BL8023H

400mA Bi-Direction Relay Driver

DESCRIPTION

BL8023H 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.

BL8023H can provide 400mA typical driving current, which will different according to the relay coil resistance. The input High Level Threshold of BL8023H is 2V; it can compatible with most single chip microcontroller.
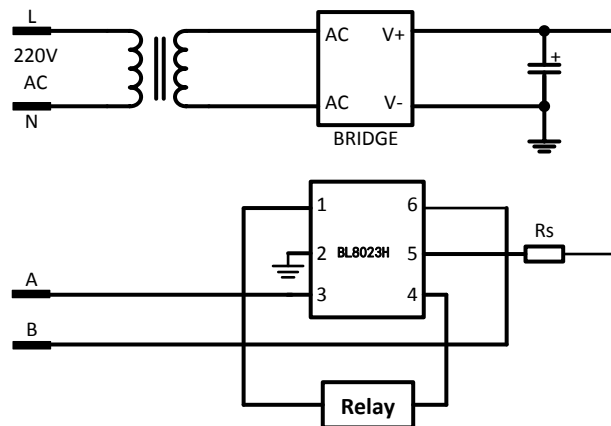
BL8023H is available in SOT-23-6 package.

FEATURES

- 5 to 40V input voltage range
- Low Power Consumption (IQ<1uA)
- Input High Level Threshold: 2V, compatible with most single chip microcontroller
- Typical Driving Current: 400mA
  Rds(on)=7ohm(Vin=12V, PMOSFET+NMOSFET)
  Rds(on)=6.5ohm(Vin=30V, PMOSFET+NMOSFET)
- Peak Driving Current: 500mA@Vin=24V
- Environment Temperature: -40°C~85°C
- SOT-23-6 package

APPLICATIONS

- Smart Meter

TYPICAL APPLICATION
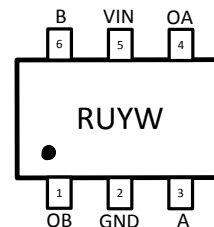

ORDERING INFORMATION

Part No.	Package	Tape & Reel
BL8023HCB6TR	SOT-23-6	3000/Reel

PIN OUT & MARKING

RU: Product Code
YW: Date code

SOT23-6

ABSOLUTE MAXIMUM RATING

Parameter			Value
Max Input Voltage			40V
Max Operating Junction Temperature(Tj)			150°C
Ambient Temperature(Ta)			-40°C – 125°C
Package Thermal Resistance	SOT23-6	θ_{ja}	190°C / W
		θ_{jc}	110°C / W
Storage Temperature(Ts)			-40°C - 150°C
Lead Temperature & Time			260°C, 10S

Note: *Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.*

RECOMMENDED WORK CONDITIONS

Parameter	Value
Input Voltage Range	Max.40V
Operating Junction Temperature(Tj)	-40°C –85°C

ELECTRICAL CHARACTERISTICS

(VIN=5V, T_A=25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIN	Input Voltage Range		5		40	V
Iq	Quiescent Current				1	uA
Rdson	Switch Rdson	Vin=12V, R_L=75ohm		7	10	ohm
		Vin=30V, R_L=75ohm		6.5	10	ohm
		Vin=12V, R_L=40ohm		7	10	ohm
V_{TH}	ON Input High Voltage	Vin=12V		2		V
R_{IN}	Equivalent Input Resistor			500		Kohm
V_{SD}	Fly-Wheel Diode Forward Voltage	Is=1A		0.8	1.5	V
T_R	Rise Time	VIN=12V, R_L=75ohm		40		ns
$T_{D(ON)}$	Turn ON Delay Time	VIN=12V, R_L=75ohm		60		ns
T_F	Fall Time	VIN=12V, R_L=75ohm		30		ns
$T_{DIOFF)}$	Turn OFF Delay Time	VIN=12V, R_L=75ohm		70		ns

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

BL8023H

PIN DESCRIPTION

NAME	PIN #	DESCRIPTION
OB	1	Output B
GND	2	Ground.
A	3	Input A
OA	4	Output A
VIN	5	Supply input voltage
B	6	Input B

ELECTRICAL PERFORMANCE

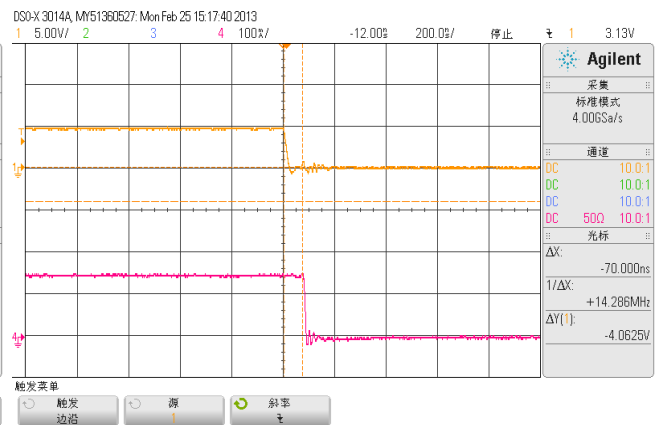*Tested under TA=25°C, unless otherwise specified*

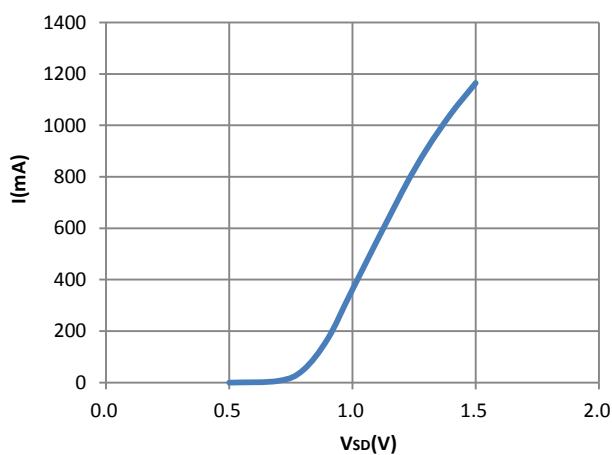### Turn on delay and rise time
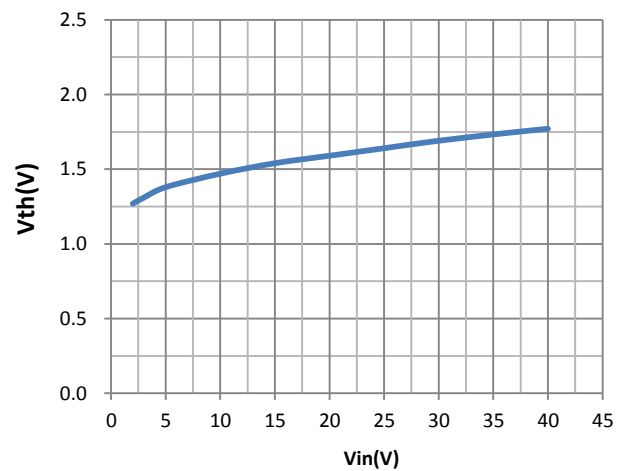Ch1---Input   Ch2---Output

Turn off delay and fall time
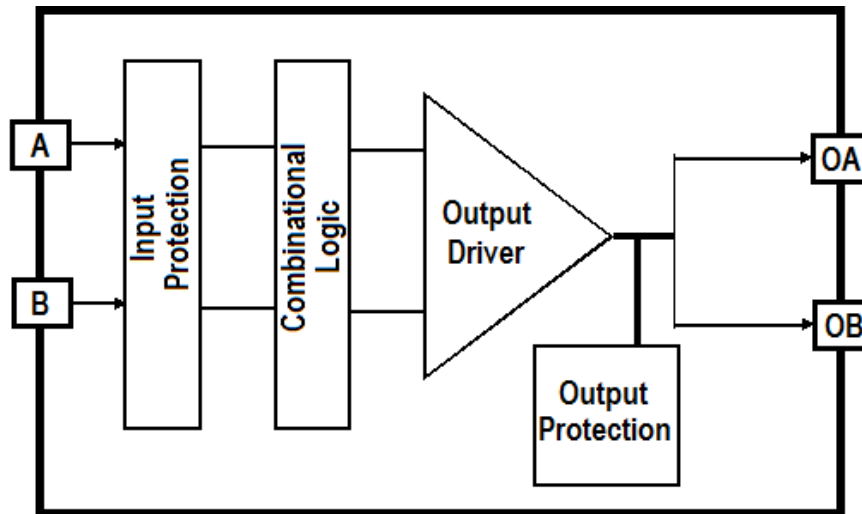Ch1---Input   Ch2---Output

Forward Voltage

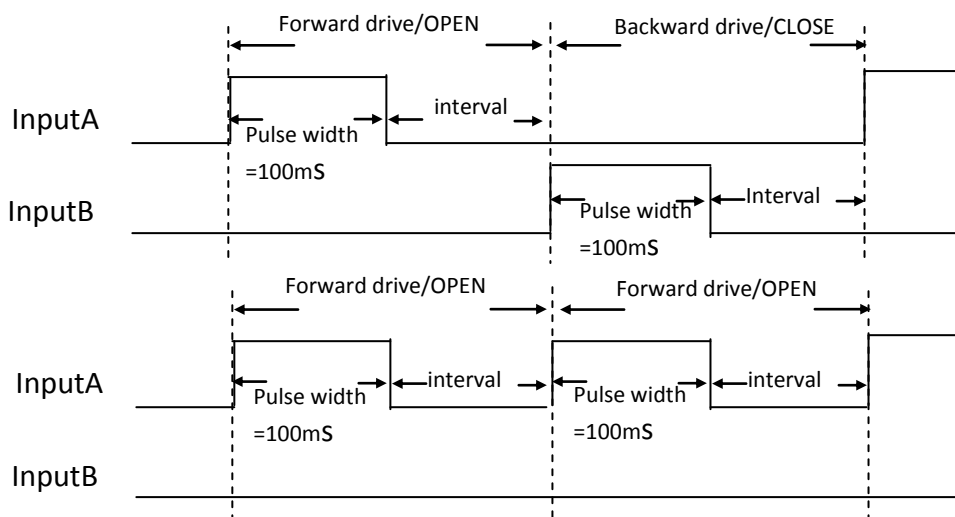### Vth VS. Vin
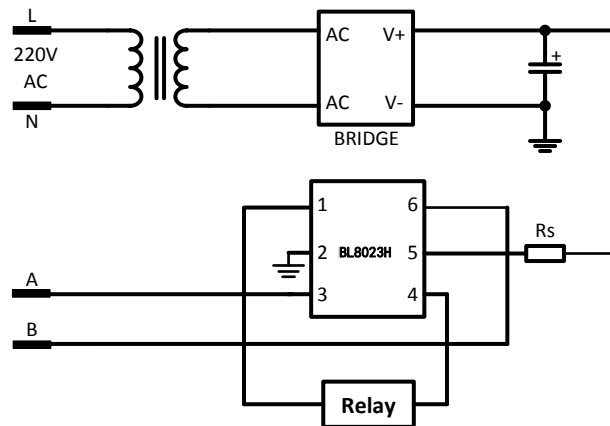
BLOCK DIAGRAM

DETAILED DESCRIPTION

Pulse Triggering

If input is driven by square pulse, connect the inputs to the pulse source directly. Relay will operate as logic table stated (Vin should be less than the power supply voltage, Rs is current-limiting resistor, it can be ignored in the voltage is below 20V, i.e. Rs=0).

The recommended pulse width=100ms. The length of the intervals should be longer than 100ms. These intervals include: intervals between forward drive pulse and next backward drive pulse, intervals between forward drive pulse and next forward drive pulse, intervals between backward drive pulse and next forward drive pulse, intervals between backward drive pulse and next backward drive pulse.

Pulse triggering application diagram

Relay free-wheel

Relay from ON to OFF, the energy stored in the relay inductor released by the chip's internal body diode and the relay inductor. Until the end of the release of this energy, relay proceeding to the next operation.

PACKAGE OUTLINE

Package	SOT23-6	Devices per reel	3000	Unit	mm

Package specification：

TAPE AND REEL INFORMATION

Package	SOT23-6	Unit	mm

共同尺寸

外观	尺寸 (MM)
E	1.75 ± 0.10
F	3.50 ± 0.05
P2	2.00 ± 0.05
D	$1.55^{+0.10}_{-0}$
D1	1.05 ± 0.05
P0	4.00 ± 0.10
10P0	40.0 ± 0.20

变动尺寸

外观	尺寸 (MM)
W	8.00 ± 0.1
P	4.00 ± 0.10
A0	3.26 ± 0.10
B0	3.30 ± 0.10
K0	1.40 ± 0.10
t	0.20 ± 0.02
θ	$3° \sim 5°$ TYP