Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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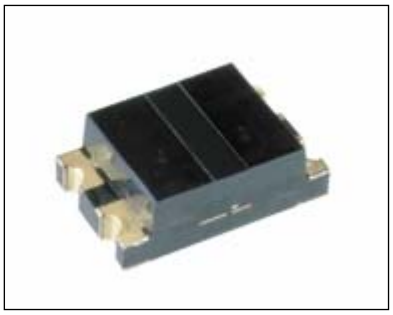


Pb-free HEAT

KU163C

Reflector Sensor

Features

Function	Reflector Sensor (Analog Output)
Product features	・Outer Dimension : 3.1 x 1.9 x 1.1mm (L x W x H) ・Compact Small Package of Surface Mount ・ Integrated IRED and Phototransistor ・Lead-free soldering compatible ・RoHS compliant
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: ϕ 180mm

Recommended Applications

・Cameras, DSC (Lenz 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	℃
Storage Temperature		T_{stg}	-40～+100	℃
LED Ta = 25℃	Power Dissipation	Pd	75	mW
	Forward Current	I_F	20	mA
	Derating ※1	ΔI_F	0.17	mA/℃
	Pulse Forward Current ※2	I_{FRM}	300	mA
	Pulse Forward Current Derating ※1	ΔI_{FRM}	4	mA/℃
	Reverse Voltage	V_R	5	V
Phototransistor Ta = 25℃	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 Ta=25℃ or higher

※2 I_{FRM} Measurement condition : Pulse Width ≦ 0.1ms, Duty≦ 1/100

Electro-Optical Characteristics

(Ta=25℃)

Item		Conditions	Symbol	Characteristics		Unit
Input	Forward Voltage	I_F= 5mA	V_F	MIN.	0.9	V
				TYP.	1.1	
				MAX.	1.5	
	Reverse Current	V_R = 5V	I_R	MAX.	10	μA
	Peak Wavelength	I_F= 20mA	λ_p	TYP.	940	nm
Output	Dark Current	V_{CEO} = 10V	I_{CEO}	MAX.	0.1	μA
	Peak Sensitivity Wavelength	-	λ p	TYP.	850	nm
Coupling Characteristics	Photo Current	V_{CE} = 5V, I_F= 5mA, d = 1mm	Ic	MIN.	115	μA
				TYP.	200	
				MAX.	425	
	Leak Current	V_{CE} = 5V, I_F = 5mA, No Reflector	I_{LEAK}	MAX.	2	μA
	Rise Time/Fall Time	V_{CE} = 10V, R_L = 100Ω, I_F = 5mA	tr/tf	TYP.	10/10	μs

fig.1 Photo Current

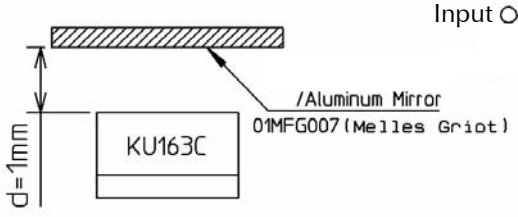


fig.2 Response Speed

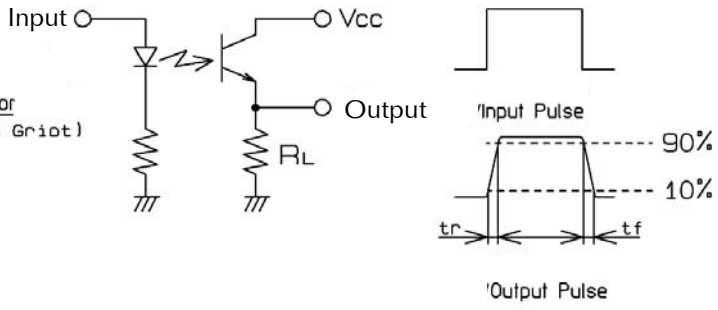
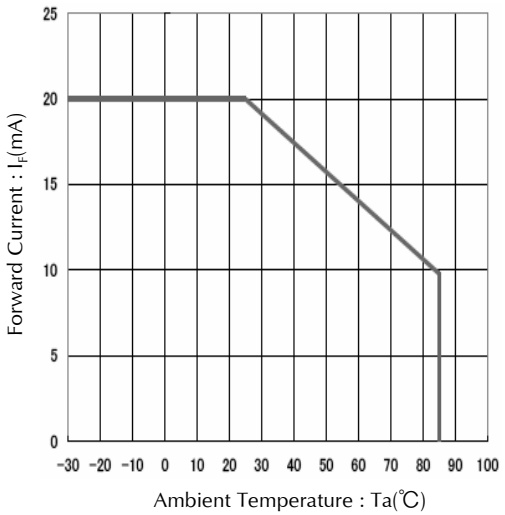


Photo Current Rank

Ranks	Photo Current I_C (μA)		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	

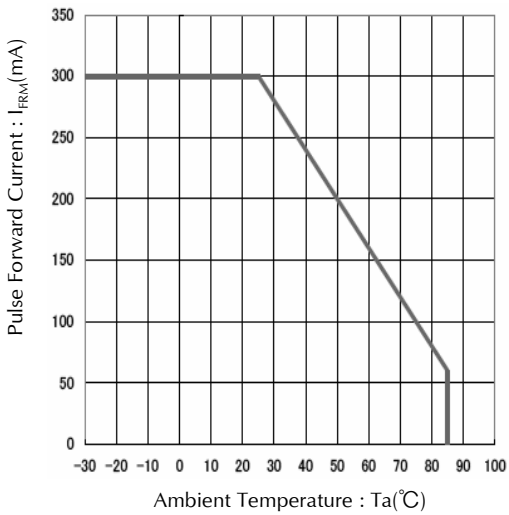
Technical Data

Ambient Temperature vs. Forward Current



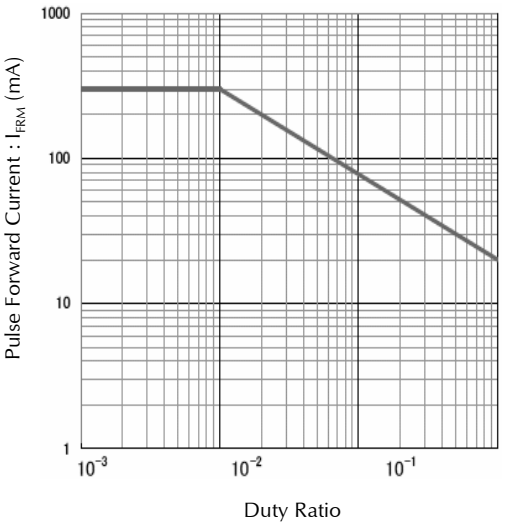
Ambient Temperature vs. Pulse Forward Current

Condition : tw ≦ 100 μs, Duty ≦ 1/100

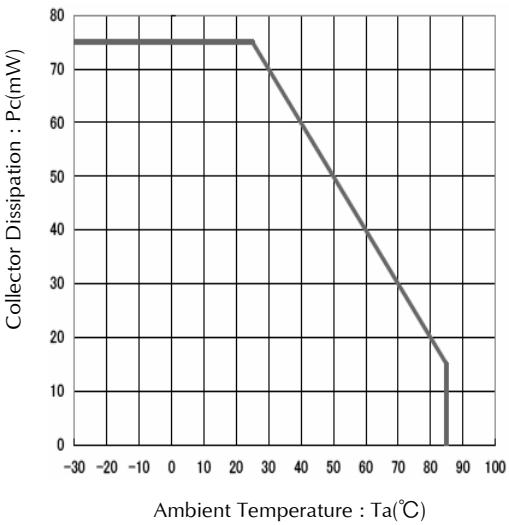


Duty Ratio vs. Pulse Forward Current

Condition : Ta = 25℃, tw ≦ 100 μs

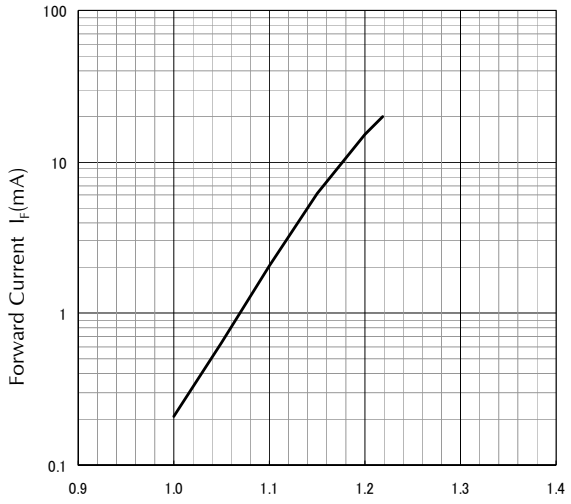


Ambient Temperature vs. Collector Dissipation

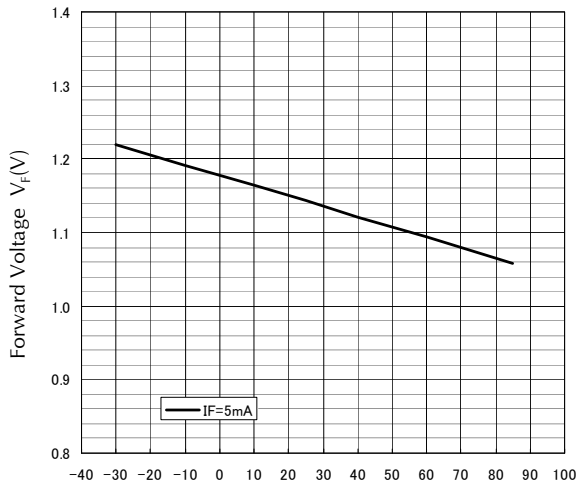


Technical Data

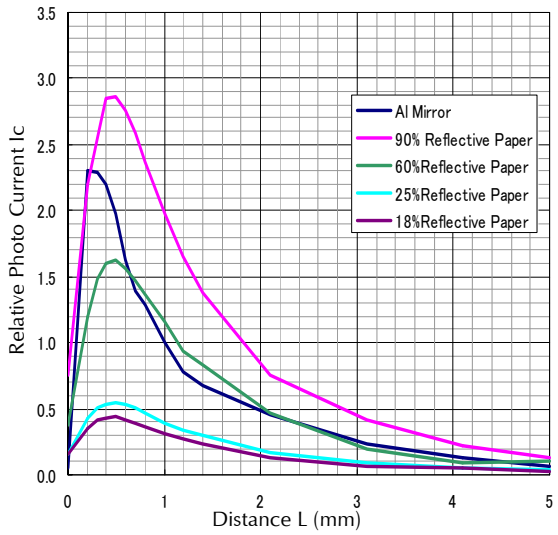
Forward Voltage vs. Forward Current
Condition : Ta = 25℃



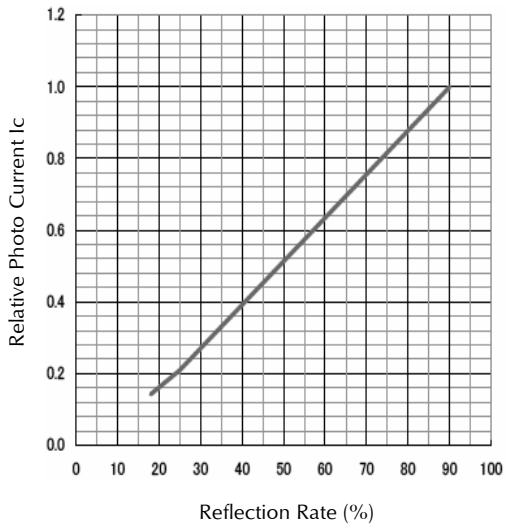
Ambient Temperature vs. Forward Voltage



Distance vs. Relative Photo Current
Condition : Ta = 25℃, I_F = 5mA, V_{CE} = 5V,
Aluminum Mirror

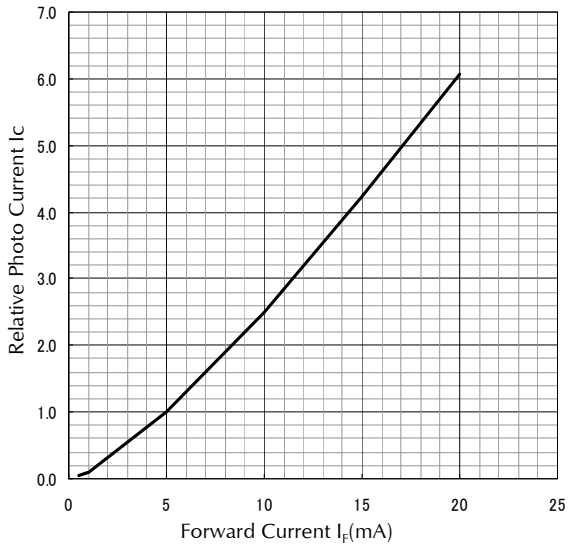


Reflection Rate vs. Relative Photo Current
Condition : Ta = 25℃, I_F = 5mA, V_{CE} = 5V, Gray Scale

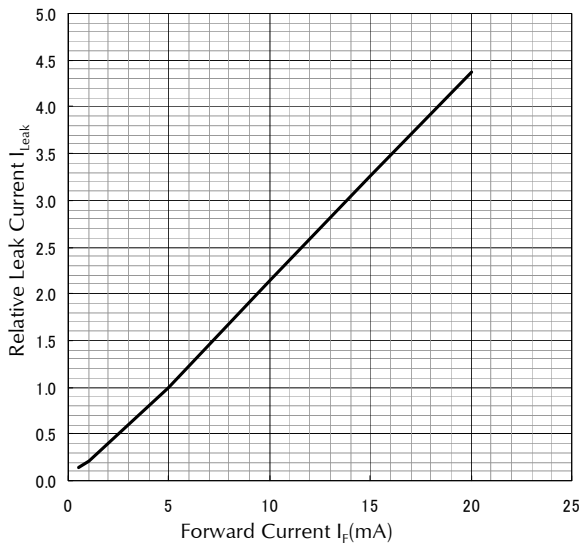


Technical Data

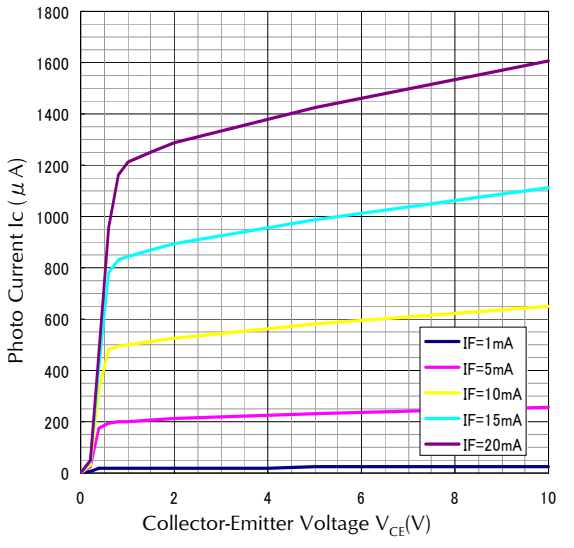
Forward Current vs. Relative Photo Current
Condition : Ta = 25℃, V_{CE} = 5V, d = 1mm, Aluminum Mirror



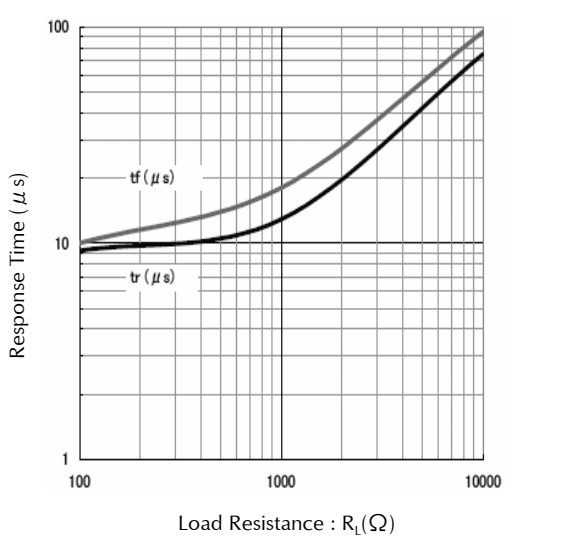
Forward Current vs. Relative Leak Current
Condition : Ta = 25℃, V_{CE} = 5V



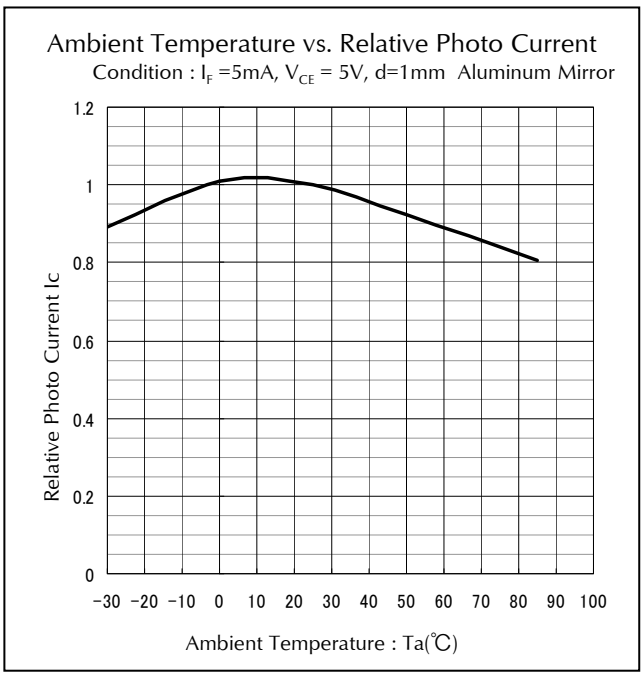
Collector-Emitter Voltage vs. Photo Current
Condition : Ta = 25℃, d = 1mm, Aluminum Mirror

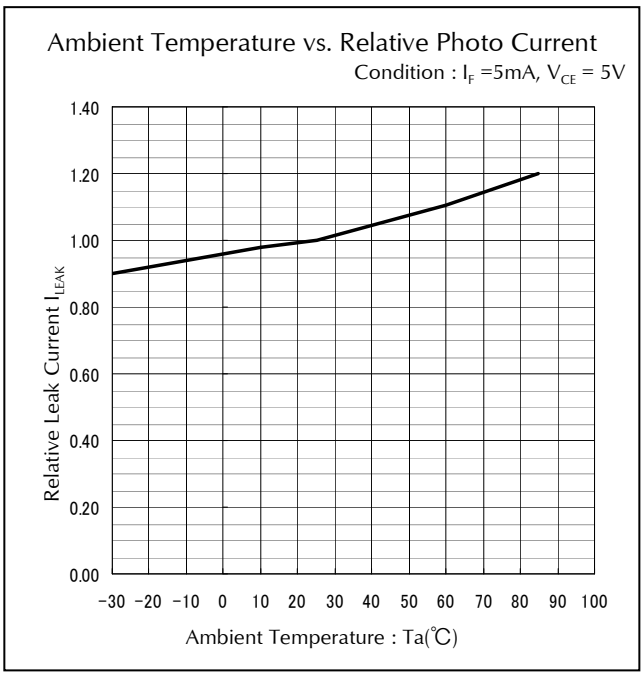


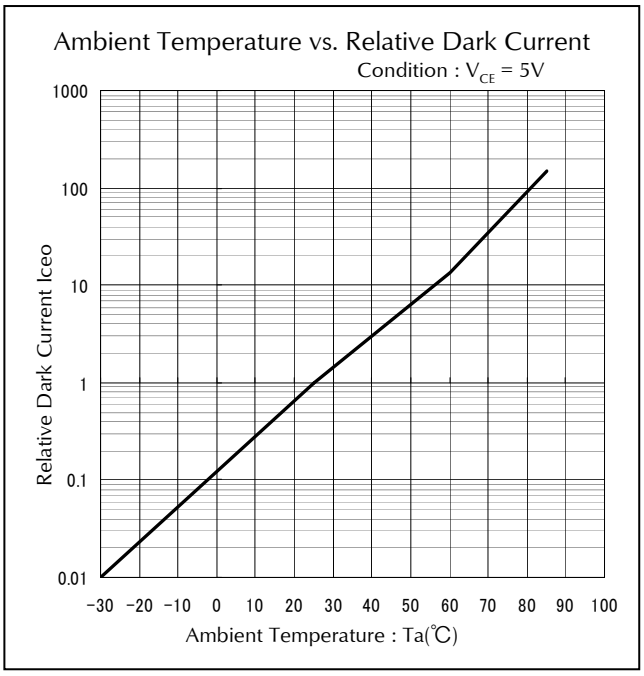
Load Resistance vs. Response Time
Condition : Ta = 25℃, I_F = 5mA, V_{CE}= 5V, d = 1mm,
Aluminum Mirror



Technical Data







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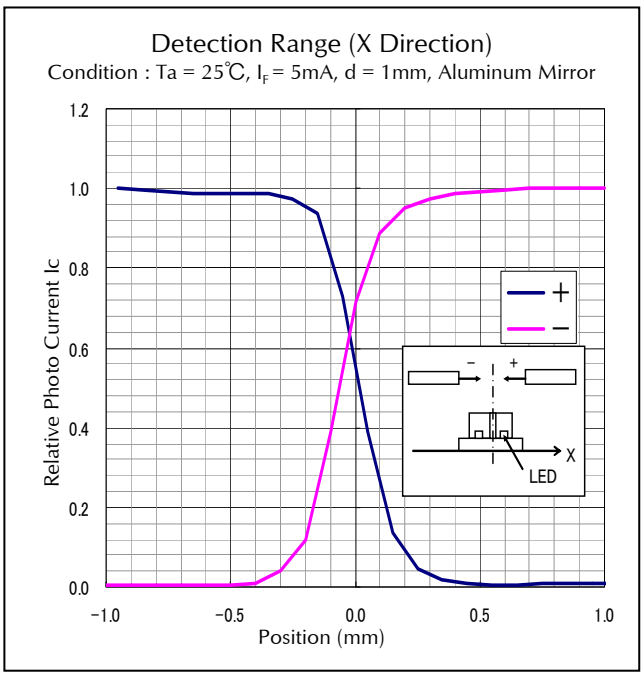
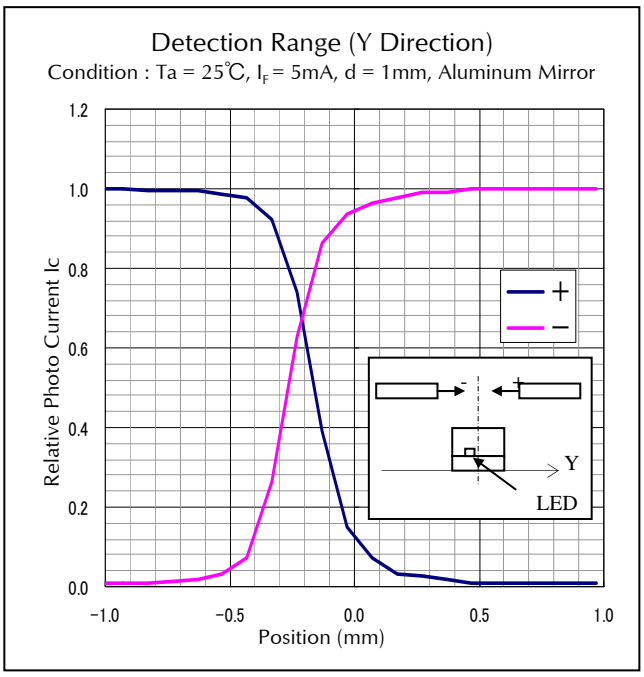
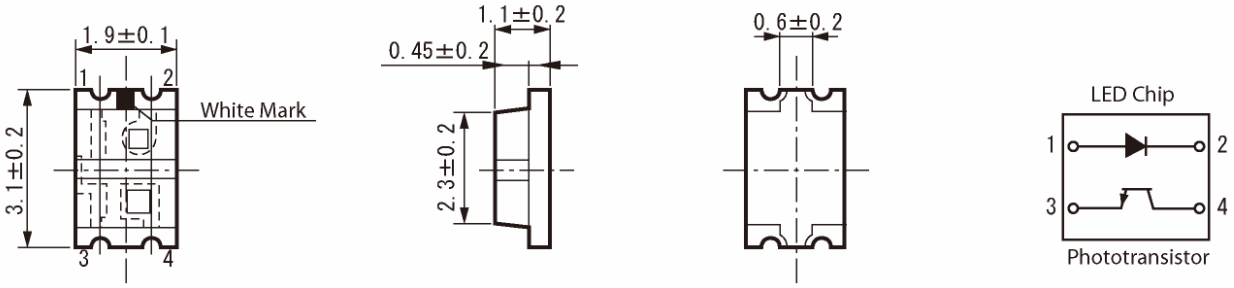




Package Dimensions

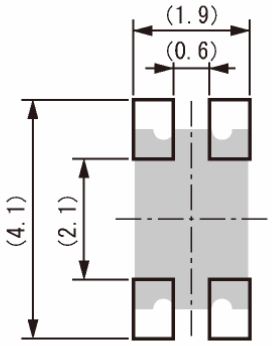
(Unit: mm)

MASS：(9.0mg)



Recommended Soldering Pattern

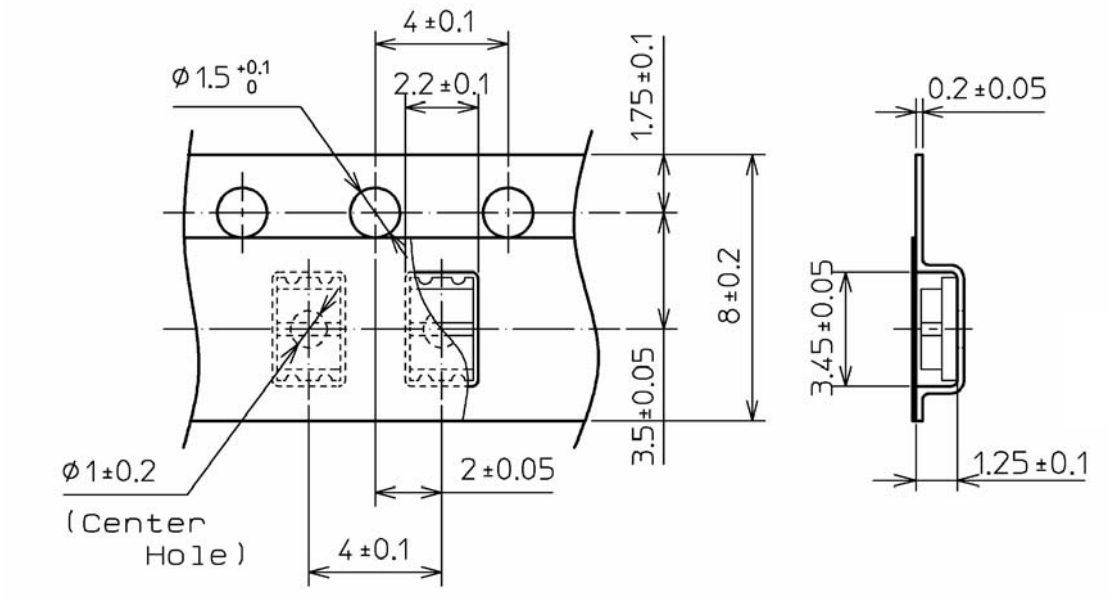
(Unit: mm)



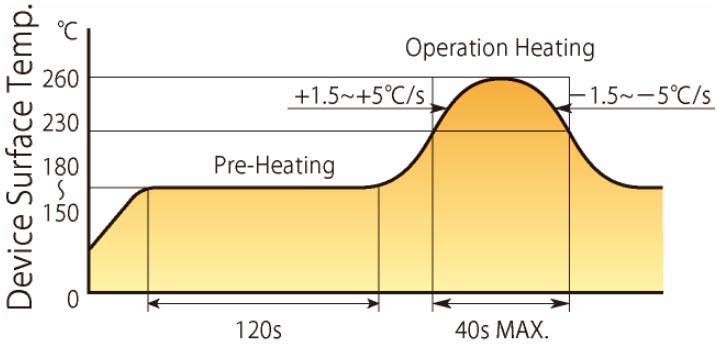
Taping Specification

(Unit: mm)

Quantity: 2,500pcs/ reel (standard)



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 ℃	
Soldering time and frequency	3 s 1 time	(MAX.) (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℃, LED : I_F = 5mA, Phototransistor : V_{CE} = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Wet High Temp. Operaing Life	EIAJ ED-4701/100(102)	Ta = 60℃, RH = 90%, LED : I_F = 5mA, Phototransistor : V_{CE} = 5V, There is a reflector., d = 1mm	1,000 h	0/25
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 85℃, LED : I_F = 5mA, Phototransistor : V_{CE} = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -30℃, LED : I_F = 5mA, Phototransistor : V_{CE} = 5V, There is a reflector., d = 1mm	1,000 h	0/25
Thermal Shock	EIAJ ED-4701/200/(203)	-40℃(15min)～100℃(15min)	5 cycles	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(301)	(Reflow)Preheat : 150 ～ 180℃(120s Max.) Operating Heat : 230℃以上 (40s Max.) Peak : 260℃ (5s Max.)	Twice	0/25

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Forward Voltage	V_F	I_F=5mA	Testing Max.Value ≧ Initial Value x 1.2
Reverse Current	I_R	V_R=5V	Testing Max.Value ≧ 10 μA x 2.5
Photo Current	I_C	I_F=5mA, V_{CE}=5V, d=1mm	Testing Max.Value ≧ Initial Value × 1.2 Testing Min.Value ≦ Initial Value × 0.8
Leak Current	I_{LEAK}	I_F=5mA, V_{CE}=5V, No Reflector	Testing Max.Value ≧ 2 μA x1.2

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2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.

3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.

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