T527

Octa-core 64-bit Artificial Intelligent Platform Processor T527 Series

Overview

T527 series features high-performance octa-core Cortex™-A55 AI platform SoCs for the electronic commercial and Industrial fields. The chip family integrates Cortex™-A55 octa-core CPU, NPU, DSP, G57 MC1 GPU, 32-bit DDR3/DDR3L/DDR4/LPDDR3/LPDDR4/LPDDR4X DRAM, high-speed interfaces (PCIe2.1 and USB3.1), automotive interface (CAN), multi video output interfaces (2*RGB/2*Dual-LVDS/2*MIPI-DSI/HDMI/eDP), and video input interfaces (MIPI CSI). The chip family supports 4K@60fps H.265 decoder, 4K@25fps H.264 encoder, DI, and AWonder system, which provides users with smooth experience and professional AI visual effect. T527 series can be used in Content sharing and self-service interactive terminals, Smart manufacturing and other electronic commercial and Industrial devices.

Device Differences

Orderable Devices	NPU
T527M02X0DCH	Support
T527M00X0DCH	Not Support

Highlight

- High performance: T527 series integrates 8 x A55 CPU, 2 TOPS NPU, G57 MC1 GPU, and 4GB DDR3/DDR4/LPDDR3/LPDDR4/LPDDR4X, which provides users with smooth experience and professional AI visual effect.
- Video multimedia: Supports full format video playback, 4K@60fps H.265 video decoder, and 4K@25fps H.264 video encoder.
- Video output: Supports multi video output interfaces such as RGB888, MIPI-DSI, LVDS, HDMI, and eDP to achieve different display in dual screen.
- Video input: Integrated MIPI CSI can support maximum 4-ch HD camera inputs to achieve differentiated visual functions.
- Rich interfaces: Supports 2xUSB 2.0, 1xPCIE 2.1&USB 3.1 combo, 2xGMAC, 10xUART, 9xTWI, 24-ch GPADC, greatly facilitating product expansion.

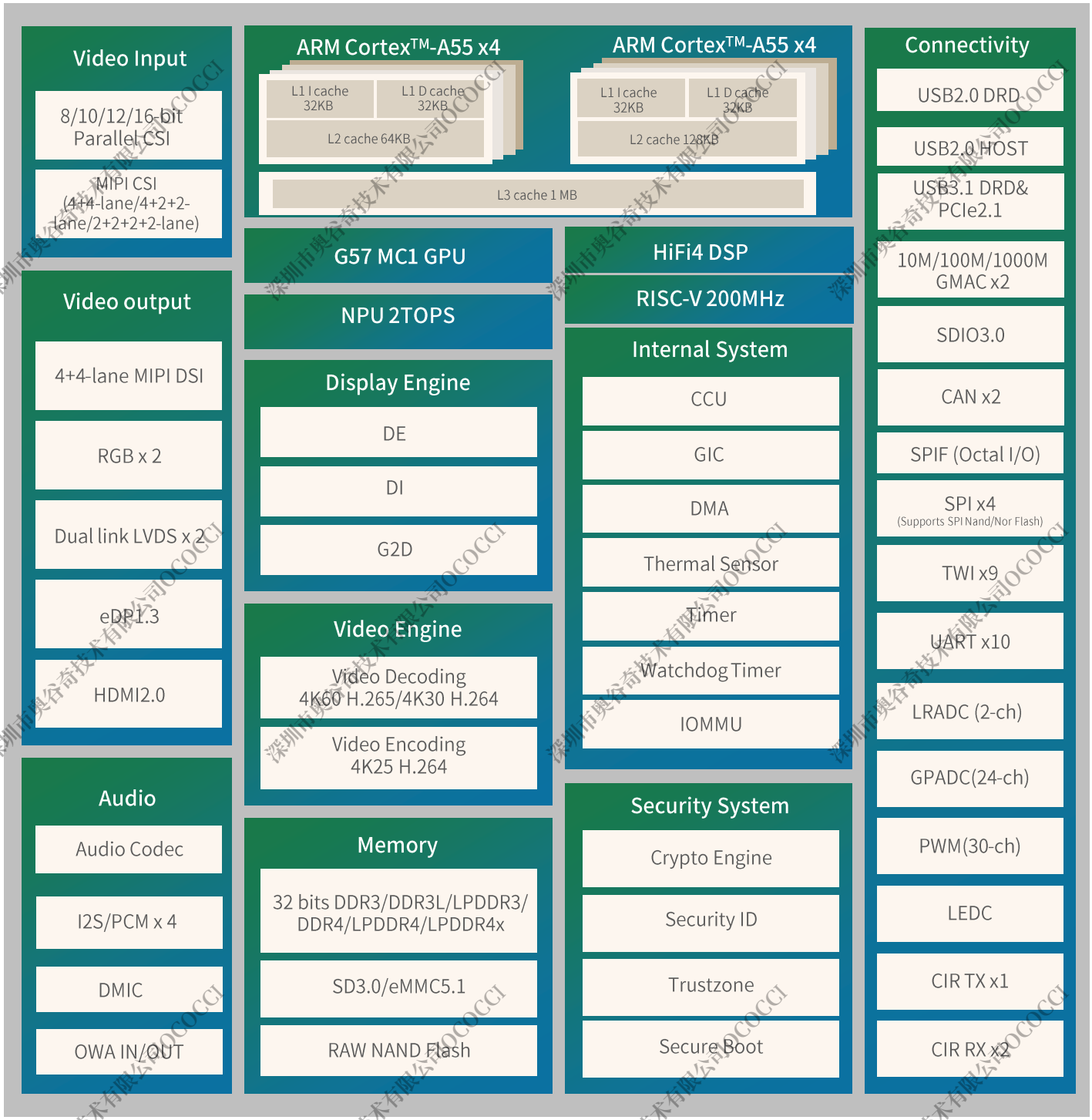
Features

Processor	• Octa-core ARM Cortex™-A55, up to 1.8 GHz • RISC-V CPU, up to 200 MHz • ARM G57 MC1 GPU • HiFi4 DSP • Up to 2 TOPS NPU
Memory	• 32-bit DDR3/DDR3L/DDR4/LPDDR3/LPDDR4/LPDDR4X interface, supporting maximum capacity of 4GB • 4 chip select lines for LPDDR3, LPDDR4, and LPDDR4X (especially the 64-bit LPDDR3, LPDDR4, and LPDDR4X) • SDIO3.0/eMMC5.1 interface • 8-bit NAND flash interface with maximum 80-bit/1KB ECC
Video Engine	Video decoder • H.265 MP decoder up to 4K@60fps • H.264 BL/MP/HP decoder up to 4K@30fps • VP9 decoder up to 4K@60fps • Multi-format 1080p@60fps video playback, including VP8, MPEG1/2 SP/MP, MPEG4 SP/ASP, AVS+/AVS JIZHUN Video encoder • H.264 encoder up to 4K@25fps • MJPEG encoder up to 4K@15fps • JPEG encoder up to 8K x 8K resolution
Video Input	Parallel CSI interface • 8/10/12/16-bit width • Supports BT.656 up to 4*720P@30fps and BT.1120 up to 4*1080P@30fps MIPI CSI interface • 4 + 4-lane, 4 + 2 + 2-lane, or 2 + 2 + 2 + 2-lane MIPI CSI, up to 2.0 Gbit/s per lane in HS transmission, compliant with MIPI-CSI2 V1.1 and MIPI DPHY V1.1 • Maximum video capture resolution of 8M@30fps
Video Output	• HDMI 2.0b up to 4K@60fps • 4 + 4-lane MIPI-DSI output, supporting up to 2.5K@60fps and 4K@45fps • 2 x LVDS interface with dual link, up to 1080p@60fps • 2 x RGB interfaces with DE/SYNC mode, up to 1080p@60fps • eDP1.3 up to 2.5K@60fps and 4K@30fps
Audio	• 2 DACs and 3 ADCs • 3 x audio outputs: LINEOUTLP/N, LINEOUTRP/N, HPOUTL/R • 3 x audio inputs: MICIN1P/N, MICIN2P/N, MICIN3P/N • Embedded 4 I2S/PCM interfaces, supporting maximum 16 channels, 8 kHz-384 kHz sample rate, and 8-bit-32-bit width • Maximum 8 digital PDM microphones (DMIC) • One OWA input and one OWA ouput
Security Engine	• Supports Full Disk Encryption • AES, DES, 3DES, and SM4 encryption and decryption algorithms • MD5, SHA, and HMAC tamper proofing • RSA, ECC signature and verification algorithms • Supports 160-bit hardware pseudo random number generator(PRNG) with 175-bit seed • Supports 256-bit hardware true random number generator(TRNG) • Integrated 4K-bit EFUSE for chip ID and security application
Connectivity	• 1 x USB2.0 Host, 1 x USB2.0 DRD, 1 x USB3.1 DRD&PCIe2.1 Combo • 2 x GMAC (10/100/1000 Mbps port with RGMII and RMII interfaces) • 2 x CIR RX, 1 x CIR TX, 9 x TWI, 4 x SPI, 10 x UART, 2 x CAN • 30-ch PWM, 24-ch GPADC, 2-ch LRADC • SDIO 3.0, LEDC, SPIF (Octal I/O)

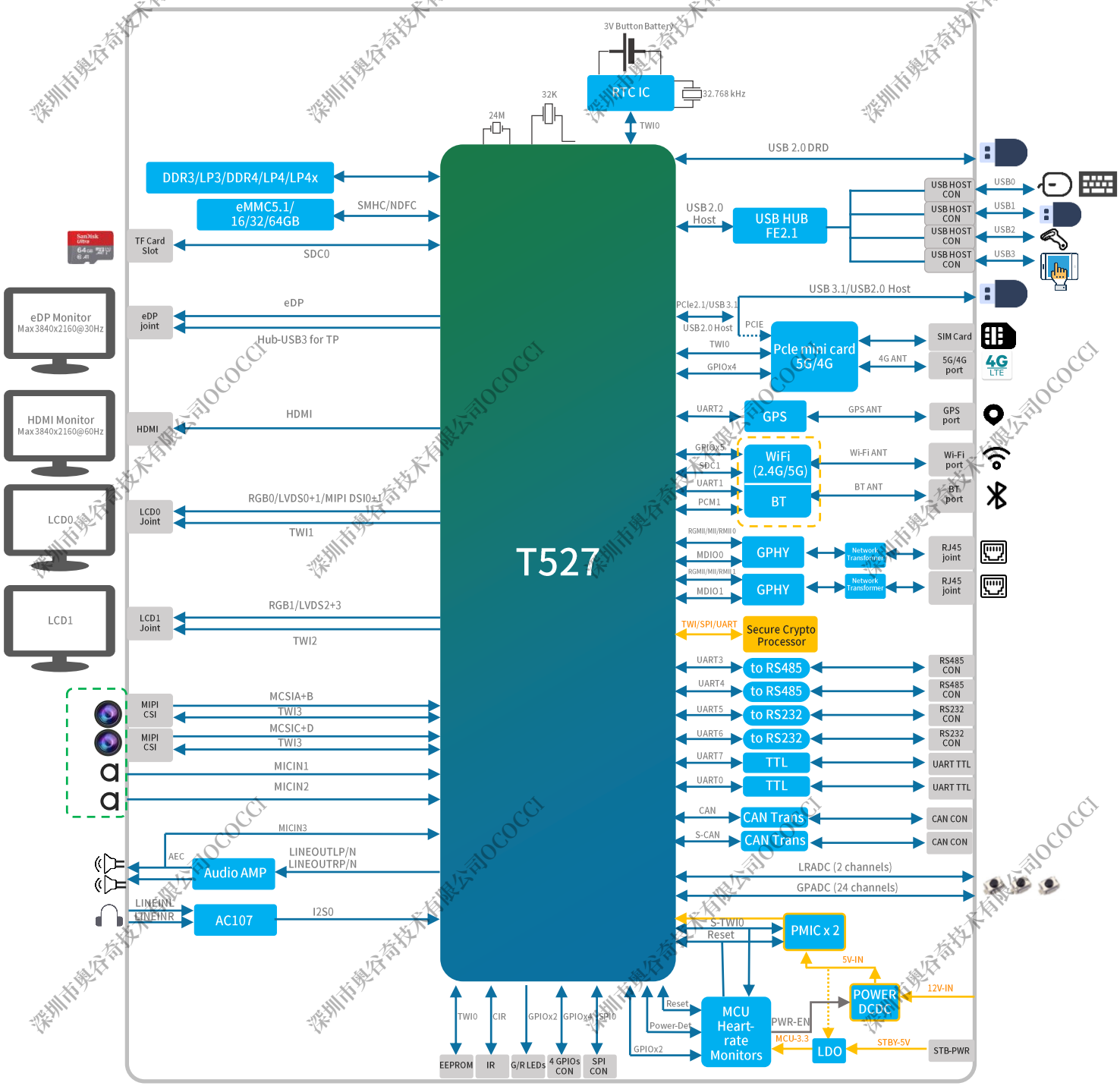
深圳市奥谷奇技术有限公司OCOCCI

PMIC	• Companion Allwinner Power Management IC
Package	• FCBGA 664balls • 17 mm x 17 mm size,0.5 mm ball pitch,0.3 mm ball size
Process	• 22nm HPC

Block Diagram



Application Diagram



ABOUT ALLWINNER

Allwinner Technology, founded in 2007, is a outstanding designer dedicated to intelligent application SoC, high performance analog component and wireless connectivity IC. It is headquartered in Zhuhai China, with other R&D centers and offices in Shenzhen, HongKong, Xi'an, Beijing and Shanghai. Listed on the GEM of the Shenzhen Stock Exchange in 2015, with the stock code 300458.

Motivated by customer-oriented strategy, Allwinner aligns remarkable R&D teams with long-term core-technology investment in UHD video processing, high-performance multi-core CPU/GPU integration with AI and advanced manufacturing process in terms of high integration, ultra-low power consumption and full-stack integration platform, providing competitive turnkey solutions with considerate services. The products powered by Allwinner spread across from smart hardware, smart home, consumer electronics, HD media, smart video, connected car, industry control, wireless communication to analog products.

CONTACT US

Email: service@allwinnertech.com

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