

Breakout Board for Vishay IR Reflective Sensors

OVERVIEW

This simple breakout board is designed to fit either the TCRT5000 or the VCNT2020. A basic implementation of the Vishay application notes is used to enable engineers to quickly evaluate the performance of these sensors. Many very useful sensors are available in packages that are difficult to quickly evaluate so we hope this is a meaningful addition to your toolbox.

DESIGN NOTES

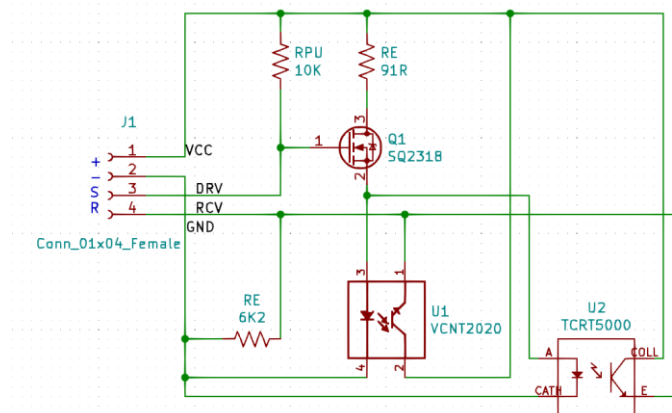
The values chosen for the on-board components are based on these application notes:

[Applications of Optical Sensors](#)

[Designing the VCNT2020 Into an Application](#)

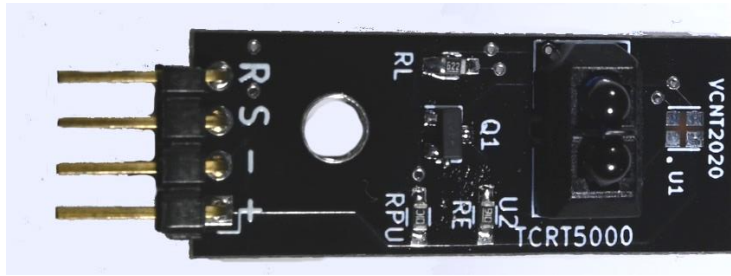
We highly recommend reading these to understand the operation of these sensors more clearly. The sensor side of the device will likely require either amplification for a linear application, or a simple transistor for a set “trip” threshold application.

SCHEMATIC



The RE (emitter resistance) of 910hms corresponds to roughly 40mA from a 5V supply. A small MOSFET is placed to enable the IR LED from a standard GPIO rather than sourcing it directly. Only ONE sensor should be installed, as they share outputs.

HOOKUP



(shown with TCRT5000 sensor installed)

R	Receive – output from phototransistor, active HI with 6.2K pulldown
S	Send – input to N-channel FET, active LO with 10K pullup
-	Ground
+	Power – supply for IRLED and phototransistor, maximum 5V

The header is a breadboard-friendly 0.1" spacing and can be either direct-wired or the engineer may choose a header as shown above. The center mounting hole is electrically isolated and will accept up to a 6-32 machine screw. This hole is aligned with the center axis of both sensors.