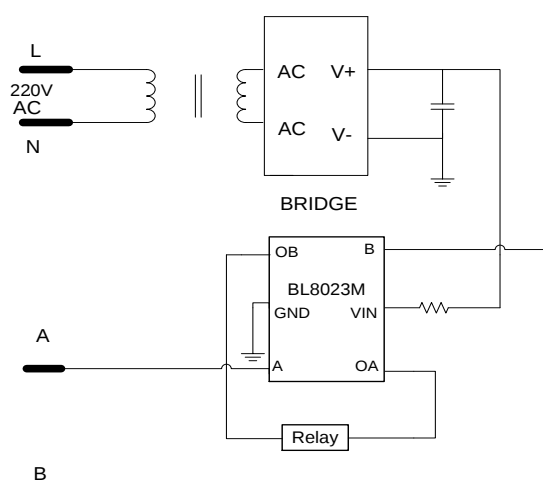


Description

BL8023M is a bi-direction relay driver circuit, used to control the magnetic latching relay, with large output capability, ultra-low power consumption. It can be widely used in smart meters and other pulses, level control applications.

Typical Application



Ordering Information

Part No.	Package	Tape & Reel
BL8023MCB6TR	SOT23-6	3000/Reel
BL8023MCD8TR	SOP8	3000/Reel

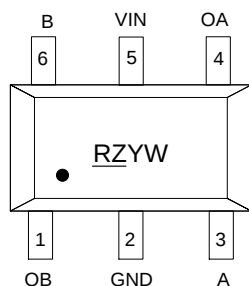
Features

- The chip DC withstand voltage is 45V, and the recommended safe working voltage is 5~36V
- The input high low conversion level is about 1.5V, compatible with various single chip computers
- Integrated high-speed freewheeling diode, with embedded reverse voltage function, can cancel TVS tube in general applications single chip microcontroller
- The typical driving current is 450mA, and it is different according to the internal resistance of the relay coil (the driving current is equal to the sum of the power supply voltage divided by the internal resistance of the chip itself and the internal resistance of the relay coil. The internal resistance of the chip itself is driven by $7\ \Omega$ when the power supply voltage is 12V, and $6\ \Omega$ when the power supply voltage is 30V)
- Maximum drive current 800mA (refers to the value of the relay coil inductance recoil current that the chip can withstand. This value is related to the power supply voltage. 800mA refers to the general working voltage of 12V. When the voltage is 30V, the drive current should be less than 200mA)

Applications

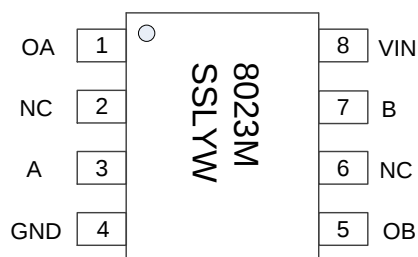
- Smart Meter

Pin Out & Marking



RZ: Product Code

YW: Date Code



8023M: Product Code

SS: Lot No.

L: Fab Code

YW: Date Code

Pin Description

Pin Num.(SOT23-6)	Pin Num.(SOP8)	Symbol	Description
1	5	OB	Output B
2	4	GND	Ground
3	3	A	Input A
4	1	OA	Output A
5	8	VIN	Supply input voltage
6	7	B	Input B
-	2, 6	NC	NC

Absolute Maximum Rating

Parameter		Symbol	Range	Unit
Max Supply Voltage		$V_{IN}-V_{GND}$	45	V
Voltage Range of other Pins			$V_{GND}-0.4-V_{IN}+0.4$	V
Package Thermal Resistance (Junction to Air)	SOT23-6	θ_{JA}	200	°C/W
	SOP8		136	°C/W
Internal Power Dissipation	SOT23-6	P_D	0.63	W
	SOP8		0.92	W
Storage temperature		T_{STG}	-55~+150	°C
Operating Ambient Temperature Range		T_A	-50 ~ +85	°C
Junction Temperature		T_J	-50 ~ +150	°C

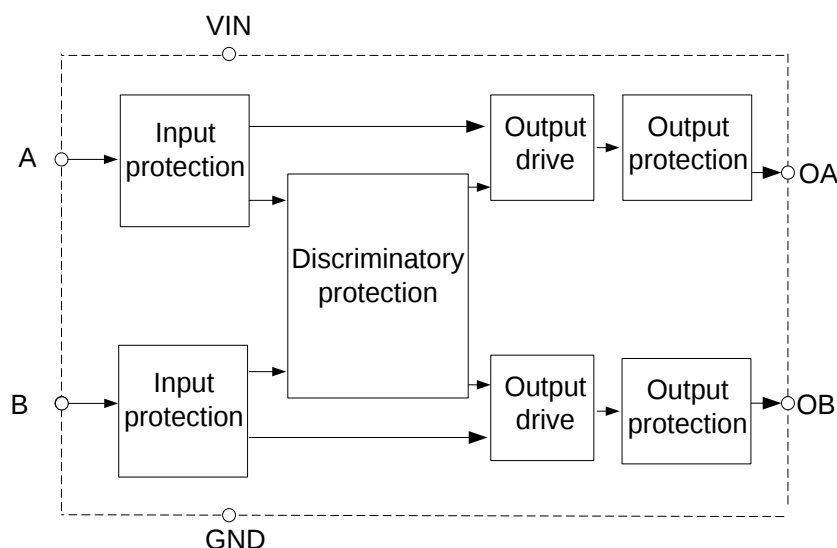
Note:

1. The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Recommended Work Conditions

Parameter	Value
Input Voltage Range	Max.36V
Operating Ambient Temperature Range (T_A)	-40°C~+85°C

Block Diagram



Electrical Characteristics

$V_{IN}=12V$, $T_A=25^{\circ}C$, if not otherwise noted.

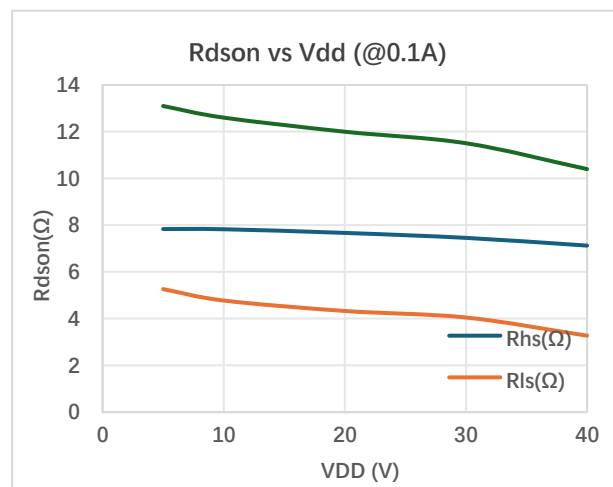
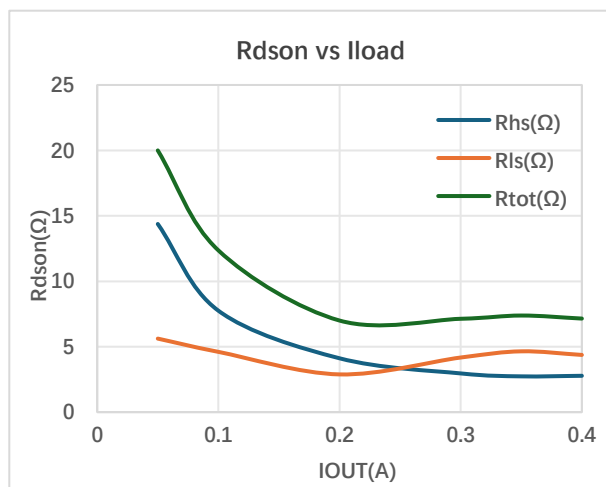
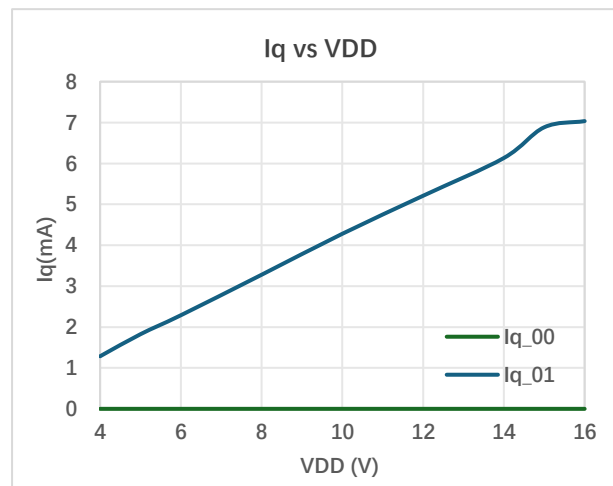
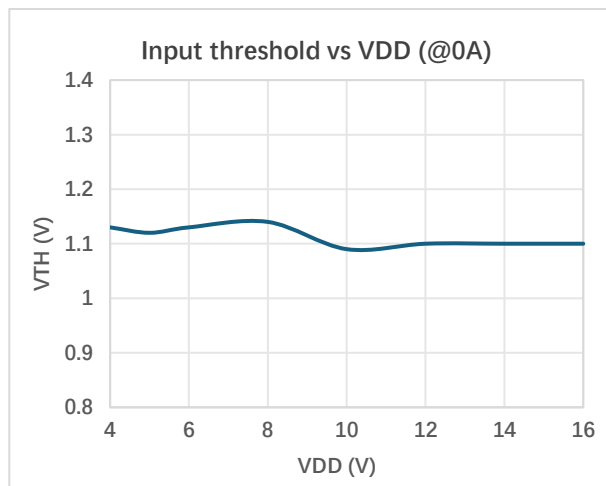
Parameter	Symbol	Test Conditions	Min	Typ.	Max	Unit
Static turn off characteristics						
Output pin breakdown voltage	BV	VA=VB=0V, I=250uA	45			V
Output pin leakage current	ISS	VA=VB=0V, V=24V			10	uA
Static opening characteristics						
Input tube opening voltage	VTH			1.3	2	V
Equivalent on resistance of output tube	RCEON	VIN=12V, RL=80Ω		7	10	Ω
		VIN=30V, RL=80Ω		6	10	Ω
		VIN=12V, RL=40Ω		7	10	Ω
		VIN=30V, RL=40Ω		6	10	Ω
Input Properties						
Input resistance to ground	RIN	VIN=12V, VA=VB=0V		150		KΩ
Input current	IIN	VA=3V or VB=3V		220	400	uA
		VA=5V or VB=5V		450	600	uA
Freewheeling diode characteristics						
Forward conduction voltage	VSD	IS=1A		1.5	2	V
Reverse recovery time	TRR	VIN=12V, RL=80Ω		190		uS

Transmission characteristics						
Rising edge time	TR	$V_{IN}=12V, R_L=80\Omega$		50		nS
Turn ON Delay Time	TD(ON)			60		nS
Falling edge time	TF			50		nS
Turn OFF Delay Time	TD(OFF)			2		uS

Logic Function Table

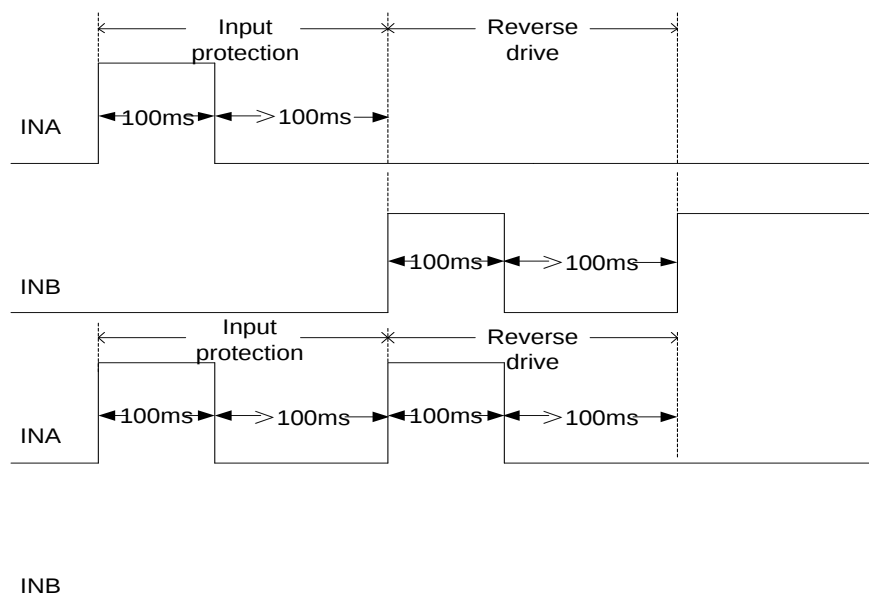
Input A	Input B	Output OA	Output OB	Relay Response
1	0	1	0	ON
0	1	0	1	OFF
0	0	High-impedance	High-impedance	Hold
1	1	High-impedance	High-impedance	Hold

Electrical Performance



Detailed Description

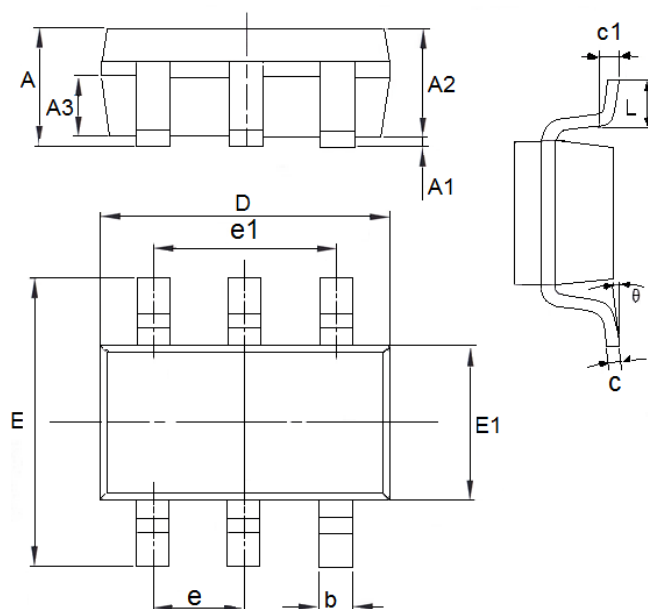
Input terminals A and B are triggered by pulses. They can work as long as the input terminal is directly connected with the output terminal of the corresponding device. As long as the trigger pulse works When the state of the energy meter is triggered, the relay will act accordingly. In the application of smart meters, it is recommended that the pulse width be 100ms. Forward drive and reverse drive Forward drive pulse, forward drive and next forward drive pulse, reverse drive and forward drive pulse, and reverse drive and next reverse drive Minimum interval between driving pulses is 100ms. The pulse diagram is as follows:



Package Outline

Package	SOT23-6	Devices per reel	3000 pcs
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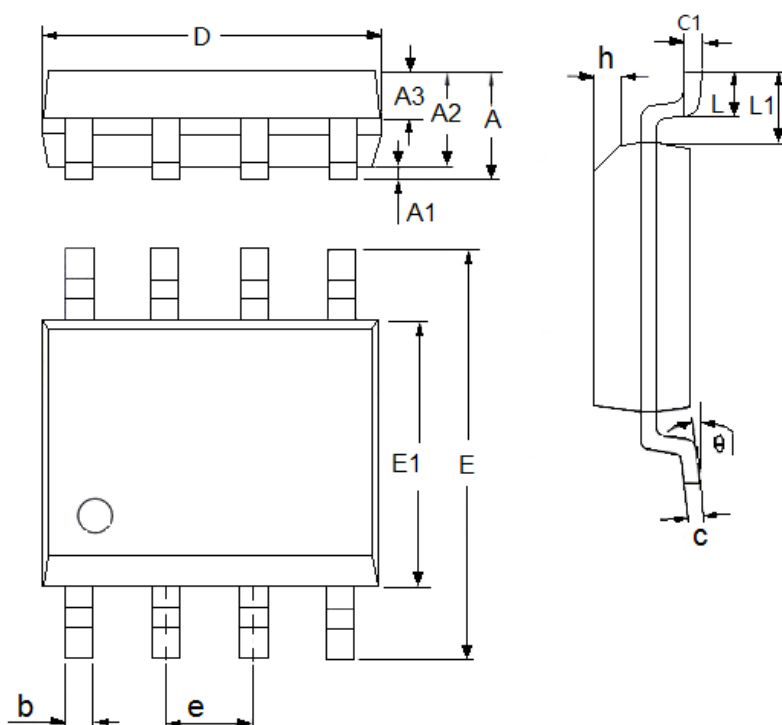
Package specification:



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.55	0.75	0.0217	0.0295
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.7	3.12	0.1063	0.1228
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.1	0.1024	0.1220
E1	1.4	1.8	0.0551	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

Package	SOP8	Devices per reel	3000 pcs
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Package specification:



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.3	1.8	0.0512	0.0709
A1	0.05	0.25	0.002	0.0098
A2	1.25	1.65	0.0492	0.065
A3	0.55	0.75	0.0217	0.0295
b	0.3	0.51	0.0118	0.0201
c	0.17	0.25	0.0067	0.0098
D	4.7	5.1	0.185	0.2008
E	5.8	6.2	0.2283	0.2441
E1	3.8	4	0.1496	0.1575
e1	1.27(TYP)		0.05(TYP)	
h	0.25	0.5	0.0098	0.0197
L	0.4	1.27	0.0157	0.05
L1	1.04(TYP)		0.0409(TYP)	
θ	0	8°	0.0000	8°
c1	0.25(TYP)		0.0098(TYP)	