TS-7180 Rev A

NXP i.MX6UL
Speed: 696MHz
Temp: -40 to 85C

Input Power
DC 8V-30V
GND

Charging Circuit
SD Boot
NO Charge

Super Cap
(20 sec.)
Regulator

USB Device
(Console)

SiLabs μC:
System Monitor/Debug Support

DDR3 RAM
512MByte
1GByte
8-64GByte

eMMC
4GByte

Micro SD Card Socket
FRAM
2kByte

Screw Terminals
2x12
(24 Positions,
3.5mm)

4x 10V ADC
or 4-20mA
x4

7x 30V DIO
x7

5V Out
x1

2x 24V Dln/Quadrature
x2

2x 24V Dln/2kHz Tach.
x2

Ground
x6

Screw Terminals 2x8 (16 Positions, 3.5mm)

Number of Screw Term. Pos. = x9
Connector = Optional Feature = ... ...

Technologic Systems
TS-7180
Rev: A
Date April 17, 2017
Title: TS-7180
Sheet 2 of 26
**Standard Options**

Option 1 TS-7180-SMW11  
NXP i.MX6UL 695MHz ARM A7, 512MB DDR3, 4GB eMMC, MultiTech, NimbeLink/Xbee, 2 CAN, 3 RS-232, TS-SILO, WiFi/Bluetooth w/Chip, FRAM (-40 to 85C)

Option 2 TS-7180-SRW9I  
NXP i.MX6UL 695MHz ARM A7, 1GB DDR3, 4GB eMMC, MultiTech, NimbeLink/Xbee, 2 CAN, 3 RS-232, TS-SILO, WiFi/Bluetooth w/Chip, FRAM, Gyro, GPS (-40 to 85C)

---

**Optional Components/Features Summary**

### TS-SILO Option
- Included on ALL Standard Options
- ADD: C98, C99

### WiFi/Bluetooth Option
- w/ Chip Antenna
- U.FL available on request
- Included on ALL Standard Options
- ADD: K2 (chip antenna)  
  (alternate: U.FL antenna connector)

### NimbeLink Option
- Included on ALL Standard Options
- ADD: CN5, C95, D6, U29 and U31

### MultiTech Option
- Included on ALL Standard Options
- ADD: CN6, C96, U29, U31 and U39

### GPS Option
- Included only on xxx9x Standard Option
- ADD: K4 & CN4

### Gyro Option:
- Included only on xxx9x Standard Option
- ADD: U34

### 1 GByte RAM Option
- Included only on xxx9x Standard Option
- REMOVE: U23 4Gbit Die
- ADD: U23 8Gbit Die

### FRAM Option:
- Included on ALL standard Options
- ADD: U35

### 2nd CAN Option
- Included on ALL Standard Options
- ADD: U5, TVS17, R140, R141, RN21, C161, C141
- REMOVE: R197, R198

### 4th RS-232 Option
- NOT Included on any Standard Options
- ADD: R197, R198
- REMOVE: U5, TVS17, R140, R141, RN21, C161, C141

---

**Technologic Systems**

**Date**: April 17, 2017

**Title**: TS-7180

**Rev**: A  
**Designer**:  
**Sheet**: 1 of 26
Title: Rev: Designer Sheet of TS-7180

6UL Ethernet
HD1 I2C pins can be used as DIO

HD1_PIN7 is 5V tolerant
SD Card 1A Reg
1.8V or 3.2V

3.3V 2A Reg #1

SW_4.7V --> 3.3V

3.3V is shutdown if EXT_RESET# or WDOG# is asserted, or 3.3V_A is too low

CPU Core 1A Reg #2

SW_4.7V --> VDD_6UL_CORE

RAM 1.35V 1A Reg #2

SW_4.7V --> RAM_1.35V
WiFi 3.6V Regulator

Gyro-Accelerometer
Included only on xxx9x Standard Option

WiFi / Bluetooth Radio Module
SuperCap 20 Second Power Hold

20 seconds assumes 1 watt load
25F SuperCaps charged to 4.8V
Functions down to SuperCap = 3.8V
FPGA required for:
- Auto-485 for one UART
- MJX for UARTs
- Two Tachometers
- One Quadrature detector
- Additional I/O

Resistor Strapping Table

<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>R31 R38 R36 R37</td>
<td>R31 R38 R36 R37</td>
</tr>
</tbody>
</table>

0 0 0 1 TS-7180-SMW1I
1 0 0 1 TS-7180-SRW9I

6UL Clock
24MHz

To WiFi
Radio

FPGA bypass Caps

---

Title: TS-7180
Rev: A
Sheet 17 of 26
Vishay SiC462 6A Regulator

8-30 VDC

Power Input

Push Switch

TVS

Boot to SD

U-Boot Stop

No Chrg Jumper

8-30 VDC

Power Input

Push Switch

TVS

Boot to SD

U-Boot Stop

No Chrg Jumper
USB and NimbeLink Modem
Switched Power

Rise time of both outputs measured at ~1V/ms

NimbeLink Modem Socket

3G Modem Switched Power

3mm max under

MultiTech Modem Socket

Multitech Modems

Inputs (TXD) are always TTL compatible
Outputs (RXD) swing CMOS levels
This means 0-5V if 5V powered

DTR and RTS are active low true Inputs
DIO_1

Sinks 500 mA
Max. Input = 30V

DIO_2

Sinks 500 mA
Max. Input = 30V

DIO_3

Sinks 500 mA
Max. Input = 30V

DIO_4

Sinks 500 mA
Max. Input = 30V
**Title:** Designer Sheet of TS-7180

**DIO_5**
- Sinks 500 mA
- Max. Input = 30V

**DIO_6**
- Sinks 500 mA
- Max. Input = 30V

**DIO_7**
- Sinks 500 mA
- Max. Input = 30V

**Components:**
- TVS9 30V
- TVS10 30V
- RN17-D 3.3K
- RN23-C 1.5K
- RN20-A 3.3K
- RN30-D 1.5K
- RN23-D 1.5K
- RN20-B 3.3K

**Pinouts:**
- **DIO_5 IN**
- **DIO_6 IN**
- **EN_LS_OUT_5**
- **EN_LS_OUT_6**
- **DIO_7 IN**

**Voltages:**
- 3.3V

---

**Technologic Systems**
**Date:** April 17, 2017
**Title:** TS-7180
**Rev:** A  **Designer**  **Sheet:** 24 of 26
2 x 12 Screw Term. Positions

Top Row

Bottom Row

2 x 8 Screw Term.

Top Row

Bottom Row

When 10 ohm resistors populated
CAN parts depopulated