

### DESCRIPTION

BL8023K 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.

BL8023K can provide 400mA typical driving current, which will different according to the relay coil resistance. The input High Level Threshold of BL8023K is 2V, making it compatible with most single chip microcontroller.

BL8023K is available in SOT23-6 and SOP-8 packages.

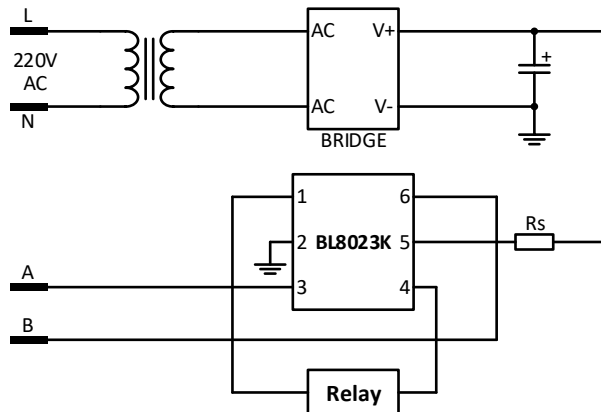
### FEATURES

- 5 to 40V 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: 400mA  
 $R_{DS(ON)} = 7\Omega$  ( $V_{IN} = 12V$ , PMOSFET+NMOSFET)  
 $R_{DS(ON)} = 7\Omega$  ( $V_{IN} = 30V$ , PMOSFET+NMOSFET)
- Peak driving current: 500mA@ $V_{IN} = 24V$
- Environment temperature:  $-40^\circ C \sim 85^\circ C$
- SOT23-6 and SOP-8 packages

### APPLICATIONS

- Smart Meter

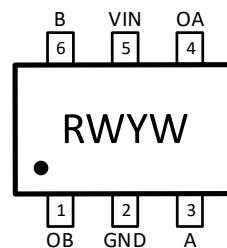
### TYPICAL APPLICATION



### ORDERING INFORMATION

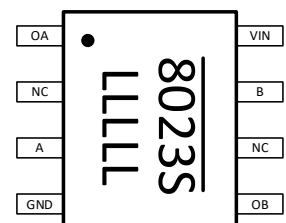
Part No.	Package	Tape & Reel
BL8023KCB6TR	SOT23-6	3000/Reel
BL8023KCD8TR	SOP-8	2500/Reel

### PIN OUT & MARKING



SOT23-6

RW: Product Code  
YW: Date code



SOP-8

8023S: Product Code  
LLLLL: Lot No.

# BL8023K

## ABSOLUTE MAXIMUM RATING

Parameter		Value	
Supply voltage $V_{IN}$		-0.3V to 40V	
Input pins		-0.3V to 40V	
Output pins		-0.3V to 40V	
Max operating junction temperature ( $T_J$ )		150°C	
Ambient temperature ( $T_A$ )		-40°C to 125°C	
Package thermal resistance	SOT23-6	$\theta_{JA}$	190°C/W
		$\theta_{JC}$	110°C/W
	SOP-8	$\theta_{JA}$	128°C/W
		$\theta_{JC}$	45°C/W
Storage temperature ( $T_S$ )		-40°C to 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 ( $T_J$ )	-40°C to 85°C

## ELECTRICAL CHARACTERISTICS

( $V_{IN}=12V$ ,  $T_A=25^\circ C$ )

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{IN}$	Input voltage range		5		40	V
$I_Q$	Quiescent current				1	uA
$R_{DS(ON)}$	Switch $R_{DS(ON)}$	$V_{IN}=12V$ , $R_L=75ohm$		7	10	ohm
		$V_{IN}=30V$ , $R_L=75ohm$		7	10	ohm
		$V_{IN}=12V$ , $R_L=40ohm$		7	10	ohm
$V_{TH}$	ON input high voltage	$V_{IN}=12V$		2		V
$R_{IN}$	Equivalent input resistor			20		Kohm
$V_{SD}$	Fly-wheel diode forward voltage	$I_S=1A$		1.4	1.5	V
$T_R$	Rise time	$V_{IN}=12V$ , $R_L=75ohm$		560		ns
$T_{D(ON)}$	Turn on delay time	$V_{IN}=12V$ , $R_L=75ohm$		1400		ns
$T_F$	Fall time	$V_{IN}=12V$ , $R_L=75ohm$		200		ns
$T_{D(OFF)}$	Turn off delay time	$V_{IN}=12V$ , $R_L=75ohm$		800		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

# BL8023K

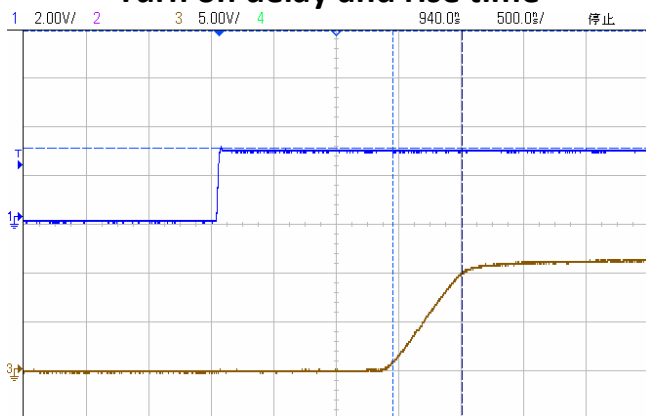
## PIN DESCRIPTION

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

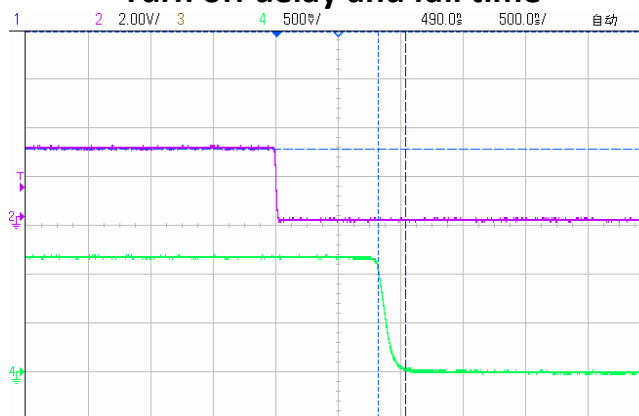
Tested under  $T_A=25^{\circ}\text{C}$ , unless otherwise specified.

### Turn on delay and rise time



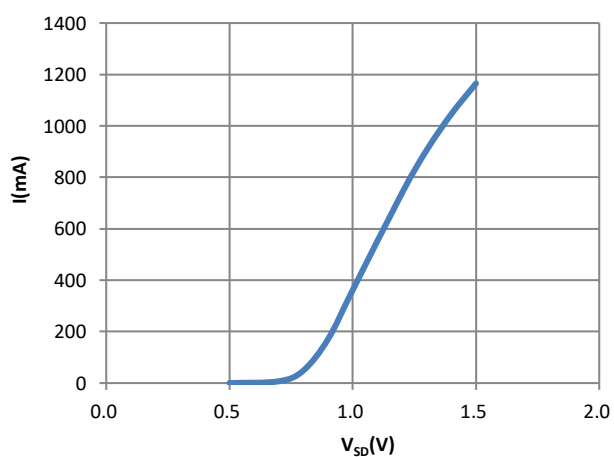
Ch1—Input, Ch3—Output

### Turn off delay and fall time

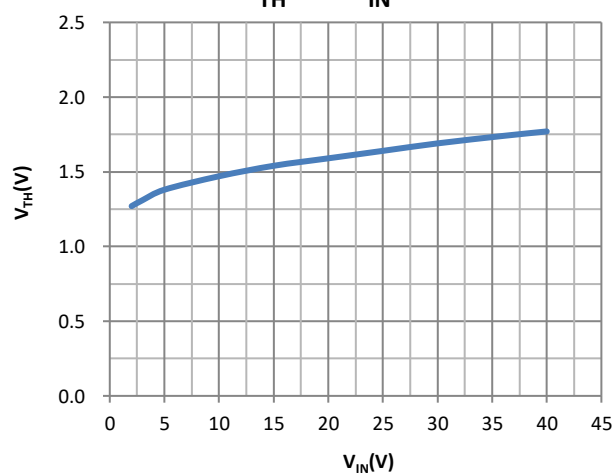


Ch2—Input, Ch4—Output

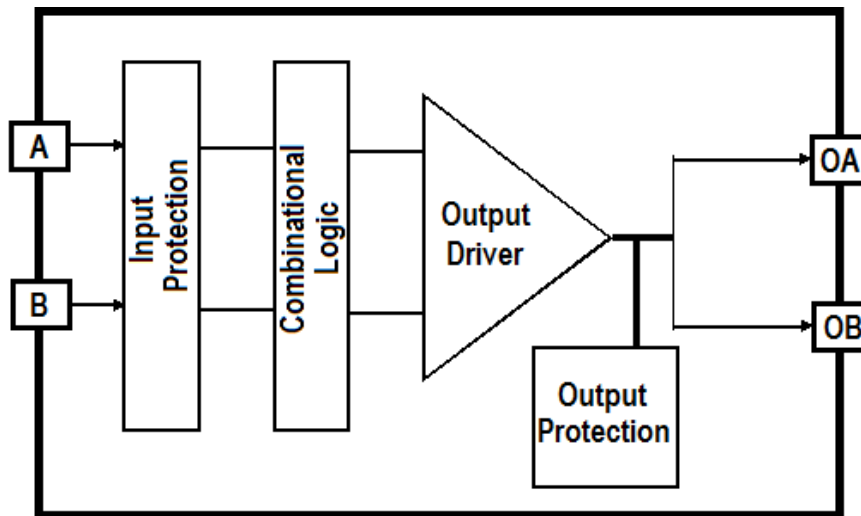
### Forward Voltage



### $V_{TH}$ vs. $V_{IN}$



## BLOCK DIAGRAM

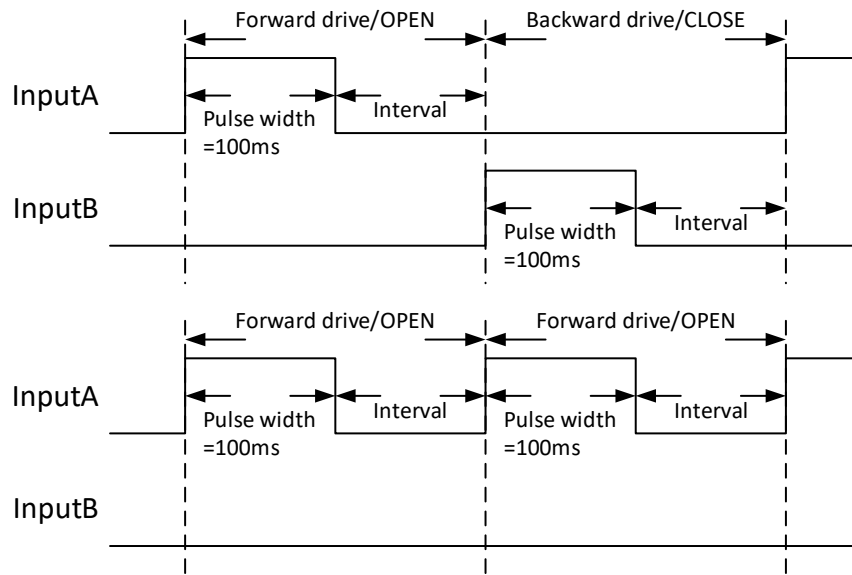


## DETAILED DESCRIPTION

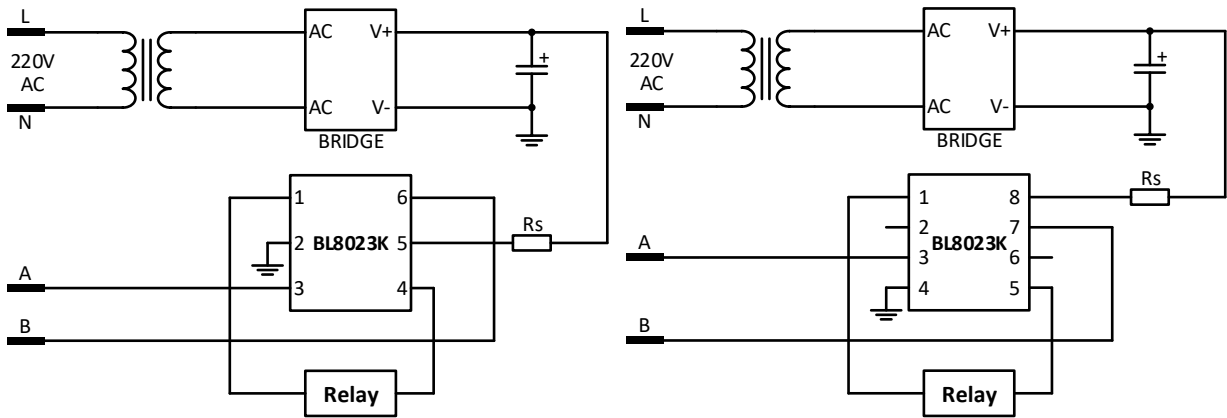
### Pulse Triggering

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

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.



# BL8023K



Pulse triggering application diagram

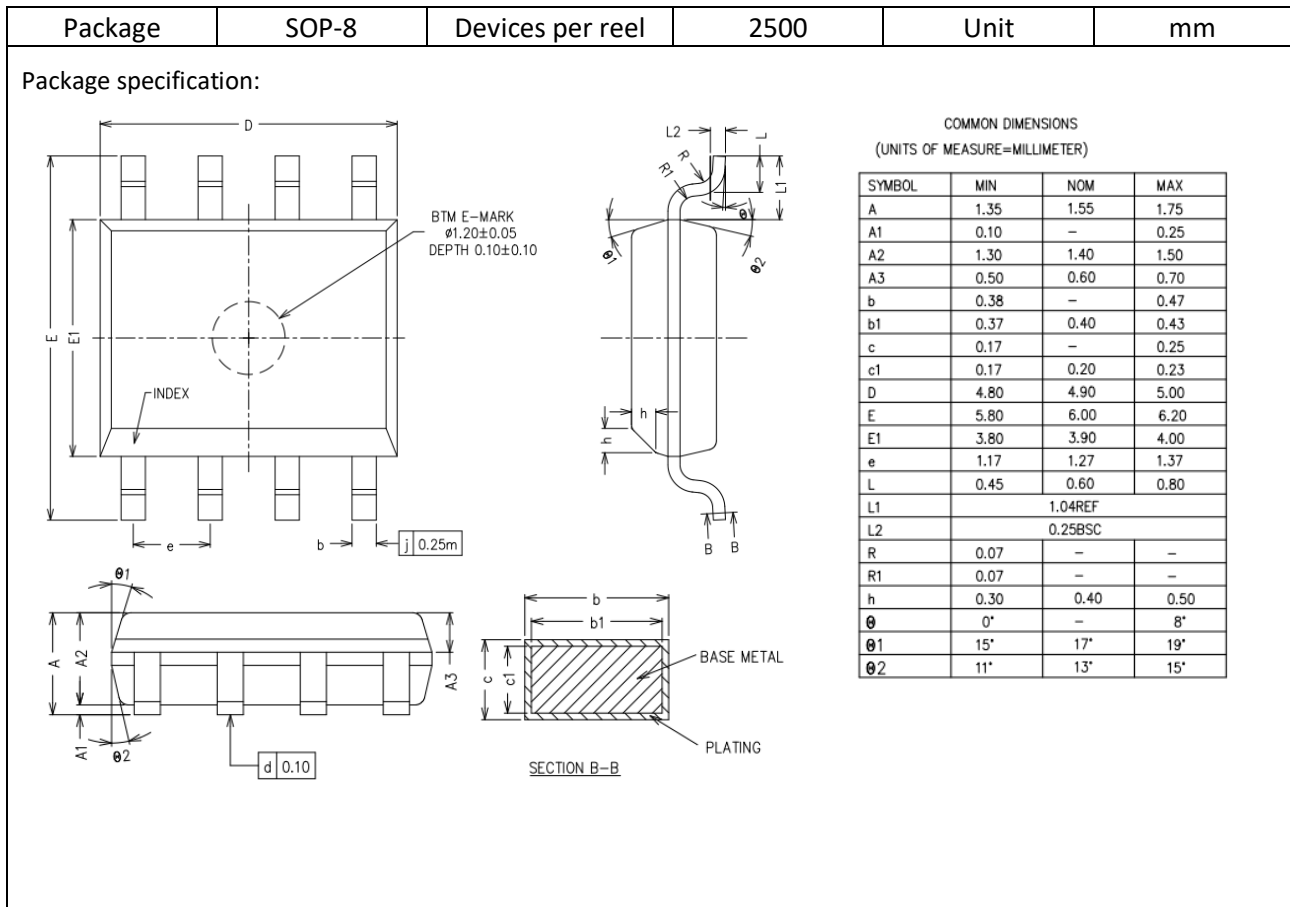
## Relay free-wheel

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:					

# BL8023K



单击下面可查看定价，库存，交付和生命周期等信息

[>>BELLING\(上海贝岭\)](#)