



## Slotted Photointerrupters

LTH-301-20/LTH-301-24/LTH-306-04

## Features

- Non-contact switching.
- For direct PC board or dual-in-line socket mounting.
- Fast switching speed.

## Application

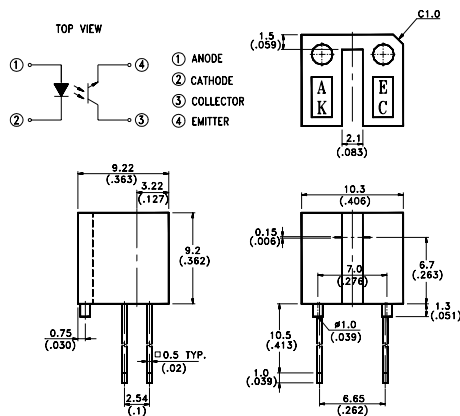
- Printer
- Scanner
- Disk driver

### Description

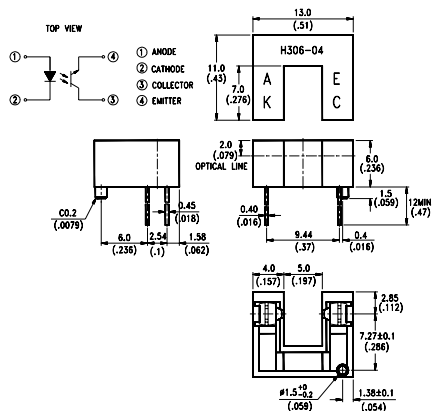
The LTH-301/LTH-306 series consist of Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor mounted in a black plastic housing. Phototransistor switching takes place whenever an opaque object passes through the slot. The LTH-301A series is designed for direct soldering into PC board or mounting in standard dual-in-line socket.

## Package Dimensions

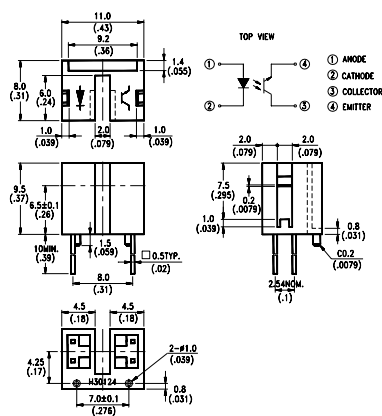
LTH-301-20



LTH-306-04



LTH-301-24



## PHOTOINTERRUPTERS

Notes:

- 1.All dimensions are in millimeters (inches).
- 2.Tolerance is  $\pm 0.25$  mm (.010").
- 3.Lead spacing is measured where the leads emerge from the package.
- 4.Specifications are subject to change without notice.

## Absolute Maximum Ratings at Ta=25°C

Parameter		Symbol	Maximum Rating	Unit
Input LED	Continuous Forward Current	I <sub>F</sub>	60	mA
	Reverse Voltage	V <sub>R</sub>	5	V
	Peak Forward Current (Pulse Wide=10 $\mu$ S, 300PPS)	I <sub>CP</sub>	1	A
	Power Dissipation	P <sub>D</sub>	75	mW
Output phototransistor	Collector Current	I <sub>C</sub>	20	mA
	Power Dissipation	P <sub>C</sub>	100	mW
	Collector-emitter Voltage	V <sub>CEO</sub>	30	V
	Emitter-collector Voltage	V <sub>ECO</sub>	5	V
Operating Temperature Range		T <sub>opr</sub>	-25°C to + 85°C	
Storage Temperature Range		T <sub>stg</sub>	-40°C to + 100°C	
Lead Soldering Temperature [1.6mm(.063 in.)from body]		T <sub>s</sub>	260°C for 5 Seconds	

## Electrical Optical Characteristics at Ta=25°C

Parameter		Symbol	Part No.	Min.	Typ.	Max.	Unit	Test Condition
Input LED								
Forward Voltage		V <sub>F</sub>			1.2	1.6	V	I <sub>F</sub> =20mA
Reverse Current		I <sub>R</sub>				100	$\mu$ A	V <sub>R</sub> =5V
Output phototransistor								
Collector Dark Current		I <sub>CEO</sub>				100	nA	V <sub>CE</sub> =10V
Coupler								
Collector-Emitter Saturation Voltage		V <sub>CE(sat)</sub>	LTH-301-20			0.4	V	I <sub>C</sub> =0.035mA, I <sub>F</sub> =20mA
			LTH-301-24			0.4		I <sub>C</sub> =0.35mA, I <sub>F</sub> =20mA
			LTH-306-04			0.4		I <sub>C</sub> =0.25mA, I <sub>F</sub> =20mA
On State Collector Current		I <sub>C(ON)</sub>	LTH-301-20	0.07	0.15		mA	V <sub>CE</sub> =5V, I <sub>F</sub> =20mA
			LTH-301-24	0.7		20		
			LTH-306-04	0.5	2			
Response Time	Rise Time	t <sub>r</sub>			3	15	$\mu$ S	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA R <sub>L</sub> =100 $\Omega$
	Fall Time	t <sub>f</sub>			4	20		

# Typical Electrical/Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Power Dissipation vs.  
Ambient Temperature

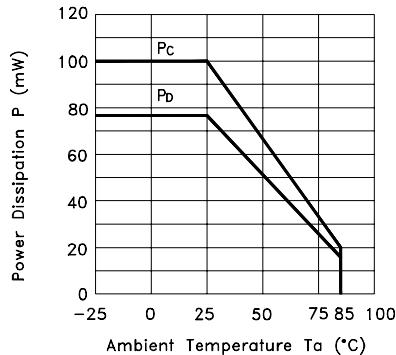


Fig.2 Forward Current vs.  
Forward Voltage

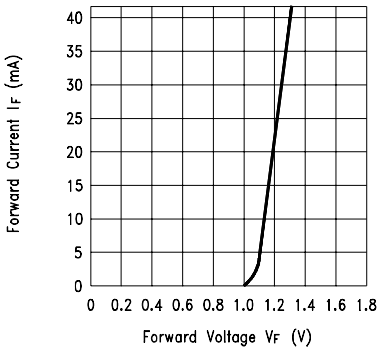


Fig.3 Collector Current vs.  
Collector-emitter Voltage

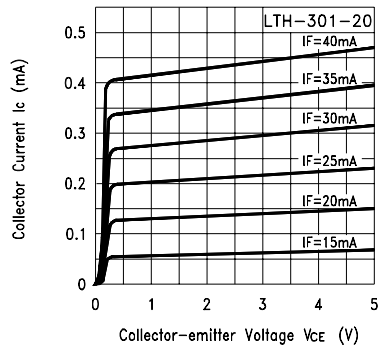


Fig.4 Collector Current vs.  
Collector-emitter Voltage

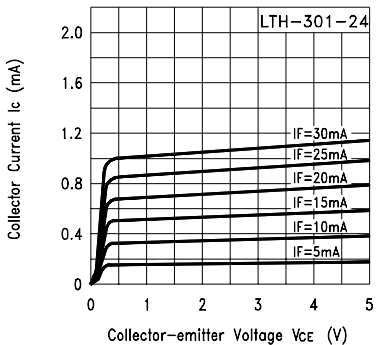


Fig.5 Collector Current vs.  
Collector-emitter Voltage

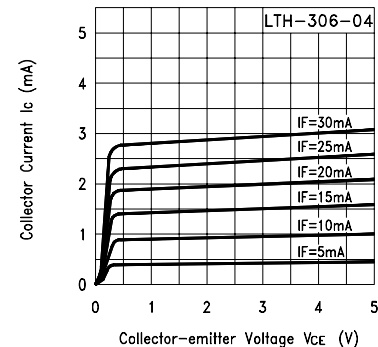
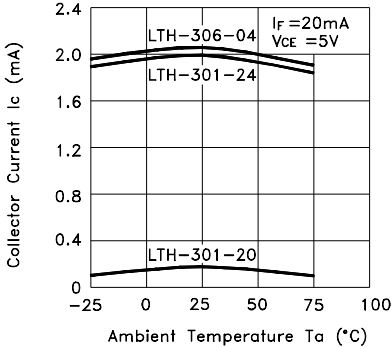


Fig.6 Collector Current vs.  
Ambient Temperature



# Typical Electrical/Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

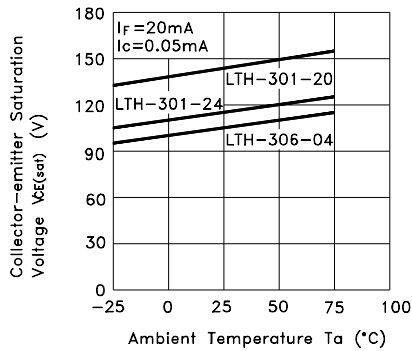
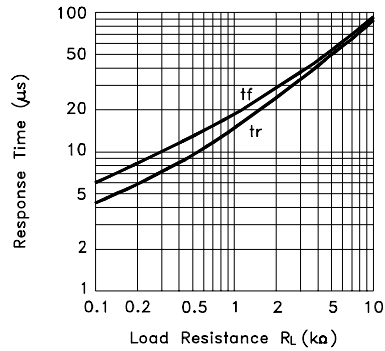


Fig.8 Response Time vs. Load Resistance



Test Circuit for Response Time

