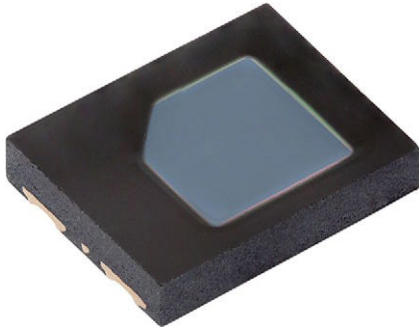


## Ambient Light Sensor



### DESCRIPTION

VEMD5510FX01 is a PIN photodiode ambient light sensor. The photodiode detects visible light much like the human eye and has its peak sensitivity at 540 nm.

The VEMD5510FX01 uses a low profile surface-mount QFN package with wettable flanks for optical solder joint inspection.

### FEATURES

- Package type: surface-mount
- Package form: top view
- Dimensions (L x W x H in mm): 5 x 4 x 0.9
- Radiant sensitive area (in mm<sup>2</sup>): 7.5
- AEC-Q101 qualified
- Adapted to human eye responsivity
- Angle of half sensitivity:  $\varphi = \pm 65^\circ$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- Automotive
- Ambient light sensors

### PRODUCT SUMMARY

COMPONENT	$I_{ra}$ ( $\mu\text{A}$ ) at $E_V = 100 \text{ lx}$ , CIE Illuminant A, $V_R = 5 \text{ V}$	$\varphi$ ( $^\circ$ )	$\lambda_{0.5}$ (nm)
VEMD5510FX01	0.7	$\pm 65$	420 to 620

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD5510FX01	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Top view
VEMD5510FX01-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs/reel	Top view

#### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	10	V
Operating temperature range		$T_{amb}$	-40 to +110	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-40 to +110	$^\circ\text{C}$
Soldering temperature	According to reflow solder profile Fig. 8	$T_{sd}$	260	$^\circ\text{C}$
ESD safety HBM	$\pm 2000 \text{ V}$ , 1.5 k $\Omega$ , 100 pF, 3 pulses	$\text{ESD}_{\text{HBM}}$	$\geq 2$	kV

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50\text{ mA}$	$V_F$	-	0.9	1.3	V
Reverse dark current	$V_R = 5\text{ V}, E = 0$	$I_{ro}$	-	1	10	nA
Diode capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}, E = 0$	$C_D$	-	950	-	pF
	$V_R = 3\text{ V}, f = 1\text{ MHz}, E = 0$	$C_D$	-	650	-	pF
Reverse light current	$E_e = 0.2\text{ mW/cm}^2, \lambda = 525\text{ nm}, V_R = 5\text{ V}$	$I_{ra}$	2.9	3.8	4.8	$\mu\text{A}$
	$E_V = 100\text{ lx}, \text{CIE illuminant A}, V_R = 5\text{ V}$	$I_{ra}$	-	0.7	-	$\mu\text{A}$
Angle of half sensitivity		$\varphi$	-	$\pm 65$	-	$^{\circ}$
Wavelength of peak sensitivity		$\lambda_p$	-	540	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	420 to 620	-	nm

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

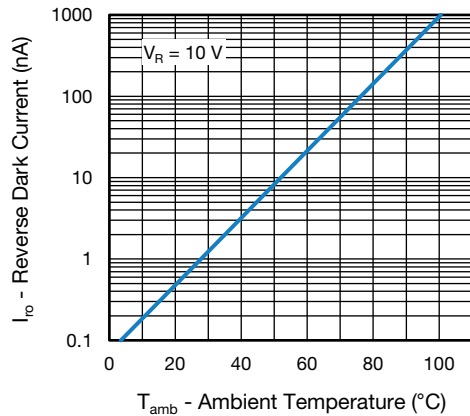
 Basic characteristics graphs to be extended to  $110\text{ }^{\circ}\text{C}$  ambient temperatures where applicable.


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

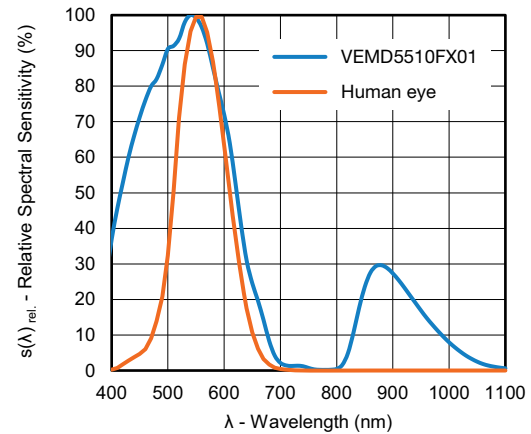


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

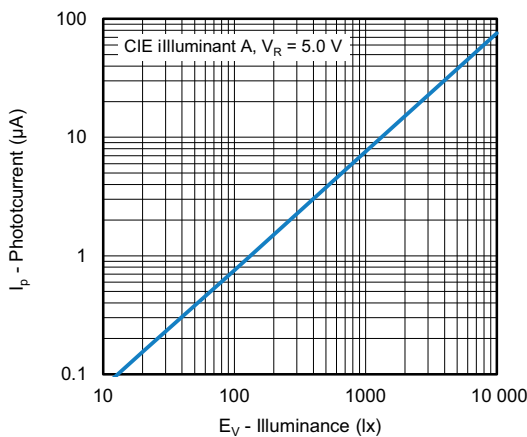


Fig. 2 - Reverse Light Current vs. Irradiance

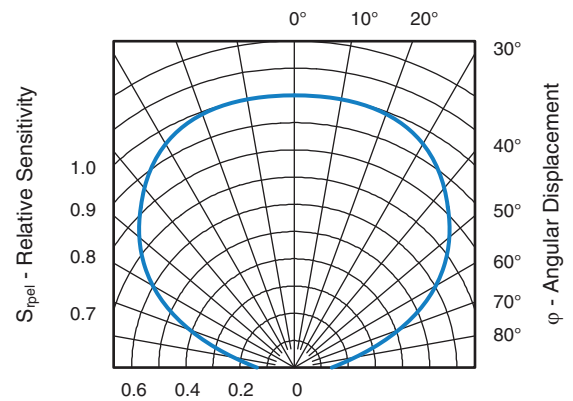
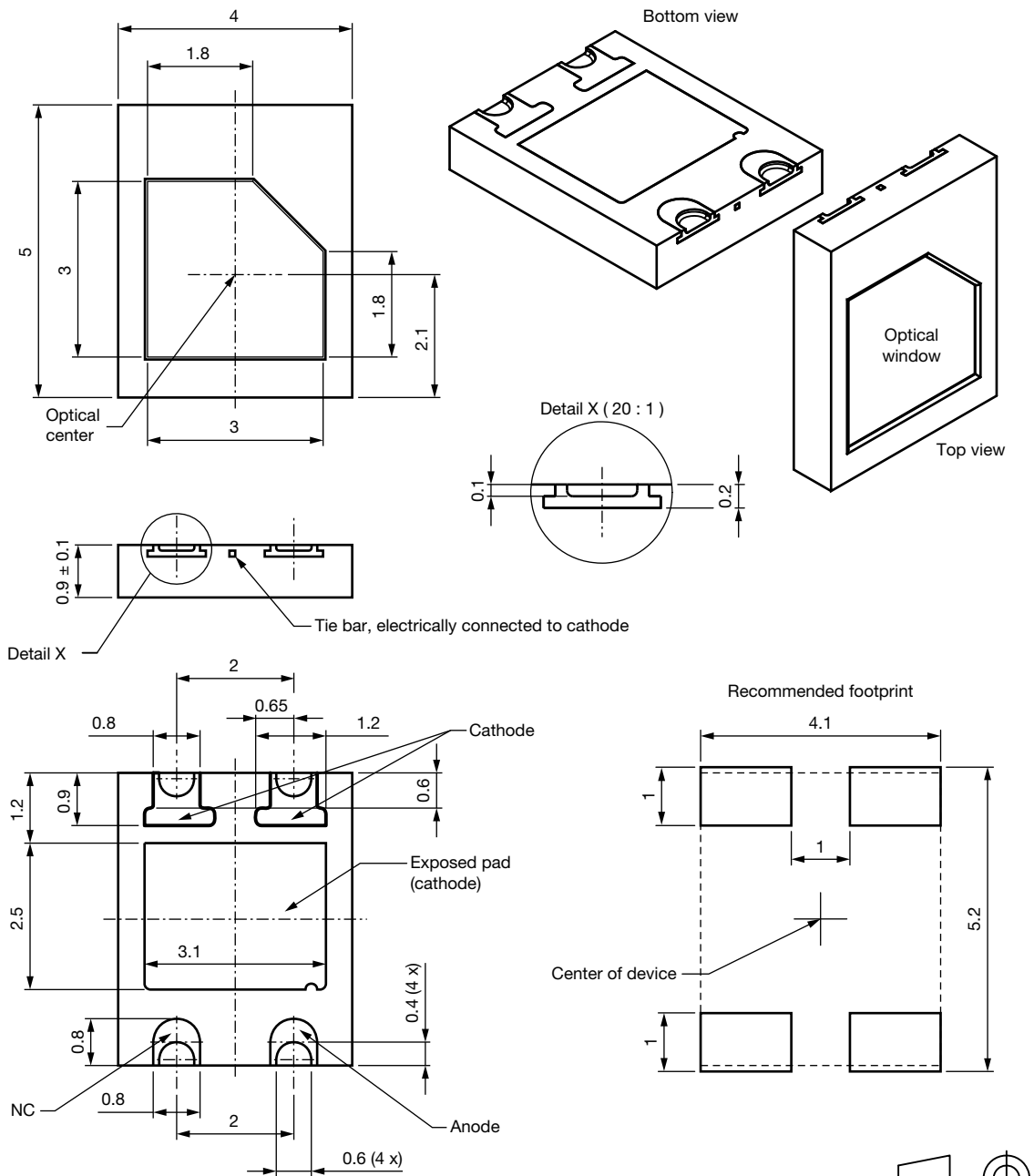


Fig. 4 - Relative Sensitivity vs. Angular Displacement

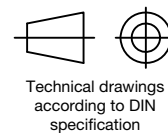


### PACKAGE DIMENSIONS in millimeters



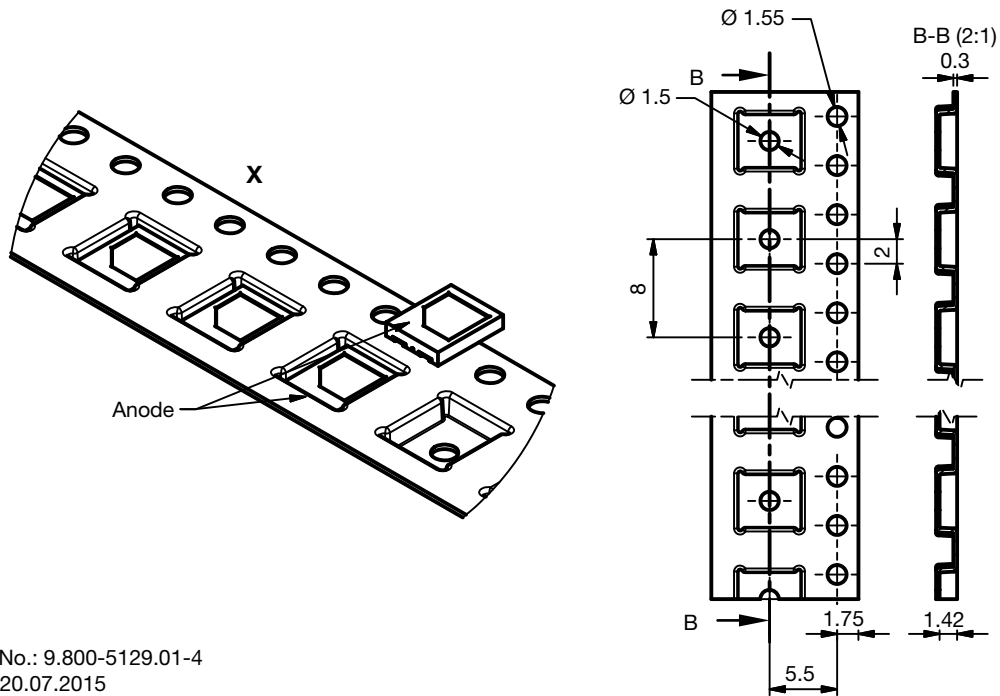
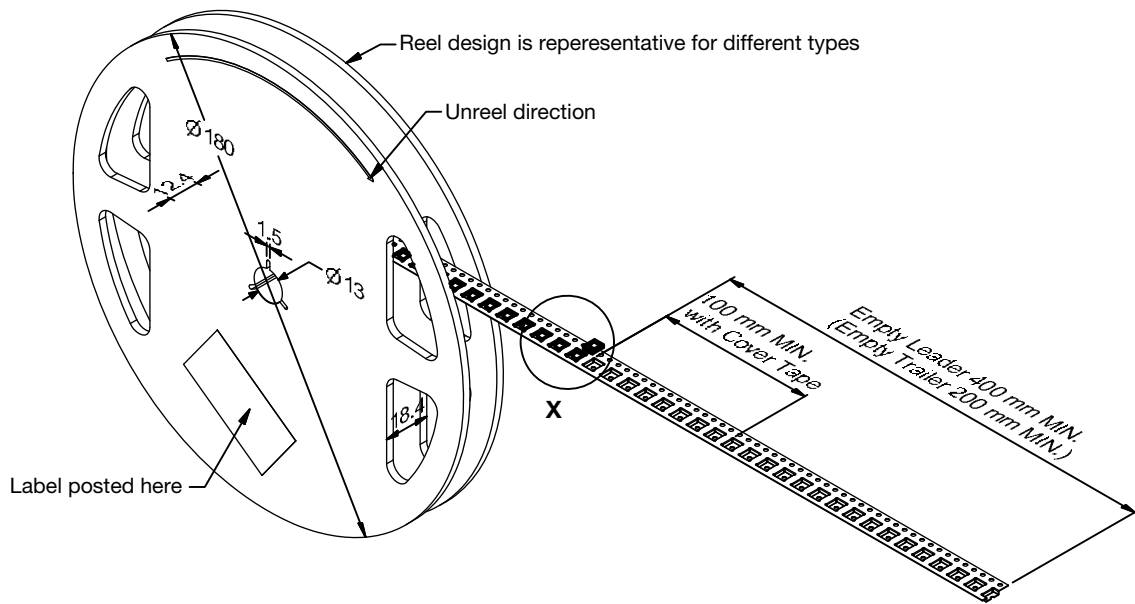
Drawing- No.: 6.550-5329.01-4  
Issue: 5; 23.09.2020

Not indicated tolerances ± 0.1



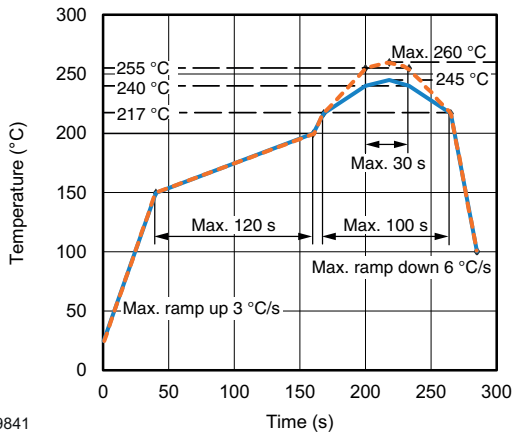


TAPE AND REEL DIMENSIONS in millimeters



Drawing No.: 9.800-5129.01-4  
Issue: 1; 20.07.2015

**SOLDER PROFILE**



19841

Fig. 5 - 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:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ ,  $\text{RH} < 60\%$

**DRYING**

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or recommended conditions:

192 h at  $40\text{ }^{\circ}\text{C} (+ 5\text{ }^{\circ}\text{C})$ ,  $\text{RH} < 5\%$

or

96 h at  $60\text{ }^{\circ}\text{C} (+ 5\text{ }^{\circ}\text{C})$ ,  $\text{RH} < 5\%$



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