

Photo Modules for PCM Remote Control Systems

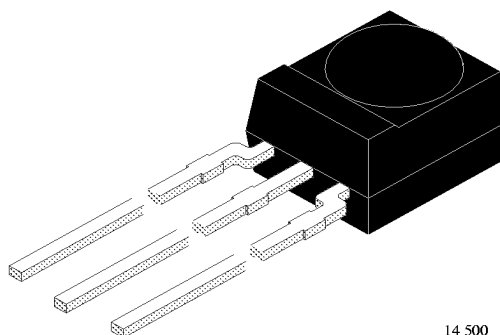
Available types for different carrier frequencies

Type	f ₀	Type	f ₀
TSOP2830ON	30 kHz	TSOP2833ON	33 kHz
TSOP2836ON	36 kHz	TSOP2837ON	36.7 kHz
TSOP2838ON	38 kHz	TSOP2840ON	40 kHz
TSOP2856ON	56 kHz		

Description

The TSOP28..ON – 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. The main benefit is the reliable function even in disturbed ambient and the protection against uncontrolled output pulses.



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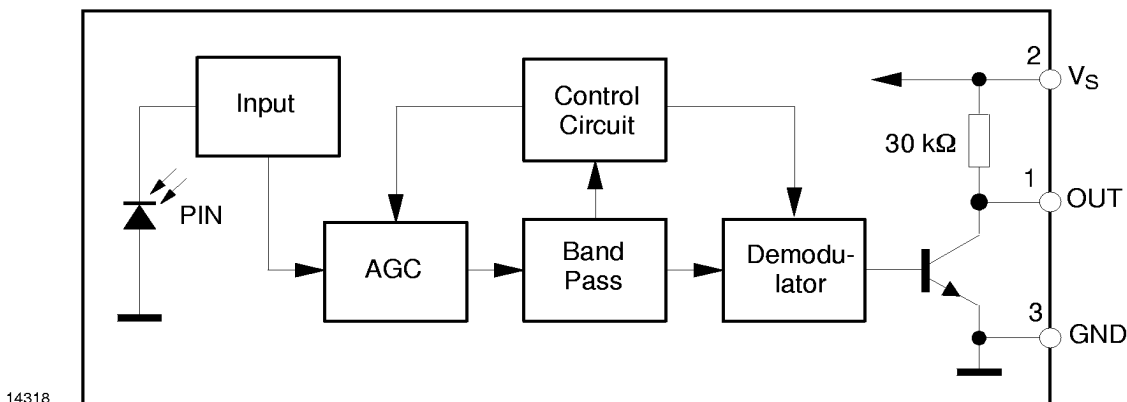
Features

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- TTL and CMOS compatibility
- Output active low
- Improved shielding against electrical field disturbance
- Suitable burst length ≥ 6 cycles/burst

Special Features

- Small size package
- Enhanced immunity against all kinds of disturbance light
- No occurrence of disturbance pulses at the output
- Short settling time after power on ($< 200 \mu s$)

Block Diagram



Absolute Maximum Ratings

$T_{amb} = 25^{\circ}\text{C}$

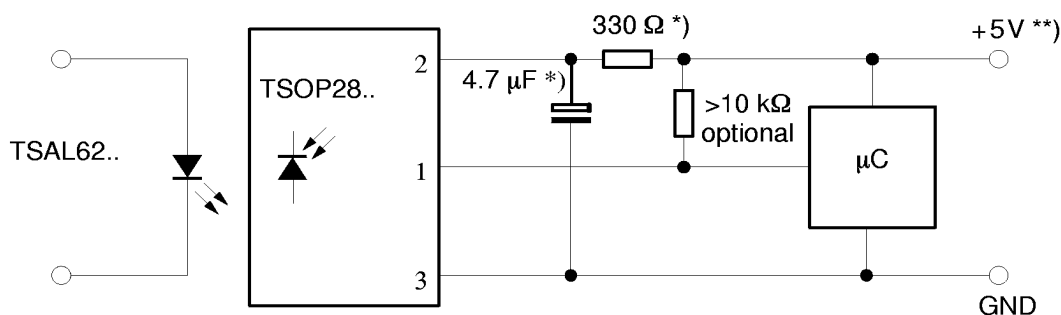
Parameter	Test Conditions	Symbol	Value	Unit
Supply Voltage	(Pin 2)	V_S	-0.3...6.0	V
Supply Current	(Pin 2)	I_S	5	mA
Output Voltage	(Pin 1)	V_O	-0.3...6.0	V
Output Current	(Pin 1)	I_O	5	mA
Junction Temperature		T_j	100	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-25...+85	$^{\circ}\text{C}$
Operating Temperature Range		T_{amb}	-25...+85	$^{\circ}\text{C}$
Power Consumption	($T_{amb} \leq 85^{\circ}\text{C}$)	P_{tot}	50	mW
Soldering Temperature	$t \leq 10\text{ s}$, 1 mm from case	T_{sd}	260	$^{\circ}\text{C}$

Basic Characteristics

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Supply Current (Pin 2)	$V_S = 5\text{ V}$, $E_v = 0$	I_{SD}	0.9	1.1	1.5	mA
	$V_S = 5\text{ V}$, $E_v = 40\text{ klx}$, sunlight	I_{SH}		1.3		mA
Transmission Distance	$E_v = 0$, test signal see fig.6, IR diode TSAL6200, $I_F = 300\text{ mA}$	d		35		m
Output Voltage Low (Pin 1)	$I_{OL} = 0.5\text{ mA}$, $E_e = 0.7\text{ mW/m}^2$, $f = f_o$	V_{OL}			250	mV
Irradiance (30 – 40 kHz)	Pulse width tolerance: $t_{pi} - 4/f_o < t_{po} < t_{pi} + 6/f_o$, test signal (see fig.6)	$E_{e\ min}$		0.3	0.5	mW/m^2
Irradiance (56 kHz)		$E_{e\ min}$		0.4	0.7	mW/m^2
Irradiance		$E_{e\ max}$	30			W/m^2
Directivity	Angle of half transmission distance	$\Phi_{1/2}$		± 45		deg

Application Circuit



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*) only necessary to suppress power supply disturbances

**) tolerated supply voltage range : $4.5\text{ V} < V_S < 5.5\text{ V}$

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

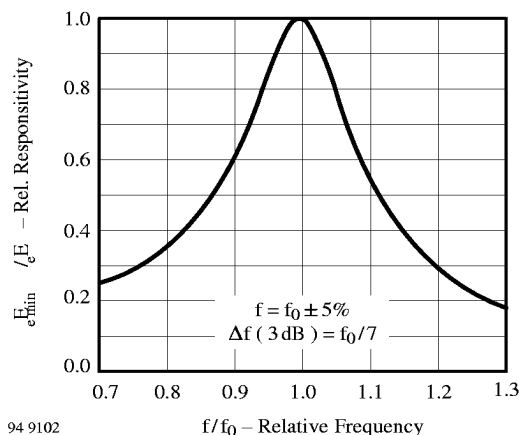


Figure 1. Frequency Dependence of Responsivity

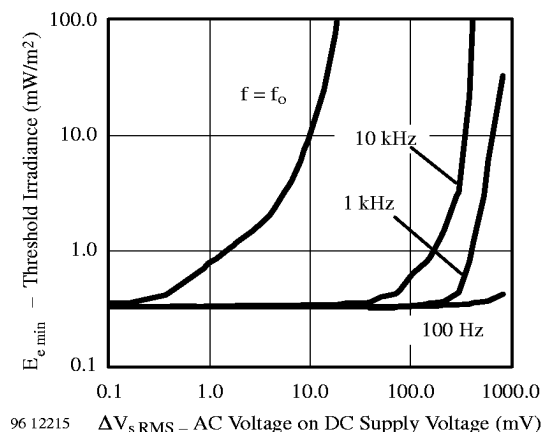


Figure 4. Sensitivity vs. Supply Voltage Disturbances

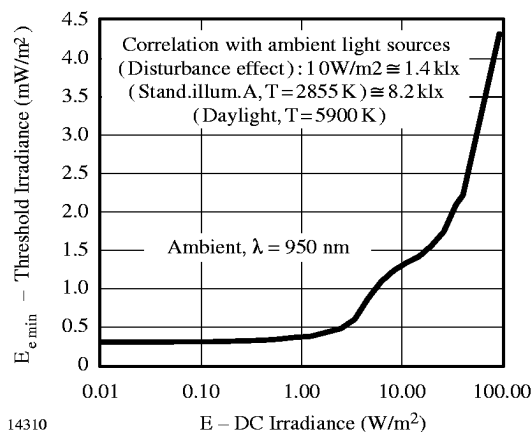


Figure 2. Sensitivity in Bright Ambient

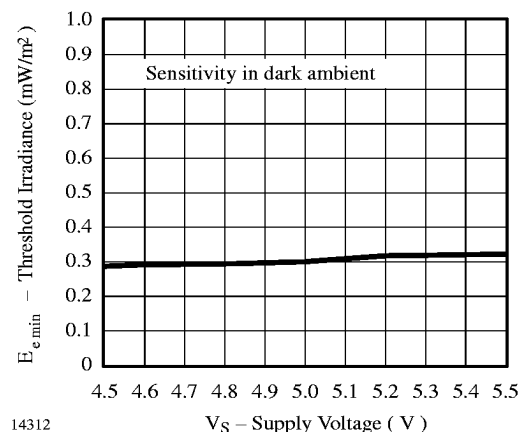


Figure 5. Sensitivity vs. Supply Voltage

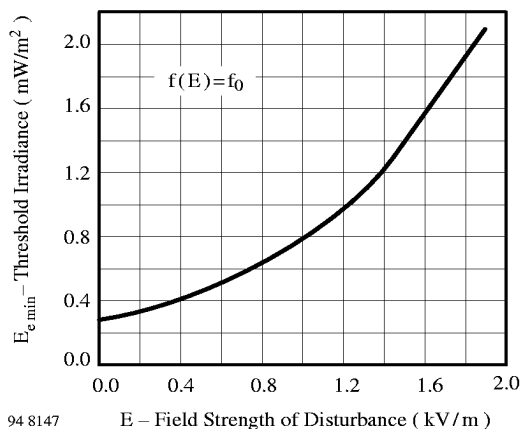


Figure 3. Sensitivity vs. Electric Field Disturbances

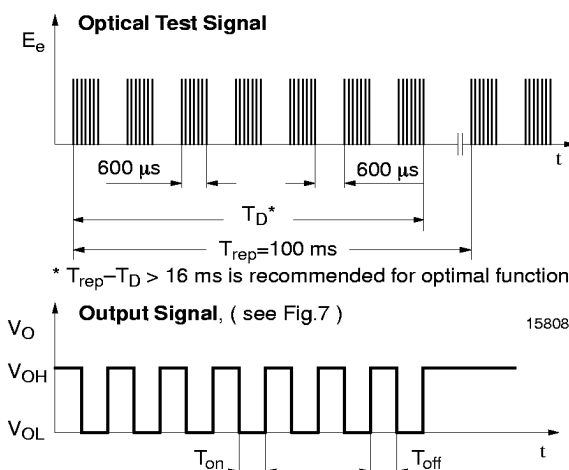


Figure 6. Output Function

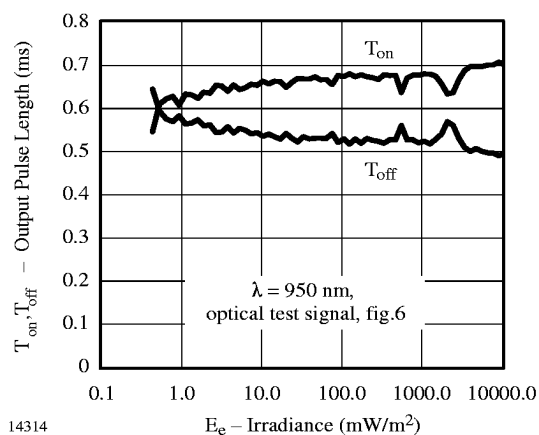


Figure 7. Output Pulse Diagram

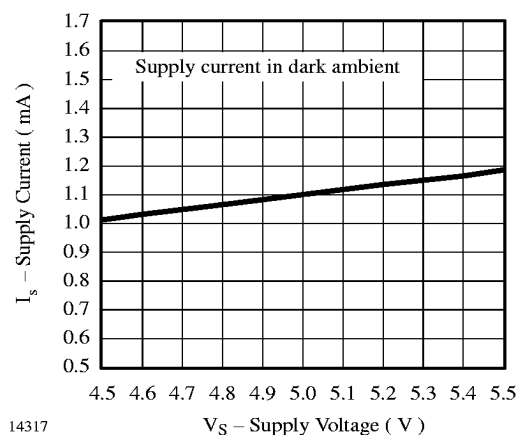


Figure 10. Supply Current vs. Supply Voltage

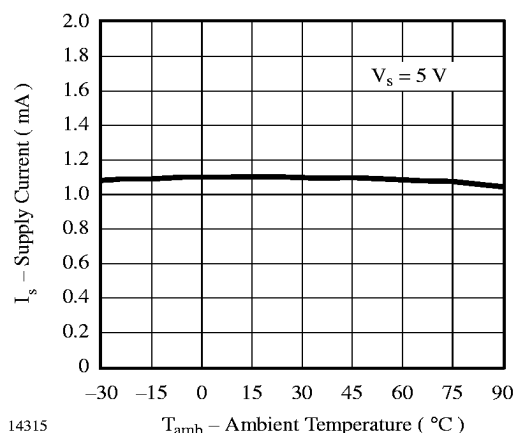


Figure 8. Supply Current vs. Ambient Temperature

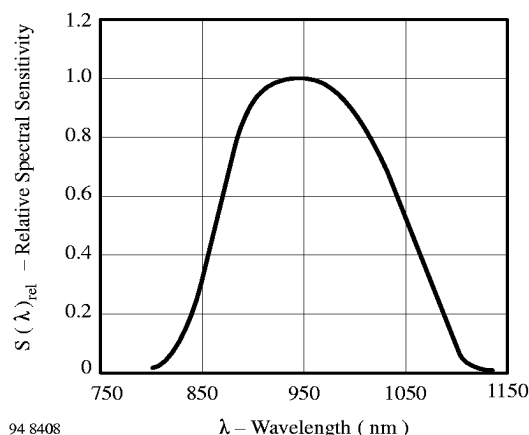


Figure 11. Relative Spectral Sensitivity vs. Wavelength

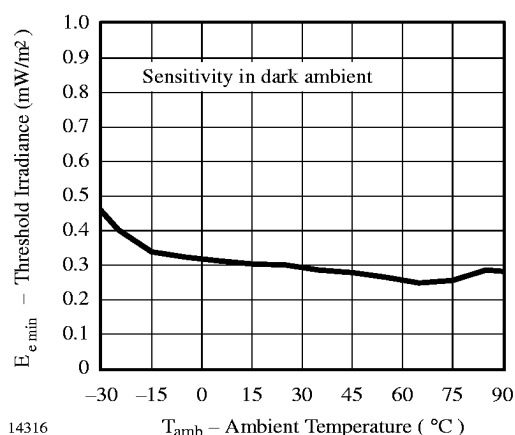


Figure 9. Sensitivity vs. Ambient Temperature

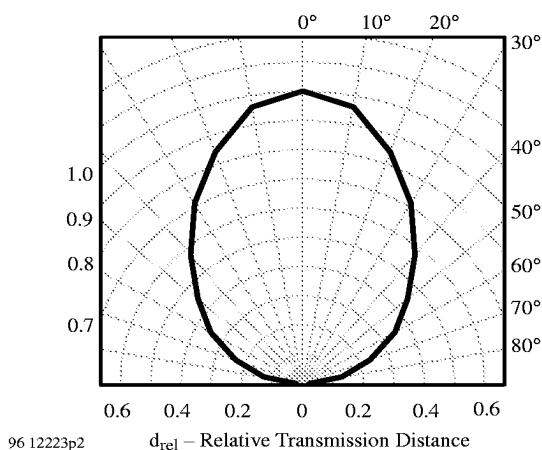


Figure 12. Directivity



Dimensions in mm

