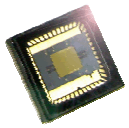
MEMS SCANNING MIRROR

Single Axis MEMS Scanning Mirror With Large Reflective Mirror

BA00 is a single axis MEMS scanning mirror (MEMS scanner) providing high performance light beam scanning in a single silicon chip.



MEMS scanning mirror

Features

- Large millimeter-size mirror capable of projecting & collecting reflected light beam
- Au or Al coated mirror to maximize optical reflectivity for selected wave length range
- Single-crystal silicon structure operated without mechanical wear
- Monolithic mirror & micro-actuator driven by electrostatic principle
- Low power consumption & ultra low noise
- Resonant operation for low scan jitter
- Compact and lightweight
- Standard PLCC (plastic leadless chip carrier) package
- Shock tolerant
- ROHS compliant

Applications

- Bar code scanning
- Laser area sensing
- LADAR (laser detection and range sensing)
- Non contact measurement and sensing
- Applications requiring line scan of laser beam

Specifications (Preliminary)

Mirror plate size	2.5x3.0 mm^2 / rectangular
Mirror reflectivity	> 90% (λ = 650nm @ 45°)
Mirror resonant frequency	500Hz ± 10%
Mirror metallization	Au or Al
Power consumption	< 20 mW
Typical drive voltage	50 VAC p-p unipolar
Maximum drive voltage	60 VAC p-p unipolar
Typical scan angle	+/-25° (optical)
Maximum scan angle	+/-28° (optical)
Scan trajectory	Sinusoidal
Drive principle	Electrostatic
Operating temperature	0°~60°C
Operating humidity	10%~85%
Package footprint	10x10 mm^2
Package	PLCC48

1. Mirror is resonantly operated
2. Scan angle adjustable by controlling amplitude or duty ratio of drive voltage signal
3. Exceeding maximum scan angle or maximum drive voltage may cause permanent damage to the mirror.

TYPICAL PERFORMANCE CURVES:

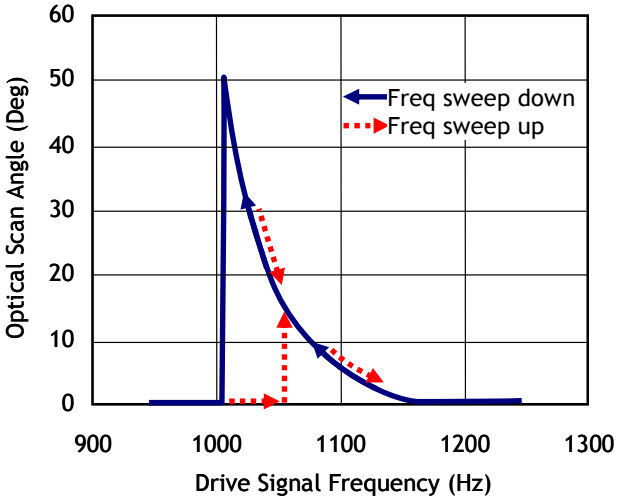


Figure 1. Typical Scan Angle vs. Drive Frequency with Constant Drive Signal Voltage

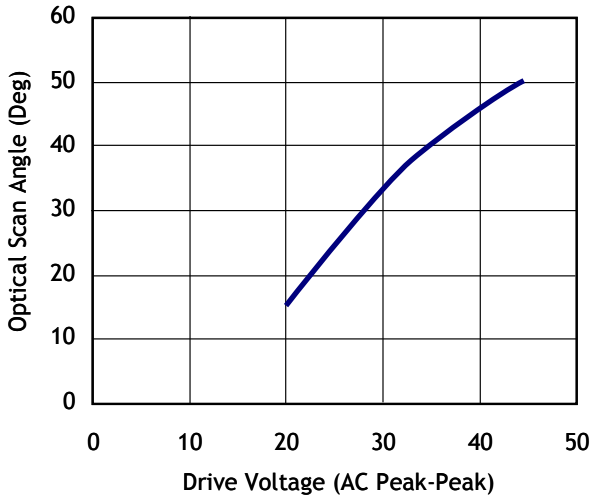


Figure 2. Typical Scan Angle vs. Drive Voltage with Constant Driving Frequency

MIRROR SCAN TRAJECTORY VERSUS DRIVE SIGNAL:

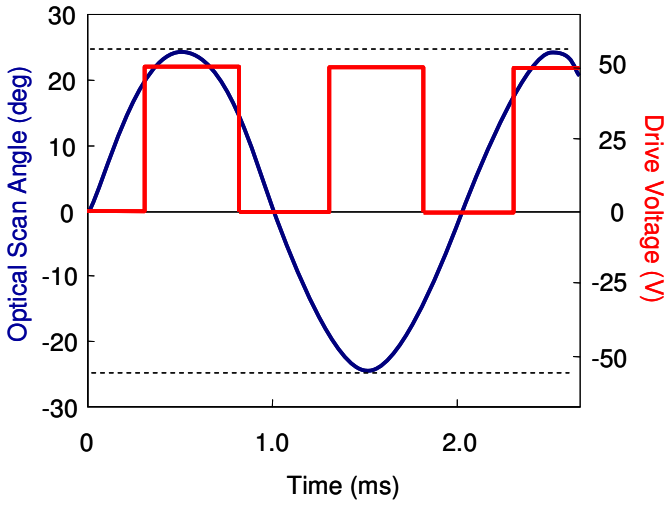


Figure 3. Typical Scan Trajectory Versus Drive Signal

Remarks:

1. Mirror scan trajectory is sinusoidal and scan frequency is half of drive signal frequency.
2. There is an inherent phase difference between drive signal and scan trajectory.
3. Mirror scanning can be started by sweeping drive signal frequency from high to desired operation point.
4. Mirror scanning can also be started by increasing duty ratio from low (5% typical) to 50% with fixed drive signal frequency.
5. Duty ratio exceeding 50% will not yield higher scan angle.
6. Stability of mirror scan is dominated by the stability of drive signal amplitude and frequency.

PACKAGE OUTLINE & PIN ASSIGNMENT

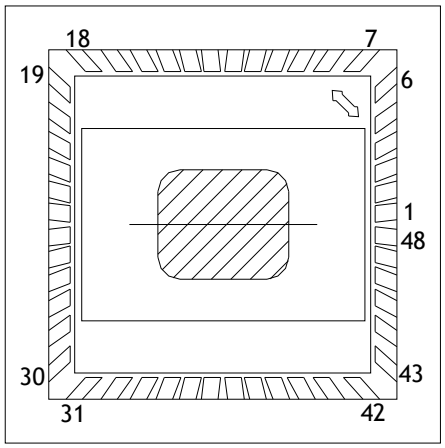


Figure 4. Package Drawing Top View

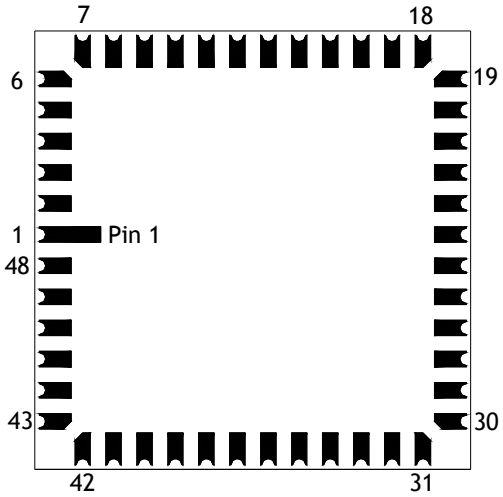


Figure 5. Package Drawing Bottom View

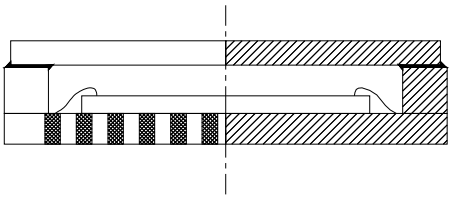


Figure 6. Package Drawing Side View

PIN #	DESCRIPTION
Pin 8/32	Drive Signal
Pin 17	GND
Pin 40	GND
Pin 41	GND
All other pins	Not Connected

Table 1. Pin Assignment