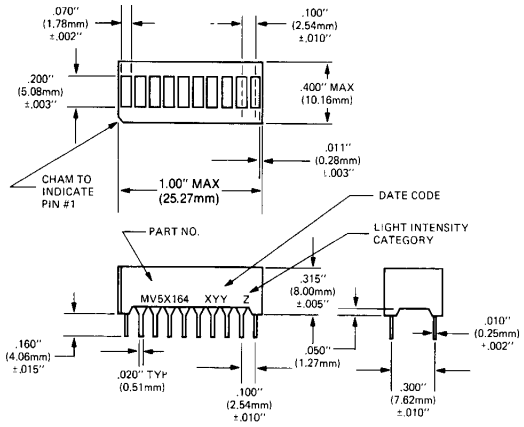
FAIRCHILD
SEMICONDUCTOR™

**BARGRAPH DISPLAYS**

# YELLOW MV53164
# HIGH EFFICIENCY GREEN MV54164
# HIGH EFFICIENCY RED MV57164

## PACKAGE DIMENSIONS




C1468A

NOTE: TOLERANCES ±.010" UNLESS SPECIFIED

## DESCRIPTION

The MV5X164 series is a 10 segment bargraph display with separate anodes and cathodes for each light segment. The packages are end-stackable.

## FEATURES

- Large segments, closely spaced
- End-stackable
- Fast switching—excellent for multiplexing
- Low power consumption
- Directly compatible with IC's
- Wide viewing angle
- Standard .3-inch DIP lead spacing
- Categorized for Luminous Intensity (See Note 1)

## ABSOLUTE MAXIMUM RATINGS

| | MV53164 | MV54164 | MV57164 |
|---|---|---|---|
| Power dissipation at 25°C ambient | 750 mW | 750 mW | 750 mW |
| Derate linearly from 50°C | −14.3 mW/°C | −14.3 mW/°C | −14.3 mW/°C |
| Storage and operating temperature | −40°C to +85°C | −40°C to +85°C | −40°C to +85°C |
| Continuous forward current | | | |
| Total | 200 mA | 300 mA | 300 mA |
| Per segment | 25 mA | 30 mA | 30 mA |
| Reverse voltage | | | |
| Per segment | 6.0 V | 6.0 V | 6.0 V |
| Soldering time at 260°C | | | |
| (See Notes 3 and 5) | 5 sec. | 5 sec. | 5 sec. |

## TYPICAL THERMAL CHARACTERISTICS

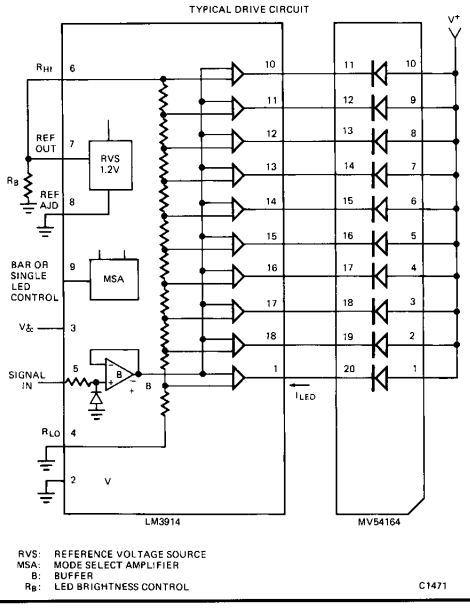
| | MV53164 | MV54164 | MV57164 |
|---|---|---|---|
| Thermal resistance junction to free air $\Phi_{JA}$ | 160°C/W | 160°C/W | 160°C/W |
| Wavelength temperature coefficient (case temp.) | 1.0 A/°C | 1.0 A/°C | 1.0 A/°C |
| Forward voltage temperature coefficient | −1.5 mV/°C | −1.4 mV/°C | −2.0 mV/°C |

## ELECTRO-OPTICAL CHARACTERISTICS

(25°C Free Air Temperature Unless Otherwise Specified)

| | MIN. | TYP. | MAX. | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|
| Forward voltage MV53164, MV57164/MV54164 | | 2.0/2.2 | 2.5/3.0 | V | $I_F$=10 mA |
| Luminous Intensity (unit average) (See Note 1) | 510 | 1800 | | $\mu$cd | $I_F$=10 mA |
| Pulsed Luminous Intensity (MV54164) | 710 | 2500 | | $\mu$cd | $I_F$=60 mA peak; 1:6 DF |
| Peak emission wavelength | | | | | |
| MV53164 | | 585 | | nm | |
| MV54164 | | 562 | | nm | |
| MV57164 | | 630 | | nm | |
| Spectral line half width MV53164, MV57164/MV54164 | | 40/30 | | nm | |
| Dynamic resistance | | | | | |
| Segment MV53164, MV57164/MV54164 | | 26/12 | | $\Omega$ | $I_F$=20 mA |
| Capacitance MV53164, MV57164/MV54164 | | 35/40 | | pF | V=0, f=1 MHz |
| Switching time | | 500 | | ns | $I_F$=10 mA |
| Reverse voltage | 6.0 | | | | $I_R$=100$\mu$A |

## TYPICAL DRIVE CIRCUIT




## PIN CONNECTIONS

| PIN NO. | ELECTRICAL CONNECTIONS | PIN NO. | ELECTRICAL CONNECTIONS | PIN NO. | ELECTRICAL CONNECTIONS | PIN NO. | ELECTRICAL CONNECTIONS |
|---|---|---|---|---|---|---|---|
| 1 | Bar 1 Anode | 6 | Bar 6 Anode | 11 | Bar 10 Cathode | 16 | Bar 5 Cathode |
| 2 | Bar 2 Anode | 7 | Bar 7 Anode | 12 | Bar 9 Cathode | 17 | Bar 4 Cathode |
| 3 | Bar 3 Anode | 8 | Bar 8 Anode | 13 | Bar 8 Cathode | 18 | Bar 3 Cathode |
| 4 | Bar 4 Anode | 9 | Bar 9 Anode | 14 | Bar 7 Cathode | 19 | Bar 2 Cathode |
| 5 | Bar 5 Anode | 10 | Bar 10 Anode | 15 | Bar 6 Cathode | 20 | Bar 1 Cathode |

## TYPICAL CURVES MV53164 MV54164 MV57164 (PER SEGMENT) (25°C Free Air Temperature)

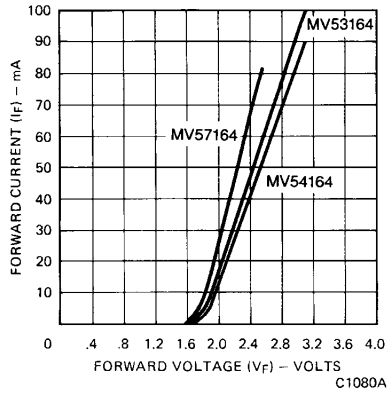



*Fig. 1. Forward Current vs. Forward Voltage*

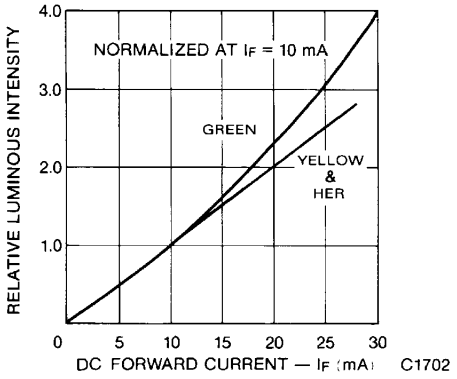



*Fig. 2. Relative Luminous Intensity vs. DC Forward Current (Both LED Chips ON)*

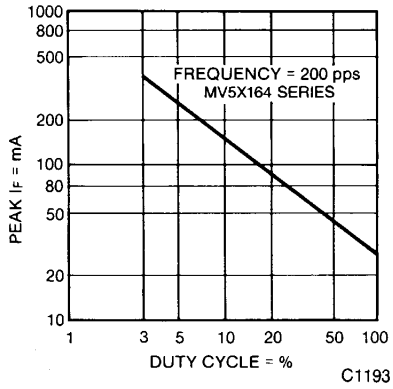



*Fig. 3. Max Peak Current vs. Duty Cycle*

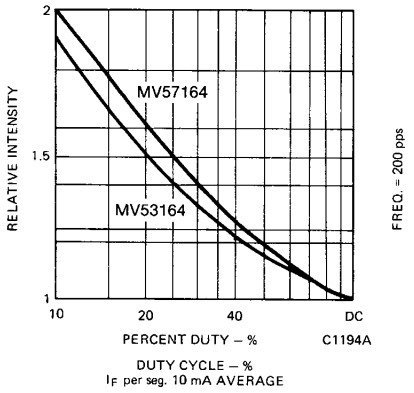



*Fig. 4. Luminous Intensity vs. Duty Cycle*

## TYPICAL CURVES MV53164 MV54164 MV57164 (PER SEGMENT) (25°C Free Air Temperature) (Cont'd)

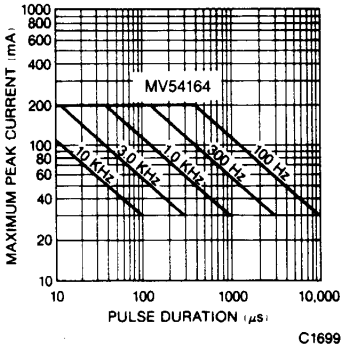



*Fig. 5. Maximum Peak Current vs. Pulse Duration*

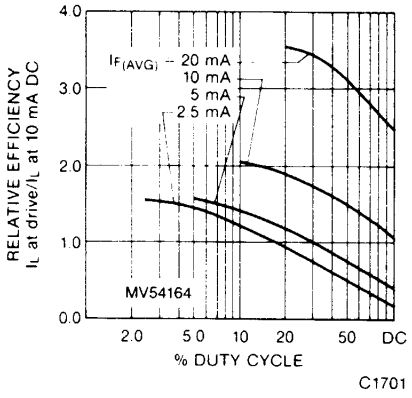



*Fig. 6. Relative Efficiency vs. Duty Cycle*

## FILTER RECOMMENDATIONS

For optimum ON and OFF contrast, one of the following filters or equivalents may be used over the lamp:

| MV53164 | MV54164 | MV57164 |
|---|---|---|
| Panelgraphic Yellow 25 or Amber 23<br>Homalite 190—1720 or 100—1726 | Panelgraphic Green 48<br>Homalite 100—1440 Green | Panelgraphic Red 60<br>Homalite 100—1605 |

In situations of high ambient light, a neutral density filter can be used to achieve greater contrast:

| | |
|---|---|
| Panelgraphic Grey 10 | Panelgraphic Grey 10<br>Homalite 100—1266 Grey |

## NOTES

1. *The average Luminous Intensity is obtained by summing the Luminous Intensity of each segment and dividing by the total number of segments. The standard of measurement is the Photo Research Corp. "Spectra" Microcandela Meter (Model IV-D) corrected for wavelength. Intensity will not vary more than ±33.3% between all segments within a unit.*
2. *Leads immersed to 1/16 inch (1.6 mm) from the body of the device. Maximum unit surface temperature is 140°C.*
3. *All units are categorized for Luminous Intensity. The Intensity category is marked on each part as a suffix letter to the part number.*
4. *For flux removal, Freon TF, Freon TE, Isoproponal or water may be used to their boiling points.*

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.