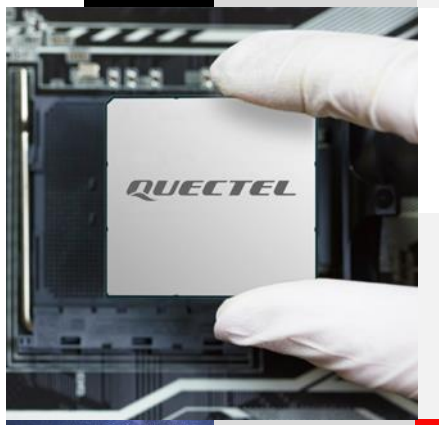
Quectel SC696S Series Smart Module

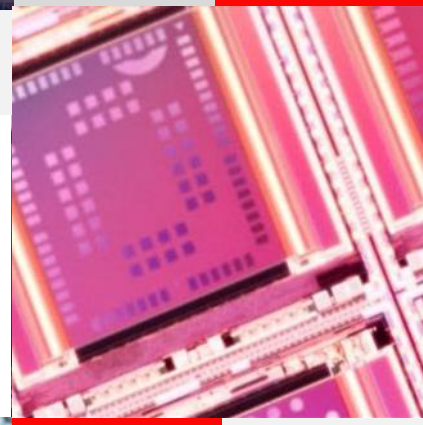
Introduction

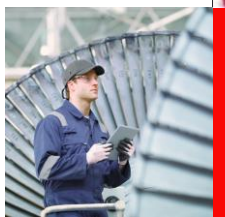
Build a Smarter World

Duty of Confidentiality

The Receiving Party shall keep confidential all documentation and information provided by Quectel, except when the specific permission has been granted by Quectel. The Receiving Party shall not access or use Quectel’s documentation and information for any purpose except as expressly provided herein. Furthermore, the Receiving Party shall not disclose any of the Quectel's documentation and information to any third party without the prior written consent by Quectel. For any noncompliance to the above requirements, unauthorized use, or other illegal or malicious use of the documentation and information, Quectel will reserve the right to take legal action.







Smart Solution Introduction

Smart Module Portfolio

Specifications & Timelines

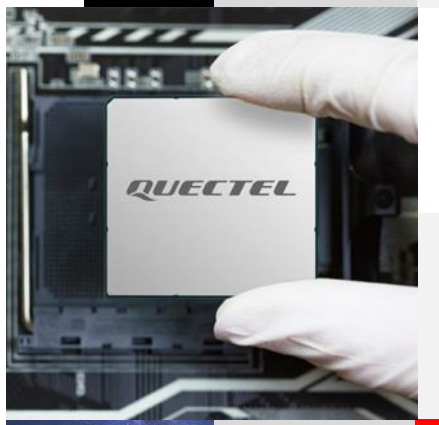
Enhancements

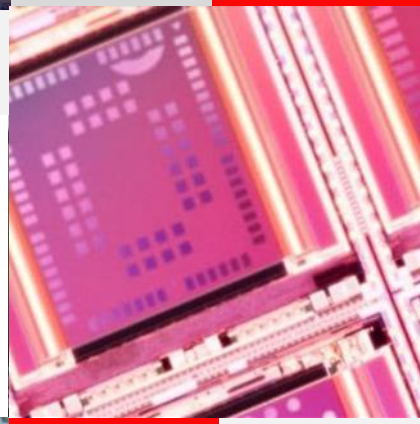
Typical Applications

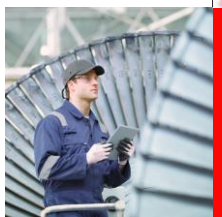
Customer Support

Appendix

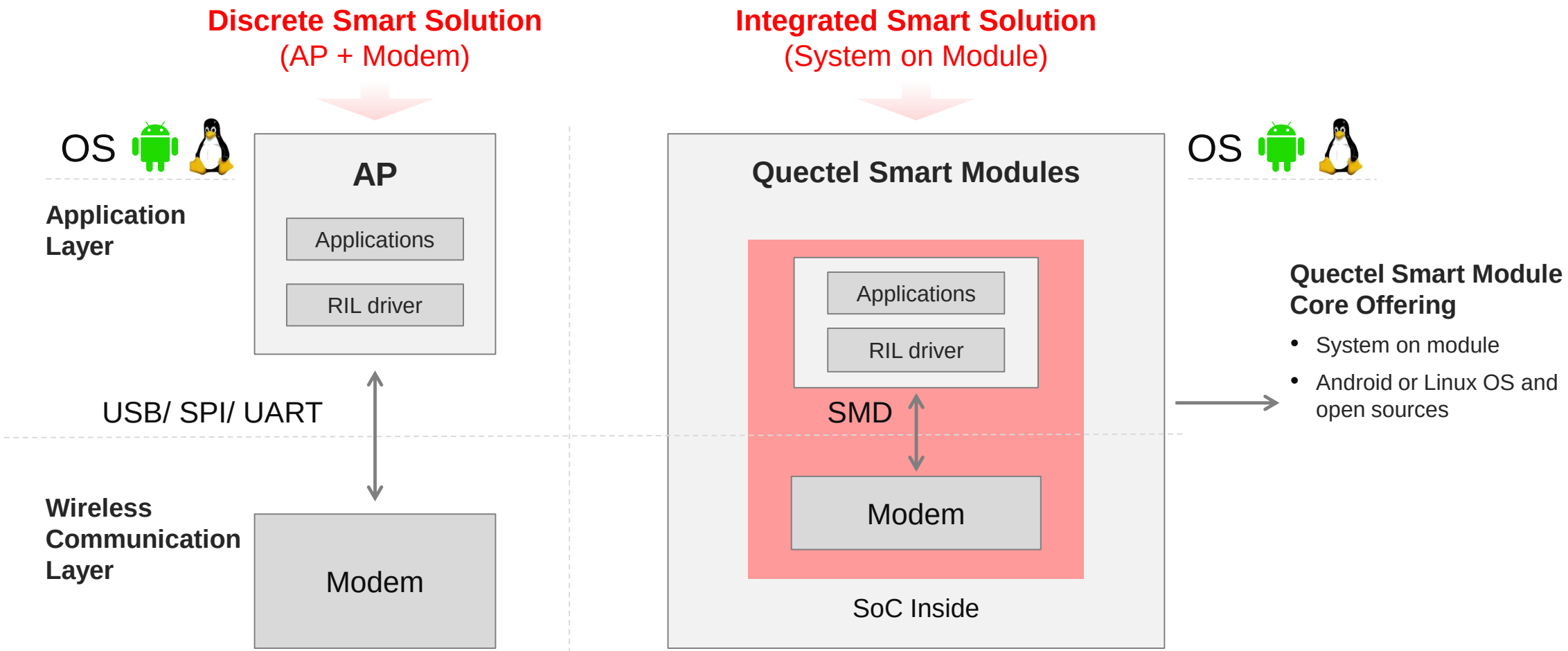
Build a Smarter World







Smart Solution Architecture Comparison



AP: Application Processor.
OS: Operating System.
SMD: Shared Memory Driver.
SoC: System On a Chip.

Quectel Smart Solution Advantages

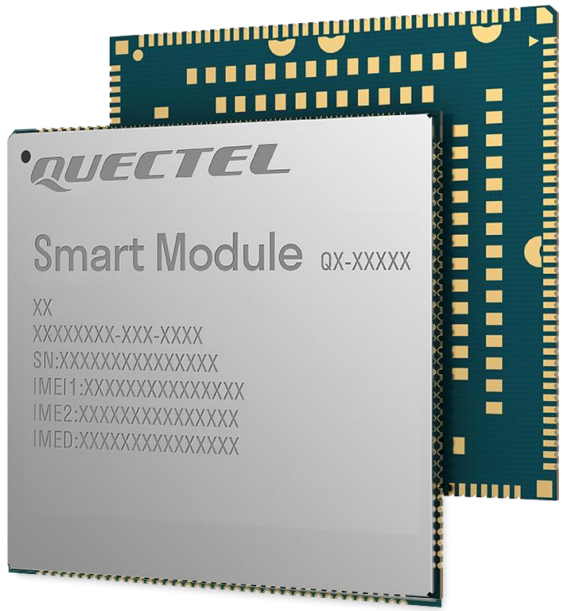
SoC Platforms

High-performance CPU/ GPU/ NPU/ DSP

Various Multimedia Functions: LCD/ Audio/ Camera/ Video

Global Certifications

Open Android or Linux



Multi-Mode: 5G/ LTE/ UMTS/ GSM

Integrated Wi-Fi/ Bluetooth/ GNSS

Abundant Peripheral Interfaces

Professional Customer Support

GPU: Graphics Processing Unit DSP: Digital Signal Processing NPU: Neural Processing Unit LCD: Liquid-crystal Display

Smart Solution Introduction

Smart Module Portfolio

Specifications & Timelines

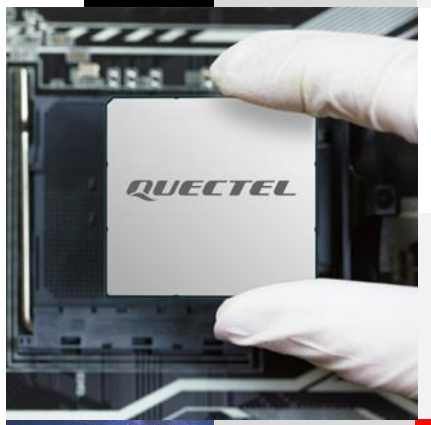
Enhancements

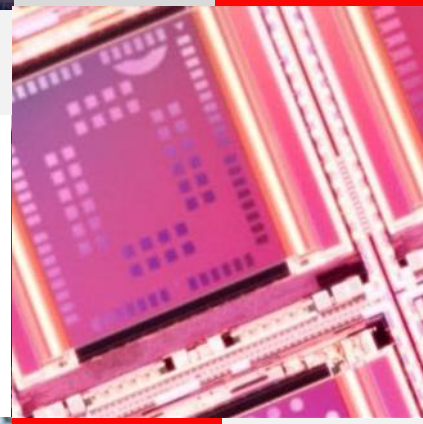
Typical Applications

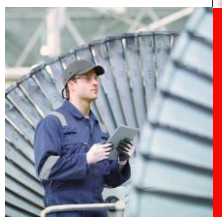
Customer Support

Appendix

Build a Smarter World







Smart Module Portfolio

Premium Level

SG865W

- QCS8250 ①
- CPU: 8x Kryo585 2.84 GHz
- GPU: Adreno 650
- Camera: 64 MP
- Video: 4K @ 240 fps/ 8K @ 60 fps
- Wi-Fi: 2 × 2 11ax; Bluetooth 5.1

SG885G

- QCS8550 ①
- CPU: 1 + 4 + 3 Kryo™ CPU (3.2/ 2.8/ 2.0 GHz)
- GPU: Adreno 740 – 4K 120 fps UI
- Camera: 64 MP
- Video: 4K @ 240 fps / 8K @ 60 fps
- Wi-Fi: 2.4 & 5 & 6 GHz, Wi-Fi 7; Bluetooth 5.3

High Level

SC600T

- MSM8953 ①
- CPU: 8x A53 2.0 GHz
- GPU: Adreno 506
- Camera: 24 MP
- Video: 4K @ 30 fps
- Wi-Fi: 11ac; Bluetooth 4.2
- Modem: LTE Cat 6
- GNSS: L1

SC66

- SDM660 ①
- CPU: 4 + 4 Kryo260 2.2/ 1.8 GHz
- GPU: Adreno 512
- Camera: 24 MP
- Video: 4K @ 30 fps
- Wi-Fi: 2 × 2 11ac; Bluetooth 5.0
- Modem: LTE Cat 6
- GNSS: L1

SC668S

- QCM6125 ①
- CPU: 4 + 4 Kryo260 2.0/ 1.8 GHz
- GPU: Adreno 610
- Camera: 24 MP
- Video: 4K @ 30 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

SG560D

- QCM6490 ①
- CPU: 1 + 3 + 4 Kyro670 (2.7/ 2.4/ 1.9 GHz)
- GPU: Adreno 643
- Camera: 64 MP
- Video: 4K30D/ 4K30E
- Wi-Fi: 2 × 2 11ax DBS; Bluetooth 5.2
- Modem: 5G Sub 6/ LTE Cat 18
- GNSS: L1 + L5

SC606T

- MSM8953 ①
- CPU: 8x A53 2.0 GHz
- GPU: Adreno 506
- Camera: 24 MP
- Video: 4K @ 30 fps
- Wi-Fi: 11ac; Bluetooth 4.2
- Modem: LTE Cat 6
- GNSS: L1

SC696S

- QCM6125 ①
- CPU: 4 + 4 Kryo260 2.0/ 1.8 GHz
- GPU: Adreno 610
- Camera: 24 MP
- Video: 4K @ 30 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

Medium Level

SC600Y

- SDM450 ①
- CPU: 8x A53 1.8 GHz
- GPU: Adreno 506
- Camera: 21 MP
- Video: 1080P @ 60 fps
- Wi-Fi: 11ac; Bluetooth 4.2
- Modem: LTE Cat 6
- GNSS: L1

SC200K

- UIS8581E ②
- CPU: 8x A55 1.6 GHz
- GPU: GE8322
- Camera: 16 MP
- Video: 1080P @ 60 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

SC680A

- QCM4290 ①
- CPU: 4 + 4 Kryo260 2.0/ 1.8 GHz
- GPU: Adreno 610
- Camera: 25 MP
- Video: 1080P @ 60 fps
- Wi-Fi: 11ac; Bluetooth 5.1
- Modem: LTE Cat 6
- GNSS: L1 + L5

SC686A

- QCM4290 ①
- CPU: 4+4 Kryo260 2.0/ 1.8 GHz
- GPU: Adreno 610
- Camera: 25 MP
- Video: 1080P @ 60 fps
- Wi-Fi: 11ac; Bluetooth 5.1
- Modem: LTE Cat 6
- GNSS: L1 + L5

Entry Level

SC200R

- QCM2150 ①
- CPU: 4x A53 1.3 GHz
- GPU: Adreno 308
- Camera: 13 MP
- Video: 1080P @ 30 fps
- Wi-Fi: 11n; Bluetooth 4.2
- Modem: LTE Cat 4
- GNSS: L1

SC200L

- SL8541E ②
- CPU: 4x A53 1.4GHz
- GPU: Mali-T820
- Camera: 8 MP
- Video: 1080P @ 30 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

SC200E

- QCM2290 ①
- CPU: 4x A53 2.0 GHz
- GPU: Adreno 702
- Camera: 25 MP
- Video: 1080P @ 30 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

SG150H

- SL8521E ②
- CPU: 2x A53 1.3GHz
- GPU: Mali-T820
- Camera: 5 MP
- Video: 720P @ 30 fps
- Wi-Fi: 11n; Bluetooth 4.2
- Modem: LTE Cat 4
- GNSS: L1

SC20

- MSM8909 ①
- CPU: 4x A7 1.1GHz
- GPU: Adreno 304
- Camera: 8 MP
- Video: 1080P @ 30 fps
- Wi-Fi: 11n; Bluetooth 4.2
- Modem: LTE Cat 4
- GNSS: L1

SC206E

- QCM2290 ①
- CPU: 4x A53 2.0 GHz
- GPU: Adreno 702
- Camera: 25 MP
- Video: 1080P @ 30 fps
- Wi-Fi: 11ac; Bluetooth 5.0
- Modem: LTE Cat 4
- GNSS: L1

①: Qualcomm. ②: Unisoc. DBS: Dual Band Simultaneous.

Smart Solution Introduction

Smart Module Portfolio

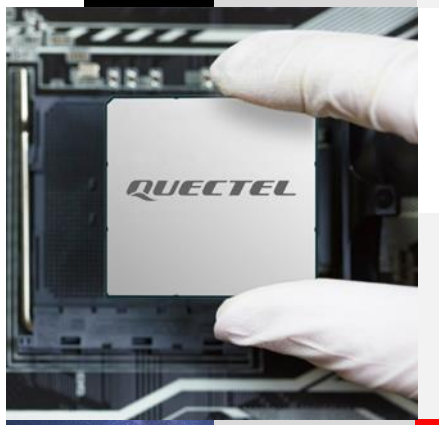
Specifications & Timelines

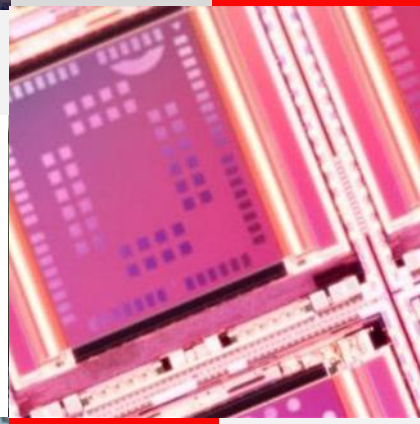
Enhancements

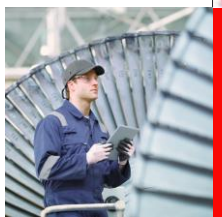
Typical Applications

Customer Support

Appendix



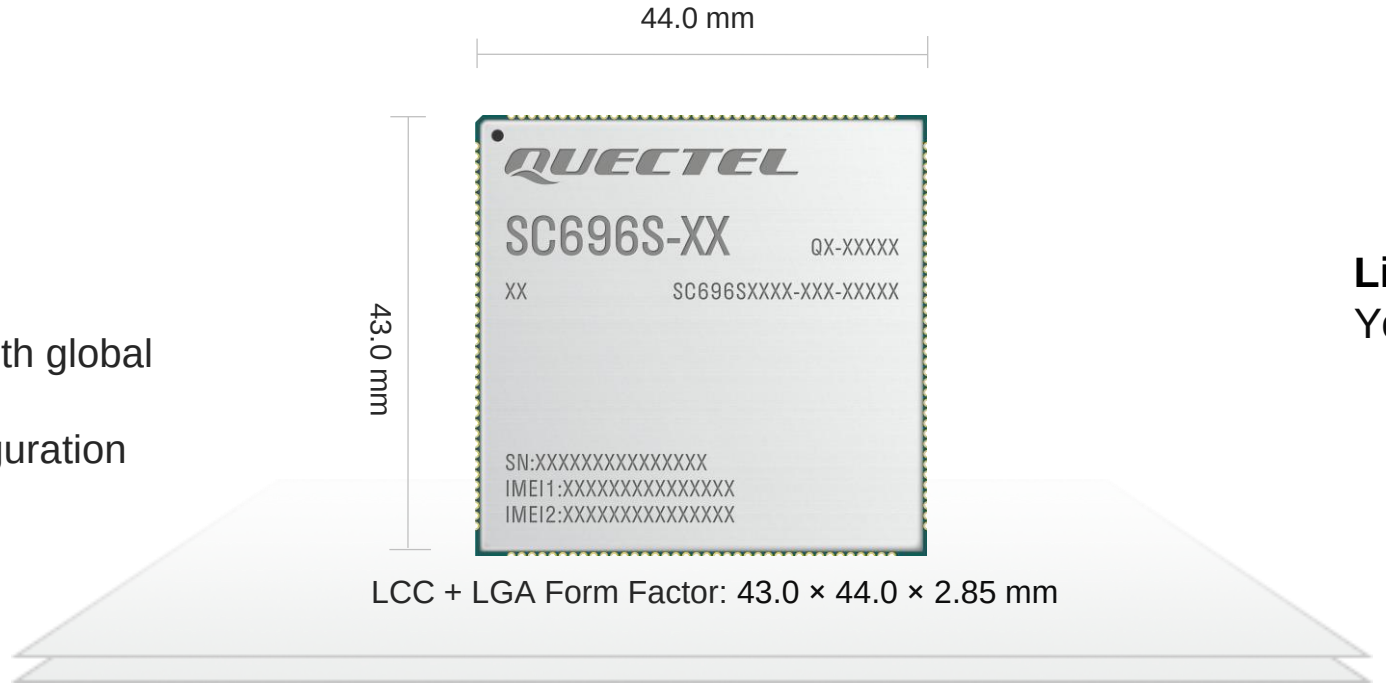




Build a Smarter World

SC696S Series Highlights

Multiple Variants:
- Multi-region variants with global certifications
- Multiple memory configuration



LCC + LGA Form Factor: 43.0 × 44.0 × 2.85 mm

Linux OS:
Yocto Linux (Kernel 4.14)

Chipset platform: QCM6125. Powerful system performance, multimedia, LTE Cat 4, Wi-Fi 802.11ac, Bluetooth, GNSS

Long life time:
Till the year of 2028①

Compatible with SC600Y, SC600T, SC606T, SC66, SC680A and SC686A series

①: Planning, to be confirmed.

SC696S Series Specifications

Variant		SC696S-EM	SC696S-NA	SC696S-WF
Region		EMEA/ Korea/ South Asia/ Latin America/ India/ Australia/ New Zealand/ South Africa	North America	Global
LTE	**FDD Band**	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 66/ 71	-
	TDD Band	B38/ 39/ 40/ 41 (200 MHz)	B41 (200 MHz)	-
UMTS	**WCDMA Band**	B1/ 2/ 4/ 5/ 8	-	-
EVDO/ CDMA		-	-	-
GSM/ EDGE		Quad Band	-	-
GNSS		Supported	Supported	-
Wi-Fi/ Bluetooth		Supported	Supported	Supported
Certification		**Regulatory:** CE*/ RCM*/ GCF*	**Carrier:** Verizon*/ AT&T* **Regulatory:** FCC*/ IC*/ GCF*/ PTCRB*	**Regulatory:** FCC*/ IC*/ KC*/ CE*/ RCM*
Project Stage		MP	MP	MP

* : In progress.

SC696S Series Features and Interfaces

Key Features		Interfaces	
CPU	QCM6125, custom 64-bit ARM v8.0 application processor (Qualcomm® Kryo™ 260 CPU) • Kryo Gold quad-core high-performance processor @ 2.0 GHz • Kryo Silver Quad Core Low Power Processor @ 1.8 GHz	**LCM**	1 set of 4-lane MIPI DSI supporting up to 1920 × 1200 @ 60 fps or 1080 × 2520 @ 60 fps + Native DP supporting 1920 × 1200 @ 60 fps
GPU	Qualcomm® Adreno™ 610 graphics processing unit (GPU) at 950 MHz	**Camera**	• 3 sets of 4-lane MIPI CSI up to 2.1 Gbps/ lane • Each group of 4-lane can be disassembled into 2-lane + 1-lane, which can support up to 6 cameras and open up to 2 cameras at the same time • Dual ISP, supports up to two simultaneous 16 MP + 16 MP or single 24 MP
Video	• Decode: 4K @ 30 fps; HEVC/H.264/VP8/VP9 1080P @ 30 fps; MPEG-2 • Encode: 4K @ 30 fps; HEVC/H.264/VP8	**Touch Panel**	Capacitive touch panel
Memory	2 GB LPDDR4X + 16 GB eMMC	**Audio**	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC) 3 outputs: Line Out, earpiece, headphone
OS	Yocto Linux (Kernel4.14)	**USB**	× 1, supports USB 3.1 Type-C interface, compatible with USB 2.0, support native DP
Wi-Fi	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	**(U)SIM**	× 2, supports 1.8/ 2.95 V (U)SIM cards; supports (U)SIM card hot swap detection and dual-SIM dual-standby
Bluetooth	Bluetooth 2.1 + EDR/ 3.0/ 4.1 LE/ 4.2 BLE/ 5.0 LE	**UART**	× 3 Debug UART: 2-wire serial port, specialized for debugging use UART03: 2-wire serial port UART00: 4-wire serial port, supports RTS and CTS hardware flow control with maximum data rate of 4 Mbps
GNSS①	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS	**SD Card**	× 1, SD 3.0, supports 4-bit SDIO
Modem	3GPP Release 12	**I2C/ SPI/ ADC/ GPIO/ PWRKEY**	Supported
Battery Charge	Not supported	**Antenna**	× 4, Main, Rx-diversity, GNSS, Wi-Fi/ Bluetooth antennas respectively (SC696S-WF: × 1, Wi-Fi/ Bluetooth antenna)

①: GNSS is not supported on SC696S-WF;

SC696S-EM/ -NA/ -WF Timelines

2023											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

SC696S-EM/ -NA/ -WF

MP

SC696S-EM

Certification

Regulatory CE/ RCM — Start — Compete (Planned)

GCF

SC696S-NA

Certification

Carrier Verizon/ AT&T

Regulatory FCC/ IC/ PTCRB/ GCF

SC696S-WF

Certification

Regulatory FCC/ IC/ KC/ CE/ RCM

ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the "certification schedule".

Smart Solution Introduction

Smart Module Portfolio

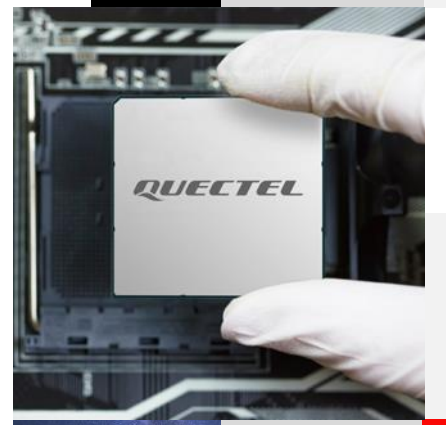
Specifications & Timelines

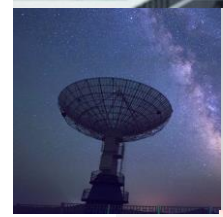
Enhancements

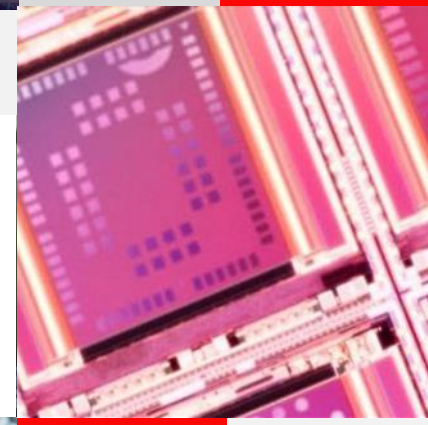
Typical Applications

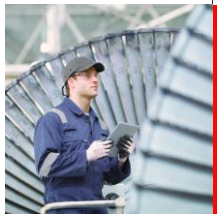
Customer Support

Appendix



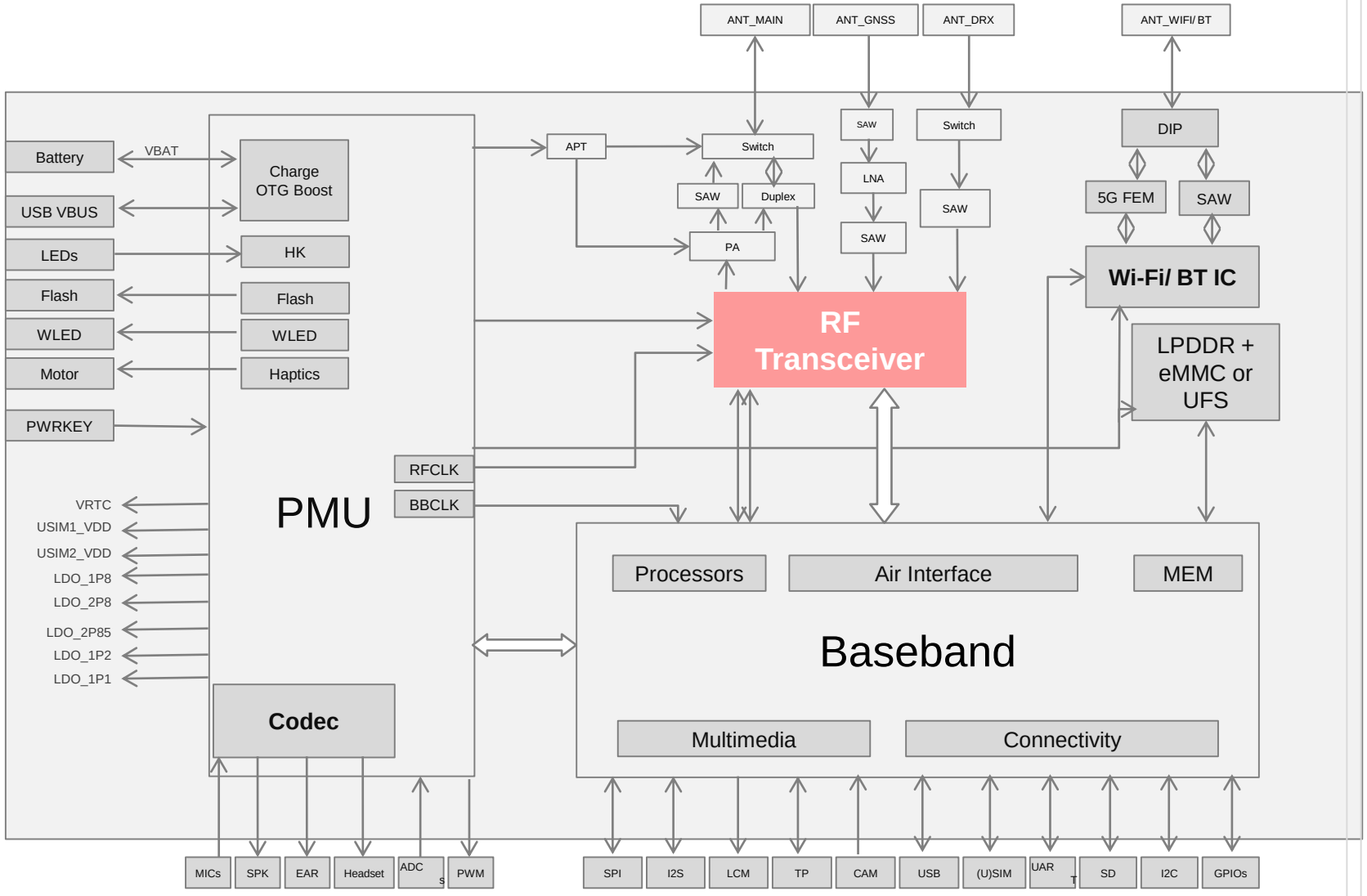






Build a Smarter World

Smart Module Hardware Block Diagram

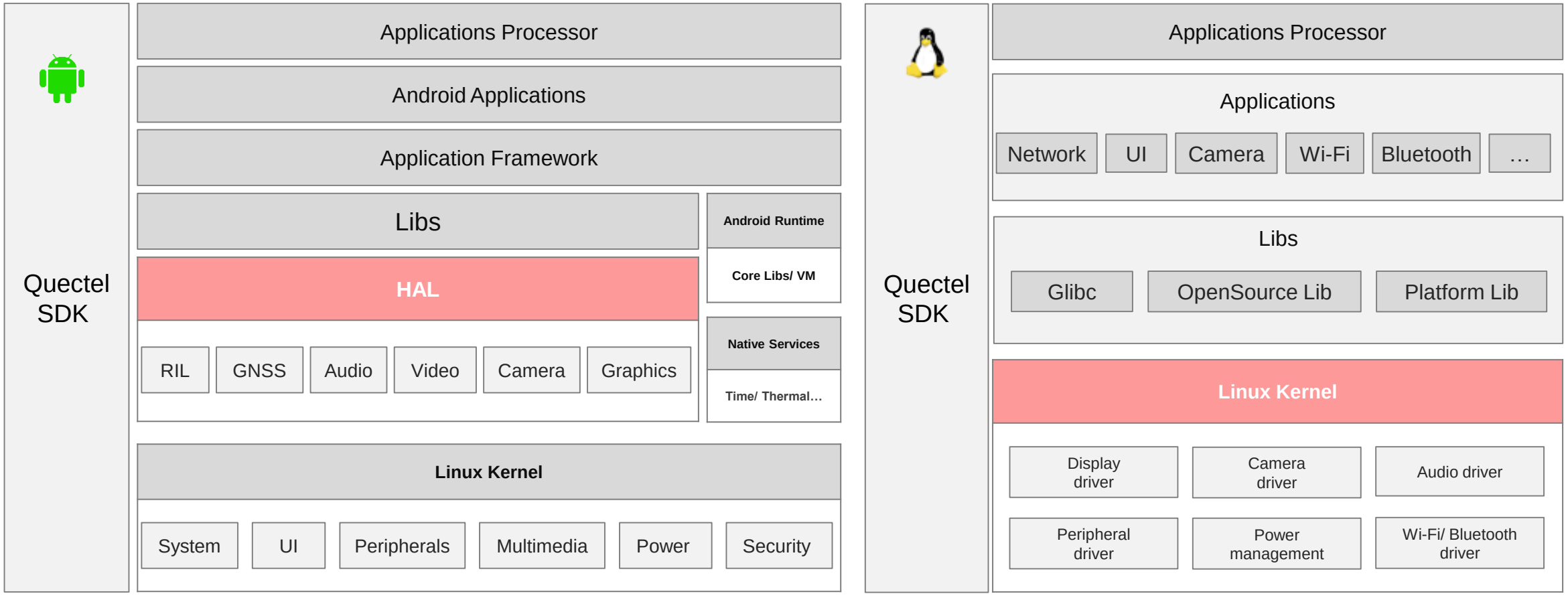


- Baseband: SoC with CPU, GPU, DSP, NPU processors, multimedia and other digital peripherals
- PMU: Provides power supply internally; some PMUs have codec inside
- RF Transceiver: Implements 2G/ 3G/ 4G/ 5G and GNSS functionalities
- Wi-Fi/ Bluetooth IC: Implements Wi-Fi/ Bluetooth functionalities
- LPDDR + eMMC or UFS: Internal DDR and storage

PMU: Power Management Unit LPDDR: Low-power Double Data Rate

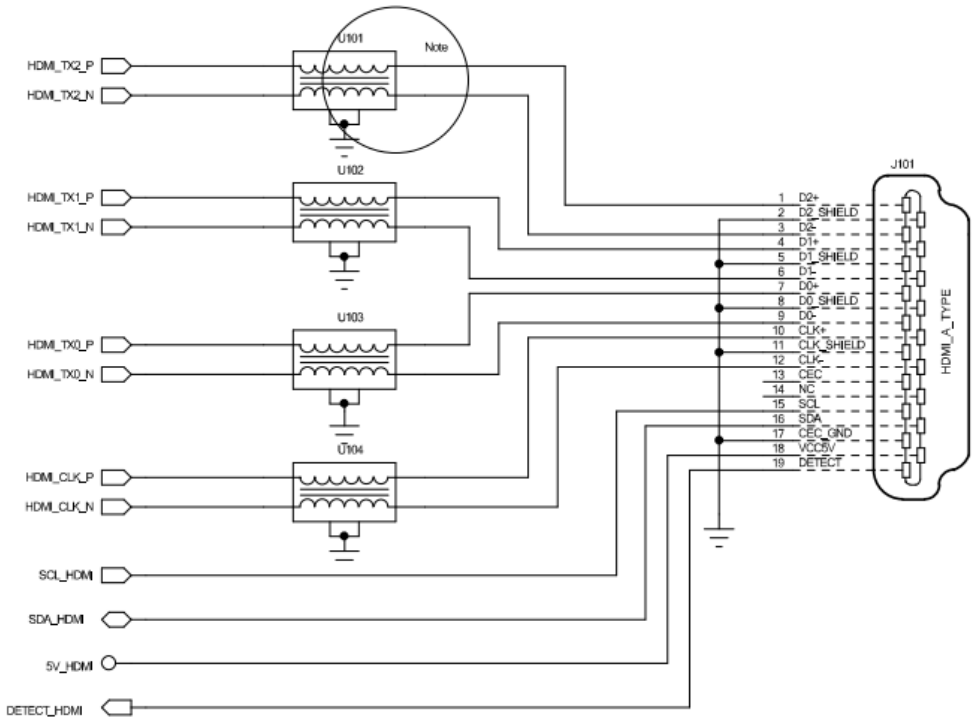
Smart Module SDK System Architecture

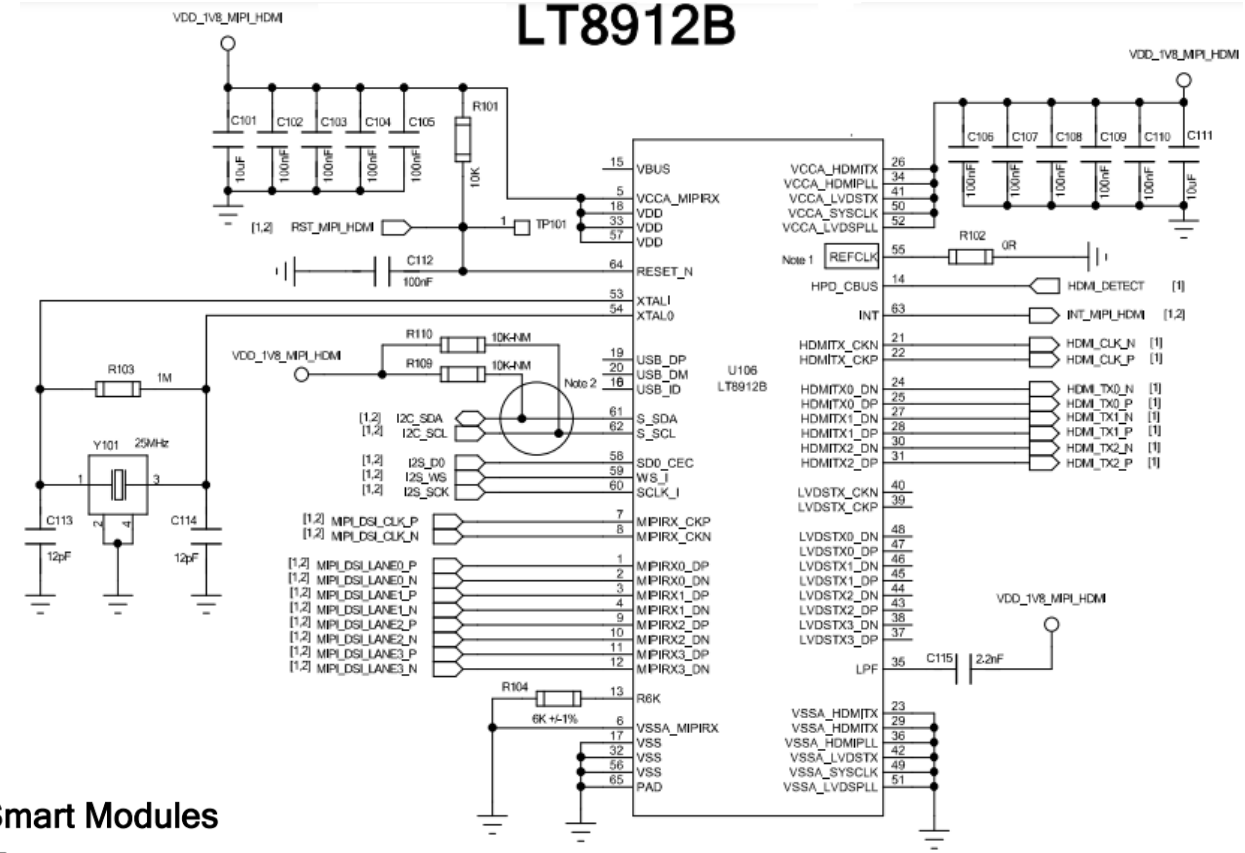
Quectel provides Android AOSP or Linux SDK which include libs and source codes to customers under NDA.



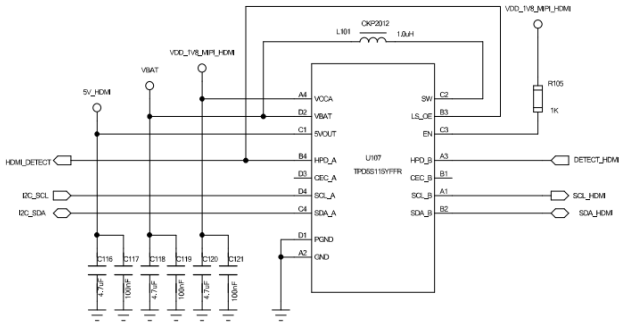
AOSP: Android Open-source Project HAL: Hardware Abstraction Layer VM: Virtual Machine RIL: Radio Interface Layer

Extensive Function – MIPI DSI to HDMI

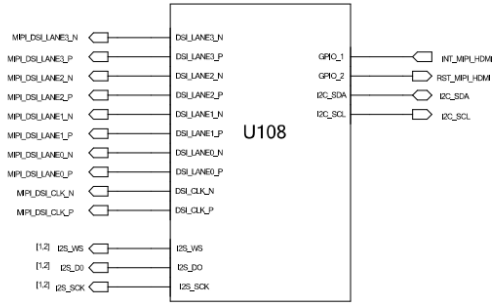




HDMI Companion Chip



DSI/I2S Interfaces of Smart Modules

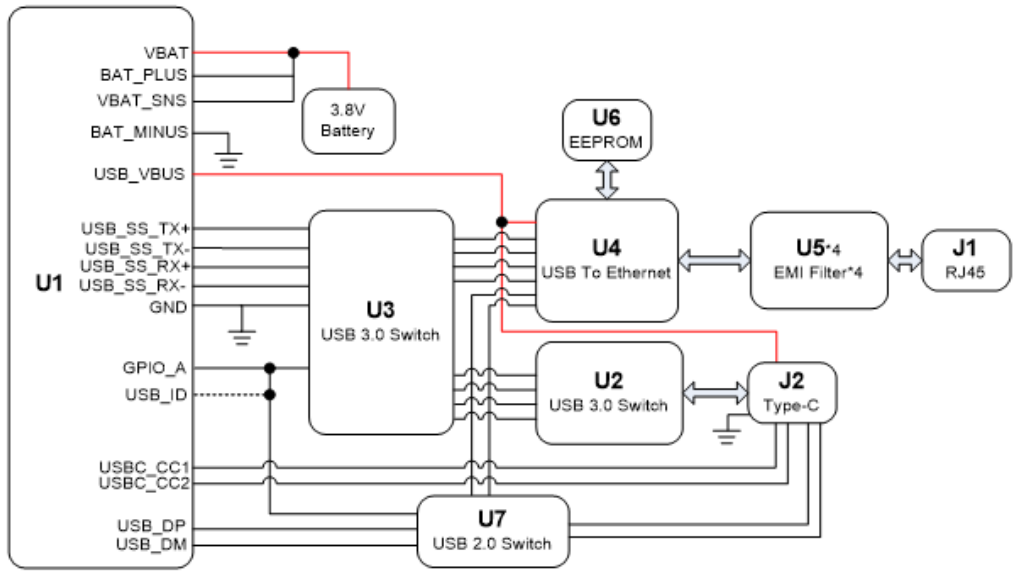


With external MIPI DSI to HDMI conversion chipset, HDMI display can be supported by smart modules.

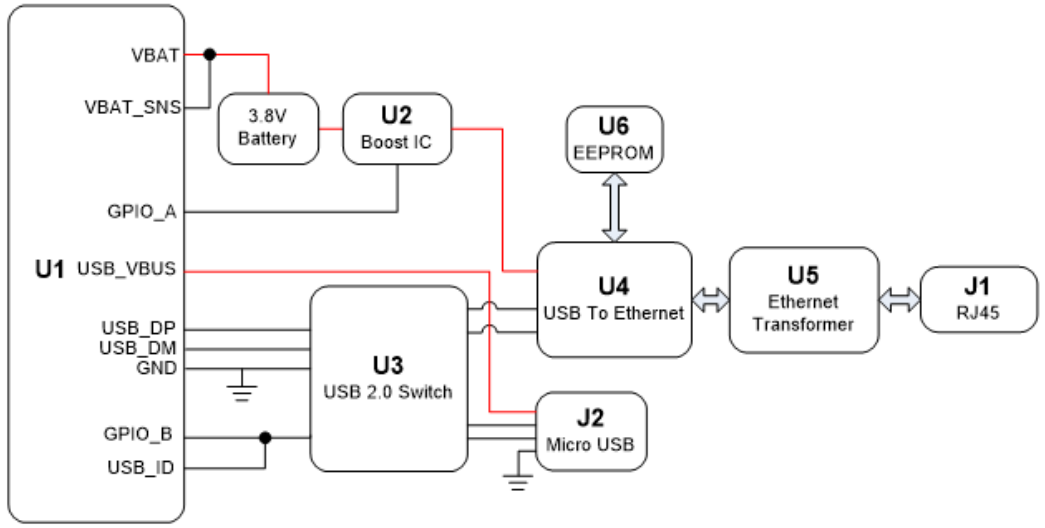
Extensive Function – USB to Ethernet

Smart modules have no Ethernet interface, while the USB can be converted to Ethernet when the smart modules work in Host mode. External conversion chipset is needed for the conversion.

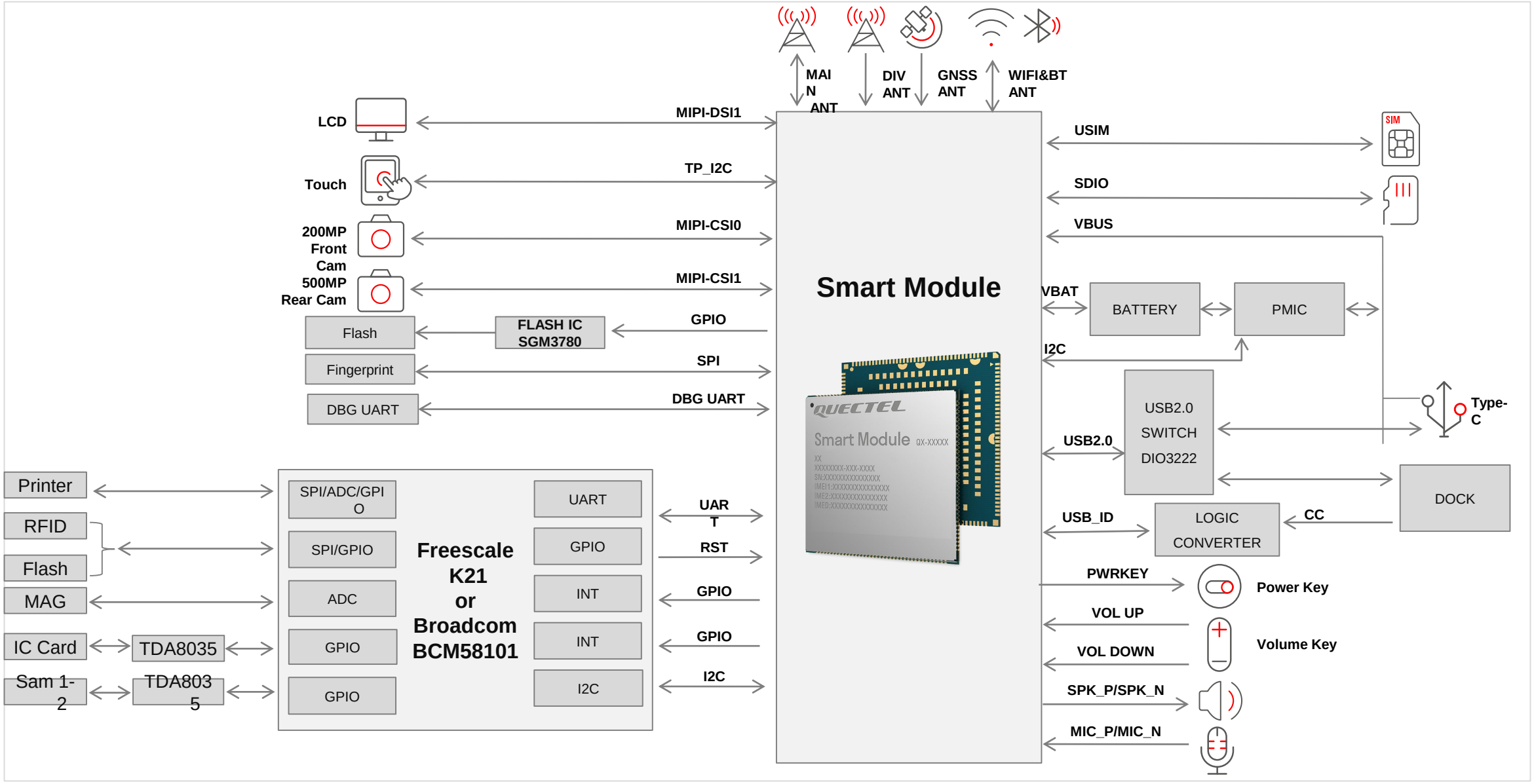
USB 3.0 to 10/ 100/ 1000M Ethernet



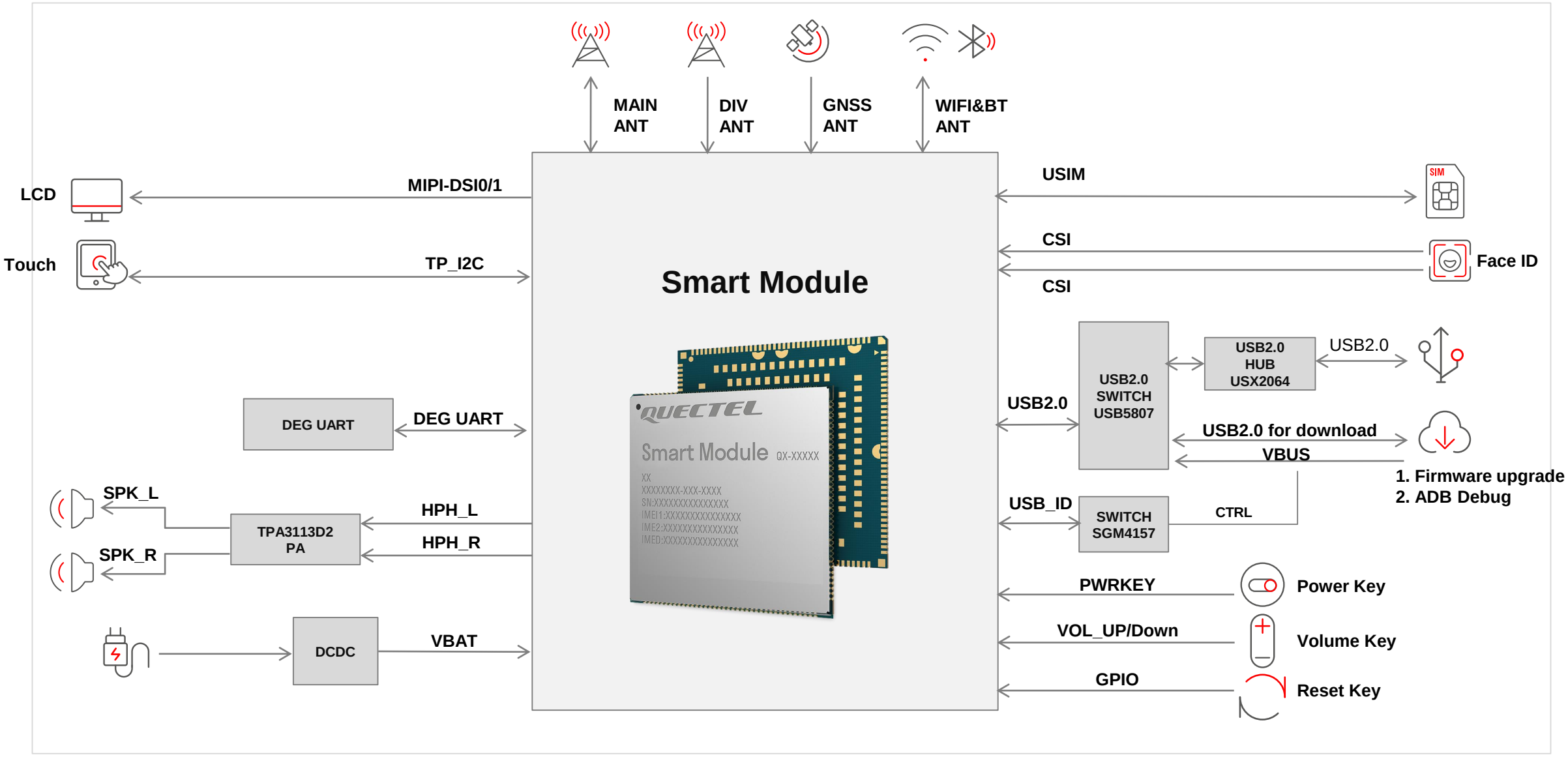
USB 2.0 to 10/ 100M Ethernet



Typical Solution – POS



Typical Solution – Access Control



Support Package

EVB

SMARTEVBG5-INT-KIT: SC696S

Smart Solution Introduction

Smart Module Portfolio

Specifications & Timelines

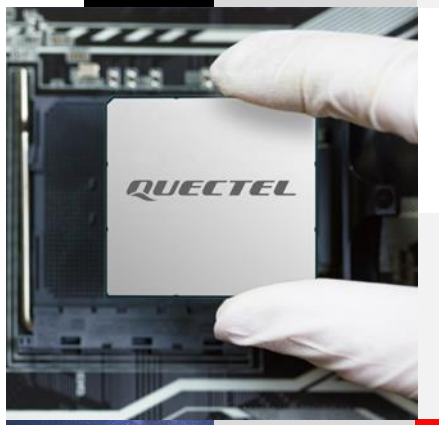
Enhancements

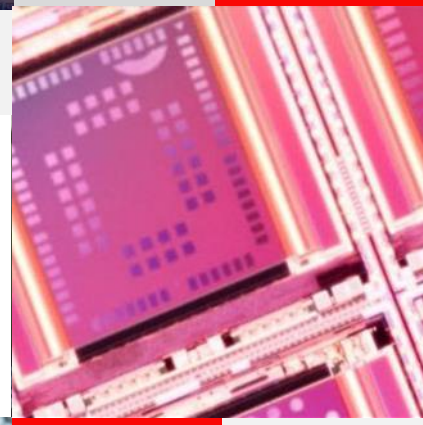
Typical Applications

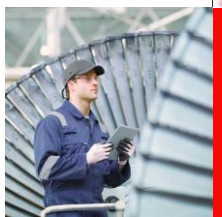
Customer Support

Appendix

Build a Smarter World

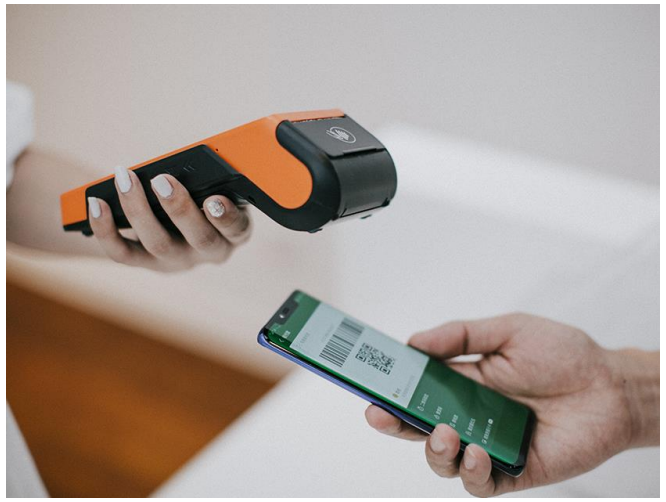






Retail

POS and Payment Terminal



Vending Machine

Electronic Cash Register and Kiosk

Configuration

- Magnetic strip cards, IC cards, contactless/ NFC, 1D & 2D codes reader
- Android
- Processor: Quad-Core or Octa-Core
- Memory: eMCP, 1 GB + 8 GB or higher
- Camera: 2 MP or higher
- Display: HD with touchscreen
- 5G/ 4G/ 3G/ Wi-Fi/ Bluetooth/ GNSS
- SAM, SIM Cards
- Audio
- USB ports

Recommended Smart Modules

Industrial Handheld

Different Industrial Applications

- Retail
- Transportation
- Manufacturing
- Field Mobility
- Warehouse Management
- Hospitality

Configuration

- Android
- Processor: Quad-Core or Octa-Core CPU
- Memory: 2 GB + 16 GB or higher
- Camera: 20 MP or higher pixel cameras
- Display: 5'' HD with touch or higher
- 5G/ 4G/ 3G/ Wi-Fi/ Bluetooth/ GNSS
- RFID
- Scanner
- Audio
- Battery
- IP Sealing: IP68
- TUMBLE: Meet IEC tumble spec
- Drop: Multiple 1.8 m drops to concrete per MIL STD 810H

Recommended Smart Modules

Vehicle Aftermarket — Infotainment & DashCam

Smart modules provide flexible, reliable, safe, and secure integration for In-Vehicle Infotainment and DashCam products.

Supported functionalities

- 360 reversing camera
- Voice recognition
- Real time navigation
- App store
- Multi-view
- CarPlay

Configuration

- Android
- Processor: Quad-Core or Octa-Core CPU
- Memory: 2 GB + 16 GB or higher
- Camera: AHD 2 M or higher pixel reversing cameras
- Display:10’’ HD with touch
- 5G/ 4G/ 3G/ Wi-Fi/ Bluetooth/ GNSS
- DSP audio, speaker power amplifier, Mic
- 360 cameras input
- CAN bus protocol interface
- USB ports spec

Recommended Smart Modules

Vehicle Aftermarket — 2-Wheeler, Small Electric Car

Supported functionalities

- Real time navigation
- Music
- Voice recognition
- Call

Configuration

- Android
- Processor: Quad-Core or Octa-Core CPU
- Memory: 2 GB + 16 GB or higher
- Display: 7’’ HD with touch
- 4G/ Wi-Fi/ Bluetooth/ GNSS
- Speaker, Mic
- USB ports
- Mileage: 80–100 km
- Battery: 48 V or higher

Recommended Smart Modules

Livestreaming and Video Conferences

Live shopping and B2B live broadcast have become the new normal of world's e-commerce development. Video conference system enables people to join the meeting remotely just the same as the off-line meeting. Smart modules provide the premium system performance and are very suitable to be the platforms to design these types of products.

Supported functionalities

- Multi-function
- Mic
- Virtual background
- Multi app
- Multi shot switching
- App store

Configuration

- Android
- Processor: Octa-Core CPU
- Memory: 8 GB + 256 GB or higher
- Camera: 21 M or higher pixels
- Video: 4 K,1080p
- TOPS: 3.5–12.5 TOPS
- Display: 10'',32/43'' with touch
- 4G/ Wi-Fi/ Bluetooth/ GNSS
- Speaker, Mic
- Remote control

Recommended Smart Modules

Robotics

Application Scenarios

- Reception
- Airport guider
- Bank guider
- Lawn mower
- Hospital guider
- Hotel reception
- Logistics

Configuration

- Android or Linux
- Processor: Octa-Core CPU
- TOPS: 3.5–12.5 TOPS
- Memory: 8 GB + 256 GB or higher
- Camera: 21 M or higher pixels
- Video: 4K,1080p, 720p
- Display: 10’’ or larger with touch
- 4G/ Wi-Fi/ Bluetooth/ GNSS
- Speaker, Mic
- Battery
- Machinery parts

Recommended Smart Modules

AR/ VR

Augmented Reality

Augmented reality overlays computer-generated images on the view of the natural world with the camera on smart phones, tablets, or other mobile devices. Quectel works hard to bring the vision of lightweight and stylish AR glasses to life.

Virtual Reality

Through cutting-edge graphics, best-in-class hardware, and artistically rendering experiences, VR lets us explore new worlds, defy obstacles. VR has enormous potential to transform how we play, work, learn, communicate, and experience the world around us.

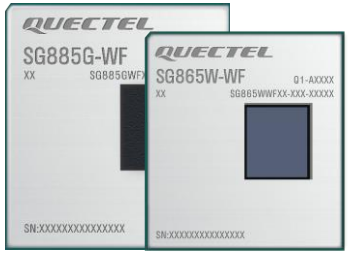
3D Scanner

3D measurement scanners can measure cross-sections, thickness, and perform GD&T measurements in a single scan.

Configuration

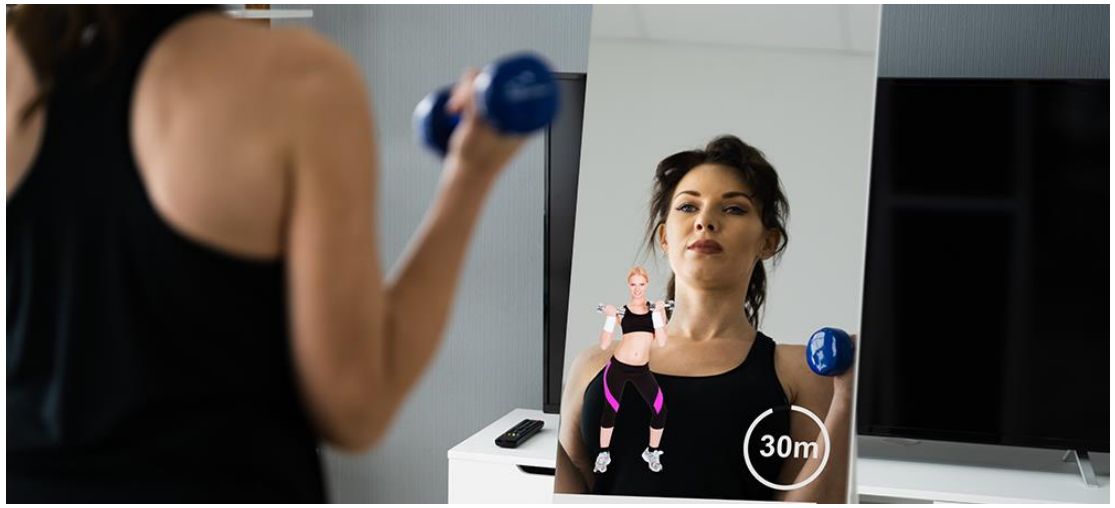
- Android or Linux
- Memory: 8 GB + 64 GB or higher
- TOPS: 12.5 TOPS

Recommended Smart Modules



Intelligent Fitness Mirror

Intelligent fitness mirror is the product of home fitness needs. It can play fitness course videos and the virtual coaches can correct users' fitness movements in real time.



Installation method and supported functionalities

Floor standing

Wall mount

Full HD IPS

Touch

Infrared sensor

Camera

Configuration

- Android
- Processor: Octa-Core CPU
- Memory: 4 GB + 64 GB or higher
- Camera: 21 M or higher pixels
- Video: 4K,1080p
- TOPS: 3.5–12.5 TOPS
- Display: 43'' or 55'' with touch
- Wi-Fi/ Bluetooth
- Speaker, Mic
- Adapter
- Machinery parts

Recommended Smart Modules

ARM Based SoC Array Server

Mobile applications mushroom and the demands for end-cloud architecture increase with the rapid development of mobile Internet. The ARM based SoC array server, instead of the traditional x86 architecture, can be well compatible with mobile applications since most mobile applications are developed based on the ARM architecture.

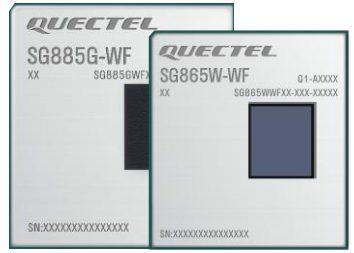
Application Scenarios

- Cloud game
- Distributed computing
- Cloud mobile phone
- Distributed storage
- Edge computing
- Operation management

Configuration

- Android or Linux
- ARM Based SoC Array Server
- Memory: 8 GB + 64 GB or higher
- Blade quantity: 16
- Net work: 1 Gbps or higher
- TOPS: 12.5 TOPS
- Power supply: AC 100–240 V
- Heat dissipation: Fan or Sink

Recommended Smart Modules



Smart Solution Introduction

Smart Module Portfolio

Specifications & Timelines

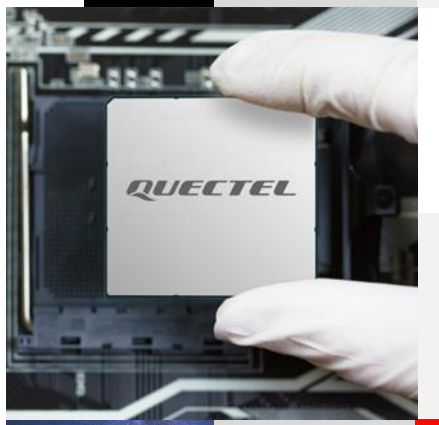
Enhancements

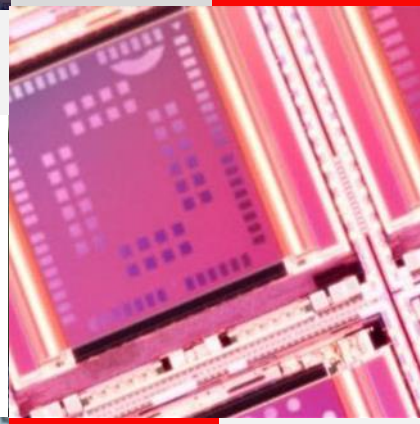
Typical Applications

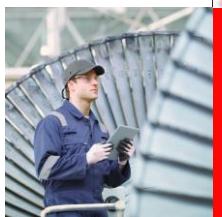
Customer Support

Appendix

Build a Smarter World



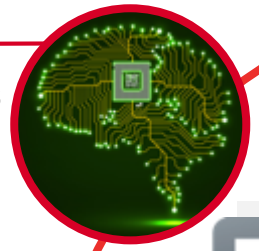




360 Degree Support

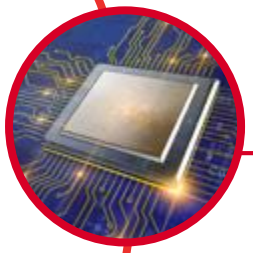
1. System Evaluation

- Analyzing customer requirements
- Recommending the right module for the customer
- Evaluating antenna placement
- Designing antennas



2. Design In

- Recommending referenced hardware designs
- Checking schematics and layouts
- Providing software design support



3. Prototype

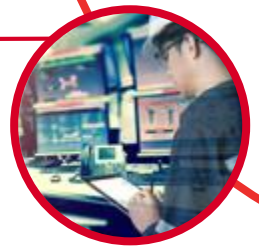
- Providing design validation testing
- Recommending suppliers

4. Testing Service

- RF testing
- Power consumption testing
- Audio testing
- Reliability & environmental testing
- ESD testing
- Certification testing
- Antenna debugging

5. Mass Production

- Providing assembly and testing guidelines
- Providing after-sales services



Smart Solution Introduction

Smart Module Portfolio

Specifications & Timelines

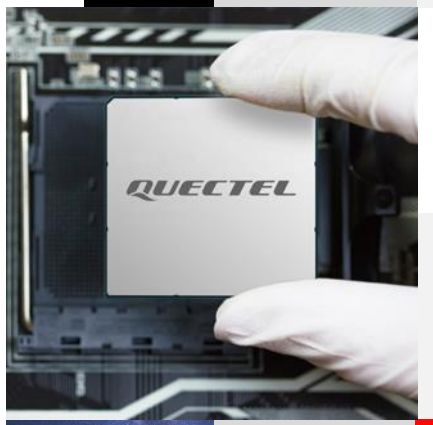
Enhancements

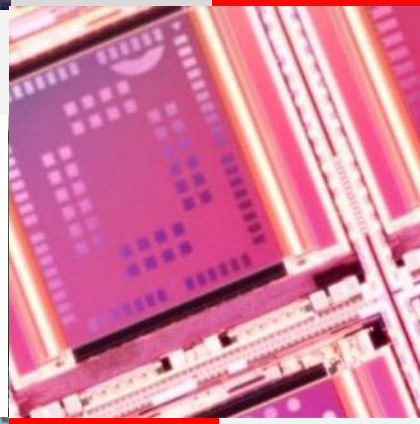
Typical Applications

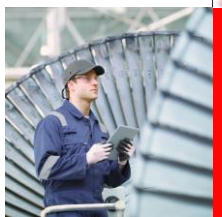
Customer Support

Appendix

Build a Smarter World







Entry Level Features & Comparison

	Entry Level					
Item	**SC20 Series**	**SC200R Series**	**SC200E Series**	**SC206E Series**	**SC200L Series**	**SG150H Series**
Dimensions	40.5 × 40.5 × 2.8 mm	40.5 × 40.5 × 2.85 mm	40.5 × 40.5 × 2.85 mm	40.5 × 40.5 × 2.85 mm	40.5 × 40.5 × 2.85 mm	35 × 31 × 2.65 mm
Form-factor	LCC + LGA	LCC + LGA	LCC + LGA	LCC + LGA	LCC + LGA	LGA
SKUs	-CE/ -E/ -A/ -AU/ -J/ -W/ -EL/ -EX/ -AL/ -AX/ -WL	-CE/ -EM/ -NA/ -WF/ -JP①	-CE/ -EM/ -NA/ -WF /-JP/ -GL	-EM/ -NA/ -WF/ -GL	-CE/ -EU/ -AU/ -WF	-EU/ -AU
Memory	1 GB + 8 GB/ 2 GB + 16 GB	1 GB + 8 GB/ 2 GB +16 GB	2 GB + 16 GB / 3 GB + 32 GB	2 GB + 16 GB / 3 GB + 32 GB	1 GB + 8 GB/ 2 GB +16 GB	256 MB LPDDR2 + 512 MB NAND
Platform	MSM8909	QCM2150	QCM2290	QCM2290	SL8541E	SL8521E
Process	28 nm	28 nm	11 nm	11 nm	28 nm	28 nm
Modem	LTE Cat 4	LTE Cat 4	LTE Cat 4	LTE Cat 4	LTE Cat 4	LTE Cat 4
OS	Android 7.1/ 8.1/ Linux①	Android 10	Android 12/ 13/ 14②	Yocto Linux	Android 10	Yocto Linux
CPU	4 × A7 @ 1.1 GHz	4 × A53 @ 1.3 GHz	4 × A53 @ 2.0 GHz	4 × A53 @ 2.0 GHz	4 × A53 @ 1.4 GHz	2 × A53 @ 1.3 GHz
GPU	Adreno 304 @ 409.6 MHz	Adreno 308 @ 485 MHz	Adreno 702 @ 845 MHz	Adreno 702 @ 845 MHz	Mali-T820 MP1 @ 680 MHz	Mali-T820 MP1 @ 384 MHz
Display	1 × MIPI DSI HD (1280 × 720)	1 × MIPI DSI HD+ (1440 × 720)	1 × MIPI DSI HD+ (1680 × 720)	1 × MIPI DSI HD+ (1680 × 720)	1 × MIPI DSI HD+ (1440 × 720)	1 × MIPI DSI: 640 × 480 SPI: 320 × 240
Camera	1 × ISP Max. 8 MP @ 1 × ISP	2 × ISP 8 MP @ 1 × ISP + 8 MP @ 1 × ISP Max. 13 MP @ 2 × ISP	2 × ISP 13 MP @ 1 × ISP + 13 MP @ 1 × ISP Max. 25 MP @ 2 × ISP	2 × ISP 13 MP @ 1 × ISP + 13 MP @ 1 × ISP Max. 25 MP @ 2 × ISP	1 × ISP Max. 8 MP + 2 MP	1 × ISP Max. 5 MP
Video	**Encode:** 720p30, H.264 **Decode:** 1080p30, H.264, H.265	**Encode:** 1080p30, H.264 **Decode:** 1080p30, H.264, H.265	**Encode/ Decode:** 1080p30, H.264, H.265	**Encode/ Decode:** 1080p30, H.264, H.265	**Encode:** 1080p30, H.264 **Decode:** 1080p30, H.264, H.265	**Encode:** 720p30, H.264 **Decode:** 720p30, H.264
Bluetooth	Bluetooth 4.2/ BLE	Bluetooth 4.2/ BLE	Bluetooth 5.0/ BLE	Bluetooth 5.0/ BLE	Bluetooth 5.0/ BLE	Bluetooth 4.2/ BLE
Wi-Fi	2.4 & 5 GHz, 802.11a/ b/ g/ n	2.4 & 5 GHz, 802.11a/ b/ g/ n	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 GHz, 802.11a/ b/ g/ n
GNSS	GPS/ GLONASS/ BDS	GPS/ GLONASS/ BDS/ Galileo	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS/ NavIC (supported by SC200E-NA)	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS/ NavIC (supported by SC206E-NA)	GPS/ GLONASS/ BDS	GPS/ GLONASS or GPS/ BDS
USB	1 × USB 2.0	1 × USB 2.0	1 × USB 2.0/ 3.1 (Type-C)	1 × USB 2.0/ 3.1 (Type-C)	2 × USB 2.0	1 × USB 2.0
Lifetime	2025	2028	2028	2028	2027	2027
Antutu(V6.3.3) benchmark	21,036 (AOS 7.1, 1 + 8 GB) 26,945 (AOS 7.1, 2 + 16 GB)	35,115 (AOS 10, 1 + 8 GB) 35,940 (AOS 10, 2 + 16 GB)	58,766 (AOS 12, 3 + 32 GB, 69, 139 if test with Antutu V7.2.8)	-	35,101 (AOS 10, 1 + 8 GB) 35,195 (AOS 10, 2 + 16 GB)	TBD

①: SC20-EL/ -EX/ -AL/ -AX/ -WL are variants with Yocto Linux OS inside. ②: TBD.

Medium Level Features & Comparison

	Medium Level			
Item	**SC600Y Series**	**SC680A Series**	**SC686A Series**	**SC200K Series**
Dimensions	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85mm	40.5 × 40.5 × 2.85 mm
Form-factor	LCC + LGA	LCC + LGA	LCC + LGA	LCC + LGA
SKUs	-EM/ -NA/ -JP/ -WF	-EM/ -NA/ -WF/ -JP①	-EM/ -NA/ -WF	-CE/ -WF/ -EU①
Memory	2 GB + 16 GB	4 GB + 64 GB/ 3 GB + 32 GB/ 8 GB + 128 GB	2 GB + 16 GB	2 GB + 32 GB/ 3 GB + 32 GB/ 4 GB + 64 GB
Platform	SDM450	QCM4290	QCM4290	UIS8581E
Process	14 nm	11 nm	11 nm	28 nm
Modem	LTE Cat 6	LTE Cat 6	LTE Cat 6	LTE Cat 4
OS	Android 9/ 10	Android 12/ 13*/ 14①	Yocto Linux	Android 10
CPU	8 × A53 @ 1.8 GHz	4 × Kryo Gold 260 @ 2.0 GHz + 4 × Kryo Silver 260 @ 1.8 GHz	4 × Kryo Gold 260 @ 2.0 GHz + 4 × Kryo Silver 260 @ 1.8 GHz	4 × A55 @ 1.6 GHz 4 × A55 @ 1.2 GHz
GPU	Adreno 506 @ 600 MHz	Adreno 610 @ 950 MHz	Adreno 610 @ 950 MHz	GE8322 @ 550 MHz
Display	2 × MIPI DSI WUXGA (1920 × 1200) FHD (1920 × 1080)	1 × MIPI DSI FHD+ (1080 × 2520)	1 × MIPI DSI FHD+ (1080 × 2520)	1 × MIPI DSI FHD+ (2160 × 1080)
Camera	2 × ISP 13 MP @ 1 × ISP + 13 MP @ 1 × ISP Max. 21 MP @ 2 × ISP	3 × ISP 13 MP @ 1 × ISP + 13 MP @ 1 × ISP Max. 25 MP @ 2 × ISP	3 × ISP 13 MP @ 1 × ISP + 13 MP @ 1 × ISP Max. 25 MP @ 2 × ISP	2 × ISP 13 MP @ 1 × ISP + 5 MP @ 1 × ISP Max. 16 MP @ 2 × ISP
Video	**Encode/ Decode:** 1080p60, H.264, H.265	**Encode/ Decode:** 1080p60, H.264, H.265	**Encode/ Decode:** 1080p60, H.264, H.265	**Encode/ Decode:** 1080p30, H.264, H.265
Bluetooth	Bluetooth 4.2/ BLE	Bluetooth 5.1/ BLE	Bluetooth 5.1/ BLE	Bluetooth 5.0/ BLE
Wi-Fi	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac/ ax-ready	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac
GNSS	GPS/ GLONASS/ BDS/ Galileo	GPS/ GLONASS/ BDS/ Galileo/ NavIC/ QZSS/ SBAS	GPS/ GLONASS/ BDS/ Galileo/ NavIC/ QZSS/ SBAS	GPS/ GLONASS/ BDS
USB	1 × USB 2.0/ 3.0 (Type-C)	1 × USB 2.0/ 3.1 (Type-C)	1 × USB 2.0/ 3.1 (Type-C)	2 × USB 2.0
Lifetime	2025	2028	2028	2027
Antutu(V7.2.8) benchmark	72,427 (AOS 9, 2 + 16 GB) 74,216 (AOS 10, 2 + 16 GB)	141,064 (AOS 12, 4 + 64 GB)	-	99,553 (AOS 10, 2 + 32 GB, tested with Antutu V8.4.6, about equivalent to 76,861 with Antutu V7.2.8)

* : Under development/ in progress/ planning. ①: TBD (To be determined).

High Level Features & Comparison

	High Level					
Item	**SC600T Series**	**SC606T Series**	**SC66 Series**	**SC668S Series**	**SC696S Series**	**SG560D Series**
Dimensions	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85 mm	43.0 × 44.0 × 2.85 mm	42.5 × 56.5 × 2.95 mm
Form-factor	LCC + LGA	LCC + LGA	LCC + LGA	LCC + LGA	LCC + LGA	LGA
SKUs	-EM/ -NA/ -JP/ -WF	-EM/ -NA/ -JP①/ -WF	-CE/ -E/ -A/ -J/ -MW	-CN/ -EM/ -NA/ -JP①/ -WF	-EM/ -NA/ -WF	-CE*/ -EM*/ -NA*/ -WF
Memory	2 GB + 16 GB	2 GB + 16 GB	3 GB + 32 GB/ 4 GB + 64 GB	3 GB + 32 GB/ 4 GB + 64 GB	2 GB + 16 GB	4 GB + 64 GB
Platform	MSM8953	MSM8953	SDM660	QCM6125	QCM6125	QCM6490
Process	14 nm	14 nm	14 nm	11 nm	11 nm	6 nm
Modem	LTE Cat 6	LTE Cat 6	LTE Cat 6	LTE CAT 4	LTE CAT 4	5G & LTE Cat 18
OS	Android 9/ 10	Yocto Linux	Android 9/ 10	Android 10/ 11/ 13	Yocto Linux	Android 12/ 13*/ 14①/ 15①/ 16①
CPU	8 × A53 @ 2.0 GHz	8 × A53 @ 2.0 GHz	4 × Kryo Gold 260 @ 2.2 GHz + 4 × Kryo Silver 260 @ 1.8 GHz	4 × Kryo Gold 260 @ 2.0 GHz + 4 × Kryo Silver 260 @ 1.8 GHz	4 × Kryo Gold 260 @ 2.0 GHz + 4 × Kryo Silver 260 @ 1.8 GHz	1 × Kryo Gold Plus @ 2.7 GHz + 3 × Kryo Gold @ 2.4 GHz + 4 × Kryo Silver @ 1.9 GHz
GPU	Adreno 506 @ 650 MHz	Adreno 506 @ 650 MHz	Adreno 512 @ 650 MHz	Adreno 610 @ 950 MHz	Adreno 610 @ 950 MHz	Adreno 643 @ 812 MHz
Display	2 × MIPI DSI,WUXGA (1920 × 1200), FHD (1920 × 1080)	2 × MIPI DSI,WUXGA (1920 × 1200), FHD (1920 × 1080)	2 × MIPI DSI, WQXGA (2560 × 1600) WQXGA (2560 × 1600)	1 × MIPI DSI, WUXGA(1920 × 1200)/ 1080 × 2520	1 × MIPI DSI, WUXGA(1920 × 1200)/ 1080 × 2520	MIPI: 1200 × 2520 @ 144 fps & DP: 4K (3840 × 2160) @ 60 fps Wi-Fi：4K @ 60fps
Camera	2 × ISP,13 MP @ 1 × ISP + 13 MP @ 1 × ISP, Max. 24 MP @ 2 × ISP	2 × ISP,13 MP @ 1 × ISP + 13 MP @ 1 × ISP, Max. 24 MP @ 2 × ISP	2 × ISP,16 MP @ 1 × ISP + 16 MP @ 1 × ISP, Max. 24 MP @ 2 × ISP	2 × ISP, 16 MP @ 1 × ISP + 16 MP @ 1 × ISP, Max. 24 MP @ 2 × ISP	2 × ISP, 16 MP @ 1 × ISP + 16 MP @ 1 × ISP, Max. 24 MP @ 2 × ISP	4 × 4-lane MIPI CSI, Supports up to 2.5 Gbps/ lane; 3 × ISP, 3 × 27 MP @ 24 fps; or 3 × 22MP @ 30 fps ; or 36 MP + 27 MP @24 fps; or 36MP + 22MP @ 30 fps; or Max. 1 × 64 MP @ 30 fps
Video	**Encode/ Decode:** 4K30, 1080p60, H.264, H.265	**Encode/ Decode:** 4K30, 1080p60, H.264, H.265	**Encode/ Decode:** 4K30, 1080p60, H.264, H.265	**Encode/ Decode:** 4K30, 1080p60, H.264, H.265	**Encode/ Decode:** 4K30, 1080p60, H.264, H.265	**Encode:** 4K (H.264/ H.265) @ 30 fps **Decode:** 4K (H.264/ H.265/ VP9) @ 60 fps
Bluetooth	Bluetooth 4.2/ BLE	Bluetooth 4.2/ BLE	Bluetooth 5.0/ BLE	Bluetooth 5.0/ BLE	Bluetooth 5.0/ BLE	Bluetooth 5.2
Wi-Fi	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz, 2 × 2 MIMO 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz 802.11a/ b/ g/ n/ ac	2.4 & 5 GHz 802.11a/ b/ g/ n/ ac	2.4 & 5 & 6 GHz, 2 × 2 MU-MIMO 802.11a/ b/ g/ n/ ac/ ax, Wi-Fi 6E
GNSS	GPS/ GLONASS/ BDS/ Galileo	GPS/ GLONASS/ BDS/ Galileo	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ SBAS	GPS/ GLONASS/ BDS/ NavIC/ Galileo/ QZSS/ SBAS
USB	1 × USB 2.0/ 3.0 (Type-C)	1 × USB 2.0/ 3.0 (Type-C)	1 × USB 3.1 (DP over Type-C) + 1 × USB 2.0	1 × USB 2.0/ 3.1 (Type-C/ Native DP)	1 × USB 2.0/ 3.1 (Type-C/ Native DP)	1 × USB 3.1 (DP over Type-C) + 1 × USB 2.0
PCIe	-	-	-	-	-	1 × 2-lane PCIe Gen 3
Lifetime	2025	2025	2025	2028①	2028①	2028
Antutu(V7.2.8) benchmark	80,712 (AOS 9, 2 + 16 GB) 82,273 (AOS 10, 2 + 16 GB)	-	141,958 (AOS 10, 3 + 32 GB) 142,754 (AOS 10, 4 + 64 GB)	140,546 (AOS 10, 4 + 64 GB)	-	398,155 (AOS 12, 4 + 64 GB. will be 547,276 when tested with Antutu V9.3.5)

* : Under development/ in progress/ planning. ①: TBD (To be determined).

Premium Level Features & Comparison

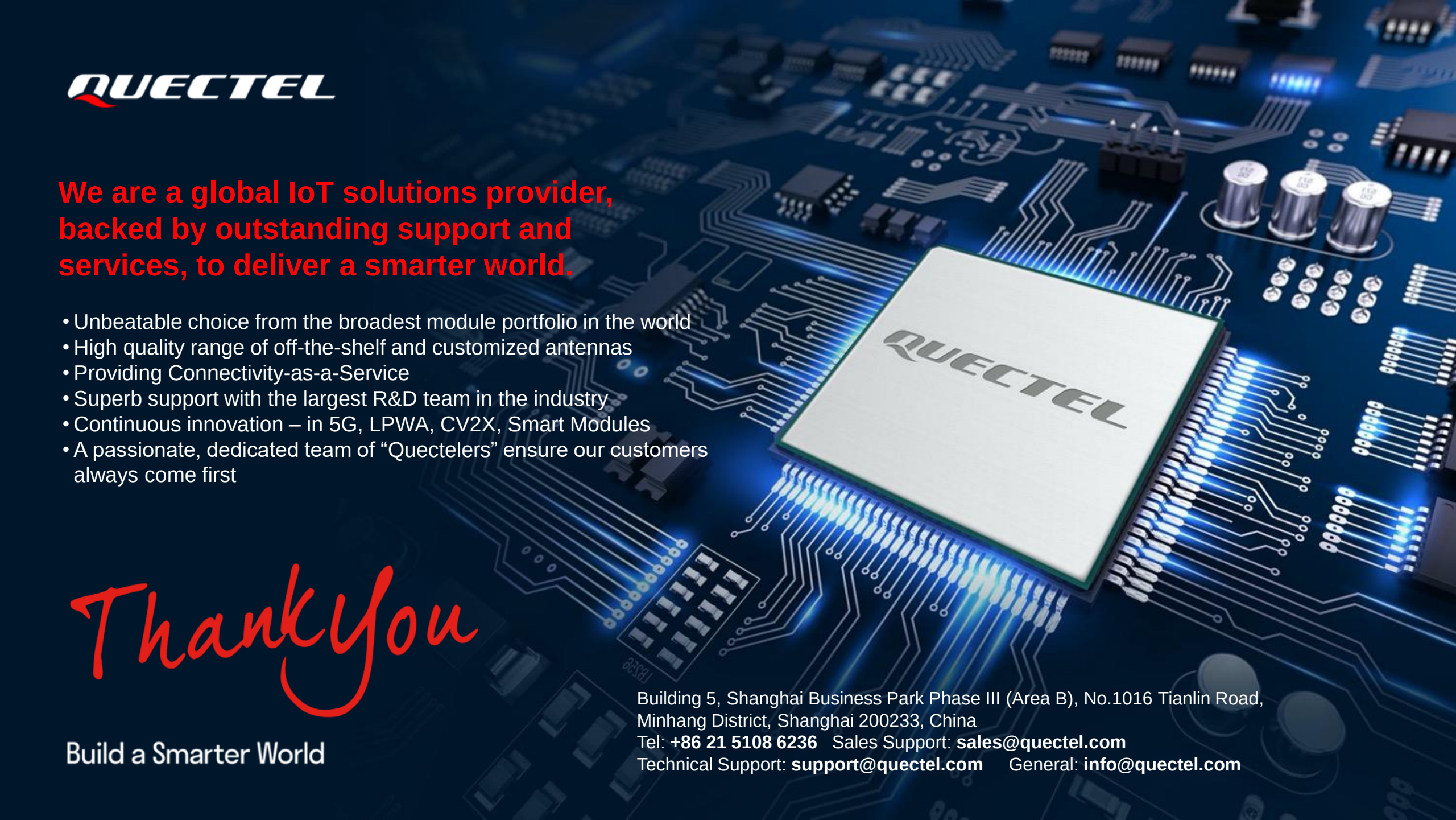
	Premium Level	
Item	**SG865W-WF**	**SG885G-WF***
Dimensions	42.0 × 46.0 × 2.95 mm	49.0 × 51.0 × 4.25 mm
Form-factor	LGA	LGA
SKUs	-WF	-WF
Memory	8 GB + 64 GB/ 12 GB + 256 GB	12 GB + 256 GB
Platform	QCS8250	QCS8550
Process	7 nm	4 nm
Modem	Wi-Fi/ Bluetooth only	Wi-Fi/ Bluetooth only
OS	Android 10/ Ubuntu 18.04	Android 13*
CPU	1 × Kryo 585 Gold prime @ 2.842 GHz + 3 × Kryo 585 Gold @ 2.419 GHz + 4 × Kryo 585 Silver @ 1.805 GHz	1 × Kryo Gold prime @ 3.2 GHz + 4 × Kryo Gold @ 2.8 GHz + 3 × Kryo Silver @ 2.0 GHz
GPU	Adreno 650 @ 587 MHz	Adreno 740
NPU	NPU230	Dual eNPU V3
DSP	Compute Hexagon DSP with: • 4 × HVX Vector co-processor • Other Hexagon coprocessor	Compute Hexagon DSP with: • 4 × HVX Vector co-processor optimized for pixel processing • 1 × HMX Matrix co-processor optimized for deep neural network processing • Other Hexagon coprocessor
Display	Adreno DPU 995 2 × MIPI DSI + 1 × DP (MST Mode), 4K (5040 × 2160)	Adreno DPU 1295 2 × 4-lane MIPI DSI (3480 × 2160 at 120 Hz, 3360 × 1600 at 144 Hz) + 2 × DP (MST Mode), 4K60
Camera	2 × ISP + 2 × Lite ISP 25 MP @ 1 × ISP + 25 MP @ 1 × ISP Max. 64 MP @ 2 × ISP	6 × 4-lane MIPI CSI, Connect up to 14x/20x cameras, 5x concurrent 3 × ISP + 2 × Lite ISP. some ZSL example are: (36 M + 36 M + 36 M) @ 30 fps - triple camera or (64 M + 36 M) @ 30 fps - dual camera or 108 M @ 30 fps - single camera
Video	**Encode:** 4K120/ 8K30, H.264, H.265, VP8, VP9 **Decode:** 4K240/ 8K60, H.264, H.265, VP8	**Encoder:** 4K120/ 8K30, H.265, H.264 **Decoder:** 4K240/ 8K60, H.265, H.264, VP9
Bluetooth	Bluetooth 5.1/ BLE	Bluetooth 5.3 (BR/ EDR + BLE)
Wi-Fi	2.4 & 5 GHz, 2 × 2 MIMO, 802.11a/ b/ g/ n/ ac/ ax, Wi-Fi 6	2.4 & 5 & 6 GHz, Wi-Fi 7, 802.11a/ b/ g/ n/ ac/ ax/ be, 2 × 2 Wi-Fi MIMO
USB	1 × USB 3.1 (DP over type-C) + 1 × USB 3.1	1 × USB 3.1 (DP over type-C)
PCIe	2 × 2-lane PCIe Gen 3	1 × 2-lane PCIe Gen 3 + 1 × 1-lane PCIe Gen 3
Lifetime	2029①	2030
Antutu(V7.2.8) benchmark	441,954 (AOS 10, 8 + 64 GB)	TBD

*: Under development/ in progress/ planning. ①: TBD (To be determined).

QUECTEL

We are a global IoT solutions provider, backed by outstanding support and services, to deliver a smarter world.

- Unbeatable choice from the broadest module portfolio in the world
- High quality range of off-the-shelf and customized antennas
- Providing Connectivity-as-a-Service
- Superb support with the largest R&D team in the industry
- Continuous innovation – in 5G, LPWA, CV2X, Smart Modules
- A passionate, dedicated team of “Quectelers” ensure our customers always come first



Thank You

Build a Smarter World

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road,
Minhang District, Shanghai 200233, China
Tel: **+86 21 5108 6236** Sales Support: **sales@quectel.com**
Technical Support: **support@quectel.com** General: **info@quectel.com**