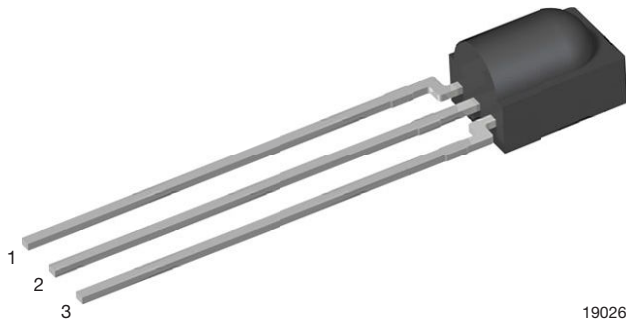




IR Receiver Modules for Remote Control Systems



FEATURES

- Very low supply current
- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Supply voltage: 2.5 V to 5.5 V
- Improved immunity against ambient light
- Insensitive to supply voltage ripple and noise
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

DESIGN SUPPORT TOOLS

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MECHANICAL DATA

Pinning for TSOP382.., TSOP384..:

1 = OUT, 2 = GND, 3 = V_S

DESCRIPTION

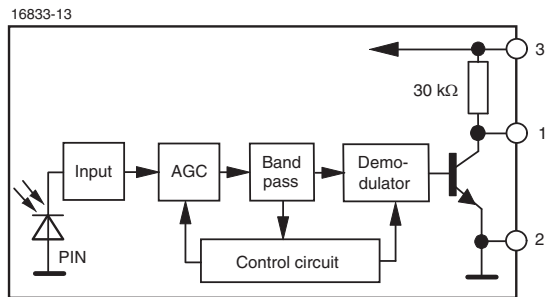
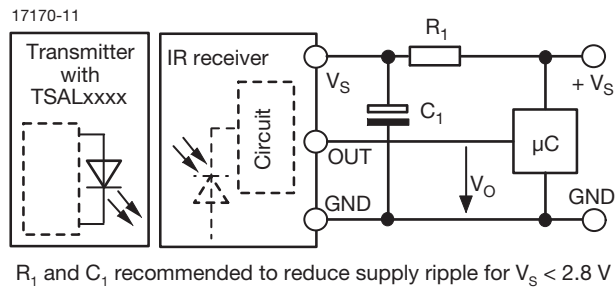
These products are miniaturized IR receiver modules for infrared remote control systems. A PIN diode and a preamplifier are assembled on a leadframe, the epoxy package contains an IR filter.

The demodulated output signal can be directly connected to a microprocessor for decoding.

The TSOP384.. series devices are optimized to suppress almost all spurious pulses from energy saving lamps like CFLs. The AGC4 used in the TSOP384.. may suppress some data signals. The TSOP382.. series are provided primarily for compatibility with old AGC2 designs. New designs should prefer the TSOP384.. series containing the newer AGC4.

These components have not been qualified according to automotive specifications.

| PARTS TABLE | | | |
|-------------------|---|---|---|
| AGC | | LEGACY, FOR LONG BURST REMOTE CONTROLS (AGC2) | RECOMMENDED FOR LONG BURST CODES (AGC4) |
| Carrier frequency | 30 kHz | TSOP38230 | TSOP38430 |
| | 33 kHz | TSOP38233 | TSOP38433 |
| | 36 kHz | TSOP38236 | TSOP38436 ⁽¹⁾⁽²⁾⁽³⁾ |
| | 38 kHz | TSOP38238 | TSOP38438 ⁽⁴⁾⁽⁵⁾ |
| | 40 kHz | TSOP38240 | TSOP38440 |
| | 56 kHz | TSOP38256 | TSOP38456 ⁽⁶⁾⁽⁷⁾ |
| Package | Minicast | | |
| Pinning | 1 = OUT, 2 = GND, 3 = V _S | | |
| Dimensions (mm) | 5.0 W x 6.95 H x 4.8 D | | |
| Mounting | Leaded | | |
| Application | Remote control | | |
| Best choice for | ⁽¹⁾ RC-5 ⁽²⁾ RC-6 ⁽³⁾ Panasonic ⁽⁴⁾ NEC ⁽⁵⁾ Sharp ⁽⁶⁾ r-step ⁽⁷⁾ Thomson RCA | | |

BLOCK DIAGRAM

APPLICATION CIRCUIT

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-----------------------------|---|-----------|-----------------------|------|
| Supply voltage | | V_S | -0.3 to +6 | V |
| Supply current | | I_S | 3 | mA |
| Output voltage | | V_O | -0.3 to $(V_S + 0.3)$ | V |
| Output current | | I_O | 5 | mA |
| Junction temperature | | T_j | 100 | °C |
| Storage temperature range | | T_{stg} | -25 to +85 | °C |
| Operating temperature range | | T_{amb} | -25 to +85 | °C |
| Power consumption | $T_{amb} \leq 85^\circ\text{C}$ | P_{tot} | 10 | mW |
| Soldering temperature | $t \leq 10\text{ s}, 1\text{ mm from case}$ | T_{sd} | 260 | °C |

Note

- Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability.

ELECTRICAL AND OPTICAL CHARACTERISTICS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------|---|-------------------|------|----------|------|-------------------|
| Supply current | $E_v = 0, V_S = 3.3\text{ V}$ | I_{SD} | 0.27 | 0.35 | 0.45 | mA |
| | $E_v = 40\text{ klx, sunlight}$ | I_{SH} | - | 0.45 | - | mA |
| Supply voltage | | V_S | 2.5 | - | 5.5 | V |
| Transmission distance | $E_v = 0$, test signal see Fig. 1, IR diode TSAL6200, $I_F = 50\text{ mA}$ | d | - | 24 | - | m |
| Output voltage low | $I_{OSL} = 0.5\text{ mA}, E_e = 0.7\text{ mW/m}^2$, test signal see Fig. 1 | V_{OSL} | - | - | 100 | mV |
| Minimum irradiance | Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see Fig. 1 | $E_e\text{ min.}$ | - | 0.12 | 0.25 | mW/m ² |
| Maximum irradiance | $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see Fig. 1 | $E_e\text{ max.}$ | 30 | - | - | W/m ² |
| Directivity | Angle of half transmission distance | $\phi_{1/2}$ | - | ± 45 | - | ° |

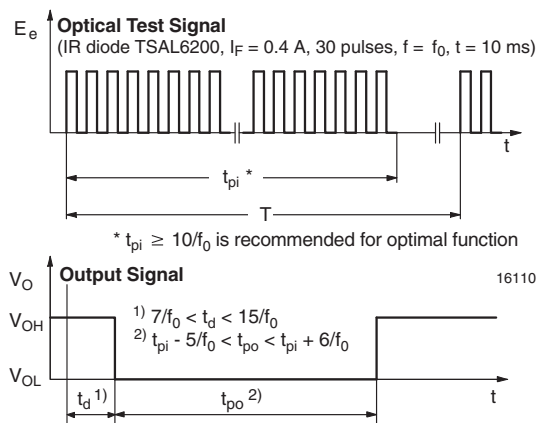
TYPICAL CHARACTERISTICS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)


Fig. 1 - Output Active Low

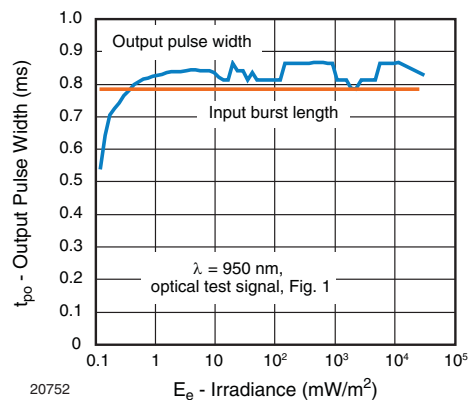


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient