Abstracts

A novel HMSM photodetector with resonant cavity for short haul communications

Xiying Chen, B. Nabet, F. Quaranta, A. Cola and M. Currie. "A novel HMSM photodetector with resonant cavity for short haul communications." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 1281-1284 vol.2.

A novel RCE (resonant-cavity-enhanced) HMSM (Heterostructure Metal-Semiconductor-Metal) photodetector with Al/sub 0.24/Ga/sub 0.76/As/Al/sub 0.9/Ga/sub 0.1/As distributed Bragg reflector is presented. The photocurrent spectrum shows a clear peak at 850 nm wavelength with full width at half maximum (FWHM) of around 30 nm. The top reflector is a delta modulation doped Al/sub 0.24/Ga/sub 0.76/As that also acts as the barrier enhancement layer thus providing very low dark current values. I-V curve shows that there is a five-fold decrease in dark current, with bias less than 10 V and a factor of two increase in photocurrent as a result of delta doping. Time response measurements gives a 3 dB bandwidth of about 33 GHz. Combination of low dark current, fast response, wavelength selectivity, and compatibility with high electron mobility transistors makes this device especially suitable for short haul communications purposes.

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