



Corning® Varioptic® A-PE-39NX-A1 Series Variable Focus Lens

Overview

A-PE-39NX-A1 Series is based on Corning® Varioptic® A-39NX-A1 liquid lens providing a fast and robust variable focus, it is designed to compensate for temperature related variation using V-temp® feature and relieve customer from calibration work. In addition, it embeds V-speed® response time optimization algorithm further accelerating the liquid lens change from one optical power to another. Pre-implemented V-sweep® algorithm allows customer to make linear change of the optical power of the variable focus lens with time.

Ordering Information

- **Corning® Varioptic® A-PE-39NX-A1-37 variable focus lens:** Packaged A-39NX-A1 (X=0,1) with electronic board and 6-pin, 0.5 mm pitch straight flex cable with on-flex thermistor.
 - Coating options:
 - X = 0: has anti-reflective (AR) coatings optimized in the visible range
 - X = 1: has AR coatings optimized in near infrared range

Performance Summary

- 15 diopters dynamic range
- Low wave front error, 50 nm typical
- Embeds liquid lens driver, temperature sensor and microcontroller
- Integrate individual lens thermal calibration parameters
- Embeds response time optimization algorithm
- I²C / RS 232 interface

Applications

Corning Varioptic A-PE-39NX-A1 liquid lenses have been used in:

- Barcode readers, machine vision
- Biometrics
- Lasers
- ...



Contents

Ordering Information.....	1
Performance Summary.....	1
Applications.....	1
Opto-Electrical Performance.....	2
Transmission Performance.....	3



A-PE electronic board.....	3
Mechanical Dimensions.....	4
Absolute Maximum Ratings	4
Embedded Features	5

Opto-Electrical Performance

@25°C, @635 nm unless otherwise stated.

<i>Parameter</i>	<i>Unit</i>	<i>Symbol</i>	<i>Typ</i>	<i>Notes</i>
Aperture size	mm	\varnothing_e	3.5	(1)
Low optical power	m ⁻¹	P _L	-5	
High optical power	m ⁻¹	P _H	+10	
Optical power @0V	m ⁻¹	P _o	-9	
Wave Front Error, rms	nm	WFE _{rms}	50	(2); (3); (4)
Transmission @ 587 nm	%	T ₅₈₇	95	

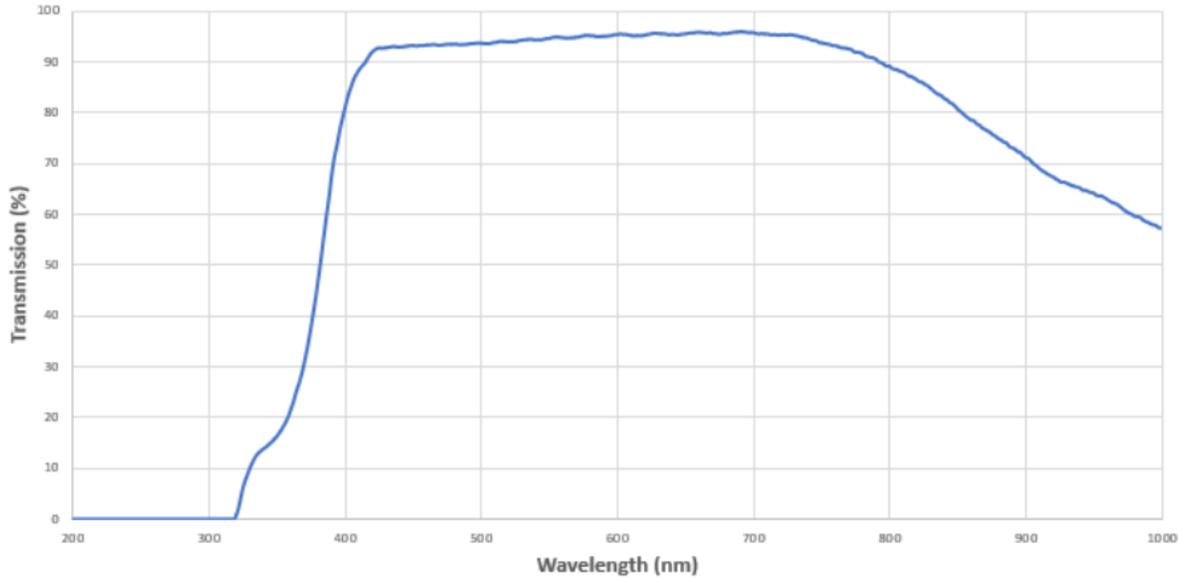
Notes:

- (1) Pupil size on the bottom part of the lens.
- (2) Measured on typical pupil size and on [P_L;P_H] – WFE is mainly astigmatism – Above P_H, spherical aberration becomes significant.
- (3) Parameter is compiled on [P_L;P_H].
- (4) Parameters measured through 42 acquisition points within the optical range.

Transmission Performance

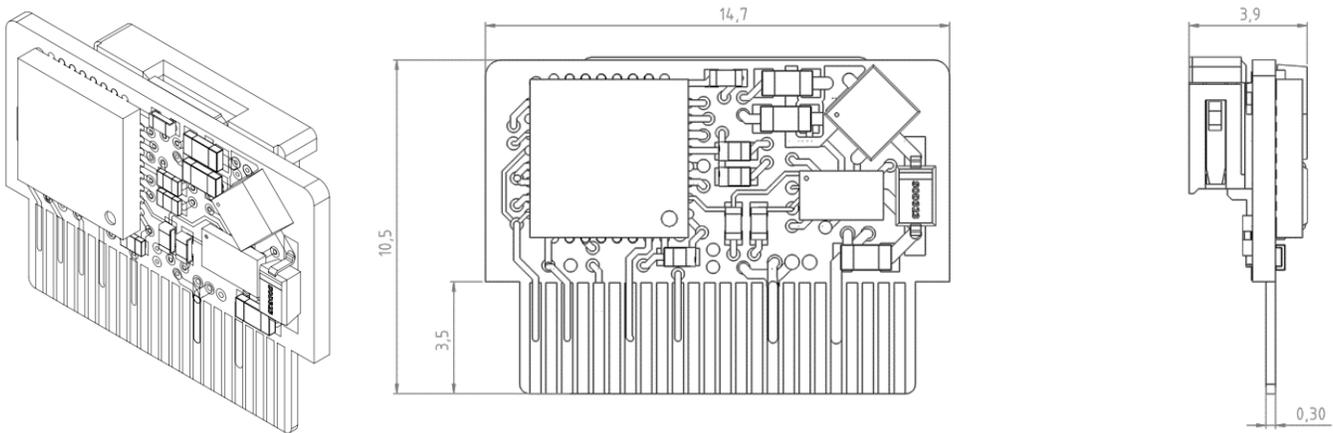
The two outer surfaces of the glass windows of the adjustable lenses have AR coatings. These AR coatings have been optimized for different wavelengths.

Transmission curves of the complete adjustable lens including AR coatings:



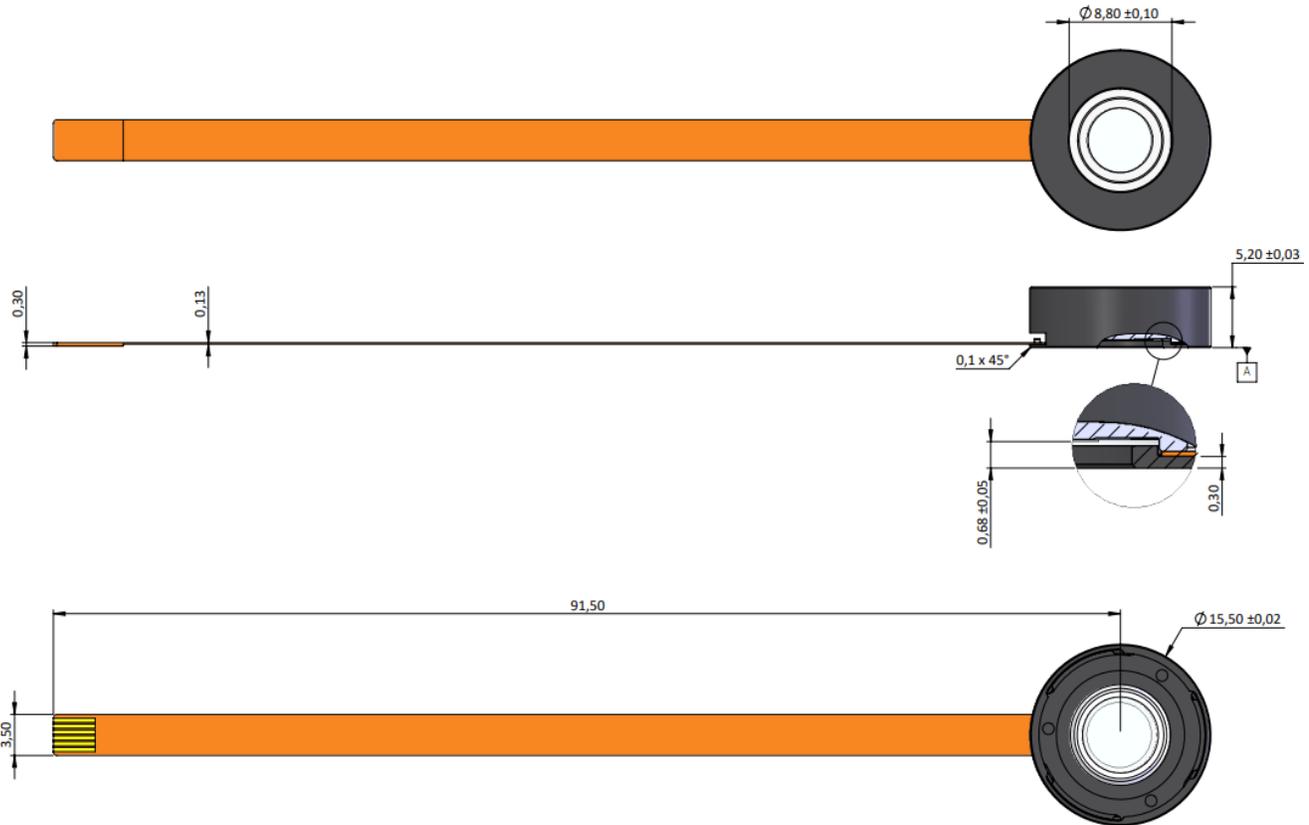
A-PE electronic board

For additional information on the A-PE board, please refer to MAAN - 251003 - A-PE series hardware



Mechanical Dimensions

Packaged Lens



Absolute Maximum Ratings

<i>Parameter</i>	<i>Symbol</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	<i>Notes</i>
Operating Temperature	T	-30	..	60	°C	
Storage Temperature	T _{stg}	-40	..	85	°C	
Input Voltage	V _{in}	2.8	3.3	3.6	V	

Important note:

Corning Varioptic Lenses and electronic boards are sensitive to electrostatic discharge (ESD). Use caution when handling.

Embedded Features

- **V-Speed:** Up to x5 faster compared to standard response time
- **V-Temp:** Up to x5 improvement on thermal stability
- **V-Sweep:** Driving profile of the liquid lens with linear change of the optical power of the lens with time, allowing the user to take pictures while the lens is still moving with virtually no settling time. For more information on this feature, please refer to the A-PE-39NX-A1 Technical Data Sheet (TEDS).

For additional information on the register map, please refer to MAAN - 251003 - Serial Communication Protocols.

Corning reserves the right to change its product specifications at any time without notice. Please ensure you have the latest applicable specification before purchasing a Corning product. Corning does not provide any warranty of merchantability or fitness for a particular purpose. Additionally, the products sold by Corning are not designed, intended or authorized for use in life support, life sustaining, medical device, healthcare, nuclear, military, or any applications in which the failure of such products could reasonably be expected to result in personal injury, loss of life or catastrophic property or environmental damage. Corning does not make any claims or statements that our products have been approved for such applications. Further, Corning has not tested its products for safety and efficacy in any such applications. The customer is responsible for determining the suitability of Corning's product for its application, including any testing, validation, and/or regulatory submissions that may be required to support the safety and efficacy of its intended use. Product specifications are available upon request at varioptic@corning.com