



NORTHROP GRUMMAN

DEFINING THE FUTURE

RBA Nd:YVO Data

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Rev C

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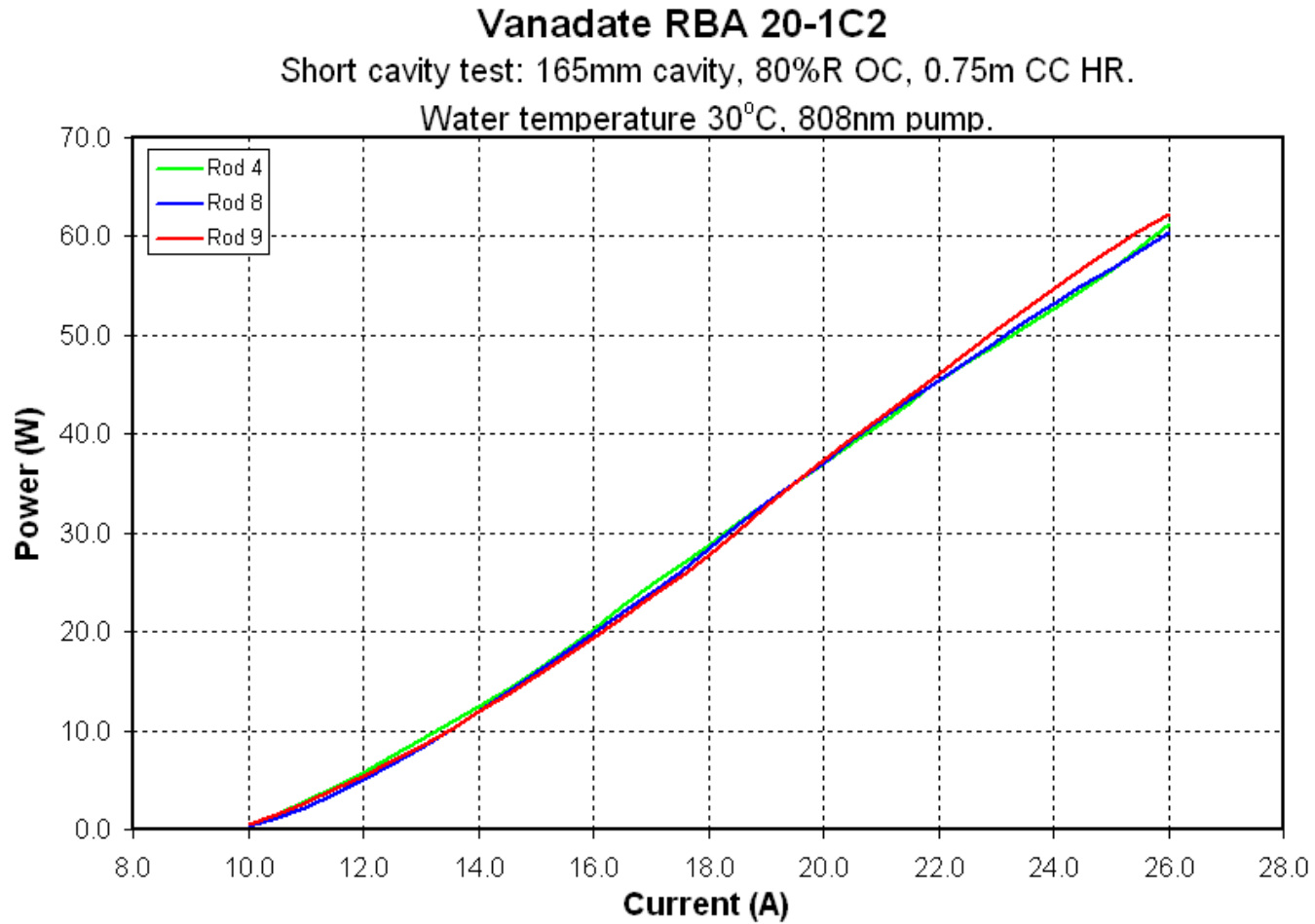
Vanadate Pump Modules

- Vanadate modules can be used both as oscillators and amplifiers.
- Has a shorter upper state lifetime than YAG and higher gain cross section.
- This means it has better performance at higher q-switch repetition rate, and larger small signal gains for amplifiers.
- It also operates at the same wavelength as Nd:YAG. Thus a Nd:YVO₄ module can amplify a Nd:YAG laser oscillator.



- Vanadate is polarized unlike YAG.
- Side pumping enabled by using an a-axis rod. The c-axis can be aligned as desired.
- 2mm x 40mm rod.

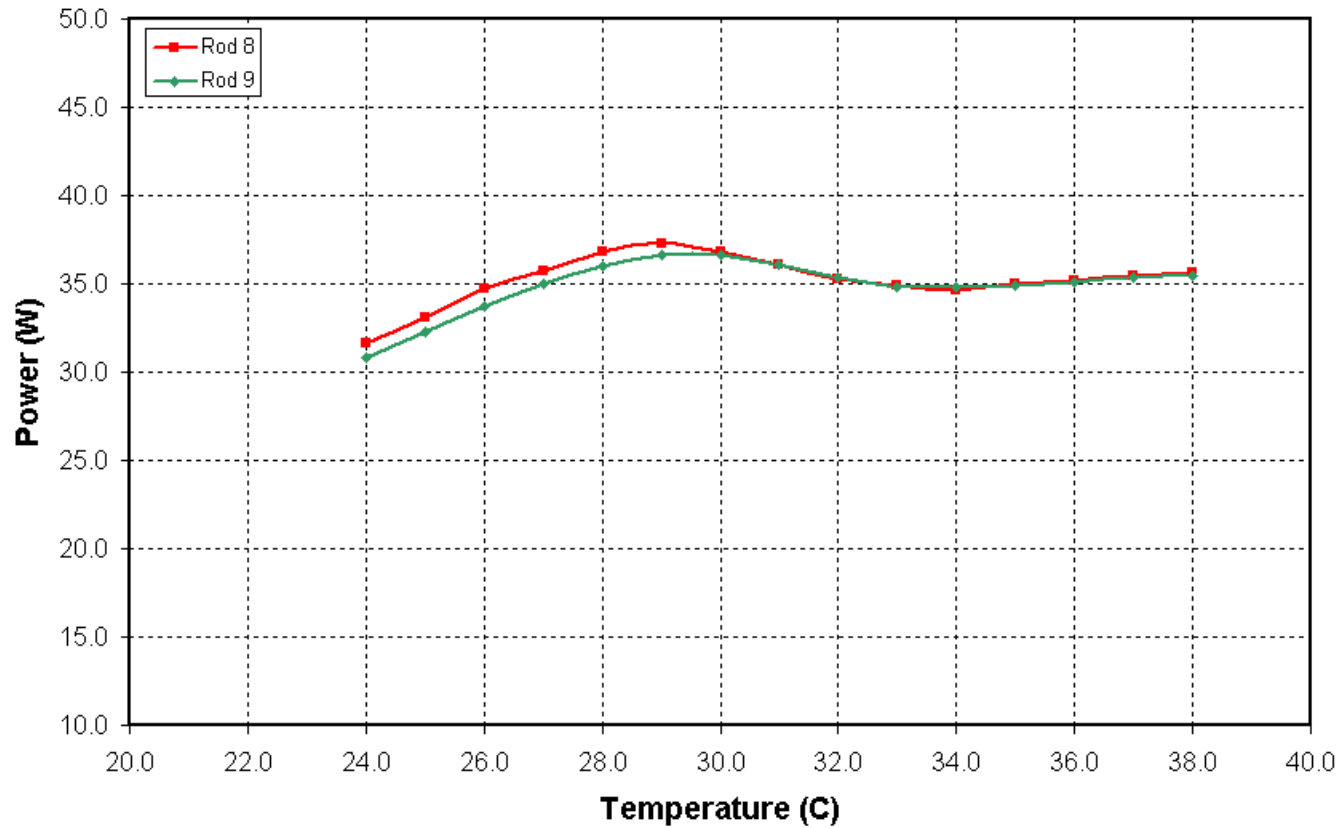
Power vs. Current



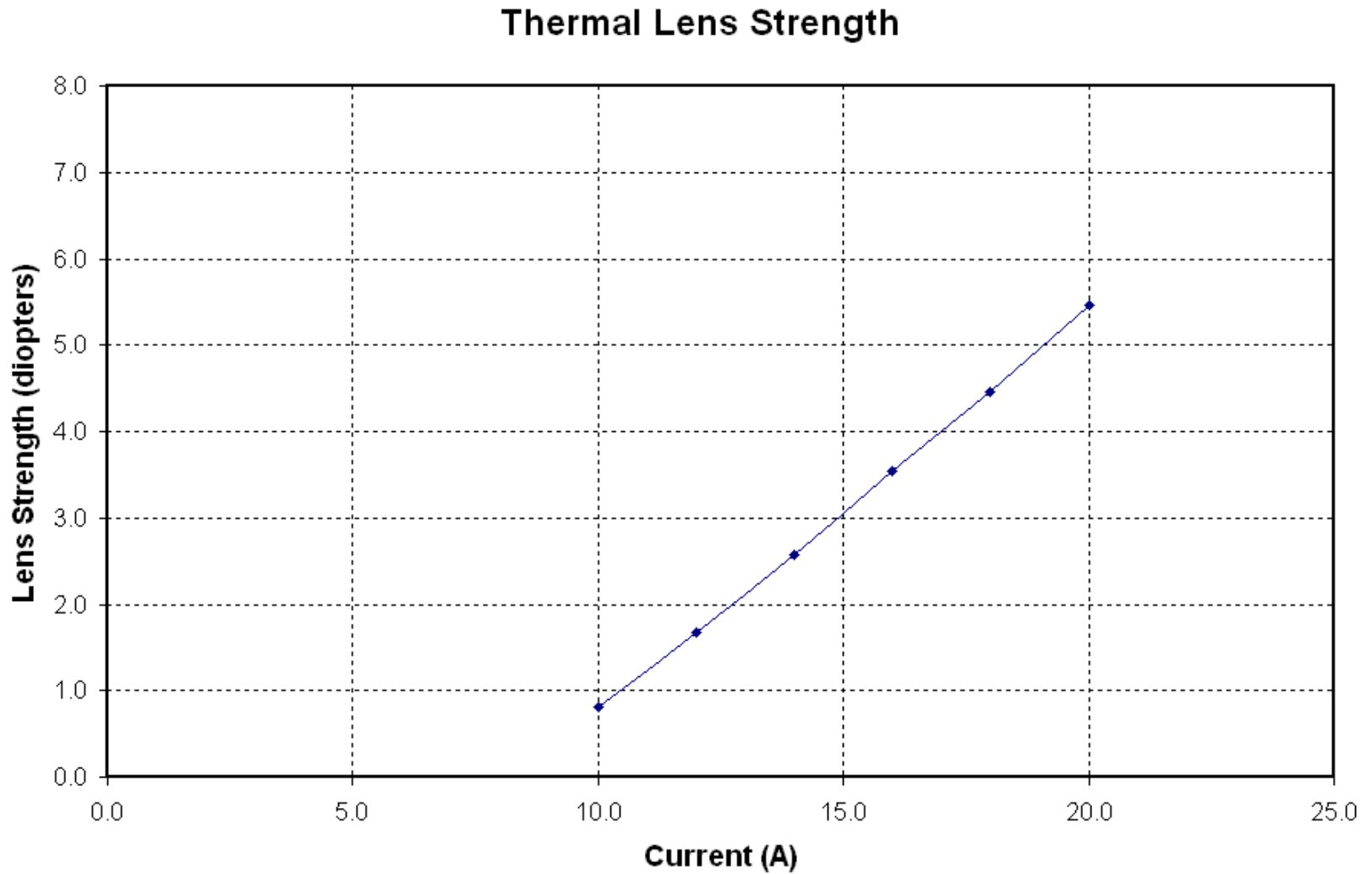
Power vs. Temperature

Temperature Tuning Vanadate RBA20-1C2

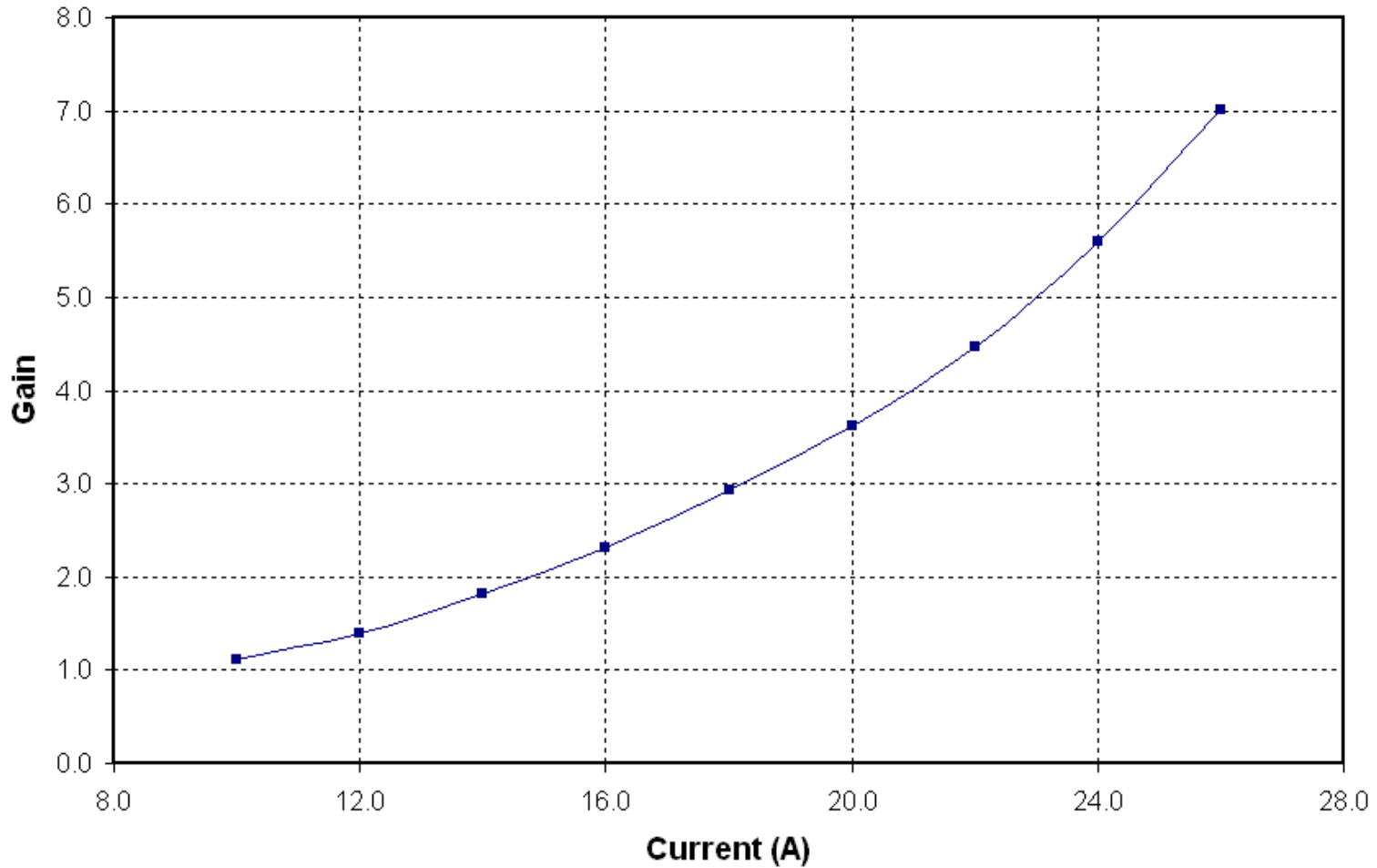
In 165mm cavity and at 20A drive current.



Thermal Lens Strength



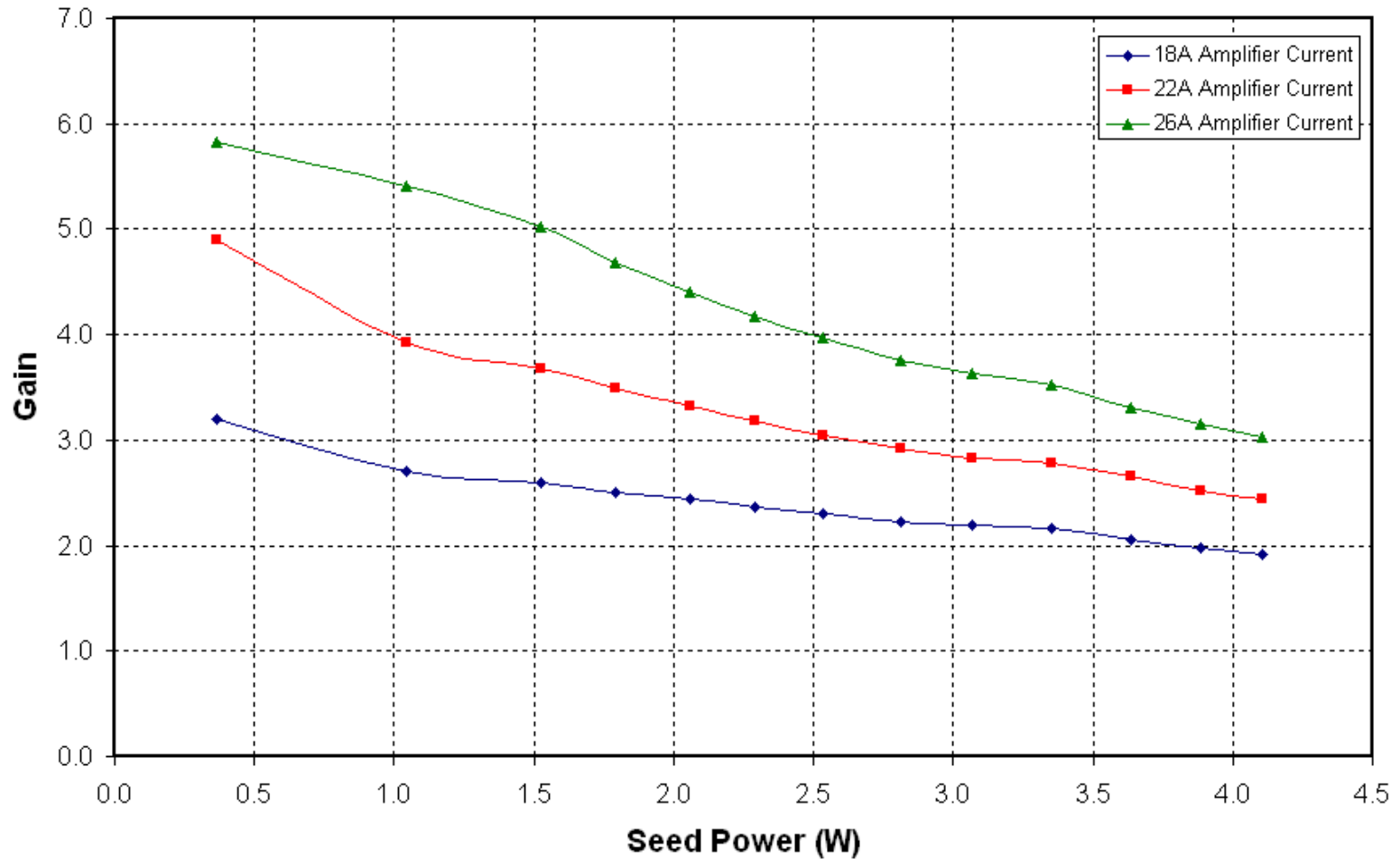
Small Signal Gain YVO4



Large Signal Gain

Amplifier Gain at Various Amplifier Currents

Seed Laser: 10kHz, 35-50ns, $M^2 = \sim 1.2$

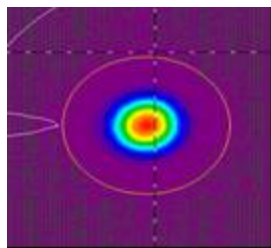


Beam Quality Preservation

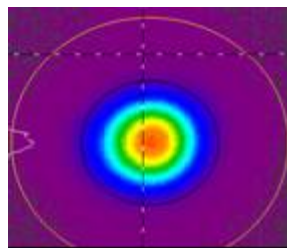
- Source laser is a 10kHz, 40ns, 3.8W YAG laser.

Amplifier Current (A)	M_x^2	M_y^2
0	1.19	1.28
18	1.28	1.41
22	1.19	1.39
28	1.2	1.34

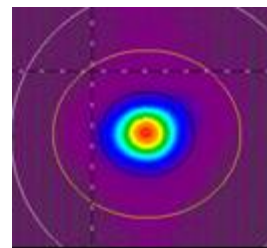
Post amplifier beam profiles.



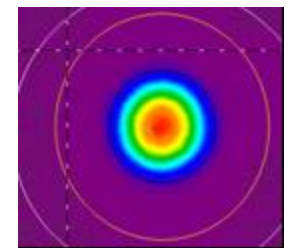
0A



18A



22A



28A

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