

HaneSOM

Small embedded system on module

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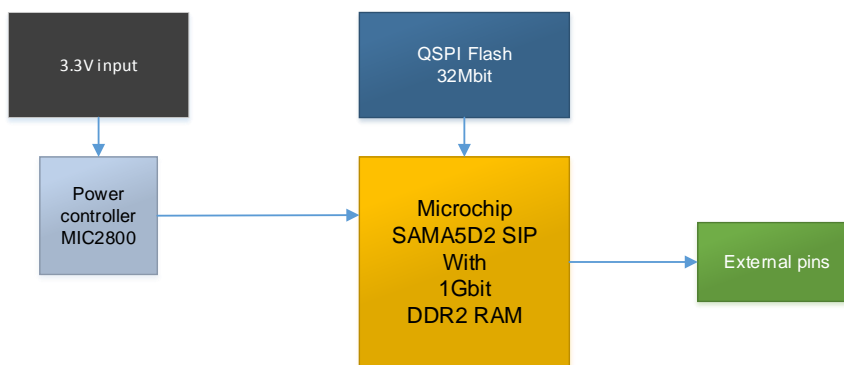
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Overview

The HaneSOM – small embedded compute module.

The HaneSOM board based on ARM® Cortex®-A5 processor-based SAMA5D2 MPU with up to 1 Gbit DDR2-SDRAM in a single package and 32 Mbit of QSPI Flash. This makes HaneSOM module suitable for small device integration.

Block diagram



Features:

- Microchip® SAMA5D27C SIP with 1Gbit RAM;
- Bootable QSPI Flash up to 32Mbit;
- PMIC MIC2800;
- 69 I/Os;
- Independent power rails for SD card I/Os, camera I/Os and RTC;
- Main module power supply: 3.3V ± 8%
- Operating temperature range: -40°C to 85°C
- All necessary components integrated on the HaneSOM to run standalone applications.

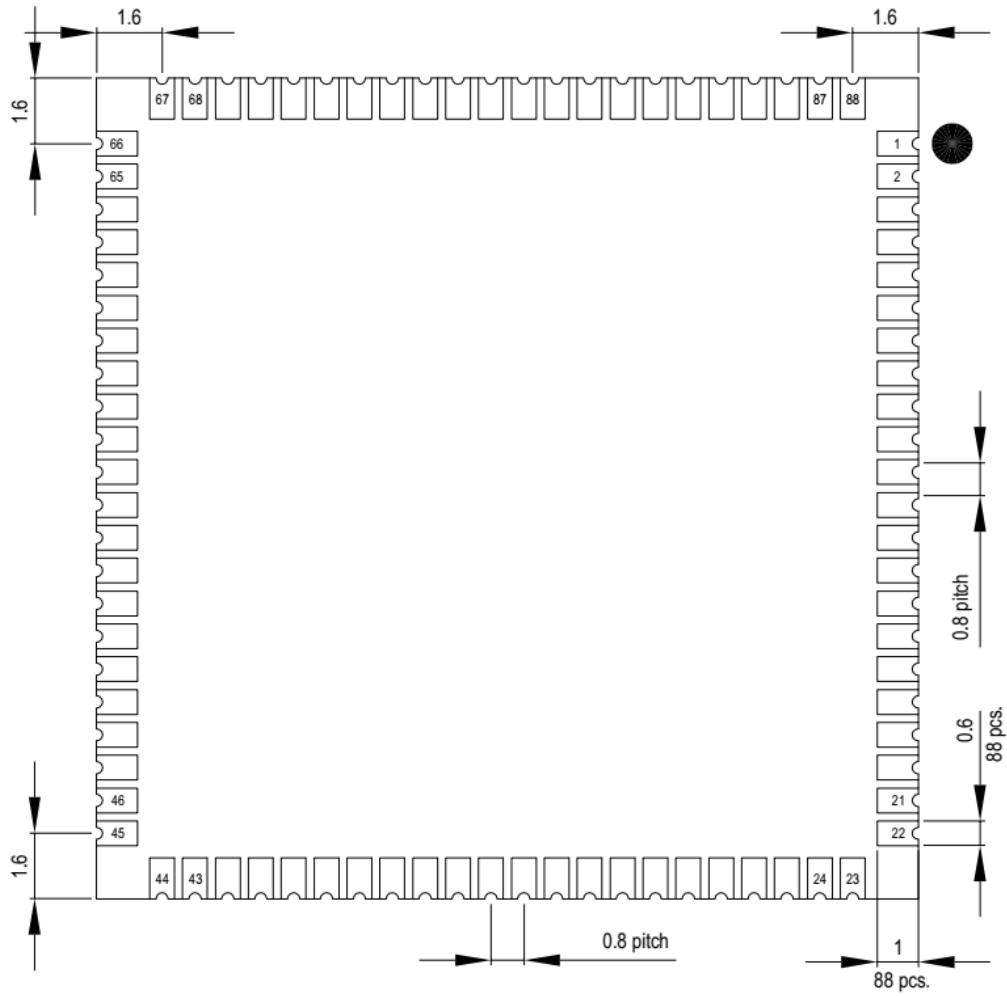
Applications:

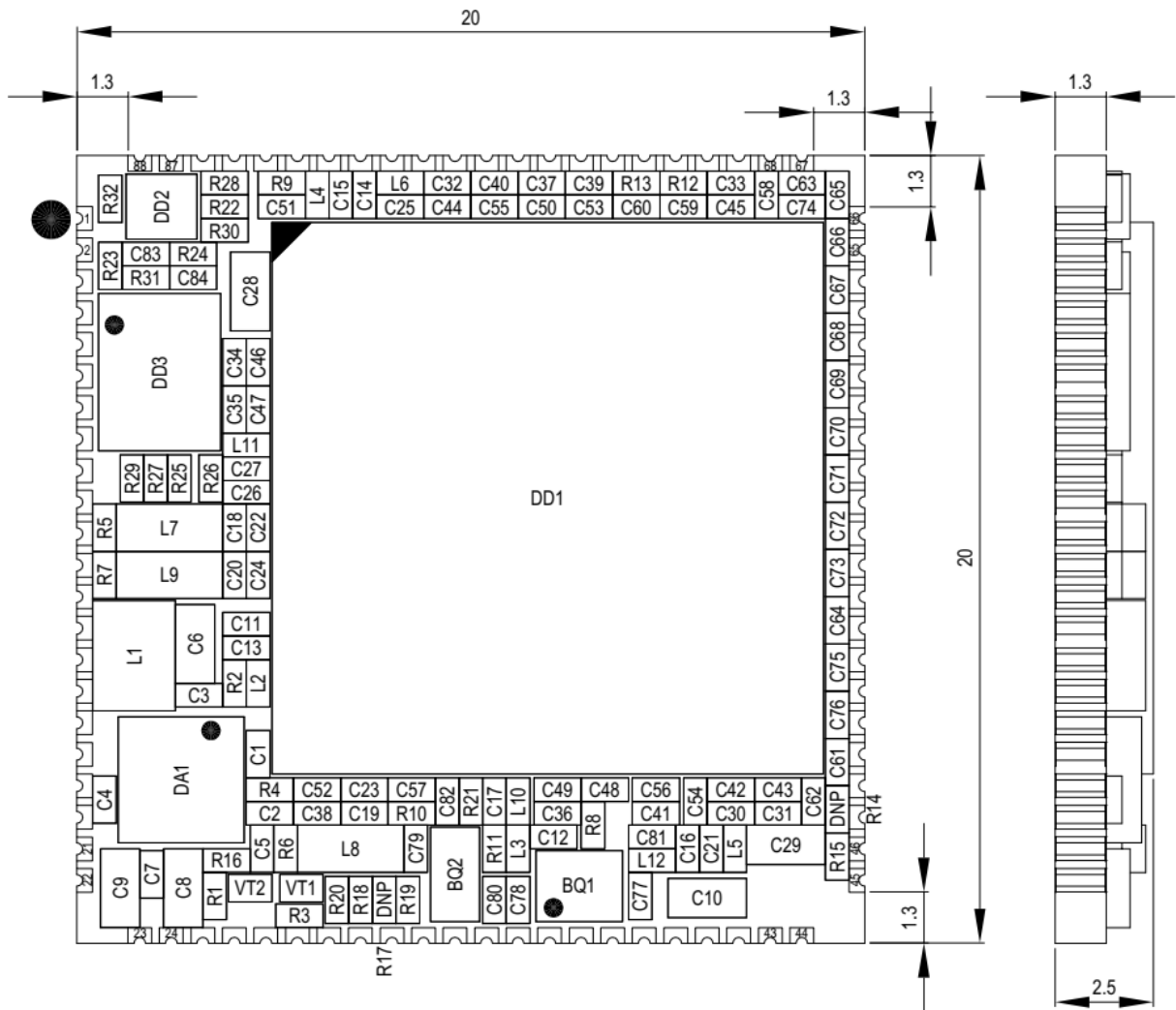
- WiFi camera;
- IoT gateway;
- LCD HMI panel;
- Small AI machine.

Interfaces

The HaneSOM has rich number of interfaces:

- LCD TFT support (24bit RGB);
- 5MPix CMOS camera sensor support;
- Audio interfaces (SSC, I2S);
- Capacitive touch controller;
- USB 2.0 High speed ports (OTG and Host);
- 10/100 MBit Ethernet MAC;
- microSD memory interfaces;
- SPI buses;
- I2C buses;
- UARTs;
- CAN-FD buses;
- 12-bit ADC;
- PWM outputs.





Power supply.

| Pin | Description |
|------------------------|--------------------------------------|
| 18, 19 | +3.3V power line |
| 17, 34, 37, 40, 55, 82 | GND |
| 33 | SDMMC0 power supply (1.8V or 3.3V) |
| 28 | RTC power supply |
| 83 | Camera ISC pins power (1.65 .. 3.6V) |

- Using order code "DAB-002002" – module supplies with 0 Ohm resistors connects 83, 28, 33, 18 and 19 pins all together – for single 3.3V operation.

Power consumption example:

| Condition | Time of active operation |
|-------------------------|--------------------------|
| Linux 5.4 running, IDLE | 3.3V @ 160mA |
| ULPO | TBD |
| ULP1 | TBD |

- Check Microchip AN2896 "SAMA5D2 Low-Power Modes Implementation" for more details
 - <http://ww1.microchip.com/downloads/en/Appnotes/SAMA5D2-Low-Power-Modes-Implementation-Application-Note-DS00002896A.pdf>

Details

Package and pinout

The HaneSOM is using SAMA5D2 SIP in TFBGA289 package. More details in Microchip DS60001484A datasheet: "SAMA5D2 System-In-Package (SIP) MPU with up to 1Gbit DDR2 SDRAM".

Memory

The HaneSOM module has Winbond W971GG6SB DDR2 chip integrated in same SAMA5D2 SIP.

Additionally, QSPI Flash GigaDevice GD25Q32CNIGR has been installed on board. The QSPI Flash connected to QSPI1 port, IOSet 2:

| Signal | Pin |
|-----------|------|
| QSPI1_SCK | PB5 |
| QSPI1_CS | PB6 |
| QSPI1_IO0 | PB7 |
| QSPI1_IO1 | PB8 |
| QSPI1_IO2 | PB9 |
| QSPI1_IO3 | PB10 |

Booting from QSPI Flash can be disabled, by pushing pin 86 of the HaneSOM to low level (GND).

Power supplies

The HaneSOM is supplied by an external 3.3V and generates all necessary voltages using PMIC Microchip MIC2800. PMIC generates DDR2 voltage (1.8V), core power line (1.25V) and VDDFUSE (2.5V).

IMPORTANT: The HaneSOM has internal resistors R8-R10 which connect VDDSDHC, VDDISC and VDDBU to 3.3V. If customer requires to supply separate power lines with different voltage levels, need to order the HaneSOM module with "-NS" postfix.

System control

The HaneSOM provides global system Reset (nRST) and Shutdown (SHDN) pins to the application board.

- The nRST pin is an output pin generated by the internal Power Management Unit (MIC2800) in respect with power sequence timing. It can be forced externally in case of a system crash and must be connected as described in the example schematic below.
- The SHDN pin is an output pin and is managed by the software application. It switches the Main 3.3V Supply ON or OFF.

Electrical characteristics

See the SAMA5D2 Data Sheet, document no. DS60001476 .

Mechanics

Board dimensions is 20x20x2.5 mm

Weight

Board weight: 3 grams.

Order codes

Board has 2 order options:

| Order code | |
|---------------|---------------------------------------------------------------------------------|
| DAB-002002 | Module with 3.3V single operation |
| DAB-002002-NS | Module with separate power domains for SD, camera and main system power supply. |

GTIN: 05419980085429



References

[1] Microchip SAMA5D2 datasheet available on NXP website: www.microchip.com

[2] SAM-BA programming tool:

<https://www.microchip.com/developmenttools/ProductDetails/PartNO/SAM-BA%20In-system%20Programmer>

Legal

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