

SA400 Circuit Description

The SA400 consists of a SAESL562 RF transmitter mounted in an ESL 560SA photoelectric smoke detector. The 560SA utilizes a microcontroller whose clock frequency is set by a 500 kHz ceramic resonator. If smoke is detected, it triggers the SAESL562 RF transmitter. The 560SA also determines the condition of the battery and sends low battery alarm to the SAESL562 RF transmitter.

The SAESL562 uses Q1 as the RF oscillator, controlled to operate at 312 MHz by SAW1. The tank circuit and antenna function is provided by a printed circuit loop tuned by C2, C5, and C8. Positive feedback for oscillation is provided by C6 to R4. Filter L2, L3, and C7 decouple the RF oscillator from the rest of the unit.

OOK modulation is supplied to Q1 from microcontroller U1 through R3. The clock for U1 is an internal 4 MHz R-C oscillator. Data is a 21 bit stream at 1 Kb/s, with 333 microsecond pulses representing "0" and 667 microsecond pulses representing "1". Data is sent multiple times, with a 20 ms pause between rounds. In the normal state, a 13 round status report is sent every 75 minutes nominal to confirm proper operation of the transmission link. If the smoke detector is in alarm, 26 rounds of data will be sent every 50 seconds. A low battery condition does not initiate a RF transmission, but is included in any transmission.