

Bug Advisory

Title	Bug Advisory Concerning Low Wi-Fi Transmit Power on ESP32-C3 (chip revision v0.1 ~ v1.0)
Issue Date	2024/07/09
Advisory Number	AR2024-002
Serial Number	NA
Version	v1.0

Issue Summary

For ESP32-C3 chips (chip revision v0.1 ~ v1.0), using specific PHY versions and configurations can result in a 20 dB decrease in Wi-Fi transmit power in certain ESP-IDF versions.

Preconditions for Issue

The occurrence of this issue requires the simultaneous fulfillment of the following three conditions:

1. [The ESP32-C3 chip revision is v0.1 ~ v1.0](#) (chips with revision v1.1 and above are not affected).
2. Using affected ESP-IDF versions or PHY version v1000 ~ v1130.

Note: Follow these steps to check the PHY version used:

- 1) Build the station example located at
\$IDF_PATH/examples/wifi/getting_started/station.
- 2) Flash the station bin file to the development board.
- 3) Check the PHY version on the phy_init line in the boot log.

For example, by following the above steps, you can obtain a log like the one shown below.

```
I (512) phy_init: phy_version 1150,7c3c08f,Jan 24 2024,17:32:21
```

In the figure, the PHY version is v1150.

3. One of the following three scenarios is satisfied:
 - a) The Menuconfig option `CONFIG_ESP_PHY_INIT_DATA_IN_PARTITION` has been disabled, `phy_init_data.c` / `phy_init_data.h` has been modified, and `phy_init_data[18]` has been set to 1.
 - b) The Menuconfig option `CONFIG_ESP_PHY_INIT_DATA_IN_PARTITION` has been enabled, `phy_init_data.bin` has been modified, and the 26th bit of `[0:127]` has been set to 1.
 - c) The Menuconfig option `CONFIG_ESP_PHY_INIT_DATA_IN_PARTITION` has been enabled, and the option `CONFIG_ESP_PHY_MULTIPLE_INIT_DATA_BIN` has been enabled.

ESP-IDF Affected Versions:

ESP-IDF Branch	Affected Commit IDs	Affected ESP-IDF Versions
master	0672067e - 946fdfce (excluded)	NA
release/v5.2	0672067e - 8ab1027f (excluded)	v5.2-beta1 ~ v5.2
release/v5.1	9331e240 - 7cbee80f (excluded)	v5.1.2
release/v5.0	cf4c628e - 090dd404 (excluded)	v5.0.4 ~ v5.0.5
release/v4.4	e2782777 - fe0da0ee (excluded)	v4.4.6
release/v4.3	bb95e4ca - 2463efbc (excluded)	v4.3.6 ~ v4.3.7

ESP-IDF Patched Versions:

ESP-IDF Branch	Fixed Commit ID	Fixed ESP-IDF Version
master	946fdfce	NA
release/v5.2	8ab1027f	Fixed in v5.2.1
release/v5.1	7cbee80f	Fixed in v5.1.3
release/v5.0	090dd404	Fixed in v5.0.6
release/v4.4	fe0da0ee	Fixed in v4.4.7
release/v4.3	2463efbc	Fixed in a commit of release/v4.3

Note: ESP-IDF v4.3 & ESP-IDF v4.4 has officially reached the end of maintenance. Espressif will no longer provide support for adding new features, fixing bugs, or addressing security issues in this version. However, a fix commit has been submitted based on v4.3.7 due to the high impact of this issue.



Recommendations for Application Developers

If you encounter this issue in your application, it is recommended to the fixed ESP-IDF versions (see the table above). If you encounter any problems during the upgrade process, please provide the ESP-IDF version or Commit ID to [Espressif](#). We will assist you in resolving the related issues as soon as possible.