
Evaluation Kit

APPLICABLE PARTS

- AIC1601

DESCRIPTION

The AIC1601 Eval board can be used for evaluation of the Apex AIC1601 in an inductive proximity switch application. It features a low side open collector output which is integrated in the IC, and a high side output realized by means of external components. Both outputs are protected against over voltage and over current. In case of over current, power dissipation is limited by entering a hiccup mode until normal load condition has returned. Freewheel diodes are placed on both outputs, allowing to switch inductive loads such as relays.

FEATURES

- Sensitivity adjustable by potentiometer (R5)
- Jumper JP1 to select normally OFF or normally ON operation (preset to NO)
- Power LED (green)
- Detect LED (red)
- Freewheel diode for external relay (D4 for low side, D5 for high side switch)
- Optional low supply voltage operation by closing jumper JP2 and solder joint SJ1 (the latter only in case of high side switch operation)

GETTING STARTED

After connecting a DC supply voltage of 5.5V to 24V to the supply terminals VCC (positive) and Gnd the green Power LED is turned on. With no target near the sensor coil the red Detection LED should be off, indicating that the LC oscillator is working. This can be validated by connecting an oscilloscope probe to test point TP2. The ringing amplitude should be in the order of 2Vpp. If the Detection LED is on and no oscillation is observed on TP2 the resistance of potentiometer R5 for sensitivity adjustment can be reduced by turning the trimming screw counter-clockwise until the oscillation starts and the Detection LED turns off.

Once the Detection LED is off a metal target can be placed in the desired detection distance an potentiometer R5 is set to switch the LED at this distance. Turn the trimming screw clockwise until the LED turns on or counter-clockwise until it turns off. As a rule of thumb a detection distance of 50% to 75% of the coil diameter is appropriate for a stable design.

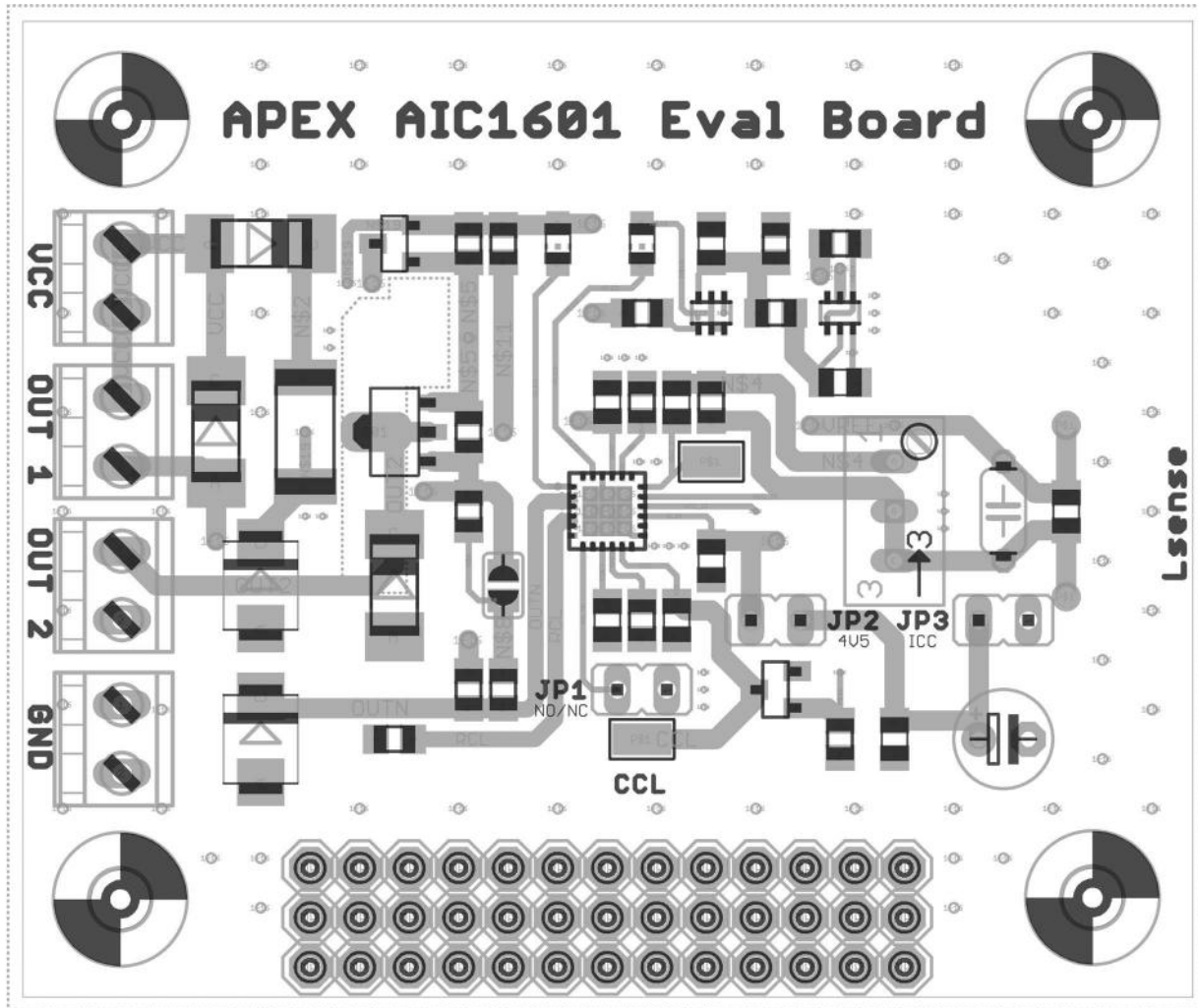
Jumper JP3 (normally closed) can be used to measure the IC's supply current, excluding the external load current. Before applying the supply voltage to VCC of the board, an amp-meter should be connected to the two terminals of the opened jumper.

Solder joint SJ1 should be shorted (closed) in case the high side output OUT2 is used and the supply voltage VCC is 8V or lower. SJ1 reduces the base drive resistor for Q1 from 6.1kΩ to 2.2kΩ.

For further information please refer to AIC1601's data sheet and Application Note AN67.

EVAL BOARD SCHEMATIC

Figure 1: Schematic of AIC1601 Evaluation Board



Jumper and solder joint function and preset:

JP1	NO/NC normally open/normally closed	open = NO
JP2	to be closed for low supply operation*	open = 5.5V – 24V operation
JP3	open for IC current measurement	closed
SJ1	adjustment of Q1 base drive current	open = 8V – 24V operation

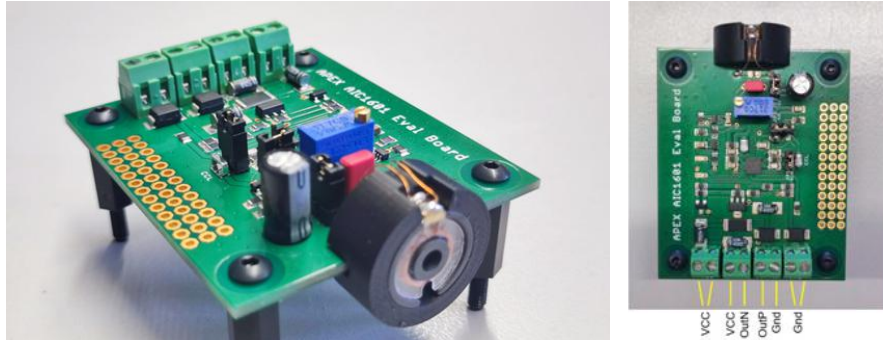
Test points

TP1	voltage on over current timing capacitor
TP2	output voltage of the internal oscillator driving the LC resonant circuit

* Note: all Operations below 5.5 V are outside of the specification of the IC. Accordingly, correct operation of the IC is not guaranteed. Operation of the board at supply voltages between 4.5V and 5.5V is possible by closing jumper JP2. In that case the internal voltage regulator is bypassed and the external supply voltage is directly fed into its output V_{lin}. Please note that the Eval-Board contains a reverse protection diode which reduces the voltage applied from external by approximately 0.7V.

AIC1601 APPLICATION

Figure 2: Photos of AIC1601 Applications



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