



DATA SHEET

## NY9M009B

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### Single Channel 1.4A Motor Driver



## Revision History

<i>Version</i>	<i>Date</i>	<i>Description</i>	<i>Modified Page</i>
1.0	2019/01/24	Formal release.	-

矽源特科技  
ChipSourceTek

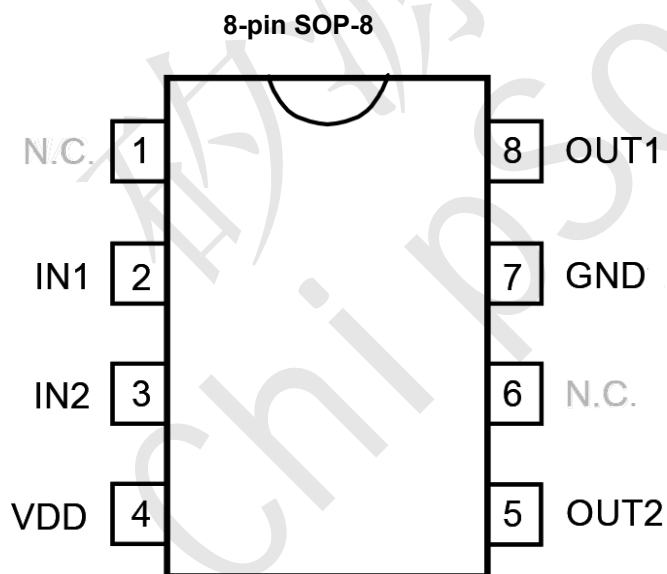


## 1. NY9M009B概述

NY9M009B 為單晶片CMOS的雙向馬達驅動IC，利用大型積體電路(LSI)製造技術，具有低電源及低成本的特性，可應用於低電壓工作模式。電路採用H橋架構，內置功率 MOSFET 開關，可實現對直流電機做 正轉、反轉、煞車、停止 四個功能的控制。

## 2. NY9M009B功能

- (1). 寬廣的工作電壓： 1.8V ~ 6.8V 。
- (2). 內置 PMOS/NMOS 功率開關的 H 橋驅動器。
- (3). 支援4種操作模式：正轉 / 反轉 / 剎車 / 停止。
- (4). 低待機電流 (Typ.=0.1uA)。
- (5). 1400mA 以上電流輸出能力。
- (6). 內建過溫保護功能。(TSD, Thermal Shutdown)
- (7). CMOS 輸入，輸入腳無需外加限流電阻，且輸入腳內建下拉電阻。
- (8). 高達 5KV 的人體靜電模式 (HBM) 的 ESD 保護。
- (9). 僅提供 SOP-8 封裝。



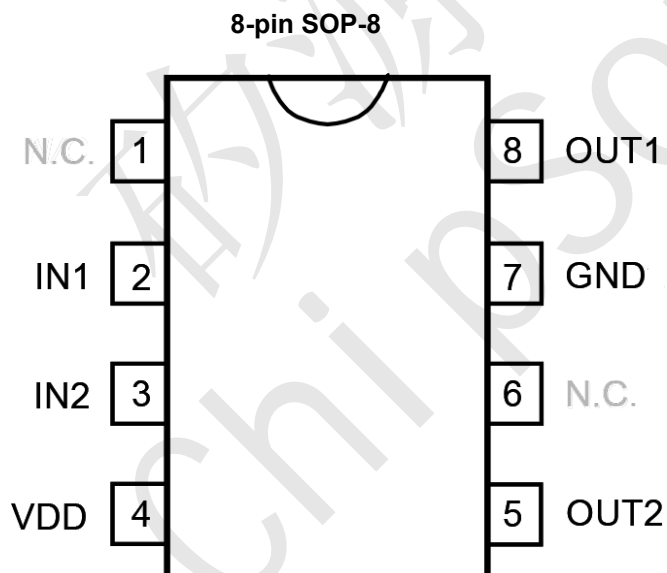


## 1. NY9M009B GENERAL DESCRIPTION

NY9M009B 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.

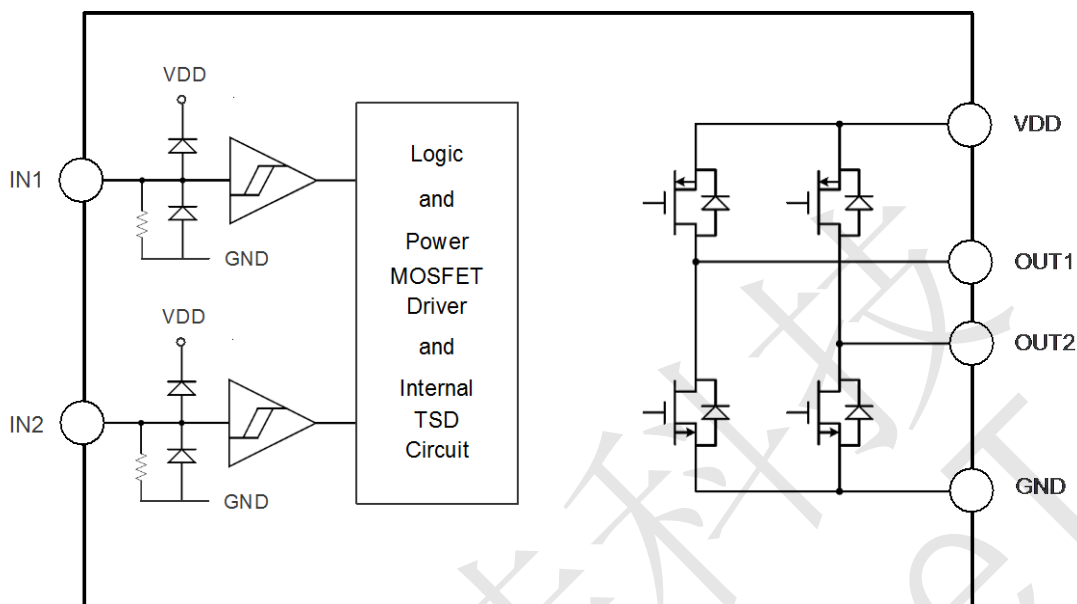
## 2. NY9M009B FEATURES

- (1). Wide operating voltage: 1.8V ~ 6.8V.
- (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 1400mA 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). Only SOP-8 package type is available.





### 3. NY9M009B BLOCK DIAGRAM



### 4. NY9M009B PIN DESCRIPTION

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

\* N.C. pin 1 is suggested connecting to VDD for pin-to-pin compatible with NY9M008BS8 at PCB layout.

N.C. pin 6 is suggested connecting to GND for pin-to-pin compatible with NY9M008BS8 at PCB layout.

### 5. NY9M009B 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. NY9M009B ELECTRICAL CHARACTERISTICS

#### 6.1 Absolute Maximum Rating

Symbol	Parameter		Rating	Unit
$V_{DD} - V_{SS}$	Supply voltage		-0.5 ~ +7.5	V
$I_{OUT-PEAK}$	Output peak current		2.5	A
$\theta_{JA}$	Thermal resistance (Junction to Ambient)	SOP-8	150	°C/W
$P_D$	Power dissipation	SOP-8	0.9	W
$T_A$	Operating ambient temperature		-40 ~ +85	°C
$T_J$	Operating junction temperature		+160	°C
$T_{ST}$	Storage temperature		-55 ~ +150	°C

#### 6.2 DC Characteristics ( $V_{DD}=6.0V$ , $T_A=25^\circ C$ , unless otherwise specified)

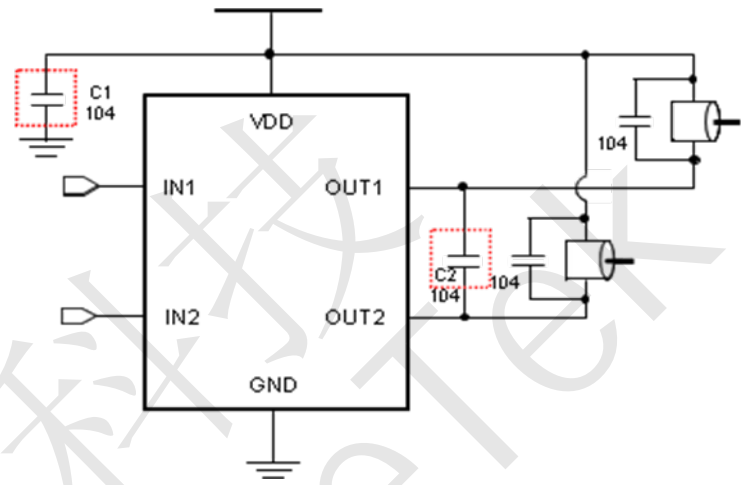
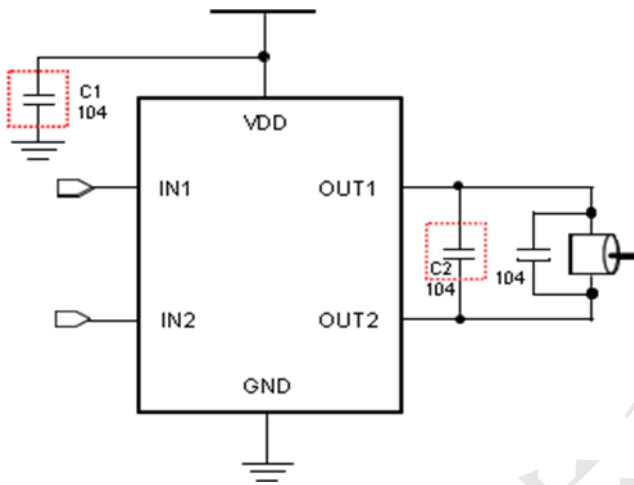
Symbol	Parameter		Min.	Typ.	Max.	Unit	Condition
$V_{DD}$	Operating voltage		1.8		6.8	V	
$I_{SB}$	Standby current			0.1	1	uA	IN1=IN2=0
$I_{OP}$	Operating current	$V_{DD} = 3.0V$		120		uA	IN1=1, IN2=0 or IN1=0, IN2=1 or IN1=1, IN2=1
		$V_{DD} = 6.0V$		210		uA	
$I_{IH}$	Input high current (12kΩ pull-low resistance)			250		uA	$V_{IH} = 3.0V$
				500		uA	$V_{IH} = 6.0V$
$V_{IH}$	Input high voltage		2.0			V	
$V_{IL}$	Input low voltage				0.8	V	
$R_{ON}$	Output resistance (SOP-8 Package)			0.40		Ω	$I_{OUT} = 200mA$
				0.42		Ω	$I_{OUT} = 500mA$
				0.45		Ω	$I_{OUT} = 800mA$
$I_{OUT}$	Output continuous current (* with PCB heat dissipation)			1400	1600*	mA	SOP-8
$I_{PULSE}$	Pulsed drain current				5.0	A	Pulse width < 20ms
$T_{RISE}$	Output rise time			300		ns	PWM=20kHz, Duty=50%
$T_{FALL}$	Output fall time			150		ns	
$T_{RP}$	Input-to-Output response time			300		ns	
$T_{TSD}$	Thermal shutdown (TSD)			160		°C	Junction temperature
$T_{TSDH}$	Thermal shutdown hysteresis			45		°C	



## 7. NY9M009B APPLICATION CIRCUIT

### (1) One Motor Bi-Directional Control

### (2) Two Motors Directional Control



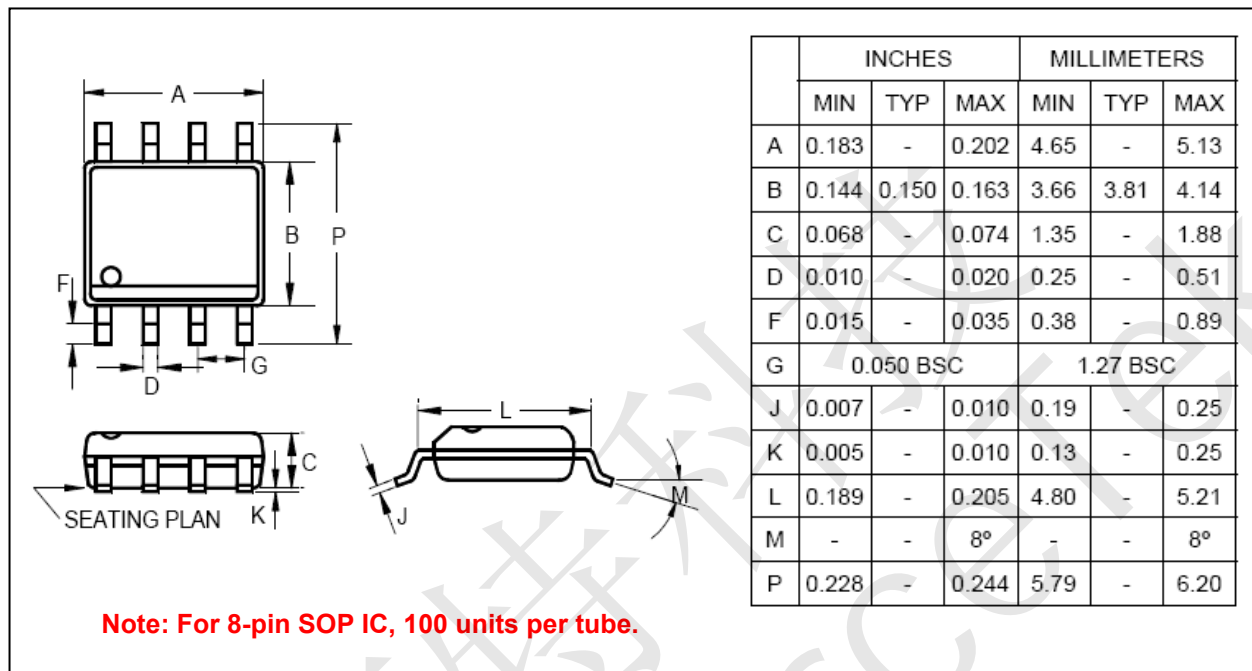
\* In normal application, C1 (0.1uF) can be saved, but please reserve C1 space at PCB layout.

\* If voltage is higher than 6.0V, C2 (0.1uF) is necessary to endure high voltage.



## 8. NY9M009B PACKAGE DIMENSION

### 8-Pin Plastic SOP (150 mil)



## 9. NY9M009B ORDERING INFORMATION

P/N	Package Type	Package Width	Shipping
NY9M009BS8	SOP-8	150 mil.	<u>Tape &amp; Reel</u> : 2.5K pcs per Reel <u>Tube</u> : 100 pcs per Tube