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Standard Test Method for Nanosecond Event Detection for Electrical Contacts and Connectors[1]

This standard is issued under the fixed designation B878; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes equipment and techniques for detecting contact resistance transients yielding resistances greater than a specified value and lasting for at least a specified minimum duration.

1.2 The minimum durations specified in this standard are 1, 10, and 50 nanoseconds (ns).

1.3 The minimum sample resistance required for an event detection in this standard is 10 Ω.

1.4 An ASTM guide for measuring electrical contact transients of various durations is available as Guide B854.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B542 Terminology Relating to Electrical Contacts and Their Use

B854 Guide for Measuring Electrical Contact Intermittences

2.2 *Other Standards:*

IEC 801-2 ed 2:91 [3]

EN 50 082-1:94 [3]

3. Terminology

3.1 *Definitions*—Many terms used in this standard are defined in Terminology B542.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *event, n*—a condition in which the sample resistance increases by more than 10 Ω for more than a specified time duration.

4. Significance and Use

4.1 The tests in this test method are designed to assess the resistance stability of electrical contacts or connections.

4.2 The described procedures are for the detection of events that result from short duration, high-resistance fluctuations, or of voltage variations that may result in improper triggering of high speed digital circuits.

4.3 In those procedures, the test currents are 100 mA (±20 mA) when the test sample has a resistance between 0 and 10 Ω. Since the minimum resistance change required to produce an event (defined in 3.2.1) is specified as 10 Ω (see 1.3), the voltage increase required to produce this event must be at least 1.0 V.

4.4 The detection of nanosecond-duration events is considered necessary when an application is susceptible to noise. However, these procedures are not capable of determining the actual duration of the event detected.

4.5 The integrity of nanosecond-duration signals can only be maintained with transmission lines; therefore, contacts in series are connected to a detector channel through coaxial cable. The detector will indicate when the resistance monitored exceeds the minimum event resistance for more than the specified duration.

4.6 The test condition designation corresponding to a specific minimum event duration of 1, 10, or 50 ns is listed in

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[1] This test method is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.11 on Electrical Contact Test Methods.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

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Table 1. These shall be specified in the referencing document.

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