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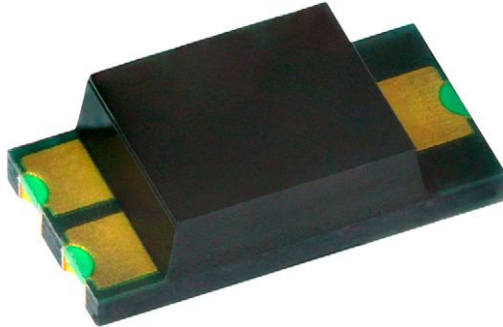
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Silicon PIN Photodiode



DESCRIPTION

VEMD6160X01 is a high speed and high sensitive PIN photodiode with excellent I_{ra} linearity. It is a small surface mount device (SMD) including the chip with a 0.85 mm² sensitive area and a daylight blocking filter.

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
- Daylight blocking filter
- High photo sensitivity
- High radiant sensitivity
- Excellent I_{ra} linearity
- Fast response times
- Angle of half sensitivity: $\phi = \pm 70^\circ$
- Floor life: 72 h, MSL 4, according to 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
- Small signal detection
- Proximity sensors

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μ A) | ϕ (deg) | $\lambda_{0.1}$ (nm) |
|-------------|---------------------|--------------|----------------------|
| VEMD6160X01 | 5 | ± 70 | 700 to 1070 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VEMD6160X01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 1206 |

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 | 20 | V |
| Power dissipation | $T_{amb} \leq 25^\circ\text{C}$ | P_V | 215 | mW |
| Junction temperature | | T_j | 110 | $^\circ\text{C}$ |
| 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 | $^\circ\text{C}$ |
| Thermal resistance junction / ambient | According to EIA / JESD51 | 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 | - | 0.85 | 1.1 | V |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0$ | $V_{(BR)}$ | 20 | - | - | V |
| Reverse dark current | $V_R = 10\text{ V}$, $E = 0$ | I_{ro} | - | 0.03 | 5 | nA |
| Diode capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 11 | - | pF |
| | $V_R = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 4.6 | - | pF |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | V_o | - | 360 | - | 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 | - | 5 | - | μA |
| Temperature coefficient of I_k | $E_e = 1\text{ mW/cm}^2$, $\lambda = 835\text{ nm}$ | 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} | 3.5 | 5 | 6.5 | μA |
| | $E_e = 1\text{ mW/cm}^2$, $\lambda = 890\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | - | 7 | - | μA |
| Angle of half sensitivity | | ϕ | - | ± 70 | - | deg |
| Wavelength of peak sensitivity | | λ_p | - | 840 | - | nm |
| Range of spectral bandwidth | | $\lambda_{0.1}$ | - | 700 to 1070 | - | nm |
| Rise time | $V_R = 10\text{ V}$, $R_L = 50\text{ }\Omega$, $\lambda = 830\text{ nm}$ | t_r | - | 60 | - | ns |
| Fall time | $V_R = 10\text{ V}$, $R_L = 50\text{ }\Omega$, $\lambda = 830\text{ nm}$ | t_f | - | 50 | - | ns |

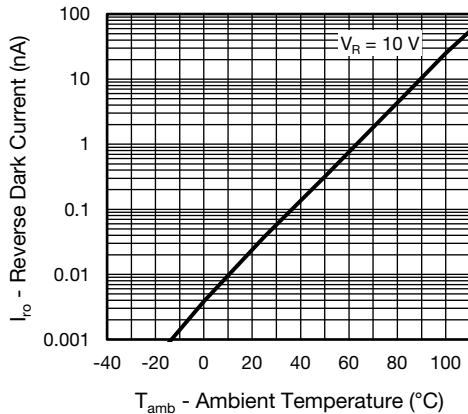
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

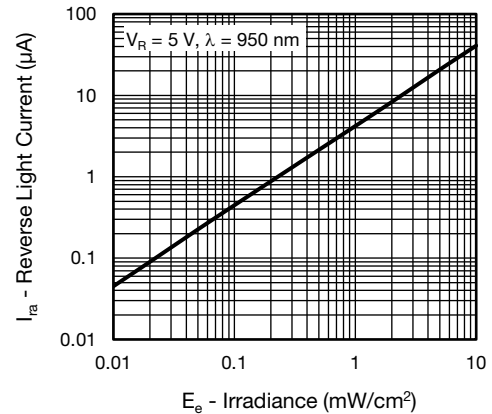


Fig. 3 - Reverse Light Current vs. Irradiance

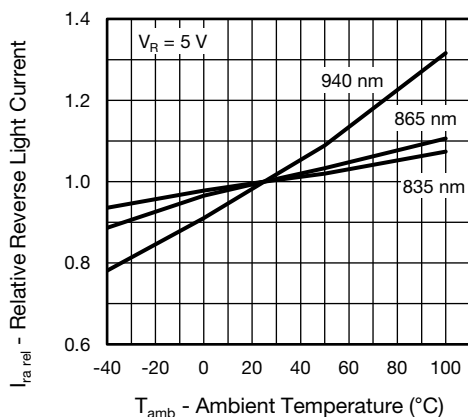


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

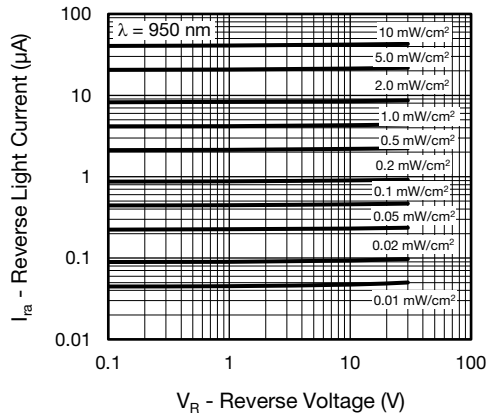


Fig. 4 - Reverse Light Current vs. Reverse Voltage

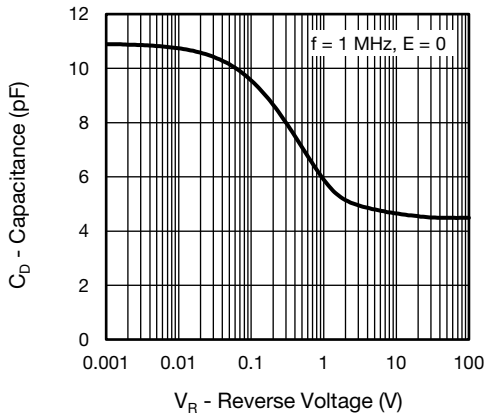


Fig. 5 - Diode Capacitance vs. Reverse Voltage

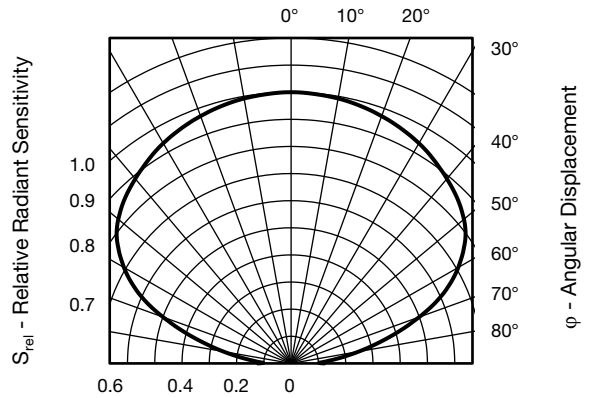


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

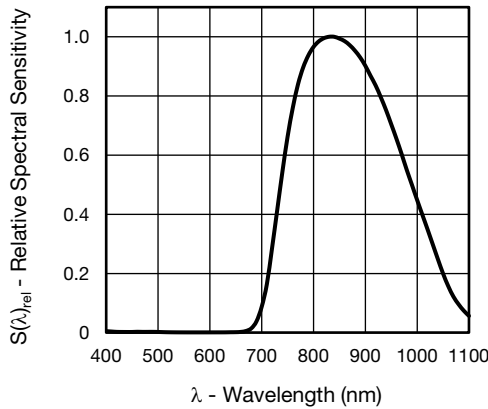
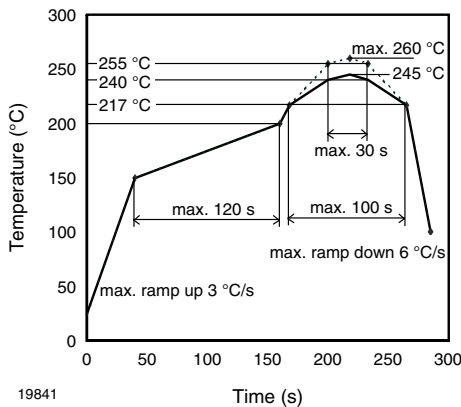


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

REFLOW SOLDER PROFILE



19841

Fig. 8 - Lead (Pb)-free Reflow Solder Profile According to 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: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

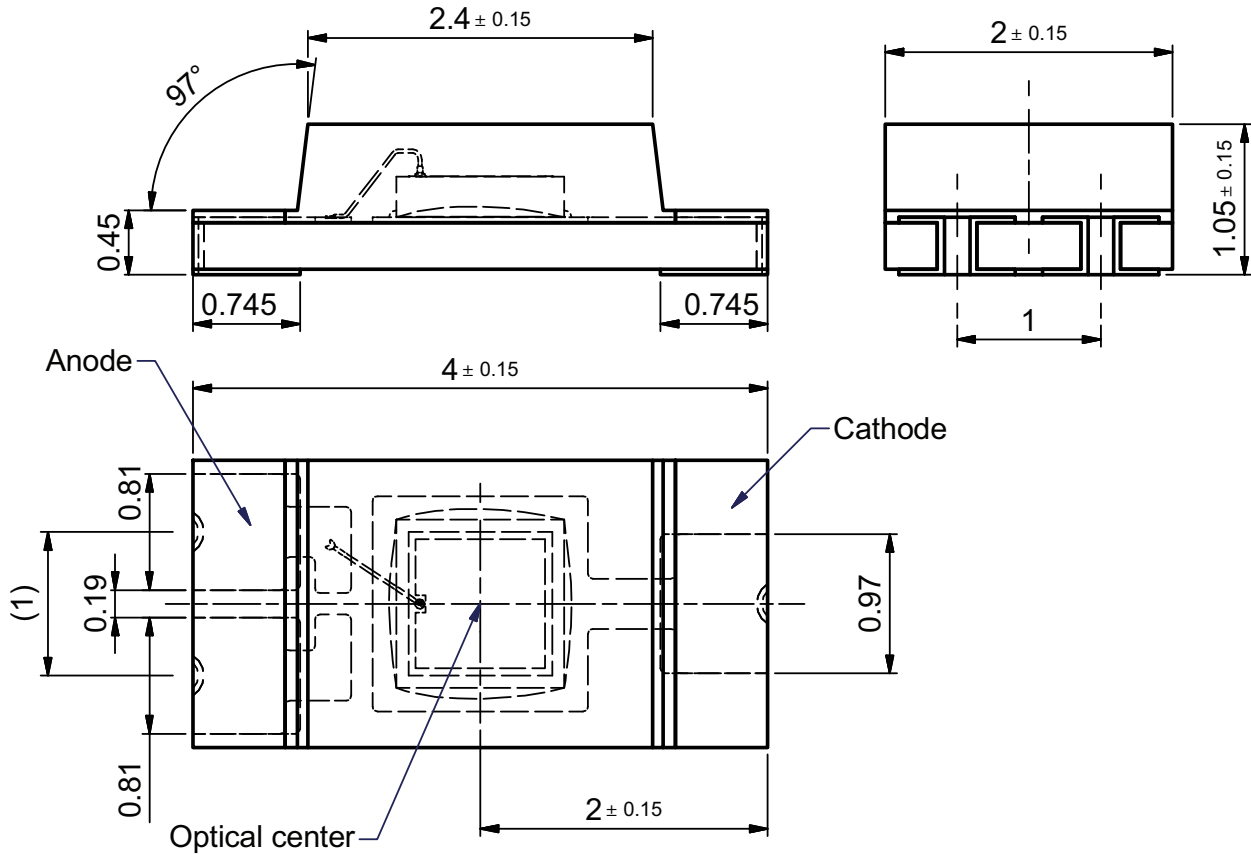
Moisture sensitivity level 4, according to J-STD-020.

DRYING

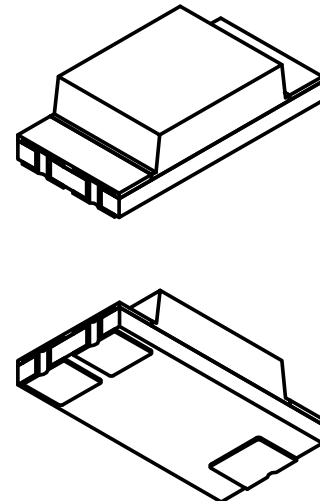
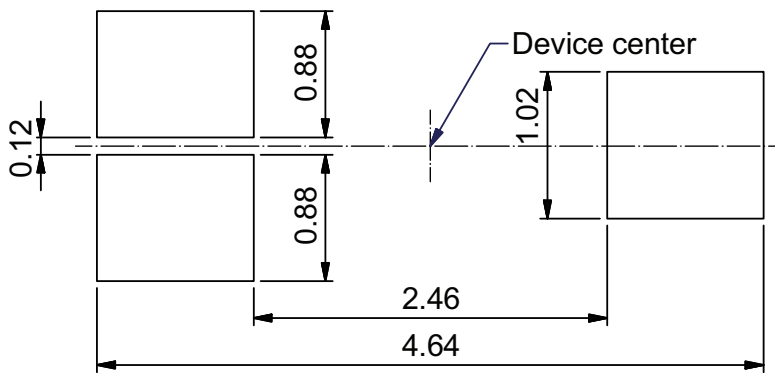
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$.



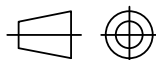
PACKAGE DIMENSIONS in millimeters



Recommended solder pad footprint



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

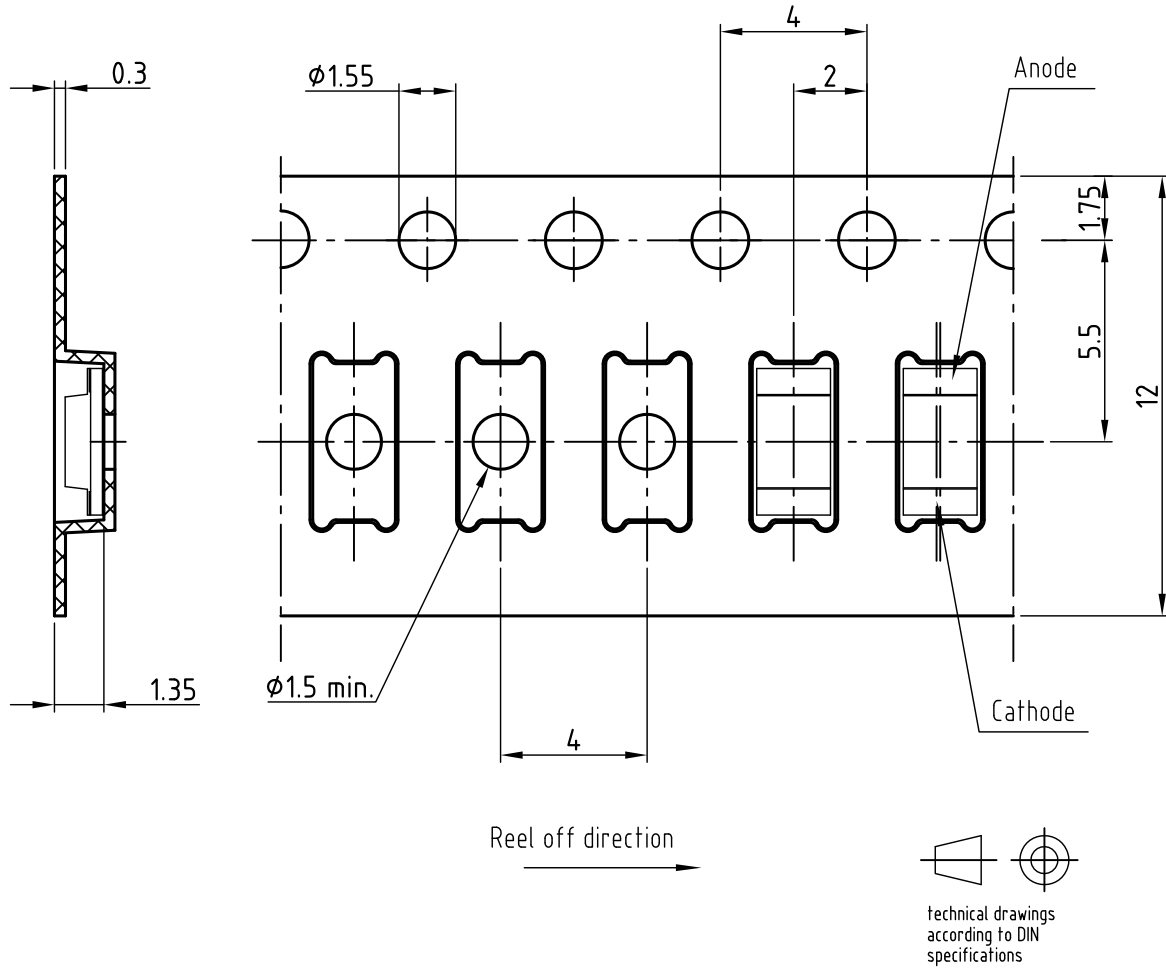


Technical drawings according to DIN specification.

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

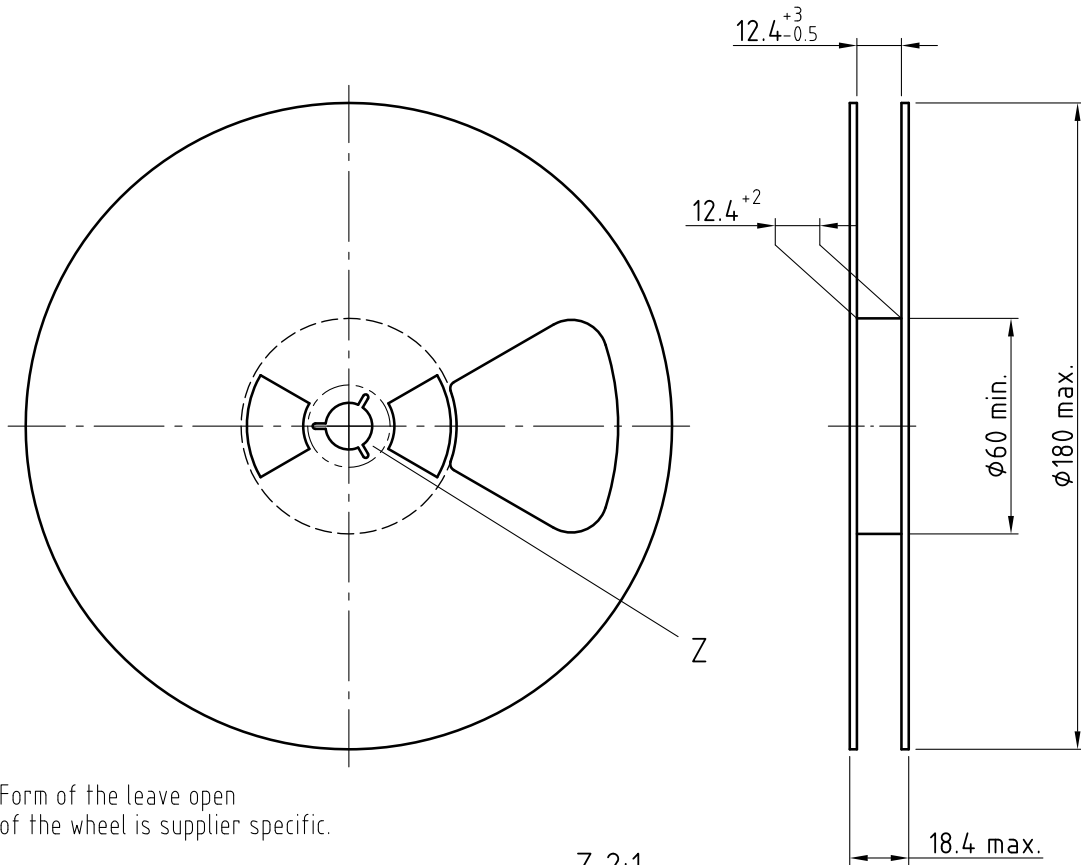
Drawing-No.: 9.700-5329.02-4

VEMD6x15X01

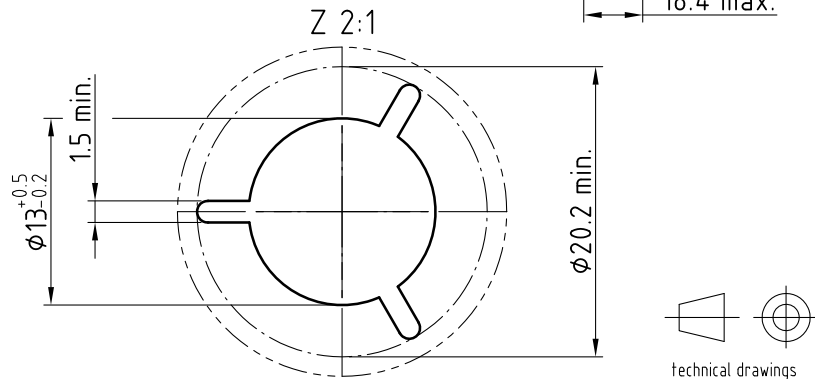
Prel Issue: 16.07.2013



REEL DIMENSIONS in millimeters



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



technical drawings according to DIN specifications

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



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