CMJA5050
SURFACE MOUNT SILICON
ADJUSTABLE
CURRENT LIMITING DIODE
50V, 50-80mA

DESCRIPTION:
The CENTRAL SEMICONDUCTOR CMJA5050 is a silicon field effect adjustable current regulating diode designed for applications requiring a constant current over a wide voltage range.

MARKING CODE: CA50

APPLICATIONS:
- LED lighting and displays
- AC lighting panels
- Decorative lighting
- Test and measurement equipment

MAXIMUM RATINGS: (T_A=25°C)
- Peak Operating Voltage
- Operating and Storage Junction Temperature
- Thermal Resistance

SYMBOL UNITS
P_{OV} 50 V
P_D 570 mW
P_D 1.0 W
T_J, T_{stg} -65 to +150 °C
\theta_{JA} 220 °C/W
\theta_{JA} 125 °C/W

Note 1: Mounted on 300mm² 4-layer PCB with 2-ounce copper traces.

ELECTRICAL CHARACTERISTICS: (T_A=25°C)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady State</td>
<td></td>
</tr>
<tr>
<td>Regulator Current*</td>
<td></td>
</tr>
<tr>
<td>L_L @ V_T=12V</td>
<td></td>
</tr>
<tr>
<td>MIN mA</td>
<td>NOM mA</td>
</tr>
<tr>
<td>45</td>
<td>50</td>
</tr>
</tbody>
</table>

*Measured after applying DC test voltage for 90 seconds duration or greater with device mounted on FR-4 PC Board with 2oz. copper mounting pad area of 300mm² in still air.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Limiting</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td></td>
</tr>
<tr>
<td>V_L @ L_L=0.8 x L_P MIN</td>
<td></td>
</tr>
<tr>
<td>MIN mA</td>
<td>NOM mA</td>
</tr>
<tr>
<td>8.5</td>
<td>8.0</td>
</tr>
</tbody>
</table>

*Pulse width ≤1.0ms
**Measured between 25°C and 50°C.

FEATURES:
- Constant current range
- Adjustable regulation up to 80mA
- Wide operating voltage
- Negative temperature coefficient for LED protection
- Eliminates need for additional regulation

APPLICATIONS:
- LED lighting and displays
- AC lighting panels
- Decorative lighting
- Test and measurement equipment

DFN123F CASE

MAXIMUM RATINGS:
<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Operating Voltage</td>
<td>50 V</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>570 mW</td>
</tr>
<tr>
<td>Power Dissipation (Note 1)</td>
<td>1.0 W</td>
</tr>
<tr>
<td>Operating and Storage Junction Temperature</td>
<td>-65 to +150 °C</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>220 °C/W</td>
</tr>
<tr>
<td>Thermal Resistance (Note 1)</td>
<td>125 °C/W</td>
</tr>
</tbody>
</table>

Note 1: Mounted on 300mm² 4-layer PCB with 2-ounce copper traces.

R3 (10-August 2020)
Adjustment Compensation Resistance:
Placing resistors in parallel with a CLD allows the regulator current to be adjusted from 50mA to 80mA. This also corrects any current decrease when the applied voltage increases due to self heating.

REGULATOR CURRENT PER RESISTANCE:

<table>
<thead>
<tr>
<th>Steady State Regulator Current $I_L$ @ $V_T=12V$</th>
<th>Resistor (1/4W) Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN mA</td>
<td>NOM mA</td>
</tr>
<tr>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>49.5</td>
<td>55</td>
</tr>
<tr>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>58.5</td>
<td>65</td>
</tr>
<tr>
<td>67.5</td>
<td>75</td>
</tr>
<tr>
<td>72</td>
<td>80</td>
</tr>
</tbody>
</table>

*A 300Ω resistor may be added to achieve more linear regulator current characteristics.
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DFN123F CASE - MECHANICAL OUTLINE

DIMENSIONS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>INCHES</th>
<th>MILLIMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.144</td>
<td>3.65</td>
</tr>
<tr>
<td>B</td>
<td>0.059</td>
<td>1.50</td>
</tr>
<tr>
<td>C</td>
<td>0.031</td>
<td>0.80</td>
</tr>
<tr>
<td>D</td>
<td>0.000</td>
<td>0.00</td>
</tr>
<tr>
<td>E</td>
<td>0.110</td>
<td>2.80</td>
</tr>
<tr>
<td>F</td>
<td>0.033</td>
<td>0.85</td>
</tr>
<tr>
<td>G</td>
<td>0.020</td>
<td>0.50</td>
</tr>
</tbody>
</table>

LEAD CODE:
1) Cathode
2) Anode

MARKING CODE: CA50

www.centralsemi.com
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TYPICAL ELECTRICAL CHARACTERISTICS

CLD Voltage-Current Characteristic

Current Regulation vs. Time

Steady State Current vs. Anode-Cathode Voltage

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R3 (10-August 2020)
OUTSTANDING SUPPORT AND SUPERIOR SERVICES

PRODUCT SUPPORT
Central’s operations team provides the highest level of support to insure product is delivered on-time.
• Supply management (Customer portals)
• Inventory bonding
• Consolidated shipping options
• Custom bar coding for shipments
• Custom product packing

DESIGNER SUPPORT/SERVICES
Central’s applications engineering team is ready to discuss your design challenges. Just ask.
• Free quick ship samples (2\textsuperscript{nd} day air)
• Online technical data and parametric search
• SPICE models
• Custom electrical curves
• Environmental regulation compliance
• Customer specific screening
• Up-screening capabilities
• Special wafer diffusions
• PbSn plating options
• Package details
• Application notes
• Application and design sample kits
• Custom product and package development

REQUESTING PRODUCT PLATING
1. If requesting Tin/Lead plated devices, add the suffix “TIN/LEAD” to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix “PBFREE” to the part number when ordering (example: 2N2222A PBFREE).

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