At 2011 IMAPS conference & exhibition in October, hold in Long Beach, CA., ANCeram presented a paper on:

Silicon Nitride Substrates with AMB Copper Conductor

ANCeram (www.anceram.com) has recently developed a tape cast, gas pressure sintered Silicon Nitride ceramic exhibiting a thermal conductivity three times higher than that of typical Silicon Nitride materials and with good flexural strength .

The increase in thermal conductivity is the result of using different types of sintering aids as well as optimizing their content in the material. The high bending strength allows for the design of thinner substrates compared to other typical power electronics ceramic materials such as Aluminum Nitride. This thickness reduction leads to a decrease of the total substrate thermal resistance which improves the heat dissipation. For the AMB (Active Metal Brazing) process a silver based active brazing solder optimized for Silicon Nitride was used. The copper surface can be coated on request with Nickel or Nickel/Gold alloys for improved solderability and wire bondability as well as for corrosion protection.

The Silicon Nitride substrate with AMB Copper Conductor lines and fully plated back side ground shows a much higher reliability than comparable substrates made out of typical ceramic materials. The heat dissipation is comparable to that of conventional AMB substrates made of high thermal conductive ceramic such as Aluminum Nitride, but the thermal cycling behavior easily surpasses the limits reached with AlN-AMB or AlN-DCB. Tests results according to MIL-STD. 883G are available.

For more information, please visit ANCeram booth # 119 or contact JB Lafon at anceram@euro-industries.net / 719 264 6111.