

## High Sensitivity Single Output Hall Effect Latch

CL177

### ■ Description

The CL177 is a single output integrated Hall sensors. It is used in field that the magnetic field response change rate is quick and magnetic density is small. The device includes a one-chip Hall voltage generator for magnetic sensing, an amplifier that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold  $B_{op}$ , DO is turned on (low). The output state is held until a magnetic flux density falls below  $B_{rp}$  causing DO to be turned off (high).

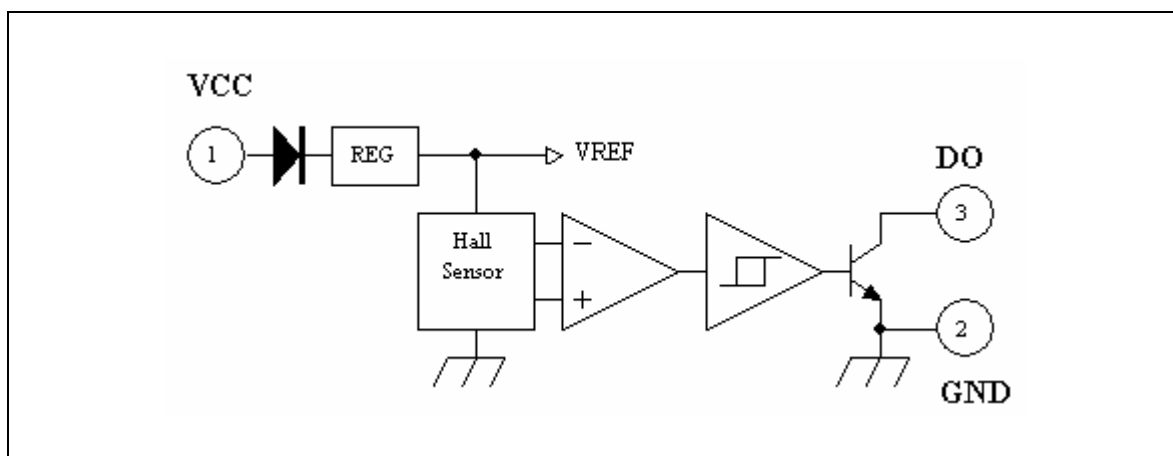
### ■ Features

- Wide range of operating supply voltage (3.5~20V)
- High sensitivity
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range
- No mobile components and high dependability
- Small size
- Output voltage compatible with bipolar and MOS logic systems

### ■ Applications

- Brush less DC fan
- Brush less DC motor
- Revolution counting
- Speed measurement
- High sensitivity and unconnected switch

### ■ Function Block

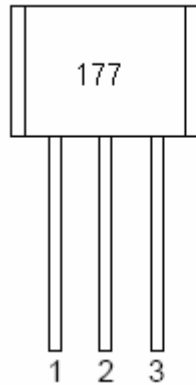


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### ■ Pin Descriptions

TO-92S Plastic Package



Top view

- 1: Vcc
- 2: Gnd
- 3: DO

| Pin No. | Symbol | Function       |
|---------|--------|----------------|
| 1       | VCC    | Supply voltage |
| 2       | GND    | Ground         |
| 3       | DO     | Output         |

### ■ Ordering Information

| Package | Temperature Range | Part No. | Marking ID | Packing Type |
|---------|-------------------|----------|------------|--------------|
| TO-92S  | -20 to 105°C      | CL177-E1 | CL177      | Bulk         |

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### ■ Absolute Maximum Ratings (Ta= 25°C)

| Symbol | Parameter                    | Range     | Unit |
|--------|------------------------------|-----------|------|
| VCC    | Supply voltage               | 3.5 ~ 22  | V    |
| VRCC   | Reverse VCC polarity voltage | -22       | V    |
| B      | Magnetic flux density        | Unlimited | G    |
| IO     | Output ON current            | 25        | mA   |
| PD     | Package dissipation (SIP3)   | 0.4       | W    |
| Ta     | Operation temperature        | -20 ~ 125 | °C   |
| Tstg   | Storage temperature          | -50 ~ 150 | °C   |

Note: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

### ■ Recommended Operating Conditions (Ta= 25°C)

| Parameter             | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------|--------|------|------|------|------|
| Supply voltage        | VCC    | 3.5  | --   | 20   | V    |
| Operating temperature | Ta     | -20  | --   | 105  | °C   |

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## ■ Electrical Characteristics

(VCC = 12V, Ta = 25°C, unless otherwise specified)

| Symbol | Parameter                 | Test Condition         | Min | Typ. | Max | Unit |
|--------|---------------------------|------------------------|-----|------|-----|------|
| VCC    | Supply Voltage            |                        | 3.5 |      | 20  | V    |
| VSAT   | Output saturation voltage | IO=20mA                | --  | 0.3  | 0.7 | V    |
| IOL    | Output leakage current    | VCE=22V                | --  | 0.1  | 10  | μ A  |
| ICC    | Supply current            | VCC=22V<br>Output open | --  | 5.0  | 9.5 | mA   |
| tr     | Output rise time          | RL=820 Ω<br>CL=20pF    | --  | 0.3  | 1.5 | μ s  |
| tf     | Output falling time       | RL=820 Ω<br>CL=20pF    | --  | 0.3  | 1.5 | μ s  |

## ■ Magnetic Characteristics

### A grade

| Symbol | Parameter     | Test Condition    | Min | Typ. | Max | Unit |
|--------|---------------|-------------------|-----|------|-----|------|
| Bop    | Operate point | VCC=12V, Ta= 25°C | 10  |      | 60  | G    |
| Brp    | Release point | VCC=12V, Ta= 25°C | -60 |      | -10 | G    |
| Bhys   | Hysteresis    | VCC=12V, Ta= 25°C |     | 90   |     | G    |

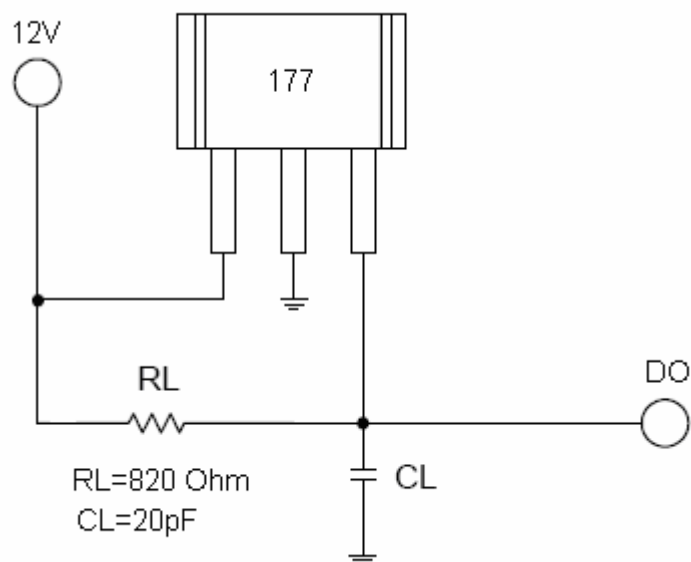
### B grade

| Symbol | Parameter     | Test Condition    | Min  | Typ. | Max | Unit |
|--------|---------------|-------------------|------|------|-----|------|
| Bop    | Operate point | VCC=12V, Ta= 25°C |      |      | 100 | G    |
| Brp    | Release point | VCC=12V, Ta= 25°C | -100 |      |     | G    |
| Bhys   | Hysteresis    | VCC=12V, Ta= 25°C |      | 90   |     | G    |

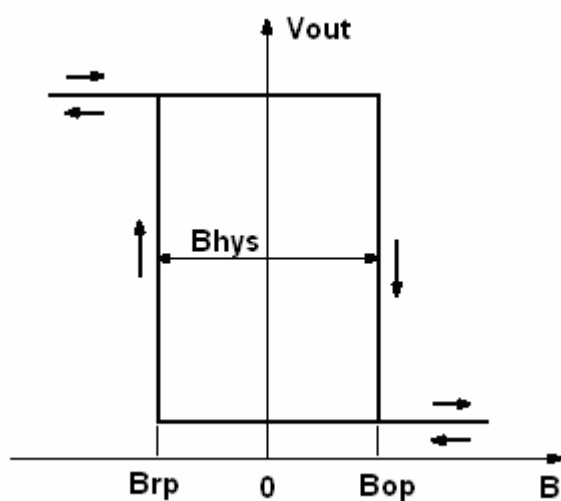
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## Test circuit



## Hysteresis Characteristics

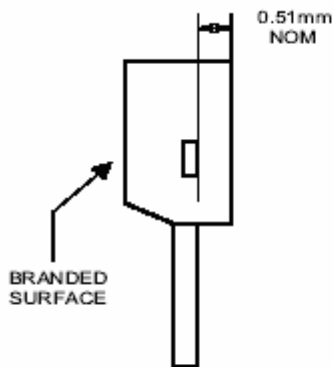


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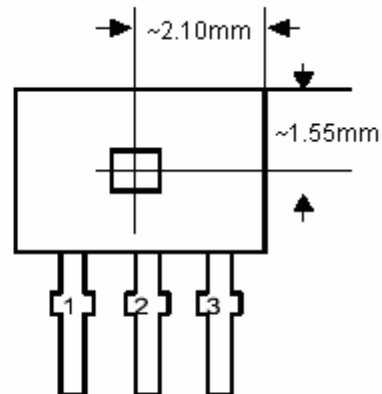
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## Package Mechanical Data

Package Type: TO-92S

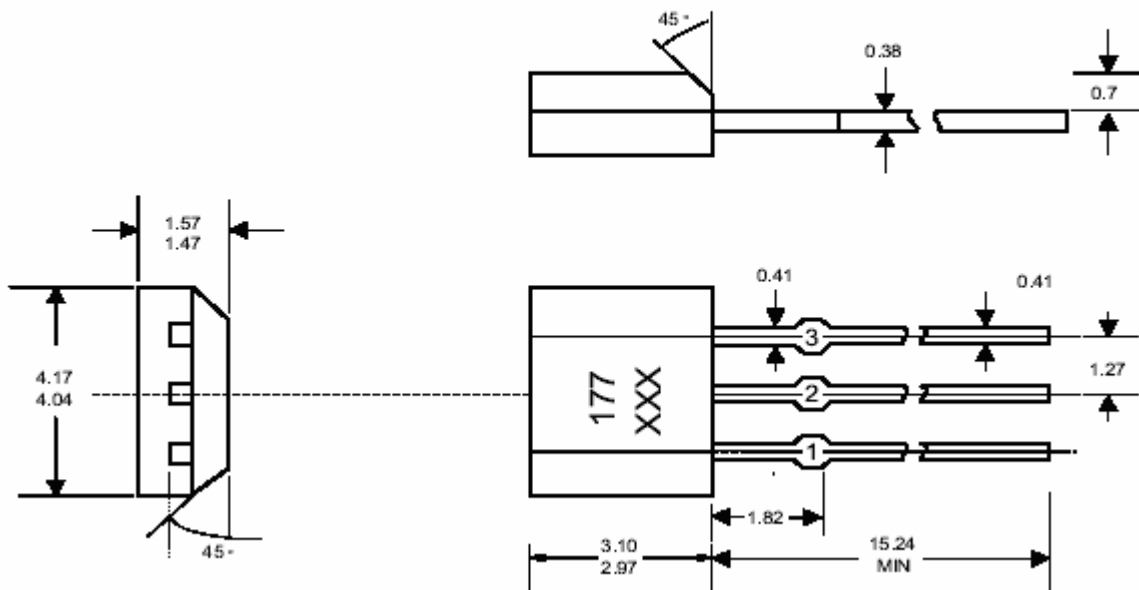


Active Area Depth



Sensor Location

## Package Dimension



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