Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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TMCS-28 Hardware Manual

Hardware Version V1.00 | Document Revision V1.00 • 2017-Mar-01

TMCS-28 is a low-cost and small-size optical incremental encoder for use with stepper motors and 3-phase PMSM/BLDC motors. It comes with high resolution optical code wheels with a resolution of up to 10K lines.
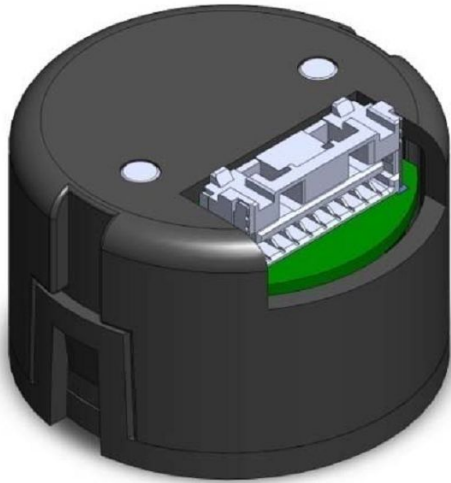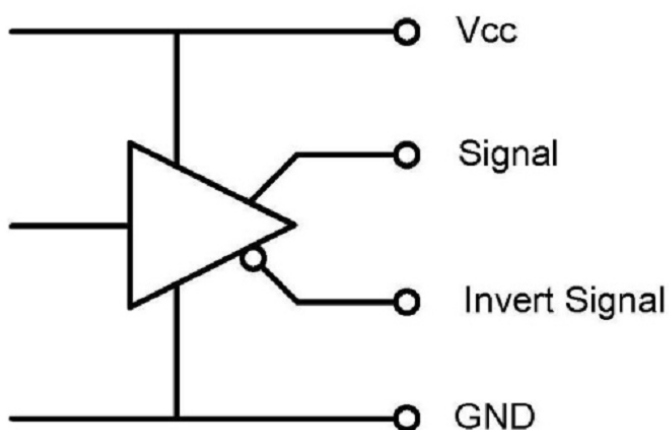
Features

- Low Cost
- High Resolution
- Small Dimension
- Easy Mounting

Applications

- Stepper Motor FOC
- Servo Motors
- Precision Motion Control
- Automated Equipment
- Robotics

Simplified Block Diagram

Read entire documentation.

TRINAMIC
MOTION CONTROL

Contents

1   Order Codes

Order Code	Description	Size (LxWxH)
TMCS-28-5-10000-AT-01	Encoder Module 28mmm diameter, Resolution of 10K lines (40K increments), ABN, 5mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-6.35-10000-AT-01	Encoder Module 28mmm diameter, Resolution of 10K lines (40K increments), ABN, 6.35mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-KIT	TRINAMIC TMCS-28 encoder kit including encoder housing, all code wheel options, cable loom and assembly tools	100mm x 150mm x 30mm

Table 1: Order codes

Other encoder resolutions, signal output types, and shaft diameters on request.

2 Technical Specifications

2.1 Mechanical and Electrical Parameters

Parameter	Min	Typ	Max	Unit
Supply voltage	4.5	5	5.5	V
Supply current			100	mA
Rise/fall time			100	ns
Frequency			300	kHz
Output Voltage "'H'"	2.4			V
Input Voltage "'L'"			0.4	V
Max. output current			20	mA
Resolution		32.768 (32k)		increments

Table 2: Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Hollow Diameter		4		mm
Starting Torque			0.8	Ncm
Shaft Loading Axial			50	N
Shaft Loading Radial			80	N
Max. RPM			6000	rpm
Net weight		30		g

Table 3: Mechanical Specifications

Parameter	Description
Operating Temperature	-20 – +85°C
Storage Temperature	-20 – +85°C
Operating Humidityl	RH 85% max, non collecting
Shock	490 m/s^2, 3Dx2 times
Vibration	1.2mm, 10-55kHz, 3Dx30min
Protection	IP40

Table 4: Environmental Specifications

2.2   Signals and Connection

Pin Number	Color	Signal Name
1	Red	VCC
2	Black	GND
3	White	A+
4	White/Black	A-
5	Green	B+
6	Green/Black	B-
7	Yellow	Z+
8	Yellow/Black	Z-
9	Blue	Shield

Table 5: Connector and cable pinning and signals

The required encoder cable connector is a Molex type 5023800900 CLIK-MATE™ crimp housing using Molex type 5023810000 CLIK-MATE™ crimp terminals.
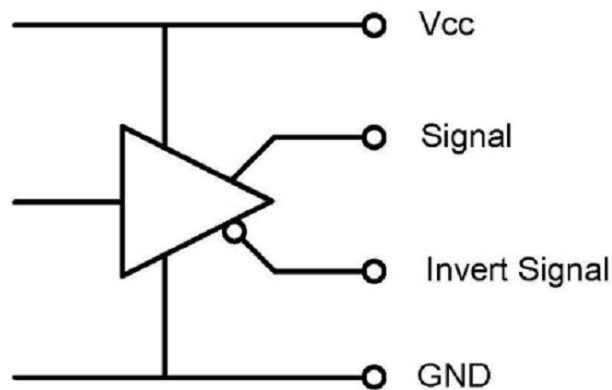

Figure 1: Connection and circuit diagram for the line driver outputs
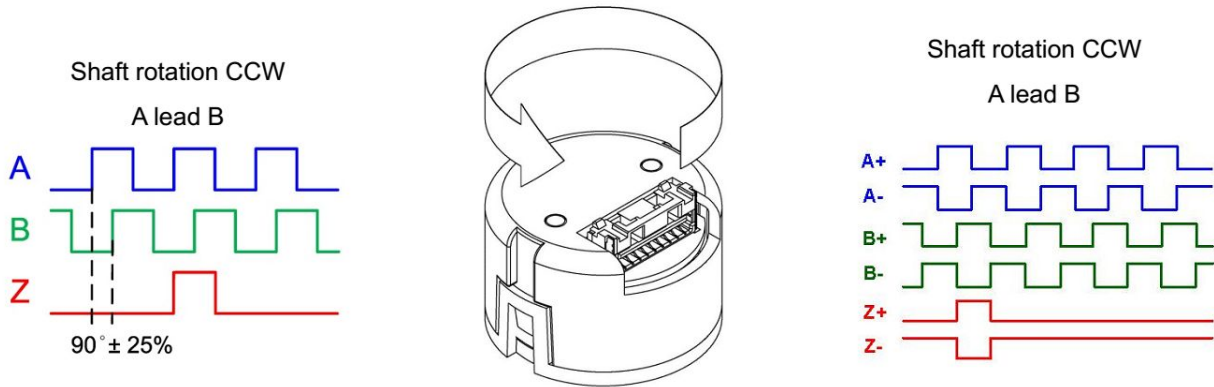
2.3   Wave Form

Figure 2: Wave form for CCW and CW rotation

2.4 Mechanical Drawings

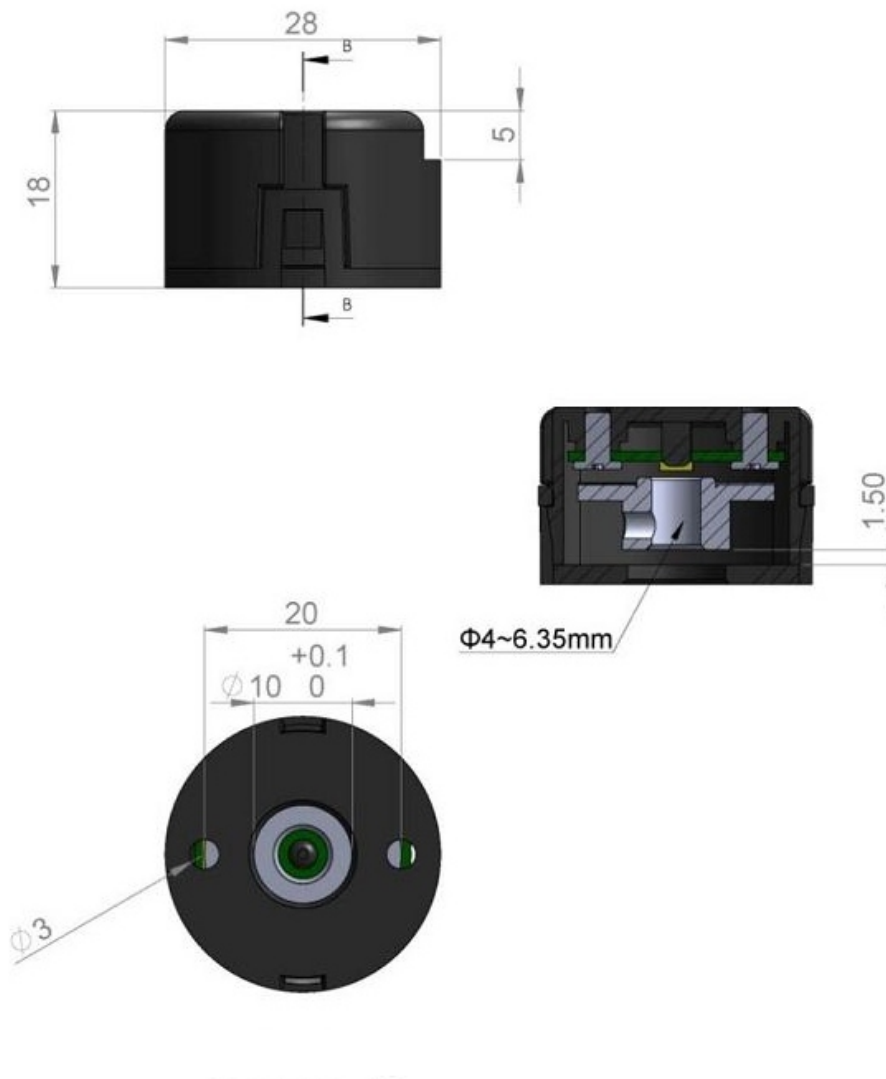*Figure 3: Bottom view, side view, and cut view (units = mm)*
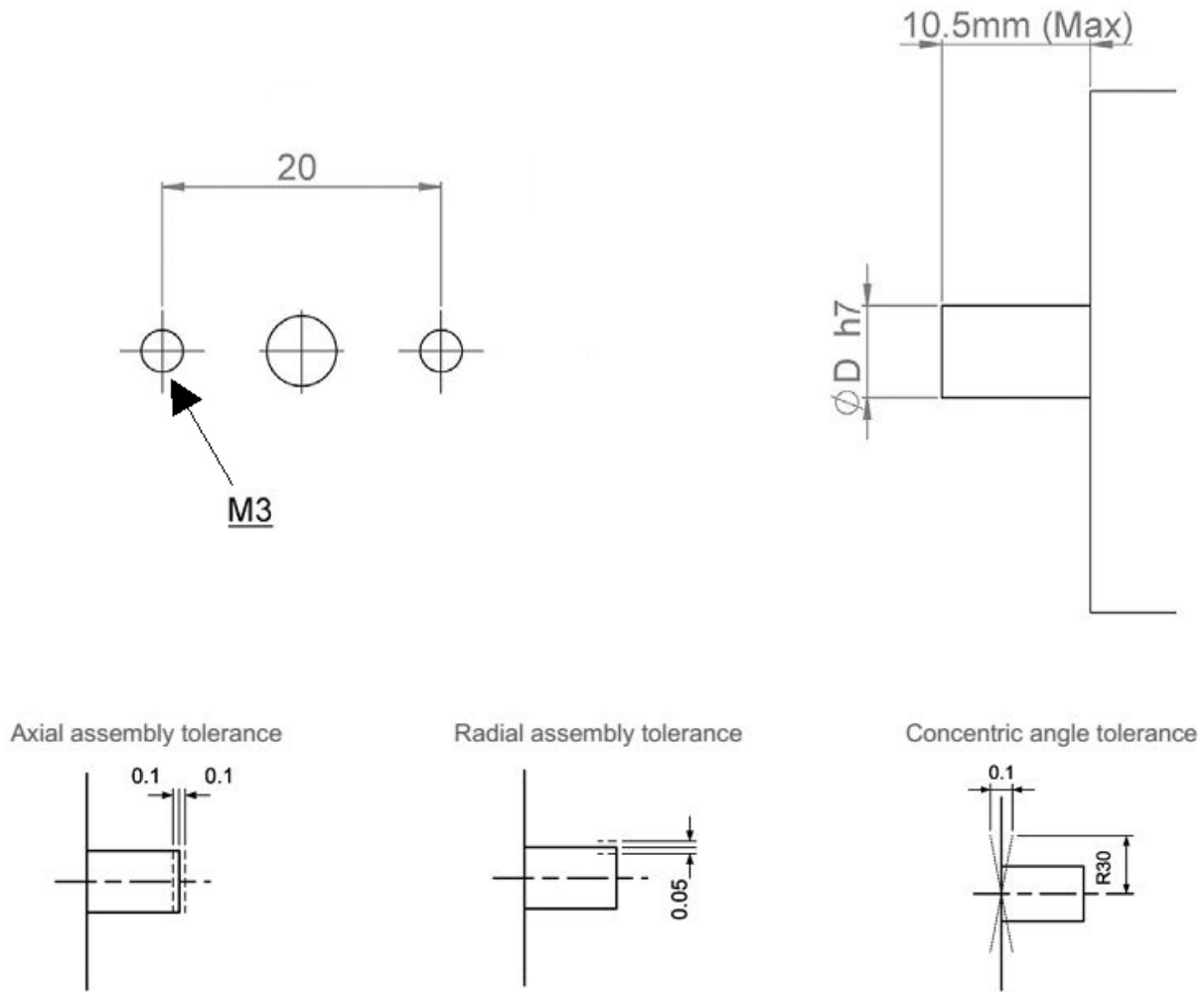
2.5   Motor Assembly

Figure 4: Required dimensions for motor assembly (units = mm)

3 Figures Index

4 Tables Index

5 Supplemental Directives

5.1 Producer Information

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5.7   Collateral Documents & Tools

This product documentation is related and/or associated with additional tool kits, firmware and other items, as provided on the product page at: www.trinamic.com.

6 Revision History

6.1 Hardware Revision

Version	Date	Author	Description
1.00	01.03.2017	TMC	Initial release

Table 6: Hardware Revision

6.2 Document Revision

Version	Date	Author	Description
1.00	23.02.2017	SK	Initial release

Table 7: Document Revision