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NASA TECH BRIEF

Edge-Type Connectors Evaluated by Electrical Noise Measurement

An electrical noise measurement system is designed to measure the noise generated by edge-type connectors and circuit cards when the connector and circuit card are subjected to sinusoidal vibration. This is accomplished by providing a signal across the contact area and monitoring the signal change during vibration by means of differential amplifier techniques. A vibration fixture provides a means for supporting an etched circuit card and various configurations of circuit card connectors during sinusoidal vibration testing in each of three mutually orthogonal directions. Vibration input parameters selected are ±25 g peak over a frequency range of 30 to 3000 Hz. An additional vibration requirement concerning the fixture is that fixture dynamic response over the test frequency range would not significantly affect the resonance characteristics of the card/connector combination.

Noise measured can be expressed as a varying change in total contact resistance. Theory, and previous investigation indicate that any relative movement between contact and card pad (to 0.001 inch) has the effect of the destruction of surface films and introduces semiconductor effects. In this investigation, data has been free from open circuit effects because of the low level open circuit voltage of 18 mv.

Notes:

1. Throughout the investigation, there were no indications of complete opening of the card/connector circuit and noise level amplitude varied from 0 to 1 mv with the majority of measurements falling below 500 microvolts peak-to-peak.
2. This innovation is more completely described in Marshall Space Flight Center Document D5-13286-2, dated October 6, 1966, "Test Procedures, Electrical Noise Level Study".
3. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B67-10125

Patent status:

No patent action is contemplated by NASA.

Source: S. L. Brummett
of The Boeing Company
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Category 01