



# Standard Guide for Measuring Electrical Contact Intermittences<sup>1</sup>

This standard is issued under the fixed designation B854; 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.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 The techniques described in this guide apply to electrical circuits that include one or more electrical contacts in devices such as slip rings, separable connectors, electromechanical relays or closed switch contacts. The user should determine applicability for other devices.

1.2 The range of techniques described apply to circuit discontinuities (intermittences) of durations ranging from approximately 10 nanoseconds to several seconds and of sufficient magnitude to cause alteration of the circuit function. Extension of the guide to shorter duration events may be possible with suitable instrumentation. Events of longer duration may be monitored by techniques for dc measurements such as those described in Test Methods B539 or by adaptation of methods described in this guide.

1.3 The techniques described in this guide apply to electrical circuits carrying currents typical of signal circuits. Such currents are generally less than 100 ma. Extension of these techniques to circuits carrying larger currents may be possible, but the user should evaluate applicability first.

1.4 *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 Safety Data Sheet (SDS) 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:<sup>2</sup>

<sup>1</sup> This guide 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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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

B539 Test Methods for Measuring Resistance of Electrical Connections (Static Contacts)

B542 Terminology Relating to Electrical Contacts and Their Use

B615 Practice for Measuring Electrical Contact Noise in Sliding Electrical Contacts

B878 Test Method for Nanosecond Event Detection for Electrical Contacts and Connectors

### 2.2 Other Documents:

IEC Publication 512 Test 2e Contact Disturbance<sup>3</sup>

EIA-364-46 Continuity Test Procedure for Electrical Connectors<sup>4</sup>

## 3. Terminology

3.1 Terms relevant to this guide are defined in Terminology B542 except as noted in the following section.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *intermittence, n*—a transient increase in the voltage drop across a pair of electrical contacts.

## 4. Significance and Use

4.1 This guide suggests techniques to evaluate intermittences in a contact pair while it is subjected to simulated or actual environmental stress. Such measurements are a valuable tool in predicting circuit performance under these stress conditions and in diagnosing observed problems in circuit function under such conditions.

4.2 This document is intended to provide some general guidance on the best available practices for detecting, quantifying, characterizing and reporting short duration intermittences in circuits containing electrical contacts. Certain environmental stresses such as mechanical shock, vibration or temperature change may cause intermittences. These measurement procedures include methods applicable to contacts operating under various conditions in testing or in service.

4.3 Practice B615 defines methods for measuring electrical contact noise in sliding electrical contacts. In contrast Guide

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

<sup>4</sup> Available from Electronic Industries Association, 2001 Pennsylvania Ave NW, Washington D.C. 20006.