TTC 508 – High Performance Safety Controller

General Description

TTC 508 is a high-end electronic control solution for the automotive industry. The core of the controller is the powerful TMS570 CPU designed for use in demanding safety-critical automotive and transportation applications. The TTC 508 fulfills safety requirements up to SIL 2 (IEC 61508) / PL d (ISO 13849) and AgPL d (ISO 25119).

The TTC 508 is part of a complete and compatible product family and is protected by a compact, automotive-style housing suited to mobile applications.

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU dimensions</td>
<td>231.3 x 204.9 x 38.8 mm</td>
</tr>
<tr>
<td>Dimensions for minimum</td>
<td>315.3 x 204.9 x 38.8 mm</td>
</tr>
<tr>
<td>connector release clearance</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1,200 g</td>
</tr>
<tr>
<td>Connector</td>
<td>154 pins</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 to +85 °C</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>0 to 4,000 m</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>8 to 32 V</td>
</tr>
<tr>
<td>Peak supply voltage</td>
<td>45 Vmax</td>
</tr>
<tr>
<td>Supply current at 12/24 V without load</td>
<td>400/200 mAmax</td>
</tr>
<tr>
<td>Standby current</td>
<td>&lt;1 mAmax</td>
</tr>
<tr>
<td>Total load current</td>
<td>40 Amax</td>
</tr>
</tbody>
</table>

Standards

- Functional safety: IEC 61508 SIL2, EN ISO 13849 PL d, ISO 25119 AgPL d
- CE-Mark: 2014/30/EU, 2006/42/EC
- E-Mark: ECE-R10 Rev.4
- EMC: EN 13309, ISO 14982, CISPR 25
- ESD: ISO 10605
- Electrical: ISO 16750-2, ISO 7637-2, -3
- Ingress protection: EN 60529 IP67, ISO 20653 IP6k9k
- Climatic: ISO 16750-4
- Mechanical: ISO 16750-3
- ISOBUS: ISO 11783

Software
- C-Programming environment

Features

CPU Core
- 32-bit TI TMS570, ARM cortex-R4F based
- Dual-core lockstep CPU and memory protection for safety-relevant applications
- 180 MHz, 298 DMIPS, Floating-Point Unit
- 3 MB int. Flash, 256 kB int. RAM
- 16 MB ext. Flash, 2 MB ext. RAM, 64 kB ext. EEPROM
- Safety Companion CPU

Interfaces
- 2 x CAN 50 kbit/s up to 1 Mbit/s
- 1 x CAN ISOBUS
- 3 x CAN bus termination configurable via connector pins
- 1 x 100BASE-T1 BroadR-Reach®
- 1 x Real-Time Clock

Outputs
- 10 x PWM OUT or digital OUT, up to 4 A, high side, with high side current measurement
- 8 x digital OUT up to 4 A, high side, overload and open load detection, current sense
- alternative use as LED control OUT or analog IN 12-bit, 0 - 32 V with configurable pull-up/down
- 8 x digital OUT up to 4 A, low side, current sense, overload and open load detection, alternative use as analog IN 12-bit, 0 - 32 V
- Wiring option to use up to 8 of the digital OUT, high side and 8 digital OUT, low side, as full H-bridge for motor control

Multi-purpose I/Os
- 6 x configurable as:
  - PVG OUT, 10 - 90% of BAT + or voltage OUT, 0 - 100% of BAT + or digital OUT up to 4 A high side or LED control OUT or analog IN 12-bit, 0 - 32 V

Inputs
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 10 V, 0 - 25 mA
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 32 V, 0 - 25 mA
- 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, digital (7/14 mA) current loop speed-sensor alternative use as analog IN 12-bit, 0 - 32 V
- 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, alternative use as analog IN 12-bit, 0 - 32 V
- 8 x digital timer IN (0.1 Hz - 10 kHz) with pull-up
- K15 and wake up

Sensor supply
- 1 x sensor supply, 5 V, max. 500 mA

All I/Os and interfaces are protected against short circuits to GND and BAT+ and can be configured by software.
Board temperature, sensor supply and supply voltage are monitored by software.
Inputs and Outputs can also be used as digital inputs. Two independent shut-off groups for PWM output stages are available. Details about the standards can be found in the System Manual.

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TTC 508

Block Diagram

TMS 570
ARM Cortex

- Dual-core lockstep
- 32 bit / 180 MHz
- 256 kB RAM
- 3 MB Flash
- Safety Companion

INTERFACES

CAN
CANBUS
ISOBUS
100BASE-T1
BroadR-Reach

IN / OUT

RAM: 2 MB
Flash: 16 MB
EEPROM: 64 kB
RTC

1 ▶ K15
1 ▶ Wake-Up
8 ▶ analog IN
0–5 V / 0–25 mA / 0–100 kOhm
8 ▶ analog IN
0–5 V / 0–10 V / 0–25 mA
8 ▶ analog IN
0–5 V / 0–32 V / 0–25 mA
6 ▶ digital timer IN
0.1 Hz – 20 kHz or analog IN
6 ▶ digital timer IN
0.1 Hz – 20 kHz or digital timer IN
7/14 mA or analog IN
8 ▶ digital timer IN
0.1 Hz – 10 kHz with pull-up

Sensor supply
5 V / 500 mA

HS PWM OUT
up to 4 A with current measurement

HS digital OUT
up to 4 A with current sense or LED OUT or analog IN

LS digital OUT
up to 4 A with current sense or analog IN

PVG OUT
or Voltage OUT
or HS digital OUT
or LED OUT
or analog IN

Wake-Up

Housing and connector

Aluminum die-cast housing
154-pin connector

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

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