

TLIN1431-Q1 Automotive LIN SBC with Integrated High-Side Switch and Watchdog

1 Features

- AEC-Q100 (Grade 1): Qualified for automotive applications
- **Functional safety-capable**
 - Documentation available to aid functional safety system design
- Local interconnect network (LIN) physical layer specification LIN 2.2A, ISO 17987-4:2016 and SAE J2602:2021 compliant
- Integrated watchdog supervisor configurable by pin or serial peripheral interface, SPI
- Enhanced features supporting 12-V applications
 - ± 58 V LIN bus fault protection
 - 3.3 V (TLIN14313-Q1) or 5 V (TLIN14315-Q1) LDO output supporting 125 mA from 12 V supply
 - High-side switch with open load and short circuit detection controlled by 10-bit PWM or timer
 - LIMP pin configurable as a high-side switch
 - Configurable WAKE pin supporting different input thresholds or methods
 - Sleep mode: ultra-low current consumption allows wake up event from:
 - LIN bus
 - Local wake up through WAKE
 - Cyclic and static sensing
- Protection Features:
 - ESD protection
 - Under voltage protection on V_{SUP} and V_{CC}
 - TXD dominant time out (DTO) protection
 - Thermal shutdown protection
- Integrated battery voltage monitor
- Available in leadless QFN (20) package with improved automated optical inspection (AOI) capability

2 Applications

- Body electronics and lighting
- Hybrid, electric and powertrain systems
- Infotainment and cluster
- Appliances

3 Description

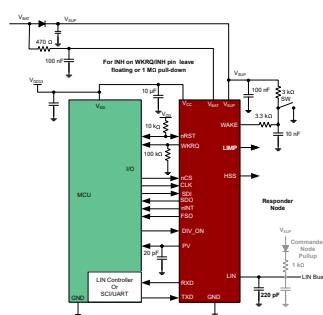
The TLIN1431x-Q1 is a local interconnect network (LIN) system basis chip (SBC) that integrates a watchdog, high-side switch, limp home capability and highly configurable WAKE input pin. The device self-determines the control method, pin or serial peripheral interface (SPI), at power up. The watchdog defaults to a window watchdog for both control methods but for flexibility the device can be configured as a window or timeout watchdog with greater than 20 different time windows when SPI control is used.

The LIN transceiver provides a 200 kbps fast mode for end of line programming. A high-side switch with diagnostic capability is provided for on board LED. The highly configurable WAKE pin can be used with the high-side switch for cyclic sensing, thus, reducing the ECU sleep current. The WKQ/RQ/INH pin can be configured for a digital wake output (WKQ) or a VSUP based inhibit (INH) enable pin for an external supply.

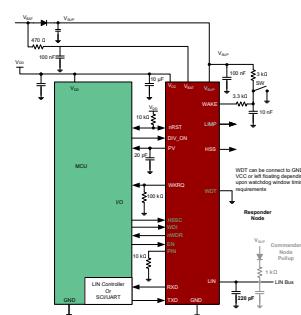
Device Information

PART NUMBER	PACKAGE ⁽¹⁾	BODY SIZE (NOM)
TLIN1431x-Q1	VQFN (RGY)(20)	4.50 mm x 3.50 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.



Simplified Schematics, SPI Control



Simplified Schematics, Pin Control



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