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标题: Broadband conversion of TE01 mode for the coaxial gyrotron at low terahertz
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摘要: This paper investigates the mode characteristics of coaxial waveguide and proposes a mechanism to convert a rectangular TE10 mode to a coaxial TE01 mode. Four-wave, eight-wave, and sixteen-wave coupling structures are developed to selectively excite the desired coaxial TE01 mode with different outer to inner radius ratios. The proposed structures can suppress the unwanted parasitic modes and lead to high converting efficiency with broad bandwidth. The measured 3-dB transmission bandwidths at W-band are 13.5 GHz (14.3%), 8.5 GHz (9.0%), and 12.2 GHz (13.0%), respectively. These coaxial TE01 mode converters are mutually non-overlapping in their coaxial cross-sections, and therefore can be joined concentrically and utilized to develop a multi-channel gyrotron traveling-wave tube or backward-wave oscillator in a single superconducting magnet. (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.3698409]
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