

CUSTOMER: 研揚科技(AAEON Technology INC.)

APPROVAL SHEET

ISSUE DATE : 24/Aug/2015
Memphis Partn no. : D3S0512M646GLI-A58IA
DESCRIPTION : D3L-1600 4GB SODIMM 1.35V I-Temp
1Rank(x8)

CUSTOMER APPROVAL:

MEMPHIS ELECTRONIC AG

Authorized by : Alex Lee

D3S0512M646GLI-A58IA

4GB DDR3 Unbuffered SO-DIMM
RoHS Compliant Product

Revision History

Version: 1.0

1.0 Initial release

We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to: sales@memphis.ag

Overview

This chapter gives an overview of the 4GB DDR3 Unbuffered SO-DIMM and describes its main characteristics.

Features

- 204-Pin Unbuffered Small Outline Dual-In-Line Memory Module
- Capacity: 4GB
- Maximum Data Transfer Rate: 12.80 GB/Sec
- JEDEC-Standard
- Power Supply: VDD, VDDQ = 1.35V (1.283V-1.45V)
- Backward compatible to VDD, VDDQ = 1.5V (1.425V-1.575V)
- Bi-directional Differential Data-Strobe
- 64 Bit Data Bus Width without ECC
- Programmable CAS Latency (CL): 5, 6, 7, 8, 9, 10, 11 (Clock)
- Programmable Additive Latency (Posted / CAS): 0, CL-2 or CL-1 (Clock)
- Programmable CAS Write Latency (CWL): 5, 6, 7, 8
- On-Die Termination (ODT)
- ZQ calibration supported
- Burst Type (Sequential & Interleave)
- Burst Length: 4, 8
- Refresh Mode: Auto and Self
- 8192 Refresh Cycles / 64ms
- Asynchronous Reset
- Serial Presence Detect (SPD) with EEPROM
- SSTL_135 Interface (compatible to SSTL_15)
- Gold Edge Contacts
- 100% RoHS-Compliant
- Standard Module Height: 30.00mm (1.18 inch)

Table 1 - Ordering Information for RoHS Compliant Product

Product Part Number	Max. Speed	Memory Clock	Clock Cycles (CL-tRCD-tRP)	Temperature Range (Tcase*)	Module Type
D3S0512M646GLI-A58IA	PC3-12800	800MHz	11-11-11	-40 to 95°C	4GB DDR3 Unbuffered SO-DIMM
D3S0512M643GLI-A58IA	PC3-10600	667MHz	9-9-9	-40 to 95°C	4GB DDR3 Unbuffered SO-DIMM

Remark: Tcase is the case surface temperature on the center/top side of the DRAM. The refresh rate is required to double when 85°C < Tcase ≤ 95°C.

Table 2 - Performance Range

Speed	Max Frequency
PC3-12800	800MHz (1.25ns@CL=11)
PC3-10600	667MHz (1.5ns@CL=9)
PC3-8500	533MHz (1.875ns@CL=7)

Table 3 - Memory Chip Information

Brand	Part No	Type	Chip packaging
I'M	IM4G08D3FABG-125I	512Mx8	Lead Free

Table 4 - Addressing

Parameter	4GB
Refresh count	8K
Row address	64K A[15:0]
Device bank address	8 BA[2:0]
Device configuration	4Gb (512MX8)
Column address	1K A[9:0]
Module rank address	1 / S[0]
Number of devices	8

Pin Assignment

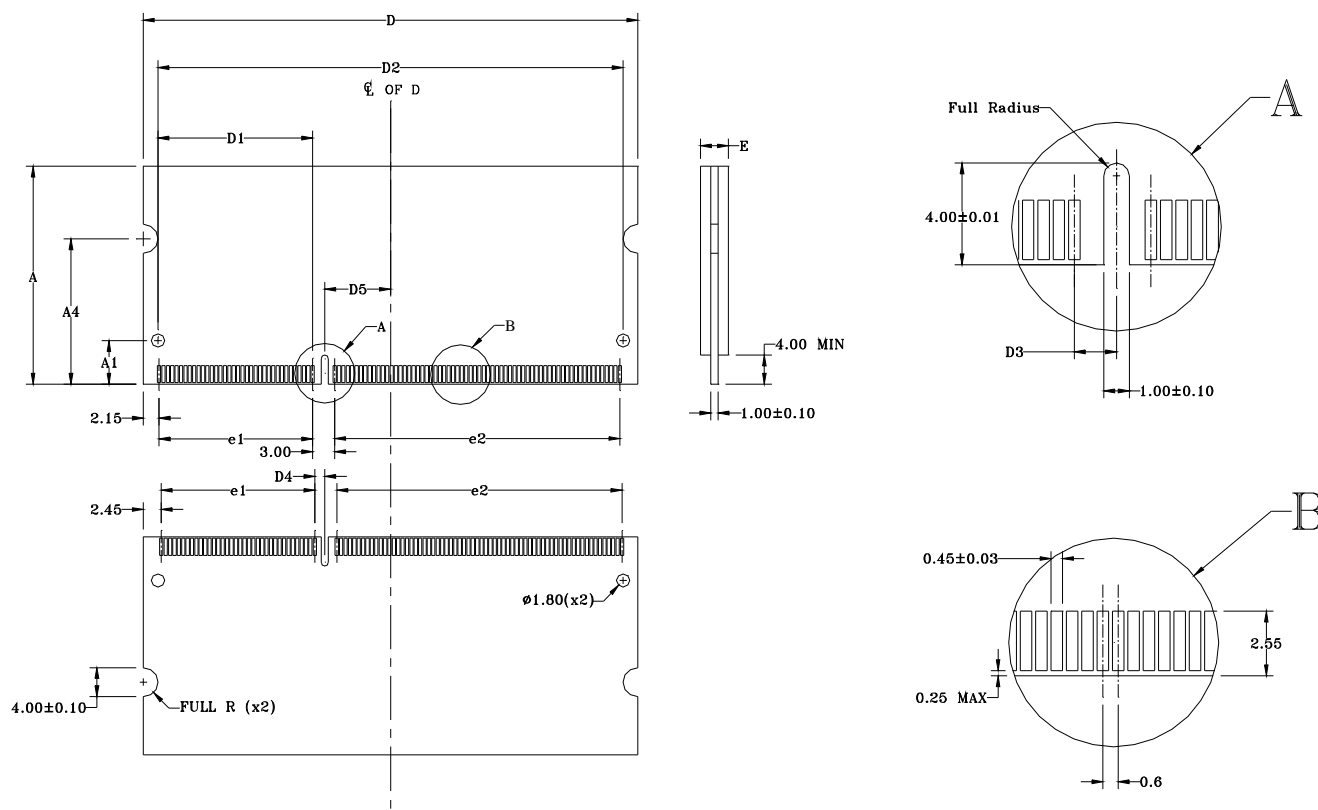
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	VREFDQ	2	VSS	103	/CK0	104	NC
3	VSS	4	D4	105	VDD	106	VDD
5	D0	6	D5	107	A10, AP	108	BA1
7	D1	8	VSS	109	BA0	110	/RAS
9	VSS	10	/DQS0	111	VDD	112	VDD
11	DM0	12	DQS0	113	/WE	114	/S0
13	VSS	14	VSS	115	/CAS	116	ODT0
15	D2	16	D6	117	VDD	118	VDD
17	D3	18	D7	119	A13	120	NC
19	VSS	20	VSS	121	NC	122	NC
21	D8	22	D12	123	VDD	124	VDD
23	D9	24	D13	125	NC	126	VREFCA
25	VSS	26	VSS	127	VSS	128	VSS
27	/DQS1	28	DM1	129	D32	130	D36
29	DQS1	30	/RESET	131	D33	132	D37
31	VSS	32	VSS	133	VSS	134	VSS
33	D10	34	D14	135	/DQS4	136	DM4
35	D11	36	D15	137	DQS4	138	VSS
37	VSS	38	VSS	139	VSS	140	D38
39	D16	40	D20	141	D34	142	D39
41	D17	42	D21	143	D35	144	VSS
43	VSS	44	VSS	145	VSS	146	D44
45	/DQS2	46	DM2	147	D40	148	D45
47	DQS2	48	VSS	149	D41	150	VSS
49	VSS	50	D22	151	VSS	152	/DQS5
51	D18	52	D23	153	DM5	154	DQS5
53	D19	54	VSS	155	VSS	156	VSS
55	VSS	56	D28	157	D42	158	D46
57	D24	58	D29	159	D43	160	D47
59	D25	60	VSS	161	VSS	162	VSS
61	VSS	62	/DQS3	163	D48	164	D52
63	DM3	64	DQS3	165	D49	166	D53
65	VSS	66	VSS	167	VSS	168	VSS
67	D26	68	D30	169	/DQS6	170	DM6
69	D27	70	D31	171	DQS6	172	VSS
71	VSS	72	VSS	173	VSS	174	D54
73	CKE0	74	NC	175	D50	176	D55
75	VDD	76	VDD	177	D51	178	VSS
77	NC	78	A15	179	VSS	180	D60

Pin	Name	Pin	Name	Pin	Name	Pin	Name
79	BA2	80	A14	181	D56	182	D61
81	VDD	82	VDD	183	D57	184	VSS
83	A12, /BC	84	A11	185	VSS	186	/DQS7
85	A9	86	A7	187	DM7	188	DQS7
87	VDD	88	VDD	189	VSS	190	VSS
89	A8	90	A6	191	D58	192	D62
91	A5	92	A4	193	D59	194	D63
93	VDD	94	VDD	195	VSS	196	VSS
95	A3	96	A2	197	SA0	198	NC
97	A1	98	A0	199	VDDSPD	200	SDA
99	VDD	100	VDD	201	SA1	202	SCL
101	CK0	102	NC	203	VTT	204	VTT

Pin Description

Pin Name	Description	Pin Name	Description
VDD	SDRAM core power supply	VREFDQ	SDRAM I/O reference supply
VREFCA	SDRAM command/address reference supply	VSS	Power supply return (ground)
A0-A15	SDRAM address bus	BA0-BA2	SDRAM bank addresses
CK0	SDRAM clocks (positive line of differential pair)	/CK0	SDRAM clocks (negative line of differential pair)
/RAS	SDRAM row address strobe	/CAS	SDRAM column address strobe
/WE	SDRAM write enable	CKE0	SDRAM clock enable lines
/S0	DIMM Rank Select Lines	ODT0	On-die termination control lines
DQS0-DQS7	SDRAM data strobes (positive line of differential pair)	/DQS0 - /DQS7	SDRAM data strobes (negative line of differential pair)
D0-D63	DIMM memory data bus	DM0-DM7	SDRAM data mask/high data strobes
SCL	EEPROM clock	SDA	EEPROM data line
SA0-SA1	EEPROM address input	VDDSPD	EEPROM positive power supply
/RESET	Reset Pin	VTT	Termination Voltage
NC	Spare Pins (no connect)	-	-

Figure 1 –Module Dimension 204 Pin DDR3 SDRAM Unbuffered SO-DIMM



Symbol	MIN	NOM	MAX
A	29.85	30.00	30.15
A1	6.00 BSC		
A4	20.00 BSC		
D	67.45	67.60	67.75
D1	21.15 BSC		
D2	63.60 BSC		
D3	1.65 BSC		
D4	1.35 BSC		
D5	9.00 BSC		
e1	21.00 BSC		
e2	39.00 BSC		
E			3.80

- Notes: 1. All dimensioning and tolerancing conform to ASME Y14.5M-1994.
2. Tolerances on all dimensions ± 0.15 unless otherwise specified.
3. All dimensions are in millimeters.

RoHS Compliance Declaration

We, Memphis Electronics AG, hereby certify that our product indicated below is compliant with the European Union (EU) Directive 2011/65/EU, Restriction of Hazardous Substances (RoHS), issued 8 June 2011 with respect to the following six substances:

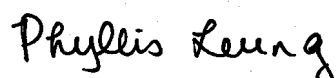
RoHS Restricted Substance	Maximum Concentration Value
Lead and its compounds	1000 ppm (0.1%)
Mercury and its compounds	1000 ppm (0.1%)
Cadmium and its compounds	100 ppm (0.01%)
Hexavalent chromium and its compounds	1000 ppm (0.1%)
Polybrominated biphenyls (PBB)	1000 ppm (0.1%)
Polybrominated diphenyl ethers (PBDE)	1000 ppm (0.1%)

Part Number:

D3SO512M646GLI-A58IA

Although the RoHS conformity of the materials consigned by customers is subject to the customer's confirmation, all the information provided in this RoHS Compliance Declaration is accurate, to the best of our knowledge, as of the date this declaration was issued.

If you have other questions on specific products or other PFT product compliance efforts, please contact your sales and marketing representative.



Phyllis Leung
Manufacturing Manager
Memphis Electronics AG
Date: 24 Aug 2015

Memphis Electronic AG

REACH* Notification

December 2014

Most of our products, inclusive their accessories kits, components and packaging, we are placing in the market are "products" in the meaning of the REACH Ordinance.

In accordance with Article 3 every item is a product, which will get a specific form, surface or shape while the manufacturing and which will be defined to a greater extent in his function than his chemical composition.

Under the scope of Article 59 of the REACH Ordinance the "list of candidates" of very high concern substances (SVHC**) has last been published on the **17th of December, 2014**, by the European Chemicals Agency (ECHA) with currently **161 substances** at

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp.

This notification is to hereby confirm that all our electronic products do not contain the substances listed in the scope of REACH regulations in concentrations higher than 0.1 % weight by weight (w/w) in accordance with Article 33, passage 2 of the REACH Ordinance***.

In addition, Memphis Electronic undertakes regular reviews and checks within the supply chain to ensure the necessary quality controls are in place. If necessary, we will notify our customers of any changes that may affect the safe usage of our products.

* REACH - Registration, Evaluation, Authorisation of Chemicals

** Substances of very high concern.

*** Ordinance (EG) No. 1907/2006 of the European Parliament and the council at December 18, 2006 for registration, assessment, approval and restriction of chemical substances (**REACH ordinance**)
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:136:0003:0280:EN:PDF>

Declaration:2013/02/01

Statement concerning the use of „conflict materials “regarding article 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank-Act)

As a global partner of the electronics industry, **Memphis Electronic** is concerned with the minerals covered in Section 1502 of the Dodd-Frank Act (Tungsten, Tantalum, Tin and Gold) that are extracted from military conflict regions of the Democratic Republic of Congo (DRC) and other adjoining countries recognized worldwide for human rights violations and environmental degradation. As a privately held company that does not report to the Securities and Exchange Commission of the United States of America, **Memphis Electronic** is not directly subject to the rules and regulations of the Dodd-Frank Wall Street Reform and Consumer Protection Act section 1502 on Conflict Minerals.

Memphis Electronic recognizes its social responsibility concerning environmental and occupational safety, health, and human rights and understands that its business behavior has an influence on the society and the environment. In order to guarantee a peaceful, fair, and sustained use of our worldwide resources **Memphis Electronic** assures the following:

- All **Memphis Electronic** products do not contain, either directly or indirectly, conflict minerals from mines that are financed or supported by armed groups in the Democratic Republic of the Congo or its neighboring countries.
- **Memphis Electronic** advocates for transparency of the supply chain and traceability of such ‘conflict minerals’ in the supply chain by our support of the Due Diligence Guidelines as recommended by the OCDE.
- **Memphis Electronic** will not purchase or use conflict minerals or their derivatives that may directly or indirectly finance or benefit armed groups through mining or mineral trading in the Democratic Republic of Congo (DRC) or an adjoining country.

This policy has been integrated into requirements for suppliers of **Memphis Electronic** and will be implemented by management as a governing policy. If you have questions or require further information regarding **Memphis Electronic** or its policies with regard to the Dodd-Frank Wall Street Reform and consumer protection act, please contact your local **Memphis Electronic** Representative.

Update 10/2013_02