Discrete Semiconductors Introduction

Discrete Semiconductors are typically application-specific and though not considered state-of-the-art, they are critical in military applications. Since they rely on power dissipation a great deal, their construction, rating, and reliability are critical elements in their performance.

This section describes quality, reliability and rating requirements for Discrete Semiconductors with detailed recommendations. This information is provided to assist in choosing between standard military (QML-19500), tailored application specific, or commercial item parts.

MIL-HDBK-5961 lists Standard Discrete Semiconductors. Detailed performance requirements are in MIL-PRF-19500, and listed in QML-19500 are qualified parts/manufacturers. MIL-HDBK-6100 details the dimensions for many of the standard case outlines used for Discrete Semiconductors.

The military no longer requires equipment manufacturers to use military-only parts. It is highly recommended to use QML-19500 manufacturers and JANTX level parts, as a minimum.

This section discusses both Silicon and Gallium Arsenide discrete semiconductors.

Optoelectronic Semiconductors are briefly described in this section. The section on Optoelectronic's addresses them in more detail.

Closing Comments

Use QML-19500 manufacturers and parts. The military Discrete Semiconductor industry is mature and knowledgeable in many different applications. Recommend using them in all environments to keep risk to a minimum.

Use MIL-PRF-19500 to define performance requirements**.**

For applications that the part’s temperature will be greater than 60° C, require a thermal resistance limit and thermal impedance limit and monitoring.