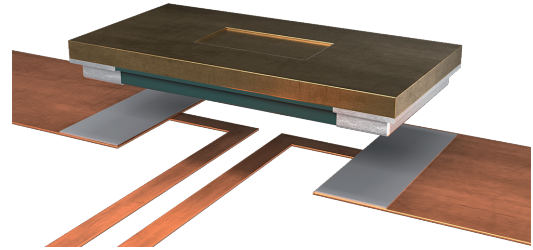


FMK (1206)

ISA-PLAN® PRECISION RESISTOR



FEATURES

- 3.5 W power rating at 70 °C (2 mOhm)
- Constant current up to 41 A (2 mOhm)
- Excellent long-term stability
- High pulse power rating
- Mounting: Reflow-, and IR-soldering / vacuum soldering recommended
- AEC-Q200 qualified



APPLICATIONS

- Current sensor for power hybrid applications
- Control systems for the automotive market
- Power modules
- Frequency converters
- Switch mode power supplies

Technical data

Resistance values	mOhm	2 / 3 / 4 / 5 / 6
Tolerance	%	0.8* / 1 / 5 / 10
Temperature coefficient (20-60 °C)	ppm/K	<50
Applicable temperature range	°C	-65 to +170
Power rating P_{110°C}	W	up to 2
Power rating P_{70°C}	W	up to 3.5
Dielectric withstanding voltage (AC/DC)	V	200
Inductance	nH	<1
Stability (at rated power) deviation after 2000h <i>T_k</i> = Terminal temperature	%	<0.5 (<i>T_k</i> = 80 °C) <1.0 (<i>T_k</i> = 110 °C)

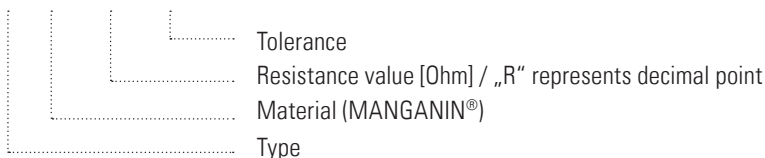
Type	Value [mΩ]	Rthi [K/W]	TCR [ppm/K]	P _{70°C} [W]	P _{110°C} [W]	Available tolerances			
						0.8*	1 %	5 %	10 %
FMK-M-R002	2	<26	<50	3.5	2		✓	✓	
FMK-M-R003	3	<33	<50	3	1.5		✓	✓	
FMK-V-R004	4	<40	<50	2.5	1.5		✓	✓	✓
FMK-V-R005	5	<50	<50	2	1	✓	✓	✓	
FMK-V-R006	6	<58	<50	1.5	1		✓	✓	

Abbreviation type M=MANGANIN®, V=NOVENTIN®

* under development

Ordering code

FMK - M - R002 - 1.0

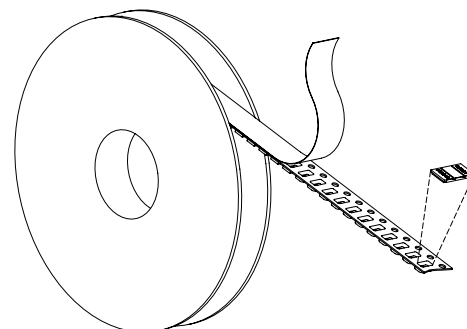


Recommended solder profile

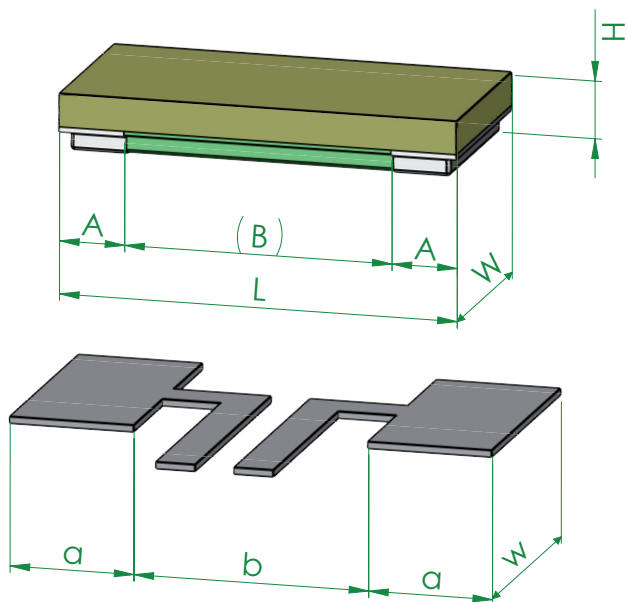
Reflow- and vacuum soldering				
Temperature	°C	260	255	217
Time	sec	peak	40	90

Tape and reel information

Specification	DIN EN 60286-3			
Tape width	mm	8		
Reel size	inch	13		
Parts per reel	pcs	12500		
Packaging weight	g	454		
Information	Only components with 1% tolerance are trimmed and marked			



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

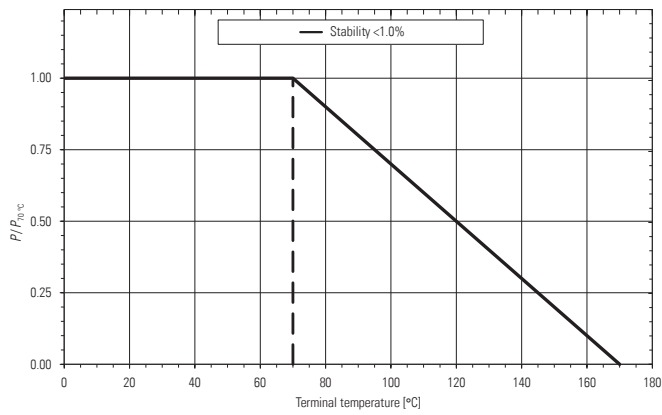


L	W	H	A	B
3.05 ±0.2	1.52 ±0.2	0.4 ±0.2	0.5 ±0.2	(2.05)

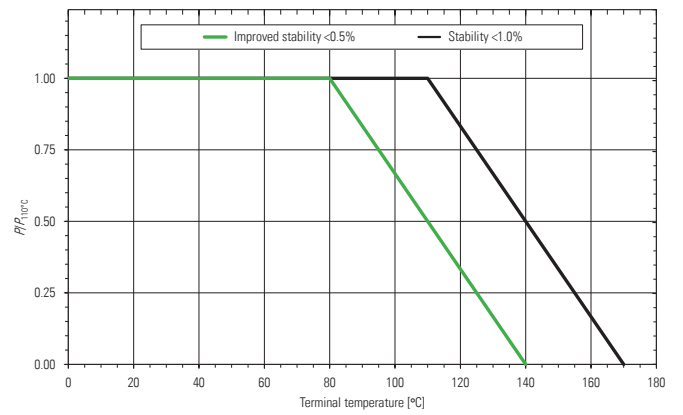
a	b	w
1.00	1.80	1.65

For values <3 mOhm recommend copper layer thickness of 105 µm due to the higher current load.

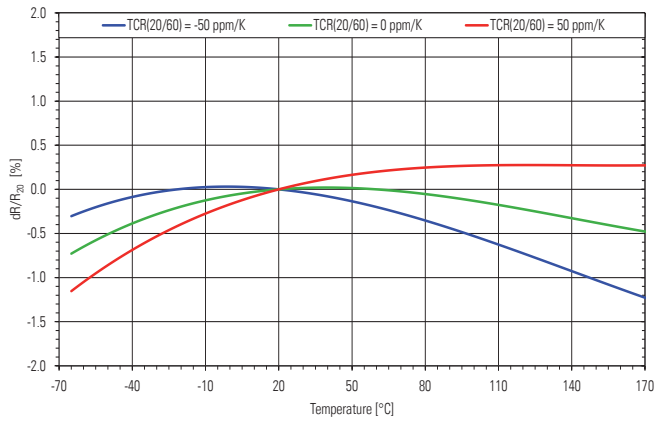
Power derating curve at 70°C



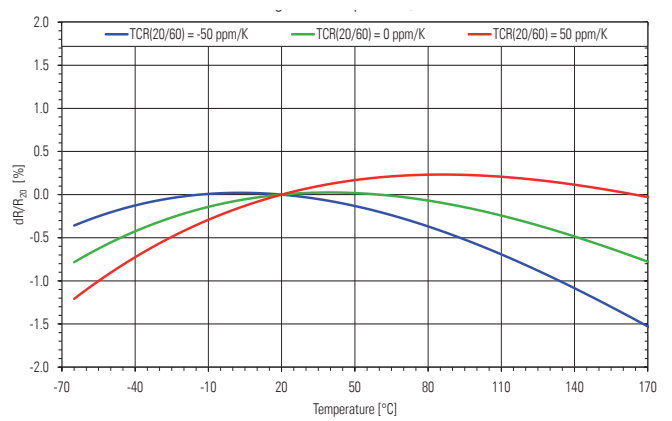
Power derating curve at 110°C



Temperature dependence of the electrical resistance of MANGANIN® resistors

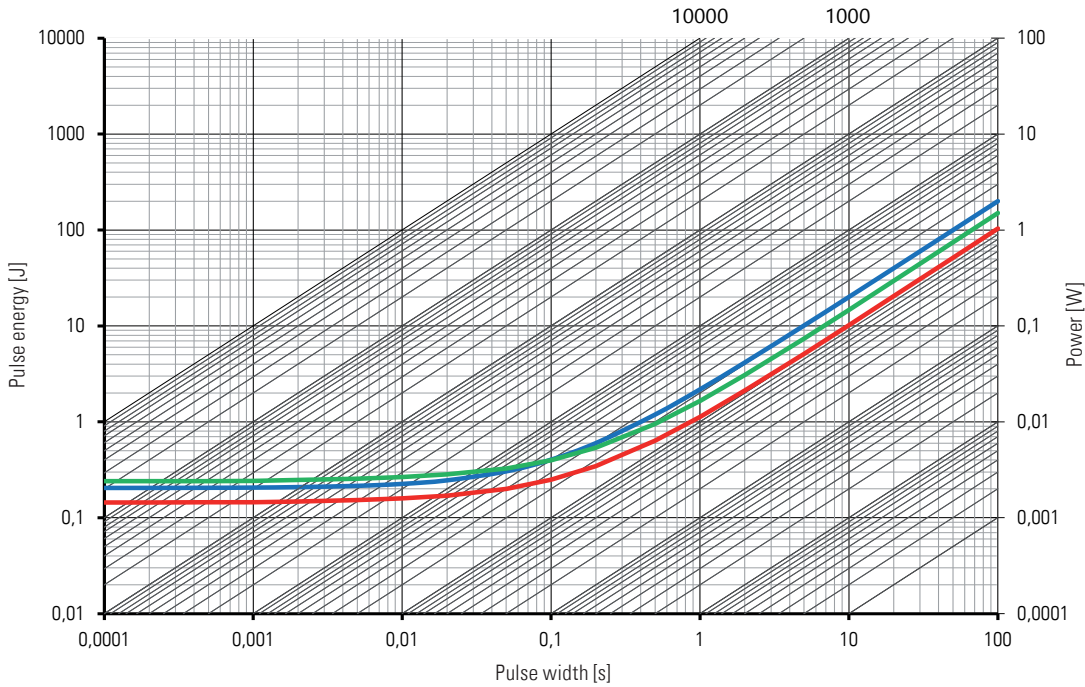


Temperature dependence of the electrical resistance of NOVENTIN® resistors



Maximum pulse energy respectively pulse power for permanent operation ($T_k=110\text{ °C}$)

FMK-M-R002; FMK-V-R004; FMK-V-R006
 Maximum pulse energy / power continuous operation ($T_k = 110\text{ °C}$)



Specification

Parameters	Test conditions	Specified values
Temperature Cycling	2000 cycles (-55°C to +150°C)	±0.5 %
Low Temperature Storage	-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, T_k max at rated power	±1.0 %
High Temperature Exposure	2000 h at 140°C	±0.5 %
	2000 h at 170°C (in covered condition)*	±1.0 %
Bias Humidity	+85°C, 85 r.F., 1000 h, powered	±0.5 %

*for MANGANIN®

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.

