DDR4 SDRAM SODIMM Addendum

MTA4ATF1G64HZ – 8GB

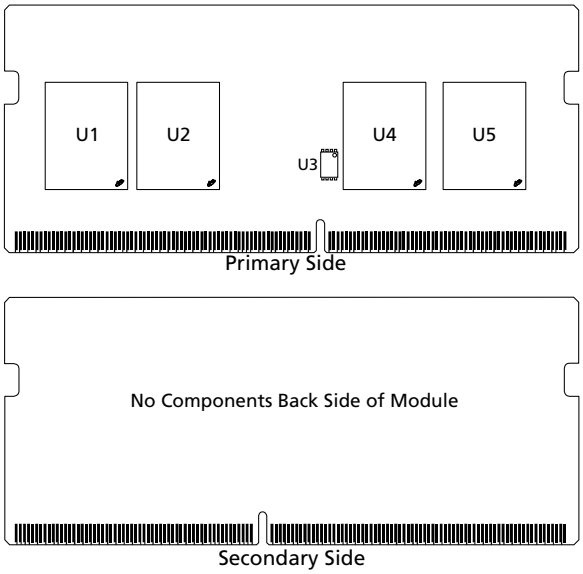
Introduction

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

Features

- 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 rate: PC4-2666, PC4-3200
- 8GB (1 Gig x 64)
- Data bus inversion (DBI) for data bus
- Single-rank
- On-board I^2C serial presence-detect (SPD) EEPROM
- 8 internal banks; 2 groups of 4 banks each

Figure 1: 260-Pin SODIMM



Options

Marking

- Operating temperature
  - Commercial ($0°C \leq T_{OPER} \leq 95°C$) — None
- Package
  - 260-pin DIMM (halogen-free) — Z
- Frequency/CAS latency
  - 0.625ns @ CL = 22 (DDR4-3200) — -3G2
  - 0.75ns @ CL = 19 (DDR4-2666) — -2G6

Table 1: Addressing

Parameter	8GB
Row address	128K A[16:0]
Column address	1K A[9:0]
Device bank group address	2 BG0
Device bank address per group	4 BA[1:0]
Device configuration	16Gb (1 Gig x 16), 8 banks
Module rank address	CS0_n

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Table 2: Part Numbers and Timing Parameters – 8GB Modules

Base device: MT40A1G16,[1] 16Gb DDR4 SDRAM

Part Number[2]	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles ($CL-_nRCD-_nRP$)
MTA4ATF1G64HZ-3G2__	8GB	1 Gig x 64	25.6 GB/s	0.625ns/3200 MT/s	22-22-22
MTA4ATF1G64HZ-2G6__	8GB	1 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: MTA4ATF1G64HZ-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
U1	00	3	21	U2	00	19	63
	01	1	7		01	17	49
	02	2	20		02	18	62
	03	0	8		03	16	50
	04	7	17		04	23	59
	05	5	3		05	21	45
	06	6	16		06	22	58
	07	4	4		07	20	46
	08	10	41		08	26	83
	09	8	28		09	24	70
	10	11	42		10	27	84
	11	9	29		11	25	71
	12	14	38		12	30	79
	13	13	25		13	29	67
	14	15	37		14	31	80
	15	12	24		15	28	66
U4	00	35	186	U5	00	51	229
	01	33	173		01	49	215
	02	34	187		02	50	228
	03	32	174		03	48	216
	04	39	182		04	55	225
	05	37	169		05	53	212
	06	38	183		06	54	224
	07	36	170		07	52	211
	08	42	207		08	58	249
	09	40	195		09	56	237
	10	43	208		10	59	250
	11	41	194		11	57	236
	12	46	203		12	62	245
	13	45	190		13	61	233
	14	47	204		14	63	246
	15	44	191		15	60	232

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I_{DD} Specifications

Table 4: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 8GB (Die Revision E)

Values are for the MT40A1G16 DDR4 SDRAM only and are computed from values specified in the 16Gb (1 Gig x 16) component data sheet

Parameter	Symbol	3200	2666	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}	280	272	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I_{PP} current	I_{PP0}	16	16	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}	336	328	mA
Precharge standby current	I_{DD2N}	180	172	mA
Precharge standby ODT current	I_{DD2NT}	232	224	mA
Precharge power-down current	I_{DD2P}	152	152	mA
Precharge quiet standby current	I_{DD2Q}	168	168	mA
Active standby current	I_{DD3N}	248	240	mA
Active standby I_{PP} current	I_{PP3N}	8	8	mA
Active power-down current	I_{DD3P}	204	196	mA
Burst read current	I_{DD4R}	1196	1052	mA
Burst write current	I_{DD4W}	944	852	mA
Burst refresh current (1x REF)	I_{DD5R}	272	272	mA
Burst refresh I_{PP} current (1x REF)	I_{PP5R}	16	16	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I_{DD6N}	212	212	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I_{DD6E}	452	452	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I_{DD6R}	80	80	mA
Auto self refresh current (25°C)	I_{DD6A}	44	44	mA
Auto self refresh current (45°C)	I_{DD6A}	80	80	mA
Auto self refresh current (75°C)	I_{DD6A}	204	204	mA
Auto self refresh current (95°C)	I_{DD6A}	452	452	mA
Auto self refresh I_{PP} current	I_{PP6X}	24	24	mA
Bank interleave read current	I_{DD7}	980	944	mA
Bank interleave read I_{PP} current	I_{PP7}	36	36	mA
Maximum power-down current	I_{DD8}	144	144	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.

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Table 5: DDR4 I_{DD} Specifications and Conditions (0° ≤ T_C ≤ 85°) – 8GB (Die Revision B)

Values are for the MT40A1G16 DDR4 SDRAM only and are computed from values specified in the 16Gb (1 Gig x 16) component data sheet

Parameter	Symbol	3200	2666	Units
One bank ACTIVATE-PRECHARGE current	I_{DD0}	312	304	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I_{PP} current	I_{PP0}	20	20	mA
One bank ACTIVATE-READ-PRECHARGE current	I_{DD1}	396	388	mA
Precharge standby current	I_{DD2N}	208	200	mA
Precharge standby ODT current	I_{DD2NT}	260	252	mA
Precharge power-down current	I_{DD2P}	172	172	mA
Precharge quiet standby current	I_{DD2Q}	188	188	mA
Active standby current	I_{DD3N}	324	316	mA
Active standby I_{PP} current	I_{PP3N}	12	12	mA
Active power-down current	I_{DD3P}	288	280	mA
Burst read current	I_{DD4R}	1304	1136	mA
Burst write current	I_{DD4W}	1096	960	mA
Burst refresh current (1x REF)	I_{DD5R}	316	308	mA
Burst refresh I_{PP} current (1x REF)	I_{PP5R}	20	20	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I_{DD6N}	268	268	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I_{DD6E}	484	484	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I_{DD6R}	116	116	mA
Auto self refresh current (25°C)	I_{DD6A}	40	40	mA
Auto self refresh current (45°C)	I_{DD6A}	116	116	mA
Auto self refresh current (75°C)	I_{DD6A}	244	244	mA
Auto self refresh current (95°C)	I_{DD6A}	484	484	mA
Auto self refresh I_{PP} current	I_{PP6X}	44	44	mA
Bank interleave read current	I_{DD7}	1072	1040	mA
Bank interleave read I_{PP} current	I_{PP7}	44	44	mA
Maximum power-down current	I_{DD8}	160	160	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.

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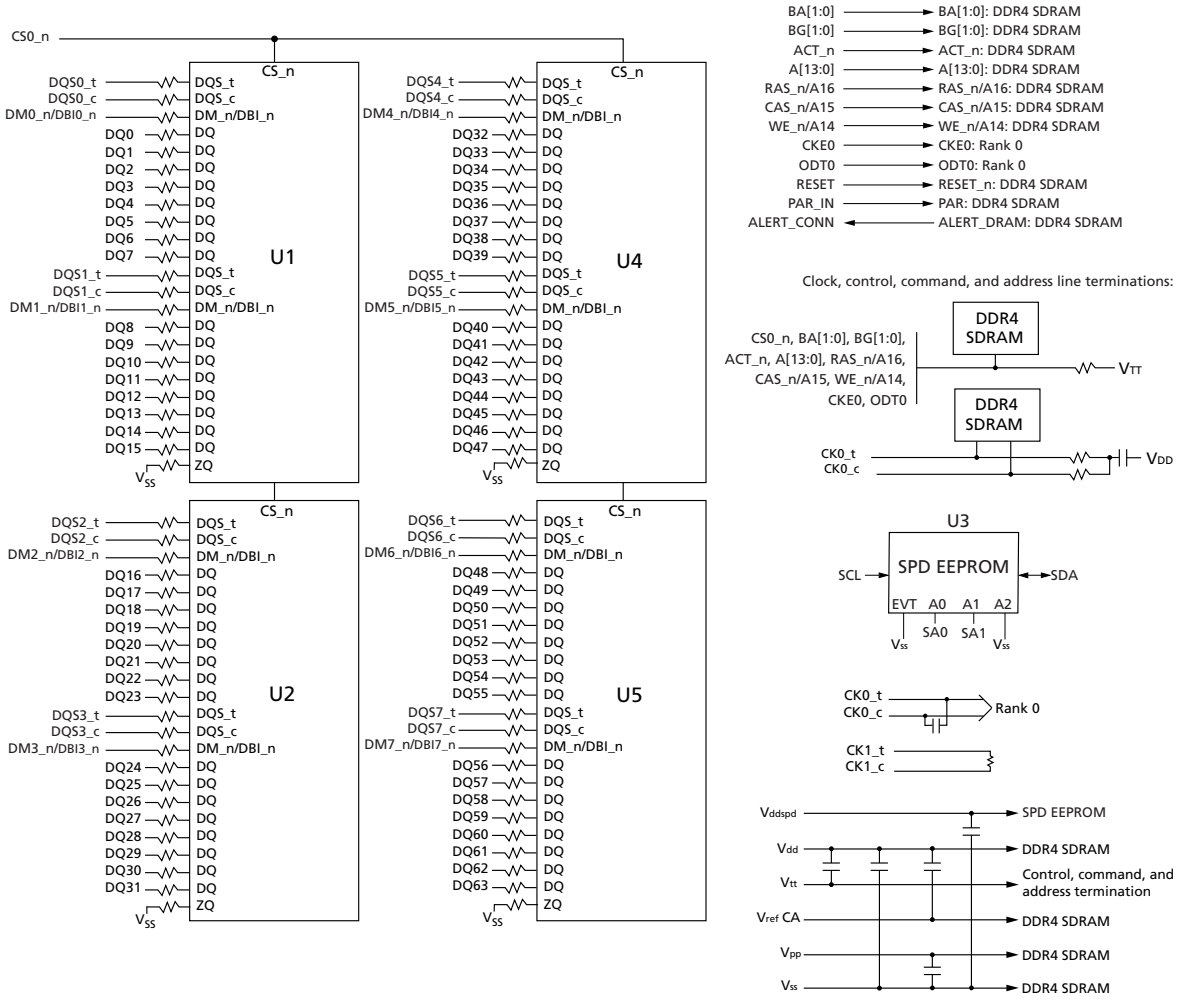
Functional Block Diagram

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.

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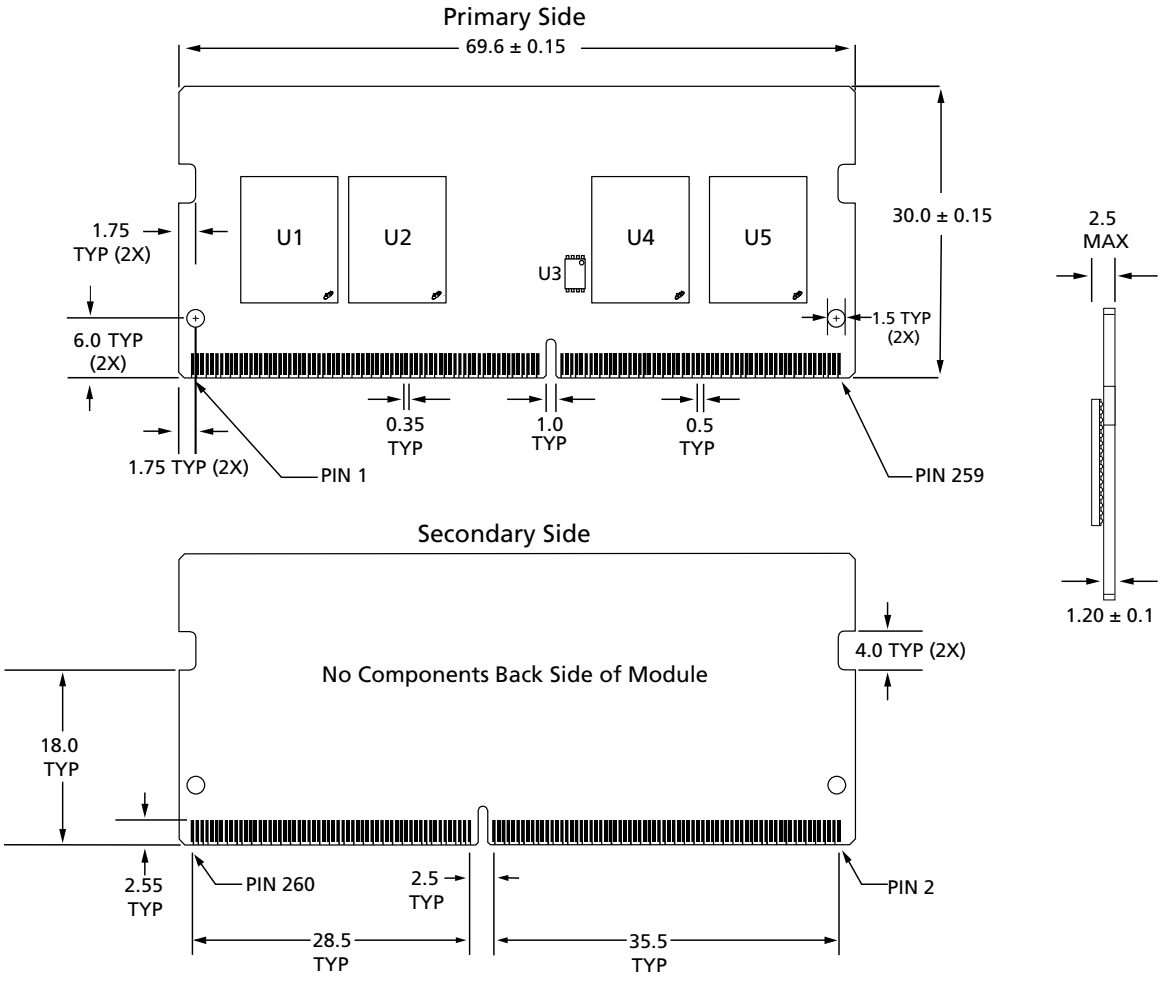
Module Dimensions

Figure 3: 260-Pin DDR4 SODIMM - PCB 2874



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

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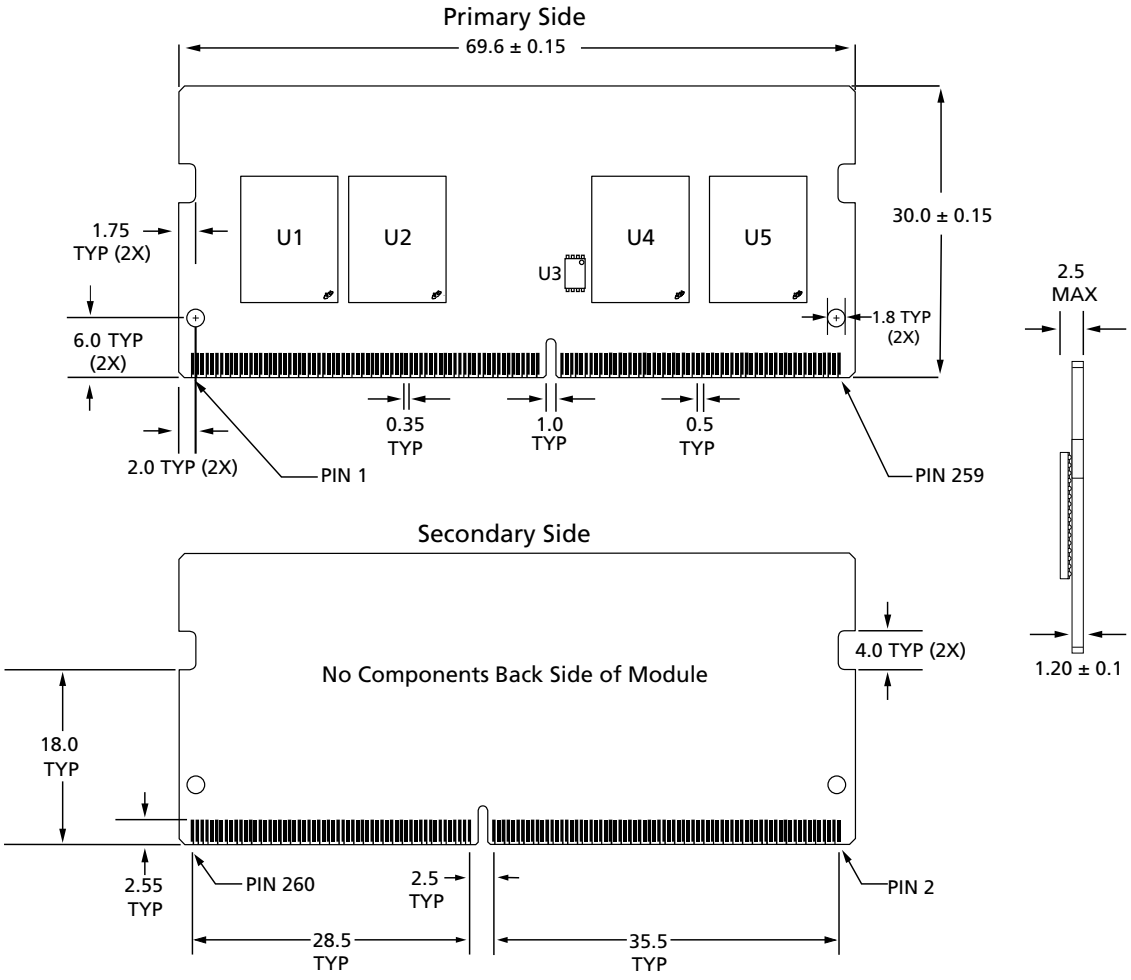
Figure 4: 260-Pin DDR4 SODIMM - PCB 3222



Notes:
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