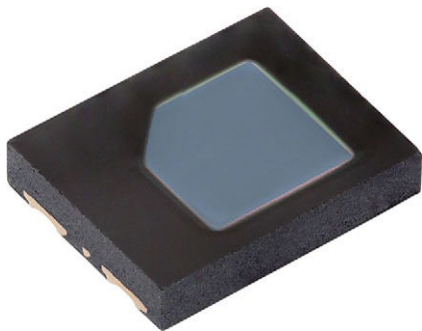


Ambient Light Sensor



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 mm²): 7.5
- AEC-Q101 qualified
- Adapted to human eye responsivity
- Angle of half sensitivity: $\phi = \pm 65^\circ$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Automotive
- Ambient light sensors

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA) at $E_V = 100$ lx, CIE Illuminant A, $V_R = 5$ V	ϕ (°)	$\lambda_{0.5}$ (nm)
VEMD5510FX01	0.7	± 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 ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	10	V
Operating temperature range		T_{amb}	-40 to +110	°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	kV

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	μA
	$E_V = 100\text{ lx}, \text{CIE illuminant A}, V_R = 5\text{ V}$	I_{ra}	-	0.7	-	μA
Angle of half sensitivity		ϕ	-	± 65	-	$^{\circ}$
Wavelength of peak sensitivity		λ_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.

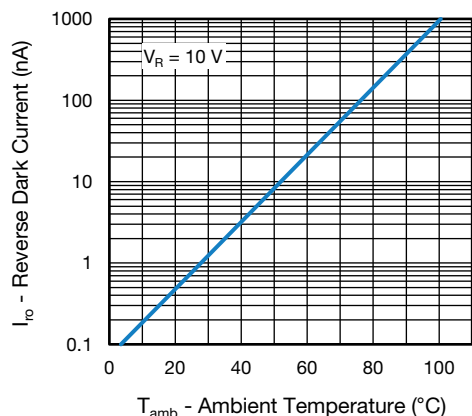


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

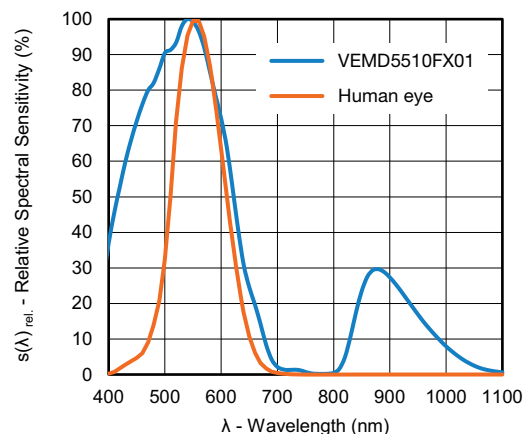


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

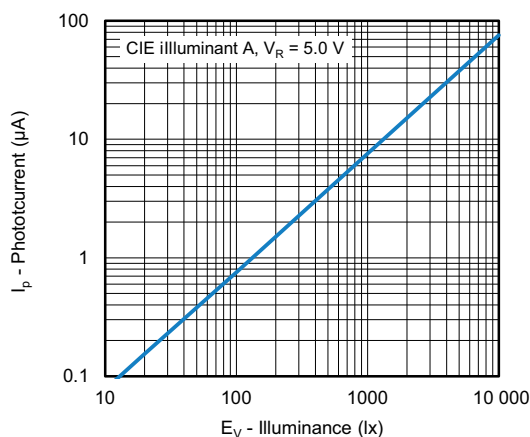


Fig. 2 - Reverse Light Current vs. Irradiance

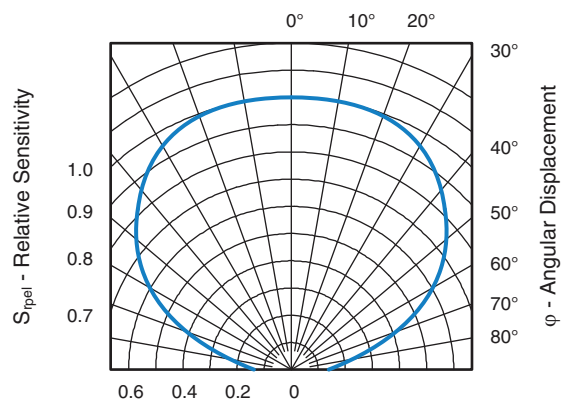
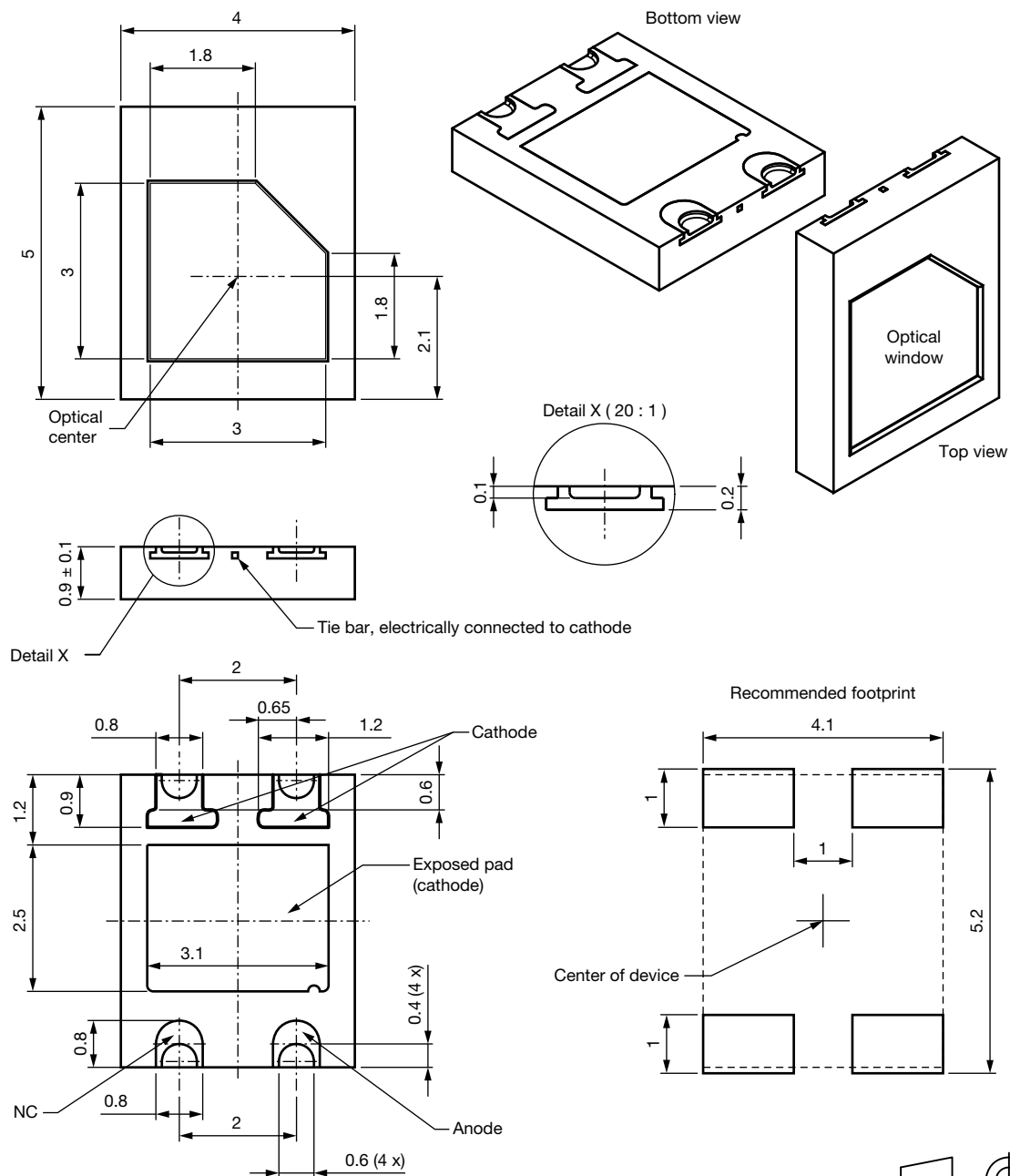


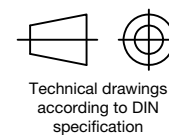
Fig. 4 - Relative Sensitivity vs. Angular Displacement

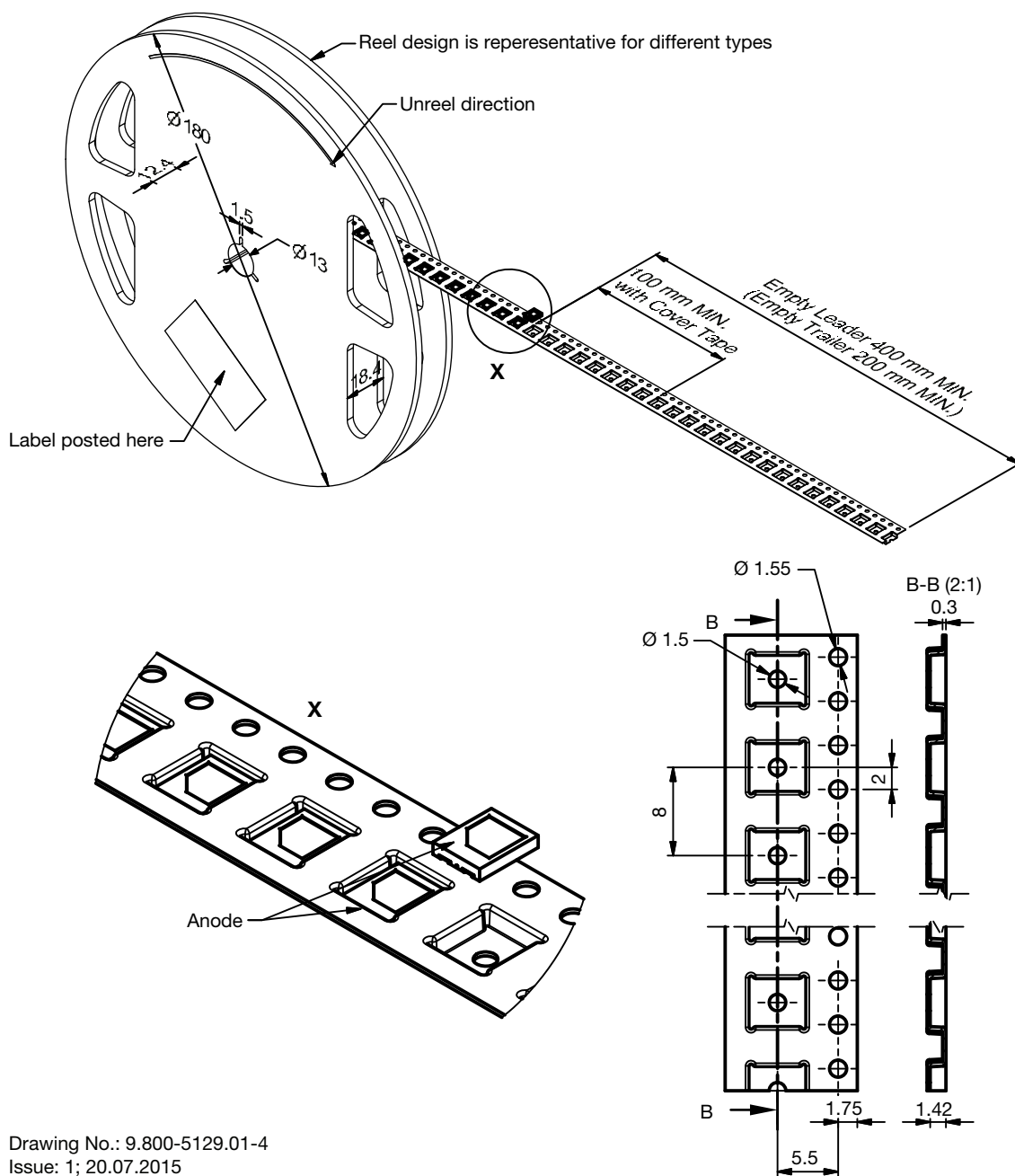
PACKAGE DIMENSIONS in millimeters


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

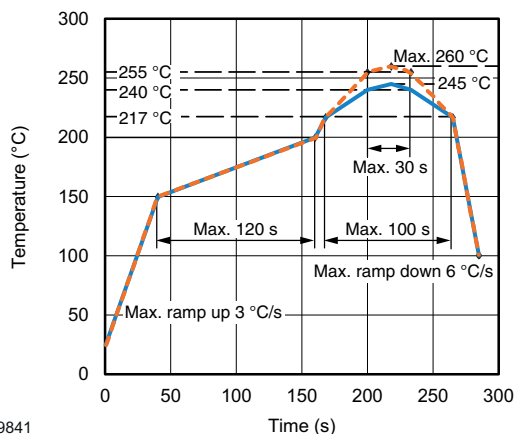


Fig. 5 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020D

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: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

DRYING

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

192 h at 40 °C (+ 5 °C), $RH < 5\%$

or

96 h at 60 °C (+ 5 °C), $RH < 5\%$

19841



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