

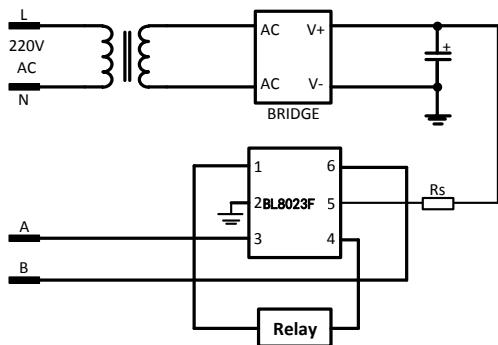
DESCRIPTION

BL8023F 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.

BL8023F can provide 300mA typical driving current, which will different according to the relay coil resistance. The input High Level Threshold of BL8023F is 2V; it can compatible with most single chip microcontroller.

BL8023F is available in SOT-23-6 and SOP-8 packages.

TYPICAL APPLICATION

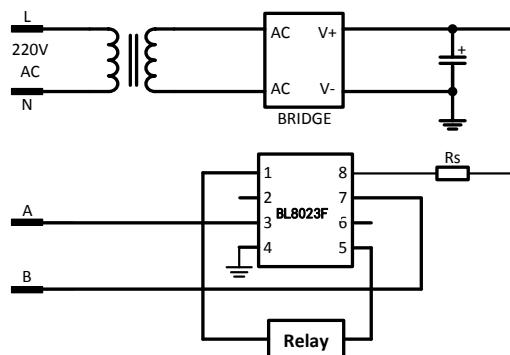


FEATURES

- 5 to 36V input voltage range
- Low Power Consumption ($I_Q < 1\mu A$)
- Input High Level Threshold: 2V, compatible with most single chip microcontroller
- Typical Driving Current: 300mA
 $R_{ds(on)}=12\Omega$ ($V_{in}=12V$, PMOSFET+NMOSFET)
 $R_{ds(on)}=10\Omega$ ($V_{in}=30V$, PMOSFET+NMOSFET)
- Peak Driving Current: 500mA@ $V_{in}=24V$
- Environment Temperature: -40°C~85°C
- SOT-23-6 and SOP-8 packages

APPLICATIONS

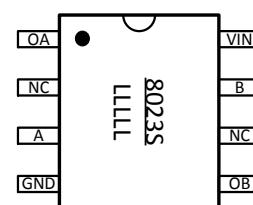
- Smart Meter



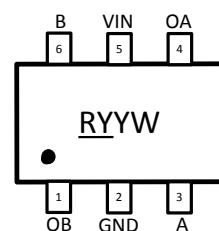
ORDERING INFORMATION

Part No.	Package	Tape & Reel
BL8023FCB6TR	SOT-23-6	3000/Reel
BL8023FCD8TR	SOP-8	2500/Reel

PIN OUT & MARKING



SOT-8/DIP8



SOT23-6

8023S: Product Code

LL: Lot No.

L: Fab code

LL: Date code

RY: Product Code

YW: Date code

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		40V
Max Operating Junction Temperature(T_j)		150°C
Ambient Temperature(T_a)		-40°C – 125°C
Package Thermal Resistance	SOT23-6	θ_{ja} 190°C / W
		θ_{jc} 110°C / W
	SOP-8	θ_{ja} 128°C / W
		θ_{jc} 45°C / W
Storage Temperature(T_s)		-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.36V
Operating Junction Temperature(T_j)		-40°C – 85°C

ELECTRICAL CHARACTERISTICS(VIN=5V, T_A =25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIN	Input Voltage Range		5		36	V
Iq	Quiescent Current				1	uA
Rdson	Switch Rdson	Vin=12V, R_L =75ohm		12	18	ohm
		Vin=30V, R_L =75ohm		10	16	ohm
		Vin=12V, R_L =40ohm		12	20	ohm
		Vin=30V, R_L =40ohm ¹		10	16	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 _{D(OFF)}	Turn OFF Delay Time	VIN=12V, R_L =75ohm		70		ns

Note: 1) This condition is not suitable for SOT23-6 package.

2) Input rise/fall time must less than 1ms, otherwise maybe destroy the chip.

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

PIN DESCRIPTION

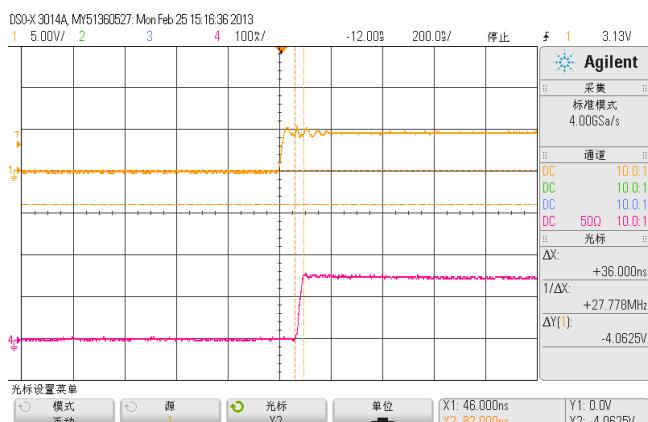
NAME	PIN #		DESCRIPTION
	SOT23-6	SOP-8	
OA	4	1	Output A
NC	-	2, 6	Not connected.
A	3	3	Input A
GND	2	4	Ground.
OB	1	5	Output B
B	6	7	Input B
VIN	5	8	Supply input voltage

ELECTRICAL PERFORMANCE

Tested under $TA=25^{\circ}\text{C}$, unless otherwise specified

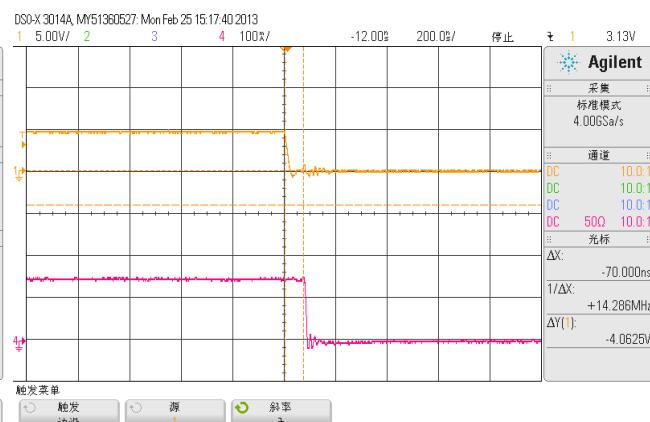
Turn on delay and rise time

Ch1---Input Ch2---Output

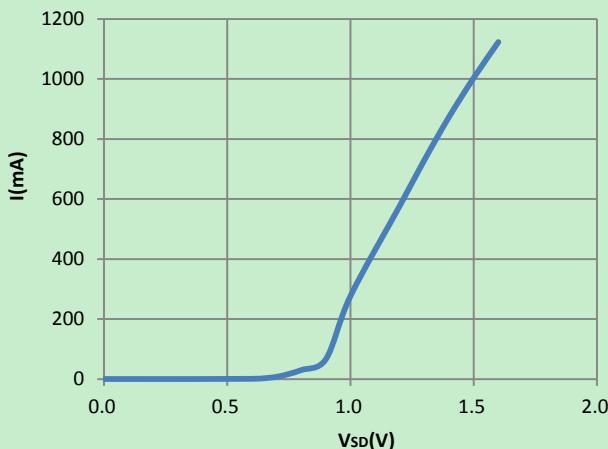


Turn off delay and fall time

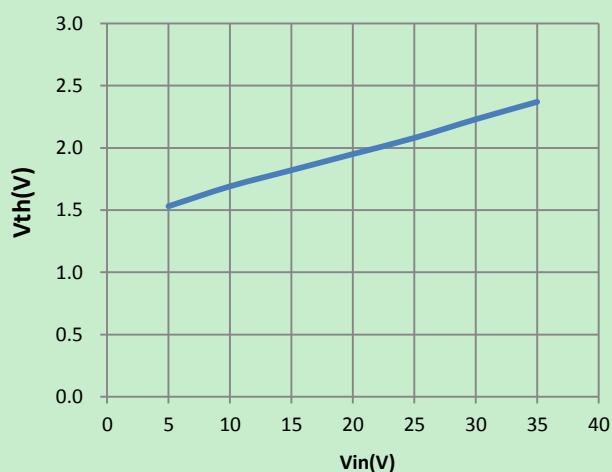
Ch1---Input Ch2---Output

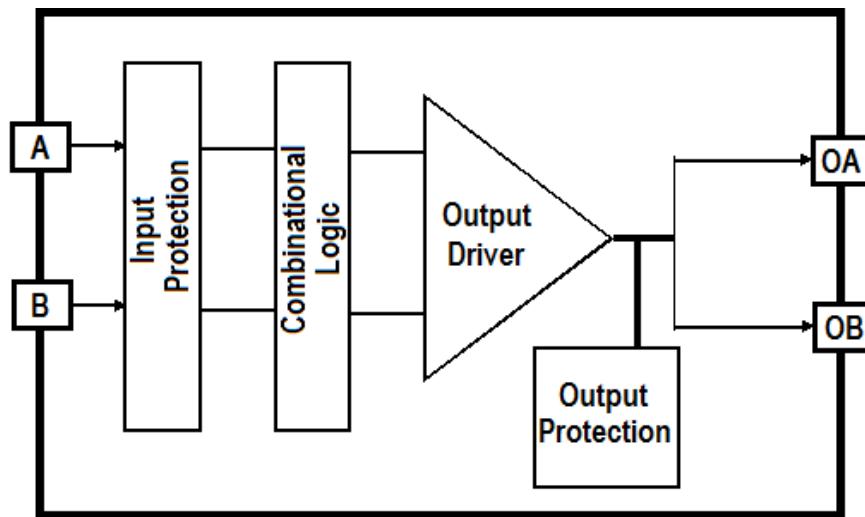


Forward Voltage



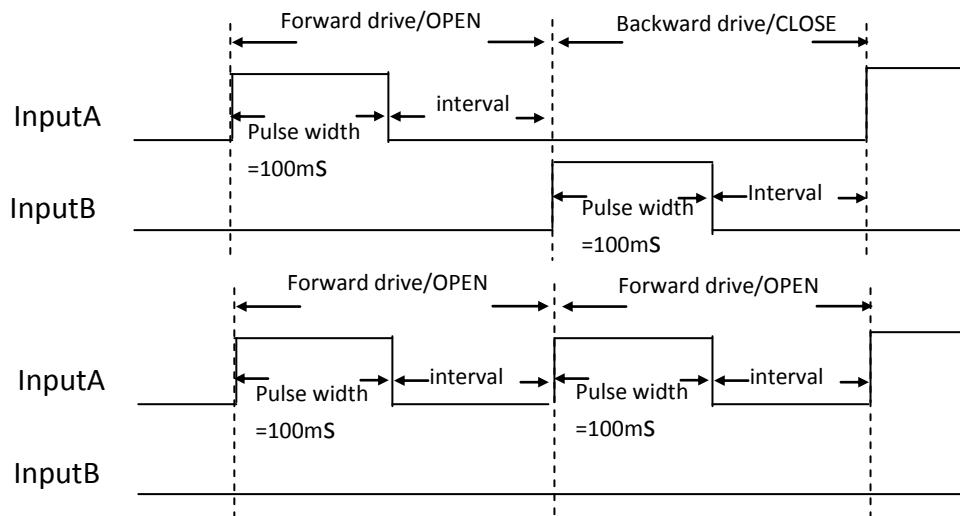
Vth VS. Vin

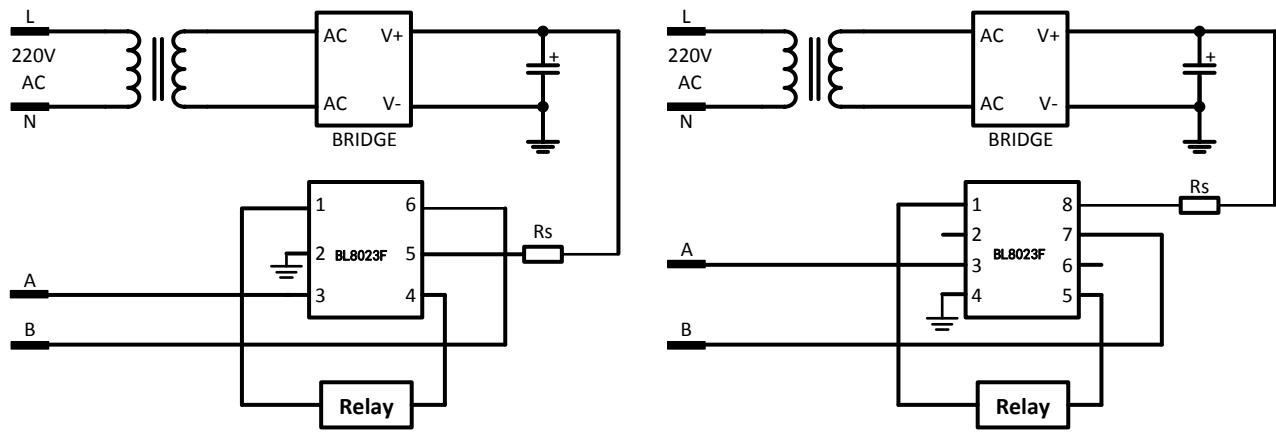


BLOCK DIAGRAM**DETAILED DESCRIPTION****Pulse Triggering**

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.





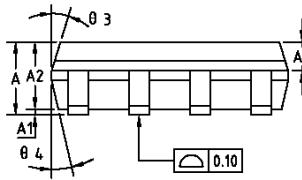
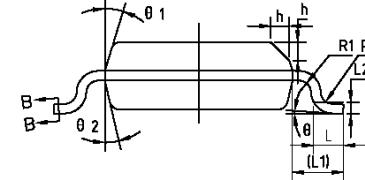
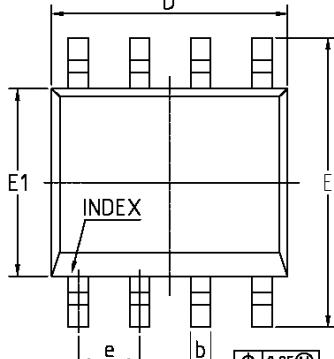
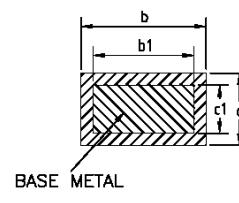
Pulse triggering application diagram

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:					
					<p>Technical drawing of the SOT23-6 package outline. The top view shows the package with lead numbers 1 through 6. Dimensions are provided for the overall width (2.9±0.2), lead spacing (1.9±0.2), lead height (0.95), lead thickness (0.4±0.1), and lead pitch (0.4±0.1). The side view shows the height of the package body (1.6±0.2) and the lead thickness (0.15±0.05). The bottom view shows the footprint of the package.</p>

Package	SOP-8	Devices per reel	2500	Unit	mm
Package specification:					
	   				
COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)					
SYMBOL	MIN	NOM	MAX		
A	1.35	1.55	1.75		
A1	0.10	0.15	0.25		
A2	1.25	1.40	1.65		
A3	0.50	0.60	0.70		
b	0.38	—	0.51		
b1	0.37	0.42	0.47		
c	0.17	—	0.25		
c1	0.17	0.20	0.23		
D	4.80	4.90	5.00		
E	5.80	6.00	6.20		
E1	3.80	3.90	4.00		
e	—	1.275SC	—		
L	0.45	0.60	0.80		
L1	—	1.04REF	—		
L2	—	0.255SC	—		
R	0.07	—	—		
R1	0.07	—	—		
h	0.30	0.40	0.50		
θ	0°	—	8°		
θ1	15°	17°	19°		
θ2	11°	13°	15°		
θ3	15°	17°	19°		
θ4	11°	13°	15°		