

Features and Benefits

- Low R_{DS(on)} outputs
- Standby mode with zero current drain
- Small 2×2 DFN package
- Crossover Current protection
- Thermal Shutdown protection

Package: 8-contact DFN with Exposed Thermal Pad (suffix EE)



Not to scale

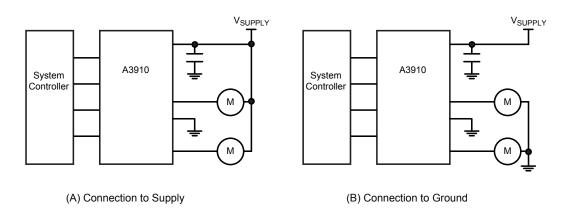
Description

The A3910 is a dual half bridge motor driver, designed for low cost, low voltage battery operated power applications. The outputs are rated for operation up to 500 mA.

Direct control of high- and low-side drivers is implemented to allow either high-side or low-side PWM. The motor can be connected to either supply or GND. Using a MOS switch results in improved braking action for the motor, compared to implementation with simple clamp diode.

The A3910 is supplied in a 2 mm \times 2 mm 8-contact DFN package (EE) with exposed thermal pad. The package is lead (Pb) free, with 100% matte tin leadframe plating.

Typical Application Diagram



Selection Guide

Part Number	Packing*	Package
A3910EEETR-T	3000 pieces per 13-in. reel	8-contact DFN with exposed thermal pad

*Contact AllegroTM for additional packing options.

Absolute Maximum Ratings*

Characteristic	Symbol	Notes	Rating	Unit
Supply Voltage	V _{BB}		-0.3 to 5.5	V
Logic Input Voltage Range	V _{IN}		-0.3 to 6	V
Output Current	I _{OUT}		500	mA
Output Voltage	V _{OUT}		–0.3 to V _{BB} + 1	V
Operating Ambient Temperature	T _A	E temperature range	-40 to 85	°C
Maximum Junction Temperature	T _J (max)		150	°C
Storage Temperature	T _{stg}		–55 to 150	°C

Thermal Characteristics may require derating at maximum conditions, see application information

Characteristic	Symbol	Test Conditions*	Value	Unit
		On 4-layer PCB based on JEDEC standard	49	°C/W
Package Thermal Resistance		On 2-layer PCB based with 0.23 in. ² exposed copper each side	92	°C/W

*Additional thermal information available on the Allegro website.

Terminal List Table

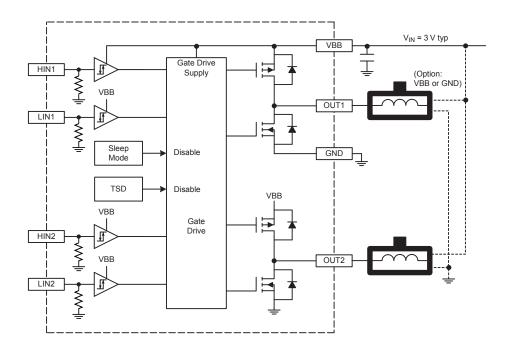
Pin-out Diagram

HIN1	[1])	PAD	(8)	OUT1
LIN1	[2])		(7)	VBB
LIN2	[3])		(6)	GND
HIN2	[4])		(5)	OUT2

Number	Name	Function		
1	HIN1	Logic input		
2	LIN1	Logic input		
3	LIN2	Logic input		
4	HIN2	Logic input		
5	OUT2	Motor terminal		
6	GND	Ground		
7	VBB	Input Supply		
8	OUT1	Motor terminal		



Functional Block Diagram





ELECTRICAL CHARACTERISTICS* Valid at $T_A = 25^{\circ}C$; unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
VBB Supply Range	V _{BB}		2.5	_	5.5	V
VBB Supply Current		Both bridges, PWM = 50 kHz	-	0.3	1	mA
	I _{BB}	Sleep mode (HIN1=HIN2=LIN1=LIN2=0V)	-	<1	1	μA
		Source driver, I = 400 mA, V _{BB} = 3 V	-	1.1	1.4	Ω
Output Driver On Desistance		Source driver, I = 400 mA, V _{BB} = 5 V	-	0.8	1	Ω
Output Driver On-Resistance	R _{DS(on)}	Sink driver, I = 400 mA, V _{BB} = 3 V	-	0.5	0.65	Ω
		Sink driver, I = 400 mA, V _{BB} = 5 V	-	0.4	0.52	Ω
Input Logic Low Level	VIL		-	_	0.5	V
Input Logic High Level	V _{IH}		V _{BB} /2	_	-	V
Input Hysteresis	V _{HYS}		50	150	300	mV
Logic Input Current	I _{IN}	V _{IN} = 3.3 V (Pulldown = 100 kΩ)	-	33	50	μA
Thermal Shutdown Temperature	T _{JTSD}	Temperature increasing	-	165	-	°C
Thermal Shutdown Hysteresis	ΔT_{J}	Recovery = $T_{JTSD} - \Delta T_J$	-	15	-	°C

*Specified limits are tested at a single temperature and assured over operating temperature range by design and characterization.

Logic Table

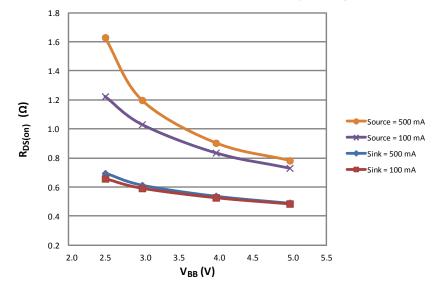
HINx	LINx	OUTx	Function Motor to Supply	Function Motor to GND
0	0	Hi-Z ¹	Coast (Sleep ²)	Coast (Sleep ²)
1	0	High	Brake	Drive
0	1	Low	Drive	Brake
1	1	Hi-Z ¹	Coast	Coast

¹Hi-Z is high impedance.

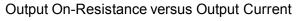
²Sleep mode activated by all four inputs <100 mV.

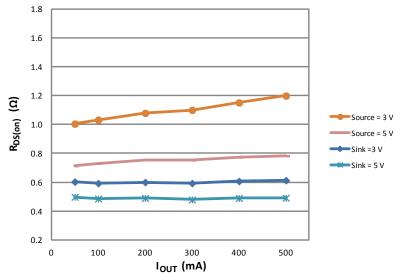


Characteristic Performance

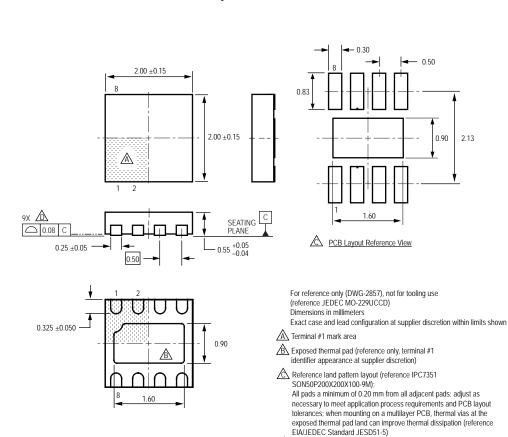


Output On-Resistance versus Load Supply Voltage









Package EE, 8-Contact DFN with Exposed Thermal Pad





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