Application Note

TAC5x1x Power Consumption Matrix Across Various Usage Scenarios

ABSTRACT

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

- TAC5212
- TAC5211
- TAC5112
- TAC5111

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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^2C 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

3 TAC5112 and TAC5111 Power Consumption

3.1 TAC511x: Target Mode Power Consumption With PLL Disabled

This section describes the typical current consumption of the TAC511x 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 3-1, 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 3-1. 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	8.74	109.99	-99.28	109.99	-99.28	10.19	114.87	-98.26	114.87	-98.26
24	1	Fully Differential	Line Out	32	32	Enabled	8.18	110.16	-93.48	110.16	-93.48	9.51	115.3	-96.26	115.3	-96.26
24	1	Single Ended	Headphone	32	32	Enabled	7.83	101.88	-94.71	101.88	-94.71	9.11	107.69	-91.68	107.69	-91.68
24	1	Single Ended	Line Out	32	32	Enabled	7.52	101.9	-92.64	101.9	-92.64	8.81	107.61	-96.33	107.61	-96.33
24	2	Fully Differential	Headphone	64	32	Enabled	15.62	109.78	-92.84	109.78	-92.84	18.3	114.44	-93.52	114.44	-93.52
24	2	Fully Differential	Line Out	64	32	Enabled	14.43	110.02	-92.9	110.02	-92.9	16.91	114.7	-91.74	114.7	-91.74
24	2	Single Ended	Headphone	64	32	Enabled	13.65	101.71	-92.97	101.71	-92.97	16.05	107.38	-91.19	107.38	-91.19
24	2	Single Ended	Line Out	64	32	Enabled	13.09	101.77	-91.67	101.77	-91.67	15.36	107.48	-95.75	107.48	-95.75
32	1	Fully Differential	Headphone	32	32	Enabled	9.01	106.64	-97.75	106.64	-97.75	10.46	108.38	-97.29	108.38	-97.29
32	1	Fully Differential	Line Out	32	32	Enabled	8.45	106.81	-93.27	106.81	-93.27	9.78	108.52	-95.97	108.52	-95.97
32	1	Single Ended	Headphone	32	32	Enabled	8.1	101.36	-94.44	101.36	-94.44	9.43	105.61	-91.51	105.61	-91.51
32	1	Single Ended	Line Out	32	32	Enabled	7.8	101.28	-92.44	101.28	-92.44	9.08	105.42	-96.09	105.42	-96.09
32	2	Fully Differential	Headphone	64	32	Enabled	16.11	106.72	-92.71	106.72	-92.71	18.74	108.35	-93.1	108.35	-93.1
32	2	Fully Differential	Line Out	64	32	Enabled	14.94	106.8	-92.81	106.8	-92.81	17.4	108.35	-91.96	108.35	-91.96
32	2	Single Ended	Headphone	64	32	Enabled	14.16	101.23	-93.15	101.23	-93.15	16.54	105.42	-90.78	105.42	-90.78
32	2	Single Ended	Line Out	64	32	Enabled	13.57	101.17	-91.55	101.17	-91.55	15.87	105.43	-95.33	105.43	-95.33
48	1	Fully Differential	Headphone	32	32	Enabled	8.46	109.86	-97.92	109.86	-97.92	9.88	114.4	-98.72	114.4	-98.72
48	1	Fully Differential	Line Out	32	32	Enabled	7.89	109.85	-93.48	109.85	-93.48	9.22	114.96	-96.32	114.96	-96.32

Table 3-1. 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)
48	1	Single Ended	Headphone	32	32	Enabled	7.53	101.88	-94.5	101.88	-94.5	8.84	107.64	-91.67	107.64	-91.67
48	1	Single Ended	Line Out	32	32	Enabled	7.22	101.93	-92.54	101.93	-92.54	8.51	107.61	-96.52	107.61	-96.52
48	2	Fully Differential	Headphone	64	32	Enabled	14.98	109.94	-92.52	109.94	-92.52	17.6	114.31	-94.63	114.31	-94.63
48	2	Fully Differential	Line Out	64	32	Enabled	13.79	109.86	-92.92	109.86	-92.92	16.32	114.94	-91.78	114.94	-91.78
48	2	Single Ended	Headphone	64	32	Enabled	13.04	101.74	-92.93	101.74	-92.93	15.4	107.5	-91.17	107.5	-91.17
48	2	Single Ended	Line Out	64	32	Enabled	12.49	101.76	-91.71	101.76	-91.71	14.7	107.42	-95.59	107.42	-95.59
96	1	Fully Differential	Headphone	32	32	Enabled	8.97	109.85	-99.22	109.85	-99.22	10.38	114.44	-98.66	114.44	-98.66
96	1	Fully Differential	Line Out	32	32	Enabled	8.38	109.95	-93.52	109.95	-93.52	9.72	114.87	-96.45	114.87	-96.45
96	1	Single Ended	Headphone	32	32	Enabled	8	101.84	-94.77	101.84	-94.77	9.36	107.56	-91.67	107.56	-91.67
96	1	Single Ended	Line Out	32	32	Enabled	7.72	101.76	-92.7	101.76	-92.7	9.01	107.65	-96.49	107.65	-96.49
96	2	Fully Differential	Headphone	64	32	Enabled	15.8	109.74	-93.54	109.74	-93.54	18.42	114.5	-94.34	114.5	-94.34
96	2	Fully Differential	Line Out	64	32	Enabled	14.54	110.04	-93.38	110.04	-93.38	17.04	114.94	-93.15	114.94	-93.15
96	2	Single Ended	Headphone	64	32	Enabled	13.83	101.7	-93.3	101.7	-93.3	16.12	107.5	-90.53	107.5	-90.53
96	2	Single Ended	Line Out	64	32	Enabled	13.24	101.73	-91.66	101.73	-91.66	15.44	107.46	-95.86	107.46	-95.86

3.2 TAC511x: Target Mode Power Consumption With PLL Enabled

This section describes the typical current consumption of the TAC511x 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 3-2, 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 3-2. 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	109.99	-84.67	109.99	-84.67	12.4	115.04	-84.86	115.04	-84.86
8	1	Fully Differential	Headphone	32	32	Low Latency	10.99	109.85	-84.62	109.85	-84.62	12.44	114.86	-84.87	114.86	-84.87
8	1	Fully Differential	Headphone	32	32	Ultra Low Latency	10.98	109.9	-84.65	109.9	-84.65	12.43	115.06	-84.87	115.06	-84.87
8	1	Fully Differential	Line Out	32	32	Linear Phase	10.42	110.25	-84.24	110.25	-84.24	11.75	115.63	-84.53	115.63	-84.53
8	1	Fully Differential	Line Out	32	32	Low Latency	10.42	110.27	-84.25	110.27	-84.25	11.72	115.69	-84.51	115.69	-84.51
8	1	Fully Differential	Line Out	32	32	Ultra Low Latency	10.42	110.26	-84.24	110.26	-84.24	11.71	115.72	-84.52	115.72	-84.52
8	1	Single Ended	Headphone	32	32	Linear Phase	10.04	100.1	-84.24	100.1	-84.24	11.39	107.89	-83.96	107.89	-83.96
8	1	Single Ended	Headphone	32	32	Low Latency	10.08	100.06	-84.25	100.06	-84.25	11.36	107.88	-83.99	107.88	-83.99
8	1	Single Ended	Headphone	32	32	Ultra Low Latency	10.02	100.09	-84.23	100.09	-84.23	11.38	107.66	-83.99	107.66	-83.99

Table 3-2. 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	Single Ended	Line Out	32	32	Linear Phase	9.74	100.06	-83.92	100.06	-83.92	11.02	107.77	-84.76	107.77	-84.76
8	1	Single Ended	Line Out	32	32	Low Latency	9.77	100.14	-83.91	100.14	-83.91	11.04	107.75	-84.75	107.75	-84.75
8	1	Single Ended	Line Out	32	32	Ultra Low Latency	9.78	100.1	-83.92	100.1	-83.92	11.04	107.72	-84.76	107.72	-84.76
8	2	Fully Differential	Headphone	64	32	Linear Phase	17.83	109.94	-83.88	109.94	-83.88	20.51	114.88	-84.67	114.88	-84.67
8	2	Fully Differential	Headphone	64	32	Low Latency	17.79	109.92	-83.92	109.92	-83.92	20.48	114.72	-84.67	114.72	-84.67
8	2	Fully Differential	Headphone	64	32	Ultra Low Latency	17.84	110.09	-84.01	110.09	-84.01	20.53	114.89	-84.64	114.89	-84.64
8	2	Fully Differential	Line Out	64	32	Linear Phase	16.58	110.31	-84.08	110.31	-84.08	19.11	115.27	-83.95	115.27	-83.95
8	2	Fully Differential	Line Out	64	32	Low Latency	16.68	110.22	-84.07	110.22	-84.07	19.14	115.43	-83.95	115.43	-83.95
8	2	Fully Differential	Line Out	64	32	Ultra Low Latency	16.6	110.16	-84.09	110.16	-84.09	19.06	115.35	-83.96	115.35	-83.96
8	2	Single Ended	Headphone	64	32	Linear Phase	15.85	101.87	-84.11	101.87	-84.11	18.27	107.38	-83.93	107.38	-83.93
8	2	Single Ended	Headphone	64	32	Low Latency	15.88	101.91	-84.08	101.91	-84.08	18.3	107.63	-83.96	107.63	-83.96
8	2	Single Ended	Headphone	64	32	Ultra Low Latency	15.89	101.86	-84.15	101.86	-84.15	18.25	107.57	-83.96	107.57	-83.96
8	2	Single Ended	Line Out	64	32	Linear Phase	15.26	101.78	-83.71	101.78	-83.71	17.52	107.59	-84.7	107.59	-84.7
8	2	Single Ended	Line Out	64	32	Low Latency	15.23	101.75	-83.72	101.75	-83.72	17.6	107.41	-84.68	107.41	-84.68
8	2	Single Ended	Line Out	64	32	Ultra Low Latency	15.32	101.79	-83.73	101.79	-83.73	17.52	107.54	-84.69	107.54	-84.69
16	1	Fully Differential	Headphone	32	32	Linear Phase	12.18	109.92	-98.98	109.92	-98.98	13.59	115.12	-97.43	115.12	-97.43
16	1	Fully Differential	Headphone	32	32	Low Latency	12.16	109.83	-99.92	109.83	-99.92	13.61	115.04	-97.18	115.04	-97.18
16	1	Fully Differential	Headphone	32	32	Ultra Low Latency	12.16	110.12	-100.57	110.12	-100.57	13.54	115.05	-97.1	115.05	-97.1
16	1	Fully Differential	Line Out	32	32	Linear Phase	11.58	110.23	-93.73	110.23	-93.73	12.92	115.63	-96.31	115.63	-96.31
16	1	Fully Differential	Line Out	32	32	Low Latency	11.58	110.1	-93.66	110.1	-93.66	12.93	115.75	-96.37	115.75	-96.37
16	1	Fully Differential	Line Out	32	32	Ultra Low Latency	11.59	110.23	-93.69	110.23	-93.69	12.91	115.58	-96.34	115.58	-96.34
16	1	Single Ended	Headphone	32	32	Linear Phase	11.23	98.7	-91.08	98.7	-91.08	12.52	107.76	-90.65	107.76	-90.65
16	1	Single Ended	Headphone	32	32	Low Latency	11.24	98.74	-91.1	98.74	-91.1	12.57	107.83	-90.63	107.83	-90.63
16	1	Single Ended	Headphone	32	32	Ultra Low Latency	11.19	98.79	-91.07	98.79	-91.07	12.56	107.73	-90.67	107.73	-90.67
16	1	Single Ended	Line Out	32	32	Linear Phase	10.9	98.69	-89.96	98.69	-89.96	12.22	107.6	-97.03	107.6	-97.03
16	1	Single Ended	Line Out	32	32	Low Latency	10.88	98.7	-90.03	98.7	-90.03	12.2	107.71	-96.99	107.71	-96.99
16	1	Single Ended	Line Out	32	32	Ultra Low Latency	10.91	98.68	-89.96	98.68	-89.96	12.23	107.6	-97.06	107.6	-97.06
16	2	Fully Differential	Headphone	64	32	Linear Phase	19.69	109.88	-92.94	109.88	-92.94	22.43	114.89	-93.97	114.89	-93.97
16	2	Fully Differential	Headphone	64	32	Low Latency	19.73	109.93	-93.08	109.93	-93.08	22.47	114.95	-93.8	114.95	-93.8
16	2	Fully Differential	Headphone	64	32	Ultra Low Latency	19.8	110.2	-93.21	110.2	-93.21	22.38	114.99	-94.11	114.99	-94.11
16	2	Fully Differential	Line Out	64	32	Linear Phase	18.56	110.07	-93.13	110.07	-93.13	21.04	115.36	-91.78	115.36	-91.78
16	2	Fully Differential	Line Out	64	32	Low Latency	18.59	110.24	-93.15	110.24	-93.15	21.04	115.43	-91.76	115.43	-91.76
16	2	Fully Differential	Line Out	64	32	Ultra Low Latency	18.61	110.13	-93.13	110.13	-93.13	21.07	115.25	-91.79	115.25	-91.79
16	2	Single Ended	Headphone	64	32	Linear Phase	17.78	101.67	-93.02	101.67	-93.02	20.17	107.64	-90.6	107.64	-90.6
16	2	Single Ended	Headphone	64	32	Low Latency	17.87	101.79	-93.1	101.79	-93.1	20.24	107.6	-90.6	107.6	-90.6

Table 3-2. 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	Single Ended	Headphone	64	32	Ultra Low Latency	17.84	101.77	-93.16	101.77	-93.16	20.18	107.51	-90.65	107.51	-90.65
16	2	Single Ended	Line Out	64	32	Linear Phase	17.26	101.78	-90.97	101.78	-90.97	19.52	107.52	-96.11	107.52	-96.11
16	2	Single Ended	Line Out	64	32	Low Latency	17.26	101.74	-91.04	101.74	-91.04	19.49	107.56	-96.04	107.56	-96.04
16	2	Single Ended	Line Out	64	32	Ultra Low Latency	17.2	101.66	-90.96	101.66	-90.96	19.55	107.44	-96.03	107.44	-96.03
24	1	Fully Differential	Headphone	32	32	Linear Phase	12.84	109.91	-100.28	109.91	-100.28	14.26	114.88	-98.1	114.88	-98.1
24	1	Fully Differential	Headphone	32	32	Low Latency	12.82	109.87	-100.62	109.87	-100.62	14.27	115.13	-97.59	115.13	-97.59
24	1	Fully Differential	Headphone	32	32	Ultra Low Latency	12.74	109.86	-98.81	109.86	-98.81	14.14	115.03	-98.13	115.03	-98.13
24	1	Fully Differential	Line Out	32	32	Linear Phase	12.29	110.19	-93.7	110.19	-93.7	13.59	115.75	-96.34	115.75	-96.34
24	1	Fully Differential	Line Out	32	32	Low Latency	12.23	110.09	-93.75	110.09	-93.75	13.58	115.59	-96.44	115.59	-96.44
24	1	Fully Differential	Line Out	32	32	Ultra Low Latency	12.17	110.21	-93.75	110.21	-93.75	13.53	115.67	-96.5	115.67	-96.5
24	1	Single Ended	Headphone	32	32	Linear Phase	11.92	101.98	-94.72	101.98	-94.72	13.27	107.83	-90.72	107.83	-90.72
24	1	Single Ended	Headphone	32	32	Low Latency	11.87	101.87	-94.57	101.87	-94.57	13.25	107.73	-90.72	107.73	-90.72
24	1	Single Ended	Headphone	32	32	Ultra Low Latency	11.83	101.81	-94.69	101.81	-94.69	13.16	107.8	-90.7	107.8	-90.7
24	1	Single Ended	Line Out	32	32	Linear Phase	11.63	101.93	-92.24	101.93	-92.24	12.94	107.75	-97.14	107.75	-97.14
24	1	Single Ended	Line Out	32	32	Low Latency	11.6	101.68	-92.32	101.68	-92.32	12.91	107.71	-97.13	107.71	-97.13
24	1	Single Ended	Line Out	32	32	Ultra Low Latency	11.53	101.86	-92.44	101.86	-92.44	12.77	107.76	-97.18	107.76	-97.18
24	2	Fully Differential	Headphone	64	32	Linear Phase	20.81	109.98	-93.42	109.98	-93.42	23.48	114.95	-93.98	114.95	-93.98
24	2	Fully Differential	Headphone	64	32	Low Latency	20.69	110.09	-90.91	110.09	-90.91	23.37	114.91	-94.38	114.91	-94.38
24	2	Fully Differential	Headphone	64	32	Ultra Low Latency	20.51	109.93	-92.68	109.93	-92.68	23.23	114.93	-94.35	114.93	-94.35
24	2	Fully Differential	Line Out	64	32	Linear Phase	19.55	110.12	-93.22	110.12	-93.22	22.1	115.24	-91.7	115.24	-91.7
24	2	Fully Differential	Line Out	64	32	Low Latency	19.51	110.21	-93.26	110.21	-93.26	22.09	115.4	-91.63	115.4	-91.63
24	2	Fully Differential	Line Out	64	32	Ultra Low Latency	19.4	110.08	-93.27	110.08	-93.27	21.81	115.45	-91.69	115.45	-91.69
24	2	Single Ended	Headphone	64	32	Linear Phase	18.83	101.9	-93.25	101.9	-93.25	21.22	107.53	-90.69	107.53	-90.69
24	2	Single Ended	Headphone	64	32	Low Latency	18.86	101.85	-93.25	101.85	-93.25	21.16	107.65	-90.65	107.65	-90.65
24	2	Single Ended	Headphone	64	32	Ultra Low Latency	18.6	101.86	-93.03	101.86	-93.03	20.96	107.54	-90.66	107.54	-90.66
24	2	Single Ended	Line Out	64	32	Linear Phase	18.25	101.8	-90.98	101.8	-90.98	20.57	107.57	-96.17	107.57	-96.17
24	2	Single Ended	Line Out	64	32	Low Latency	18.2	101.61	-91.12	101.61	-91.12	20.49	107.45	-96.16	107.45	-96.16
24	2	Single Ended	Line Out	64	32	Ultra Low Latency	18.03	101.92	-91.06	101.92	-91.06	20.27	107.54	-96.25	107.54	-96.25
32	1	Fully Differential	Headphone	32	32	Linear Phase	13.83	109.97	-99.3	109.97	-99.3	15.27	115.02	-98.53	115.02	-98.53
32	1	Fully Differential	Headphone	32	32	Low Latency	13.8	109.92	-98.15	109.92	-98.15	15.24	115.05	-97.76	115.05	-97.76
32	1	Fully Differential	Headphone	32	32	Ultra Low Latency	13.71	110.16	-98.41	110.16	-98.41	15.16	115.16	-98.31	115.16	-98.31
32	1	Fully Differential	Line Out	32	32	Linear Phase	13.28	110.08	-93.78	110.08	-93.78	14.63	115.41	-96.26	115.41	-96.26
32	1	Fully Differential	Line Out	32	32	Low Latency	13.26	110.15	-93.71	110.15	-93.71	14.6	115.61	-96.31	115.61	-96.31
32	1	Fully Differential	Line Out	32	32	Ultra Low Latency	13.09	110.17	-93.72	110.17	-93.72	14.49	115.64	-96.23	115.64	-96.23
32	1	Single Ended	Headphone	32	32	Linear Phase	12.91	101.91	-94.64	101.91	-94.64	14.22	107.79	-90.69	107.79	-90.69

Table 3-2. 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	Single Ended	Headphone	32	32	Low Latency	12.9	101.93	-94.5	101.93	-94.5	14.21	107.79	-90.66	107.79	-90.66
32	1	Single Ended	Headphone	32	32	Ultra Low Latency	12.77	101.77	-94.56	101.77	-94.56	14.09	107.7	-90.7	107.7	-90.7
32	1	Single Ended	Line Out	32	32	Linear Phase	12.63	101.87	-92.33	101.87	-92.33	13.88	107.66	-97.07	107.66	-97.07
32	1	Single Ended	Line Out	32	32	Low Latency	12.58	101.76	-92.27	101.76	-92.27	13.85	107.75	-96.95	107.75	-96.95
32	1	Single Ended	Line Out	32	32	Ultra Low Latency	12.49	101.9	-92.24	101.9	-92.24	13.75	107.63	-96.99	107.63	-96.99
32	2	Fully Differential	Headphone	64	32	Linear Phase	22.41	109.98	-91.34	109.98	-91.34	25.08	114.99	-93.94	114.99	-93.94
32	2	Fully Differential	Headphone	64	32	Low Latency	22.28	109.98	-90.91	109.98	-90.91	25.05	114.96	-94.41	114.96	-94.41
32	2	Fully Differential	Headphone	64	32	Ultra Low Latency	22.12	109.86	-91.67	109.86	-91.67	24.82	115.04	-94.68	115.04	-94.68
32	2	Fully Differential	Line Out	64	32	Linear Phase	21.14	110.19	-93.12	110.19	-93.12	23.7	115.28	-91.21	115.28	-91.21
32	2	Fully Differential	Line Out	64	32	Low Latency	21.09	110.19	-93.15	110.19	-93.15	23.6	115.42	-91.18	115.42	-91.18
32	2	Fully Differential	Line Out	64	32	Ultra Low Latency	20.94	110.11	-93.07	110.11	-93.07	23.4	115.38	-91.19	115.38	-91.19
32	2	Single Ended	Headphone	64	32	Linear Phase	20.44	101.74	-92.88	101.74	-92.88	22.86	107.59	-90.94	107.59	-90.94
32	2	Single Ended	Headphone	64	32	Low Latency	20.42	101.83	-92.88	101.83	-92.88	22.72	107.57	-90.9	107.57	-90.9
32	2	Single Ended	Headphone	64	32	Ultra Low Latency	20.12	101.9	-92.74	101.9	-92.74	22.57	107.55	-90.93	107.55	-90.93
32	2	Single Ended	Line Out	64	32	Linear Phase	19.82	101.72	-90.63	101.72	-90.63	22.12	107.46	-95.85	107.46	-95.85
32	2	Single Ended	Line Out	64	32	Low Latency	19.81	101.86	-90.68	101.86	-90.68	22.07	107.49	-95.86	107.49	-95.86
32	2	Single Ended	Line Out	64	32	Ultra Low Latency	19.51	101.78	-90.74	101.78	-90.74	21.9	107.53	-95.82	107.53	-95.82
48	1	Fully Differential	Headphone	32	32	Linear Phase	14.95	109.83	-98.13	109.83	-98.13	16.44	115.04	-97.14	115.04	-97.14
48	1	Fully Differential	Headphone	32	32	Low Latency	15.08	109.75	-98.25	109.75	-98.25	16.65	115	-97.56	115	-97.56
48	1	Fully Differential	Headphone	32	32	Ultra Low Latency	14.83	109.8	-99.39	109.8	-99.39	16.24	115.15	-97.21	115.15	-97.21
48	1	Fully Differential	Line Out	32	32	Linear Phase	14.41	110.18	-93.65	110.18	-93.65	15.7	115.5	-96.32	115.5	-96.32
48	1	Fully Differential	Line Out	32	32	Low Latency	14.64	109.96	-93.7	109.96	-93.7	15.87	115.56	-96.31	115.56	-96.31
48	1	Fully Differential	Line Out	32	32	Ultra Low Latency	14.31	109.86	-93.77	109.86	-93.77	15.61	115.5	-96.31	115.5	-96.31
48	1	Single Ended	Headphone	32	32	Linear Phase	14.08	101.9	-94.66	101.9	-94.66	15.34	107.73	-90.73	107.73	-90.73
48	1	Single Ended	Headphone	32	32	Low Latency	14.31	101.88	-94.63	101.88	-94.63	15.66	107.76	-90.74	107.76	-90.74
48	1	Single Ended	Headphone	32	32	Ultra Low Latency	14	101.98	-94.62	101.98	-94.62	15.28	107.81	-90.71	107.81	-90.71
48	1	Single Ended	Line Out	32	32	Linear Phase	13.72	101.94	-92.31	101.94	-92.31	15	107.73	-96.96	107.73	-96.96
48	1	Single Ended	Line Out	32	32	Low Latency	13.91	101.97	-92.41	101.97	-92.41	15.28	107.69	-97.02	107.69	-97.02
48	1	Single Ended	Line Out	32	32	Ultra Low Latency	13.57	101.87	-92.39	101.87	-92.39	14.86	107.59	-96.98	107.59	-96.98
48	2	Fully Differential	Headphone	64	32	Linear Phase	23.31	109.92	-92.5	109.92	-92.5	25.97	115.11	-94.39	115.11	-94.39
48	2	Fully Differential	Headphone	64	32	Low Latency	23.75	110.11	-91.86	110.11	-91.86	26.39	114.79	-93.82	114.79	-93.82
48	2	Fully Differential	Headphone	64	32	Ultra Low Latency	23.06	109.85	-91.77	109.85	-91.77	25.78	115.02	-93.55	115.02	-93.55
48	2	Fully Differential	Line Out	64	32	Linear Phase	22.18	110.08	-93.22	110.08	-93.22	24.6	115.62	-91.53	115.62	-91.53
48	2	Fully Differential	Line Out	64	32	Low Latency	22.53	110.07	-93.18	110.07	-93.18	24.98	115.55	-91.5	115.55	-91.5
48	2	Fully Differential	Line Out	64	32	Ultra Low Latency	21.92	110.1	-93.22	110.1	-93.22	24.37	115.41	-91.6	115.41	-91.6

Table 3-2. 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	Single Ended	Headphone	64	32	Linear Phase	21.38	101.79	-93.11	101.79	-93.11	23.81	107.53	-90.55	107.53	-90.55
48	2	Single Ended	Headphone	64	32	Low Latency	21.93	101.72	-93.2	101.72	-93.2	24.24	107.69	-90.64	107.69	-90.64
48	2	Single Ended	Headphone	64	32	Ultra Low Latency	21.16	101.74	-92.98	101.74	-92.98	23.53	107.56	-90.6	107.56	-90.6
48	2	Single Ended	Line Out	64	32	Linear Phase	20.84	101.74	-91.18	101.74	-91.18	23.06	107.45	-95.87	107.45	-95.87
48	2	Single Ended	Line Out	64	32	Low Latency	21.33	101.79	-91.04	101.79	-91.04	23.58	107.45	-95.93	107.45	-95.93
48	2	Single Ended	Line Out	64	32	Ultra Low Latency	20.54	101.86	-91.21	101.86	-91.21	22.78	107.44	-95.83	107.44	-95.83
96	1	Fully Differential	Headphone	32	32	Linear Phase	18.44	109.81	-98.75	109.81	-98.75	19.84	115.15	-96.45	115.15	-96.45
96	1	Fully Differential	Headphone	32	32	Low Latency	18.33	109.65	-100.7	109.65	-100.7	19.74	114.98	-96.52	114.98	-96.52
96	1	Fully Differential	Headphone	32	32	Ultra Low Latency	17.5	109.56	-98.12	109.56	-98.12	19.02	115.03	-96.8	115.03	-96.8
96	1	Fully Differential	Line Out	32	32	Linear Phase	17.88	109.9	-93.62	109.9	-93.62	19.2	115.58	-95.98	115.58	-95.98
96	1	Fully Differential	Line Out	32	32	Low Latency	17.73	109.69	-93.62	109.69	-93.62	19.07	115.62	-95.95	115.62	-95.95
96	1	Fully Differential	Line Out	32	32	Ultra Low Latency	17.04	109.83	-93.74	109.83	-93.74	18.43	115.64	-95.94	115.64	-95.94
96	1	Single Ended	Headphone	32	32	Linear Phase	17.52	101.96	-94.51	101.96	-94.51	18.83	107.93	-90.62	107.93	-90.62
96	1	Single Ended	Headphone	32	32	Low Latency	17.33	101.94	-94.35	101.94	-94.35	18.74	107.89	-90.66	107.89	-90.66
96	1	Single Ended	Headphone	32	32	Ultra Low Latency	16.64	101.81	-94.37	101.81	-94.37	18	107.79	-90.62	107.79	-90.62
96	1	Single Ended	Line Out	32	32	Linear Phase	17.19	101.94	-92.39	101.94	-92.39	18.47	107.65	-97.09	107.65	-97.09
96	1	Single Ended	Line Out	32	32	Low Latency	17.13	101.83	-92.39	101.83	-92.39	18.39	107.66	-96.98	107.66	-96.98
96	1	Single Ended	Line Out	32	32	Ultra Low Latency	16.38	101.93	-92.29	101.93	-92.29	17.63	107.7	-96.81	107.7	-96.81
96	2	Fully Differential	Headphone	64	32	Linear Phase	28.07	109.56	-91.91	109.56	-91.91	32.11	115.04	-93.27	115.04	-93.27
96	2	Fully Differential	Headphone	64	32	Low Latency	27.66	109.83	-92.17	109.83	-92.17	31.78	115.04	-93.3	115.04	-93.3
96	2	Fully Differential	Headphone	64	32	Ultra Low Latency	26.25	109.86	-92.5	109.86	-92.5	30.47	114.99	-93.21	114.99	-93.21
96	2	Fully Differential	Line Out	64	32	Linear Phase	26.82	109.78	-92.79	109.78	-92.79	30.47	115.44	-90.35	115.44	-90.35
96	2	Fully Differential	Line Out	64	32	Low Latency	26.54	110.02	-92.81	110.02	-92.81	30.15	115.6	-90.35	115.6	-90.35
96	2	Fully Differential	Line Out	64	32	Ultra Low Latency	25.13	109.68	-92.84	109.68	-92.84	27.69	115.29	-90.38	115.29	-90.38
96	2	Single Ended	Headphone	64	32	Linear Phase	26.07	101.74	-92.64	101.74	-92.64	28.47	107.71	-90.78	107.71	-90.78
96	2	Single Ended	Headphone	64	32	Low Latency	25.73	101.78	-92.61	101.78	-92.61	28.12	107.6	-90.89	107.6	-90.89
96	2	Single Ended	Headphone	64	32	Ultra Low Latency	24.33	101.82	-92.65	101.82	-92.65	26.7	107.65	-90.91	107.65	-90.91
96	2	Single Ended	Line Out	64	32	Linear Phase	25.43	101.85	-89.87	101.85	-89.87	27.78	107.46	-95.39	107.46	-95.39
96	2	Single Ended	Line Out	64	32	Low Latency	25.08	101.75	-89.78	101.75	-89.78	27.36	107.48	-95.46	107.48	-95.46
96	2	Single Ended	Line Out	64	32	Ultra Low Latency	23.87	101.78	-89.86	101.78	-89.86	26.02	107.51	-95.38	107.51	-95.38
192	1	Fully Differential	Headphone	32	32	Linear Phase	15.79	109.33	-100.94	109.33	-100.94	17.24	115.09	-96.86	115.09	-96.86
192	1	Fully Differential	Headphone	32	32	Low Latency	16.27	109.33	-99.18	109.33	-99.18	17.66	114.84	-96.93	114.84	-96.93
192	1	Fully Differential	Headphone	32	32	Ultra Low Latency	15.55	109.14	-98.89	109.14	-98.89	17.02	114.79	-96.3	114.79	-96.3
192	1	Fully Differential	Line Out	32	32	Linear Phase	15.21	109.44	-93.31	109.44	-93.31	16.56	115.31	-93.93	115.31	-93.93
192	1	Fully Differential	Line Out	32	32	Low Latency	15.69	109.46	-93.31	109.46	-93.31	17.05	115.22	-93.9	115.22	-93.9

Table 3-2. 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	Line Out	32	32	Ultra Low Latency	14.99	109.44	-93.28	109.44	-93.28	16.34	115.2	-94.04	115.2	-94.04
192	1	Single Ended	Headphone	32	32	Linear Phase	14.86	101.87	-94.69	101.87	-94.69	16.17	107.82	-91.12	107.82	-91.12
192	1	Single Ended	Headphone	32	32	Low Latency	15.31	101.83	-94.58	101.83	-94.58	16.64	107.85	-91.12	107.85	-91.12
192	1	Single Ended	Headphone	32	32	Ultra Low Latency	14.64	101.7	-94.62	101.7	-94.62	15.95	107.91	-91.05	107.91	-91.05
192	1	Single Ended	Line Out	32	32	Linear Phase	14.56	101.87	-91.41	101.87	-91.41	15.86	107.56	-96.05	107.56	-96.05
192	1	Single Ended	Line Out	32	32	Low Latency	15.01	101.82	-91.49	101.82	-91.49	16.34	107.79	-96.05	107.79	-96.05
192	1	Single Ended	Line Out	32	32	Ultra Low Latency	14.34	101.77	-91.52	101.77	-91.52	15.62	107.63	-96	107.63	-96
192	2	Fully Differential	Headphone	64	32	Linear Phase	25.25	109.51	-90.88	109.51	-90.88	27.9	114.88	-93.57	114.88	-93.57
192	2	Fully Differential	Headphone	64	32	Low Latency	26.16	109.6	-91.09	109.6	-91.09	30.47	114.82	-93.58	114.82	-93.58
192	2	Fully Differential	Headphone	64	32	Ultra Low Latency	24.78	109.68	-91.18	109.68	-91.18	27.42	114.84	-93.6	114.84	-93.6
192	2	Fully Differential	Line Out	64	32	Linear Phase	24.08	109.58	-92.84	109.58	-92.84	26.58	115.09	-91.9	115.09	-91.9
192	2	Fully Differential	Line Out	64	32	Low Latency	24.93	109.65	-92.81	109.65	-92.81	27.43	115.34	-91.91	115.34	-91.91
192	2	Fully Differential	Line Out	64	32	Ultra Low Latency	23.62	109.62	-92.86	109.62	-92.86	26.07	115.28	-91.97	115.28	-91.97
192	2	Single Ended	Headphone	64	32	Linear Phase	23.25	101.63	-90.79	101.63	-90.79	25.66	107.12	-91.82	107.12	-91.82
192	2	Single Ended	Headphone	64	32	Low Latency	24.22	101.69	-90.77	101.69	-90.77	26.58	107.37	-91.8	107.37	-91.8
192	2	Single Ended	Headphone	64	32	Ultra Low Latency	22.86	101.53	-90.8	101.53	-90.8	25.19	107.34	-91.87	107.34	-91.87
192	2	Single Ended	Line Out	64	32	Linear Phase	22.71	101.46	-89.68	101.46	-89.68	24.99	107.38	-97.4	107.38	-97.4
192	2	Single Ended	Line Out	64	32	Low Latency	23.63	101.5	-89.67	101.5	-89.67	25.87	107.09	-97.3	107.09	-97.3
192	2	Single Ended	Line Out	64	32	Ultra Low Latency	22.23	101.48	-89.66	101.48	-89.66	24.54	107.27	-97.34	107.27	-97.34
384	1	Fully Differential	Headphone	32	32	Linear Phase	17.62	109.06	-98.46	109.06	-98.46	19.12	114.55	-97.33	114.55	-97.33
384	1	Fully Differential	Headphone	32	32	Low Latency	18.5	108.6	-98.59	108.6	-98.59	20	114.29	-96.82	114.29	-96.82
384	1	Fully Differential	Headphone	32	32	Ultra Low Latency	17.13	108.98	-97.65	108.98	-97.65	18.64	114.53	-97.33	114.53	-97.33
384	1	Fully Differential	Line Out	32	32	Linear Phase	17.06	109.06	-93.37	109.06	-93.37	18.44	114.81	-96.3	114.81	-96.3
384	1	Fully Differential	Line Out	32	32	Low Latency	17.92	108.68	-93.34	108.68	-93.34	19.32	114.59	-96.32	114.59	-96.32
384	1	Fully Differential	Line Out	32	32	Ultra Low Latency	16.57	109.08	-93.29	109.08	-93.29	17.96	114.76	-96.29	114.76	-96.29
384	1	Single Ended	Headphone	32	32	Linear Phase	16.71	101.43	-93.8	101.43	-93.8	18.03	107.31	-91.93	107.31	-91.93
384	1	Single Ended	Headphone	32	32	Low Latency	17.61	101.47	-93.9	101.47	-93.9	18.95	107.36	-91.82	107.36	-91.82
384	1	Single Ended	Headphone	32	32	Ultra Low Latency	16.2	101.47	-93.85	101.47	-93.85	17.55	107.34	-91.97	107.34	-91.97
384	1	Single Ended	Line Out	32	32	Linear Phase	16.39	101.42	-91.12	101.42	-91.12	17.73	107.45	-98.33	107.45	-98.33
384	1	Single Ended	Line Out	32	32	Low Latency	17.3	101.17	-91.17	101.17	-91.17	18.62	107.39	-98.13	107.39	-98.13
384	1	Single Ended	Line Out	32	32	Ultra Low Latency	15.91	101.35	-91.09	101.35	-91.09	17.25	107.29	-97.99	107.29	-97.99
384	2	Fully Differential	Headphone	64	32	Linear Phase	30.8	108.33	-91.52	108.33	-91.52	34.07	113.76	-92.33	113.76	-92.33
384	2	Fully Differential	Headphone	64	32	Ultra Low Latency	30.15	107.53	-94.44	107.53	-94.44	33.09	113.83	-93.26	113.83	-93.26
384	2	Fully Differential	Line Out	64	32	Linear Phase	28.63	108.67	-92.59	108.67	-92.59	32.43	114.09	-91.25	114.09	-91.25
384	2	Fully Differential	Line Out	64	32	Ultra Low Latency	27.75	108.23	-92.37	108.23	-92.37	31.45	114.31	-91.83	114.31	-91.83

Table 3-2. 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	Single Ended	Headphone	64	32	Linear Phase	27.9	101.32	-92.17	101.32	-92.17	31.78	106.35	-91.26	106.35	-91.26
384	2	Single Ended	Headphone	64	32	Ultra Low Latency	27.08	100.76	-91.01	100.76	-91.01	30.8	107.25	-88.77	107.25	-88.77
384	2	Single Ended	Line Out	64	32	Linear Phase	27.2	100.39	-90.12	100.39	-90.12	30.8	107	-93.72	107	-93.72
384	2	Single Ended	Line Out	64	32	Ultra Low Latency	26.42	100.58	-90.11	100.58	-90.11	30.15	106.83	-93.92	106.83	-93.92

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.

4.1 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 include the following:

- **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^{th} order to 4^{th} 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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