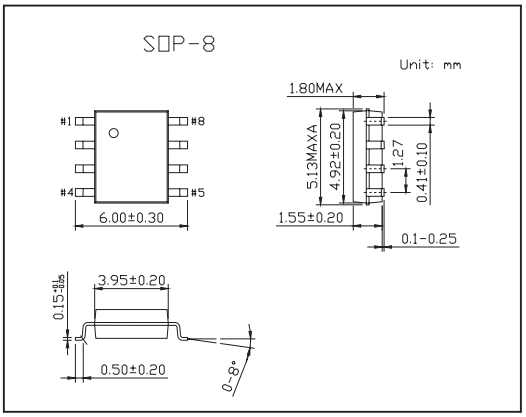
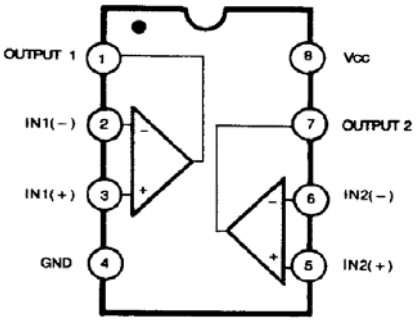
# Dual Differential Comparator
# LM2903



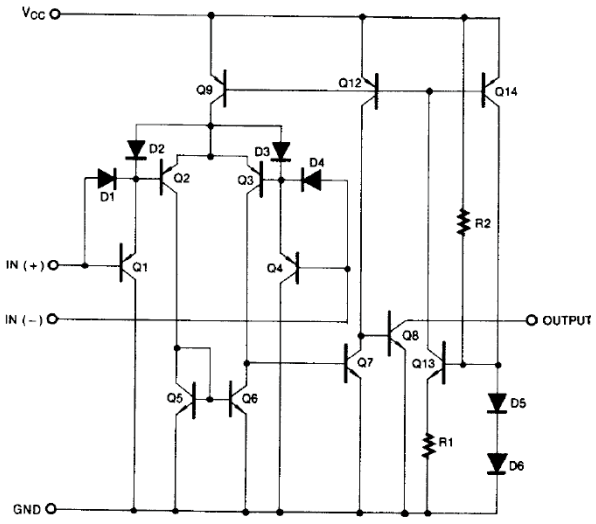

## ■ Features

- Allow Comparison of Voltages Near Ground Potential
- Low Current Drain 800μA Typ.
- Compatible with all Forms of Logic
- Low Input Bias Current 25nA Typ.
- Low Input Offset Current ±5nA Typ.
- Low Offset Voltage ±1mV Typ.

## ■ Internal Block Diagram




## ■ Schematic Diagram



# LM2903

## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Power Supply Voltage | $V_{CC}$ | ±18 or 36 | V |
| Differential Input Voltage | $V_{I(DIFF)}$ | 36 | V |
| Input Voltage | $V_I$ | - 0.3 to +36 | V |
| Output Short Circuit to GND | | Continuous | |
| Power Dissipation, Ta = 25□C | $P_D$ | 480 | mW |
| Operating Temperature | $T_{OPR}$ | - 40 to +105 | ℃ |
| Storage Temperature | $T_{STG}$ | - 65 to +150 | ℃ |
| Thermal Resistance Junction-Ambient Max. | $R_{\theta ja}$ | 260 | ℃/W |

## ■ Electrical Characteristics ($V_{CC}$ = 5V, $T_A$ = 25℃, unless otherwise specified)

| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input Offset Voltage | $V_{IO}$ | $V_{O(P)}$ =1.4V, $R_S$ = 0Ω | | ±1 | ±7 | mV |
| | | $V_{O(P)}$ =1.4V, $R_S$ = 0Ω,-40 ≤ $T_A$ ≤ +85℃ | | ±9 | ±15 | |
| Input Offset Current | $I_{IO}$ | | | ±5 | ±50 | nA |
| | | -40 ≤ $T_A$ ≤ +85℃ | | ±50 | ±200 | |
| Input Bias Current | $I_{BIAS}$ | | | 65 | 250 | nA |
| | | -40 ≤ $T_A$ ≤ +85℃ | | | 500 | |
| Input Common Mode Voltage Range | $V_{I(R)}$ | | 0 | | $V_{CC}$-1.5 | V |
| | | -40 ≤ $T_A$ ≤ +85℃ | 0 | | $V_{CC}$-2 | V |
| Supply Current | $I_{CC}$ | $V_{CC}$ = 5V, $R_L$ = ∞ | | 0.6 | 1 | mA |
| | | $V_{CC}$ = 30V, $R_L$ = ∞ | | 1 | 2.5 | mA |
| Voltage Gain | $G_V$ | $V_{CC}$ =15V, $R_L$ ≥ 15kΩ | 25 | 100 | | V/mV |
| Large Signal Response Time Response Time | $T_{LRES}$ | $V_I$ = $T_{TL}$ Logic Swing $V_{REF}$ = 1.4V, $V_{RL}$ = 5V, $R_L$ = 5.1kΩ ,-40 ≤ $T_A$ ≤ +85℃ | | 350 | | ns |
| Response Time | $T_{RES}$ | $V_{RL}$ = 5V, $R_L$ = 5.1kΩ | | 1.5 | | μs |
| Output Sink Current | $I_{SINK}$ | $V_I$(-) ≥ 1V, $V_I$(+) = 0V, $V_{O(P)}$ ≤ 1.5V | 6 | 16 | | mA |
| Output Saturation Voltage | $V_{SAT}$ | $V_I$(-) ≥ 1V, $V_I$(+) = 0V | | 160 | 400 | mV |
| | | $_{SINK}$ = 4mA,-40 ≤ $T_A$ ≤ +85℃ | | | 700 | |
| Output Leakage Current | $I_{O(LKG)}$ | $V_I$(-) = 0V,$V_I$(+) = 1V,$V_{O(P)}$ = 5V | | 0.1 | | nA |
| | | $V_I$(-) = 0V,$V_I$(+) = 1V,$V_{O(P)}$ = 30V | | | 1.0 | μA |