

| PRODUCT | PTX100R | PTX105R | PTX130R |
|---|---|---|--|
| Product description | High-performance, high-power, multi-protocol NFC Forum reader. Universal SW device integration. | Mid-power , multi-protocol NFC Forum compliant reader. Universal SW device integration. | High-performance, high-efficiency and high-power multi-protocol NFC Forum compliant reader. Universal SW device integration. Additional applications and new Form-Factors. |
| Technology | 180nm | 180nm | 180nm |
| STANDARDS & PROTOCOLS | | | |
| NFC Forum certification, FeliCa pre-certification test | NFC Forum compliance, ✓ | NFC Forum compliance, - | NFC Forum compliance, - |
| Reader / Writer | ISO/IEC 14443 A/B, EMVCo 3.0/3.1 ISO/IEC 18092, FeliCa™ ISO/IEC 15693 ISO/IEC 18000-3 M1 | ISO/IEC 14443 A/B, ISO/IEC 18092, FeliCa™ ISO/IEC 15693 ISO/IEC 18000-3 M1 | ISO/IEC 14443 A/B, EMVCo 3.1 ISO/IEC 18092, FeliCa™ ISO/IEC 15693 ISO/IEC 18000-3 M1 |
| Carrier frequency [MHz] | 13,56 MHz | 13,56 MHz | 13,56 MHz |
| NFC Forum Tag-Type support | 2, 3, 4, 5 | 2, 3, 4, 5 | 2, 3, 4, 5 |
| ISO/IEC 14443 bitrate [kbit/s] | 106/212/424/848 kbit/s | 106/212/424/848 kbit/s | 106/212/424/848 kbit/s |
| ISO/IEC 18092 / FeliCa™¹, bitrate [kbit/s] | 212/424 kbit/s | 212/424 kbit/s | 212/424 kbit/s |
| MIFARE Classic®² support (MFCC) | ✓ | ✓ | ✓ |
| Support Apple ECP “Enhanced Contactless Polling”³ | ✓ | ✓ | ✓ |
| ISO/IEC 15693 bitrate [kbit/s] | 26.5 kbit/s | 26.5 kbit/s | 26.5 kbit/s |
| ISO/IEC 18000-3 M1 | ✓ | ✓ | ✓ |
| EMVCo compliance | ✓ (3.1) | - | ✓ (3.1) |
| EMVCo High Power behind Display Compliance (HPDC) | ✓ | - | ✓ |
| Card emulation (HCE) | ✓ | ✓ | ✓ |
| NFC Tag-Type emulation @ bitrate [kbit/s] | 4A @ [106 kbit/s] | 4A @ [106 kbit/s] | 4A @ [106 kbit/s] |
| Peer-to-peer (ISO/IEC 18092) | ✓ | ✓ | ✓ |
| Passive communication | Initiator | Initiator | Initiator |
| Active communication | - | - | - |
| Special Protocols & Features | China ID | China ID | China ID |
| PRODUCT FEATURES | | | |
| Ultra-low power on-chip MCU with integrated Firmware | ✓ | ✓ | ✓ |
| High power digital conversion sine wave RF frontend | ✓ | ✓ | ✓ |
| Digital dynamic power control (DDPC) | ✓ | ✓ | ✓ |
| DIRAC®: EMI filter-less solution | ✓ | ✓ | ✓ |
| Advanced Digital Wave-Shaping | ✓ | ✓ | ✓ |
| Phase Accurate Active Load-Modulation HCE | ✓ | ✓ | ✓ |
| High receiver/LMA sensitivity [dBc] | -80 dBc | -80 dBc | -80 dBc |
| Very High Dynamic Range Receiver (VHRR) | ✓ | ✓ | ✓ |
| Operating distance up to [mm], ISO 14443⁴ / ISO 15693⁵ | 140 mm / 320 mm | 100 mm / 200 mm | 140 mm / 320 mm |
| RF transmitter supply voltage [V] | 2.5 V – 5.5 V | 2.5 V – 5.5 V | 2.5 V – 5.5 V |
| Transmitter supply current, max. [mA] | 650 mA | 430 mA | 650 mA |
| Power Output, max. [W] | 2.0 W | 1.0 W | 2.0 W |
| Host interface | SPI, I2C, UART | SPI, I2C, UART | SPI, I2C, UART |
| Supply voltage host interface [V] | 1.8V, 3.3V, 5.0V | 1.8V, 3.3V, 5.0V | 1.8V, 3.3V, 5.0V |
| Power-down mode current, typ. [µA] | 3 µA | 3 µA | 3 µA |
| Standby current with LPFD⁵ @ HCE, typ. [µA] | 16,5 µA | 16,5 µA | 16,5 µA |
| Standby current with LPFD and Host event, typ. [µA] | 16,5 µA | 16,5 µA | 16,5 µA |
| Low Power Card Detection mode (LPCD), typ. [µA], @ 2 Hz | 100 µA | 100 µA | 100 µA |
| Customizable GPIO | ✓ | ✓ | ✓ |
| Temperature range [°C] | -40 to +70 | -40 to +85 | -40 to +85 ⁷ |
| Field-detection signal output | IRQ | IRQ | IRQ |
| PRODUCT SUPPORT AND ORDERING INFORMATION | | | |
| Product packages | QFN56 | QFN56 | QFN56 |
| Product type | PTX100RDQ56 | PTX105RDQ56 | PTX130RDQ56 |
| Order code single tray (dry pack) | PTX100RDQ56B | PTX105RDQ56B | PTX130RDQ56B |
| Order code reel (TR dry reel 13”) | PTX100RDQ56D13 | PTX105RDQ56D13 | PTX130RDQ56D13 |
| EVALUATION BOARDS | | | |
| Name of evaluation kit | PTX100R NFC Reader Eval Kit | PTX105R NFC Reader Eval Kit | PTX130R NFC Reader Eval Kit |
| Order number of evaluation kit | 10009100 | 10009105 | 10009130 |
| NFC IoT PTX105R Pmod™ Board (Renesas Quick Connect IoT) | - | Get your QC PTX105R Pmod board | - |
| SOFTWARE / SDKS / GUI | NFC reader libraries (SDK's) for PoS (EMVCo 3.1) and IoT in Non-OS (MCU's, RTOS) and OS versions (Linux, Multi-Tasking-OS). Config Tool GUI for evaluation of IC features, RF optimization and Tag reading (Windows® and Linux) | NFC reader libraries (SDK's) IoT in Non-OS (MCU's, RTOS) and OS versions (Linux, Multi-Tasking-OS). Config Tool GUI for evaluation of IC features, RF optimization and Tag reading (Windows® and Linux) | NFC reader libraries (SDK's) for PoS (EMVCo 3.1), IoT in Non-OS (MCU's, RTOS) and OS versions (Linux, Multi-Tasking-OS). NCI 2.0 SDK. AIS (Android™ ⁸ Integration Stack). Config Tool GUI for evaluation of IC features, RF optimization and Tag reading (Windows® and Linux) |

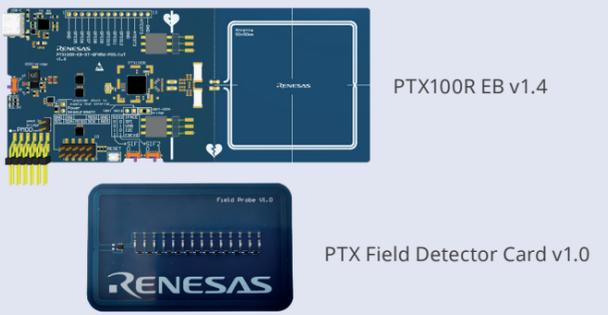
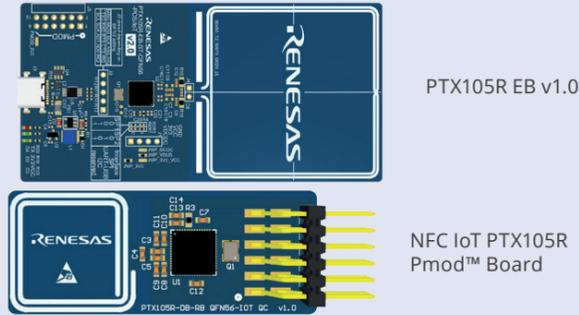
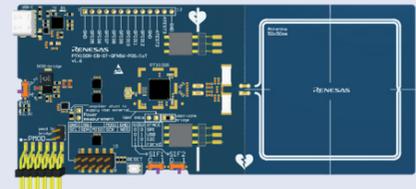
FULL PRODUCT DETAILS AT: WWW.RENESAS.COM

1. FeliCa™ is a registered trademark of Sony Group Corporation
 2. MIFARE Classic® is a registered trademark of NXP B.V.
 3. Only for customer authorized by Apple

4. 6,5 x 6,5 cm coil @ 3,5V supply voltage
 5. 19 x 19 cm coil @ 3,5V supply voltage
 6. Low Power Field Detection (LPFD)

7. Depending on output power
 8. Android is the trademark of Google LLC



| EVALUATION KIT (ORDER NUMBER) | PTX100R NFC READER EVAL KIT (10009100) | PTX105R NFC READER EVAL KITS (10009105) NFC IOT PTX105R Pmod™ BOARD: GET YOUR QC PTX105R Pmod BOARD AND VIA RENESAS RA PARTNER ECOSYSTEM | PTX130R NFC READER EVAL KIT (10009130) |
|--|---|--|--|
| Supported products | PTX100R | PTX105R | PTX130R |
| Contents (Order number of boards) | <ul style="list-style-type: none"> • 1 PTX100R EB v1.4 (10009001) • 1 PTX H-Field Detector Card v1.0 (10009006) • 1 USB-A to USB-C cable | <ul style="list-style-type: none"> • 1 PTX105R EB v1.0 (10009018) • 1 PTX H-Field Detector Card v1.0 (10009006) • 1 USB-A to USB-C cable | <ul style="list-style-type: none"> • 1 PTX130R EB v1.0 (1009019) • 1 PTX H-Field Detector Card v1.0 (10009006) • 1 USB-A to USB-C cable |
| Key features | <ul style="list-style-type: none"> • High-power (2W), high-performance NFC Reader kit for universal reader hardware platform IC PTX100R. EMVCo L1 with antenna behind display. • Easy-to-use, ready-to-go SW integration into any terminal/device Host-MCU architecture supporting all types of NFC protocols, standards, and Tag protocols (ISO14443 A/B, ISO18092, ISO15693, FeliCa and others). EMVCo L1 compliant protocols (PoS SDK). • NFC P2P (initiator) and Card Emulation (HCE) • Digital dynamic power control (DDPC), DIRAC®: EMI filter-less solution, Advanced Digital Wave-Shaping, Phase Accurate Active Load-Modulation in Card Mode, Very High Dynamic Range Receiver (VHDDR) • RF-design supported with Config Tool and SDKs | <ul style="list-style-type: none"> • Mid-power (1W) NFC Reader kit for universal reader hardware platform IC PTX105R. • Easy-to-use, ready-to-go SW integration into any terminal/device host MCU architecture supporting all types of NFC protocols, standards, and Tag protocols (ISO14443 A/B, ISO18092, ISO15693, FeliCa). • NFC P2P (initiator) and Card Emulation (HCE) • Digital dynamic power control (DDPC), DIRAC®: EMI filter-less solution, Advanced Digital Wave-Shaping, Phase Accurate Active Load-Modulation in Card Mode, Very High Dynamic Range Receiver (VHDDR) • RF-design supported with Config Tool and SDKs | <ul style="list-style-type: none"> • High-efficiency, high-power (2W), high-performance NFC Reader kit for universal reader hardware platform IC PTX130R. EMVCo L1 with antenna behind display. • Easy-to-use, ready-to-go SW integration into any terminal/device host MCU architecture supporting all types of NFC protocols, standards, and Tag protocols (ISO14443 A/B, ISO18092, ISO15693, FeliCa and others). EMVCo L1 compliant protocols (PoS SDK). • NFC P2P (initiator) and Card Emulation (HCE) • Digital dynamic power control (DDPC), DIRAC®: EMI filter-less solution, Advanced Digital Wave-Shaping, Phase Accurate Active Load-Modulation in Card Mode, Very High Dynamic Range Receiver (VHDDR) • RF-design supported with Config Tool and SDKs |
| Certifications | FCC & CE compliant, MIC Japan compliance (TELEC labs), SONY FeliCa® pre-test passed | Planned: CE, FCC | Planned: CE, FCC |
| Software and tools | <ul style="list-style-type: none"> • SDKs “Non-OS” optimized Software solution for integration with any Host-MCU/RTOS. High performance APIs in C source code with compact code size: <ul style="list-style-type: none"> • PoS SDK compliant to EMVCo and NFC standards • IoT SDK compliant to all relevant NFC standards • SDKs “OS”: PoS (EMVCo compliant) and IoT reader libraries in C source code including extended SW functions for OS’s: <ul style="list-style-type: none"> • Linux®, RTOS and any Multi-Tasking OS • Config Tool for evaluation and Demo GUI (Windows® and Linux): Demonstration and evaluation of IC-Features, RF/antenna optimization and Tag read (via USB interface) • ‘Tunneling’-SDK: UART to SPI bridge in C-source code for any MCU providing direct connection of the Config Tool to the PTX-IC to optimize RF/coil design and RF parameters. • Antenna design support with open-source tool Qucs Studio. | <ul style="list-style-type: none"> • SDKs “Non-OS” optimized Software solution for integration with any Host-MCU/RTOS. High performance APIs in C source code with compact code size: <ul style="list-style-type: none"> • IoT SDK compliant to all relevant NFC standards • SDKs “OS”: IoT reader libraries in C source code including extended SW functions for OS’s: <ul style="list-style-type: none"> • Linux®, RTOS and any Multi-Tasking OS • Config Tool for evaluation and Demo GUI (Windows® and Linux): Demonstration and evaluation of IC-Features, RF/antenna optimization and Tag read (via USB interface) • ‘Tunneling’-SDK: UART to SPI bridge in C-source code for any MCU providing direct connection of the Config Tool to the PTX-IC to optimize RF/coil design and RF parameters. • Antenna design support with open-source tool Qucs Studio | <ul style="list-style-type: none"> • SDKs “Non-OS” optimized Software solution for integration with any Host-MCU/RTOS. High performance APIs in C source code with compact code size: <ul style="list-style-type: none"> • PoS SDK compliant to EMVCo and NFC standards • IoT SDK compliant to all relevant NFC standards • SDKs “OS”: PoS (EMVCo compliant) and IoT reader libraries in C source code including extended SW functions for OS’s: <ul style="list-style-type: none"> • Linux®, RTOS and any Multi-Tasking OS • Android Integration Stack (AIS) on NCI specification • Config Tool for evaluation and Demo GUI (Windows® and Linux): Demonstration and evaluation of IC-Features, RF/antenna optimization and Tag read (via USB interface) • ‘Tunneling’-SDK: UART to SPI bridge in C-source code for any MCU providing direct connection of the Config Tool to the PTX-IC to optimize RF/coil design and RF parameters. • Antenna design support with open-source tool Qucs Studio |
| Target applications | <p>High-power universal multi-market reader solutions:</p> <ul style="list-style-type: none"> • EMVCo POS, mPOS and SmartPOS terminals (antenna behind display) • Compact POS Chip&Sign, ATM POS modules • Transportation terminals, gateways, industrial application • High-end access control, door locks • Accessories identification, brand protection, printing devices • Gaming consoles, fitness accessories and Smart-TV • e-Government, eMRTD, home eID • Small FormFactor NFC Reader (e.g.: Dongle, medical, pen-reader) | <p>Mid-power universal multi-market reader solutions:</p> <ul style="list-style-type: none"> • Transportation terminals, gateways, industrial application • Access control, door locks • Accessories identification, brand protection, printing devices • Gaming consoles, fitness accessories and Smart TV • e-Government, eMTRD, home eID • Small FormFactor NFC Reader (e.g.: Dongle, medical, pen-reader) • NFC tag protection for Qi Wireless charging systems | <p>High-efficiency, high-power universal multi-market reader solutions:</p> <ul style="list-style-type: none"> • EMVCo POS, mPOS and SmartPOS terminals (antenna behind display) • Compact POS Chip&Sign, ATM POS modules • Mobile Handheld PDA, phones or other devices running Android • Transportation terminals, gateways, industrial application • High-end access control, door locks • Accessories identification, brand protection, printing devices • Gaming consoles, fitness accessories and Smart-TV • e-Government, eMRTD, home eID • Small FormFactor NFC Reader (e.g.: Dongle, medical, pen-reader) |
| Application team support (Registered customers) | <ul style="list-style-type: none"> • SW-expert team supports you with target system Software/Firmware integration • Expert support for RF and antenna design for your end application • Retrofit support: Customer antenna retrofitted with customer antenna • End form factor RF optimization and verification with ‘Tunneling’-SDKs • EMVCo L1 certification support | <ul style="list-style-type: none"> • SW-expert team supports you with target system Software/Firmware integration • Expert support for RF and antenna design for your end application • Retrofit support: Customer antenna retrofitted with customer antenna • End form factor RF optimization and verification with ‘Tunneling’-SDKs | <ul style="list-style-type: none"> • SW-expert team supports you with target system Software/Firmware integration • Expert support for RF and antenna design for your end application • Retrofit support: Customer antenna retrofitted with customer antenna • End form factor RF optimization and verification with ‘Tunneling’-SDKs • EMVCo L1 certification support |
| For registration, ordering of boards and SDK’s please visit our website |  <p>PTX100R EB v1.4</p> <p>PTX Field Detector Card v1.0</p> |  <p>PTX105R EB v1.0</p> <p>NFC IoT PTX105R Pmod™ Board</p> |  |