

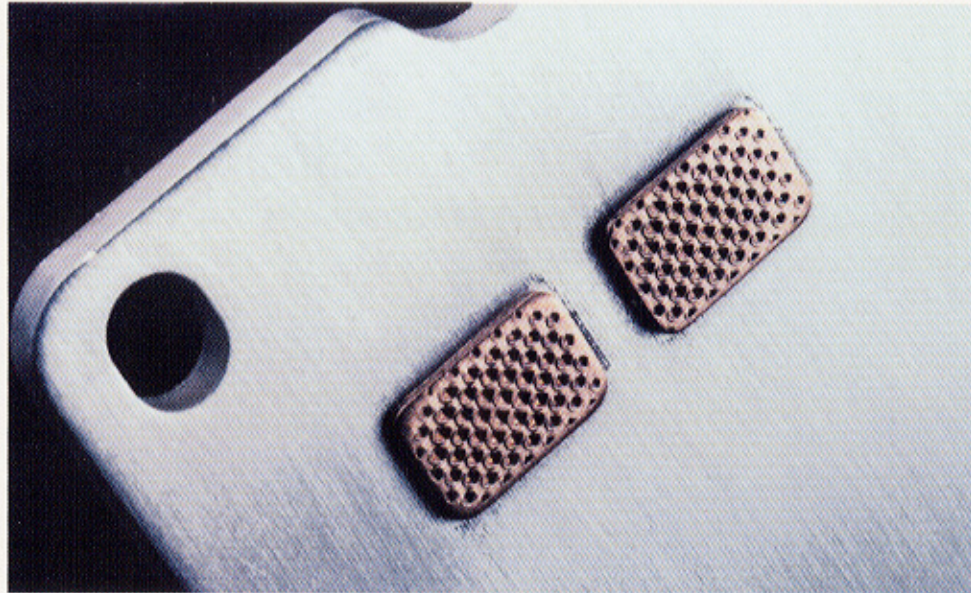


AMTECH[®]
WORLD LEADER IN
ULTRASONIC METAL WELDING

APPLICATIONS

APPLICATION BRIEF #16
HEAT SINK - 2/95

Ultrasonic Welding of Copper pads onto Aluminum Backplates



View Showing Finished Ultrasonic Welds

THE PROBLEM: Designers integrating high power density semiconductors and heat sinks into one assembly must achieve an excellent thermal and mechanical connection. One solution is an assembly consisting of an aluminum heat sink and a copper pad which will readily accept a solder connection. Previously, bonding of the copper pad to aluminum could only be accomplished if the aluminum was plated to accept a solder connection. This was an expensive and unreliable technique that compromised the thermal conductivity aspect of the assembly.

THE SOLUTION: Employ ultrasonic welding to join the copper pad to the aluminum heat sink. This technique has several advantages: it creates a metallurgical bond between the aluminum and copper, which provides a reliable mechanical connection and superior thermal path, and it eliminates the costs of the extra plating and soldering processes.

THE APPLICATIONS: Production applications vary from heavy duty diode assemblies in automotive alternators to ignition modules and other "under the hood" monitoring and control devices, as well as discreet high power circuits used in a variety of other products.

AmTech's ultrasonic equipment and process accomplish in one simple operation what used to take several operations. Additionally, the ultrasonic process is easily automated, and its clearly defined variables are monitored and controlled to ensure consistent, high quality results throughout the production cycle.

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