SL2001 Product Brief

Features

- Flexible architecture can provide laser FWHM pulses less than 2ns
- Dual Drive Outputs Support Peak Power up to 1000W
- High charging efficiency from a 2.8V to 24V supply
- Integrates needed blocks for Charging and Firing Resonant-Mode Diode Lasers utilizing either EEL Diodes or VCSEL Arrays
- Integrated GaN/MOS Drive for charging a Resonant Capacitor
- Inductor Current Control offers precise Resonant Capacitor Energy even with Input Voltage Fluctuations
- < 5 mW System No Load Power Consumption
- Up to 10 MHz rep rate limited by temperature rise in laser and other board components
- Dual Polarity LIGHT Output signal to indicate when laser fires with extremely low jitter (time error jitter < 0.1ns)
- Minimal external components enable extremely integrated and efficient layout
- Integrated I^2C interface for Output Power Control and fault monitoring
- 7 MTP Bytes (3 time programmable) for fault and timing settings
- 219 OTP Bytes for customer usage
- 1 mm x 3.5 mm WLCSP Package

Applications

- Laser TOF Measurement Systems
- Industrial LIDAR Measurement
- Range Finding
- 3D Mapping
- ADAS LIDAR

Product Description

The SL2001 is an Integrated Laser drive system including resonant capacitor charge control, timing control, laser safety monitoring and driver for Laser Time-of-Flight Measurement Systems employing Edge Emitting Laser Diodes or VCSEL Arrays.

The integrated Pulse Timing Controller uses a proprietary Architecture to provide Light pulses less than 3 ns wide with over 1000 watts of peak output power. An internal driver provides enough drive current to fire dual GaN/MOS FETs. An output trigger signal is provided for accurate start indication of Time-of-Flight measurements.

The Resonant Capacitor C_{res} is charged during each pulse cycle from an internal boost charger. This architecture implements an inductive current generator which charges C_{res} each cycle, and minimizes losses normally associated with transferring charge from standard High Voltage Supply Rails. The supply voltage for the charger can be as low as 2.8 volts and still achieve laser diode anode voltages of > 100 volts.

I^2C addressable registers and Multiple Time Programmable fuses are provided for light power adjustment and device monitoring/protection features. The Laser Cathode is sensed to provide Laser Eye Safety.

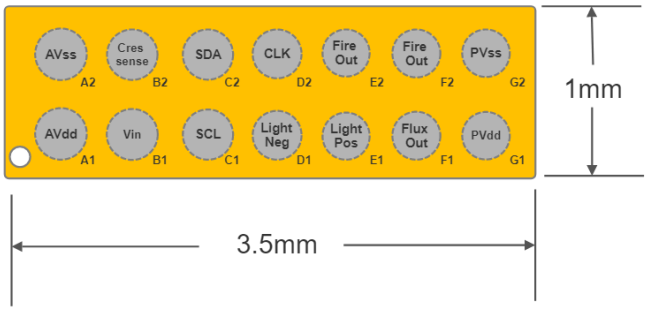

Figure 1: SL2001 Pin Out

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Functional Block Diagram

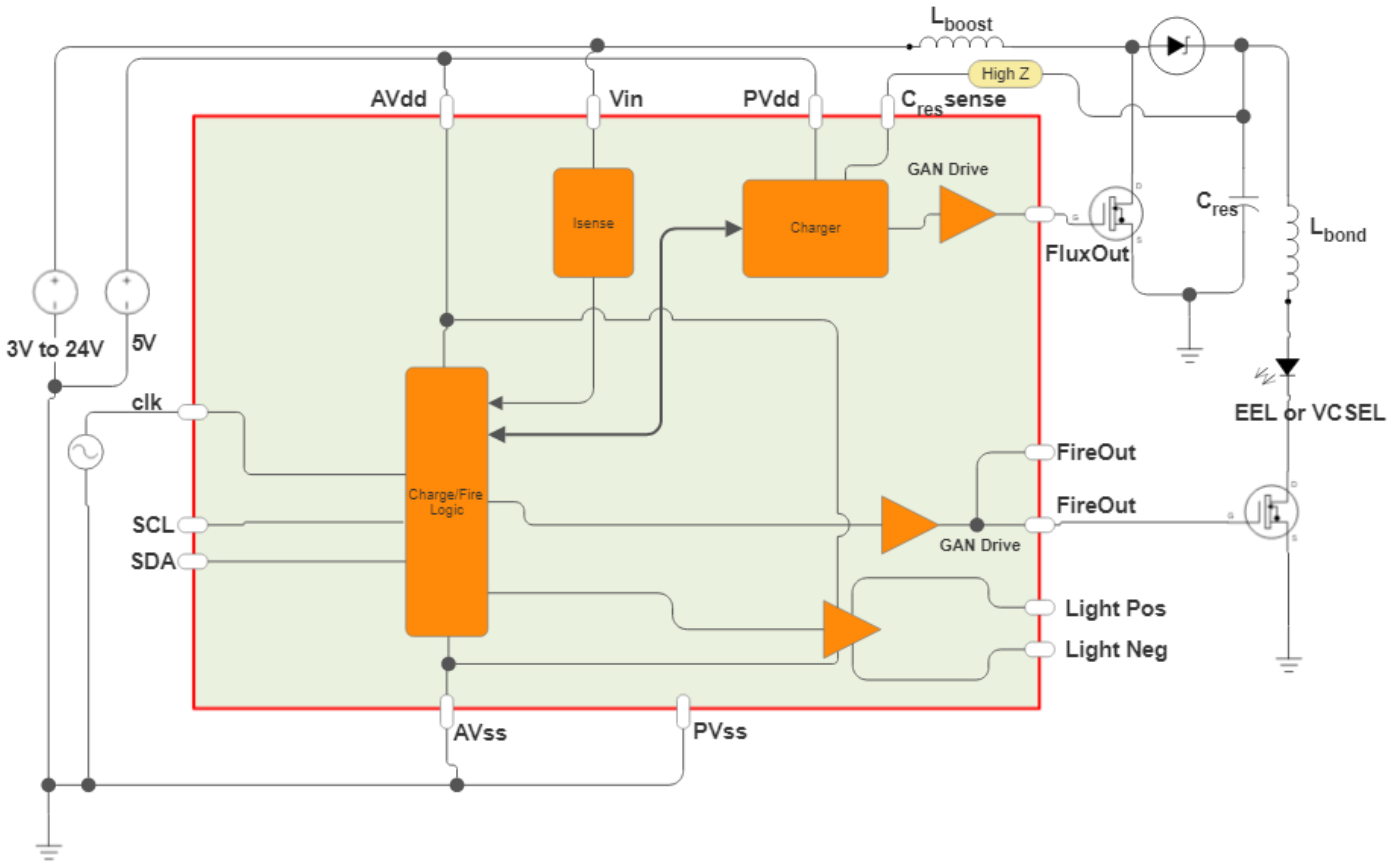

Figure 2: Functional Block Diagram

Version History

Version	Description of Change	Author	Date
1.0	Initial Review	KB	9/23/2025