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Design of a 600g Micro Pulse Tube Cryocooler

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A new coaxial micro pulse tube cryocooler has been designed for infrared detector, which has the characteristics of low vibration, long life, and high reliability. Due to the optimization of linear compressor volume and the coupling with a 10mm cold finger, it has a compact structure and 120Hz optimal frequency. The entire system weight is 600 grams, including the 380 gram compressor. The pulse tube cryocooler has achieved a minimum temperature of 51K, and a cooling capacity of 1.2W at 80K with an input power of 45W. It takes less than 3 minutes to cool down from 300K to 80K with payload. This paper describes the components and presents test data of this pulse tube cryocooler.