National Semiconductor

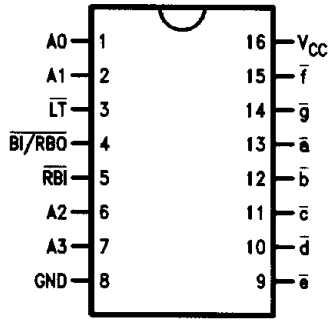
54LS347/DM74LS347
BCD to 7-Segment Decoder/Driver

General Description

The 'LS347 is the same as the 'LS47 except that the Output OFF Voltage, V_{OH}, is specified as 7.0V rather than 15V, with the same I_{OH} limit of 250 μA. For all other information please refer to the 'LS47 data sheet.

Connection Diagram

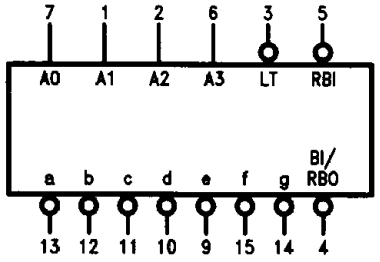
Dual-In-Line Package



TL/F/10184–1

Order Number 54LS347DMQB, 54LS347FMQB, DM74LS347M or DM74LS347N
See NS Package Number J16A, M16A, N16E or W16A

Logic Symbol



TL/F/10184–2

V_{CC} = Pin 16
GND = Pin 8

Pin Names	Description
A0–A3	BCD Inputs
$\overline{RBI}$	Ripple Blanking Input (Active LOW)
$\overline{LT}$	Lamp Test Input (Active LOW)
$\overline{BI}/\overline{RBO}$	Blanking Input (Active LOW) or Ripple Blanking Output (Active LOW)
$\overline{a}$–$\overline{g}$	*Segment Outputs (Active LOW)

*OC—Open Collector

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	7V
Operating Free Air Temperature Range	
54LS	−55°C to +125°C
DM74LS	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

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	54LS347			DM74LS347			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			0.7			0.8	V
I_{OH}	High Level Output Voltage			−50			−50	μA
I_{OL}	Low Level Output Current			12			24	mA
T_A	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
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −18 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, V_{OH} = Max, V_{IL} = Max	54LS	2.5			V
			DM74	2.7			
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min	54LS			0.4	V
			DM74			0.5	
		I_{OL} = 4 mA, V_{CC} = Min	DM74			0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 10V				0.1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V				20	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V		−0.03		−0.4	mA
		BI/$\overline{RBO}$ Input		−0.09		−1.2	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	54LS	−0.3		−2.0	mA
			DM74	−0.3		−2.0	
I_{CC}	Supply Current	V_{CC} = Max				13	mA
I_{OFF}		Segment Outputs, V_O = 7V				250	μA

Switching Characteristics

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

Symbol	Parameter	C_L = 15 pF		Units
		Min	Max	
t_{PLH}	Propagation Delay A_n to $\overline{a}$–$\overline{g}$		100	ns
t_{PHL}			100	ns
t_{PLH}	Propagation Delay $\overline{RBI}$ to $\overline{a}$–$\overline{g}$		100	ns
t_{PHL}			100	ns

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, and the duration should not exceed one second.