Silicon PIN Photodiode

FEATURES

- Package type: surface-mount
- Technology: homogeneous
- Package form: top view
- Dimensions (L x W x H in mm): 4.72 x 4.72 x 0.75
- AEC-Q101 qualified
- Floor life: 186 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

LINKS TO ADDITIONAL RESOURCES

3D Models Footprints

DESCRIPTION

K857PH is a 4-quadrant photo detector in surface-mount package. Each quadrant PD has an active area of 1.6 mm^2.

PRODUCT SUMMARY			
COMPONENT	I_{ra} (µA) (E_e = 1.0 mW/cm^2, λ = 850 nm, V_R = 5 V)	φ (°)	$λ_{0.1}$ (nm)
K857PH	10	± 60	710 to 1100

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
K857PH	Tape and reel	MOQ: 1000 pcs, 1000 pcs per reel	Top view
K857PH-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs per reel	Top view

Note

- MOQ: minimum order quantity

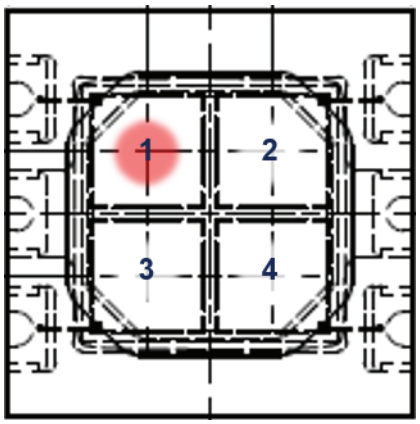
ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	10	V
Operating temperature range		T_{amb}	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Soldering temperature	According to reflow solder profile Fig. 8	T_{sd}	260	°C
ESD safety HBM	± 2000 V, 1.5 kΩ, 100 pF, 3 pulses	ESD_{HBM}	2.0	kV

BASIC CHARACTERISTICS, SINGLE QUADRANT (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 50 mA	V_F	-	1.25	1.5	V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}	-	1.0	10	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D	-	18	-	pF
	V_R = 3 V, f = 1 MHz, E = 0	C_D	-	6	-	pF
Reverse light current	E_e = 1 mW/cm², λ = 850 nm, V_R = 5 V	I_{ra}	-	10	-	µA
	E_e = 1 mW/cm², λ = 940 nm, V_R = 5 V	I_{ra}	-	11	-	µA
Angle of half sensitivity		φ	-	± 60	-	°
Wavelength of peak sensitivity		λ_p	-	950	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	710 to 1100	-	nm
Rise time	V_R = 10 V, R_L = 50 Ω, λ = 950 nm	t_r	-	3.9	-	µs
Fall time	V_R = 10 V, R_L = 50 Ω, λ = 950 nm	t_f	-	2.5	-	µs

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

Values measured / estimated per quadrant q [q = 1, 2, 3, 4]

CROSS-TALK SPECIFICATION			
Laser illumination (850 nm, 65 µm spot diameter, radiant power 0.7 mW) of center of PD quadrant 1 (q = 1), V_R, q = 5 V applied to all quadrants (q = 1, 2, 3, 4)			
ILLUMINATED	**MEASURED PARAMETER**	**TYP. VALUE**	**UNIT**
Yes	Ira_850_1	100	%
No	Ira_850_2	0.1	%
No	Ira_850_3	0.1	%
No	Ira_850_4	0.05	%



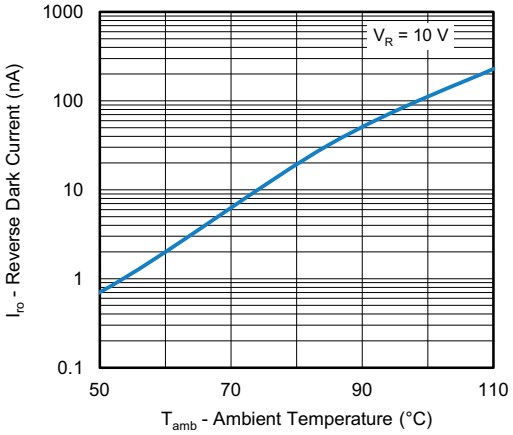


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

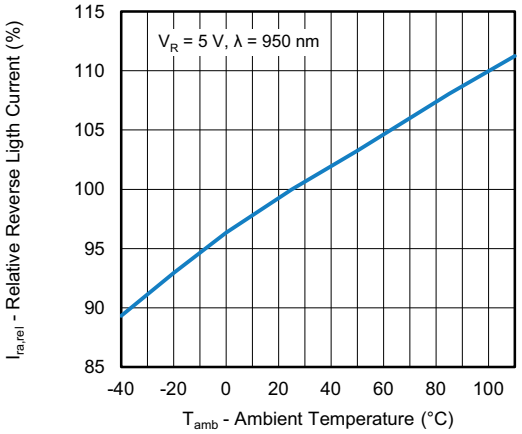


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

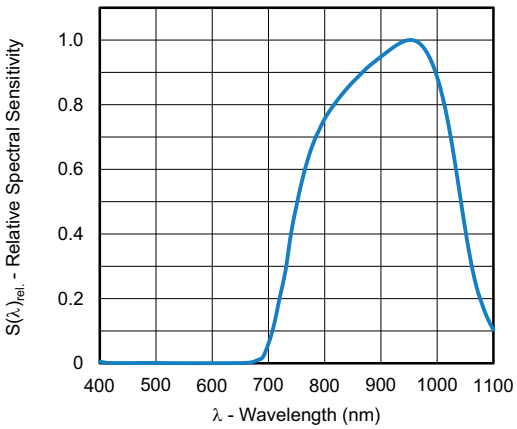


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

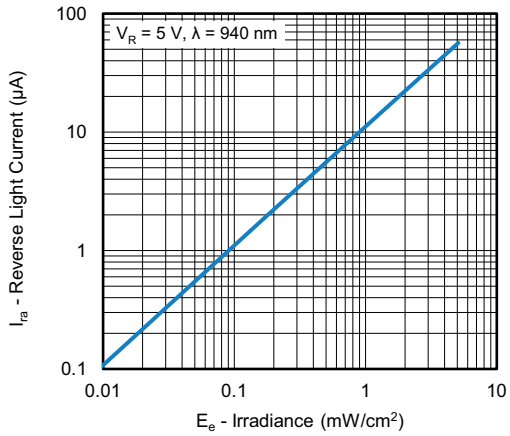


Fig. 3 - Reverse Light Current vs. Irradiance

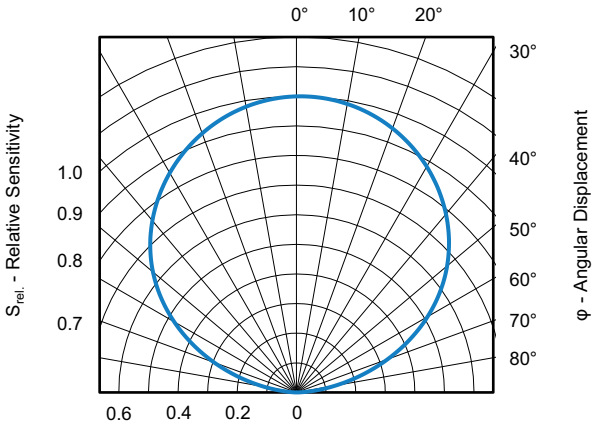


Fig. 6 - Relative Sensitivity vs. Angular Displacement

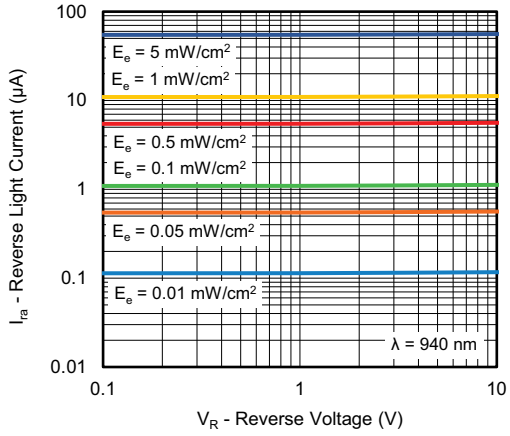


Fig. 4 - Reverse Light Current vs. Reverse Voltage

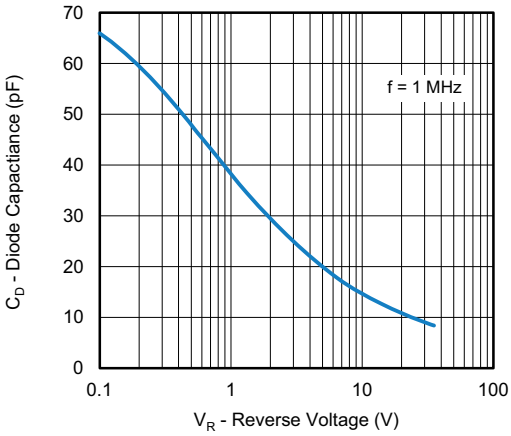
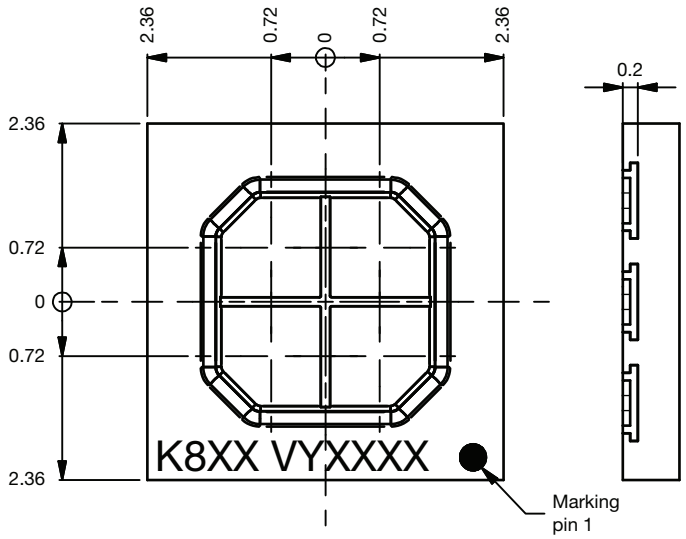
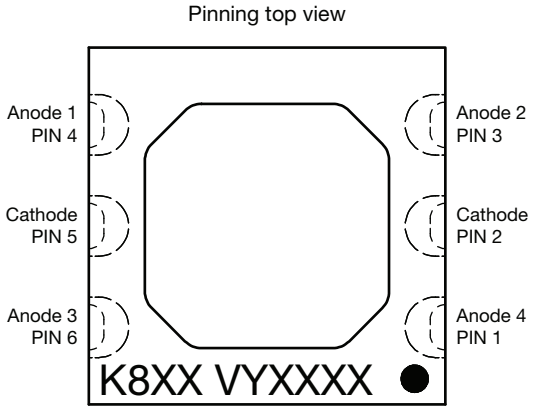
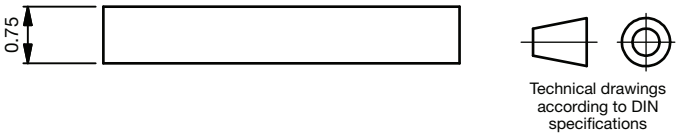


Fig. 7 - Diode Capacitance vs. Reverse Voltage
(applied to all four anode contacts)

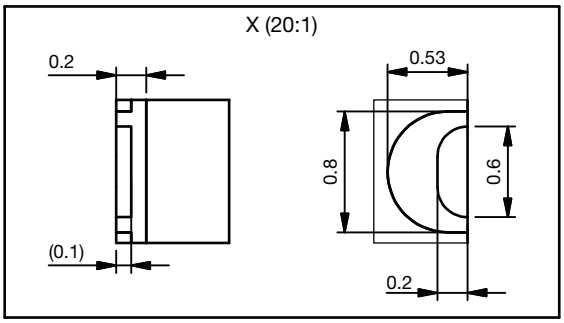
PACKAGE DIMENSIONS in millimeters

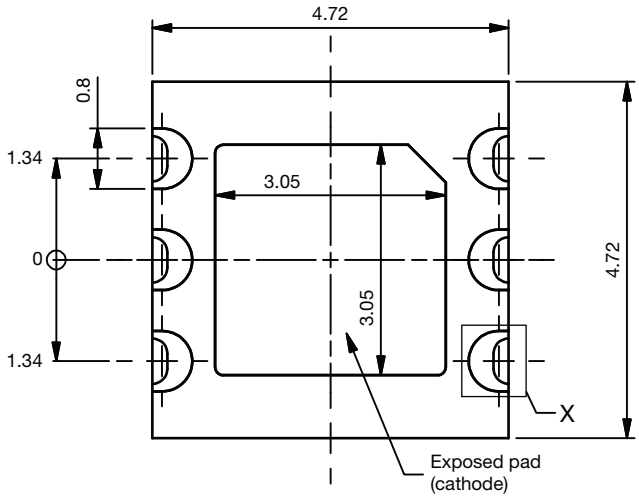


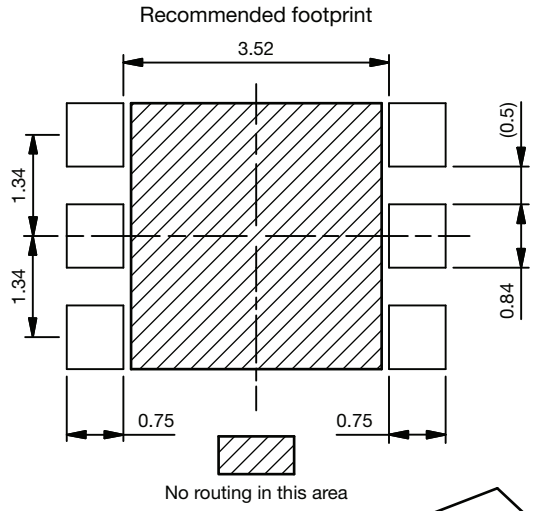




Technical drawings
according to DIN
specifications



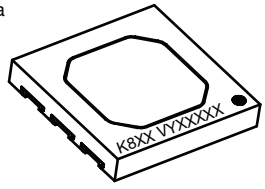




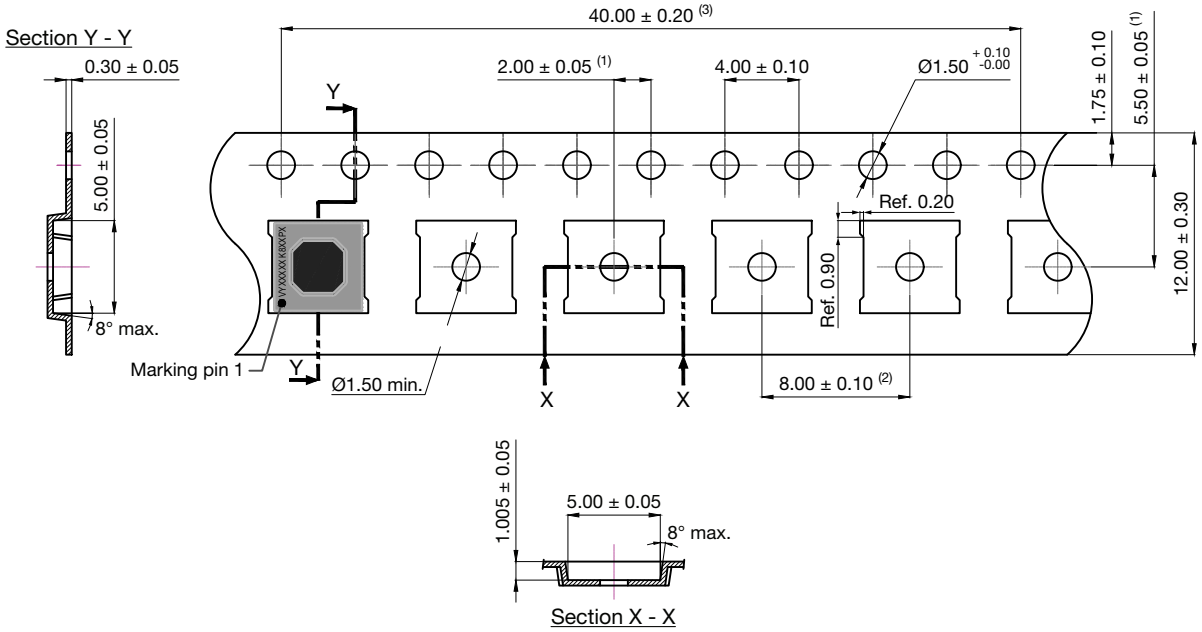
Not indicated tolerances ± 0.1 mm

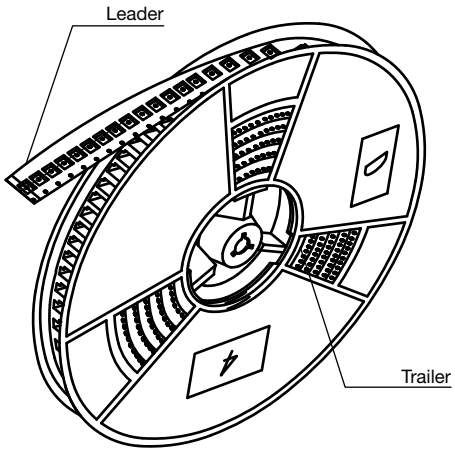
Drawing No.: 6.550-5356.01-4
Issue: 2; 19.02.2021

Active area photodiodes:	
Single PD:	1.6 mm²
All PDs:	6.4 mm²
Total opening:	7.1 mm²



TAPE AND REEL DIMENSIONS in millimeters





Notes

- Allowable camber to be 1 mm per 250 mm in length for single winding and 2 mm per 250 mm in length for cross winding

(1) Measure from centerline of sprocket hole to centerline of pocket
(2) Measure from centerline of pocket to centerline of pocket
(3) Pitch tolerance for sprocket hole, 10 pitch cumulative tolerance is ± 0.2 mm

SOLDER PROFILE

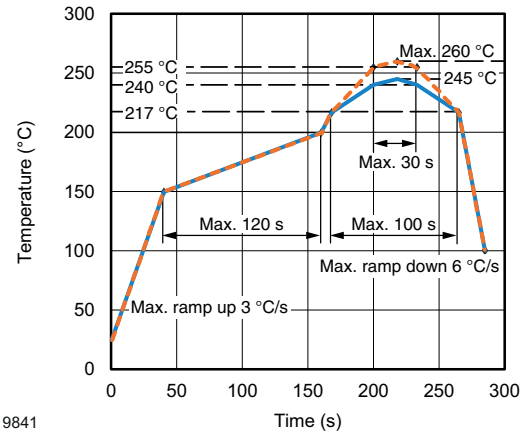


Fig. 8 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

Conditions: T_{amb} < 30 °C, RH < 60 %

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or recommended conditions:

192 h at 40 °C (+ 5 °C), RH < 5 %

or

96 h at 60 °C (+ 5 °C), RH < 5 %

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