

VLN05-9MAS8

Single Channel 0.6A Motor Driver

Version 1.2

Aug. 21, 2014

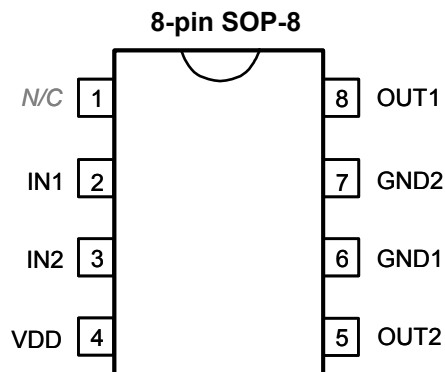
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1. GENERAL DESCRIPTION

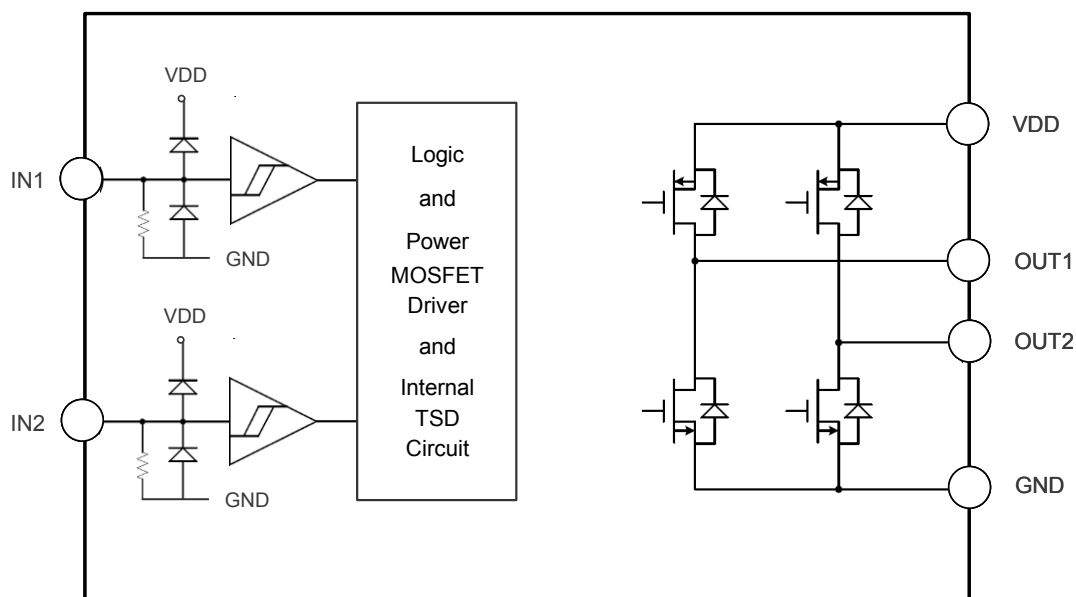
VLN05-9MAS8 is a single-chip bi-directional motor driver CMOS IC for low-voltage applications. It is designed with LSI high technology with a low-power and low-cost process. It has H bridge driver of built-in MOSFET power switch to provide Forward / Reverse / Brake / Stop function for motor driver applications.

2. FEATURES

- (1). Wide operating voltage: 1.8V ~ 5.5V.
- (2). H bridge driver of internal PMOS/NMOS power switches.
- (3). Support 4 operating mode: Forward / Backward / Brake / Stop.
- (4). Low standby current. (Typ.=0.1uA)
- (5). Over 600mA output current capability.
- (6). Built-in Thermal Shutdown (TSD) circuit.
- (7). CMOS input. No current-limit resistance required and built-in input pull-low resistance.
- (8). High 5KV Human Body Mode (HBM) ESD protection.
- (9). SOP-8 package type are available.



3. BLOCK DIAGRAM



4. PIN DESCRIPTION

Pin Name	Pin No. (SOT23-6 / SOP8)	ATTR.	Description
IN1	4 / 2	I	Forward rotation logic input.
IN2	3 / 3	I	Backward rotation logic input.
OUT1	6 / 8	O	Forward rotation output.
OUT2	1 / 5	O	Backward rotation output.
VDD	5 / 4	Power	Positive power.
GND	2 / 6, 7	Power	Negative power.
N/C*	- / 1	-	No connection.

* N/C pin is suggested connecting to VDD for pin-to-pin compatible with VLN05-9MAS8 at PCB layout.

5. FUNCTION DESCRIPTION

IN1	IN2	OUT1	OUT2	Function
0	0	Z (Off)	Z (Off)	Stop (Standby)
1	0	1	0	Forward
0	1	0	1	Backward
1	1	0	0	Brake

6. ELECTRICAL CHARACTERISTICS

6.1 Absolute Maximum Rating

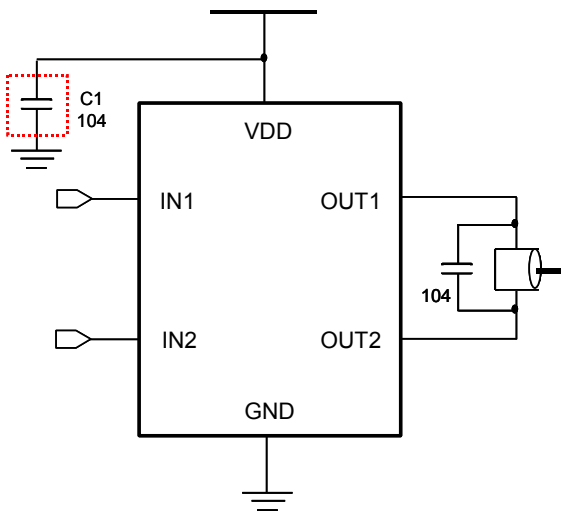
Symbol	Parameter		Rating	Unit
V _{DD} - V _{SS}	Supply voltage		-0.5 ~ +6.0	V
I _{OUT-PEAK}	Output peak current		1.0	A
θ _{JA}	Thermal resistance (Junction to Ambient)	SOT23-6	180	°C/W
		SOP-8	150	
P _D	Power dissipation	SOT23-6	0.7	W
		SOP-8	0.8	
T _A	Operating ambient temperature		-40 ~ +85	°C
T _J	Operating junction temperature		+150	°C
T _{ST}	Storage temperature		-55 ~ +150	°C

6.2 DC Characteristics ($V_{DD}=4.5V$, $T_A=25^\circ C$, unless otherwise specified)

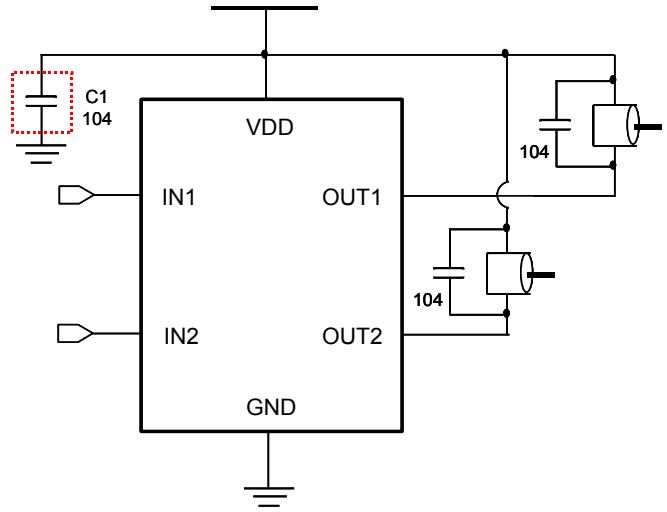
Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V_{DD}	Operating voltage	1.8		5.5	V	
I_{SB}	Standby current		0.1	1	μA	IN1=IN2=0
I_{OP}	Operating current	$V_{DD} = 3.0V$	35		μA	IN1=1, IN2=0 or IN1=0, IN2=1 or IN1=1, IN2=1
		$V_{DD} = 4.5V$	50		μA	
I_{IH}	Input high current (12kΩ pull-low resistance)		250		μA	$V_{IH} = 3.0V$
			370		μA	$V_{IH} = 4.5V$
V_{IH}	Input high voltage	$0.7V_{DD}$			V	
V_{IL}	Input low voltage			$0.3V_{DD}$	V	
R_{ON}	Output resistance (SOT23-6 Package)		1.3		Ω	$I_{OUT} = 200mA$
			1.6		Ω	$I_{OUT} = 500mA$
			2.0		Ω	$I_{OUT} = 800mA$
	Output resistance (SOP-8 Package)		1.4		Ω	$I_{OUT} = 200mA$
			1.8		Ω	$I_{OUT} = 500mA$
			2.3		Ω	$I_{OUT} = 800mA$
I_{OUT}	Output continuous current (* with PCB heat dissipation)		650	800*	mA	SOT23-6
			600	750*	mA	SOP-8
I_{PULSE}	Pulsed drain current			2.0	A	Pulse width < 20ms
T_{RISE}	Output rise time		300		ns	PWM=20kHz, Duty=50%
T_{FALL}	Output fall time		120		ns	
T_{RP}	Input-to-Output response time		150		ns	
T_{TSD}	Thermal shutdown (TSD)		150		°C	Junction temperature
T_{TSDH}	Thermal shutdown hysteresis		35		°C	

7. APPLICATION CIRCUIT

(1) One Motor Bi-Directional Control



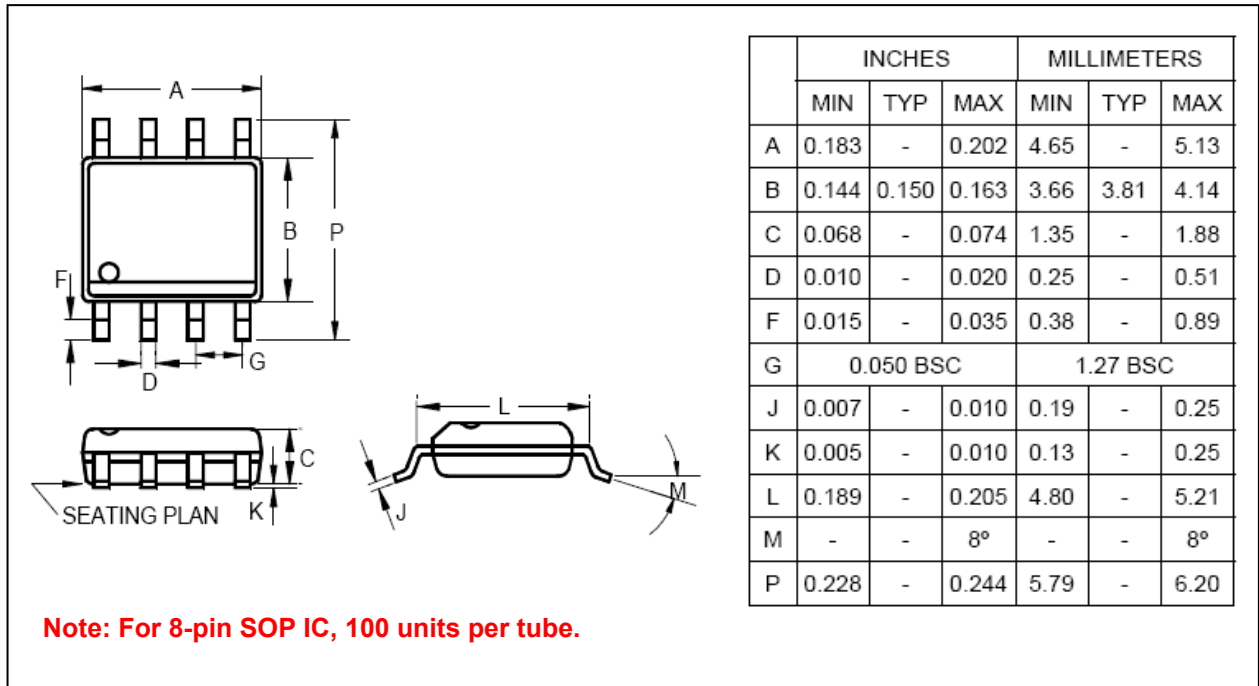
(2) Two Motors Directional Control



** In normal application, C1 (0.1μF) can be saved, but please reserve C1 space at PCB layout.*

8. PACKAGE DIMENSION

8-Pin Plastic SOP (150 mil)



9. ORDERING INFORMATION

<i>P/N</i>	<i>Shipping Type</i>	<i>Remarks</i>
VLN05-9MAS8	SOP-8	Width 150 mil.