

# 11-MD124

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*Low-saturation, Low-voltage  
Bi-directional Motor Driver*



**SITI**

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## 11-MD124

### Low-saturation, Low-voltage Bi-directional Motor Driver

#### General Specifications

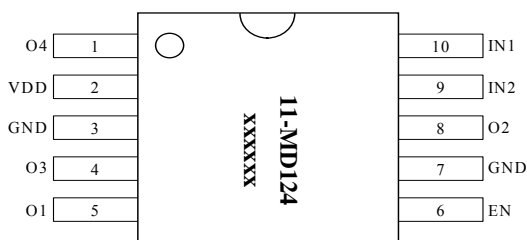
The device is a two-channel low-saturation bi-directional motor driver IC. The design is optimal for stepper-motor applications, such as cameras, printers, FDDs, or other portable devices.

#### Features and Benefits

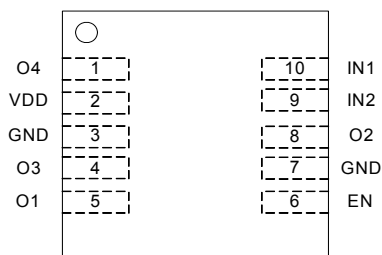
- Low voltage operation (  $V_{DD\ min} = 1.5V$  )
- Low saturation voltage
- Optimal for 2 phase excitation drive for 2-phase stepping motors
- High output sinking and driving capability
- Thin, highly reliable package (MSOP10, DFN10)

#### Pin Assignment

##### MSOP10



##### DFN10



PIN NO.	PIN NAME	DESCRIPTION
1	O4	Output sinking / driving pin.
2	VDD	Power supply pin.
3	GND	Ground pin
4	O3	Output sinking / driving pin.
5	O1	Output sinking / driving pin.
6	EN	Input pin that determines driving mode
7	GND	Ground pin
8	O2	Output sinking / driving pin.
9	IN2	Input pin that determines driving mode.
10	IN1	Input pin that determines driving mode.

### Absolute Maximum Ratings ( Unless otherwise noted, $T_A=25^{\circ}\text{C}$ )

Characteristic	Symbol	Rating	Unit
Supply Voltage	$V_{DD}$	6.0	V
Input Voltage	$V_{IN}$	$V_{DD}+0.4$	V
$I_{ODC}$ Current	$I_{ODC}$	500	mA
Power Dissipation	$P_D$	486	mW
Operating Temperature Range	$T_{OPR}$	-40 ~ 125	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-65 ~ 150	$^{\circ}\text{C}$

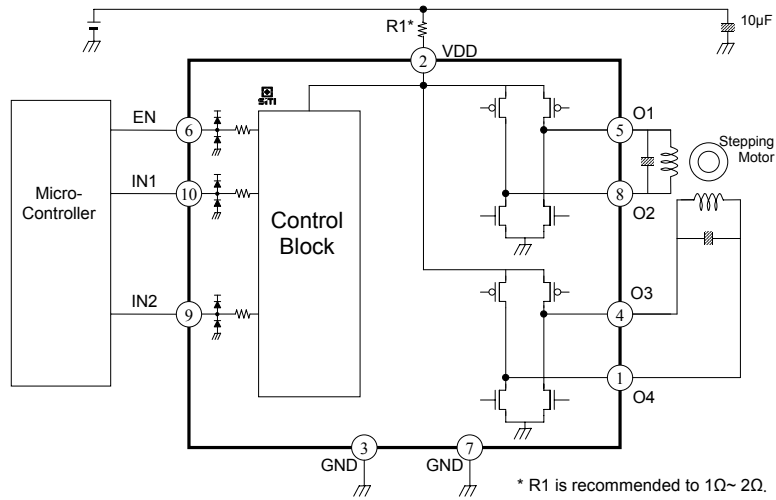
### Electrical Characteristic ( Unless otherwise noted, $T_A=25^{\circ}\text{C}$ & $V_{DD}=3\text{V}$ )

Characteristic	Sym.	Condition	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	$V_{DD}$		1.5	3	6	V
Supply Current	$I_{DD}$	$V_{EN, IN1, IN2} = 0\text{V}$		0.2	0.5	$\mu\text{A}$
EN / IN1 / IN2 Input Terminal ( $T_J = 25^{\circ}\text{C}$ )						
Input Voltage "H"	$V_{IH}$	-	$0.5 \cdot V_{DD}$	-	$V_{DD}+0.4$	V
Input Voltage "L"	$V_{IL}$	-	-0.4	-	$0.2 \cdot V_{DD}$	V
Input Current "H"	$I_{IH}$	$V_{IN} = V_{DD}$	-	-	$\pm 5$	$\mu\text{A}$
Input Current "L"	$I_{IL}$	$V_{IN} = 0\text{V}$	-	-	$\pm 5$	$\mu\text{A}$
O1 / O2 / O3 / O4 Output Terminal ( $T_J = 25^{\circ}\text{C}$ )						
Output Voltage (upper + lower)	$V_{OUT0}$	$I_{OUT} = 200\text{mA}$	-	0.25	0.35	V
	$V_{OUT1}$	$I_{OUT} = 400\text{mA}$	-	0.4	0.6	V

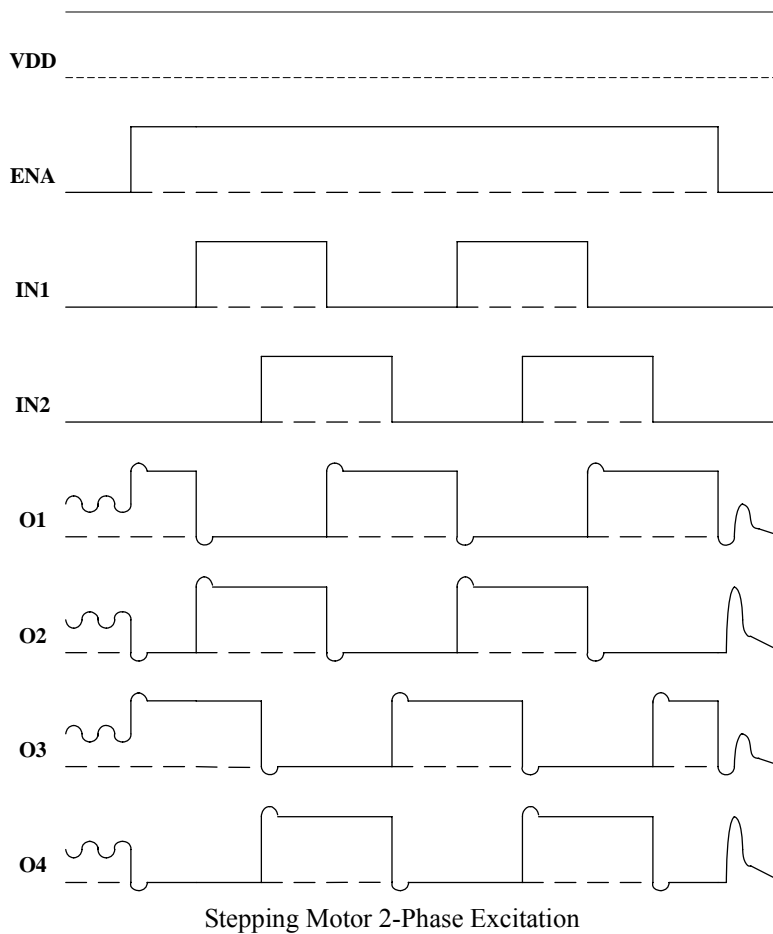
### Truth Table

Input pins			Output pins				Notes
EN	IN1	IN2	O1	O2	O3	O4	
L	-	-	OFF	OFF	OFF	OFF	Standby
H	L	L	H	L	H	L	2-phase excitation
	L	H	H	L	L	H	
	H	H	L	H	L	H	
	H	L	L	H	H	L	

## Block Diagram & Application Circuit



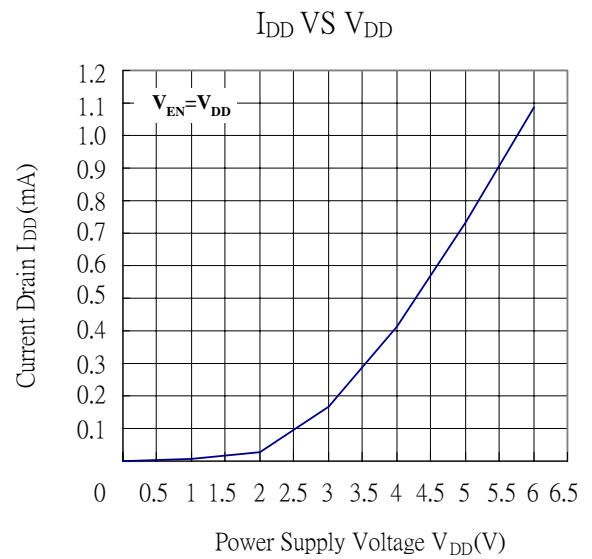
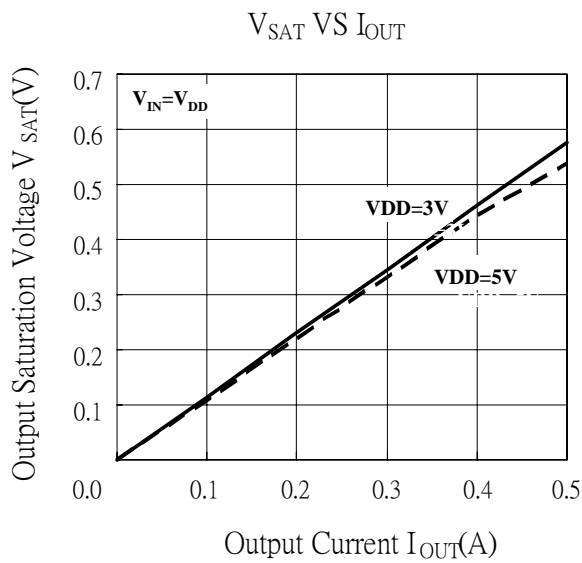
## Timing Chart



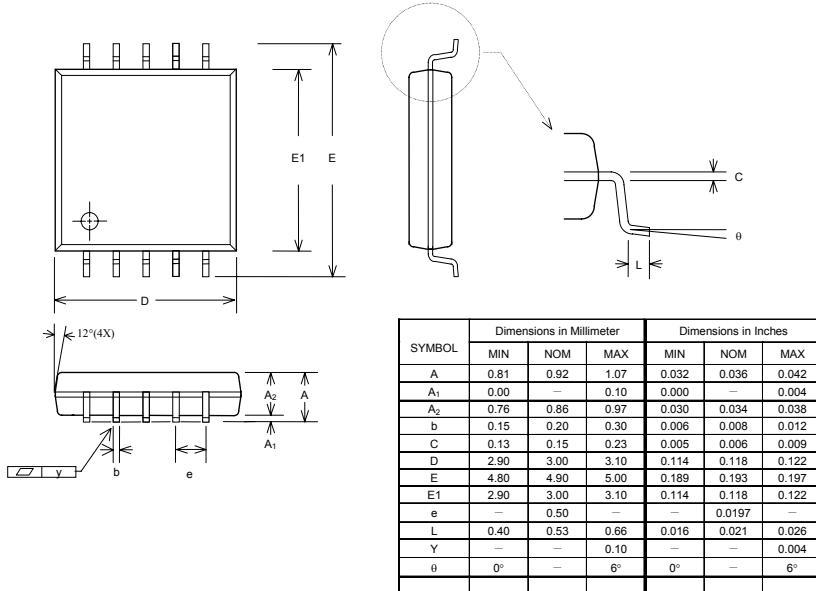
## Application Notes

- The GND pin 3 and pin 7 must both connect to system ground.
- To increase system stability, connecting the resistor R1 about  $1\Omega \sim 2\Omega$  between system power and IC power supply VDD is recommended.

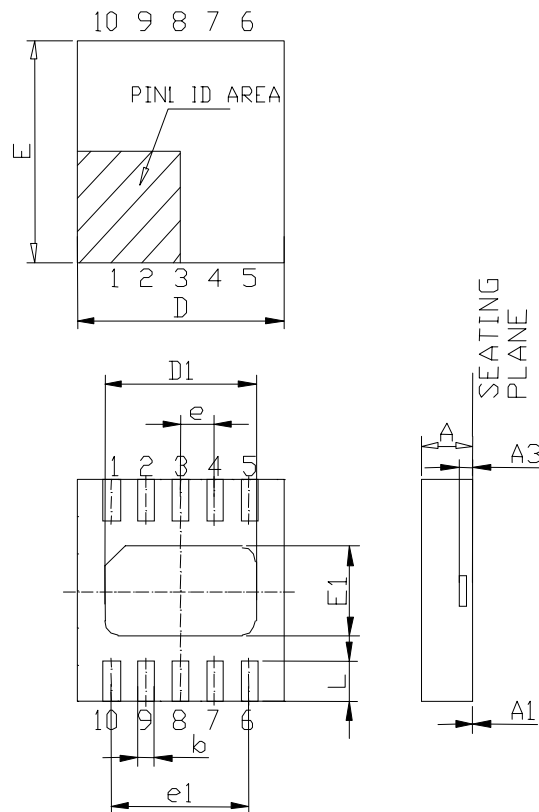
## Typical Performance Curve



## Package Specifications (MSOP10)



## (DFN10)





The products listed herein are designed for ordinary electronic applications, such as electrical appliances, audio-visual equipment, communications devices and so on. Hence, it is advisable that the devices should not be used in medical instruments, surgical implants, aerospace machinery, nuclear power control systems, disaster/crime-prevention equipment and the like. Misusing those products may directly or indirectly endanger human life, or cause injury and property loss.

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