

Abstract Submitted
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A Hybrid Microwave Source and Irradiator for Biological Lab On a Chip Applications. DAVID ISSADORE, Harvard University, Department of Engineering and Applied Sciences, TOM HUNT, KRISTI ADAMSON, Harvard University, Physics, ROBERT WESTERVELT, Harvard University, Department of Engineering and Applied Sciences, RICK ROGERS, Harvard Medical School — Using a standard lithographic process, we have built a hybrid microwave irradiator for use in microwave enhanced chemistry and localized, rapid heating. The device combines a 100mW microwave source with a near field antenna to produce an entirely on-chip system for delivering microwave energy into a thin($<100\mu\text{m}$) layer above a substrate. The antenna utilizes a serpentine wire pattern to produce a thin layer of intense microwave electromagnetic field intensity that falls off exponentially in distance away from the substrate. The device, including RF electronics, was built on a standard 1" by 3" glass slide, and several antenna pixel sizes are tested for Biological Lab On a Chip Applications. This work is made possible by the NSEC NSF grant PHY-0117795.

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