

DDR4 SDRAM SODIMM Addendum

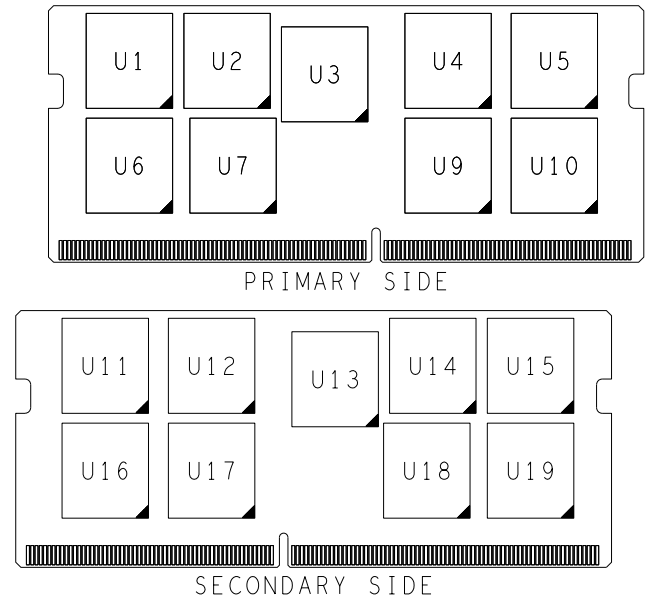
MTA18ASF4G72HZ – 32GB

Features

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

- DDR4 functionality and operations supported as defined in the component data sheet
- Features and specifications supported in the Micron DDR4 SODIMM Core data sheet
- Fast data transfer rates: PC4-3200 or PC4-2666
- 32GB (4 Gig x 72)
- Data bus inversion (DBI) for data bus
- Dual-rank
- On-board I²C temperature sensor with integrated serial presence-detect (SPD) EEPROM
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 260-Pin SODIMM



Options

- Operating temperature
 - Commercial (0°C ≤ T_{OPER} ≤ 95°C)
- Package
 - 260-pin DIMM (halogen-free)
- Frequency/CAS latency
 - 0.62ns @ CL = 22 (DDR4-3200)
 - 0.75ns @ CL = 19 (DDR4-2666)

Marking

None
Z
-3G2
-2G6

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 (2Gig x 8), 16 banks
Module rank address	CS_n[1:0]



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

Base device: MT40A2G8,¹ 16Gb DDR4 SDRAM

Part Number²	Module Density	Configuration	Module Bandwidth	Memory Clock/Data Rate	Clock Cycles (CL-^tRCD-^tRP)
MTA18ASF4G72HZ-3G2__	32GB	4 Gig x 72	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA18ASF4G72HZ-2G6__	32GB	4 Gig x 72	21.3 GB/s	0.75ns/2666 MT/s	19-19-19

- 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: MTA18ASF4G72HZ-3G2E1.



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 R/C-G1 (PCB 2637), Front

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U1	0	11	42	U2	0	27	84
	1	8	28		1	25	71
	2	10	41		2	26	83
	3	9	29		3	24	70
	4	14	38		4	31	80
	5	12	24		5	29	67
	6	15	37		6	30	79
	7	13	25		7	28	66
U3	0	CB3	105	U4	0	34	187
	1	CB0	92		1	33	173
	2	CB2	101		2	35	186
	3	CB1	91		3	32	174
	4	CB6	101		4	39	182
	5	CB4	88		5	36	170
	6	CB7	104		6	38	183
	7	CB5	87		7	37	169
U5	0	51	229	U6	0	2	20
	1	49	215		1	0	8
	2	50	228		2	3	21
	3	48	216		3	1	7
	4	55	225		4	6	16
	5	53	212		5	4	4
	6	54	224		6	7	17
	7	52	211		7	5	3
U7	0	22	58	U9	0	42	207
	1	20	46		1	40	195
	2	23	59		2	43	208
	3	21	45		3	41	194
	4	18	62		4	46	203
	5	16	50		5	45	190
	6	19	63		6	47	204
	7	17	49		7	44	191



Table 3: Component-to-Module DQ Map R/C-G1 (PCB 2637), Front (Continued)

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U10	0	59	250				
	1	57	236				
	2	58	249				
	3	56	237				
	4	63	246				
	5	61	233				
	6	62	245				
	7	60	232				

Table 4: Component-to-Module DQ Map R/C-G1 (PCB 2451), Back

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U11	0	49	215	U12	0	33	173
	1	51	229		1	34	187
	2	48	216		2	32	174
	3	50	228		3	35	186
	4	53	212		4	36	170
	5	55	225		5	39	182
	6	52	211		6	37	169
	7	54	224		7	38	183
U13	0	CB0	92	U14	0	25	71
	1	CB3	105		1	27	84
	2	CB1	91		2	24	70
	3	CB2	101		3	26	83
	4	CB4	88		4	29	67
	5	CB6	100		5	31	80
	6	CB5	87		6	28	66
	7	CB7	104		7	30	79
U15	0	8	28	U16	0	57	236
	1	11	42		1	59	250
	2	9	29		2	56	237
	3	10	41		3	58	249
	4	12	24		4	61	233
	5	14	38		5	63	246
	6	13	25		6	60	232
	7	15	37		7	62	245



Table 4: Component-to-Module DQ Map R/C-G1 (PCB 2451), Back (Continued)

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U17	0	40	195	U18	0	20	46
	1	42	207		1	22	58
	2	41	194		2	21	45
	3	43	208		3	23	59
	4	45	190		4	16	50
	5	46	203		5	18	62
	6	44	191		6	17	49
	7	47	204		7	19	63
U19	0	0	8				
	1	2	20				
	2	1	7				
	3	3	21				
	4	4	4				
	5	6	16				
	6	5	3				
	7	7	17				



I_{DD} Specifications

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 x 8) component data sheet.

Parameter	Symbol	3200	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	954	936	mA
One bank ACTIVATE-PRECHARGE, wordline boost, I _{pp} current	I _{PP0}	63	63	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	1053	1035	mA
Precharge standby current	I _{DD2N}	936	900	mA
Precharge standby ODT current	I _{DD2NT}	891	873	mA
Precharge power-down current	I _{DD2P}	774	774	mA
Precharge quite standby current	I _{DD2Q}	846	846	mA
Active standby current	I _{DD3N}	1440	1404	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}	2205	2025	mA
Burst write current	I _{DD4W}	2034	1881	mA
Different logic rank burst refresh current (1x REF)	I _{DD5R}	1098	1080	mA
Different logic rank 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} (0–85°C)	1206	1206	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E} (0–95°C)	2178	2178	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R} (0–45°C)	522	522	mA
Auto self refresh current (25°C)	I _{DD6A} (25°C)	180	180	mA
Auto self refresh current (45°C)	I _{DD6A} (45°C)	522	522	mA
Auto self refresh current (75°C)	I _{DD6A} (75°C)	1098	1098	mA
Auto self refresh current (95°C)	I _{DD6A} (95°C)	2178	2178	mA
Auto self refresh I _{pp} current (0°C to 95°C)	I _{PP6X}	198	198	mA
Bank interleave read current	I _{DD7}	2151	2097	mA
Bank interleave read I _{pp} current	I _{PP7}	117	117	mA
Maximum power-down current	I _{DD8}	720	720	mA



32GB (x72, ECC DR) 260-Pin DDR4 SODIMM I_{DD} Specifications

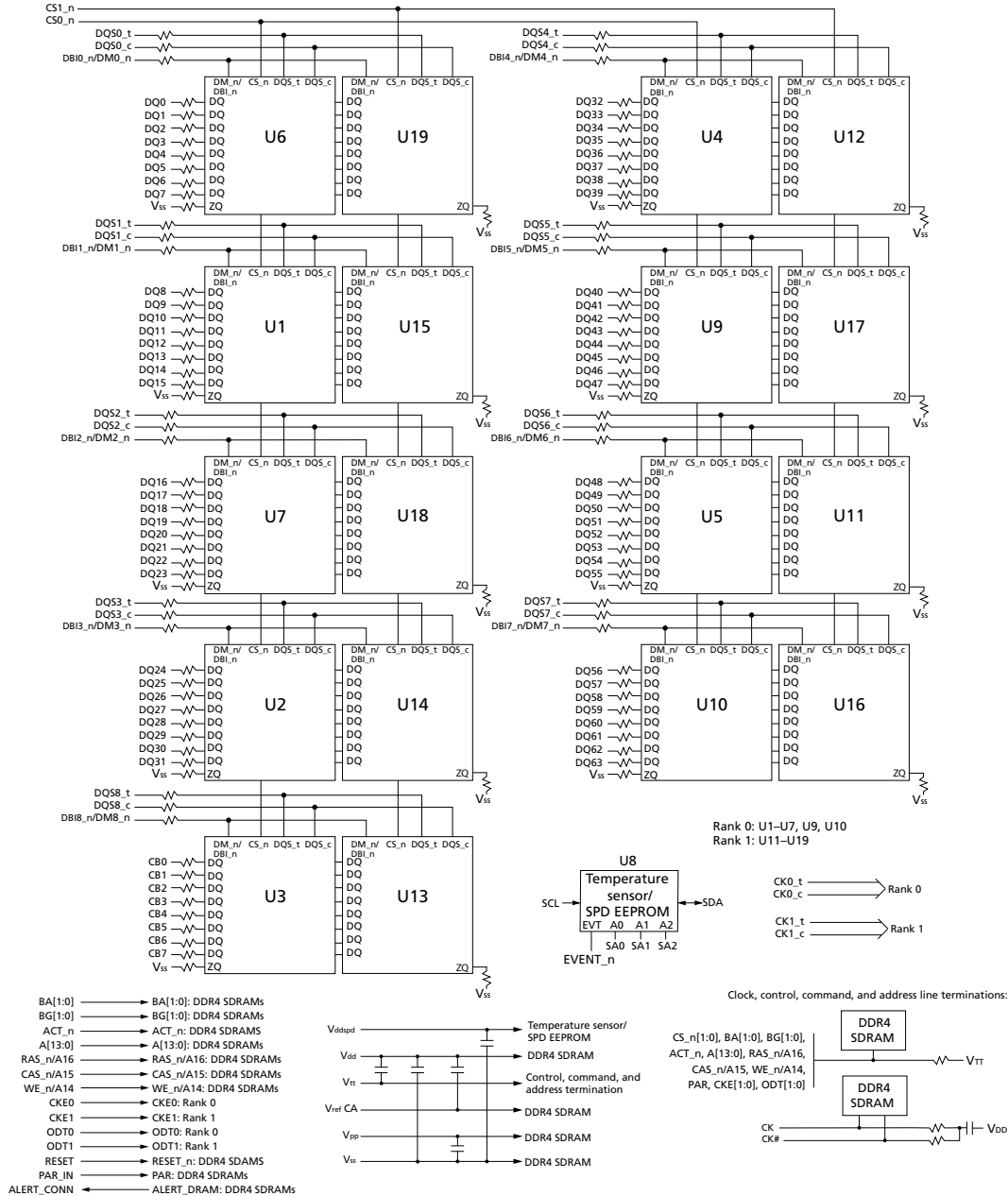
Table 6: DDR4 I_{DD} Specifications and Conditions – 32GB (Die Revision F)

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

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

Functional Block Diagrams

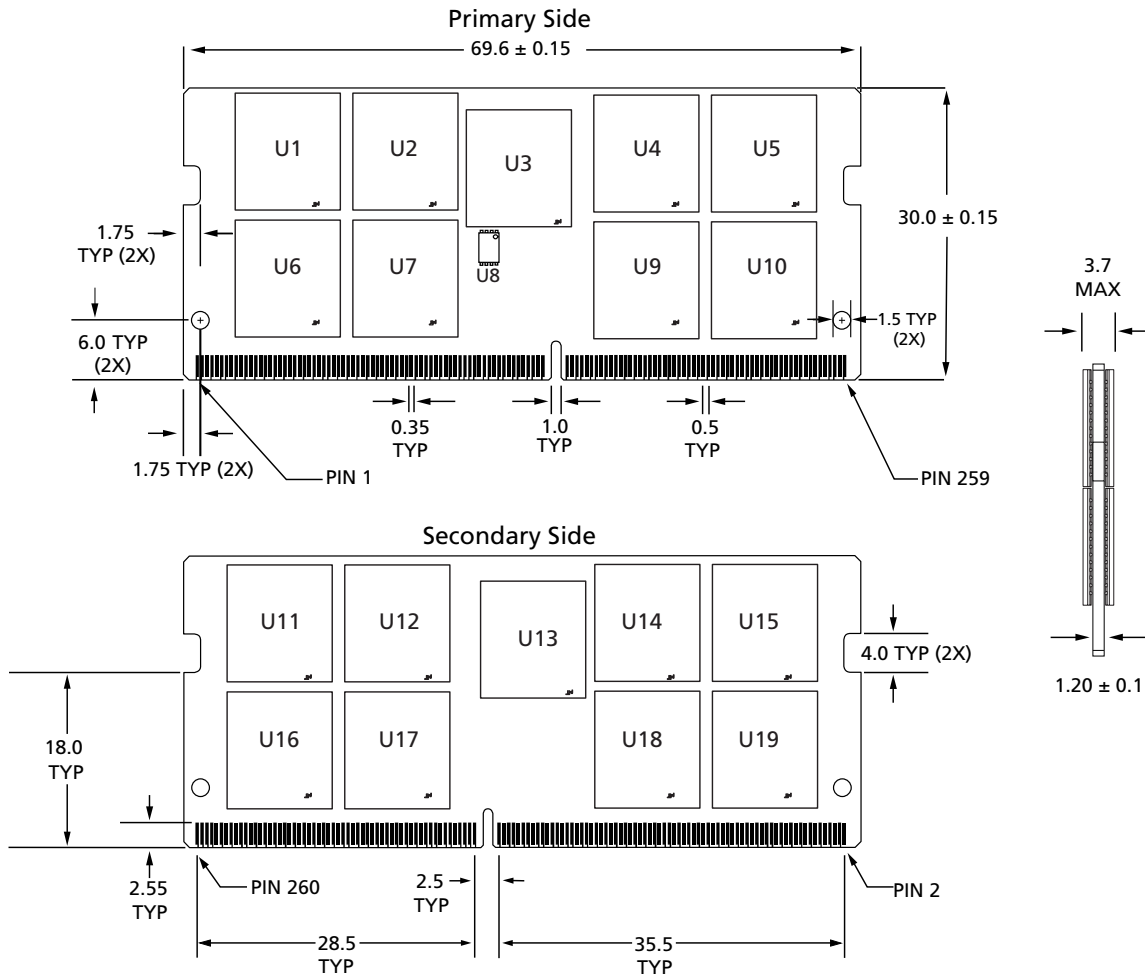
Figure 2: Functional Block Diagram, R/C-G1 (PCB 2637)



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.

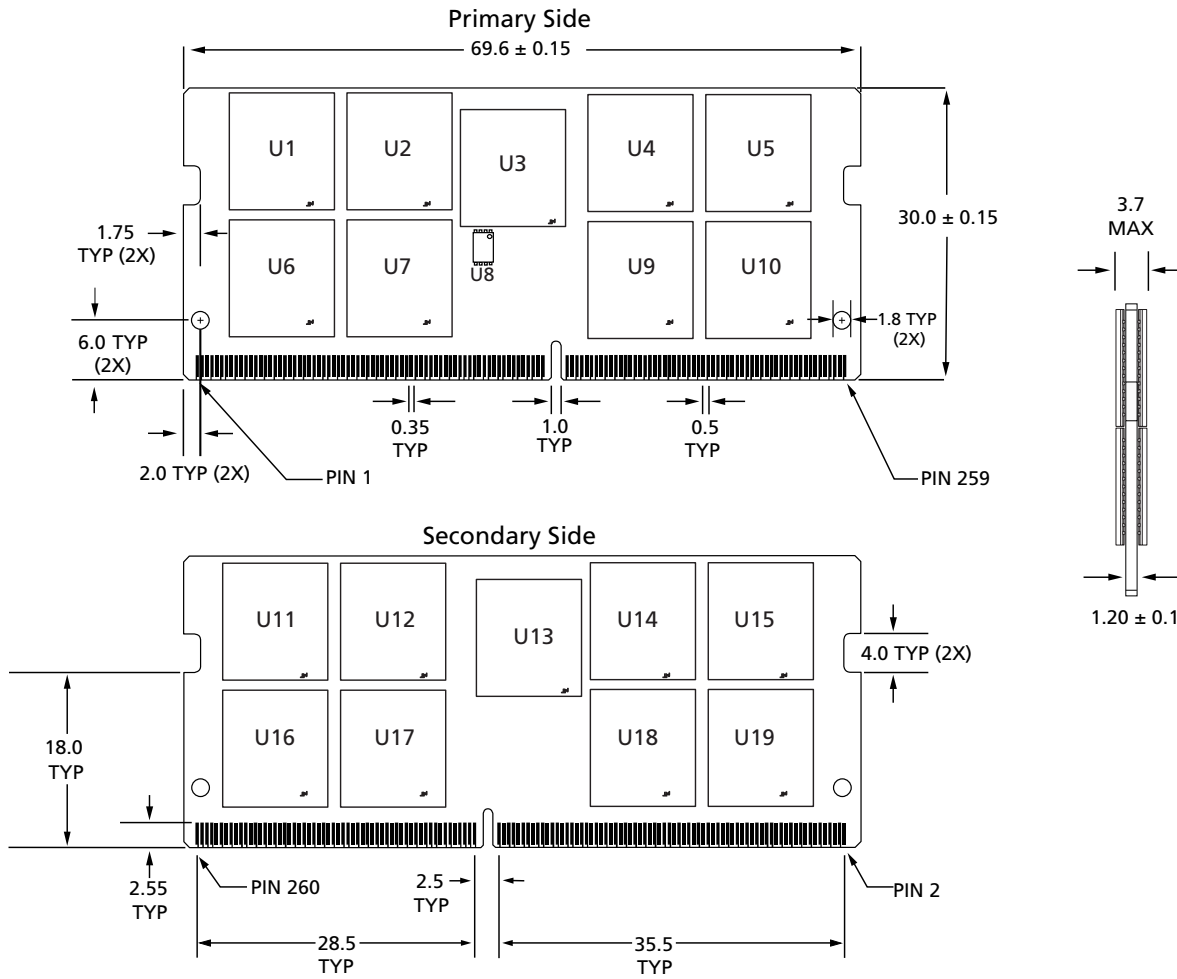
Module Dimensions

Figure 3: 260-Pin DDR4 SODIMM - PCB 2637



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

Figure 4: 260-Pin DDR4 SODIMM - PCB 3218



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

8000 S. Federal Way, P.O. Box 6, Boise, ID 83707-0006
 208-368-4000, micron.com/support

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.