Delphi Stepper Motor Driver

Description

The Delphi Stepper Motor Driver (SMD) is a bipolar IC used for driving stepper motors. The stepper motor is a two-winding, bipolar, two-phase stepper with substantial resistance incorporated into the winding. The SMD protects itself against motor failure or shorted wire conditions. The output drivers feature short-circuit protection, thermal limiting and over-voltage shutdown. Internal commutating diodes are included to allow for decay of the stored inductive energy of the motor windings.

Features

- Stepper motor driver for 4-phase bipolar motor
- Sink and source loads up to 420 mA
- Operating voltage range of 9V to 16V
- Outputs have shorts to battery and ground protection
- Over-temperature shutdown protection
- Over-voltage shutdown protection

Packaging

- Available in 15-Pin SIP TO-220 package

Typical Applications

- Stepper Motor

Delphi Corporation
World Headquarters
5725 Delphi Drive
Troy, Michigan 48098-2815 USA

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Recommended Operating Conditions			
Characteristic	**Symbol**	**Value**	**Unit**
Supply Voltage	Vcc	9 to 16	V
Input Voltage: High Level	Vih	2.0	V
Input Voltage: Low Level	Vil	0.8	V
Output Current High Level Vcc=16V, TA=40°C, 25°C Vcc=16, TA=125°C Vcc=9V	Ion	±357 (min) ±278 (min) ±180 (min)	mA
Output Current: Low Level Vcc=9V to 16V	Ioff	±2.5 (min)	mA
Operating Temperature Range, Ambient	Ta	-40 to 125	°C

Absolute Maximum Ratings			
Characteristic	**Symbol**	**Value**	**Unit**
Supply Voltage	Vcc	1.5 to 24	V
Input Voltage	Vin	-0.3 to 16	V
Storage Temperature Range	Tstg	-65 to 150	°C
Maximum Junction Temperature		150	°C
Maximum Power Dissipation (Ta=125°C)		2.23 @ 100% duty cycle	W

Electrical Performance Characteristics					
Characteristics	**Symbol**	**Condition**	**Min**	**Max**	**Unit**
Input Low Voltage Threshold	VIL			0.8	V
Input High Voltage Threshold	VIH		2.0		V
Input Hysteresis	VH		0.2		V
Input Low Current	IIL	Vin=0V		±20	µA
Input High Current	IIH	VIN=5.0V		±20	µA
Supply Current	ICC	Inhibit=0.0V, VCC=12V Inhibit=5.0V, TA=-40°C, 25°C Inhibit=5.0V, TA=125°C		0.2 50 35	mA mA mA
Over-Voltage Shutdown	VOVSD		17	20	V
Over-Current Shutdown	IOCSD			700	mA
Over-Temperature Shutdown				165	°C
Output Current "ON"	ION	VCC=16, Ta=-40°C, 25°C VCC=16, Ta=125°C VCC=9V	±357 ±278 ±180		mA mA mA
Output Combined Vsat	Vsat	VCC=16V	1.3	3.5	V

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