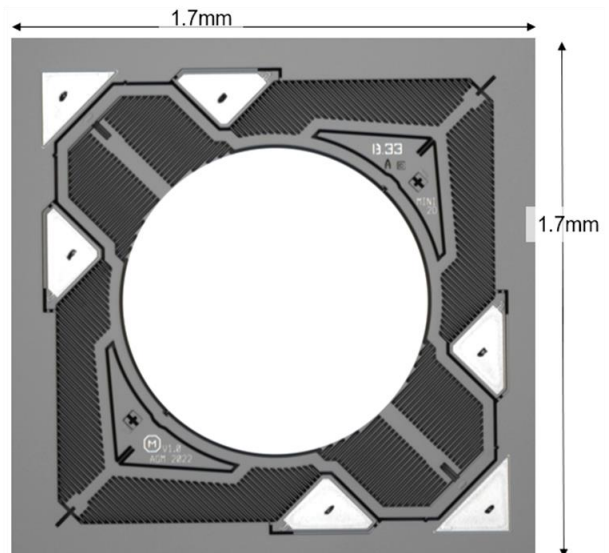




Mini2D Two Axis MEMS Chip for Optical Switches

The AGM Mini2D MEMS mirror product extends the functionality of AGM’s original 1xN MEMS chip. Accordingly, it is designed for applications including 1x4, 1x8, 1x16, and 1x32 optical switches, as well as Tunable Filter and Optical Channel Monitor (OCM). In addition, customers are welcome to explore other applications of this technology in emerging areas such as 3D imaging, LIDAR and free space optical communication.

The Mini2D MEMS Mirror technology is established on the use of comb drive actuation for robust and reliable actuation at lower voltages. These devices can be packaged in TO46 or TO39 headers, or in surface mount ceramic packages, allowing for smaller package size and lower production costs. The MEMS chip offers superior optical performance, with Mirror angle very stable and repeatable over time. Other features of this product include low susceptibility to shock, vibration, and temperature. The chips are shipped to customers in industry standard Gelpak trays.



The Mini2D MEMS chip comes in two varieties: Des. A, offering rotational angle of 3.2 x2.5 deg at 60V; and Des. M, offering 3.5x1.7 deg at 50V. The max overdrive angle is 6.5/3.5 deg in the Y/X axes. Performance specifications for the AGM Mini2D MEMS chips are given in the table below.

AGM Part Numbers:

Design M: 786043

Design A: 786044

This AGM product is protected by US Patent # 10437046, 11372234, and 11726312.

Key Specifications:

Item	Parameter	Conditions	Value			Unit
			Min	Typ	Max	
1.	Excess Insertion Loss	Excess Insertion Loss of chip relative to perfect mirror			0.25	dB



2.	Chip Dimension	Length			1.7	mm
		Width			1.7	mm
3.	Operating temperature		-5		75	° C
4.	Reflectivity	S, C, L band	95			%
5.	Mirror curvature	Positive curvature means concave	-0.5	0	1.25	m ⁻¹
6.	Mirror Dimension	Diameter	1.0			mm
7.	Mirror roughness				10	nm
8A.	Des. A Operational Angle (60V)	Inner (Y) Axis		± 3.2		deg.
		Outer (X) Axis		± 2.5		deg.
8M.	Des. M Operational Angle (50V)	Inner (Y) Axis		± 3.5		deg.
		Outer (X) Axis		± 1.7		deg.
9.	Bondpad size Base x height	Triangular, circumscribes a 150u diam circle		175 x 350		um
10.	Resistance	Between Drive & Ground bondpads	60	600		MΩ
11.	Drive Voltage			60		V
12.	Snap Voltage	Voltage at which the mirror snaps	80			V
13.	Time response	Switching between channels		5	10	ms
14.	Max Optical Power handling	CW in C or L band			500	mW
15.	Repeatability	Angle difference between voltage ramping up and down			10	mdeg
16.	Stability	Long term drift			30	mdeg
17.	Angular Cross Talk	Coupling between X and Y axes			3	%
18.	ESD	Standard electrostatic discharge testing	500			V