

# Qualcomm® SA6155P Product Brief



Qualcomm Technologies provides a wide range of integrated and scalable automotive solutions specifically targeted at the integrated cockpit/cluster and compute architectures.

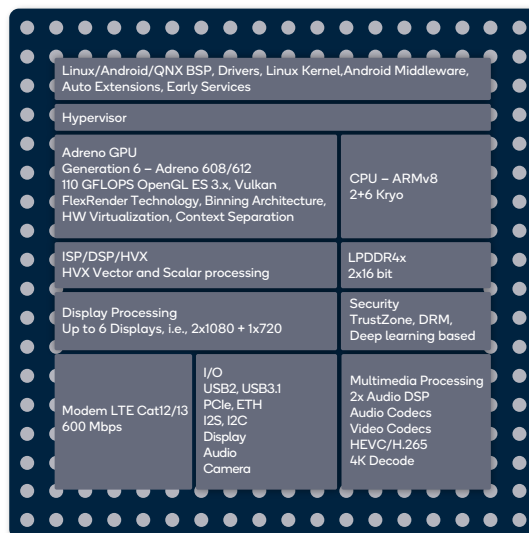
With industry leading performance, graphics and DSP, our automotive compute solutions provide for unprecedented level of support for cockpit/ clusters, surround-view monitoring, advanced audio integration and additional communications such as WLAN and WWAN integration. All of these solutions are augmented by software that extend beyond a basic BSP package. The software solutions from Qualcomm Technologies support multiple operating systems including Android for Automotive, Automotive Grade Linux and other Linux for automotive distributions, and other real-time operating systems including QNX and Green Hills.

SA6155P is an integrated, next-generation automotive cockpit platform. It is a 11nm system-on-chip (SOC) designed with custom hardware blocks including:

- An octa-core CPU subsystem featuring the 4th generation Qualcomm® Kryo CPUs based on the ARMv8 architecture
- Custom Qualcomm Adreno™ Generation 6 GPU, with enhanced support for preemption for next-generation cluster designs and featuring patented Qualcomm® FlexRender™ technologies
- Custom and dedicated video decode/encode hardware accelerators
- Display engine supporting up to 2x FHD plus 1x HD displays (at 60 fps), with support for instrument cluster integrity
- Audio DSPs supporting Echo Cancellation/Noise Suppression (ECNS), Active Noise Cancellation (ANC), and in-car communication algorithms
- Optional 600 Mbps-capable modem baseband integrated; RF is supported in a dedicated companion chip
- Support for 802.11ac or ax baseband with RF companion chip
- High-speed connectivity for peripherals—USB 3.0, PCIe Gen 2.0, Ethernet (Gigabit-capable)
- High speed I2S interfaces to support Software Defined Radio
- Automotive Grade-3 support with PPAP and documentation

- Technology IP leadership  
Leading 11nm FINFET low power
- HW thermal management
- Highest performance GPU  
for infotainment, instrument cluster
- Heterogeneous compute architecture
- High-performance DSP
- Multi-camera input
- Surround-view camera
- Object recognition
- Image recognition
- Multi-display compositor
- Optional Modem:  
Leading Cat12/13 LTE
- Optional GNSS:  
Multi-constellation support
- Optional Connectivity:  
Wi-Fi + Bluetooth

- Optional:  
External Wi-Fi 802.11ac or ax/  
Bluetooth
- Optional:  
Qualcomm®  
SIRFStar™  
GNSS
- PMICPM6155P

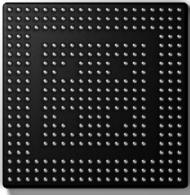


- Software integration
- System-level performance optimization
- Platform integration
- Multimedia shared device driver
- High performance, power efficient:  
Customized ARMv8 CPUs
- High performance CPU technology
- Multiple displays,  
up to 3 simultaneous displays
- Latest SCSA security architecture
- Next generation audio and video codecs  
in hardware including HEVC, VP9
- DVR capability with H.265 encode
- Superior multimedia technologies and features

Note: Some features are optional based on the product variant.



Qualcomm SA6155P, Qualcomm Adreno, Qualcomm FlexRender, Qualcomm Kryo and Qualcomm SirfStar are products of Qualcomm Technologies, Inc. and/or its subsidiaries.



## Feature Details

### • CPU

- Custom 64-bit Kryo 2x gold + 6x silver octa-core CPU
- 11nm FINFET with advanced power savings
- SOC virtualization support
- Gold cores: 64 kB L1 I/D + 256 kB L2
- Silver cores: 32 kB L1 I/D + 64 kB L2
- 1 MB L3 + 256 kB system cache (L1/L2/L3 with ECC)

### • GPU

- Adreno 608/612 GPU: OpenGL ES 3.2, OpenCL 2.0 Full, Vulkan, RenderScript, 64-bit virtual addressing, plus hardware tessellation, geometry shaders, programmable blending, and decreased power consumption
- High granularity for preemption with HW queues and doorbell features

### • DSP

- Qualcomm® Hexagon™ 6 DSP with Hexagon Vector eXtensions (HVX) Two instances

### • Audio DSP and Audio Interfaces

- Dedicated Audio Low Power Audio Subsystem (LPASS) with Hexagon 6 DSP
- Support for ECNS, ANC, and in-car communication using Qualcomm® Noise and Echo Cancellation
- 5 interfaces supporting I2S and PCM/TDM
- Up to 512\* 48 kHz (24.576 MHz)
- 2x high-speed I2S (70 MHz) to support Software Defined Radio (SDR)

### • Display and Video Processing

- Up to 2x 1080p60 + 1x 720p60 support—Total of 5 Mpix supported in HW display compositor
- Support for 1x DSI V1.0 and DisplayPort V1.4 with Multi-Stream Transport (MST) support
- Multiple surface processing pipes
- Support for instrument cluster integrity
- Hardware video decode/encode support—Up to 4k60 decode, 1080p60 encode support
- Support for major video codecs (H.264/H.265, MPEG-2, VP8, VP9, etc.)

### • Memory and Storage

- 2x16 LPDDR4X support—Up to 26 GBps with compression (Gen 2 of UBWC)
- UFS 2.0 support
- QSPI for boot

### • Camera and ISP Support

- Support for ISP
- 3x4 CSI 2.0 lane for camera support
- Support for Around View Monitoring (AVM) and Rear-View Camera (RVC)

### • Interfaces and I/O

- 1x PCIe Gen2 (RC and EP)
- 1x USB3.1 (SS) + 1x USB2.0 (HS) support
- 1x GigE with RGMII support
- Up to 14 programmable serial interfaces
- Up to 100 general purpose I/Os

### • Integrated Communication Support (optional)

- Integrated 4G LTE modem
- DL 6xCA, UL 2xCA – Up to 40 MHz
- IPA for Wi-Fi/Ethernet and modem built in

### • Security

- Secure boot using RSA2048/SHA256, boot image encryption
- HW and SW encryption including inline crypto, RNG and general-purpose crypto engine
- Qualcomm® Trusted Execution Environment (TEE) support

### • OS Supported

- Android Automotive
- Linux—AGL, GENIVI
- Hypervisor including QNX and Green Hills

### • Power Management

- Power Management IC—PMM6155AU providing power management for SA6155P
- RTC, power-down and wake-up support
- PWM support

### • Power and Thermal

- -40° to 105°C junction temperature support
- Estimated TDP of 3 W (at 65°C ambient)
- Support for always-on/suspend to RAM

### • Automotive Spec and Package

- AEC-Q100 Grade-3
- 0.8 mm ball pitch package—23 mm x 23 mm 761 ball FCBGA package
- In production, PPAP and documentation available

Visit us at: [qualcomm.com/automotive](http://qualcomm.com/automotive)

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