

NUQ



NUFERN®



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株式会社オプトサイエンス
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東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング
TEL: 03 (3356) 1064 FAX: 03 (3356) 3466 E-mail: info@optoscience.com
大阪支店 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館
TEL: 06 (6305) 2064 FAX: 06 (6305) 1030 E-mail: osk@optoscience.com
名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル
TEL: 052 (569) 6064 FAX: 052 (569) 8064 E-mail: ngo@optoscience.com

NUQ



High Performance

20W, 30W & 50W Pulsed Fiber Marking Lasers

NUFERN[®]

NUQ

1 μ pulsed marking laser



Head on competitor

NUFERN[®]

NUQ

1 μ pulsed marking laser



Faster turn on time

NUFERN[®]

NUQ

1 μ pulsed marking laser



Better beam quality

NUFERN[®]

NUQ

1 μ pulsed marking laser



Highest peak power

NUFERN[®]

NUQ

1 μ pulsed marking laser



No ghost marks from bleed through

NUFERN[®]

NUQ

1 μ pulsed marking laser



Stable output with flexing cable

NUFERN[®]

NUQ

1 μ pulsed marking laser



Broader temperature operating range

NUFERN[®]

Specifications

Optical Specifications

	NUQ-1064-NA-0020-YZ	NUQ-1064-NA-0030-YZ	NUQ-1064-NA-0050-YZ (Preliminary)
Output Power	20.0 W per output	30.0 W per output	50.0 W per output
Output Power Adjustment	10 – 100%	10 – 100%	10 – 100%
Leakage Power in Off State	0 mW	0 mW	0 mW
Power Stability ¹	± 2.5%	± 2.5%	± 2.5%
Beam Quality	$M^2 < 1.5$	$M^2 < 1.5$	$M^2 < 1.5$
Output Beam Diameter	1.0 ± 0.5 mm 3.8 ± 0.8 mm 7.5 ± 1.5 mm 12.0 ± 1.5 mm	1.0 ± 0.5 mm 3.8 ± 0.8 mm 7.5 ± 1.5 mm 12.0 ± 1.5 mm	5.0 ± 0.8 mm
Visible Pointer	No Pointer Red Pointer	No Pointer Red Pointer	No Pointer Red Pointer
Output Type	Fiber to Free space isolator	Fiber to Free space isolator	Fiber to Free space isolator
Mode of Operation	Pulsed	Pulsed	Pulsed
Polarization	Random	Random	Random
Peak Power ²	10.0 kW	10.0 kW	10.0 kW
Pulse Energy ²	1.0 mJ	1.0 mJ	1.0 mJ
Pulse Width ³	100 ± 20 ns	100 ± 20 ns	120 ± 20 ns
Pulse Repetition Rate (PRR)	20 – 100 kHz	30 – 100 kHz	50 – 100 kHz
Turn-on Time ⁴	< 250 μs	< 250 μs	< 250 μs
Turn-off Time ⁵	< 2 μs	< 2 μs	< 2 μs
Central Wavelength	1064.0 ± 2.0 nm	1064.0 ± 2.0 nm	1064.0 ± 2.0 nm
Emission Linewidth ³	3.0 nm	3.0 nm	3.0 nm

Specifications

Mechanical Specifications

	NUQ-1064-NA-0020-YZ	NUQ-1064-NA-0030-YZ	NUQ-1064-NA-0050-YZ (Preliminary)
Delivery Fiber Length	3 m	3 m	3 m
Output Cable Minimum Bend Radius	30 mm	30 mm	30mm
Dimensions	215 x 95 x 284 mm	215 x 95 x 284 mm	215 x 95 x 284 mm
Weight	5.7 kg	5.7 kg	12.0 kg

Electrical Specifications

DC Supply Voltage	22 - 26 VDC	22 - 26 VDC	22 - 26 VDC
Current Consumption	6.0 A	8.0 A	15.0 A
Digital Interfaces ⁶	RS-232 & DB25	RS-232 & DB25	RS-232 & DB25

Environmental Specifications

Operating Ambient Temperature ⁷	0 to 42° C	0 to 42° C	0 to 42° C
Storage Temperature	-10 to 60° C	-10 to 60° C	-10 to 60° C
Operating Humidity	0 to 85% RH non-condensing	0 to 85% RH non-condensing	0 to 85% RH non-condensing
Warm-up Time	60 sec	60 sec	60 sec
Cooling	Air cooled	Air cooled	Air cooled

¹ Peak to peak at full rated power for 5 hrs.

² At the lowest PRR and full rated power.

³ FWHM at full rated power.

⁴ Typical rise time from 0 to 90% of max power at 80 kHz.

⁵ Typical fall time from 100% to 10% of max power at 80 kHz.

⁶ DB25 connector uses industry standard pin assignments.

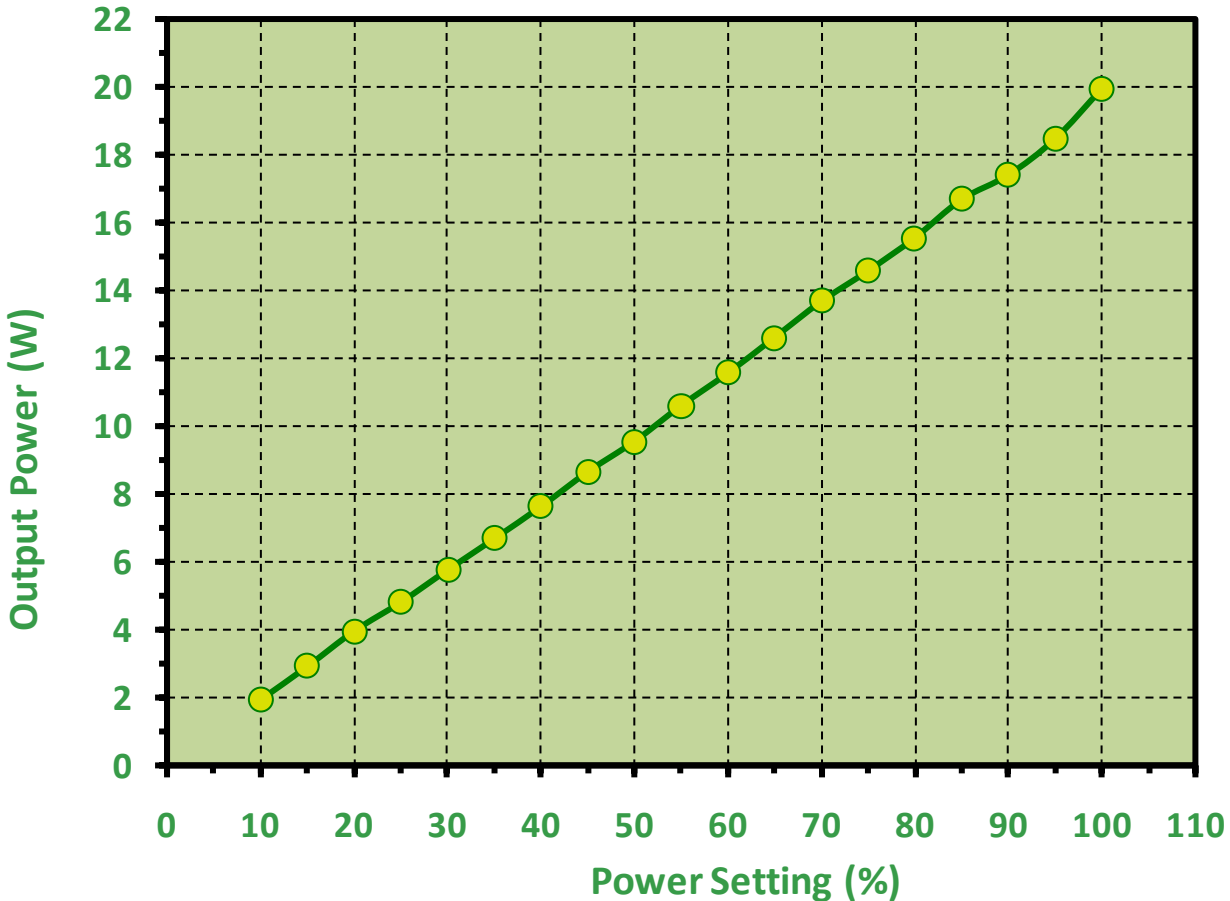
NUQ



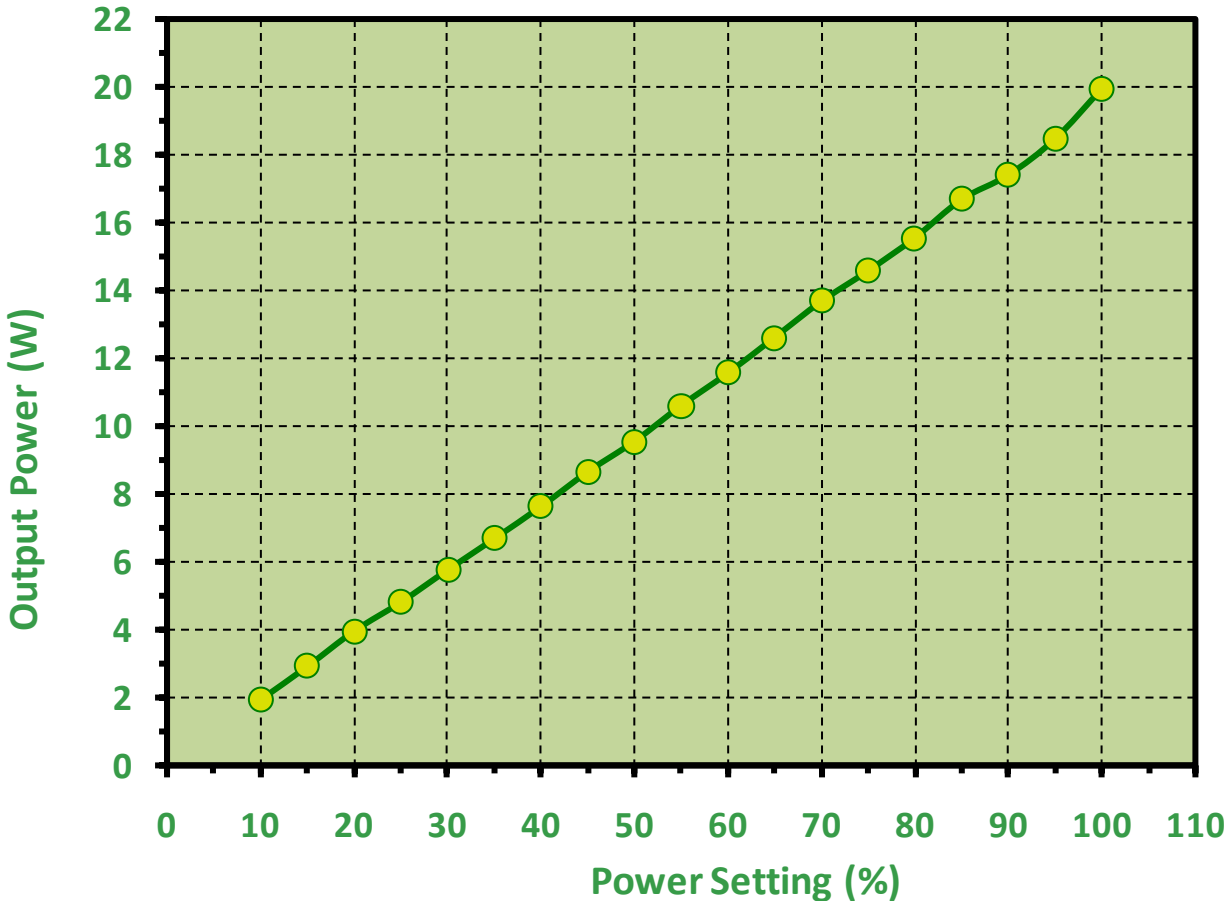
Mark Fast

Gaussian pulse shape — Highest peak power — Fastest On

Output Power Adjustable 10 → 100% (20W Unit)

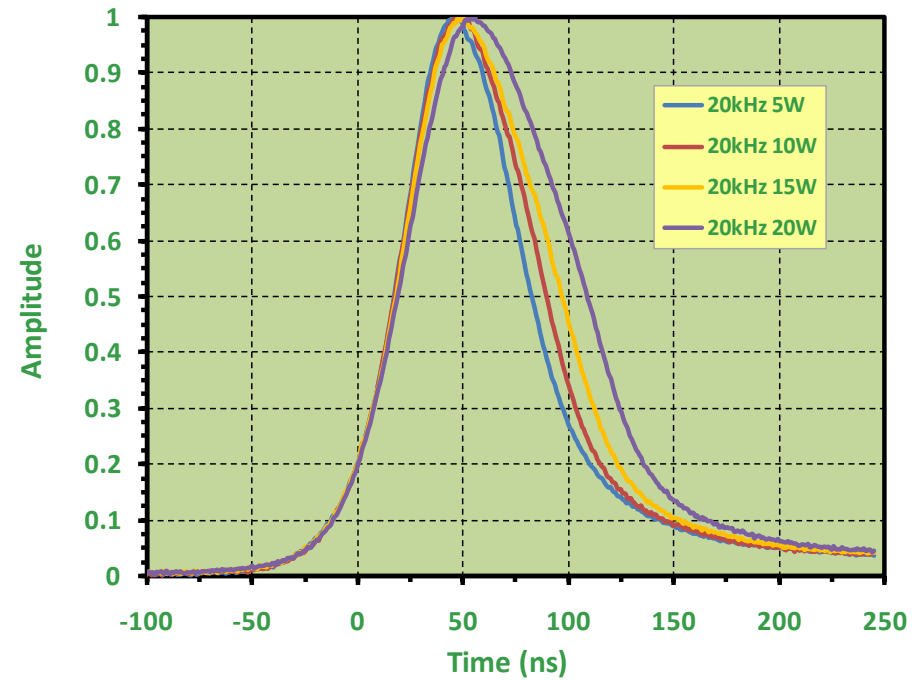
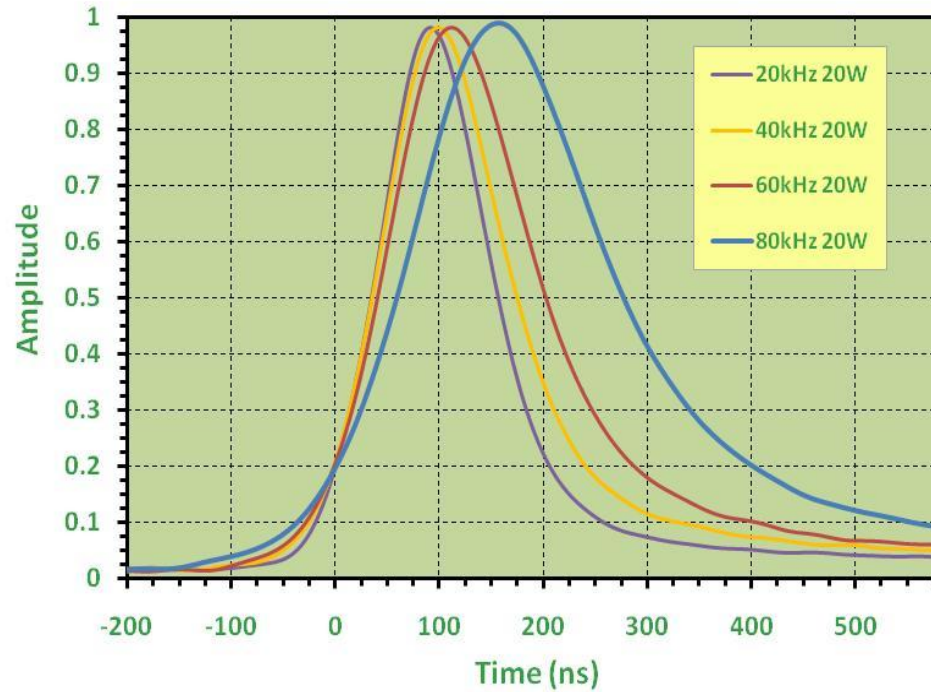


Output Power Adjustable 10 → 100% (20W Unit)

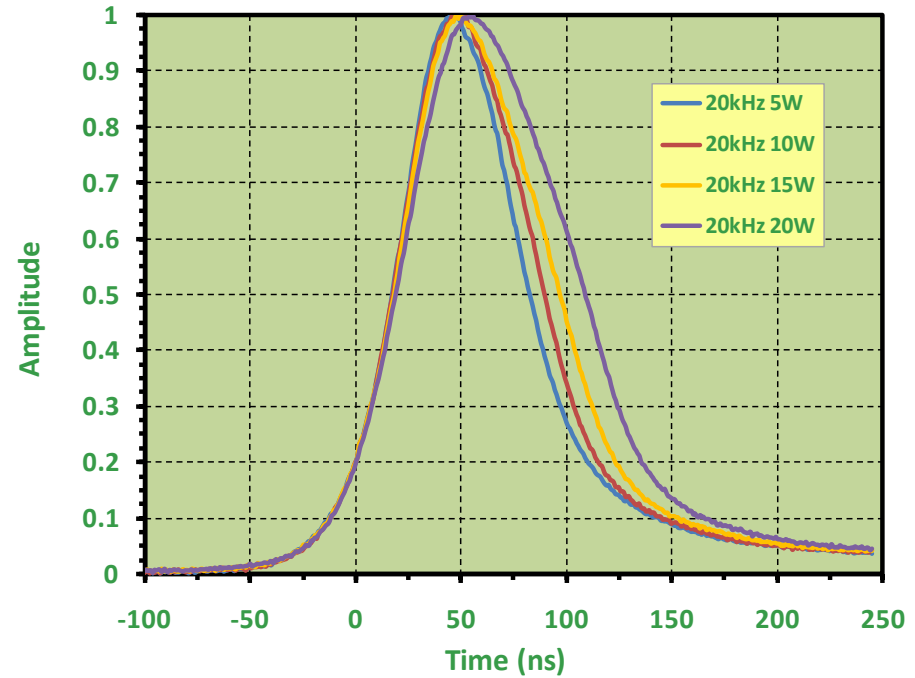
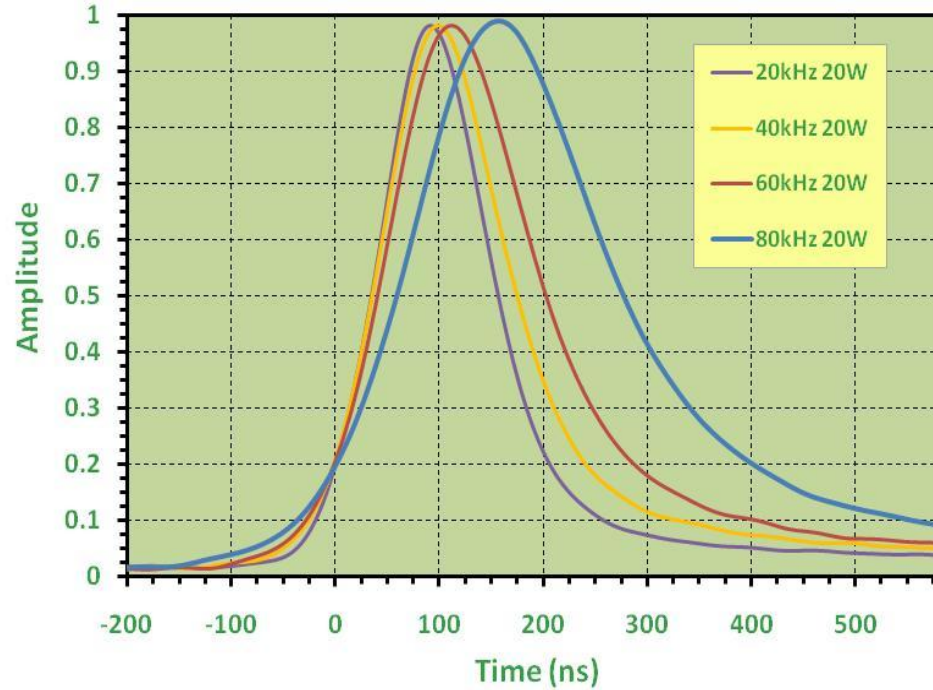


**Yields: Precise & repeatable marks on sensitive materials
Elimination of “over-burn” on critical applications**

Gaussian Like Pulse Shape (20W Unit)



Gaussian Like Pulse Shape (20W Unit)



Yields: Maximum vaporization of material → lowest dross & re-cast

Marking Results

NuQ QSW S/N:30015
No Ghost Marks



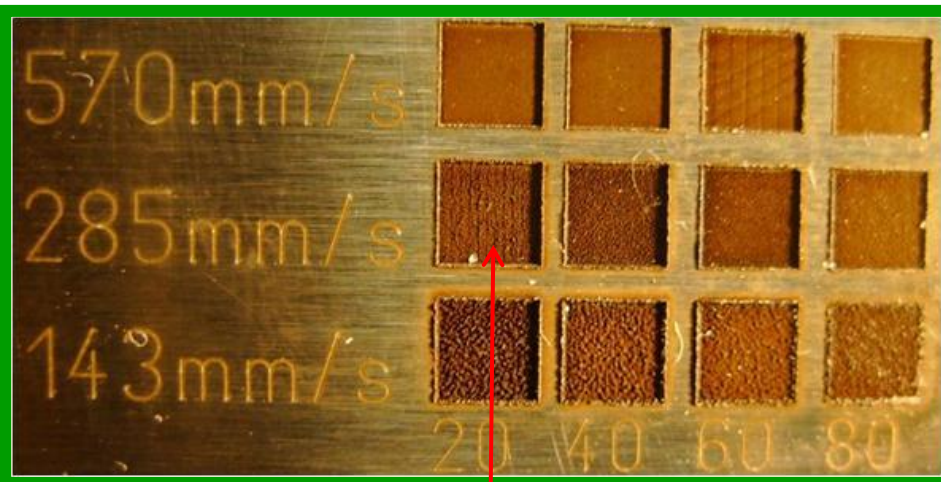
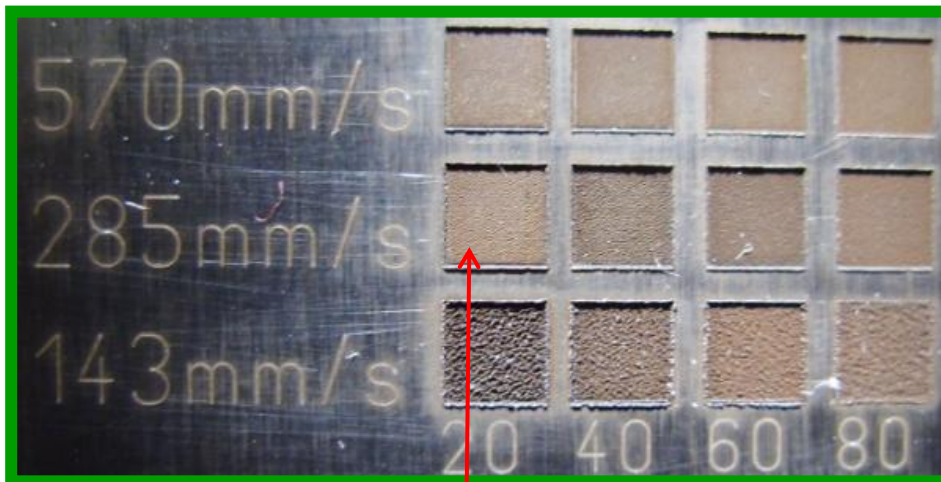
Competitors Standard
Ghost Marks & Low Marking Contrast



Deep Engraving (Stainless) Results

With NuQ-20W

With competitor's laser



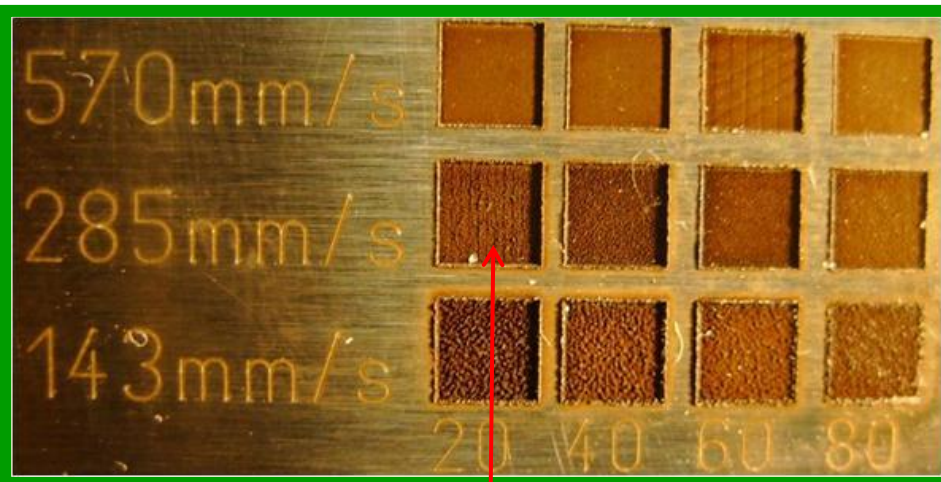
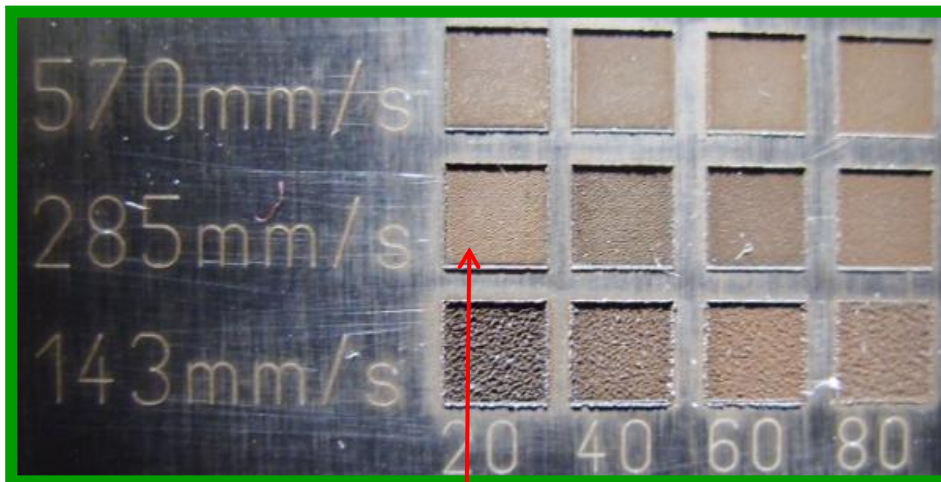
Smooth bottom surface

Rough bottom surface

Deep Engraving (Stainless) Results

With NuQ-20W

With competitor's laser

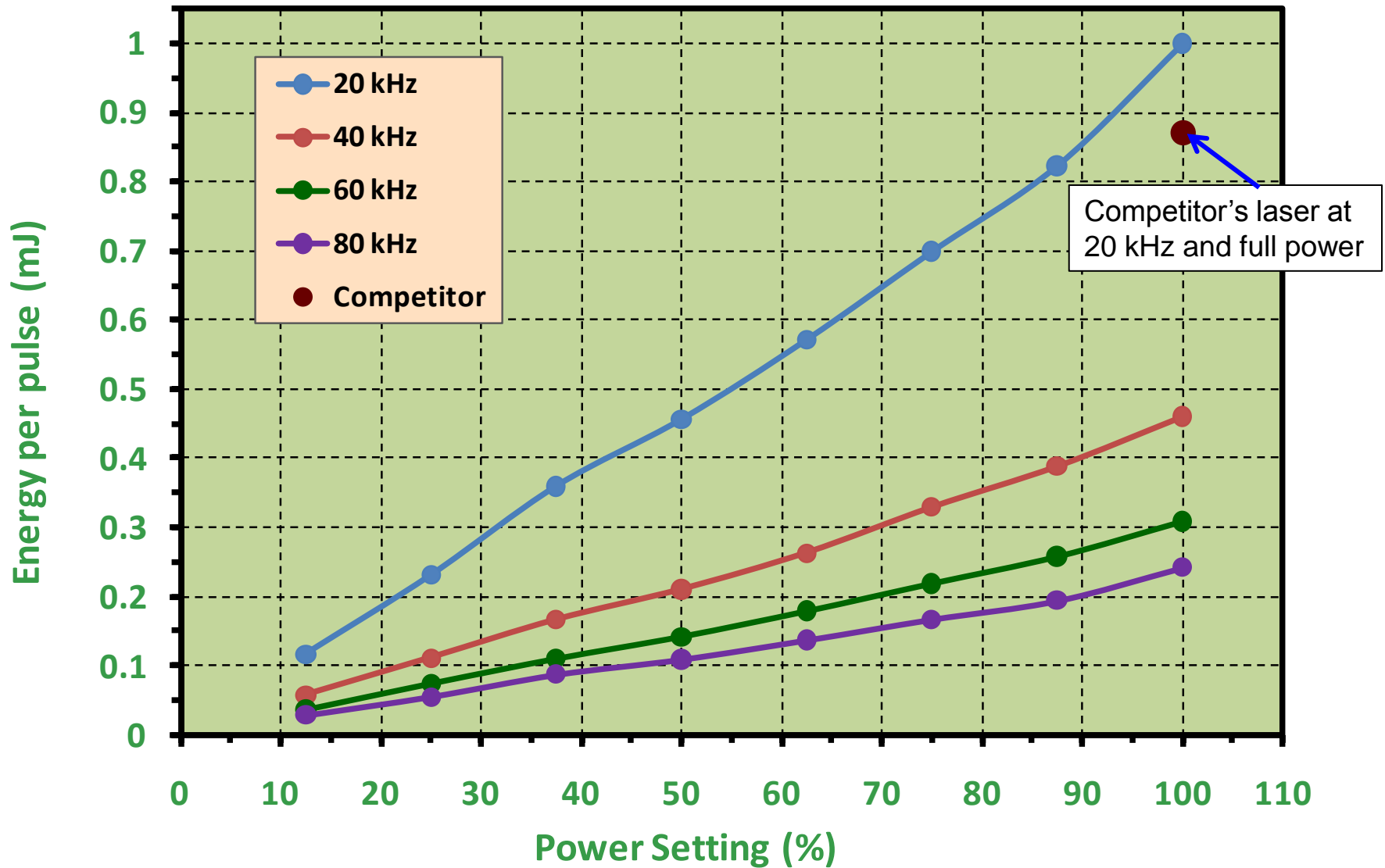


Smooth bottom surface

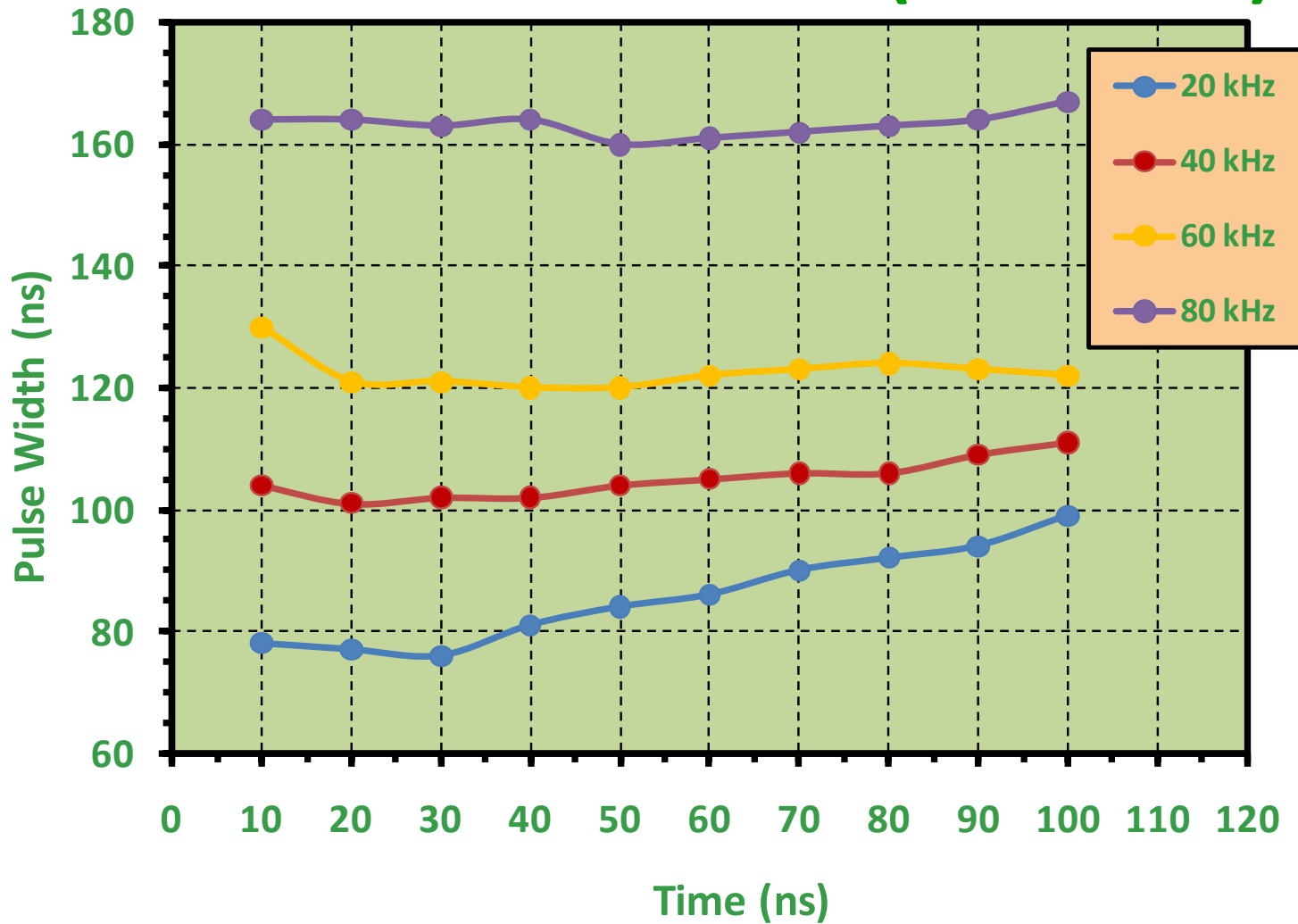
Rough bottom surface

Yields: Better finish for a more marketable end result

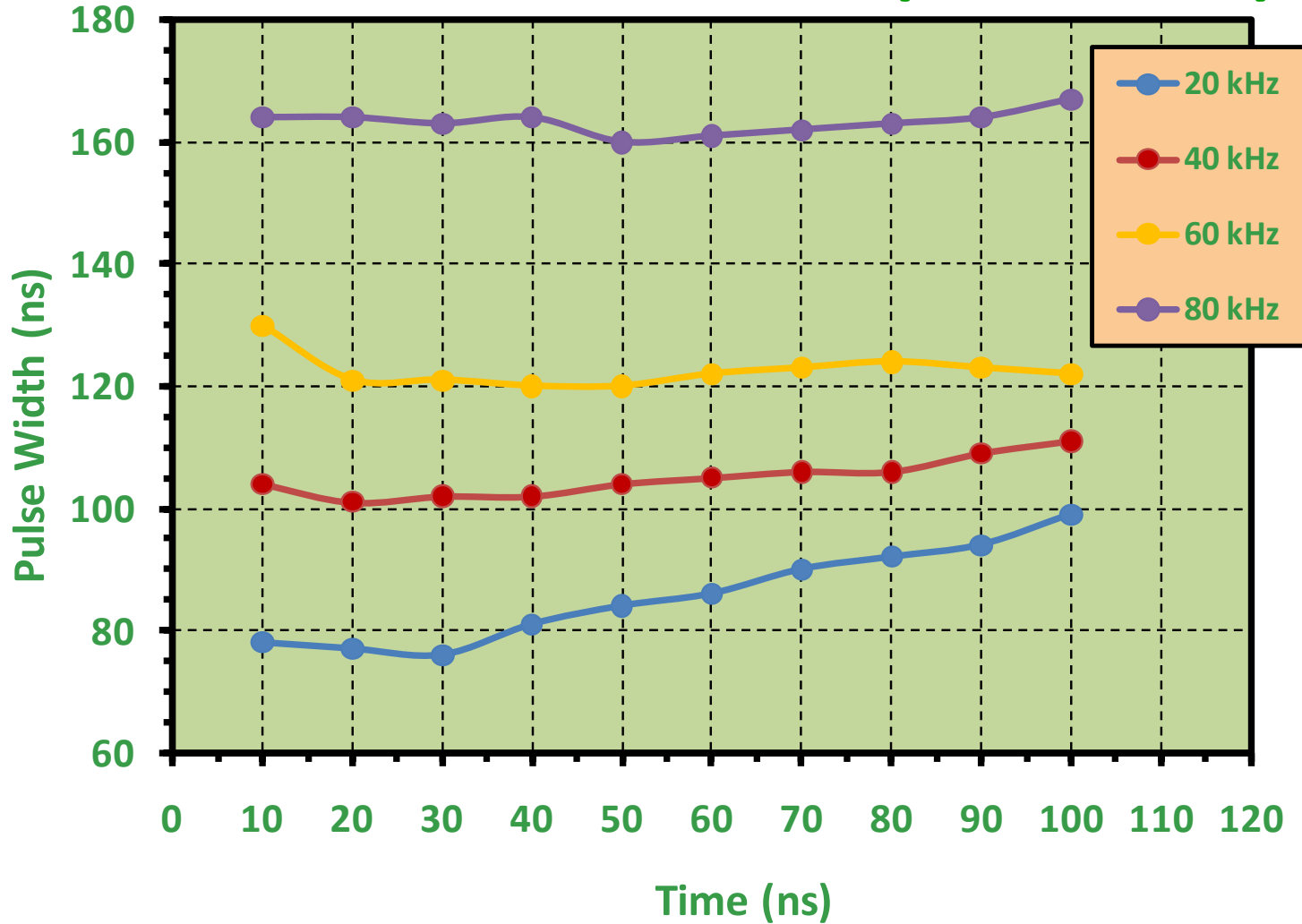
NuQ Peak Power vs. Strongest Competitor



Narrow Pulse Width (20W Unit)

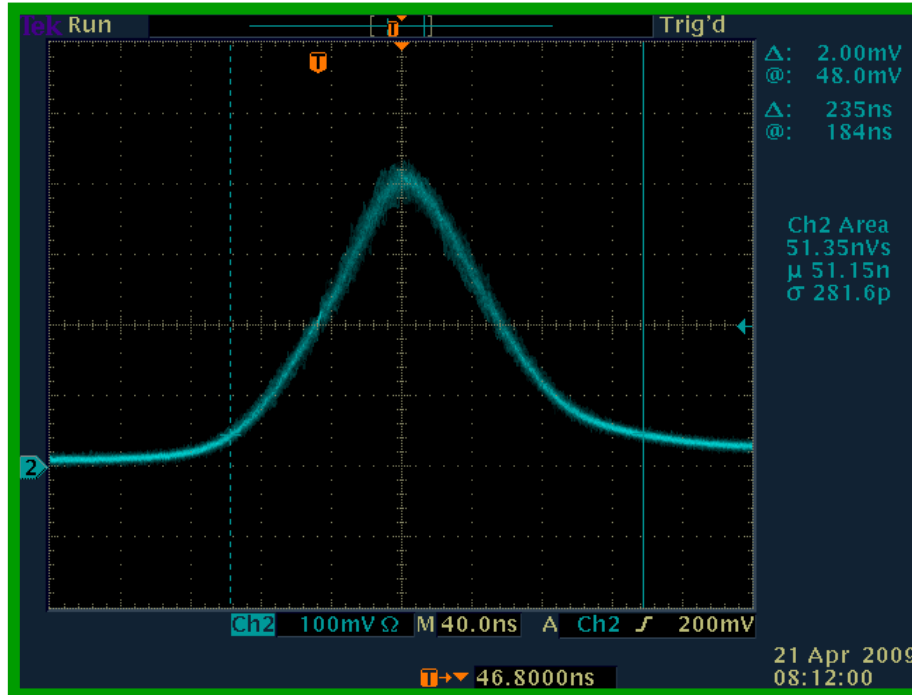


Narrow Pulse Width (20W Unit)

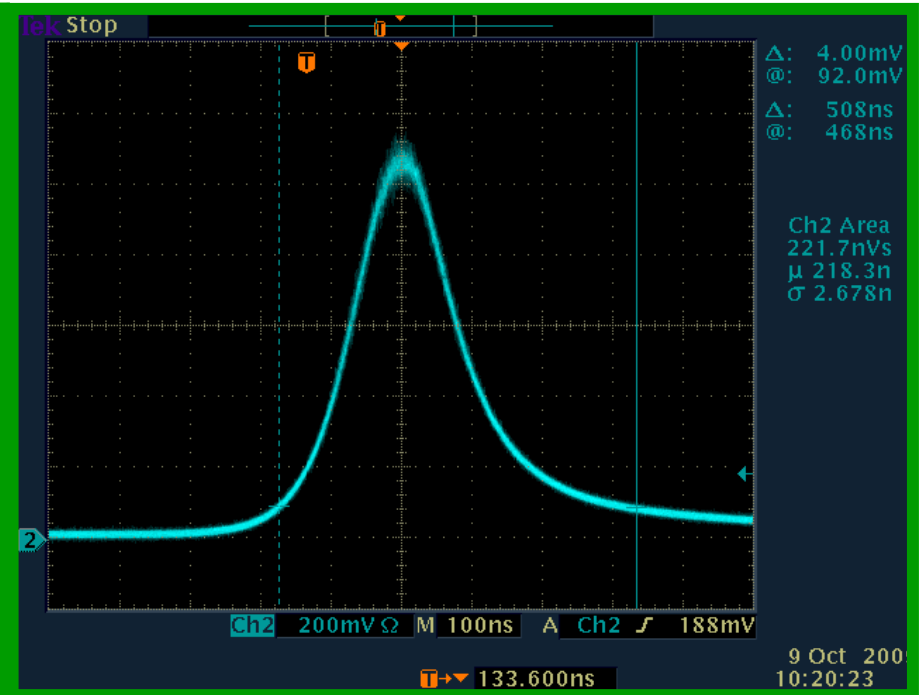


Yields: Highest energy density for deep marks

Excellent Pulse-to-Pulse Energy Stability (20W Unit)

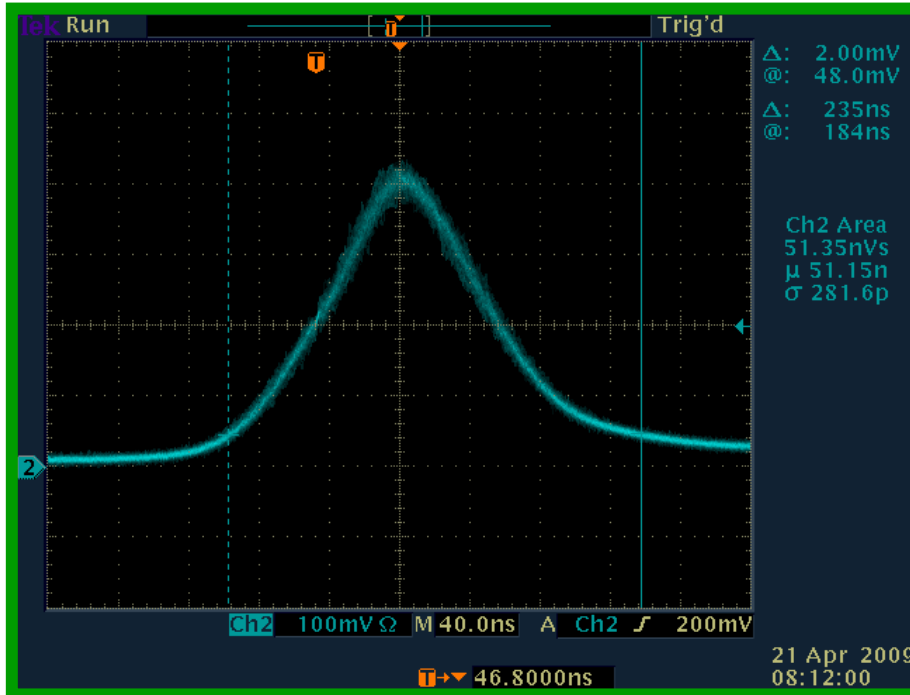


1.7% pulse-to-pulse energy variation at 20 kHz, full power.

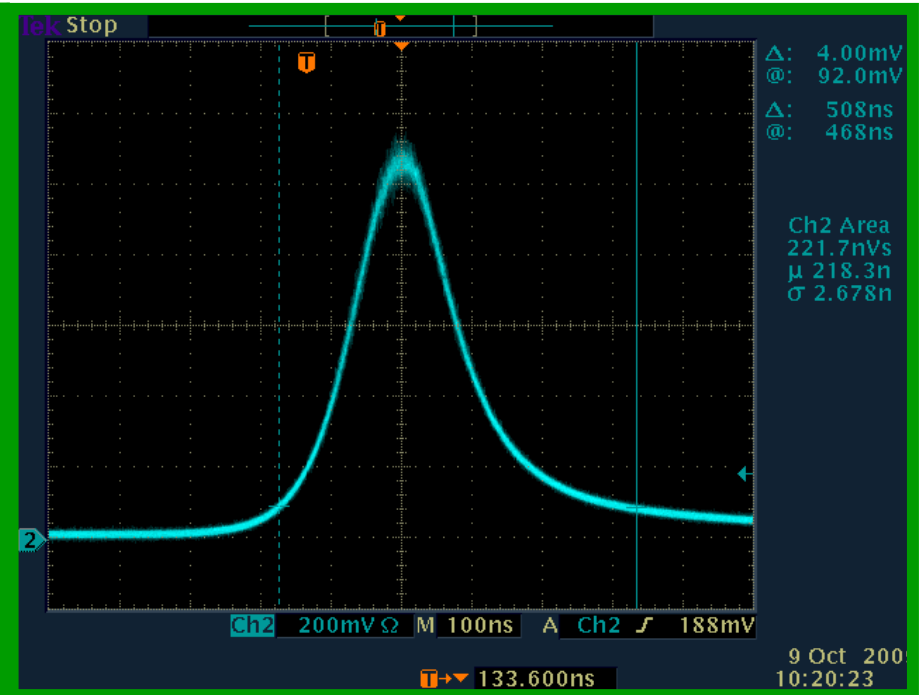


2.3% pulse-to-pulse energy variation at 80 kHz, full power.

Excellent Pulse-to-Pulse Energy Stability (20W Unit)



1.7% pulse-to-pulse energy variation at 20 kHz, full power.



2.3% pulse-to-pulse energy variation at 80 kHz, full power.

Yields: Highest mark repeatability in class

*defined as $3\sigma/\mu$ of pulse area.

NUQ

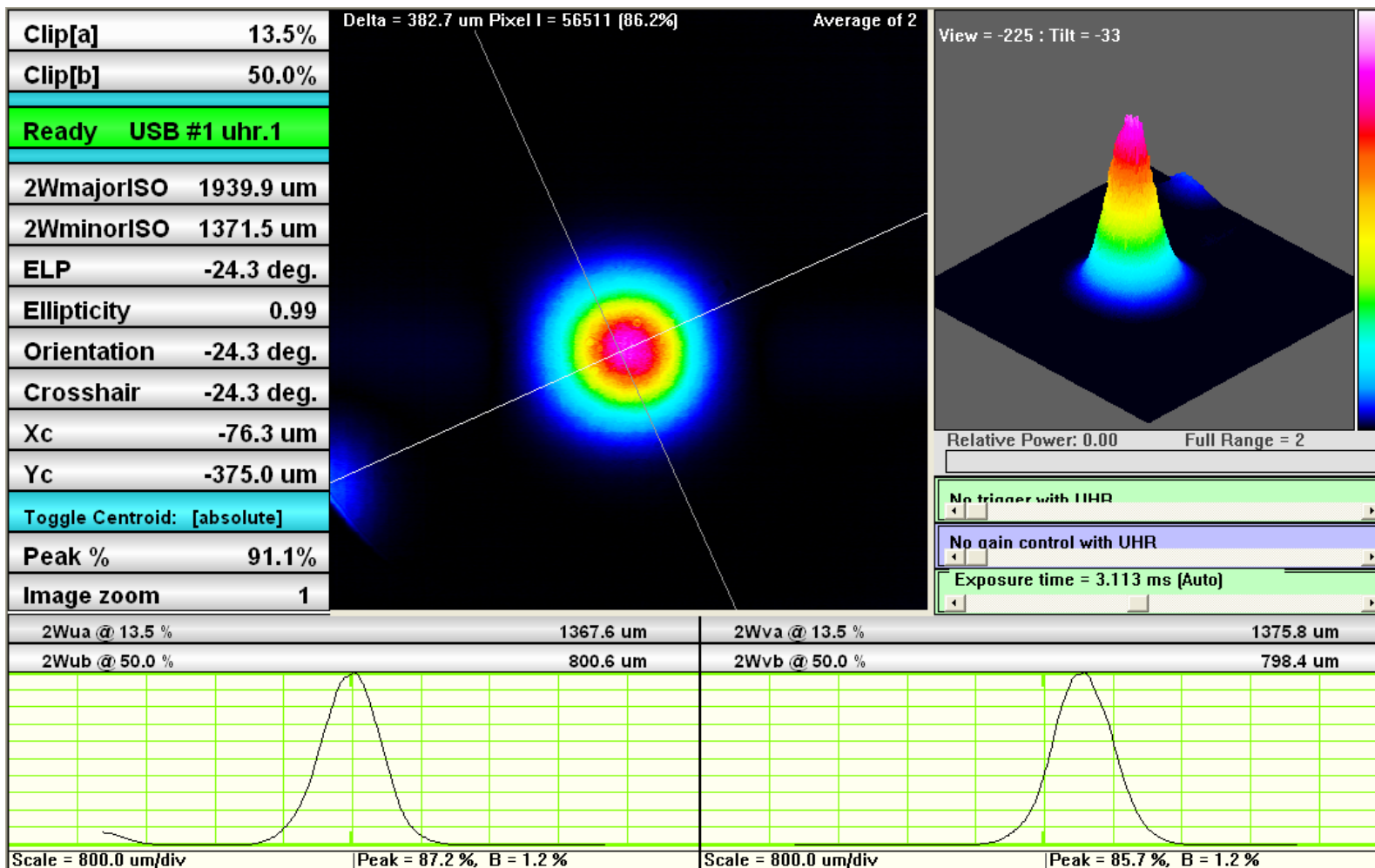


More Marking Power Per Watt

Gaussian pulse shape — Highest peak power — Fastest On

NUFERN[®]

High Beam Quality with High 90% Circularity



NUQ



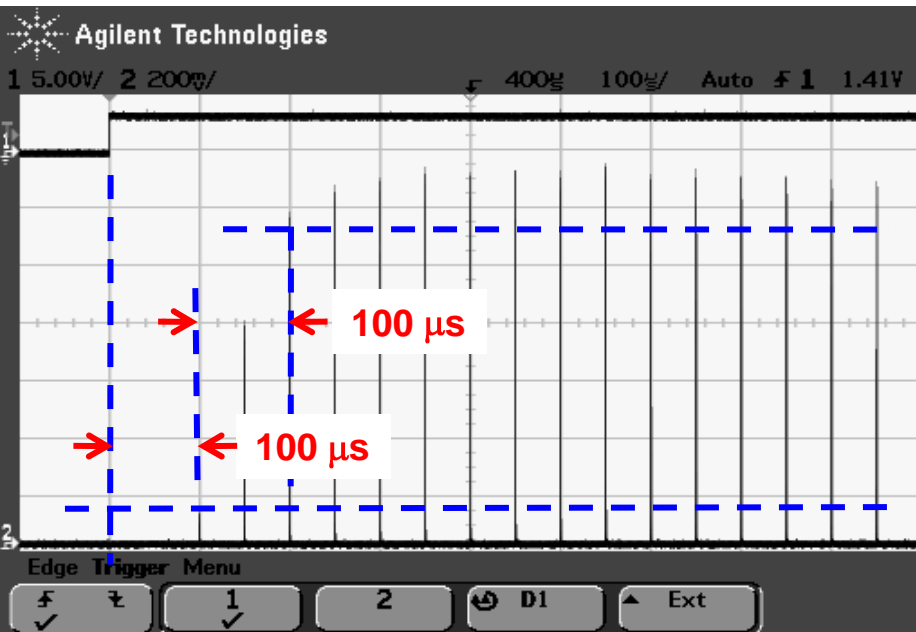
Ultra-Fine, Crisp Marks

Single-mode beam quality

NUFERN[®]

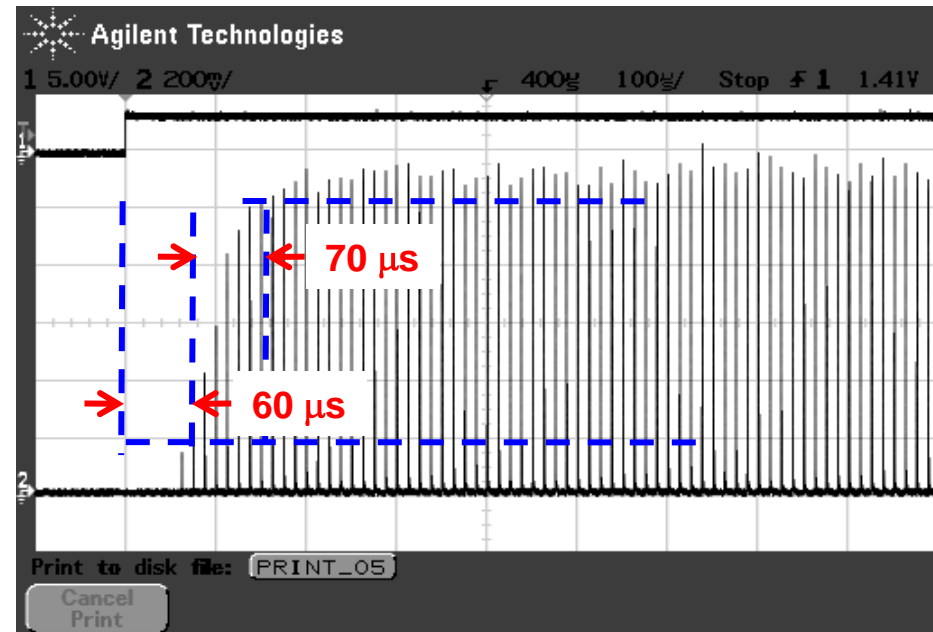
Fast Turn-on Time

20 kHz, 20W Turn on Time



100 ms delay time from laser turn on
100 ms 10% to 90% rise time

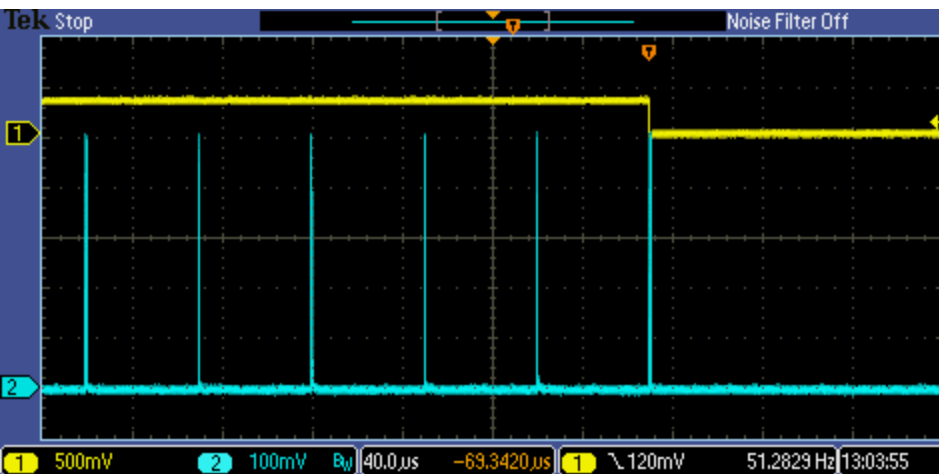
80 kHz, 20W Turn on Time



60 ms delay time from laser turn on
70 ms 10% to 90% rise time

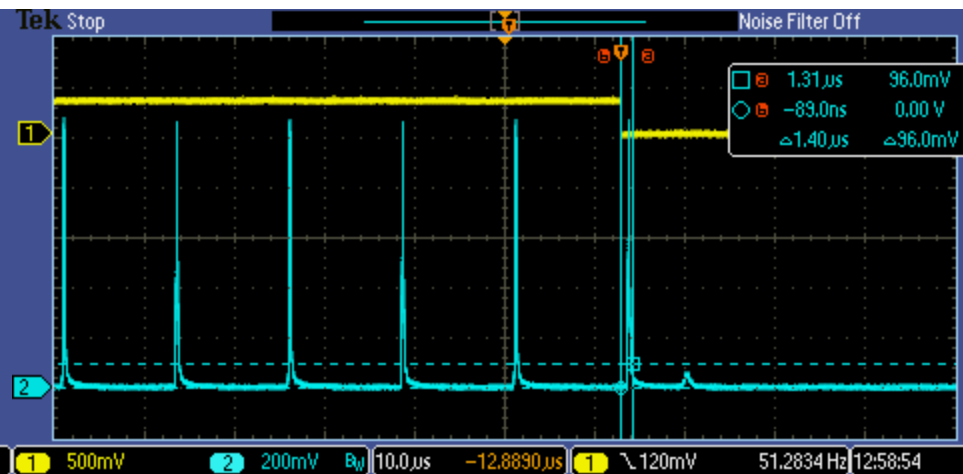
Fast Turn-off Time with $< \mu\text{W}$ Leakage

20 kHz, 20W Turn off Time



Instant turn off

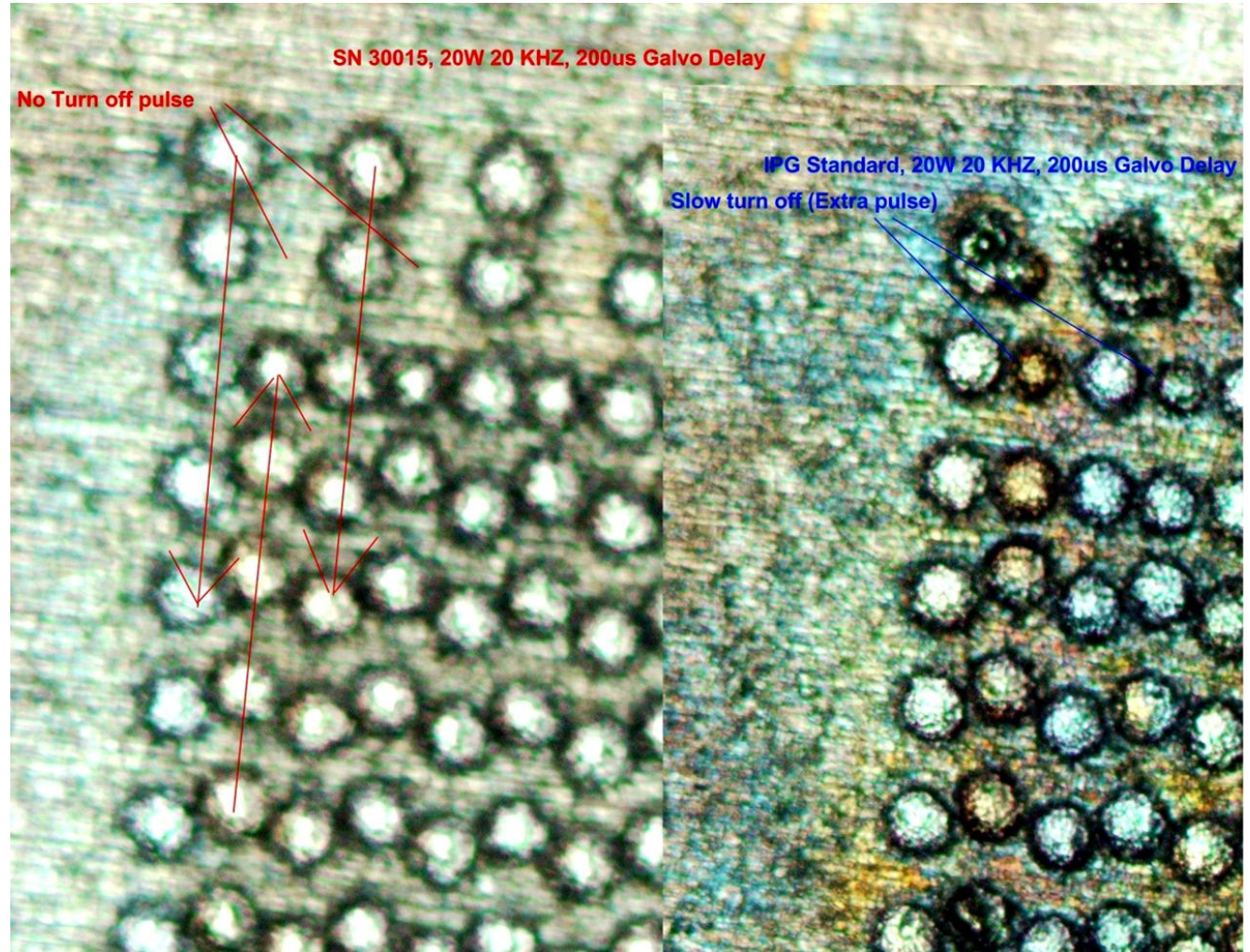
80 kHz, 20W Turn off Time



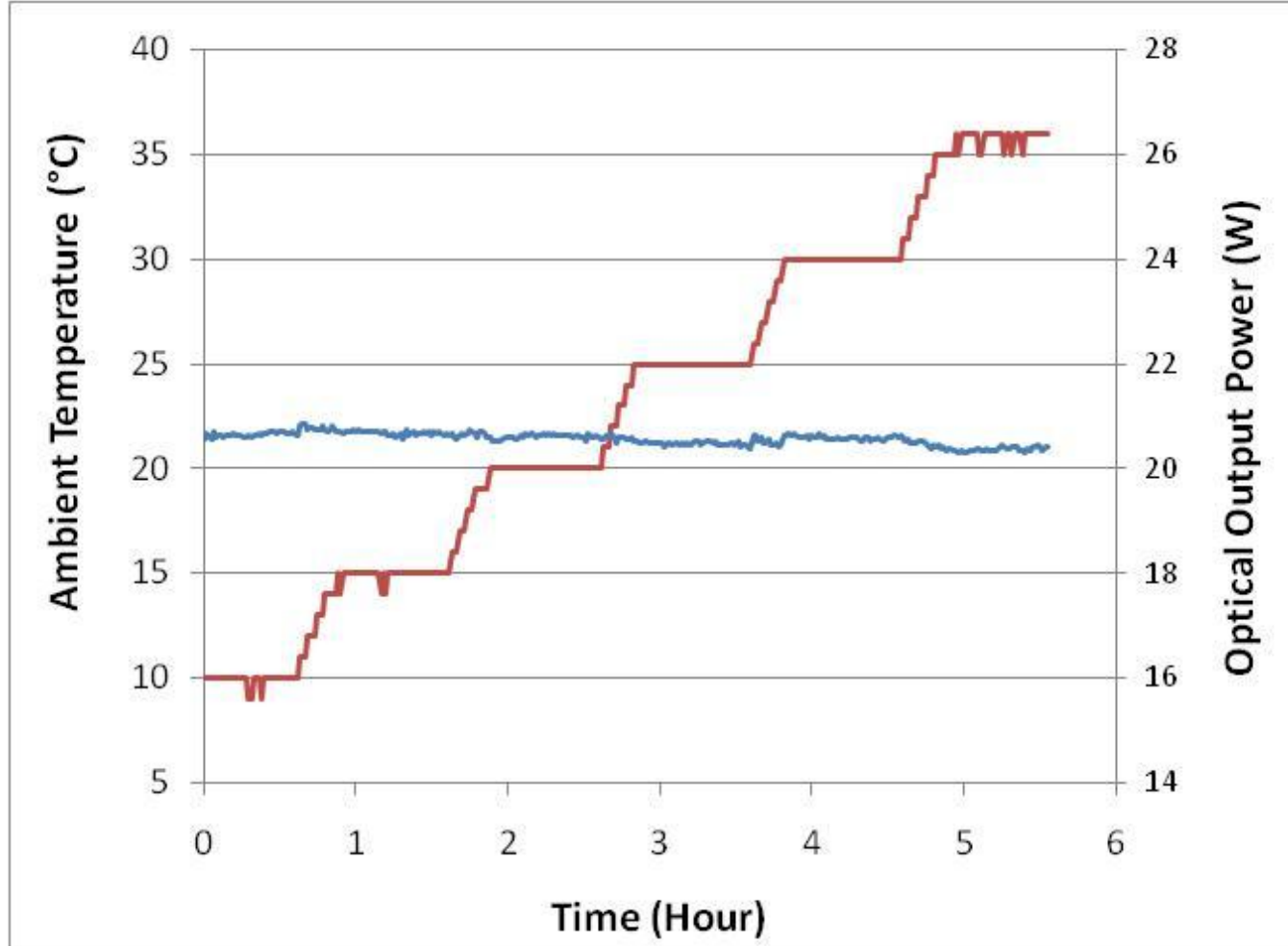
Turn off within 1.4 ms

Marking Results

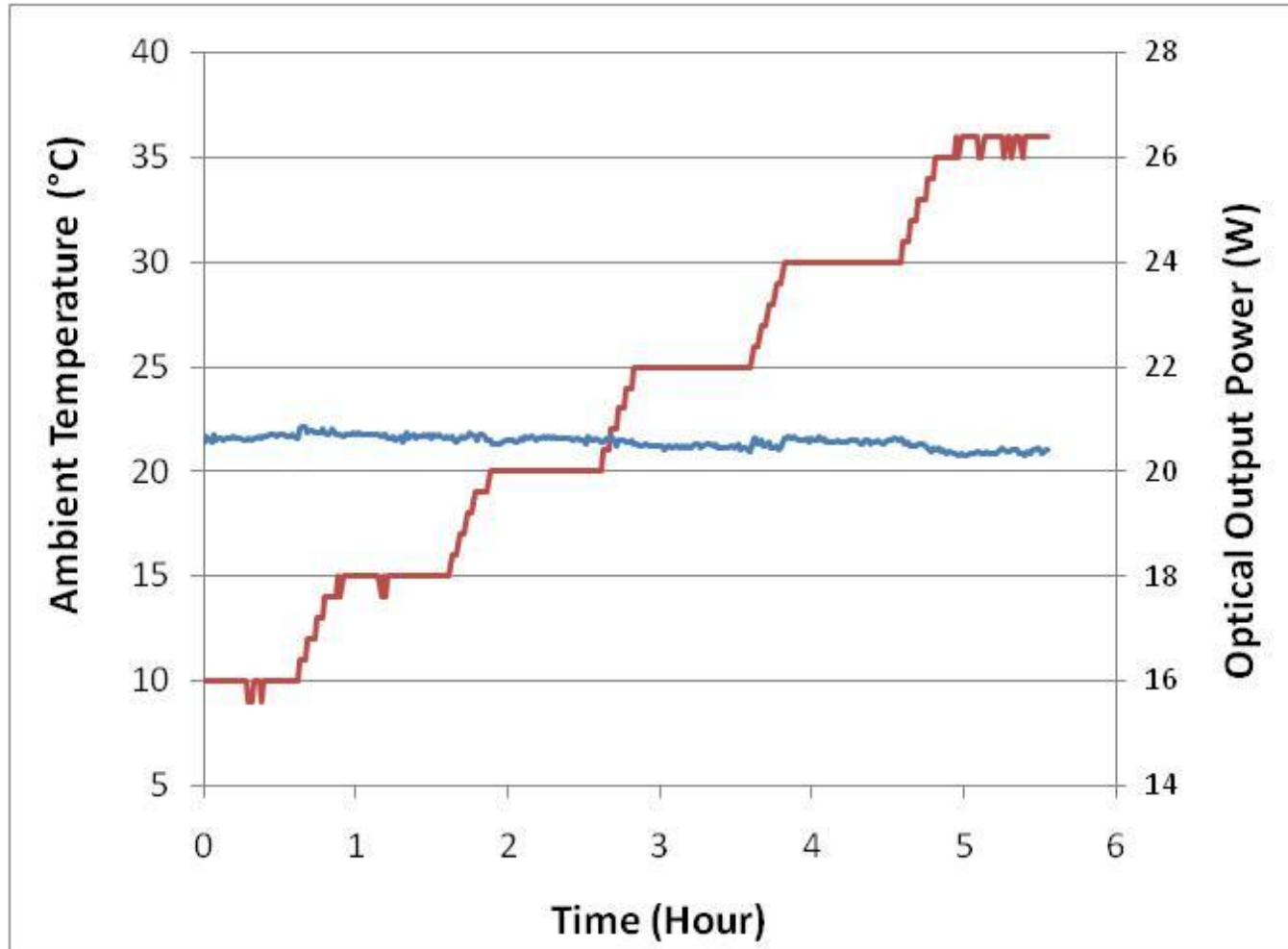
1. Long IPG turn off time results in two aftermaths:
2. The galvo head may need to decelerate for a long time, resulting in low marking speed.
3. When galvo head delay is set to short for high marking speed, the slow turn off pulse train leaves a irregular turn around ghost trace and sacrifice the marking contrast.



Stable Over a Widest Temperature Range

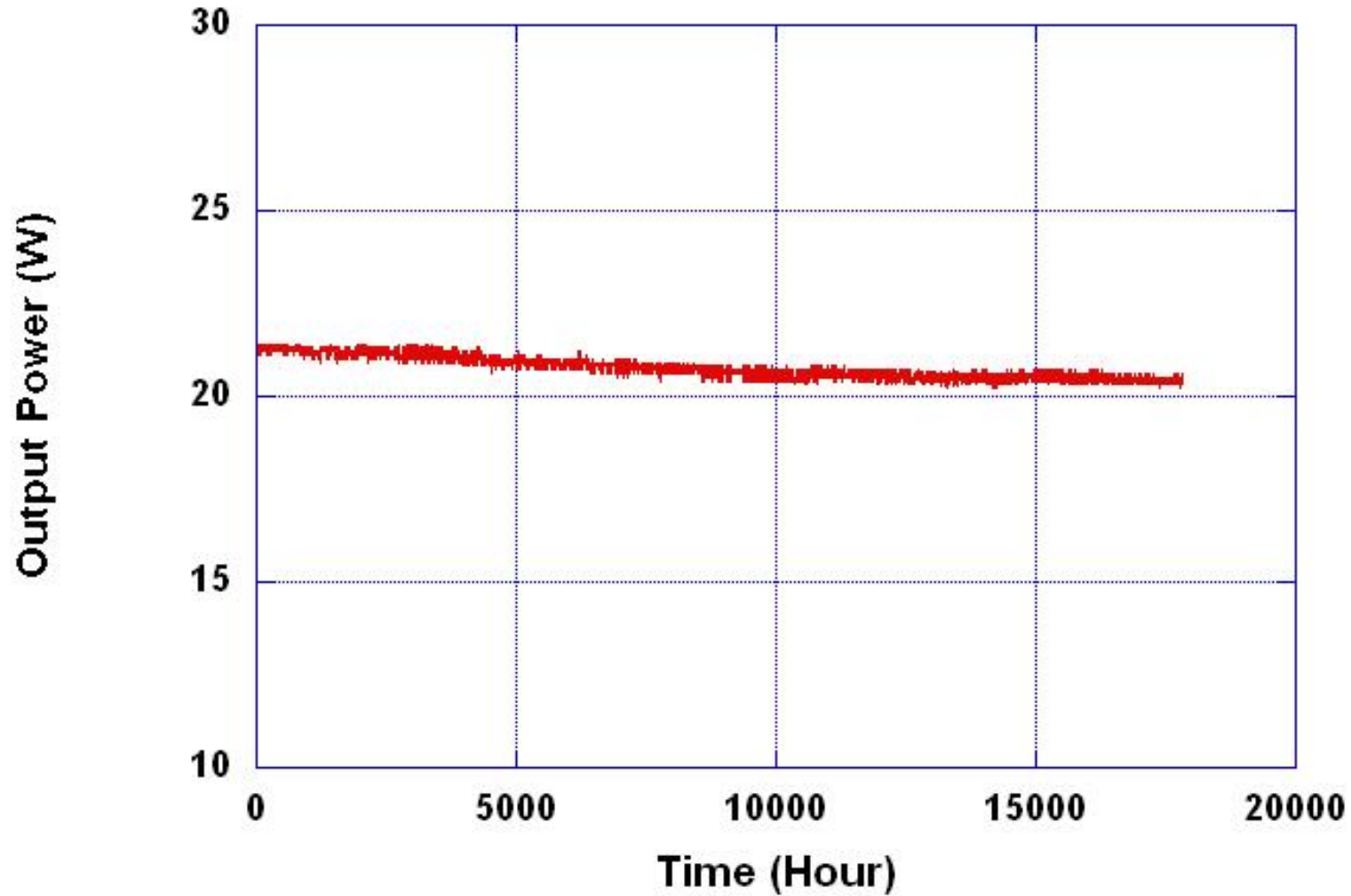


Stable Over a Widest Temperature Range

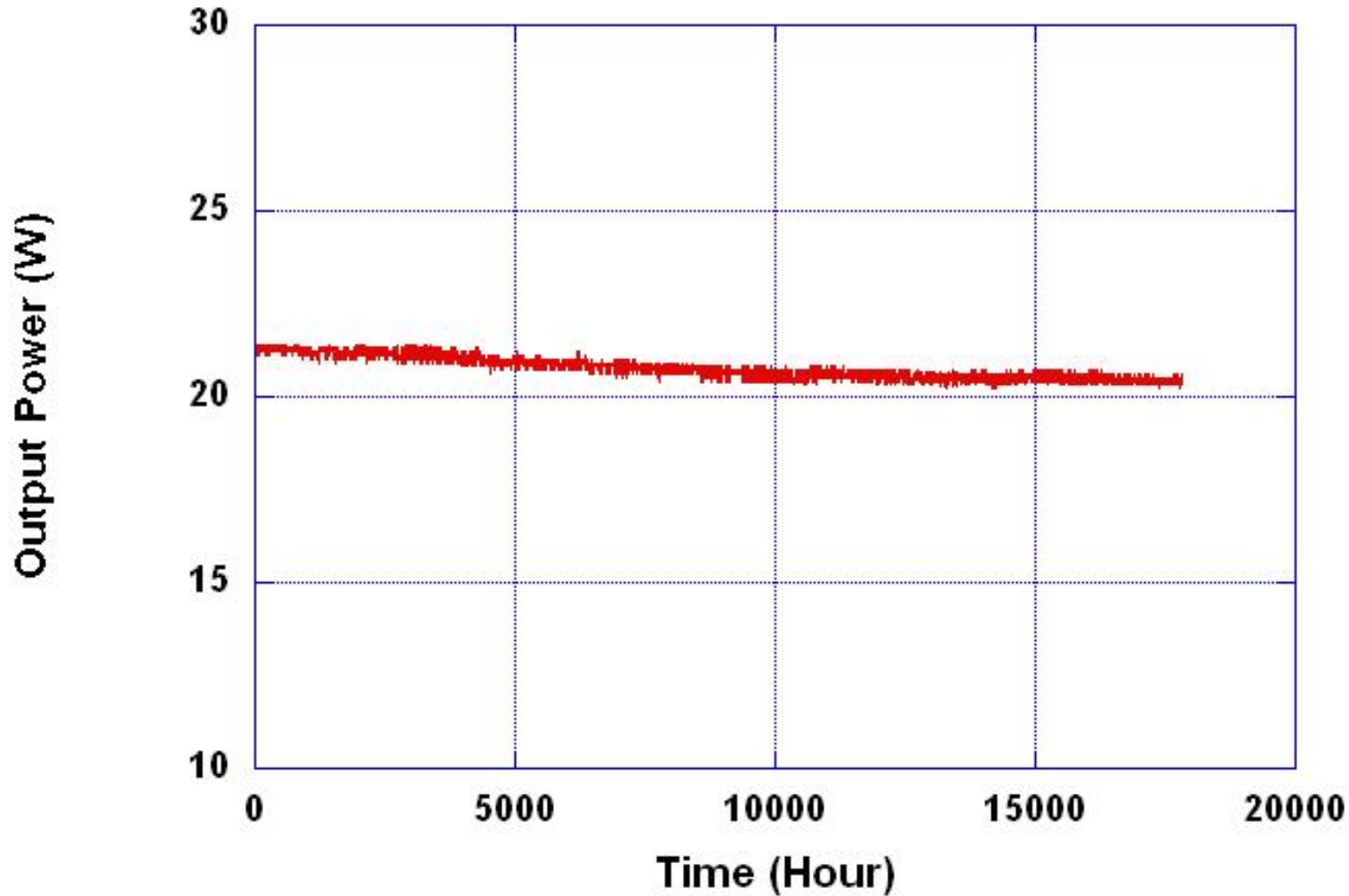


Yields: Greatest application ease

High Long Term Reliability



High Long Term Reliability



Yields: Great commercial value



Make the Switch

