



Fiber laser technology for defense applications is advancing rapidly due to advantages over solid state lasers and funding by the US Department of Defense. Fiber lasers offer features that are critical to the Directed Energy platform. Key components of a highly integrated fiber laser and amplifier system are high-power all-fiber pump and pump signal combiners. OFS fiber combiners can be implemented in almost any fiber laser or amplifier architecture.

OFS combiners can be used in a high brightness, $(42+1) \times 1$ cascaded combiner system which consists of one $(6+1) \times 1$ pump-signal combiner pumped with six 7×1 multimode pump combiners. The cascaded combiner system has a pump efficiency of $\geq 96\%$. The higher brightness of the combiner system is driven by optimized high efficiency multimode pump combiners that have 99% pump throughput.

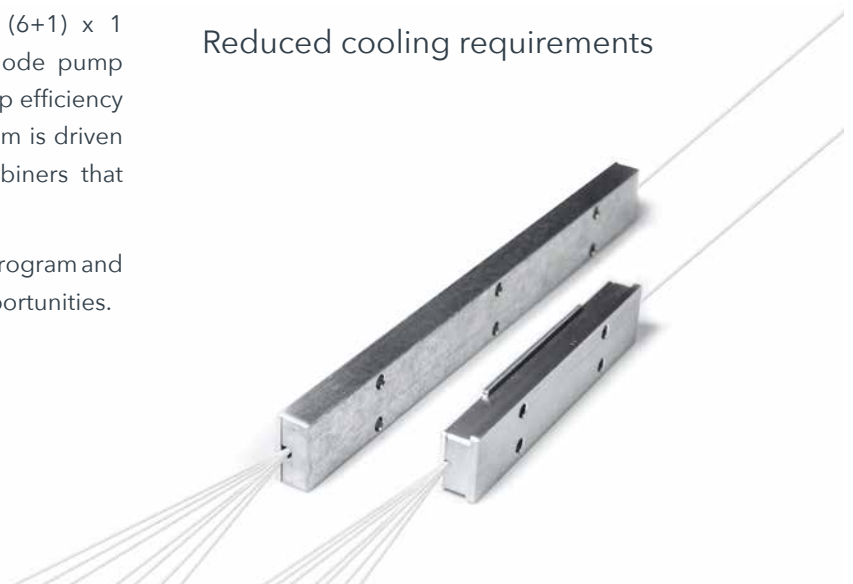
OFS has an extensive fiber laser and amplifier research program and seeks partners for collaboration in defense related opportunities.

High pump transmission

Low signal loss

Compact size

Reduced cooling requirements



High Power CoolMode™ Pump Combiners and High Power CoolMode Pump Signal Combiners for Directed Energy

(42+1) x 1 High Power CoolMode Pump Signal Combiner Specification

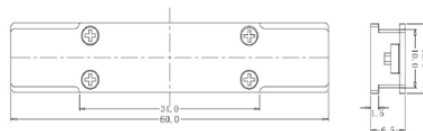
Description (42+1) x 1 High Power CoolMode Pump Signal Combiner - 400 μm Output

Feature	Min.	Typical	Max.	Unit	NOTE
MM Input Fibers					
Number			42		Up to 42 pump arms are available by attaching six 7x1 MM pump combiners to a (6+1) x 1 pump-signal combiner
Numerical Aperture (NA)		0.225			
Coating Outer Diameter	240	245	250	μm	
Clad Diameter	123	125	127	μm	
Core Diameter	104	105	106	μm	
Pigtail Fiber Length	1			m	
Coating					High Index Acrylate
Signal Input Fiber					
Core MFD @ 1064 nm		11		μm	
Coating Outer Diameter		425		μm	
Clad Diameter	244	245	248	μm	
Pigtail Fiber Length	1			m	
Coating					High Index Acrylate
Output Fiber					
Core NA		0.065			
Cladding NA		0.46			
Core MFD @ 1064 nm		17		μm	
Coating Outer Diameter	555	560	565	μm	
Clad Diameter		400		μm	
Pigtail Fiber Length	1			m	
Coating					Low Index Polymer Coating
Optical Performance					
Multimode Transmission	95	96	96	%	OFS Standard Test Condition: 95% power within 0.15 NA
Signal Transmission @ 10XXnm	90			%	Fundamental mode transmission
Pump Power Peg Leg		72		W	
Maximum Pump Power			2500	W	
Environmental		Transport and Storage Temperature			-40 to +85 °C
		Transport and Storage Humidity			< 85% (non-condensing)
Mechanical Packages	60 x 12 x 6.5/116 x 12 x 6			mm	See Drawing
Order by Part Number					TBD

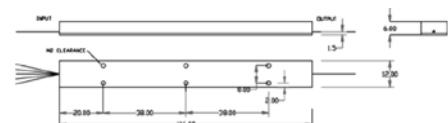
Applications: Directed Energy

NOTE: Custom configurations and packaging is available upon request.

Mechanical Dimensions (all units in mm)



60 x 12 x 6.5



116 x 12 x 6

7x1 High Power CoolMode Pump Combiner Specification

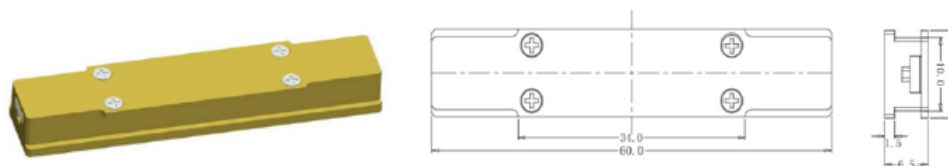
Description 7x1 High Power CoolMode Pump Combiner - 400 μm Output

Feature	Min.	Typical	Max.	Unit	NOTE
Multimode Pump Input Fibers					
Number		7			
Numerical Aperture (NA)		0.22			
Coating Outer Diameter	240	245	250	μm	
Clad Diameter	123	125	127	μm	
Core Diameter	104	105	106	μm	
Pigtail Fiber Length	1			m	
Coating					High Index Acrylate
Output Fiber					
Core NA		0.22			
Cladding NA					
Coating Outer Diameter		425		μm	
Clad Diameter	244	245	248	μm	
Core Diameter	229	231	233	μm	
Pigtail Fiber Length	1			m	
Coating					High Index Acrylate
Optical Performance					
Multimode Transmission	95	98	99	%	OFS Standard Test Condition: 95% power within 0.15 NA
Overall Backward Cross Talk		TBD			
Average Isolation (per leg)		TBD			
Pump Power Peg Leg		72		W	
Total Pump Power		450		W	
Package Weight (g) Al		12		g	
Environmental	Transport and Storage Temperature Transport and Storage Humidity				-40 to +85 °C < 85% (non-condensing)
Mechanical Package	60 x 12 x 6.5			mm	See Drawing
Order by Part Number	TBD				

Applications: Directed Energy

NOTE: Custom configurations and packages are available upon request.

Mechanical Dimensions (all units in mm)



60 x 12 x 6.5

(6+1) x 1 High Power CoolMode Pump Signal Combiner Specification

Description						
(6+1) x 1 High Power CoolMode Pump Signal Combiner - 400 µm Output						
Feature	Min.	Typical	Max.	Unit	NOTE	
Multimode Pump Input Fibers						
Number		6				
Numerical Aperture (NA)		0.225				
Coating Outer Diameter		425		µm		
Clad Diameter	240	245	250	µm		
Core Diameter	229	231	233	µm		
Pigtail Fiber Length	1			m		
Coating					High Index Acrylate	
Signal Input Fiber						
Core MFD @ 1064 nm		11		µm		
Coating Outer Diameter		425		µm		
Clad Diameter	244	245	248	µm		
Pigtail Fiber Length	1			m		
Coating					High Index Acrylate	
Output Fiber						
Core NA		0.065				
Cladding NA		0.46				
Core MFD @ 1064 nm		17		µm		
Coating Outer Diameter	555	560	565	µm		
Clad Diameter		400		µm		
Pigtail Fiber Length	1			m		
Coating					Low Index Polymer Coating	
Optical Performance						
Multimode Transmission	98			%	OFS Standard Test Condition: 95% power within 0.15 NA	
Signal Transmission @ 10XXnm	90			%	Fundamental mode transmission	
Overall Backward Cross Talk		TBD				
Average Isolation (per leg)		TBD				
Pump Power Peg Leg		415		W		
Maximum Pump Power			2500	W		
Package Weight (g) Al		21		g		
Environmental		Transport and Storage Temperature Transport and Storage Humidity			-40 to +85 °C < 85% (non-condensing)	
Mechanical Package		60 x 12 x 6.5		mm		See Drawing
Order by Part Number						TBD

Applications: Directed Energy

NOTE: Custom configurations and packaging is available upon request.



For additional information please contact your sales representative.

You can also visit our website at www.ofsoptics.com

or call 1-888-FIBER-HELP (1-888-342-3743) from inside the USA or +1-770-798-5555 from outside the USA.

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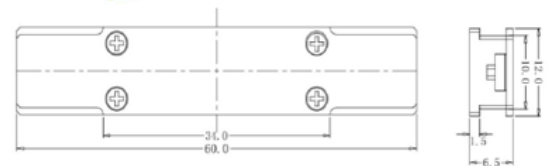
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Mechanical Dimensions
(all units in mm)



60 x 12 x 6.5