SFH 2700 FA

CHIPLED®
Silicon PIN Photodiode

Applications
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)

Features:
- Package: black epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Very small SMT package
- Especially suitable for applications from 700 nm to 1100 nm

Ordering Information

<table>
<thead>
<tr>
<th>Type</th>
<th>Photocurrent E&lt;sub&gt;e&lt;/sub&gt; = 0.5 mW/cm²; λ = 850 nm; V&lt;sub&gt;R&lt;/sub&gt; = 5 V</th>
<th>Photocurrent E&lt;sub&gt;e&lt;/sub&gt; = 0.5 mW/cm²; λ = 850 nm; V&lt;sub&gt;R&lt;/sub&gt; = 5 V</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFH 2700 FA</td>
<td>≥ 1.2 µA</td>
<td>1.5 µA</td>
<td>Q65112A4434</td>
</tr>
</tbody>
</table>
### Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>$T_{op}$</td>
<td>min. -40 °C, max. 100 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>min. -40 °C, max. 100 °C</td>
</tr>
<tr>
<td>Reverse voltage</td>
<td>$V_R$</td>
<td>max. 16 V</td>
</tr>
<tr>
<td>ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)</td>
<td>$V_{ESD}$</td>
<td>max. 2 kV</td>
</tr>
</tbody>
</table>

### Characteristics

$T_A = 25 \degree C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength of max sensitivity</td>
<td>$\lambda_{S\text{ max}}$</td>
<td>typ. 890 nm</td>
</tr>
<tr>
<td>Spectral range of sensitivity</td>
<td>$\lambda_{10%}$</td>
<td>typ. 700 ... 1100 nm</td>
</tr>
<tr>
<td>Radiant sensitive area</td>
<td>$A$</td>
<td>typ. 0.35 mm²</td>
</tr>
<tr>
<td>Dimensions of active chip area</td>
<td>$L \times W$</td>
<td>typ. 0.59 x 0.59 mm x mm</td>
</tr>
<tr>
<td>Half angle</td>
<td>$\phi$</td>
<td>typ. 70 °</td>
</tr>
<tr>
<td>Dark current $V_R = 5$ V</td>
<td>$I_R$</td>
<td>typ. max. 0.045 nA, 5 nA</td>
</tr>
<tr>
<td>Open-circuit voltage $E_a = 0.5$ mW/cm²; $\lambda = 850$ nm</td>
<td>$V_O$</td>
<td>min. 290 mV, typ. 300 mV</td>
</tr>
<tr>
<td>Short-circuit current $E_a = 0.5$ mW/cm²; $\lambda = 850$ nm</td>
<td>$I_{SC}$</td>
<td>typ. 1.4 µA</td>
</tr>
<tr>
<td>Rise time $V_R = 5$ V; $R_L = 50$ Ω; $\lambda = 850$ nm</td>
<td>$t_r$</td>
<td>typ. 0.12 µs</td>
</tr>
<tr>
<td>Fall time $V_R = 5$ V; $R_L = 50$ Ω; $\lambda = 850$ nm</td>
<td>$t_f$</td>
<td>typ. 0.12 µs</td>
</tr>
<tr>
<td>Forward voltage $I_F = 5$ mA</td>
<td>$V_F$</td>
<td>typ. 0.8 V</td>
</tr>
<tr>
<td>Capacitance $V_R = 0$ V; $f = 1$ MHz; $E = 0$</td>
<td>$C_0$</td>
<td>typ. 4.6 pF</td>
</tr>
</tbody>
</table>
Relative Spectral Sensitivity 1), 2)

\[ S_{\text{rel}} = f(\lambda) \]

Directional Characteristics 1), 2)

\[ S_{\text{rel}} = f(\phi) \]
**Photocurrent** ¹, ²

\[ I_P = f(E_d); \lambda = 850 \text{ nm}; V_R = 5 \text{ V} \]

**Dark Current** ¹, ²

\[ I_R = f(V_R); E = 0 \]

**Capacitance** ¹, ²

\[ C = f(V_R); f = 1 \text{ MHz}; E = 0; \]
Approximate Weight: 3.8 mg

Package marking: Cathode

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anode</td>
</tr>
<tr>
<td>2</td>
<td>Cathode</td>
</tr>
</tbody>
</table>
Recommended Solder Pad

Bauteil positioniert
Component location on pad

Reflow Soldering Profile
Product complies to MSL Level 3 acc. to JEDEC J-STD-020E
Profile Feature | Symbol | Pb-Free (SnAgCu) Assembly Unit
--- | --- | --- | --- | --- |
Ramp-up rate to preheat*) |  |  |  | Minimum | Recommendation | Maximum |
25 °C to 150 °C |  |  |  | 2 | 3 | K/s |
Time \( t_s \) | \( t_s \) | 60 | 100 | 120 | s |
Ramp-up rate to peak*) |  |  |  | Minimum | Recommendation | Maximum |
\( T_{\text{Smin}} \) to \( T_{\text{Smax}} \) |  | 2 | 3 | K/s |
Liquidus temperature | \( T_L \) | 217 | °C |
Time above liquidus temperature | \( t_L \) | 80 | 100 | s |
Peak temperature | \( T_P \) | 245 | 260 | °C |
Time within 5 °C of the specified peak temperature \( T_P \) - 5 K | \( t_P \) | 10 | 20 | 30 | s |
Ramp-down rate* |  |  |  | Minimum | Recommendation | Maximum |
\( T_P \) to 100 °C | 3 | 6 | K/s |
Time |  |  |  | 480 | s |

All temperatures refer to the center of the package, measured on the top of the component
* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range

**Taping 3)**

---

Downloaded from Arrow.com.
**Tape and Reel**

4) **Reel dimensions [mm]**

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>W (mm)</th>
<th>N&lt;sub&gt;min&lt;/sub&gt;</th>
<th>W&lt;sub&gt;1&lt;/sub&gt;</th>
<th>W&lt;sub&gt;2 max&lt;/sub&gt;</th>
<th>Pieces per PU</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>8 + 0.3 / - 0.1</td>
<td>60</td>
<td>8.4 + 2</td>
<td>14.4</td>
<td>3000</td>
</tr>
</tbody>
</table>

Leader: min. 400 mm *
Trailer: min. 160 mm *
*) Dimensions acc. to IEC 60286-3; EIA 481-D

OHAY0324
Barcode-Product-Label (BPL)

Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Dry Packing Process and Materials

Moisture-sensitive label or print
Barcode label
Humidity indicator
Barcode label

Desiccant

Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.
Transportation Packing and Materials

Dimensions of transportation box in mm

<table>
<thead>
<tr>
<th>Width</th>
<th>Length</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 ± 5 mm</td>
<td>195 ± 5 mm</td>
<td>30 ± 5 mm</td>
</tr>
</tbody>
</table>
Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet falls into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related informations please visit www.osram-os.com/appnotes
Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

Attention please!
The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.
For information on the types in question please contact our Sales Organization.
If printed or downloaded, please find the latest version in the OSRAM OS Webside.

Packing
Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.
By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Product safety devices/applications or medical devices/applications
OSRAM OS components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
In case Buyer – or Customer supplied by Buyer – considers using OSRAM OS components in product safety devices/applications or medical devices/applications, Buyer and/or Customer has to inform the local sales partner of OSRAM OS immediately and OSRAM OS and Buyer and/or Customer will analyze and coordinate the customer-specific request between OSRAM OS and Buyer and/or Customer.
Glossary

1) **Typical Values**: Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

2) **Testing temperature**: \( T_A = 25^\circ C \)

3) **Tolerance of Measure**: Unless otherwise noted in drawing, tolerances are specified with \( \pm 0.1 \) and dimensions are specified in mm.

4) **Tape and Reel**: All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.