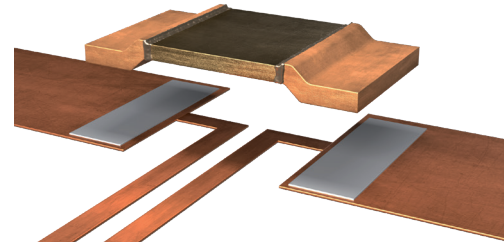


BVS (3920)

ISA-WELD® PRECISION RESISTOR



FEATURES

- Power rating up to 12 W
- Continuous current load up to 245 A (0.2 mOhm)
- Heavy copper connectors
- Excellent long-term stability
- Max. solder temperature up to 350 °C / 30 sec
- AEC-Q200 qualified



APPLICATIONS

- High current applications for the automotive market
- Frequency converters
- Power modules

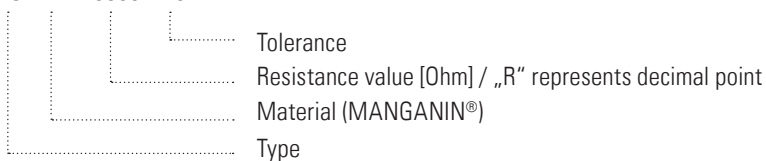
Technical data ¹

Resistance values	mOhm	0.1 to 5
Tolerance	%	1 / 5
Temperature coefficient (20-60 °C)	ppm/K	from 0 ± 50
Applicable temperature range	°C	-65 to +170
Power rating P_{100°C}	W	up to 7
Power rating P_{70°C}	W	up to 12
Internal heat resistance (R_{th})	K/W	from 2
Inductance	nH	<3
Stability (at rated power) deviation after 2000 h	%	<0.5 ($T_{max} = 140 °C$) <1.0 ($T_{max} = 170 °C$)

¹For detailed information see table on page 3

Ordering code

BVS - M - R0005 - 1.0



Recommended solder profile

Reflow-, IR-soldering

Temperature	°C	260	255	217
Time	sec	peak	40	90

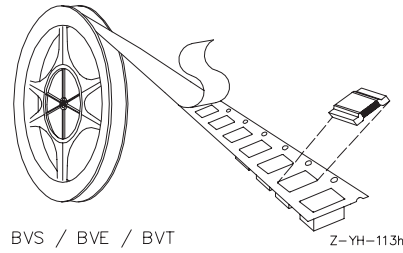
Alternative solder profile

H2 soldering under vacuum

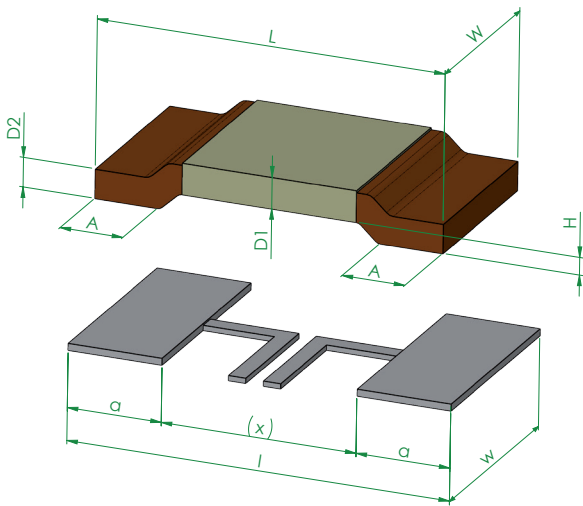
Temperature	°C	350
Time	min	20

Tape and reel information

Specification	DIN EN 60286-3		
Tape width	mm	16	
Reel size	inch	13	
Parts per reel	pcs	3000	
Packaging weight	g	474	



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



Solder pad dimensions

Type	l	w	a	x
BVS	11	6.2	2.7	5.6
BVS-Z-R0001	11	6.2	3.6	3.8

Mechanical dimensions

Type	Value [mΩ]	L	W	H	A	D1	D2
BVS-K-R000	<0.2	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	1 ±0.1	1 ±0.1
BVS-Z-R0001	0.1	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2.25 +0.3/-0.5	1.42 ±0.1	1.42 ±0.1
BVS-Z-R0002	0.2	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	1.49 ±0.1	1.42 ±0.1
BVS-M-R0003	0.3	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	1.42 ±0.1	1.42 ±0.1
BVS-M-R0005	0.5	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.84 ±0.1	0.84 ±0.1
BVS-M-R0007	0.7	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.6 ±0.1	0.64 ±0.1
BVS-M-R001	1	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.42 ±0.05	0.42 ±0.05
BVS-A-R001	1	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	1.32 ±0.1	1.30 ±0.1
BVS-I-R001	1	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	1.32 ±0.1	1.30 ±0.1
BVS-A-R0015	1.5	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.91 ±0.1	0.84 ±0.1
BVS-A-R002	2	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.64 ±0.1	0.64 ±0.1
BVS-I-R002	2	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.66 ±0.1	0.64 ±0.1
BVS-V-R002	2	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.44 ±0.1	0.42 ±0.1
BVS-A-R0028	2.8	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.44 ±0.05	0.64 ±0.1
BVS-A-R003	3	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.44 ±0.05	0.42 ±0.05
BVS-I-R003	3	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.44 ±0.05	0.42 ±0.05
BVS-A-R004	4	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.31 ±0.05	0.4 ±0.05
BVS-I-R004	4	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.36 ±0.05	0.4 ±0.1
BVS-I-R005	5	10 +0.3	5.2 +0.3/-0.2	0.5 ±0.1	2 -0.5	0.35 ±0.05	0.4 ±0.05

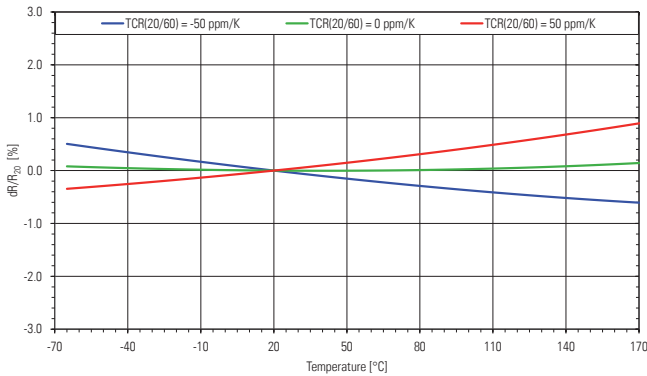
Electrical specification

Type	Material	Value [mΩ]	R_{thi} [K/W]	TCR [ppm/K]	$P_{70^{\circ}C^*}$ [W]	$P_{>100^{\circ}C^*}$ [W]	Note
BVS-Z-R0001	ZERANIN®30	0.1	2.0	300 ± 50	12	7	
BVS-Z-R0002	ZERANIN®30	0.2	3	150 ± 50	12	5	
BVS-M-R0003	MANGANIN®	0.3	4.5	100 ± 50	10	5	
BVS-M-R0005	MANGANIN®	0.5	8	20 ± 50	9	5	
BVS-M-R0007	MANGANIN®	0.7	11	10 ± 50	8	5	
BVS-M-R001	MANGANIN®	1	15	0 ± 50	7	4	
BVS-A-R001	Aluchrom	1	9	0 ± 50	8	5	
BVS-A-R0015	Aluchrom	1.5	12	0 ± 50	7	4.5	
BVS-A-R002	Aluchrom	2	16	0 ± 50	6	4	Aluchrom material has ferromagnetic properties and should not be used in AC-applications
BVS-A-R0028	Aluchrom	2.8	21	0 ± 50	5	3	
BVS-A-R003	Aluchrom	3	22	0 ± 50	5	3	
BVS-A-R004	Aluchrom	4	30	0 ± 50	4	2.5	
BVS-I-R001	ISAOHM®	1	9	0 ± 50	8	5	
BVS-I-R002	ISAOHM®	2	16	0 ± 50	6	4	
BVS-I-R003	ISAOHM®	3	22	0 ± 50	5	3	
BVS-I-R004	ISAOHM®	4	30	0 ± 50	3.5	2.5	
BVS-I-R005	ISAOHM®	5	38	0 ± 50	2.5	2	
BVS-V-R002	NOVENTIN®	2	20	0 ± 50	5	3.5	
BVS-K-R000	SF-copper tinned	<0.2 mΩhm			$I_{max} = 160 A$		

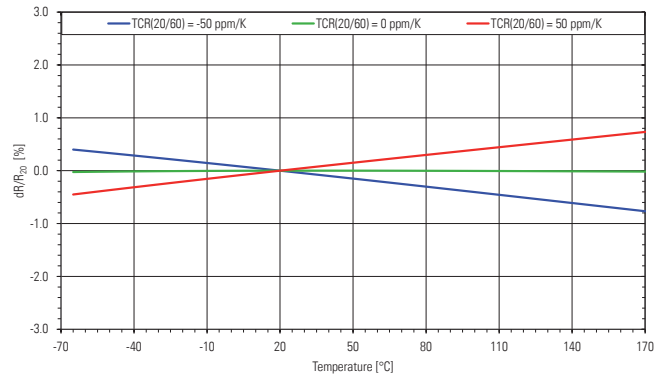
* Recommended max. power (limited by thermal conditions of the assembly)

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 BVS-M-R0005: $T_K = 170^{\circ}C - (8 K/W \times 5 W) = 130^{\circ}C$.

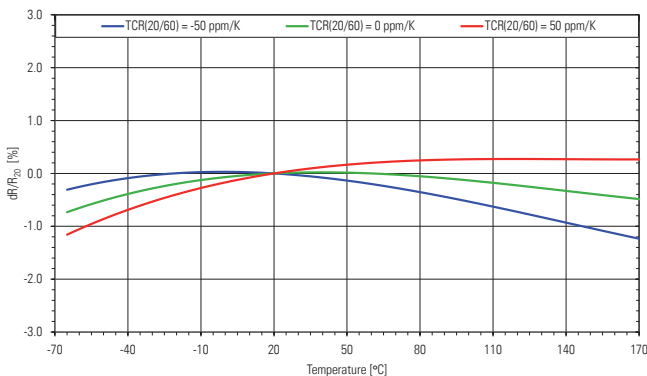
Temperature dependence of the electrical resistance of ALUCHROM resistors



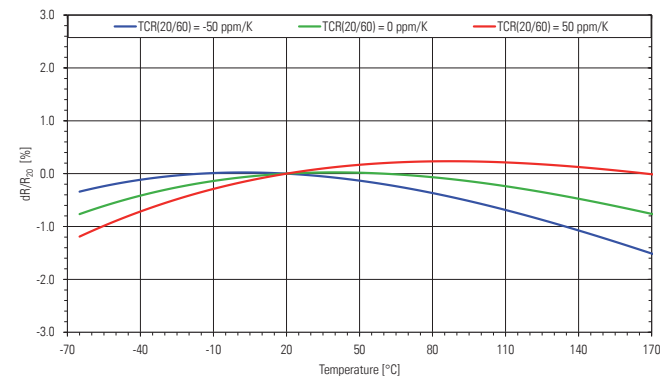
Temperature dependence of the electrical resistance of ISAOHM® resistors



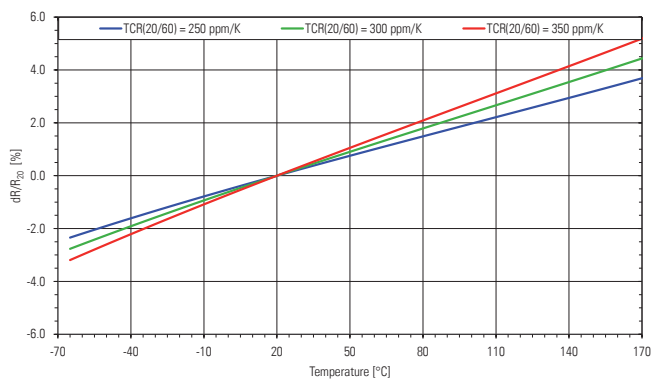
Temperature dependence of the electrical resistance of MANGANIN® resistors. Example: BVS-M-R001



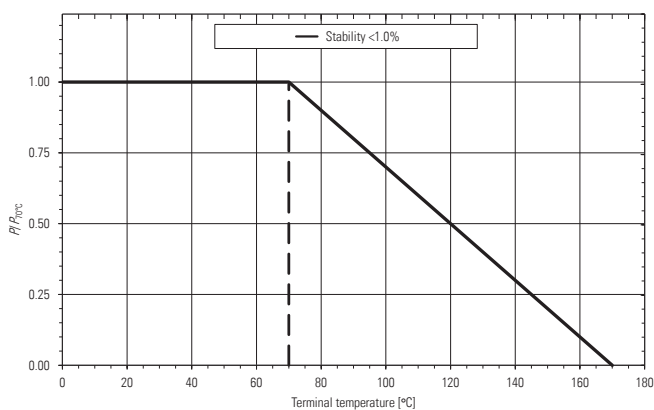
Temperature dependence of the electrical resistance of NOVENTIN® resistors



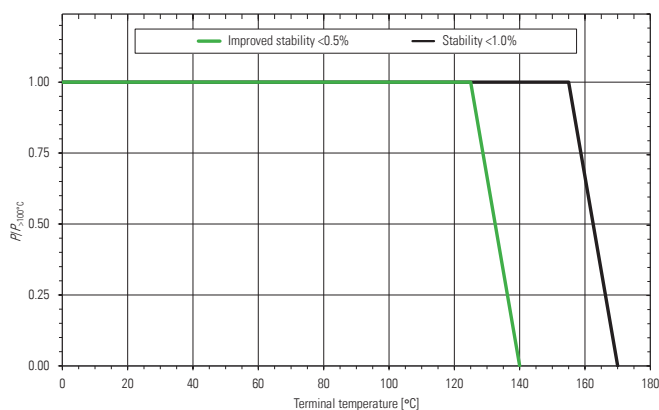
Temperature dependence of the electrical resistance of ZERANIN® resistors. Example: BVS-Z-R0001



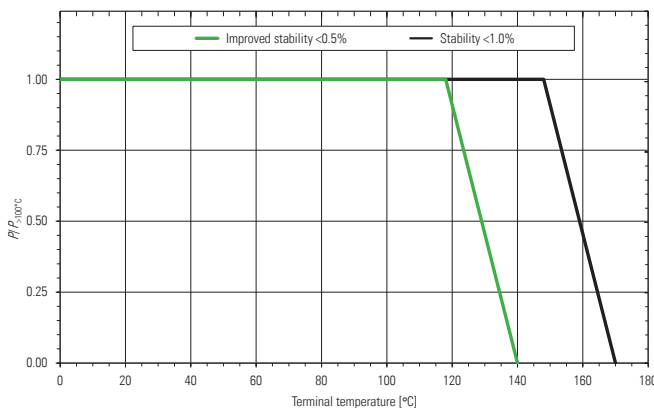
Power derating curve at 70 °C. (see table on page 3)



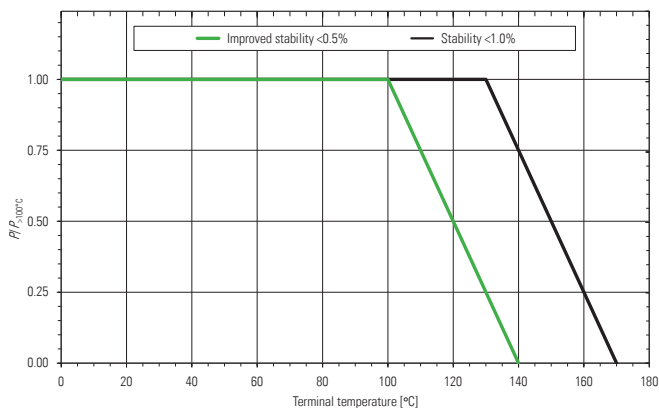
Power derating curve BVS-Z-R0001 / BVS-Z-R0002



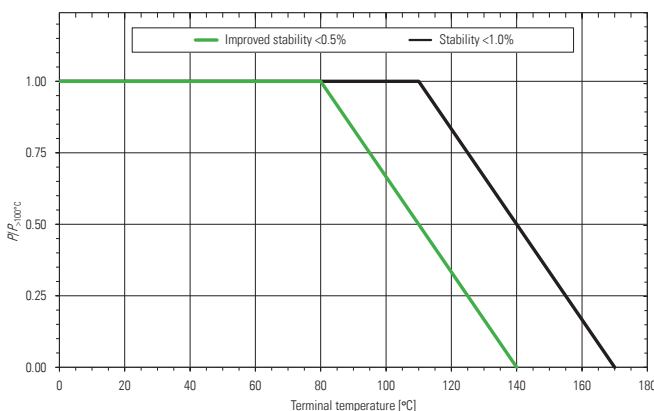
Power derating curve BVS-M-R0003



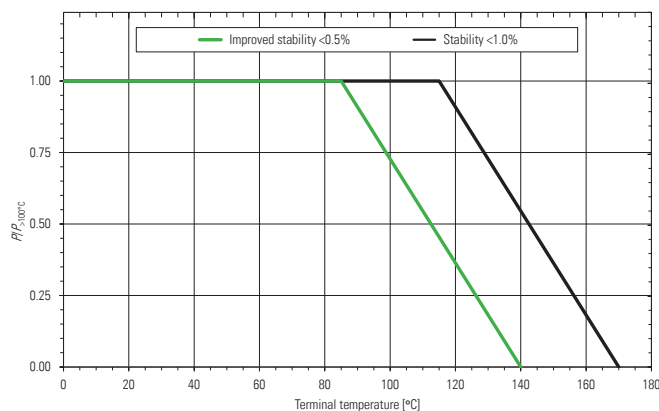
Power derating curve BVS-M-R0005



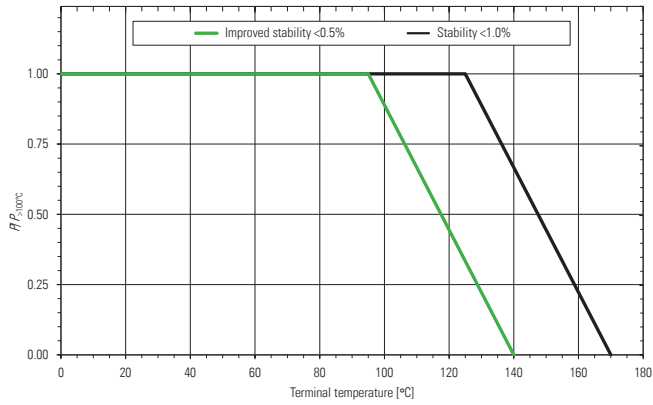
Power derating curve BVS-M-R001



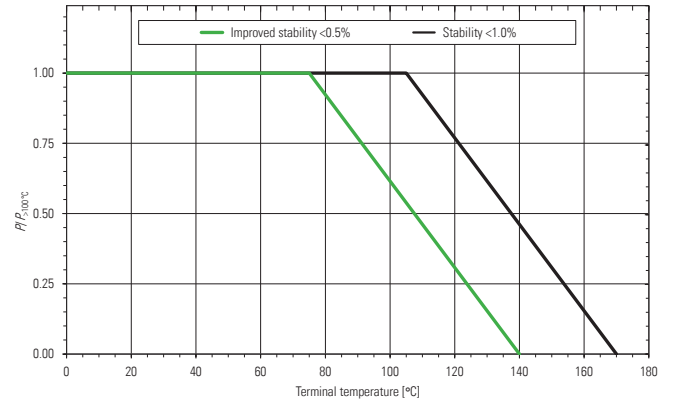
Power derating curve BVS-M-R0007



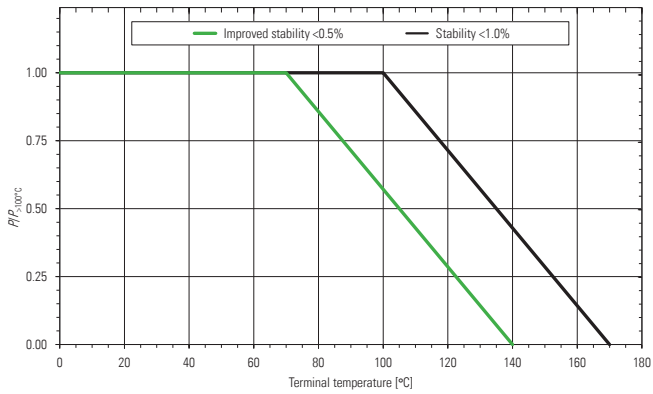
Power derating curve BVS-I-R001



Power derating curve BVS-I-R002 / BVS-I-R003



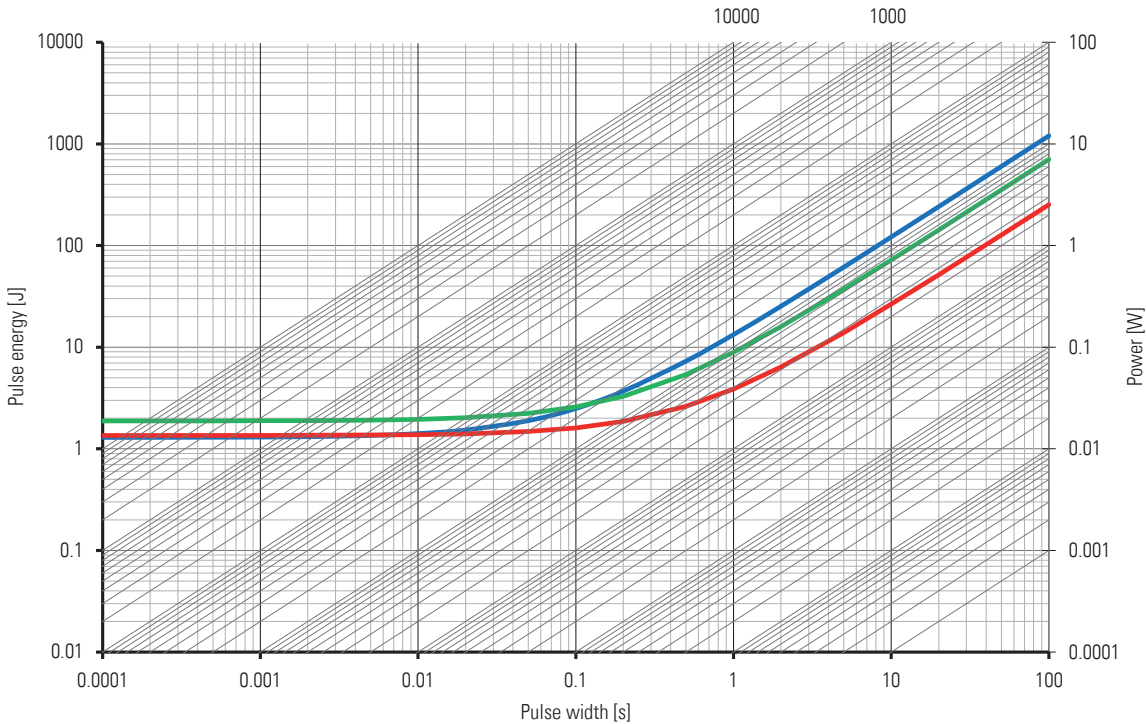
Power derating curve BVS-V-R002 / BVS-I-R004 / R005



Further power derating curves on request.

Maximum pulse energy respectively pulse power for permanent operation

BVS-I-R005 **BVS-Z-R0001** **BVS-M-R001**
 Maximum pulse energy / power for continuous operation ($T_K = 70\text{ °C}$)



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 %
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 %

* for MANGANIN® and ZERANIN®30

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