

V_{DD} Power-Up and Power Supply Considerations for Intersil Ambient Light Sensors

Overview

If V_{DD} falls below specification and recovers, the part may enter an undetermined mode of operation. Users can return to normal operation after a V_{DD} glitch/droop event by following a simple procedure. This reset procedure can be through software or hardware means.

Symptoms

A part may have entered this unknown state if the DATA registers have unexpectedly stopped updating, or oscillate around 0 or full scale range. The ability of a part to communicate over I²C is not affected, but a user may find that registers read back different values than originally programmed to.

Technical Explanation

When V_{DD} sinks to approximately 1.8V or below, some of the part's registers may change their state. When V_{DD} recovers to 2.25V (or greater), the part may thus be in an unknown mode of operation. The user can return the part to a known mode of operation either by (a) setting V_{DD} = 0V for 1 second or more and then powering back up with a slew rate of 0.5V/ms or greater, or (b) via I²C, disable all ALS/PROX conversions, clear the test registers and then rewrite all registers to the desired values.

Methods of Restoring Part to Normal Operation

Hardware (V_{DD}) Reset Procedure

One way to restore the part to normal operation mode is to set V_{DD} to 0V for 1 second or more. A minimum of one second is needed for the internal capacitances of the part to fully discharge. When powering the part up, please ensure a slew rate of 0.5V/ms or greater to ensure that the part's power-on reset is activated.

Software (I²C) Reset Procedure

If the user desires to not alter V_{DD}, the part can be reset by first clearing any internal TEST registers, then disabling ALS/PROX conversions and finally rewriting all registers as desired.

After power-up, or if the user's power supply temporarily deviates from our specification (2.25V to 3.63V), Intersil recommends users wait ~1ms or more, then proceed with the following procedures for each Ambient Light Sensor architecture.

FOR ISL29001, ISL29002

1. Write command 0x8C
2. Rewrite all registers to the desired values

FOR ISL29003, ISL29004, ISL29010, ISL29012, ISL29013, ISL29015, ISL29020

1. Write 0x00 to register 0x00
2. Rewrite all registers to the desired values

FOR ISL29011, ISL29018, ISL29021, ISL29023, ISL29033

1. Write 0x00 to register 0x08
2. Write 0x00 to register 0x00
3. Rewrite all registers to the desired values

FOR ISL29028, ISL29030, ISL29040, ISL29042

1. Write 0x29 to register 0x0F
2. Write 0x00 to registers 0x0E, 0x0F, 0x01 (in that order)
3. Rewrite all registers to the desired values

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