

**Enhanced Stack-bar package using advanced
collimation system
(In cooperation with OSRAM)**

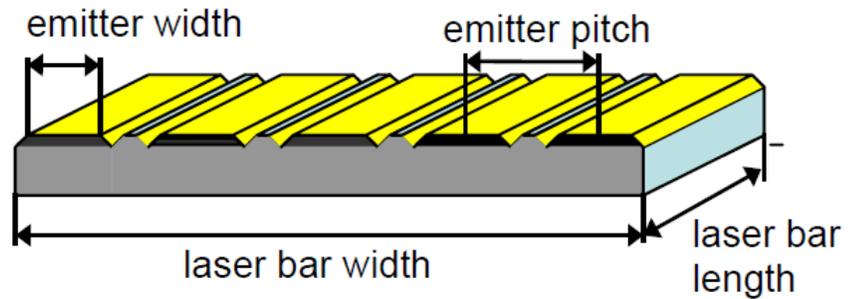


Purpose – Make High Power > 3kW and High Bright laser for
Aesthetic treatment

Obstacles: High bright laser systems are limited in total power due to high density of emitters and requires sophisticated cooling systems

BOM

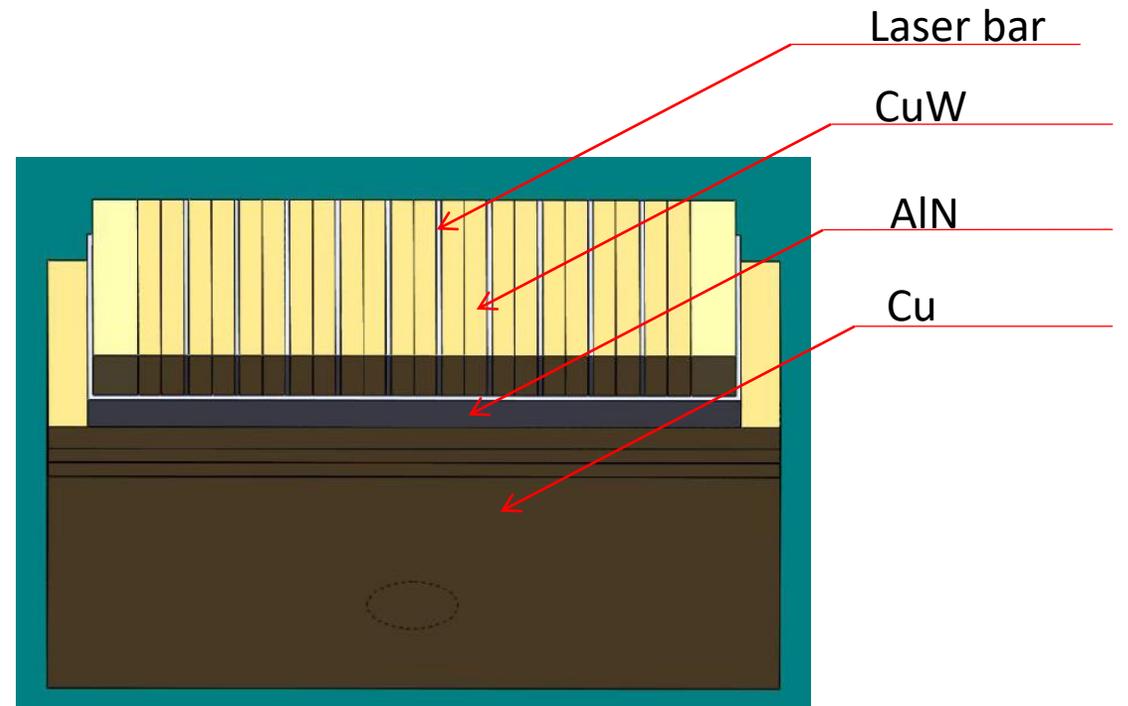
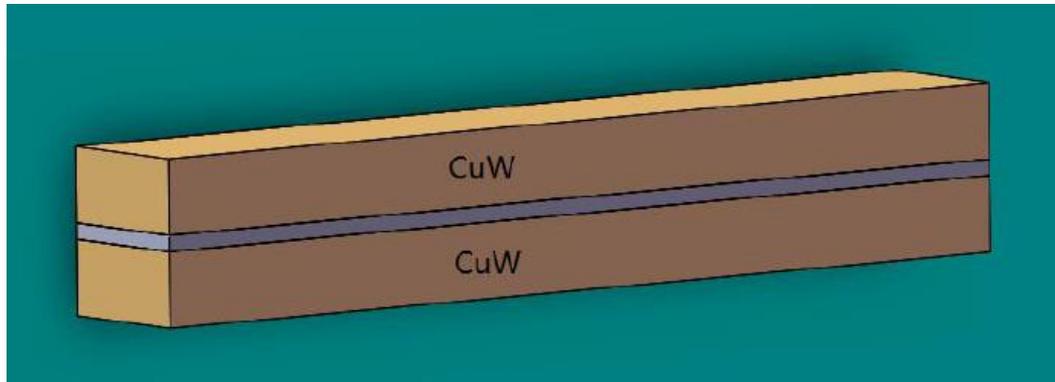
Type	Power ¹⁾	Wavelength ²⁾	Ordering Code
SPL BK81-15	100 W	805 ± 10nm	Q65112A4201



Dimensions

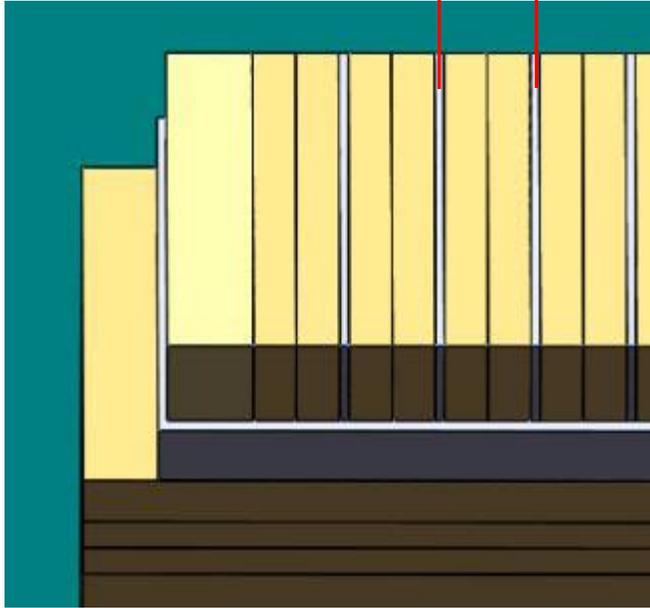
Parameter	Values			Unit
	min.	typ.	max.	
Number of emitters	-	23	-	
Single emitter contact width	-	200	-	µm
Emitter pitch	-	400	-	µm
Fill factor	-	50	-	%

10-Bar Stack on Sub-mount ~1.4kW



High Brightness and Laser Cooling

Bar-to-bar pitch

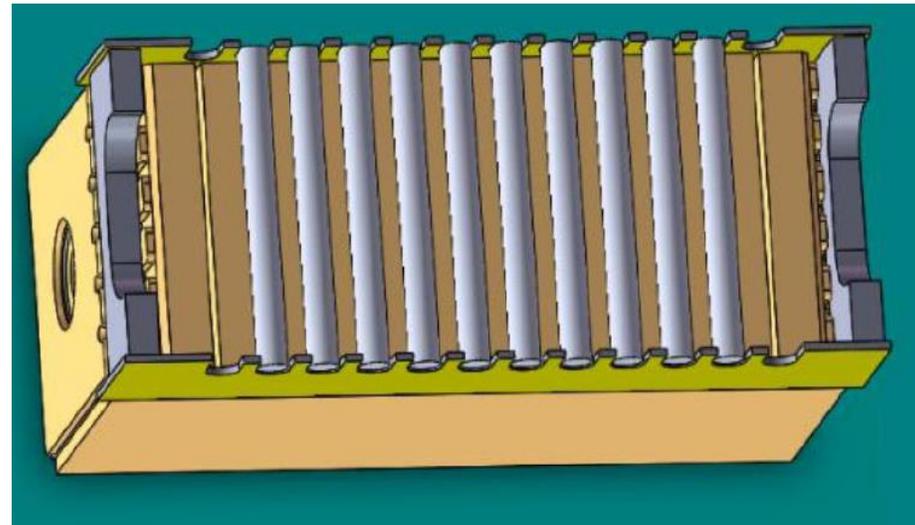
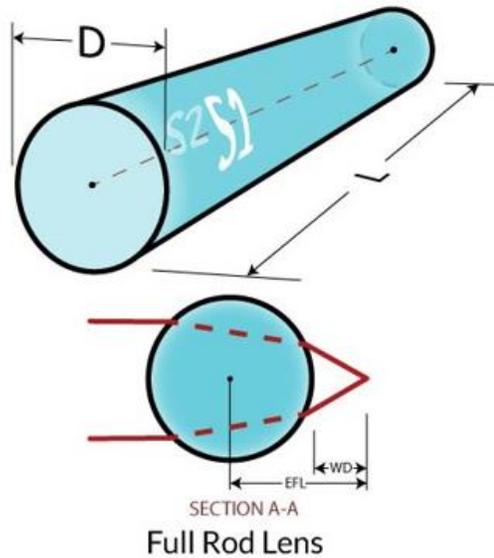


High bright laser can provide more efficient aesthetic treatment.

How to reach:

- “Mechanical” approach– high dense bar package
- It leads to high brightness but absolute power value became limited.
- Increasing the absolute power, requires sophisticated Colling system and makes solution non-practical.
- Optical approach - use collimation lenses to increase brightness
- It allows to keep “wide” pitch, total power with necessary brightness

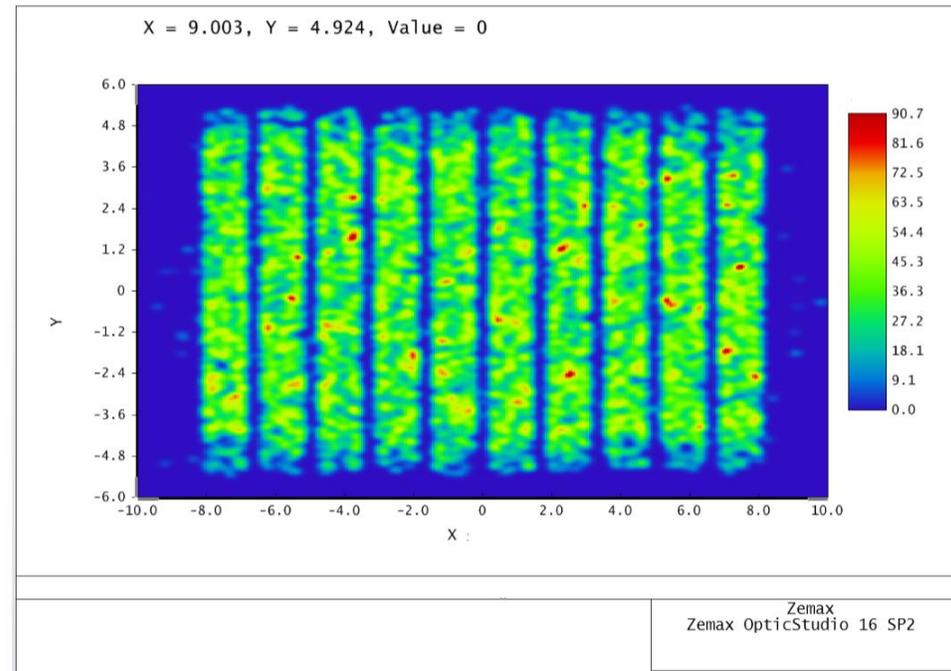
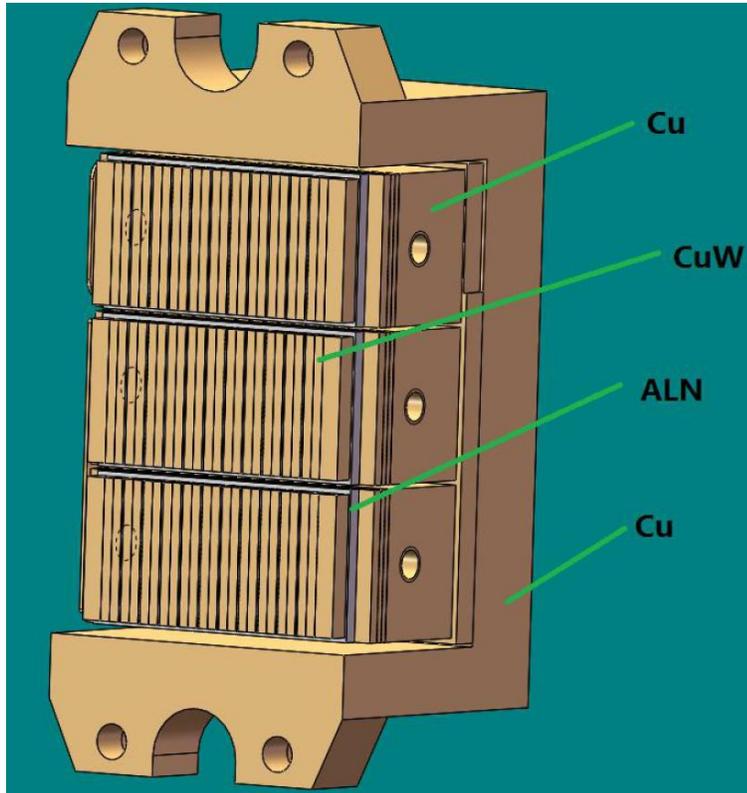
In order to control the uniformity collimation lens
was added to laser package



Rod lenses are commonly used

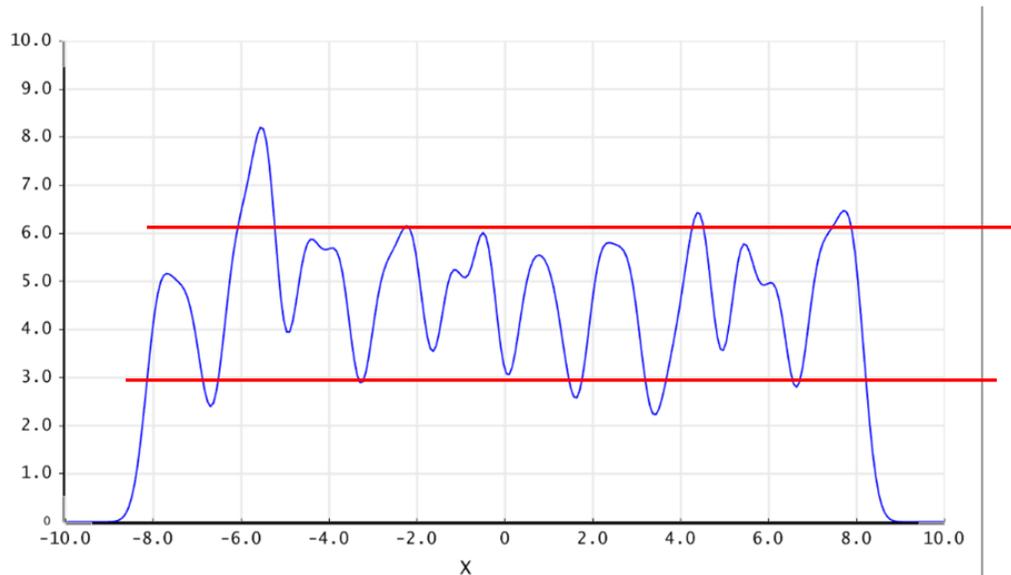
High Power Stack-Bars of several kW When pitch becomes critical?

Bar-to-bar pitch of 1.5mm. Burned at 2.4kW.



Optical Simulations Result.

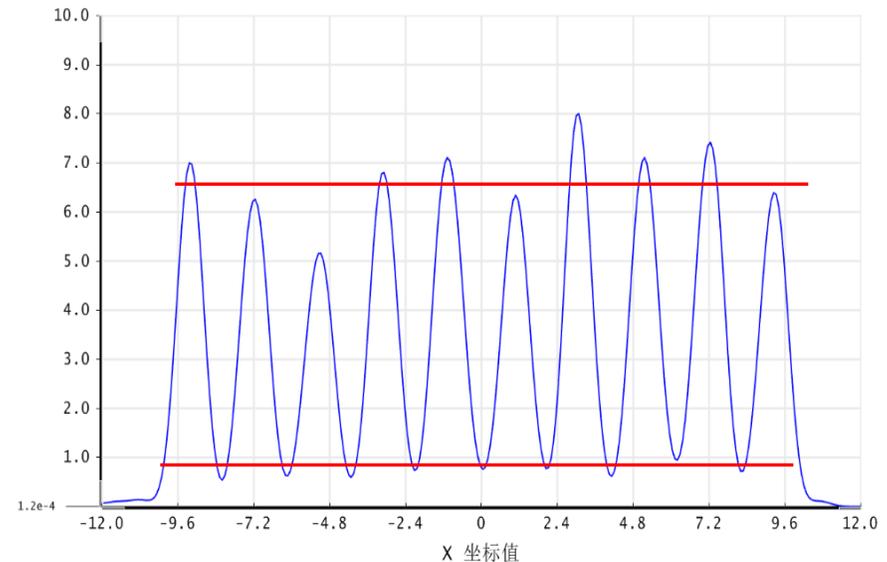
Bar-to-bar pitch of 1.5mm



Uniformity about 50%

Zemax
Zemax OpticStudio 16 SP2

Bar-to-bar pitch of 2.05mm

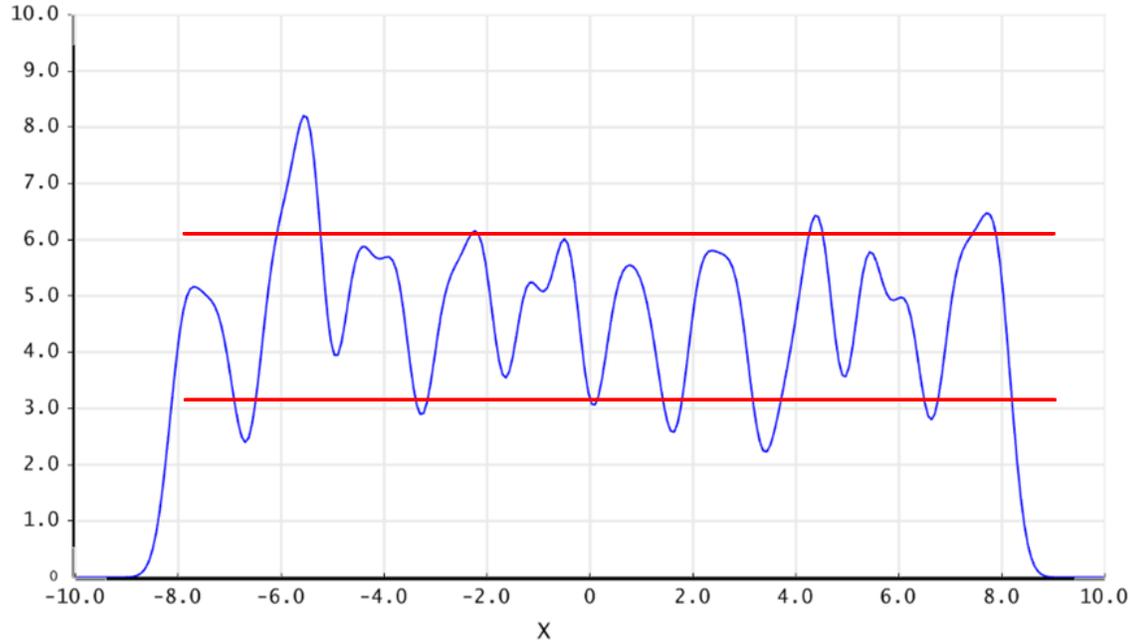


Uniformity about 14%

Zemax
Zemax OpticStudio 16 SP2

Uniformity down to 14%, but power was increased to 3.4kW from 2.4kW

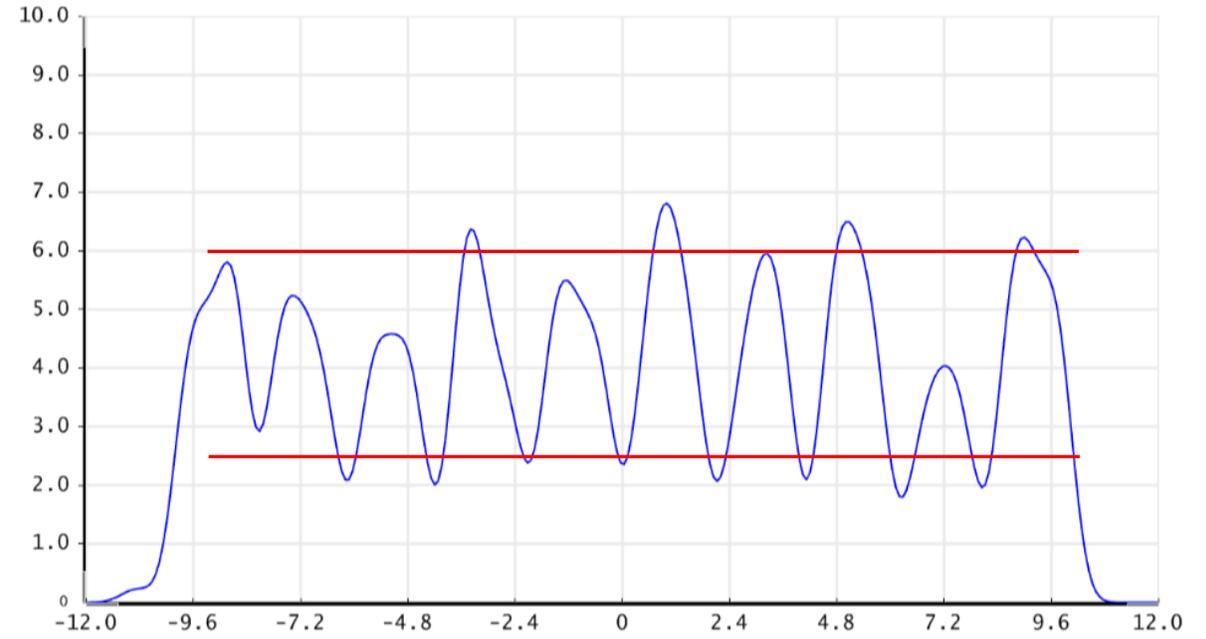
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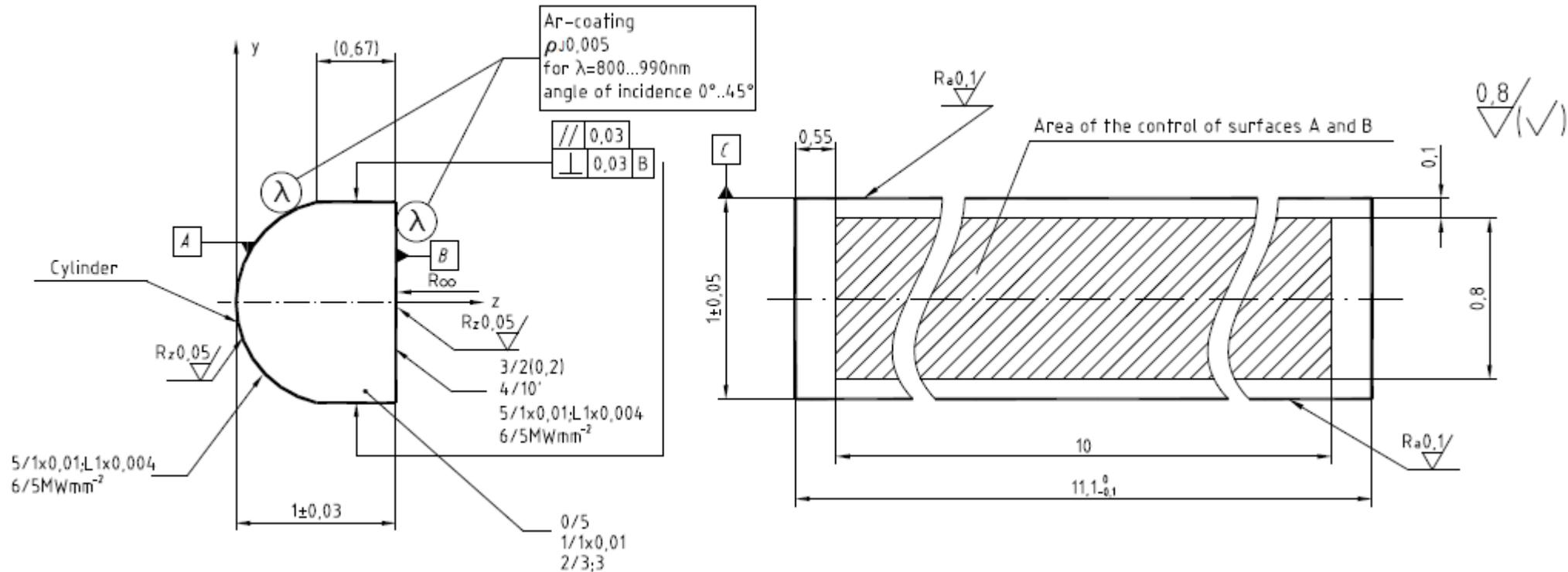


Uniformity about 40%

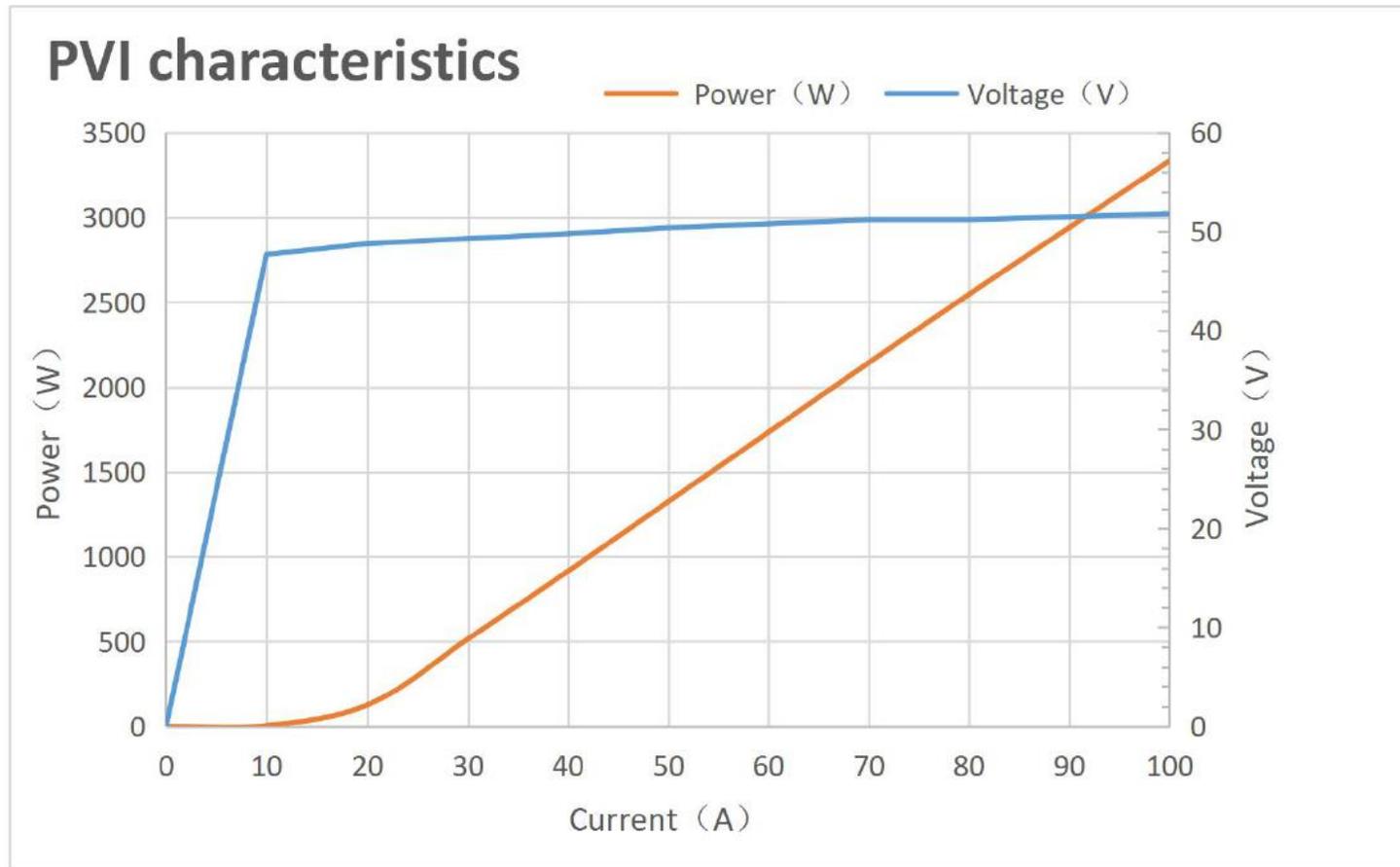
Zemax
Zemax OpticStudio 16 SP2

Required Lens shift of 10um – impossible to control with rod lens

Lens was changed to D-shape, in order to control lens shift of 10um.
 As a result laser power was increased to 3.4kW with enhanced uniformity



Achievement of 5M Pulses at 3.4kW



Thank You