



MODULE DATA SHEET

DTM68021

MEMORY

CMOS 8Mx64 BIT Synchronous DRAM Module

DTM68021

CMOS 8,388,608 x 64 Bit Synchronous DRAM Module

GENERAL DESCRIPTION

The DTM68021 is a high performance, 64MB Synchronous, Dynamic RAM Module, organized as 8M words by 64 bit, in a 144-pin Small Outline Dual-In-Line Memory Module (SO-DIMM) Package. The DTM68021 consists of eight CMOS 4Mx16 bit Synchronous DRAMs in 400-mill TSOP-II packages. Each device is accompanied by two decoupling capacitors for improved noise immunity. A Serial EEPROM contains the module configuration information.

FEATURES

- * High Density: 64MByte
- * Cycle Time: 7.5ns (133MHz-CL3)
10ns (100MHz-CL2)
- * Refresh Cycles: 4K every 65.6 ms
- * Power Supply: 3.3V
- * Height: 31.75mm
- * All inputs and outputs are LVTTL (3.3V) compatible.
- * Complies with Intel PC-133 Standard.

ORDERING INFORMATION

Part Number	Organization	Max. Freq. (Speed)	Leads	Power
DTM68021	8Mx64	133MHz (7.5ns@CL3) 100MHz (10ns@CL2)	Au	3.3 Volts

ABSOLUTE MAXIMUM RATINGS

(see NOTE)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-1.0 to +4.6	V
Input Voltage	V_{IN}	-1.0 to +4.6	V
Output Voltage	V_{OUT}	-1.0 to +4.6	V
Short Circuit Output Current	I_{OS}	50	mA
Power Dissipation	P_D	4	W
Operating Temperature	T_{OPR}	0 to +70	°C
Storage Temperature	T_{STG}	-55 to +125	°C

RECOMMENDED DC OPERATING CONDITIONS

(Referenced to GND)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	3.0	3.3	3.6	V
Input High Voltage, all inputs	V_{IH}	2.0	3.0	$V_{CC} + 0.3$	V
Input Low Voltage	V_{IL}	-0.5	-	0.8	V
Output High Voltage	V_{OH}	2.4	-	-	V
Output Low Voltage	V_{OL}	-	-	0.4	V
Input Leakage Current (DQMB0-DQMB7)	I_{IL1}	-2	-	2	uA
Input Leakage Current (CLK0, CLK1, CKE0, CKE1, $\overline{CS0}$, $\overline{CS1}$)	I_{IL2}	-4	-	4	uA
Input Leakage Current (A0-A11, BA0, BA1, $\overline{CAS}$, $\overline{RAS}$, $\overline{WE0}$)	I_{IL3}	-8	-	8	uA
Output Leakage Current	I_{OL}	-3	-	3	uA

NOTE



MODULE DATA SHEET

DTM68021

Permanent device damage may occur if the above Absolute Maximum Ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

PIN DESCRIPTION

Name	PIN	PIN	Name	Name	PIN	PIN	Name
GND	1	2	GND	DQ17	85	86	DQ49
DQ0	3	4	DQ32	DQ18	87	88	DQ50
DQ1	5	6	DQ33	DQ19	89	90	DQ51
DQ2	7	8	DQ34	GND	91	92	GND
DQ3	9	10	DQ35	DQ20	93	94	DQ52
VCC	11	12	VCC	DQ21	95	96	DQ53
DQ4	13	14	DQ36	DQ22	97	98	DQ54
DQ5	15	16	DQ37	DQ23	99	100	DQ55
DQ6	17	18	DQ38	VCC	101	102	VCC
DQ7	19	20	DQ39	A6	103	104	A7
GND	21	22	GND	A8	105	106	BA0
DQMB0	23	24	DQMB4	GND	107	108	GND
DQMB1	25	26	DQMB5	A9	109	110	BA1
VCC	27	28	VCC	A10	111	112	A11
A0	29	30	A3	VCC	113	114	VCC
A1	31	32	A4	DQMB2	115	116	DQMB6
A2	33	34	A5	DQMB3	117	118	DQMB7
GND	35	36	GND	GND	119	120	GND
DQ8	37	38	DQ40	DQ24	121	122	DQ56
DQ9	39	40	DQ41	DQ25	123	124	DQ57
DQ10	41	42	DQ42	DQ26	125	126	DQ58
DQ11	43	44	DQ43	DQ27	127	128	DQ59
VCC	45	46	VCC	VCC	129	130	VCC
DQ12	47	48	DQ44	DQ28	131	132	DQ60
DQ13	49	50	DQ45	DQ29	133	134	DQ61
DQ14	51	52	DQ46	DQ30	135	136	DQ62
DQ15	53	54	DQ47	DQ31	137	138	DQ63
GND	55	56	GND	GND	139	140	GND
NC	57	58	NC	SDA	141	142	SCL
NC	59	60	NC	VCC	143	144	VCC
CLK0	61	62	CKE0				
VCC	63	64	VCC				
RAS	65	66	CAS				
WE0	67	68	CKE1				
CS0	69	70	A12				
CS1	71	72	A13				
NC	73	74	CLK1				
GND	75	76	GND				
NC	77	78	NC				
NC	79	80	NC				
VCC	81	82	VCC				



MODULE DATA SHEET

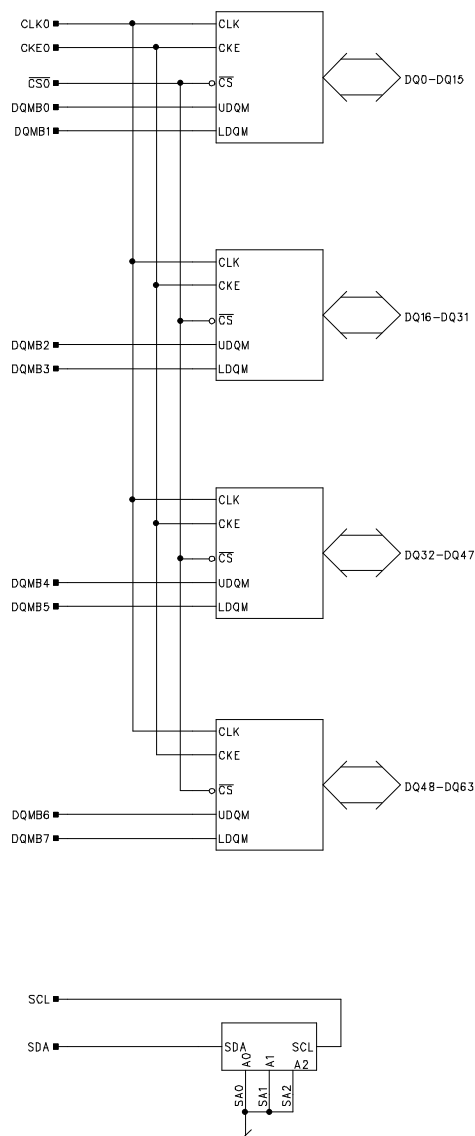
DTM68021

DQ16	83	84	DQ48
------	----	----	------

Notes

- 1. A12 and A13 are not used in this module.

FUNCTIONAL BLOCK DIAGRAM

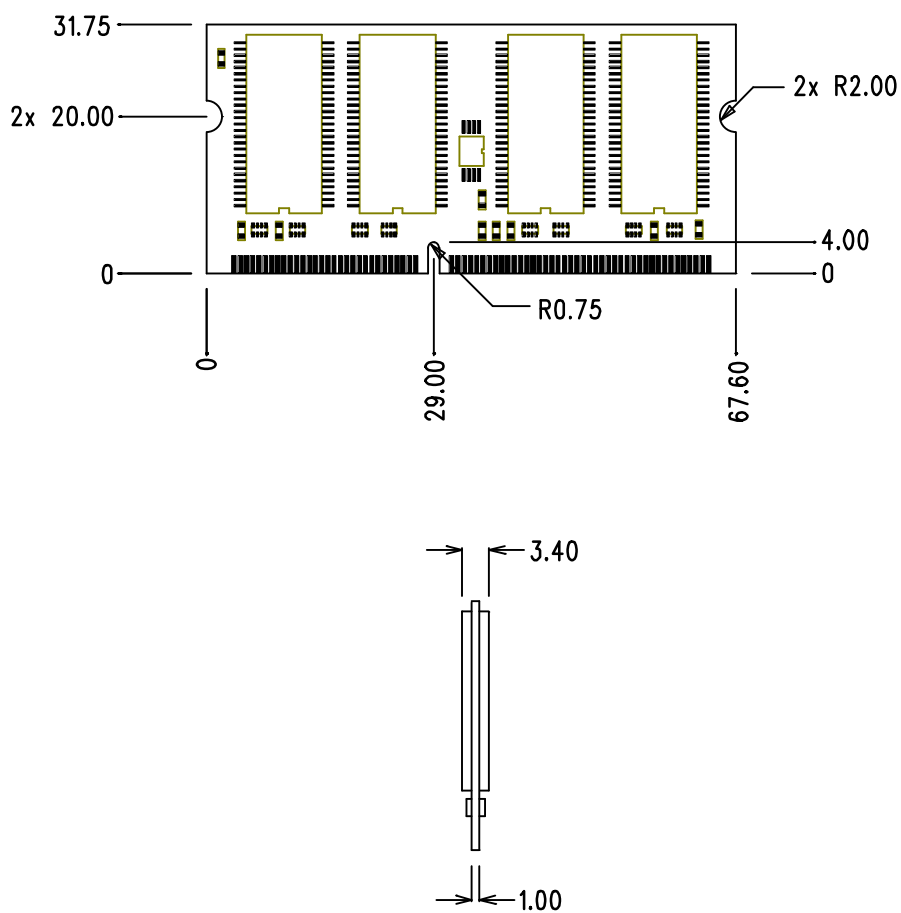


Notes

1. Only Bank 0 is shown. Bank 1 uses CLK1, CKE1 and CS1.
2. A0-A11, BA0 and BA1 are connected to all devices.
3. WE0, RAS, CAS are connected to all devices.
4. Data are terminated using 10 ohm Series Resistors.

MODULE DIMENSIONS

Note: All dimensions are in millimeters.





MODULE DATA SHEET

DTM68021

Dataram Corporation

DATARAM CORPORATION, P.O.Box 7528, Princeton, NJ 08543-7528; Voice: 609-799-0071, Fax: 609-799-6734; www.dataram.com

DATARAM International, Soenderhoej 22, 8260 Viby J / Aarhus, Denmark; Voice: +45 70 212 212, Fax: +45 70 212 211, Fax Sales: +45 70 212 216; www.dataram.dk

All rights reserved.

The information contained in this document has been carefully checked and is believed to be reliable. However, Dataram assumes no responsibility for inaccuracies.

The information contained in this document does not convey any license under the copyrights, patent rights or trademarks claimed and owned by Dataram.

Dataram reserves the right to change products or specifications without notice.

No part of this publication may be copied or reproduced in any form or by any means, or transferred to any third party without prior written consent of Dataram.