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ABSOLUTE MAXIMUM RATINGS							
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT			
Supply voltage (pin 2)		V _S	- 0.3 to + 6	V			
Supply current (pin 2)		I _S	3	mA			
Output voltage (pin 3)		Vo	- 0.3 to (V _S + 0.3)	V			
Output current (pin 3)		I _O	5	mA			
Junction temperature		Tj	100	°C			
Storage temperature range		T _{stg}	- 25 to + 85	°C			
Operating temperature range		T _{amb}	- 25 to + 85	°C			
Power consumption	T _{amb} ≤ 85 °C	P _{tot}	10	mW			
Soldering temperature	$t \le 10 \text{ s}, 1 \text{ mm from case}$	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 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		Vs	2.5		5.5	V
Supply current (pin 2)	$E_{V} = 0, V_{S} = 3.3 V$	I _{SD}	0.27	0.35	0.45	mA
	$E_v = 40$ klx, sunlight	I _{SH}		0.45		mA
Transmission distance	$E_V = 0$, test signal see fig. 1, IR diode TSAL6200, $I_F = 250 \text{ mA}$	d		45		m
Output voltage low (pin 3)	$I_{OSL} = 0.5 \text{ mA}, E_e = 0.7 \text{ mW/m}^2,$ 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 min.}		0.15	0.35	mW/m²
Maximum irradiance	t_{pi} - 5/f ₀ < t_{po} < t_{pi} + 6/f ₀ , test signal see fig. 1	E _{e max.}	30			W/m²
Directivity	Angle of half transmission distance	Ψ1/2		± 45		deg

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

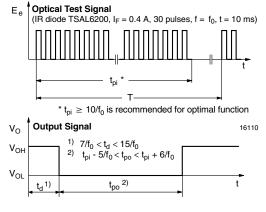


Fig. 1 - Output Active Low

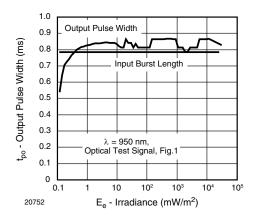
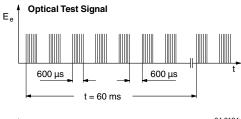


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient



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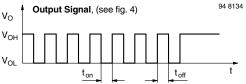


Fig. 3 - Output Function

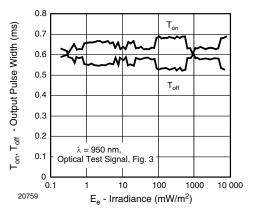


Fig. 4 - Output Pulse Diagram

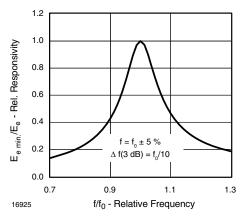


Fig. 5 - Frequency Dependence of Responsivity

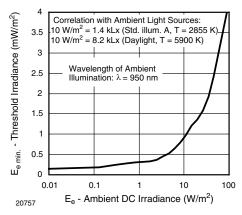


Fig. 6 - Sensitivity in Bright Ambient

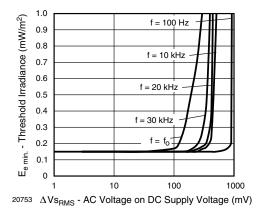


Fig. 7 - Sensitivity vs. Supply Voltage Disturbances

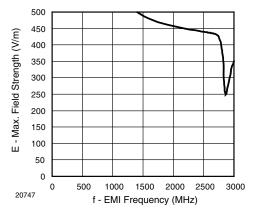


Fig. 8 - Sensitivity vs. Electric Field Disturbances



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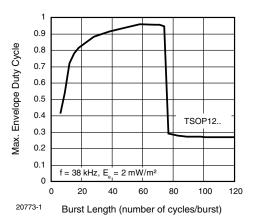


Fig. 9 - Max. Envelope Duty Cycle vs. Burst Length

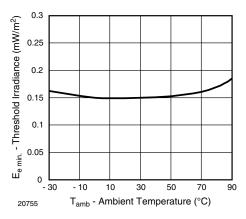


Fig. 10 - Sensitivity vs. Ambient Temperature

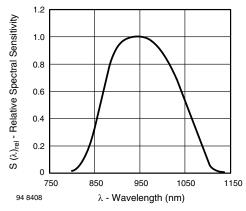


Fig. 11 - Relative Spectral Sensitivity vs. Wavelength

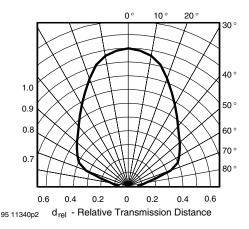


Fig. 12 - Horizontal Directivity

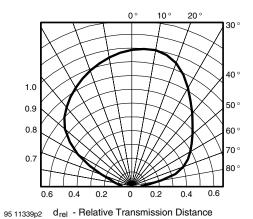


Fig. 13 - Vertical Directivity

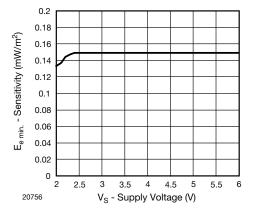


Fig. 14 - Sensitivity vs. Supply Voltage



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SUITABLE DATA FORMAT

The TSOP12.. series is designed to suppress spurious output pulses due to noise or disturbance signals. Data and disturbance signals can be distinguished by the devices according to carrier frequency, burst length and envelope duty cycle. The data signal should be close to the band-pass center frequency (e.g. 38 kHz) and fulfill the conditions in the table below.

When a data signal is applied to the TSOP12.. in the presence of a disturbance signal, the sensitivity of the receiver is reduced to insure that no spurious pulses are present at the output. Some examples of disturbance signals which are suppressed are:

- DC light (e.g. from tungsten bulb or sunlight)
- · Continuous signals at any frequency
- Strongly or weakly modulated noise from fluorescent lamps with electronic ballasts (see figure 15 or figure 16)

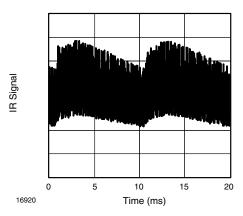


Fig. 15 - IR Signal from Fluorescent Lamp with Low Modulation

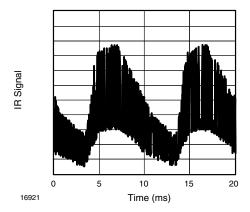


Fig. 16 - IR Signal from Fluorescent Lamp with High Modulation

	TSOP12			
Minimum burst length	10 cycles/burst			
After each burst of length a minimum gap time is required of	10 to 70 cycles ≥ 10 cycles			
For bursts greater than a minimum gap time in the data stream is needed of	70 cycles > 4 x burst length			
Maximum number of continuous short bursts/second	1800			
Recommended for NEC code	yes			
Recommended for RC5/RC6 code	yes			
Recommended for Sony code	yes			
Recommended for Thomson 56 kHz code	yes			
Recommended for Mitsubisi code (38 kHz, preburst 8 ms, 16 bit)	yes			
Recommended for Sharp code	yes			
Suppression of interference from fluorescent lamps	Most common disturbance signals are suppressed			

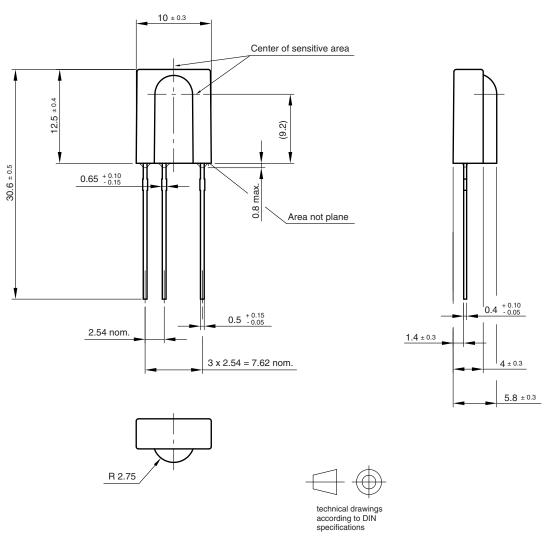
Note

• For data formats with short bursts please see the datasheet for TSOP11.., TSOP13.



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PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.550-5095.01-4

Issue: 20; 15.03.10

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