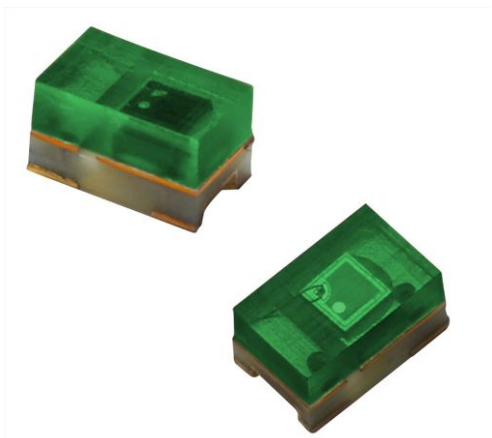


## Ambient Light Sensor in 0805 Package



### DESCRIPTION

TEMT6200FX01 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a miniature transparent 0805 package for surface mounting. It is sensitive to visible light much like the human eye and has peak sensitivity at 550 nm.

### FEATURES

- Package type: surface mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity:  $\phi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- 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 sensors
- Ambient light sensor for display backlight dimming in:
  - Mobile phones
  - Notebook computers
  - PDAs
  - Cameras
  - Dashboards

### PRODUCT SUMMARY

| COMPONENT    | $I_{PCE}$ ( $\mu A$ ) | $\phi$ (deg) | $\lambda_{0.5}$ (nm) |
|--------------|-----------------------|--------------|----------------------|
| TEMT6200FX01 | 23                    | $\pm 60$     | 450 to 610           |

#### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING     | REMARKS                                                                                                                                         | PACKAGE FORM |
|---------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| TEMT6200FX01  | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel. Label with $I_{PCE}$ group on each reel. Specifications of group A/B/C see table "Type Dedicated Characteristics" | 0805         |

#### Note

- MOQ: minimum order quantity

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

| PARAMETER                           | TEST CONDITION                                   | SYMBOL     | VALUE       | UNIT       |
|-------------------------------------|--------------------------------------------------|------------|-------------|------------|
| Collector emitter voltage           |                                                  | $V_{CEO}$  | 6           | V          |
| Emitter collector voltage           |                                                  | $V_{ECO}$  | 1.5         | V          |
| Collector current                   |                                                  | $I_C$      | 20          | mA         |
| Power dissipation                   |                                                  | $P_V$      | 100         | mW         |
| Junction temperature                |                                                  | $T_j$      | 100         | $^\circ C$ |
| Operating temperature range         |                                                  | $T_{amb}$  | -40 to +100 | $^\circ C$ |
| Storage temperature range           |                                                  | $T_{stg}$  | -40 to +100 | $^\circ C$ |
| Soldering temperature               | Acc. reflow profile fig. 9                       | $T_{sd}$   | 260         | $^\circ C$ |
| Thermal resistance junction/ambient | Soldered on PCB with pad dimensions: 4 mm x 4 mm | $R_{thJA}$ | 450         | K/W        |

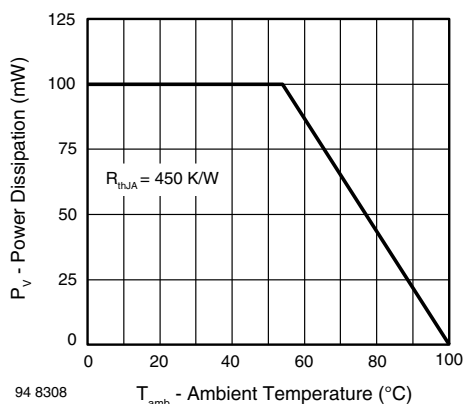


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                                 |                 |      |            |      |               |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------|------|------------|------|---------------|
| PARAMETER                                                                                           | TEST CONDITION                                                  | SYMBOL          | MIN. | TYP.       | MAX. | UNIT          |
| Collector emitter breakdown voltage                                                                 | $I_C = 0.1\text{ mA}$                                           | $V_{CEO}$       | 6    |            |      | V             |
| Collector dark current                                                                              | $V_{CE} = 5\text{ V}$ , $E = 0\text{ lx}$                       | $I_{CEO}$       |      | 3          | 50   | nA            |
| Collector emitter capacitance                                                                       | $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ lx}$  | $C_{CEO}$       |      | 16         |      | pF            |
| Photo current                                                                                       | $E_V = 20\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$  | $I_{PCE}$       |      | 4.6        |      | $\mu\text{A}$ |
|                                                                                                     | $E_V = 100\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$ | $I_{PCE}$       | 7.5  | 23         | 39   | $\mu\text{A}$ |
| Temperature coefficient of $I_{PCE}$                                                                | CIE illuminant A                                                | $TK_{IPCE}$     |      | 1.18       |      | %/K           |
|                                                                                                     | LED, white                                                      | $TK_{IPCE}$     |      | 0.9        |      | %/K           |
| Angle of half sensitivity                                                                           |                                                                 | $\phi$          |      | $\pm 60$   |      | deg           |
| Wavelength of peak sensitivity                                                                      |                                                                 | $\lambda_p$     |      | 550        |      | nm            |
| Range of spectral bandwidth                                                                         |                                                                 | $\lambda_{0.5}$ |      | 450 to 610 |      | nm            |
| Collector emitter saturation voltage                                                                | $E_V = 20\text{ lx}$ , $0.45\text{ }\mu\text{A}$                | $V_{CEsat}$     |      | 0.1        |      | V             |

| <b>TYPE DEDICATED CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                                       |              |           |      |      |               |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------|-----------|------|------|---------------|
| PARAMETER                                                                                                    | TEST CONDITION                                                        | BINNED GROUP | SYMBOL    | MIN. | MAX. | UNIT          |
| Photo current                                                                                                | $E_V = 100\text{ lx}$ ,<br>CIE illuminant A,<br>$V_{CE} = 5\text{ V}$ | A            | $I_{PCE}$ | 7.5  | 15   | $\mu\text{A}$ |
|                                                                                                              |                                                                       | B            | $I_{PCE}$ | 12   | 24   | $\mu\text{A}$ |
|                                                                                                              |                                                                       | C            | $I_{PCE}$ | 19.5 | 39   | $\mu\text{A}$ |

**Note**

- Each 3000 piece packing unit will contain a single group. The label on the bag will indicate which binned group is in the bag. A specific group cannot be ordered. Production shipments containing multiple bags will likely include multiple groups. Please design accordingly.

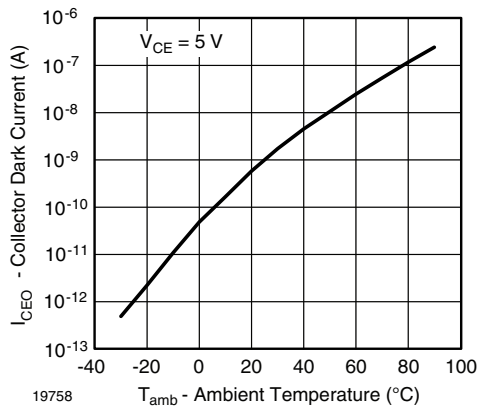
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 2 - Collector Dark Current vs. Ambient Temperature

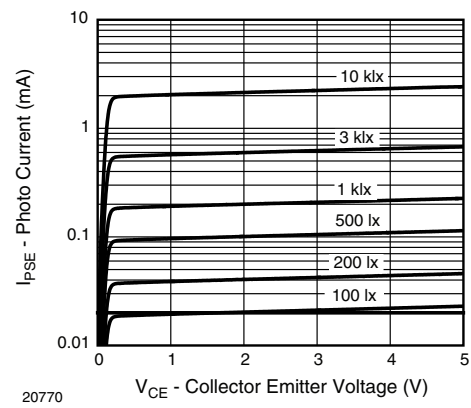


Fig. 5 - Photo Current vs. Collector Emitter Voltage

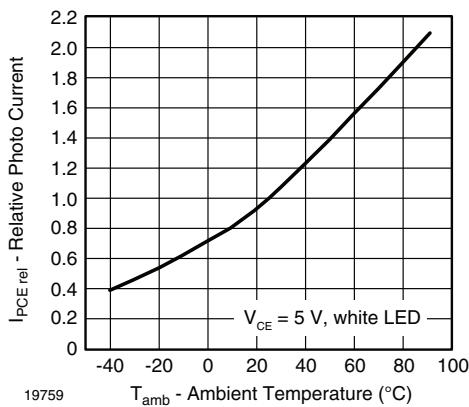


Fig. 3 - Relative Photo Current vs. Ambient Temperature

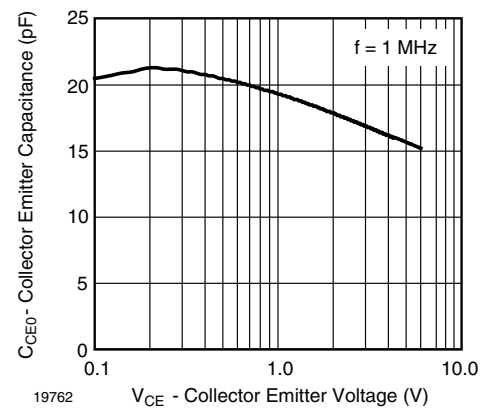


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

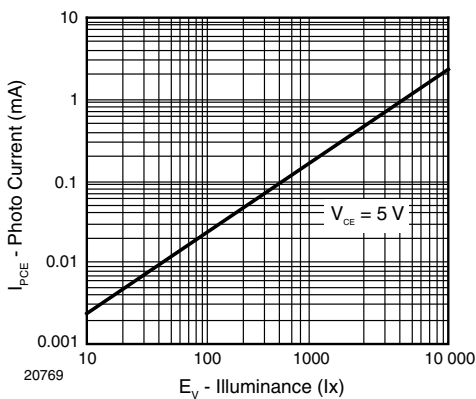


Fig. 4 - Photo Current vs. Illuminance

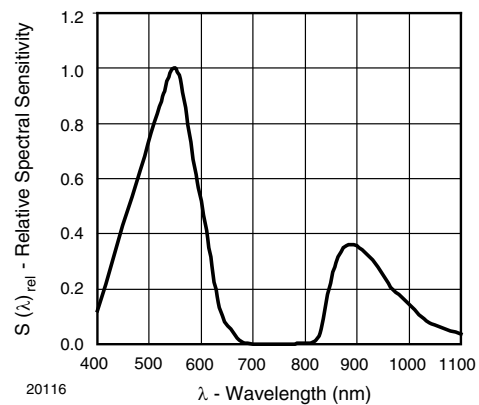


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

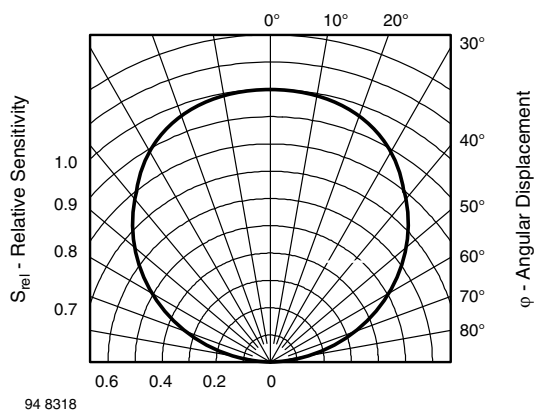


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

## REFLOW SOLDER PROFILE

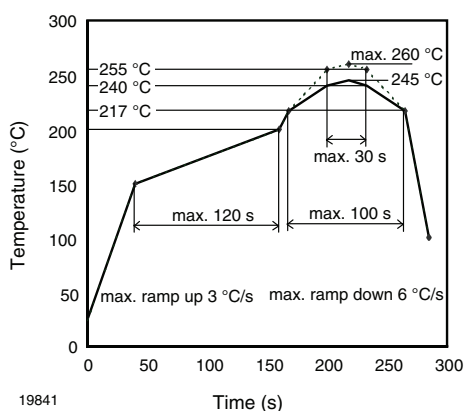


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

## 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

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

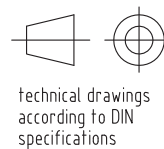
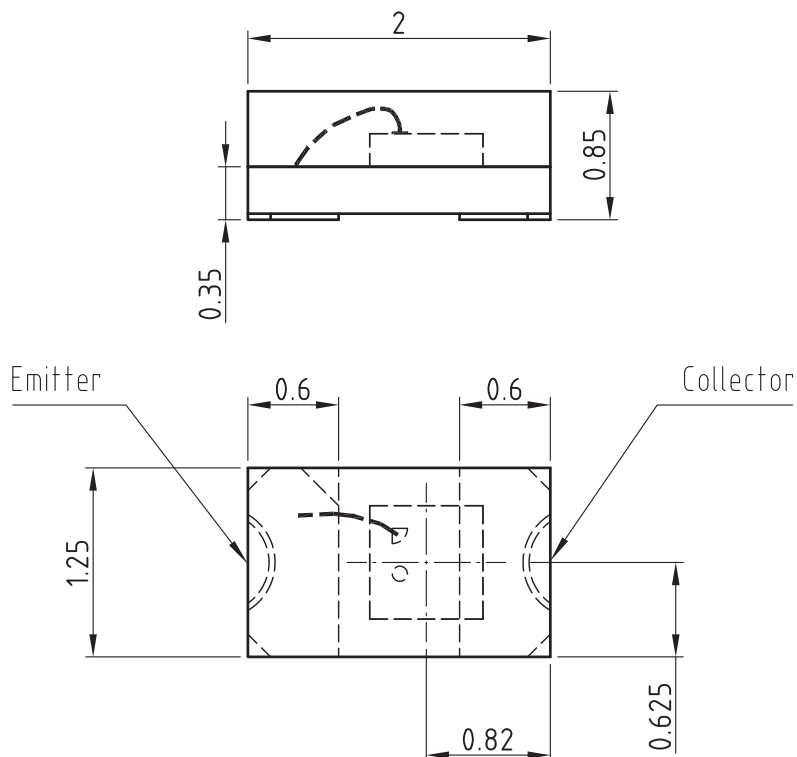
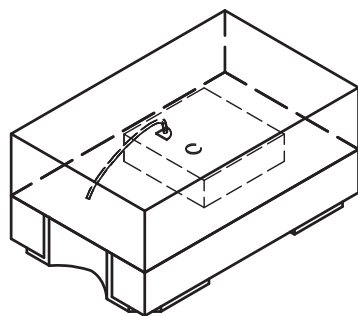
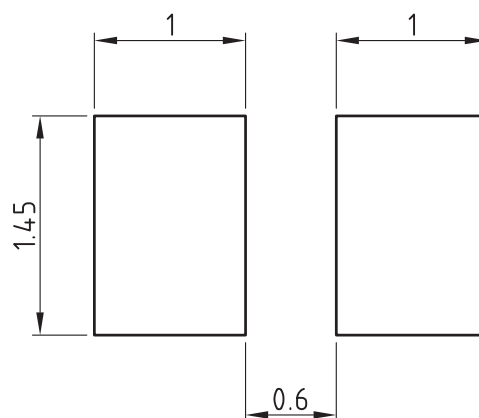
Moisture sensitivity: level 3

Floor life: 168 h

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

## DRYING

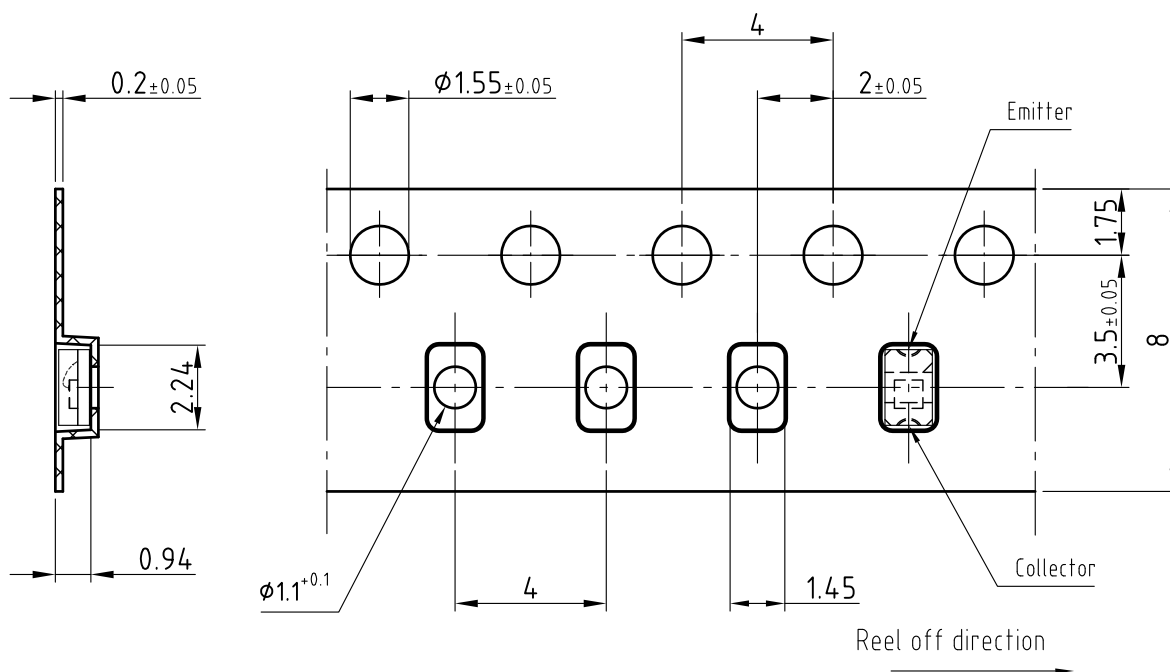
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ °C} (+ 5\text{ °C})$ ,  $RH < 5\%$ .

**PACKAGE DIMENSIONS** in millimeters

Not indicated tolerances  $\pm 0.1$ 

Recommended solder pad  
Footprint


Drawing-No.: 6.541-5063.01-4

Issue: 3; 23.02.07

19757

**BLISTER TAPE DIMENSIONS** in millimeters

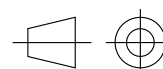
Drawing-No.: 9.700-5310.01-4

Issue: 2; 14.08.07

20690

Not indicated tolerances  $\pm 0.1$

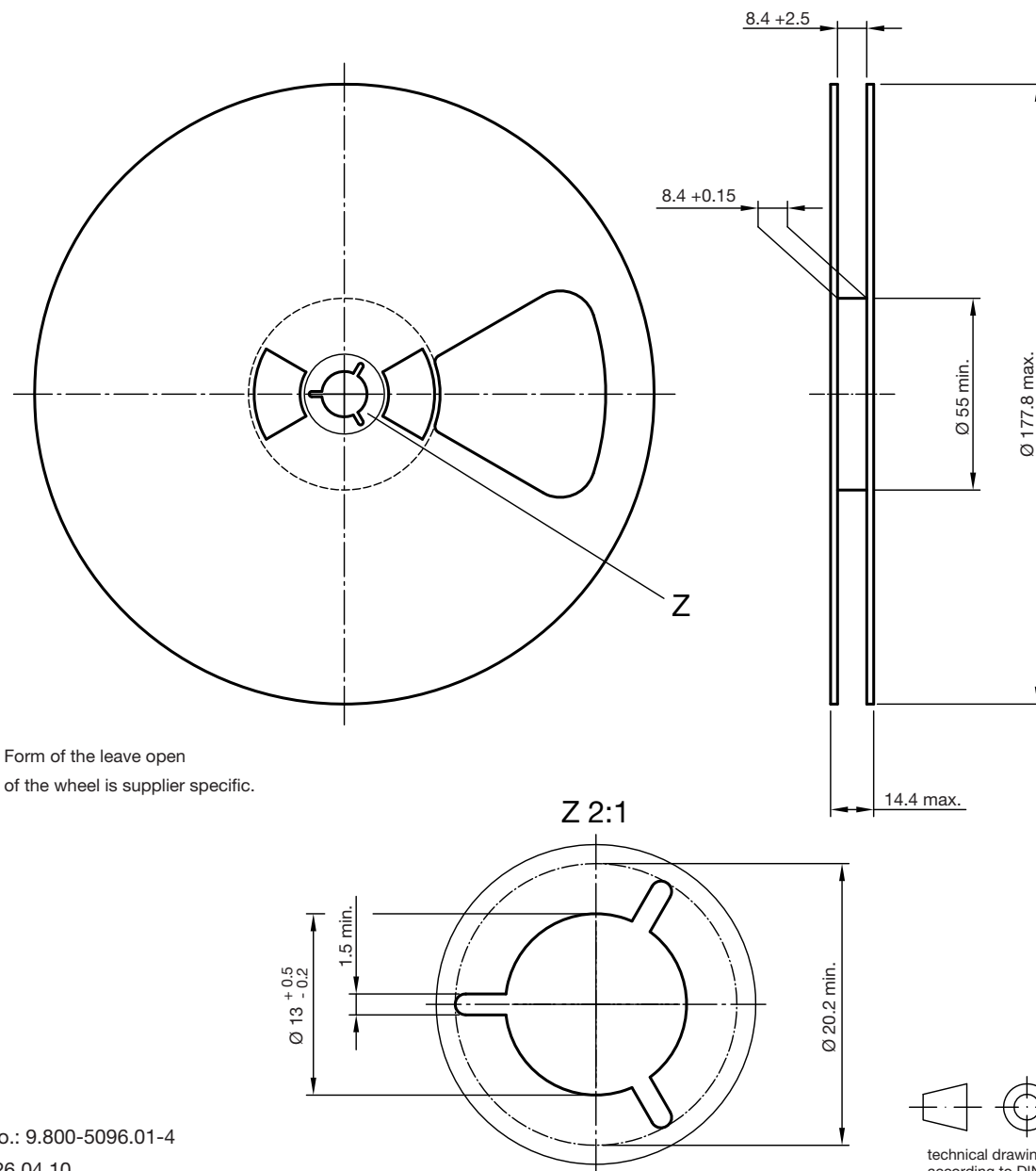
Quantity per reel: 3000 pcs



technical drawings  
according to DIN  
specifications



**REEL DIMENSIONS** in millimeters



Drawing-No.: 9.800-5096.01-4

Issue: 2; 26.04.10

20875



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