

DDR4 SDRAM RDIMM

Addendum

MTA9ASF2G72PZ – 16GB

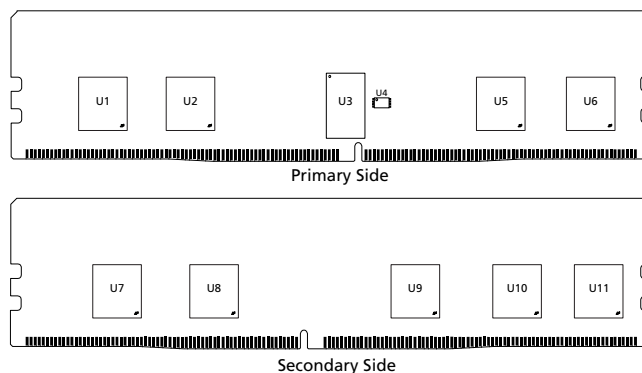
Introduction

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 supported in the Micron DDR4 RDIMM core data sheet
- 288-pin, registered dual in-line memory module (RDIMM)
- Fast data transfer rate: PC4-2933, PC4-3200
- 16GB (2 Gig x 72)
- Supports ECC error detection and correction
- Data bus inversion (DBI) for data bus
- Single-rank
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 288-Pin RDIMM (MO-309, R/C-D1)



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)

Marking

None
Z
-3G2
-2G9

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

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

Base device: MT40A2G8,¹ 16Gb DDR4 SDRAM

Part Number ²	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles (CL-nRCD-nRP)
MTA9ASF2G72PZ-3G2__	16GB	2 Gig x 72	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA9ASF2G72PZ-2G9__	16GB	2 Gig x 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: MTA9ASF2G72PZ-3G2B1.

Important Notes and Warnings

Micron Technology, Inc. ("Micron") reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions. This document supersedes and replaces all information supplied prior to the publication hereof. You may not rely on any information set forth in this document if you obtain the product described herein from any unauthorized distributor or other source not authorized by Micron.

Automotive Applications. Products are not designed or intended for use in automotive applications unless specifically designated by Micron as automotive-grade by their respective data sheets. Distributor and customer/distributor shall assume the sole risk and liability for and shall indemnify and hold Micron harmless against all claims, costs, damages, and expenses and reasonable attorneys' fees arising out of, directly or indirectly, any claim of product liability, personal injury, death, or property damage resulting directly or indirectly from any use of non-automotive-grade products in automotive applications. Customer/distributor shall ensure that the terms and conditions of sale between customer/distributor and any customer of distributor/customer (1) state that Micron products are not designed or intended for use in automotive applications unless specifically designated by Micron as automotive-grade by their respective data sheets and (2) require such customer of distributor/customer to indemnify and hold Micron harmless against all claims, costs, damages, and expenses and reasonable attorneys' fees arising out of, directly or indirectly, any claim of product liability, personal injury, death, or property damage resulting from any use of non-automotive-grade products in automotive applications.

Critical Applications. Products are not authorized for use in applications in which failure of the Micron component could result, directly or indirectly in death, personal injury, or severe property or environmental damage ("Critical Applications"). Customer must protect against death, personal injury, and severe property and environmental damage by incorporating safety design measures into customer's applications to ensure that failure of the Micron component will not result in such harms. Should customer or distributor purchase, use, or sell any Micron component for any critical application, customer and distributor shall indemnify and hold harmless Micron and its subsidiaries, subcontractors, and affiliates and the directors, officers, and employees of each against all claims, costs, damages, and expenses and reasonable attorneys' fees arising out of, directly or indirectly, any claim of product liability, personal injury, or death arising in any way out of such critical application, whether or not Micron or its subsidiaries, subcontractors, or affiliates were negligent in the design, manufacture, or warning of the Micron product.

Customer Responsibility. Customers are responsible for the design, manufacture, and operation of their systems, applications, and products using Micron products. ALL SEMICONDUCTOR PRODUCTS HAVE INHERENT FAILURE RATES AND LIMITED USEFUL LIVES. IT IS THE CUSTOMER'S SOLE RESPONSIBILITY TO DETERMINE WHETHER THE MICRON PRODUCT IS SUITABLE AND FIT FOR THE CUSTOMER'S SYSTEM, APPLICATION, OR PRODUCT. Customers must ensure that adequate design, manufacturing, and operating safeguards are included in customer's applications and products to eliminate the risk that personal injury, death, or severe property or environmental damages will result from failure of any semiconductor component.

Limited Warranty. In no event shall Micron be liable for any indirect, incidental, punitive, special or consequential damages (including without limitation lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort, warranty, breach of contract or other legal theory, unless explicitly stated in a written agreement executed by Micron's duly authorized representative.

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
U1	0	10	23	U2	0	26	45
	1	9	161		1	25	183
	2	11	168		2	27	190
	3	8	16		3	24	38
	4	15	166		4	31	188
	5	12	14		5	28	36
	6	14	21		6	30	43
	7	13	159		7	29	181
U5	0	42	115	U6	0	58	137
	1	41	253		1	57	275
	2	43	260		2	59	282
	3	40	108		3	56	130
	4	47	258		4	63	280
	5	44	106		5	60	128
	6	46	113		6	62	135
	7	45	251		7	61	273
U7	0	52	117	U8	0	36	95
	1	54	124		1	38	102
	2	53	262		2	37	240
	3	55	267		3	39	247
	4	48	119		4	32	97
	5	51	271		5	35	249
	6	49	264		6	33	242
	7	50	126		7	34	104
U9	0	CB4	47	U10	0	20	25
	1	CB6	54		1	22	32
	2	CB5	192		2	21	170
	3	CB7	199		3	23	177
	4	CB0	49		4	16	27
	5	CB3	201		5	19	179
	6	CB1	194		6	17	172
	7	CB2	56		7	18	34



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	4	1				
	1	6	10				
	2	5	148				
	3	7	155				
	4	0	5				
	5	3	157				
	6	1	150				
	7	2	12				

I_{DD} Specifications

Table 4: DDR4 I_{DD} Specifications and Conditions – 16GB (Die Revision E)

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

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	540	531	mA
One bank ACTIVATE-PRECHARGE, word line boost, I _{pp} current	I _{PP0}	27	27	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	639	630	mA
Precharge standby current	I _{DD2N}	405	396	mA
Precharge standby ODT current	I _{DD2NT}	459	450	mA
Precharge power-down current	I _{DD2P}	342	342	mA
Precharge quiet standby current	I _{DD2Q}	378	378	mA
Active standby current	I _{DD3N}	549	540	mA
Active standby I _{pp} current	I _{PP3N}	18	18	mA
Active power-down current	I _{DD3P}	450	441	mA
Burst read current	I _{DD4R}	1458	1386	mA
Burst write current	I _{DD4W}	1152	1107	mA
Burst refresh current (1 x REF)	I _{DD5R}	612	612	mA
Burst refresh I _{pp} current (1 x REF)	I _{PP5R}	36	36	mA
Self refresh current: Normal temperature range (0°C to +85°C)	I _{DD6N}	477	477	mA
Self refresh current: Extended temperature range (0°C to +95°C)	I _{DD6E}	1017	1017	mA
Self refresh current: Reduced temperature range (0°C to +45°C)	I _{DD6R}	180	180	mA
Auto self refresh current (25°C)	I _{DD6A}	99	99	mA
Auto self refresh current (45°C)	I _{DD6A}	180	180	mA
Auto self refresh current (75°C)	I _{DD6A}	459	459	mA
Auto self refresh current (95°C)	I _{DD6A}	1017	1017	mA
Auto self refresh I _{pp} current	I _{PP6X}	54	54	mA
Bank interleaved read current	I _{DD7}	1665	1647	mA
Bank interleaved read I _{pp} current	I _{PP7}	72	72	mA
Maximum power-down current	I _{DD8}	324	324	mA

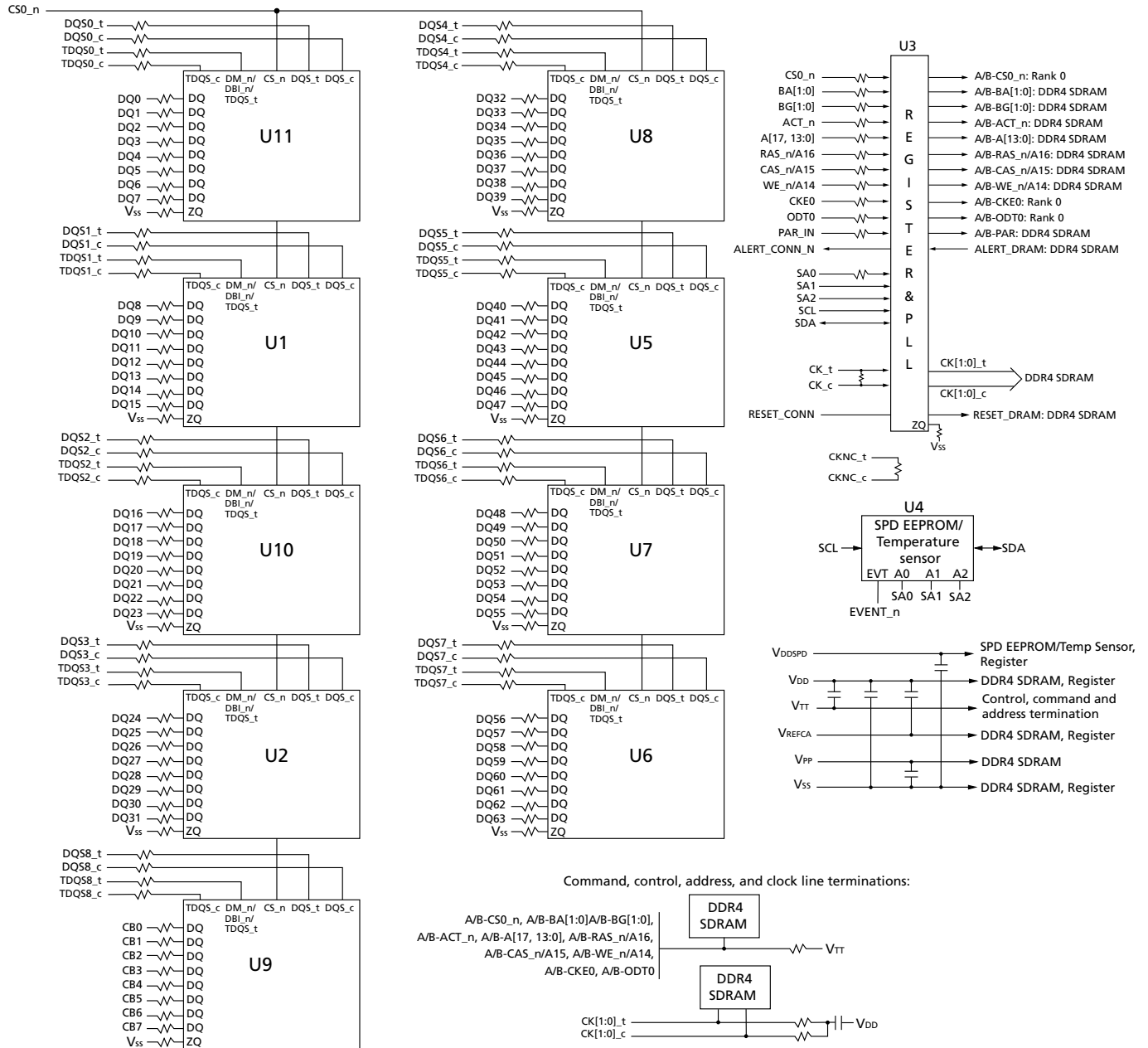
Table 5: DDR4 I_{DD} Specifications and Conditions – 16GB (Die Revision B)

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

Parameter	Symbol	3200	2933	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	567	558	mA
One bank ACTIVATE-PRECHARGE, word line boost, I _{pp} current	I _{PP0}	36	36	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	666	657	mA
Precharge standby current	I _{DD2N}	468	459	mA
Precharge standby ODT current	I _{DD2NT}	504	495	mA
Precharge power-down current	I _{DD2P}	387	387	mA
Precharge quiet standby current	I _{DD2Q}	423	423	mA
Active standby current	I _{DD3N}	720	711	mA
Active standby I _{pp} current	I _{PP3N}	27	27	mA
Active power-down current	I _{DD3P}	621	621	mA
Burst read current	I _{DD4R}	1818	1728	mA
Burst write current	I _{DD4W}	1647	1575	mA
Burst refresh current (1 x REF)	I _{DD5R}	711	702	mA
Burst refresh I _{pp} current (1 x REF)	I _{PP5R}	45	45	mA
Self refresh current: Normal temperature range (0°C to +85°C)	I _{DD6N}	603	603	mA
Self refresh current: Extended temperature range (0°C to +95°C)	I _{DD6E}	1089	1089	mA
Self refresh current: Reduced temperature range (0°C to +45°C)	I _{DD6R}	261	261	mA
Auto self refresh current (25°C)	I _{DD6A}	90	90	mA
Auto self refresh current (45°C)	I _{DD6A}	261	261	mA
Auto self refresh current (75°C)	I _{DD6A}	549	549	mA
Auto self refresh current (95°C)	I _{DD6A}	1089	1089	mA
Auto self refresh I _{pp} current	I _{PP6X}	99	99	mA
Bank interleave read current	I _{DD7}	1764	1737	mA
Bank interleave read I _{pp} current	I _{PP7}	90	90	mA
Maximum power-down current	I _{DD8}	360	360	mA

Functional Block Diagram

Figure 2: Functional Block Diagram



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



16GB (x72, ECC, SR) 288-Pin DDR4 RDIMM Functional Block Diagram

8000 S. Federal Way, P.O. Box 6, Boise, ID 83707-0006, Tel: 208-368-4000

www.micron.com/products/support Sales inquiries: 800-932-4992

Micron and the Micron logo are trademarks of Micron Technology, Inc.

All other trademarks are the property of their respective owners.

This data sheet contains minimum and maximum limits specified over the power supply and temperature range set forth herein. Although considered final, these specifications are subject to change, as further product development and data characterization sometimes occur.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Micron Technology:](#)

[MTA9ASF2G72PZ-3G2B1](#)