LINEAR INTEGRATED CIRCUIT CHIPS

GENERAL DESCRIPTION

Motorola now offers a very broad selection of linear integrated circuit chips. Among the types of circuits which compose the linear family there are:

A. Operational Amplifiers
B. Voltage Regulators
C. Comparators
D. Drivers and Receivers
E. Sense Amplifiers
F. D/A and A/D Converters

As a general rule of thumb, all linear chips from Motorola are 100% unit probed to the D.C. parameters given in Volume 6 of the Semiconductor Data Library. For specific information on electrical parameters which are probed contact the nearest Motorola Sales Office.

STANDARD FEATURES FOR LINEAR INTEGRATED CIRCUIT CHIPS

All linear integrated circuit chips . . .

- are 100% electrically tested to sufficient parameter limits (min/max) to permit distinct identification as either premium or industrial versions
- employ phosphorsilicate passivation which protects the entire active surface area including metallization interconnects during shipping and handling
- are 100% visually inspected to a modified criteria per MIL-STD-883, Method 2010, Condition B
- incorporate a minimum of 4000 Å gold backing to ensure positive adherence bonding

GENERAL PHYSICAL CHARACTERISTICS OF LINEAR CHIPS

The following characteristics represent the vast majority of all Motorola linear chips. Since an individual chip type may vary slightly, contact your local sales office for information regarding physical characteristics critical to a specific application. The overall size and final metallization patterns are shown in the following pages; however the geometries shown and MIC numbers listed are current at the date of printing. Since we are constantly striving to improve the quality, performance, and yield of our linear devices we cannot be responsible for changes at future dates. Please contact your local Motorola Sales representative for the most current information.

A. Chips thickness: 8 ± 1 mil
B. Passivation: Phosphorsilicate
C. Passivation thickness: 5kÅ ± 1kÅ
D. Metallization: Aluminum
E. Metallization thickness: 12kÅ ± 2kÅ
F. Back metallization: Gold, alloyed
G. Bonding pad dimensions:
   Typical 4.0 mil x 5.0 mil
H. Overall chip dimensions:
   See pages that follow for individual device type. Tolerance of ±5 mils should be allowed.

HANDLING PRECAUTIONS

Although passivation on all chips provides protection in shipping and handling, care should be exercised to prevent damaging the face of the chip. A vacuum pickup is most useful for this purpose; tweezers are not recommended.

There are four basic requirements for handling devices in a prudent manner:

1. Store the chips in a covered or sealed container
2. Store devices in an environment of no more than 30% relative humidity
3. Process the chips in a non-inert atmosphere not exceeding 100°C, or in an inert atmosphere not exceeding 400°C.
4. Processing equipment should conform to the minimum standards that are normally employed by semiconductor manufacturers.

Motorola's engineering staff is available for consultation in the event of correlation or processing problems encountered in the use of Motorola linear chips. For assistance, please contact your nearest Motorola sales representative.

CHIP AND WAFER PACKAGING

Chips

Motorola's linear integrated circuit chips come Packaged to the customer in the Multi-Pak carrier. Refer to page 1-11, Figure 7.

Wafers

Motorola's linear integrated circuit wafers come packaged to the customer in the Wafer-Pak plastic bow. The wafer has been probed and rejects are designated by a red color dot on the die surface. Refer to page 1-8, Figure 2.

HOW TO ORDER LINEAR CHIPS OR WAFERS FROM MOTOROLA

1. Remove all suffix package designators from the desired device type. (EXAMPLE: MC1741CP1 now becomes MC1741C)
2. Add a C to the prefix designator if individual chips are desired. (EXAMPLE: MC1741C now is MCC1741C)

   Add a W to the prefix designator if a wafer is desired. (EXAMPLE: MC1741C now is MCW1741C)
3. When ordering chips, two options are available:
   a. The -1 suffix designator will deliver to you 10 chips per Multi-Pak, up to 1000 chips. (EXAMPLE: MCC1741C-1)

MCC4000 Series (0 to +75°C)
MCC4300 Series (–55 to +125°C)

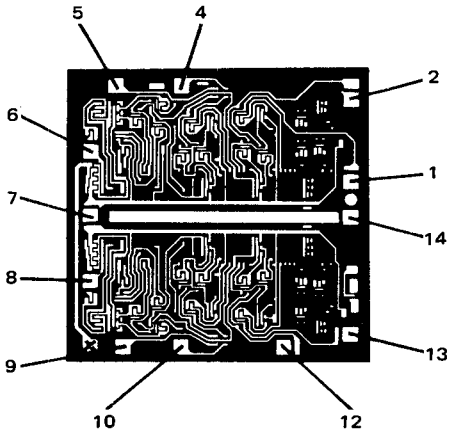
The MTTL complex functions are designed for digital applications in the medium to high-speed range.

These MTTL devices provide significant reduction in package count and increased logic per function over devices in the basic MTTL and MDTL families.

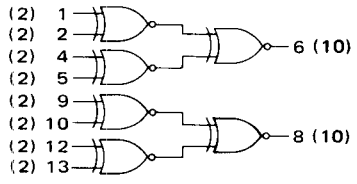
Type		Function	Wafer Mask Set #	Chip Size (Mils)
0 to 75°C	–55 to +125°C			
MCC4000	MCC4300	Dual 4 Channel Data Selector	18E	58x86
MCC4002	MCC4302	Dual Data Distributor	59B	60x90
MCC4003	MCC4303	Dual Binary to NBCD Converter	06T	73x75
MCC4004	MCC4304	16 Bit Scratch Pad Memory Cell	1PR	77x82
MCC4005	MCC4305	16 Bit Scratch Pad Memory Cell	1PR	77x82
MCC4006	MCC4306	Binary to one of eight Line Decoder	31C	88x88
MCC4007	MCC4307	Dual Binary to one of four Line Decoder	31C	88x88
MCC4008/74408	MCC4308	8 Bit Parity Tree	8HT	53x59
MCC4010	MCC4310	Dual 4 Bit Parity Tree	94F	78x79
MCC4012	MCC4312	4 Bit Shift Register	43L	58x74
MCC4015	MCC4315	Quad Type D Flip-Flop	87N	68x74
MCC4016/74416	MCC4316	Program. Modulo-N Decade Counter	30P	79x89
MCC4017/74417	MCC4317	Modulo 2, Modulo 5 Program. Counter	30P	79x89
MCC4018/74418	MCC4318	Program. Modulo-N Hexadecimal Counter	30P	79x89
MCC4019/74419	MCC4319	Dual Modulo 4 Program. Counter	30P	79x89
MCC4021	MCC4321	Dual 4 Bit Comparator (O.C.)	04R	63x69
MCC4022	MCC4322	Dual 4 Bit Comparator	04R	63x69
MCC4023	MCC4323	4-Bit Universal Counter	74H	94x95
MCC4024	MCC4324	Dual Voltage Controlled Multivibrator	54H	66x53
MCC4026	MCC4326	Full Adder	33K	58x60
MCC4027	MCC4327	Full Adder	33K	58x60
MCC4028	MCC4328	Adder (Dependent Carry)	33K	58x60
MCC4029	MCC4329	Adder (Dependent Carry)	33K	58x60
MCC4030	MCC4330	Adder (Independent Carry)	33K	58x60
MCC4031	MCC4331	Adder (Independent Carry)	33K	58x60
MCC4032	MCC4332	Carry Decoder	50K	39x43
MCC4035	MCC4335	Quad Latch (O.C.)	1DB	60x61
MCC4037	MCC4337	Quad Latch	1DB	60x61
MCC4042	MCC4342	Quad Predriver	31E	55x67
MCC4043	MCC4343	Dual Line Selector	32E	61x61
MCC4044	MCC4344	Phase Frequency Detector	46K	62x66
MCC4050/74450	MCC4350	Counter-Latch Decoder/Driver	09R	92x94
MCC4051	MCC4351	Counter-Latch Decoder/Driver	09R	92x94
MCC4052/74452	MCC4352	Dual Decade Counter	91R	80x84
MCC4053/74453	MCC4353	Dual Hexadecimal Counter	91R	80x84
MCC4054/74454	MCC4354	Dual Decade Up/Down Counter	66W	102x99
MCC4055/74455	MCC4355	Dual Binary Up/Down Counter	66W	102x99
MCC4056/74456	MCC4356	NBCD Adder	74V	69x90
MCC4058/74458	MCC4358	Nines Complement/Zero Element	1DK	61x62
MCC4060/74460	MCC4360	Bus Transfer Switch	38T	64x66
MCC4062	MCC4362	Dual Majority Logic Gate	62T	50x45
MCC4068/74468	MCC4368	Dual MOS to TTL Level Translator	2AG	50x50

MCC4010/MCC4310
Dual 4 Bit Parity Tree

78 x 79
(94F)



PIN CONNECTIONS

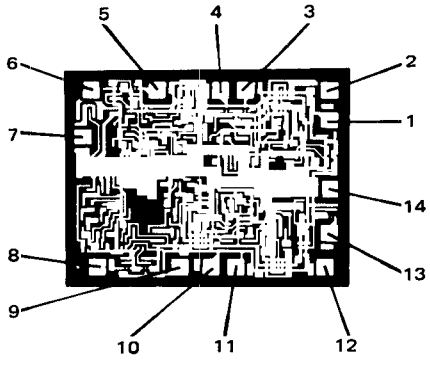


t_{pd} = 9.5-22 ns typ
P_D = 125 mW typ/pkg

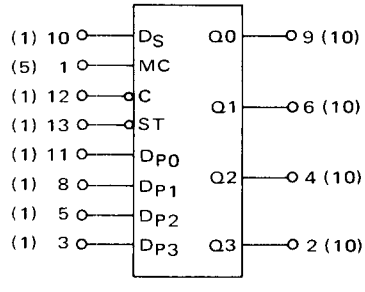
V_{CC} = Pin 14
GND = Pin 7

MCC4012/MCC4312
4 Bit Shift Register

58 x 74
(43L)



PIN CONNECTIONS



t_{pd} = 22 ns typ/bit
P_D = 180 mW typ/pkg

V_{CC} = Pin 14
GND = Pin 7

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