DUV-HL46N

- Deep Ultraviolet Light Emission Source
- 265, 280, 310, 325, 340 nm
- TO18 metal can
- Hemispherical SiO₂ lens
- Beam angle 6 deg.

**Description**

DUV-HL46N is a series of AlGaN based single emitter DEEP-UV LEDs in a hermetically sealed TO18 package, utilizing a hemispherical quartz glass lens with narrow beam angle of 6 degree. DUV-HL46N is available from 265 nm up to 340 nm peak wavelength with an optical output power of typically 0.5 mW.

**Maximum Rating (T_{CASE} = 25°C)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Values</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current (T_A=25°C)</td>
<td>I_F</td>
<td>40</td>
<td>mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>T_{OPR}</td>
<td>-20 - 80</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_{STG}</td>
<td>-40 + 100</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (max. 5s)</td>
<td>T_{SOL}</td>
<td>+300</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Electro-Optical Characteristics (T_{CASE} = 25°C, I_F =20 mA)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>DUV265 -HL46N</th>
<th>DUV280 -HL46N</th>
<th>DUV310 -HL46N</th>
<th>DUV325 -HL46N</th>
<th>DUV340 -HL46N</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>\lambda</td>
<td>265 ±5</td>
<td>280 ±5</td>
<td>310 ±5</td>
<td>325 ±5</td>
<td>340 ±5</td>
<td>nm</td>
</tr>
<tr>
<td>Radiated Power</td>
<td>P_O</td>
<td>0.5</td>
<td>1.0</td>
<td>0.4</td>
<td>0.7</td>
<td>0.8</td>
<td>mW</td>
</tr>
<tr>
<td>Spectral Width (FWHM)</td>
<td>\Delta \lambda</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>11</td>
<td>9</td>
<td>nm</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>V_F</td>
<td>7.0</td>
<td>6.5</td>
<td>6.0</td>
<td>4.5</td>
<td>4.0</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Voltage (I_R=10µA)</td>
<td>V_R</td>
<td>&gt; 4</td>
<td>&gt; 2</td>
<td>&gt; 10</td>
<td>&gt; 10</td>
<td>&gt; 10</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Current (V_R=5V)</td>
<td>I_R</td>
<td>&lt; 50</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>µA</td>
</tr>
<tr>
<td>Viewing Angle</td>
<td>2\theta</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>deg.</td>
</tr>
<tr>
<td>Thermal resistance</td>
<td>\Theta</td>
<td>~250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>Rise time*</td>
<td>t_r</td>
<td>/</td>
<td>/</td>
<td>16</td>
<td>20</td>
<td>12</td>
<td>ns</td>
</tr>
<tr>
<td>Fall time*</td>
<td>t_f</td>
<td>/</td>
<td>/</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>ns</td>
</tr>
</tbody>
</table>

*Based on calculations
Performance Characteristics

**Forward Current vs. Forward Voltage**

![Graph showing Forward Current vs. Forward Voltage](image)

**(Ta=25°C)**

**Forward Voltage vs. Ambient Temp.**

![Graph showing Forward Voltage vs. Ambient Temp.](image)

**If=20mA**

**Wavelength Shift vs. Ambient Temp.**

![Graph showing Wavelength Shift vs. Ambient Temp.](image)

**If=20mA**

**Radiant Flux vs. Ambient Temp.**

![Graph showing Radiant Flux vs. Ambient Temp.](image)

**If=20mA**

**Forward Current vs. Relative Radiant Flux [%]**

![Graph showing Forward Current vs. Relative Radiant Flux [%]](image)

**(Ta=25°C)**

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Performance Characteristics

### Junction Temp. vs. Forward Current

![Graph showing Junction Temperature vs. Forward Current](image)

### Radiation Pattern

![Radiation Pattern Diagram](image)

#### Outline Dimensions

**TO18**

![Diagram of TO18 Outline Dimensions](image)

*all dimensions in mm*

#### Device Materials

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lens</td>
<td>SiO2</td>
</tr>
<tr>
<td>Cap</td>
<td>Fe-Ni alloy, Ni plating</td>
</tr>
<tr>
<td>Stem</td>
<td>SPC, Au plating</td>
</tr>
<tr>
<td>Leads</td>
<td>Fe-Ni alloy, Au plating</td>
</tr>
</tbody>
</table>

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Precautions

Soldering:
- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux.
- Do only solder the leads. Soldering of header or cap will damage the LED
- Do only cut the leads at room temperature with an ESD protected tool
- Do not solder closer than 3 mm from base of the header
- Do form leads prior to soldering
- Do not impose mechanical stress on the header when forming the leads
- Do not apply current to the LED until it has cooled down to room temperature after soldering

Static Electricity:
LEDs are sensitive to electrostatic discharge (ESD). Precautions against ESD must be taken when handling or operating these LEDs. Surge voltage or electrostatic discharge can result in complete failure of the device.

UV-Radiation:
During operation these LEDs do emit high intensity ultraviolet light, which is hazardous to skin and eyes, and may cause cancer. Do avoid exposure to the emitted UV light. Protective glasses are recommended. It is further advised to attach a warning label on products/systems that do utilize UV-LEDs:

![Class 1 UV LED Warning Label](image)

Operation:
Do only operate LEDs with a current source.
Running these LEDs from a voltage source will result in complete failure of the device.
Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory

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