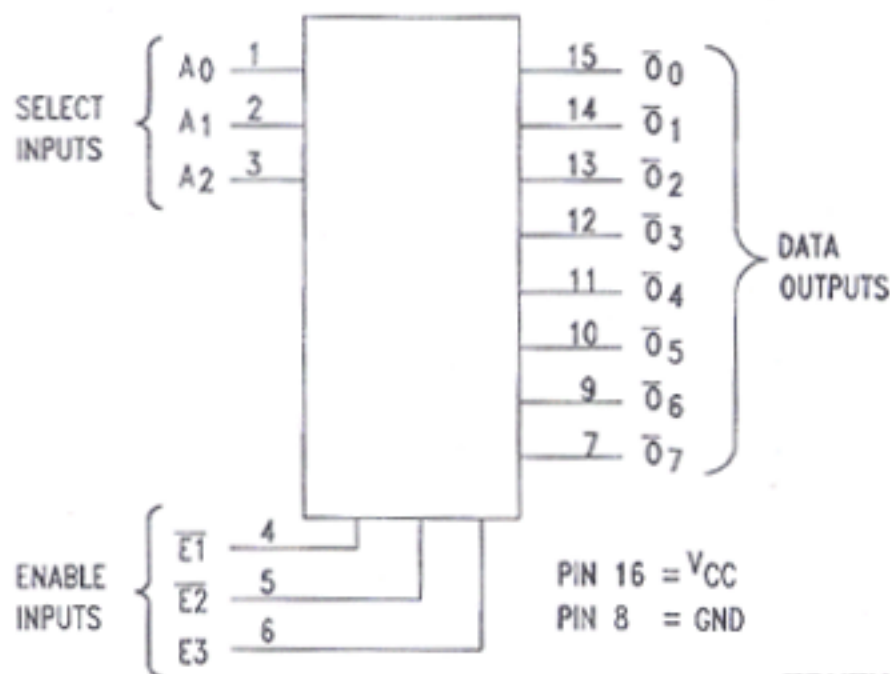
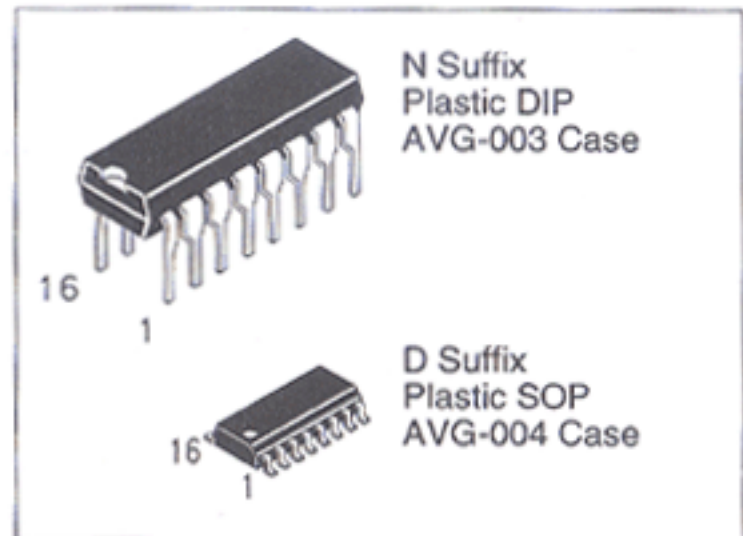


3 Line to 8 Line Decoder/Demultiplexer

These Schottky-clamped circuits are designed to be used in high-performance memory-decoding or data-routing applications requiring very short propagation delay times. One of eight lines is decoded based upon the conditions at the three binary select inputs and the three enable inputs. Two active-low and one active-high enable inputs reduce the need for external gates or inverters when expanding.

- AVG's LS operates over extended Vcc from 4.5 to 5.5 V
- AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc range
- Switching specifications for ALS at 50 pF
- AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series

DV74LS138
DV74ALS138



A₀-A₂ Address Inputs
 \bar{E}_1, \bar{E}_2 Enable (Active LOW) Inputs
E₃ Enable (Active HIGH) Input
 \bar{O}_0 - \bar{O}_7 Active LOW Outputs



TRUTH TABLE

Inputs						Outputs							
\bar{E}_1	\bar{E}_2	E ₃	A ₀	A ₁	A ₂	\bar{O}_0	\bar{O}_1	\bar{O}_2	\bar{O}_3	\bar{O}_4	\bar{O}_5	\bar{O}_6	\bar{O}_7
H	X	X	X	X	X	H	H	H	H	H	H	H	H
X	H	X	X	X	X	H	H	H	H	H	H	H	H
X	X	L	X	X	X	H	H	H	H	H	H	H	H
L	L	H	L	L	L	L	H	H	H	H	H	H	H
L	L	H	H	L	L	H	L	H	H	H	H	H	H
L	L	H	L	H	L	H	H	L	H	H	H	H	H
L	L	H	H	H	L	H	H	H	L	H	H	H	H
L	L	H	L	L	H	H	H	H	H	L	H	H	H
L	L	H	H	L	H	H	H	H	H	H	L	H	H
L	L	H	L	H	H	H	H	H	H	H	H	L	H
L	L	H	H	H	H	H	H	H	H	H	H	H	L

H = High Logic Level L = Low Logic Level X=Don't Care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	LS138	ALS138	Unit
V _{CC}	Supply Voltage	7.0	7.0	V
V _{IN}	Input Voltage	7.0	7.0	V
T _{STG}	Storage Temperature Range	-65 to +150	-65 to + 150	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	LS138		ALS138		Unit
		Min	Max	Min	Max	
V _{CC}	Supply Voltage	4.5	5.5	4.5	5.5	V
V _{IH}	High Level Input Voltage	2.0		2.0		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		8.0		8.0	mA
T _A	Ambient Temperature Range	-10 to +70		-10 to + 70		°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Conditions	LS138			ALS138			Unit
			Min	Typ	Max	Min	Typ	Max	
V _{IK}	Input Clamp Voltage	V _{CC} = min, I _{IN} = -18 mA			-1.5			-1.5	V
V _{OH}	High Level Output Voltage	V _{CC} =min, I _{OH} = max	V _{CC} -2	3.5		V _{CC} -2			V
V _{OL}	Low Level Output Voltage	V _{CC} =min; I _{OL} =4 mA V _{CC} =min; I _{OL} =8 mA		0.25 0.35	0.4 0.5		0.25 0.35	0.4 0.5	V
I _{IH}	High Level Input Current	V _{CC} =max, V _{IN} = 2.7V V _{CC} =max, V _{IN} = 7V			20 0.1			20 0.1	μA mA
I _{IL}	Low Level Input Current	V _{CC} =max, V _{IN} =0.4V			-0.4			-0.1	mA
I _O	Short Circuit Current	V _{CC} =max, V _O =2.25V	-20		-110	-30		-112	mA
I _{CC}	Supply Current	V _{CC} =Max			10		5	10	mA

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	From	To	LS138 $C_L=15\text{ pF}$		ALS138 $V_{RL}=500\Omega,$ $C_L=50\text{ pF}$		Unit
				Min	Max	Min	Max	
t_{PLH}	Propagation Delay Time, Low to High Level Output	Address	Y		27	6	22	ns
t_{PHL}	Propagation Delay Time High-to-Low Level Output	Address	Y		39	6	18	ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	Enable	Y		26	4	17	ns
t_{PHL}	Propagation Delay Time High-to-Low Level Output	Enable	Y		38	5	17	ns

SWITCHING WAVEFORMS

