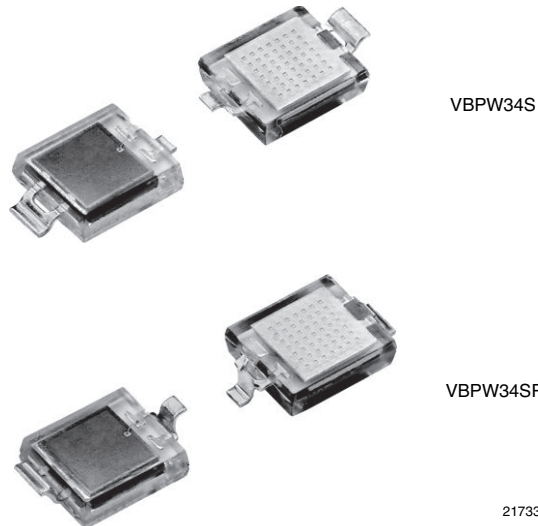




### Silicon PIN Photodiode



#### FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 6.4 x 3.9 x 1.2
- Radiant sensitive area (in mm<sup>2</sup>): 7.5
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 65^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



#### DESCRIPTION

VBPW34S and VBPW34SR are high speed and high sensitive PIN photodiodes. It is a surface mount device (SMD) including the chip with a 7.5 mm<sup>2</sup> sensitive area detecting visible and near infrared radiation.

#### APPLICATIONS

- High speed photo detector

| PRODUCT SUMMARY |                      |         |             |
|-----------------|----------------------|---------|-------------|
| COMPONENT       | I <sub>ra</sub> (μA) | φ (deg) | λ0.1 (nm)   |
| VBPW34S         | 55                   | ± 65    | 430 to 1100 |
| VBPW34SR        | 55                   | ± 65    | 430 to 1100 |

#### Note

- Test conditions see table “Basic Characteristics”

| ORDERING INFORMATION |               |                              |                  |
|----------------------|---------------|------------------------------|------------------|
| ORDERING CODE        | PACKAGING     | REMARKS                      | PACKAGE FORM     |
| VBPW34S              | Tape and reel | MOQ: 1000 pcs, 1000 pcs/reel | Gullwing         |
| VBPW34SR             | Tape and reel | MOQ: 1000 pcs, 1000 pcs/reel | Reverse gullwing |

#### Note

- MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |                                   |                   |               |      |
|---------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|------|
| PARAMETER                                                                       | TEST CONDITION                    | SYMBOL            | VALUE         | UNIT |
| Reverse voltage                                                                 |                                   | V <sub>R</sub>    | 60            | V    |
| Power dissipation                                                               | T <sub>amb</sub> ≤ 25 °C          | P <sub>V</sub>    | 215           | mW   |
| Junction temperature                                                            |                                   | T <sub>j</sub>    | 100           | °C   |
| Operating temperature range                                                     |                                   | T <sub>amb</sub>  | - 40 to + 100 | °C   |
| Storage temperature range                                                       |                                   | T <sub>stg</sub>  | - 40 to + 100 | °C   |
| Soldering temperature                                                           | Acc. reflow solder profile fig. 8 | T <sub>sd</sub>   | 260           | °C   |
| Thermal resistance junction/ambient                                             |                                   | R <sub>thJA</sub> | 350           | 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                   | 1.3  | V                           |
| Breakdown voltage                                                                                   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                      | $V_{(BR)}$      | 60   |                     |      | V                           |
| Reverse dark current                                                                                | $V_R = 10\text{ V}$ , $E = 0$                                                 | $I_{ro}$        |      | 2                   | 30   | nA                          |
| Diode capacitance                                                                                   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                             | $C_D$           |      | 70                  |      | pF                          |
|                                                                                                     | $V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                             | $C_D$           |      | 25                  | 40   | pF                          |
| Open circuit voltage                                                                                | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $V_o$           |      | 350                 |      | mV                          |
| Temperature coefficient of $V_o$                                                                    | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $TK_{V_o}$      |      | -2.6                |      | mV/K                        |
| Short circuit current                                                                               | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $I_k$           |      | 50                  |      | $\mu\text{A}$               |
| 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                                                                               | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ ,<br>$V_R = 5\text{ V}$  | $I_{ra}$        | 45   | 55                  |      | $\mu\text{A}$               |
| Angle of half sensitivity                                                                           |                                                                               | $\phi$          |      | $\pm 65$            |      | deg                         |
| Wavelength of peak sensitivity                                                                      |                                                                               | $\lambda_p$     |      | 940                 |      | nm                          |
| Range of spectral bandwidth                                                                         |                                                                               | $\lambda_{0.1}$ |      | 430 to 1100         |      | nm                          |
| Noise equivalent power                                                                              | $V_R = 10\text{ V}$ , $\lambda = 950\text{ nm}$                               | NEP             |      | $4 \times 10^{-14}$ |      | $\text{W}/\sqrt{\text{Hz}}$ |
| Rise time                                                                                           | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ ,<br>$\lambda = 820\text{ nm}$ | $t_r$           |      | 100                 |      | ns                          |
| Fall time                                                                                           | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ ,<br>$\lambda = 820\text{ nm}$ | $t_f$           |      | 100                 |      | ns                          |

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

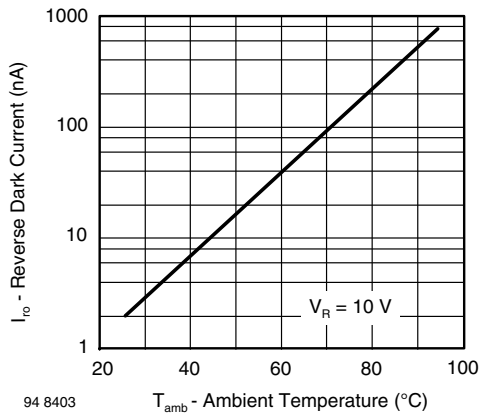


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

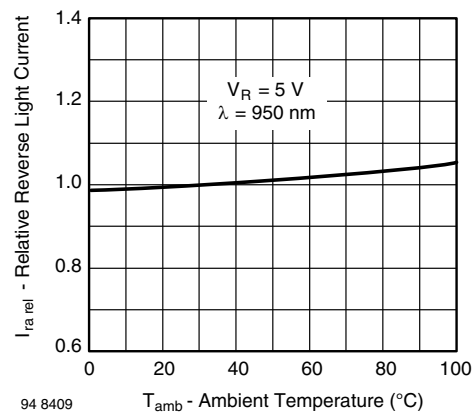


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



Fig. 3 - Reverse Light Current vs. Irradiance



Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

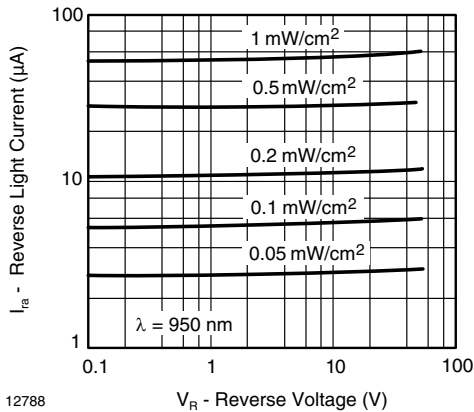


Fig. 4 - Reverse Light Current vs. Reverse Voltage

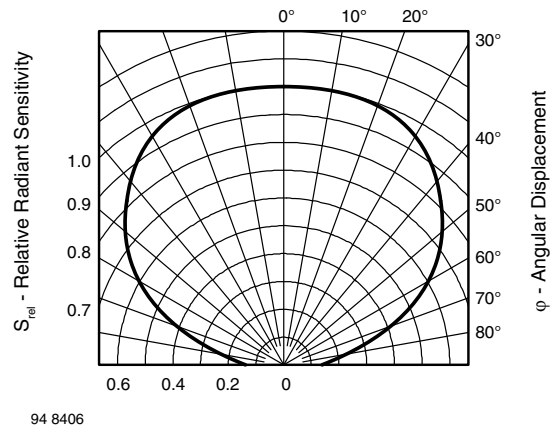


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

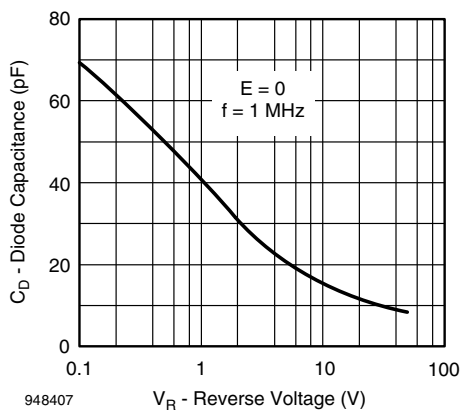
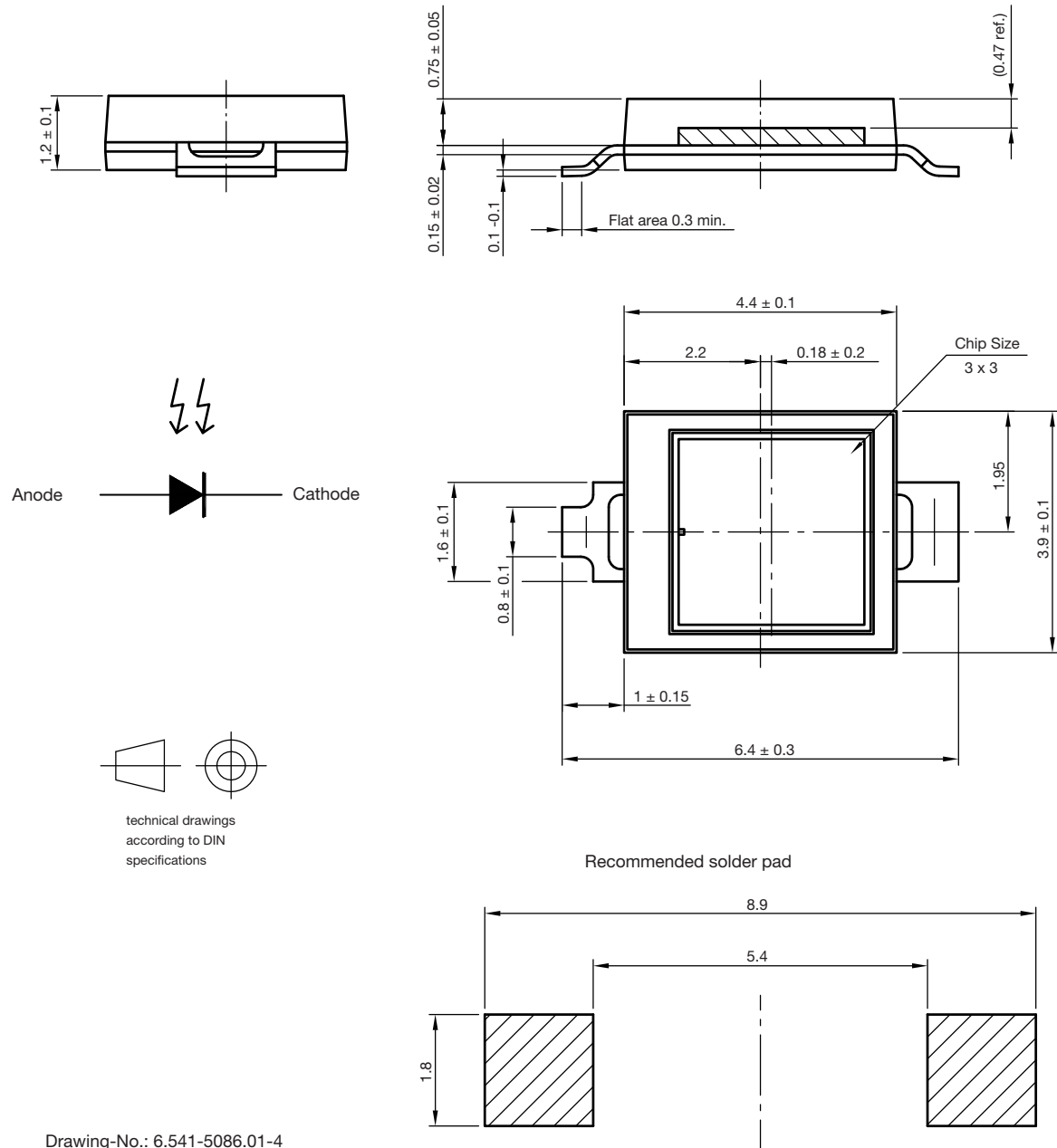


Fig. 5 - Diode Capacitance vs. Reverse Voltage



## PACKAGE DIMENSIONS FOR VBPW34S in millimeters



Anode Cathode

technical drawings according to DIN specifications

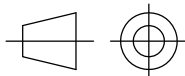
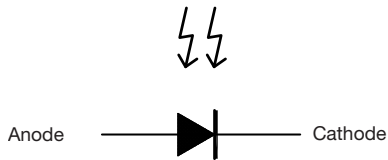
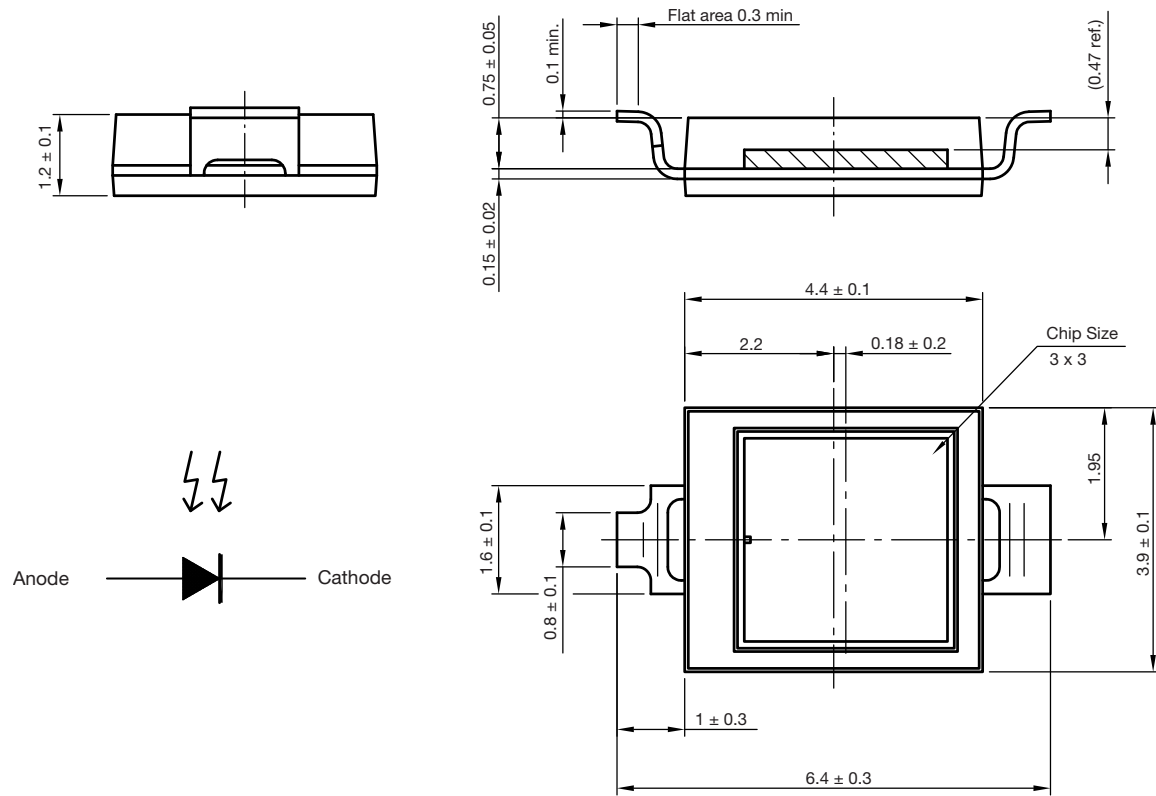
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Issue: 1; 15.04.10

22105

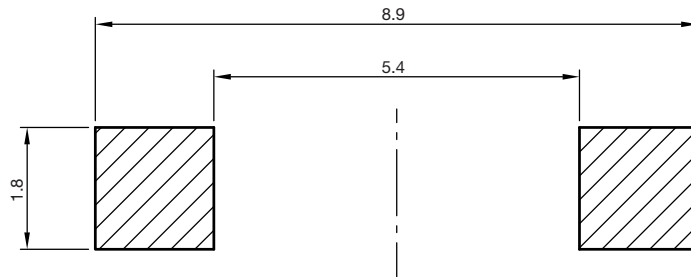


## PACKAGE DIMENSIONS FOR VBPW34SR in millimeters



technical drawings according to DIN specifications

Recommended solder pad



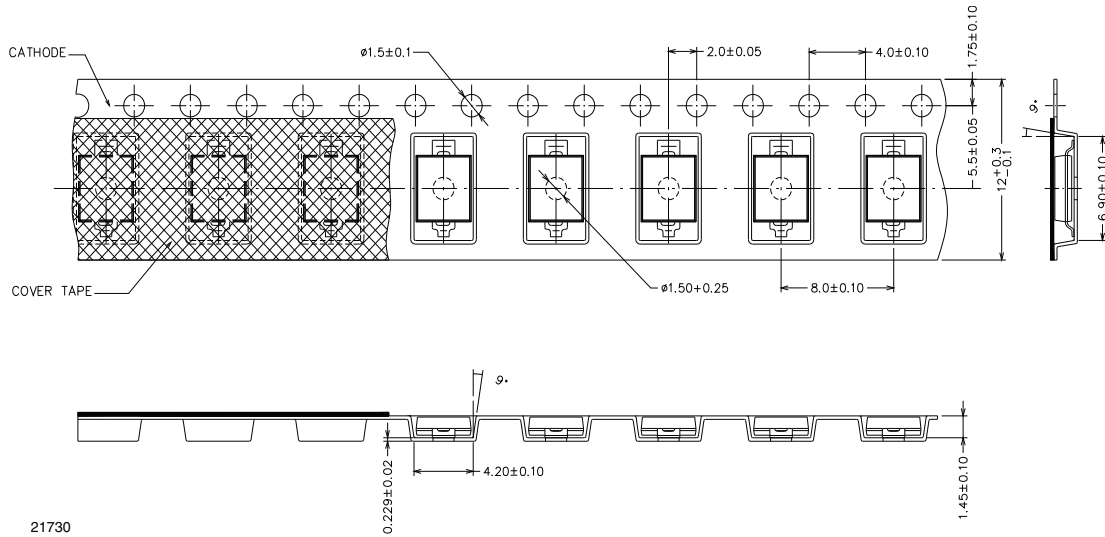
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Issue: 1; 15.04.10

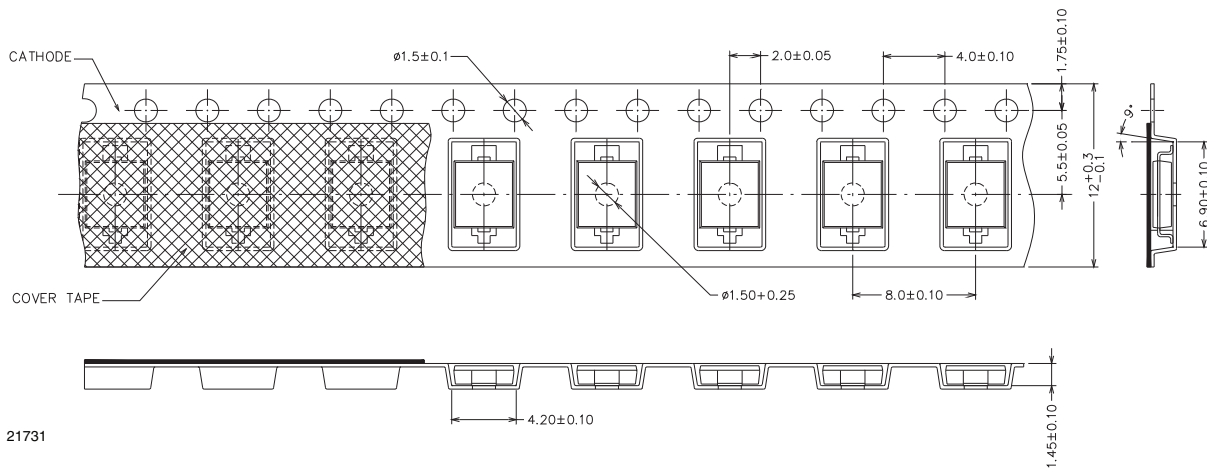
22104



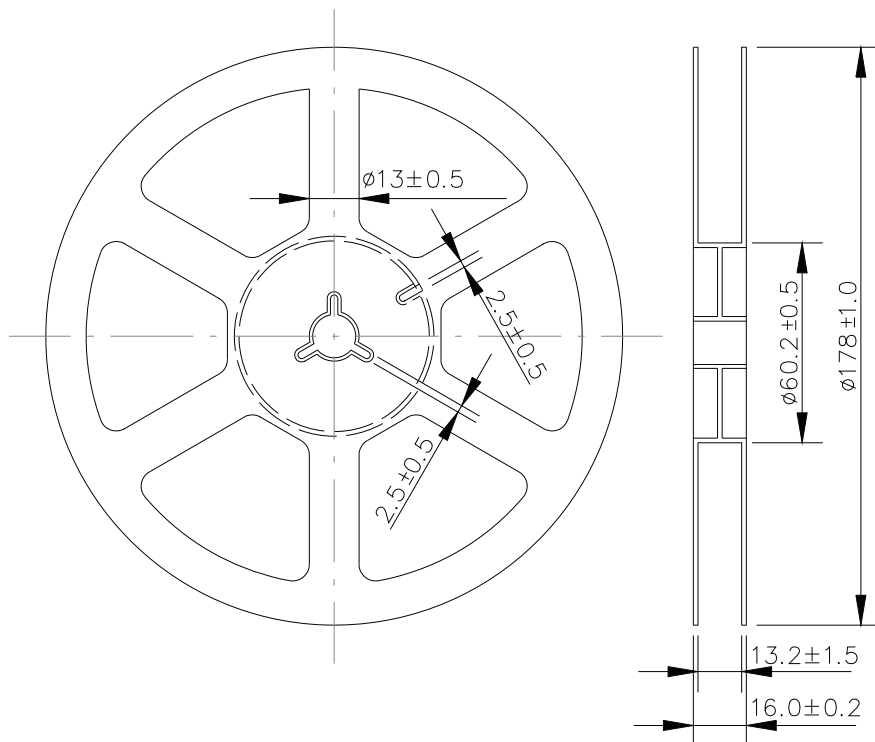
### TAPING DIMENSIONS FOR VBPW34S in millimeters



### TAPING DIMENSIONS FOR VBPW34SR in millimeters

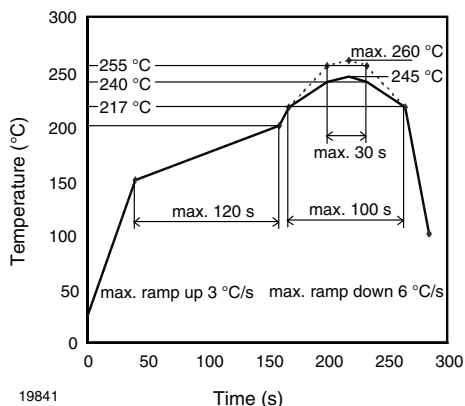


**REEL DIMENSIONS FOR VBPW34S AND VBPW34SR** in millimeters



21732

**SOLDER PROFILE**



19841

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**

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

**DRYING**

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or recommended conditions:  
 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5 °C),  $\text{RH} < 5\text{ }\%$   
 or  
 96 h at  $60\text{ }^{\circ}\text{C}$  (+ 5 °C),  $\text{RH} < 5\text{ }\%$ .



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