

SGeT

STANDARDIZATION
GROUP FOR
EMBEDDED
TECHNOLOGIES

- Provide a platform
 - to grow embedded industry specifications with a low overhead and high performance
- Define and market industry standards
 - without bureaucracy
- Free access and download
 - for all specifications
- Non-Profit Organization
 - low operation cost is financed by the membership fee's

New members 2020:

Somdevices, DH Electronic,
NXP, Phytex, BMK,
Enclustra, Embedded
Experts, Texas Instruments,
Trenz Electronics



Who are the heads behind SGET e.V. in 2021

- President: Christian Eder - congatec
- 1. Deputy: Martin Unverdorben - Kontron
- 2. Deputy: open
- Secretary: Mark Swiecicki
- Treasurer: Martin Steger - IESY

Chairman of the Standards Development Teams

- SMARC module (SDT.01)
- Qseven (SDT.02)
- embedded NUC (SDT.03)
- UIC (SDT.04)
- OSM (SDT.05)

Martin Unverdorben - Kontron

Mark Swiecicki

Martin Steger - IESY

Carsten Rebmann - Adlink

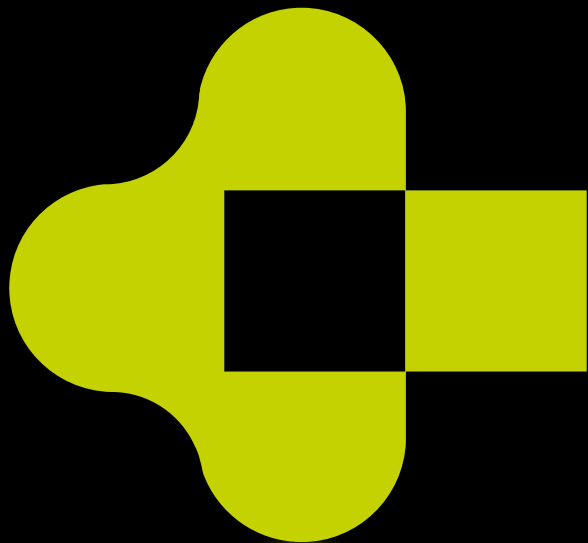
Martin Steger - IESY

Standardization – Why?

$$1 + 1 > 2$$

Henry Maudslay developed the first industrially practical screw-cutting lathe in 1800. This allowed for the standardization of screw thread sizes for the first time and paved the way for the practical application of interchangeability (an idea that was already taking hold) to nuts and bolts.

SGET hosted Standards



SMARC

module

module

SMARC

Two different Infrastructures

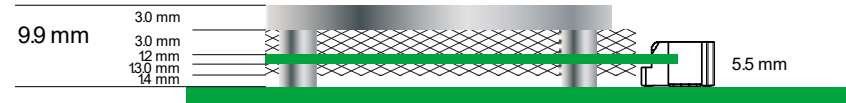
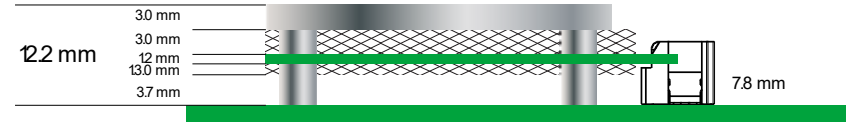
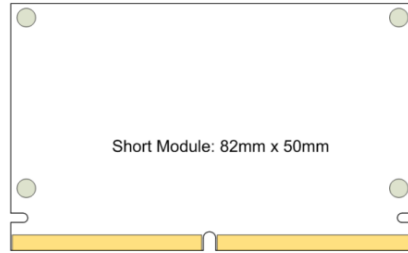
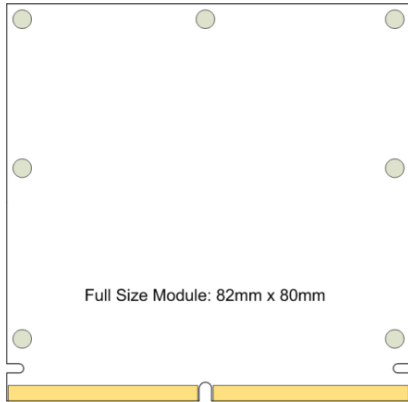
ARM

Parallel TFT display bus
MIPI display interface
Camera interfaces
Multiple SPI links
Multiple SDIO interfaces
Serial ports

Many USB (8 lanes)
Lots of PCI Express (6 lanes)
PCI Express graphics (16 lanes)
LPC (an x86 only bus)
.....and more

X86 +**Designed for mobility**

SMARC Modules combines both worlds on one form factor

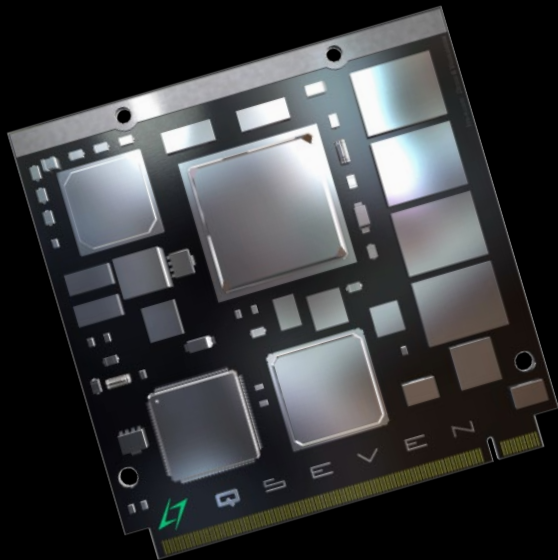


Feature Set SMARC 2.1

| |
|----------------------------------|
| 4x Gigabit Ethernet ¹ |
| 4x PCIe ¹ |
| 4x MIPI CSI ² |
| HDA + 2x I2S |
| 2x LVDS/eDP/MIPI DSI |
| DP++/HDMI + DP++ |
| 1x SATA |
| 6x USB 2.0 + 2x USB 3.0 |
| 14x GPIO + 1x SDIO |
| 4x SER + 2x CAN |
| eSPI + QSPI |
| SPI + I2C |
| Power |

¹ 2x ETH & 4x PCIe or 4x ETH & 2x PCIe

² 2x Flatfoil Connector

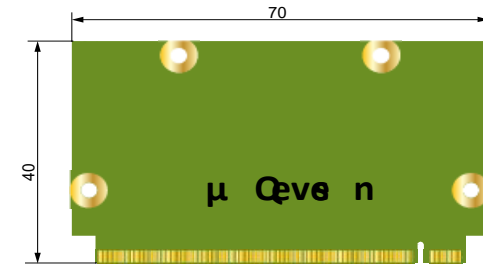
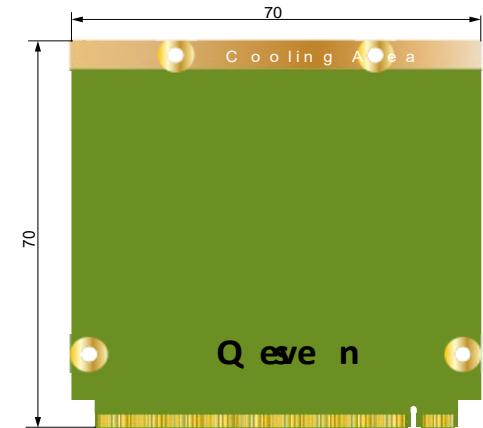


Compact size

- Square 7 cm (~2,76" x ~2,76")
- Rev. 2.0 allows for a microQseven Size 4 x 7 cm (~2,76" x 1,57")
- Solid mechanical mounting
- Cost efficient direct edge connector

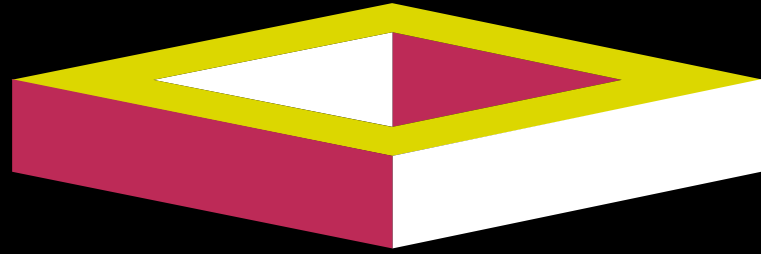
Defined Cooling Interface

- Top edge defined for heat transfer
- Heat transfer from CPU, Chipset and DRAM enhanced via copper layers
- Heatspreader defined for high power versions (max. 12 W)



Feature Set Qseven

| |
|-------------------------|
| Gigabit Ethernet |
| LPC |
| 4x PCIe |
| HDA / I2S |
| LVDS 2x24 / eDP |
| 2x MIPI CSI (Flatfoil) |
| DDI |
| 2x SATA |
| 8x USB 2.0 / 2x USB 3.0 |
| 8x GPIO / SDIO |
| 2x SER / CAN |
| SPI / I2C |
| Power |



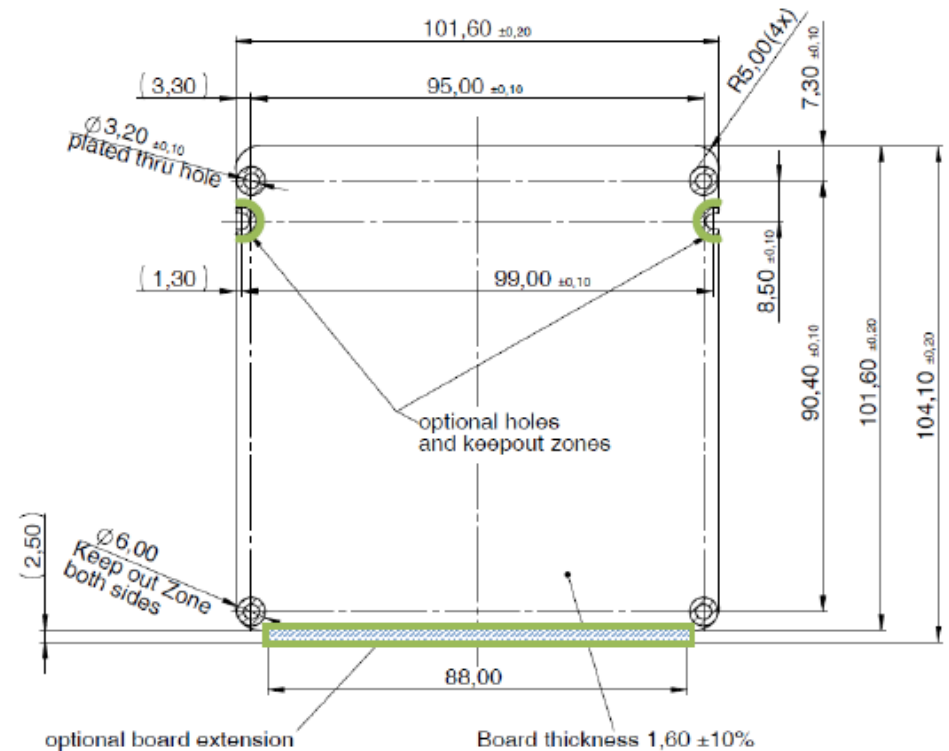
embedded NUC

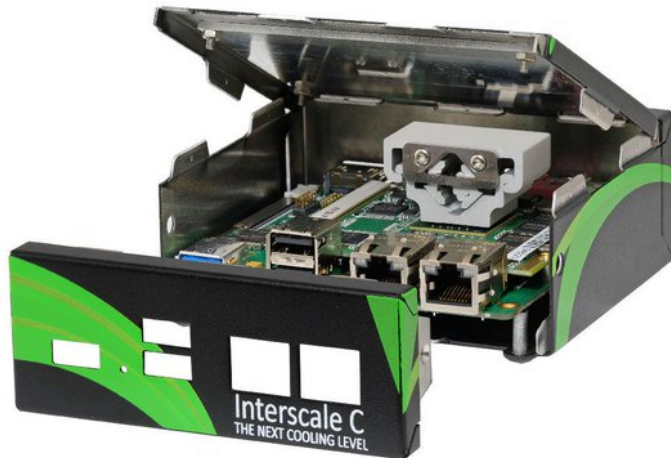
embedded NUC



Small Embedded Form Factor

- Typically used for
 - Qseven Carrier Board
 - SMARC Carrier Board

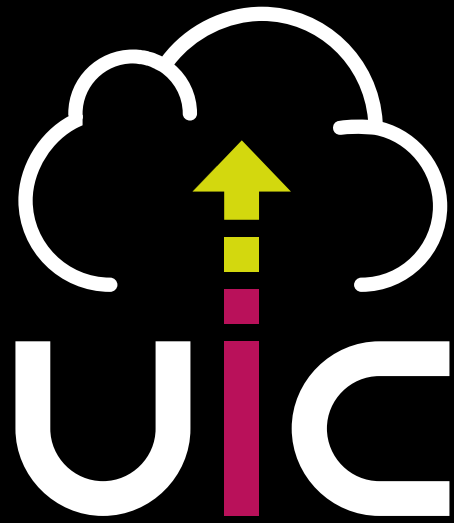






#11 Report SDT.04 UIC

Carsten Rebmann



Universal Internet of Things

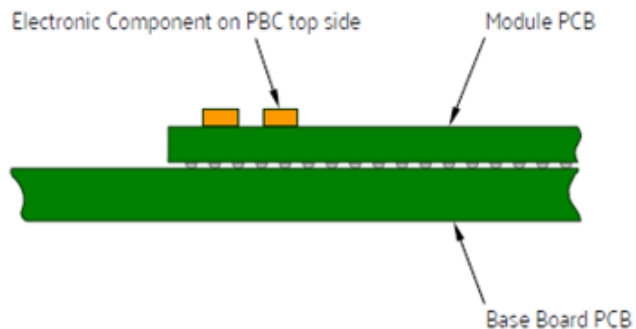
- Software specification
- Common approach for embedded hardware suppliers to provide access to the sensor level devices onboard or thru additional interfaces
- Independent from supplier specific software interfaces
- Workgroup closed
- Results are free available on Github



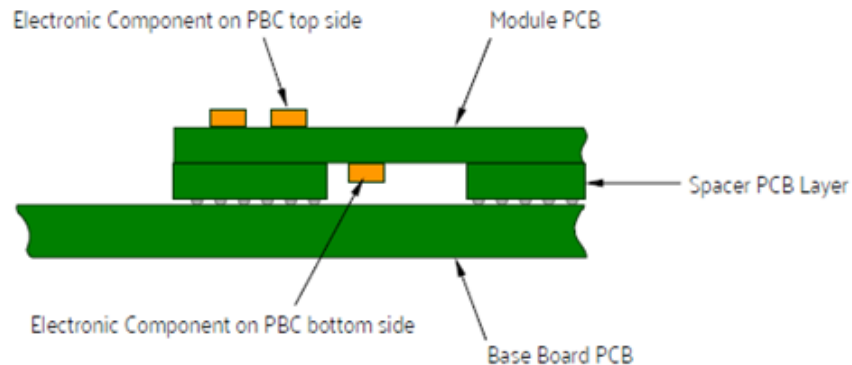
OPEN
STANDARD
MODULE™



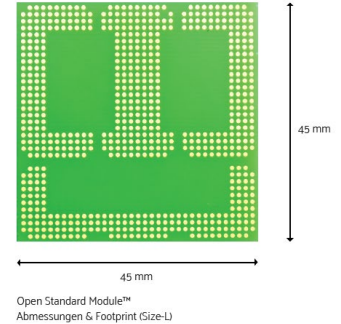
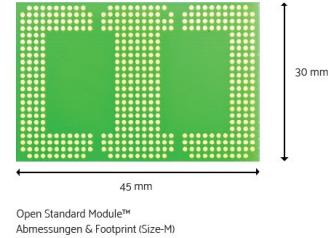
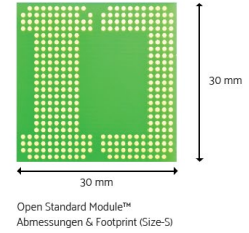
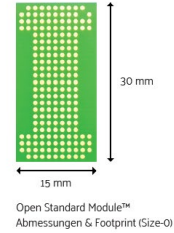
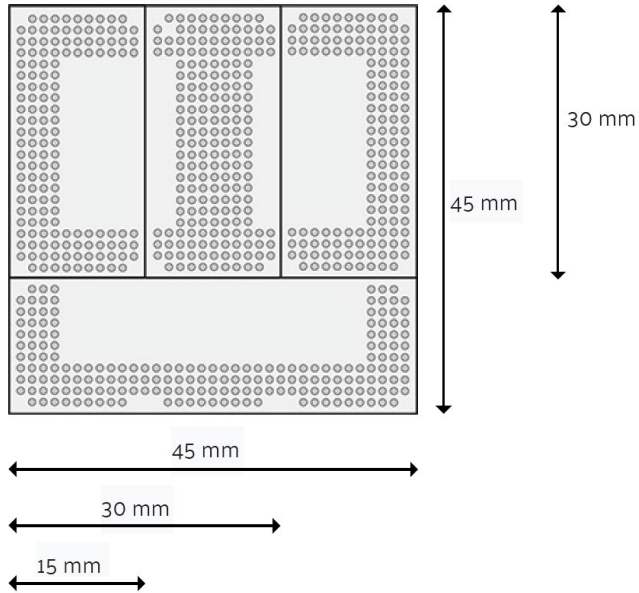
WODUPE™
STANDARD



Standard Height



Extended Height



SGeT

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