ISSUE: May 2025

IToF Laser Driving Demo Board Uses Automotive-Qualified GaN FETs

From Efficient Power Conversion (EPC), the EPC91116 is a high-speed, high-current laser driver evaluation board tailored for indirect time-of-flight (iToF) applications in automotive and industrial sensing. Built around the AEC-Q101 qualified EPC2203 eGaN FET, the eval board delivers nanosecond-scale performance with a flexible, low-cost architecture that simplifies prototyping and accelerates time to market.

As iToF systems become critical for automotive driver monitoring, in-cabin sensing, and 3D mapping, designers need tools that are ready for qualification and production. The EPC91116 answers this need with support for peak currents above 10 A, pulse widths as narrow as 5 ns, and switching speeds up to 100 MHz (see the figure).

"With the EPC91116, developers get a low-cost, production-ready solution that highlights GaN's speed and power, bridging the gap between prototyping and iToF deployment," said Alex Lidow, CEO and co-founder of EPC.

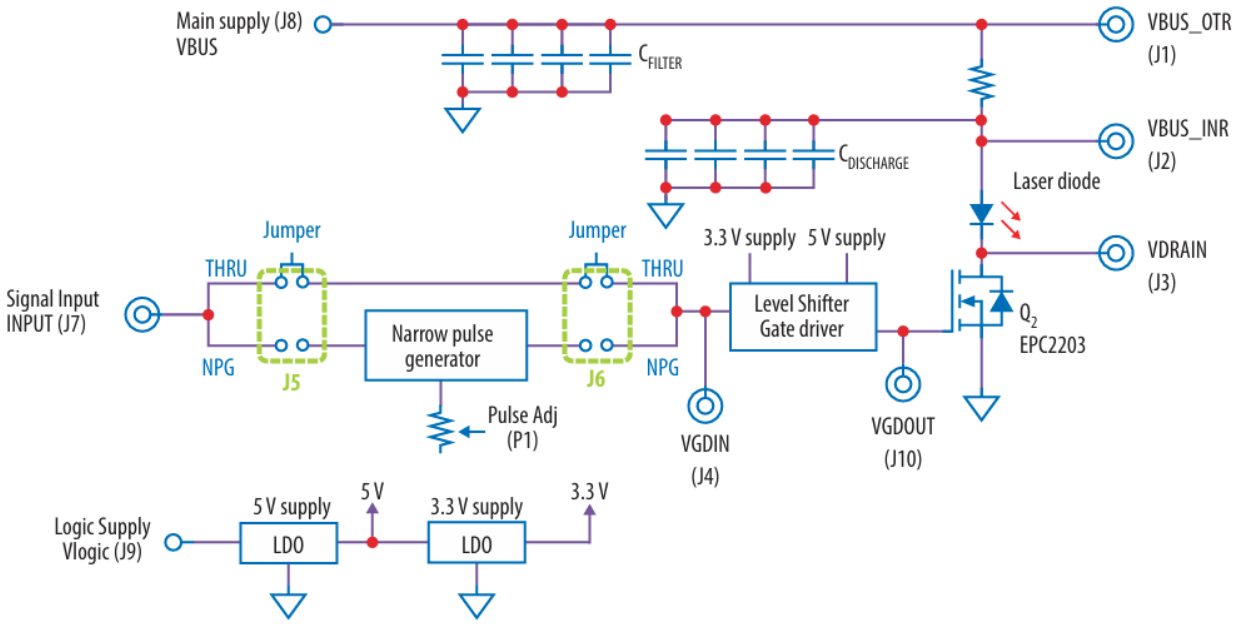
Key features include its automotive-qualified components, simplified gate drive, flexible input logic, built-in narrow pulse generator (NPG) option and its laser-ready capability. Among its automotive-qualified parts are the EPC2203, which is an 80-V, 17-A (pulsed), 0.9-mm × 0.9-mm GaN FET with 670-pC total gate charge and 80-mΩ $R_{DS(ON)}$, and the AEC-Q100-qualified 74LVC2T45GS logic-level translator.

Meanwhile, the board eliminates the need for specialized gate drivers by using a low-cost CMOS logic IC to reliably drive GaN at up to 100 MHz. Input logic is compatible with logic levels from 1.2 V to 5.5 V with simple modification. In addition, its NPG option enables precise, tunable pulse widths (5 to 60 ns) and it includes the EPC9989 interposer board for easy mounting of a variety of laser diodes and loads.

This development platform is well suited for engineers looking to implement automotive-grade iToF designs or explore other fast-switching power topologies such as Class-E amplifiers, SEPIC converters, or other lidar systems. The EPC91116 evaluation board is priced at $423.49, while the EPC2203 is priced at $0.395 each in 2,500-piece volumes.

To download datasheets, schematics, and additional documentation, see the EPC91116 page. Also see the EPC2203 page.

(a)



(b)

Figure. Tailored for indirect time-of-flight (iToF) applications in automotive and industrial sensing, the EPC91116 is a demonstration board suitable for driving laser diodes with short current pulses, achieving minimum pulse widths as low as 5 ns. It supports peak currents of more than 10 A, and a bus voltage of 40 V. This high-speed performance is enabled by EPC's eGaN FET technology, the EPC2203 in particular. Photo (a) and block diagram (b) of EPC91116 evaluation board are shown here.