TSL-BLDC-2430 Brushless DC Motor

Specification Sheet | 12 V / 24 V Options | 6000 rpm Series

Item	Specification
Motor type	Brushless DC motor with integrated driver board
Series / frame	BLDC24 series, 24 mm diameter frame
Main model	TSL-BLDC-2430
Available versions	BLDC2430-1260 (12 V) / BLDC2430-2460 (24 V)
No-load speed	6000 rpm nominal
Control functions	PWM speed regulation, FG speed signal, CW/CCW direction control
Lead wires	5 wires: red, black, yellow, white, orange

Figure 1. Product appearance

Performance parameters and outline drawings are for reference only. Shaft, lead wire, connector, voltage, speed, mounting, and other specifications can be customized according to customer requirements.

1. Outline Drawing and Mechanical Dimensions

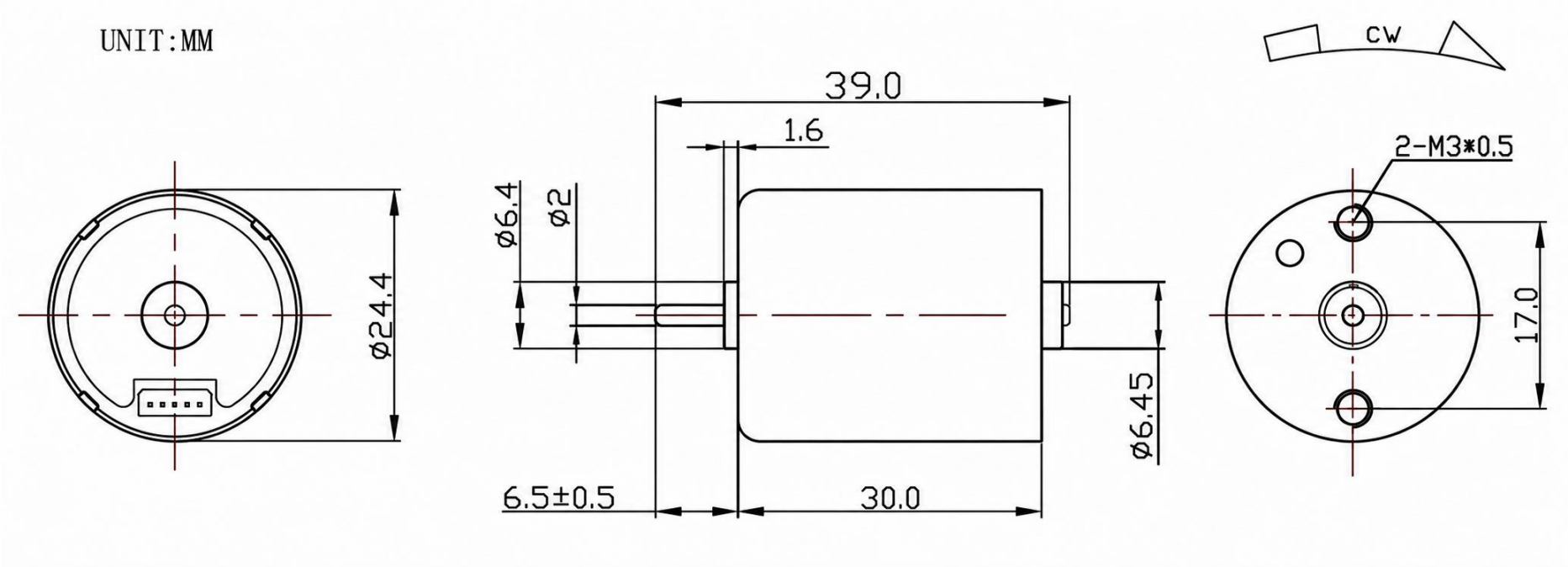

Figure 2. Outline drawing, unit: mm

Dimension item	Value
Body diameter	24.4 mm
Body length	30.0 mm reference
Overall reference length	39.0 mm
Shaft diameter	2.0 mm
Shaft extension	6.5 +/- 0.5 mm
Mounting holes	2 x M3 x 0.5
Mounting hole pitch	17.0 mm

Outline dimensions are for reference only. Customized shaft length, shaft shape, connector, wire length, and mounting configuration are available upon request.

2. Performance Parameters

Model	Operating range (V)	Nominal voltage (V)	No-load speed (rpm)	No-load current (A)	Max. efficiency speed (rpm)	Max. efficiency current (A)	Max. efficiency torque (g.cm)	Max. efficiency output (W)	Max. power speed (rpm)	Max. power current (A)	Max. power torque (g.cm)	Max. power output (W)	Stall torque (g.cm)	Stall current (A)
BLDC2430-1260	9.0-14.0	12	6000	0.1	4911	0.436	61.82	3.11	3354	0.9	165.7	5.119	331.4	1.9
BLDC2430-2460	14.5-26.0	24	6000	0.0585	4937	0.23	60.18	1.53	3526	0.42	148.29	2.369	296.6	0.903

Test note: nominal performance curves are measured at an ambient temperature of 20-27 C. Motor tests are performed rapidly to avoid significant temperature rise. Performance and characteristics are based on limited motor samples only.

3. Driver Board Lead Description

Pin No.	Signal	Function
1	**GND**	Power negative
2	**VCC**	Power positive
3	**FG**	Speed signal output
4	**PWM**	Duty-cycle speed regulation
5	**FR / CW-CCW**	Forward / reverse direction toggle

Figure 3. Driver board lead description

4. Performance Curve - 12 V 6000 rpm Version

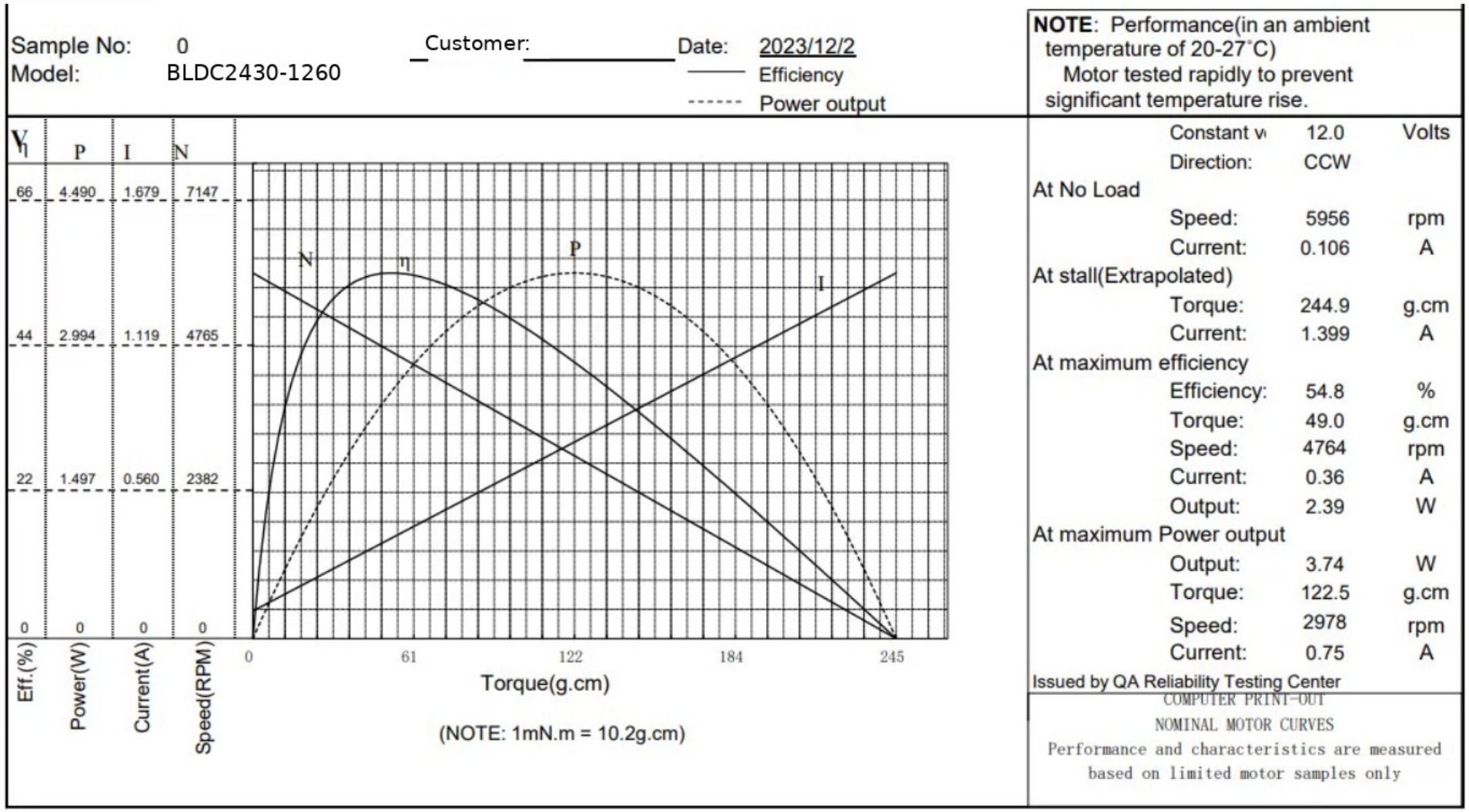

Figure 4. BLDC2430-1260 performance curve, 12 V 6000 rpm version

5. Performance Curve - 24 V 6000 rpm Version

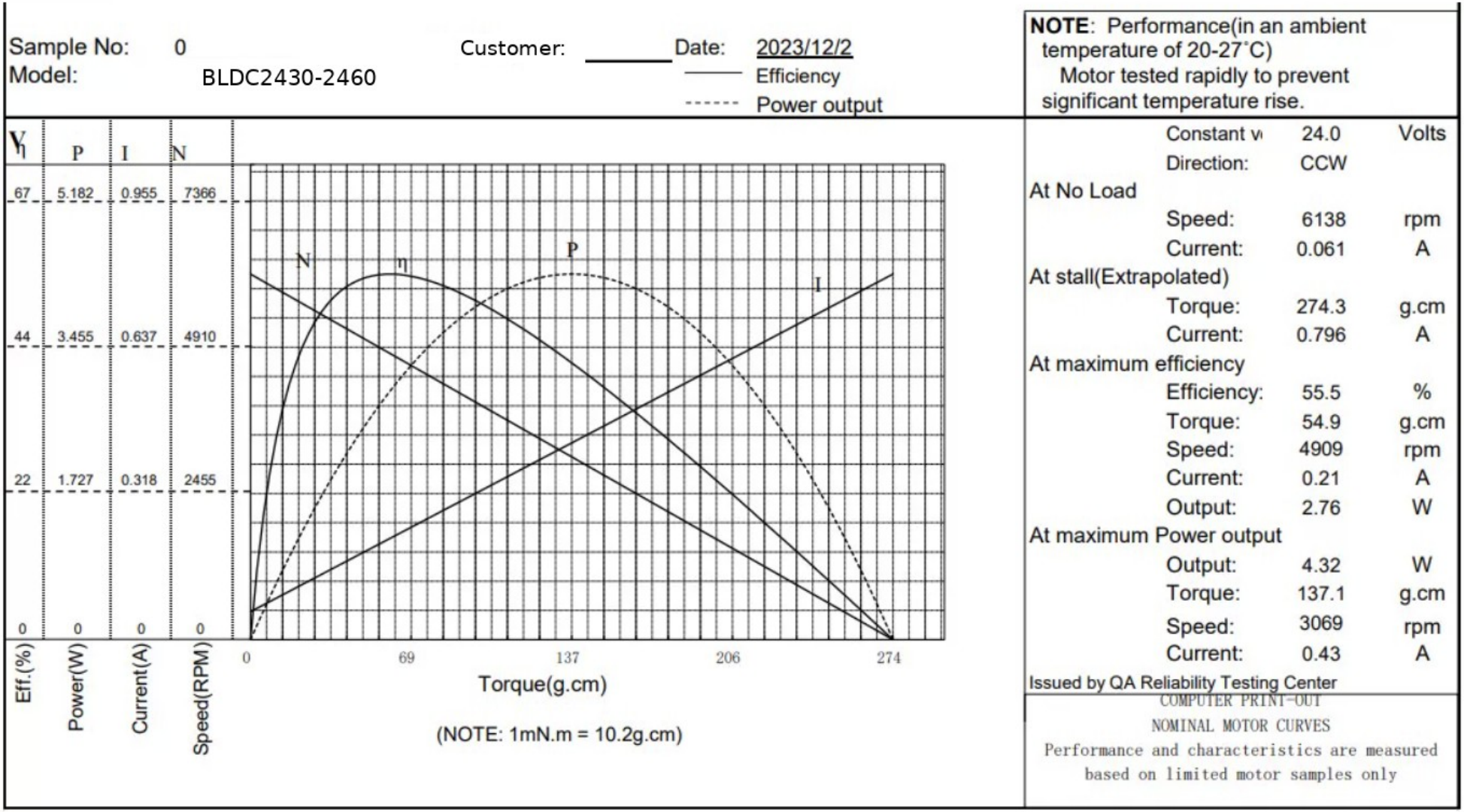

Figure 5. BLDC2430-2460 performance curve, 24 V 6000 rpm version

6. Brushless Motor Electrical Interface (BLDC24 Series)

Pin	Signal	I/O	Parameter	Specification	Wire / remark
P1	**GND**	IN	Ground	-	Black wire, ground
P2	**VCC**	IN	Motor power supply	12 V: 8.5-15 V / 24 V: 8.5-26 V	Red wire, motor power supply
P3	**FG**	OUT	VOH	1.5-5.0 V	Yellow wire, speed signal output
P3	**FG**	OUT	VOL	<=0.6 V	
P3	**FG**	OUT	FG current	<=3 mA	
P3	**FG**	OUT	FG pulse quantity	9 pulses/rev	
P4	**PWM**	IN	Input voltage	0-5.0 V	White wire, PWM speed regulation
P4	**PWM**	IN	VIH	>=1.5 V	High level: stop
P4	**PWM**	IN	VIL	<=0.6 V	Low level: running
P4	**PWM**	IN	PWM frequency	Recommended 20-30 kHz	
P5	**CW/CCW**	IN	Input voltage	0-5.0 V	Orange wire, direction select
P5	**CW/CCW**	IN	VIH	>=1.5 V	High level: CCW
P5	**CW/CCW**	IN	VIL	<=0.6 V	Low level: CW

7. Lead Wire Color Coding and Wiring Method

Wire color	Function	Description
Red	Motor power positive (+)	Select DC supply according to the motor specification.
Black	Motor power negative (-)	Ground / power negative.
Yellow	FG speed signal output	For external speed detection.
White	PWM speed control	0-5 V PWM input. Low level enables running; high level stops.
Orange	Direction control	High level or open: CCW. Low level (<=0.6 V): CW.

Basic direction wiring when speed regulation is not used

Mode	Connection
Reverse wiring	Power + to red wire; power - to black + white wires; other wires left unconnected.
Forward wiring	Power + to red wire; power - to black + white + orange wires; other wires left unconnected.

Important notes

- VCC and GND must not be connected interchangeably. Reversing positive and negative power may damage the motor or driver board.
- Switch CW/CCW direction only when the motor is stopped. Switching direction while running may damage internal electronic components.
- For normal start, connect red to positive supply, black to GND, and hold the white PWM input at low level or apply a valid PWM running signal.
- Default rotation is CCW unless otherwise customized. Pulling the orange direction input low selects CW rotation.