



MEMORY

CMOS 32Mx64 BIT Synchronous DRAM Module

DTM68023

CMOS 33,554,432 x 64 Bit Synchronous DRAM Module

GENERAL DESCRIPTION

The DTM68023 is a high performance, 256MB Synchronous, Dynamic RAM Module, organized as 32M words by 64 bit, in a 144-pin Small Outline Dual-In-Line Memory Module (SO-DIMM) Package.

The DTM68023 consists of eight CMOS 16Mx16 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: 256MByte
- * Cycle Time: 7.5ns (133MHz-CL3)
10ns (100MHz-CL2)
- * Refresh Cycles: 8K every 64 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
DTM68023	32Mx64	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	8	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}	-0.3	-	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}	-20	-	20	μA
Input Leakage Current (CLK0, CLK1, CKE0, CKE1, CS0, CS1)	I_{IL2}	-40	-	40	μA
Input Leakage Current (A0-A12, BA0, BA1, CAS, RAS, WE0)	I_{IL3}	-80	-	80	μA
Input/Output Leakage Current (DQ)	I_{OL}	-20	-	20	μA

NOTE

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
GND	1
DQ0	3
DQ1	5
DQ2	7
DQ3	9
VCC	11
DQ4	13
DQ5	15
DQ6	17
DQ7	19
GND	21
DQMB0	23
DQMB1	25
VCC	27
A0	29
A1	31
A2	33
GND	35
DQ8	37
DQ9	39
DQ10	41
DQ11	43
VCC	45
DQ12	47
DQ13	49
DQ14	51
DQ15	53
GND	55
NC	57
NC	59
CLK0	61
VCC	63
RAS	65
WE0	67
CS0	69
CS1	71
NC	73
GND	75
NC	77
NC	79
VCC	81
DQ16	83

Pin	Name
2	GND
4	DQ32
6	DQ33
8	DQ34
10	DQ35
12	VCC
14	DQ36
16	DQ37
18	DQ38
20	DQ39
22	GND
24	DQMB4
26	DQMB5
28	VCC
30	A3
32	A4
34	A5
36	GND
38	DQ40
40	DQ41
42	DQ42
44	DQ43
46	VCC
48	DQ44
50	DQ45
52	DQ46
54	DQ47
56	GND
58	NC
60	NC
62	CKE0
64	VCC
66	CAS
68	CKE1
70	A12
72	A13
74	CLK1
76	GND
78	NC
80	NC
82	VCC
84	DQ48

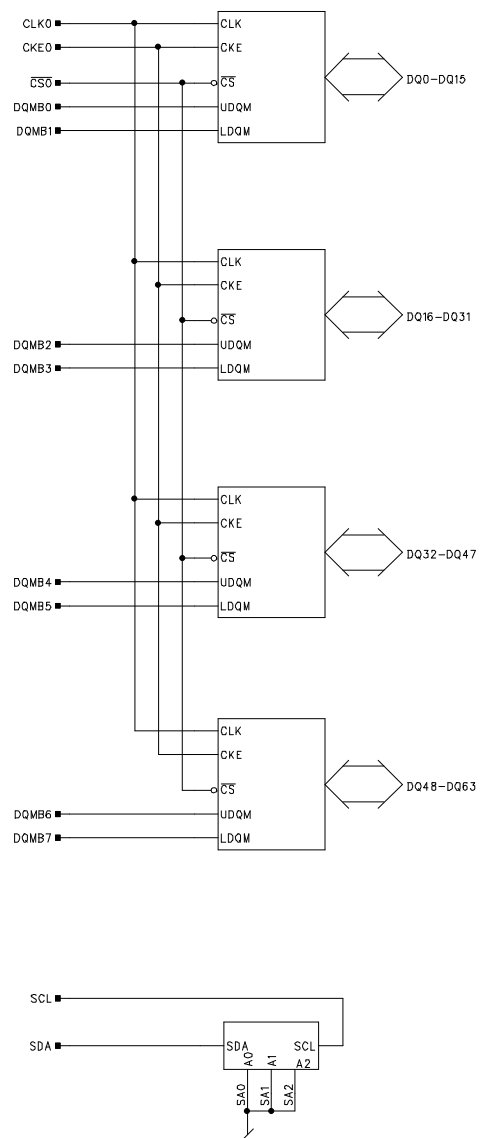
Name	Pin
DQ17	85
DQ18	87
DQ19	89
GND	91
DQ20	93
DQ21	95
DQ22	97
DQ23	99
VCC	101
A6	103
A8	105
GND	107
A9	109
A10	111
VCC	113
DQMB2	115
DQMB3	117
GND	119
DQ24	121
DQ25	123
DQ26	125
DQ27	127
VCC	129
DQ28	131
DQ29	133
DQ30	135
DQ31	137
GND	139
SDA	141
VCC	143

Pin	Name
86	DQ49
88	DQ50
90	DQ51
92	GND
94	DQ52
96	DQ53
98	DQ54
100	DQ55
102	VCC
104	A7
106	BA0
108	GND
110	BA1
112	A11
114	VCC
116	DQMB6
118	DQMB7
120	GND
122	DQ56
124	DQ57
126	DQ58
128	DQ59
130	VCC
132	DQ60
134	DQ61
136	DQ62
138	DQ63
140	GND
142	SCL
144	VCC

Notes

1. A13 is not used in this module.

FUNCTIONAL BLOCK DIAGRAM

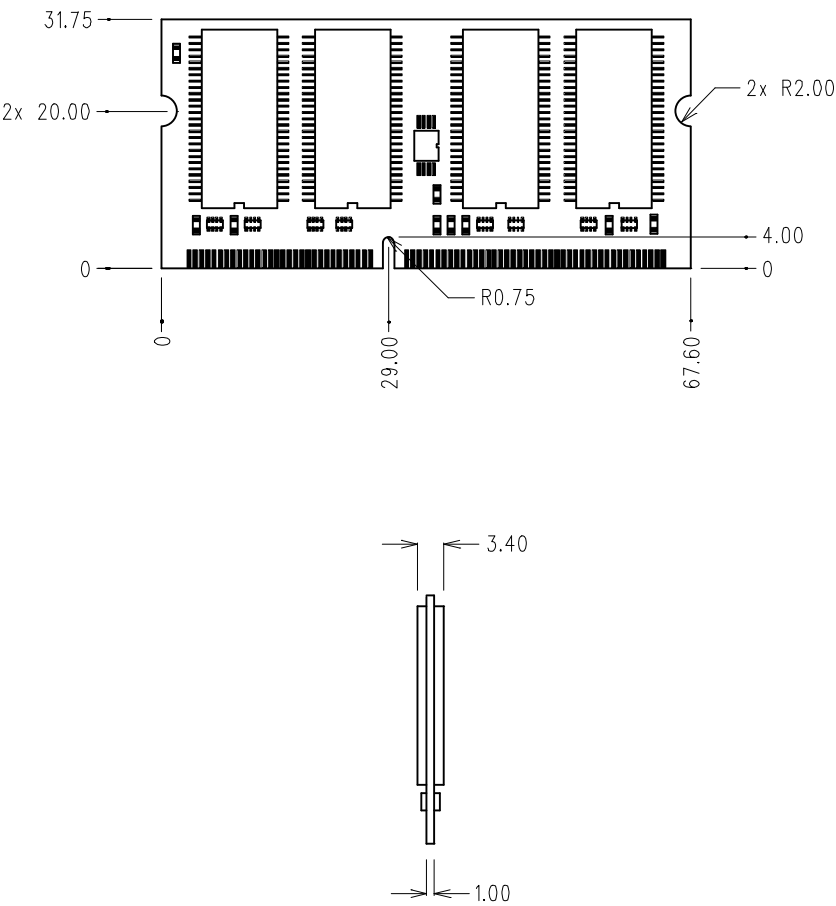


Notes

1. Only Bank 0 is shown. Bank 1 uses CLK1, CKE1 and $\overline{CS1}$.
2. A0-A12, BA0 and BA1 are connected to all devices.
3. $\overline{WE0}$, $\overline{RAS}$, $\overline{CAS}$ are connected to all devices.
4. Data are terminated using 10 ohm Series Resistors.

MODULE DIMENSIONS

Note: All dimensions are in millimeters.





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

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