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Title:Electrical performance of carbon nanotube-polymer composites at frequencies up to 220 GHz
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Abstract:We have measured the sub-THz electrical response of screen printed carbon nanotube-poly(methyl methacrylate) polymer composites up to 220 GHz. The measured electrical losses using mm long coplanar waveguide geometries averaged as low as 0.15 dB/mm in the frequency range 40 GHz-110 GHz and showed a reduction in signal loss with increasing frequency; a behaviour opposite to that found in conventional metallic conductors. Between 140 and 220 GHz, the electrical losses averaged 0.28 dB/mm. We show that the low electrical losses are associated with the capacitive coupling between the nanotubes and discuss potential high frequency applications.
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