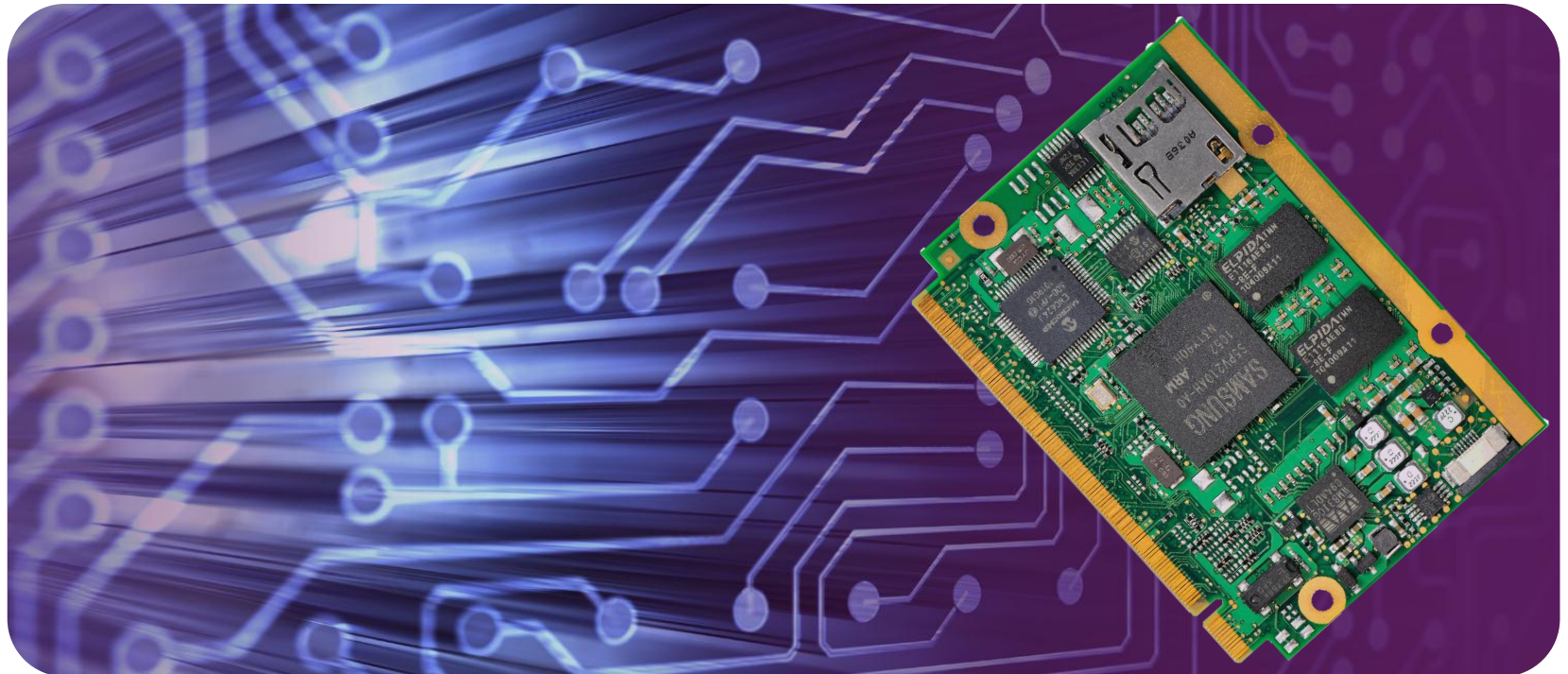


...embedding excellence



ARM Processor Modules cut down Development Time



Peter Eckelmann, Product Marketing Manager, MSC Vertriebs GmbH

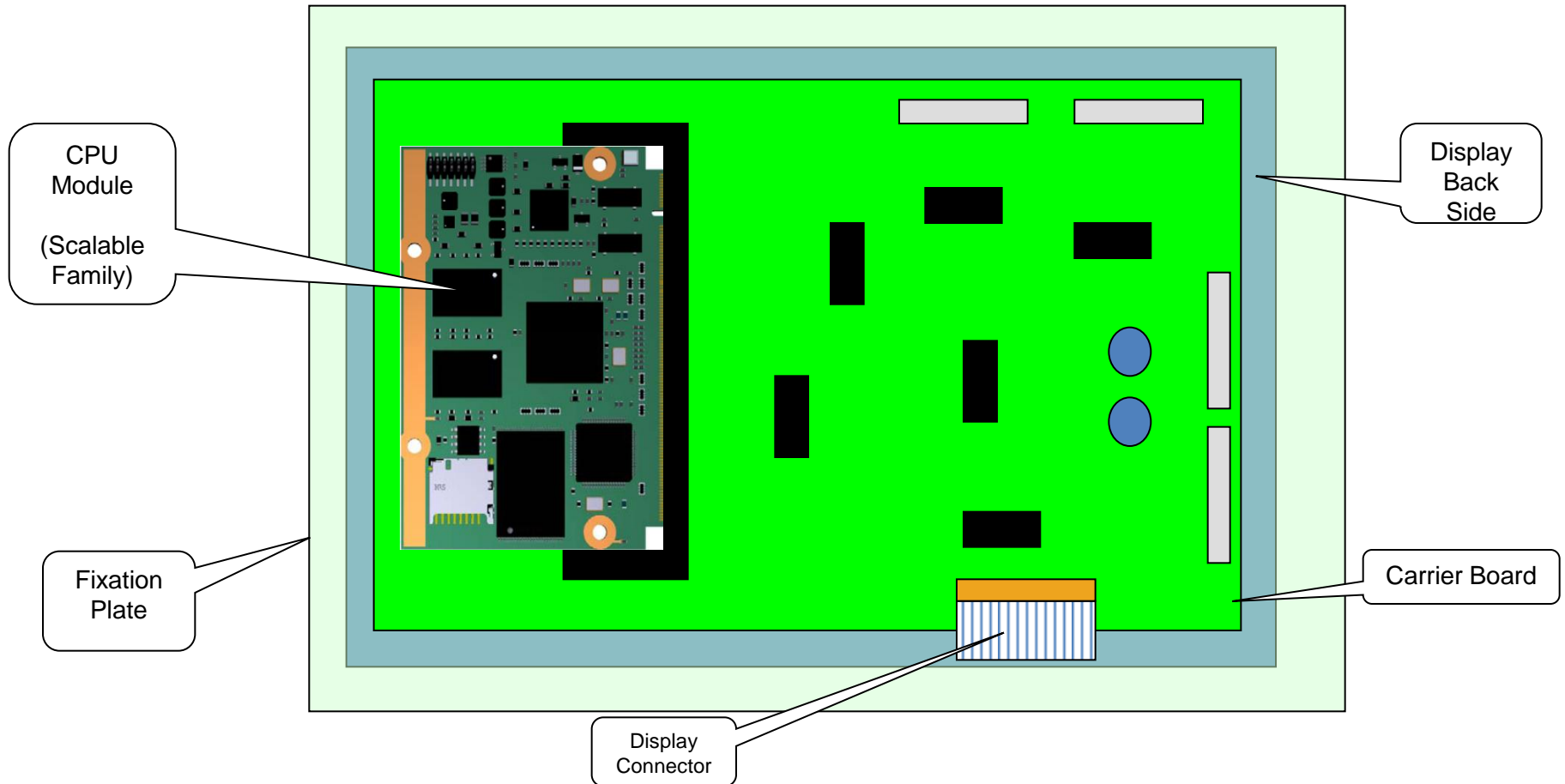
New COM Family from MSC – The main Targets:

- CPU range from ARM9 up to ARM Cortex-A9 multi core and more
- Performance up to medium „x86 level“
- Deeply-embedded interface (easy system integration)
- Low power / passive cooling (mostly no heat sink required)
- Low cost / small form factor

Typical Application

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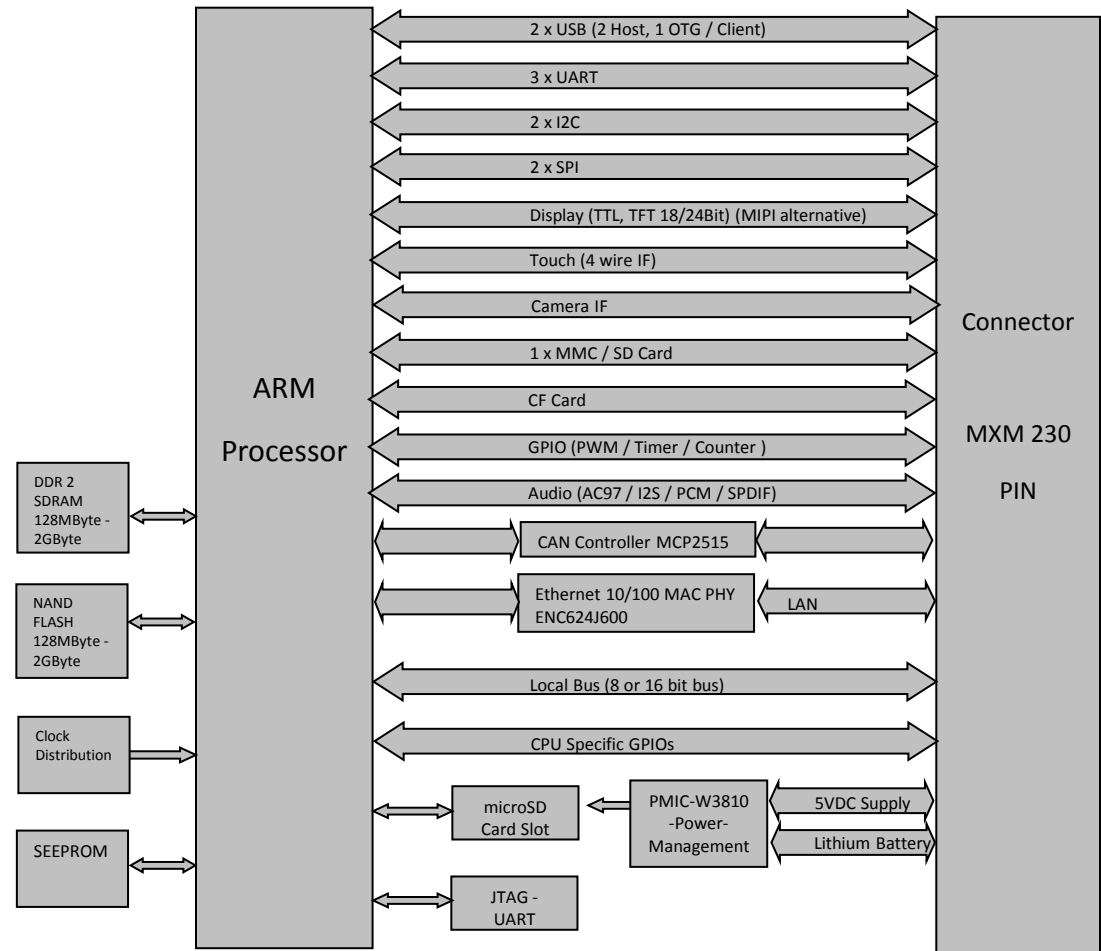
Backside view Display with electronics



System I/O of the Module

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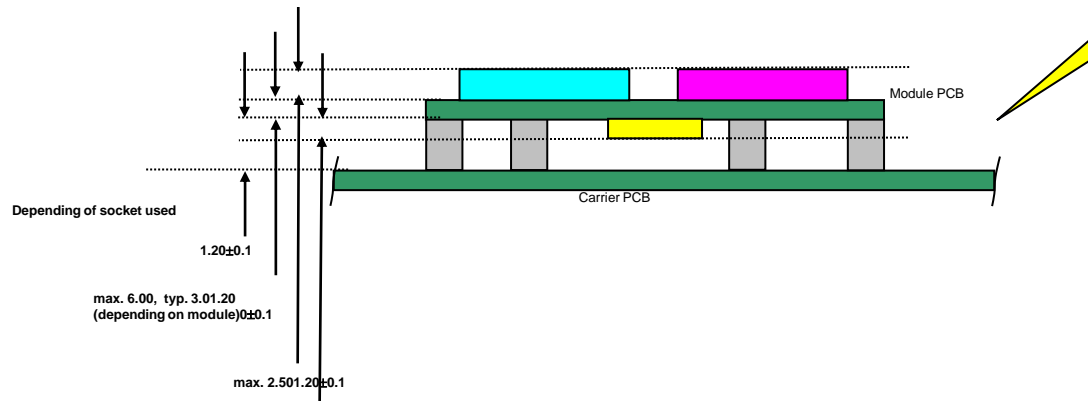
System IO	MIN	MAX
LAN 10/100/ (1000, FFU)	1	1
MMC / SD	1	2
SPI	1	2
I2C	1	2
UART	1	3
UART Debug	1	1
USB Host	0	2
USB Client or OTG	0	1
Display 18/24 TTL, (AO)	1	1
HDMI, (AO)	0	1
Audio, digital	1	1
TV Out	0	1
Touch	0	1
Camera	0	1
PCIe x 1, (FFU)	0	1
SATA, (FFU)	0	1
Local Bus	0	1
CF Card	0	1
PWM	2	2
Timer	2	2
CAN, (AO)	0	1
MIPI, (AO)	0	1
JTAG	0	1
Battery Management	1	1
Note:		
(FFU) = For Future Use		
(AO) = Assembly Option		



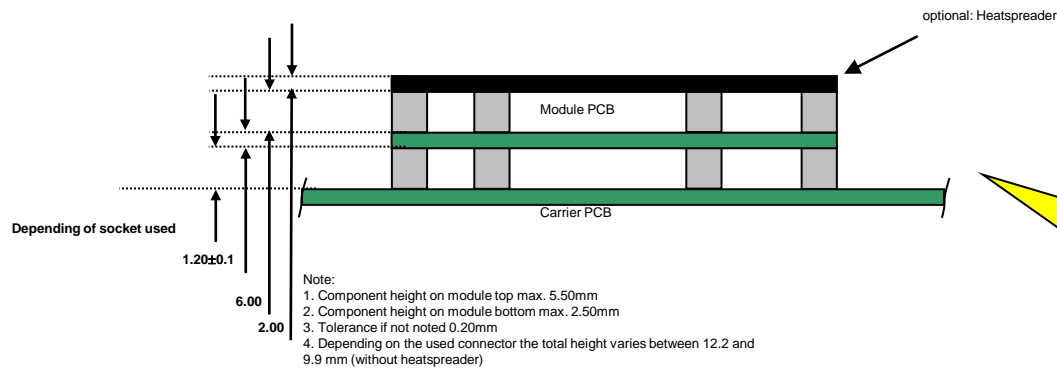
Mechanical Data (2)

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Form
Factor



Standard
use



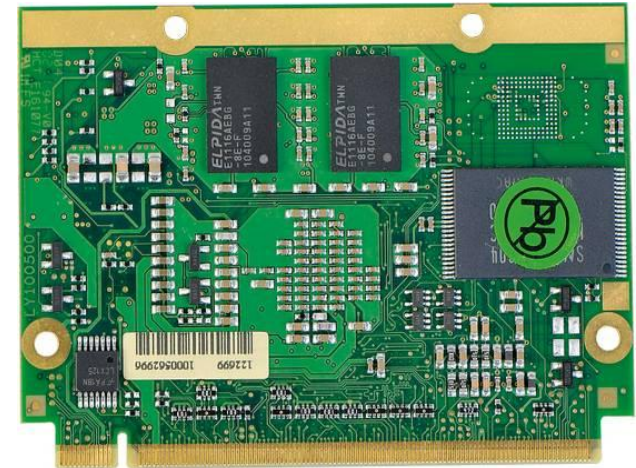
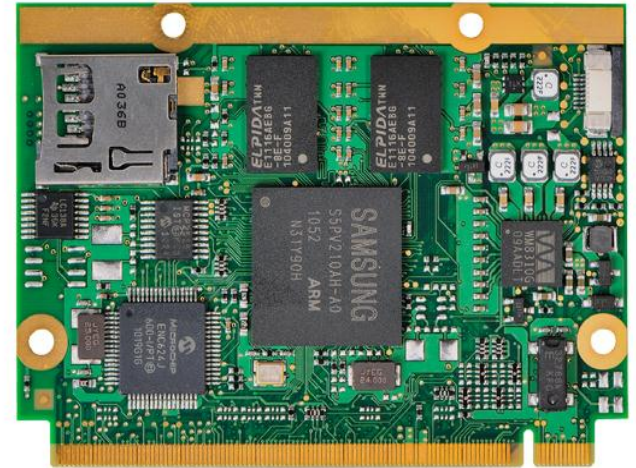
If Heat
Sink is
required

S5PV210 Module

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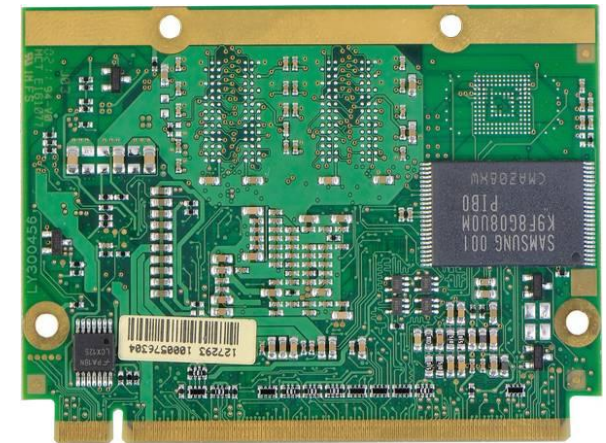
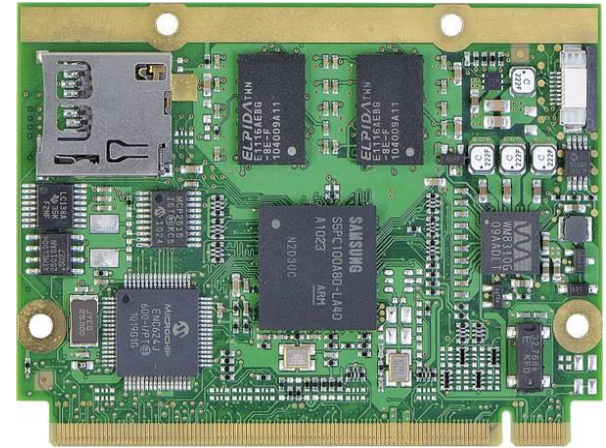
NANORISC-S5PV210

- ARM S5PV210 Cortex™-A8 CPU (800MHz / 1.0GHz)
- Up to 1GB DDR2 DRAM, up to 4GB NAND Flash soldered on the module
- Up to 32GB eMMC Flash (optional); microSD Socket
- 10/100 Base-T Ethernet Interface
- USB 2.0 Host and USB 2.0 OTG
- RGB 18/24 bit LCD Graphics up to 1,366 x 768
- HDMI/DVI Graphics up to 1,920 x 1,080
- CAN 2.0B, 3x UART, 2x SPI, 2x I²C Interfaces
- AC97 and I²S Audio Interface
- SD V2.0 / SDIO V1.0 / MMC V4.2



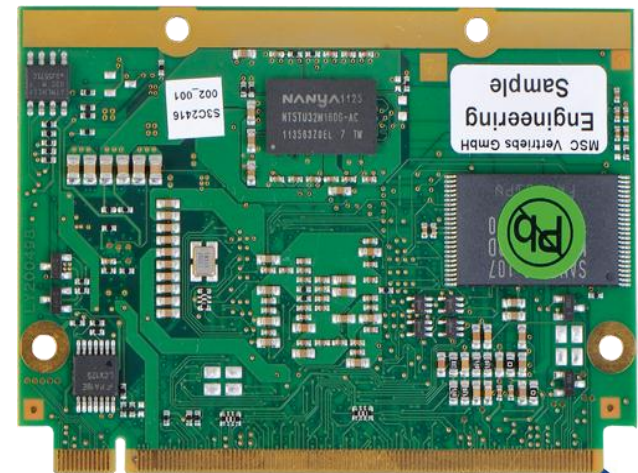
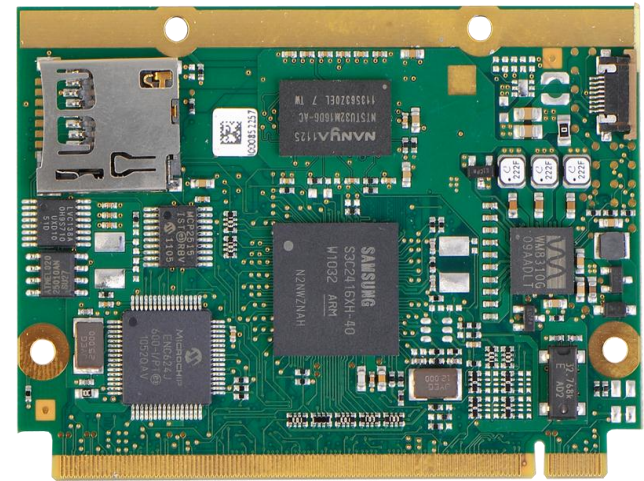
NANORISC-S5PC100

- ARM S5PC100 Cortex™-A8 CPU (667 / 833MHz)
- Up to 512MB DDR2 DRAM, up to 4GB NAND Flash soldered on the module
- Up to 32GB eMMC Flash (optional); microSD Socket
- 10/100 Base-T Ethernet Interface
- USB 1.1 Host and USB 2.0 OTG
- RGB 18/24 bit LCD Graphics up to 1,280 x 720
- HDMI/DVI Graphics up to 1,280 x 720
- CAN 2.0B, 2x UART, 2x SPI, 2x I²C Interfaces
- AC97 and I²S Audio Interface
- SD V2.0 / SDIO V1.0 / MMC V4.2



NANORISC-S3C2416

- ARM S3C2416 ARM9 CPU (400MHz)
- Up to 128MB DDR2 DRAM, up to 1GB NAND Flash soldered on the module
- Up to 32GB eMMC Flash (optional); microSD Socket
- 10/100 Base-T Ethernet Interface
- USB 1.1 Host and USB 2.0 Device
- RGB 18/24 bit LCD Graphics up to 640 x 480
- CAN 2.0B, 3x UART, SPI, I²C Interfaces
- AC97 and I²S Audio Interface
- SD V2.0 / SDIO V1.0 / MMC V4.2
- Touchscreen Interface



System I/O per Module

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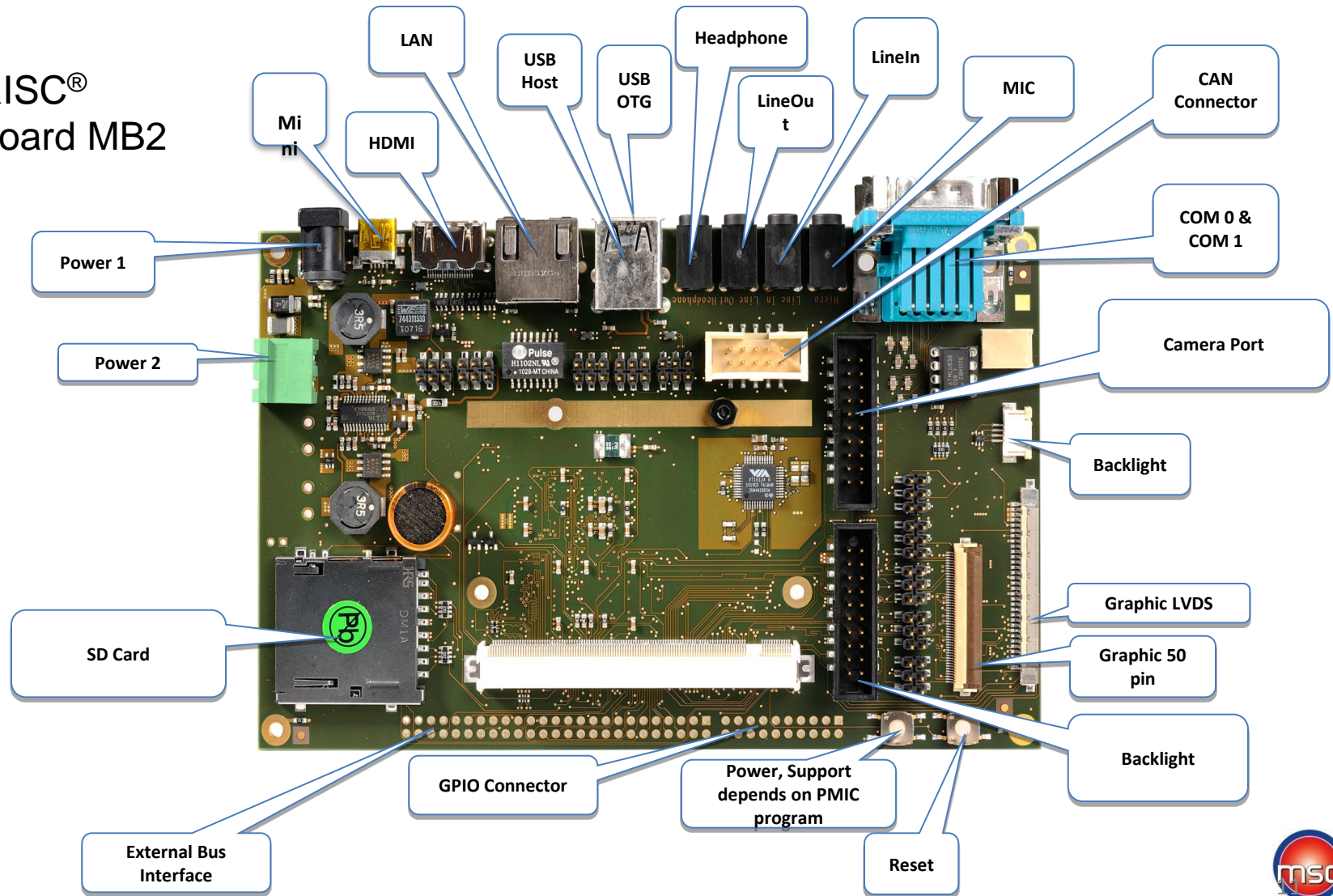
System IO	MIN	MAX	Note	Module Support				
				S5PV210	S5PC100	Candidate A	Candidate B	S3C2416
LAN 10/100/ (1000, FFU)	1	1	MAC / PHY on board, Transformer on carrier	1	1	1	1	1
MMC / SD	1	2	one on module	2	2	2	2	2
SPI	1	2		2	2	1	2	1
I2C	1	2		2	2	2	2	1
UART	1	2	Tx / Rx / RTSn / CTSn	2	2	2	2	2
UART Debug	1	1	Debug UART on module	1	1	1	1	1
USB Host	0	2		1	1	0	1	1
USB Client or OTG	0	1		1 (OTG)	1 (OTG)	1 (OTG)	1 (Client)	1 (Client)
Display 18/24 TTL, (AO)	1	1		1	1	1	1	1
HDMI, (AO)	0	1		1	1	0	0	0
Max. Resolution HDMI				1920x1080	1280x720			
Max.Resolution TTL				1366x768	1280x720	800x480	640x480	640x480
Audio, digital	1	1	I2S, option AC97, PCM or HDA	1 (I2S or AC97 or PCM)	1 (I2S or AC97 or PCM)	1 (I2S or PCM)	1 (I2S or AC97 or PCM)	1 (I2S or AC97 or PCM)
TV Out	0	1		1	1	1	0	0
Touch	0	1	4 wire Touch	1	1	1	1	1
Camera	0	1		1	1	0	1	0
PCle x 1, (FFU)	0	1	for future use	0	0	0	0	0
SATA, (FFU)	0	1	for future use	0	0	0	0	0
Local Bus	0	1		1	1	0	1	1
CF Card	0	1	shared with Local Bus	1	1	0	1	0
PWM	0	2	*) max. not specified because of multi functions pins	2	2	2	2	2
Timer	2	2	*) max. not specified because of multi functions pins	2	2	2	2	2
CAN, (AO)	0	1		1	1	1	1	1
MIPI, (AO)	0	1	only present if supported by CPU	1 (Full)	1 (Full)	1 (DSI)	0	0
JTAG	0	1	JTAG on module	1	1	1	1	1
Battery Management	1	1		1	1	1	1	1
Note:								
(FFU) = For Future Use								
(AO) = Assembly Option								



Base Board MB2

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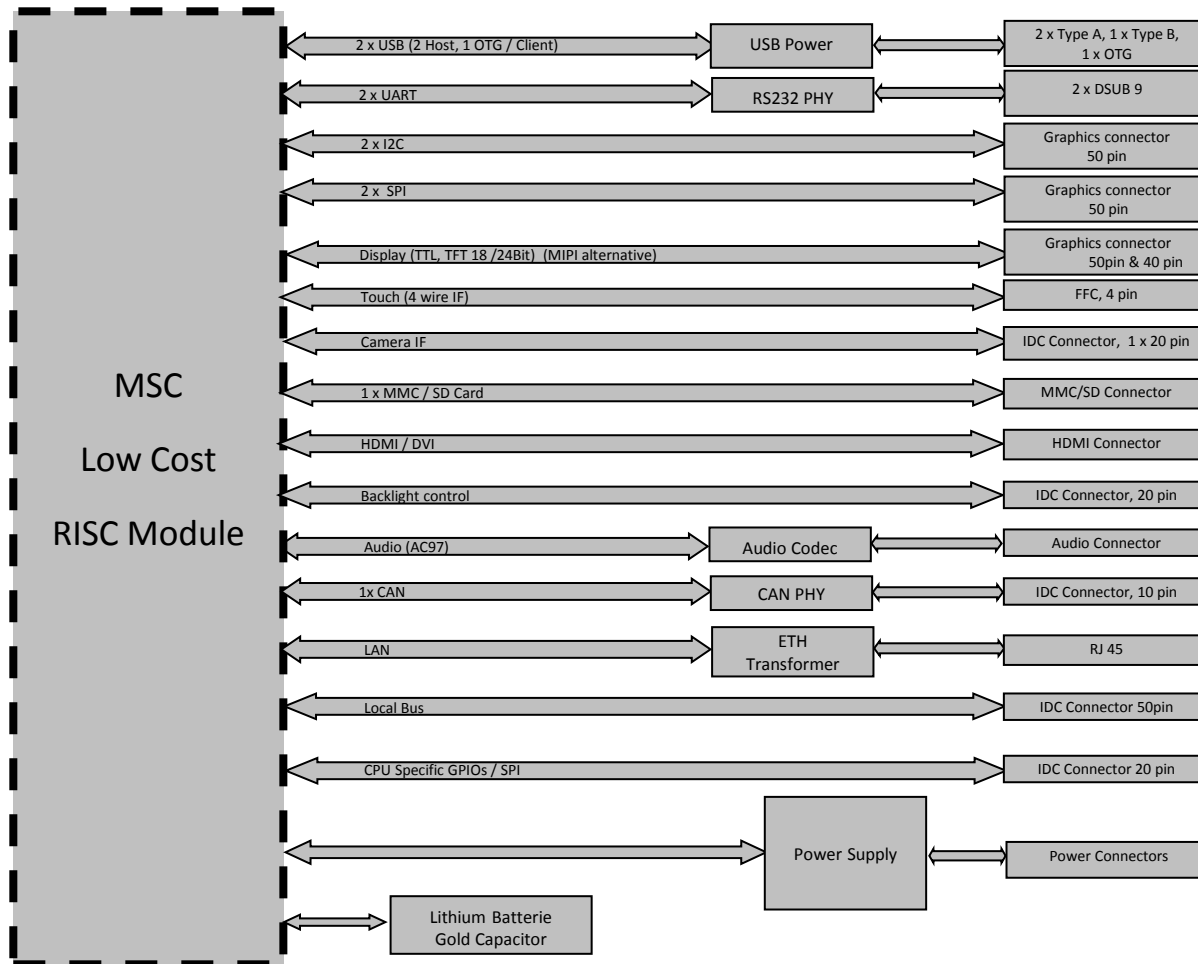
nanoRISC®
Baseboard MB2



System I/O Evaluation Board MB2

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Evaluation Board MB2



MSC NANORISC-STARTERKIT

- **Evaluation and Development Kit for all nanoRISC Modules**
- **Includes 7" WVGA LCD Panel**
 - Optionally with resistive touch
- **Power Supply included**
- **SD Card with pre-installed Linux Operating System available**



Specification Overview:

- **Power Supply:**
 - 5.0VDC 10%
 - Lithium Cell
- **Power consumption:**
 - Operating: ~ 2.3 W
- **Power States Support** (depending on CPU / Driver support):
 - ClockStop / Suspend to RAM / Suspend to Disk
- **Dimensions:**
 - 50 x 70 x max. 8.7 mm (L x W x H)
- **Operating System:**
 - Linux
 - WinCE and Android on request

Software Support Model

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Software

LINUX
(Android in prep.)

WinCE
(in preparation)

Customer

Application

Application

MSC

Operating
System

Drivers

LINUX
2.6

Drivers

WinCE
6.0 / 7

MSC

Bootloader

UBOOT

EBOOT

WinCE BSP and Support is in
preparation at a partner company



MSC Statements

- **Longterm availability**
MSC will guarantee an availability of at least 5 years after introduction
or
MSC will provide a successor in form, fit and function
- **Operating System**
LINUX supported (WinCE, Android on request)
- **Compatibility (Scalability)**
Migration of modules possible by using the min. specification functions

Target markets:

- POI Terminals
- POS / Cash Register Terminals
- Any kind of low and medium HMI
- Medical Equipment
- Industrial Equipment (non ruggedized)
- Low to medium Digital Signage
- Home Automation (Domotics)
- V2oIP (Video and Voice over IP)
- Video Surveillance
- Taxi Meters w/ Navigation and Multimedia
- Mobile Devices
- Small panel PC
- Embedded PC

Why should I use nanoRISC Modules ?

- Huge CPU scalability from ARM9 (400 MHz) to Cortex-A8 (1 GHz); Cortex-A9 in preparation
- ARM CPUs offer a lot of interfaces without additional cost for the baseboard
- Low cost module designed for high quantities
- Low power, usually no cooling requirements
- Provided interface ideal for embedded solutions
- Full Linux support, WinCE and Android to come

How can I start evaluation and design in ?

- CPU datasheets and design guides available
- CPU evaluation boards available
- nanoRISC baseboard design guides available
- nanoRISC modules and Starter Kit available
- Tools and Debugger available (Third Party)