

OD850 TECHNICAL DESCRIPTION

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10/31/01

1/11/02 rev A

The OD850 is a Dual PIR/Microwave motion detector intended for use outside. The coverage is 50ft by 50 ft.

+5V Regulator

The 5V regulator (U1) consists of an LM78L05 voltage regulator. The power coming from the terminal strip is rectified through D1 to prevent reverse power damage to U1. RV1 protects the voltage regulator from harmful voltage spikes.

PIR Amplifier

The PIR amplifier utilizes a LM358 (U4). The DET is DC coupled to the first amp stage. The gain of the first amp is determined by the ratio of R39 to R40. The bandwidth of the first stage is limited by the values of C11 and C12, or .2 to 23 Hz. The gain of the second stage is determined by the ratio of R14 to R44. The bandwidth is limited by C13 and C14, to .2 to 23 Hz. The amplified signal is coupled to one of the analog inputs of the microprocessor (U4) where signal processing is performed.

Microwave Subsystem

The MW subsystem utilizes a Stripline Microwave Transceiver. The transmitter consists of a FET oscillator (Q99) biased through R499. The frequency of oscillation is determined by the electrical/physical properties of the ceramic resonator Y99. Fine tuning of the transmitter frequency is accomplished by adjusting the position of the tuning screw located in the back of the plastic black shield. The transmitter drive pulse is generated by microprocessor U2. The drive pulses are applied to Q99 via Q1, and are 20 microseconds on-time, and 480 microsecond off-time. There are two receivers that incorporate balanced mixer designs consisting of two diodes present in D99 and D199. Equal amounts of RF energy are applied to each diode, one from the transmitter and one from the receiver section for each diode package. Diode package D99 however has the phase of the received signal shifted by 90 degrees. This balancing of the RF energy should produce a nominal pulse voltage on the IF output for both outputs of 0Vp, and should always be less than +/- 0.15Vp. The two IF outputs are fed to a sample-and-hold circuit Q2,Q7 via AC coupling cap C6,C28. The sample pulse is generated by the microprocessor and should be 16 microseconds long and centered in the middle of the drive pulse. Both Doppler signals are then amplified by U3 with two amplifiers used for each signal. The MW range is adjusted by potentiometer R58 which changes a DC voltage that is fed into pin 5 of the microprocessor (see microprocessor specification). The amplified signals is fed into two of the five analog inputs of the microprocessor where the rest of the signal processing is done (see software spec.).

Microprocessor Functions

See DS820 Microprocessor Specification.