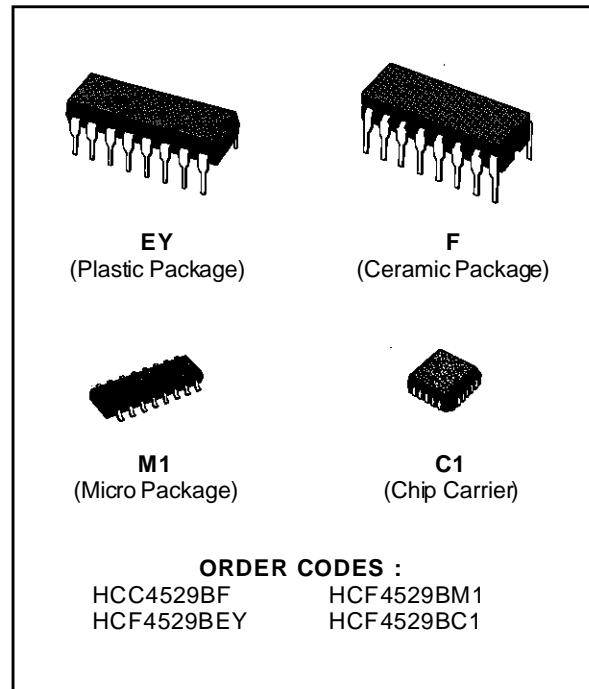


**DUAL 4-CHANNEL OR SINGLE 8-CHANNEL  
ANALOG DATA SELECTOR**

- DATA PATHS ARE BIDIRECTIONAL
- 10 MHz OPERATION (typical)
- 3-STATE OUTPUTS
- "ON" RESISTANCE 125  $\Omega$  TYPICAL @ 15V
- SUPPLY VOLTAGE RANGE = 3Vdc TO 18Vdc

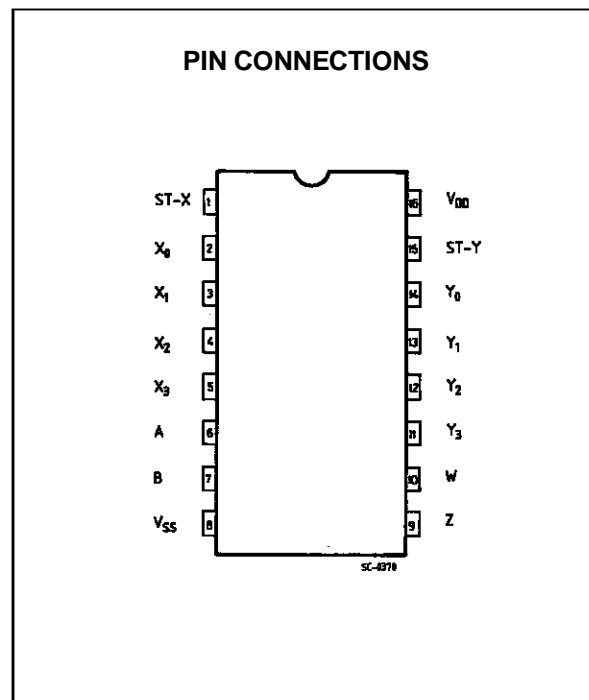


**DESCRIPTION**

The HCC4529B (extended temperature range) and HCF4529b (intermediate temperature range) are monolithic integrated circuits available in 16-lead dual in line plastic or ceramic package and plastic micropackage.

The HCC/HCF4529b is a DUAL 4-CHANNEL or 8-CHANNEL device. One of the two possible functions can be selected by a proper input coding. For the single 8-bit mode Z and W output must be tied together.

HCC/HCF4529B is suitable for digital as well as analogue applications, including 1 of 4 and 1 of 8 data selector functions. Dual binary to 1 of 4 or single binary to 1 of 8 decoder applications can be implemented because the device allow analogue and bidirectional operation.



# HCC/HCF4529B

## ABSOLUTE MAXIMUM RATING

| Symbol            | Parameter  | Value                         | Unit |
|-------------------|--|-------------------------------|------|
| V <sub>DD</sub> * | Supply Voltage: <b>HCC</b> Types<br><b>HCF</b> Types   | -0.5 to +20                   | V    |
|                   |  | -0.5 to +18                   | V    |
| V <sub>i</sub>    | Input Voltage  | -0.5 to V <sub>DD</sub> + 0.5 | V    |
| I <sub>I</sub>    | DC Input Current (any one input)   | ± 10                          | mA   |
| P <sub>tot</sub>  | Total Power Dissipation (per package)<br>Dissipation per Output Transistor<br>for Top = Full Package Temperature Range | 200                           | mW   |
|                   |  | 100                           | mW   |
| T <sub>op</sub>   | Operating Temperature: <b>HCC</b> Types<br><b>HCF</b> Types  | -55 to +125                   | °C   |
|                   |  | -40 to +85                    | °C   |
| T <sub>stg</sub>  | Storage Temperature  | -65 to +150                   | °C   |

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for external periods may affect device reliability.

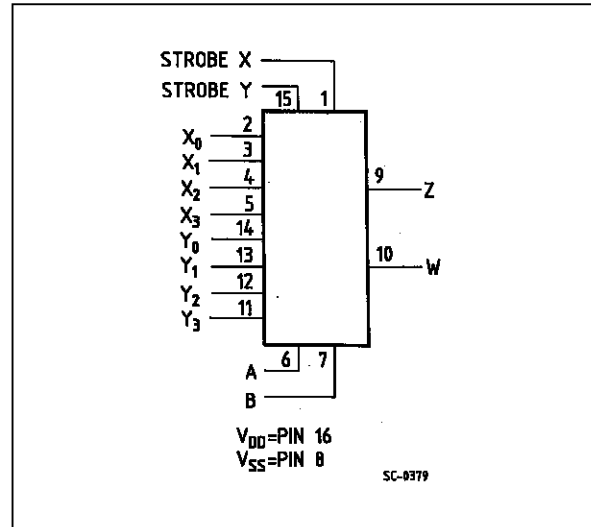
\* All voltage values are referred to V<sub>SS</sub> pin voltage.

## TRUTH TABLE

| ST <sub>X</sub> | ST <sub>Y</sub> | B | A | Z              | W  | MODE  |
|-----------------|-----------------|---|---|----------------|----|---|
| 1               | 1               | 0 | 0 | X0             | Y0 | Dual<br>4-Channel<br>Mode<br>2 Outputs                                |
| 1               | 1               | 0 | 1 | X1             | Y1 |   |
| 1               | 1               | 1 | 0 | X2             | Y2 |   |
| 1               | 1               | 1 | 1 | X3             | Y3 |   |
| 1               | 0               | 0 | 0 | X0             |    | Single<br>8-Channel<br>Mode<br>1 Output<br>(Z and W<br>tied together) |
| 1               | 0               | 0 | 1 | X1             |    |   |
| 1               | 0               | 1 | 0 | X2             |    |   |
| 1               | 0               | 1 | 1 | X3             |    |   |
| 0               | 1               | 0 | 0 | Y0             |    |   |
| 0               | 1               | 0 | 1 | Y1             |    |   |
| 0               | 1               | 1 | 0 | Y2             |    |   |
| 0               | 1               | 1 | 1 | Y3             |    |   |
| 0               | 0               | X | X | High Impedance |    |   |

X = Don't care

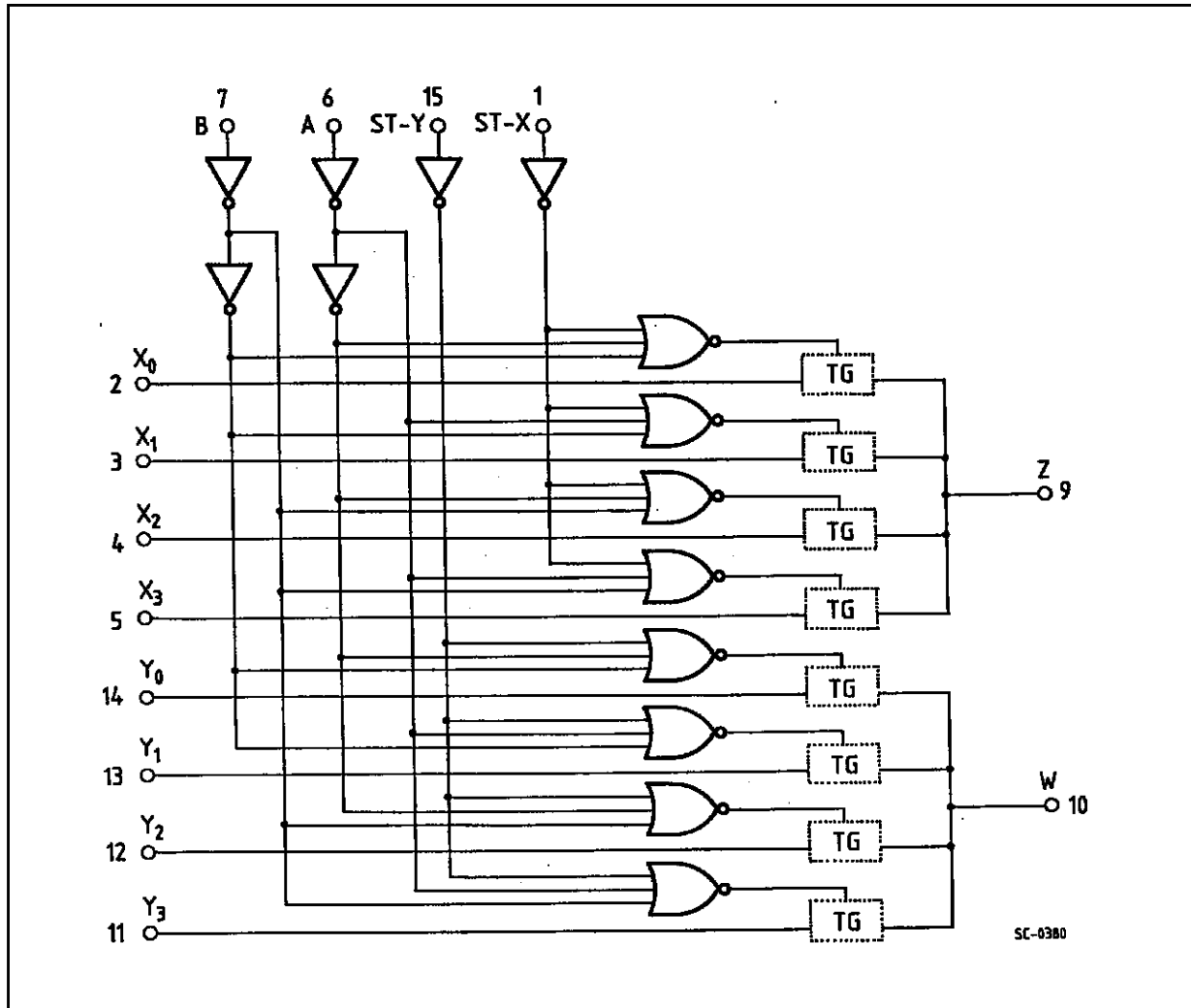
## FUNCTIONAL DIAGRAM



## RECOMMENDED OPERATING CONDITIONS

| Symbol          | Parameter   | Value                | Unit |
|-----------------|---|----------------------|------|
| V <sub>DD</sub> | Supply Voltage: <b>HCC</b> Types<br><b>HCF</b> Types        | 3 to 18              | V    |
|                 |   | 3 to 15              | V    |
| V <sub>i</sub>  | Input Voltage   | 0 to V <sub>DD</sub> | V    |
| T <sub>op</sub> | Operating Temperature: <b>HCC</b> Types<br><b>HCF</b> Types | -55 to +125          | °C   |
|                 |   | -40 to +85           | °C   |

BLOCK DIAGRAM



**STATIC ELECTRICAL CHARACTERISTICS** (over recommended operating conditions)

| Symbol                              | Parameter   |           | Test Conditions                      |  |                                      | Value              |      |       |                   |                   |                     | Unit |      |    |      |
|-------------------------------------|---|-----------|--------------------------------------|--|--------------------------------------|--------------------|------|-------|-------------------|-------------------|---------------------|------|------|----|------|
|                                     |   |           | V <sub>IS</sub><br>(V)               | V <sub>SS</sub><br>(V)   | V <sub>DD</sub><br>(V)               | T <sub>LOW</sub> * |      | 25 °C |                   |                   | T <sub>HIGH</sub> * |      |      |    |      |
|                                     |   |           |                                      |  |                                      | Min.               | Max. | Min.  | Typ.              | Max.              | Min.                |      | Max. |    |      |
| I <sub>L</sub>                      | Quiescent Current                                       | HCC Types |                                      |  | 5                                    |                    | 5    |       | 0.04              | 5                 |                     | 150  | μA   |    |      |
|                                     |   |           |                                      |  | 10                                   |                    | 10   |       | 0.04              | 10                |                     | 300  |      |    |      |
|                                     |   |           |                                      |  | 15                                   |                    | 20   |       | 0.04              | 20                |                     | 600  |      |    |      |
|                                     |   |           |                                      |  | 20                                   |                    | 100  |       | 0.08              | 100               |                     | 3000 |      |    |      |
|                                     |   | HCF Types |                                      |  | 5                                    |                    | 20   |       | 0.04              | 20                |                     | 150  |      |    |      |
|                                     |   |           |                                      |  | 10                                   |                    | 40   |       | 0.04              | 40                |                     | 300  |      |    |      |
|                                     |   |           |                                      |  | 15                                   |                    | 80   |       | 0.04              | 80                |                     | 600  |      |    |      |
| <b>SWITCH</b>                       |   |           |                                      |  |                                      |                    |      |       |                   |                   |                     |      |      |    |      |
| ON                                  | Resistance  | HCC Types | 0 ≤ V <sub>I</sub> ≤ V <sub>DD</sub> | 0  | 5                                    |                    | 880  |       | 470               | 1050              |                     | 1200 | Ω    |    |      |
|                                     |   |           |                                      |  | 10                                   |                    | 310  |       | 180               | 400               |                     | 580  |      |    |      |
|                                     |   |           |                                      |  | 15                                   |                    | 220  |       | 125               | 280               |                     | 400  |      |    |      |
|                                     |   | HCC Types |                                      |  | 0 ≤ V <sub>I</sub> ≤ V <sub>DD</sub> | 0                  | 5    |       | 880               |                   | 470                 | 1050 |      |    | 1200 |
|                                     |   |           |                                      |  |                                      |                    | 10   |       | 330               |                   | 180                 | 400  |      |    | 520  |
|                                     |   |           |                                      |  |                                      |                    | 15   |       | 230               |                   | 125                 | 280  |      |    | 360  |
| ΔON                                 | Resistance ΔR <sub>ON</sub><br>(Between any 2 channels) |           |                                      | 0  | 5                                    |                    |      |       | 10                |                   |                     | Ω    |      |    |      |
|                                     |   |           |                                      |  | 10                                   |                    |      |       | 10                |                   |                     |      |      |    |      |
|                                     |   |           |                                      |  | 15                                   |                    |      |       | 5                 |                   |                     |      |      |    |      |
| OFF Channel Leakage Current         | Any Channel OFF   | HCC Types | 0                                    | 0  | 18                                   |                    | 100  |       | ±0.1              | 100               |                     | 1000 | nA   |    |      |
|                                     | All Channel OFF (common OUT/IN)                         | HCC Types |                                      |  | 18                                   |                    | 100  |       | ±0.1              | 100               |                     | 1000 | nA   |    |      |
|                                     | Any Channel OFF   | HCC Types |                                      |  | 15                                   |                    | 300  |       | ±0.1              | 300               |                     | 1000 | nA   |    |      |
|                                     | All Channel OFF (common OUT/IN)                         | HCC Types |                                      |  | 15                                   |                    | 300  |       | ±0.1              | 300               |                     | 1000 | nA   |    |      |
| <b>CONTROL (Address or Inhibit)</b> |   |           |                                      |  |                                      |                    |      |       |                   |                   |                     |      |      |    |      |
| V <sub>IL</sub>                     | Input Low Voltage                                       |           | = V <sub>DD</sub> thru 1KΩ           | R <sub>L</sub> =1KΩ to V <sub>SS</sub><br>I <sub>IS</sub> < 2μA<br>(On All OFF Channels) | 5                                    |                    | 1.5  |       |                   | 1.5               |                     | 1.5  | V    |    |      |
|                                     |   |           |                                      |  | 10                                   |                    | 3    |       |                   | 3                 |                     | 3    |      |    |      |
|                                     |   |           |                                      |  | 15                                   |                    | 4    |       |                   | 4                 |                     | 4    |      |    |      |
| V <sub>IH</sub>                     | Input High Voltage                                      |           |                                      |  | 5                                    | 3.5                |      | 3.5   |                   |                   | 3.5                 | V    |      |    |      |
|                                     |   |           |                                      |  | 10                                   | 7                  |      | 7     |                   |                   | 7                   |      |      |    |      |
|                                     |   |           |                                      |  | 15                                   | 11                 |      | 11    |                   |                   | 11                  |      |      |    |      |
| I <sub>IH</sub> , I <sub>IL</sub>   | Input Leakage Current                                   | HCC Types | V <sub>I</sub> = 0/18V               |  | 18                                   |                    | ±0.1 |       | ±10 <sup>-3</sup> | ±0.1              |                     | ±1   | μA   |    |      |
|                                     |   | HCF Types |                                      |  | V <sub>I</sub> = 0/15V               | 15                 |      | ±0.3  |                   | ±10 <sup>-3</sup> | ±0.3                |      |      | ±1 |      |
| C <sub>I</sub>                      | Input Capacitance                                       |           | Any Input                            |  |                                      |                    |      |       | 5                 | 7.5               |                     | pF   |      |    |      |

\* T<sub>LOW</sub> = -55 °C for HCC device; -40 °C for HCF device.

\* T<sub>HIGH</sub> = +125 °C for HCC device; +85 °C for HCF device.

The Noise Margin for both "1" and "0" level is: 1V min. with V<sub>DD</sub> = 5V, 2V min. with V<sub>DD</sub> = 10V, 2.5V min. with V<sub>DD</sub> = 15V

**DYNAMIC ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ ,  $C_L = 50\text{ pF}$ ,  $R_L = 200\text{ K}\Omega$ , typical temperature coefficient for all  $V_{DD}$  values is  $03\text{ } \%/^{\circ}\text{C}$ , all input rise and fall times =  $20\text{ ns}$ )

| Symbol                 | Parameter  | Test Conditions |              | Value |                         |      | Unit |
|------------------------|--|-----------------|--------------|-------|-------------------------|------|------|
|                        |  | $V_{SS}$ (V)    | $V_{DD}$ (V) | Min.  | Typ.                    | Max. |      |
| $t_{PLH}$<br>$t_{PHL}$ | $V_{in}$ to $V_{out}$ Propagation Delay Time<br>( $C_L = 50\text{ pF}$ , $R_L = 1\text{ K}\Omega$ )  | 0               | 5            |       | 20                      | 40   | ns   |
|                        |  |                 | 10           |       | 10                      | 20   |      |
|                        |  |                 | 15           |       | 8                       | 15   |      |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay Time, Control to Output,<br>$V_{in} = V_{DD}$ or $V_{SS}$<br>( $V_{in} \leq 10\text{ Vdc}$ , $C_L = 50\text{ pF}$ , $R_L = 1\text{ K}\Omega$ )   | 0               | 5            |       | 200                     | 400  | ns   |
|                        |  |                 | 10           |       | 80                      | 160  |      |
|                        |  |                 | 15           |       | 50                      | 120  |      |
|                        | Crosstalk, Control to Output<br>( $C_L = 50\text{ pF}$ , $R_L = 1\text{ K}\Omega$ , $R_{out} = 10\text{ K}\Omega$ )  | 0               | 5            |       | 5                       |      | mV   |
|                        |  |                 | 10           |       | 5                       |      |      |
|                        |  |                 | 15           |       | 5                       |      |      |
|                        | Maximum Control Input Pulse Frequency<br>( $C_L = 50\text{ pF}$ , $R_L = 1\text{ K}\Omega$ )   | 0               | 5            |       | 5                       |      | MHz  |
|                        |  |                 | 10           |       | 10                      |      |      |
|                        |  |                 | 15           |       | 12                      |      |      |
|                        | Sine Wave (Distortion) ( $V_{in} = 1.77\text{ Vdc RMS}$<br>Centred @ $0.0\text{ Vdc}$ , $R_L = 10\text{ K}\Omega$ , $f = 1\text{ KHz}$ )   | -5              | 5            |       | 0.36                    |      | %    |
| BW                     | Bandwidth (-3 dB) ( $V_{in} = 1.77\text{ Vdc RMS}$<br>Centred @ $0.0\text{ Vdc}$ )<br>( $R_L = 1\text{ K}\Omega$ )<br>( $R_L = 10\text{ K}\Omega$ )<br>( $R_L = 100\text{ K}\Omega$ )<br>( $R_L = 1\text{ M}\Omega$ )                      | -5              | 5            |       | 35<br>28<br>27<br>26    |      | MHz  |
|                        | Feedthrough and Crosstalk<br>$\left(-20 \text{ Log}_{10} \frac{V_{out}}{V_{in}} = -50\text{ dB}\right)$<br>( $R_L = 1\text{ K}\Omega$ )<br>( $R_L = 10\text{ K}\Omega$ )<br>( $R_L = 100\text{ K}\Omega$ )<br>( $R_L = 1\text{ M}\Omega$ ) | -5              | 5            |       | 850<br>100<br>12<br>1.5 |      | KHz  |

**Plastic DIP16 (0.25) MECHANICAL DATA**

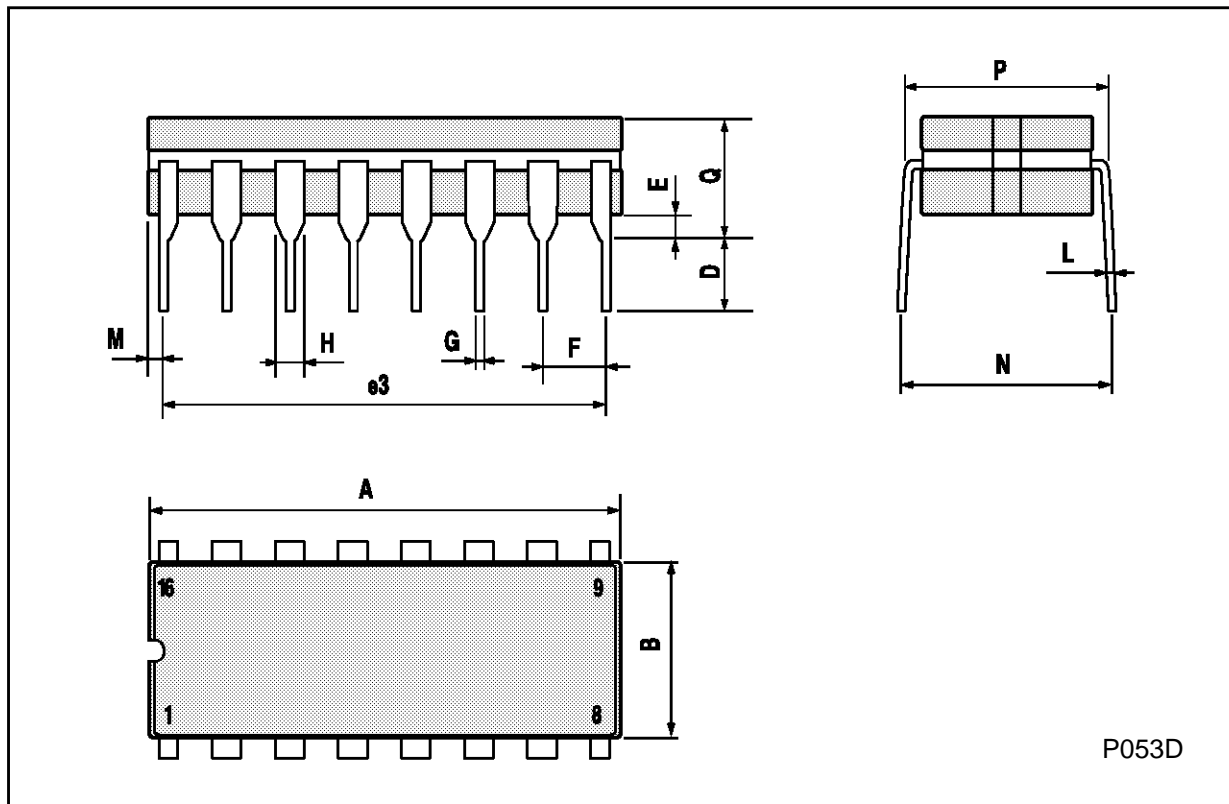
| DIM. | mm   |       |      | inch  |       |       |
|------|------|-------|------|-------|-------|-------|
|      | MIN. | TYP.  | MAX. | MIN.  | TYP.  | MAX.  |
| a1   | 0.51 |       |      | 0.020 |       |       |
| B    | 0.77 |       | 1.65 | 0.030 |       | 0.065 |
| b    |      | 0.5   |      |       | 0.020 |       |
| b1   |      | 0.25  |      |       | 0.010 |       |
| D    |      |       | 20   |       |       | 0.787 |
| E    |      | 8.5   |      |       | 0.335 |       |
| e    |      | 2.54  |      |       | 0.100 |       |
| e3   |      | 17.78 |      |       | 0.700 |       |
| F    |      |       | 7.1  |       |       | 0.280 |
| I    |      |       | 5.1  |       |       | 0.201 |
| L    |      | 3.3   |      |       | 0.130 |       |
| Z    |      |       | 1.27 |       |       | 0.050 |



P001C

Ceramic DIP16/1 MECHANICAL DATA

| DIM. | mm   |       |      | inch  |       |       |
|------|------|-------|------|-------|-------|-------|
|      | MIN. | TYP.  | MAX. | MIN.  | TYP.  | MAX.  |
| A    |      |       | 20   |       |       | 0.787 |
| B    |      |       | 7    |       |       | 0.276 |
| D    |      | 3.3   |      |       | 0.130 |       |
| E    | 0.38 |       |      | 0.015 |       |       |
| e3   |      | 17.78 |      |       | 0.700 |       |
| F    | 2.29 |       | 2.79 | 0.090 |       | 0.110 |
| G    | 0.4  |       | 0.55 | 0.016 |       | 0.022 |
| H    | 1.17 |       | 1.52 | 0.046 |       | 0.060 |
| L    | 0.22 |       | 0.31 | 0.009 |       | 0.012 |
| M    | 0.51 |       | 1.27 | 0.020 |       | 0.050 |
| N    |      |       | 10.3 |       |       | 0.406 |
| P    | 7.8  |       | 8.05 | 0.307 |       | 0.317 |
| Q    |      |       | 5.08 |       |       | 0.200 |



SO16 (Narrow) MECHANICAL DATA

| DIM. | mm         |      |      | inch  |       |       |
|------|------------|------|------|-------|-------|-------|
|      | MIN.       | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    |            |      | 1.75 |       |       | 0.068 |
| a1   | 0.1        |      | 0.2  | 0.004 |       | 0.007 |
| a2   |            |      | 1.65 |       |       | 0.064 |
| b    | 0.35       |      | 0.46 | 0.013 |       | 0.018 |
| b1   | 0.19       |      | 0.25 | 0.007 |       | 0.010 |
| C    |            | 0.5  |      |       | 0.019 |       |
| c1   | 45° (typ.) |      |      |       |       |       |
| D    | 9.8        |      | 10   | 0.385 |       | 0.393 |
| E    | 5.8        |      | 6.2  | 0.228 |       | 0.244 |
| e    |            | 1.27 |      |       | 0.050 |       |
| e3   |            | 8.89 |      |       | 0.350 |       |
| F    | 3.8        |      | 4.0  | 0.149 |       | 0.157 |
| G    | 4.6        |      | 5.3  | 0.181 |       | 0.208 |
| L    | 0.5        |      | 1.27 | 0.019 |       | 0.050 |
| M    |            |      | 0.62 |       |       | 0.024 |
| S    | 8° (max.)  |      |      |       |       |       |

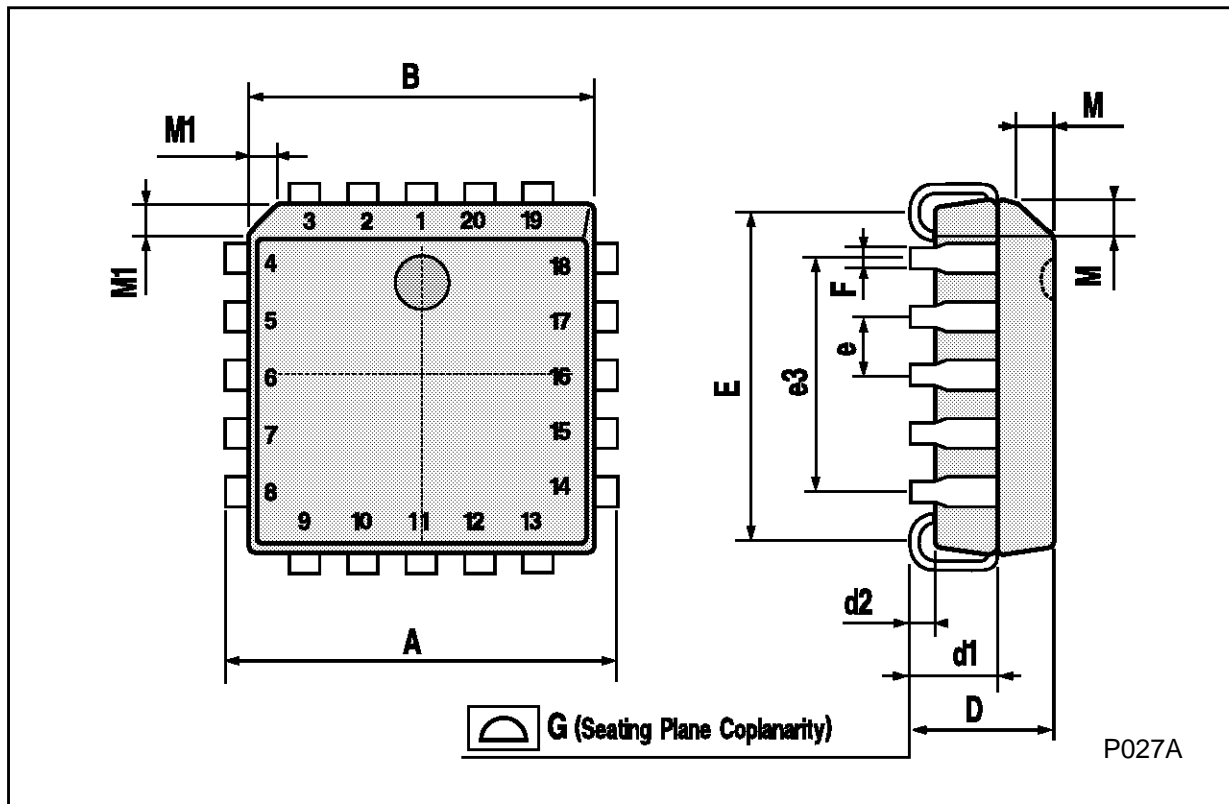


P013H



**PLCC20 MECHANICAL DATA**

| DIM. | mm   |      |       | inch  |       |       |
|------|------|------|-------|-------|-------|-------|
|      | MIN. | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 9.78 |      | 10.03 | 0.385 |       | 0.395 |
| B    | 8.89 |      | 9.04  | 0.350 |       | 0.356 |
| D    | 4.2  |      | 4.57  | 0.165 |       | 0.180 |
| d1   |      | 2.54 |       |       | 0.100 |       |
| d2   |      | 0.56 |       |       | 0.022 |       |
| E    | 7.37 |      | 8.38  | 0.290 |       | 0.330 |
| e    |      | 1.27 |       |       | 0.050 |       |
| e3   |      | 5.08 |       |       | 0.200 |       |
| F    |      | 0.38 |       |       | 0.015 |       |
| G    |      |      | 0.101 |       |       | 0.004 |
| M    |      | 1.27 |       |       | 0.050 |       |
| M1   |      | 1.14 |       |       | 0.045 |       |



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