TSL-BLDC-2418 Series Brushless DC Motor Specification

12 V / 24 V, 8000 rpm variants with built-in driver and speed-control wiring

Product appearance image for the TSL-BLDC-2418 motor series; appearance may vary by voltage and speed variant.

1. Product Overview

The TSL-BLDC-2418 series is a compact silver brushless DC motor with a built-in driver and five-wire control interface. This specification sheet covers the 12 V / 8000 rpm and 24 V / 8000 rpm variants and includes speed-control wiring, signal definitions, mechanical reference dimensions, and nominal performance curves.

2. Model Variants

Model	Nominal Voltage	Speed Class	Description
BL2418-1280	12 V DC	8000 rpm class	Built-in driver, five-wire interface, speed control supported
BL2418-2480	24 V DC	8000 rpm class	Built-in driver, five-wire interface, speed control supported

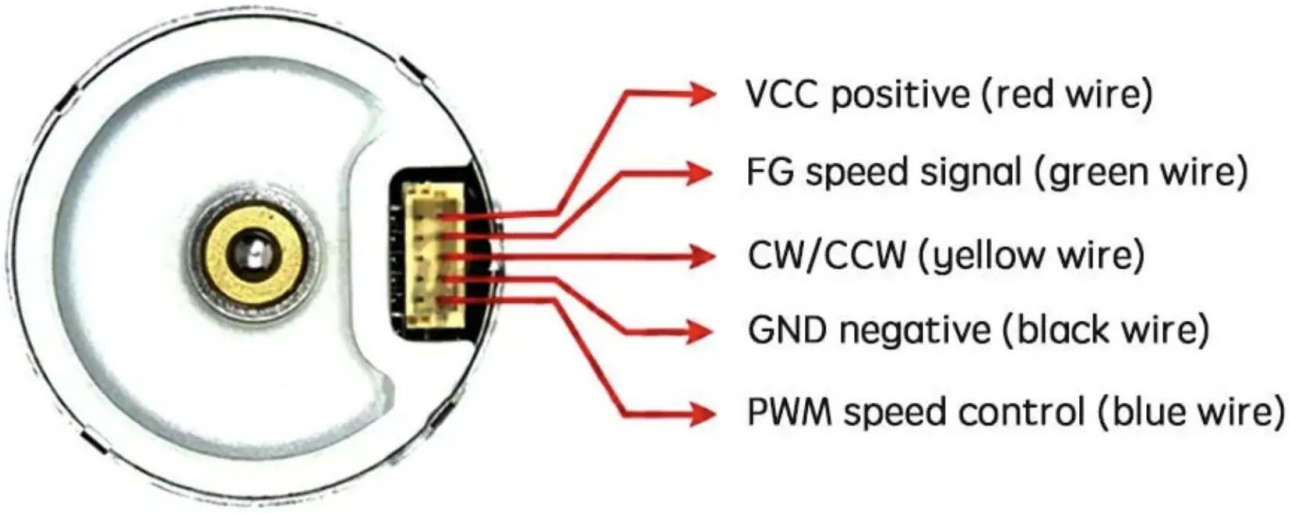
3. Key Features

- Compact 24 mm class brushless DC motor with built-in driver.
- Five-wire interface: motor positive, FG pulse output, CW/CCW control, ground, and PWM speed-control input.
- PWM speed-control wiring option for variable speed and CW/CCW direction control.
- FG output provides Hall signal pulse feedback at 6 pulses per rotation cycle.
- Available in 12 V and 24 V, 8000 rpm nominal variants based on supplied test curves.

4. Electrical and Control Interface

No.	Signal	Wire Color	I/O	Specification	Function / Note
1	Vm / VCC positive	Red	Input	DC 12 V or DC 24 V by model variant	Motor power positive
2	FG signal	Green	Output	VOH <= 5.0 V; VOL <= 0.5 V; output current 2 mA; 6 pulses/cycle	Hall signal pulse output
3	CW/CCW control	Yellow	Input	0-5 V logic input; VIH >= 2.0 V; VIL <= 0.5 V	High = motor CCW; Low = motor CW
4	GND negative	Black	Input	Power ground	Motor power negative / signal ground
5	PWM speed control	Blue	Input	0-5 V input; typical 15-25 kHz; 60 kHz max; VIH >= 2.0 V or open; VIL <= 0.5 V	High = motor OFF; Low = motor ON

Note: In the speed-control wiring configuration, the green FG signal wire is not connected to the speed-control board. It remains an FG pulse output for applications that require speed feedback.



Five-wire motor interface: red VCC, green FG, yellow CW/CCW, black GND, and blue PWM.

5. Speed-Control Wiring Method

Use this connection method when variable speed control and CW/CCW direction control are required.

Board Terminal	Motor / Connection
Power V+	DC power input positive, DC V+ IN
Power V-	DC power input negative, DC V- IN
Motor VCC +	Connect motor positive, red wire
Motor GND -	Connect motor negative, black wire
CW/CCW	Connect motor direction-control wire, yellow wire
BRAKE	Leave unconnected
PWM	Connect motor speed-control wire, blue wire
FG	Do not connect the green wire for this speed-control wiring method

For BLDC2418 / BLDC2430 / BLDC2838 Silver Motors

Speed Control Wiring (Variable Speed, CW/CCW)	
Board Terminal	**Motor / Connection**
Power V+	DC power input positive, DC V+ IN
Power V-	DC power input negative, DC V- IN
Motor Vcc +	Motor positive (Red wire)
Motor GND-	Motor negative (Black wire)
CW/CCW	Motor direction-control wire (Yellow wire)
BRAKE	Leave unconnected
PWM	Connect motor speed-control wire (Blue wire)

Brake Function Wiring (No Speed Control, CW/CCW)	
Board Terminal	**Motor / Connection**
Power V+	DC power input positive, DC V+ IN
Power V-	DC power input negative, DC V- IN
Motor Vcc +	Motor positive (Red wire)
Motor GND-	Motor negative (Black wire)
CW/CCW	Motor direction-control wire (Yellow wire)
BRAKE	Connect motor speed-control wire (Blue wire)
PWM	Leave unconnected

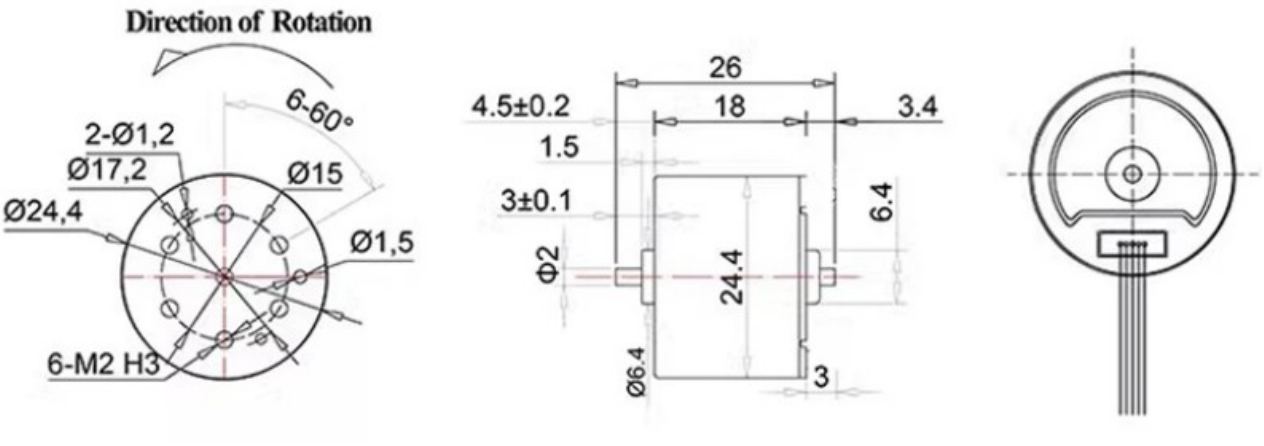
FG signal: do not connect the green wire.

Speed-control wiring reference for BLDC2418 / BLDC2430 / BLDC2838 silver motors.

6. Mechanical Reference Dimensions

All dimensions are in millimeters. The following values are summarized from the supplied dimensional drawing; refer to the drawing for detailed geometry and hole positions.

Item	Value
Motor outside diameter	24.4 mm
Body length	18 mm
Overall length shown in drawing	26 mm
Shaft diameter	2 mm
Front shaft projection	4.5 +/- 0.2 mm
Front step / locating boss diameter	6.4 mm
Rear projection shown in drawing	3.4 mm
Mounting holes	6 x M2 H3, equally spaced at 60 degrees
Auxiliary holes	2 x diameter 1.2 mm
Reference diameters	diameter 15 mm, diameter 17.2 mm, diameter 24.4 mm as shown



Mechanical reference drawing for the 24 mm class motor. Dimensions shown in mm.

7. Nominal Performance Summary

Performance curves were measured at an ambient temperature of 20-27 degC. The motor was tested rapidly to prevent significant temperature rise. Curves are nominal and based on limited motor samples.

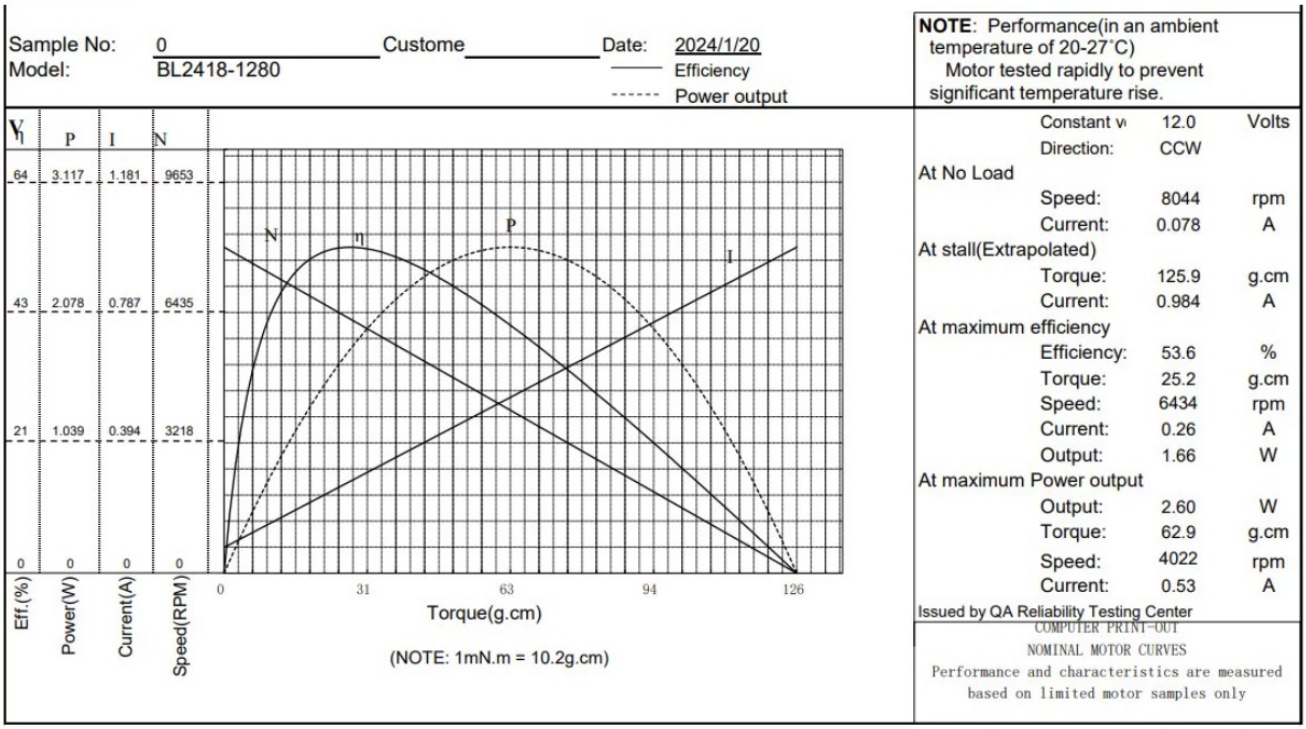
Model	Voltage	Direction	No-load Speed	No-load Current	Stall Torque	Stall Current
BL2418-1280	12.0 V	CCW	8044 rpm	0.078 A	125.9 g.cm	0.984 A
BL2418-2480	24.0 V	CCW	8030 rpm	0.043 A	135.4 g.cm	0.524 A

Model	Max. Efficiency	Torque	Speed	Current	Output
BL2418-1280	53.6%	25.2 g.cm	6434 rpm	0.26 A	1.66 W
BL2418-2480	53.6%	27.1 g.cm	6423 rpm	0.14 A	1.79 W

Model	Maximum Power Output	Torque	Speed	Current
BL2418-1280	2.60 W	62.9 g.cm	4022 rpm	0.53 A
BL2418-2480	2.79 W	67.7 g.cm	4015 rpm	0.28 A

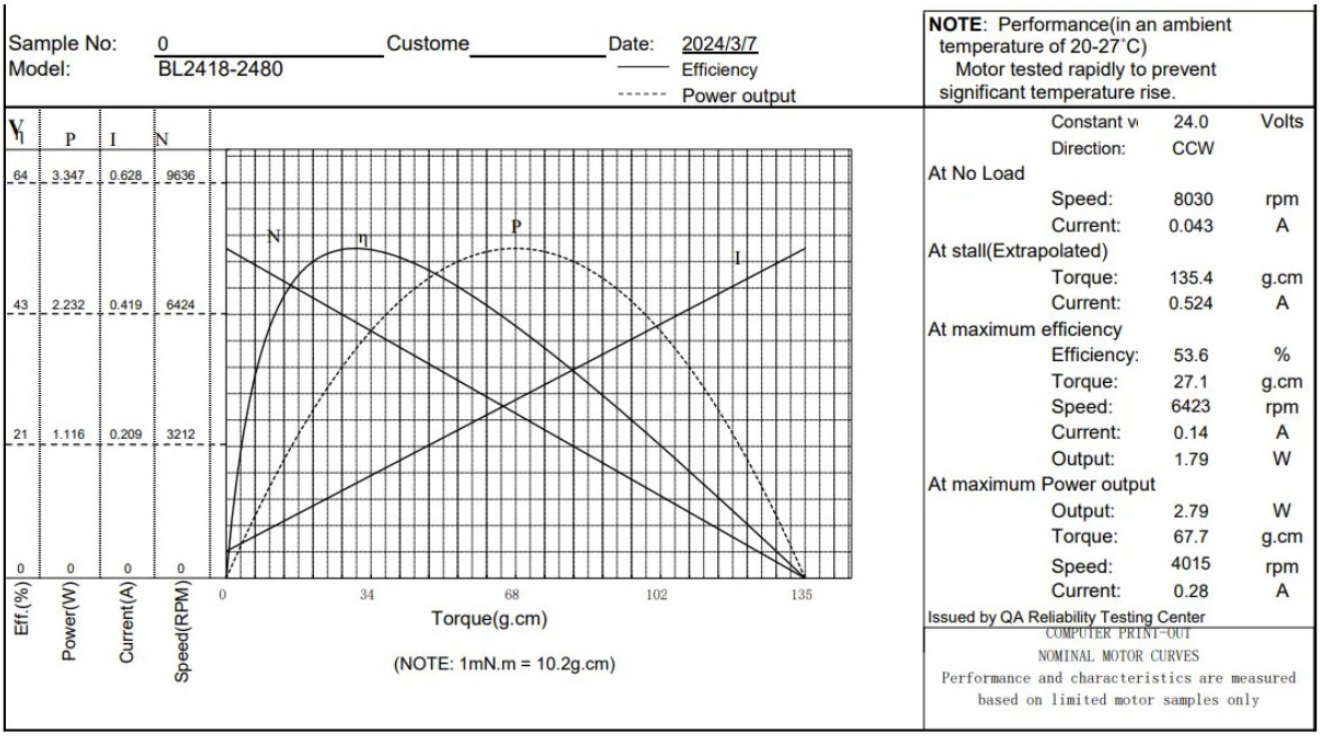
8. Performance Curves

8.1 BL2418-1280 - 12 V, 8000 rpm



Nominal motor curve for BL2418-1280 at 12.0 V, CCW direction.

8.2 BL2418-2480 - 24 V, 8000 rpm



Nominal motor curve for BL2418-2480 at 24.0 V, CCW direction.

9. Application Notes

- Confirm the required voltage variant before connection. Do not apply 24 V to a 12 V motor variant.
- For variable speed operation, connect the blue motor wire to the PWM terminal and leave the BRAKE terminal unconnected.
- The FG green wire is a pulse output. Do not connect FG to the speed-control input terminal unless the application circuit is designed to read FG feedback.
- Direction control is logic level: High = CCW, Low = CW, according to the supplied termination table.
- PWM control logic is active-low according to the supplied termination table: High or open = motor OFF; Low = motor ON.
- Final product-level validation is recommended under the actual load, supply, ambient temperature, and airflow conditions.