



TEP0001 CAN FD TRM

Authors: Jan Kumann
Revision: V21
Date: 09-Dec-2016 18:23

Table of Contents

Overview	3
Features	3
Main Components	3
Interfaces and Pins	4
J1 Connector, CAN0 Bus	4
J2 Connector, Pmod Interface	4
J3 Connector, CAN0 Bus	4
J4 Connector, CAN1 Bus	4
J5 Jumper Block/Connector CAN1 bus	5
J6 Jumper Block/Connector, CAN0 bus	5
Operating Conditions, Ratings and Dimensions	6
Recommended Operating Conditions	6
Absolute Maximum Ratings	6
Power Requirements	6
Physical Dimensions	6
Revision History	7
Hardware Revision History	7
Document Change History	7
Disclaimer	8
Document Warranty	8
Limitation of Liability	8
Copyright Notice	8
Technology Licenses	8
Environmental protection	8
REACH	9
RoHS	9
WEEE	9

Overview

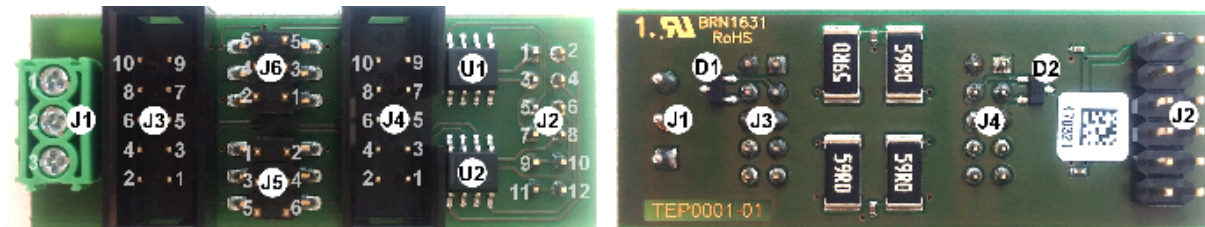
Refer to https://shop.trenz-electronic.de/de/Download/?path=Trenz_Electronic/PMOD/TEP0001 for online version of this manual and other documents available about the product.

The Trenz Electronic TEP0001 is an industrial-grade dual CAN FD transceiver with Pmod interface.


Features

- Diligent Pmod interface compatible
- Dual CAN FD PHY's (CAN0 and CAN1)
 - Texas Instruments TCAN337G
 - Up to 5Mbit data rate
 - Compatible with ISO 11898-2
 - Bus pin fault protection of ± 14 V
 - Integrated 12 kV IEC-61000-4-2 ESD contact discharge protection
 - 10 pin headers (IDC cable to DB9)
 - One CAN FD transceiver has extra 3-pin screw connector terminal
- Single 3.3V supply

Main Components



- J1. Screw connector terminal of CAN0 bus
- J2. 2.54mm pitch 2x6-pin header Pmod interface
- J3. 2.54mm pitch 2x5-pin box header, CAN0 bus
- J4. 2.54mm pitch 2x5-pin box header, CAN1 bus
- J5. 2.54mm pitch SMT 2x3-pin jumper block, can also be used as CAN1 bus connector
- J6. 2.54mm pitch SMT 2x3-pin jumper block, can also be used as CAN0 bus connector
- U1. Texas Instruments TCAN337G CAN FD transceiver, CAN0
- D1. Bourns CDSOT23-T24CAN CANbus Protector, CAN0
- U2. Texas Instruments TCAN337G CAN FD transceiver, CAN1
- D2. Bourns CDSOT23-T24CAN CANbus Protector, CAN1

 TEP0001 PMOD connector is mounted for Right Angle connection to PMOD Baseboard.

Interfaces and Pins

J1 Connector, CAN0 Bus

Pin	Signal	Notes
1	CAN0_H	U1 high level CAN bus line
2	GND	U1 ground connection
3	CAN0_L	U1 low level CAN bus line

J2 Connector, Pmod Interface

Pin	Signal	Notes	Pin	Signal	Notes
1	CAN0_TX	U1 CAN0 transmit data input, integrated pull up	2	CAN1_TX	U2 CAN1 transmit data input, integrated pull up
3	CAN0_RX	U1 CAN0 receive data output, tri-state	4	CAN1_RX	U2 CAN1 receive data output, tri-state
5	CAN0_S	U1 silent mode, integrated pull down	6	CAN1_S	U2 silent mode, integrated pull down
7	CAN0_F	U1 open drain fault output	8	CAN1_F	U2 open drain fault output
9	GND	U1 ground connection	10	GND	U2 ground connection
11	3.3V	U1 3.3V supply voltage	12	3.3V	U2 3.3V supply voltage

J3 Connector, CAN0 Bus

Pin	Signal	Notes	Pin	Signal	Notes
1	N/A	-	2	GND	U1 ground connection
3	CAN0_L	U1 low level CAN bus line	4	CAN0_H	U1 high level CAN bus line
5	GND	U1 ground connection	6	N/A	-
7	N/A	-	8	N/A	-
9	N/A	-	10	N/A	-

J4 Connector, CAN1 Bus

Pin	Signal	Notes	Pin	Signal	Notes
1	N/A	-	2	GND	U2 ground connection
3	CAN1_L	U2 low level CAN bus line	4	CAN1_H	U2 high level CAN bus line
5	GND	U2 ground connection	6	N/A	-
7	N/A	-	8	N/A	-

Pin	Signal	Notes	Pin	Signal	Notes
9	N/A	-	10	N/A	-

J5 Jumper Block/Connector CAN1 bus

Close pins 1-3 and 2-4 with jumpers to enable on-board terminator for CAN1 bus. J5 header can also be used as CAN1 bus connector, refer to the following table pin mapping.

Pin	Signal	Note	Pin	Signal	Note
3	CAN1_L	U2 low level CAN bus line	4	CAN1_H	U2 high level CAN bus line
5	GND	U2 ground connection	6	GND	U2 ground connection

J6 Jumper Block/Connector, CAN0 bus

Close pins 1-3 and 2-4 with jumpers to enable on-board terminator for CAN0 bus. J6 header can also be used as CAN0 bus connector, refer to the following table for pin mapping.

Pin	Signal	Note	Pin	Signal	Note
3	CAN0_L	U1 low level CAN bus line	4	CAN0_H	U1 high level CAN bus line
5	GND	U1 ground connection	6	GND	U1 ground connection


Operating Conditions, Ratings and Dimensions

Recommended Operating Conditions

	Minimum	Maximum	Unit
Supply voltage	3	3.6	V
Operational free-air temperature	-40	125	°C

Absolute Maximum Ratings

Parameter	Minimum	Maximum	Unit
Supply voltage range	-0.3	5	V
Voltage at any bus terminal (CANH or CANL)	-14	14	V
Operating temperature range	-40	150	°C
Storage temperature	-	150	°C

 Refer to Texas Instruments [TCAN337G](#) product datasheet for additional information about conditions and ratings.

Power Requirements

3.3V supply voltage TBD* (180 mA max per one CAN FD transceiver in "Normal Mode", dominant state with bus fault as per TCAN337G datasheet).

* TBD - To Be Determined soon with reference design setup.

Physical Dimensions

- Module size: 54 mm x 20.5 mm.
- Mating height of the J2 connector from the PCB: 8mm
- PCB thickness: 1.6mm
- Highest parts on PCB are J1, J3 and J4 connectors, approximately 9.5mm from the PCB.

Revision History

Hardware Revision History

Date	Revision	Notes	PCN
2016-08-22	01	Initial batch	-

Hardware revision number is printed on the PCB board next to the module model number separated by the dash.



Document Change History

Date	Rrevision	Contributors	Description
2016-09-05	V21	Jan Kumann	Initial document.

Disclaimer

Document Warranty

The material contained in this document is provided “as is” and is subject to being changed at any time without notice. Trenz Electronic does not warrant the accuracy and completeness of the materials in this document. Further, to the maximum extent permitted by applicable law, Trenz Electronic disclaims all warranties, either express or implied, with regard to this document and any information contained herein, including but not limited to the implied warranties of merchantability, fitness for a particular purpose or non infringement of intellectual property. Trenz Electronic shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein.

Limitation of Liability

In no event will Trenz Electronic, its suppliers, or other third parties mentioned in this document be liable for any damages whatsoever (including, without limitation, those resulting from lost profits, lost data or business interruption) arising out of the use, inability to use, or the results of use of this document, any documents linked to this document, or the materials or information contained at any or all such documents. If your use of the materials or information from this document results in the need for servicing, repair or correction of equipment or data, you assume all costs thereof.

Copyright Notice

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Trenz Electronic.

Technology Licenses

The hardware / firmware / software described in this document are furnished under a license and may be used /modified / copied only in accordance with the terms of such license.

Environmental protection

To confront directly with the responsibility toward the environment, the global community and eventually also oneself. Such a resolution should be integral part not only of everybody's life. Also enterprises shall be conscious of their social responsibility and contribute to the preservation of our common living space. That is why Trenz Electronic invests in the protection of our Environment.

REACH

Trenz Electronic is a manufacturer and a distributor of electronic products. It is therefore a so called downstream user in the sense of [REACH](#). The products we supply to you are solely non-chemical products (goods). Moreover and under normal and reasonably foreseeable circumstances of application, the goods supplied to you shall not release any substance. For that, Trenz Electronic is obliged to neither register nor to provide safety data sheet. According to present knowledge and to best of our knowledge, no [SVHC \(Substances of Very High Concern\) on the Candidate List](#) are contained in our products. Furthermore, we will immediately and unsolicited inform our customers in compliance with REACH - Article 33 if any substance present in our goods (above a concentration of 0,1 % weight by weight) will be classified as SVHC by the [European Chemicals Agency \(ECHA\)](#).

RoHS

Trenz Electronic GmbH herewith declares that all its products are developed, manufactured and distributed RoHS compliant.

WEEE

Information for users within the European Union in accordance with Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE).

Users of electrical and electronic equipment in private households are required not to dispose of waste electrical and electronic equipment as unsorted municipal waste and to collect such waste electrical and electronic equipment separately. By the 13 August 2005, Member States shall have ensured that systems are set up allowing final holders and distributors to return waste electrical and electronic equipment at least free of charge. Member States shall ensure the availability and accessibility of the necessary collection facilities. Separate collection is the precondition to ensure specific treatment and recycling of waste electrical and electronic equipment and is necessary to achieve the chosen level of protection of human health and the environment in the European Union. Consumers have to actively contribute to the success of such collection and the return of waste electrical and electronic equipment. Presence of hazardous substances in electrical and electronic equipment results in potential effects on the environment and human health. The symbol consisting of the crossed-out wheeled bin indicates separate collection for waste electrical and electronic equipment.

Trenz Electronic is registered under WEEE-Reg.-Nr. DE97922676.