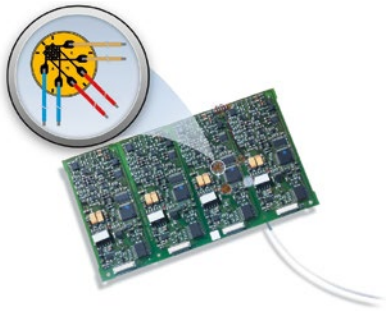
Strain gauges for measurements on PCBs



RF91

0°/45°/90° miniature rosette
Temperature response matched to steel
with $\alpha = 10.8 \cdot 10^{-6}/K$

RF9x

Temperature response matched to customer's choice
see page 16

Illustrations show actual size

1-RF91-0.8_ZE

1-RF91-0.8_W

Contents per package
5 pc.

Field of application: Strain measurements and experimental stress analysis on PCBs and other very small components

Properties: Small strain gauge rosette with paint-insulated copper wire (“ZE”) and stacked measuring grids with a diameter of 5 mm; available as variant with measuring grid covered (“ZE”) and measuring grid not covered with very small integrated solder tabs (“_W”)

Types available from stock		Variants	Noml. resistance	Dimensions (mm)			Maximum excitation voltage (*)	Sldr. terminals
				Measuring grid		Meas. grid carrier		
Steel	Aluminum	Other	Ω	a	b	c	V	
1-RF91-0.8/120ZE		1-RF9x-0.8/120ZE(#)	120	0.8	0.9	5	1	–
1-RF91-0.8/120_W		1-RF9x-0.8/120_W(#)	120	0.8	0.9	5	1	–

(*) Maximum excitation voltage for ferritic steel. For other temperature response matchings, the corresponding value is printed on the data sheet included with delivery.
(#) Types are only available with matching to aluminum, ferritic or austenitic steel

Available for you on site: HBM engineers come to you

HBM has been supporting manufacturers of printed circuit boards for many years by performing strain measurements on PCBs using strain gauges.

You benefit from seamless documentation, reliable measurement data and greater reliability in mobile applications for printed circuit boards.

Advantages

- Follows guidelines and customer requirements
- Current international guidelines (e.g. IPC JEDEC 9804), industrial standards
- Reliable, robust results with definitive and independent test reports
- Avoid measurement errors by using our experienced service engineers
- The fast and efficient way to measurement results, without having to invest in your own equipment
- As global as your company: We perform measurements worldwide

Speak with your personal HBM sales partner!

Specifications – RF9

Type		Type 1-RF91-0.8/120ZE / 1-RF91.00/120_W
Strain gauge construction		Foil strain gauge with embedded measuring grid (ZE) or measuring grid not covered (_W)
Measuring grid		
Material		Constantan
Thickness	µm	3.8
Carrier		
Material		Special plastic material
Thickness	µm	18 ± 3
Covering agent; only with option _W		
Material		Polyimide foil
Total thickness SG	µm	95 ± 15
Connections		Paint-insulated copper wire, 500 mm, Ø 0.2 mm (2x blue [measuring grid a], 2x red [measuring grid b], 2x golden [measuring grid c])
Option _W		integrated solder tabs, approx. 0.8 mm long, approx. 0.6 mm wide
Nominal resistance	Ω	120
Resistance tolerance	%	± 1
Gauge factor		approx. 2
Nominal (rated) value of the gauge factor		Specified on each package
Gauge factor tolerance	%	± 1.5
Temperature coefficient of the gauge factor		Specified on each package
Reference temperature	°C	23
Application temperature range		
for static, i.e. zero-point related measurements	°C	-40 … +140
for dynamic, i.e. non zero-point related measurements	°C	-75 … +140
Transverse sensitivity		Specified on each package
Temperature response		Specified on each package
Temperature response matched to expansion coefficient		
α for ferritic steel	1/K	10.8 · 10^{-6}
α for aluminum	1/K	23 · 10^{-6}
α for austenitic steel	1/K	16 · 10^{-6}
Tolerance of temperature response	1/K	± 0.3 · 10^{-6}
Temperature response with matching in the range of	°C	-10 … +120
Maximum elongation[1] at reference temperature using adhesive Z70 on SG type 1-RF91-0.8/120ZE		
Absolute strain value ε for positive direction	µm/m	50,000 (5 %)
Absolute strain value ε for negative direction	µm/m	50,000 (5 %)
Fatigue life[1] at reference temperature using adhesive Z70 on SG type 1-RF91-0.8/120ZE		
Achievable number of load cycles L_W with alternating strain ε_W = ± 1,000 µm/m and variation of zero point ε_m Δ % 300 µm/m		> 10^4
Minimum radius of curvature, longitudinal and transverse, at reference temperature	mm	10
Applicable bonding materials		
Cold curing adhesives		Z70, X280
Hot curing adhesives		EP150, EP310N

[1] The data depend on the various parameters of the specific installation and are therefore stated for representative examples only