



Qualcomm Technologies, Inc.

# **C-V2X Experimental Licensing**

## **User Guide**

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## Revision history

| Revision | Date        | Description   |
|----------|-------------|---|
| A        | August 2019 | Initial release   |
| B        | August 2019 | Minor update to text in 1 <sup>st</sup> paragraphi of Chapter 1 |

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# 1 Purpose

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Experimental licenses are required prior to transmission by some equipment before device utilization under certain circumstances defined in 47 CFR §2 and 47 CFR §5 for the United States.

This document summarizes the process to obtain both an experimental license from the Federal Communication Commission (FCC) for a C-V2X device and the radio frequency (RF) usage information that should be known prior to operating an experimental transmitter.

**Table 1-1 Definition of Terms**

|             |                                    |
|-------------|------------------------------------|
| <b>STA</b>  | Special Temporary Authorization    |
| <b>RF</b>   | Radio Frequency                    |
| <b>EIRP</b> | Effective Isotropic Radiated Power |
| <b>ERP</b>  | Effective Radiated Power           |
| <b>FRN</b>  | FCC Registration Number            |
| <b>BTS</b>  | Base Transceiver Station           |

## 2 Prerequisites for a C-V2X Experimental Filing

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The general process flow for a C-V2X experimental license is as follows:

1. Specify the location(s) if not requesting the entire United States.
2. Determine experimental license type.
3. Generate an experiment description document that describes the request and captures technical parameters.
4. File an experimental application.
5. Prior to transmission, identify local licenses to determine frequencies to avoid and also verify the spectrum is vacant prior to transmission.
6. Address any experimental license usage conditions defined in the experimental license grant.

### 2.1 License Types

Experimental licenses are authorized by the Office of Engineering and Technology (OET) at the FCC using the online portable at: <http://www.fcc.gov/oet/>

There are two types of licenses types that can be applied for:

- An *Experimental License* is a long-term license.
- A *Special Temporary Authorization* (STA) is a short-term experimental license that is easier to obtain and limited to 6 months of operation.

### 2.2 Experiment Description

The experiment description is a document that establishes the credibility of the applicant, defines the purpose of the experiment, and specifies relevant technical criteria for the FCC, other agencies, and potential interference recipients to review.

The document should provide adequate information for the reader to understand the technology, experiment constraints, and transmission characteristics.

An example of a C-V2X experimental description is posted under experimental license file # 0014-EX-CM-2018 as an attached exhibit at:

[https://apps.fcc.gov/oetcf/els/reports/GetApplicationInfo.cfm?id\\_file\\_num=0014-EX-CM-2018](https://apps.fcc.gov/oetcf/els/reports/GetApplicationInfo.cfm?id_file_num=0014-EX-CM-2018)

## 2.3 Experimental License Filing Prerequisites

The applicant must have an FCC Registration Number (FRN) and pay a filing fee (\$70 in 2019).

An FRN number is required for billing purposes and should be retained for future transactions with the FCC. Request an FRN at: <https://www.fcc.gov/wireless/support/universal-licensing-system-uls-resources/getting-fcc-registration-number-frn>

## 2.4 Determination of License Owners/Users in Region

Prior to experimental transmission, the applicant must verify that the targeted spectrum is vacant and available. In cases where licensed spectrum is occupied, consent from the license owner may be required and the FCC may require evidence of this coordination.

Search for licenses in the ITS frequency band on the FCC ULS database at: <https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>

This website may be searched for the radio service “IQ-Intelligent Transportation Service (Public Safety)” and refined by frequency or location as shown in Figure 2-1.

The screenshot displays the FCC Advanced License Search interface. At the top, there are navigation links for 'FCC', 'WTS', 'ULS', 'Online Systems', and 'License Search'. Below this, the page title is 'License Search' and 'Advanced License Search'. The main search area includes a 'RESET' button and a 'Please be aware that some combinations of search criteria may result in a longer wait.' warning. The search filters are organized into sections: 'Call Sign & Radio Services' (with 'Call Sign' and 'Service Group' dropdowns), 'Licensee' (with 'Name', 'FRN', 'City', 'State', and 'ZIP Code' fields), 'License Detail' (with 'Status' and 'Authorization Type' checkboxes), 'Date Information' (with 'Date Type', 'Date', and 'Date Range' fields), and 'Frequencies' (with 'Frequency' and 'Range' fields). The 'Results Display' section shows '10 matches per page sorted by Call Sign in ascending order'. At the bottom, there is a 'RESET' button and another warning: 'Please be aware that some combinations of search criteria may result in a longer wait.'.

**Figure 2-1 Advance License Search website**

The OET maintains a database of all experimental licenses authorized in a geographic area that can also be searched at: <https://apps.fcc.gov/oetcf/els/reports/CallsignSearch.cfm>.

## 2.5 Application Information required for Experimental License Application or STA

Table 2-1 lists parameters that must be filled out as part of a station location in the online experimental license application. Parameters have been provided for an example C-V2X experimental license covering the United States.

**Table 2-1 General Experimental License Application Requirements**

| All Experimental License forms |   |  |
|--------------------------------|---|--|
| 1                              | Radio frequencies required for fixed and mobile units | 5850-5925 MHz                          |
| 2                              | Conducted Power                                       | Leave blank                            |
| 3                              | Antenna Gain  | Leave Blank                            |
| 4                              | (ERP)/(EIRP) of fixed (BTS) and mobile units          | 1.21 W ERP mean                        |
| 5                              | Any antenna pattern information if not isotropic      |  |
| 6                              | Fixed antenna locations (lat./long.)                  | United States (leave lat./long. blank) |
| 7                              | Operational radius                                    | Blank                                  |
| 8                              | Fixed antenna heights                                 | Blank                                  |
| 9                              | Emission bandwidth                                    | 20 MHz                                 |
| 10                             | Emission designator                                   | W7W                                    |
| 12                             | Dates experimental license is required                | Either range or duration               |
| 13                             | Manufacturer of equipment                             |  |
| 14                             | Quantity of equipment to be used                      |  |
| STA Specific Questions         |   |  |
| 1                              | Explain why an STA is necessary                       |  |
| 2                              | Explain the purpose of operation                      |  |

# 3 Application Filing Procedure Summary

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Refer to the *FCC Experimental Licensing System (External) Users Manual* link for detailed experimental license filing instructions at: <https://apps.fcc.gov/oetcf/els/misc/elsweb.pdf>

The general experimental license/STA filing process flow is as follows:

1. Access the application at: <https://apps.fcc.gov/oetcf/els/forms/442Dashboard.cfm>
2. Choose one of the following:
  - Form 442 - *Application for New or Modified Experimental Radio Station Authorization*
  - Special Temporary Authority – *For Application for Special Temporary Authority*.
3. Login with FRN and password (see section 2.3).
4. Complete the online form.

**NOTE:** Within the first few screens a “Confirmation Number” and “File Number” will appear. Record this information for future reference. These numbers are required to check application status or to complete the application if it could not be completed all at one time. To retrieve this information if not recorded, contact the OET.

5. Upload the Experiment Description in .pdf format on company letterhead (see section 2.2).
6. Proceed to Form 159 Fee Payment screen.
7. To make changes after the initial application is filed, click on the **Amend/Complete Application** link.
8. The OET review time varies and after the authorization is issued a link to the grant will be received via email. Example: [CV2-X Experimental License Grant: 0134-EX-CM-2019](#)

**NOTE:** Review the license notes that are generally included in the grant that list RF coordination requirements and restrictions that must be adhered to.



# 4 Post Grant Options

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An experimental license or STA is issued with a fixed duration of time before the transmission authorization expires. The FCC has processes to extend or modify operations.

## 4.1 Experimental License Renewals and STA Modifications

- Experimental licenses: file Form 405 using the call sign (on the final grant) and FRN.
- STAs may not be renewed, however a new STA may be filed with modified criteria referencing the original STA. Alternatively, a new experiment license may be filed.

## 4.2 Experimental License Modifications

Use Form 442 as a new experimental license application, enter the call sign, and update the forms.