

MULTIBYTE™ family characteristics**Family specifications****GENERAL**

These family specifications cover the common electrical ratings and characteristics of the entire MB family, unless otherwise specified in the individual device data sheet.

INTRODUCTION

The MB Advanced BiCMOS family combines the low power dissipation and low noise of BiCMOS with the high speed and high output drive of bipolar products.

The basic family of devices designated as 74ABTXXX will operate at TTL logic input levels or CMOS logic input levels. The devices operate from a power supply of 4.5 to 5.5V.

HANDLING BICMOS DEVICES

Inputs and outputs are protected against electrostatic effects in a wide variety of device-handling situations.

However, to be totally safe, it is wise to use ESD handling precautions at all times.

ABSOLUTE MAXIMUM RATINGS^{1, 2}

| SYMBOL | PARAMETER | CONDITIONS | RATING | UNIT |
|------------------|--------------------------------|-----------------------------|--------------|------|
| V _{CC} | DC supply voltage | | -0.5 to +7.0 | V |
| I _{IK} | DC input diode current | V _I < 0 | -18 | mA |
| V _I | DC input voltage ³ | | -1.2 to +7.0 | V |
| I _{OK} | DC output diode current | V _O < 0 | -50 | mA |
| V _{OUT} | DC output voltage ³ | output in Off or High state | -0.5 to +5.5 | V |
| I _{OUT} | DC output current | output in Low state | 128 | mA |
| T _{stg} | Storage temperature range | | -65 to 150 | °C |

NOTES:

- Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C.
- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | LIMITS | | UNIT |
|------------------|--------------------------------------|--------|-----------------|------|
| | | MIN | MAX | |
| V _{CC} | DC supply voltage | 4.5 | 5.5 | V |
| V _I | Input voltage | 0 | V _{CC} | V |
| V _{IH} | High-level input voltage | 2.0 | | V |
| V _{IL} | Low-level Input voltage | | 0.8 | V |
| I _{OH} | High-level output current | | -32 | mA |
| I _{OL} | Low-level output current | | 64 | mA |
| Δt/Δv | Input transition rise or fall rate | 0 | 10 | ns/V |
| T _{amb} | Operating free-air temperature range | -40 | +85 | °C |

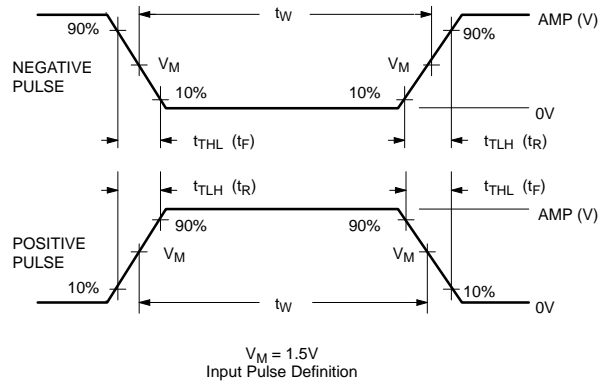
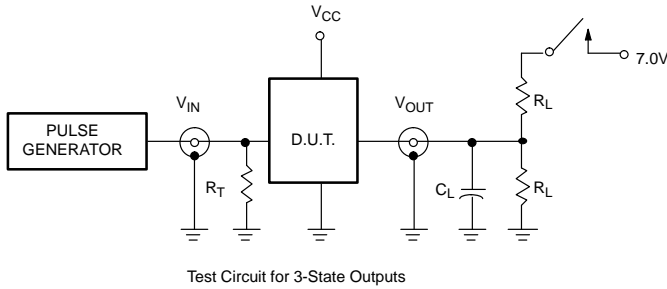
DC ELECTRICAL CHARACTERISTICS

| SYMBOL | PARAMETER | TEST CONDITIONS | LIMITS | | | | | UNIT |
|------------------------------------|--|---|--------------------------|-------|------|-----------------------------------|------|------|
| | | | T _{amb} = +25°C | | | T _{amb} = -40°C to +85°C | | |
| | | | MIN | TYP | MAX | MIN | MAX | |
| V _{IK} | Input clamp voltage | V _{CC} = 4.5V; I _{IK} = -18mA | | -0.9 | -1.2 | | -1.2 | V |
| V _{OH} | High-level output voltage | V _{CC} = 4.5V; I _{OH} = -3mA; V _I = V _{IL} or V _{IH} | 2.5 | 2.9 | | 2.5 | | V |
| | | V _{CC} = 5.0V; I _{OH} = -3mA; V _I = V _{IL} or V _{IH} | 3.0 | 3.4 | | 3.0 | | V |
| | | V _{CC} = 4.5V; I _{OH} = -32mA; V _I = V _{IL} or V _{IH} | 2.0 | 2.4 | | 2.0 | | V |
| V _{OL} | Low-level output voltage | V _{CC} = 4.5V; I _{OL} = 64mA; V _I = V _{IL} or V _{IH} | | 0.42 | 0.55 | | 0.55 | V |
| V _{RST} | Power-up output low voltage ³ | V _{CC} = 5.5V; I _{OL} = 1mA; V _I = GND or V _{CC} | | 0.13 | 0.55 | | 0.55 | V |
| I _I | Input leakage current | Control pins | | ±0.01 | ±1.0 | | ±1.0 | μA |
| | | Data pins | | 5 | 100 | | 100 | μA |
| I _{OFF} | Power-off leakage current | V _{CC} = 0V; V _O or V _I ≤ 4.5V | | ±5.0 | ±100 | | ±100 | μA |
| I _{PU/PD} | Power-up/down 3-State output current ⁴ | V _{CC} = 2.1V; V _O = 0.5V; V _I = GND or V _{CC} ; V _{OE} = Don't care | | ±5.0 | ±50 | | ±50 | μA |
| I _{IH} + I _{OZH} | 3-State output High current | V _{CC} = 5.5V; V _O = 2.7V; V _I = V _{IL} or V _{IH} | | 5.0 | 50 | | 50 | μA |
| I _{IL} + I _{OZL} | 3-State output Low current | V _{CC} = 5.5V; V _O = 0.5V; V _I = V _{IL} or V _{IH} | | -5.0 | -50 | | -50 | μA |
| I _{CEX} | Output High leakage current | V _{CC} = 5.5V; V _O = 5.5V; V _I = GND or V _{CC} | | 5.0 | 50 | | 50 | μA |
| I _O | Output current ¹ | V _{CC} = 5.5V; V _O = 2.5V | -50 | -70 | -180 | -50 | -180 | mA |
| I _{CCH} | Quiescent supply current | V _{CC} = 5.5V; Outputs High, V _I = GND or V _{CC} | | 120 | 250 | | 250 | μA |
| I _{CCL} | | V _{CC} = 5.5V; Outputs Low, V _I = GND or V _{CC} | | 39 | 60 | | 60 | mA |
| I _{CCZ} | | V _{CC} = 5.5V; Outputs 3-State; V _I = GND or V _{CC} | | 120 | 250 | | 250 | μA |
| ΔI _{CC} | Additional supply current per input pin ² | V _{CC} = 5.5V; one input at 3.4V, other inputs at V _{CC} or GND | | 0.5 | 1.5 | | 1.5 | mA |

NOTES:

1. Not more than one output should be tested at a time, and the duration of the test should not exceed one second.
2. This is the increase in supply current for each input at 3.4V.
3. For valid test results, data must not be loaded into the flip-flops (or latches) after applying the power.
4. This parameter is valid for any V_{CC} between 0V and 2.1V with a transition time of up to 10msec. From V_{CC} = 2.1V to V_{CC} = 5V ± 10% a transition time of up to 100μsec is permitted.

TEST CIRCUIT AND WAVEFORM



SWITCH POSITION

| TEST | SWITCH |
|-----------|--------|
| t_{PLZ} | closed |
| t_{pZL} | closed |
| All other | open |

DEFINITIONS

- R_L = Load resistor; see AC CHARACTERISTICS for value.
- C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
- R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

| FAMILY | INPUT PULSE REQUIREMENTS | | | | |
|--------|--------------------------|-----------|-------|-------|-------|
| | Amplitude | Rep. Rate | t_w | t_R | t_F |
| MB | 3.0V | 1MHz | 500ns | 2.5ns | 2.5ns |

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