

DDR4 SDRAM RDIMM

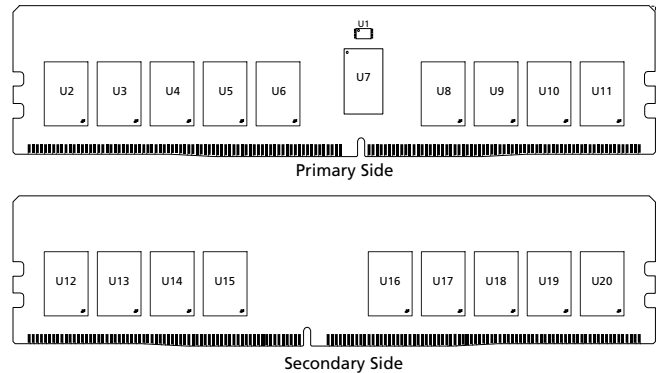
Addendum

MTA18ASF2G72PZ – 16GB

Features

- 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, PC4-2666, or PC4-2400
- 16GB (2 Gig x 72)
- Single-rank
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 288-Pin RDIMM (MO-309, R/C-C1, R/C-C2)



Options

- Operating temperature
 - Commercial ($0^{\circ}\text{C} \leq T_{\text{OPER}} \leq 95^{\circ}\text{C}$)
- Package
 - 288-pin DIMM (halogen-free)
- Frequency/CAS latency
 - 0.625ns @ CL = 22 (DDR4-3200)
 - 0.682ns @ CL = 21 (DDR4-2933)
 - 0.75ns @ CL = 19 (DDR4-2666)
 - 0.83ns @ CL = 17 (DDR4-2400)

Marking

- None
- Z
- 3G2
- 2G9
- 2G6
- 2G3

Table 1: Addressing

Parameter	16GB
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	8Gb (2 Gig x 4), 16 banks
Module rank address	1 CS0_n



Table 2: Part Numbers and Timing Parameters – 16GB Modules

Base device: MT40A2G4,¹ 8Gb DDR4 SDRAM

Part Number ²	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles (CL-nRCD-nRP)
MTA18ASF2G72PZ-3G2__	16GB	2 Gig x 72	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA18ASF2G72PZ-2G9__	16GB	2 Gig x 72	23.47GB/s	0.682/2933 MT/s	21-21-21
MTA18ASF2G72PZ-2G6__	16GB	2 Gig x 72	21.3 GB/s	0.75ns/2666 MT/s	19-19-19
MTA18ASF2G72PZ-2G3__	16GB	2 Gig x 72	19.2 GB/s	0.83ns/2400 MT/s	17-17-17

- 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: MTA18ASF2G72PZ-3G2J3.

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DQ Maps

Table 3: Component-to-Module DQ Map (PCB 1946, R/C-C1)

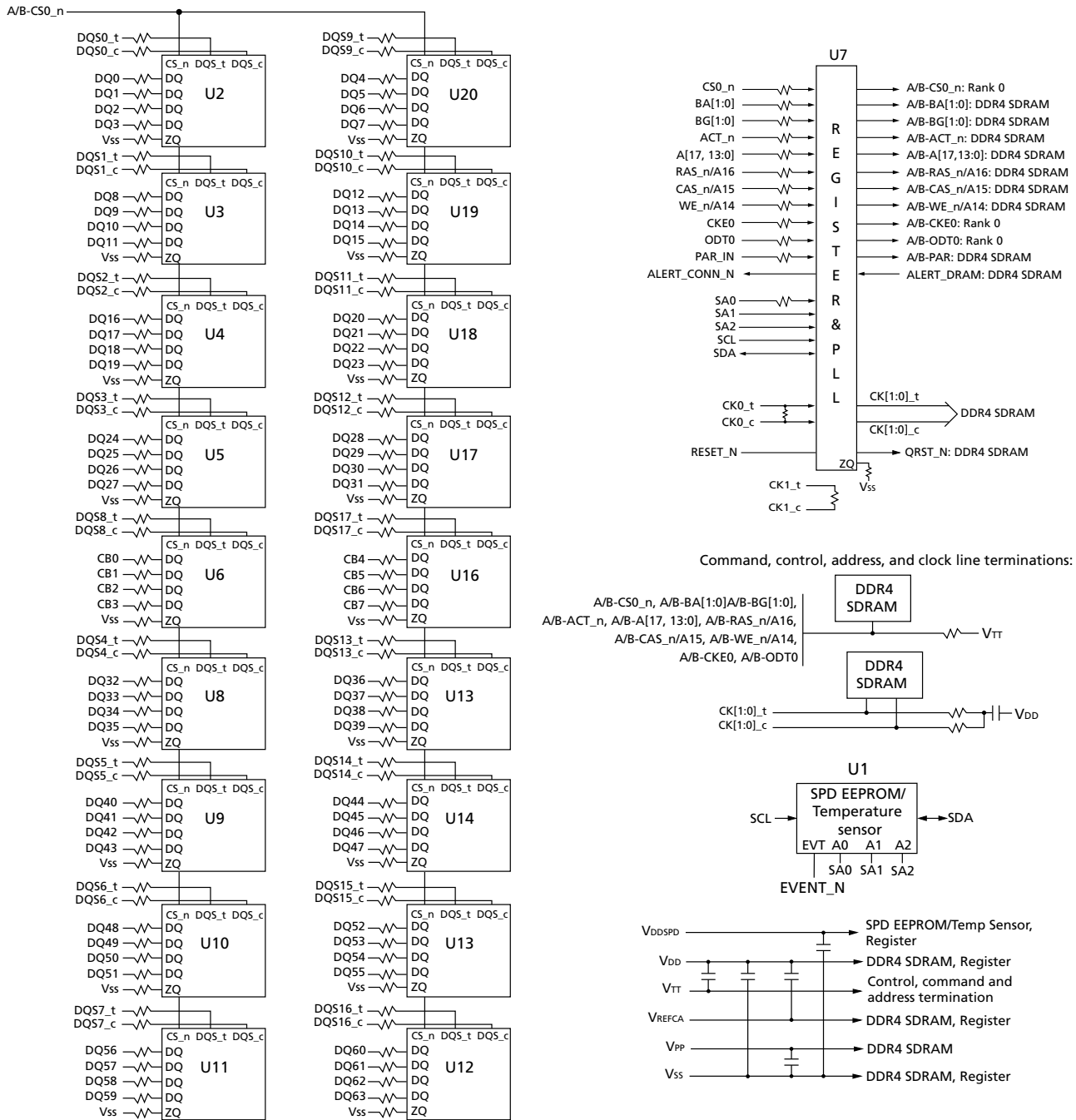
Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U2	0	2	12	U3	0	10	23
	1	1	150		1	9	161
	2	3	157		2	11	168
	3	0	5		3	8	16
U4	0	18	34	U5	0	26	45
	1	17	172		1	25	183
	2	19	179		2	27	190
	3	16	27		3	24	38
U6	0	CB2	56	U8	0	34	104
	1	CB1	194		1	33	242
	2	CB3	201		2	35	249
	3	CB0	49		3	32	97
U9	0	42	115	U10	0	50	126
	1	41	253		1	49	264
	2	43	260		2	51	271
	3	40	108		3	48	119
U11	0	58	137	U12	0	61	273
	1	57	275		1	62	135
	2	59	282		2	60	128
	3	56	130		3	63	280
U13	0	53	262	U14	0	45	251
	1	54	124		1	46	113
	2	52	117		2	44	106
	3	55	269		3	47	258
U15	0	37	240	U16	0	CB5	192
	1	38	102		1	CB6	54
	2	36	95		2	CB4	47
	3	39	247		3	CB7	199
U17	0	29	181	U18	0	21	170
	1	30	43		1	22	32
	2	28	36		2	20	25
	3	31	188		3	23	177
U19	0	13	159	U20	0	5	148
	1	14	21		1	6	10
	2	12	14		2	4	3
	3	15	166		3	7	155

Table 4: Component-to-Module DQ Map (PCBs 2243, 2456, and 2850 R/C-C2)

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	1	150		1	9	161
	2	2	12		2	10	23
	3	0	5		3	8	16
U4	0	19	179	U5	0	27	190
	1	17	172		1	25	183
	2	18	34		2	26	45
	3	16	27		3	24	38
U6	0	CB3	201	U8	0	35	249
	1	CB1	194		1	33	242
	2	CB2	56		2	34	104
	3	CB0	49		3	32	97
U9	0	43	260	U10	0	51	271
	1	41	253		1	49	264
	2	42	115		2	50	126
	3	40	108		3	48	119
U11	0	59	282	U12	0	60	128
	1	57	275		1	62	135
	2	58	137		2	61	273
	3	56	130		3	63	280
U13	0	52	117	U14	0	44	106
	1	54	124		1	46	113
	2	53	262		2	45	251
	3	55	269		3	47	258
U15	0	36	95	U16	0	CB4	47
	1	38	102		1	CB6	54
	2	37	240		2	CB5	192
	3	39	247		3	CB7	199
U17	0	28	36	U18	0	20	25
	1	30	43		1	22	32
	2	29	181		2	21	170
	3	31	188		3	23	177
U19	0	12	14	U20	0	4	3
	1	14	21		1	6	10
	2	13	159		2	5	148
	3	15	166		3	7	155

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.

I_{DD} Specifications

Table 5: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 16GB (Die Revision B)

Values are for the MT40A2G4 DDR4 SDRAM only and are computed from values specified in the 8Gb (2 Gig x 4) component data sheet

Parameter	Symbol	2400	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	744	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I _{pp} current	I _{PP0}	54	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	990	mA
Precharge standby current	I _{DD2N}	612	mA
Precharge standby ODT current	I _{DD2NT}	900	mA
Precharge power-down current	I _{DD2P}	450	mA
Precharge quiet standby current	I _{DD2Q}	540	mA
Active standby current	I _{DD3N}	684	mA
Active standby I _{pp} current	I _{PP3N}	54	mA
Active power-down current	I _{DD3P}	576	mA
Burst read current	I _{DD4R}	1980	mA
Burst write current	I _{DD4W}	1854	mA
Burst refresh current (1x REF)	I _{DD5R}	954	mA
Burst refresh I _{pp} current (1x REF)	I _{PP5R}	90	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	540	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	630	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	360	mA
Auto self refresh current (25°C)	I _{DD6A}	154.8	mA
Auto self refresh current (45°C)	I _{DD6A}	360	mA
Auto self refresh current (75°C)	I _{DD6A}	540	mA
Auto self refresh I _{pp} current	I _{PP6X}	90	mA
Bank interleave read current	I _{DD7}	3330	mA
Bank interleave read I _{pp} current	I _{PP7}	306	mA
Maximum power-down current	I _{DD8}	450	mA

Note: 1. When T_C > 85°C, the I_{DD} and I_{pp} values must be derated. Refer to the base device data sheet I_{DD} and I_{pp} specification tables for derating values for the applicable die-revision.

Table 6: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 16GB (Die Revision D)

Values are for the MT40A2G4 DDR4 SDRAM only and are computed from values specified in the 8Gb (2 Gig x 4) component data sheet

Parameter	Symbol	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	828	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I _{PP} current	I _{PP0}	54	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	1044	mA
Precharge standby current	I _{DD2N}	630	mA
Precharge standby ODT current	I _{DD2NT}	900	mA
Precharge power-down current	I _{DD2P}	450	mA
Precharge quiet standby current	I _{DD2Q}	540	mA
Active standby current	I _{DD3N}	828	mA
Active standby I _{PP} current	I _{PP3N}	54	mA
Active power-down current	I _{DD3P}	612	mA
Burst read current	I _{DD4R}	2178	mA
Burst write current	I _{DD4W}	2196	mA
Burst refresh current (1x REF)	I _{DD5R}	1098	mA
Burst refresh I _{PP} current (1x REF)	I _{PP5R}	90	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	558	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	648	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	378	mA
Auto self refresh current (25°C)	I _{DD6A}	154.8	mA
Auto self refresh current (45°C)	I _{DD6A}	378	mA
Auto self refresh current (75°C)	I _{DD6A}	558	mA
Auto self refresh I _{PP} current	I _{PP6X}	90	mA
Bank interleave read current	I _{DD7}	3600	mA
Bank interleave read I _{PP} current	I _{PP7}	324	mA
Maximum power-down current	I _{DD8}	450	mA

Note: 1. When T_C > 85°C, the I_{DD} and I_{PP} values must be derated. Refer to the base device data sheet I_{DD} and I_{PP} specification tables for derating values for the applicable die-revision.

Table 7: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 16GB (Die Revision E)

Values are for the MT40A2G4 DDR4 SDRAM only and are computed from values specified in the 8Gb (2 Gig x 4) component data sheet

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	810	774	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I _{PP} current	I _{PP0}	54	54	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	1044	1008	mA
Precharge standby current	I _{DD2N}	594	576	mA
Precharge standby ODT current	I _{DD2NT}	792	756	mA
Precharge power-down current	I _{DD2P}	396	396	mA
Precharge quiet standby current	I _{DD2Q}	468	468	mA
Active standby current	I _{DD3N}	756	720	mA
Active standby I _{PP} current	I _{PP3N}	54	54	mA
Active power-down current	I _{DD3P}	576	558	mA
Burst read current	I _{DD4R}	2754	2556	mA
Burst write current	I _{DD4W}	2376	2214	mA
Burst refresh current (1x REF)	I _{DD5R}	900	882	mA
Burst refresh I _{PP} current (1x REF)	I _{PP5R}	90	90	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	612	612	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	1044	1044	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	378	378	mA
Auto self refresh current (25°C)	I _{DD6A}	154.8	154.8	mA
Auto self refresh current (45°C)	I _{DD6A}	378	378	mA
Auto self refresh current (75°C)	I _{DD6A}	558	558	mA
Auto self refresh current (95°C)	I _{DD6A}	1044	1044	mA
Auto self refresh I _{PP} current	I _{PP6X}	90	90	mA
Bank interleave read current	I _{DD7}	4140	3870	mA
Bank interleave read I _{PP} current	I _{PP7}	252	252	mA
Maximum power-down current	I _{DD8}	324	324	mA

Note: 1. When T_C > 85°C, the I_{DD} and I_{PP} values must be derated. Refer to the base device data sheet I_{DD} and I_{PP} specification tables for derating values for the applicable die-revision.

Table 8: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 16GB (Die Revision J)

Values are for the MT40A2G4 DDR4 SDRAM only and are computed from values specified in the 8Gb (2 Gig x 4) component data sheet

Parameter	Symbol	3200	2933	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	774	738	702	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I _{PP} current	I _{PP0}	54	54	54	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	990	954	918	mA
Precharge standby current	I _{DD2N}	558	540	540	mA
Precharge standby ODT current	I _{DD2NT}	756	720	684	mA
Precharge power-down current	I _{DD2P}	396	396	396	mA
Precharge quiet standby current	I _{DD2Q}	468	468	468	mA
Active standby current	I _{DD3N}	756	720	684	mA
Active standby I _{PP} current	I _{PP3N}	54	54	54	mA
Active power-down current	I _{DD3P}	576	558	540	mA
Burst read current	I _{DD4R}	2610	2430	2250	mA
Burst write current	I _{DD4W}	2268	2106	1944	mA
Burst refresh current (1x REF)	I _{DD5R}	846	828	810	mA
Burst refresh I _{PP} current (1x REF)	I _{PP5R}	90	90	90	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	576	576	576	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	990	990	990	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	360	360	360	mA
Auto self refresh current (25°C)	I _{DD6A}	147.6	147.6	147.6	mA
Auto self refresh current (45°C)	I _{DD6A}	360	360	360	mA
Auto self refresh current (75°C)	I _{DD6A}	540	540	540	mA
Auto self refresh current (95°C)	I _{DD6A}	990	990	990	mA
Auto self refresh I _{PP} current	I _{PP6X}	90	90	90	mA
Bank interleave read current	I _{DD7}	3942	3690	3420	mA
Bank interleave read I _{PP} current	I _{PP7}	198	198	198	mA
Maximum power-down current	I _{DD8}	324	324	324	mA

Note: 1. When T_C > 85°C, the I_{DD} and I_{PP} values must be derated. Refer to the base device data sheet I_{DD} and I_{PP} specification tables for derating values for the applicable die-revision.

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