

# Qualcomm Dragonwing™ Q-6690 Processor



Introducing the world's first enterprise mobile processor with fully integrated RFID—engineered for future-ready enterprise and industrial devices. This groundbreaking processor enables on-device AI, advanced connectivity, and software-defined features—all without the need for hardware redesign.

The Dragonwing Q-6690 is designed to solve challenges like fast-changing technology, complex connectivity, and the need for AI. The Dragonwing Q-6690 processor gives you fully integrated UHF (RAIN) RFID, a future-ready foundation with upgradable feature packs, built-in performance headroom, and next-gen connectivity, so your designs and devices stay current longer, scale across product lines, and adapt without starting over.

The Dragonwing Q-6690 processor, built on 4 nm technology, delivers exceptional performance and efficiency. It features 5G + 5G DSDA, Wi-Fi 7, Bluetooth 6.0, UWB, on-device AI, and advanced imaging. With 4K120 decode and 4K60 encode support, it enables immersive display experiences while optimizing power and performance across applications.

## Ordering Information

Product	Part Number
Q-6690	QCS6690 (standalone) QCM6690 (with modem)

## Highlights

### FULLY INTEGRATED UHF (RAIN) RFID

As the world's first enterprise mobile processor with a fully integrated UHF (RAIN) RFID reader, the Dragonwing Q-6690 eliminates the need for bulky, external RFID reader modules. This enables enterprise and industrial mobile devices to read UHF RFID tags natively, simplifying device design, reducing costs, and opening new use cases. Fully integrated RFID enables enterprise and industrial applications—all with improved efficiency and reliability.

**Use cases:** Retail inventory intelligence, asset tracking, product authentication, etc.



### PREMIUM CONNECTIVITY

With 5G + 5G DSDA, the Dragonwing Q-6690 supports simultaneous connections to two 5G networks, enabling failover redundancy for business-critical and low-latency applications. This is complemented by Wi-Fi 7's 320MHz channels and Multi-Link Operation (MLO), which deliver aggregate throughputs exceeding 30 Gbps. The Dragonwing Q-6690 also supports Bluetooth® 6.0 and integrated UWB for fast, more reliable, and location-aware connections.

**Use cases:** HMLs and handheld scanners, smart kiosks, etc.



### POWERFUL PERFORMANCE / ON-DEVICE AI

The Dragonwing Q-6690 offers strong performance with a Qualcomm® Kryo™ CPU with a maximum clock speed of 2.9 GHz, featuring an octa-core architecture, powerful GPU, and dedicated AI engine delivering up to 6 TOPS. Built on energy-efficient 4 nm technology, it handles complex tasks like real-time AI, image recognition, and video processing directly on device. This enables faster, smarter applications while maintaining low power consumption for longer battery life and cooler operation in mobile and edge devices.

**Use cases:** Automated retail checkout, industrial analytics, rugged tablets for field teams, etc.



### SOFTWARE-CONFIGURABLE FEATURES

With the Dragonwing Q-6690, add or upgrade features through configurable feature packs (software) with no hardware replacement. Need more AI power, better camera support, expanded peripherals, or extra performance? Simply upgrade the feature pack. Keep devices current for years without costly redesigns.

**Use cases:** Hi-res security surveillance, AI-powered fraud detection, multi-functional industrial controllers, etc.





## Target Industries

- Retail
- Smart Buildings & Enterprises
- Smart Cities
- Supply Chain & Logistics
- Home & Life Appliances
- Medical & Healthcare Devices

## Features

- **Fully-integrated RFID:** UHF (RAIN) RFID reader functionality; Gen2X-capable
- **Premium connectivity:** Features Wi-Fi 7, Bluetooth 6, and a UWB combo chip for ultra-fast, reliable connections. Includes an upgraded 5G modem with dual-SIM dual-active (DSDA) support for seamless, power-efficient, global connectivity
- **Leading-edge CPU:** Build with the latest Kryo core with powerful processing for 64-bit applications
- **Energy-efficient:** Designed using the 4 FinFet process node for extended battery life, enhancing end user experience. Supports advanced use cases at the edge
- **Enhanced AI engine:** Uses the 3rd Gen Qualcomm® AI Engine with feature enhancements for quicker vector and matrix calculations
- **Next-gen GPU:** Elevated multimedia and interactive experiences delivered on the next-gen Qualcomm® Adreno™ 7-series GPU
- **Advanced ISP:** Built with the most advanced Qualcomm Spectra™ ISP, delivering 4K staggered HDR, intelligent image processing, and advanced AI features—for richer, sharper captures, even in challenging, low-light conditions
- **Upgraded display:** Enhanced display experiences with Wide Full High Definition (WFHD+) resolution at 144 FPS, 10-bit DisplayPort 4K60 MST, improved HDR10/10+; consistently enhanced color accuracy and consistency across displays, and enhanced dynamic range and visual depth
- **Expanded interfaces:** Enterprise-ready with the latest and expanded I/O capabilities, including 2x PCIe, USB 3.1 with eUSB 2, and eMMC 5.1
- **Dual-channel, non-PoP, high-speed memory:** LPDDR5/LPDDR4x SDRAM
  - LPDDR5 SDRAM designed for 3200 MHz clock (1x16-bit)
  - LPDDR4x SDRAM designed for 2133 MHz clock (2x16-bit)
- **Security:** Includes Secure Boot, hardware crypto engines, key provisioning, Qualcomm® Content Protection with Widevine, Qualcomm® Trusted Execution Environment 5.4, TME 2.0, and Hypervisor 3.0 for superior device integrity, trusted execution, and premium content protection
- **Longevity:** Long-term support for Android OS upgrades—up to 8 years

To learn more visit: [qualcomm.com](https://www.qualcomm.com)



## Specifications

SKU	QCS6690
Feature Pack	Feature Pack 4 (FP4) FP4 is the highest; FP1-FP3 are also available.
CPU	Kryo CPU with a maximum clock speed of 2.9 GHz, featuring an octa-core architecture <ul style="list-style-type: none"><li>• Kryo Gold Prime: One high-performance core @ 2.9 GHz</li><li>• Kryo Gold: Three high-performance cores @ 2.7 GHz</li><li>• Kryo Silver: Four low-power cores @ 2.0 GHz</li></ul>
AI Performance	Qualcomm® Hexagon™ 7xx <ul style="list-style-type: none"><li>• 1.5 GHz</li><li>• 6 TOPS</li></ul>
GPU	Adreno GPU 7-series <ul style="list-style-type: none"><li>• 1.15 GHz</li></ul>
Memory	2x16 LPDDR4x @ 2.1 GHz, LPDDR5 @ 3.2 GHz
Audio DSP (LPASS)	Integrated SVA, enhanced Audio AI Accelerator, 2 MB shared LPI with sensor, MI2S/TDM/PCM/SoundWire
Display Support	WFHD+ 144 Hz, 10-bit DisplayPort 4K60 MST (2x external display support)
Video Decode/Encode	4K120/4K60
Camera	Triple ISP for multi-camera setups up to 21 MP simultaneously Dual-camera: 32 MP and 21 MP at 30 FPS zero shutter lag HW sHDR, 4K60, 4-lane CSI
PCIe	2x PCIe Gen 3 interfaces
USB	Supports USB 3.1 Type-C DisplayPort 1.4 with eUSB 2.0
Other I/O	167x GPIO, 20x QUP, UART, SPI, I2C, I3C
Storage	eMMC 5.1, SD 3.0, UFS 3.1 Gen 4 (2-lane)
Wi-Fi/Bluetooth/WAN	2x2 Wi-Fi 7 / Bluetooth 6.0 / UWB 2x2 Wi-Fi 6E / Bluetooth 5.4
OS	Android
Package	Non-PoP Package: 14.0 x 12.0 x 0.89 mm, ball pitch: 0.35 mm, 4 nm technology
Temperature Range (Tj)	105 °C
Longevity	2034*

## Block Diagram

Kryo-7 Series CPU	Adreno 7-Series GPU
Hexagon DSP	Qualcomm Spectra ISP
LPDDR4x/LPDDR5 Memory	Audio AI Accelerator
Security	UHF RFID
5G + 5G DSDA	Location
Wi-Fi 7	Bluetooth 6.0

\* Product longevity dates are subject to change without notice. Refer to the [product longevity page](#) for details.