

Voltage Operating Envelope

In the 1980s, computer manufacturers recognized that voltage transients occur with different durations and magnitudes. Short duration transients may reach very high magnitude, while longer duration transients tend to be lower in magnitude. The CBEMA¹ and ITIC² voltage operating envelope curves were introduced to help manufacturers design equipment that is compatible with expected transient voltages. Standard SEMI F47 further defines test acceptance criteria for undervoltage shutdown of semiconductor processing equipment (Figure 1).

Normal operation refers to when the supply voltage is within the rated voltage utilization range. Equipment should be able to ride through electrical transients that are within this envelope.

Shutdown occurs when the supply voltage is too low for too long of a duration.

Potential for damage exists when the supply voltage is too high for too long of a duration. Transients of a larger magnitude, or for a longer duration, contain more energy and have more potential for damage.

¹ Computer and Business Equipment Manufacturers Association (CBEMA)

² Information Technology Industry Council (ITIC)

Figure 1. Voltage operating envelope

