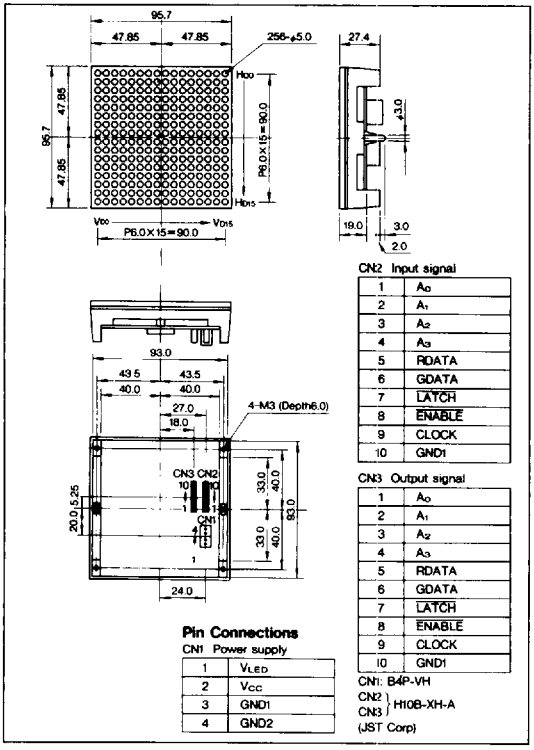
LT1450ED

16×16 Dot Matrix LED Unit for Outdoor Use

■ Features

1. 16×16 dot matrix LED unit
2. Active display size: 95.7mm square
3. Three color emission by use of di-chromatic LED
4. Radiation color: Red, yellow-green and orange (mixed color)
5. Wide viewing angle
6. Built-in shift registers, latch circuits, LED driver ICs and scanning line select circuits
7. Clock frequency: 3MHz
8. Dynamic drive (Duty ratio: 1/16)

■ Outline Dimensions (Unit: mm)



CN2 Input signal

1	A_0
2	A_1
3	A_2
4	A_3
5	RDATA
6	GDATA
7	$\overline{\text{LATCH}}$
8	$\overline{\text{ENABLE}}$
9	CLOCK
10	GND1

CN3 Output signal

1	A_0
2	A_1
3	A_2
4	A_3
5	RDATA
6	GDATA
7	$\overline{\text{LATCH}}$
8	$\overline{\text{ENABLE}}$
9	CLOCK
10	GND1

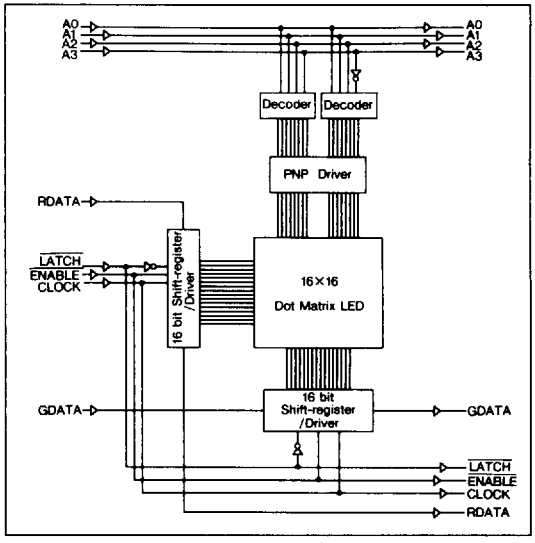
CN1: B4P-VH
CN2, CN3: H10B-XH-A
(JST Corp)

Pin Connections

CN1 Power supply

1	V_{LED}
2	V_{CC}
3	GND1
4	GND2

■ Block Diagram



■ Terminal Functions

Connector	Pin No.	Name	Function
CN1 (Power supply)	1	V_{LED}	Power supply for LED
	2	V_{CC}	Power supply for IC
	3	GND1	Ground for IC
	4	GND2	Ground for LED
CN2 (Input signal)	1~4	A_0~A_3	Address specification signal for row driver
	5	RDATA	Serial data input for red (H: lit, L: no lit)
	6	GDATA	Serial data input for Yellow-green (H: lit, L: no lit)
	7	$\overline{\text{LATCH}}$	L: The contents are latched
	8	$\overline{\text{ENABLE}}$	"L": Each dot can be driven in accordance with data
	9	CLOCK	Clock signal for data transmission in the shift-register. (L→H: The data are shifted)
	10	GND1	Ground for IC
CN3 (Output signal)	1~4	A_0~A_3	Buffered the input signals A_0~A_3
	5	RDATA	Input signal is generated through 16-bit shift register in the unit.
	6	GDATA	
	7	$\overline{\text{LATCH}}$	Buffered the input signal $\overline{\text{LATCH}}$.
	8	$\overline{\text{ENABLE}}$	Buffered the input signal $\overline{\text{ENABLE}}$
	9	CLOCK	Buffered the input signal CLOCK.
	10	GND1	Ground for IC

6

■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
IC supply voltage	V_{CC}	6.0	V
LED supply voltage	V_{LED}	6.0	V
Input voltage	V_I	*1 5.5	V
LED current dissipation	I_{LED}	*2 2.8	A
Operating temperature range	Topr	−10 to +45	°C
Storage temperature range	Tstg	−20 to +70	°C

*1 $V_I < V_{CC}$ at $V_{CC} \leqq 5.5$
*2 When all dots are lit, Duty ratio: 1/16

■ Electro-optical Characteristics

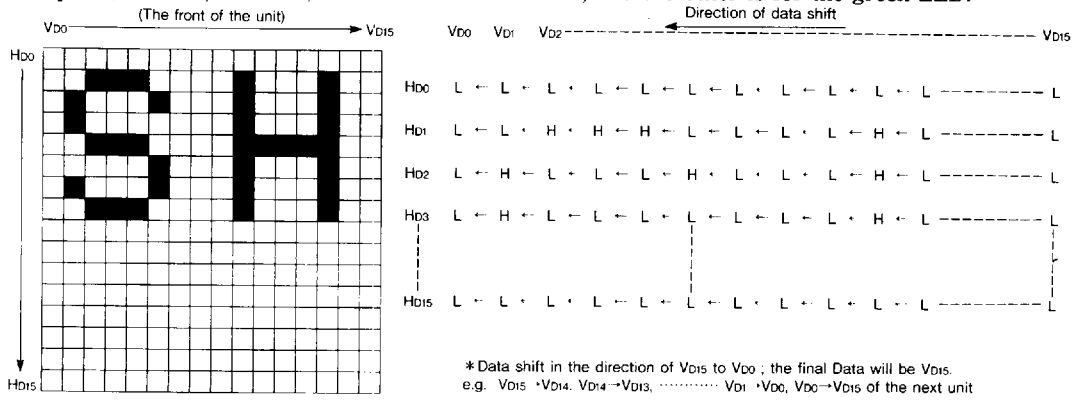
(Ta=25°C, V_{CC}=5V, V_{LED}=5V)

Parameter		Symbol	MIN	TYP	MAX	Unit
Operating IC supply voltage		V_{CC}	4.75	5.0	5.25	V
Oprating LED supply voltage		V_{LED}	—	5.0	5.25	V
IC current dissipation		I_{CC}	—	50	—	mA
LED current dissipation I_{LED}		—	—	*3 2.4	—	A
Input voltage		V_{IL}	—	—	1.5	V
		V_{IH}	3.5	—	—	V
Input current		I_{IL}	—	—	0.12	mA
		I_{IH}	—	—	0.1	μA
Clock frequency		f_{CLK}	—	—	3.0	MHz
Frame frequency		f_{FR}	70	100	—	Hz
*3 Luminance	Red	L_V	75	100	130	cd/m²
	Yellow-green		75	100	130	
Peak emission wavelength	Red	λp	—	635	—	nm
	Yellow-green		—	565	—	
Spectrum radiation bandwidth	Red	Δλ	—	35	—	nm
	Yellow-green		—	30	—	

*3 Duty ratio: 1/16, When all dots are lit, f_{FR}=100Hz

■ Interface Signals

1. Data being displayed corresponds to a dot pattern, where each dot is either on or off (high=on, low=off). The data for each dot is clocked into a register in a serial, synchronous fashion by the data transmission clock (CLOCK). The data scan direction is from right to left, thus the first bit input will control the left most dot in a row (scan line). Data is input for one row at a time. There are two data inputs (RDATA, GDATA). One is for the red LED, and the other is for the green LED.

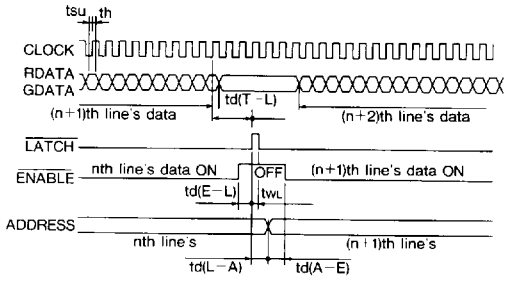


*Data shift in the direction of V_{D15} to V_{D0} ; the final Data will be V_{D15}.
e.g. V_{D15} →V_{D14}, V_{D14}→V_{D13}, ····· V_{D1} →V_{D0}, V_{D0}→V_{D15} of the next unit

2. When all of the data for one row has been clocked into the shift-register, a data latch signal (LATCH) should be enabled. The data latch signal sends the data from the shift-register to a line driver register. The data remains in the line driver register until another data latch signal occurs. Once the data is in the line driver register, the row for which it was intended, is enabled by the enable clock (ENABLE). The appropriate dots are then turned on or off. While one row is being enabled, the data for the next row is being clocked in..
   The address (A_0-A_3) for the desired row must be present at the same time or after data latch signal, and prior to the enable signal.

3. LT1450ED is driven dynamically, so you must scan each row continuously to maintain the correct display.

Timing chart



■ Connections Method