



V50XX Datasheet

Version: V0.1
Release Date: 2020. 06. 30

Specifications are subject to change without notice.

©2020 Hangzhou Vango Technologies, Inc.

This document contains information that is proprietary to Hangzhou Vango Technologies, Inc.

Unauthorized reproduction of this information in whole or in part is strictly prohibited.

Revision History

Date	Version	Author	Description
2020.06.30	0.1		Initial Release

The Table of Contents

Revision History	1
Figure List	3
Table List	3
1. General Description	4
1.1. Overview	4
1.2. Block Diagram	4
1.3. Features	5
2. PIN Information	6
3. Typical Application	7
4. Electrical Specifications	8
4.1. Absolute Maximum Ratings	8
4.2. Electrical Characteristics	8
4.3. Typical Characteristics	10
5. Package Information	13

Figure List

Figure 1. V50XX Block Diagram 4

Figure 2. Pin Assignment..... 6

Figure 3...... 7

Figure 4...... 7

Table List

Table 1. Pin Description 6

Table 2. Input Logic Truth Table..... 6



1. General Description

1.1. Overview

The V50XX chip is an H-bridge motor driver used for driving reversible motors, which can drive one DC motor, one winding of a stepper motor, or other loads.

The V50XX operates on a motor power supply voltage from 4.5V to 24V, which can supply an output current of up to 0.8A according to the logic control.

The V50XX is controlled by two input pins. The two on/off inputs determine the output mode: forward, reverse, coast, or brake. Very low standby circuit current can be achieved when the two inputs are both at a low level.

1.2. Block Diagram

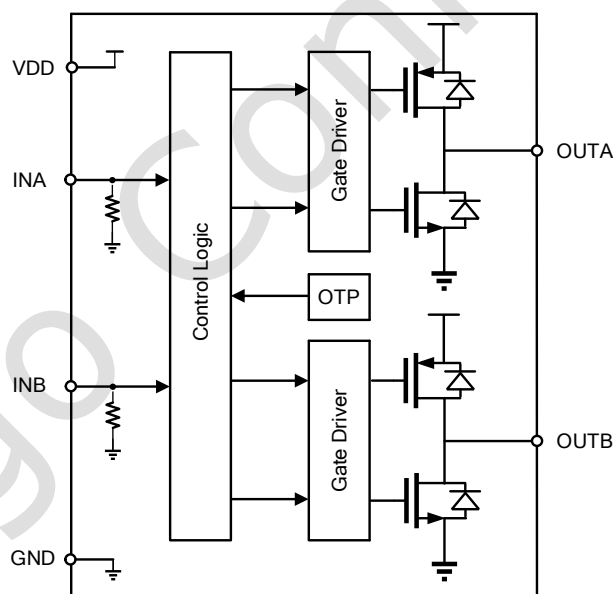


Figure 1. V50XX Block Diagram

1.3. Features

- Wide power range: 4.5V to 24V
- 0.8A maximum continuous output
- Above 3A peak current ability
- Low MOSFET on resistance: $R_{hs}=0.6\Omega$, $R_{ls}=0.3\Omega$
- Forward, Reverse, Coast, or Brake output modes
- Suitable for wide range MCU control logic
- Input logic hysteresis
- Thermal shutdown
- Package
 - SOT23-6 (V5050J)
 - SOP-8 (V5060H)
 - ESOP-8 (V5061H)

2. PIN Information

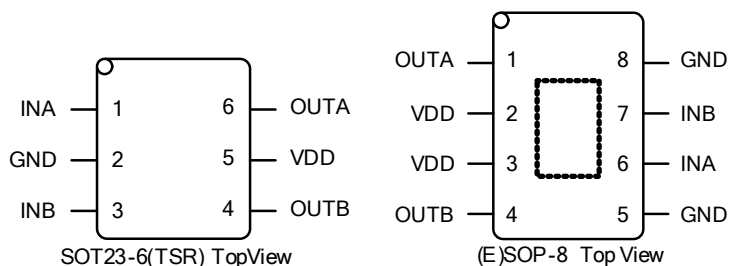


Figure 2. Pin Assignment

Table 1. Pin Description

PIN		Name	Description
SOT23-6(TSR)	(E)SOP-8		
6	1	OUTA	Output, Connect this pin to the motor winding.
5	2,3	VDD	Supply voltage. A decap capacitor is required to prevent large voltage spikes.
4	4	OUTB	Output, Connect this pin to the motor winding.
2	5,8,9	GND	Thermal PAD is also GND.
1	6	INA	Logic input, with a large internal pull-down resistor.
3	7	INB	Logic input, with a large internal pull-down resistor.

Table 2. Input Logic Truth Table

INA	INB	OUTA	OUTB	Function (DC Motor)
L	L	Hi-Z	Hi-Z	Coast or Standby
L	H	L	H	Reverse
H	L	H	L	Forward

H	H	L	L	Brake
---	---	---	---	-------

3. Typical Application

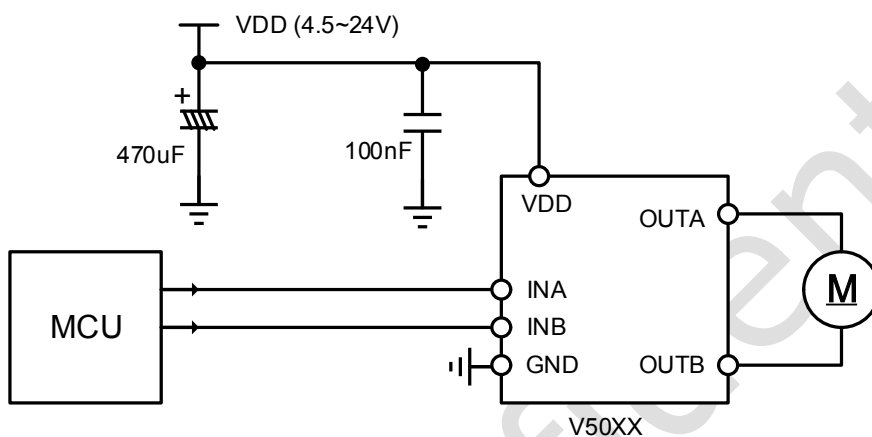


Figure 3.

Make sure that the input pins INA and INB remain low during power-up and power-down.

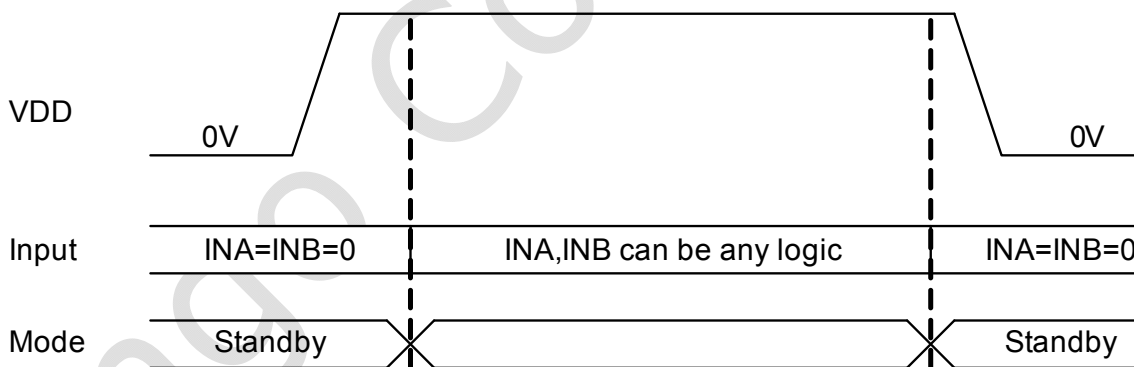


Figure 4.

4. Electrical Specifications

4.1. Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
V _{VDD}	VDD Supply Voltage Range	-0.4 ~ +25		V
V _{OUTX}	Output Pins Voltage Range	VVDD		
V _{INX}	Input Pins Voltage Range	GND-0.4 ~ 5.5		V
T _J	Maximum Junction Temperature	150		°C
T _{STG}	Storage Temperature Range	-55 ~ 160		°C
θ _{JA} *	Package Thermal Resistance (Ambient to Junction)	SOT23-6	180	°C/W
		SOP-8	160	°C/W
		ESOP-8	80	°C/W
V _{ESD (HBM)}	Electrostatic Discharge Voltage (HBM)	6000		V

*Note: There is 8 cm² copper foil on PCB.

4.2. Electrical Characteristics

Test conditions: TA=25°C, VDD=12V, unless otherwise noted.

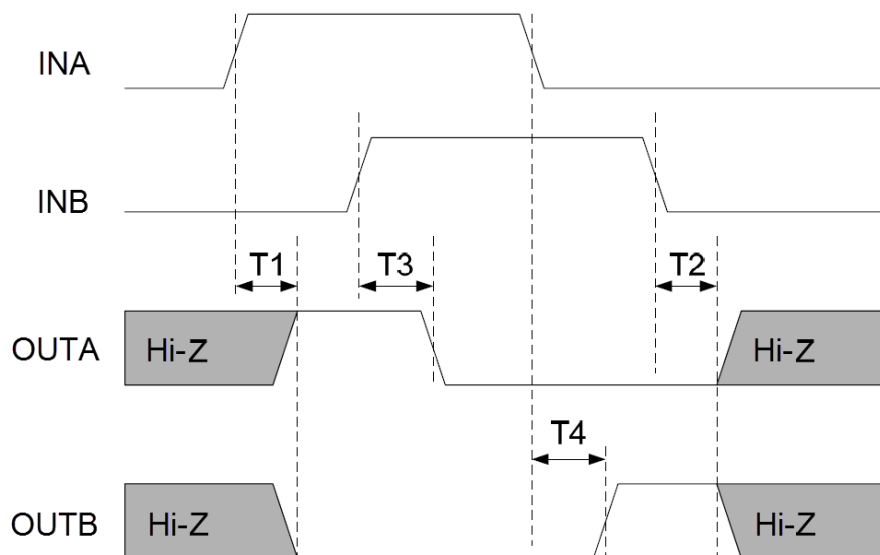
Parameters	Symbol	Condition	Min	Typ.	Max	Units
Operating supply voltage	VDD		4.5		24	V
Standby mode supply current	I _{q0}	INA=INB=0V		25	36	μA
Operating supply current	I _{q1}			60	75	μA
UVLO threshold rising				4.05	4.4	V
UVLO hysteresis				0.3		V
Input high voltage	V _{IH}		1.95			V
Input low voltage	V _{IL}				0.45	V



V50XX Datasheet H-Bridge Motor Driver

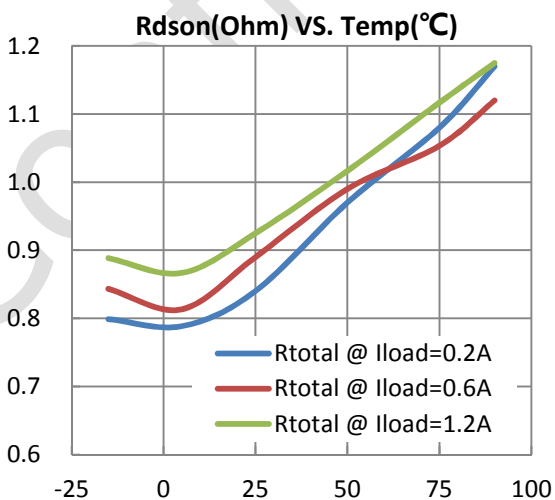
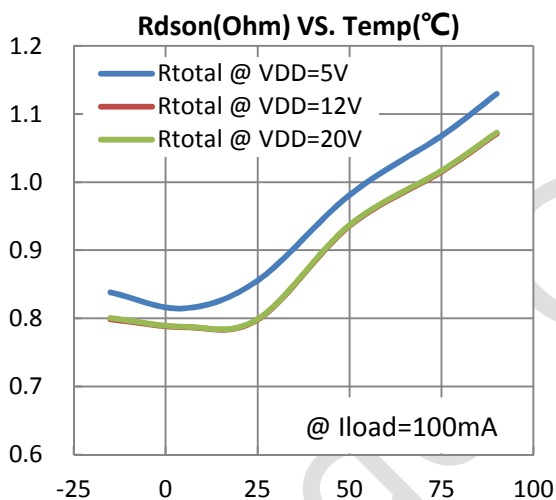
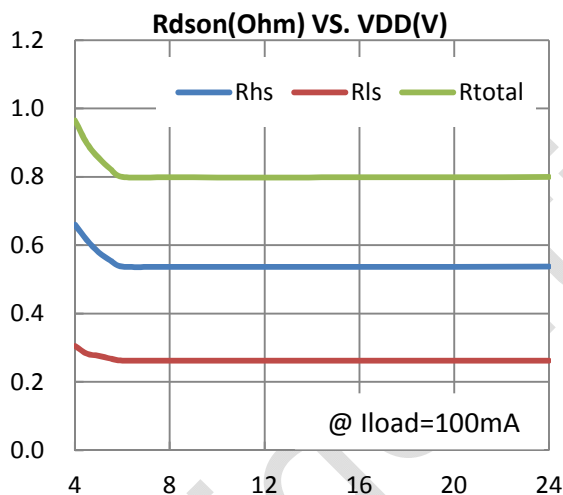
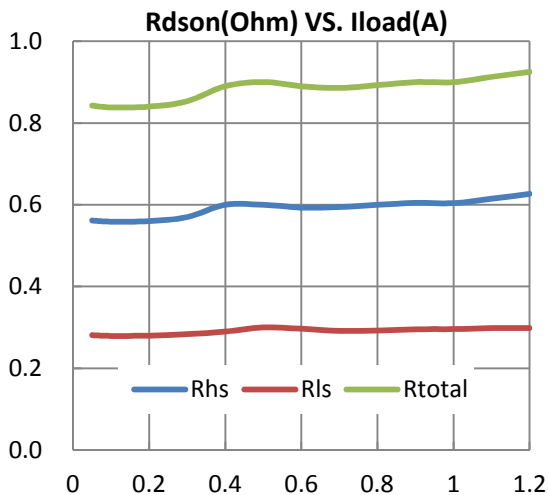
Confidential

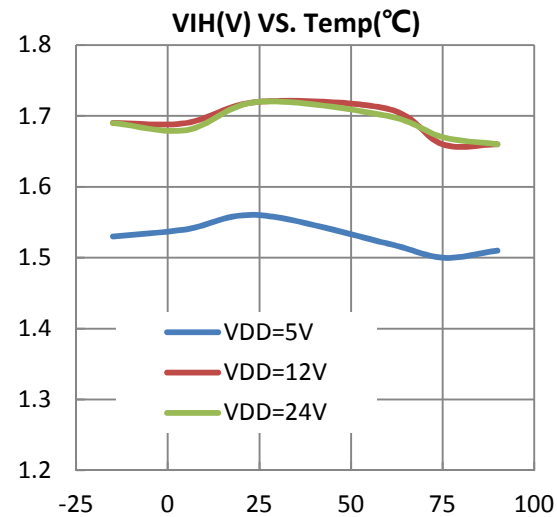
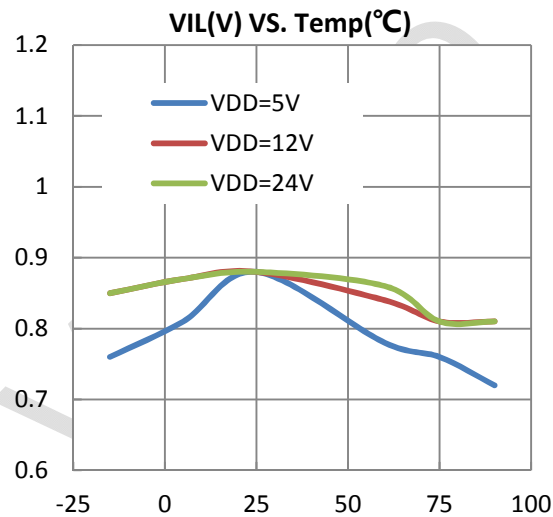
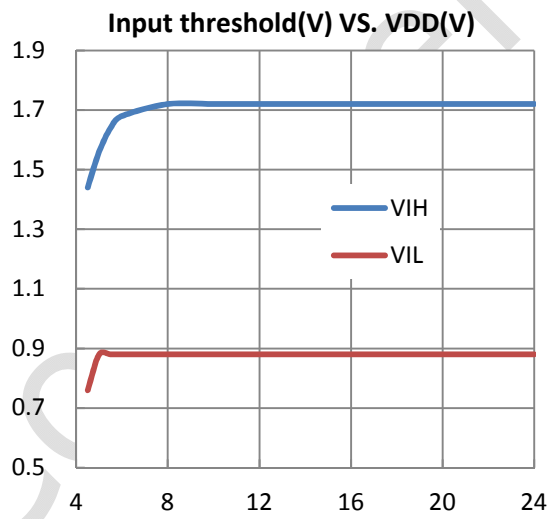
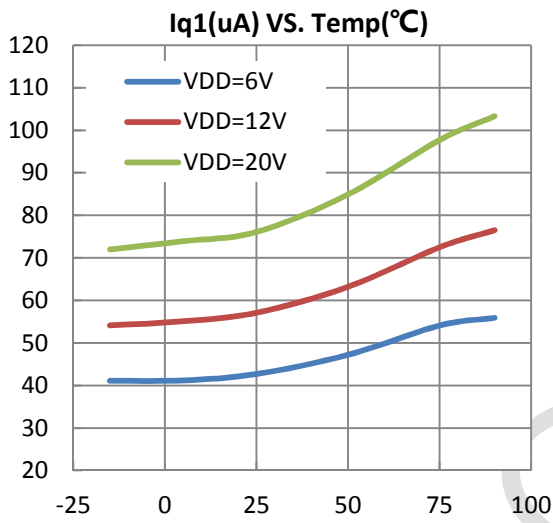
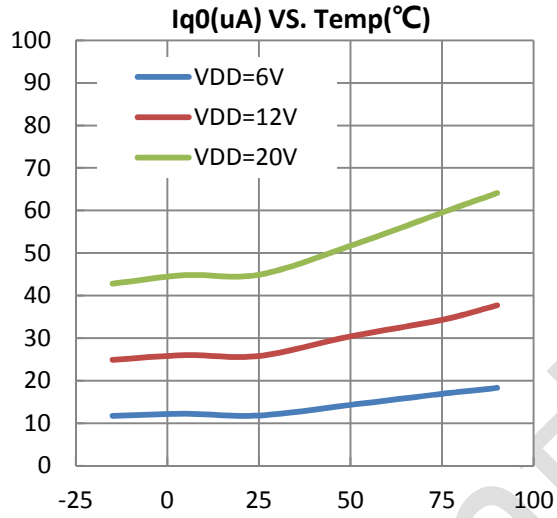
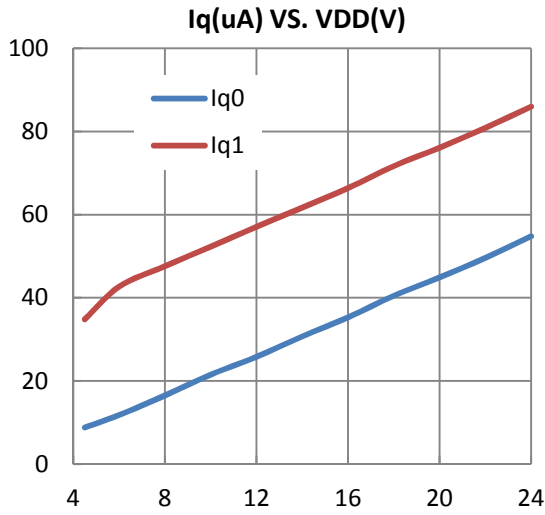
Input high current	I _{IH}	V _{IN} =3.3V		3.5		μA
Input pull-down resistance	R _{IN}			1.2		MΩ
HS switch on resistance	R _{hs}	I _{LOAD} =300mA		0.6	0.75	Ω
LS switch on resistance	R _{ls}	I _{LOAD} =300mA		0.3	0.4	Ω
Output enable time	T ₁			150		ns
Output disable time	T ₂			250		ns
Delay time	T ₃	INx high to OUTx high		200		ns
	T ₄	INx low to OUTx low		350		ns
Dead time				200		ns
Thermal shutdown threshold				155		°C
Thermal shutdown hysteresis				25		°C



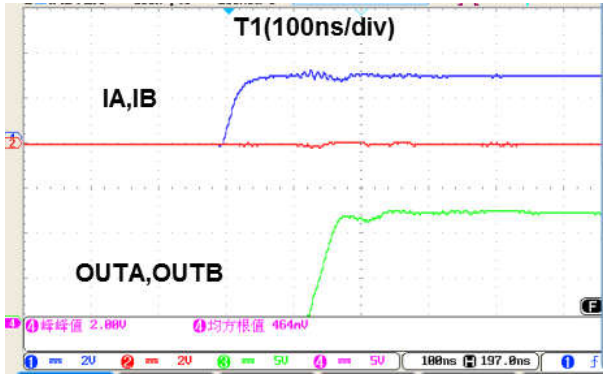
4.3. Typical Characteristics

Test conditions: VDD=12V, TA=25°C, Iload=0mA, unless otherwise noted.

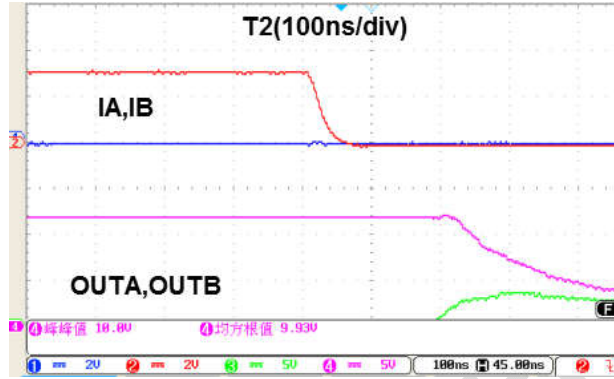




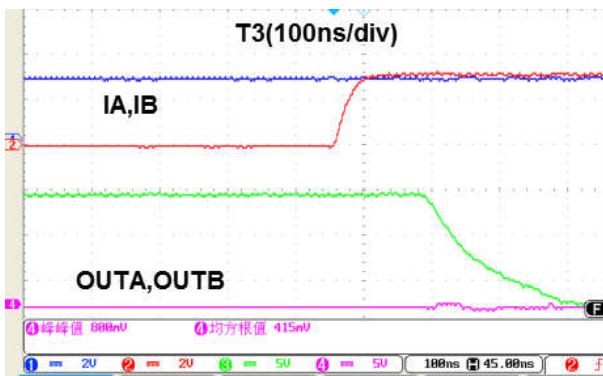
Output Enable Time (T1)



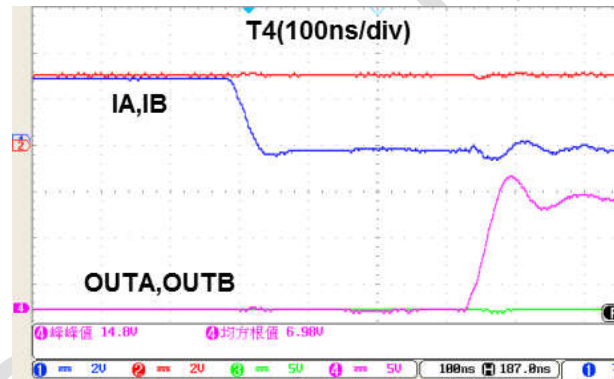
Output Disable Time (T2)



Delay Time (T3)

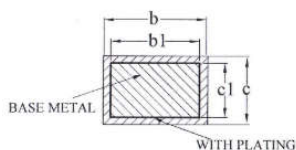
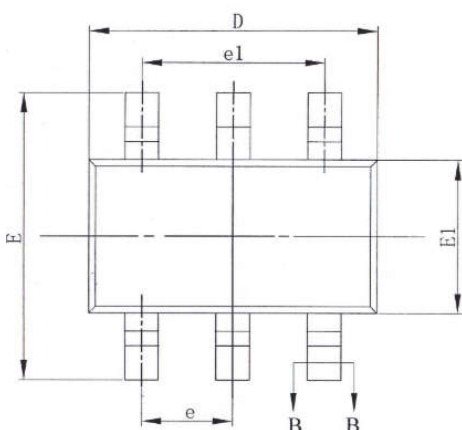
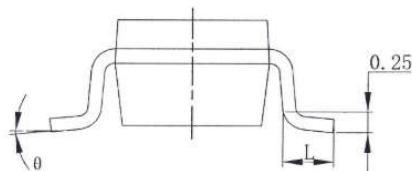
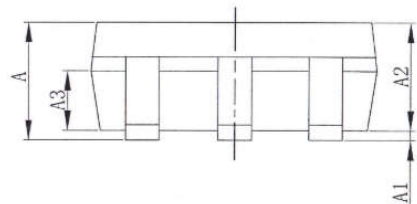


Delay Time (T4)

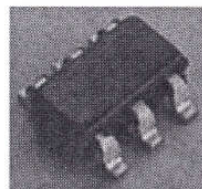


5. Package Information

SOT23-6

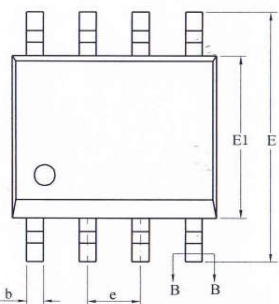
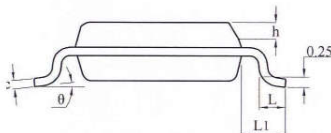
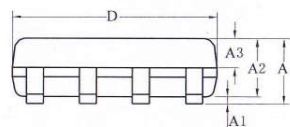
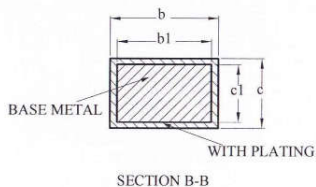
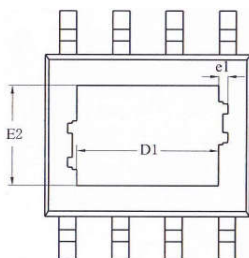


SECTION B-B



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.25
A1	0.04	—	0.10
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.38	—	0.48
b1	0.37	0.40	0.43
c	0.11	—	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
e1	1.90BSC		
L	0.30	—	0.60
θ	0	—	8°

ESOP-8, SOP-8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.65
A1	0.05	—	0.15
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.47
b1	0.38	0.41	0.44
c	0.20	—	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	—	0.50
L	0.50	0.60	0.80
L1	1.05REF		
θ	0	—	8°

Size (mm) L/P Size (mil)	D1	E2	e1
90*90	2.09REF	2.09REF	0.16REF
95*130	3.10REF	2.21REF	0.10REF