



DM5453/DM7453 Expandable 4-Wide 2-Input AND-OR-INVERT Gates

General Description

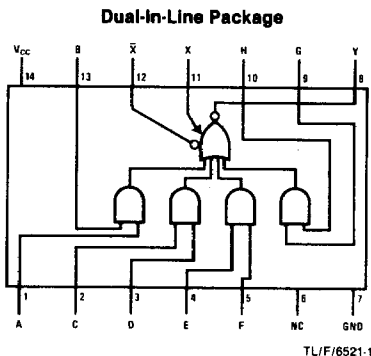
This device contains a combination of gates which performs the logic AND-OR-INVERT function.

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



DM5453 (J) DM7453 (N)

Function Table

$$Y = \overline{AB + CD + EF + GH + X}$$

Inputs									Output
A	B	C	D	E	F	G	H	X	Y
H	H	Y	Y	Y	Y	Y	Y	Y	L
Y	Y	H	H	Y	Y	Y	Y	Y	L
Y	Y	Y	Y	H	H	Y	Y	Y	L
Y	Y	Y	Y	Y	Y	H	H	Y	L
Y	Y	Y	Y	Y	Y	Y	Y	H	L
All Other Combinations									H

H = High Logic Level

L = Low Logic Level

Y = Either Low or High Logic Level

Recommended Operating Conditions

Sym	Parameter	DM5453			DM7453			Units
		Min	Nom	Max	Min	Nom	Max	
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			0.8			0.8	V
I_{OH}	High Level Output Current			-0.4			-0.4	mA
I_{OL}	Low Level Output Current			16			16	mA
T_A	Free Air Operating Temperature	-55		125	0		70	°C

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

Sym	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -12 \text{ mA}$			-1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{Min}, I_{OH} = \text{Max}$ $V_{IL} = \text{Max}$	2.4	3.4		V
		$I_X = 150 \mu\text{A}$ $I_{\bar{X}} = -150 \mu\text{A}$ $I_{OH} = \text{Max}$	2.4	3.4		
		$I_X = 270 \mu\text{A}$ $I_{\bar{X}} = -270 \mu\text{A}$ $I_{OH} = \text{Max}$	2.4	3.4		
V_{OL}	Low Level Output Voltage	$V_{CC} = \text{Min}, I_{OL} = \text{Max}$ $V_{IH} = \text{Min}$		0.2	0.4	V
		$I_X + I_{\bar{X}} = 300 \mu\text{A}$ $R_{X\bar{X}} = 138\Omega$ $I_{OL} = \text{Max}$		0.2	0.4	
		$I_X + I_{\bar{X}} = 430 \mu\text{A}$ $R_{X\bar{X}} = 130\Omega$ $I_{OL} = \text{Max}$		0.2	0.4	
V_{BEQ}	Base-Emitter Voltage of Output Transistor Q	$I_X + I_{\bar{X}} = 410 \mu\text{A}$ $R_{X\bar{X}} = 0$ $I_{OL} = 16 \text{ mA}$	DM54		1.1	V
		$I_X + I_{\bar{X}} = 620 \mu\text{A}$ $R_{X\bar{X}} = 0$ $I_{OL} = 16 \text{ mA}$	DM74		1	
$I_{\bar{X}}$	Expander Current	$V_{X\bar{X}} = 0.4 \text{ V}$ $I_{OL} = 16 \text{ mA}$	DM54		-2.9	mA
			DM74		-3.1	
I_I	Input Current@ 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

Electrical Characteristics

(Continued) over recommended operating free air temperature
(unless otherwise noted)

Parameter		Conditions		Min	Typ (Note 1)	Max	Units
I_{OS}	Short Circuit Output Current	$V_{CC} = \text{Max}$ (Note 2)	DM54	- 20		- 55	mA
			DM74	- 18		- 55	
I_{CCH}	Supply Current With Outputs High	$V_{CC} = \text{Max}$			4	8	mA
I_{CCL}	Supply Current With Outputs Low	$V_{CC} = \text{Max}$			5.1	9.5	mA

Switching Characteristics

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

Parameter	Conditions	$C_L = 15 \text{ pF}$ $R_L = 400\Omega$			Units
		Min	Typ	Max	
t_{PLH} Propagation Delay Time Low to High Level Output	(Expander Pins Open)		13	22	ns
t_{PHL} Propagation Delay Time High to Low Level Output			8	15	ns

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

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