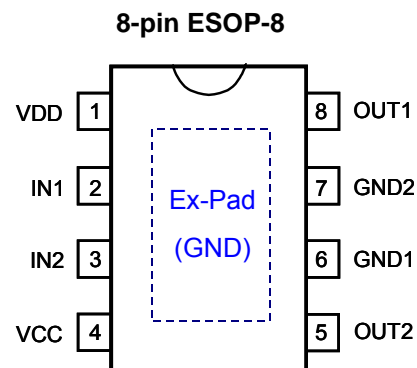
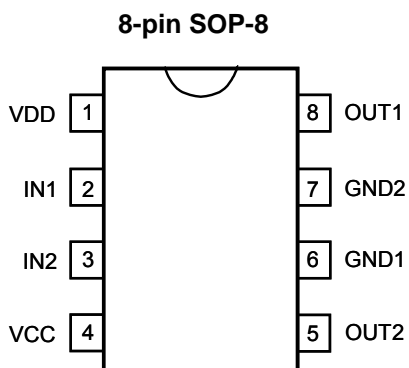



## 1. 概述

HM2511 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. 功能

- (1). 寬廣的工作電壓：1.8V ~ 9.0V。
- (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). 900mA 以上電流輸出能力。
- (6). 內建過溫保護功能。(TSD, Thermal Shutdown)
- (7). CMOS 輸入，輸入腳內建下拉電阻，無需外加限流電阻。
- (8). 高達 5KV 的人體靜電模式 (HBM) 的 ESD 保護。
- (9). 提供 SOP-8 和 ESOP-8 封裝。



 : 外部焊墊。

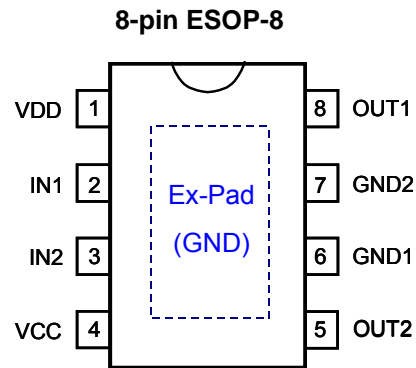
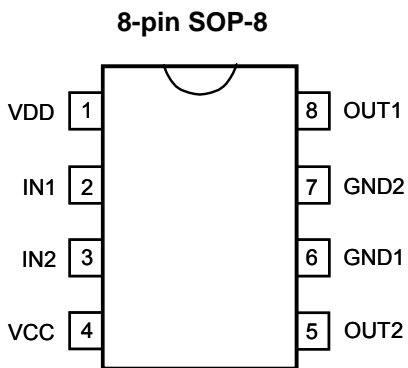
連接到PCB的接地散熱片以利散熱。

## 1. GENERAL DESCRIPTION

HM2511 is a single-chip bi-directional motor driver CMOS IC for low-voltage applications. It is designed by 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

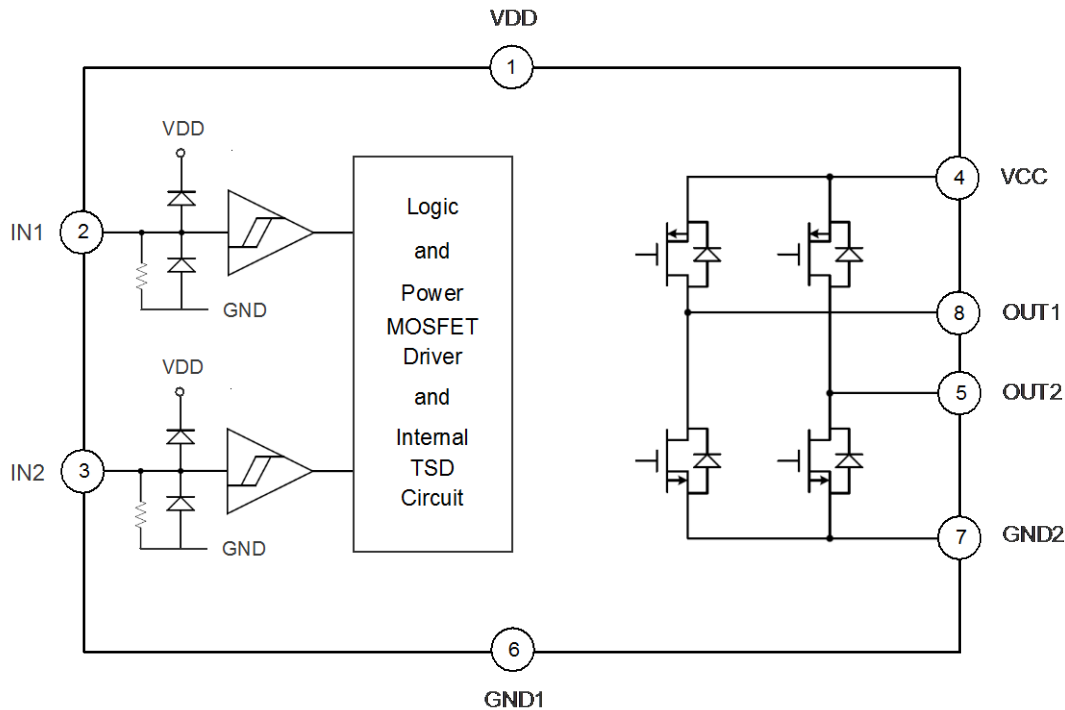
- (1). Wide operating voltage: 1.8V ~ 9.0V.
- (2). H bridge driver of internal PMOS/NMOS power switches.
- (3). Support 4 operating mode: Forward / Backward / Brake / Stop.
- (4). Low standby current. (Typ.=0.1uA)
- (5). Over 900mA output current capability.
- (6). Built-in Thermal Shutdown (TSD) circuit.
- (7). CMOS input. Built-in input pull-low resistance and no current-limit resistance required.
- (8). High 5KV Human Body Mode (HBM) ESD protection.
- (9). SOP-8 and ESOP-8 package type are available.



: Exposed Pad.

Connect to PCB ground plane for heat dissipation.

### 3. BLOCK DIAGRAM



### 4. 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	1	Power	Positive power of logic control circuit.
VCC	4	Power	Positive power of output power MOSFET.
GND1	6	Power	Negative power of logic control circuit.
GND2	7	Power	Negative power of output power MOSFET.
Ex-Pad	9	Power	Exposed pad for thermal tab, must be connected to GND.

### 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

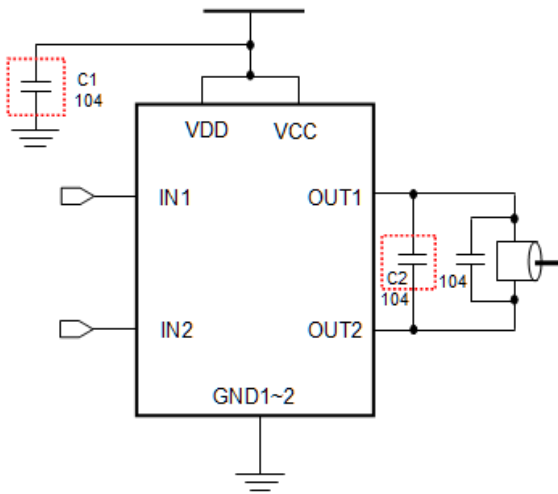
Symbol	Parameter		Rating	Unit
$V_{DD} - V_{SS}$	Supply voltage of logic control circuit		-0.5 ~ +7.5	V
$V_{CC}$	Supply voltage of output power MOSFET		9.6	V
$I_{OUT-PEAK}$	Output peak current		2.0	A
$\theta_{JA}$	Thermal resistance (Junction to Ambient)	SOP-8	150	°C/W
		ESOP-8	60	
$P_D$	Power dissipation	SOP-8	0.9	W
		ESOP-8	2.3	
$T_A$	Operating ambient temperature		-40 ~ +85	°C
$T_J$	Operating junction temperature		+160	°C
$T_{ST}$	Storage temperature		-55 ~ +160	°C

### 6.2 DC Characteristics ( $V_{DD}=3.0V$ , $V_{CC}=6.0V$ , $T_A=25^\circ C$ , unless otherwise specified)

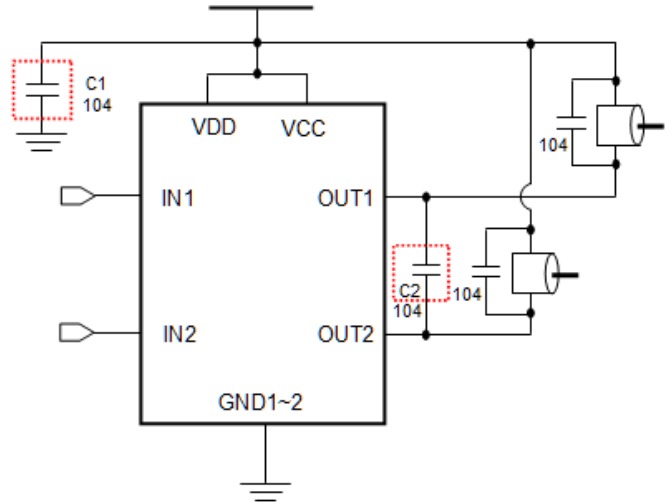
Symbol	Parameter		Min.	Typ.	Max.	Unit	Condition
$V_{DD}$	Operating voltage (Logic)		1.8		6.8	V	
$V_{CC}$	Operating voltage (MOSFET)		1.8		9.0	V	
$I_{SB}$	Standby current			0.1	1	uA	IN1=IN2=0
$I_{OP}$	Operating current	$V_{DD} = V_{CC} = 3.0V$		200		uA	IN1=1, IN2=0 or IN1=0, IN2=1 or IN1=1, IN2=1
		$V_{DD} = V_{CC} = 6.0V$		270		uA	
$I_{IH}$	Input high current (12k $\Omega$ pull-low resistance)			260		uA	$V_{IH} = 3.0V$
				510		uA	$V_{IH} = 6.0V$
$V_{IH}$	Input high voltage		$0.7V_{DD}$			V	
$V_{IL}$	Input low voltage				$0.3V_{DD}$	V	
$R_{ON}$	Output resistance (SOP-8 Package)			0.68		$\Omega$	$I_{OUT} = 500mA$
				0.77		$\Omega$	$I_{OUT} = 800mA$
				0.92		$\Omega$	$I_{OUT} = 1200mA$
	Output resistance (ESOP-8 Package)			0.60		$\Omega$	$I_{OUT} = 500mA$
				0.65		$\Omega$	$I_{OUT} = 800mA$
				0.79		$\Omega$	$I_{OUT} = 1200mA$
$I_{OUT}$	Output continuous current (* with PCB heat dissipation)			900	1200*	mA	SOP-8
				1100	1600*	mA	ESOP-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			120		ns	
$T_{RP}$	Input-to-Output response time			250		ns	
$T_{TSD}$	Thermal shutdown (TSD)			160		°C	Junction temperature
$T_{TSDH}$	Thermal shutdown hysteresis			35		°C	

**7. APPLICATION CIRCUIT**

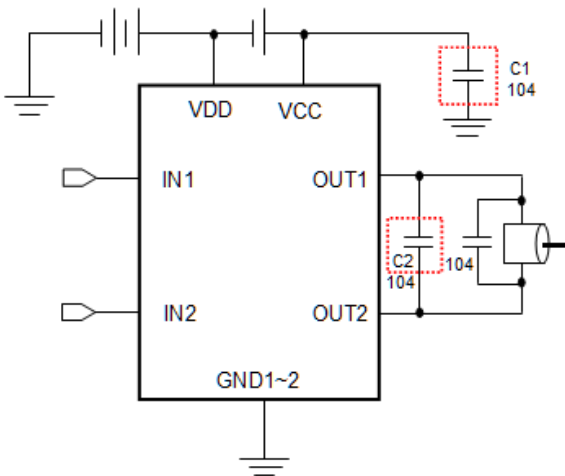
**(1) One Motor Bi-Directional Control  
 (Single Power)**



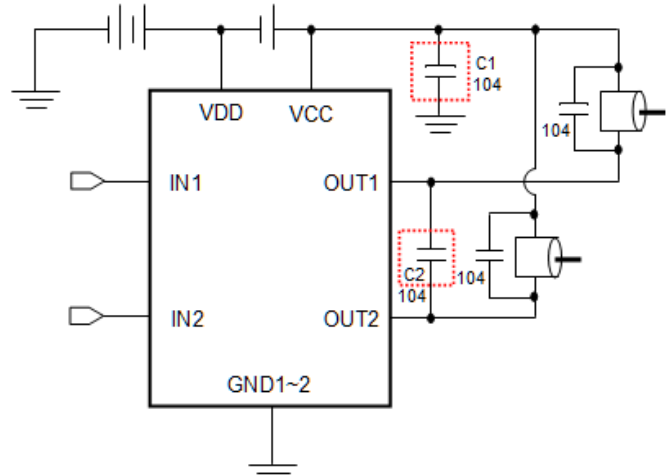
**(2) Two Motors Directional Control  
 (Single Power)**



**(3) One Motor Bi-Directional Control  
 (Dual Power)**



**(4) Two Motors Directional Control  
 (Dual Power)**

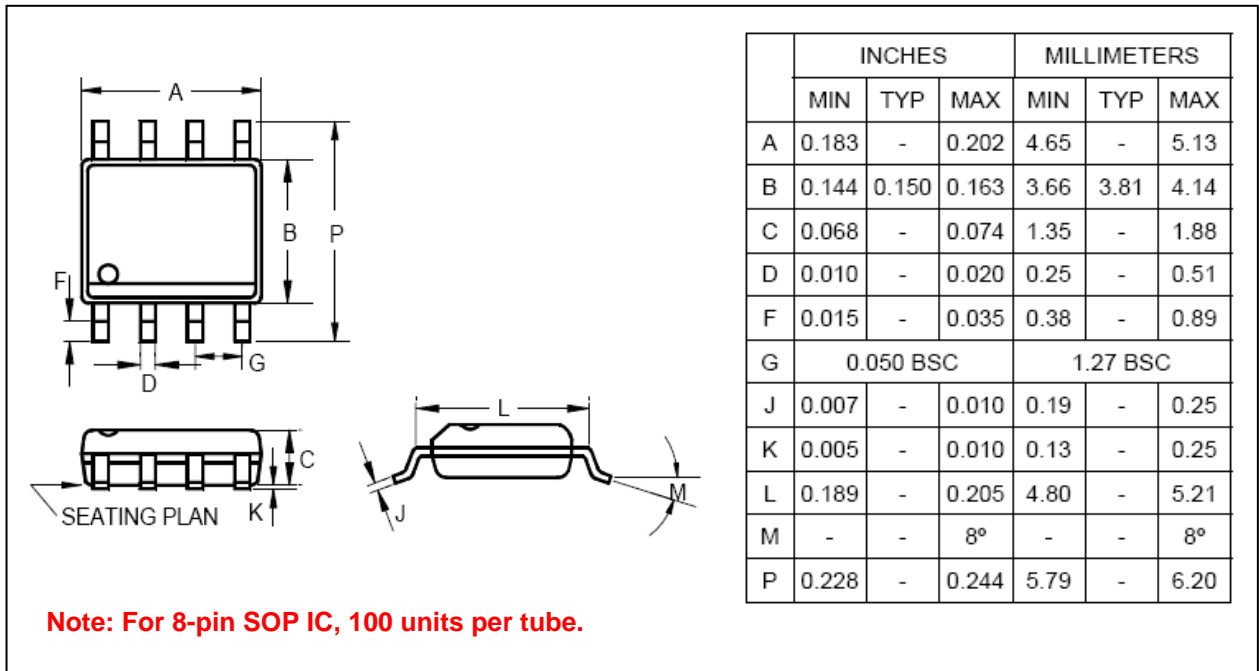


*\* In normal application, C1 (0.1uF) can be saved, but please reserve C1 space at PCB layout.*

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

**8. PACKAGE DIMENSION**

**8.1 8-Pin Plastic SOP (150 mil)**



**8.2 8-Pin Plastic ESOP with Exposed Pad (150 mil)**

