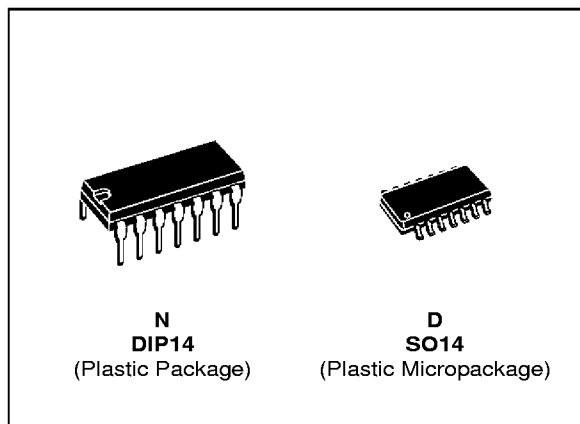


## LOW POWER QUAD CMOS VOLTAGE COMPARATORS

- WIDE SINGLE SUPPLY RANGE OR DUAL SUPPLIES 3V TO 16V OR  $\pm 1.5V$  to  $\pm 8V$
- VERY LOW SUPPLY CURRENT : 0.1mA/COMP INDEPENDENT OF SUPPLY VOLTAGE
- EXTREMELY LOW INPUT BIAS CURRENT : 1pA TYP
- EXTREMELY LOW INPUT OFFSET CURRENT : 1pA TYP
- LOW INPUT OFFSET VOLTAGE
- INPUT COMMON-MODE VOLTAGE RANGE INCLUDES GND
- LOW OUTPUT SATURATION VOLTAGE 150mV TYP
- OUTPUT COMPATIBLE WITH TTL, MOS AND CMOS
- HIGH INPUT IMPEDANCE  $10^{12}\Omega$  TYP
- FAST RESPONSE TIME : 200ns TYP FOR TTL LEVEL INPUT STEP

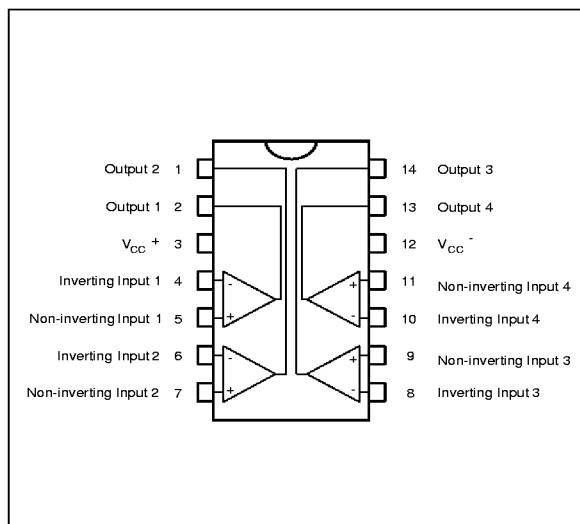


### ORDER CODES

| Part Number | Temperature Range | Package |   |
|-------------|-------------------|---------|---|
|             |                   | N       | D |
| TS374C      | 0°C, +70°C        | ●       | ● |
| TS374I      | -40°C, +125°C     | ●       | ● |
| TS374M      | -55°C, +125°C     | ●       | ● |

**Example :** TS374CN

### PIN CONNECTIONS (top view)



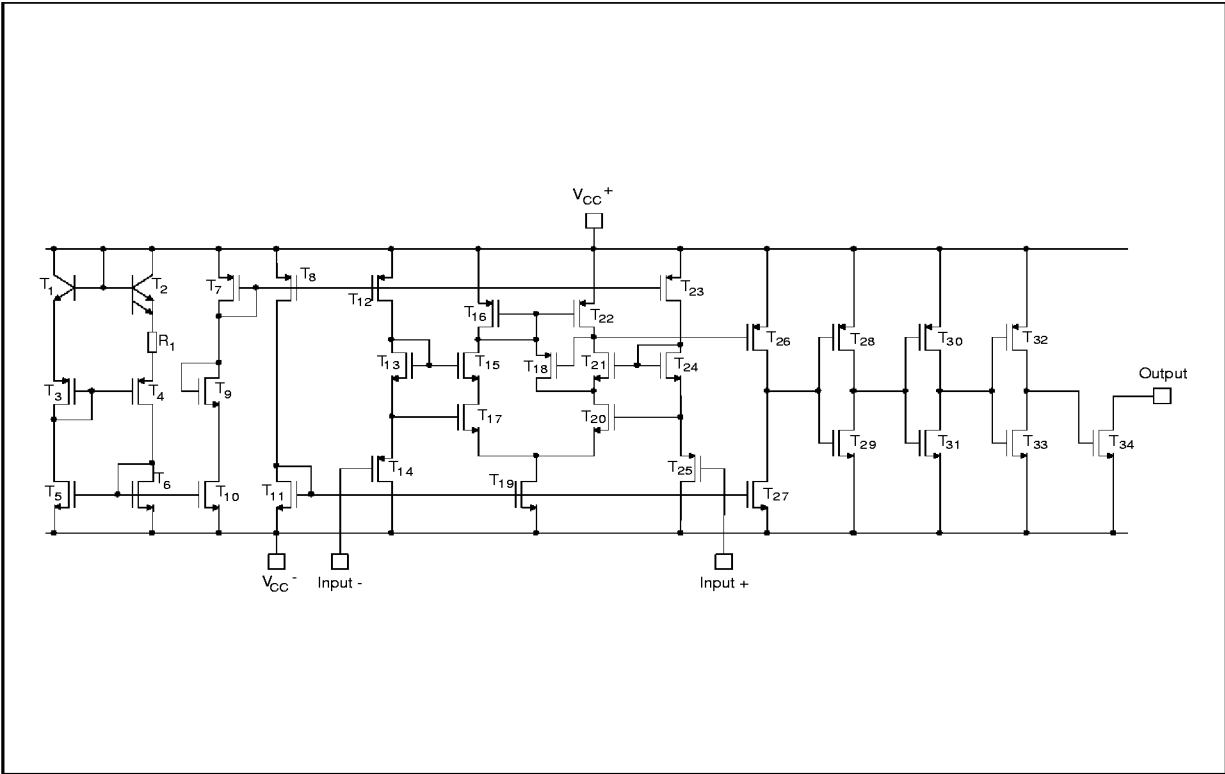
### DESCRIPTION

These devices consist of four independent precision voltage comparators, designed to operate with single or dual supplies.

These differential comparators use the SGS-THOMSON silicon lin MOS process giving them an excellent consumption-speed ratio.

These devices are ideally suited for low consumption applications.

SCHEMATIC DIAGRAM (for 1/4 TS374)



MAXIMUM RATINGS

| Symbol       | Parameter                                          | Value                                  | Unit               |
|--------------|----------------------------------------------------|----------------------------------------|--------------------|
| $V_{CC}^{+}$ | Supply Voltage - (note 1)                          | 18                                     | V                  |
| $V_{id}$     | Differential Input Voltage - (note 2)              | $\pm 18$                               | V                  |
| $V_i$        | Input Voltage - (note 3)                           | 18                                     | V                  |
| $V_o$        | Output Voltage                                     | 18                                     | V                  |
| $I_o$        | Output Current                                     | 20                                     | mA                 |
|              | Duration of Output Short-Circuit to GND - (note 4) | Infinite                               |                    |
| $T_{oper}$   | Operating Free-Air Temperature Range               | 0 to +70<br>-40 to +125<br>-55 to +125 | $^{\circ}\text{C}$ |
| $T_{stg}$    | Storage Temperature Range                          | -65 to +150                            | $^{\circ}\text{C}$ |

Notes : 1. All voltage values, except differential voltage, are with respect to network ground terminal.  
2. Differential voltages are the non-inverting input terminal with respect to the inverting input terminal.  
3. The magnitude of the input and the output voltages must never exceed the magnitude of the positive supply voltage.  
4. Short circuit from outputs to  $V_{CC}^{+}$  can cause excessive heating and eventual destruction.

OPERATING CONDITIONS

| Symbol       | Parameter                       | Value                   | Unit |
|--------------|---------------------------------|-------------------------|------|
| $V_{CC}^{+}$ | Supply Voltage                  | 3 to 16                 | V    |
| $V_{icm}$    | Common Mode Input Voltage Range | 0 to $V_{CC}^{+} - 1.5$ | V    |

**ELECTRICAL CHARACTERISTICS** $V_{CC}^+ = 5V$ ,  $V_{CC}^- = 0V$ ,  $T_{amb} = 25^\circ C$  (unless otherwise specified)

| Symbol    | Parameter                                                                                                                                         | Min.                                                                   | Typ. | Max.       | Unit          |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------|------------|---------------|
| $V_{io}$  | Input Offset Voltage ( $V_{ic} = V_{icm\ min.}$ ) - (note 1)<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$                   |                                                                        | 2    | 10<br>12   | mV            |
| $I_{io}$  | Input Offset Current - (note 2)<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$<br>TS374C<br>TS374I/TS374M                     |                                                                        | 1    | 100<br>200 | pA            |
| $I_{ib}$  | Input Bias Current - (note 2)<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$<br>TS374C<br>TS374I/TS374M                       |                                                                        | 1    | 150<br>300 | pA            |
| $V_{icm}$ | Input Common Mode Voltage Range<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$<br>TS374C<br>TS374I/TS374M                     | 0 to $V_{CC}^+ - 2$<br>0 to $V_{CC}^+ - 2.25$<br>0 to $V_{CC}^+ - 2.5$ |      |            | V             |
| $I_{OH}$  | High Level Output Current ( $V_{id} = 1V$ )<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$<br>$V_{OH} = 5V$<br>$V_{OH} = 15V$ |                                                                        | 0.1  | 1          | nA<br>$\mu A$ |
| $V_{OL}$  | Low Level Output Voltage ( $V_{id} = -1V$ , $I_{OL} = 4mA$ )<br>$T_{amb} = 25^\circ C$<br>$T_{min.} \leq T_{amb} \leq T_{max.}$                   |                                                                        | 100  | 400<br>700 | mV            |
| $I_{OL}$  | Low Level Output Current ( $V_{id} = -1V$ , $V_{OL} = 1.5V$ )                                                                                     | 6                                                                      | 45   |            | mA            |
| $I_{CC}$  | Supply Current (4 comparators) ( $V_{id} = +1V$ , no load)                                                                                        |                                                                        | 0.6  | 1          | mA            |

**SWITCHING CHARACTERISTICS** ( $V_{CC}^+ = 5V$ ,  $T_{amb} = 25^\circ C$ )

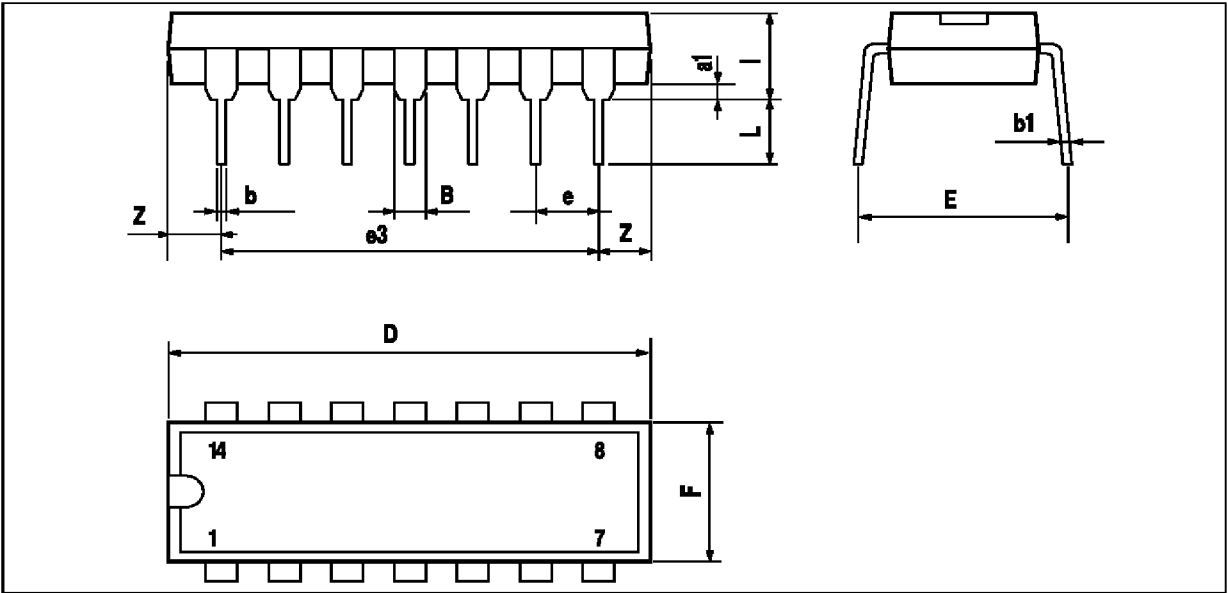
| Symbol   | Parameter                                                                                                                                      | Min. | Typ.       | Max. | Unit |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|------|------|
| $t_{re}$ | Response Time ( $R_L = 5.1k\Omega$ connected to 5V, $C_L = 15pF$ - (note 3)<br>• 100mV input step with 5mV overdrive<br>• TTL level input step |      | 600<br>200 |      | ns   |

Notes : 1. The specified offset voltage is the maximum value required to drive the output down to 400mV or up to 4V with  $R_L = 100k\Omega$  to  $V_{CC}^+$ .

2. Maximum values including unavoidable inaccuracies of the industrial test.

3. The response time which is specified is the interval between the input signal and the instant when the output signal crosses 1.4V.

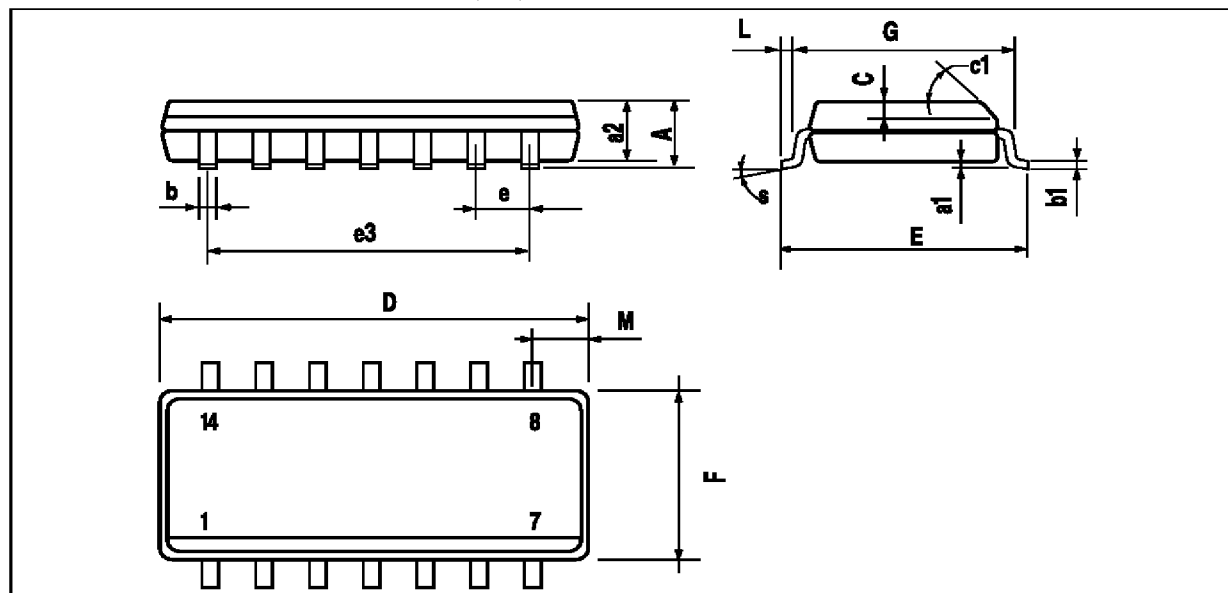
PACKAGE MECHANICAL DATA  
14 PINS - PLASTIC DIP



| Dimensions | Millimeters |       |      | Inches |       |       |
|------------|-------------|-------|------|--------|-------|-------|
|            | Min.        | Typ.  | Max. | Min.   | Typ.  | Max.  |
| a1         | 0.51        |       |      | 0.020  |       |       |
| B          | 1.39        |       | 1.65 | 0.055  |       | 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         |             | 15.24 |      |        | 0.600 |       |
| F          |             |       | 7.1  |        |       | 0.280 |
| i          |             |       | 5.1  |        |       | 0.201 |
| L          |             | 3.3   |      |        | 0.130 |       |
| Z          | 1.27        |       | 2.54 | 0.050  |       | 0.100 |

**PACKAGE MECHANICAL DATA**

14 PINS - PLASTIC MICROPACKAGE (SO)



PM-S014LEPS

| Dimensions | Millimeters |      |      | Inches |       |       |
|------------|-------------|------|------|--------|-------|-------|
|            | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A          |             |      | 1.75 |        |       | 0.069 |
| a1         | 0.1         |      | 0.2  | 0.004  |       | 0.008 |
| a2         |             |      | 1.6  |        |       | 0.063 |
| b          | 0.35        |      | 0.46 | 0.014  |       | 0.018 |
| b1         | 0.19        |      | 0.25 | 0.007  |       | 0.010 |
| C          |             | 0.5  |      |        | 0.020 |       |
| c1         | 45° (typ.)  |      |      |        |       |       |
| D          | 8.55        |      | 8.75 | 0.336  |       | 0.334 |
| E          | 5.8         |      | 6.2  | 0.228  |       | 0.244 |
| e          |             | 1.27 |      |        | 0.050 |       |
| e3         |             | 7.62 |      |        | 0.300 |       |
| F          | 3.8         |      | 4.0  | 0.150  |       | 0.157 |
| G          | 4.6         |      | 5.3  | 0.181  |       | 0.208 |
| L          | 0.5         |      | 1.27 | 0.020  |       | 0.050 |
| M          |             |      | 0.68 |        |       | 0.027 |
| S          | 8° (max.)   |      |      |        |       |       |

S014.TBL

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