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Title:A novel terahertz rat-race hybrid coupler based on ppdw

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Abstract:A novel rat-race hybrid coupler based on parallel-plate dielectric waveguide (PPDW) is proposed. PPDW has been proposed as a basic terahertz transmission line for its remarkable simple structure and comparatively low attenuation at terahertz frequency band. It can be applied to design many terahertz components. In this paper, a $(3N + 3/2) \times \lambda$ circumference PPDW rat-race hybrid coupler operating at quasi-TE₁₀ mode is studied. The investigation results show that, at 0.34 THz, the transmission losses of the two split output ports are both equals -3.2 dB; the return loss at its input port is below -20 dB; the insertion loss at each split transmission port is less than 0.2 dB; and the two isolated ports show good isolation of above 20 dB. Therefore, it will have wide potential applications at terahertz frequency band.

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