



## DM7544/DM8544 TRI-STATE® Quad Switch Debouncers

### General Description

These circuits are for use in front panels, and similar applications where contact bounce must be eliminated. Within the single package, these circuits do the job of four R-S latches plus pull-up resistors. A strobe is also available which permits sampling of the switch information at a pre-determined time. TRI-STATE outputs are also provided for direct connections to the switch line bus.

### Features

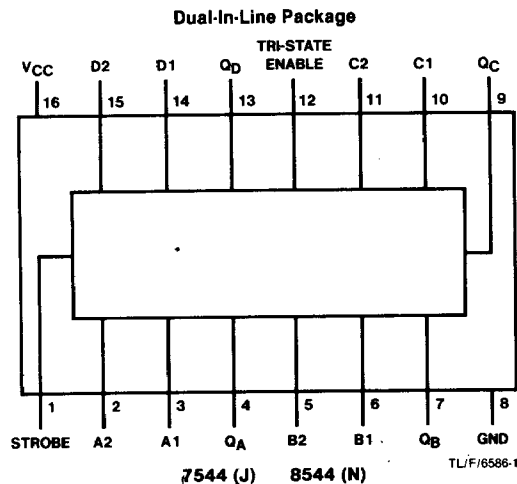
- Replaces SN54279/74279
- Eliminates push-button noise
- Allows clocked devices to be operated from switches
- Maximum power dissipation 250 mW
- Bus-line connectable
- TRI-STATE outputs
- Typical propagation delay 18 ns

### Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Storage Temperature Range	- 65 °C to 150 °C

**Note 1:** The "Absolute Maximum Ratings" are those values beyond which the safety of the device can not be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

### Connection Diagram



### Function Table

A1	A2	TRI-STATE Enable	Strobe	QA(t)
X	X	H	X	Hi-Z
X	X	L	L	QA(t-1)
L	L	L	$\overline{L}$	Indeterminate
L	H	L	H	L
H	L	L	H	H
H	H	L	H	QA(t)

## Recommended Operating Conditions

Symbol	Parameter	DM7544			DM8544			Units
		Min	Nom	Max	Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V <sub>IH</sub>	High Level Input Voltage	2			2			V
V <sub>IL</sub>	Low Level Input Voltage			0.8			0.8	V
I <sub>OH</sub>	High Level Output Current			-2			-5.2	mA
I <sub>OL</sub>	Low Level Output Current			16			16	mA
T <sub>A</sub>	Free Air Operating Temperature	-55		125	0		70	°C

## Electrical Characteristics over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -12 mA			-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max V <sub>IL</sub> = Max, V <sub>IH</sub> = Min	2.4			V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			0.4	V
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			40	μA
I <sub>IL</sub>	Low Level Input current	V <sub>CC</sub> = Max V <sub>I</sub> = 0.4V	Data		-2.5	mA
			Other		-1.6	
I <sub>OZH</sub>	Off-State Output Current with High Level Output Voltage Applied	V <sub>CC</sub> = Max, V <sub>O</sub> = 2.4V V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			40	μA
I <sub>OZL</sub>	Off-State Output Current with Low Level Output Voltage Applied	V <sub>CC</sub> = Max, V <sub>O</sub> = 0.4V V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			-40	μA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	DM75	-18	-55	mA
			DM85	-18	-55	
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max			50	mA

**Note 1:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 2:** Not more than one output should be shorted at a time.

**Switching Characteristics** at  $V_{CC} = 5V$  and  $T_A = 25^\circ C$  (See Section 1 for Test Waveforms and Output Load)

Parameter	From (Input) To (Output)	$R_L = 400\Omega$						Units
		$C_L = 5\text{ pF}$			$C_L = 50\text{ pF}$			
		Min	Typ	Max	Min	Typ	Max	
$t_{PLH}$ Propagation Delay Time Low to High Level Output	Data to Output					20	36	ns
$t_{PHL}$ Propagation Delay Time High to Low Level Output	Data to Output					17	30	ns
$t_{PZH}$ Output Enable Time to High Level Output	Enable to Q					15	25	ns
$t_{PZL}$ Output Enable Time to Low Level Output	Enable to Q					12	24	ns
$t_{PHZ}$ Output Disable Time from High Level Output	Enable to Q		5	10				ns
$t_{PLZ}$ Output Disable Time from Low Level Output	Enable to Q		10	20				ns

**Logic Diagram**
