Bug Advisory

Title	Bug Advisory Concerning ESP32-P4 DC-DC Design and Deep-Sleep Wake-up Stability
Issue Date	2025/11/03
Advisory Number	AR2025-005
Serial Number	NA
Version	V1.0

Issue Summary

Issue 1: Instability at High-Frequency Operation Caused by ESP32-P4 Feedback Resistor Design

In ESP32-P4 Hardware Design Guidelines v1.0, two 499 kΩ feedback resistors were connected in parallel at the output of the DC-DC converter. Verification has shown that this design limits the DC-DC output voltage, which can lead to instability when the chip operates at 360 MHz or 400 MHz, affecting overall system reliability.

To address this issue, Hardware Design Guidelines v1.1 has updated the design recommendation: only keep the resistor pads for the feedback resistors, but do not populate the resistors. This ensures stable operation of the chip at high frequencies.

Issue 2: Abnormal Power Switching During Deep-Sleep Wake-up Without External Feedback Resistors (Software Fix Available)

In Deep-sleep applications based on certain ESP-IDF versions, if the DC-DC converter design has been revised as described in Issue 1 (without external feedback resistors), the chip may occasionally experience anomalies during the bootloader stage after waking up from deep-sleep. When the internal core power supply switches from LDO to DC-DC, a POWERON or BROWN_OUT reset may occur, or the system may hang.

This issue has been confirmed to be fixable through software, and an updated ESP-IDF version is provided to resolve it.

Impact Analysis

Affected Product Series:

Issues 1 and 2 affect ESP32-P4 chip revision v1.3 and earlier revisions.

ESP-IDF Affected Versions:

ESP-IDF Branch	Affected Commit IDs	Affected ESP-IDF Versions
master	Commits before 7bd0eeff (excluded)	NA
release/v5.5	Commits before 9f9eebf9 (excluded)	v5.5 – v5.5.1
release/v5.4	Commits before b2eefe5a (excluded)	v5.4 – v5.4.2
release/v5.3	Commits before 9003643c (excluded)	v5.3 – v5.3.4

Mitigation

ESP-IDF Patched Versions:

ESP-IDF Branch	Fixed Commit IDs	Fixed ESP-IDF Versions
master	7bd0eeff	v6.0
release/v5.5	9f9eebf9	v5.5.2
release/v5.4	b2eefe5a	V5.4.3
release/v5.3	9003643c	v5.3.5

Recommendations for Application Developers

If you are using ESP32-P4 chip revisions v1.3 and earlier, it is recommended to follow the latest ESP32-P4 Hardware Design Guidelines > Section "Internal Voltage Regulators and External DCDC" and remove the feedback resistors at the output of the DC-DC converter. If you are using an affected ESP-IDF version, it is recommended to upgrade to the fixed ESP-IDF release (see the table above). If you encounter any issues during the upgrade process, please provide Espressif with the ESP-IDF version number or Commit ID. We will confirm and handle related matters as soon as possible.