



SILICON V-GROOVE CHIPS

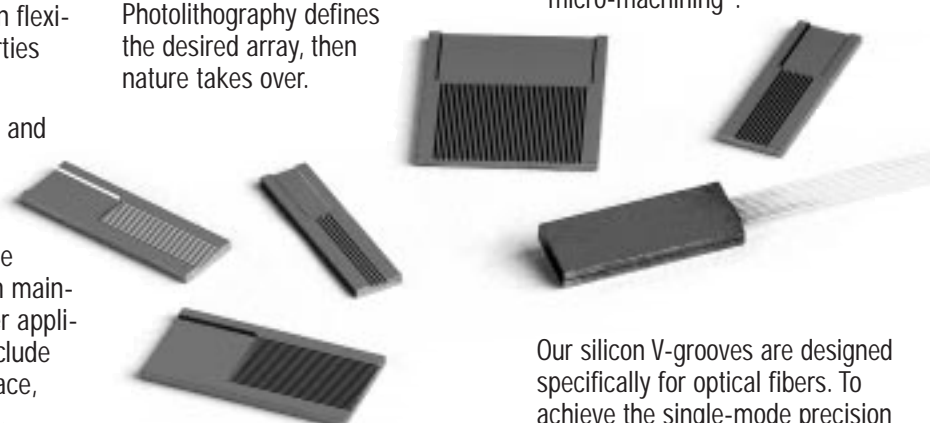
Silicon V-grooves accurately position multiple fibers in a one-dimensional array. The precision of these parts makes them ideal for pigtailed integrated optic devices, coupling to an array of active devices, or connecting to another array of fibers. Other applications take advantage of the design flexibility and mechanical properties of the silicon itself.

Wave Optics offers standard and custom designed silicon V-groove chips. Chips can be used in pairs or with a flat top plate and are suitable for single-mode, polarization maintaining, and multi-mode fiber applications. V-groove options include gold metalized, angled endface, and mounted on a substrate.

What is a V-groove? A “V” shaped groove etched in a silicon chip that can accurately position a fiber. Wave Optics places a series of V-grooves side-by-side to create a highly precise linear array for mounting fibers. The walls of a V-groove are actually crystal planes in the silicon.

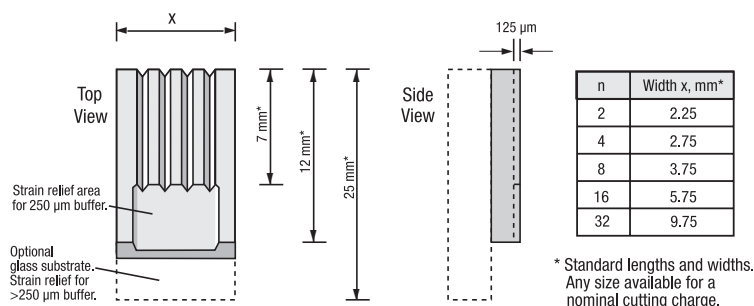
What creates the precision? Photolithography defines the desired array, then nature takes over.

First, the patterns are defined photolithographically on the surface of the silicon. The silicon is then selectively removed by chemical etching. A series of grooves are formed that have predictable center-to-center spacing. Tolerances do not accumulate, even over a wide array. The process is known as “micro-machining”.



Our silicon V-grooves are designed specifically for optical fibers. To achieve the single-mode precision required, we use high purity silicon and specially developed processes.

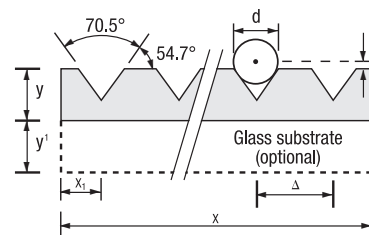
Can two-dimensional (2-D) precision arrays be formed? Yes, but not with the same tolerances as a standard array. Most 2-D arrays are custom, so please contact Wave Optics’ technical support to discuss the specifics of your application.



Silicon V-Groove Chip Specifications

	DRAWING REFERENCE	STANDARD	CUSTOM
Positions	n	2, 4, 8, 16, 32	1 to 1024
Fiber diameter	d	125 μ m	1 to 500 μ m
Fiber spacing	Δ	250.00 \pm 0.25 μ m	1 to 500 μ m
Thickness of silicon	y	525 \pm 25 μ m **	400 to 1500 μ m
Thickness of substrate	y'	1.0 \pm 0.1 mm	1.0 mm
Height of fiber center	h	10 \pm 10 μ m	-75 to +50 μ m
Vertical uniformity	Δ h	\pm 0.5 μ m	-75 to +50 μ m
Width of array	x	1.75 + 0.25 x n mm	1 to 100 mm
Edge to first groove center	x ₁	0.9 \pm 0.2 mm	0.25 to 25 mm
Temperature	All:	- 60 to + 150°C	

** Availability of this silicon thickness varies, please check before ordering.



Ordering Information: Silicon V-Groove Chips

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NO. OF GROOVES **OPTIONAL SUBSTRATE**

02 = 2 grooves 16 = 16 grooves
 04 = 4 grooves 32 = 32 grooves
 08 = 8 grooves

N = No substrate
 G = Glass Substrate