

# Photocoupler

## Part Name: LA314

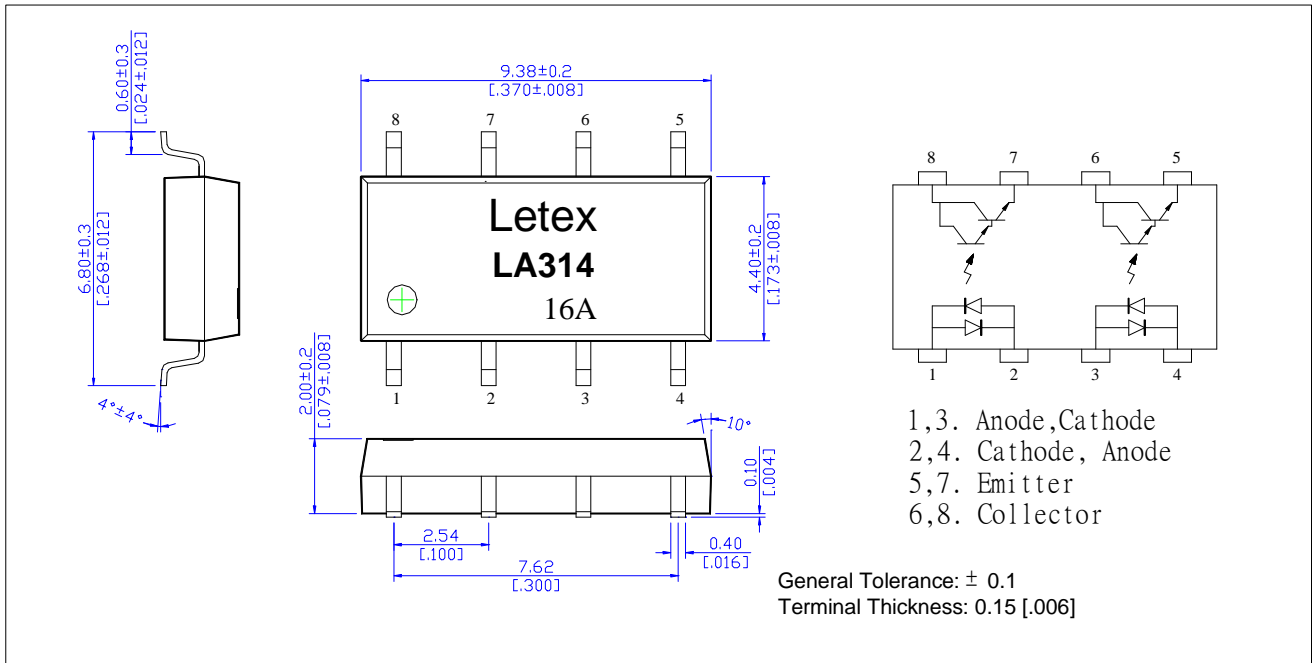
### Features

- SOP package 4 Pin type in miniature design
- 600% minimum current transfer ratio
- 1500V rms Input/Output isolation
- AC input.

### Applications

- Telephones
- Programmable controllers
- System appliances, measuring instruments.
- Signal transmission between circuits of different potentials and impedances.

Dimensions(Unit: mm [inch])



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Absolute Maximum Ratings (Ambient Temperature: 25°C)

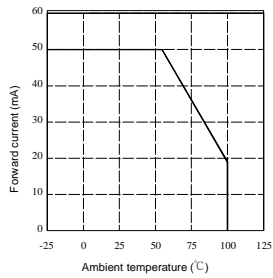
Item		Symbol	Rating	Units	Note
Input	Forward Current	I <sub>F</sub>	50	mA	
	Reverse Voltage	V <sub>R</sub>	5	V	
	Peak Forward Current	I <sub>FP</sub>	1	A	
Output	Collector to Emitter Voltage	V <sub>ceo</sub>	40	V	I <sub>c</sub> =1mA, I <sub>B</sub> =0
	Emitter to Collector Voltage	V <sub>eco</sub>	6	V	I <sub>E</sub> =100μA, I <sub>B</sub> =0
	Collector Current	I <sub>c</sub>	50	mA	
	Power Dissipation	P <sub>c</sub>	150	mW	
I/O Breakdown Voltage		V <sub>I/O</sub>	1500	V <sub>rms</sub>	RH=60%, 1min
Power Dissipation		P <sub>D</sub>	200	mW	
Storage Temperature		T <sub>stg</sub>	-55 to +125	°C	
Operating Temperature		T <sub>op</sub>	-55 to +100	°C	
Soldering Temperature		T <sub>Sol</sub>	260	°C	10 seconds max.

Electrical Specifications (Ambient Temperature: 25°C)

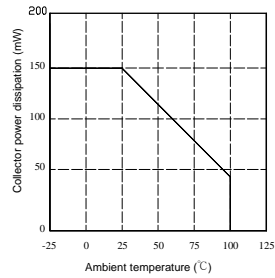
Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	Forward Voltage	V <sub>F</sub>		1.2	1.4	V	I <sub>F</sub> = ± 20mA
	Reverse Current	I <sub>R</sub>			-	μA	
	Junction Capacitance	C <sub>t</sub>		30		pF	V=0, f=1.0KHz
Output	C-E Breakdown Voltage	V <sub>ceo</sub>	35			V	I <sub>c</sub> =0.5mA
	E-C Breakdown Voltage	V <sub>eco</sub>	6			V	I <sub>e</sub> =0.1mA
	Collector Dark Current	I <sub>ceo</sub>			100	nA	V <sub>ce</sub> =20V, I <sub>F</sub> =0
Coupled	Current Transfer Ratio	CTR	600	1600	7000	%	I <sub>F</sub> = ± 1mA, V <sub>ce</sub> =5V
	Collector Saturation Voltage	V <sub>ce(sat)</sub>			1	V	I <sub>F</sub> =±20mA, I <sub>c</sub> =1mA
	Isolation Resistance	R <sub>I/O</sub>			10 <sup>9</sup>	Ω	V=500V DC
	Isolation Capacitance	C <sub>I/O</sub>		1.0		pF	V=0, f=1.0MHz
	Rise Time	t <sub>r</sub>			300	μs	V <sub>ce</sub> =5V, I <sub>c</sub> =2mA, R <sub>L</sub> =100Ω
	Fall Time	t <sub>f</sub>			250	μs	

# Photocoupler Reference Data

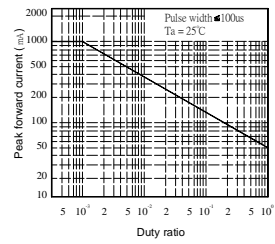
Forward current Vs.  
Ambient temperature



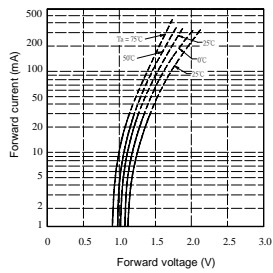
Collector power dissipation Vs.  
Ambient temperature



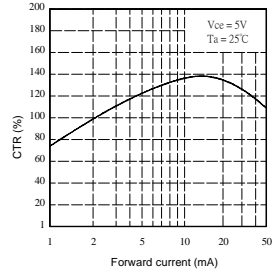
Peak forward current Vs.  
Duty ratio



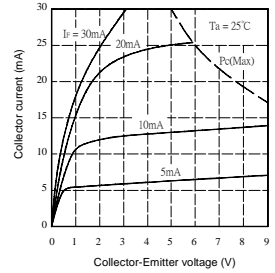
Forward current Vs.  
Forward voltage



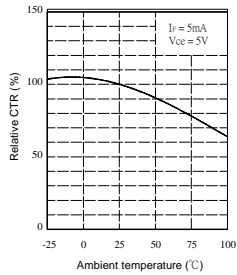
Current transfer ratio Vs.  
Forward current



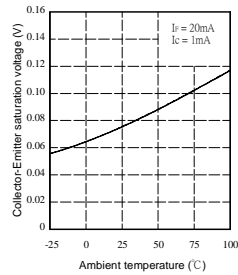
Collector current Vs.  
Collector-Emitter voltage



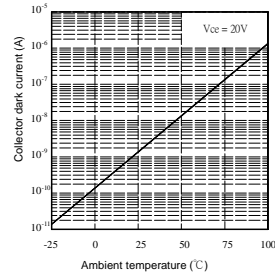
Relative CTR Vs.  
Ambient temperature



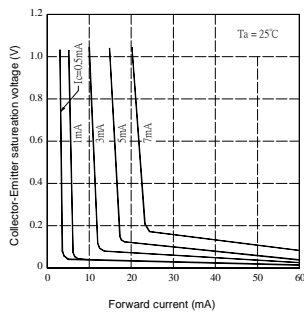
Collector-Emitter saturation voltage Vs.  
Ambient temperature



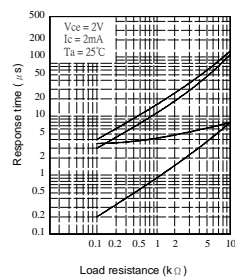
Collector dark current Vs.  
Ambient temperature



Collector-Emitter saturation voltage Vs.  
Forward current



Response time Vs.  
Load resistance



Test circuit for response time

