

Characterization

Temperature and Radiation

Characterizations for sensor: **1036**

TEMPERATURE CHARACTERIZATION

The temperature characterization is conducted using the temperature system CTS T-40/50 at the company facilities. Each sample is exposed at three different temperatures (20, 50 and 70 °C). 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 the temperature effect on the sensor readout.

Temperature Step (°C)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
20	43454 ± 6	44911 ± 6
50	39357 ± 6	41191 ± 6
70	37080 ± 7	38998 ± 7

Lineal regression equation: $y = mx + b$

m: 1.08 b: -5096

Date: 02 / 05 / 2019

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 15 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*
43167	35739

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

$s = 495 \text{ Hz/rad}$

Date: 02 / 05 / 2019

* Temperature compensated

Characterizations for sensor: **1037**

TEMPERATURE CHARACTERIZATION

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the lineal regression equation. The regression equation permits to compensate the sensor output against the reference output and eliminate the temperature effect on the sensor readout.

Temperature Step (°C)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
20	44198 ± 8	44615 ± 5
50	39627 ± 6	41438 ± 7
70	37086 ± 10	39564 ± 9

Lineal regression equation: $y = mx + b$

m: 1.41 b: -18783

Date: 02 / 05 / 2019

RADIATION CHARACTERIZATION

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rate for an accumulated Total Ionizing Dose (TID) of 15 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*
43894	36025

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

$s = 525 \text{ Hz/rad}$

Date: 02 / 05 / 2019

* Temperature compensated