

# DDR4 SDRAM SODIMM Addendum

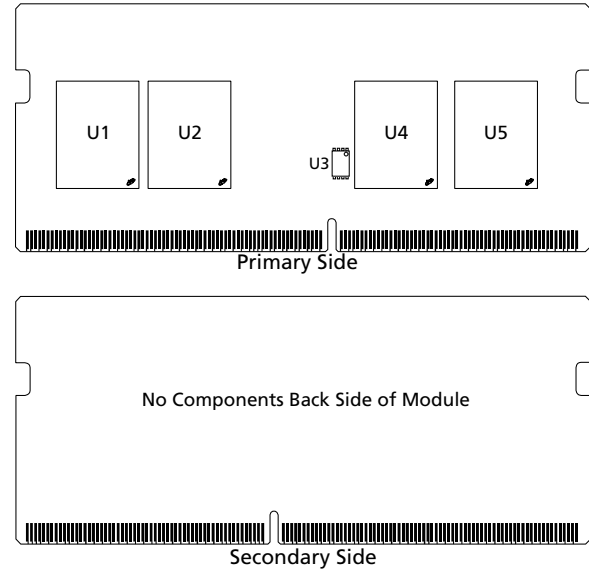
## MTA4ATF1G64HZ – 8GB

### 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 rate: PC4-2666, PC4-3200
- 8GB (1 Gig x 64)
- Data bus inversion (DBI) for data bus
- Single-rank
- On-board I<sup>2</sup>C serial presence-detect (SPD) EEPROM
- 8 internal banks; 2 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

None  
Z  
-3G2  
-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



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

Base device: MT40A1G16,<sup>1</sup> 16Gb DDR4 SDRAM

<b>Part Number<sup>2</sup></b>	<b>Module Density</b>	<b>Configuration</b>	<b>Module Bandwidth</b>	<b>Memory Clock/Data Rate</b>	<b>Clock Cycles (CL<sub>-n</sub>RCD<sub>-n</sub>RP)</b>
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](http://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-3G2F1.



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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		



## I<sub>DD</sub> Specifications

**Table 4: DDR4 I<sub>DD</sub> Specifications and Conditions (0° ≤ T<sub>C</sub> ≤ 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 <sub>DD0</sub>	280	272	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I <sub>pp</sub> current	I <sub>PP0</sub>	16	16	mA
One bank ACTIVATE-READ-PRECHARGE current	I <sub>DD1</sub>	336	328	mA
Precharge standby current	I <sub>DD2N</sub>	180	172	mA
Precharge standby ODT current	I <sub>DD2NT</sub>	232	224	mA
Precharge power-down current	I <sub>DD2P</sub>	152	152	mA
Precharge quiet standby current	I <sub>DD2Q</sub>	168	168	mA
Active standby current	I <sub>DD3N</sub>	248	240	mA
Active standby I <sub>pp</sub> current	I <sub>PP3N</sub>	8	8	mA
Active power-down current	I <sub>DD3P</sub>	204	196	mA
Burst read current	I <sub>DD4R</sub>	772	1052	mA
Burst write current	I <sub>DD4W</sub>	564	852	mA
Burst refresh current (1x REF)	I <sub>DD5R</sub>	272	272	mA
Burst refresh I <sub>pp</sub> current (1x REF)	I <sub>PP5R</sub>	16	16	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I <sub>DD6N</sub>	212	212	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I <sub>DD6E</sub>	360	452	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I <sub>DD6R</sub>	80	80	mA
Auto self refresh current (25°C)	I <sub>DD6A</sub>	44	44	mA
Auto self refresh current (45°C)	I <sub>DD6A</sub>	80	80	mA
Auto self refresh current (75°C)	I <sub>DD6A</sub>	204	204	mA
Auto self refresh current (95°C)	I <sub>DD6A</sub>	360	452	mA
Auto self refresh I <sub>pp</sub> current	I <sub>PP6X</sub>	24	24	mA
Bank interleave read current	I <sub>DD7</sub>	800	944	mA
Bank interleave read I <sub>pp</sub> current	I <sub>PP7</sub>	52	36	mA
Maximum power-down current	I <sub>DD8</sub>	144	144	mA

Notes: 1. When T<sub>C</sub> > 85°C, the I<sub>DD</sub> and I<sub>pp</sub> values must be derated. Refer to the base device data sheet I<sub>DD</sub> and I<sub>pp</sub> specification tables for derating values for the applicable die-revision.



## 8GB (x64, SR) 260-Pin DDR4 SODIMM I<sub>DD</sub> Specifications

**Table 5: DDR4 I<sub>DD</sub> Specifications and Conditions (0° ≤ T<sub>C</sub> ≤ 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 <sub>DD0</sub>	312	304	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I <sub>pp</sub> current	I <sub>PP0</sub>	20	20	mA
One bank ACTIVATE-READ-PRECHARGE current	I <sub>DD1</sub>	396	388	mA
Precharge standby current	I <sub>DD2N</sub>	208	200	mA
Precharge standby ODT current	I <sub>DD2NT</sub>	260	252	mA
Precharge power-down current	I <sub>DD2P</sub>	172	172	mA
Precharge quiet standby current	I <sub>DD2Q</sub>	188	188	mA
Active standby current	I <sub>DD3N</sub>	324	316	mA
Active standby I <sub>pp</sub> current	I <sub>PP3N</sub>	12	12	mA
Active power-down current	I <sub>DD3P</sub>	288	280	mA
Burst read current	I <sub>DD4R</sub>	1304	1136	mA
Burst write current	I <sub>DD4W</sub>	1096	960	mA
Burst refresh current (1x REF)	I <sub>DD5R</sub>	316	308	mA
Burst refresh I <sub>pp</sub> current (1x REF)	I <sub>PP5R</sub>	20	20	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I <sub>DD6N</sub>	268	268	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I <sub>DD6E</sub>	484	484	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I <sub>DD6R</sub>	116	116	mA
Auto self refresh current (25°C)	I <sub>DD6A</sub>	40	40	mA
Auto self refresh current (45°C)	I <sub>DD6A</sub>	116	116	mA
Auto self refresh current (75°C)	I <sub>DD6A</sub>	244	244	mA
Auto self refresh current (95°C)	I <sub>DD6A</sub>	484	484	mA
Auto self refresh I <sub>pp</sub> current	I <sub>PP6X</sub>	44	44	mA
Bank interleave read current	I <sub>DD7</sub>	1072	1040	mA
Bank interleave read I <sub>pp</sub> current	I <sub>PP7</sub>	44	44	mA
Maximum power-down current	I <sub>DD8</sub>	160	160	mA

Notes: 1. When T<sub>C</sub> > 85°C, the I<sub>DD</sub> and I<sub>pp</sub> values must be derated. Refer to the base device data sheet I<sub>DD</sub> and I<sub>pp</sub> specification tables for derating values for the applicable die-revision.



## 8GB (x64, SR) 260-Pin DDR4 SODIMM I<sub>DD</sub> Specifications

**Table 6: DDR4 I<sub>DD</sub> Specifications and Conditions (0° ≤ T<sub>C</sub> ≤ 85°) – 8GB (Die Revision F)**

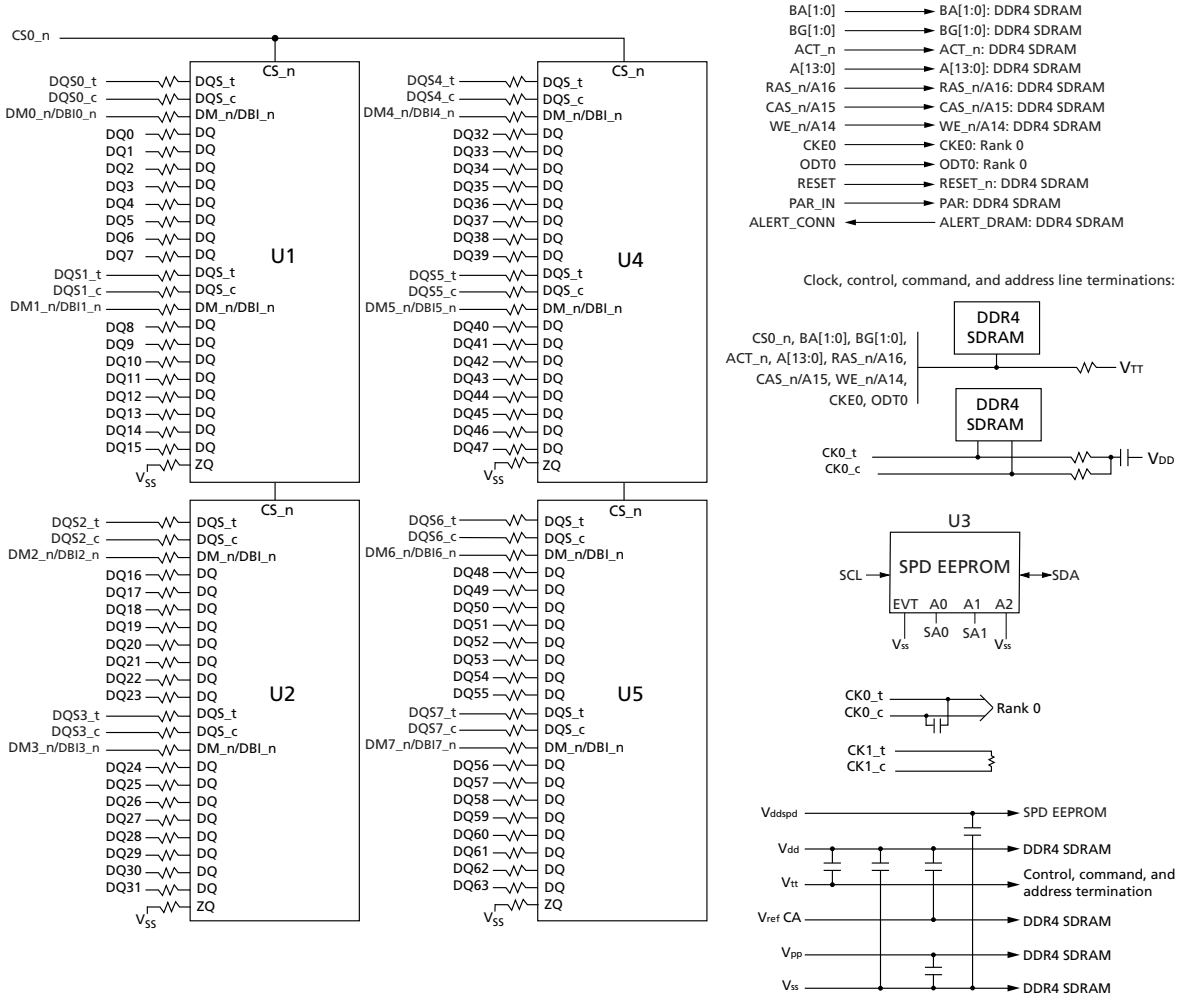
Values are for the MT40A1G16 DDR4 SDRAM only and are computed from values specified in the 16Gb (1 Gig x 16) component data sheet

Parameter	Symbol	3200	2666	Units
One bank ACTIVATE-PRECHARGE current	I <sub>DD0</sub>	280	272	mA
One bank ACTIVATE-PRECHARGE, Word Line Boost, I <sub>pp</sub> current	I <sub>PP0</sub>	16	16	mA
One bank ACTIVATE-READ-PRECHARGE current	I <sub>DD1</sub>	336	328	mA
Precharge standby current	I <sub>DD2N</sub>	180	172	mA
Precharge standby ODT current	I <sub>DD2NT</sub>	232	224	mA
Precharge power-down current	I <sub>DD2P</sub>	152	152	mA
Precharge quiet standby current	I <sub>DD2Q</sub>	168	168	mA
Active standby current	I <sub>DD3N</sub>	248	240	mA
Active standby I <sub>pp</sub> current	I <sub>PP3N</sub>	8	8	mA
Active power-down current	I <sub>DD3P</sub>	204	196	mA
Burst read current	I <sub>DD4R</sub>	772	668	mA
Burst write current	I <sub>DD4W</sub>	564	484	mA
Burst refresh current (1x REF)	I <sub>DD5R</sub>	272	272	mA
Burst refresh I <sub>pp</sub> current (1x REF)	I <sub>PP5R</sub>	16	16	mA
Self refresh current: Normal temperature range (0°C to 85°C)	I <sub>DD6N</sub>	212	212	mA
Self refresh current: Extended temperature range (0°C to 95°C)	I <sub>DD6E</sub>	360	360	mA
Self refresh current: Reduced temperature range (0°C to 45°C)	I <sub>DD6R</sub>	80	80	mA
Auto self refresh current (25°C)	I <sub>DD6A</sub>	44	44	mA
Auto self refresh current (45°C)	I <sub>DD6A</sub>	80	80	mA
Auto self refresh current (75°C)	I <sub>DD6A</sub>	204	204	mA
Auto self refresh current (95°C)	I <sub>DD6A</sub>	360	360	mA
Auto self refresh I <sub>pp</sub> current	I <sub>PP6X</sub>	24	24	mA
Bank interleave read current	I <sub>DD7</sub>	800	760	mA
Bank interleave read I <sub>pp</sub> current	I <sub>PP7</sub>	52	52	mA
Maximum power-down current	I <sub>DD8</sub>	144	144	mA

Notes: 1. When T<sub>C</sub> > 85°C, the I<sub>DD</sub> and I<sub>pp</sub> values must be derated. Refer to the base device data sheet I<sub>DD</sub> and I<sub>pp</sub> specification tables for derating values for the applicable die-revision.

## Functional Block Diagram

Figure 2: Functional Block Diagram

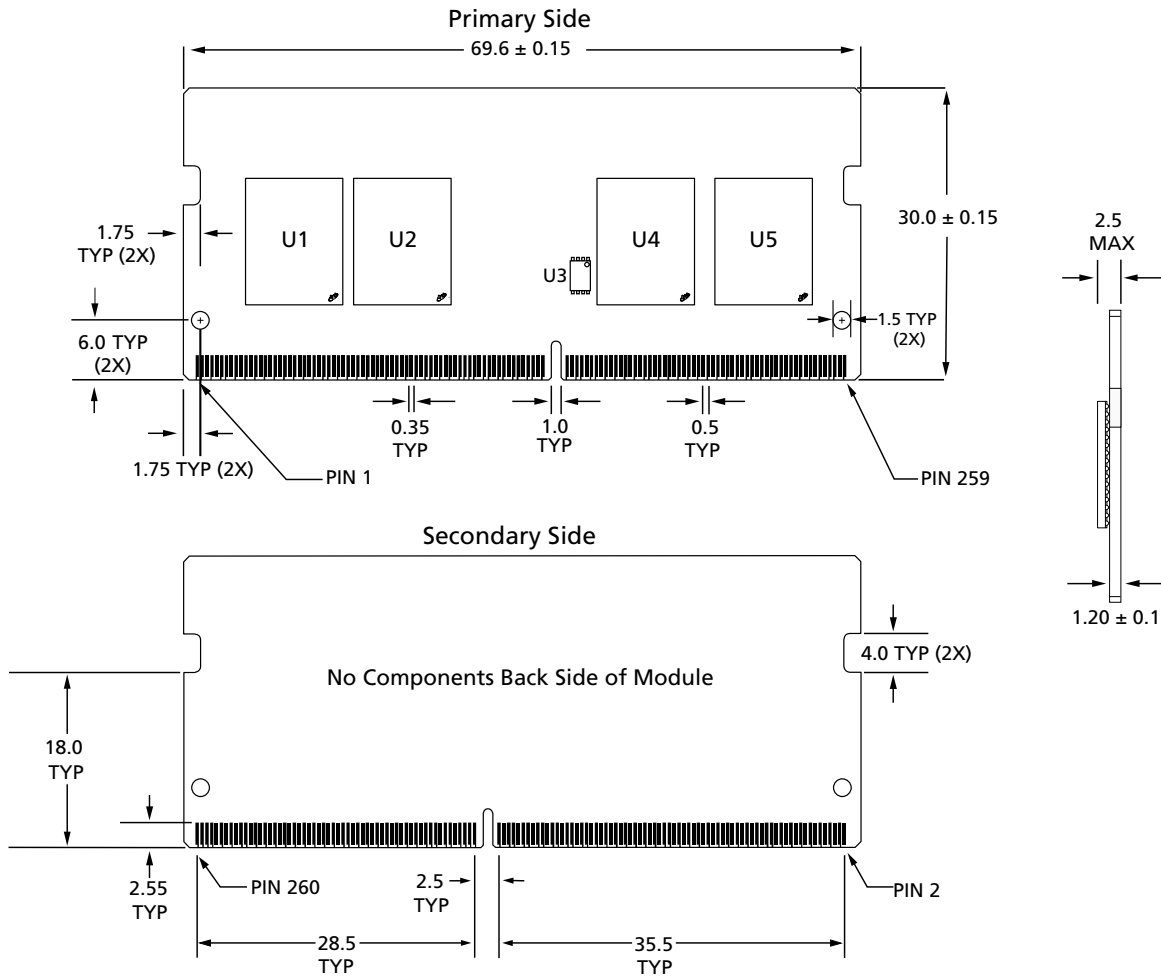


Note: 1. The ZQ ball on each DDR4 component is connected to an external  $240\Omega \pm 1\%$  resistor that is tied to ground. It is used for the calibration of the component's ODT and output driver.



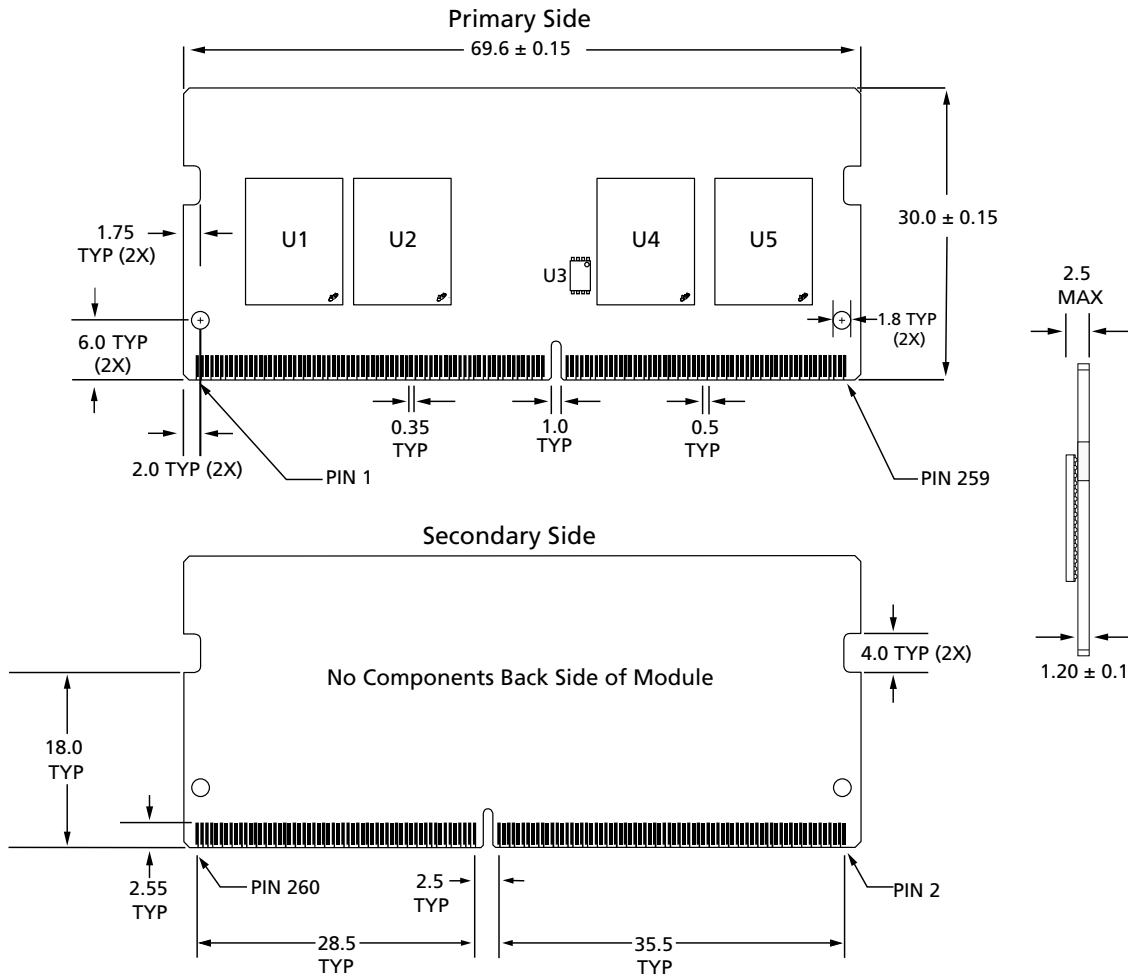
## Module Dimensions

**Figure 3: 260-Pin DDR4 SODIMM - PCB 2874**



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

**Figure 4: 260-Pin DDR4 SODIMM - PCB 3222**



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

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