

11-MD124

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



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

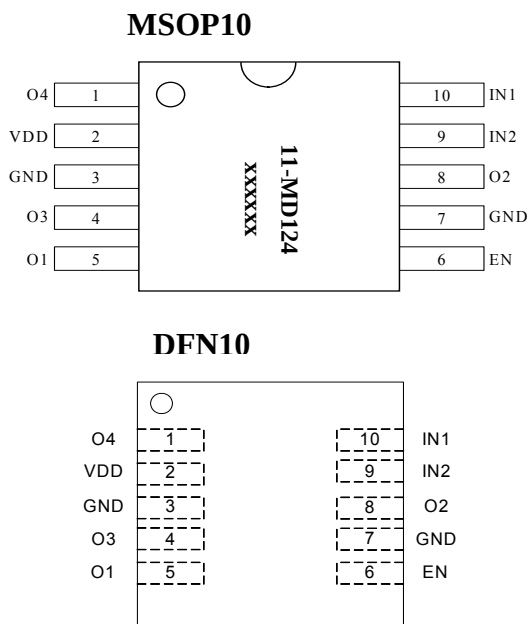
General Specifications

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



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	$^\circ\text{C}$

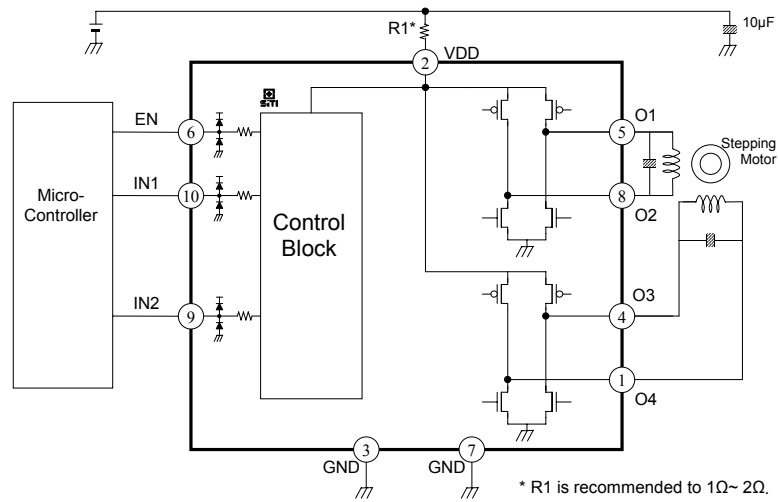
Electrical Characteristic (Unless otherwise noted, $T_A = 25^\circ\text{C}$ & $V_{DD} = 3\text{V}$)

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	μA
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}	$V_{IN} = V_{DD}$	-	-	± 5	μA
Input Current "L"	I_{IL}	$V_{IN} = 0\text{V}$	-	-	± 5	μA
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

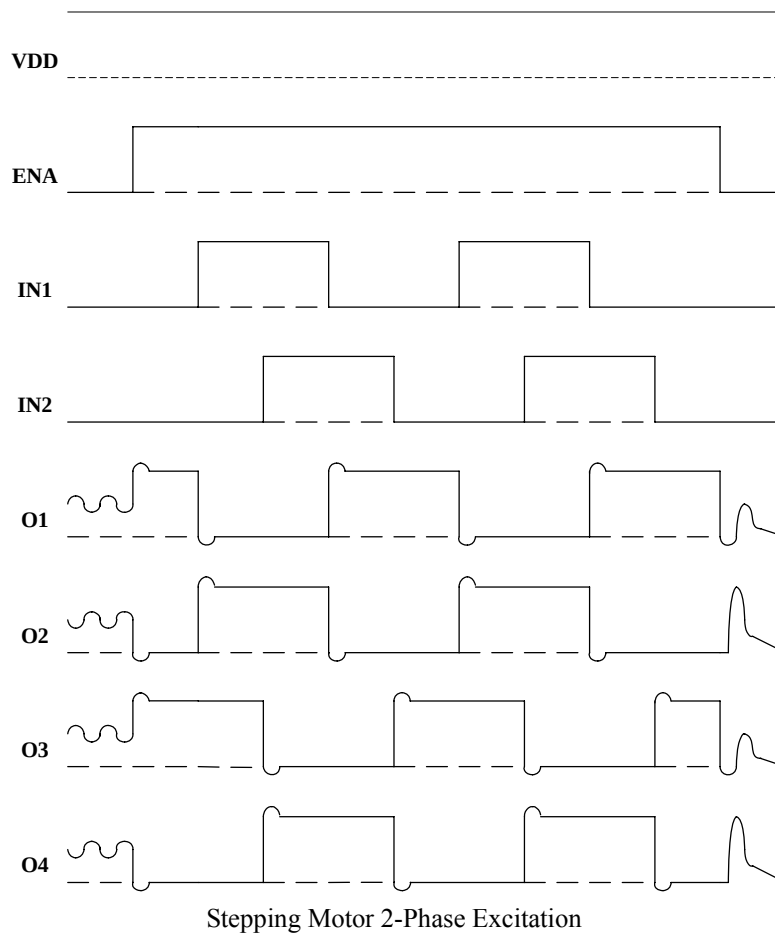
Truth Table

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



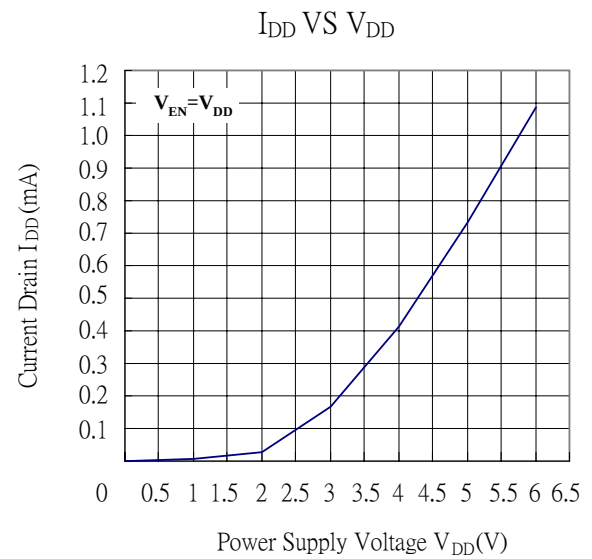
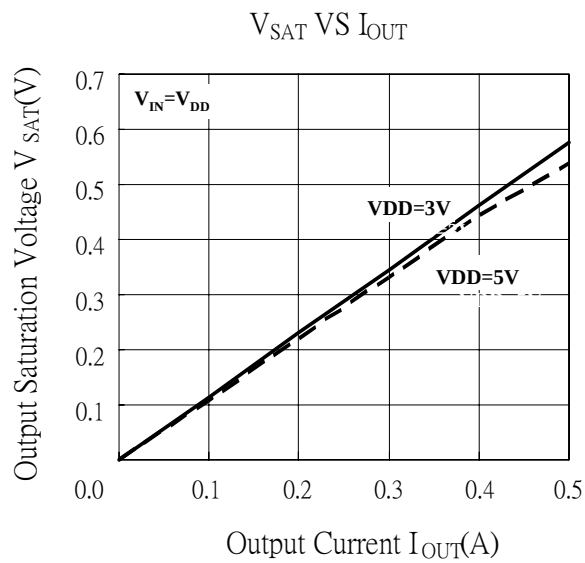
Timing Chart



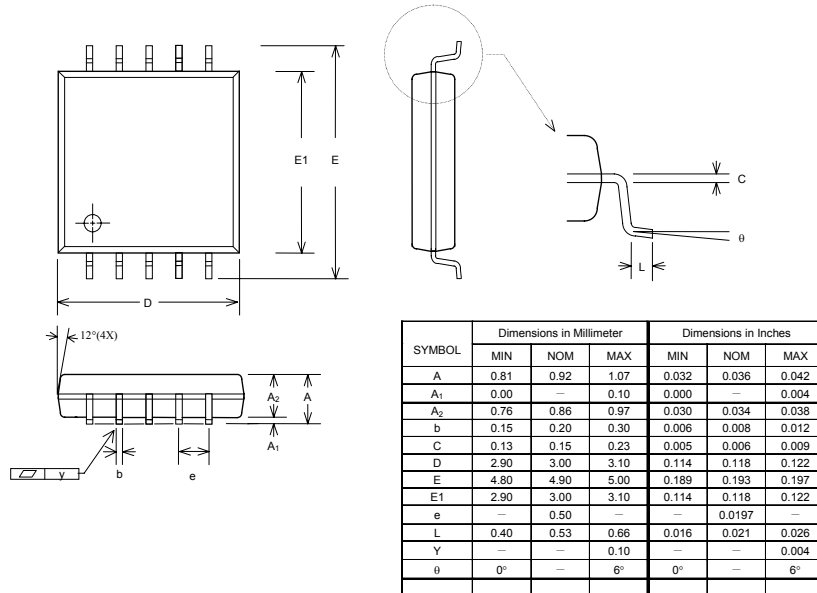
Application Notes

- 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.

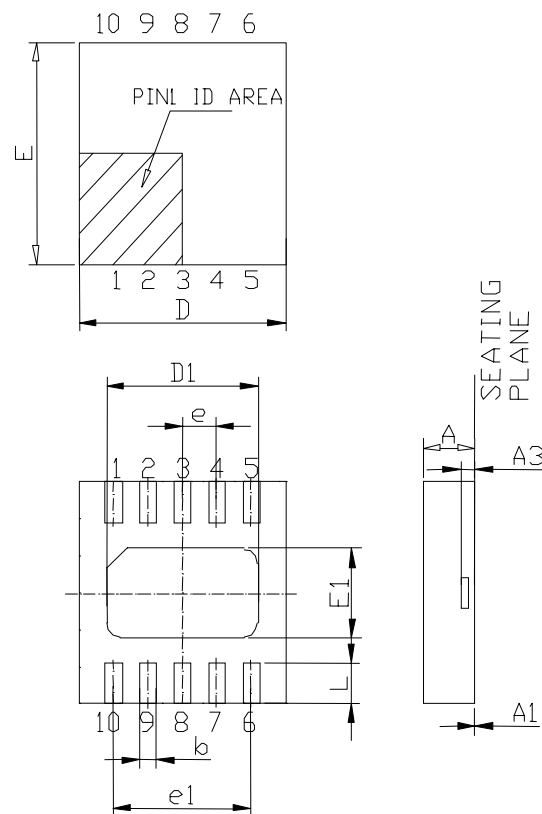
Typical Performance Curve



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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