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

DECEMBER 1972-REVISED MARCH 1988

#### **FUNCTION TABLE**

TONOTION TABLE									
INP	OUTPUTS								
$\Sigma$ OF H's AT	EVEN	ODD	Σ	Σ					
A THRU H	EVEN	ODD	EVEN	ODD					
EVEN	Τ	L	Н	L					
ODD	Н	L	L	Н					
EVEN	L	н	L	Н					
ODD	L	Н	Н	L					
×	Н	H	L	٦					
Х	L	L	Н	Н					

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  $-55^{\circ}$ C to  $125^{\circ}$ C; and the SN74180 is characterized for operation from  $0^{\circ}$ C to  $70^{\circ}$ C.

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

Supply voltage, V <sub>CC</sub> (see Note 1)			 	 7 V
Input voltage			 	 5.5 V
Operating free-air temperature range	SN5418	0 Circuits	 	 -55°C to 125°C
	SN7418	0 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
	МІ	MIN NOM MAX		MIN	NOM	MAX	וואוט	
Supply voltage, V <sub>CC</sub>	4	.5	5	5.5	4.75	5	5.25	٧
High-level output current, IOH				-800			-800	μA
Low-level output current, IOL				16			16	mA
Operating free-air temperature, TA	<u>-</u> -	55		125	0		70	°C

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

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

	PARAMETER		TEST CONDITIONS†	L.	SN54180			SN74180		
FARANEICK		TEST CONDITIONS.	MIN	TYP‡	MAX	MIN	TYP‡	MAX	UNIT	
$v_{IH}$	VIH High-level input voltage			2			2			V
VIL	Low-level input voltage					8.0			0.8	V
VIK	Input clamp voltage		V <sub>CC</sub> = MIN, I <sub>I</sub> = -12 mA			-1.5			-1.5	V
V <sub>OH</sub>	High-level output voltage	)	$V_{CC} = MIN, V_{IH} = 2 V,$ $V_{IL} = 0.8 V, I_{OH} = -800 \mu A$	2.4	3,3		2.4	3.3		V
VOL	Low-level output voltage		V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 16 mA		0.2	0.4		0.2	0.4	v
կ	Input current at maximum input voltage		V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V			1			1	mA
1	High-level input current	Any data input				40			40	
ΉΗ	mgn-sever mpat current	Even or odd input	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V			80			80	μА
1	Low-level input current	Any data input	V 144V V 044V			-1.6			-1.6	
l)L	Low-level input current	Even or odd input	$V_{CC} = MAX, V_{\dagger} = 0.4 V$			-3.2			-3.2	mA
los	Short-circuit output current § V		V <sub>CC</sub> = MAX	-20		-55	-18		-55	mA
Icc	Supply current		V <sub>CC</sub> = 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.

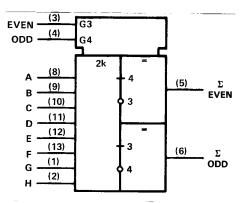
For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.  $^{\ddagger}$ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C. § Not more than one output should be shorted at a time.

### switching characteristics, $V_{CC} = 5 \text{ V}$ , $T_A = 25^{\circ}\text{C}$

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	TEST CONDIT	MIN	TYP	MAX	UNIT	
<sup>t</sup> PLH	Data	Σ Even				40	60	
tPHL	Data	2 Lven	C <sub>L</sub> = 15 pF, Odd input grounded,	$R_L = 400 \Omega$ , See Note 3		45	68	ns
tPLH .	Data	Σ Odd				32	48	ns
<sup>t</sup> PHL	Data					25	38	
<sup>t</sup> PLH	_ Data	Σ Even				32	48	
<sup>t</sup> PHL	Data	2 2 20011	C <sub>L</sub> = 15 pF, Even input grounded,	_		25	38	ns
<sup>t</sup> PLH		Σ Odd				40	60	
tPHL.						45	68	ns
<sup>t</sup> PLH	Even or Odd	Σ Even or Σ Odd	C <sub>L</sub> = 15 pF,	$R_L = 400 \Omega$ ,		13	20	
t <sub>PHL</sub>	Even or Odd	2 Even of 2 Odd	See Note 3			7	10	ns

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

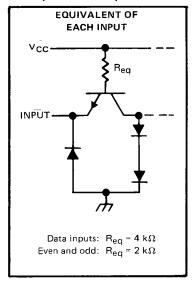
## logic symbol†

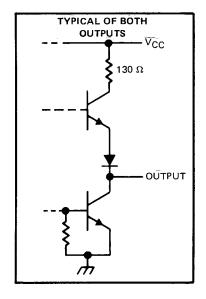


<sup>&</sup>lt;sup>†</sup> This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

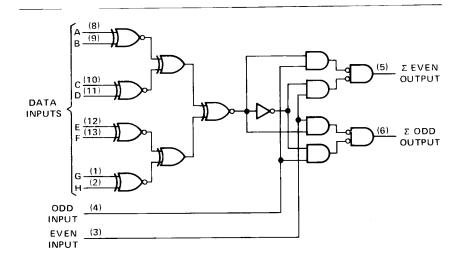


### schematics of inputs and outputs





## logic diagram (positive logic)



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