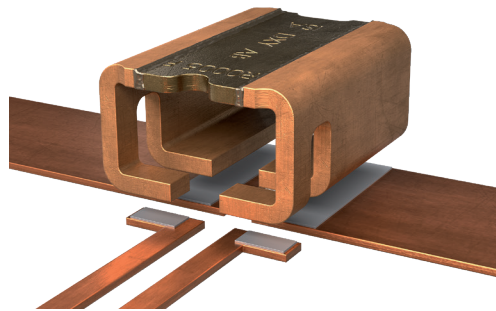




## ISA-WELD® // PRECISION RESISTORS



### BVN (1216)



#### Features

- Constant current up to 100 A (0.5 mOhm)
- Power rating up to 10 W<sup>1</sup>
- Four terminal-configuration
- Excellent long-term stability
- Ideal suited for mounting on DBC / IMS substrate
- High application temperature range -65 to +170 °C
- Max. solder temperature up to 350 °C / 30 sec
- RoHS 2011/65/EU compliant
- AEC-Q200 qualified



#### Applications

- Current sensor for power hybrid applications
- High current applications for the automotive market
- Frequency converters
- Power modules

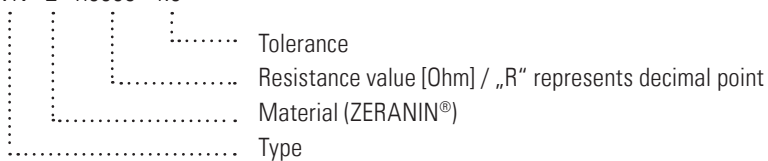
#### Technical data<sup>1</sup>

Resistance values	<b>mOhm</b>	0.3 / 0.4 / 0.5 / 0.75 / 1 / 2 / 3
Tolerance	<b>%</b>	1 / 5
Temperature coefficient (20-60 °C)	<b>ppm/K</b>	from 0 ± 50
Applicable temperature range	<b>°C</b>	-65 to +170
Power rating <b>P<sub>70°C</sub></b>	<b>W</b>	up to 10
Internal heat resistance ( $R_{thi}$ )	<b>K/W</b>	from 6
Inductance	<b>nH</b>	<2
Stability (at rated power) deviation after 2000h	<b>%</b>	<0.5 ( $T_{max.} = 140\text{ °C}$ ) <1.0 ( $T_{max.} = 170\text{ °C}$ )

<sup>1</sup> For detailed information see table on page 2

#### Ordering code

BVN - Z - R0005 - 1.0

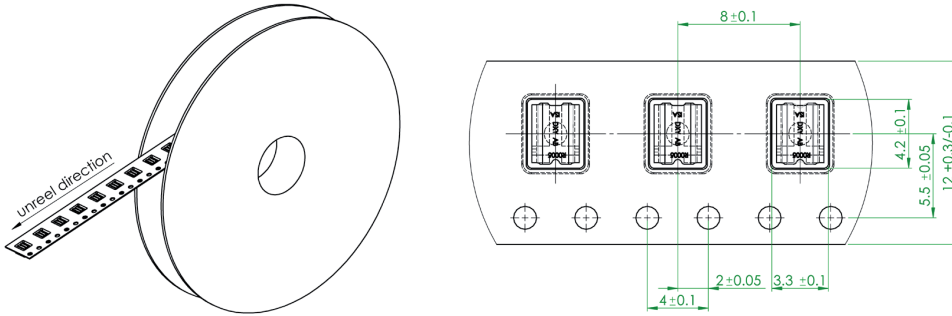


## Tape and reel information

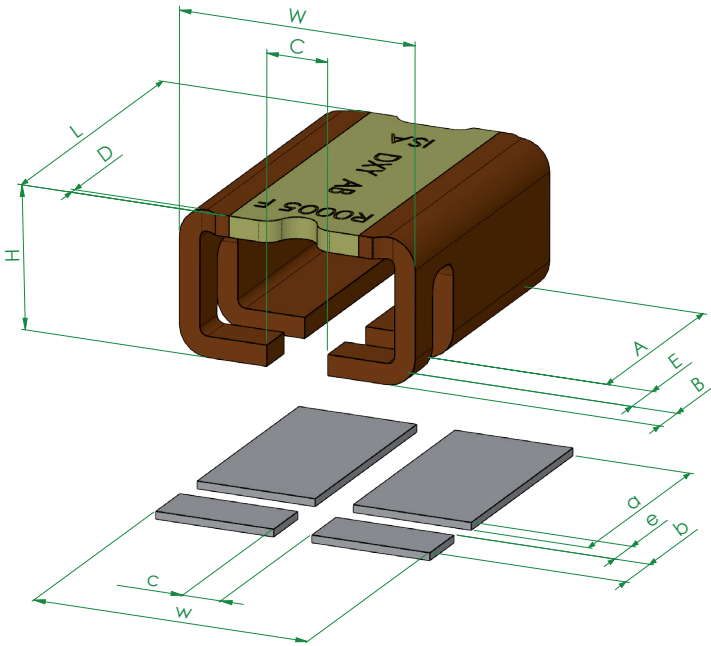
Specification	DIN EN 60286-3	
Tape width	<b>mm</b>	12
Parts per reel	<b>pcs</b>	3000

## Recommended solder profile

Reflow- and IR-soldering				
Temperature	<b>°C</b>	260	255	217
Time	<b>sec</b>	peak	40	90



## Mechanical dimensions and pcb-layout proposal (Reflow-soldering) [mm]



type:	value / mOhm	L	W	H	A	B	C	D	E
BVN-Z-R0003	0.3	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	(0.8)	0.1	0.6±0.15
BVN-Z-R0004	0.4	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	(0.8)	0.1	0.6±0.15
BVN-Z-R0005	0.5	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	0.8+0.3	0.1	0.6±0.15
BVN-M-L750	0.75	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	(0.8)	0.1	0.6±0.15
BVN-M-R001	1	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	0.8+0.3	0.1	0.6±0.15
BVN-V-R002	2	4.1-0.3	3.1-0.35	1.9-0.35	2.7±0.1	0.5±0.1	(0.8)	0.1	0.6±0.15

solder pad type:	w	a	b	c	e
BVN	3.6	2.95	0.7	0.6	0.5

## Electrical specification

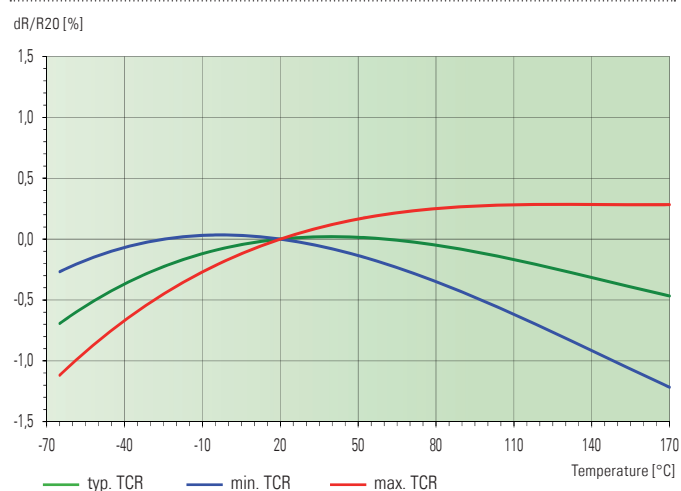
Type	Material	Value [mΩ]	$R_{th}$ [K/W]	TCR [ppm/K]	$P_{70^{\circ}\text{C}^*}$ [W]	$P_{>100^{\circ}\text{C}^*}$ [W]	Notes
BVN-Z-R0003	ZERANIN®	0.3	6	50 ± 50	10 W	5 W	available standard resistance value
BVN-Z-R0004	ZERANIN®	0.4	7	25 ± 50	10 W	5 W	C-samples available, series delivery Q3/24
BVN-Z-R0005	ZERANIN®	0.5	8	0 ± 50	9 W	5 W	available standard resistance value
BVN-M-L750	MANGANIN®	0.75	11	0 ± 50	8 W	4 W	C-samples available, series delivery Q4/24
BVN-M-R001	MANGANIN®	1.0	13	0 ± 50	7 W	3 W	available standard resistance value
BVN-V-R002	NOENTIN®	2.0	20	0 ± 50	5 W	2 W	available standard resistance value
BVN-V-R003	NOENTIN®	3.0	35	0 ± 50	3 W	2 W	available standard resistance value

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

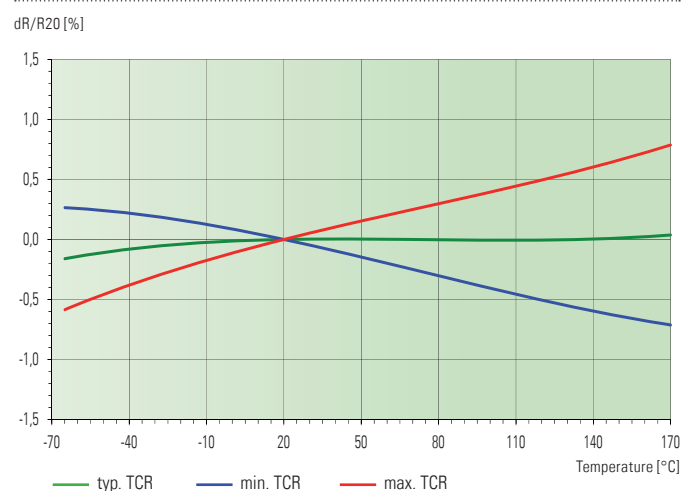
**Note:** For calculation of the maximum derating terminal temperature ( $T_K$ ) the following formula can be used:  $T_K = T_{max.} - (R_{th} \times P)$ .

Example for BVN-Z-R0005:  $T_K = 170^{\circ}\text{C} - (8 \text{ K/W} \times 5 \text{ W}) = 130^{\circ}\text{C}$ .

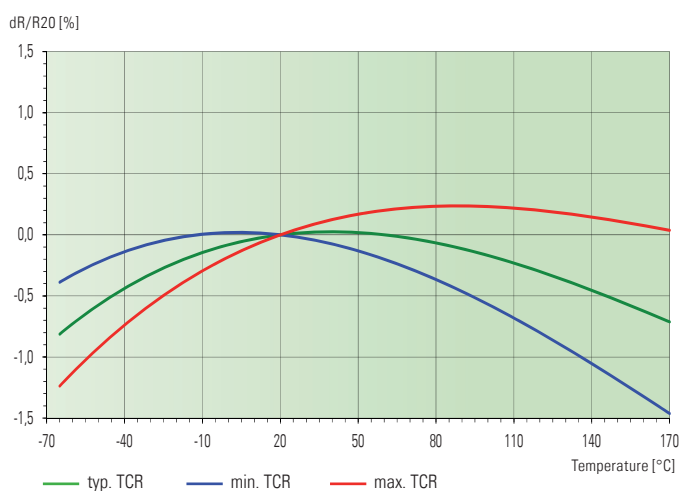
### Temperature dependence of the electrical resistance of MANGANIN® resistors. Example: BVN-M-R001



### Temperature dependence of the electrical resistance of ZERANIN® resistors. Example: BVN-Z-R0005

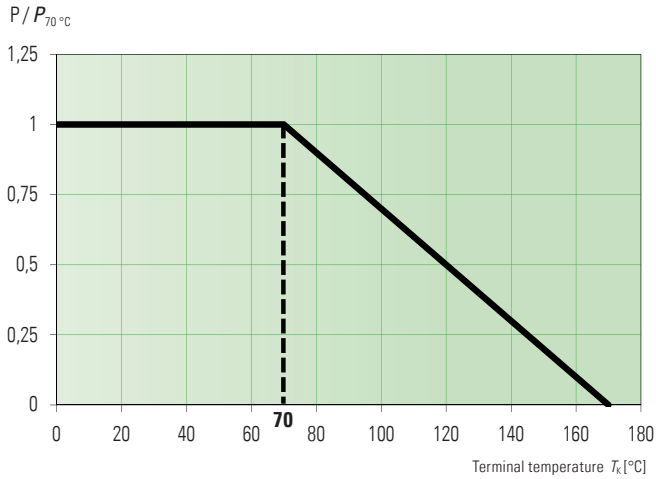


### Temperature dependence of the electrical resistance of NOENTIN® resistors. Example: BVN-V-R002



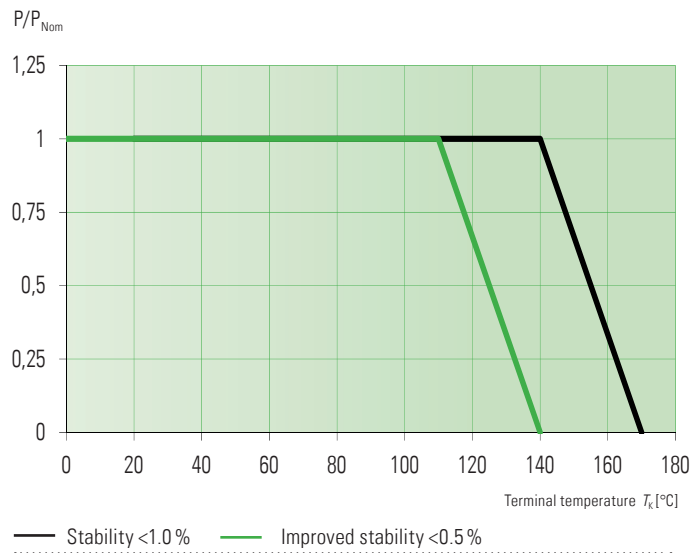
# BVN (1216)

## Power derating curve at 70 °C

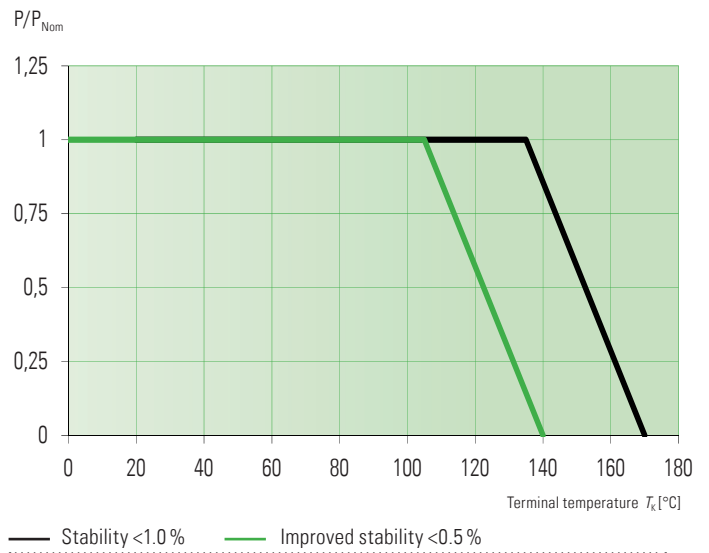


## Power derating curve for higher temperature, $T_k = 170^\circ\text{C} - (R_{thi} \times P)$ , for detailed information see table on page 2.

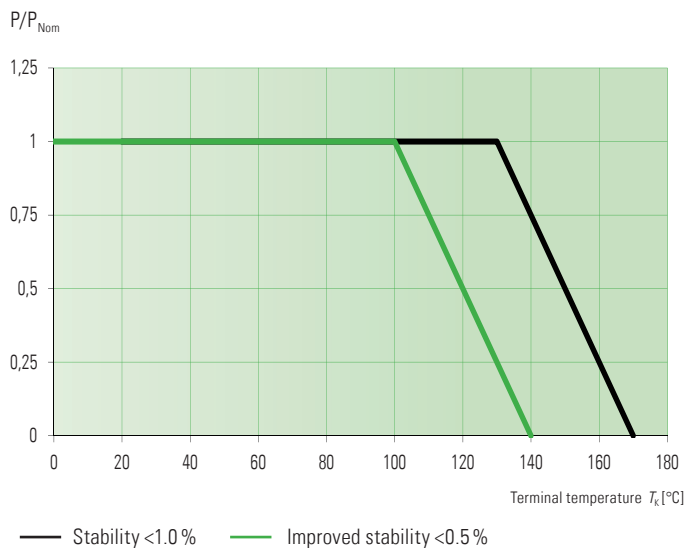
### BVN-Z-R0003



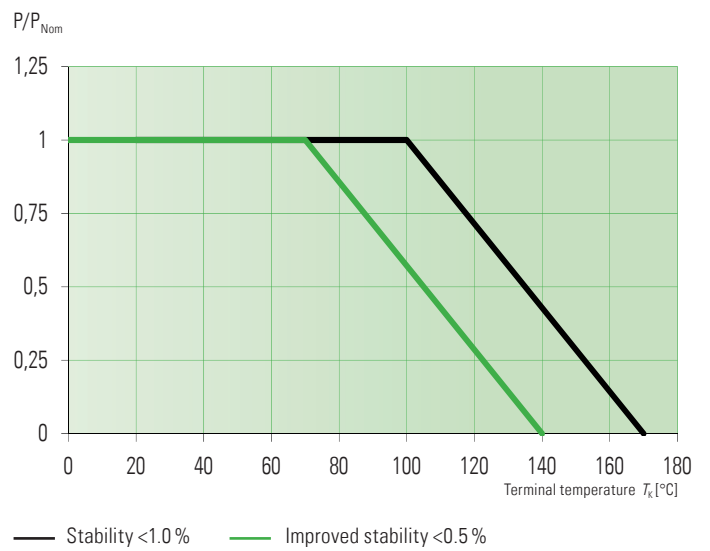
### BVN-Z-R0004



### BVN-Z-R0005, BVN-M-L750, BVN-M-R001, BVN-V-R002



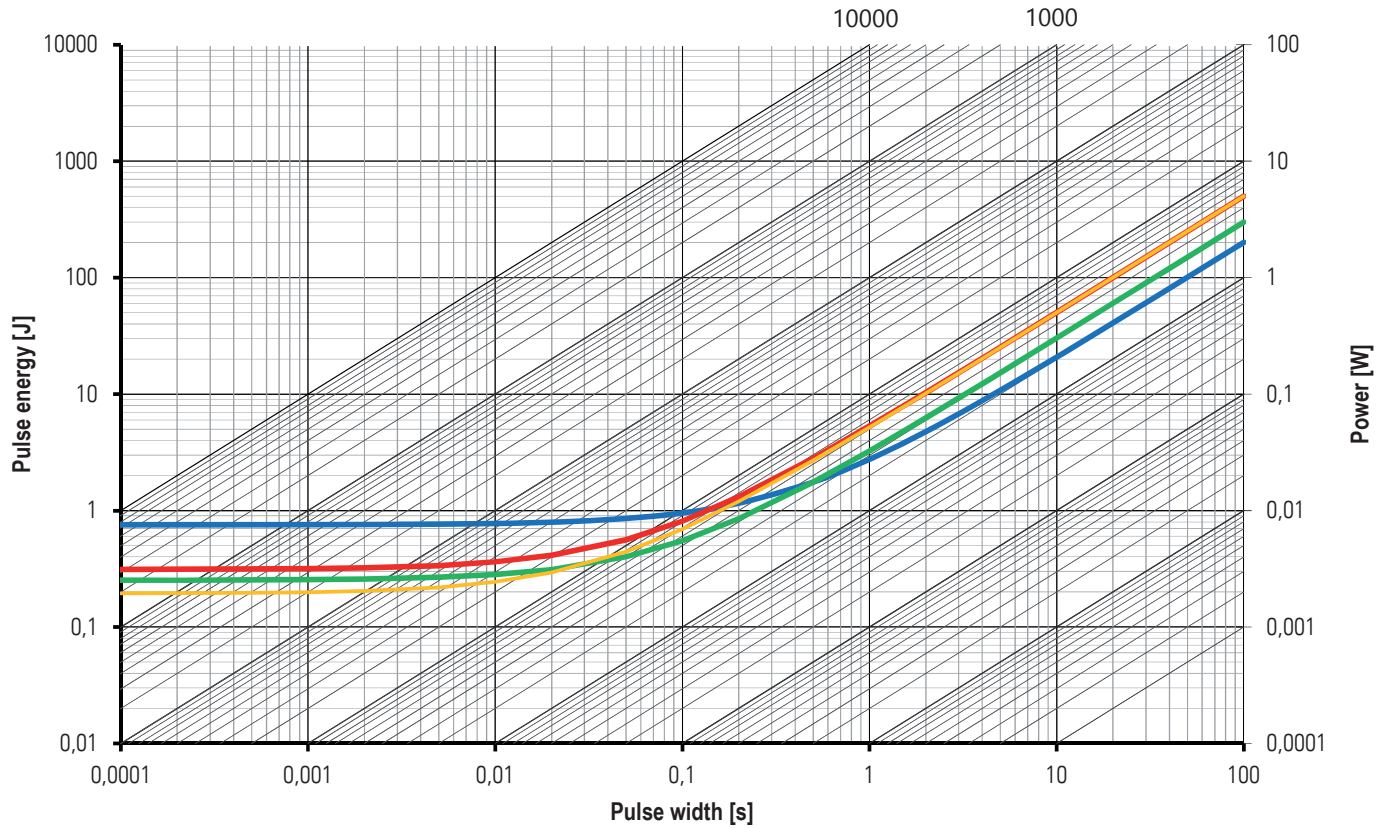
### BVN-V-R003



## Maximum pulse energy respectively pulse power for permanent operation

### BVN-V-R003, BVN-M-R001, BVN-Z-R0005, BVN-Z-R0003

Maximum pulse energy / power continuous operation



### Test 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 250 h	±0.1 %
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, 24 h each axis	±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 %

### Disclaimer // All products, product specifications and data are subject to change without notice.

The product specifications do not expand or otherwise modify Isabellenhütte's terms and conditions of sale, including but not limited to, the warranty expressed therein. Isabellenhütte makes no warranty, representation or guarantee other than as set forth in its terms and conditions of sale. Information provided in datasheets and/or specifications may vary from actual results in different applications. Any statements made by Isabellenhütte regarding the suitability of products for certain types of applications are based on its knowledge of typical requirements that are often placed on its products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in the application intended. No license, express or implied, or otherwise, to any intellectual property rights is granted by this document. Any and all liability arising out of the application or use of any product shall be as set forth in Isabellenhütte's terms and conditions of sale.

