



AXIOMTEK

SCM120

**Freescale i.MX6 Series ARM-based
SMARC System-on-Module**

Hardware User's Manual



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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Chapter 1

Introduction



The SCM120 is a new SMARC module to support Freescale i.MX6 series SoCs. It integrates system memory, storage as eMMC/SDHC socket, TTL LCD, Audio, USB Host/Client, UARTs, CANBus and various I/O features. Taking the low power consumption advantages of ARM RISC architecture, the SCM120 is extremely suitable to be deployed in the deeply embedded applications; such as HMI, data logger, extended temperature embedded controllers, etc.

1.1 Features

- Freescale i.MX6 family SoC information:

Feature	i.MX6Quad(800MHz) MCIMX6Q7CVT08A	i.MX6Quad(1.0GHz) MCIMX6Q5EYM10A	i.MX6DualLite(800MHz) MCIMX6U7CVM08A
On-chip RAM	DDR3 1066MHz 1GB	DDR3 1066MHz 1GB	DDR3 800MHz 1GB
Memory I/F	eMMC NAND Flash 4GB	eMMC NAND Flash 4GB	eMMC NAND Flash 4GB
Touchscreen	No	No	No
Ethernet	x1	x1	x1
Display	LVDS x2 24-bit TTL LCD HDMI x1	LVDS x2 24-bit TTL LCD HDMI x1	LVDS x2 24-bit TTL LCD HDMI x1
Storage	SATA x1 SD/SDHC x1	SATA x1 SD/SDHC x1	SD/SDHC x1
Mini PCIE	x1 (with SIM slot)	x1 (with SIM slot)	x1 (with SIM slot)
USB 2.0	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1
Camera sensors	Serial port x1 Parallel port x1	Serial port x1 Parallel port x1	Serial port x1 Parallel port x1
CAN	x2	x2	x2
JTAG	x1	x1	x1
SPI	x2	x2	x2
I2C	x4	x4	x4
UART	RS-232 x2	RS-232 x2	RS-232 x2
GPIO	x8	x8	x8
Audio	Headphone x1 Mic-in x1	Headphone x1 Mic-in x1	Headphone x1 Mic-in x1
System Control	Buttons x2 (Power,Reset,)	Buttons x2 (Power,Reset,)	Buttons x2 (Power,Reset,)
Power	DC 5V, 5A CR2032 for Standby Power	DC 5V, 5A CR2032 for Standby Power	DC 5V, 5A CR2032 for Standby Power

- Onboard DDR3-1066 memory 1GB supports up to 2GB capacity
- Onboard eMMC flash as booting device
- 24-bit TTL LCD
- One USB 2.0 ports and One Mini USB OTG port
- One 10/100/1000 Base-T Ethernet
- IIS Audio

1.2 Specifications

- **CPU**
 - Freescale i.MX6 series SoC; default is i.MX6 DualLite
 - ARM Cortex A9™ CPU running at 1.2GHz.
 - 256KB integrated low power on-chip SRAM.
 - 64KB integrated mask-programmable on-chip ROM.
- **Boot ROM**
 - Linux kernel 3.0.35 compliant Android 4.3.1
(Please contact your agent for detail shipping content).
- **System Memory**
 - 1GB Maximum up to 2GB DDR3-1066 Memory.
- **USB Interface**
 - One USB 2.0 ports and One Mini USB OTG port OTG comply with USB Spec. Rev. 2.0.
- **Storage Interface**
 - One eMMC NAND flash chip on module; default is 4GB.
 - One SATA Connector on base serial-ATA to interface with hard disk drives.
 - One SD/SDHC Connector on base with up to 32GB capacity.
 - One Micro SD Connector on base with up to 32GB capacity
- **Display**
 - Two LVDS channels, connectivity to displays with LVDS interface.
 - One parallel display ports, RGB Data of 24 bits.
 - One HDMI with up to 1920x1080 resolution.
- **Ethernet**
 - One 10/100/1000 Base-T with Freescale i.MX6 integrated MAC and Atheros AR8031 PHY, support IEEE std 1588-compatible hardware timestamp.
 - Compatible with IEEE std 802.3.
- **Audio**
 - Freescale IIS SGTL5000 codec for MIC-in/headphone via SMARC MXM interface.
- **Serial Port**
 - Two RS-232, with 4-wire(TX/RX/RTS/CTS)
- **CANBus**
 - Two 2.0B protocol-compatible Controller Area Network (CAN) via SMARC MXM interface.
- **Camera sensors**
 - MIPI CSI-2(2 lanes)
 - Parallel Camera port(8 bit)
- **I²C**
 - Four I²C Master/Slave interfaces (up to 400kbps) connected to SMARC MXM interface.

- **SPI**
 - Two SPI channel for 2 chip select via SMARC MXM interface.
- **GPIO**
 - Eight GPIO interfaces (up to 400kbps) via SMARC MXM interface with buttons.
- **Power**
 - +5V \pm 5% DC-in.
- **Form Factor**
 - 82mm x50mm.
 - Thickness as 1.2mm \pm 0.1mm.
 - SMARC Hardware Specification V1.0.
- **Environments**
 - Operating temperature with IMX6: -40 ~ 85°C
 - Operating humidity: 10% RH ~ 85% RH relative humidity, non-condensing.

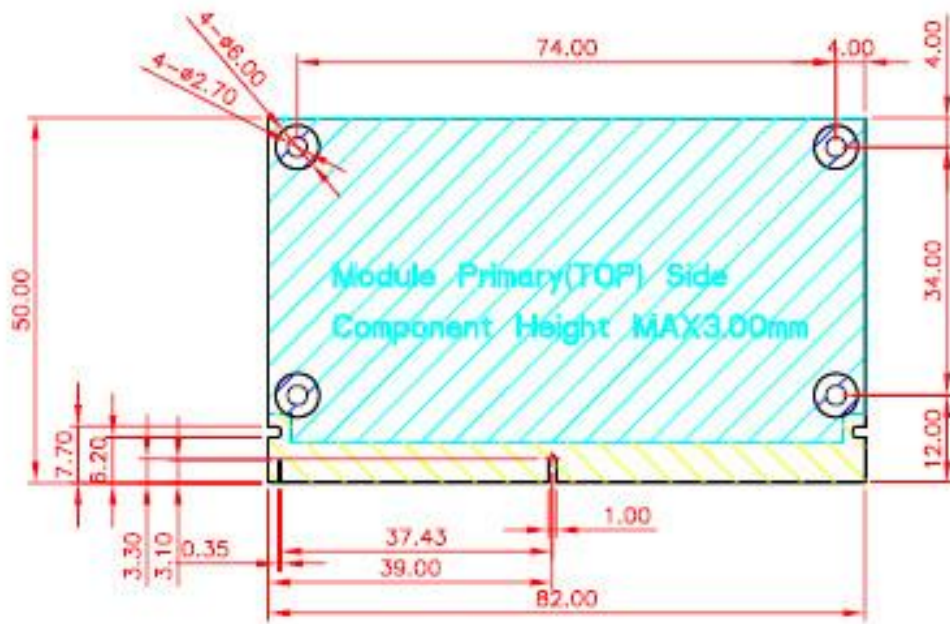


Note: *All specifications and images are subject to change without notice.*

Chapter 2

Board and Pin Assignments

2.1 Board Dimensions and Fixing Holes

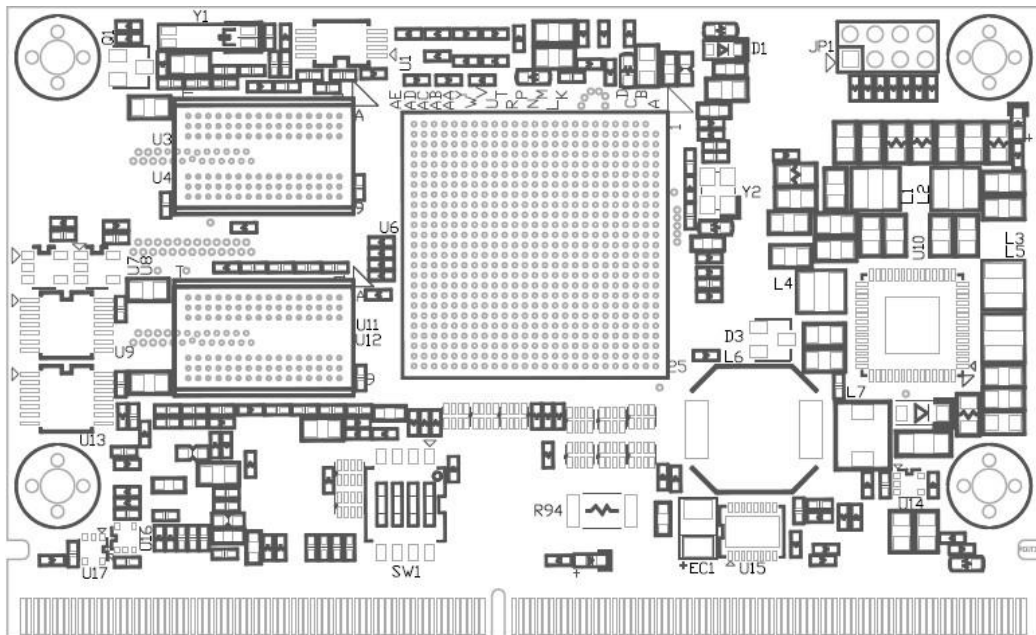


Top View

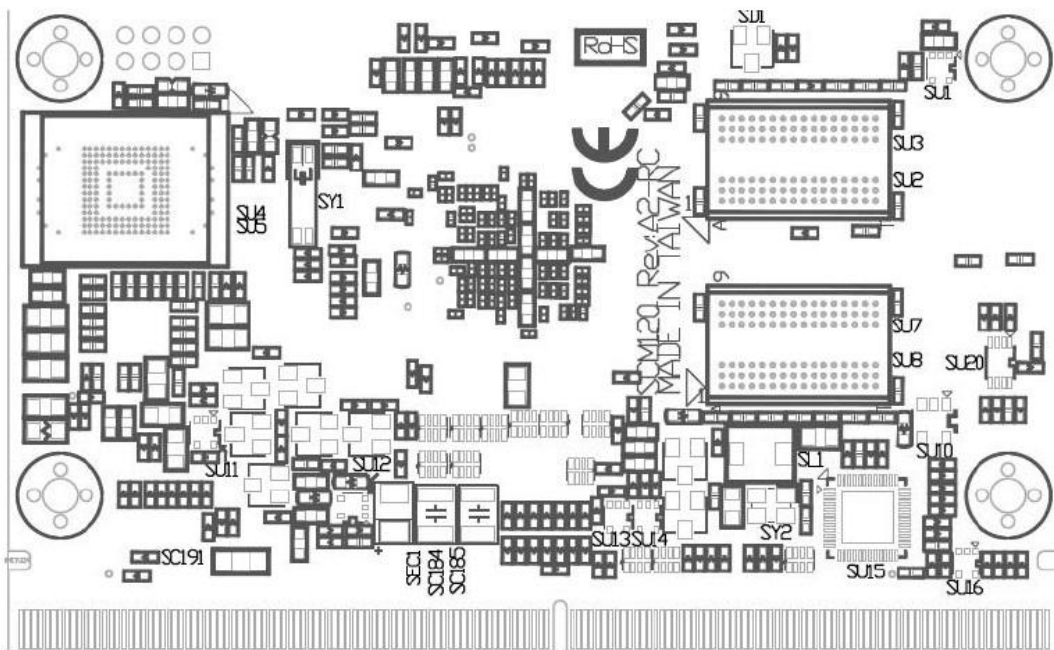


Bottom View

2.2 Board Layout



Top View



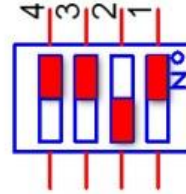
Bottom View

2.3 Switch Settings

2.3.1 SWICH (SW1)

SCM120 jumpers are for boot mode selection

Function	Setting
Depend on base board (Default)	SW1(1,3,4) ON SW1(2) OFF



2.3.2 JTAG Connector (JP1)

This board has a JTAG Connector (JP1) for interfacing JTAG ICE TOOL.

Pin	Signal	Pin	Signal
1	GEN_3V3	2	JTAG_TMS
3	JTAG_nTRST	4	JTAG_TCK
5	JTAG_TDI	6	JTAG_TDO
7	GND	8	POR_B

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