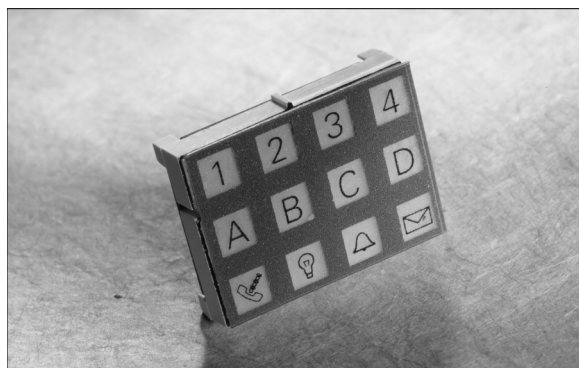


## GREEN and YELLOW, GREEN and RED **II340GY/GR** 3 x 4 Cells, Bi-Color Intelligent Indicators



### FEATURES

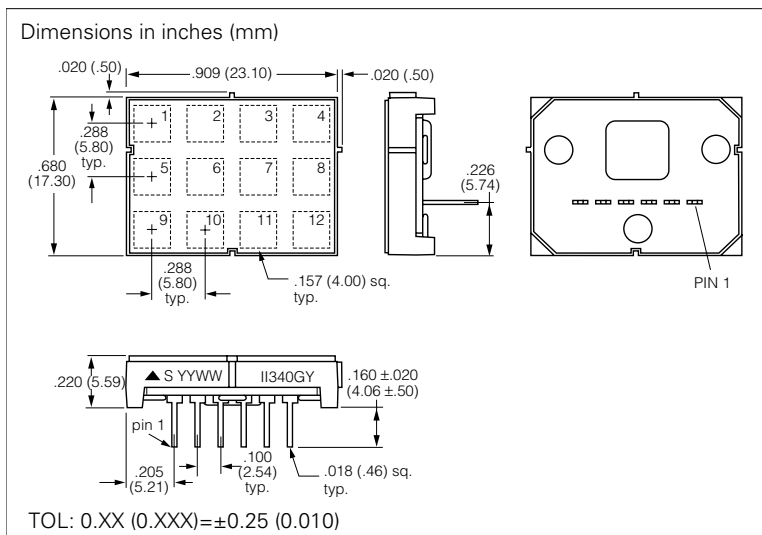
- **Colors:** GY=Green and Yellow, GR=Green and Red
- **Each Cell, 4.0 mm square**
- **Vertical and Horizontal Pitch, 5.8 mm**
- **X-Y Stackable**
- **TTL Compatible**
- **Easily Cascaded for Multiple Displays**
- **Ideal for Graphics Panels**

### DESCRIPTION

The II340GY/GR bi-color intelligent indicator is a 3 x 4 cell assembly with a built-in CMOS shift register and LED drivers. Each cell or pixel has a green and yellow LED (GY) or a green and red LED (GR). To turn a LED "ON" a 1 (high) has to be clocked into the respective shift register (see the block diagram). The serial clock has to be provided to pin 4, the "shift register clock." The serial data bit stream is clocked in on the falling edge of the clock pulses.

The blanking pin can be used to blank the indicator while the data is being updated and it can also be pulse width modulated to dim the display and consume less power.

Cascading multiple indicators is possible because of the data out and data in pins. Notice in the block diagram that only 24 LED drivers are used while 28 shift registers are available. So when multiple indicators are cascaded data for the next indicator will only be at the data out pin after the twenty eighth clock pulse.



### Absolute Maximum Ratings, $T_A=25^\circ\text{C}$

|                                                     |                            |
|-----------------------------------------------------|----------------------------|
| DC Supply Voltage .....                             | -0.5 V to +7.0 V           |
| Input Voltage Levels Relative to GND .....          | -0.5 V to $V_{CC} + 0.5$ V |
| Operating/Storage Temperature Range .....           | -40°C to +85°C             |
| Maximum solder Temperature 0.063 in (1.59 mm) below |                            |
| Seating Plane t<5.0 sec. ....                       | 260°C                      |

**Table 1. Pin Function/Description**

| Pin | Function                | Description                                   |
|-----|-------------------------|-----------------------------------------------|
| 1   | $\overline{\text{GND}}$ | Ground                                        |
| 2   | Data Out                | Serial data output for cascading              |
| 3   | Blanking                | Blanking control to enable or disable display |
| 4   | Serial Clock            | Shift register clock                          |
| 5   | Data In                 | Serial data input                             |
| 6   | $V_{CC}$                | +5.0 V supply                                 |

**Custom overlays are available from:**

### GM Nameplate

Electronic Input Devices / Injection & Compression Molding / Innovative Graphics

1-800-279-6001

Actual size



**Table 2. Electrical Characteristics,  $T_A=25^\circ\text{C}$** 

| Parameters                             | Min. | Typ. | Max. | Unit               | Conditions                                                                                         |
|----------------------------------------|------|------|------|--------------------|----------------------------------------------------------------------------------------------------|
| $I_{CC}$ (quiescent)                   | —    | 5.0  | 10   | mA                 | $V_{CC}=5.25\text{ V}$ , $V_B=0.4\text{ V}$ ,<br>$V_{CLK}=V_{DATA}=2.4\text{ V}$ (All SR stages=1) |
| $I_{CC}^1$                             |      | 120  | —    |                    | $V_{CC}=5.0\text{ V}$ , $V_B=2.4\text{ V}$ , 12 LEDs ON                                            |
| $I_{CC}^2$                             |      | 240  | —    |                    | $V_{CC}=5.0\text{ V}$ , $V_B=2.4\text{ V}$ , 24 LEDs ON                                            |
| $V_{IL}$ (DATA, $V_B$ , CLK)           |      | —    | 0.8  | V                  | $V_{CC}=4.75\text{ V}$ – $5.25\text{ V}$                                                           |
| $V_{IH}$ (DATA, $V_B$ , CLK)           | 2.0  |      | —    |                    | $V_{CC}=4.25\text{ V}$ – $5.25\text{ V}$                                                           |
| $V_{OH}$ (DATA)                        | 2.4  |      | —    |                    | $V_{CC}=4.75\text{ V}$ , $I_{COL}=0\text{ mA}$ , $I_{OH}=-0.5\text{ mA}$                           |
| $V_{OL}$ (DATA)                        | —    |      | 0.4  |                    | $V_{CC}=4.75\text{ V}$ , $I_{COL}=0\text{ mA}$ , $I_{OL}=1.6\text{ mA}$                            |
| $I_{IL}$ ( $V_B$ only)                 | -30  | -110 | -300 | $\mu\text{A}$      | $V_{CC}=4.75\text{ V}$ – $5.25\text{ V}$ , $V_{IL}=0.8\text{ V}$                                   |
| $I_{IL}$ (DATA, CLK)                   | —    | -1   | -10  |                    |                                                                                                    |
| Package Dissipation                    | —    | —    | 1.2  | W                  | —                                                                                                  |
| Thermal Resistance, IC junction to pin | —    | 55   | —    | $^\circ\text{C/W}$ | —                                                                                                  |

**Table 3. Operating Conditions,  $T_A=25^\circ\text{C}$** 

| Parameters                             | Min. | Typ. | Max. | Unit |
|----------------------------------------|------|------|------|------|
| $V_{CC}$                               | 4.75 | 5.0  | 5.25 | V    |
| $I_{OH}$                               | -0.5 | —    | —    | mA   |
| $I_{OL}$                               | —    | —    | 1.6  |      |
| $V_B$ pulse width modulation frequency | —    | —    | 50   | kHz  |

**Table 4. Typical Optical Characteristics,  $T_A=25^\circ\text{C}$** 

|                                                 |        |                                |
|-------------------------------------------------|--------|--------------------------------|
| Spectral peak wavelength $\lambda_{pk}$         | Red    | 526 nm                         |
|                                                 | Green  | 568 nm                         |
|                                                 | Yellow | 583 nm                         |
| Average luminous intensity<br>—Green/Red/Yellow |        | 500 $\mu\text{cd/dot}$<br>Min. |

**Table 5. AC Electrical Characteristics,  $V_{CC}=4.75$  to  $5.25\text{ V}$ ,  $T_A=25^\circ\text{C}$** 

| Parameter             | Sym.                     | Min. | Typ. | Max. (Note 1) | Unit | Fig. |
|-----------------------|--------------------------|------|------|---------------|------|------|
| Set Up Time           | $T_{SETUP}$              | 50   | 10   | —             | ns   | 2    |
| Hold Time             | $T_{HOLD}$               | 25   | 20   | —             |      |      |
| Clock Width Low       | $T_{WL}$                 | 60   | 45   | —             |      |      |
| Clock Width High      | $T_{WH}$                 |      |      | —             |      |      |
| Clock Frequency       | $F_{CLK}$                | 0    | 5.0  | 7.0           | MHz  |      |
| Clock Transition Time | $T_{THL}$ ,<br>$T_{TLH}$ | —    | 75   | 200           | ns   |      |
|                       | $T_{PHL}$ ,<br>$T_{PLH}$ |      | 50   | 125           |      |      |

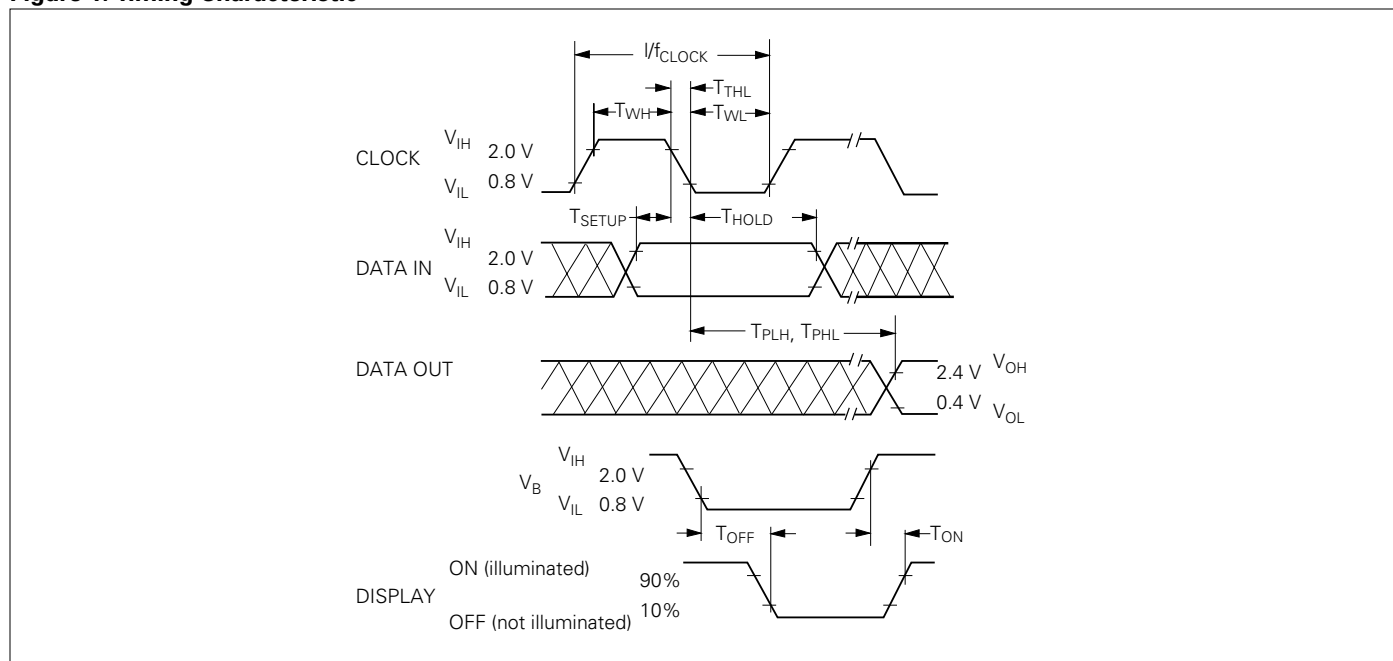
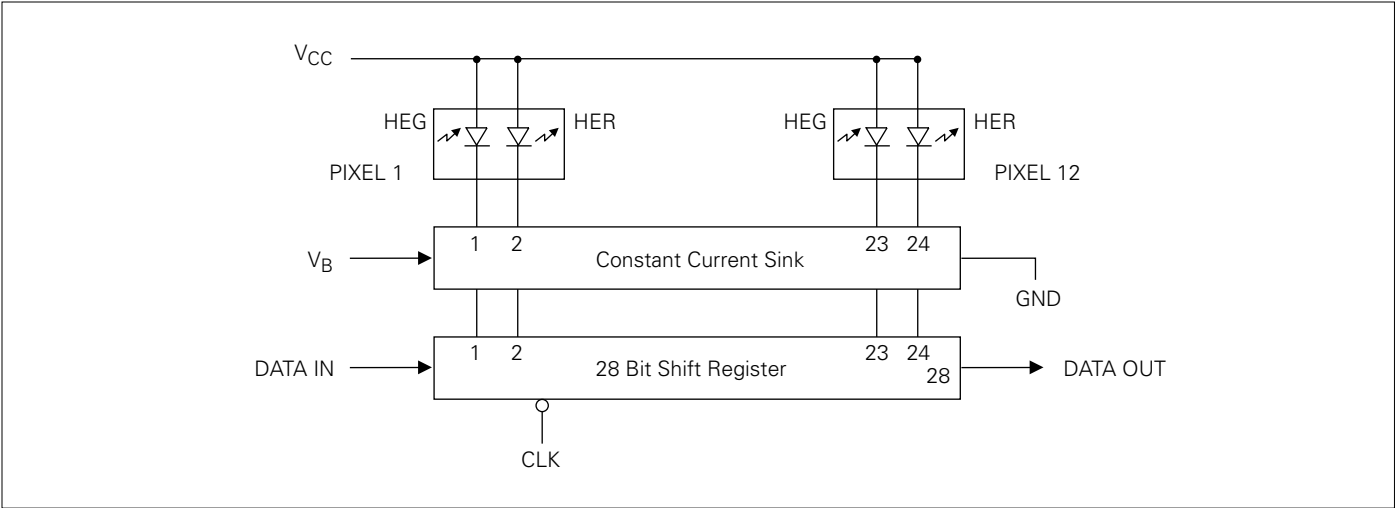
**Note:**1.  $V_B$  pulse width modulation is 50 kHz (max.).**Figure 1. Timing Characteristic**

Figure 2. Block Diagram



**Note:**

- HEG=High Efficiency Green LED.
  - HER=High Efficiency Red LED.
  - The LEDs are direct current driven.
  - The pixels are not bit addressable.
  - A stream of 24 bits must be clocked in.
- The first or LSB (the least significant bit) will control LED number 24 in pixel 12.  
The last or MSB (the most significant bit) will control LED number 1 in pixel 1.

Table 6. Data Definition

| Cell <sup>(1)</sup> | 1 |   | 2 |   | 3 |   | 4 |   | 5 |   | 6  |    | 7  |    | 8  |    | 9  |    | 10 |    | 11 |    | 12 |    |
|---------------------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| BIT                 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| GY                  | G | Y | G | Y | G | Y | G | Y | G | Y | G  | Y  | G  | Y  | G  | Y  | G  | Y  | G  | Y  | G  | Y  | G  | Y  |
| GR                  | G | R | G | R | G | R | G | R | G | R | G  | R  | G  | R  | G  | R  | G  | R  | G  | R  | G  | R  | G  | R  |

**Note:**

- See "Product Drawing" for cell functions.