

Description

The 10A8 PWM servo amplifiers are designed to drive brush type DC motors. The 10A8 is fully protected against over-voltage, over-current, over-heating and short-circuits across motor, ground and power leads. This amplifier interfaces with digital controllers or can be used as a stand-alone drive. The 10A8 requires only a single unregulated power supply. A potentiometer is located on the side for loop gain adjustment.

Power Range

Peak Current	10 A
Continuous Current	6 A
Supply Voltage	20 - 80 VDC


Features

- ▲ Four Quadrant Regenerative Operation
- ▲ Direct Board-to-Board Integration
- ▲ Lightweight
- ▲ High Switching Frequency
- ▲ Differential Input Command
- ▲ Current Monitor Output
- ▲ Adjustable Input Gain
- ▲ Single Supply Operation
- ▲ Compact Size
- ▲ High Power Density

MODES OF OPERATION

- Current
- Tachometer Velocity
- Voltage

COMMAND SOURCE

- ± 10 V Analog

FEEDBACK SUPPORTED

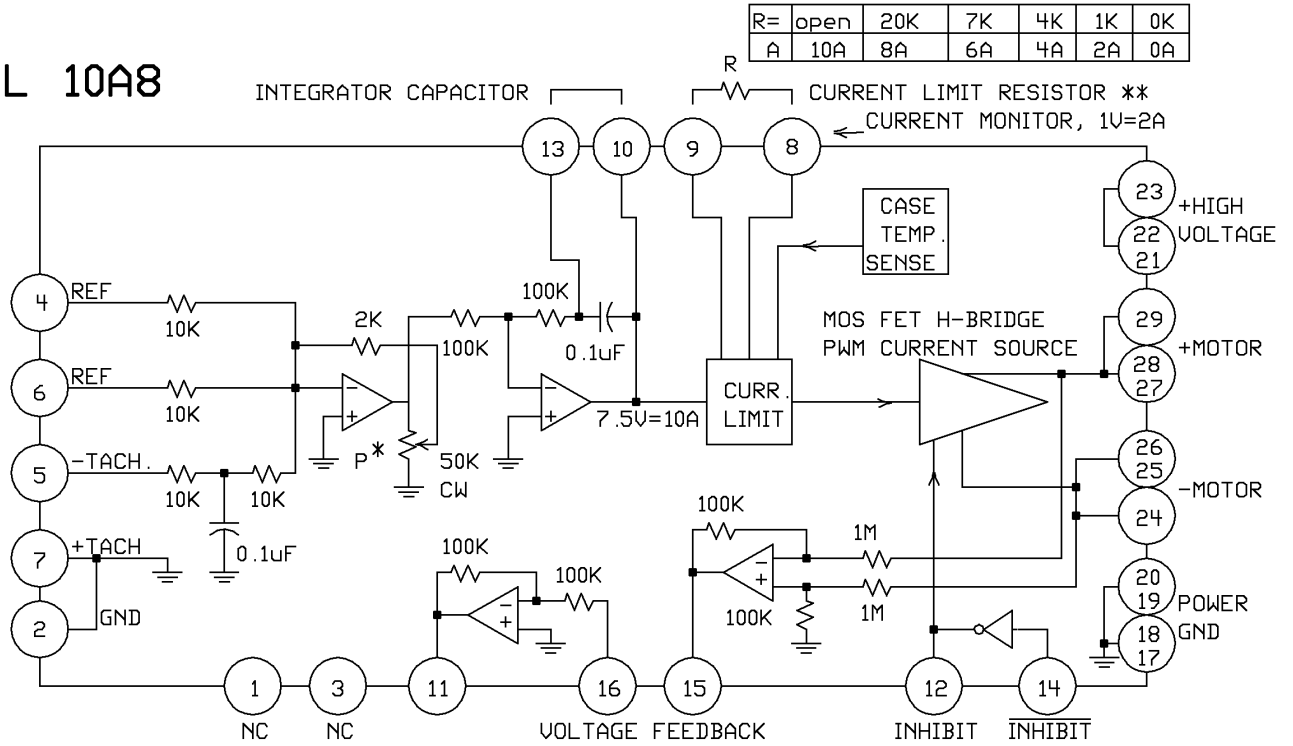
- Tachometer

COMPLIANCES & AGENCY APPROVALS

- UL
- cUL
- CE Class A (LVD)
- CE Class A (EMC)
- RoHS




BLOCK DIAGRAM

MODEL 10A8



* P IS LOOP GAIN ADJUSTMENT ON THE SIDE OF CASE
 ** SUPPLIED BY USER (OPTIONAL)

Information on Approvals and Compliances

	<p>US and Canadian safety compliance with UL 508c, the industrial standard for power conversion electronics. UL registered under file number E140173. Note that machine components compliant with UL are considered UL registered as opposed to UL listed as would be the case for commercial products.</p>
	<p>Compliant with European CE for both the Class A EMC Directive 89/336/EEC on Electromagnetic Compatibility (specifically EN 61000-6-4:2001, EN 61000-6-2:2001, EN 61000-3-2:2000, and EN 61000-3-3:1995/A1:2001) and LVD requirements of directive 73/23/EEC (specifically EN 60204-1), a low voltage directive to protect users from electrical shock.</p>
	<p>RoHS (Reduction of Hazardous Substances) is intended to prevent hazardous substances such as lead from being manufactured in electrical and electronic equipment.</p>

SPECIFICATIONS

Power Specifications		
Description	Units	Value
DC Supply Voltage Range	VDC	20 - 80
DC Bus Over Voltage Limit	VDC	86
Maximum Peak Output Current ¹	A	10
Maximum Continuous Output Current	A	6
Maximum Power Dissipation at Continuous Current	W	24
Minimum Load Inductance (Line-To-Line) ²	μH	200
Switching Frequency	kHz	33
Control Specifications		
Description	Units	Value
Command Sources	-	±10 V Analog
Feedback Supported	-	Tachometer
Modes of Operation	-	Current, Tachometer Velocity, Voltage
Motors Supported	-	Single Phase (Brushed, Voice Coil, Inductive Load)
Hardware Protection	-	Over Current, Over Temperature, Over Voltage, Short Circuit (Phase-Phase & Phase-Ground)
Mechanical Specifications		
Description	Units	Value
Agency Approvals	-	CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL
Size (H x W x D)	mm (in)	50.8 x 101.6 x 15.2 (2 x 4 x 0.6)
Weight	g (oz)	145 (5.1)
Heatsink (Base) Temperature Range ³	°C (°F)	0 - 65 (32 - 149)
Storage Temperature Range	°C (°F)	-40 - 85 (-40 - 185)
Form Factor	-	PCB Mounted
P1 Connector	-	Two 16-pin, 2.54 mm spaced headers (3 pins removed)

Notes

1. Maximum duration of peak current is ~2 seconds.
2. Lower inductance is acceptable for bus voltages well below maximum. Use external inductance to meet requirements.
3. Additional cooling and/or heatsink may be required to achieve rated performance.

PIN FUNCTIONS

P1 - Signal & Power Connector			
Pin	Name	Description / Notes	I/O
1	NC	Not Connected (Reserved)	-
2	SIGNAL GND	Signal Ground	GND
3	NC	Not Connected (Reserved)	-
4	+REF IN	Positive Reference Input. ± 10 V Operating Range, ± 15 V Maximum Input. Referenced To Signal Ground.	I
5	-TACH IN	Negative Tachometer Input (Maximum ± 60 V). Use signal ground for positive input.	I
6	+REF IN	Positive Reference Input. ± 10 V Operating Range, ± 15 V Maximum Input. Referenced To Signal Ground.	I
7	+TACH / GND	Positive Tachometer Input and Signal Ground	GND
8	CURR LIMIT RES	Current Monitor and Current Limit Resistor. This signal is proportional to the actual current output. Scaling is 2 A/V. This pin is also used for current limiting (see P1-9).	O
9	CURR LIMIT RES	Current Limit Resistor. Used to reduce the factory preset maximum current limit. See details below.	I
10	INT CAP	Current Reference and Integrator Capacitor. Measures the command signal to the internal current-loop. This pin has a maximum output of ± 7.25 V when the drive outputs maximum peak current. This pin is also used to eliminate velocity/voltage loop integral gain (see P1-13).	O
11	INV OUT	Output of the internal unity-gain inverting amplifier.	O
12	INHIBIT IN	Apply +3 to +15 V @ 1 mA to inhibit drive. Inhibit turns off all power devices.	I
13	INT CAP	Integrator Capacitor. Shorting this pin to P1-10 eliminates velocity/voltage loop integral gain.	O
14	INHIBIT	Apply +15 V or leave open to enable drive. Pull to ground to inhibit drive. Inhibit turns off all power devices.	I
15	VOLT OUT	Output of the internal differential amplifier. This signal is proportional to the output voltage.	O
16	INV IN	Input of the internal unity-gain inverting amplifier.	I
17	GND	Power Ground (Common With Signal Ground)	GND
18	GND		GND
19	GND		GND
20	GND		GND
21	+PWR	DC Power Input	I
22	+PWR		I
23	+PWR		I
24	-MOT	Negative Motor Output	O
25	-MOT		O
26	-MOT		O
27	+MOT	Positive Motor Output	O
28	+MOT		O
29	+MOT		O

Pin Details
CURR LIMIT RES (P1-9)

This pin can be used to reduce the peak and continuous current limits while maintaining their ratio (60%) by connecting an external current limiting resistor between this pin (P1-9) and P1-8. See table below.

Current Limit Resistor	OPEN	20 k Ω	7 k Ω	4 k Ω	1 k Ω	0 k Ω (SHORT)
Peak Current Limit	10 A	8 A	6 A	4 A	2 A	0 A

HARDWARE SETTINGS

Mode Selection Table

	CONFIGURATION
CURRENT	Short pin P1-10 to P1-13
VOLTAGE	Short pin P1-15 to P1-5
TACHOMETER VELOCITY	Connect Tachometer to pins P1-5 and P1-7 as described in pin descriptions



Potentiometer Functions

Potentiometer	Description	Turning CW
1	Loop gain adjustment for voltage/velocity modes. Turn this pot fully CCW in current mode.	Increases gain

Note: Potentiometers are approximately linear and have 12 active turns with 1 inactive turn on each end.

MECHANICAL INFORMATION

P1 - Signal & Power Connector		
Connector Information	Two 16-pin, 2.54 mm spaced headers (3 pins removed)	
Mating Connector	Details	Samtec: BCS-116-L-S-PE
	Included with Drive	No

<ul style="list-style-type: none"> □ 1 NC □ 2 SIGNAL GND □ 3 NC □ 4 +REF IN □ 5 -TACH IN □ 6 +REF IN □ 7 +TACH / GND □ 8 CURR LIMIT RES □ 9 CURR LIMIT RES □ 10 INT CAP □ 11 INV OUT □ 12 INHIBIT IN □ 13 INT CAP □ 14 INHIBIT □ 15 VOLT OUT □ 16 INV IN 		<ul style="list-style-type: none"> +MOT 29 □ +MOT 28 □ +MOT 27 □ -MOT 26 □ -MOT 25 □ -MOT 24 □ +PWR 23 □ +PWR 22 □ +PWR 21  GND 20 □ GND 19 □ GND 18 □ GND 17 □
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