

PURPOSE AND APPLICATION

The purpose of this application note is to provide insight and guidance to manufacturers when performing an Electric Strength Test on equipment containing Integrated Power Designs (IPD) power supplies.

INSULATION DIAGRAM

Figure 1 represents a typical power supply with regards to insulation systems.

R – Reinforced Insulation, between primary and secondary

B – Basic Insulation, between primary and ground

O – Operational Insulation, between secondary and ground

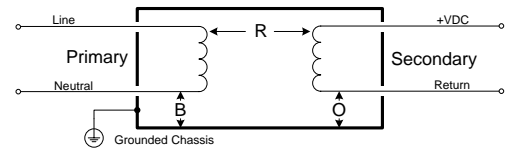


Figure 1: Typical Power Supply Insulation

GUIDANCE

1. Choose the appropriate safety standard for your product. IPD power supplies are approved to UL/CSA/EN 60601-1 and/or UL/CSA/EN 60950-1. If approved to both standards the more stringent 60601-1 requirements are used during testing regardless of end product application. UL 60601-1 1st Edition, Annex DVB, dictates test voltages used by IPD during the production line final test.
2. IPD encourages use of VDC voltages when administering the Electric Strength Test. Use of VAC voltages can damage the power supply primary to ground Y-caps, consult factory for guidance.
3. Short the primary pins, Line and Neutral, together. Short all secondary pins, VDC output, together. See Figure 2.
4. Select appropriate test voltage, test time, leakage current limit and ramp time for your application. See IPD datasheets for test voltage and time applied for the specific product in use. IPD leakage current limit is set to 5mA max. when applying VDC test voltages. Ramp time is described in 60601-1 3rd Ed., clause 8.8.3. See Figure 3.
5. Care should be taken to ensure that the voltage applied to reinforced insulation does not overstress basic insulation. Basic insulation may need to be removed prior to a test of reinforced insulation, i.e. Y-caps.
6. Corona discharge or a single momentary flashover is not regarded as insulation breakdown or an electrical strength failure.
7. In the event an electric strength failure is found, remove the IPD power supply, and test outside the end product equipment. Inadequate spacings between the power supply and end product equipment can cause electric strength failures.

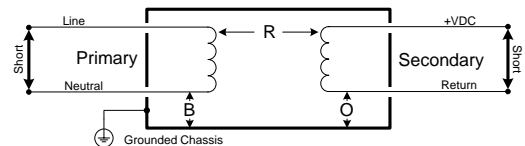


Figure 2: Power Supply Configuration

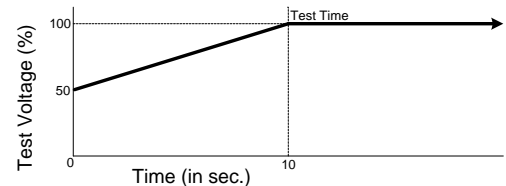


Figure 3: Test Voltage Ramp Characteristics