Outgassing Modification Codes

Series 806 Connectors for Space Flight

The Series 806 is an ideal interconnect choice for space flight equipment. The series 806 features materials, finishes, and performance specifications that meet the MIL-DTL-38999 Class G requirements for space-grade connectors, except with higher density and lower weight.

Outgassing

Space flight equipment requires low-outgassing components in order to prevent degradation to optics and other sensitive instruments. Series 806 connectors contain nonmetallic materials such as rubber, plastic, adhesives and potting compounds which can give off gasses when subjected to a vacuum or high heat. Unless the connector is specially processed, the TML and CVCM can exceed allowable limits. The space industry has adopted a standardized test procedure, ASTM E595, to evaluate outgassing properties. The MIL-DTL-38999 specification Class G also details specific TVM and CVCM values in addition to finish specifications. In Glenair's 186T process, for example, connectors and connector materials are heated to 175° C at a vacuum of 5 X 10^{-6} Torr for 48 hours. Items under test are then weighed to calculate the Total Mass Loss (TML), which may not exceed 1.0% of the total initial mass. A collector plate is used to determine the Collected Volatile Condensable Material (CVCM), which may not exceed 0.1% of the total original specimen mass for Class G rated connectors. Glenair is able to offer outgas processing which assures all materials comply with their respective standards.

Note on Connector Material and Finish Options

Some types of metals are prohibited for space flight. "Pure Tin, Cadmium and Zinc shall not be used as a final finish on EEE parts." (NASA EEE-INST-002 Instructions for EEE Parts Selection, Screening, Qualification, and Derating). NASA recommends electroless nickel or gold finish on connector shells and gold finish for contacts.

Specifying Appropriate NASA Screening

1 ***Choose a NASA EEE-INST-002 (Table 2A) screening level.*** This table contains three screening levels: ***Level 1*** for missions requiring the highest reliability and lowest level of risk, ***Level 2*** for low to moderate risk missions, and ***Level 3*** missions where enhanced screening and inspection is not invoked.

2 ***Choose outgassing process and/or NASA inspection requirements.*** Eight options are available for NASA outgassing, see Table I for details. Cross reference Table II for inspections completed by screening level as required by NASA standards.

3 ***Select the modification code*** from the Table I and add it to the Series 806 part number. Example: 806-044-ME16-10V4BMA-**429.**

TABLE I: OUTGASSING PER NASA SCREENING LEVELS AND D38999, CLASS G

Nasa Screening Level	Screening Type	No Outgas Processing	48 Hour Oven Bake 175° C 100%	Thermal Vacuum* Outgassing 24 Hour 125° C 100%	Mod Code
1	Highest Reliability	●			429B
				●	429C
			●		429J
2	High Reliability	●			429
				●	429A
			●		429K
3	Standard Reliability	‡		●	429L
			●		186

*Thermal vacuum of 10^{-6} Torr. ‡ Use standard part number

TABLE II: NASA EEE-INST-02, TABLE 2A SCREENING LEVELS

Inspection	Level 1	Level 2	Level 3
Visual	100%	100%	100%
Mechanical	2	2	
Dielectric Withstanding Voltage	2	2	
Insulation Resistance	2	2	
Contact Engagement & Separation Force	2		
Coupling Force	2		

Note: required inspection quantity shown. Zero acceptance of failures allowed for all quantities inspected. Inspection is not performed/required for MIL-DTL-38999, Class G

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Dimensions in Inch (millimeter) are subject to change without notice.