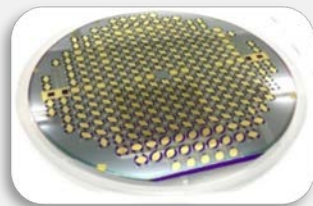


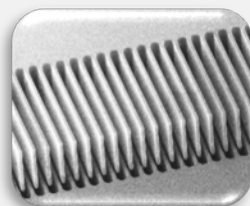
High-performance Si MEMS scanners
for 3-dim perception/display in 5G era

Si MEMS Scanners

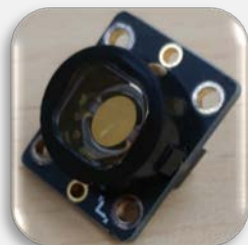
embedded with *mirror position sensors* enabling our customers to enhance performance and design versatility of *LiDAR, AR display, Optical imaging etc.*



Si MEMS mirror chip



MEMS actuator



Packaged resonant scanner



Sensor-embedded quasistatic scanner



Two-axis MEMS scanner (quasi-static/resonant)



Digital driver

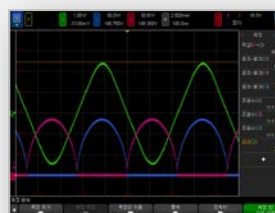
Product Lines

- One-axis resonant or quasi-static scanner
- Two-axis quasi-static scanner
- Two-axis quasi-static/resonant scanner
- Embedded with mirror position sensor
- MEMS driver and control board

Features of WeMEMS Scanner

- Fast speed (~ 33 kHz)
- Large mirror (~ 5.8 mm)
- Large scanning angle (~ 40 deg.)
- Low power consumption (< 1 mW)
- Precise position sensing (< 1 us)
- High linearity in a quasi-static mode
- Immune to vibration/temperature changes

* Detailed specifications on the backside



- Drive input 1
- Drive input 2
- Sensor output

Shaped input and output for quasi-static scanners

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R&D / Fab : A-2212 Xi-tower, 67 Saebitgongwon-ro, Gwangmyeong-si, Gyeonggi-do, 14348. S. Korea

Product Specifications

One-axis MEMS Scanners

April 28, 2023

Types		Resonant				Quasi-static
Model #		RS1-xyyyS0	RS1-3531S3	RS1-3529S3	RS1-1785S1	QS1-5018BS3
Features	Actuation	electrostatic	electrostatic	electrostatic	electrostatic	electrostatic
	Embedded sensor	no	optional	optional	optional	optional
Specification	Mirror shape	circular	elliptic	elliptic	elliptic	elliptic
	Mirror size (dia.)	1 ~ 6 mm	3.5 / 5.8 mm	3.5 / 5.8 mm	1.7 / 2.4 mm	5.0 / 3.5 mm
	Frequency	1 ~ 5 kHz	3.1 kHz ±3%	2.9 kHz ±3%	8 ~ 9 kHz	0 ~ 120 Hz
	OSA (optical scan angle)	10 ~ 40 deg.	> 25 deg.	> 30 deg.	> 35 deg.	> 15 deg.
	Input Voltage	40 ~ 150 V	60 ~ 150 V	60 ~ 150 V	60 ~ 150 V	90 ~ 120 V
Packaging	ARC window	optional	optional	optional	optional	optional
	Connector	10 pins	10 or 20 pins	10 or 20 pins	10 or 20 pins	10 or 20 pins
Applications	(recommended)	LiDAR fast-axis	LiDAR fast-axis	LiDAR fast-axis	LiDAR fast-axis	LiDAR slow-axis
Remarks		• hermetic seal upon request	• 20 pin connector for sensing	• sense electrodes available	• amplifier of drive signal	• DM2-AR driver required

Two-axis MEMS Scanners

Types (custom design)		Quasi-static			Quasi-static/Resonant	
Model #		QS2-1018US3	QS2-2015US3	QS2-4410US3	QR2-1035US4	QR2-2035US4
Features	Actuation	electrostatic	electrostatic	electrostatic	electrostatic	electrostatic
	Embedded sensor	optional	optional	optional	optional	optional
Specification	Mirror shape	circular	circular	elliptic	elliptic	circular
	Mirror size (dia.)	~ 1 mm	~ 2 mm	4.4 / 4.7 mm	1 / 0.7 mm	2 mm
	Slow (x) frequency	50 ~ 120 Hz	50 ~ 120 Hz	50 ~ 120 Hz	0 ~ 60 Hz	0 ~ 60 Hz
	Fast (y) frequency	"	"	"	30 ~ 33 kHz	8 ~ 10 kHz
	Slow (x) OSA	> 18 deg.	> 15 deg.	> 10 deg.	10 ~ 15 deg.	12 ~ 18 deg.
	Fast (y) OSA	"	"	"	30 ~ 40 deg.	25 ~ 35 deg.
	Input Voltage	90 ~ 150 V	90 ~ 150 V	90 ~ 150 V	80 ~ 160 V	80 ~ 160 V
Packaging	ARC window	optional	Optional	optional	optional	optional
	Connector	10 or 20 pins	10 or 20 pins	10 or 20 pins	10 pins (FPCB)	10 pins (FPCB)
Applications	(recommended)	general research	optical imaging	optical imaging	AR display	LiDAR
Remarks		• stability < 0.005°	• stability < 0.005°	• stability < 0.01°	• sense electrodes available	• sense electrodes available

MEMS Drivers and Controllers

Types		RS driver	QR driver	DC driver
Model #		DA1-SS18-V1.2	DM2-AR18-V1.1	DA4-DC15-V1.0
Features	Feedback control	No	drive frequency, scan angle and temp. (upon request)	no
	GUI	LCD GUI for control and PC serial communication	PC GUI for control	LCD GUI for control and PC serial communication
Specification	Channels	1	2	4
	Power	9 V / 1A	12 V / 1A	9 V / 1A
	Temp. range	-20 ~ +80°C	-20 ~ +80°C	-20 ~ +80°C
	Waveform / bandwidth	DC sinusoidal, square: 10 kHz	DC sinusoidal, square: ~ 10kHz half sine, arbitrary: ~ 500Hz	DC
	Output range	0 ~ 180 V _{pp}	0 ~ 180 V _{pp}	0 ~ 150 V
	Miscellaneous	laser control on/off overheat protection circuit	overheat protection circuit	overheat protection circuit
Applications	(recommended)	• driving one-axis scanners • resonant mode	• driving two-axis scanners • resonant/quasi-static mode	• piston/tilt motion control

- Customized scanners can be delivered **within 3~6 months**.
- Performance of each scanner can be improved **by calibration**.
- **Magnetic / piezoelectric** scan can be combined upon request.
- Consulting on **scanning solution** and evaluation are available.
- The specifications are subject to change without prior notice.