

Flat heating elements

Basic values:

Parameter	Value
Dimensions	7 x 3 x 1.5 mm
Heated area	7 x 3 x 1.5 mm
T _{max}	500 °C

Details of Standard:

Description

The currently smallest heating element from Bach RC. In spite of its small dimensions, the type HS is extremely efficient, with a rated power of more than 30 W. The small, flat heating elements are used especially where heat has to be generated precisely and with high power density within a small space, for example, for nozzle heating, for dynamic heating of tool tips - such as pick-and-place applications, flip-chip or die-bonding processes in electronics and semiconductor manufacturing. Much of the surrounding material needs not be warmed up unnecessarily due to the low mass of the heating element: This helps to save energy by avoiding waste heat being emitted into the environment of the heating element. The "thermal mass" remains low, the heating element reacts dynamically while heating, and also quickly cools down again.

* The actual power depends on resistance, temperature and voltage.

Parameter	Value
Article no.	FLE 100 576
Resistance @ 20 °C	18,7 Ω ±25 %
Nominal voltage	24 V
Nominal power @ 20 °C	30,8 W*

Basic Material

Parameter	Scale unit	Si ₃ N ₄
max. temperature (T _{max})	°C	1 000
thermal conductivity (l)	W/mK	40
temperature shock resistance (ΔT)	K	500
emissivity (1 100 °C) (ε)	-	0.96
Young's modulus (E)	GPa	320
bending strength (δ _{BB})	MPa	400
compressive strength (δ _D)	MPa	2 000
coefficient of thermal expansion (α)	10 ⁻⁶ K ⁻¹	3
density (g)	g/cm ³	3.21
specific heat (c _p)	J/kgK	750
porosity (100 - % t.D.)	%	0
critical stress intensity factor (K _{IC})	MPa m ^{1/2}	6
Weibull - modulus (m)	-	7.9

The thermal shock resistance depends on the geometric shape of the heater.

Electrical parameters

Parameter	Scale unit	Si ₃ N ₄
resistivity	Ω cm	5 · 10 ⁻³ - 5 · 10 ⁻¹
isolation resistivity	Ω mm (20 °C)	10 ¹³
dielectric strength	kV/mm	25

Emission spectrum

Fully ceramic heating elements are long-wave infrared heaters with a maximum emission of 5 to 10 μm and a radiation coefficient of ε > 0.9.



