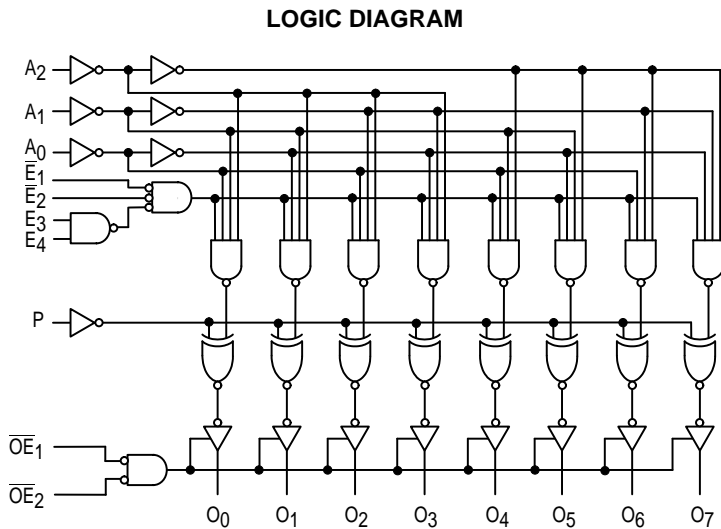
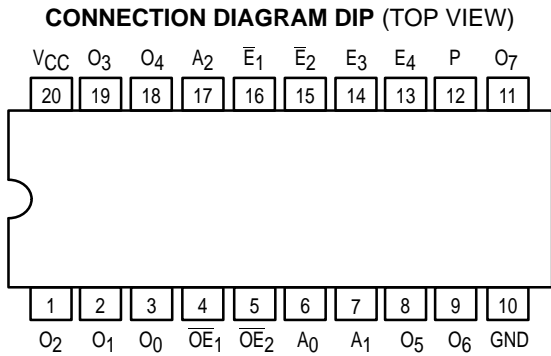




1-OF-8 DECODER WITH 3-STATE OUTPUTS

The MC54/74F538 decoder/demultiplexer accepts three Address (A_0-A_2) input signals and decodes them to select one of eight mutually exclusive outputs. A polarity control input (P) determines whether the outputs are active LOW or active HIGH. A HIGH Signal on either of the active LOW Output Enable (\overline{OE}) inputs forces all outputs to the high impedance state. Two active HIGH and two active LOW input enables are available for easy expansion to 1-of-32 decoding with four packages, or for data demultiplexing to 1-of-8 or 1-of-16 destinations.

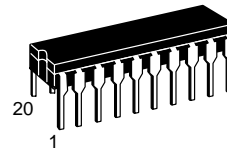
- Output Polarity Control
- Data Demultiplexing Capability
- Multiple Enables for Expansion
- 3-State Outputs
- ESD Protection > 4000 Volts



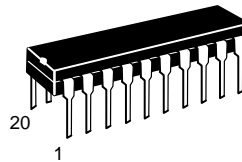
Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

MC54/74F538

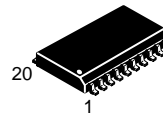
1-OF-8 DECODER WITH 3-STATE OUTPUTS
FAST™ SCHOTTKY TTL



J SUFFIX
 CERAMIC
 CASE 732-03



N SUFFIX
 PLASTIC
 CASE 738-03

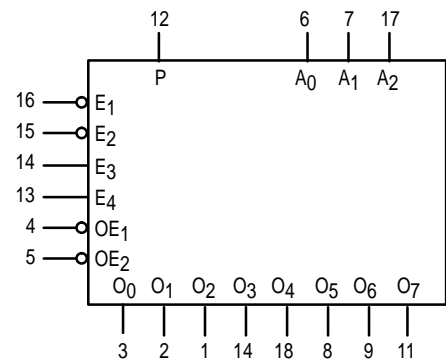


DW SUFFIX
 SOIC
 CASE 751D-03

ORDERING INFORMATION

MC54FXXXJ Ceramic
 MC74FXXXN Plastic
 MC74FXXXDW SOIC

LOGIC SYMBOL



V_{CC} = PIN 20
 GND = PIN 10

MC54/74F538

GUARANTEED OPERATING RANGES

Symbol	Parameter	Min	Typ	Max	Unit	
V _{CC}	Supply Voltage	54, 74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I _{OH}	Output Current — High	54, 74			-3.0	mA
I _{OL}	Output Current — Low	54, 74			24	mA

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter	Limits			Unit	Test Conditions
		Min	Typ	Max		
V _{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage
V _{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage
V _{IK}	Input Clamp Diode Voltage			-1.2	V	V _{CC} = MIN, I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54, 74	2.4		V	I _{OH} = -3.0 mA, V _{CC} = 4.5 V
		74	2.7		V	I _{OH} = -3.0 mA, V _{CC} = 4.75 V
V _{OL}	Output LOW Voltage			0.5	V	I _{OL} = 24 mA, V _{CC} = MIN
I _{OZH}	Output OFF Current — HIGH			50	μA	V _{OUT} = 2.7 V, V _{CC} = MAX
I _{OZL}	Output OFF Current — LOW			-50	μA	V _{OUT} = 0.5 V, V _{CC} = MAX
I _{IH}	Input HIGH Current			20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
				0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
I _{IL}	Input LOW Current			-0.6	mA	V _{CC} = MAX, V _{IN} = 0.5 V
I _{OS}	Output Short Circuit Current (Note 2)	-60		-150	mA	V _{CC} = MAX, V _{OUT} = 0 V
I _{CCZ}	Power Supply Current		37	56	mA	V _{CC} = MAX: A ₀ -A ₂ , \bar{E}_1 , \bar{E}_2 = GND \bar{OE}_1 , \bar{OE}_2 , E ₃ , E ₄ , P = HIGH

AC CHARACTERISTICS

Symbol	Parameter	54/74F			54F		74F		Unit
		T _A = +25°C V _{CC} = +5.0 V C _L = 50 pF			T _A = -55 to +125°C V _{CC} = 5.0 V ± 10% C _L = 50 pF		T _A = 0 to 70°C V _{CC} = 5.0 V ± 10% C _L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay A _n to O _n	4.0 3.0	11 7.5	13 12.5	4.0 3.0	17 16.5	4.0 3.0	14 13.5	ns
t _{PLH} t _{PHL}	Propagation Delay \bar{E}_1 or \bar{E}_2 to O _n	4.0 3.0	8.5 6.5	12 12	3.5 3.0	15 14.5	3.5 3.0	13 12.5	
t _{PLH} t _{PHL}	Propagation Delay E ₃ or E ₄ to O _n	6.5 4.0	11 10	12.5 12.5	5.5 3.5	15.5 15	5.5 3.5	13.5 13	ns
t _{PLH} t _{PHL}	Propagation Delay P to O _n	4.5 3.5	11.5 11	15 11.5	4.0 3.5	18.5 12.5	4.0 3.5	16.5 12	
t _{PZH} t _{PZL}	Output Enable Time \bar{OE}_1 or \bar{OE}_2 to O _n	2.5 4.0	5.5 9.0	9.5 13.5	2.0 4.0	13 16	2.0 4.0	11 15	ns
t _{PHZ} t _{PLZ}	Output Disable Time \bar{OE}_1 or \bar{OE}_2 to O _n	1.0 1.0	4.0 5.0	6.0 8.5	1.0 1.0	8.0 10.5	1.0 1.0	7.0 9.5	

MC54/74F538

TRUTH TABLE

FUNCTION	INPUTS									OUTPUTS							
	\overline{OE}_1	\overline{OE}_2	\overline{E}_1	\overline{E}_2	E ₃	E ₄	A ₂	A ₁	A ₀	O ₀	O ₁	O ₂	O ₃	O ₄	O ₅	O ₆	O ₇
High Impedance	H	X	X	X	X	X	X	X	X	Z	Z	Z	Z	Z	Z	Z	Z
	X	H	X	X	X	X	X	X	X	Z	Z	Z	Z	Z	Z	Z	Z
Disable	L	L	H	X	X	X	X	X	X	Outputs Equal P Input							
	L	L	X	H	X	X	X	X	X								
	L	L	X	X	L	X	X	X	X								
	L	L	X	X	X	L	X	X	X								
Active HIGH Output (P = L)	L	L	L	L	H	H	L	L	L	H	L	L	L	L	L	L	L
	L	L	L	L	H	H	L	L	H	L	H	L	L	L	L	L	L
	L	L	L	L	H	H	L	H	L	L	L	H	L	L	L	L	L
	L	L	L	L	H	H	L	H	H	L	L	L	H	L	L	L	L
	L	L	L	L	H	H	H	L	L	L	L	L	L	H	L	L	L
	L	L	L	L	H	H	H	L	H	L	L	L	L	L	L	L	L
	L	L	L	L	H	H	H	H	L	L	L	L	L	L	L	L	L
	L	L	L	L	H	H	H	H	H	L	L	L	L	L	L	L	L
Active LOW Output (P = H)	L	L	L	L	H	H	L	L	L	L	H	H	H	H	H	H	H
	L	L	L	L	H	H	L	L	H	H	L	H	H	H	H	H	H
	L	L	L	L	H	H	L	H	L	H	H	L	H	H	H	H	H
	L	L	L	L	H	H	L	H	H	H	H	H	L	H	H	H	H
	L	L	L	L	H	H	H	L	L	H	H	H	H	H	L	H	H
	L	L	L	L	H	H	H	H	L	H	H	H	H	H	H	L	H
	L	L	L	L	H	H	H	H	L	H	H	H	H	H	H	H	L
	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	L

H = HIGH Voltage Level
L = LOW Voltage Level
X = Don't Care
Z = High Impedance