SG2380 Product Brief
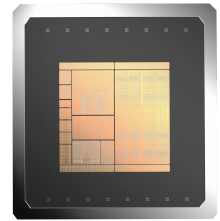

Computing

Processor
- 16-core SiFive RISC-V CPU P670
- 32KB L1I$, 32KB L1D$; 256KB pL2$; 8MB L3$

Graphics
- Imagination AXT-16-512
- Configurable enable/disable io coherence with P670

TPU
- 4-Core SiFive X280
- 32KB L1I$, 32KB L1D$; 256KB pL2$; 2MB L3$
- Support 32 TOPs int8 and 16 TFLOPs fp16

Multi-media

Video decoder
- Hardware decoder support max resolution: 8192x4320
- Hardware decoder support min resolution: 64x64
- AV1 Decoder
  ◇ Support AV1 MAIN Profile @ L5.1 Main-tier 50Mbps
  ◇ YUV420 8/10-bit
- H.265/HEVC Decoder
  ◇ Support HEVC Main/Main10 Profile @ L5.1 High-tier
- H.264/AVC Decoder
  ◇ Support AVC Baseline/Constrained Baseline/ Main/High/High10 Profiles @ L5.2
- VP9 Decoder
  ◇ Support VP9 Profile 0/Profile 2(HBD)
  ◇ YUV420 8/10-bit
- Support 4K@60fps

Video encoder
- Hardware encoder support max resolution: 4096x2304
- Hardware encoder support min resolution: 128x128
- H.265/HEVC Encoder
  ◇ Support HEVC Main Profile @ L5.0 High-tier
- H.264/AVC Encoder
  ◇ Support AVC Baseline/Constrained Baseline /Main/High Profiles @ L5.1
- YUV420 8-bit
- Support 4K@30fps

Security
- Support hardware AES/DES/SHA256/RSA
- Support True Random Number Generator
- Support secure key storage, secure boot, World-Guard
- 32Kb OTP

Misc Interface
- Sensor hub function
- Support AVS bus and SPI for power supply management interface
- Support SMBus for thermal management interface

Power Management
- Support power management
- Support DVFS

OS
- Linux，Android
- openEuler, openKylin, Fedora, Ubuntu

Camera
- 2 clock lanes and 4 data lanes image sensor input, support MIPI-CSI2, support 1 x4 lanes or 2 x2 lanes, support max lane speed 2.5Gbps

CSI
- Support 1 sensor at these senarios: 2f-HDR 3840x2160 30fps，SDR 3840x2160 60fps, SDR 8192x4096 15fps, SDR 64M 2fps
- Support 2 sensor at these senarios: 2f-HDR 2688x1520 30fps，SDR 2688x1520 60fps

ISP
- Support noise reduction, HDR, sharpen, white balance, gamma adjust and demosaic
- Max resolution 9248 x 6944 (under tile mode)
- Supports up to 20% correction of barrel or pillow distortion for lenses

Display
- 1 x DP 1.4a, combo with USB 3.2 Gen2 x1 as a full feature Type-C USB
  ◇ Support max 600Mhz pixel clock
  ◇ Max resolution: 8/10-bit 3840x2400@60fps or 8/10-bit 4096x2160@60fps
  ◇ Only supports DP1.4 date-rates (HBR, HBR2, HBR3), and doesn't support low-voltage swing
  ◇ Support 4 or 2 lanes
  ◇ Support HDCP 1.4 and 2.3
  ◇ Support Multi Stream Transport
  ◇ Support Display Stream Compression V1.2
- 1 x DP 1.4a or eDP 1.4b
  ◇ Support max 420Mhz pixel clock Max resolution: 8/10-bit 3440x1440@60fps or
  ◇ 8/10-bit 2560x1920@60fps
  ◇ Only supports DP1.4 date-rates (HBR, HBR2, HBR3), and doesn't support low-voltage swing
  ◇ Support 2 lanes
  ◇ Support HDCP 1.4 and 2.3
  ◇ Not support Multi Stream Transport
  ◇ Not support Display Stream Compression
- 1 x HDMI 2.0
  ◇ Support max 600Mhz pixel clock
  ◇ Max resolution: 8-bit 3840x2400@60fps, 8-bit 4096x2160@60fps or 10-bit 3072x1920@60fps
  ◇ Support 6 Gbps/lane
  ◇ Support CEC
  ◇ Support HDCP 1.4 and 2.3 Not support FRL, DSC, ARC, eARC, HEAC
- 1 x MIPI-DSI
  ◇ Support max 300Mhz pixel clock
  ◇ Max resolution: 8 or 10-bit 2560x1440@60fps
  ◇ Support 2.5 Gbps/lane
  ◇ Support max 4 lanes
  ◇ Support output format:RGB565, RGB666 packed, RGB888, RGB10-10-10
- Only 2 interface of 2 lane 1 x DP 1.4a or eDP 1.4b, HDMI and DSI can be enabled simultaneously.

TDP and Work Temperature
- TDP: 55W（draft）
- Junction temperature: -40℃ ~ +125℃

Memory
- 256bit DDR interface, maximum capacity 128GB
- Support LPDDR5 @6400Mbps, LPDDR4 and LPDDR4x @4266Mbps
- Support in-line ECC
- 16 channel * 16bit
- Support SDRAMs soldered and LPCAMM2

High-speed Interface
- 1 x16, or 1 x8 + 2 x4, or 4 x2 + 2 x4 PCIe Gen4 controller
  ◇ Each controller can be configured as root complex or end point independently
- 4 x1 lanes high speed interface, can be configured as 4 x1 lane PCIe Gen3 controller, or 2 x 1/2.5/5/10/25Gbps Ethernet and 2 x 1/2.5/5 /10 Ethernet
  ◇ Each controller can be configured as root
  ◇ complex or end point independently 1/2.5/5/10Gbps Ethernet support IEEE1588 / AVB / TSN
  ◇ Ethernet support 1000BASE-KX, 2.5GBASE-KX, 5GBASE-KR, 10GBASE-KR, 25GAUI C2C, 25GAUI C2M interface
- 4 x1 lanes high speed interface, can be configured as 4 x1 lane PCIe Gen3 controller, or 4 x SATA 3.0
  ◇ Each controller can be configured as root complex or end point independently
  ◇ SATA 3.0 support AHCI
- 1 x USB 1.1, 2.0, 3.2 Gen2 x1（10 Gpb), Type-C, DP Alt Mode, dual role；DP support 2 or 4 lanes
  ◇ Support 8 endpoints when used as USB device
- 2 x USB 1.1, 2.0, 3.2 Gen2 x1（10 Gpb), Type-C, dual role
  ◇ Support 8 endpoints when used as USB device
- 1 x USB 1.1, 2.0, 3.2 Gen2 x1（10 Gpb), Type-A, dual role
  ◇ Support 8 endpoints when used as USB device
- 4 x USB 1.1, 2.0, host only
- 3 x SDIO 3.0/SD 3.0/eMMC 5.1
- 2 x Gbit Ethernet MAC, RGMII interface, support 10/100/1000 Mbps, support IEEE1588 / AVB / TSN

Low-speed Interface
- 2 x CAN 2.0b
- 4 x UART without traffic control function or 2 x UART with traffic control function
- 8 x I2C, SMBUS supported
- 2 x SPI with 2CS each
- 1 x QSPI NOR/NAND and 1 x QSPI NOR flash interface
- 8 x PWM
- 1 x Fan detect
- 1 x HD Audio, support 2 codec
- 4 x PDM with 1 x I2S
- 3 x I2S, support clock output and input selection; 1 of them share pin with HD Audio, support up to 8 channels
- 8 x dedicated GPIO
- All low speed IO mutiplexed with GPIO

Package and Dimension
- FCBGA
- Package size: TBD; ball pitch: 0.7mm

System Feature
- Support with and without EC