

Micron Optics, Inc.
os3600 Strain Sensor
Long Term Test Summary

Preliminary

The following tests have been performed on the os3600 style optical strain sensor to determine the long term reliability of this product under extreme environmental conditions. The tests include thermal cycling and high temperature humidity soak.

Thermal Cycling:

The os3600 sensor was subjected to thermal cycling for 500 cycles of -40°C to 80°C. A total of 5 sensors were subjected to this test. The sensor end brackets were mounted to a steel plate. A pre-tension of 1,000 μ strain was applied to each sensor and the sensors were locked into place. The mounted sensors were placed in an environmental chamber and cycled from -40°C to 80°C using a triangular ramp at a rate of 2°C per minute. For this test, both the strain FBG and temperature FBG were monitored using a Micron Optics sm125. The temperature FBG was used to factor out thermally induced strain. The resulting mechanically induced strain was recorded. The maximum drift for the duration of the test was 30 μ strain.

High Temperature and Humidity Soak:

The os3600 was subjected to high temperature and humidity soak for 1000 hours at 75°C at 75% relative humidity. A total of 5 sensors were subjected to this test. The sensor end brackets were mounted to a steel plate. A pre-tension of 1,000 μ strain was applied to each sensor and the sensors were locked into place. The mounted sensors were placed in an environmental chamber and allowed to stabilize at 75°C. Once the temperature stabilized, data collection was started and the chamber humidity was ramped to 75% RH. For this test, both the strain FBG and temperature FBG were monitored using a Micron Optics sm125. The temperature FBG was used to factor out thermally induced strain. The resulting mechanically induced strain was recorded. The maximum drift over the 1000 hour test was 22 μ strain.