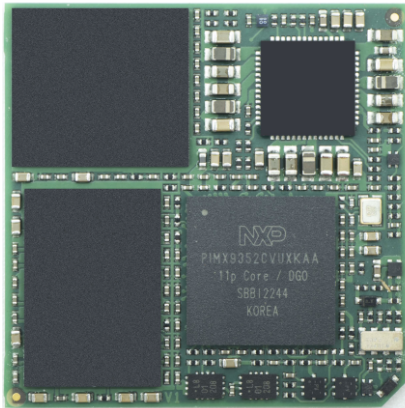


## TRIA OSM-SF-IMX93

NXP™ i.MX 93 ARM® Cortex™-A55 / M33



30 x 30 mm

500mW - 2W

-40 +85



### Highlights

- Single or Dual core ARM Cortex-A55 Applications Processors up to 1.7GHz
- ARM Cortex-M33 Real Time Processor at 250MHz
- ARM Ethos™-U65 microNPU with 256 MACs/Cycle
- Pixel processing pipeline (PXP) engine
- Up to 2GB LPDDR4 SDRAM with inline ECC
- Up to 256GB eMMC Flash
- MIPI-DSI x4, Single-channel LVDS (opt. on RGB)
- MIPI CSI-2 Camera Interface
- 1x USB 2.0 Host interface
- 1x USB 2.0 Host/Device interface
- 2x Gigabit Ethernet (RGMII)
- 2x SD/SDIO interfaces
- 2x CAN-FD interfaces
- 2x ADC inputs (12-bit)
- Optimized design for low power applications
- OSM 1.1 (SF) Compliant, 322 Pin, RM 1,25 mm

## Technical Data

<b>Technology</b>	ARM
<b>Formfactor</b>	OSM-SF, 332 Contacts, RM 1,25 mm
<b>CPU</b>	<p>NXP i.MX 93 ARM Cortex-A55 Applications Processors</p> <ul style="list-style-type: none"> <li>• i.MX 9352, dual-core, NPU, 1.7GHz</li> <li>• i.MX 9332, dual-core, 1.7GHz</li> <li>• i.MX 9351, single-core, NPU, 1.7GHz</li> <li>• i.MX 9331, single-core, 1.7GHz</li> <li>• i.MX 9302, dual-core, 900 MHz</li> <li>• i.MX 9301, single-core, 900 MHz</li> </ul> <p>ARM Cortex-M33 Real Time Processor at 250MHz ARM Ethos-U65 microNPU with 256 MACs/Cycle</p>
<b>Chipset</b>	SOC
<b>RAM</b>	Up to 2GB 3700MT/s LPDDR4 SDRAM, soldered, inline ECC support
<b>Flash</b>	Up to 256GB eMMC Flash
<b>Storage Interfaces</b>	2x MMC/SD/SDIO
<b>USB</b>	1x USB 2.0 Host/Client, 1x USB 2.0 Host
<b>Serial Interfaces</b>	<p>1x UART Console with Rx, Tx only 1x UART with 2-wire hand shake 2x UART w/o hand shake</p>
<b>Bus Interfaces</b>	<p>2x I2C up to 400 Kbit/s 2x SPI (with two chip selects) 2x CAN-FD /CAN 2.0B</p>
<b>Display Controller</b>	<p>Pixel processing pipeline (PXP) engine to support 2D image processing (i.e. Blending/Composition, Rotation, Resize, Color Space Conversion)</p> <p>no 3D Graphics Processing Unit (GPU) no Video Processing Unit (VPU)</p>
<b>Display Interfaces</b>	<p>MIPI-DSI Display Interface, 4 lanes, up to 1920x1080 @ 60fps Single-channel LVDS interface, 18 or 24 bit, up to 1366x768 @ 60fps (opt. on RGB Pins)</p>
<b>Network Interface</b>	2x Ethernet, (RGMII interface)
<b>Audio Interface</b>	1x I2S Audio
<b>Security Device</b>	Advanced Security, Safety, and Reliability integrated in the SOC Integrated EdgeLock secure enclave enables autonomous management of security functions, including runtime attestation, silicon root of trust, reusable certifications, trust provisioning, and fine-grain key management augmented by extensive crypto services for advanced attack resistance
<b>Miscellaneous</b>	<p>Watchdog Timer for system reset (programmable, 1s ... 600s)</p> <p>RTC</p> <p>20x GPIO, configurable as input or output, interrupt capable</p> <p>2x PWM</p> <p>2x ADC inputs (12-bit)</p> <p>MIPI CSI-2 camera interface (2 lane)</p>
<b>Feature Highlights</b>	OSM, Size-S compatible
<b>Firmware</b>	uboot
<b>OS Support</b>	Linux Board Support Package Android Board Support Package (on request)

<b>Power Requirement</b>	Power Supply +5V +/-5% Power Consumption 500mW-2W typ.
<b>Environment</b>	Temperature Range: Commercial: 0° ... 70°C (operating) -20° ... 85°C (storage) Extended: -25° ... 85°C (operating) -40° ... 85°C (storage) Industrial: -40° ... 85°C (operating) -40° ... 85°C (storage)  Humidity: 5 ... 95% (operating, non condensing) 5 ... 95% (storage, non-condensing)
<b>Dimensions</b>	30 x 30 mm
<b>Certificates</b>	UL / CE
<b>Carrier</b>	TRIA SM2F-OSM-AD-001

Technical Data for TRIA OSM-MF-IMX93

## Order Reference

Order No.	Description	Reference	Status*
111852	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.5GHz, NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C	MSC OSM-SF-IMX93-DC-14N0A00I PCBFTX	PV
111801	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.5GHz, NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C	MSC OSM-SF-IMX93-DC-03N0A00I PCBFTX	PV
111853	OSM 1.1 module based on NXP i.MX 9332, Dual Core Cortex-A55 processor at 1.5GHz, no NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-DCL-03N0A00E PCBFTX	PV
111854	OSM 1.1 module based on NXP i.MX 9331, Single Core Cortex-A55 processor at 1.5GHz, no NPU, 512MB LPDDR4, 4GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-SCL-92N0A00E PCBFTX	PV
116920	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 2GB LPDDR4, 64GB eMMC Flash (20GB in SLC Mode), 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-DC-16N2A00E PCBFTX	OR
117956	OSM 1.1 module based on NXP i.MX 9332, Dual Core Cortex-A55 processor at 1.7GHz, no NPU, 2GB LPDDR4, 4GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C	MSC OSM-SF-IMX93-DCL-12N0A00E PCBFTX	OR
116367	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-DC-14N0A00I-RN PCBFTX	PV
116366	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, industrial temperature -40...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-DC-03N0A00I-RN PCBFTX	PV
116368	OSM 1.1 module based on NXP i.MX 9332, Dual Core Cortex-A55 processor at 1.7GHz, no NPU, 1GB LPDDR4, 8GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-DCL-03N0A00E-RN PCBFTX	PV

Order No.	Description	Reference	Status*
116369	OSM 1.1 module based on NXP i.MX 9331, Single Core Cortex-A55 processor at 1.7GHz, no NPU, 512MB LPDDR4, 4GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-SCL-92N0A00E-RN PCBFTX	PV
116972	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.7GHz, NPU, 2GB LPDDR4, 64GB eMMC Flash (20GB in SLC Mode), 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-DC-16N2A00E-RN PCBFTX	OR
117957	OSM 1.1 module based on NXP i.MX 9332, Dual Core Cortex-A55 processor at 1.7GHz, no NPU, 2GB LPDDR4, 4GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, extended temperature -25...+85°C, Tape&Reel packaging, PU: 240 pcs.	MSC OSM-SF-IMX93-DCL-12N0A00E-RN PCBFTX	OR
98573	OSM 1.1 module based on NXP i.MX 9352, Dual Core Cortex-A55 processor at 1.5GHz, NPU, 1GB LPDDR4, 16GB eMMC Flash, soldered on SM2F-OSM-AD-001	MSC SM2F-OSM-AD-93D2G160-001 ES2 PCBES	OR

Ordering Information for TRIA OSM-SF-IMX93

\*PV = Preferred variant; OR = on Request (in OEM quantities only)

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