Snapdragon 820 - Technology and Traction

Francisco Cheng
Staff Manager, Technical Marketing
Snapdragon roadmap drives new experiences

- VR / AR - beyond small screen
- 360 degree camera
- 3D and low-light photography
- Security
- Biometric sensor
- Ultra HD VoLTE / audio quality
- Superior converged connectivity
- Context aware computing
- Machine learning
- Computing performance
- Virtual SIM/Multiple devices
Snapdragon 820 is ideal for mobile VR
Designed to meet the VR processing demands within the thermal and power constraints

- Smooth, 3D stereoscopic, image rendering, & support for the latest GPU APIs
- Low power 360° 4K HEVC video decoding & display at 60 FPS
- Qualcomm® TruPalette™ display gamut mapping, color enhancement, etc.
- Qualcomm® EcoPix™ compression, variable refresh, etc.
- Positional audio & 3D surround sound
- Fluence™ noise filtering & active noise cancellation
- Low level DSP access & tools for custom audio development
- Integrated dual-camera ISP + DSP for low power 3D reconstruction & predictive 6 DOF motion tracking
- Ultra-fast sensing for minimal motion to pixel latency

Qualcomm TruPalette, Qualcomm EcoPix, Fluence Qualcomm Aqstic, and FastCV are products of Qualcomm Technologies, Inc.
MWC 2016 Recap
Snapdragon 820 Momentum

Snapdragon 820 in virtually every flagship device

HP Elite X3
Xiaomi Mi5
LeEco Le Max Pro
Samsung Galaxy S7 and Galaxy S7 Edge
LG G5
Sony Xperia X Performance
Vivo Xplay 5S

100+ designs in development
“Qualcomm back inside Samsung’s flagship phones”

“The San Diego Union-Tribune.”

“Xiaomi’s Mi 5 Launch Event a Giant Qualcomm Lovefest”

“Xiaomi’s 'most beautiful' flagship rocks a Snapdragon 820”

“The Verge”

“5 Reasons To Buy The LG G5”

“Qualcomm: The Biggest Winner Of MWC 2016”

“Qualcomm is back with a vengeance. Welcome to Snapdragon World Congress”

“Engadget”

“Forbes”

“BFN Business Finance News”
Expanding the Snapdragon platform
Increases differentiation and revenue opportunities

BOM integration
- Quick Charge
- Power management interface
- Speaker amp
- Touch
- Sensor Hub
- Fingerprint
- Codec

End-to-end design
- Filters
- Power Amplifier
- Envelope Tracker
- RF Transceiver
- Antenna Switch
- Antenna Tuner

Tri-band Wi-Fi
- 802.11ac MU-MIMO
- 802.11ad

CPU
- Memory
- Sensor processing
- DSP

ISP
- Adreno display processing
- BT FM
- Wi-Fi
- GNSS
- USB PCI

Multimedia processing
- LTE Modem
  - 802.11ac MU-MIMO
  - 802.11ad
- Codec
- Tri-band Wi-Fi
Snapdragon X12 LTE Modem

Up to 600 Mbps - Cat 12 DL
via 3x20MHz CA and 256-QAM, support for 4x4 MIMO

Up to 150 Mbps - Cat 13 UL
via 2x20MHz CA and 64-QAM

Multi-gigabit, Tri-Band Wi-Fi (2.4, 5 and 60GHz)
With 802.11ac 2x2 MU-MIMO and 802.11ad

Next-gen Calling – Enhanced mobility + quality
Smart Wi-Fi calling, Ultra HD voice
Kryo CPU

Custom 64-bit CPU architecture

Up to 2x Better performance*
2X Lower power*

14nm FinFET process technology

Quad core CPU up to 2.2GHz

Source: QTI
* Compared with Snapdragon 810
Adreno 530 GPU
Leading the way in mobile visual processing

Up to 40% better performance*
Up to 40% lower power*

Designed for mobile UIs, games, web and VR
Latest in graphics and compute APIs

*compared to Snapdragon 810
Hexagon 680 DSP
Core technical benefits

New Hexagon
Media coprocessing and computer vision

3x better performance*
10X lower power

Integrated Sensor Core
Low power island for always-on processing

*compared to our quad core Krait on imaging use case
Before
Qualcomm Spectra ISP
With Heterogeneous Signal Processing
Introducing

Qualcomm Quick Charge™ 3.0

• 4X faster than conventional charging
• > 35% more efficient than Quick Charge 2.0
• #1 fast charging solution
• Connector agnostic
Snapdragon Sense ID fingerprint technology

Mobile Industry’s FIRST ultrasonic fingerprint technology

**Easier & More Reliable User Experience**

- Scans through:
  - Common contaminants
  - Glass (up to 400 µm)
  - Metal (up to 400 µm)
  - Plastic

**More Secure**

- Detailed 3D map
- Liveness detection
- Based in hardware
- On-device processing

**End-to-end solution**

- Custom ultrasonic ASIC
- Integrated with FIDO UAF biometric protocol
- Algorithms managed by SecureMSM technology

**Expected in commercial devices 2H 2015**
Snapdragon Sense ID

Accuracy and consistency

Improved user experience by consistently scanning through various contaminants

Sweat

Lotion/Oils

Condensation
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<tr>
<th>Snapdragon 810 Processor</th>
<th>Snapdragon 820 Processor</th>
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<tbody>
<tr>
<td>Cortex A53/A57</td>
<td>Custom Kryo CPU</td>
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<tr>
<td>Adreno 430</td>
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<td>Hexagon 680</td>
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<td>4K60 10-bit</td>
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<td>X10 LTE Cat 10</td>
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<td>Dual-ISP 20MP</td>
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<td>Display Compression</td>
<td>Intra-core compression with UBWC</td>
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<td>Low Power Island (NEW)</td>
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</tbody>
</table>
Adjacent opportunities transformed by mobile

Auto

Mobile compute

IoT

Networking
Adjacent opportunities transformed by mobile

**Auto**
- Mobile experiences on car displays
- Vehicle-2-Cloud connectivity

**IoT**
- Connectivity everywhere and smart processing
- Mobile ecosystem scale
- Smartphone as IoT remote control

**Mobile compute**
- Smartphone changing productivity
- Cloud experience driving always on connectivity
- All-day computing

**Networking**
- Integrated gateway hub for the home or enterprise
- Wireless video defining use cases
- LTE and Wi-Fi convergence