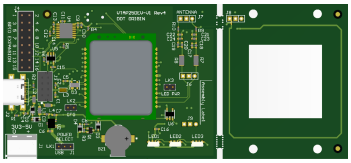
VTAP

DATASHEET
VTAP25-DEV

VTAP25 reader module development kit



Complete reference implementation of an industry-certified universal mobile wallet NFC reader using the VTAP25 surface mount module.

Supports multiple USB, serial and inter-processor comms protocols including secure OSDP.

Includes a proven reference antenna and facilities to attach and tune any other suitable external antenna.

Rapid path to design a product based on the VTAP25 NFC module, and to explore the VTAP NFC reader feature set.

Key features and benefits

- Supplied as a fully functional NFC reader development board with comprehensive on-board interfaces, components, antenna and connectors.
- Power via on-board USB-C, 8-pin captive cable or screw terminal block (3.3V or 5V). Flexible power management, VBUS detection and low power modes.
- Fully certified by Apple and Google for VAS and Smart Tap. Tested and qualified for Apple ECP2 Access Control protocols using DESFire credentials. (Finished readers also require certification testing in their final enclosure for Apple Access).
- On-board serial RGB LEDs, beeper and RS-232 driver plus unpopulated external antenna tuning circuit. Expansion connector connects to all VTAP25 serial and I/O pins.
- MIFARE & NFC tag support includes UID, MIFARE sector, secure DESFire, Ultralight AES, NDEF, HCE and MIFARE2Go. NFC tag emulation and handoff also supported.
- Comprehensive developer resources include reference schematics, module footprint and surface mount soldering profile, plus technical support, antenna design and certification services from our engineering team.

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.

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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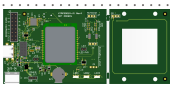
VTAP25-DEV development kit specification

Physical characteristics	VTAP25-DEV: Development kit
Dimensions	52.7mm x 118mm (2.07in x 4.65in)
Form factor	
Power supply	3.3V or 5V DC
Cable	1.8m (71in) USB-A captive cable
Weight	86g (3.0oz) including cable
Operating conditions	-25 to +70°C (-13 to 158°F); 0 to 95% RH non-condensing
NFC interface	
Frequency/standards	13.56MHz, ISO 14443A/B, ISO 15693 and ISO 18092
Antenna	Development board provides reference antenna and tuned matching circuit for the on-board VTAP25-MOD reader module. Can be replaced by an external antenna with suitable built-in tuning components or with an external antenna using the on-board tuning components of the development board.
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; NFC Forum connection handover (CH/TNEP); low power mode
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 (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. Sleep mode.
Other features	
Operator feedback	On board sounder plus output signal (3.3V logic) for AC sounder, configurable note sequences on startup and card/pass read. 3 LEDs on board (which can be disabled with a jumper) plus I/O to drive external serial LED output (3.3V logic) configurable colours on startup and card/pass read.
Wake up	External wake input and output pins to manage sleep (low power) modes
Reader management	USB/serial interface using configuration text files that can be locked and encrypted firmware file for field upgrades
Compliance/Certification	
Apple VAS, Apple ECP2/Access, Google Smart Tap, RoHS, UKCA, CE, FCC, ISED; Requires certification tests with chosen antenna, according to your application	

SEPTEMBER 2025

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