LED Display Modules

128 x 32 Graphics Display with
Drive Electronics and +5V HC CMOS Level Video Interface

FEATURES

- LED replacement for the popular APD-128G032 plasma display module
- +5V HC CMOS level video interface
- Large characters
- Highly visible for long distance viewing
- > 30:1 contrast ratio
- Brilliant neon orange color
- Slim profile

The LED-128G032 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 LED-128G032 LED display offers high contrast, wide viewing angle, and long distance readability. It emits a brilliant orange color which catches the attention of the viewer, but is yet comfortable to the eye.

The LED-128G032 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 8MHz. 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 70Hz, but may be as high as 200Hz.

ELECTRICAL SPECIFICATIONS

Voltage(s) Required: + 5 VDC (V_{CC})
Power Required (Fully Lit): Typical =12.5 watts.
Maximum = 15 watts

OPTICAL SPECIFICATIONS

Viewing Area: 12.75" [323.8mm] W x 3.15" [80.01mm] L
Character Size (5x7): 0.65" [16.51mm] H x 0.45" [11.43mm] W
Pixel Size: 0.063" [1.6mm] H x 0.031" [0.8mm] W
Pixel Pitch: 0.100" [2.54mm]
Luminance: 100 foot-lamberts minimum
Color: Neon Orange
Viewing Angle: >150°

ENVIRONMENTAL SPECIFICATIONS

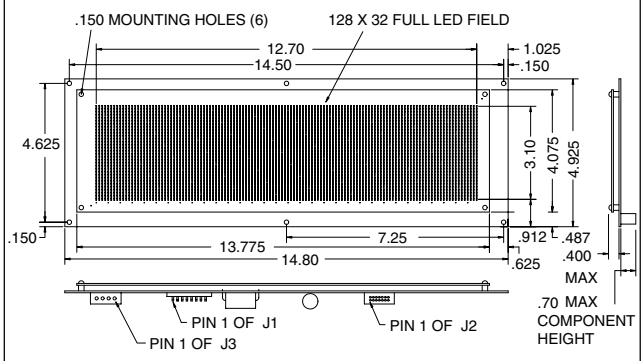
Operating Temperature: - 40°C to + 85°C
Storage Temperature: - 40°C to + 85°C
Relative Operating Humidity: To 95% non-condensing
Mechanical Shock: 30G
Vibration: 3G
Operating Altitude: 10,000 feet

STANDARD ELECTRICAL SPECIFICATIONS*

DESCRIPTION	SYMBOL	MIN.	TYP.	MAX.	UNITS
Logic and LED Drive Voltage	V_{cc}	+ 4.5	+ 5.0	+ 5.5	VDC
Logic and LED Drive Current (Fully Lit)	I_{cc}	—	2.5	3.0	ADC
Logic 1 Input	V_{ih}	0.7 V_{cc}	—	—	VDC
Logic 0 Input	V_{il}	—	—	0.2 V_{cc}	VDC

*Recommended operating voltages . All maximums are absolute maximum.

DIMENSIONS in inches [millimeters]



PIN DESCRIPTION

J1 - POWER CONNECTOR

Tyco AMP #640445-8 or equivalent.
Mates with Tyco AMP 640428-8, MOLEX 09-50-3081 or equivalent.

PIN	SIGNAL	DESCRIPTION
1	n/c	no connection
2	n/c	no connection
3	KEY	Used to key connector
4	GND	GND
5	GND	GND
6	V_{cc}	Logic and LED drive supply
7	RESERVED	no connection
8	n/c	no connection

J2 - DATA CONNECTOR

Tyco AMP #103309-2 or equivalent.
Mates with Tyco AMP 746195-2, MOLEX 39-27-1146 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 connect	14	GROUND

J3 - POWER CONNECTOR

Tyco AMP #641737-1 or equivalent.
Mates with Tyco AMP 1-480424-0 housing and 60617-4 socket terminals

PIN	SIGNAL	DESCRIPTION
1	RESERVED	no connection
2	GND	
3	GND	
4	V_{cc}	Logic and LED drive supply

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.

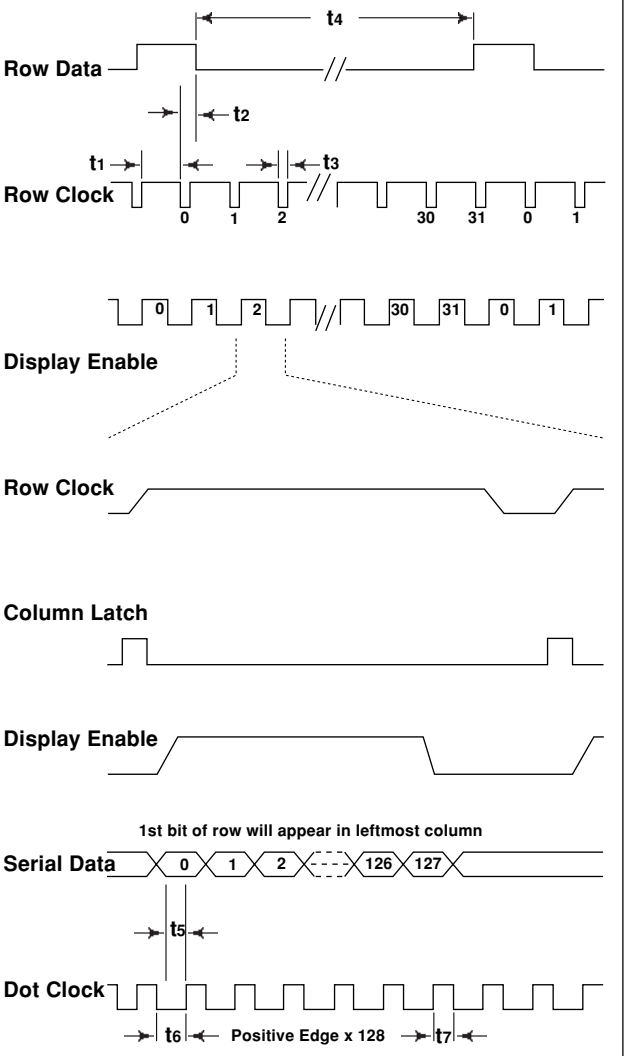
DISPLAY ENABLE - This signal enables the output drivers. Using a duty cycle control, this signal may also be used for intensity control. The DISPLAY ENABLE must be at logic zero before the COLUMN LATCH signal transitions. To avoid display blurring, the ROW CLOCK signal should also transition while DISPLAY 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 LED-128G032 has an 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.)

LOGIC AND DATA TIMING



PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS
t_1	100	-	-	nS
t_2	5	-	-	uS
t_3	1	-	-	uS
t_4	-	70	200	Hz
t_5	25	-	-	nS
t_6	75	-	-	nS
t_7	75	-	-	nS

ORDERING INFORMATION

DESCRIPTION	PART NUMBER
Display, Driver Electronics and +5V HC CMOS Interface	LED-128G032
J2 Data Connector Kit (2pcs. recommended)	280105-05
J1 Power Connector Kit	280108-12
J3 Power Connector Kit	280108-05

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