

## LSM050B-E03T4A Datasheet



- 25, 50, 100, 150 and 200 mm travel
- Recirculating ball bearing design for high load (25 kg) and long lifetime
- Encoder position feedback with slip/stall detection and automatic recovery
- Multiple LSM-E stages can be assembled in XY or XYZ configurations without additional hardware
- Designed for use with an X-MCC Series stepper motor controller or any 2-phase stepper motor controller
- With AutoDetect, the X-MCC controller configures its settings automatically for the connected peripheral
- Custom versions available

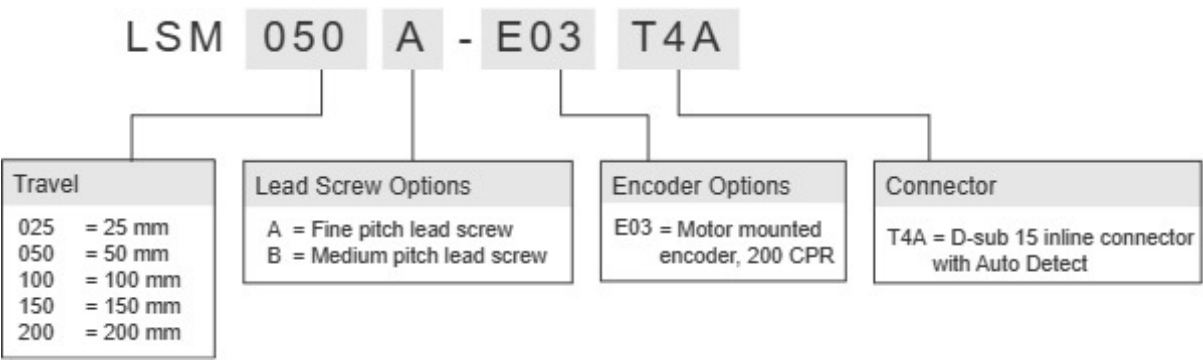
### LSM-E Series Overview

Zaber's LSM-E Series devices are computer-controlled, motorized linear stages with high thrust and speed capabilities and a very compact size. They are designed to interface with our X-MCC Series universal motor controllers, offering high resolution daisy-chainable operation. Set up is easy with AutoDetect. Once connected, the X-MCC controller will automatically detect and configure the LSM-E.

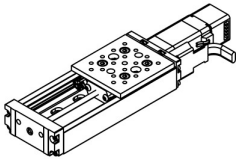
The built-in motor encoder allows closed-loop operation and slip/stall recovery features. At only 21 mm high, these miniature stages are excellent for applications where a small profile is required. The LSM-E's innovative design allows speeds up to 104 mm/s and loads up to 25 kg. The stages can be mounted in XY and XYZ configurations with no additional hardware.

For more information visit: <https://www.zaber.com/products/linear-stages/LSM-E>

### LSM-E Series Part Numbering

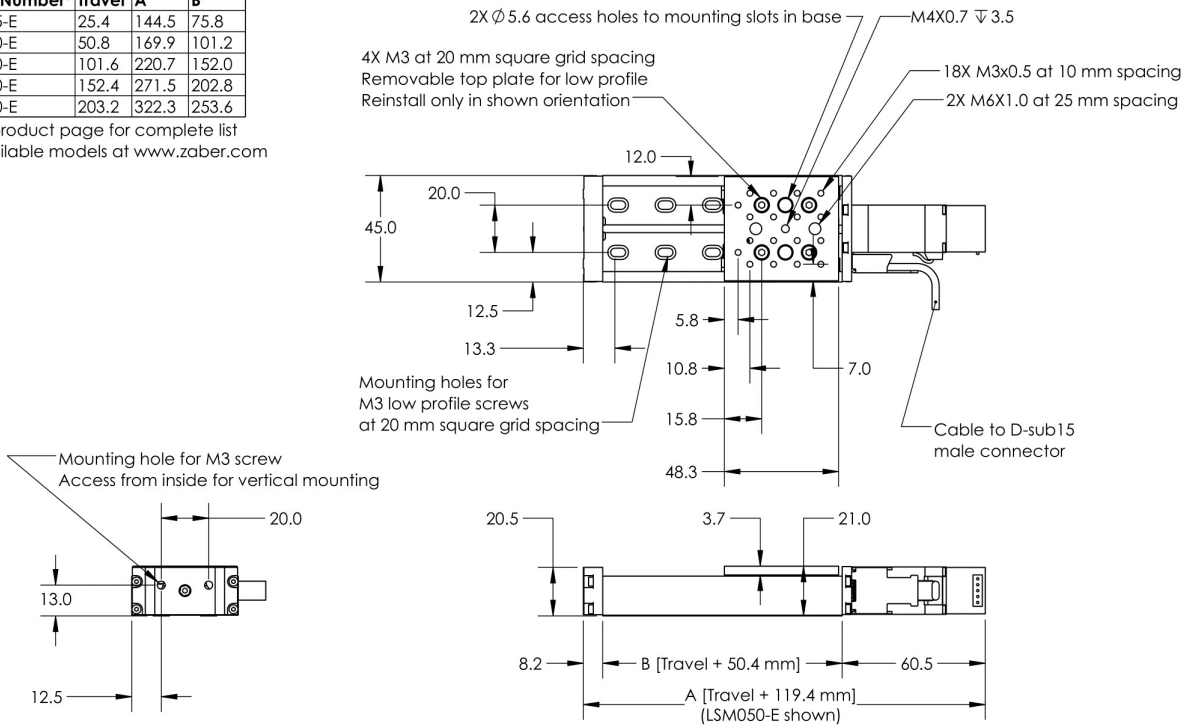


LSM050B-E03T4A Drawings



| Model Number* | Travel | A     | B     |
|---------------|--------|-------|-------|
| LSM025-E      | 25.4   | 144.5 | 75.8  |
| LSM050-E      | 50.8   | 169.9 | 101.2 |
| LSM100-E      | 101.6  | 220.7 | 152.0 |
| LSM150-E      | 152.4  | 271.5 | 202.8 |
| LSM200-E      | 203.2  | 322.3 | 253.6 |

\*See product page for complete list of available models at [www.zaber.com](http://www.zaber.com)



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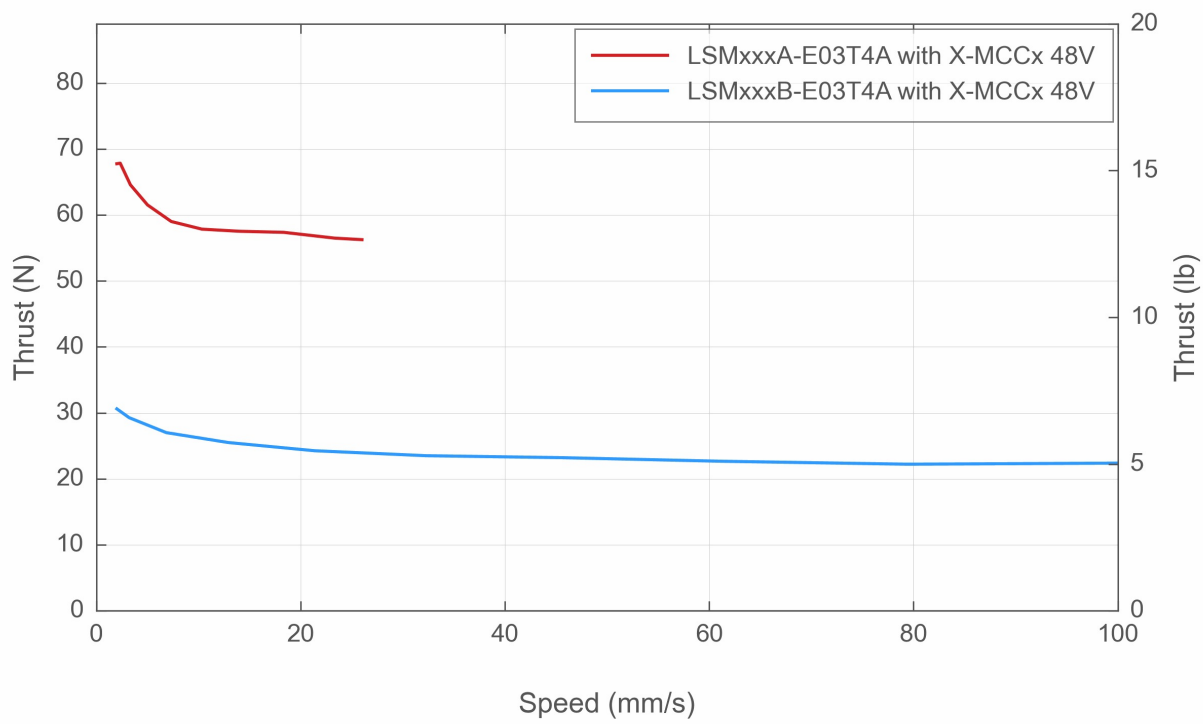
## LSM050B-E03T4A Specifications

| Specification                       | Value                      | Alternate Unit          |
|-------------------------------------|----------------------------|-------------------------|
| Microstep Size (Default Resolution) | 0.1905 $\mu\text{m}$       |                         |
| Built-in Controller                 | No                         |                         |
| Recommended Controller              | X-MCC (48 V) Recommended   |                         |
| AutoDetect                          | Yes                        |                         |
| Travel Range                        | 50.8 mm                    | 2.000"                  |
| Accuracy (unidirectional)           | 25 $\mu\text{m}$           | 0.000984"               |
| Repeatability                       | < 6 $\mu\text{m}$          | < 0.000236"             |
| Backlash                            | < 16 $\mu\text{m}$         | < 0.000630"             |
| Maximum Speed                       | 104 mm/s                   | 4.094"/s                |
| Minimum Speed                       | 0.000116 mm/s              | 0.000005"/s             |
| Speed Resolution                    | 0.000116 mm/s              | 0.000005"/s             |
| Encoder Resolution                  | 200 CPR                    | 800 states/rev          |
| Encoder Type                        | Rotary quadrature encoder  |                         |
| Peak Thrust                         | 25 N                       | 5.6 lb                  |
| Maximum Continuous Thrust           | 25 N                       | 5.6 lb                  |
| Maximum Centered Load               | 250 N                      | 56.1 lb                 |
| Maximum Cantilever Load             | 10 N-m                     | 7.4 ft-lb               |
| Guide Type                          | Recirculating ball bearing |                         |
| Vertical Runout                     | < 11 $\mu\text{m}$         | < 0.000433"             |
| Horizontal Runout                   | < 14 $\mu\text{m}$         | < 0.000551"             |
| Pitch                               | 0.03°                      | 0.523 mrad              |
| Roll                                | 0.03°                      | 0.523 mrad              |
| Yaw                                 | 0.03°                      | 0.523 mrad              |
| Stiffness in Pitch                  | 150 N-m/°                  | 116 $\mu\text{rad/N-m}$ |
| Stiffness in Roll                   | 150 N-m/°                  | 116 $\mu\text{rad/N-m}$ |
| Stiffness in Yaw                    | 150 N-m/°                  | 116 $\mu\text{rad/N-m}$ |
| Linear Motion Per Motor Rev         | 2.4384 mm                  | 0.096"                  |
| Motor Steps Per Rev                 | 200                        |                         |
| Motor Type                          | Stepper (2 phase)          |                         |
| Motor Rated Current                 | 600 mA/phase               |                         |

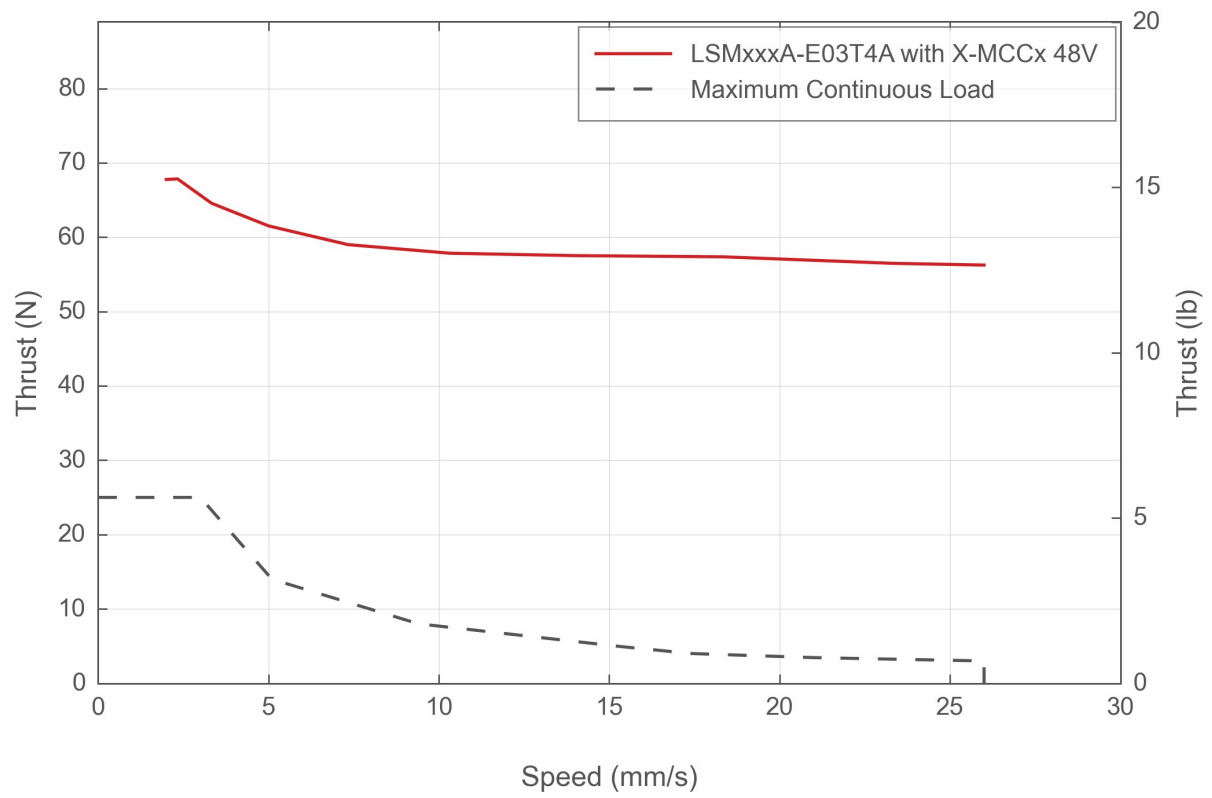
| Specification               | Value                                                | Alternate Unit |
|-----------------------------|------------------------------------------------------|----------------|
| Motor Winding Resistance    | 6.5 ohms/phase                                       |                |
| Inductance                  | 3.5 mH/phase                                         |                |
| Motor Connection            | D-sub 15                                             |                |
| Default Resolution          | 1/64 of a step                                       |                |
| Motor Frame Size            | NEMA 08                                              |                |
| Mechanical Drive System     | Precision lead screw                                 |                |
| Limit or Home Sensing       | Magnetic hall sensor                                 |                |
| Axes of Motion              | 1                                                    |                |
| Mounting Interface          | M3 and M6 threaded holes and M4 threaded centre hole |                |
| Stage Parallelism           | < 25 µm                                              | < 0.000984"    |
| Operating Temperature Range | 0 to 50 °C                                           |                |
| RoHS Compliant              | Yes                                                  |                |
| CE Compliant                | Yes                                                  |                |
| Vacuum Compatible           | No                                                   |                |
| Weight                      | 0.28 kg                                              | 0.617 lb       |

LSM-E Series Charts

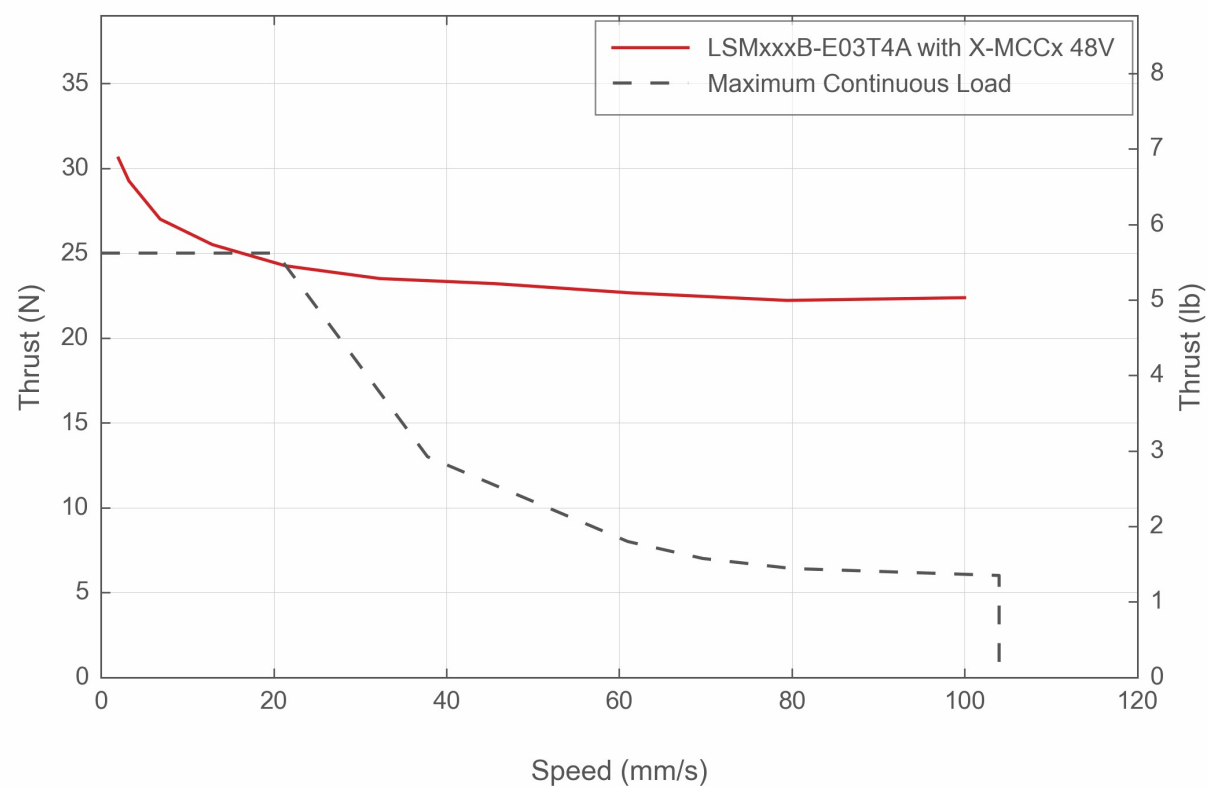
Thrust Speed Performance



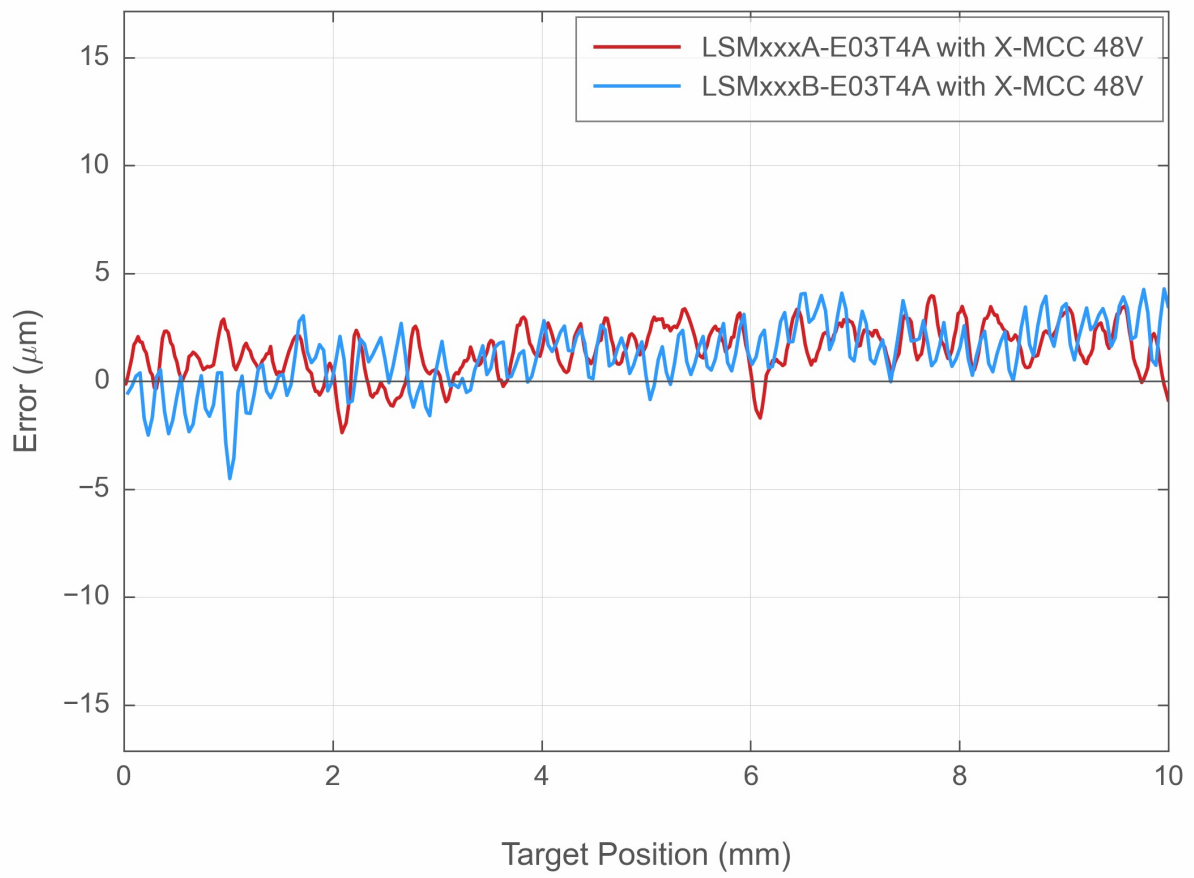
## Thrust Speed Performance



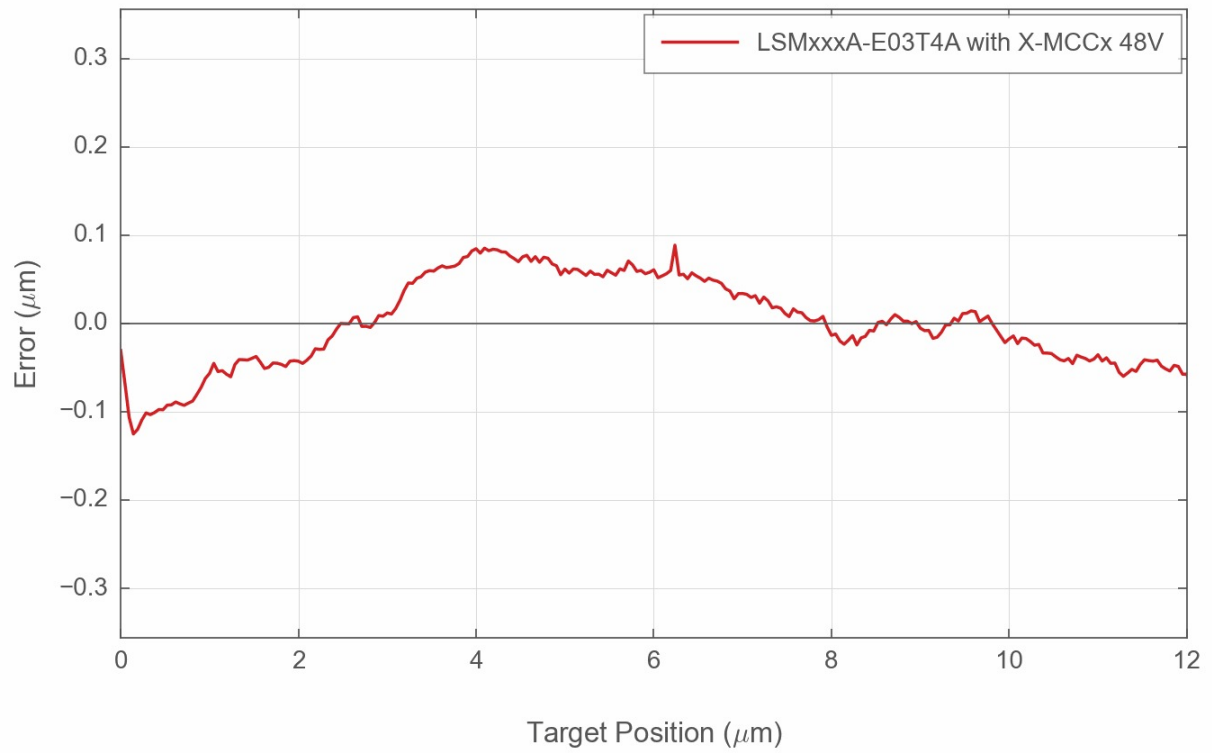
Thrust Speed Performance



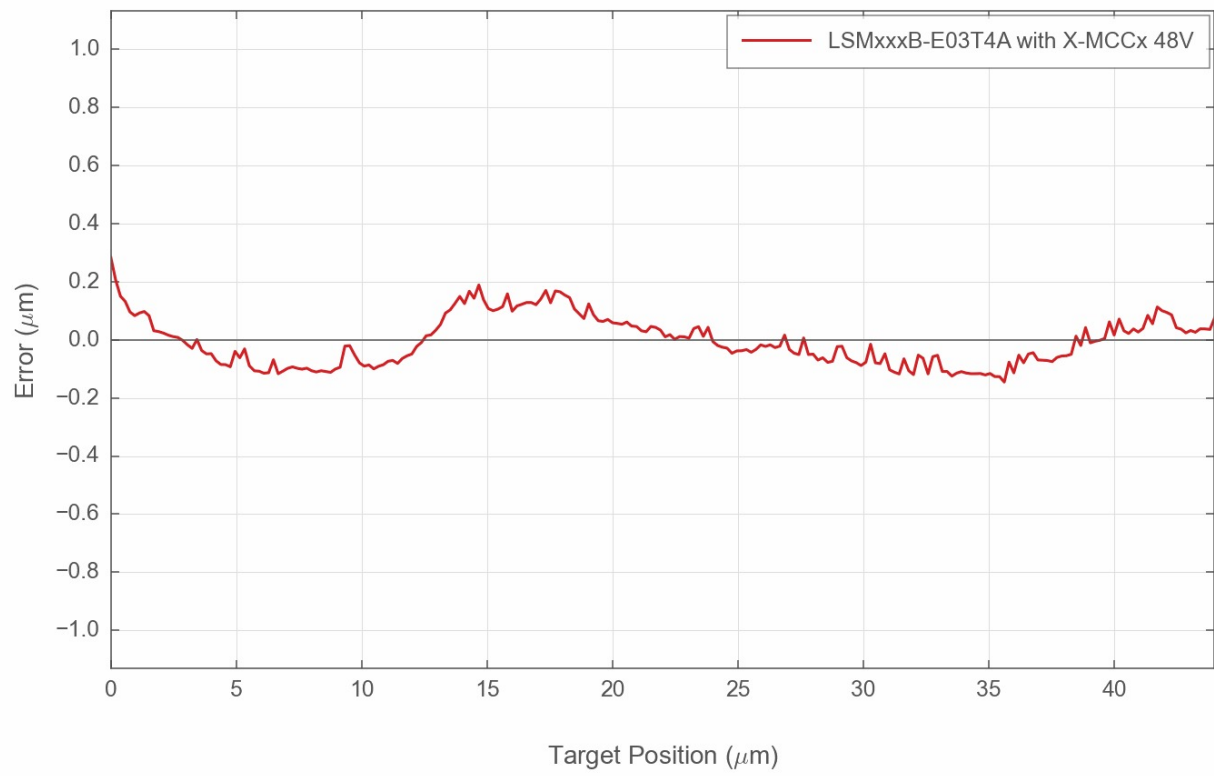
## Typical Accuracy



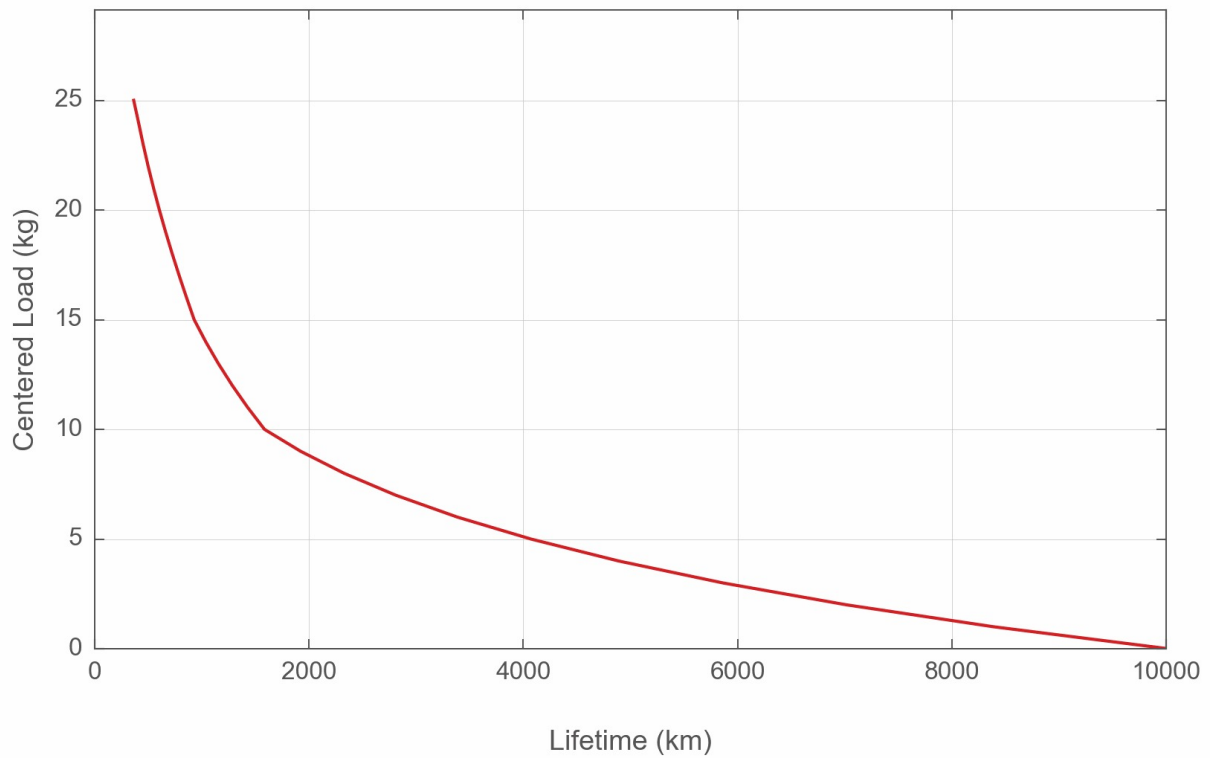
## Typical Microstepping Accuracy



## Typical Microstepping Accuracy



## LSM Linear Bearing Lifetime



## Contact

Email: [contact@zaber.com](mailto:contact@zaber.com)

Phone (toll free Canada/USA): 1-888-276-8033

Phone (direct): 1-604-569-3780

Fax: 1-604-648-8033

Zaber Technologies Inc.

#2 - 605 West Kent Ave. N.

Vancouver, British Columbia

Canada, V6P 6T7

<https://www.zaber.com>