

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)

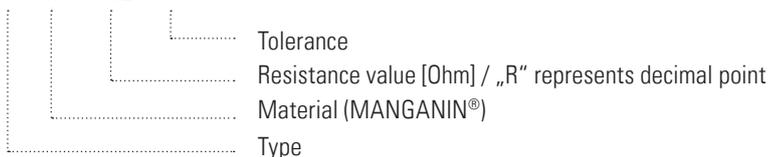
Type	Value [mΩ]	R _{thi} [K/W]	TCR [ppm/K]	P _{70°C} [W]	P _{110°C} [W]	Available tolerances			
						0.8*	1 %	5 %	10 %
FMK-M-R002	2	<26	<50	3.5	2		✓	✓	
FMK-M-R003	3	<33	<50	3	1.5		✓	✓	
FMK-V-R004	4	<40	<50	2.5	1.5		✓	✓	✓
FMK-V-R005	5	<50	<50	2	1	✓	✓	✓	
FMK-V-R006	6	<58	<50	1.5	1		✓	✓	

Abbreviation type M=MANGANIN®, V=NOVENTIN®

* under development

Ordering code

FMK - M - R002 - 1.0

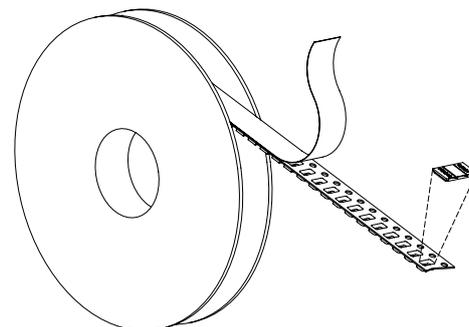


Recommended solder profile

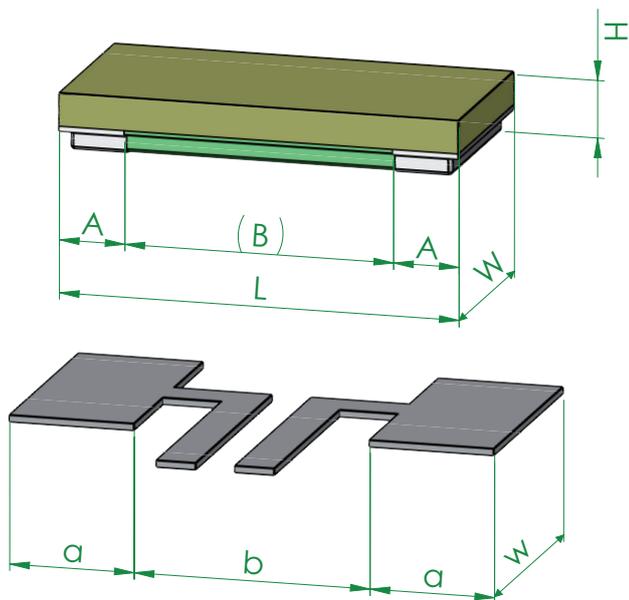
Reflow- and vacuum soldering				
Temperature	°C	260	255	217
Time	sec	peak	40	90

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]

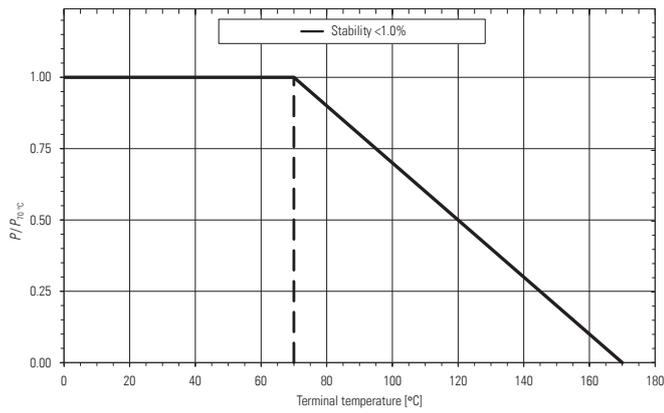


L	W	H	A	B
3.05 ±0.2	1.52 ±0.2	0.4 ±0.2	0.5 ±0.2	(2.05)

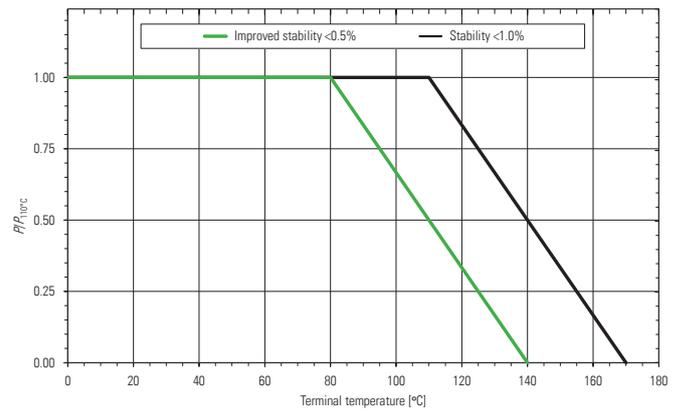
a	b	w
1.00	1.80	1.65

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

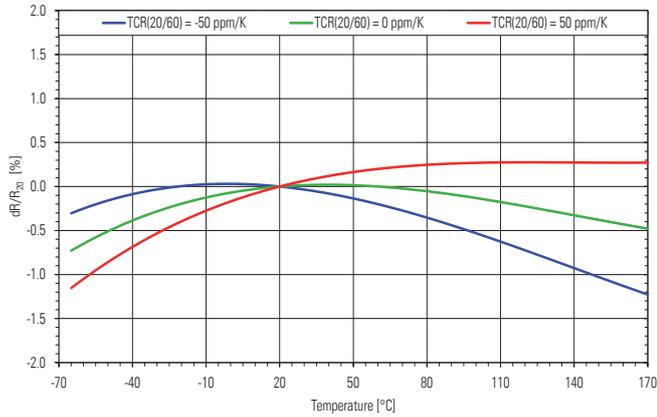
Power derating curve at 70 °C



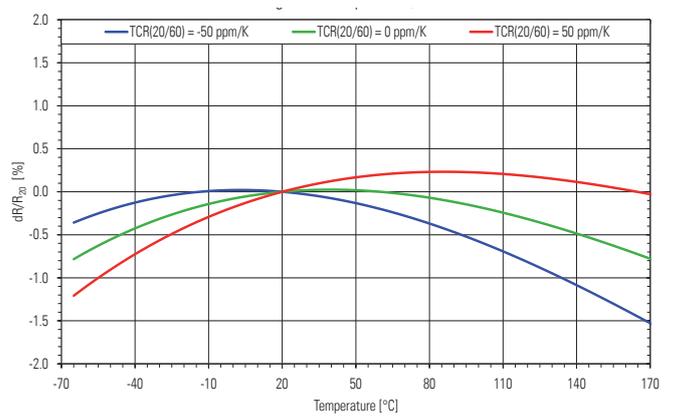
Power derating curve at 110 °C



Temperature dependence of the electrical resistance of MANGANIN® resistors

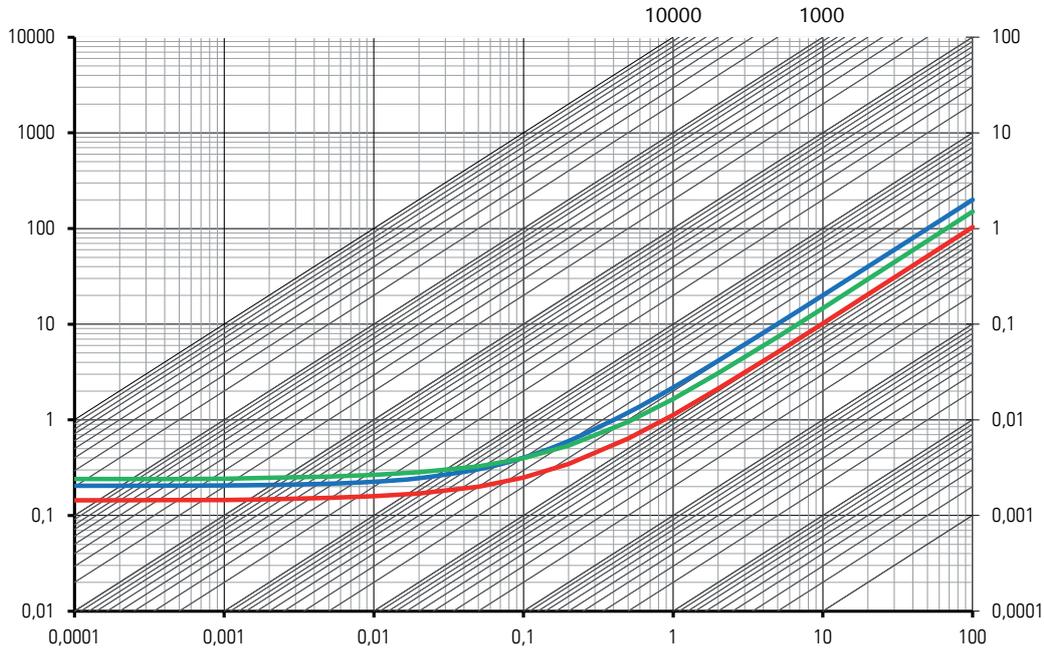


Temperature dependence of the electrical resistance of NOVENTIN® resistors



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	±1.0 %
Bias Humidity	+85°C, 85 r.F., 1000 h, powered	±0.5 %

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