

Calcular el valor de Beta para un termistor NTC sobre el que se han medido tres resistencias a tres temperaturas diferentes:

- $R(25^{\circ}\text{C}) = 10000$ ohmios
- $R(50^{\circ}\text{C}) = 3605$ ohmios
- $R(75^{\circ}\text{C}) = 1500$ ohmios

$$\frac{1}{T} = A + B \cdot \ln(R_T) + C \cdot [\ln(R_T)]^3$$

$$\frac{1}{298.15} = A + B \cdot \ln(10000) + C \cdot [\ln(10000)]^3$$

$$\frac{1}{323.15} = A + B \cdot \ln(3605) + C \cdot [\ln(3605)]^3$$

$$\frac{1}{348.15} = A + B \cdot \ln(1500) + C \cdot [\ln(1500)]^3$$

$$\frac{1}{298.15} = A + B \cdot 9.21 + C \cdot 781.32$$

$$\frac{1}{323.15} = A + B \cdot 8.19 + C \cdot 549.35$$

$$\frac{1}{348.15} = A + B \cdot 7.31 + C \cdot 391.13$$

$$\frac{1}{298.15} - \frac{1}{323.15} = B \cdot (9.21 - 8.19) + C \cdot (781.32 - 549.35)$$

$$\frac{1}{323.15} - \frac{1}{348.15} = B \cdot (8.19 - 7.31) + C \cdot (549.35 - 391.13)$$

$$\frac{\frac{1}{298.15} - \frac{1}{323.15}}{(9.21 - 8.19)} = B + C \cdot \frac{(781.32 - 549.35)}{(9.21 - 8.19)}$$

$$\frac{\frac{1}{323.15} - \frac{1}{348.15}}{(8.19 - 7.31)} = B + C \cdot \frac{(549.35 - 391.13)}{(8.19 - 7.31)}$$

$$\frac{\frac{1}{298.15} - \frac{1}{323.15}}{(9.21 - 8.19)} - \frac{\frac{1}{323.15} - \frac{1}{348.15}}{(8.19 - 7.31)} = C \cdot \left[\frac{(781.32 - 549.35)}{(9.21 - 8.19)} - \frac{(549.35 - 391.13)}{(8.19 - 7.31)} \right]$$

$$C = \frac{\frac{\frac{1}{298.15} - \frac{1}{323.15}}{(9.21 - 8.19)} - \frac{\frac{1}{323.15} - \frac{1}{348.15}}{(8.19 - 7.31)}}{\frac{(781.32 - 549.35)}{(9.21 - 8.19)} - \frac{(549.35 - 391.13)}{(8.19 - 7.31)}} = 0.1929954684 \cdot 10^{-7}$$

$$B = \frac{1}{\frac{323.15}{(8.19 - 7.31)} - \frac{1}{343.15}} - C \cdot \frac{(549.35 - 391.13)}{(8.19 - 7.31)} = 2.499372478 \cdot 10^{-8}$$

$$A = \frac{1}{298.15} - B \cdot 9.21 - C \cdot 781.32 = 1.036930255 \cdot 10^{-3}$$

SRS Thermistor Calculator v1.1
for Laser Diode and TEC Controllers
by Stanford Research Systems Inc

Please input resistance-temperature pairs:
(Don't use the Enter key)

R (Ω)	T (°C)
R1: 10000	T1: 25
R2: 3605	T2: 50
R3: 1500	T3: 75

Calculated Steinhart-Hart model coefficients:

A = 1.036930255 e-3
 B = 2.499372478 e-4
 C = 0.1929954684 e-7

Calculated β model coefficients:
(R3 and T3 are not used)

R(25°C) = 10000.00 Ω
 β = 3931.98 K

The graph plots Resistance (Ω) on the y-axis (0 to 20000) against Temperature (°C) on the x-axis (0 to 80). It shows experimental data points (red squares) and two model fits: a β model (yellow line) and an S-H model (blue line). The data points are approximately at (25, 10000), (50, 3605), and (75, 1500). The β model and S-H model both provide a smooth curve that fits the data points well.

β S-H Data

Model Calculator
(The coefficients shown on the left are used)

R(Ω)	T(°C)
10000	25.0000
	25.0000

Use ↓ ↑ keys

S-H model
β model