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HIGH POWER LASER DIODES

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Rare earth ions can be efficiently pumped by Ga Al As / Ga As laser diode emitters. For exemple the 808 nm wavelengt fits well with a strong absorption line of Nd ion in YAG material to implement Diode Pumped Solid State Lasers.

Recent improvements in structures, epitaxial conditions and technological process have proved the feasibility of high power Ga Al As / Ga As laser diodes with strong efficiency.

In this paper, we will describe recent work done at THOMSON and we will present the main results measured on laser diode bar array structures (1 cm long). More than 10 W CW are obtained with bars formed by 30 arrays of 10 coupled stripes. Optical to electrical efficiency is 35 %. Linear characteristics have been measured over 60 W of peak power in a QCW operating mode (pulse width = 200 μ s and a repetition rate of 50 Hz).

Wavelength characteristics and thermal behavior will be analysed as a function of geometries and submounts.

Then we will discuss the possibility of more advanced monolithic structures for high optical power density.