



## Tantalum Capacitors and Moisture Sensitivity

Vishay supplies 292D, 293D, 593D, 298D, 893D, TR3, TP3, TH3, TF3 and T83 molded and 195D, 572D, 591D, 592D, 594D, 595D, 597D, 695D, T95, T96, T97 and T98 conformal coated surface mount series of solid tantalum capacitors with  $\text{MnO}_2$  cathode construction. The 195D, 572D, 591D, 592D, 594D, 595D, 597D, 695D, T95, T96, T97 and T98 conformal coated series are vacuum packaged in metalized bags and meet a moisture sensitivity level rating (MSL) of 2a as specified in IPC/JEDEC J-STD-020D. Level 2a testing specifies Floor Life as 4 weeks at 30 °C and 60 % RH conditions. Unused capacitors should be re-sealed in the metalized bag with fresh desiccant. A moisture strip (Humidity Indicator Card) can be included in the bag to assure dryness. If excess moisture remains, capacitors can be dried at 40 °C for 168 h (standard 'dry box' conditions). However, to avoid this type of issue, it is advised to use the conformal coated series within the 4 weeks specified by J-STD-020D, Level 2a.

The 292D, 293D, 593D, 298D, 893D TR3, TP3, TH3, TF3 and T83 molded series meet MSL 1, are not considered moisture sensitive and are not stored or shipped in moisture protective packaging. These series do not require any special handling provided the storage and manufacturing environment is nominally at 30 °C and 60 % RH.

Moisture sensitivity levels and test conditions to assure capability were developed for the semiconductor industry to prevent the "popcorning" effect especially in high temperature, lead (Pb)-free processing environments. Passive components including solid tantalum capacitors are typically not subject to this kind of failure mode but can be affected if exposed to high levels of humidity for long periods of time.