

# E 500: Optical Detected Magnetic Resonance



Dedicated ODMR accessory for X- and Q-Band

## Device Characteristics

- High speed microwave amplitude modulation
- CW microwave amplifier for X- and Q-Band
- Up to 1 GS/s digitizer rate



(a) Typical ODMR spectra by monitoring the total intensity of the band-to-band photoluminescence from an  $\text{GaN}_{0.021}\text{As}_{0.979}$  epilayer, obtained at 3K under  $\sigma^x$  and  $\sigma^+$  excitation at 850 nm. The microwave frequency used is 9.2823 GHz. A simulated ODMR spectrum of the identified  $\text{Ga}_i$  defect (denoted by  $\text{Ga}_i\text{-C}$ ) is also shown.

(b) Calculated energy levels associated with the electronic and nuclear spin states of the  $\text{Ga}_i^{2+}$  defect. The allowed ESR transitions ( $\Delta m_s = \pm 1$  and  $\Delta m_l = 0$ ) occur when the electron spin splitting matches the microwave photon energy, and are marked by the vertical lines.

[From X.J. Wang, I.A. Buyanova, F. Zhao, D. Lagarde, A. Balocchi, X. Marie, C.W. Tu, J.C. Harmand and W.M. Chen, Nature Materials 8, 198 (2009)]

