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# VBPW34FAS, VBPW34FASR

Vishay Semiconductors

## Silicon PIN Photodiode



21726

### DESCRIPTION

VBPW34FAS and VBPW34FASR 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 and a daylight blocking filter matched with IR emitters operating at wavelength 870 nm or 950 nm.

### 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 radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- 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



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmissionsystems, e.g. in combination with TSFFxxxx

PRODUCT SUMMARY			
COMPONENT	$I_{ra}$ ( $\mu A$ )	$\phi$ (deg)	$\lambda_{0.5}$ (nm)
VBPW34FAS	55	$\pm 65$	780 to 1050
VBPW34FASR	55	$\pm 65$	780 to 1050

#### Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VBPW34FAS	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing
VBPW34FASR	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		$V_R$	60	V
Power dissipation	$T_{amb} \leq 25^\circ C$	$P_V$	215	mW
Junction temperature		$T_j$	100	°C
Operating temperature range		$T_{amb}$	- 40 to + 100	°C
Storage temperature range		$T_{stg}$	- 40 to + 100	°C
Soldering temperature	Acc. reflow solder profile fig. 8	$T_{sd}$	260	°C
Thermal resistance junction/ambient		$R_{thJA}$	350	K/W



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## VBPW34FAS, VBPW34FASR

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BASIC CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 50 mA	V <sub>F</sub>		1	1.3	V
Breakdown voltage	I <sub>R</sub> = 100 μA, E = 0	V <sub>(BR)</sub>	60			V
Reverse dark current	V <sub>R</sub> = 10 V, E = 0	I <sub>ro</sub>		2	30	nA
Diode capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	C <sub>D</sub>		70		pF
	V <sub>R</sub> = 3 V, f = 1 MHz, E = 0	C <sub>D</sub>		25	40	pF
Open circuit voltage	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm	V <sub>o</sub>		350		mV
Temperature coefficient of V <sub>o</sub>	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm	TK <sub>V<sub>o</sub></sub>		- 2.6		mV/K
Short circuit current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm	I <sub>k</sub>		50		μA
Temperature coefficient of I <sub>k</sub>	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm	TK <sub>I<sub>k</sub></sub>		0.1		%/K
Reverse light current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, V <sub>R</sub> = 5 V	I <sub>ra</sub>	45	55		μA
Angle of half sensitivity		φ		± 65		deg
Wavelength of peak sensitivity		λ <sub>p</sub>		950		nm
Range of spectral bandwidth		λ <sub>0.5</sub>		780 to 1050		nm
Noise equivalent power	V <sub>R</sub> = 10 V, λ = 950 nm	NEP		4 × 10 <sup>-14</sup>		W/√Hz
Rise time	V <sub>R</sub> = 10 V, R <sub>L</sub> = 1 kΩ, λ = 820 nm	t <sub>r</sub>		100		ns
Fall time	V <sub>R</sub> = 10 V, R <sub>L</sub> = 1 kΩ, λ = 820 nm	t <sub>f</sub>		100		ns

### BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

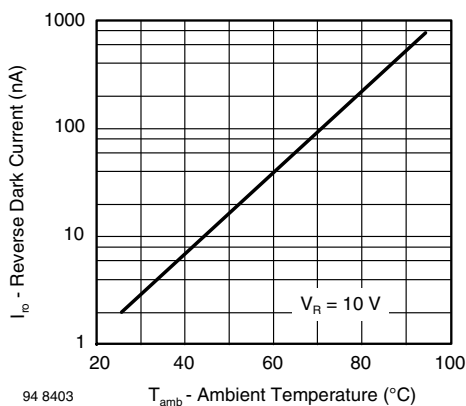


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

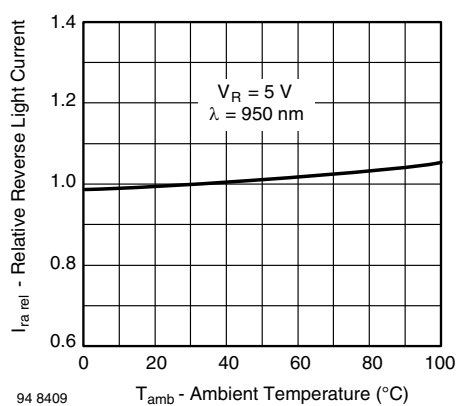


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



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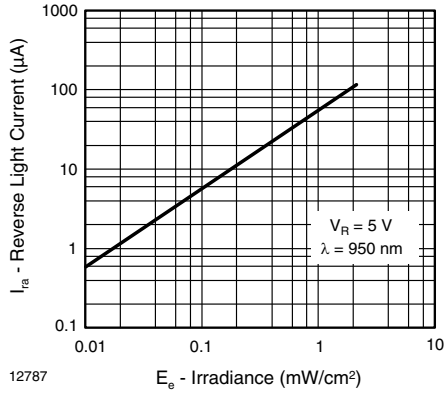


Fig. 3 - Reverse Light Current vs. Irradiance

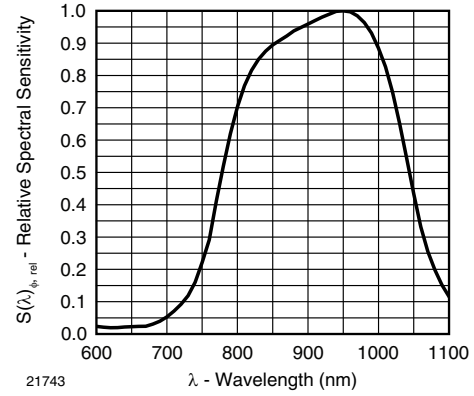


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

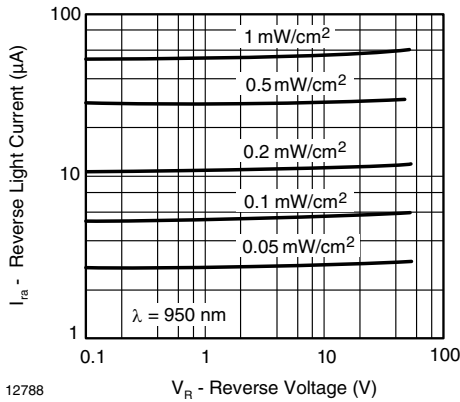


Fig. 4 - Reverse Light Current vs. Reverse Voltage

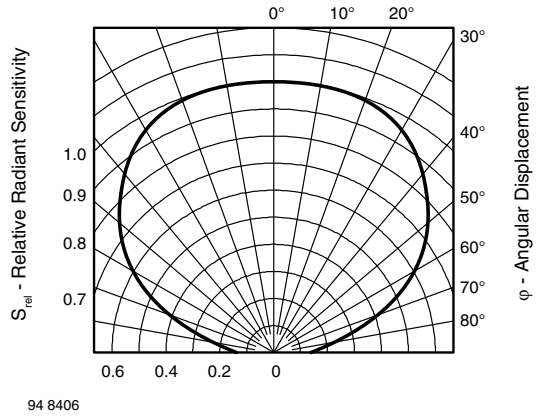


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

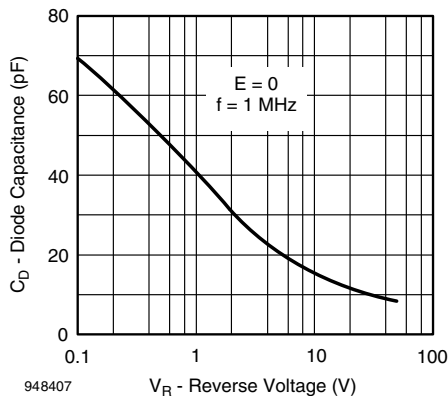


Fig. 5 - Diode Capacitance vs. Reverse Voltage

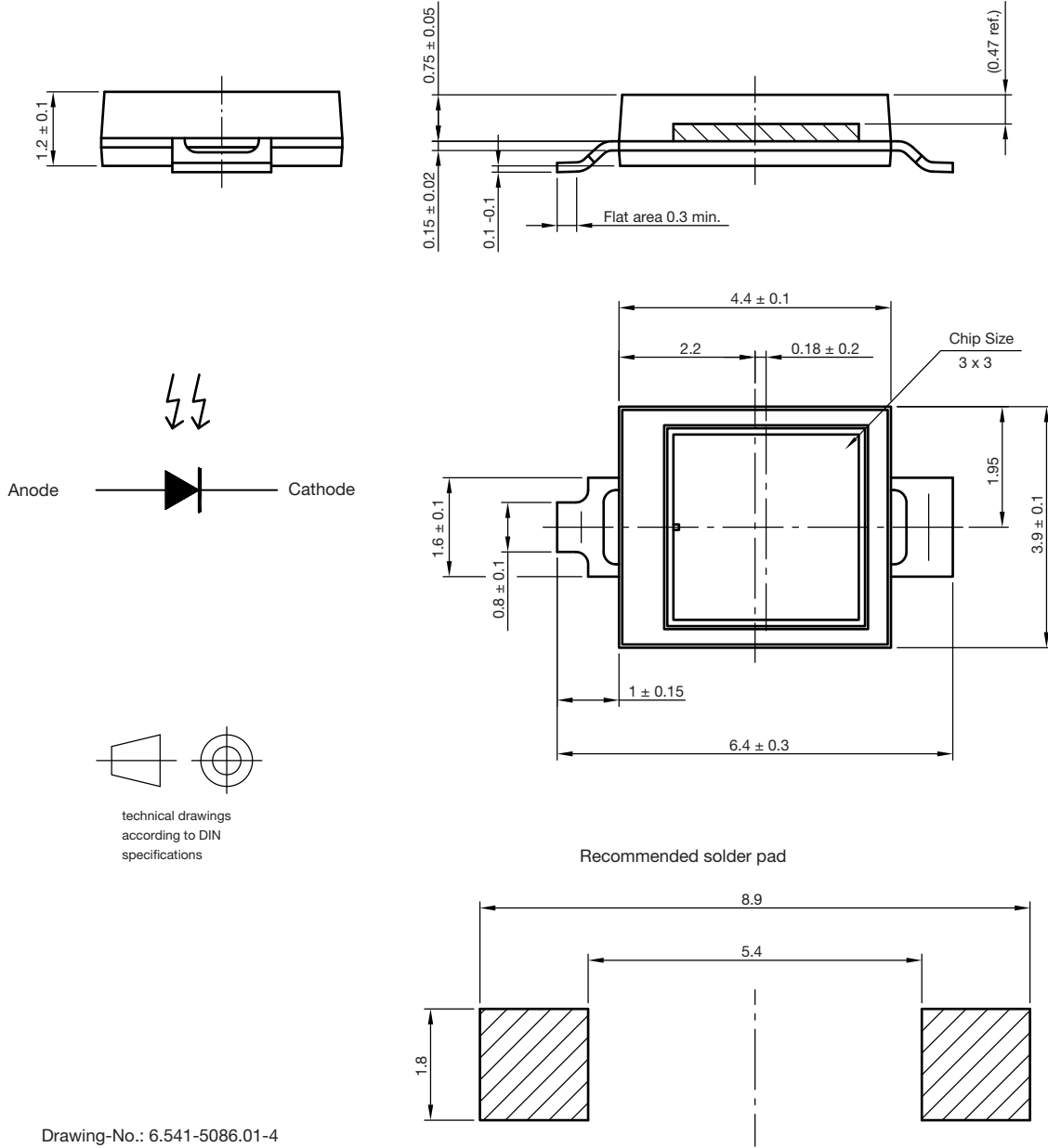


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**PACKAGE DIMENSIONS FOR VBPW34FAS** in millimeters



Drawing-No.: 6.541-5086.01-4  
 Issue: 1; 15.04.10  
 22105

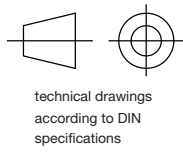
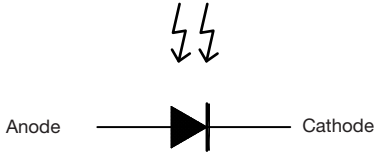
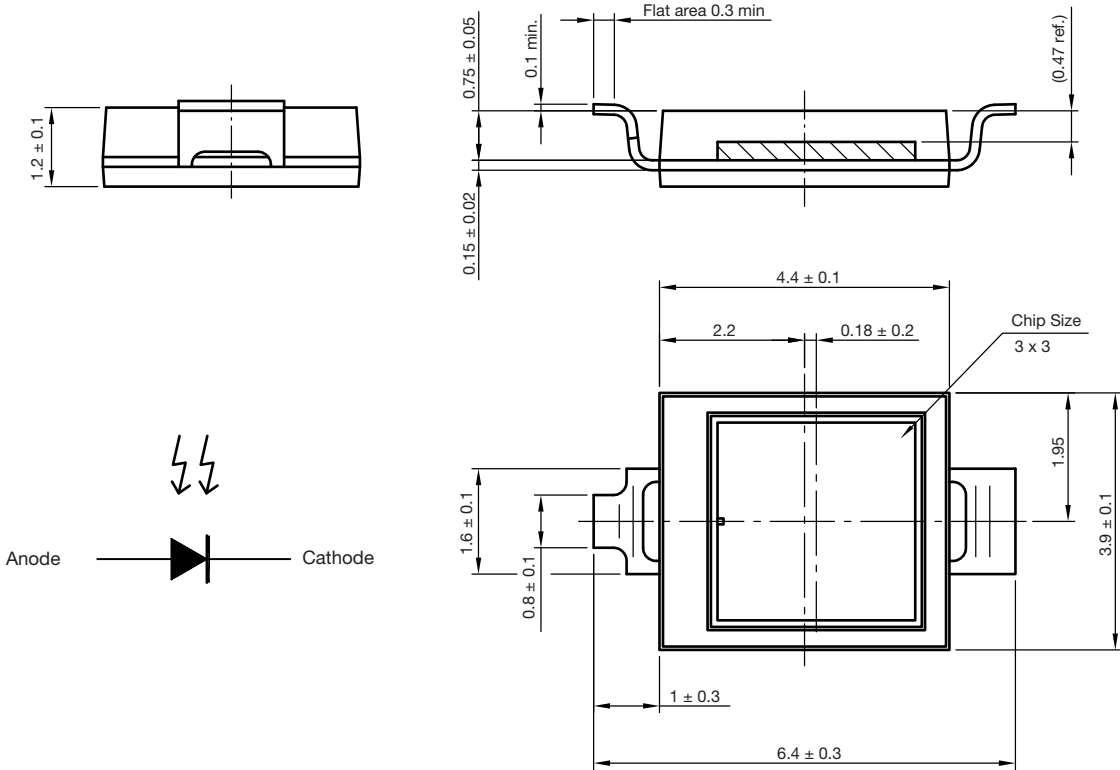


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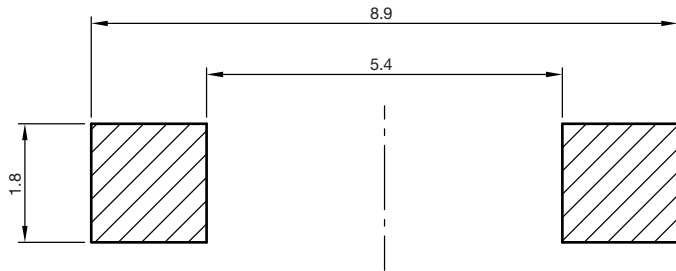
**VBPW34FAS, VBPW34FASR**

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**PACKAGE DIMENSIONS FOR VBPW34FASR** in millimeters



Recommended solder pad



Drawing-No.: 6.541-5085.01-4  
 Issue: 1; 15.04.10  
 22104

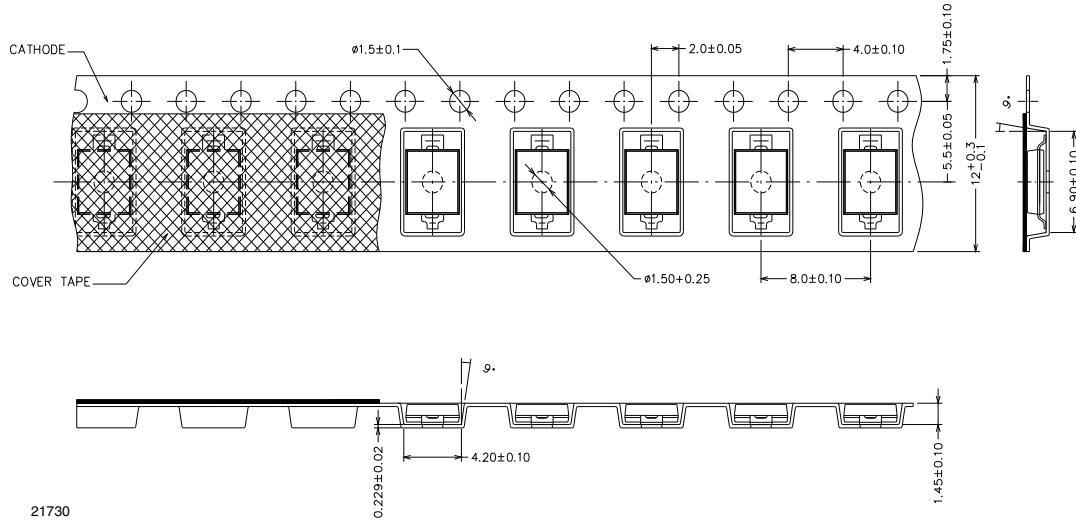


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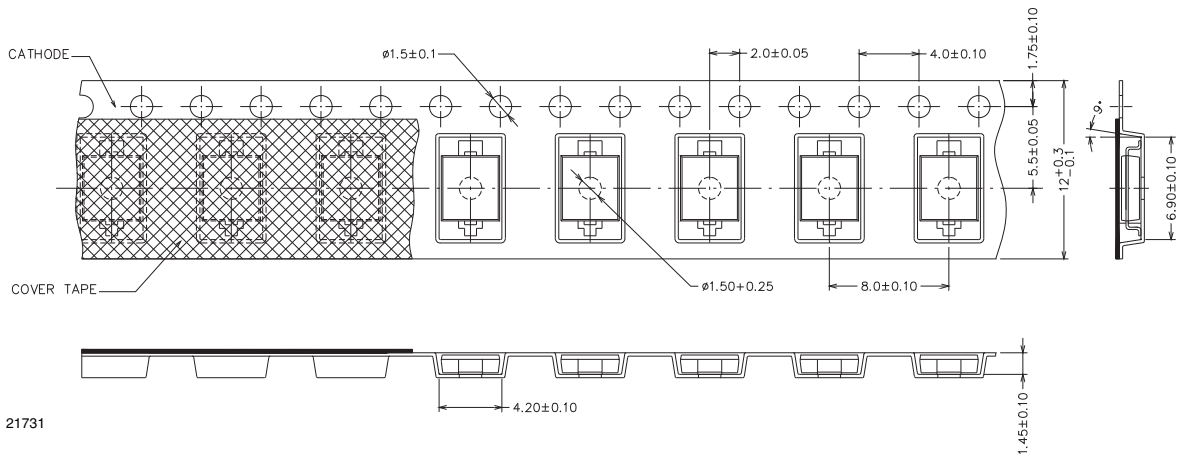
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**TAPING DIMENSIONS FOR VBPW34FAS** in millimeters



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**TAPING DIMENSIONS FOR VBPW34FASR** in millimeters



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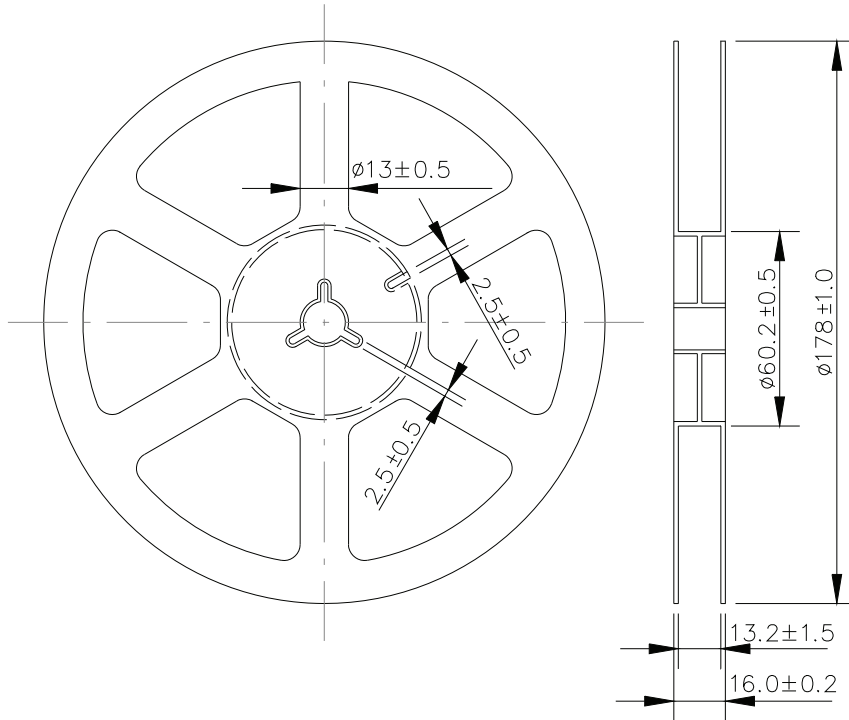


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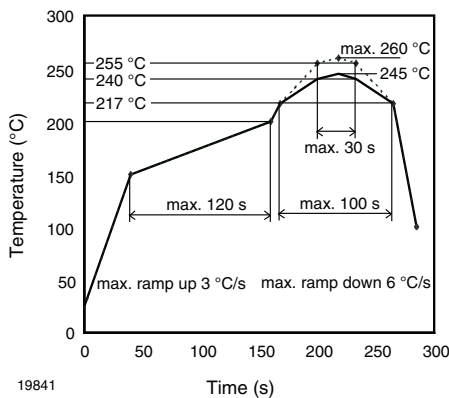
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**REEL DIMENSIONS FOR VBPW34FAS AND VBPW34FASR** in millimeters



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

**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),  $\text{RH} < 5\%$   
 or  
 96 h at  $60\text{ }^{\circ}\text{C}$  (+ 5 °C),  $\text{RH} < 5\%$ .





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