

MECL III MC1600 Series

MC1600 Series (–30°C to –85°C)

The requirement for digital systems with ever higher performance has increased the need for high-speed integrated circuits. The industry has recognized that the only economical way to obtain high operating system speed is through the use of emitter-coupled logic. Motorola offers a state-of-the-art, emitter-coupled logic family with subnanosecond propagation delays — MECL III.

MECL III circuit design is similar to that used is the popular MECL 10,000 family. In the MECL III line, as well as MECL 10,000, advanced processing techniques are employed and the capability for driving low-impedance terminated lines is provided. MECL III is recommended for new designs.

FUNCTIONS AND CHARACTERISTICS (V_{CC} = 0, V_{EE} = –5.2 V, T_A = 25°C unless otherwise noted).

| Function | Type 1 –30° to –85°C | Loading Factor # Each Output | Propagation Delay 50-ohm L. ns typ | Pow. Dis. (No L.) mW typ/pkg | Case |
|--|----------------------------|---------------------------------------|--|---------------------------------------|----------|
| High Bandwidth Quad 2-Input OR/NOR Gate | MC1601 | — | 0.75 | 600 | 650 |
| High Bandwidth Triple 2-2-3-Input OR/NOR Gate | MC1602 | — | 0.75 | 460 | 650 |
| High Bandwidth 4-5-Input OR/NOR Gate | MC1603 | — | 0.75 | 320 | 650 |
| High Bandwidth Triple Line Receiver | MC1604 | — | 0.75 | 460 | 650 |
| Dual Type D Master-Slave Flip-Flop | MC1605 | — | 500 MHz | 525 | 650 |
| Voltage Controlled Oscillator | MC1648 | — | *225 MHz | 150 | 632, 646 |
| Dual A/D Comparator | MC1650 | 70 | 3.5 | 275 | 620 |
| Dual A/D Comparator | MC1651 | 70 | 3.0 | 275 | 620 |
| Binary Counter | MC1654 | 70 | *325 MHz | 750 | 620 |
| Voltage-Controlled Multivibrator | MC1658 | 70 | *150 MHz | 125 | 620 648 |
| Dual 4-Input OR/NOR Gate | MC1660 | 70 | 1.1 | 120 | 620 |
| Quad 2-Input NOR Gate | MC1662 | 70 | 1.1 | 240 | 620 |
| Quad 2-Input OR Gate | MC1664 | 70 | 1.1 | 240 | 620 |
| Dual Clocked R-S Flip-Flop | MC1666 | 70 | 1.8 | 220 | 620 |
| Dual Clocked Latch | MC1668 | 70 | 1.8 | 220 | 620 |
| Master-Slave Type D Flip-Flop | MC1670 | 70 | *350 MHz | 220 | 620 |
| Triple 2-Input Exclusive OR Gate | MC1672 | 70 | 1.3 | 220 | 620 |
| Triple 2-Input Exclusive NOR Gate | MC1674 | 70 | 1.3 | 220 | 620 |
| Bi-Quinary Counter | MC1678 | 70 | *350 MHz | 750 | 620 |
| Dual 4-5-Input OR/NOR Gate | MC1688 | 70 | 0.8 | 125 | 650 |
| UHF Prescaler Type D Flip-Flop | MC1690 | 70 | *500 MHz min | 200 | 620 |
| Quad Line Receiver | MC1692 | 70 | 1.1 | 220 | 620 |
| 4-Bit Shift Register | MC1694 | 70 | *325 MHz | 750 | 620 |
| 1 GHz Divide-By-Ten Counter | MC1696 | — | *1 GHz min | 650 | 650 |
| Divide-By-Four Gigahertz Counter | MC1699 | — | *1.2 GHz | 650 | 650 |

1 L suffix denotes Dual In-Line Ceramic Package, F suffix denotes Ceramic Flat Package, P suffix denotes Dual In-Line Plastic Package. (i.e., MC1600L = Ceramic Dual In-Line Package, MC1600F = Ceramic Flat Package, MC1600P = Plastic Dual In-Line Package).

• Requires Heat Sink — IERC-LIC-214A2WCB or equivalent. # Loading Factors are based on:

* Toggle Frequency

1. Full load output current, I_L = –25 mAdc max
2. Maximum input current, I_{in} = 350 μAdc

GENERAL FEATURES

- Gate Switching Speeds of 1.0 ns typical
- Capability of Driving Terminated Lines with Impedance as Low as 50 Ohms
- Flip-Flop Toggle Rate Greater Than 500 MHz
- Operation with Unused Inputs Left Open
- Compatibility with MECL 10,000 Series
- Counting Speeds to above 1 GHz

Cases