

## LED Display Modules

128 x 32 Graphics Display with Drive Electronics and + 5 V HC CMOS Level Video Interface  
 Red LED Modules, Normal Brightness, Single Board Construction, RoHS Compliant



The LEE-128G032B is an LED replacement for the popular APD-128G032 plasma display module. It is designed to offer high brightness and superior viewing characteristics in a slim package. This display is ideal for low to medium level information content and is ideal for applications such as arcade games, process control, POS terminals, medical equipment, message centers and ATM machines.

The LEE-128G032B LED display offers high contrast, wide viewing angle, and long distance readability. It emits a bright red color which catches the attention of the viewer, but is yet comfortable to the eye.

The LEE-128G032B LED display has a video type interface and is driven in a standard row/column refresh method. Pixel data is clocked for a row, and rows are scanned sequentially. Signals are presented for *serial data*, *dot clock*, *column latch*, *row data*, *row clock* and *display enable*. The *serial data* is entered with the *dot clock* up to frequencies as high as 8 MHz. After a row of 128 pixels is clocked in, the *column latch* signal is toggled and the data is latched. At the time the data is latched, the display is briefly disabled using the *display enable* signal, then the row pointer is advanced with the *row clock* signal. Once each frame the *row data* must be asserted to synchronize the column serial data with the beginning row. The recommended scanning frequency is approximately 70 Hz, but may be as high as 200 Hz.

STANDARD ELECTRICAL SPECIFICATIONS (1)					
DESCRIPTION	SYMBOL	MIN.	TYP.	MAX.	UNITS
Logic and LED Drive Voltage	$V_{CC}$	+ 4.5	+ 5.0	+ 5.5	$V_{DC}$
Logic and LED Drive Current (Fully Lit)	$I_{CC}$	-	1.1	1.3	$A_{DC}$
Logic 1 Input	$V_{ih}$	0.7 $V_{CC}$	-	-	$V_{DC}$
Logic 0 Input	$V_{il}$	-	-	0.3 $V_{CC}$	$V_{DC}$

**Note**

(1) Recommended operating voltages, all maximums are absolute maximum

**FEATURES**

- LED replacement for the popular APD-128G032 plasma display module
- + 5 V HC CMOS level video interface
- Large characters
- Highly visible for long distance viewing
- > 30:1 contrast ratio
- Bright red color
- Slim profile
- Reduced power and brightness version
- Compliant to RoHS directive 2002/95/EC


**RoHS**  
 COMPLIANT

**ELECTRICAL SPECIFICATIONS**
**Voltage(s) Required:** + 5  $V_{DC}$  ( $V_{CC}$ )

**Power Required (Fully Lit):** Typical = 5.5 W  
 Maximum = 6.5 W

**OPTICAL SPECIFICATIONS**
**Viewing Area:** 12.75" [323.8 mm] W x 3.15" [80.01 mm] L

**Character Size (5 x 7):** 0.65" [16.51 mm] H x 0.45" [11.43 mm] W

**Pixel Size:** 0.063" [1.6 mm] H x 0.031" [0.8 mm] W

**Pixel Pitch:** 0.100" [2.54 mm]

**Luminance:** 100 ft-L minimum

**Color:** Bright red

**Viewing Angle:** > 150°

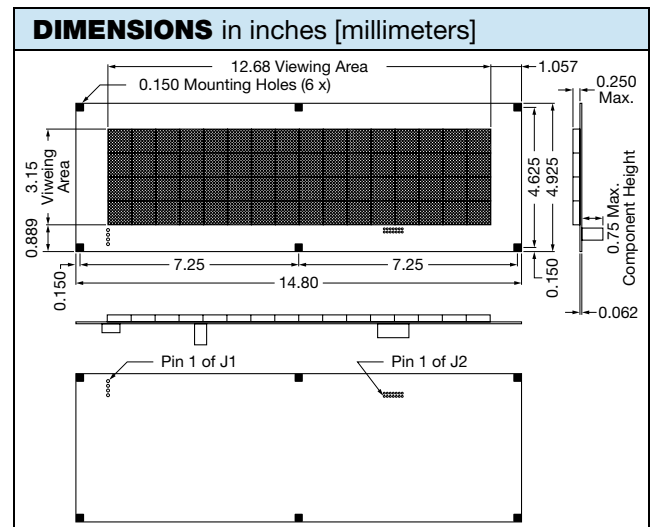
**ENVIRONMENTAL SPECIFICATIONS**
**Operating Temperature:** - 40 °C to + 85 °C

**Storage Temperature:** - 40 °C to + 85 °C

**Relative Operating Humidity:** To 95 % non-condensing

**Mechanical Shock:** 30 G

**Vibration:** 3 G

**Operating Altitude:** 10 000 ft


PIN DESCRIPTION			
<b>J2 - POWER CONNECTOR</b>			
Molex 26-48-1045 or equivalent. Mates with Tyco AMP 3-640428-8, or Molex 09-50-3041 housing with 08-50-0106 socket crimp terminals or equivalent.			
PIN	SIGNAL	DESCRIPTION	
1	V <sub>CC</sub>	Logic and LED drive supply	
2	V <sub>CC</sub>	Logic and LED drive supply	
3	GND	Ground	
4	GND	Ground	
<b>J1 - DATA CONNECTOR</b>			
FCI 75869-102LF or equivalent. Mates with Tyco AMP 1658621-2 or equivalent			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	Display enable	2	Ground
3	Row data	4	Ground
5	Row clock	6	Ground
7	Column latch	8	Ground
9	Dot clock	10	Ground
11	Serial data	12	Ground
13	No connection	14	Ground

**INTERFACE SIGNAL DESCRIPTION**

**Dot clock** - This signal enters the *serial data* on each low to high transition. A total of 128 *dot clock* transitions must be present for each line of column/anode data.

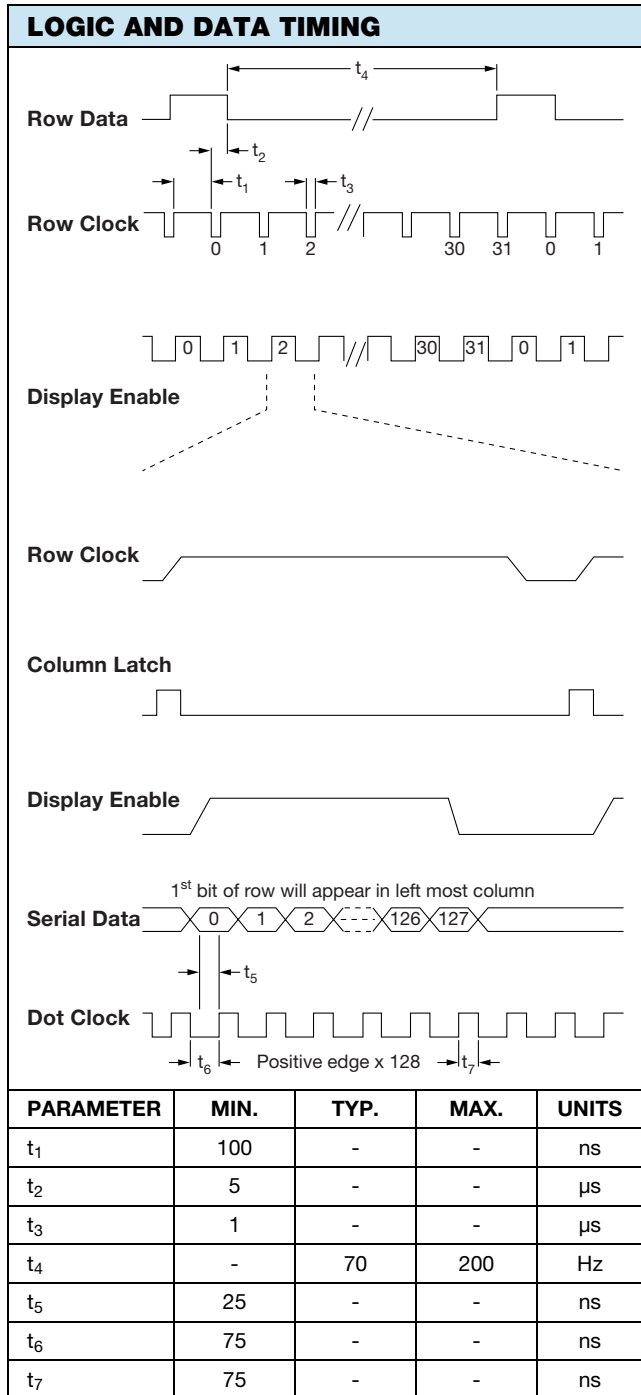
**Serial data** - This signal presents the pixel data in positive logic format. A logic one represents a lit pixel and a logic zero represents an extinguished pixel. Data is entered from right to left. The first pixel data entered will represent the left most pixel in the row.

**Column latch** - This signal latches the pixel data into the driver outputs. When the *column latch* signal goes to logic one the data entered previously will fall through to the driver outputs. When the signal returns to a logic zero the data is latched and the shift register is now ready to accept the next row of data. Must be held low while entering new *serial data*.

**Display enable** - This signal enables the output drivers. Using a duty cycle control, this signal may also be used for intensity control. The *display enable* must be at logic zero before the *column latch* signal transitions. To avoid display blurring, the *row clock* signal should also transition while *display enable* is a logic zero.

**Row data** - This signal is the first line marker for the scan. This input should be held high to correspond to the first row of pixel data.

**Row clock** - This signal clocks *row data* on the falling edge. The *row clock* signal is repetitive and must be present for proper scanning of the display module. The LEE-128G032B has a unique input protection circuit that assures the column drivers stay blanked on power up. The protection circuit unblanks the column drivers when the *row clock* signal begins (i.e the display begins scanning).



ORDERING INFORMATION	
DESCRIPTION	PART NUMBER
Display, Driver Electronics and + 5 V HC CMOS Interface	LED-128G032B
J1 Data Connector Kit (2 pcs. recommended)	280105-08
J2 Power Connector Kit	280108-16



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**