THIS SPEC IS OBSOLETE

Spec No: 002-14919

Spec Title: AN214919 - CYW43242 POWER SUPPLY CONSIDERATIONS

Replaced by: NONE

AN214919

# CYW43242 Power Supply Considerations

**Associated Part Family: CYW43242**

This document provides CYW43242 power consumption information for Bluetooth and WLAN during transmission and calibration.



## 1 About This Document

### 1.1 Cypress Part Numbering Scheme

Cypress is converting the acquired IoT part numbers from Broadcom to the Cypress part numbering scheme. Due to this conversion, there is no change in form, fit, or function as a result of offering the device with Cypress part number marking. The table provides Cypress ordering part number that matches an existing IoT part number.

Table 1. Mapping Table for Part Number between Broadcom and Cypress

| Broadcom Part Number | Cypress Part Number |
|---|---|
| BCM43242 | CYW43242 |

### 1.2 Acronyms and Abbreviations

In most cases, acronyms and abbreviations are defined on first use. For a more complete list of acronyms and other terms used in Cypress documents, go to: http://www.cypress.com/glossary.

## 2 USB Power Specifications

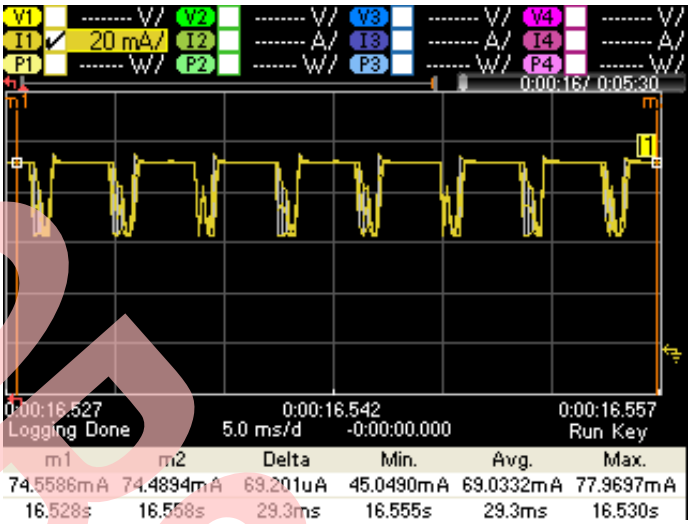
| Parameter | Value | Comment |
|---|---|---|
| USB power specifications (typical) | 500 mA at 5V | This translates to 720 – 760 mA at 3.3V, given 95 – 100% regulator efficiency. |

## 3 Bluetooth Power Consumption Considerations

| Parameter | Value | Comment |
|---|---|---|
| Bluetooth power consumption (maximum) | | Bluetooth consumes the highest amount of current when continuously transmitting DH5 packets (see Figure 1). |
| Peak: | 75 mA at 3.3V | |
| Average: | 70 mA at 3.3V | |

The plot shown in Figure 1 shows current consumption when DH5 packets are continuously transmitted.

Figure 1. Continuous DH5 TX




# 4 WLAN Power Consumption Considerations

## 4.1 Remaining Budget

| Parameter | Value(s) |
|---|---|
| WLAN Remaining Budget: | 645 – 685 mA at 3.3V |

## 4.2 WLAN Maximum Current During Transmission

Table 2 lists WLAN maximum current during transmission.

**Note:** WLAN sinks the maximum current during transmission.

Table 2. WLAN Maximum Current During Transmission

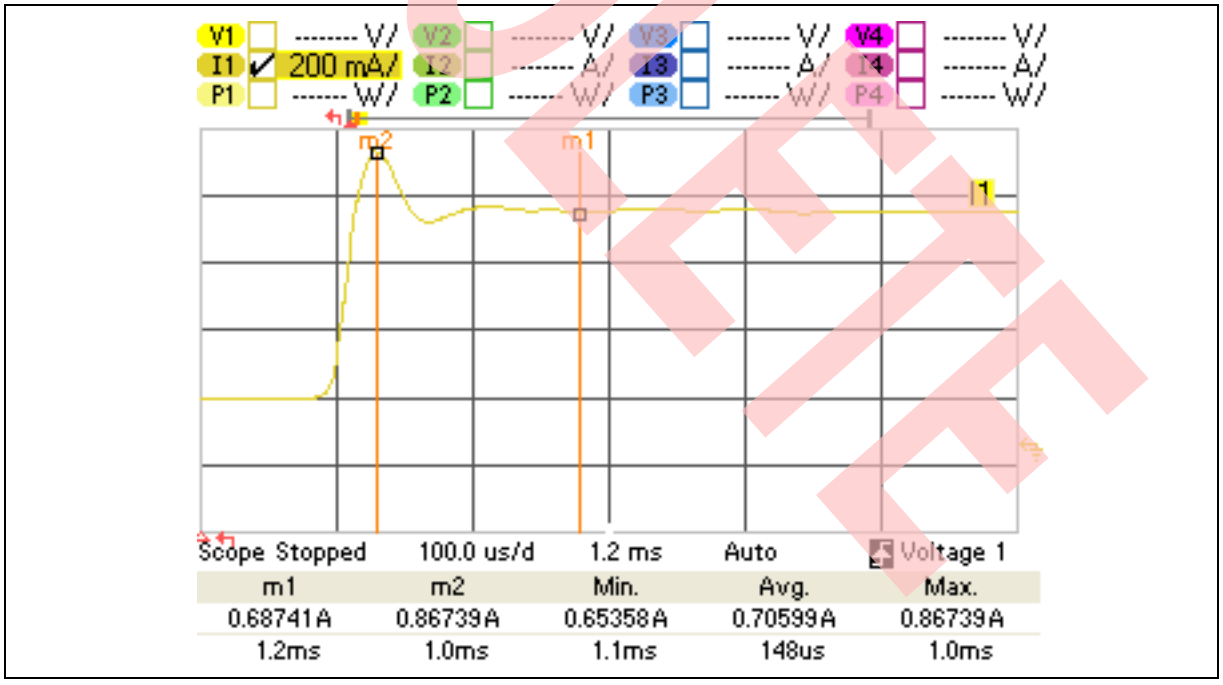
| Parameter | Tx Power on A0 (dBm) | Ptotal (dBm) | Icc_max at Packet Start (mA) | Icc_steady (mA) |
|---|---|---|---|---|
| **Channel 7 with 20 MHz Bandwidth** | | | | |
| | 6.1 | 9.1 | 675 | 543 |
| | 7.6 | 10.6 | 680 | 547 |
| | 9.0 | 12.0 | 690 | 555 |
| | 10.2 | 13.2 | 700 | 560 |
| | 11.1 | 14.1 | 710 | 570 |
| | 11.7 | 14.7 | 720 | 585 |
| | 12.5 | 15.5 | 740 | 600 |
| | 13.3 | 16.3 | 760 | 610 |
| | 14.3 | 17.3 | 790 | 630 |
| | 15.4 | 18.4 | 850 | 680 |
| | 16.2 | 19.2 | 860 | 690 |
| | 17.6 | 20.6 | 910 | 730 |
| **Channel 7 with 40 MHz Bandwidth** | | | | |
| | 7.6 | 10.6 | 730 | 600 |
| | 9.4 | 12.4 | 740 | 607 |

Table 2. WLAN Maximum Current During Transmission (Cont.)

| Parameter | Tx Power on A0 (dBm) | Ptotal (dBm) | Icc_max at Packet Start (mA) | Icc_steady (mA) |
|---|---|---|---|---|
| | 10.5 | 13.5 | 750 | 615 |
| | 11.6 | 14.6 | 760 | 625 |
| | 12.2 | 15.2 | 770 | 640 |
| | 13.2 | 16.2 | 790 | 655 |
| | 14.2 | 17.2 | 820 | 675 |
| | 15.3 | 18.3 | 850 | 700 |
| | 16.2 | 19.2 | 890 | 740 |
| | 17 | 20 | 915 | 760 |
| **Channel 100 with 20 MHz Bandwidth** | | | | |
| | 7.3 | 10.3 | 710 | 580 |
| | 8.3 | 11.3 | 725 | 590 |
| | 9.3 | 12.3 | 740 | 600 |
| | 10.2 | 13.2 | 755 | 610 |
| | 11.2 | 14.2 | 770 | 620 |
| | 12.1 | 15.1 | 790 | 640 |
| | 13 | 16 | 840 | 660 |
| | 14 | 17 | 900 | 690 |

The plot shown in Figure 2 shows peak current at packet start. As the plot shows, the current settles within 100 µs.

Figure 2. Peak Current at Packet Start




## 4.3 WLAN Maximum Current During Calibrations

Table 3 lists WLAN maximum current during calibration.

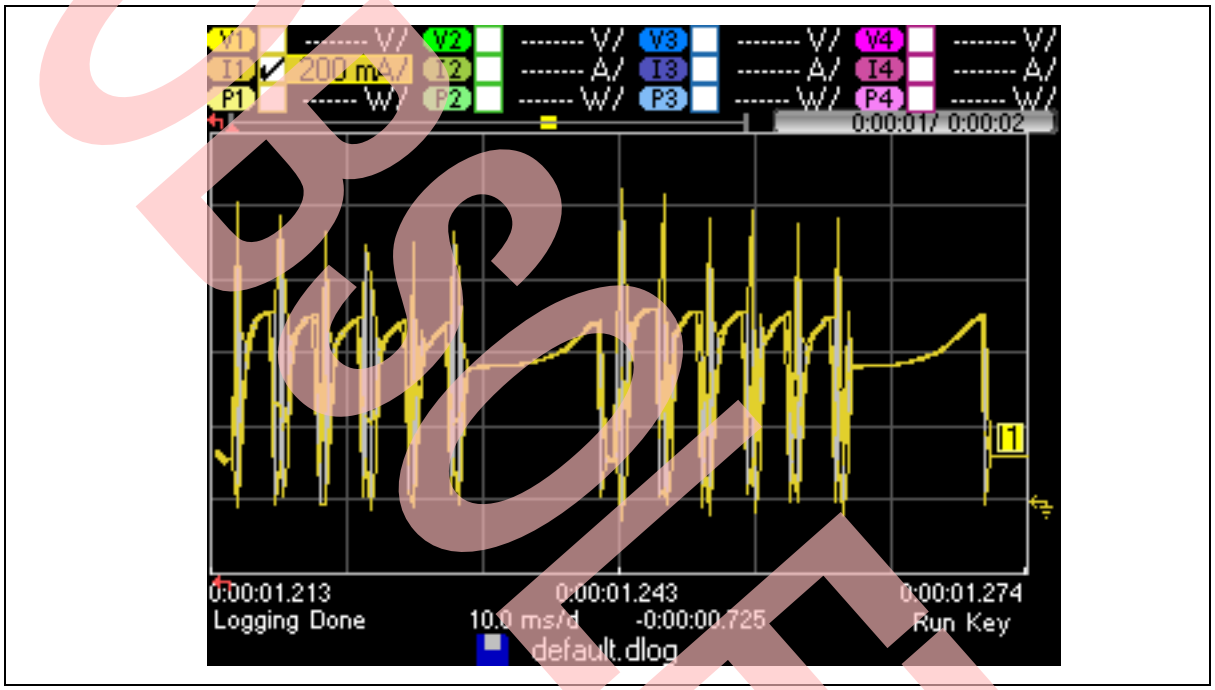
**Note:** WLAN sinks the maximum current during calibration.

Table 3. Maximum Current During Calibration

| Channel | Operating Mode (bandwidth in MHz) | Icc_max (mA) | Icc_max duration (µs) | Icc_steady (at the end of calibration) |
|---|---|---|---|---|
| 7 | 20 | 830 – 870 | 135 | 530 |
| 7 | 40 | 890 | 100 | 530 |
| 100 | 20 | 860 | 135 | 530 |

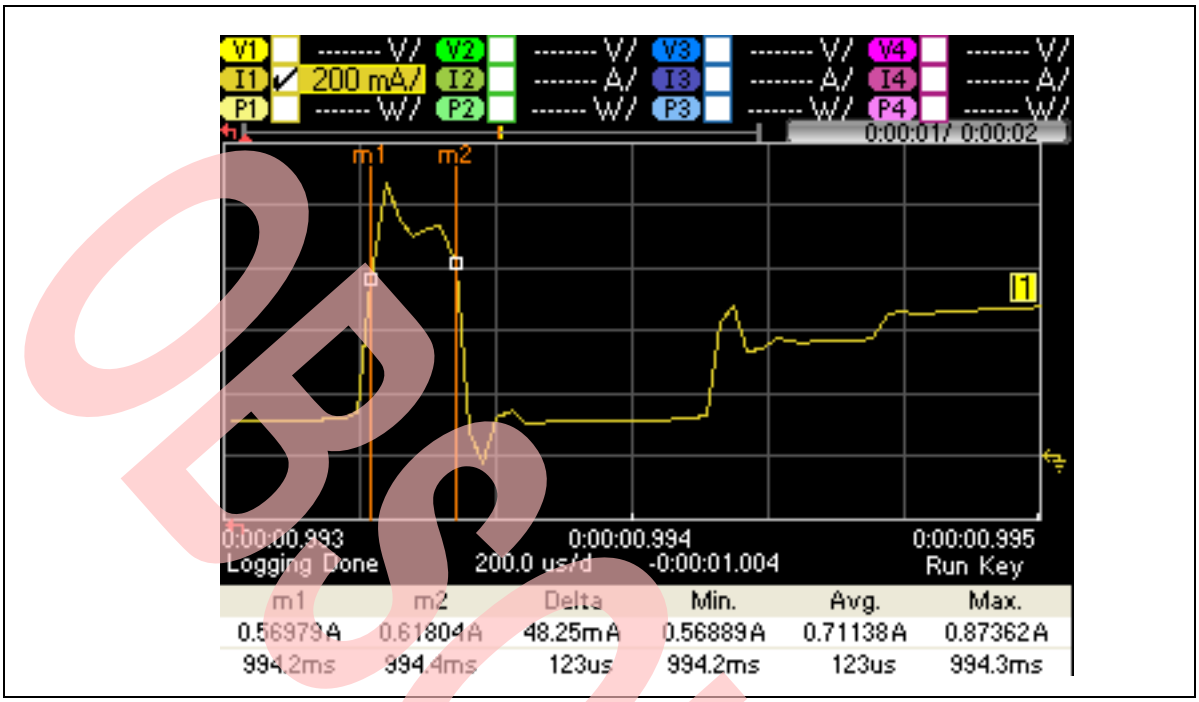
Figure 3 shows current consumption over time during power amplifier pre-distortion (PAPD) calibration.

Figure 3. Calibration Duration for Both Cores (2G BW20)



The plot shown in Figure 4 shows a magnified view of peak current and duration.

Figure 4. Peak Current Duration






## 5 Concerns

Consider the following regarding the budget current allowed by USB:

- At certain WLAN output power levels, Icc_max and/or Icc_steady will exceed the budget current allowed by USB.
- At the start of calibration, Icc_max is over the current budget allowed by USB.

## 6 Considerations

Consider the following in regards to USB current specifications:

- Consider using a USB supply that ca deliver up to 1000 mA
- If the peak value can be accepted (peak duration is less than 200 µs), then the WLAN output power can be adjusted so that Icc_steady can meet USB current specifications.

# Document History Page

| Document Title: AN214919 - CYW43242 Power Supply Considerations<br>Document Number: 002-14919 | | | | |
|---|---|---|---|---|
| **Rev.** | **ECN No.** | **Orig. of Change** | **Submission Date** | **Description of Change** |
| ** | – | – | 02/18/2013 | 43242-AN400-R<br>Initial release. |
| *A | 5473662 | UTSV | 10/13/2016 | Updated to Cypress template. |
| *B | 5881512 | AESATMP9 | 09/12/2017 | Updated logo and copyright. |
| *C | 6439059 | JPCH | 01/11/2019 | Obsolete document.<br>Completing Sunset Review. |

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