

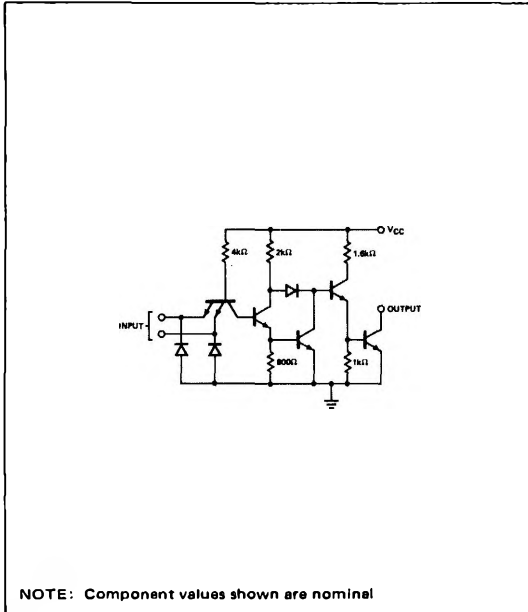
S5409-A,F,W • N7409-A,F

DIGITAL 54/74 TTL SERIES

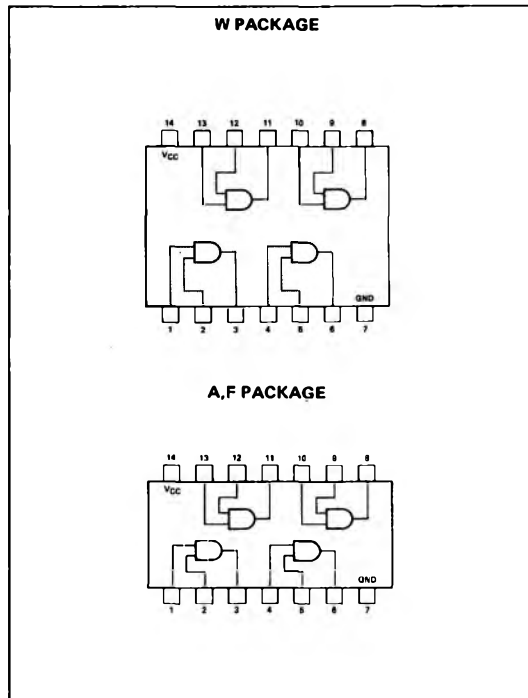
DESCRIPTION

The 54/7409 Quad 2-Input AND Gate with open collector outputs provides the capability of expanding AND logic functions.

SCHEMATIC (each gate)



PIN CONFIGURATIONS



RECOMMENDED OPERATING CONDITIONS

	S5409			N7409			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply Voltage V_{CC}	4.5	5	5.5	4.75	5	5.25	V
Normalized Fan-Out from each Output, N			10			10	
Operating Free-Air Temperature Range, T_A	-55	25	125	0	25	70	°C

ELECTRICAL CHARACTERISTICS (over recommended operating free-air temperature range unless otherwise noted)

PARAMETER	TEST CONDITIONS *	MIN	TYP **	MAX	UNIT
V_{IH}	High-level input voltage		2		V
V_{IL}	Low-level input voltage			0.8	V
I_{OH}	High-level output current	$V_{CC} = \text{MIN}, V_{IH} = 2V, V_{OH} = 5.5V$		250	mA
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = 0.8V, I_{OL} = 16mA$		0.4	V
I_{IH}	High-level input current (each input)	$V_{CC} = \text{MAX}, V_1 = 2.4V$		40	μA
		$V_{CC} = \text{MAX}, V_1 = 5.5V$		1	mA
I_{IL}	Low-level input current (each input)	$V_{CC} = \text{MAX}, V_1 = 0.4V$		-1.6	mA
I_{CCH}	Supply current, high-level output	$V_{CC} = \text{MAX}, V_1 = 5V$	10	15	mA
I_{CCL}	Supply current, low-level output	$V_{CC} = \text{MAX}, V_1 = 0$	18	26	mA

DIGITAL 54/74 TTL SERIES ■ S5409, N7409

SWITCHING CHARACTERISTICS, $V_{CC} = 5V$, $T_A = 25^\circ C$, $N = 10$

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15pF$		21	32	ns
t_{PHL}	Propagation delay time, high-to-low-level output	$R_L = 400 \Omega$		16	24	ns

- * For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
- ** All typical values at $V_{CC} = 5V$, $T_A = 25^\circ C$.

ELECTRICAL CHARACTERISTICS (Cont'd)

PARAMETER		TEST CONDITIONS*		MIN	TYP**	MAX	UNIT
$I_{CC(0)}$	Logical 0 level supply current	$V_{CC} = \text{MAX}$,	$V_{in} = 5V$		9	16.5	mA
$I_{CC(1)}$	Logical 1 level supply current	$V_{CC} = \text{MAX}$,	$V_{in} = 0$		3	6	mA

SWITCHING CHARACTERISTICS, $V_{CC} = 5V$, $T_A = 25^\circ\text{C}$, $N = 10$

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{pd0}	Propagation delay time to logical 0 level	$C_L = 15\text{pF}$,	$R_L = 400\Omega$		7	15	ns
t_{pd1}	Propagation delay time to logical 1 level	$C_L = 15\text{pF}$,	$R_L = 400\Omega$		11	22	ns

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

** All typical values are at $V_{CC} = 5V$, $T_A = 25^\circ\text{C}$.

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