

NanoTorque GST-600

Datasheet

Three axis magnetorquer for 6U sized satellites

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Author: KLK

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2 Overview

The GomSpace NanoTorque GST-600 is a compact three axis magnetorquer that is designed for 6U CubeSats but can be used in both smaller and larger satellites. The system consists of a single air-torquer and two magnetorquer-rods.

2.1 Highlighted Features

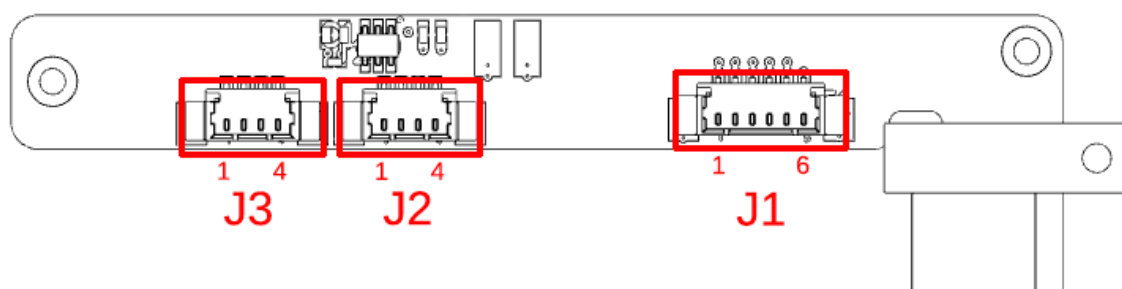
- 3-axis magnetorquer
- Build-in temperature sensor
- High torque and low residual dipole

2.2 Temperature sensor

The temperature sensor is a TMP100 sensor with an I²C address of 0x4e. There is not internal I²C pull-ups or isolation.

3 Connector Pinout

3.1 Connector Locations



3.2 J1 - Magnetorquer

Molex PicoBlade 53398-0671

Pin	Description
1	Magnetorquer Y Neg
2	Magnetorquer Y Pos
3	Magnetorquer X Neg
4	Magnetorquer X Pos
5	Magnetorquer Z Neg
6	Magnetorquer Z Pos

3.3 J2 - Communication

Molex PicoBlade 53398-0471

Pin	Description
1	VCC
2	GND
3	SDA
4	SCL

3.4 J3 - Communication

Molex PicoBlade 53398-0471

Pin	Description
1	VCC
2	GND
3	SDA
4	SCL

4 Absolute Maximum Ratings

Stresses above those listed under Absolute Maximum Rating may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect the reliability.

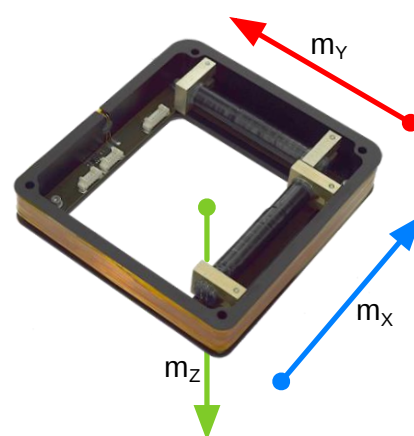
Parameter	Description	Min	Typ.	Max	Unit
V _{pwm}	Maximum PWM voltage	-0.3		4.0	V
T _{op}	Operational temperature range	-40		85	°C
T _{st}	Storage temperature range	-40		85	°C

5 Electrical and Magnetorque Characteristics

Parameter	Condition	Min	Typ.	Max	Unit
V _{pwm}	PWM voltage	0	3.3	4	V
m _z	Dipole moment @3.3V (Z-axis) (20degC)		0,340		Am ²
m _{xy}	Dipole moment @3.3V (X- and Y-axis) (20degC)		0.310		Am ²
Residual dipole				1	mAm ²
R _z	Resistance Z – axis (20degC)		25.5		Ω
R _{xy}	Resistance X- and Y-axis (20degC)		28.5		Ω
ρ _z	Temperature coefficient – Z-axis		0.104		Ω/°C
ρ _{xy}	Temperature coefficient – X- and Y-axis		0.112		Ω/°C

The directions of the magnetic fields are shown on the right.

Notice it is a left-hand-coordinate system.

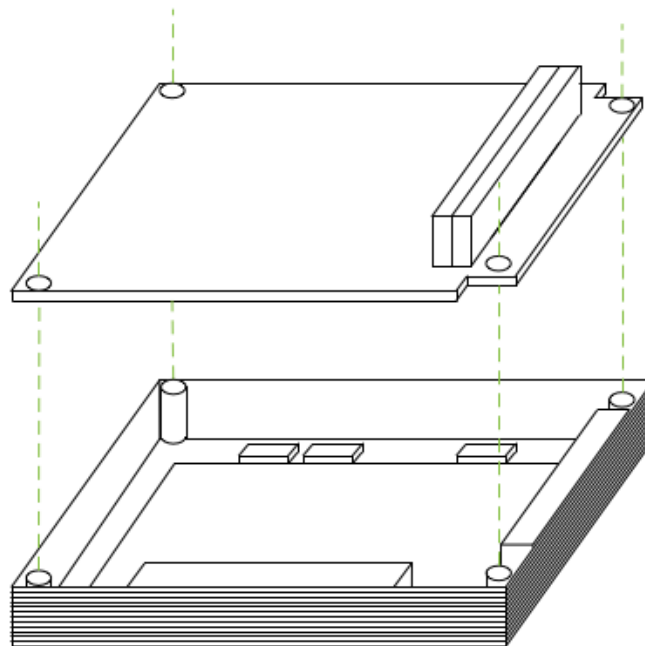


6 Physical Characteristics

Description	Value	Unit
Mass	156	g
Size	90.5 x 96.9 x 17.2	mm

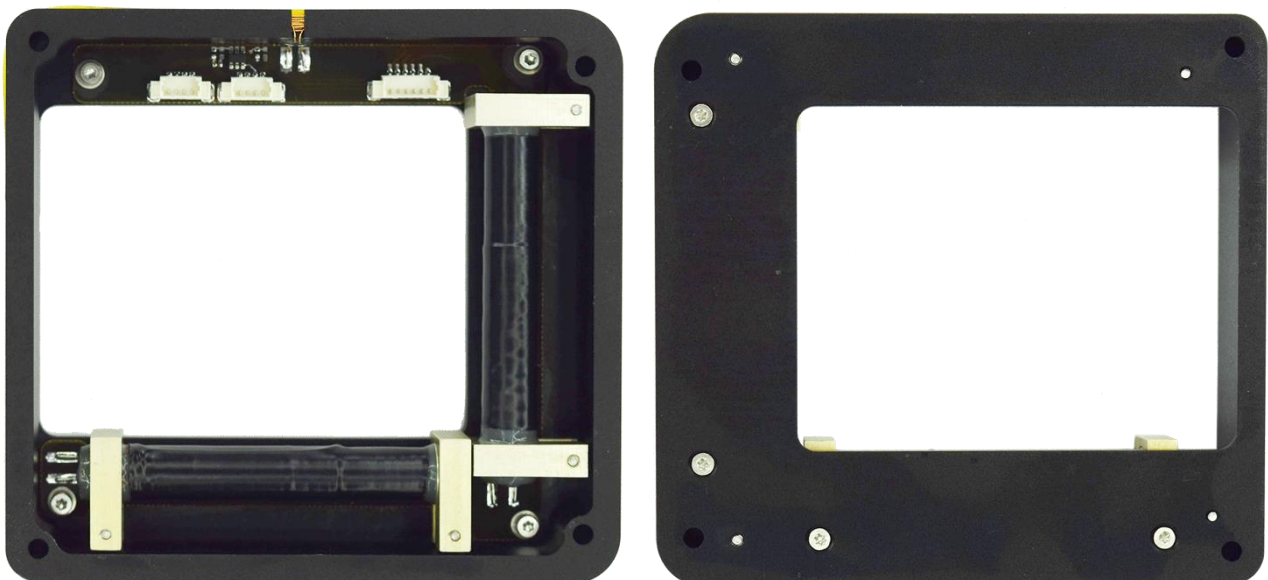
7 Connecting with other PCB's

To place the GST-600 correctly within a PC104 stack, place the stack connector on top the Y magnetorquer rod. View the drawing below.



8 Physical Layout

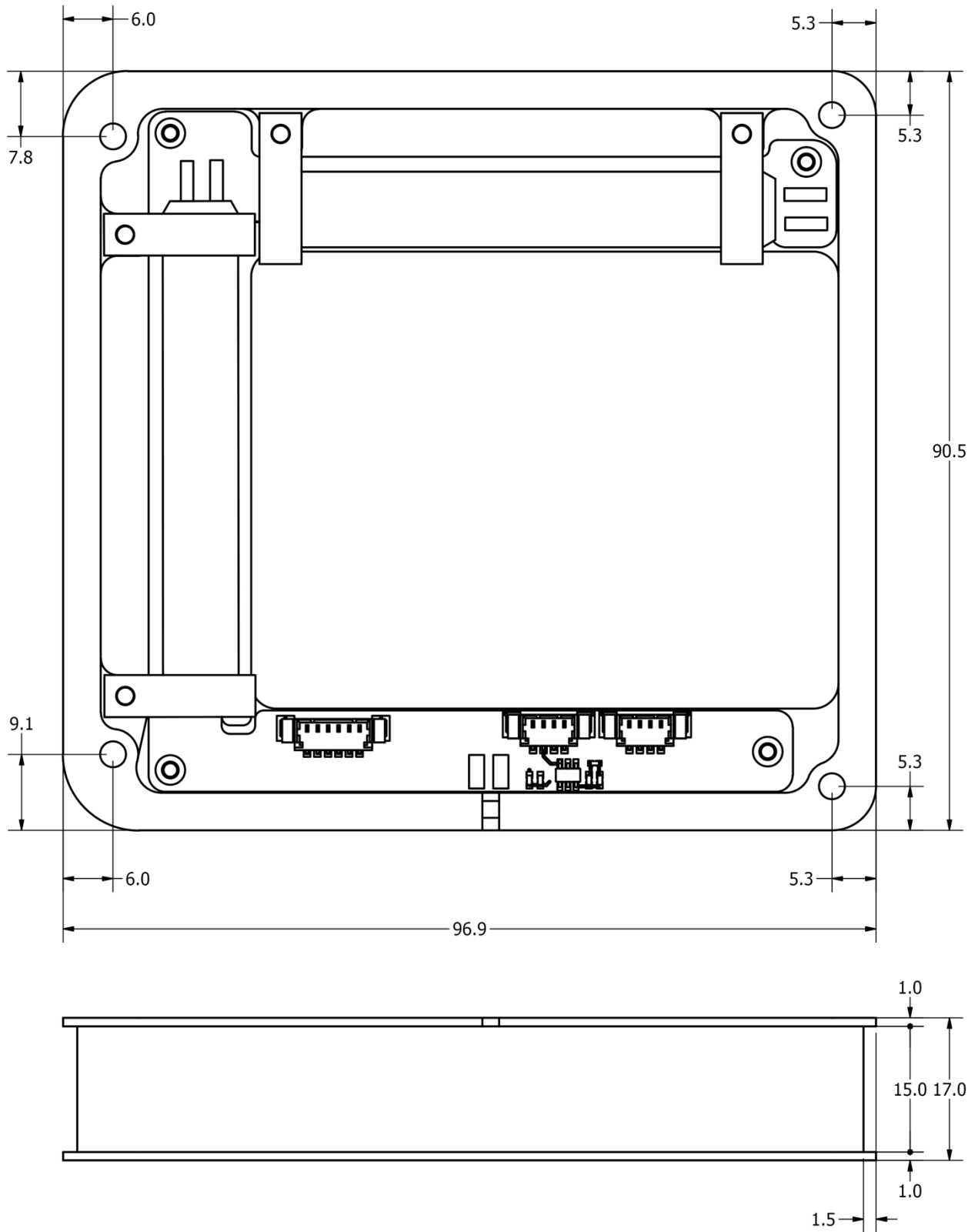
Below is shown a picture of the top and bottom of the GST-600.



The top view shows the three connectors and the two magnetorquer-rods. Temperature sensor is located just behind connector J2.

9 Mechanical Drawing

All dimensions in mm.



10 Disclaimer

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