

88. Title: Operation of resonant-tunnelling oscillators beyond tunnel lifetime limit

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Abstract: The tunnel lifetime of the electrons in the quantum well of a resonant-tunnelling diode (RTD) is usually assumed to be imposing an inherent fundamental limitation on the operating frequencies of RTD oscillators. Here, we experimentally demonstrate that one can overcome the limitation by heavy doping of the RTD collector. We present RTD oscillators with the fundamental oscillation frequency up to a factor of 3 above the tunnel lifetime limitation. Our results indicate that the inherent frequency limitations of RTDs should lie far above the state-of-the-art frequency of the contemporary RTD oscillators.