



Shelf Life, Storage, and Solderability of Surface Mount Chip Resistors

Shelf Life

Resistance value and temperature coefficient of resistance typically remain within tolerance indefinitely when ESD precautions are effective. Shelf life is determined primarily by the integrity of the termination finish. Are the solderable finishes still solderable and the bondable finishes still bondable? Proper storage results in long shelf life.

Storage

Proper storage of surface mount chip resistors must address electrostatic discharge and solderability considerations. The storage conditions must provide adequate protection from electrostatic discharge that can damage the resistor film (thick film Class II and thin film Class I per MIL-HDBK-263). Little or no drift in resistance value is found in these surface mount resistors when ESD precautions are effective. The storage conditions must also preserve the solderability or bondability of the surface mount resistors by minimizing contamination of the resistor terminations. Oxidized or tarnished terminations result in poor electrical and mechanical connections to the circuit. Oxidation is prevented by maintaining the product at $23\pm 5^{\circ}\text{C}$ and 10-70%RH. Avoid storage in direct sunlight and avoid contact with sulfur containing compounds (rubber bands) that degrade the performance of the termination finish.

State of the Art, Inc. (SOTA) recommends storing resistors in sealable, ESD dissipative plastic storage bags, waffle carriers, or tape carriers at typical office conditions ($23\pm 5^{\circ}\text{C}$ and 10-70%RH). Avoid exposure to excessive humidity, direct sunlight, and sulfur containing materials (rubber bands, etc.). These storage conditions provide for adequate performance for periods up to 2 years. Storage under an inert atmosphere (N_2) should be considered if you plan to store these devices for more than 2 years.

Solderability

SOTA assesses solderability in accordance with MIL-STD-202, method 208 and MIL-PRF-55342 as part of our manufacturing process prior to date code assignment. SOTA recertifies solderability on an out going basis at a two year interval. A new layer of solder must cover at least 95% of the bottom and end faces of the resistor termination after immersion in molten solder for acceptable performance.