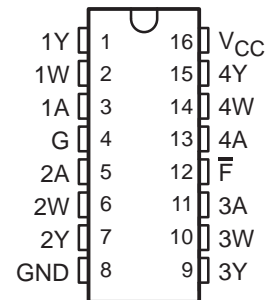


- Meets or Exceeds the Requirements of IBM 360/370 Input/Output Interface Specification GA22-6974-3
- Minimum Output Voltage of 3.11 V at $I_{OH} = -59.3$ mA
- Fault-Flag Circuit Output Signals Driver Output Fault
- Fault-Detection Current-Limit Circuit Minimizes Power Dissipation During a Fault Condition
- Common Enable and Common Fault Flag
- Designed to Be an Improved Replacement for the MC3485

**D OR N PACKAGE
(TOP VIEW)**



description

The SN75130 quadruple line driver is designed to meet the IBM 360/370 I/O specification GA22-6974-3. The output voltage is 3.11 V minimum (at $I_{OH} = -59.3$ mA) over the recommended ranges of supply voltage (4.5 V to 5.95 V) and temperature (0°C to 70°C). Driver outputs use a fault-detection current-limit circuit to allow high drive current but still minimize power dissipation when the output is shorted to ground. The SN75130 is compatible with standard TTL logic and supply voltages.

Fault-flag circuitry is designed to sense and signal a line short on any Y line. Upon detecting an output fault condition, the fault-flag circuit forces the driver output into the off (low) state and signals a fault condition by causing the fault-flag output to go low.

The SN75130 can drive a 50-Ω load or a 90-Ω load as used in many I/O systems. Optimum performance can be achieved when the device is used with either the SN75128 or SN75129 line receiver. Also, see the SN751730 for new 360/370 interface designs.

The SN75130 is characterized for operation from 0°C to 70°C.

**FUNCTION TABLE
(each driver)**

INPUTS		OUTPUTS		
G†	A	Y	F̄	W
L	X	L	H	H
X	L	L	H	H
H	H	H	H	L
H	H	S	L	H

H = high level, L = low level, X = irrelevant,
S = shorted to ground

† G and F̄ are common to the four drivers.
If any of the four Y outputs is shorted, the
fault flag responds.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is 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.

 **TEXAS
INSTRUMENTS**

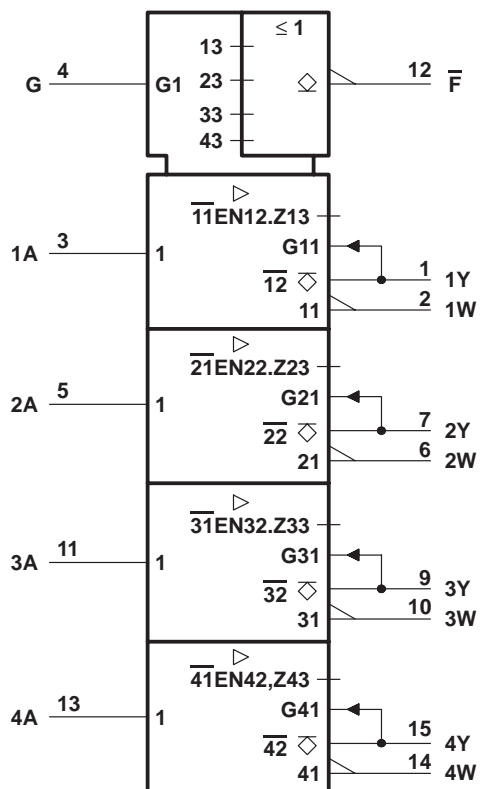
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

Copyright © 1995, Texas Instruments Incorporated

SN75130 QUADRUPLE LINE DRIVER

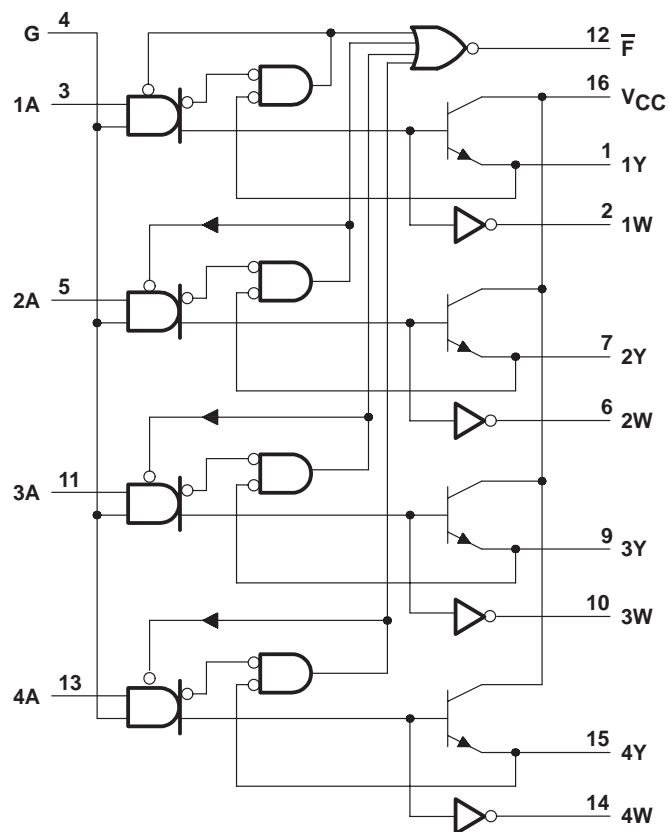
SLLS077B – FEBRUARY 1990 – REVISED MAY 1995

logic symbol†

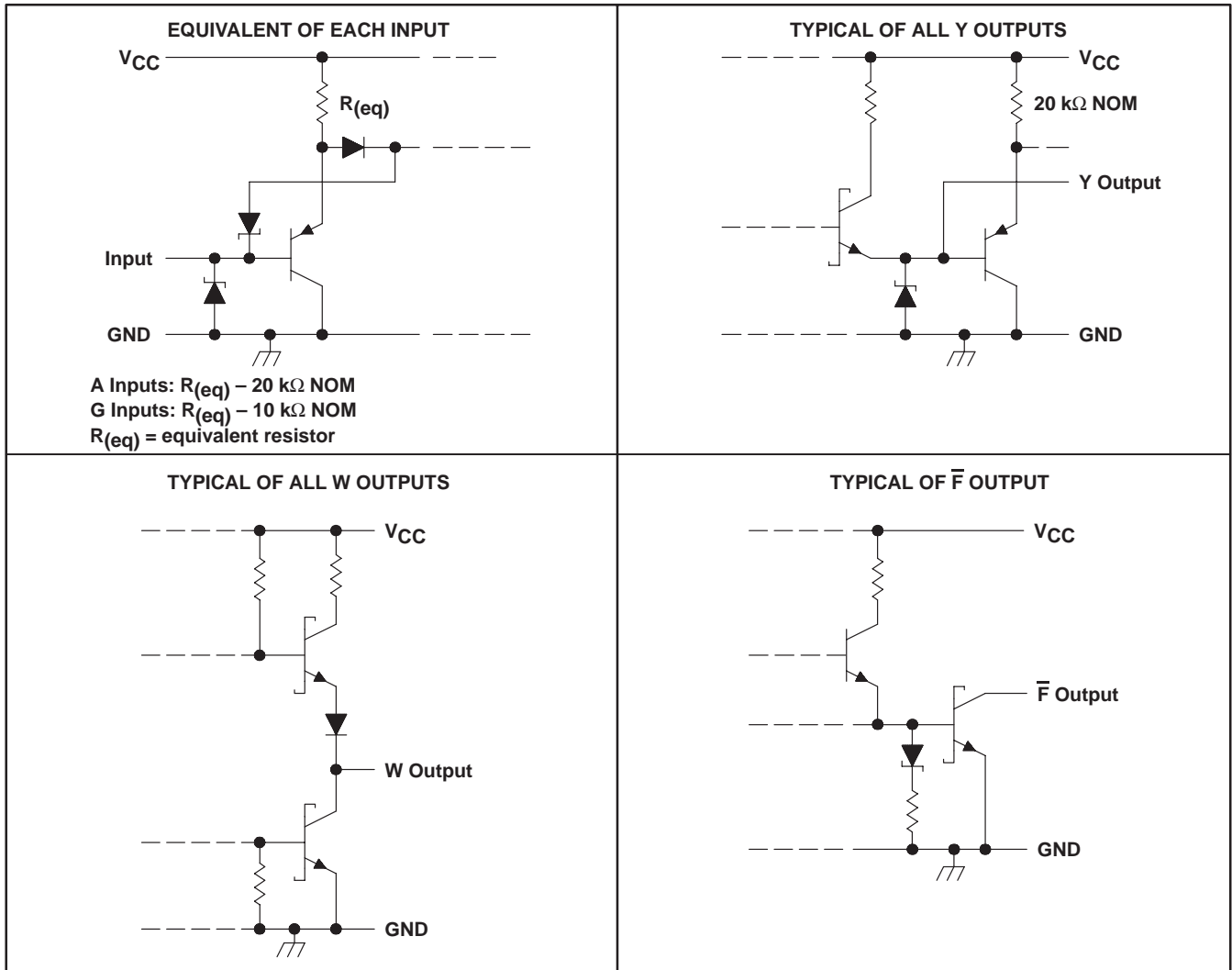


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



schematics of inputs and outputs



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

Supply voltage, V_{CC}	7 V
Input voltage, V_I	7 V
Continuous total power dissipation	See Dissipation Rating Table
Operating free-air temperature range, T_A	0°C to 70°C
Storage temperature range, T_{stg}	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

SN75130

QUADRUPLE LINE DRIVER

SLLS077B – FEBRUARY 1990 – REVISED MAY 1995

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING
D	950 mW	7.6 mW/ $^\circ\text{C}$	608 mW
N	1150 mW	9.2 mW/ $^\circ\text{C}$	736 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.5	5	5.95	V
High-level input voltage, V_{IH}	2			V
Low-level input voltage, V_{IL}			0.8	V
High-level output current, I_{OH}			-59.3	mA
Operating free-air temperature, T_A	0		70	$^\circ\text{C}$

electrical characteristics over recommended operating free-air temperature range

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
V_{IK}	Input clamp voltage	A, G $I_I = -18\text{ mA}$		-1.5	V
V_{OH}	High-level output voltage	Y $V_{CC} = 4.5\text{ V}$, $I_{OH} = -59.3\text{ mA}$, $V_{IH} = 2\text{ V}$	3.11		V
		Y $V_{CC} = 5.25\text{ V}$, $I_{OH} = -41\text{ mA}$, $V_{IH} = 2\text{ V}$	3.9		
		W $V_{CC} = 4.5\text{ V}$, $I_{OH} = -400\text{ }\mu\text{A}$, $V_{IH} = 2\text{ V}$	2.5		
V_{OL}	Low-level output voltage	Y $V_{CC} = 5.5\text{ V}$, $I_{OL} = -240\text{ }\mu\text{A}$, $V_{IL} = 0.8\text{ V}$		0.15	V
		Y $V_{CC} = 5.95\text{ V}$, $I_{OL} = -1\text{ mA}$, $V_{IL} = 0.8\text{ V}$		0.15	
		F $V_{CC} = 4.5\text{ V}$, $I_{OL} = 8\text{ mA}$, Y at 0 V		0.5	
		W $V_{CC} = 4.5\text{ V}$, $I_{OL} = 8\text{ mA}$		0.5	
$I_{O(off)}$	Off-state output current	Y $V_{CC} = 4.5\text{ V}$, $V_{IL} = 0$, $V_O = 3.11\text{ V}$		100	μA
		Y $V_{CC} = 0$, $V_{IL} = 0$, $V_O = 3.11\text{ V}$		200	
I_{OH}	High-level output current	F $V_{CC} = 5.95\text{ V}$, $V_{OH} = 5.95\text{ V}$		100	μA
I_I	Input current	A $V_{CC} = 4.5\text{ V}$, $V_{IH} = 5.5\text{ V}$		100	μA
		G $V_{CC} = 4.5\text{ V}$, $V_{IH} = 5.5\text{ V}$		400	
I_{IH}	High-level input current	A $V_{CC} = 4.5\text{ V}$, $V_{IH} = 2.7\text{ V}$		20	μA
		G $V_{CC} = 4.5\text{ V}$, $V_{IH} = 2.7\text{ V}$		80	
I_{IL}	Low-level input current	A $V_{CC} = 5.95\text{ V}$, $V_{IL} = 0.4\text{ V}$		250	μA
		G $V_{CC} = 5.95\text{ V}$, $V_{IL} = 0.4\text{ V}$		-1000	
I_{OS}	Short-circuit output current	Y $V_{CC} = 5.5\text{ V}$, $V_O = 0$		-5	mA
		W $V_{CC} = 5.5\text{ V}$, $V_O = 0$	-15	-100	
		Y $V_{CC} = 5.95\text{ V}$, $V_O = 0$		-5	
		W $V_{CC} = 5.95\text{ V}$, $V_O = 0$	-15	-110	
I_{CCH}	Supply current, all outputs high	$V_{CC} = 5.5\text{ V}$, $V_I = 2\text{ V}$		75	mA
		$V_{CC} = 5.95\text{ V}$, $V_I = 2\text{ V}$		85	
I_{CCL}	Supply current, Y outputs low	$V_{CC} = 5.5\text{ V}$, $V_I = 0.8\text{ V}$		55	mA
		$V_{CC} = 5.95\text{ V}$, $V_I = 0.8\text{ V}$		70	

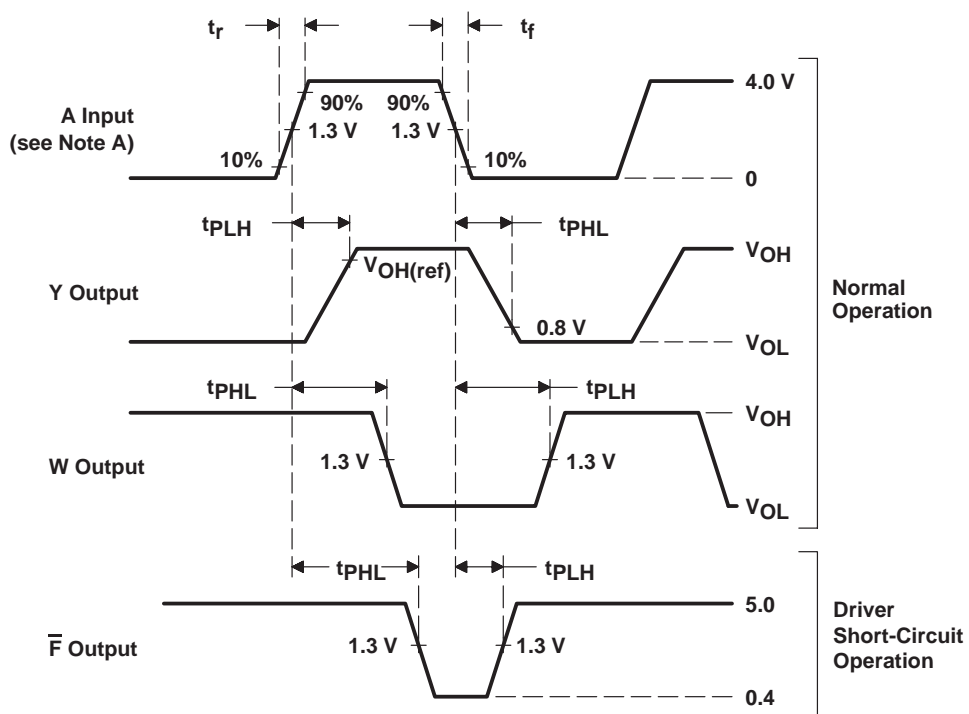
switching characteristics over recommended operating free-air temperature range

PARAMETER		FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	MAX	UNIT
t _{PLH}	Propagation delay time, low- to high-level output	A	Y	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, Input f = 1 MHz, V _{OH(ref)} = 3.11 V, R _L = 50 Ω, See Figures 1 and 2		40	ns
t _{PHL}	Propagation delay time, high- to low-level output					37	ns
$\frac{t_{PLH}}{t_{PHL}}$	Ratio of propagation delay times				0.3	3	
t _{PLH}	Propagation delay time, low- to high-level output	A	Y	V _{CC} = 5.25 V to 5.59 V, C _L = 50 pF, Input f = 5 MHz, V _{OH(ref)} = 3.9 V, R _L = 90 Ω, See Figures 1 and 2		45	ns
t _{PHL}	Propagation delay time, high- to low-level output					45	ns
t _{PLH}	Propagation delay time, low- to high-level output	A	W	V _{CC} = 5 V, C _L = 15 pF, R _L = 2 kΩ, See Figures 1 and 2		45	ns
t _{PHL}	Propagation delay time, high- to low-level output					28	ns
t _{PLH}	Propagation delay time, low- to high-level output	A	\bar{F}	V _{CC} = 5 V, C _L = 15 pF, R _L = 2 kΩ, See Figures 1 and 2		60	ns
t _{PHL}	Propagation delay time, high- to low-level output					100	ns

SN75130 QUADRUPLE LINE DRIVER

SLLS077B – FEBRUARY 1990 – REVISED MAY 1995

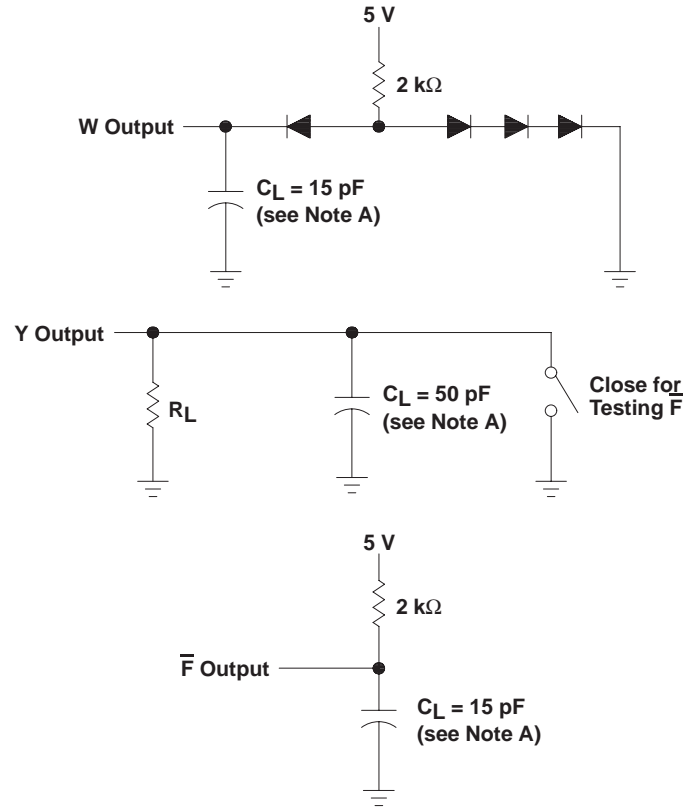
PARAMETER MEASUREMENT INFORMATION



NOTE A: The input pulse is supplied by a generator having the following characteristics: PRR = 1 MHz, duty cycle = 50%, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_O = 50 \Omega$.

Figure 1. Input and Output Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION



NOTE A: C_L includes probe and stray capacitance.

Figure 2. Switching Characteristics Load Circuits

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.