

# TAC5x1x Power Consumption Matrix Across Various Usage Scenarios



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## ABSTRACT

This application note details the power consumption of TAC5x1x devices across various usage scenarios.

Applicable devices include:

- TAC5212
- TAC5211
- TAC5112
- TAC5111

## Table of Contents

|   |    |
|---|----|
| <b>1 Introduction</b> .....                                       | 2  |
| <b>2 TAC5212 and TAC5211 Power Consumption</b> .....              | 3  |
| 2.1 TAC521x: Target Mode Power Consumption With PLL Disabled..... | 3  |
| 2.2 TAC521x: Target Mode Power Consumption with PLL Enabled.....  | 4  |
| <b>3 TAC5112 and TAC5111 Power Consumption</b> .....              | 0  |
| 3.1 TAC511x: Target Mode Power Consumption With PLL Disabled..... | 0  |
| 3.2 TAC511x: Target Mode Power Consumption With PLL Enabled.....  | 0  |
| <b>4 Settings for Lowest Power Consumption</b> .....              | 11 |
| <b>5 Summary</b> .....  | 12 |
| <b>6 References</b> .....   | 12 |

## List of Tables

|   |   |
|---|---|
| Table 2-1. Typical Current Consumption with PLL Disabled..... | 3 |
| Table 2-2. Typical Current Consumption with PLL Enabled.....  | 4 |
| Table 3-1. Typical Current Consumption with PLL Disabled..... | 0 |
| Table 3-2. Typical Current Consumption with PLL Enabled.....  | 0 |

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## 1 Introduction

Power consumption in TAC5x1x devices is highly dependent on the enabled usage and features. The following tables summarize power consumption across:

- Supply voltage
- Sampling frequency
- Enabled channel count
- Decimation filter
- Bit clock to frame sync ratio
- PLL state (enabled or disabled)
- Output configuration and loads
- Converted word length

The following tables report the average idle-channel current consumed on the AVDD analog supply. This supply powers all the internal analog and digital circuits. Depending on the application, the input/output (I/O) supply, IOVDD, is excluded as the current is consumed by the digital I/O pins. I/O power is dependent upon:

- The load capacitance of the system bus interface
- The digital data I/O clock rate
- The I<sup>2</sup>C bus interface pull-up and frequency of transactions performed by the host

## 2 TAC5212 and TAC5211 Power Consumption

The following subsections describe the power consumption of the TAC5212 and TAC5211 devices.

### 2.1 TAC521x: Target Mode Power Consumption With PLL Disabled

This section describes the typical current consumption of the TAC521x devices, when the PLL is disabled, with AVDD set to 1.8V and 3.3V.

The PLL is disabled by setting the corresponding bit fields, B0\_P0\_R52[7] (PLL\_DIS) and LOW\_PWR\_FILT, which must be enabled for both ADC and DAC (ADC\_LOW\_PWR\_FILT and DAC\_LOW\_PWR\_FILT), and B0\_P0\_R78[2] and B0\_P0\_R79[2], respectively.

By default, the bit clock is used as the clock source when the PLL is disabled. Alternatively, an external clock source (CCLK) can be used in the device through one of the GPI-capable pins (GPIOx/GPIx), if the system has a low jitter clock available.

- If GPIOx is used for the CCLK input, the appropriate GPIOx\_CFG bit field in the GPIOx\_CFG0 register must be configured for GPI function.
- If GPIx is used for the CCLK input, the appropriate GPIx\_CFG bit field in the GPI\_CFG register must be enabled for GPI function.
- The pin configured for GPI must be configured as CCLK, this is done by configuring B0\_P0\_R15[6:5] (CCLK\_SEL), based on the configured pin.
- With the CCLK configured, the external CCLK must be used as the clock source, instead of BCLK, this is done by configuring B0\_P0\_R52[3:1] (CLK\_SRC\_SEL).
- Once configured, the device runs the external CCLK as the clock source.

In [Table 2-1](#), the power consumption measurements have the biquad filters disabled, the DAC and ADC are both in idle channel, the ADC is in a full differential input setting, and an external CCLK of 12.288MHz is used as the device clock source through the GPIO1 pin.

**Table 2-1. Typical Current Consumption with PLL Disabled**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Low Power Filter | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                  | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 24                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Enabled          | 8.84              | 113.73          | -97.06         | 113.73          | -97.06         | 10.26             | 117.14          | -97.66         | 117.14          | -97.66         |
| 24                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Enabled          | 8.27              | 114.92          | -95.54         | 114.92          | -95.54         | 9.58              | 118.78          | -101.08        | 118.78          | -101.08        |
| 24                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Enabled          | 7.89              | 105.22          | -95.27         | 105.22          | -95.27         | 9.19              | 111.09          | -91.85         | 111.09          | -91.85         |
| 24                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Enabled          | 7.6               | 105.2           | -93.38         | 105.2           | -93.38         | 8.88              | 111.15          | -97.54         | 111.15          | -97.54         |
| 24                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Enabled          | 15.83             | 113.61          | -90.29         | 113.61          | -90.29         | 18.45             | 116.73          | -93.71         | 116.73          | -93.71         |
| 24                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Enabled          | 14.63             | 114.39          | -95.03         | 114.39          | -95.03         | 17.08             | 118.08          | -99.04         | 118.08          | -99.04         |
| 24                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Enabled          | 13.82             | 104.91          | -90.82         | 104.91          | -90.82         | 16.19             | 110.29          | -90.61         | 110.29          | -90.61         |
| 24                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Enabled          | 13.22             | 105.04          | -90.81         | 105.04          | -90.81         | 15.48             | 110.49          | -97.48         | 110.49          | -97.48         |
| 32                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Enabled          | 9.12              | 108.08          | -97.2          | 108.08          | -97.2          | 10.56             | 108.88          | -97.05         | 108.88          | -97.05         |
| 32                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Enabled          | 8.55              | 108.37          | -95.17         | 108.37          | -95.17         | 9.89              | 109.01          | -100.26        | 109.01          | -100.26        |
| 32                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Enabled          | 8.16              | 103.82          | -94.94         | 103.82          | -94.94         | 9.49              | 107.21          | -91.61         | 107.21          | -91.61         |
| 32                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Enabled          | 7.89              | 103.79          | -93.14         | 103.79          | -93.14         | 9.16              | 107.08          | -97.25         | 107.08          | -97.25         |
| 32                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Enabled          | 16.36             | 108.1           | -89.96         | 108.1           | -89.96         | 18.95             | 108.77          | -93.42         | 108.77          | -93.42         |
| 32                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Enabled          | 15.12             | 108.13          | -94.84         | 108.13          | -94.84         | 17.62             | 108.82          | -98.62         | 108.82          | -98.62         |
| 32                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Enabled          | 14.36             | 103.65          | -90.66         | 103.65          | -90.66         | 16.64             | 106.99          | -90.4          | 106.99          | -90.4          |

**Table 2-1. Typical Current Consumption with PLL Disabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Low Power Filter | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                  | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 32                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Enabled          | 13.7              | 103.67          | -90.73         | 103.67          | -90.73         | 15.98             | 107.08          | -96.81         | 107.08          | -96.81         |
| 48                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Enabled          | 8.55              | 113.72          | -98.16         | 113.72          | -98.16         | 9.98              | 116.68          | -98.86         | 116.68          | -98.86         |
| 48                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Enabled          | 7.99              | 114.45          | -95.52         | 114.45          | -95.52         | 9.3               | 118.29          | -101.4         | 118.29          | -101.4         |
| 48                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Enabled          | 7.63              | 105.23          | -95.31         | 105.23          | -95.31         | 8.92              | 110.99          | -91.87         | 110.99          | -91.87         |
| 48                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Enabled          | 7.31              | 105.29          | -93.3          | 105.29          | -93.3          | 8.58              | 110.93          | -97.58         | 110.93          | -97.58         |
| 48                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Enabled          | 15.18             | 113.9           | -90.48         | 113.9           | -90.48         | 17.81             | 116.75          | -94.26         | 116.75          | -94.26         |
| 48                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Enabled          | 13.96             | 114.55          | -95.16         | 114.55          | -95.16         | 16.43             | 118.34          | -99.55         | 118.34          | -99.55         |
| 48                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Enabled          | 13.17             | 104.93          | -90.86         | 104.93          | -90.86         | 15.54             | 110.35          | -90.7          | 110.35          | -90.7          |
| 48                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Enabled          | 12.6              | 105.13          | -90.72         | 105.13          | -90.72         | 14.87             | 110.58          | -97.25         | 110.58          | -97.25         |
| 96                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Enabled          | 9.06              | 113.89          | -97.74         | 113.89          | -97.74         | 10.5              | 116.8           | -98.67         | 116.8           | -98.67         |
| 96                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Enabled          | 8.48              | 114.54          | -95.67         | 114.54          | -95.67         | 9.82              | 118.37          | -101.69        | 118.37          | -101.69        |
| 96                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Enabled          | 8.11              | 105.27          | -95.27         | 105.27          | -95.27         | 9.41              | 110.94          | -91.73         | 110.94          | -91.73         |
| 96                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Enabled          | 7.81              | 105.32          | -93.43         | 105.32          | -93.43         | 9.09              | 111.01          | -97.74         | 111.01          | -97.74         |
| 96                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Enabled          | 15.92             | 113.87          | -90            | 113.87          | -90            | 18.51             | 116.83          | -93.17         | 116.83          | -93.17         |
| 96                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Enabled          | 14.76             | 114.49          | -95.67         | 114.49          | -95.67         | 17.23             | 118.56          | -100.62        | 118.56          | -100.62        |
| 96                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Enabled          | 14                | 104.98          | -90.91         | 104.98          | -90.91         | 16.36             | 110.5           | -90.25         | 110.5           | -90.25         |
| 96                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Enabled          | 13.3              | 105.03          | -90.95         | 105.03          | -90.95         | 15.57             | 110.43          | -97.03         | 110.43          | -97.03         |

## 2.2 TAC521x: Target Mode Power Consumption with PLL Enabled

This section describes the typical current consumption of the TAC521x devices when the PLL is enabled with AVDD set to 1.8V and 3.3V.

By default, upon power-up, the PLL is configured to be enabled. The bit field corresponding to this is B0\_P0\_R52[7] (PLL\_DIS) in the register map.

In [Table 2-2](#), the power consumption measurements have the biquad filters disabled, the DAC and ADC are both in idle channel, and ADC is in a full differential input setting.

**Table 2-2. Typical Current Consumption with PLL Enabled**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 8                           | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 11.05             | 114.1           | -84.87         | 114.1           | -84.87         | 12.47             | 118.07          | -85            | 118.07          | -85            |
| 8                           | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 11.09             | 114.08          | -84.84         | 114.08          | -84.84         | 12.52             | 118.01          | -84.97         | 118.01          | -84.97         |
| 8                           | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 11.11             | 114.22          | -84.84         | 114.22          | -84.84         | 12.48             | 117.92          | -84.94         | 117.92          | -84.94         |
| 8                           | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 10.45             | 115.13          | -84.48         | 115.13          | -84.48         | 11.85             | 120.14          | -84.67         | 120.14          | -84.67         |
| 8                           | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 10.5              | 115.14          | -84.48         | 115.14          | -84.48         | 11.86             | 119.97          | -84.68         | 119.97          | -84.68         |



**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 8                           | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 10.49             | 115.06          | -84.48         | 115.06          | -84.48         | 11.83             | 120.07          | -84.69         | 120.07          | -84.69         |
| 8                           | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 10.12             | 101.98          | -84.41         | 101.98          | -84.41         | 11.44             | 111.2           | -83.95         | 111.2           | -83.95         |
| 8                           | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 10.14             | 101.9           | -84.41         | 101.9           | -84.41         | 11.41             | 111.29          | -83.95         | 111.29          | -83.95         |
| 8                           | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 10.14             | 101.95          | -84.41         | 101.95          | -84.41         | 11.47             | 111.17          | -83.95         | 111.17          | -83.95         |
| 8                           | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 9.8               | 101.88          | -83.99         | 101.88          | -83.99         | 11.1              | 111.29          | -84.79         | 111.29          | -84.79         |
| 8                           | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 9.84              | 101.9           | -83.98         | 101.9           | -83.98         | 11.08             | 111.26          | -84.79         | 111.26          | -84.79         |
| 8                           | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 9.81              | 101.84          | -83.99         | 101.84          | -83.99         | 11.11             | 111.24          | -84.78         | 111.24          | -84.78         |
| 8                           | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 18.04             | 114             | -83.76         | 114             | -83.76         | 20.67             | 117.55          | -84.87         | 117.55          | -84.87         |
| 8                           | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 18.08             | 114.02          | -83.73         | 114.02          | -83.73         | 20.71             | 117.6           | -84.81         | 117.6           | -84.81         |
| 8                           | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 18.06             | 114.07          | -83.71         | 114.07          | -83.71         | 20.68             | 117.56          | -84.8          | 117.56          | -84.8          |
| 8                           | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 16.85             | 114.93          | -84.36         | 114.93          | -84.36         | 19.23             | 119.68          | -84.62         | 119.68          | -84.62         |
| 8                           | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 16.85             | 114.93          | -84.35         | 114.93          | -84.35         | 19.27             | 119.64          | -84.62         | 119.64          | -84.62         |
| 8                           | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 16.85             | 114.97          | -84.35         | 114.97          | -84.35         | 19.25             | 119.47          | -84.63         | 119.47          | -84.63         |
| 8                           | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 16                | 104.85          | -83.77         | 104.85          | -83.77         | 18.44             | 110.56          | -83.85         | 110.56          | -83.85         |
| 8                           | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 16.07             | 104.76          | -83.77         | 104.76          | -83.77         | 18.33             | 110.66          | -83.86         | 110.66          | -83.86         |
| 8                           | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 16                | 104.75          | -83.79         | 104.75          | -83.79         | 18.37             | 110.72          | -83.85         | 110.72          | -83.85         |
| 8                           | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 15.45             | 104.89          | -83.57         | 104.89          | -83.57         | 17.72             | 110.82          | -84.66         | 110.82          | -84.66         |
| 8                           | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 15.35             | 104.88          | -83.54         | 104.88          | -83.54         | 17.74             | 110.8           | -84.66         | 110.8           | -84.66         |
| 8                           | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 15.46             | 104.8           | -83.57         | 104.8           | -83.57         | 17.66             | 110.75          | -84.65         | 110.75          | -84.65         |
| 16                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 12.24             | 113.99          | -98.21         | 113.99          | -98.21         | 13.69             | 117.93          | -98.8          | 117.93          | -98.8          |
| 16                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 12.25             | 113.92          | -97.68         | 113.92          | -97.68         | 13.68             | 117.96          | -98.75         | 117.96          | -98.75         |
| 16                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 12.26             | 113.93          | -97.45         | 113.93          | -97.45         | 13.7              | 118.02          | -99.04         | 118.02          | -99.04         |
| 16                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 11.69             | 115.06          | -95.72         | 115.06          | -95.72         | 13.03             | 119.85          | -101.6         | 119.85          | -101.6         |
| 16                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 11.68             | 115             | -95.64         | 115             | -95.64         | 13.03             | 119.99          | -101.61        | 119.99          | -101.61        |
| 16                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 11.69             | 114.95          | -95.64         | 114.95          | -95.64         | 13.03             | 119.92          | -101.55        | 119.92          | -101.55        |
| 16                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 11.3              | 99.95           | -91.37         | 99.95           | -91.37         | 12.59             | 111.01          | -90.61         | 111.01          | -90.61         |
| 16                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 11.3              | 99.9            | -91.32         | 99.9            | -91.32         | 12.58             | 111.1           | -90.69         | 111.1           | -90.69         |
| 16                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 11.28             | 99.92           | -91.38         | 99.92           | -91.38         | 12.64             | 110.93          | -90.64         | 110.93          | -90.64         |
| 16                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 11                | 99.83           | -89.88         | 99.83           | -89.88         | 12.3              | 111.17          | -99.34         | 111.17          | -99.34         |
| 16                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 10.99             | 99.9            | -89.9          | 99.9            | -89.9          | 12.28             | 111.08          | -99.3          | 111.08          | -99.3          |
| 16                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 10.95             | 99.88           | -89.91         | 99.88           | -89.91         | 12.31             | 111.06          | -99.26         | 111.06          | -99.26         |
| 16                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 20.01             | 113.88          | -89.79         | 113.88          | -89.79         | 22.56             | 117.44          | -94.73         | 117.44          | -94.73         |
| 16                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 20                | 113.96          | -89.62         | 113.96          | -89.62         | 22.64             | 117.57          | -95.04         | 117.57          | -95.04         |
| 16                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 19.91             | 113.93          | -89.61         | 113.93          | -89.61         | 22.53             | 117.63          | -95.05         | 117.63          | -95.05         |
| 16                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 18.75             | 114.89          | -95.08         | 114.89          | -95.08         | 21.21             | 119.42          | -100.01        | 119.42          | -100.01        |

**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 16                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 18.79             | 114.9           | -95.05         | 114.9           | -95.05         | 21.21             | 119.44          | -99.96         | 119.44          | -99.96         |
| 16                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 18.71             | 114.93          | -95.13         | 114.93          | -95.13         | 21.2              | 119.57          | -100.05        | 119.57          | -100.05        |
| 16                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 17.93             | 104.69          | -90.97         | 104.69          | -90.97         | 20.26             | 110.52          | -90.16         | 110.52          | -90.16         |
| 16                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 17.91             | 104.66          | -91.01         | 104.66          | -91.01         | 20.26             | 110.54          | -90.15         | 110.54          | -90.15         |
| 16                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 17.95             | 104.8           | -91.03         | 104.8           | -91.03         | 20.27             | 110.63          | -90.17         | 110.63          | -90.17         |
| 16                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 17.35             | 104.79          | -89.73         | 104.79          | -89.73         | 19.68             | 110.75          | -96.86         | 110.75          | -96.86         |
| 16                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 17.31             | 104.65          | -89.72         | 104.65          | -89.72         | 19.59             | 110.7           | -96.87         | 110.7           | -96.87         |
| 16                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 17.39             | 104.63          | -89.74         | 104.63          | -89.74         | 19.67             | 110.67          | -96.86         | 110.67          | -96.86         |
| 24                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 12.98             | 113.88          | -97.89         | 113.88          | -97.89         | 14.41             | 117.96          | -99.83         | 117.96          | -99.83         |
| 24                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 12.94             | 113.92          | -98.11         | 113.92          | -98.11         | 14.36             | 117.68          | -99.34         | 117.68          | -99.34         |
| 24                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 12.87             | 114.02          | -97.96         | 114.02          | -97.96         | 14.31             | 117.78          | -98.95         | 117.78          | -98.95         |
| 24                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 12.35             | 114.81          | -95.67         | 114.81          | -95.67         | 13.73             | 119.86          | -102.2         | 119.86          | -102.2         |
| 24                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 12.37             | 114.9           | -95.66         | 114.9           | -95.66         | 13.7              | 119.99          | -102.2         | 119.99          | -102.2         |
| 24                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 12.26             | 114.93          | -95.69         | 114.93          | -95.69         | 13.57             | 119.94          | -102.2         | 119.94          | -102.2         |
| 24                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 11.95             | 105.44          | -95.63         | 105.44          | -95.63         | 13.31             | 111.36          | -90.79         | 111.36          | -90.79         |
| 24                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 11.94             | 105.45          | -95.63         | 105.45          | -95.63         | 13.27             | 111.22          | -90.75         | 111.22          | -90.75         |
| 24                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 11.86             | 105.47          | -95.64         | 105.47          | -95.64         | 13.2              | 111.3           | -90.75         | 111.3           | -90.75         |
| 24                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 11.7              | 105.42          | -92.33         | 105.42          | -92.33         | 13                | 111.47          | -100.26        | 111.47          | -100.26        |
| 24                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 11.68             | 105.32          | -92.25         | 105.32          | -92.25         | 12.96             | 111.51          | -100.24        | 111.51          | -100.24        |
| 24                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 11.58             | 105.35          | -92.27         | 105.35          | -92.27         | 12.88             | 111.3           | -100.1         | 111.3           | -100.1         |
| 24                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 21.02             | 114.02          | -89.56         | 114.02          | -89.56         | 23.6              | 117.8           | -94.86         | 117.8           | -94.86         |
| 24                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 20.98             | 113.86          | -89.64         | 113.86          | -89.64         | 23.61             | 117.63          | -94.22         | 117.63          | -94.22         |
| 24                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 20.74             | 113.9           | -89.55         | 113.9           | -89.55         | 23.34             | 117.57          | -93.96         | 117.57          | -93.96         |
| 24                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 19.81             | 114.91          | -95.2          | 114.91          | -95.2          | 22.29             | 119.73          | -100.25        | 119.73          | -100.25        |
| 24                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 19.71             | 114.79          | -95.15         | 114.79          | -95.15         | 22.18             | 119.55          | -100.35        | 119.55          | -100.35        |
| 24                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 19.54             | 114.76          | -95.11         | 114.76          | -95.11         | 22                | 119.42          | -100.29        | 119.42          | -100.29        |
| 24                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 18.98             | 105.13          | -90.99         | 105.13          | -90.99         | 21.35             | 110.36          | -90.31         | 110.36          | -90.31         |
| 24                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 18.91             | 105.15          | -91.03         | 105.15          | -91.03         | 21.26             | 110.68          | -90.17         | 110.68          | -90.17         |
| 24                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 18.78             | 105.06          | -91.02         | 105.06          | -91.02         | 21.06             | 110.63          | -90.28         | 110.63          | -90.28         |
| 24                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 18.31             | 105.14          | -89.74         | 105.14          | -89.74         | 20.65             | 110.9           | -97.21         | 110.9           | -97.21         |
| 24                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 18.37             | 105.04          | -89.71         | 105.04          | -89.71         | 20.64             | 110.71          | -97.29         | 110.71          | -97.29         |
| 24                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 18.14             | 104.95          | -89.69         | 104.95          | -89.69         | 20.42             | 110.68          | -97.23         | 110.68          | -97.23         |
| 32                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 13.93             | 113.95          | -97.69         | 113.95          | -97.69         | 15.41             | 117.85          | -98.08         | 117.85          | -98.08         |
| 32                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 13.89             | 113.9           | -98.32         | 113.9           | -98.32         | 15.36             | 117.88          | -98.98         | 117.88          | -98.98         |
| 32                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 13.84             | 113.93          | -98.34         | 113.93          | -98.34         | 15.25             | 117.82          | -99.17         | 117.82          | -99.17         |

**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 32                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 13.36             | 114.88          | -95.71         | 114.88          | -95.71         | 14.69             | 119.66          | -101.98        | 119.66          | -101.98        |
| 32                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 13.34             | 114.88          | -95.72         | 114.88          | -95.72         | 14.7              | 119.58          | -102.04        | 119.58          | -102.04        |
| 32                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 13.19             | 114.79          | -95.7          | 114.79          | -95.7          | 14.55             | 119.85          | -102.08        | 119.85          | -102.08        |
| 32                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 12.98             | 105.57          | -95.54         | 105.57          | -95.54         | 14.31             | 111.15          | -90.8          | 111.15          | -90.8          |
| 32                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 12.96             | 105.35          | -95.62         | 105.35          | -95.62         | 14.25             | 111.32          | -90.76         | 111.32          | -90.76         |
| 32                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 12.84             | 105.42          | -95.53         | 105.42          | -95.53         | 14.17             | 111.25          | -90.76         | 111.25          | -90.76         |
| 32                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 12.64             | 105.32          | -92.33         | 105.32          | -92.33         | 13.97             | 111.2           | -100.14        | 111.2           | -100.14        |
| 32                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 12.65             | 105.37          | -92.29         | 105.37          | -92.29         | 13.95             | 111.35          | -99.99         | 111.35          | -99.99         |
| 32                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 12.56             | 105.32          | -92.36         | 105.32          | -92.36         | 13.83             | 111.37          | -100.13        | 111.37          | -100.13        |
| 32                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 22.59             | 114.01          | -89.45         | 114.01          | -89.45         | 25.26             | 117.86          | -94.34         | 117.86          | -94.34         |
| 32                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 22.57             | 113.82          | -89.26         | 113.82          | -89.26         | 25.21             | 117.71          | -94.35         | 117.71          | -94.35         |
| 32                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 22.29             | 113.91          | -88.97         | 113.91          | -88.97         | 24.88             | 117.76          | -94.52         | 117.76          | -94.52         |
| 32                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 21.33             | 114.88          | -95.1          | 114.88          | -95.1          | 23.88             | 119.53          | -99.87         | 119.53          | -99.87         |
| 32                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 21.28             | 114.81          | -95.1          | 114.81          | -95.1          | 23.77             | 119.56          | -99.85         | 119.56          | -99.85         |
| 32                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 21.09             | 114.69          | -95.11         | 114.69          | -95.11         | 23.61             | 119.74          | -99.83         | 119.74          | -99.83         |
| 32                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 20.6              | 105.07          | -90.95         | 105.07          | -90.95         | 22.94             | 110.68          | -90.28         | 110.68          | -90.28         |
| 32                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 20.56             | 105.17          | -90.97         | 105.17          | -90.97         | 22.9              | 110.75          | -90.23         | 110.75          | -90.23         |
| 32                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 20.27             | 105.08          | -90.95         | 105.08          | -90.95         | 22.71             | 110.63          | -90.28         | 110.63          | -90.28         |
| 32                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 19.92             | 105.06          | -89.56         | 105.06          | -89.56         | 22.3              | 110.68          | -97.25         | 110.68          | -97.25         |
| 32                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 19.96             | 105.12          | -89.53         | 105.12          | -89.53         | 22.26             | 110.81          | -97.16         | 110.81          | -97.16         |
| 32                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 19.7              | 105.05          | -89.54         | 105.05          | -89.54         | 21.94             | 110.64          | -97.16         | 110.64          | -97.16         |
| 48                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 15.12             | 113.59          | -97.79         | 113.59          | -97.79         | 16.51             | 117.88          | -98.18         | 117.88          | -98.18         |
| 48                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 15.25             | 113.5           | -97.29         | 113.5           | -97.29         | 16.8              | 117.77          | -98.9          | 117.77          | -98.9          |
| 48                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 15                | 113.73          | -98.17         | 113.73          | -98.17         | 16.33             | 117.9           | -98.51         | 117.9           | -98.51         |
| 48                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 14.52             | 114.49          | -95.69         | 114.49          | -95.69         | 15.84             | 119.87          | -102.46        | 119.87          | -102.46        |
| 48                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 14.68             | 114.43          | -95.69         | 114.43          | -95.69         | 16.1              | 119.86          | -102.32        | 119.86          | -102.32        |
| 48                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 14.34             | 114.46          | -95.7          | 114.46          | -95.7          | 15.73             | 119.62          | -102.12        | 119.62          | -102.12        |
| 48                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 14.14             | 105.35          | -95.55         | 105.35          | -95.55         | 15.43             | 111.34          | -90.77         | 111.34          | -90.77         |
| 48                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 14.26             | 105.27          | -95.47         | 105.27          | -95.47         | 15.53             | 111.35          | -90.87         | 111.35          | -90.87         |
| 48                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 14.02             | 105.39          | -95.39         | 105.39          | -95.39         | 15.37             | 111.23          | -90.79         | 111.23          | -90.79         |
| 48                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 13.78             | 105.3           | -92.4          | 105.3           | -92.4          | 15.11             | 111.34          | -100.06        | 111.34          | -100.06        |
| 48                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 14.04             | 105.35          | -92.35         | 105.35          | -92.35         | 15.28             | 111.33          | -100.07        | 111.33          | -100.07        |
| 48                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 13.73             | 105.32          | -92.38         | 105.32          | -92.38         | 14.92             | 111.25          | -100.03        | 111.25          | -100.03        |
| 48                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 23.47             | 113.65          | -89.71         | 113.65          | -89.71         | 26.19             | 117.79          | -94.68         | 117.79          | -94.68         |
| 48                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 23.87             | 113.69          | -89.71         | 113.69          | -89.71         | 26.58             | 117.7           | -94.6          | 117.7           | -94.6          |

**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 48                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 23.29             | 113.86          | -89.71         | 113.86          | -89.71         | 25.99             | 117.83          | -94.82         | 117.83          | -94.82         |
| 48                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 22.34             | 114.54          | -95.19         | 114.54          | -95.19         | 24.76             | 119.89          | -100.26        | 119.89          | -100.26        |
| 48                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 22.76             | 114.69          | -95.4          | 114.69          | -95.4          | 25.11             | 119.57          | -100.32        | 119.57          | -100.32        |
| 48                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 22.03             | 114.67          | -95.33         | 114.67          | -95.33         | 24.56             | 119.79          | -100.09        | 119.79          | -100.09        |
| 48                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 21.54             | 105.12          | -90.99         | 105.12          | -90.99         | 23.88             | 110.62          | -90.11         | 110.62          | -90.11         |
| 48                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 22.03             | 105.07          | -90.92         | 105.07          | -90.92         | 24.21             | 110.76          | -90.25         | 110.76          | -90.25         |
| 48                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 21.28             | 105.02          | -90.97         | 105.02          | -90.97         | 23.74             | 110.67          | -90.26         | 110.67          | -90.26         |
| 48                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 20.96             | 104.98          | -89.81         | 104.98          | -89.81         | 23.26             | 110.79          | -97.18         | 110.79          | -97.18         |
| 48                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 21.51             | 104.96          | -89.77         | 104.96          | -89.77         | 23.64             | 110.8           | -97.3          | 110.8           | -97.3          |
| 48                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 20.7              | 104.97          | -89.83         | 104.97          | -89.83         | 22.95             | 110.81          | -97.12         | 110.81          | -97.12         |
| 96                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 18.53             | 113.43          | -97.3          | 113.43          | -97.3          | 19.95             | 117.89          | -98.65         | 117.89          | -98.65         |
| 96                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 18.41             | 113.33          | -97.24         | 113.33          | -97.24         | 19.85             | 117.81          | -99.2          | 117.81          | -99.2          |
| 96                          | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 17.6              | 113.16          | -97.57         | 113.16          | -97.57         | 19.1              | 117.52          | -99.5          | 117.52          | -99.5          |
| 96                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 17.95             | 114.13          | -95.66         | 114.13          | -95.66         | 19.29             | 119.76          | -102.11        | 119.76          | -102.11        |
| 96                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 17.86             | 114             | -95.67         | 114             | -95.67         | 19.21             | 119.88          | -102.07        | 119.88          | -102.07        |
| 96                          | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 17.03             | 113.65          | -95.7          | 113.65          | -95.7          | 18.44             | 120.12          | -102.11        | 120.12          | -102.11        |
| 96                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 17.55             | 105.37          | -95.14         | 105.37          | -95.14         | 18.92             | 111.38          | -90.6          | 111.38          | -90.6          |
| 96                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 17.46             | 105.34          | -95.31         | 105.34          | -95.31         | 18.62             | 111.26          | -90.67         | 111.26          | -90.67         |
| 96                          | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 16.73             | 105.15          | -95.36         | 105.15          | -95.36         | 18.05             | 111.14          | -90.68         | 111.14          | -90.68         |
| 96                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 17.26             | 105.31          | -92.41         | 105.31          | -92.41         | 18.54             | 111.25          | -99.89         | 111.25          | -99.89         |
| 96                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 17                | 105.25          | -92.38         | 105.25          | -92.38         | 18.39             | 111.42          | -99.94         | 111.42          | -99.94         |
| 96                          | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 16.35             | 105.2           | -92.44         | 105.2           | -92.44         | 17.76             | 111.36          | -99.91         | 111.36          | -99.91         |
| 96                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 28.24             | 113.22          | -90.03         | 113.22          | -90.03         | 32.11             | 117.65          | -93.86         | 117.65          | -93.86         |
| 96                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 27.94             | 113.41          | -89.61         | 113.41          | -89.61         | 32.11             | 117.53          | -94.97         | 117.53          | -94.97         |
| 96                          | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 26.49             | 113.37          | -89.41         | 113.37          | -89.41         | 30.47             | 117.74          | -94.31         | 117.74          | -94.31         |
| 96                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 26.97             | 113.99          | -94.71         | 113.99          | -94.71         | 30.8              | 119.66          | -99.36         | 119.66          | -99.36         |
| 96                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 26.68             | 114.12          | -94.79         | 114.12          | -94.79         | 30.15             | 119.79          | -99.26         | 119.79          | -99.26         |
| 96                          | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 25.23             | 114.17          | -94.78         | 114.17          | -94.78         | 27.79             | 119.29          | -99.21         | 119.29          | -99.21         |
| 96                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 26.16             | 104.97          | -91.01         | 104.97          | -91.01         | 28.52             | 110.56          | -89.95         | 110.56          | -89.95         |
| 96                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 25.99             | 105.12          | -91.1          | 105.12          | -91.1          | 28.19             | 110.65          | -90.03         | 110.65          | -90.03         |
| 96                          | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 24.56             | 105.08          | -91.18         | 105.08          | -91.18         | 26.91             | 110.54          | -90.01         | 110.54          | -90.01         |
| 96                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 25.55             | 104.98          | -89.73         | 104.98          | -89.73         | 27.87             | 110.82          | -96.92         | 110.82          | -96.92         |
| 96                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 25.37             | 105.1           | -89.74         | 105.1           | -89.74         | 27.63             | 110.79          | -96.96         | 110.79          | -96.96         |
| 96                          | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 23.92             | 104.91          | -89.72         | 104.91          | -89.72         | 26.19             | 110.71          | -96.79         | 110.71          | -96.79         |
| 192                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 15.9              | 112.26          | -97.71         | 112.26          | -97.71         | 17.33             | 117.47          | -99.7          | 117.47          | -99.7          |

**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 192                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 16.38             | 112.51          | -97.56         | 112.51          | -97.56         | 17.81             | 117.55          | -99.71         | 117.55          | -99.71         |
| 192                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 15.68             | 112.72          | -98.36         | 112.72          | -98.36         | 17.11             | 117.44          | -99.61         | 117.44          | -99.61         |
| 192                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 15.31             | 112.87          | -95.15         | 112.87          | -95.15         | 16.66             | 119.81          | -100.87        | 119.81          | -100.87        |
| 192                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 15.8              | 113.24          | -95.28         | 113.24          | -95.28         | 17.12             | 119.63          | -100.76        | 119.63          | -100.76        |
| 192                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 15.04             | 112.93          | -95.28         | 112.93          | -95.28         | 16.44             | 119.82          | -100.88        | 119.82          | -100.88        |
| 192                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 14.93             | 105.15          | -95.08         | 105.15          | -95.08         | 16.24             | 111.23          | -90.35         | 111.23          | -90.35         |
| 192                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 15.4              | 105.25          | -95.04         | 105.25          | -95.04         | 16.73             | 111.33          | -90.42         | 111.33          | -90.42         |
| 192                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 14.71             | 105.19          | -95.13         | 105.19          | -95.13         | 16.04             | 111.25          | -90.5          | 111.25          | -90.5          |
| 192                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 14.63             | 105.14          | -92.43         | 105.14          | -92.43         | 15.93             | 111.42          | -98.97         | 111.42          | -98.97         |
| 192                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 15.11             | 105.06          | -92.4          | 105.06          | -92.4          | 16.4              | 111.26          | -98.9          | 111.26          | -98.9          |
| 192                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 14.36             | 105.07          | -92.37         | 105.07          | -92.37         | 15.71             | 111.34          | -98.82         | 111.34          | -98.82         |
| 192                         | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 25.45             | 112.93          | -87.89         | 112.93          | -87.89         | 28.04             | 117.31          | -94.58         | 117.31          | -94.58         |
| 192                         | 2                     | Fully Differential   | Headphone    | 64            | 32          | Low Latency        | 26.37             | 113.03          | -88.05         | 113.03          | -88.05         | 30.15             | 117.56          | -94.76         | 117.56          | -94.76         |
| 192                         | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 25.02             | 112.86          | -87.97         | 112.86          | -87.97         | 27.62             | 117.7           | -94.43         | 117.7           | -94.43         |
| 192                         | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 24.25             | 113.4           | -94.43         | 113.4           | -94.43         | 26.68             | 118.96          | -100.41        | 118.96          | -100.41        |
| 192                         | 2                     | Fully Differential   | Line Out     | 64            | 32          | Low Latency        | 25.16             | 113.65          | -94.47         | 113.65          | -94.47         | 27.63             | 119.04          | -100.24        | 119.04          | -100.24        |
| 192                         | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 23.79             | 113.61          | -94.62         | 113.61          | -94.62         | 26.28             | 119.46          | -100.28        | 119.46          | -100.28        |
| 192                         | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 23.43             | 104.93          | -86.57         | 104.93          | -86.57         | 25.8              | 110.52          | -91.71         | 110.52          | -91.71         |
| 192                         | 2                     | Single Ended         | Headphone    | 64            | 32          | Low Latency        | 24.31             | 104.99          | -86.42         | 104.99          | -86.42         | 26.64             | 110.53          | -91.7          | 110.53          | -91.7          |
| 192                         | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 23.01             | 104.91          | -86.5          | 104.91          | -86.5          | 25.34             | 110.54          | -91.76         | 110.54          | -91.76         |
| 192                         | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 22.84             | 104.94          | -87.24         | 104.94          | -87.24         | 25.12             | 110.63          | -96.55         | 110.63          | -96.55         |
| 192                         | 2                     | Single Ended         | Line Out     | 64            | 32          | Low Latency        | 23.69             | 104.95          | -87.15         | 104.95          | -87.15         | 25.99             | 110.42          | -96.4          | 110.42          | -96.4          |
| 192                         | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 22.4              | 104.84          | -87.21         | 104.84          | -87.21         | 24.68             | 110.53          | -96.33         | 110.53          | -96.33         |
| 384                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Linear Phase       | 17.77             | 112.14          | -94.73         | 112.14          | -94.73         | 19.22             | 116.8           | -98.35         | 116.8           | -98.35         |
| 384                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Low Latency        | 18.65             | 111.52          | -94.67         | 111.52          | -94.67         | 20.07             | 116.88          | -97.73         | 116.88          | -97.73         |
| 384                         | 1                     | Fully Differential   | Headphone    | 32            | 32          | Ultra Low Latency  | 17.3              | 112.62          | -94.79         | 112.62          | -94.79         | 18.73             | 117.4           | -98.47         | 117.4           | -98.47         |
| 384                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Linear Phase       | 17.18             | 112.65          | -95.01         | 112.65          | -95.01         | 18.53             | 118.64          | -102.06        | 118.64          | -102.06        |
| 384                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Low Latency        | 18.07             | 112.06          | -95.03         | 112.06          | -95.03         | 19.41             | 118.74          | -101.89        | 118.74          | -101.89        |
| 384                         | 1                     | Fully Differential   | Line Out     | 32            | 32          | Ultra Low Latency  | 16.7              | 112.92          | -94.92         | 112.92          | -94.92         | 18.05             | 118.8           | -101.81        | 118.8           | -101.81        |
| 384                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Linear Phase       | 16.78             | 104.97          | -90.39         | 104.97          | -90.39         | 18.1              | 110.9           | -93.36         | 110.9           | -93.36         |
| 384                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Low Latency        | 17.67             | 104.91          | -90.42         | 104.91          | -90.42         | 19.02             | 111.06          | -93.28         | 111.06          | -93.28         |
| 384                         | 1                     | Single Ended         | Headphone    | 32            | 32          | Ultra Low Latency  | 16.32             | 104.97          | -90.26         | 104.97          | -90.26         | 17.65             | 110.91          | -93.38         | 110.91          | -93.38         |
| 384                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Linear Phase       | 16.47             | 104.9           | -89.51         | 104.9           | -89.51         | 17.8              | 110.89          | -101.7         | 110.89          | -101.7         |
| 384                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Low Latency        | 17.37             | 104.84          | -89.47         | 104.84          | -89.47         | 18.69             | 111.11          | -101.57        | 111.11          | -101.57        |
| 384                         | 1                     | Single Ended         | Line Out     | 32            | 32          | Ultra Low Latency  | 16.02             | 105.08          | -89.46         | 105.08          | -89.46         | 17.33             | 110.79          | -101.6         | 110.79          | -101.6         |

**Table 2-2. Typical Current Consumption with PLL Enabled (continued)**

| Sampling Frequency (in kHz) | Enabled Channel Count | Output Configuration | Output Drive | BCLK-FS Ratio | Word Length | Decimation Filters | AVDD = 1.8V       |                 |                |                 |                | AVDD = 3.3V       |                 |                |                 |                |
|-----------------------------|-----------------------|----------------------|--------------|---------------|-------------|--------------------|-------------------|-----------------|----------------|-----------------|----------------|-------------------|-----------------|----------------|-----------------|----------------|
|                             |                       |                      |              |               |             |                    | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) | AVDD Current (mA) | DAC DR (dB-Awt) | DAC THD+N (dB) | ADC DR (dB-Awt) | ADC THD+N (dB) |
| 384                         | 2                     | Fully Differential   | Headphone    | 64            | 32          | Linear Phase       | 31.45             | 110.08          | -88.37         | 110.08          | -88.37         | 34.07             | 115.72          | -93.46         | 115.72          | -93.46         |
| 384                         | 2                     | Fully Differential   | Headphone    | 64            | 32          | Ultra Low Latency  | 30.47             | 108.37          | -92.34         | 108.37          | -92.34         | 33.09             | 114.47          | -93.03         | 114.47          | -93.03         |
| 384                         | 2                     | Fully Differential   | Line Out     | 64            | 32          | Linear Phase       | 30.15             | 110.52          | -93.77         | 110.52          | -93.77         | 32.43             | 116.09          | -98.17         | 116.09          | -98.17         |
| 384                         | 2                     | Fully Differential   | Line Out     | 64            | 32          | Ultra Low Latency  | 28.02             | 109.43          | -95.41         | 109.43          | -95.41         | 32.11             | 116.93          | -99.82         | 116.93          | -99.82         |
| 384                         | 2                     | Single Ended         | Headphone    | 64            | 32          | Linear Phase       | 28.04             | 102.01          | -86.56         | 102.01          | -86.56         | 31.78             | 107.69          | -90.39         | 107.69          | -90.39         |
| 384                         | 2                     | Single Ended         | Headphone    | 64            | 32          | Ultra Low Latency  | 27.16             | 101.19          | -89.68         | 101.19          | -89.68         | 30.8              | 107.97          | -87.36         | 107.97          | -87.36         |
| 384                         | 2                     | Single Ended         | Line Out     | 64            | 32          | Linear Phase       | 27.35             | 100.98          | -87.87         | 100.98          | -87.87         | 31.13             | 107.45          | -96.87         | 107.45          | -96.87         |
| 384                         | 2                     | Single Ended         | Line Out     | 64            | 32          | Ultra Low Latency  | 26.55             | 101.91          | -92.01         | 101.91          | -92.01         | 30.15             | 106.58          | -96.66         | 106.58          | -96.66         |



## 4 Settings for Lowest Power Consumption

To minimize the power consumption of the TAC5x1x devices, verify that unused modules are disabled, use the lowest sampling rate, bit clock, and controller clock required by the application, and operate at the lowest AVDD and IOVDD supply voltages possible. The following list summarizes the settings and registers for lowest power operation:

- Operate at the lowest supply voltage possible. AVDD and IOVDD support a 1.8V or 3.3V supply, independently (AVDD and IOVDD can have different supply voltages).
  - Unused analog inputs, tie to analog ground.
  - Unused digital inputs, tie to digital ground.
  - Unused outputs, leave unconnected.
- Disable unused DAC and ADC and PDM channels through the CH\_EN register.
- Disable MICBIAS power, if unused, through the PWR\_CFG register.
- Operate at the lowest sample rate possible.
- Disable PLL if the system supplies a low jitter controller clock (these settings are discussed in the *PLL Disabled* sections, refer to the [Table of Contents](#)).
- Disable unused post-processing blocks:
  - Disable biquad filters, if unused, through the DSF\_CFG0 and DST\_CFG1 registers for ADC and DAC, respectively.
- Select ultra-low latency filters over linear-phase decimation filters, if the application allows, through the DSP\_CFGx register.
- Use the smallest word length allowed by the application for the primary and secondary audio serial interfaces (ASI), using PASI\_CFG0 and SASI\_CFG0, respectively.

### Power Tune options

TAC5x1x also features a group of power tune settings aimed toward reducing further current consumption by optimizing the power consumed in the analog signal chain and the MIPS required by the DSP. These power tune options can be found in PWR\_TUNE\_CFG0 and PWR\_TUNE\_CFG1 for ADC and DAC, respectively. The power tune options exercised are:

- **ADC Power Tune options**
  - **Modulator Clock by 2 Mode:** This mode reduces the modulator clock of the ADC to 1.5MHz from the default 3MHz.
    - *For AVDD > 2V, this mode is only applicable in ADC 10k input impedance (ADC\_CHx\_IMP) along with rail-to-rail common mode configuration (ADC\_CHx\_CM\_TOL).*
  - **CIC Filter Order:** This mode reduces the number of CIC filter stages from 5<sup>th</sup> order to 4<sup>th</sup> order.
  - **Low Power Filter:** This mode when set, overrides the ADC decimation filters to reduce the MIPS required by the DSP to the lowest possible. This mode is used in conjunction with the PLL disabled condition to efficiently utilize the reduced MIPS available for the DSP.
- **DAC Power Tune options**
  - **Modulator Clock by 2 Mode:** This mode when set, reduces the modulator clock of the DAC to 1.5MHz from the default 3MHz.
  - **DAC Power Scale:** This mode when set, reduces intermediate current stages in the DAC by half (VREF/2R).
  - **Low Power Filter:** This mode when set, overrides the DAC decimation filters to reduce the MIPS required by the DSP to the lowest possible. This mode is used in conjunction with the PLL disabled condition, to efficiently utilize the reduced MIPS available for the DSP.

To access the power tune current consumption matrix, select this [Excel link](#).

## 5 Summary

The typical power consumption matrix of the TAC5x1x devices, across various usage scenarios, was tabulated in this document and recommendations for lowering power consumption was highlighted.

## 6 References

- Texas Instruments, [TAC5212 High-Performance Stereo Audio Codec With 118dB Dynamic Range ADC and 119dB Dynamic Range DAC](#), data sheet
- Texas Instruments, [TAC5211 High-Performance Mono Audio Codec With 118dB Dynamic Range ADC and 119dB Dynamic Range DAC](#), data sheet
- Texas Instruments, [TAC5112 Low-Power Stereo Audio Codec With 100dB Dynamic Range ADC and 106dB Dynamic Range DAC](#), data sheet
- Texas Instruments, [TAC5111 Low-Power Mono Audio Codec With 100dB Dynamic Range ADC and 106dB Dynamic Range DAC](#), data sheet



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