

Identification

DTM60149:16Mx64 PC100
DTM60151:16Mx64 PC133
DTM60153:16Mx72 PC100
DTM60155:16Mx72 PC133

Performance range

PC100=100MHz(10ns@CL=2)
PC133=133MHz(7.5ns@CL=3)

Features

Burst mode operation
Auto & self refresh capability (4096 Cycles/64ms)
LVTTTL compatible inputs and outputs
Single 3.3V±0.3V power supply
MRS cycle with address key programs Latency (Access from column address) Burst length (1, 2, 4 & 8 page) Data scramble (Sequential & Interleave)
Serial presence detect with EEPROM
168-pin PC100/PC133 DIMM double-sided assembly 5.250" wide by 1.000" high

Description

The Dataram DTM60149 and DTM60151 are unbuffered 16Mx64 Synchronous Dynamic RAM high density memory modules. The Dataram DTM60153 and DTM60155 are unbuffered 16Mx72 Synchronous Dynamic RAM high density memory modules. The 16Mx64 assemblies consist of eight 8Mx16bit SDRAMs and the 16Mx72bit assemblies consist of eight 8Mx16bit and two 8Mx8bit SDRAMs in a TSOP-II 400mil package. One 2K EEPROM for serial presence detect is used on all assemblies. Synchronous design allows for precise cycle control with the use of a system clock.

Pin configurations

Front side			Back side		
1 Vss	29 DQM1	57 DQ18	85 Vss	113 DQM5	141 DQ50
2 DQ0	30 CS0	58 DQ19	86 DQ32	114 CS1	142 DQ51
3 DQ1	31 DU	59 Vdd	87 DQ33	115 RAS	143 Vdd
4 DQ2	32 Vss	60 DQ20	88 DQ34	116 Vss	144 DQ52
5 DQ3	33 A0	61 NC	89 DQ35	117 A1	145 NC
6 Vdd	34 A2	62 *Vref	90 Vdd	118 A3	146 *Vref
7 DQ4	35 A4	63 CKE1	91 DQ36	119 A5	147 REGE
8 DQ5	36 A6	64 Vss	92 DQ37	120 A7	148 Vss
9 DQ6	37 A8	65 DQ21	93 DQ38	121 A9	149 DQ53
10 DQ7	38 A10/AP	66 DQ22	94 DQ39	122 BA0	150 DQ54
11 DQ8	39 BA1	67 DQ23	95 DQ40	123 A11	151 DQ55
12 Vss	40 Vdd	68 Vss	96 Vss	124 Vdd	152 Vss
13 DQ9	41 Vdd	69 DQ24	97 DQ41	125 CLK1	153 DQ56
14 DQ10	42 CLK0	70 DQ25	98 DQ42	126 *A12	154 DQ57
15 DQ11	43 Vss	71 DQ26	99 DQ43	127 Vss	155 DQ58
16 DQ12	44 DU	72 DQ27	100 DQ44	128 CKE0	156 DQ59
17 DQ13	45 CS2	73 Vdd	101 DQ45	129 CS3	157 Vdd
18 Vdd	46 DQM2	74 DQ28	102 Vdd	130 DQM6	158 DQ60
19 DQ14	47 DQM3	75 DQ29	103 DQ46	131 DQM7	159 DQ61
20 DQ15	48 DU	76 DQ30	104 D Q 4 7	132 *A13	160 DQ62
21 CB0***	49 Vdd	77 DQ31	105 CB4***	133 Vdd	161 DQ63
22 CB1***	50 NC	78 Vss	106 CB5***	134 NC	162 Vss
23 Vss	51 NC	79 CLK2	107 Vss	135 NC	163 CLK3
24 NC	52 CB2***	80 NC	108 NC	136 CB6***	164 NC
25 NC	53 CB3***	81 WP	109 NC	137 CB7***	165 **SA0
26 Vdd	54 Vss	82 **SDA	110 Vdd	138 Vss	166 **SA1
27 WE	55 DQ16	83 **SCL	111 CAS	139 DQ48	167 **SA2
28 DQM0	56 DQ17	84 Vdd	112 DQM4	140 DQ49	168 Vdd

Pin names

Pin name	Function
A0-A11	Address input (Multiplexed)
BA0-BA1	Select bank
DQ0-DQ63	Data input/output
CB0-CB7	Check bit (Data-in/data-out)
CLK0	Clock input
CKE0	Clock enable input
CS0-CS3	Chip select input
RAS	Row address strobe
CAS	Column address strobe
WE	Write enable
DQM0-DQM7	DQM
Vdd	Power supply (3.3V)
Vss	Ground
*Vref	Power supply for reference
REGE	Register enable
SDA	Serial data I/O
SCL	Serial clock
SA0-SA2	Address in EEPROM
DU	Don't use
NC	No connection
WP	Write protection

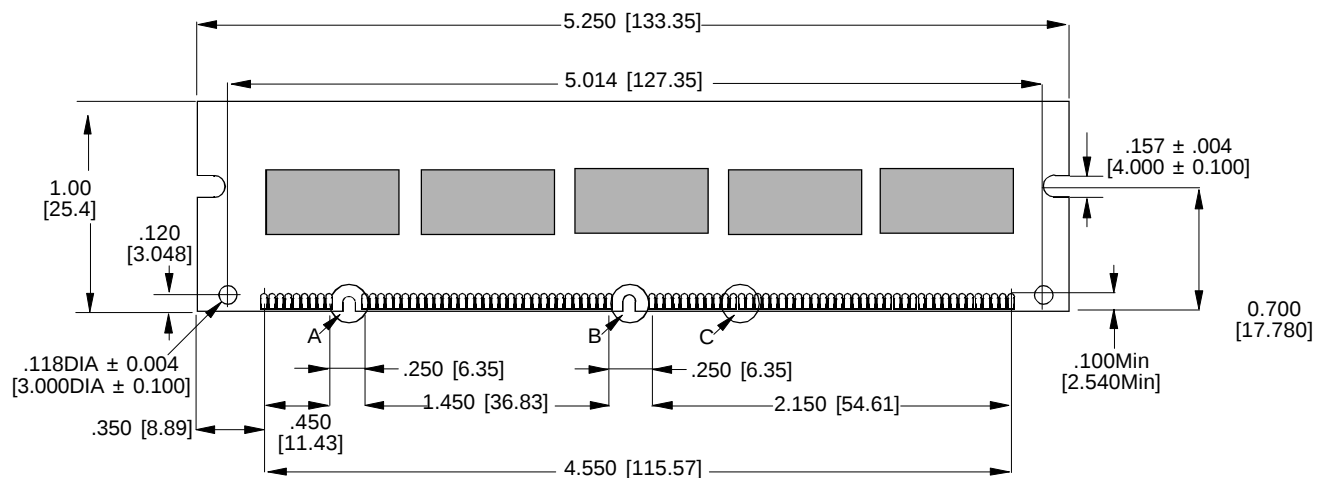
* These pins are not used in this module.

** These pins should be NC in the system which does not support SPD.

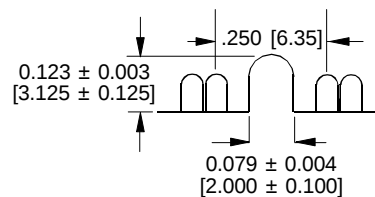
*** Used on DTM60153 and DTM60155 only.

DTM60149, 60151, 60153, 60155
128MB- 16M x 64 / 72, 168-Pin Unbuffered SDRAM DIMMS

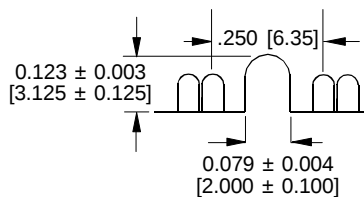
Front view



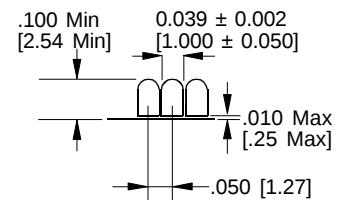
Detail A



Detail B

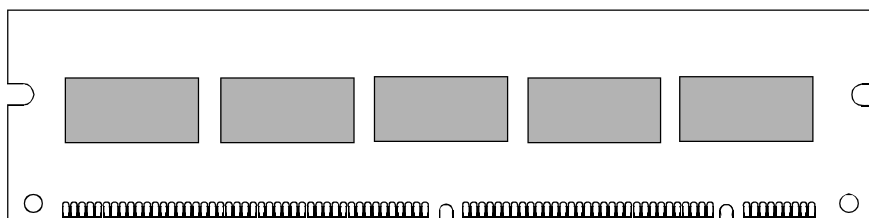


Detail C

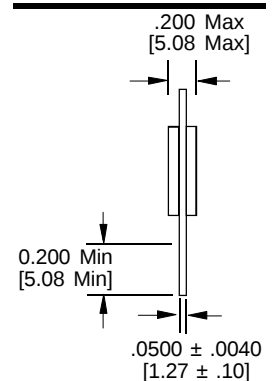


Units: Inches (Millimeters)

Back view



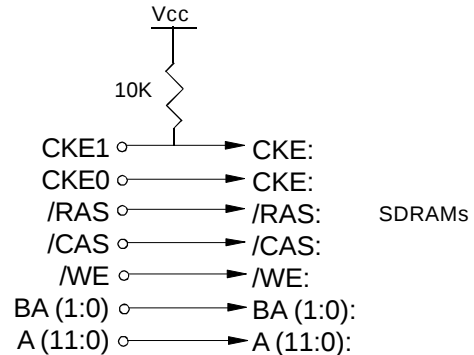
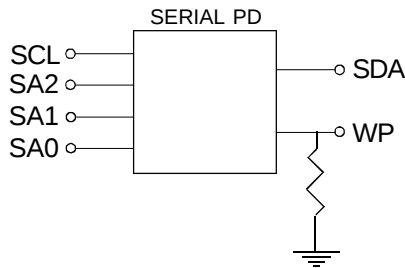
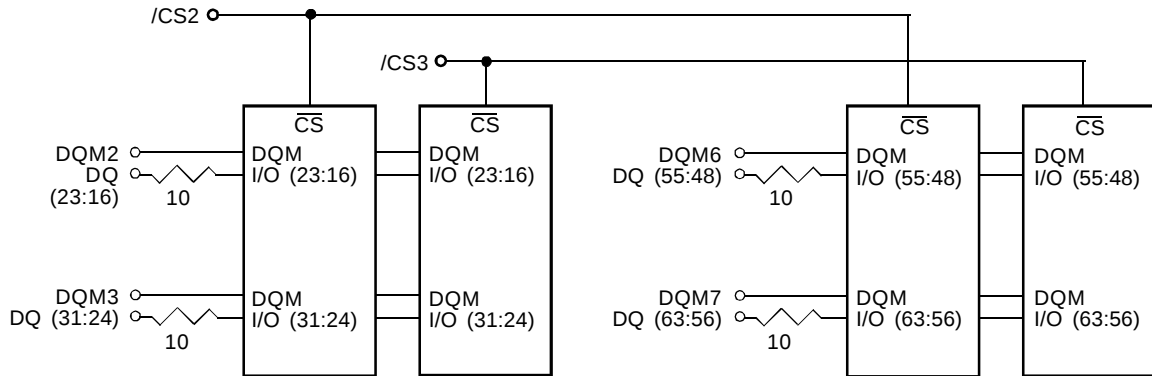
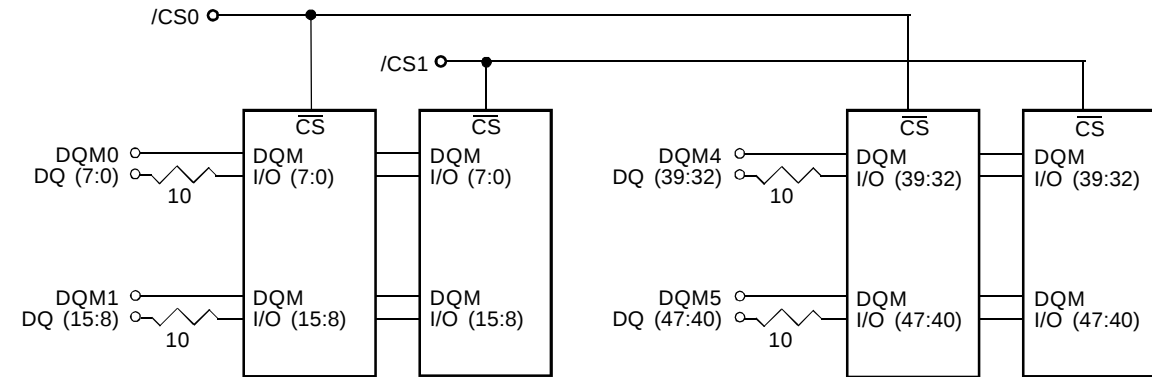
Side view



Notes

Tolerances on all dimensions except where otherwise indicated are $\pm .005$ [.13].
All dimensions are expressed: inches [millimeters].
Center IC's are removed on 16Mx64 assemblies.

DIAGRAM OF DTM60149 AND DTM60151



Clock Wiring

Clock Input	Load
CK0	2 SDRAMs + 15pF cap
CK1	2 SDRAMs + 15pF cap
CK2	2 SDRAMs + 15pF cap
CK3	2 SDRAMs + 15pF cap

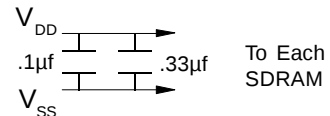
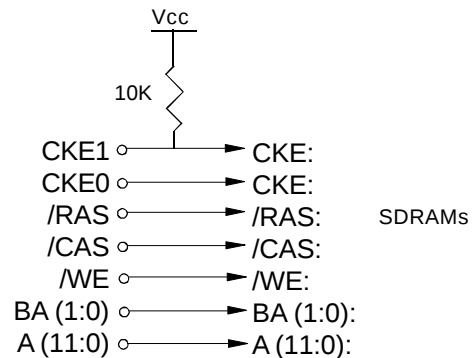
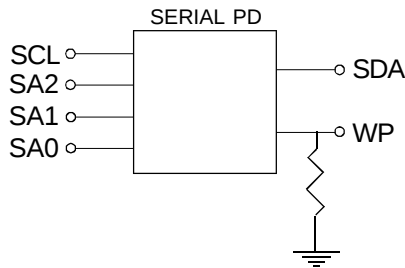
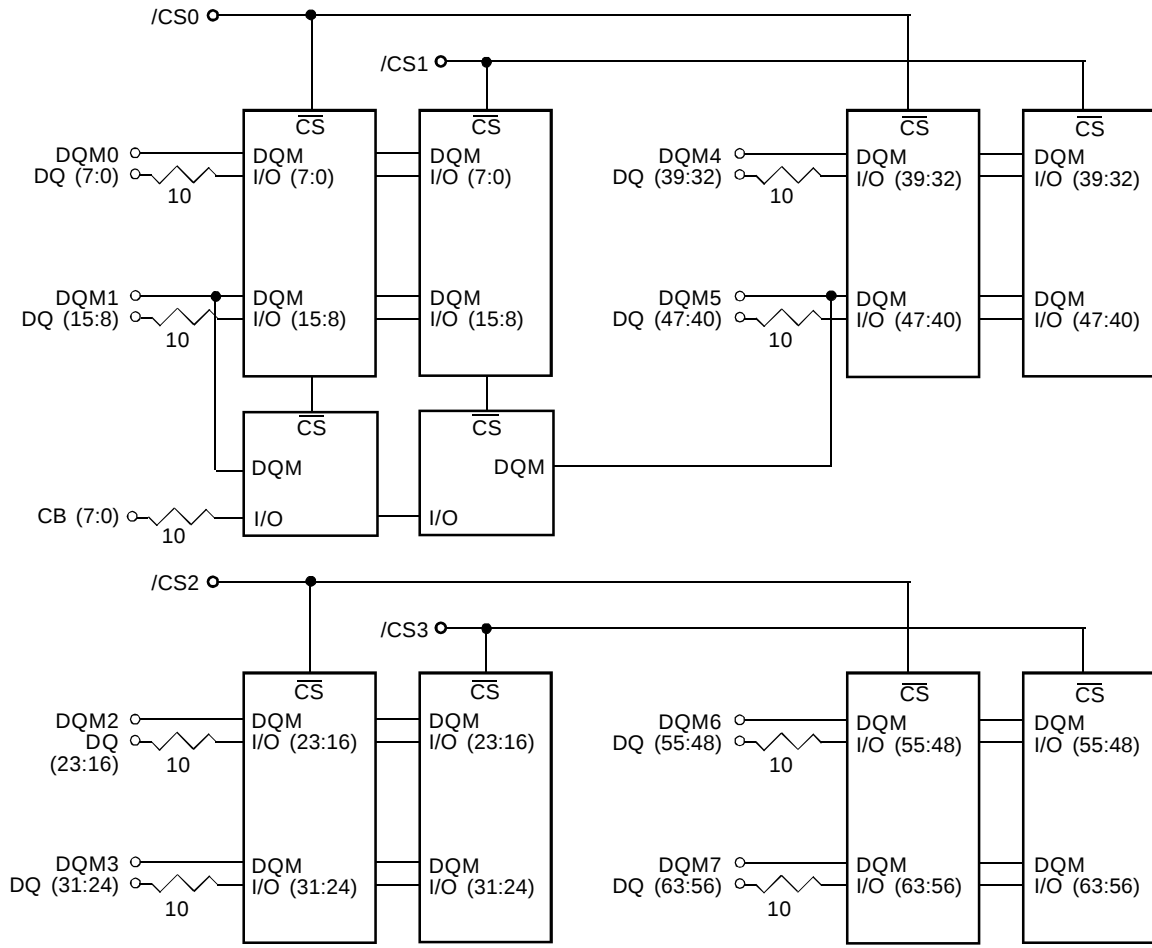


DIAGRAM OF DTM60153 AND DTM60155



Clock Wiring

Clock Input	Load
CK0	3 SDRAMs + 10pF cap
CK1	3 SDRAMs + 10pF cap
CK2	2 SDRAMs + 15pF cap
CK3	2 SDRAMs + 15pF cap

