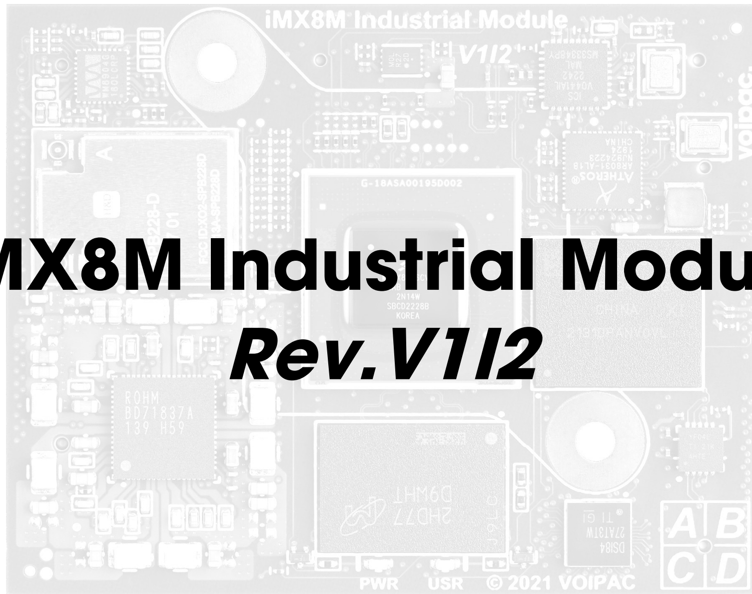

iMX8M Industrial Module

Rev.V1I2

Datasheet

DATE	REVISION	CHANGES
February 7, 2023	1.0	Initial Release
June 9, 2023	1.1	Power Consumption Tables Added
December 2, 2023	1.2	Connectors Signals and Warranty Terms Updated
October 18, 2024	1.3	Mating Connectors Updated

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1. Introduction

1.1. Hardware

This highly-integrated computer on module, based on the NXP i.MX 8M ARM® CPU with Cortex®-A53 and Cortex-M4 cores, combines remarkable performance and peripheral availability with robust 1.6mm thick 12-layer PCB and reliable industrial connectors essential for a stable-performance embedded system. Its wide diameter mounting holes with standardized 30x30mm pitch, matching highly effective screwed heatsinks with mounting tabs and springs, are a necessity for harsh industrial environments.

This passive-cooled solution provides all of the must-have peripherals of a standard embedded system like the industry-leading i.MX 8M CPU, up to 4GB LP-DDR4 RAM, up to 64GB eMMC, 2x PCIE, 2x USB3, dual channel LVDS and 2x MIPI-CSI2. Moreover, it includes multiple development demanding parts soldered right on the COM, such as 1Gb Ethernet PHY, Audio chip, LVDS bridge, PCI Express clock generator, WiFi and Bluetooth module, thus significantly reduces new product time-to-market.

The 3 pcs of robust, 100-pin, low-density shielded connectors with wide mating length, 3mm stacking height, and -55°C to +85°C operating temperature range provide perfect board-to-board connection for demanding applications, optimal heat dissipation and enough room for custom baseboard components placement and conformal coating application. These connectors feature shielding metal fittings along the connector signal pins, both on the module and the baseboard, ideal for a reliable industrial embedded system.

iMX8M Industrial Module is designed to be used to accelerate a project launch on a new platform, and represents the possibility of parallel hardware and software development, allowing the newly designed rugged embedded system to be tuned for price and performance by a simple module replacement, and re-use of the developed applications as well as source code.

The confidential schematic of the iMX8M Industrial Module in PDF, providing answers to further engineering questions, is also included in complete development kit, and becomes available right after the development kit purchase.

1.2. Software

Voipac fully supports Linux operating system with drivers for all basic interfaces. Customized drivers for specific applications can be developed upon request.

OPERATING SYSTEM	DESCRIPTION
Linux	Yocto Project 3.1 (Dunfell) Linux distribution
Debian	Debian 11 (Bullseye) – porting in progress
Android	Android 12 (Snow Cone) – porting in progress

1.3. Booting Options

The standard configuration iMX8M Industrial Module comes with virgin e-Fuses. Standard development kits are set for direct boot from eMMC Flash located on the module.
Internal Boot options are:

BOOT DEVICE OPTIONS	DESCRIPTION
MMC/eMMC	Supported by VOIPAC Development Kit
SD/eSD	Supported by VOIPAC Development Kit
NAND	Available at customized carrier board

The CPU supports following boot mode configurations:

- Boot From e-Fuses: Standard mode
- Serial Downloader: USB mode
- Internal Boot: Depending on values of GPIO pins, booting device is selected (without the need of changing e-Fuses settings)

NOTE: *All associated pins used for boot configuration are available on 3x 100pin connectors.*
To ease the prototyping, all the signals are also connected to DIP switches placed on the baseboard.

<table>
<tr><th>BMODE(1:0)</th><th>BOOT TYPE</th><th>NOTE:</th></tr>
<tr><td>00</td><td>Boot from Fuses</td><td rowspan="4">More Information available in
iMX8M Industrial Module Schematics
Sheet 18: DOC – BOOT CFG.</td></tr>
<tr><td>01</td><td>Serial Downloader</td></tr>
<tr><td>10</td><td>Internal Boot (Development)</td></tr>
<tr><td>11</td><td>Reserved</td></tr>
</table>

1.4. Features Summary

FEATURE	DESCRIPTION
CPU	NXP i.MX 8M ARM® Cortex®-A53 Cortex-M4 CPU, clocked up to 1.5 GHz / up to 4 cores
DDR4 SDRAM	LPDDR4-3733 SDRAM (1.866 GHz), 1024 / 2048 / 4096 MB
I2C EEPROM	1024 KBit
eMMC	1x eMMC Flash 8 / 16 / 32 / 64 GB
SD Card	1x SD
GPU engine	GC7000Lite (4 shaders) OpenGL® ES 2.0 / 3.0 / 3.1, Vulkan®, OpenCL™ 1.2
VIDEO OUT	• 1x HDMI 2.0a up to 4K 4096 x 2160 px • 1x LVDS dual channel up to WUXGA 1920 x 1200 px
VIDEO IN/CAMERA	2x MIPI-CSI; 4 data lines; up to 2592 x 1944 px
AUDIO	Digital Audio (SAI), Analog Audio codec (Analog / Digital Microphone, Line In/Out, Headphones Out)
ETHERNET	10/100/1000 Mbps
WiFi + Bluetooth	802.11 a/b/g/n/ac 2.4 and 5GHz + Bluetooth 5.0
USB	2x High-Speed USB 3.0 HOST/DEVICE (OTG)
OTHER IO	4x UART / GPIOs / 1x PWM / 2x I2C / 2x SPI / 1x NAND
OTHER HIGH SPEED	1x PCIE 2.0 (additional 1x PCIE 2.0 optional – **when WiFi module not fitted on the COM**)
SYSTEM SIGNALS	RESET IN/OUT, BOOT MODE, POWER OK, USER BUTTON

1.5. Reference Documents

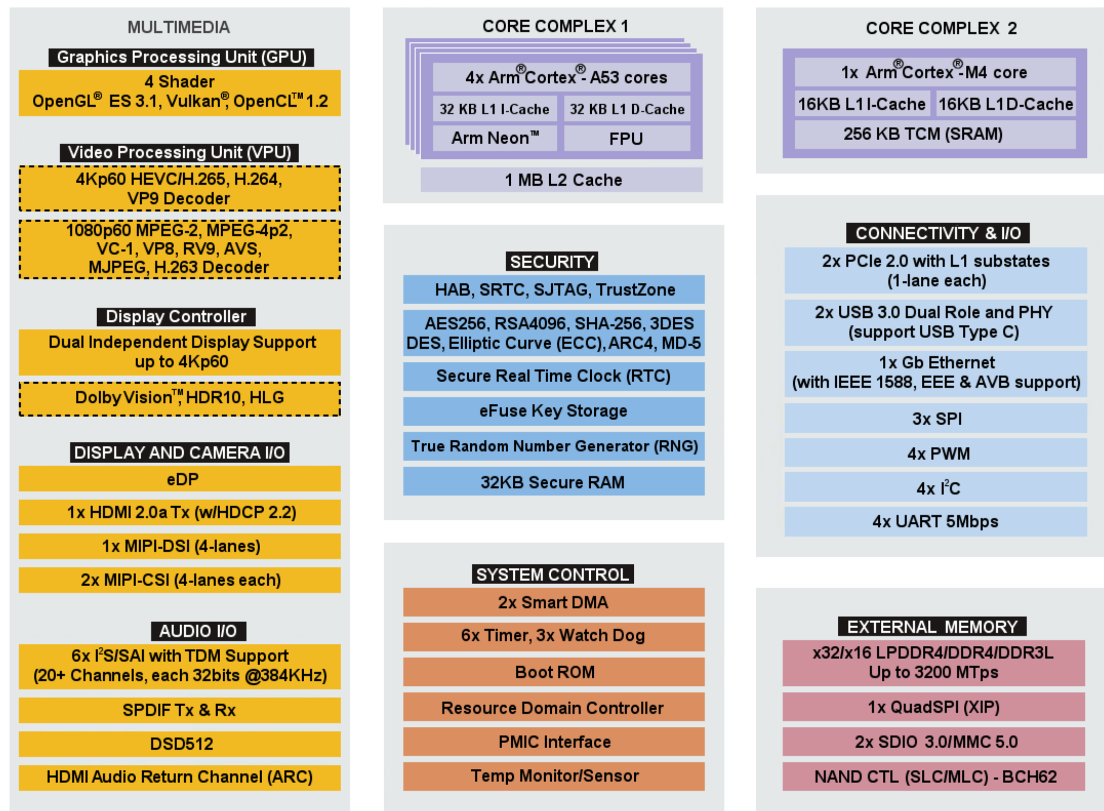
For more detailed technical information about the iMX8M Industrial Module components, please refer to the web resources and documents listed below.

COMPONENT	MANUFACTURER	DESCRIPTION	CLI*
i.MX 8M Processor	NXP Semiconductors	i.MX8 Quad / i.MX8M QuadLite / i.MX8M Dual	U1
DDR4 SDRAM Memory	Micron Technology, Inc.	MT53D1024M32D4DT-053WT:D	U2
PCI Express Clock/Frequency Generator	Renesas Electronics America Inc	9FGV0441AKILF	U3
I2C EEPROM	ON Semiconductor	CAT24M01HU51-GT3	U4
iNAND eMMC Flash	SanDisk Corporation	SDINBDG4-16G-I1	U5
LVDS	Texas Instruments	SN65DSI84ZQER	U6
Voltage-Level Translator	Texas Instruments	TXS0104ERGYR	U7
Ethernet Controller	Atheros Communications, Inc.	AR8031-AL1A-R	U8
AUDIO	Cirrus Logic, Inc.	WM8904CGEFL/RV	U9
WiFi and Bluetooth	AzureWave Technologies, H&D Wireless AB.	AW-CM276NF, SPB228-D-2	U10
PMIC – Voltage Regulator	ROHM Co., Ltd.	BD71837AMWV-E2	U11

***CLI – iMX8M Industrial Module Component Location Indication.**

2. Functional Processor Description

2.1. i.MX 8M Series Applications Processors Block Diagram



2.2. Target Applications

The i.MX 8M processor features NXP advanced and power-efficient implementation of the ARM® Cortex®-A53 core, which operates at speeds as high as 1.5 GHz. Up to 1866 MHz DDR4 and mobile DDR DRAM clock rates are supported. The CPU is suitable for the following applications:

AUTOMOTIVE	
Heating Ventilation, and Air Conditioning (HVAC)	Motorcycle Engine Control Unit (ECU) and Small Engine Control

INDUSTRIAL	
Air Conditioning (AC)	Heat Metering
Building Security	Industrial HMI
Programmable Logic Controller (PLC) and Remote I/O	Smart Lighting Building Safety
Motor Drives	Vision, Advanced Sensing and Processing Board
Smart Power Socket and Light Switch	

MOBILE	
Hearables	Input Device (Mouse, Pen, Keyboard)
	Wireless Charging Pad

SMART CITY	
Automatic Vehicle Identification	Fleet Management
Inventory and Supply Chain Management	Transport Ticketing

SMART HOME	
Home Security and Surveillance	In-Home Energy Display
Major Home Appliances	Robotic Appliance
Set Top Boxes	Small and Medium Appliances
Soundbar	

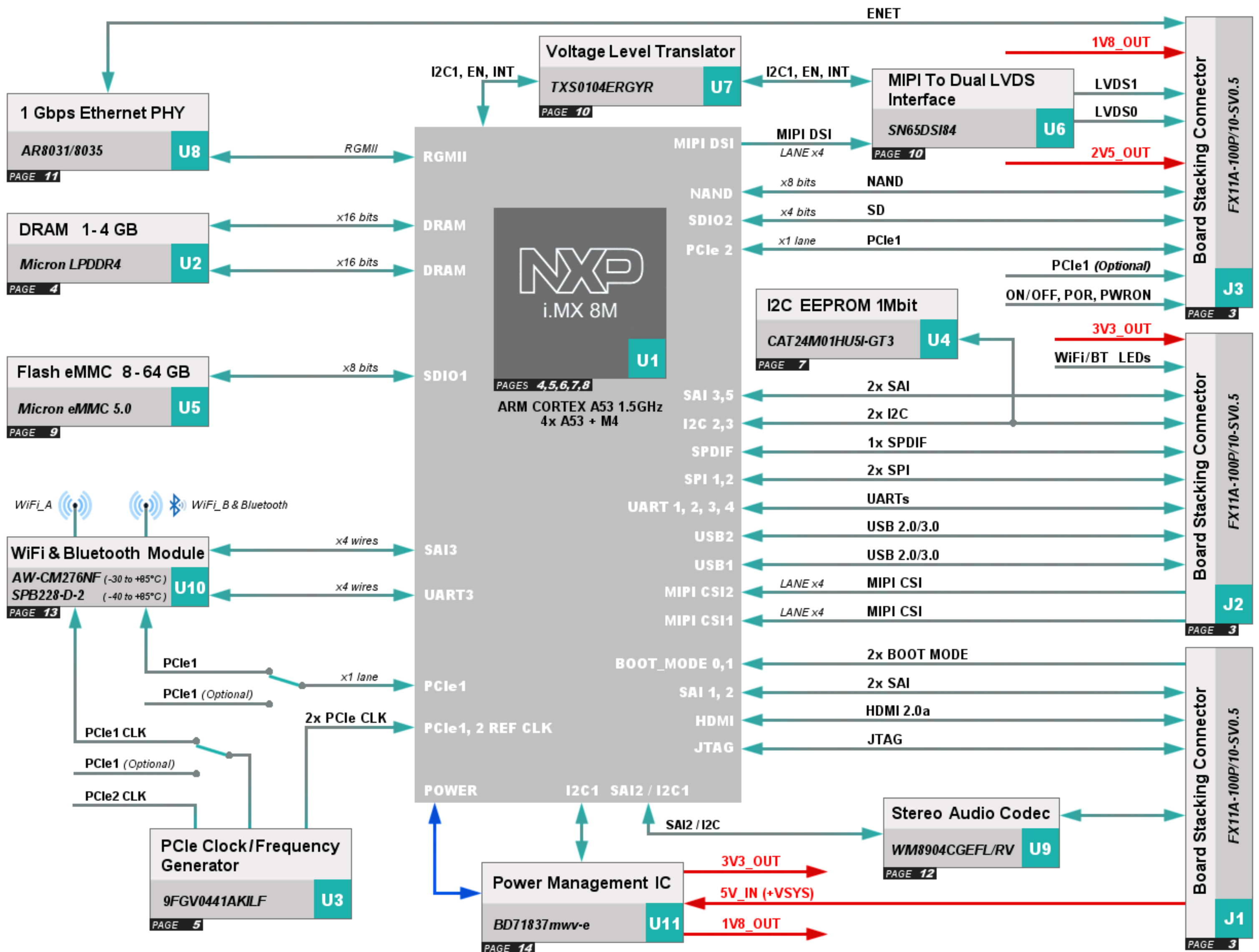
2.3. CPU Features Comparision

FEATURE	i.MX 8M DUAL / i.MX 8M QUAD	i.MX 8M QUADLITE
ARM® Core	2 or 4 x Cortex®-A53	4 x Cortex®-A53
ARM Core	1 x Cortex-M4F	1 x Cortex-M4F
Audio	20 channels in/out; 32-bit up to 384 kHz, with DSD512 support	
GPU	GC7000Lite	GC7000Lite
Video Acceleration	4Kp60, HEVC (H.265) and VP9	
Camera	2 x MIPI-CSI	2 x MIPI-CSI

3. iMX8M Industrial Module Signal Description

This chapter describes the signals of the iMX8M Industrial Module. Some pins have dedicated functionality, but most of them are highly multiplexed, so that the same pin can serve different roles and the same functionality can be selected on different pins. Each of these multiplexed pins is also usable as a General Purpose Input/Output pin (GPIO). Additionally, each GPIO pin can be set as an interrupt source.

3.1. iMX8M Industrial Module Block Diagram



*NOTE: The page number in **black field** refers to the iMX8M Industrial Module schematics document page.*
The confidential schematics is provided to each development kit.

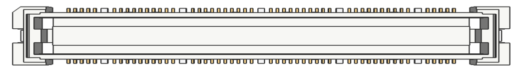
3.2. IO Types Notation

TYPE	DESCRIPTION	TYPE	DESCRIPTION
PWR	Power	G	Ground
I	Input	O	Output
I/O	Input / Output		

3.3. J1 - 100 Contacts Board Stacking Connector *(CONN RCPT 100POS SMD GOLD)*

Description: J1 Board-to-board shielded connector connects the module to the baseboard. 100 low-density pins with additional ground strips provide strong and reliable peripheral connection.

Manufacturer: Hirose Electric Co. Ltd.
Connector: [FX11A-100P/10-SV0.5(71)]



J1

DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Connector Ground Plate	G	GND		111					
Analog Microphone Left	I	MICIN_L	AUDIO	1	2	AUDIO	DMIC1_IN	I	Digital Microphone 1
Analog Microphone Right	I	MICIN_R	AUDIO	3	4	AUDIO	DMIC2_IN	I	Digital Microphone 2
Headphone Output Ground Loop Noise Rejection Feedback	I	HP_OUT_FB	AUDIO	5	6	AUDIO	LINE_OUT_L	O	
Headphone Output Right	O	HP_OUT_R	AUDIO	7	8	AUDIO	LINE_OUT_R	O	
Headphone Output Left	O	HP_OUT_L	AUDIO	9	10	AUDIO	LINE_OUT_FB	I	
Ground	G	GND		101	102		GND	G	Ground
Synchronous Audio Interface	O	SAI1_TXD7	SAI1	11	12		DMIC_CLK	O	
Synchronous Audio Interface	O	SAI1_TXD5	SAI1	13	14	BOOT	GND	G	Ground
Synchronous Audio Interface	O	SAI1_TXD3	SAI1	15	16	BOOT	BOOT_MODE0	I	
Synchronous Audio Interface	O	SAI1_TXD1	SAI1	17	18	BOOT	BOOT_MODE1	I	
Synchronous Audio Interface	O	SAI1_TXD0	SAI1	19	20	BOOT	GND	G	Ground
Ground	G	GND	SAI1	21	22	SAI1	SAI1_TXD6	O	Synchronous Audio Interface
Synchronous Audio Interface	I	SAI1_RXD7	SAI1	23	24	SAI1	SAI1_TXD4	O	Synchronous Audio Interface
Synchronous Audio Interface	I	SAI1_RXD5	SAI1	25	26	SAI1	SAI1_TXD2	O	Synchronous Audio Interface

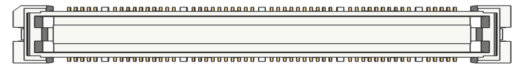
DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Synchronous Audio Interface	I	SAI1_RXD3	SAI1	27	28		GND	G	Ground
	I	SAI1_RXD1		29	30		SAI1_MCLK	O	Synchronous Audio Interface
Ground	G	GND		103	104		GND	G	Ground
Synchronous Audio Interface	O	SAI1_TXC		31	32	SAI1	SAI1_RXC	I	Synchronous Audio Interface
	O	SAI1_TXFS		33	34		SAI1_RXFS	I	
Ground	G	GND		35	36		GND	G	Ground
Synchronous Audio Interface	O	SAI2_TXC_CON	SAI2	37	38		SAI1_RXD6	I	Synchronous Audio Interface
	O	SAI2_TXFS_CON		39	40		SAI1_RXD4	I	
Ground	G	GND		41	42		SAI1_RXD2	I	
Synchronous Audio Interface	I	SAI2_RXD_CON		43	44		SAI1_RXD0	I	
	O	SAI2_TXD_CON		45	46	SAI2	GND	G	Ground
Ground	G	GND		47	48		SAI2_RXC_CON	I	Synchronous Audio Interface
Synchronous Audio Interface	O	SAI2_MCLK_CON		49	50		SAI2_RXFS_CON	I	
Ground	G	GND		105	106		GND	G	Ground
	O	HDMI_TX2_N	HDMI	51	52	HDMI	HDMI_DDC_SCL	O	
	O	HDMI_TX2_P		53	54		HDMI_DDC_SDA	I/O	
Ground	G	GND		55	56		GND	G	Ground
	O	HDMI_TX0_N		57	58		HDMI_CLK_P	O	
	O	HDMI_TX0_P		59	60		HDMI_CLK_N	O	
Ground	G	GND		61	62		GND	G	Ground
	I	HDMI_AUX_N		63	64		HDMI_TX1_N	O	
	I	HDMI_AUX_P		65	66		HDMI_TX1_P	O	
Ground	G	GND		67	68		GND	G	Ground
	I/O	HDMI_CEC		69	70		HDMI_HPD	I	
Ground	G	GND		107	108		GND	G	Ground
	I	JTAG_TMS	JTAG	71	72	JTAG	JTAG_TCK	I	
	O	JTAG_TDO		73	74		GND	G	Ground
	I	JTAG_TDI		75	76		JTAG_nTRST	I	
Ground	G	GND		77	78		GND	G	Ground
Ground	G	GND	POWER	79	80	POWER	GND	G	Ground
Ground	G	GND		81	82		GND	G	Ground
Input Voltage (from +3.4V to +5.5V)	PWR	+VSYS		83	84		+VSYS	PWR	Input Voltage (from +3.4V to +5.5V)
	PWR	+VSYS		85	86		+VSYS	PWR	
	PWR	+VSYS		87	88		+VSYS	PWR	
	PWR	+VSYS		89	90		+VSYS	PWR	
Ground	G	GND		109	110		GND	G	Ground

DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Input Voltage (from +3.4V to +5.5V)	PWR	+VSYS	POWER	91	92	POWER	+VSYS	PWR	Input Voltage (from +3.4V to +5.5V)
	PWR	+VSYS		93	94		+VSYS	PWR	
	PWR	+VSYS		95	96		+VSYS	PWR	
	PWR	+VSYS		97	98		+VSYS	PWR	
	PWR	+VSYS		99	100		+VSYS	PWR	
Connector Ground Plate	G	GND		112					

3.4. J2 - 100 Contacts Board Stacking Connector *(CONN RCPT 100POS SMD GOLD)*

Description: J2 Board-to-board shielded connector connects the module to the baseboard. 100 low-density pins with additional ground strips provide strong and reliable peripheral connection.

Manufacturer: Hirose Electric Co. Ltd.
Connector: [FX11A-100P/10-SV0.5(71)]



DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Connector Ground Plate	G	GND		111					
Synchronous Audio Interface	I	SAI5_RXD0	SAI5	1	2	SAI3	SAI3_TXC_CON	O	Synchronous Audio Interface
	I	SAI5_RXC		3	4		SAI3_TXFS_CON	O	
	I	SAI5_RXFS		5	6		SAI3_TXD_CON	O	
Ground	G	GND		7	8		GND	G	Ground
Synchronous Audio Interface	O	SAI5_MCLK		9	10		SAI3_MCLK_CON	O	Synchronous Audio Interface
Ground	G	GND		101	102		GND	G	Ground
	O	LED_BT	LED	11	12		SAI3_RXC_CON	I	Synchronous Audio Interface
	O	LED_WLAN		13	14		SAI3_RXFS_CON	I	
		NC		15	16		SAI3_RXD_CON	I	
		NC		17	18		GND	G	Ground
		NC		19	20	I2C	I2C2_SCL	O	Signals pulled to +VDD_3V3 by 4k7 resistor
		NC		21	22		I2C2_SDA	I/O	
	I	SPDIF_RX	S	23	24		I2C3_SDA	I/O	
	O	SPDIF_TX		25	26		I2C3_SCL	O	

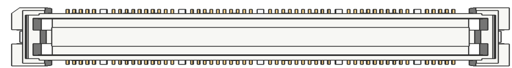
DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Ground	G	GND	PDIF	27	28	UART	UART1_RXD	I	
	I	SPDIF_EXT_CLK		29	30		UART1_TXD	O	
Ground	G	GND		103	104		GND	G	Ground
	O	ECSPI2_SCLK	ESPI2	31	32		+VDD_3V3	PWR	+3.3V Power Supply Output (max. current 1A)
Ground	G	GND		33	34		+VDD_3V3	PWR	
	O	ECSPI2_SS0		35	36	SPI	ECSPI1_SCLK	O	
	O	ECSPI2_MOSI		37	38		GND	G	Ground
	I	ECSPI2_MISO		39	40		ECSPI1_MOSI	O	
Ground	G	GND	UART	41	42	UA	UART3_CTS/ECSPI1_MISO_CON	I/O	
	I	UART3_RXD_CON		43	44		UART3_RTS/ECSPI1_SS0_CON	I/O	
	O	UART3_TXD_CON		45	46		+NVCC_SNVS_3V3	PWR	+3.3V System Power Supply Output (max. current 5mA)
	O	UART2_TXD		47	48	RT	UART4_TXD/UART2_RTS	O	
	I	UART2_RXD		49	50		UART4_RXD/UART2_CTS	I	
Ground	G	GND		105	106		GND	G	Ground
USB2 PHY Power Supply Input	PWR	USB2_VBUS	USB2	51	52	USB1	USB1_VBUS	PWR	USB1 PHY Power Supply Input
Ground	G	GND		53	54		GND	G	Ground
	I	USB2_RX_N		55	56		USB1_RX_N	I	
	I	USB2_RX_P		57	58		USB1_RX_P	I	
Ground	G	GND		59	60		GND	G	Ground
	O	USB2_TX_N		61	62		USB1_TX_N	O	
	O	USB2_TX_P		63	64		USB1_TX_P	O	
Ground	G	GND		65	66		GND	G	Ground
	I/O	USB2_D_N		67	68		USB1_D_N	I/O	
	I/O	USB2_D_P		69	70		USB1_D_P	I/O	
Ground	G	GND		107	108		GND	G	Ground
	I	USB2_ID		71	72		USB1_ID	I	
Ground	G	GND		73	74		GND	G	Ground
	I	CSI_P2_D2_N	CSI2	75	76	CSI2	CSI_P2_D3_N	I	
	I	CSI_P2_D2_P		77	78		CSI_P2_D3_P	I	
Ground	G	GND		79	80		GND	G	Ground
	I	CSI_P2_D0_N		81	82		CSI_P2_D1_N	I	
	I	CSI_P2_D0_P		83	84		CSI_P2_D1_P	I	
Ground	G	GND		85	86	CSI	GND	G	Ground
	I	CSI_P2_CK_N		87	88		CSI_P1_CK_N	I	

DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
	I	CSI_P2_CK_P		89	90	1	CSI_P1_CK_P	I	
Ground	G	GND		109	110		GND	G	Ground
	I	CSI_P1_D2_N	CSI1	91	92	CSI1	CSI_P1_D3_N	I	
	I	CSI_P1_D2_P		93	94		CSI_P1_D3_P	I	
Ground	G	GND		95	96		GND	G	Ground
	I	CSI_P1_D0_N		97	98		CSI_P1_D1_N	I	
	I	CSI_P1_D0_P		99	100		CSI_P1_D1_P	I	
Connector Ground Plate	G	GND		112					

3.5. J3 - 100 Contacts Board Stacking Connector (CONN RCPT 100POS SMD GOLD)

Description: J3 Board-to-board shielded connector connects the module to the baseboard. 100 low-density pins with additional ground strips provide strong and reliable peripheral connection.

Manufacturer: Hirose Electric Co. Ltd.
Connector: FX11A-100P/10-SV0.5(71)



J3

DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Connector Ground Plate	G	GND		111					
	I/O	ETH_TRX0_P	ETH	1	2	ETH	ETH_TRX1_P	I/O	
	I/O	ETH_TRX0_N		3	4		ETH_TRX1_N	I/O	
Ground	G	GND		5	6		GND	G	Ground
	I/O	ETH_TRX2_P		7	8		ETH_TRX3_P	I/O	
	I/O	ETH_TRX2_N		9	10		ETH_TRX3_N	I/O	
Ground	G	GND		101	102		GND	G	Ground
	O	LED_ACT	ETH	11	12	PCIE2	PCIE2_nCLKREQ	I/O	
	O	LED_LINK1000		13	14		GND	G	
	O	LED_LINK10_100		15	16		PCIE2_CON_CLK_N	O	
Ethernet Power Supply Output (max. current 20mA)	PWR	+ENET_VDDIO_2V5		17	18		PCIE2_CON_CLK_P	O	

DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Ground	G	GND		19	20		GND	G	Ground
	I	PCIE2_CON_RX_N	PCIE2	21	22		PCIE2_CON_TX_N	O	
	I	PCIE2_CON_RX_P		23	24		PCIE2_CON_TX_P	O	
Ground	G	GND		25	26		GND	G	Ground
	I	PCIE1_CON_RX_N	PCIE	27	28	PCIE	PCIE1_CON_TX_N	O	
	I	PCIE1_CON_RX_P		29	30		PCIE1_CON_TX_P	O	
Ground	G	GND		103	104		GND	G	Ground
	O	PCIE1_CON_CLK_N	1	31	32	1	PCIE1_nCLKREQ	I/O	
	O	PCIE1_CON_CLK_P		33	34		GND	G	Ground
Ground	G	GND	SYSTEM	35	36	NAND	NAND_DATA0	I/O	
+1.8V Power Supply Output (max. current 0.5A)*	PWR	+VDD_1V8		37	38		NAND_DATA1	I/O	
	PWR	+VDD_1V8		39	40		NAND_DATA2	I/O	
Internally powered by +NVCC_SNVS_3V3	I	ONOFF_CPU		41	42		NAND_DATA3	I/O	
Reset Output, internally powered by +NVCC_SNVS_3V3	O	POR_B		43	44		NAND_DATA4	I/O	
Reset Input, internally powered by +NVCC_SNVS_3V3	I	PWRON_B		45	46		NAND_DATA5	I/O	
Ground	G	GND		47	48		NAND_DATA6	I/O	
	I/O	NAND_DQS		49	50		NAND_DATA7	I/O	
Ground	G	GND		105	106		GND	G	Ground
	I/O	NAND_nWP	NAND	51	52	NAND	NAND_CLE	I/O	
	I/O	NAND_nCE3		53	54		NAND_nWE	I/O	
	I/O	NAND_nCE2		55	56		NAND_nRE	I/O	
	I/O	NAND_nCE1		57	58		NAND_nREADY	I/O	
	I/O	NAND_nCE0		59	60		NAND_ALE	I/O	
Ground	G	GND	SD2	61	62	SD2	GND	G	Ground
	I/O	SD2_DATA3		63	64		SD2_VSELECT	O	
	I/O	SD2_DATA2		65	66		SD2_CMD	I/O	
	I/O	SD2_DATA1		67	68		+NVCC_SD2	PWR	SD Power Supply Output
	I/O	SD2_DATA0		69	70		SD2_nCD	I	
Ground	G	GND		107	108		GND	G	Ground
	O	SD2_CLK		71	72		SD2_nRST	O	
Ground	G	GND	LVDS	73	74	LVDS	GND	G	Ground
	O	LVDS1_TX0_N		75	76		LVDS0_TX0_N	O	
	O	LVDS1_TX0_P		77	78		LVDS0_TX0_P	O	

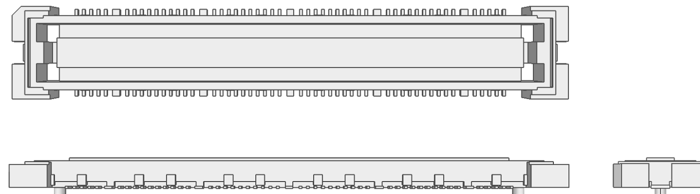
DESCRIPTION	TYPE	PIN NAME		PIN	PIN		PIN NAME	TYPE	DESCRIPTION
Ground	G	GND	1	79	80	0	GND	G	Ground
	O	LVDS1_TX1_N	LVDS1	81	82	LVDS0	LVDS0_TX1_N	O	
	O	LVDS1_TX1_P		83	84		LVDS0_TX1_P	O	
Ground	G	GND		85	86		GND	G	Ground
	O	LVDS1_TX2_N		87	88		LVDS0_TX2_N	O	
	O	LVDS1_TX2_P		89	90		LVDS0_TX2_P	O	
Ground	G	GND		109	110		GND	G	Ground
	O	LVDS1_TX3_N	LVDS1	91	92	LVDS0	LVDS0_TX3_N	O	
	O	LVDS1_TX3_P		93	94		LVDS0_TX3_P	O	
Ground	G	GND		95	96		GND	G	Ground
	O	LVDS1_CLK_N		97	98		LVDS0_CLK_N	O	
	O	LVDS1_CLK_P		99	100		LVDS0_CLK_P	O	
Connector Ground Plate	G	GND		112					

**NOTE:* *DRAM Memories are supplied by +VDD_1V8 power rail.*
Extreme care is recommended while using +VDD_1V8 on baseboard.

3.6. Mating Connectors

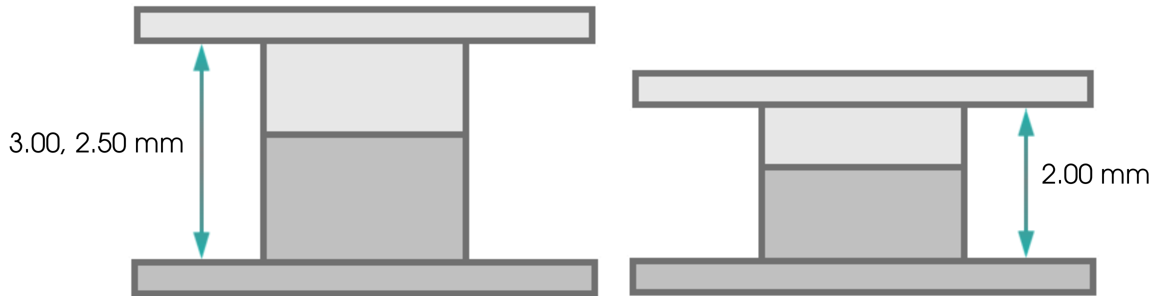
The standard configuration of iMX8M Industrial Module has 3 low profile, shielded, board-to-board connectors soldered on the bottom side. The recommended 3 mating receptacle connectors (3 pcs supplied with each complete development kit, extra pcs available for purchase at VOIPAC website) for the custom baseboard interfacing are:

Manufacturer: Hirose Electric Co. Ltd.
Connector: Double Row Receptacle Connector **FX11A-100S/10-SV(71)**



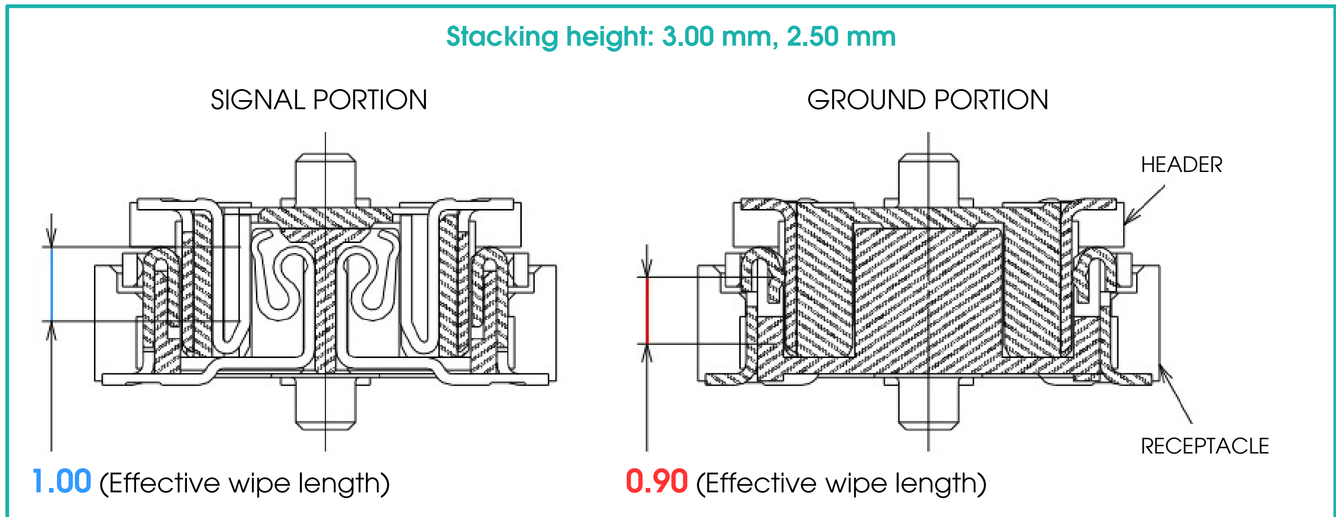
Besides the 3mm connectors mating height used at the Voipac iMX8M Industrial Development Kit, the board-to-board stacking connectors are available also in mating height of 2.5mm or even 2mm, to fit smaller, thinner case designs.

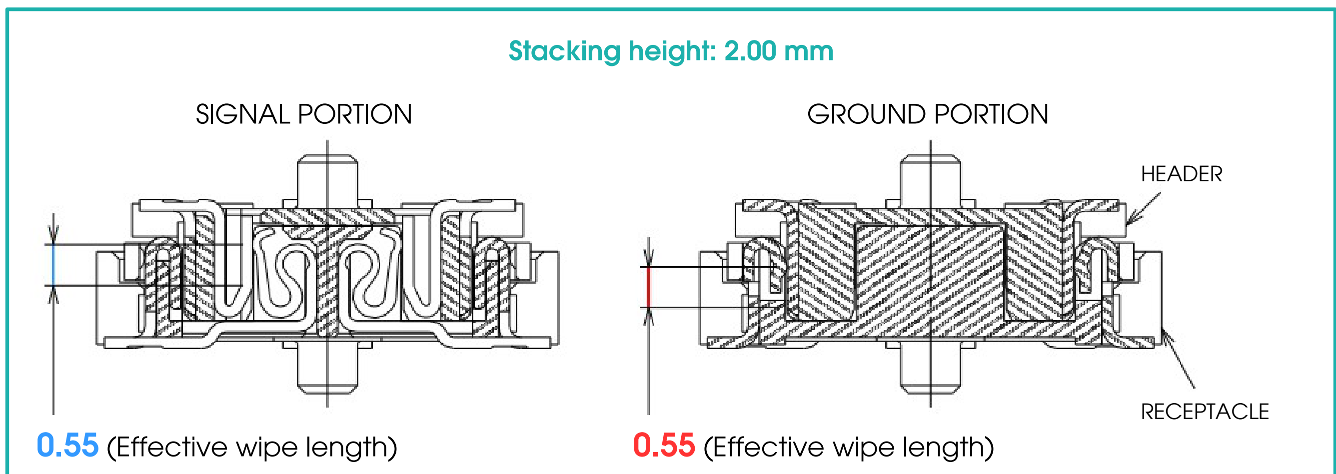
Stacking Height Variation



NOTE: 2.0 mm stacking height type cannot be used or interchanged with the 2.5 mm or 3.0 mm types.

Cross section of mating

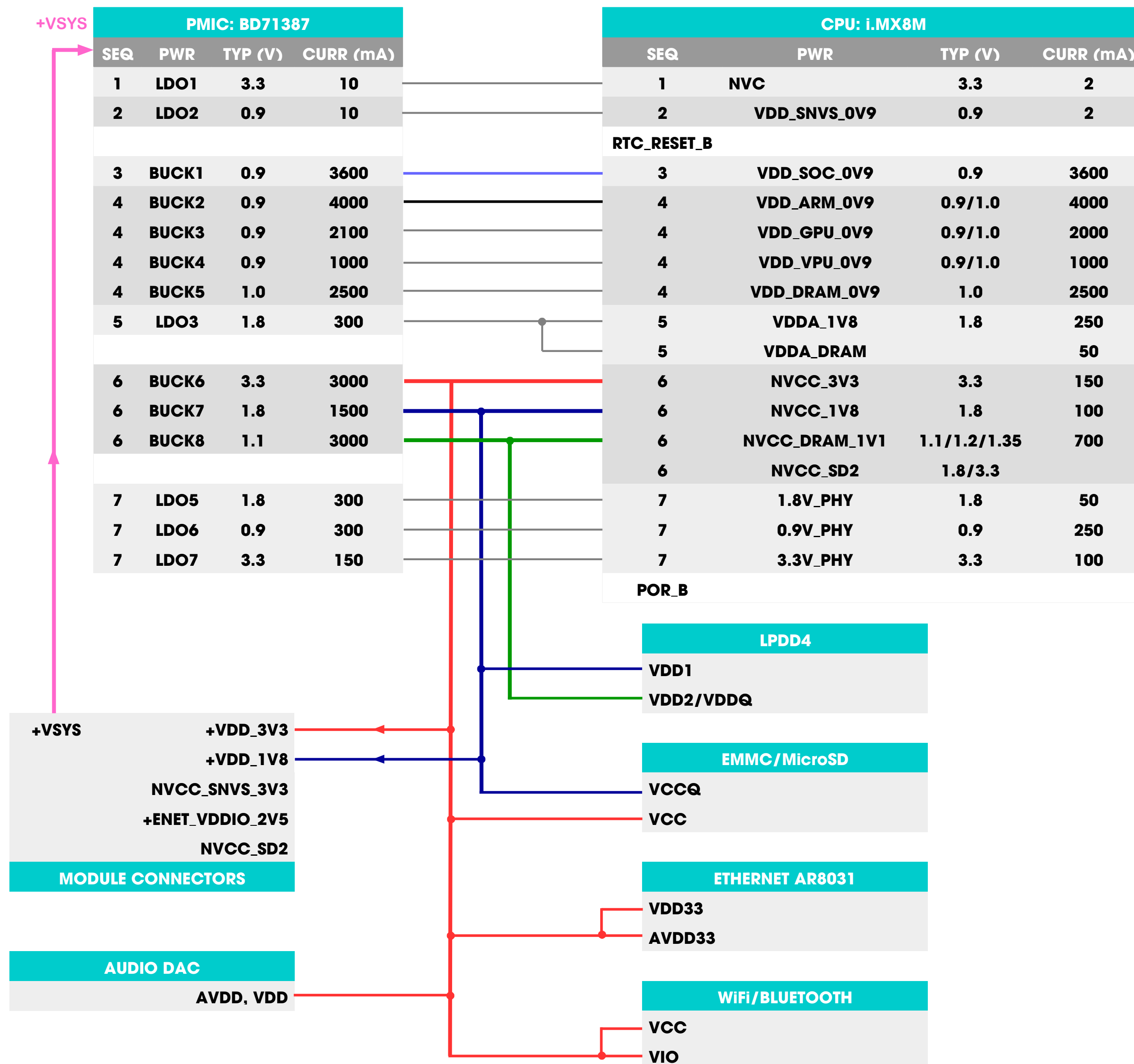




voipac.

4. Technical Specification

4.1. Electrical - Power Distribution Tree



4.2. Electrical - Powering Options

The iMX8M Industrial Module is powered via +VSYS pins, in range from +3.4 to +5.5V. To ensure the full performance of all the peripherals, the entire development kit with accessories might require up to 30W of power.

4.3. Electrical – Typical Power Consumption

iMX8M Industrial Development Kit BASIC			
TEST CONDITION	INPUT VOLTAGE	MEASURED CURRENT	POWER USAGE
	Vin [V]	I [A]	P [W]
Uboot only	5.183	0.463	2.400
Booting-up process (maximum)	5.177	0.720	3.727
Linux at idle	5.184	0.423	2.193
Linux + ETH	5.182	0.491	2.539
Linux + ETH + HDMI	5.179	0.566	2.931
Linux + ETH + HDMI + Stresstest	5.173	0.791	4.092

iMX8M Industrial Development Kit PRO			
TEST CONDITION	INPUT VOLTAGE	MEASURED CURRENT	POWER USAGE
	Vin [V]	I [A]	P [W]
Uboot only	5.182	0.524	2.714
Booting-up process (maximum)	5.180	0.893	4.626
Linux at idle	5.181	0.506	2.621
Linux + ETH	5.178	0.570	2.951
Linux + ETH + HDMI	5.175	0.649	3.359
Linux + ETH + HDMI + Stresstest	5.164	1.071	5.525

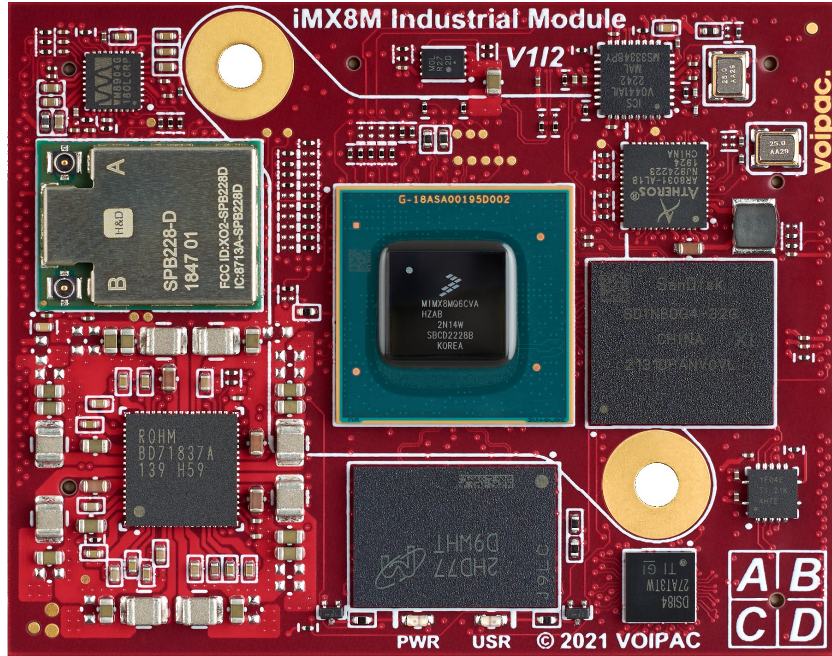
iMX8M Industrial Development Kit MAX			
TEST CONDITION	INPUT VOLTAGE	MEASURED CURRENT	POWER USAGE
	Vin [V]	I [A]	P [W]
Uboot only	5.173	0.664	3.435
Booting-up process (maximum)	5.172	0.967	5.001
Linux at idle	5.179	0.551	2.854
Linux + ETH	5.177	0.613	3.174
Linux + ETH + HDMI	5.174	0.689	3.565
Linux + ETH + HDMI + Stresstest	5.162	1.145	5.910

NOTE: *All 3 kits used during the test procedure were running the default Linux distribution and booted up from the eMMC NAND Flash Memory.*

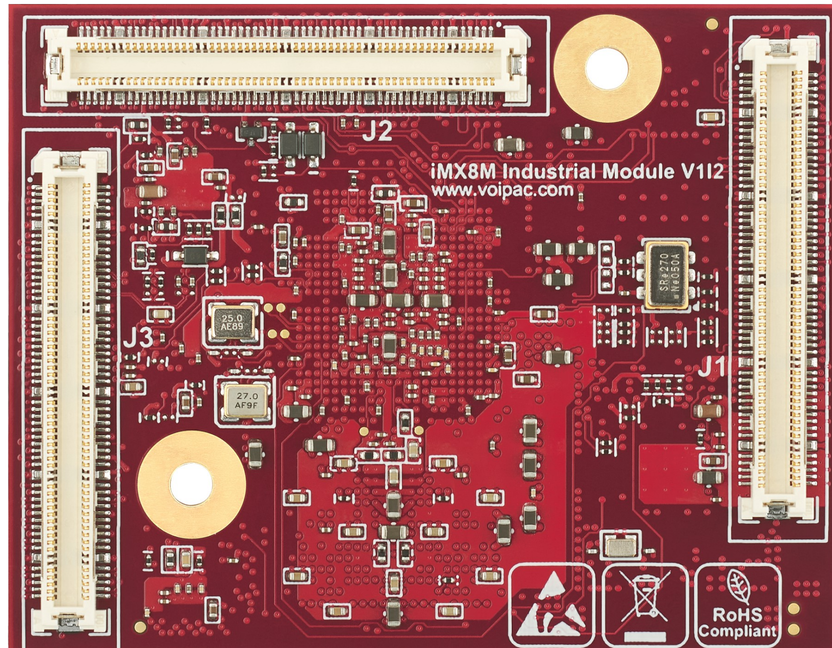
While measured, the development kits were placed under a very heavy load - using stress test application putting CPU, memories, Ethernet and HDMI under challenging conditions.

4.4. Product Image

Top Side

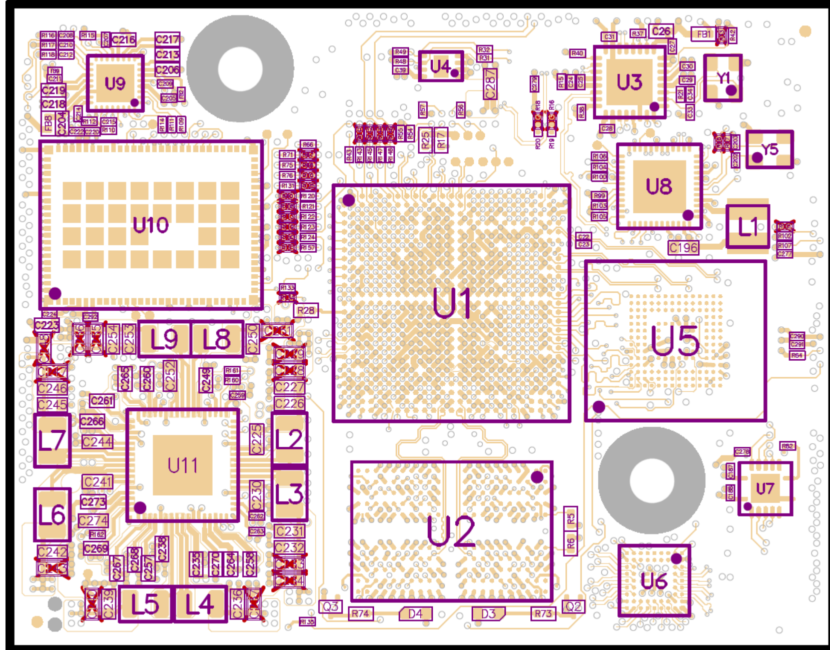


Bottom Side

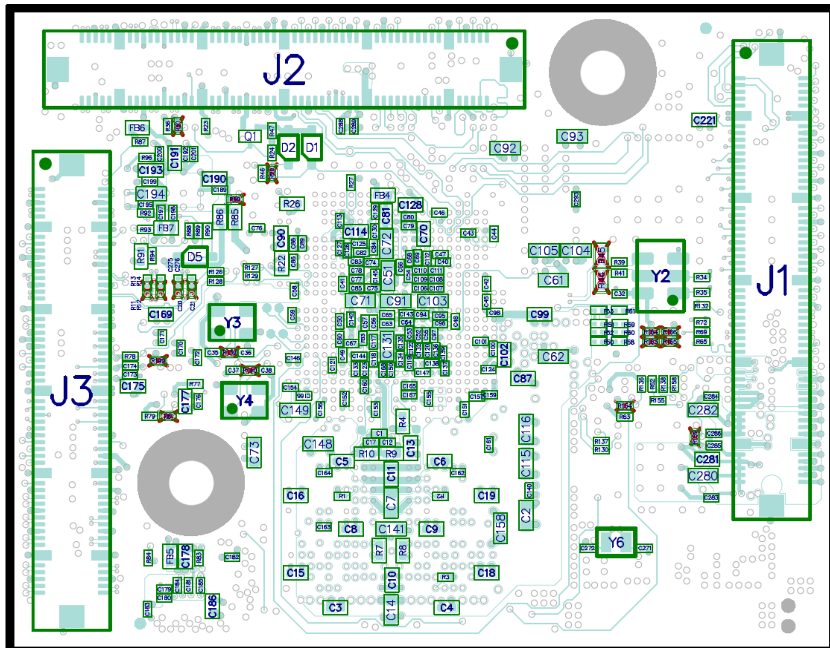


4.5. Assembly Drawing

Top Side

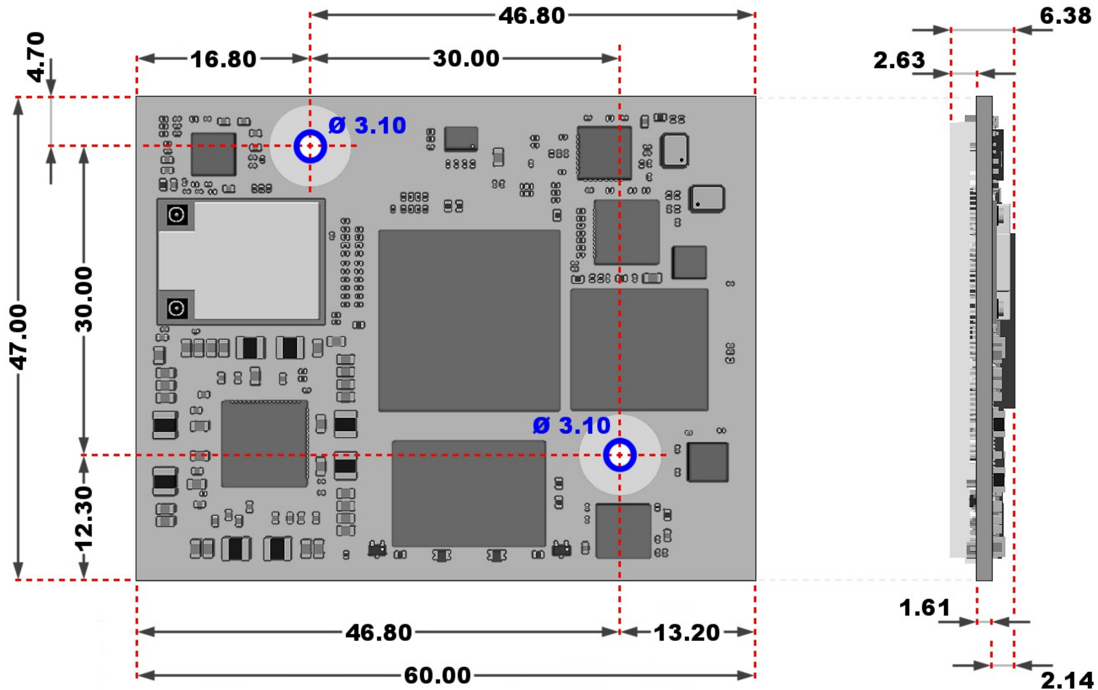


Bottom Side

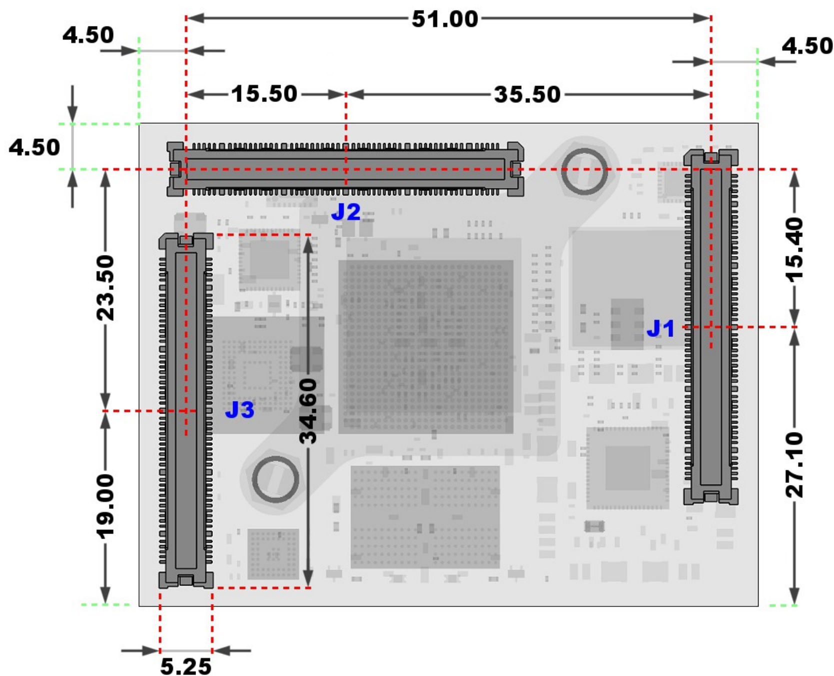


4.6. Mechanical

Dimensions **(top view, in millimeters)** **(side view, in millimeters)**



Connectors Placement and Dimensions **(bottom view, in millimeters)**



4.7. Temperature Range

SYMBOL	DESCRIPTION	MIN	MAX	UNIT	Temperature Range of the Module in Standard Webshop Configuration
T_AMB_C	Operating temperature range - COMMERCIAL	0	+70	°C	x
T_AMB_E	Operating temperature range - EXTENDED	-20	+70	°C	
T_AMB_I	Operating temperature range - INDUSTRIAL	-40	+85	°C	

4.8. ISO Certification of Voipac Production

Production of Voipac hardware is performed at ISO 9001:2016 certified facilities with proprietary Quality Management System, satisfying international customer and regulatory requirements. The company's facilities are equipped with in-house stainless steel laser stencil production, advanced assembly machines, oxygen-free soldering, and 3D Automated Optical Inspection (AIO) that ensure high-quality of assembled products. Every Voipac product has to withstand an extensive post-assembly checkup and visual inspection. Each individual COM is also preloaded with a customizable firmware and follows an in-depth peripheral inspection with zero-tolerance policy to any deviation from the full functionality.

4.9. CE Compliance of Voipac Products

The CE label is a mandatory conformity mark for electronic devices placed on the market in the European Economic Area and every product sold within the EU needs a CE Certificate of Conformance that ensures it complies with the essential requirements of the applicable European Commission (EC) directives.

Voipac COMs are considered components for further processing by the industry, skilled development teams or system integrators, not finished Electrical Electronic Equipment (EEE) used as stand-alone devices by the general public, thus do not need to observe the CE marking requirements and consequently do not need any identification either.

To make sure that Voipac COMs can be used in CE/FFC certified final devices, they are designed and manufactured to obey both the EC and FFC directives. The modules and baseboards in standard webshop configurations, together with accessories, are stress-tested in an environmental chamber for a wide range of operating temperatures. Under a heavy load, their radiated and conducted emissions are also tested and measured to confirm compliance with the Electromagnetic Interference limits. The COMs and baseboards are furthermore subject to broad-band random vibration tests, sweep sinus mechanical vibration tests and shock tests to prove their dynamic load resilience.
See Voipac Wiki for Environmental Chamber Testing, EMC Testing and Shock and Vibration Testing results.

4.10. RoHS, REACH, UL 94, Conflict Minerals, WEEE and Waste Recycling Declarations Compliance

RoHS I / II / III

Voipac certifies to the best of its knowledge, that all of its production is made in lead-free facilities using standardized manufacturing quality systems and control parameters, thereby meeting the regulatory compliance of RoHS 1 Directive (2002/95/EC), RoHS 2 Directive (2011/65/EU) and RoHS 3 Directive (2015/863/EU). Read more.

REACH

REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals. Voipac products are "articles" as defined in Article 3(3) of the REACH regulations, and do not release substances under normal use. Read more.

UL 94 V-0

UL 94 certification is a normalized method of determining the flammability of plastic materials as the standard evaluates ignition, process of burning and flame spread resistance. Voipac products are complying with the most flame-resistance class V-0 of this standard, by using only UL 94 certified components. Read more.

Conflict Minerals

Voipac will not knowingly procure material supplies and components which contain minerals that directly or indirectly finance or benefit non-governmental military groups in the Democratic Republic of Congo (DRC) or adjoining countries. Voipac declares and commits to refuse usage of metals also from other conflict regions. Read more.

WEEE

To minimize the amount of non-recycled electrical and electronic equipment waste and its impact on the environment, Voipac also conforms with the Waste Electrical and Electronic Equipment Directive 2018/852/EC, and designs its products and packaging with consideration to future dismantling and recycling. Read more.

Waste Recycling

Voipac has been participating in responsible selective collection, recovery and recycling of its production activities waste. Over the years, the collective effort of manufacturers has helped to minimize the waste impact on the environment by saving an equivalent of thousands of tons of carbon dioxide. Read more.

Warranty:

VOIPAC TECHNOLOGIES s.r.o. Does Not Bear Responsibility for the Following:

- Failure of a product resulting from misuse, accident, modification, unsuitable operating environment, or improper maintenance by user

- Any technical or other support provided by VOIPAC TECHNOLOGIES s.r.o. such as assistance, set-up and installation is provided WITHOUT WARRANTY OF ANY KIND, unless agreed otherwise

Disclaimer:

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