

DDR4 SDRAM RDIMM

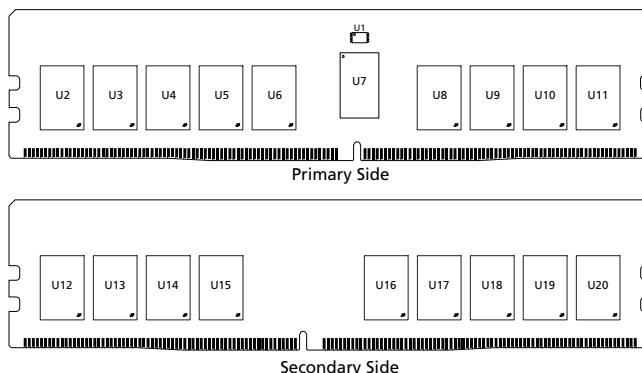
Addendum

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



16GB (x72, ECC, SR) 288-Pin DDR4 RDIMM Features

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.

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 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

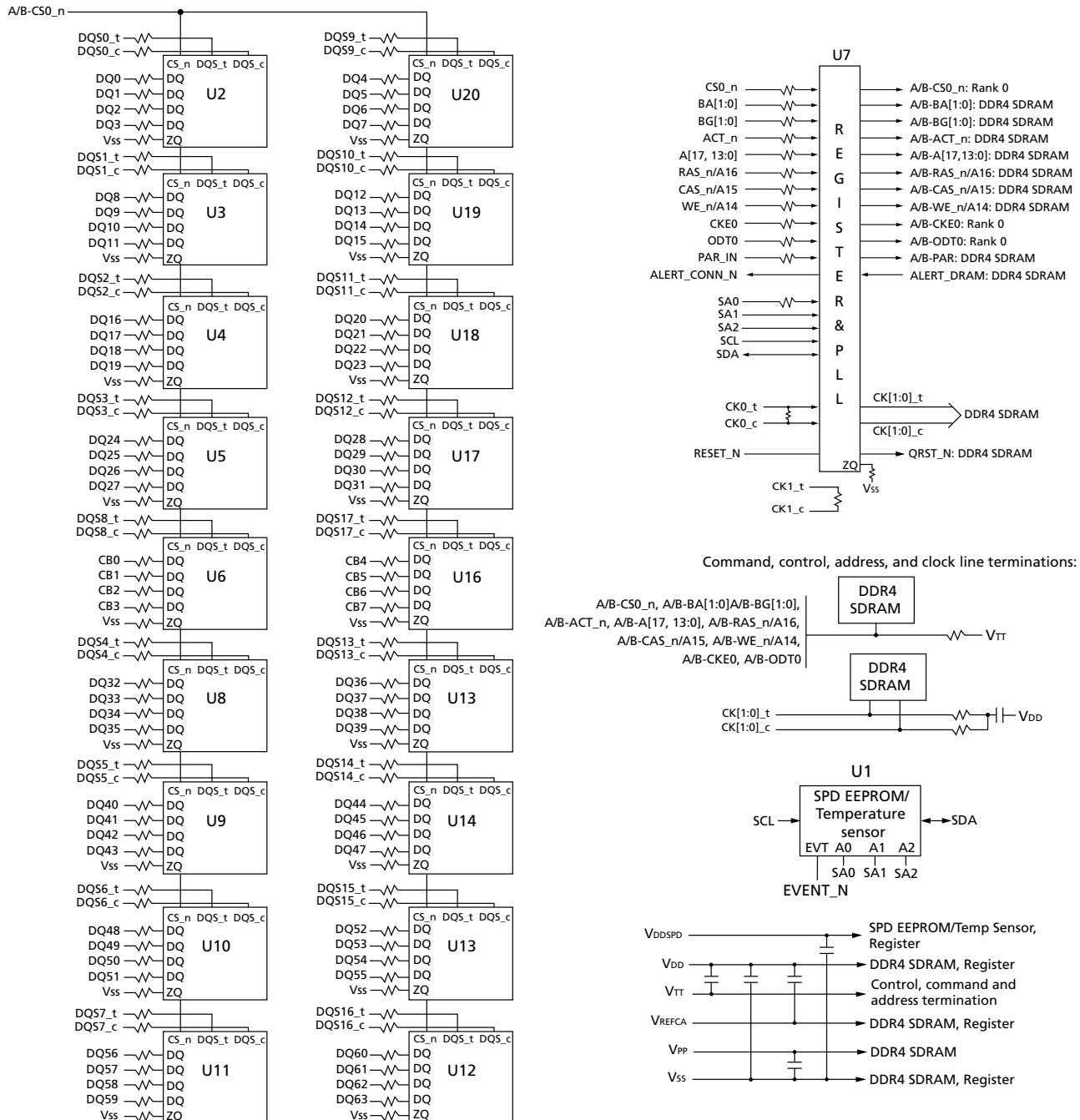


Table 4: Component-to-Module DQ Map (PCBs 2243, 2456, and 2850 R/C-C2)

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 $240\Omega \pm 1\%$ 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.

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:

[MTA18ASF2G72PZ-2G9E1](#) [MTA18ASF2G72PZ-2G3A1](#) [MTA18ASF2G72PZ-2G3B1](#) [MTA18ASF2G72PZ-2G6D1](#)
[MTA18ASF2G72PZ-3G2E1](#) [MTA18ASF2G72PZ-2G9J1](#) [MTA18ASF2G72PZ-2G6J1](#) [MTA18ASF2G72PZ-2G9E6](#)
[MTA18ASF2G72PZ-2G6E1](#) [MTA18ASF2G72PZ-3G2E2](#) [MTA18ASF2G72PZ-2G9J3](#) [MTA18ASF2G72PZ-3G2J3](#)