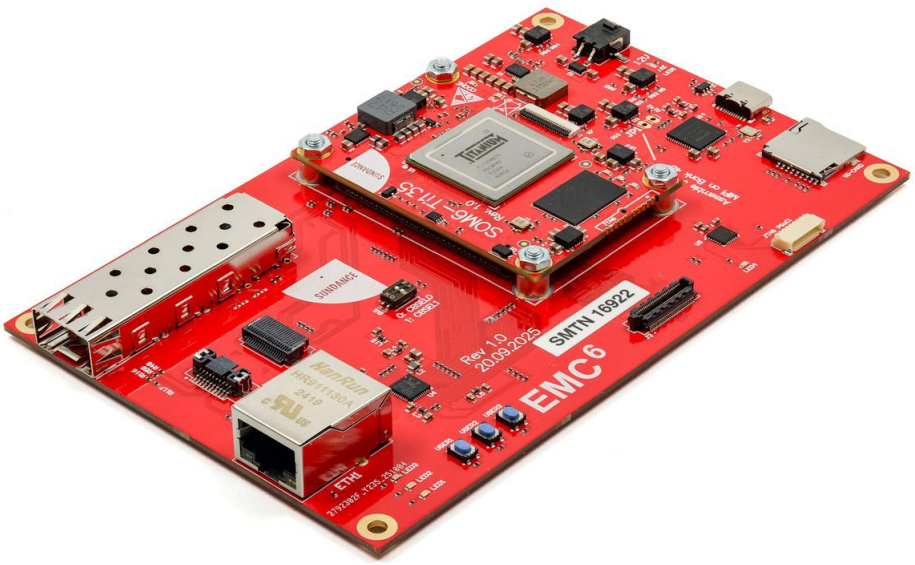
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User Guide for SMT135-C



Efinix Titanium Ti135 Evaluation Board
Based on a SoM6 Ti135 System On Module (SOM)

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Revision History

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1.0	Initial draft	16/12/25	CB
1.01	Photos updated	16/12/25	BL
1.02	Power & Mass Measurements Added	20/01/26	CB
1.03	Git details added and document updated	2/09/26	CB

Table of Contents

1 Introduction 5
1.1 Hardware Features 5
1.2 High Speed Interfaces and Connectivity 5
1.3 SD Card Interface 5
1.4 Clock Sources and Power Sequencing 6
1.5 USB JTAG and UART 6
1.6 User LED and Switches 6
2 Related Documents 7
3 Acronyms, Abbreviations and Definitions 8
4 Interfaces 8
4.1 SMT135-C Connector Overview 8
4.2 SMT135-C Block Diagram 9
5 Environmental 10
6 Power and Electrical 10

Table 1: SMT135-C Board Interfaces 8

Figure 1: SMT135-C Block Diagram 9

1 Introduction

1.1 Hardware Features

The SMT135-C Evaluation Board is based on a SoM6 Ti135 compact, low-power System-on-Module (SoM) built around the Efinix Titanium Ti135 FPGA, in the high-density N676 package**.** Designed for advanced embedded applications requiring performance, flexibility, and energy efficiency, the SoM6 Ti135 integrates a rich set of modern features in a form factor that emphasises modularity and interoperability. The SMT135-C expands on the SOM functionality, providing a range of additional IO options. Including a Gigabit Ethernet Interface, SFP Optical Interface, Samtec Firefly Mid-Board Optical Transceiver, SD Card Interface and the option for 8-Lane MIPI TX and RX Operation. LED and user switches.

Key SOM Processing and Fabric Features

At the core of the SoM is the Efinix Ti135 FPGA, fabricated on a TSMC 16nm process and featuring the Quantum™ compute fabric. This fabric includes:

- Up to 129,600 logic elements using eXchangeable Logic and Routing (XLR) cells
- 960 blocks of 10-kbit SRAM (totalling ~9.83 Mbits)
- 480 DSP blocks supporting integer and BFLOAT16 computations
- A quad-core hardened RISC-V processor with full support for RV32IMACFD extensions

This makes the SMT135-C a strong candidate for edge computing, real-time control, and vision-centric workloads.

For more details refer to the SoM6 Ti135 Users Guide.

1.2 High-Speed Interfaces and Connectivity

A total of 4 full duplex Transceivers are broken out from the TI135. 1 full duplex channel from Quad Q0 and 3 full duplex channels from Quad Q1.

A Realtek RTL8211FI-CG integrated 10/100/1000 Ethernet Precision Transceiver is used with an RJ45 connector to provide a Gigabit Ethernet interface. See Realtek datasheet and Ethernet example on the SMT135-C GitHub for more details.

A Samtec SFPK-SL-TR connector and cage is used to provide a SFP connection. Refer to the SFPK-SL data from Samtec and the SFP Loopback example on the SMT135-C GitHub for more details.

Samtec Firefly PCUO connectors have been used to provide Mid Board Optical Transceivers for functions such as PCIe over optical link. Refer to the Firefly example on the SMT135-C GitHub for more details

Please note the SMT135-C can be configured to support SFP+ or Firefly Midboard connector operation but not both simultaneously. Please contact contact Sundance Multiprocessor Ltd for more details.

8-Lane MIPI TX & RX is available but requires configuration, contact Sundance Multiprocessor Ltd for more details.

1.3 SD Card Interface

A Micro SD Card Interface is included to support SD card operation for example Linux Boot for the RISCV These are connected to the GPIO 2 through 8 of the SoM. Refer to the SDCARD example on the SMT135-C GitHub for more details

1.4 Clock Sources & Power Sequencing

A Skyworks SI5338A is used to provide 4 clock sources for the SoM6 Ti135 it is configured by a Infineon CY8C4024LQI Microcontroller which also controls the power sequencing. Clock frequencies can be custom selected to suit required IO and FPGA SERDES operation. By default, all clocks are set to 100Mhz. The clocks may be set to 156Mhz to support Gigabit Ethernet, or any other frequency required by the user. Refer to the PSOC Code example on the SMT135-C GitHub for more details

1.5 USB JTAG & UART

A USB-C connector is used to connect via a FTDI FT4232H-56Q to facilitate a JTAG and UART connection to the Ti135 FPGA. Refer to Efinix software for connection and configuration requirements to their SW tools. Or follow the instructions given in the Carrier Hello World example on the SMT135-C GitHub for more details. This will ensure you have a valid tool setup and interface.

1.6 User LED and Switches

3 User LEDs and 3 User Configurable Switches are provided. For details refer to the Carrier Hello World example on the SMT135-C GitHub for more details

2 Related Documents

SoM6 Ti135 User's Guide - found on the SMT135-C GitHub listed below

Ti135 Data Sheet:-
https://www.efinixinc.com/support/docsdl.php?s=ef&pn=DSTi135

Efinity Software (for FPGA design and programming):-
Efinity Software | Efinix, Inc.

Realtek RTL8211FI-CG Data:-
RTL8211F(I)-CG

Samtec SFPK-SL data:-
SFPK-SL - SFP+ Cage and Connector Kit

Samtec Firefly Optical Transceivers
FireFly™ Optical Transceivers

FTDI FT4232H-56Q Data:-
FT4232H-56Q - FTDI

SMT135-C GitHub
SundanceMultiprocessorTechnology/SMT135-C

3 Acronyms, Abbreviations and Definitions

FPGA	Field Programmable Gate Array
GigE	Gigabit Ethernet
I2C	Inter-Integrated Circuit
IC	Integrated Circuit
JTAG	Joint Test Action Group
Kria	Kria™ is a AMD® “System-on-Module”
LVDS	Low Voltage Differential Serial
PCB	Printed Circuit Board
SGMII	Serial Gigabit Media Independent Interface
SPI	Serial Peripheral Interface

4 Interfaces

4.1 SMT135-C Connector Overview

Table 1: SMT135-C Board Interfaces

Interface	Description
RJ45	10/100/1000 Ethernet Interface
SFPK-SL-TR	SFP Interface
USB-C	JTAG and UART via FTDI for the Ti135 FPGA
Firefly PCUO	For Mid Board Optical Interface
SS4-30-3.00-L-D-K-T-R	8-Lane MIPI TX & RX
TE 2-1445057-2	12V Power Connector
Operating voltage	12V DC
Total mass	100g

4.2 SMT135-C Block Diagram

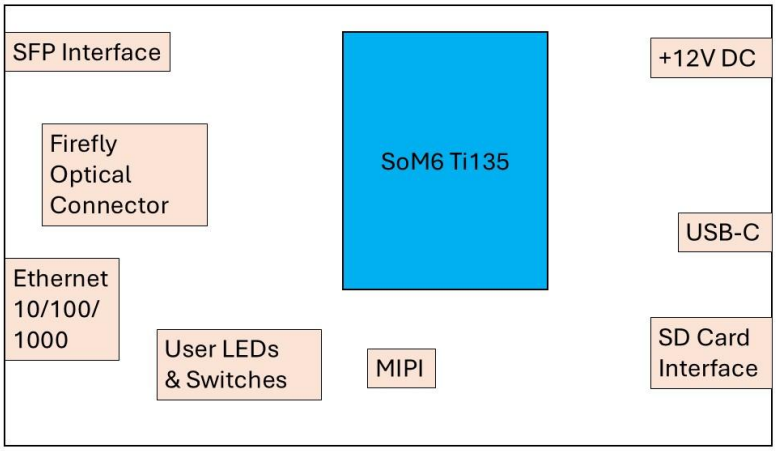
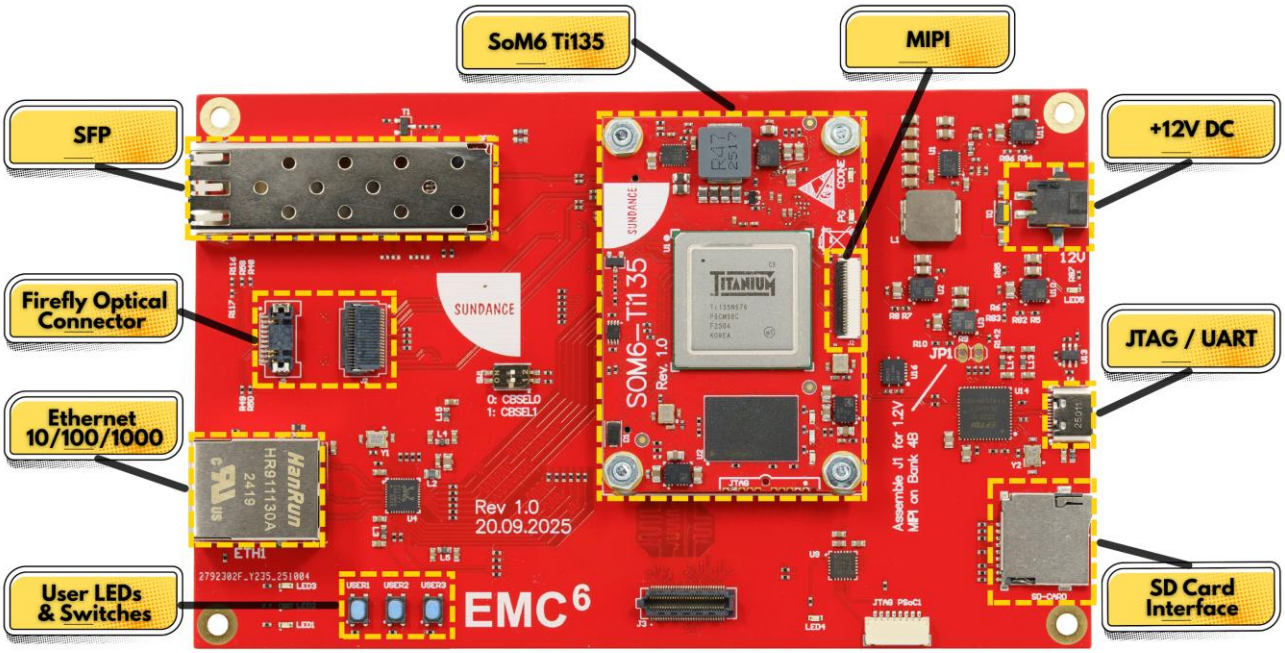


Figure 1: SMT135-C Block Diagram



5 Environmental

SoM6 Ti135 will require either Active cooling, which requires a heatsink and fan, or Convection cooling, which requires just a heatsink; either of these solutions will allow the SoM6 Ti135 to operate in an environment up to 60˚C. The choice of active or convection cooling will dictate the specific temperature grade of the FPGA.

6 Power and Electrical

Table 6: SoM6 Ti135 Power Specifications

Parameter	Description
Supply Voltages	12V DC
Max Supply Current	1 Amps
Supply Current (Running Hello World)	210mA
Supply Current (Running DDR Memory Test)	320mA
Supply Current (Running Ethernet iPerf2 Test)	380mA