TEP0003 TRM

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Overview

The Trenz Electronic TEP0003 is is a BEMF (Back Electromagnetic Field) based drive. It can be used in many low cost drives where no low speed operation is needed.

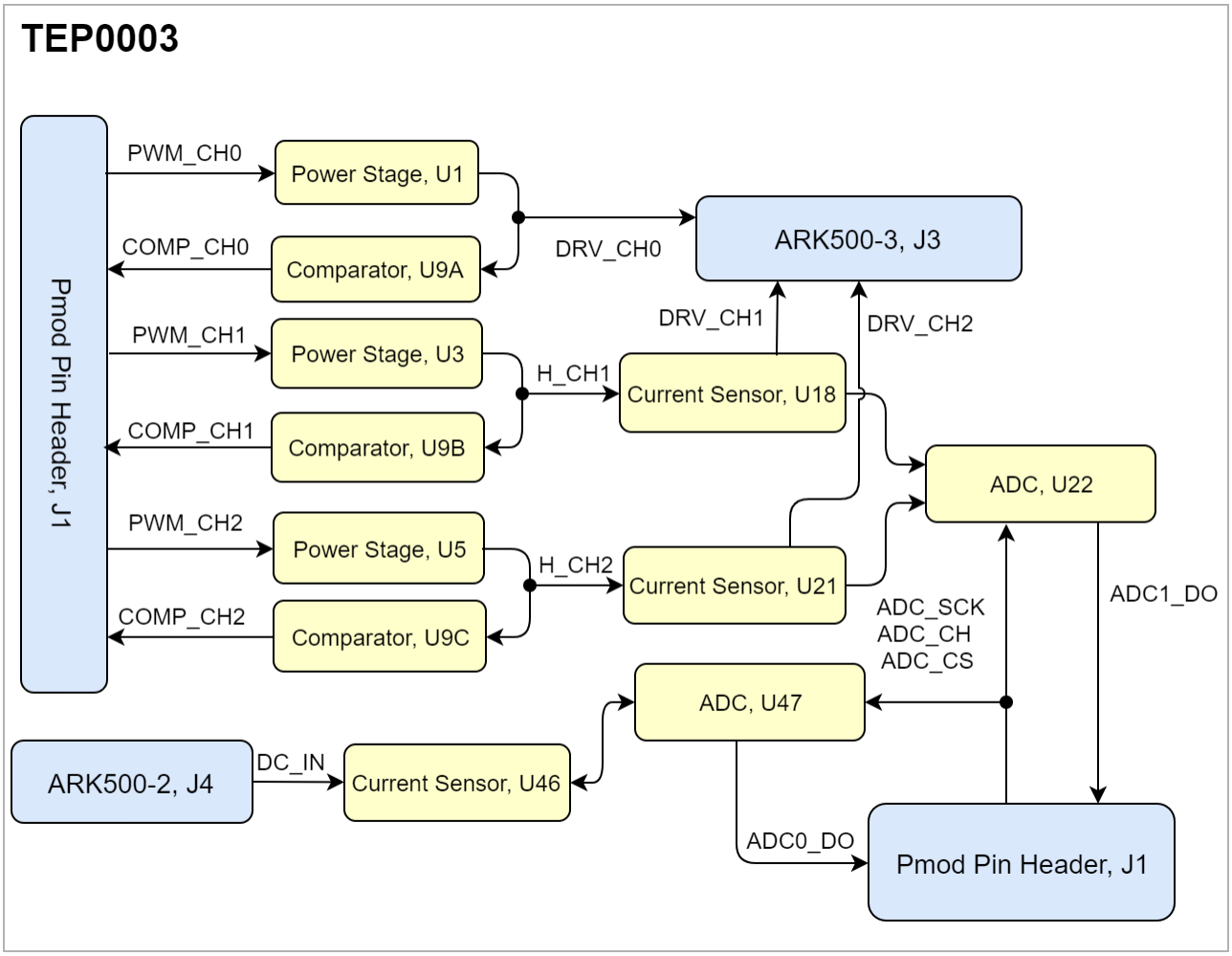
Refer to http://trenz.org/tep0003-info for the current online version of this manual and other available documentation.

Key Features

- **Modules/ SoC FPGA**
  - Compatible with Digilent's Pmod interfaces
- **RAM/Storage**
- **On Board**
  - 2x A2D Converters
  - 3x Current Sensors
  - 6x Power Stages
- **Interface**
  - 2x Pmod Pin Headers (2x6 Pol)
- **Power**
  - 3.3V supply voltage from Pmods
- **Dimension**

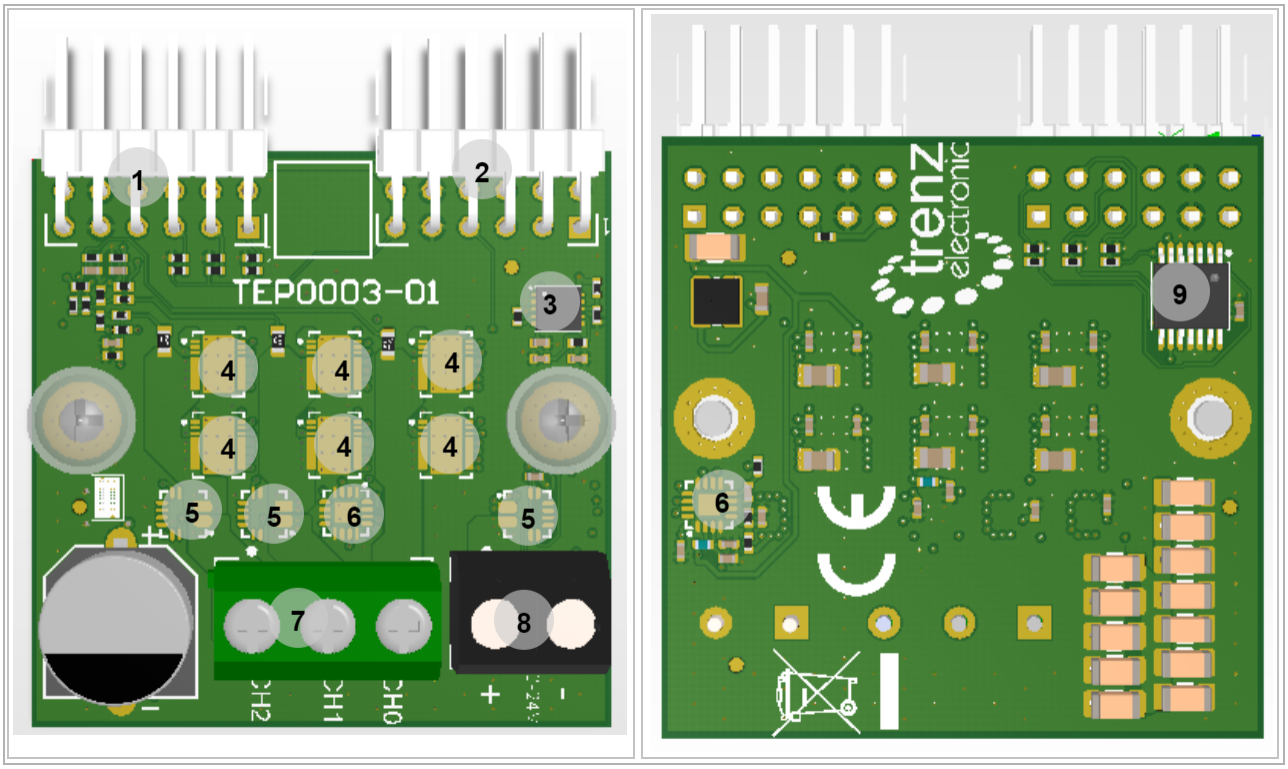
- 40 mm x 40 mm

Block Diagram



TEP0003 block diagram

Main Components



TEP0003 main components

1. Pmod Pin Header, J1
2. Pmod Pin Header, J2
3. Synchronous DC/DC Converter, U7
4. Power Stages, U1...U6
5. Current Sensors, U18, U21, U46
6. ADC, U22, U47
7. Terminal Block, J3
8. Terminal Block, J4
9. Low-Power Push-Pull Output Comparator, U9

Initial Delivery Stat

Storage device name	Content	Notes
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Initial delivery state of programmable devices on the module

Configuration Signals

Signals, Interfaces and Pins

Pmod Connectors

TEP0003 is equipped with two Pmod Connectors.

Pin	Schematic		Notes
	Pmod, J1	Pmod, J2	
1	PWM_CH0	ADC_CH	
2	PWM_CH1	ADC_SCK	
3	PWM_CH2	ADC_CS	
4	-	SENSOR_FAUL	
5	GND	GND	
6	3.3V	3.3V	
7	COMP_CH0	ADC0_DO	
8	COMP_CH1	ADC1_DO	
9	COMP_CH2	-	
10	-	-	
11	GND	GND	
12	3.3V	3.3V	

General PL I/O to B2B connectors information

Terminal blocks

The TEP0002 is equipped with two Terminal Blocks J3 and J4.

Designator	Pin	Schematic	Notes
J3	1	DRV_CH2	ARK500-3
	2	DRV_CH1	ARK500-3
	3	DRV_CH0	ARK500-3
J4	1	DC_IN	ARK500-2
	2	GND	ARK500-2

Terminal Blocks information

On-board Peripherals

Chip/Interface	Designator	Notes
ADC	U22, U47	

On board peripherals

Analog to Digital Converters

The TEP0003 has two ADCs, U22 and U47.

Pins	Connected to	

	ADC, U22	ADC, U47	Notes
AVDD	5V	5V	
REF	5V	5V	
AIN0+	U18 (VIOUT)	DC_IN	
AIN0-	GND	GND	
AIN1+	U21 (VIOUT)	U46 (VIOUT)	
AIN1-	GND	GND	
REFGND	GND	GND	
DVDD	3.3V	3.3V	
SCLK	ADC_SCK	ADC_SCK	Access via Pmod, J2
SDO	ADC1_DO	ADC0_DO	Access via Pmod, J2
CS	ADC_CS	ADC_CS	Access via Pmod, J2
CH_SEL	ADC_CH	ADC_CH	Access via Pmod, J2
PDEN	GND	GND	

Analog Digital Converter

Power and Power-On Sequence

Power Supply

TEP0003 will be power supplied through 3.3V from Pmods, J1 and J2.

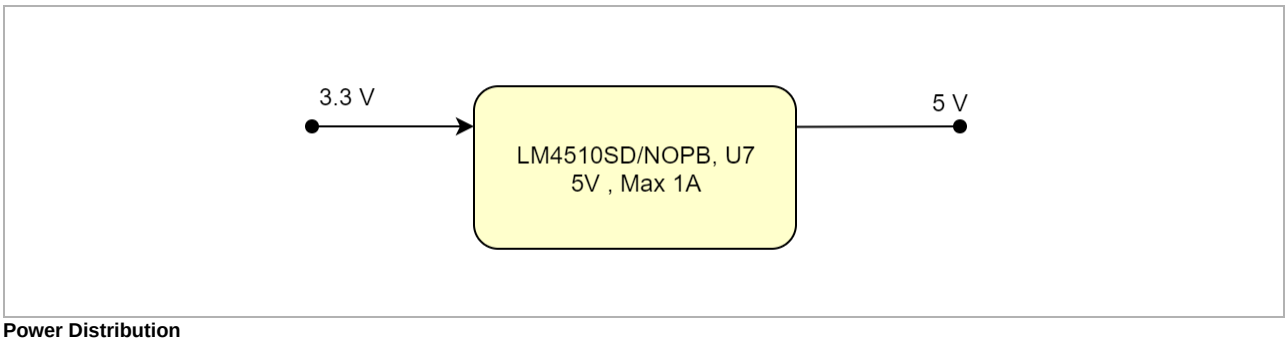
Power Consumption

Power Input Pin	Typical Current
3.3V	TBD*

Power Consumption

* TBD - To Be Determined

Power Distribution Dependencies



Power Distribution

Power-On Sequence

There is no specific power on sequence, after power on all electrical components will be enabled.

Power Rails

Power Rail Name	Pmod J1 Pin	Pmod J2 Pin	Notes
3.3V	6,12	6,12	

Module power rails.

Technical Specifications

Absolute Maximum Ratings

Symbols	Description	Min	Max	Unit
3.3V	Supply Voltage	-0.3	6.5	V
T_STG	Storage Temperature	-40	105	°C

PS absolute maximum ratings

Recommended Operating Conditions

Operating temperature range depends also on customer design and cooling solution. Please contact us for options.

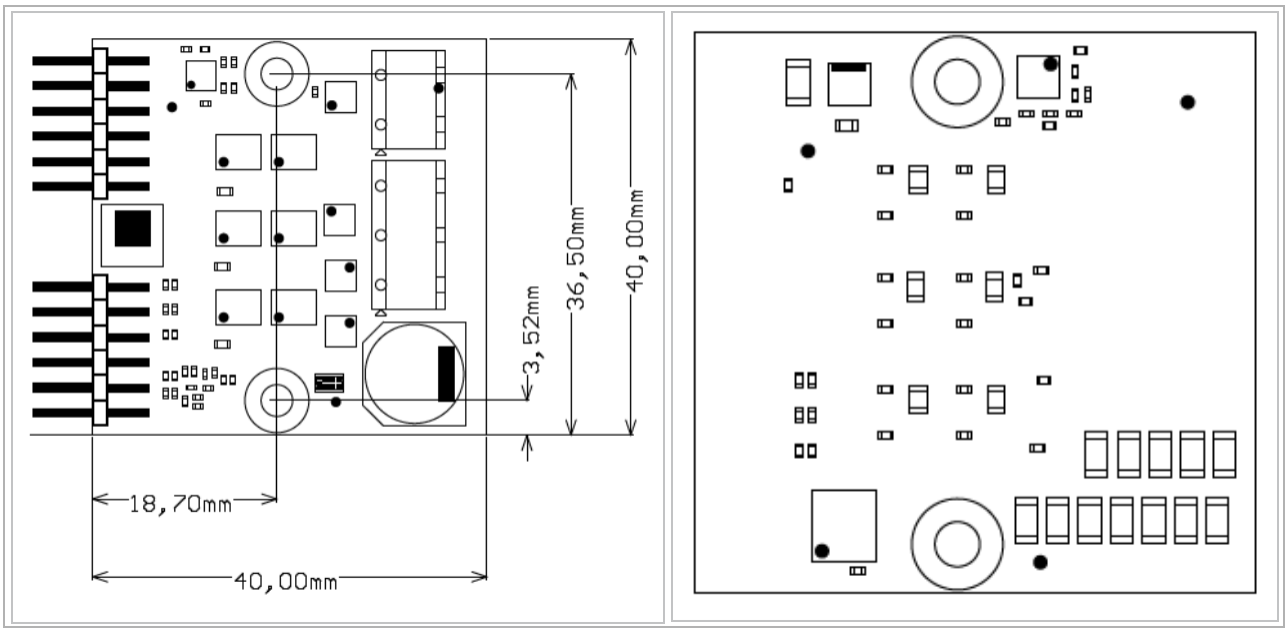
Parameter	Min	Max	Units	Reference Document
3.3V	3.0	4.2	V	Supplied from Pmod
T_OPR	-30	+105	°C	See ARK500-3 and ARK500-2 Datasheet

Recommended operating conditions.

Physical Dimensions

- Module size: 40 mm × 40 mm. Please download the assembly diagram for exact numbers.

PCB thickness: 1.6 mm.



Physical Dimension

Currently Offered Variants

Trenz shop TEP0003 overview page	
English page	German page

Trenz Electronic Shop Overview

Revision History

Hardware Revision History

Date	Revision	Changes	Documentation Link
2018-07-18	01	• Initial Release	REV01

Hardware Revision History

Hardware revision number can be found on the PCB board together with the module model number separated by the dash.

Board hardware revision number.

Document Change History

Date	Revision	Contributor	Description
Error rendering macro 'page-info' Ambiguous method overloading for method jdk.proxy279.$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]	**Error rendering macro 'page-info'** Ambiguous method overloading for method jdk.proxy279.$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]	**Error rendering macro 'page-info'** Ambiguous method overloading for method jdk.proxy279.$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]	• Initial Release

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Document change history.

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