

5475/DM5475/DM7475 Quad Latches

General Description

These latches are ideally suited for use as temporary storage for binary information between processing units and input/output or indicator units. Information present at a data (D) input is transferred to the Q input when the enable (G) is high, and the Q output will follow the data input as long as the enable remains high. When the enable goes low, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable is permitted to go high.

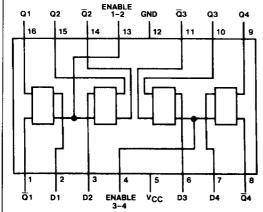
These latches feature complementary Q and \overline{Q} outputs from a 4-bit latch and are available in 16-pin packages.

Features

Alternate Military/Aerospace device (5475) is available.
 Contact a National Semiconductor Sales Office/Distributor for specifications.

Connection Diagram

Dual-In-Line Package



TL/F/6527-1

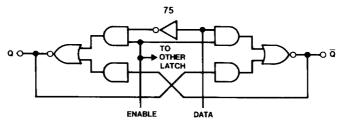
Order Number 5475DMQB, 5475FMQB, DM5475J, DM5475W or DM7475N See NS Package Number J16A, N16E or W16A

Function Table (Each Latch)

Inp	uts	Outp	uts
D	G	Q	Q
L	Ξ	L	Н
н	Н	н	L
X	L	Q_0	\overline{Q}_0

H= High Level, L= Low Level, X= Don't Care, $Q_0=$ The Level of Q Before the Highto-Low Transition of G

Logic Diagram (Each Latch)



TL/F/6527~2

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage 7V Input Voltage 5.5V

Operating Free Air Temperature Range

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot 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.

Recommended Operating Conditions

Symbol	Parameter	DM5475		DM7475			Units	
		Min	Nom	Max	Min	Nom	Max	Units
Vcc	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			2			٧
VIL	Low Level Input Voltage			0.8			0.8	٧
Іон	High Level Output Current			-0.4			-0.4	mA
loL	Low Level Output Current			16			16	mA
t _W	Enable Pulse Width (Note 4)	20			20			ns
tsu	Setup Time (Note 4)	20			20			ns
t _H	Hold Time (Note 4)	5			5			ns
TA	Free Air Operating Temperature	-55		125	0		70	°C

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

Symbol	Parameter	Conditions		Min	Typ (Note 1)	Max	Units
VI	Input Clamp Voltage	V _{CC} = Min, I _I =	= −12 mA			-1.5	٧
V _{OH}	High Level Output Voltage	$V_{CC} = Min, I_{OH} = Max$ $V_{IL} = Max, V_{IH} = Min$		2.4	3.4		٧
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} V _{IH} = Min, V _{IL}			0.2	0.4	٧
i _l	Input Current @ Max Input Voltage	V _{CC} = Max, V _i	= 5.5V			1	mA
l _{IH}	High Level Input Current	V _{CC} = Max, V _I	= 2.4V			80	μΑ
կլ	Low Level Input Current	$V_{CC} = Max, V_I = 0.4V$				-3.2	mA
los	Short Circuit	V _{CC} = Max	DM54	-20		-55	mA
	Output Current	(Note 2)	DM74	-18		-55	""
lcc	Supply Current	V _{CC} = Max	DM54		32	46	mA
		(Note 3)	DM74		32	50] '''

Note 1: All typicals are at $V_{CC} = 5V$, $T_A = 25$ °C.

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

Note 3: I_{CC} is measured with all inputs grounded and all outputs open.

Note 4: $T_A = 25^{\circ}C$ and $V_{CC} = 5V$.

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

Symbol	Parameter	From (Input) To (Output)	$\mathbf{R_L} = 400\Omega$ $\mathbf{C_L} = 15 \mathbf{pF}$		Units
			Min	Max	
t _{PHL}	Propagation Delay Time High to Low Level Output	D to Q		25	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	D to Q		30	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	D to Q		15	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	D to Q		40	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	G to Q		15	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	G to Q		30	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	G to Q		15	ns
t PLH	Propagation Delay Time Low to High Level Output	G to Q		30	ns