

Performance Testing

Excessive shock and vibration is common in computing platforms deployed in harsh environments across a range of defense and industrial applications. Systems with limited or no airflow and containing high wattage board payloads are expected to operate with high reliability in extreme ambient temperatures every day.

Effective clamping force is critical in applications demanding resistance to high shock and vibration and low thermal resistance ensures efficient heat transfer away from board components.

Elma's SureLock family of card edge retainers offer high and evenly distributed clamping forces over the length of the retainer. This provides solid mechanical rigidity while the consistent surface to surface contact ensures maximum heat transfer.

Clamping Force Performance Data and Thermal Testing

Elma SureLock card retainers (length 4.80 in) were tested by applying a controlled torque to their locking screw and measuring the resulting clamping force using a specially designed test fixture.

The stated value is the result of averaged data taken over a large sample population of SureLocks being load-tested. Each SureLock was tested 4 times. All tests were performed at sea level.

**Indicates the maximum expansion width of the SureLock model under test*

Measurement Results

retainer length 4.8" (122mm)

Elma Series	Torque	Average Measured Load		
		Yellow Alodine Finish	Black Anodize Finish	Nickel Finish
290*	6in-lb	650lbs	550lbs	530lbs
325	6in-lb	550lbs	425lbs	425lbs
460	20in-lb	1000lbs	850lbs	700lbs

Test Summary

The test confirmed the high clamping force of the SureLock retainers. Clamping force is highly dependent on the SureLock finish.

Thermal Resistance Tests of SureLock Retainers

Set Up Details

A conduction cooled 3U VPX board was used for thermal testing, representing a 90W load

Ambient temperature: 0 °C (32 °F)

Length of Surelock retainers: 4.8" (122 mm)

Using a test fixture, the thermal resistance of pairs of SureLock retainers, was measured across three different models and two finish types.

Dual 4.8" length retainers - thermal resistance

290 Series, yellow alodine finish = 0.42°C/W

290 Series, black anodize finish = 0.96°C/W

325 Series, yellow alodine finish = 0.40°C/W

325 Series, black anodize finish = 0.72°C/W

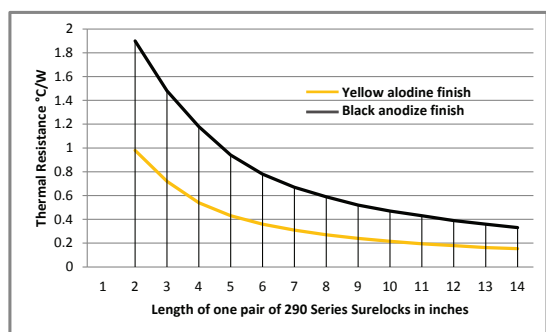
460 Series, yellow alodine finish = 0.38°C/W

460 Series, black anodize finish = 0.70°C/W

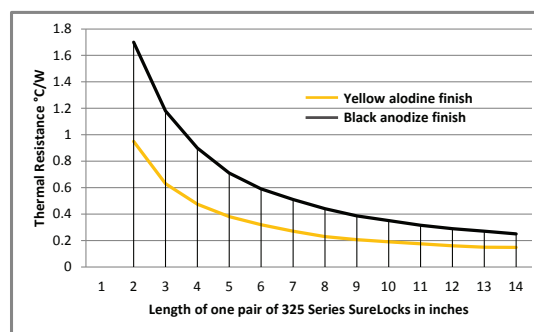
Performance Curves

The following curves each represent the average of readings from SureLock Series .290, .325 and .460 (expansion widths) across a range of paired lengths.

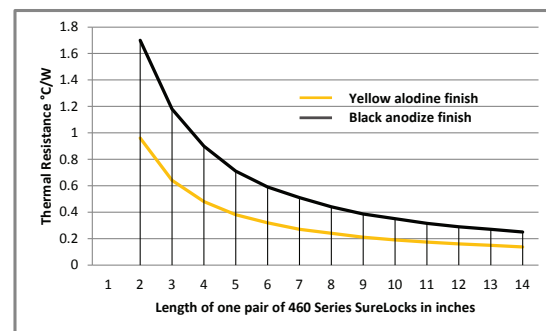
SureLock 290 Series – Thermal Resistance



SureLock 325 Series – Thermal Resistance



SureLock 460 Series – Thermal Resistance



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