

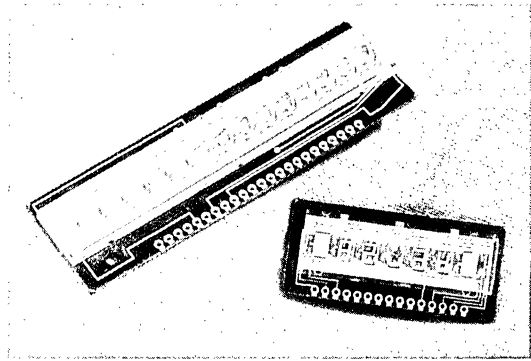
LARGE MONOLITHIC NUMERIC INDICATORS

5082-7265
5082-7275
5082-7285
5082-7295

TECHNICAL DATA APRIL 1979

Features

- **LARGE 4.45mm (.175") CHARACTER HEIGHT**
- **LOW POWER**
Satisfactory Readability can be Achieved with Drive Currents as Low as 1.0-1.5mA Average per Segment Depending on Peak Current Levels
- **MOS COMPATIBLE**
Can be Driven Directly from MOS Circuits
- **COMPACT INFORMATION DISPLAY**
5.84mm (.23") Digit Spacing Yields Over 4 Characters per Inch.
- **HIGH AMBIENT READABILITY**
High Sterance Emitting Areas Mean Excellent Readability in High Ambient Light Conditions
- **HIGH LEGIBILITY AND NUMBER RECOGNITION**
High On/Off Contrast and Fine Line Segments Improve Viewer Recognition of the Displayed Number
- **UNIFORM ALIGNMENT**
Excellent Alignment is Assured by Design
- **MATCHED BRIGHTNESS**
Provides Uniform Light Output from Digit to Digit on a Single PC Board
- **EASY MOUNTING**
Flexible Mounting in Desired Position with Edge Connectors or Soldered Wires




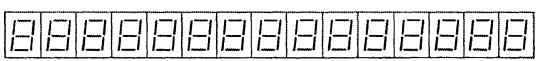

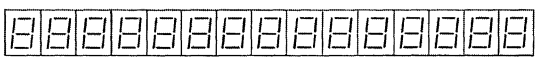
SOLID STATE
DISPLAYS

Description

The HP 5082-7265, 7275, 7285, and 7295 displays are 4.45 mm (.175") seven segment GaAsP numeric indicators mounted in 5 or 15 digit configurations on a PC Board. The monolithic light emitting diode character is magnified by the integral lens which increases both character size and luminous intensity, thereby making low power consumption possible. Options include both a right hand decimal point and centered decimal version for improved legibility. The digits are mounted on 5.84 mm (230 mil) centers.

These displays are attractive for applications such as digital instruments, desk top calculators, avionics and automobile displays, P.O.S. terminals, in-plant control equipment, and other products requiring low power, display compactness, readability in high ambients, or highly legible, long lifetime numerical displays.

Device Selection Guide

Digits Per PC Board	Configuration			Part No. 5082-
	Device	Package	Character	
5		(Figure 5)	Center Decimal Point (Figure 7)	7265
15		(Figure 6)	Center Decimal Point (Figure 7)	7275
5		(Figure 5)	Right Decimal Point (Figure 7)	7285
15		(Figure 6)	Right Decimal Point (Figure 7)	7295

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Peak Forward Current per Segment or DP (Duration <35μs)	I _{PEAK}		200	mA
Average Current per Segment or DP ⁽¹⁾	I _{AVG}		7	mA
Power Dissipation per Digit ⁽²⁾	P _D		125	mW
Operating Temperature, Ambient	T _A	-20	+70	°C
Storage Temperature	T _S	-20	+80	°C
Reverse Voltage	V _R		5	V
Solder Temperature at connector edge (t≤3 sec.) ⁽³⁾			230	°C

- NOTES: 1. Derate linearly at 0.12 mA/°C above 25°C ambient.
 2. Derate linearly at 2.3 mW/°C above 25°C ambient.
 3. See Mechanical section for recommended soldering techniques and flux removal solvents.

Electrical/Optical Characteristics at T_A=25°C

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Luminous Intensity/Segment or dp (Time Averaged) 15 digit display 5082-7275, 5082-7295 ^(4,6)	I _v	I _{avg.} = 2 mA (30 mA Peak 1/15 duty cycle)	30	90		μcd
Luminous Intensity/Segment or dp (Time Averaged) 5 digit display 5082-7265, 5082-7285 ^(4,6)	I _v	I _{avg.} = 2 mA (10 mA Peak 1/5 duty cycle)	30	70		μcd
Forward Voltage per Segment or dp 5082-7275, 5082-7295 15 digit display	V _F	I _F = 30 mA		1.60	2.3	V
Forward Voltage per Segment or dp 5082-7265, 5082-7285 5 digit display	V _F	I _F = 10 mA		1.55	2.0	V
Peak Wavelength	λ _{PEAK}			655		nm
Dominant Wavelength ⁽⁵⁾	λ _d			640		nm
Reverse Current per Segment or dp	I _R	V _R = 5V			100	μA
Temperature Coefficient of Forward Voltage	ΔV _F /°C			-2.0		mV/°C

- NOTES: 4. The luminous intensity at a specific ambient temperature, I_v(T_A), may be calculated from this relationship:
 $I_v(T_A) = I_v(25^\circ C) (.985)^{(T_A - 25^\circ C)}$
 5. The dominant wavelength λ_d, is derived from the C.I.E. Chromaticity Diagram and represents the single wavelength which defines the color of the device.
 6. Operation at peak currents of less than 6.0 mA is not recommended.

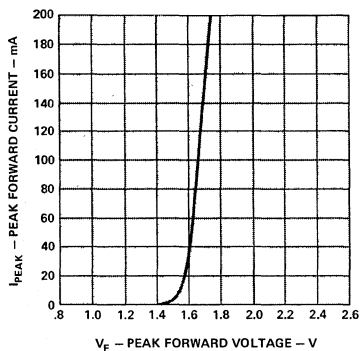


Figure 1. Peak Forward Current vs. Peak Forward Voltage.

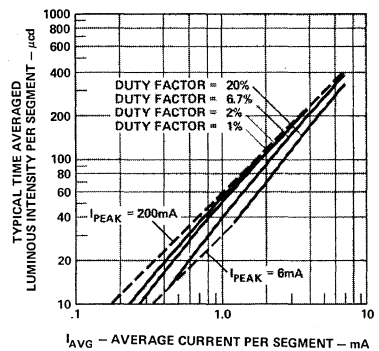


Figure 2. Typical Time Averaged Luminous Intensity per Segment vs. Average Current per Segment.

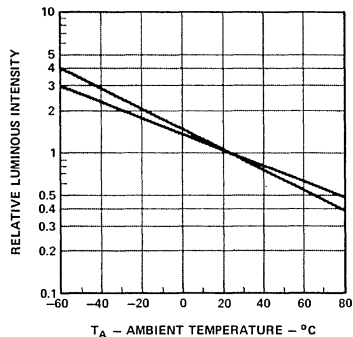


Figure 3. Relative Luminous Intensity vs. Ambient Temperature at Fixed Current Level.

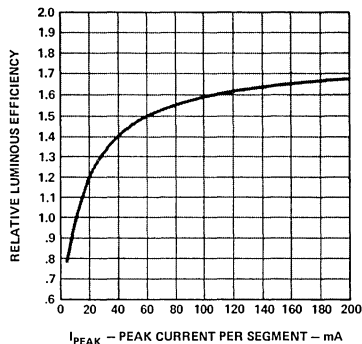


Figure 4. Relative Luminous Efficiency vs. Peak Current per Segment.

Electrical

The HP 5082-7265, 7275, 7285, and 7295 devices utilize a seven segment monolithic GaAsP chip. The 5082-7285 and 7295 devices use a separate decimal point chip located to the right of each digit. The 5082-7265 and 7275 devices use a centered decimal point on the monolithic seven segment chip. The centered decimal point version improves the displays readability by dedicating an entire digit position to distinguishing the decimal point. In the driving scheme for the centered decimal point version the decimal point is treated as a separate character with its own time frame.

The segments and decimal points of each digit are interconnected, forming an 8 by N line array, where N is the number of characters in the display. Character encoding is performed by standard 7 segment decoder driver circuits. A detailed discussion of display circuits and drive techniques appears in Applications Note 937.

These devices are tested for digit to digit luminous intensity using the circuit depicted in Figure 8. Component values are chosen to give a Peak I_F of 10 mA per segment for the 5 digit displays and 30 mA per segment for the 15 digit displays. This test method is preferred in order to provide the best possible simulation of the end product drive circuit, thereby ensuring excellent digit to digit matching. If the device is to be driven at peak currents of less than 6.0 mA, it is recommended that the HP field salesman or factory be contacted.

For special product applications, the number of digits per display can be altered. It is also possible to provide a colon instead of the centered decimal point. Contact the HP field salesman or factory to discuss such special modifications.

Optical

Each chip is positioned under a separate element of a plastic magnifying lens, producing a magnified character height of 4.45mm (.175"). To increase vertical viewing angle the secondary cylindrical magnifier can be removed reducing character height to 3.86mm (.152"). A filter, such as Panelgraphic 60 or 63, or Homalite 100-1600, will lower ambient reflectance and improve display contrast.

Mechanical

These devices are constructed on a standard printed circuit board substrate. A separately molded plastic lens is attached to the PC board over the digits. The lens is an acrylic styrene material that gives good optical lens performance, but is subject to scratching so care should be exercised in handling.

The device may be mounted either by use of pins which may be soldered into the plated through holes at the connector edge of the PC board or by insertion into a standard PC board connector. The devices may be soldered for up to 3 seconds per tab at a maximum soldering temperature of 230°C. Heat should be applied only to the edge connector tab areas of the PC board. Heating other areas of the board to temperatures in excess of 85°C can result in permanent damage to the display. It is recommended that a rosin core wire solder or a low temperature deactivating flux and solid wire solder be used in soldering operations.

The PC board is silver plated. To prevent the formation of a tarnish (Ag_2S) which could impair solderability the displays should be stored in the unopened shipping packages until they are used. Further information on the storage, handling, and cleaning of silver plated components is contained in Hewlett-Packard Application Bulletin No. 3.

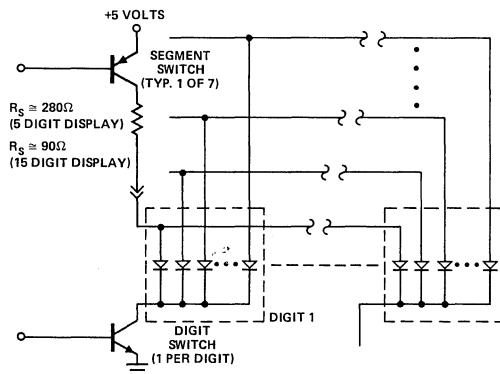


Figure 5. Circuit Diagram used for Testing the Luminous Intensity.

Package Dimensions

ALL DIMENSIONS IN MILLIMETERS AND (INCHES).

TOLERANCES ARE ± 0.203 ($\pm .008$) UNLESS OTHERWISE NOTED

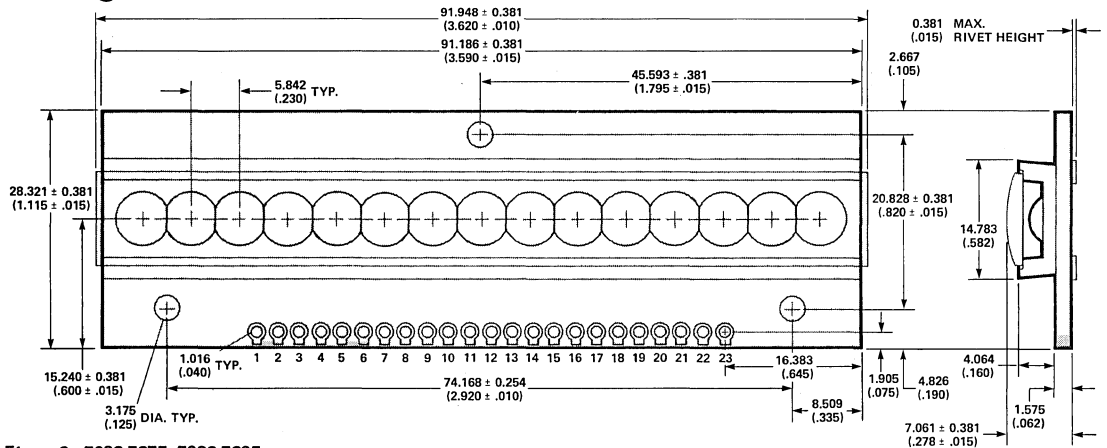


Figure 6. 5082-7275, 5082-7295.

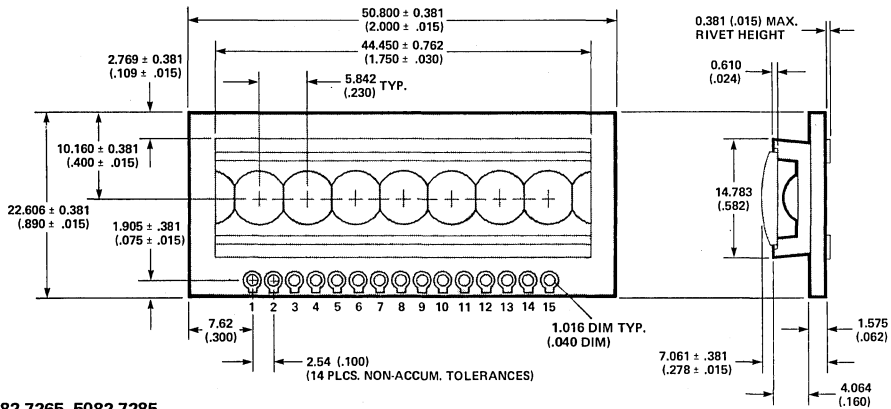
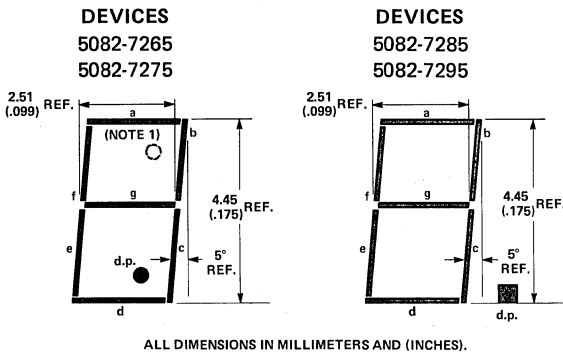


Figure 7. 5082-7265, 5082-7285.

Magnified Character Font Description



ALL DIMENSIONS IN MILLIMETERS AND (INCHES).

NOTE 1. Bonding Option for Colon Instead of Decimal Point. See Electrical Section.

Figure 8.

Device Pin Description

Pin No.	5082-7265 5082-7285 Function	5082-7275 5082-7295 Function
1	Anode Segment b	Cathode Digit 1
2	Anode Segment g	Cathode Digit 2
3	Anode Segment e	Cathode Digit 3
4	Cathode Digit 1	Cathode Digit 4
5	Cathode Digit 2	Anode Segment dp
6	Cathode Digit 3	Cathode Digit 5
7	Cathode Digit 4	Anode Segment c
8	Cathode Digit 5	Cathode Digit 6
9	Cathode Digit 6	Anode Segment e
10	Cathode Digit 7	Cathode Digit 7
11	Anode Segment dp	Anode Segment a
12	Anode Segment d	Cathode Digit 8
13	Anode Segment c	Anode Segment g
14	Anode Segment a	Cathode Digit 9
15	Anode Segment f	Anode Segment d
16		Cathode Digit 10
17		Anode Segment f
18		Cathode Digit 11
19		Anode Segment b
20		Cathode Digit 12
21		Cathode Digit 13
22		Cathode Digit 14
23		Cathode Digit 15