

Approval Sheet

Customer	
Product Number	M4US-AGM1WI0J-B
Module speed	PC4-2400
Pin	288 pin
CI-tRCD-tRP	17-17-17
Operating Temp	-40°C~85°C
Date	22nd September 2017

**The Total Solution For
Industrial Flash Storage**

Rev 1.0

1. Features

Key Parameter

Industry Nomenclature	Speed Grade	Data Rate MT/s			tRCD (ns)	tRP (ns)	tRC (ns)
		CL=13	CL=15	CL=17			
PC4-2400	S	1866	2133	2400	14.16	14.16	46.16

- JEDEC Standard 288-pin Dual In-Line Memory Module
- Intend for PC4-2400 applications
- Inputs and Outputs are SSTL-12 compatible
- VDD=VDDQ= 1.2 Volt (1.14V~1.26V)
- VPP=2.5 Volt (2.375V~2.75V)
- VDDSPD=2.2-3.6V
- Low-Power auto self-refresh (LPASR)
- SDRAMs have 16 internal banks for concurrent operation (4 Bank Group of 4 banks each)
- Normal and Dynamic On-Die Termination for data, strobe and mask signals.
- Data bus inversion (DBI) for data bus
- Gold Plating Thickness 30μ”
- Fixed burst chop (BC) of 4 and burst length (BL) of 8 via the MRS
- Selectable BC4 or BL8 on-the fly (OTF)
- Golden Connector
- Fly-By topology
- Terminated control, command and address bus
- Programmable /CAS Latency: 10,11,12,13,14,15,16,17,18, 19 ,20 ,21
- Operation temperature – (-40°C ~85°C)
- On-die VREFDQ generation and Calibration
- On-Board EEPROM
- RoHS and Halogen free (*Section 13*)

2. Environmental Requirements

DDR4 UDIMMs are intended for use in standard office environments that have limited capacity for heating and air conditioning.

Symbol	Parameter	Rating	Units	Notes
TOPR	Operating Temperature (ambient)	-40 to +85	°C	3
HOPR	Operating Humidity (relative)	10 to 90	%	
TSTG	Storage Temperature	-50 to +100	°C	1
HSTG	Storage Humidity (without condensation)	5 to 95	%	1
PBAR	Barometric Pressure (operating & storage)	105 to 69	K Pascal	1,2

1. Stresses greater than those listed may cause permanent damage to the device. This is a stress rating only, and device functional operation at or above the conditions indicated is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
 2. Up to 9850 ft.
 3. The component maximum case temperature (TCASE) shall not exceed the value specified in the DDR4 DRAM component specification. JESD79-4
 Follow JEDEC spec.

3. SDRAM Parameters by device density

RTT_Nom Setting	Parameter	8Gb	Units	
tREFI	Average periodic refresh interval	-40°C ≤ TCASE ≤ 85°C	7.8	μs
		85°C < TCASE ≤ 95°C	3.9	μs

4. Ordering Information

DDR4 W/T VLP UDIMM						
Part Number	Density	Speed	DIMM Organization	Number of DRAM	Number of rank	ECC
M4US-AGM1WI0J-B	16GB	PC4-2400	2Gx64	16	2	N

5. Pin Configurations (Front side/Back side)

DDR4 1Gx8 base UDIMM

Pin	Front	Pin	Back	Pin	Front	Pin	Back	Pin	Front	Pin	Back	Pin	Front	Pin	Back
1	NC	145	NC	37	VSS	181	DQ29	73	VDD	217	VDD	109	VSS	253	DQ41
2	VSS	146	VREFCA	38	DQ24	182	VSS	74	CK0_t	218	CK1_t	110	DM5_n/ DBI5_n,NC	254	VSS
3	DQ4	147	VSS	39	VSS	183	DQ25	75	CK0_c	219	CK1_c	111	NC	255	DQS5_c
4	VSS	148	DQ5	40	DM3_n/ DBI3_n,NC	184	VSS	76	VDD	220	VDD	112	VSS	256	DQS5_t
5	DQ0	149	VSS	41	NC	185	DQS3_c	77	VTT	221	VTT	113	DQ46	257	VSS
6	VSS	150	DQ1	42	VSS	186	DQS3_t	78	EVENT_n,NF	222	PARITY	114	VSS	258	DQ47
7	DM0_n_ DBI0_n	151	VSS	43	DQ30	187	VSS	79	A0	223	VDD	115	DQ42	259	VSS
8	NC	152	DQS0_c	44	VSS	188	DQ31	80	VDD	224	BA1	116	VSS	260	DQ43
9	VSS	153	DQS0_t	45	DQ26	189	VSS	81	BA0	225	A10/AP	117	DQ52	261	VSS
10	DQ6	154	VSS	46	VSS	190	DQ27	82	RAS_n /A16	226	VDD	118	VSS	262	DQ53
11	VSS	155	DQ7	47	CB4/NC	191	VSS	83	VDD	227	NC	119	DQ48	263	VSS
12	DQ2	156	VSS	48	VSS	192	CB5,NC	84	CS0_n	228	WE_n/ A14	120	VSS	264	DQ49
13	VSS	157	DQ3	49	CB0/NC	193	VSS	85	VDD	229	VDD	121	DM6_n/ DBI6_n	265	VSS
14	DQ12	158	VSS	50	VSS	194	CB1,NC	86	CAS_n/ A15	230	NC	122	NC	266	DQS6_c
15	VSS	159	DQ13	51	DM8_n/ DBI8_n,NC	195	VSS	87	ODT0	231	VDD	123	VSS	267	DQS6_t
16	DQ8	160	VSS	52	NC	196	DQS8_c	88	VDD	232	A13	124	DQ54	268	VSS
17	VSS	161	DQ9	53	VSS	197	DQS8_t	89	CS1_n	233	VDD	125	VSS	269	DQ55
18	DML_n/ DBI1_n,NC	162	VSS	54	CB6 DBI6_n,NC	198	VSS	90	VDD	234	NC	126	DQ50	270	VSS
19	NC	163	DQS1_c	55	VSS	199	CB7,NC	91	ODT1	235	NC	127	VSS	271	DQ51
20	VSS	164	DQS1_t	56	CB2/NC	200	VSS	92	VDD	236	VDD	128	DQ60	272	VSS
21	DQ14	165	VSS	57	VSS	201	CB3,NC	93	NC	237	NC	129	VSS	273	DQ61
22	VSS	166	DQ15	58	RESET_n	202	VSS	94	VSS	238	SA2	130	DQ56	274	VSS
23	DQ10	167	VSS	59	VDD	203	CKE1	95	DQ36	239	VSS	131	VSS	275	DQ57
24	VSS	168	DQ11	60	CKE0	204	VDD	96	VSS	240	DQ37	132	DM7_n/ DBI7_n,NC	276	VSS
25	DQ20	169	VSS	61	VDD	205	NC	97	DQ32	241	VSS	133	NC	277	DQS7_c
26	VSS	170	DQ21	62	ACT_n	206	VDD	98	VSS	242	DQ33	134	VSS	278	DQS7_t
27	DQ16	171	VSS	63	BG0	207	BG1	99	DM4_n/ DBI4_n,NC	243	VSS	135	DQ62	279	VSS
28	VSS	172	DQ17	64	VDD	208	ALERT_n	100	NC	244	DQS4_c	136	VSS	280	DQ63
29	DM2_n/ DBI2_n,NC	173	VSS	65	A12/BC_n	209	VDD	101	VSS	245	DQS4_t	137	DQ58	281	VSS
30	NC	174	DQS2_c	66	A9	210	A11	102	DQ38	246	VSS	138	VSS	282	DQ59
31	VSS	175	DQS2_t	67	VDD	211	A7	103	VSS	247	DQ39	139	SA0	283	VSS
32	DQ22	176	VSS	68	A8	212	VDD	104	DQ34	248	VSS	140	SA1	284	VSSSPD
33	VSS	177	DQ23	69	A6	213	A5	105	VSS	249	DQ35	141	SCL	285	SDA
34	DQ18	178	VSS	70	VDD	214	A4	106	DQ44	250	VSS	142	VPP	286	VPP
35	VSS	179	DQ19	71	A3	215	VDD	107	VSS	251	DQ45	143	VPP	287	VPP
36	DQ28	180	VSS	72	A1	216	A2	108	DQ40	252	VSS	144	NC	288	VPP

Note:
1. NC = No Connect, RFU = Reserved for Future Use
2. Address A17 is only valid for 16 Gb x4 based SDRAMs.
3. RAS_n is a multiplexed function with A16.
4. CAS_n is a multiplexed function with A15.
5. WE_n is a multiplexed function with A14.

6. Architecture

Pin Definition

Pin Name	Description	Pin Name	Description
A0–A17 ¹	SDRAM address bus	SCL	I ² C serial bus clock for SPD/TSE
BA0, BA1	SDRAM bank select	SDA	I ² C serial bus data line for SPD/TSE
BG0, BG1	SDRAM bank group select	SA0–SA2	I ² C slave address select for SPD/TSE
RAS_n ²	SDRAM row address strobe	PARITY	SDRAM parity input
CAS_n ³	SDRAM column address strobe	VDD	SDRAM I/O & core power supply
WE_n ⁴	SDRAM write enable	C0, C1,C2	Chip ID lines
CS0_n, CS1_n	DIMM Rank Select Lines	12 V	Optional power Supply on socket but not used on UDIMM
CKE0, CKE1	SDRAM clock enable lines	VREFCA	SDRAM command/address reference supply
ODT0, ODT1	SDRAM on-die termination control lines	VSS	Power supply return (ground)
ACT_n	SDRAM activate	VDDSPD	Serial SPD-TSE positive power supply
DQ0–DQ63	DIMM memory data bus	ALERT_n	SDRAM ALERT_n
CB0–CB7	DIMM ECC check bits (for x72 module)	VPP	SDRAM Supply
TDQS0_t-TDQS8_t TDQS0_c-TDQS8_c	Dummy loads for mixed populations of x4 based and x8 based RDIMMs. Not used on UDIMMs.		
DQS0_t–DQS8_t	SDRAM data strobes (positive line of differential pair)		
DQS0_c–DQS8_c	SDRAM data strobes (negative line of differential pair)	RESET_n	Set DRAMs to a Known State
DM0_n–DM8_n, DBI0_n–DBI8_n	SDRAM data masks/data bus inversion (x8-based x72 DIMMs)	EVENT_n	SPD signals a thermal event has occurred.
CK0_t, CK1_t	SDRAM clocks (positive line of differential pair)	VTT	SDRAM I/O termination supply
CK0_c, CK1_c	SDRAM clocks (negative line of differential pair)	RFU	Reserved for future use
<p>Note 1 Address A17 is not valid for x8 and x16 based SDRAMs. For UDIMMs this connection pin is NC.</p> <p>Note 2 RAS_n is a multiplexed function with A16.</p> <p>Note 3 CAS_n is a multiplexed function with A15.</p> <p>Note 4 WE_n is a multiplexed function with A14.</p>			

8. SDRAM Absolute Maximum Ratings

Symbol	Parameter	Rating	Units	Note	
T _{OPER}	Operation Temperature	Normal Operating Temp.	-40 to 85	°C	1,2
		Extended Temp.(optional)	85 to 95	°C	1,3
T _{STG}	Storage Temperature	-55 to 150	°C	4,5	
V _{IN} , V _{OUT}	Voltage on any pins relative to V _{ss}	-0.4 to +1.5	V	4	
V _{DD}	Voltage on VDD supply relative to V _{ss}	-0.4 to +1.5	V	4,6	
V _{DDQ}	Voltage on VDDQ supply relative to V _{ss}	-0.4 to +1.5	V	4,6	

Note:

- Operating Temperature T_{OPER} is the case surface temperature on the center / top side of the DRAM.
For measurement conditions, please refer to the JEDEC document JESD51-2.
- The Normal Temperature Range specifies the temperatures where all DRAM specifications will be supported. During operation, the DRAM case temperature must be maintained between 0 to 85 °C under all operating conditions.
- Some applications require operation of the DRAM in the Extended Temperature Range between 85 °C and 95 °C case temperature. Full specifications are supported in this range, but the following additional conditions apply:
 - Refresh commands must be doubled in frequency, therefore reducing the Refresh interval tREFI to 3.9 μs. It is also possible to specify a component with 1X refresh (tREFI to 7.8μs) in the Extended Temperature Range. Please refer to supplier data sheet and/or the DIMM SPD for option availability.
 - If Self-Refresh operation is required in the Extended Temperature Range, then it is mandatory to either use the Manual Self-Refresh mode with Extended Temperature Range capability (MR2 A6 =0b and MR2 A7 = 1b) or enable the optional Auto Self-Refresh mode (MR2 A6 = 1b and MR2 A7 =0b). Please refer to the supplier data sheet and/or the DIMM SPD for Auto Self-Refresh option availability, Extended Temperature Range support and tREFI requirements in the Extended Temperature Range.
- Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is stress rating only, and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
- Storage Temperature is the case surface temperature on the center/top side of the DRAM. For the measurement conditions, please refer to JESD51-2 standard.
- V_{DD} and V_{DDQ} must be within 300 mV of each other at all times;and VREF must be not greater than 0.6 x V_{DDQ}, When V_{DD} and V_{DDQ} are less than 500 mV; VREF may be equal to or less than 300 mV

9. Module Absolute Maximum Ratings

Symbol	Parameter	Rating	Units	Notes
V_{IN}, V_{OUT}	Voltage on I/O pins relative to Vss	-0.4 to +1.5	V	
V_{DD}	Voltage on VDD supply relative to Vss	-0.4 to +1.5	V	1
V_{DDQ}	Voltage on VDDQ supply relative to Vss	-0.4 to +1.5	V	1
V_{PP}	Voltage on VPP supply relative to Vss	-0.4 to +3.0	V	2

Note:

- VDDQ tracks with VDD; VDDQ and VDD are tied together.
- VPP must be greater than or equal to VDD at all times.

10. Operating Condition

Symbol	Parameter	Min	Nom	Max	Units	Notes
VDD	Supply Voltage	1.14	1.2	1.26	V	1
VPP	DRAM activating power supply	2.375	2.5	2.75	V	2
VREFCA(DC)	Input reference voltage command/ address bus	0.49 x VDD	0.5 x VDD	0.51 x VDD	V	3
IVTT	Termination reference voltage (DC) – command/address bus	-750	-	750	mA	
VTT	Termination Voltage	0.49 x VDD	0.5 x VDD	0.51 x VDD	V	4
II	Input leakage current; any input excluding ZQ; 0V < VIN < 1.1V	-2.0	-	2.0	μA	5
II/O	DQ leakage; 0V < Vin < VDD	-4.0	-	4.0	μA	5
Iozpd	Output leakage current; VOUT = VDD; DQ is disabled	-	-	5.0	μA	
Iozpu	Output leakage current; VOUT =VSS; DQ and ODT are disabled; ODT is disabled with ODT input HIGH	-	-	5.0	μA	
IVREFCA	VREFCA leakage; VREFCA = VDD/2 (after DRAM is initialized)	-2.0	-	2.0	μA	

Note:

- VDDQ tracks with VDD; VDDQ and VDD are tied together.
- VPP must be greater than or equal to VDD at all times.
- VREFCA must not be greater than 0.6 x VDD. When VDD is less than 500mV, VREF may be less than or equal to 300mV.
- VTT termination voltages in excess of the specification limit adversely affect the voltage margins of command and address signals and reduce timing margins.
- Multiply by the number of DRAM die on the module.
- Tied to ground. Not connected to edge connector.

11. Operating, Standby, and Refresh Currents

- 16GB UDIMM (2 Ranks 1Gx8 DDR4 SDRAMs)

Symbol	Proposed Conditions	Value		Units
		IDD Max.	IPP Max.	
IDD0	Operating One Bank Active-Precharge Current (AL=0)CKE: High; External clock: On; tCK, nRC, nRAS, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: Highbetween ACT and PRE; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling; Data IO: VDDQ; DM_n:stable at 1; Bank Activity: Cycling with one bank active at a time: 0,0,1,1,2,2,... ; Output Buffer and RTT: Enabled in Mode Registers2;ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern	768	48	mA
IDD1	Operating One Bank Active-Read-Precharge Current (AL=0)CKE: High; External clock: On; tCK, nRC, nRAS, nRCD, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: Highbetween ACT, RD and PRE; Command, Address, Bank Group Address, Bank Address Inputs, Data IO: partially toggling; DM_n: stableat 1; Bank Activity: Cycling with one bank active at a time: 0,0,1,1,2,2,... ; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern	960	48	mA
IDD2N	Precharge Standby Current (AL=0)CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: stable at 1; Command,Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: all banks closed; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern	544	48	mA

<p>IDD2NT</p>	<p>Precharge Standby ODT Current CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: stable at 1; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: VSSQ; DM_n: stable at 1; Bank Activity: all banks closed; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: toggling according ; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>800</p>	<p>48</p>	<p>mA</p>
<p>IDD2P</p>	<p>Precharge Power-Down Current CKE: Low; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL:0; CS_n: stable at 1; Command, Address, Bank Group Address, Bank Address Inputs: stable at 0; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: all banks closed; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0</p>	<p>400</p>	<p>48</p>	<p>mA</p>
<p>IDD2Q</p>	<p>Precharge Quiet Standby Current CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: stable at 1; Command, Address, Bank Group Address, Bank Address Inputs: stable at 0; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: all banks closed; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0</p>	<p>480</p>	<p>48</p>	<p>mA</p>
<p>IDD3N</p>	<p>Active Standby Current CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: stable at 1; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: all banks open; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>768</p>	<p>48</p>	<p>mA</p>

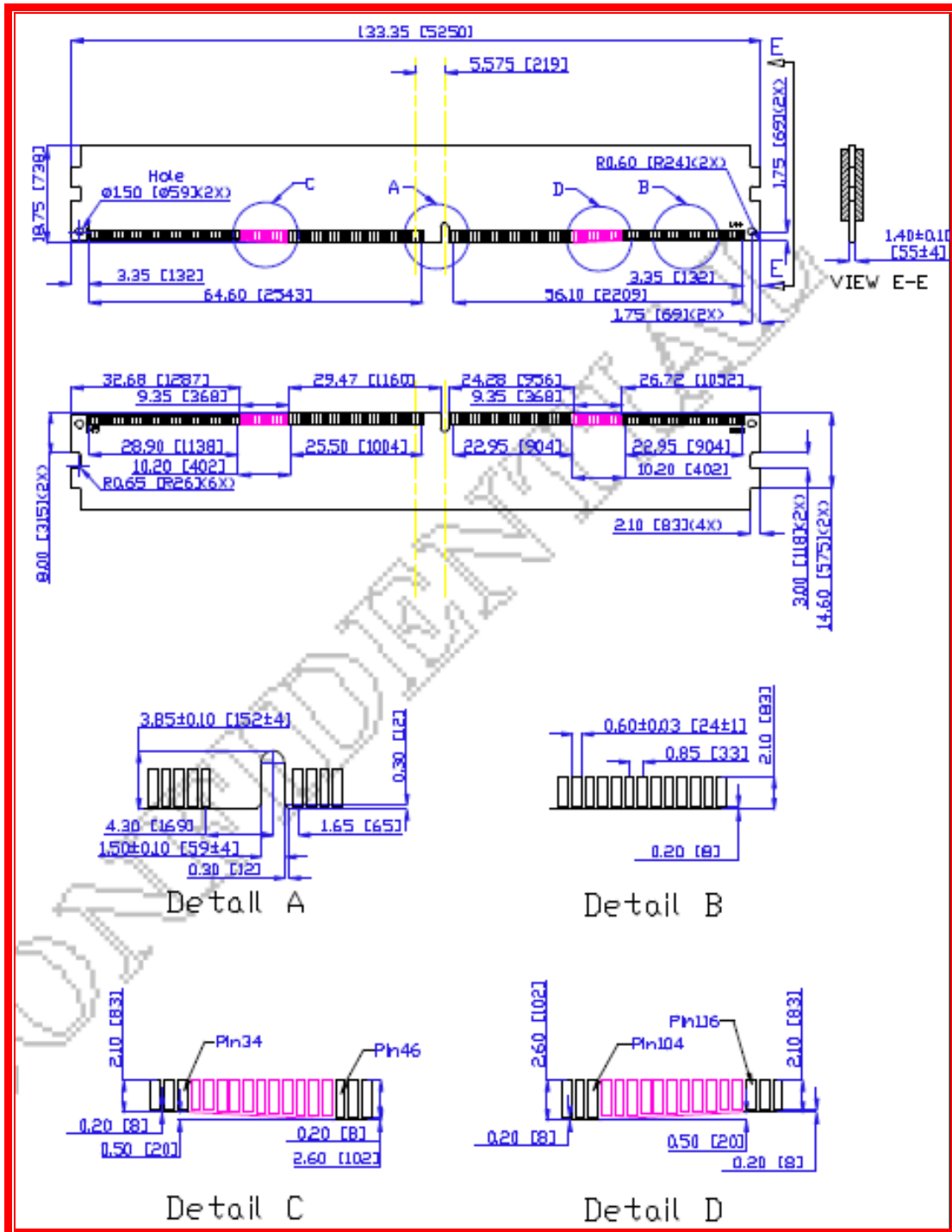
<p>IDD3P</p>	<p>Active Power-Down Current</p> <p>CKE: Low; External clock: On; tCK, CL: sRefer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: stable at 1; Command, Address, Bank Group Address, Bank Address Inputs: stable at 0; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: all banks open; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0</p>	<p>592</p>	<p>48</p>	<p>mA</p>
<p>IDD4R</p>	<p>Operating Burst Read Current</p> <p>CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 82; AL: 0; CS_n: High between RD; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: seamless read data burst with different data between one burst and the next one according ; DM_n: stable at 1; Bank Activity: all banks open, RD commands cycling through banks: 0,0,1,1,2,2,... ; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>2160</p>	<p>48</p>	<p>mA</p>
<p>IDD4W</p>	<p>Operating Burst Write Current</p> <p>CKE: High; External clock: On; tCK, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: High between WR; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: seamless write data burst with different data between one burst and the next one ; DM_n: stable at 1; Bank Activity: all banks open, WR commands cycling through banks: 0,0,1,1,2,2,... ; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at HIGH; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>2048</p>	<p>48</p>	<p>mA</p>
<p>IDD5R</p>	<p>Burst Refresh Current (1X REF)</p> <p>CKE: High; External clock: On; tCK, CL, nRFC: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n: High between REF; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; Data IO: VDDQ; DM_n: stable at 1; Bank Activity: REF command every nRFC ; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>928</p>	<p>80</p>	<p>mA</p>

<p>IDD6N</p>	<p>Self Refresh Current: Normal Temperature Range TCASE: 0 - 85°C; Low Power Array Self Refresh (LP ASR) : Normal4; CKE: Low; External clock: Off; CK_t and CK_c#: LOW; CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n#, Command, Address, Bank Group Address, Bank Address, Data IO: High; DM_n: stable at 1; Bank Activity: Self-Refresh operation; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: MIDLEVEL</p>	<p>384</p>	<p>80</p>	<p>mA</p>
<p>IDD6E</p>	<p>Self-Refresh Current: Extended Temperature Range) TCASE: 0 - 95°C; Low Power Array Self Refresh (LP ASR) : Extended4; CKE: Low; External clock: Off; CK_t and CK_c: LOW; CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n, Command, Address, Bank Group Address, Bank Address, Data IO: High; DM_n:stable at 1; Bank Activity: Extended Temperature Self-Refresh operation; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: MID-LEVEL</p>	<p>752</p>	<p>80</p>	<p>mA</p>

<p>IDD6R</p>	<p>Self-Refresh Current: Reduced Temperature Range TCASE: 0 - TBD (~35-45)°C; Low Power Array Self Refresh (LP ASR) : Reduced4; CKE: Low; External clock: Off; CK_t and CK_c#: LOW; CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n#, Command, Address, Bank Group Address, Bank Address, Data IO: High; DM_n:stable at 1; Bank Activity: Extended Temperature Self-Refresh operation; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: MID-LEVEL</p>	<p>336</p>	<p>80</p>	<p>mA</p>
<p>IDD6A</p>	<p>Auto Self-Refresh Current TCASE: 0 - 95°C; Low Power Array Self Refresh (LP ASR) : Auto4;Partial Array Self-Refresh (PASR): Full Array; CKE: Low; External clock: Off; CK_t and CK_c#: LOW; CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: 0; CS_n#, Command, Address, Bank Group Address, Bank Address, Data IO: High; DM_n:stable at 1; Bank Activity: Auto Self-Refresh operation; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: MID-LEVEL</p>	<p>137.6</p>	<p>48</p>	<p>mA</p>
<p>IDD7</p>	<p>Operating Bank Interleave Read Current CKE: High; External clock: On; tCK, nRC, nRAS, nRCD, nRRD, nFAW, CL: Refer to Component Datasheet for detail pattern; BL: 81; AL: CL-1; CS_n: High between ACT and RDA; Command, Address, Bank Group Address, Bank Address Inputs: partially toggling ; DataIO: read data bursts with different data between one burst and the next one ; DM_n: stable at 1; Bank Activity: two times interleaved cycling through banks (0, 1, ...7) with different addressing; Output Buffer and RTT: Enabled in Mode Registers2; ODT Signal: stable at 0; Pattern Details: Refer to Component Datasheet for detail pattern</p>	<p>2800</p>	<p>240</p>	<p>mA</p>
<p>IDD8</p>	<p>Maximum Power Down Current TBD</p>	<p>400</p>	<p>32</p>	<p>mA</p>

12. PACKAGE DIMENSION

- (16GB, 2 Ranks 1Gx8 DDR4 base UDIMM)



Note: All dimensions are in millimeters (mils) and should be kept within a tolerance of ± 0.15 (6), unless otherwise specified.

13. RoHS Declaration

innodisk	宜鼎國際股份有限公司 Innodisk Corporation	Page 1/1																						
Tel: (02)7703-3000 Fax: (02) 7703-3555 Internet: http://www.innodisk.com/																								
RoHS 自我宣告書 (RoHS Declaration of Conformity)																								
Manufacturer Product: All Innodisk EM Flash and Dram products																								
一、 宜鼎國際股份有限公司（以下稱本公司）特此保證售予貴公司之所有產品，皆符合歐盟 2011/65/EU 及 (EU) 2015/863 關於 RoHS 之規範要求。																								
Innodisk Corporation declares that all products sold to the company, are complied with European Union RoHS Directive (2011/65/EU) and (EU) 2015/863 requirement.																								
二、 本公司同意因本保證書或與本保證書相關事宜有所爭議時，雙方宜友好協商，達成協議。																								
Innodisk Corporation agrees that both parties shall settle any dispute arising from or in connection with this Declaration of Conformity by friendly negotiations.																								
<table border="1"> <thead> <tr> <th>Name of hazardous substance</th> <th>Limited of RoHS ppm (mg/kg)</th> </tr> </thead> <tbody> <tr><td>鉛 (Pb)</td><td>< 1000 ppm</td></tr> <tr><td>汞 (Hg)</td><td>< 1000 ppm</td></tr> <tr><td>鎘 (Cd)</td><td>< 100 ppm</td></tr> <tr><td>六價鉻 (Cr 6+)</td><td>< 1000 ppm</td></tr> <tr><td>多溴聯苯 (PBBs)</td><td>< 1000 ppm</td></tr> <tr><td>多溴二苯醚 (PBDEs)</td><td>< 1000 ppm</td></tr> <tr><td>鄰苯二甲酸二(2-乙基己基)酯 (DEHP)</td><td>< 1000 ppm</td></tr> <tr><td>鄰苯二甲酸丁酯苯甲酯 (BBP)</td><td>< 1000 ppm</td></tr> <tr><td>鄰苯二甲酸二丁酯 (DBP)</td><td>< 1000 ppm</td></tr> <tr><td>鄰苯二甲酸二異丁酯 (DIBP)</td><td>< 1000 ppm</td></tr> </tbody> </table>	Name of hazardous substance	Limited of RoHS ppm (mg/kg)	鉛 (Pb)	< 1000 ppm	汞 (Hg)	< 1000 ppm	鎘 (Cd)	< 100 ppm	六價鉻 (Cr 6+)	< 1000 ppm	多溴聯苯 (PBBs)	< 1000 ppm	多溴二苯醚 (PBDEs)	< 1000 ppm	鄰苯二甲酸二(2-乙基己基)酯 (DEHP)	< 1000 ppm	鄰苯二甲酸丁酯苯甲酯 (BBP)	< 1000 ppm	鄰苯二甲酸二丁酯 (DBP)	< 1000 ppm	鄰苯二甲酸二異丁酯 (DIBP)	< 1000 ppm		
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立 保 證 書 人 (Guarantor)																								
Company name 公司名稱： <u>Innodisk Corporation 宜鼎國際股份有限公司</u>																								
Company Representative 公司代表人： <u>Randy Chien 簡川勝</u>																								
Company Representative Title 公司代表人職稱： <u>Chairman 董事長</u>																								
Date 日期： <u>2017 / 01 / 18</u>																								
																								

Revision Log

Rev	Date	Modification
0.1	22 nd September 2017	Preliminary Edition
1.0	22 nd September 2017	Official Released