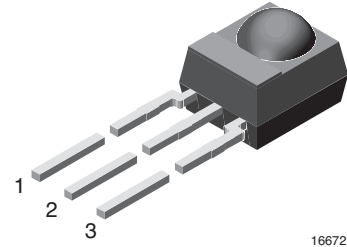


IR Receiver Modules for Remote Control Systems

Description

The TSOP348.. - series are miniaturized receivers for infrared remote control systems. PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as IR filter.

The demodulated output signal can directly be decoded by a microprocessor. TSOP348.. is the standard IR remote control receiver series for 3 V supply voltage, supporting all major transmission codes.



Features

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Improved shielding against electrical field disturbance
- TTL and CMOS compatibility
- Output active low
- Supply voltage: 2.7 V to 5.5 V
- Improved immunity against ambient light

Mechanical Data

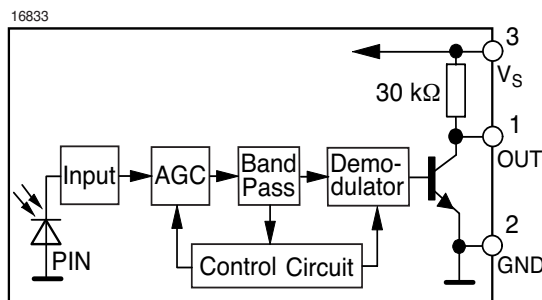
Pinning:

1 = OUT, 2 = GND, 3 = V_S

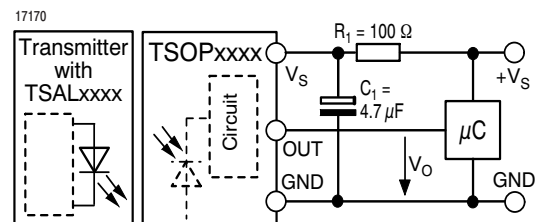
Parts Table

| Part | Carrier Frequency |
|-----------|-------------------|
| TSOP34830 | 30 kHz |
| TSOP34833 | 33 kHz |
| TSOP34836 | 36 kHz |
| TSOP34837 | 36.7 kHz |
| TSOP34838 | 38 kHz |
| TSOP34840 | 40 kHz |
| TSOP34856 | 56 kHz |

Block Diagram



Application Circuit



$R_1 + C_1$ recommended to suppress power supply disturbances.

The output voltage should not be hold continuously at a voltage below $V_O = 2.0$ V by the external circuit.

Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

| Parameter | Test condition | Symbol | Value | Unit |
|-----------------------------|---|-----------|-----------------------------|--------------------|
| Supply Voltage | (Pin 3) | V_S | - 0.3 to + 6.0 | V |
| Supply Current | (Pin 3) | I_S | 3 | mA |
| Output Voltage | (Pin 1) | V_O | - 0.3 to ($V_S + 0.3$) | V |
| Output Current | (Pin 1) | I_O | 10 | mA |
| Junction Temperature | | T_j | 100 | $^{\circ}\text{C}$ |
| Storage Temperature Range | | T_{stg} | - 25 to + 85 | $^{\circ}\text{C}$ |
| Operating Temperature Range | | T_{amb} | - 25 to + 85 | $^{\circ}\text{C}$ |
| Power Consumption | ($T_{amb} \leq 85\text{ }^{\circ}\text{C}$) | P_{tot} | 30 | mW |
| Soldering Temperature | $t \leq 10\text{ s}$, 1 mm from case | T_{sd} | 260 | $^{\circ}\text{C}$ |

Electrical and Optical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

| Parameter | Test condition | Symbol | Min | Typ. | Max | Unit |
|----------------------------|--|--------------|-----|----------|-----|-----------------|
| Supply Current (Pin 3) | $E_v = 0$ | I_{SD} | 0.7 | 1.2 | 1.5 | mA |
| | $E_v = 40\text{ klx}$, sunlight | I_{SH} | | 1.3 | | mA |
| Supply Voltage | | V_S | 2.7 | | 5.5 | V |
| Transmission Distance | $E_v = 0$, test signal see fig. 1, IR diode TSAL6200, $I_F = 250\text{ mA}$ | d | | 35 | | m |
| Output Voltage Low (Pin 1) | $I_{OSL} = 0.5\text{ mA}$, $E_e = 0.7\text{ mW/m}^2$, test signal see fig. 1 | V_{OSL} | | | 250 | mV |
| Irradiance (30-40 kHz) | $V_S = 3\text{ V}$ Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal see fig. 1 | $E_{e\ min}$ | | 0.2 | 0.4 | mW/m^2 |
| Irradiance (56 kHz) | $V_S = 3\text{ V}$ Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal see fig. 1 | $E_{e\ min}$ | | 0.3 | 0.5 | mW/m^2 |
| Irradiance (30-40 kHz) | $V_S = 5\text{ V}$ Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal see fig. 1 | $E_{e\ min}$ | | 0.35 | 0.5 | mW/m^2 |
| Irradiance (56 kHz) | $V_S = 5\text{ V}$ Pulse width tolerance: $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal see fig. 1 | $E_{e\ min}$ | | 0.45 | 0.6 | mW/m^2 |
| Irradiance | $t_{pi} - 5/f_o < t_{po} < t_{pi} + 6/f_o$, test signal see fig. 1 | $E_{e\ max}$ | 30 | | | W/m^2 |
| Directivity | Angle of half transmission distance | $\phi_{1/2}$ | | ± 45 | | deg |

Typical Characteristics ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

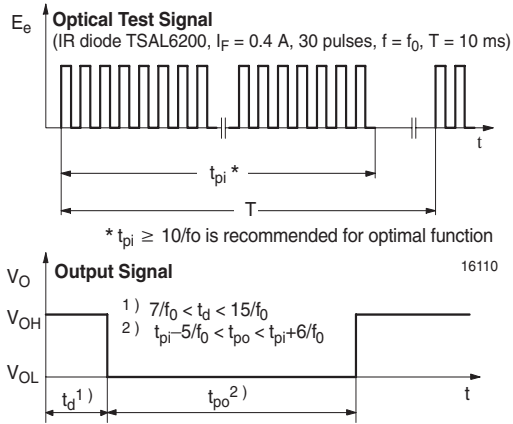


Figure 1. Output Function

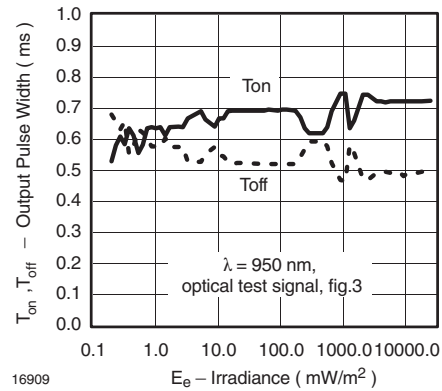


Figure 4. Output Pulse Diagram

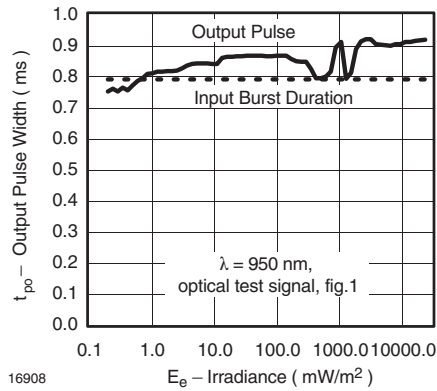


Figure 2. Pulse Length and Sensitivity in Dark Ambient

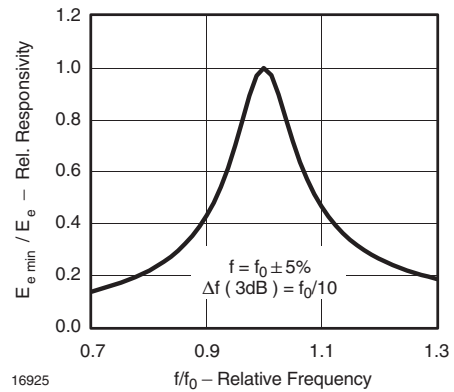


Figure 5. Frequency Dependence of Responsivity

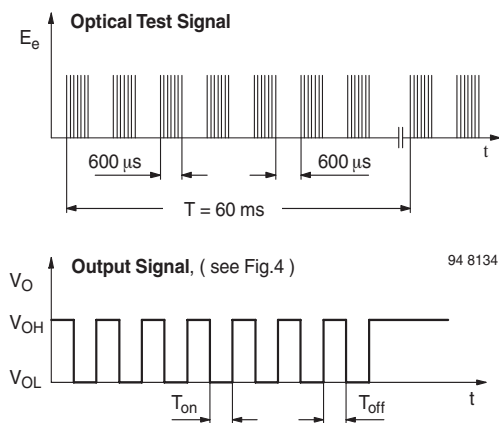


Figure 3. Output Function

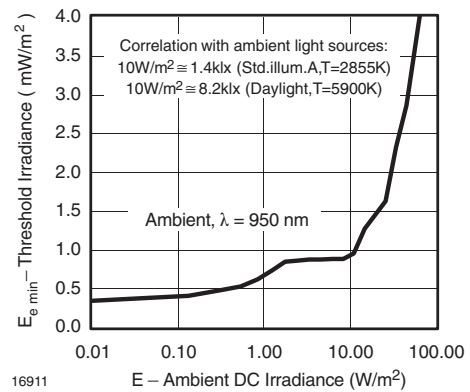


Figure 6. Sensitivity in Bright Ambient