



Build a smarter world

Quectel SG150H Series Smart Module

Product Overview



Duty of confidentiality

The Receiving Party shall keep confidential all documentation and information provided by Quectel, except when 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 of Quectel. For any non-compliance 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.

Contents

Smart module introduction	04
Specifications & timelines	10
Typical applications	14
Value-added services	18

Quectel smart module advantages



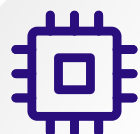
SoC platforms



Open Android or Linux



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



High-performance CPU/ GPU/
NPU/ DSP



Built-in Wi-Fi/ Bluetooth/ GNSS



Various multimedia functions:
LCD/ audio/ camera/ video



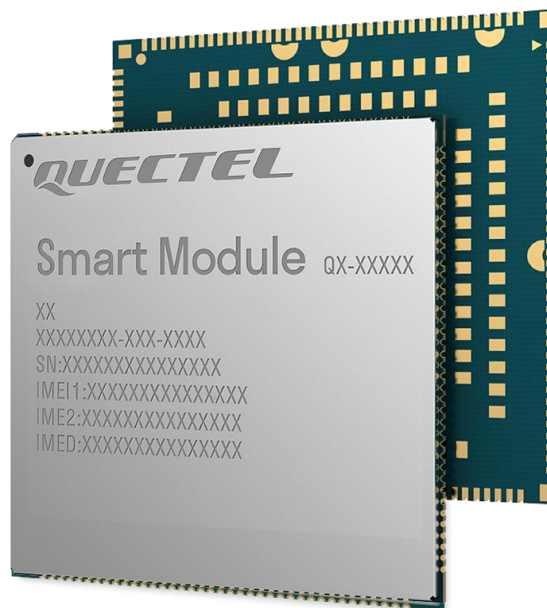
Abundant peripheral interfaces



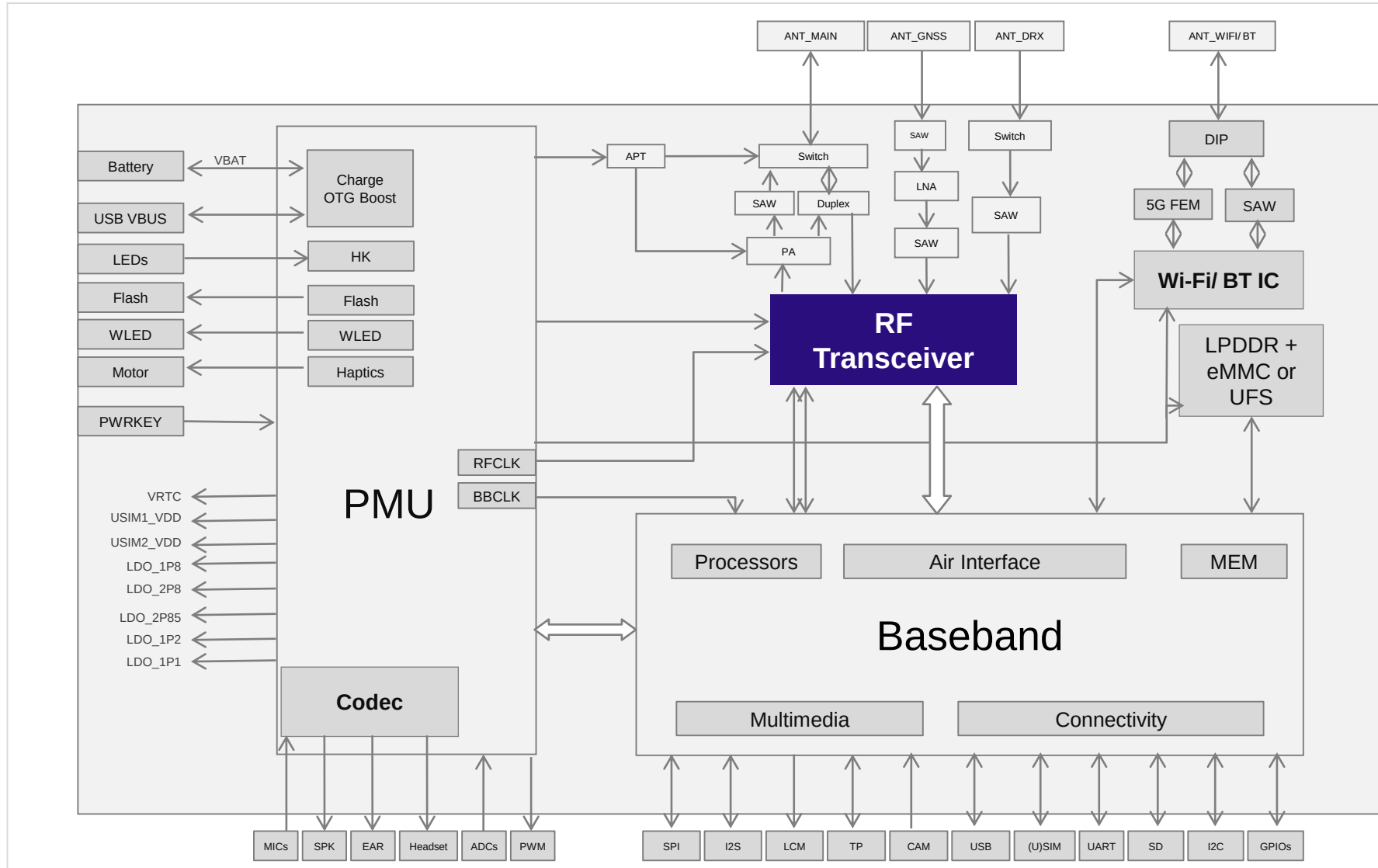
Global certifications



Excellent customer service



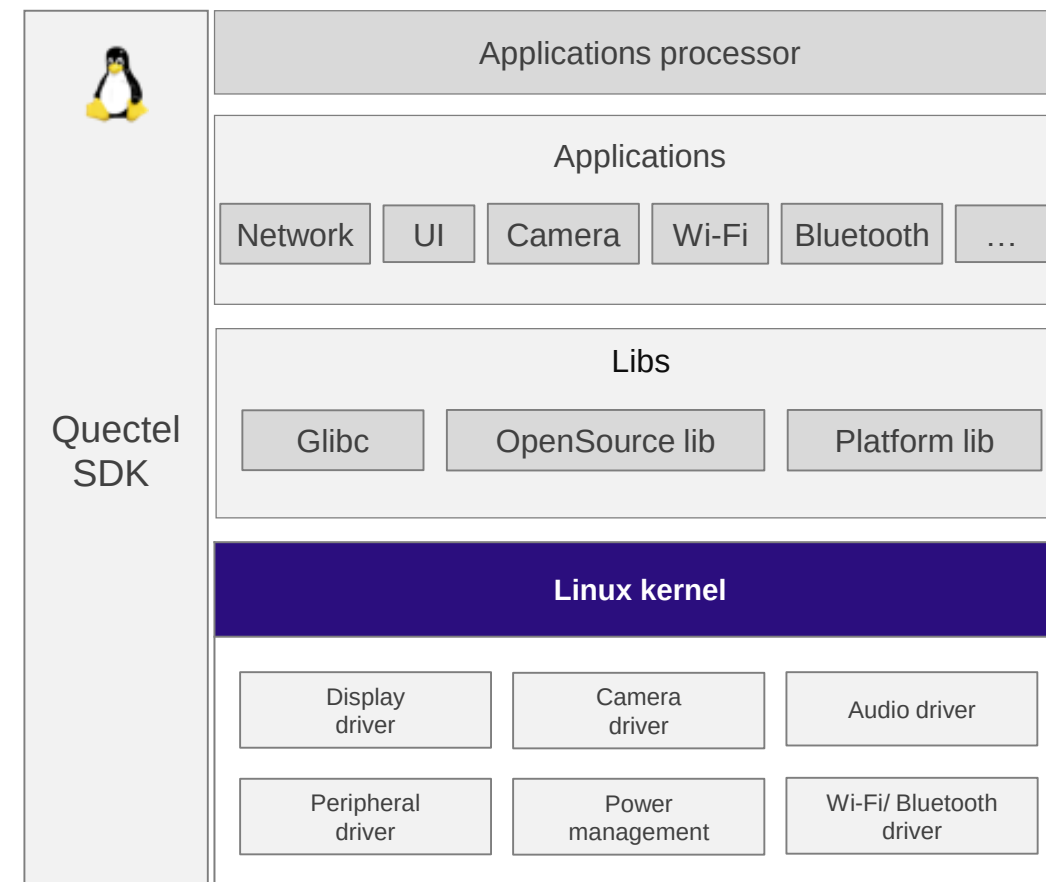
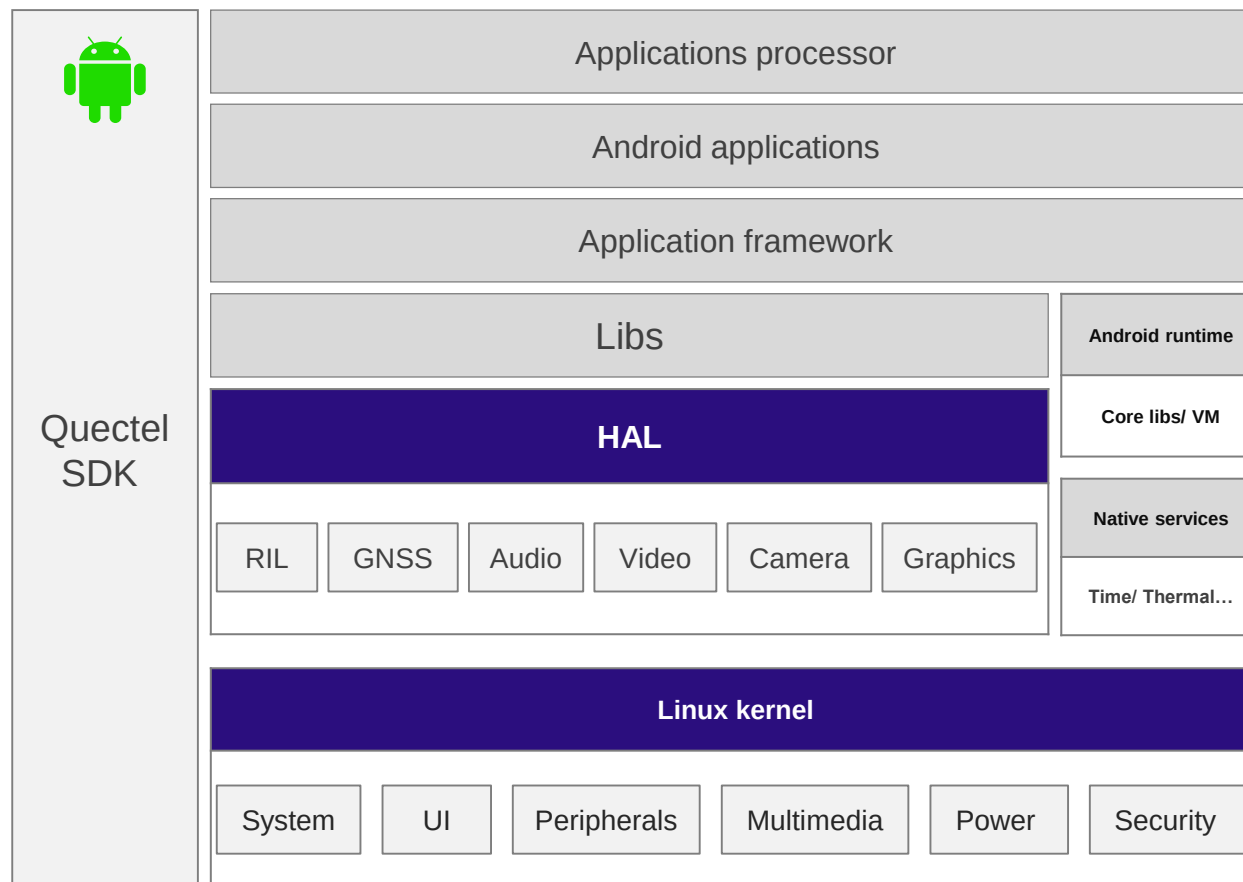
Smart module hardware block diagram



- 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

Smart module SDK

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



Smart module evaluation kit



Interfaces

- UART
- USB Type-C
- LCM
- Audio
- Camera
- SIM
- SD

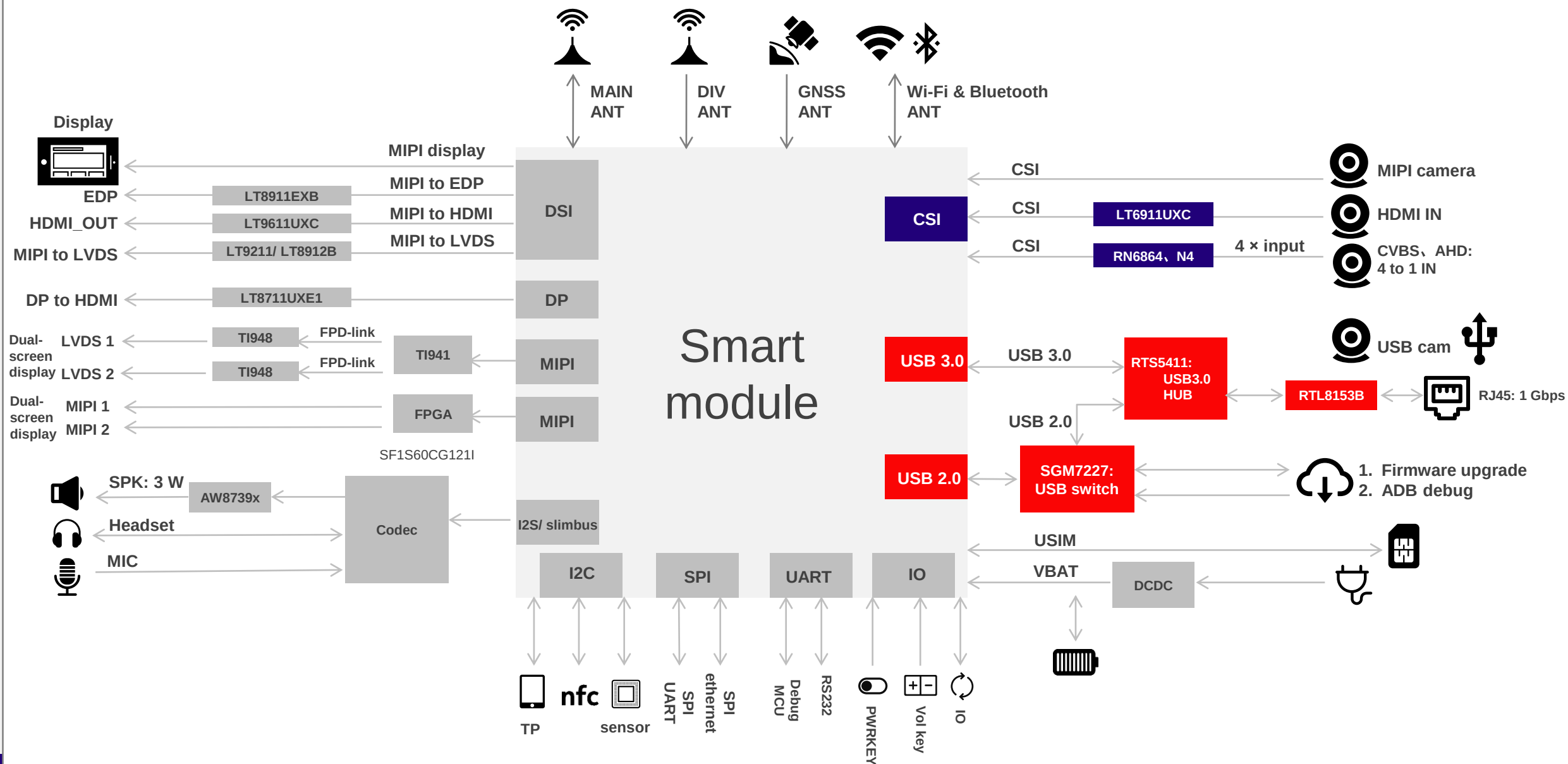
Accessories

- Antenna
- Earphone
- Adapter
- USB Type-C
- RF cables
- USB to UART cables
- U-disk

Reference documents

- Evaluation (main) board schematic
- TE-A (carrier) schematic
- Evaluation and TEA board BOM
- Smart module SDK

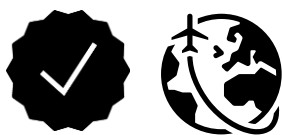
Customer hardware design based on smart module



Contents

Smart module introduction	04
Specifications & timelines	10
Typical applications	14
Value-added services	18

SG150H series highlights



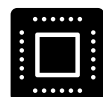
Multiple variants:
Multi-region variants, global certifications



LGA form factor : 35 × 31 × 2.65 mm



Linux OS:
Yocto Linux (kernel 4.14)



Chipset platform: SL8521E (Unisoc)
Powerful system performance, multimedia,
LTE Cat 4
Wi-Fi 4 (802.11b/ g/ n), Bluetooth, GNSS



Long life time:
Till the year of 2027

SG150H variants (pin-to-pin compatible)

Variants		SG150H-EU	SG150H-AU
Region		EMEA	Latin America/ Australia
LTE	LTE-FDD	B1/ 3/ 5/ 7/ 8/ 20	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 28
	LTE-TDD	B38/ 40/ 41	-
WCDMA		B1/ 5/ 8	B1/ 2/ 4/ 5/ 8
GSM/EDGE		900/ 1800 MHz	Quad-band
GNSS		GPS/ GLONASS or GPS/ BDS	GPS/ GLONASS or GPS/ BDS
Wi-Fi/ Bluetooth		Supported	Supported
Certification		CE	Anatel
Product stage		MP	MP

SG150H series features and interfaces

Key features		Interfaces	
CPU	SL8521E, dual-core ARM Cortex-A53 @ 1.3 GHz	LCM	MIPI DSI interface supports 640 × 480 SPI interface supports 320 × 240
GPU	Mali-T820 MP1 @ 384 MHz	Camera	One 2-lane MIPI CSI, 1 × ISP Supports up to 5 MP camera
Video	Encoding: 720P (H.264) @ 30 fps Decoding: 720P (H.264) @ 30 fps	Touch Panel	Capacitive touch panel, I2C controls
Memory	256 MB LPDDR2 + 512 MB NAND	Audio	Analog channels: 2 inputs: MIC1, MIC2 1 output: speaker
OS	Yocto Linux (kernel 4.14)	USB	× 1 USB 2.0, supports USB OTG
Wi-Fi	2.4 GHz, 802.11b/ g/ n	(U)SIM	× 2
Bluetooth	Bluetooth 2.1 + EDR/ 4.2 BLE	UART	× 3 One of them supports hardware flow control
GNSS	GPS/ GLONASS or GPS/ BDS	SD Card	× 2 SDIO • One general-purpose SDIO • One SDIO shared with SPI LCD
Modem	3GPP Release 10 compliant	I2C/ SPI/ ADC/ GPIO/ PWRKEY	Supported
Battery charge	Supported	Antenna	× 3 Main/ GNSS/ Wi-Fi & Bluetooth

Contents

Smart module introduction	04
Specifications & timelines	10
Typical applications	14
Value-added services	18

Smart POS, Payment Terminal



Cash Register, Vending Machine



Industrial PDA, Tablets & PTT



Contents

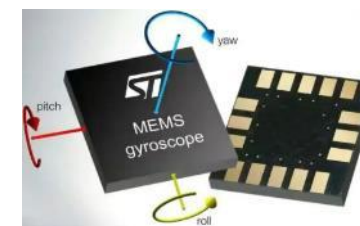
Smart module introduction	04
Specifications & timelines	10
Typical applications	14
Value-added services	18

Key components supply services

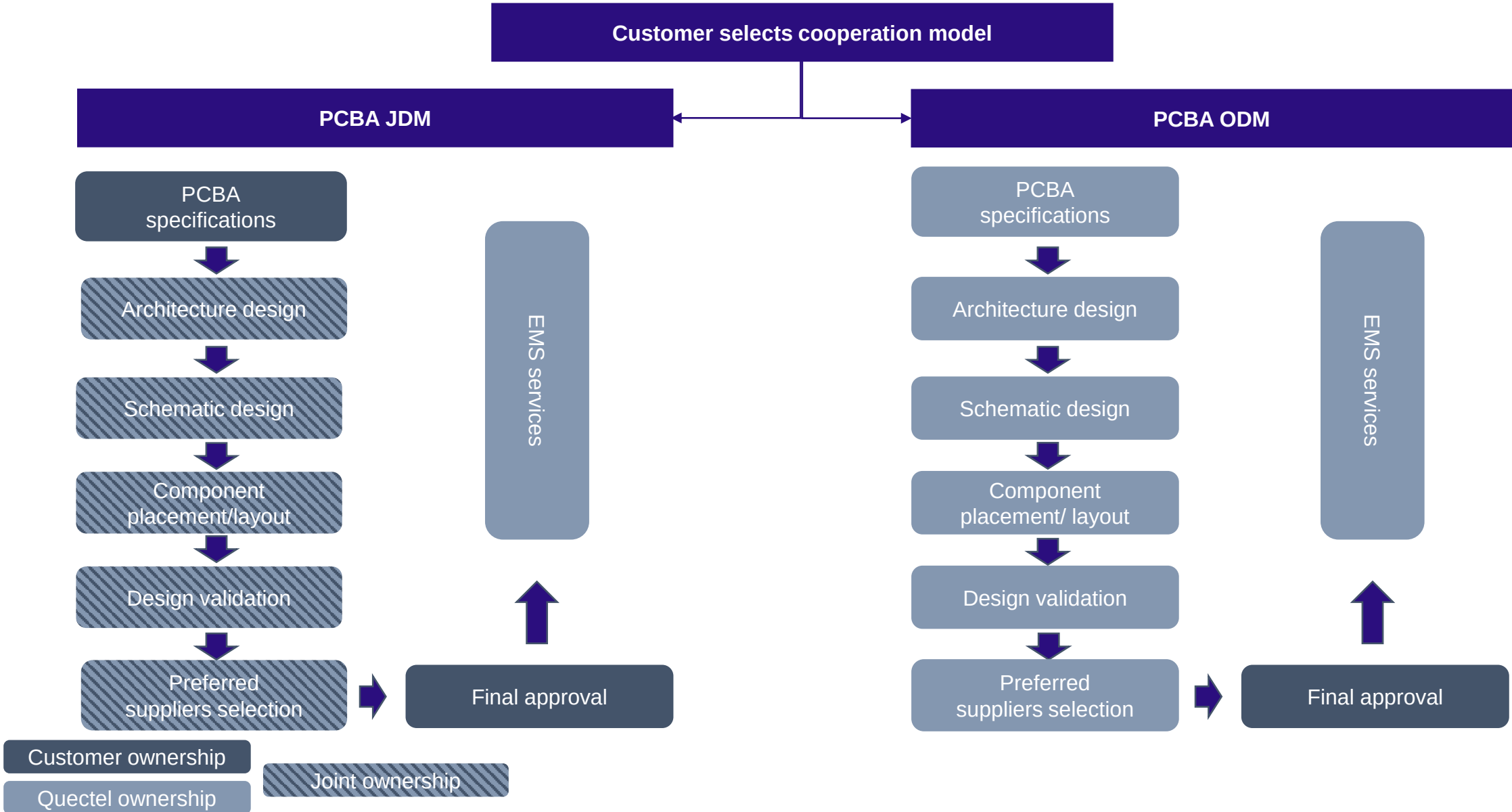
Customers may face difficulties in finding key components used in their board locally. To accelerate customers' development and shorten the time to market, Quectel will use the supply chain to provide the key components to customers.

✓ Main key components:

- LCM + TP
- Camera module
- Sensors, NFC ICs, extension ICs, etc.



Flexible PCBA service cooperation models



JDM: Joint Development Manufacturer

ODM: Original Development Manufacturer

EMS: Electronics Manufacturer Services

Build a smarter world

PCBA service – design & manufacturing

PCBA^① development service centers on customer needs, focusing on System-on-Chip (SOC) platforms with Chip-on-Board (COB) or Module-on-Board (MOB) solution delivery.

SOC vendors



PCBA solutions

MOB



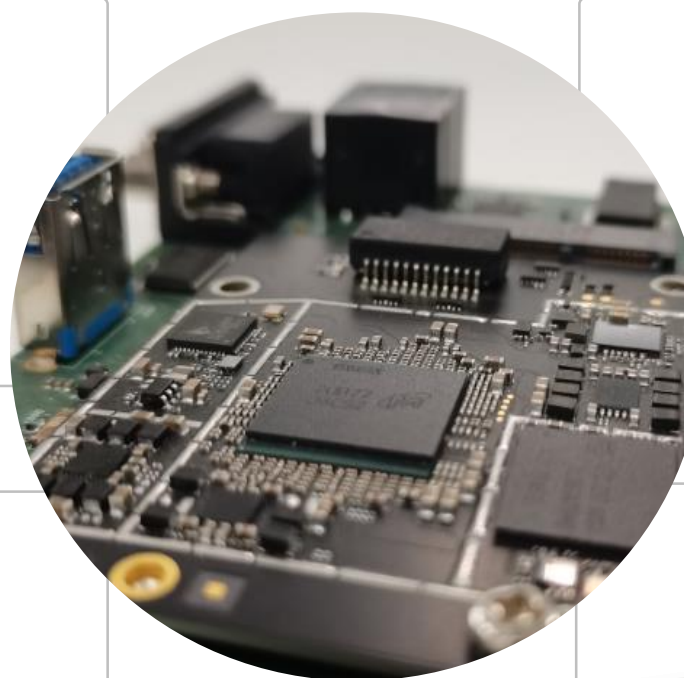
COB



Operating Systems



Applications



①: PCBA - A printed circuit board assembly (PCBA) describes the finished board after all the components have been soldered and installed on a printed circuit board (PCB)

Highly professional manufacturing

Quectel factory is **ISO 9001**,
IATF 16949, **ISO 14001** and
ISO 45001 certified.



QUECTEL

Changzhou, China

1 Automatic De-Paneling Machine & Optical Inspection System



2 Automatic DL & RF Calibration Test Station



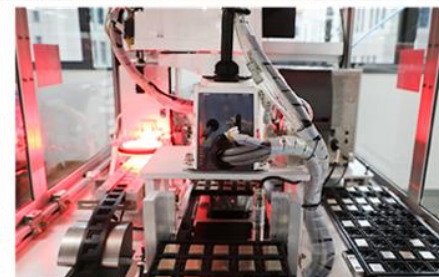
3 Automatic Module Flatness Inspection System



6 Real Time Monitoring System for Production Line Quick Response



5 Automatic Tape and Reel Packaging System



4 Convection Oven for module de-humidification



PCBA service – process

1. Requirement evaluation

- Customer requirement evaluation
- SoC solution evaluation
- System design evaluation
- Cost, timeline RD input and other evaluation

3. Sample production and tuning

- Material procurement
- PCBA production
- Hardware debugging and tuning
- Radio frequency performance debugging and tuning
- Software implementation and debugging

5. Product MP

- Production tool development
- Production process standardization
- Automatic test
- After-sales service

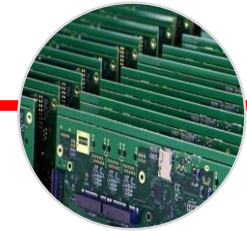
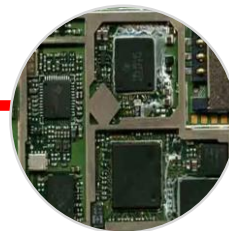
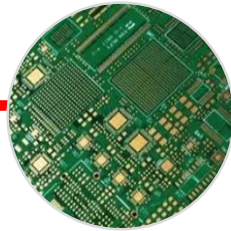
2. Product design

- Schematic and PCB layout design
- Hardware simulation
- ID/ MD/ stacking design
- EMC design
- Thermal design and simulation

4. Sample validation

- Radio frequency performance test
- Power consumption test
- Acoustic test
- Reliability and ambient test
- EMC test

INPUT:
Requirement



OUTPUT:
Finished product

PCBA service – Quectel advantages

Strong design ability



- Large and professional R&D team
- Experience in IoT module and application design
- New design or customization possible

Professional service



- Strong supply chain (part of module sourcing)
- Global support (offices in USA, EMEA and APAC)
- Value-added services

Multiple-SoC solutions



- Qualcomm, MTK, Unisoc and Rockchip SoCs
- Multiple selection of smart modules
- COB and MOB

Quality guarantee



- Tests according to defined acceptance standards
- Product quality management system
- Standardized SMT manufacturing

Value-added services

Hardware light-up service

Hardware board light-up:

Camera, LCD, etc.



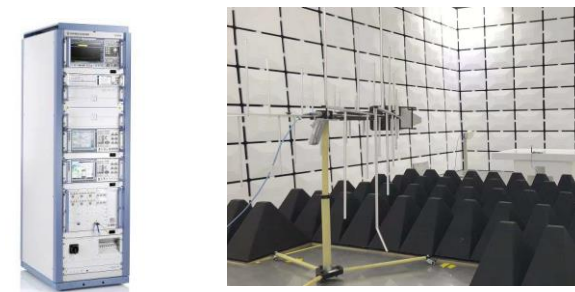
Software customization service

- Customize Android/ Linux OS deeply
- Customize algorithm
- Customize multimedia functions
- Tune camera, LCD, audio, etc.

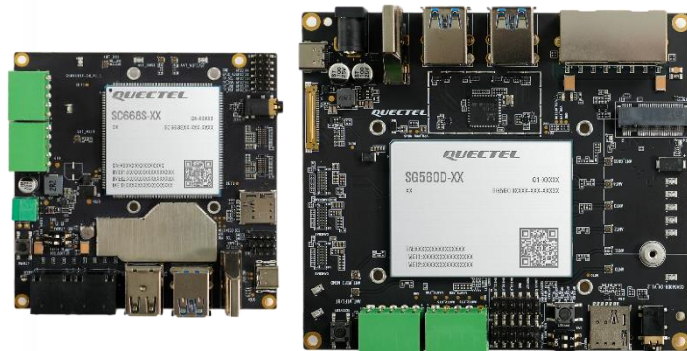


Certification service

RED, CE certifications for the device



PCBA design cases



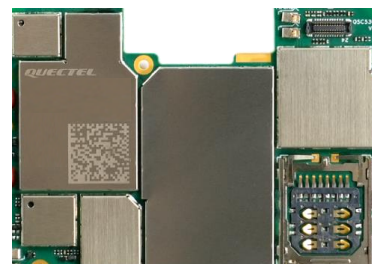
Robotics & industrial board

- 4G and 5G MOB boards
- Multiple interfaces
- Easy to expand



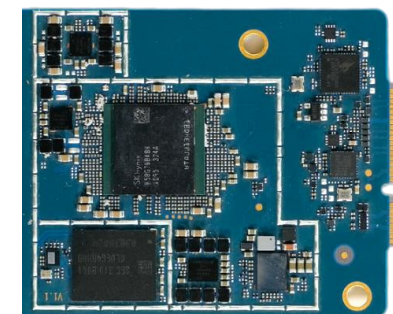
POS

- 4G COB board
- High-voltage Battery charging



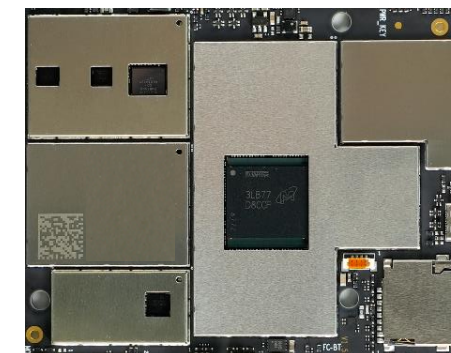
Industrial PDA

- 5G COB board
- Fast charging



ARM server board

- High performance computing COB board
- Mini-PCIe interface
- Thermal design
- Ethernet interface



Game console PCBA

- High performance computing COB board
- Wi-Fi 7
- HDMI
- Fast charging

Thank you

For more information, please visit: [quectel.com](https://www.quectel.com), [LinkedIn](#), [Facebook](#) and [X](#).
Media contact: media@quectel.com

Sales support: sales@quectel.com
Technical support: support@quectel.com General: info@quectel.com

