

DDR4 SDRAM SODIMM Addendum

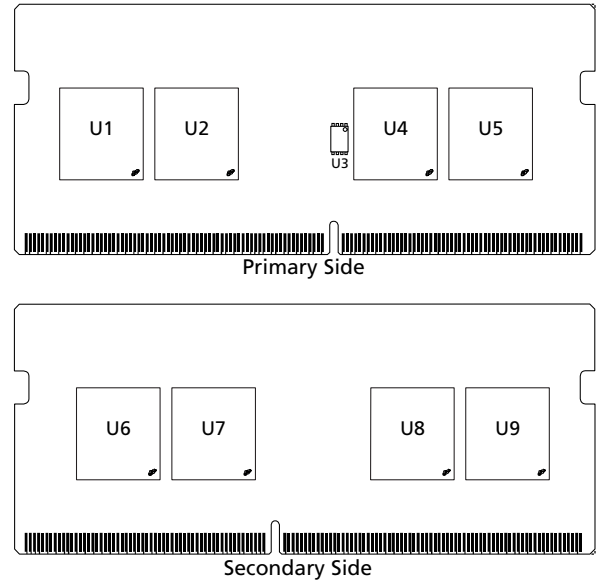
MTA8ATF2G64HZ – 16GB

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
- 260-pin, small-outline dual in-line memory module (SODIMM)
- Fast data transfer rates: PC4-2666, PC4-3200
- 16GB (2 Gig x 64)
- Data bus inversion (DBI) for data bus
- Single-rank
- On-board I²C serial presence-detect (SPD) EEPROM
- 16 internal banks; 4 groups of 4 banks each

Figure 1: 260-Pin SODIMM



Options

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

Marking

– Commercial ($0^{\circ}\text{C} \leq T_{\text{OPER}} \leq 95^{\circ}\text{C}$)	None
– 260-pin DIMM (halogen-free)	Z
– 0.625ns @ CL = 22 (DDR4-3200)	-3G2
– 0.75ns @ CL = 19 (DDR4-2666)	-2G6

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	CS0_n



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

Base device: MT40A2G8,¹ 16Gb DDR4 SDRAM

Part Number²	Module Density	Configuration	Module Bandwidth	Memory Clock/Data Rate	Clock Cycles (CL_{-n}RCD_{-n}RP)
MTA8ATF2G64HZ-3G2__	16GB	2 Gig x 64	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA8ATF2G64HZ-2G6__	16GB	2 Gig x 64	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: MTA8ATF2G64HZ-3G2F1.



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DQ Maps

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	7	17	U2	0	23	59
	1	5	3		1	21	45
	2	6	16		2	22	58
	3	4	4		3	20	46
	4	3	21		4	19	63
	5	0	8		5	16	50
	6	2	20		6	18	62
	7	1	7		7	17	49
U4	0	38	183	U5	0	55	225
	1	37	169		1	52	211
	2	39	182		2	54	224
	3	36	170		3	53	212
	4	34	187		4	51	229
	5	32	174		5	48	216
	6	35	186		6	50	228
	7	33	173		7	49	215
U6	0	60	232	U7	0	40	195
	1	62	245		1	43	208
	2	61	233		2	41	194
	3	63	246		3	42	207
	4	57	236		4	45	190
	5	58	249		5	46	203
	6	56	237		6	44	191
	7	59	250		7	47	204
U8	0	28	66	U9	0	12	24
	1	30	79		1	15	37
	2	29	67		2	13	25
	3	31	80		3	14	38
	4	25	71		4	9	29
	5	26	83		5	10	41
	6	24	70		6	8	28
	7	27	84		7	11	42



I_{DD} Specifications

Table 4: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 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	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	480	464	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I _{pp} current	I _{PP0}	24	24	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	568	552	mA
Precharge standby current	I _{DD2N}	360	344	mA
Precharge standby ODT current	I _{DD2NT}	408	392	mA
Precharge power-down current	I _{DD2P}	304	304	mA
Precharge quiet standby current	I _{DD2Q}	336	336	mA
Active standby current	I _{DD3N}	488	472	mA
Active standby I _{pp} current	I _{PP3N}	16	16	mA
Active power-down current	I _{DD3P}	400	384	mA
Burst read current	I _{DD4R}	1296	1168	mA
Burst write current	I _{DD4W}	1024	936	mA
Burst refresh current (1x REF)	I _{DD5R}	544	544	mA
Burst refresh I _{pp} current (1x REF)	I _{PP5R}	32	32	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	424	424	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	904	904	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	160	160	mA
Auto self refresh current (25°C)	I _{DD6A}	88	88	mA
Auto self refresh current (45°C)	I _{DD6A}	160	160	mA
Auto self refresh current (75°C)	I _{DD6A}	408	408	mA
Auto self refresh current (95°C)	I _{DD6A}	904	904	mA
Auto self refresh I _{pp} current	I _{PP6X}	48	48	mA
Bank interleave read current	I _{DD7}	1480	1448	mA
Bank interleave read I _{pp} current	I _{PP7}	64	64	mA
Maximum power-down current	I _{DD8}	288	288	mA

Notes: 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.



16GB (x64, SR) 260-Pin DDR4 SODIMM I_{DD} Specifications

Table 5: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 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	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	504	488	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I _{pp} current	I _{PP0}	32	32	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	592	576	mA
Precharge standby current	I _{DD2N}	416	400	mA
Precharge standby ODT current	I _{DD2NT}	448	432	mA
Precharge power-down current	I _{DD2P}	344	344	mA
Precharge quiet standby current	I _{DD2Q}	376	376	mA
Active standby current	I _{DD3N}	640	624	mA
Active standby I _{pp} current	I _{PP3N}	24	24	mA
Active power-down current	I _{DD3P}	552	544	mA
Burst read current	I _{DD4R}	1616	1456	mA
Burst write current	I _{DD4W}	1464	1328	mA
Burst refresh current (1x REF)	I _{DD5R}	632	616	mA
Burst refresh I _{pp} current (1x REF)	I _{PP5R}	40	40	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	536	536	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	968	968	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	232	232	mA
Auto self refresh current (25°C)	I _{DD6A}	80	80	mA
Auto self refresh current (45°C)	I _{DD6A}	232	232	mA
Auto self refresh current (75°C)	I _{DD6A}	488	488	mA
Auto self refresh current (95°C)	I _{DD6A}	968	968	mA
Auto self refresh I _{pp} current	I _{PP6X}	88	88	mA
Bank interleave read current	I _{DD7}	1568	1520	mA
Bank interleave read I _{pp} current	I _{PP7}	80	80	mA
Maximum power-down current	I _{DD8}	320	320	mA

Notes: 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.



16GB (x64, SR) 260-Pin DDR4 SODIMM I_{DD} Specifications

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

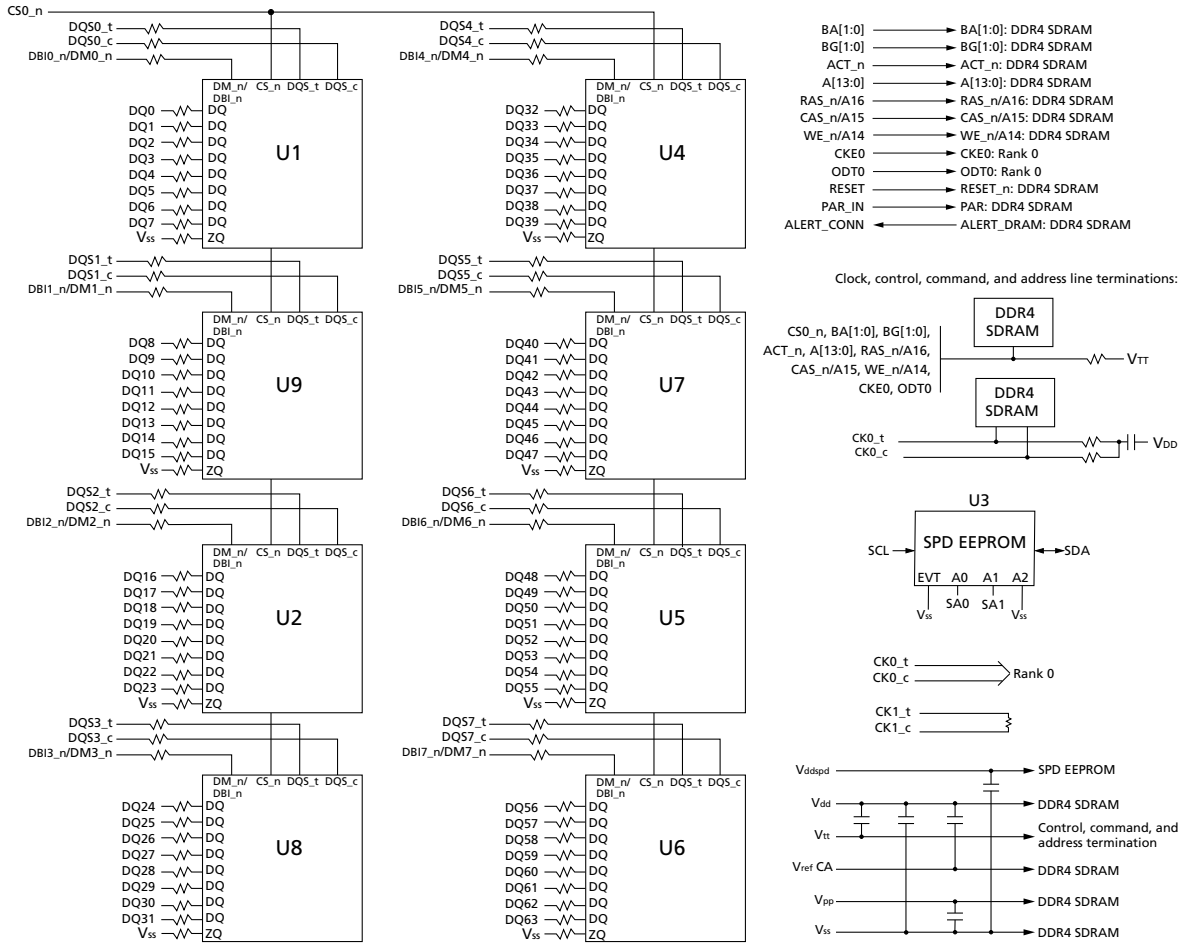
Values are for the MT40A2G8 DDR4 SDRAM only and are computed from values specified in the 16Gb (2 Gig x 8) component data sheet

Parameter	Symbol	3200	2666	Units
One bank ACTIVATE-PRECHARGE current	I _{DD0}	480	464	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I _{pp} current	I _{PP0}	24	24	mA
One bank ACTIVATE-READ-PRECHARGE current	I _{DD1}	568	552	mA
Precharge standby current	I _{DD2N}	360	344	mA
Precharge standby ODT current	I _{DD2NT}	408	392	mA
Precharge power-down current	I _{DD2P}	304	304	mA
Precharge quiet standby current	I _{DD2Q}	336	336	mA
Active standby current	I _{DD3N}	488	472	mA
Active standby I _{pp} current	I _{PP3N}	16	16	mA
Active power-down current	I _{DD3P}	400	384	mA
Burst read current	I _{DD4R}	1120	1000	mA
Burst write current	I _{DD4W}	896	816	mA
Burst refresh current (1x REF)	I _{DD5R}	544	544	mA
Burst refresh I _{pp} current (1x REF)	I _{PP5R}	32	32	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I _{DD6N}	424	424	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I _{DD6E}	720	720	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I _{DD6R}	160	160	mA
Auto self refresh current (25°C)	I _{DD6A}	88	88	mA
Auto self refresh current (45°C)	I _{DD6A}	160	160	mA
Auto self refresh current (75°C)	I _{DD6A}	408	408	mA
Auto self refresh current (95°C)	I _{DD6A}	720	720	mA
Auto self refresh I _{pp} current	I _{PP6X}	48	48	mA
Bank interleave read current	I _{DD7}	1336	1304	mA
Bank interleave read I _{pp} current	I _{PP7}	64	64	mA
Maximum power-down current	I _{DD8}	288	288	mA

Notes: 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.

Functional Block Diagram

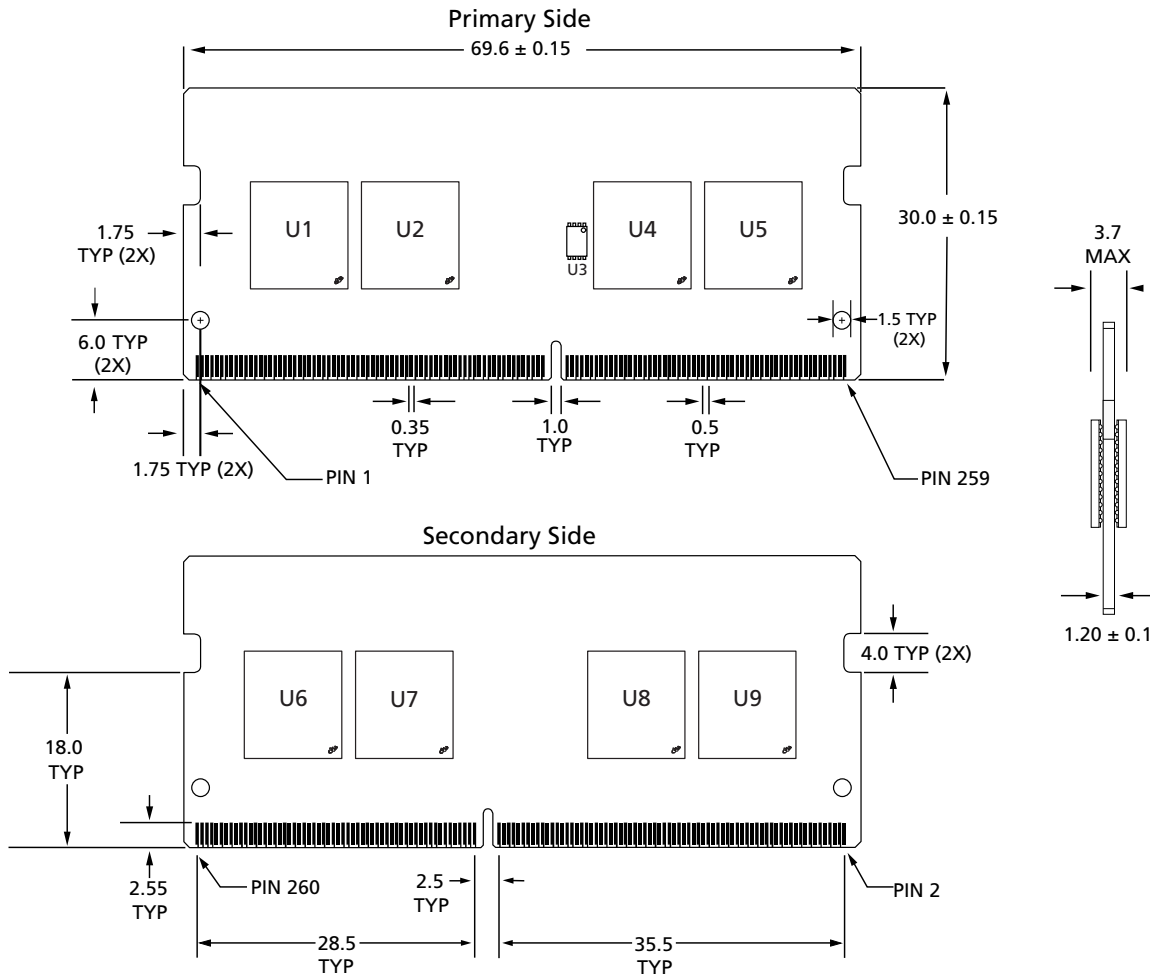
Figure 2: Functional Block Diagram



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.

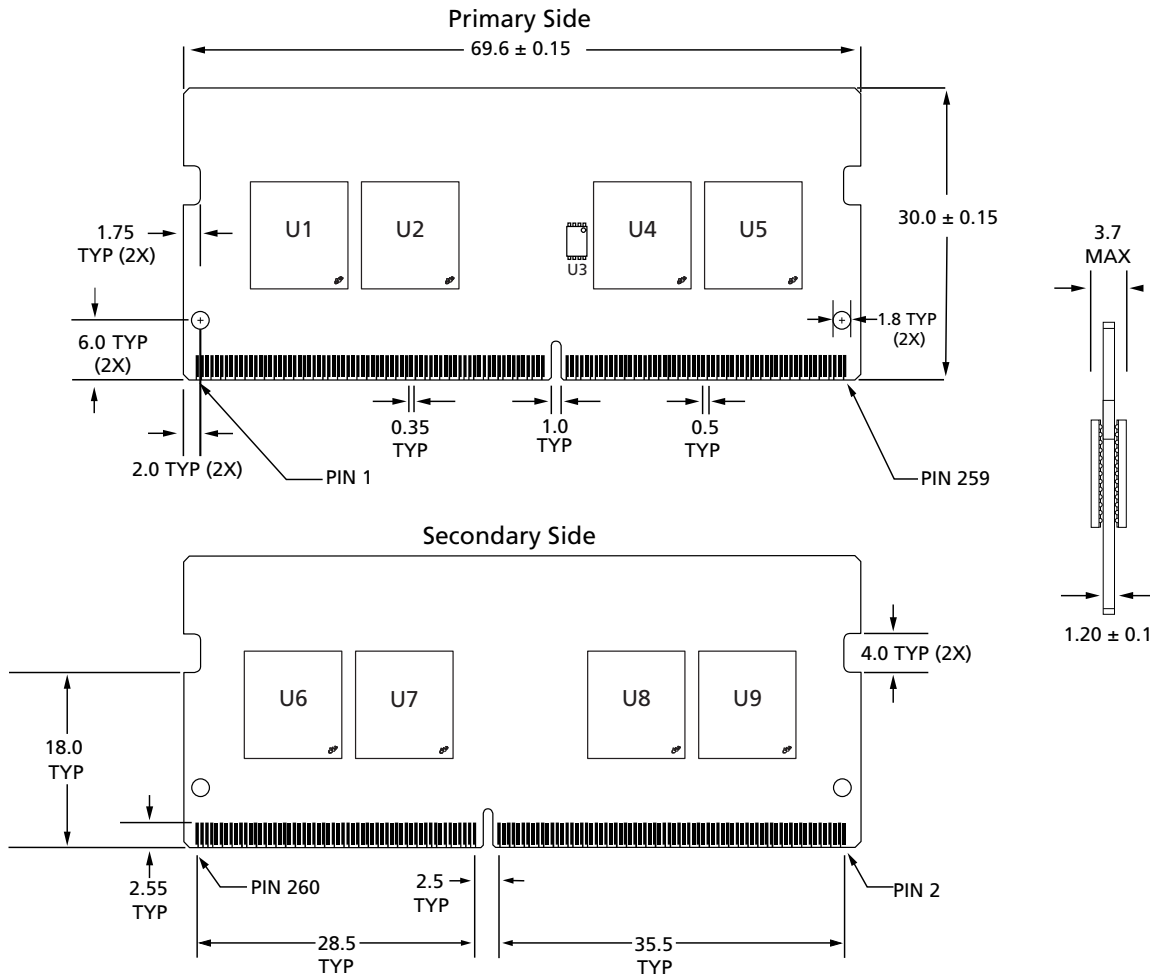
Module Dimensions

Figure 3: 260-Pin DDR4 SODIMM - PCB 2871



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

Figure 4: 260-Pin DDR4 SODIMM - PCB 3221



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

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