

Characterization

Temperature and Radiation

Characterizations for sensor: 1144

TEMPERATURE CHARACTERIZATION

The temperature characterization is conducted using the temperature system CTS T-40/50 at the company facilities. Each sample is exposed at a temperature drift from 10°C to 75°C during one hour with measures every second. The data collected during the

temperature steps is processed and extracted the lineal regression equation. The regression equation permits to compensate the sensor output against the reference output and eliminate most of the temperature effect on the sensor readout.

Temperature readout (digits)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
109	42284	40964
129	42332	41056
144	42416	41184

Lineal regression equation: $y = mx + b$

m: 1,51 b: -22602

Temperature Offset: 88

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RADIATION CHARACTERIZATION

The radiation characterization is carried out using the 60-Co source of the Radiation Physics Laboratory at the University of Santiago de Compostela (USC). The radiation procedure consists of a non-biased irradiation of the sample at 30 rad(Si)/h dose rate for an

accumulated Total Ionizing Dose (TID) of rad(Si). The measures are carried out before and after the irradiation at the company facilities. From the data collected it is extracted the sensitivity for each sensor.

Pre-irradiation sensor value (Hz) - pre*	Post-irradiation sensor value (Hz) - post*
78.1122	-10971.8

Sensor sensitivity: $s = (\text{pre} - \text{post}) / 15$

$$s = 513 \text{ Hz/rad}$$

* Temperature compensated

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Characterizations for sensor: **1145**

TEMPERATURE CHARACTERIZATION

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temperature steps is processed and extracted the lineal regression equation. The regression equation permits to compensate the sensor output against the reference output and eliminate most of the temperature effect on the sensor readout.

Temperature readout (digits)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
108	39932	38852
128	39980	38916
143	40044	38992

Lineal regression equation: $y = mx + b$

m: 1,33 b: -13984

Temperature Offset: 87

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RADIATION CHARACTERIZATION

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rate for an accumulated Total Ionizing Dose (TID) of rad(Si). The measures are carried out before and after the irradiation at the company facilities. From the data collected it is extracted the sensitivity for each sensor.

Pre-irradiation sensor value (Hz) - pre*	Post-irradiation sensor value (Hz) - post*
238.327	-9917.64

Sensor sensitivity: $s = (\text{pre} - \text{post}) / 15$

$$s = 502 \text{ Hz/rad}$$

* Temperature compensated