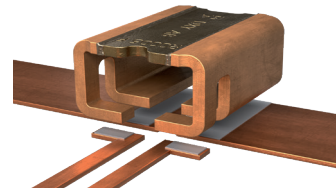


## BVN (1216)

### ISA-WELD® PRECISION RESISTOR



#### 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
- AEC-Q200 qualified



#### 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 ( $R_{th}$ )	<b>K/W</b>	from 6
Inductance	<b>nH</b>	<2
Stability (at rated power) deviation after 2000h	<b>%</b>	<0.5 ( $T_{max} = 140 °C$ ) <1.0 ( $T_{max} = 170 °C$ )

<sup>1</sup>For detailed information see table on page 3

#### Ordering code

BVN - Z - R0005 - 1.0

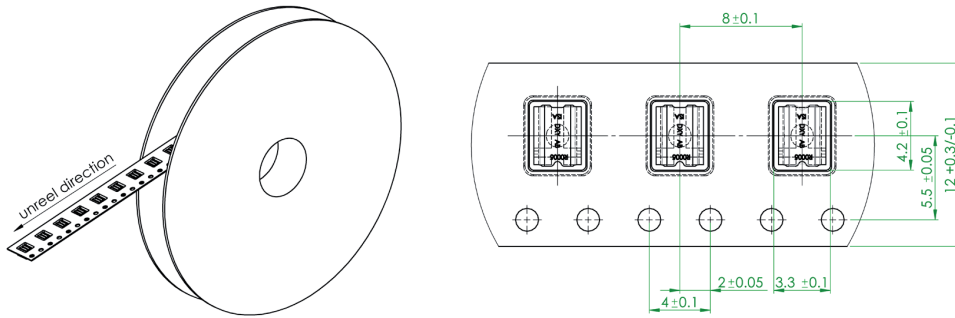
.....	Tolerance
.....	Resistance value [Ohm] / „R” represents decimal point
.....	Material (ZERANIN®)
.....	Type

## Tape and reel information

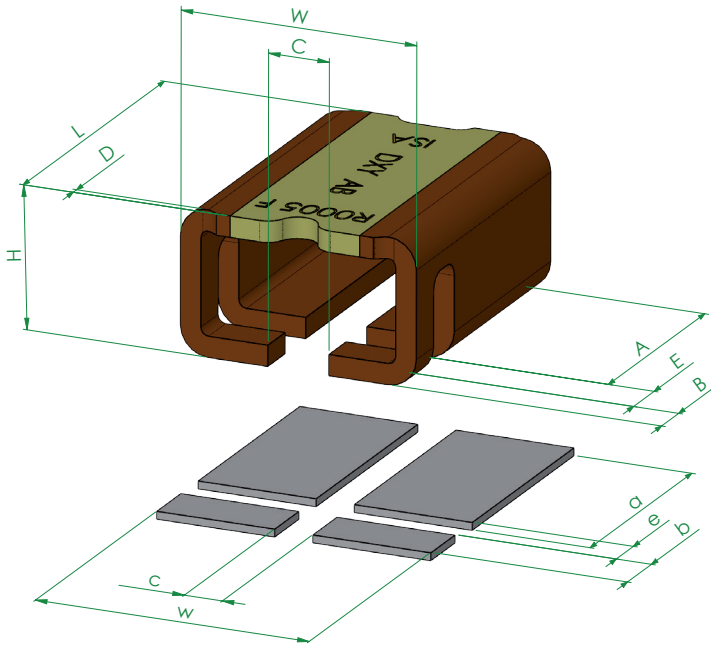
Specification	DIN EN 60286-3	
Tape width	<b>mm</b>	12
Parts per reel	<b>pcs</b>	3000

## 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

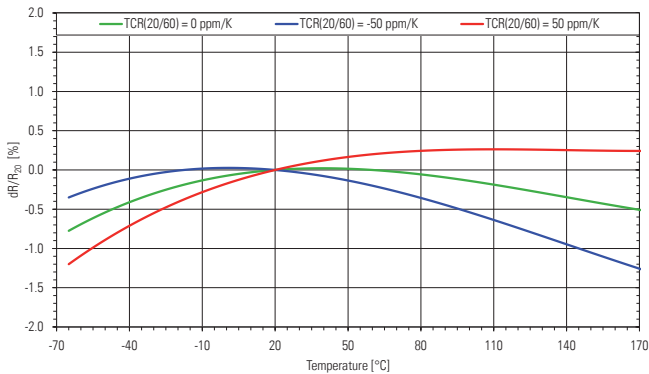
## Electrical specification

Type	Material	Value [mΩ]	$R_{thi}$ [K/W]	TCR [ppm/K]	$P_{70^{\circ}C^*}$ [W]	$P_{>100^{\circ}C^*}$ [W]	Notes
BVN-Z-R0003	ZERANIN®	0.3	6	50 ± 50	10 W	5 W	
BVN-Z-R0004	ZERANIN®	0.4	7	25 ± 50	10 W	5 W	C-samples available, series delivery Q1/25
BVN-Z-R0005	ZERANIN®	0.5	8	0 ± 50	9 W	5 W	
BVN-M-L750	MANGANIN®	0.75	11	0 ± 50	8 W	4 W	
BVN-M-R001	MANGANIN®	1.0	13	0 ± 50	7 W	3 W	
BVN-V-R002	NOVENTIN®	2.0	20	0 ± 50	5 W	2 W	
BVN-V-R003	NOVENTIN®	3.0	35	0 ± 50	3 W	2 W	

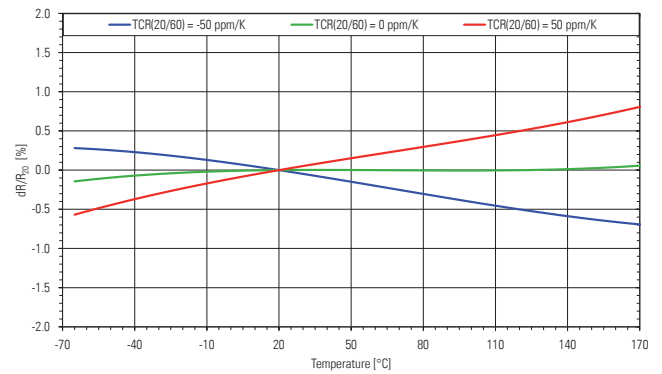
\* Recommended max. power (limited by thermal conditions of the assembly)

**Note:** For calculation of the maximum derating terminal temperature ( $T_k$ ) the following formula can be used:  $T_k = T_{max} - (R_{thi} \times P)$ .  
 Example for BVN-Z-R0005:  $T_k = 170^{\circ}C - (8 K/W \times 5 W) = 130^{\circ}C$ .

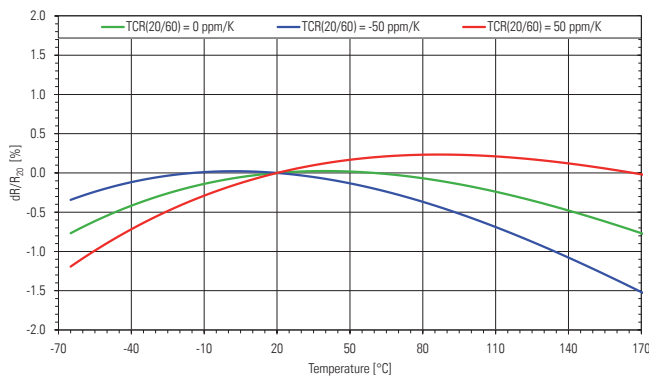
### Temperature dependence of the electrical resistance of MANGANIN® resistors



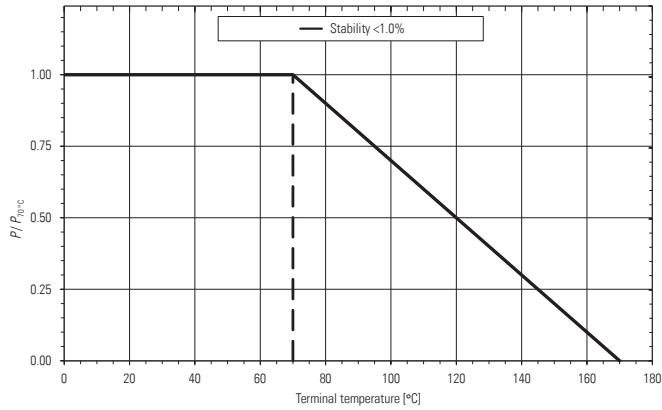
### Temperature dependence of the electrical resistance of ZERANIN® resistors: Example BVN-Z-R0005



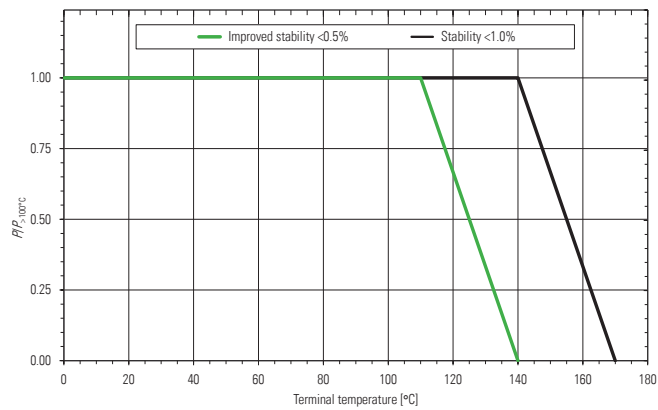
### Temperature dependence of the electrical resistance of NOVENTIN® resistors



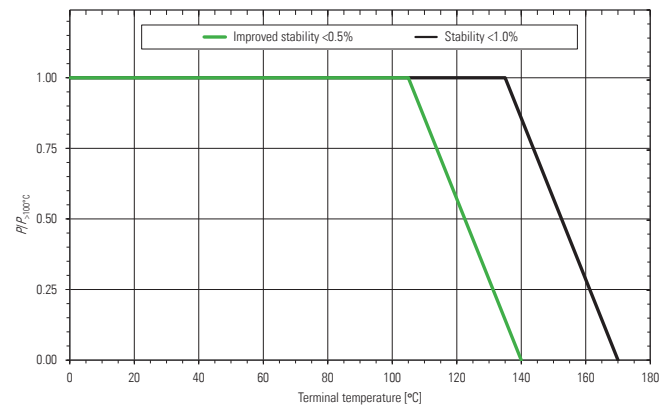
## Power derating curve at 70 °C. (see table on page 3)



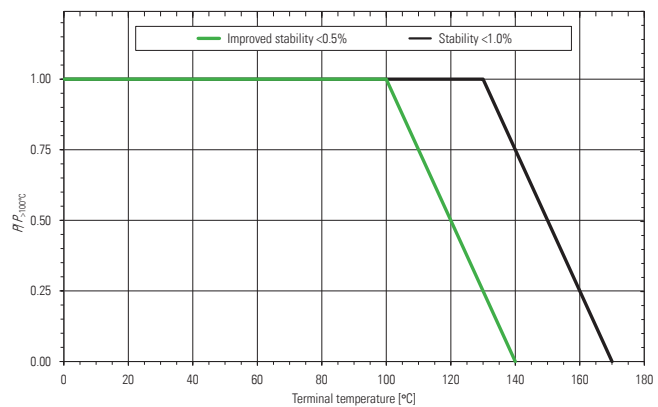
## Power derating curve BVN-Z-R0003



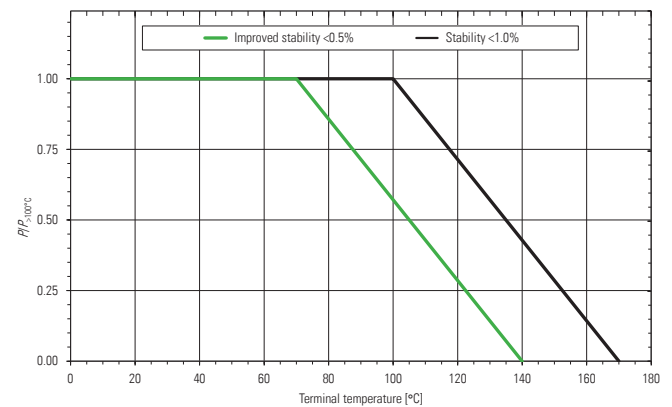
## Power derating curve BVN-Z-R0004



## Power derating curve BVN-Z-R0005/M-L750/M-R001/V-R002



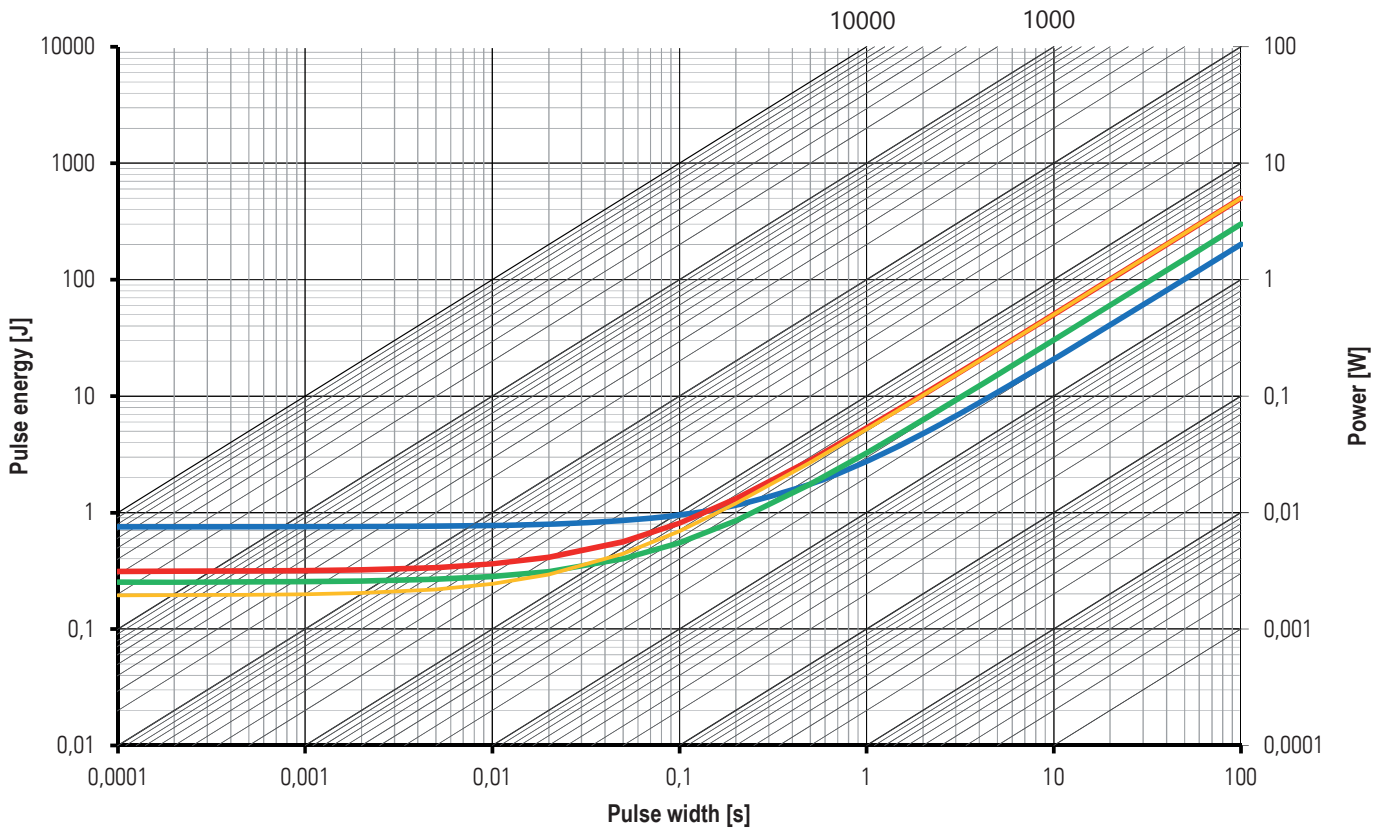
## Power derating curve BVN-V-R003



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 %

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