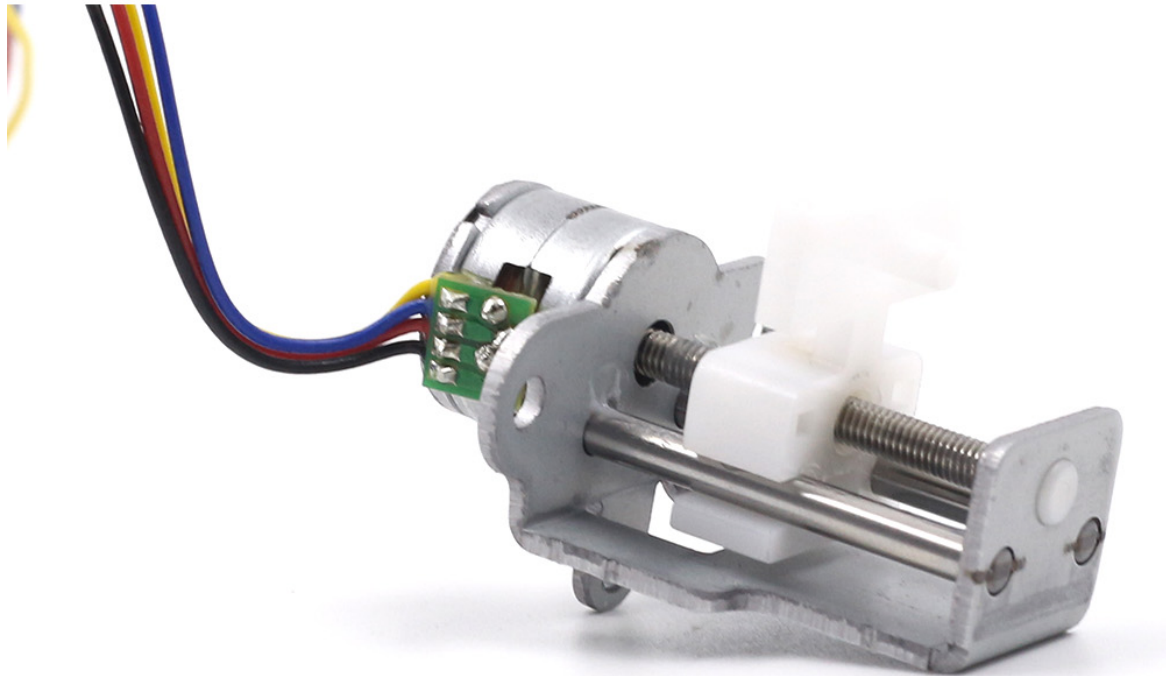


Ø15 mm PM Stepper Motor Linear Slide Module

TSL-SM1519

Compact linear motion module with bipolar PM stepper motor and precision M3 × P0.5 lead screw



Product Highlights

- **Compact 15 mm Class**
Space-efficient linear motion module for precision positioning and compact mechanisms.
- **Bipolar PM Stepper Drive**
Two-phase bipolar architecture with 18° step angle and CW/CCW rotation capability.
- **Integrated Linear Transmission**
Right-hand M3 × P0.5 threaded shaft converts rotary motion into controlled linear travel.
- **Flexible Voltage Operation**
Performance reference data is provided for 3.7 V, 5 V, 6 V and 12 V test conditions.

Rated Voltage

6 V DC

Step Angle

18° / step

Phase Current

400 mA / phase

Approx. Weight

30 g

ELECTRICAL & PERFORMANCE DATA

General Specifications

Item	Specification
Motor Model	TSL-SM1519
Shaft Diameter	M3 × P0.5 right-hand threaded shaft
Drive Mode	Bipolar drive
Rated Voltage	6 V DC
Driver IC	L6219
Phase Current	400 mA/phase (1,000 PPS)
Phase Resistance	15 Ω/phase ±10% (20°C)
Phase Number	2 phases
Step Angle	18°/step
Excitation Method	2-2 phase excitation
Pull-out Torque	≥200 g at 500 PPS
Max Response Frequency	≥1,200 PPS
Max Self-starting Frequency	≥900 PPS
Insulation Grade	Class E for coils
Insulation Strength	100 V AC for 1 second
Insulation Resistance	50 MΩ at DC 500 V
Temperature Range	0°C to +55°C
Rotation	CW / CCW
Connector	XH2.54-4PIN
Weight	Approx. 30 g

Voltage / Speed / Current Reference

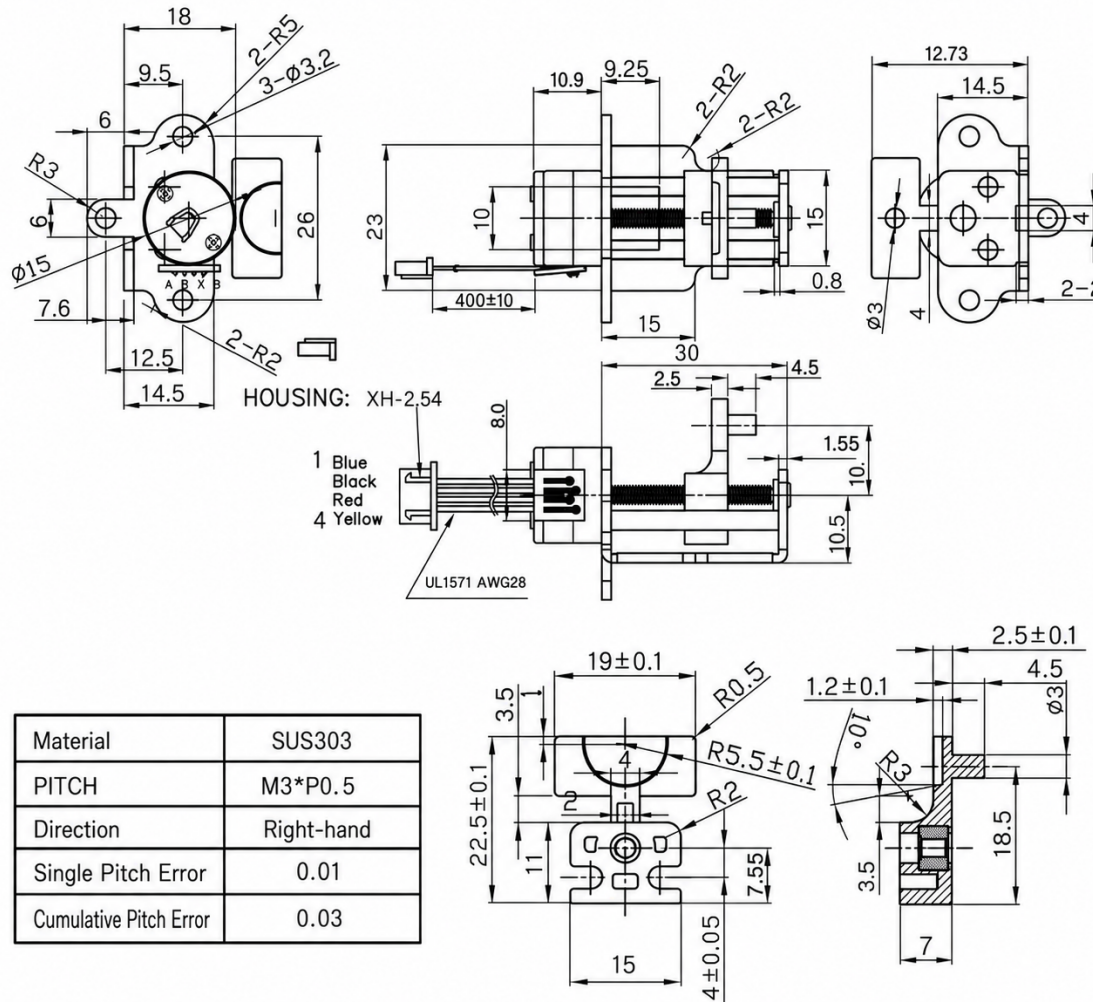
Test Voltage	12 V DC	6 V DC	5 V DC	3.7 V DC
Max Drive Efficiency	1,200 Hz	750 Hz	600 Hz	400 Hz
Speed at Max Efficiency	3,600 rpm	2,250 rpm	1,800 rpm	1,200 rpm
Current at Max Efficiency	≤0.15 A	≤0.12 A	≤0.12 A	≤0.12 A
Min Drive Efficiency	600 Hz	500 Hz	300 Hz	250 Hz
Speed at Min Efficiency	1,800 rpm	1,500 rpm	900 rpm	750 rpm
Current at Min Efficiency	≤0.5 A	≤0.17 A	≤0.25 A	≤0.18 A
Phase-locked Self-lock Current	≤1.2 A	≤0.65 A	≤0.55 A	≤0.4 A

Application Notes

- Performance values are reference test data and may vary with driver settings, load, motion profile and thermal conditions.
- Motor and module parameters can be customized according to customer requirements.
- For reliable operation, confirm the driver current limit and motion frequency under the actual load before mass production.

MECHANICAL DIMENSIONS

Outline Drawing and Lead Screw Details



Lead Screw Specification

Item	Value
Material	SUS303
Pitch	M3 × P0.5
Direction	Right-hand
Single Pitch Error	0.01
Cumulative Pitch Error	0.03

Drawing Notes

- Dimensions are in millimeters unless otherwise specified.
- Connector housing: XH-2.54.
- Wire reference: UL1571 AWG28.
- Confirm mounting interfaces and travel requirements before integration.

Mechanical Integration

The integrated support frame, guide structure and threaded shaft form a compact linear motion subassembly suitable for OEM mechanisms and precision positioning devices.

CONNECTOR & WIRING

XH2.54-4Y Connector and Bipolar Phase Wiring

Connector Definition

Connector: XH2.54-4Y | Wire: GB 1571 30 / UL AWM 105°C

Pin	Color	Phase
1	Blue	A-
2	Black	A+
3	Red	B-
4	Yellow	B+

Drive Configuration

- Two-phase bipolar stepper motor.
- 2-2 phase excitation method.
- Rotation direction: CW / CCW.
- Use a suitable current-limited bipolar stepper driver.

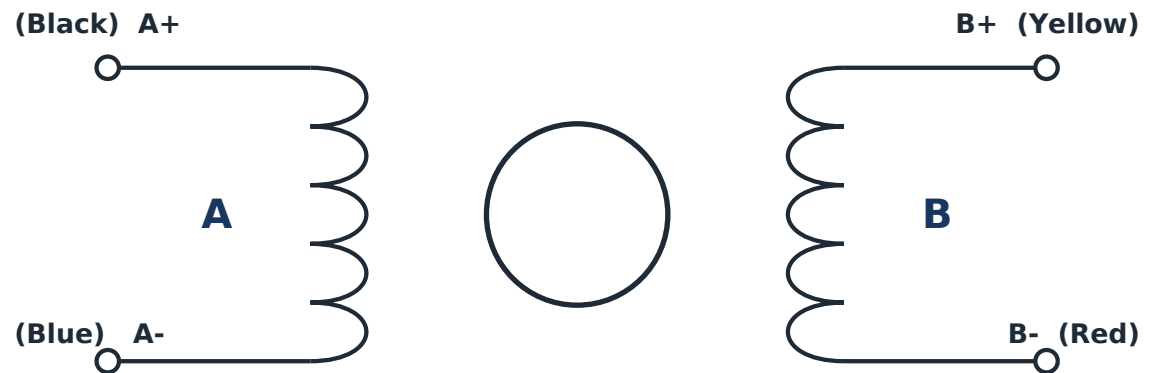
Connector Pin Location and Excitation Sequence

CCW ← 2-2 phase excitation sequence → CW

Pin	Color	Step 1	Step 2	Step 3	Step 4	Phase
1	Blue		ON	ON		A-
2	Black	ON			ON	A+
3	Red			ON	ON	B-
4	Yellow	ON	ON			B+

Bipolar Coil Connection Diagram

2-2 Phase, CW reference



Pin assignment: 1 Blue A- | 2 Black A+ | 3 Red B- | 4 Yellow B+

Use a current-limited bipolar stepper driver and verify the required rotation direction during commissioning.

Editable connector sequence and vector coil connection diagram