EXHIBIT 6: Report of Measurements

FCC TYPE ACCEPTANCE INFORMATION

The following information is in accordance with FCC Rules, 47CFR Part 2, Subpart J, sections 2.983 - 2.999.

2.983(a) Applicant: Powerwave Technologies, Inc.
2026 McGaw Avenue
Irvine, CA 92614

2.983(b) FCC ID: E675JS0027

2.983(c) Quantity production is planned.

2.983(d) Technical Description

The SPS9301-100 amplifier system is a single channel GSM power amplifier that operates from 1930 MHz to 1990 MHz. The amplifier system is module in design, and is ideally suited for use in GSM base station. The amplifier system is comprised of a minirack and two fan assemblies, two SPA9301-50 plug-in power amplifier modules, input and output coaxial cables, and ac-dc converter. The SPA9301-50 is a TDMA amplifier that operates in a 60 MHz bandwidth from 1930 MHz to 1990 MHz. Each amplifier is a self-contained plug-in module and is functionally independent of the other amplifier module. The rear panel of each amplifier as well as each fan in the minirack assembly has a connector that interfaces with the minirack power converter which, in turn, plugs into a conventional (U.S.) 120Volt AC outlet. Each amplifier front panel has I/O connectors that interface with the host RF signal source and system antenna.

Subsections

(1) Types of Emissions

PCS-1900(GSM) : GXW

(2) Frequency Range

GSM(PCS-1900) :1930 - 1990 MHz

(3) Range of Operating Power

0-/+ 48dBm

(4) Maximum Power Rating

52Watts

(5) Applied voltages and currents into the final transistor elements

Refer to Exhibit 2 .Schematic and Functional Block Diagram. Confidentiality is requested for these items

(6) Function of Each Active Device

Refer to Exhibit 2. Schematic and Functional Block Diagram. Confidentiality is requested for these items

(7) Complete Circuit Diagrams and Functional Block Diagram

Refer to Exhibit 2 .Schematic and Functional Block Diagram. Confidentiality is requested for these items.

(8) Instructions/Installation Manual

Refer to Exhibit 5.

(9) Tune-up/Optimization Procedure

Refer to installation manual, Exhibit 5.

(10) Means for Frequency Stabilization

Not Application . EUT is a power amplifier.

(11) Means for Limiting Modulation

Not applicable. EUT is a power amplifier.

(11) Means for Limiting Power

The alarm logic controls the +5Vdc bias voltage which shuts down the amplifier on an input overpower condition.

(11) Means for Attenuating Higher Audio Frequencies

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Not Applicable.

(12) Description of Digital Modulation Techniques

Not Applicable

2.983(e) Standard Test Conditions

The power amplifier was tested under the following conditions:

DC Supply Voltage: 27V
AC Supply Voltage: 120V AC

The transmitter was aligned and tuned up according to manufacturer's alignment procedure, prior to testing. All data presented represents the worst case parameter being measured.

Section 2.983(f) Equipment Identification

A drawing of the equipment identification nameplate appears in Exhibit 5.

Section 2.983(g) Photographs

Photographs of the equipment, internal and external views, are found in Exhibit 3.

Section 2.983 Description of Various Base Station Configurations

Not Applicable

Section 2.983 Use of Various Power Supplies

Supply Voltage :27V dc input.

Section 2.987 Measurement Required: Modulation Characteristics

Not Applicable

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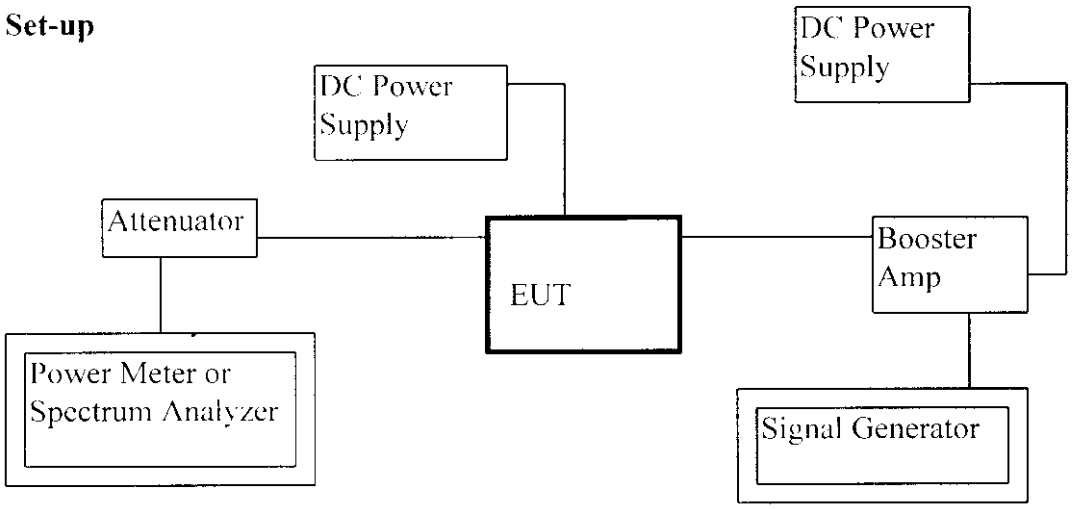
Section 2.989 Measurement Required: Occupied Bandwidth
Limits:24.238

Measurement Equipment Used:

HP Signal Generator/ ESG-D2000A
Powerwave Booster Amplifier
HP Power Meter/ 437B
HP 8563E Spectrum Analyzer
QIM "The Workhorse" low loss cable, 9 ft (loss: 0.85 dB/ft@ 26 GHz)

Test Set-up



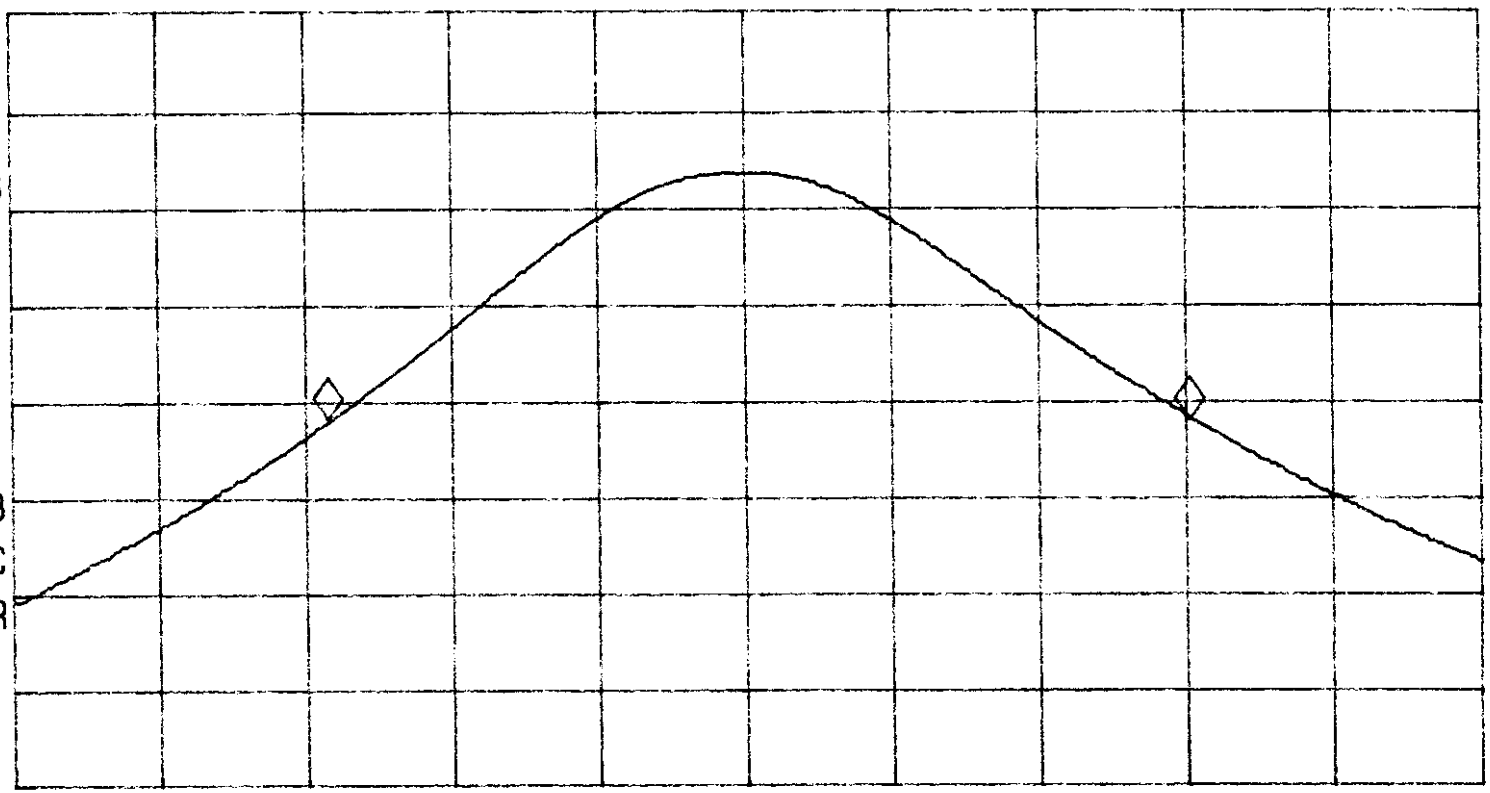
Data on the bandwidth occupied by this transmitter is presented in graphical form using spectrum analyzer plots. Emission bandwidth (per 24.238b, the 26dB BW) was measured with RBW=1 MHz. VBW=1 Mhz..Please refer to Spectrum plots attached.

Ø9: 28: 28 MAR Ø4, 1998
POWERWAVE SPA9XXX-5Ø BANDWIDTH

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.938 MHz
-.1Ø dB

REF OFFST 33.Ø dB
LOG REF 63.Ø dBm
1Ø
dB/
ATN
4Ø dB

DL
2Ø.3
dBm
VA SB
SC FC
CORR

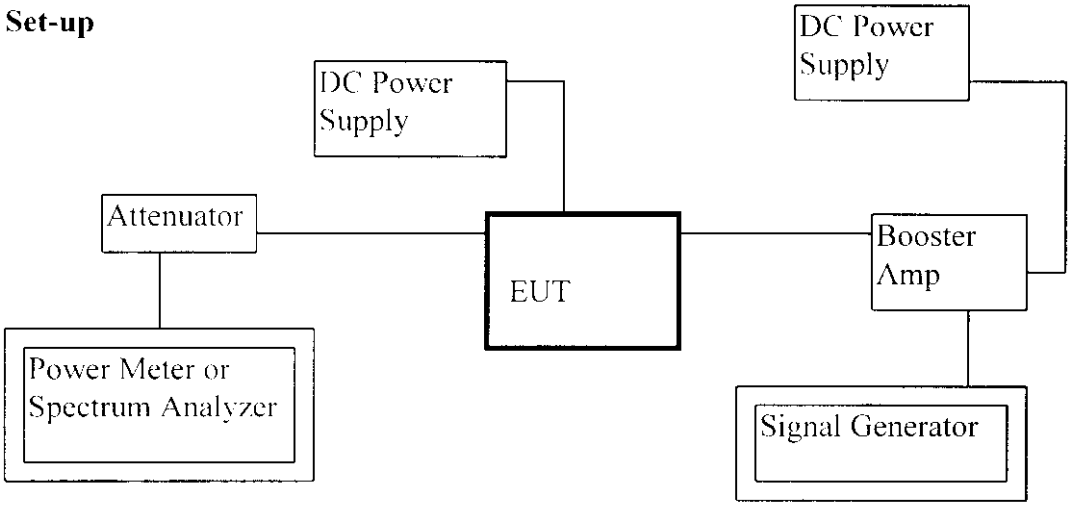


CENTER 1.96ØØØØ GHz
SPAN 5.ØØØ MHz
#IF BW 1.Ø MHz #AVG BW 1 MHz
SWP 2Ø.Ø msec

Section 2.991 Measurements Required: Spurious and Harmonic Emissions at Antenna Terminals
Section 24.238 Limits
Measurement Equipment Used:

HP Signal Generator/ ESG-D2000A
Powerwave Booster Amplifier
HP Power Meter/ 437B
HP 8563E Spectrum Analyzer
QIM "The Workhorse" low loss cable, 9 ft (loss: 0.85 dB/ft@ 26 GHz)

Test Set-up

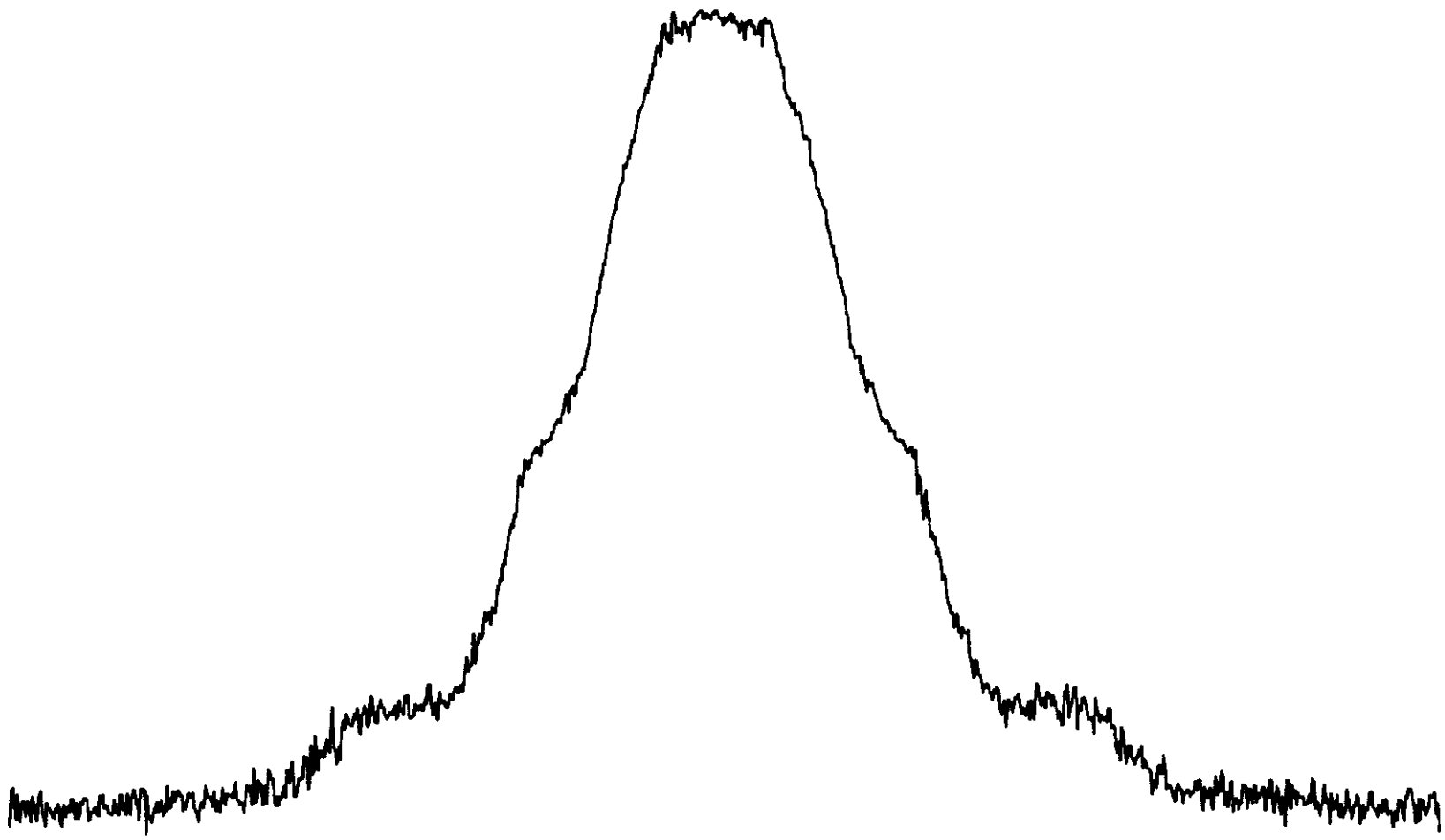


Minimum standard: The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than 43+10 log(mean output power in watts) dBc below the mean power output outside a licensee's frequency block.

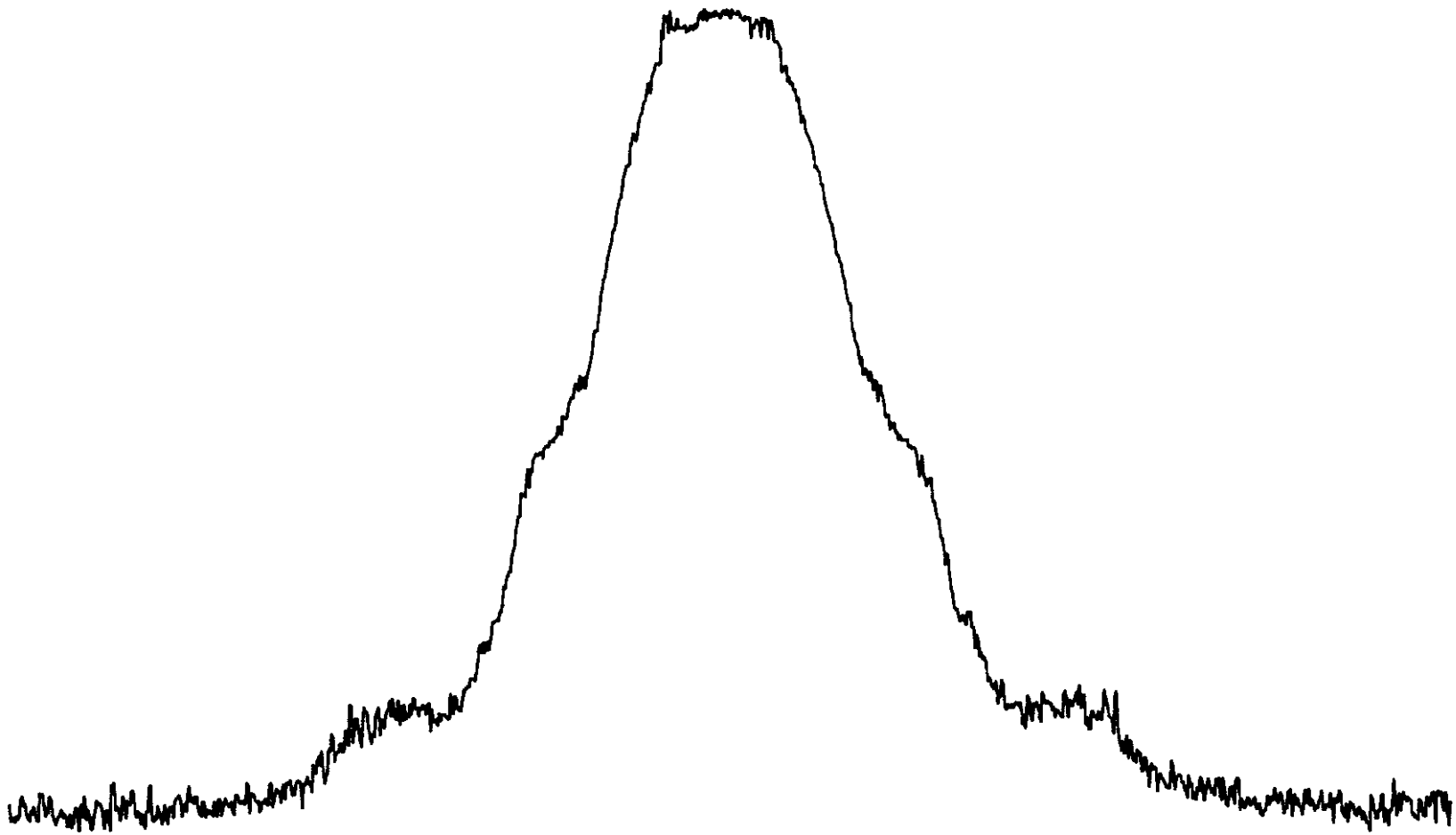
24.238 (b) & (c) Compliance with out of band emissions requirement is based on test being performed with 1MHz analyzer RES BW. At block edges, RES BW may be adjusted to a level at least as large as 1% of emission bandwidth. For the EUT this is at least

.01*2.938MHz = 29.38kHz. A RES BW of 30kHz was used for band edge measurement.

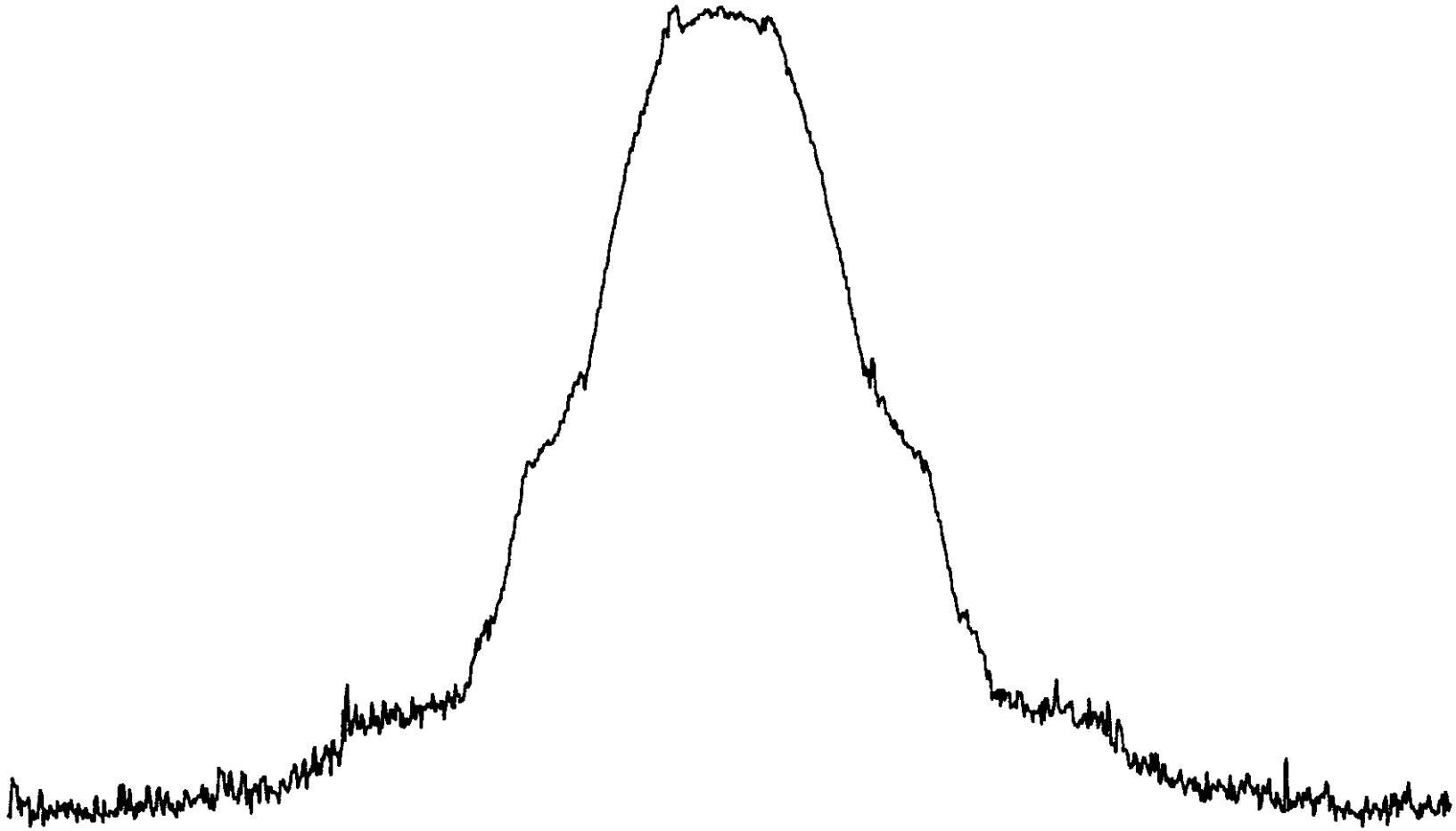
Test Results
Please refer to the following plot for Band Edge and Low . High Spurious Emissions.



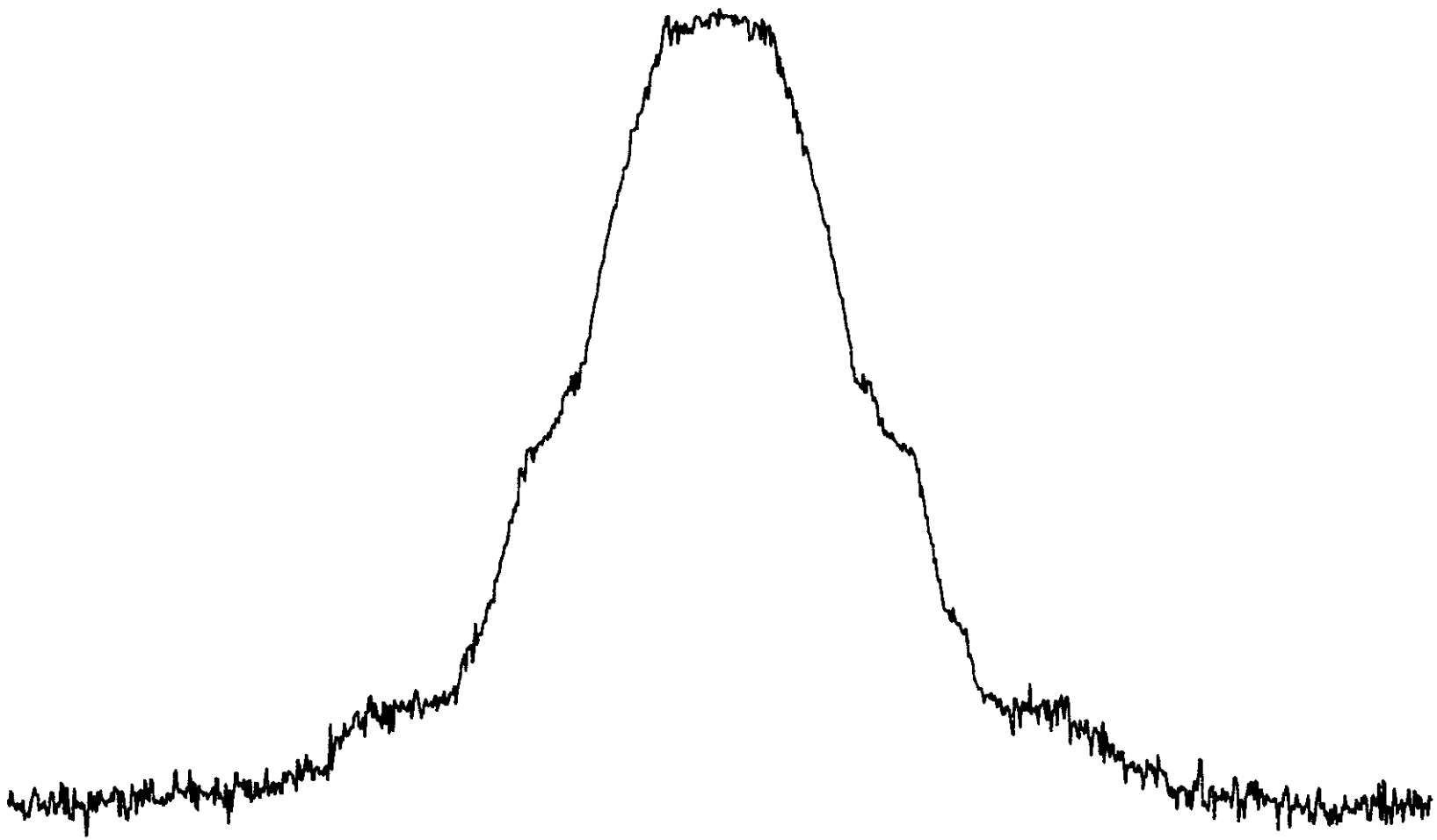
Block A (Yarn)



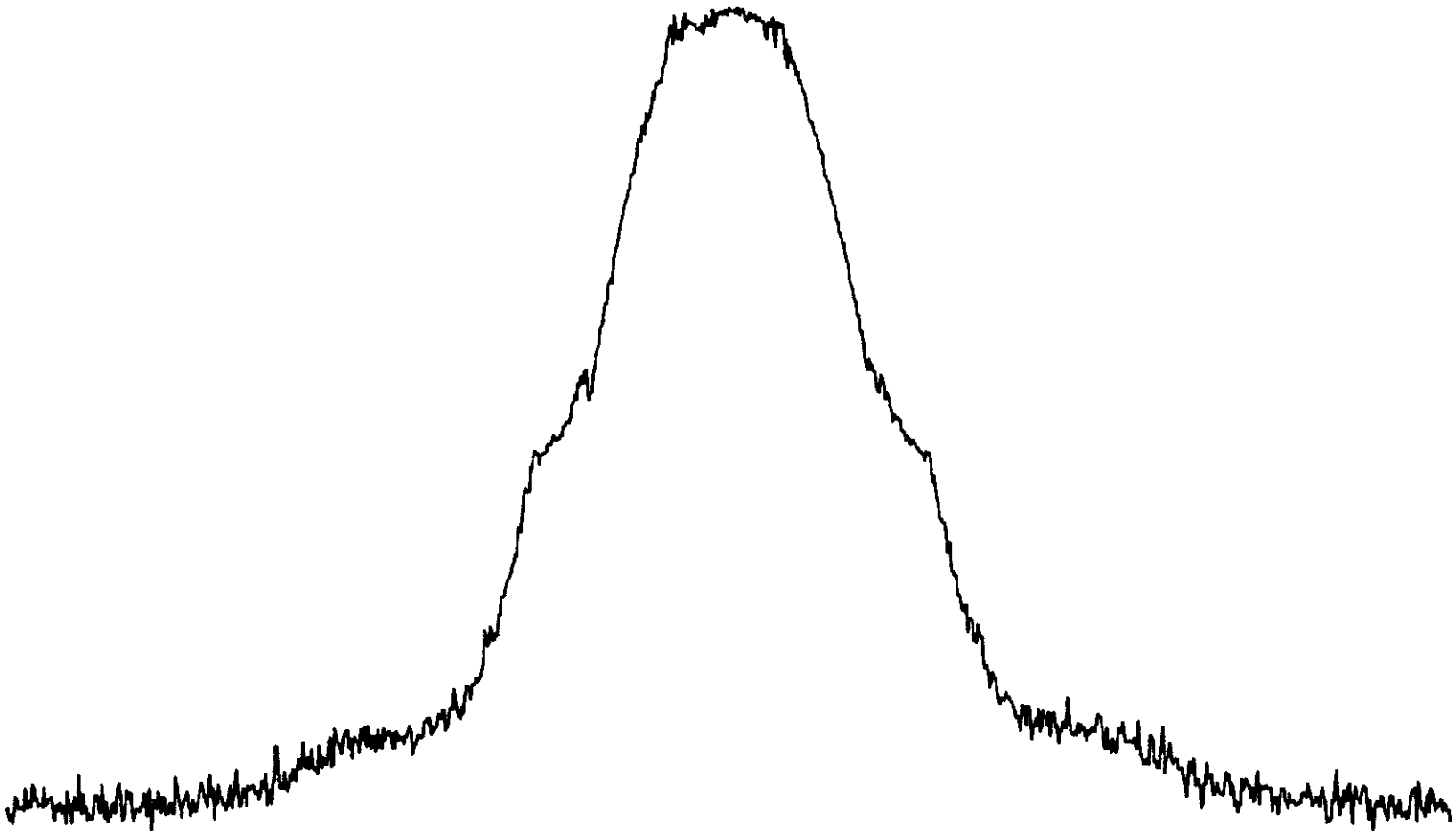
Black & B (Jam)



PK



Black & Green



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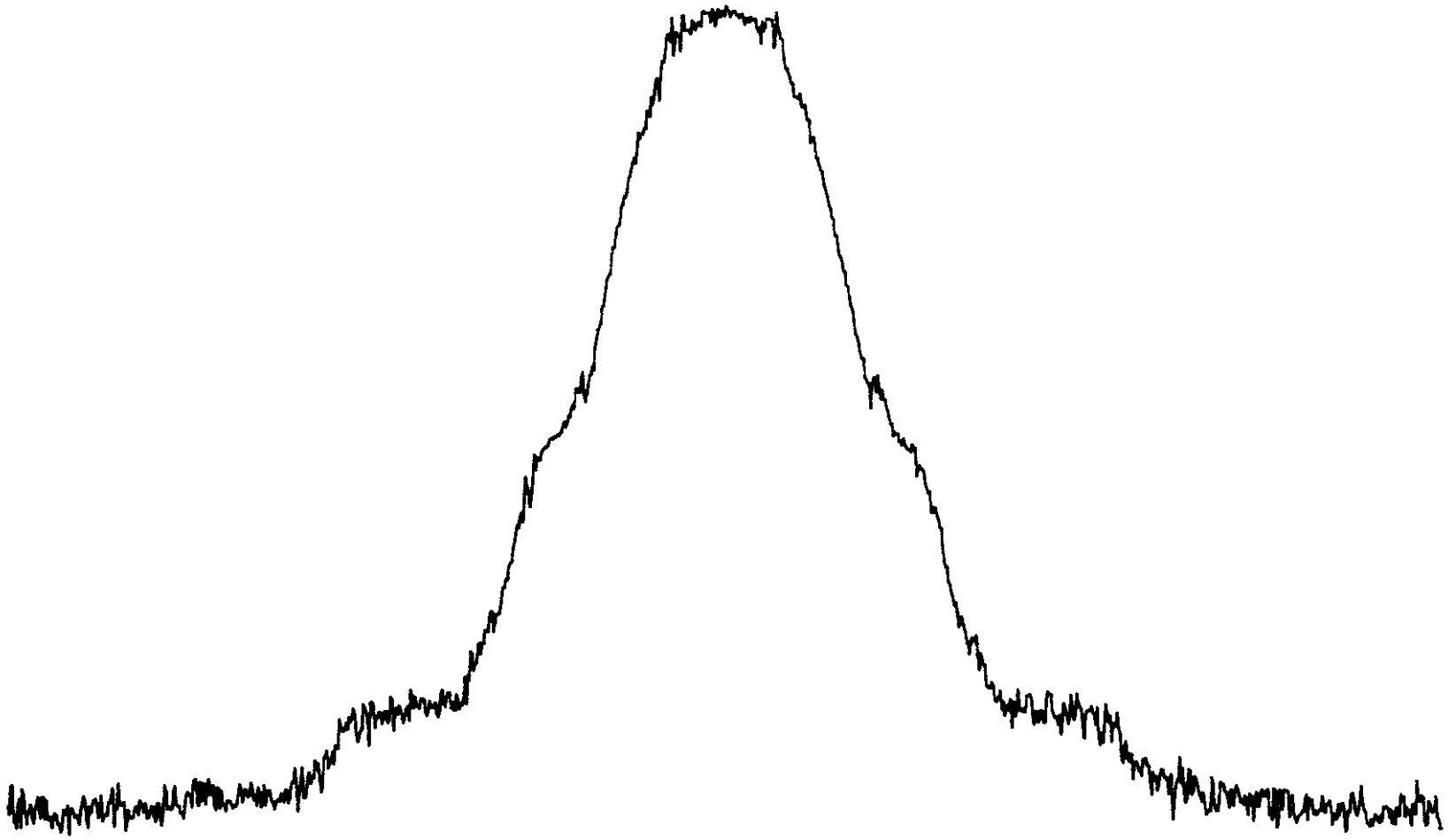
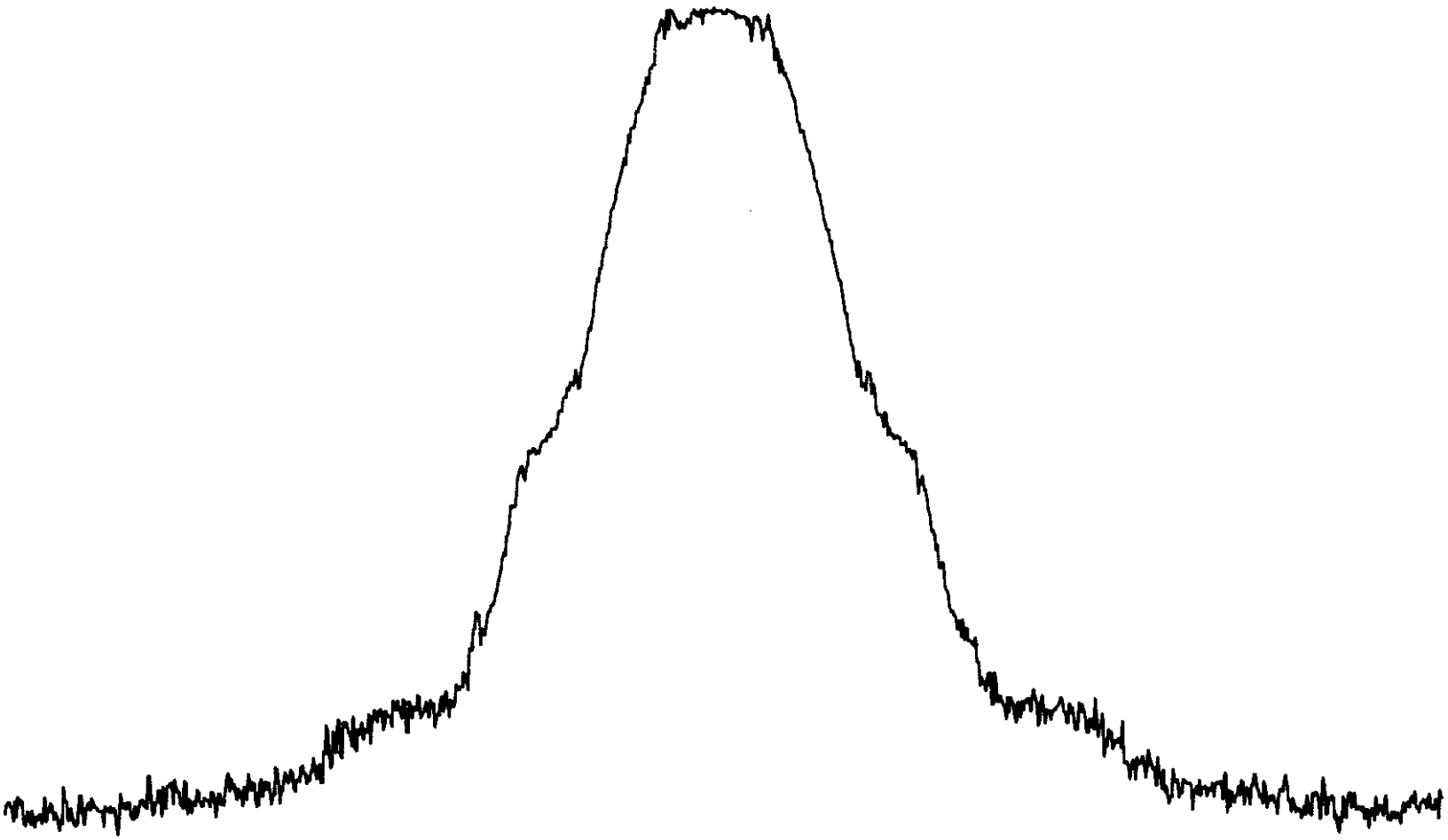
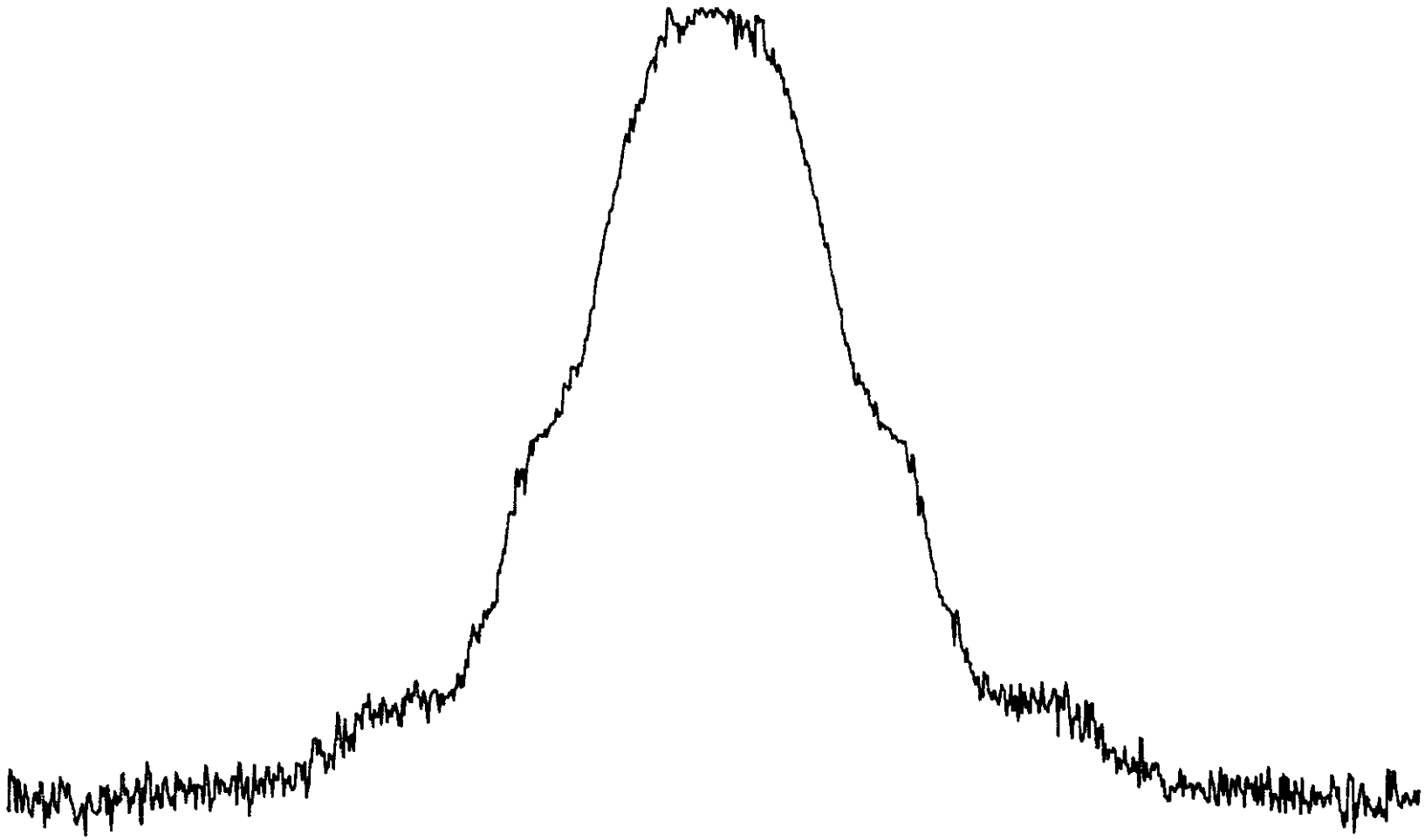
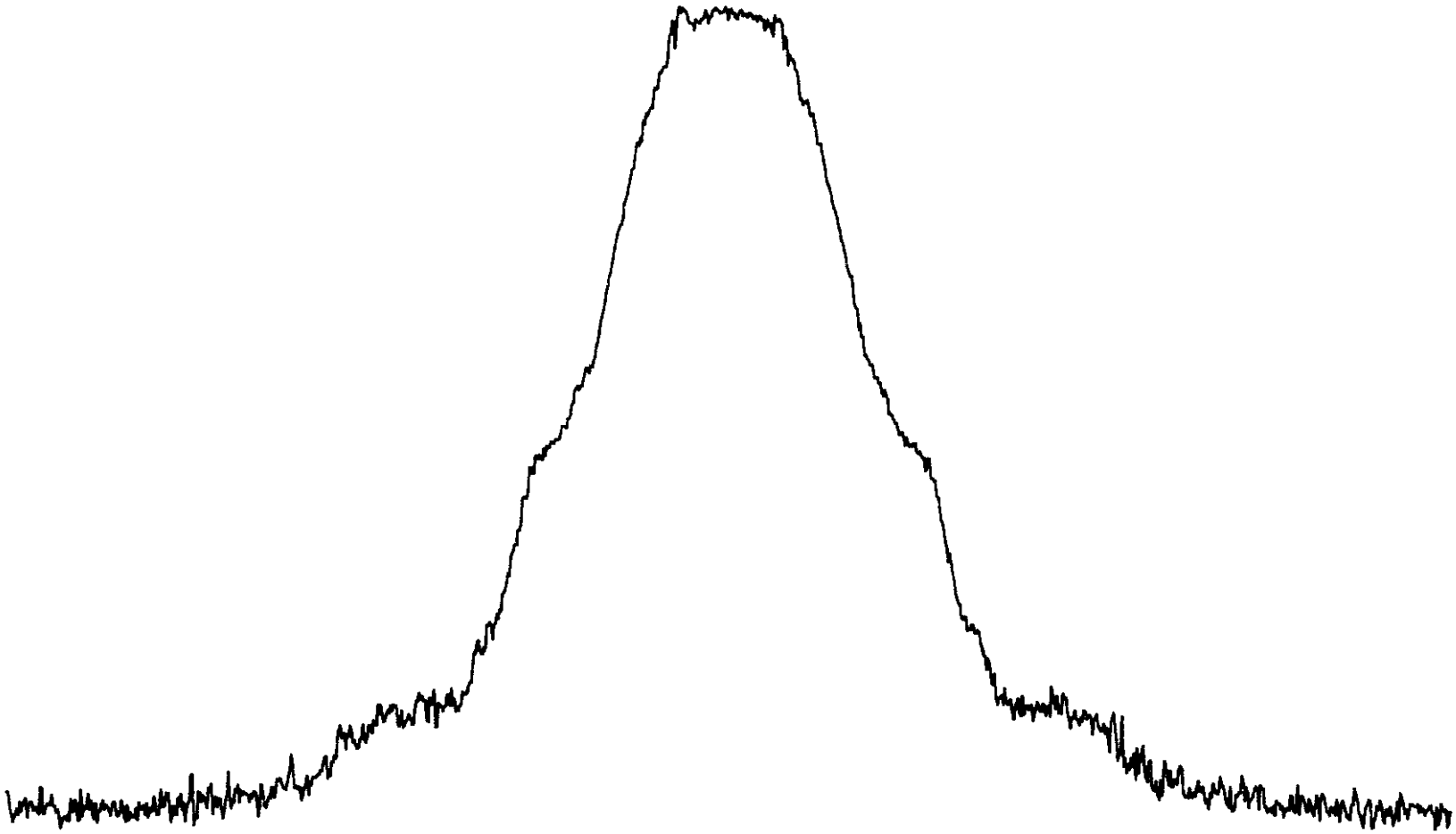


PL

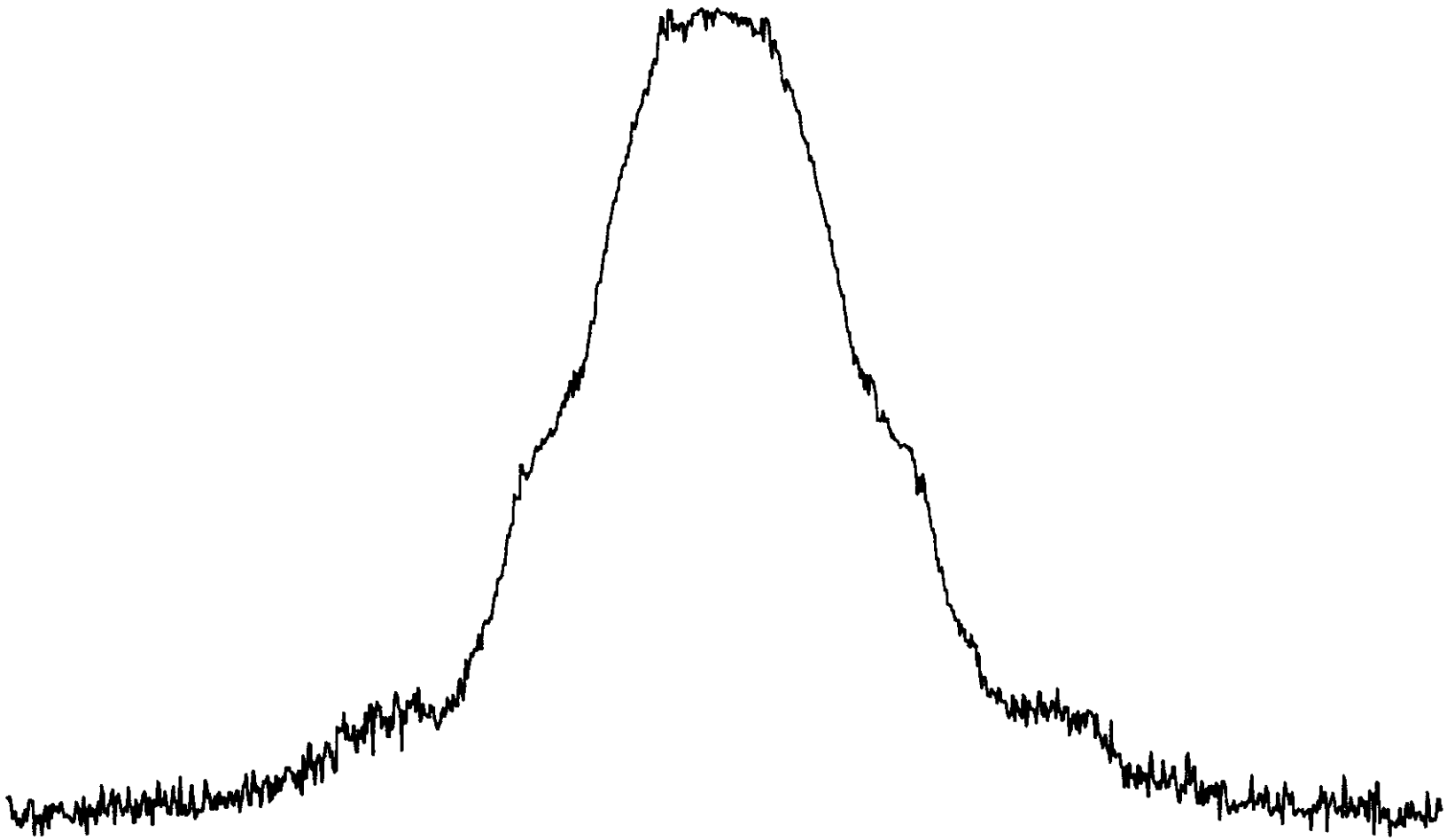


Black & Ryan

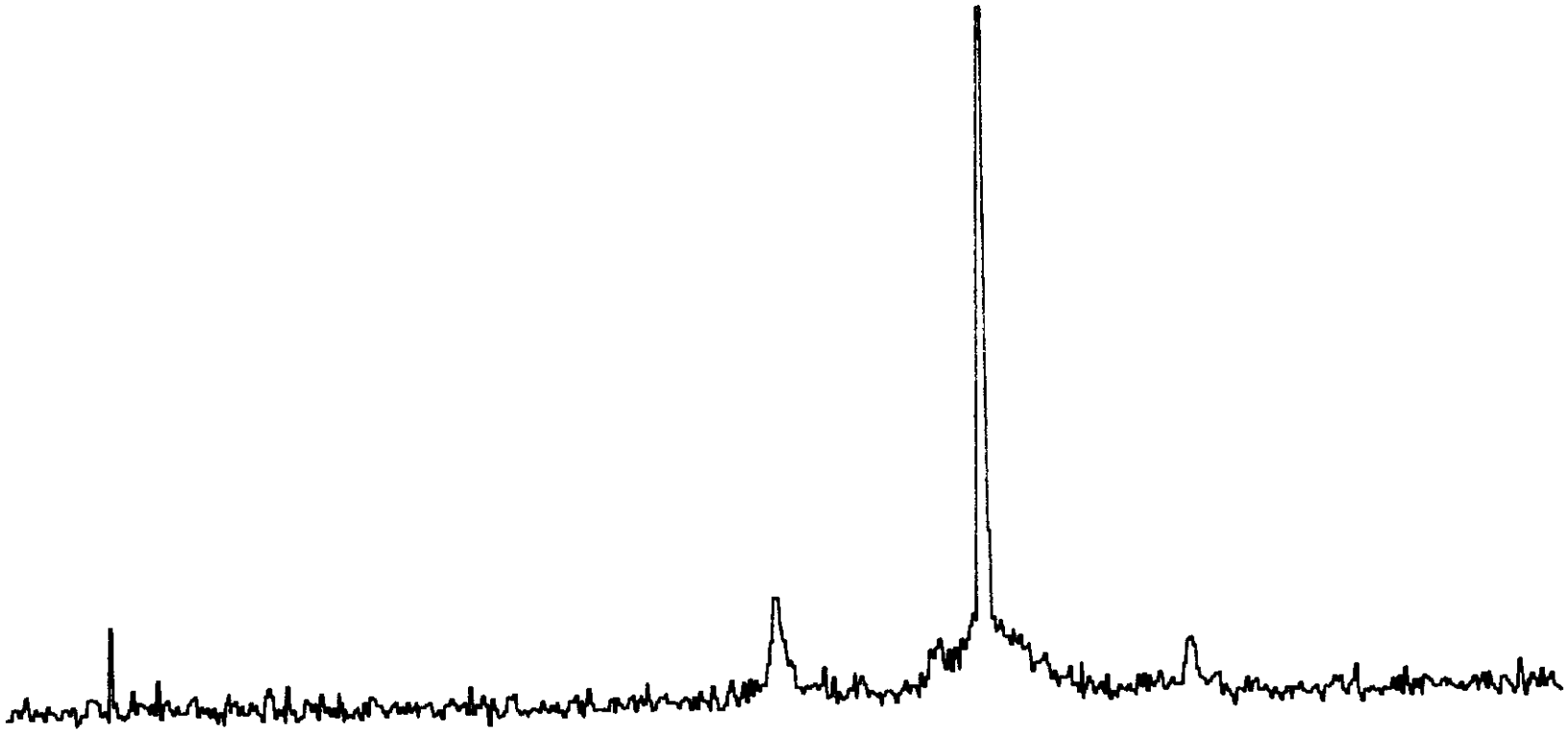




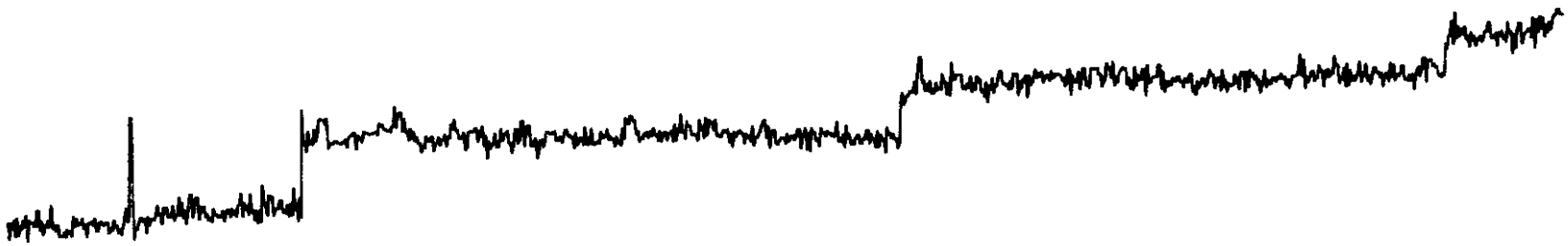
Black F (Jem)



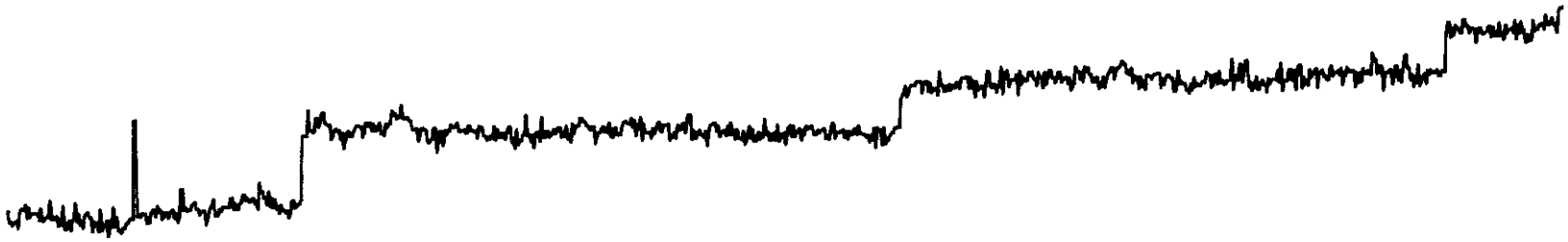
Buck A



Black A

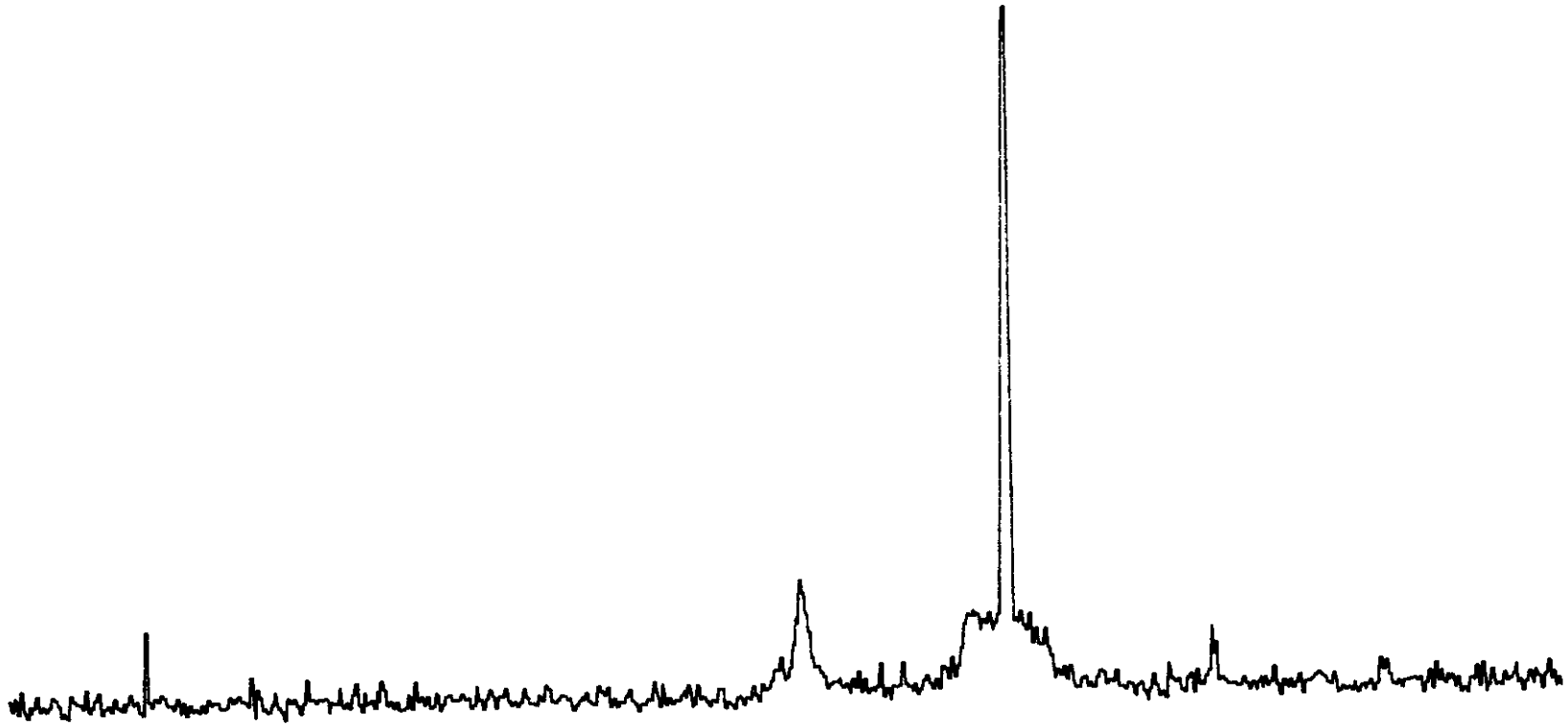


Block A



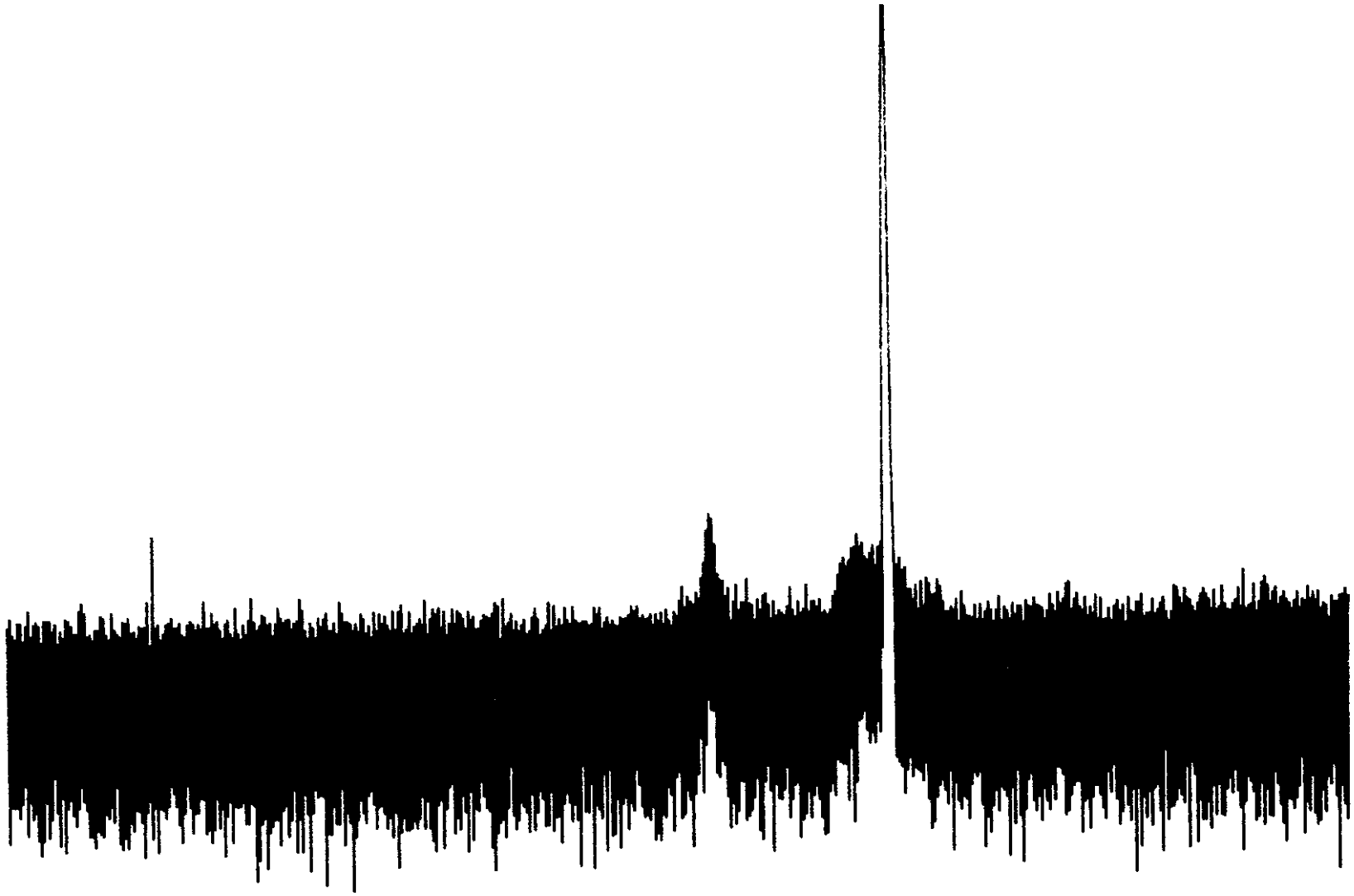
Black B

VL

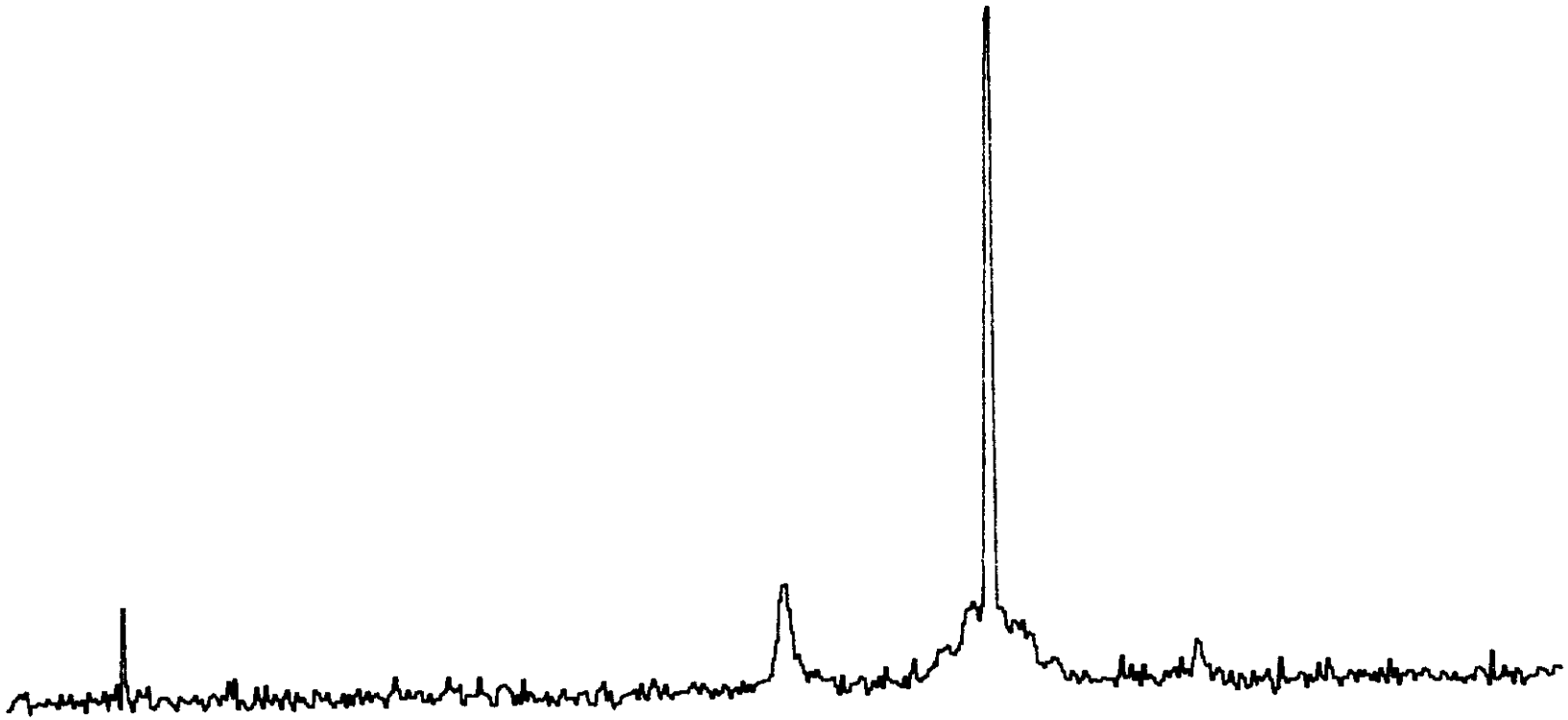


Back B

Block C



Block C



Black D

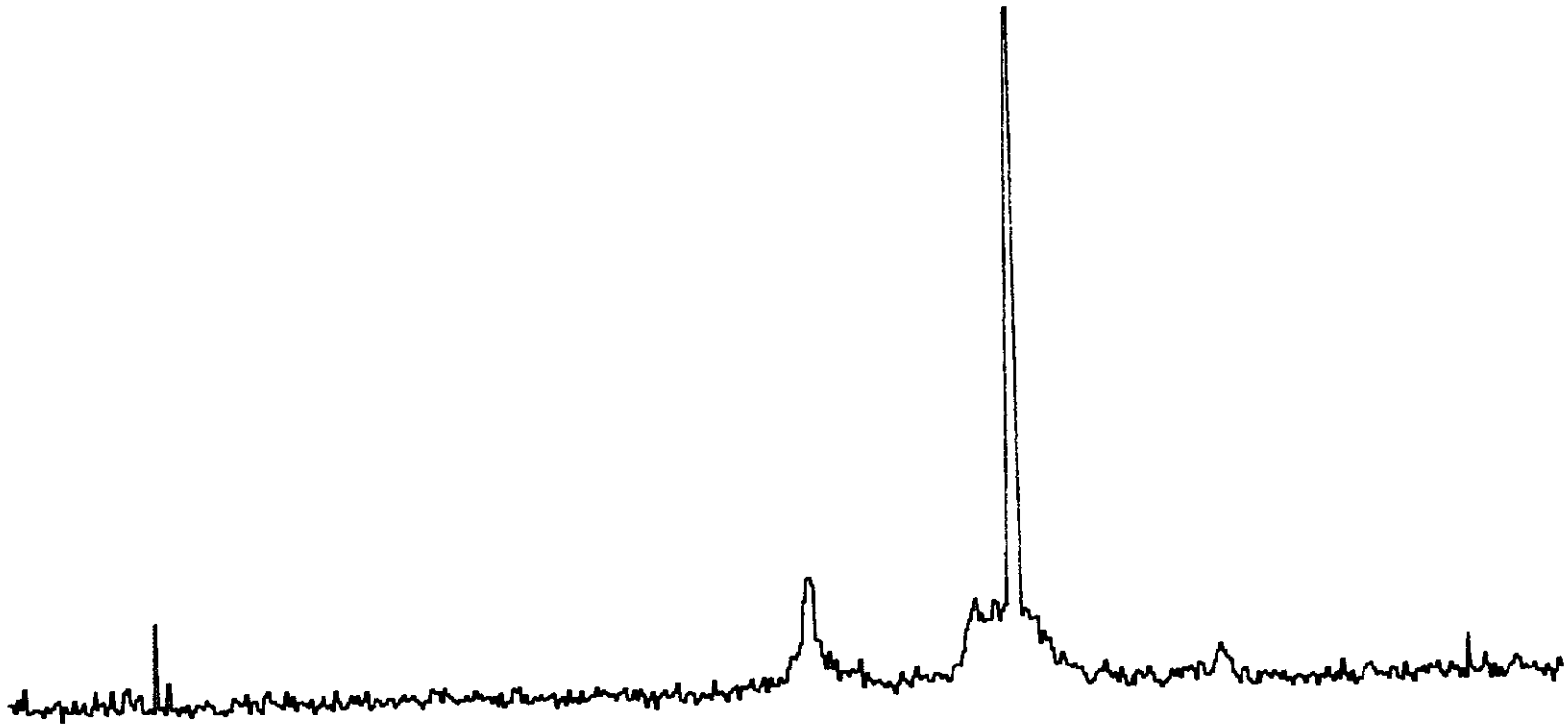
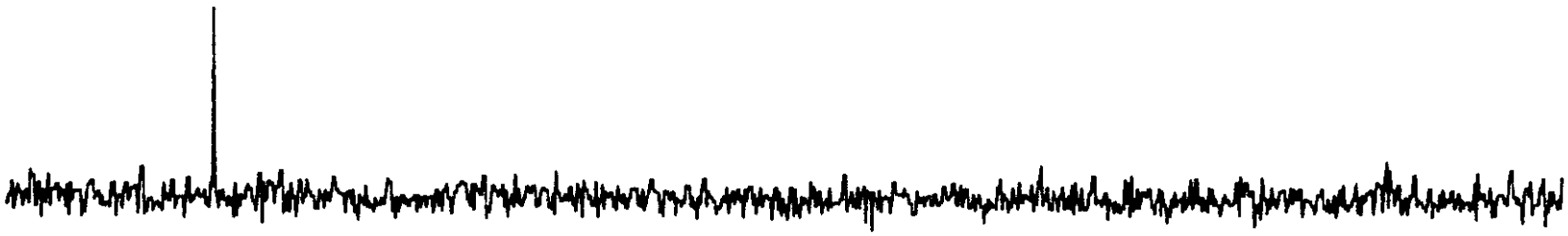
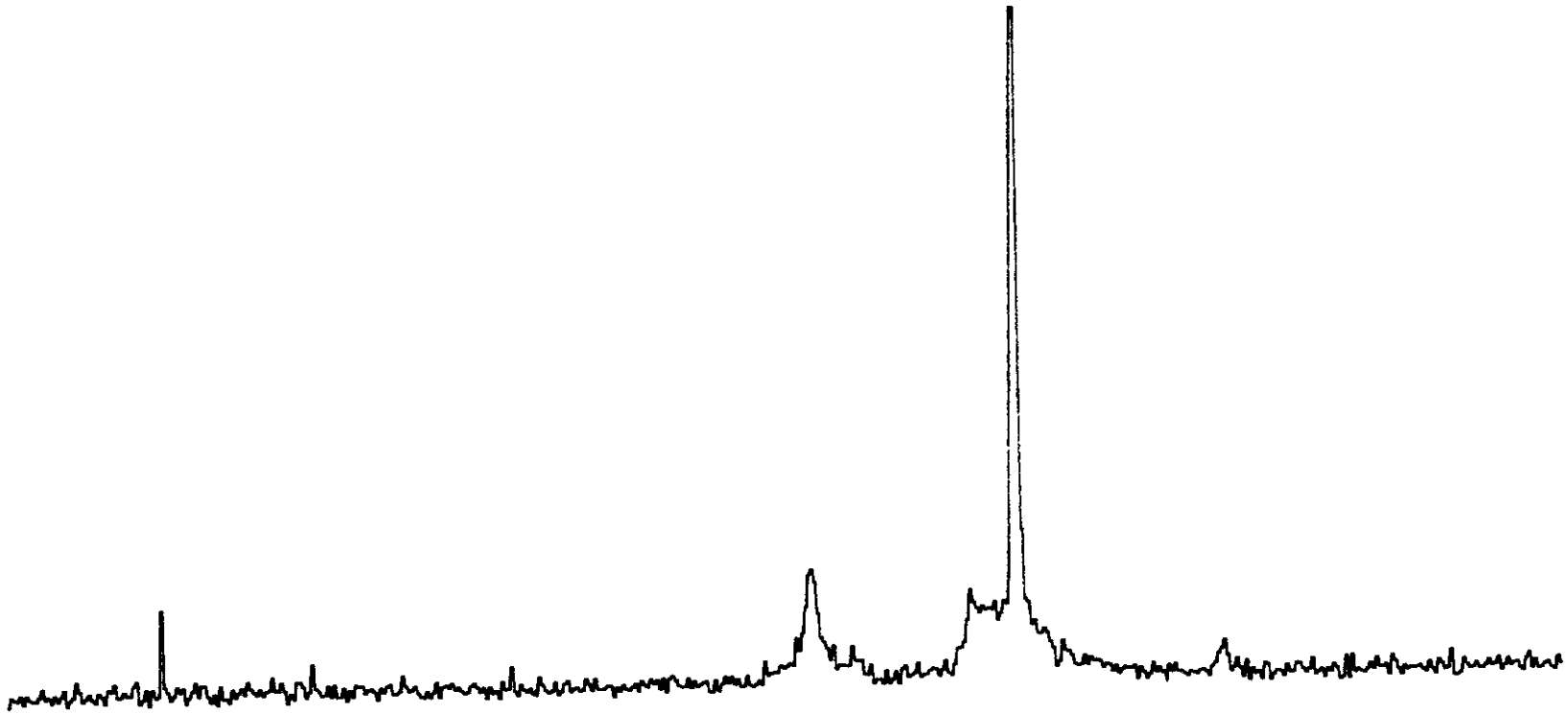


Fig. 6 E

PK



Block F



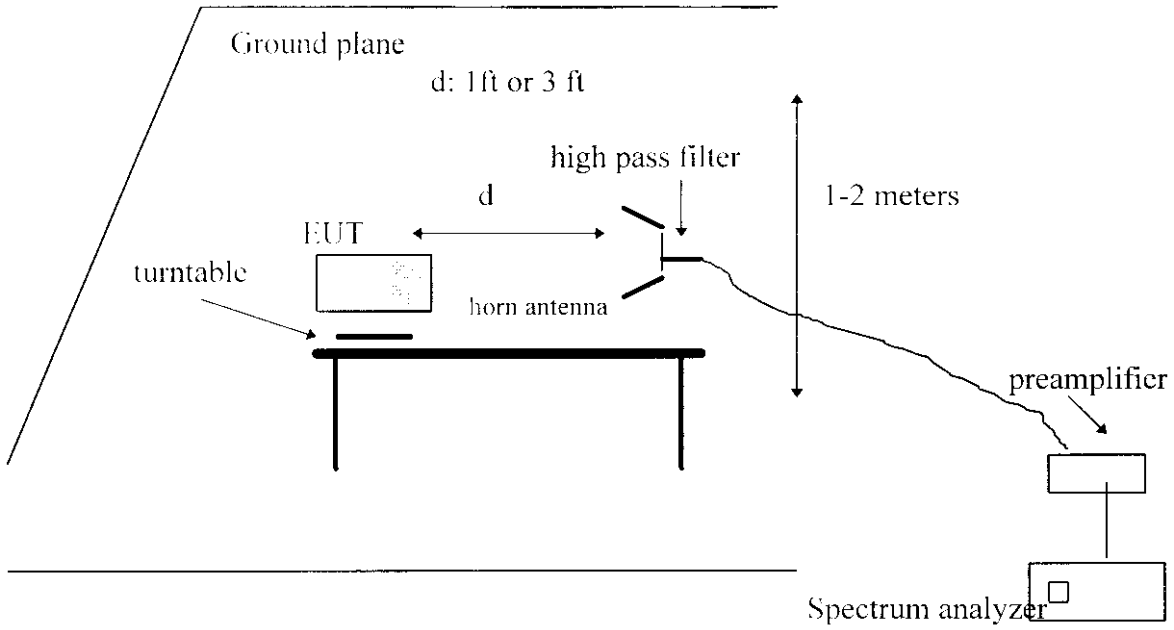
Black F

Section 2.993 Measurement Required: Field Strength of Spurious and Harmonic Radiation

Measurement Equipment Used:

HP 8563E Spectrum Analyzer
HP 8449 B Preamplifier, 1-26 GHz
ARA DRG-118/A Double Ridged Horn antenna, 1 - 18 GHz
QIM "The Workhorse" low loss cable, 9 ft (loss: 0.85 dB/ft@ 26 GHz)

Test Set-Up



Minimum Requirement

The magnitude of each spurious and harmonic emission detected as being radiated from the EUT must be at a level more than 43 + 10 log(mean output power, watts) dB below the mean power output (= -13 dBm).

Resultant radiated field at 3 m from -13 dBm source feeding isotropic antenna: 82 dBuV/m

Test Method

The antenna output port of the EUT was load and source with a 50 ohm termination. With the transmitter operating at full power, the EUT was rotated 360° and the search antenna was raised and lowered in both polarities, all in an attempt to maximize the levels of the received emission for each harmonic and spurious emission up to 10 fo.

Test Results

Corrected field strength readings extrapolated to 3m: Please refer to the following work sheet.

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FCC 24.238
POWERWAVE TECHNOLOGIES
SPA9XXX-50 PCS AMP

PETE KREBILL
3/5/98
SITE A

ALL READINGS ARE PEAK

F(MHz)	Level (dBuV)	AF (dB)	FILTER (dB)	CL (dB)	DIST (dB)	AMP (dB)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
VERTICAL									
3920	87.3	32.2	1	5.04	-10.5	-35.5	79.54	82	-2.46
5880	65.4	35.3	1	5.58	-10.5	-35.5	61.28	82	-20.72
7840	62	37	1	7.2	-10.5	-35.5	61.2	82	-20.8
9800	62.3	38	1	7.92	-10.5	-35.5	63.22	82	-18.78
11760	64.2	39.3	1	8.46	-10.5	-35.5	66.96	82	-15.04
13720NF	60.18	40.2	1	9	-10.5	-35.5	64.38	82	-17.62
15680NF	58.6	39.6	1	10.44	-10.5	-35.5	63.64	82	-18.36
17640NF	59.2	45.9	1	10.98	-10.5	-35.5	71.08	82	-10.92
19600NF	62.2	47.9	1	12.6	-10.5	-35.5	77.7	82	-4.3

C

NF=NOISE FLOOR READINGS
AF=ANTENNA FACTOR
FILTER=FILTER LOSS

CL=CABLE LOSS
DIST=DISTANCE CORRECTION
AMP=AMPLIFIER GAIN

Section 9.295 Measurement Required: Frequency Stability

Not Applicable .

Section 24.232: RF Power Output

Test Result:

Maximum power measured: 47.2dbM=52 WATTS.

Section 1.1307 Routine Environmental Evaluation

The SPA9XXX-50 amplifier total power output is much less than 2000W ERP and therefore routine evaluation is NOT required for RF exposure to personnel.

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