

TTL Memories

CM76xxx Series PROM
CM93xxx Series RAM
Suffix: D ... Ceramic DIP
P ... Plastic DIP
C ... 0 to +75°C (Commercial)
M ... -55 to +125°C (Military)

Example: MCM7621DC, MCM7621DM, etc.

Device	Function	TAA (ns)	Samples	Pins
MCM27525	512 x 8 PROM, 3-State, Registered	30/15*	2Q84	24
MCM27527	512 x 8 PROM, 3-State, Registered	35/20*	2Q84	22
MCM27535	1k x 8 PROM, 3-State, Registered	35/20*	2Q84	24
MCM27537	1k x 8 PROM, 3-State, Registered	35/20*	2Q84	24
MCM27545	2k x 8 PROM, 3-State, Registered	35/20*	1Q84	24
MCM27547	2k x 8 PROM, 3-State, Registered	35/20*	1Q84	24
MCM7621	512 x 4 PROM, 3-State	70	A	16
MCM7621A	512 x 4 PROM, 3-State	60	A	16
MCM7641	512 x 8 PROM, 3-State	70	A	24
MCM7641A	512 x 8 PROM, 3-State	60	A	24
MCM7643	1024 x 4 PROM, 3-State	70	A	18
MCM7643A	1024 x 4 PROM, 3-State	50	A	18
MCM7649	512 x 8 PROM, 3-State	70	A	20
MCM7649A	512 x 8 PROM, 3-State	50	3Q83	20
MCMXXXXX	512 x 8 PROM, 3-State	35	1984	20
MCM7681	1024 x 8 PROM, 3-State	70	A	24
MCM7681A	1024 x 8 PROM, 3-State	50	3Q83	24
MCMXXXXX	1k x 8 PROM, 3-State	35	1984	24
MCM7685	2048 x 4 PROM, 3-State	70	A	18
MCM7685A	2048 x 4 PROM, 3-State	55	A	18
MCM76161	2048 x 8 PROM, 3-State	70	A	24
MCM76161A	2048 x 8 PROM, 3-State	60	A	24
MCMXXXXX	2k x 8 PROM, 3-State	35	1984	24
MCM76165A	4096 x 4 PROM, 3-State	50	3Q83	20
MCM93422	256 x 4 RAM, 3-State	45	A	22
MCM931422	256 x 4 RAM, 3-State	60	A	22
MCM93415	1024 x 1 RAM, Open-Collector	45	A	18
MCM93425	1024 x 1 RAM, 3-State	45	A	18

*For Registered PROMs, t_{SA}TPH_L (Address setup time propagation delay, clock to output)

Abbreviations

- S = Synchronous
A = Asynchronous
B = Both Synchronous and Asynchronous

2S = 2-State Output
3S = 3-State Output
OC = Open-Collector Output

P = Planned (See Numeric List for latest availability status.)

Inverters

Description	Type of Output	No.	LS	ALS	FAST
Hex	2S OC	04 05	X X	X X	X X

AND Gates

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	2S OC	08 09	X X	X X	X X
Triple 3-Input	2S OC	11 15	X X	X X	X X
Dual 4-Input	2S	21	X	X	X

NAND Gates

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	2S OC OC	00 01 03	X X X	X X X	X X X
Quad 2-Input, High Voltage	OC	26	X	X	X
Triple 3-Input	2S OC	10 12	X X	X X	X X
Dual 4-Input	2S OC	20 22	X X	X X	X X
8-Input	2S	30	X	X	X
13-Input	2S	133	X	X	X

OR

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	2S	32	X	P	X

NOR

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	2S	2	X	X	X
Triple 3-Input	2S	27	X	X	X
Dual 5-Input	2S	260	X	X	X

Exclusive OR

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	2S OC 2S	86 136 386	X X X	X X X	P X X

Exclusive NOR

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input	OC	266	X	X	X

AND-OR-INVERT Gates

Description	Type of Output	No.	LS	ALS	FAST
Dual 2-Wide, 2-Input/3-Input	2S	51	X	X	X
4-Wide, 2-3-2-3-Input	2S	54	X	X	X
2-Wide, 4-Input	2S	55	X	X	X
4-Wide, 4-2-2-3-Input	2S	64	X	X	X

Schmitt Triggers

Description	Type of Output	No.	LS	ALS	FAST
Dual 4-Input NAND Gate	2S	13	X	P	X
Hex, Inverting	2S	14	X	P	X
Quad 2-Input NAND Gate	2S	132	X	P	X

SSI Flip-Flops

Description	Clock Edge	No.	LS	ALS	FAST
Dual D w/Set & Clear	Pos	74	X	X	X
Dual JK w/Set	Neg	113	X	X	P
Dual JK w/Clear	Neg	73 107	X X	X X	X X
Dual JK w/Set & Clear	Neg	76 78	X X	X X	P P
	Neg	112	X	X	P
	Neg	114	X	X	P
Dual JK w/Set & Clear	Pos	109	X	P	X

Multiplexers

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-to-1, Non-Inverting	2S	157	X	X	P
	3S	257	X	P	P
Quad 2-to-1, Inverting	2S	158	X	X	P
	3S	258	X	P	P
Dual 4-to-1, Non-Inverting	2S	163	X	P	X
	3S	263	X	P	X
Dual 4-to-1, Inverting	2S	362	X	P	X
	3S	363	X	P	X
8-to-1	2S	151	X	P	P
	3S	251	X	P	P
Quad 2-to-1 with Output Register	2S	298	X		
	2S	398	X		
	2S	399	X		

Encoders

Description	Type of Output	No.	LS	ALS	FAST
10- to 4-Line BCD	2S	147	X		
8- to 3-Line Priority Encoder	2S	148	X		
	3S	348	X		
	2S	748	X		
	3S	848	X		

Register Files

Description	Type of Output	No.	LS	ALS	FAST
4 x 4	OC	170	X		
	3S	670	X		

Shift Registers

Description	No. of Bits	Type of Output	Mode*				No.	LS	ALS	FAST
			SR	SL	Hold	Reset				
Serial In-Serial Out	8	2S	X				91	X		
Serial In-Parallel Out	8	2S	X				164	X	P	
Parallel In-Serial Out	8	2S	X			A	165	X		
	8	2S	X		X	A	166	X		
Parallel In-Parallel Out	16	3S	X		X		674	X		
	4	2S	X				95	X		
	4	2S	X	X	X	A	194	X		P
	4	2S	X			A	195	X		P
	4	3S	X			A	295	X		
	4	3S	X			A	395	X		
Parallel In-Parallel Out, Bidirectional	8	3S	X	X	X	A	299	X		
	8	3S	X	X	X	S	323	X		P
Sign Extended Bidirectional	8	3S	X	X	X	A	322	X		
Serial In-Parallel Out with Storage Register	16	2S/3S	X		X	S	673	X		
Parallel In-Parallel Out with Storage Register/Mux	4	3S	X	X	X	A	671		P	
	4	3S	X	X	X	S	672		P	

SR = Shift Right
SL = Shift Left

Decoders/Demultiplexers

Description	Type of Output	No.	LS	ALS	FAST
Dual 1-of-4	2S	138	X	P	P
	2S	155	X		
	OC	156	X		
	2S	239		P	
1-of-8	3S	539		P	P
	2S	138	X	P	P
	2S	238		P	
1-of-8 with Latch	3S	538		P	P
	2S	137	X		
1-of-10	2S	42	X		
	3S	537		P	P

Latches

Description	No. of Bits	Type of Output	No.	LS	ALS	FAST
Transparent, Non-Inverting	4	2S	77	X		
	8	3S	373	X		
Transparent, Inverting	8	3S	573		P	P
	8	3S	533		P	X
Transparent, Q and Q̄ Outputs	8	3S	563		P	
	8	3S	580		P	
Quad Set-Reset Latch	4	2S	75	X		
	4	2S	375	X		
Addressable	4	2S	279	X		
	8	2S	259	X		
Dual 4-Bit Addressable	4	2S	256	X		
	8	3S	873		P	
Dual 4-Bit Transparent, Non-Inverting	8	3S	880		P	
	8	3S	880		P	

Asynchronous Counters — Negative Edge-Triggered*

Description	Load	Set	Reset	No.	LS	ALS	FAST
Decade (2/5)	X	X	X	90	X		
		X	X	196	X		
Dual Decade (2/5)		X	X	290	X		
		X	X	390	X		
Dual Decade Modulo 12 (2/6)		X	X	490	X		
		X	X	92	X		
4-Bit Binary (2/8)	X	X	X	93	X		
		X	X	197	X		
Dual 4-Bit Binary		X	X	293	X		
		X	X	393	X		
Divide-By-N (0-9)	X	X	X	716*	X		
		X	X	718*	X		

*The 716 and 718 are positive edge-triggered.

Display Decoders/Drivers with Open-Collector Outputs*

Description	No.	LS	ALS	FAST
1-of-10	145	X		
	47	X		
BCD-to-7 Segment	48*	X		
	49	X		
	247	X		
	248*	X		
	249	X		

*The 48 and 248 have internal pullup resistors to VCC on their outputs.

Cascadable* Synchronous Counters — Positive Edge-Triggered

Description	Type of Output	Load	Reset	No.	LS	ALS	FAST
Decade	2S	S	A	160	X	X	P
	2S	S	S	162	X	X	P
	3S	B	B	560			
Decade, Up/Down	2S	S		168	X	P	P
	2S	A		190	X	X	P
	2S	A	A	192	X	X	P
4-Bit Binary	3S	S	B	568	X	P	
	2S	S		668	X		
	2S	S	A	161	X	X	P
4-Bit Binary, Up/Down	2S	S	S	163	X	X	P
	3S	B	B	561			
	2S	S		169	X	P	P
Decade with Latch/Mux	2S	A		191	X	X	P
	2S	A	A	193	X	X	P
	3S	S	B	569	X	P	
Decade with Register/Mux	2S	S		669	X		
	3S	S	A	690		P	
	3S	S	S	692		P	
4-Bit Binary w/ Latch/Mux	3S	S	S	694		P	
	3S	S	A	696		P	
	3S	S	S	698		P	
4-Bit Binary w/ Register/Mux	3S	S	A	691		P	
	3S	S	S	693		P	
	3S	S	S	695		P	
4-Bit Binary w/ Register/Mux	3S	S	A	697		P	
	3S	S	S	699		P	

*The 192 and 193 do not provide a clock enable for synchronous cascading.

MSI Flip-Flops/Registers

Description	No. of Bits	Type of Output	Set or Reset	Clock Enable	No.	LS	ALS	FAST
D-Type, Non-Inverting	4	3S	A	X	173	X		
	4	2S		X	377	X	X	
	6	2S	A		174	X		P
	6	2S		X	378	X		P
	8	2S	A		273	X	X	
	8	3S			374	X		X
D-Type, Inverting	8	3S			574			
	8	3S	S		575			
	8	3S			576			
	8	3S			534			X
	8	3S			564			P
	8	3S			576			P
D-Type, Q and Q̄ Outputs	8	3S	S		577			P
	4	2S	A		175	X		
	4	2S		X	379	X		P
	8	3S	A		874			
	8	3S	S		878			P
	8	3S	A		876			P
Dual 4-Bit, Non-Inverting	8	3S	S		879			P
	8	3S	A		876			P
	8	3S	S		879			P
	16	3S			604	X		
	16	OC			605	X		
	16	3S			606	X		
Dual 8-Bit with Multiplexers	16	OC			607	X		

Arithmetic Operators

Description	No.	LS	ALS	FAST
4-Bit Adder	83	X		
	283	X		P
4-Bit ALU	181	X		P
	381			P
	382			P
Look Ahead Carry Generator	182	X		P
Quad 4-Bit Adder/Subtractor	385	X		
Dual Carry/Save Full Adder	183	X		
4-Bit Barrel Shifter	350			P

Magnitude Comparitors

Description	Type of Output	P=Q	P>Q	P<Q	No.	LS	ALS	FAST
4-Bit	2S	X	X	X	85	X		
8-Bit	2S	X	X	X	682	X		
	OC	X	X	X	683	X		
	2S	X	X	X	684	X		
	OC	X	X	X	685	X		
	2S	X	X	X	521			P
8-Bit with Output Enable	2S	X	X	X	686	X		
	OC	X	X	X	687	X		
	2S	X	X	X	688	X		
	OC	X	X	X	689	X		

Parity Generators/Checkers

Description	No.	LS	ALS	FAST
9-Bit Odd/Even Parity Generator/Checker	280	X		P

Dynamic Memory Support

Description	No.	LS	ALS	FAST
Synchronous Address Multiplexer (MC6883)	783	X		
Error Detection and Correction Circuit (EDAC)	2960			P
EDAC Bus Buffer	2961			P
	2962			P
Dynamic Memory Controller	2968			P
Dynamic Memory Timing Controller with EDAC	2969			P
Dynamic Memory Timing Controller without EDAC	2970			P

VCOs and Multivibrators

Description	No.	LS	ALS	FAST
Retriggerable Monostable Multivibrator	122	X		
Dual 122	123	X		
Precision Non-Retriggerable Monostable Multivibrator	221	X		
Voltage/Crystal Controlled Oscillator	724	X		

Buffers/Line Drivers

Description	Type of Output	No.	LS	ALS	FAST
Quad 2-Input NOR	2S	28	X	P	
	OC	33	X	P	
Quad 2-Input NAND	2S	37	X	X	
	OC	38	X	X	
Dual 4-Input NAND	2S	40	X	P	
Quad, Non-Inverting	3S	125	X		
	3S	126	X		
Hex, Non-Inverting	3S	365	X		
	3S	367	X		
Hex, Inverting	3S	366	X		
	3S	368	X		
Octal, Non-Inverting	3S	241	X	X	P
	3S	244	X	X	P
	3S	541	X	P	
	3S	795	X		
Octal, Inverting	3S	797	X		
	3S	240	X	X	P
	3S	540	X	P	
	3S	796	X		
	3S	798	X		

Transceivers

Description	Type of Output	No.	LS	ALS	FAST
Quad, Non-Inverting	3S	243	X	X	P
	3S	242	X	X	P
Quad, Inverting	3S	245	X	X	X
	3S	645	X	X	
Octal, Non-Inverting	OC	621	X	X	
	3S	623	X	X	X
Octal, Inverting	3S/OC	639	X	X	
	OC	641	X	X	
Octal, Inverting	3S	620	X	X	X
	OC	622	X	X	
Octal, Non-Inverting with Register/Mux	3S/OC	638	X	X	
	3S	640	X	X	X
Octal, Non-Inverting with Register/Mux	OC	642	X	X	
	3S	643	X	X	X
Octal, Inverting with Register/Mux	OC	644	X	X	
	3S	646		P	
Octal, Inverting with Register/Mux	OC	647		P	
	3S	652		P	
Octal, Inverting with Register/Mux	OC/3S	654		P	
	3S	648		P	
Octal, Inverting with Register/Mux	OC	649		P	
	3S	651		P	
	OC/3S	653		P	

RAM

Description	Type of Output	No.	LS	ALS	FAST
16-by-4	3S	189			P
	OC	289			P

Circuit Characteristics

SCHOTTKY TTL

