



Instrumentation

Certificate of Calibration

Instrument type : **Fast Current Transformer**
Serial number : **# 3106**
Options installed : **1.25V/A, Low Droop**
Calibration date : **December 03, 2013**

At the time of manufacture, this certifies that the above instrument was calibrated in accordance with applicable Bergoz Instrumentation procedures.

At periodic intervals, Bergoz Instrumentation measurement standards are calibrated by comparison to or measurement against transfer standards traceable to national standards, natural physical constants, consensus standards, or by-ratio type measurements using self-calibrating techniques.

National standards are administered by IRMM, the European Institute for Reference Materials and Measurements, NIST, the U.S National Institute of Standards and Technology or other national standards laboratories.

At the time of shipment, the referenced instrument met its published operating specifications within the operating specifications of the instrument and the standards.

Supportive documentation relative to traceability is on file and is available for examination upon request.

Olivia Ahodan

Supervisor in charge

Attached documents:

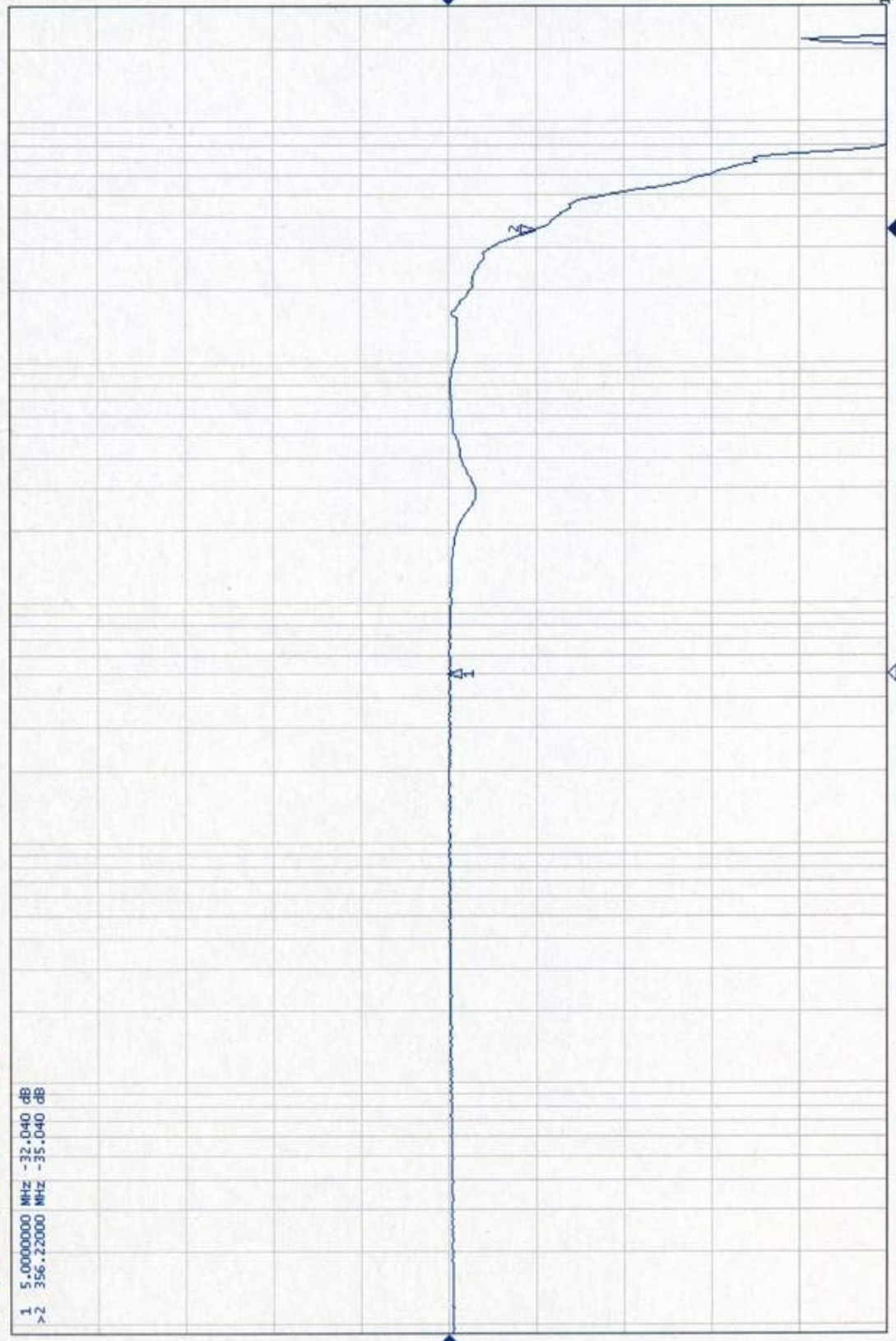
High frequency response plot with test set-up correction
High frequency response plot without test set-up correction
Low frequency response plot
Pulse response plot
Step response plot
Differentiation plot

E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mix/Analysis 5 Instr State

▶ F2 S21 Log Mag 3.000dB/ Ref -32.04*dB [F2]

1 5.0000000 MHz -32.040 dB
>2 356.22000 MHz -35.040 dB



IFBW: 2 MHz

Stop 3 GHz Cor
Hold Stop ExtRef Svc | 2013-12-03 15:16

Model:	FCT-260-1.25-LD
Sensor serial Nr.	3106
Date	Dec. 03, 2013
Plot	High freq. response
01630 St Genis Pouilly France Tel: +33-450.426.642 Fax: +33-450.426.643	

Without Test Set-up
Correction*

Risetime
0.35/ fhigh (-3dB)
Risetime
0.35/356.2 MHz
Risetime = 983ps

Instrument used:
HP E5071C
9KHz-8.5GHz

Network analyzer

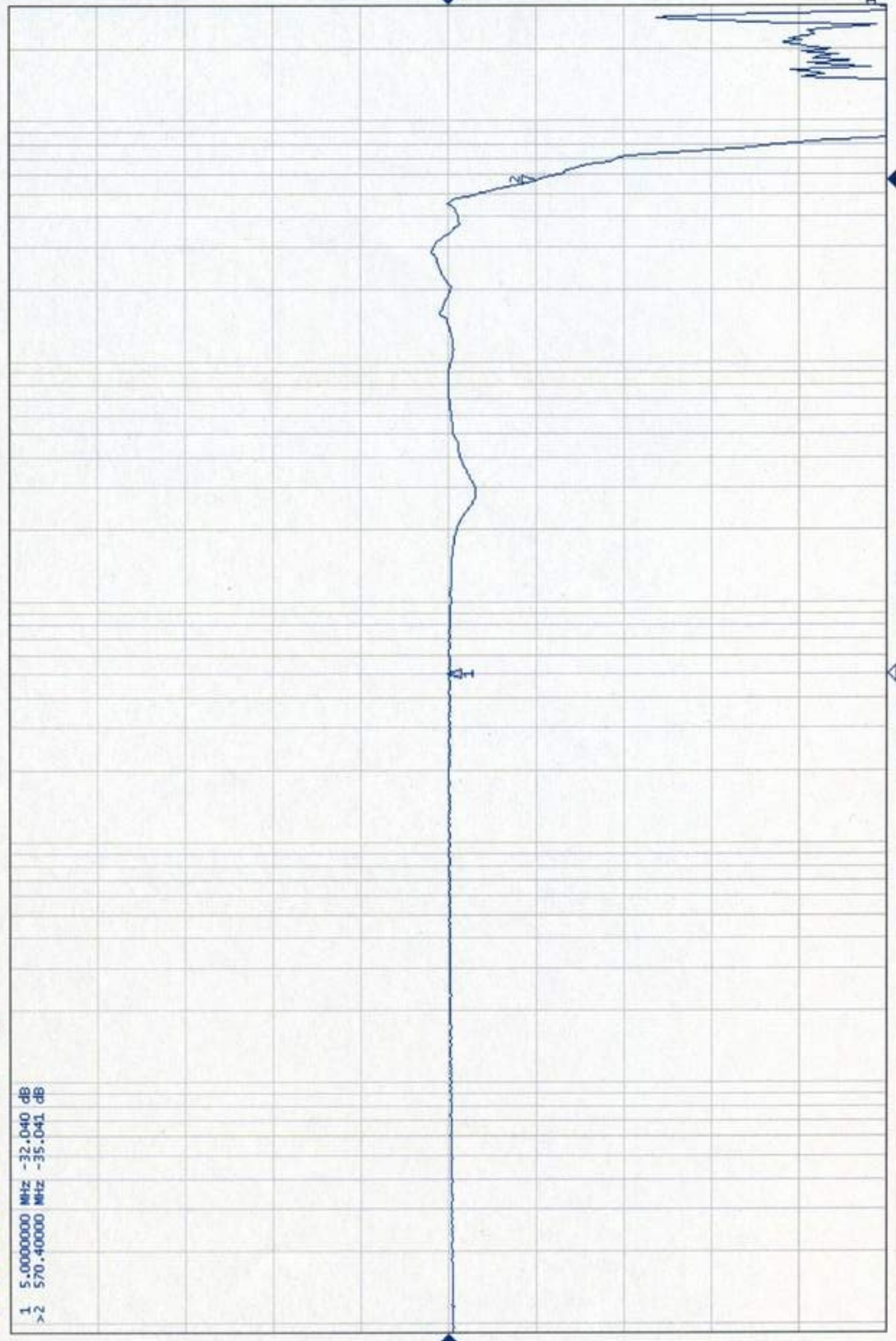
* Correction of the power loss due to reflections

E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mix/Analysis 5 Instr State

▶ **[F2]** S21 Log Mag 3.0000dB/ Ref -32.04*dB [F2 Equ]

- 1 5.0000000 MHz -32.040 dB
- >2 570.40000 MHz -35.041 dB



1 Start 3.1Hz

HF BW 2.1Hz

Hold Stop Exit/Ref Svc 2013-12-03 15:14

Step 3 GHz Cor

Model:	FCT-260-1.25-LD
Sensor serial Nr.	3106
Date	Dec. 03, 2013
Plot	High freq. response
01630 St Genis Pouilly France Tel: +33-450.426.642 Fax: +33-450.426.643	
bergoz Instrumentation	

Including Test Set-up
Correction*
 $\frac{S_{21}}{\sqrt{1 - |S_{11}|^2}}$

Risetime
0.35/ fhigh (-3dB)


Risetime
0.35/570 MHz

Risetime = 614ps

Instrument used:
HP E5071C
9KHz-8.5GHz

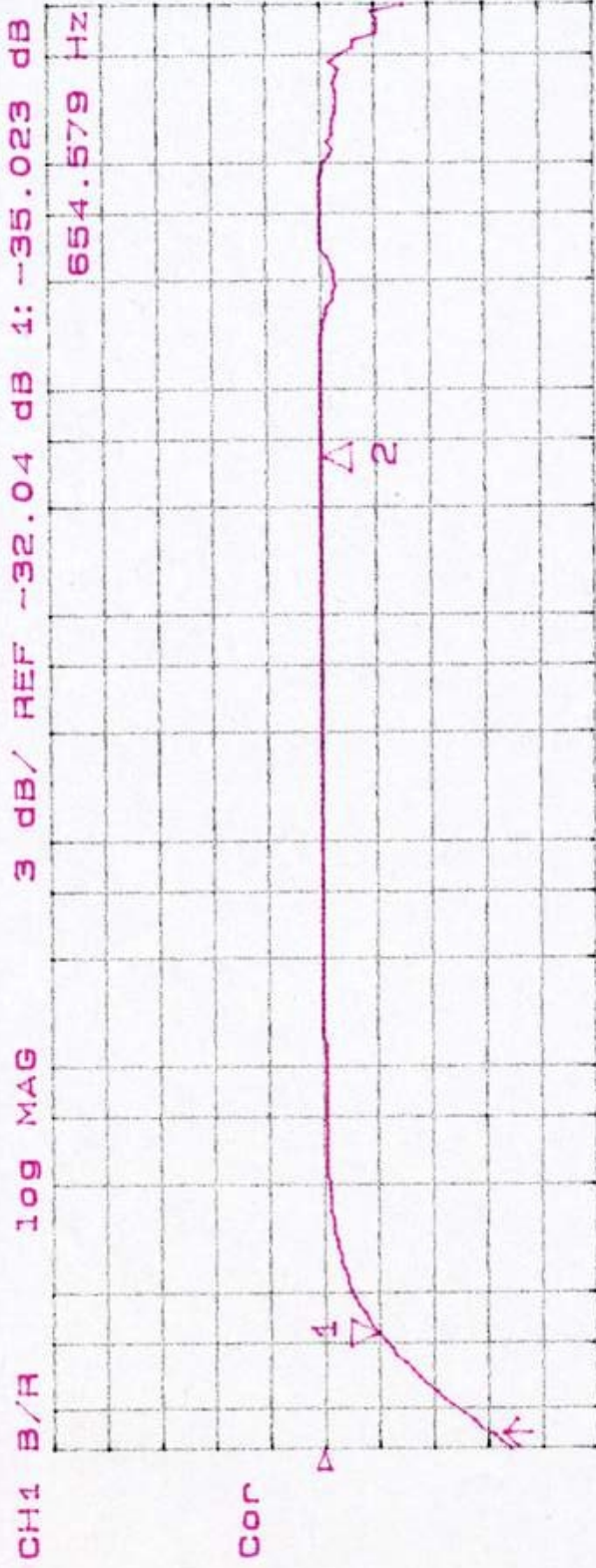
Network analyzer

* Correction of the power losses due to reflections

Model:	FCT-260-1.25-LD
Sensor serial Nr.:	3106
Plot:	Low frequency response
Date:	December 03, 2013
	
01630 St-Genis-Pouilly, France Tel: +33-450.426.642 Fax: +33-450.426.643	

Droop = $2\pi \times \text{flow} (-3\text{dB})$
 Droop = $2\pi \times 655 \text{ Hz}$
 Droop = **0.41%/μs**

Instrument used:
 HP8751A Network analyzer



START 200 Hz STOP 500 MHz

val

N STIMULUS

- | | | |
|---|------------|------------|
| 1 | 654.579 Hz | -35.023 dB |
| 2 | 5 MHz | -32.023 dB |

Model:	FCT-260-1.25-LD
Sensor serial Nr.:	3106
Plot:	Pulse response
Date:	December 03, 2013
016300 St-Genis-Pouilly France Tel: +33-450.426.642 Fax: +33-450.426.643	
bergoz Instrumentation	

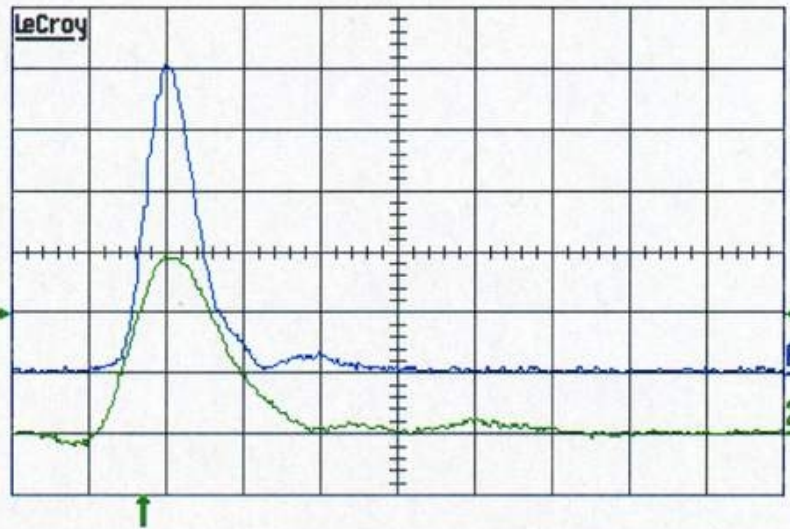
Instruments used:

- TEK Type 109 Pulse generator
- Lecroy LT584 Oscilloscope

18-Dec-13
9:39:45

1 M1
1 ns
1.00 V
FCT Input

2
1 ns
25.0mV
FCT Output



rise(1) 415 ps
rise(2) 585 ps

1 ns RIS
1 .5 V 50Ω
2 25.0mV 50Ω
3 .1 V 50Ω
4 .2 V 50Ω

 2 DC 49.0mV

50 GS/s
 STOPPED

Model:	FCT-260-1.25-LD
Sensor serial Nr.:	3106
Plot:	Step response
Date:	December 03, 2013
016300 St-Genis-Pouilly France Tel: +33-450.426.642 F ax: +33-450.426.643	bergoz Instrumentation

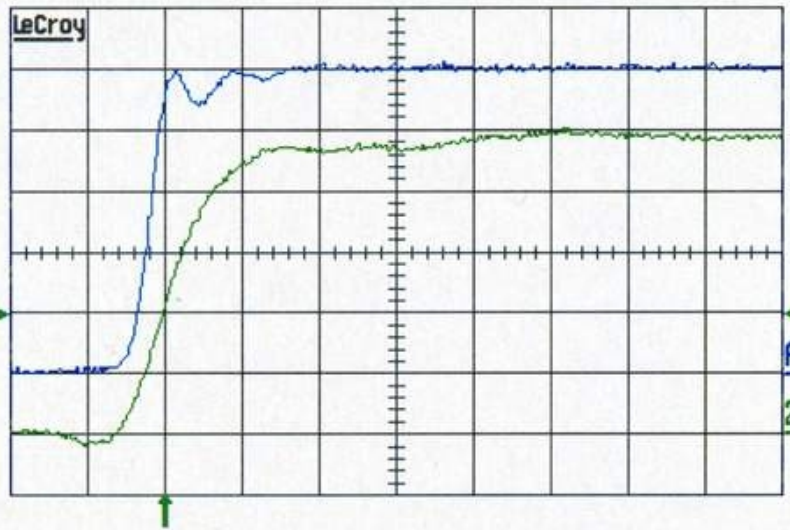
Instruments used:

- TEK Type 109 Pulse generator
- Lecroy LT584 Oscilloscope

18-Dec-13
9:46:28

1 M1
1 ns
1.00 V
FCT Input

2
1 ns
25.0mV
FCT Output



rise(**1**) 428 ps
rise(**2**) 1.251 ns

1 ns RIS

- 1** .5 V 50Ω
- 2** 25.0mV 50Ω
- 3** .1 V 50Ω
- 4** .2 V 50Ω



2 DC 49.0mV

50 GS/s

STOPPED

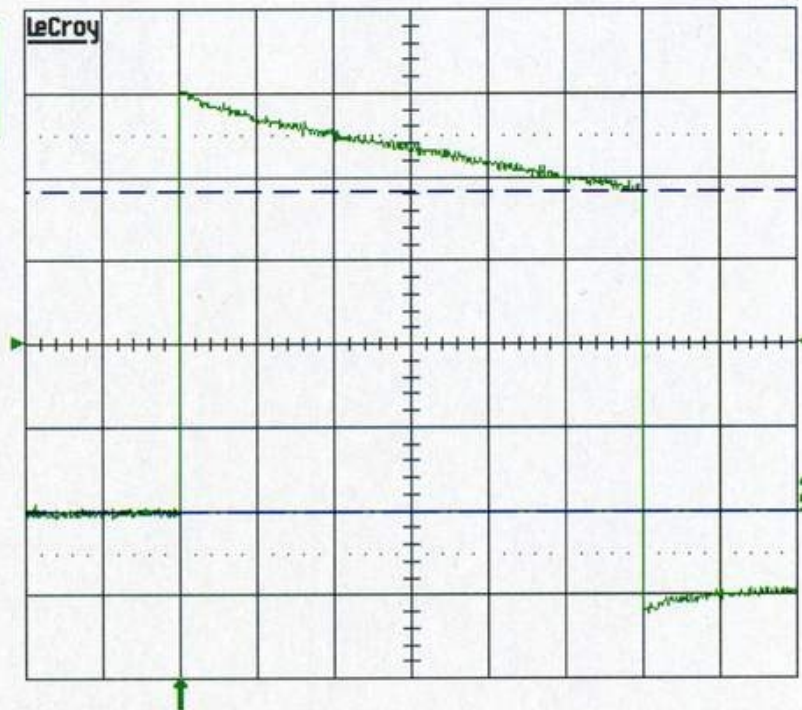
Model:	FCT-260-1.25-LD
Sensor serial Nr.:	3106
Plot:	Differentiation
Date:	December 03, 2013
01630 St-Genis-Pouilly, France Tel: +33-450.426.642 Fax: +33-450.426.643	bergoz Instrumentation

Instruments used:

- Pulse generator HP 8112A
- Lecroy LT584 1GHz Oscilloscope

3-Dec-13
16:50:03

2
10 μ s
20.0mV
76.6mV



10 μ s

1 2 V AC
2 20 mV 500
3 10 mV 500
4 .2 V 500



2 DC 40.8mV

10 MS/s

■ AUTO

CALCUL DU DROOP

Amplitude de l'impulsion
avant droop

100 [mV]

Amplitude de l'impulsion
après droop

76.6 [mV]

Perte de signal

23.4 [%]

Durée de l'impulsion

60 [μ s]

Droop

0.44 [%/ μ s]