

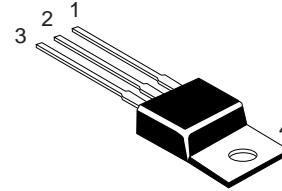
#### DESCRIPTION

QBAR® ICs provide a 3-terminal semiconductor switch that functions as:

- a solid-state normally-closed switch
- a non-inverting digital transistor
- a solid-state replacement for a normally-closed, non-isolating relay.

QBAR® ICs do not require a separate power supply lead. This makes possible:

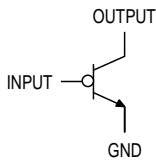
- simplified control wiring
- replacement of normally-closed D.C. relays with highly reliable solid-state devices
- improved fail-safe performance in the event of lost control power, severed or shorted control wires.



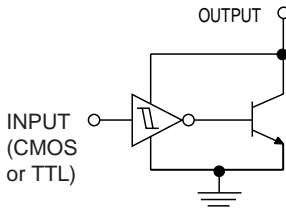
3 AMPERES  
20 VOLTS  
TO-220 package

PIN  
1 INPUT  
2 GND  
3 OUTPUT  
4 GND

#### QBAR SWITCH SYMBOL



#### FUNCTIONAL SCHEMATIC

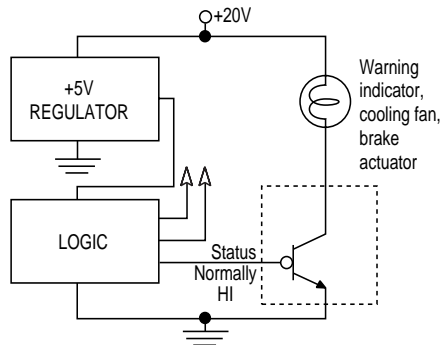


#### FUNCTION TABLE

| INPUT | SWITCH STATE<br>(OUTPUT-TO-GND) |
|-------|---------------------------------|
| HI    | OFF                             |
| LO    | ON                              |
| OPEN  | ON                              |

#### TYPICAL APPLICATIONS

##### ALARM SWITCH

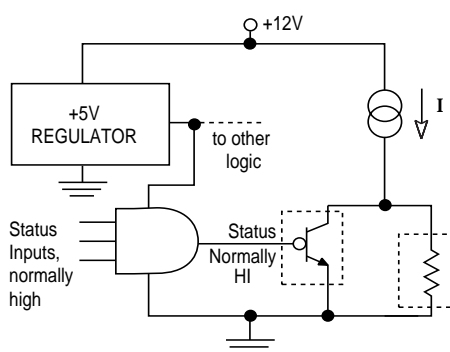


A QBAR switch activates an alarm over a large range of system failure conditions:

- system failure indicated by a LO on the status output
- status conductor cut
- status conductor shorted to ground
- loss of +5V supply

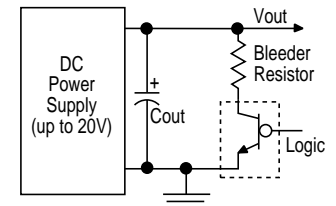
Any of these conditions will cause the QBAR switch to turn ON and power the alarm.

##### PROTECTION OF FRAGILE OR TRIGGER DEVICES



A QBAR switch protects the load from being driven by false signals when all status indicators are *not* OK. Damage to fragile loads such as laser diodes, or erroneous firing of detonators can be avoided with a QBAR switch. It shunts drive current *I* around the load when any Status Gate input goes LO, when +5V power is lost, or when the conductor from the Status Gate output to the QBAR switch input is cut or shorted to ground.

##### POWER SUPPLY EFFICIENCY BOOST



Increase your power supply efficiency by using a QBAR switch to lower the parasitic current drain through the bleeder resistor during normal supply operation.

# QB210T

## ABSOLUTE MAXIMUM RATINGS

Voltage, output to ground . . . . . 24 V  
Voltage, input to ground . . . . .  $\pm 6$  V (OK to exceed +6V if Input Current is limited to 2mA)  
Operating Temperature Range, T case . . . . . 0°C to 70°C  
Storage Temperature Range . . . . . -55°C to 150°C  
Output current, continuous . . . . . 3A

## ELECTRICAL SPECIFICATIONS (Over full operating temperature range, unless noted)

| PARAMETER                        | CONDITIONS  | MIN | TYP  | MAX  | UNITS   |
|----------------------------------|---|-----|------|------|---------|
| <u>OFF Characteristics</u>       |   |     |      |      |         |
| Output Breakdown Voltage         | V input $\geq 2.4$ V<br>I output $\leq 750$ $\mu$ A           | 20  |      |      | V       |
| Output OFF Current               | V input $\geq 2.4$ V<br>V output = 20 V                       |     | +300 | +750 | $\mu$ A |
| Input HIGH Logic Threshold       |   |     | 1.7  | 2.4  | V       |
| Input HIGH Input Current         | V input = 2.4 V   | 0   |      | +60  | $\mu$ A |
| <u>ON Characteristics</u>        |   |     |      |      |         |
| Output ON Voltage                | V input $\leq 0.8$ V<br>I output = 1.80 A                     |     | 1.3  | 1.8  | V       |
| Input LOW Logic Threshold        |   | 0.8 | 1.4  |      | V       |
| Input LOW Input Current          | -6 V $\leq$ V input $\leq 0.8$ V                              | -20 |      | +20  | $\mu$ A |
| Input Logic Threshold Hysteresis |   | 0.1 |      |      | V       |
| <u>SWITCHING Characteristics</u> |   |     |      |      |         |
| Turn-on Time, Turn-off Time      | V in0 = 0.8 V<br>V in1 = 2.4 V<br>Vcc = 12 V<br>I out = 50 mA |     | 2    | 5    | $\mu$ s |

### Notes:

- When not connected, the Input Terminal floats LOW, putting the QBAR<sup>®</sup> switch in the ON state. Nevertheless, for minimum noise susceptibility, inputs should be connected to valid logic levels.
- BitParts Inc.'s products are protected by U.S. patents 5,134,323; 6,259,292; 6,639,777; 6,958,623; foreign patents issued and pending.

### Ordering Information:

Order Number: QB210T  
Marking: QB210T  
WWYY  
Package: TO-220

See [www.bitpartsinc.com](http://www.bitpartsinc.com) or contact BitParts, Inc. for more information or packaging options.



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Ref: QB210T—02/10