

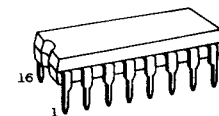
TC40H139P/F

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

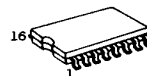
TC40H139 DUAL 2-TO-4-LINE DECODER/DEMULTIPLEXER

The TC40H139 is a dual decoder/demulti-plexer, which can select one of four output lines through two input lines A and B according to the following truth table. The selected output at this time is at "L" level.

Further, when ENABLE input \bar{G} is set to "H" level, the selection is inhibited regardless of SELECT signal and all the outputs go to "H" level.

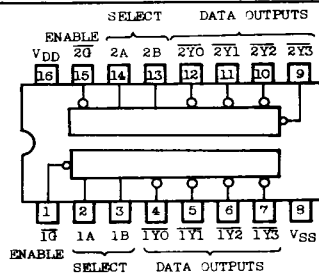


DIP16(3D16A-P)



MFP16(P16QC-P)

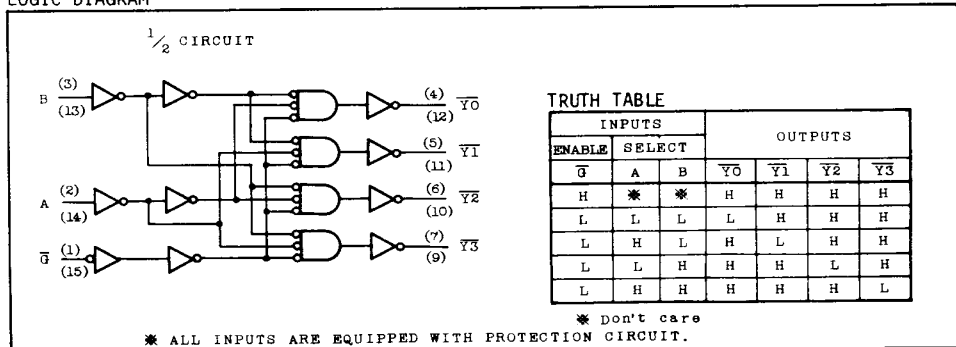
PIN CONNECTION



MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	$V_{SS}-0.5 \sim V_{SS}+10$	V
Input Voltage	V_{IN}	$V_{SS}-0.5 \sim V_{DD}+0.5$	V
Output Voltage	V_{OUT}	$V_{SS}-0.5 \sim V_{DD}+0.5$	V
Input Current	I_{IN}	± 10	mA
Power Dissipation	PD	300(DIP)/180(MFP)	mW
Storage Temperature	T_{stg}	$-65 \sim 150$	$^{\circ}\text{C}$
Lead Temp./Time	T_{sol}	$260^{\circ}\text{C} \cdot 10 \text{ sec}$	

LOGIC DIAGRAM



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RECOMMENDED OPERATING CONDITIONS ($V_{SS}=0.0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	-	2.0	-	8.0	V
Input Voltage	V_{IN}	-	0.0	-	V_{DD}	V
Operating Temperature	T_{Opr}	-	-40	-	85	°C

ELECTRICAL CHARACTERISTICS ($V_{SS}=0.0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	-40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High Level Output Voltage	V_{OH}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	4.95	-	4.95	5.0	-	4.95	-	V
Low Level Output Voltage	V_{OL}	$ I_{OUT} < 1\mu A$ $V_{IN}=V_{SS}, V_{DD}$	5	-	0.05	-	0.0	0.05	-	0.05	V
High Level Output Current	I_{OH}	$V_{OH}=4.6V$ $V_{IN}=V_{SS}, V_{DD}$	5	-0.52	-	-0.44	-	-	-0.36	-	mA
Low Level Output Current	I_{OL}	$V_{OL}=0.4V$ $V_{IN}=V_{SS}, V_{DD}$	5	1.4	-	1.1	-	-	0.8	-	mA
Input Voltage	"H" Level V_{IH}	$ I_{OUT} < 1\mu A$ $V_{OH}=4.5V$ $V_{OL}=0.5V$	5	4.0	-	4.0	-	-	4.0	-	V
	"L" Level V_{IL}		5	-	1.0	-	-	1.0	-	1.0	V
Input Current	"H" Level I_{IH}	$V_{IH}=8.0V$	8	-	0.3	-	10^{-5}	0.3	-	1.0	μA
	"L" Level I_{IL}	$V_{IL}=0.0V$	8	-	-0.3	-	-10^{-5}	-0.3	-	-1.0	μA
Quiescent Supply Current	I_{DD}	$*V_{IN}=V_{SS}, V_{DD}$	5	-	12.5	-	10^{-3}	12.5	-	75	μA

* All valid input combinations.

SWITCHING CHARACTERISTICS ($T_a=25^\circ C$, $V_{SS}=0.0V$, $C_L=15pF$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	V_{DD} (V)	MIN.	TYP.	MAX.	UNIT
Output Rise Time		t_{or}		5	-	17	35	ns
Output Fall Time		t_{of}		5	-	13	30	
Propagation Delay Time	(Low-High)	t_{PLH}	SELECT - Y	5	-	32	48	ns
Propagation Delay Time	(High-Low)	t_{pHL}		5	-	30	45	
Propagation Delay Time	(Low-High)	t_{pLH}	ENABLE - Y	5	-	32	48	ns
Propagation Delay Time	(High-Low)	t_{pHL}		5	-	30	45	
Input Capacitance		C_{IN}			-	5	-	pF

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SWITCHING TIME TEST CIRCUIT AND WAVEFORM

TEST NO.	INPUTS			OUTPUTS	
	ENABLE	SELECT		$\overline{Y0}$	$\overline{Y1}$
1	L	\overline{H}	L	$\overline{Y0}$	$\overline{Y1}$
2	L	L	\overline{H}	$\overline{Y0}$	$\overline{Y2}$
3	L	\overline{H}	\overline{H}	$\overline{Y0}$	$\overline{Y3}$
4	\overline{H}	H	H	$\overline{Y0}$	-

* ALL OUTPUTS ARE MEASURED ACCORDING TO THE LEFT TABLE.

