Fact Sheet

PN7220

High-performance, one-chip solution for EMVCo 3.1 and NFC Forum operation

This highly integrated NFC controller, optimized for designs that combine payments with other services, delivers exceptional performance while simplifying design-in, reducing footprint, and enabling easy migration from current NFC readers, including the PN5190.

Advanced RF operation gives the PN7220 an edge when faced with difficult conditions, such as metal, noise, or a small antenna. Integrated EMV L1 and NFC Forum-compliant firmware, plus Android 13+ drivers and middleware, speed certification, and create a simpler design. Secure EMVCo/NFC switching shrinks the footprint and reduces cost, while the same proven RF frontend as used on the PN5190 helps reduce time to market.

Target applications

- POS and mPOS terminals
- Android SmartPOS
- Mobile computers (handheld, PDA, tablets)
- Healthcare terminals
- Unattended payment terminals (vending, parking, etc.)
- EV charging stations

Key features

- Supports NFC Forum modes
  - Reader/writer mode: ISO/IEC 14443-A&B, FeliCa™, MIFARE 1K/4K, NFC Forum type 2/3/4A/4B/5, MIFARE card family, ISO/IEC 15693
  - Card Emulation mode: NFC Forum T4T (ISO/IEC 14443-A)
- Contact interface
  - Up to 3 contact-interface slots (with TDA8035)
- Flexible host interface
  - Supply voltage: 1.8 or 3.3 V
  - Host interface: I²C (up to 3.4 Mb/s) for 1 CPU connection or I²C and SPI (up to 15 Mb/s) for 2 CPUs
  - IRQ signal for improved synchronization
  - NCI 2.2-compliant protocol
- Fast certification
  - Contactless EMVCo 3.1 L1 compliant (analog and digital)
  - NFC Forum compliant (analog and digital), device requirement CR13
  - NFC Cockpit support
- High-performance NFC controller
  - RF transmitter supply voltage: 2.4 to 5.7 V
  - Max RF driver current with DC/DC active: 350 mA (2 W)
  - Low-power card detection

- OS support: Android 13
- Firmware updates for easy maintenance
- Temperature range: -40 to +105 °C
- Standard VFBGA64 package (4.5 x 4.5 mm)

Key benefits

- Easy EMVCo 3.1 and NFC Forum certification
- Fast antenna design and debug
- Integrated contactless EMV L1 layer
- Secure firmware updates for future proof EMVCO compliance

Advanced performance, fast certification

Several features — including RF output power of 2.0 W, high receiver sensitivity, and various on-board functions, such as dynamic power control (DPC), automatic waveshape control (AWC), and automatic error handling — give the PN7220 a distinct advantage when it comes to operation in difficult environments, such as exposure to metal or noise, or the use of a small antenna. These same features, along with integrated contactless EMV L1 and NFC Forum compliant firmware, also simplify certification, so developers can finish their designs faster.

Optimized for android systems

The PN7220 is also supported by Android 13 drivers and middleware common to the PN7160 and PN7220, so the design can be re-used for different platforms. The PN7220 implements an optimized NCI 2.2 software stack which makes it easier to meet the timing requirements for EMVCo transactions.

Seamless, hardware-based switching between EMVCO and NFC

To ensure smooth operation when switching between EMVCo and NFC operation, the PN7220 includes two independent polling loops selectable by the application processor. Each polling loop, one for EMVCo and one for NFC Forum, includes a dedicated set of optimized RF parameters. Before the system switches from one mode to the other, all previous data from earlier communications are erased and the NCI software stack is reset. The design can use a single antenna to support EMVCo and NFC Forum applications, for a highly compact footprint.

Quick in-the-field updates

The PN7220 supports firmware updates without a dedicated external pin. The firmware updates are done by an encrypted and signed firmware which is offered by NXP. This enables easy EMVCo updates, so the design keeps current with evolving EMVCo operations.

Simple upgrade for existing designs

Development teams can quickly expand their NFC-enabled product families to include EMVCo payments, because the PN7220 is backward compatible with other NXP NFC controllers. It uses the same NFC frontend. antenna connection, and power-supply pinning as the PN5190, and uses the same Android 13 middleware as the PN7160.

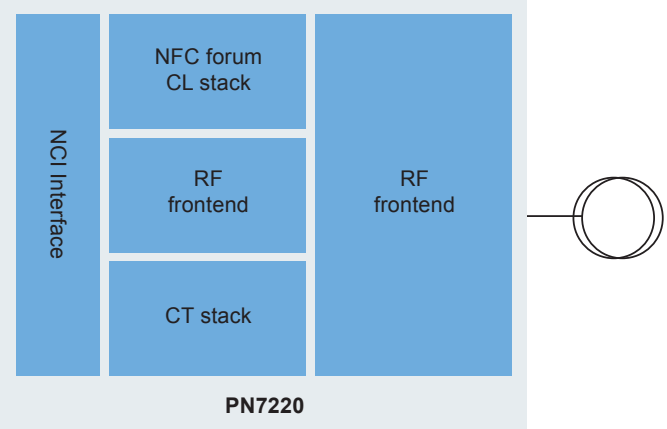
Apple ECP support (PN7221)

The PN7221 variant supports all the features of the PN7220, plus Enhanced Contactless Polling (ECP).

Time-saving development boards

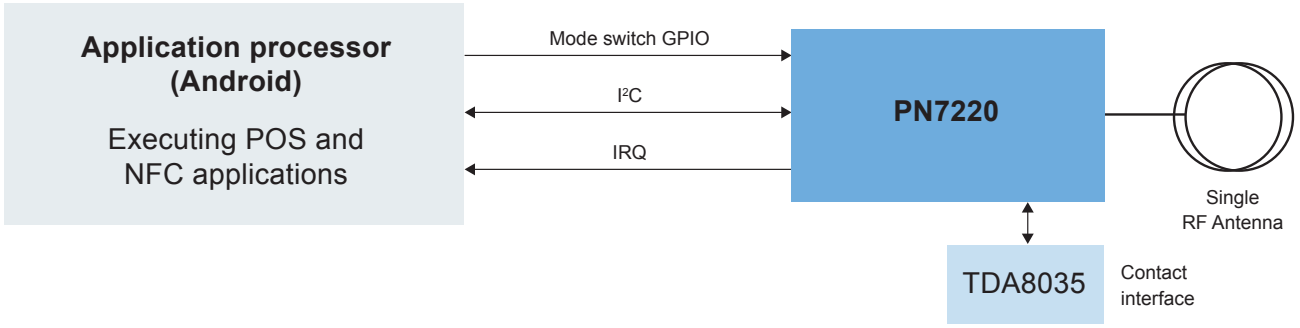
For fast design-in, the NXP PN7220 Development Board (PNEV7220BP1) connects to an NXP i.MX 8M evaluation kit with an Android host. Another option is to use the PNEV7220BP2 board, which includes an NXP K82 processor and connects to an additional host. The debug and supply lines on both boards are equipped with 45x45mm NFC antenna with copper damping to simulate a typical application situation. Both boards are also fully validated and compliant with EMVCo 3.1 and NFC Forum requirements. The PCB layout, which includes blocking capacitors, a DC/DC coil and an EMC filter, can be copied and used as a reference design in the customer application. The boards also support NFC Cockpit, NXP's intuitive GUI for configuring and adapting IC settings without having to write a software code.

PN7220 block diagram

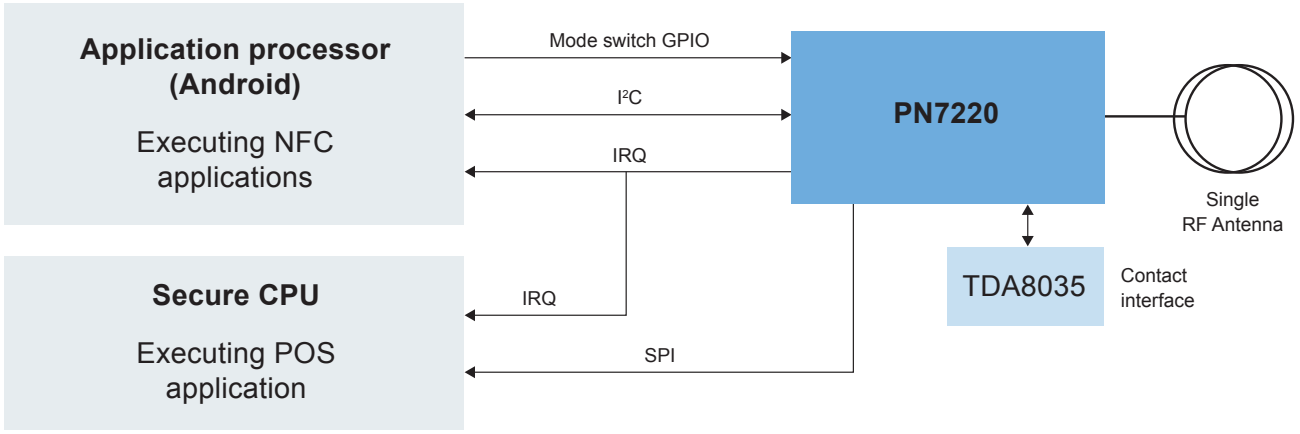


PN7220 architectures supported

Single Host Architecture



Dual Host Architecture



Ordering information

Part Number	Packing	MOQ	12NC
PN7220EV/C101Y	Reel	4000	9354 604 06518
PN7220EV/C101K	5-Tray	2450	9354 604 06557

Dev Board	12NC	Comment
PNEV7220BP1	9354 46237 598	PN7220 Development Board supporting 1 host
PNEV7220BP2	9354 46235 598	PN7220 Development Board supporting 2 hosts

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