DDR4 SDRAM RDIMM Addendum

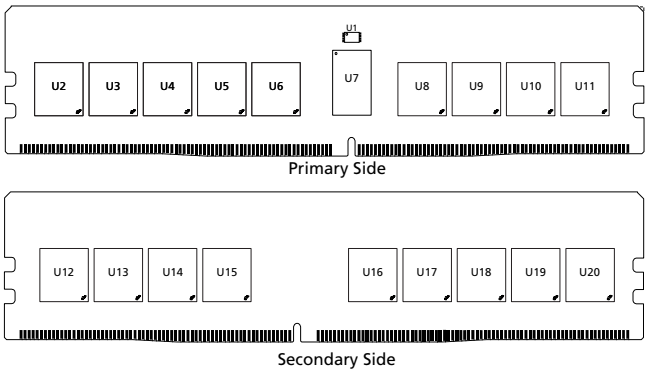
MTA18ASF4G72PDZ – 32GB

Features

Information provided here is in addition to or supersedes information provided in the Micron DDR4 RDIMM Core data sheet.

- DDR4 functionality and operations supported as defined in the component data sheet
- Features and specifications defined in the Micron DDR4 RDIMM core data sheet
- 288-pin, registered dual in-line memory module (RDIMM)
- Fast data transfer rates: PC4-3200, PC4-2933
- 32GB (4 Gig × 72)
- Data bus inversion (DBI) for data bus
- Dual-rank
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 288-Pin RDIMM



Options	Marking
• Operating temperature	
– Commercial (0°C ≤ T_{OPER} ≤ 95°C)	None
• Package	
– 288-pin DIMM (Green)	Z
• Frequency/CAS latency	
– 0.625ns @ CL = 22 (DDR4-3200)	-3G2
– 0.682ns @ CL = 21 (DDR4-2933)	-2G9

Table 1: Addressing

Parameter	32GB
Row address	128K A[16:0]
Column address	1K A[9:0]
Device bank group address	4 BG[1:0]
Device bank address per group	4 BA[1:0]
Device configuration	16Gb (2 Gig × 8), 16 banks
Module rank address	2 CS_n[1:0]

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Table 2: Part Numbers and Timing Parameters – 32GB Modules

Base device: MT40A2G8,[1] 16Gb DDR4 SDRAM

Part Number[2]	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles ($CL\text{-}_nRCD\text{-}_nRP$)
MTA18ASF4G72PDZ-3G2__	32GB	4 Gig × 72	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA18ASF4G72PDZ-2G9__	32GB	4 Gig × 72	23.47 GB/s	0.682ns/2933 MT/s	21-21-21

Notes: 1. The data sheet for the base device can be found on micron.com.
2. All part numbers end with a two-place code (not shown) that designates component and PCB revisions. Consult factory for current revision codes. Example: MTA18ASF4G72PDZ-3G2F1.

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DQ Map

Table 3: Component-to-Module DQ Map

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U2	0	3	157	U3	0	11	168
	1	0	5		1	8	16
	2	2	12		2	10	23
	3	1	150		3	9	161
	4	7	155		4	15	166
	5	4	3		5	12	14
	6	6	10		6	14	21
	7	5	148		7	13	159
U4	0	19	179	U5	0	27	190
	1	16	27		1	24	38
	2	18	34		2	26	45
	3	17	172		3	25	183
	4	23	177		4	31	188
	5	20	25		5	28	36
	6	22	32		6	30	43
	7	21	170		7	29	181
U6	0	CB3	201	U8	0	35	249
	1	CB0	49		1	32	97
	2	CB2	56		2	34	104
	3	CB1	194		3	33	242
	4	CB7	199		4	39	247
	5	CB4	47		5	36	95
	6	CB6	54		6	38	102
	7	CB5	192		7	37	240
U9	0	43	260	U10	0	51	271
	1	40	108		1	48	119
	2	42	115		2	50	126
	3	41	253		3	49	264
	4	47	258		4	55	269
	5	44	106		5	52	117
	6	46	113		6	54	124
	7	45	251		7	53	262

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Table 3: Component-to-Module DQ Map (Continued)

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U11	0	59	282	U12	0	56	130
	1	56	130		1	59	282
	2	58	137		2	57	275
	3	57	275		3	58	137
	4	63	280		4	60	128
	5	60	128		5	63	280
	6	62	135		6	61	273
	7	61	273		7	62	135
U13	0	48	119	U14	0	40	108
	1	51	271		1	43	260
	2	49	264		2	41	253
	3	50	126		3	42	115
	4	52	117		4	44	106
	5	55	269		5	47	258
	6	53	262		6	45	251
	7	54	124		7	46	113
U15	0	32	97	U16	0	CB0	49
	1	35	249		1	CB3	201
	2	33	242		2	CB1	194
	3	34	104		3	CB2	56
	4	36	95		4	CB4	47
	5	39	247		5	CB7	199
	6	37	240		6	CB5	192
	7	38	102		7	CB6	54
U17	0	24	38	U18	0	16	27
	1	27	190		1	19	179
	2	25	183		2	17	172
	3	26	45		3	18	34
	4	28	36		4	20	25
	5	31	188		5	23	177
	6	29	181		6	21	170
	7	30	43		7	22	32
U19	0	8	16	U20	0	0	5
	1	11	168		1	3	157
	2	9	161		2	1	150
	3	10	23		3	2	12
	4	12	14		4	4	3
	5	15	166		5	7	155
	6	13	159		6	5	148
	7	14	21		7	6	10

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I_{DD} Specifications

Table 4: DDR4 I_{DD} Specifications and Conditions – 32GB (Die Revision E)

Values are for the MT40A2G8 DDR4 SDRAM only and are computed from values specified in the 16Gb (2 Gig × 8) component data sheet.

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}[1]	882	873	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I_{PP} current	I_{PP0}[1]	45	45	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}[1]	981	972	mA
Precharge standby current	I_{DD2N}[2]	810	792	mA
Precharge standby ODT current	I_{DD2NT}[1]	801	792	mA
Precharge power-down current	I_{DD2P}[2]	684	684	mA
Precharge quite standby current	I_{DD2Q}[2]	756	756	mA
Active standby current	I_{DD3N}[2]	1098	1080	mA
Active standby I_{PP} current	I_{PP3N}[2]	36	36	mA
Active power-down current	I_{DD3P}[2]	900	882	mA
Burst read current	I_{DD4R}[1]	1602	1728	mA
Burst write current	I_{DD4W}[1]	1350	1449	mA
Different logic rank burst refresh current (1x REF)	I_{DD5R}[1]	954	954	mA
Different logic rank burst refresh I_{PP} current (1x REF)	I_{PP5R}[1]	54	54	mA
Self refresh current: Normal temperature range (0°C to 85°C)	$I_{DD6N\ (0–85°C)}$[2]	954	954	mA
Self refresh current: Extended temperature range (0°C to 95°C)	$I_{DD6E\ (0–95°C)}$[2]	1620	2034	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	$I_{DD6R\ (0–45°C)}$[2]	360	360	mA
Auto self refresh current (25°C)	$I_{DD6A\ (25°C)}$[2]	198	198	mA
Auto self refresh current (45°C)	$I_{DD6A\ (45°C)}$[2]	360	360	mA
Auto self refresh current (75°C)	$I_{DD6A\ (75°C)}$[2]	918	918	mA
Auto self refresh current (95°C)	$I_{DD6A\ (95°C)}$[2]	1620	2034	mA
Auto self refresh I_{PP} current (0°C to 95°C)	I_{PP6X}[2]	108	108	mA
Bank interleave read current	I_{DD7}[1]	1845	1989	mA
Bank interleave read I_{PP} current	I_{PP7}[1]	144	144	mA
Maximum power-down current	I_{DD8}[2]	648	648	mA

Notes: 1. One module rank in the active $I_{DD/PP}$, the other rank in $I_{DD2P/PP3N}$.
2. All ranks in this $I_{DD/PP}$ condition.

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Table 5: DDR4 I_{DD} Specifications and Conditions – 32GB (Die Revision B)

Values are for the MT40A2G8 DDR4 SDRAM only and are computed from values specified in the 16Gb (2 Gig × 8) component data sheet.

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}[1]	954	945	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I_{PP} current	I_{PP0}[1]	63	63	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}[1]	1053	1044	mA
Precharge standby current	I_{DD2N}[2]	936	918	mA
Precharge standby ODT current	I_{DD2NT}[1]	891	882	mA
Precharge power-down current	I_{DD2P}[2]	774	774	mA
Precharge quite standby current	I_{DD2Q}[2]	846	846	mA
Active standby current	I_{DD3N}[2]	1440	1422	mA
Active standby I_{PP} current	I_{PP3N}[2]	54	54	mA
Active power-down current	I_{DD3P}[2]	1242	1242	mA
Burst read current	I_{DD4R}[1]	2205	2115	mA
Burst write current	I_{DD4W}[1]	2034	1962	mA
Different logic rank burst refresh current (1x REF)	I_{DD5R}[1]	1098	1089	mA
Different logic rank burst refresh I_{PP} current (1x REF)	I_{PP5R}[1]	72	72	mA
Self refresh current: Normal temperature range (0°C to 85°C)	$I_{DD6N\ (0–85°C)}$[2]	1206	1206	mA
Self refresh current: Extended temperature range (0°C to 95°C)	$I_{DD6E\ (0–95°C)}$[2]	2178	2178	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	$I_{DD6R\ (0–45°C)}$[2]	522	522	mA
Auto self refresh current (25°C)	$I_{DD6A\ (25°C)}$[2]	180	180	mA
Auto self refresh current (45°C)	$I_{DD6A\ (45°C)}$[2]	522	522	mA
Auto self refresh current (75°C)	$I_{DD6A\ (75°C)}$[2]	1098	1098	mA
Auto self refresh current (95°C)	$I_{DD6A\ (95°C)}$[2]	2178	2178	mA
Auto self refresh I_{PP} current (0°C to 95°C)	I_{PP6X}[2]	198	198	mA
Bank interleave read current	I_{DD7}[1]	2151	2124	mA
Bank interleave read I_{PP} current	I_{PP7}[1]	117	117	mA
Maximum power-down current	I_{DD8}[2]	720	720	mA

Notes: 1. One module rank in the active $I_{DD/PP}$, the other rank in $I_{DD2P/PP3N}$.
2. All ranks in this $I_{DD/PP}$ condition.

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Table 6: DDR4 I_{DD} Specifications and Conditions – 32GB (Die Revision F)

Values are for the MT40A2G8 DDR4 SDRAM only and are computed from values specified in the 16Gb (2 Gig × 8) component data sheet.

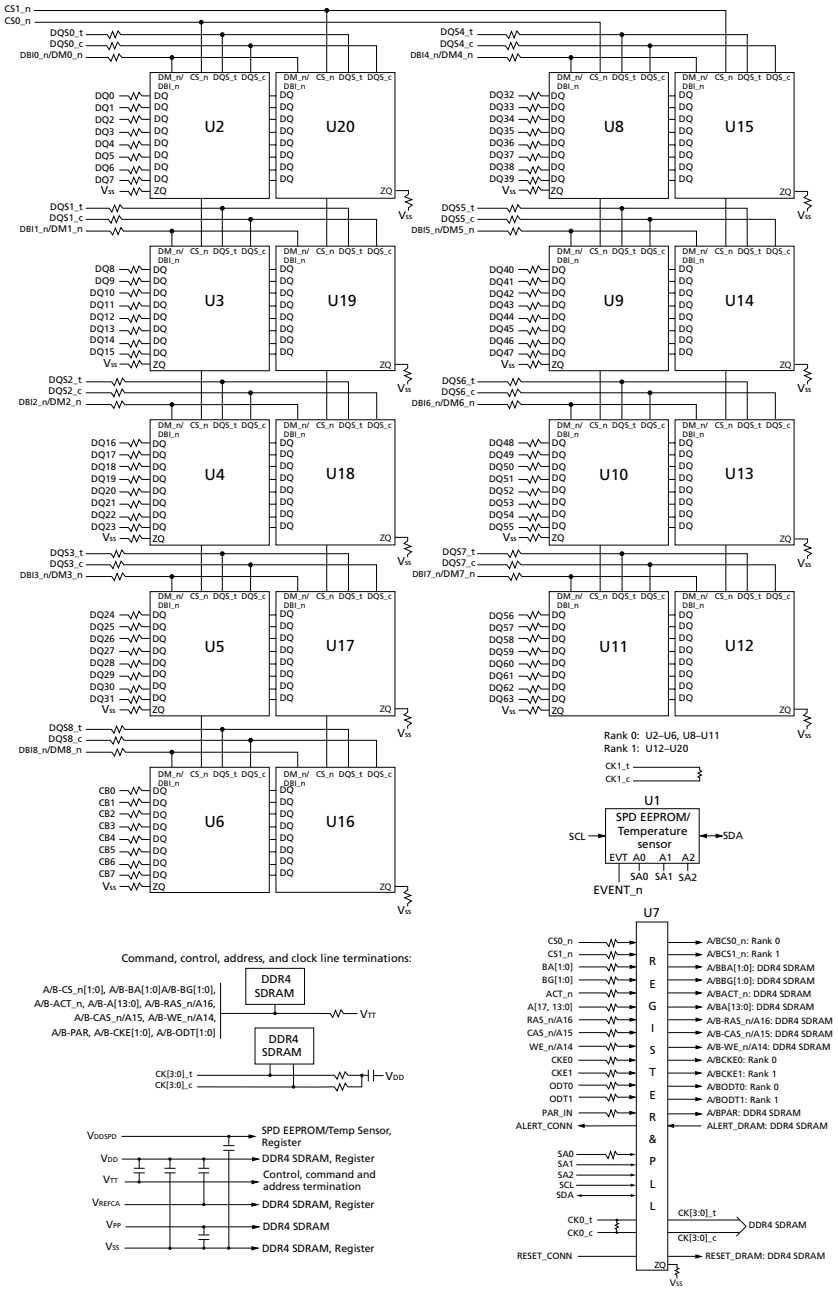
Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}[1]	882	873	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I_{PP} current	I_{PP0}[1]	45	45	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}[1]	981	972	mA
Precharge standby current	I_{DD2N}[2]	810	792	mA
Precharge standby ODT current	I_{DD2NT}[1]	801	792	mA
Precharge power-down current	I_{DD2P}[2]	684	684	mA
Precharge quite standby current	I_{DD2Q}[2]	756	756	mA
Active standby current	I_{DD3N}[2]	1098	1080	mA
Active standby I_{PP} current	I_{PP3N}[2]	36	36	mA
Active power-down current	I_{DD3P}[2]	900	882	mA
Burst read current	I_{DD4R}[1]	1602	1530	mA
Burst write current	I_{DD4W}[1]	1350	1305	mA
Different logic rank burst refresh current (1x REF)	I_{DD5R}[1]	954	954	mA
Different logic rank burst refresh I_{PP} current (1x REF)	I_{PP5R}[1]	54	54	mA
Self refresh current: Normal temperature range (0°C to 85°C)	$I_{DD6N\ (0–85°C)}$[2]	954	954	mA
Self refresh current: Extended temperature range (0°C to 95°C)	$I_{DD6E\ (0–95°C)}$[2]	1620	1620	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	$I_{DD6R\ (0–45°C)}$[2]	360	360	mA
Auto self refresh current (25°C)	$I_{DD6A\ (25°C)}$[2]	198	198	mA
Auto self refresh current (45°C)	$I_{DD6A\ (45°C)}$[2]	360	360	mA
Auto self refresh current (75°C)	$I_{DD6A\ (75°C)}$[2]	918	918	mA
Auto self refresh current (95°C)	$I_{DD6A\ (95°C)}$[2]	1620	1620	mA
Auto self refresh I_{PP} current (0°C to 95°C)	I_{PP6X}[2]	108	108	mA
Bank interleave read current	I_{DD7}[1]	1845	1827	mA
Bank interleave read I_{PP} current	I_{PP7}[1]	144	144	mA
Maximum power-down current	I_{DD8}[2]	648	648	mA

Notes: 1. One module rank in the active $I_{DD/PP}$, the other rank in $I_{DD2P/PP3N}$.
2. All ranks in this $I_{DD/PP}$ condition.

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Functional Block Diagram

Figure 2: Functional Block Diagram

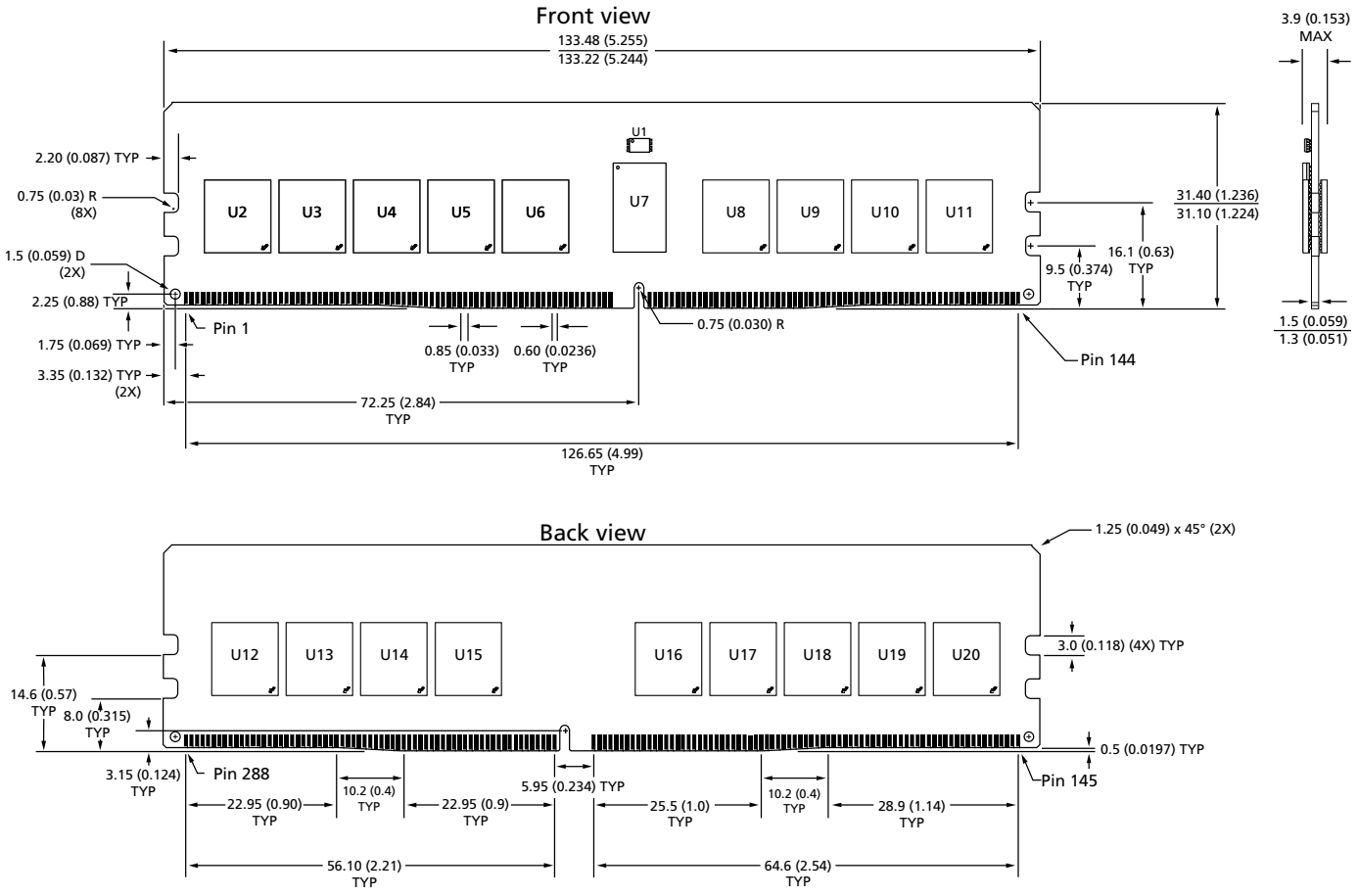


Note: 1. The ZQ ball on each DDR4 component is connected to an external 240Ω ±1% resistor that is tied to ground. It is used for the calibration of the component's ODT and output driver.

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Module Dimensions

Figure 3: 288-Pin DDR4 RDIMM



Notes: 1. All dimensions are in millimeters (inches); MAX/MIN or typical (TYP) where noted.
2. The dimensional diagram is for reference only.
3. Tolerance on all dimensions ±0.15mm unless otherwise specified.

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