DDR4 SDRAM RDIMM Addendum

MTA18ASF4G72PZ – 32GB

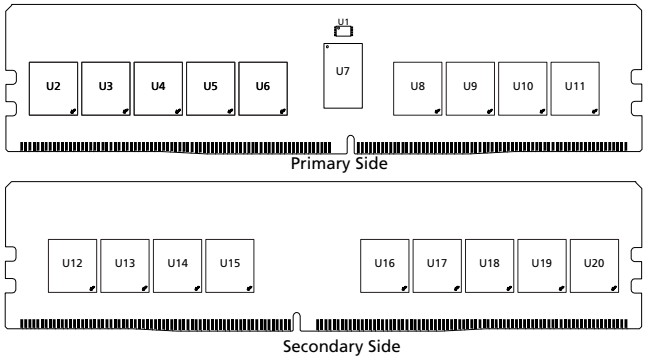
Introduction

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

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
- 32GB (4 Gig x 72)
- Single-rank
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 288-Pin RDIMM (MO-309, R/C-C3)



Options	Marking
• Operating temperature	
– Commercial ($0°C \leq T_{OPER} \leq 95°C$)	None
• Package	
– 288-pin DIMM (halogen-free)	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	256K A[17:0]
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 (4 Gig x 4), 16 banks
Module rank address	1 CS0_n

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

Base device: MT40A4G4,[1] 16Gb DDR4 SDRAM

Part Number[2]	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles ($CL\text{-}_nRCD\text{-}_nRP$)
MTA18ASF4G72PZ-3G2__	32GB	4 Gig x 72	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA18ASF4G72PZ-2G9__	32GB	4 Gig x 72	23.47 GB/s	0.682/2933 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: MTA18ASF4G72PZ-3G2B1.

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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	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

I_{DD} Specifications

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

Values are for the MT40A4G4 DDR4 SDRAM only and are computed from values specified in the 16Gb (4 Gig x 4) component data sheet.

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}	990	972	mA
One bank ACTIVATE-PRECHARGE, word line boost, I_{PP} current	I_{PP0}	54	54	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}	1188	1170	mA
Precharge standby current	I_{DD2N}	810	792	mA
Precharge standby ODT current	I_{DD2NT}	918	900	mA
Precharge power-down current	I_{DD2P}	684	684	mA
Precharge quite standby current	I_{DD2Q}	756	756	mA
Active standby current	I_{DD3N}	1080	1062	mA
Active standby I_{PP} current	I_{PP3N}	36	36	mA
Active power-down current	I_{DD3P}	864	846	mA
Burst read current	I_{DD4R}	2286	2142	mA
Burst write current	I_{DD4W}	1890	1818	mA
Burst refresh current (1x REF)	I_{DD5R}	1224	1224	mA
Burst refresh I_{PP} current (1x REF)	I_{PP5R}	72	72	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I_{DD6N}	954	954	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I_{DD6E}	2034	2034	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I_{DD6R}	360	360	mA
Auto self refresh current (25°C)	I_{DD6A}	198	198	mA
Auto self refresh current (45°C)	I_{DD6A}	360	360	mA
Auto self refresh current (75°C)	I_{DD6A}	918	918	mA
Auto self refresh current (95°C)	I_{DD6A}	2034	2034	mA
Auto self refresh I_{PP} current	I_{PP6X}	108	108	mA
Bank interleave read current	I_{DD7}	3546	3510	mA
Bank interleave read I_{PP} current	I_{PP7}	162	162	mA
Maximum power-down current	I_{DD8}	648	648	mA

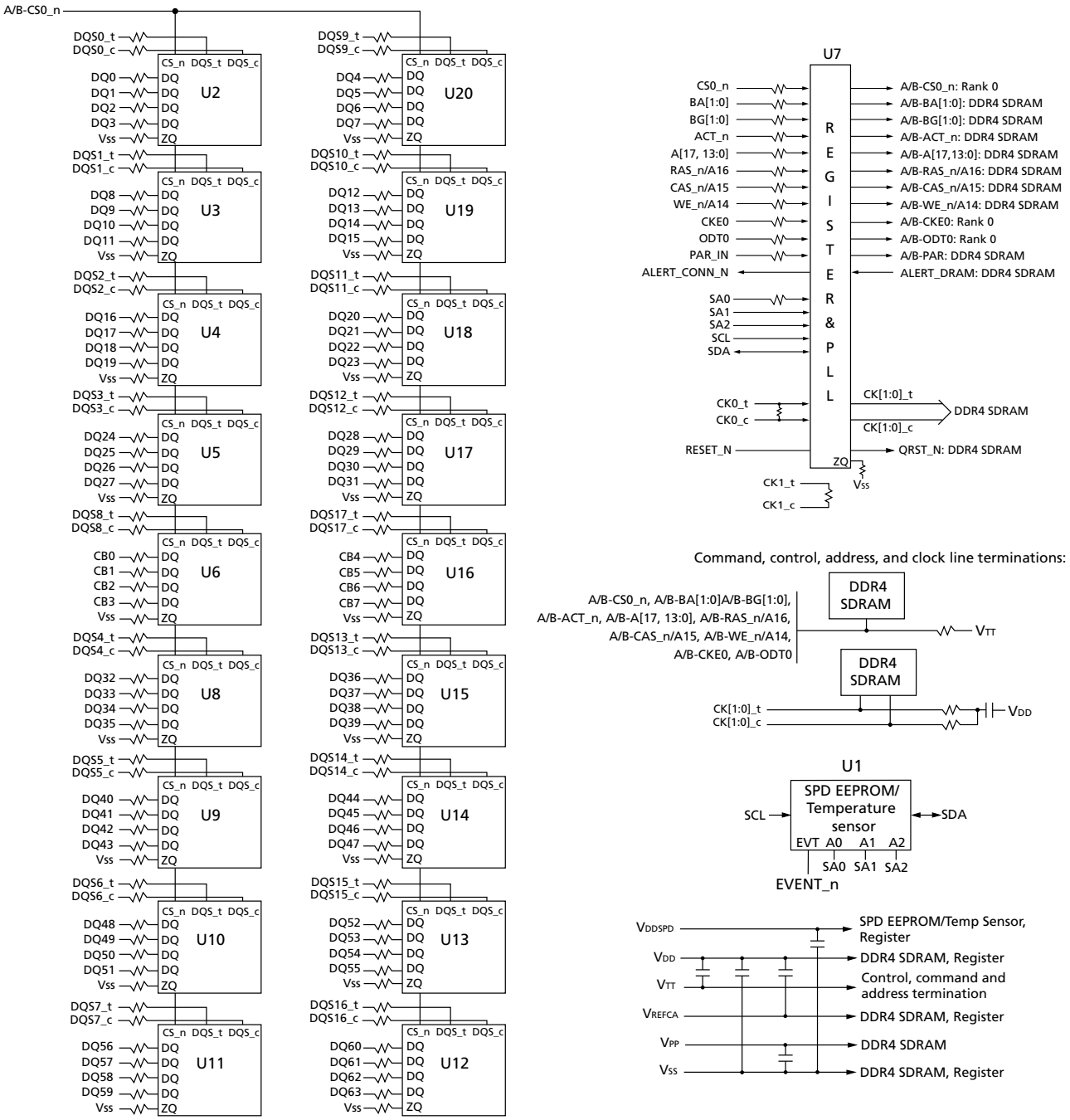
Table 5: DDR4 I_{DD} Specifications and Conditions – 32GB (Die Revision B)

Values are for the MT40A4G4 DDR4 SDRAM only and are computed from values specified in the 16Gb (4 Gig x 4) component data sheet.

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}	1080	1062	mA
One bank ACTIVATE-PRECHARGE, word line boost, I_{PP} current	I_{PP0}	72	72	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}	1260	1242	mA
Precharge standby current	I_{DD2N}	936	918	mA
Precharge standby ODT current	I_{DD2NT}	1008	990	mA
Precharge power-down current	I_{DD2P}	774	774	mA
Precharge quite standby current	I_{DD2Q}	846	846	mA
Active standby current	I_{DD3N}	1404	1386	mA
Active standby I_{PP} current	I_{PP3N}	54	54	mA
Active power-down current	I_{DD3P}	1242	1224	mA
Burst read current	I_{DD4R}	3096	2952	mA
Burst write current	I_{DD4W}	2952	2826	mA
Burst refresh current (1x REF)	I_{DD5R}	1422	1404	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}	1206	1206	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I_{DD6E}	2178	2178	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I_{DD6R}	522	522	mA
Auto self refresh current (25°C)	I_{DD6A}	180	180	mA
Auto self refresh current (45°C)	I_{DD6A}	522	522	mA
Auto self refresh current (75°C)	I_{DD6A}	1098	1098	mA
Auto self refresh current (95°C)	I_{DD6A}	2178	2178	mA
Auto self refresh I_{PP} current	I_{PP6X}	198	198	mA
Bank interleave read current	I_{DD7}	4284	4158	mA
Bank interleave read I_{PP} current	I_{PP7}	198	198	mA
Maximum power-down current	I_{DD8}	720	720	mA

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.