

## Low Power Non Magnetic Inductive Proximity Sensor Module

The circuit is CMOS technology that utilizes few external passive components. The operating voltage range is 3V to 5.5V which allows operation with most computers.

- *IDEAL FOR LIMITED SPACE APPLICATIONS*
- *SENSE FERROUS & NON-FERROUS METAL OBJECTS DOWN TO "ZERO SPEED"*
- *ELIMINATES THE NEED FOR MAGNETS*

### **Features:**

- LED indicator light
- Low supply current [1 mA typical at +3.3V, 5 mA typical at +5V]
- Supply voltage compatible with most computers [+3V to +5.5V]
- Fast start up time [600uS]
- Fast response time [200uS]

### **Applications:**

▲ Building Controls    ▲ Robotics    ▲ Home Appliances    ▲ Motor Controls

**Specifications;** Ta=+25°C, Power Supply voltage: 3V to +5.5V

1. Sensing distance: 1.5 mm min

2. Power Supply Current:

LED off; 1 mA typical at +3.3V, 5 mA typical at +5V

LED on; 7 mA typical at +3.3V, 17 mA typical at +5V

3. Switching Frequency: 5 KHz typ.

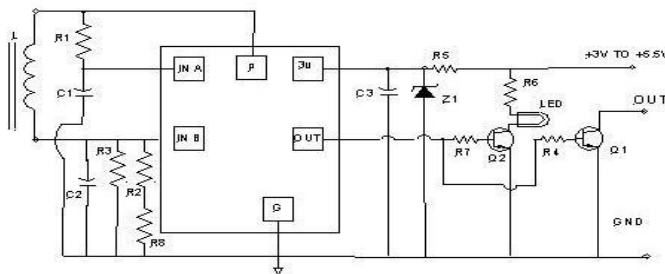
4. Output: NPN Open Collector

5. Output on load current: 1 mA min. for 0.4V drop (5K load resistor at 5V)

### **Absolute Maximum Ratings;**

<b>Power Supply Voltage <math>V_{DD}</math></b>	+5.6 V max.
<b>Input Voltage</b>	-0V min.; $V_{DD}$ V max.
<b>Output Voltage</b>	-0V min.; $V_{DD}$ V max.
<b>Temperature</b>	-40°C min.; +85°C max.

### L PROXIMITY SENSOR CIRCUIT REV 4D



LED,SMT APT2012CGCK KINGBRIGHT (PACKAGE SIZE 0805)

Z1 MM3Z3V3B Fairchild Semiconductor SOD-323F

Q1, Q2, MMBT3904TT1G ON Semiconductor SC-75

L = SDR0503-103JL BOURNS

CAP AND R ARE 0402 SIZE

C1 = 100P CAP 1%

C2 = 22P CAP 5%

C3 = 0.01U CAP 10%

ALL RESISTORS 1%

R1 = 20K

R2 = 4.3K

R3 = RESISTOR FOR TRIMMING SELECTION;  
100K, 91K, 47K, 33.2K, 30.0K

R8 = RESISTOR FOR TRIMMING SELECTION  
330, 220, 100, 0 OHMS

R4 = 10K

R7 = 20K

R5 = 402

R6 = 249

MICRO OSCILLATOR INC

## **Circuit Description;**

The IC shown in the test circuit compares the network time constant of R1 & C1 to that of R2 & L1 to determine the IC output logic level. The IC internal pulse generator applies a pulse to both network R1 & C1 and R2 & L1 and a repetition rate of about 5 KHz. The output signals of network R1 & C1 and R2 & L1 are applied to the inputs of the two high speed comparators. When either comparator input reaches a predetermined fraction of the supply voltage level the comparator output changes level and the pulse generator output is turned off. Also, depending on which of the comparator output levels changed, the IC output level becomes high or low. The network time constant of R2 & L1 changes as metal approaches L1, in general if the metal is a ferrite the inductance level increases and most other metals such as copper cause a decrease in inductance level.

## **Notes;**

1. Sensing distance is dependent on inductor size and is approximately equal to  $\frac{1}{2}$  the inductor's diameter.
2. The sensor can be adjusted to respond to either ferrous (permeability greater than 1) or non-ferrous metals by varying the value of R2. The value of R2 determines if an increase or decrease in the sensor inductance level causes a circuit output level change.

## **Warranty**

Micro Oscillator Inc does not assume any liability arising out of the application or use of any product or circuit described herein. Our products are not authorized for use as components in devices used for life support or other critical application where failure can cause death or bodily injury. In the case of this product being defective in manufacturing, labeling, packaging or shipping, it will be replaced with a satisfactory IC or the purchase price refunded. This is your exclusive remedy even though the defect or damage is caused by negligence or other fault.

Board ID: 4C-1

Board thickness: 1/16" [1.58mm]

Unit: Inches [mm]

