OEM 4-LED

4 Digit LED Data Display Module

PRODUCT DESCRIPTION

This low cost sub-miniature LED module is ideally suited for high volume data display applications. It features an exceptionally large display in a miniature package and includes 4 digits and 3 decimal points. The module accepts a clocked serial bitstream which corresponds with the segments to be displayed, and a data enable input to latch the data onto the LEDs and up to 4 external LEDs. The use of low current display technology means this LED product can be considered for battery powered applications. The OEM 4-LED is dimensionally compatible with other displays in the OEM family. Connection to the module is via two rows of pins 0.1" (x 0.5") pitch.

FEATURES

- 8mm (0.31") Digit Height
- 20mA (typ) @ +5V d.c. Power Supply
- Serial Data Input
- All Segments Addressable
- User Selectable Decimal Points
- Drives up to 4 External LEDs
- DIL Pin Connection 0.1" Pitch

Module shown actual size

This datasheet should be read in conjunction with the PS035 device datasheet. A link to this is available at *www.lascarelectronics.com* ***on the OEM 4-LED product information page.***

ORDERING INFORMATION

	Stock Number
Standard Display	OEM 4-LED

TYPICAL APPLICATIONS

- High Volume, Low Cost Systems
- Handheld Indication
- Panel-Mount Indication

ELECTRICAL SPECIFICATIONS

Specification	Min.	Typ.	Max.	Unit
Supply voltage	4	5	9	V d.c.
Supply current		20		mA
Operating temperature range	-10		60	°C
Storage temperature range	-10		60	°C
V_{LED}		3		V d.c.
Clock input frequency		500		kHz

Unless otherwise noted, specifications apply at $T_A = 25°C$, $V_{supply} = 5Vd.c.$

SAFETY

To comply with the Low Voltage Directive (LVD 93/68/EEC), input voltages to the module's pins must not exceed 60Vdc. The user must ensure that the incorporation of the panel meter into the user's equipment conforms to the relevant sections of BS EN 61010 (Safety Requirements for Electrical Equipment for Measuring, Control and Laboratory Use).

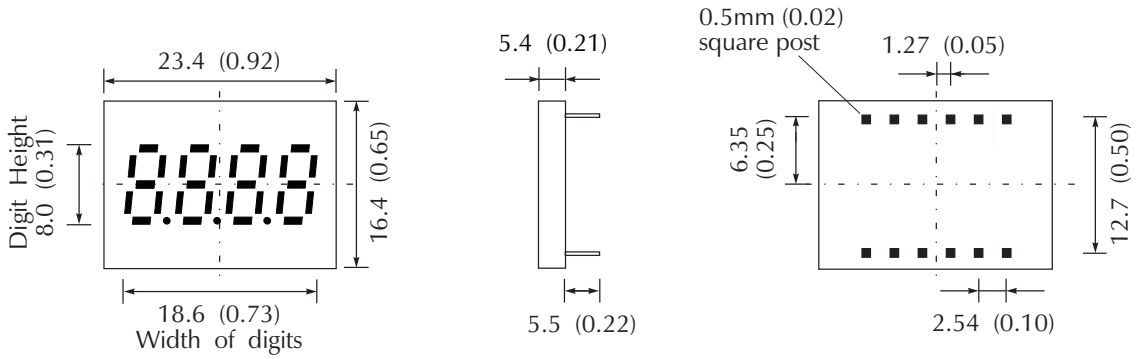
LASCAR ELECTRONICS LTD.
MODULE HOUSE
WHITEPARISH
WILTSHIRE SP5 2SJ
UK
TEL: +44 (1794) 884567
FAX: +44 (1794) 884616
E-mail: sales@lascar.co.uk

LASCAR ELECTRONICS INC.
3750 West 26th Street
Erie
PA 16506
USA
TEL: +1 (814) 835 0621
FAX: +1 (814) 838 8141
E-mail: us-sales@lascarelectronics.com

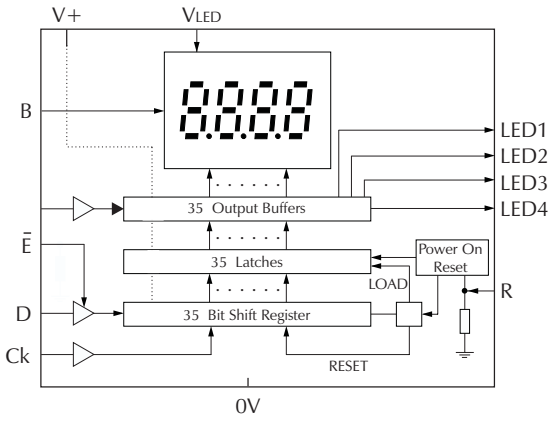
LASCAR ELECTRONICS (HK) LIMITED
FLAT C, 5/FL., LUCKY FTY. BLDG.
63-65 HUNG TO ROAD
KWUN TONG KOWLOON
HONG KONG
TEL: +852 2797 3219
FAX: +852 2343 6187
E-mail: b4lascar@samsongroup.com.hk

DIMENSIONS

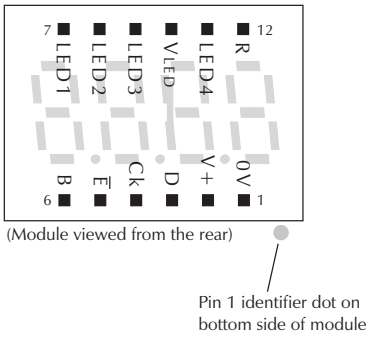
All dimensions in mm (inches)



FUNCTIONAL BLOCK DIAGRAM



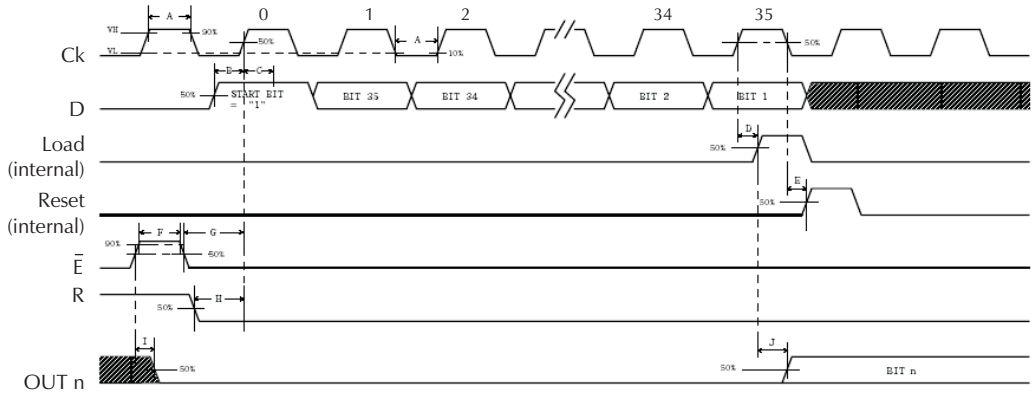
PIN CONFIGURATION (rear view)



PIN FUNCTIONS

1.	0V	Negative power supply to the display.
2.	V+	Positive power supply to the display.
3.	D	Serial data input.
4.	Ck	Clock input.
5.	$\overline{E}$	Data enable input (actively held low).
6.	B	Brightness control (see Applications).
7.	LED1	Drive pin for external LED (Bit 33).
8.	LED2	Drive pin for external LED (Bit 34).
9.	LED3	Drive pin for external LED (Bit 32).
10.	VLED	Display drive voltage.
11.	LED4	Drive pin for external LED (Bit 35).
12.	R	Reset - take high to reset.

TIMING

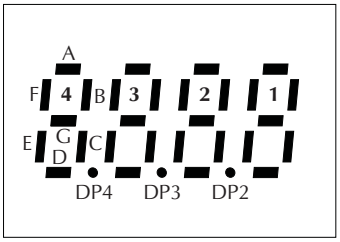


* THE INTERNAL RESET ONLY CLEARS ALL INTERNAL SHIFT REGISTERS.

** THE EXTERNAL RESET CLEARS ALL INTERNAL SHIFT REGISTERS AND LATCHES.

ITEM	DESCRIPTION	MIN	TYP	MAX	UNIT
A	Clock pulse width	250	–	–	nS
B	Serial data setup time	30	–	–	nS
C	Serial data hold time	30	–	–	nS
D	Time between clock activation & internal load pulse activation	35	–	–	nS
E	Time between clock falling & internal reset pulse activation	35	–	–	nS
F	External reset pulse duration	25	–	–	nS
G	External reset inactive setup time	120	–	–	nS
H	Data enable setup time	70	–	–	nS
I	Time between external reset activation & the output off	25	–	–	nS
J	Time between internal load activation & new output states arising	30	–	–	nS

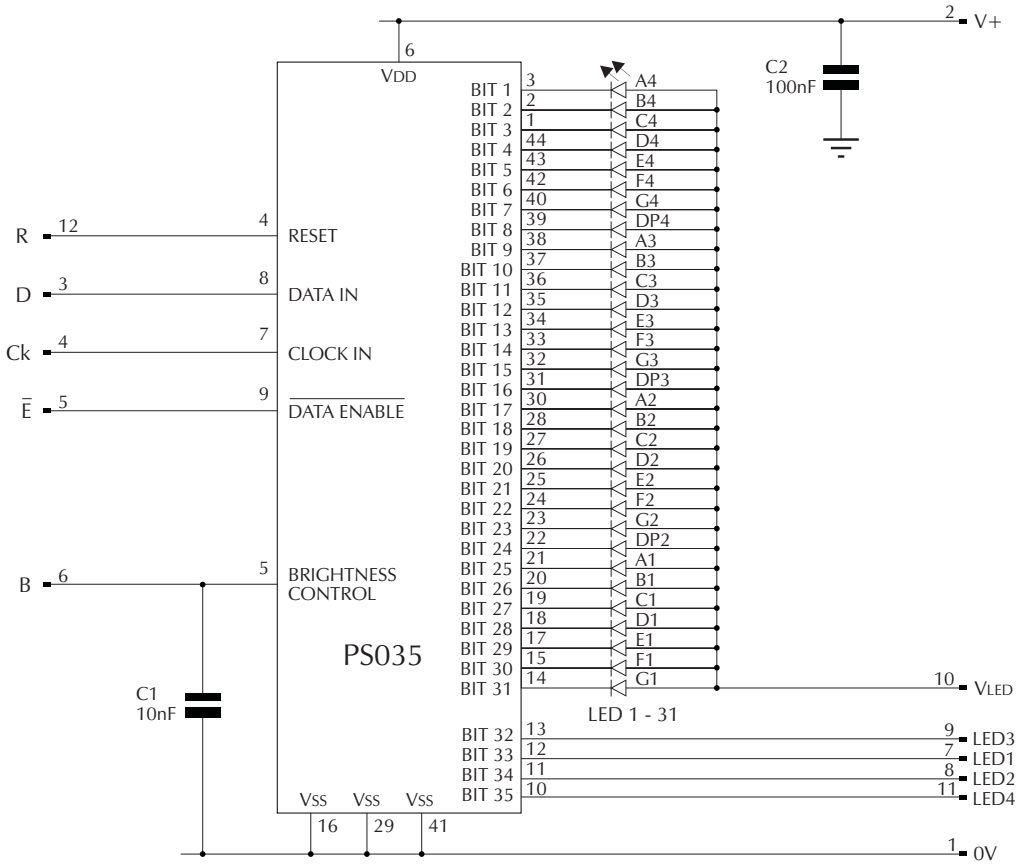
SERIAL DATA INPUT SEQUENCE



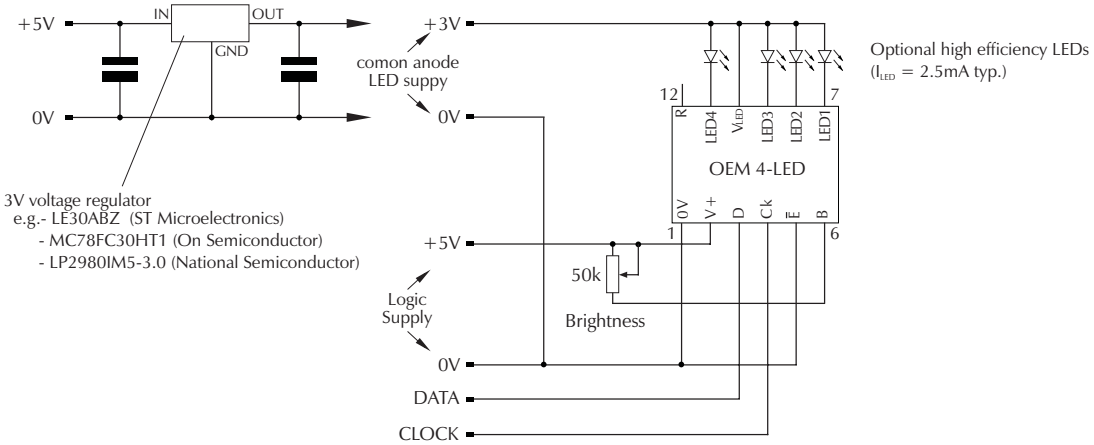
Data is clocked into latches in reverse order, starting with bit 35 (see timing diagram above)

Bit	Segment	Bit	Segment
1	A4	18	B2
2	B4	19	C2
3	C4	20	D2
4	D4	21	E2
5	E4	22	F2
6	F4	23	G2
7	G4	24	DP2
8	DP4	25	A1
9	A3	26	B1
10	B3	27	C1
11	C3	28	D1
12	D3	29	E1
13	E3	30	F1
14	F3	31	G1
15	G3	32	LED3
16	DP3	33	LED1
17	A2	34	LED2
		35	LED4

CIRCUIT DIAGRAM



APPLICATIONS



Although reset (R) is not required for normal operation, this pin can be put under microprocessor control to clear the display.

Note: for OEMs, a special version OEM 4-LED is available with built-in 3V voltage regulator and brightness control potentiometer.