

## **MCM & Hybrid Facility Assessment and Quality**

Use this section to establish a level of MCM and /or Hybrid quality and to support an assessment of a facility when required.

Although the military does not require the use of ISO 9000, it uses it as its quality standards. ISO 9000 is an international quality standard used by the majority of MCM/Hybrid manufacturers. ISO 9000 should be used in conjunction with the performance specification MIL-PRF-38534 in developing and administering a MCM/Hybrid quality system. Non-military facilities should have, as a minimum, an ISO 9000 quality system.

The military uses the “Hybrid Microcircuit Manufacturing Performance Specification” (MIL-PRF-38534) as the standard for performance, quality and reliability assurance for MCMs/Hybrids. When assessing a facility, MIL-PRF-38534 should be used as the military performance standard. This specification will assist in tailoring for critical and complex performance concerns related specifically to the MCM/Hybrid arena.

MIL-PRF-38534 has five quality assurance levels. Four of these classes, in highest to lowest order, are K, H, G, and D, as defined below. The fifth class is Class E, the quality level associated with a Class E device is defined by the acquisition document.

- a. Class K is the highest reliability level. It is intended for space applications.
- b. Class H is the standard-military quality level. Class H devices are capable of meeting the Class H tests and inspections of Appendices C and E of MIL-PRF-38534. This includes the incoming inspection flow, the in-process inspection flow, the screening flow, and the Conformance Inspection and Periodic Inspection flow. These devices are specified over the temperature range of -55C to +125C or as specified in the device acquisition document. Manufacturers of these devices should be fully certified and qualified in accordance with this specification. Verification of these Performance Requirements should be performed as described in paragraph 4 of MIL-PRF-38534.
- c. Class G is a less stringent version of Class H with a QML listing per paragraph 4.5.2.2 of MIL-PRF-38534. Class G has a narrower temperature range (-40C to +85C), a manufacturer guaranteed capability to meet the Class H Conformance Inspection and Periodic Inspection testing, and a vendor specified incoming test flow. The devices must meet the Class H requirements for In-Process Inspections and Screening. Class G devices are capable of meeting the

Class H tests and inspections of Appendices C and E of MIL-PRF-38534, except incoming inspection. This includes the In-Process Inspection flow, the screening flow, and the Conformance Inspection and Periodic Inspection flow. Compliance with the Conformance Inspection and Periodic Inspection flow must be guaranteed by the manufacturer. Actual completion of Conformance Inspection and Periodic Inspection tests and inspections are optional and at the manufacturer's discretion. DSCC approval or notification is not required to eliminate Conformance Inspection and Periodic Inspection tests and inspections for this class of device; however, it is the manufacturer's responsibility to ensure that their devices are capable of passing these tests and inspections. These devices are specified over the temperature range of -40C to +85C or a wider range. Manufacturers of these devices should be fully certified and QML listed in accordance with this specification. Verification of these Performance Requirements should be performed as described in paragraph 4 of MIL-PRF-38534.

d. Class E designates devices which are based upon one of the other classes (K, H, or G) with exceptions taken to the requirements of that class. These exceptions are specified in the device acquisition document; therefore, the device acquisition document should be carefully reviewed to ensure that the exceptions taken would not adversely affect the performance of the system. Class E devices are devices, which meet all of the requirements of one of the other classes (K, H, or G), with some exceptions taken. The device acquisition document should clearly state which class the device is based upon (K, H, or G) and what exceptions are being taken. The users of these devices should carefully examine the device acquisition document to verify that the exceptions being taken will not adversely affect the system performance. Verification of the performance requirements should be performed as described in paragraph 4 of MIL-PRF-38534.

e. Class D is a vendor specified quality level. This is a reduced temperature range (0C to +70C) part with a vendor specified test flow available from a QML listed manufacturer. Class D devices are built and tested in accordance with the manufacturer's specified production and testing flow (see Table I). These devices are capable of meeting the specified electrical tests. However, these devices are not required to meet any of the tests and inspections of this specification. These devices are specified over the temperature range of 0C to +70C or a wider range. Manufacturers of these devices should be fully certified and QML listed in accordance with this specification. Verification of these Performance Requirements should be performed as described in paragraph 4 of MIL-PRF-38534.