

HIGH THERMAL CONDUCTIVITY LOSSY  
DIELECTRICS USING A MULTI-LAYER  
APPROACH, J. O. Kiggans, T. N. Tiegs, B.  
Mikijelj<sup>†</sup> and, P. A. Menchhofer  
Oak Ridge National Laboratory, Oak Ridge, TN  
37831-6087

<sup>†</sup>Ceradyne, Inc., Costa Mesa, CA

Lossy ceramics are used as load materials in high power microwave sources. Desired properties of the materials are high thermal conductivity and high dielectric strength. BeO-based composites had been used, but due to toxicity issues, are being replaced by AlN-based materials. However, the initial AlN substitutes did not have the desired thermal conductivity. By using a multi-layer approach, high thermal conductivity AlN-based composites with high dielectric strengths were developed.