Application processors powering the next generation of high-tech devices for the Internet of Things (IoT)
The APQ8016E application processor is an ideal solution for IoT applications requiring computing horsepower and integrated Wi-Fi and Bluetooth connectivity, such as connected homes, building automation, industrial control, digital signage, smart surveillance and other IoT devices.

### Target Applications
- Internet of Things (IoT)
- Home Automation
- Industrial Automation
- Smart Cities
- Building Automation
- Healthcare

### Features
- Quad-core Arm Cortex A53 up to 1.2GHz with both 32-bit and 64-bit support — commercialized in millions of mobile devices worldwide
- Arm v8-A ISA offers an efficient instruction set
- Qualcomm® Adreno™ A306 3D GPU (up to 400MHz) with support for multiple APIs including: OpenGL ES 3.0, OpenCL, DirectX, content security, and decreased power consumption
- Qualcomm® Hexagon™ QDSP6 V5 (up to 691MHz) for differentiated signal processing
- 13MP camera support with Wavelet Noise Reduction and JPEG Decoder done in hardware
- Worldwide ecosystem of vendors, customers, developers and embedded device OEMs

### Ordering Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>APQ8016E SoC</td>
<td>APQ-8016E-1-760NSP</td>
</tr>
<tr>
<td>Integrated PMIC &amp; Audio Codec</td>
<td>PM8966-0-176NSP</td>
</tr>
<tr>
<td>Wi-Fi &amp; Bluetooth Connectivity</td>
<td>WCN3620-0-61WLNSP</td>
</tr>
<tr>
<td>GPS &amp; Glonass RF Receiver</td>
<td>WGR7640-0-17WLNSP</td>
</tr>
</tbody>
</table>

### APQ8016E Hardware Specifications

- **Package**: 12 x 14 x 0.96mm (760NSP, 0.4mm pitch)
- **Processor**: Quad-core Arm v8 Cortex A53 @ up to 1.2GHz per core with 32-bit and 64-bit support
- **Memory and Storage**: LPDDR2/3 32-bit single channel non-PoP @ 533MHz, eMMC 4.5 with DDR support, SDIO 3.0 (UHS-I)
- **Connectivity**: 802.11 a/b/g/n/ Wi-Fi, Bluetooth 4.x
- **Location**: GPS
- **Graphics**: Adreno 306 3D graphics core @ up to 400 MHz
- **DSP**: Hexagon QDSP6 v5 core @ up to 691MHz
- **Display Support**: 1920x1200, 1080p external displays supported 1x MIPI-DSI, HDMI via converter
- **Camera Support**: Single integrated ISP can support 1.5 GP/s throughput and image sensors up to 13 MP, 1x MIPI-CSI
- **Video Support**: 1080p HD @ 30fps H.264 playback and capture
- **Audio Support**: 2x I2S (multi-channel) Up to 3x analog mic, 2x digital mic, stereo headset, earpiece speaker driver
- **I/O Interfaces**: 1x USB2.0 (Host, Device, or OTG) Up to – 122x GPIO, 6x I2C, 6x SPI, 2x UART, 3x UIM, 1x CCI

### APQ8016E Block Diagram

More Info: [QR Code]

Materials are subject to change without notice.
Eragon 410 SoM by eInfochips
- Ultra small SoM: 26mm x 35mm
- Connector-less, on-chip eMCP
- USB, Wi-Fi, Bluetooth
- Expansion Connector for low speed I/O
- Sensors (lx) Gyro + Accelerometer + magnetometer using MPU 9250

Inforce 6301 Micro SoM by Inforce Computing
- Dual MIPI-CSI2 (4/2-lane) for cameras up to 13MP
- 4-lane DSI DPHY 1.2 interface for touch screen displays
- 28 x 50mm
- Pin, connector, electrical, and form-factor compatibility with all Micro SoMs

Open-Q™ 410 SoM by Intrinsyc Technologies Corp.
- 13MP camera, HW based H.264 to encode/decode with 1080p 30fps video
- 24-pin expansion header (I2C, SPI, UART, GPIO)
- Expansion interface via 2x 100-pin connectors
- 26 x 44mm

DART-SD410 SoM by Variscite
- Low power consumption
- Extended temperature range -25 to 85° grade
- Integrated Wi-Fi/BT, GPS, A/V, USB, serials
- HDMI & LVDS On-Carrier (via bridge), DSI 1080p30
- 25 x 43 x 4.7mm

TXSD-APQ8016E SoM by Ka-Ro Electronics
- 1GB LPDDR3 SDRAM, 4GB eMMC
- HD (1280 x 720) LCD controller
- SD-card interface, High Speed USB 2.0
- Six configurable UART/SPI/I2C interfaces
- LVDS display interface, 2x MIPI camera interfaces
- 67.6 x 26 x 4mm

Myon I SoM by Keith & Koep GmbH
- 1 GB LPDDR3, 8GB eMMC
- USB2.0, SD/SDIO Card, MIPI camera (2ch/4ch)
- 8 configurable ports for: GPIO, UART, SPI, I2C, I2S
- Display Interfaces: LVDS or MIPI Display (4ch)
- On-board Wi-Fi, Bluetooth, GPS
- On-board antennas or UFL connectors
- 48 x 32 x 4.2mm without antenna

TurboX™ S410 SoM by Thundercomm
- Small size: 40mm x 40mm
- Low cost, high performance, low power consumption
- Supports 1080p@30fps encode/decode
- LPDDR3 1G + eMMC 8GB
- 802.11a/b/g/n &4.x (BR/EDR +BLE)

To learn more visit Qualcomm.com or developer.qualcomm.com

For additional information for a chosen SoM/SBC please check directly with the manufacturer.
Inforce 6309 Micro SBC by Inforce Computing
- Full-HD H.264 encode/decode and dual-cameras up to 13MP
- 26-pin I/O expansion header, external antenna connectors
- 802.11b/g/n 2.4 GHz Wi-Fi, Bluetooth 4.1 LE, GPS
- Extended operating temperature (-30 to +85°C), PoE
- RS485, and EMI shields
- 54 x 85mm

ConXM Industrial Baseboard SBC by Keith & Koep GmbH
- USB2.0 Host, USB2.0 OTG, µSD Card Socket, RJ45 10/100 Mbit Ethernet, LED, Reset
- Display interfaces: LVDS, HDMI
- Voltage Supply: +12 up to +24V, +5V (USB), Lithium-ion, lithium-ion-polymer battery-charger, Coin-Cell Charger
- Expansion interfaces: UART, SPI, I2S, 2x I2C, 12x GPIO, DC power, 4L MIPI-DSI, USB, 2L+4L MIPI-CSI, stereo headset/line-out, speaker and analog line-in
- 100 x 90 x 18mm

i-PAN M7 CoverLens SBC by Keith & Koep GmbH
- 7.0" TFT-Display, capacitive touch, 800 x 480 pixel, 850 cd/qm, 1.8mm glass front
- POE (Power Over Ethernet) available
- Wireless interfaces via Myon onboard WiFi, Bluetooth, GPS
- Extension interfaces: USB, I2C, UART, Keys, Camera, Battery, Speaker, Headphone, Microphone
- i-PAN T7 Baseboard: 130 x 70 x 17mm
- Display: 201 x 133 x 8.7mm

VAR-SD410CustomBoard SBC by Variscite
- Low power consumption
- Advanced multimedia capabilities, DSI 1080p30
- Extended temperature range -25 to 85° grade
- Integrated memories, Wi-Fi, Bluetooth, GPS, A/V, USB, serials
- 8.7 x 11.8 x 2cm

To learn more visit Qualcomm.com or developer.qualcomm.com

For additional information for a chosen SoM/SBC please check directly with the manufacturer.
DragonBoard 410c by Arrow Electronics
- 1GB LPDDR3 533MHz RAM
- 8GB e.MMC 4.51 SanDisk storage, SD 3.0 (UHS-I)
- Integrated 802.11 b/g/n, Bluetooth 4.1, GPS

DragonBoard 410c Audio Kit by Arrow Electronics
- Kit includes:
  - DragonBoard 410c with populated Analog Expansion Connector
  - Audio Mezzanine Board
  - Autec 12V Wall Adaptor
  - Pre-loaded Debian Linux

DragonBoard 410c Camera Kit by Arrow Electronics
- Kit includes:
  - DragonBoard 410c
  - D3 DesignCore™ Camera Mezzanine Board
  - Leopard Imaging 5MP Micro Camera Module with Autofocus
  - Autec 12V Power supply
  - Pre-loaded Debian Linux

DragonBoard 410c IoT Starter Kit powered by AWS by Globalscale Technologies
- Kit includes:
  - Power supply
  - DragonBoard 410c with demo applications that utilize the Amazon web services SDK

Developer Board IV by Geniatech
- Offers advanced processing power, WLAN, Dual band 802.11n Wi-Fi, Bluetooth and GPS
- 1GB or 2GB LPDDR3 533MHz, 8GB or 16GB eMMC 5.0, SD 3.0 (UHS-I)
- 4-lane MIPI DSI, 2-lane+4-lane MIPI CSI up to 13MP
- TPM support for high security standards
- Apple Homekit support
- 85 x 60mm

Developer Board 4Hub RD by Geniatech
- 1GB or 2GB LPDDR3 533MHz, 8GB or 16GB eMMC 5.0
- Offers advanced processing power, WLAN, Bluetooth, and GPS
- Dual band 802.11n Wi-Fi
- HDMI 1.3 full-size type A connector (1080p HD @ 30 fps)
- 2 LED indicators: On/Off & Ethernet activity, WLAN activity
- 85 x 60mm

Developer Board 4IoT by Geniatech
- 1GB or 2GB LPDDR3 533MHz, 8GB or 16GB eMMC 5.0, SD 3.0 (UHS-I)
- Offers advanced processing power, WLAN, Bluetooth, and GPS
- Dual band 802.11n Wi-Fi
- 1x 40 pin Low Speed (LS) expansion connector: UART, SPI, I2S, I2C x2, GPIO x12, DC power
- 85 x 60mm

Developer Board 4X by Geniatech
- Small headless High Performance IoT Gateway
- 1GB or 2GB DDR3; 8GB or 16GB EMMC 5.0
- Offers advanced processing power, dual-band 802.11n Wi-Fi, Bluetooth, and GPS
- TPM support for high security standards
- Apple Homekit support
- 23 x 48 x 7mm

For additional information for a chosen SoM/SBC please check directly with the manufacturer.
For additional information for a chosen SoM/SBC please check directly with the manufacturer.

<table>
<thead>
<tr>
<th>Development Kit</th>
<th>Manufacturer</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eragon 410 Development Kit</td>
<td>eInfochips</td>
<td>• Accelerometer, gyrometer &amp; magnetometer sensor support using MPU-9250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GPS, Wi-Fi, Bluetooth, USB &amp; 10/100 Base T Ethernet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expansion connectors for low speed I/O, other I/O</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Add on modules for 5MP and 13MP camera support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 72 x 100 x 2mm</td>
</tr>
<tr>
<td>Open-Q™ 410 Development Kit</td>
<td>Intrinsyc Technologies Corp.</td>
<td>• Multi-connectivity solution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open-Q™ 5MP camera (SoM supports up to 13MP camera)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interfaces (USB 2.0, uSD, UART, digital I/O)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open-Q™ LCD Touchscreen display (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 130 x 130mm</td>
</tr>
<tr>
<td>TXSD Linux Development Kit</td>
<td>Ka-Ro Electronics</td>
<td>• TX DIMM socket; SD card socket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10/100 Mbit/s Ethernet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1GB LPDDR3 RAM, 4GB eMMC Flash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 802.11 b/g/n, BT 4.0 integrated wireless</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LVDS Display support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5VDC power supply by USB OTG or power jack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 148mm x 100mm</td>
</tr>
<tr>
<td>TXSD Linux Display Development Kit</td>
<td>Ka-Ro Electronics</td>
<td>• 5.7 inch TFT display</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 640 x 480 dots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• White LED backlight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Capacitive Touchscreen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5VDC power supply by USB OTG or power jack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 148mm x 100mm</td>
</tr>
<tr>
<td>Inforce 6301 Development Kit</td>
<td>Inforce Computing</td>
<td>• H.264/263 (AVC) playback @1080p</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1GB LPDDR3 RAM @533MHz + 8GB eMMC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2x USB 2.0 Type A (host); 1x micro USB 2.0 device</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hi-Fi low power Audio with codec support for MP3, AAC + eAAC, WMA 9/10 Pro, Dolby AC-3,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• eAC-3, and DTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 65 x 55mm</td>
</tr>
<tr>
<td>i-PAN M7 CoverLens Starter Kit</td>
<td>Keith &amp; Koep GmbH</td>
<td>• Interfaces: USB2.0 Host, μUSB2.0 OTG, RJ45 10/100 Mbit Ethernet, μSD Card Socket,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Realtime Clock with Backup battery, LED, Powerfail Detection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Extension interfaces via FFC connectors: USB, UART, Keys, Camera (Rasberry Pi), Battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Extension interfaces via Solderpads: SPI, Speaker, Headphone, Microphone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wireless interfaces via Myon onboard Wi-Fi, Bluetooth, GPS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• POE (Power Over Ethernet)</td>
</tr>
<tr>
<td>VAR-DVK-SD410 Development Kit</td>
<td>Variscite</td>
<td>• Low power consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7” WVGA, Capacitive touch panel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VAR-EXT-CB410 interface; 13MP+5MP camera board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Optional Camera Module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8.7 x 11.8 x 2.0cm</td>
</tr>
</tbody>
</table>
### Eragon EIC-LCD-1080P 5.5" LCD Display by eInfochips
- 5.5" touch screen IPS TFT-LCD
- MIPI DSI 4 data lane, I2C (8-bits)
- Supports 1080 x 1920 (FHD)
- For use with Eragon 410 development kit

### Eragon EIC-CAM-IMX135 13MP Camera System by eInfochips
- Sony IMX135 13MP with Bayer RGB output
- 2-lane/4-lane MIPI interface
- Supports Video and Snapshot modes
- For use with Eragon 410 development kit

### Inforce ACC-1H10 5MP Camera Adapter Board by Inforce Computing
- Omnivision OV5640 sensor
- Dual lane 5MP MIPI CSI interface
- Supports video and snapshot modes
- Suitable for all variants of Inforce APQ8016E and 600E platforms

### Inforce ACC-1B10 10" LVDS Display Kit by Inforce Computing
- HD 16:9 Color TFT-LCD
- Dot resolution of 1366(RGB) x 768 (WXGA)
- 10.1 inch diagonal (8.74" x 4.92" W x H)
- For use with Inforce 6309 Micro SBC

### Inforce ACC-1S70 PoE/RS485 Add-on Card by Inforce Computing
- Credit card sized Power Over Ethernet accessory
- Isolated full duplex RS-485 Transceiver
- For use with Inforce 6309 platform

### VAR-EXT-CB410 Camera Sensor Board by Variscite
- 1x Sony IMX135 13MP sensor
- 1x Omnivision OV5645 5MP sensor
- Interfaces with DART-SD410 evaluation kits and the VAR-SD410CustomBoard

### VLCD-CAP-GLD-LVDS 7" Display with PCAP by Variscite
- 7" LCD 800 x 480 (WVGA)
- Capacitive touch panel (I2C)
- Video LVDS interface
- Compatible with VAR-SD410CustomBoard and the DART-SD410 SoM

To learn more visit [Qualcomm.com](http://Qualcomm.com) or [developer.qualcomm.com](http://developer.qualcomm.com)
APQ8096SG Application Processor

The APQ8096SG application processor features leading-edge premium mobile technology for powering next-generation devices, while supporting the ultimate in performance and power efficiency, ideal for small form factors and a wide variety of innovative and intelligent IoT applications.

### Target Applications
- Industrial IoT
- Digital Signage
- UAVs and Robotics
- Smart Retail
- Smart Glasses
- VR/AR

### Features
- Customized quad-core Qualcomm® Kryo™ 64-bit CPU delivers maximum performance and low power consumption
- Fabricated using the advanced 14 nm FinFET process for low active power dissipation & fast peak CPU performance
- 28MP camera support (zero shutter lag) via dual 14-bit ISP
- Hardware assisted (HEVC/H.265) 4K Ultra HD video capture, streaming and playback
- Qualcomm® Adreno™ 530 GPU with dedicated Sensor Core to support always-on low power use cases with direct access to internal cores
- Fast-track deployment path for embedded device OEMs and developers— utilizing SoMs and SBCs available now from our Technology Providers

### APQ8096SG Specifications

| Package | 15.6 x 15 x 0.64mm* (994-pin NSP, 0.4mm pitch) |
| Processor | Custom 64-bit Kryo quad-core CPU @ up to 2.35GHz |
| Memory and Storage | LPDDR4 SDRAM dual-channel PoP @1866MHz UFS 2.0 gear 3 (1-lane), eMMC 5.1, SDIO 3.0 (UHS-I) |
| Connectivity | 802.11ac 2x2 MU-MIMO 24/5GHz Wi-Fi, Bluetooth 4.2 |
| Location | GPS and GLONASS |
| Graphics | Adreno 530 3D graphics accelerator with 64-bit addressing |
| DSP | Hexagon 680 with dual Hexagon vector processor (HVX-512) @ up to 825MHz |
| Display Support | 3840x2400 @60fps Up to 3 concurrent displays; 2 panels + external 2x MIPI-DSI, HDMI 2.0 |
| Camera Support | Dual 14-bit ISP, 28MP and 13MP @600 MHz 3x MIPI-CSI |
| Video Support | H.264 (AVC) playback and capture @4K60 H.265 (HEVC) playback @4K60 and capture @4K30 |
| Audio Support | 3x quad channel I2S, 1x 8 channel I2S, 4x PCM, PDM, SlimBUS, HDMI 7.1 Up to 6x analog mic, 6x digital mic, stereo headset, earpiece speaker driver, 6 analog inputs, 7 analog outputs. |
| I/O Interfaces | 1x USB 3.0 Gen 1 (Host, Device or OTG), 1x USB 2.0 (Host, Device, or OTG) Up to 150x GPIO, 12x I2C, 12x SPI, 12x UART, 12x UIM, 2x TSIF |

*Height dimension does not include the memory device

### APQ8096SG Block Diagram

[Diagram showing the block diagram of APQ8096SG]

### Ordering Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Part Numbers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>APQ8096SG processor</td>
<td>APQ-8096SG-1-994CMNSP-AC</td>
</tr>
<tr>
<td>Power Management ICs</td>
<td>PM8996-0-221WLP PM8996-0-210WLNSP</td>
</tr>
<tr>
<td>Audio Codec</td>
<td>WCD9335-0-113FOWLP</td>
</tr>
</tbody>
</table>

* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.
## System-on-Modules (SoMs)

### Inforce 6601 Micro SoM by Inforce Computing
- Onboard 4GB LPDDR4 and 64GB UFS 2.0
- 4K Ultra HD, simultaneous dual displays, and dual cameras up to 28 MP
- Wi-Fi 802.11ac 2x2 MU-MIMO and BT 4.2LE, GPS
- Interoperable with entire Inforce Micro SoM family
- Optional extended operating temperature and EMI shielding

### iW-Rainbow-G25M: APQ8096 SMARC SoM by iWave Systems
- Kryo quad-core CPU, Adreno 530 GPU, H.265 4K60 decode, 4K30 encode
- Gigabit Ethernet PHY, 802.11ac, BT4.1, GPS
- SMARC 2.0 compatible SoM with Android Oreo, Linux BSP support
- Applications: augmented & virtual reality, 4K digital signage, media streaming

### Open-Q™ 820 Micro SoM by Intrinsyc Technologies, Corp.
- Ultra-small, production-ready SoM
- Blazing fast 64-bit Kryo CPU, Adreno 530 GPU & Hexagon 680 DSP
- Dual-camera ISP up to 25 MP, 4K UHD HW-based H.265 (HEVC) video encode & decode
- Android, Linux

### Eragon 820 SoM by eInfochips
- Cost effective, small form factor module
- 3 x 4-lane MIPI CSI
- LPDDR4 SDRAM POP memory 4GB
- 9 axis sensor for accelerometer, gyrometer and magnetometer
- 53mmx25mm

### SoM-9X20 Module and Carrier Board by VIA
- Ultra-compact system-on-module
- On-board 4GB LPDDR4 & 64GB eMMC
- Wi-Fi 802.11 a/b/g/n/ac, Bluetooth 4.1, GPS, and GNSS
- Multi-I/O carrier board with 1 HDMI, 1 USB 3.0 OTG, 1 USB 2.0 host, 2 PCIe 2.0, 1 SDIO, 2 MIPI DSI & 3 MIPI CSI 4-lane connectors
- Android 8.0 and Linux Kernel 3.18.44

### 820 Nano SoM by Mistral
- 3/4GB LPDDR4 and 32/64/128GB UFS
- USB Type-C, 4K Encode/Decode and on-board 9-axis MEMS
- Android Oreo/Nougat and Linux OpenEmbedded
- Board-to-Board connector: HDMI, Micro SD, Audio, SB 3.0 OTG, 2.0 Host, GigE, Mini PCIe, UART/I2C/SPI, MIPI-CSI/DSI, Wi-Fi/Bluetooth, GPS
- Size: 51mm x 26mm; Weight: 9gms

### Open-Q™ 820 SoM by Intrinsyc Technologies, Corp.
- Ultra-small, production-ready SoM
- Kryo CPU Quad-Core, 64-bit, 2.2GHz
- 3GB LPDDR4 RAM (1866MHz)
- 32GB UFS 2.0 Flash 1-lane, gear 3
- Android 6 Marshmallow, Android 7 Nougat, Android 8 Oreo
- 84mm x 42mm

### TurboX™ S820 SoM by Thundercomm
- Qualcomm® Neural Processing SDK for AI
- LPDDR4 4G + eMMC/UFS 64GB
- BT 4.2 LE and dual band WLAN 2x2 MIMO
- Dual 14-bit ISP, 3xMIPI-CSI 4-lane, Dual ISP, up to 28MP
- Size: 40mm x 55mm

### TurboX™ D820 SoM by Thundercomm
- Small size SoM: 36mm x 51mm
- Qualcomm® Neural Processing SDK for AI
- LPDDR4 4G + eMMC/UFS 64GB
- BT 4.2 LE and dual band WLAN 2x2 MIMO
- Dual 14-bit ISP, 3xMIPI-CSI 4-lane, Dual ISP, up to 28MP

---

Qualcomm Neural Processing SDK is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.
APQ8096SG Application Processor

Development Kits, Single Board Computers (SBCs) & Accessories

DragonBoard 820c by Arrow Electronics
- 64-bit Kryo quad-core CPU up to 2.15GHz , 14nm FinFET process technology
- Dual-channel PoP LPDDR4 SDRAM/ UFS2.0 gear 3 (1-lane), and SD3.0
- WLAN 802.11ac, Bluetooth 4.2, location
- 96Boards compliant mezzanine products

Eragon 820 Development Kit by einfochips
- High-Speed B-B Connector
- UFS 2.0 64GB, eMMC 5.1(16 GB Optional), SD 3.0 (UHS-I)
- Gigabit Ethernet, 1 x On chip Wi-Fi + BT antenna, 1x External Antenna, 1x GPS (optional mount)
- 110mmx85mm

iW-RainboW-G25D: APQ8096 SMARC Development Kit by iWave Systems
- 120mmx120mm Nano ITX board includes APQ8096 SMARC SoM & SMARC carrier board
- 5.5” HD AMOLED Display with CAP touch
- Android Oreo & Linux BSP support
- Suitable for quick prototyping of high-end applications that require superior performance, low power consumption & integrated connectivity

Open-Q™ 820 Development Kit by Intrinsyc Technologies, Corp.
- Open-frame dev kit & accessories to fast-track product development
- Wireless: Wi-Fi 802.11ac 2.4 / 5.0 GHz 2x2 MU-MIMO, BT 4.1, GPS
- Wired: USB 3.0, PCIe, HDMI 2.0, 3x MIPI-CSI, 2x MIPI-CSI, Multi-channel audio
- Android, Linux

Open-Q™ 820 Micro SoM Development Kit by Intrinsyc Technologies, Corp.
- Wireless: Wi-Fi 802.11ac 2.4 / 5.0 GHz 2x2 MU-MIMO, BT 4.1, GPS
- Wired: USB 3.0, PCIe, HDMI 2.0, 3x MIPI-CSI, 2x MIPI-CSI, Multi-channel audio
- Carrier board 170mm X 170mm
- SoM 50mm x 25mm
- Android 6 Marshmallow, Android 7 Nougat, Android 8 Oreo

TurboX™ S820 Development Kit by Thundercomm
- 4K display, USB3.0 and HDMI In/Out.
- Wi-Fi 802.11 a/b/g/n/ac and BT4.2
- Supports creation of VR/AR devices
- Carrier Board: 170 mm x 145 mm
- Android 7.1 Nougat/Linux

Inforce 6640 SBC by Inforce Computing
- Onboard 6GB LPDDR4 and 64GB UFS 2.0
- 4K Ultra HD, simultaneous dual displays, and dual-MIPI-CSI cameras up to 25 MP
- Wi-Fi 802.11ac 2x2 MU-MIMO & BT 4.2LE, GPS
- Optional Power-over-Ethernet add-on card, extended operating temperature and EMI shielding

iW-RainboW-G25S: APQ8096 SBC by iWave Systems
- Kryo quad-core CPU, Adreno 530 GPU, H.265 4K60 decode, 4K30 encode, Hexagon 680 DSP
- On board USB3.0, HDMI, 802.11ac Wi-Fi, BT4.1, GPS, battery support
- Small form factor suitable for battery operated wearables, 4K Camera, drones, smart glass

dart BCON for MIPI by Basler
- MIPI CSI-2 camera module with longevity
- 5-Megapixel, 60 frames/s
- 8096SG embedded platform ISP support on Linux
- Comprehensive camera feature set, complies to industrial machine vision standards (Genicam)
- 96Boards compliant mezzanine board available

For additional information for a chosen SoM/SBC please check directly with the manufacturer.
Application Processors

Your Product Development Starts Here.

DragonBoard community boards, along with a variety of SoMs and SBCs featuring Qualcomm Technologies application processors, are all designed to make the development process easy and help reduce development time.

Whatever stage of development you’re at – whether prototyping new innovations, or scaling production to reach new customer opportunities – Qualcomm Technologies application processors support a clear deployment path starting with development kits and SBCs and scaling up to customer solutions, integration services and production-ready, customizable SoMs.

These distributors and module suppliers can assist you with deciding which Qualcomm Technologies application processor best supports your needs.

<table>
<thead>
<tr>
<th>Module Suppliers</th>
<th>APQ8016E</th>
<th>APQ8096SG</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrow Electronics</td>
<td>✓</td>
<td>✓</td>
<td><a href="http://www.arrow.com">www.arrow.com</a></td>
</tr>
<tr>
<td>Basler</td>
<td></td>
<td>✓</td>
<td><a href="http://www.baslerweb.com">www.baslerweb.com</a></td>
</tr>
<tr>
<td>eInfochips Ltd.</td>
<td>✓</td>
<td>✓</td>
<td><a href="http://www.eragon.einfochips.com">www.eragon.einfochips.com</a></td>
</tr>
<tr>
<td>Geniatech</td>
<td>✓</td>
<td></td>
<td><a href="http://www.geniatech.com">www.geniatech.com</a></td>
</tr>
<tr>
<td>Inforce Computing</td>
<td>✓</td>
<td>✓</td>
<td><a href="http://www.inforcecomputing.com">www.inforcecomputing.com</a></td>
</tr>
<tr>
<td>Intrinsyc Technologies Corp.</td>
<td>✓</td>
<td>✓</td>
<td><a href="http://www.intrinsyc.com">www.intrinsyc.com</a></td>
</tr>
<tr>
<td>iWave Systems</td>
<td></td>
<td>✓</td>
<td><a href="http://www.iwavesystems.com">www.iwavesystems.com</a></td>
</tr>
<tr>
<td>Ka-Ro Electronics GmbH</td>
<td>✓</td>
<td></td>
<td><a href="http://www.karo-electronics.com">www.karo-electronics.com</a></td>
</tr>
<tr>
<td>Keith &amp; Koep GmbH</td>
<td>✓</td>
<td></td>
<td><a href="http://www.keith-koep.com">www.keith-koep.com</a></td>
</tr>
<tr>
<td>Mistral</td>
<td></td>
<td>✓</td>
<td><a href="http://www.mistralsolutions.com">www.mistralsolutions.com</a></td>
</tr>
<tr>
<td>Thundercomm</td>
<td>✓</td>
<td>✓</td>
<td><a href="http://www.thundercomm.com">www.thundercomm.com</a></td>
</tr>
<tr>
<td>Variscite</td>
<td>✓</td>
<td></td>
<td><a href="http://www.variscite.com">www.variscite.com</a></td>
</tr>
<tr>
<td>VIA</td>
<td></td>
<td>✓</td>
<td><a href="http://www.viatech.com">www.viatech.com</a></td>
</tr>
</tbody>
</table>
Qualcomm® Developer Network

Whether you have a single specialty, or are crossing over to develop in new areas, Qualcomm Developer Network (QDN) is available to support your expanding needs. There are solutions to support Qualcomm Technologies application processor-based devices from initial concept all the way to commercialization. Our extensive range of software tools helps add advanced multimedia features and unique experiences, such as virtual reality, to embedded devices.

It’s easy to navigate QDN and intuitively tap into what you need for development including software development kits, hardware and software support, community projects and forums, as well as other tools for our application processors. QDN features an expansive platform of software and hardware tools to integrate revolutionary technology into your own unique concepts and cutting-edge designs.

Whatever you’re building, whether it’s high-performance apps, smart IoT devices, or immersive gaming experiences, QDN is equipping the next generation of mobile pioneers and experiences.

Our mission is to empower the visionaries of tomorrow, today.

To learn more visit Qualcomm.com or developer.qualcomm.com