

An aerial photograph of a city street, likely in New York City, taken during the "golden hour" of sunset. The street is filled with cars and lined with trees. In the background, the dense Manhattan skyline is visible, with the Manhattan Bridge's distinctive towers standing out against the orange and pink sky. The overall tone is warm and urban.

Qualcomm

Dr. James Thompson

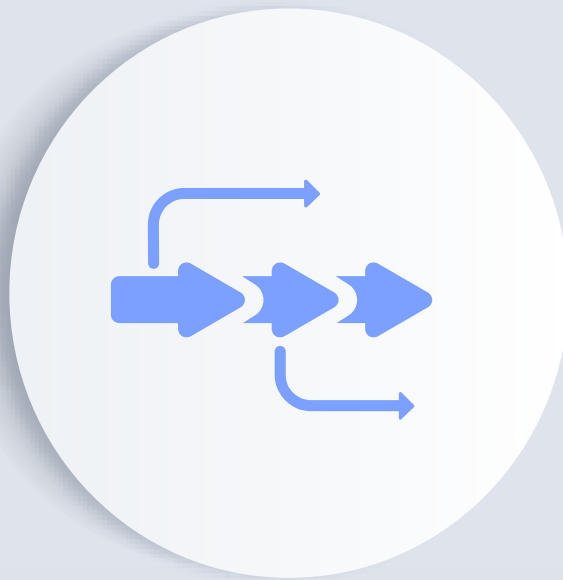
EVP, Engineering, Qualcomm Technologies, Inc. and CTO

Safe Harbor

In addition to the historical information contained herein, this presentation and the conference call that accompanies it contain forward-looking statements that are inherently subject to risks and uncertainties, including but not limited to statements regarding: our business, product, technology, financial and acquisition strategies, priorities, plans, drivers, opportunities, outlook, estimates and expectations; our growth opportunities and initiatives, including our core mobile business, 5G, RF front-end, and adjacencies such as automotive, including ADAS, IoT, security, networking, compute and cloud/edge AI, and our growth, revenues, design wins, share and investments therein and our positioning to take advantage of opportunities in these areas; 5G, including its rollout, features, benefits, performance, drivers for adoption, economic impact, the opportunities for growth it creates, including in other industries, our investments in, contributions to and innovations that enable/are at the core of 5G, and 5G’s potential impact on our business and financial results; our technologies and technology leadership; our products, product performance, product leadership and product roadmap; market and industry trends, and their potential impact on our business, and our positioning to take advantage thereof; our capital structure; QTL’s business, strategy, patent portfolio, R&D and standards leadership, foundational innovations and inventions, and being well-positioned for the future; the FTC lawsuit and our expectations regarding timing of key milestones; and our expectations, estimates, forecasts and guidance related to our financial results, other financial and business metrics, and our business, as well as the factors and assumptions underlying such expectations, estimates, forecasts and guidance. Forward-looking statements are generally identified by words such as “estimates,” “guidance,” “expects,” “anticipates,” “intends,” “plans,” “believes,” “seeks” and similar expressions. Actual results may differ materially from those referred to in the forward-looking statements due to a number of important factors, including but not limited to: commercial network deployments, expansions and upgrades of CDMA, OFDMA and other communications technologies, our customers’ and licensees’ sales of products and services based on these technologies and our customers’ demand for our products and services; competition in an environment of rapid technological change; our dependence on a small number of customers and licensees, which increasingly includes a small number of Chinese OEMs; our dependence on the premium-tier device segment; attacks on our licensing business model, including current and future legal proceedings and governmental investigations and proceedings, including potential adverse outcomes relating to the Federal Trade Commission lawsuit against us, and actions of quasi-governmental bodies and standards and industry organizations; potential changes in our patent licensing practices, whether due to governmental investigations, private legal proceedings challenging those practices, or otherwise; the difficulties in enforcing and protecting our intellectual property rights; our ability to extend our technologies, products and services into new and expanded product areas and adjacent industry segments and applications outside of traditional cellular industries; risks associated with the operation and control of our manufacturing facilities; the continued and future success of our licensing programs, which requires us to continue to evolve our patent portfolio, and the need to renew or renegotiate license agreements that are expiring; our dependence on a limited number of third-party suppliers; claims by third parties that we infringe their intellectual property; strategic acquisitions, transactions and investments and our ability to consummate planned strategic acquisitions; our compliance with laws, regulations, policies and standards; our use of open source software; the cyclical nature of the semiconductor industry, and our stock price and earnings volatility; our indebtedness and our significant stock repurchase program; security breaches of our information technology systems or other misappropriation of our intellectual property or proprietary or confidential information; potential tax liabilities; global, regional or local economic conditions or political actions that impact the industries in which we operate; our ability to attract and retain qualified employees; foreign currency fluctuations; and failures in our products or services or in the products or services of our customers or licensees, including those resulting from security vulnerabilities, defects or errors. These and other risks are set forth in our Annual Report on Form 10-K for the fiscal year ended September 29, 2019 filed with the SEC. Our reports filed with the SEC are available on our website at www.qualcomm.com. We undertake no obligation to update, or continue to provide information with respect to, any forward-looking statement or risk factor, whether as a result of new information, future events or otherwise.

This presentation includes “non-GAAP financial measures” as that term is defined in Regulation G. Further discussion regarding our use of non-GAAP financial measures, as well as the most directly comparable GAAP financial measures and information reconciling these non-GAAP financial measures to our financial results prepared in accordance with GAAP, are included at the end of this presentation. The Non-GAAP financial measures should not be considered a substitute for, or superior to, the financial measures prepared in accordance with GAAP.

We refer to “Qualcomm” for ease of reference. However, in connection with our October 2012 reorganization, Qualcomm Incorporated continues to operate QTL and own the vast majority of our patent portfolio, while Qualcomm Technologies, Inc., its wholly-owned subsidiary, now operates, along with its subsidiaries, substantially all of our products and services businesses, including QCT, and substantially all of our research and development functions.



Technology
strategy



5G innovation
leadership



Mobile platform
leadership

The Qualcomm innovation factory

Organization, culture and engineering talent to accelerate invention



Research

5-10 years



Technology development

2-5 years



Products



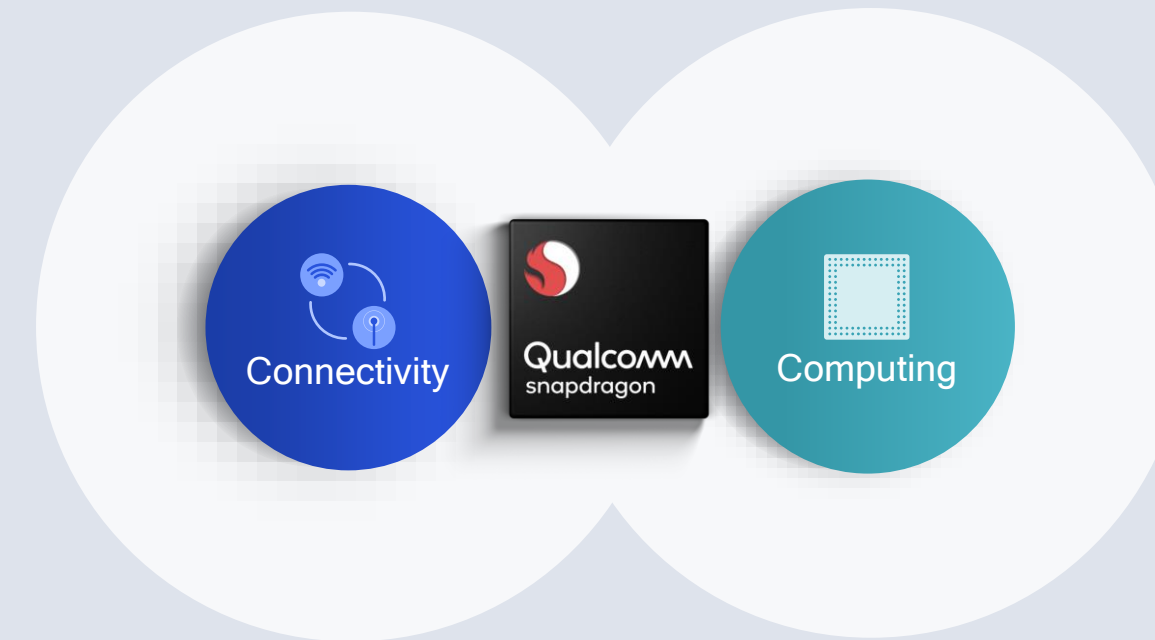
World-class technology portfolio

Wireless connectivity

2G/3G/4G/5G
802.11 n/ac/ax (Wi-Fi 6)
802.11ad (60GHz)
Bluetooth
802.15.4
C-V2X
GNSS/Location

RF Front-End

Power amps	LNAs
Acoustic filters	Antenna tuner
RF switches	Envelope tracker



Processors

CPU/GPU/DSP/AI processor
Memory controller
Secure processing

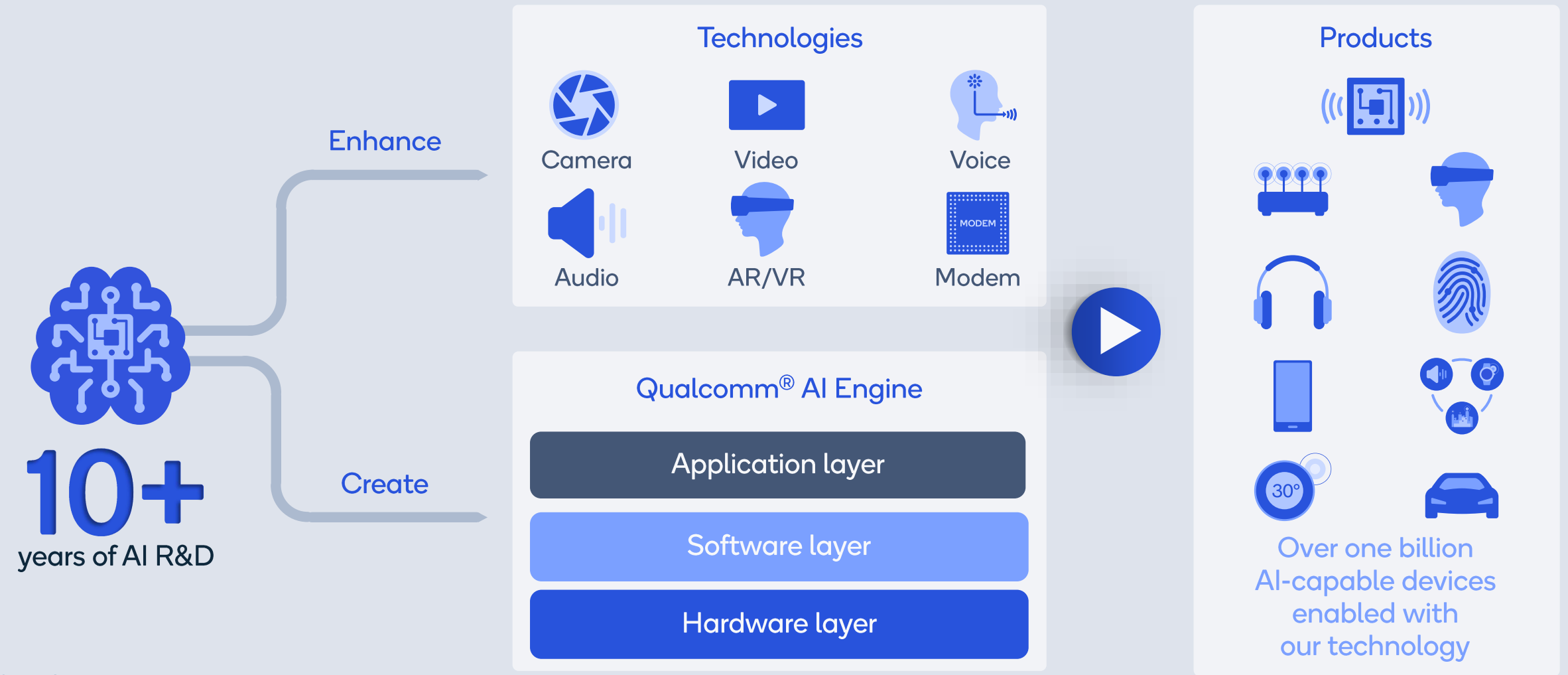
Multimedia

Camera processing	Computer vision
Video	Audio processing
Voice UI	AR/VR
Display processing	Sensors

Components

Audio codecs	Power management
Audio amplifiers	Fingerprint

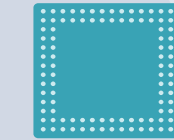
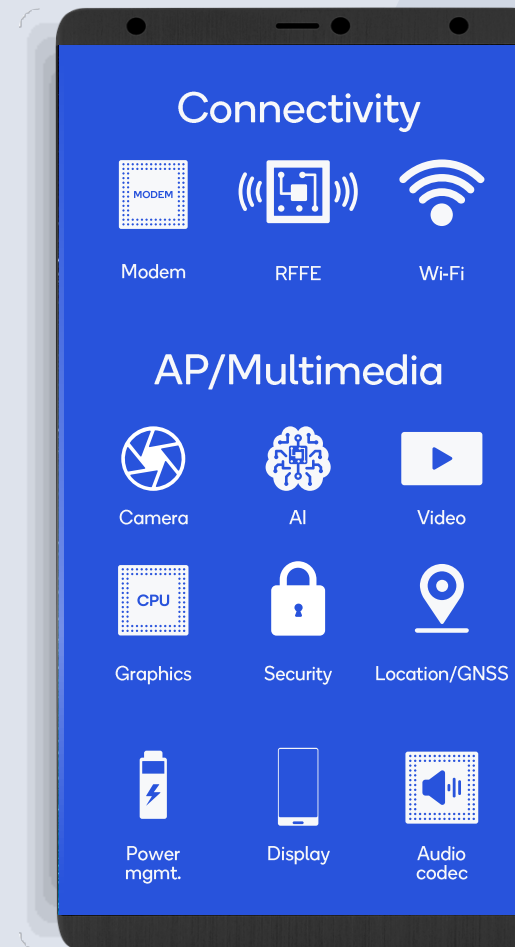
We apply AI broadly across our business



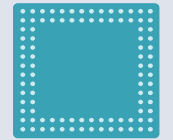
Source: Qualcomm internal data
Qualcomm AI Engine is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.

Leveraging our R&D in other industries

Well positioned to address large opportunities with incremental investments



Core tech
reuse



Mobile platform
reuse



R&D leverage in automotive



Telematics

Derived from
Modem-RF System

Ethernet

C-V2X

Infotainment

Derived from
Qualcomm® Snapdragon™
Mobile Platform

Synchronized multi-display

Instrument cluster support

Multi-OS support

Automotive safety support

GPU context switching

Surround view HDR camera

ADAS

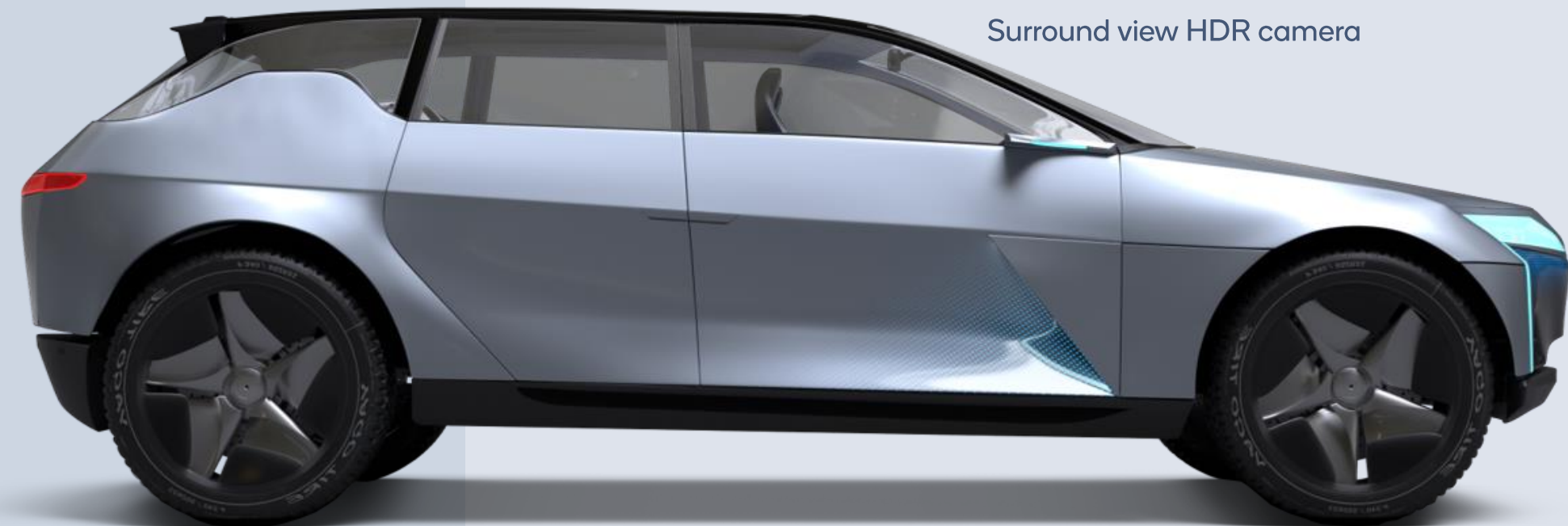
Derived from Snapdragon
Mobile Platform,
Qualcomm AI Engine

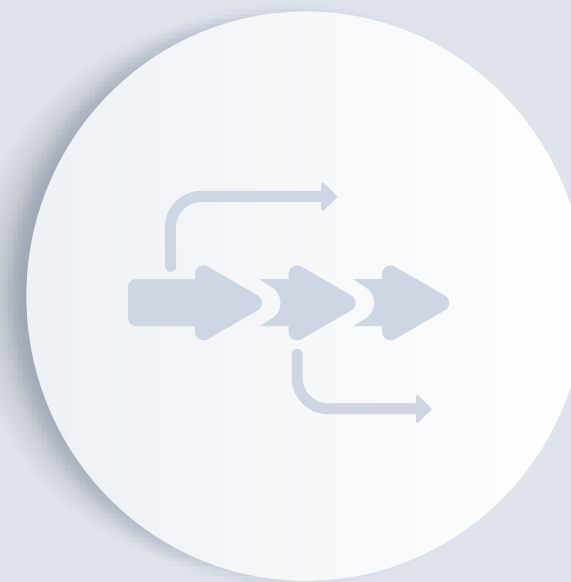
Stringent safety standards

10+ simultaneous HDR cameras

10x neural processing

Sensors





Technology
strategy

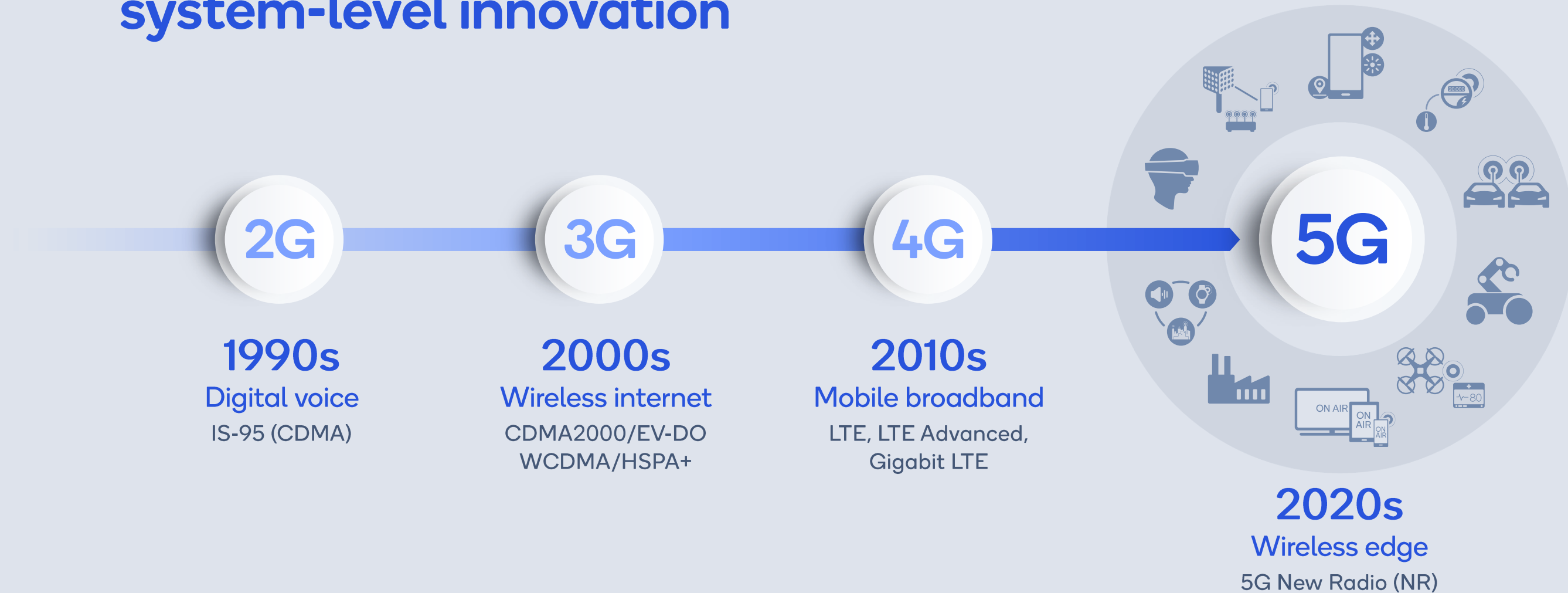


5G innovation
leadership



Mobile platform
leadership

30+ years of foundational, system-level innovation



Long-term, early R&D

Continuous
Research & Development

Investing ahead
of the industry

\$60B Investment
in R&D



Qualcomm innovations established the 5G foundation

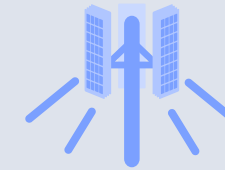


Advanced
channel coding



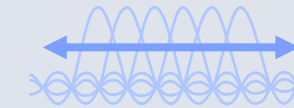
More efficient delivery of
multi-Gbps throughput

Massive
MIMO



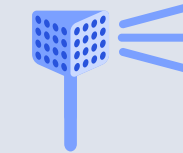
Increased network
coverage and capacity

Scalable
OFDM-based
air interface



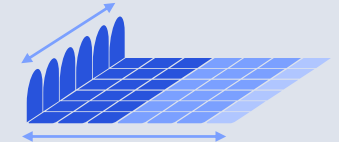
Diverse spectrum and
deployments

Mobile
mmWave



Extreme capacity
and throughput

Flexible slot-based
framework



Forward compatibility
and multiple services

Early R&D investment | Fundamental innovations | Expanding 5G to new industries

5G roadmap extends for 10+ years

Driving innovation to enhance
smartphones and transform
other industries

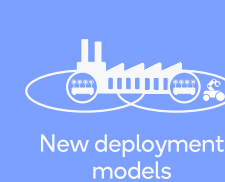
Continued innovation for new verticals,
deployments, use cases, and spectrum



3GPP
Rel. 17+

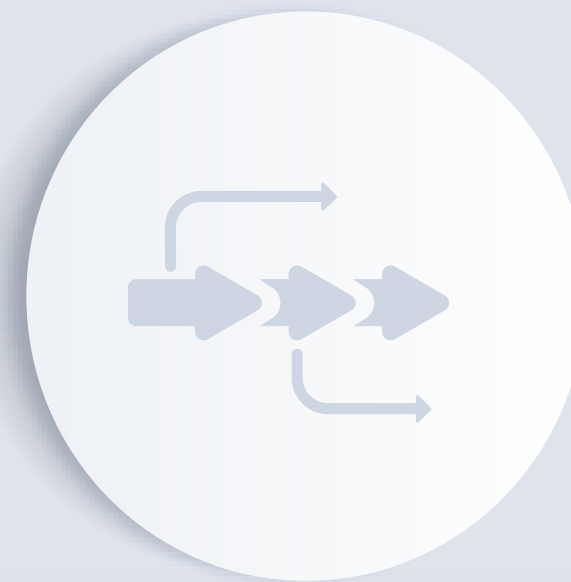


3GPP
Rel. 16



3GPP
Rel. 15





Technology
strategy



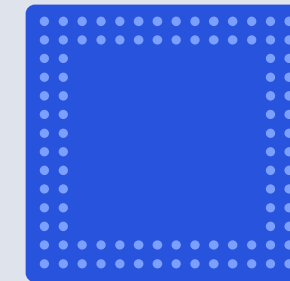
5G innovation
leadership



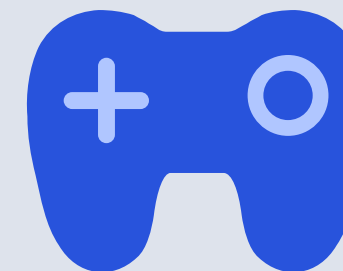
Mobile platform
leadership

Leadership in key mobile technologies

Features, power, performance,
and cost leadership



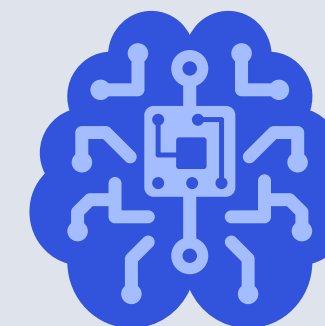
Modem-to-antenna



Graphics



Camera

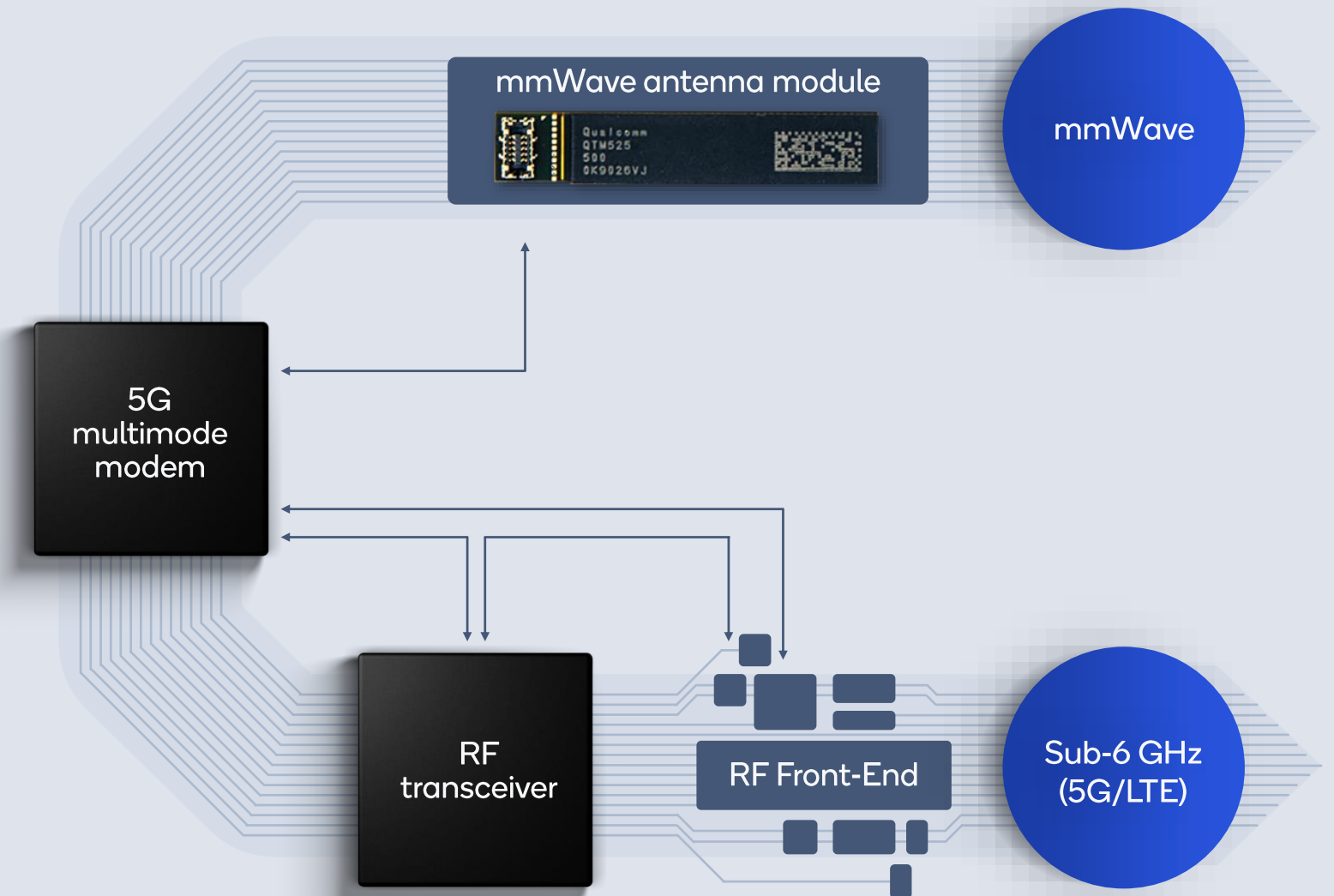


AI



5G leadership requires a comprehensive modem-to-antenna solution

Invested early to build a
differentiated end-to-end
system

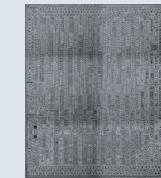


Modem leadership across every generation

Consistently delivering leading performance and efficiency

Qualcomm internal testing. Voice includes WCDMA and VoLTE talk. Data includes FDD-LTE Cat 4/6/9

4G



Snapdragon X24 LTE Modem



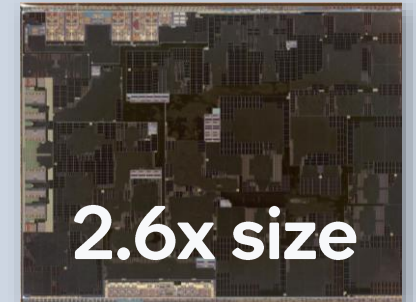
Intel XMM7660

Total transistors	>2x transistors
Peak data rate	20% lower
Voice power	50–60% higher
Data power	27–40% higher

5G



Snapdragon X55 5G Modem-RF System



Hisilicon Balong 5000

Total transistors	>2.6x transistors
Peak data rate	40% lower
5G connectivity	No mmWave

An order of magnitude increase in 5G RF band combinations

Source: Qualcomm internal data

Early 5G combinations

10,000+

4G carrier aggregation combinations

1,000+

4G today

49

Early 4G

16



A leader in RF Front-End

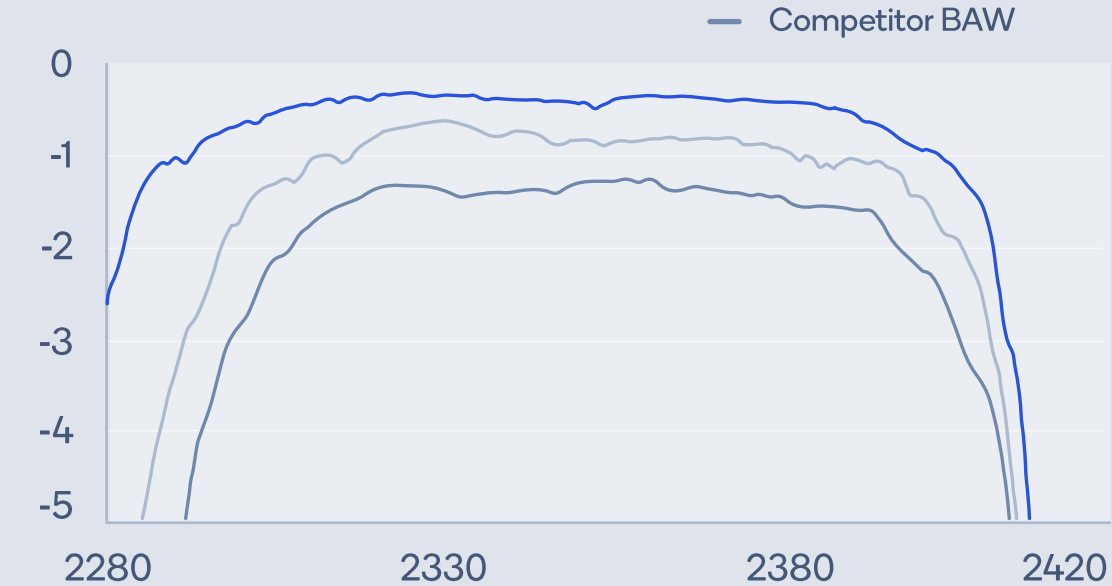
Source: Product documentation

	Qualcomm	RF competitor			
					
Modem-to-antenna portfolio (E2E)	●				
Power Amps: MMPA	●	●	●	●	●
Power Amps: PAMiDs	●	●	●	●	●
LNA/Filter modules	●		●	●	●
Power tracker	●		●	●	
Antenna tuner	●		●		
Filters/Antennas: POG/LTCC	●				●
Filters: BAW/FBAR	●	●	●	●	
Filters: SAW	●		●	●	●
Filters: TC/TF-SAW	●		●	●	●
mmWave	●				
RF transceiver	●				
Modem	●				
Modem intelligence and SW	●				
Full system-level solution	●				

Our new TF-SAW is a performance leader

Band40 Passband

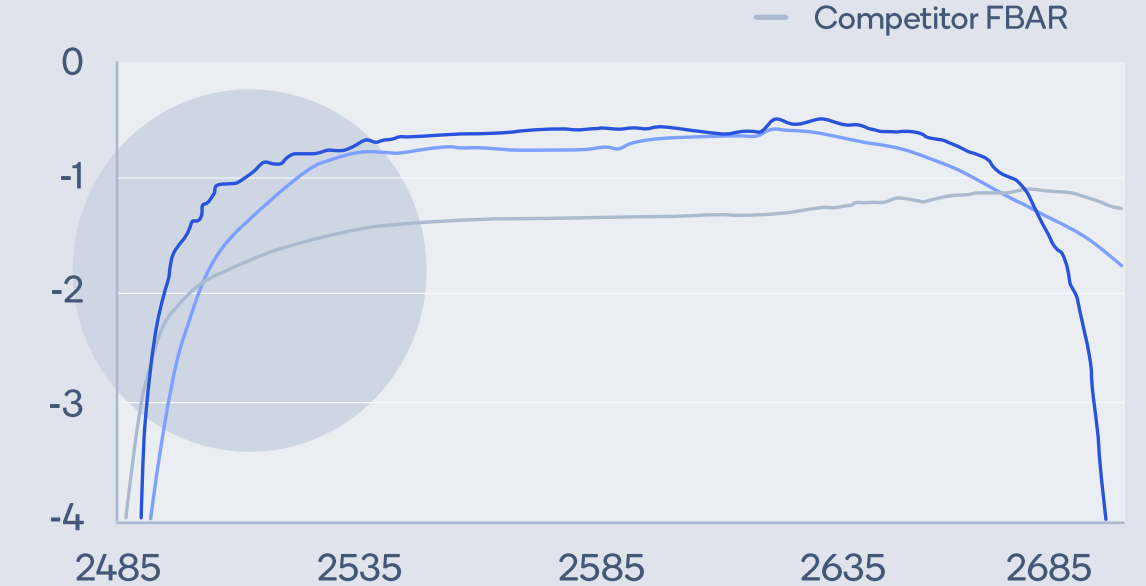
Insertion Loss (dB), Frequency (MHz)



Lowest insertion loss across the passband

Band41 Passband

Insertion Loss (dB), Frequency (MHz)



Lowest insertion loss and steepest roll off for Wi-Fi coexistence

Delivering a leading portfolio across all bands from 600MHz to 7GHz

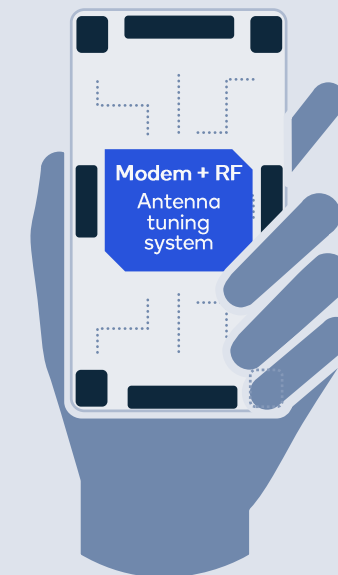
Source: Internal testing

Comprehensive Modem-RF System delivers a better solution

Qualcomm
snapdragon
X55 5G modem-RF system

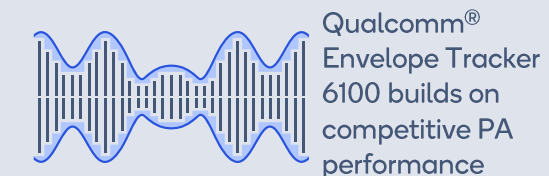


5G adaptive antenna tuning
Improved performance

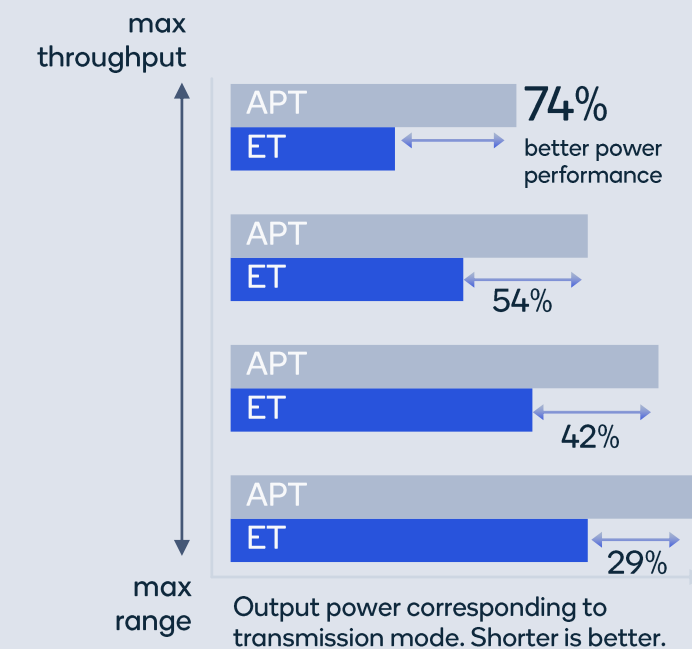


Qualcomm®
envelope tracker

Superior power efficiency



5G band n78
(3.5 GHz)

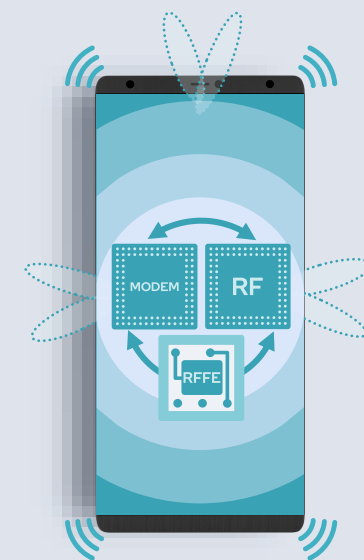


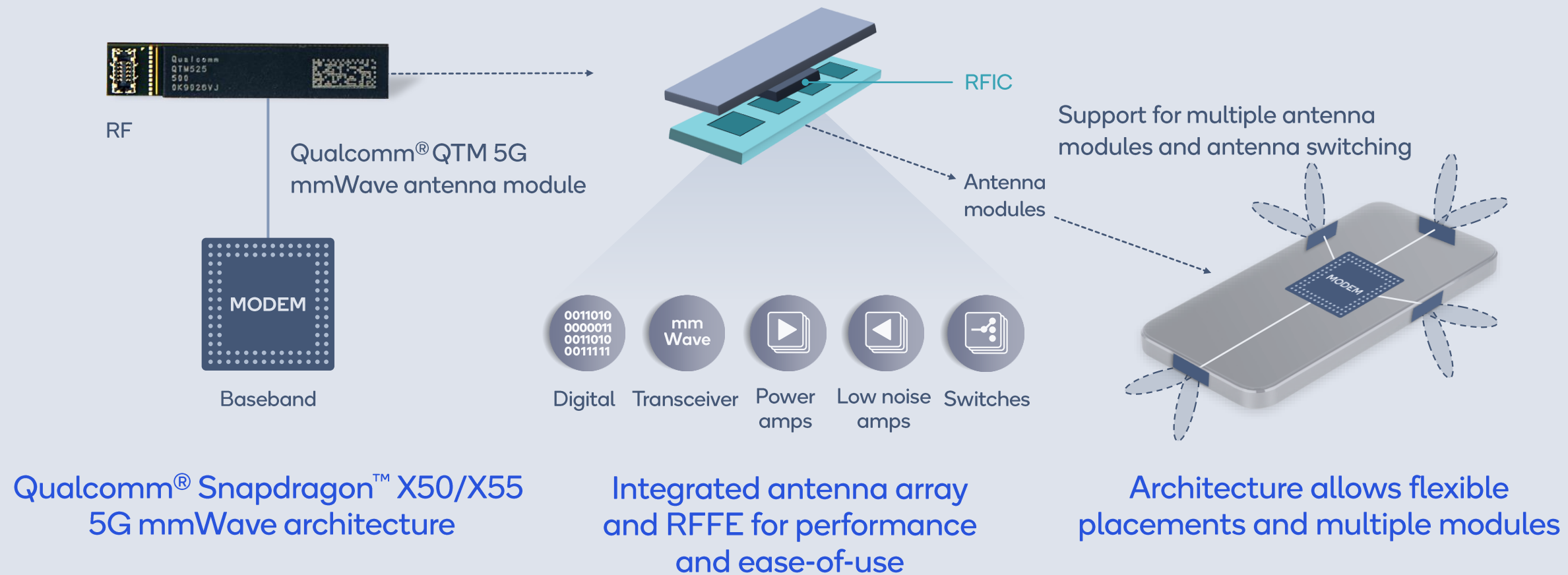
Qualcomm®
Smart Transmit™

Maximize uplink within transmission limits

Faster data transfer and higher resolution applications

Improved coverage and network capacity





Qualcomm QTM 5G is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.

Building groundbreaking 5G Modem-RF Systems for mmWave

Qualcomm® Adreno™ GPU provides leading performance

Key technology for
mobile, computing, IoT
and automotive

We ship
100s of millions
of GPUs every year

Manhattan 3.0 Performance (Frames Per Second),
Source: Qualcomm internal data.
Qualcomm Adreno is a product of Qualcomm Technologies, Inc. and/or its subsidiaries



Most power efficient in industry

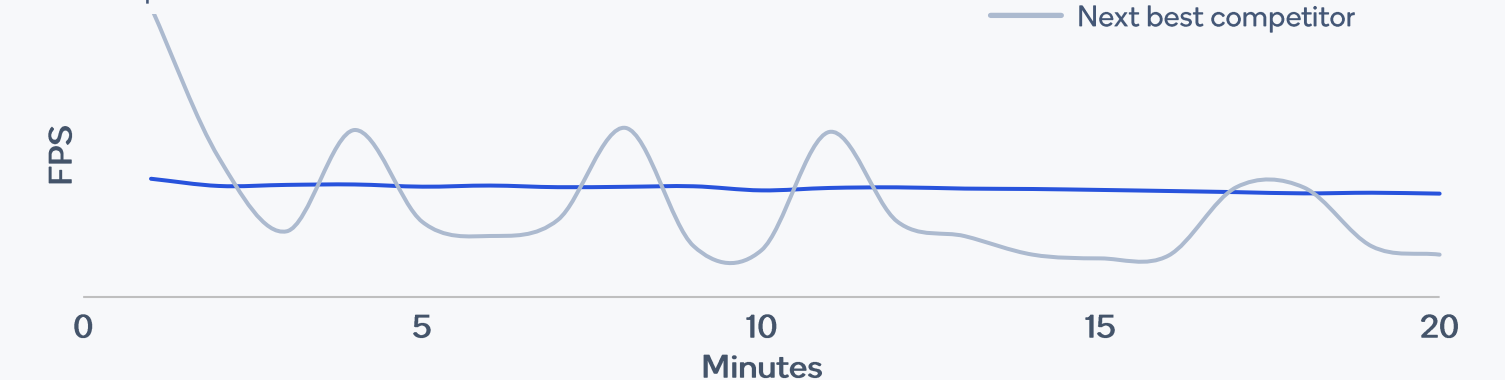
(Performance/watt)



Most area efficient in industry

(Performance/mm²)

Manhattan 3.0 benchmark across iterations
Frames per second



We power
the most
smartphone
cameras on
the planet

Source: DxOMark.com

Xiaomi Mi CC9



Best DxOMark score	121
Best video score	102
Best stabilization score	94

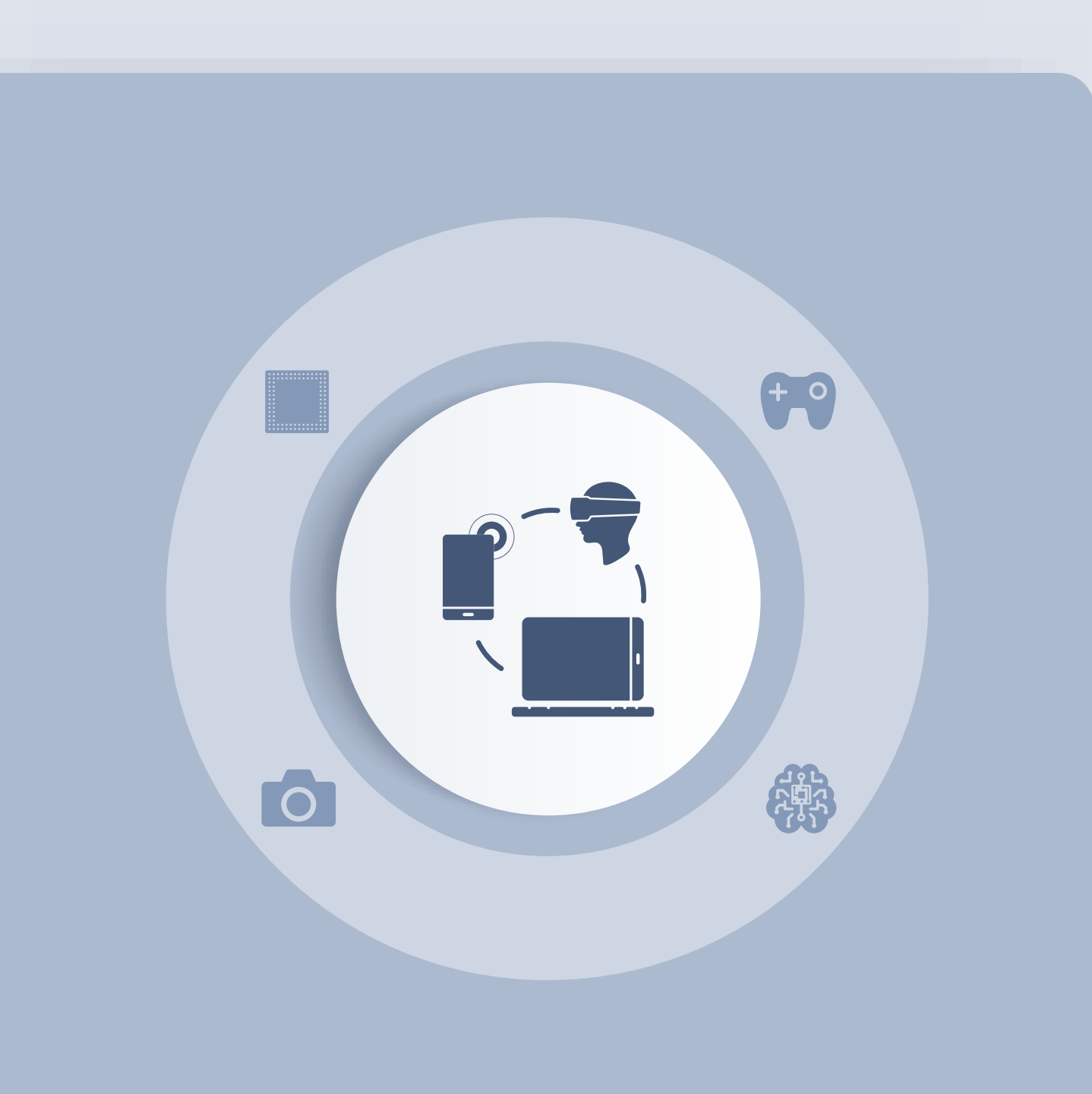


Qualcomm
Xiaomi Mi9

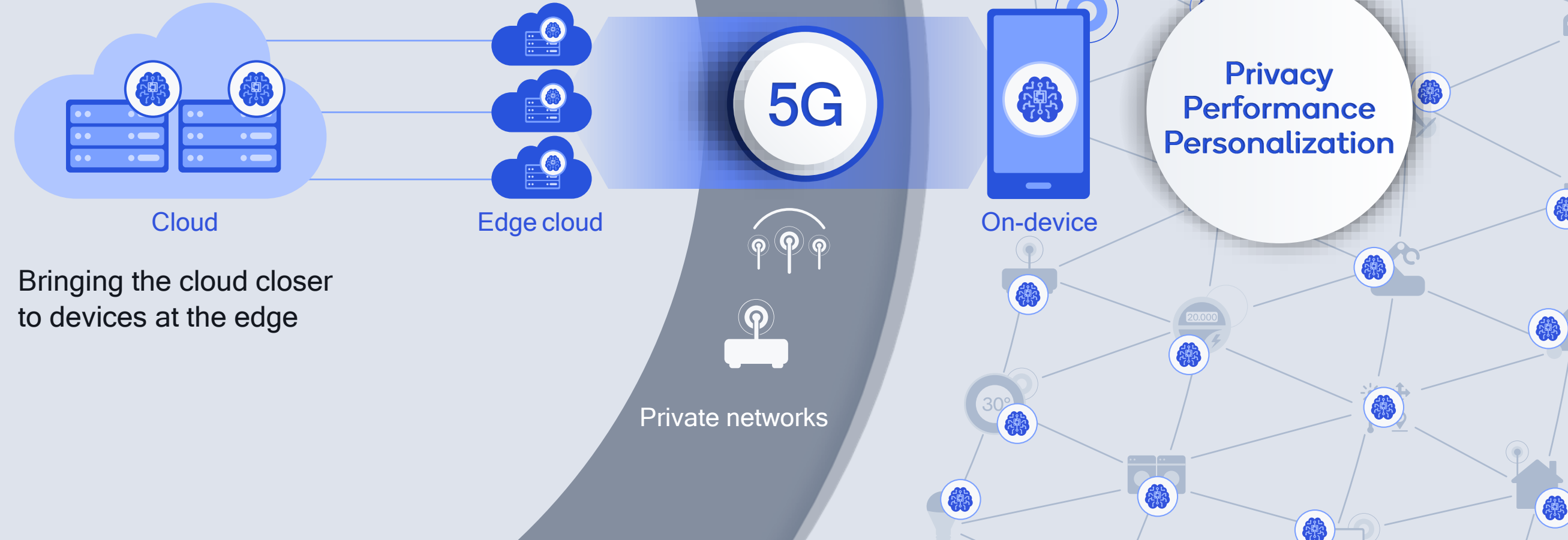
Next best
Competitor

4K Ultra HD, 30fps

4K Ultra HD, 30fps



Well positioned for the 5G + AI future



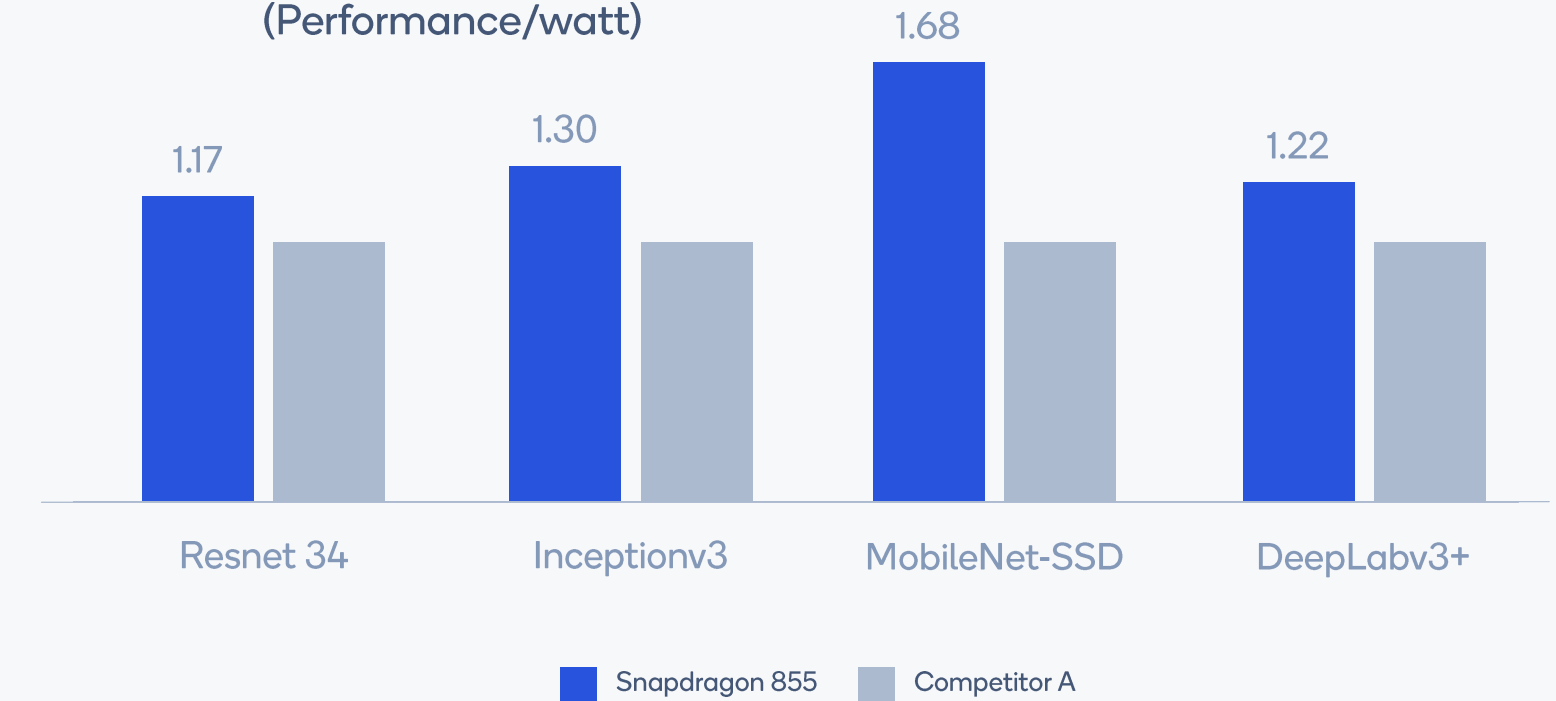
Leading in AI

Multi-core AI design delivers
leading performance



Most power efficient in industry

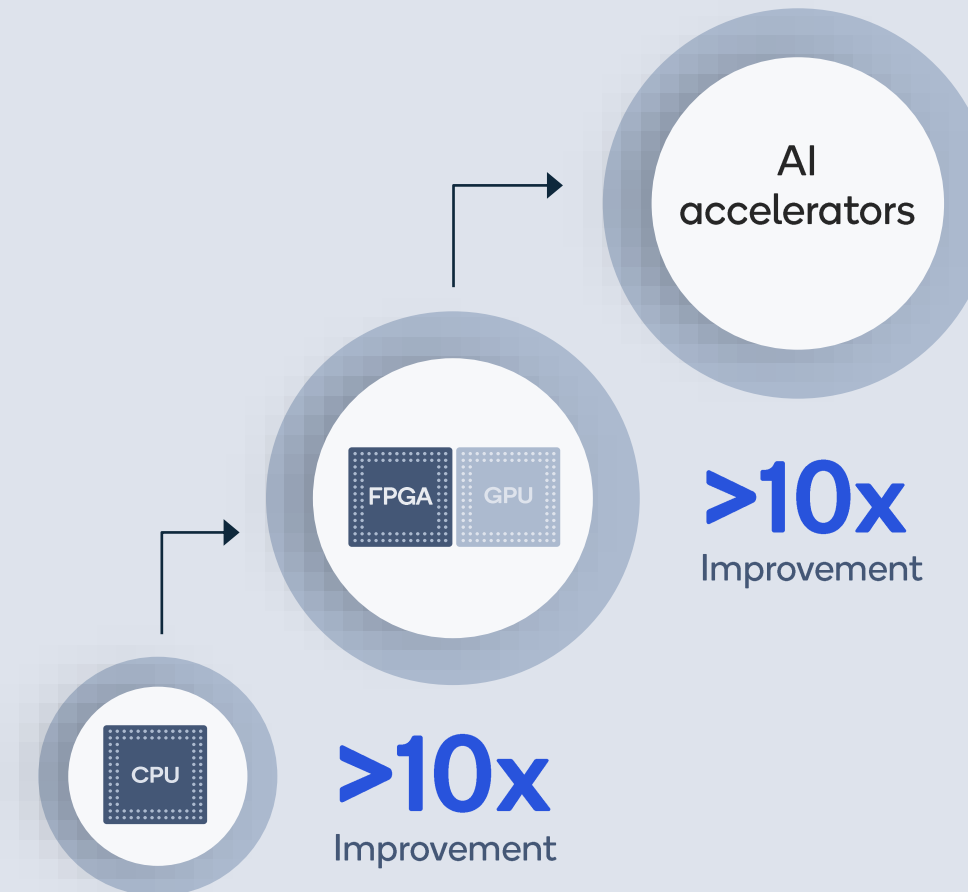
(Performance/watt)



Source: Qualcomm internal testing

Qualcomm AI Engine scales efficiently across products

Extending core technology to new opportunities

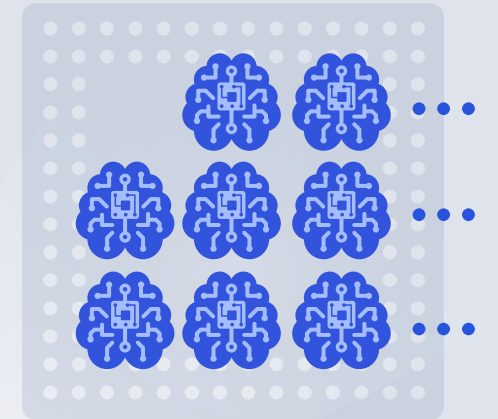


Source: Qualcomm internal analysis
Qualcomm Cloud AI is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.

Cloud/Cloud Edge
Qualcomm® Cloud AI 100



AI Engine



Leverages mobile
interconnects and
interfaces

Key takeaways

Scale of mobile investment gives us an unmatched technology portfolio

We efficiently leverage our large mobile technology investment into other industries

5G leadership comes from a 30-year commitment to research

5G strongly benefits modem-to-antenna design

We are driving the powerful intersection of 5G and AI



Thank you

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