

S5437-A,F,W • S5438-A,F,W • S5439-A,F • N7437-A,F,W • N7438-A,F • N7439-A,F

DESCRIPTION

The S5437/N7437 is a NAND Gate (output low only when all inputs are high) the same as N7400 except that it will drive 3 times as many loads. The S5438/N7438 and S5439/N7439 are also NAND Gates but have open-collectors similar to N7403.

The S5437/N7437, S5438/N7438 and S5439/N7439 contain four 2-input NAND gates in a package with a guaranteed fan-out of 30-series 54/74 loads in both the logical "1" (1.2mA), and logical "0" (48mA) states. The S5438/N7438 and S5439/N7439 have an open collector output for "WIRE-AND" applications but still retain the high sink current capability of the S5437/N7437.

ABSOLUTE MAXIMUM RATINGS (over operating temperature ranges unless otherwise noted)

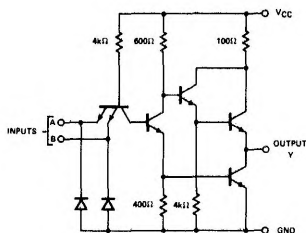
Supply Voltage V_{CC} (See Note 1)	7V
Supply Voltage (See Note 1)	5.5V
Interruption Voltage (See Note 2)	5.5V
Output Voltage (See Notes 1 and 3): S5438/N7438, S5439/N7439	5.5V
Operating Free-Air Temperature Range: S5437/S5438/S5439 N7437/N7438/N7439	-55°C to 125°C 0°C to 70°C
Storage Temperature Range	-65°C to 150°C

NOTES:

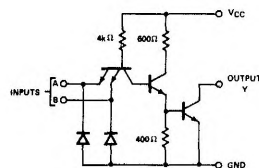
1. Voltage values, except interruption voltage, are with respect to network ground terminal.
2. This is the voltage between two emitters of a multiple-emitter transistor.
3. This is the maximum voltage which should be applied to any output when it is in the off state.

SCHEMATICS (each buffer)

S5437, N7437 (Totem-Pole Output)



S5438, N5438, S5439, N7439 (Open-Collector Output)



RECOMMENDED OPERATING CONDITIONS

	S5437, S5438, S5439			N7437, N7438, N7439			UNIT
	MIN	TYP	MAX	MIN	TYP	MAX	
Supply Voltage V_{CC}	4.5	5	5.5	4.75	5	5.25	V
Normalized Fan-Out from each Output, N			30			30	
Operating Free-Air Temperature Range, T_A	-55	25	125	0	25	70	°C

DIGITAL 54/74 TTL SERIES ■ S5437, S5438, S5439, N7437, N7438, N7439

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
V_I Input clamp voltage	$V_{CC} = \text{MAX}, I_I = -12\text{mA}$			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = 0.8\text{V}$ $I_{OH} = 1.2\text{mA}$	2.4	3.3		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}$ $I_{OL} = 48\text{mA}$		0.22	0.4	V
I_I Input current at max. input voltage	$V_{CC} = \text{MAX}, V_I = 5.5\text{V}$			1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4\text{V}$			40	μA
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$			-1.6	mA
I_{OS} Short-circuit output current	$V_{CC} = \text{MAX}$	-20 -18		-55 -55	mA
I_{CCH} Supply current, high-level output	$V_{CC} = \text{MAX},$ See Note 2		9	15.5	mA
I_{CCL} Supply current, low-level output	$V_{CC} = \text{MAX},$ See Note 3		34	54	mA

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

PARAMETER 54/7437	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL} Propagation delay time, high-to-low-level output	$C_L = 45\text{pF}, R_L = 133\Omega$		13	22	ns
t_{PLH} Propagation delay time, low-to-high-level output			8	15	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 $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}.$

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

PARAMETER 54/7438/39	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL} Propagation delay time, high-to-low-level output	$C_L = 45\text{pF}, R_L = 133\Omega$		14	22	ns
t_{PLH} Propagation delay time, low-to-high-level output			11	18	ns