Technical Data Sheet

0.51" Quadruple Digit SMD Displays

Features

- Packaged in tape and reel for SMT manufacturing.
- Design flexibility (common cathode or anode).
- Categorized for luminous intensity.
- The thickness is thinner than traditional display.
- Pb free
- The product itself will remain within RoHS compliant version

Descriptions

- The SMD type is much smaller than tradition type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.

Applications

- Suitable for indoor use.
- Audio system.
- Set top box.
- Game machine.
- Channel indicator of TV.

Device Selection Guide

<table>
<thead>
<tr>
<th>Chip</th>
<th>Material</th>
<th>Emitted Color</th>
<th>Face Color</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1GaInP</td>
<td>Brilliant Yellow Green</td>
<td>Gray</td>
</tr>
</tbody>
</table>
Technical Data Sheet
0.51" Quadruple Digit SMD Displays

Package Dimensions

Notes:
- All dimensions are in millimeters, tolerance is 0.25mm unless otherwise noted.
- Above specification may be changed without notice. Supplier will reserve authority on material change for above specification.

Absolute Maximum Ratings (Ta=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>I_F</td>
<td>25</td>
<td>mA</td>
</tr>
<tr>
<td>Pulse Forward Current</td>
<td>I_FP</td>
<td>60</td>
<td>mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Topr</td>
<td>-40 ~ +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_stg</td>
<td>-40 ~ +100</td>
<td>°C</td>
</tr>
<tr>
<td>Reflow Temperature</td>
<td>T_ref</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Electrostatic Discharge</td>
<td>ESD</td>
<td>2000</td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_d</td>
<td>60</td>
<td>mW</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V_R</td>
<td>5</td>
<td>V</td>
</tr>
</tbody>
</table>

Notes: *1: IFP Conditions--Pulse Width ≤ 10msec and Duty ≤ 1/10.
*2: Reflow time ≤ 5 seconds.
## Electro-Optical Characteristics (Ta=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage</td>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td>--</td>
<td>2.0</td>
<td>2.4</td>
<td>V</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;=20mA</td>
</tr>
<tr>
<td>Reverse Current</td>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>--</td>
<td>--</td>
<td>10</td>
<td>μA</td>
<td>V&lt;sub&gt;R&lt;/sub&gt;=5V</td>
</tr>
<tr>
<td>Luminous Intensity Per segment</td>
<td>IV</td>
<td>4.0</td>
<td>10.5</td>
<td>--</td>
<td>mcd</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;=10mA</td>
</tr>
<tr>
<td>Luminous Intensity Per decimal point</td>
<td></td>
<td>1.5</td>
<td>3.1</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Wavelength</td>
<td>λ&lt;sub&gt;p&lt;/sub&gt;</td>
<td>---</td>
<td>575</td>
<td>--</td>
<td>nm</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;=20mA</td>
</tr>
<tr>
<td>Dominant Wavelength</td>
<td>λ&lt;sub&gt;d&lt;/sub&gt;</td>
<td>---</td>
<td>573</td>
<td>--</td>
<td>nm</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;=20mA</td>
</tr>
<tr>
<td>Spectrum Radiation Bandwidth</td>
<td>Δλ</td>
<td>---</td>
<td>20</td>
<td>--</td>
<td>nm</td>
<td>I&lt;sub&gt;F&lt;/sub&gt;=20mA</td>
</tr>
</tbody>
</table>

### Bin Range of Luminous Intensity (Unit: mcd)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Min.</th>
<th>Max.</th>
<th>Rank</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>4.0</td>
<td>6.4</td>
<td>R</td>
<td>11.0</td>
<td>17.6</td>
</tr>
<tr>
<td>P</td>
<td>5.6</td>
<td>8.9</td>
<td>S</td>
<td>15.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Q</td>
<td>7.8</td>
<td>12.5</td>
<td>T</td>
<td>21.0</td>
<td>34.0</td>
</tr>
</tbody>
</table>
Technical Data Sheet
0.51" Quadruple Digit SMD Displays

Typical Electro-Optical Characteristics Curves

**Spectrum Distribution**

Ta=25°

- Relative luminous intensity (%)
- Wavelength (nm)

**Forward Current vs. Forward Voltage**

- Forward Current (mA)
- Forward Voltage (V)

**Forward Current Derating Curve**

Ta=25°

- Forward Current (mA)
- Ambient Temperature T_a (°C)

**Luminous Intensity vs. Forward Current**

Ta=25°

- Luminous Intensity (%) vs. Forward Current (mA)
■ Reflow Temp. / Time

![Reflow Temp./Time Diagram]

■ Soldering Iron:
Basic spec is ≤5 sec when 260°C. If temperature is higher, time should be shorter (+10°C → -1 sec). Power dissipation of iron should be smaller than 15 W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

■ Rework:
1. Customer must finish rework within 5 sec under 260°C.
2. The head of iron can not touch copper foil.
## Reliability test items and conditions:

The reliability of products shall be satisfied with items listed below.

Confidence level: 90%
LTPD: 10%

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>Test Conditions</th>
<th>Test Hours/Cycle</th>
<th>Sample Size</th>
<th>Failure Judgment Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reflow Soldering</td>
<td>TEMP: 260°C ± 5°C, Min. 5 SEC</td>
<td>6 Min</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
<tr>
<td>2</td>
<td>Temperature Cycle</td>
<td>H: +100°C 15 min, L: -40°C 15 min</td>
<td>300 Cycles</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
<tr>
<td>3</td>
<td>Thermal Shock</td>
<td>H: +100°C 5 min, L: -10°C 5 min</td>
<td>300 Cycles</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
<tr>
<td>4</td>
<td>High Temperature Storage</td>
<td>TEMP: 100°C</td>
<td>1000 HRS</td>
<td>22 PCS</td>
<td>Iv ≤ Iv't*0.5 or VF ≥ U or VF ≤ L</td>
</tr>
<tr>
<td>5</td>
<td>Low Temperature Storage</td>
<td>TEMP: -40°C</td>
<td>1000 HRS</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
<tr>
<td>6</td>
<td>DC Operating Life</td>
<td>TEMP: 25°C, If = 10mA</td>
<td>1000 HRS</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
<tr>
<td>7</td>
<td>High Temperature / High Humidity</td>
<td>85°C / 85% RH</td>
<td>1000 HRS</td>
<td>22 PCS</td>
<td>0/1</td>
</tr>
</tbody>
</table>

Note: Iv't: The test Iv value of the chip before the reliability test
Iv: The test value of the chip that has completed the reliability test
U: Upper Specification Limit
L: Lower Specification Limit
Technical Data Sheet
0.51" Quadruple Digit SMD Displays

ELSF-506SYGWA/S530-E2

Package Dimensions

Taping Dimensions
Technical Data Sheet
0.51" Quadruple Digit SMD Displays

ELSF-506SYGWA/S530-E2

Packing Quantity Specification
600PCS/Roll • 1Roll/Small box, 2Small boxes/Box

Label Form Specification

CPN: Customer’s Production Number
P/N: Production Number
QTY: Packing Quantity
CAT: Ranks
HUE: Peak Wavelength
REF: Reference
LOT No: Lot Number
DC: Year and Weekly
REFERENCE: Label identify code

Notes:
1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
3. These specification sheets include materials protected under copyright of EVERLIGHT Corporation. Please don’t reproduce or cause anyone to reproduce them without EVERLIGHT’s consent.