SmartVID Debug Checklist and Voltage Regulator Guidelines

Contents

1. SmartVID Debug Checklist and Voltage Regulator Guidelines

This document provides the checklist to assist you to rule out the possible causes of configuration failure due to Smart Voltage Identification (SmartVID) for the following device families:

- Stratix® 10
- Agilex™ 7
- Agilex 5

You can identify the configuration failure caused by the SmartVID in the Quartus® Prime software based on the system error message as shown in the example below. For more information, refer to the *Description of Subcode Error Messages* and *PMBus Master Mode Checklist* tables.

You may observe the following configuration error message in the **System** tab of the Quartus Prime software if your device encounters issue related to the SmartVID.

Example 1. System Error Message of Configuration Failure due to SmartVID in Quartus Prime Software

```
Info (18942): Configuring device index 1
```

```
Error (18950): Device has stopped receiving configuration data
```

```
Error (18948): Error message received from device: Detected hardware access
error. There is a failure in accessing external hardware. (Subcode 0x0032, Info
0x00000000, Location 0x0000C400)
```

```
Error (20072): A PMBUS error has occurred during configuration. Potential
errors: Incorrect VID setting in Quartus Project. The target device fails to
communicate to smart regulator or PMBUS Master on board.
```

```
Error (209012): Operation failed
```

1.1. SmartVID-related Subcode Error Messages for Agilex Devices Only

From the previous error messages, you get the second-level error details based on the subcode stated. The following example shows the subcode errors related to the SmartVID. This is applicable for the Agilex devices only.

For the Stratix 10 devices, the only indicator for the VID-related error is listed in Example: *System Error Message of Configuration Failure due to SmartVID in Quartus Prime Software*.

Example 2. SmartVID-related Subcode Error Messages

```
0xC801,
customer_message = "Verify the address used in Quartus project matches that of
the Voltage Regulator. Inspect the PMF/I2C bus traffic, ensuring proper pullups,
contention, etc. "
```

```
0xC802,
customer_message = "Voltage Regulator unable to achieve the requested voltage.
Verify the correctness of Power Management and VID settings in Quartus project
(e.g Slave device type, voltage output format, coefficient, translated votlage
value unit, PAGE command, etc.)."
```

```
0xC803,
customer_message = "Ensure External Master detects the ALERT_N assertion and
send a VOUT_COMMAND to SDM within 200mS. Refer to the handshake requirement in
Power Management User Guide.
```

```
0xC804,
customer_message = "ITD fuse is out of range, file IPS case to get support from
Intel."
```

```
0xC805,
customer_message = "Internal Error while reading or decoding the Bitstream's
Power Table, file IPS case to get support from Intel."
```

```
0xC806,
customer_message = "Internal Error while reading or decoding the efuse values,
file IPS case to get support from Intel."
```

```
0xC807,
customer_message = "Failed to validate the vccl power is valid on the board,
verify the board's power supply is in a good state."
```

```
0xC808,
customer_message = "Error while sending CLEAR_FAULTS command, ensure Voltage
Regulator supports this command."
```

```
0xC809,
customer_message = "Error while sending VOUT_MODE command, ensure Voltage
Regulator supports this command."
```

```
0xC80a,
customer_message = "Error while sending PAGE_COMMAND command, ensure Voltage
Regulator supports this command."
```

```
0xC80b,
customer_message = "Error while sending VOUT_COMMAND command, ensure Voltage
Regulator supports this command."
```

```
0xC80c,
customer_message = "Error while sending READ_VOUT command, ensure Voltage
Regulator supports this command."
```

```
0xC80d,
customer_message = "Error while sending the vendor specific LTM4677 MFR_ADC_CTRL
command, ensure Voltage Regulator supports this command."
```

```
0xC80e,
customer_message = "The first I2C command has failed, no response from Voltage
Regulator. Verify the address used in Quartus project matches that of the
Voltage Regulator, inspect the PMBus/I2C bus traffic, pull-ups, bus contention,
etc. The 'info' field of this error contains the target I2C address."
```