

Silicon PIN Photodiode



21726-1

DESCRIPTION

VBP104FAS and VBP104FASR are high speed and high sensitive PIN photodiodes. It is a surface mount device (SMD) including the chip with a 4.4 mm² 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 mm²): 4.4
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 65^\circ$
- 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


RoHS
COMPLIANT

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	φ (deg)	$\lambda_{0.5}$ (nm)
VBP104FAS	35	± 65	780 to 1050
VBP104FASR	35	± 65	780 to 1050

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VBP104FAS	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing
VBP104FASR	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Reverse gullwing

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ C$, 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	$^\circ C$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ C$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ C$
Soldering temperature	Acc. reflow solder profile fig. 8	T_{sd}	260	$^\circ C$
Thermal resistance junction/ambient		R_{thJA}	350	K/W

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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		48		pF
	$V_R = 3\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_D		17	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		32		μA
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}	25	35		μA
Angle of half sensitivity		ϕ		± 65		deg
Wavelength of peak sensitivity		λ_p		950		nm
Range of spectral bandwidth		$\lambda_{0.5}$		780 to 1050		nm
Noise equivalent power	$V_R = 10\text{ V}$, $\lambda = 950\text{ nm}$	NEP		4×10^{-14}		$\text{W}/\sqrt{\text{Hz}}$
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)

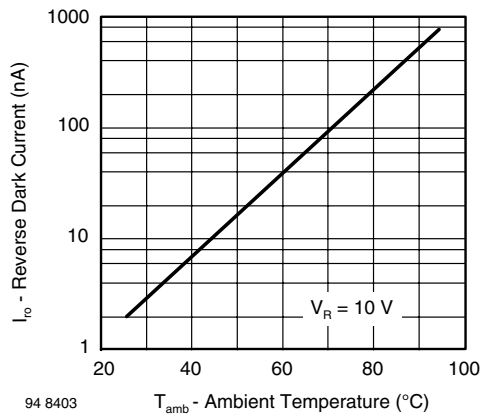


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

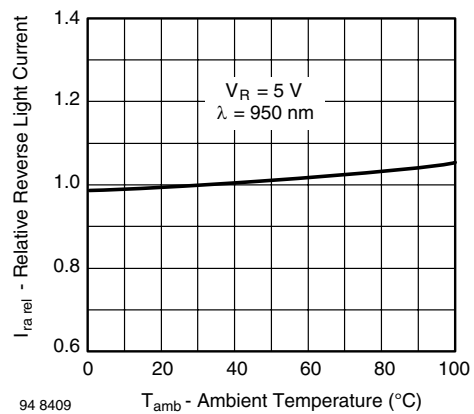


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

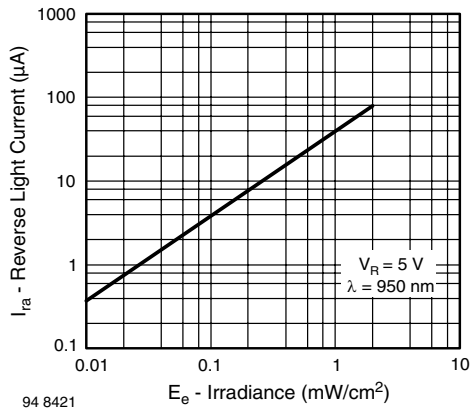


Fig. 3 - Reverse Light Current vs. Irradiance

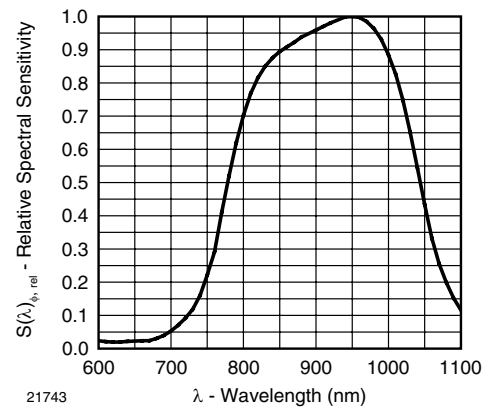


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

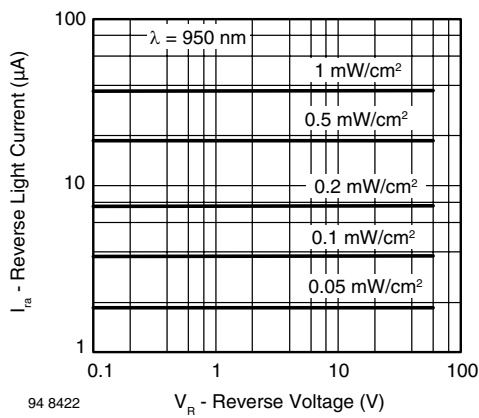


Fig. 4 - Reverse Light Current vs. Reverse Voltage

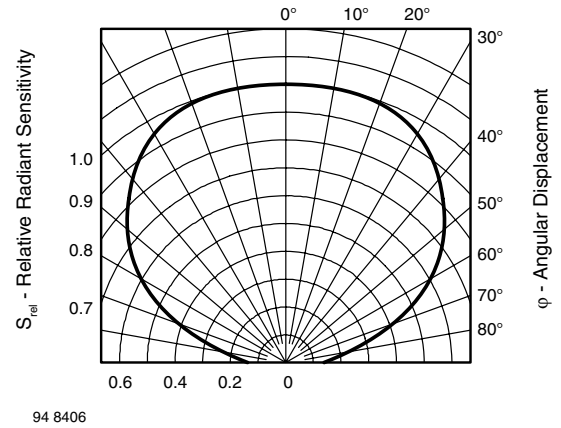


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

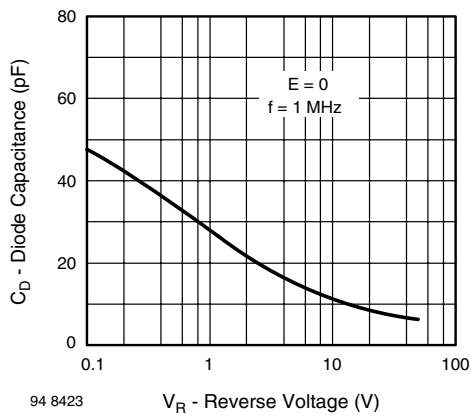


Fig. 5 - Diode Capacitance vs. Reverse Voltage

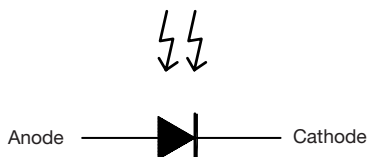
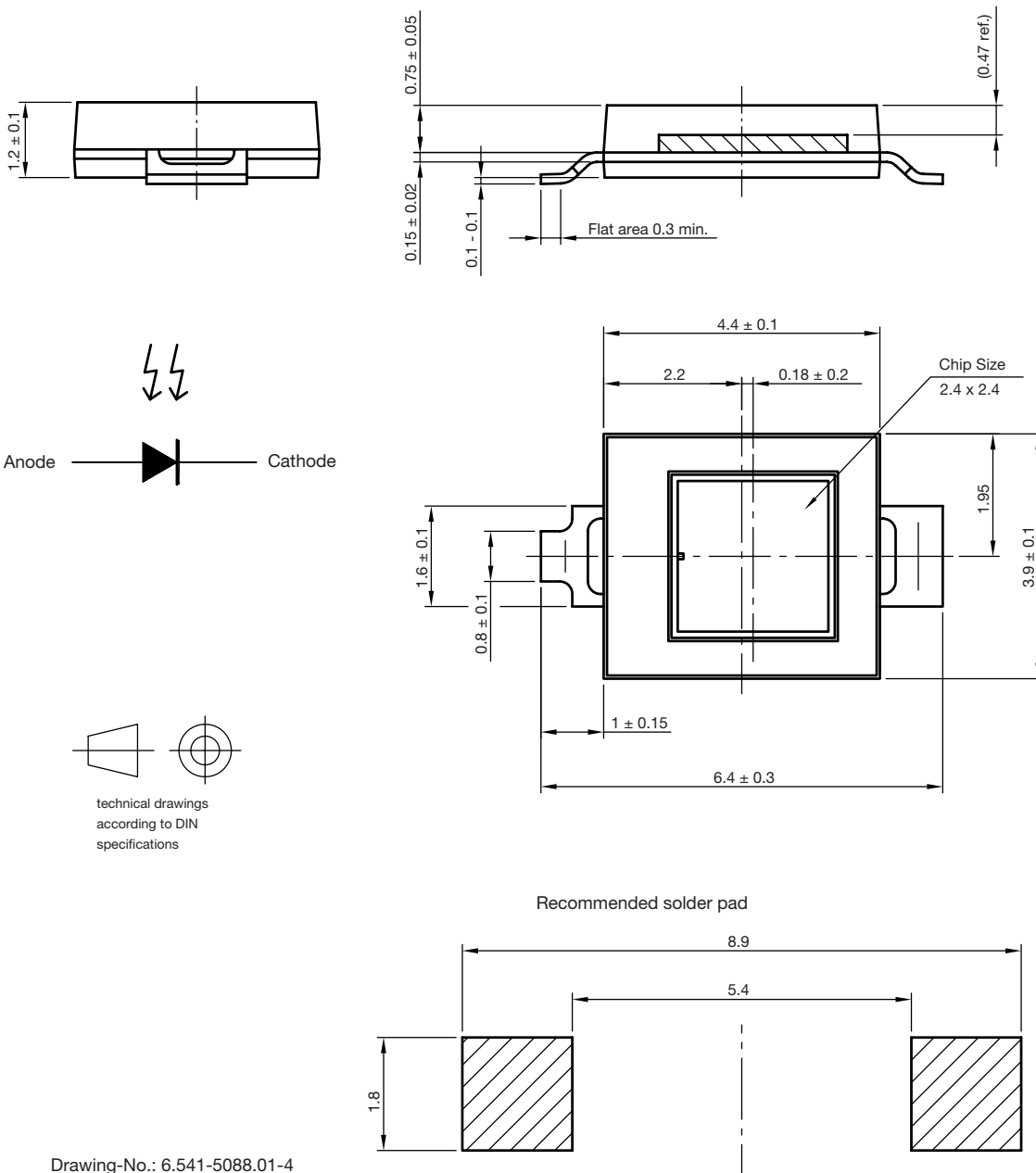
VBP104FAS, VBP104FASR

Vishay Semiconductors

Silicon PIN Photodiode



PACKAGE DIMENSIONS FOR VBP104FAS in millimeters



technical drawings according to DIN specifications

Drawing-No.: 6.541-5088.01-4
Issue: 1; 15.04.10
22107

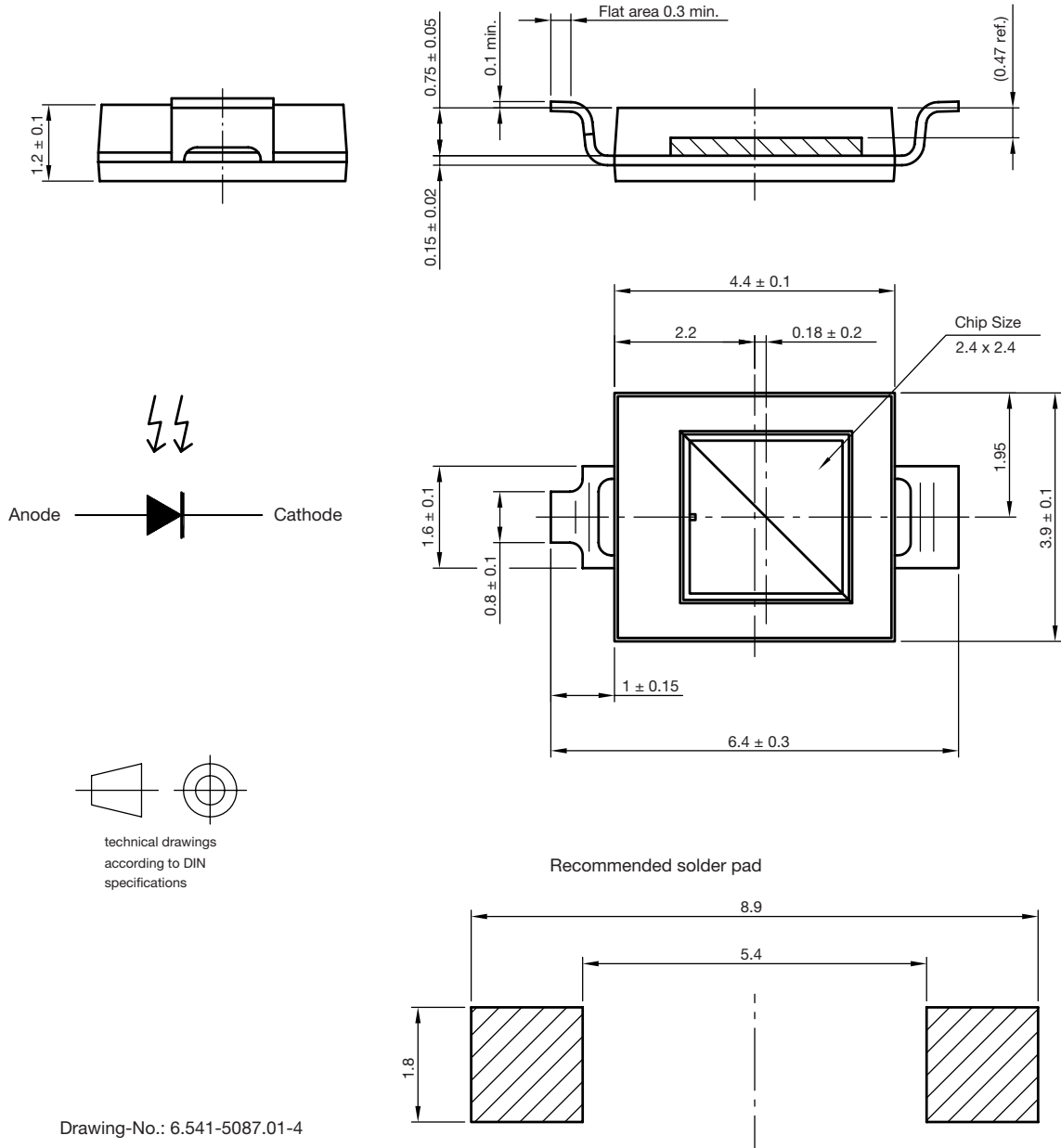


VBP104FAS, VBP104FASR

Silicon PIN Photodiode

Vishay Semiconductors

PACKAGE DIMENSIONS FOR VBP104FASR in millimeters



Drawing-No.: 6.541-5087.01-4
Issue: 1; 15.04.10
22106

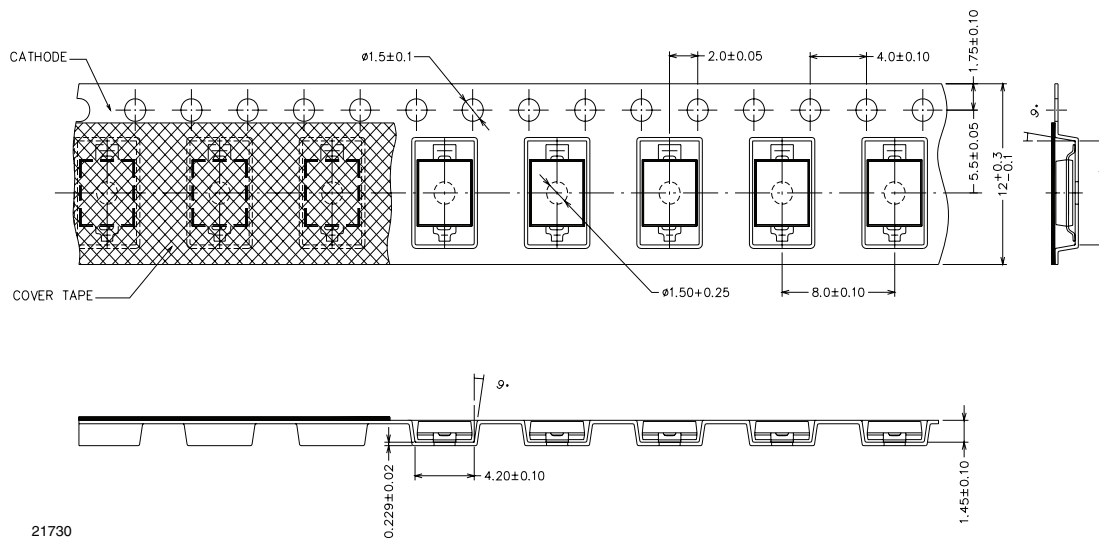
VBP104FAS, VBP104FASR

Vishay Semiconductors

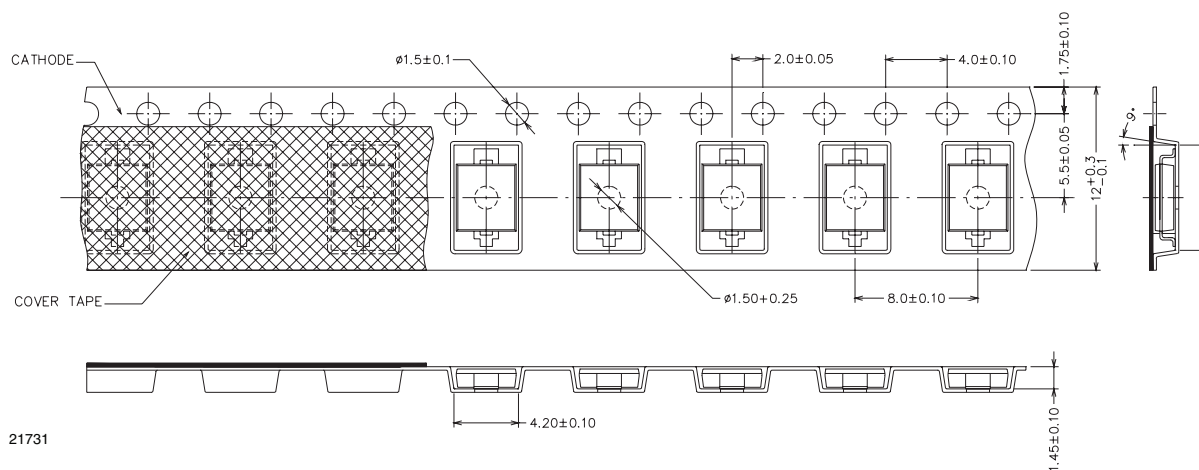
Silicon PIN Photodiode



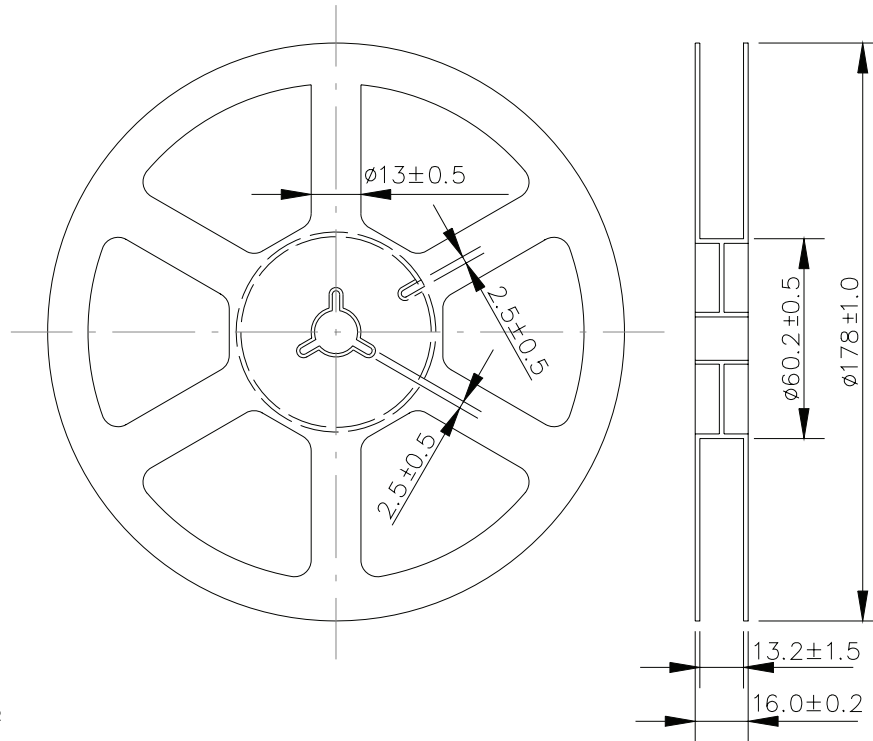
TAPING DIMENSIONS FOR VBP104FAS in millimeters



TAPING DIMENSIONS FOR VBP104FASR in millimeters

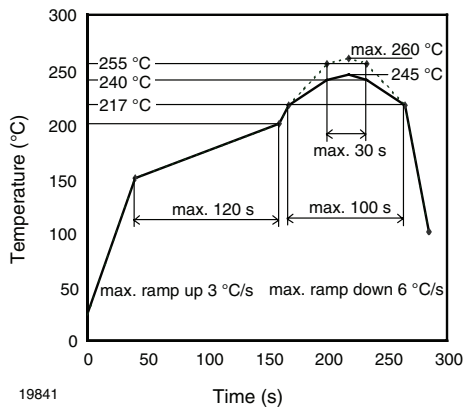


REEL DIMENSIONS FOR VBP104FAS AND VBP104FASR in millimeters



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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