

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 mm²): 4.4
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- 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

DESCRIPTION

VBP104S and VBP104SR 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 detecting visible and near infrared radiation.

APPLICATIONS

- High speed photo detector

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	φ (deg)	$\lambda_{0.1}$ (nm)
VBP104S	35	± 65	430 to 1100
VBP104SR	35	± 65	430 to 1100

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VBP104S	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing
VBP104SR	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Reverse gullwing

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V _R	60	V
Power dissipation	T _{amb} ≤ 25 °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



BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 50 mA	V _F		1	1.3	V
Breakdown voltage	I _R = 100 μA, E = 0	V _(BR)	60			V
Reverse dark current	V _R = 10 V, E = 0	I _{ro}		2	30	nA
Diode capacitance	V _R = 0 V, f = 1 MHz, E = 0	C _D		48		pF
	V _R = 3 V, f = 1 MHz, E = 0	C _D		17	40	pF
Open circuit voltage	E _e = 1 mW/cm ² , λ = 950 nm	V _o		350		mV
Temperature coefficient of V _o	E _e = 1 mW/cm ² , λ = 950 nm	TK _{V_o}		- 2.6		mV/K
Short circuit current	E _e = 1 mW/cm ² , λ = 950 nm	I _k		32		μA
Temperature coefficient of I _k	E _e = 1 mW/cm ² , λ = 950 nm	TK _{I_k}		0.1		%/K
Reverse light current	E _e = 1 mW/cm ² , λ = 950 nm, V _R = 5 V	I _{ra}	25	35		μA
Angle of half sensitivity		φ		± 65		deg
Wavelength of peak sensitivity		λ _p		940		nm
Range of spectral bandwidth		λ _{0.1}		430 to 1100		nm
Noise equivalent power	V _R = 10 V, λ = 950 nm	NEP		4 x 10 ⁻¹⁴		W/√Hz
Rise time	V _R = 10 V, R _L = 1 kΩ, λ = 820 nm	t _r		100		ns
Fall time	V _R = 10 V, R _L = 1 kΩ, λ = 820 nm	t _f		100		ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

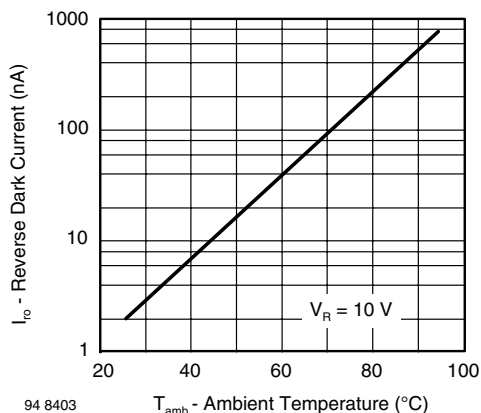


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

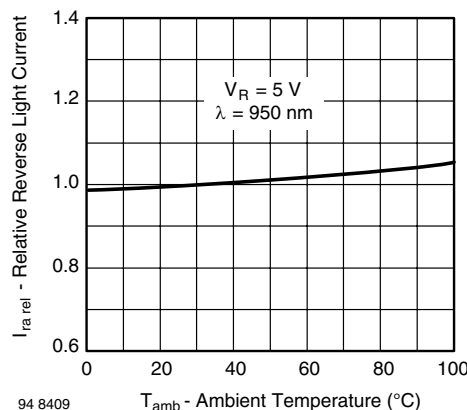


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

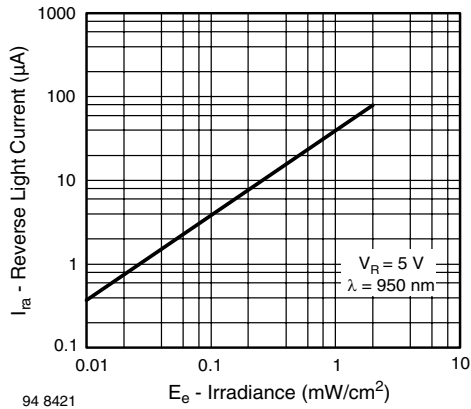


Fig. 3 - Reverse Light Current vs. Irradiance

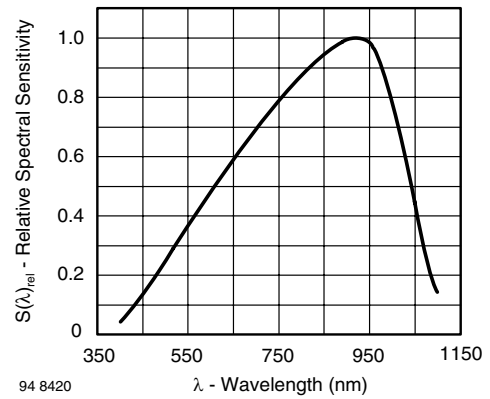


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

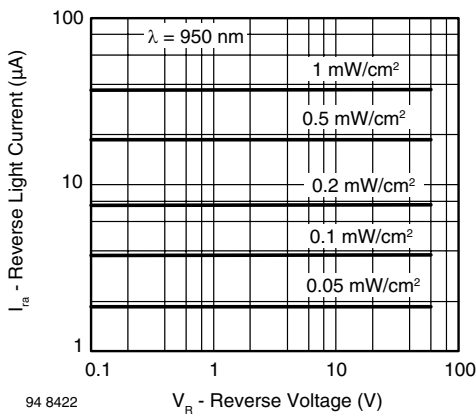


Fig. 4 - Reverse Light Current vs. Reverse Voltage

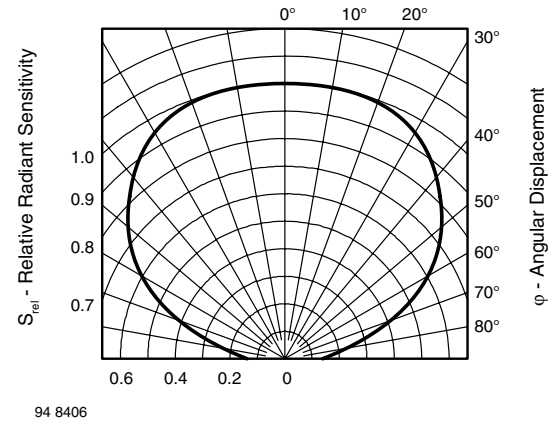


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

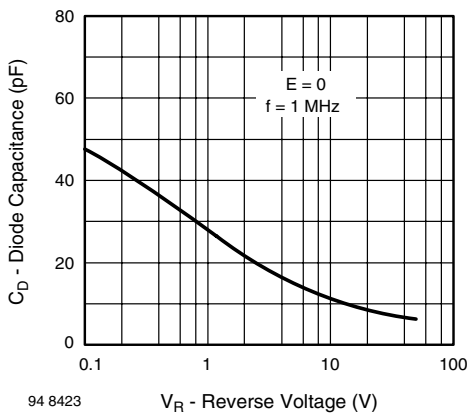


Fig. 5 - Diode Capacitance vs. Reverse Voltage

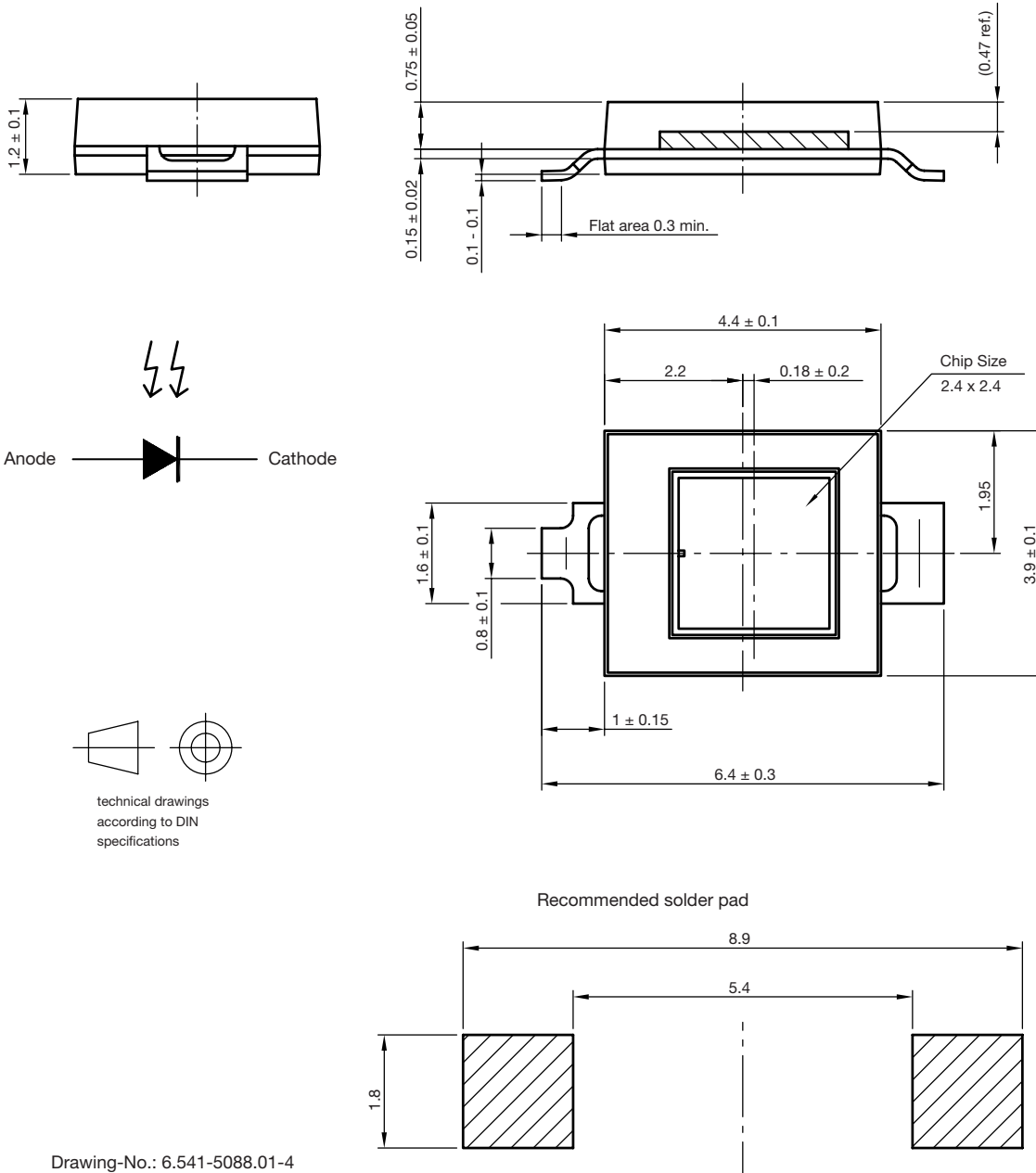
VBP104S, VBP104SR

Vishay Semiconductors

Silicon PIN Photodiode

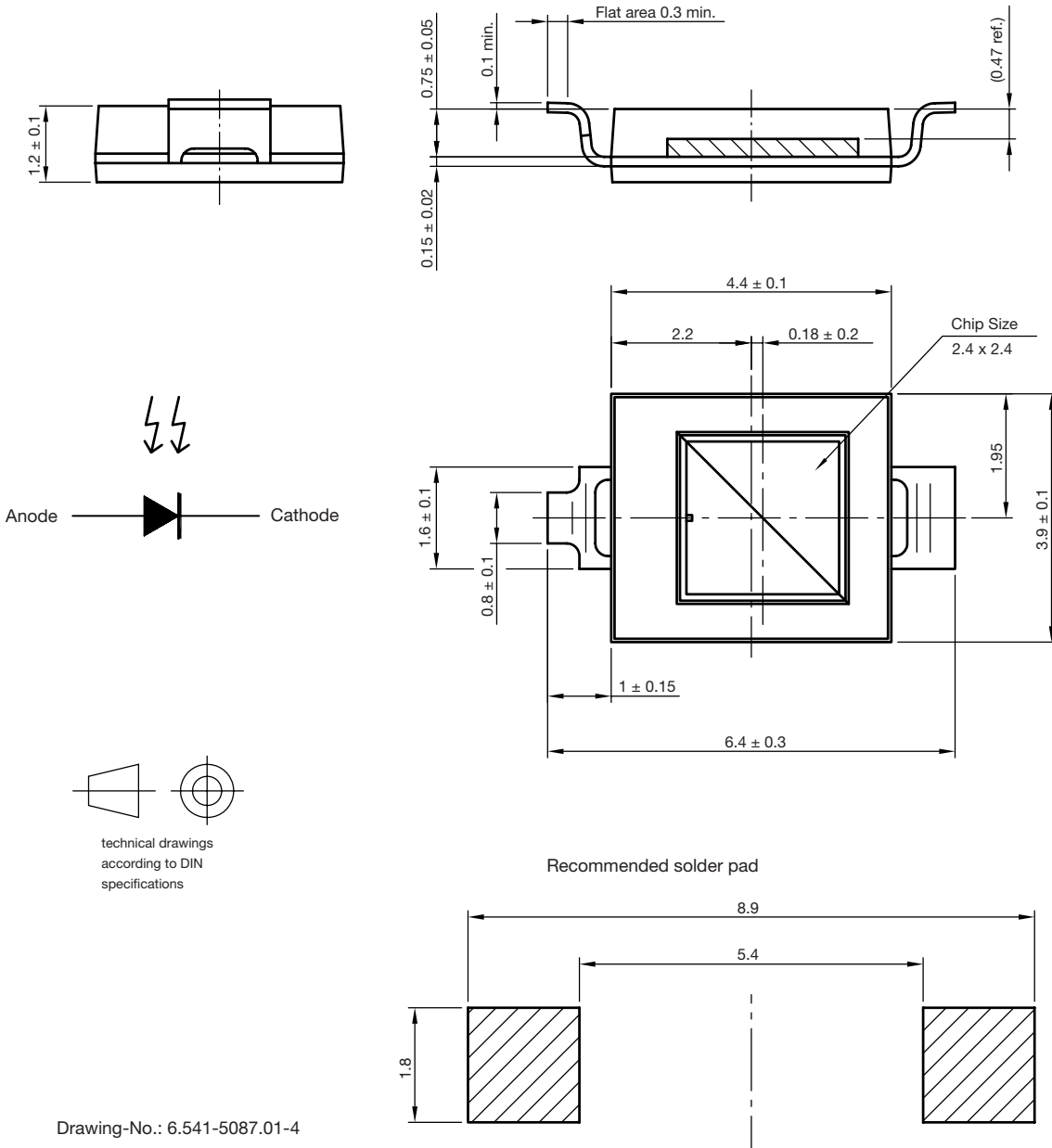


PACKAGE DIMENSIONS FOR VBP104S in millimeters



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

PACKAGE DIMENSIONS FOR VBP104SR in millimeters



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

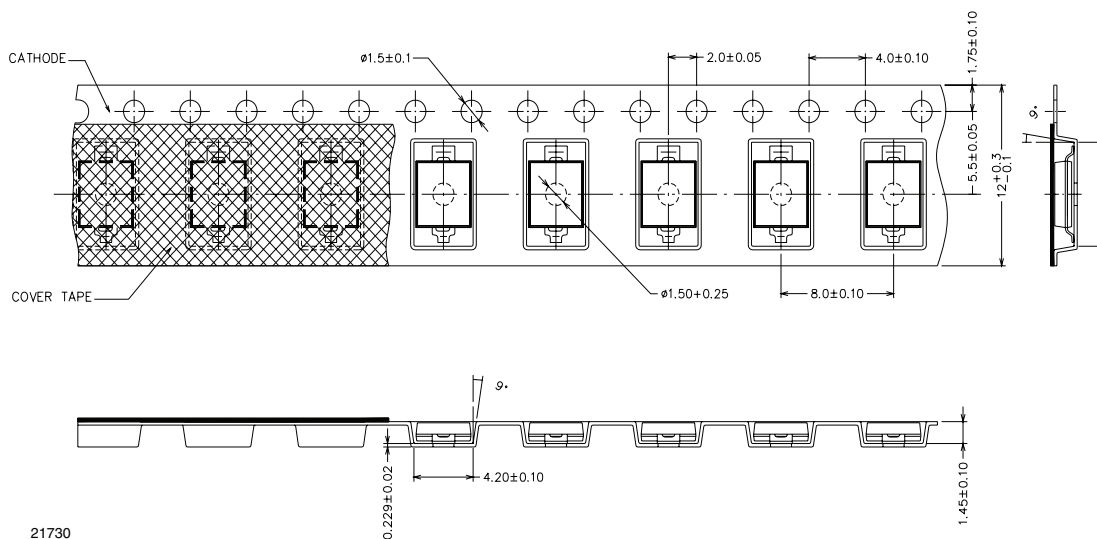
VBP104S, VBP104SR

Vishay Semiconductor

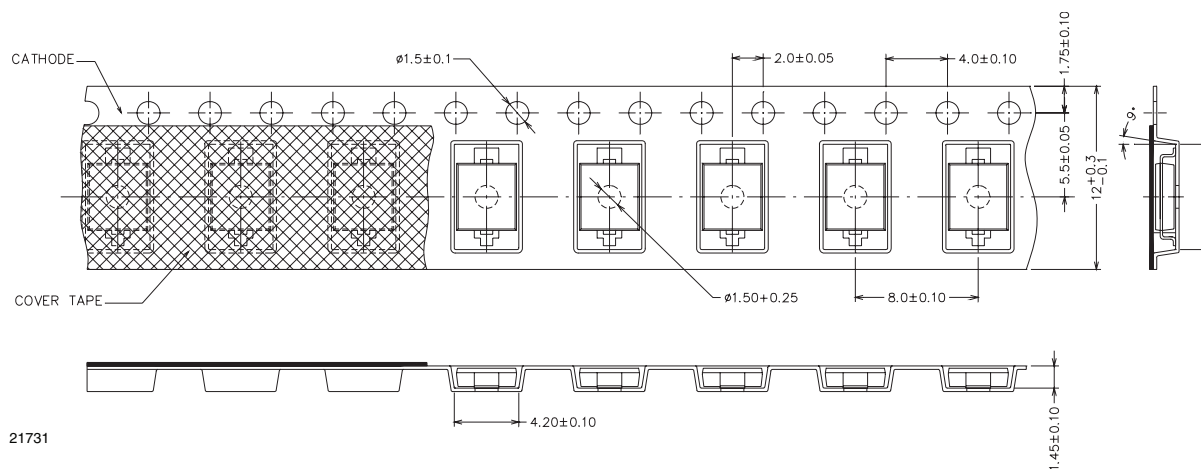
Silicon PIN Photodiode



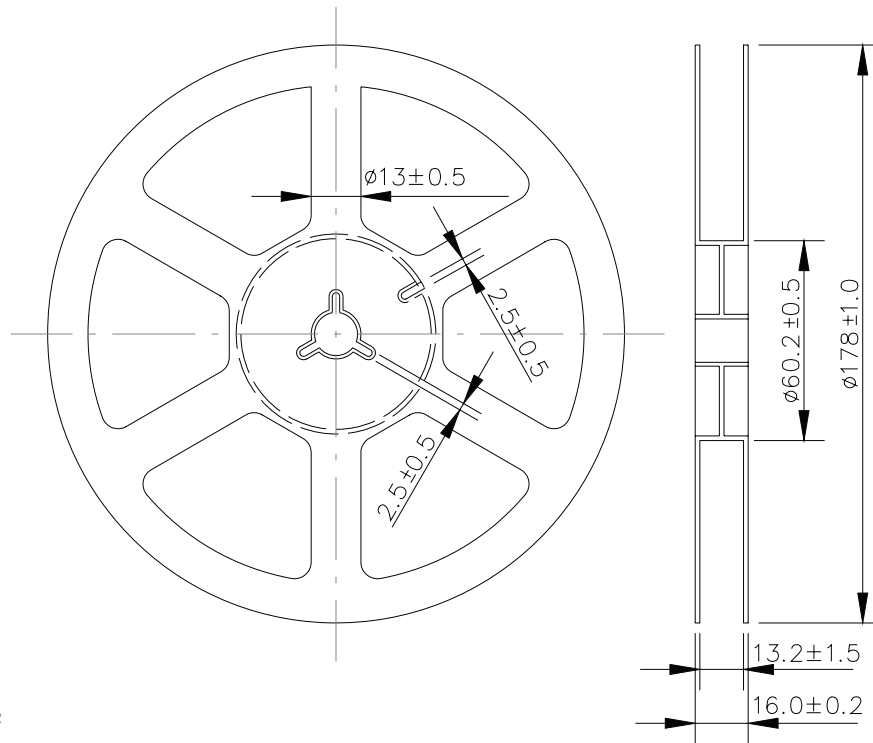
TAPING DIMENSIONS FOR VBP104S in millimeters



TAPING DIMENSIONS FOR VBP104SR in millimeters

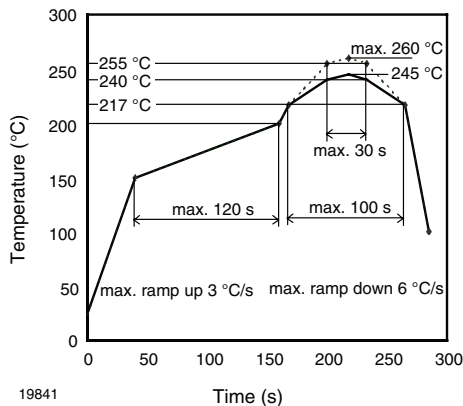


REEL DIMENSIONS FOR VBP104S AND VBP104SR in millimeters



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 $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $\text{RH} < 5\%$
 or
 96 h at $60\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $\text{RH} < 5\%$.

Disclaimer

All product specifications and data are subject to change without notice.

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