

Abstract Submitted  
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**Bolometric photo response of dual-gated bilayer graphene**<sup>1</sup> JUN YAN, M.-H. KIM, Center for Nanophysics and Advanced Materials and Department of Physics, University of Maryland, College Park, J.A. ELLE, Institute for Research in Electronics and Applied Physics, and Department of Physics, University of Maryland, College Park, A.B. SUSHKOV, G.S. JENKINS, Center for Nanophysics and Advanced Materials and Department of Physics, University of Maryland, College Park, H.M. MILCHBERG, Institute for Research in Electronics and Applied Physics and Department of Physics, University of Maryland, College Park, H.D. DREW, M.S. FUHRER, Center for Nanophysics and Advanced Materials and Department of Physics, University of Maryland, College Park — We study the photo response of dual-gated bilayer graphene devices under infrared radiation. By comparison to Joule heating measurements using a second harmonic transport technique, we determine that the photo response is bolometric instead of photoconductive. The measured large electron-phonon heat resistance of our device is in good agreement with theoretical estimates in magnitude and temperature dependence, and enables our graphene bolometer operating at a temperature of 5 K to have a low noise equivalent power ( $33 \text{ fW/Hz}^{1/2}$ ) and fast response time (sub nanosecond).

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