Acousto-Optic Q-Switches

Intracavity Q-switching devices with high damage threshold and high modulation loss

The Acousto-optic Q-switches (AOQS) are a type of Q-switch designed for laser Q-switching applications. At the beginning of pumping, the AOQS increases the diffraction loss in the cavity, causing the cavity to be in a low Q-value state, which increases the oscillation threshold and prevents oscillation from occurring. This allows a large number of inverted particles in the upper energy level to accumulate. When the accumulation reaches saturation, suddenly removing the diffraction loss causes the cavity loss to decrease and the Q-value to suddenly increase, rapidly establishing laser oscillation. In a very short period of time, the inverted particles in the upper energy level are consumed and converted into optical energy in the cavity, resulting in high-peak-power giant pulse laser output.

CASTECH can provide a variety of A-O Q-switches with operating wavelength ranges covering 310 nm-10.6 um. Our products have high transmittance (single pass transmittance up to 99.6%), fast switching speed, strong shut-off capability, high damage threshold, and excellent pulse stability. To achieve higher diffraction efficiency, large aperture A-O Q-switches require higher RF power injection. Therefore, water cooling is needed to ensure proper heat dissipation of the device.

CASTECH's products are produced independently throughout the entire process and can be customized according to customer needs. Refer to the following list for standard products.

Applications

- Laser marking
- Medical procedure
- Material processing
- Material processing

Model Number: CAQS-f-a-mt-w-c-h

Center Frequency (f)	Aperture (a)	Material (m)	Mode (t)	Wavelength (w)	RF Connector (c)	Housing (h)
041 (40.68 MHz) …	010 (1 mm) …	CQ T	C (Compressional) …	266 (266 nm) …	AF (SMA-F) …	A01 …

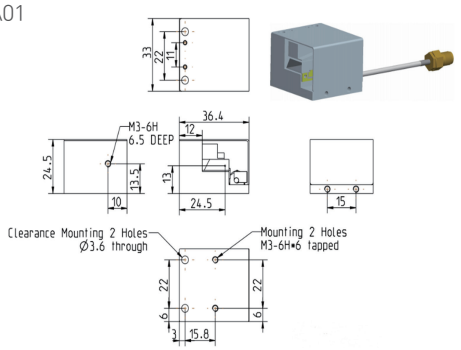
Typical Specifications

Wavelength	Aperture	Operation frequency	Loss modulation	Material
1030-1064 nm	1-6 mm	24，27.12，40.68，68，80 MHz	>85 %	FS
1030-1064 nm	1-3 mm	40.68，68，80，100 MHz	>85 %	CQ
1319-1342 nm	1 mm	80 MHz	>85 %	CQ
1550 nm	1 mm	80 MHz	>85 %	CQ
1900-2100 nm	4 mm	40.68 MHz	⩾75 %	CQ
9.4-10.6 µm	11.6 mm	40.68 MHz	⩾85 %	/

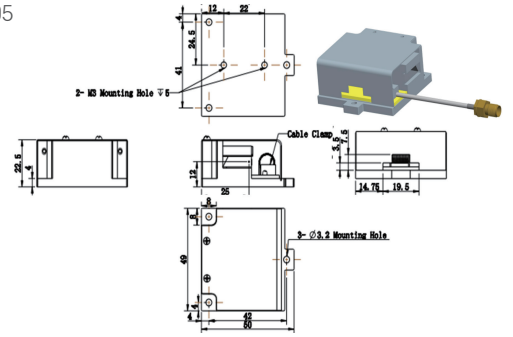
*Damage threshold > 1.0 GW/cm² @ 1064 nm, 10 ns， 10 Hz

Housing dimensions(mm):

A01



A05



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