Applications

LED Packaging Manufactures

According to the new research report "LED Packaging Market by Package Type (SMD, COB, CSP), Packaging Material (Lead Frames, Substrates, Bonding Wire, Encapsulation Resins), Application (General Lighting, Automotive Lighting, Backlighting), and Geography - Global Forecast to 2023", The LED packaging market is expected to grow from USD 18.41 Billion in 2017 to USD 26.39 Billion by 2023, at a CAGR of 6.2% between 2017 and 2023. Increased government initiatives and regulations to adopt energy-efficient LEDs, growing demand for smart lighting solutions, and growing demand from horticulture markets are the key driving factors for the LED packaging market.

LED Drivers Manufactures

The global LED driver market is expected to register a CAGR of over 18.1% during the forecast period 2018 - 2023. LED driver is an electrical device, which regulates the power to an LED or a string of LEDs. It offers dimming by integrating LEDs with dimmers, which helps in reducing the consumption of energy. Lighting dimmers also promote green environment due to reduced energy consumption, while extending the durability of LEDs.
Applications

Testing Product Example

LED Color Yellow Light (3000K)/ Natural Light (4000K)/ White Light (6000K), each LED package voltage 6.62V · current 150mA.

Product Information

FATC® P5610N-01

Features & Benefits & Applications

- Top view White LED (5.6x3.0x0.8mm), Lead Frame Package With Individual 4 Pins
- Independent thermal structure (Thermal and electrical separation)
- Viewing Angle ≥110°, Precondition : JEDEC Level 3
- RoHS- and REACH- compliant
- Low Power Requirement and Excellent Energy Efficient, Environmentally friendly, no disposal issues
- Indoor Lighting : Ambient Light, Tube, Down light, LED bulbs and Ceiling Light

Specification

<table>
<thead>
<tr>
<th>Product Code (C/N)</th>
<th>Color</th>
<th>If (mA)</th>
<th>VF (V)</th>
<th>Luminous Flux (lm)</th>
<th>CCT (K)</th>
<th>CRI</th>
<th>R9</th>
<th>Power Dissipation (W)</th>
<th>Luminous Efficiency</th>
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<tbody>
<tr>
<td>5610-CSI30M-THSSWNZSS</td>
<td>Warm</td>
<td>150</td>
<td>6.62</td>
<td>96.4</td>
<td>104.2</td>
<td>3000</td>
<td>80</td>
<td>&gt; 0</td>
<td>1.0</td>
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<tr>
<td>5610-CSI40M-THSSWNZSS</td>
<td>Neutral</td>
<td>150</td>
<td>6.62</td>
<td>104.5</td>
<td>113.0</td>
<td>4000</td>
<td>80</td>
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<tr>
<td>5610-CSI60M-THSSWNZSS</td>
<td>White</td>
<td>150</td>
<td>6.62</td>
<td>106.5</td>
<td>114.1</td>
<td>6000</td>
<td>80</td>
<td>&gt; 0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Applications

Testing Product Example 2

LED Color Yellow Light(2700K)/ Natural Light(4000K)/ White Light(6000K), each LED package voltage 38.5V, current 350mA.

Product Information

FATC® CA5A2N-01

Features & Benefits & Applications
- LED Lighting engine (15x15x1.0mm)
- Viewing Angle: ±110°, Precondition: JEDC Level 3
- Reduced SMT costs
- RoHS- and REACH- compliant
- Low Power Requirement and Excellent Energy Efficient, Environmentally friendly, no disposal issues
- Indoor Lighting: Ambient Light, Downlight, LED bulbs and Ceiling Light

Specification

<table>
<thead>
<tr>
<th>Product Code(C/N)</th>
<th>Color</th>
<th>If (mA)</th>
<th>Vf (V)</th>
<th>Luminescent Flux(Lm)</th>
<th>CCT (K)</th>
<th>CRI</th>
<th>R9</th>
<th>Power Dissipation (W)</th>
<th>Luminous Efficiency Typ.</th>
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</thead>
<tbody>
<tr>
<td>A5A2-CSI27M-ACSSWWZZSS</td>
<td>Warm</td>
<td>350</td>
<td>38.5</td>
<td>1280.2</td>
<td>1412.6</td>
<td>2700</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
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<tr>
<td>A5A2-CSI30M-ACSSWZZSS</td>
<td>Warm</td>
<td>350</td>
<td>38.5</td>
<td>1290.2</td>
<td>1459.7</td>
<td>3000</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
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<tr>
<td>A5A2-CSI40M-ACSSWZZSS</td>
<td>Neutral</td>
<td>350</td>
<td>38.5</td>
<td>1372.1</td>
<td>1487.5</td>
<td>4000</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
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<tr>
<td>A5A2-CSI50M-ACSSWZZSS</td>
<td>White</td>
<td>350</td>
<td>38.5</td>
<td>1446.2</td>
<td>1505.7</td>
<td>5000</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
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<tr>
<td>A5A2-CSI57M-ACSSWZZSS</td>
<td>White</td>
<td>350</td>
<td>38.5</td>
<td>1462.0</td>
<td>1597.4</td>
<td>5700</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
</tr>
<tr>
<td>A5A2-CSI65M-ACSSWZZSS</td>
<td>Cool</td>
<td>350</td>
<td>38.5</td>
<td>1458.0</td>
<td>1605.0</td>
<td>5700</td>
<td>80</td>
<td>&gt;0</td>
<td>13.5</td>
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<tr>
<td>A5A2-B5I65M-ACSSWZXZSS</td>
<td>White</td>
<td>350</td>
<td>38.5</td>
<td>1560.0</td>
<td>1702.2</td>
<td>6000</td>
<td>70</td>
<td>--</td>
<td>13.5</td>
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</tbody>
</table>

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Can do single package test and can do the programmable on current to adjust the illumination. Time consuming and effort.
Customer hopes to find a new way to do multiple LED package at one time in order to save the testing time and increase production speed.
Testing Requirements

- Test Items: LED Package Aging Test
- Test Equipment: Programmable DC power supply + Environmental Chamber
- Control: Remote control and monitoring by Ethernet interface
- Testing Product: LED package 2-6V (new product 6V)
- Test Diagram: Serial connection 46 set LED and parallel connect 10 rows LED. Use the constant current driver to keep on 350mA with 280V, total current 3.5A
- Output Mode: CV、CC、CP
- Programmable:
  - Step 1 – Initial V、I; (for stabilizing LED)
  - Step 2 – working voltage 280V、3.5A; (Start Burning Test)
  - Testing Time: 24-48hr
After the LED chips cut, the LED need the environmental chamber to do the burn-in testing.
Preen DC Power Solution

Programmable Voltage and Current Steps

0 ~ 330 V
0 ~ 50A max.

Start Number
STEP Set 1 → STEP Set 2 → STEP Set 3 → STEP Set 4 → STEP Set 5 → STEP Set 6

End Number
Repeat the Step Loop 5 Times

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Additional Features

◆ High Power Density with 3U height.

◆ Remote sense voltage compensation

◆ Flexible Single phase or 3phase voltage input
Additional Features

◆ With PFC input power correction

**PF 0.99**

◆ Measurement, High Accuracy, High Stability and Reliability

◆ Full protection and event detection
Additional Features

◆ ADG-L Provide Parallel Connection for expansion the capacity

◆ Different Models for Variety Voltage and Current Range Selection

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## Competitors Comparison:

<table>
<thead>
<tr>
<th></th>
<th>ADG-L series</th>
<th>62000H series</th>
<th>3603D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>8KW (330V / 50A)</td>
<td>15KW (450V / 34A)</td>
<td>180W (60V / 3A)</td>
</tr>
<tr>
<td><strong>Programmability</strong></td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td><strong>Output Mode</strong></td>
<td>CV / CC / CP</td>
<td>CV / CC</td>
<td>CV / CC</td>
</tr>
<tr>
<td><strong>Input Power Factor</strong></td>
<td>0.99 / ≥ 90%</td>
<td>0.5 ~ 0.95 / 87%</td>
<td>?</td>
</tr>
<tr>
<td><strong>Accuracy (V / I)</strong></td>
<td>≤ 0.08%F.S.+100mV</td>
<td>0.05% + 0.05%F.S. + 0.1% + 0.1%F.S.</td>
<td>?</td>
</tr>
<tr>
<td><strong>Line Regulation/Load Regulation</strong></td>
<td>≤ 0.05% F.S. ≤ 0.2% F.S.</td>
<td>≤ 0.05% F.S. ≤ 0.1% F.S.</td>
<td>± 0.01%+2mV</td>
</tr>
<tr>
<td><strong>Communication Interface</strong></td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td><strong>Models</strong></td>
<td>For 4KW / 8KW / 12KW</td>
<td>100V (model) only</td>
<td>X</td>
</tr>
<tr>
<td><strong>Remote Sense</strong></td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>Middle</td>
<td>High</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

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