

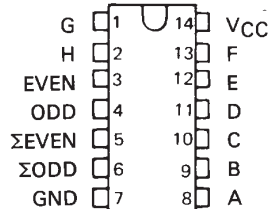
SN54180, SN74180 9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

DECEMBER 1972 – REVISED MARCH 1988

SN54180 . . . J OR W PACKAGE
SN74180 . . . N PACKAGE
(TOP VIEW)

| FUNCTION TABLE | | | INPUTS | | OUTPUTS | |
|----------------|--|--|-----------------------------|-----|----------|-----|
| | | | Σ OF H's AT A THRU H | | Σ | |
| | | | EVEN | ODD | EVEN | ODD |
| | | | EVEN | H | L | H |
| | | | ODD | H | L | L |
| | | | EVEN | L | H | H |
| | | | ODD | L | H | L |
| | | | X | H | H | L |
| | | | X | L | L | H |

H = high level, L = low level, X = irrelevant



description

These universal, monolithic, 9-bit (8 data bits plus 1 parity bit) parity generators/checkers, utilize familiar Series 54/74 TTL circuitry and feature odd/even outputs and control inputs to facilitate operation in either odd or even-parity applications. Depending on whether even or odd parity is being generated or checked, the even or odd inputs can be utilized as the parity or 9th-bit input. The word-length capability is easily expanded by cascading.

The SN54180/SN74180 are fully compatible with other TTL or DTL circuits. Input buffers are provided so that each data input represents only one normalized series 54/74 load. A full fan-out to 10 normalized series 54/74 loads is available from each of the outputs at a low logic level. A fan-out to 20 normalized loads is provided at a high logic level to facilitate the connection of unused inputs to used inputs. Typical power dissipation is 170 mW.

The SN54180 is characterized for operation over the full military temperature range of -55°C to 125°C ; and the SN74180 is characterized for operation from 0°C to 70°C .

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

| | |
|--|--|
| Supply voltage, V_{CC} (see Note 1) | 7 V |
| Input voltage | 5.5 V |
| Operating free-air temperature range: SN54180 Circuits | -55°C to 125°C |
| SN74180 Circuits | 0°C to 70°C |
| Storage temperature range | -65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

| | SN54180 | | | SN74180 | | | UNIT |
|---------------------------------------|---------|-----|------|---------|-----|------|--------------------|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| Supply voltage, V_{CC} | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| High-level output current, I_{OH} | | | -800 | | | -800 | μA |
| Low-level output current, I_{OL} | | | 16 | | | 16 | mA |
| Operating free-air temperature, T_A | -55 | | 125 | 0 | | 70 | $^{\circ}\text{C}$ |

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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TTL Devices

SN54180, SN74180 9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS† | SN54180 | | | SN74180 | | | UNIT |
|---|---|---------|------|------|---------|------|------|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IH} High-level input voltage | | 2 | | | 2 | | | V |
| V _{IL} Low-level input voltage | | | | 0.8 | | | 0.8 | V |
| V _{IK} Input clamp voltage | V _{CC} = MIN, I _I = -12 mA | | | -1.5 | | | -1.5 | V |
| V _{OH} High-level output voltage | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = -800 µA | 2.4 | 3.3 | | 2.4 | 3.3 | | V |
| V _{OL} Low-level output voltage | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 16 mA | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| I _I Input current at maximum input voltage | V _{CC} = MAX, V _I = 5.5 V | | | 1 | | | 1 | mA |
| I _{IH} High-level input current | Any data input | | | 40 | | | 40 | µA |
| | Even or odd input | | | 80 | | | 80 | |
| I _{IL} Low-level input current | Any data input | | | -1.6 | | | -1.6 | mA |
| | Even or odd input | | | -3.2 | | | -3.2 | |
| I _{OS} Short-circuit output current§ | V _{CC} = MAX | -20 | | -55 | -18 | | -55 | mA |
| I _{CC} Supply current | V _{CC} = MAX, See Note 2 | 34 | 49 | | 34 | 56 | | mA |

NOTE 2: I_{CC} is measured with even and odd inputs at 4.5 V, all other inputs and outputs open.

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

‡All typical values are at V_{CC} = 5 V, T_A = 25°C.

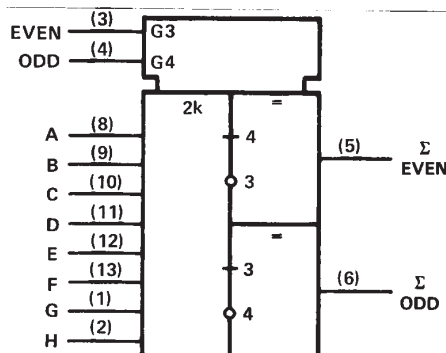
§Not more than one output should be shorted at a time.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

| PARAMETER¶ | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------|-----------------|-----------------|--|-----|-----|-----|------|
| t _{PLH} | Data | Σ Even | C _L = 15 pF, R _L = 400 Ω, Odd input grounded, See Note 3 | 40 | 60 | ns | |
| t _{PHL} | | | | 45 | 68 | | |
| t _{PLH} | Data | Σ Odd | | 32 | 48 | ns | |
| t _{PHL} | | | | 25 | 38 | | |
| t _{PLH} | Data | Σ Even | C _L = 15 pF, R _L = 400 Ω, Even input grounded, See Note 3 | 32 | 48 | ns | |
| t _{PHL} | | | | 25 | 38 | | |
| t _{PLH} | Data | Σ Odd | | 40 | 60 | ns | |
| t _{PHL} | | | | 45 | 68 | | |
| t _{PLH} | Even or Odd | Σ Even or Σ Odd | C _L = 15 pF, R _L = 400 Ω, See Note 3 | 13 | 20 | ns | |
| t _{PHL} | | | | 7 | 10 | | |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

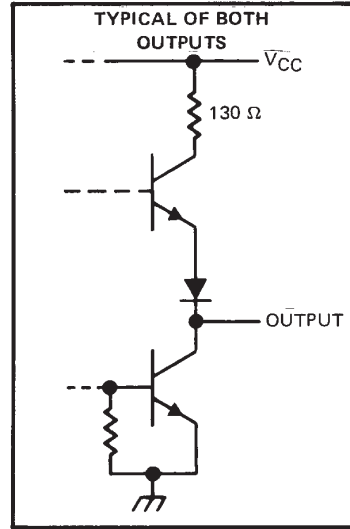
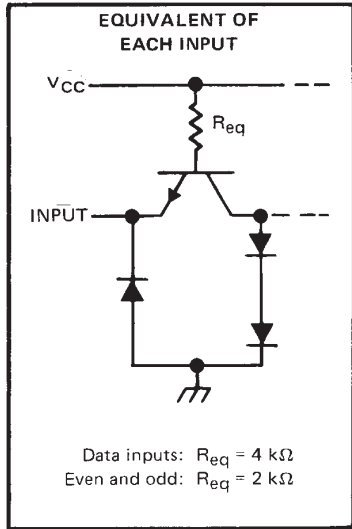
logic symbol†



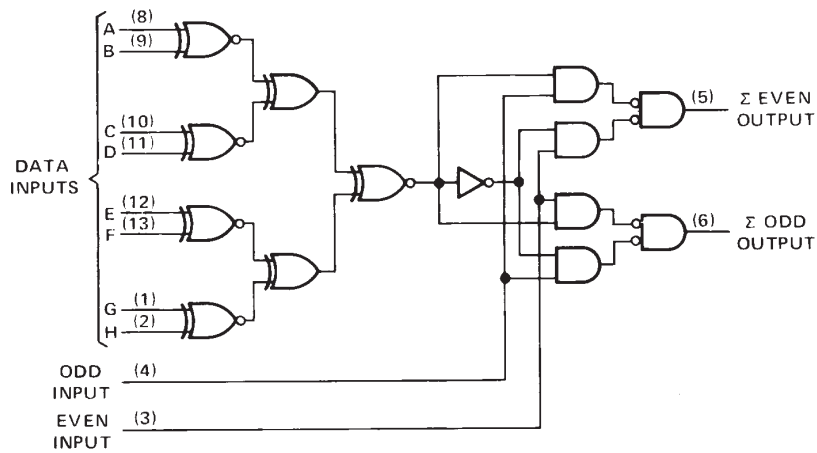
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

SN54180, SN74180
9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

schematics of inputs and outputs



logic diagram (positive logic)



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