TECH NOTE

LRS-9424B Heat Sink Temperature Uniformity

OVERVIEW

The LRS-9424B Laser Reliability and Burn-In Test System utilizes a family of fixtures that are designed to ensure temperature measurement accuracy of ±1.0°C. These fixtures support up to 32 TO-can devices. Temperature measurement is accomplished through the use of an AD590 temperature sensor located at the center of the fixture.

The high density of the fixtures, coupled with the use of a single temperature sensor, make temperature uniformity a prime consideration in evaluating temperature measurement accuracy.

TEST SET UP

In this test, twelve type-K thermocouples were potted into the bases of expired TO-9 devices. The thermocouples were then calibrated for use at a nominal temperature of 100°C. The devices were loaded onto an LRS-9400B-4352 fixture. The fixture was loaded into an LRS-9424B, and brought to 100°C for a period of two hours. Thermocouple temperatures were recorded with an Agilent 34970 data acquisition unit.

TEST PROCEDURE

Temperature data was collected for one hour after the fixture settled to the set point. The data was then averaged over the final 30 minutes to eliminate noise.

Temperature variation was calculated as the difference between the measured temperature of a given device and the measured temperature at the location of the AD590 temperature sensor.

RESULTS

Table 1 shows that the maximum variation from the measured temperature at the AD590 location was 0.91°C. Figure 1 shows a plot of heat-sink surface temperature variation fit to the twelve data points. Values were interpolated between measured data points.

Devices	$\Delta T = T_{Device} - T_{AD590}$ (°C)
Device 1	0.10
Device 3	-0.67
Device 5	-0.91
Device 8	0.06
Device 12	-0.10
Device 15	0.77
Device 20	-0.18
Device 23	0.55
Device 25	0.07
Device 27	-0.63
Device 29	0.16
Device 32	0.46

TABLE 1 – Temperature Variation by Device Location

LRS-9424B Fixture Temperature Variation

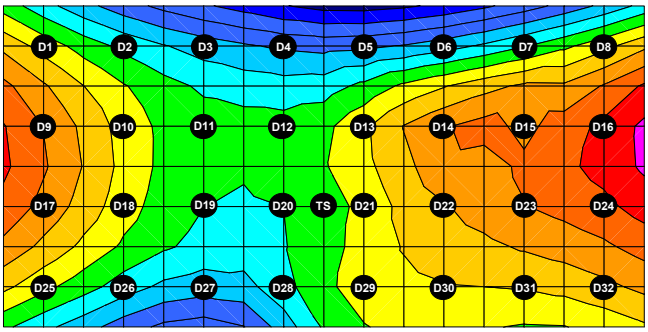

FIGURE 1 – Fixture Surface Temperature Variation