MAR1200 | 2D MEMS LASER SCANNING MIRRORS FAMILY

A MEMS (Micro Electro Mechanical System) mirror is a tiny solid-state scanning mirror (mirror on a chip) actuated by micro-size motors to move in one or two scanning directions. In order to create a laser-based display, a laser beam pointed at the mirror is precisely deflected and steered by the scanning mirror to reach a target point at a specific time.

30 kHz 2D MEMS mirrors for LASER base SCANNING

The MAR1200 scanning mirrors family is based on industry-leading MEMS technology with novel and precise actuation schemes. The innovative MEMS device combines a fast electro-static actuator and a powerful electro-magnetic actuator, which yields peak performance under varying conditions.

The MAR1200 scanning mirror, combined with a MEMS and video controller, builds a full LBS system.

A general block diagram of such systems is depicted in Figure 1.

There are two kinds of packaging in this product family. Hermitic package (Package type C), suitable also for an automotive grade, and plastic package (Package type E), mostly used in consumer applications.

FEATURES

- 2D single mirror using a gimballed structure – minimizes optical engine size and increases optical efficiency for dual axes scanning
- Combination of the electrostatic actuator for the fast axis and electromagnetic actuator for the slow axis – improves robustness and optimizes performance for 2D scanning
- Wide optical field of view (FOV), <45° (fast axis) & <30° (slow axis) – delivers large image and scanning area
- Highly reliable – tested to mechanical shocks and vibrations
- Plastic package – cost-effective mechanical protection

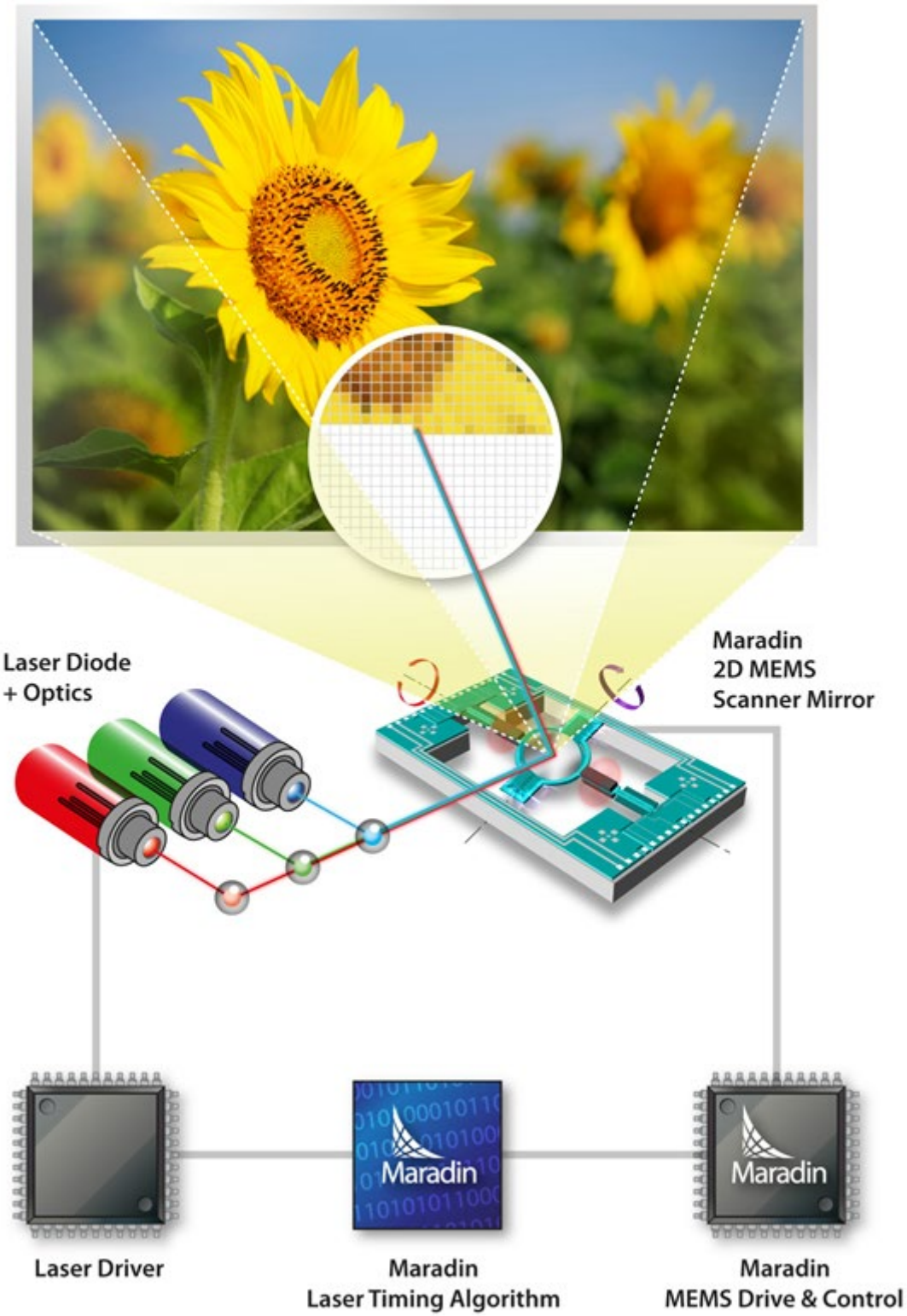

Figure 1: System Block Diagram

SPECIFICATION

	Parameter	Min	Typical Value	Max	Unit	Remarks
General	HFOV - Horizontal Optical angle	20		50	Deg.	Fast axis
	VFOV - Vertical Optical angle	0	30	40	Deg.	Slow axis
	Resolution (HxV)		1280x720P		Pixel	Frame Rate dependent
	Frame Rate		60	120	Hz	
	Pixel position error		±1/3		Pixel	Both vertical and Horizontal
	Resonance frequency (H)	28,500	29,000	29,500	Hz	
	Resonance frequency (V)	900	950	1000	Hz	
	Effective mirror size		1.1x1		mm	
	Power consumption	TBD	70	TBD	mW	RMS
Optical	Throw Ratio		1.2	1		Distance/Diagonal FOV
	Incident angle (H)	15	18	20	Deg.	
	Incident angle (V)		0	18	Deg.	
	Mirror reflectance	90		98	%	Wavelength dependent
	Overall reflectance	84		94	%	Mirror and Optical window
	Wavelength range for reflection	400	440-700	1550	nm	Any wavelength upon request
	Laser spot size on mirror aperture		0.7	0.8	mm	
Package	MEMS Module dimensions	11.4x6x5.1			mm	Length x Width x Height
	Package Type	Plastic - Non-Hermetic				

Table 1: MAR1200 Specifications

OPTO-MECHANICAL INTERFACE

Scanning module

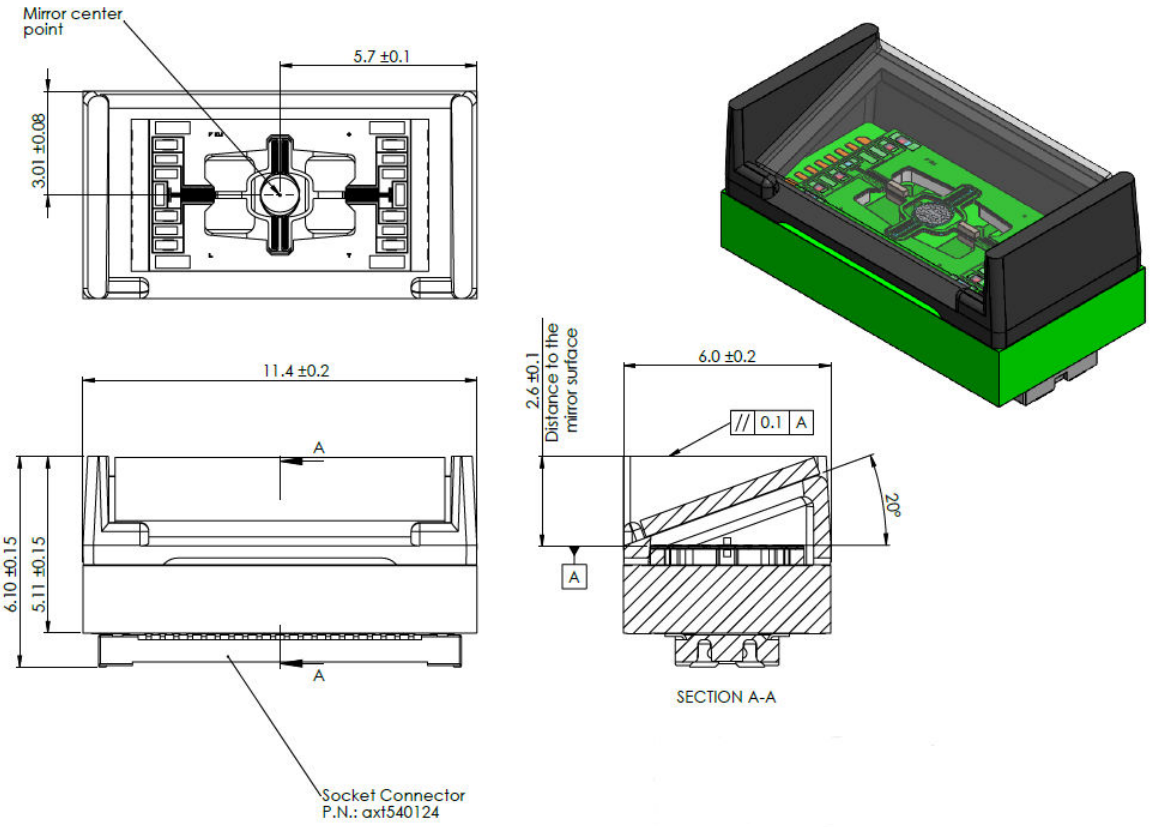

Figure 2: MAR1200 - MEMS Module General View

Scanning module electrical connection

The scanning module should be connected to the control board by a specified flat printed cable having a header 40pin connector AXT640124 (Panasonic).

Laser Interface

The optical window of the MAR1200 enables a typical projection of a 50[deg]x30[deg] FOV. The laser should be positioned according to the instructions detailed in Figure 3. For higher projection angles this should be modified accordingly.

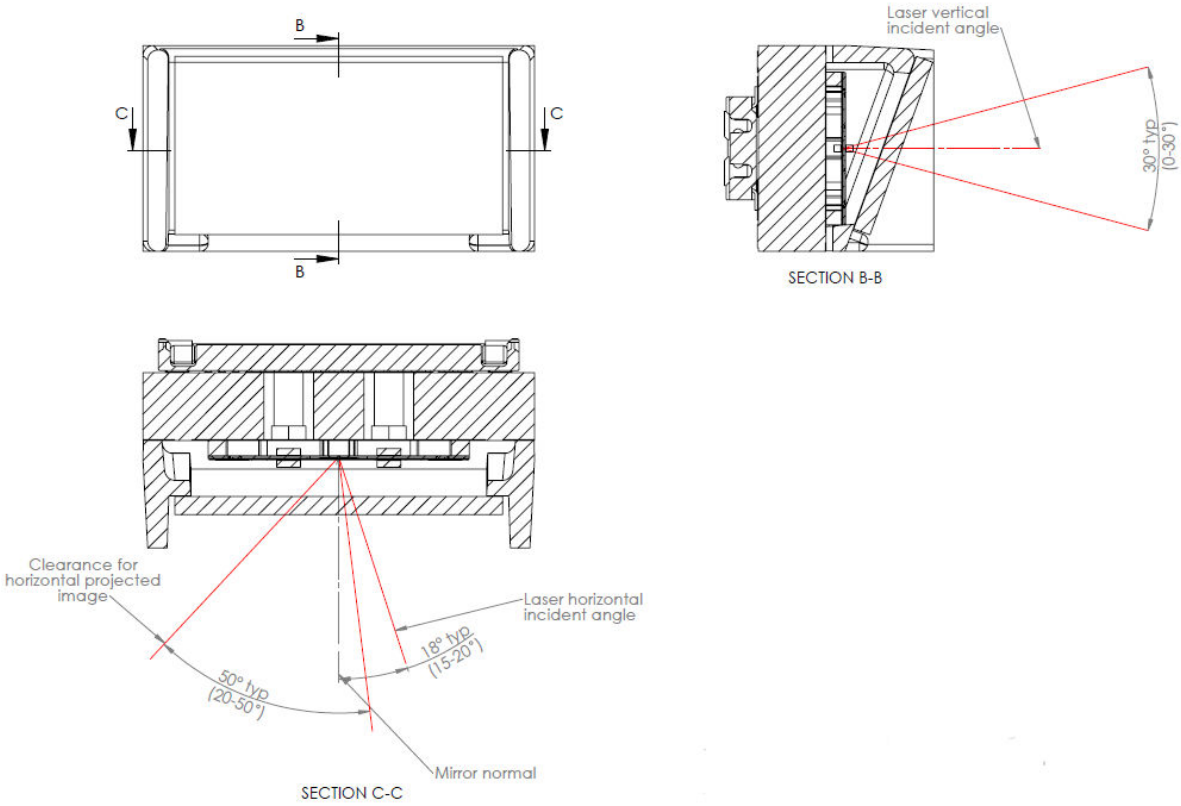

Figure 3: MAR1200 – Laser input angles and FOV

IMPORTANT NOTE

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