



# 22-Bit Bidirectional Low-Voltage Translator

## GTL2000DGG

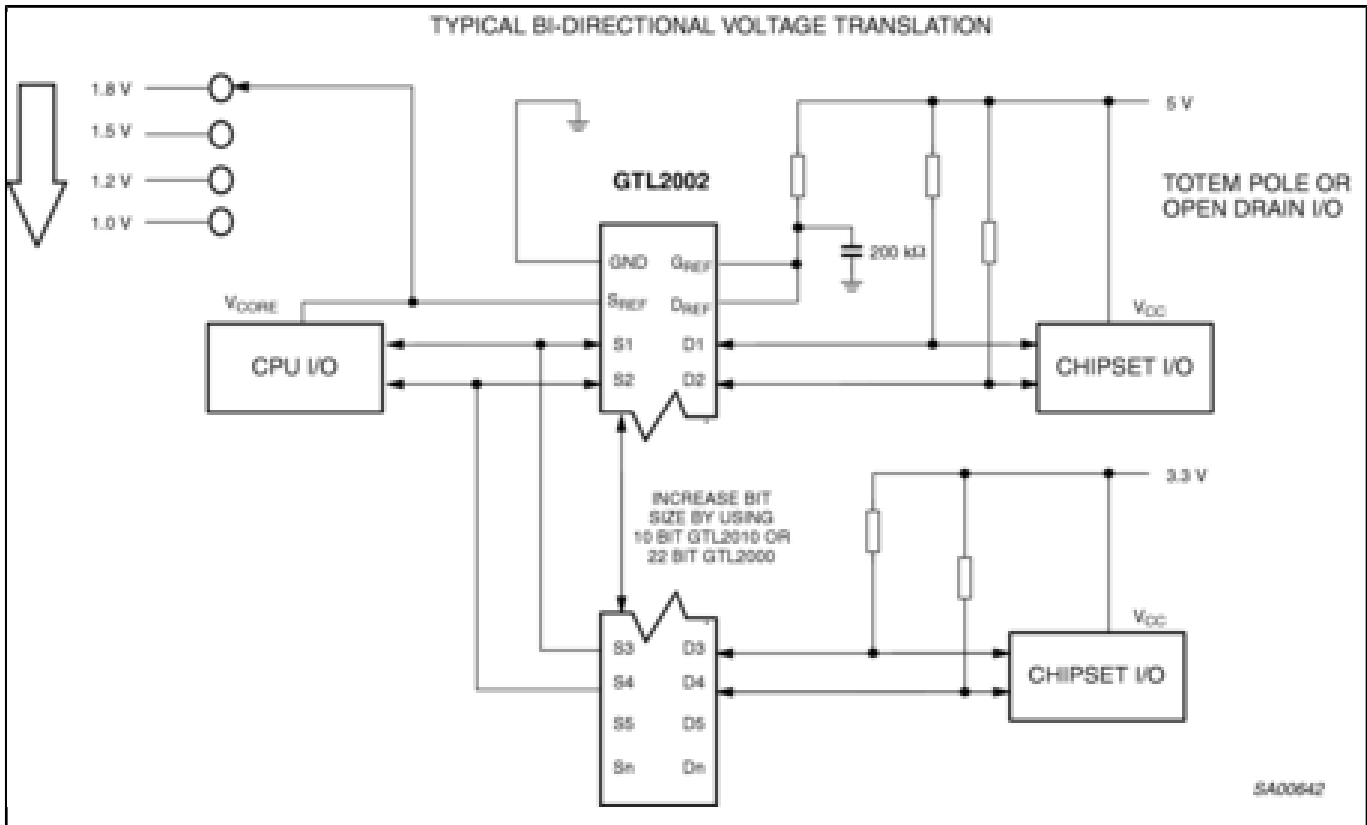
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The Gunning Transceiver Logic - Transceiver Voltage Clamps (GTL-TVC) provide high-speed voltage translation with low ON-state resistance and minimal propagation delay. The GTL2000 provides 22 NMOS pass transistors ( $S_n$  and  $D_n$ ) with a common gate (GREF) and a reference transistor (SREF and DREF). The device allows bi-directional voltage translations between 1.0 V and 5.0 V without use of a direction pin.

When the  $S_n$  or  $D_n$  port is low the clamp is in the ON-state and a low resistance connection exists between the  $S_n$  and  $D_n$  ports. Assuming the higher voltage is on the  $D_n$  port, when the  $D_n$  port is high, the voltage on the  $S_n$  port is limited to the voltage set by the reference transistor (SREF). When the  $S_n$  port is high, the  $D_n$  port is pulled to VCC by the pull up resistors. This functionality allows a seamless translation between higher and lower voltages selected by the user, without the need for directional control.

All transistors have the same electrical characteristics and there is minimal deviation from one output to another in voltage or propagation delay. This is a benefit over discrete transistor voltage translation solutions, since the fabrication of the transistors is symmetrical. Because all transistors in the device are identical, SREF and DREF can be located on any of the other twenty-two matched  $S_n/D_n$  transistors, allowing for easier board layout. The translator's transistors provides excellent ESD protection to lower voltage devices and at the same time protect less ESD resistant devices.

**GTL2000 Block Diagram Block Diagram**



View additional information for [22-Bit Bidirectional Low-Voltage Translator](#).

**Note:** The information on this document is subject to change without notice.

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