

93

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Title:Narrowband terahertz emitters using metamaterial films

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Abstract:In this article we report on metamaterial-based narrowband thermal terahertz (THz) emitters with a bandwidth of about 1 THz. Single band emitters designed to radiate in the 4 to 8 THz range were found to emit as high as  $36 \text{ W/m}^2$  when operated at  $400 \text{ }^\circ\text{C}$ . Emission into two wellseparated THz bands was also demonstrated by using metamaterial structures featuring more complex unit cells. Imaging of heated emitters using a microbolometer camera fitted with THz optics clearly showed the expected higher emissivity from the metamaterial structure compared to low-emissivity of the surrounding aluminum. &copy; 2012 Optical Society of America.

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