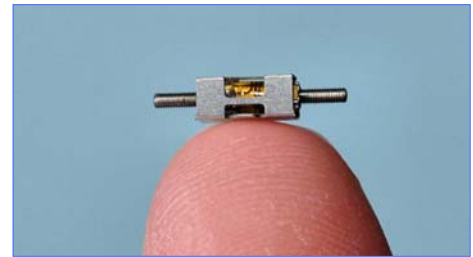




SQL Series Piezo Motors for OEM Product Applications



FEATURES

- Scalable to tiny sizes (less than 2 x 2 x 6 mm)
- Simple construction for high-volume, low-cost manufacturing
- No gears or cams - reduces part count in OEM products
- Uses power only when moving
- Robust construction withstands high shock loads
- Sub-micrometer precision
- Silent, ultrasonic operation
- Wide operating temperature range

APPLICATIONS

- Microfluidics, lab-on-a-chip
- Electronic locks and fasteners
- Medical devices
- Automotive modules
- Imaging
- Mobile phone cameras
- Micro actuation for robotics, UAVs, instruments and more

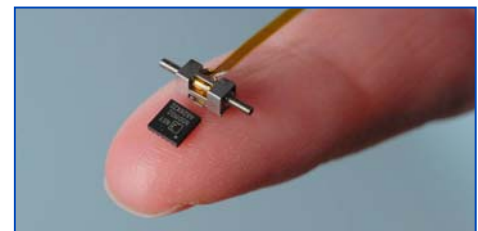
The world's smallest linear motor for OEM products

The SQL Series piezoelectric SQUIGGLE[®] motor is the world's smallest linear motor. This patented ultrasonic motor offers millimeters of stroke, sub-micrometer precision and high force. It withstands high shock and has low power requirements for battery-driven devices.

We work with OEM customers to tailor SQUIGGLE motors, drivers and modules to your needs. We will help you navigate trade-offs among size, speed, force and power. To get you started, we offer development kits including a SQUIGGLE motor and controller with New Scale Pathway[™] software – a flexible and sophisticated development tool with easy to use graphical user interface and intuitive scripting environment.



SQL-1.8-SS and SQL-3.4 SQUIGGLE motors. SQL Series motors are also available in custom sizes for OEMs.

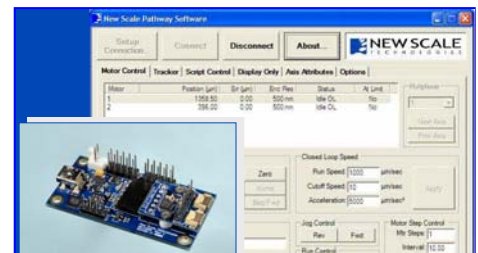


ASIC driver and SQL-1.8-SS motor. The NSD-1202 dual piezo motor driver accepts I²C input. Stainless steel motor housing simplifies mounting.

Specifications	Model SQL-1.8-6-12-SS	Model SQL-3.4-10
Travel Range	6 mm (call for custom)	5 mm, 20 mm
Housing Dimensions	2.7 x 2.8 x 6 mm	∅ 6.83 x 11.02 mm
Stator Dimensions	1.8 x 1.8 x 6 mm	3.4 x 3.4 x 10mm
Stall Force	30 gram force (0.3 N)	200 gram force (2 N)
Speed (at ½ stall force)	7 mm/s	4 mm/s
Resolution	0.5 µm	0.5 µm
Input Power (stopped)	OFF POWER HOLD (0 mW / 0 V to hold position)	
Input Power to motor (moving) *	< 300 mW (resonant drive) < 500 mW (direct drive)	700 mW
Input Power to controller (moving) *	100-900 mW (MC-33DB driver) ~1.2 W (MC-3300 controller)	~1.6 W (MC-1000 controller)
Lifetime **	>1 Million cycles	>70,000 cycles
Operating Temperature	-30 to +80° C	
Storage Temperature	-40 to +85° C	
Shock Resistance	2500 Gs	
Operating Frequency	~ 171 KHz	~ 112 KHz
Capacitance per Phase	~ 0.67 nF	~ 1.29 nF
Motor Controller	NSD-1202, MC-33DB, MC-3300	MC-1000 or SQ-2300
Weight	0.16 grams	1.7 grams

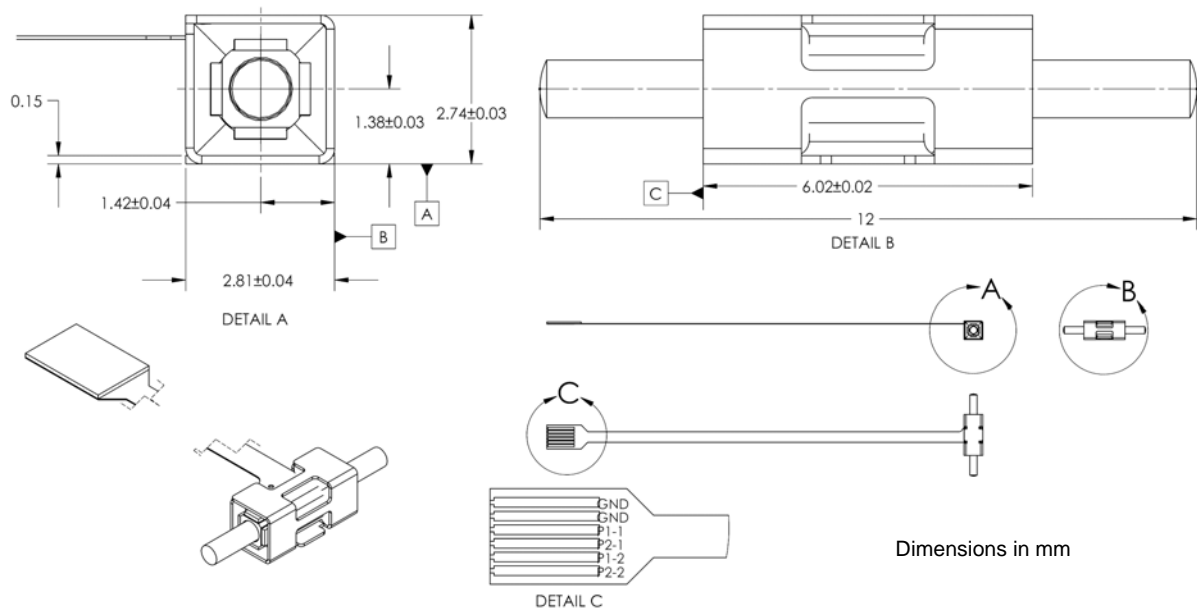
* Power depends on motor speed and load.

** Continuous operation with load ~10 gram force at full speed, room temperature.

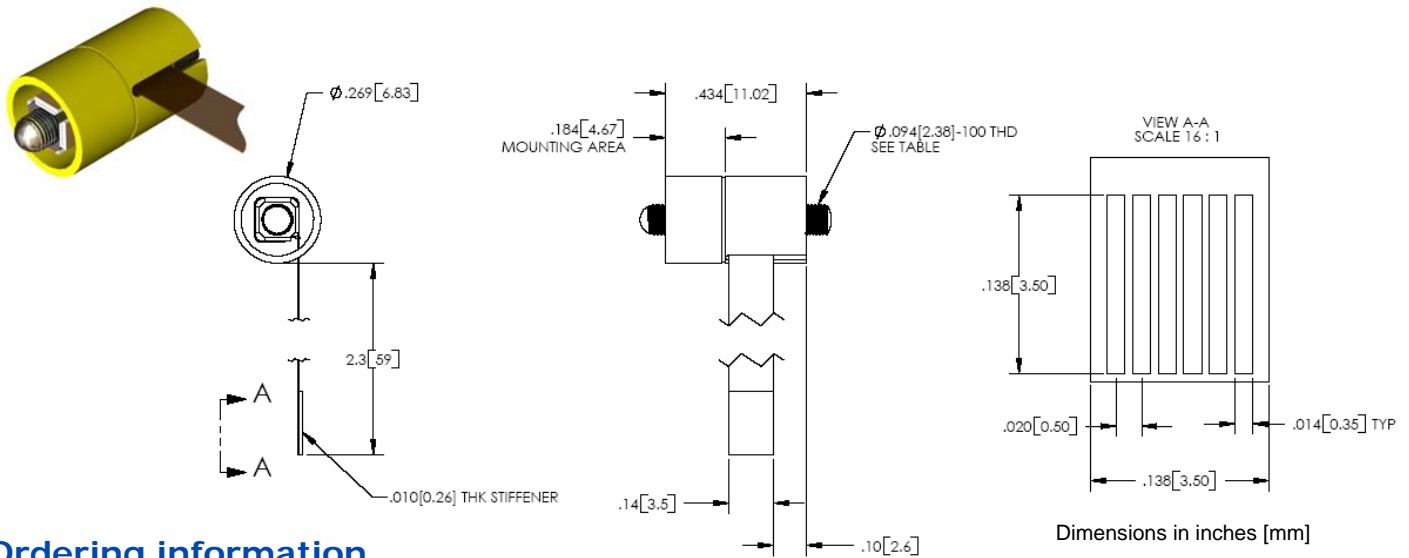


MC-3300 controller incorporates the NSD-1202 drive ASIC on the MC-33DB drive card. New Scale Pathway software facilitates evaluation, system development and prototype test.

SQL-1.8-6-12-SS SQUIGGLE motor



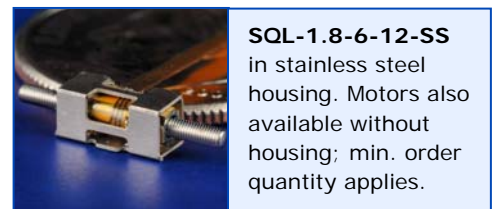
SQL-3.4-10 SQUIGGLE motor



Ordering information

Model	Travel Range*	Mounting
SQL-1.8-6-12-SS	6 mm (12 mm screw)	Pre-mounted in stainless steel housing
SQL-3.4-10-30 SQL-3.4-10-15	20 mm (30 mm screw) 5 mm (15 mm screw)	Pre-mounted in Torlon sleeve
SQL-1.8-E-SS evaluation pack	Includes pre-mounted SQL-1.8-6-12-SS motor, MC-3300 controller, power adapter, cables and New Scale Pathway software	
SQL-3.4-E evaluation pack	Includes SQL-3.4-10-30 motor, MC-1000 controller, AC power adapter, cables and New Scale Pathway software	

* Call for custom travel range and screw length



SQL-1.8-6-12-SS
in stainless steel housing. Motors also available without housing; min. order quantity applies.

SQL- 09-03-19