Simple 90V, 25mA, Temperature Compensated, Constant Current, LED Driver IC

Features
► 5.0 - 90V operating range ($V_{\text{op}}$)
► 25mA ±10% at 5.0 - 90V
► 0.01%/°C typical temperature coefficient
► No external components (two terminal device)
► Can be paralleled for higher current

Applications
► LED channel lighting
► Industrial lamp indicators
► Accent lighting

General Description
The Supertex CL25 is a high voltage, temperature compensated, constant current source. The device is trimmed to provide a constant current of 25mA±10% at an input voltage of 5.0 - 90V. No external components are required. The device can be used as a two terminal constant current source or constant current sink.

A typical application for the CL25 is to drive LEDs with a constant current of 25mA. Multiple CL2s can also be used in parallel to provide higher currents such as 50mA, 75mA or 100mA. The device is available in TO-92 and TO-243AA (SOT-89) packaging.
Ordering Information

<table>
<thead>
<tr>
<th>Device</th>
<th>Package Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TO-92</td>
</tr>
<tr>
<td>CL25</td>
<td>CL25N3-G</td>
</tr>
</tbody>
</table>

-G indicates package is RoHS compliant (‘Green’)

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage, ( V_{A-B} )</td>
<td>100V</td>
</tr>
<tr>
<td>Operating junction temperature, ( T_J )</td>
<td>-40°C to +125°C</td>
</tr>
<tr>
<td>Storage temperature, ( T_S )</td>
<td>-55°C to +150°C</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Electrical Characteristics

<table>
<thead>
<tr>
<th>Sym</th>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{A-B} )</td>
<td>Operating voltage</td>
<td>5.0</td>
<td>-</td>
<td>90</td>
<td>V</td>
<td>---</td>
</tr>
<tr>
<td>( I_{A-B} )</td>
<td>Current regulation</td>
<td>22.5</td>
<td>25</td>
<td>27.5</td>
<td>mA</td>
<td>( V_{A-B} = 5.0V - 90V )</td>
</tr>
<tr>
<td>( \Delta I_{A-B}/\Delta T )</td>
<td>( I_{A-B} ) temperature coefficient</td>
<td>-</td>
<td>0.01</td>
<td>-</td>
<td>%/°C</td>
<td>( V_{A-B} = 45V, T_J = -40°C to +100°C )</td>
</tr>
<tr>
<td>( T_J )</td>
<td>Operating junction temperature</td>
<td>-40</td>
<td>-</td>
<td>125</td>
<td>°C</td>
<td>---</td>
</tr>
<tr>
<td>( R_{A-B} )</td>
<td>Dynamic resistance</td>
<td>-</td>
<td>300</td>
<td>-</td>
<td>kΩ</td>
<td>---</td>
</tr>
</tbody>
</table>

Pin Configuration

Product Marking

YY = Year Sealed
WW = Week Sealed
NC = No Connect

Package may or may not include the following marks: Si or Pb-Free

W = Code for week sealed

Package may or may not include the following marks: Si or Pb-Free

- NC = No Connect

* Mounted on FR4 board; 25mm x 25mm x 1.57mm
Output Current vs Voltage

Temperature Characteristics

Functional Circuit Diagram

Equivalent Block Diagram

Control Circuit and Temperature Compensation
CL25 for Multiple LED Strings

CL25 for Higher Current
3-Lead TO-92 Package Outline (N3)

Front View

Side View

Bottom View

<table>
<thead>
<tr>
<th>Symbol</th>
<th>A</th>
<th>b</th>
<th>c</th>
<th>D</th>
<th>E</th>
<th>E1</th>
<th>e</th>
<th>e1</th>
<th>L</th>
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</thead>
<tbody>
<tr>
<td>MIN</td>
<td>.170</td>
<td>.014&quot;</td>
<td>.014&quot;</td>
<td>.175</td>
<td>.125</td>
<td>.080</td>
<td>.095</td>
<td>.045</td>
<td>.500</td>
</tr>
<tr>
<td>NOM</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MAX</td>
<td>.210</td>
<td>.022&quot;</td>
<td>.022&quot;</td>
<td>.205</td>
<td>.165</td>
<td>.105</td>
<td>.105</td>
<td>.055</td>
<td>.610*</td>
</tr>
</tbody>
</table>

JEDEC Registration TO-92.
* This dimension is not specified in the JEDEC drawing.
† This dimension differs from the JEDEC drawing.
Drawings not to scale.
Supertex Doc.#: DSPD-3TO92N3, Version E041009.
3-Lead TO-243AA (SOT-89) Package Outline (N8)

† This dimension differs from the JEDEC drawing
Drawings not to scale.
Supertex Doc. #: DSPD-3TO243AAN8, Version F111010.

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