

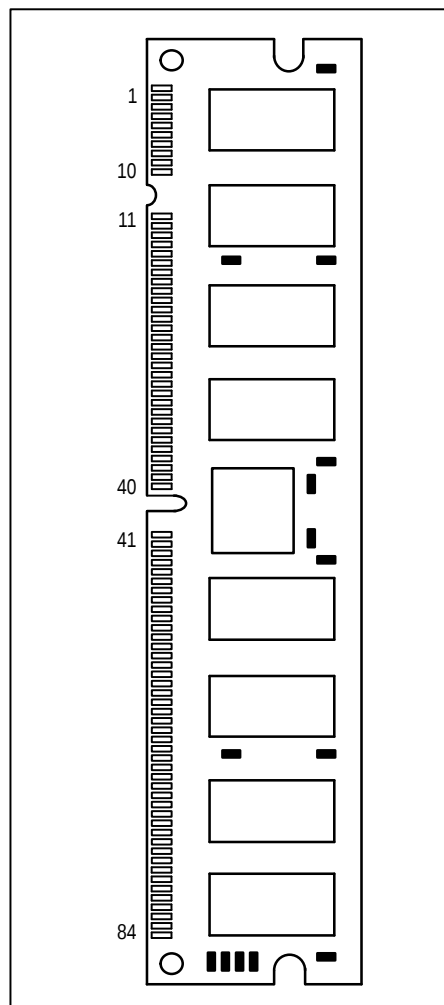
MCM64400

Product Preview

4M x 64 Bit Dynamic Random Access Memory Module

The MCM64400 is a dynamic random access memory (DRAM) module organized as 4,194,304 x 64 bits. The module is a JEDEC-standard 168-lead dual-in-line memory module (DIMM) with 84 separate contacts per side, consisting of sixteen MCM516400 DRAMs housed in 400-mil thin small outline packages (TSOP), mounted on a substrate along with a 0.22 μ F (min) decoupling capacitor mounted adjacent to each DRAM. Buffering is provided for address and all clock pins except RAS. The MCM516400 is a CMOS high speed dynamic random access memory organized as 4,194,304 four-bit words and fabricated with CMOS silicon-gate process technology.

- Three-State Data Output
- Early-Write Common I/O Capability
- Fast Page Mode Capability
- TTL-Compatible Inputs and Outputs
- RAS-Only Refresh
- CAS Before RAS Refresh
- Hidden Refresh
- 4096 Cycle Refresh: 64 ms
- Consists of Sixteen 4M x 4 DRAMs, Sixteen 0.22 μ F (Min) Decoupling Capacitors, and Two 20-Bit Buffers
- Unlatched Data Out at Cycle End Allows Two Dimensional Chip Selection
- Presence Detect Enable (PDE) Controls Access to 8 Bits of Buffered PD Information
- Notch Keys Prevent Accidental Insertion in Low Voltage (3.3 V) Systems
- Fast Access Time (t_{RAC}): MCM64400-60 = 60 ns (Max)
MCM64400-70 = 70 ns (Max)
- Low Active Power Dissipation: MCM64400-60 = 10.89 W (Max)
MCM64400-70 = 9.13 W (Max)
- Low Standby Power Dissipation: TTL Levels = 193 mW (Max)
CMOS Levels = 105 mW (Max)

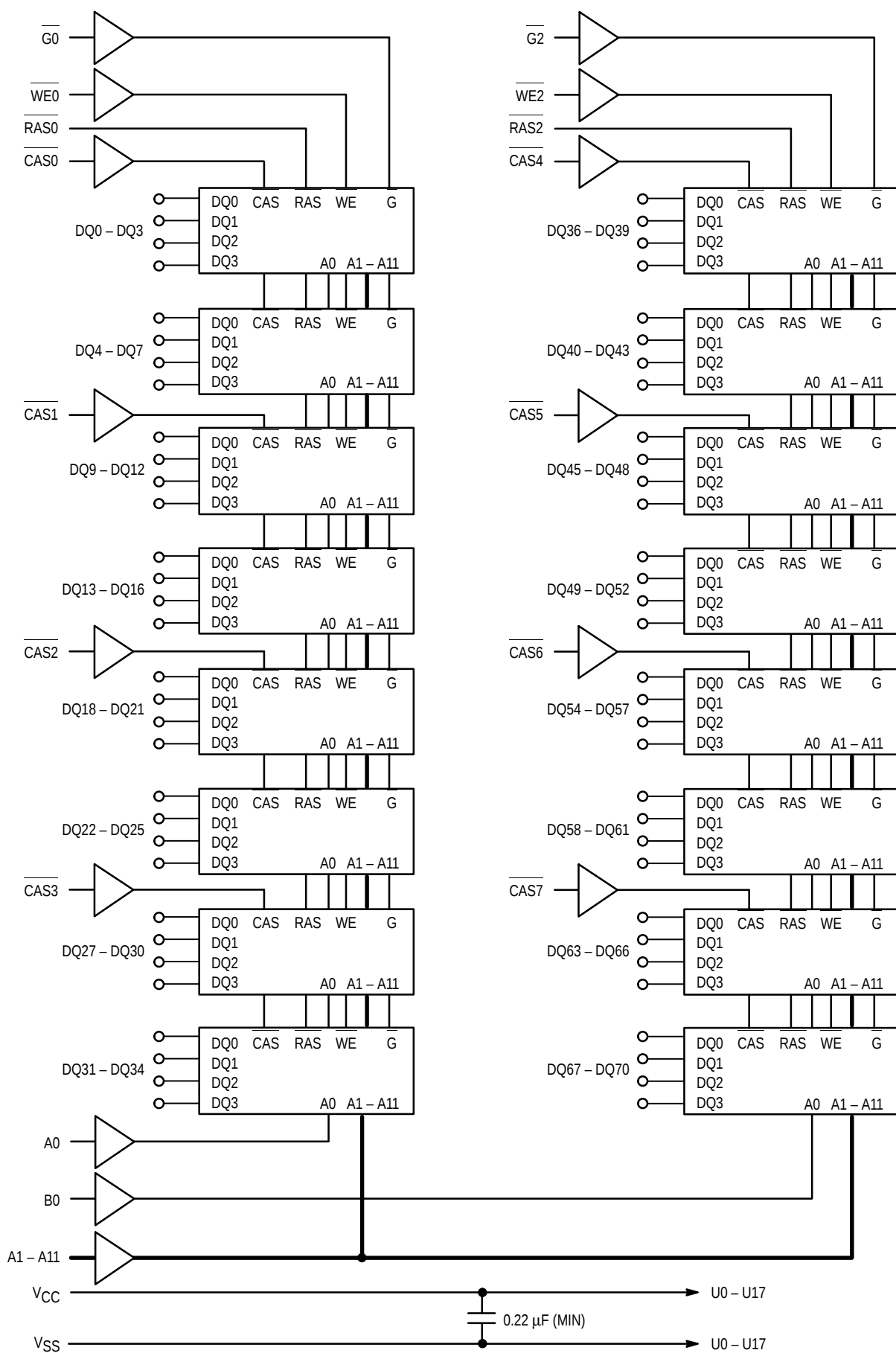


PIN NAMES	
A0, B0, A1 – A11 Address Inputs	DQ0 – DQ70* Data Input/Output
CAS0 – CAS7 . . . Column Address Strobe	RAS0, RAS2 Row Address Strobe
WE0, WE2 Write Enable	G0, G2 Output Enable
PD1 – PD8 Buffered Presence Detect	ID0, ID1 Unbuffered ID Bit
PDE Presence Detect Output Enable	VCC Power (+ 5 V)
VSS Ground	NC No Connection

*DQ8, DQ17, DQ26, DQ35, DQ44, DQ53, and DQ62 are not present on 64 bit modules.

This document contains information on a new product under development. Motorola reserves the right to change or discontinue this product without notice.

BLOCK DIAGRAM



4M x 64 168 DIMM Pinout

Front Side								Back Side							
Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	V _{SS}	22	NC	43	V _{SS}	64	NC	85	V _{SS}	106	NC	127	V _{SS}	148	NC
2	DQ0	23	V _{SS}	44	G2	65	DQ25	86	DQ36	107	V _{SS}	128	NC	149	DQ61
3	DQ1	24	NC	45	RAS2	66	NC	87	DQ37	108	NC	129	NC	150	NC
4	DQ2	25	NC	46	CAS4	67	DQ27	88	DQ38	109	NC	130	CAS5	151	DQ63
5	DQ3	26	V _{CC}	47	CAS6	68	V _{SS}	89	DQ39	110	V _{CC}	131	CAS7	152	V _{SS}
6	V _{CC}	27	WE0	48	WE2	69	DQ28	90	V _{CC}	111	NC	132	PDE	153	DQ64
7	DQ4	28	CAS0	49	V _{CC}	70	DQ29	91	DQ40	112	CAS1	133	V _{CC}	154	DQ65
8	DQ5	29	CAS2	50	NC	71	DQ30	92	DQ41	113	CAS3	134	NC	155	DQ66
9	DQ6	30	RAS0	51	NC	72	DQ31	93	DQ42	114	NC	135	NC	156	DQ67
10	DQ7	31	G0	52	DQ18	73	V _{CC}	94	DQ43	115	NC	136	DQ54	157	V _{CC}
11	NC	32	V _{SS}	53	DQ19	74	DQ32	95	NC	116	V _{SS}	137	DQ55	158	DQ68
12	V _{SS}	33	A0	54	V _{SS}	75	DQ33	96	V _{SS}	117	A1	138	V _{SS}	159	DQ69
13	DQ9	34	A2	55	DQ20	76	DQ34	97	DQ45	118	A3	139	DQ56	160	DQ70
14	DQ10	35	A4	56	DQ21	77	NC	98	DQ46	119	A5	140	DQ57	161	NC
15	DQ11	36	A6	57	DQ22	78	V _{SS}	99	DQ47	120	A7	141	DQ58	162	V _{SS}
16	DQ12	37	A8	58	DQ23	79	PD1	100	DQ48	121	A9	142	DQ59	163	PD2
17	DQ13	38	A10	59	V _{CC}	80	PD3	101	DQ49	122	A11	143	V _{CC}	164	PD4
18	V _{CC}	39	NC	60	DQ24	81	PD5	102	V _{CC}	123	NC	144	DQ60	165	PD6
19	DQ14	40	V _{CC}	61	NC	82	PD7	103	DQ50	124	V _{CC}	145	NC	166	PD8
20	DQ15	41	NC	62	NC	83	ID0	104	DQ51	125	NC	146	NC	167	ID1
21	DQ16	42	NC	63	NC	84	V _{CC}	105	DQ52	126	B0	147	NC	168	V _{CC}

NOTE: Contact your Motorola representative for additional information on the availability of other configurations and densities of modules in the new 168 pin DIMM family.

Presence Detect/ID Bit Populations

Pin Name	60 ns	70 ns
PD1	NC	NC
PD2	NC	NC
PD3	V _{SS}	V _{SS}
PD4	NC	NC
PD5	V _{SS}	V _{SS}
PD6	NC	V _{SS}
PD7	NC	NC
PD8	NC	NC
ID0	V _{SS}	V _{SS}
ID1	V _{SS}	V _{SS}

NOTE: PDs and IDs must each be pulled up through a resistor to V_{CC} at the next higher level of assembly. PDs are buffered and gated to the edge connector by the PDE (Presence Detect Enable) signal.

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MCM64400/D

