

# Digital Servo Motor Driver

SRVODRV-806

## Description

This digital servo drive is designed to drive brushed and brushless servomotors from a compact form factor ideal for embedded applications. This fully digital drive operates in torque, velocity, or position mode and employs Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation compared to traditional PWM. The command source can be generated internally or can be supplied externally. In addition to motor control, this drive features dedicated and programmable digital and analog inputs and outputs to enhance interfacing with external controllers and devices.

The drive features a RS-232 interface for drive configuration and setup as well as a RS-485 interface for drive networking.

All drive and motor parameters are stored in non-volatile memory.

## Power Range

Peak Current	12 A (8.5 A <sub>RMS</sub> )
Continuous Current	6 A (4.2 A <sub>RMS</sub> )
Supply Voltage	20 - 80 VDC



## Features

- ▲ Four Quadrant Regenerative Operation
- ▲ Space Vector Modulation (SVM) Technology
- ▲ Fully Digital State-of-the-art Design
- ▲ Programmable Gain Settings
- ▲ Fully Configurable Current, Voltage, Velocity and Position Limits
- ▲ PIDF Velocity Loop
- ▲ PID + FF Position Loop
- ▲ Compact size, high power density
- ▲ 12-bit Analog to Digital Hardware

## MODES OF OPERATION

- Current
- Position
- Velocity

## COMMAND SOURCE

- Encoder Following
- $\pm 10$  V Analog
- 5V Step and Direction

## FEEDBACK SUPPORTED

- Halls
- Incremental Encoder
- $\pm 10$  V Analog
- Auxiliary Incremental Encoder

## INPUTS/OUTPUTS

- 2 High Speed Captures
- 1 Programmable Analog Input (12-bit Resolution)
- 2 Programmable Digital Inputs (Differential)
- 3 Programmable Digital Inputs (Single-Ended)
- 3 Programmable Digital Outputs (Single-Ended)

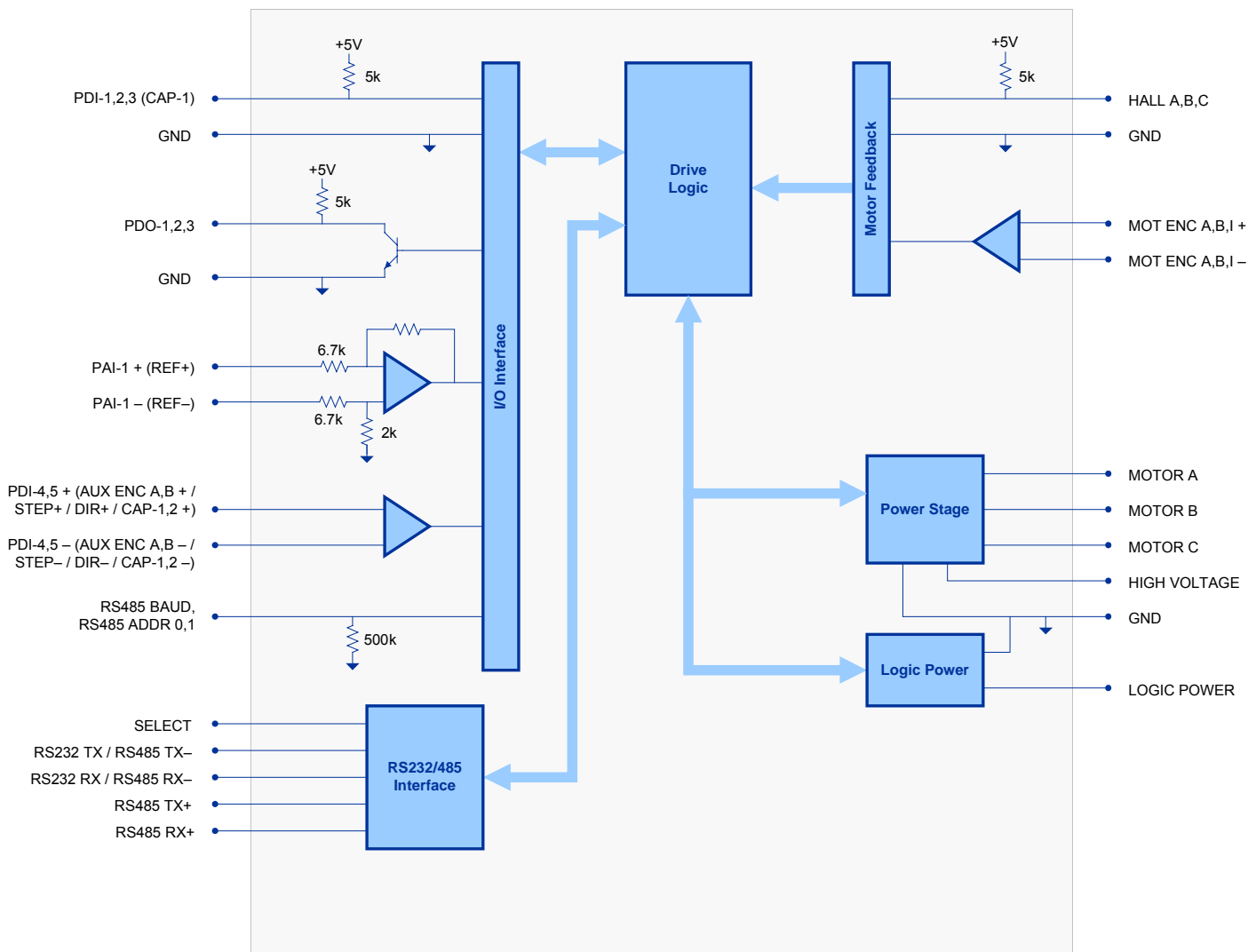


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## BLOCK DIAGRAM



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## SPECIFICATIONS

Power Specifications		
Description	Units	Value
DC Supply Voltage Range	VDC	20 - 80
DC Bus Over Voltage Limit	VDC	86
DC Bus Under Voltage Limit	VDC	17
Logic Supply Voltage	VDC	5
Maximum Peak Output Current	A (Arms)	12 (8.5)
Maximum Continuous Output Current	A (Arms)	6 (4.2)
Internal Bus Capacitance	µF	33
Minimum Load Inductance (Line-To-Line) <sup>1</sup>	µH	250
Switching Frequency	kHz	20
Control Specifications		
Description	Units	Value
Communication Interfaces	-	RS-232, RS-485
Command Sources	-	±10 V Analog, 5V Step and Direction, Encoder Following
Feedback Supported	-	±10 V Analog, Auxiliary Incremental Encoder, Halls, Incremental Encoder
Commutation Methods	-	Sinusoidal, Trapezoidal
Modes of Operation	-	Current, Position, Velocity
Motors Supported	-	Brushed, Brushless, Induction, Voice Coil
Hardware Protection	-	40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage
Programmable Digital Inputs/Outputs (PDIs/PDOs)	-	5/3
Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	1/0
Primary I/O Logic Level	-	5V TTL
Current Loop Sample Time	µs	50
Velocity Loop Sample Time	µs	100
Position Loop Sample Time	µs	100
Maximum Encoder Frequency	MHz	20 (5 pre-quadrature)
Mechanical Specifications		
Description	Units	Value
Weight	g (oz)	94 (3.3)
Heatsink (Base) Temperature Range <sup>2</sup>	°C (°F)	0 - 65 (32 - 149)
Storage Temperature Range	°C (°F)	-40 - 85 (-40 - 185)
Cooling System	-	Natural Convection
Form Factor	-	Chassis Mounted

### Notes

1. Lower inductance is acceptable for bus voltages well below maximum. Use external inductance to meet requirements.
2. Additional cooling and/or heatsink may be required to achieve rated performance.



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## PIN FUNCTIONS

P1 - Signal Connector			
Pin	Name	Description / Notes	I/O
1	PAI-1 - (REF-)	Differential Programmable Analog Input or Reference Signal Input (12-bit Resolution)	I
2	PAI-1 + (REF+)		I
3	GND	Ground	GND
4	PDO-1	Programmable Digital Output	O
5	PDO-2	Programmable Digital Output	O
6	PDO-3	Programmable Digital Output	O
7	PDI-1	Programmable Digital Input	I
8	PDI-2	Programmable Digital Input	I
9	PDI-3 (CAP-1)	Programmable Digital Input or High Speed Capture	I
10	PDI-4 + (STEP+ / AUX ENC A+ / CAP-2)	Programmable Digital Input or Step+ or Auxiliary Encoder or High Speed Capture	I
11	PDI-4 - (STEP- / AUX ENC A-)	Programmable Digital Input or Step- or Auxiliary Encoder (For Differential Signals Only)	I
12	PDI-5 + (DIR+ / AUX ENC B+ / CAP-3)	Programmable Digital Input or Direction+ or Auxiliary Encoder or High Speed Capture	I
13	PDI-5 - (DIR- / AUX ENC B-)	Programmable Digital Input or Direction- or Auxiliary Encoder (For Differential Signals Only)	I
14	+5 VDC	+5 VDC	GND
15	HALL A	Single-ended Commutation Sensor Input	I
16	HALL B		I
17	HALL C		I
18	MOT ENC I+	Differential Encoder Index Input	I
19	MOT ENC I-		I
20	MOT ENC A+	Differential Encoder A Channel Input	I
21	MOT ENC A-		I
22	MOT ENC B+	Differential Encoder B Channel Input	I
			I

P2 - Power Connector			
Pin	Name	Description / Notes	I/O
4	HIGH VOLTAGE	DC Power Input	I
3	GND	Ground	I
7	MOTOR C	Motor Phase C	O
10	MOTOR B	Motor Phase B	O
11	MOTOR A	Motor Phase A	O

P3 - Communication Connector			
Pin	Name	Description / Notes	I/O
1			
2			
3	RS232 TX / RS485 TX-	Transmit Line (RS-232 or RS-485)	O
4	RS485 TX+	Transmit Line (RS-485)	O
5	RS232 RX / RS485 RX-	Receive Line (RS-232 or RS-485)	I
6	RS485 RX+	Receive Line (RS-485)	I
7			
8			
9	GND	Ground	GND
10			

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE



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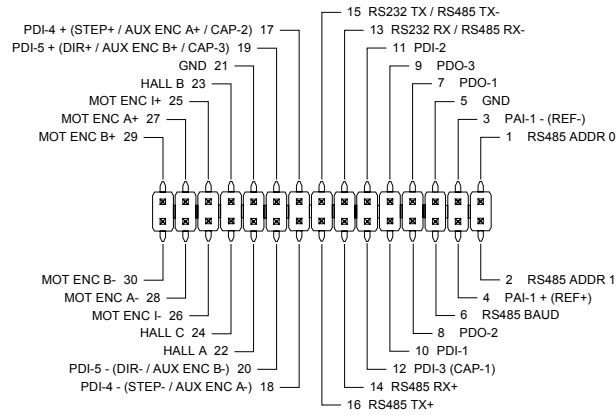
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## MECHANICAL INFORMATION

### P1 - Signal Connector

Connector Information		30-pin, 2.54 mm spaced, dual-row header
Mating Connector	Details	Samtec: SSM-115-L-DV
	Included with Drive	No



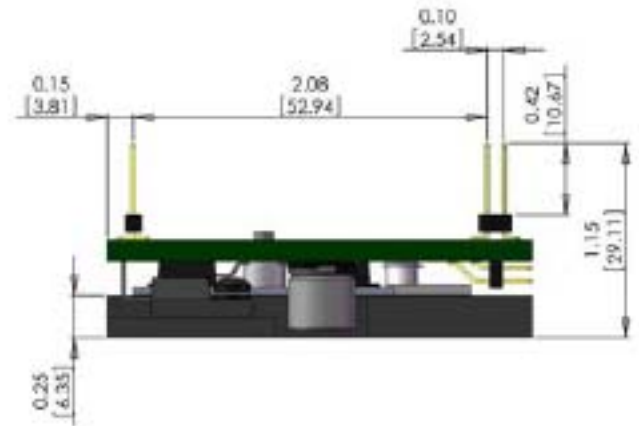
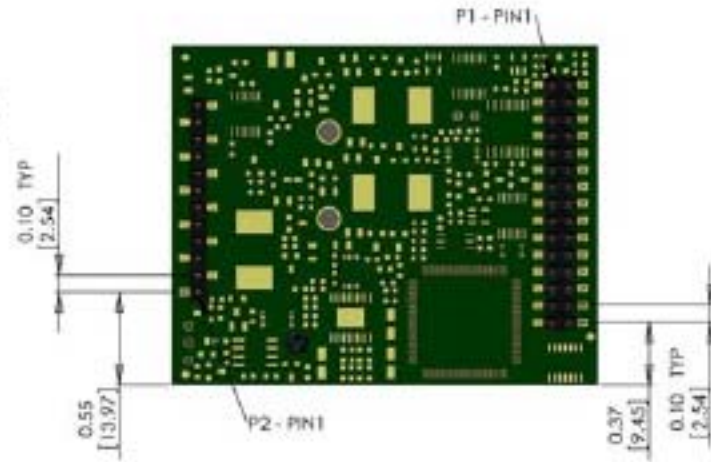
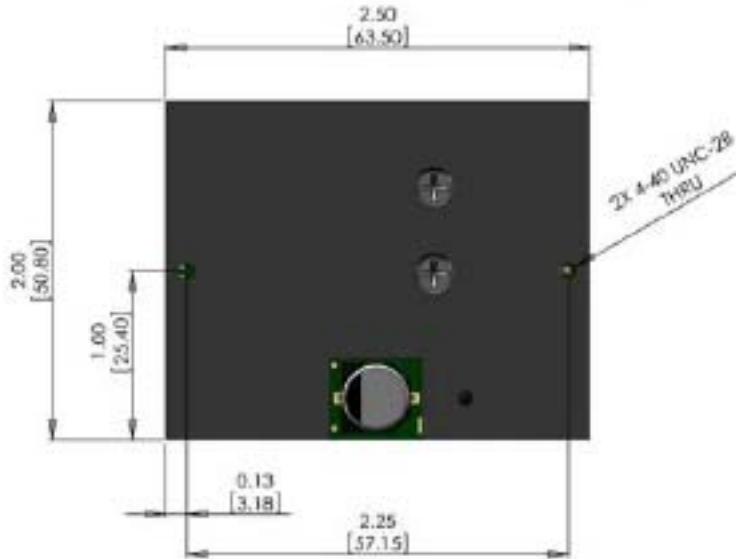
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# Digital Servo Motor Driver

## P2 - Power Connector

Connector Information		12-pin, 2.54 mm spaced header
Mating Connector	Details	Samtec: BCS-112-L-S-PE
	Included with Drive	No



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