

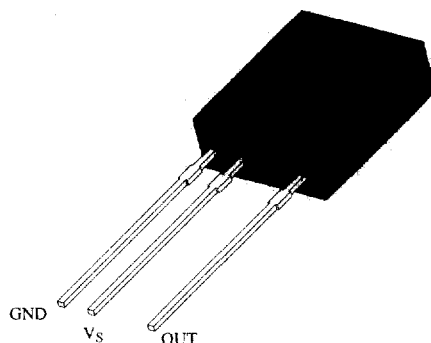
Photo Modules for PCM Remote Control Systems

Available types for different carrier frequencies

Type	f_0	Type	f_0
TSOP1730	30 kHz	TSOP1733	33 kHz
TSOP1736	36 kHz	TSOP1737	36.7 kHz
TSOP1738	38 kHz	TSOP1740	40 kHz
TSOP1756	56 kHz		

Description

The TSOP17.. - 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. TSOP17.. is the standard IR remote control receiver series, supporting all major transmission codes.

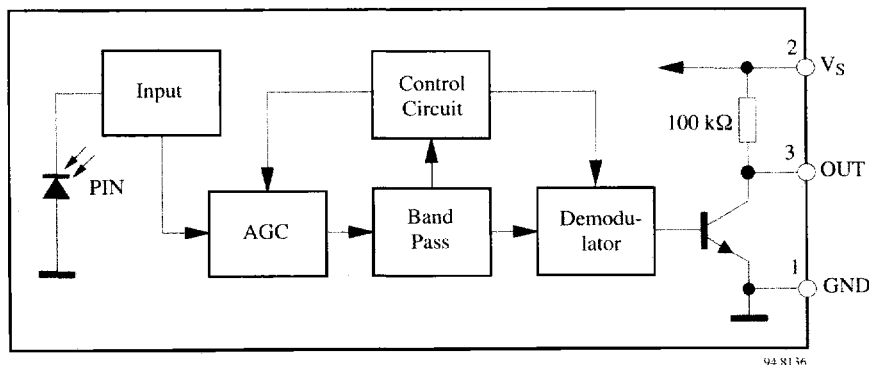


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Features

- 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
- Low power consumption
- High immunity against ambient light
- Continuous data transmission possible (1200 bit/s)
- Suitable burst length ≥ 10 cycles/burst

Block Diagram



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Absolute Maximum Ratings

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

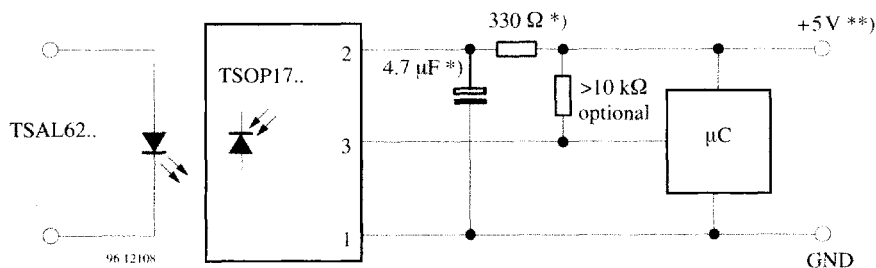
Parameter	Test Conditions	Symbol	Value	Unit
Supply Voltage	(Pin 2)	V_S	-0.3...6.0	V
Supply Current	(Pin 2)	I_S	5	mA
Output Voltage	(Pin 3)	V_O	-0.3...6.0	V
Output Current	(Pin 3)	I_O	5	mA
Junction Temperature		T_j	100	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-25...+85	$^{\circ}\text{C}$
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}	0.4	0.6	0.8	mA
	$V_S = 5\text{ V}$, $E_v = 40\text{ klx}$, sunlight	I_{SH}		1.0		mA
Transmission Distance	$E_v = 0$, test signal see fig.7, IR diode TSIP5201, $I_F = 400\text{ mA}$	d		35		m
Output Voltage Low (Pin 3)	$I_{OSL} = 0.5\text{ mA}$, $E_e = 0.7\text{ mW/m}^2$, $f = f_0$, $t_p/T = 0.4$	V_{OSL}			250	mV
Irradiance (30 – 40 kHz)	Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal (see fig.7)	$E_{e\text{ min}}$		0.35	0.5	mW/m^2
Irradiance (56 kHz)	Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal (see fig.7)	$E_{e\text{ min}}$		0.4	0.6	mW/m^2
Irradiance		$E_{e\text{ max}}$	30			W/m^2
Directivity	Angle of half transmission distance	$\phi_{1/2}$		± 45		deg

Application Circuit



*) 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)

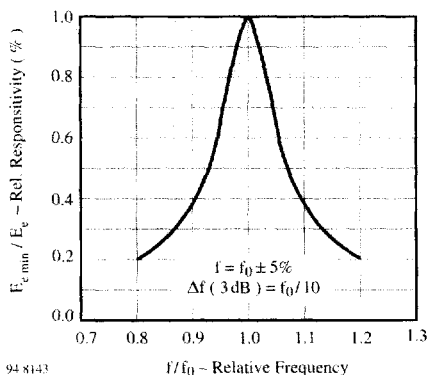


Figure 1. Frequency Dependence of Responsivity

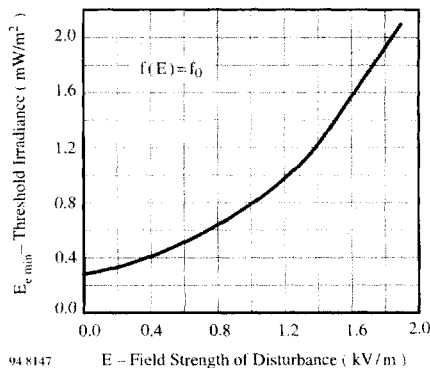


Figure 4. Sensitivity vs. Electric Field Disturbances

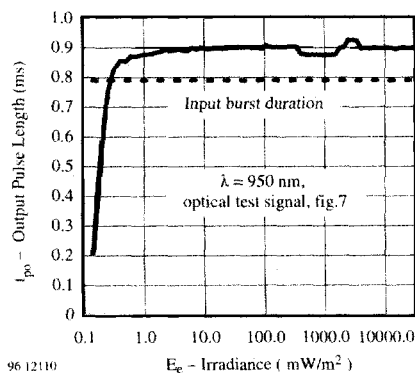


Figure 2. Sensitivity in Dark Ambient

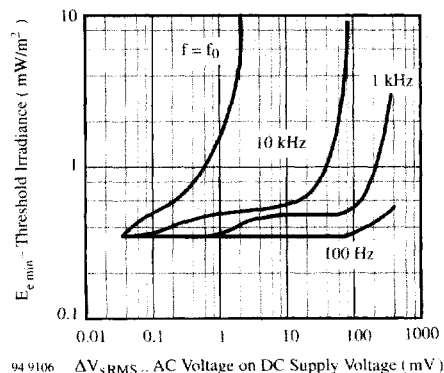


Figure 5. Sensitivity vs. Supply Voltage Disturbances

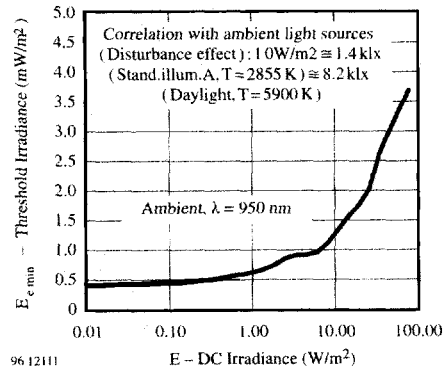


Figure 3. Sensitivity in Bright Ambient

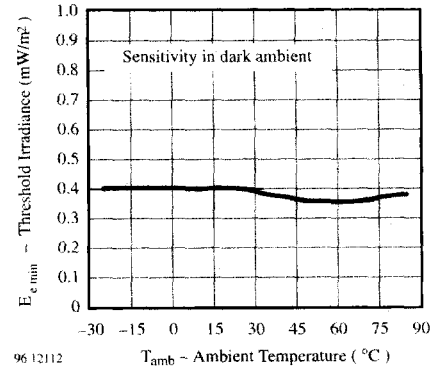


Figure 6. Sensitivity vs. Ambient Temperature

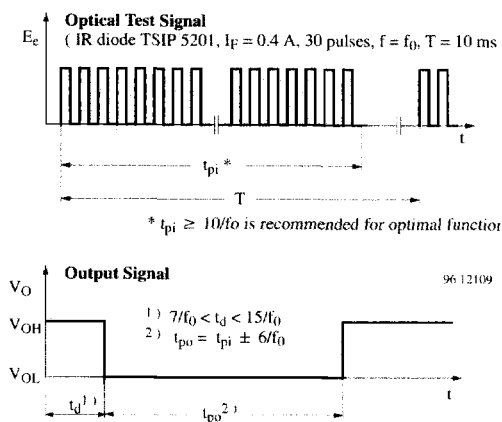


Figure 7. Output Function

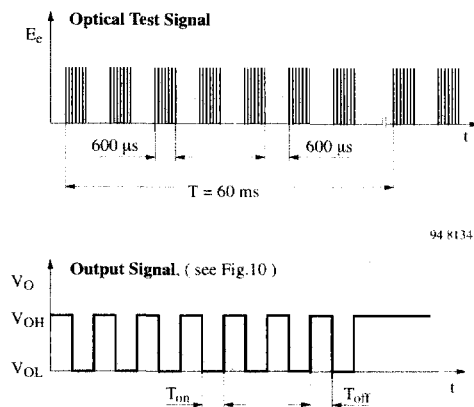


Figure 8. Output Function

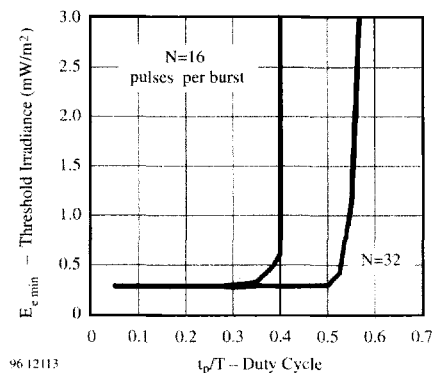


Figure 9. Sensitivity vs. Duty Cycle

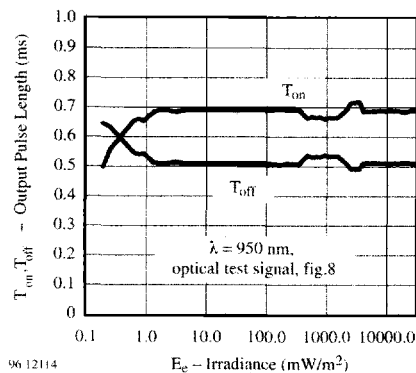


Figure 10. Output Pulse Diagram

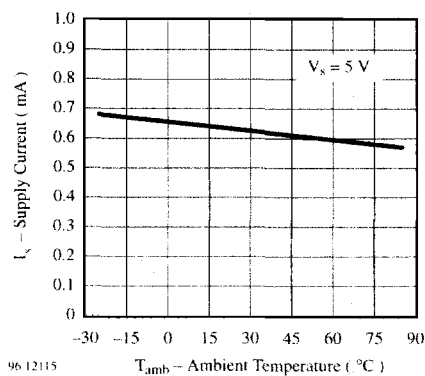


Figure 11. Supply Current vs. Ambient Temperature

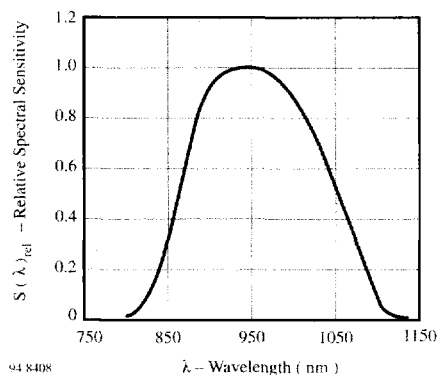


Figure 12. Relative Spectral Sensitivity vs. Wavelength

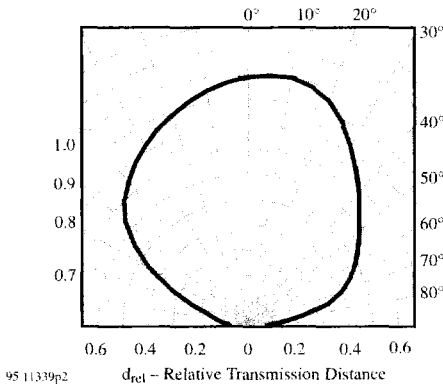


Figure 13. Vertical Directivity ϕ_y

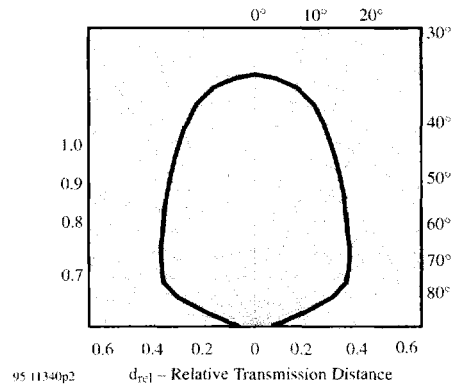
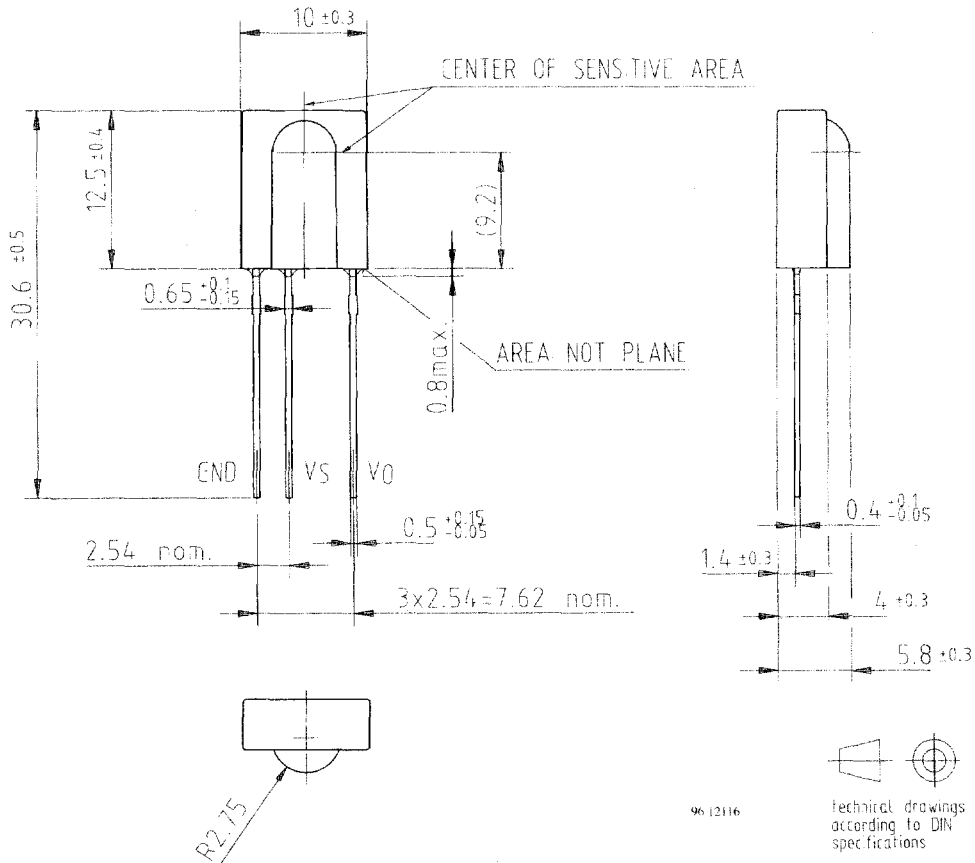


Figure 14. Horizontal Directivity ϕ_x

Dimensions in mm



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technical drawings
according to DIN
specifications