

X-LSM-SV1 Series Datasheet



- Vacuum compatible to 10⁻³ Torr
- 25, 50, 100, 150, 200 mm travel
- Up to 100 mm/s speed and up to 35 N thrust
- 10 kg load capacity
- Built-in controller; daisy-chains with other Zaber products
- Only 4 feedthrough wires required to control all units in the daisy-chain via serial port (with an X-PIB adaptor)
- Custom versions available

X-LSM-SV1 Series Overview

For more information about the basics of a vacuum system and considerations to keep in mind when gathering requirements for your application, read our technical article, "Motion Device Design Considerations for Vacuum Applications".

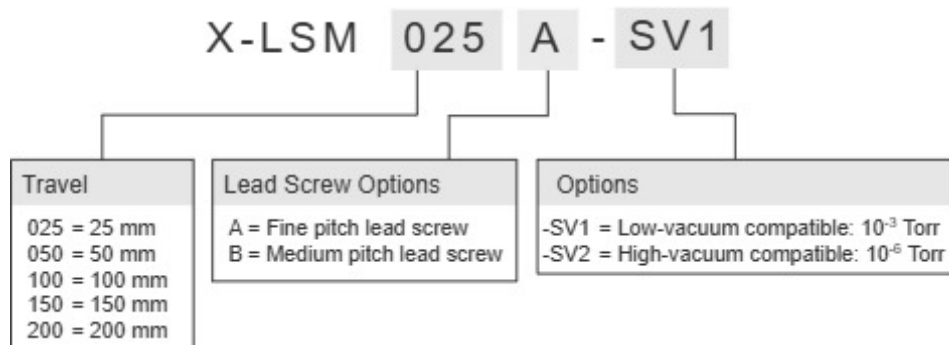
Zaber's X-LSM-SV1 Series devices are low-vacuum compatible, computer-controlled, motorized linear stages with high thrust and speed capabilities, and a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply.

These stages connect to the RS-232 port or USB port of any computer, and they can be daisy-chained with any other Zaber products. The daisy-chain also shares power, making it possible for multiple X-Series products to share a single power supply.

At only 21 mm high, these miniature stages are excellent for applications where a small profile is required. The X-LSM-SV1 is designed with vacuum compatible materials to minimize outgassing and allow for faster pump down times. Like all of Zaber's products, the X-LSM-SV1 Series is designed to be 'plug and play' and very easy to set up and operate.

For more information visit: <https://www.zaber.com/products/vacuum-compatible-stages/X-LSM-SV1>

X-LSM-SV1 Series Part Numbering & Options



X-LSM-SV1 Series Drawings

- [X-LSM-SV.png \(Drawing for the X-LSM-SV\)](#)

X-LSM-SV1 Series Specifications

Built-in Controller	
Encoder Type	No
Maximum Continuous Thrust	25 N (5.6 lb)
Communication Interface	RS-232
Communication Protocol	Zaber ASCII (Default), Zaber Binary
Data Cable Connection	Teflon flying leads with M8 4 pin M/F
Maximum Centered Load	100 N (22.4 lb)
Maximum Moment (Roll)	300 N-cm (424.8 oz-in)
Maximum Moment (Pitch)	300 N-cm (424.8 oz-in)
Maximum Moment (Yaw)	300 N-cm (424.8 oz-in)
Guide Type	Needle roller bearing
Stiffness in Pitch	55 N-m/° (317 µrad/N-m)
Stiffness in Roll	52.5 N-m/° (332 µrad/N-m)
Stiffness in Yaw	85 N-m/° (205 µrad/N-m)
Power Supply	24-48 VDC
Power Plug	None, use X-PIB
Maximum Current Draw	350 mA
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	800 mA/phase
Inductance	3.5 mH/phase
Default Resolution	1/64 of a step
Mechanical Drive System	Precision lead screw
Limit or Home Sensing	Magnetic hall sensor
Manual Control	No
Axes of Motion	1
LED Indicators	Yes
Mounting Interface	M3 and M6 threaded holes and M4 threaded center hole
Stage Parallelism	< 25 µm (< 0.000984")
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes

Built-in Controller	
Vacuum Compatible	Low vacuum (10-3 Torr)

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LSM025A-SV1	0.047625 µm	25.4 mm (1.000")	15 µm (0.000591")	< 3 µm (< 0.000118")
X-LSM025B-SV1	0.1905 µm	25.4 mm (1.000")	15 µm (0.000591")	< 6 µm (< 0.000236")
X-LSM050A-SV1	0.047625 µm	50.8 mm (2.000")	20 µm (0.000787")	< 3 µm (< 0.000118")
X-LSM050B-SV1	0.1905 µm	50.8 mm (2.000")	25 µm (0.000984")	< 6 µm (< 0.000236")
X-LSM100A-SV1	0.047625 µm	101.6 mm (4.000")	35 µm (0.001378")	< 3 µm (< 0.000118")
X-LSM100B-SV1	0.1905 µm	101.6 mm (4.000")	45 µm (0.001772")	< 6 µm (< 0.000236")
X-LSM150A-SV1	0.047625 µm	152.4 mm (6.000")	50 µm (0.001968")	< 3 µm (< 0.000118")
X-LSM150B-SV1	0.1905 µm	152.4 mm (6.000")	65 µm (0.002559")	< 6 µm (< 0.000236")
X-LSM200A-SV1	0.047625 µm	203.2 mm (8.000")	60 µm (0.002362")	< 3 µm (< 0.000118")
X-LSM200B-SV1	0.1905 µm	203.2 mm (8.000")	85 µm (0.003346")	< 6 µm (< 0.000236")

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LSM025A-SV1	< 12 µm (< 0.000472")	24 mm/s (0.945"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
X-LSM025B-SV1	< 16 µm (< 0.000630")	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
X-LSM050A-SV1	< 12 µm (< 0.000472")	24 mm/s (0.945"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
X-LSM050B-SV1	< 16 µm (< 0.000630")	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
X-LSM100A-SV1	< 12 µm (< 0.000472")	24 mm/s (0.945"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
X-LSM100B-SV1	< 16 µm (< 0.000630")	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
X-LSM150A-SV1	< 12 µm (< 0.000472")	24 mm/s (0.945"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
	< 16 µm	100 mm/s	0.000116 mm/s	0.000116 mm/s

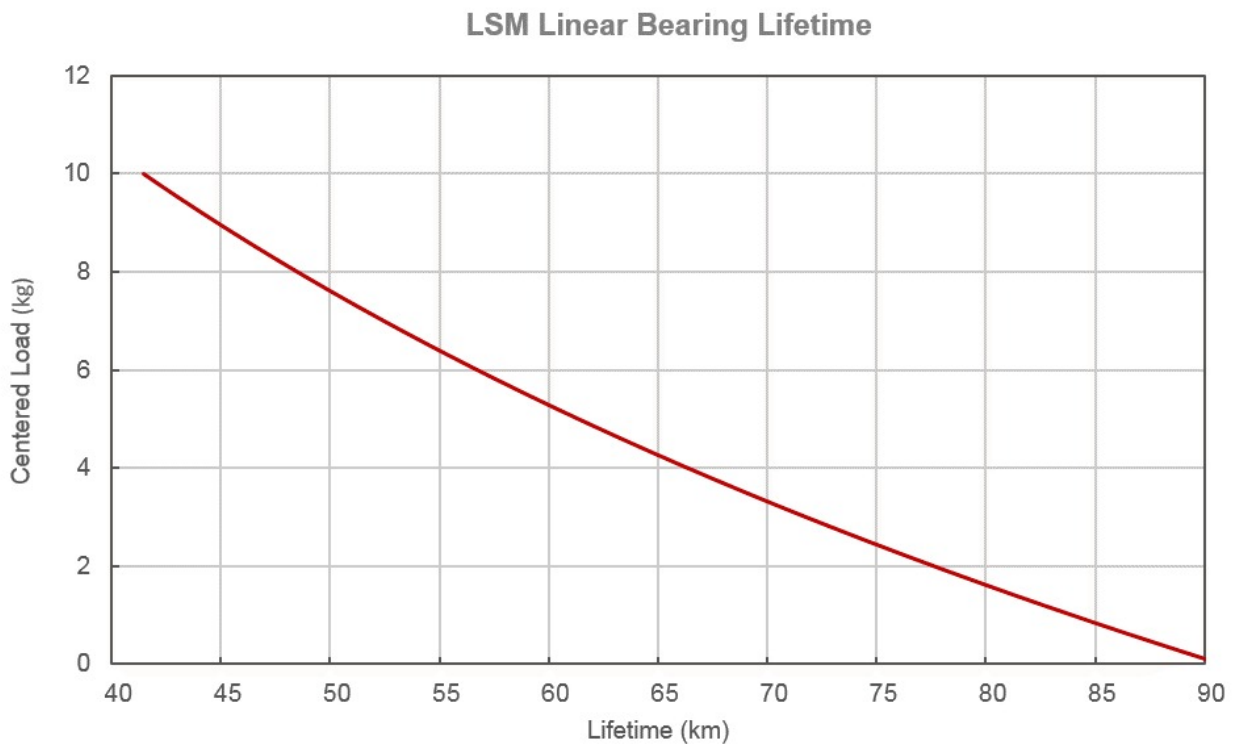
Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LSM150B-SV1	(< 0.000630")	(3.937"/s)	(0.000005"/s)	(0.000005"/s)
X-LSM200A-SV1	< 12 µm (< 0.000472")	24 mm/s (0.945"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
X-LSM200B-SV1	< 16 µm (< 0.000630")	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)

Part Number	Peak Thrust	Vertical Runout	Horizontal Runout	Pitch
X-LSM025A-SV1	35 N (7.8 lb)	< 8 µm (< 0.000315")	< 12 µm (< 0.000472")	0.02° (0.349 mrad)
X-LSM025B-SV1	15 N (3.4 lb)	< 8 µm (< 0.000315")	< 12 µm (< 0.000472")	0.02° (0.349 mrad)
X-LSM050A-SV1	35 N (7.8 lb)	< 11 µm (< 0.000433")	< 14 µm (< 0.000551")	0.03° (0.523 mrad)
X-LSM050B-SV1	15 N (3.4 lb)	< 11 µm (< 0.000433")	< 14 µm (< 0.000551")	0.03° (0.523 mrad)
X-LSM100A-SV1	35 N (7.8 lb)	< 18 µm (< 0.000709")	< 18 µm (< 0.000709")	0.04° (0.698 mrad)
X-LSM100B-SV1	15 N (3.4 lb)	< 18 µm (< 0.000709")	< 18 µm (< 0.000709")	0.04° (0.698 mrad)
X-LSM150A-SV1	35 N (7.8 lb)	< 25 µm (< 0.000984")	< 23 µm (< 0.000906")	0.04° (0.698 mrad)
X-LSM150B-SV1	15 N (3.4 lb)	< 25 µm (< 0.000984")	< 23 µm (< 0.000906")	0.04° (0.698 mrad)
X-LSM200A-SV1	35 N (7.8 lb)	< 32 µm (< 0.001260")	< 27 µm (< 0.001063")	0.04° (0.698 mrad)
X-LSM200B-SV1	15 N (3.4 lb)	< 32 µm (< 0.001260")	< 27 µm (< 0.001063")	0.04° (0.698 mrad)

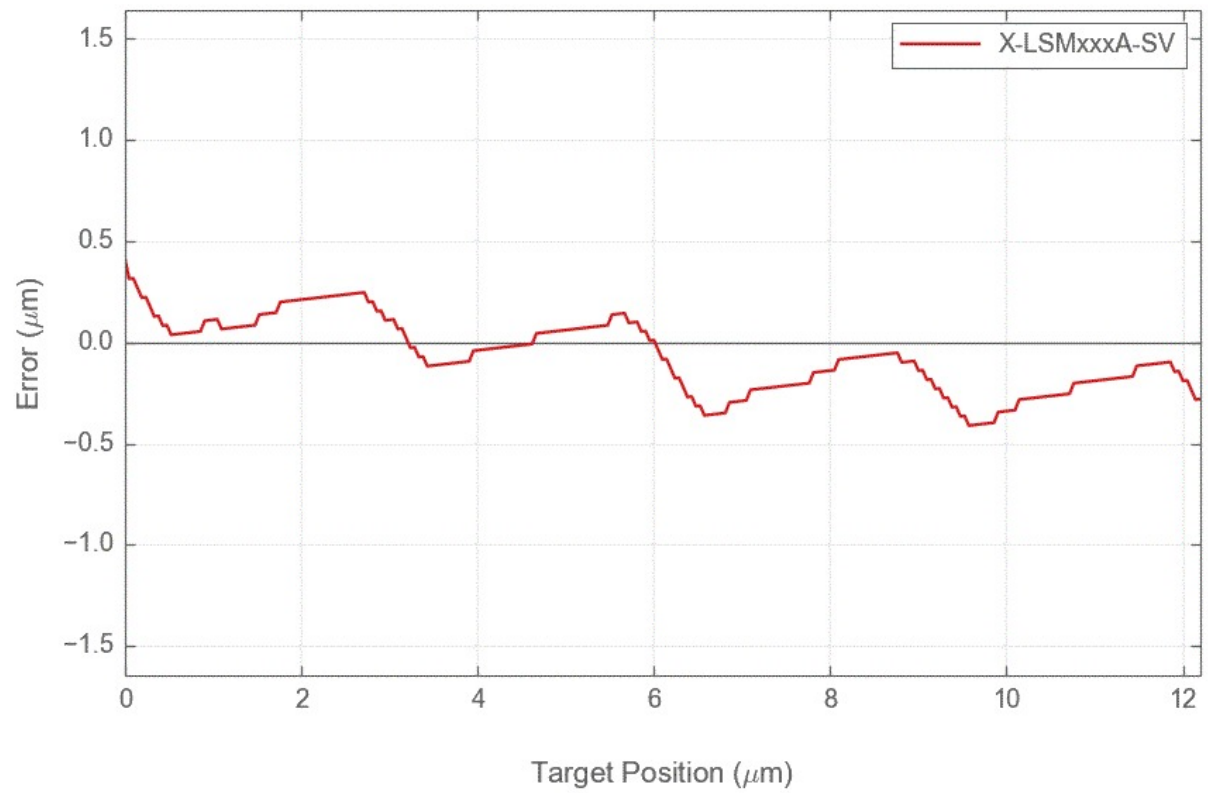
Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
X-LSM025A-SV1	0.02° (0.349 mrad)	0.03° (0.523 mrad)	0.6096 mm (0.024")	0.39 kg (0.860 lb)
X-LSM025B-SV1	0.02° (0.349 mrad)	0.03° (0.523 mrad)	2.4384 mm (0.096")	0.39 kg (0.860 lb)
X-LSM050A-SV1	0.03° (0.523 mrad)	0.03° (0.523 mrad)	0.6096 mm (0.024")	0.40 kg (0.882 lb)
X-LSM050B-SV1	0.03° (0.523 mrad)	0.03° (0.523 mrad)	2.4384 mm (0.096")	0.40 kg (0.882 lb)
X-LSM100A-SV1	0.04° (0.698 mrad)	0.04° (0.698 mrad)	0.6096 mm (0.024")	0.43 kg (0.948 lb)
	0.04°	0.04°	2.4384 mm	0.43 kg

Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
X-LSM100B-SV1	(0.698 mrad)	(0.698 mrad)	(0.096")	(0.948 lb)
X-LSM150A-SV1	0.05° (0.873 mrad)	0.05° (0.873 mrad)	0.6096 mm (0.024")	0.47 kg (1.036 lb)
X-LSM150B-SV1	0.05° (0.873 mrad)	0.05° (0.873 mrad)	2.4384 mm (0.096")	0.47 kg (1.036 lb)
X-LSM200A-SV1	0.05° (0.873 mrad)	0.05° (0.873 mrad)	0.6096 mm (0.024")	0.50 kg (1.102 lb)
X-LSM200B-SV1	0.05° (0.873 mrad)	0.05° (0.873 mrad)	2.4384 mm (0.096")	0.50 kg (1.102 lb)

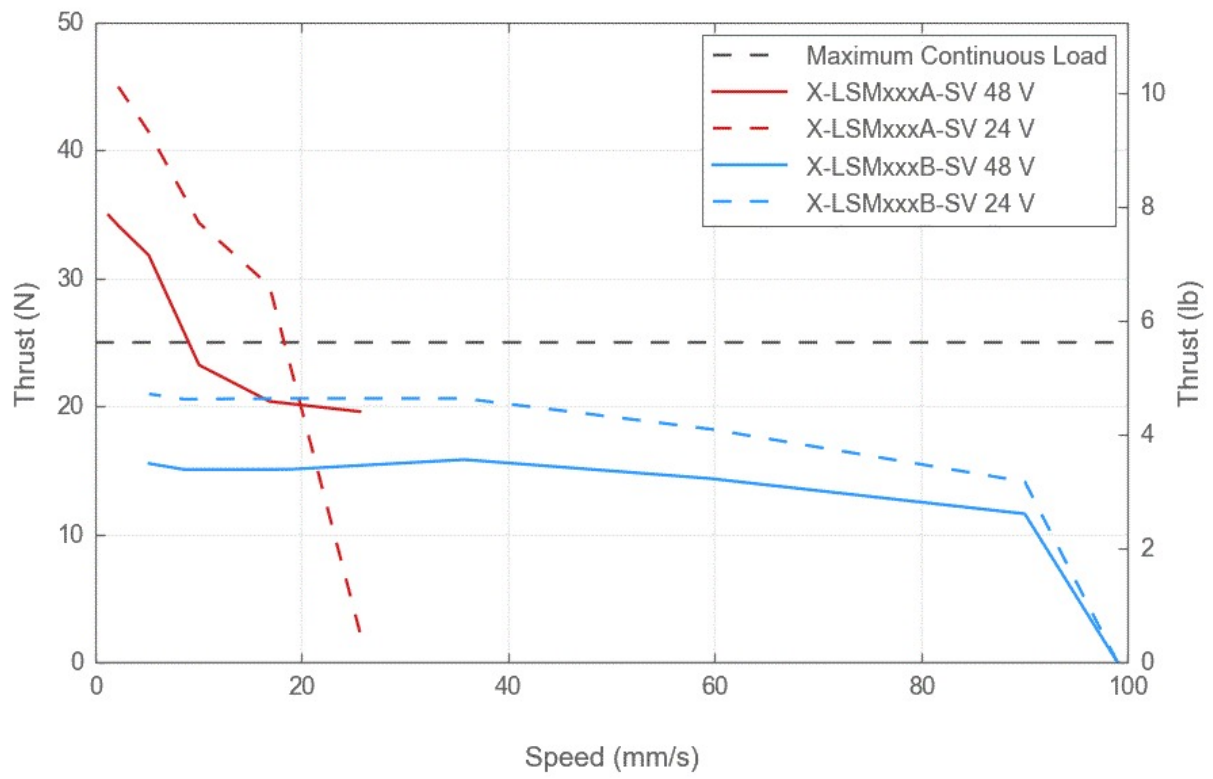
X-LSM-SV1 Series Charts



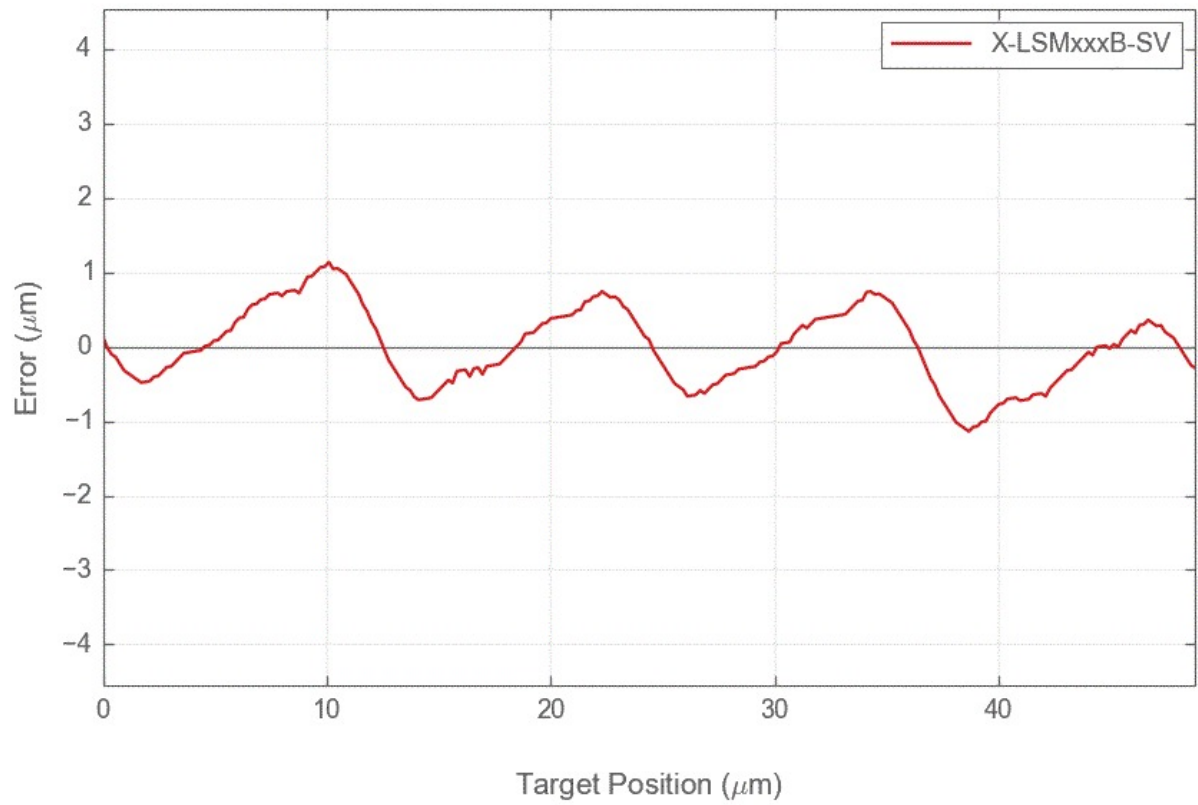
Typical Microstepping Accuracy



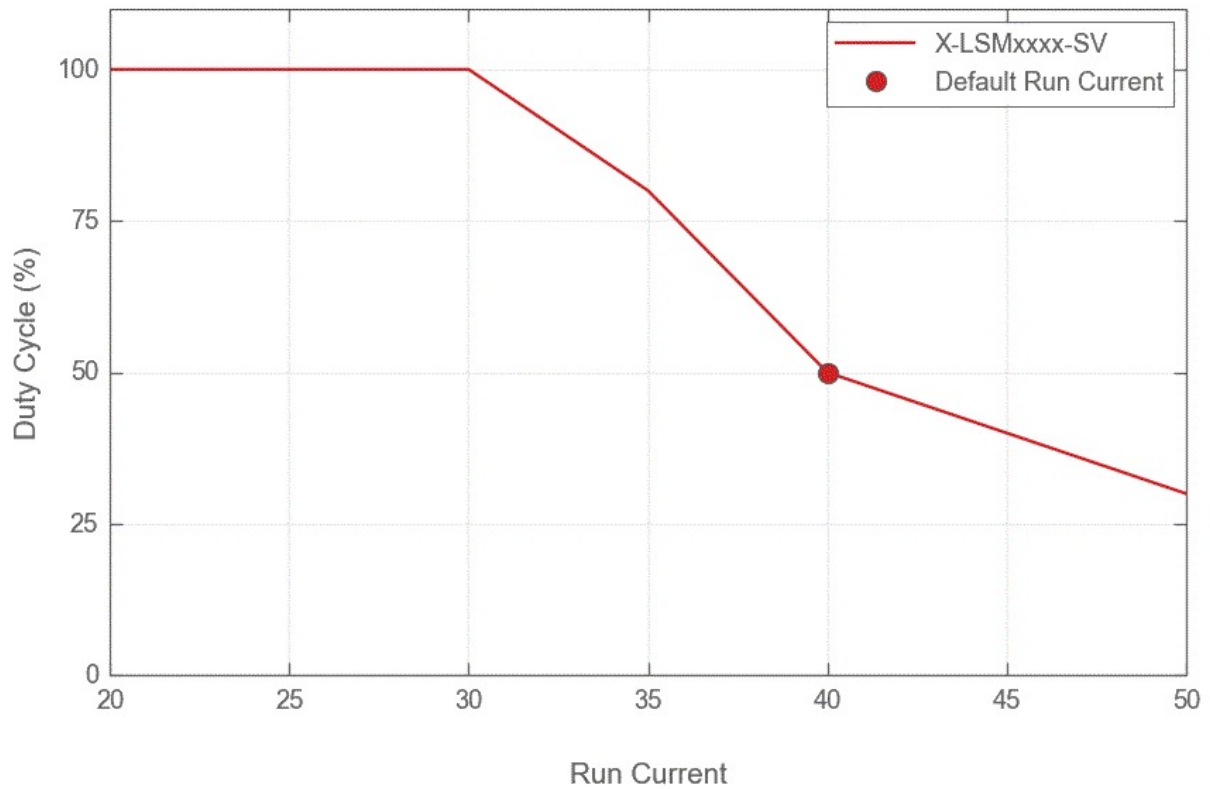
Thrust Speed Performance



Typical Microstepping Accuracy



Duty Cycle vs Run Current



Contact

Email: 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>