

RAD Hard Quality Systems

The various quality systems, for example QML, Class M, MIL-STD-883 compliant, Automotive Quality Systems and commercial grade have unique implications for the selection and acquisition of pieceparts for radiation hardness assured applications that should be understood. The primary concern is that for the acquisition of a device that must be radiation hardness assured, the entire cost of ownership (i.e., purchase price, cost of additional supplier data, radiation characterization costs, radiation test and screening costs, subsequent radiation acceptance test costs, increased radiation hardness assurance costs, maintenance and surveillance costs, increased system design costs, etc.) must be considered.

RHA Provisions

The QML system has extensive provisions to qualify a line as capable of meeting a set of radiation requirements. A sub-set of QML manufacturers have qualified RHA products. The radiation limits set by the vendor are guaranteed as an ongoing part of the SPC system and expressed as a RHACL for a technology or product. If available in appropriate RHA levels, RHA-QML parts often provide the most cost-effective solution due to reduced part test requirements. Any claims of RHA are controlled by the vendor. To assure consistent RHA product in Class M devices will require investigation of each vendor's method of certifying and maintaining RHA levels.

RHA in other quality systems

The three commercial quality systems do not incorporate radiation requirements. However, these parts can be radiation tested to define their capability limits (up-screening). The limitation of this method is that no process control can be assumed concerning radiation response since suppliers frequently change and update their process. This requires an ongoing radiation test program for each new lot of devices, or proof of continuity from the vendor. This has a severe impact on total cost of the parts.