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## PARTIAL Forensic Analysis Report Sample

### COPYRIGHT STATEMENT

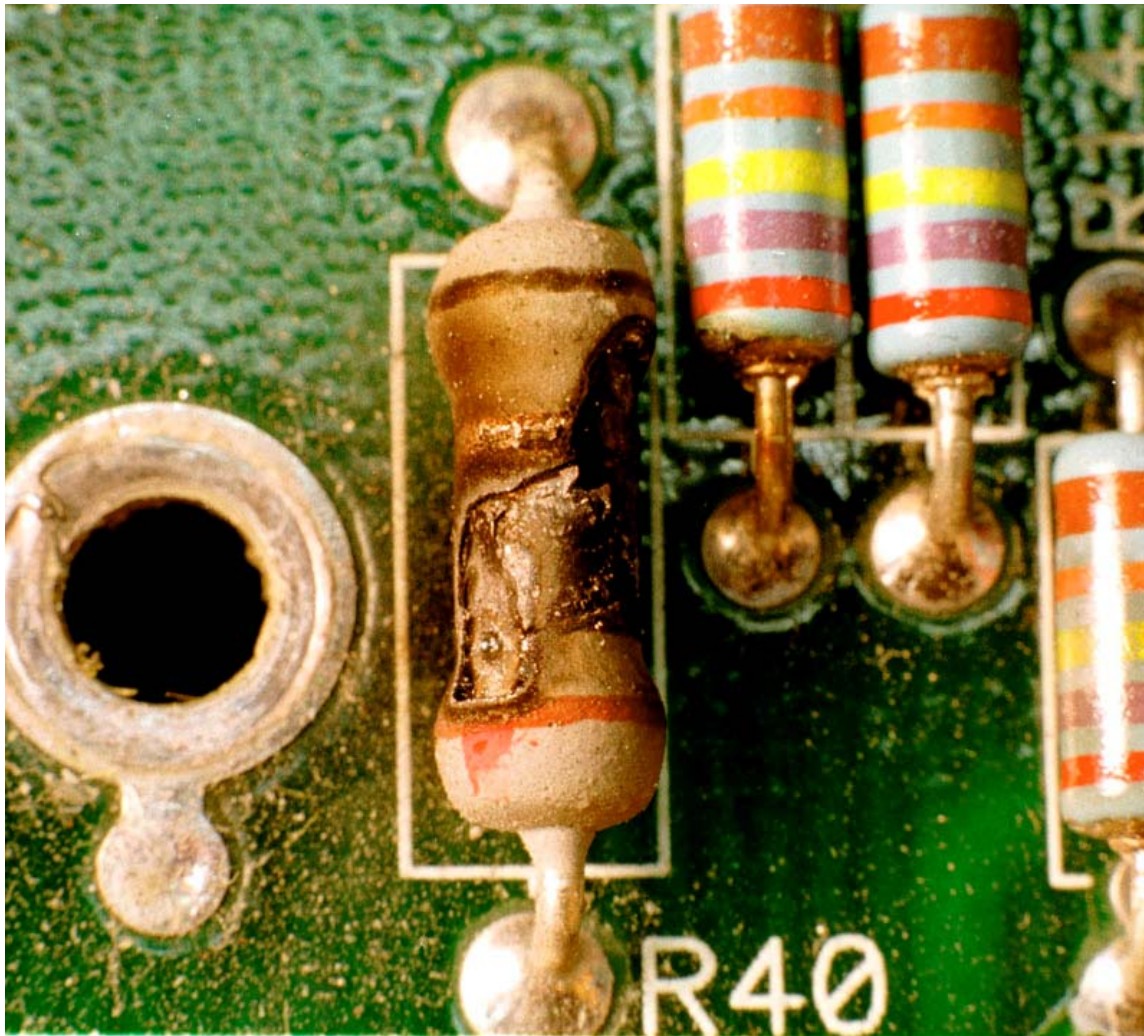
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We have made a preliminary forensic analysis of one switch mode power supply used to power a #####, model #####\_##### switch. The power supply had failed catastrophically at the client's location, rendering the product unusable. There were no observations given by the client about the moment of failure of the unit.

Our investigation of the power supply determined that the manufacturer was #####. It was a custom switch mode power supply (Pulse Width Modulation type) manufactured specifically for the ##### application, model number #####, Part ##### REV. 05, Serial No. #####, dated September 2004, with an rated output power of 248W. The unit appeared to follow conventional industry manufacturing practices with no unusual configurations detected and showed high quality design features. We did not detect any gross quality defects in the assembly, and the unit had stickers from quality assured tests with inspector stamps.

The failed unit did show visible signs of damage on certain components. Of note was a fixed resistor, R40 that had burn marks on the outer casing with vitrification of the resistive element. This failure mode can occur when an abnormally high current pulse passes through the component, causing extreme heating of the resistive element and subsequent fusion of the resistive element into a glassy substance. This resistor is located in the same circuit trace as the main high voltage capacitor C13, rated at 330uF/ 450VDC. Any fault in the power supply would cause current in the large

capacitor to seek a path to ground with the least resistance. Resistor R40, the lowest rated resistor in the vicinity of C13, has a power rating of 1W or less and would not be able to sustain a large surge of current. Thus failure of the resistor occurred when the fault was present in the power supply. (See picture below)

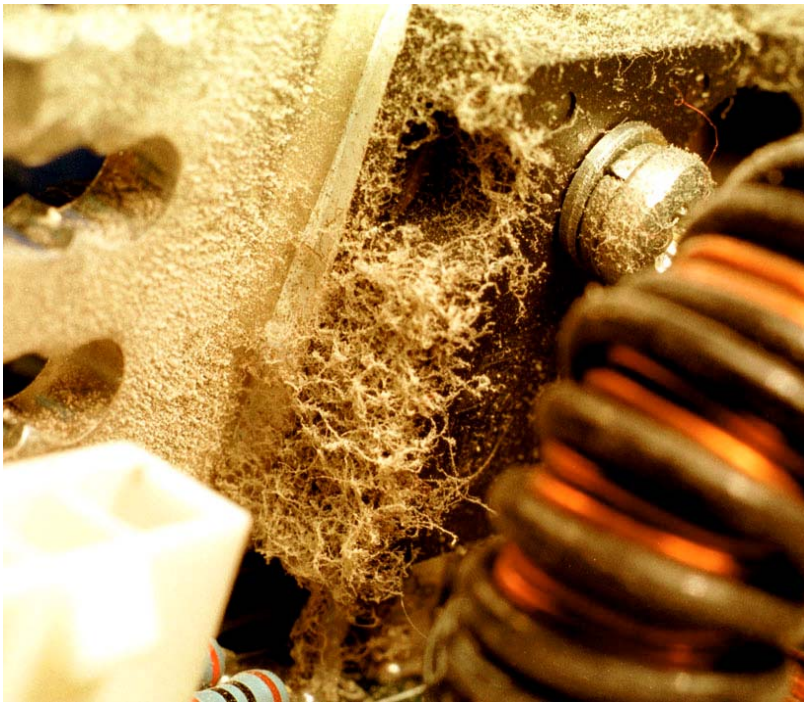


Preliminary electrical analysis showed that a few components had failed, these included the semiconductors located at Q3, Q9, resistor R40, the main unit fuse F1. Other components may also have failed in the power supply. The input varistor was intact as well as the main charge electrolytic capacitor. We did not conduct an exhaustive test of all components located in the power supply. This would require desoldering each component individually and testing for failures. As the unit is a proprietary MDI product, the electrical schematics of the power supply are not available, and complete testing would not be possible.

Upon disassembly of the power supply we did notice the presence of large amounts of debris on certain components. This consisted of dust and fibers that had adhered to the surfaces of semi-conductors and power resistors. Viewing of the debris under moderate magnification showed that several types of fibers were present in the debris. These included (and are not limited to) hair, plastic filaments, textile fibers, black filaments resembling carbon fibers and very small shiny strands. A complete analysis of the fiber masses was not conducted at the time of our investigation. The fibers bridged the gap between semiconductor ground plates and heat sinks used for cooling, as well as bridging one lead of AC high voltage resistor, R76, to the heat sink. Inspection of the metal chassis housing the power supply revealed a small protrusion of dust and debris on the metal plate that contacted the edge of the circuit board near component location fuse F2. (See pictures below).



Dust and debris at component location BR100



Dust and debris at component location CR24



Dust and debris at component location R76

**END OF SAMPLE**