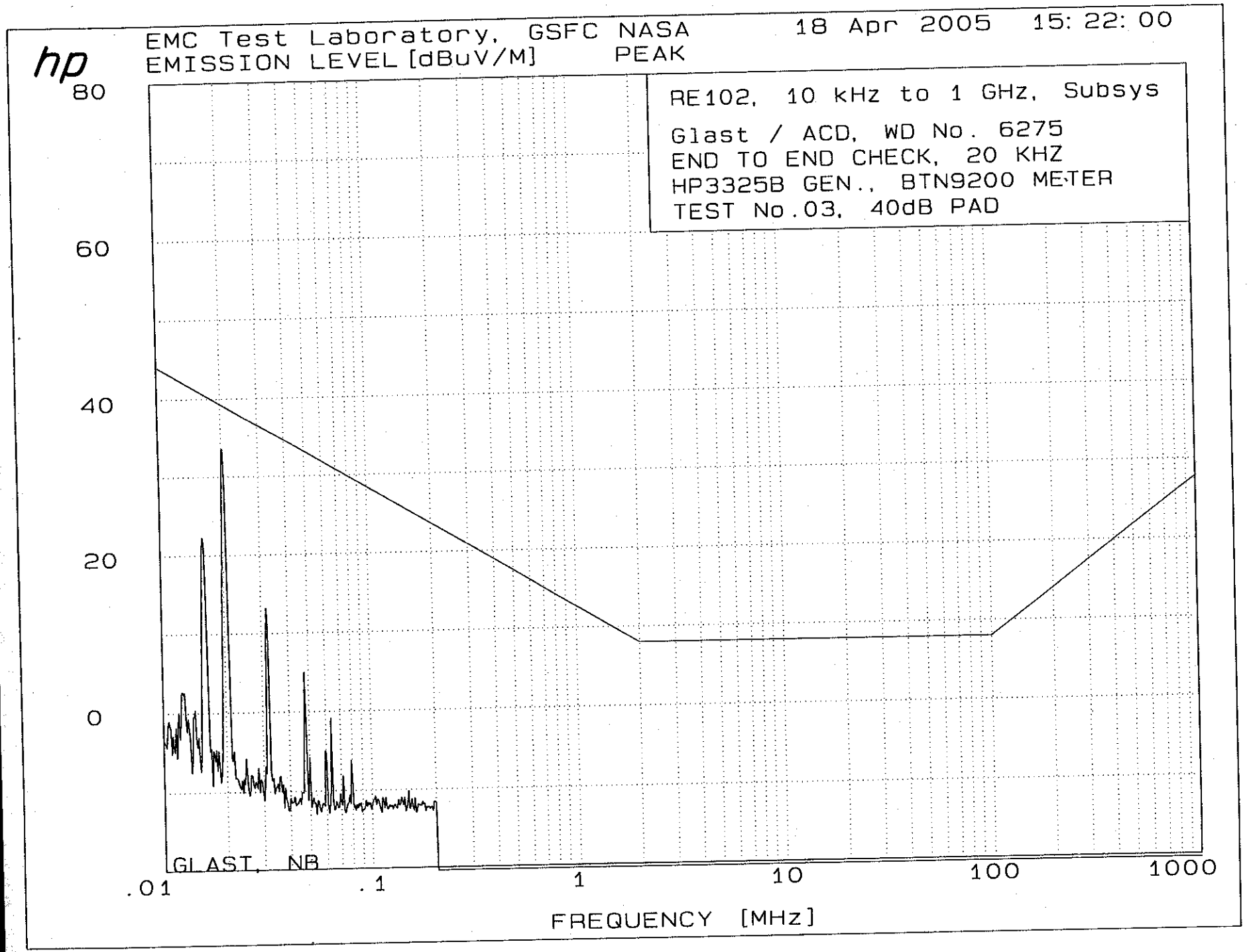
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]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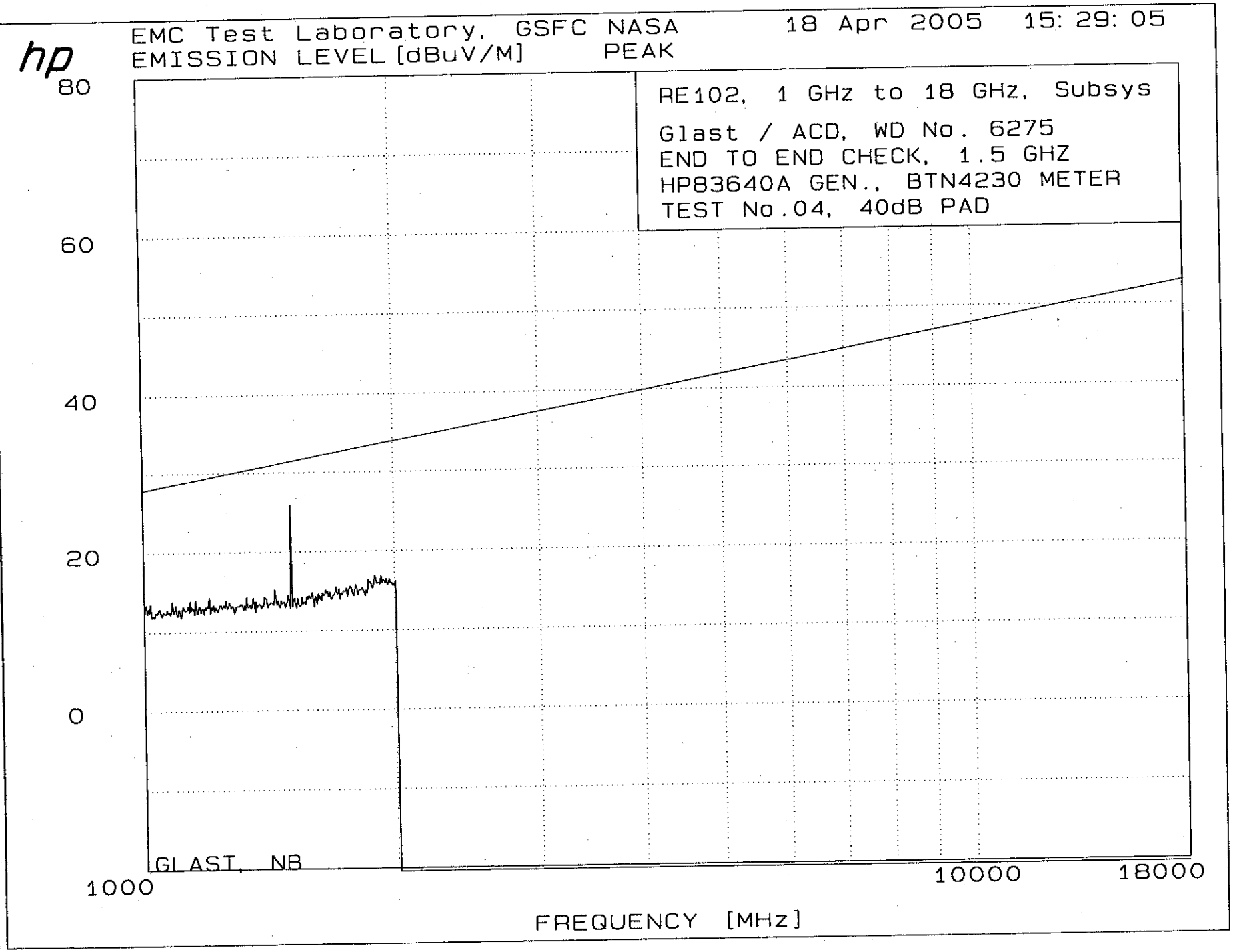
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
END TO END CHECK, 20 KHZ
HP3325B GEN., BTN9200 METER
TEST No.03, 40dB PAD
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]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EMISSION LEVEL [dBuV/M]
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RE102, 1 GHz to 18 GHz, Subsys
Glast / ACD, WD No. 6275
END TO END CHECK, 1.5 GHZ
HP83640A GEN., BTN4230 METER
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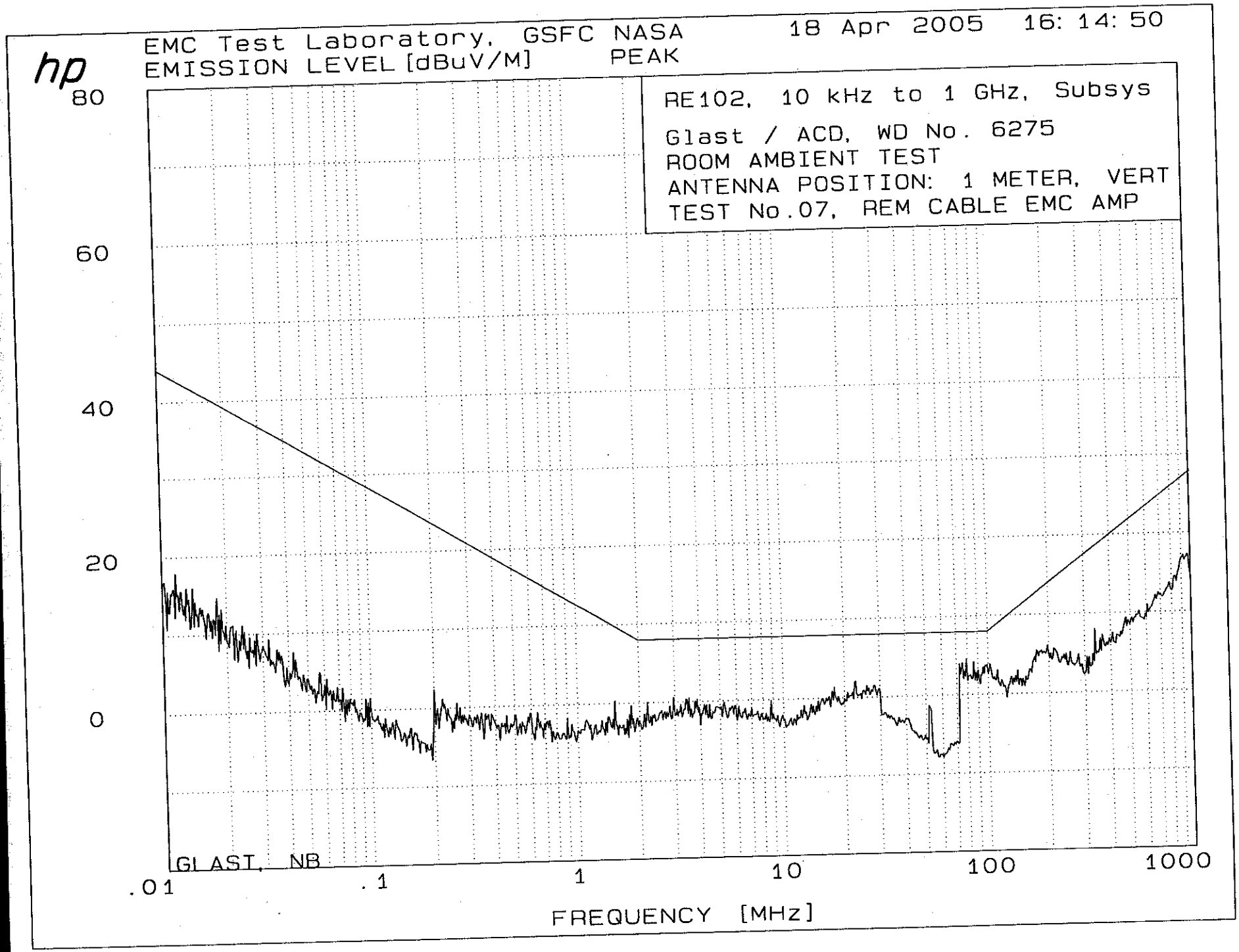
60
40
20
0
GLAST, NB
1000
10000
18000
FREQUENCY [MHz]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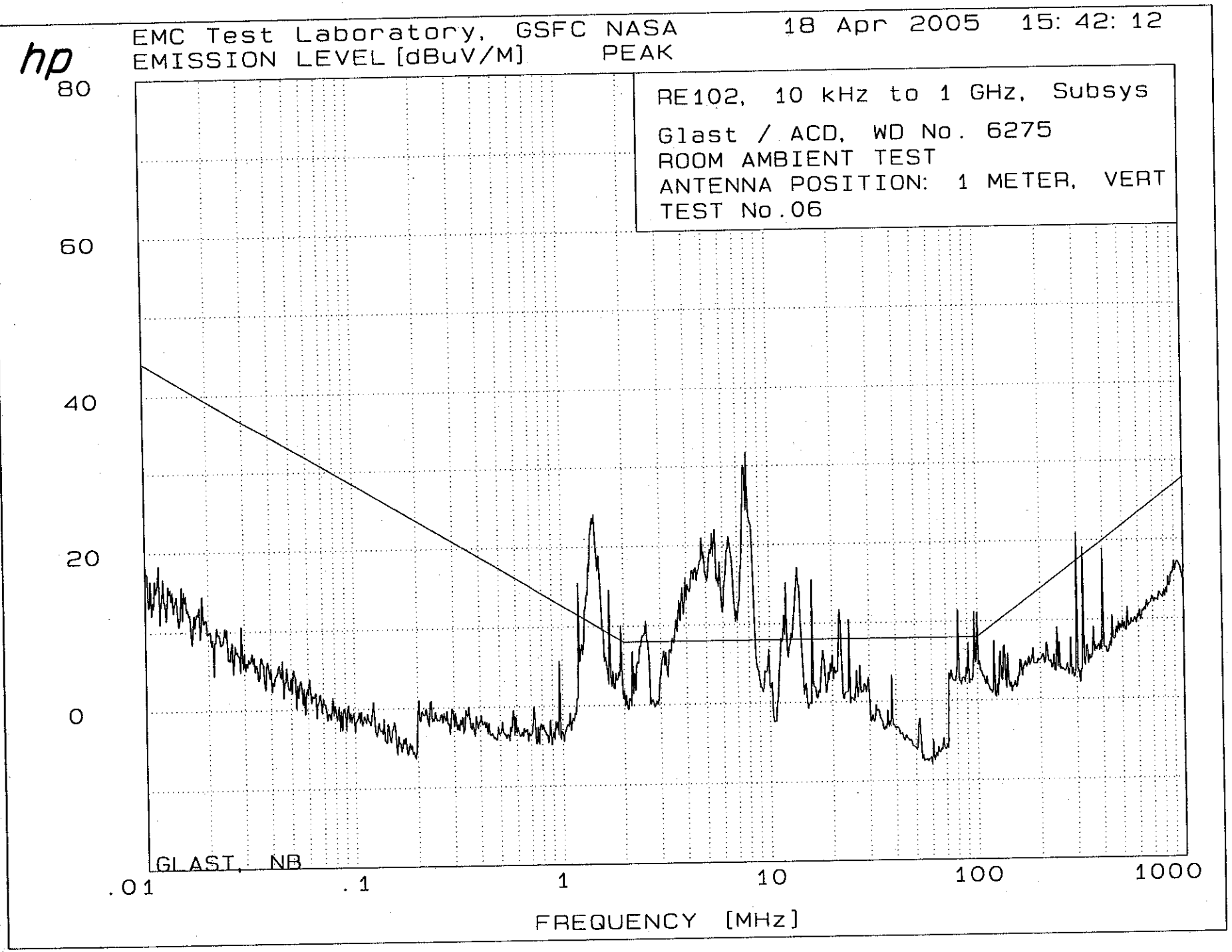
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
ROOM AMBIENT TEST
ANTENNA POSITION: 1 METER, VERT
TEST No.07, REM CABLE EMC AMP
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]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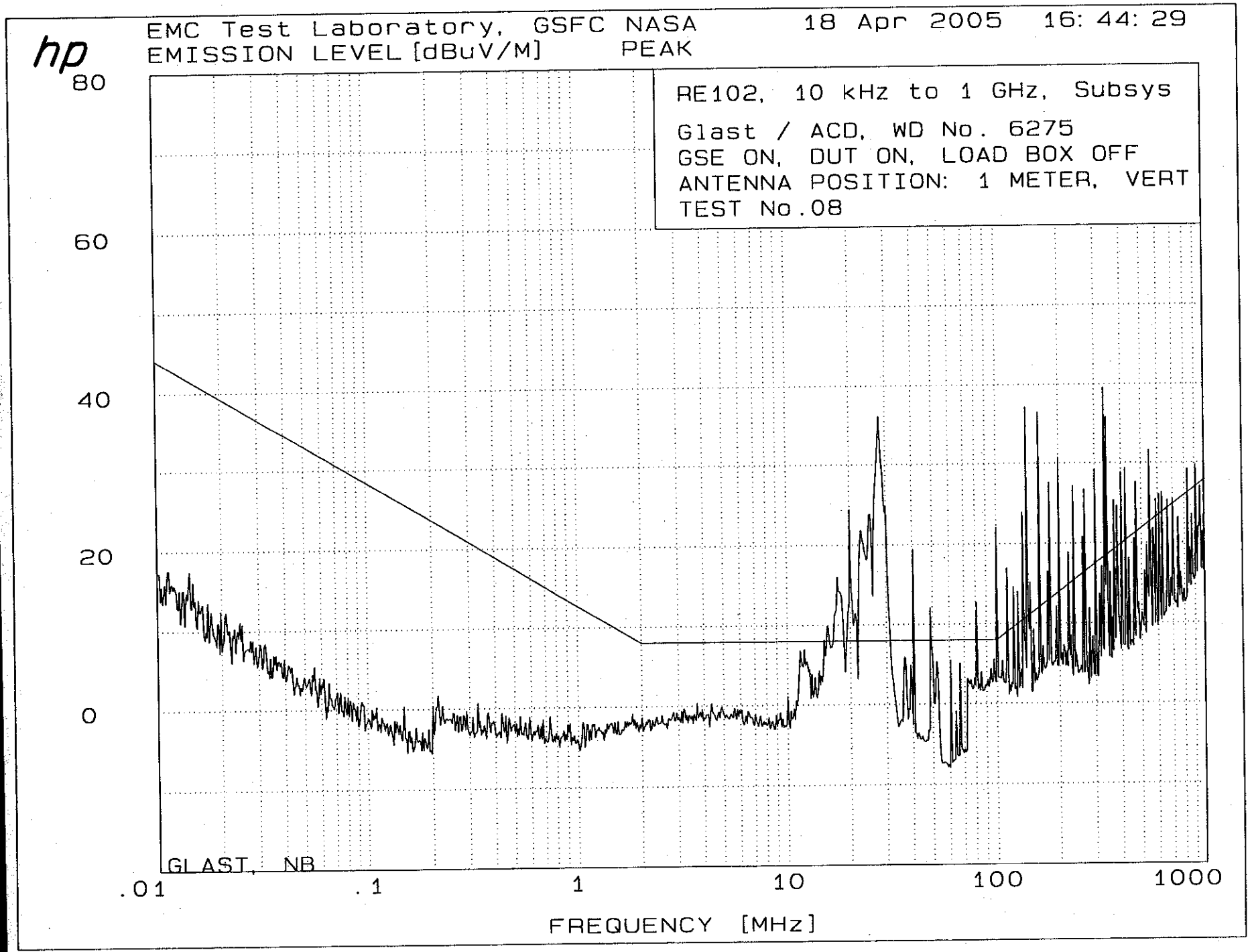
18 Apr 2005 15: 42: 12
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
ROOM AMBIENT TEST
ANTENNA POSITION: 1 METER, VERT
TEST No.06
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 15:42:12

1. Radiated Emissions Test Setup
   1.1 RE102, 10 kHz to 1 GHz, Subsys

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1.21	15.5	4.1
2	1.455	24.1	14.0
3	1.709	14.6	5.6
4	1.94	10.1	1.9
5	2.556	10.6	2.6
6	5.524	22	14.0
7	6.415	21.1	13.1
8	7.89	31.7	23.7
9	12.08	15.2	7.2
10	13.7	17.1	9.1
11	16.1	15.5	7.5
12	21.71	11.7	3.7
13	24.08	10.4	2.4
14	80.56	11.4	3.4
15	96.83	11.2	3.2
16	100.23	11.1	3.1
17	298.9	20.9	3.5
18	320.25	19.1	1.1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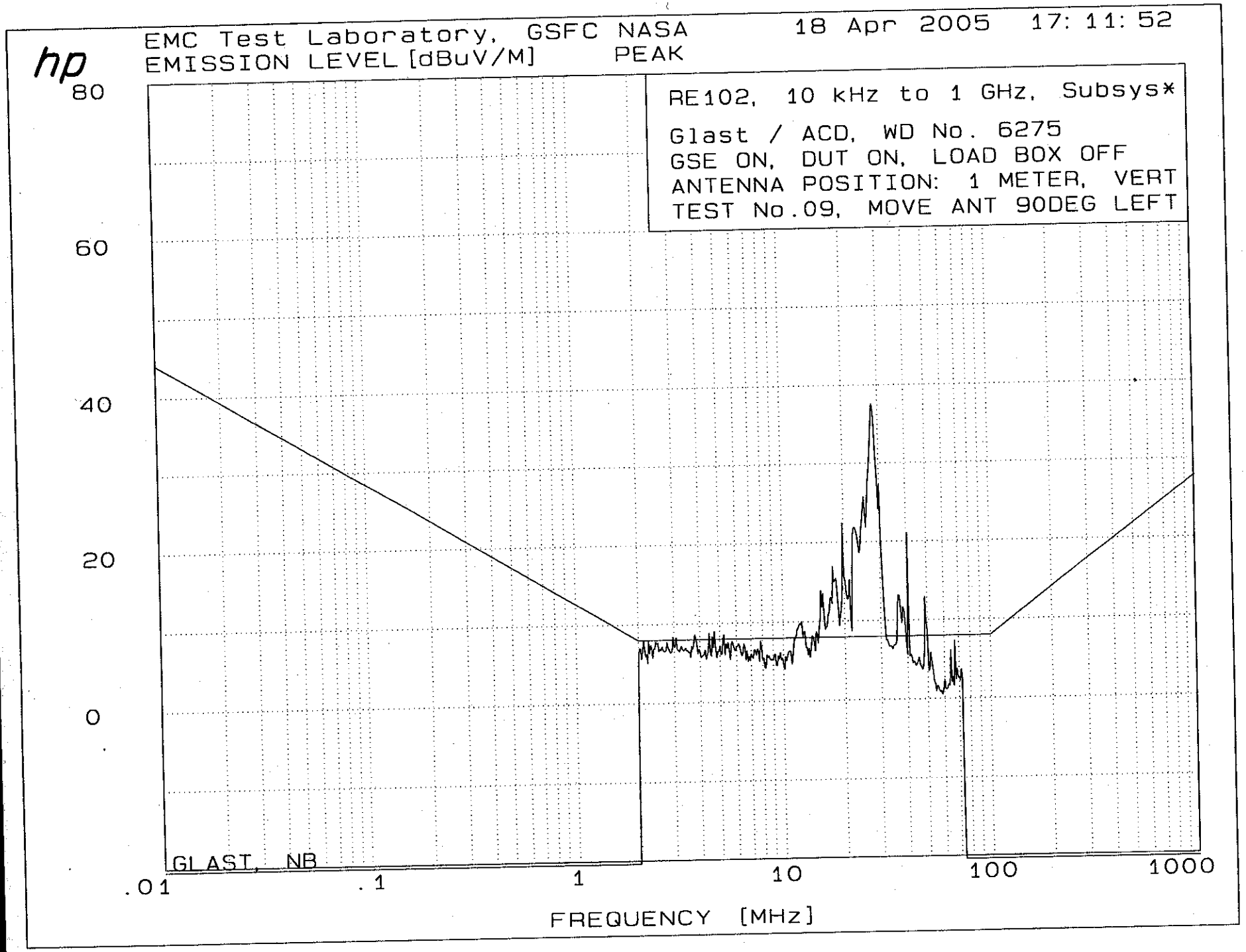
EMC Test Laboratory, GSFC NASA
18 Apr 2005 16: 44: 29
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, LOAD BOX OFF
ANTENNA POSITION: 1 METER, VERT
TEST No.08
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 16:44:29

1. Radiated Emissions Test Setup
   1.1 RE102, 10 kHz to 1 GHz, Subsys

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	17.45	16	8.0
2	20.03	24.4	16.4
3	24.92	23.8	15.8
4	27.96	36.2	28.2
5	40.4	19.4	11.4
6	48.56	12.1	4.1
7	80.56	12.7	4.7
8	100.23	22	14.0
9	112.45	16.9	7.9
10	120.48	14.6	5.0
11	126.15	14	4.0
12	133.62	23.9	13.4
13	139.91	37.2	26.3
14	160.62	36.6	24.5
15	176.1	16.5	3.6
16	180.2	27.6	14.5
17	199.85	30.7	16.8
18	221.64	18.9	4.1
19	234.76	27.1	11.8
20	260.37	20.8	4.6
21	266.42	26.7	10.3
22	298.9	29.2	11.8
23	331.5	39.6	21.3
24	339.21	35.9	17.4
25	367.65	25.3	6.1
26	380.56	24.6	5.1
27	398.47	28.8	8.9
28	417.23	29.3	9.0
29	468.09	27.6	6.3
30	543.58	31.6	9.0
31	582.42	25.4	2.2
32	602.86	26	2.5
33	624.03	26.3	2.5
34	660.97	25.3	1.0
35	700.09	25.5	.7
36	822.4	29.2	3.0
37	901.66	29.7	2.7

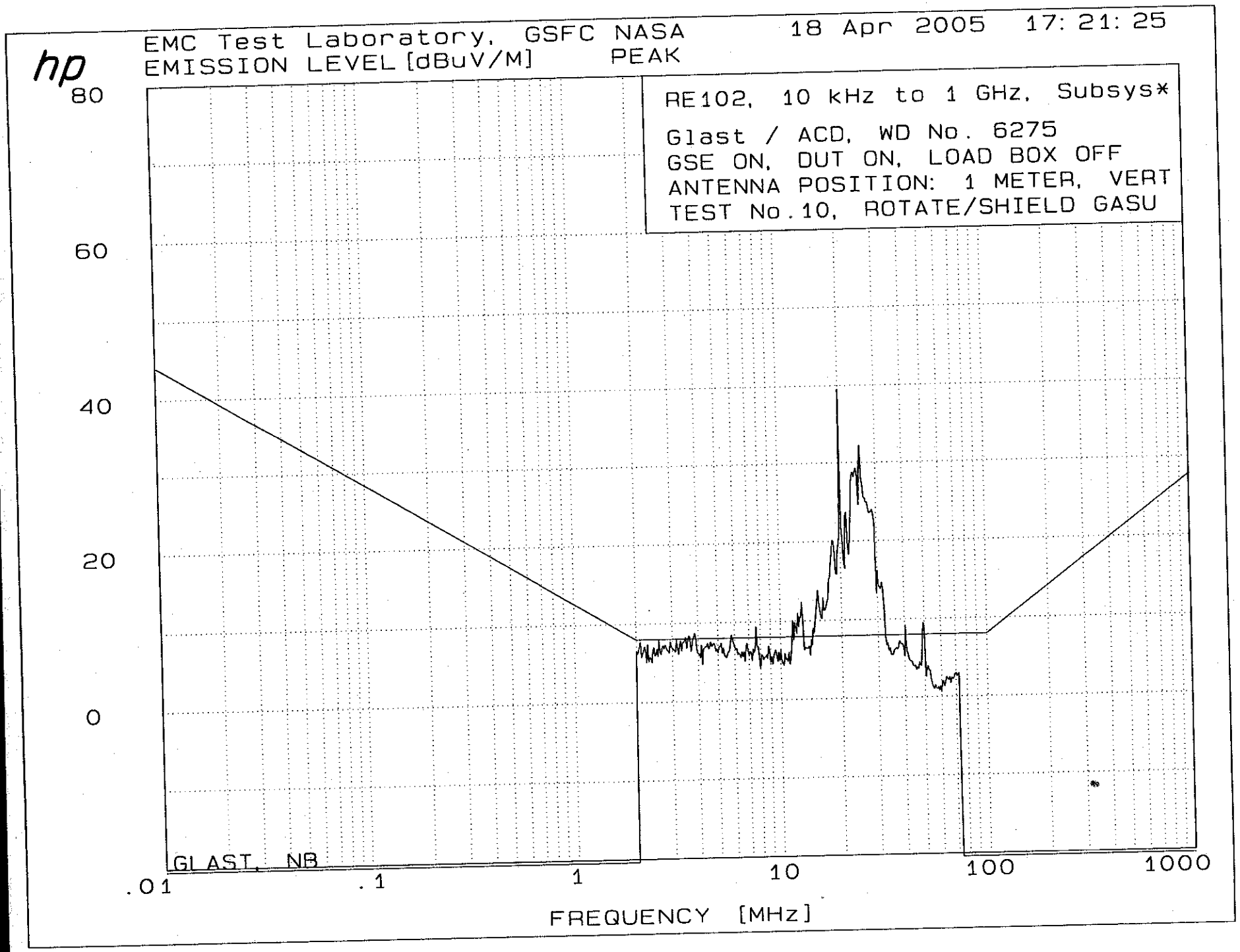

EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:11:52
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, LOAD BOX OFF
ANTENNA POSITION: 1 METER, VERT
TEST No.09, MOVE ANT 90DEG LEFT
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:11:52

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	17.65	16.9	8.9
2	19.8	22.4	14.4
3	27.96	37.6	29.6
4	36.43	13.2	5.2
5	40.4	21.1	13.1
6	48.56	12.9	4.9

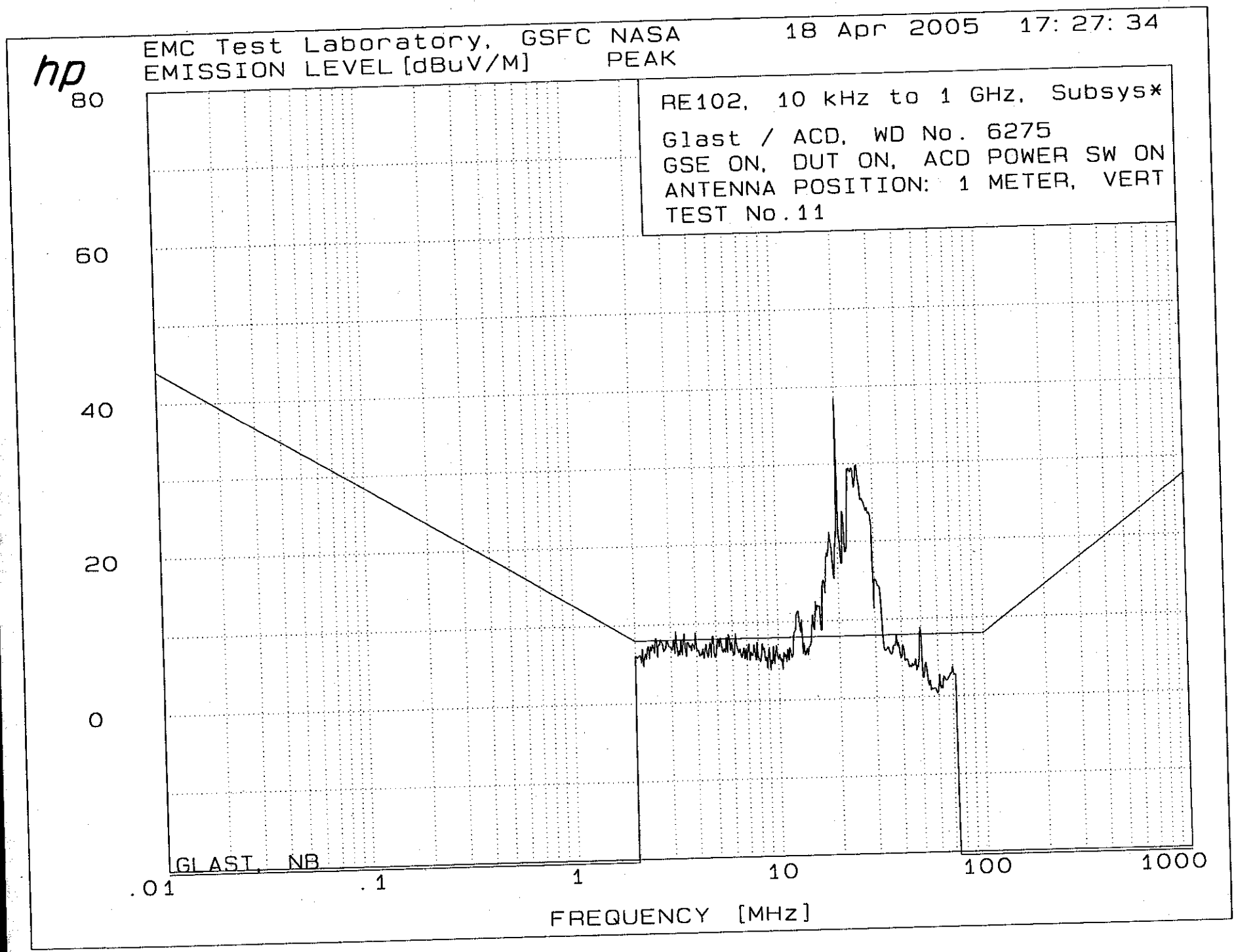

EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:21:25
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WO No. 6275
GSE ON, DUT ON, LOAD BOX OFF
ANTENNA POSITION: 1 METER, VERT
TEST No.10, ROTATE/SHIELD GASU
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:21:25

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	12.79	12.4	4.4
2	20.03	39.5	31.5
3	25.21	32.2	24.2

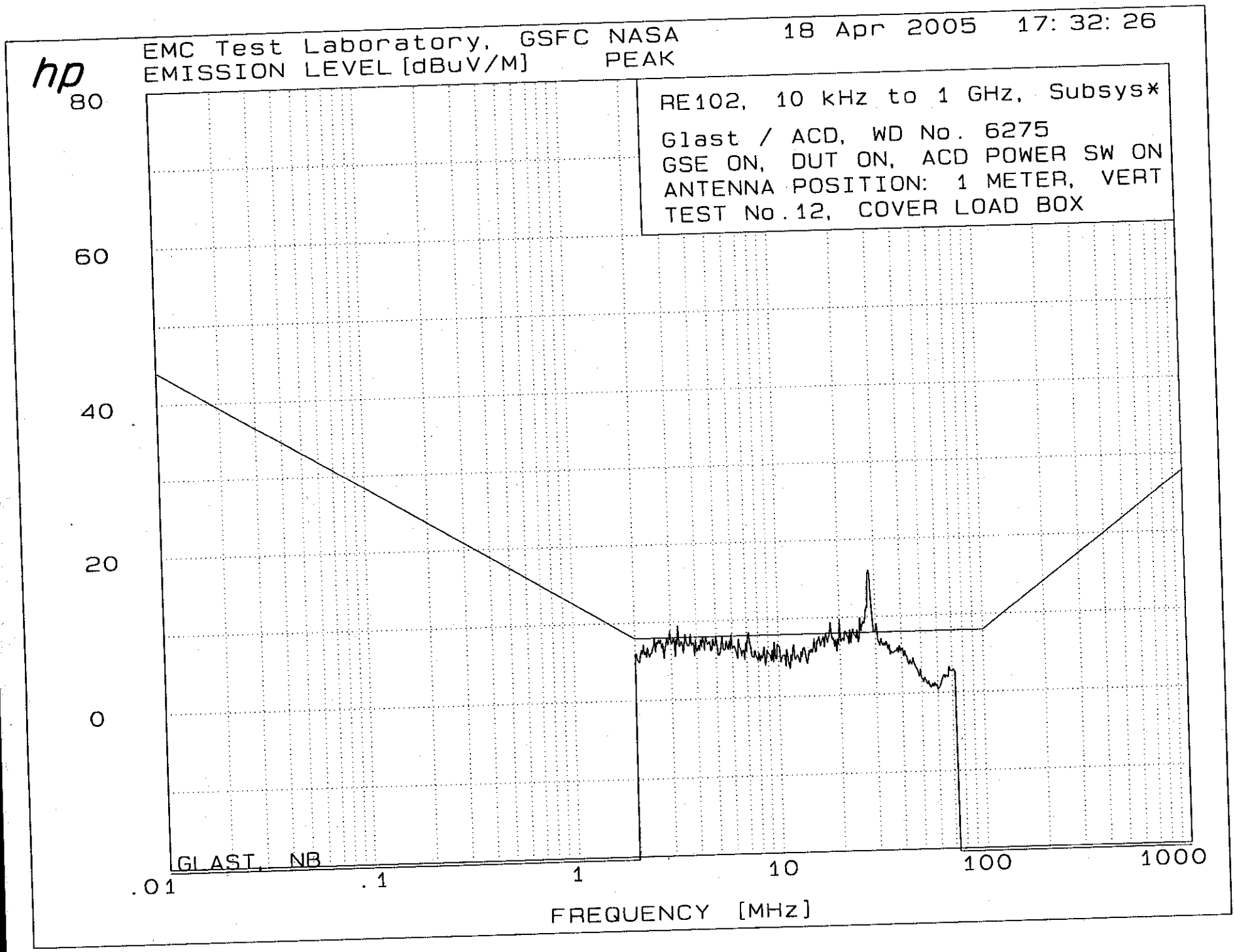

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:27:34
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No.11
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:27:34

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	20.03	38.5	30.5
2	25.21	29.8	21.8

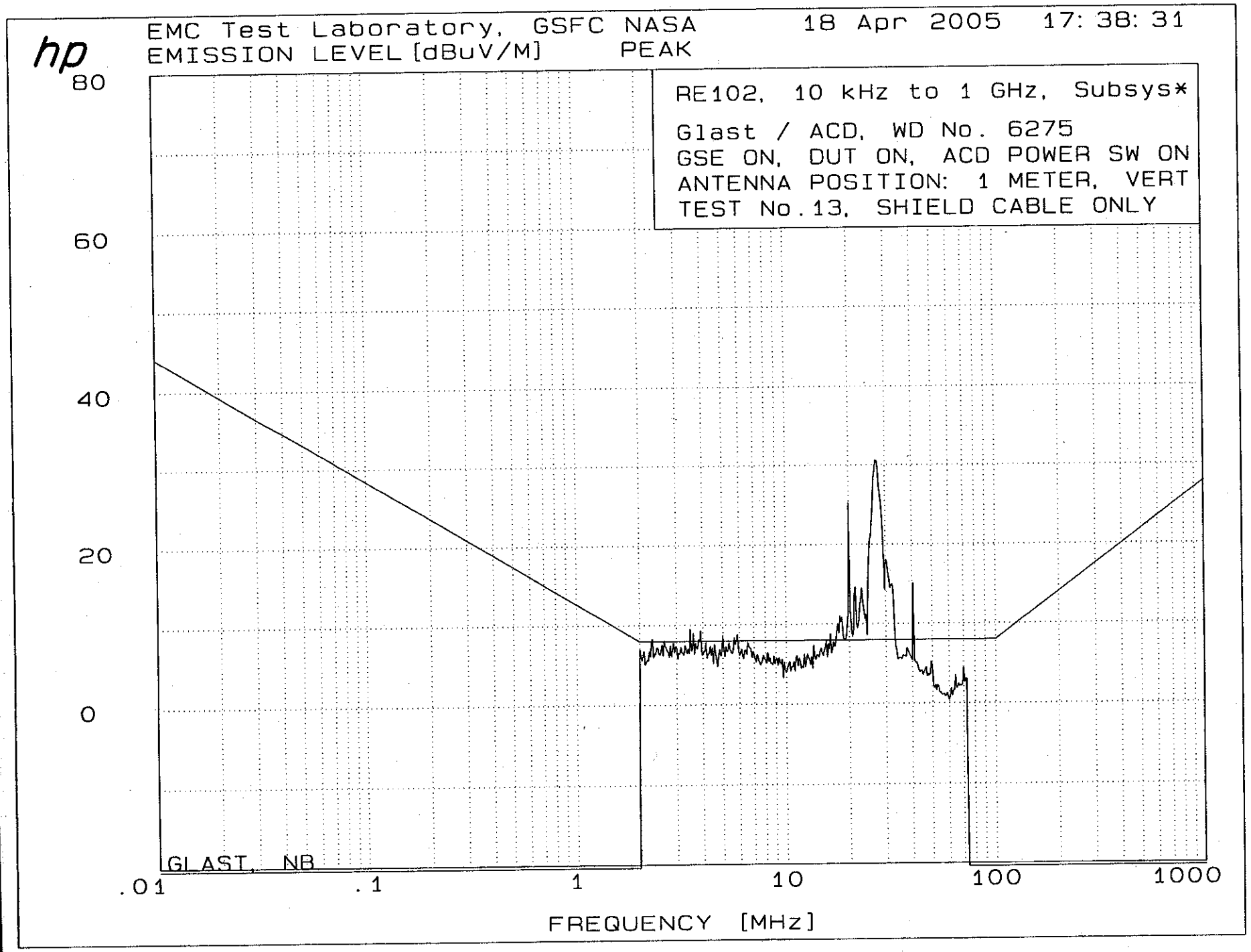

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:32:26
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No.12, COVER LOAD BOX
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:32:26

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	27.96	16	8.0

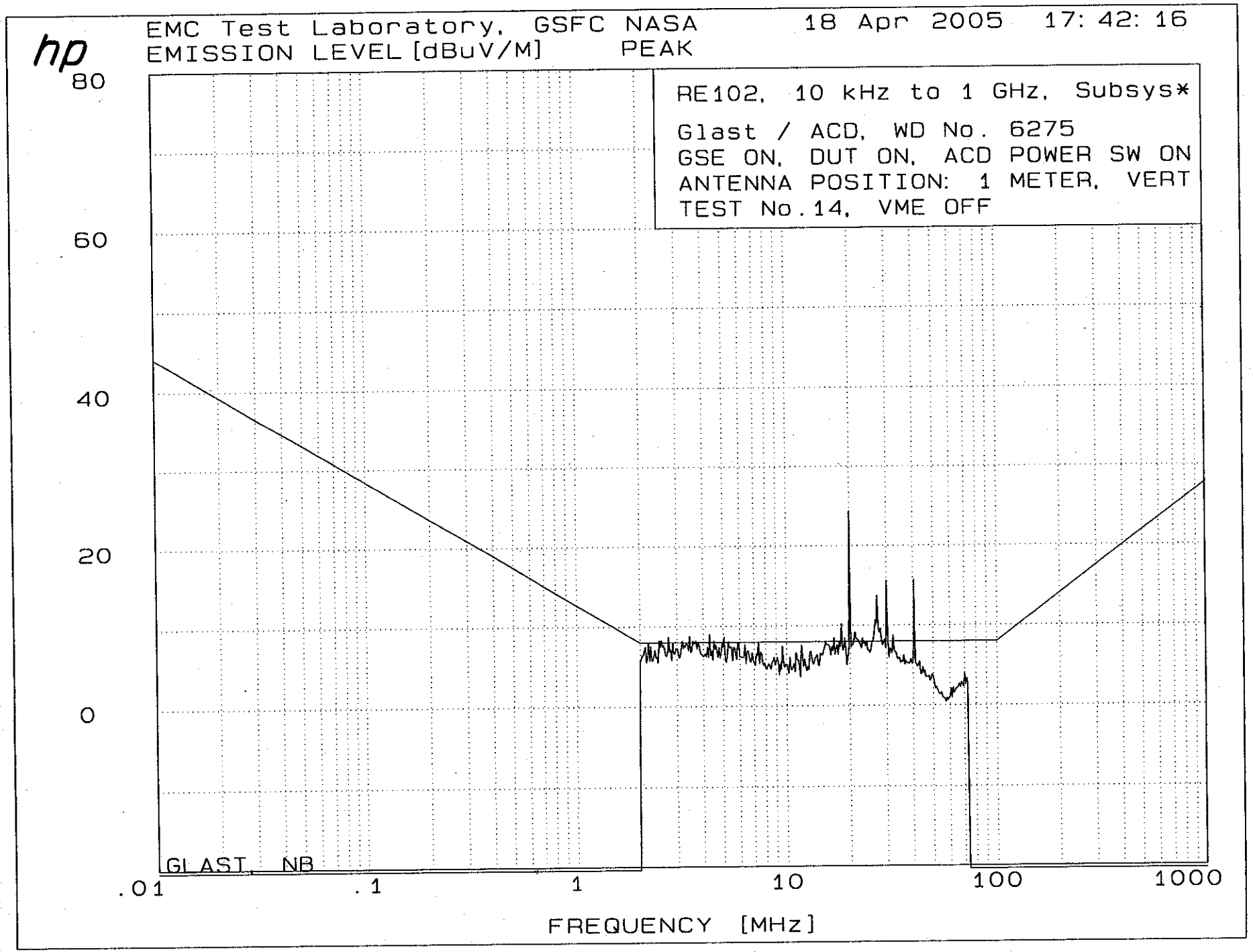

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:38:31
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No.13, SHIELD CABLE ONLY
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:38:31

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	3.487	9.5	1.5
2	20.03	25.2	17.2
3	27.01	30.6	22.6
4	40.4	15.1	7.1

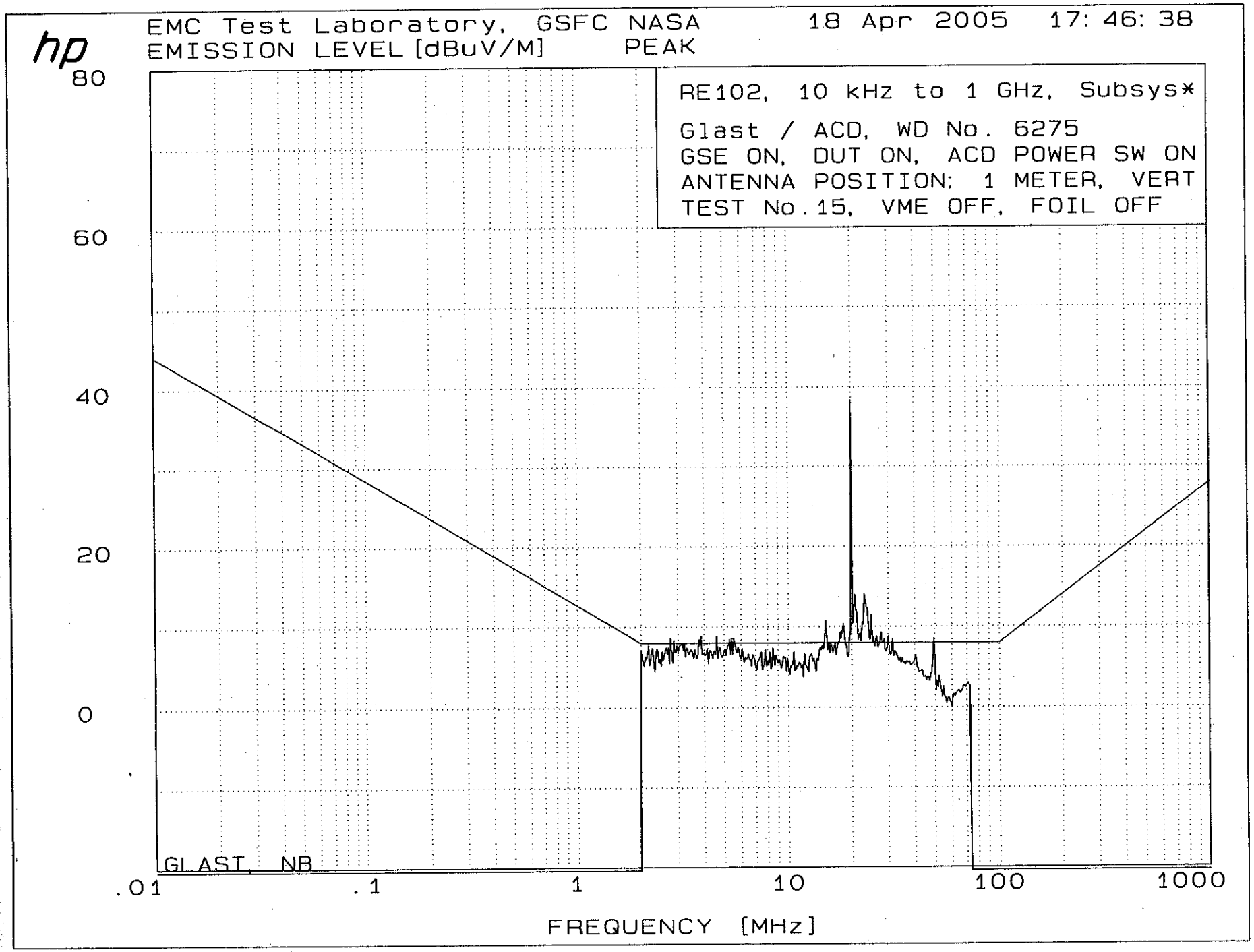

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17: 42: 16
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No.14, VME OFF
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:42:16

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	20.03	24.4	16.4
2	27.01	13.7	5.7
3	29.96	15.6	7.6
4	40.4	15.7	7.7

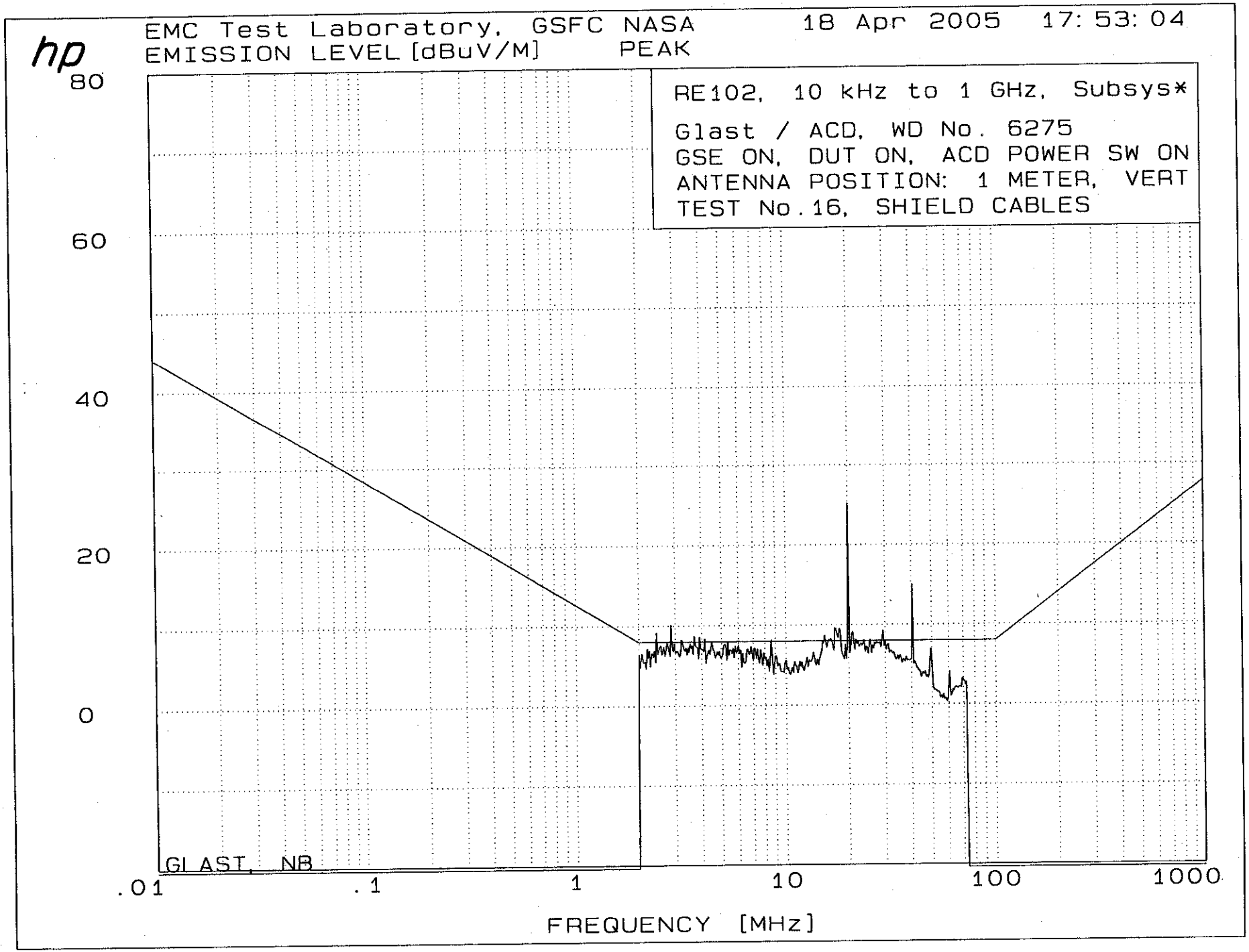

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:46:38
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No. 15, VME OFF, FOIL OFF
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:46:38

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	20.03	38.4	30.4

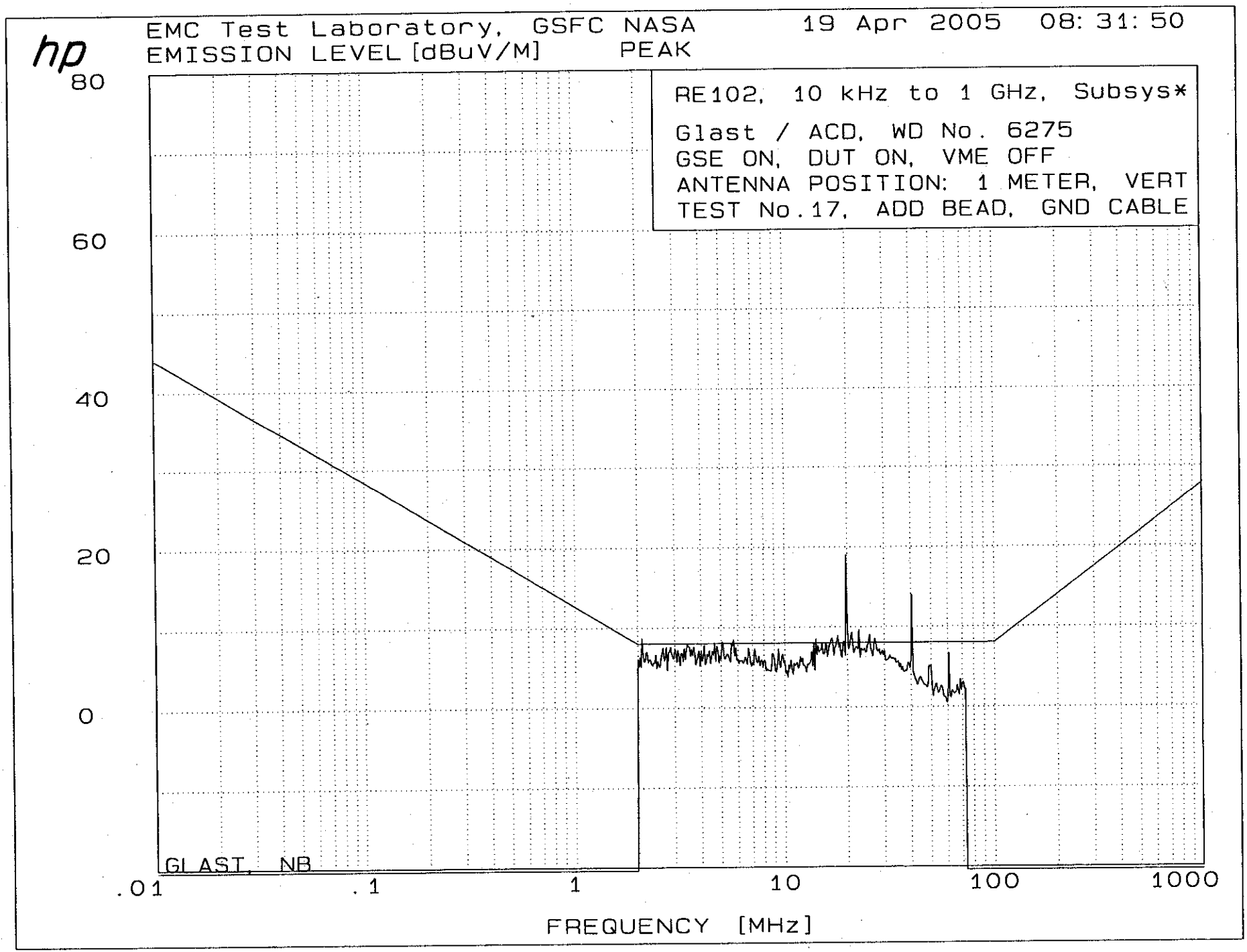

hp
EMC Test Laboratory, GSFC NASA
18 Apr 2005 17:53:04
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD POWER SW ON
ANTENNA POSITION: 1 METER, VERT
TEST No. 16, SHIELD CABLES
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 18 Apr 2005 17:53:04

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	2.868	10.1	2.1
2	20.03	25.2	17.2
3	40.4	15	7.0

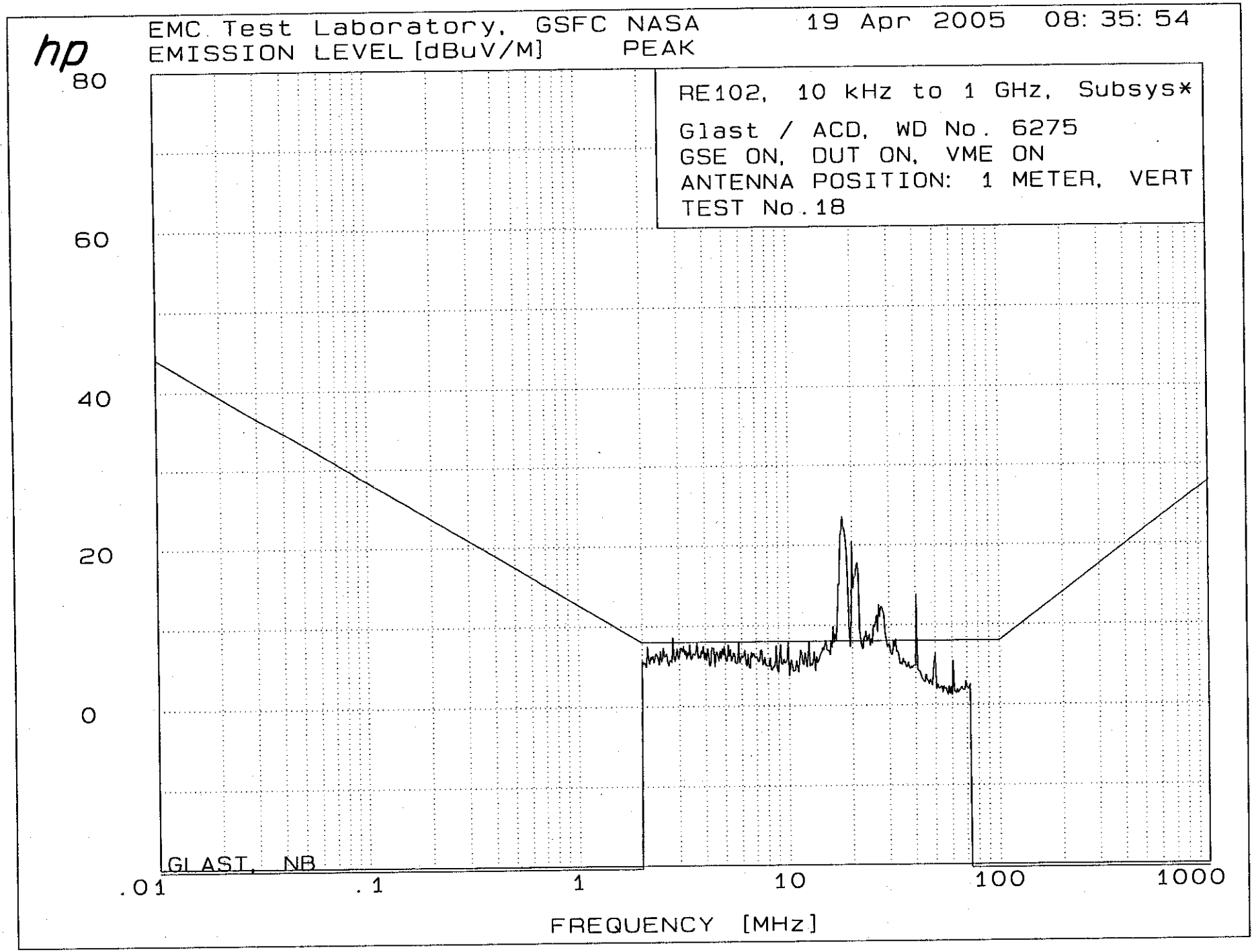

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 08:31:50
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME OFF
ANTENNA POSITION: 1 METER, VERT
TEST No.17, ADD BEAD, GND CABLE
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 08:31:50

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	19.8	19	11.0
2	40.4	14	6.0

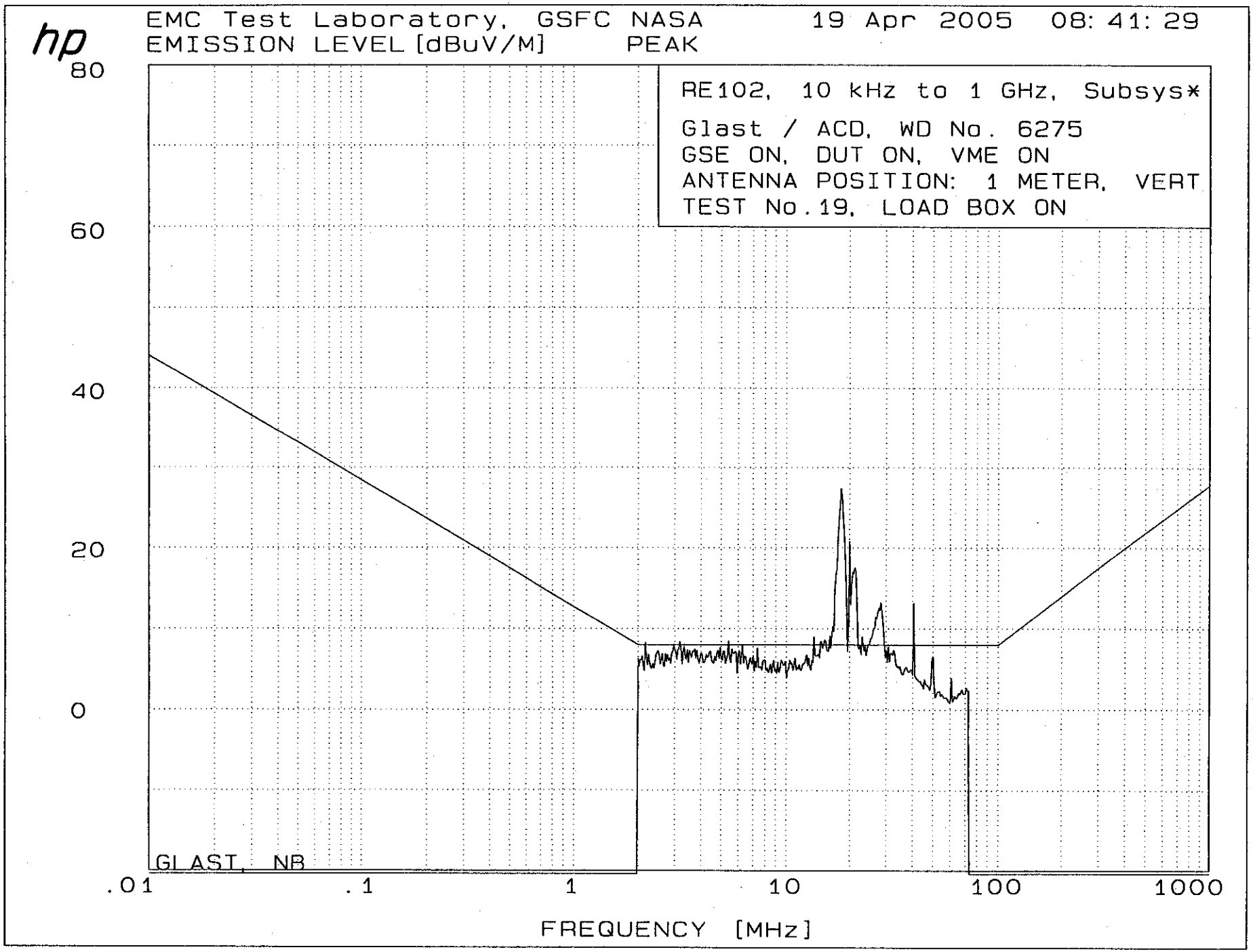

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 08: 35: 54
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No. 18
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 08:35:54

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	18.06	23.6	15.6
2	20.03	20.3	12.3
3	40.4	13.8	5.8

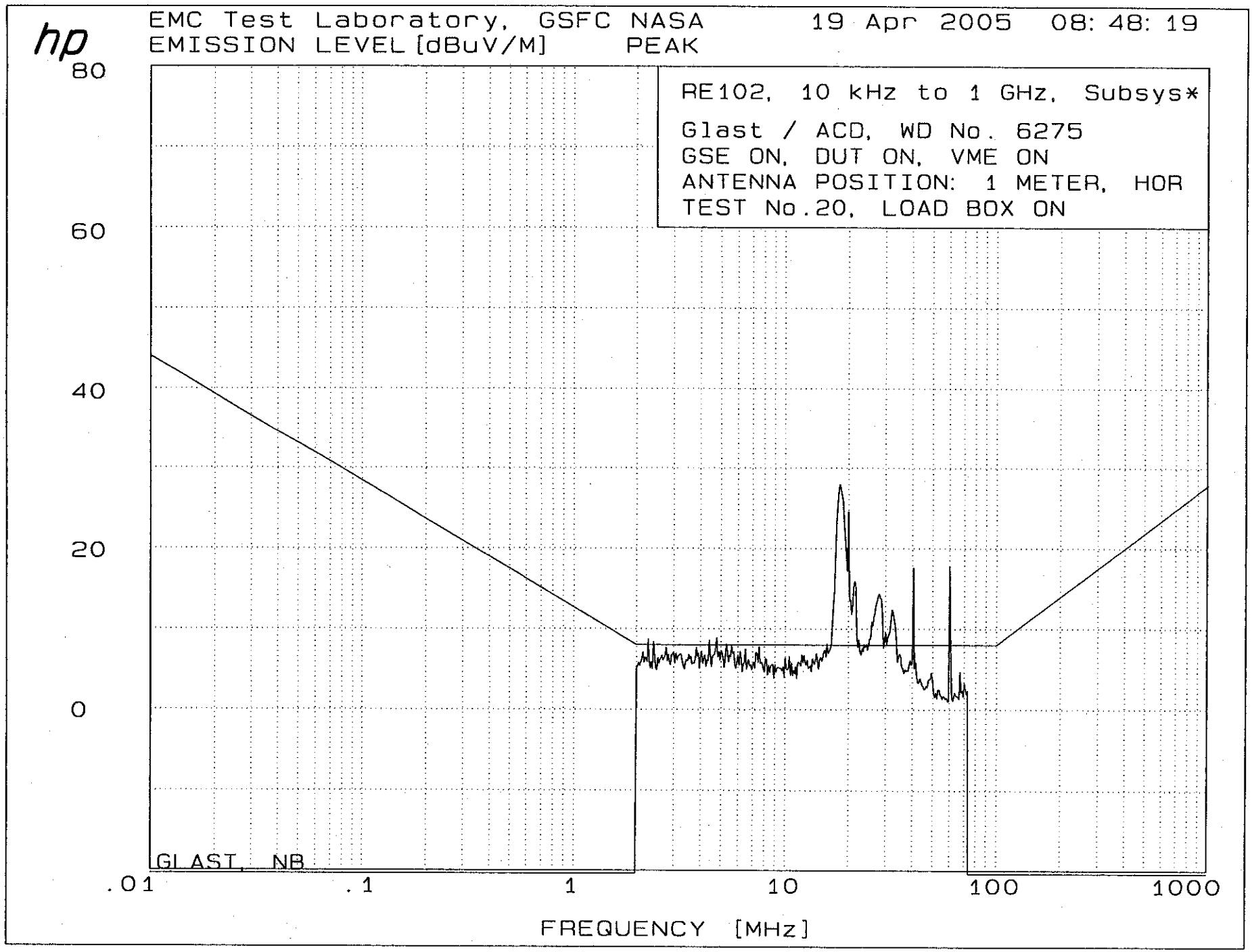

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 08:41:29
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.19, LOAD BOX ON
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 08:41:29

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	18.27	27.4	19.4
2	20.03	20.8	12.8
3	28.28	13.3	5.3
4	40.4	13.2	5.2

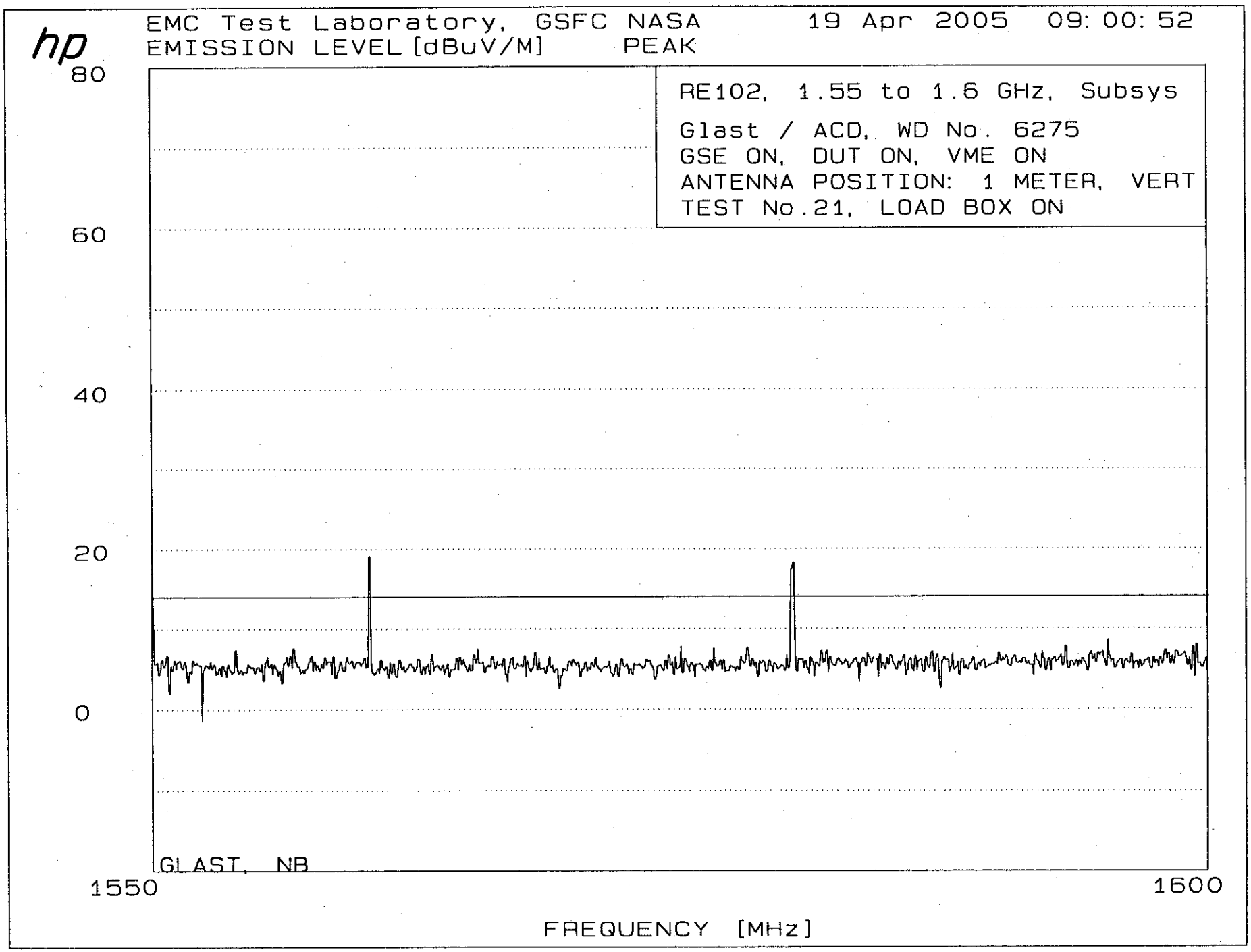

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 08: 48: 19
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys*
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, HOR
TEST No.20, LOAD BOX ON
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 08:48:19

1. Radiated Emissions Test Setup
   1.7 RE102, 10 kHz to 1 GHz, Subsys*

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	18.27	28	20.0
2	20.03	24.6	16.6
3	27.96	14.4	6.4
4	40.4	17.6	9.6
5	59.73	17.8	9.8

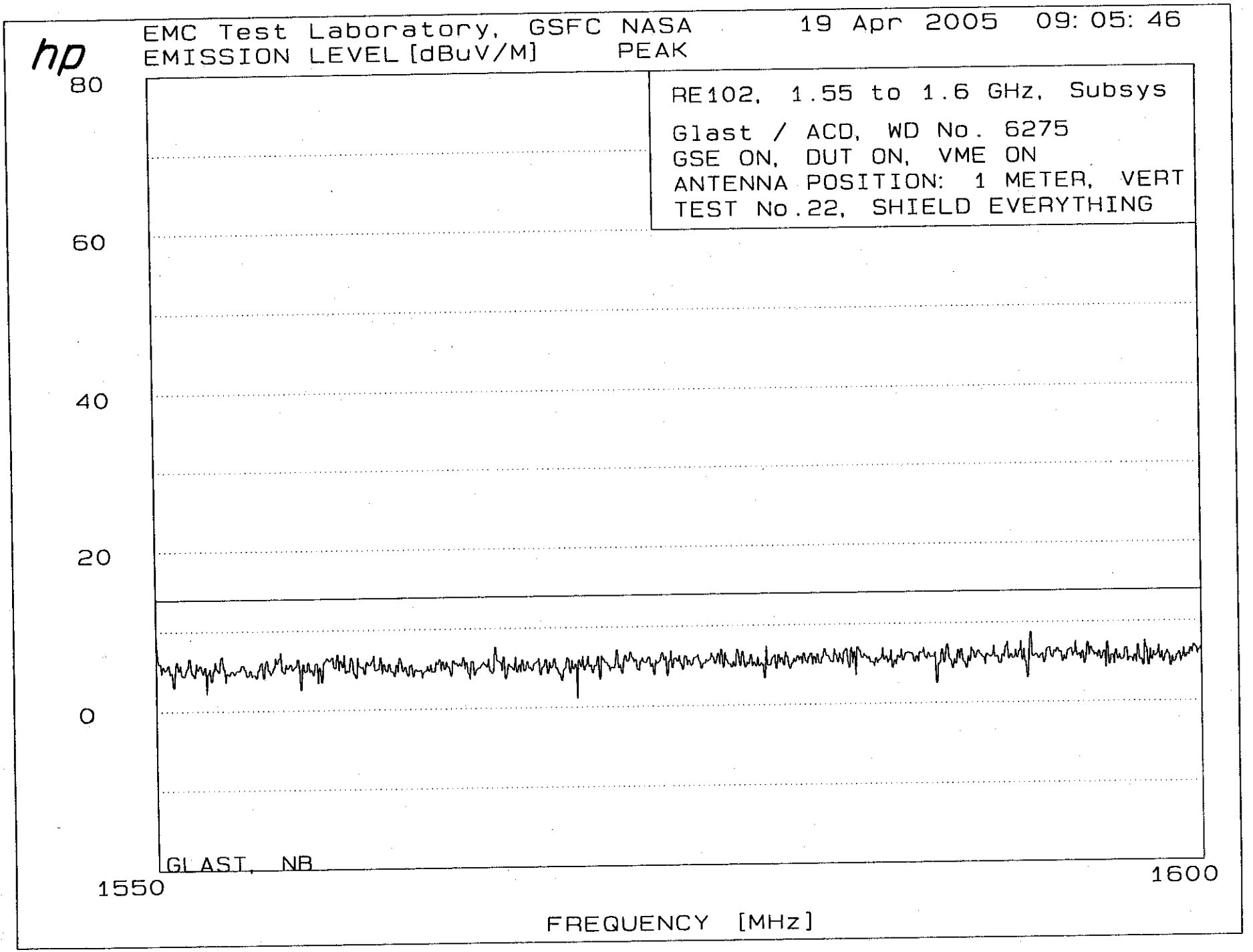

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 09:00:52
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.21, LOAD BOX ON
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

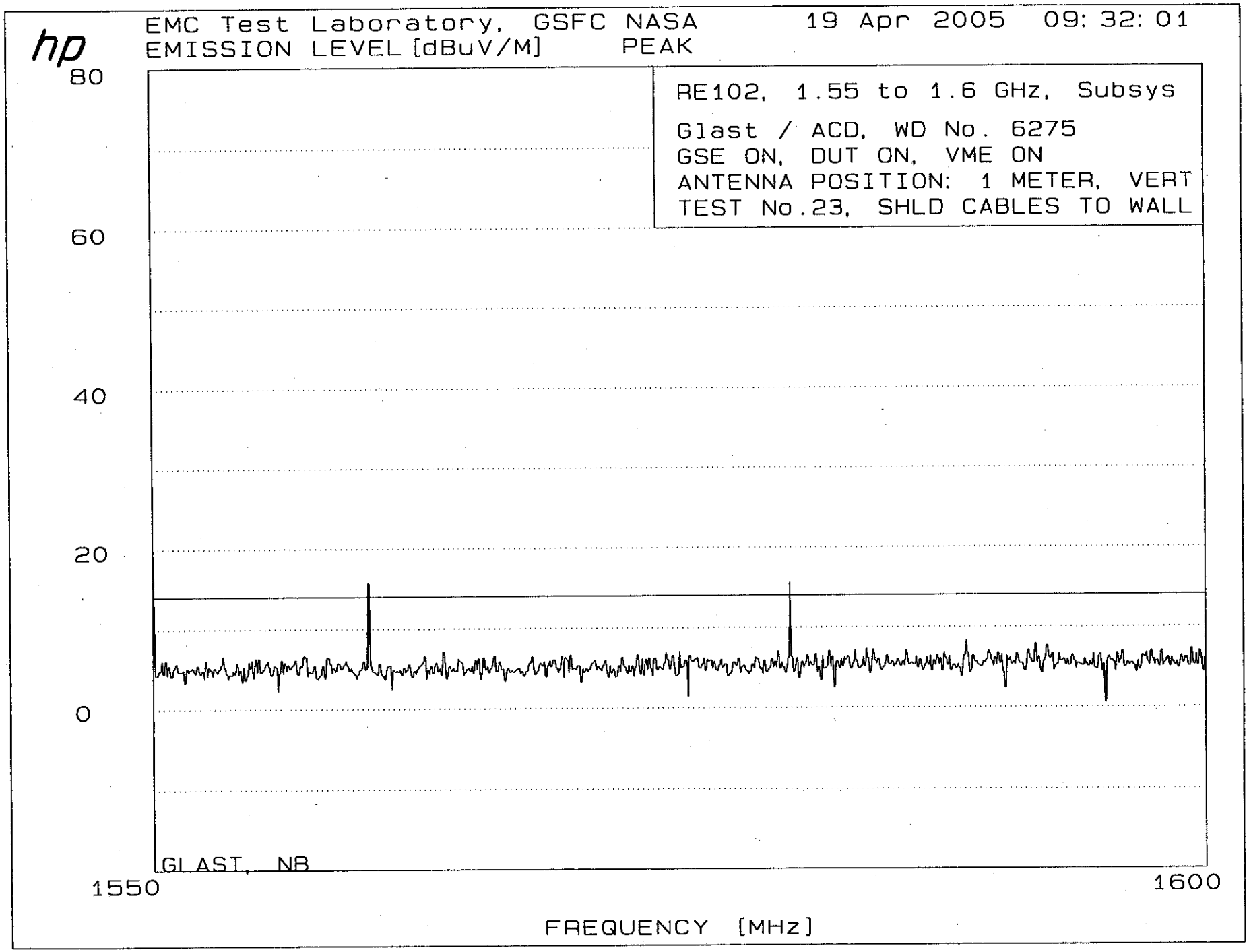
EMC Test Laboratory, GSFC NASA 19 Apr 2005 09:00:52

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1560.2	19	5.0
2	1580.2	18.2	4.2


hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 09: 05: 46
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.22, SHIELD EVERYTHING
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

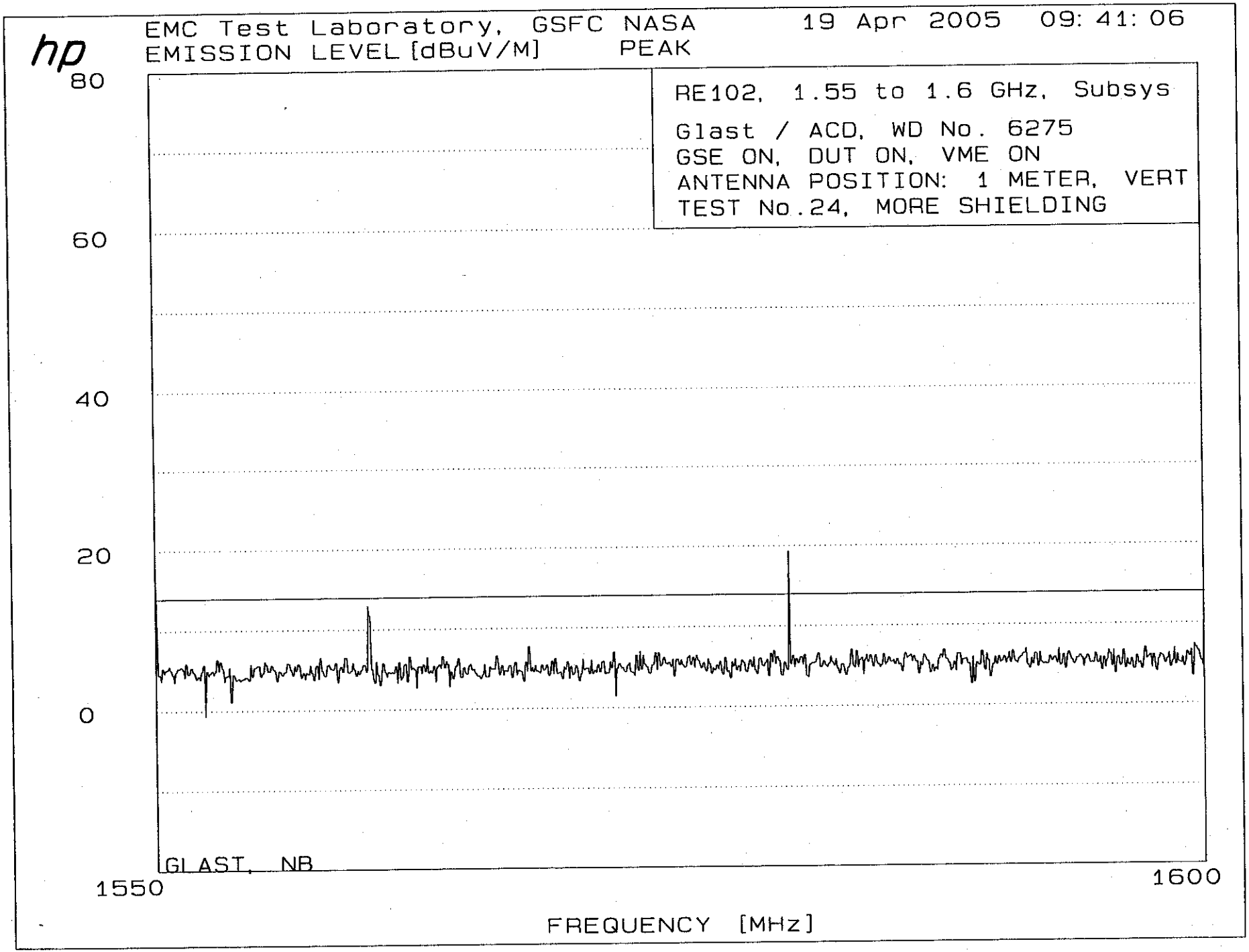

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 09:32:01
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.23, SHLD CABLES TO WALL
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 09:32:01

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1560.1	15.7	1.7
2	1580	15.6	1.6

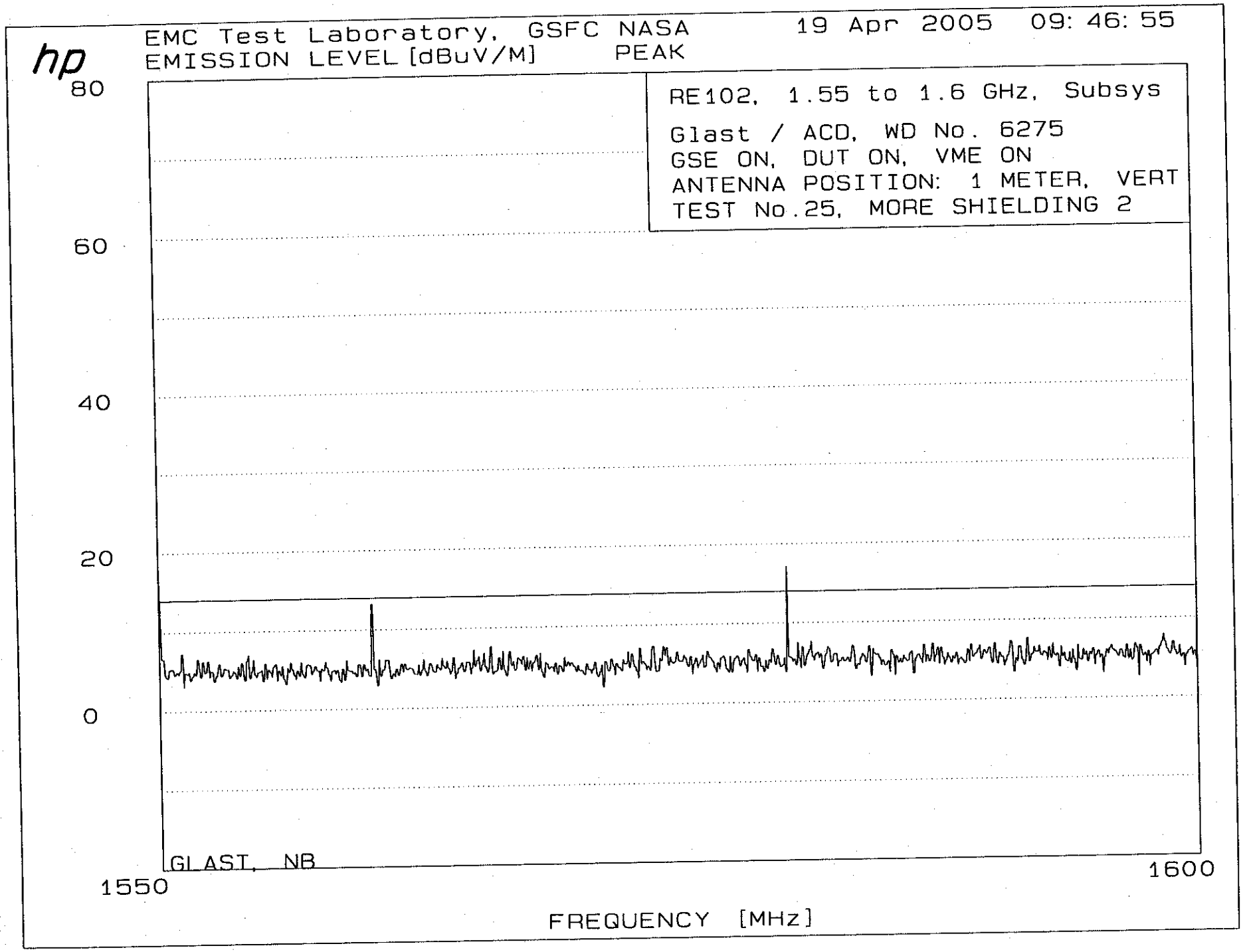

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 09:41:06
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.24, MORE SHIELDING
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 09:41:06

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1580	19.3	5.3

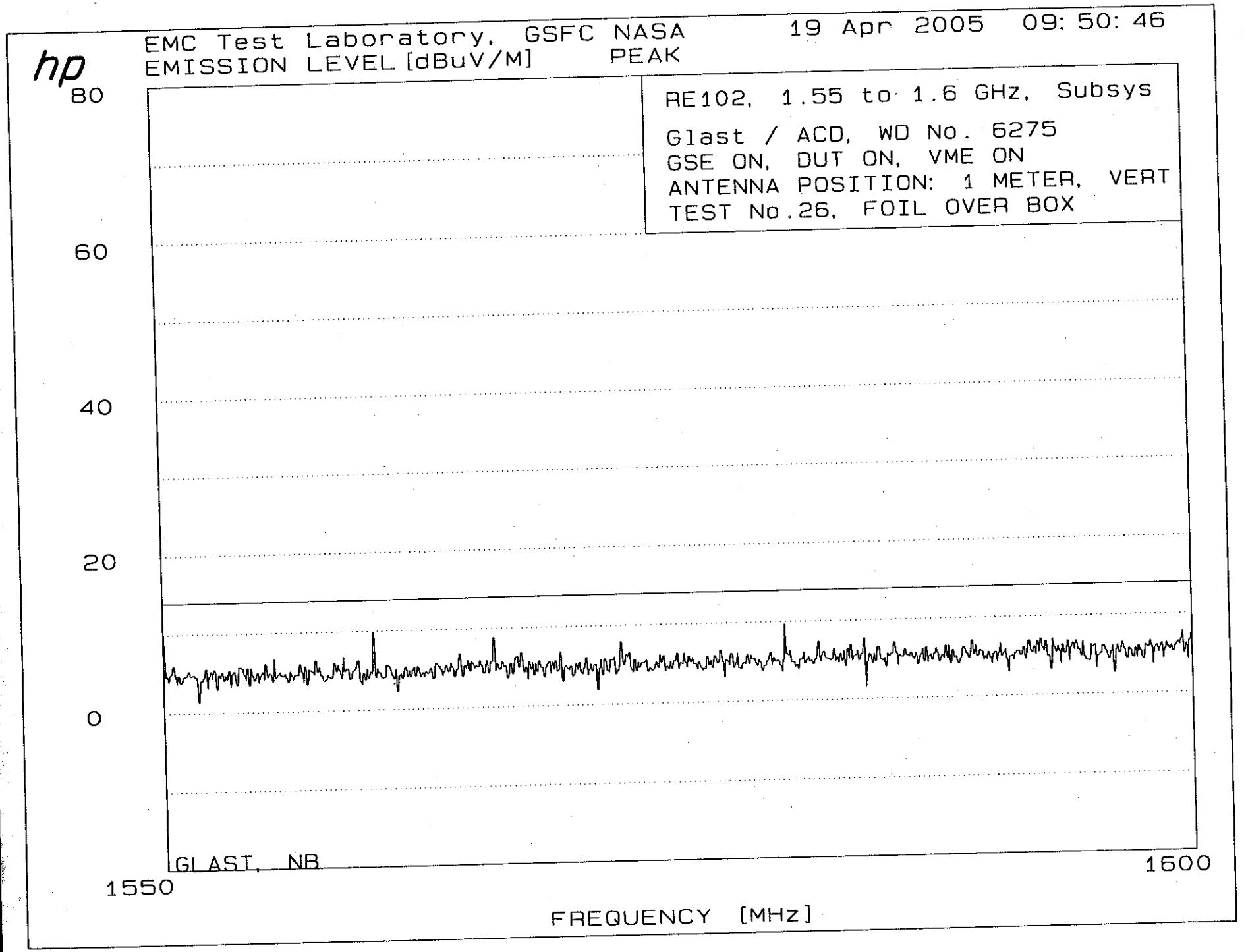

EMC Test Laboratory, GSFC NASA
19 Apr 2005 09: 46: 55
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.25, MORE SHIELDING 2
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

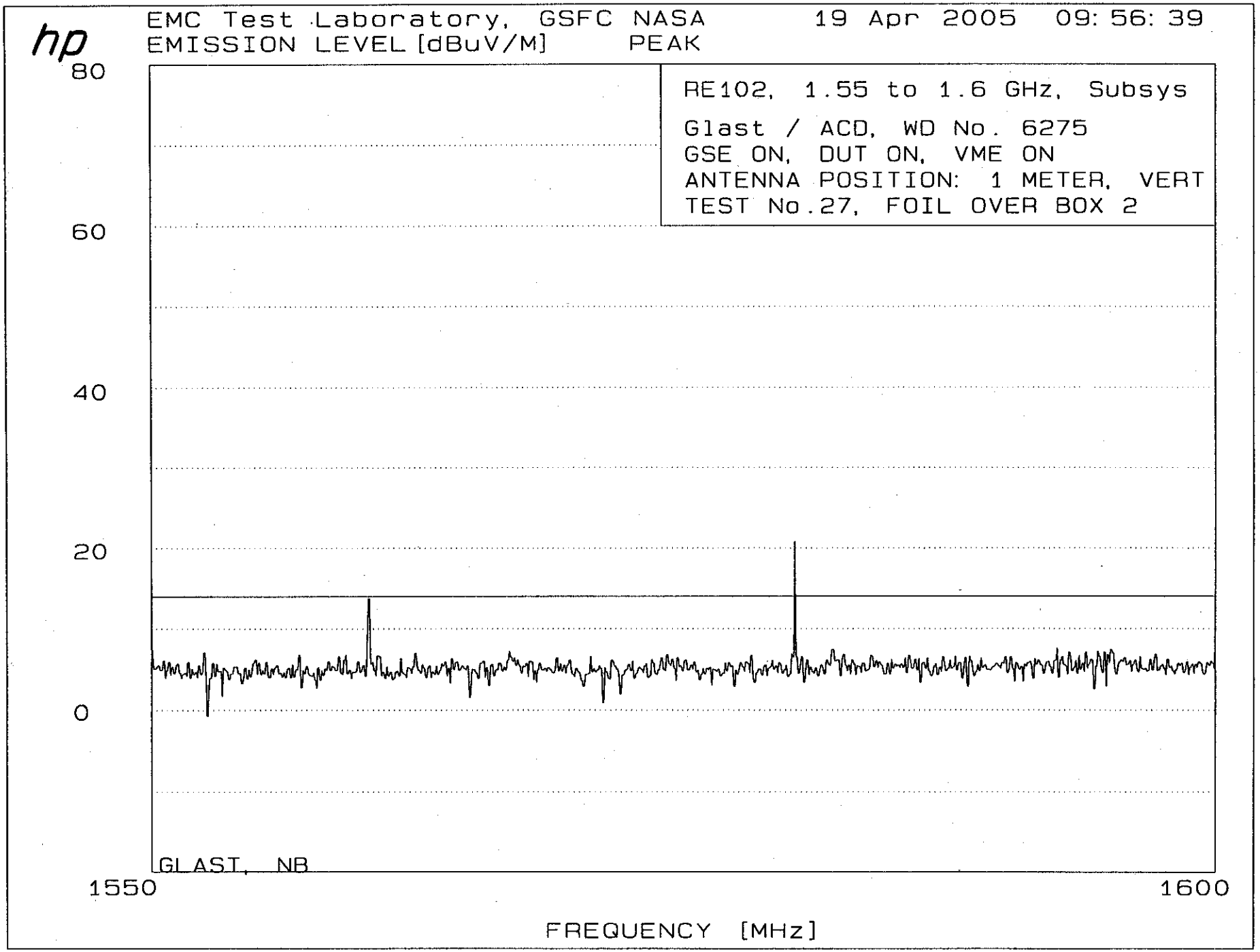
EMC Test Laboratory, GSFC NASA 19 Apr 2005 09:46:55

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1580	17.1	3.1


EMC Test Laboratory, GSFC NASA
19 Apr 2005 09: 50: 46
hp
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.26, FOIL OVER BOX
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]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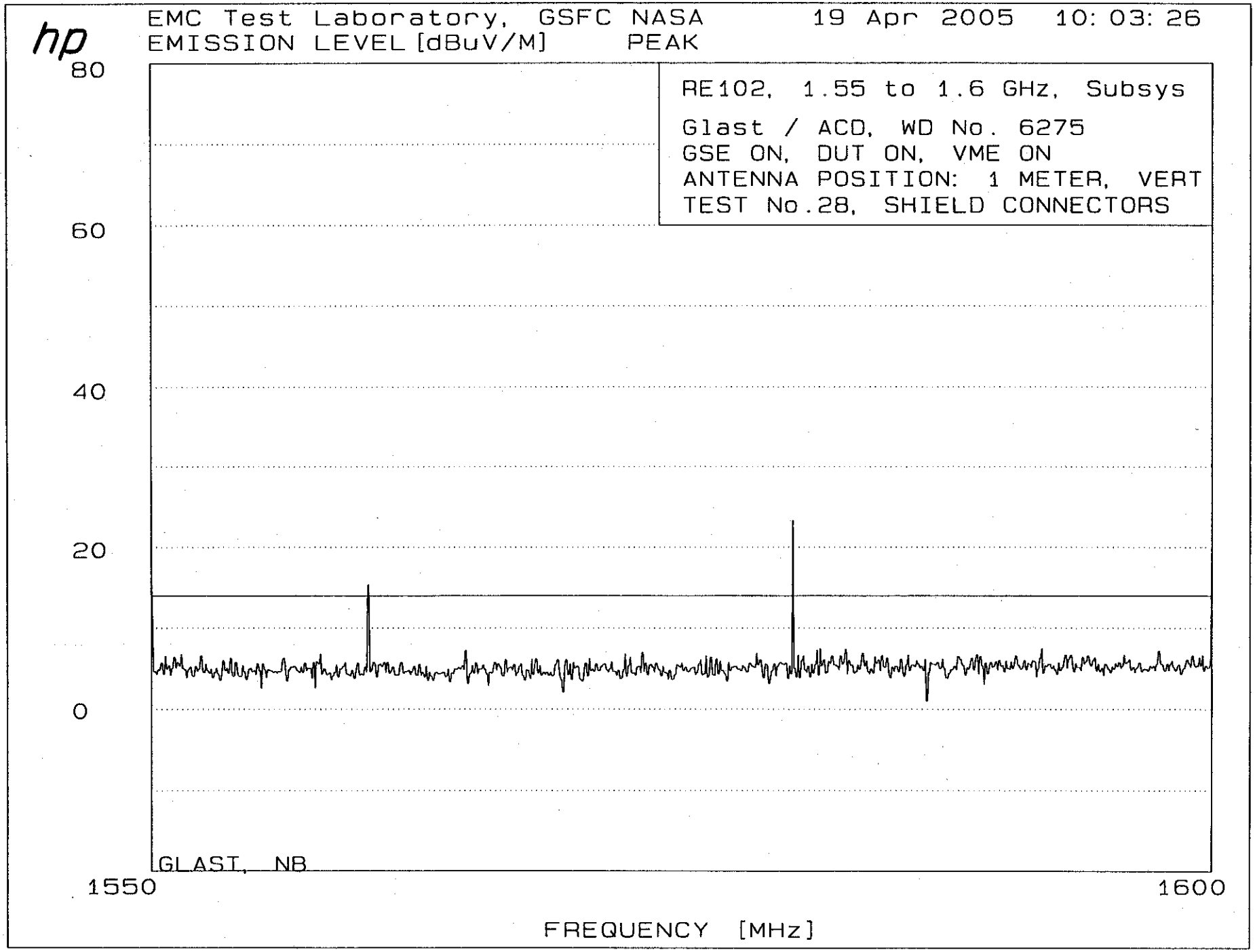
EMC Test Laboratory, GSFC NASA
19 Apr 2005 09:56:39
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.27, FOIL OVER BOX 2
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

```
==========================================================
EMC Test Laboratory, GSFC NASA   19 Apr 2005  09:56:39
==========================================================
 1. Radiated Emissions Test Setup
    1.3  RE102, 1.55 to 1.6 GHz, Subsys
==========================================================
Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#     FREQ (MHz)        (dBuV/M)       DELTA
  1      1580                20.8           6.8
```

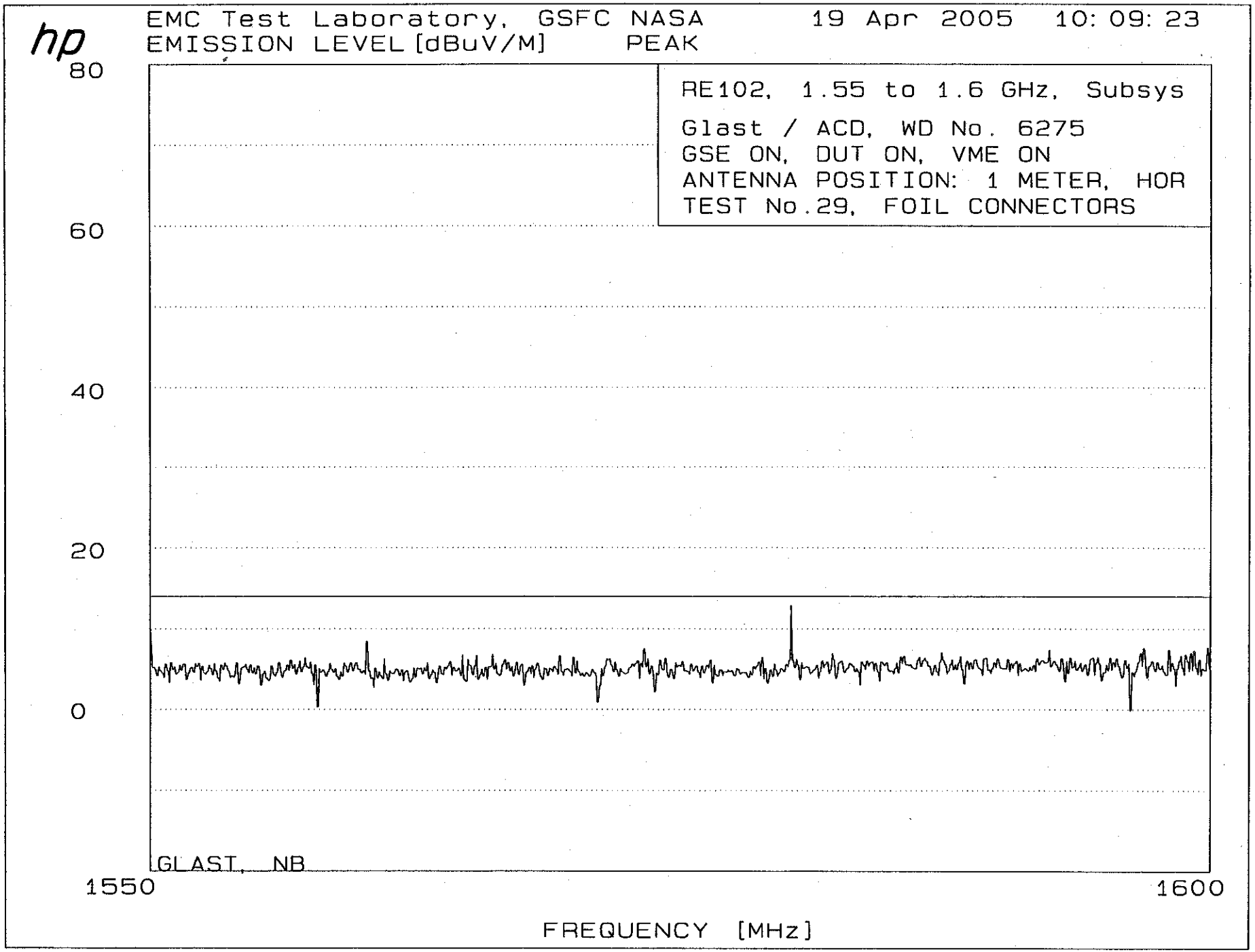

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 10: 03: 26
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.28, SHIELD CONNECTORS
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

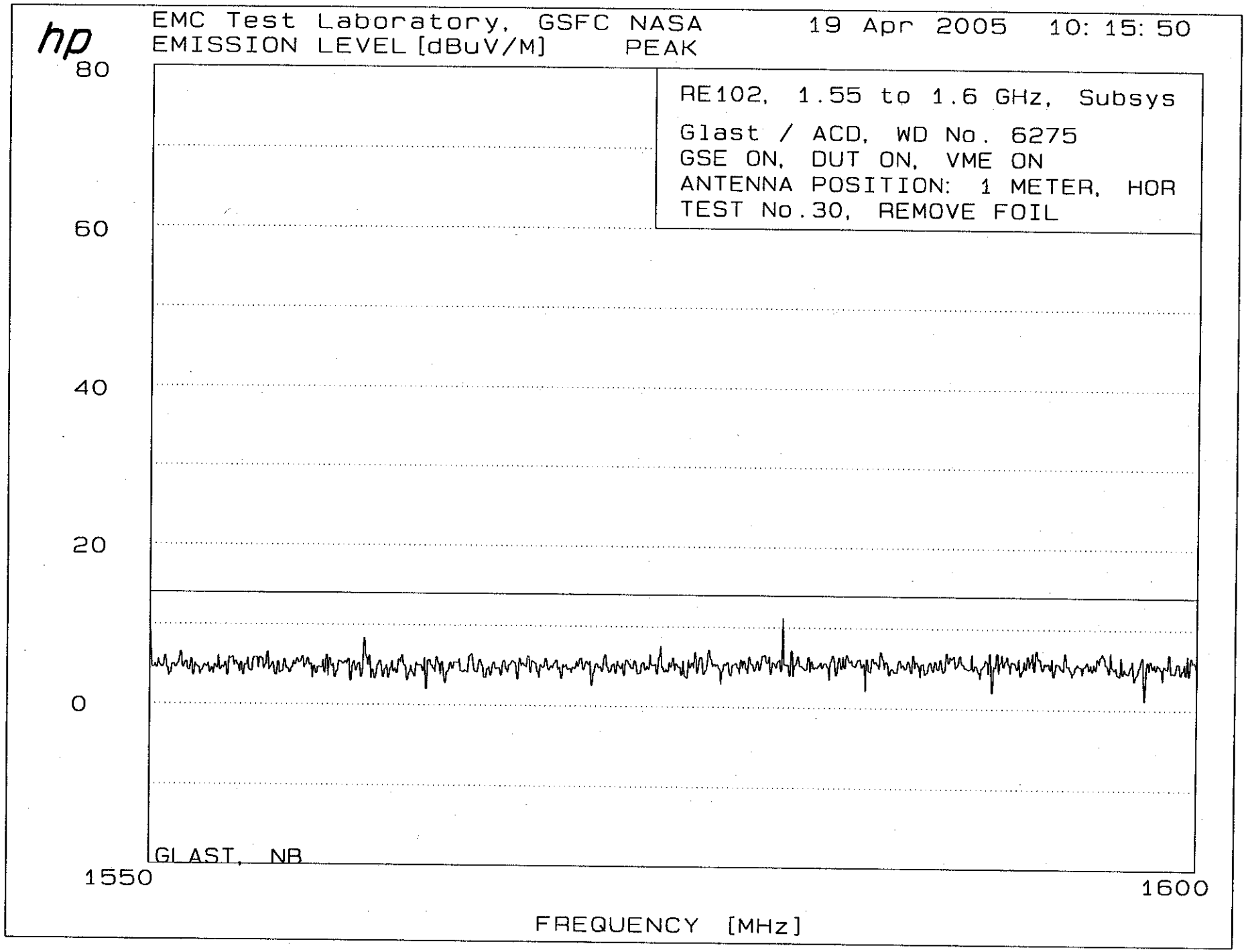
EMC Test Laboratory, GSFC NASA 19 Apr 2005 10:03:26

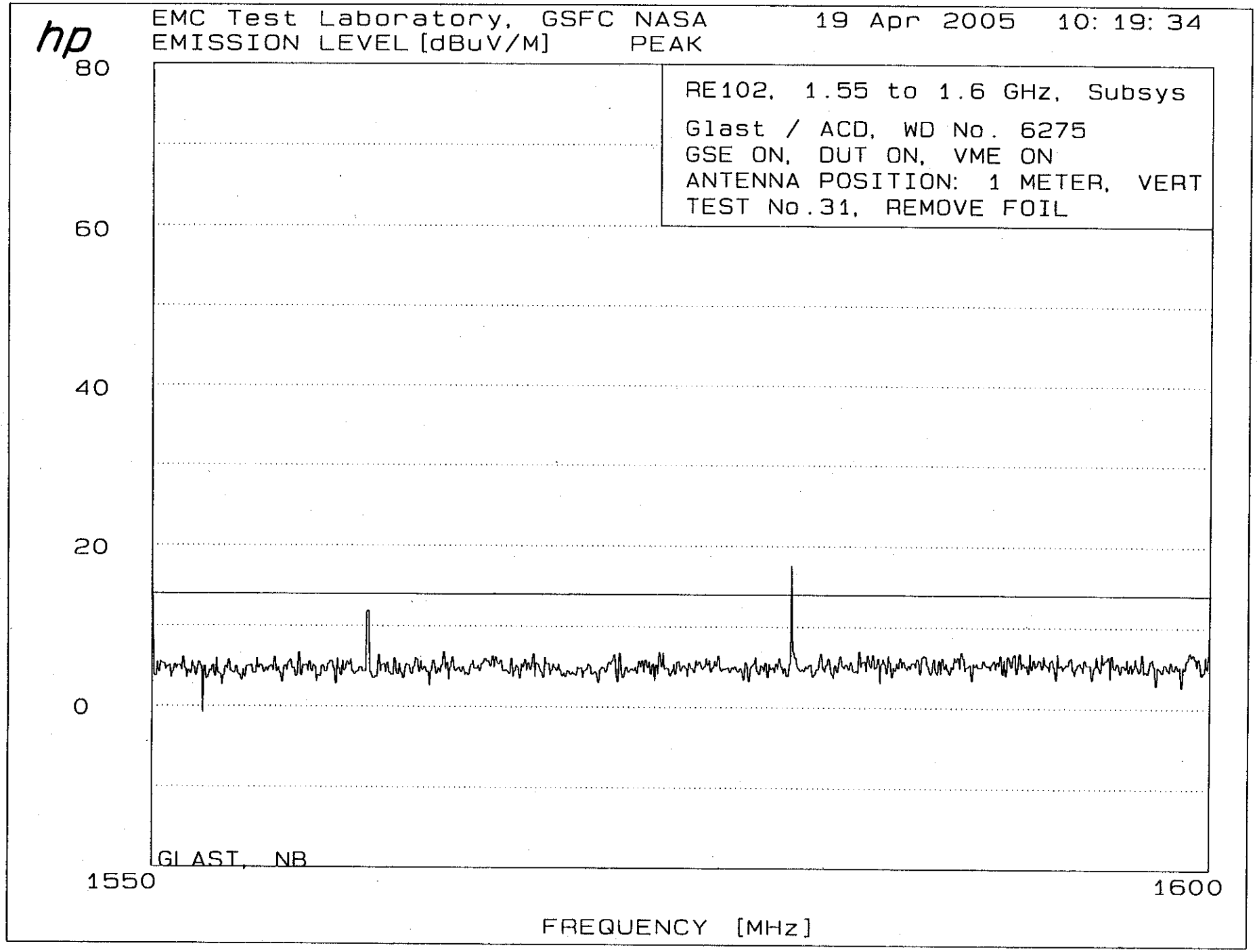
1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1560.1	15.3	1.3
2	1580	23.3	9.3


hp
EMC Test Laboratory, GSFC NASA 19 Apr 2005 10:09:23
EMISSION LEVEL [dBuV/M] PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, HOR
TEST No.29, FOIL CONNECTORS
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]


hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 10: 15: 50
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, HOR
TEST No.30, REMOVE FOIL
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

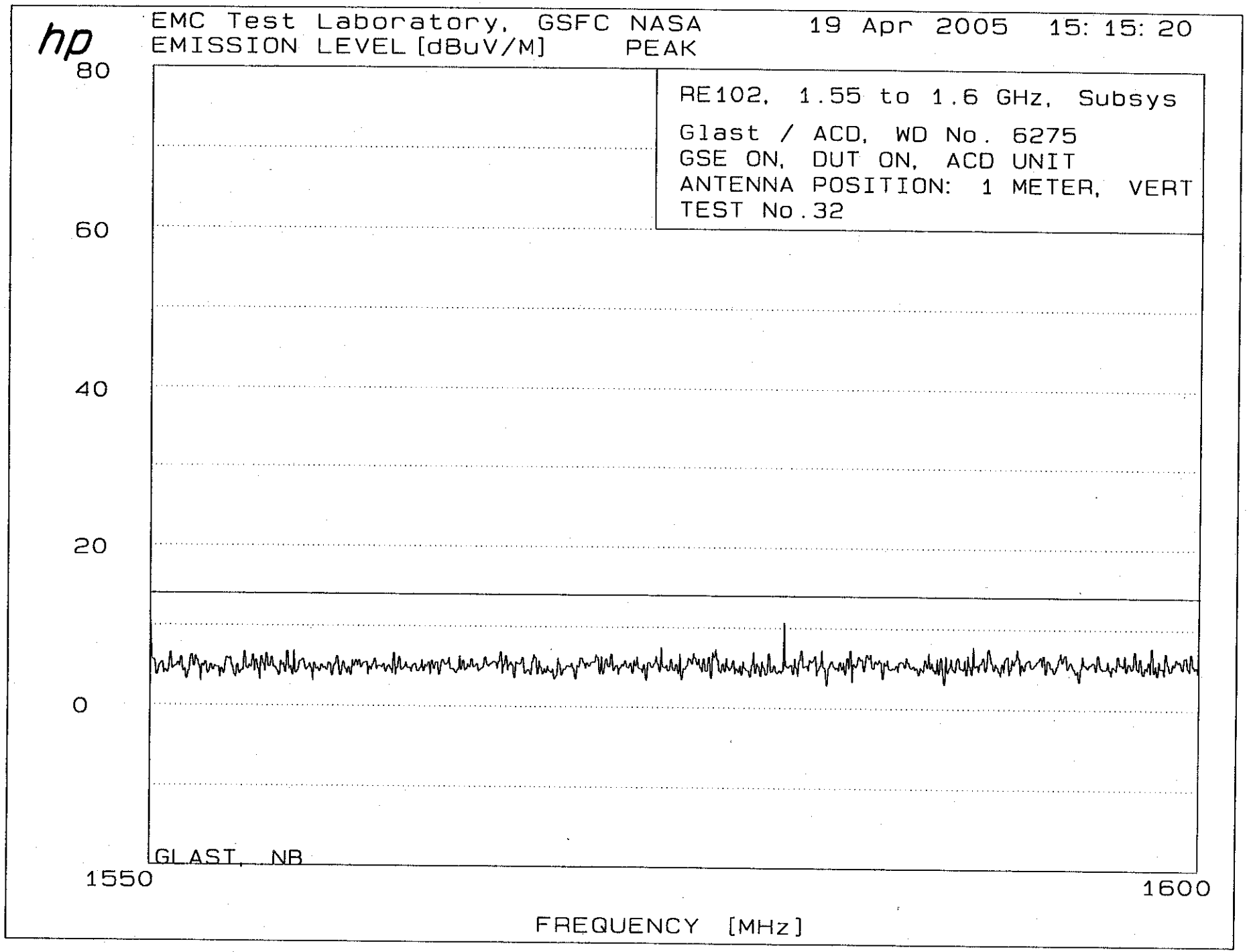

hp
EMC Test Laboratory, GSFC NASA 19 Apr 2005 10: 19: 34
EMISSION LEVEL [dBuV/M] PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, VME ON
ANTENNA POSITION: 1 METER, VERT
TEST No.31, REMOVE FOIL
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

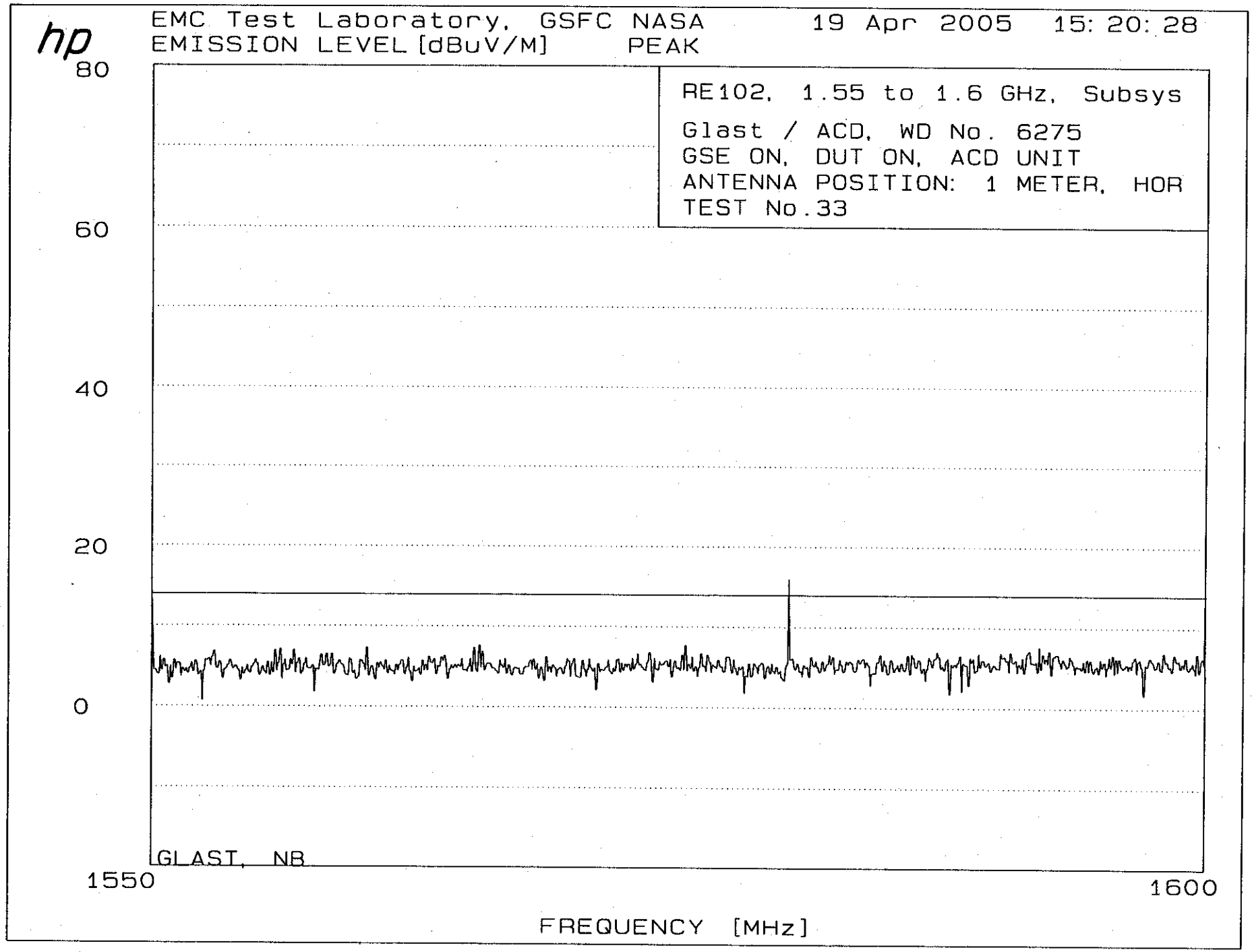
EMC Test Laboratory, GSFC NASA 19 Apr 2005 10:19:34

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1580	17.6	3.6


hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 15: 15: 20
EMISSION LEVEL [dBuV/M]
PEAK
80
60
40
20
0
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, VERT
TEST No.32
GLAST, NB
1550
1600
FREQUENCY [MHz]

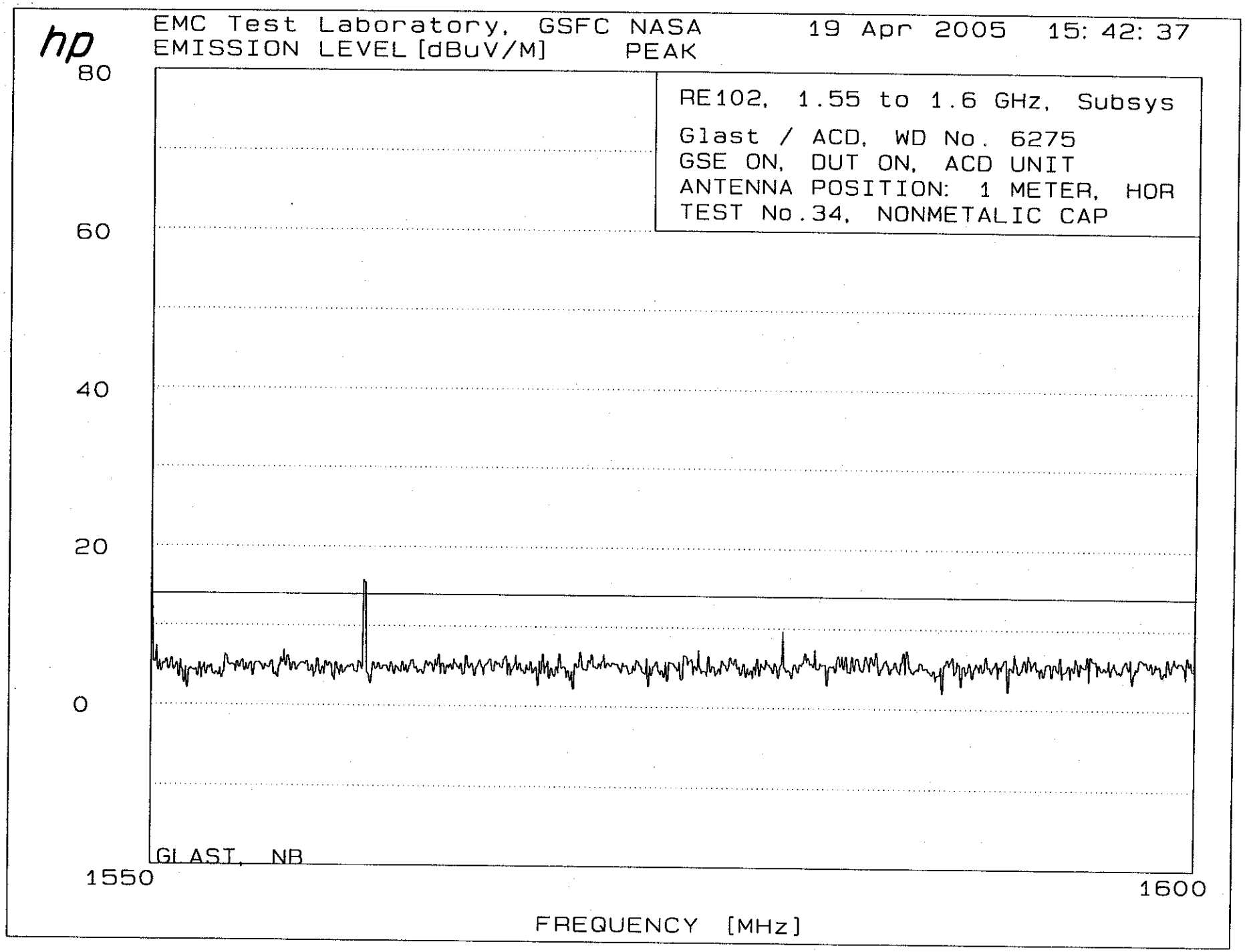

hp
EMC Test Laboratory, GSFC NASA 19 Apr 2005 15:20:28
EMISSION LEVEL [dBuV/M] PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, HOR
TEST No.33
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 15:20:28

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1580	16	2.0

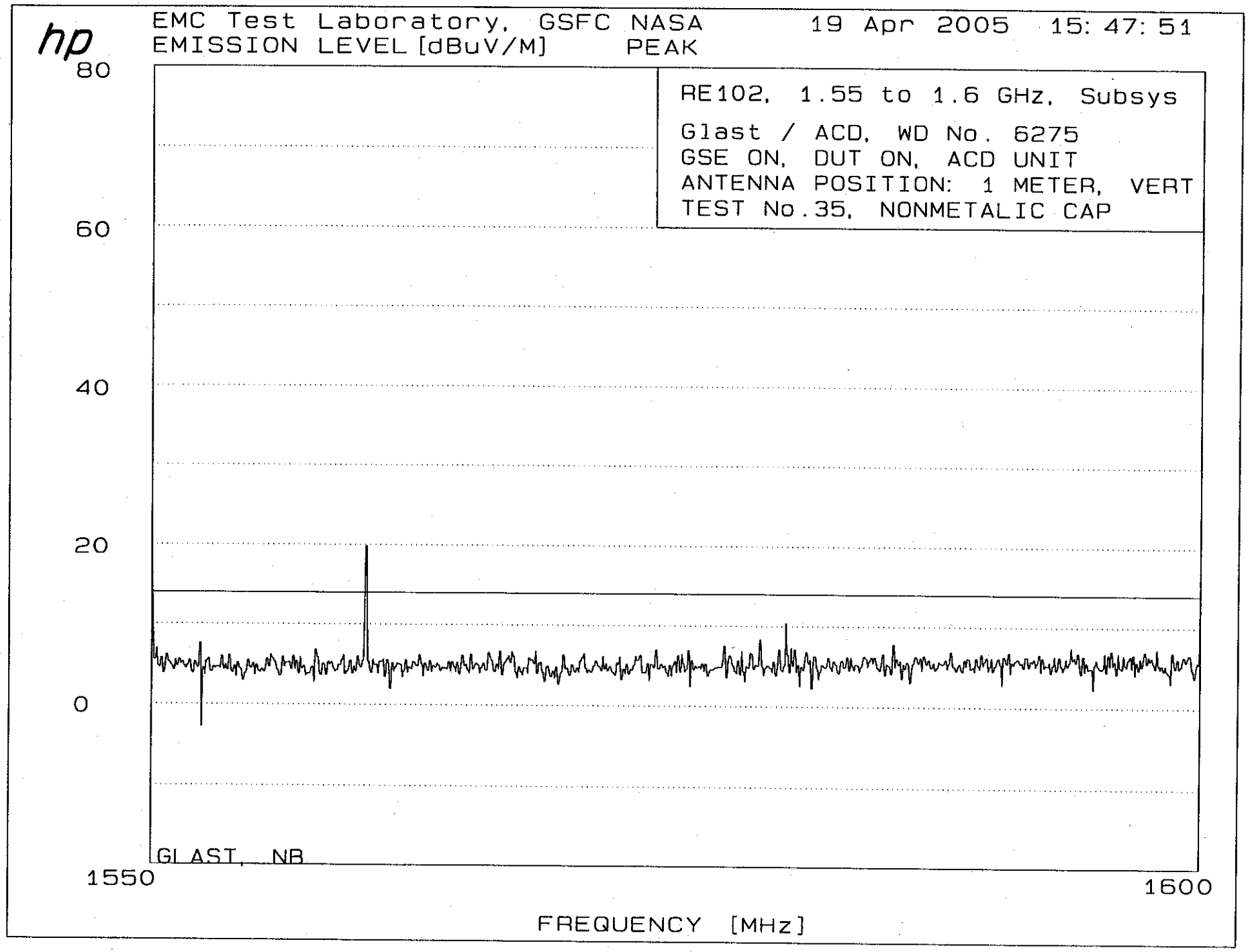

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 15: 42: 37
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, HOR
TEST No.34, NONMETALIC CAP
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 15:42:37

1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1560	15.8	1.8

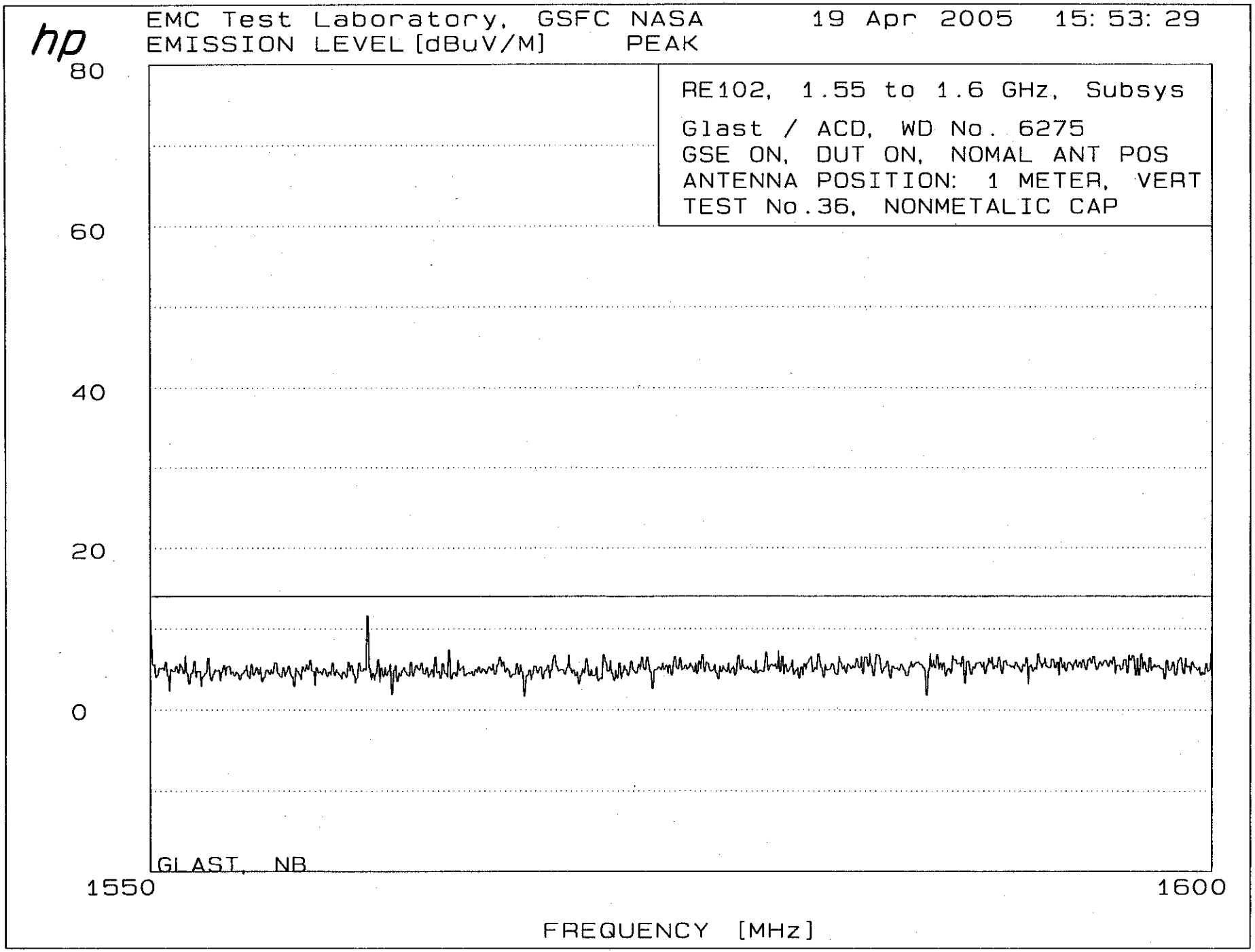

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 15:47:51
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, VERT
TEST No.35, NONMETALIC CAP
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

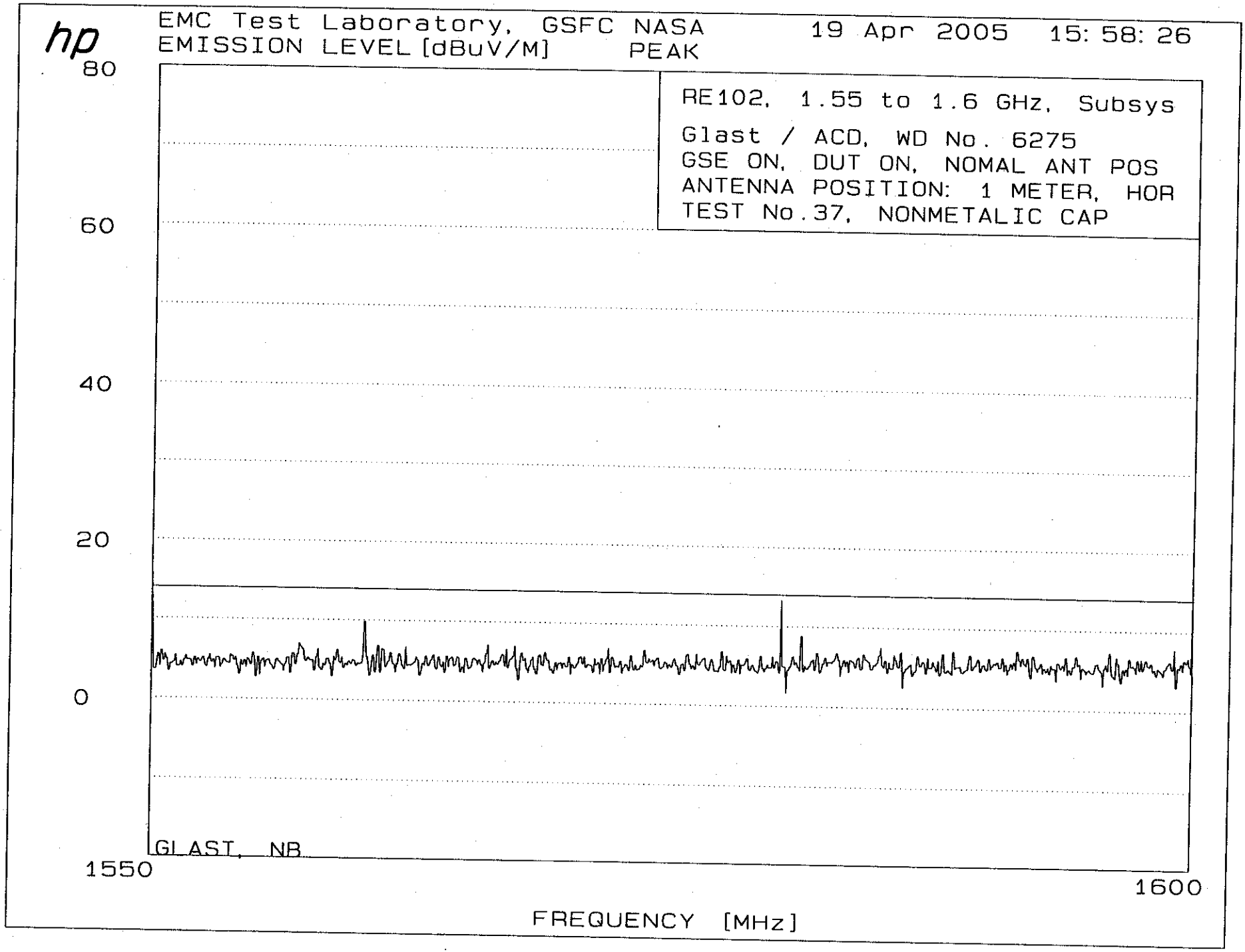
EMC Test Laboratory, GSFC NASA 19 Apr 2005 15:47:51

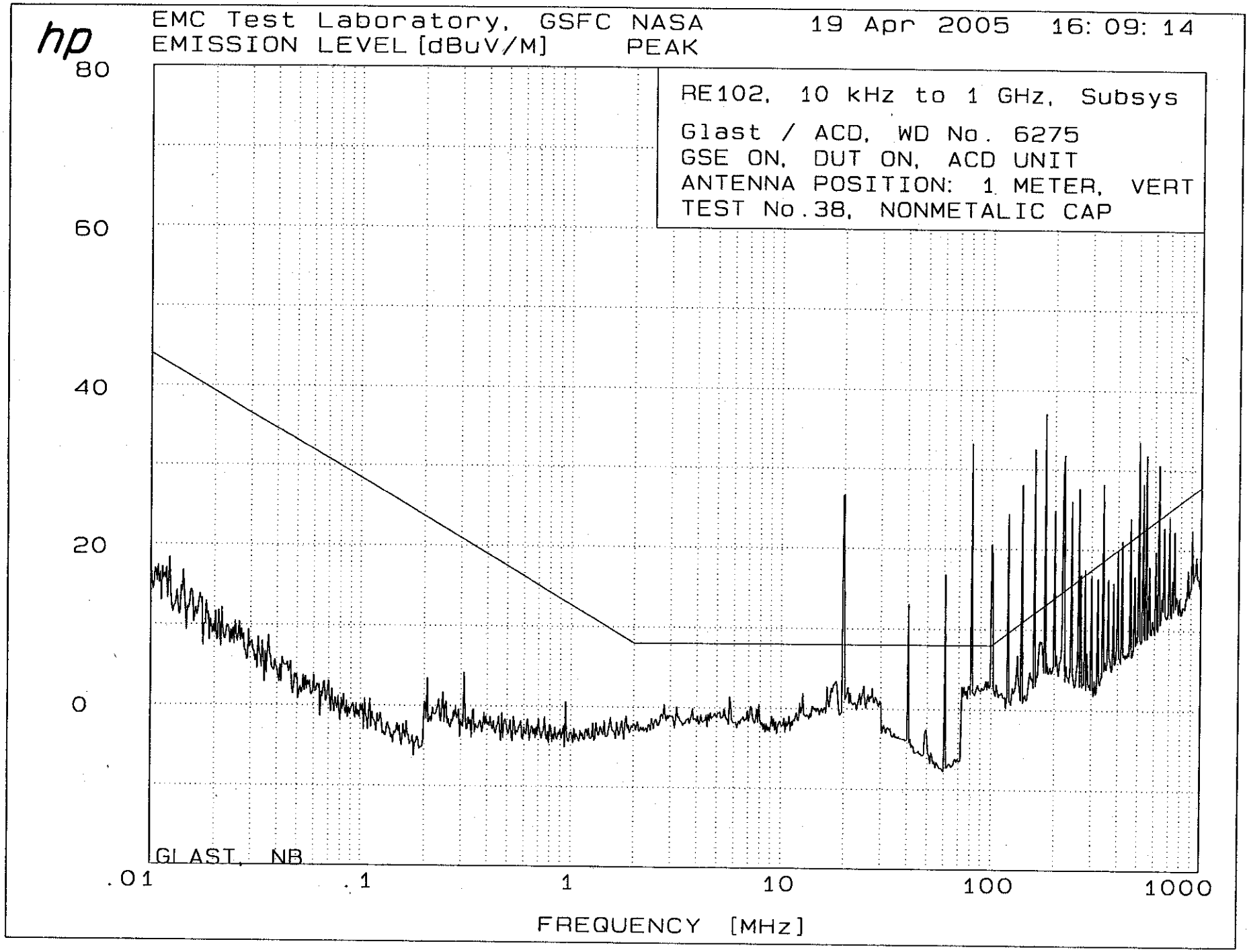
1. Radiated Emissions Test Setup
   1.3 RE102, 1.55 to 1.6 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	1560.1	19.8	5.8


hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 15:53:29
EMISSION LEVEL [dBuV/M]
PEAK
80
60
40
20
0
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, NOMAL ANT POS
ANTENNA POSITION: 1 METER, VERT
TEST No.36, NONMETALIC CAP
GLAST, NB
1550
1600
FREQUENCY [MHz]


hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 15:58:26
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 1.55 to 1.6 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, NOMAL ANT POS
ANTENNA POSITION: 1 METER, HOR
TEST No.37, NONMETALIC CAP
80
60
40
20
0
GLAST, NB
1550
1600
FREQUENCY [MHz]

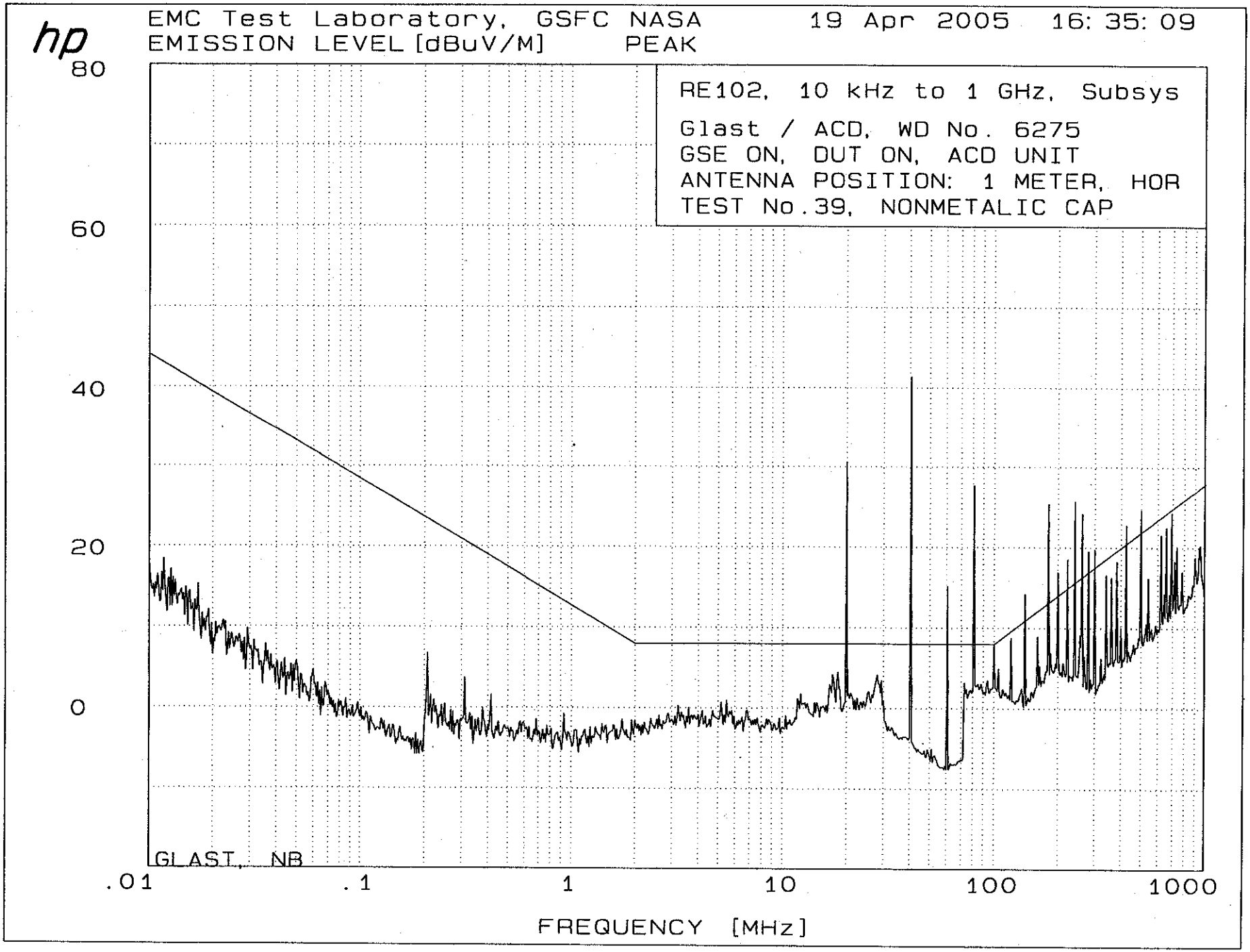

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 16:09:14
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, VERT
TEST No.38, NONMETALIC CAP
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 16:09:14

1. Radiated Emissions Test Setup
   1.1 RE102, 10 kHz to 1 GHz, Subsys

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	20.03	26.7	18.7
2	40.4	13.1	5.1
3	60.43	16.8	8.8
4	80.56	33.2	25.2
5	100.23	20.6	12.6
6	120.48	24.4	14.8
7	139.91	28.1	17.2
8	160.62	32.6	20.5
9	180.2	37.1	24.0
10	199.85	24.8	10.9
11	221.64	31.8	17.0
12	240.23	26	10.5
13	260.37	27.6	11.4
14	266.42	16.9	.5
15	278.97	17.5	.7
16	339.21	28.2	9.7
17	398.47	20	.1
18	417.23	21.1	.8
19	457.45	23.9	2.8
20	501.53	33.5	11.6
21	525.15	28.3	6.0
22	543.58	31.8	9.2
23	624.03	30.6	6.8

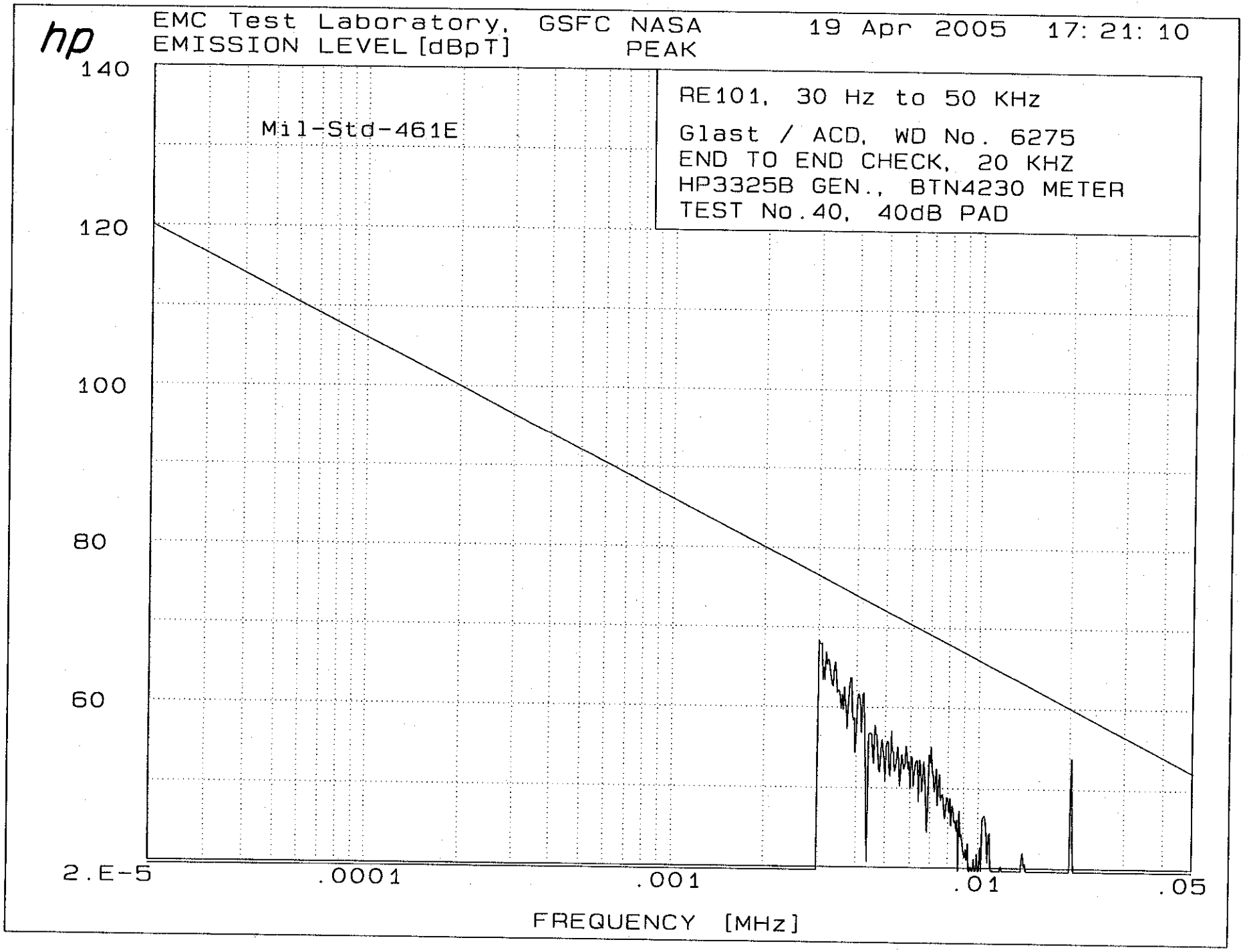

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 16:35:09
EMISSION LEVEL [dBuV/M]
PEAK
RE102, 10 kHz to 1 GHz, Subsys
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 1 METER, HOR
TEST No.39, NONMETALIC CAP
80
60
40
20
0
GLAST, NB
.01
.1
1
10
100
1000
FREQUENCY [MHz]

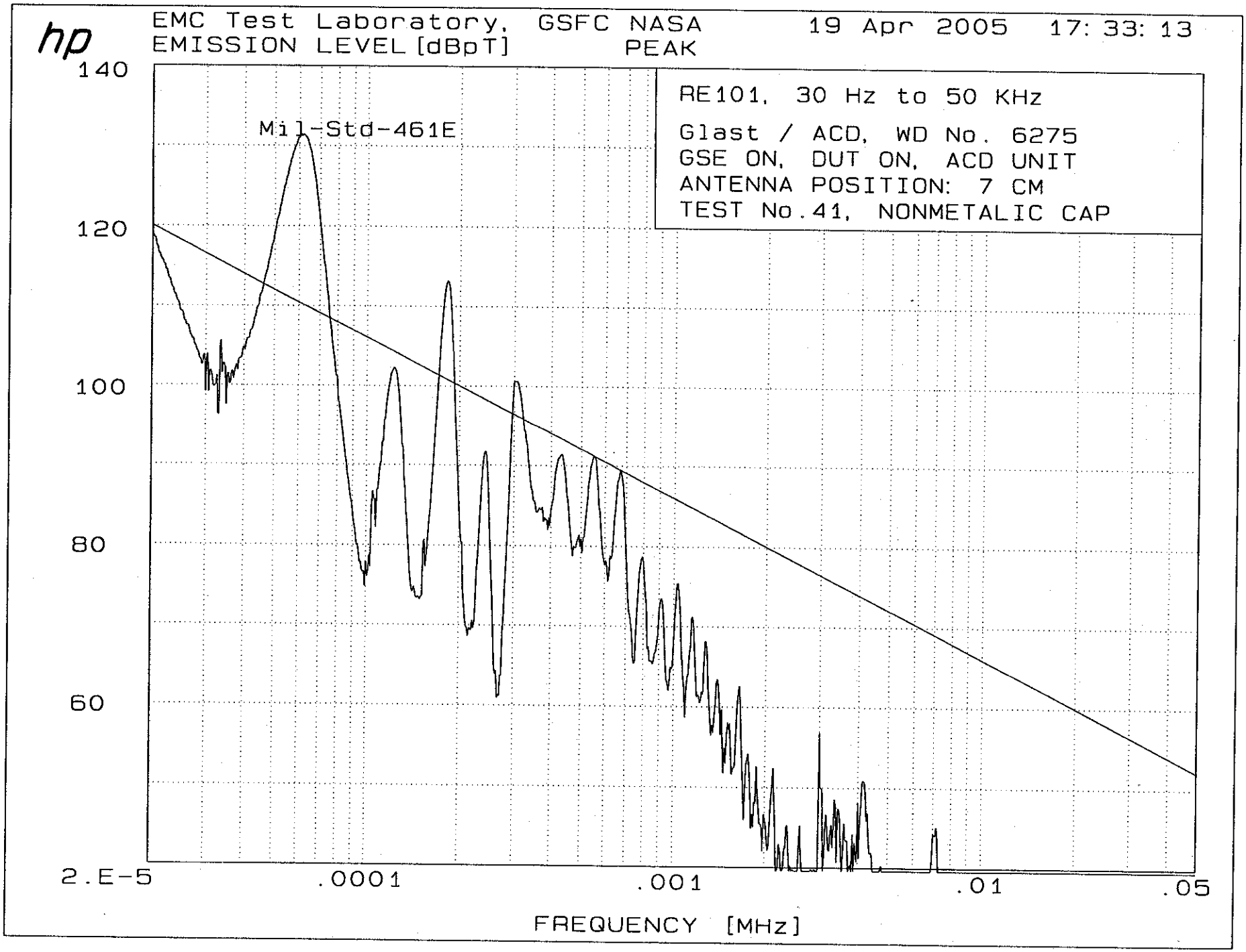
EMC Test Laboratory, GSFC NASA 19 Apr 2005 16:35:09

1. Radiated Emissions Test Setup
   1.1 RE102, 10 kHz to 1 GHz, Subsys

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/M)	DELTA
1	20.03	30.6	22.6
2	40.4	41.4	33.4
3	60.43	15.2	7.2
4	80.56	27.7	19.7
5	139.91	14.2	3.3
6	180.2	25.4	12.3
7	199.85	16.9	3.0
8	221.64	18.5	3.7
9	240.23	25.7	10.2
10	260.37	24.2	8.0
11	278.97	19.5	2.7
12	298.9	19.8	2.4
13	422.06	22.8	2.4
14	495.8	24.6	2.8


hp
EMC Test Laboratory, GSFC NASA
EMISSION LEVEL [dBpT]
PEAK
19 Apr 2005 17: 21: 10
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
END TO END CHECK, 20 KHZ
HP3325B GEN., BTN4230 METER
TEST No.40, 40dB PAD
Mil-Std-461E
140
120
100
80
60
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

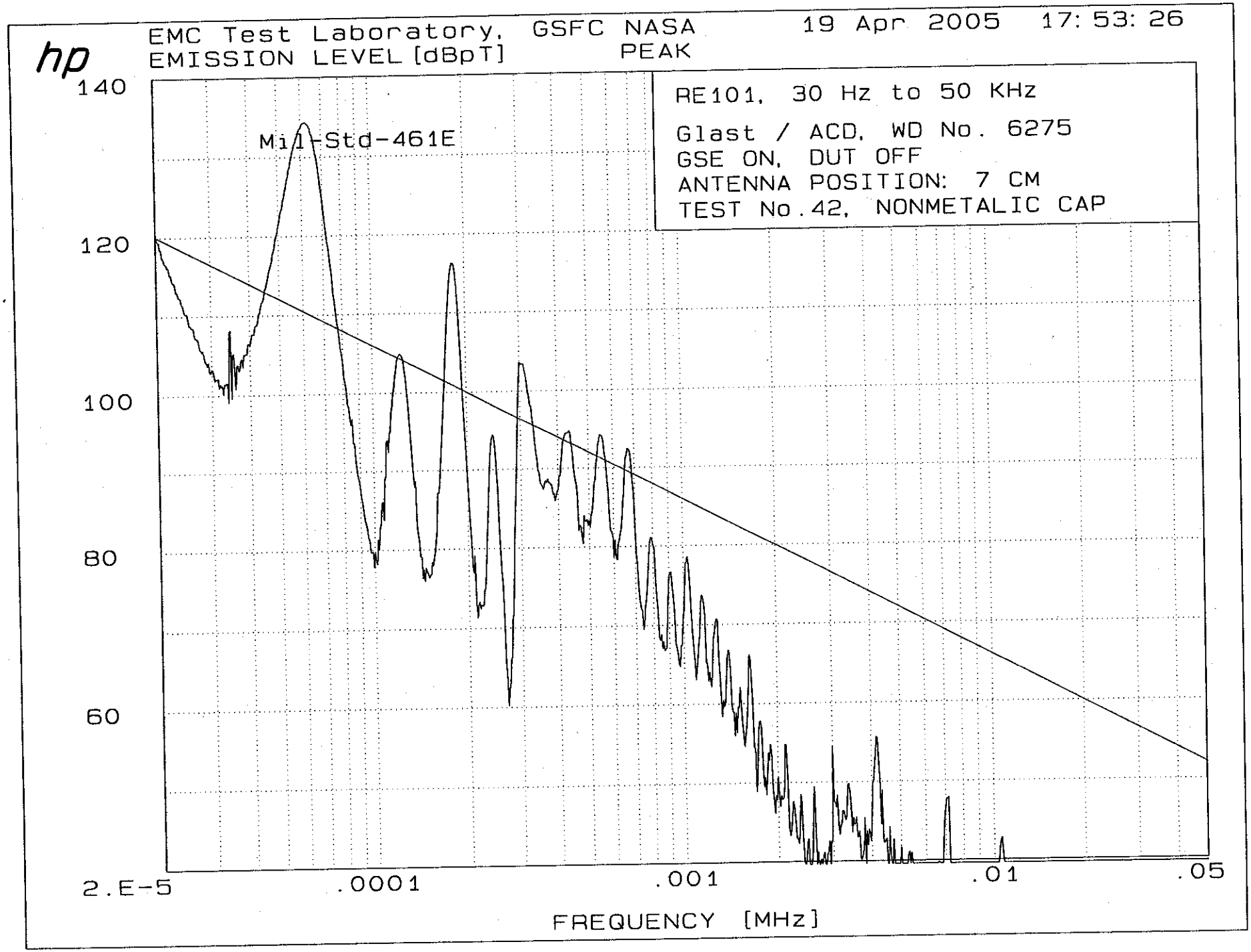

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 17:33:13
EMISSION LEVEL [dBpT]
PEAK
140
120
100
80
60
Mil-Std-461E
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
GSE ON, DUT ON, ACD UNIT
ANTENNA POSITION: 7 CM
TEST No.41, NONMETALIC CAP
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 17:33:13

1. Radiated Emissions Test Setup
   1.5 RE101, 30 Hz to 50 KHz

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBpT)	DELTA
1	6.1E-5	131.4	21.2
2	.000183	113.2	12.5
3	.000301	100.7	4.3

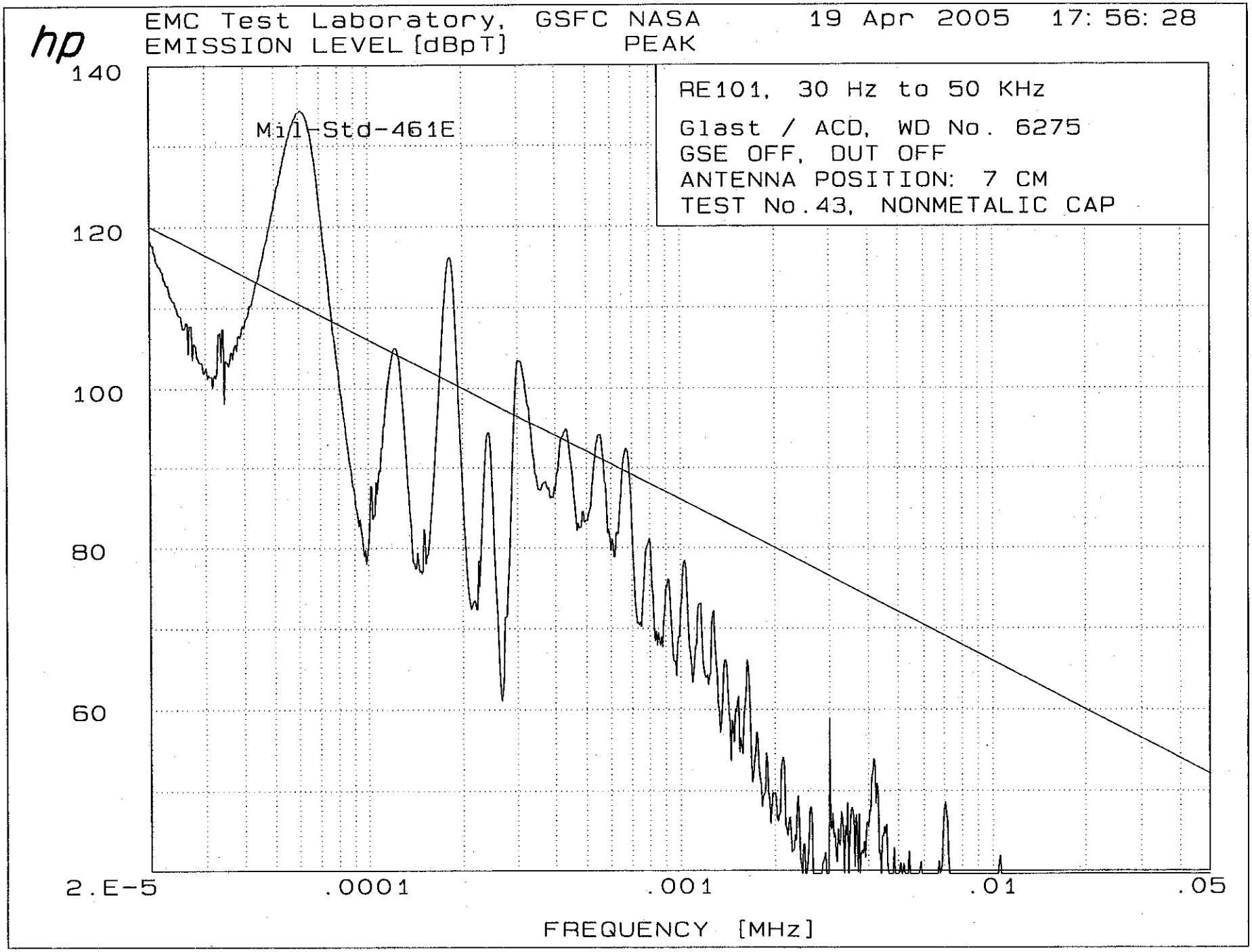

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 17:53:26
EMISSION LEVEL [dBpT]
PEAK
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
GSE ON, DUT OFF
ANTENNA POSITION: 7 CM
TEST No.42, NONMETALIC CAP
Mil-Std-461E
140
120
100
80
60
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 17:53:26

1. Radiated Emissions Test Setup
   1.5 RE101, 30 Hz to 50 KHz

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBpT)	DELTA
1	6.2E-5	134.3	24.2
2	.000123	104.9	.7
3	.000183	116.3	15.6
4	.000301	103.6	7.2
5	.000435	94.8	1.6
6	.000546	94.2	3.0
7	.000669	92.4	3.0

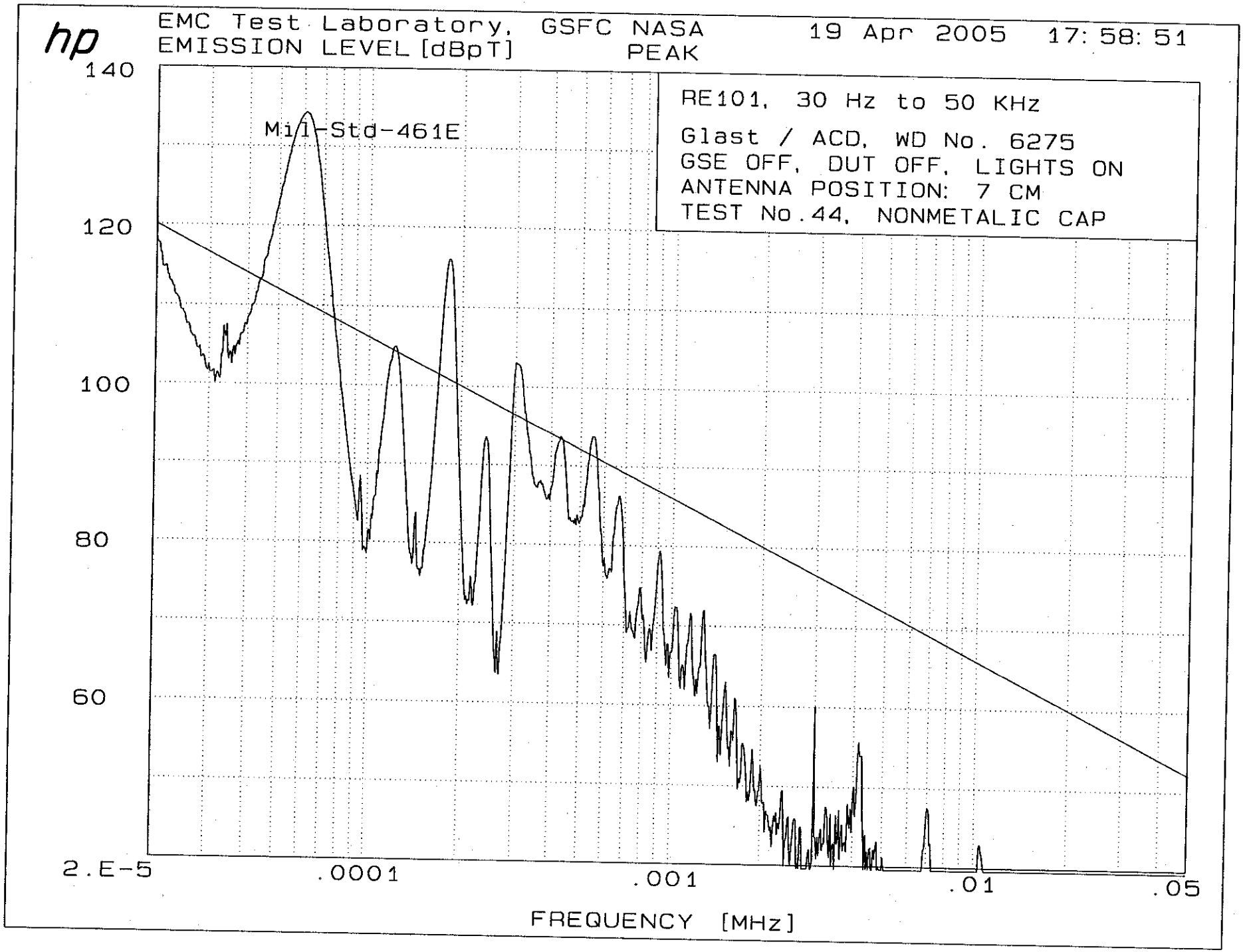

hp
EMC Test Laboratory, GSFC NASA
19 Apr 2005 17:56:28
EMISSION LEVEL [dBpT]
PEAK
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
GSE OFF, DUT OFF
ANTENNA POSITION: 7 CM
TEST No.43, NONMETALIC CAP
Mil-Std-461E
140
120
100
80
60
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 17:56:28

1. Radiated Emissions Test Setup
   1.5 RE101, 30 Hz to 50 KHz

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBpT)	DELTA
1	6.1E-5	134.4	24.2
2	.000122	105	.7
3	.000183	116.2	15.5
4	.000301	103.5	7.1
5	.000432	94.8	1.5
6	.000546	94.1	2.9
7	.000669	92.4	3.0

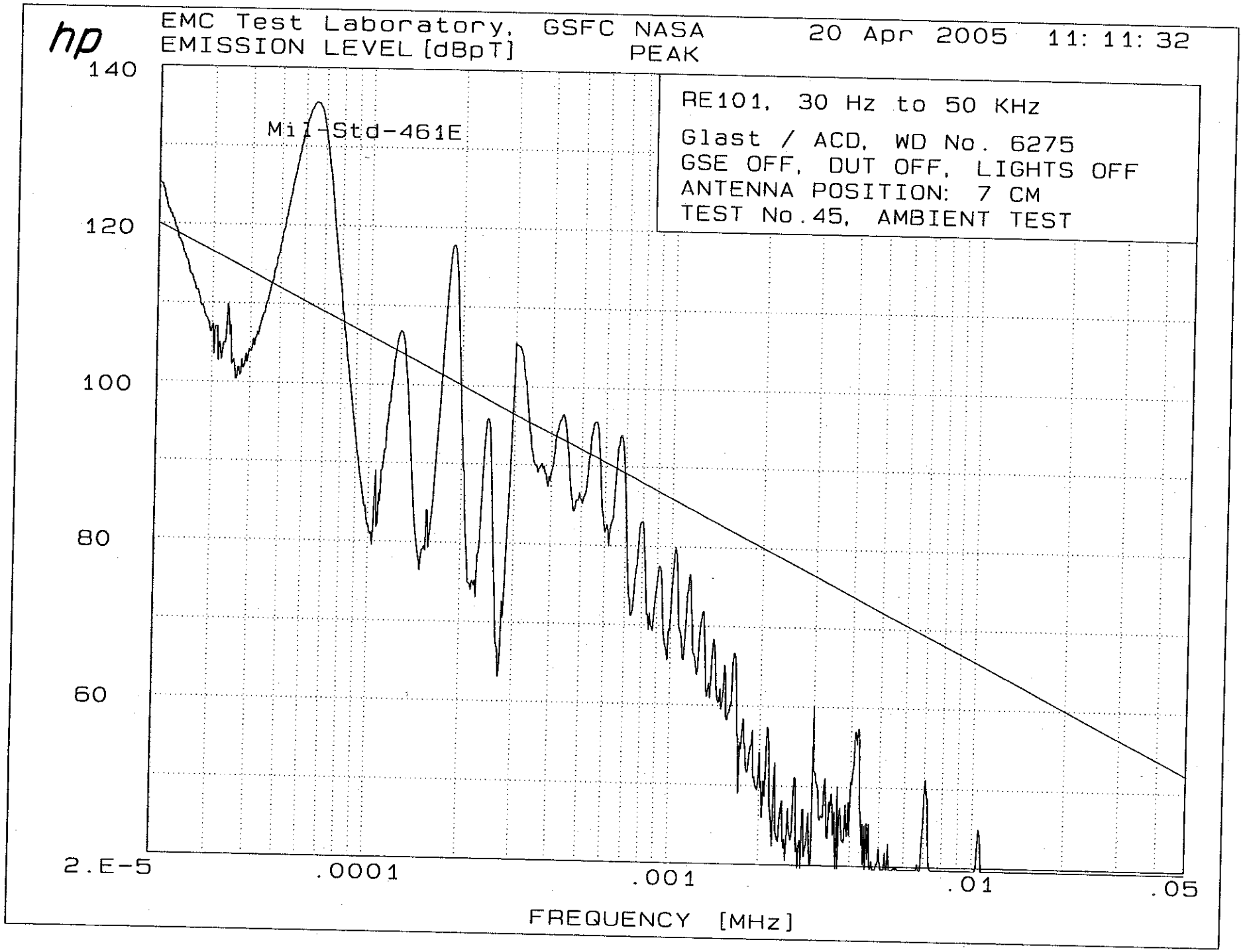

hp
EMC Test Laboratory, GSFC NASA
EMISSION LEVEL [dBpT]
PEAK
19 Apr 2005 17:58:51
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
GSE OFF, DUT OFF, LIGHTS ON
ANTENNA POSITION: 7 CM
TEST No.44, NONMETALIC CAP
Mil-Std-461E
140
120
100
80
60
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 19 Apr 2005 17:58:51

1. Radiated Emissions Test Setup
   1.5 RE101, 30 Hz to 50 KHz

Peaks above 0 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBpT)	DELTA
1	6.1E-5	134.3	24.1
2	.000122	104.9	.6
3	.000181	116	15.2
4	.000301	103.1	6.7
5	.000428	93.7	.4
6	.000546	93.7	2.5


hp
EMC Test Laboratory, GSFC NASA
EMISSION LEVEL [dBpT]
PEAK
20 Apr 2005 11:11:32
RE101, 30 Hz to 50 KHz
Glast / ACD, WD No. 6275
GSE OFF, DUT OFF, LIGHTS OFF
ANTENNA POSITION: 7 CM
TEST No.45, AMBIENT TEST
Mil-Std-461E
140
120
100
80
60
2.E-5
.0001
.001
.01
.05
FREQUENCY [MHz]

EMC Test Laboratory, GSFC NASA 20 Apr 2005 11:11:32

1. Radiated Emissions Test Setup
   1.5 RE101, 30 Hz to 50 KHz

Peaks above 0 dB of Limit Line #1
  peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBpT)	DELTA
1	6.5E-5	135.6	25.9
2	.000126	106.8	2.8
3	.000186	117.8	17.2
4	.000301	105.5	9.1
5	.000435	96.6	3.4
6	.000554	95.7	4.6
7	.000674	94	4.6