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## Specification Sheet

### **Liquid Crystal Variable Attenuator**

The liquid crystal variable attenuator achieves a contrast ratio of over 1000:1. This unique component requires no compensation film and has a dark state at zero volts. Discrete voltage changes can either increase or decrease light transmission. In addition to a standard off the shelf component, custom-built attenuators can be developed to meet OEM specifications. Bolder Vision's expertise is bringing custom prototypes to volume production.

Specification	Standard Device Description
<b>Birefringent Material</b>	Nematic liquid crystal with no compensation film
<b>Substrates</b>	Industry standard soda lime
<b>Size</b>	23.1mm x 25.1mm, with 17mm clear aperture
<b>Unit Thickness</b>	4mm
<b>Polarizer</b>	High contrast dichroic sheet type polarizer
<b>Wavelength</b>	Over visible region from 425–685nm
<b>Contrast Ratio</b>	Minimum 1000:1 at a single wavelength over a 2mm aperture
<b>Reflectance</b>	≤ 0.5% per surface typical with AR coated endcaps (normal incidence)
<b>Insertion Loss</b>	28% ± 5% with AR coated endcaps, input polarized light
<b>Surface Quality</b>	60-40 scratch/dig
<b>Field of View</b>	≤ 5° to maintain contrast ratio
<b>Operating Range</b>	0° Celsius to +60° Celsius, non-cycled
<b>Electrical Drive</b>	0 Volts <sub>pp</sub> to 15 Volts <sub>pp</sub> , 2 KHz AC square wave AC voltage, Zero DC Bias
<b>Response Times</b>	Send time – 5 msec typical, Relaxation time – 40 msec typical
<b>Capacitance</b>	≤ 3nF
<b>Damage Threshold</b>	1 Watt/cm <sup>2</sup> CW (due to polarizer)

**Bolder Vision Optik**  
P.O. Box 18702  
Boulder, Colorado  
80308-1702



**Phone:** 303.440.3327  
**FAX:** 303.823.6433  
**E-Mail:** info@boldervision.com