

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: $5k\text{Å} \pm 1k\text{Å}$
- D. Metallization: Aluminum
- E. Metallization thickness: $12k\text{Å} \pm 2k\text{Å}$
- 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)

MTTL – MSI

MCC5400 Series (–55 to +125°C) MCC7400 Series (0 to +75°C)

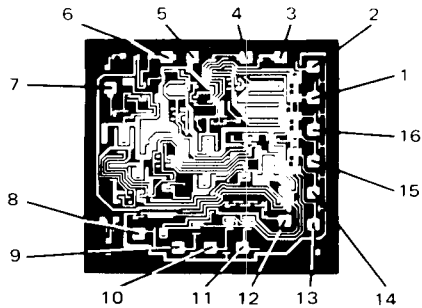
MC5400/7400 Series MSI circuits comprise a family of transistor-transistor logic similar in design to the SSI series but more complex in function. The family has a medium operating speed (15-30 MHz clock rate), good external noise immunity, high fan out, and capability of driving capacitive loads of up to 600 pF.

Type		Function	Wafer Mask Set #	Chip Size (Mils)
0 to 75°C	–55 to +125°C			
MCC74H87	MCC54H87	4-Bit True/Complement Zero/One Element	8GM	69x72
MCC7413	MCC5413	Dual 4-Input NAND Gate Schmitt Trigger	7KB	40x42
MCC7414	MCC5414	Hex Schmitt Trigger Inverter	2JA	56x62
MCC7441A	MCC5441A	BCD to Decimal Decoder/High Level Driver	17F	74x79
MCC7442	MCC5442	BCD to Decimal Decoder	6FE	64x66
MCC7443	MCC5443	Excess Three-to-Decimal Decoder	29R	68x67
MCC7444	MCC5444	Excess Three Gray to Decimal Decoder	29R	68x67
MCC7445	MCC5445	BCD to Decimal Decoder/Driver	96M	79x87
MCC7446	MCC5446	BCD to seven Segment Decoder/Driver	83M	65x76
MCC7447	MCC5447	BCD to seven Segment Decoder/Driver	83M	65x76
MCC7448	MCC5448	BCD to seven Segment Decoder/Driver	01L	88x79
MCC7449	MCC5449	BCD to seven Segment Decoder/Driver	01L	88x79
MCC7475	MCC5475	Quad Latch	7AJ	62x68
MCC7480	MCC5480	Gated Full Adder (1-Bit)	10L	58x58
MCC7481	MCC5481	16-Bit Scratch Pad Memory	1PR	77x82
MCC17482	MCC15482	2 Bit Full Adder	13E	65x82
MCC27482	MCC25482	2 Bit Full Adder	13E	65x82
MCC7483	MCC5483	4-Bit Full Adder	10M	69x80
MCC7484	MCC5484	16-Bit Scratch Pad Memory	1PR	77x82
MCC7485	MCC5485	4-Bit Magnitude Comparator	7GK	65x77
MCC7486	MCC5486	Quadruple 2-Input Exclusive OR Gate	8GM	69x72
MCC7490A	MCC5490A	Decade Counter	3HT	69x71
MCC7491A	MCC5491A	8-Bit Shift Register	05R	59x72
MCC7492A	MCC5492A	Divide by 12 Counter	3HT	69x71
MCC7493A	MCC5493A	4-Bit Binary Counter	3HT	69x71
MCC7494	MCC5494	4-Bit Shift Register	66N	66x76
MCC7495A	MCC5495A	4-Bit Shift Register (Parallel Access)	6RP	64x88
MCC7496	MCC5496	5-Bit Shift Register	8BG	86x77
MCC7497	MCC5497	Synchronous 6-Bit Binary Rate Multiplier	7MG	94x101
MCC74100	MCC54100	Dual 4-Bit Latch	31R	70x72
MCC74120	MCC54120	Dual Pulse Synchronizers/Drivers	7HG	68x69
MCC74121	MCC54121	Monostable Multivibrator	97M	50x53
MCC74122	MCC54122	Retriggerable Monostable Multivibrator	6GR	52x53
MCC74123	MCC54123	Dual Retriggerable Monostable Multivibrator	3HA	58x100
MCC74132	MCC54132	Quadruple 2-Input NAND Schmitt Trigger	1KD	49x52
MCC74136	MCC54136	Quadruple 2-Input Exclusive OR Gate (O.C.)	8GM	69x72
MCC74141	MCC54141	BCD to Decimal Decoder/Driver	8HF	77x78
MCC74145	MCC54145	BCD to Decimal Decoder/Driver	96M	79x87
MCC74150	MCC54150	16 Channel Data Selector/Multiplexer	68N	64x80

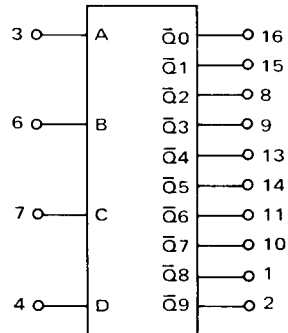
(continued)

MCC7441A/MCC5441A
BCD to Decimal Decoder/High Level Driver

74 x 79
(17F)



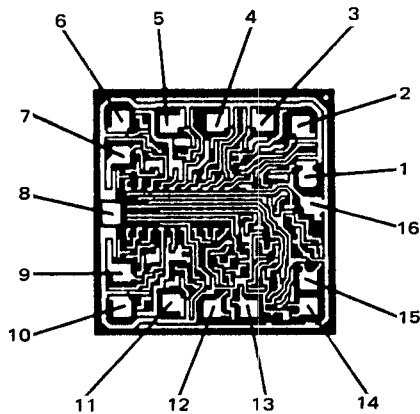
PIN CONNECTIONS



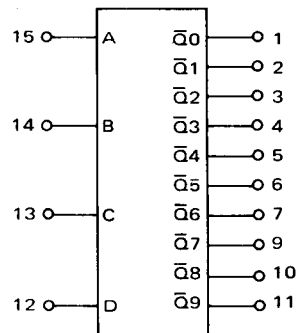
VCC = Pin 5
GND = Pin 12

MCC7442/MCC5442
BCD to Decimal Decoder

64 x 66
(6FE)



PIN CONNECTIONS



VCC = Pin 16
Gnd = Pin 8