- **Inverting Versions of SN54LS253, SN74LS253**
- **Schottky-Diode-Clamped Transistors**
- **Permits Multiplexing from N lines to 1 line**
- **Performs Parallel-to-Serial Conversion**
- **Typical Average Propagation Delay Times:**
  Data Input to Output . . . 12 ns
  Control Input to Output . . . 16 ns
  Select Input to Output . . . 21 ns
- **Fully Compatible with most TTL Circuits**
- **Low Power Dissipation . . . 35 mW Typical (Enabled)**
- **Inverted Data**

SN54LS353 . . . J OR W PACKAGE
SN74LS353 . . . D OR N PACKAGE
(TOP VIEW)

$1\overline{G}$	1	16	V_{CC}
B	2	15	$2\overline{G}$
1C3	3	14	A
1C2	4	13	2C3
1C1	5	12	2C2
1C0	6	11	2C1
1Y	7	10	2C0
GND	8	9	2Y
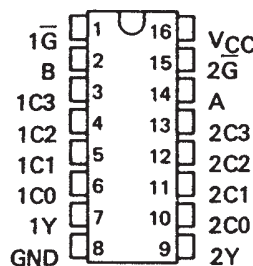
SN54LS353 . . . FK PACKAGE
(TOP VIEW)

Top pins (left to right): B $1\overline{G}$ NC V_{CC} $2\overline{G}$
Pin numbers: 3 2 1 20 19

	pin		pin	
1C3	4	18	A	
1C2	5	17	2C3	
NC	6	16	NC	
1C1	7	15	2C2	
1C0	8	14	2C1	

Bottom pins: 9 10 11 12 13
1Y GND NC 2Y 2C0
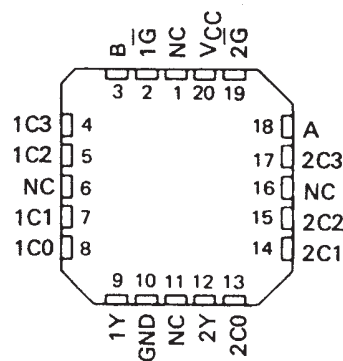
NC – No internal connection

description

Each of these Schottky-clamped data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-invert gates. Separate output control inputs are provided for each of the two four-line sections.

The three-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state) the low-impedance of the single enabled output will drive the bus line to a high or low logic level.

FUNCTION TABLE

SELECT INPUTS		DATA INPUTS				OUTPUT CONTROL	OUTPUT
B	A	C0	C1	C2	C3	$\overline{G}$	Y
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	H
L	L	H	X	X	X	L	L
L	H	X	L	X	X	L	H
L	H	X	H	X	X	L	L
H	L	X	X	L	X	L	H
H	L	X	X	H	X	L	L
H	H	X	X	X	L	L	H
H	H	X	X	X	H	L	L

Select inputs A and B are common to both sections.

H = high level, L = low level, X = irrelevant, Z = high impedance (off)

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

Supply voltage, V_{CC} (see Note 1) . . . . 7 V

Input voltage . . . . 7 V

Off-state output voltage . . . . 5.5 V

Operating free-air temperature range: SN54LS353 . . . . −55°C to 125°C

SN74LS353 . . . . 0°C to 70°C

Storage temperature range . . . . −65°C to 150°C

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

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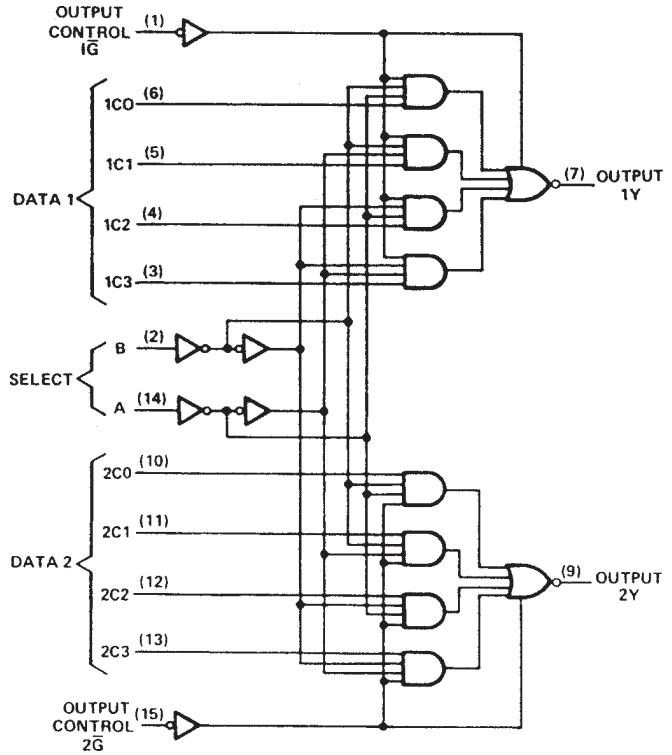
TEXAS INSTRUMENTS

logic symbol†

†This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
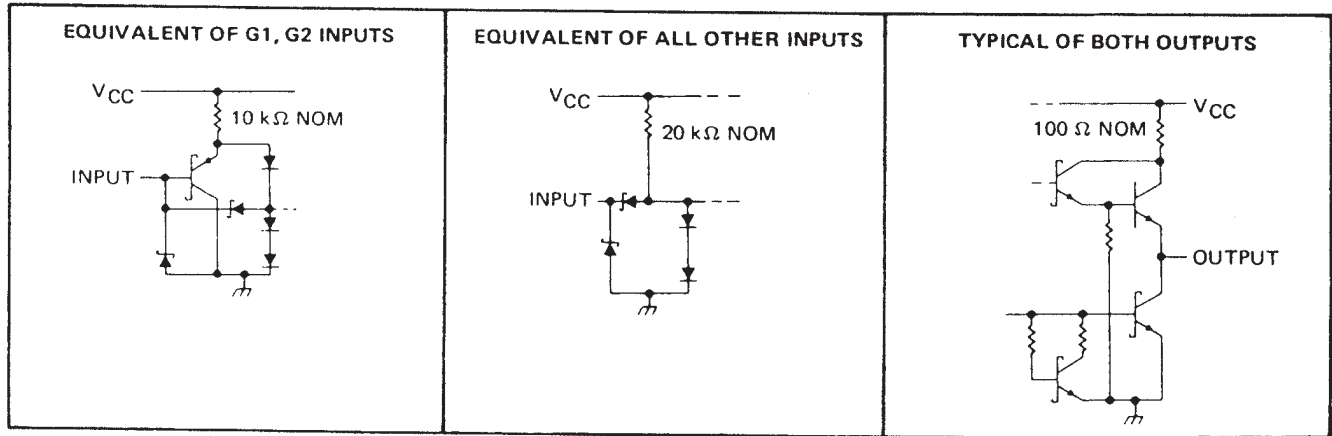
Pin numbers shown are for D, J, N, and W packages.

logic diagram (positive logic)

Pin numbers shown are for D, J, N, and W packages.

schematic of inputs and outputs

recommended operating conditions

		SN54LS353 MIN	SN54LS353 NOM	SN54LS353 MAX	SN74LS353 MIN	SN74LS353 NOM	SN74LS353 MAX	UNIT
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			−1			−2.6	mA
I_{OL}	Low-level output current			4			8	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS †		SN54LS353 MIN	SN54LS353 TYP‡	SN54LS353 MAX	SN74LS353 MIN	SN74LS353 TYP‡	SN74LS353 MAX	UNIT
V_{IK}		$V_{CC} = MIN$,	$I_I = −18$ mA			−1.5			−1.5	V
V_{OH}		$V_{CC} = MIN$, $V_{IH} = 2$ V, $V_{IL} = MAX$, $I_{OH} = MAX$		2.4	3.4		2.4	3.1		V
V_{OL}		$V_{CC} = MIN$, $V_{IH} = 2$ V, $V_{IL} = MAX$	$I_{OL} = 4$ mA		0.25	0.4		0.25	0.4	V
			$I_{OL} = 8$ mA					0.35	0.5	
I_{OZ}		$V_{CC} = MAX$, $V_{IH} = 2$ V	$V_O = 2.7$ V			20			20	μA
			$V_O = 0.4$ V			−20			−20	
I_I		$V_{CC} = MAX$,	$V_I = 7$ V			0.1			0.1	mA
I_{IH}		$V_{CC} = MAX$,	$V_I = 2.7$ V			20			20	μA
I_{IL}	G1, $\overline{G1}$	$V_{CC} = MAX$, $V_I = 0.4$ V				−0.2			−0.2	mA
	All other					−0.4			−0.4	
I_{OS} §		$V_{CC} = MAX$		−30		−130	−30		−130	mA
I_{CC}		$V_{CC} = MAX$, See Note 2	Condition A		7	12		7	12	mA
			Condition B		8.5	14		8.5	14	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at $V_{CC} = 5$ V, $T_A = 25°$C.
§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.
NOTE 2: I_{CC} is measured with the outputs open under the following conditions:
    A.   All inputs grounded.
    B.   Output control at 4.5 V, all inputs grounded.

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

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Data	Y	$C_L = 15$ pF, $R_L = 2$ kΩ, See Note 3		11	25	ns
t_{PHL}					13	20	
t_{PLH}	Select	Y			20	45	ns
t_{PHL}					21	32	
t_{PZH}	Output Control	Y			11	23	ns
t_{PZL}					15	23	
t_{PHZ}	Output Control	Y	$C_L = 5$ pF, $R_L = 2$ kΩ, See Note 3		27	41	ns
t_{PLZ}					12	27	

¶ t_{PLH} = Propagation delay time, low-to-high-level output
 t_{PHL} = Propagation delay time, high-to-low-level output
 t_{PZH} = Output enable time to high level
 t_{PZL} = Output enable time to low level
 t_{PHZ} = Output disable time from high level
 t_{PLZ} = Output disable time from low level
NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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