

OPTICAL SENSOR

Super intensity infrared LEDs and photo detectors are used in these photo sensors. Stanley offers high quality and reliability in all of its sensors for use in optical disks, office automation equipment and optical connectors for surface mount devices.

Liquid Level Detecting Sensor

Characteristics

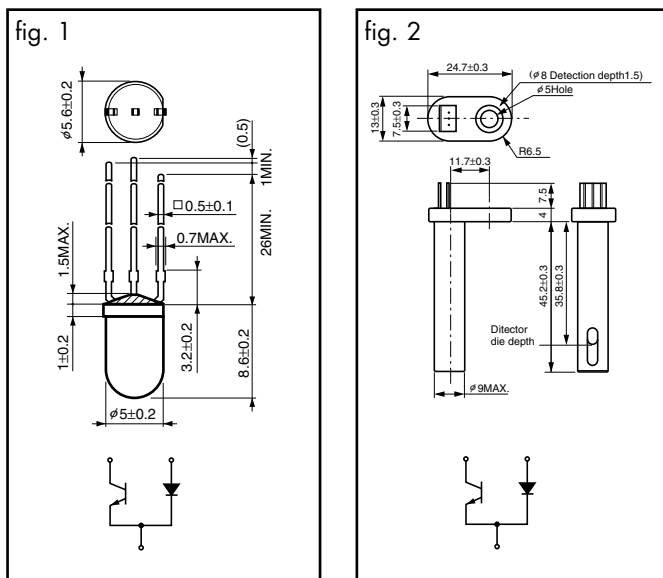
Ta=25°C

Shape	Part No.	Output voltage in the liquid ❖V _{OH} MIN.	Output voltage in the air ❖V _{OL} MAX.	Forward voltage V _F MAX.	I _F	Operating temperature Topr.	fig.
	KU165	4.0	0.4	2.0	50	-20~+70	1
	KU166						2
Unit		V	V	V	mA	C	

❖ condition: V_{CC}=5V, R_L=5.6K, R_L=V_{CE} value at R_S=160

Package Dimensions

unit: mm



DVD • CD Detecting Sensor

Characteristics

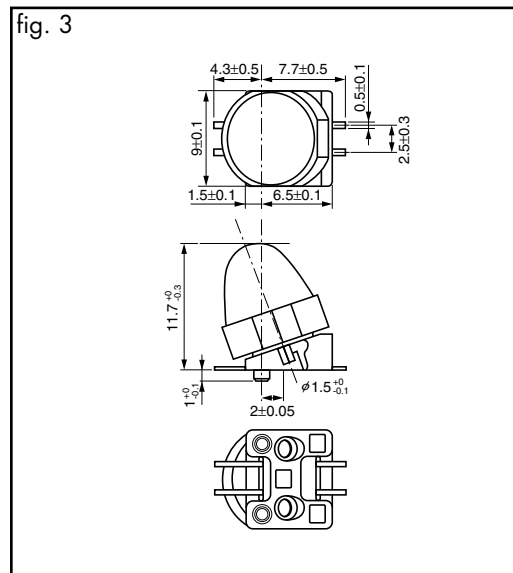
Ta=25°C

Shape	Part No.	DVD detection output ❖MAX.	CD detection output ❖MIN.	Forward Voltage V _F MAX.	I _F	fig.
	KU160	85	270	1.5	50	3
Unit		mV	mV	V	mA	

❖ condition: W.D=2.8mm(from the top), in a dedicated circuit
❖ Product contains no lead

Package Dimensions

unit:mm



OPTICAL SENSOR

Stanley's optical sensors, KU168 and KU159, can detect the angle of DVD for easy pick-up.

Disk Detecting Sensor (for DVD+RW, DVD-RW, RAM)

Characteristics

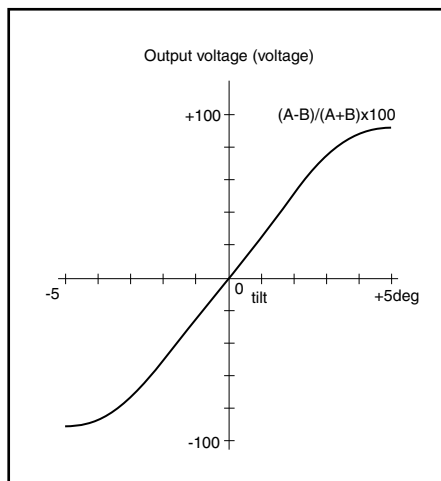
Ta=25°C

Shape	Part No.	sensing angle MIN. ✧1	normal absolute ✧1,2 sensitivity MIN. MAX.	leak output MAX.	initial freezing point off set ✧1	recorded/ not recorded off set ✧4	reflection rate off set ✧3,4	operating temp. Topr.	fig.
	KU168	±2.0	24 38	0.62	±2.5	±0.1	±0.15	-10~+70	4
Unit		deg.	%	V	deg.	deg.	deg.	C	

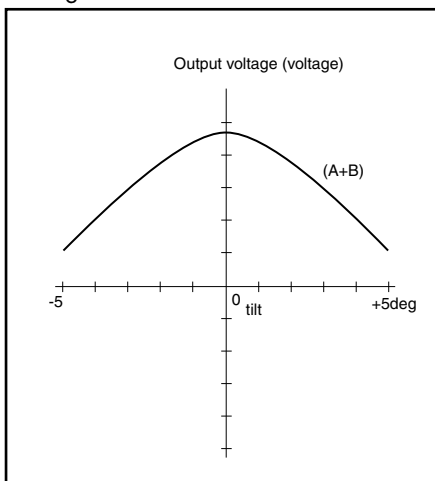
✧1 L=7.3mm ✧2 at 1 degree ✧3 RW disk ✧4 aluminum plate mirror is used

✧ Product contains no lead

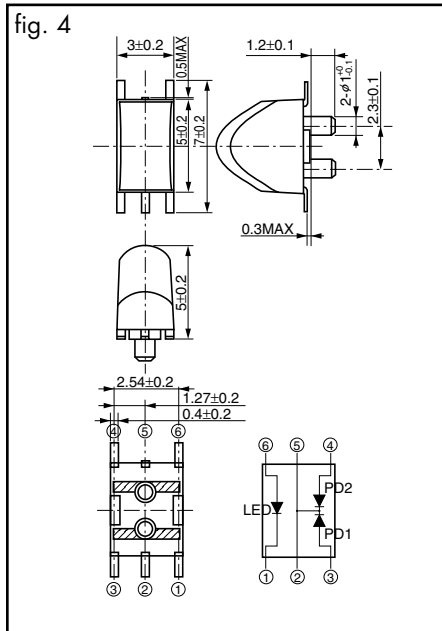
• Radial Direction



• Tangential Direction



Package Dimensions unit: mm



Disk Detecting Sensor (for DVD-ROM)

Characteristics

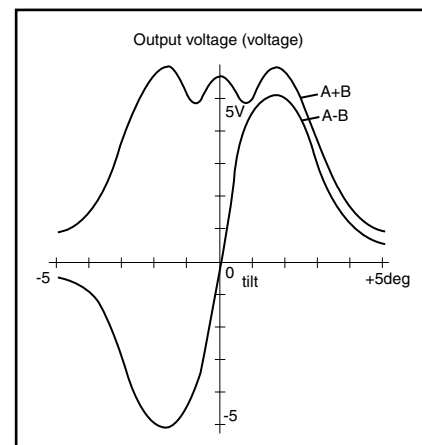
Ta=25°C

Shape	Part No.	❖1 derate at ±2.5 deg. MAX.	❖1, 2 Absolute sensitivity		Leak output MAX.	Initial freezing point off set ❖1 0	Half loading detection capability ❖1	Operating temperature Topr.	fig.
			MIN.	MAX.					
	KU159	50	2.4	7.2	0.23	±2	±0.07	-10~+70	5
Unit		%	V		V	deg.	deg.	C	

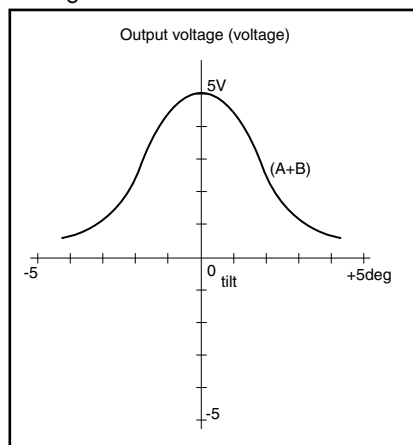
✧1 condition: L=10mm (From the bottom) ✧2 condition: at 1 degree in a dedicated circuit

✧ Product contains no lead

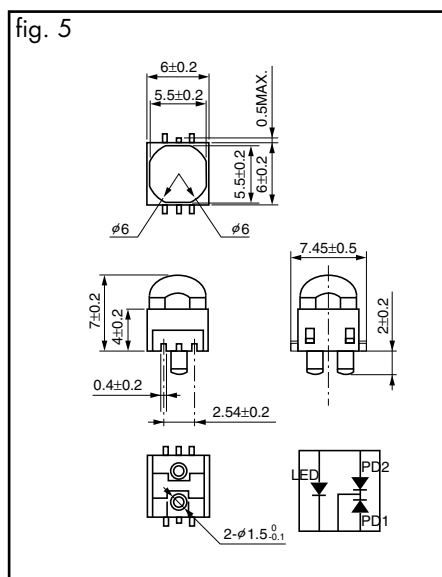
• Radial Direction



• Tangential Direction



Package Dimensions unit: mm



OPTICAL SENSOR

Human Detecting Sensor

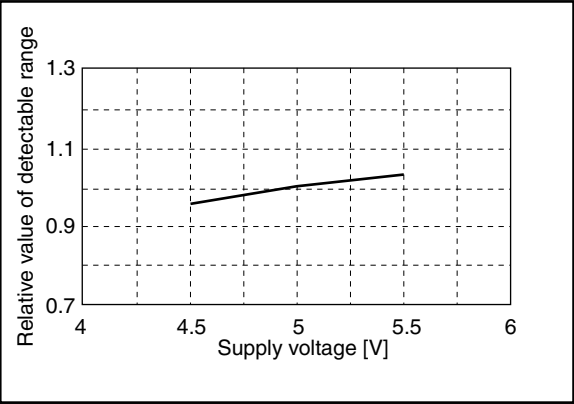
Characteristics

Ta=25°C

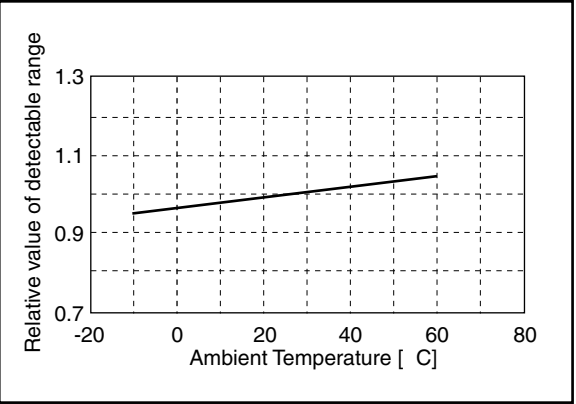
Shape	Part No.	Detection distance	Supply Voltage Vcc	Current consumption Mean MAX. Peak MAX.		Output I/F	Response time MAX.	Acceptable ambient illuminate MAX.	Operating temperature Topr.	fig.
	KU381-40	400	5	80	350	Open Collector (4.7k)	5	3000	0~+60	6
	KU381-60	600								
	KU381-80	800								
Unit		mm	V	mA			msec	lx	C	

❖ condition:Vcc=5V, Ambient brightness=0Lux.

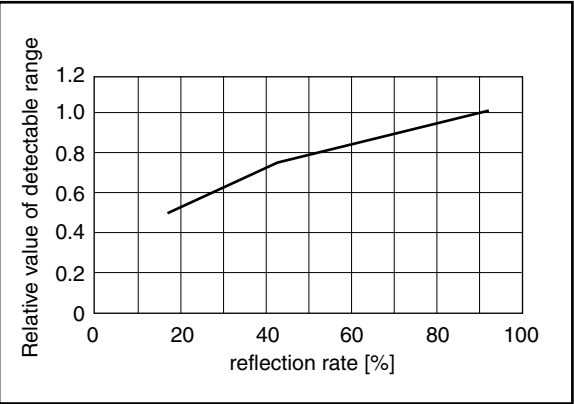
• Detection Distance vs. Supply Voltage



• Temperature Characteristics



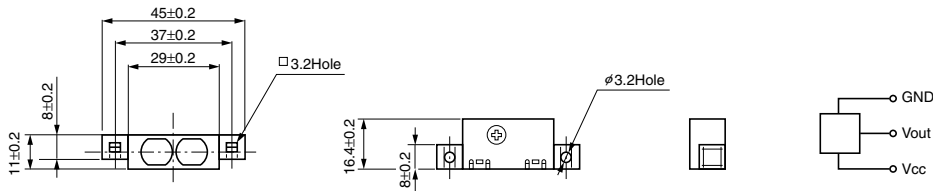
• Detection Distance vs. Reflection Rate



Package Dimensions

unit: mm

fig. 6



OPTICAL SENSOR

Reflector Sensor

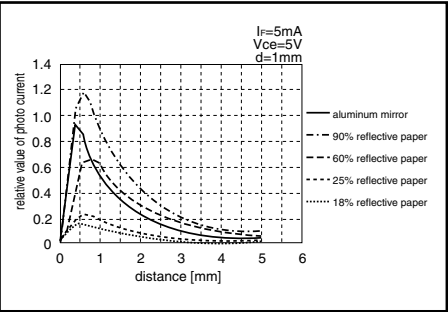
Characteristics

Ta=25°C

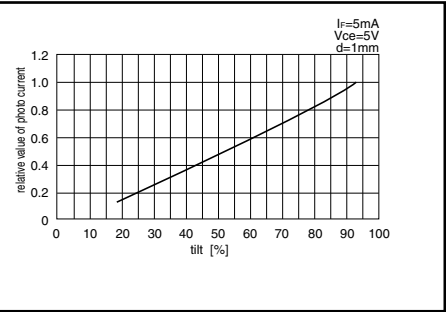
Shape	Part No.	Photo Current Ip					Leak Current I _{LEAK}			Rise Time • Fall Time tr • tf				Forward Voltage VF		Operating Temperature Topr.	fig.
		MIN.	TYP.	MAX.	VCE	IF	MAX.	VCE	IF	TYP.	VCE	RL	IF	MAX.	IF		
	KU163A	90	300	688	5	5	2	5	5	10	10	100	5	1.5	5	-30~+85	7
Unit		A			V	mA	A	V	mA	s	V		mA	V	mA	C	

❖ Product contains no lead

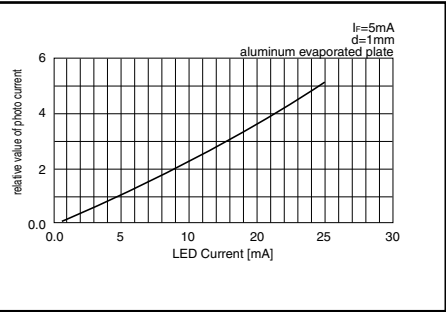
• Detection Range Characteristics



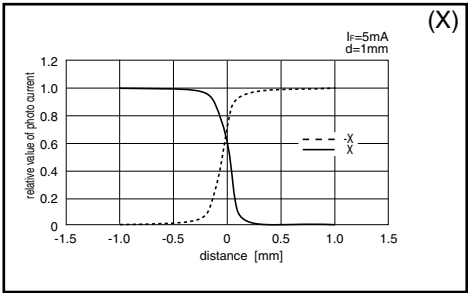
• Detection Distance vs. Object Reflection



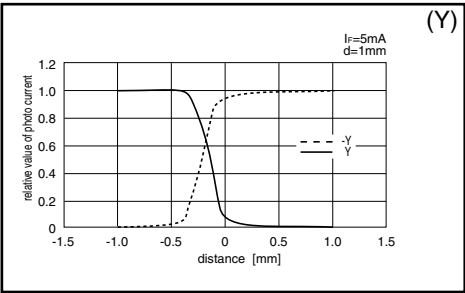
• LED Current-Relative Value



• Detection Distance Range Characteristics

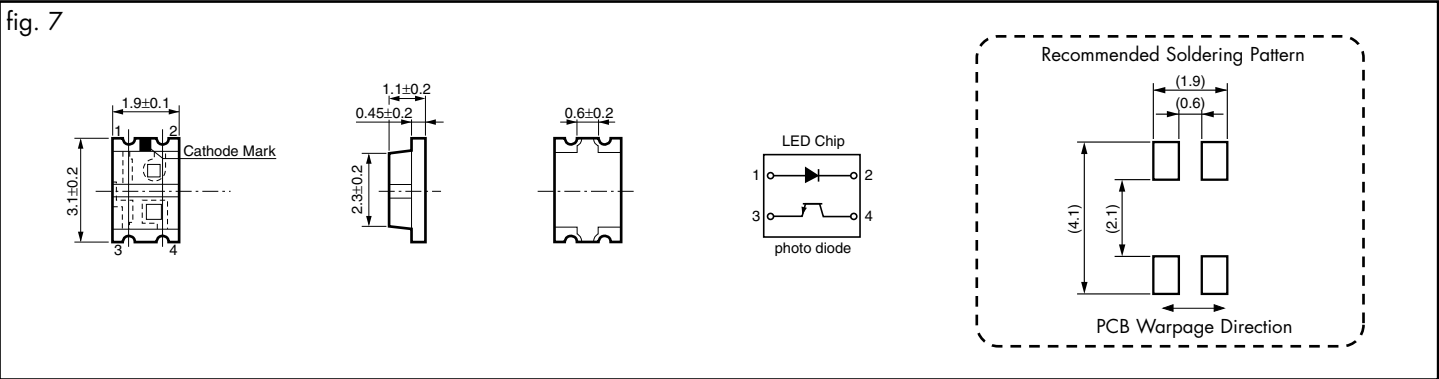


• Detection Distance Range Characteristics



Package Dimensions

unit: mm



OPTICAL SENSOR

Color Toner Density Sensor

Characteristics

Ta=25°C

Shape	Part No.	Supply Voltage Vcc	Forward Current If	Sensor Output Vout		Monitor Output Vmon	Response Time tr • tf	Output Change Rate*1 Tout	fig
				Detector Board A	Detector Board B				
	KUA0003A	0 ~ +5.5	100	3.9 ~ 4.1	0.2 ~ 0.4	0.9 ~ 4.1	10	±15	8
Unit		V	mA	V	V	V	msec	%	

*1 Output change rate within the operating temperature (0~60 C)

Package Dimensions

unit: mm

fig. 8

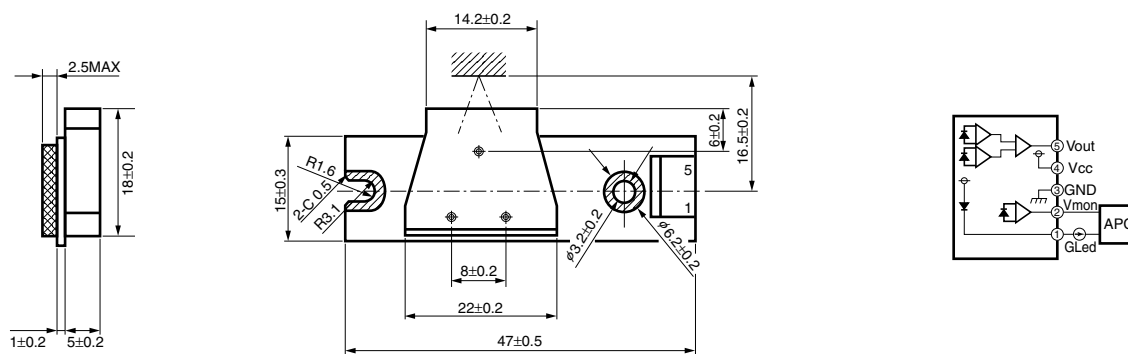


Photo Connector

Characteristics

Ta=25°C

Shape	Part No.	INFRARED LED						PIN PHOTO DIODE								fig.
		Radiant Intensity		Forward Voltage		Cut-Off Frequency		Photo Current			Dark Current		Capacitance			
		I_E		V_F		$\nabla 1.f_c$		I_p			I_o		C_T			
		TYP.	I_F	MAX.	I_F	TYP.	I_F	TYP.	V_R	$\nabla 2.E_e$	MAX.	V_R	TYP.	V_R	f	
	KU167	2	20	1.6	20	12	20	4	5	5	10	10	3	10	1	9
Unit		mW/sr	mA	V	mA	MHz	mA	A	V	mW/cm ²	nA	V	pF	V	MHz	

*1 Fc condition: I_F= 20mADC+10mAp-p *2 A standard tungsten lamp with color temperature 2856k is used

* Product contains no lead

Package Dimensions

unit: mm

fig. 9

