



Acousto Optic Cavity Dumper

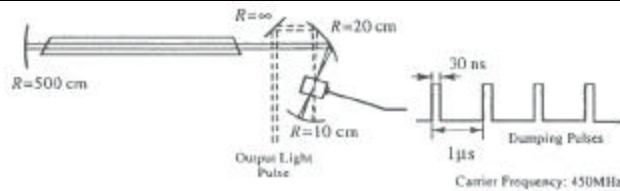
Features/Applications



- High Diffraction Efficiency
- Small Size
- Brewster Angle Incidence
- High Modulation Bandwidth
- Up to 380 MHz Frequency
- Low Cost

For this application the +1 order beam from the AO device is used. The basic structure of a cavity-dumper laser apparatus is shown in figure below. The purpose of cavity-dumping is similar to that of q switching, but the operating principles are different. For a cavity-dumping laser the A-O device usually lies in an inactive state (with no electric power applied to the transducer) between two very high reflectance mirrors. Under these circumstances, the Q value of the resonant cavity is extremely high and very intense lasing occurs within the cavity. Applying a strong electric pulse to the AO device reflects this radiation to a planar mirror as shown by the dotted lines in the figure below. As a result, nearly all the laser energy is dumped out of the resonant cavity in the form of a single optical pulse.

An AO device used for cavity-dumping must operate in the Bragg for a diffracted beam operation and high diffraction efficiency. The response speed of the AO device should be high so as to optimize the pulse width and increase the pulse repetition frequency. The resonant cavity is composed of three spherical mirrors, which serve to focus the laser beam in the plane of the AO device and thereby maximize the response time. The proper design of the AO device is very important. A cavity-dumper offers high peak power and higher repetition frequencies by combining cavity-dumping with mode locking, subnanosecond pulses can be achieved at repetition rates of 1 MHz without sacrificing average power of the laser.





VIS-IR Cavity Dumpers

	TECD-380-95-543	TECD-380-50-780	TECD-380-95-800
Laser Wavelength:	543 nm	780 nm	800 nm
Substrate: (TeO ₂)	Tellurium Dioxide (TeO ₂)	Tellurium Dioxide (TeO ₂)	Tellurium Dioxide (TeO ₂)
Active Aperture:	0.30 mm	0.30 mm	0.10 mm
Center Frequency:	380 MHz	380 MHz	380 MHz
Modulation Bandwidth (3dB):	95 MHz	50 MHz	95 MHz
Optical Transmission:	> 95	> 95	> 98
Maximum Diffraction Efficiency:	70% @ 1W	40% @ 1W	60% @ 2W
Rise-time/Optical Beam Diameter:	10/31	20/62	5.8/29
Extinction Ratio:	>1000:1	>1000:1	>1000:1
Wave Front Distortion:	$\lambda/10$	$\lambda/10$	$\lambda/10$
Surface Finish Scratch/Dig:	10-20	10-20	10-20
Parallelism of Optical Faces:	30" -60"	30" -60"	30" -60"
Bragg Angle:	1.4 mrad	2.0 mrad	36 mrad
Acoustic Velocity:	4.2E+3	4.2E+3	4.2E+3
Maximum Electric Input Power:	1 Watts	2 Watts	2 Watts
Input Impedance:	50	50	50
V.S.W.R.:	2.1:1	2.1:1	2.1:1
Optical Polarization:	Linear	Linear	Linear
Case Type:	#120	#120	#120

Fixed Frequency Driver

	FFJ-380-B3-F2
Frequency:	380
Frequency Control:	Quartz crystal referenced or externally referenced phase locked loop, user selectable.
Frequency Accuracy:	0.01% (100ppm)
Harmonic Content:	≤ -20 dBc
Stability:	0.0015% minimum after 15 minute warm-up
Output Power:	1-2 Watts. Power is optimized for peak performance of the supplied A-O device.
Output Protection:	Power amplifiers used will tolerate an infinite V.S.W.R. without damage. Rated power is available only when a proper RF load is connected.
Modulation:	Pulse modulation via internal pulse generator with adjustable pulse delay. Pulse generator may be set for internal or external trigger mode with a rep rate of 12 MHz to 50 KHz, pulse width is variable from 7 nsec to 150 nsec. Pulse delay adjustable from 0 to 10 nsec.
Rise Time/Fall Time:	≤ 3.5 nsec
Dynamic Range	RF Modulation Depth 30 dB min.
Pulses:	
Operating Power:	117 VAC $\pm 25\%$ 50-60 Hz; 55 W max.
Enclosure:	The unit will be packed in a nominal 7.5 inch wide by 3.5 inch high by 8.75 inch deep instrument case. The rear panel heat sink increases depth to 10.5 inch max. Size is exclusive of connector. A detachable AC line cord is provided.
Environmental:	Nominal laboratory conditions: max temperature +35° C; the unit is not sealed against moisture of condensing humidity.

Brimrose Corporation of America
 19 Loveton Circle
 Baltimore, MD 21152-9201 USA
 Phone: +1 410 472-7070
 Fax: +1 410 472-7960
 E-Mail: offices@brimrose.com
 Web: <http://www.brimrose.com>

BRIMROSE



UV-VIS Cavity Dumpers

	FSCD-250-54-BR-400	FSCD-380-92-BR-800
Laser Wavelength:	250-450 nm	800 nm
Substrate:	Fused Sillica (SiO ₂)	Fused Silica (SiO ₂)
Active Aperture:	0.10 mm	0.10 mm
Center Frequency:	250 MHz	380 MHz
Modulation Bandwidth (3dB):	54 MHz	92 MHz
Optical Transmission:	>98 %	>98%
Diffraction Efficiency:	70% @ 5W	30% @ 10W
Rise-time/Optical Beam Diameter:	10 nsec / 72 μm	6 nsec / 42 μm
Extinction Ratio:	>1000:1	>1000:1
Wave Front Distortion:	λ/10	λ/10
Surface Finish Scratch/Dig:	10-20	10-20
Parallelism of Optical Faces:	30"-60"	30"-60"
Bragg Angle:	9 mrad@ 450 nm	25 mrad
Acoustic Velocity:	5.96E+3	5.96E+3
Maximum Electric Input Power:	5 Watts Pulsed	10 Watts Pulsed
Input Impedance:	50	50
V.S.W.R.:	2.1:1	2.1:1
Optical Polarization:	Linear (Vertical)	Linear (Vertical)
Case Type:	#120	#120

Fixed Frequency Driver

	FFJ-250-B3-F5	FFJ-380-B3-F10
Frequency:	250 MHz	380 MHz
Frequency Control:	Quartz crystal referenced or externally referenced phase locked loop, user selectable.	
Frequency Accuracy:	0.01% (100ppm)	
Harmonic Content:	≤ -20 dBc	≤ -20 dBc
Stability:	0.0015% minimum after 15 minute warm-up	
Output Power	5 Watts	10 Watts
Output Protection:	Power is optimized for peak performance of the supplied A-O Device Power Amplifiers used will tolerate an infinite V.S.W.R. without damage. Rated power is available only when a proper RF load is connected.	
Modulation:	Pulse modulation via internal pulse generator with adjustable pulse delay. Pulse generator may be set for internal or external trigger mode with a rep rate of 10 KHz to 4 MHz, pulse width is variable from 7 nsec to 150 nsec. Pulse delay adjustable from 0 to 10 nsec.	
Rise Time/ Fall Time:	≤ 3.5 nsec	
Dynamic Range Pulses:	RF Modulation Depth 30 dB min.	
Operating Power:	117 VAC ± 25% 50-60Hz; 55 Watts max.	
Enclosure:	The unit will be packed in a nominal 7.5 inch wide by 3.5 inch high by 8.75 inch deep instrument case. The rear panel heat sink increases depth to 10.5 inch max. Size is exclusive of connector. A detachable AC line cord is provided.	
Environmental:	Nominal laboratory conditions: max temperature +35°C; the unit is not sealed against moisture of condensing humidity.	