芯北科技
CHIPNORTH

CN8031

H-Bridge Motor Driver

4.5~24V, 0.9Ω, Continuous:0.8A, Peak:3A

■ Introduction

The CN8031 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.

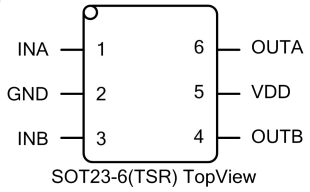
The CN8031 operates on a motor power supply voltage from 4.5V to 24V, which can supply an output current of up to 0.8A (ESOP-8) or 0.65A(SOT23-6) according to the logic control.

The CN8031 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.

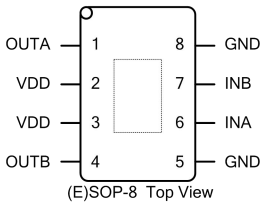
The CN8031 is available with SOT23-6, SOP-8 or ESOP-8 package.

■ Features

- Wide Power Range: 4.5V to 24V
- 0.8A Maximum Continuous Output
- Above 3A peak current ability
- Low MOSFET On Resistance: Rhs=0.6Ω, Rls=0.3Ω
- Forward, Reverse, Coast, or Brake Output Modes
- Suitable for wide range MCU control logic
- Input logic hysteresis
- Thermal Shutdown



SOT23-6(TSR) TopView



(E)SOP-8 Top View

■ APPLICATIONS

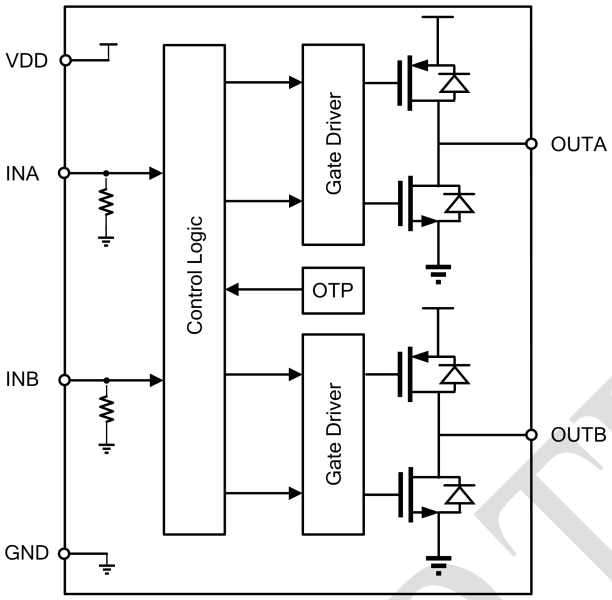
- Smart Breaker
- Smart Lock
- Smart Water/Gas Meter
- Toys

■ Order Information

Part No.	Package	Tape/Reel	Mark*
CN8031TSR	SOT23-6	3000/Reel	31YW
CN8031SHR	SOP-8	2500/Reel	CN8031/KYYWW
CN8031EHR	ESOP-8	2500/Reel	CN8031/KYYWW

*Note: Y/YY = Year; W/WW = Week; 31/3B/CN8031 = Product Name; K = Product code

■ Simplified Block Diagram



■ Pin Description

TSR SOT23-6	(E)SOP-8	Symbol	Description
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.

■ 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

■ Absolute Maximum Ratings

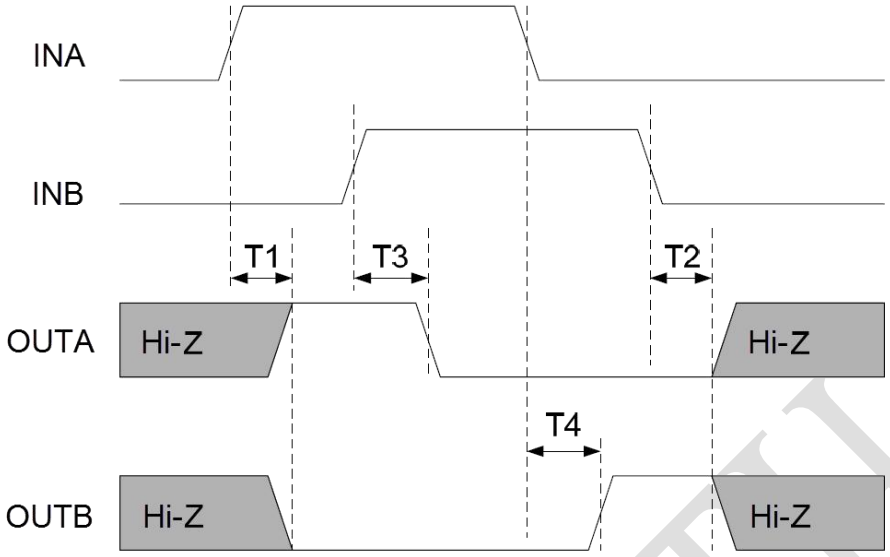
Symbol	Parameter	Value		Unit
V_{VDD}	VDD Supply Voltage Range	-0.4 ~ +25		V
V_{OUTX}	Output Pins Voltage Range	V_{VDD}		
V_{INX}	Input Pins Voltage Range	GND-0.4 ~ 5.5		V
T_J	Maximum Junction Temperature	150		℃
T_{STG}	Storage Temperature Range	-55~160		℃
θ_{JA}*	Package Thermal Resistance (Ambient to Junction)	SOT23-6	180	℃/W
		SOP-8	160	℃/W
		ESOP-8	80	℃/W
$V_{ESD\ (\ HBM\ )}$	Electrostatic Discharge Voltage (HBM)	4000		V

*Note: There is 8 cm^2 copper foil on PCB.

■ Electrical Characteristics

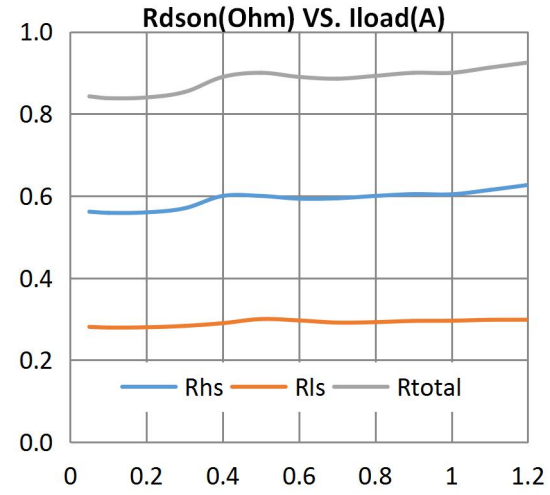
Test conditions: TA = 25°C, VDD=12V, unless otherwise noted.

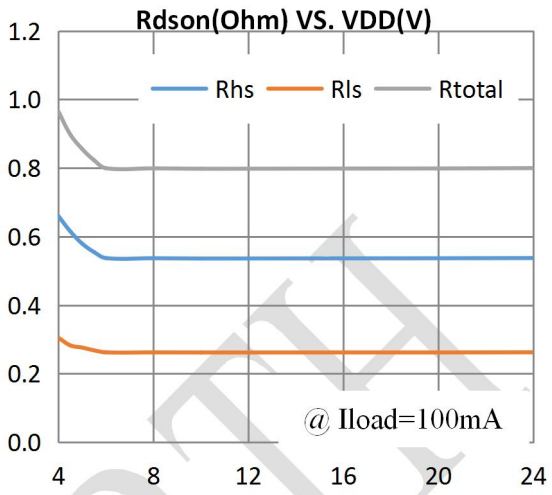
Parameters	Symbol	Condition	Min	Typ.	Max	Units
Operating supply voltage	VDD		4.5		24	V
Standby mode supply current	Iq0	INA=INB=0V		25	36	μA
Operating supply current	Iq1			60	75	μA
UVLO threshold rising				4.05	4.4	V
UVLO hysteresis				0.3		V
Input high voltage	VIH		1.95			V
Input low voltage	VIL				0.45	V
Input high current	IIH	VIN=3.3V		3.5		μA
Input pull-down resistance	RIN			1.2		MΩ
HS switch on resistance	Rhs	ILOAD=300mA		0.6	0.75	Ω
LS switch on resistance	Rls	ILOAD=300mA		0.3	0.4	Ω
Output enable time	T1			150		ns
Output disable time	T2			250		ns
Delay time	T3	INx high to OUTx high		200		ns
	T4	INx low to OUTx low		350		ns
Dead time				200		ns
Thermal shutdown threshold				155		°C
Thermal shutdown hysteresis				25		°C

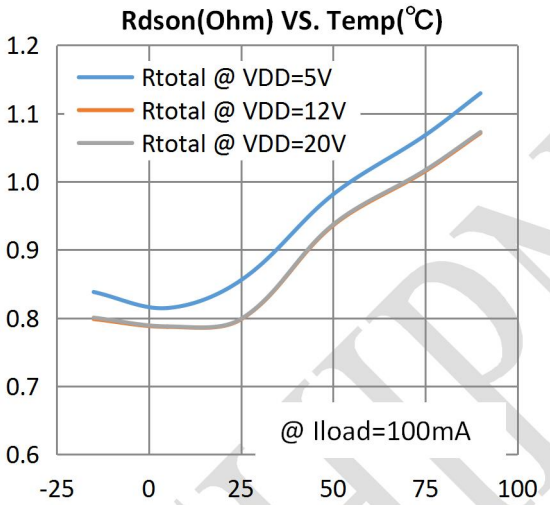


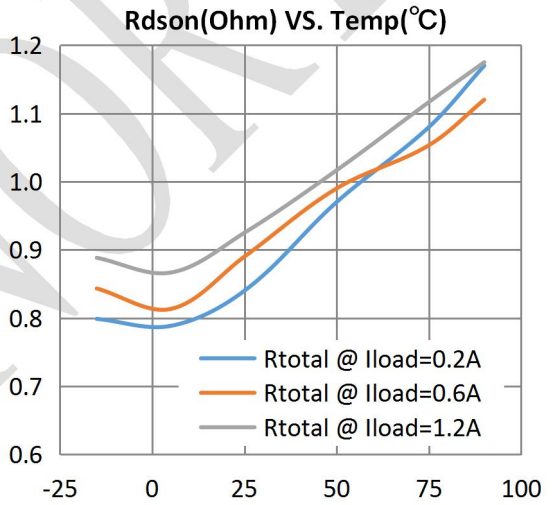
■ Typical Characteristics

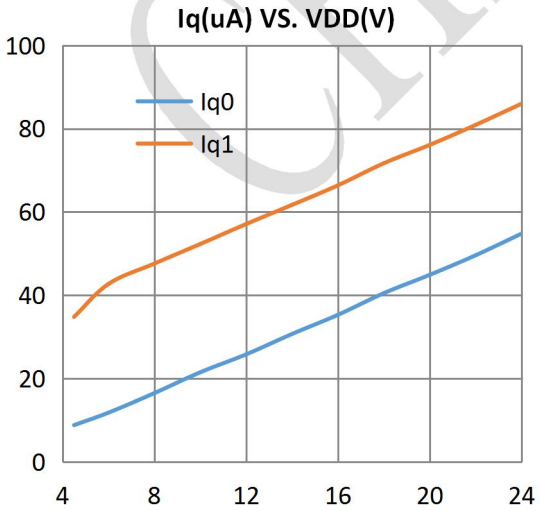
Test conditions: VDD=12V, TA=25℃, Iload=0mA, unless otherwise noted.

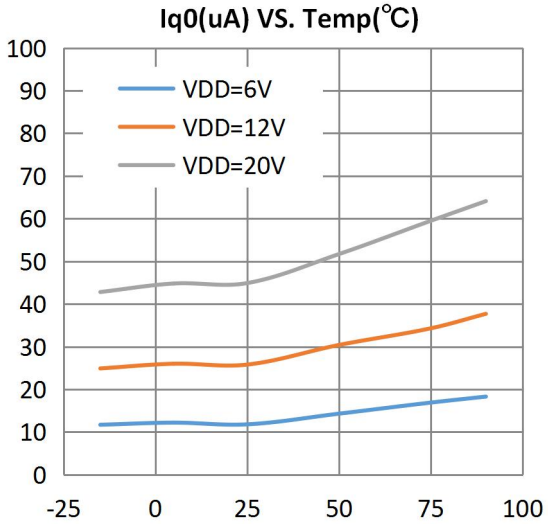




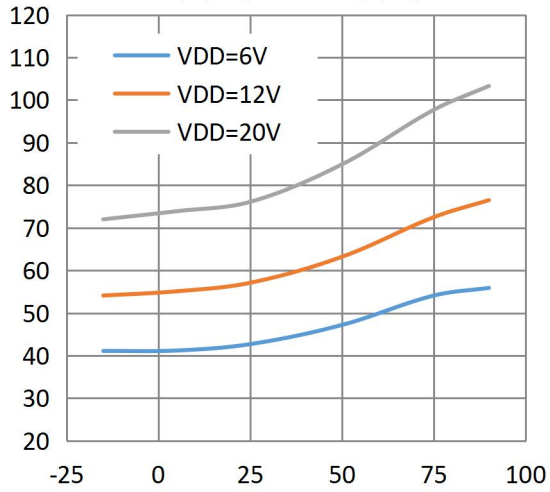




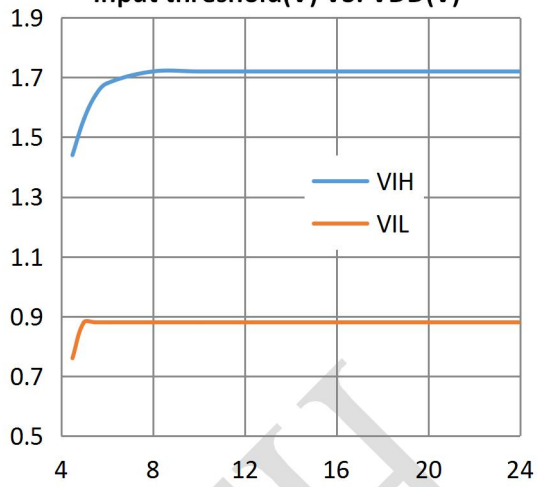




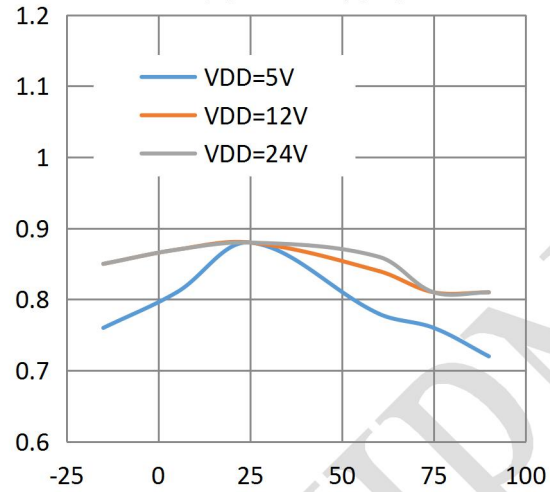
Iq1(uA) VS. Temp(℃)



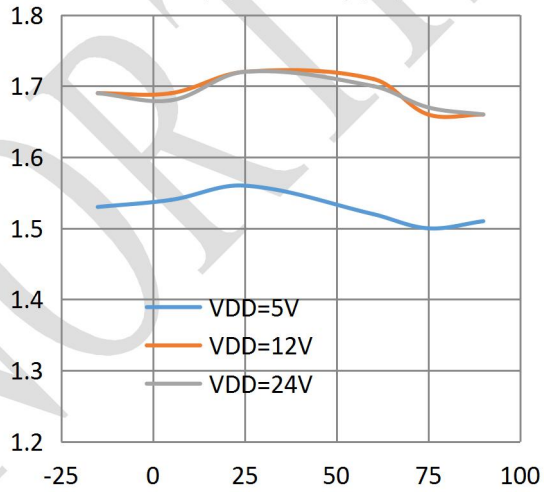
Input threshold(V) VS. VDD(V)



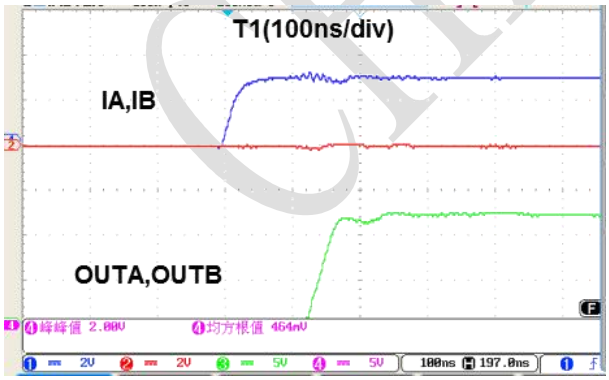
VIL(V) VS. Temp(℃)



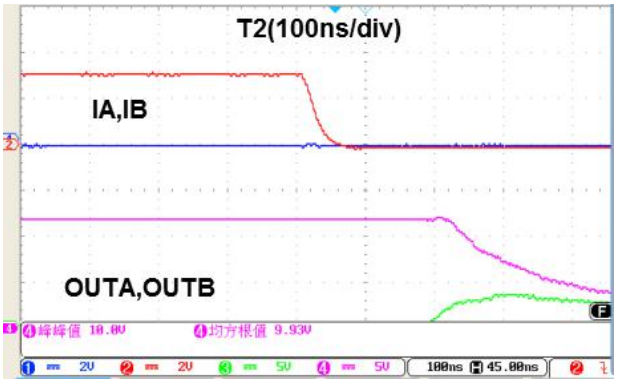
VIH(V) VS. Temp(℃)



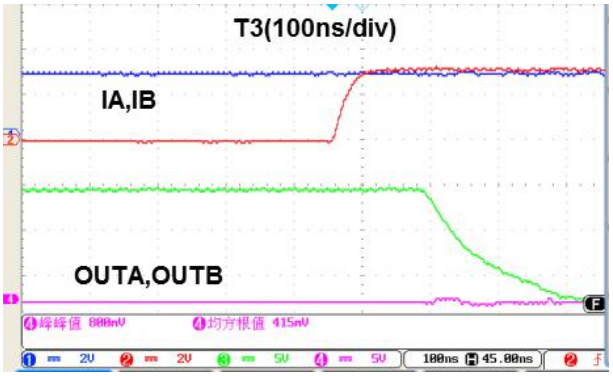
Output Enable Time (T1)



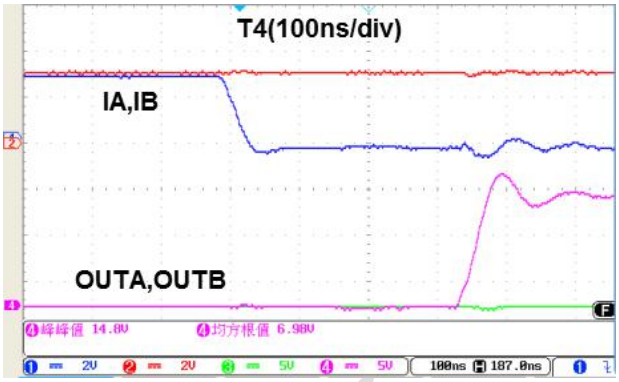
Output Disable Time (T2)



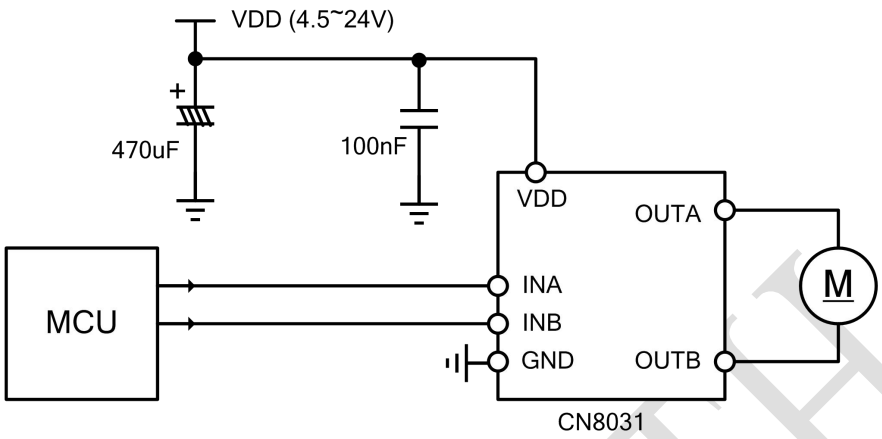
Delay Time (T3)



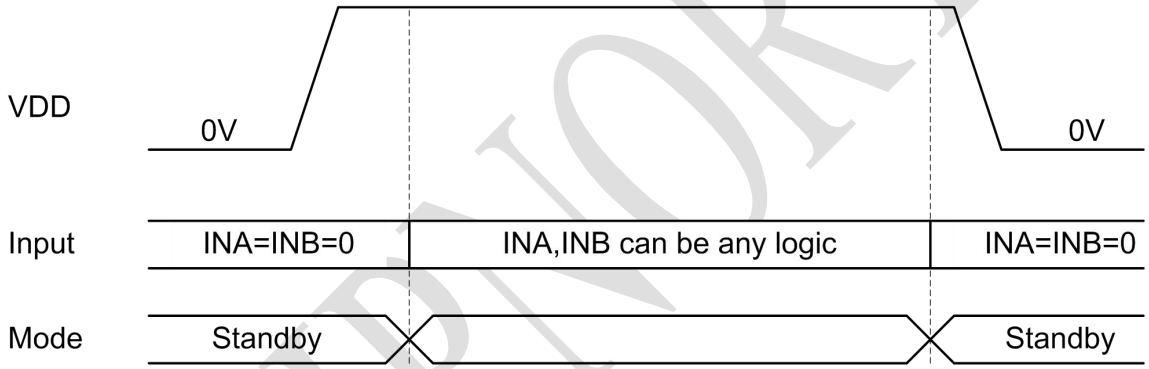
Delay Time (T4)



■ Typical Application

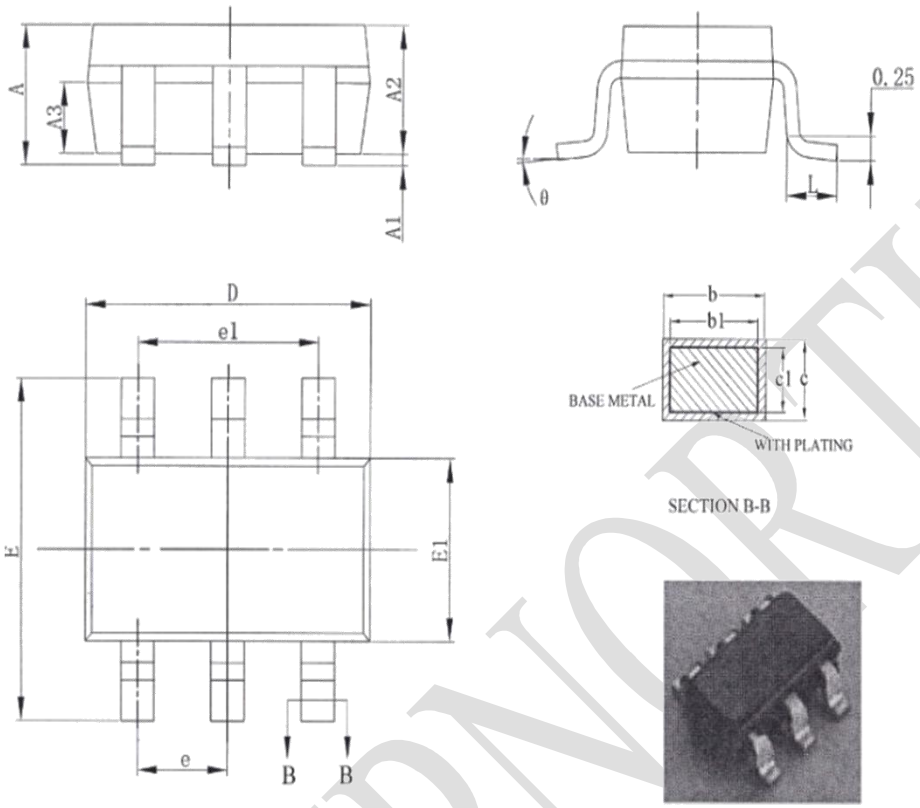


Please make sure that the input pins INA and INB remain low during power-up and power-down.



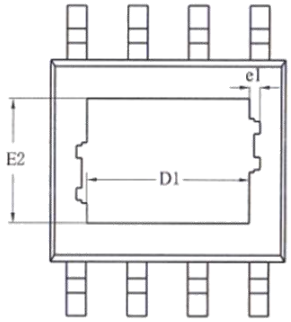
■ Package Outline

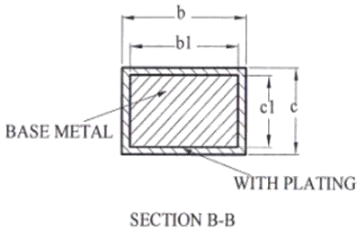
SOT23-6

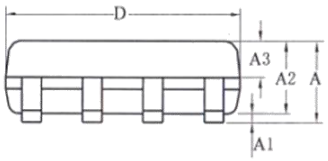


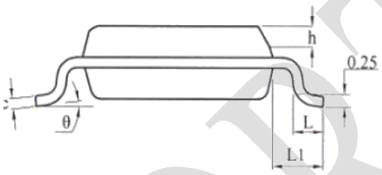
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.25
A1	0.04	—	0.10
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.38	—	0.48
b1	0.37	0.40	0.43
c	0.11	—	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
e1	1.90BSC		
L	0.30	—	0.60
θ	0	—	8°

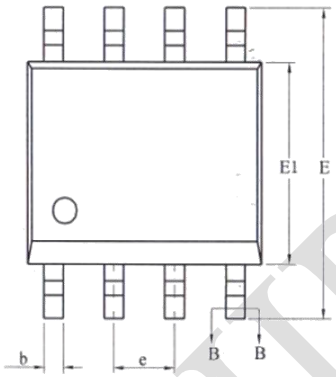
ESOP-8, SOP-8

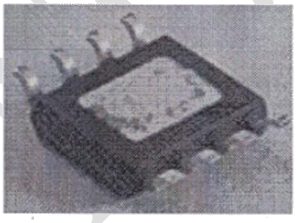












SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.65
A1	0.05	—	0.15
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.47
b1	0.38	0.41	0.44
c	0.20	—	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	—	0.50
L	0.50	0.60	0.80
L1	1.05REF		
θ	0	—	8°

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

■ ORDER INFORMATION:

date	Version	Revision notes	Reviser
2020.3.19	V1.0	Initial data compilation	ZhangSongfeng
2020.4.16	V1.1	Delete SOT23-6(TZR) information	LiuJun