

11-MD311

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Micro-actuator Driver



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11- MD311

Micro-actuator Driver

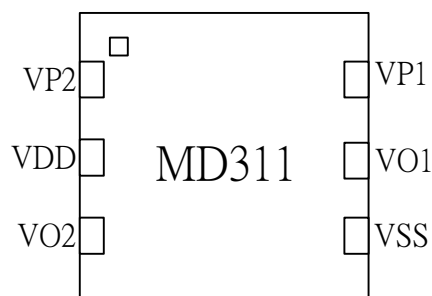
General Specifications

11-MD311 is a micro-actuator driver IC with miniature package. It is one channel low voltage bi-directional motor driver IC. The design is optimal for driving different type micro-actuator, such as voice coil motor, piezo-actuator, or other dc motor actuators. It is suitable for camera module application or other portable device.

Features and Benefits

- ◆ Low voltage operation ($V_{DD\ Min} = 1.8\ V$)
- ◆ Low input current
- ◆ Zero standby current
- ◆ High frequency switch (1MHz)
- ◆ Thin, small package (LFCSP6)

Pin Assignment



Pin Num.	Pin Name	Description
1	VP2	Driver control pin2
2	VDD	Power supply pin1
3	VO2	Driver output 2
4	VSS	Ground
5	VO1	Driver output 1
6	VP1	Driver control pin1
BULK		Ground



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

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{DD}	4.5	V
Input Voltage	V_{P1}	$V_{DD}+0.4$	V
I_o Peak Current	I_{OPeak}	400	mA
I_{ODC} Current	I_{ODC}	280	mA
Power Dissipation	P_D	300	mW
Operating Temperature Range	T_{OPR}	-40 ~ 80	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 ~ 150	$^{\circ}\text{C}$

Electrical Characteristic

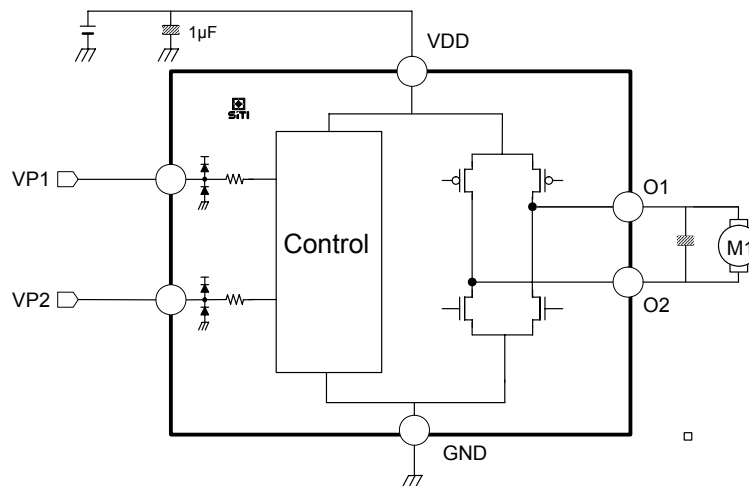
(Unless otherwise noted, $T_A=25^{\circ}\text{C}$ & $V_{DD}=2.8\text{V}$)

Characteristic	Sym.	Condition	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{DD}		1.8	2.8	4.5	V
Standby Current	I_{DD}	No load	-	-	3	μA
VP1 VP2 and PD Input Terminal ($T_J = 25^{\circ}\text{C}$)						
Input Voltage "H"	V_{IH}	-	$0.8 \cdot V_{DD}$	-	$V_{DD}+0.4$	V
Input Voltage "L"	V_{IL}	-	-0.4	-	$0.2 \cdot V_{DD}$	V
Input Current "H"	I_{IH}	$V_{IN} = V_{DD}$	-	-	± 1	μA
Input Current "L"	I_{IL}	$V_{IN} = 0\text{V}$	-	-	± 1	μA
Output Terminal (O1, O2)						
Propagation Delay (Low to High)	T_{IN_LH}	Rload = 10ohm	-	70	120	ns
Propagation Delay (High to Low)	T_{IN_HL}	Rload = 10ohm	-	35	70	ns
Output Resistance (Upper)	R_{OH}	$I_{OUT}=200\text{mA}$	-	1.32	1.6	Ohm
Output Resistance (Low)	R_{OL}	$I_{OUT}=200\text{mA}$	-	0.73	0.9	Ohm

Truth Table

Input		Output	
VP1	VP2	O1	O2
L	L	H	H
L	H	H	L
H	L	L	H
H	H	L	L

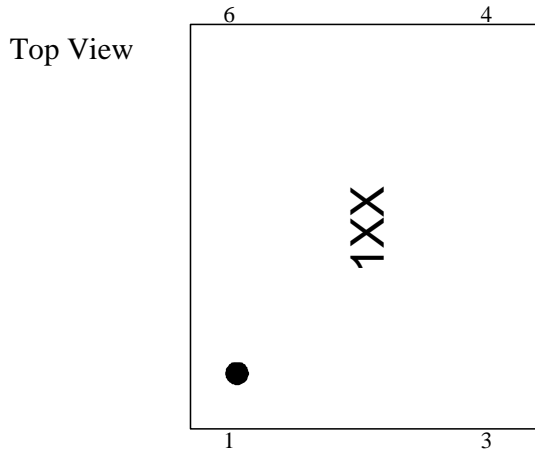
Function Block



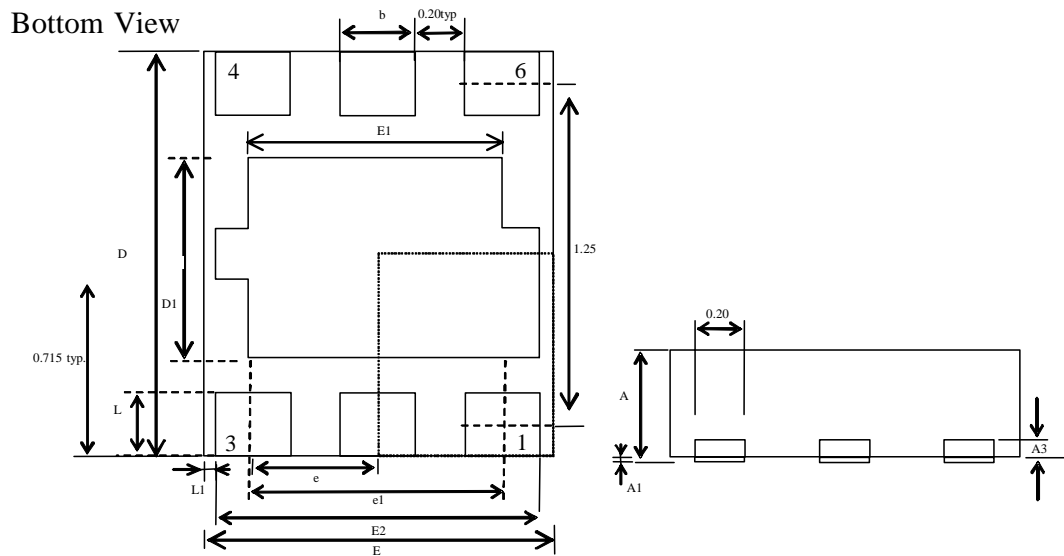
Application Notes

- The O1/O2 output H/H or L/L will brake the motor. Though the active current of driver is near to zero, if the application is required to turn off driver, please turn off the driver's power from VDD.
- The capacitor connected between the output nodes O1/O2 will reduce the noise generating by motor when the motor is switched to opposed direction.

Package Specifications (CSP6)



Note:
1 and XX of the "1XX" are the product number and lot number respectively.



SYMBOL	DIMENSION (mm)			DIMENSION (mil)		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	-	-	0.425	-	-	16.7
A1	0.00	0.02	0.05	0	0.8	2
A3	0.127 REF			5 REF		
b	0.22	0.30	0.38	8.7	11.8	15
D	1.50	1.60	1.70	59.1	63.0	66.9
D1	0.5	0.6	0.7	19.7	23.6	27.6
E	1.30	1.40	1.50	51.1	55.1	59.1
E1	1.00	1.10	1.20	39.4	43.3	47.2
E2	1.30 BASIC			51.2 BASIC		
L	0.25	0.30	0.35	9.8	11.8	13.8
L1	0.05 BASIC			2.00 BASIC		
e	0.50 BASIC			20.0 BASIC		
e1	1.00 BASIC			39.4 BASIC		
y	-	-	0.08	-	-	3



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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