SMD type package

\[ S6060--Wavelength--Power--Voltage \]

- Emission Peak +/- 5 nm
- Voltage @ 350mA +/- 0.5 V
- mW @ 350mA +/- 10%

Example:

S6060-W265-P70-V7.0

Interpretation:

Surface Mount type 6.0 x 6.0 mm packaged LED
- Peak wavelength = 265 +/- 5nm
- Power output @ 350mA = 70 mW (+/-10%)
- Forward voltage @ 350mA = 7.0V (+/- 0.5V)
6060 Packaged LED Diagram

All Units = mm

Drawings not exactly to scale
Specifications subject to change without notice
### TABLE 1. Performance @ 350 mA forward current (25°C ambient, packaged)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>λ&lt;sub&gt;p&lt;/sub&gt;</td>
<td>nm</td>
<td>260</td>
<td>270</td>
<td>275</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>φ&lt;sub&gt;e&lt;/sub&gt;</td>
<td>mW</td>
<td>60</td>
<td>72</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TBA*</td>
<td>TBA*</td>
<td>TBA*</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>VF</td>
<td>V</td>
<td>6.5</td>
<td>7.0</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TBA*</td>
<td>TBA*</td>
<td>TBA*</td>
</tr>
<tr>
<td>Spectrum Half Width</td>
<td>Δλ</td>
<td>nm</td>
<td>9.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>View Angle</td>
<td>2θ&lt;sub&gt;½&lt;/sub&gt;</td>
<td>°</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>RJ-b</td>
<td>°C/W</td>
<td>&lt;10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*TBA* type LEDs: To be announced

Specifications may subject to change without notice
UVC LED: Electro-optical parameters (continued)

**Fig 3.** Peak Wavelength vs. Forward Current

**Fig 4.** Spectrum

**Fig 5.** Forward Voltage vs Ambient Temperature

**Fig 6.** Relative Radiant Flux vs Ambient Temperature

**Fig 7.** Far-field Emission Pattern
### TABLE 2. Device lifetime (forward current =20mA, $T = 25^\circ$C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>70% Power Lifetime</td>
<td>L70</td>
<td>hours</td>
<td>850</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>50% Power Lifetime</td>
<td>L50</td>
<td>hours</td>
<td>1200</td>
<td>2000</td>
<td>5000</td>
</tr>
</tbody>
</table>
### TABLE 3. Bin Structures

[ Ta =25°C, I_F = 20mA ]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Peak Wavelength</td>
<td>265</td>
<td>260</td>
<td>265</td>
<td>270</td>
</tr>
<tr>
<td></td>
<td></td>
<td>275</td>
<td>270</td>
<td>275</td>
<td>280</td>
</tr>
<tr>
<td>P</td>
<td>Radiant Flux (Φ_e)</td>
<td>60</td>
<td>55</td>
<td>60</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70</td>
<td>65</td>
<td>70</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80</td>
<td>75</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>G2*</td>
<td>TBA</td>
<td>-</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Forward Voltage (V)</td>
<td>5.5</td>
<td>5.0</td>
<td>5.5</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.5</td>
<td>6.0</td>
<td>6.5</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.5</td>
<td>7.0</td>
<td>7.5</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>8.0</td>
<td>8.5</td>
<td>8.5</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Note: Bin Code method

Bin Code (W-P-V): Peak Wavelength = W ; Radiant Flux = P ; Forward Voltage = V

*G2: performance to be announced*
Soldering conditions of UVC LED

**FIG 8. Solder reflow temperature profile**

- **Lead Solder (40/60 alloy)**
  - Pre-Heating: 120 ~ 150°C
  - Pre-Heat Time: 120 sec. Max.
  - Peak Temperature: 240°C Max.
  - Soldering Time: 5 sec. Max.
  - 2.5 ~ 5°C/sec.

- **Lead-Free (SAC305 alloy) Solder**
  - Pre-Heating: 180 ~ 200°C
  - Pre-Heat Time: 120 sec. Max.
  - Peak Temperature: 260°C Max.
  - Soldering Time: 5 sec. Max.
  - 1 ~ 5°C/sec.

- Temperature profile for reflow soldering:
  - 120 ~ 150°C Max. (120 sec. Max.)
  - Above 200°C (60 sec. Max.)
  - Above 220°C (60 sec. Max.)

**Recommended solder composition:** 305 alloy (SnAgCu)

- **Recommended stencil thickness is 60~80um**
- **Recommended stencil solder paste area is 60~80%**
- **Forming gas (5%-7%H₂ in N₂) ambient recommended for best results**
- **After reflow soldering, Rapid cooling should be avoided**
- **When soldering, do not use a hot plate. A convection type reflow oven is preferred. (Fig 9.)**

**FIG 9. Do not use a hot plate to mount led-package onto PCB. A reflow oven is recommended.**
Handling Precautions

ESD Protection

Workplace setup should follow the recommendations given in JEDEC standard document JESD625B “Requirements for Handling Electrostatic-Discharge-Sensitive (ESDS) Devices” or IEC 61340-5-1, 2 and 3. The operators should be properly trained to handle UVC flipchips according the guidelines listed below:

• Always wear conductive wrist straps that is continuously monitored when working or handling assembled boards containing unprotected chips.

• Use an ion blower to neutralize the static discharge that may build up on the surface of the UVC flipchips during storage and handling.

• Always keep unused UVC flipchips in the protective ESD storage bag. Depending on the final application, it may be necessary to include additional ESD protection, such as a TVS protection diode on the substrate on which UVC flip chip is reflowed. Bolb Inc. includes a TVS chip inside each LED package.

• Use tweezers to pick up UVC LEDs, teflon coated tweezers would be recommended to avoid scratching UVC LEDs.

• Recommend holding the sidewalls of the LEDs (See Fig 10.)

FIG 10. incorrect handling (left) and correct handling (right) of UVC LED Package
Packing

Carrier Tape & Reel Dimensions (unit = mm)

NOTES:
1. 10 sprocket hole pitch cumulative tolerance ±0.2mm.
2. Camber not to exceed 1mm in 250mm.
4. Ao and Bo measured on a plane 3.3mm above the bottom of the pocket.
5. Kp measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
7. Pocket center and pocket hole center must be the same position.

Quantity < 3,000 units/reel
Cover tape adhesion <0.7 Newtons
Leader tape < 200 empty pockets
Trailer <60 empty pockets
UVC flipchip emits deep ultraviolet radiation, with extremely high intensity near its surface. This allows rapid disinfection but safety precautions must be observed during assembly and testing.

By purchasing the UVC chips (bare dice) or packaged LEDs from the manufacturer, the customer hereby agrees to absolve the manufacturer's responsibility of any bodily harm as a result of failure to observe the precautions, warnings and guidelines contained within this Specifications document.

All assembly workers, observers and bystanders must wear eye and skin protection when the UVC LEDs are energized. Bare-eye observation (including through microscopes) and bare-hand handling of a UVC LED in operation is PROHIBITED.

UVC light can be easily absorbed, so any oil or other absorbent liquid or solid substance must NOT be allowed to touch the sapphire side of the UVC chip, or the dome lens on a packaged LED.

Do not apply pressure to the dome lens on packaged LED.