Application Note

DP83867E/IS/CS/IR/CR RGZ Power Consumption Data

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ABSTRACT

Power consumption on an Ethernet PHY is affected by different operating conditions. System design around Ethernet products requires accurate power consumption numbers for component selection, thermal management and power distribution planning. This application report details power consumption of DP83867 in different conditions.

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Trademarks

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1 Introduction

Power consumption data mentioned in the data sheet is accurate for typical operating conditions. However, Ethernet transceiver power consumption is affected by the operating conditions. This application report details the key factors affecting the power consumption.

This application report is applicable to the following devices:

DP83867ERGZ

DP83867ISRGZ

DP83867IRRGZ

DP83867CSRGZ

DP83867CRRGZ

2 Factors Affecting Power Consumption

Power consumption is affected by several operating conditions like I/O pin loading, packet payload, channel utilization, cable length, operational mode and Temperature.

Power mentioned in Section 4.1 can be used as benchmark for comparison.

2.1 Operational Mode

Power consumption depends on the operational mode of the PHY. Depending on the data rate selected, the PHY has different signaling which affects the data coding, voltage and operating frequency. This in turn affects the power demand by the PHY.

See Appendix Section 6.1, Section 6.2 and Section 6.3 for observing the power variation due to change in operational mode.

2.2 I/O Pin Loading

Digital I/O pin loading affects the power consumption of the PHY. Digital I/O pins include clock output pins, general-purpose output pins, and MII digital output pins. For example, 6 digital outputs driving 5 pF loads at 25 MHz can result in a current demand of 15 mA in a typical application. Power demand can be reduced by making MII signal traces as short as possible, and by adding series termination to the MII output signals. Some PHYTER products include integrated digital output series resistance. For more details, see the device-specific data sheets

Higher voltage level on the Digital I/O pins also leads to higher power consumption. See Appendix Section 6.1 for observing the power variation due to change in VDDIO voltage.

2.3 Channel Utilization

Channel Utilization is defined by the length of inter-packet gap. Channel utilization can be increased by decreasing the interpacket gap. Increasing the channel utilization also increases the transitions on I/O pins which increases power consumption.

See Appendix Section 6.4 for observing power consumption variations due to change in channel utilization.

2.4 Payload

The size of data packets has a definite impact on power consumption. When the size of data packets is increased it leads to higher transitions on the I/O pins. This increases power consumption.

2.5 Temperature

Operating temperature also affects the power consumption of the PHY. Higher ambient temperature means higher power consumption.

Temperature has the least amount of influence on total power consumption because PHYTER products are designed to internally compensate temperature variations.

3 Power Saving Modes

See Appendix Section 6.5 for observing the power consumption of the PHY in Power Down modes.

3.1 IEEE Power Down

The PHY is powered down except for essential functions. Access to the PHY via MDIO-MDC pins is retained. This mode can be activated by asserting external PWDN pin or by setting bit 11 of BMCR (Register 0x00).

The PHY can be taken out of this mode by a power cycle, software reset or by writing 0 to bit 11 in BMCR register. However, the external PWDN pin should be de-asserted. If the PWDN pin is kept asserted then the PHY will remain in power down.

3.2 Deep Power Down Mode

Deep Power Down is same as IEEE power down but the XI pad will also be turned off. This mode can be activated by asserting the external PWDN pin or by setting bit 11 of BMCR (Register 0x00). Before activating this mode, it is required to set bit 7 for PHYCR(Register 0x10).

The PHY can be taken out of this mode by a power cycle, software reset or by writing 0 to bit 11 in BMCR register. Additionally, the external PWDN pin should be de-asserted. If the PWDN pin is kept asserted then the PHY will remain in power down.

3.3 Active Sleep

In this mode all the digital and analog blocks are powered down. The PHY is automatically powered up when a link partner is detected. This mode is useful for saving power when the link partner is down/inactive but the PHY cannot be powered down. In Active Sleep mode, the PHY will still routinely send NLP to the link partner. This mode can be active by writing 1 to bit 9 and 0 to bit 8 for PHYCR (Register 0x10).

3.4 Passive Sleep

Passive sleep is just like Active sleep except the PHY does not send NLP. This mode can be activated by writing 1 to bits 9 and 8 of PHYCR (Register 0x10).

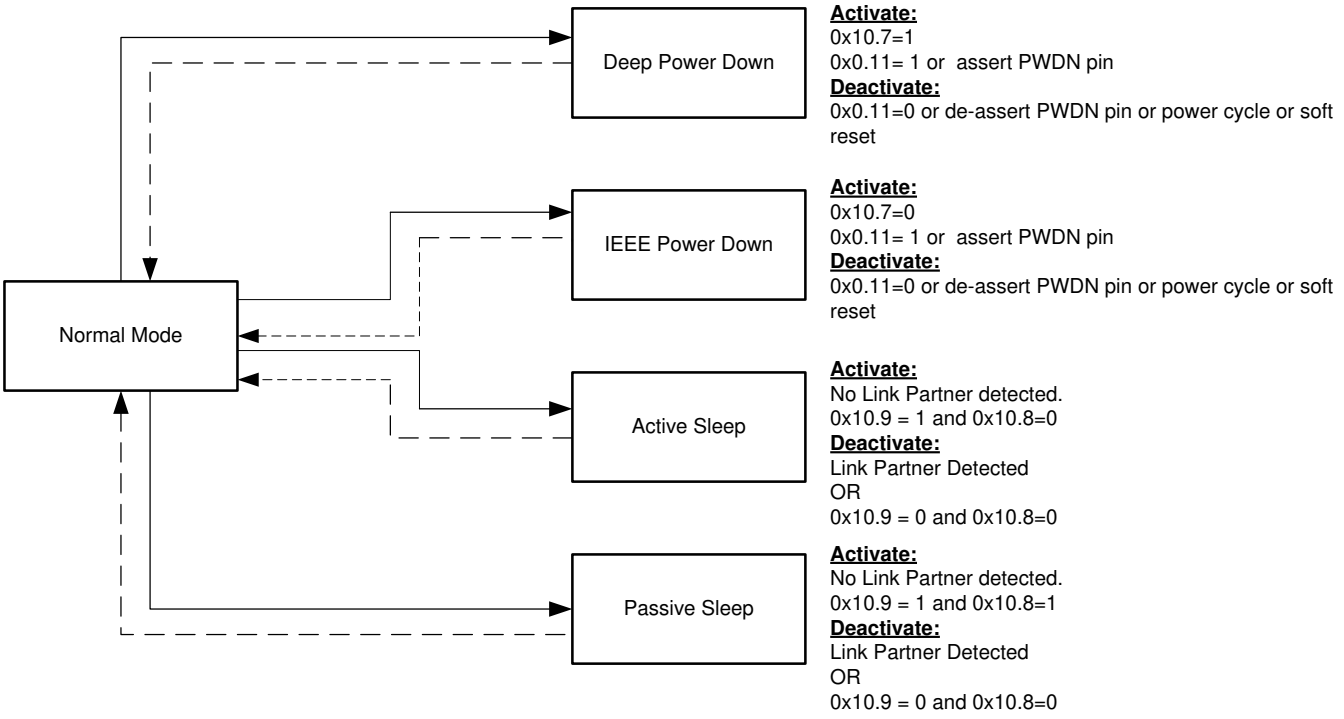

Figure 3-1. Power Saving Modes State Diagram

4 Power Consumption Baseline Data

The power consumption of the PHY can vary with all of the factors listed above. For the scope of this Application report, the PHY's power consumption with respect to Operating Mode, Supply type, VDDIO voltage and temperature is listed below. Also, the power numbers are measured after the optimization techniques listed above. The parameters for the tests are 1518 byte Packet size, 50% utilization, 100m cable length and random data pattern. The packet size, cable length and data pattern are selected to mimic the worst case conditions. The utilization is selected to be a worst case for most of the real world applications. As mentioned above, increasing the utilization will result in increase in power consumption.

The power numbers listed below were measured on a limited number of samples in a lab environment. Data is presented in a column format with current consumed by individual supplies listed with the total power number.

4.1 Base Line Power Consumption

The baseline power consumption number for each mode is measured by setting the following parameters. These numbers serve as a benchmark for observing changes in power consumption with change in parameters.

- Temperature: 25 °C
- Channel Utilization: 50%
- Cable Length: 100m
- VDDIO: 1.8V

Table 4-1. 1000M Triple Supply Baseline Power

Mode	Total Power (mW)	VDDIO			VDD2P5			VDD1P1			VDD1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
1000	453.94	1.8	23.75	42.75	2.5	85.65	214.14	1	107.5	107.5	1.8	49.76	89.56
100	245.02	1.8	7.19	12.95	2.5	68.51	171.27	1	26.46	26.46	1.8	19.08	34.34
10	231.87	1.8	8.35	15.03	2.5	72.35	180.87	1	19.02	19.02	1.8	9.42	16.95

Table 4-2. 1000M Dual Supply Baseline Power

Mode	Total Power (mW)	VDDIO			VDD2P5			VDD1P1		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
1000	489.38	1.8	23.71	42.68	2.5	135.66	339.16	1	107.55	107.55
100	257.47	1.8	6.66	11.99	2.5	87.8	219.5	1	25.98	25.98
10	239.85	1.8	8.92	16.06	2.5	81.89	204.72	1	19.07	19.07

5 Summary

The data above shows the operating conditions have a significant impact on the power consumption of the PHY. Voltage levels of the I/O pins and supply mode are the major factors affecting the power consumption.

6 Appendix

All power consumption numbers are for 50% utilization, unless specified otherwise. DP83867ERGZ was used in RGMII mode for the power measurements below. The highest operating temperature would depend on which variant of the RGZ family is used.

6.1 1000M Power

Table 6-1. 1000M Triple Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	478.62	1.8	23.85	42.93	2.5	85.58	213.94	1.1	120.17	132.19	1.8	49.75	89.56
25	453.94	1.8	23.75	42.75	2.5	85.65	214.14	1	107.5	107.5	1.8	49.76	89.56
25	521.67	2.5	33.93	84.83	2.5	85.75	214.37	1.1	120.88	132.97	1.8	49.72	89.5
25	494.9	2.5	33.43	83.58	2.5	85.56	213.91	1	107.9	107.9	1.8	49.73	89.51
25	591.85	3.3	46.87	154.67	2.5	85.73	214.33	1.1	121.12	133.23	1.8	49.79	89.62
25	565.08	3.3	46.61	153.82	2.5	85.58	213.94	1	107.73	107.73	1.8	49.77	89.59
105	498.16	1.8	24.74	44.53	2.5	84.33	210.83	1.1	139.52	153.472	1.8	49.64	89.34
105	465.42	1.8	23.34	42.01	2.5	84.13	210.33	1	123.67	123.67	1.8	49.67	89.41
105	516.42	2.5	33.25	83.13	2.5	82.26	205.65	1.1	130.79	143.869	1.8	46.54	83.77
105	509.14	2.5	34.55	86.37	2.5	83.93	209.81	1	123.62	123.62	1.8	49.63	89.33
105	613.7	3.3	48.72	160.78	2.5	83.88	209.69	1.1	140.08	154.088	1.8	49.52	89.14
105	582.61	3.3	48.41	159.75	2.5	83.87	209.68	1	123.95	123.95	1.8	49.58	89.24
-40	477.68	1.8	23.34	42	2.5	86.15	215.37	1.1	118.48	130.33	1.8	49.99	89.98
-40	452.61	1.8	23.19	41.74	2.5	86.01	215.03	1	105.83	105.83	1.8	50.01	90.01
-40	515.13	2.5	31.9	79.76	2.5	86.17	215.43	1.1	118.08	129.88	1.8	50.03	90.06
-40	489.53	2.5	31.62	79.05	2.5	86.11	215.27	1	105.3	105.3	1.8	49.95	89.91
-40	585.24	3.3	45.45	150	2.5	86.12	215.3	1.1	118.14	129.96	1.8	49.99	89.98
-40	559.87	3.3	45.08	148.75	2.5	86.07	215.18	1	105.93	105.93	1.8	50	90.01

Table 6-2. 1000M Dual Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	514.3	1.8	23.8	42.85	2.5	135.65	339.12	1.1	120.31	132.34	0	0	0
25	489.38	1.8	23.71	42.68	2.5	135.66	339.16	1	107.55	107.55	0	0	0
25	555.36	2.5	33.91	84.78	2.5	135.55	338.86	1.1	119.74	131.71	0	0	0
25	530.05	2.5	33.4	83.5	2.5	135.58	338.94	1	107.6	107.6	0	0	0
25	626.32	3.3	46.71	154.14	2.5	135.65	339.13	1.1	120.96	133.06	0	0	0
25	600.65	3.3	46.44	153.26	2.5	135.66	339.16	1	108.23	108.23	0	0	0
105	534.13	1.8	24.93	44.87	2.5	134	335	1.1	140.24	154.26	0	0	0
105	503.7	1.8	24.77	44.59	2.5	133.89	334.72	1	124.4	124.4	0	0	0
105	575.52	2.5	34.81	87.02	2.5	133.55	333.89	1.1	140.56	154.62	0	0	0
105	543.51	2.5	34.39	85.97	2.5	133.51	333.77	1	123.78	123.78	0	0	0
105	648.98	3.3	48.48	159.97	2.5	133.64	334.1	1.1	140.82	154.91	0	0	0
105	617.2	3.3	48.12	158.8	2.5	133.5	333.74	1	124.66	124.66	0	0	0
-40	512.52	1.8	23.06	41.51	2.5	136.38	340.94	1.1	118.25	130.07	0	0	0
-40	488.09	1.8	23.01	41.42	2.5	136.2	340.49	1	106.17	106.17	0	0	0
-40	552.51	2.5	32.7	81.74	2.5	136.28	340.7	1.1	118.25	130.08	0	0	0
-40	527.39	2.5	32.33	80.84	2.5	136.26	340.64	1	105.91	105.91	0	0	0
-40	621.78	3.3	45.6	150.5	2.5	136.33	340.83	1.1	118.6	130.46	0	0	0
-40	595.58	3.3	45.22	149.23	2.5	136.18	340.44	1	105.91	105.91	0	0	0

6.2 100M Power

Table 6-3. 100M Triple Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	188.54	1.8	5.48	9.86	2.5	43.63	109.08	1.1	32.69	35.96	1.8	18.69	33.64
25	180.84	1.8	6.10	10.98	2.5	43.56	108.90	1	27.30	27.30	1.8	18.70	33.66
25	203.8	2.5	10.12	25.3	2.5	43.56	108.90	1.1	35.96	35.96	1.8	18.69	33.64
25	191.6	2.5	9.18	22.95	2.5	43.56	108.90	1	26.08	26.08	1.8	18.71	33.67
25	231.75	3.3	16.14	53.262	2.5	43.60	109.00	1.1	32.59	35.85	1.8	18.69	33.64
25	218.65	3.3	15.12	49.90	2.5	43.53	108.83	1	26.29	26.29	1.8	18.69	33.64
105	210.24	1.8	6.43	11.57	2.5	44.34	110.85	1.1	49.99	54.99	1.8	18.24	32.83
105	196.6	1.8	6.41	11.54	2.5	44.28	110.70	1	41.34	41.34	1.8	18.35	33.03
105	225.4	2.5	10.67	26.68	2.5	44.32	110.80	1.1	50.09	55.10	1.8	18.24	32.83
105	211.74	2.5	10.54	26.35	2.5	44.27	110.68	1	41.70	41.70	1.8	18.34	33.01
105	253.55	3.3	16.57	54.68	2.5	44.29	110.73	1.1	50.3	55.33	1.8	18.23	32.81
105	239.81	3.3	16.57	54.68	2.5	44.25	110.63	1	41.49	41.49	1.8	18.34	33.01
-40	182.09	1.8	5.37	9.67	2.5	42.5	106.25	1.1	31.07	34.18	1.8	17.78	32.00
-40	173.08	1.8	5.36	9.65	2.5	42.46	106.15	1	25.28	25.28	1.8	17.78	32.00
-40	194.81	2.5	8.95	22.38	2.5	42.5	106.25	1.1	31.09	34.20	1.8	17.77	31.99
-40	185.44	2.5	8.89	22.23	2.5	42.5	106.25	1	24.95	24.95	1.8	17.79	32.02
-40	218.51	3.3	14.86	49.04	2.5	42.57	106.43	1.1	31.04	31.042	1.8	17.78	32.00
-40	210.41	3.3	14.83	48.94	2.5	42.5	106.25	1	23.20	23.20	1.8	17.79	32.02

Table 6-4. 100M Dual Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	204.71	1.8	6.15	11.07	2.5	62.95	157.38	1.1	32.97	36.27	0	0	0
25	195.75	1.8	6.13	11.03	2.5	62.93	157.33	1	27.39	27.39	0	0	0
25	225.03	2.5	12.57	31.43	2.5	62.95	157.38	1.1	32.94	36.23	0	0	0
25	216.08	2.5	12.58	31.45	2.5	62.92	157.30	1	27.33	27.33	0	0	0
25	267.29	3.3	22.51	74.28	2.5	62.92	157.30	1.1	32.46	35.71	0	0	0
25	260.77	3.3	23.26	76.76	2.5	62.93	157.33	1	26.69	26.69	0	0	0
105	226.26	1.8	6.44	11.59	2.5	64.05	160.13	1.1	49.58	54.54	0	0	0
105	212.75	1.8	6.42	11.56	2.5	64.06	160.15	1	41.04	41.04	0	0	0
105	246.60	2.5	12.81	32.03	2.5	64.05	160.13	1.1	49.5	54.45	0	0	0
105	233.41	2.5	12.87	32.18	2.5	64.08	160.20	1	41.03	41.03	0	0	0
105	290.26	3.3	23.09	76.20	2.5	64.03	160.08	1.1	49.08	53.99	0	0	0
105	279.54	3.3	23.93	78.97	2.5	64.06	160.15	1	40.42	40.42	0	0	0
-40	196.71	1.8	6.02	10.84	2.5	61.56	153.90	1.1	29.07	31.98	0	0	0
-40	188.98	1.8	6.00	10.80	2.5	61.53	153.83	1	24.35	24.35	0	0	0
-40	217.24	2.5	12.53	31.32	2.5	61.58	153.95	1.1	29.06	31.97	0	0	0
-40	209.61	2.5	12.53	31.32	2.5	61.58	153.95	1	24.33	24.33	0	0	0

Table 6-4. 100M Dual Supply (continued)

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
-40	259.98	3.3	22.53	74.35	2.5	61.62	154.05	1.1	31.58	31.58	0	0	0
-40	253.83	3.3	23.06	76.10	2.5	61.58	153.95	1	23.78	23.78	0	0	0

6.3 10M power

Table 6-5. 10M Triple Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	240.1	1.8	8.98	16.16	2.5	72.47	181.17	1.1	23.45	25.8	1.8	9.43	16.97
25	231.87	1.8	8.35	15.03	2.5	72.35	180.87	1	19.02	19.02	1.8	9.42	16.95
25	256.03	2.5	12.96	32.4	2.5	72.42	181.05	1.1	23.34	25.68	1.8	9.39	16.91
25	249.84	2.5	12.97	32.43	2.5	72.6	181.5	1	19	19	1.8	9.4	16.91
25	288.76	3.3	19.68	64.95	2.5	72.47	181.17	1.1	23.33	25.67	1.8	9.43	16.97
25	281.19	3.3	19.98	65.94	2.5	71.88	179.7	1	18.99	18.99	1.8	9.2	16.56
105	258.33	1.8	9.86	17.74	2.5	70.38	175.96	1.1	43.4	47.74	1.8	9.39	16.9
105	245.2	1.8	9.27	16.69	2.5	70.19	175.48	1	36.09	36.09	1.8	9.41	16.93
105	277.1	2.5	14.84	37.09	2.5	70.17	175.43	1.1	43.36	47.7	1.8	9.37	16.87
105	263.12	2.5	14.08	35.2	2.5	69.99	174.97	1	36.03	36.03	1.8	9.4	16.93
105	309.39	3.3	20.93	69.06	2.5	70.24	175.6	1.1	43.55	47.9	1.8	9.35	16.84
105	297.75	3.3	21.03	69.4	2.5	70.1	175.26	1	36.12	36.12	1.8	9.43	16.97
-40	241.77	1.8	8.33	15	2.5	74.74	186.85	1.1	20.92	23.01	1.8	9.4	16.92
-40	235.8	1.8	8.48	15.26	2.5	74.62	186.55	1	17.09	17.09	1.8	9.39	16.91
-40	257.44	2.5	12.42	31.04	2.5	74.63	186.58	1.1	20.91	23	1.8	9.34	16.82
-40	251.69	2.5	12.43	31.08	2.5	74.62	186.55	1	17.17	17.17	1.8	9.38	16.89
-40	289.14	3.3	19.09	62.99	2.5	74.53	186.32	1.1	20.92	23.01	1.8	9.34	16.82
-40	283.32	3.3	19.07	62.93	2.5	74.57	186.42	1	17.13	17.13	1.8	9.35	16.83

Table 6-6. 10M Dual Supply

Temp (°C)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	246.64	1.8	8.95	16.11	2.5	81.93	204.83	1.1	23.36	25.7	0	0	0
25	239.85	1.8	8.92	16.06	2.5	81.89	204.72	1	19.07	19.07	0	0	0
25	263.54	2.5	13.22	33.05	2.5	81.87	204.67	1.1	23.47	25.82	0	0	0
25	256.85	2.5	13.23	33.08	2.5	81.87	204.66	1	19.11	19.11	0	0	0
25	295.7	3.3	19.88	65.6	2.5	81.74	204.34	1.1	23.42	25.76	0	0	0
25	289.14	3.3	19.84	65.46	2.5	81.82	204.56	1	19.12	19.12	0	0	0
105	265.4	1.8	9.86	17.75	2.5	79.96	199.9	1.1	43.41	47.75	0	0	0
105	253.54	1.8	9.83	17.69	2.5	79.94	199.85	1	36	36	0	0	0
105	283.15	2.5	14.34	35.84	2.5	79.8	199.5	1.1	43.47	47.81	0	0	0
105	270.98	2.5	14.13	35.32	2.5	79.81	199.53	1	36.12	36.12	0	0	0
105	316.33	3.3	20.81	68.68	2.5	79.95	199.87	1.1	43.44	47.78	0	0	0
105	305.21	3.3	20.98	69.23	2.5	79.94	199.85	1	36.13	36.13	0	0	0
-40	248.5	1.8	8.61	15.49	2.5	83.99	209.97	1.1	20.95	23.04	0	0	0
-40	242.45	1.8	8.52	15.34	2.5	83.98	209.94	1	17.17	17.17	0	0	0
-40	264.96	2.5	12.9	32.25	2.5	83.91	209.78	1.1	20.84	22.93	0	0	0
-40	258.65	2.5	12.71	31.77	2.5	83.92	209.8	1	17.09	17.09	0	0	0
-40	295.05	3.3	18.96	62.56	2.5	83.79	209.47	1.1	20.93	23.02	0	0	0
-40	289.46	3.3	19.03	62.79	2.5	83.81	209.53	1	17.13	17.13	0	0	0

6.4 Channel Utilization 1000M

Table 6-7. 1000M Triple Supply Power for Channel Utilization

Temp (°C)	Utilization (%)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
			V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	0	459.9	1.8	15.9	28.62	2.5	86.16	215.41	1.1	114.91	126.4	1.8	49.71	89.48
25	50	478.62	1.8	23.85	42.93	2.5	85.58	213.94	1.1	120.17	132.19	1.8	49.75	89.56
25	100	497.05	1.8	31.2	56.17	2.5	85.29	213.23	1.1	125.57	138.13	1.8	49.74	89.53
25	0	432.8	1.8	14.75	26.54	2.5	86.03	215.07	1	101.61	101.61	1.8	49.76	89.58
25	50	453.94	1.8	23.75	42.75	2.5	85.65	214.14	1	107.5	107.5	1.8	49.76	89.56
25	100	467.91	1.8	28.86	51.95	2.5	85.39	213.47	1	112.99	112.99	1.8	49.72	89.5
25	0	487.07	2.5	22.5	56.25	2.5	85.93	214.82	1.1	114.99	126.49	1.8	49.73	89.51
25	50	521.67	2.5	33.93	84.83	2.5	85.75	214.37	1.1	120.88	132.97	1.8	49.72	89.5
25	100	550.45	2.5	43.49	108.73	2.5	85.24	213.1	1.1	126.5	139.15	1.8	49.71	89.48
25	0	461.87	2.5	22.15	55.37	2.5	86.04	215.1	1	101.88	101.88	1.8	49.73	89.52
25	50	494.9	2.5	33.43	83.58	2.5	85.56	213.91	1	107.9	107.9	1.8	49.73	89.51
25	100	522.95	2.5	42.84	107.09	2.5	85.27	213.18	1	113.03	113.03	1.8	49.8	89.65
25	0	533.07	3.3	30.91	102.01	2.5	86	214.99	1.1	114.96	126.46	1.8	49.78	89.61
25	50	591.85	3.3	46.87	154.67	2.5	85.73	214.33	1.1	121.12	133.23	1.8	49.79	89.62
25	100	638.52	3.3	59.39	196	2.5	85.35	213.38	1.1	126.91	139.6	1.8	49.74	89.54
25	0	508.35	3.3	30.93	102.07	2.5	85.88	214.71	1	101.91	101.91	1.8	49.81	89.67
25	50	565.08	3.3	46.61	153.82	2.5	85.58	213.94	1	107.73	107.73	1.8	49.77	89.59
25	100	610.24	3.3	58.76	193.92	2.5	85.36	213.39	1	113.31	113.31	1.8	49.79	89.62

Table 6-8. 1000M Dual Supply Power for Channel Utilization

Temp (°C)	Utilization (%)	Total Power (mW)	VDDIO			VDDA2P5			VDDA1P0			VDDA1P8		
			V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
25	0	495.05	1.8	15.95	28.71	2.5	136.12	340.3	1.1	114.59	126.05	0	0	0
25	50	514.3	1.8	23.8	42.85	2.5	135.65	339.12	1.1	120.31	132.34	0	0	0
25	100	533.64	1.8	31.17	56.1	2.5	135.38	338.46	1.1	126.44	139.08	0	0	0
25	0	470.54	1.8	15.88	28.59	2.5	135.77	339.43	1	102.52	102.52	0	0	0
25	50	489.38	1.8	23.71	42.68	2.5	135.66	339.16	1	107.55	107.55	0	0	0
25	100	503.41	1.8	28.94	52.09	2.5	135.29	338.22	1	113.09	113.09	0	0	0
25	0	522.54	2.5	22.56	56.39	2.5	135.97	339.93	1.1	114.74	126.22	0	0	0
25	50	555.36	2.5	33.91	84.78	2.5	135.55	338.86	1.1	119.74	131.71	0	0	0
25	100	586.19	2.5	43.49	108.73	2.5	135.24	338.1	1.1	126.69	139.36	0	0	0
25	0	497.63	2.5	22.12	55.3	2.5	135.95	339.88	1	102.45	102.45	0	0	0
25	50	530.05	2.5	33.4	83.5	2.5	135.58	338.94	1	107.6	107.6	0	0	0
25	100	555.74	2.5	42	104.99	2.5	135.16	337.91	1	112.83	112.83	0	0	0
25	0	567.83	3.3	30.81	101.68	2.5	135.95	339.86	1.1	114.81	126.29	0	0	0
25	50	626.32	3.3	46.71	154.14	2.5	135.65	339.13	1.1	120.96	133.06	0	0	0
25	100	673.05	3.3	59.24	195.49	2.5	135.23	338.08	1.1	126.8	139.48	0	0	0
25	0	543.84	3.3	30.75	101.46	2.5	135.94	339.85	1	102.52	102.52	0	0	0
25	50	600.65	3.3	46.44	153.26	2.5	135.66	339.16	1	108.23	108.23	0	0	0
25	100	644.12	3.3	58.72	193.78	2.5	135.18	337.96	1	112.38	112.38	0	0	0

6.5 Power Down Consumption

Table 6-9. Deep Power Down

Triple/ Dual Supply	Total Power (mW)	VDDIO			VDDA1P0			VDDA2P5			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
triple	30.99	1.8	5.12	9.21	1.1	13.11	14.42	2.5	2.46	6.15	1.8	0.67	1.21
triple	39.52	2.5	7.43	18.57	1.1	12.65	13.91	2.5	2.35	5.86	1.8	0.65	1.18
triple	54.64	3.3	10.22	33.72	1.1	12.67	13.93	2.5	2.35	5.87	1.8	0.62	1.12
triple	27.51	1.8	6.26	11.27	1	9.51	9.51	2.5	2.23	5.58	1.8	0.64	1.15
triple	39.99	2.5	9.33	23.31	1	9.56	9.56	2.5	2.4	6	1.8	0.62	1.12
triple	50.67	3.3	10.37	34.21	1	9.55	9.55	2.5	2.32	5.81	1.8	0.61	1.09
dual	30.96	1.8	6.2	11.15	1.1	12.61	13.87	2.5	2.37	5.93	0	0	0
dual	38.44	2.5	7.51	18.77	1.1	12.64	13.9	2.5	2.31	5.77	0	0	0
dual	54.05	3.3	10.34	34.13	1.1	12.62	13.88	2.5	2.41	6.03	0	0	0
dual	26.79	1.8	6.29	11.32	1	9.45	9.45	2.5	2.41	6.02	0	0	0
dual	34.61	2.5	7.59	18.97	1	9.48	9.48	2.5	2.46	6.16	0	0	0
dual	49.68	3.3	10.37	34.23	1	9.49	9.49	2.5	2.38	5.96	0	0	0

Table 6-10. IEEE Power Down

Triple/ Dual Supply	Total Power (mW)	VDDIO			VDDA1P0			VDDA2P5			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
triple	32.67	1.8	5.15	9.26	1.1	13.15	14.47	2.5	3.16	7.9	1.8	0.58	1.04
triple	40.74	2.5	7.44	18.59	1.1	12.68	13.95	2.5	2.87	7.18	1.8	0.57	1.02
triple	56.28	3.3	10.25	33.82	1.1	12.71	13.99	2.5	2.94	7.35	1.8	0.62	1.12
triple	29.66	1.8	6.26	11.26	1	9.55	9.55	2.5	3.09	7.72	1.8	0.62	1.12
triple	42.03	2.5	9.37	23.41	1	9.59	9.59	2.5	3.16	7.9	1.8	0.62	1.12
triple	52.54	3.3	10.38	34.27	1	9.62	9.62	2.5	3.03	7.57	1.8	0.6	1.09
dual	32.97	1.8	6.18	11.13	1.1	12.64	13.9	2.5	3.18	7.94	0	0	0
dual	40.61	2.5	7.53	18.84	1.1	12.67	13.93	2.5	3.14	7.84	0	0	0
dual	55.9	3.3	10.33	34.1	1.1	12.69	13.96	2.5	3.14	7.85	0	0	0
dual	28.66	1.8	6.3	11.34	1	9.51	9.51	2.5	3.12	7.81	0	0	0
dual	36.46	2.5	7.57	18.93	1	9.54	9.54	2.5	3.2	7.99	0	0	0
dual	51.65	3.3	10.4	34.33	1	9.55	9.55	2.5	3.11	7.77	0	0	0

Table 6-11. Active Sleep

Triple/ Dual Supply	Total Power (mW)	VDDIO			VDDA1P0			VDDA2P5			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
triple	109.31	1.8	5.86	10.54	1.1	20.66	22.73	2.5	23	57.51	1.8	10.29	18.53
triple	118.83	2.5	8.33	20.83	1.1	20.23	22.25	2.5	22.86	57.14	1.8	10.34	18.61
triple	135.77	3.3	11.37	37.51	1.1	20.3	22.33	2.5	22.92	57.3	1.8	10.35	18.63
triple	103.31	1.8	6.94	12.49	1	16.35	16.35	2.5	22.83	57.07	1.8	9.67	17.41
triple	116.72	2.5	10.23	25.57	1	16.44	16.44	2.5	22.91	57.28	1.8	9.68	17.42
triple	128.78	3.3	11.49	37.93	1	16.39	16.39	2.5	22.87	57.17	1.8	9.61	17.29
dual	116.59	1.8	6.89	12.41	1.1	20.19	22.21	2.5	32.79	81.97	0	0	0
dual	125.19	2.5	8.44	21.1	1.1	20.23	22.25	2.5	32.74	81.84	0	0	0
dual	142.07	3.3	11.44	37.76	1.1	20.23	22.25	2.5	32.82	82.06	0	0	0
dual	110.77	1.8	6.97	12.54	1	16.32	16.32	2.5	32.76	81.91	0	0	0
dual	119.11	2.5	8.45	21.14	1	16.34	16.34	2.5	32.65	81.64	0	0	0
dual	135.8	3.3	11.48	37.88	1	16.34	16.34	2.5	32.63	81.58	0	0	0

Table 6-12. Passive Sleep

Triple/ Dual Supply	Total Power (mW)	VDDIO			VDDA1P0			VDDA2P5			VDDA1P8		
		V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)	V (V)	I (mA)	Power (mW)
triple	109.54	1.8	5.85	10.53	1.1	20.69	22.76	2.5	23.05	57.64	1.8	10.34	18.61
triple	118.83	2.5	8.35	20.86	1.1	20.28	22.31	2.5	22.85	57.13	1.8	10.29	18.52
triple	135.75	3.3	11.4	37.62	1.1	20.27	22.3	2.5	22.9	57.25	1.8	10.32	18.58
triple	103.44	1.8	6.95	12.51	1	16.35	16.35	2.5	22.85	57.13	1.8	9.69	17.44
triple	117.03	2.5	10.25	25.62	1	16.44	16.44	2.5	23.04	57.59	1.8	9.65	17.37
triple	129.17	3.3	11.51	37.97	1	16.41	16.41	2.5	22.97	57.42	1.8	9.65	17.37
dual	116.68	1.8	6.89	12.41	1.1	20.21	22.23	2.5	32.82	82.04	0	0	0
dual	125.27	2.5	8.46	21.14	1.1	20.2	22.22	2.5	32.76	81.91	0	0	0
dual	141.71	3.3	11.45	37.78	1.1	20.23	22.25	2.5	32.67	81.67	0	0	0
dual	110.7	1.8	6.97	12.55	1	16.32	16.32	2.5	32.73	81.82	0	0	0
dual	119.15	2.5	8.48	21.2	1	16.34	16.34	2.5	32.65	81.62	0	0	0
dual	135.67	3.3	11.49	37.92	1	16.34	16.34	2.5	32.56	81.41	0	0	0

7 Revision History

Changes from Revision * (October 2015) to Revision A (July 2025)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document	1
• Updated 100M triple and dual supply tables with recently measured data	9

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