

## High power room temperature, compact, narrow line THz source as a local oscillator for THz receivers

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**Abstract**—We present a continuous wave terahertz source based on intracavity difference frequency generation within a dual color vertical external cavity surface emitting laser. Using a nonlinear crystal with a surface emitting phase matching scheme allows for high conversion efficiencies. Due to the tunability of the dual mode spacing, the entire spectral range of the terahertz gap can be covered. The terahertz output scales quadratically with the intracavity intensity, potentially allowing for terahertz intensities in the range of 10s of milliwatts and beyond. This source has already shown great promise as a high power THz local oscillator. We present initial testing results and remaining the challenges.