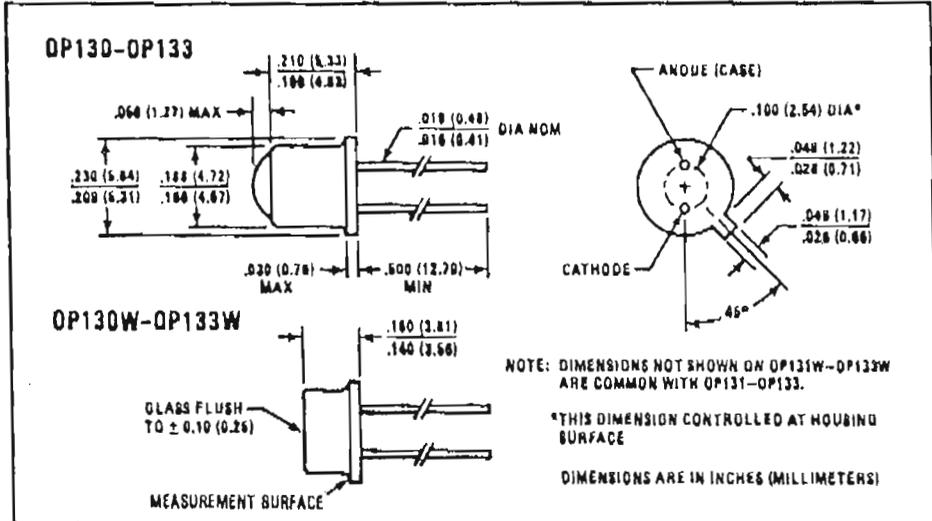
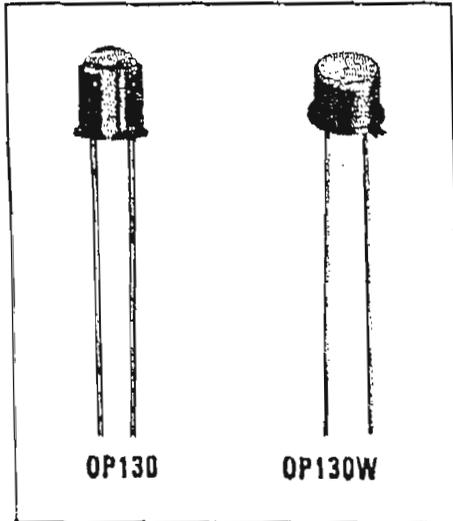


GaAs Hermetic Infrared Emitting Diodes

Types OP130, OP131, OP132, OP133, OP130W, OP131W, OP132W, OP133W



Features

- Reliability significantly improved
- TO-46 hermetically sealed packages
- Designer specified to apertured power with ranges designed to satisfy most applications
- Mechanically and spectrally matched to OP800/OP800W and OP693/OP698 phototransistors or OP830/OP830W photodarlington

Description

The OP130 series are high intensity gallium arsenide infrared emitting diodes mounted in hermetic TO-46 housings. They have lensed cans providing a relatively narrow beam angle. The narrow beam angle and the specified radiant intensity allow ease of design in beam interrupt applications in conjunction with the OP800 or OP698 series. The GaAs LED offers improved reliability in degradation due to improved processing techniques. (See percent change in I_a versus Time.)

The OP130W series are wide beam angle GaAs LEDs specified for ease of design in applications where radiant intensity over a broad area is required or when an accessory lens is being used. They are mechanically and spectrally matched to the OP800W and OP830W series.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

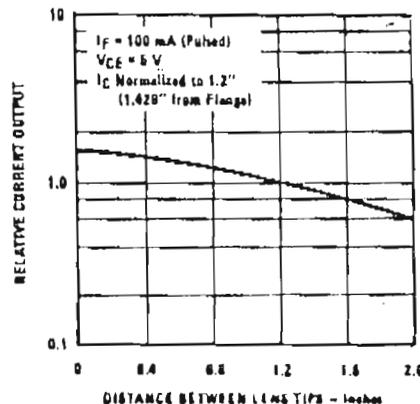
Reverse Voltage	2.0 V
Continuous Forward Current	100 mA
Pulse Forward Current (Pulse Width = 2 μsec , 0.1% Duty Cycle)	10.0 A
Storage and Operating Temperature Range	-65°C to +150°C
Lead Soldering Temperature (1/16 in. (1.6 mm) from case for 5 sec. with soldering iron) ⁽¹⁾	240°C
Power Dissipation	200 mW ⁽²⁾

Notes:

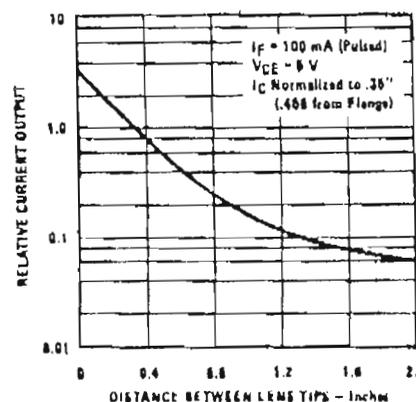
- (1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering.
- (2) Derate linearly 1.8 mW/°C above 25°C
- (3) $E_{\theta}(\text{APT})$ is a measurement of the average radiant intensity within the cone formed by the measurement surface, a radius of 1.428" (36.30 mm) measured from the lens side of the tab to the sensing surface and a sensing surface of 0.250" (6.36 mm) in diameter forming a 10° cone. (See Dimensional Drawing.) On the OP133W series, a radius of 0.466" (11.84 mm) measured from the lens side of the tab to the sensing surface and a sensing surface of 0.250" (6.36 mm) in diameter forms a 30° cone.
- (4) Measurement made with 100 μs pulse measured at the trailing edge of the pulse with a duty cycle of 0.1% and an $I_f = 100 \text{ mA}$.

Typical Performance Curves

Coupling Characteristics of OP130 and OP800



Coupling Characteristics of OP130W and OP800W



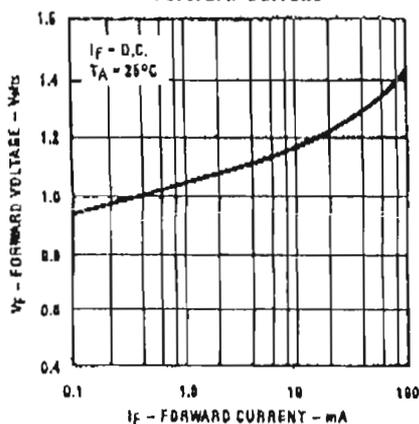
Types OP130, OP131, OP132, OP133, OP130W, OP131W, OP132W, OP133W

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

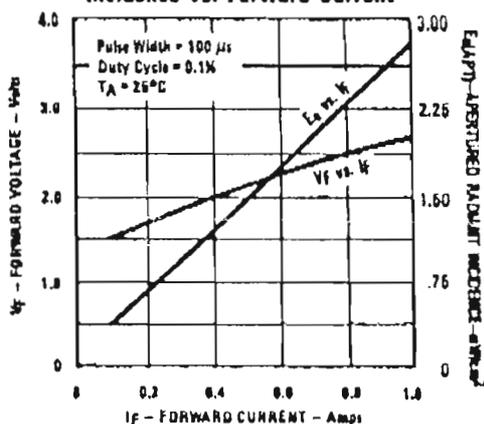
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$E_a(\text{APT})$	Apertured Radiant Incidence		0.30 0.60 1.00 1.60		mW/cm^2 mW/cm^2 mW/cm^2 mW/cm^2	$I_F = 100 \text{ mA}$ (1) (4) $I_F = 100 \text{ mA}$ (3) (4) $I_F = 100 \text{ mA}$ (3) (4) $I_F = 100 \text{ mA}$ (3) (4)
P_O	Radiant Power Output	1.0 3.0 4.0 6.0			mW mW mW mW	$I_F = 100 \text{ mA}$ (4) $I_F = 100 \text{ mA}$ (4) $I_F = 100 \text{ mA}$ (4) $I_F = 100 \text{ mA}$ (4)
V_F	Forward Voltage		1.5	1.75	V	$I_F = 100 \text{ mA}$ (4)
I_R	Reverse Current			100	μA	$V_R = 2 \text{ V}$
λ_P	Wavelength at Peak Emission		830		nm	$I_F = 100 \text{ mA}$ (4)
Δ	Spectral Bandwidth Between Half Power Points		60		nm	$I_F = 100 \text{ mA}$ (4)
θ_{HP}	Emission Angle at Half Power Points		18 50		Deg. Deg.	$I_F = 100 \text{ mA}$ (4) $I_F = 100 \text{ mA}$ (4)
t_r	Output Rise Time		1000		ns	$I_F(\text{PK}) = 100 \text{ mA}$, $PW = 10 \mu\text{s}$, $\text{D.C.} = 10\%$
t_f	Output Fall Time		600		ns	

Typical Performance Curves

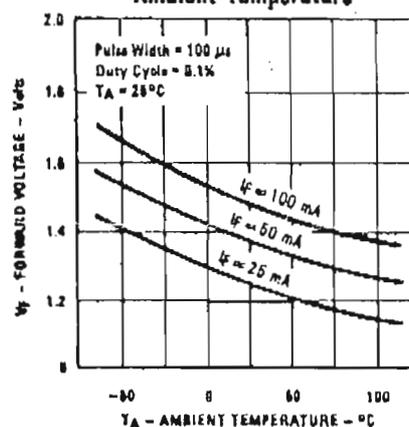
Forward Voltage vs. Forward Current



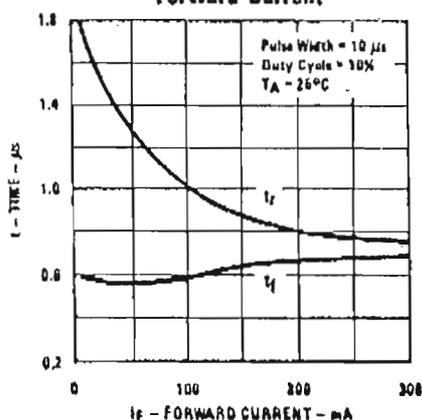
Forward Voltage and Radiant Incidence vs. Forward Current



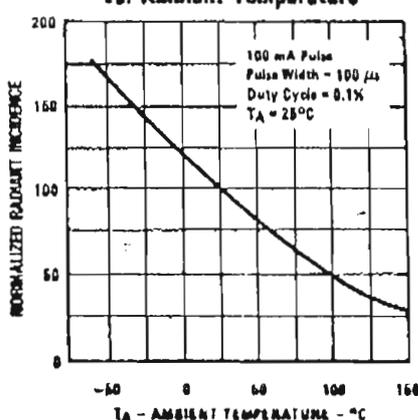
Forward Voltage vs. Ambient Temperature



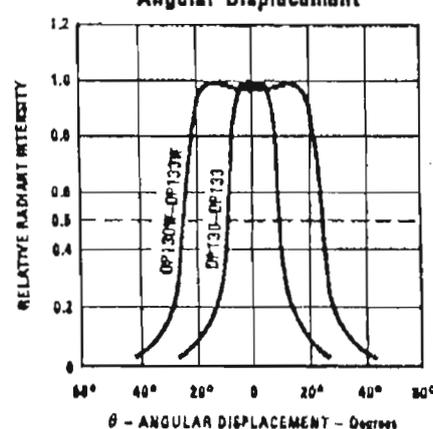
Rise and Fall Time vs. Forward Current



Normalized Radiant Incidence vs. Ambient Temperature



Relative Radiant Intensity vs. Angular Displacement



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible

Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215849
© TRW Inc. 1985. TRW is the name and mark of TRW Inc. Printed in U.S.A.