## 6.9 VPP Specifications for One-Time Programmable (OTP) eFuses

This section specifies the operating conditions required for programming the OTP eFuses.

### *6.9.1 VPP Specifications*

over recommended operating conditions (unless otherwise noted)

| PARAMETER | DESCRIPTION | TEST CONDITIONS | MIN | NOM | MAX | UNIT |
|---|---|---|---|---|---|---|
| VDD | Supply voltage range for the core domain during OTP operation | Normal Operation | 1.140 | 1.200 | 1.260 | V |
| VPP | Supply voltage range for the eFuse ROM domain | Normal Operation | No Connection | | | V |
| | Supply voltage range for the eFuse ROM domain during OTP programming | OTP Programming | 1.65 | 1.7 | 1.75 | V |
| $I_{(VPP)}$ | VPP Current | $I_{(VPP)}$ | | | 100 | mA |
| $T_A$ | Ambient Temperature | Ambient Temperature | 0 | 30 | 50 | ℃ |

### *6.9.2 Hardware Requirements*

The following hardware requirements must be met when programming keys in the OTP eFuses:

- The VPP power supply must be disabled when not programming OTP registers.
- The VPP power supply must be ramped up after the proper device power-on sequence (for more details, see Section 6.11.2.1, *Power-On and Reset Sequencing*).

### *6.9.3 Programming Sequence*

Programming sequence for OTP eFuses:

- Power on the board per the power-on sequencing. No voltage should be applied on the VPP terminal during power up and normal operation.
- Load the OTP write software required to program the eFuse (contact your local TI representative for the OTP software package).
- Apply the voltage on the VPP terminal according to the specification in Section 6.9.1, *VPP Specifications*.
- Run the software that programs the OTP registers.
- After validating the content of the OTP registers, remove the voltage from the VPP terminal.

### *6.9.4 Impact to Your Hardware Warranty*

You accept that e-Fusing the TI Devices with security keys permanently alters them. You acknowledge that the e-Fuse can fail, for example, due to incorrect or aborted program sequence or if you omit a sequence step. Further the TI Device may fail to secure boot if the error code correction check fails for the Production Keys or if the image is not signed and optionally encrypted with the current active Production Keys. These types of situations will render the TI Device inoperable and TI will be unable to confirm whether the TI Devices conformed to their specifications prior to the attempted e-Fuse.

CONSEQUENTLY, TI WILL HAVE NO LIABILITY (WARRANTY OR OTHERWISE) FOR ANY TI DEVICES THAT HAVE BEEN e-FUSED WITH SECURITY KEYS.


Copyright © 2025 Texas Instruments Incorporated