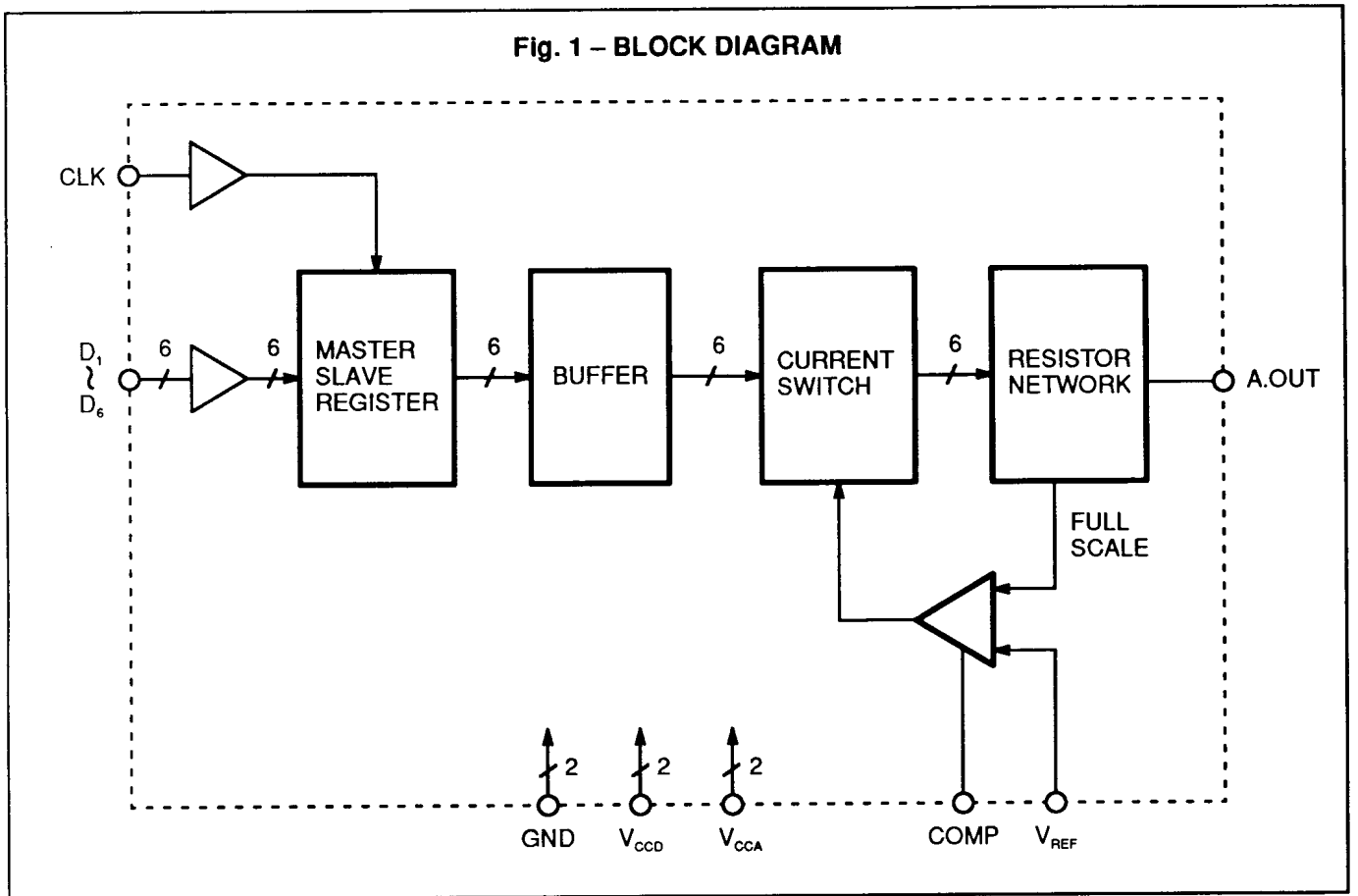


Fig. 1 – BLOCK DIAGRAM



RECOMMENDED OPERATING CONDITIONS

| Parameter | | Symbol | Value | | | Unit |
|----------------------------------|----------|------------------------|-------|------|------|------|
| | | | Min | Typ | Max | |
| Power Supply Voltage | | V_{CCA} V_{CCD} | 4.75 | 5.00 | 5.25 | V |
| Analog Reference Voltage*1 | | V_{REF} | 3.70 | 4.00 | 4.30 | V |
| Clock Pulse Width at High level | MB40776H | t_{w^+} | 8.3 | | | ns |
| | MB40776 | | 25 | | | |
| Clock Pulse Width at Low level | MB40776H | t_{w^-} | 8.3 | | | ns |
| | MB40776 | | 25 | | | |
| Data Setup Time | MB40776H | t_s | 10.0 | | | ns |
| | MB40776 | | 12.5 | | | |
| Data Hold Time | MB40776H | t_h | 4.0 | | | ns |
| | MB40776 | | 12.5 | | | |
| Operating Temperature | | T_A | 0 | | 70 | °C |
| Phase Compensation Capacitance*2 | | C_{COMP} | 1 | | | μF |

NOTE: *1 : $V_{CC} - V_{REF} \leq 1.2V$
*2 : The capacitance should be connected between COMP and GND.

ELECTRICAL CHARACTERISTICS

ANALOG DC CHARACTERISTICS

(V_{CC}=4.75 to 5.25V, T_A=0 to 70°C)

| Parameter | Symbol | Condition | Value | | | Unit |
|----------------------------------|------------------|---|-------------------------|------------------|-------------------------|------|
| | | | Min | Typ | Max | |
| Resolution | | | | | 6 | bits |
| Linearity Error | LE | DC | | | ±0.8 | % |
| Full-Scale Analog Output Voltage | V _{OFS} | V _{CC} =5.000V V _{REF} =3.976V | V _{CCA} -0.015 | V _{CCA} | V _{CCA} +0.015 | V |
| Zero-Scale Analog Output Voltage | V _{OZS} | V _{CC} =5.000V V _{REF} =3.976V | 3.932 | 3.992 | 4.052 | V |
| Reference Input Current | I _{REF} | V _{REF} =4.00V | | | 10 | μA |
| Output Impedance | Z _{OUT} | T _A =25°C | 70 | 80 | 90 | Ω |

DIGITAL DC CHARACTERISTICS

(V_{CC}=4.75 to 5.25V, T_A=0 to 70°C)

| Parameter | Symbol | Condition | Value | | | Unit |
|--------------------------|------------------|---|-------|-----|-----|------|
| | | | Min | Typ | Max | |
| High-level Input Voltage | V _{IHD} | | 2.0 | | | V |
| Low-level Input Voltage | V _{ILD} | | | | 0.8 | V |
| Maximum Input Current | I _{ID} | V _{CC} =5.25V V _{ID} =7.00V | | 0 | 100 | μA |
| High-level Input Current | I _{IHD} | V _{CC} =5.25V V _{IHD} =2.70V | | 0 | 20 | μA |
| Low-level Input Current | I _{ILD} | V _{CC} =5.25V V _{ILD} =0.40V | -400 | -40 | | μA |
| Power Supply Current | I _{CC} | V _{REF} =4.05V | | 43* | 65 | mA |

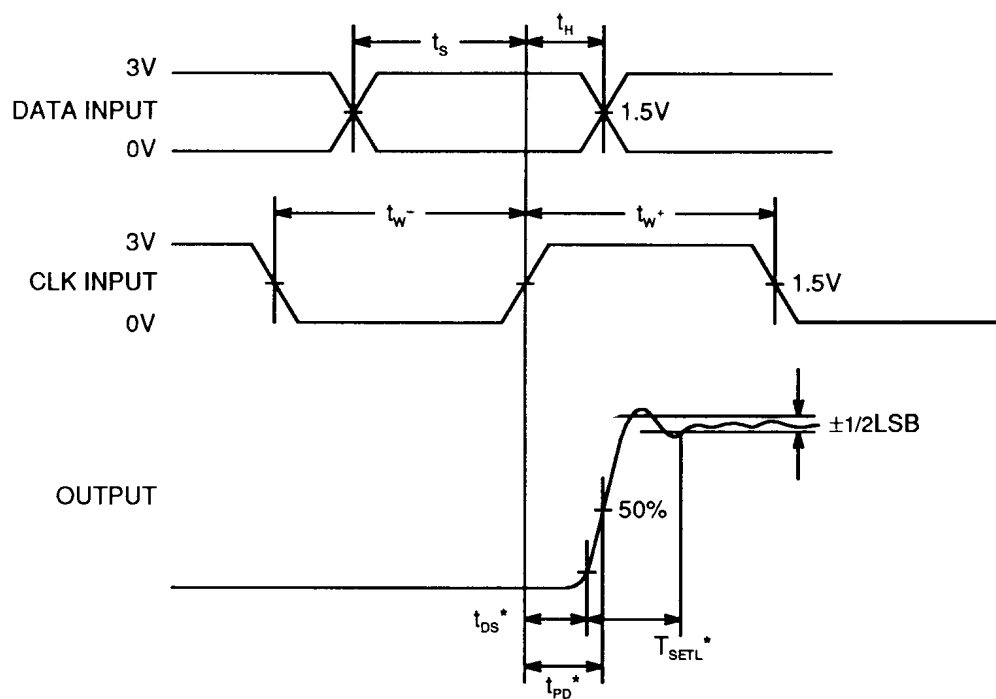
NOTE: *V_{CC}=5.00V, V_{REF}=4.00V

SWITCHING CHARACTERISTICS

($V_{CC}=4.75$ to $5.25V$, $T_A=0$ to $70^{\circ}C$)

| Parameter | Symbol | Condition | Value | | | Unit |
|-------------------------|----------|-----------|-------|-----|-----|------|
| | | | Min | Typ | Max | |
| Maximum Conversion Rate | MB40776H | FS | 60 | | | MSPS |
| | MB40776 | | 20 | 30 | | |

Fig. 2 – TIMING DIAGRAM



NOTE: *These values are not specified because they depend on application circuit.

OUTPUT VOLTAGE

($V_{CCA}=5.000V$, $V_{REF}=3.976V$)

| Step | Input Code | OUTPUT VOLTAGE (V) |
|------|------------|--------------------|
| 0 | 000000 | 3.992 |
| 1 | 000001 | 4.008 |
| | ⋮ | ⋮ |
| 31 | 011111 | 4.488 |
| 32 | 100000 | 4.504 |
| 33 | 100001 | 4.520 |
| | ⋮ | ⋮ |
| 62 | 111110 | 4.984 |
| 63 | 111111 | 5.000 |

NOTE: 1LSB=16mV

Fig. 5 – IDEAL OUTPUT OPERATION

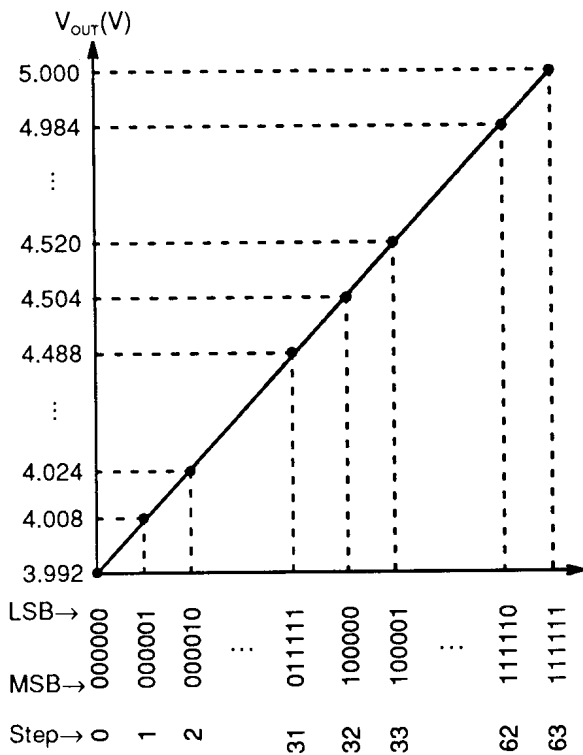
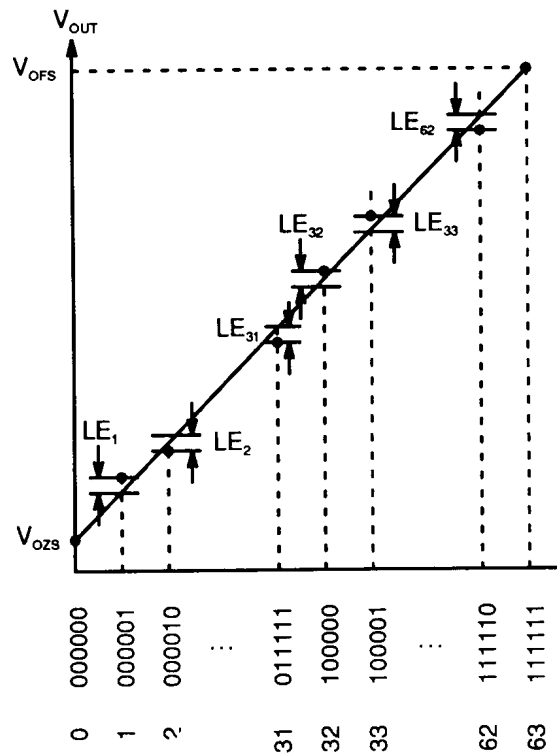


Fig. 6 – PRACTICAL OUTPUT OPERATION



$$\text{Linearity Error} = \frac{|LE_n|_{\max}}{|FS|}$$

TYPICAL CHARACTERISTICS CURVES

Fig. 7 – POWER SUPPLY CURRENT vs. TEMPERATURE

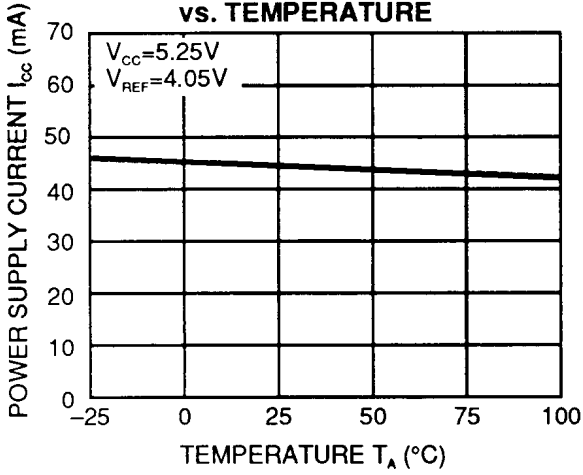


Fig. 8 – LINEARITY ERROR vs. TEMPERATURE

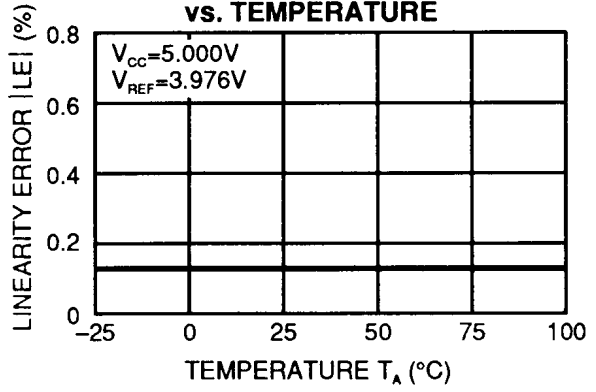


Fig. 9 – OUTPUT IMPEDANCE vs. TEMPERATURE

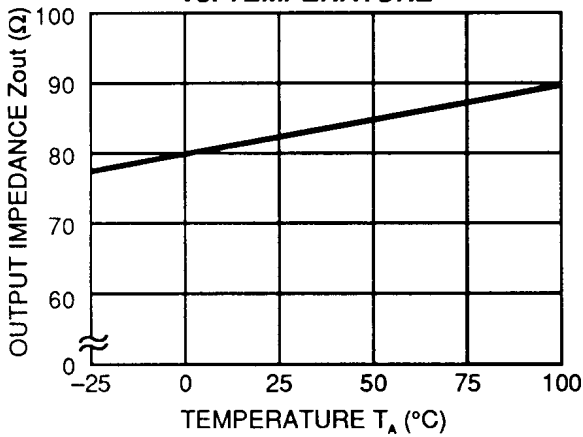


Fig. 10 – ZERO-SCALE ANALOG OUTPUT VOLTAGE vs. TEMPERATURE

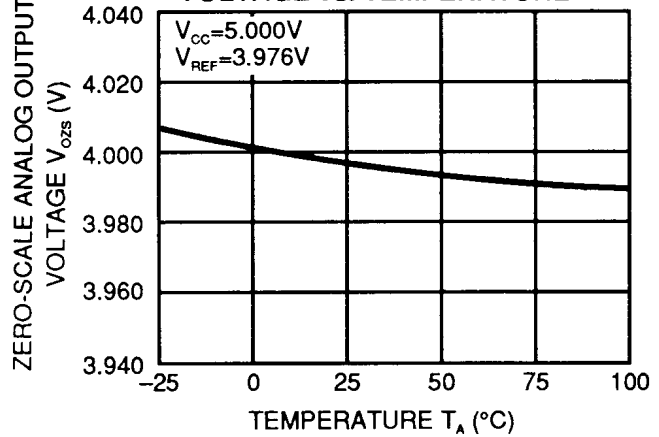


Fig. 11 – FULL-SCALE ANALOG OUTPUT VOLTAGE vs. TEMPERATURE

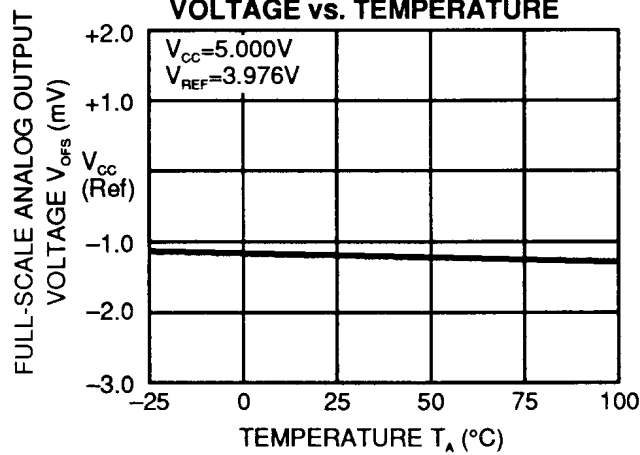


Fig. 12 – DELAY TIME vs. TEMPERATURE

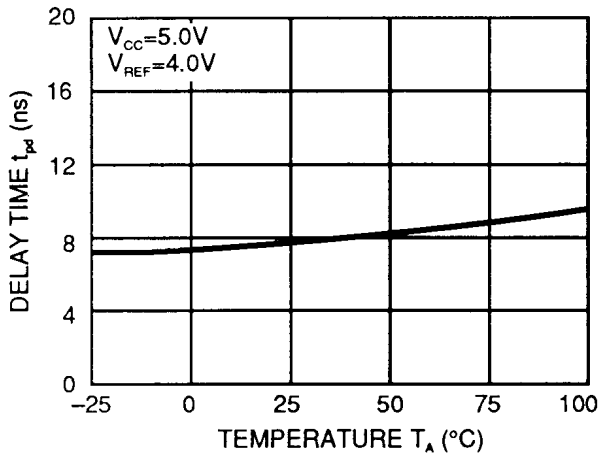


Fig. 13 – DELAY TIME vs. POWER SUPPLY VOLTAGE

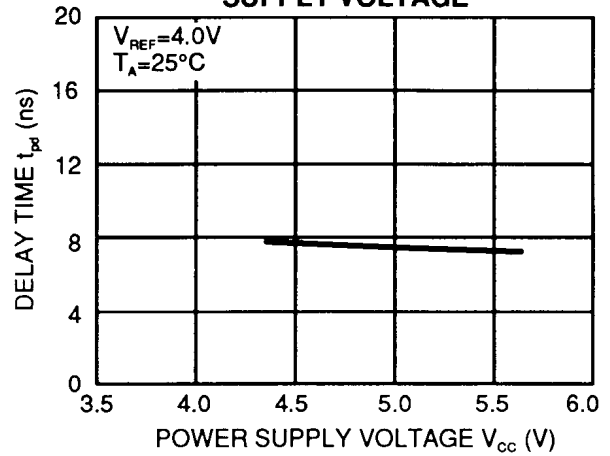


Fig. 14 – CLOCK PULSE WIDTH vs. TEMPERATURE

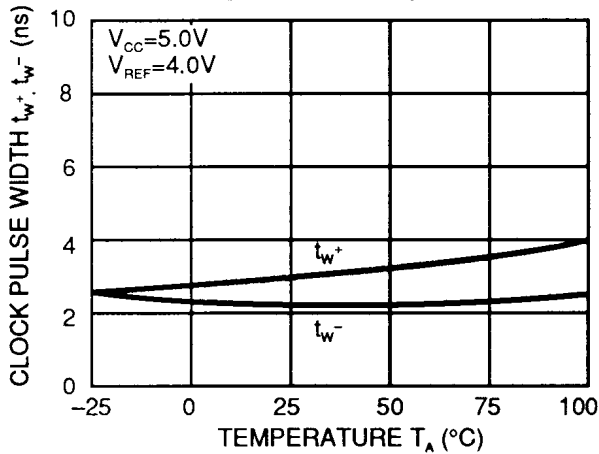


Fig. 15 – CLOCK PULSE WIDTH vs. POWER SUPPLY VOLTAGE

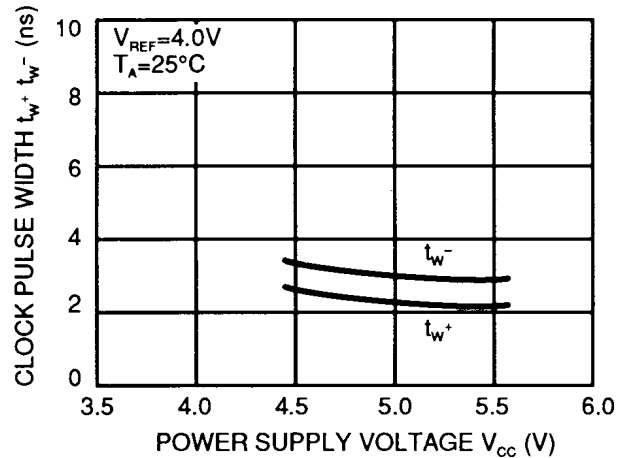
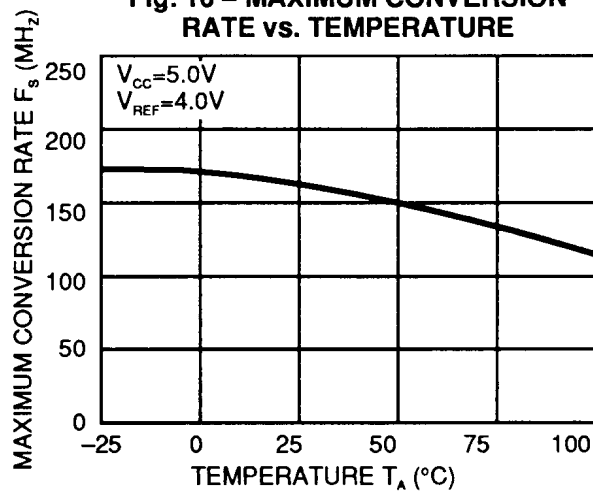


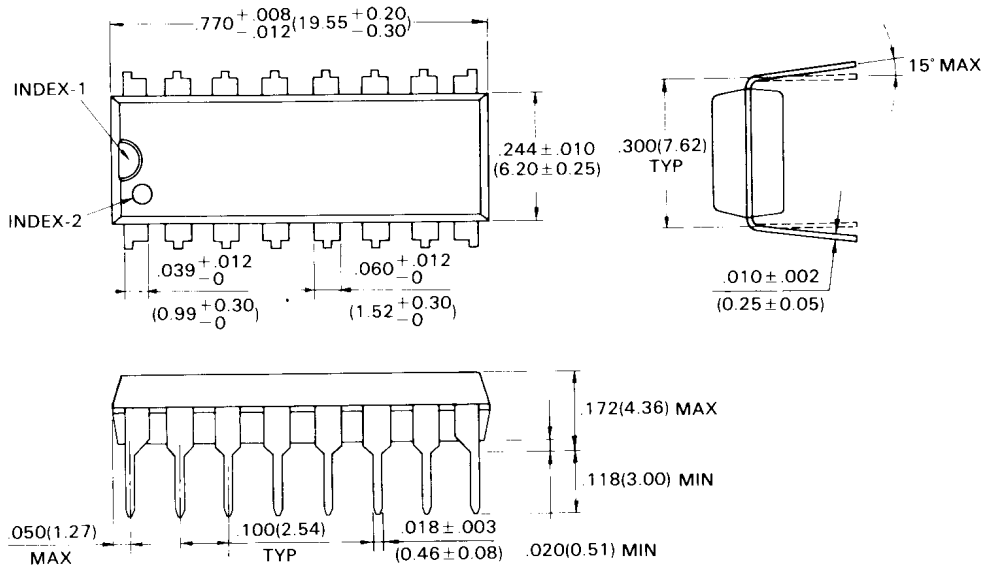
Fig. 16 – MAXIMUM CONVERSION RATE vs. TEMPERATURE



MB40776H
MB40776

PACKAGE DIMENSIONS

16-LEAD PLASTIC DUAL IN-LINE PACKAGE
(CASE No.: DIP-16P-M04)

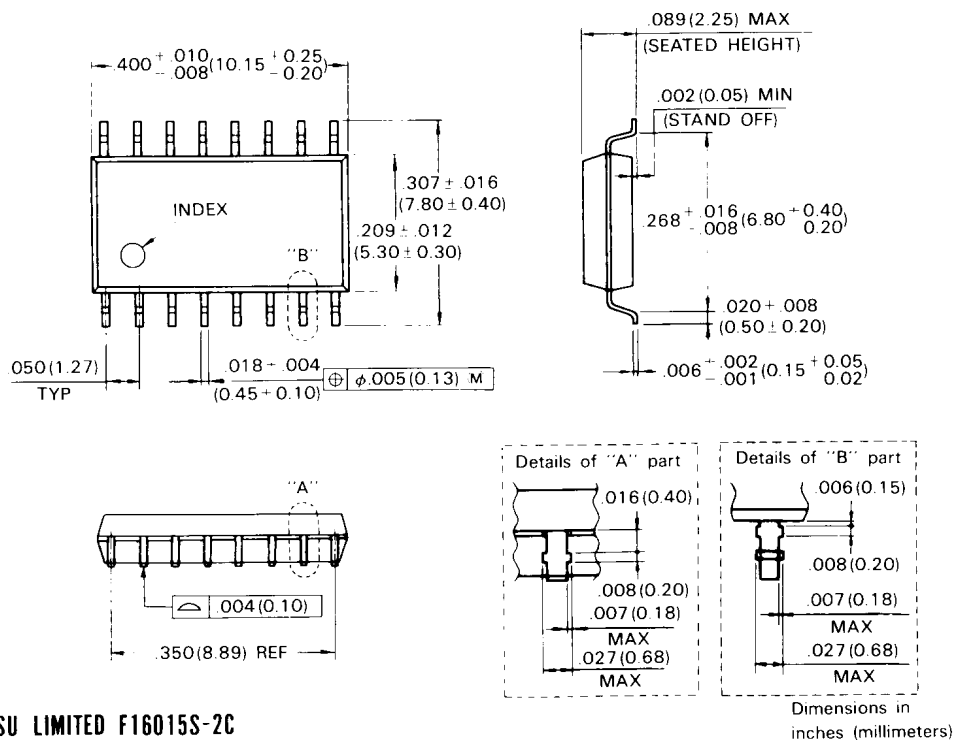


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Dimensions in
inches (millimeters)

PACKAGE DIMENSIONS

16-LEAD PLASTIC FLAT PACKAGE (CASE No.: FPT-16P-M06)



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