Integrated Thin-Film Resistor Materials for High-Frequency Applications

John Andresakis
Ohmega Ticer
john.andresakis@ohmegaticer.com

As AESA radar and mmWave systems push into higher frequencies and tighter phase tolerances, passive component parasitics increasingly limit system performance. Traditional surface-mount resistors introduce inductance, insertion loss, and assembly variability that can degrade phase consistency, increase calibration burden, and impact signal integrity above 30 GHz.

This presentation examines how embedded thin-film resistors function as planar RF elements rather than lumped components — reducing parasitic inductance, improving phase consistency, and enhancing high-frequency performance. Real-world Ka-band power divider results and insertion loss comparisons will be discussed, along with practical design considerations, tolerance implications, and when embedded resistors are (and are not) appropriate.

Agenda

- Performance challenges in modern AESA systems
- Electrical comparison: embedded vs discrete
- Ka-band & 40 GHz data
- Reliability & tolerance realities
- Design checklist and limitations
- Q&A