



Technical Data Sheet

OPTO INTERRUPTER ITR

ITR20402

■ Features

- Fast response time
- High sensitivity
- Cut-off visible wavelength $\lambda_p=940\text{nm}$
- Thin
- Small package
- Pb free
- The product itself will remain within RoHS compliant version.

■ Descriptions

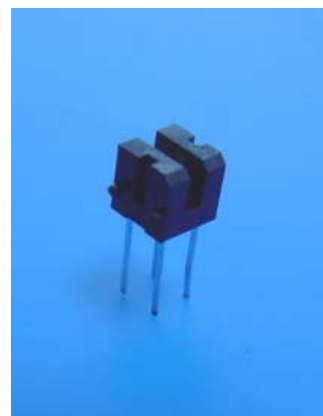
The **ITR20402** consists of an infrared emitting Diode and a silicon phototransistor encased in a black Thermo-plastic housing. The advantage of the device is the small package. Phototransistor receives radiation from the IRLED only, and avoids the noise from ambient light

■ Applications

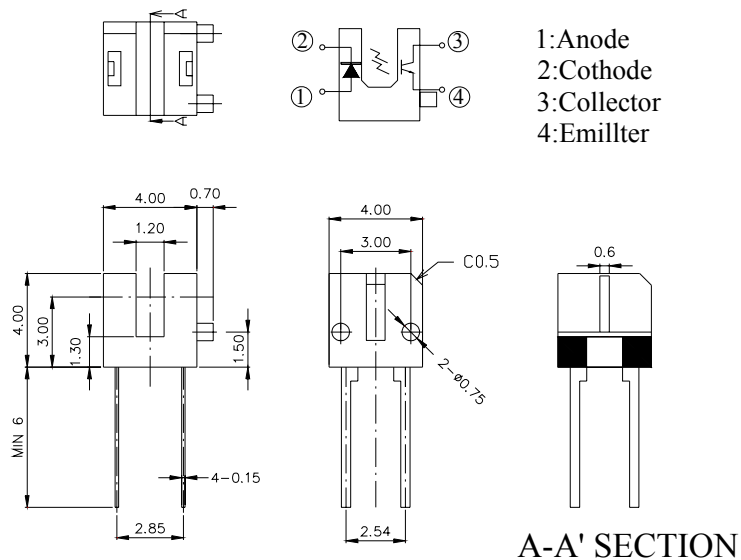
- Camera
- Copier
- Scanner
- Non-contact Switching
- For Direct PC Board

■ Device Selection Guide

Device No.	Chip Material
IR	GaAs
PT	Silicon



Package Dimensions



Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions $\pm 0.25\text{mm}$

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at(or below) 25°C Free Air Temperature	P_d	75	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1) Pulse width $\leq 100 \mu\text{s}$, Duty cycle=1%	I_{FP}	1	A
Output	Collector Power Dissipation	P_C	75	mW
	Collector Current	I_C	20	mA
	Collector-Emitter Voltage	$B V_{CEO}$	30	V
	Emitter-Collector Voltage	$B V_{ECO}$	5	V
Operating Temperature		T_{opr}	$-25\sim+85$	$^\circ\text{C}$
Storage Temperature		T_{stg}	$-40\sim+85$	$^\circ\text{C}$
Lead Soldering Temperature (*2)		T_{sol}	260	$^\circ\text{C}$

(*1) $t_w=100 \mu\text{sec.}$, $T=10 \text{ msec.}$ (*2) $t=5 \text{ Sec}$

Electro-Optical Characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	V_F	---	1.2	1.5	V	$I_F=20\text{mA}$
	Reverse Current	I_R	---	---	10	μA	$V_R=5\text{V}$
	Peak Wavelength	λ_P	---	940	---	nm	---
Output	Dark Current	I_{CEO}	---	1	100	nA	$V_{CE}=10\text{V}$
	C-E Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=2\text{mA}$ $E_e=1\text{mW/cm}^2$
Transfer Characteristics	Collector Current	$I_C(ON)$	0.3	---	---	mA	$V_{CE}=5\text{V}$, $I_F=10\text{mA}$
	Leakage Current	I_{CEOD}	---	---	1	μA	$V_{CE}=5\text{V}$ $I_F=20\text{mA}$
	Rise time	t_r	---	15	---	μsec	$V_{CE}=2\text{V}$ $I_C=1\text{mA}$ $R_L=1\text{K}\Omega$
	Fall time	t_f	---	15	---	μsec	

Typical Electrical/Optical/Characteristics Curves for IR

Fig.1 Forward Current vs Ambient Temperature. Fig.2 Spectral Distribution

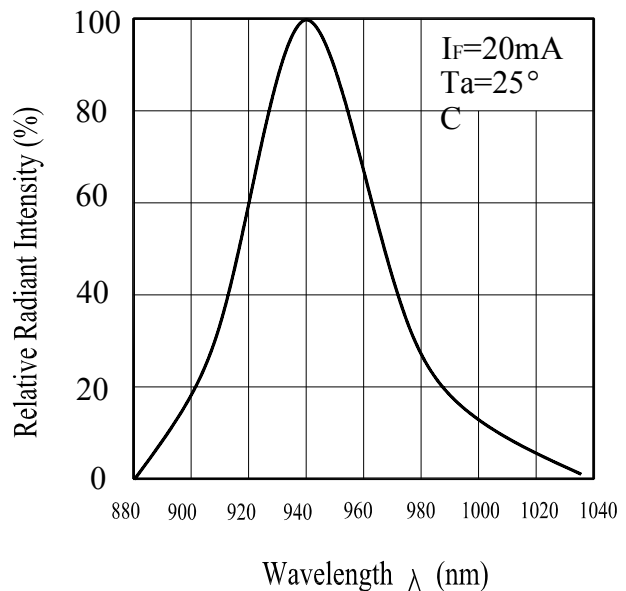
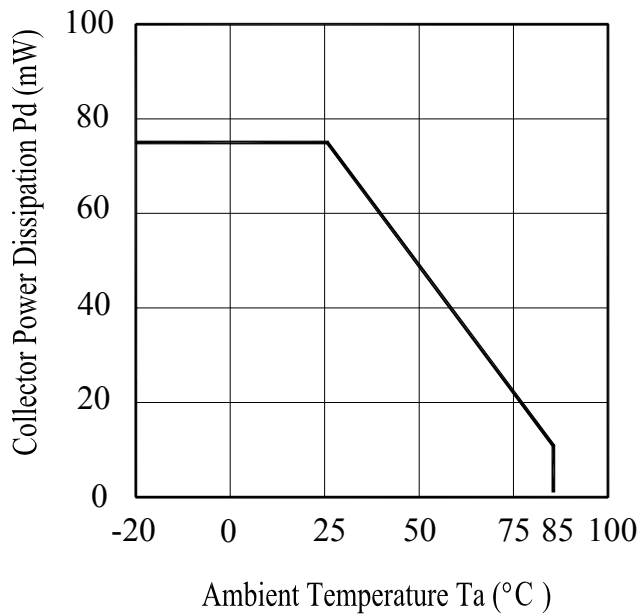


Fig.3 Peak Emission Wavelength
Ambient Temperature

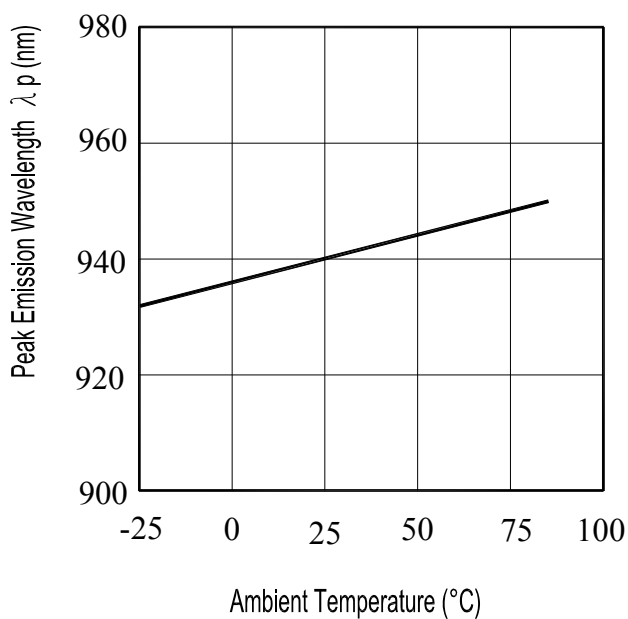


Fig.4 Forward Current vs. Forward Voltage

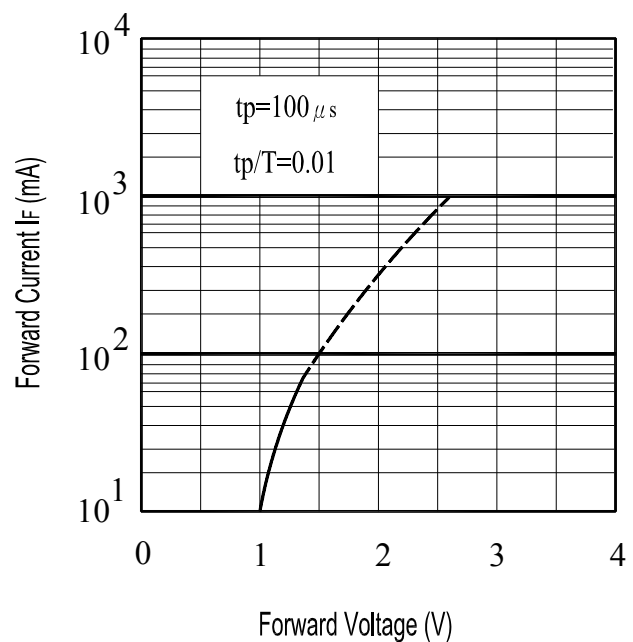


Fig.5 Forward Voltage vs.
Ambient Temperature($^{\circ}\text{C}$)

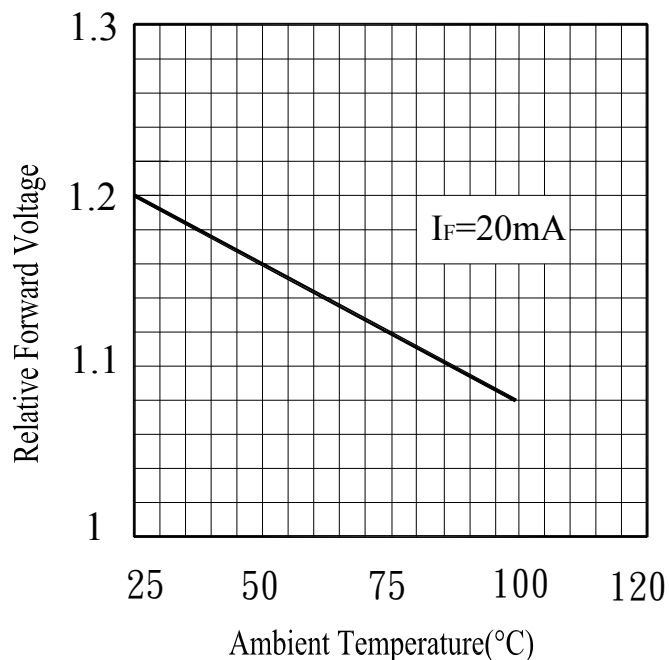
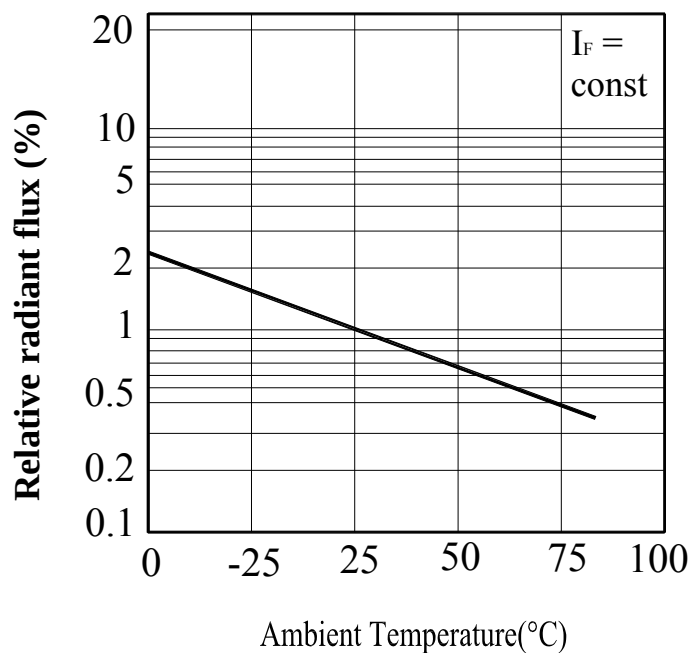


Fig.6 Relative Radiant Flux vs.
Ambient Temperature($^{\circ}\text{C}$)



Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

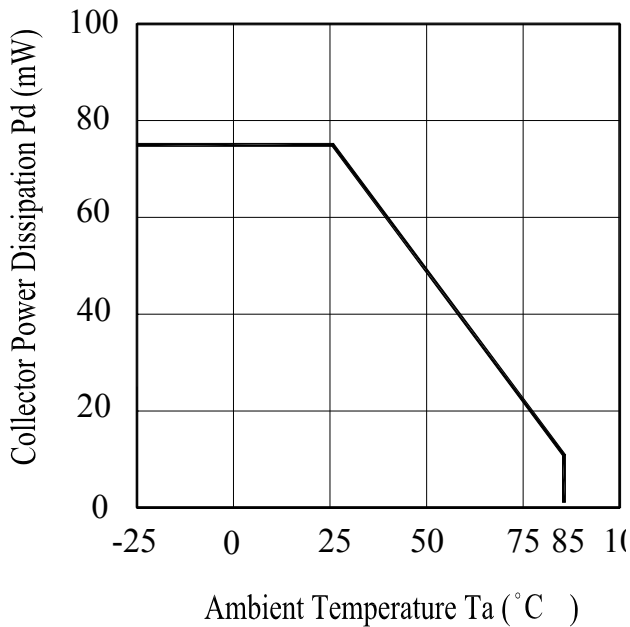


Fig.2 Spectral Sensitivity

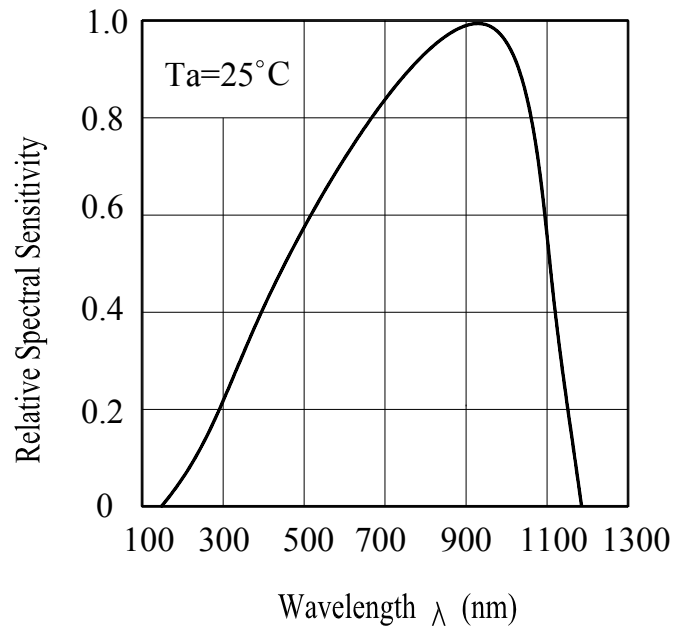


Fig.3 Relative Collector Current vs. Ambient Temperature

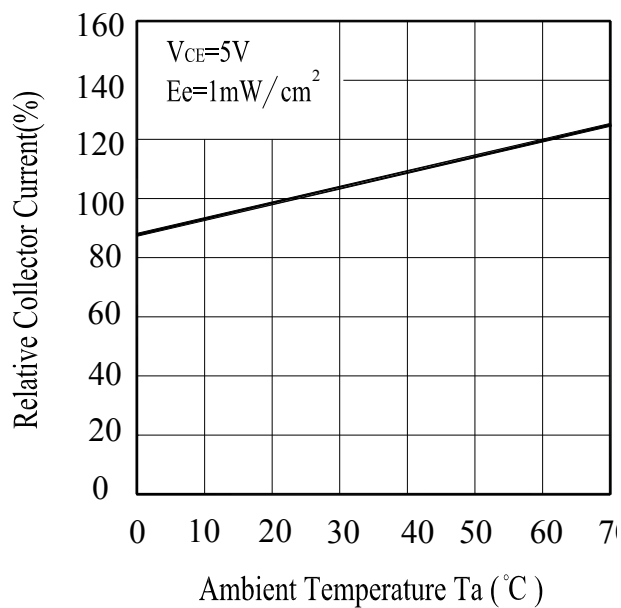


Fig.4 Collector Current vs. Irradiance

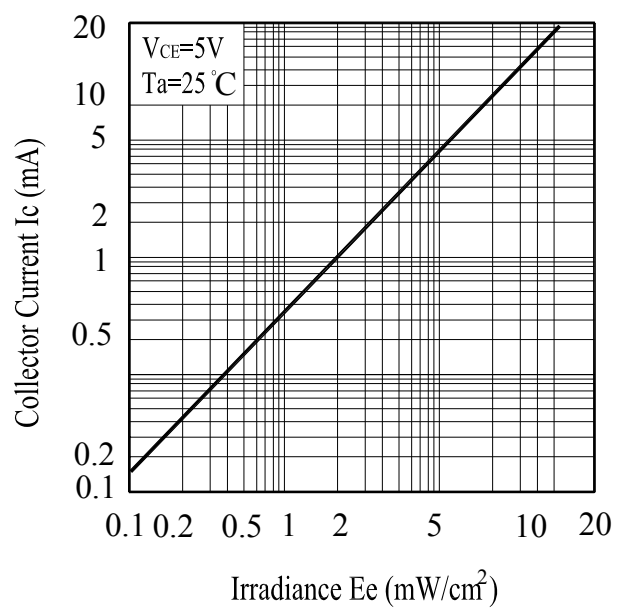


Fig.5 Collector Dark Current vs.
Ambient Temperature

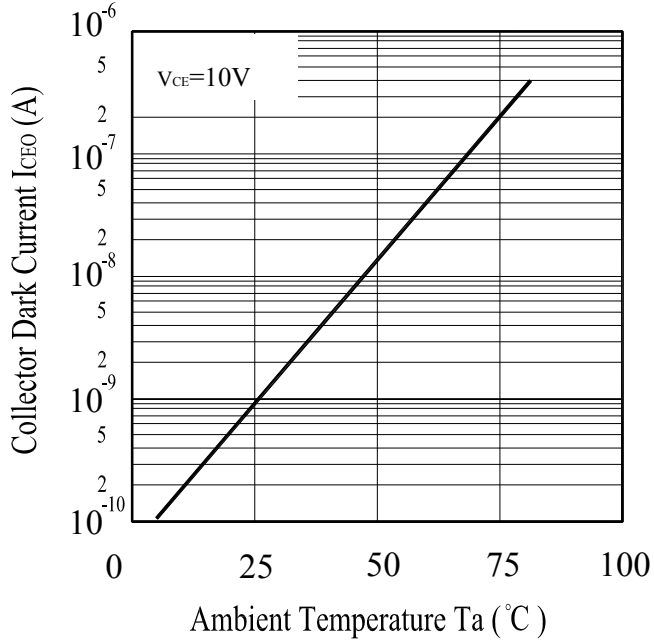
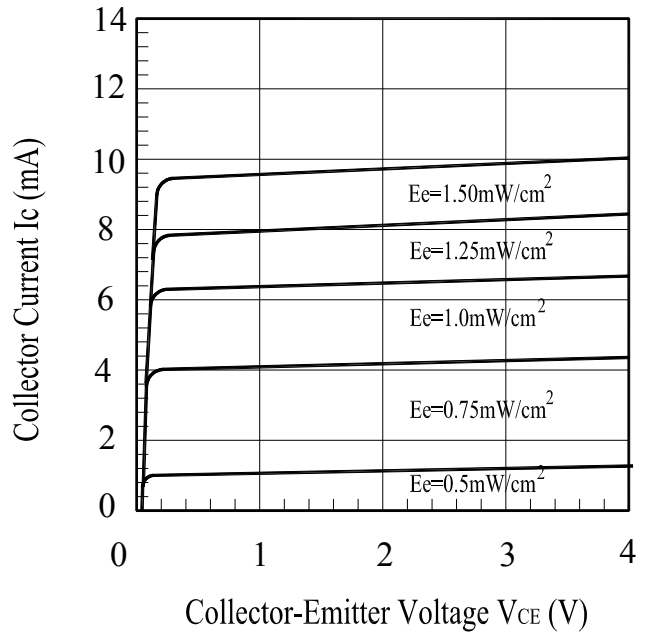
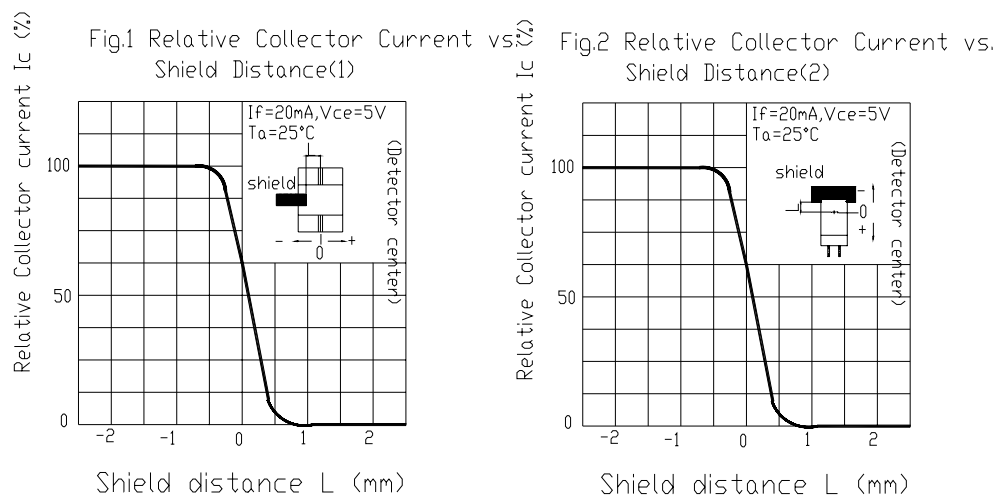


Fig.6 Collector Current vs.
Collector-Emitter Voltage



Typical Electro-Optical Characteristics Curves

ITR20402



Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	Solder Resistance	$T_a = 260 \pm 3^\circ C$ Time = 10 ± 1 sec	0 / 22	22pcs	Specification Limit	0/1
2	Temperature Cycle	H : $+100^\circ C$ 15mins ↕ 5mins L : $-40^\circ C$ 15mins	50Cycles	22pcs		0/1
3	Thermal Shock	H : $+100^\circ C$ 5mins ↕ 10secs L : $-10^\circ C$ 5mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP. : $+100^\circ C$	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP. : $-40^\circ C$	1000hrs	22pcs		0/1
6	DC Operating Life	$V_{CE}=5V$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	$85^\circ C$ / 85% R.H	1000hrs	22pcs		0/1

Label Form Specification

EVERLIGHT	
CPN:	
P/N:	
	RoHS
ITR20402	
QTY:	CAT:
	HUE:
LOT NO:	REF:
	
MADE IN TAIWAN	

CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Peak Wavelength

REF: Reference

LOT No: Lot Number

MADE IN TAIWAN: Production Place

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent.

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