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Abstract:A high sensitivity broadband terahertz direct detector based on YBa 2Cu3O7 high-Tc superconductor microbolometers is presented. At 77 K, the responsivity of the spiral antenna-integrated microbolometers (1.5 um×1.5 um) is 190 V/W, referenced to the input of the silicon substrate lens, across the frequency range of 330 GHz-1.63 THz in a single device. The response time is approximately 300 ps. Using a room temperature readout, we measure an optical noise equivalent power (NEP) of 20 pW/Hz0.5 (readout noise limited) for modulation frequencies ranging from 500 Hz to 100 kHz.
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