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## Silicon PIN Photodiode



VBPW34FAS

VBPW34FASR

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	$T_{amb} \leq 25^\circ\text{C}$	$P_V$	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 sloder profile fig. 8	$T_{sd}$	260	°C
Thermal resistance junction/ambient		$R_{thJA}$	350	K/W



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 x 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)

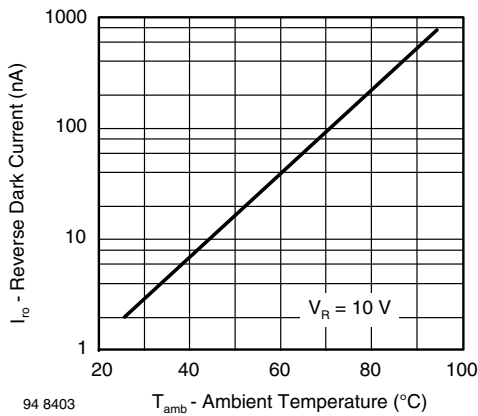


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

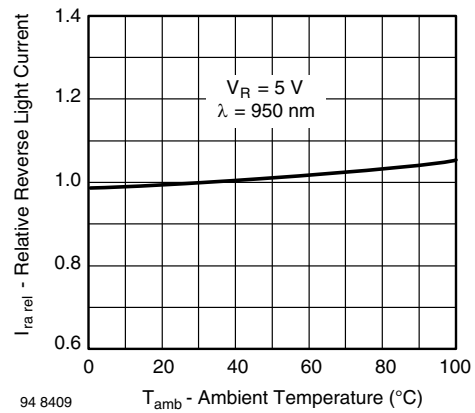
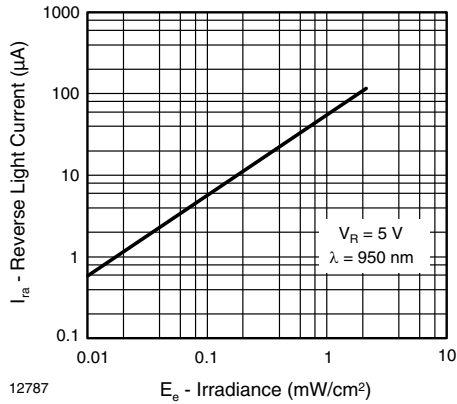
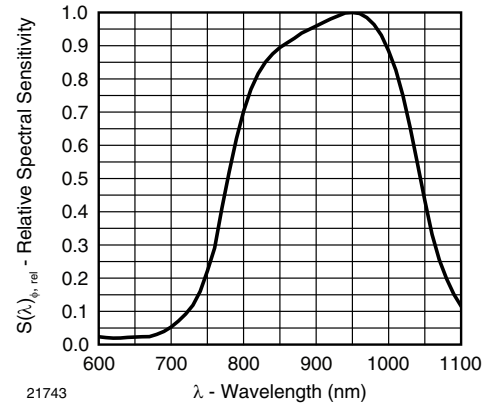


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



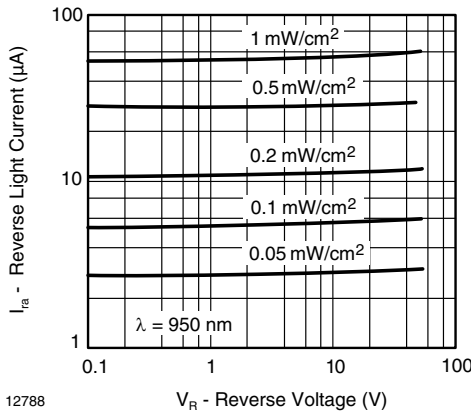
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Fig. 3 - Reverse Light Current vs. Irradiance



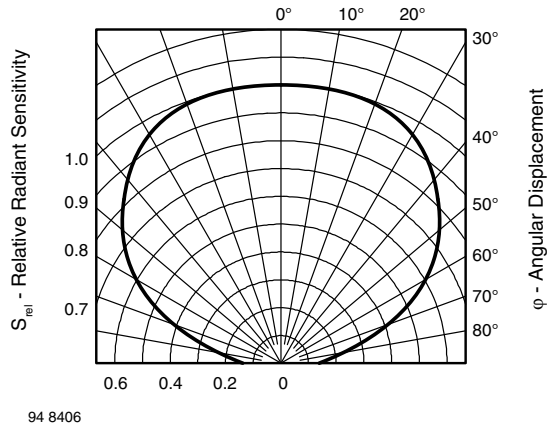
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Fig. 6 - Relative Spectral Sensitivity vs. Wavelength



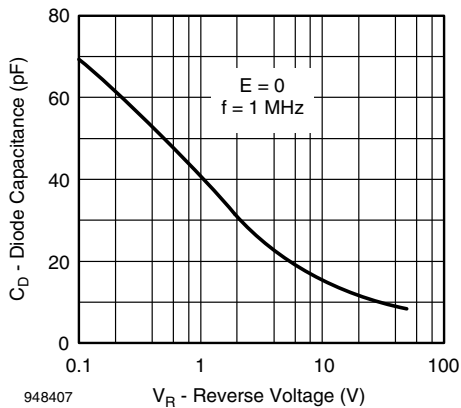
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Fig. 4 - Reverse Light Current vs. Reverse Voltage



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Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

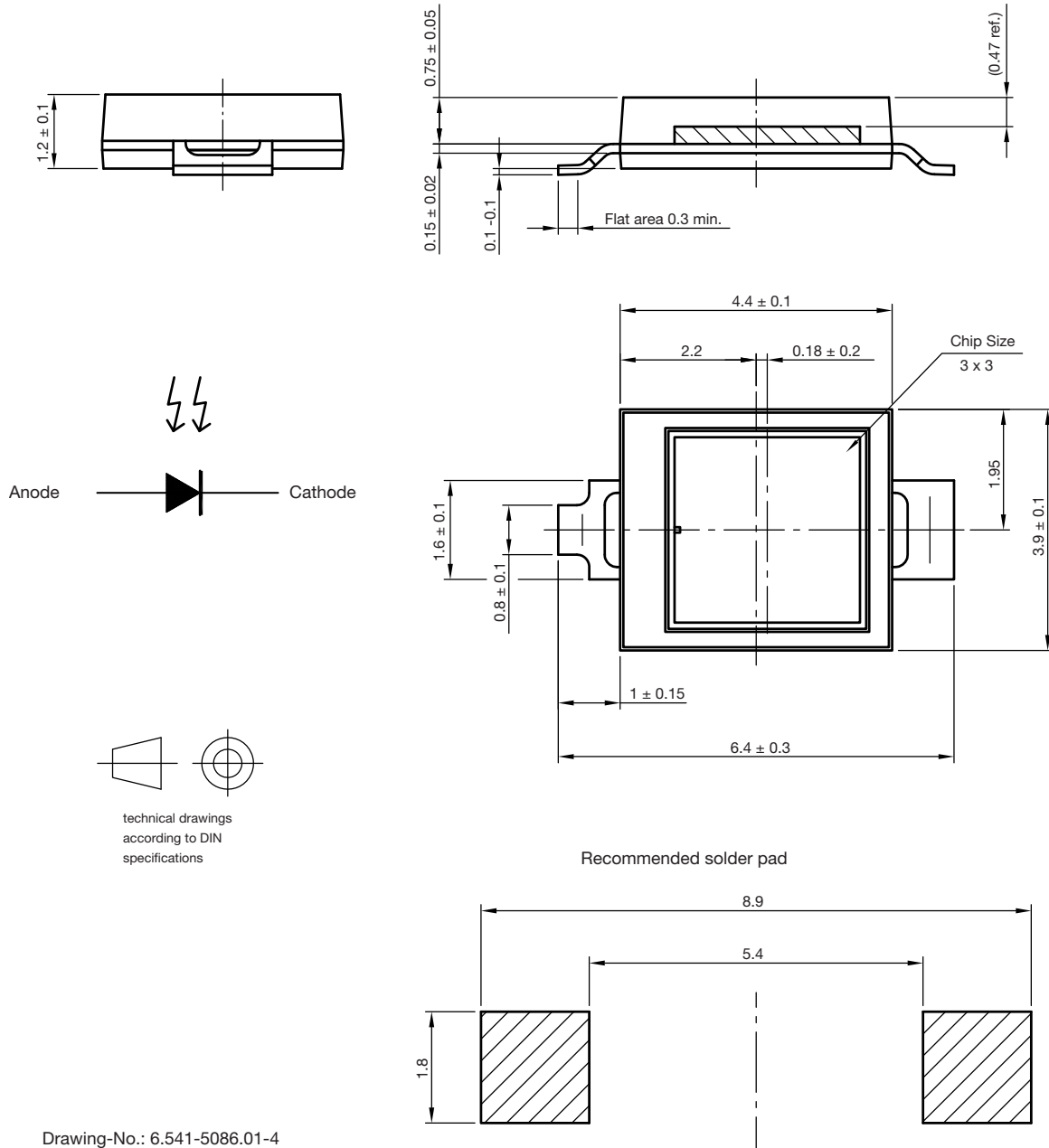


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Fig. 5 - Diode Capacitance vs. Reverse Voltage



## PACKAGE DIMENSIONS FOR VBPW34FAS in millimeters



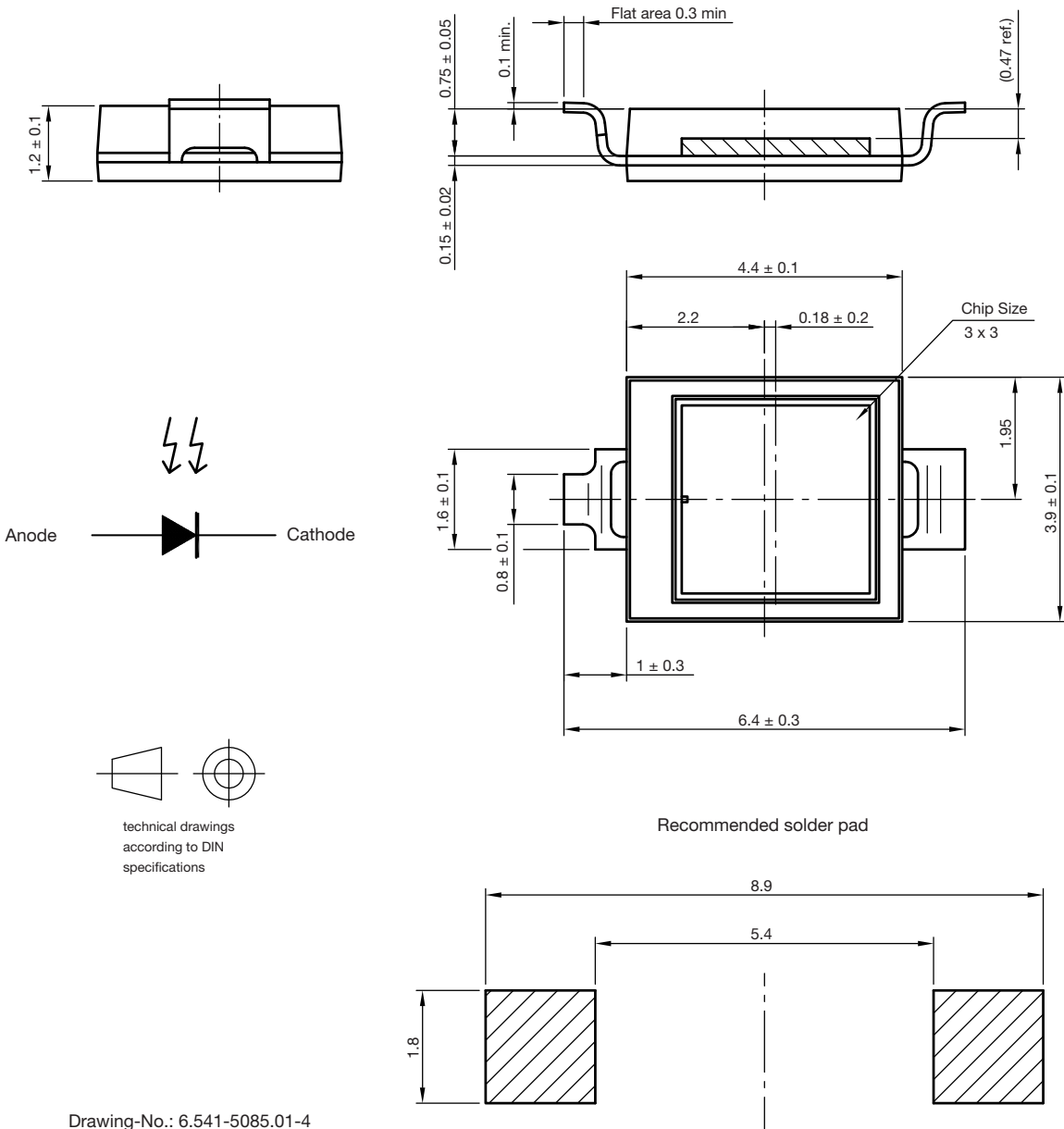
Drawing-No.: 6.541-5086.01-4

Issue: 1; 15.04.10

22105



## PACKAGE DIMENSIONS FOR VBPW34FASR in millimeters



technical drawings according to DIN specifications

Recommended solder pad

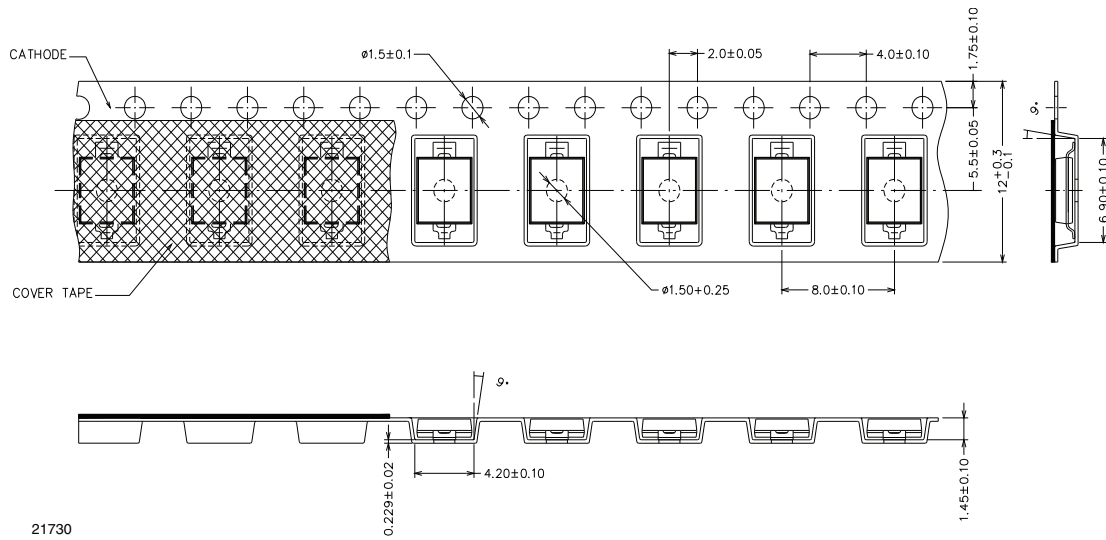
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Issue: 1; 15.04.10

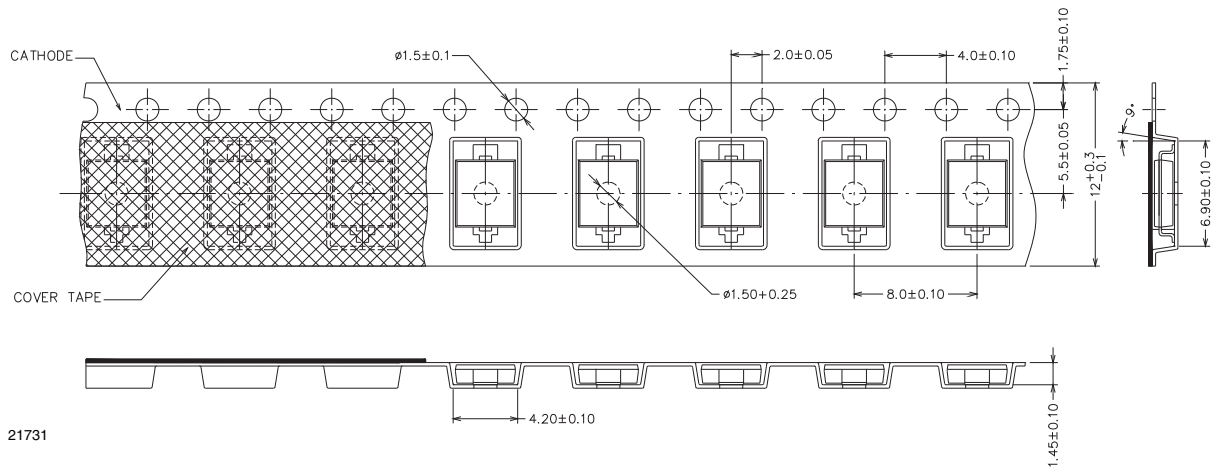
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## TAPING DIMENSIONS FOR VBPW34FAS in millimeters

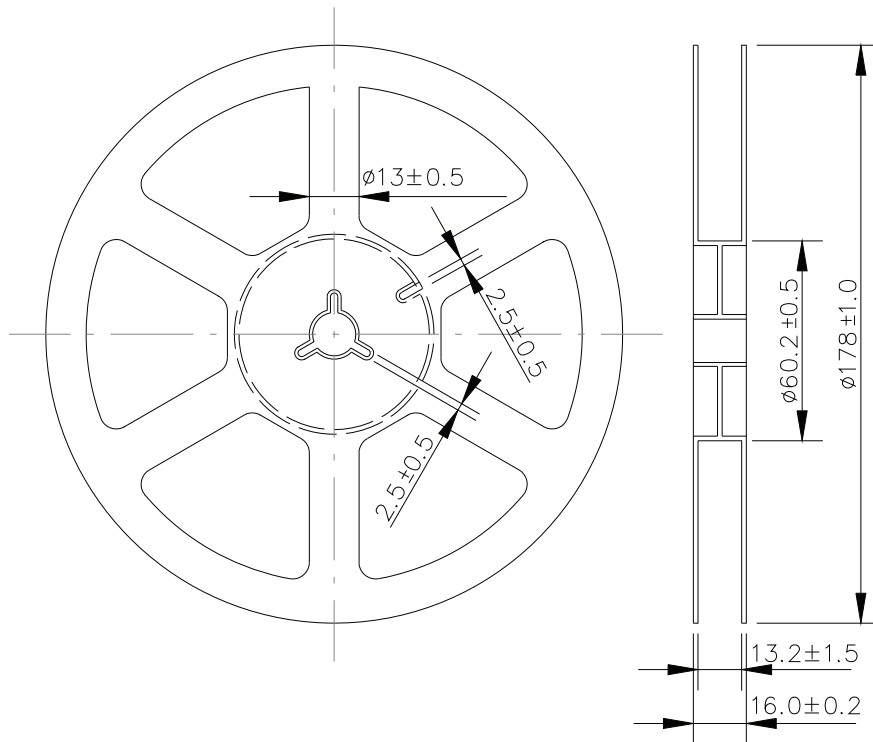


## TAPING DIMENSIONS FOR VBPW34FASR in millimeters



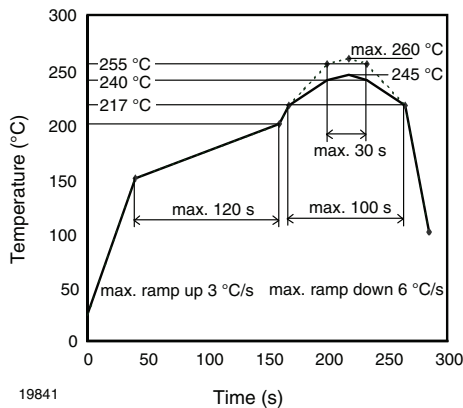


## REEL DIMENSIONS FOR VBPW34FAS AND VBPW34FASR in millimeters



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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