



**HEWLETT  
PACKARD**

# HEXADECIMAL AND NUMERIC DISPLAYS

**5082-7300  
5082-7302  
5082-7304  
5082-7340**

## Features

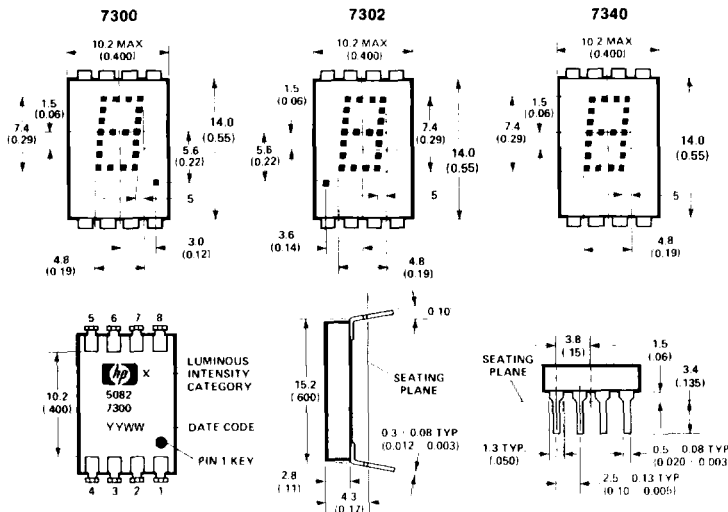
- **NUMERIC**  
5082-7300/-7302  
0-9, Test State, Minus Sign, Blank States, Decimal Point  
7300 Right Hand D. P.  
7302 Left Hand D.P.
- **HEXADECIMAL**  
5082-7340  
0-9, A-F, Base 16 Operation, Blanking Control, Conserves Power, No Decimal Point
- **TTL COMPATIBLE**
- **INCLUDES DECODER/DRIVER WITH MEMORY**  
8421 Positive Logic Input
- **4 x 7 DOT MATRIX ARRAY**  
Shaped Character, Excellent Readability
- **STANDARD DUAL-IN-LINE PACKAGE INCLUDING CONTRAST FILTER**  
15.2 mm x 10.2 mm (0.6 inch x 0.4 inch)
- **CATEGORIZED FOR LUMINOUS INTENSITY**

## Description

The HP 5082-7300 series solid state numeric and hexadecimal displays with on-board decoder/driver and memory provide 7.4 mm (0.29 inch) displays for reliable, low-cost methods of displaying digital information.

The 5082-7300 numeric display decodes positive 8421 BCD logic inputs into characters 0-9, a "—" sign, a test pattern, and four blanks in the invalid BCD states. The unit employs a right-hand decimal point.

## Package Dimensions



Pin	Function	
	5082-7300 and 7302 Numeric	5082-7340 Hexadecimal
1	Input 2	Input 2
2	Input 4	Input 4
3	Input 8	Input 8
4	Decimal Point	Blanking Control
5	Latch Enable	Latch Enable
6	Ground	Ground
7	V <sub>CC</sub>	V <sub>CC</sub>
8	Input 1	Input 1

### Notes:

- 1 Dimensions in millimeters and inches.
- 2 Unless otherwise specified, the tolerance on all dimensions is ±0.38 mm (±0.015 inch).
- 3 Digit center line is ±0.25 mm (±0.01 inch) from package center line.



The 5082-7302 is the same as the 5082-7300, except that the decimal point is located on the left-hand side of the digit.

The 5082-7340 hexadecimal display decodes positive 8421 logic inputs into 16 states, 0-9 and A-F. In place of the decimal point an input is provided for blanking the display (all LEDs off), without losing the contents of the memory. Applications include terminals and computer systems using the base-16 character set.

The 5082-7304 is a (±1) overrange display including a right-hand decimal point.

The ESD susceptibility of these IC devices is Class A of MIL-STD-883 or Class 2 of DOD-STD-1686 and DOD-HDBK-263.

## Applications

Typical applications include point-of-sale terminals, instrumentation, and computer system.

ALPHANUMERIC DISPLAYS

## Absolute Maximum Ratings

Description	Symbol	Min.	Max.	Unit
Storage temperature, ambient	$T_S$	-40	+100	°C
Operating temperature, case <sup>(1,2)</sup>	$T_C$	-20	+85	°C
Supply voltage <sup>(3)</sup>	$V_{CC}$	-0.5	+7.0	V
Voltage applied to input logic, dp and enable pins	$V_{I1}, V_{DD}, V_{E1}$	-0.5	+7.0	V
Voltage applied to blanking input <sup>(3)</sup>	$V_B$	-0.5	$V_{CC}$	V
Maximum solder temperature at 1.59mm (.062 inch) below seating plane; $t \leq 5$ seconds			230	°C

## Recommended Operating Conditions

Description	Symbol	Min.	Nom.	Max.	Unit
Supply Voltage	$V_{CC}$	4.5	5.0	5.5	V
Operating temperature, case	$T_C$	-20		+85	°C
Enable Pulse Width	$t_w$	120			nsec
Time data must be held before positive transition of enable line	$t_{SETP}$	50			nsec
Time data must be held after positive transition of enable line	$t_{HOLD}$	50			nsec
Enable pulse rise time	$t_{RHH}$			200	nsec

## Electrical/Optical Characteristics ( $T_C = -20^\circ\text{C}$ to $+85^\circ\text{C}$ , Unless Otherwise Specified)

Description	Symbol	Test Conditions	Min.	Typ. <sup>(4)</sup>	Max.	Unit
Supply Current	$I_{CC}$	$V_{CC} = 5.5\text{ V}$ (characters "5." or "B" displayed)		112	170	mA
Power dissipation	$P_I$			560	935	mW
Luminous intensity per LED (Digit average) <sup>(5,6)</sup>	$I_v$	$V_{CC} = 5.0\text{ V}$ , $T_C = 25^\circ\text{C}$	32	70		$\mu\text{cd}$
Logic low-level input voltage	$V_{IH}$	$V_{CC} = 4.5\text{ V}$			0.8	V
Logic high-level input voltage	$V_{IHL}$		2.0			V
Enable low-voltage; data being entered	$V_{E1L}$				0.8	V
Enable high-voltage; data not being entered	$V_{E1H}$		2.0			V
Blanking low-voltage; display not blanked <sup>(7)</sup>	$V_{BL}$				0.8	V
Blanking high-voltage; display blanked <sup>(7)</sup>	$V_{BLH}$		3.5			V
Blanking low-level input current <sup>(7)</sup>	$I_{BL}$		$V_{CC} = 5.5\text{ V}$ , $V_{BL} = 0.8\text{ V}$			20
Blanking high-level input current <sup>(7)</sup>	$I_{BLH}$	$V_{CC} = 5.5\text{ V}$ , $V_{BLH} = 4.5\text{ V}$			2.0	mA
Logic low-level input current	$I_{IL}$	$V_{CC} = 5.5\text{ V}$ , $V_{IH} = 0.4\text{ V}$			-1.6	mA
Logic high-level input current	$I_{IHL}$	$V_{CC} = 5.5\text{ V}$ , $V_{IHL} = 2.4\text{ V}$			+250	$\mu\text{A}$
Enable low-level input current	$I_{E1L}$	$V_{CC} = 5.5\text{ V}$ , $V_{E1L} = 0.4\text{ V}$			-1.6	mA
Enable high-level input current	$I_{E1HL}$	$V_{CC} = 5.5\text{ V}$ , $V_{E1HL} = 2.4\text{ V}$			+250	$\mu\text{A}$
Peak wavelength	$\lambda_{PEAK}$	$T_C = 25^\circ\text{C}$		655		nm
Dominant Wavelength <sup>(8)</sup>	$\lambda_d$	$T_C = 25^\circ\text{C}$		640		nm
Weight				0.8		gm

Notes: 1. Nominal thermal resistance of a display mounted in a socket which is soldered into a printed circuit board:  $\theta_{JA} = 50^\circ\text{C/W}$ ;  $\theta_{JC} = 15^\circ\text{C/W}$ ; 2.  $\theta_{CA}$  of a mounted display should not exceed  $35^\circ\text{C/W}$  for operation up to  $T_C = +85^\circ\text{C}$ . 3. Voltage values are with respect to device ground, pin 6. 4. All typical values at  $V_{CC} = 5.0$  Volts,  $T_A = 25^\circ\text{C}$ . 5. These displays are categorized for luminous intensity with the intensity category designated by a letter located on the back of the display contiguous with the Hewlett-Packard logo marking. 6. The luminous intensity at a specific case temperature,  $I_v(T_C)$  may be calculated from this relationship:  $I_v(T_C) = I_v(25^\circ\text{C}) e^{[0.0188/^\circ\text{C}(T_C - 25^\circ\text{C})]}$ . 7. Applies only to 7340. 8. The dominant wavelength,  $\lambda_d$ , is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

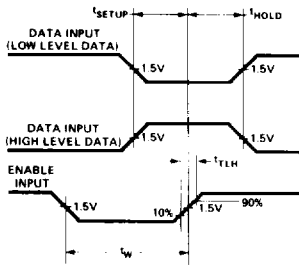


Figure 1. Timing Diagram of 5082-7300 Series Logic.

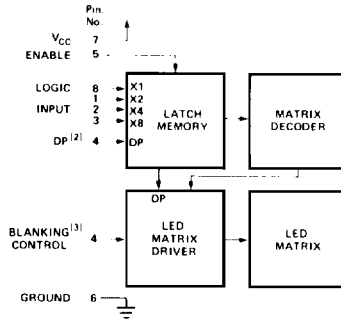


Figure 2. Block Diagram of 5082-7300 Series Logic.

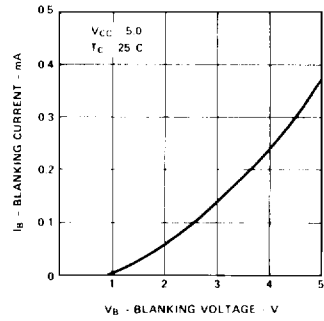


Figure 3. Typical Blanking Control Current vs. Voltage for 5082-7340.

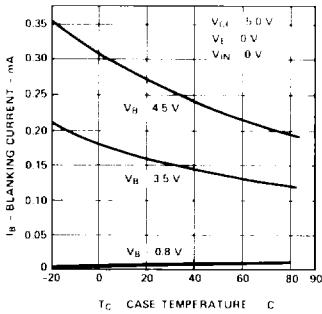


Figure 4. Typical Blanking Control Input Current vs. Temperature, 5082-7340.

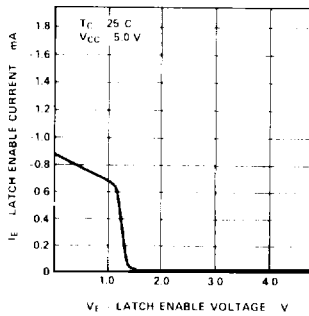


Figure 5. Typical Latch Enable Input Current vs. Voltage for the 5082-7300 Series Devices.

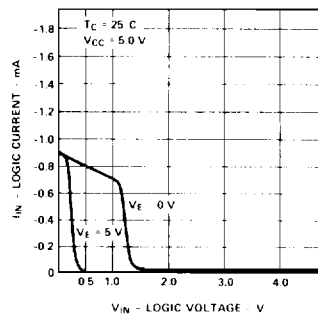


Figure 6. Typical Logic and Decimal Point Input Current vs. Voltage for the 5082-7300 Series Devices. Decimal Point Applies to 5082-7300 and -7302 Only.

BCD DATA <sup>[1]</sup>				TRUTH TABLE	
X <sub>8</sub>	X <sub>4</sub>	X <sub>2</sub>	X <sub>1</sub>	5082-7300/7302	5082-7340
L	L	L	L	0	0
L	L	L	H	1	1
L	L	H	L	2	2
L	L	H	H	3	3
L	H	L	L	4	4
L	H	L	H	5	5
L	H	H	L	6	6
L	H	H	H	7	7
H	L	L	L	8	8
H	L	L	H	9	9
H	L	H	L	(BLANK)	(BLANK)
H	L	H	H	(BLANK)	(BLANK)
H	H	L	L	(BLANK)	(BLANK)
H	H	L	H	(BLANK)	(BLANK)
H	H	H	L	(BLANK)	(BLANK)
H	H	H	H	(BLANK)	(BLANK)
DECIMAL PT. <sup>[2]</sup>	ON			V <sub>DP</sub> L	
	OFF			V <sub>DP</sub> H	
ENABLE <sup>[1]</sup>	LOAD DATA			V <sub>E</sub> L	
	LATCH DATA			V <sub>E</sub> H	
BLANKING <sup>[3]</sup>	DISPLAY ON			V <sub>B</sub> L	
	DISPLAY OFF			V <sub>B</sub> H	

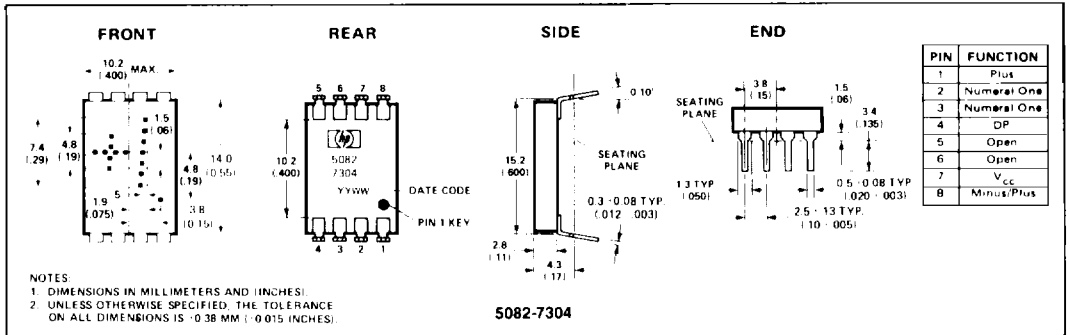
Notes

- H = Logic High; L = Logic Low. With the enable input at logic high changes in BCD input logic levels or D.P. input have no effect upon display memory, displayed character, or D.P.
- The decimal point input, DP, pertains only to the 5082-7300 and 5082-7302 displays.
- The blanking control input, B, pertains only to the 5082-7340 hexadecimal display. Blanking input has no effect upon display memory.

# Solid State Over Range Display

For display applications requiring a +, 1, or decimal point designation, the 5082-7304 over range display is available. This display module comes in the same package as the 5082-7300 series numeric display and is completely compatible with it.

## Package Dimensions



## TRUTH TABLE FOR 5082-7304

CHARACTER	PIN			
	1	2,3	4	8
+	H	X	X	H
-	L	X	X	H
1	X	H	X	X
Decimal Point	X	X	H	X
Blank	L	L	L	L

NOTES: L: Line switching transistor in Figure 7 cutoff.  
 H: Line switching transistor in Figure 7 saturated.  
 X: 'Don't care'

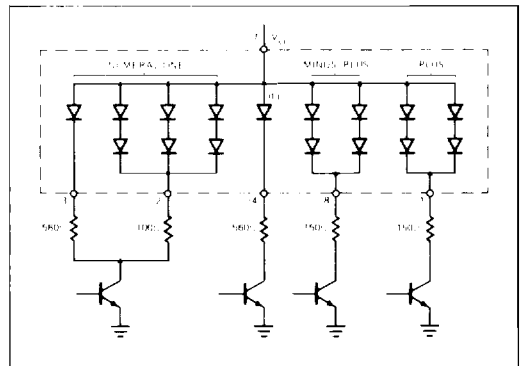


Figure 7. Typical Driving Circuit for 5082-7304

## Recommended Operating Conditions

	SYMBOL	MIN	NOM	MAX	UNIT
LED supply voltage	V <sub>CC</sub>	4.5	5.0	5.5	V
Forward current, each LED	I <sub>F</sub>		5.0	10	mA

NOTE:  
 LED current must be externally limited. Refer to Figure 7 for recommended resistor values.

## Absolute Maximum Ratings

DESCRIPTION	SYMBOL	MIN.	MAX.	UNIT
Storage temperature, ambient	T <sub>S</sub>	-40	+100	°C
Operating temperature, case	T <sub>C</sub>	-20	+85	°C
Forward current, each LED	I <sub>F</sub>		10	mA
Reverse voltage, each LED	V <sub>R</sub>		4	V

## Electrical/Optical Characteristics

5082-7358 (T<sub>C</sub> = -20°C to +85°C, Unless Otherwise Specified)

DESCRIPTION	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Forward Voltage per LED	V <sub>F</sub>	I <sub>F</sub> = 10 mA		1.6	2.0	V
Power dissipation	P <sub>T</sub>	I <sub>F</sub> = 10 mA all diodes lit		250	320	mW
Luminous Intensity per LED (digit average)	I <sub>v</sub>	I <sub>F</sub> = 6 mA T <sub>C</sub> = 25°C	32	70		μcd
Peak wavelength	λ <sub>peak</sub>	T <sub>C</sub> = 25°C		655		nm
Dominant Wavelength	λ <sub>d</sub>	T <sub>C</sub> = 25°C		640		nm
Weight				0.8		gm