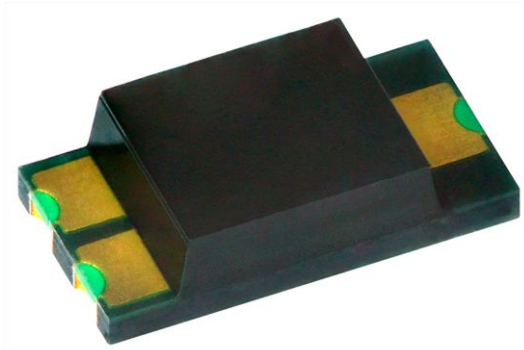


Silicon PIN Photodiode



DESCRIPTION

VEMD6110X01 is a high speed and high sensitive PIN photodiode. It is a small surface mount device (SMD) including the chip with a 0.85 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength of 830 nm to 950 nm.

FEATURES

- Package type: surface mount
- Package form: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- Radiant sensitive area (in mm²): 0.85
- High photo sensitivity
- High radiant sensitivity
- Daylight blocking filter matched with 830 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 60^\circ$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- High speed photo detector

PRODUCT SUMMARY

| COMPONENT | I _{ra} (μA) | φ (deg) | λ _{0.5} (nm) |
|-------------|----------------------|---------|-----------------------|
| VEMD6110X01 | 9.5 | ± 60 | 750 to 1050 |

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VEMD6110X01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 1206 |

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 | 32 | V |
| Power dissipation | T _{amb} ≤ 25 °C | P _V | 215 | mW |
| Junction temperature | | T _j | 110 | °C |
| Operating temperature range | | T _{amb} | -40 to +110 | °C |
| Storage temperature range | | T _{stg} | -40 to +110 | °C |
| Soldering temperature | Acc. reflow solder profile fig. 8 | T _{sd} | 260 | °C |
| Thermal resistance junction/ambient | Acc. J-STD-051 | R _{thJA} | 270 | K/W |

| 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 | | 1 | | V |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0$ | $V_{(BR)}$ | 32 | | | V |
| Reverse dark current | $V_R = 10\text{ V}$, $E = 0$ | I_{ro} | | 1 | 3 | nA |
| Diode capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | | 12 | | pF |
| | $V_R = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | | 3.6 | | pF |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | V_o | | 356 | | mV |
| Temperature coefficient of V_o | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | TK_{V_o} | | -3.1 | | mV/K |
| Short circuit current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | I_k | | 9 | | μA |
| Temperature coefficient of I_k | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | TK_{I_k} | | 0.1 | | %/K |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | 6.7 | 9.5 | 12.4 | μA |
| Angle of half sensitivity | | ϕ | | ± 60 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 950 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | 750 | | 1050 | nm |
| Rise time | $V_R = 10\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 820\text{ nm}$ | t_r | | 100 | | ns |
| Fall time | $V_R = 10\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 820\text{ nm}$ | t_f | | 100 | | ns |

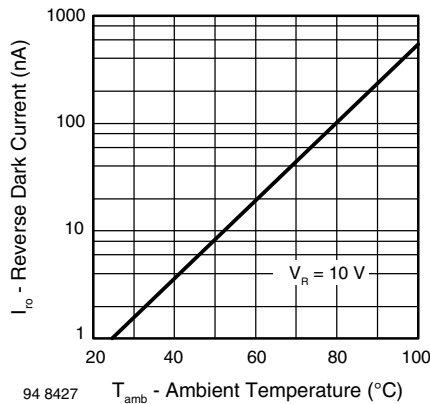
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

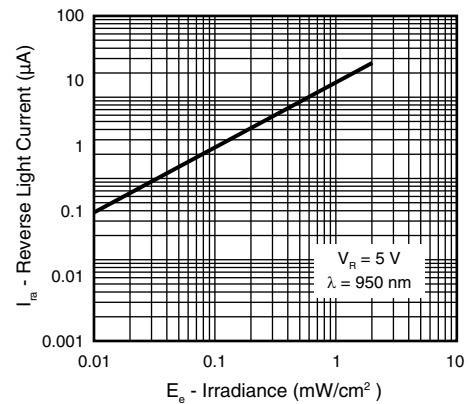


Fig. 3 - Reverse Light Current vs. Irradiance

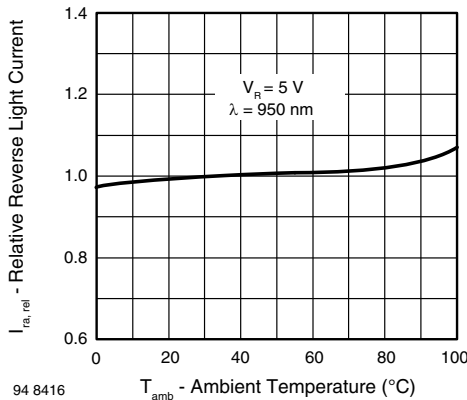


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

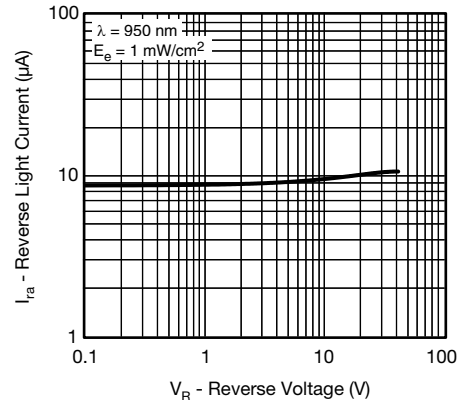


Fig. 4 - Reverse Light Current vs. Reverse Voltage

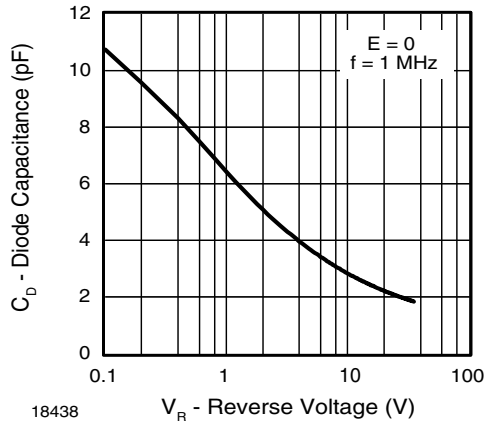


Fig. 5 - Diode Capacitance vs. Reverse Voltage

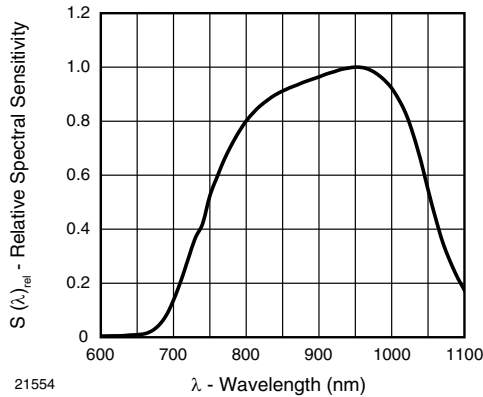


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

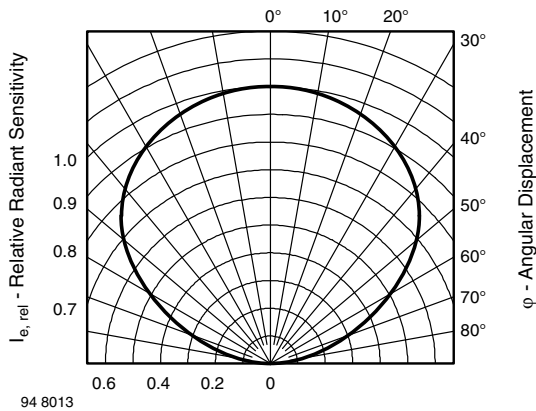


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

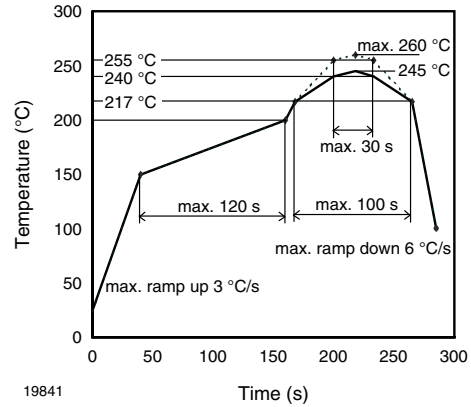


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 72 h

Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $RH < 60\%$

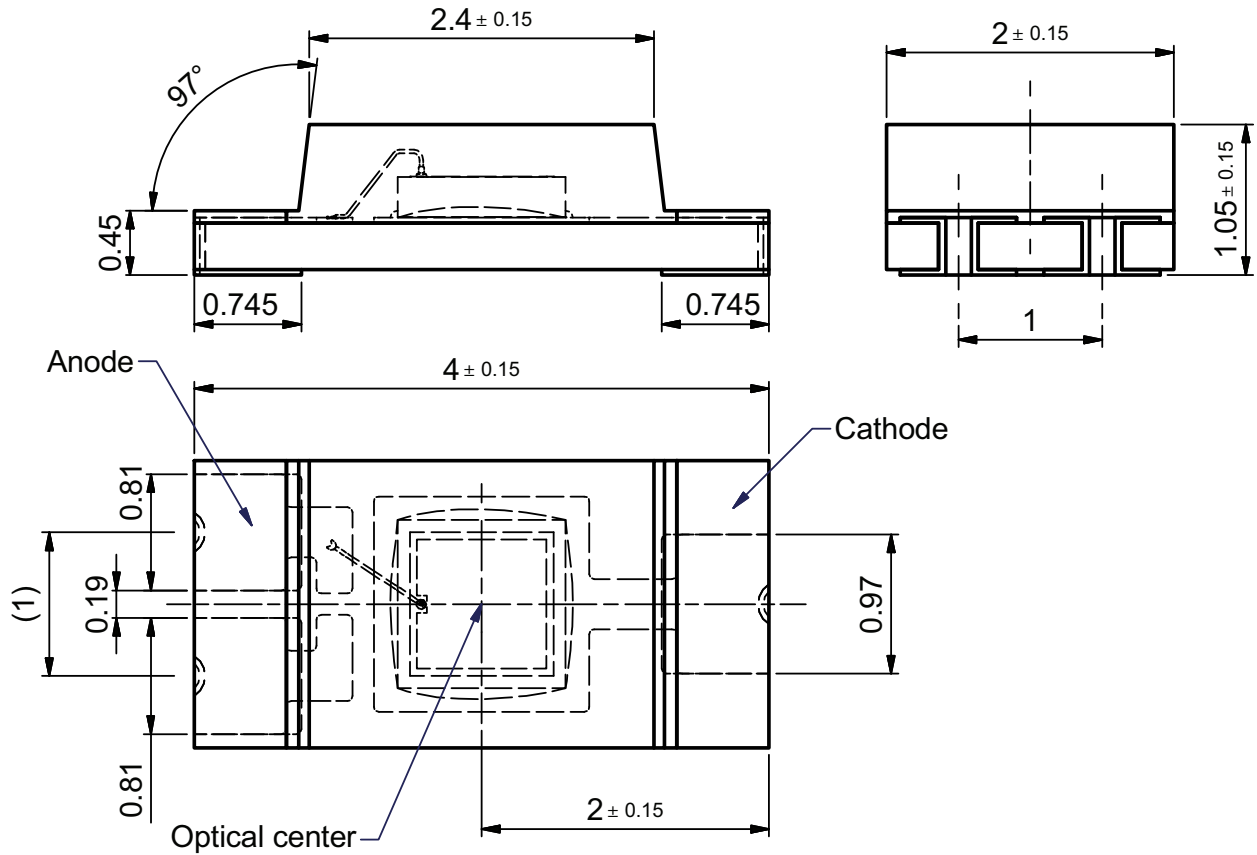
Moisture sensitivity level 4, acc. to J-STD-020.

DRYING

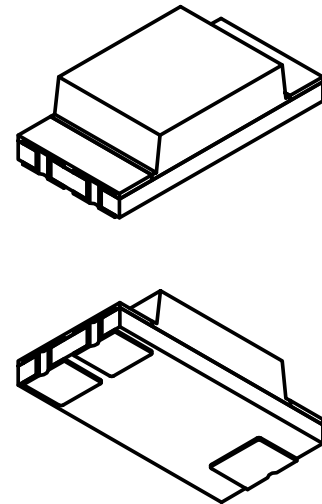
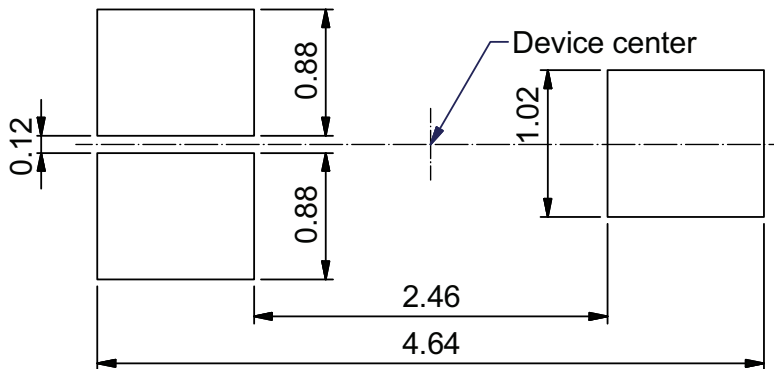
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ }^{\circ}\text{C}$ (+ 5 °C), $RH < 5\%$.



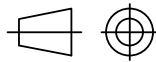
PACKAGE DIMENSIONS in millimeters



Recommended solder pad footprint



Drawing-No. 6.541-5100.01-4
Preliminary issue 04.07.2013

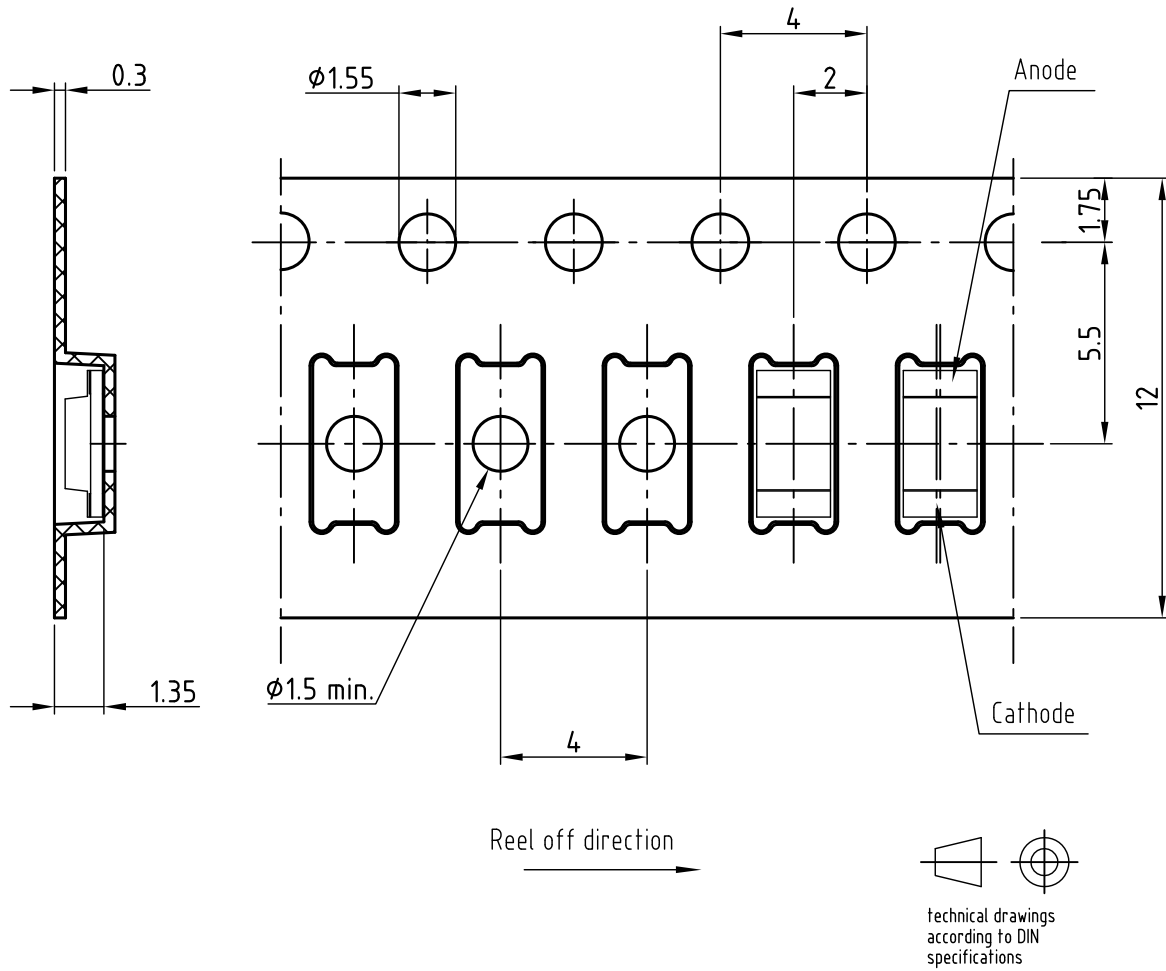


Technical drawings according to DIN specification.

Not indicated tolerances ± 0.1 mm



BLISTER TAPE DIMENSIONS in millimeters



Not indicated tolerances ± 0.1

All dimensions in mm

Drawing refers to following Types: TEMD6010FX01

VEMD6x10X01

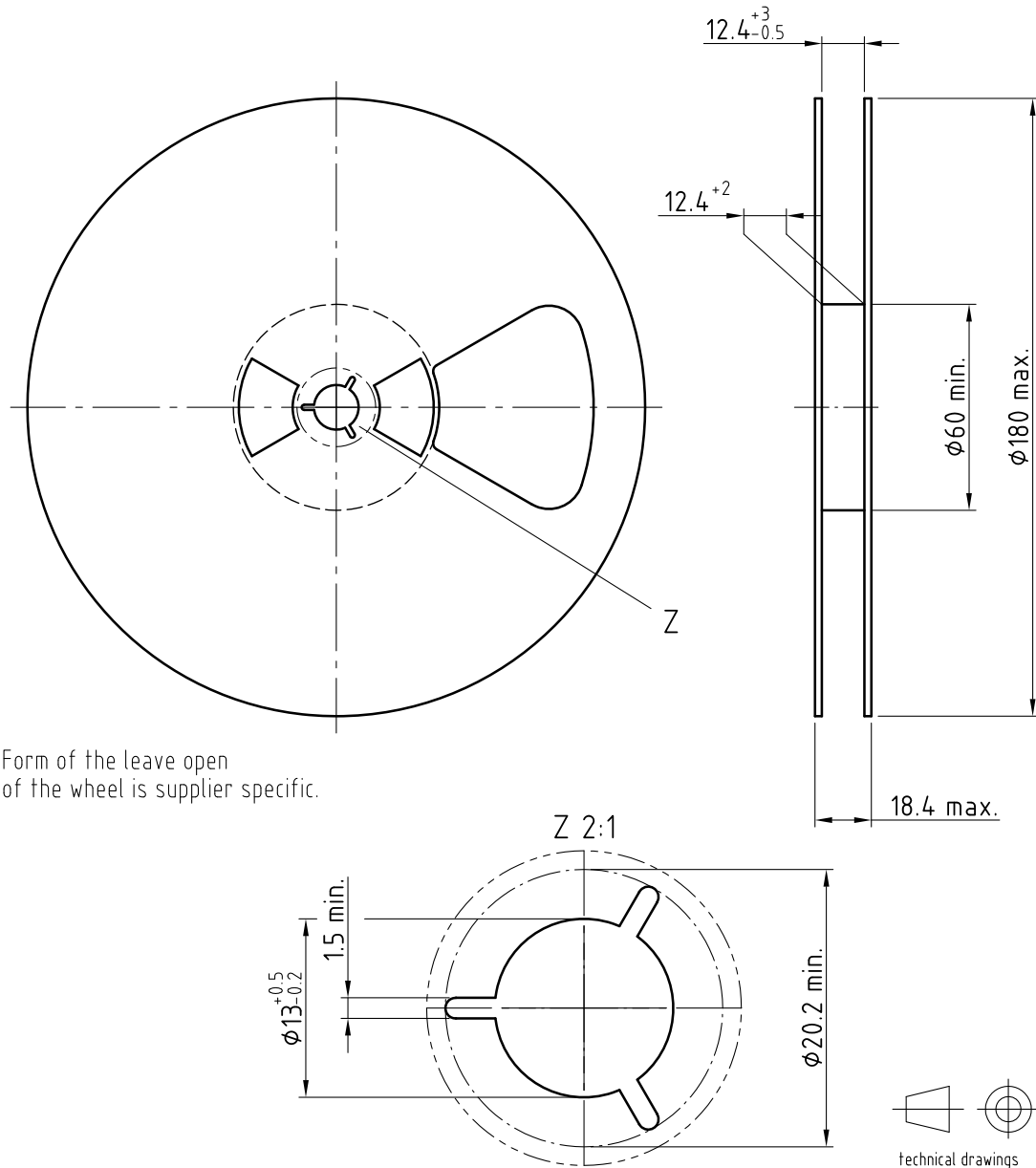
Drawing-No.: 9.700-5329.02-4

VEMD6x15X01

Prel Issue: 16.07.2013



REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.

Drawing-No.: 9.800-5097.01-4
Issue: 1; 05.05.08
20874

technical drawings according to DIN specifications



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