Time-Of-Flight Demo Board Showcases GaN Speed In Driving Lasers

Efficient Power Conversion's EPC9144 is a demonstration board for a 15-V, 28-A high-current pulsed laser diode driver. In time-of-flight systems, speed and accuracy of object detection is critical. As demonstrated on this board, the rapid transition capability of the EPC2216, an AEC Q101-qualified 15-V, 28-A enhancement-mode GaN power transistor, provides power pulses to drive laser diodes, VCSELs or LEDs at speeds up to ten times faster than an equivalent silicon MOSFET, in a small fraction of the area, energy, and cost according to EPC (see Figs, 1 and 2).

eGaN FETs and integrated circuits provide the high current pulses, extremely narrow pulse widths, and small size that make affordable, high-performance lidar possible. The short pulse width lead to higher resolution, and the tiny size and low cost make eGaN FETs well suited for time-of-flight applications from automotive to industrial, healthcare to smart advertising, gaming, and security.

The EPC9144 ships with an interposer board. The interposer board is a collection of break-away 5-mm x 5-mm square interposer PCBs with footprints to accommodate different lasers, RF connectors, and a collection of other footprints designed for experimentation with different loads. The use of the interposers allows many different lasers or other loads to be mounted, allowing users to test the performance with the load requirements that are appropriate to their application.

GaN is a critical factor making affordable, high-performance lidar possible. Thus, the use of GaN components further expands the number of applications where increased accuracy is vital. These applications include self-driving cars and other time-of-flight applications such as facial recognition, warehouse automation, drones and topological mapping. The EPC9144 can also be used for applications requiring a ground-referenced eGaN FET; for example, in class E or similar circuits.

The EPC9144 demonstration board is priced $378.00 each. The EPC2216 eGaN FET used on the EPC9144 demonstration board is priced at at $0.532 each in a 2.5-Ku/reel quantity. Both are available for immediate delivery from Digi-Key.

Fig. 1. The EPC9144 development board is primarily intended to drive laser diodes with high current pulses with total pulse widths as short as 1.2 ns and currents of up to 28 A, highlighting the fast switching speed of the automotive-qualified 15-V EPC2216 eGaN FET. The demo board ships with the EPC9989 interposer board with footprints for different lasers, RF connectors, and a collection of other footprints designed for experimentation with different loads.

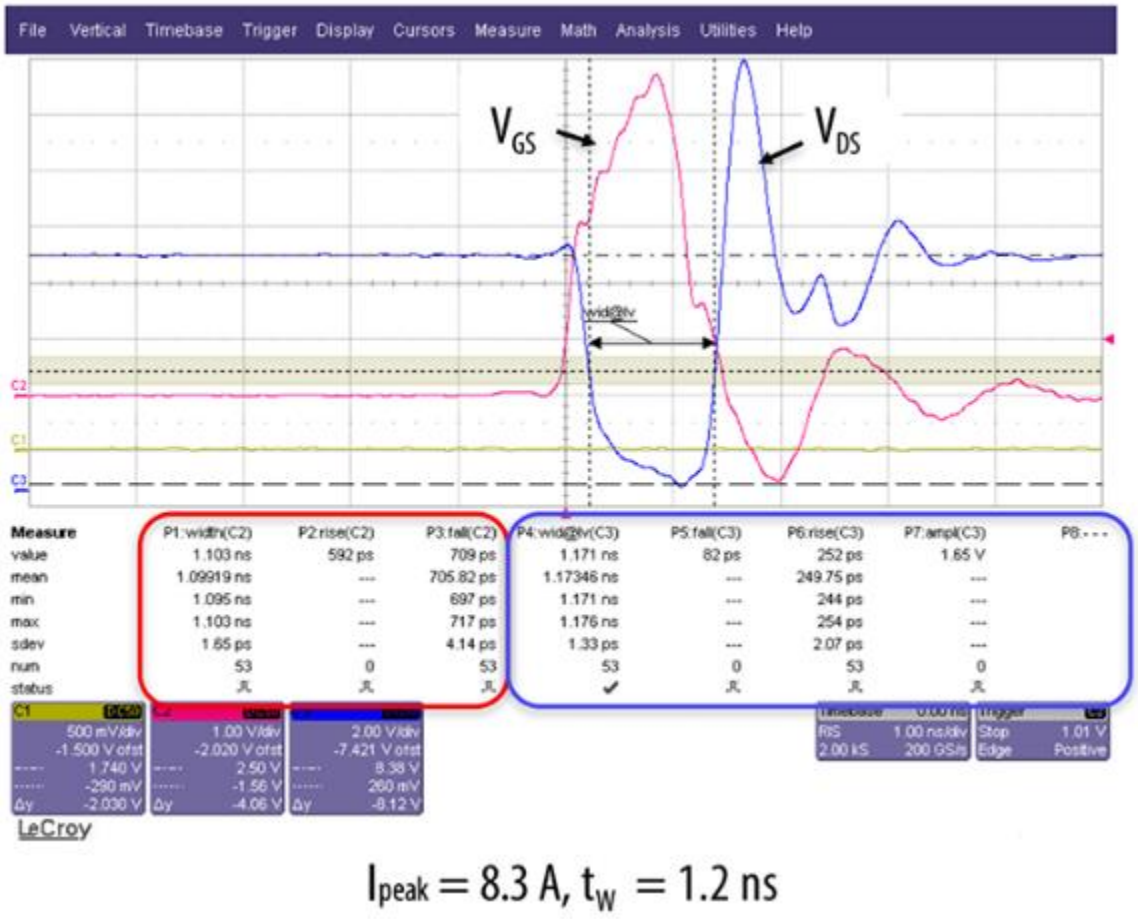

Fig. 2. The fast switching speed of the EPC2216 eGaN FET drives laser diodes, VCSELs or LEDs up to ten times faster than an equivalent silicon MOSFET. In the measurement shown, the GaN FET generates an 8.3-A pulse with a pulse width of only 1.2 ns.