SudoProc Specifications

version 1.0

Overview

Lightning fast system on module. Made for performance and speed. In the IoT industry, there's no excuse for slow-responding devices.
SudoProc is capable of playing multiple Full 4K HD videos without buffering.

SudoProc highlighted features:

- 4GB LPDDR3
- Based on Cortex A-17, ARM (v7) with NEON co-processor Quad Core
- Small size 65 x 40 x 4,3mm
- Solderable and tiny
- Reliable software implementation
- Multiple OS support
- Aluminium dissipation design keeps the SOM cool

System Specifications

PROCESSOR	
Type	Cortex-A17, ARM (v7) with NEON co-processor
Cores	Quad Core
Speed	1,8 GHz

MEMORY	
Size	4 GB LPDDR3
Speed	1066 MHz
Configuration	2 x 32 bit, dual channel

VIDEO I/O	
eDP output	eDPTM Specification, version 1.3, 4K x 2K @ 30fps
HDMI	HDMI 1.4 and 2.0 operation, 1080p @ 120 Hz and 4K x 2K @ 60 Hz
LVDS (optional on demand)	TIA/EIA -644-A, 10 data lanes total – single & dual channel
MIPI PHY	MIPI 0 TX, MIPI 1 RX and TX, MIPI 2 RX, 4 data lanes, up to 4 Gbps, 1080p @ 60 fps output
CIF input	8 bits BT656 (PAL / NTSC) interface, 16bits BT601 DDR interface, 8bits / 10bits / 12bits raw data interface, Maximum input resolution 14M (4416 x 3312) pixels

GRAPHICS	
Graphics processor	Mali-T764 @ 650 MHz
3D graphics engine	Embedded 4 shader cores with shared hierarchical tiler, Pixel rate: 2.6G pixels/s @ 400 MHz, Max frequency: 500 MHz, OpenGL ES1.1 / 2.0 / 3.0, OpenCL 1.1/1.2 and DirectX 11
2D graphics engine	Max frequency: 500 MHz Pixel rate: 320Mpix/s without scale, 256Mpix/s with scale @ 400 MHz
Video processing unit	H.264 decoder 2160 p @ 24 fps, H.265 decoder 2160 p@ 30 fps and H.264/MVC/VP8 encoder 1080 @ 30 fps
Image processor	Image pre-processor, Video stabilization, Image Post-Processor (embedded inside video decoder), Image Enhancement-Processor (IEP)
JPEG Codec	Decoder 48 x 48 to 8176 x 8176 (66.8 Mpixels), Encoder 96 x 32 to 8192 x 8192 (64 Mpixels), YCbCr 4:0:0, 4:2:0, 4:4:0, 4:1:1 and 4:4:4, From RGB444 and BGR444 up to RGB101010 and BRG101010

AUDIO I/O	
I2S	Up to 8 channels (4 x TX, 2 x RX), Audio resolution from 16 bits to 32 bits, Sample rate up to 192 KHz, 8 channel, 192 KHz, 16 bit and 32 bit
SPDIF (optional on demand)	Support 16,20,24 bits audio data transfer in linear PCM mode

NETWORK	
RGMII interface	10 / 100 / 1000 – Mbps, Supports IEEE 802.3x and IEEE 802.1Q
SDIO interface	3.0 Protocol, 4 bit data bus

INTERNAL STORAGE	
Type	eMMC4.5
Interface	8bit, 200 MB/s
Capacity	32 GB / 64 GB / 128 GB / 256 GB / 512 GB

EXTERNAL STORAGE	
NAND Flash interface	8 bits, up to 4 banks, Async or sync DDR up to 75 MHz, Up to 60 bits hardware ECC
SDMMC interface	SDMMC 3.0 (4 bit)

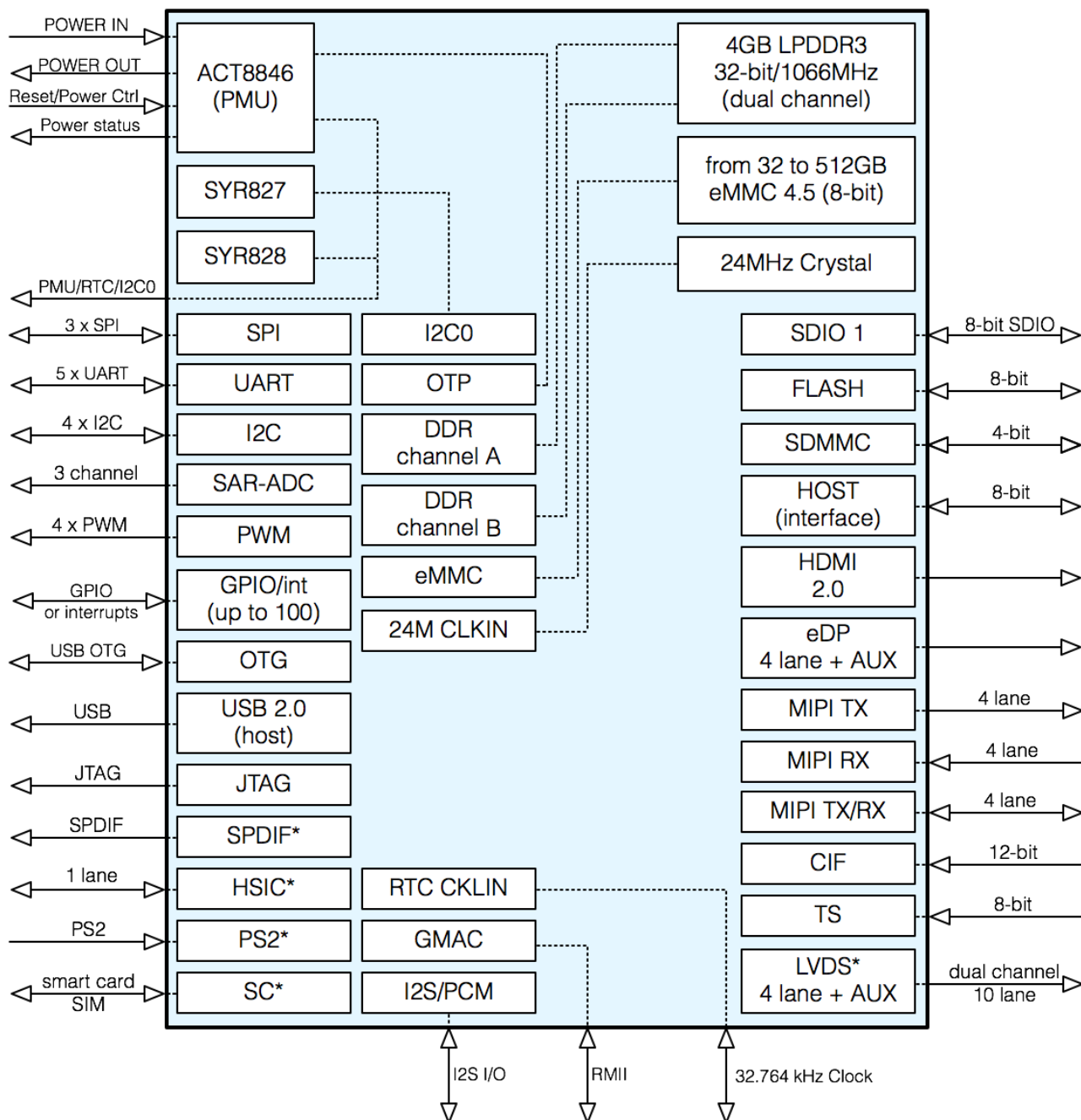| GPIO, SERIAL	
SPI	3x Master or slave mode with 2 chip select outputs
UART	5x Asynchronous (3 with flow control), Up to 4 Mbps or other special baud rate, 64 byte FIFO for TX / RX operation
I2C	5x Multi-master operation, Support 7 bits and 10 bits address mode, Up to 400 Kbit/s
SAR-ADC	3 channel (10 bit), Up to 1 MSPS, 0V to 1.8V
USB host 2.0	Supports high-speed (480 Mbps), full-speed (12 Mbps) and low-speed (1.5 Mbps) mode, Provides 16 host mode channels
USB OTG	Compatible with USB OTG2.0 specification, Supports high-speed (480 Mbps), full speed (12Mbps) and low-speed (1,5 Mbps) mode, Provides 9 host mode channels
HSIC 2.0 interface (optional on demand)	Compliant with the USB 2.0 specification
GPS interface	Complete 1-band, C/A and NMEA-0183 compatibility, Support reference frequencies 16.368 MHz, 32 DMA channels for AHB master access
Host interface	Low Pin Count interface (8 inputs / 16 outputs or 16 inputs / 8 outputs), All signals driven using source synchronous clock (2 DDR clock signals per direction for TX and RX paths)
PS2 interface (optional on demand)	Support PS/2 master mode up to 33 kHz
Smart card (optional on demand)	T0, T1
TS interface	Supports 2 Built-in PTIs, 64 PID filters, CSA v2.0 standard, up to 104 Mbps, 4/8 PCR extraction channels, 8/10 bit
PWM (with interrupt)	4 x 32-bit timer/counter
GPIOs (all can be used as interrupt)	Up to 100x

SECURITY	
AES	Up to 256 bit
DES and TDES	ECB and CBC modes
SHA	SHA-1 to SHA-512
PKA	From 128 bit to 3136 bit in steps of 32 bits
Cortex-A12 security mode	TZMA and TZPC
eFUSE	2 x (one 256 bits (32 x 8) and one 102 bits (32 x 32))

ELECTRICAL	
Input voltage	5 V (± 10%)
Input current	Max. 3 A
PMIC	ACT8846
PMIC remote control	Yes (with GPIO, I2C, Reset)
I/O operation range	3.3 V or 2.5 V or 1.8 V (± 10%), depends on port configuration
Output mode	Independent output control over I2C
Output 1	3.3 V / 2 A
Output 2	2 V / 1 A
Output 3	3.3 V / 150 mA
Output 4	3.3 V / 350 mA
Output 5	3.3 V / 350 mA
Output 6	3.3 V / 350 mA
Output 7	1.8 V / 150 mA
Output 8	1.8 V / 350 mA
Input 2	Vcc MAC (1.8 - 3.3 V)
Input 3	Vcc CIF/TS (1.8 - 3.3 V)

THERMAL	
Max TDP	10 W
Heatsink	Additional heatsink is not required with proper PCB thermal design
Operating temperature range	- 25 °C to + 85 °C
Storage temperature range	- 25 °C to + 85 °C

PHYSICAL	
Footprint	Custom LGA218
Pin count	218
Dimensions	L: 65 mm W: 40 mm H: 4.3 mm

Block Diagram

POWER IN	
POWER OUT	ACT8846 (PMU)
Reset/Power Ctrl	
Power status	
	SYR827
	SYR828
PMU/RTC/I2C0	
3 x SPI	SPI
5 x UART	UART
4 x I2C	I2C
3 channel	SAR-ADC
4 x PWM	PWM
GPIO or interrupts	GPIO/int (up to 100)
USB OTG	OTG
USB	USB 2.0 (host)
JTAG	JTAG
SPDIF	SPDIF*
1 lane	HSIC*
PS2	PS2*
smart card SIM	SC*

I2C0	
OTP	
DDR channel A	
DDR channel B	
eMMC	
24M CLKIN	
RTC CKLIN	
GMAC	
I2S/PCM	

4GB LPDDR3 32-bit/1066MHz (dual channel)

from 32 to 512GB eMMC 4.5 (8-bit)

24MHz Crystal

SDIO 1	8-bit SDIO
FLASH	8-bit
SDMMC	4-bit
HOST (interface)	8-bit
HDMI 2.0	
eDP 4 lane + AUX	
MIPI TX	4 lane
MIPI RX	4 lane
MIPI TX/RX	4 lane
CIF	12-bit
TS	8-bit
LVDS* 4 lane + AUX	dual channel 10 lane

I2S I/O   RMII   32.764 kHz Clock

* on demand

Available versions

VERSIONS				
SudoProc 32	SudoProc 64	SudoProc 128	SudoProc 256	SudoProc 512
FLASH				
32 GB	64 GB	128 GB	256 GB	512 GB

Safety Notice

- This device is to be used with certified power adaptor with output rated 5VDC, 3A. Power adapter must meet limited power source (LPS) requirements.
- Power adapter must meet local safety standards and requirements based on product intended use.
- Power adapter must meet Operating environment conditions as specified above.

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