Designation: F1662 – 16

Standard Test Method for Verifying the Specified Dielectric Withstand Voltage and Determining the Dielectric Breakdown Voltage of a Membrane Switch or Printed Electronic Device[1]

This standard is issued under the fixed designation F1662; 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 covers the verification of a specified dielectric withstand voltage or dielectric breakdown voltage of a membrane switch or printed electronic device.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1680 Test Method for Determining Circuit Resistance of a Membrane Switch

F1663 Test Method for Determining the Capacitance of a Membrane Switch or Printed Electronic Device

3. Terminology

3.1 *Definitions:*

3.1.1 *dielectric withstand voltage*—a voltage, above rated voltage, applied for a specific time between mutually insulated test points or between an insulated test point and ground, which results in no visual change or specified leakage current.

3.1.2 *dielectric breakdown voltage*—the voltage at which a disruptive discharge or excessive leakage current occurs.

3.1.3 *disruptive discharge*—flashover (surface discharge), spark over (air discharge), or breakdown (puncture discharge).

3.1.4 *leakage current*—current between mutually insulated test points when a voltage is applied.

3.1.5 *membrane switch*—a momentary switching device in which at least one contact is on, or made of, a flexible substrate.

3.1.6 *printed electronic device*—electrically functional device manufactured primarily using additive processes, with or without attached conventional or other electronic components, often in flexible format.

3.1.7 *test points*—two preselected mutually insulated locations on switch assembly.

4. Significance and Use

4.1 Dielectric withstand voltage testing is useful for design verification, quality control of materials, and workmanship.

4.2 This test method is used to verify that the membrane switch or printed electronic device can operate safely at its rated voltage, and withstand momentary overpotentials due to switching, surges and other similar electrical phenomena.

4.3 Specific areas of testing are, but not limited to:

4.3.1 Conductor/dielectric/conductor crossing point,

4.3.2 Close proximity of conductors, and

4.3.3 Any other conductive surface such as shielding or metal backing panel.

4.4 Dielectric withstand voltage testing may be destructive and units that have been tested should be considered unreliable for future use.

4.5 Testing using ac voltage may be useful for switches intended for control circuits powered by ac voltages.

5. Interferences

5.1 The following parameters may affect the results of this test:

5.1.1 Humidity,

5.1.2 Contamination, and

5.1.3 Temperature.

6. Apparatus

6.1 *Electric Device,* suitable to provide a controlled dc or ac voltage, leakage current measurement.

7. Procedure

7.1 *Dielectric Withstand Test Method:*

7.1.1 *Membrane Switch:*

7.1.1.1 Measure and record the following characteristics prior to performing test:

[1] This test method is under the jurisdiction of ASTM Committee F01 on Electronics and is the direct responsibility of Subcommittee F01.18 on Printed Electronics.

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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.