FCC 15 SUBPART C

EMI MEASUREMENT AND TEST REPORT

For

AMBIT Microsystems Corporation

4-1, Ming Shen Street, Tu Chen Industrial District.
Tu Chen, Taipei Hsien 236, Taiwan, R.O.C.

FCC ID: MCLT60H418

May 29, 2002

This Report Concerns:	**Equipment Type:**
☒ Original Report	WLAN 802.11b Module

Test Engineer:	Jeff Lee
Test Date:	May 18, 2002
Reviewed By:	Benjamin Jin
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	AMBIT Microsystems Corporation
Model Name:	T60H418
Product Description:	WLAN 802.11b Module
Dimension:	2.4" L x 1.7" W approximately
FCC ID:	MCLT60H418
TX Frequency:	2400-2497MHz ISM Band
Max. Output Power:	8.20dBm (6.61mW)
Power Supply:	Get power from Host PC P/S, HP F1781S

** The test data in this test report was good for the test sample only. It may have deviation for other test samples.*

1.2 Objective

This type approval report is prepared on behalf of. *Ambit Microsystems Corporation* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission, and processing gain.

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corporation. The radiated testing was performed at an antenna-to-EUT distance of 3 Meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI).

The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8568B	2610A02165	12/6/02
HP	Spectrum Analyzer	8593B	2919A00242	12/20/02
HP	Amplifier	8349B	2644A02662	12/20/02
HP	Quasi-Peak Adapter	85650A	917059	12/6/02
HP	Amplifier	8447E	1937A01046	12/6/02
A.H. System	Horn Antenna	SAS0200/571	261	12/27/02
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/02
Com-Power	Biconical Antenna	AB-100	14012	11/2/02
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/02
Com-Power	LISN	LI-200	12208	12/20/02
Com-Power	LISN	LI-200	12005	12/20/02
BACL	Data Entry Software	DES1	0001	12/20/02

*** Statement of Traceability: Bay Area Compliance Laboratory Corp.** certifies that all calibration has been performed using suitable standards traceable to the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (NIST).

1.7 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
AMBIT	Motherboard	N/A	N/A	DoC
Samsung	LCD	LIN141XF	N/A	DoC
SONY	3.5” Floppy Drive	MPF920-F	N/A	DoC
HP	Power Sypply	HP F1781A	21104338CB	DoC
Toshiba	Hard Drive	N/A	N/A	DoC
QSI	CD-Rom	SCR-242	N/A	DoC

1.8 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
HP	Notebook PC	KT1	QCHCMF20800115	DoC
Citizen	Printer	LSP-10	5047999-82	DLK66TLSP-10
EVERX	Modem	EV-945	N/A	E3E5UVEV-945

1.9 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shielded Serial Cable	1.5	Serial Port/Host	Modem
Shielded Printer Cable	2.0	Parallel Port/Host	Printer

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The host system was configured for testing in a typical fashion (as a normally used by a typical user).

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The test software, terminal.exe, provided by the customer, is started the Windows 98 terminal program under the Windows 98 operating system. Once loaded, the program sequentially exercises each system component.

The sequence used is as follows:

1. Lines of Hs scroll across the notebook monitor.
2. The modem(s) receives Hs.
3. The printer output Hs.

This process is continuous throughout all tests.

2.3 Special Accessories

As shown in section 2.5, all interface cables used for compliance testing are shielded as normally supplied by INMAC and their respective support equipment manufacturers. The host pc and other peripherals featured shielded metal connectors.

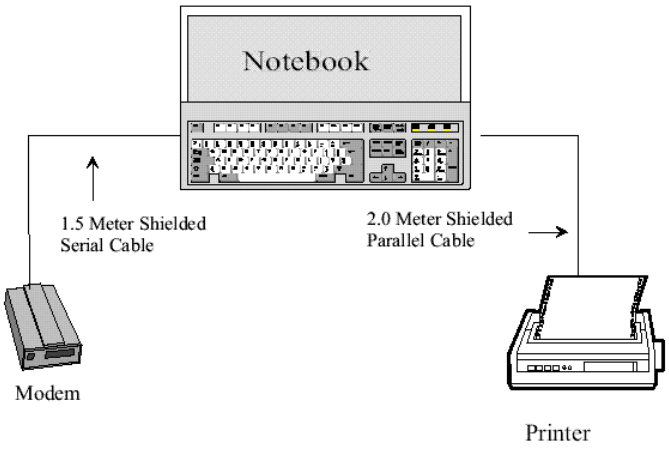
2.4 Schematics / Block Diagram

Appendix A contains a copy of the EUT's schematics diagram as reference.

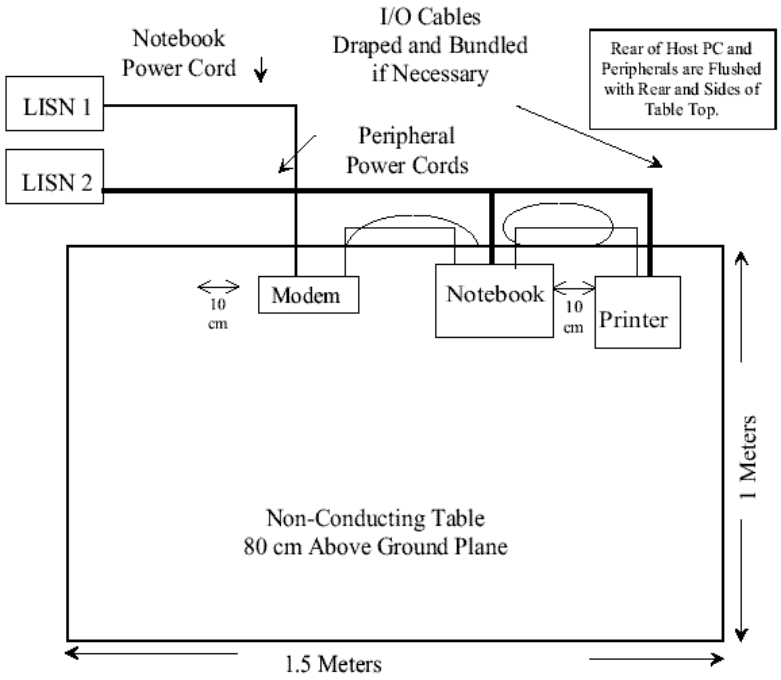
2.5 Equipment Modifications

No modifications were made by BACL Corporation to ensure the EUT to comply with the applicable limits and requirements.

2.6 Configuration of Test System



2.7 Test Setup Block Diagram



3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.205	Restricted Bands	Compliant
§ 2.1091	RF Safety Requirements	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emission	Compliant
§15.209 (a)	Radiated Emission	Compliant
§15.209 (f)	Spurious Emission	Compliant
§15.247 (a) (2)	6 dB Bandwidth	Compliant
§15.247 (b) (2)	Peak Output Power	Compliant
§15.247 (b) (4)	RF Exposure	Compliant
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edges	Compliant
§15.247 (d)	Peak Power Spectral Density	Compliant
§15.247 (e)	Processing Gain	Compliant

4 - PEAK OUTPUT POWER MEASUREMENT

4.1 Standard Applicable

According to §15.247(b) (2), for all direct sequence systems, the maximum peak output power of the intentional radiator shall not exceed 1 Watt.

4.2 Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

4.3 Measurement Result

Please refer to the attached pictures for more information.

Frequency (MHz)	Output Power in dBm	Output Power in mW	Standard	Result
Port 1 with B24-18 Antenna				
2413.50	7.55	5.69	≤ 1W	Compliant
2438.17	7.40	5.50	≤ 1W	Compliant
2464.20	7.19	5.24	≤ 1W	Compliant
Port 2 with B24-18 Antenna				
2413.50	7.56	5.70	≤ 1W	Compliant
2438.17	7.31	5.38	≤ 1W	Compliant
2464.20	7.17	5.21	≤ 1W	Compliant
Port 1 with B24-19 Antenna				
2413.50	7.32	5.40	≤ 1W	Compliant
2438.17	8.20	6.61	≤ 1W	Compliant
2464.20	7.19	5.24	≤ 1W	Compliant
Port 2 with B24-19 Antenna				
2413.50	7.37	5.46	≤ 1W	Compliant
2438.17	7.47	5.58	≤ 1W	Compliant
2464.20	8.12	6.49	≤ 1W	Compliant

4.4 Test Equipment

Manufacturer	Model No.	Serial No.	Calibration Due Date
Agilent	E4419b	GB40202891	4/8/03
Agilent	E4412a	US38486529	4/8/03


Agilent
E4419B
EPM Series Power Meter
7.55dBm
POWER REF
CHANNEL


Agilent
E4419B
EPM Series Power Meter
7.40dBm
POWER REF
CHANNEL


Agilent
E4419B
EPM Series Power Meter
7.19dBm
POWER REF
CHANNEL


Agilent E4419B EPM Series Power Meter
7.58 dBm
POWER REF
CHANNEL


Agilent E4419B EPM Series Power Meter
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CHANNEL


Agilent
E4419B
7.32dBm
POWER REF
CHANNEL


Agilent
E4419B
8.20dBm
POWER REF
CHANNEL


Agilent
E4419B
7.19dBm
POWER REF
CHANNEL


Agilent
7.37 dBm
POWER REF
CHANNEL


Agilent
7.47 dBm
POWER REF
CHANNEL


Agilent
8.12 dBm
POWER REF
CHANNEL

5 - SPURIOUS EMISSION

5.1 Standard Applicable

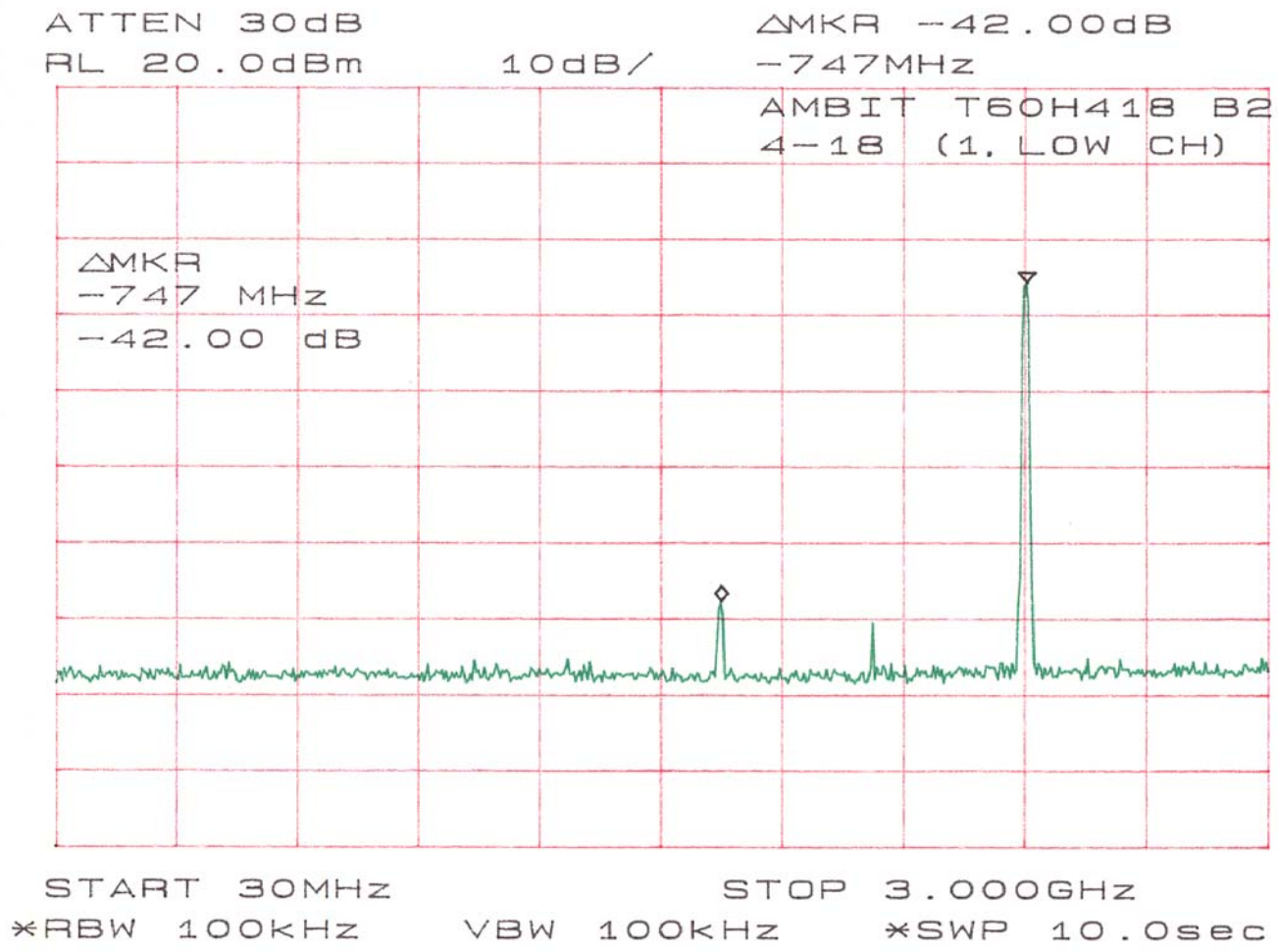
According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation f a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

5.2 Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

5.3 Measurement Data

Please refer to the appending for more information.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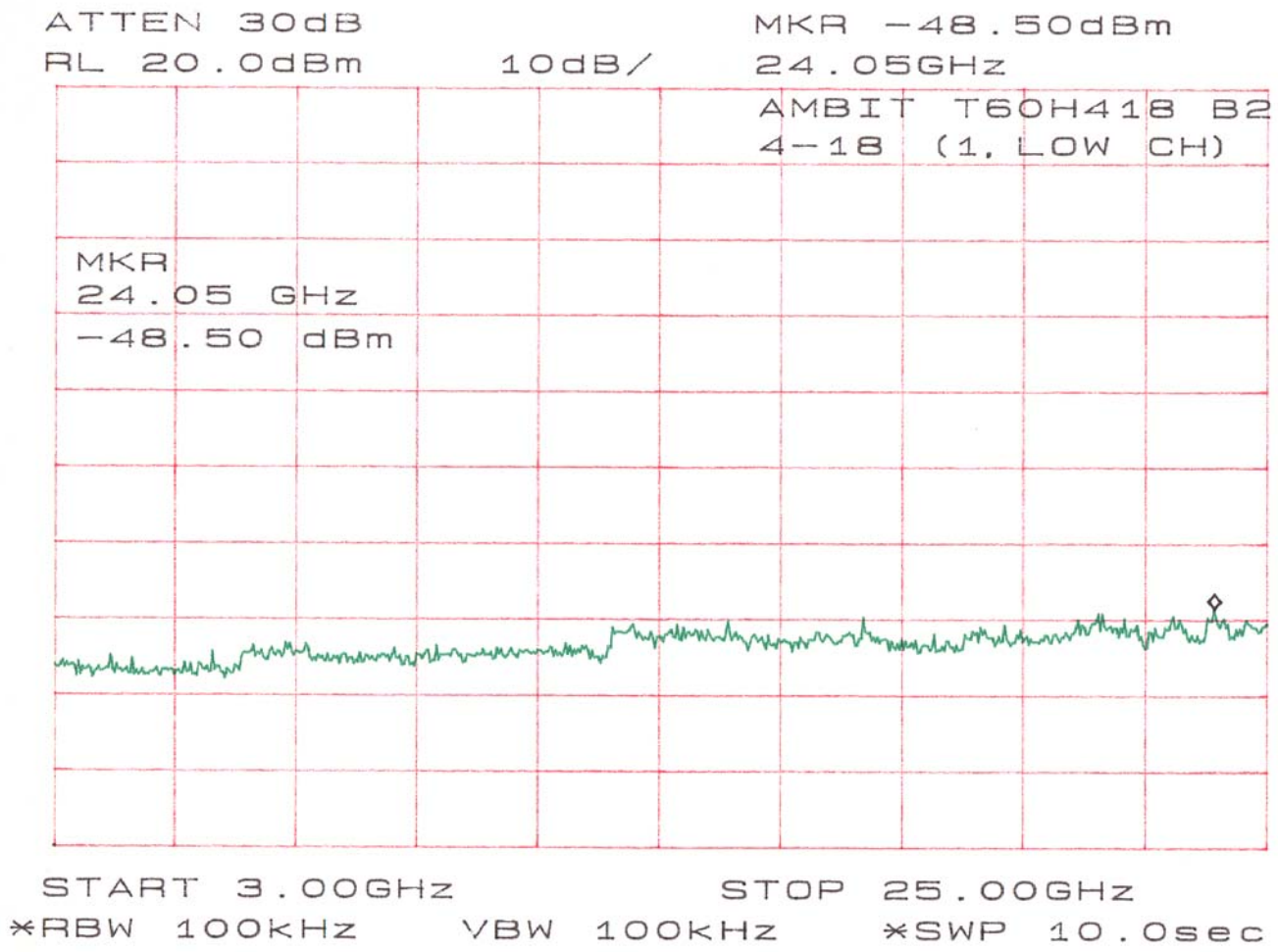
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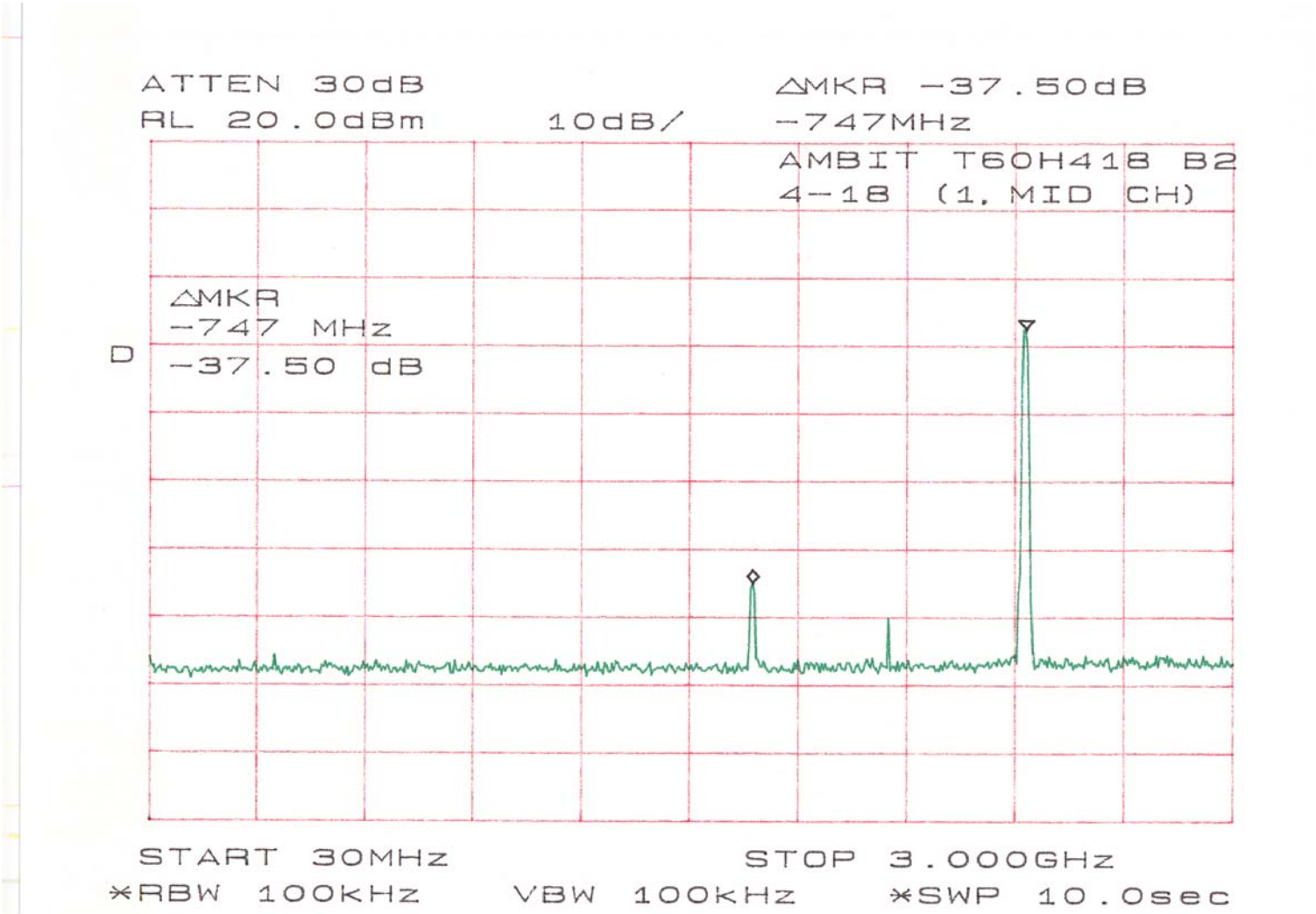
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-37.50 dB
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VBW 100kHz
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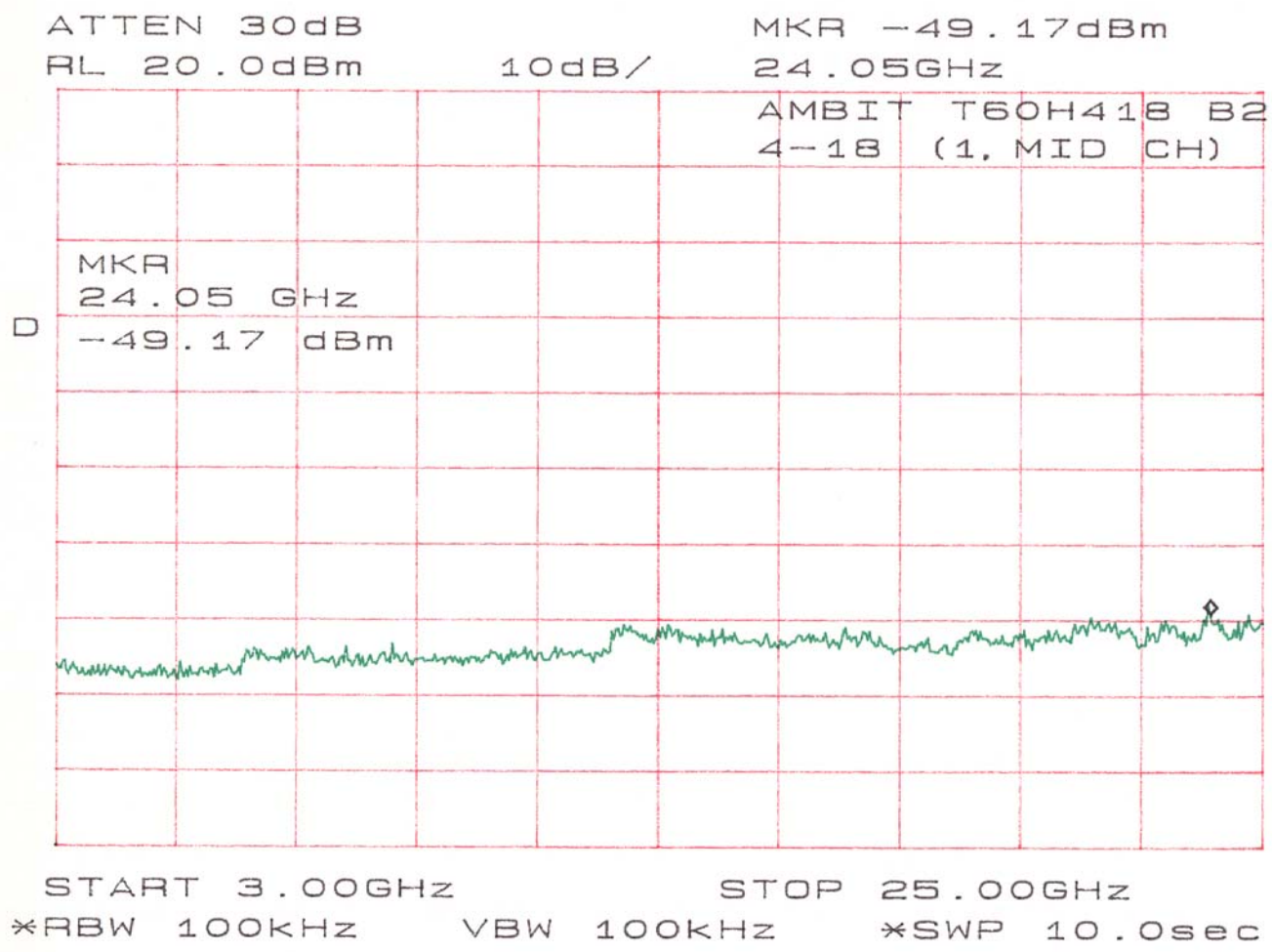
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-49.17 dBm
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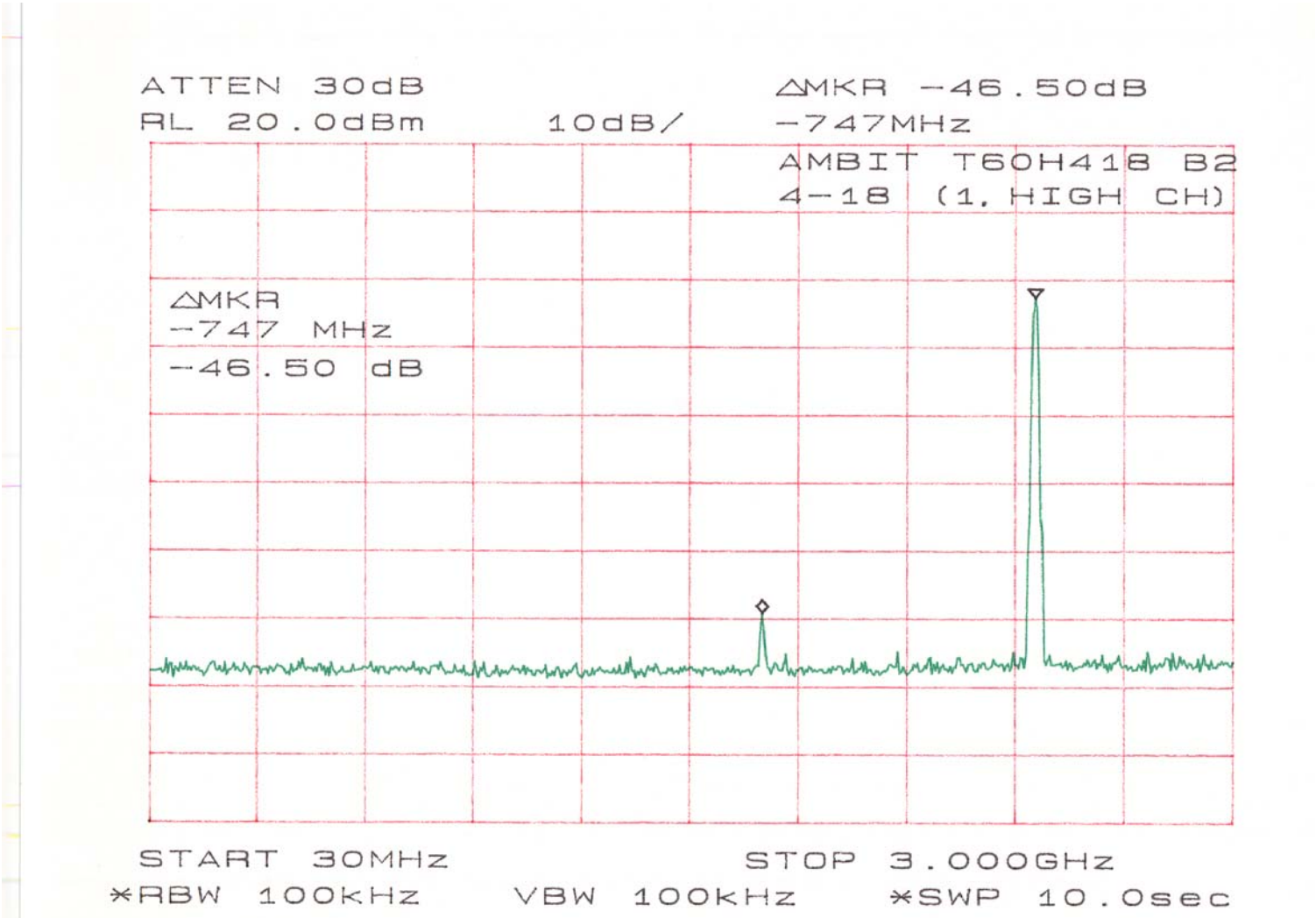
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VBW 100kHz
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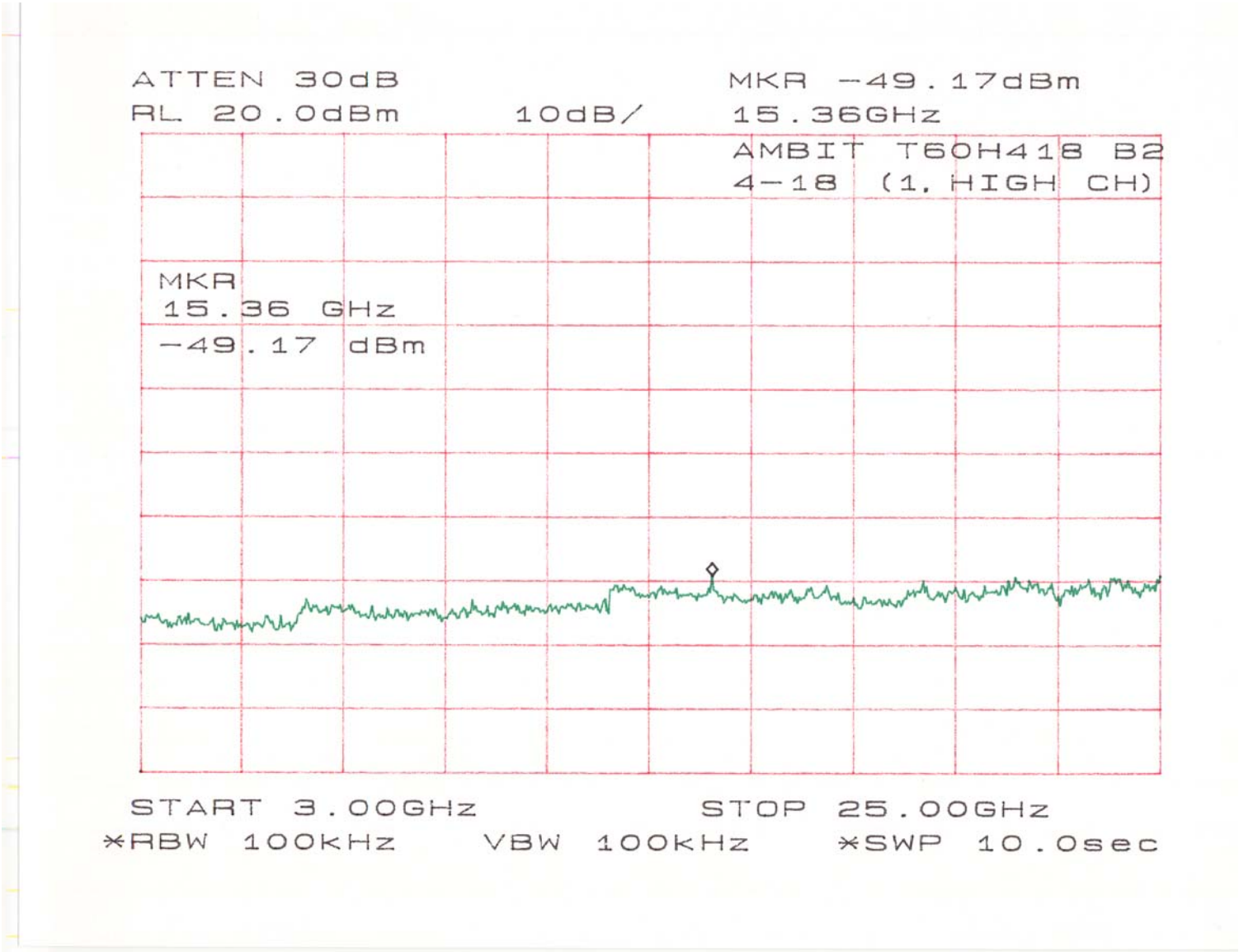
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VBW 100kHz
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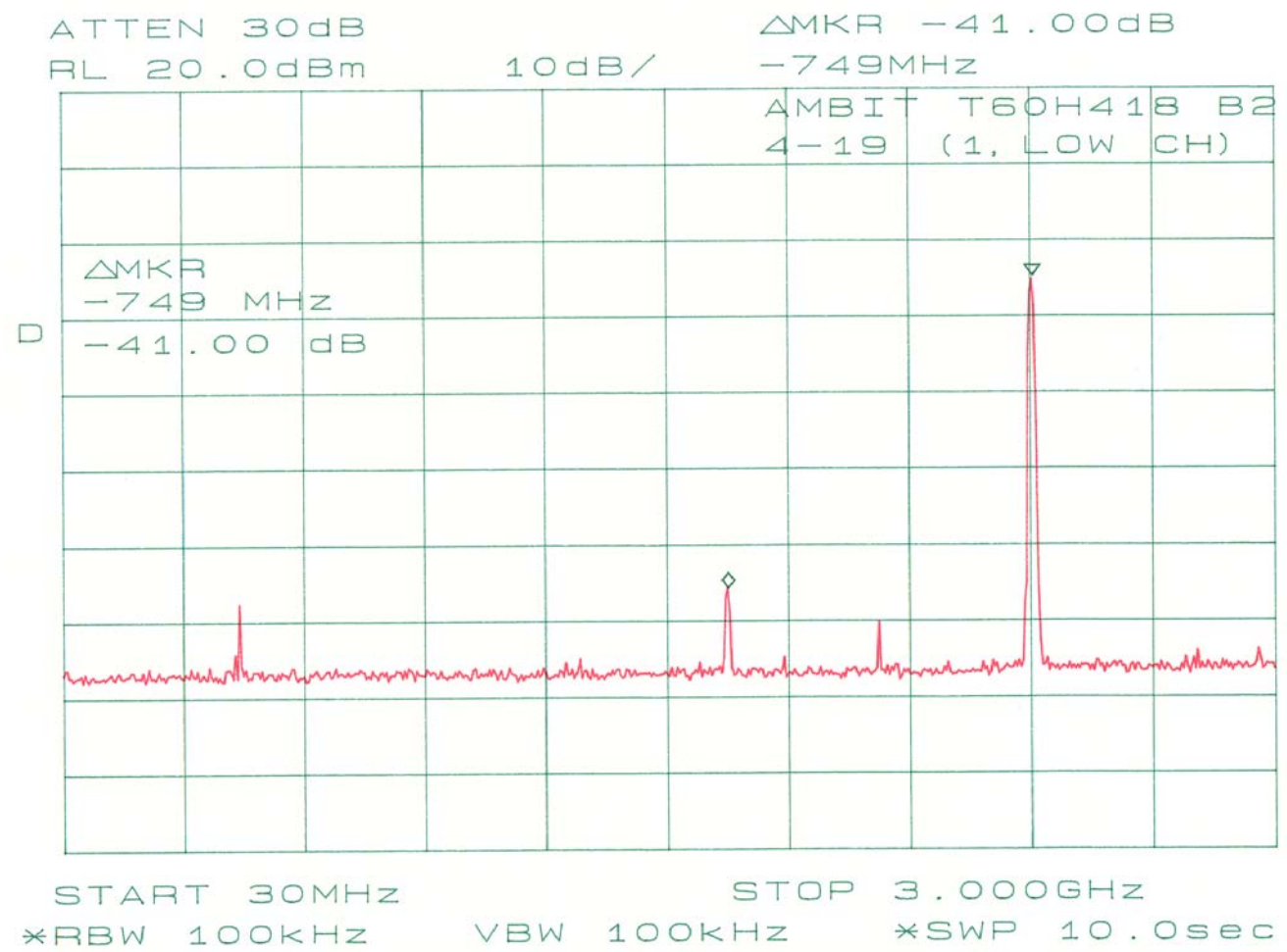
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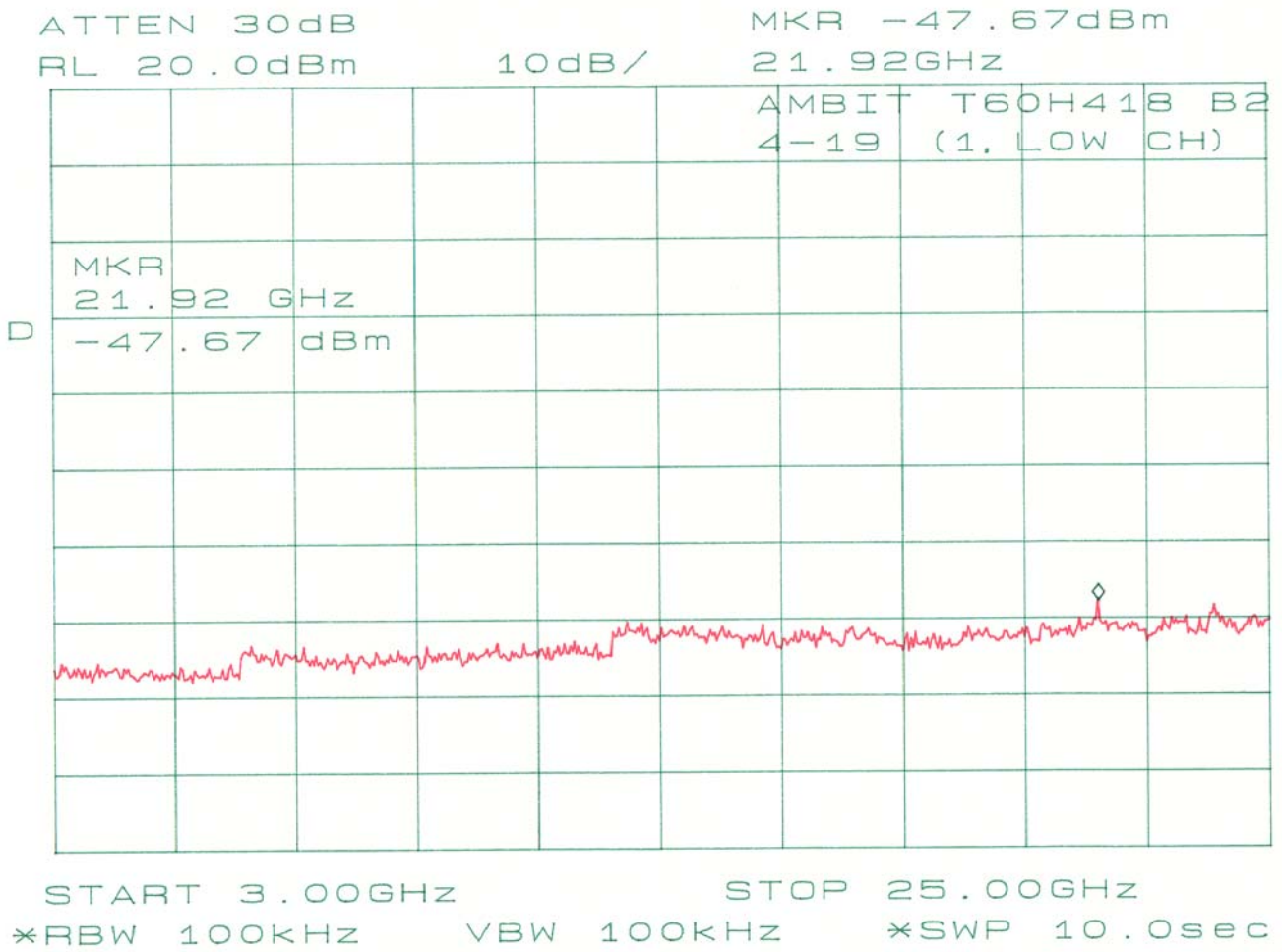
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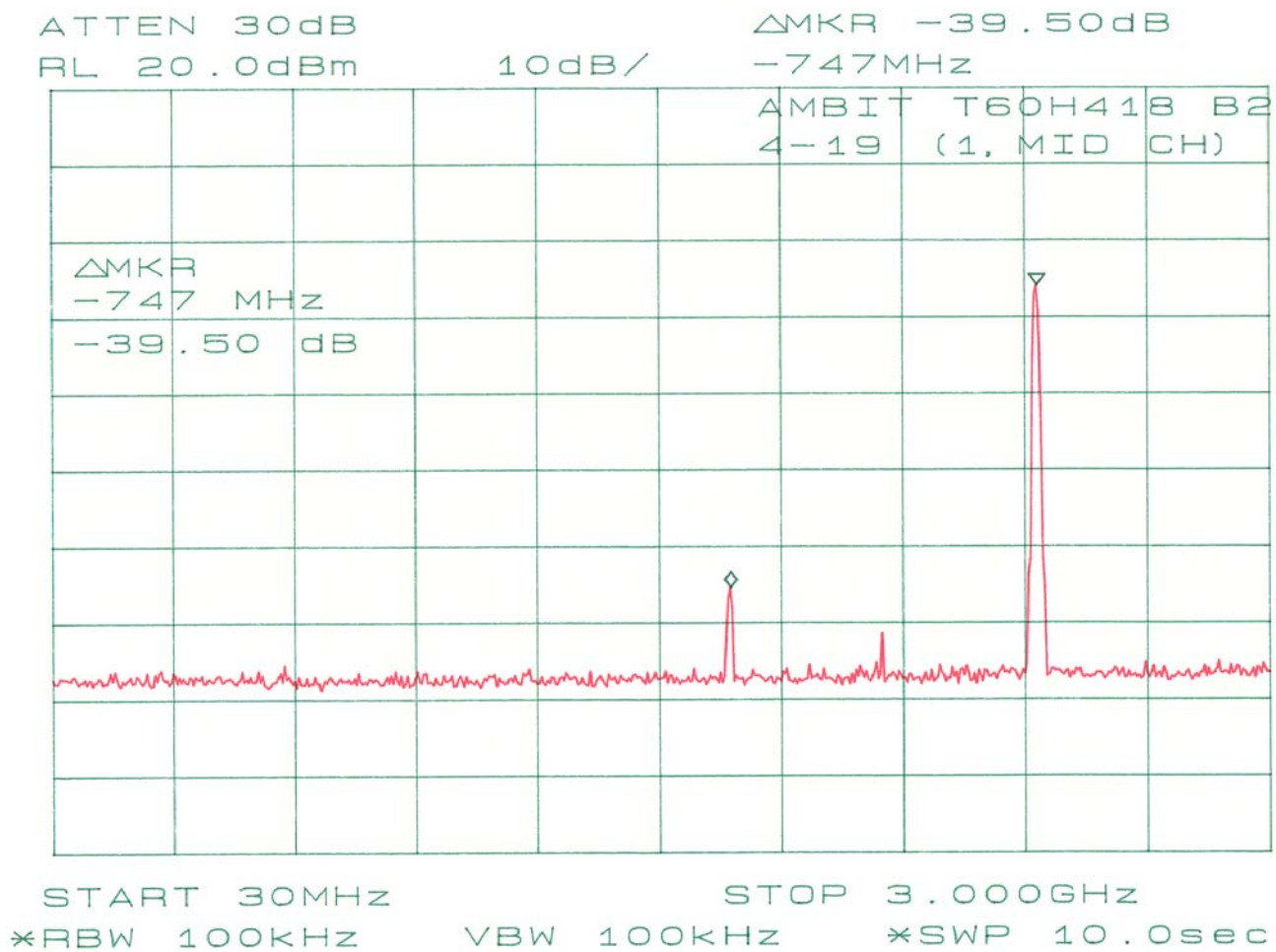
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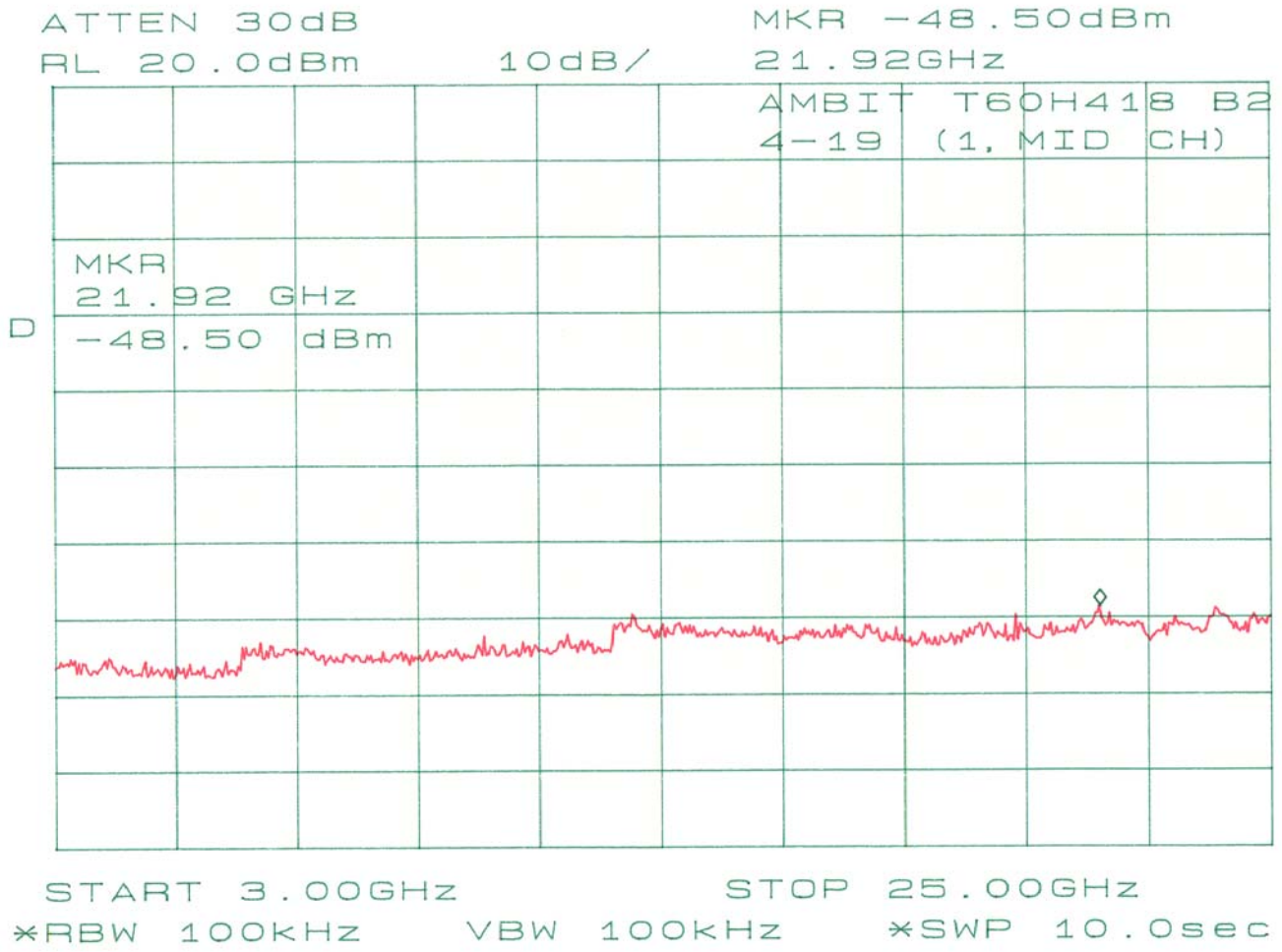
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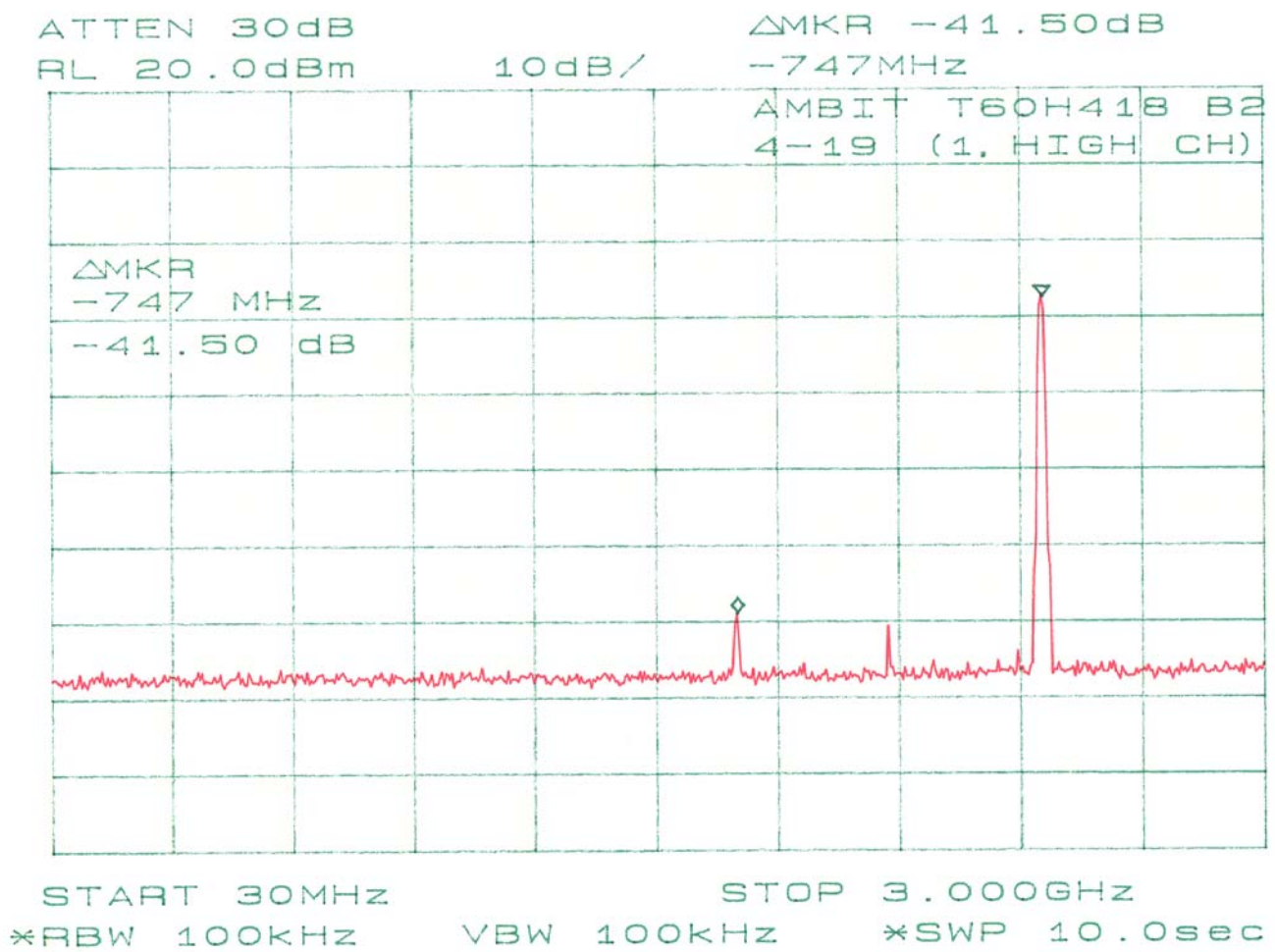
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-41.50 dB
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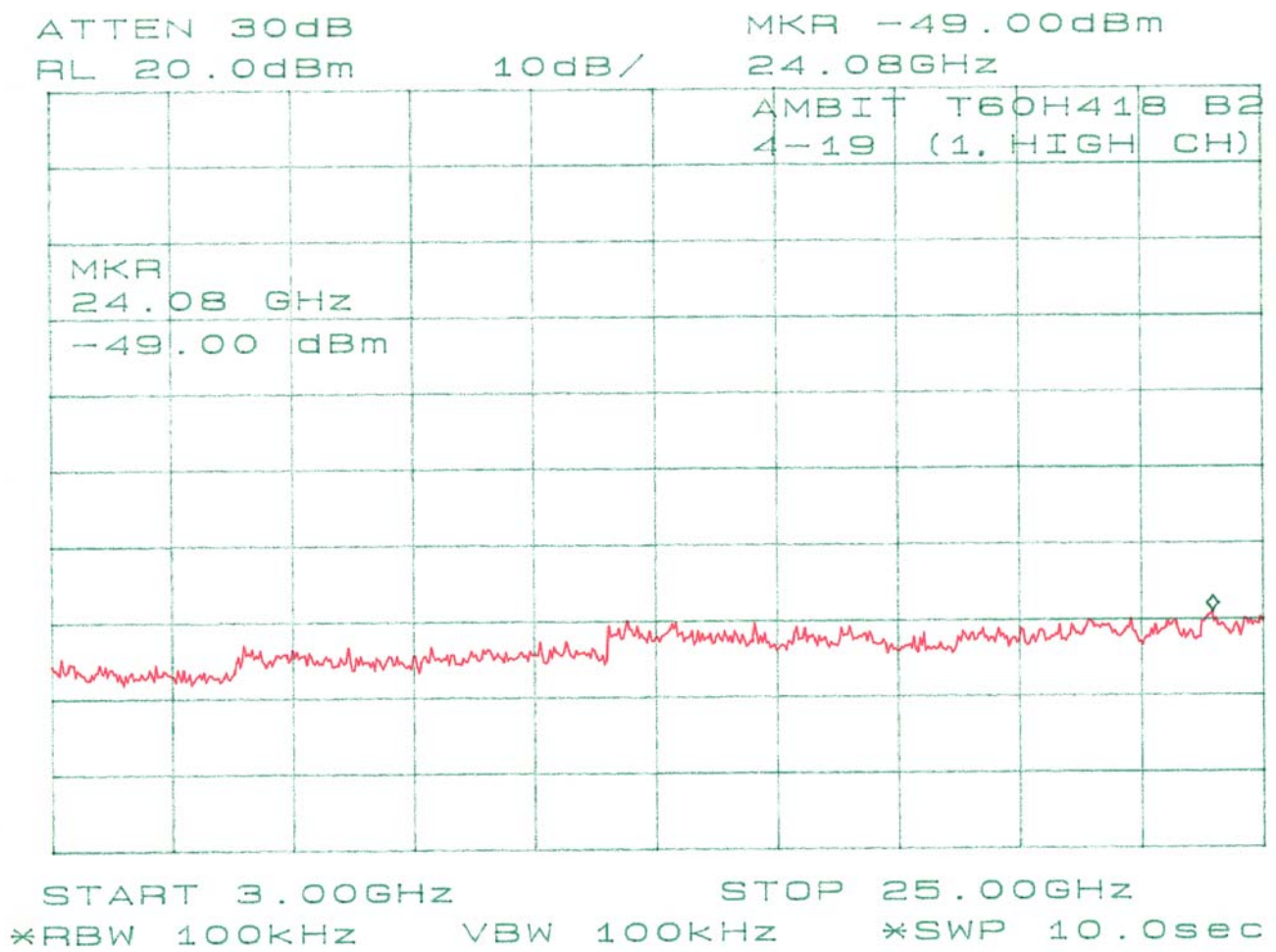
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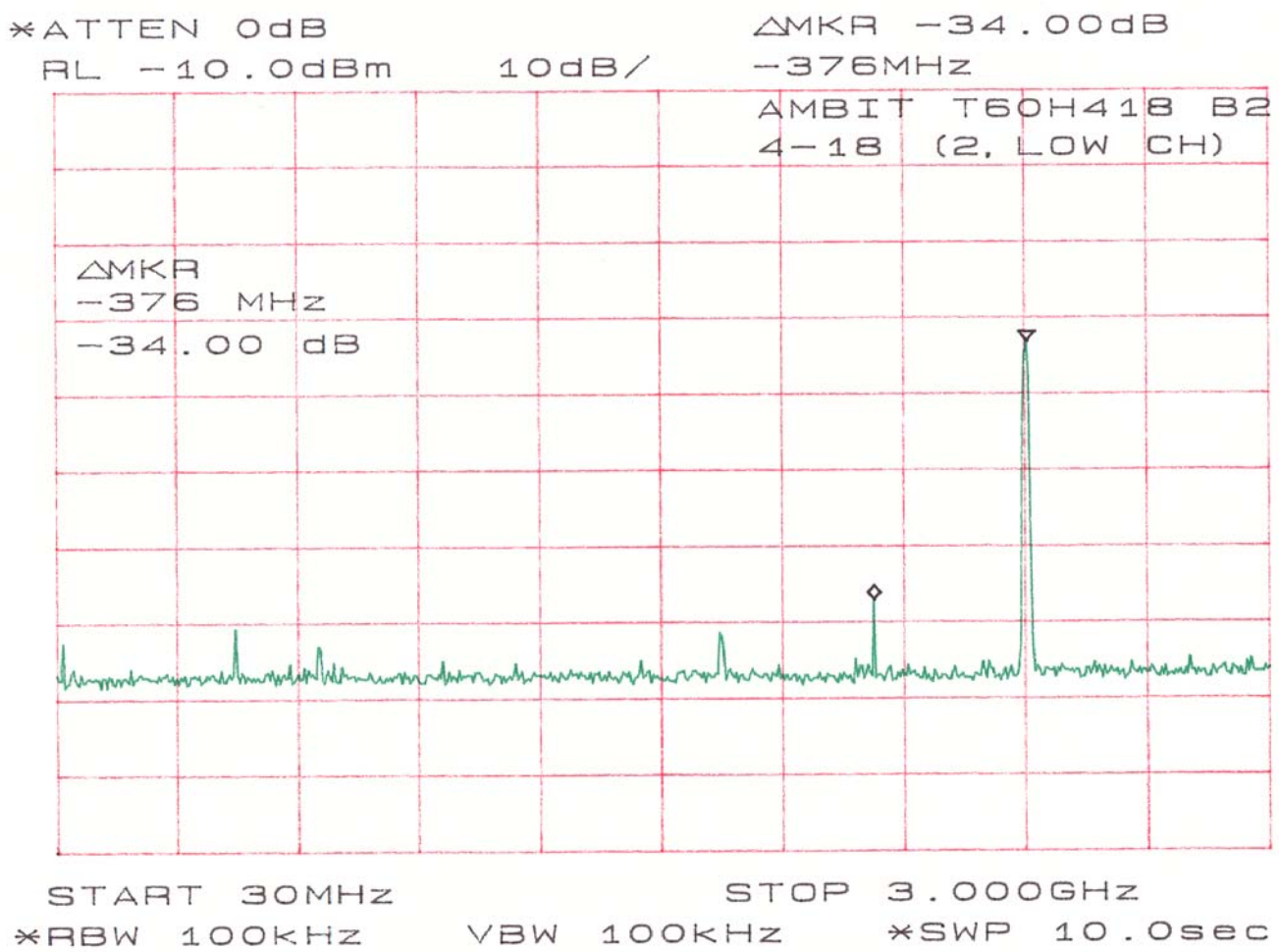
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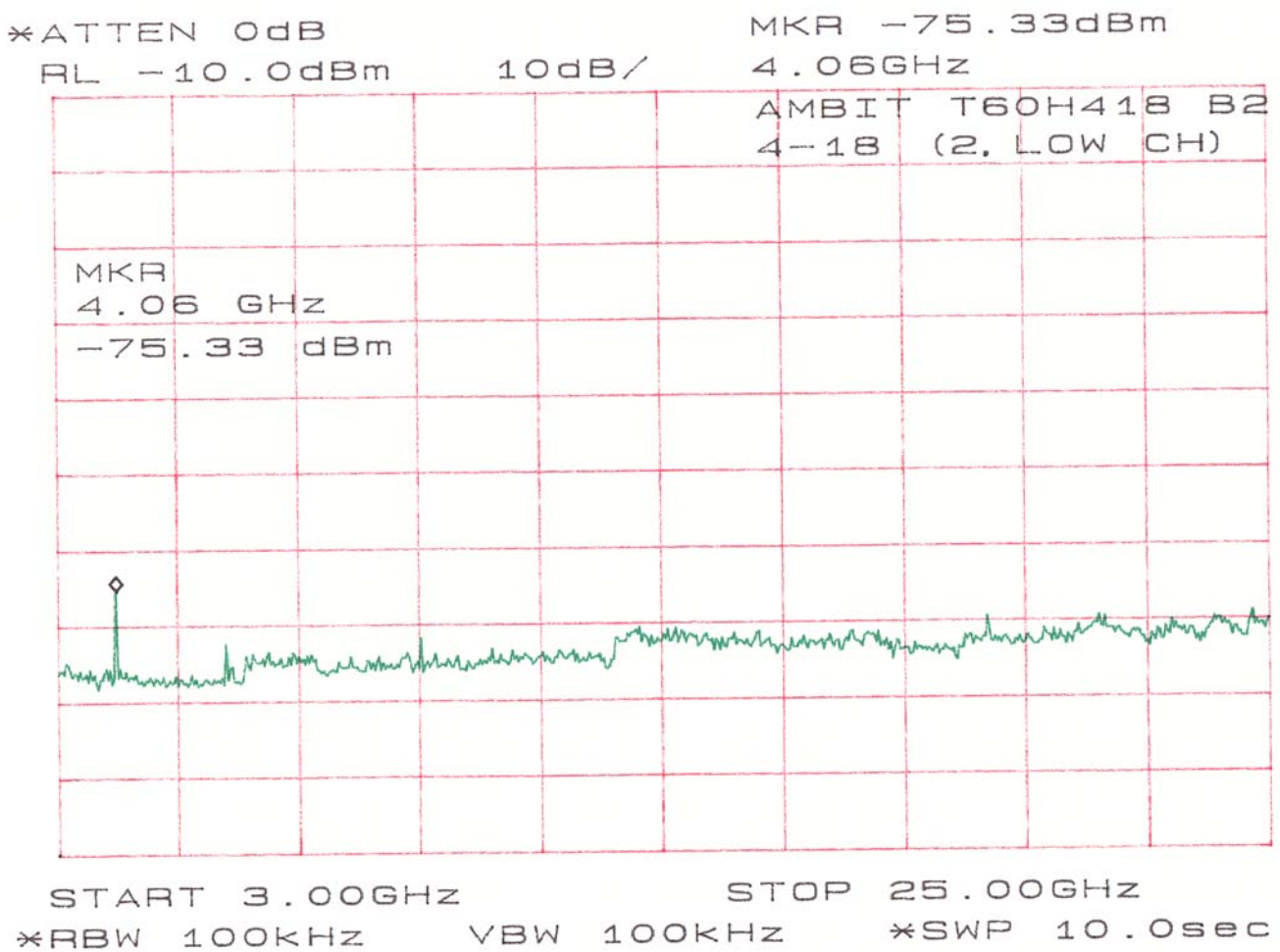
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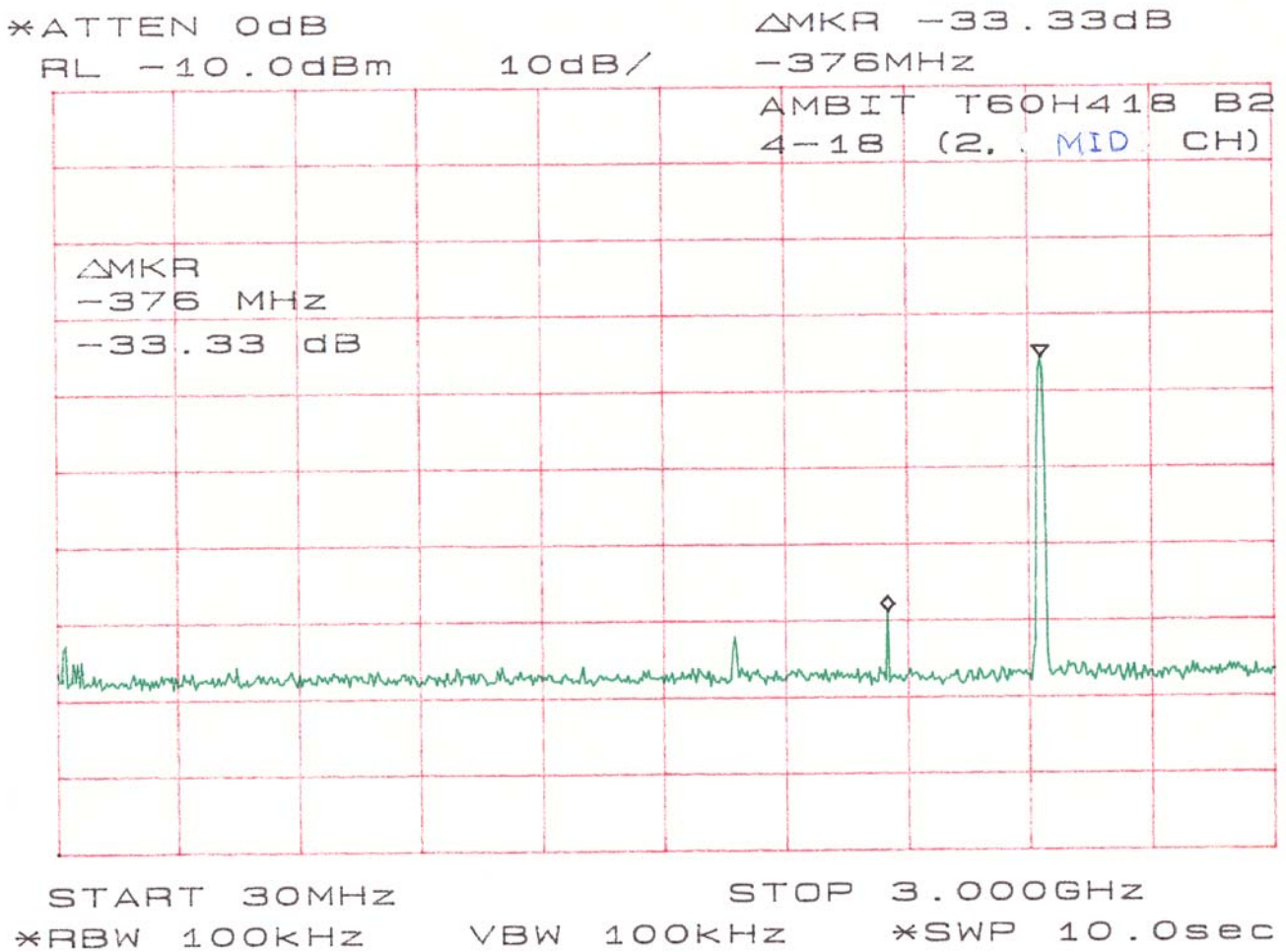
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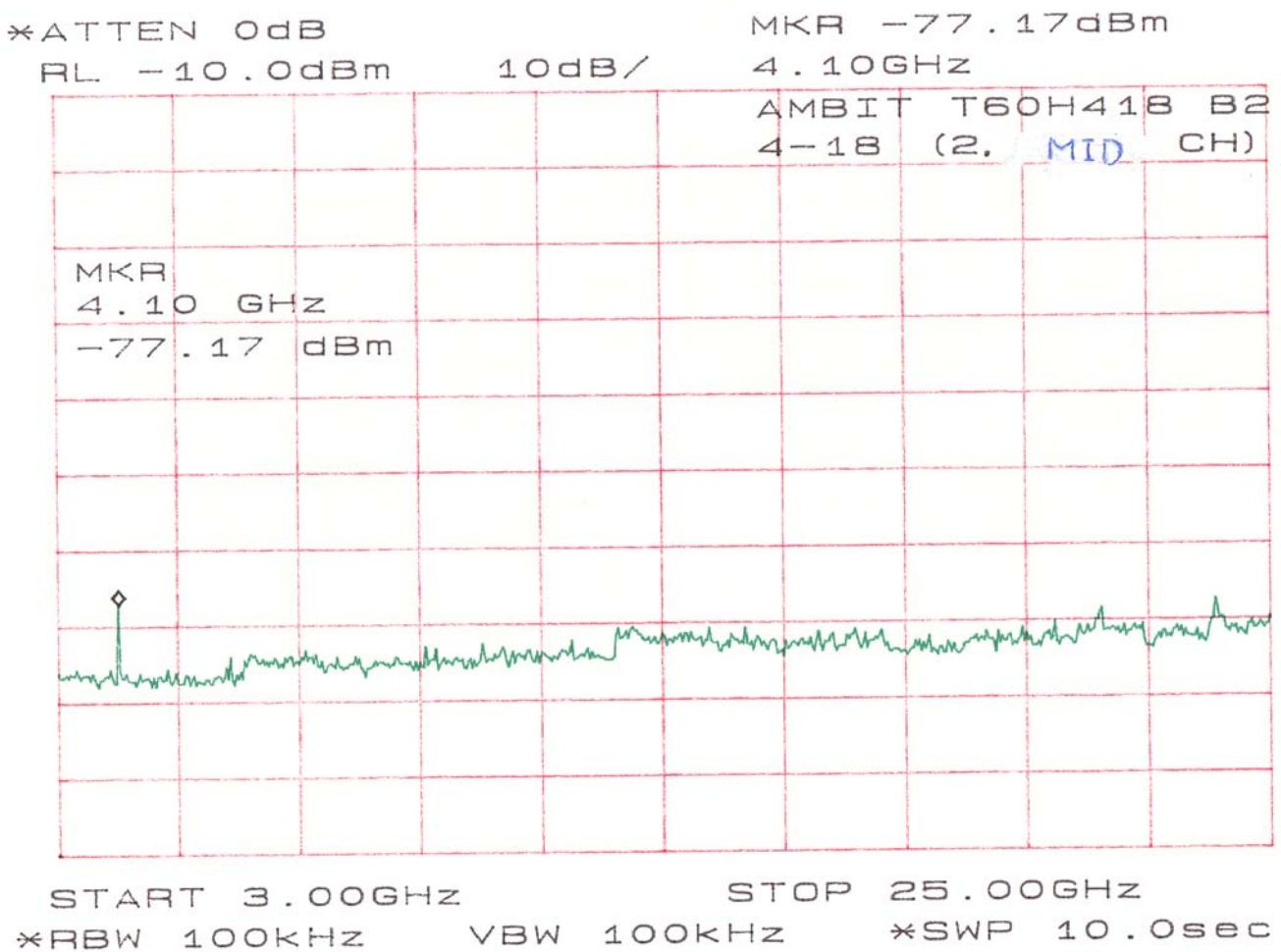
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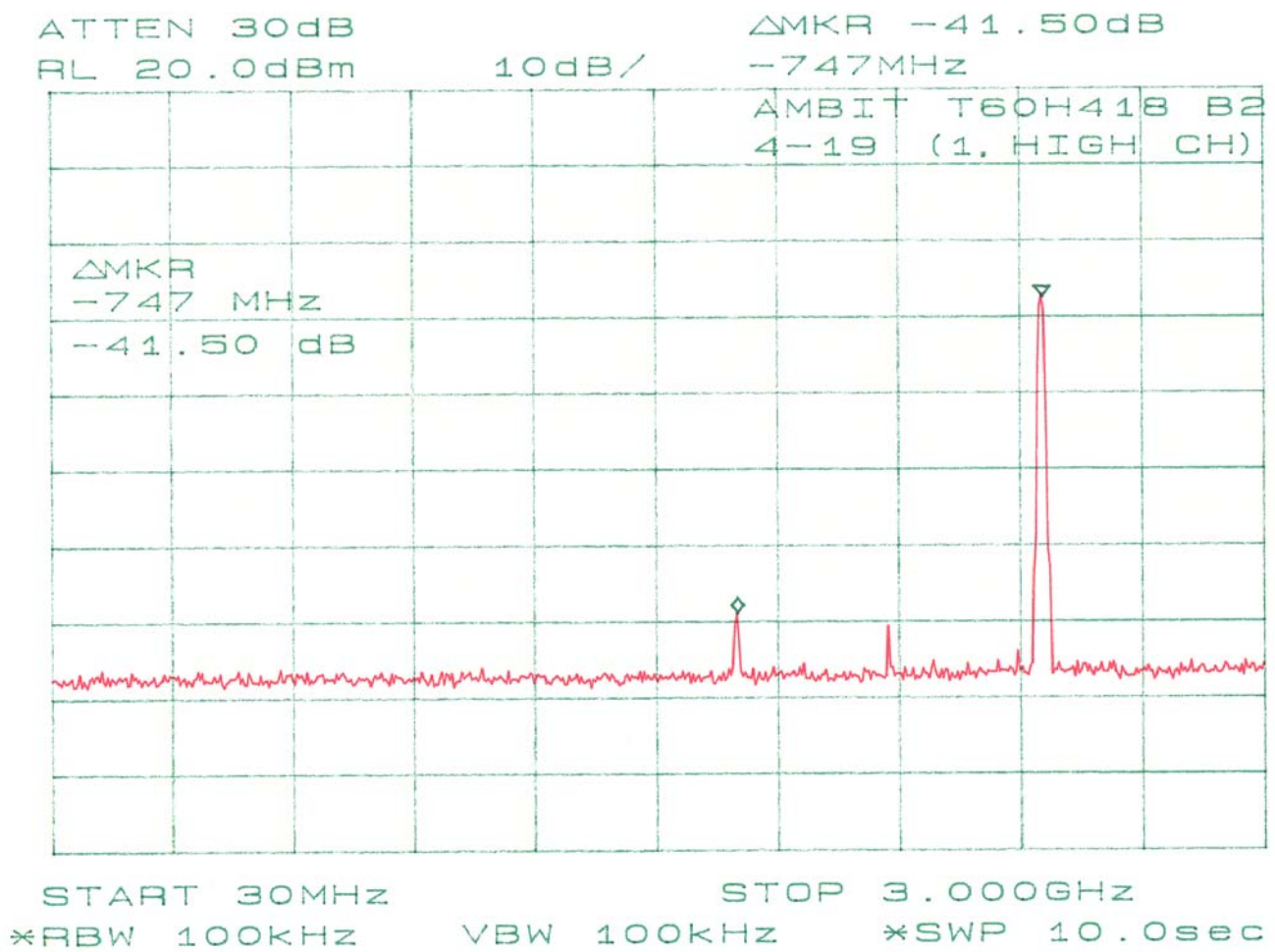
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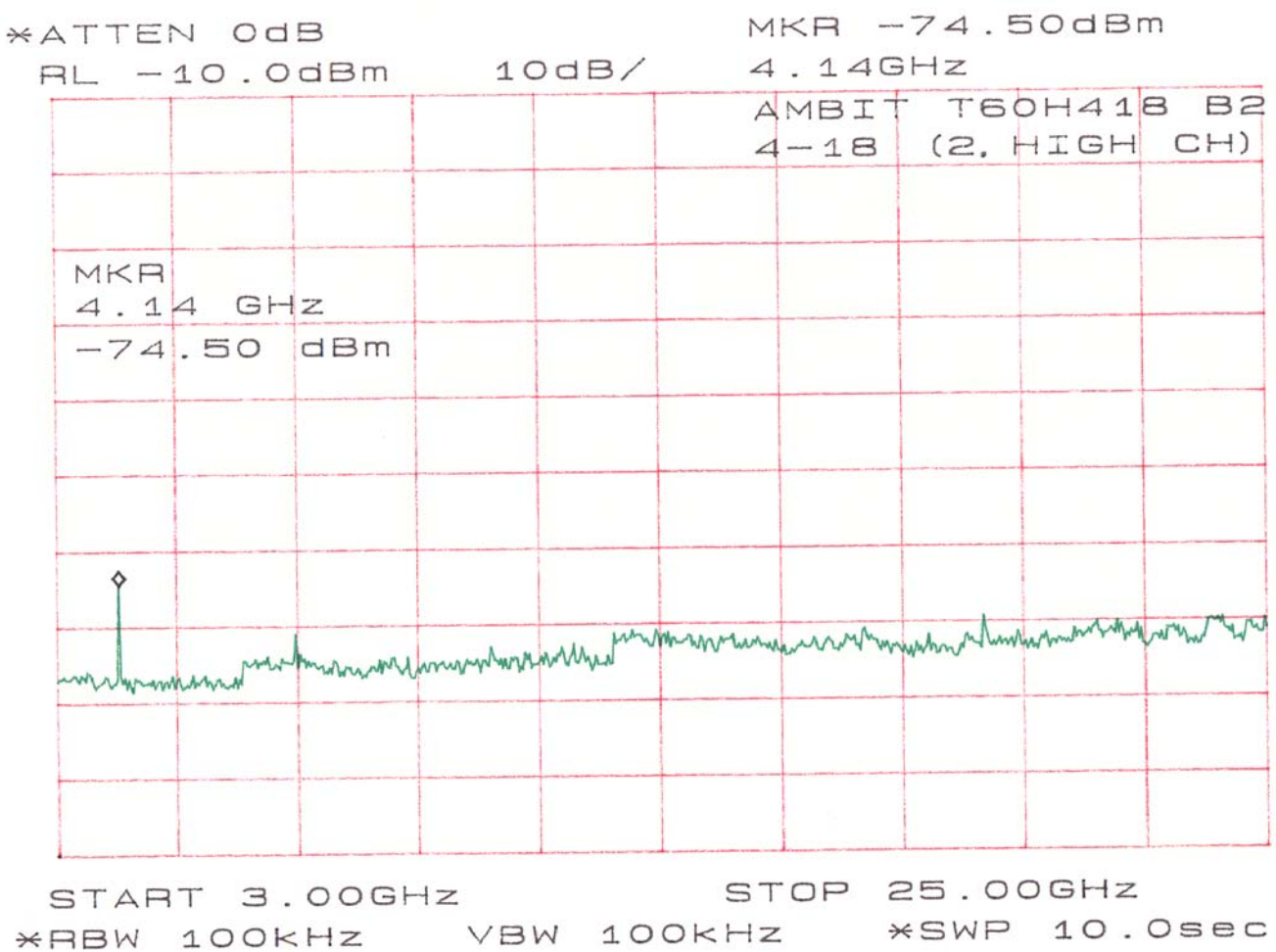
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-74.50 dBm
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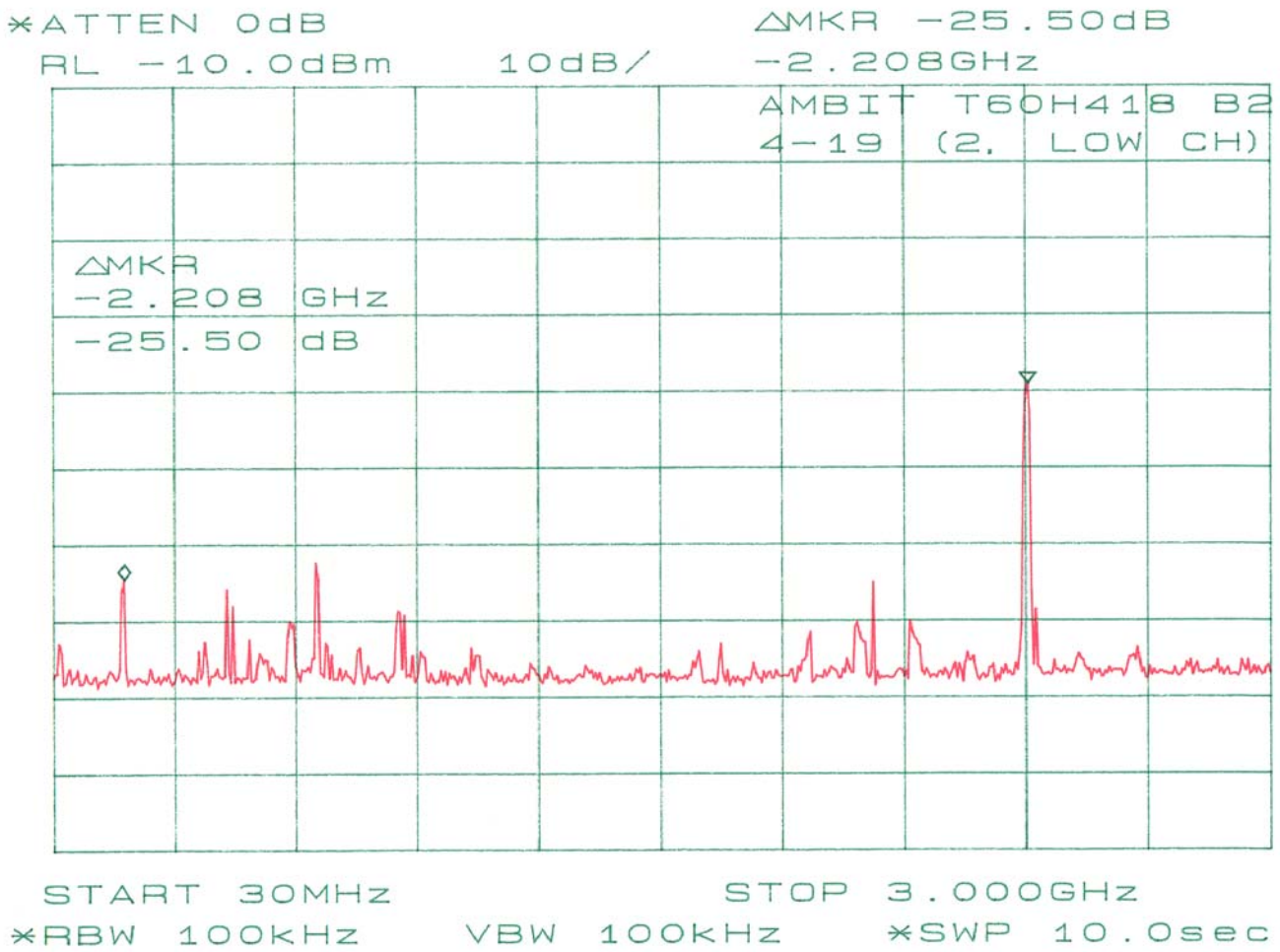
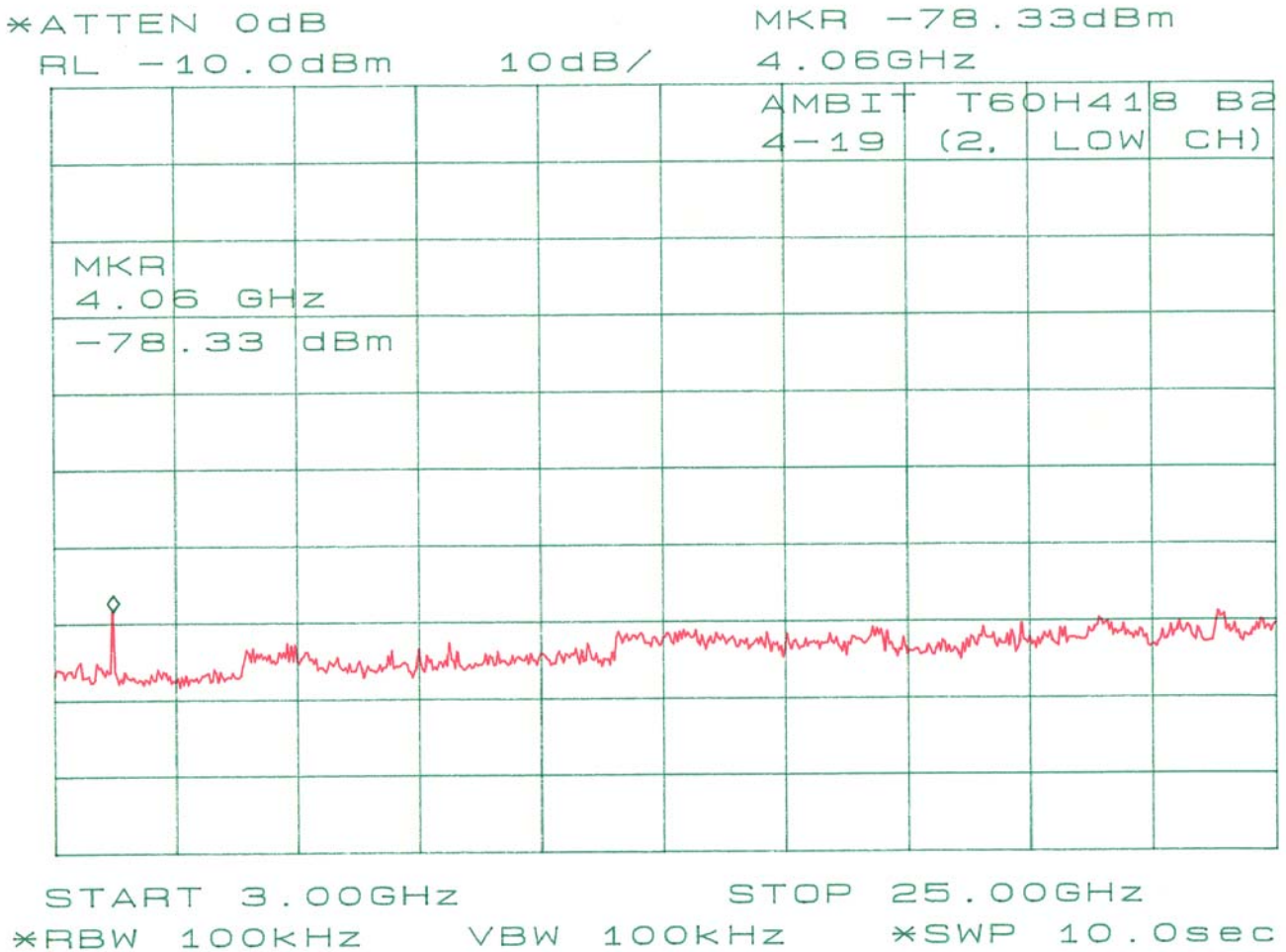
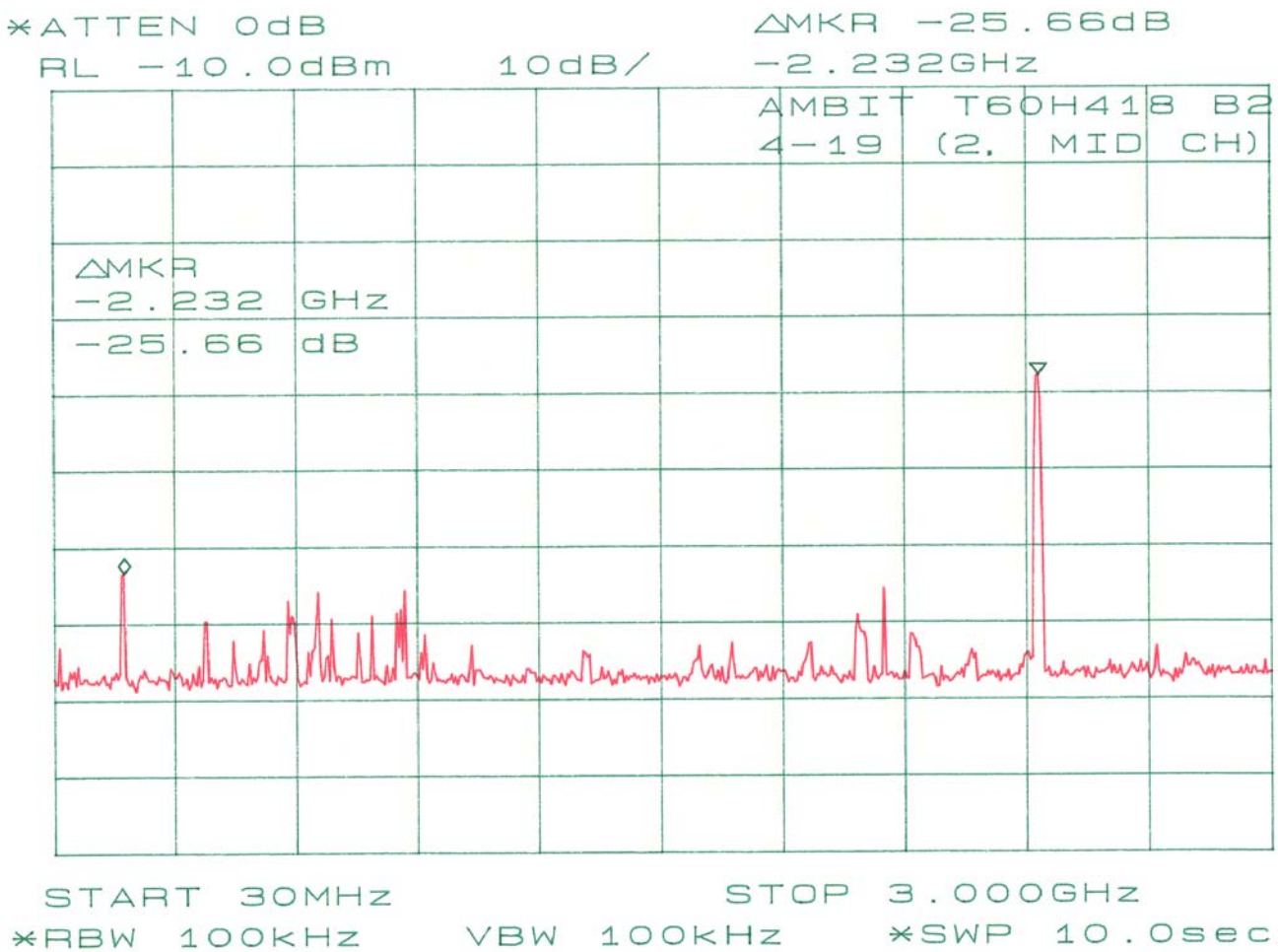
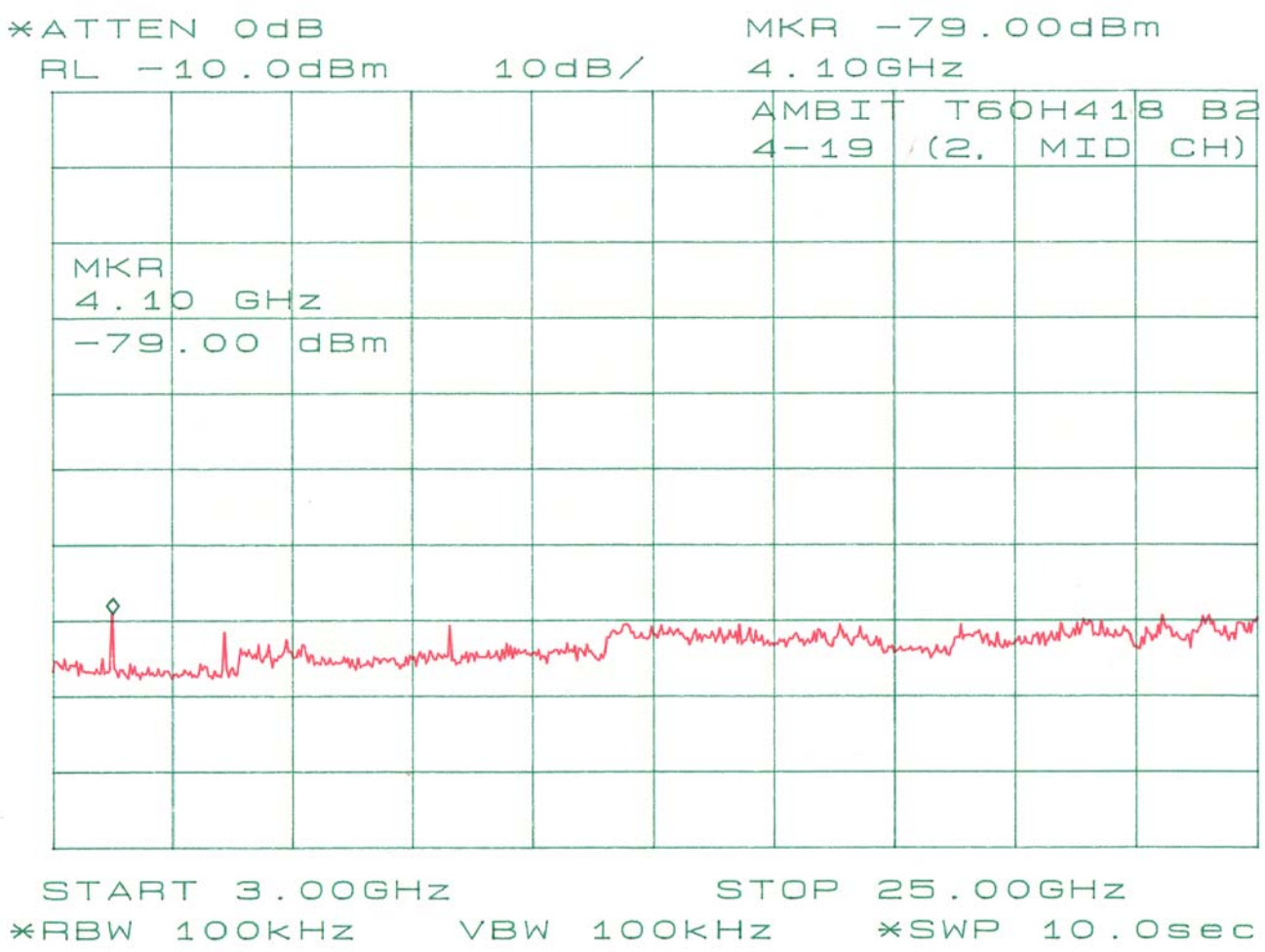
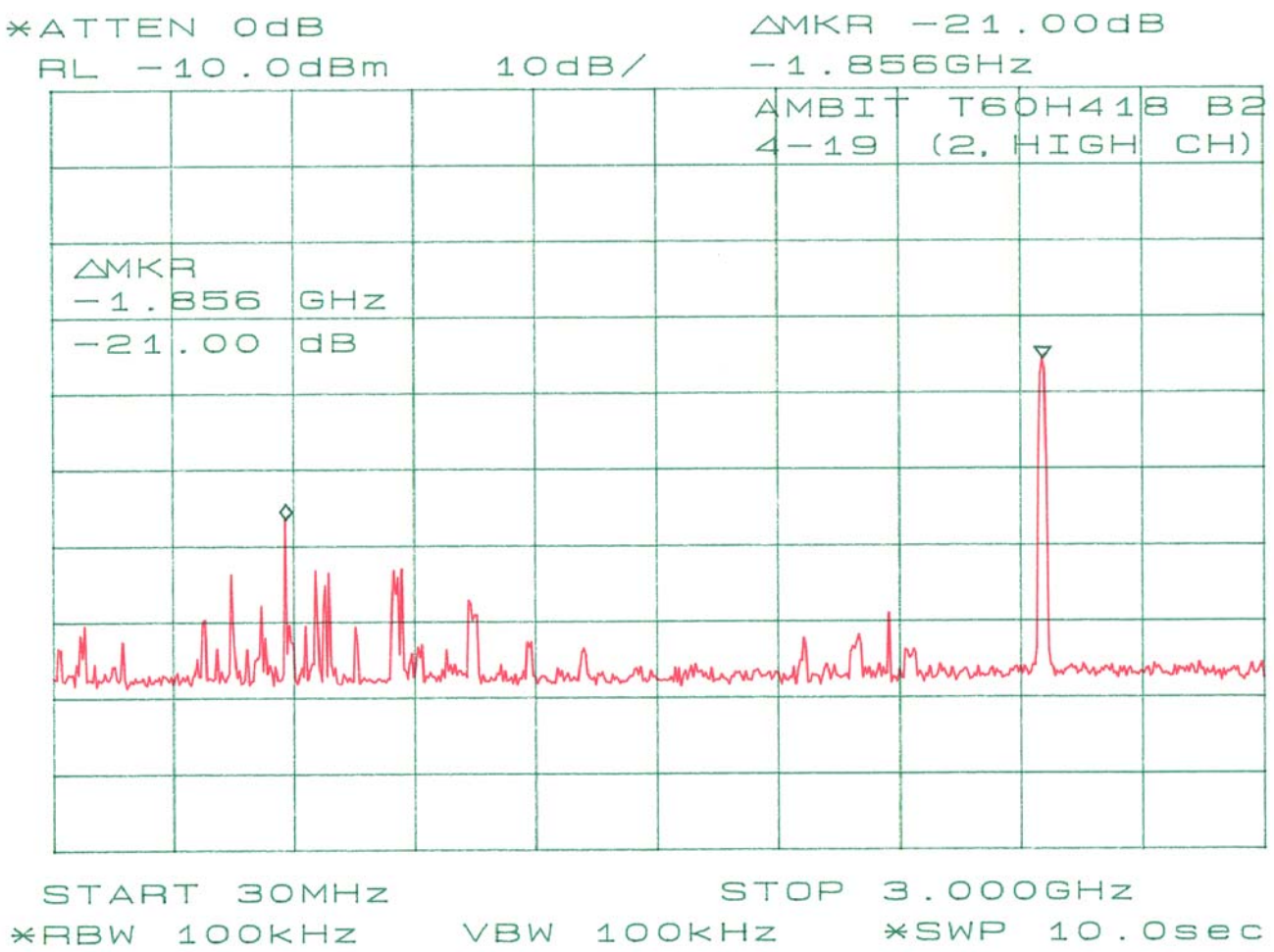
VBW 100kHz
*SWP 10.0sec

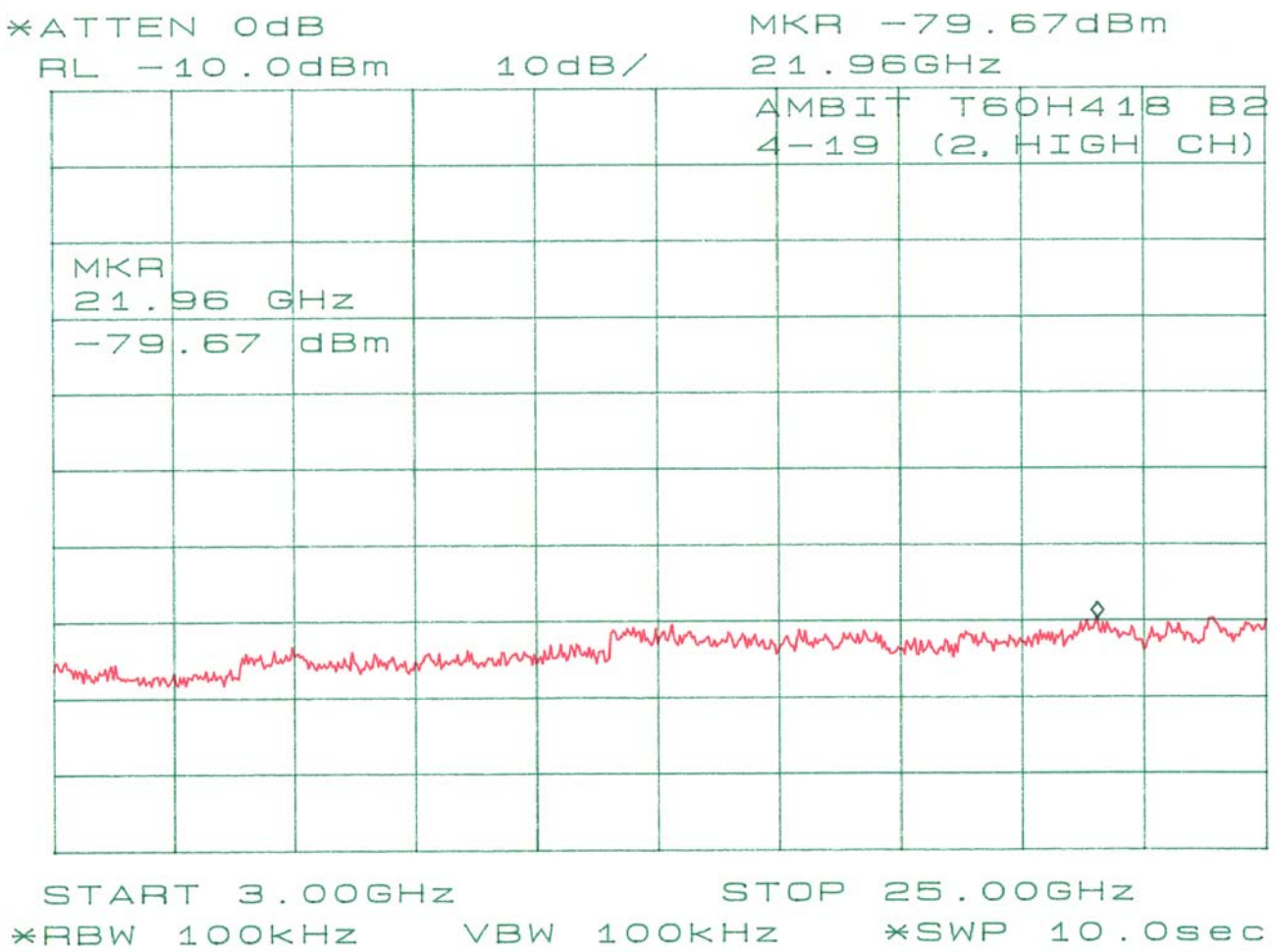

*ATTEN 0dB
RL -10.0dBm
10dB/
ΔMKR -25.50dB
-2.208GHz
AMBIT T60H418 B2
4-19 (2. LOW CH)
ΔMKR
-2.208 GHz
-25.50 dB
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec


*ATTEN 0dB
RL -10.0dBm
10dB/
MKR -78.33dBm
4.06GHz
AMBIT T60H418 B2
4-19 (2. LOW CH)
MKR
4.06 GHz
-78.33 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec


*ATTEN 0dB
RL -10.0dBm
10dB/
ΔMKR -25.66dB
-2.232GHz
AMBIT T60H418 B2
4-19 (2. MID CH)
ΔMKR
-2.232 GHz
-25.66 dB
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec


*ATTEN 0dB
RL -10.0dBm
10dB/
MKR -79.00dBm
4.10GHz
AMBIT T60H418 B2
4-19 (2. MID CH)
MKR
4.10 GHz
-79.00 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec


*ATTEN 0dB
RL -10.0dBm
10dB/
ΔMKR -21.00dB
-1.856GHz
AMBIT T60H418 B2
4-19 (2, HIGH CH)
ΔMKR
-1.856 GHz
-21.00 dB
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec


*ATTEN 0dB
RL -10.0dBm
10dB/
MKR -79.67dBm
21.96GHz
AMBIT T60H418 B2
4-19 (2, HIGH CH)
MKR
21.96 GHz
-79.67 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 10.0sec