DDR5 SDRAM UDIMM Addendum

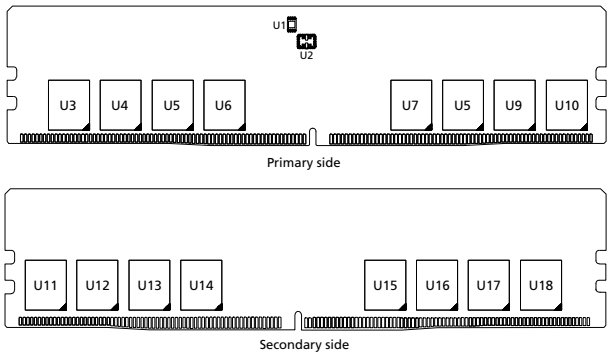
MTC16C2085S1UC – 32GB
16Gb Die Revision A

Features

Information provided here is in addition to or supersedes information provided in the Micron DDR5 UDIMM Core data sheet.

- DDR5 functionality and operations supported as defined in the component data sheet
- Features and specifications defined in the Micron DDR5 UDIMM core data sheet
- 288-pin, DDR5 unbuffered dual in-line memory module (DDR5 UDIMM)
- Fast data transfer rate: PC5-4800, PC5-5600
- 32GB (4 Gig x 64)
- Dual-rank
- 32 internal banks; 8 groups of 4 banks each

Figure 1: 288-Pin DDR5 UDIMM (R/C-A0)



Options — Marking

- Operating temperature
  - Commercial (0°C ≤ T_{OPER} ≤ 95°C) — C
- Frequency/CAS latency
  - 0.416ns @ CL = 40 (DDR5-4800) — 48B
  - 0.357ns @ CL = 46 (DDR5-5600) — 56B

Table 1: Addressing

Parameter	32GB
Row address [1]	64K (R0-R15)
Column address [1]	1K (C0-C9)
Device bank group address [1]	8 (BG0-BG2)
Device bank address per bank group [1]	4 (BA0-BA1)
Device configuration	16Gb (2Gb x 8), 32 banks
Module rank address	2 (CS0_n, CS1_n)

Notes: 1. These parameters represent the logical address state of the CA bus for different commands. Refer to the command truth table in the component data sheet.

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

Base device: MT60B2G8,[1] 16Gb DDR5 SDRAM Die Revision A

Part Number	Module Density	Configuration	Module Bandwidth	Memory Clock/ Data Rate	Clock Cycles ($CL\text{-}_nRCD\text{-}_nRP$)
MTC16C2085S1UC48BA1	32GB	4Gb x 64	38.4 GB/s	0.416ns/4800 MT/s	40-39-39
MTC16C2085S1UC56BA1	32GB	4Gb x 64	44.8 GB/s	0.357ns/5600 MT/s	46-45-45

Notes: 1. The data sheet for the base device can be found on micron.com.

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 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
U3	0	3A	156	U4	0	11A	166
	1	2A	154		1	8A	20
	2	1A	11		2	10A	164
	3	0A	9		3	9A	22
	4	7A	162		4	15A	173
	5	4A	16		5	12A	26
	6	5A	18		6	13A	28
	7	6A	160		7	14A	171
U5	0	23A	183	U6	0	29A	49
	1	20A	37		1	28A	47
	2	22A	181		2	31A	194
	3	21A	39		3	30A	192
	4	19A	177		4	27A	187
	5	16A	30		5	24A	41
	6	18A	175		6	25A	43
	7	17A	32		7	26A	185
U7	0	3B	248	U8	0	10B	256
	1	0B	101		1	8B	112
	2	2B	246		2	11B	258
	3	1B	103		3	9B	114
	4	7B	254		4	15B	265
	5	4B	108		5	12B	118
	6	5B	110		6	13B	120
	7	6B	252		7	14B	263
U9	0	18B	267	U10	0	29B	141
	1	17B	124		1	28B	139
	2	19B	269		2	31B	286
	3	16B	122		3	30B	284
	4	23B	275		4	27B	279
	5	20B	129		5	24B	133
	6	21B	131		6	26B	277
	7	22B	273		7	25B	135

Table 3: Component-to-Module DQ Map (Continued)

Component Reference Number	Component DQ	Module DQ	Module Pin Number	Component Reference Number	Component DQ	Module DQ	Module Pin Number
U11	0	28B	139	U12	0	17B	124
	1	29B	141		1	18B	267
	2	30B	284		2	16B	122
	3	31B	286		3	19B	269
	4	24B	133		4	20B	129
	5	27B	279		5	23B	275
	6	25B	135		6	22B	273
	7	26B	277		7	21B	131
U13	0	8B	112	U14	0	0B	101
	1	10B	256		1	3B	248
	2	9B	114		2	1B	103
	3	11B	258		3	2B	246
	4	12B	118		4	4B	108
	5	15B	265		5	7B	254
	6	14B	263		6	6B	252
	7	13B	120		7	5B	110
U15	0	28A	47	U16	0	20A	37
	1	29A	49		1	23A	183
	2	30A	192		2	21A	39
	3	31A	194		3	22A	181
	4	24A	41		4	16A	30
	5	27A	187		5	19A	177
	6	26A	185		6	17A	32
	7	25A	43		7	18A	175
U17	0	8A	20	U18	0	2A	154
	1	11A	166		1	3A	156
	2	9A	22		2	0A	9
	3	10A	164		3	1A	11
	4	12A	26		4	4A	16
	5	15A	173		5	7A	162
	6	14A	171		6	6A	160
	7	13A	28		7	5A	18

I_{DD} Specifications

Table 4: DDR5 I_{DD} Specifications and Conditions – 32GB (Die Revision A)

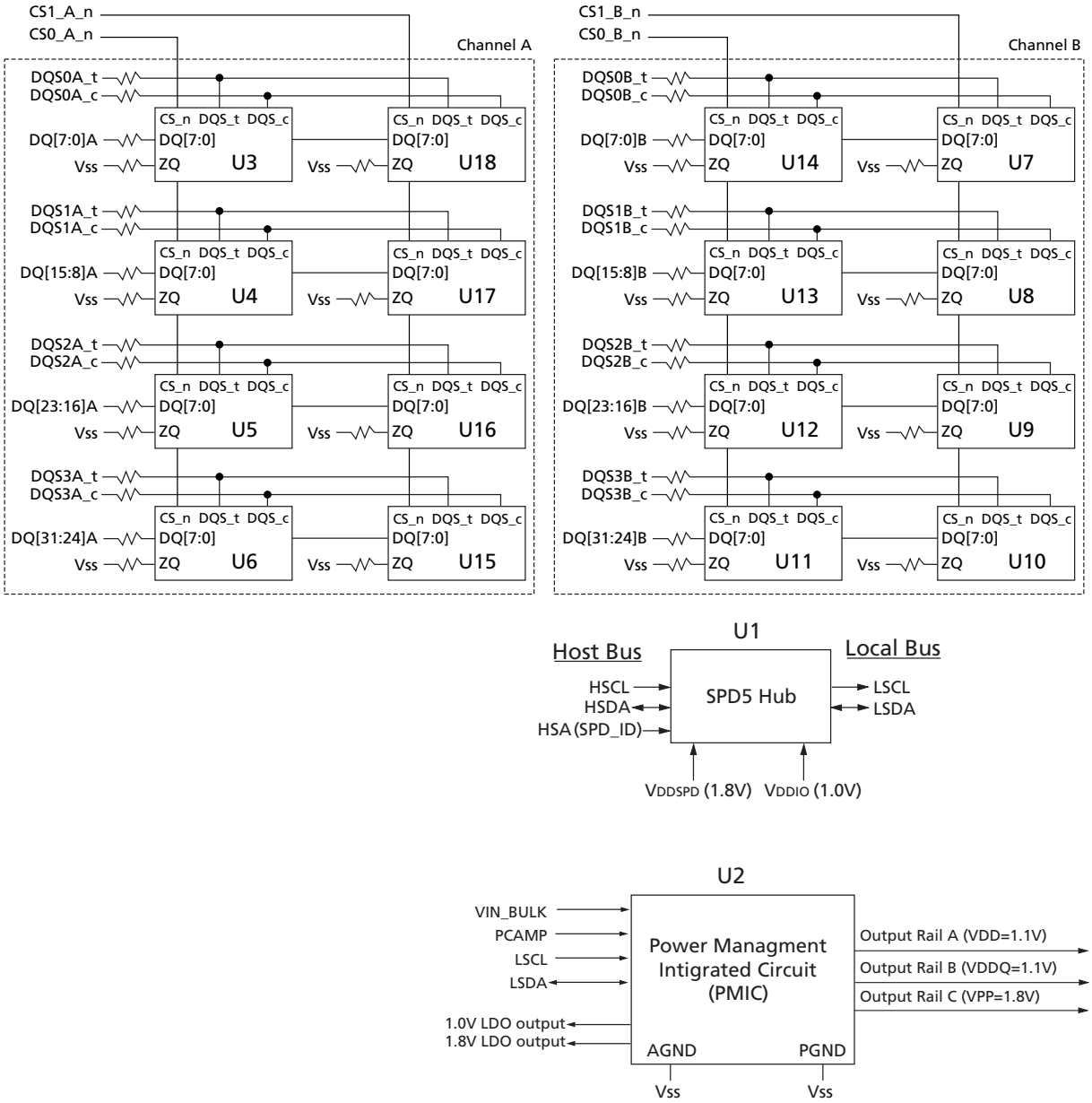
Module I_{DD} is based on PMIC VIN_BULK 5V input current and typical operating range of temperature. Each I_{DD} parameter includes PMIC efficiency and all DRAM current on all supplies (V_{DD}, V_{DDQ}, and V_{PP}).

Parameter	Symbol	4800	5600	Units
Operating one bank ACTIVATE-PRECHARGE current	I_{DD0}[1]	247	TBD	mA
Operating four bank ACTIVATE-PRECHARGE current	I_{DD0F}[1]	328	TBD	mA
Precharge standby current	I_{DD2N}[2]	219	TBD	mA
Precharge standby non-target command	I_{DD2NT}[1]	370	TBD	mA
Precharge power-down current	I_{DD2P}[2]	187	TBD	mA
Active standby current	I_{DD3N}[2]	249	TBD	mA
Active power-down current	I_{DD3P}[2]	221	TBD	mA
Operating burst read current	I_{DD4R}[1]	757	TBD	mA
Operating burst write current	I_{DD4W}[1]	993	TBD	mA
Operating burst write with write CRC current	I_{DD4WC}[1]	907	TBD	mA
Burst refresh (normal refresh mode) current	I_{DD5B}[1]	550	TBD	mA
Burst refresh (fine granularity refresh mode) current	I_{DD5F}[1]	373	TBD	mA
Burst refresh (same bank refresh mode) current	I_{DD5C}[1]	290	TBD	mA
Self refresh current	I_{DD6N}[2]	119	TBD	mA
Operating bank interleave read current	I_{DD7}[1]	825	TBD	mA
Maximum power saving deep power down mode current	I_{DD8}[2]	86	TBD	mA

Notes: 1. One module rank in this $I_{DD}/I_{DDQ}/I_{PP}$ condition, the other rank in $I_{DD2N}/I_{DDQ2N}/I_{PP2N}$.
2. Both ranks in this $I_{DD}/I_{DDQ}/I_{PP}$ condition.

Functional Block Diagram

Figure 2: Functional Block Diagram



Notes: 1. The ZQ ball on each DDR5 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.
2. Functional block diagram is for reference only.

Revision History

Rev. F – 10/2021

- Add 5600 speed, IDDs are TBD
- Remove Micron Confidential marking

Rev. E – 08/2021

- Production Release

Rev. D – 02/2021

- Preliminary Release

Rev. C – 01/2021

- Preliminary Release

Rev. B – 06/2020

- Preliminary Release

Rev. A – 06/2020

- Preliminary Release

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