**General description**

The robust and powerful TTC 2310 mid-sized electronic control solution is equipped with Infineon's TriCore™ Aurix™ TC377 CPU to fulfill the demanding performance requirements of automotive safety applications.

Protected by a compact and robust housing, the device was especially developed for vehicles used in a rugged operating environment and at extreme operating temperatures. Due to the ISO 26262 ASIL C automotive safety certification, the device is also used in road vehicles.

**Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU dimensions</td>
<td>170.6 x 232.0 x 42.0 mm</td>
</tr>
<tr>
<td>Dimensions for minimum connector release clearance</td>
<td>70.0 x 182.0 x 50.0 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1215 g</td>
</tr>
<tr>
<td>Connector</td>
<td>2 x 48 pins</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 to +85 °C</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>0 to 4000 m</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>8 to 32 V</td>
</tr>
<tr>
<td>Maximum supply current at 12 / 24V without load</td>
<td>200 / 130 mA</td>
</tr>
<tr>
<td>Maximum standby current</td>
<td>&lt;1 mA</td>
</tr>
<tr>
<td>Maximum total load current</td>
<td>45 A</td>
</tr>
</tbody>
</table>

**Standards**

<table>
<thead>
<tr>
<th>Functional safety</th>
<th>IEC 61508 SIL2 EN ISO 13849 PL d ISO 25119 AgPL d SRL2 ISO 26262 ASIL C ISO 19014 MPL d</th>
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<tbody>
<tr>
<td>CE-Mark</td>
<td>2014/30/EU 2006/42/EC</td>
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<tr>
<td>E-Mark</td>
<td>ECE-R10 Rev.6</td>
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<tr>
<td>FCC-Mark</td>
<td>47 CFR Part 15B, Class A</td>
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<td>EMC</td>
<td>EN 13766 ISO 14982 CISPR 25 IEC 61000-4-2/-3/-4/-5/-6/-8 IEC 61000-6-4</td>
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<tr>
<td>ESD</td>
<td>ISO 10605</td>
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<tr>
<td>Electrical</td>
<td>ISO 16750-2 ISO 7637-2,-3</td>
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<tr>
<td>Ingress protection</td>
<td>EN 60529 IP65 and IP67 ISO 20653 IP68k9</td>
</tr>
<tr>
<td>Climatic</td>
<td>ISO 16750-4</td>
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<tr>
<td>Mechanical</td>
<td>ISO 16750-3</td>
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<tr>
<td>ISOBUS</td>
<td>ISO 11783</td>
</tr>
</tbody>
</table>

**Features**

- **CPU core**
  - 32-Bit Infineon TriCore™ Aurix™ TC377
- **3 cores (2 lockstep cores) running at 300 MHz and memory protection for safety-relevant applications**
- **Floating-Point Unit and Hardware Security Module**
- **992 KB int. SRAM, 6 MB int. Flash**
- **16 MB ext. Flash, 8 KB FRAM, 256 KB int. EEPROM emulation**

**Interfaces**

- 4 x CAN FD 50 kbit/s up to 2 Mbit/s (1 x CAN FD with wake-up capability and 1 x CAN FD ISOBUS)
- 1 x CAN bus termination configurable via connector pins
- 4 x SENT with SPC support, 1 x LIN

**Outputs**

- 10 x PWM OUT up to 1 kHz or digital OUT, up to 4 A (2 x up to 8 A), high side, with current measurement, alternative use as digital timer IN (0.1 Hz - 20 kHz) configurable pull-up in groups of 2 or analog IN 12 bit, 0 - 32 V or LED control OUT
- 18 x digital OUT up to 4 A, high side, with current sense alternative use 4 x as voltage OUT 0 - 10 V or 10 x as P0G OUT, 10 - 90% of BAT+ or 8 x as digital timer IN (0.1 Hz - 20 kHz) or LED control OUT or analog IN 12 bit, 0 - 32 V
- 8 x PWM OUT up to 4 kHz, up to 4 A, low side, with current measurement (4 x featuring timer feedback) alternative use as analog IN 12 bit, 0 - 5 V, 0 - 32 V or 4 x as digital timer IN (0.1 Hz - 20 kHz)
- 1 x emergency stop OUT*, alternative use as analog IN 12 bit, 0 - 32 V
- Option to configure up to 4 x H-bridges for motor control*
- 3 x status LED

**Inputs**

- 8 x analog IN 12 bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm, LED control
- 4 x analog IN 12 bit, 0 - 5 V, 0 - 32 V
- 8 x digital timer IN (0.1 Hz - 20 kHz), encoder support, configurable pull-up/down, support for 7/14 mA current loop speed sensors alternative use as analog IN 12 bit, 0 - 32 V, 0 - 25 mA
- 4 x digital timer IN (0.1 Hz - 20 kHz), encoder support, configurable pull-up, alternative use as analog IN 12 bit, 0 - 32 V or SENT interface
- 2 x emergency stop IN*, alternative use as analog IN 12 bit, 0 - 32 V
- Terminal 15 and Wake-Up pin

**Sensor supply**

- 2 x sensor supply, 5 V, max. 500 mA
- 1 x sensor supply, 5 - 12 V, max. 2.5 W, configurable by SW in 0.5 V steps

All inputs and outputs supporting analog IN can also be used as digital input.

All I/Os and interfaces are protected against short circuit to GND and BAT+, and can be configured by software.

Board temperature, sensor supply, and supply voltage are monitored by software.

Two independent shut-off groups for PWM output stages. Details to the standards can be found in the system manual.*

* upcoming feature
Block diagram

Aurix TC 377

Super-Scalar TriCore
- 32-bit
- 300 MHz / 3 cores
- 992 KB SRAM
- 6 MB Flash
- 256 KB EEPROM emulation
- HSM

Interfaces

CAN FD 3
CAN FD ISOBUS 1
LIN 1

IN / OUT

1 ➤ Terminal 15 Key Switch
1 ➤ Wake-Up
1 ➤ emergency stop OUT*
2 ➤ emergency stop IN* for analog IN 0-32 V

8 ➤ analog IN
- 0.5 V / 0.25 mA
- 0-100 kOhm / LED control
digital timer IN
- 0.1 Hz - 20 kHz
digital timer IN
- 7/14 mA or analog IN 0-32 V / 0-25 mA
digital timer IN
- 0.1 Hz - 20 kHz or analog IN 0-32 V or SENT
4 ➤ analog IN
- 0-5 V / 0-32 V

Sensor supply
5 V / 500 mA
2 ➤
Sensor supply
5-12 V / max 2.5 W 1 ➤

HS PWM OUT
up to 4 A (2 x up to 8 A) with current measurement or digital timer IN
- 0.1 Hz – 20 kHz or analog IN 0-32 V or LED out 10 ➤

HS digital OUT
up to 4 A with current sense or
(10 x) PVG out or
(4 x) Vout 0-10 V or
(5 x) digital timer IN
- 0.1 Hz – 20 kHz or analog IN 0-32 V or LED out 18 ➤

LS PWM OUT
up to 4 A with current measurement or analog IN
- 0-5 V / 0-32 V or
digital timer IN
- 0.1 Hz – 20 kHz 4 ➤

LS PWM OUT
up to 4 A with current measurement or analog IN
- 0-5 V / 0-32 V 4 ➤

Housing and connector

Aluminum die-cast housing
2 x 48-pin connectors

For further information, including price and availability, please contact products@tttech-auto.com.

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