Bivar SMP4 Tri-Color LED combines three chips in a single package and is offered in an industry standard PLCC4 footprint. The SMP4 LED has a water clear lens for high luminous intensity and wide viewing angle making them ideal for small scale applications such as illumination, general indication, and backlighting. The flexible three chip design allows for a wide variety of lighting options where the chips can be individually driven or mixed to create different color combinations. The robust package is ideal for harsh working environments and can be clustered in LED arrays for high luminous applications. Low power consumption and excellent long life reliability are suitable for battery powered equipment. Bivar SMP4 LED is packaged in standard tape and reels for pick and place assemblies.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Material</th>
<th>Emitted Color</th>
<th>Lumen Typ. mcd</th>
<th>Lens Color</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMP4-RGY</td>
<td>AlGaAs</td>
<td>Red</td>
<td>36</td>
<td>Water Clear</td>
<td>120°</td>
</tr>
<tr>
<td></td>
<td>GaP</td>
<td>Green</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GaAsP</td>
<td>Yellow</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Outline Dimensions

Outline Drawings Notes:
1. All dimensions are in inches [millimeters].
2. Standard tolerance: ±0.010” unless otherwise noted.
Absolute Maximum Ratings
TA = 25°C unless otherwise noted

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Dissipation</td>
<td>72 mW</td>
</tr>
<tr>
<td>Continuous Forward Current</td>
<td>30 mA</td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>100 mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>5 V</td>
</tr>
<tr>
<td>Electrostatic Discharge</td>
<td>2000 V</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-40 ~ +85°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-40 ~ +100°C</td>
</tr>
<tr>
<td>Soldering Temperature</td>
<td>260°C</td>
</tr>
</tbody>
</table>

Notes: 1. 10% Duty Cycle, Pulse Width ≤ 0.1 msec.
2. Solder time less than 5 seconds at temperature extreme.

Electrical Characteristics
TA = 25°C & IF = 20 mA unless otherwise noted

<table>
<thead>
<tr>
<th>Emitting Color</th>
<th>Forward Voltage (V)</th>
<th>Recommend Forward Current (mA)</th>
<th>Reverse Current (µA) Vf=5V</th>
<th>Dominant Wavelength (nm)²</th>
<th>Luminous Intensity (mcd)³</th>
<th>Viewing Angle 2 θ ½ (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYP</td>
<td>MAX</td>
<td>TYP</td>
<td>MAX</td>
<td>TYP</td>
<td>MIN</td>
</tr>
<tr>
<td>Red</td>
<td>1.85</td>
<td>2.3</td>
<td>20</td>
<td>10</td>
<td>640</td>
<td>18</td>
</tr>
<tr>
<td>Green</td>
<td>1.9</td>
<td>2.4</td>
<td>20</td>
<td>10</td>
<td>570</td>
<td>20</td>
</tr>
<tr>
<td>Yellow</td>
<td>1.9</td>
<td>2.4</td>
<td>20</td>
<td>10</td>
<td>585</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes: 1. Tolerance of Forward Voltage : ±0.05V.
2. Tolerance of Dominant Wavelength : ±0.1nm.
3. Tolerance of Luminous Intensity : ±15%.

Directivity Radiation
TA = 25°C unless otherwise noted
Typical Electrical / Optical Characteristics Curves

$T_A = 25^\circ C$ unless otherwise noted

Relative Spectrum Emission $I_{rel} = f (I)$, $T_A = 25^\circ C$, $I_r = 20$ mA

$V(I) = $ Standard eye response curve

Forward Current $I_r = f (V_r)$

$T_A = 25^\circ C$

Relative Luminous Intensity $I_r/I_r \geq 20$ mA) = $f (I_r)$

$T_A = 25^\circ C$

Ambient Temperature vs. Allowable Forward Current

Relative Luminous Intensity $I_r/I_r \geq 20$ mA) = $f (I_r)$

$T_A = 25^\circ C$

Forward Current $I_r$ (mA)

Ambient Temperature $T_A$ ($^\circ C$)

Fig.1 Relative Luminous Intensity vs. Wavelength

Fig.2 Forward Current vs. Forward Voltage

Fig.3 Relative Luminous Intensity vs. Forward Current

Fig.4 Forward Current vs. Ambient Temperature
Recommended Soldering Conditions

![Soldering Profile Diagram]

**Recommended Soldering Conditions**

- **MAX LEAD FREE SOLDERING**
  - TEMP: 255°C - 5 SEC

- **MAX LEADED SOLDERING**
  - TEMP: 220°C - 5 SEC

**CONVECTIVE REFLOW SOLDERING PROFILE**

- **140 °C to 170 °C**
- **20 - 70 SECONDS ABOVE LIQUIDOUS**

**Outline Drawings Notes:**
1. All dimensions are in inches [millimeters].
2. Standard tolerance: ±0.010" unless otherwise noted.

**Tape and Reel Dimensions**

**Note:** 2000 pcs/Reel

![Tape and Reel Diagram]
PLCC4 SMD Top View Package LED
SMP4-RGY, RED/GREEN/YELLOW

Outline Drawings Notes:
1. All dimensions are in inches [millimeters].
2. Standard tolerance unless otherwise noted: X.XXX ± 0.010”
   XX ± 0.1”

Packaging and Labeling Plan

Note: 1 Reel / Bag

Sealed ESD and Moisture Barrier Bag

Humidity Indicator Card

Desiccant

Bivar Standard Packaging Label

Part No.: XXXX-XXX-XXX
Prod. No.: XXXX-XXX-XXX
PO No.: XXXX
Lot No.: XXXXXXXXXX
Q’ty: X.XXX PCS
Q.C.: XXX BIN
Date: 2008.XX.XX

Bivar, Inc.
4 Thomas, Irvine, CA 92618-2593
LOT: XXXXXXXXXX

Part: XXXX-XXX-XXX
Quantity: X.XXX
RoHS Compliant