

System on Module

UCM-iMX91L

Datasheet v1.0



UCM-iMX91L is an ultra-miniature form factor System on Module built on the ARM Cortex-A55 CPU from NXP.

Optimised for industrial applications and an ideal solution for cost-sensitive systems such as Smart Home and Building Control, the UCM-iMX91L features up to 2GB LPDDR4 RAM and up to 64GB eMMC storage.

Measuring just 28 x 30 x 4mm, UCM-iMX91L offers Gbit Ethernet, extensive I/O options, and a wide operating temperature range of -40°C to +85°C.

Key Features:

- ARM Cortex-A55 CPU, 1.4GHz
- Up to 2GB LPDDR4 and 64GB eMMC
- GbE, RGMII, 2x USB, 2x CAN-FD, 7x UART
- 2 x SDIO, 7 x SPI, 6 x I2C, 65 x GPIO
- Operating temperature: -40°C to +85°C



UCM-iMX91L

CPU Core, Memory & Storage

Note:

- "Option" column specifies the configuration code required to have the particular feature.
- "+" means that the feature is always available

Feature	Specification	Option
CPU	NXP i.MX9131 ARM Cortex-A55, 1.4GHz	C1400D
RAM	512MB – 2GB, LPDDR4	D
Storage	eMMC flash, 8GB – 64GB	N

Network

Feature	Specification	Option
Ethernet	Gigabit Ethernet port (MAC+PHY)	E
	Secondary RGMII	+

I/O

Feature	Specification	Option
USB	2x USB2.0 dual-role ports	+
UART	Up to 7x UART	+
CAN bus	Up to 2x CAN-FD	+
SD/SDIO	2x SD/SDIO	+
SPI	Up to 7x SPI	+
I2C	Up to 6x I2C	+
Digital Audio	Up to 2x I2S/SAI	+
	S/PDIF input/output	+
ADC	Up to 4x general-purpose ADC channels	+
PWM	Up to 6x general-purpose PWM signals	+
GPIO	Up to 65x GPIO (multifunctional signals shared with other functions)	+

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System Logic and Debug

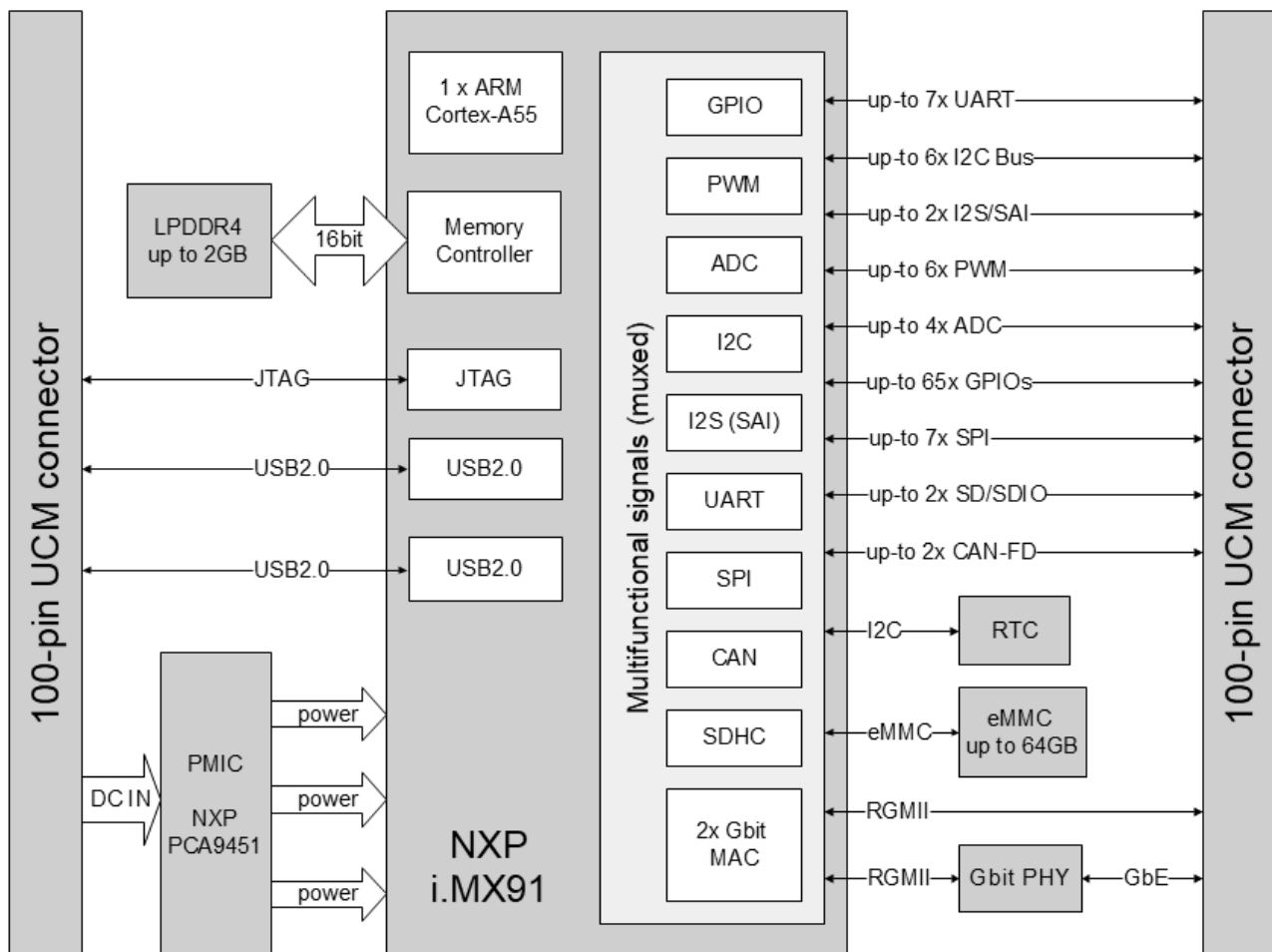
RTC	Real Time Clock, powered by external lithium battery	+
JTAG	JTAG debug interface	+

Electrical, Mechanical and Environmental Specifications

Supply Voltage	3.45V to 5.5V
Digital I/O Voltage	3.3V/1.8V
Power Consumption	0.5-2.0W depending on system load and board configuration
Dimensions	28 x 30 x 4 mm
Weight	5 grams
Connectors	2 x 100-pin, 0.4mm pitch
MTTF	> 200,000 hours
Operating Temperature (case)	Commercial: 0°C to +70°C Extended: -20°C to +70°C Industrial: -40°C to +85°C
Storage Temperature	-40°C to +85°C
Relative Humidity	10% to 90% (operation) 05% to 95% (storage)
Shock	50G / 20 ms
Vibration	20G / 0 - 600 Hz

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Block Diagram

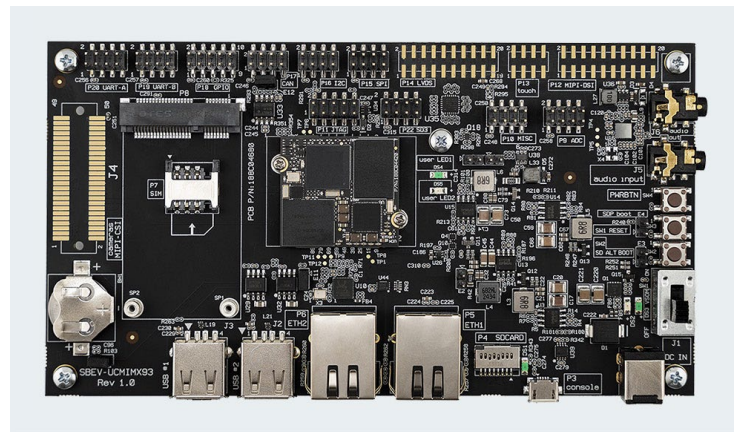


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UCM-iMX91L Evaluation Kit

Hardware

- UCM-iMX91L-C1400D-D1-N16-E-TIC
- SBEV-UCMIMX93 carrier board
- Optional: Quectel EG25G LTE cellular modem
- Cables and adapters
- 12V power supply



Technical Support

- Technical support for 12 months.
- Schematics review of the customer's carrier board design.
- LCD panel compatibility verification and driver adaptation service.
- 45-day trial period. Eval Kit will be accepted for refund if the user finds the product not suitable for their needs.

Rev no.	Rev date.	Contents	Page
v1.0	06.08.2025	New creation	