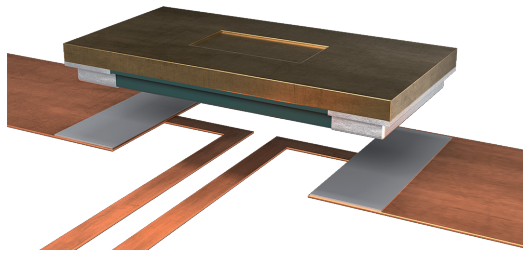




## ISA-PLAN® // PRECISION RESISTORS

### FMP // Size 2010

### PRELIMINARY VERSION



#### Features

- Power rating up to 4 W at 70°C (1.5 mOhm)
- Constant current up to 50 A (1.5 mOhm)
- Standard pad size (2010)
- High pulse power rating
- Excellent long-term stability
- Mounting: Reflow- and IR-soldering
- AEC-Q200 qualification in preparation
- RoHS 2011/65/EU compliant



#### Applications

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

#### Preliminary technical data

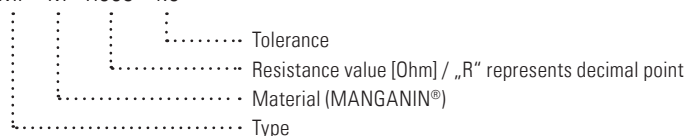
Resistance values	<b>mOhm</b>	1.5 / 2 / 3 / 4 / 5 / 6
Tolerance	<b>%</b>	1 / 5
Temperature coefficient (20-60 °C)	<b>ppm/K</b>	<50
Applicable temperature range	<b>°C</b>	-65 to +170
Power rating	<b>W</b>	up to 4
Dielectric withstanding voltage	<b>V AC/DC</b>	200
Inductance	<b>nH</b>	<3
Stability (at rated power) deviation after 2000h, T <sub>k</sub> = Terminal temperature		< 0.5 % (TK=80 °C) < 1.0 % (TK=110 °C)

Type	Value [mΩ]	R <sub>thi</sub> [K/W]	TCR [ppm/K]	P <sub>70 °C</sub> [W]	P <sub>110 °C</sub> [W]
FMP-Z-R0015*	1.5	20	<50	4	3
FMP-M-R002*	2	25	<50	3.5	2
FMP-M-R003	3	40	<50	2.5	1.5
FMP-V-R004*	4	50	<50	2	1
FMP-V-R005	5	55	<50	2	1
FMP-V-R006*	6	67	<50	1.5	1

\* values in preparation

#### Ordering code

FMP - M - R003 - 1.0





**FMP // Size 2010**

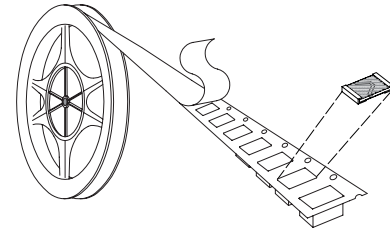
**Recommended solder profile**

Reflow- and IR-soldering

Temperature	°C	260	255	217
Time	sec	peak	40	90

**Tape and reel information**

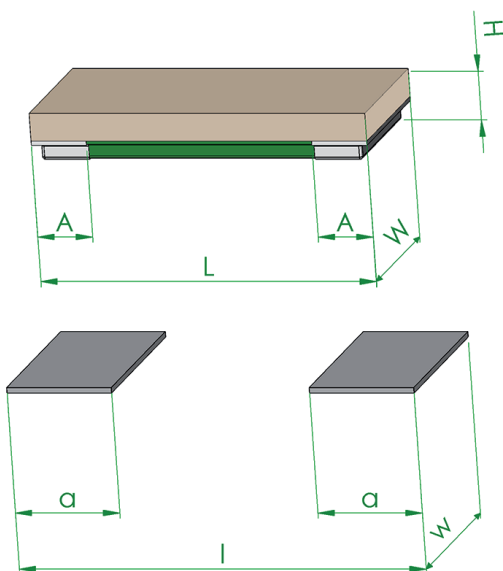
Specification	DIN EN 60286-3		
Tape width	mm	12	
Reel size	inch	13	
Parts per reel	pcs	12500	
Packaging weight net	g	481	



**Information**

Product status	under development
Sample availability	B-samples
Qualification release acc. AEC-Q200	Q2/2020
Mass production availability	Q4/2020

**Mechanical dimensions and pcb-layout proposal (Reflow-soldering) [mm] / Drawing Z-YL-257**



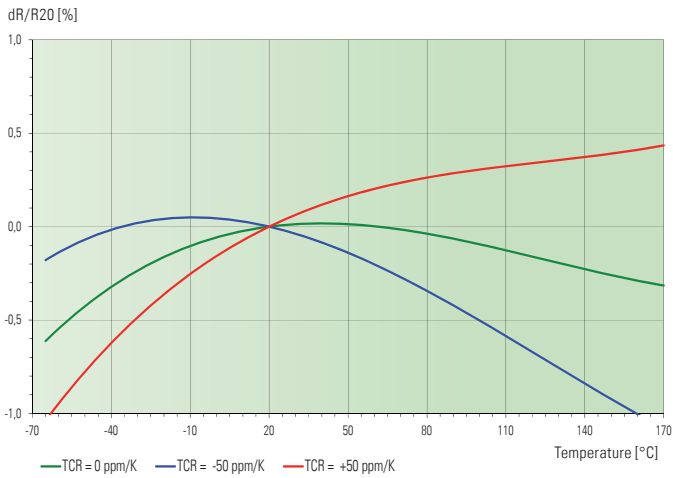
type:	L	W	H	A
FMP	5.08 ±0.2	2.54 ±0.2	0.4 ±0.2	0.7 ±0.2

solder pad type:	l	w	a
FMP	6.0	3.0	1.25

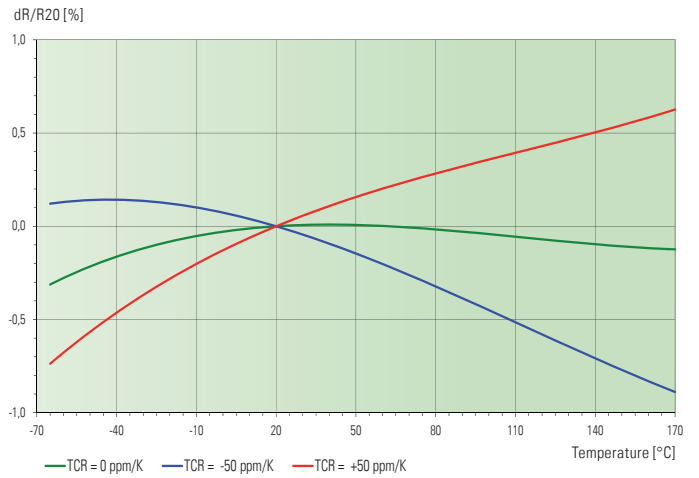


FMP // Size 2010

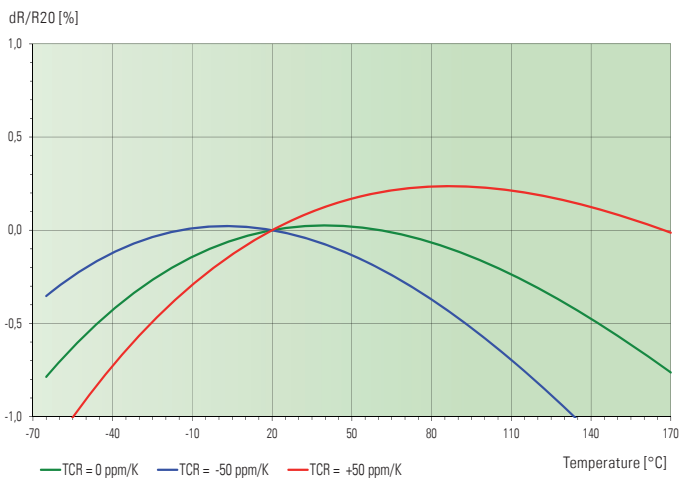
Temperature dependence of the electrical resistance of MANGANIN® resistors



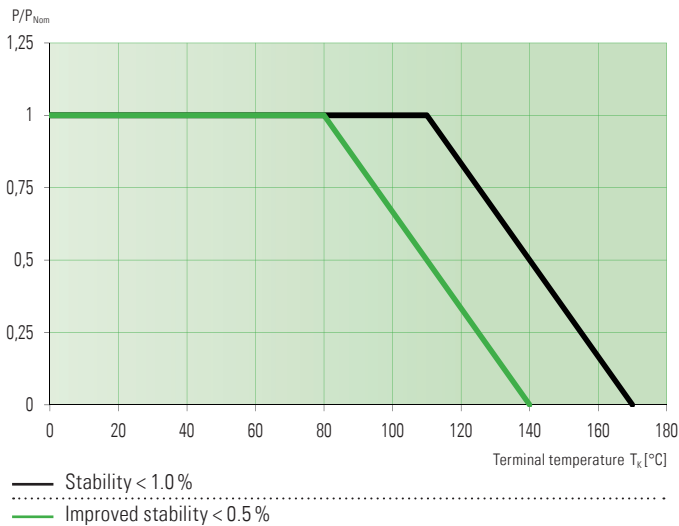
Temperature dependence of the electrical resistance of ZERANIN® resistors



Temperature dependence of the electrical resistance of NOVENTIN® resistors



Power derating curve

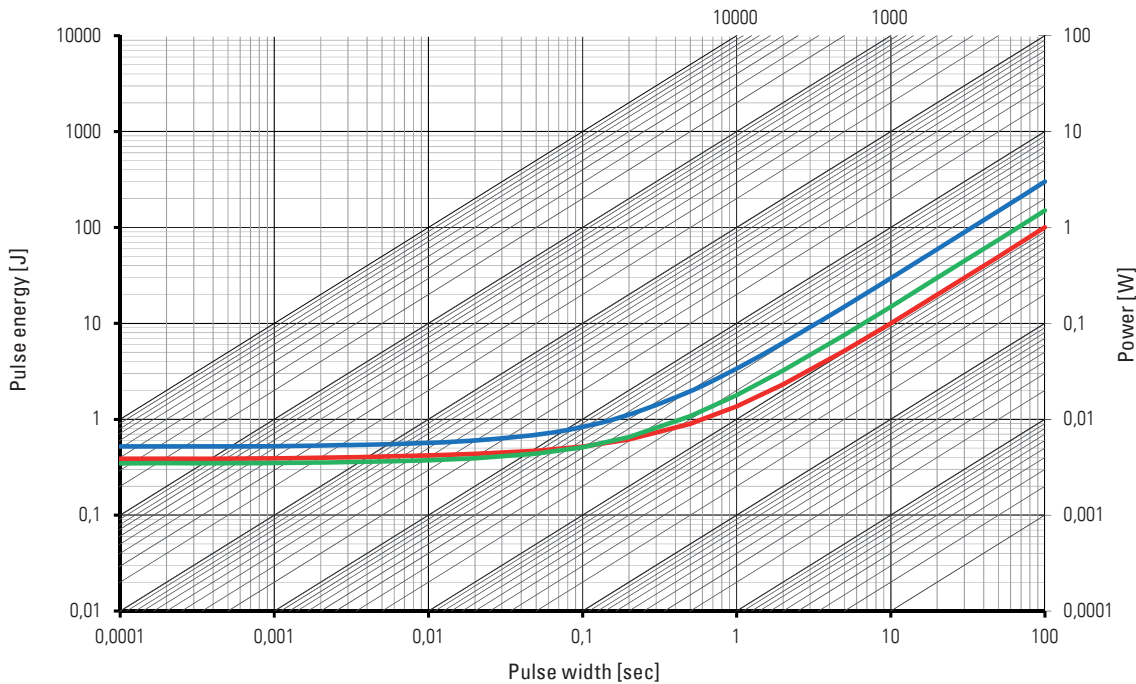




**FMP // Size 2010**

**Maximum pulse energy respectively pulse power for permanent operation**

**FMP-Z-R0015, FMP-M-R003, FMP-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)	in preparation
Low Temperature Storage	-65 °C for 250 h	
Moisture Resistance	MIL-STD-202 method 106	
Mechanical Shock	100 g, 6 ms half sine	
Vibration, High Frequency	10 g, 10-2000 Hz, 24 h each axis	
Operational Life	2000 h, $T_K$ max at rated power	
High Temperature Exposure	2000 h / 170 °C	
Bias Humidity	+85 °C, 85 r.F., 1000 h, powered	

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