



Slotted Photointerrupters

LTH-301A/LTH-301-05/LTH-301-07/LTH-301-19

LTH-301-23/LTH-301-32/LTH-306-01/LTH-306-02

Features

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

Application

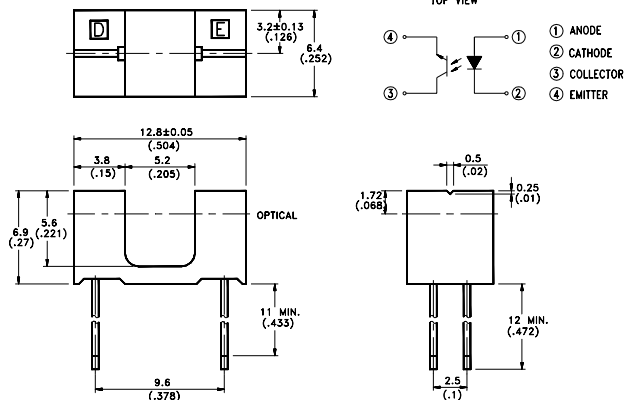
- Scanner
- Printer
- FAX machine
- Counter

Description

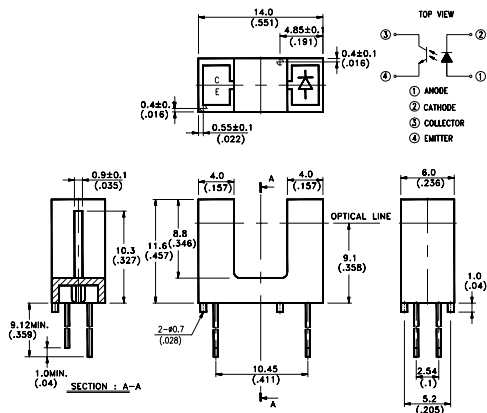
The LTH-301/LTH-306 series consist of Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor mounted in a black plastic housing. Phototransistor switching takes place whenever an opaque object passes through the slot. These series are designed for direct soldering into PC board or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

Package Dimensions

LTH-301A



LTH-301-05



Notes:

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

Figure 1 shows the dimensions and electrical connections of the 2N4340A JFET. The top view shows a rectangular package with dimensions 143.2 (SS1) and 6.1 (.240). The side view shows a package with dimensions 9.0 (.354), 7.543, 2 (.293), 0.2 (.008), 0.7 (.028), 2.5 (.098), 0.5 (.020), 2.2 (.087), 3.681 (.145), 1.0 (.039), and 2.54 (.1). The cross-sectional view shows a package with dimensions 2.35 (.093), 6.8 (.260), 5.2 (.200), and 2-90.7 (.700). A legend indicates: ① ANODE, ② CATHODE, ③ COLLECTOR, ④ EMITTER.

TOP VIEW

① ANODE
② CATHODE
③ COLLECTOR
④ EMITTER

OPTICAL

CATHODE **COLLECTOR**

ANODE **EMITTER**

TOP VIEW

① ANODE
② CATHODE
③ COLLECTOR
④ EMITTER

13.7
(.54)
5.0
(.197)
5.6
(.22)

C1
(.039)

2.54NOM
(.10)

10
(.39)
7.5
(.30)
2.2±0.5
(.087)

2.5
(.098)
(Center of sensor)

10.3
(.41)
0.5±0.1
(.02)

E
A
C
K

TOP VIEW

① ANODE
② CATHODE
③ COLLECTOR
④ EMITTER

Technical drawing of the LITH-301-32 tube showing top, front, and side views with dimensions and a pinout diagram.

Top View Dimensions:

- Overall width: 2440.2 (±0.008)
- Pin 1 (Anode) diameter: 4.1 (±0.1)
- Pin 2 (Cathode) diameter: 8.1 (±0.1)
- Pin 3 (Collector) diameter: 4.1 (±0.1)
- Pin 4 (Emitter) diameter: 8.1 (±0.1)
- Pin 1 to Pin 2 distance: 15.0 (+0.2, -0)
- Pin 2 to Pin 3 distance: 0.2 (±0.08)
- Pin 3 to Pin 4 distance: 10.4 (+0.4, -0.1)
- Pin 4 to Pin 1 distance: 15.3 (±0.2)
- Pin 1 to Pin 4 distance: 191.0 (±0.748 ±0.04)
- Pin 2 to Pin 3 distance: 0.7 (±0.08)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)
- Pin 1 to Pin 2 distance: 1.5 (±0.09)
- Pin 2 to Pin 3 distance: 1.0 (±0.09)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)

Front View Dimensions:

- Overall height: 7.35 (±0.05)
- Pin 1 (Anode) diameter: 11.6 (±0.450)
- Pin 2 (Cathode) diameter: 5.2 (±0.05)
- Pin 3 (Collector) diameter: 5.2 (±0.05)
- Pin 4 (Emitter) diameter: 5.2 (±0.05)
- Pin 1 to Pin 2 distance: 191.0 (±0.748 ±0.04)
- Pin 2 to Pin 3 distance: 0.7 (±0.08)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)
- Pin 1 to Pin 4 distance: 1.5 (±0.09)
- Pin 2 to Pin 3 distance: 1.0 (±0.09)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)

Side View Dimensions:

- Overall width: 2.54 (±0.100)
- Pin 1 (Anode) diameter: 1.5 (±0.09)
- Pin 2 (Cathode) diameter: 1.0 (±0.09)
- Pin 3 (Collector) diameter: 1.5 (±0.09)
- Pin 4 (Emitter) diameter: 1.0 (±0.09)
- Pin 1 to Pin 2 distance: 15.0 (+0.2, -0)
- Pin 2 to Pin 3 distance: 0.2 (±0.08)
- Pin 3 to Pin 4 distance: 10.4 (+0.4, -0.1)
- Pin 4 to Pin 1 distance: 15.3 (±0.2)
- Pin 1 to Pin 4 distance: 191.0 (±0.748 ±0.04)
- Pin 2 to Pin 3 distance: 0.7 (±0.08)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)
- Pin 1 to Pin 2 distance: 1.5 (±0.09)
- Pin 2 to Pin 3 distance: 1.0 (±0.09)
- Pin 3 to Pin 4 distance: 1.5 (±0.09)
- Pin 4 to Pin 1 distance: 1.0 (±0.09)

Absolute Maximum Ratings at Ta=25°C

Parameter		Symbol	Maximum Rating	Unit
Input LED	Continuous Forward Current	I _F	60	mA
	Reverse Voltage	V _R	5	V
	Peak Forward Current (Pulse Wide=10 μ S,300PPS)	I _{CP}	1	A
	Power Dissipation	P _D	75	mW
Output phototransistor	Collector Current	I _C	20	mA
	Power Dissipation	P _C	100	mW
	Collector-emitter Voltage	V _{CEO}	30	V
	Emitter-collector Voltage	V _{ECO}	5	V
Operating Temperature Range		T _{opr}	-25°C to + 85°C	
Storage Temperature Range		T _{stg}	-40°C to + 100°C	
Lead Soldering Temperature [1.6mm(.063 in.)from body]		T _s	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 _F			1.2	1.6	V	I _F =20mA
Reverse Current		I _R				100	μ A	V _R =5V
Output phototransistor								
Collector Dark Current		I _{CEO}				100	nA	V _{CE} =10V
Coupler								
Collector-Emitter Saturation Voltage	V _{CE(sat)}	LTH-301A				0.4	V	I _C =0.25mA,I _F =20mA
		LTH-301-05				0.4		I _C =0.25mA,I _F =20mA
		LTH-301-07				0.4		I _C =0.25mA,I _F =20mA
		LTH-301-19				0.4		I _C =0.75mA,I _F =20mA
		LTH-301-23				0.4		I _C =0.2mA,I _F =20mA
		LTH-301-32				0.4		I _C =0.2mA,I _F =20mA
		LTH-306-01				0.4		I _C =2.5mA,I _F =20mA
		LTH-306-02				0.4		I _C =0.25mA,I _F =20mA
On State Collector Current	I _{C(ON)}	LTH-301A	0.5				mA	V _{CE} =5V,I _F =20mA
		LTH-301-05	0.5					
		LTH-301-07	0.4					
		LTH-301-19	1.5					
		LTH-301-23	0.4					
		LTH-301-32	0.4					
		LTH-306-01	5.0					
		LTH-306-02	0.5					
Response Time	Rise Time	t _r			3	15	μ S	V _{CE} =5V,I _C =2mA R _L =100 Ω
	Fall Time	t _f			4	20		

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

Fig.1 Power Dissipation vs.
Ambient Temperature

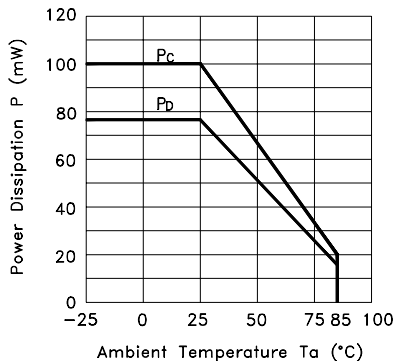


Fig.2 Forward Current vs.
Forward Voltage

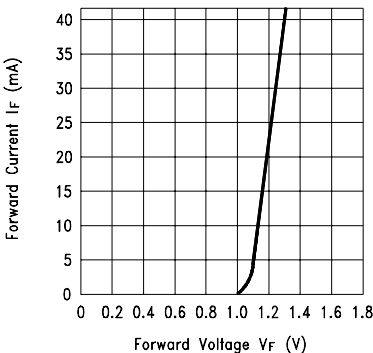


Fig.3 Collector Current vs.
Collector-emitter Voltage

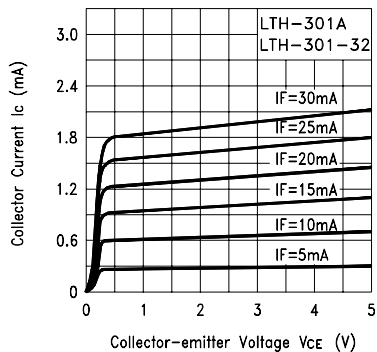


Fig.4 Collector Current vs.
Collector-emitter Voltage

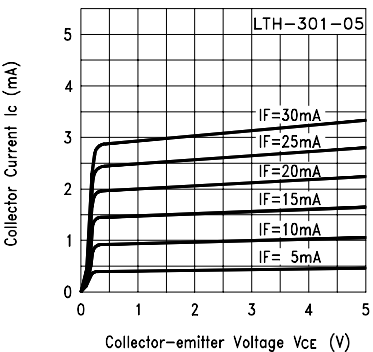


Fig.5 Collector Current vs.
Collector-emitter Voltage

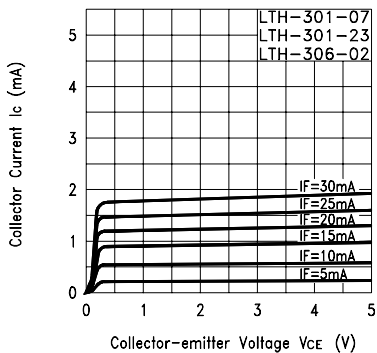
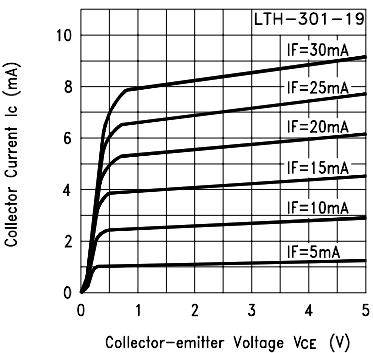


Fig.6 Collector Current vs.
Collector-emitter Voltage



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

Fig.7 Collector Current vs.
Collector-emitter Voltage

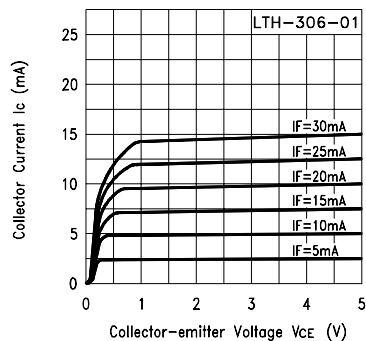


Fig.8 Collector Current vs.
Ambient Temperature

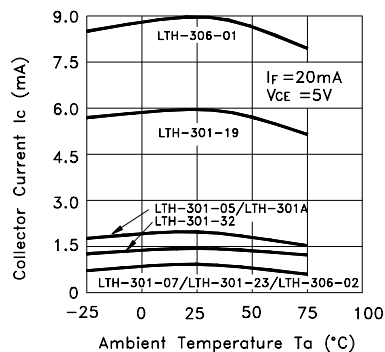


Fig.9 Collector-emitter Saturation
Voltage vs. Ambient Temperature

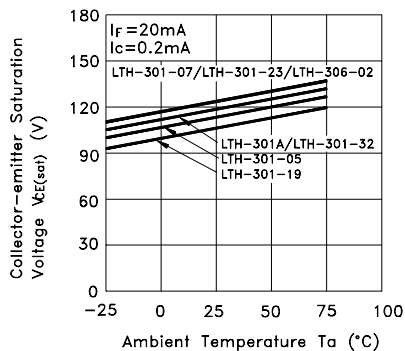
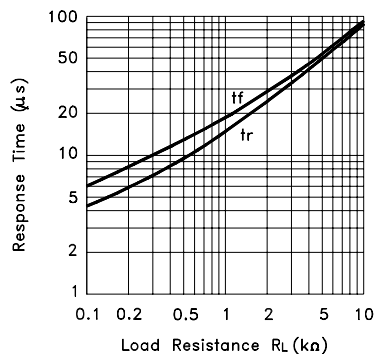


Fig.10 Response Time vs.
Load Resistance



Test Circuit for Response Time

