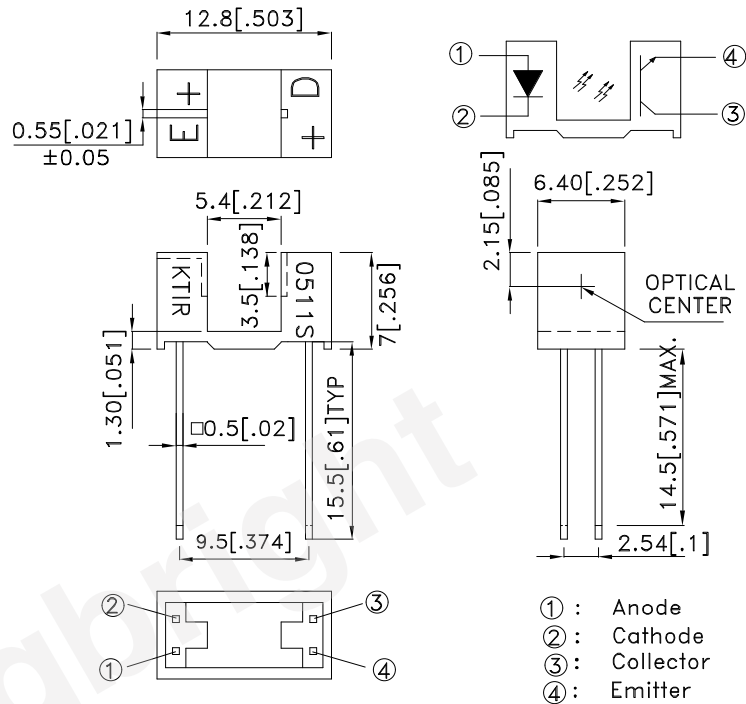


Part Number: KTIR0511S

### Package Dimensions



### Features

- Ultra-small.
- Minimal influence from stray light.
- Low collector-emitter saturation voltage.
- RoHS Compliant.

### Applications

- Optical control equipment.
- Cameras.
- Floppy disk drives.

#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25$  (0.01") unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.
4. The specifications, characteristics and technical data described in the data-sheet are subject to change without prior notice.

### Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_d$	75	mW
	Peak Forward Current (Pulse Width $\leq 100\mu\text{s}$ , Duty Cycle = 1%)	$I_{FP}$	1	A
Output	Collector-emitter voltage	$V_{CEO}$	35	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	20	mA
	Collector power dissipation	$P_C$	75	mW
Operating temperature		$T_{opr}$	-25~+85	°C
Storage temperature		$T_{stg}$	-40~+100	°C
soldering temperature (1/16 inch from body for 5 seconds)		$T_{sol}$	260	°C

#### Note:

1. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

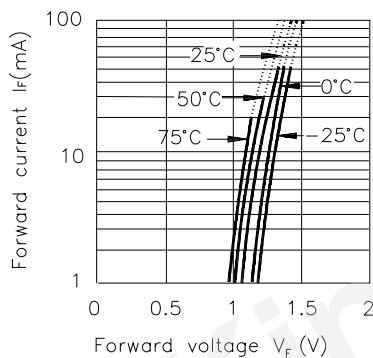


### Electro-optical Characteristics (Ta=25°C)

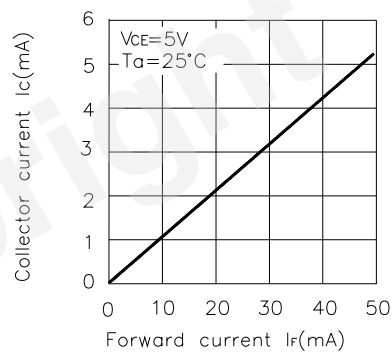
Parameter		Symbol	Conditions	Min.	TYP.	Max.	Unit
Input	Forward Voltage	$V_F$	$I_F=20\text{mA}$	1.0	1.2	1.5	V
	Reverse Current	$I_R$	$V_R=6\text{V}$	-	-	10	$\mu\text{A}$
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20\text{V}$	-	-	100	nA
Transfer characteristics	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=1\text{mA}$ $I_F=40\text{mA}$	-	-	0.4	V
	Current transfer ratio	CTR	$V_{CE}=5\text{V}$ $I_F=20\text{mA}$	-	10	-	%
	Response time	Rise time	$t_r$	$V_{CE}=2\text{V}$ $I_C=2\text{mA}$	-	5	25
Fall time		$t_f$	$R_L=100\Omega$	-	4	20	$\mu\text{s}$

\*1 Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

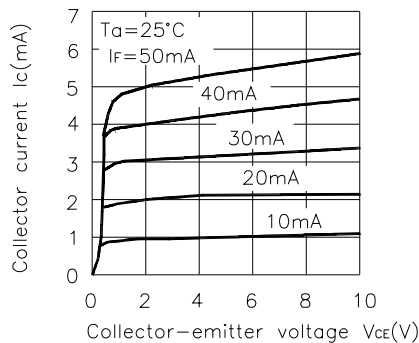
**Fig.1 Forward Current vs. Forward Voltage**



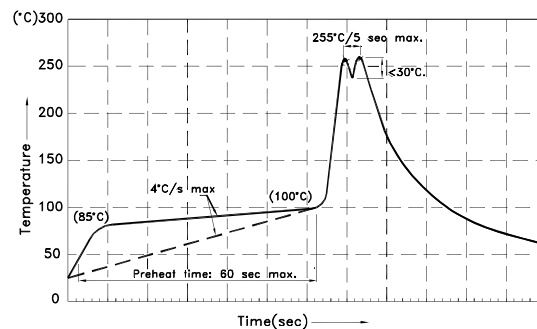
**Fig.2 Collector Current vs. Forward Current**



**Fig.3 Collector Current vs. Collector-emitter Voltage**



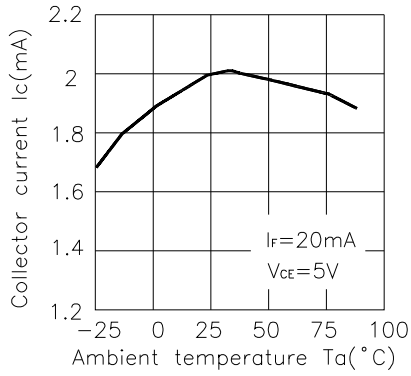
Wave Soldering Profile For Lead-free Through-hole LED.



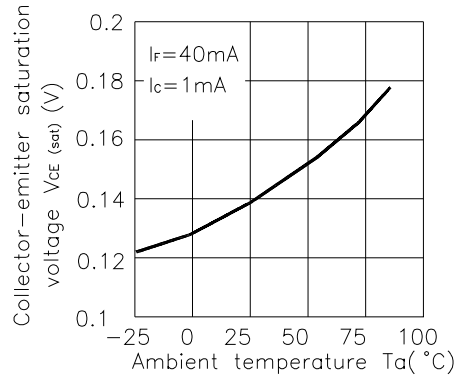
**Notes:**

1. Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
2. Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
3. Do not apply stress to the epoxy resin while the temperature is above 85°C.
4. Fixtures should not incur stress on the component when mounting and during soldering process.
5. SAC 305 solder alloy is recommended.
6. No more than one wave soldering pass.

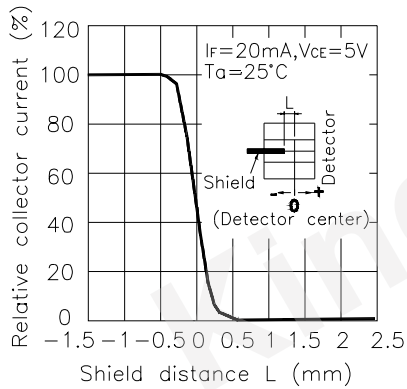
**Fig. 4 Collector Current vs. Ambient Temperature**



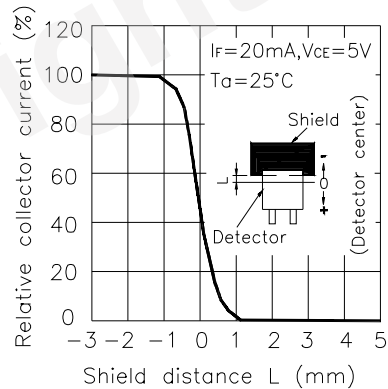
**Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature**



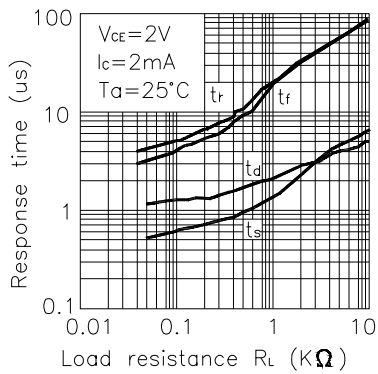
**Fig.6 Relative Collector Current vs. Shield Distance (1)**



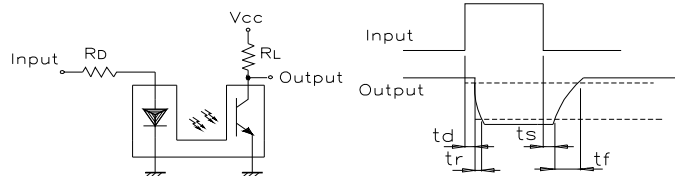
**Fig.7 Relative Collector Current vs. Shield Distance (2)**



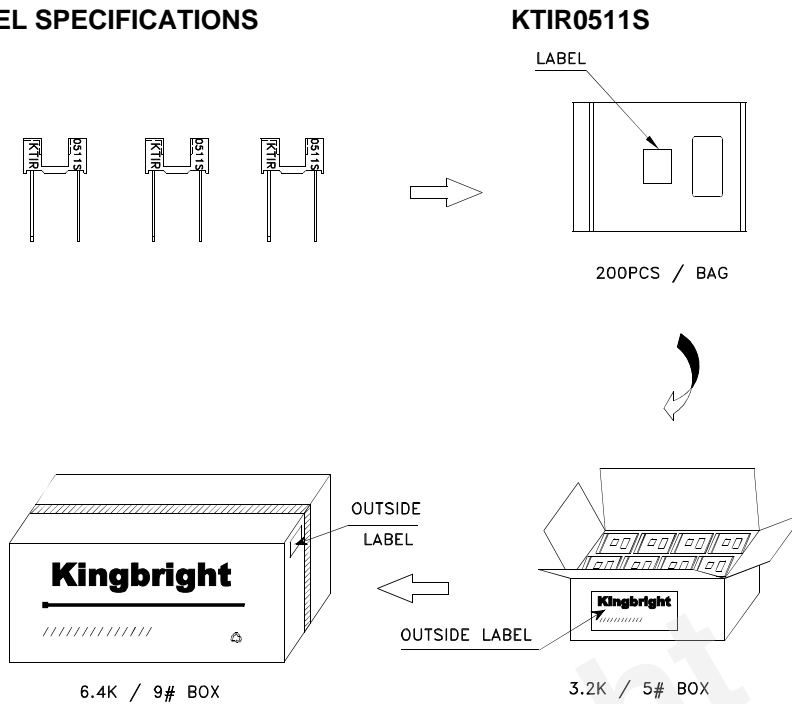
**Fig.8 Response Time vs Load Resistance**




**Test Circuit for Response Time**



### PACKING & LABEL SPECIFICATIONS



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