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A microstrip spin-wave amplifier MINGQIANG BAO, AMBER CHEN, ALEX KHITUN, KANG WANG, University of California, Los Angeles, AJEY JACOB, Intel — To date, the spin-wave logic devices are seen promising for parallel data processing at high speed [Appl. Phys. Lett. 87, 153501 (2005), and Superlattices and Microstructures 38, 184 (2005)]. However, there is no power gain with the current spin-wave logic devices yet, and the spin-wave cannot propagate a long distance because of the spin-wave dumping effect. All those will prevent the spin-wave devices from real applications. Here we report a spin-wave amplifier with a power gain that is controlled by the pumping power level: At the pumping power of 16 dBm at 2.6 GHz, the power gain is 6.4 dB and the frequency is 1.3 GHz. The amplifier is made from a permalloy film with its thickness of 25 nm. The signal input, pump wave input, and signal output are simple microstrip lines, thus the device structure is simple.

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