

Pb-free  
HEAT



# KU163C

Reflector Sensor

## Features

Function	Reflector Sensor (Analog Output)
Product features	<ul style="list-style-type: none"><li>• Outer Dimension : 3.1 x 1.9 x 1.1mm ( L x W x H )</li><li>• Compact Small Package of Surface Mount</li><li>• Integrated IRED and Phototransistor</li><li>• Lead-free soldering compatible</li><li>• RoHS compliant</li></ul>
Die materials (Emitter)	GaAs
Die materials (Detector)	Si
Assembly method	Auto pick & place machine (Auto Mounter)
Soldering methods	Reflow soldering, and manual soldering ※Please refer to Soldering Conditions about soldering.
Taping and reel	2,500pcs per reel in a 8mm width tape. (Standard) Reel diameter: $\phi$ 180mm

## Recommended Applications

- Cameras, DSC (Lens Controller, Film Detection, Tape-end Detection)
- MO, DVD (Pick-up Controller, Disk Detection)
- Other General Applications for Controller (Object Detection, Code Reader)

## Absolute Maximum Ratings

Item	Symbol	Absolute Maximum Ratings	Unit	
Operating Temperature	$T_{opr}$	-30~+85	°C	
Storage Temperature	$T_{stg}$	-40~+100	°C	
LED $T_a = 25^{\circ}\text{C}$	Power Dissipation	Pd	75	mW
	Forward Current	$I_F$	20	mA
	Derating <sup>※1</sup>	$\Delta I_F$	0.17	mA/°C
	Pulse Forward Current <sup>※2</sup>	$I_{FRM}$	300	mA
	Pulse Forward Current Derating <sup>※1</sup>	$\Delta I_{FRM}$	4	mA/°C
	Reverse Voltage	$V_R$	5	V
Phototransistor $T_a = 25^{\circ}\text{C}$	Collector Dissipation	Pc	75	mW
	Collector-Emitter Voltage	$V_{CEO}$	20	V
	Emitter-Collector Voltage	$V_{ECO}$	5	V
	Collector Current	Ic	20	mA

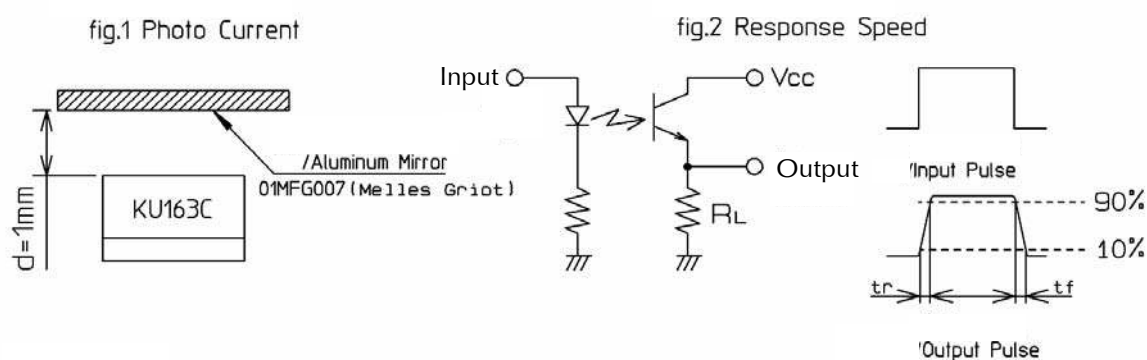
※1  $T_a=25^{\circ}\text{C}$  or higher

※2  $I_{FRM}$  Measurement condition : Pulse Width  $\leq 0.1\text{ms}$ , Duty  $\leq 1/100$

## Electro-Optical Characteristics

(Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
Input	I <sub>F</sub> = 5mA	V <sub>F</sub>	MIN.	0.9	V
			TYP.	1.1	
			MAX.	1.5	
	V <sub>R</sub> = 5V	I <sub>R</sub>	MAX.	10	μ A
	I <sub>F</sub> = 20mA	λ <sub>p</sub>	TYP.	940	nm
Output	V <sub>CEO</sub> = 10V	I <sub>CEO</sub>	MAX.	0.1	μ A
	-	λ <sub>p</sub>	TYP.	850	nm
Coupling Characteristics	V <sub>CE</sub> = 5V, I <sub>F</sub> = 5mA, d = 1mm	I <sub>c</sub>	MIN.	115	μ A
			TYP.	200	
			MAX.	425	
	V <sub>CE</sub> = 5V, I <sub>F</sub> = 5mA, No Reflector	I <sub>LEAK</sub>	MAX.	2	μ A
	V <sub>CE</sub> = 10V, R <sub>L</sub> = 100Ω, I <sub>F</sub> = 5mA	tr/tf	TYP.	10/10	μ s

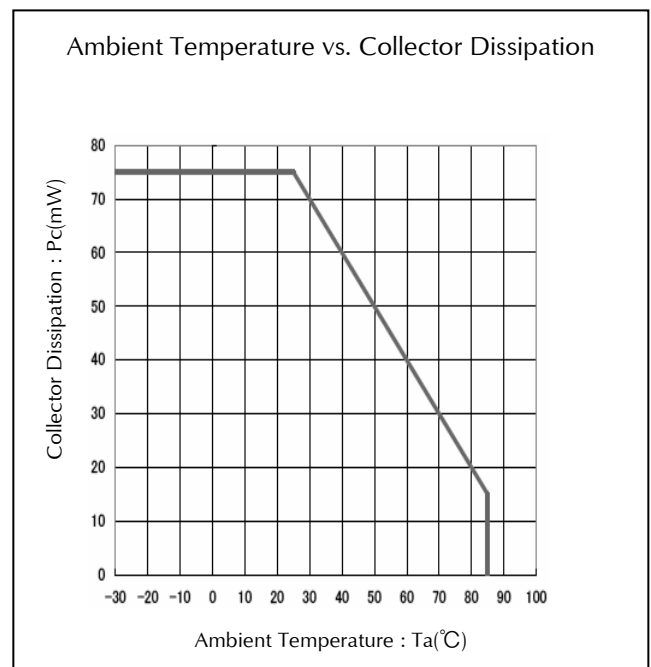
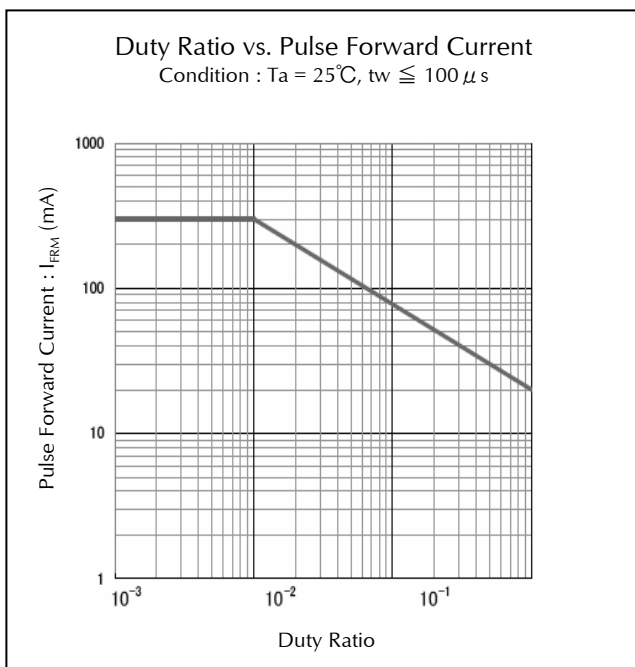
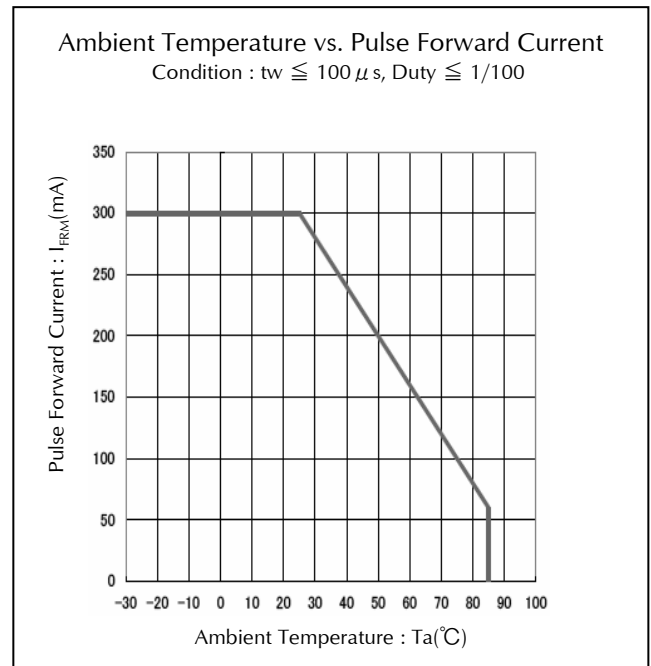
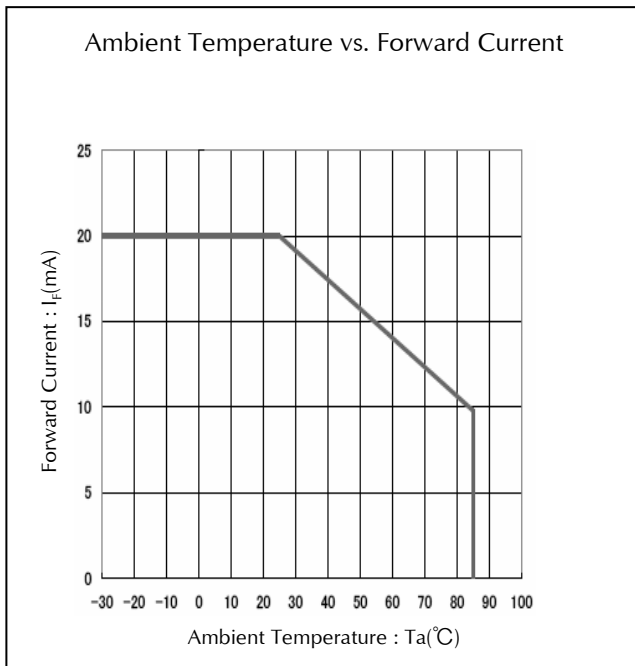


## Photo Current Rank

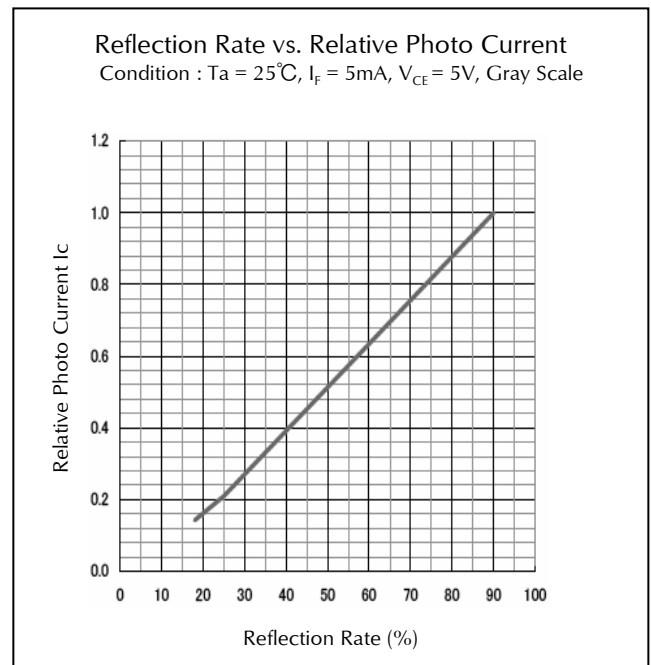
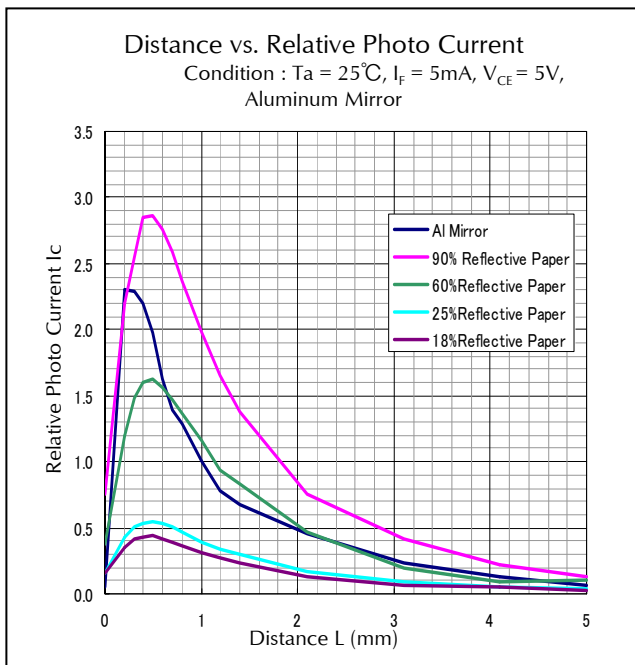
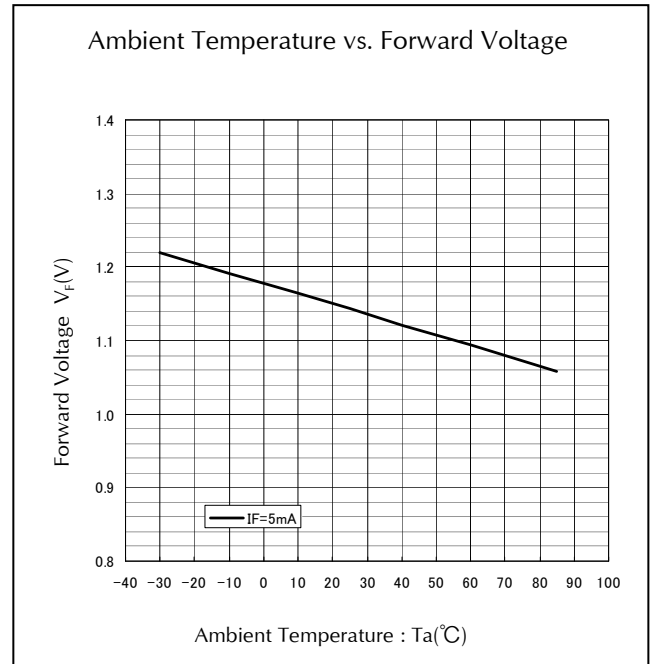
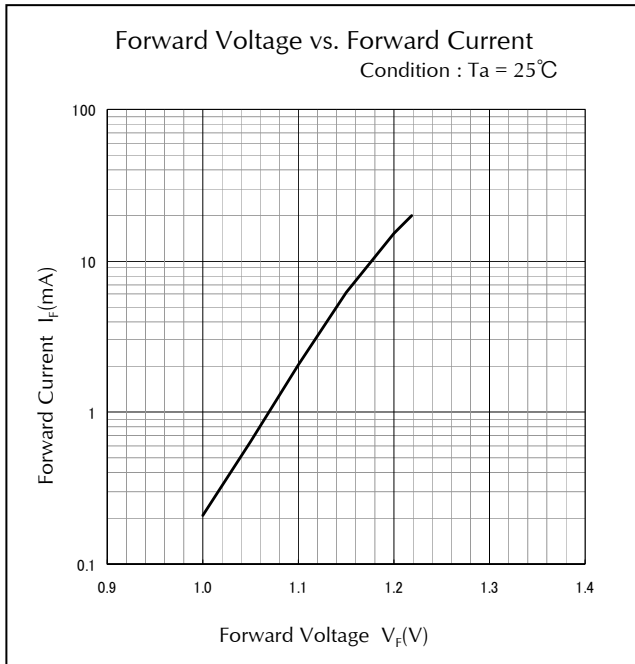
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Ranks	Photo Current $I_C$ ( $\mu A$ )		Conditions
	MIN.	MAX.	
B	115	162	$I_F=5mA$ $V_{CE}=5V$ $d=1mm$
C	146	206	
D	185	262	
E	236	334	
F	300	425	

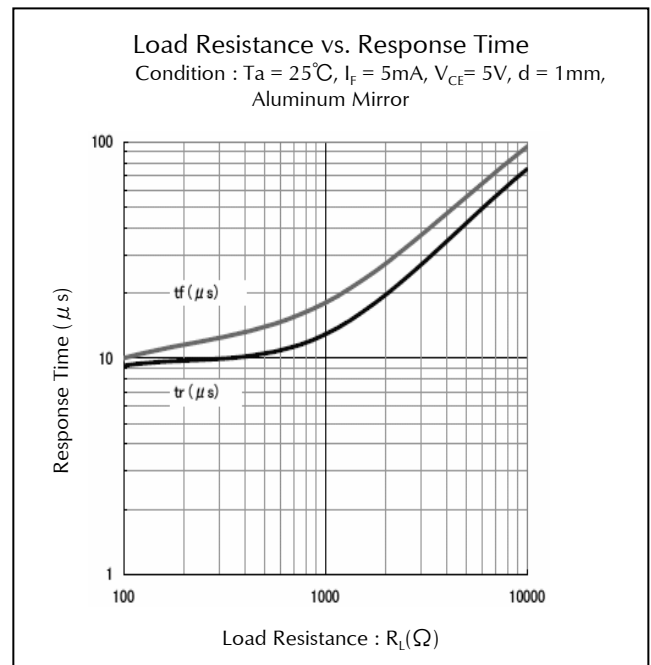
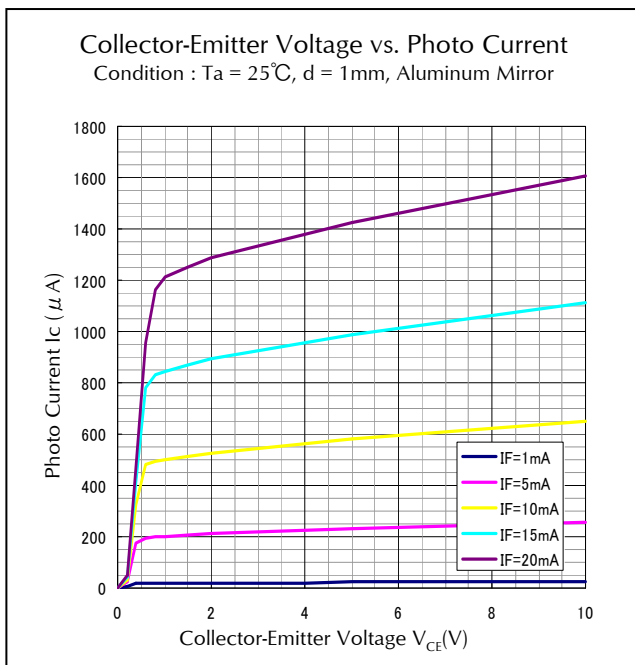
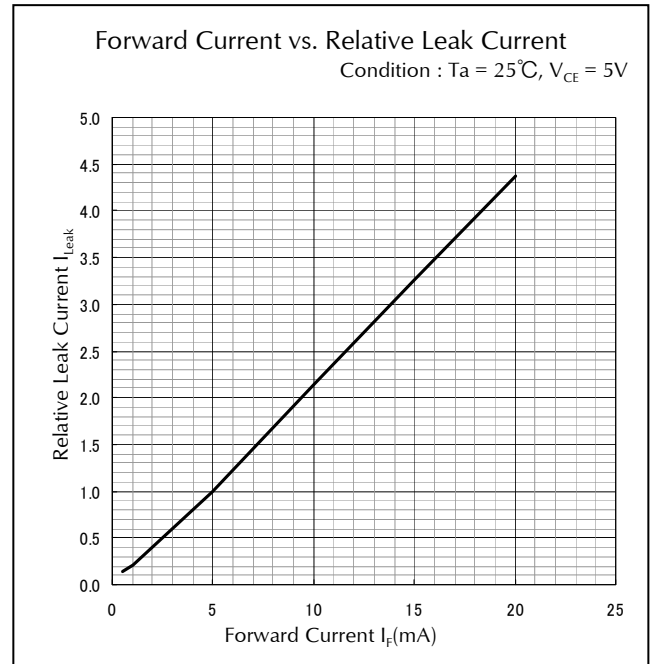
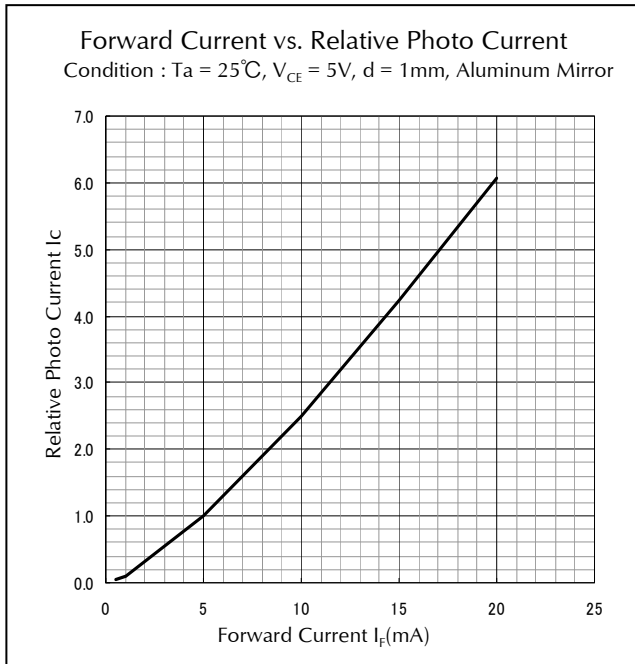
## Technical Data



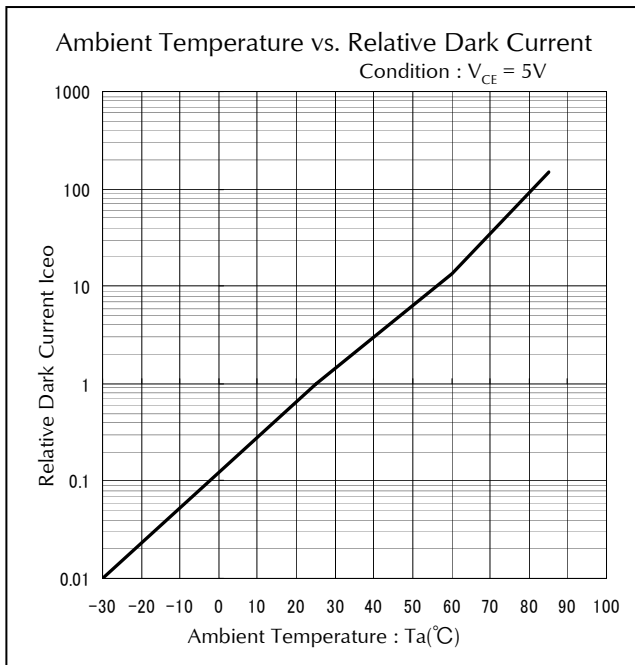
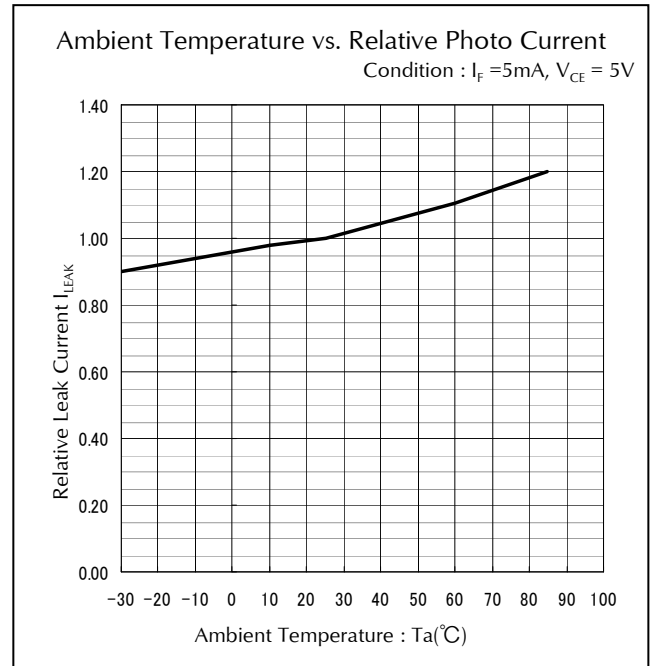
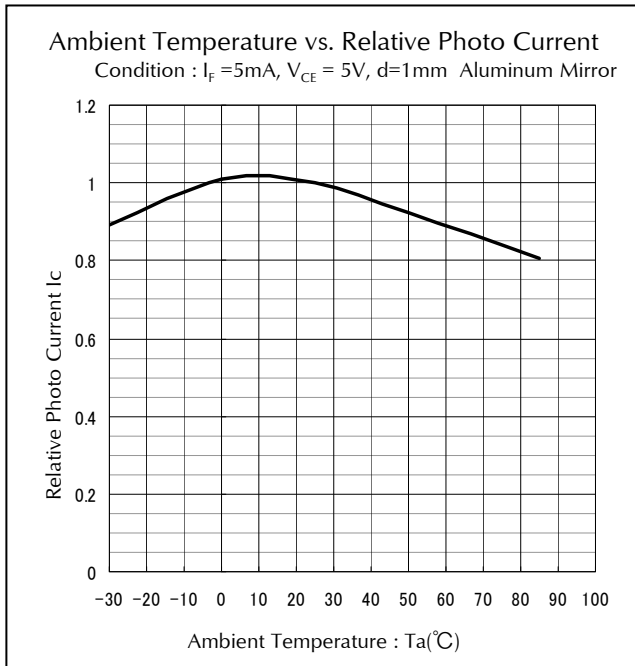
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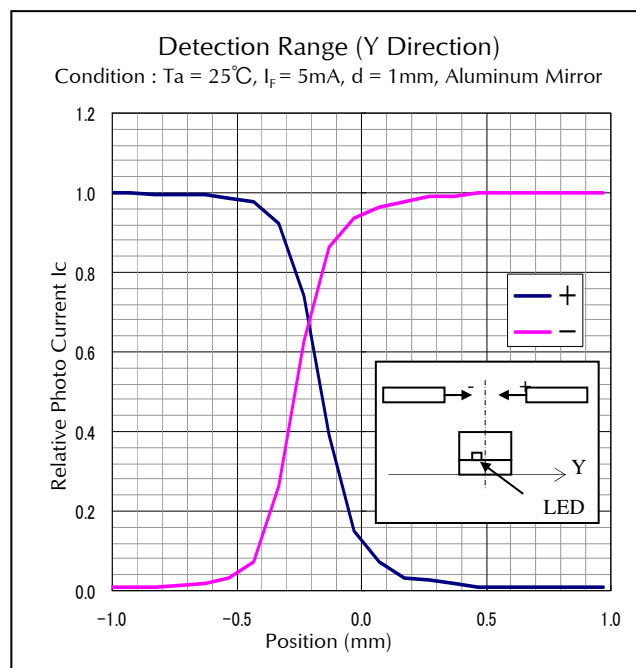
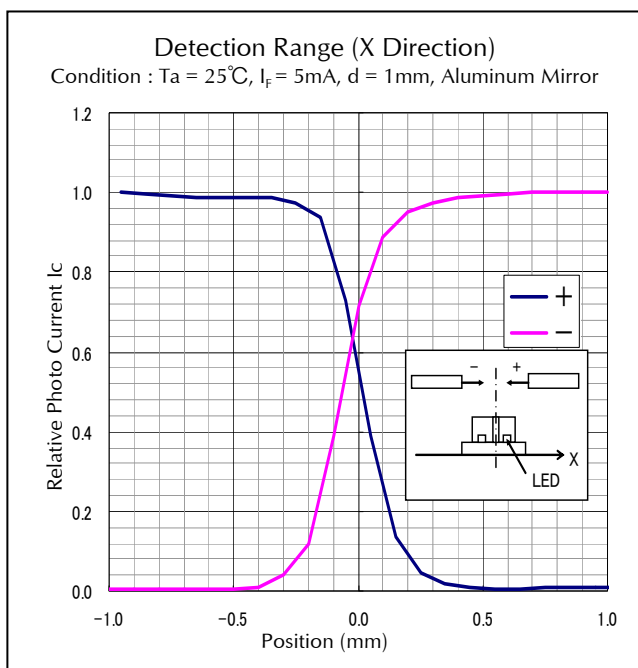


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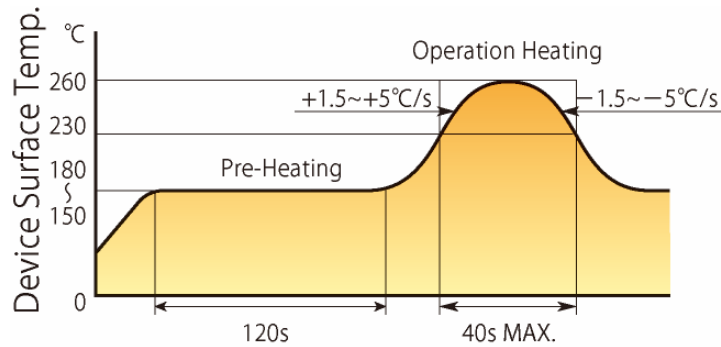


## Technical Data





## Reflow Soldering Conditions



- 1) The above profile temperature gives the maximum temperature of the product resin surface. Please set the temperature so as to avoid exceeding this range.
- 2) Total times of reflow soldering process shall be no more than 2 times. When the second reflow soldering process is performed, intervals between the first and second reflow should be short as possible (while allowing some time for the component to return to normal temperature after the first reflow) in order to prevent the product from absorbing moisture.
- 3) Temperature fluctuation to the product during the pre-heating process shall be minimized.

## Manual Soldering Conditions

- (1) Please avoid the installation of the substrate with the manual soldering as much as possible.**  
**If you do with the manual soldering, please note the following .**

Iron tip temp.	350 °C	
Soldering time and frequency	3 s (MAX.)	1 time (MAX.) (Per One Terminal)

## Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25°C, LED : I <sub>F</sub> = 5mA, Phototransistor : V <sub>CE</sub> = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60°C, RH = 90%, LED : I <sub>F</sub> = 5mA, Phototransistor : V <sub>CE</sub> = 5V, There is a reflector., d = 1mm	1,000 h	0/25
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 85°C, LED : I <sub>F</sub> = 5mA, Phototransistor : V <sub>CE</sub> = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -30°C, LED : I <sub>F</sub> = 5mA, Phototransistor : V <sub>CE</sub> = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Thermal Shock	EIAJ ED-4701/200/(203)	-40°C(15min)~100°C(15min)	5 cycles	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(301)	(Reflow)Preheat : 150 ~ 180°C(120s Max.) Operating Heat : 230°C以上 (40s Max.) Peak : 260°C (5s Max.)	Twice	0/25

## Failure Criteria

Items	Symbols	Conditions	Failure criteria
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =5mA	Testing Max.Value $\geq$ Initial Value x 1.2
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	Testing Max.Value $\geq$ 10 $\mu$ A x 2.5
Photo Current	I <sub>C</sub>	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V, d=1mm	Testing Max.Value $\geq$ Initial Value x 1.2 Testing Min.Value $\leq$ Initial Value x 0.8
Leak Current	I <sub>LEAK</sub>	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V, No Reflector	Testing Max.Value $\geq$ 2 $\mu$ A x 1.2

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