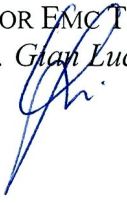




ELECTROMAGNETIC COMPATIBILITY
ELECTRICAL SAFETY
LASER SPECTROSCOPY
ENVIRONMENTAL PHYSICS

G.S.D. S.r.l.
Certified in accordance with
UNI EN ISO 9001:2008
by
TÜV Rheinland Italia S.r.l.
Certificate N. 39 00 1850509

G.S.D. Srl PISA - Italy	Test Report n. 17318FCC	Rev. 01
Manufacturer	JAGGER & LEWIS	
Address	165 Avenue de Bretagne Euratechnologies 59000 LILLE FRANCE	
Test Family Name	Smart Dog Device	
Testing Laboratory Name	G.S.D. S.r.l.	
Address	Via Marmiceto, 8 56121 Pisa (PI) Italy	
Tel/Fax	+39 050 984254 / +39 050 984262	
P.IVA/VAT	01343950505	
http – e-mail	www.gsd.it - info@gsd.it	
FCC Listed. Registration Number: 424037.		
Location and Date of Issue	Pisa, 2017 July 03	
G.S.D. s.r.l. Via Marmiceto, 8 56121 OSPEDALETTO - PISA Tel. 050.984254 - Fax 050.984262 P. IVA 01343950505 SENIOR EMC TEST MANAGER <i>Dr. Gian Luca Genovesi</i>  QUALITY MANAGER <i>Dr. David Pelliccia</i> 		

INDEX		
1. MANUFACTURER AND EUT IDENTIFICATION	3	
2. REFERENCE STANDARDS.....	4	
3. RESULT, CONDITION, MEASUREMENT UNCERTAINTY.....	5	
4. RADIATED EMISSIONS - FIELD STRENGTH EMISSIONS – EMISSIONS RADIATED OUTSIDE THE BAND – OCCUPIED BANDWIDTH.....	7	
4.1. BLUETOOTH.....	9	
4.2. WiFI.....	29	
Report Revision History		
Revision details		
Date	Page No.(s)	Details
2017 July 03	58	Rev. 00 Initial issue
2017 July 03	60	Rev. 01 Second issue

1. MANUFACTURER AND EUT IDENTIFICATION¹	
Manufacturer	JAGGER & LEWIS.
Address	165 Avenue de Bretagne Euratechnologies59000 LILLE FRANCE
Test Family Name	Smart Dog Device
Frequency Range	2402-2480 MHz (BLE) 2412-2462 MHz (WLAN 802.11b/g/n)
Date of reception	2017 May 20
Sampling	Laboratory sample for certification
Test Item Description	Smart Dog Device
Nominal Input Voltage	Internal Battery - USB connector for charging battery
FCC ID	2AMKG-JL1PETDEVICE

¹A detailed documentation is preserved in the internal fascicle.

This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 3 / 60

2. REFERENCE STANDARDS

Tests and measurements are performed accordingly to the reference standards given in the table below:

<i>TEST</i>	<i>STANDARD</i>
Emissions: Conducted and Radiated – Section 15.207 and 15.209	FCC Rules and Regulations, Title 47 Part 15 – Sub part C ANSI C63.4 2014 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz ANSI C63.10 2013 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
§15.249 Operation within the band 2400.00 – 2483.00 MHz:	FCC Rules and Regulations, Title 47 Part 15 – Sub part C ANSI C63.4 2014 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz ANSI C63.10 2013 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Antenna Requirement: §15.203	FCC Rules and Regulations, Title 47 Part 15 – Sub part C

This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 4 / 60

3. RESULT, CONDITION, MEASUREMENT UNCERTAINTYSummary of Test Results

<i>TEST</i>	<i>RESULT</i>
<i>Emissions: radiated Section 15.209</i>	<i>Pass</i>
<i>Field Strength Emissions – Emissions outside the bands - Bandwidth Section 15.249 (a)(c)(d)(e) – 15.215 (c)</i>	<i>Pass</i>

Measurement uncertainty

<i>TEST</i>	<i>EXPANDED UNCERTAINTY</i>
Conducted Emission – 50Ω/50μH (150 kHz - 30 MHz)	± 3.5 dB
Radiated Emission – (Semianechoic Room) (30 MHz - 18 GHz)	± 4.7 dB

Climatic Conditions

<i>PARAMETER</i>	<i>VALUE</i>
Temperature	(293 ± 3) K
Relative humidity	(50 ± 5) %

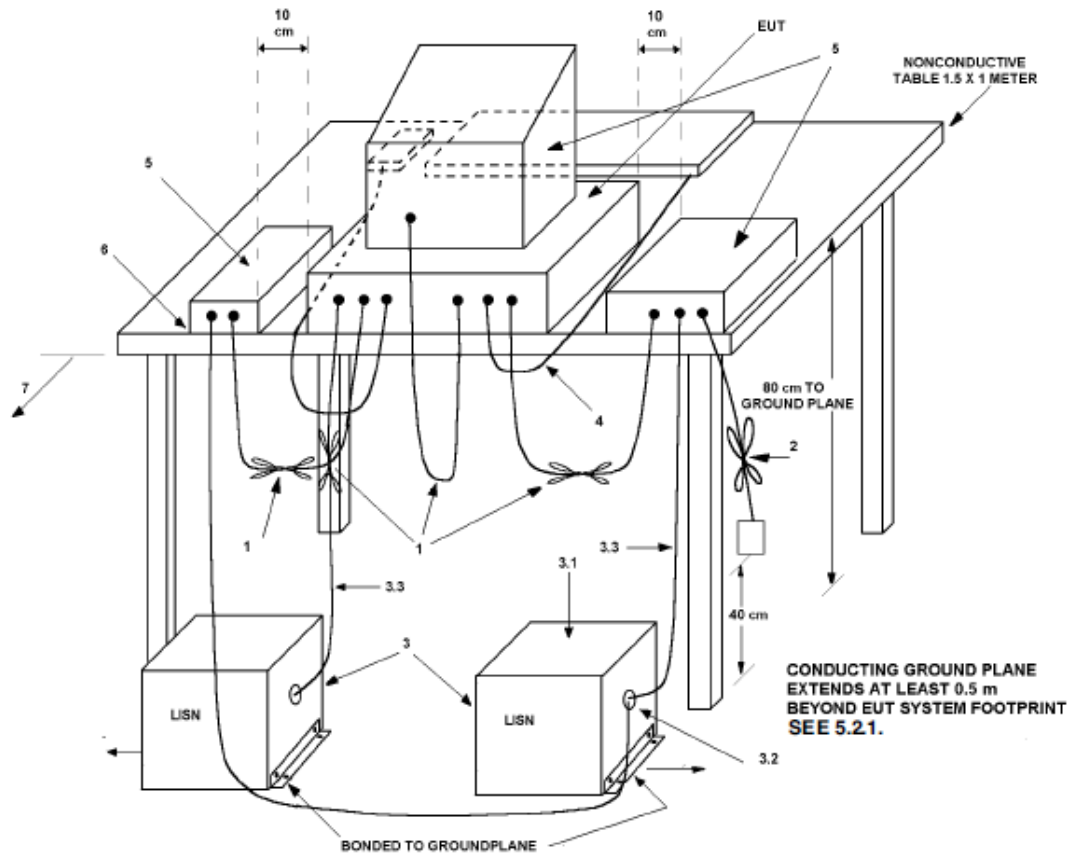
Extensions

The results refer only to the sampled EUT and under the specified conditions.

This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 5 / 60



Conducted and Radiated EUT Test Set-up example (ANSI C63.10 2013)

4. RADIATED EMISSIONS - FIELD STRENGTH EMISSIONS – EMISSIONS RADIATED OUTSIDE THE BAND – OCCUPIED BANDWIDTH

In the following table you can find the limits established by the reference standard:

§ 15.209 Limits

FREQUENCY RANGE (MHz)	<i>Field Strenght</i> <i>QUASI-PEAK LIMITS</i> [dB (μV/m)]
0.009 ÷ 0.490	48.15 ÷ 13.8 @ 300m
0.490 ÷ 1.705	33.8 ÷ 23 @ 30m
1.705 ÷ 30	29.5 @ 30m
30 ÷ 88	40
88 ÷ 216	43,5
216 ÷ 960	46
Above 960	54

The Field strength of emissions form intentional radiators operated in the 2400.00 – 2483.00 MHz band shall comply with the following:

Fundamental Frequency (MHz)	Field Strenght of Fundamental (mV/m)	Field Strenght of harmonics (μV/m)
2400 – 2483.5	50	500

Field strength are specified at a distance of 3 meters

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
MXE EMI Receiver	Agilent/Keysight	N9038A	01/2018
Anechoic Chamber	Comtest	CSA01	01/2018
Bilog Antenna	Schaffner	CBL6112B	01/2018
Horn Antenna	EMCO	3115	01/2018
Horn Antenna	Alpha Industries	61932500	01/2018
Controllor	Deisel	HD100	01/2018
Turn Table	Deisel	MA240	01/2018
LISN	GSD	NTW06	01/2018

This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 7 / 60

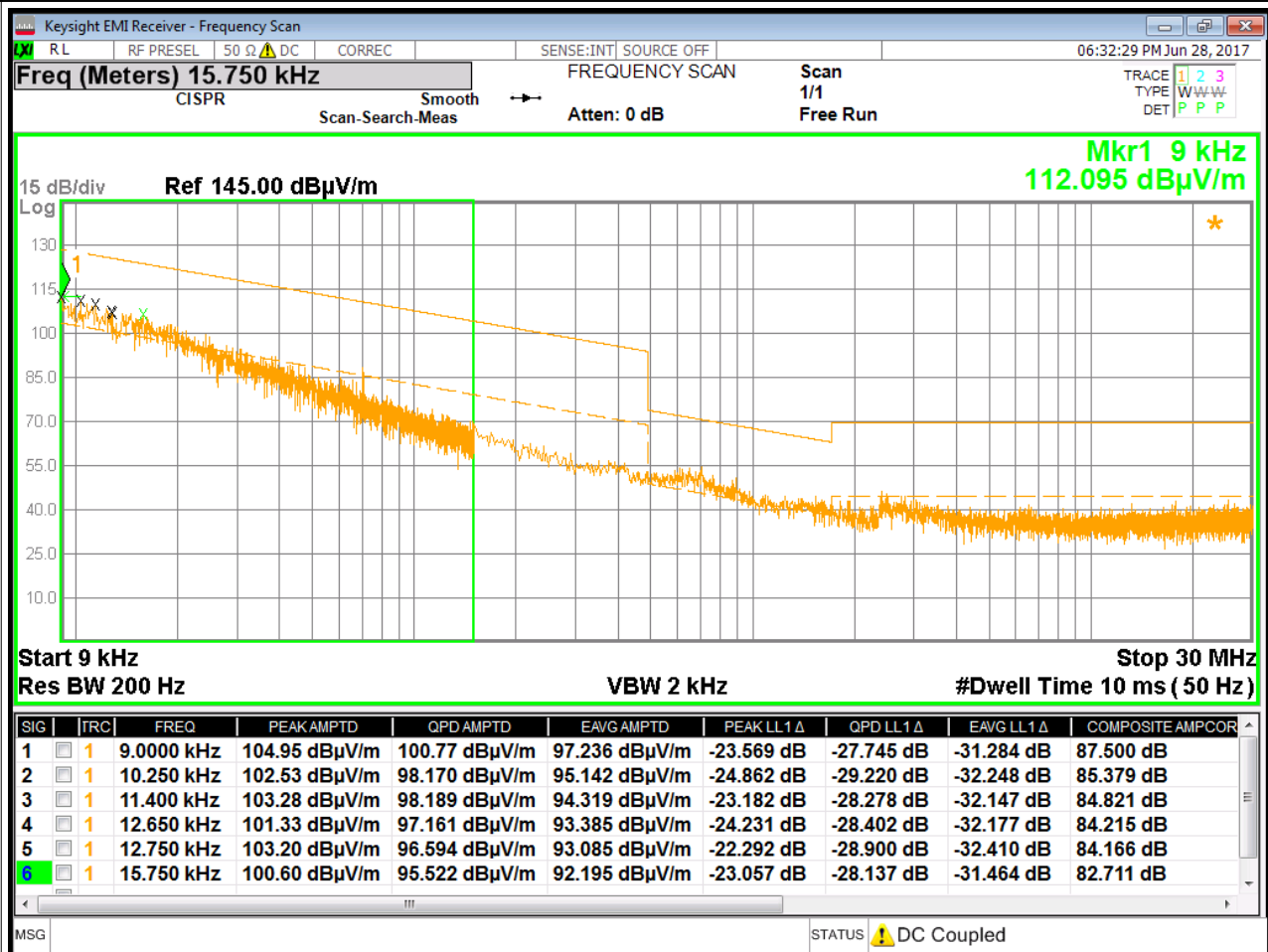
<u>Test procedure:</u> RE22R02
<u>Notes</u>
Azimuth position EUT-Antenna corresponding to 0° identifies the rotating table orientation (TT) in which the instrument to be tested shows the front part turned towards the antenna. Positive grades individuate clockwise rotations of TT when this one is observed from the top. For negative degrees, TT rotation is counter-clockwise. Antenna height respect to the mass plane is conventionally individuated with: MA=XXX where XXX indicates the height (always positive and greater than 100) expressed in cm. Antenna horizontal polarisation is indicated by POL=H. Antenna vertical polarisation is indicated by POL=V. EUT was tested in the three orthogonal planes.
<u>Results and conclusions</u>
In all the operative conditions, equipment complied with the standard limits. Graphics in following figures show the most significant registrations of the performed measurements.
As indicated in §15.215 of Part 15C, unwanted emissions outside the frequency band are attenuated to the emission limit §15.209 and 20 dB BW is inside the 2400-2483.5 permitted band of operation.

This document may be only fully reproduced.

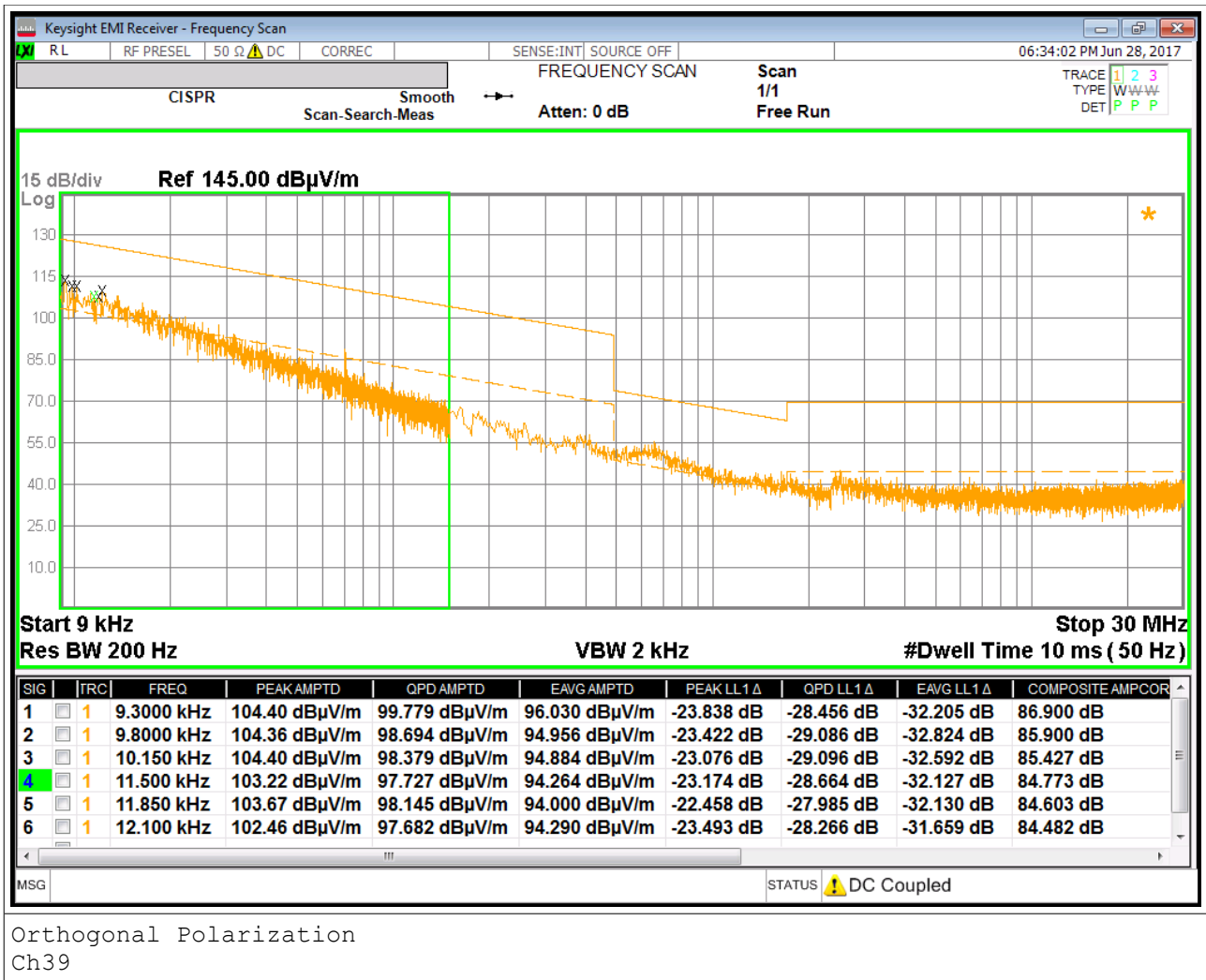
Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 8 / 60

4.1. BLUETOOTH



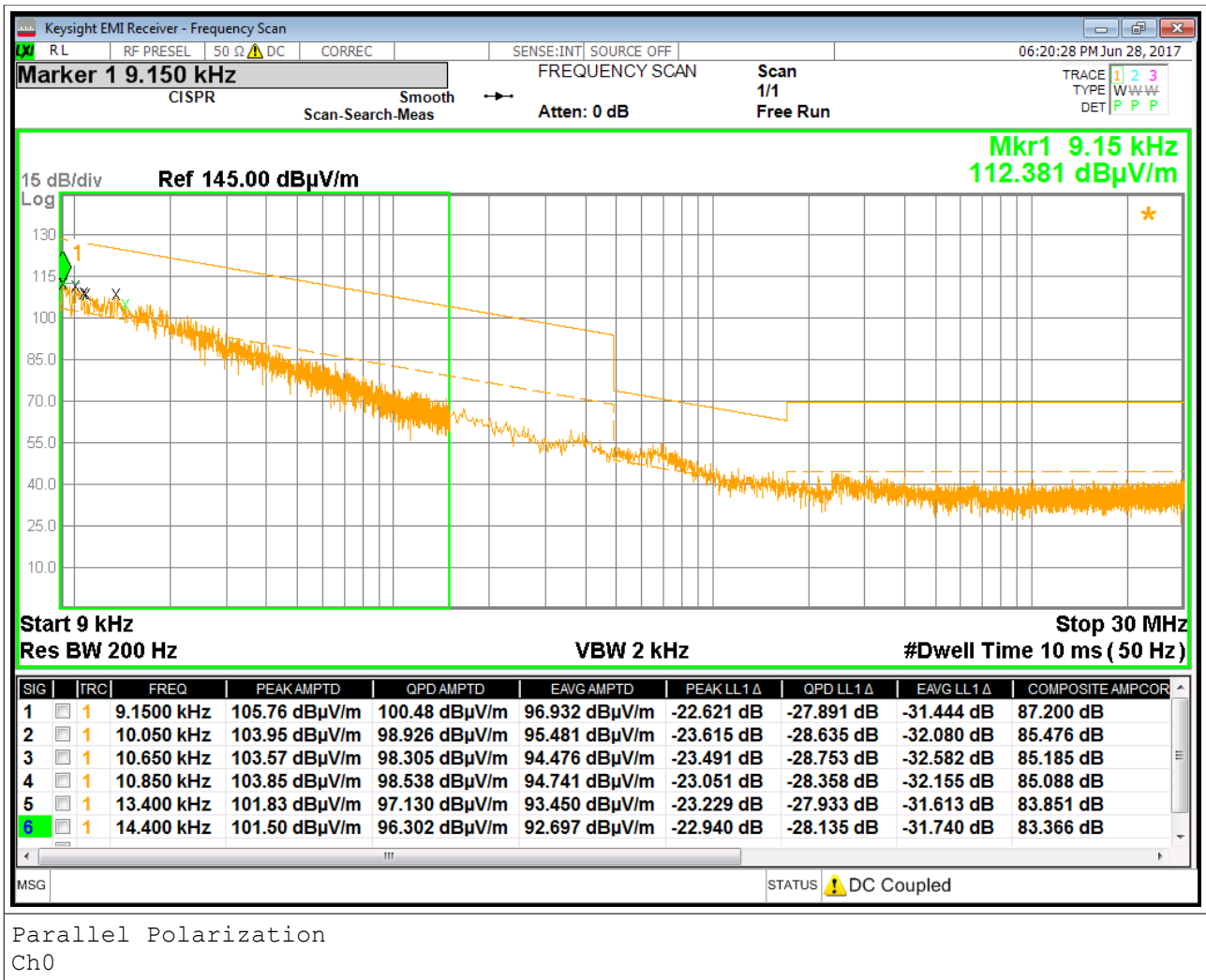
Orthogonal Polarization
Ch0

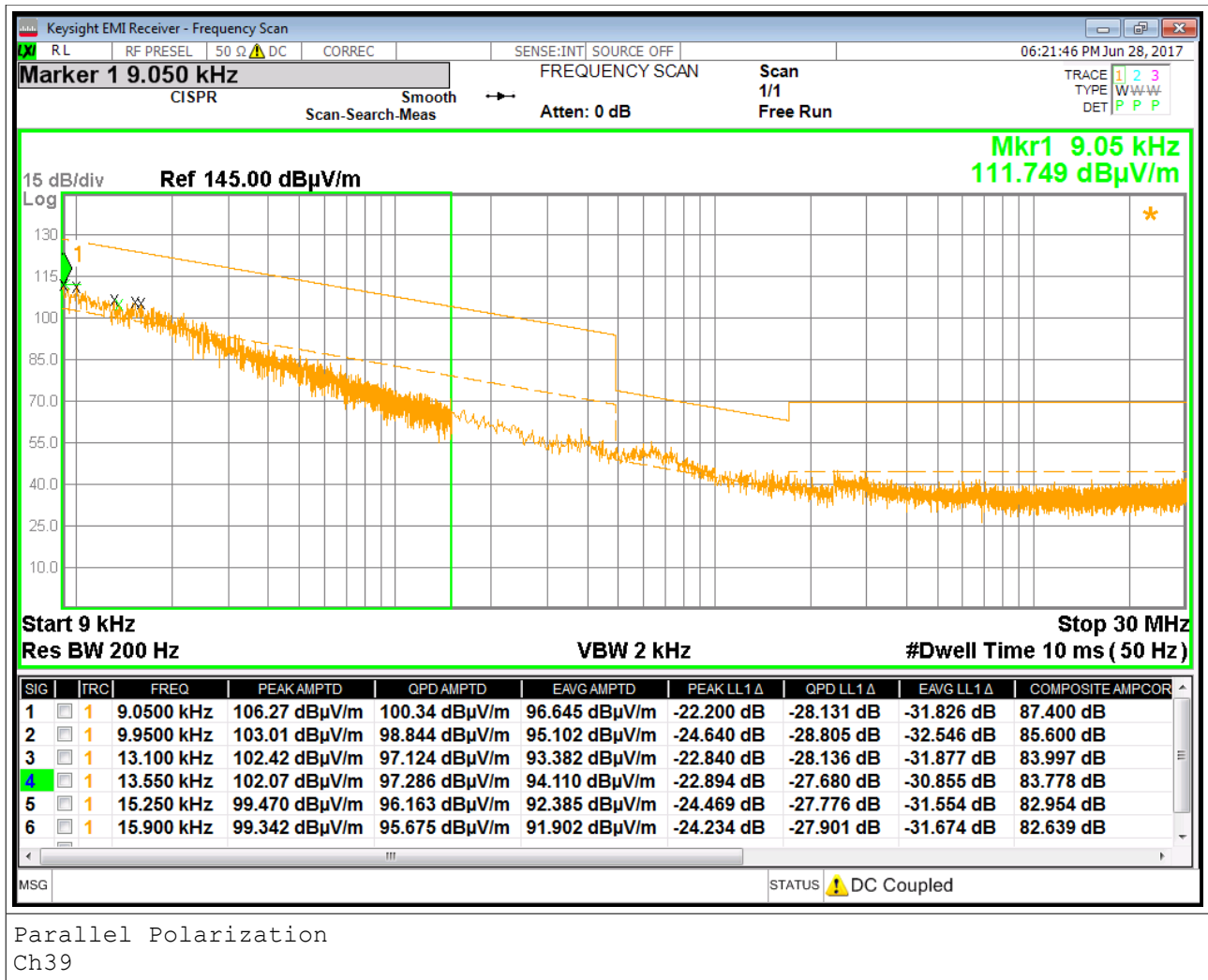


This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 10 / 60

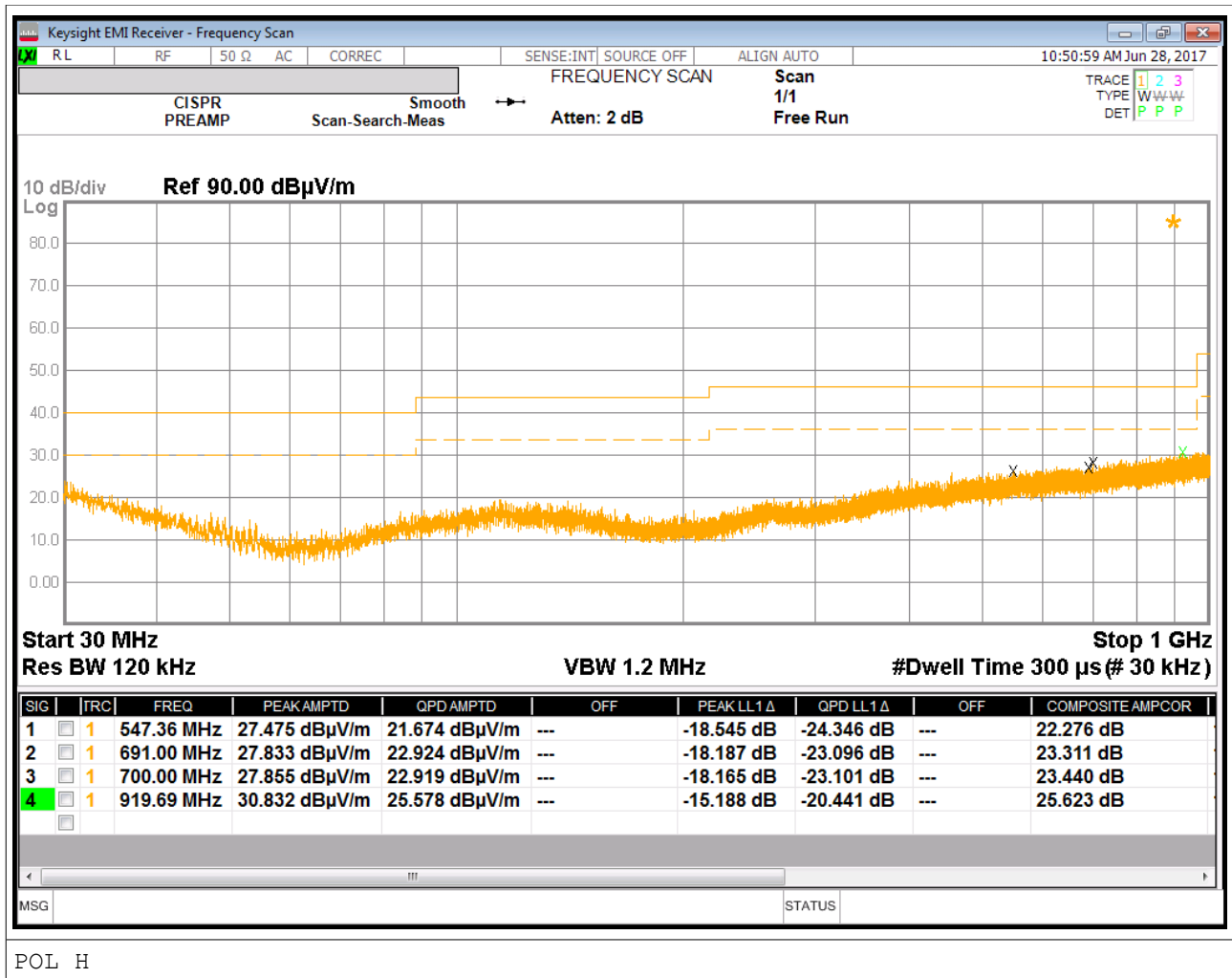


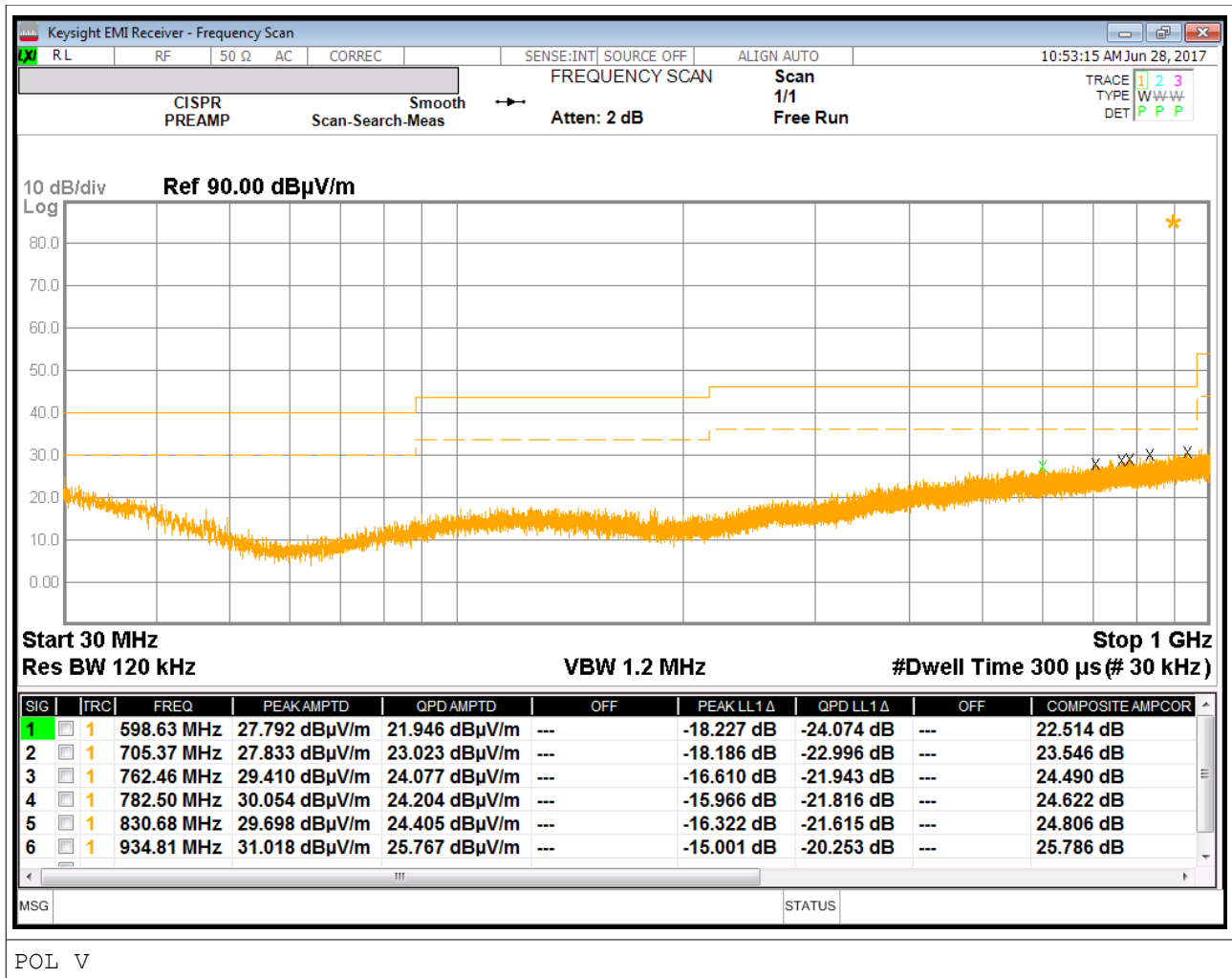


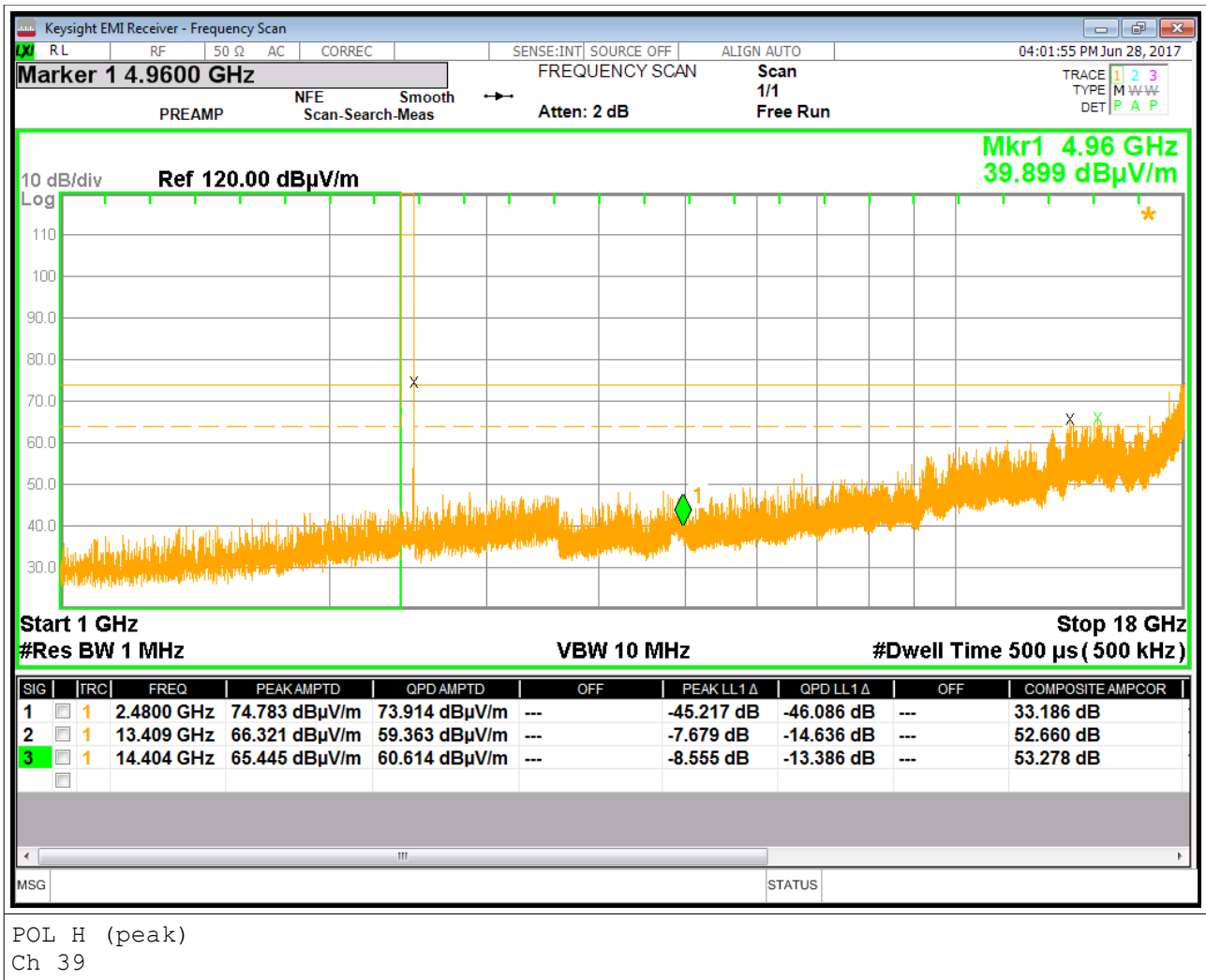
This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 12 / 60



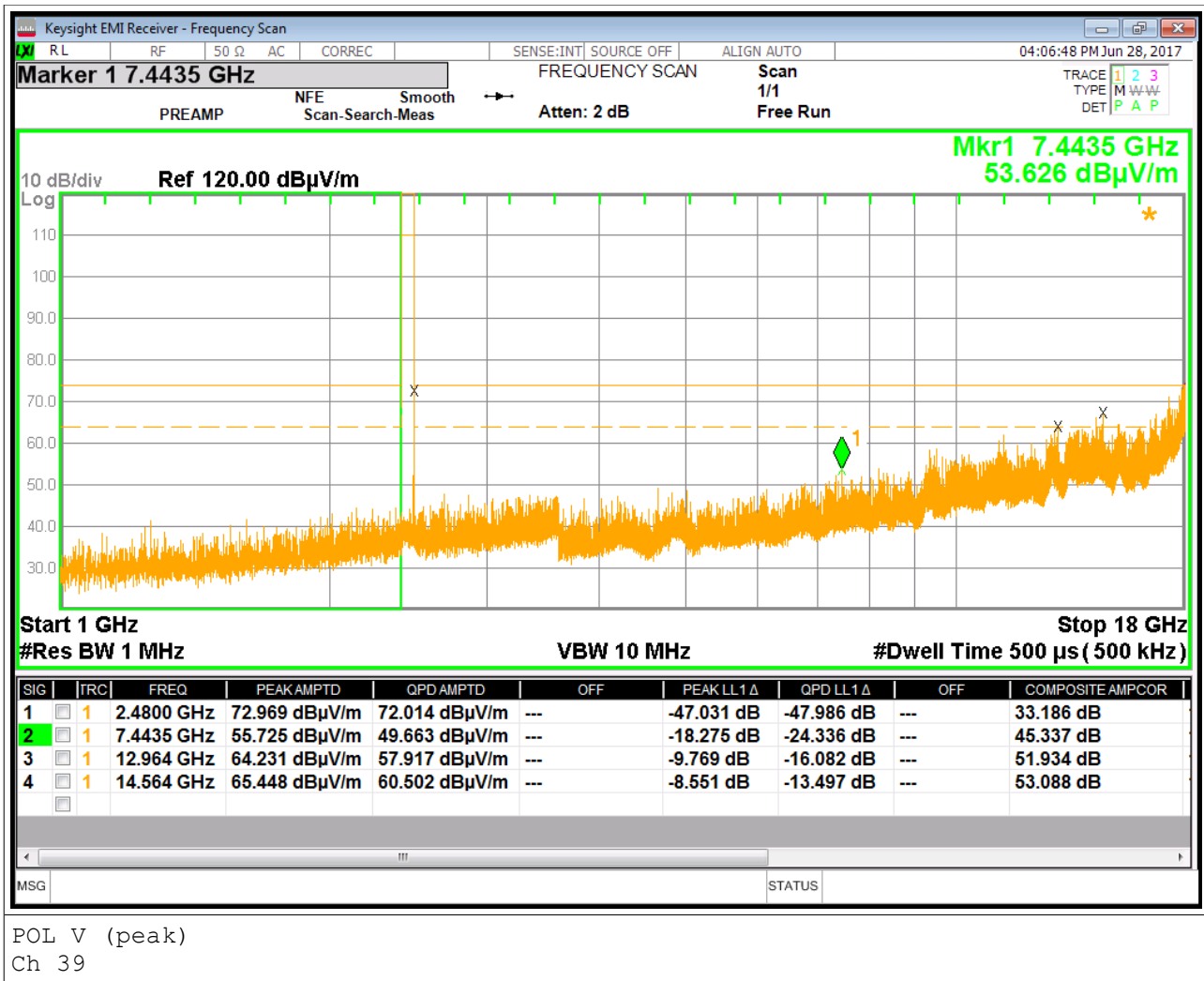




This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

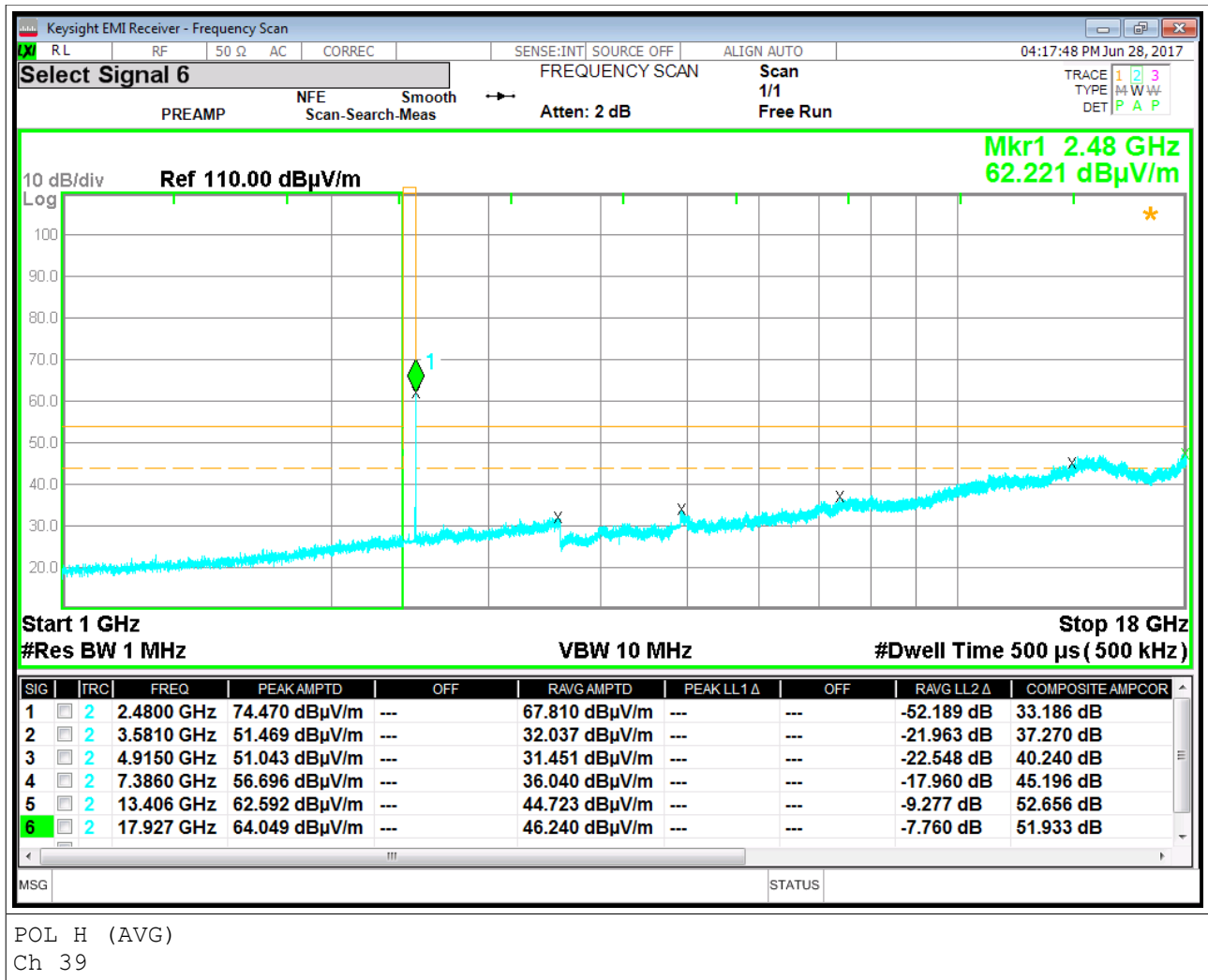
Report n. 17318FCC Rev. 01, page 15 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

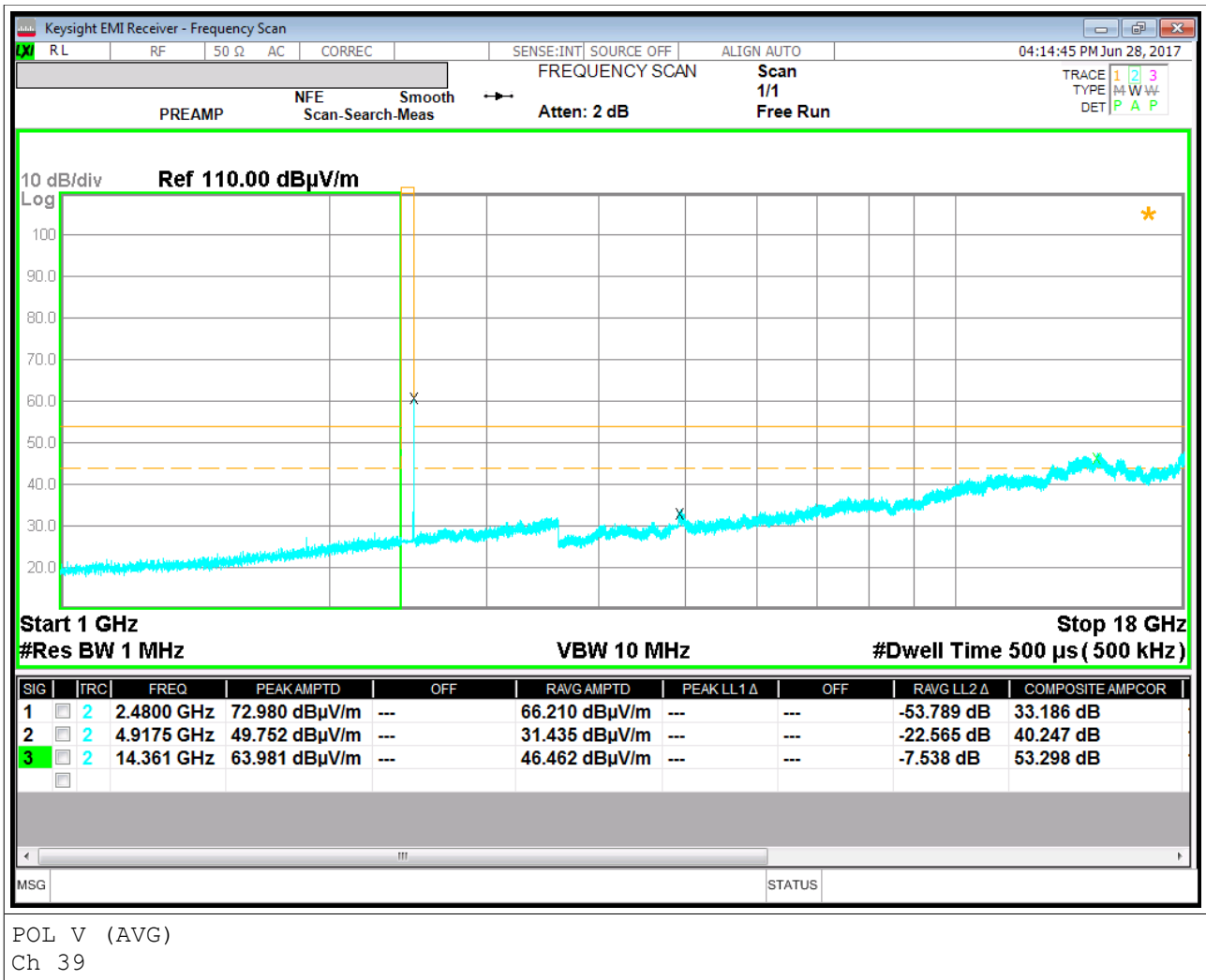
Report n. 17318FCC Rev. 01, page 16 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

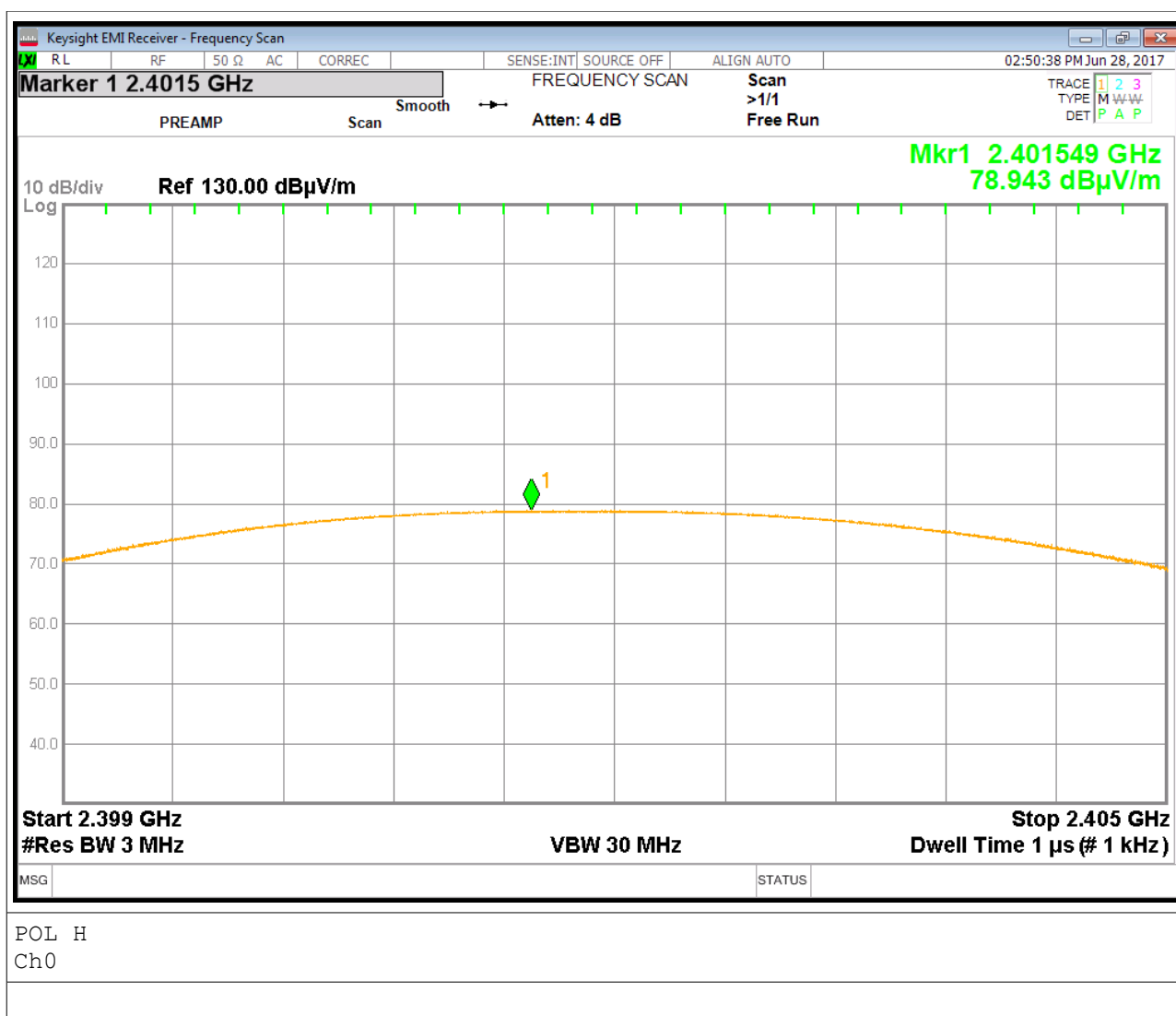
Report n. 17318FCC Rev. 01, page 17 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

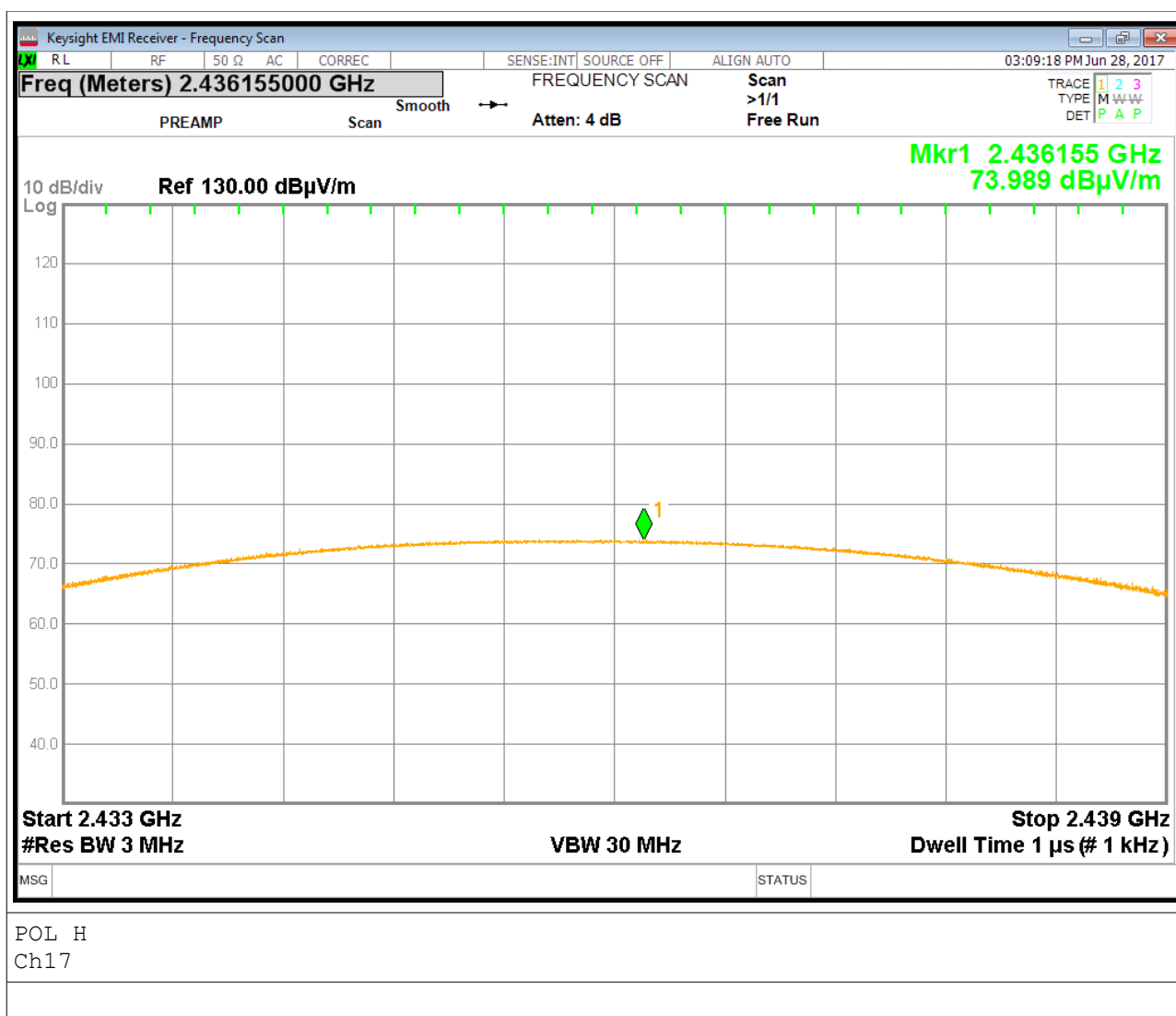
Report n. 17318FCC Rev. 01, page 18 / 60



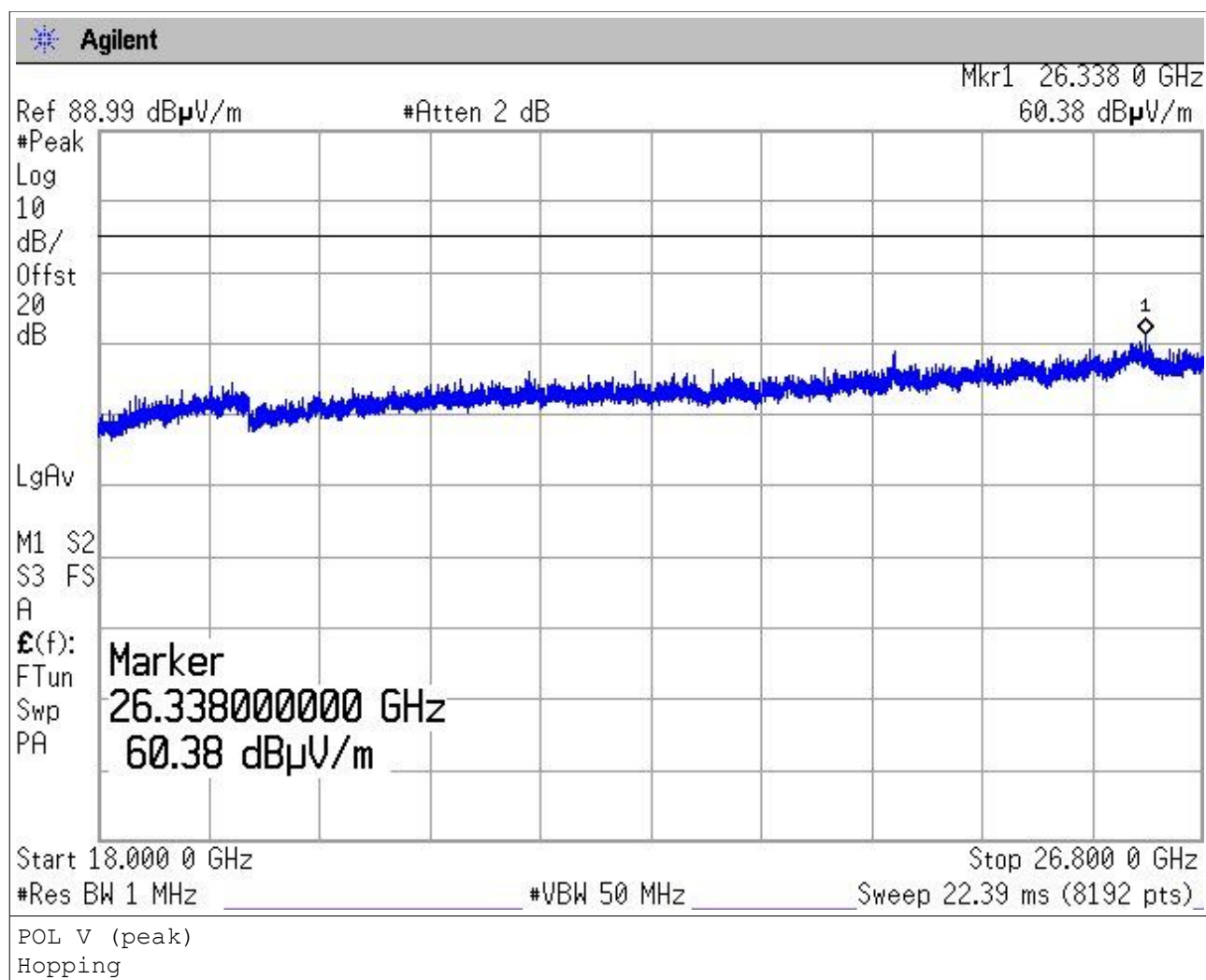
This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 19 / 60



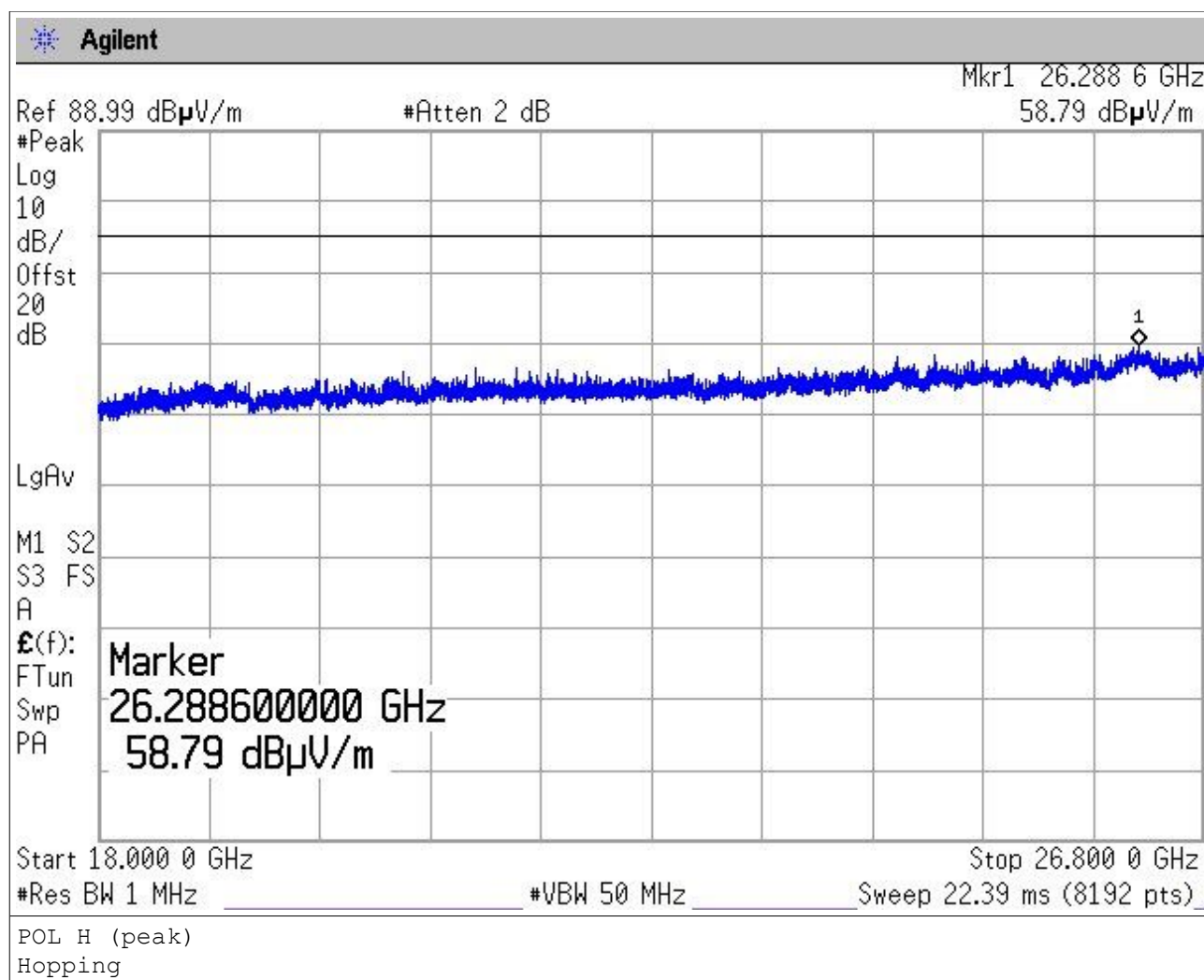




This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

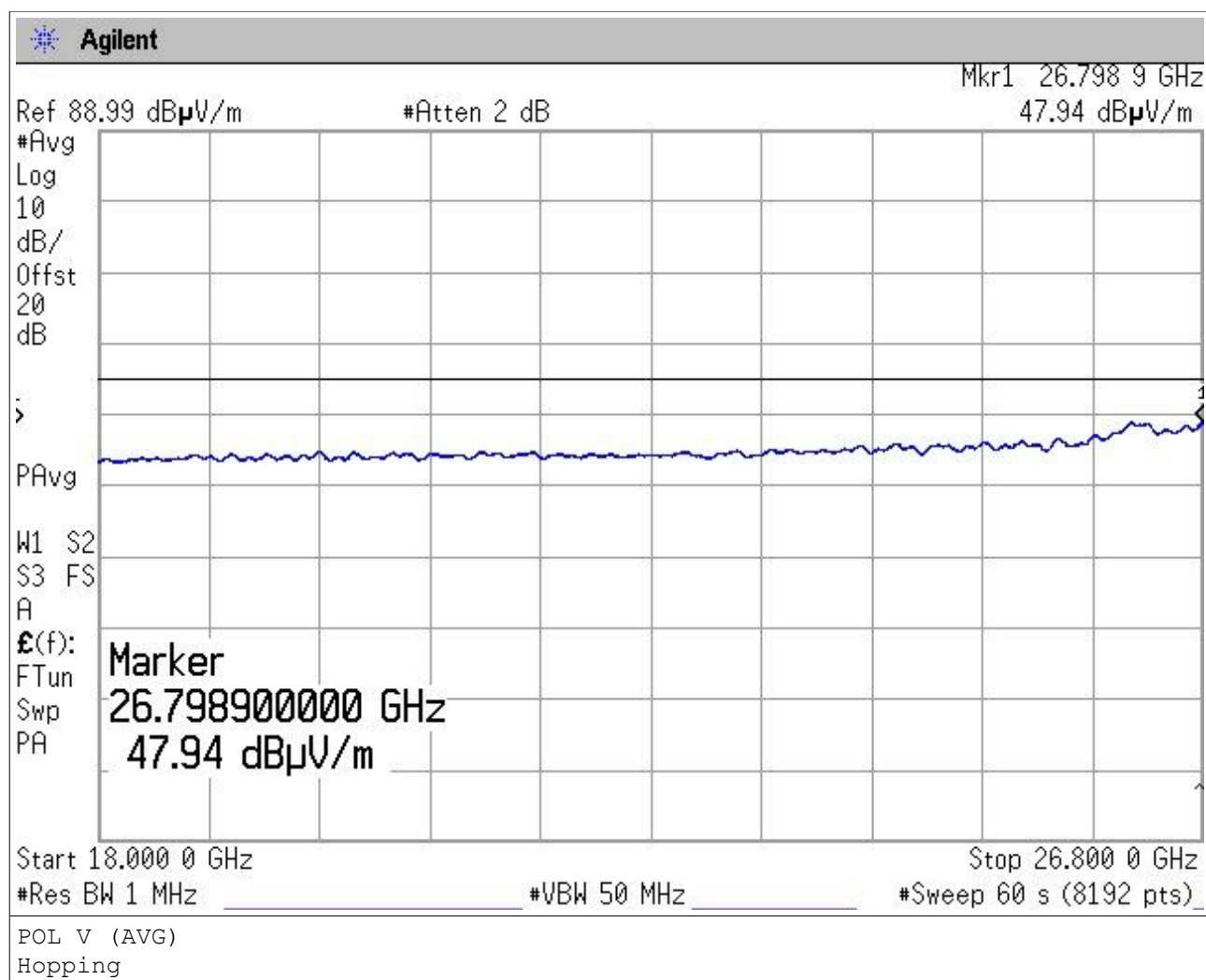
Report n. 17318FCC Rev. 01, page 22 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

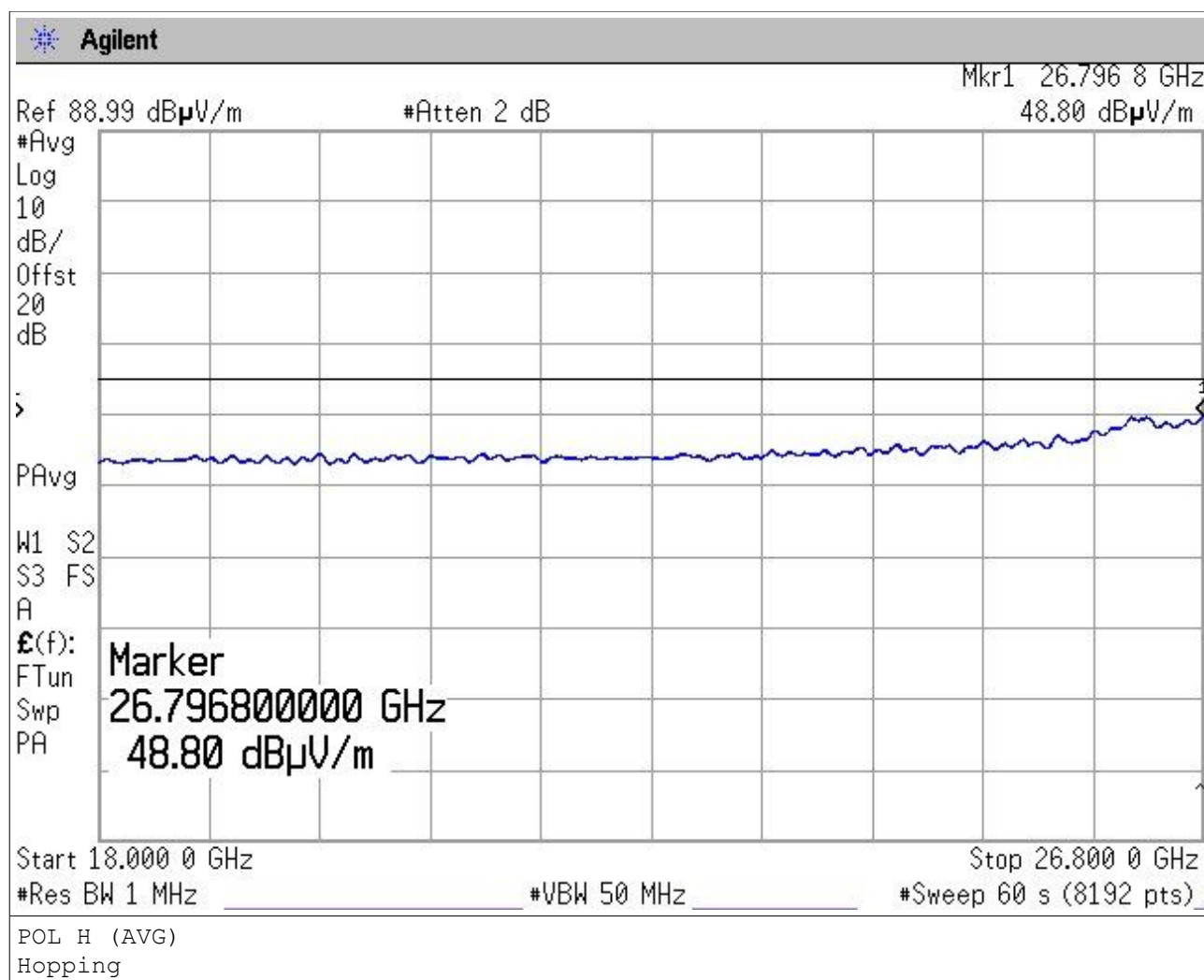
Report n. 17318FCC Rev. 01, page 23 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

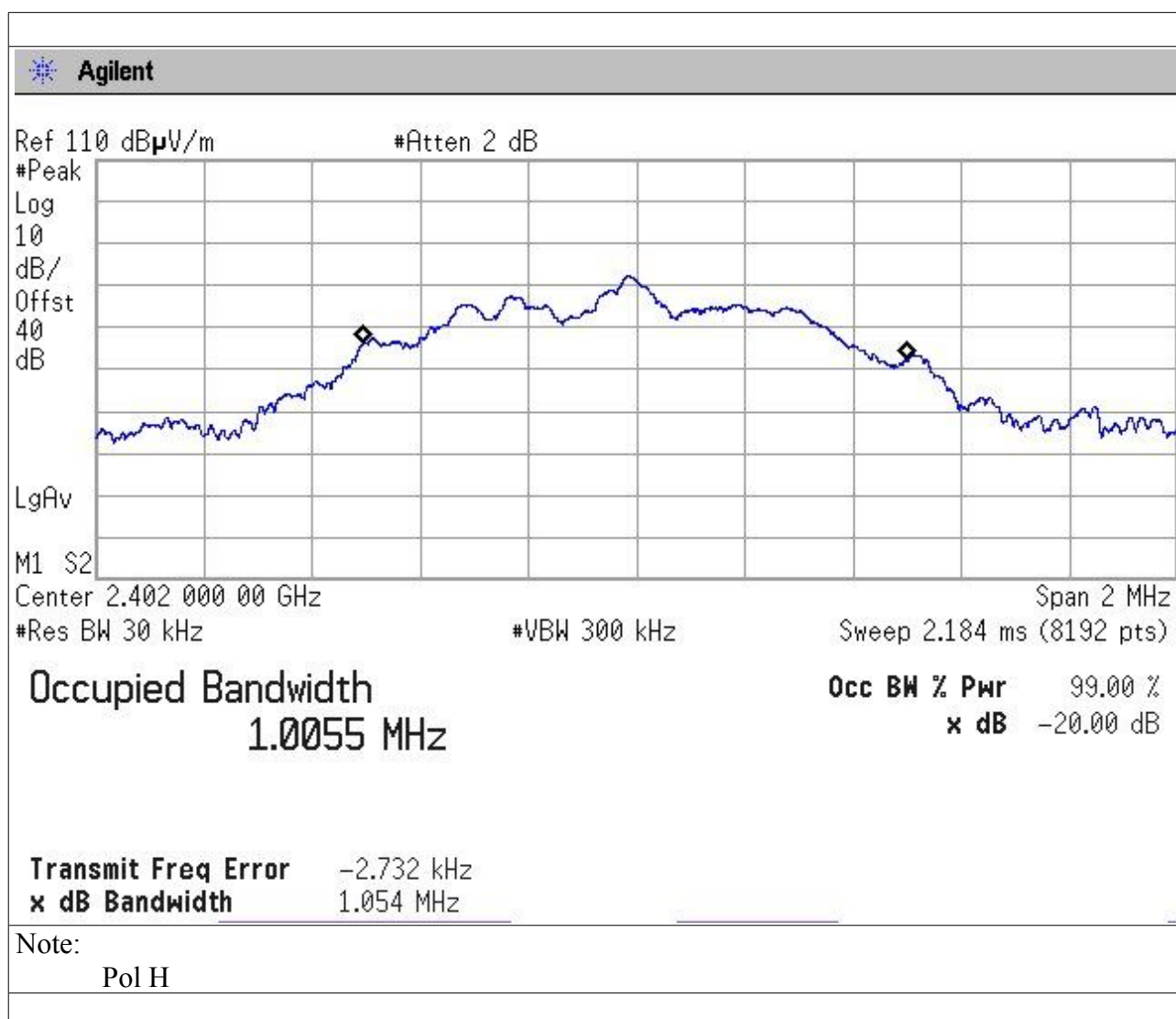
Report n. 17318FCC Rev. 01, page 24 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

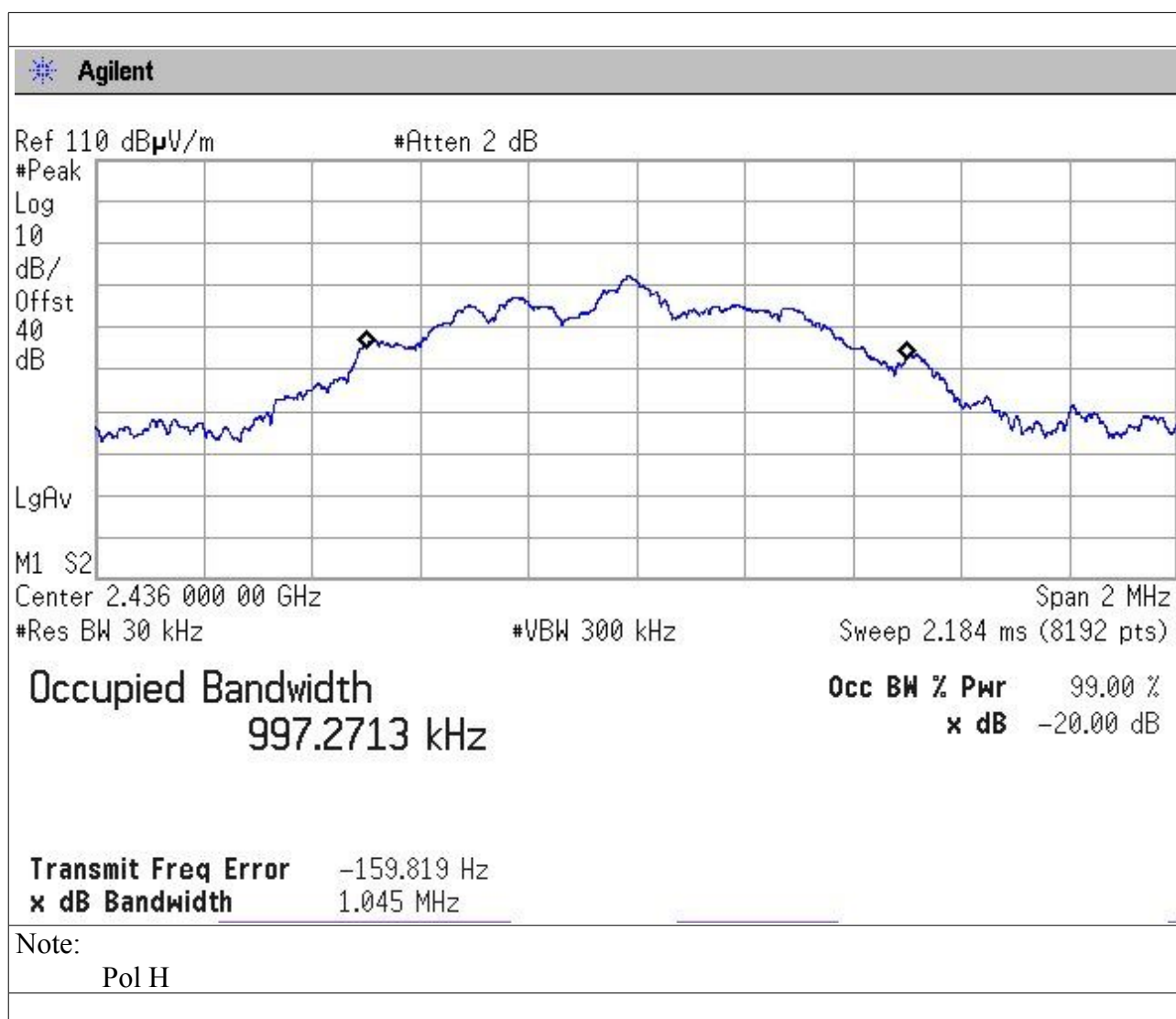
Report n. 17318FCC Rev. 01, page 25 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

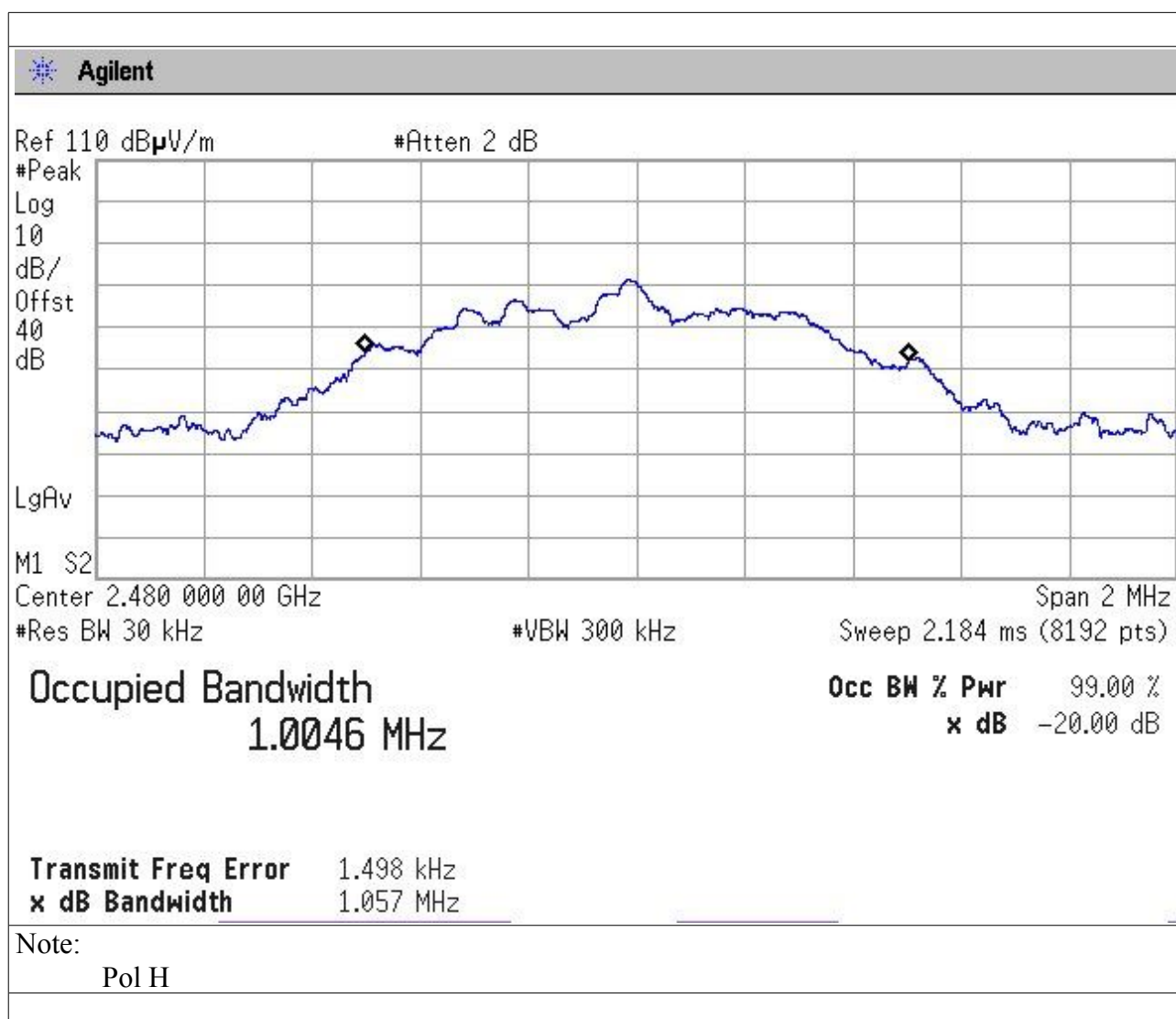
Report n. 17318FCC Rev. 01, page 26 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 27 / 60

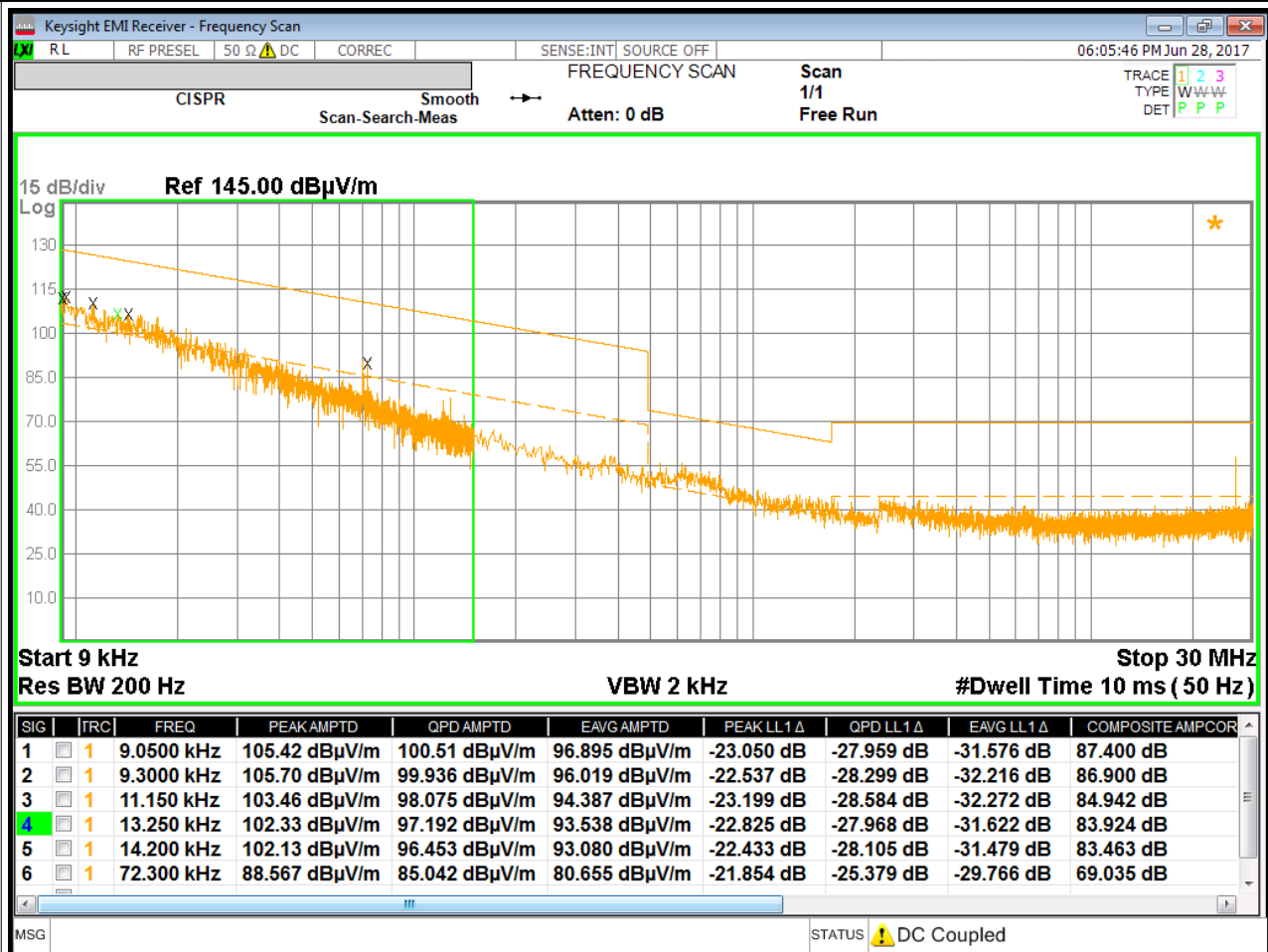


This document may be only fully reproduced.

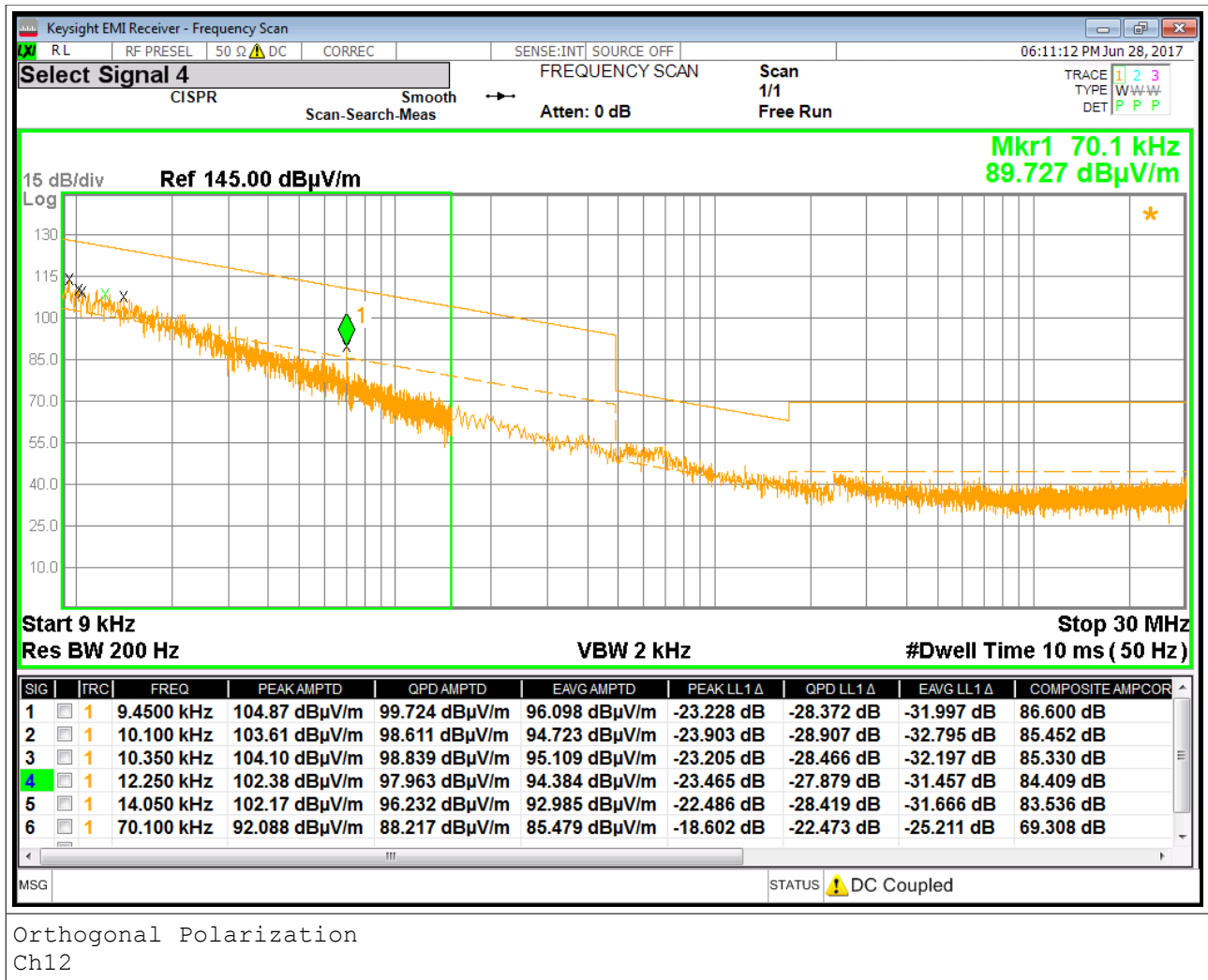
Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 28 / 60

4.2. Wi-Fi



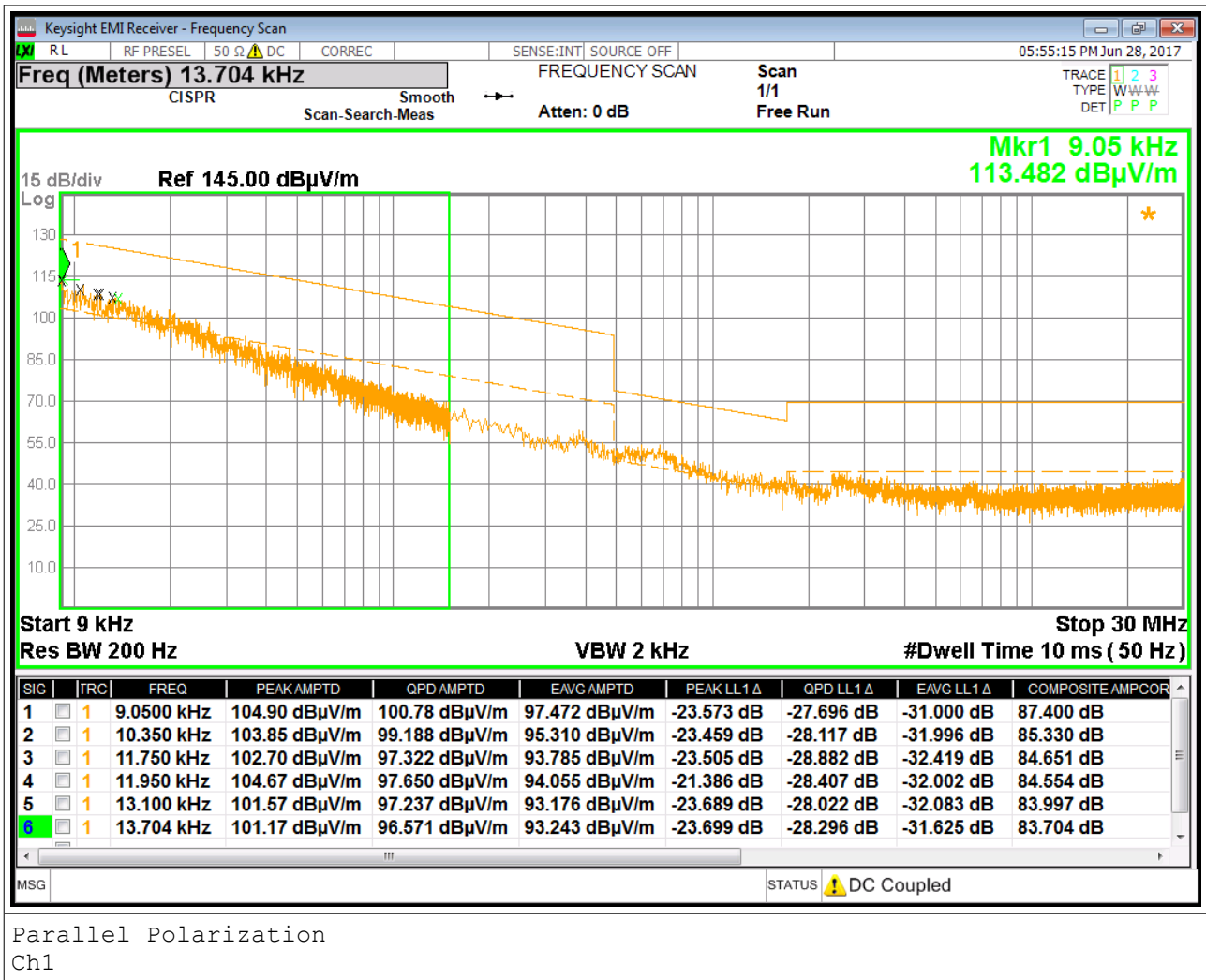
Orthogonal Polarization
Ch1



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

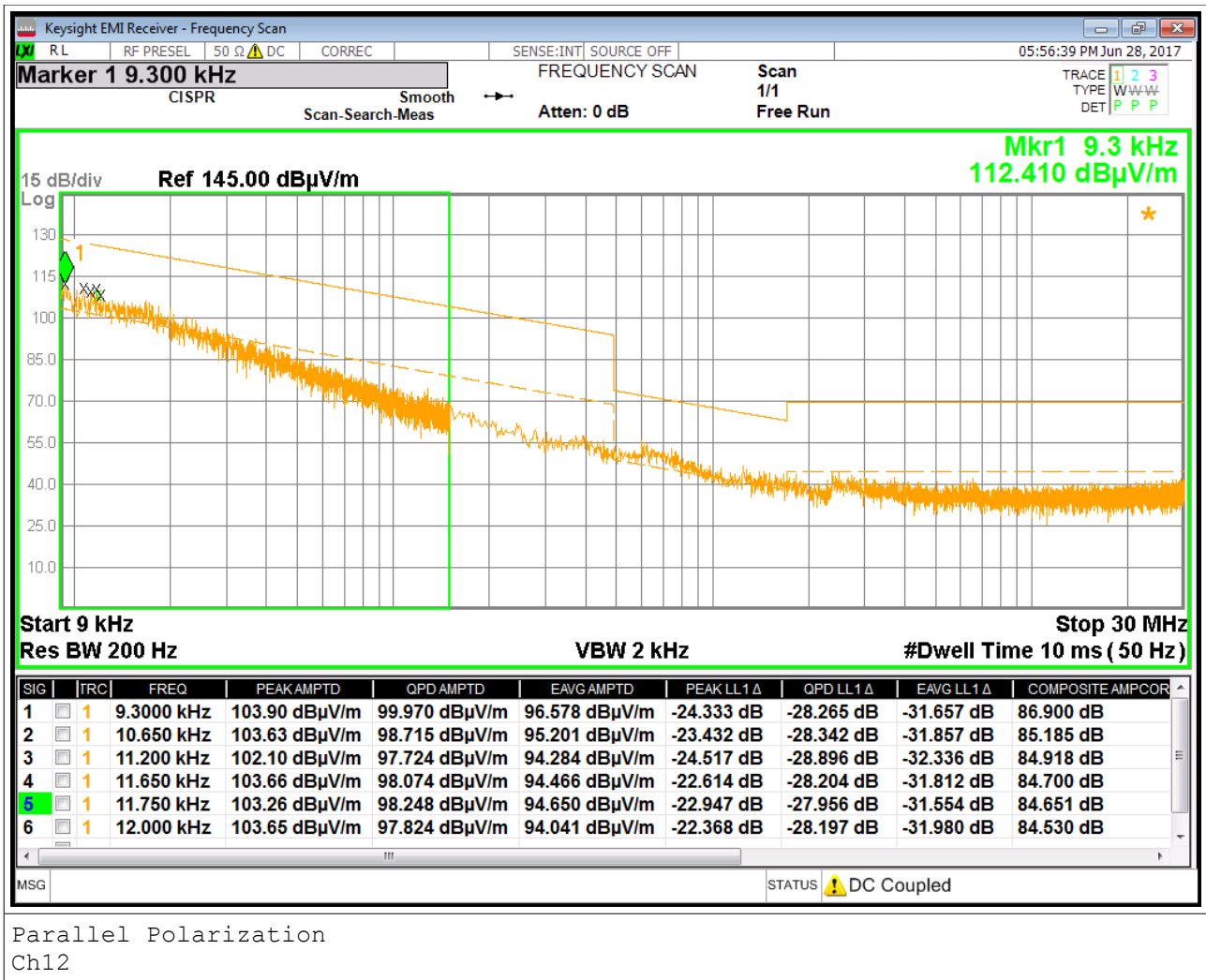
Report n. 17318FCC Rev. 01, page 30 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

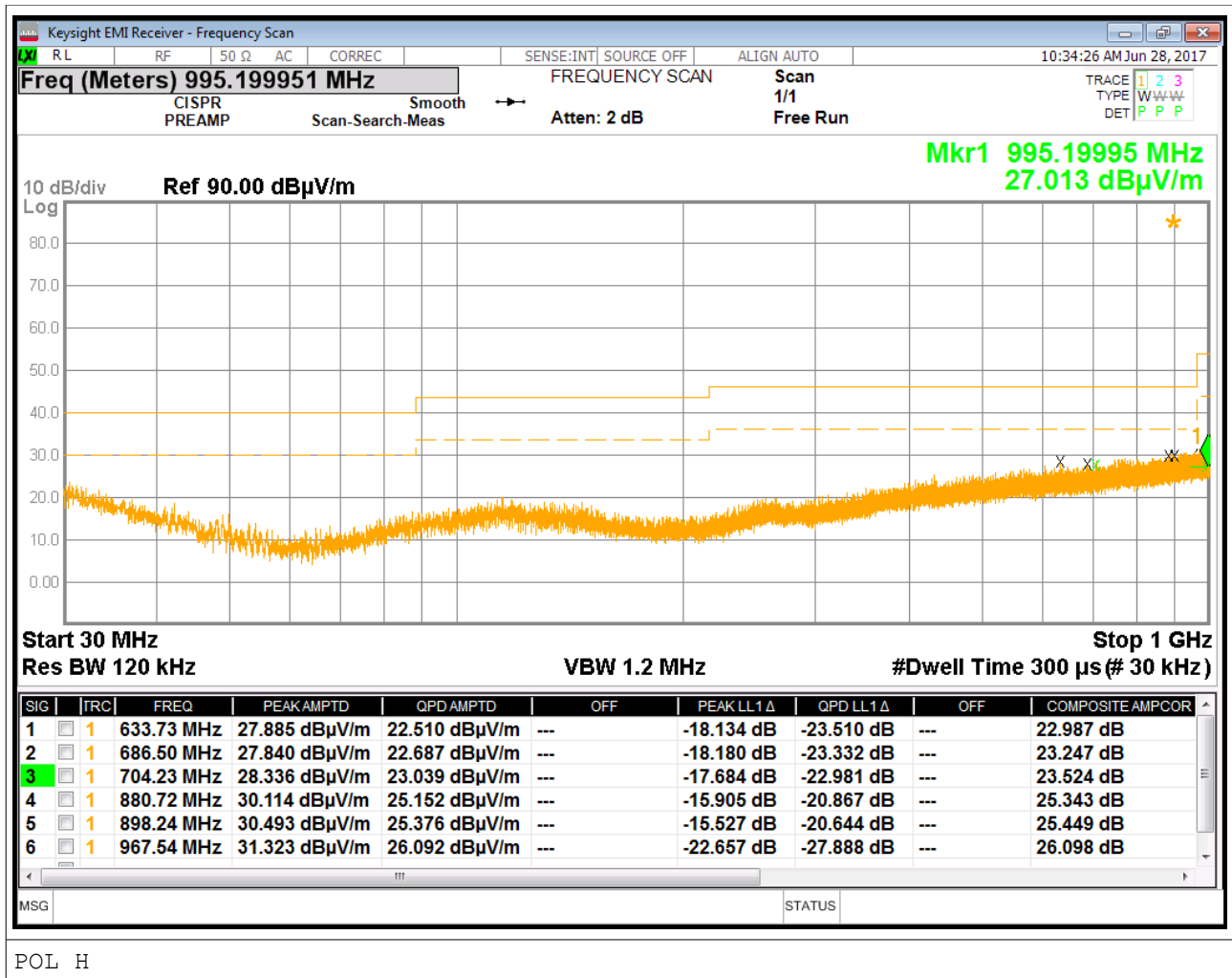
Report n. 17318FCC Rev. 01, page 31 / 60

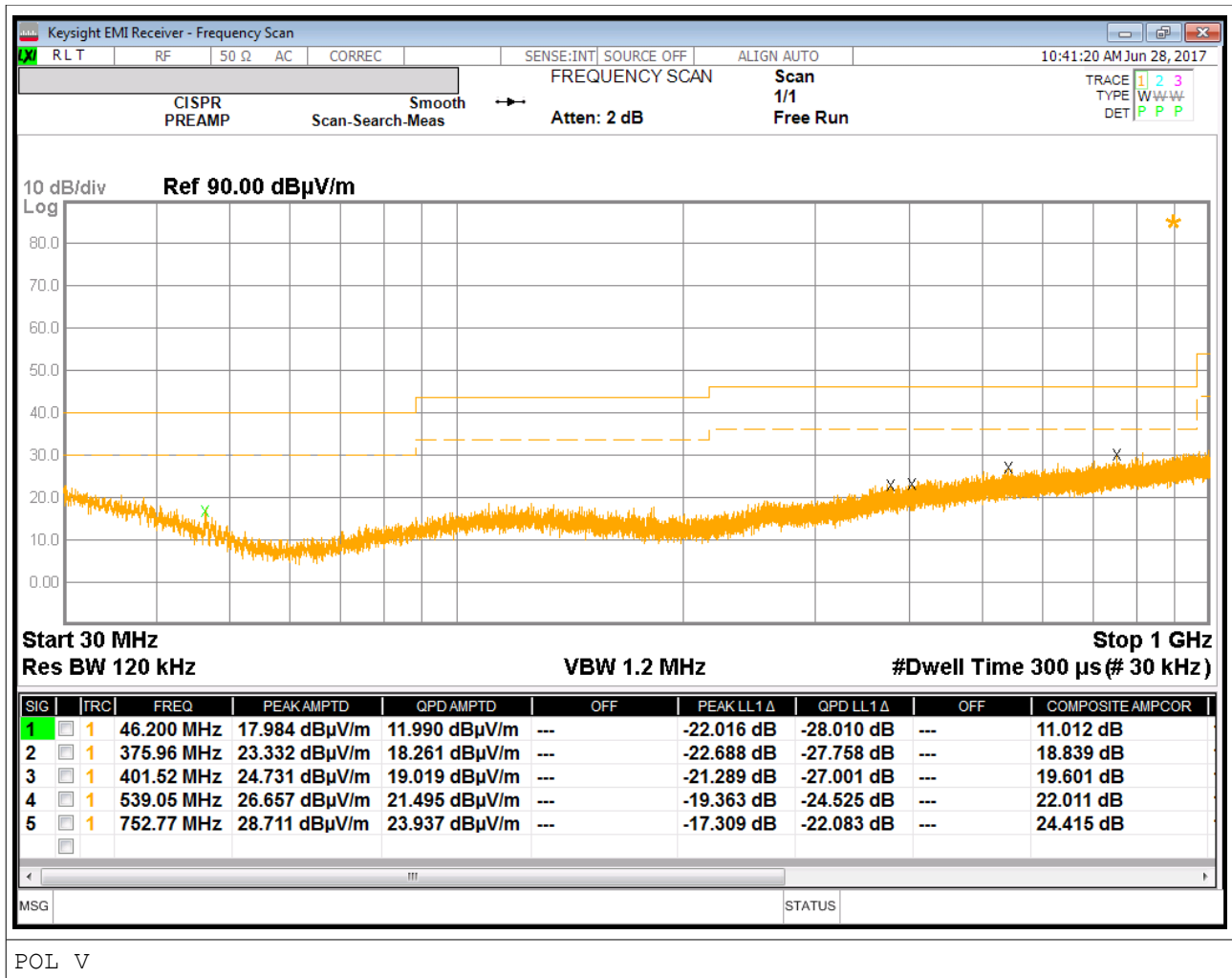


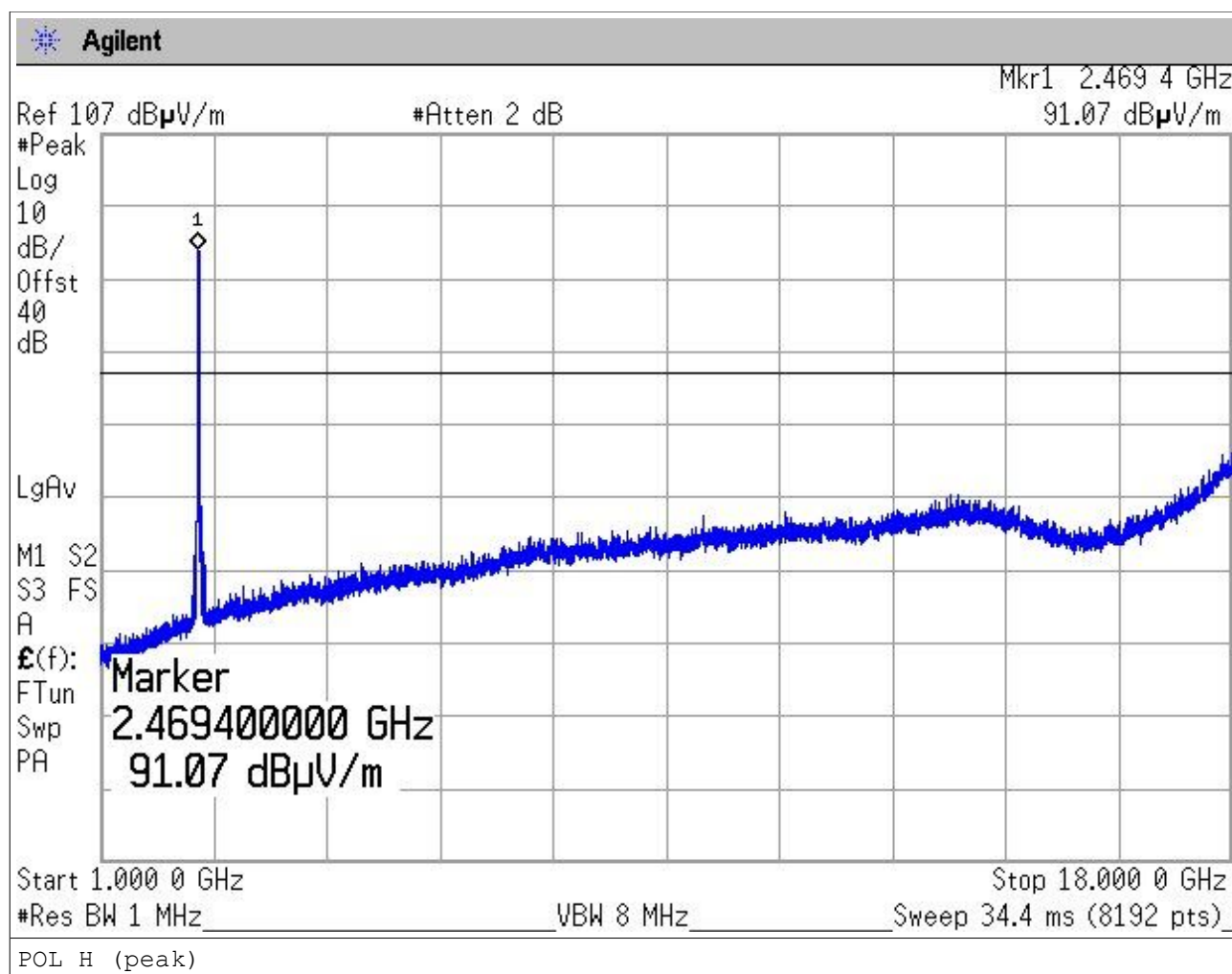
This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 32 / 60



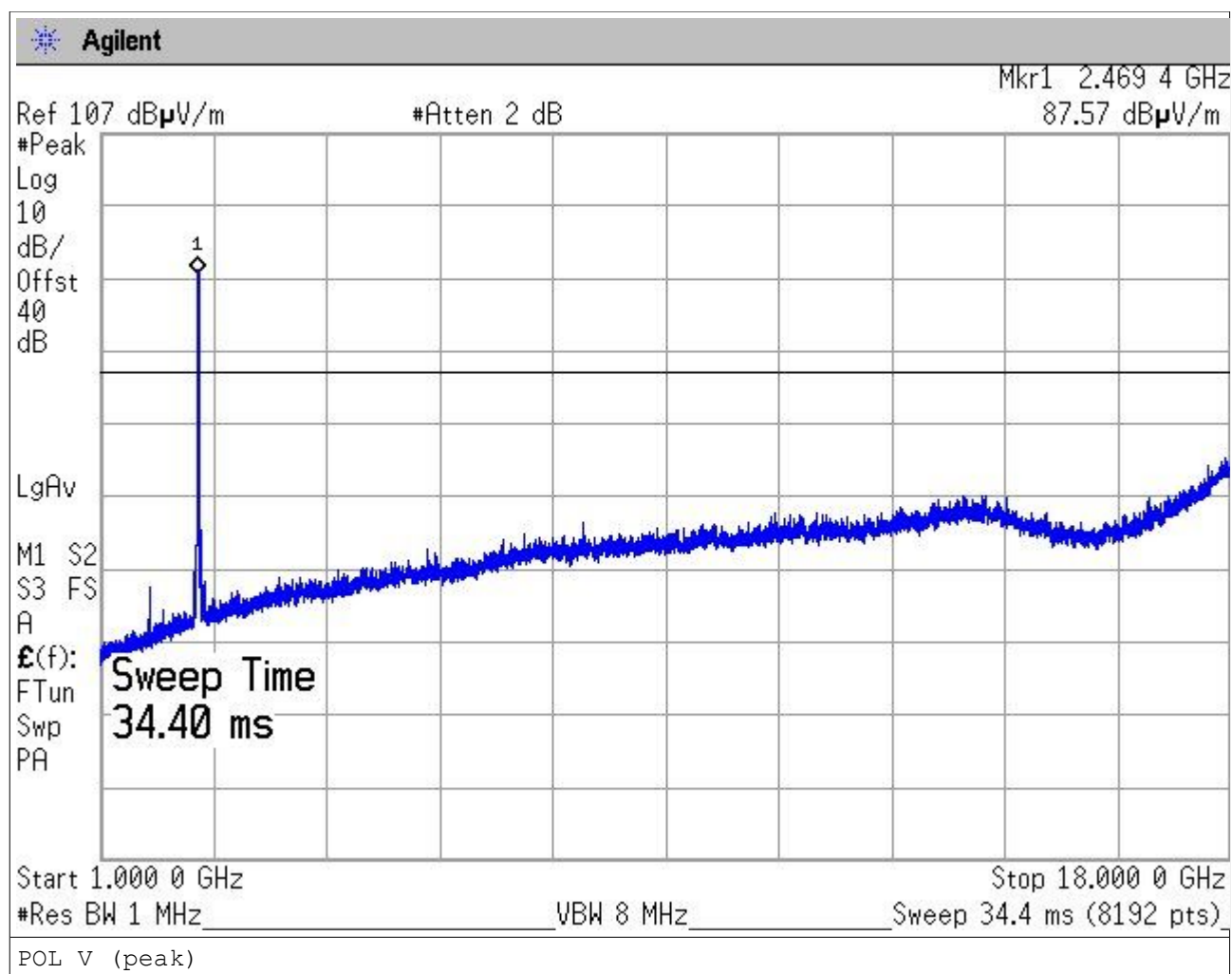




This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

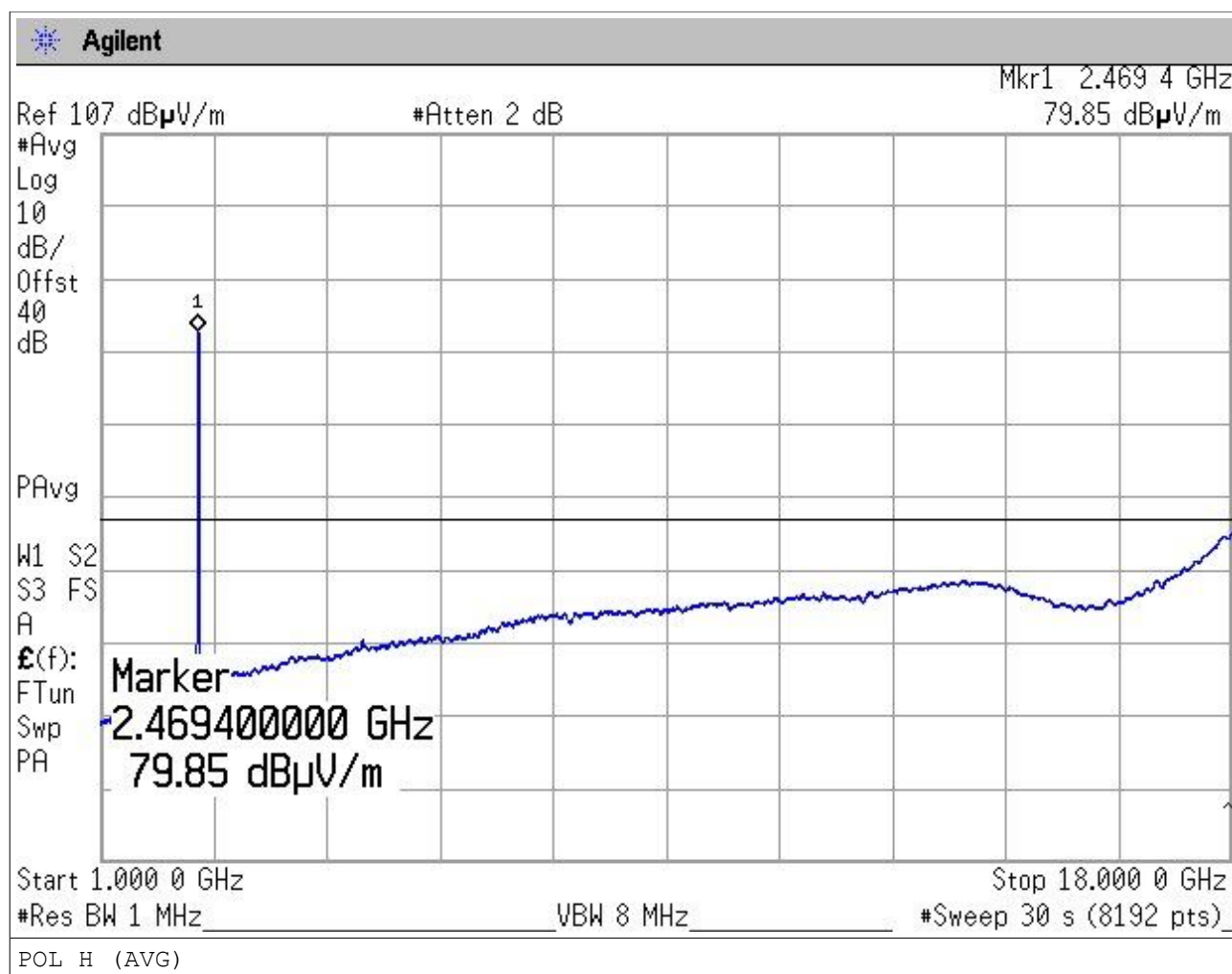
Report n. 17318FCC Rev. 01, page 35 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

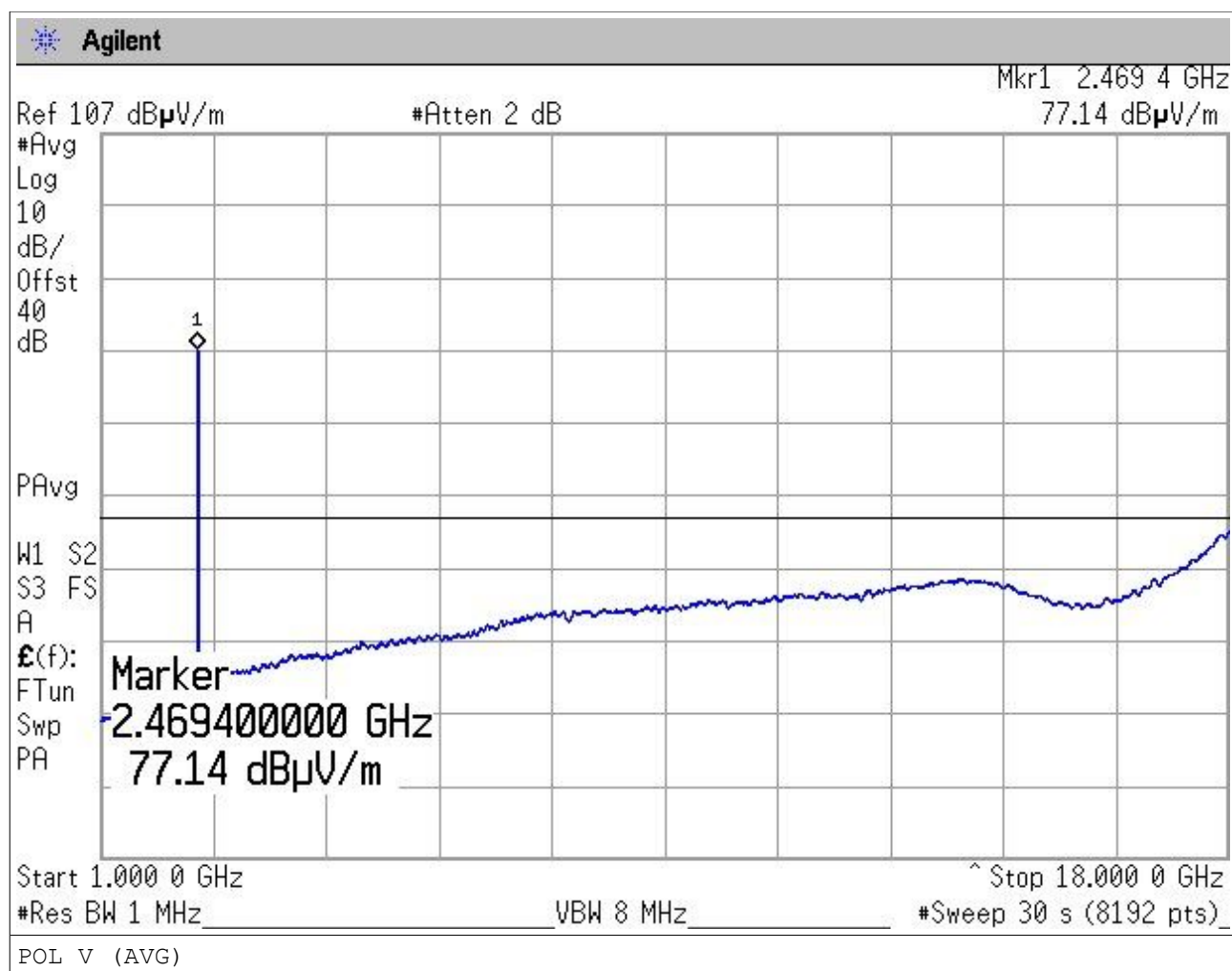
Report n. 17318FCC Rev. 01, page 36 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

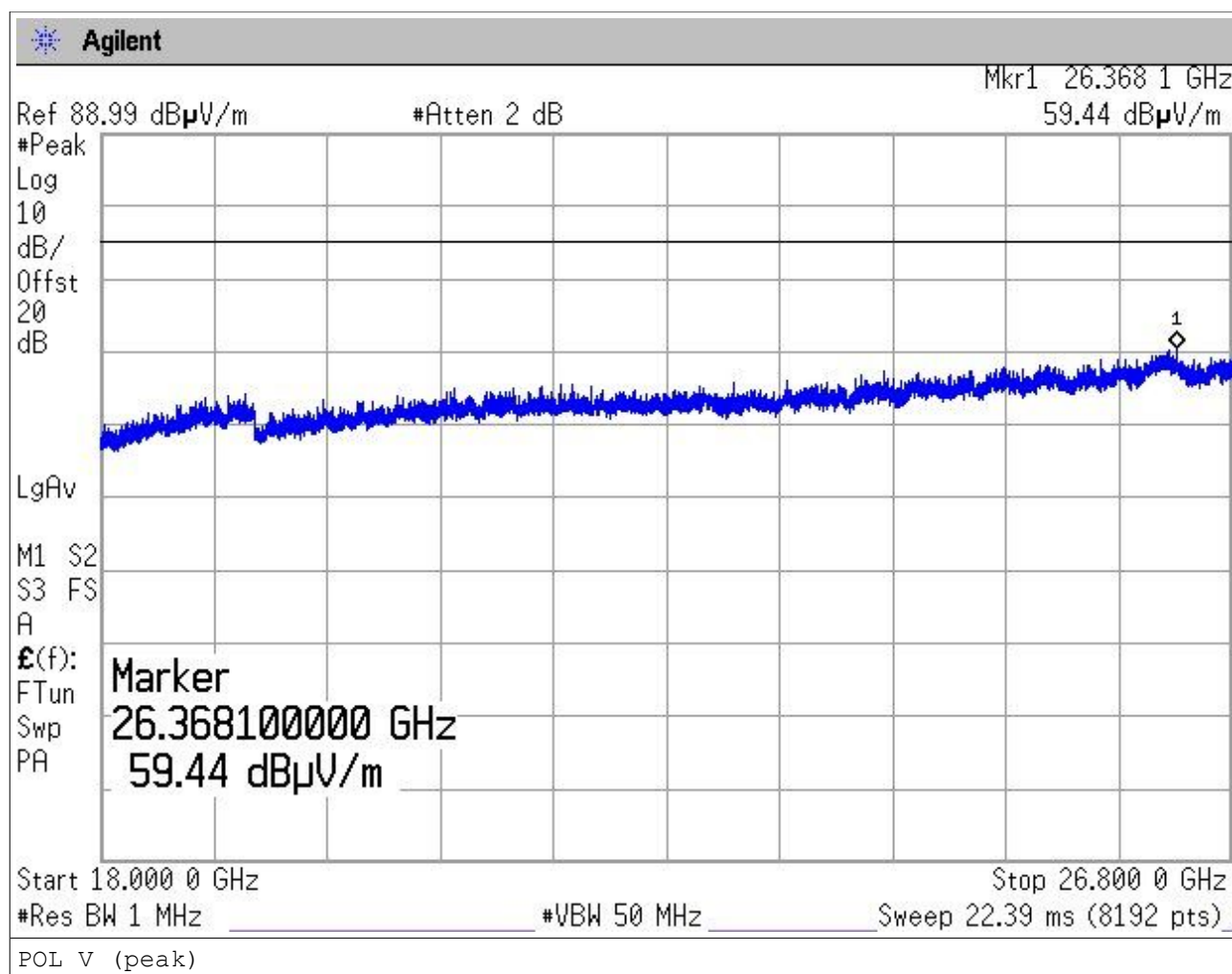
Report n. 17318FCC Rev. 01, page 37 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

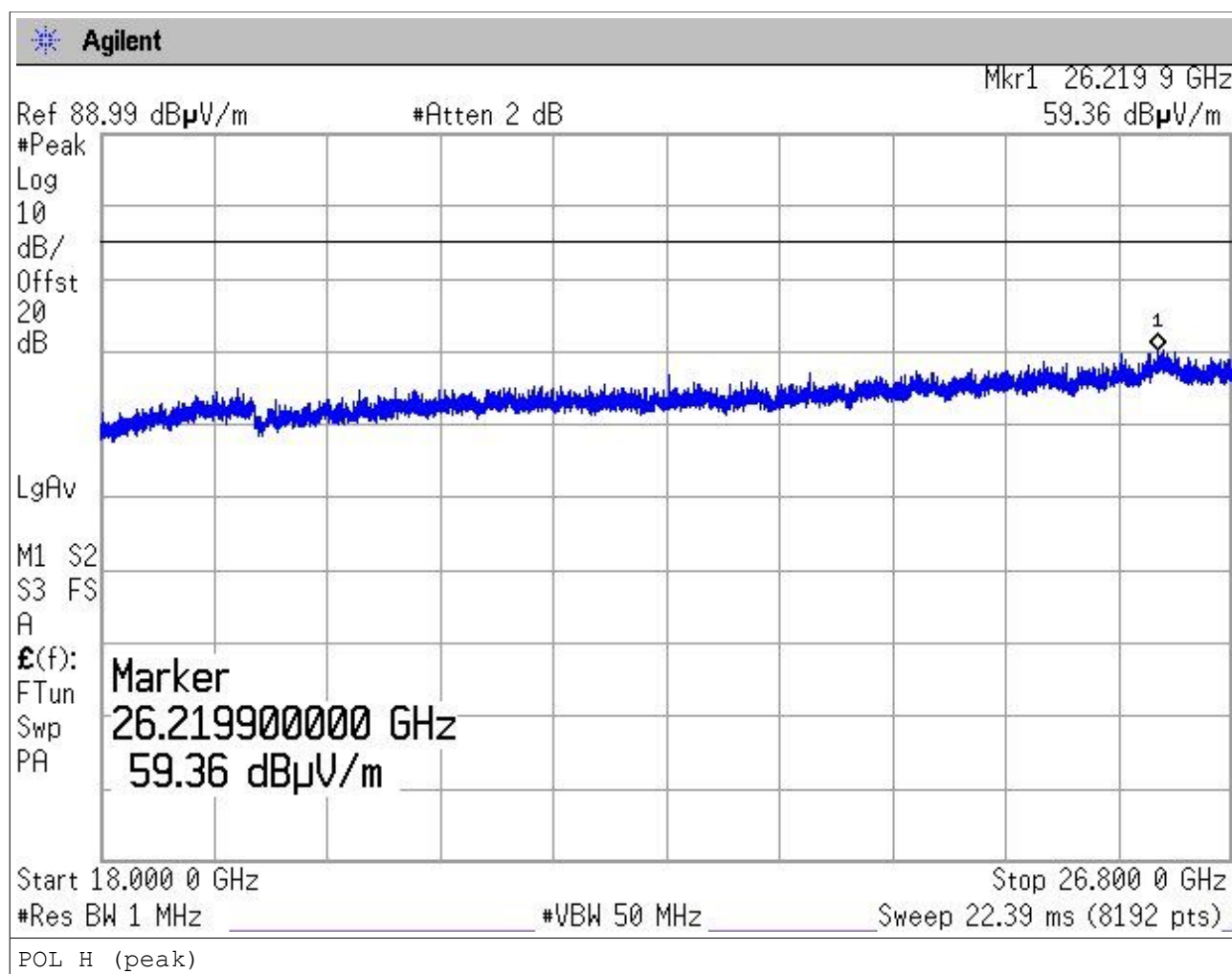
Report n. 17318FCC Rev. 01, page 38 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

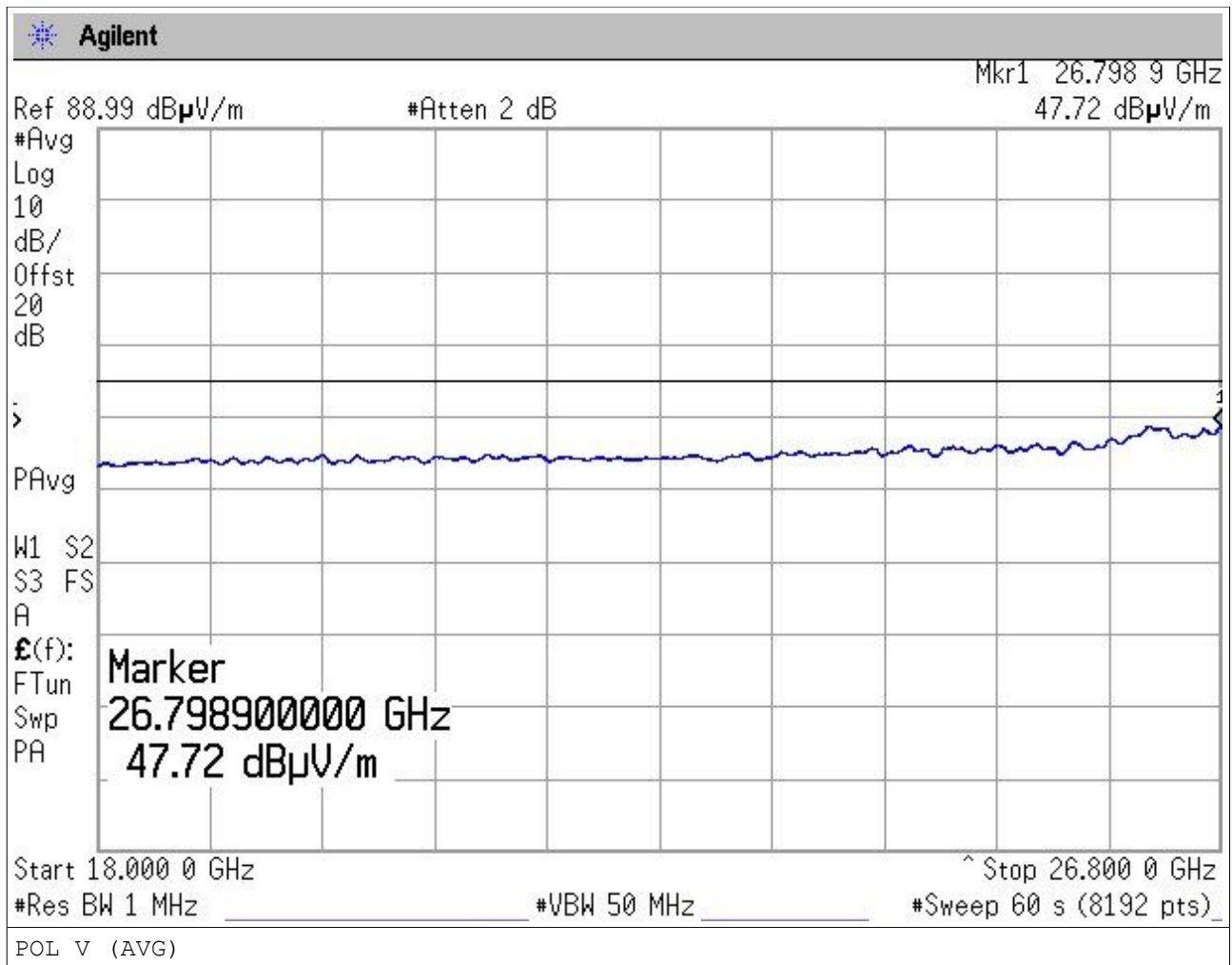
Report n. 17318FCC Rev. 01, page 39 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

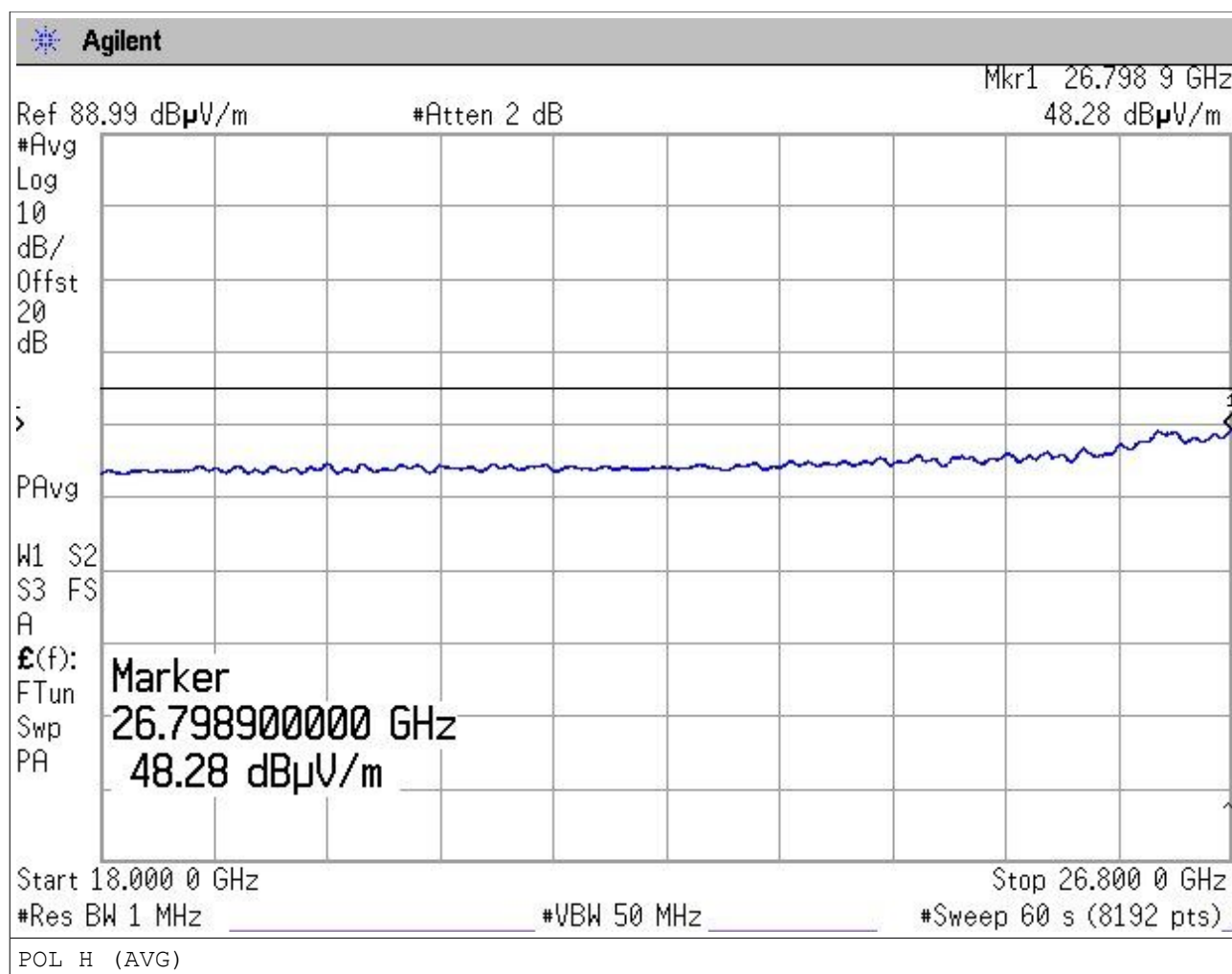
Report n. 17318FCC Rev. 01, page 40 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

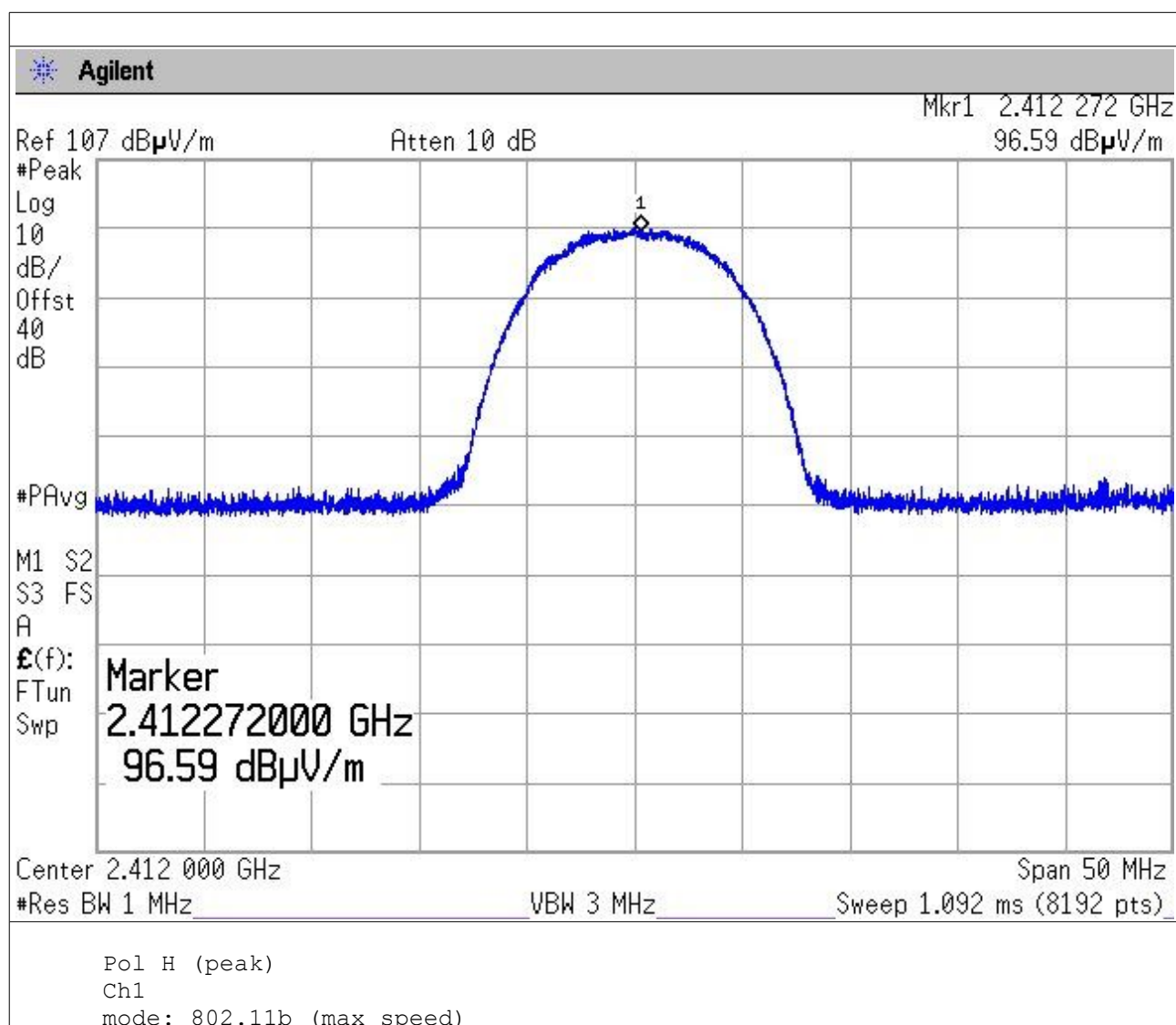
Report n. 17318FCC Rev. 01, page 41 / 60

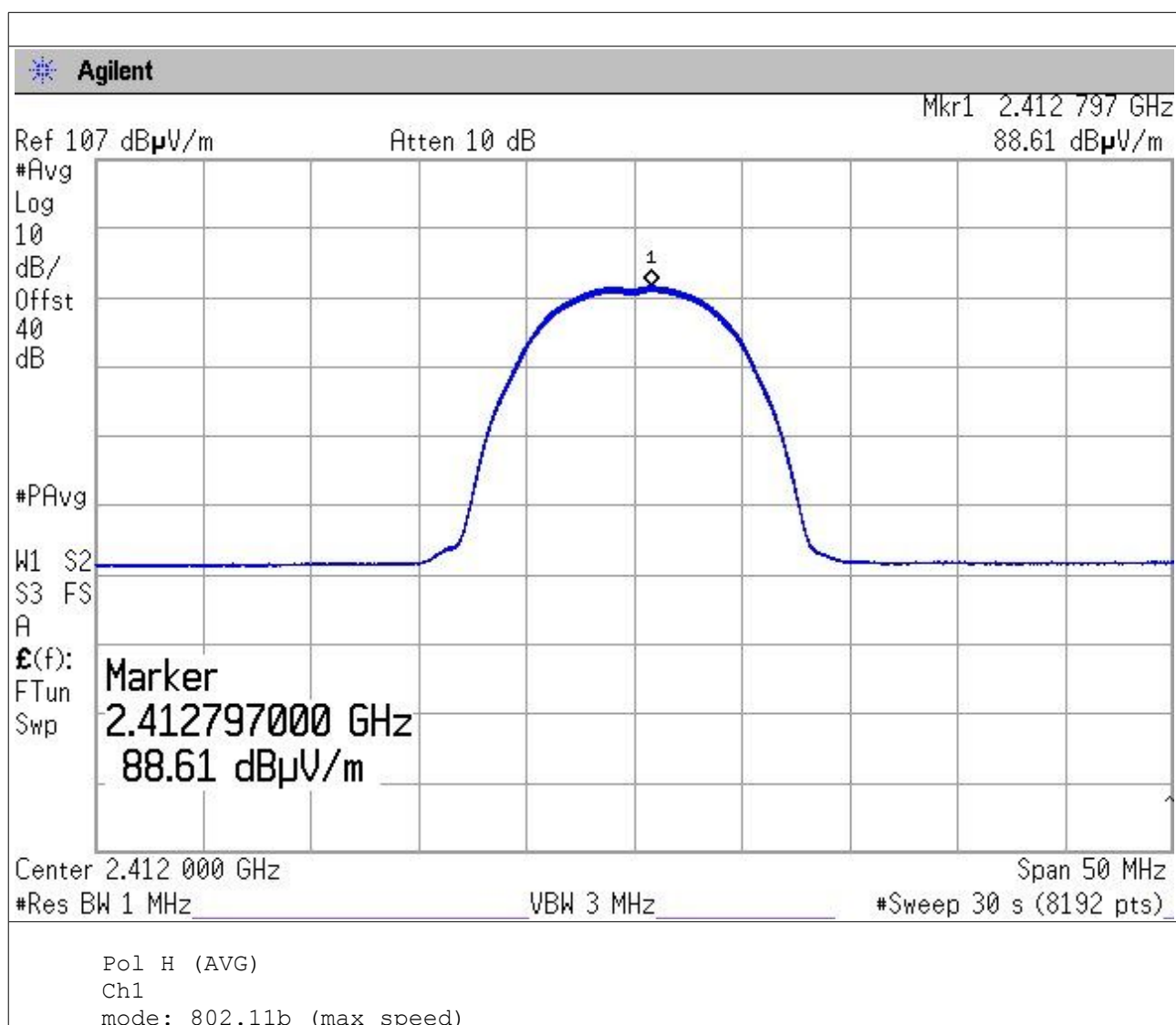


This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 42 / 60

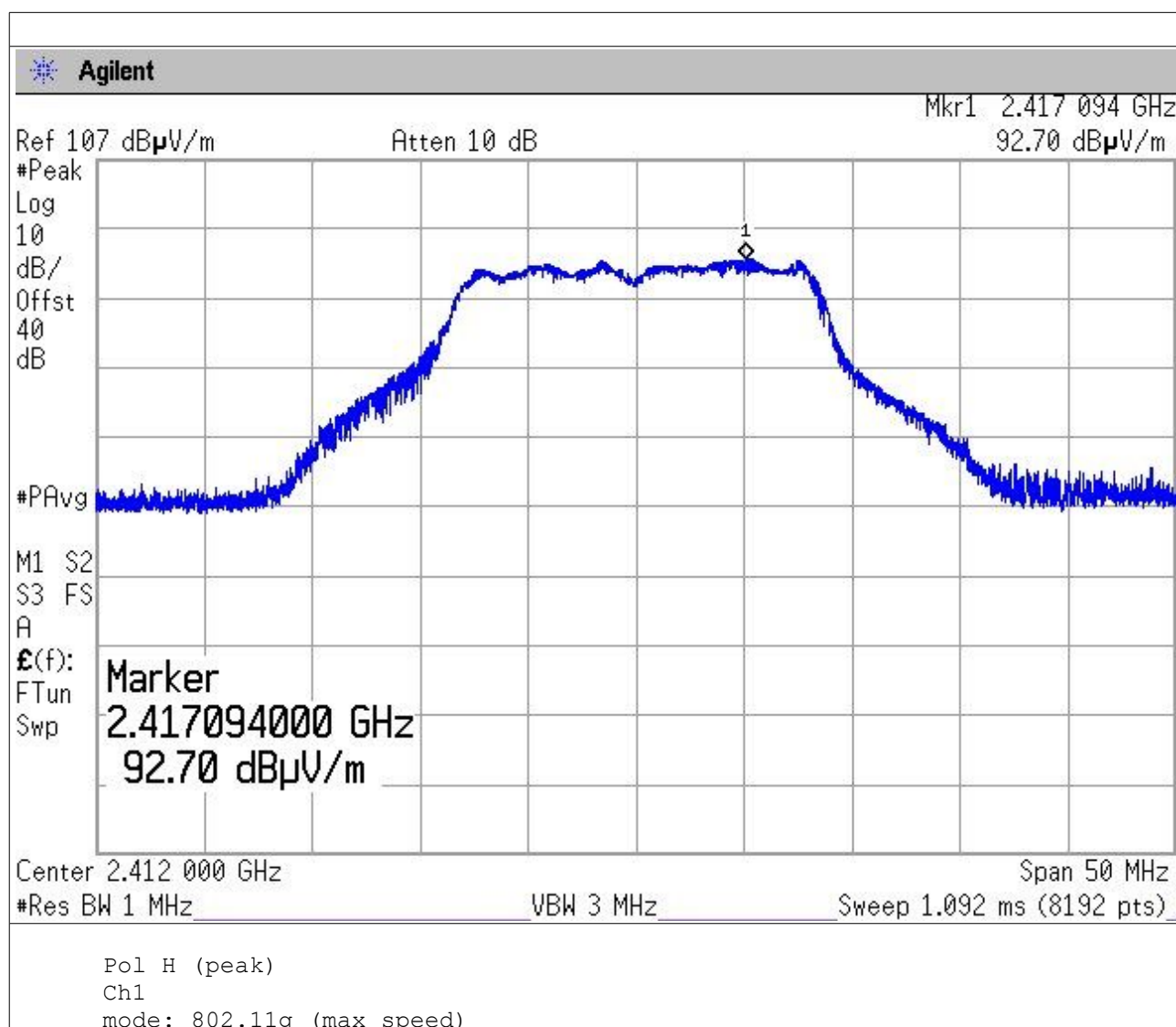


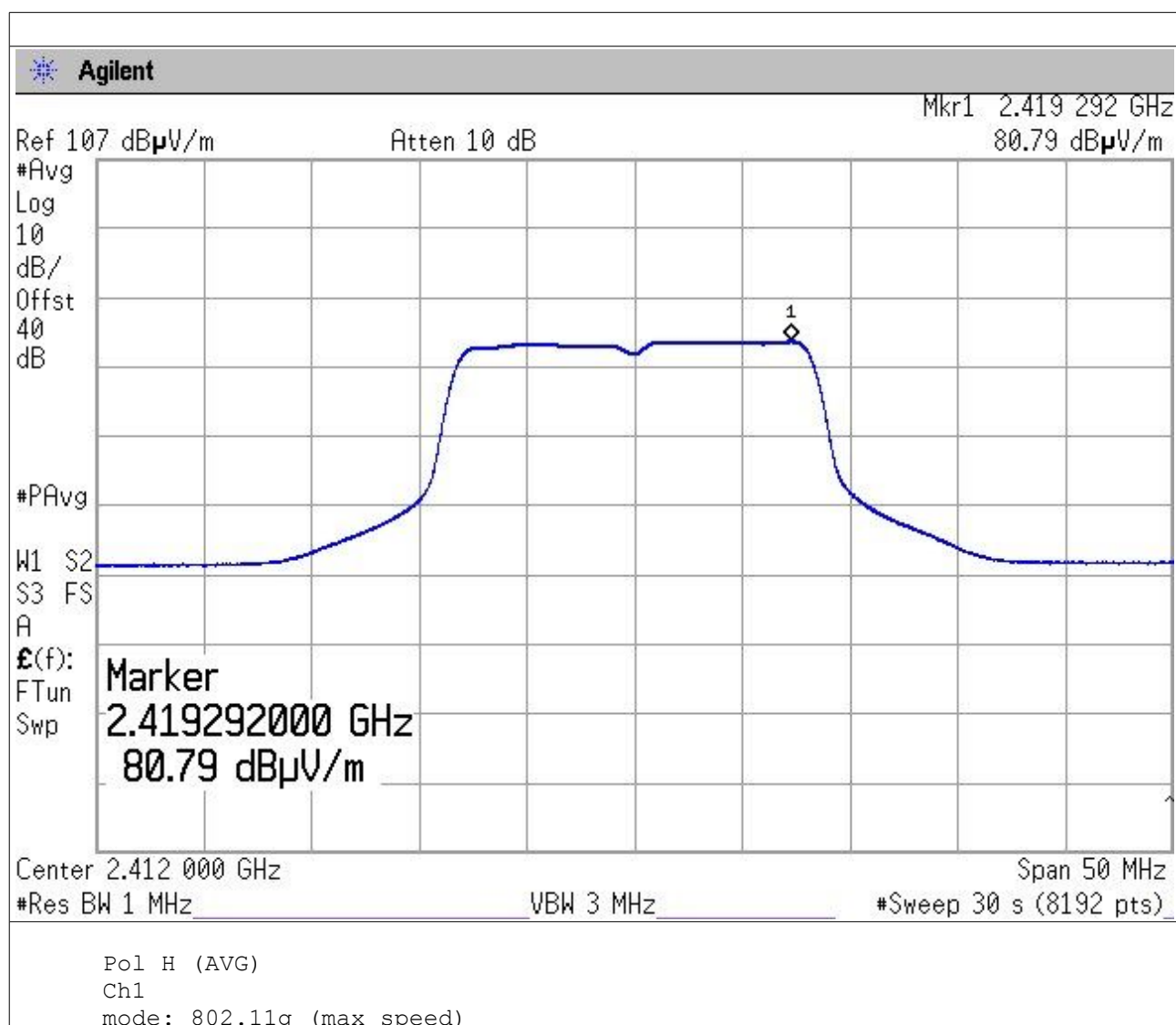


This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 44 / 60

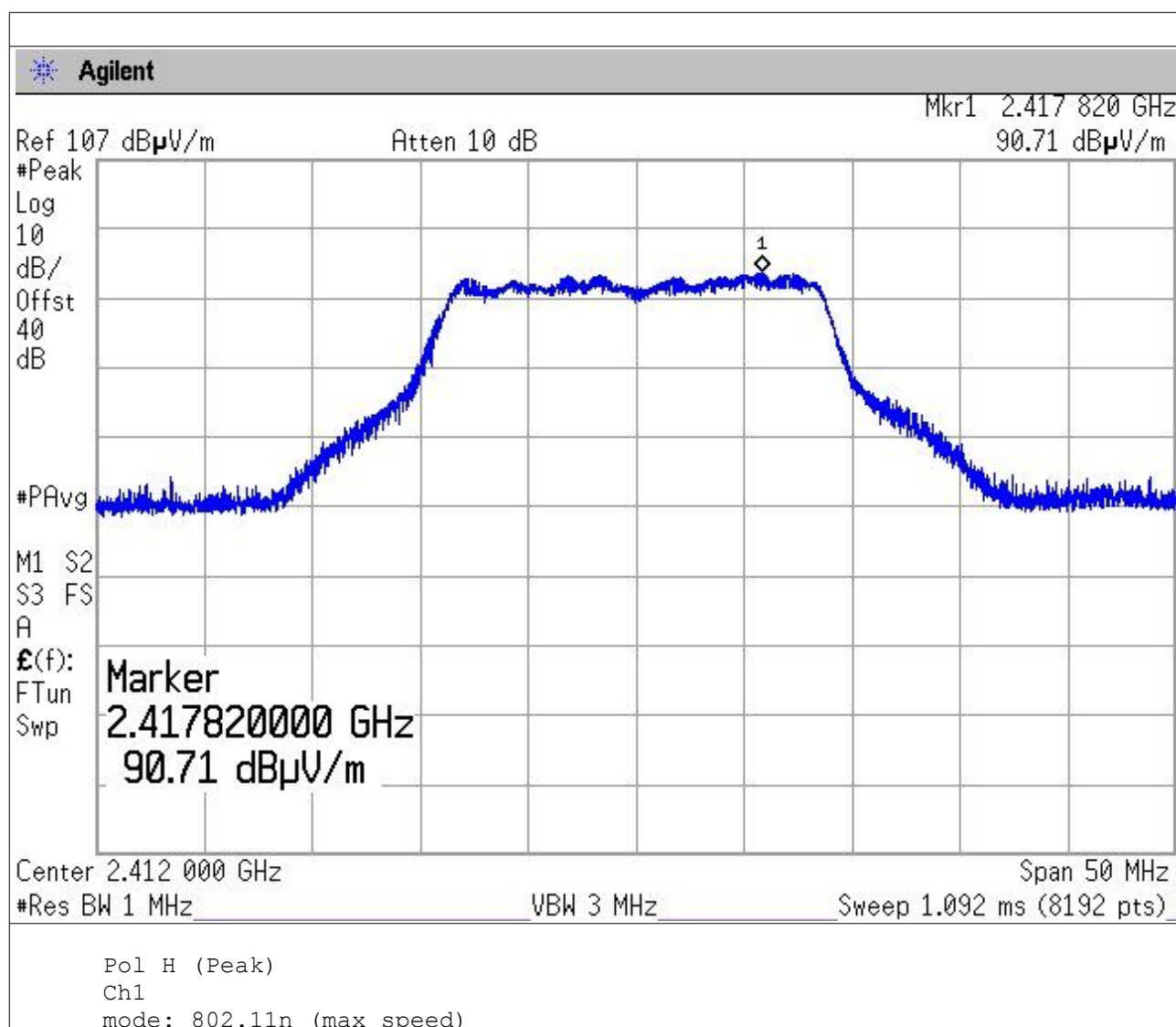


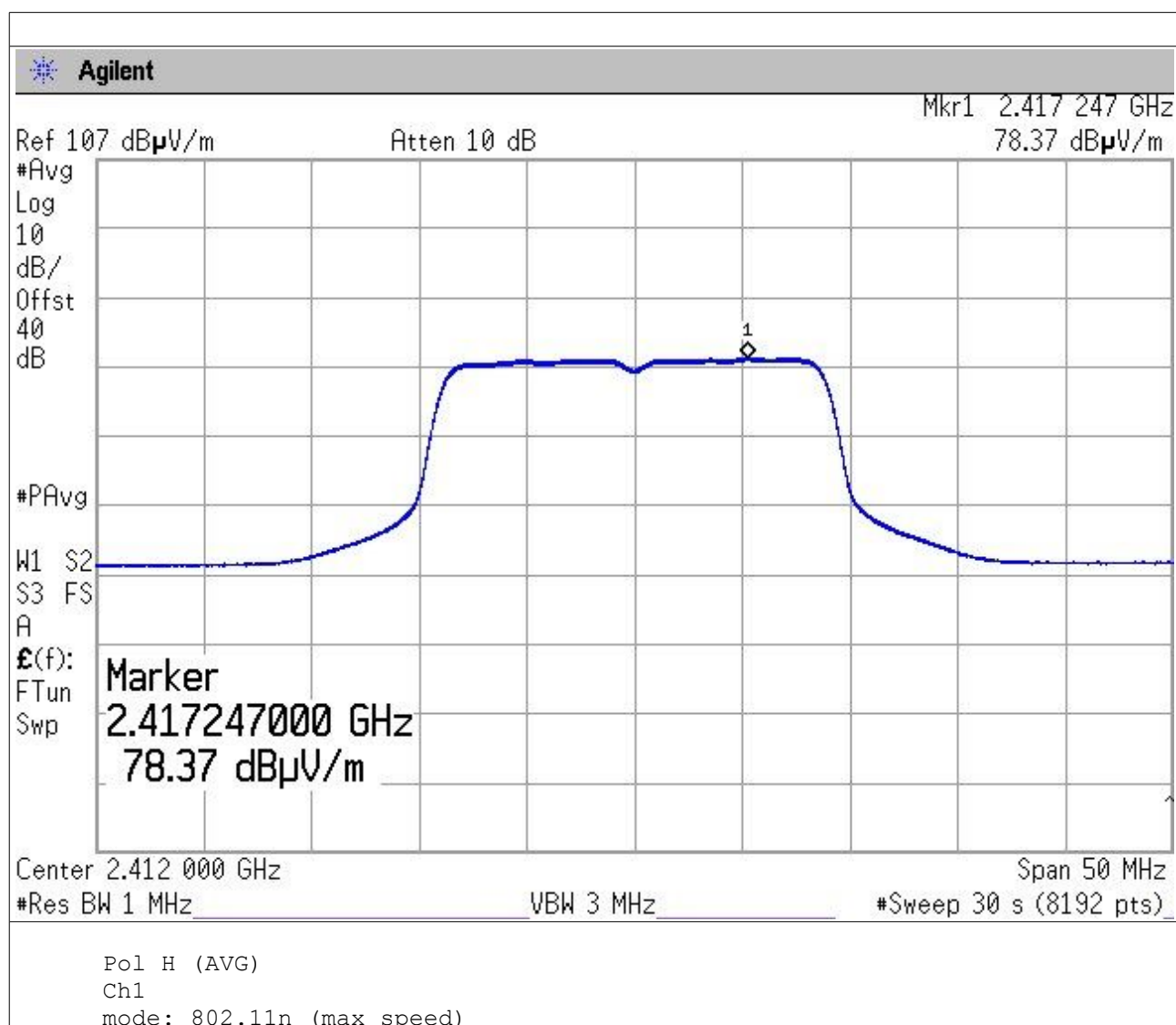


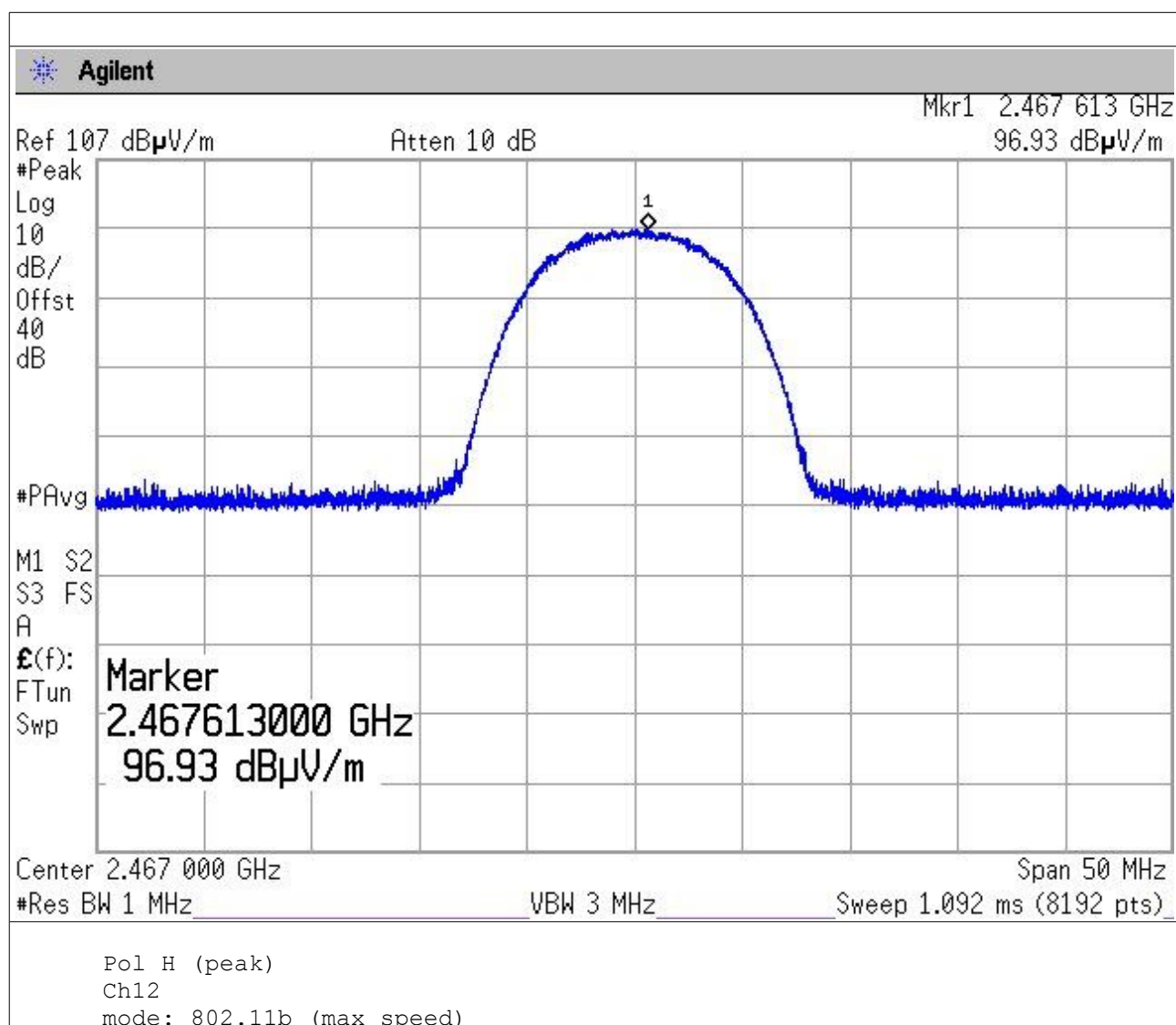
This document may be only fully reproduced.

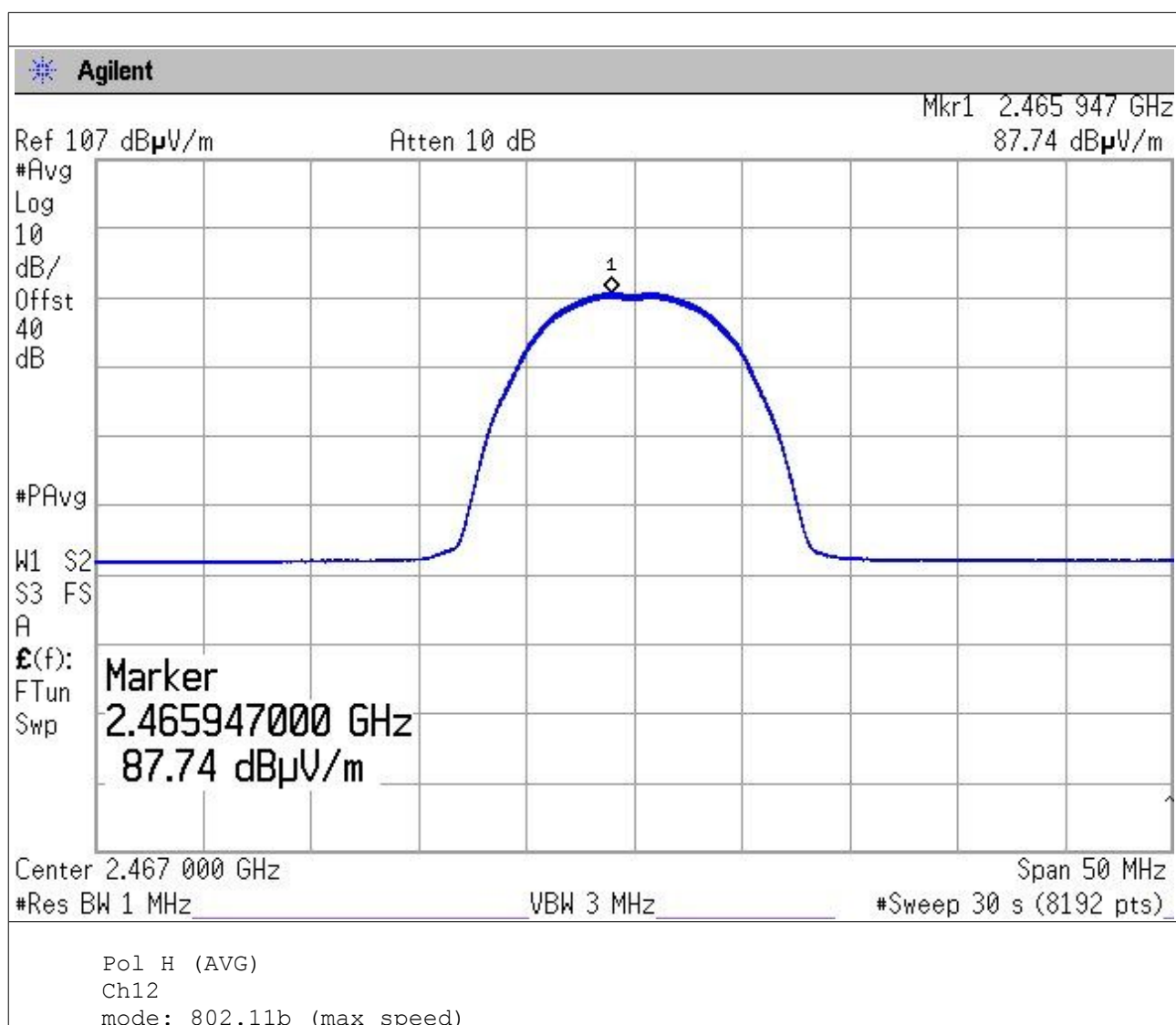
Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 46 / 60





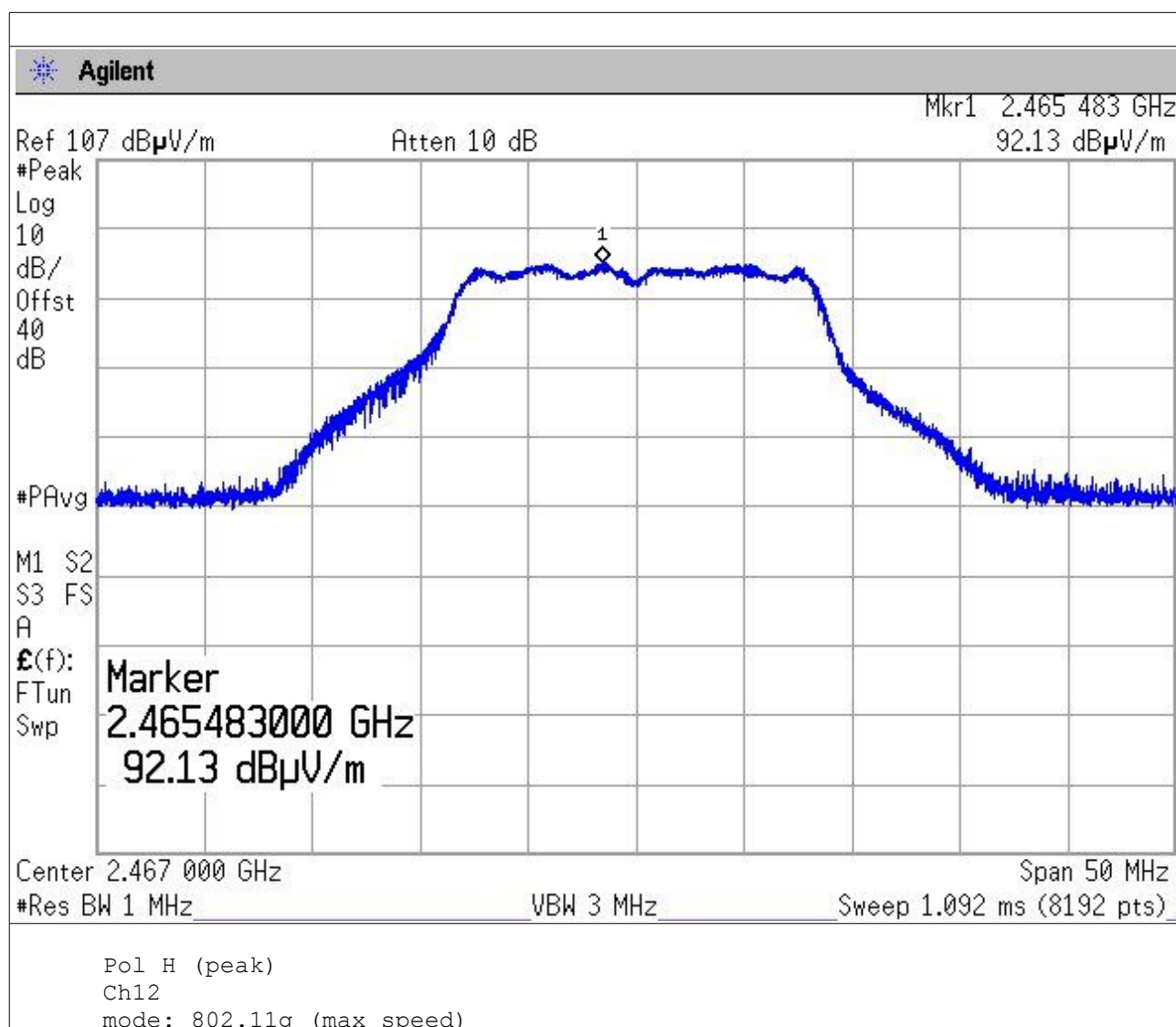


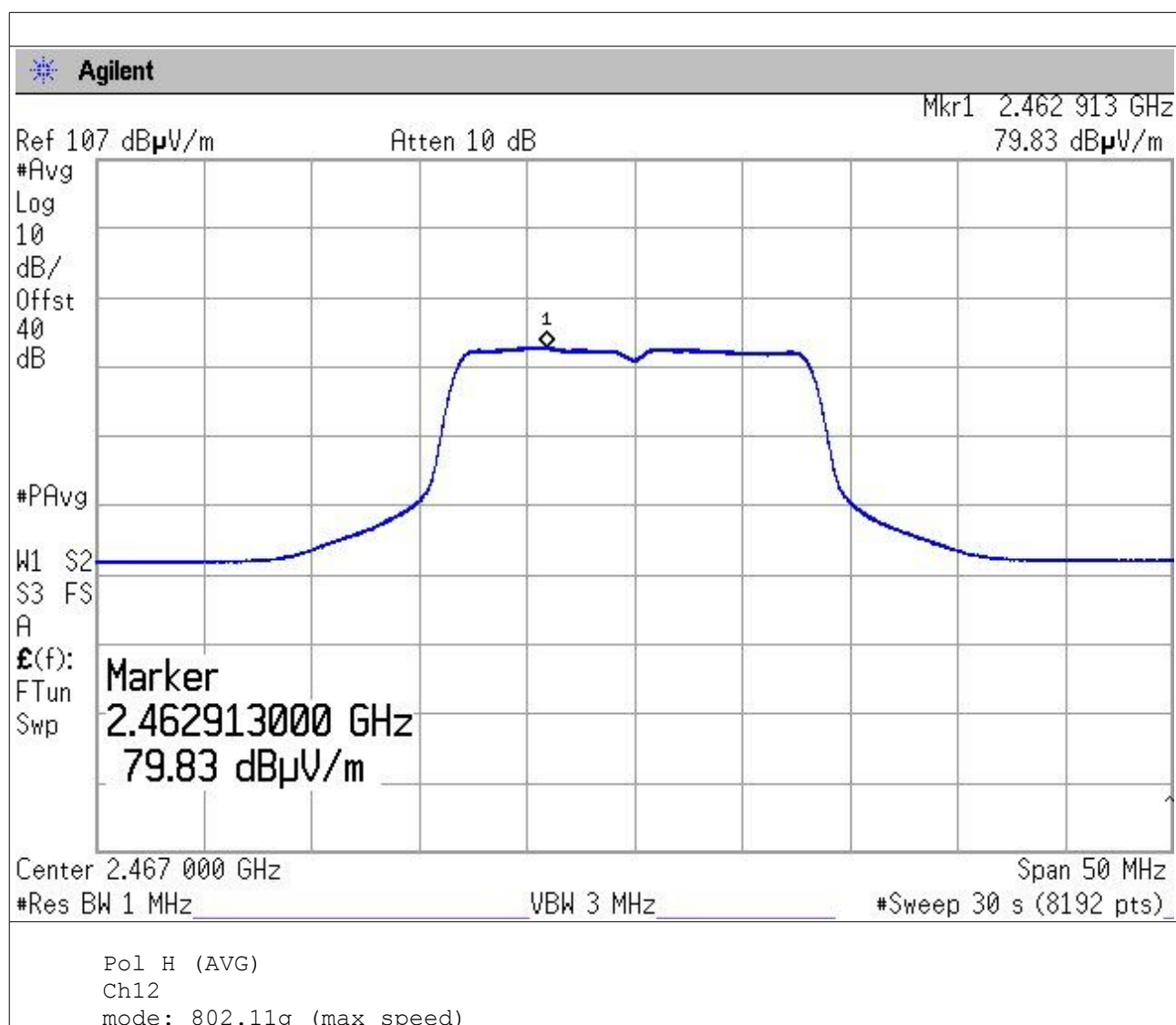


This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 50 / 60

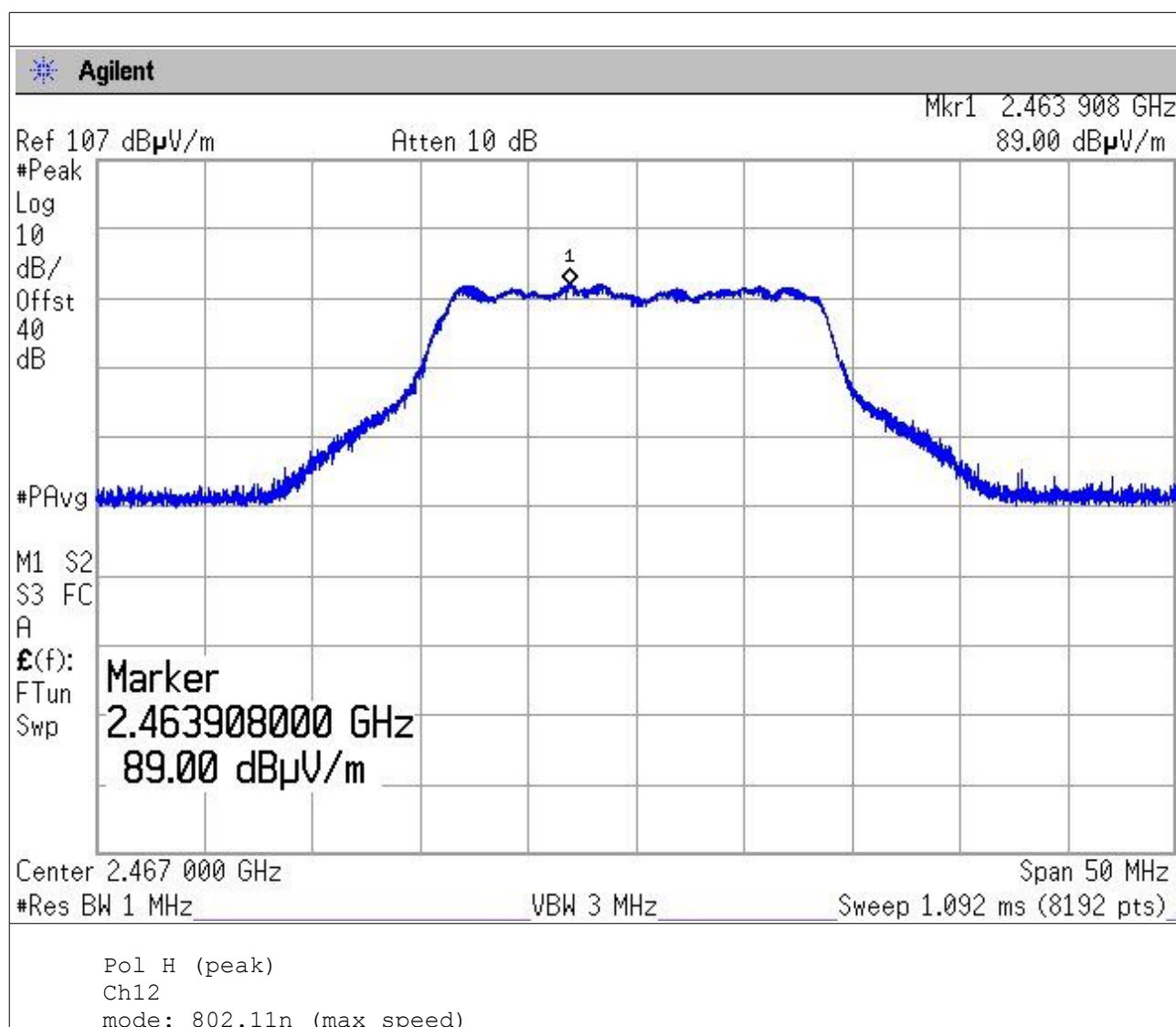


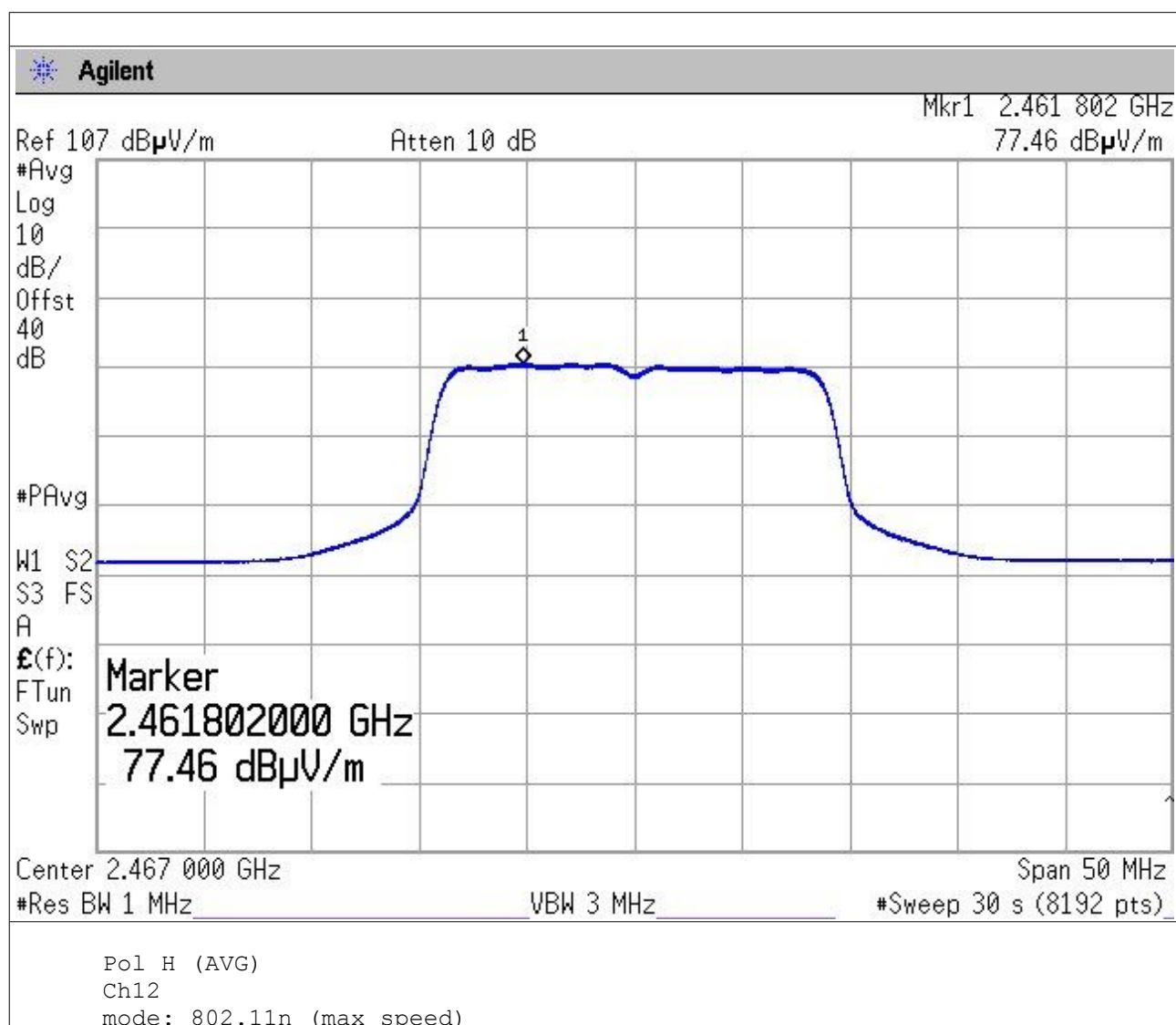


This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 52 / 60

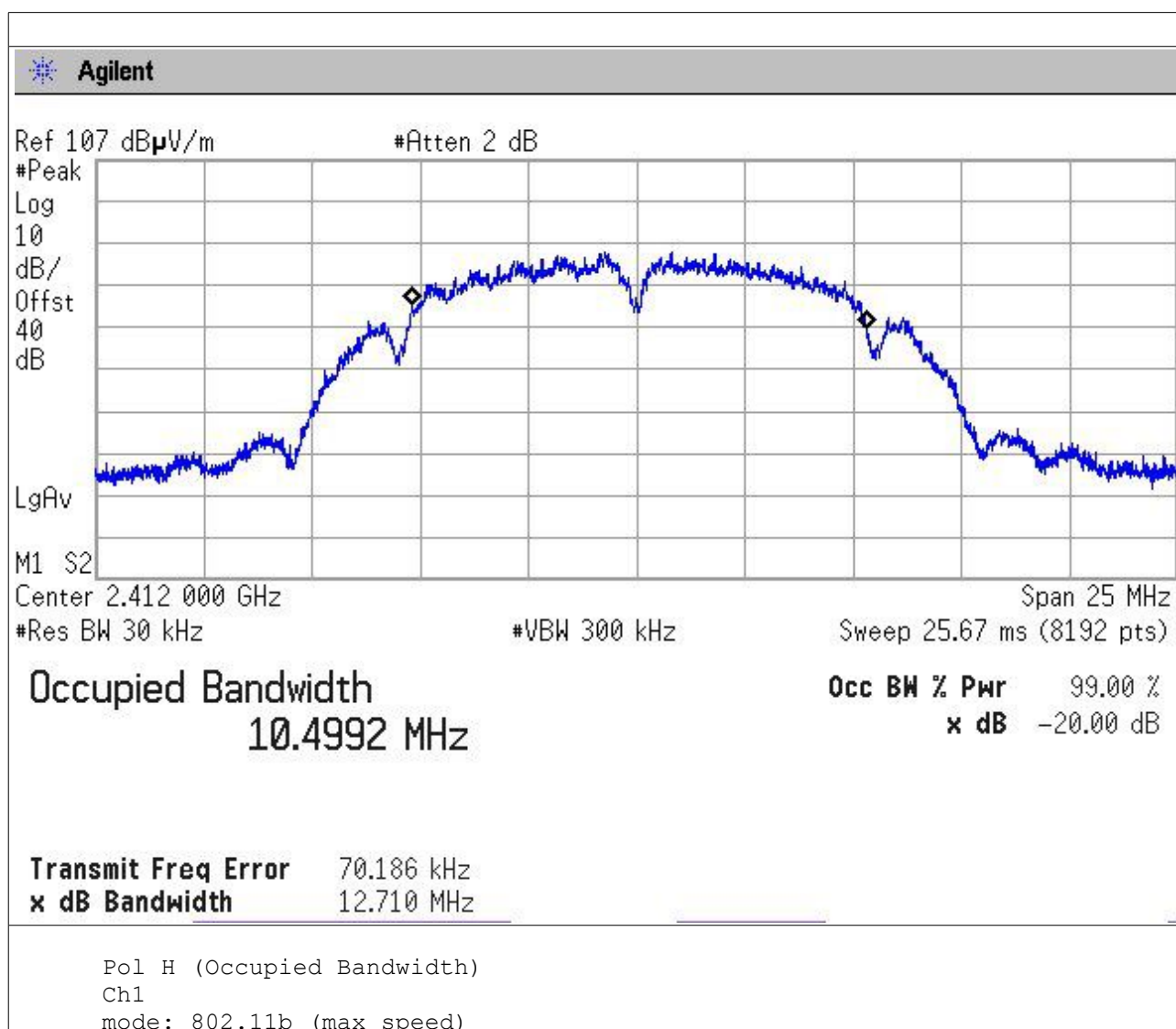




This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

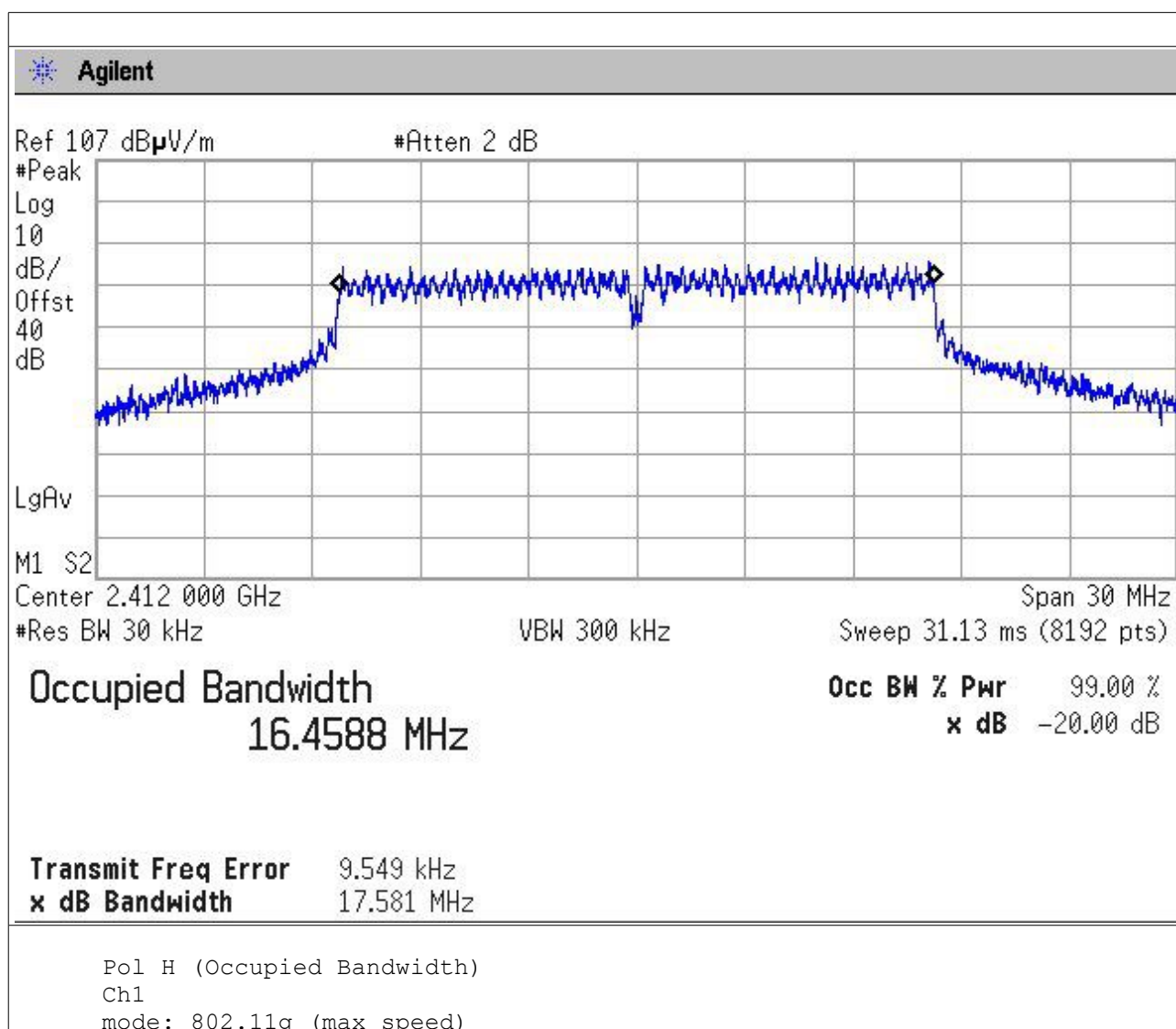
Report n. 17318FCC Rev. 01, page 54 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

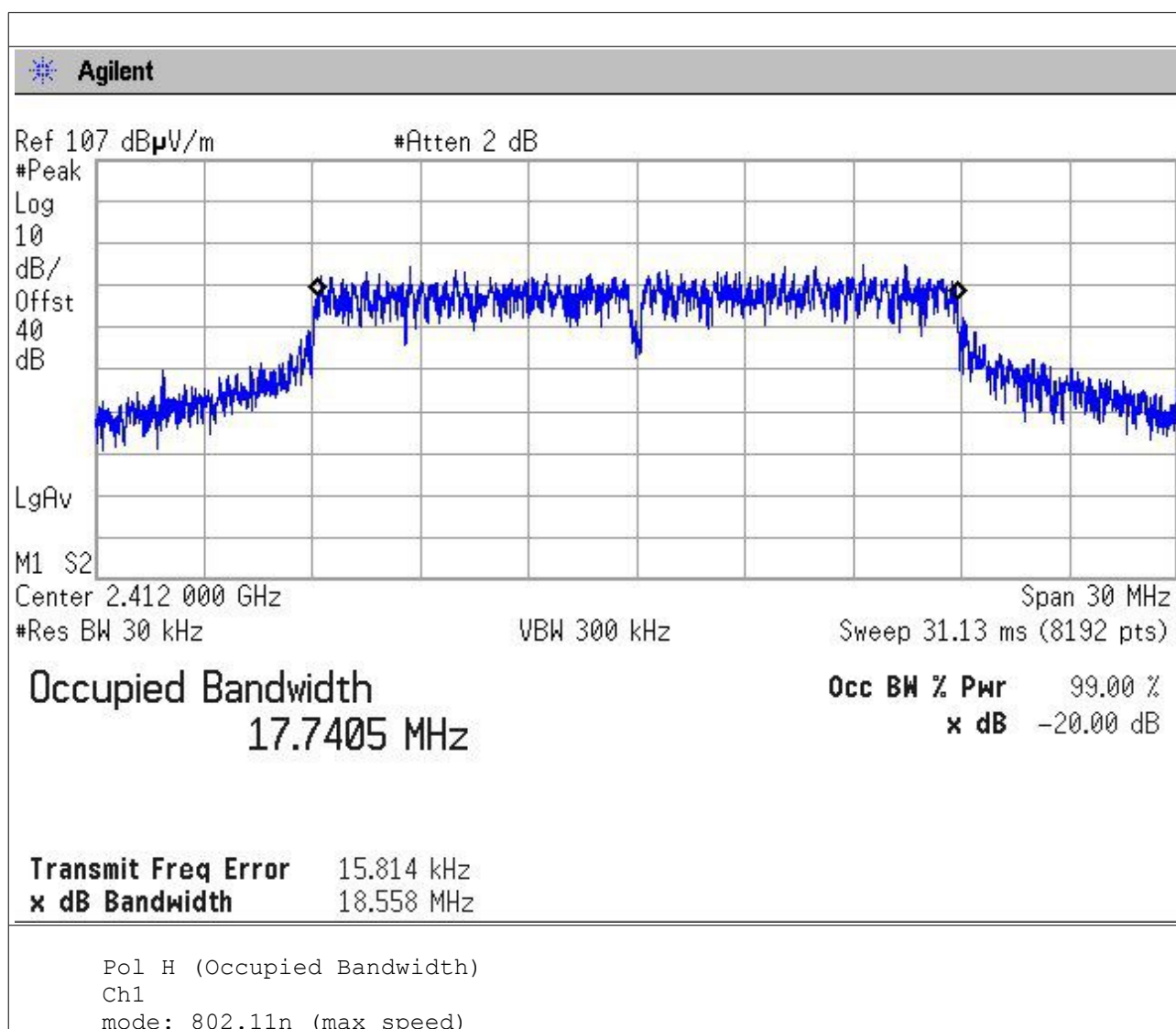
Report n. 17318FCC Rev. 01, page 55 / 60

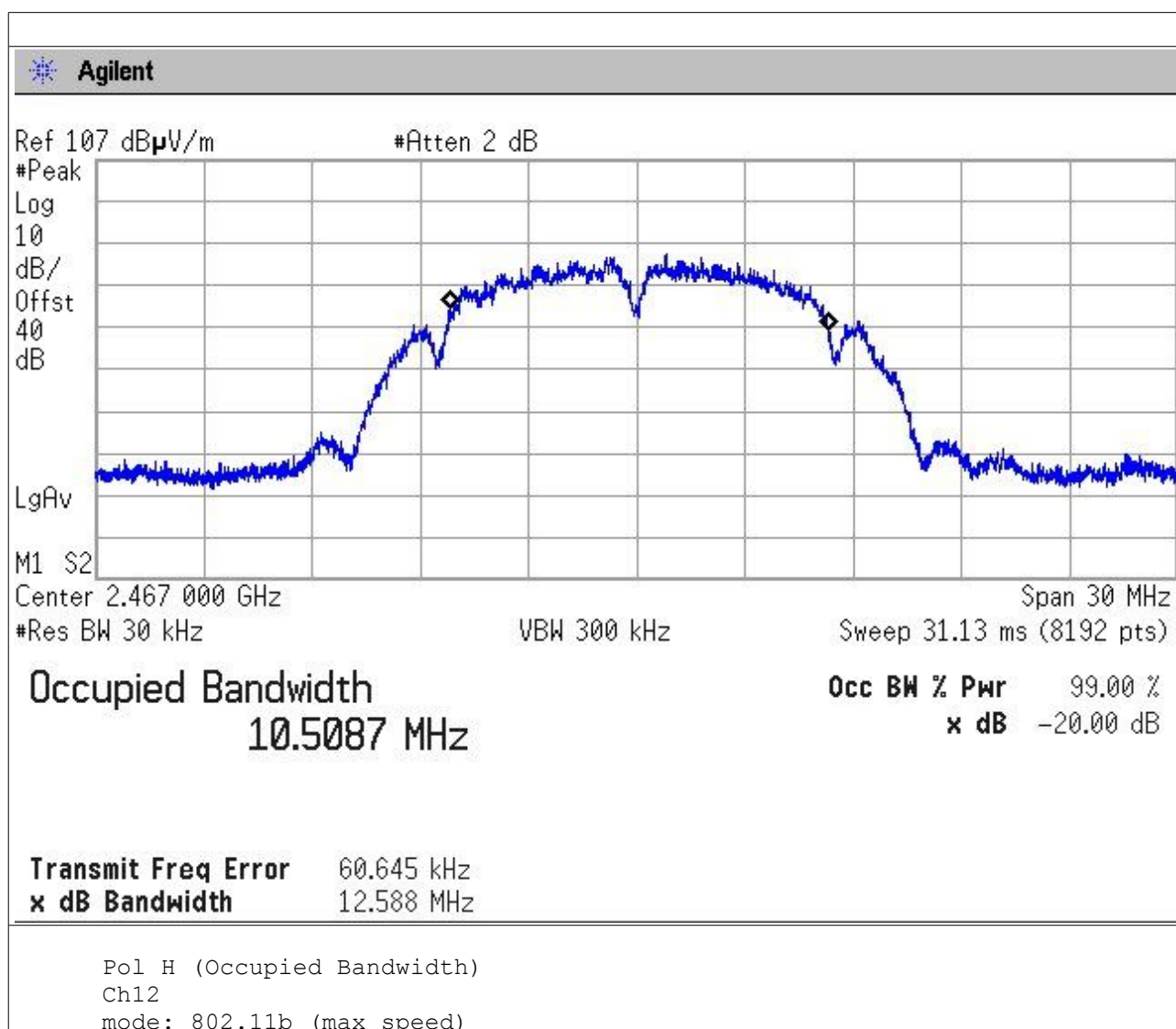


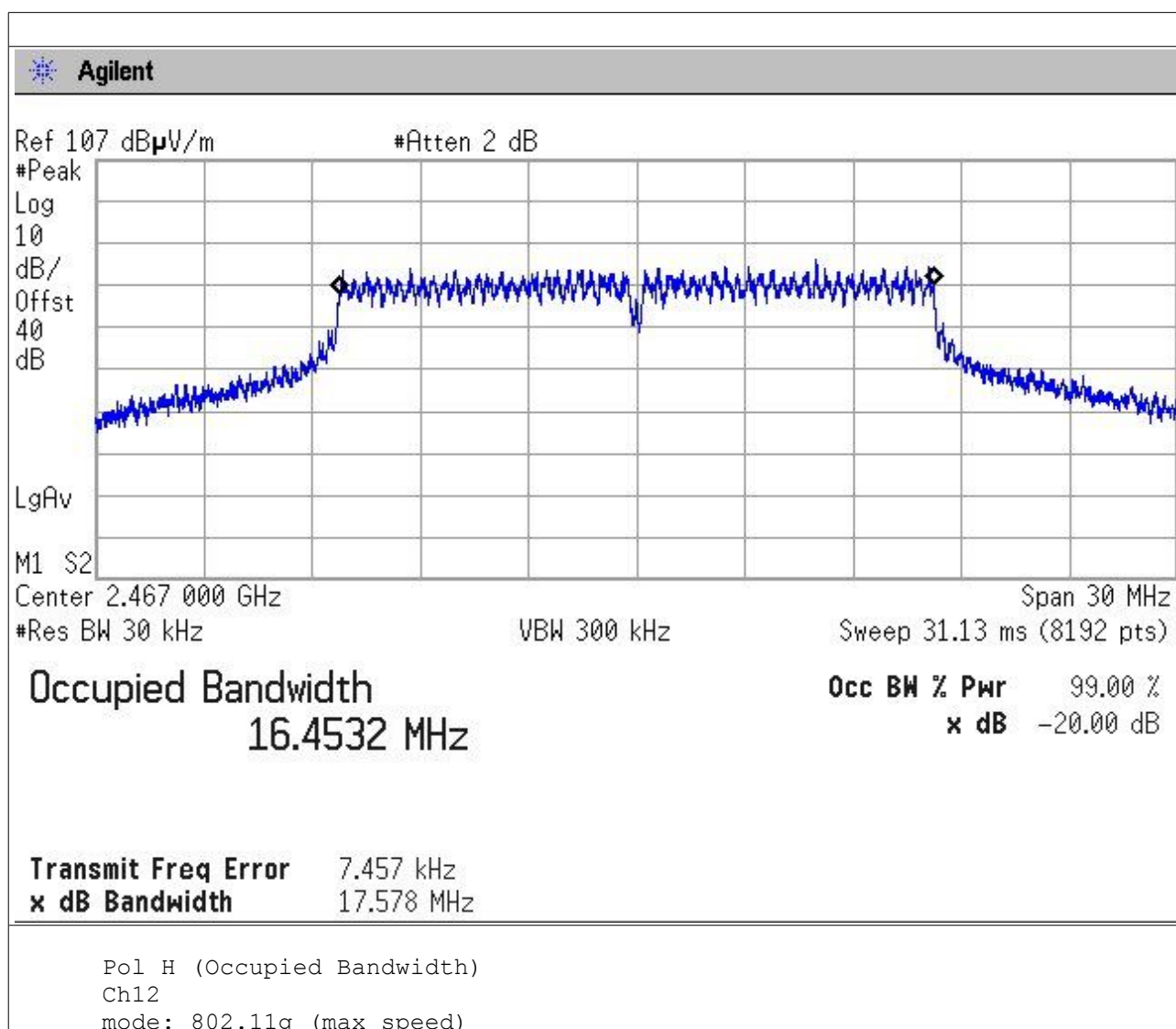
This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 56 / 60



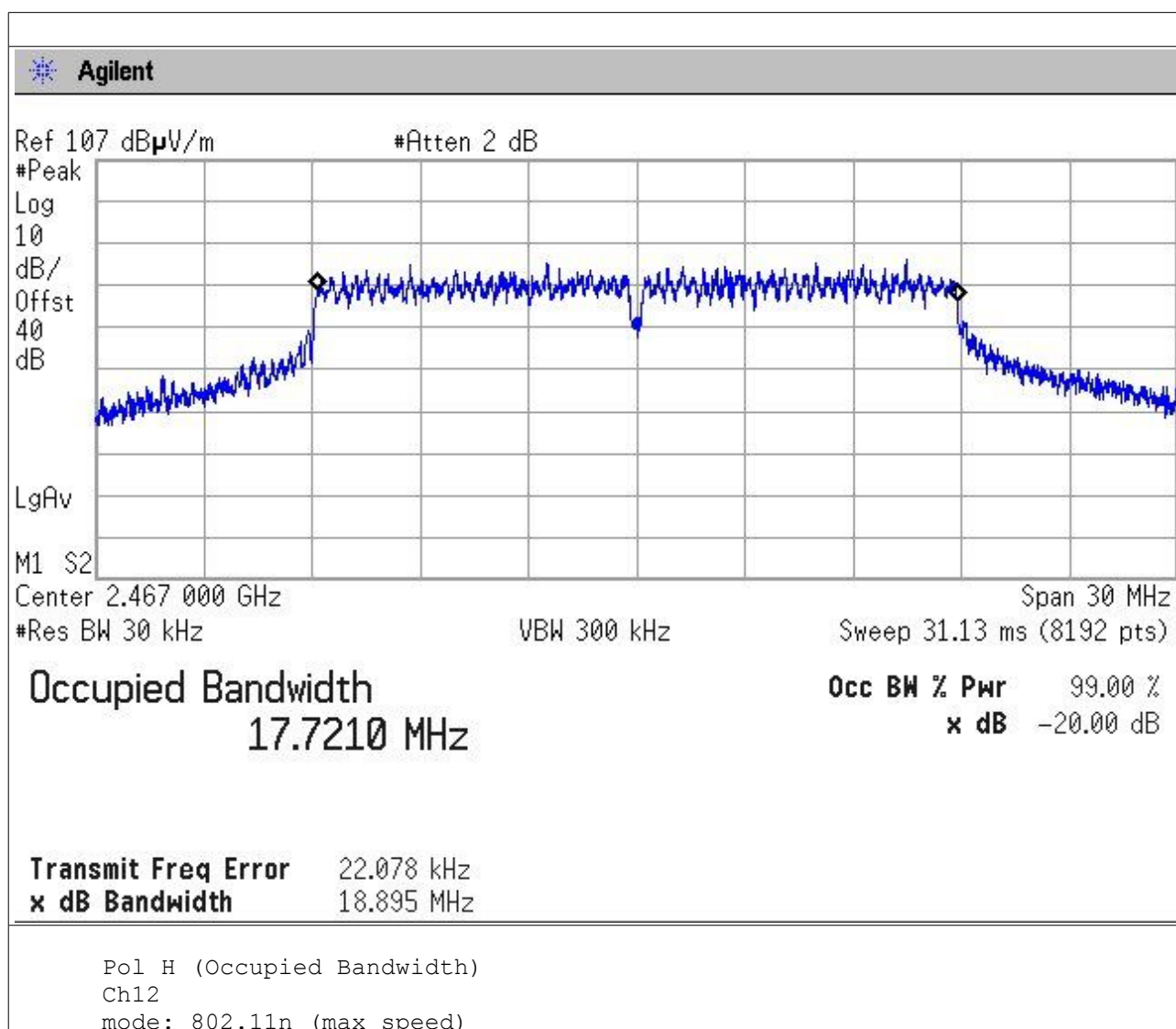




This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 59 / 60



This document may be only fully reproduced.

Every partial reproduction is only allowed after written approval released by G.S.D. S.r.l.

Report n. 17318FCC Rev. 01, page 60 / 60