LUMISSIL Microsystems
A Division of ISSI

IS32IO1163 – CAN FD Transceiver with LDO for Automotive Applications

The Controller Area Network (CAN bus) is the “automotive nervous system” that enables communication among various nodes in automobiles. In other words – these nodes, or ECUs are like parts of the body, interconnected via the CAN bus. Information sensed by one part can seamless be shared with another part.

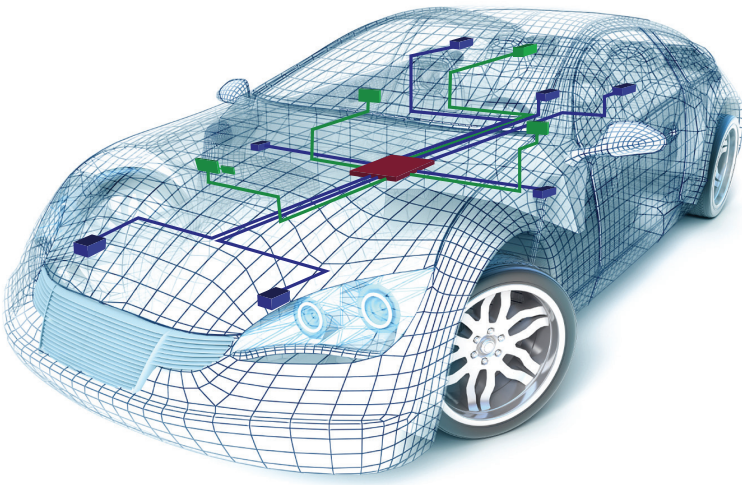
CAN FD is essentially a CAN bus with flexible data rate and an extension of the classical CAN data link layer. In comparison with classical CAN protocol, CAN FD increases the payload from 8 to 64 bytes. It also allows a higher data bit rate, depending on the CAN transceiver.

Compared to other communication protocols like UART, SPI, and I2C, using the CAN protocol is much more reliable as they are standard automotive communication protocols that are used to transmit vital data like a throttle position in a vehicle. If miscommunication or loss of data occurs, it could lead to critical failures. In a vehicle, safety and reliability are the two most valued features. CAN-BUS is therefore the ideal protocol for automotive applications.

The CAN bus system enables each ECU to communicate with all other ECUs - without complex dedicated wiring. Specifically, an ECU can prepare and broadcast information (e.g. sensor data) via the CAN bus (consisting of two wires, CAN low and CAN high). The broadcasted data is accepted by all other ECUs on the CAN network - and each ECU can then check the data and decide whether to receive or ignore it. A modern passenger vehicle may have up to 50 to 70 ECUs - and each of them may have information that needs to be shared with other parts of the network.

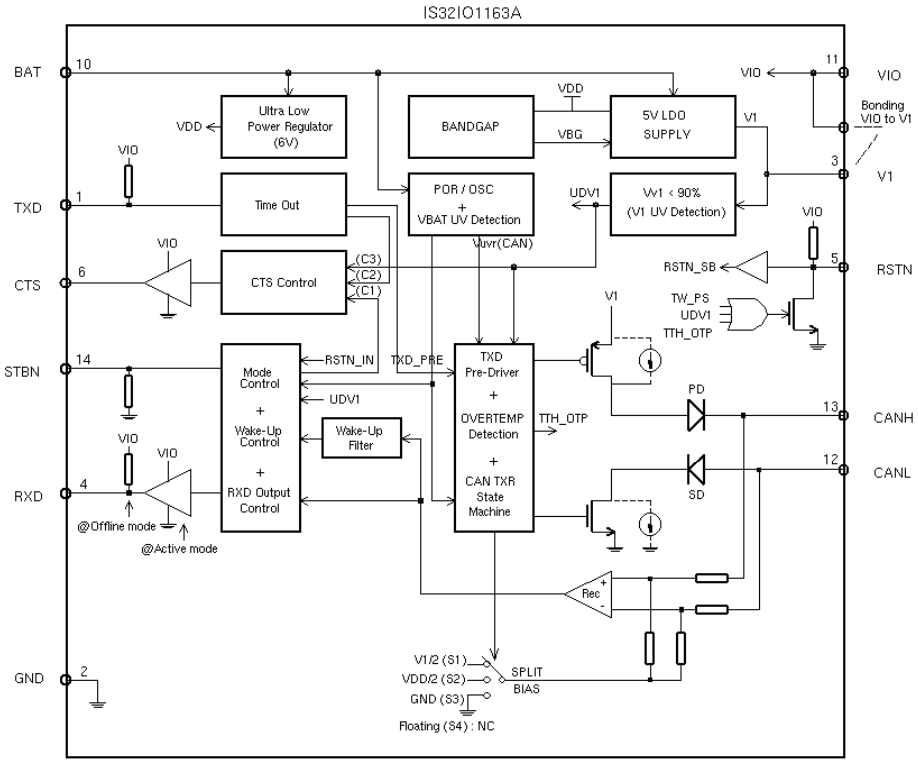
EXAMPLES OF APPLICATION SEGMENTS AND ASSOCIATED CONTROL MODULES WITH CAN APPLICATIONS:

Application Segments	Specific CAN SBC Application Examples
Roof	Sensor, light sensor, light control, sun roof
Steering wheel	Cruise control, wiper, turning light, climate control, radio
Seat	Seat position motors, occupant sensors, control panel
Engine	Sensors, small motors, cooling fan motors
Grille	Grille shutter
Climate	Small motors, control panel
Door	Mirror, central ECU, mirror switch, window lift, seat control switch, central door lock
Illumination	Vehicle trim enhancement, sill plates illuminated with RGB LED



Following table shows different networking protocols used in automobiles. It so happens, though there are several competing auto networking protocols, the CAN bus – because of it ease of implementation and robustness, has become a kind of de-facto standard for automotive networking. Furthermore, procuring parts needed CAN network implementation is relatively easy and parts are competitively priced

Standard	CAN, CAN FD	LIN	FlexRay	MOST	IDB 1394
Contain	Power train Car body control	Body electronics Sun-bus	Security control Car comm.	Telematics Fiber network	Telematics Fiber network
Transfer rate	50kbps ~ 5Mbps	20kbps	5 ~ 15Mbps	10 ~ 100Mbps	100 ~ 400Mbps
Issue time	1986	1998	2000	2000	2002
Organization	ISO	LIN Consortium	FlexRay Consortium	MOST Cooperation	1394 Trade Association
Main factory	Robert Bosch	Motorola => Freescale, Audi, BMW, VW, Volvo, DaimlerChrysler	Philips, Freescale, BMW, GM, Bosch, DaimlerChrysler	DaimlerChrysler, BMW, Harman/Becker, Oasis SiliconSystems	Renault



Block Diagram of IS32IO1163

The IS32IO1163 is a CAN FD transceiver integrated with 5V LDO. The CAN FD transceiver meets ISO 11898-2/5 requirements and supports low power mode specified in ISO 11898-6 with local/remote wakeup capability. The CAN FD allows up to 6 Mbps data rate. The built-in LDO is 5V and can supply up to 100mA external load such as MCU and sensors or actuators. IS32IO1163A is 5V I/O compatible (its VIO pin is internally shorted to V1). IS32IO1163B supports separate VIO and can be 3.3V IO compatible. The IS32IO1163 is in a standard eTSSOP-14 package with exposed pad.

The IS32IO1163 is targeted to be automotive AEC-Q100 and ASIL B compliant. Customer samples available in Q1 and AEC-Q100/PPAP parts for series production targeted in 2H of 2023.

Additional information on IS32IO1163 can be obtained at www.lumissil.com.