

# VTAP

## Application Note - EMC/RF Compliance for VTAP integrators

VTAP Core Firmware from v2.5.0.2

VTAP25, VTAP50 and VTAP100

Revised April 2026 v1.01

**If you need help** to set up or use your VTAP reader, beyond what is contained in this Application Note, then please contact our support team.

Email: [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com)

Download the latest documentation and firmware from <https://vtapnfc.com>

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**If you have any feedback** on setting up or using your VTAP reader or this documentation, then please contact our support team. The product is constantly being reviewed and improved and we value feedback about your experience.

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# 1 EMC/RF compliance for VTAP integrators

Any manufacturer of electronic products will be familiar with the need to test all new products for Electromagnetic Compatibility (EMC). This is to ensure the product does not cause any unwanted radio frequency (RF) emissions, which could be a problem for other devices, and that it is not susceptible to the emissions of other electrical devices, sometimes called immunity testing.

EMC testing, together with safety testing, is a legal requirement for market access approvals such as FCC in the USA or CE marking in Europe. So some EMC testing will usually have to be conducted by an accredited laboratory. If a product fails any EMC test it must be altered so that it can pass, or it would be illegal to sell that product for use in the region where the failed requirement applies.

All VTAP products, including boards and modules, have already been tested for compliance with a wide range of consumer safety and radio emissions regulations, to suit the markets where those products are commonly sold.

Regional EMC compliance varies by product, but can include:

- UKCA (UK)
- CE/RED (Europe)
- FCC (USA)
- Anatel (Brazil)
- ISED (Canada)
- BIS (India)
- MIC (Japan)
- NCC (Taiwan)

VTAP readers also come with approvals for use with NFC Wallet applications with which they need to interact.

## 1.1 Testing after integration to extend certifications

When you integrate a VTAP reader board or module into your own enclosure or equipment, or you change the antenna used, your continued compliance with some of these standards will need to be proven by further EMC testing. It is the process for maintaining compliance with FCC/ISED certification which raises the most questions, perhaps because this area has a number of its own special terms.

VTAP readers are classified as **intentional radio emitters**, like Wi-Fi routers or Bluetooth devices, which require more testing than non-intentional radiators. The VTAP products hold a **modular certification** for FCC and ISED. This simplifies the re-certification process and minimises the time and expense for integrators, for changes such as use of a different antenna, to better suit your application. The FCC and ISED call this simplified process a **permissive change**. We have already taken a number of customers through this process and are familiar with what is required.

## 1.2 Purpose of this note

This Application Note answers some questions you may have about when and how to act to preserve VTAP reader certifications, including use of a permissive change process where appropriate. The information here is based on our understanding of the standards and regulations at the time of publishing, our experience with certification of the original VTAP products, with customer-specific variants and VTAP reader integrations, over many years. If your scenario is more complex than those described here we strongly advise that you to seek further advice from an accredited test lab at an early stage.

This Application Note should not be taken as formal advice on certifications required in each region, as those rules do change over time. Anyone planning to integrate a VTAP board or module into their product should take expert advice on how the rules will impact them, in their specific circumstance, at the time of their planned product launch.

The integration guide for each VTAP product contains the essential details needed to preserve existing certifications, such as text to include on your product label. This Application Note aims to answer your broader questions about certification, to help you plan testing and certification activities which match your ambitions for equipment containing VTAP reader boards or modules.

There is a separate VTAP Application Note that addresses maintaining NFC Wallet approvals, called **Wallet Compliance for VTAP Integrators**.

## 2 Modular certifications and permissive changes

The following explanations clarify how modular certifications can open up a permissive change route for retaining certain EMC certifications, like FCC and ISED.

### 2.1 Which VTAP reader certifications are modular?

Certifications for FCC (USA), ISED (Canada), and MIC (Japan) are modular. This means that these VTAP reader boards and modules (in their original state) can be integrated inside host equipment and, as long as there are no other intentional emitters in that equipment, the certification of the module will apply to the host equipment, without any additional RF testing.

### 2.2 What is a permissive change?

The FCC and ISED have a simplified process called a "permissive change" to extend modular certification to equipment that only varies in limited ways from the original application for certification.

Strictly speaking, when referring to a hardware change with minimal effect on RF performance, the process to follow is a "Class II Permissive Change". This could apply to a VTAP reader operated with a different antenna and tuning components, or perhaps used in closer proximity to the body than envisaged in the original grant. Although it is uncommon, if the effect on RF emissions from that hardware change is found to go beyond FCC/ISED defined limits a permissive change will not be sufficient, and a new grant application will need to be filed.

A permissive change is also required where there are additional transmitters in the host equipment, and confidence testing with the VTAP reader and other transmitters together shows emissions exceed FCC/ISED limits. (MIC does not require further testing when additional transmitters are in the same host system.)

### 2.3 Why request a permissive change?

The advantage of following the permissive change process is that the time and cost of certification are minimised, compared to a making new application.

### 2.4 Who makes the permissive change application?

As the owner of original modular certification, it is Dot Origin Ltd who must arrange confidence-testing on your samples and submit a permissive change application, on your behalf, along with your physical samples and instructions to our lab.

There is some time and cost involved in preparing the application. This will involve some pre-compliance testing at a local lab, photos and descriptions of the antenna, or other change, in the correct format, together with test-ready, configured samples and specific test instructions. As soon as you decide that this might be needed for your equipment, do

contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) for a quote and estimated turnaround time for this work.

## 2.5 What does FCC permissive change testing involve?

Limited testing, usually spot-checking, is required to confirm that the equipment still operates within FCC limits, and paperwork is prepared as an update to the existing approval. This typically takes around 6 weeks and costs will depend on the exact nature of the change and extent of additional testing required.

## 2.6 How does equipment show its FCC certification after a permissive change?

You will label your equipment with the same FCC ID as a standard version of the VTAP reader in a case, for example as 'FCC ID: 2A282-VTAP50' or 'FCC ID: 2A282-VTAP100G2'. After a permissive change has been granted, the original VTAP reader FCC ID will now refer to your new variant of the product as well as the original. The approval can be verified through the online FCC database.

## 2.7 How does ISED permissive change work?

This process is almost the same as that for FCC. If both FCC and ISED permissive changes are required, then it is most cost-effective to conduct both together.

### 3 Maintaining VTAP reader RF certifications

The appropriate approach depends on the scale of change to the VTAP reader in your integration:

- New enclosure only (section [3.1](#)) – applies to all uses of VTAP reader boards;
- Different antenna (section [3.2](#)) – applies to all uses of VTAP reader modules;
- Built-in to equipment with no other radio emitters (section [3.3](#)) – can apply to use of VTAP reader modules or boards;
- Built-in to equipment with other radio emitters (section [3.4](#)) – can apply to use of VTAP reader modules or boards.

The following paragraphs answer questions about maintaining certifications in each of those scenarios for integrating a VTAP reader board or module:

#### 3.1 Change only the enclosure around a VTAP reader board

To retain modular certifications when integrating a VTAP reader board or module into a new enclosure, such as for FCC, ISED or MIC, just follow the Module Integration Instructions in the Integration Guide for your VTAP product. Your new enclosure will need labels to identify that it 'Contains FCC ID: 2A282-VTAP50' or 'Contains FCC ID: 2A282-VTAP100G2' as appropriate.

For certification in other regions, even though it is only the enclosure that has changed, the integrator will have to follow the appropriate certification process in full. For UKCA or CE certification that will mean collating a technical file, albeit a relatively simple one. If you contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) we can supply a Declaration of Conformity and original test reports (under NDA) for the VTAP reader component, as input to your technical file.

#### 3.2 Change the antenna used by a VTAP reader module

Any change of antenna will require updated certification to meet regional EMC standards where your end product will be used. This can be treated as a permissive change to modular approvals such as FCC/ISED. (If RF emissions are found to be above the levels of the original grant during this process, you would need to apply for a new approval.) Follow the Module Integration Instructions in the Integration Guide for your VTAP product and label appropriately.

For certification in other regions, even though it is only the antenna that has changed, the integrator will have to follow the appropriate certification process in full. For UKCA or CE certification that will mean collating a technical file, albeit a relatively simple one. For MIC, although it offers a modular approval, it does not have a permissive change process, so a new application would need to be filed, with full testing. If you contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) we can supply a Declaration of Conformity and original test reports (under NDA) for the VTAP reader component, as input to your technical file.

### 3.2.1 How do I choose an alternate antenna?

There is a separate **VTAP Application Note about external antennas**, which goes into more detail about external antenna choices, tuning, interference risks and user experience for both off-the-shelf and custom antennas.

## 3.3 Integrate a VTAP reader into an electronic product with no other radio emitters

If a VTAP reader board or module is integrated into other electronic equipment without any other intentional radio emitters, it will require EMC testing (such as FCC P15B or ISED ICES-003) of the finished product for unintentional emissions, to meet regional EMC standards where the end product will be used. As there is no change to the only emitter, no further radio testing or permissive change is required to retain the VTAP reader's FCC/ISED approval. Follow the Module Integration Instructions in the Integration Guide for your VTAP product and label appropriately.

To retain existing compliance of the VTAP component with Japan Radio Law (MIC) no additional testing is required, just label the equipment with the VTAP model name and designation number. And include the Japan Radio Law statement from the relevant VTAP integration guide in the documentation for your host equipment.

For certification in other regions the integrator will in any case have to follow the appropriate certification process in full for the new equipment. For UKCA or CE certification that will mean collating a technical file. If you contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) we can supply a Declaration of Conformity and original test reports (under NDA) for the VTAP reader component, as input to your CE/UKCA technical file.

## 3.4 Integrate a VTAP reader into an electronic product with other radio emitters

If a VTAP reader board or module is integrated into equipment with other emitters it will require confidence testing with all emitters running and EMC and emissions testing (such as FCC P15B or ISED ICES-003) of the complete equipment for any unintentional emissions.

Several scenarios are possible depending on the nature of the composite product and the results of those tests:

1. All emitters have separate modular approval and the emissions found during confidence testing:
  - a. Are within the limits of the original tests for every individual emitter:  
Then just save the test report and label the product housing with the FCC ID of every module contained.

- b. Exceed the limits of the original tests for one or more emitters:  
Then submit a permissive change for every emitter where the emissions exceeded original test limits, through the manufacturer of that emitter. Save the test report and permissive change grant(s), original grants and original test reports, and label the product housing with the FCC ID of every module contained.
2. The entire product had FCC/ISED approval before addition of the VTAP reader and the emissions found during confidence testing:
  - a. Are within the limits of the original tests for both the VTAP reader and the host product:  
Then save the test report and label the product housing with the FCC ID of the VTAP reader as well as the FCC ID for the host product.
  - b. Exceed the limits of the original tests for the VTAP reader and/or the host product:  
Then submit a permissive change for the VTAP reader and/or the host product, for which the emissions exceeded original test limits. Save the test report and permissive change grant(s), original grants and original test reports, and label the product housing with the FCC ID of every module contained.
3. If one or more emitters in the product do not have existing FCC/ISED modular approval, and the entire product does not have FCC/ISED approval, then full testing of the product, with confidence testing of the VTAP reader function is required. A new certification application must be filed, with the VTAP reader noted as a pre-approved part of the host device. Co-location tests will need to be done as part of the comprehensive testing.

To retain existing compliance of the VTAP component with Japan Radio Law (MIC) no additional testing is required, just label the equipment with the VTAP model name and designation number, along with labels for other modular approved components. And include the Japan Radio Law statement from the relevant VTAP integration guide in the documentation for your host equipment.

For certification in other regions the integrator will have to follow the appropriate certification process in full for the new equipment. For UKCA or CE certification that will mean collating a technical file. If you contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) we can supply a Declaration of Conformity and original test reports (under NDA) for the VTAP reader component, as input to your technical file.

## 4 Other certifications

Finally, this section deals with preserving non-modular certifications, such as UKCA and CE, when VTAP readers are integrated into other equipment, and certification in regions that have not yet been mentioned.

### 4.1 How do I maintain UKCA (UK) or CE (European) certifications?

In the UK or Europe there is no direct equivalent to the FCC modular certification and permissive change process. For UKCA and CE certification you are responsible for collecting a technical file that relates to your equipment, before it is placed on the market. This technical file will allow you to self-certify the compliance of your product with the relevant standards, following your own due diligence and testing. If you contact [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) we can supply a Declaration of Conformity for the VTAP reader board or module you are integrating and, if needed, original test reports (under NDA) as input to your technical file.

### 4.2 What about certification for other regions?

We already have EMC certification for most VTAP products to be used in the UK, Europe, USA and Canada, and in some cases Japan, Taiwan, India or Brazil. Product datasheets will always show you the current list for any given product. (These are available on the VTAP website at <https://www.vtapnfc.com/documentation>).

If you need compliance testing for a combination of VTAP product and approval authority or region that we have not yet listed in our datasheets, please get in touch with [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com) to find out whether it is already on our product roadmap.

## 5 About Application Notes

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Application Notes address topics of interest to small groups of customers, or topics around the use of a VTAP reader with third-party systems.

An Installation or Integration Guide for your VTAP reader model, together with the VTAP Configuration Guide, are the key documents to read. You will find the latest versions of these, and other useful information at <https://vtapnfc.com>.

If you need further help do contact us by email to [vtap-support@dotorigin.com](mailto:vtap-support@dotorigin.com), or by phone +44 (0) 1428 685861 from Europe and Asia, or +1 (562) 262-9642 from Northern and Latin America.