PCB Spark Gap for ESD Current Diversion

Description

- Electrostatic discharge (ESD) may happen across isolated parts in an isolated power supply
- Discharge current naturally takes the path of the least resistance that may undesirably be through the electrical circuitries Interrupting functionality of sensitive devices that results in malfunction of the power supply
- An alternative ESD bypass pathway with one or more spark gaps is laid out on PCB through which the ESD current or any generated noise is safely conducted back to the AC source
- The bypass pathway includes a preferable protection path bordering a portion of the isolation region and an ESD conducting path that borders a periphery of PCB

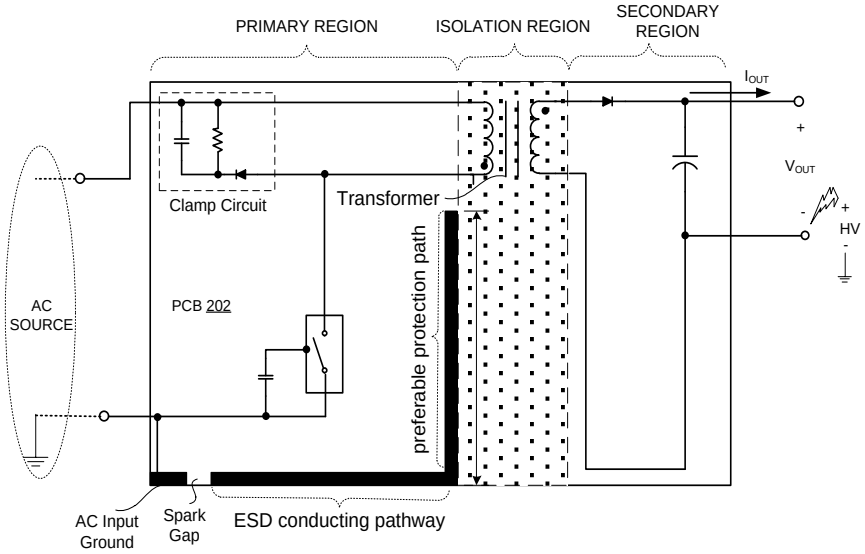

Figure 1. Schematics of an example isolated power supply where an ESD current pathway with spark gap protects the primary circuitry

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Benefits

- Protects the sensitive devices from undesirable electrostatic discharge path that may effect operation of power supply
- The preferable protection path is a protective barrier to the primary circuitry in the case that dust or other conducting particles may form conducting path between primary and secondary
- The ESD conducting path at periphery border of PCB ensures redirecting the ESD current away from the sensitive components to the AC input ground
- The multiple spark gaps along the conducting path distributes the spark energy
- Could be used on any PCB layout of the isolated power supplies with devices sensitive to ESD or noise

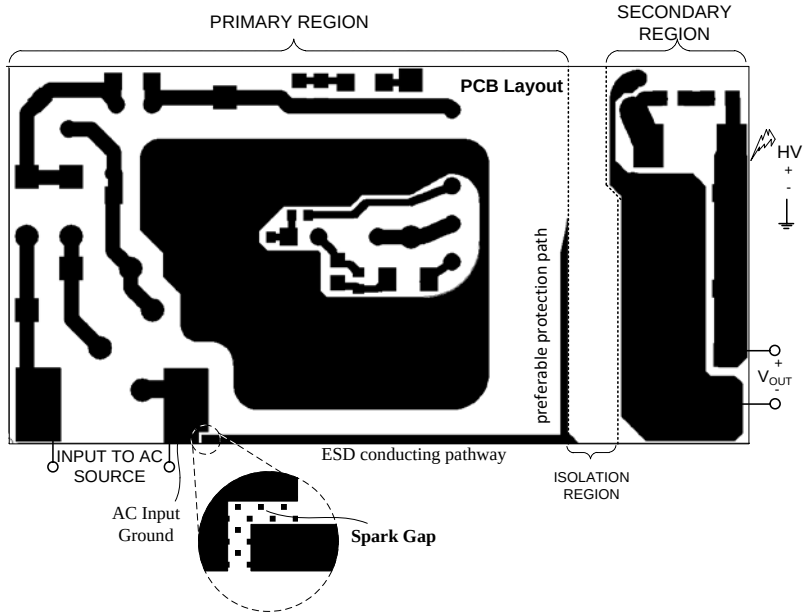

Figure 2. An example PCB layout of the power supply in Figure 1 with the spark gap pathway adjacent to the AC input ground terminal

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