

Linear LTC4310 绝缘双向 I2C 总线通信方案

Linear 公司的 LTC4310 是绝缘的双向 I2C 总线通信器件，每个器件可把 I2C 逻辑状态编码成信号，通过绝缘层传输到另一个器件。接收器件解码，并驱动 I2C 总线到适当的确逻辑状态。主要用在绝缘的 I2C, SMBus 和 PMBus 接口，绝缘电源，以太网供电和正到负电源通信。本文介绍了 LTC4310 主要特性，典型应用以及多种应用电路框图。

The LTC®4310 provides bidirectional I2C communications between two I2C buses whose grounds are isolated from one another. Each LTC4310 encodes I2C bus logic states into signals that are transmitted across an isolation barrier to another LTC4310. The receiving LTC4310 decodes the transmission and drives its I2C bus to the appropriate logic state. The isolation barrier can be bridged by an inexpensive Ethernet, or other transformer, to achieve communications across voltage differences reaching thousands of volts, or it can be bridged by capacitors for lower voltage isolation. The LTC4310-1 is intended for use in 100kHz I2C systems. The LTC4310-2 is intended for 400kHz I2C systems.

Rise time accelerators provide strong pull-up currents on SCL and SDA rising edges to meet rise time specifications for heavily loaded systems. Data and clock Hot Swap™ circuitry prevent data corruption when a card is inserted into or removed from a live bus. When a bus is stuck low for 37ms, the LTC4310 turns off its pull-down devices and generates up to sixteen clocks and a STOP bit in an attempt to free the bus. Driving EN low sets the LTC4310 in a very low current shutdown mode to conserve power.

LTC4310 主要特性:

Bidirectional I2C Communication Between Two Isolated Buses

Full Isolation with Inexpensive Ethernet Transformers or Capacitors

Low Voltage Level Shifting

I2C Maximum Operating Frequency:

100kHz for LTC4310-1

400kHz for LTC4310-2

I2C Specification Compliant VOL, VIL

±5kV Human Body Model ESD Protection

Rise Time Accelerators

SDA, SCL Hot-Swapping

Very Low Shutdown Current

Stuck Bus Disconnect and Recovery

Thermal Shutdown

10-Lead MSOP and 3mm × 3mm DFN Packages

LTC4310 应用:

Isolated I2C, SMBus and PMBus Interfaces

Isolated Power Supplies

Positive-to-Negative Rail Communications

Power-over-Ethernet

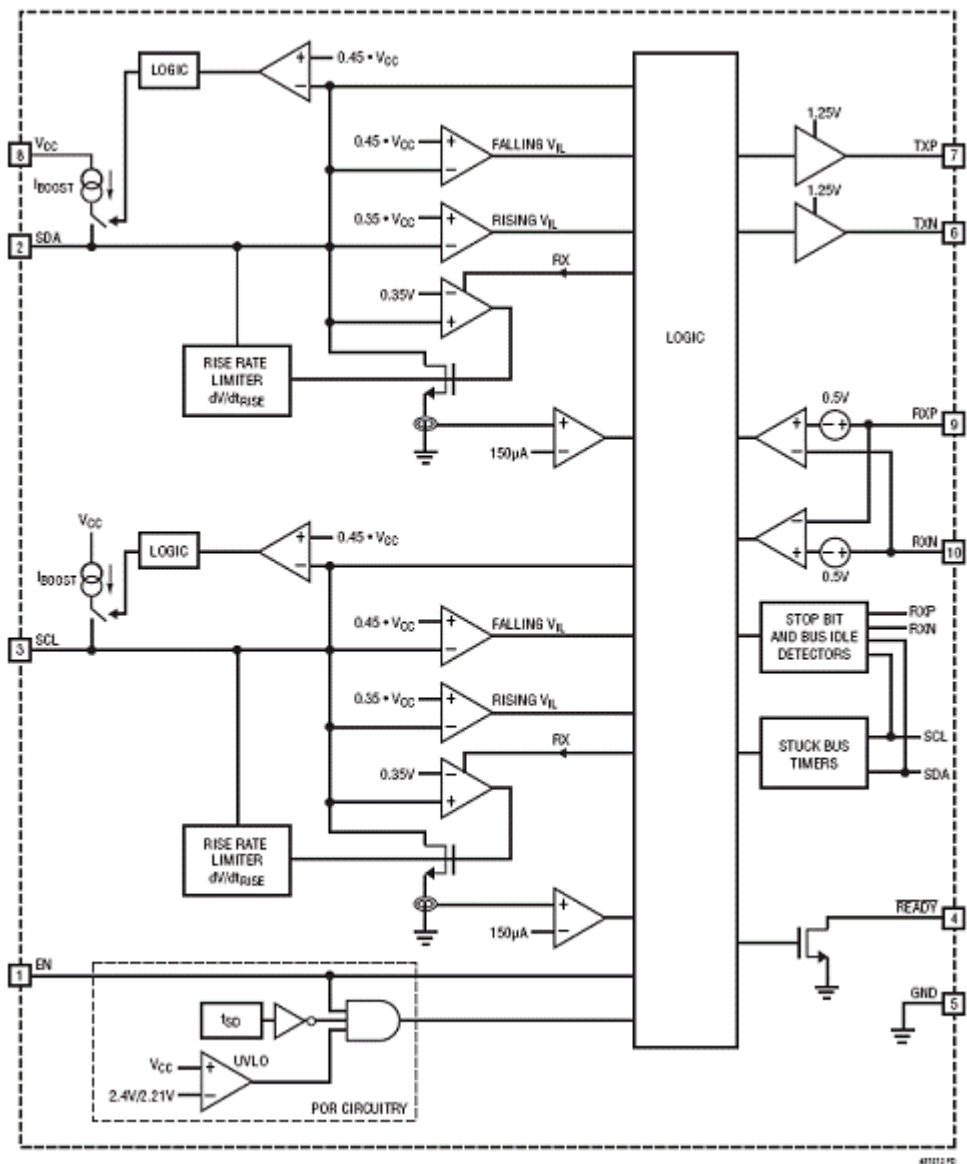


图 1 . LTC4310 方框图

LTC4310 典型应用：

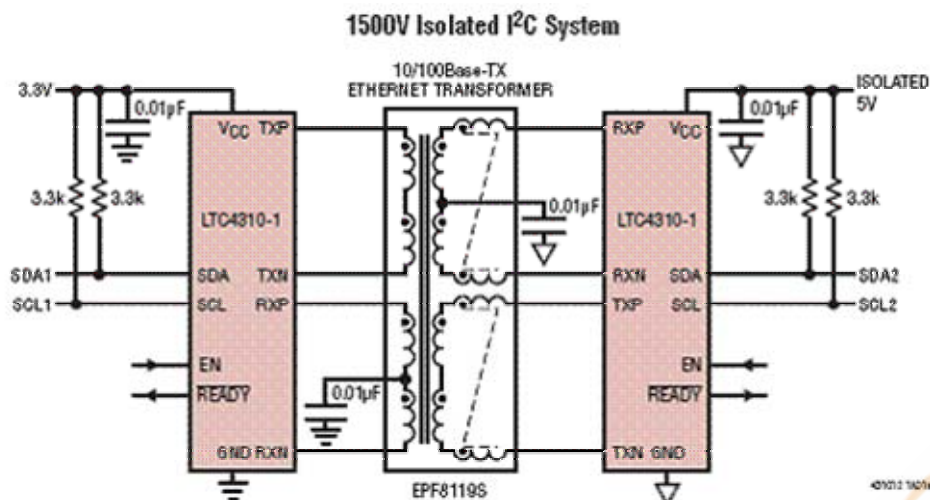


图 2 . LTC4310 在 1500V 绝缘 I2C 系统应用框图

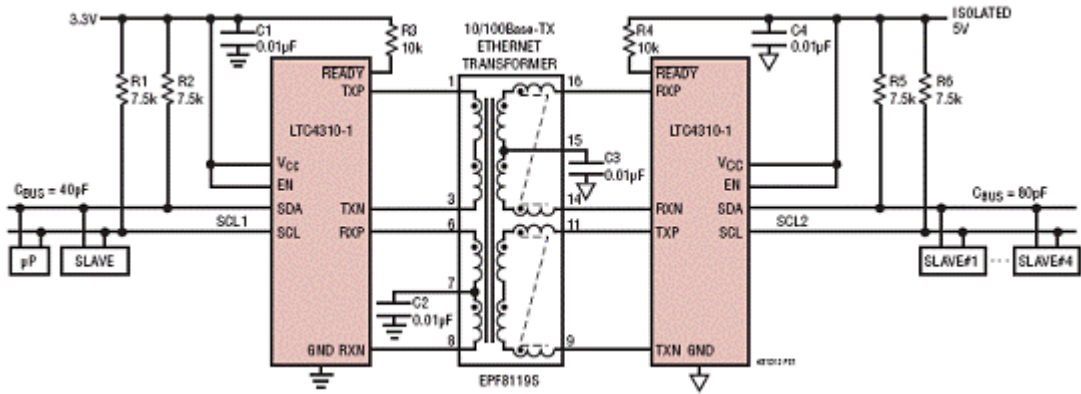


图 3 . LTC4310- 1 在变压器绝缘应用框图

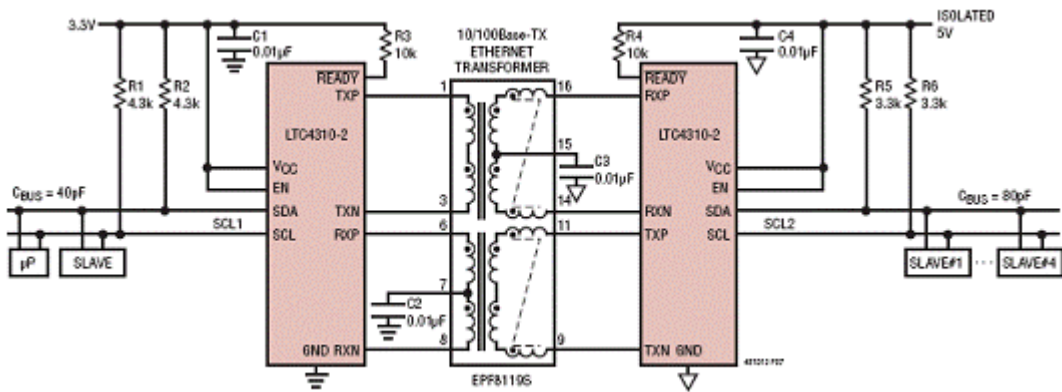


图 4 . LTC4310-2 在 400 kHz 的应用框图

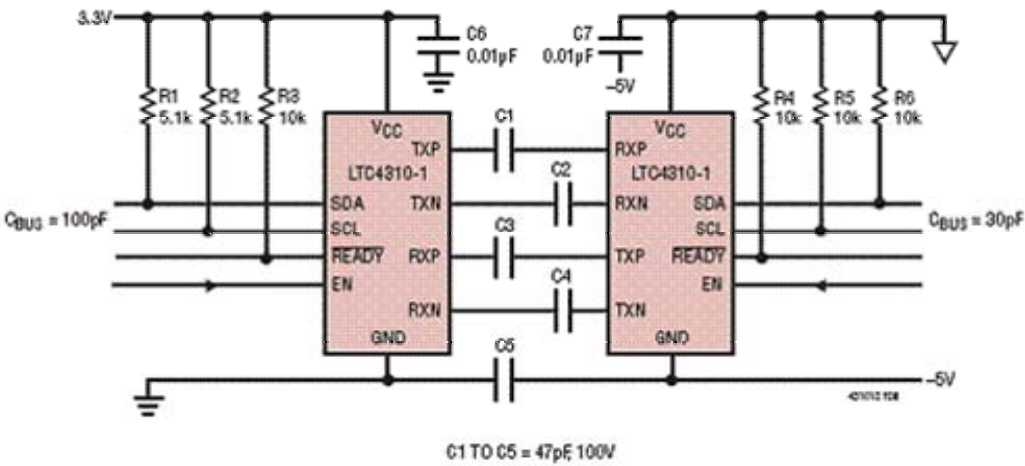


图 5 . LTC4310- 1 在地参考总线 and -5V 参考总线间的 I2C 绝缘应用框图

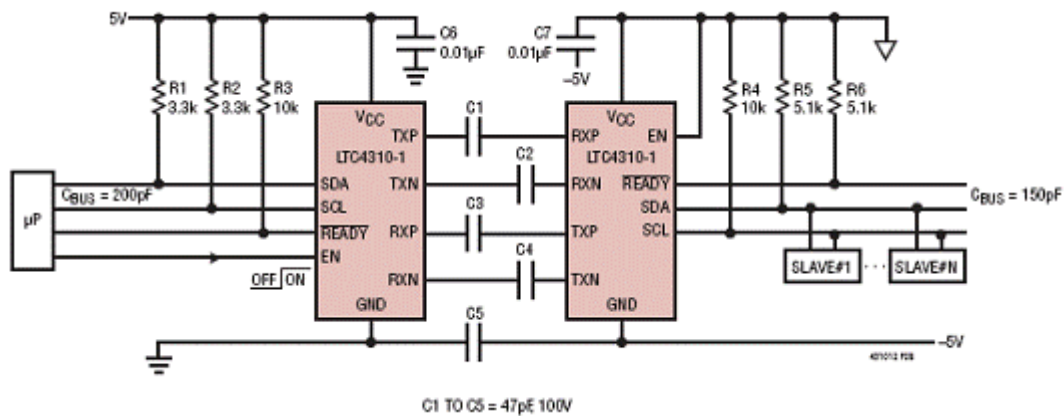


图 6 . LTC4310-1 在零电流关断下应用框图

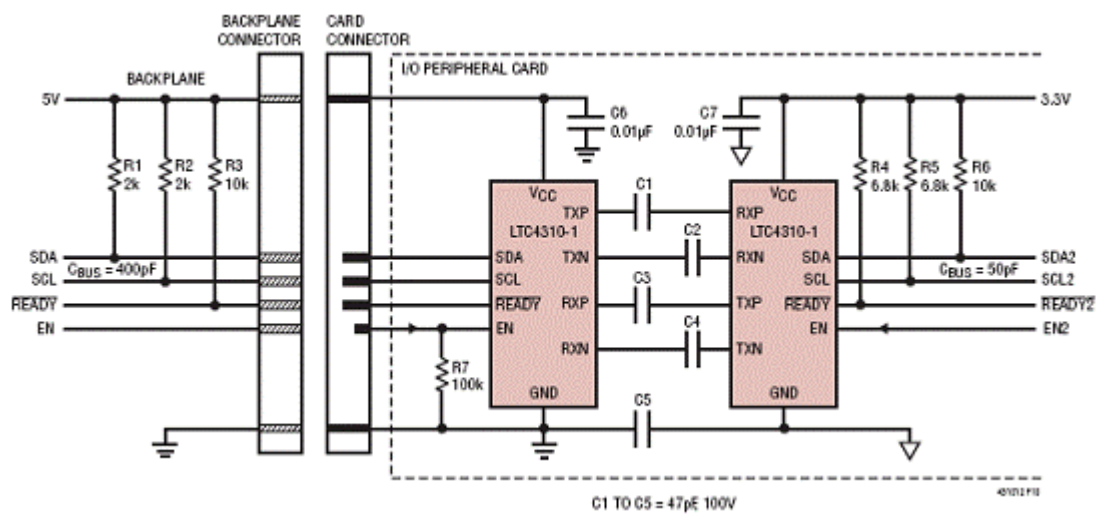


图 7 . LTC4310-1 在 I2C 热插拔应用框图