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标题: Research of sine waveguide slow-wave structure for a 220-GHz backward wave oscillator
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摘要: A watt-class backward wave oscillator is proposed, using the concise sine waveguide slow-wave structure combined with a pencil electron beam to operate at 220 GHz. Firstly, the dispersion curve of the sine waveguide is calculated, then, the oscillation frequency and operating voltage of the device are predicted and the circuit transmission loss is calculated. Finally, the particle-in-cell simulation method is used to forecast its radiation performance. The results show that this novel backward wave oscillator can produce over 1-W continuous wave power output in a frequency range from 210 GHz to 230 GHz. Therefore, it will be considered as a very promising high-power millimeter-wave to terahertz-wave radiation source.
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