

High Temperature Resistive Emitter

Stephen A. Campbell (PI), Steve Solomon, Maryam Jalali
Department of Electrical Engineering, University of Minnesota
NNIN Facility utilized: Nanofabrication Center

This technology projects accurate, realistic, and dynamic IR scene into the entrance aperture of the sensor being tested.

The main goal is to achieve the desired maximum radiance, which is a function of pixel temperature detector wavelength band, and pixel fill factor.

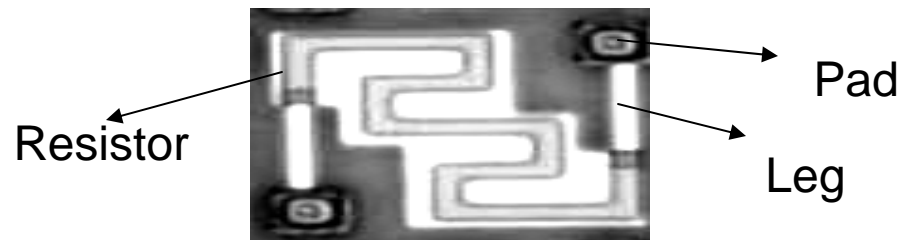
In the resistive emitter pixels, the resistor is capable of withstanding extremely high temperatures.



Acumen Scientific

Material Properties

- Chemically inert
- Minimal specific heat so it responds rapidly
- Minimal stress
- All the materials should have stable and repeatable thermo-physical properties over the range of 300-3000k
- Minimal CTE to maintain the shape of optical cavity
- Perfect diffusion barrier
- Leg metal should have minimal thermal conductivity
- Leg metal should have high electric conductivity
- The absorber material should have minimal TCR
- The resistor material should be stable with respect to TCR over its operating range
- The resistor material should be transparent in IR



Solomon, R. Ginn, S. Campbell, M. Jalali, G. Goldsmith II, "High Temperature Materials for Resistive IRSPs", *Technologies for Synthetic Environments: Hardware-in-the-Loop Testing XI*, Proceedings SPIE (2006).