iWave
Embedding Intelligence

# System On Module iW-RainboW-G50M

# i.MX 93 or i.MX 91 SMARC Module

The i.MX 93 or i.MX 91 SoC based SMARC System On Module is designed as per SMARC specification v2.1.1. It integrates NXP's i.MX 93 offerings Dual Cortex A55 @ 1.7GHz, NPU with up to 0.5 TOP/s* and IEEE 802.11 a/b/g/n/ac/ax Wi Fi + Bluetooth 5.3 module.

The i.MX 93 or i.MX 91 SMARC System On Module is aimed to offer for applications mainly focusing on Machine Learning, NPU* and vision system, advanced multimedia and industrial automation with high reliability.

## iW-RainboW-G50M HIGHLIGHTS

i.MX 93 Dual with 64-bit ARM v8.2-A architecture

i.MX 91 Solo with 64-bit ARM v8.2-A architecture

NPU with up to 0.5 TOP/s Neural Network performance*

Up to 2GB LPDDR4/4X* Memory (in i.MX 91 LPDDR4 is supported)

IEEE 802.11a/b/g/n/ac/ax+ Bluetooth 5.3+ IEEE802.15.4 (Optional)

SMARC v2.1.1 Compatible SOM with 82mm x 50mm form factor

10+ years of Product Longevity Program

## SPECIFICATIONS

| SoC |
|---|
| **i.MX 9352:** 2x Cortex®-A55, NPU, MIPI DSI, LVDS, MIPI CSI, Parallel camera, Parallel display, 2x Ethernet, 2x USB 2.0, 7x I2S TDM |
| **i.MX 9351:** 1 x Cortex-A55, NPU, MIPI DSI, LVDS, MIPI CSI, Parallel camera, Parallel display, 2x Ethernet, 2x USB 2.0, 7x I2S TDM |
| **i.MX 9332:** 2x Cortex®-A55, MIPI DSI, LVDS, MIPI CSI, Parallel camera, Parallel display, 2x Ethernet, 2x USB 2.0, 7x I2S TDM |
| **i.MX 9331:** 1x Cortex®-A55, MIPI DSI, LVDS, MIPI CSI, Parallel camera, Parallel display, 2x Ethernet, 2x USB 2.0, 7x I2S TDM |
| **i.MX 91 Processor** |
| i.MX 91: 1x Cortex®-A55, Parallel camera, Parallel display, 2x Ethernet, 2x USB 2.0 |
| **Memory & Storage** |
| LPDDR4/LPDDR4X* -2GB |
| eMMC Flash - 8GB (Expandable) |
| EEPROM |
| Micro SD Connector (Optional) |
| **Other** |
| IEEE 802.11a/b/g/n/ac/ax+ Bluetooth 5.3+ IEEE802.15.4 |
| USB2.0 1:4 Hub |
| Gigabit Ethernet PHY Transceiver x 2 |
| RTC Controller |
| UART Header (Optional), JTAG header (Optional), TPM2.0 (Optional) |

| SMARC PCB Edge Interfaces |
|---|
| Gigabit Ethernet x 2 Ports (through On-SOM Gigabit Ethernet PHY transceivers) |
| SD (4bit) x 1 Port |
| USB2.0 OTG x 1 |
| USB2.0 Host x 4 (through On-SOM USB Hub) |
| SAI/I2S (Audio Interface) x 1 |
| SPI x 2 (1 is optional) |
| Data UART with flow control x 2 |
| Data UART without flow control x 1 |
| Debug UART x 1 |
| GPIOs x 15 |
| MIPI_DSI(4lane) x 1* |
| MIPI_CSI(2lane) x 1* |
| LVDS x 1* |
| I2C x 2 |
| PWM x 1 |
| Tamper x 2 (through RSVD pins) |
| **OS Support** |
| Linux 6.1.22 |
| **General Features** |
| **Power Input** |
| 5V, 2.5A through SMARC Edge Connector |
| **Form Factor** |
| 82mm x 50mm |
| **Operating Temperature** |
| -40°C to +85°C (Industrial) |
| **Environment Specification** |
| REACH & RoHS3 Compliant |

* Not supported in i.MX 91 SoC

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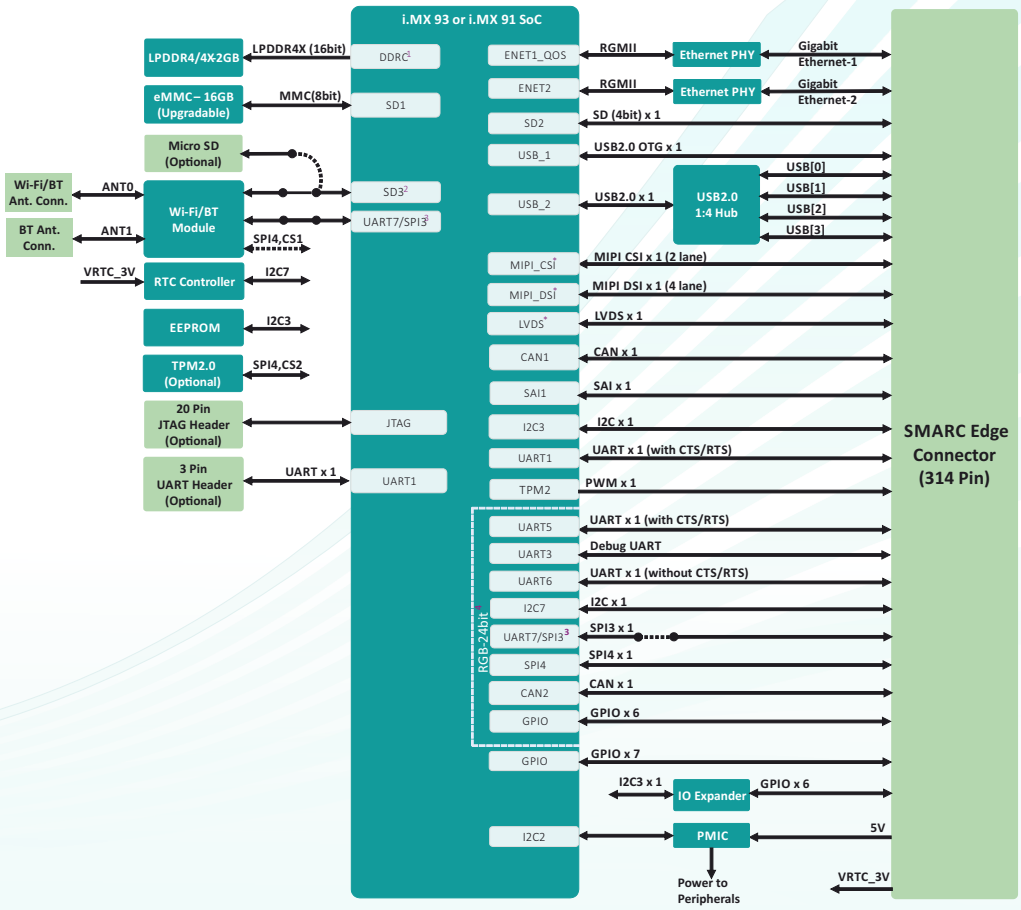
# i.MX 93 or i.MX 91 based SMARC SOM Block Diagram




*Note:*

*1. By default, LPDDR4X is supported in i.MX 93. Also note, LPDDR4X is not supported in i.MX 91 SoC.*

*2. SD3 is default connected to Wi-Fi module and Optionally connected to microSD Connector.*

*3. In default configuration UART7 interface of i.MX 93 is connected to on SOM Bluetooth module and optionally connected to SMARC SPI1.*

*4. 24-bit RGB is optionally available.*

** Not supported in i.MX 91 SoC*

## OS SUPPORT
Linux 6.1.22

## DELIVERABLES
i.MX 93 or i.MX 91 SMARC Module
Board Support Package
User Manual

## OPTIONAL KITS/Modules
i.MX 93 or i.MX 91 SMARC Development Kit
Heat Sink

## CUSTOM DEVELOPMENT
BSP Development/OS Porting
Custom SOM/Carrier Development
Custom Application/GUI Development
Design Review and Support

iWave Systems Technologies is an ISO 9001:2015 certified company, head quartered in Bangalore India established in the year 1999. The company focuses on providing embedded solution and services for Industrial, Medical, Automotive and various other Embedded Computing applications. iWave Systems offers wide range of System On Modules and Single Board Computers built using wide range of CPU and FPGA SoC platforms with different form factors such as Qseven, SMARC, SODIMM and HPC by closely working with Tier-1 silicon companies such as NXP, Xilinx, Intel etc.

iWave Systems offers various state of art ready ODM solutions such as Connected Telematic Control Unit / OBD II devices for the automotive edge analytics, Comprehensive ARINC818 solutions for the low latency Aerospace applications and Rugged IP rated performance scalable HMI solutions for Industrial applications.

iWave Systems also provides comprehensive Engineering design services involving Embedded Hardware, FPGA and Software development. iWave offers carrier board and custom hardware development with manufacturing and certification services.iWave's Hardware expertise spans complex board design up to 30 layers; Analog, Digital & RF Designs; FPGA Development up to 3+ million gates and VHDL / Verilog RTL Development & Verification. Our Software expertise ranges from OS Porting, Firmware & Device Drivers Development and Wireless & Protocol Stacks.

**Optional items not included in the standard deliverables.*



## i.MX 93 or i.MX 91 SMARC Module

The device can be ordered online from the iWave Website
https://www.iwavesystems.com/product/i-mx-93-i-mx-91-smarc-som
Or from our Local Partners in your region
http://www.iwavesystems.com/about-us/business-partner.html

iW-G50M-BR-R1.0

**INDIA**
iWave Systems Technologies Pvt Ltd.
#7/B, 29th Main, BTM Layout
2nd Stage,
Bangalore - 560 076
mktg@iwavesystems.com

**JAPAN**
iWave Japan Inc.
8F Kannai Sumiyoshi Building,
3-29 Sumiyoshi-cho,Naka -ku,
Yokohama Kanagawa, Japan
mktg@iwavesystems.com

**EUROPE**
International Sales & Marketing Europe
Venkelbaan 55 2908KE Capelle
aan den Ijssel,
The Netherlands
info@iwavesystems.eu

**USA**
iWave USA
1692 Westmont Ave. Campbell
Ca95008
USA
info@iwavesystems.us

**www.iwavesystems.com**