

Everett Roach
Sr. Director, Product Management
Qualcomm Technologies, Inc.

Advancing charging technologies: Qualcomm® Quick Charge™

QUALCOMM

3G/LTE Summit

September 14–16, 2015
Hong Kong

Qualcomm Quick Charge is a product of Qualcomm technologies, Inc.



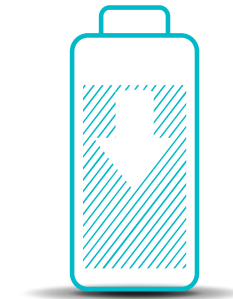
Agenda

- Battery Management Landscape
- Quick Charge 2.0 snapshot
- Quick Charge 3.0
 - What it is
 - Comparison vs Quick Charge 2.0
 - Availability
- Type C connector is coming
- Summary

Battery management landscape

Consumers demand their handset to be charged and ready

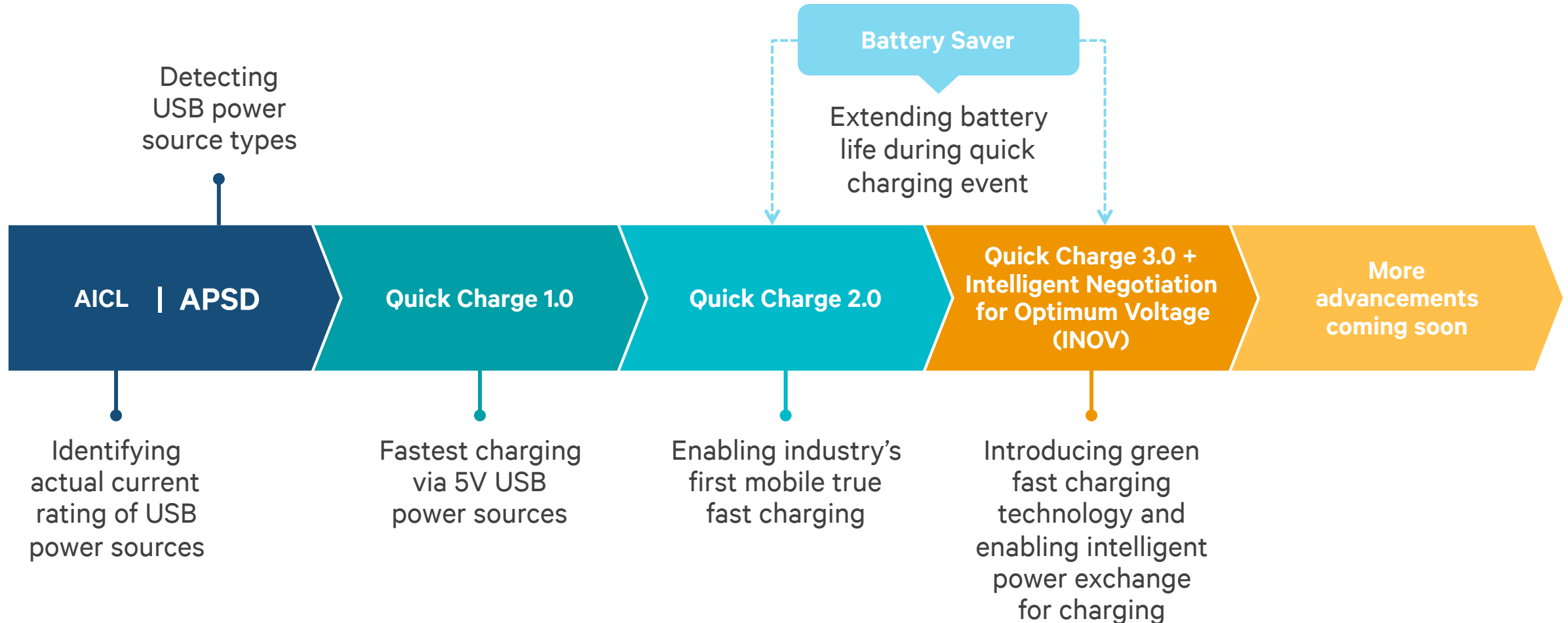
- Batteries keep getting bigger >4000mAh
- Handsets getting thinner
- Almost 50% of consumers charge their phone for 30 minutes or less*
- Consumers have come to expect fast charging feature
- Innovation needs to keep step with consumer expectations



Mobile industry needs technology and standards that pave the way for getting more power into the handset

The evolution of fast charging technology

Qualcomm Technologies, Inc. is a leader in battery management advances

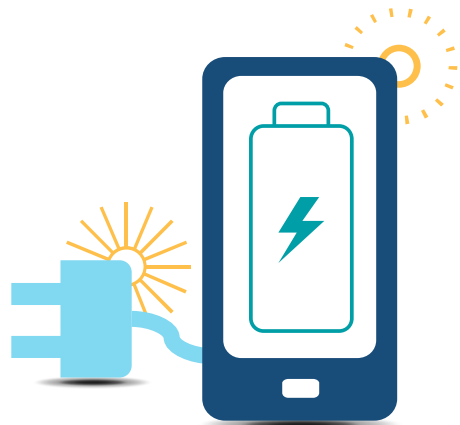


Challenge: How much power can we put into the battery?

Quick Charge 1.0

2013

X

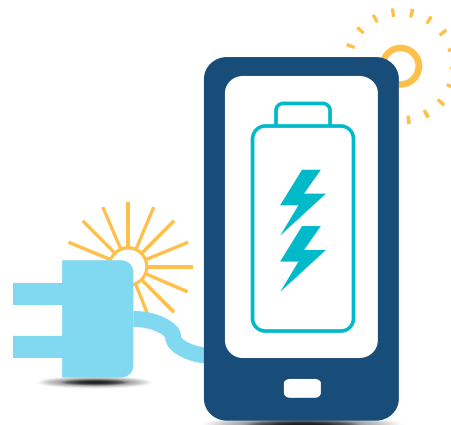


- AICL (Automatic Input Current Limit)
- APSD (Automatic Power Source Detection)

Quick Charge 2.0

2015

1.5X

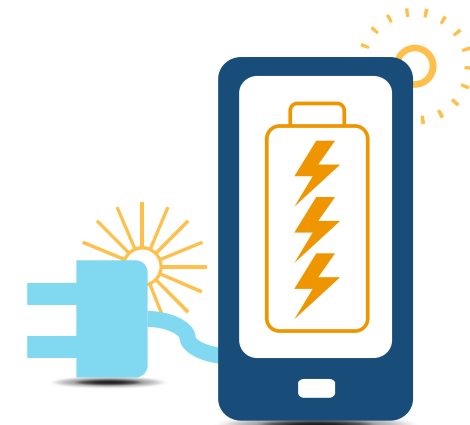


- AICL, APSD
- HVDCP
- Parallel Charging

Quick Charge 3.0

2016

>2.0X



- AICL, APSD
- HVDCP+
- Parallel Charging+
- INOV
- Battery Saver Technologies

Quick Charge 2.0 Milestones

#1

A leading method for fast charging*

- Worldwide standard open for use with any architecture
- Available for 3 years
- Carrier and consumer preference

100+

Accessory products available

- Variety of types: wall and car adapter, battery packs, docking stations
- Available in-box from certain OEMs, plus online, retail and carrier stores

40+

Mobile Devices

- Asus
- Fujitsu
- Google
- HTC
- LeTV
- LG
- Motorola
- Samsung
- Sony
- Xiaomi
- ZTE
- and more

Quick Charge 2.0 making headlines

Handset makers are using Quick Charge as a product differentiator and key selling point

“Motorola also bigged up the new Moto X Style's 'TurboPower', which makes the Moto X Style the world's fastest-charging phone.”

[Recombo](#)

“LeTV One Pro and One Max, First USB Type-C Smartphones to Support Quick Charge 2.0”

[GizmoChina](#)



[LifeHacker.com](#)

[Pocket-lint.com](#)

[TechnoBuffalo.com](#)

[PocketNow.com](#)

[AndroidHeadlines.com](#)

[TheVerge.com](#)

Quick Charge 2.0 is the underlying technology driving OEM brands such at TurboPower, Rapid Charger, etc.

Quick Charge 3.0 quick facts

100%

Faster charging
than Quick
Charge 1.0

38%

Power dissipation
reduction vs.
Quick Charge 2.0

- 100% Backwards Compatible with Quick Charge 1.0 and 2.0
- Cost similar to Quick Charge 2.0
- Connector agnostic – can be implemented with USB Type-A, USB micro, USB Type-C or proprietary connectors



The first charging technology to employ an intelligent algorithm allowing your portable device to determine what power level to request at any point in time, enabling optimum power transfer while maximizing efficiency

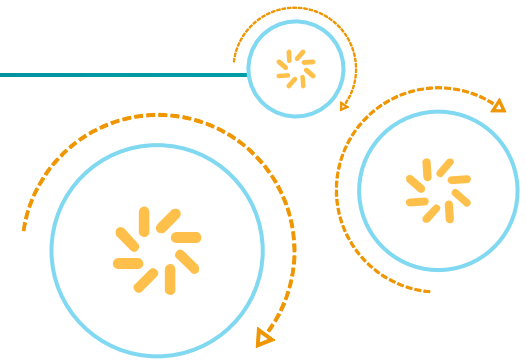
Quick Charge 3.0 intelligently finds optimum voltage setting for a given device



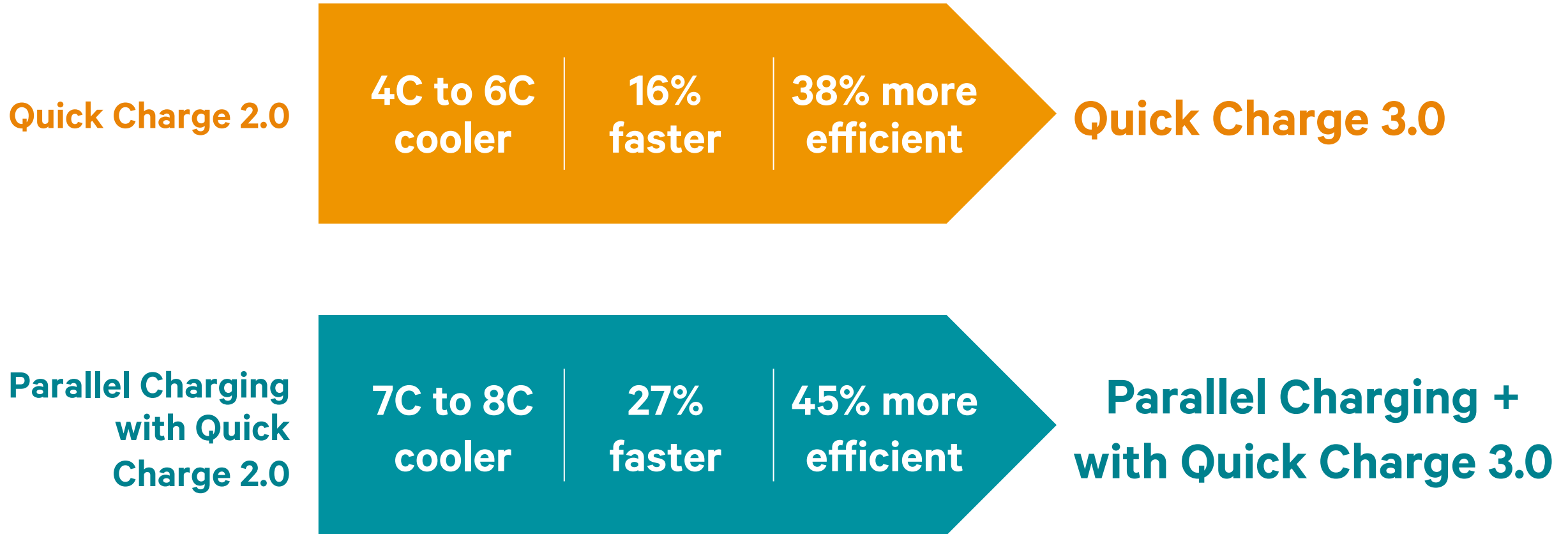
- 1.** Standard USB cable connected
- 2.** Smartphone detects a Quick Charge 3.0 adapter
- 3.** Smartphone requests a voltage from the adapter
- 4.** Adapter adjusts voltage actual power need



Video: Quick Charge 3.0

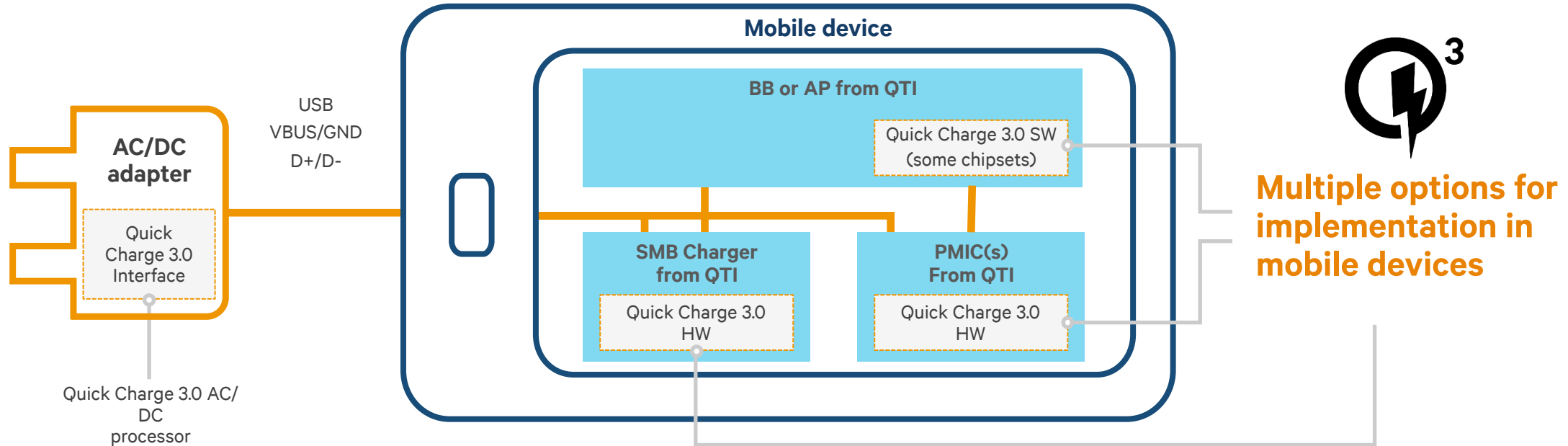


Comparing technologies



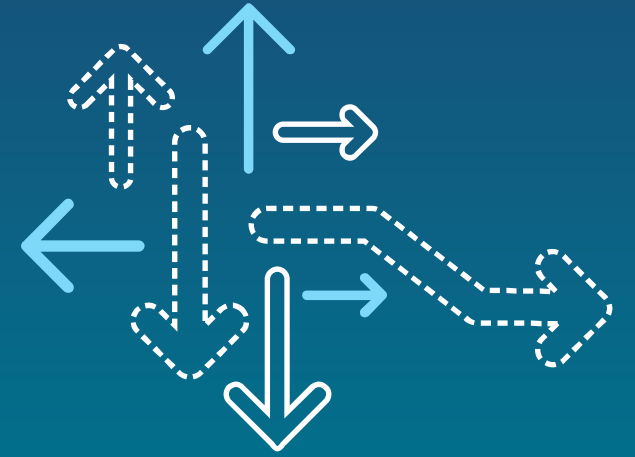
Based on internal tests charging a 2750mAh fast charge battery (1.5C charge rate) and using the maximum power for a thermal limit of 40C for all charging implementations. Charge time based on 0% to 50% (August 2015).

Quick Charge 3.0 will be in the newest Qualcomm Technologies' chipsets



Power Provider Chips (many available now)		QTI Chips/Platforms	Quick Charge 2.0	Quick Charge 3.0
Qualcomm® WiPower™ wireless charging technology	Power Integrations	SMB1356/7/8/9	yes	
On Semiconductor	Dialog Semiconductor	SMB1350/51	yes	yes
ST Microelectronics	NXP Semiconductor	Qualcomm® Snapdragon™ 804/808 processor	yes	
Etron Technology	Via Labs	Snapdragon 617	yes	yes
Others		Snapdragon 618	yes	yes
		Snapdragon 820	yes	yes

USB Type-C

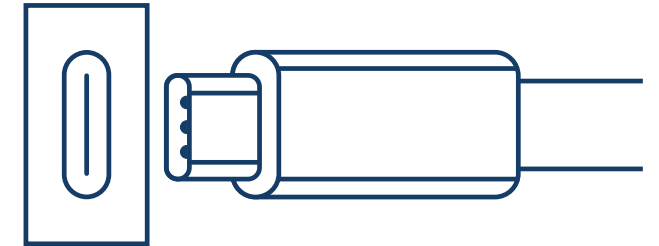


USB Type-C and Quick Charge

Quick Charge provides a small, low-cost mature charging technology for Type-C based portable devices

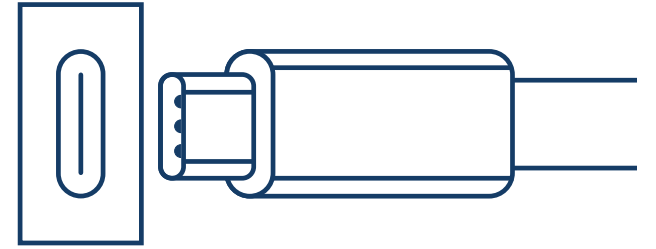
USB Type-C connectors enable an improved user experience

Transition to Type-C is starting at premium tier



Qualcomm Technologies, Inc. supports Type-C and provides superior implementation as well as continued technology leadership”

USB Type C connector and Quick Charge



- The new USB Type-C connector enables an improved user experience and is embraced and supported by Qualcomm Technologies Inc. and its platforms
- Quick Charge technology is connector agnostic and therefore is already being utilized with Type A, Type micro, Type-C and proprietary connectors
- First Premium Tier phones are already available with Type-C and Quick Charge technology for superior consumer experience (superior connector and superior charging experience)
- Quick Charge technology is flexible and is co-existing with many other technologies (examples: WiPower, SlimPort, USB PD, others) to provide superior charging experience
- Quick Charge remains a cost effective, high efficiency and flexible technology for mobile devices and power accessories

Qualcomm Technologies, Inc. is supporting Type-C and will provide superior implementations as well as continued technology leadership

Summary



Up to 75%
faster charging* -
Under 1 hour in certain
implementations



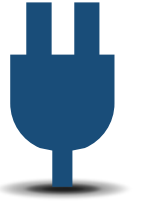
Quick Charge 3.0
significantly
improves
efficiency above
Quick Charge 2.0



Connector agnostic.
Compatible with
USB type A, USB micro,
USB Type C and
proprietary connectors



100% backwards
compatible with Quick
Charge 1.0 and Quick
Charge 2.0



Established
ecosystem with
devices and
accessories

*Based on internal tests charging a 3300mAh battery using a [1] QC2.0 USB wall adapter (9V, 2A), [2] USB wall adapter (5V, 2A), and [3] USB wall adapter (5V, 1A), respectively. (February 2013)

Thank you

Follow us on:  

For more information, visit us at:
www.qualcomm.com & www.qualcomm.com/blog

© 2013-2015 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved.

Qualcomm, WiPower and Snapdragon are trademarks of Qualcomm Incorporated, registered in the United States and other countries. Quick Charge is a trademark of Qualcomm Incorporated. All trademarks of Qualcomm Incorporated are used with permission. Other products and brand names may be trademarks or registered trademarks of their respective owners.

References in this presentation to “Qualcomm” may mean Qualcomm Incorporated, Qualcomm Technologies, Inc., and/or other subsidiaries or business units within the Qualcomm corporate structure, as applicable.

Qualcomm Incorporated includes Qualcomm’s licensing business, QTL, and the vast majority of its patent portfolio. Qualcomm Technologies, Inc., a wholly-owned subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, substantially all of Qualcomm’s engineering, research and development functions, and substantially all of its product and services businesses, including its semiconductor business, QCT.

