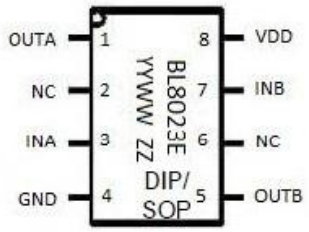
Description

BL8023E is a bidirectional relay driver, which is suitable for driving magnetic latching relay, DC motor and so on. This device can output large current when driving load, and keep a ultra low current consumption when idle.

Features

- Recommended supply voltage range is 5~25V
- Level shifter and pre-driver integrated
- Ultra low static current(<10nA)
- Threshold voltage is about 2.1V, compatible with most MCU
- High impedance pull down resister(about 100KΩ) at INA and INB
- Driving current can up to 400mA typically(related by supply voltage and load impedance)



YY-Package Year

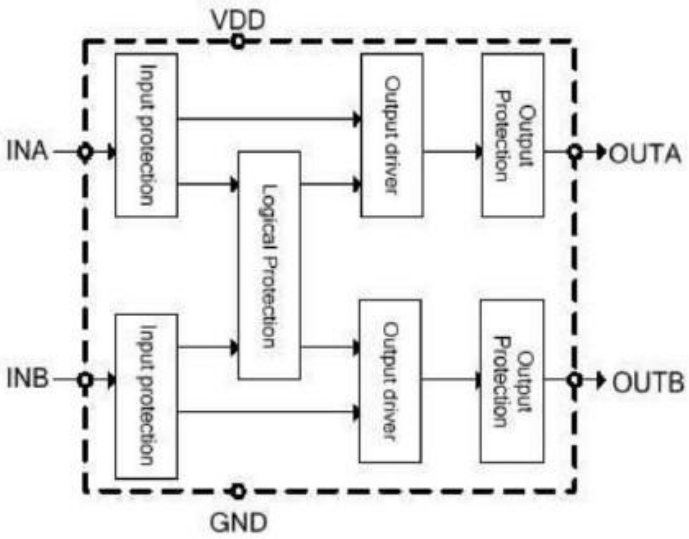
WW-Package Week

ZZ-Package Factory

Applications

- Smart meters
- Industry auto control
- Electric power system

Blocks



Pin Out

No.	Name	Description	No.	Name	Description
1	OUTA	Output A	5	OUTB	Output B
2	NC	NC	6	NC	NC
3	INA	Input A	7	INB	Input B
4	GND	Chip ground	8	VDD	Chip supply

Truth Table

INA	INB	OUTA	OUTB
0	0	Z	Z
0	1	0	1
1	0	1	0
1	1	Z	Z

Absolute maximum ratings

VDD-VGND	-0.4~+50	V
Other Pins	(VGND-0.4, VDD+0.4)	V
Junction Temperature	150	℃
Storage Temperature	-65~150	℃
Thermal Resistor(Junction to Ambient)	120	℃/W
ESD (HBM)	8000	V
ESD (MM)	200	V

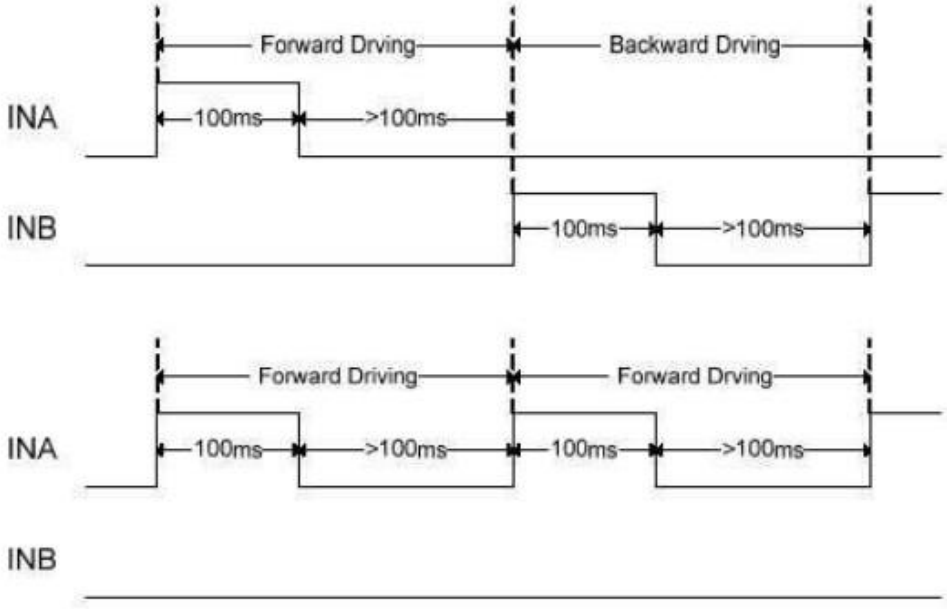
Electrical Specifications (TA=25℃, Unless otherwise noted)

Name	Description	Condition	Min.	Typ.	Max.	Unit
DC						
B_{VDSS}	Break down voltage of OUTA , OUTB and VDD pins	VINA=VINB=0V, ID=250uA	50			V
I_{DSS}	Leakage current from VDD pin	VINA=VINB=0V, VD=25V			3	uA
V_{TH}	Turn on threshold voltage			2.1		V
$R_{DS(ON)}$	$R_{DS(NFET)}$ + $R_{DS(PFET)}$	VDD=12V, RL=80Ω		12	15	Ω
		VDD=25V, RL=80Ω		11	14	Ω
Parasitic						
R_{IN}	Equivalent input resister			100		KΩ
C_{IN}	Equivalent input capacitor				5	pF
Body diodes						
I_S	Continuous forward current				1	A
V_{SD}	Forward voltage	I_S=1A		0.86	1.3	V
T_{RR}	Reverse recovery time	VDD=12V, RL=80Ω		190		ns
Transfer						
T_R	Rise time	VDD=12V, RL=80Ω		75		ns
$T_{D(ON)}$	Turn on delay			210		ns
T_F	Fall time			35		ns
$T_{D(OFF)}$	Turn off delay			190		ns

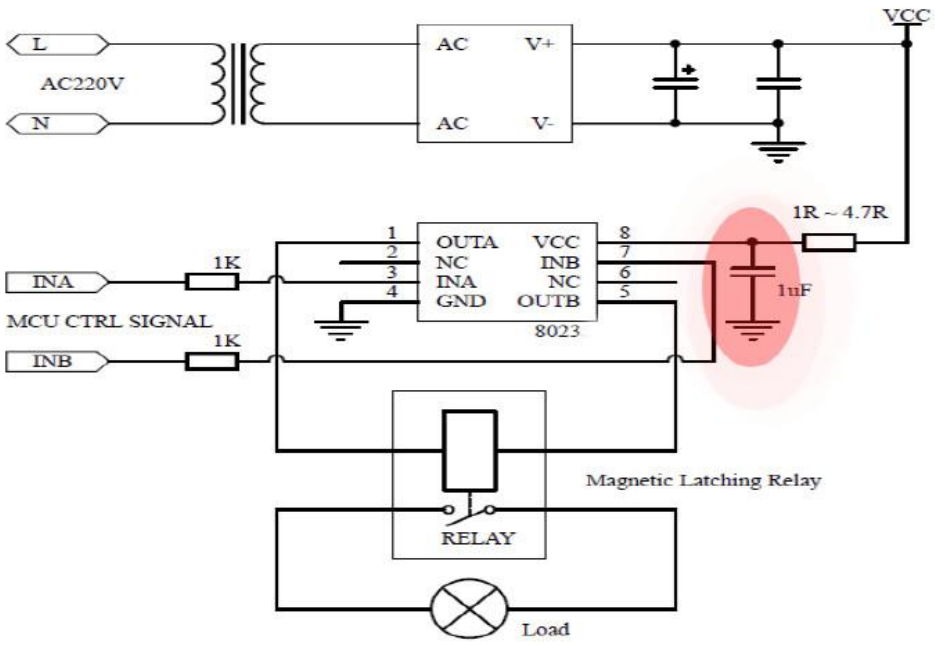
Example Application

Magnetic latching relay is driven by a pulse rather than a continuous current. And the pulse width should be large enough to make sure that the relay has been driven. Typically in smart meters application, the pulse width is recommend no less than 100ms.

BL8023E has bidirectional driving, and it will output high impedance whether tie both inputs(INA and INB) to high or low. The relation between input and output refers to the truth table.



Driving Waveform Example

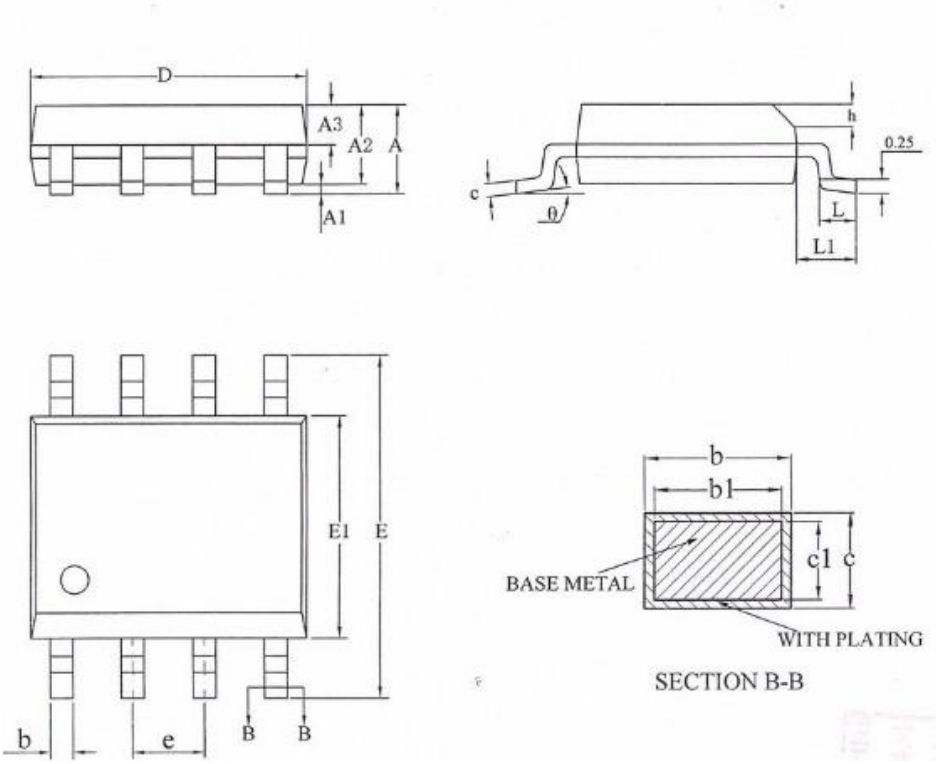


Note: The 1μF capacitor must be placed closest to the pin 8 to decouple high frequency noises;

Example Schematic

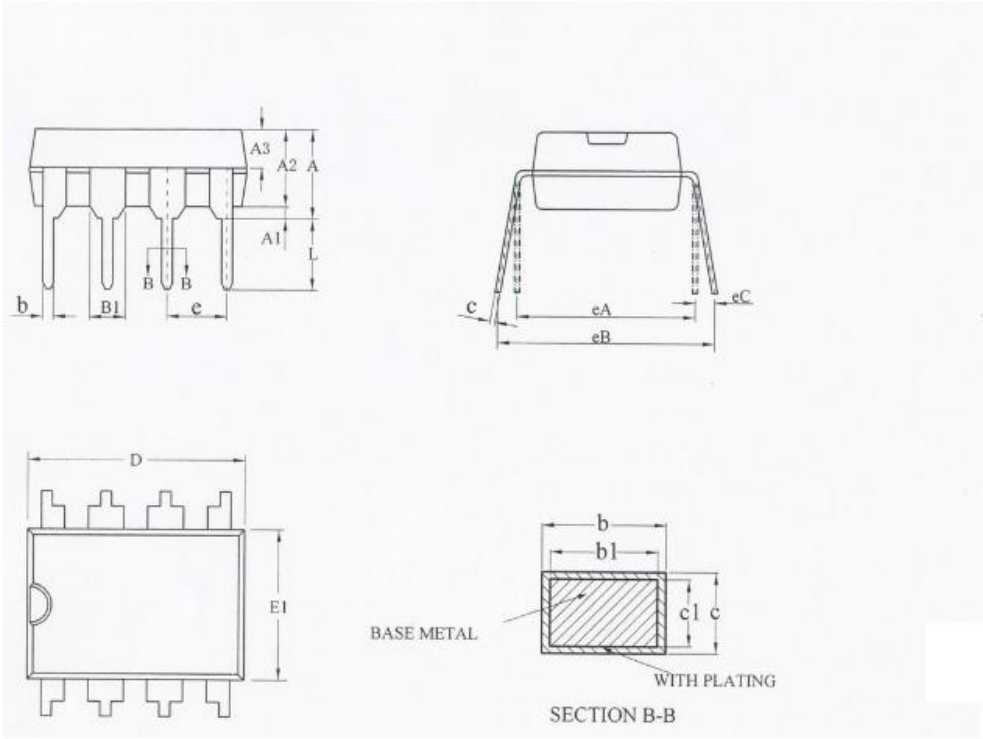
Outline Dimension

SOP8:



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.75
A1	0.10	—	0.225
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
h	0.25	—	0.50
L	0.50	—	0.80
L1	1.05BSC		
θ	0	—	8°

DIP8:



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	3.60	3.80	4.00
A1	0.51	—	—
A2	3.00	3.30	3.40
A3	1.55	1.60	1.65
b	0.44	—	0.53
b1	0.43	0.46	0.48
B1	1.52BSC		
c	0.25	—	0.31
c1	0.24	0.25	0.26
D	9.05	9.25	9.45
E1	6.15	6.35	6.55
e	2.54BSC		
eA	7.62BSC		
eB	7.62	—	9.30
eC	0	—	0.84
L	3.00	—	—