

TITAN BRUSHLESS DC MOTOR – TECHNICAL SPECIFICATION

Overview Titan intelligent brushless DC motor

OVU00133 (continuous shroud)

OVU00134 (end stop shroud)

Features

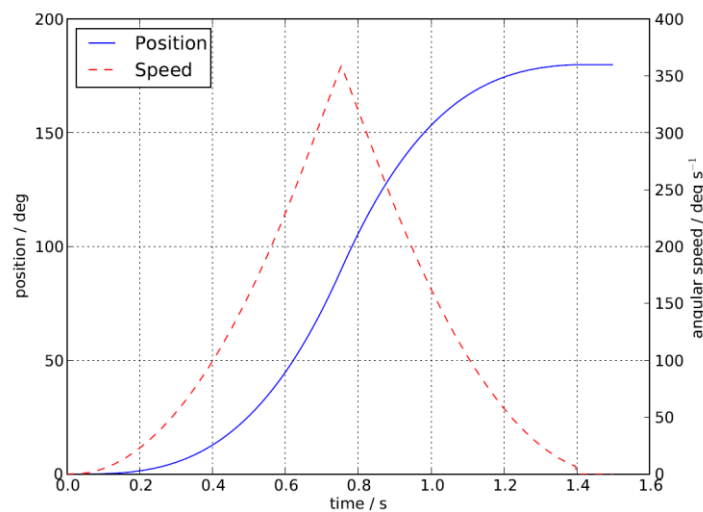
- Wide dynamic speed range
- Rapid and precise positional control
- Near silent operation
- Control commands fed though a simple I²C bus
- PCB connections conveniently arranged for use in a pan – tilt camera unit
- Two shroud configurations available with mechanical end stop (pictured), and with no stop for continuous rotation
- All control and drive components are contained within the 56mm by 63mm PCB



Control System	
Speed range	0.01 °s ⁻¹ to 540 °s ⁻¹
Positional resolution	0.005°
Calibration time	< 20s
180° Move Profile	1.5s from rest to rest.



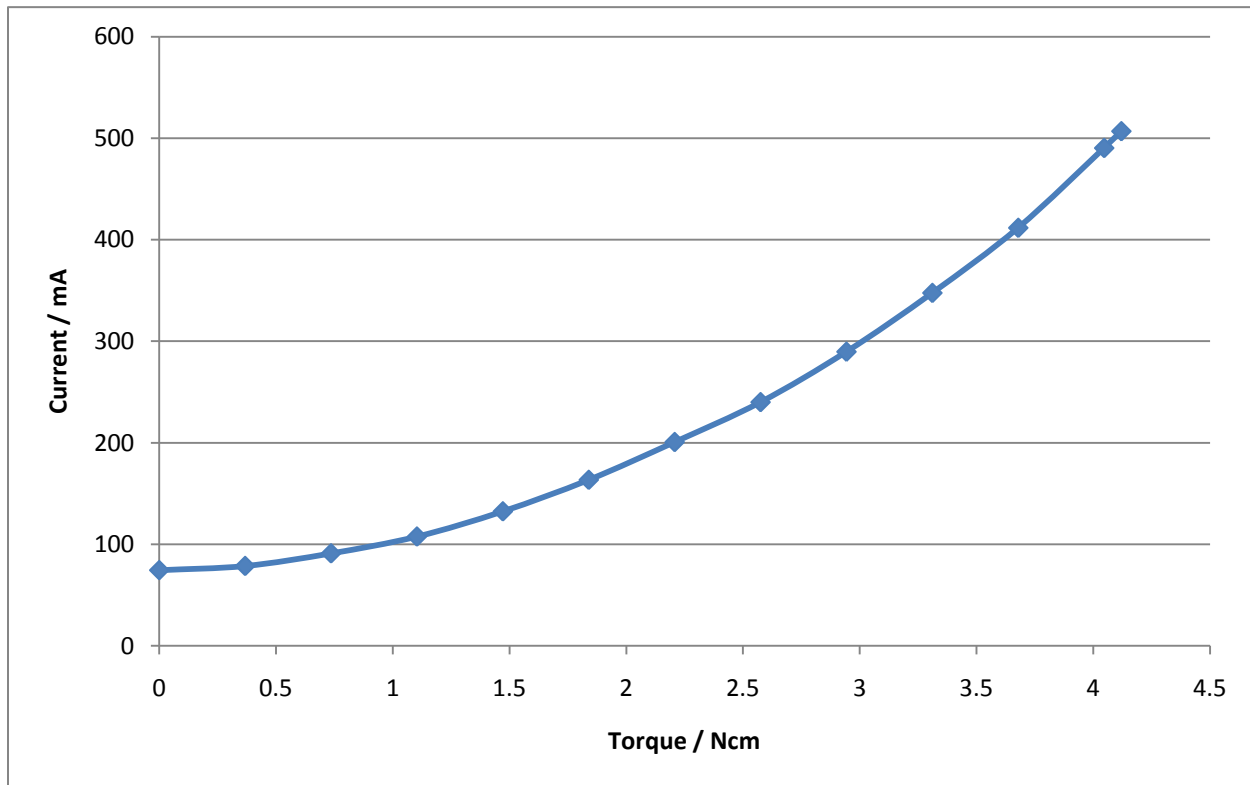
Move profile for a positional step demand of 180 degrees



Electrical Properties	
Operating voltage	9.0V to 12.0V DC (externally regulated)
Current at max torque (12V supply)	510 mA
Initialisation current	600 mA
Idle, no load, current	90 mA
Winding Resistance	8.0 $\Omega \pm 1\%$
Winding Inductance	1.37 mH (@15kHz)
Back EMF constant	100 mV p2p / rad s ⁻¹
No Load Speed	1180rpm
Rated Conditions	
Rated Voltage	12V
Rated Current	65mA
Rated Temperature	25°C \pm 10°C
Rated Load Moment of Inertia	1700 g cm ²
Rated Speed	360s ⁻¹
Torque at rated speed	3.6 N cm
Rated load MTBF	1,200,000 hours

Mechanical Properties	
Weight	0.096kg
Stator slots	12
Rotor poles	16
Number of phases	3
Rotor Moment of Inertia	140 g cm ²
Stall Torque	4.1 N cm
Cogging Torque	4mNm
Max Radial Load	
Environmental Capabilities	
Temperature Range (standard operation)	-10°C to 50° C
Ambient Conditions	25°C \pm 10°C
Humidity Range (standard operation)	35% to 90% Rh at 40°C
Storage Conditions	-40°C to 85 °C

I-T CURVE UNDER RATED CONDITIONS



PIN ASSIGNMENT

J5 - 8 way JST: S8B-ZR-SM4A-TF(LF)(SN)			J4 - 9 way FFC: Molex 0522710979		J2 - 9 way FFC: Molex 0522710979	
Pin	Function	Notes	Pin	Function	Pin	Function
1	VM	9-12V DC	1	VM	1	GND
2	SDA	I ² C data	2	SDA	2	GND
3	SCL	I ² C Clock	3	SCL	3	Do not use
4	PASS_THROUGH_0		4	GND	4	Do not use
5	PASS_THROUGH_1		5	PASS_THROUGH_3	5	SCL
6	PASS_THROUGH_2		6	PASS_THROUGH_2	6	SDA
7	PASS_THROUGH_3		7	GND	7	Unused
8	GND		8	PASS_THROUGH_0	8	VM
			9	PASS_THROUGH_1	9	VM

RELIABILITY TESTING

Test pass parameter: 100% rated performance achievable after the following tests

Dynamic Testing		
Test	Description	Result
Vibration	7 – 200Hz frequency sweep in 5 minutes @ 2.4G for 40minutes	TBC
Impact	11ms impulses successively in x, y and z directions @ 200G	TBC
Environmental		
Low temperature storage	Stored at -40°C for 72 hours and then left at room temperature for 24 hours	PASS
High temperature storage	Stored at 85°C for 72 hours and then left at room temperature for 24 hours	PASS
Storage temperature cycling	4 one hour cycles from -40°C to 70°C and then left at room temperature for 24 hours	PASS
Humidity storage test	Stored at 60°C, 90% RH for 72 hours and then left at room temperature for 24 hours	PASS
Electrical Safety		
HiPot Testing	Leakage current between the coil and the PCB at 300VAC	<1mA
Insulation Resistance	Resistance between a coil and the PCB at 500VDC	>1000MΩ

LIFE TESTING

1. TEST

5 x 10⁶ 120° moves, three consecutive in each direction at rated conditions.

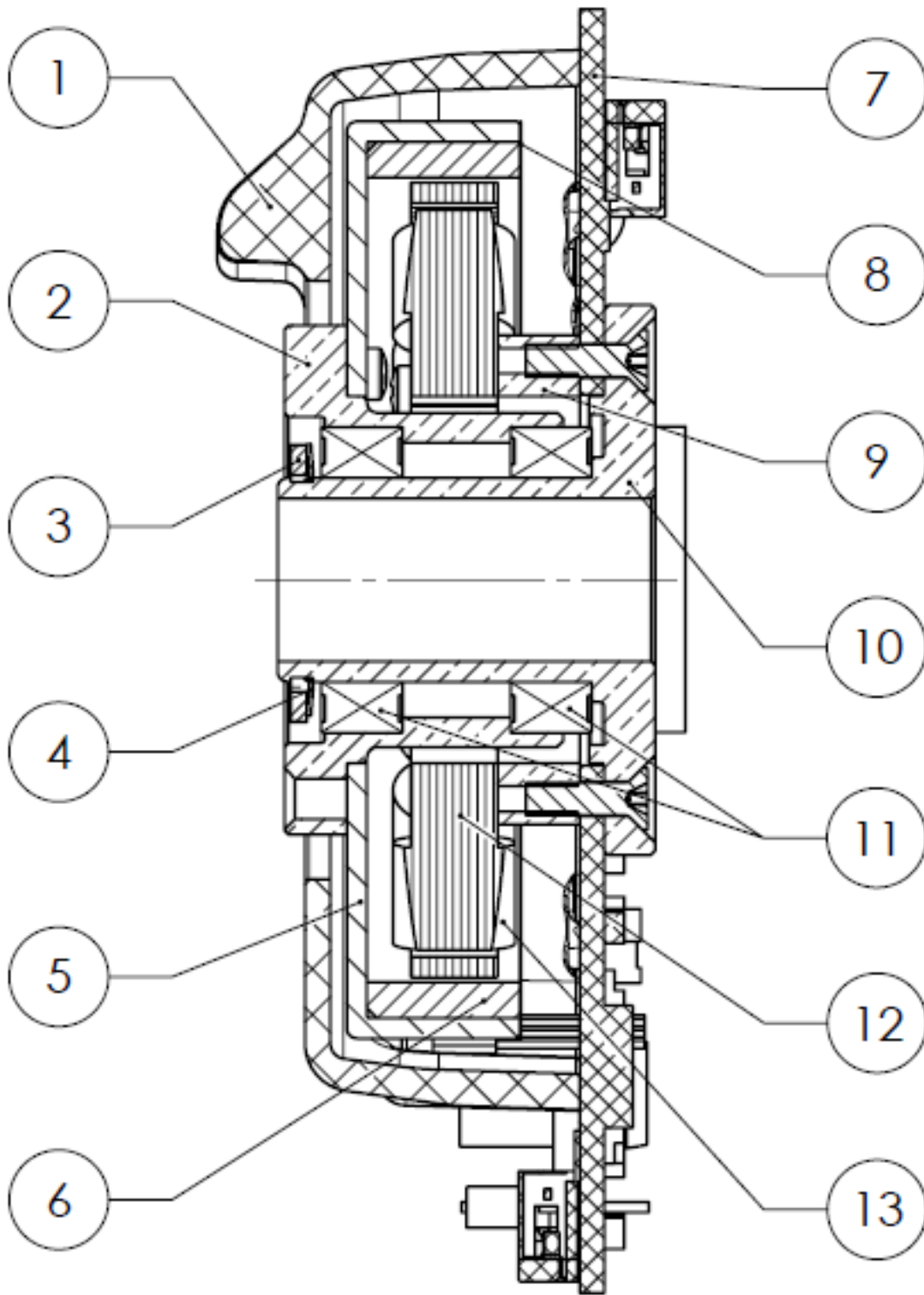
2. TEST PASS PARAMETER:

100% rated performance achievable after the following tests

3. TEST RESULT

TBC

MOTOR STRUCTURE



#	Part Name	Material	UL File #
1	Endstop Shroud	PC/ABS	E121562
2	Rotor Sleeve	Brass	
3	Circlip	Steel 65Mn/AISI106	
4	Wave Washer	Steel 65Mn/AISI106	
5	Rotor	Steel (DC51D+Z)	
6	Magnet	GPM-8L (NEODYMIUM)	
7	PCBA	FR4	
8	Encoder Wheel	Steel	
9	Spacer	Brass	
10	Spindle	Brass	
11	Bearing	Chrome Steel	
12	Stator Windings	Enamelled Copper Wire	E227047
13	Stator	Silicon Steel Sheet	