

## DESCRIPTION

Magnetic FSM for optical pointing with larger motion than piezo FSM while keeping high resolution and large bandwidth.

The M-FSM62 mechanism volume contains the mirror, its flexure bearing, the actuators and the Eddy Current positioning Sensors (ECP).

High performance Moving Iron Control Actuator (MICA™) allows to perform the dynamic strokes with low Joule heating.

Frictionless flexure bearings allow to achieve both high resolution and infinite life time.

Dedicated electronics for sensing, driving and controlling are respectively the [ECS45](#) and [MCSA480](#) for lab testing. The M-FSM62 has a TRL 5.



*Magnetic Fast Steering Mirror M-FSM62  
(with Ø31 mm mirror)*

## APPLICATIONS

Typical applications are Free Space Optic (FSO) communication links, laser applications, optical imaging..

PARAMETER	UNIT	M-FSM62	TOLERANCE	NOTES
Angular stroke max	Degree (°)	+/- 2	+/- 10%	
Angular stroke max	mrad	+/- 34	+/- 10%	
Resolution	µrad	20		With MCSA480 & ECS45
1st resonance frequency	Hz	93	+/- 10%	with SiC mirror Ø31mm
Mirror full stroke open loop bandwidth (without heating)	Hz	40		
Mirror full stroke open loop bandwidth (with heating)	Hz	200		For max 10min duration
Max driving voltage	V	+/- 48		Only for dynamic operation beyond resonance frequency
Max driving current	A	+/- 10 A		Only for dynamic operation beyond resonance frequency
Resistance @ 20°C per axis	Ohm	0.5		In static condition
Inductance @ 20°C per axis	mH	0.64		In static condition

### > Dimensional characteristics

Dimensions	mm	Ø62 x H56		
Moving part weight	gr	<17		
Total weight	gr	400		
Mirror size	mm	Ø31		SiC mirror with clear aperture 27mm

> **Example of operating point @20Hz sinewave**

Voltage RMS	V	0.8		
Current RMS	A	1.2		
Angular stroke (0-pk)	mrad	20		
Electrical power	W	0.5		
Accuracy in closed loop bandwidth / Linearity	$\mu\text{rad}$	40		With MCSA480 & ECS45
Accuracy in closed loop bandwidth / Thermal Drift	$\mu\text{rad}/^\circ\text{C}$	2		With MCSA480 & ECS45

Table a : Performance of M-FSM62

