# VTAP

VTAP25 certified* NFC reader module

Embedded surface mount reader module - USB & serial

Universal contactless NFC reader module for quick integration and easy certification in any mobile wallet scenario where a small form-factor and/or custom antenna is required.

USB and multiple serial host interfaces, with secure embedded management and firmware update capabilities.

Supports a wide range of cards, tags and secure NFC credentials, including Apple Wallet, Google Wallet, MIFARE® and NFC tag types.
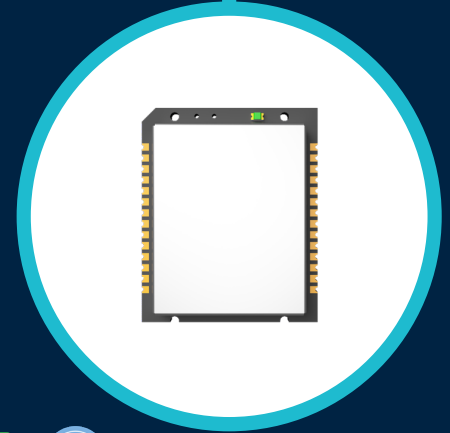
Key features and benefits

- Planned certification in Q2 2025 for Apple VAS, Google Smart Tap and Apple ECP2 access control - modules also generally require certification in final enclosure to meet Apple requirements.

- 5V or 3.3V supply with on-board power management and USB VBUS detection

- USB and serial UART, SPI and I2C interfaces via castellated SMD pinout. Developer/evaluation kit available Q2 2025.

- MIFARE & NFC tag support including UID, MIFARE sector, secure DESFire, Ultralight AES, NDEF, HCE and MIFARE2Go

- Support for up to 255 external serial RGB LEDs including animations

- Configuration, keys and firmware updates managed locally over USB or serial

- Powerful real and virtual COM interface with multiple protocols including secure OSDP over serial

- Secure on-board decryption of many pass types and storage of multiple ECC and AES keys

- Additional NFC tag emulation and GymKit handoff modes

- On board EAL6+ secure element (SE050) plus other additional I/O pins and features available

Why choose VTAP technology?

VTAP technology is available with a wide range of form-factors and interfaces, offering unrivalled capabilities and features.

VTAP readers support all types of NFC mobile wallet passes and credentials, with extended support for many common RFID/NFC cards and tags.

It is easy to integrate a VTAP reader into any system — platform independent, with no SDK required. And it is simple to configure, deploy, use and update any VTAP reader in the field. Connectivity options include a wide range of host interfaces and protocols.

The VTAP Cloud option adds remote configuration and a unique 'taps to apps' gateway on selected models.

All models are certified* for Apple VAS, Google Smart Tap and Apple ECP2/Access Control.

* Planned for Q2 2025 on VTAP25.

Why choose Dot Origin?

Dot Origin is a trusted partner of Apple and Google, licensed and certified to deliver NFC reader hardware that supports their Wallet programs

We are also long-established partners of NXP, which enables us to support many RFID and NFC technologies such as MIFARE DESFire, NTAG and MIFARE2Go.
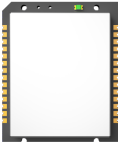
We have an extensive partner ecosystem of NFC Wallet card and pass providers, cloud application providers, resellers, installers and distributors.

We offer comprehensive service and support including dedicated consulting and engineering services.

Our VTAP products are engineered in the UK and available in many form-factors as finished products or embedded modules.

Learn more about the VTAP advantage and VTAP readers at **https://vtapnfc.com**.

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VTAP25 certified NFC reader module specification (Preliminary)

Physical characteristics	VTAP25-MOD: Embedded surface-mount reader module
Dimensions	24mm x 29.3mm x 5.9mm (0.95in x 1.15in x 0.23in) to use with external antenna
Mounting options	Surface mount module, supplied in trays
Form factor	
Power supply	3.3V or 5V DC
Operating conditions	–40 to +85ºC (–40 to 185ºF); 0 to 95% RH non-condensing

NFC interface	
Frequency/standards	13.56MHz, ISO 14443A/B, ISO 15693 and ISO 18092
Antenna	Requires external antenna and tuned matching circuit. Developer/evaluation kit including sample 40mm square antenna available Q2 2025.
Read range	Depends on antenna shape and size – typically 50mm (2in)
Mobile wallet compatibility & features	Apple Wallet NFC cards (VAS for loyalty/membership/tickets, ECP2 DESFire for Access/ID); Google Wallet NFC cards (Smart Tap, including extensions, MIFARE2Go DESFire); Card auto-selection with VAS, ECP2, Smart Tap and DESFire; Express Mode & CDCVM with ECP2; Mobile device type detection; ECC key auto-selection and reporting; Multiple pass type IDs, Apple enrolment URL and Google STUID capture where supported.
Card/tag compatibility & data reading capability	UID/CSN reading from all supported card/tag types – including NFC Type 1 (Topaz), Type 2 (MIFARE Ultralight & NTAG), Type 3 (FeliCa), Type 4 (DESFire, T=CL & HCE), Type 5 (ICODE) & MIFARE Classic; NDEF records from NFC Type 2, 3 & 4; Block data from MIFARE Classic, Ultralight/NTAG (NFC Type 2) & ICODE (NFC Type 5); Secure data reading from MIFARE Classic, MIFARE DESFire, MIFARE Ultralight AES.
Other NFC modes	Dynamic NFC format NDEF card/tag emulation with smart write-back; GymKit handoff
Pass IDs	6 x Apple merchant IDs and 6 x Google collector IDs
Encryption key slots	6 x ECC key slots (for Apple & Google ID keys); 9 x Application key slots (for MIFARE Classic, DESFire, Ultralight AES and/or OSDP secure channel)
Encryption algorithms	NIST P-256 modes ECDH and ECDSA, HMAC SHA-256, AES-128 and AES-256 in CTR, GCM, CMAC and CBC modes, ANSI-X9.63-KDF & HKDF according to RFC5869 using HMAC-SHA256, key derivation following NXP AN 10922

Security	
Security in hardware	Programmable EAL6+ secure element for custom applications (SE050)

USB interface	
USB device types (can enable/disable as required)	USB mass storage (for easy configuration, key loading & firmware updates) Human Interface Device (standard barcode reader/keyboard emulation) USB virtual COM port (for configuration, file transfer and command interface, including OSDP over USB COM)
Connection methods	USB powered, 3.3V powered with VBUS detection
Operating system support	Windows, Linux, MacOS full support for keyboard emulation, virtual COM device and mass storage; Android support for keyboard emulation, virtual COM device; iPhone and iPad support

Serial interface	
Serial interface types	Primary UART, secondary UART, SPI slave, I2C slave – all 3.3V
Serial mode features	External barcode scanner input, VTAP command and OSDP modes, including support for secure configuration, encryption key and firmware updates from host processor

Other features	
Operator feedback	Buzzer output signal (3.3V logic) for AC sounder, configurable note sequences on startup and card/pass read. External serial LED output (3.3V logic) configurable colours on startup and card/pass read.
Wake up	Can be set as input (to wake the module) or output (to send a wakeup signal the host device)
Reader management	USB/serial interface using configuration text files that can be locked and encrypted firmware file for field upgrades
Development kit	Comprehensive evaluation kit includes antenna and 10x10 grid of RGB LEDs

Compliance/Certification	
	Apple VAS, Apple ECP2/Access, Google Smart Tap planned for Q2 2025; Requires certification tests with chosen antenna and/or tests to meet Apple ECP2 requirements, according to your application

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