VM114

Version	:	***PRE.001***
Issue Date	:	***2010/01/14***
File Name	:	***SP-VM114-PRE.001.doc***
Total Page	:	***8***

Micro-actuator Driver with I^2C Interface

新竹市科學園區展業一路 9 號 7 樓之 1
SILICON TOUCH TECHNOLOGY INC.
9-7F-1, Prosperity Road I, Science Based Industrial Park,
Hsin-Chu, Taiwan 300, R.O.C.
Tel：886-3-5645656 Fax：886-3-5645626

VM114

Micro-actuator Driver *with I²C Interface*

General Specifications

VM114 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 devices.

Features and Benefits

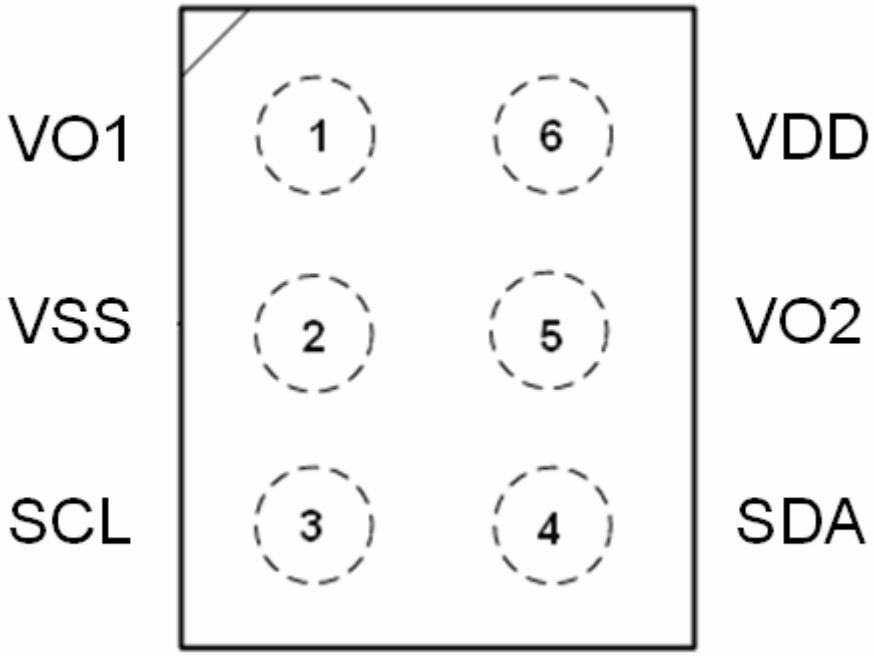
- Low voltage operation ($V_{DD\ Min}$ = 1.8 V)
- Low input current
- Zero standby current
- I^2C serial interface
- Automatic power on reset
- Ultra small package: WLCSP (0.78*1.27*0.35mm)

Ordering Information

Part Number	Package	Marking
VM114 WLCSP	WLCSP, 6Pin	TBD

*Pin Assignment of WLCSP (0.78*1.27*0.35mm)*

TOP View



Pin Number	Pin Name	Description
1	VO1	Driver output 1
2	VSS	Ground
3	SCL	I^2C Interface Clock Line(Serial Clock Line)
4	SDA	I^2C Interface Data Line(Serial Data Line)
5	VO2	Driver output 2
6	VDD	Power supply

Absolute Maximum Ratings *(Unless otherwise noted, T_A= 25℃)*

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	°C
Storage Temperature Range	T_{STG}	-65 ~ 150	°C

Electrical Characteristic

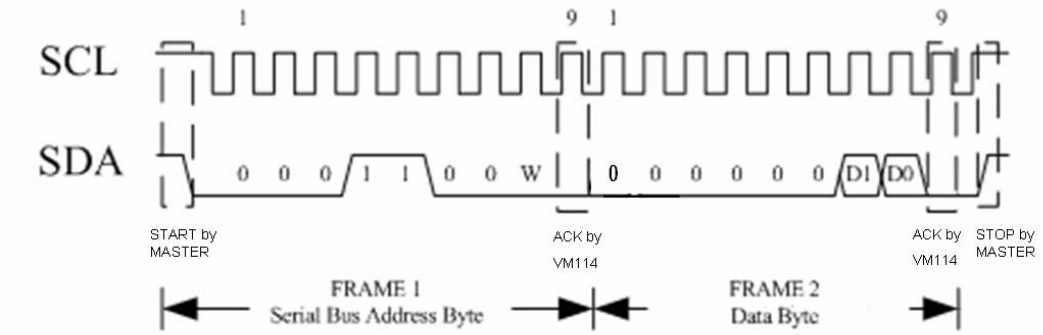
(Unless otherwise noted, T_A= 25℃ & V_{DD}=2.8V)

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
SDA SCL Input Terminal (T_J = 25℃)						
Input Voltage “H”	V_{IH}	-	0.5*V_{DD}	-	V_{DD}+0.4	V
Input Voltage “L”	V_{IL}	-	-0.4	-	0.2*V_{DD}	V
Input Current “H”	I_{IH}	V_{IN} = V_{DD}	-	-	±1	μA
Input Current “L”	I_{IL}	V_{IN} = 0 V	-	-	±1	μA
Output Terminal (O1, O2)						
Output Resistance (Upper)	R_{OH}	I_{OUT}=200mA	-	1.3	1.6	Ohm
Output Resistance (Low)	R_{OL}	I_{OUT}=200mA	-	0.7	0.9	Ohm

Data Format

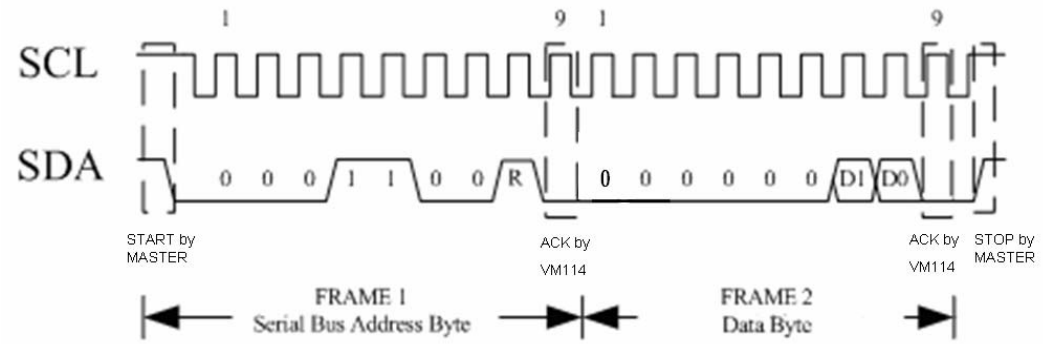
VM114 Write Mode

In the writing mode, data is written to VM114 and shifted into a 8-bit input register. After all 8 bits of data have been shifted in, a STOP signal is generated by master controller. The data in the input register is transferred to VM114 internal controller at the same time.



VM114 Read Mode

In reading mode, data is read from IC to a master controller in the same bit order.



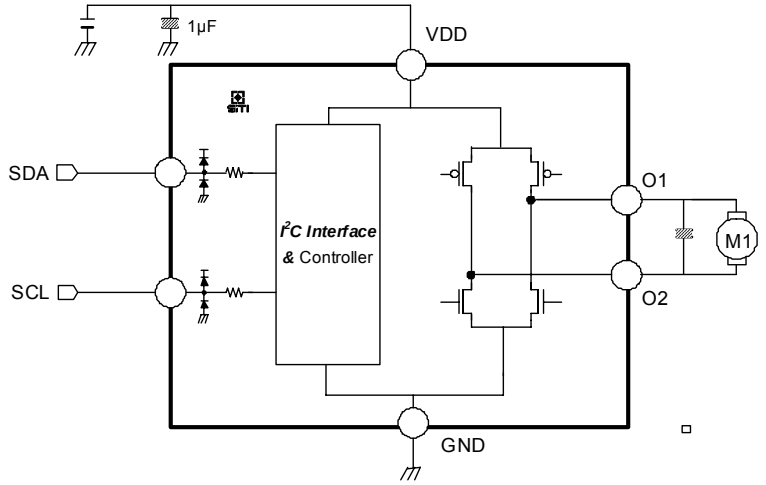
Table

	Address								Data							
Serial Data Bits	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Function	ID6	ID5	ID4	ID3	ID2	ID1	ID0	R/W	0	0	0	0	0	0	D1	D0

D[1:0]: The output O1/O2 is set by D[1:0] as defined below.

Input		Output	
D1	D0	O1	O2
0	0	H	H
0	1	H	L
1	0	L	H
1	1	L	L

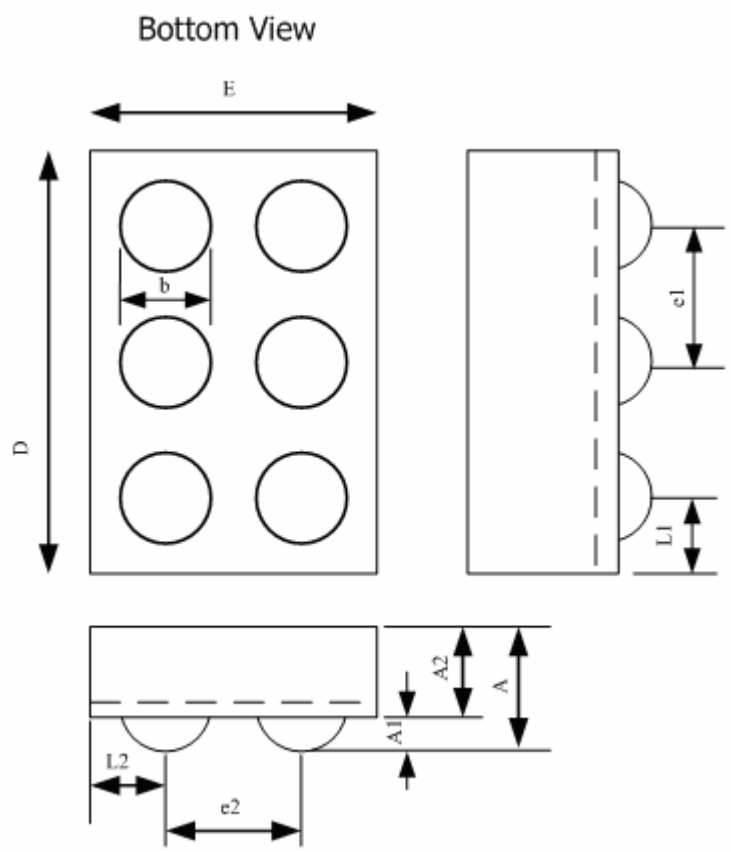
Function Block



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 generated by the motor when the motor is switched to opposed direction.

Package Specifications (WLCSP1): *(0.78*1.27*0.35mm)*



SYMBOL	DIMENSION (mm)		
	MIN.	NOM.	MAX.
A	0.325	0.350	0.375
A1	0.090	0.100	0.110
A2	0.235	0.250	0.265
b	0.234	0.260	0.286
D	1.255	1.270	1.285
E	0.765	0.780	0.795
e1	0.380	0.400	0.420
e2	0.380	0.400	0.420
L1	0.215	0.235	0.255
L2	0.170	0.190	0.210

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.

Silicon Touch Technology, Inc. will not take any responsibilities regarding the misusage of the products mentioned above. Anyone who purchases any products described herein with the above-mentioned intention or with such misused applications should accept full responsibility and indemnify. Silicon Touch Technology, Inc. and its distributors and all their officers and employees shall defend jointly and severally against any and all claims and litigation and all damages, cost and expenses associated with such intention and manipulation.