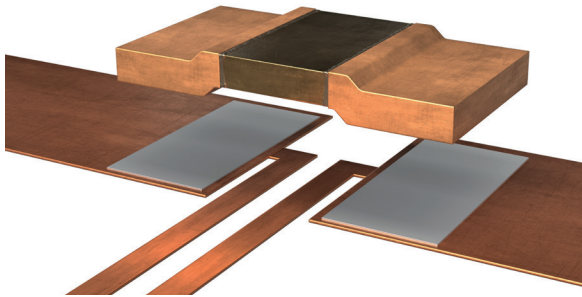




## ISA-WELD® // PRECISION RESISTORS



### BVE // Size 5930



#### Features

- Power rating up to 15 W
- Continuous current load up to 315 A (0.1 mOhm)
- Heavy copper connectors
- Excellent long-term stability
- Max. solder temperature up to 350 °C / 30 sec
- AEC-Q200 qualified
- RoHS 2011/65/EU compliant



#### Applications

- Current sensor for power hybrid applications
- For welding on bus bars
- High current applications for the automotive market
- Frequency converters
- Power modules

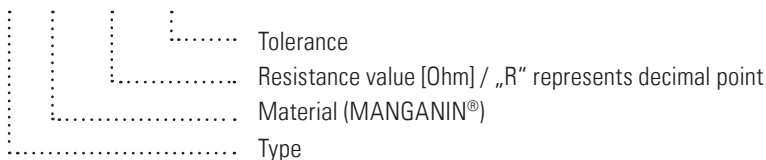
#### Technical data <sup>1</sup>

Resistance values	<b>mOhm</b>	0.1 to 3
Tolerance	<b>%</b>	1 / 5
Temperature coefficient (20-60 °C)	<b>ppm/K</b>	nominal value ±50
Applicable temperature range	<b>°C</b>	-55 to +170
Power rating <b>P<sub>70°C</sub></b>	<b>W</b>	up to 15
Internal heat resistance (R <sub>thi</sub> )	<b>K/W</b>	from 2
Inductance	<b>nH</b>	<3
Stability (at rated power) deviation after 2000h	<b>%</b>	<0.5 (T <sub>max.</sub> = 140 °C) <1.0 (T <sub>max.</sub> = 170 °C)

<sup>1</sup> For detailed information see table on page 4

#### Ordering code

BVE - M - R0005 - 1.0





## BVE // Size 5930

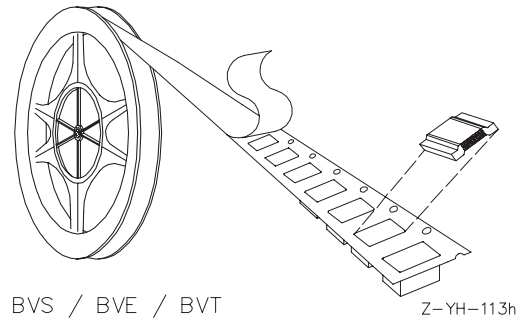
### Recommended solder profile

Reflow-, IR- and wave-soldering

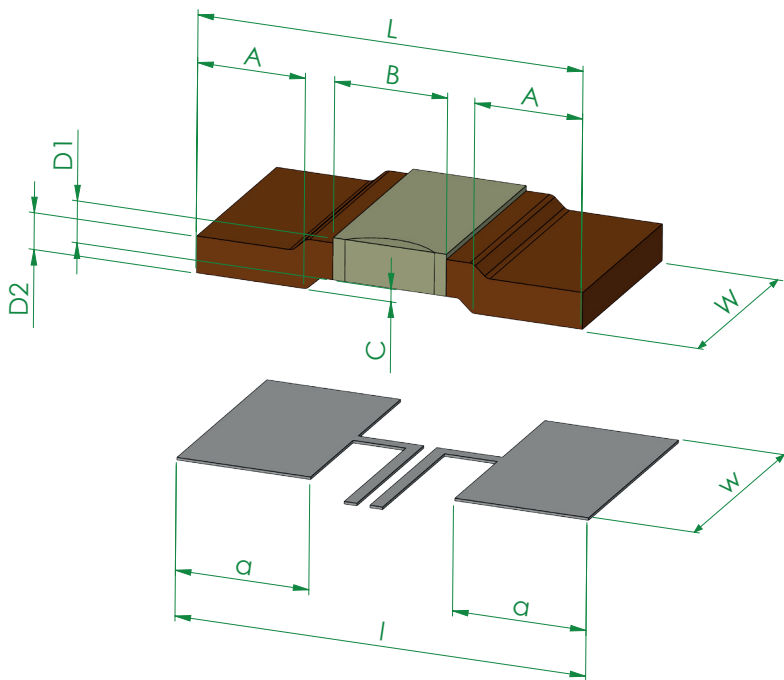
Temperature	°C	260	255	217
Time	sec	peak	40	90

### Tape and reel information

Specification	DIN EN 60286-3			
Tape width	mm	24		
Reel size	inch	13		
Parts per reel	pcs	2000		
Packaging weight	g	563		



### Mechanical dimensions and pcb-layout proposal (Reflow-soldering) [mm] // Z-YE-583b



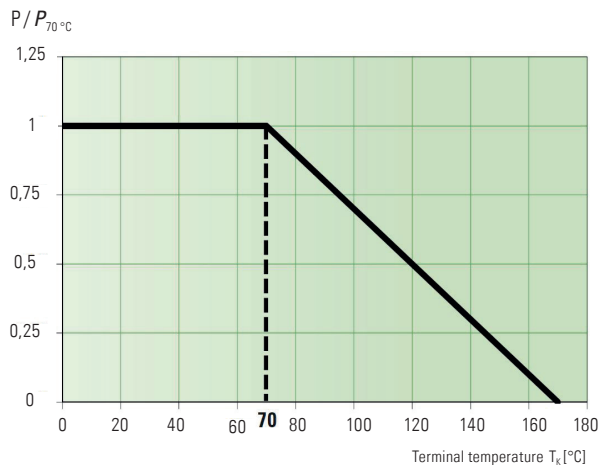
type:	value / mOhm	L	W	A	B	C	D1	D2
BVE-Z-R0001	0.1	15 ±0.2	7.75 +0.3/-0.2	4.95 +0.1/-0.7	3.7 +0.2/-0.3	0.5 ±0.1	1.42 ±0.1	1.42 ±0.1
BVE-M-R0002	0.2	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	5 +0.2/-0.3	0.5 ±0.1	1.42 ±0.1	1.42 ±0.1
BVE-M-R0003	0.3	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	5 +0.2/-0.3	0.5 ±0.1	0.94 ±0.1	0.84 ±0.1
BVE-M-R0005	0.5	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	5 +0.2/-0.3	0.5 ±0.1	0.56 ±0.1	0.56 ±0.1
BVE-A-R0005	0.5	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	4.4 +0.2/-0.3	0.5 ±0.1	1.62 ±0.1	1.42 ±0.1
BVE-A-R001	1	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	4.9 +0.2/-0.3	0.5 ±0.1	0.91 ±0.1	0.84 ±0.1
BVE-A-R002	2	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	4.9 +0.2/-0.3	0.5 ±0.1	0.44 ±0.05	0.64 ±0.1
BVE-A-R003	3	15 ±0.2	7.75 +0.3/-0.2	4.2 +0.1/-0.7	5 +0.2/-0.3	0.5 ±0.1	0.31 ±0.05	0.4 ±0.1

solder pad type:	l	w	a
BVE	16	8.75	5.2

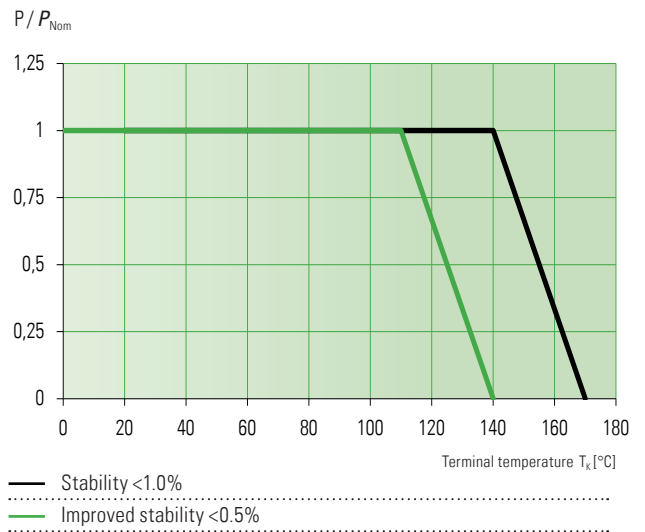


**BVE // Size 5930**

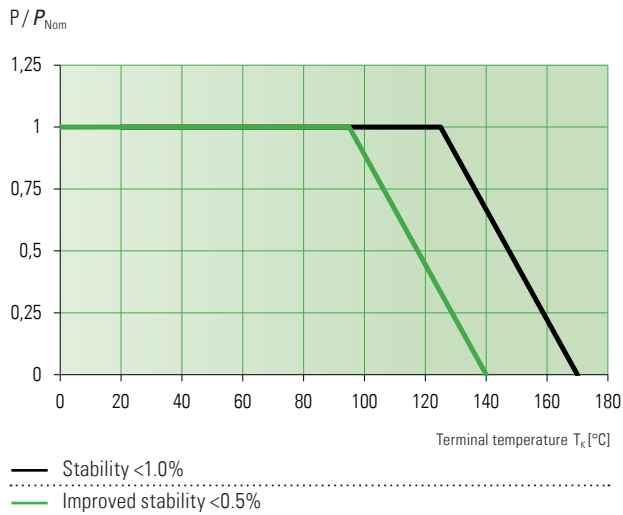
**Power derating curve at  $P_{70^\circ\text{C}}$**



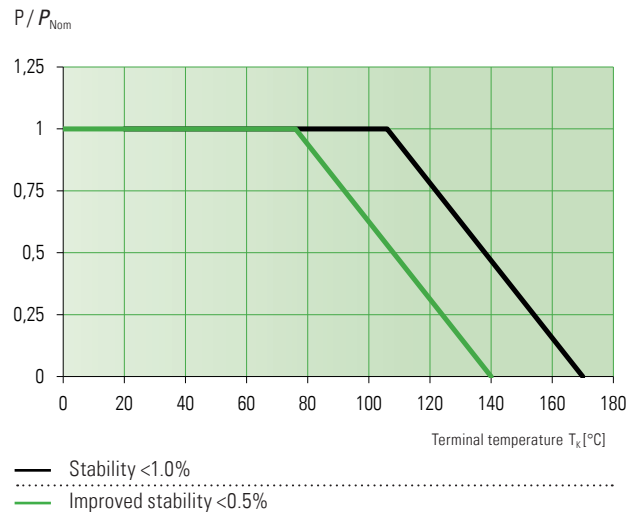
**Power derating curve BVE-Z-R0001**



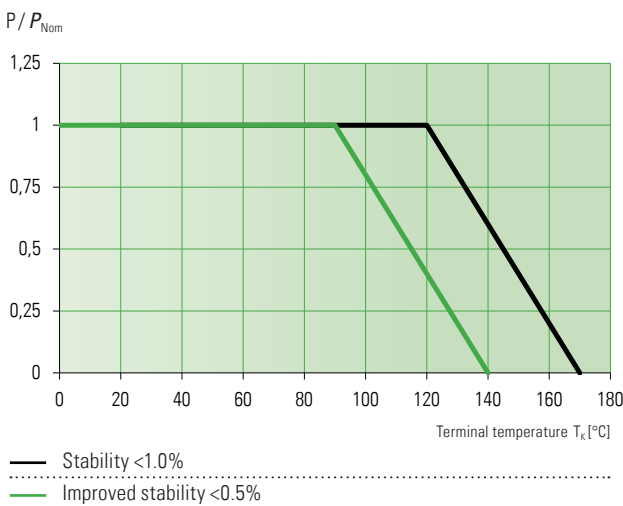
**Power derating curve BVE-M-R0002 // BVE-M-R0003**



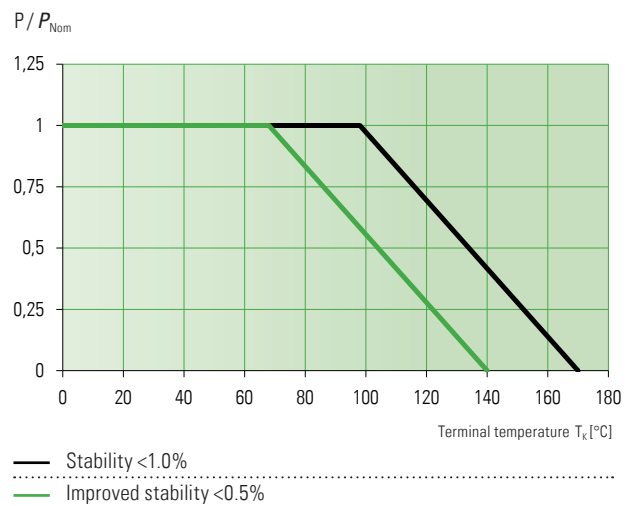
**Power derating curve BVE-M-R0005**



**Power derating curve BVE-A-R0005**



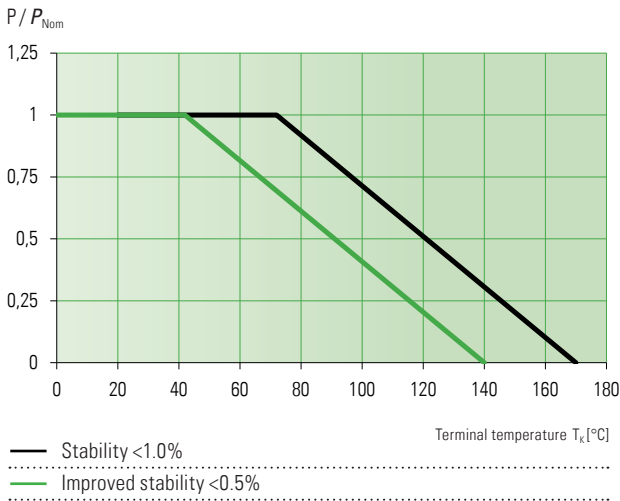
**Power derating curve BVE-A-R001**



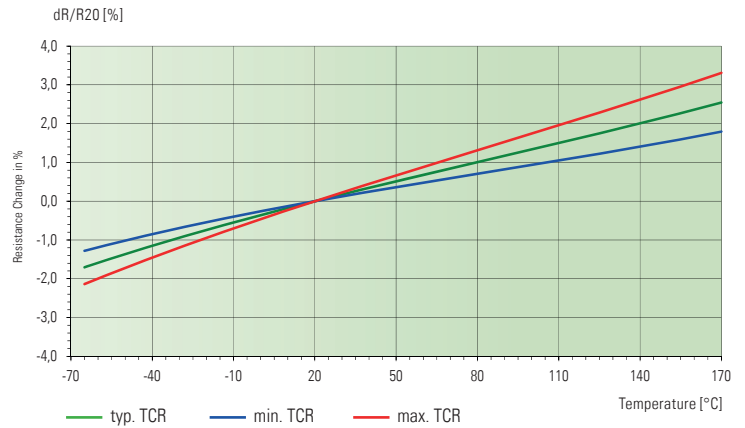


## BVE // Size 5930

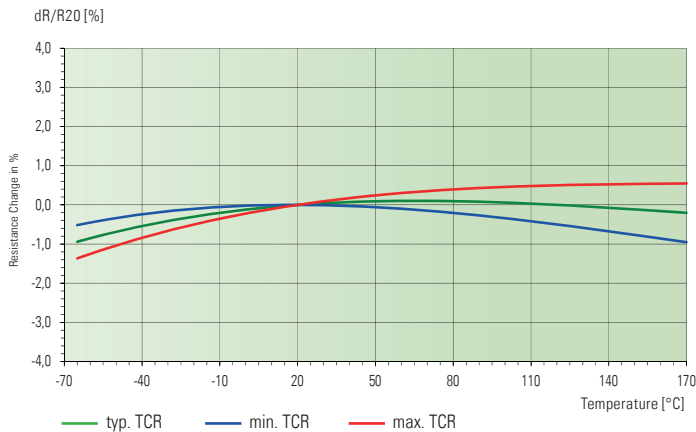
### Power derating curve BVE-A-R002 // BVE-A-R003



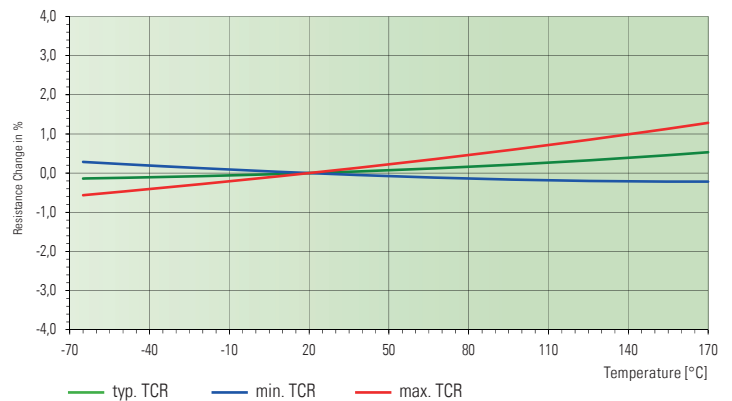
### Temperature dependence of the electrical resistance of ZERANIN® for BVE-Z-R0001



### Temperature dependence of the electrical resistance of MANGANIN® for BVE-M-R0005



### Temperature dependence of the electrical resistance of Aluchrom for BVE-A-R0005



Type	Material	Value [mΩ]	$R_{th}$ [K/W]	TCR (20-60°C) [ppm/K]	$P_{70°C}^*$ [W]	Note
BVE-Z-R0001	ZERANIN®30	0.1	2.0	170 ±50	15	C-samples of 1% version available/ series delivery Q3/23
BVE-M-R0002	MANGANIN®	0.2	3.0	50 ±50	15	
BVE-M-R0003	MANGANIN®	0.3	4.5	50 ±50	10	
BVE-M-R0005	MANGANIN®	0.5	8.0	25 ±50	8	
BVE-A-R0005	Aluchrom	0.5	5.0	25 ±50	10	
BVE-A-R001	Aluchrom	1.0	8.0	0 ±50	9	Material has ferromagnetic properties and should not be used in AC-applications
BVE-A-R002	Aluchrom	2.0	14.5	0 ±50	7	
BVE-A-R003	Aluchrom	3.0	24	0 ±50	4	

\* Recommended max. power (limited by thermal conditions of the assembly)

#### Note

For calculation of the maximum derating terminal temperature ( $T_k$ ) the following formula can be used:  $T_k = T_{max.} - (R_{th} \times P_{70°C})$ .

Example for BVE-M-R0005:  $T_k = 170 °C - (8 K/W \times 8 W) = 106 °C$ .

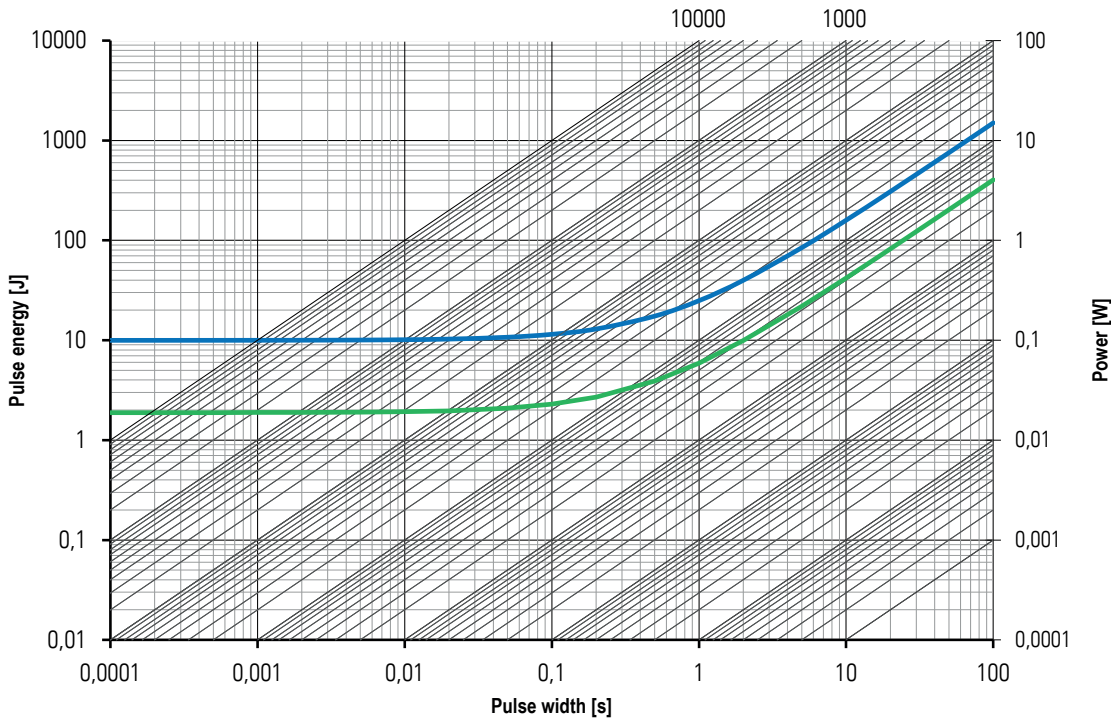


**BVE // Size 5930**

**Maximum pulse energy respectively pulse power for permanent operation**

**BVE-Z-R0001; BVE-A-R003**

**Maximum pulse energy / power for continuous operation ( $T_K=70\text{ °C}$ )**



**Specification**

Parameters	Test conditions	Specified values
Temperature Cycling	2000 cycles (-55 °C to +150 °C)	±0.5%
Low Temperature Storage and Operation	-65 °C for 24 h	±0.1%
Resistance to Soldering Heat	260 °C for 10 sec / 8h steam aging	n.a.
Moisture Resistance	MIL-STD-202 method 106	±0.1%
Mechanical Shock	100 g, 6 ms half sine	±0.2%
Vibration, High Frequency	10 g, 10-2000 Hz	±0.2%
Operational Life	2000 h, max. $T_K$ at rated power	±1.0%
High Temperature Exposure	2000 h / 170 °C (in covered condition)*	±1.0%
Bias Humidity	+85 °C, 85 r.F., 1000 h	±0.5%

\* for MANGANIN® and ZERANIN®30

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