

# High Temperature Microbalance Sensor Crystals

## Type R-20



R-20 sensor crystals are optimized for use in thin film deposition systems at higher temperatures, as required in PVD, CVD, ALD and OLED. The crystals are temperature compensated at 240°C (464°F) and enable precise measurements from 0°C – 450°C (32°F – 842°F) with a limiting temperature of 800°C (1472°F). The electrode design is compatible with the industrial standard (Inficon, Maxtec, Sycon and Sigma).

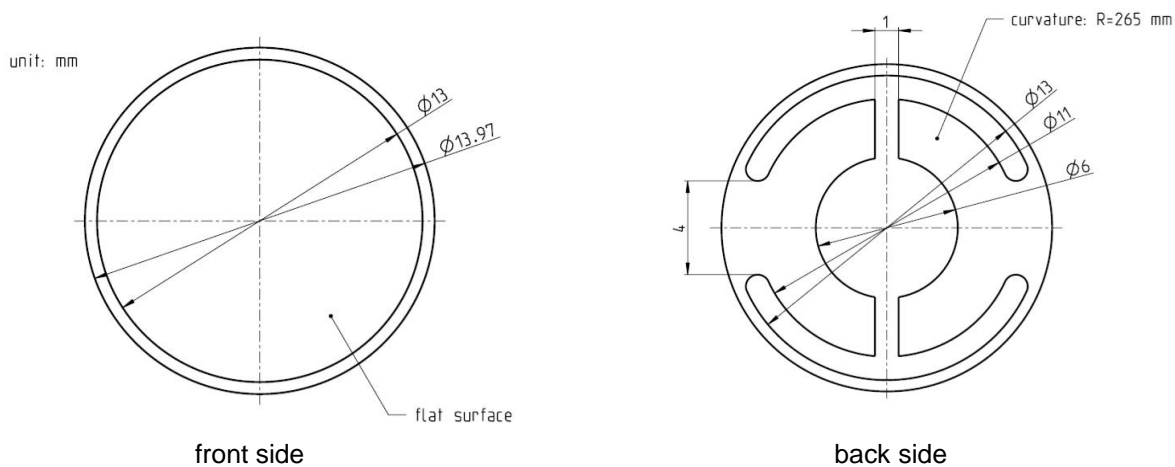
### BENEFITS

- Excellent frequency stability from 0°C up to 450°C (32°F to 842°F)
- High temperature stability up to 550°C (1022°F)
- electrode design compatible with industry standard
- high Q factor around 70000

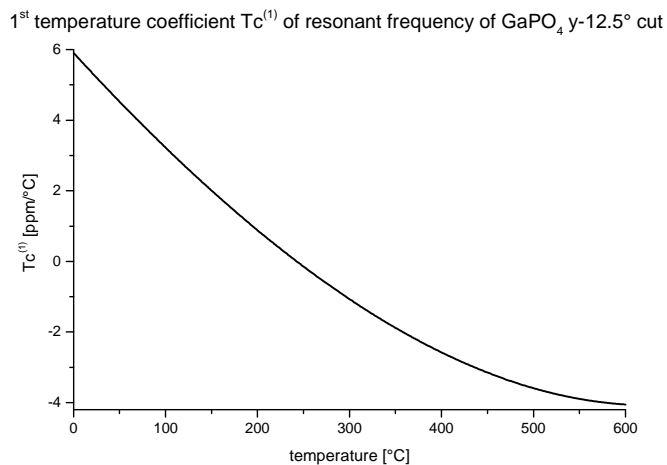
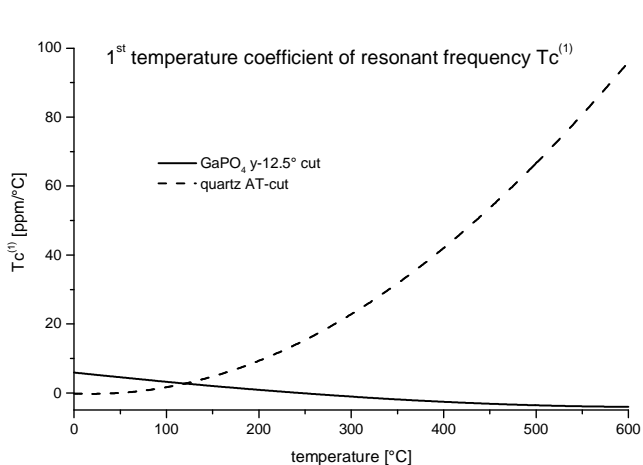
### SPECIFICATIONS

Resonant frequency	5.8 ± 0.1 MHz
Piezoelectric crystal	GaPO <sub>4</sub> (gallium phosphate) single crystal
Diameter	13.97 mm (0.550 inch)
Thickness	0.2 mm (0.008 inch)
Sensitivity	≈ 0.3 ng/Hz
Frequency – temperature behavior	$f_s(T) = f_s(T_0) [1 + a(T - T_0) + b(T - T_0)^2 + c(T - T_0)^3]$
T <sub>0</sub> , a, b, c	240°C (464°F), 0.00717 ppm/°C, - 0.00976 ppm/°C <sup>2</sup> , 7.2·10 <sup>-6</sup> ppm/°C <sup>3</sup>
Front side	fully metallized, flat
Back side	double anchor, curvature = 2 dioptre (R = 265 mm)
Electrode material (T < 450°C)	gold on NiCr (adhesion layer)
Surface	fine lapped (#4000)
Dynamic resistance R <sub>1</sub>	< 10 Ohm
Dynamic capacitance C <sub>1</sub>	0.08 pF
Static capacitance C <sub>0</sub>	32 pF

## Resonator dimensions



## Frequency Temperature dependence



## Modifications (on request)

- wrapped around electrode design (both contacts at back side)
- custom specified temperature compensation from -50°C up to 650°C (-58°F to 1202°F)
- electrode material
- shape of resonator (plano-convex, beveled, plano-plano, biconvex ...)

Piezocryst reserves the right to change specifications and accessories without notice.