

# DDR4 SDRAM SODIMM

## Addendum

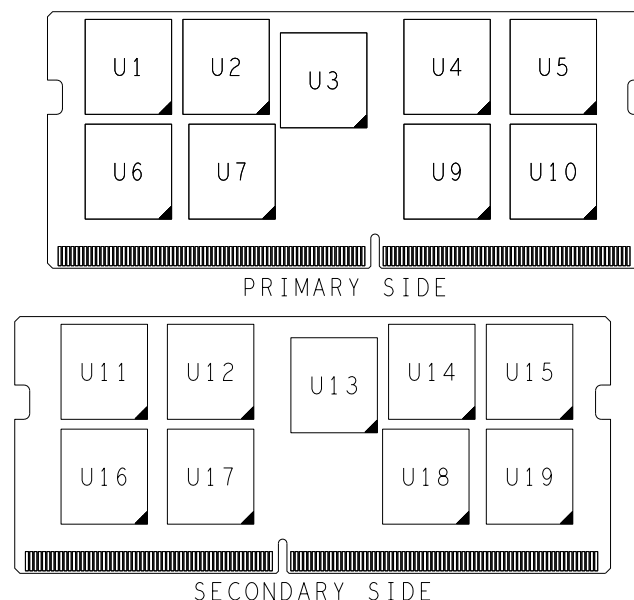
### MTA18ASF4G72HZ – 32GB

#### Features

Information provided here is in addition to or supercedes 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 I<sup>2</sup>C 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<sub>OPER</sub> ≤ 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 <sub>n</sub> [1:0]     |



## 32GB (x72, ECC DR) 260-Pin DDR4 SODIMM Features

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

Base device: MT40A2G8,<sup>1</sup> 16Gb DDR4 SDRAM

| Part Number <sup>2</sup> | Module Density | Configuration | Module Bandwidth | Memory Clock/Data Rate | Clock Cycles (CL- <sup>t</sup> RCD- <sup>t</sup> RP) |
|--------------------------|----------------|---------------|------------------|------------------------|------------------------------------------------------|
| 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](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: MTA18ASF4G72HZ-3G2E1.



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## 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<sub>DD</sub> Specifications

**Table 5: DDR4 I<sub>DD</sub> 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 <sub>DD0</sub>           | 954  | 936  | mA    |
| One bank ACTIVATE-PRECHARGE, wordline boost, I <sub>pp</sub> current | I <sub>PP0</sub>           | 63   | 63   | mA    |
| One bank ACTIVATE-READ-PRECHARGE current                             | I <sub>DD1</sub>           | 1053 | 1035 | mA    |
| Precharge standby current                                            | I <sub>DD2N</sub>          | 936  | 900  | mA    |
| Precharge standby ODT current                                        | I <sub>DD2NT</sub>         | 891  | 873  | mA    |
| Precharge power-down current                                         | I <sub>DD2P</sub>          | 774  | 774  | mA    |
| Precharge quite standby current                                      | I <sub>DD2Q</sub>          | 846  | 846  | mA    |
| Active standby current                                               | I <sub>DD3N</sub>          | 1440 | 1404 | mA    |
| Active standby I <sub>pp</sub> current                               | I <sub>PP3N</sub>          | 54   | 54   | mA    |
| Active power-down current                                            | I <sub>DD3P</sub>          | 1242 | 1224 | mA    |
| Burst read current                                                   | I <sub>DD4R</sub>          | 2205 | 2025 | mA    |
| Burst write current                                                  | I <sub>DD4W</sub>          | 2034 | 1881 | mA    |
| Different logic rank burst refresh current (1x REF)                  | I <sub>DD5R</sub>          | 1098 | 1080 | mA    |
| Different logic rank burst refresh I <sub>pp</sub> current (1x REF)  | I <sub>PP5R</sub>          | 72   | 72   | mA    |
| Self refresh current: Normal temperature range (0°C to 85°C)         | I <sub>DD6N</sub> (0–85°C) | 1206 | 1206 | mA    |
| Self refresh current: Extended temperature range (0°C to 95°C)       | I <sub>DD6E</sub> (0–95°C) | 2178 | 2178 | mA    |
| Self refresh current: Reduced temperature range (0°C to 45°C)        | I <sub>DD6R</sub> (0–45°C) | 522  | 522  | mA    |
| Auto self refresh current (25°C)                                     | I <sub>DD6A</sub> (25°C)   | 180  | 180  | mA    |
| Auto self refresh current (45°C)                                     | I <sub>DD6A</sub> (45°C)   | 522  | 522  | mA    |
| Auto self refresh current (75°C)                                     | I <sub>DD6A</sub> (75°C)   | 1098 | 1098 | mA    |
| Auto self refresh current (95°C)                                     | I <sub>DD6A</sub> (95°C)   | 2178 | 2178 | mA    |
| Auto self refresh I <sub>pp</sub> current (0°C to 95°C)              | I <sub>PP6X</sub>          | 198  | 198  | mA    |
| Bank interleave read current                                         | I <sub>DD7</sub>           | 2151 | 2097 | mA    |
| Bank interleave read I <sub>pp</sub> current                         | I <sub>PP7</sub>           | 117  | 117  | mA    |
| Maximum power-down current                                           | I <sub>DD8</sub>           | 720  | 720  | mA    |



## 32GB (x72, ECC DR) 260-Pin DDR4 SODIMM I<sub>DD</sub> Specifications

**Table 6: DDR4 I<sub>DD</sub> 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.

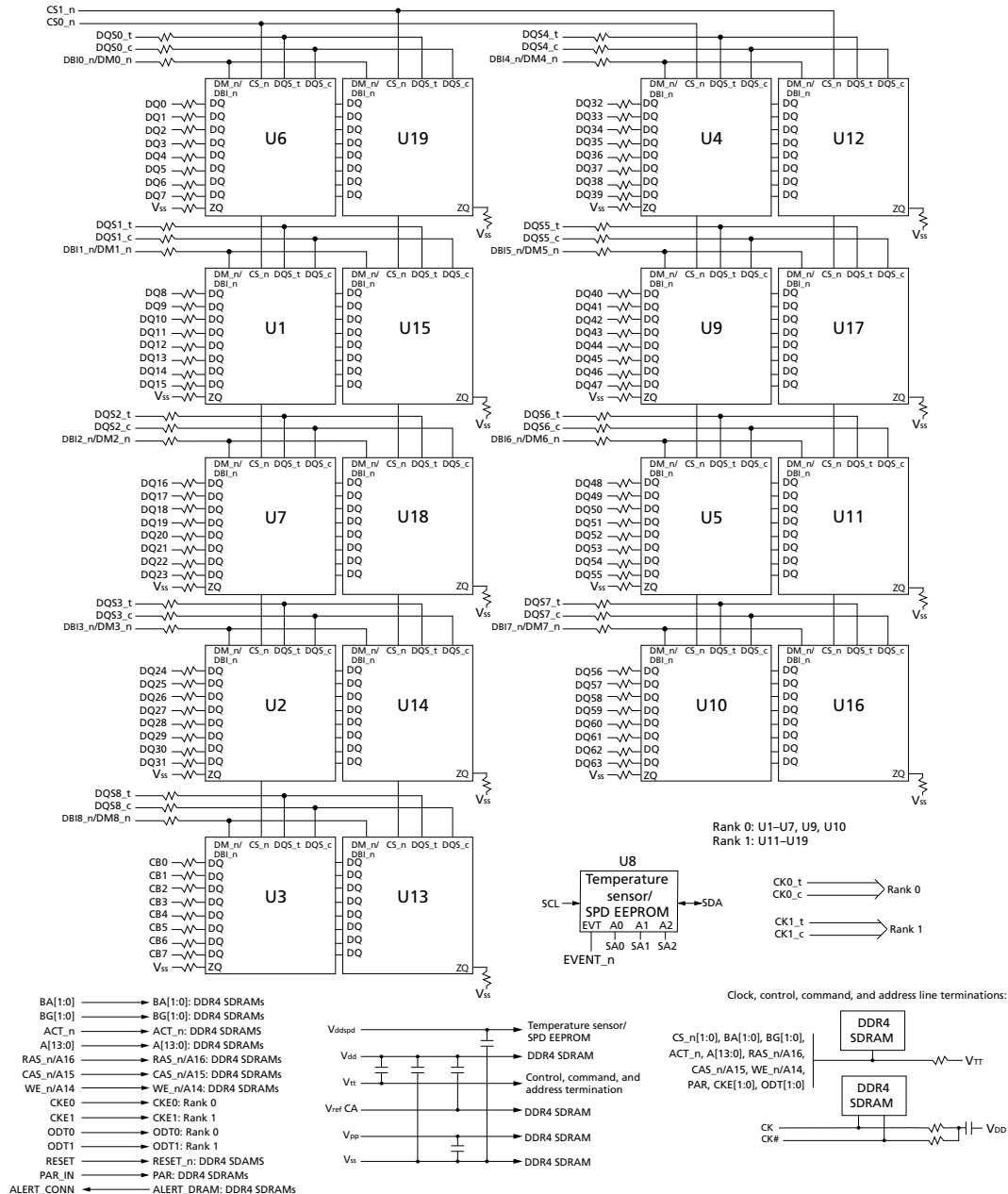
| Parameter                                                            | Symbol                     | 3200 | Units |
|----------------------------------------------------------------------|----------------------------|------|-------|
| One bank ACTIVATE-PRECHARGE current                             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



## 32GB (x72, ECC DR) 260-Pin DDR4 SODIMM Functional Block Diagrams

### Functional Block Diagrams

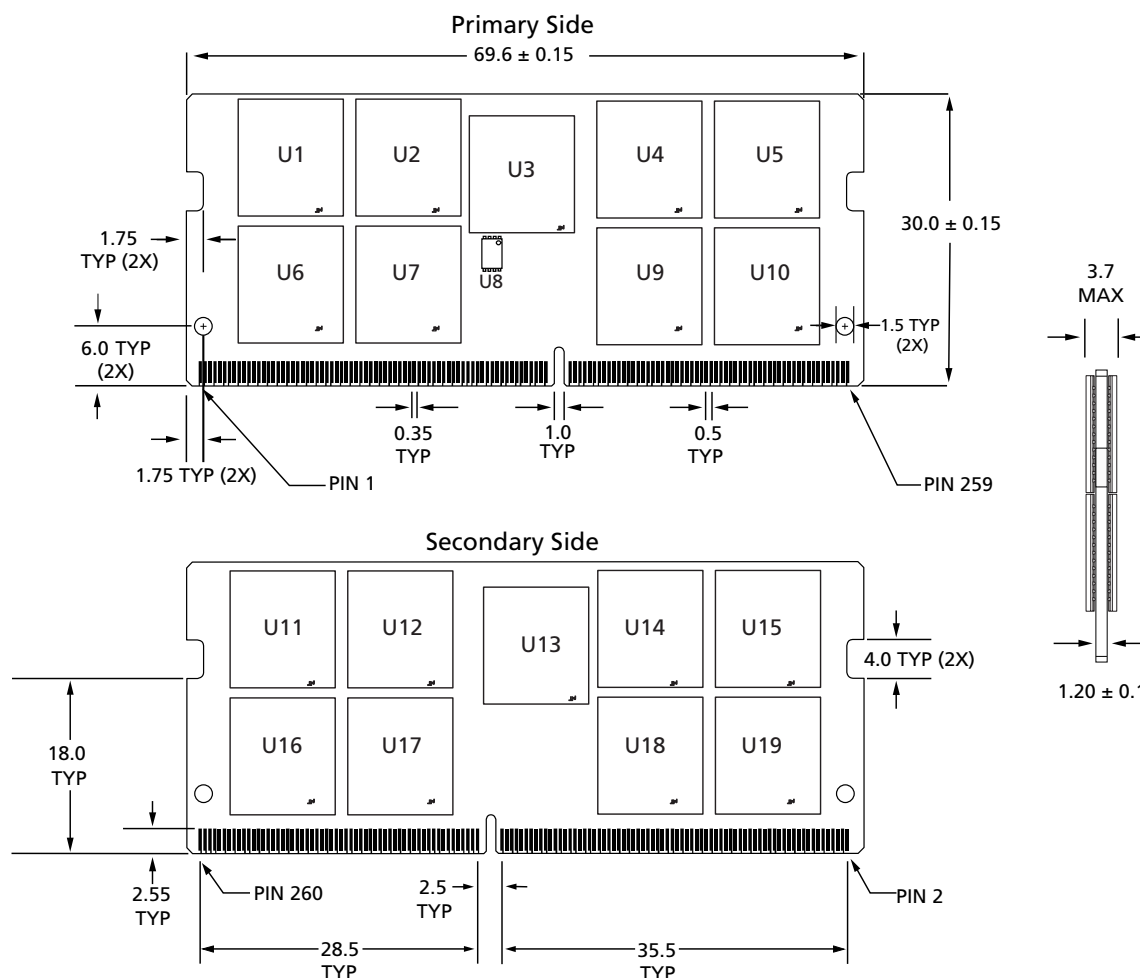
Figure 2: Functional Block Diagram, R/C-G1 (PCB 2637)



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

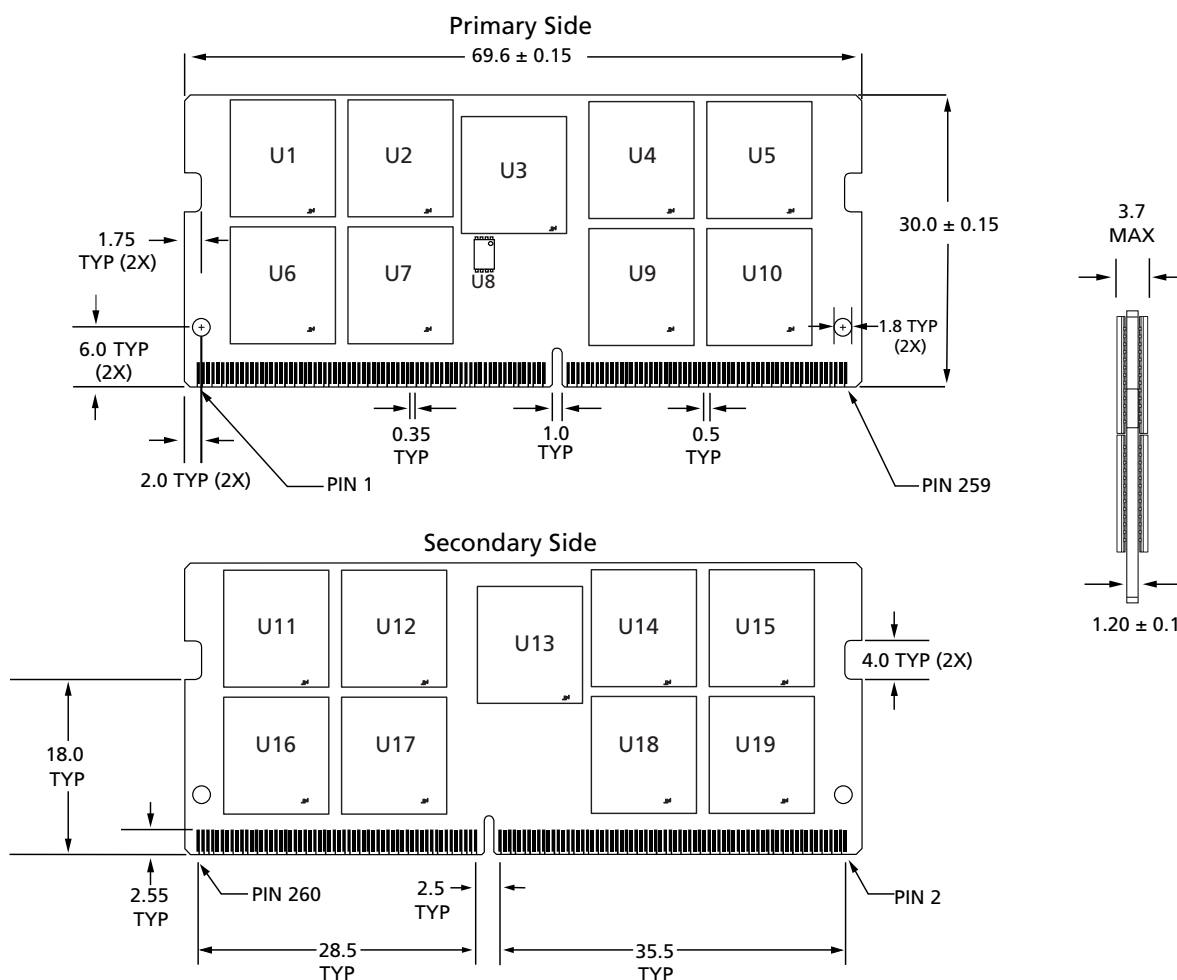
## Module Dimensions

**Figure 3: 260-Pin DDR4 SODIMM - PCB 2637**



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

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