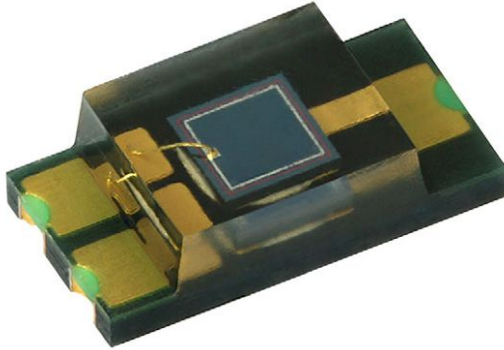


## Silicon PIN Photodiode



### 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 mm<sup>2</sup>): 0.85
- High photo sensitivity
- High sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\varphi = \pm 60^\circ$
- 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](http://www.vishay.com/doc?99912)

### APPLICATIONS

- High speed photo detector

### DESCRIPTION

VEMD6010X01 is a high speed and high sensitive PIN photodiode. It is a small surface mount device (SMD) including the chip with a 0.85 mm<sup>2</sup> sensitive area detecting visible and near infrared radiation.

### PRODUCT SUMMARY

COMPONENT	$I_{ra}$ (μA)	$\varphi$ (°)	$\lambda_{0.1}$ (nm)
VEMD6010X01	9.5	± 60	430 to 1100

#### Note

- Test conditions see table “Basic Characteristics”

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD6010X01	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		$V_R$	32	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	$P_V$	215	mW
Junction temperature		$T_j$	110	°C
Ambient 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
Thermal resistance junction to ambient	According to J-STD-051	$R_{thJA}$	270	K/W

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50\text{ mA}$	$V_F$	-	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	-	$\mu\text{A}$
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	$\mu\text{A}$
Angle of half sensitivity		$\phi$	-	$\pm 60$	-	$^{\circ}$
Wavelength of peak sensitivity		$\lambda_p$	-	900	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	430 to 1100	-	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

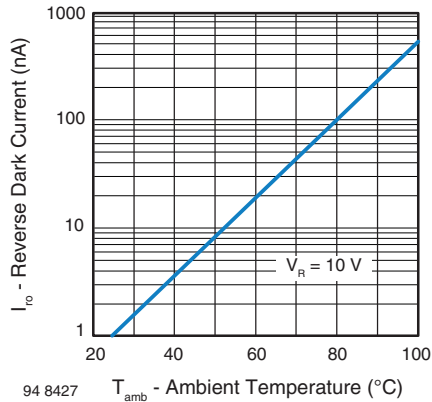
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

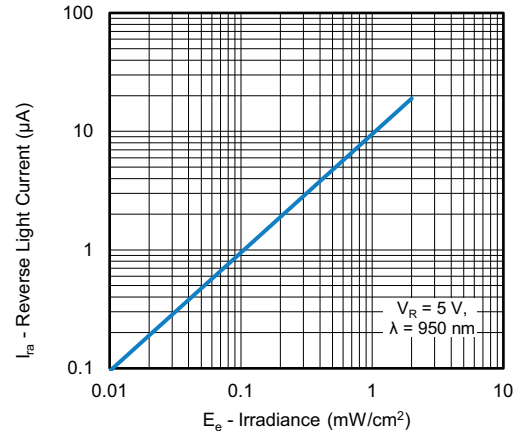


Fig. 3 - Reverse Light Current vs. Irradiance

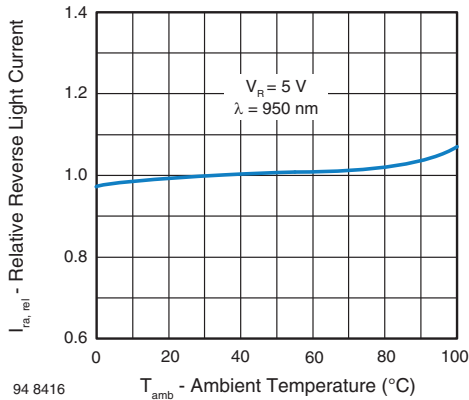


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

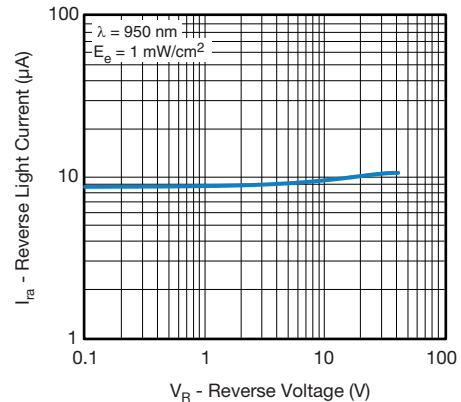


Fig. 4 - Reverse Light Current vs. Reverse Voltage

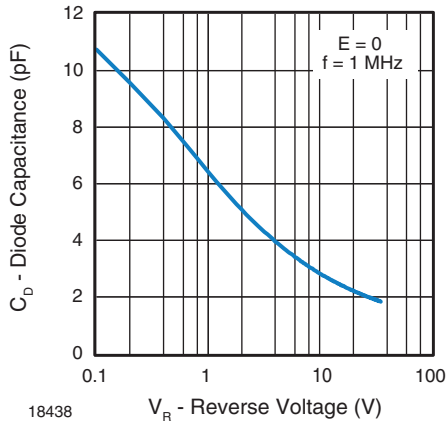


Fig. 5 - Diode Capacitance vs. Reverse Voltage

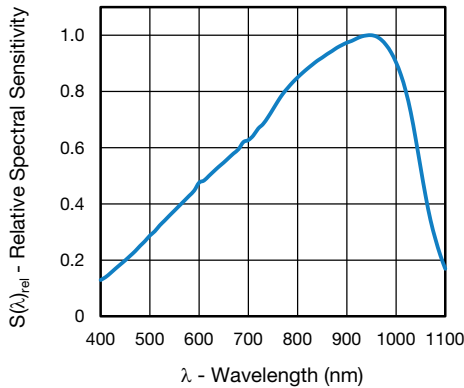
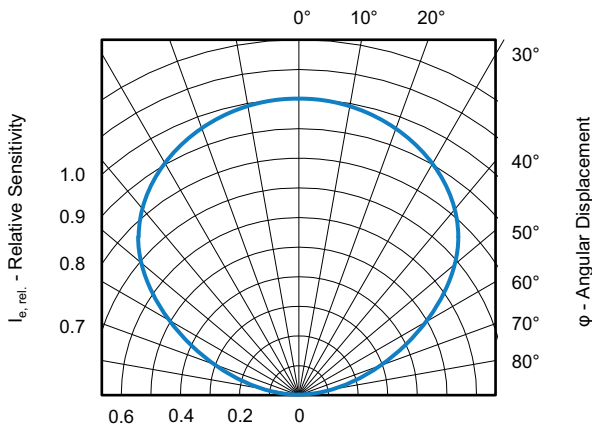


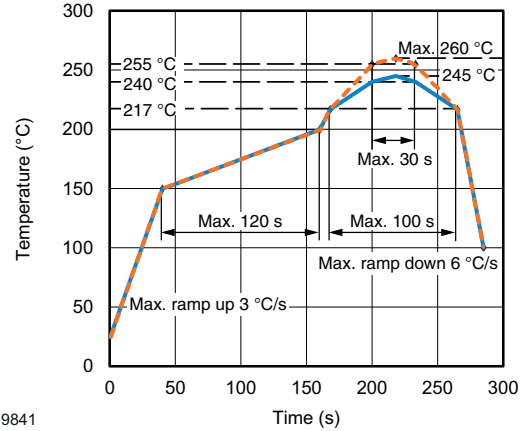
Fig. 6 - Relative Spectral Sensitivity vs. Wavelength



94 8013

Fig. 7 - Relative Sensitivity vs. Angular Displacement

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

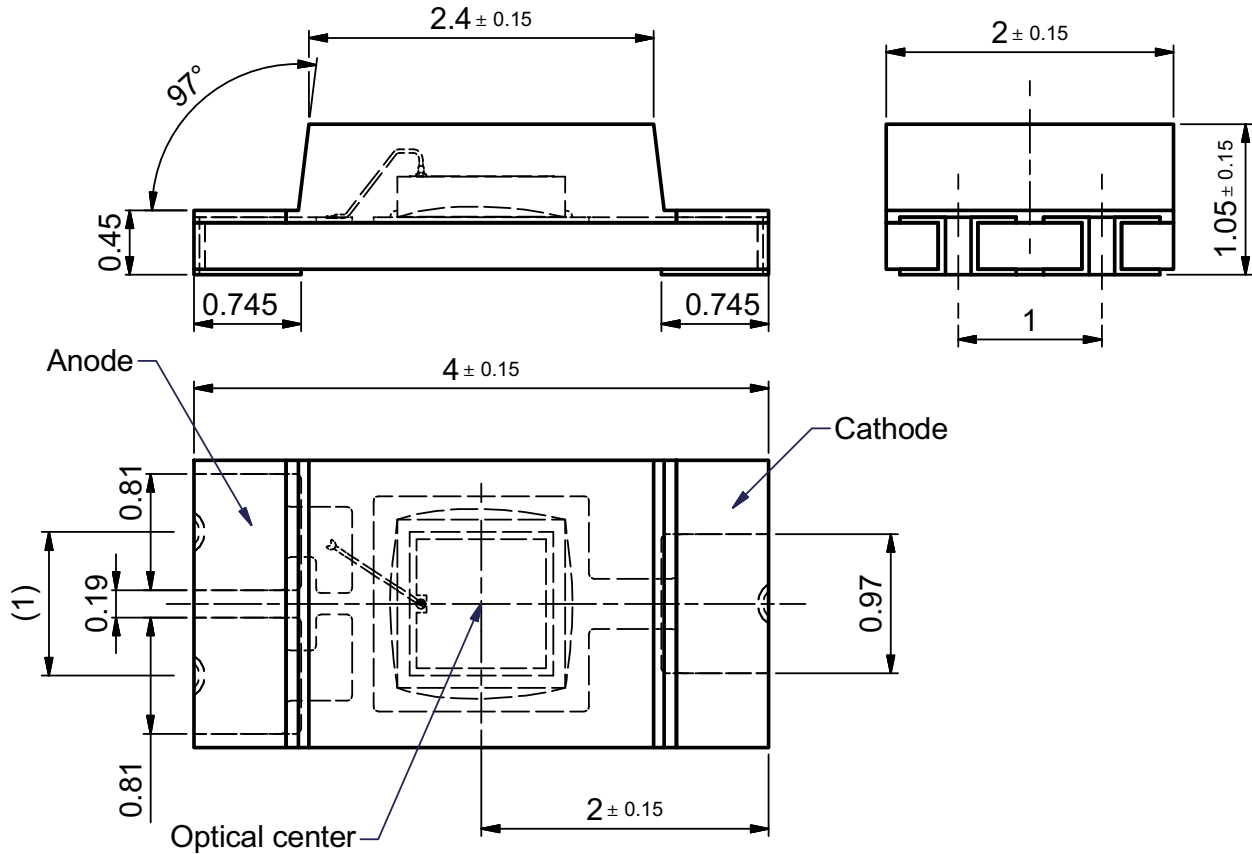
Moisture sensitivity level 4, acc. to J-STD-020.

**DRYING**

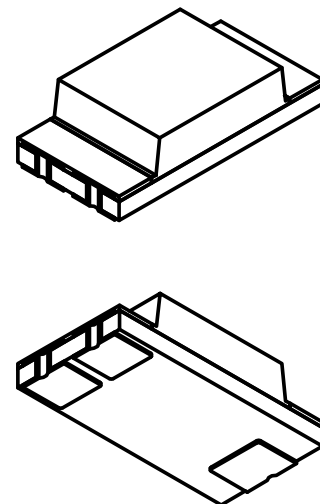
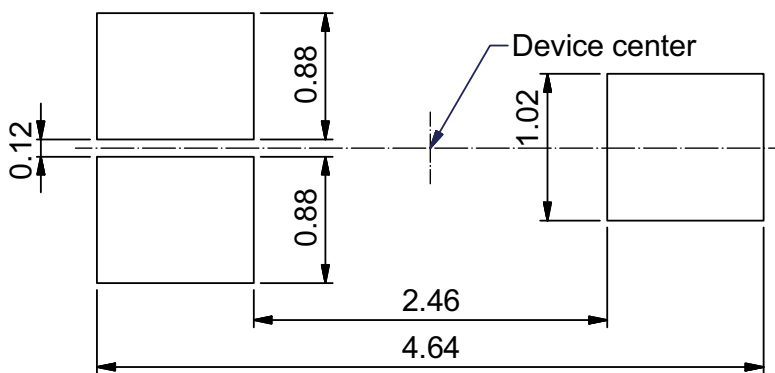
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5 °C),  $RH < 5\%$ .



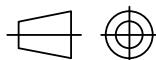
PACKAGE DIMENSIONS in millimeters



Recommended solder pad footprint



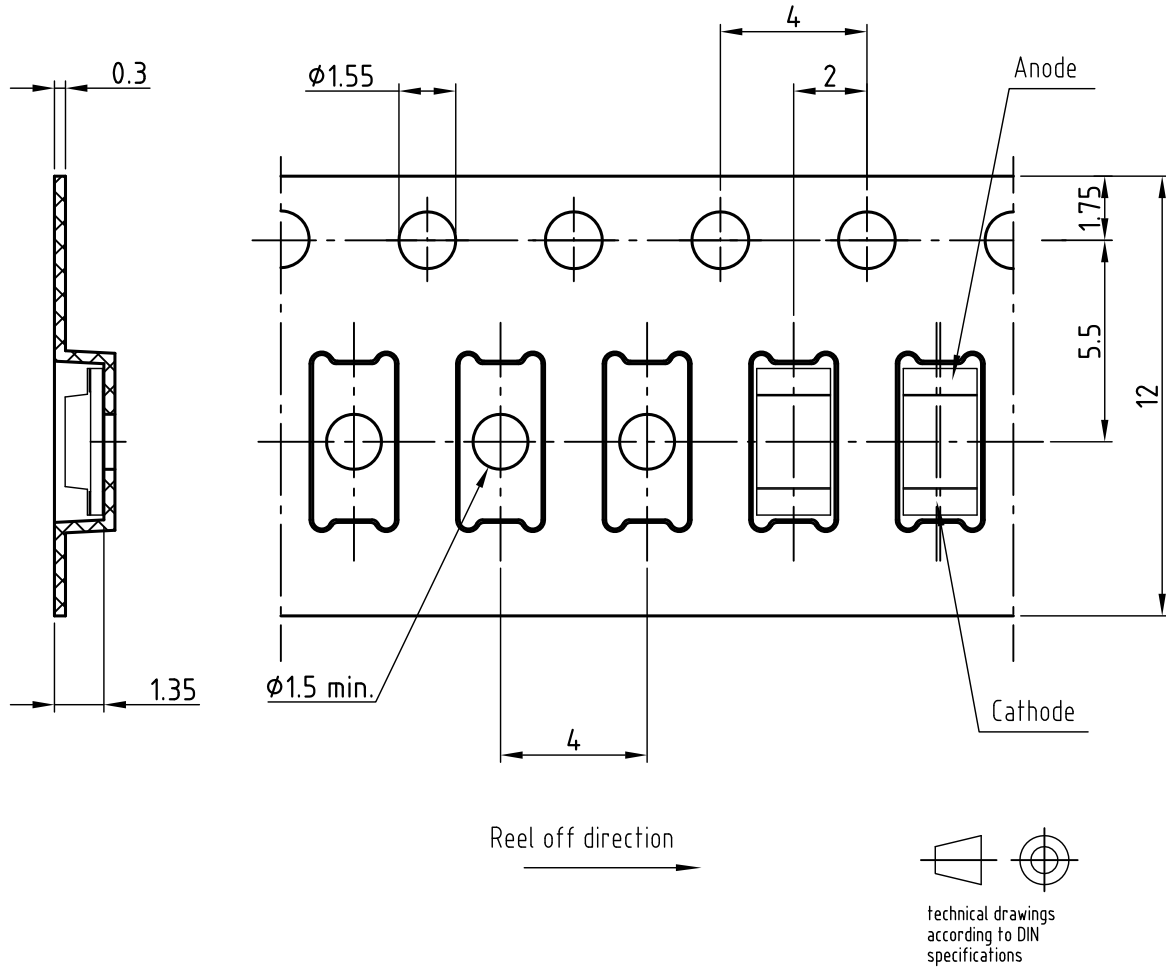
Drawing-No. 6.541-5100.01-4  
Preliminary issue 04.07.2013



Technical drawings according to DIN specification.

Not indicated tolerances  $\pm 0.1$ mm

**BLISTER TAPE DIMENSIONS** in millimeters



Not indicated tolerances  $\pm 0.1$

All dimensions in mm

Drawing refers to following Types: TEMD6010FX01

VEMD6x10X01

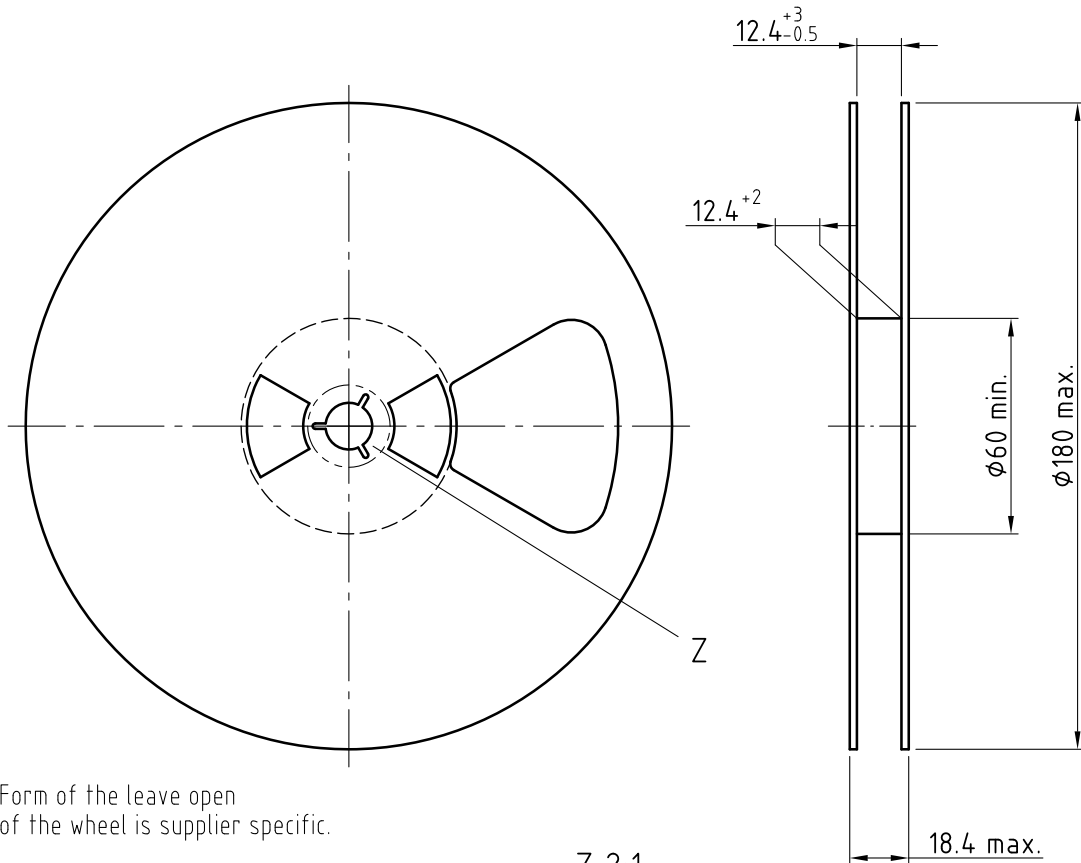
Drawing-No.: 9.700-5329.02-4

VEMD6x15X01

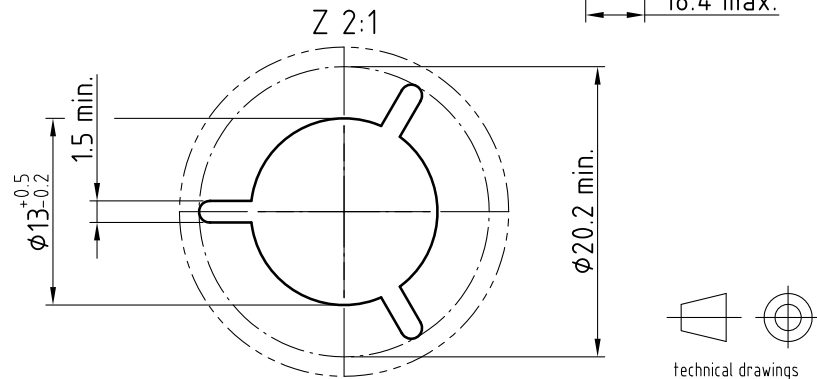
Prel Issue: 16.07.2013



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



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