# OSRAM SFH 2705

# Datasheet

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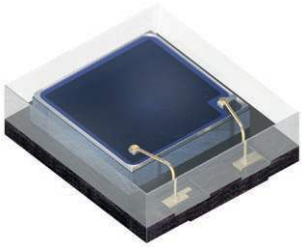
OSRAM

Chip LED

# SFH 2705

Silicon PIN Photodiode



## Applications

- Digital Diagnostic Devices
- Vital Sign Monitoring

## Features

- Package: clear epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Suitable for reflow soldering
- Especially suitable for applications from 400 nm to 1100 nm
- Enhanced blue and green sensititvity

## Ordering Information

| Type | Photocurrent<br>typ.<br>$E_e$ = 0.1 mW/cm²; λ = 535 nm; $V_R$ = 5 V<br>$I_P$ | Ordering Code |
|---|---|---|
| SFH 2705 | 1.4 µA | Q65113A1911 |

## Maximum Ratings

| Parameter | Symbol | | Values |
|---|---|---|---|
| Operating Temperature | $T_{op}$ | min.<br>max. | -40 °C<br>85 °C |
| Storage temperature | $T_{stg}$ | min.<br>max. | -40 °C<br>85 °C |
| Reverse voltage | $V_R$ | max. | 16 V |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2) | $V_{ESD}$ | max. | 2 kV |

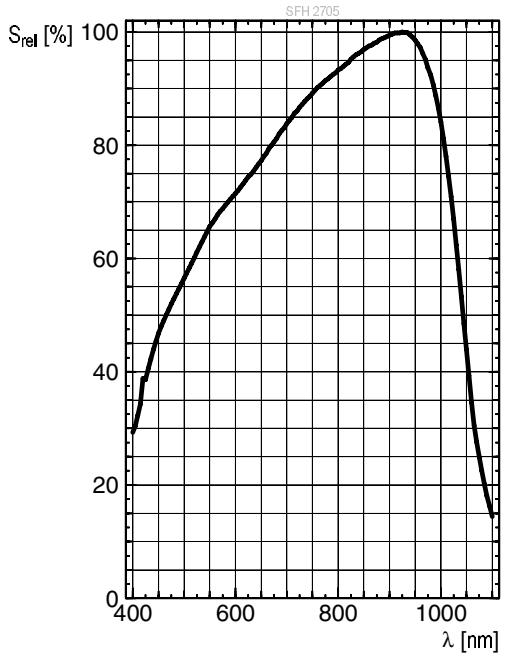
## Characteristics

$T_A$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Wavelength of max sensitivity | $\lambda_{S\ max}$ | typ. | 930 nm |
| Spectral range of sensitivity | $\lambda_{10\%}$ | typ. | 400 ... 1100 nm |
| Photocurrent<br>$E_e$ = 0.1 mW/cm²; λ = 535 nm; $V_R$ = 5 V | $I_P$ | typ. | 1.4 µA |
| Photocurrent<br>$E_e$ = 0.1 mW/cm²; λ = 950 nm; $V_R$ = 5 V | $I_P$ | typ. | 2.3 µA |
| Radiant sensitive area | A | typ. | 3.4 mm² |
| Dimensions of chip area | L x W | typ. | 1.975 x 1.975 mm x mm |
| Half angle | φ | typ. | 65 ° |
| Dark current<br>$V_R$ = 5 V | $I_R$ | typ.<br>max. | 0.2 nA<br>25 nA |
| Open-circuit voltage<br>$E_e$ = 0.1 mW/cm²; λ = 535 nm | $V_O$ | typ. | 270 mV |
| Rise time<br>$V_R$ = 5 V; $R_L$ = 50 Ω; λ = 535 nm | $t_r$ | typ. | 93 ns |
| Fall time<br>$V_R$ = 5 V; $R_L$ = 50 Ω; λ = 535 nm | $t_f$ | typ. | 93 ns |
| Forward voltage<br>$I_F$ = 10 mA; E = 0 | $V_F$ | typ. | 1.05 V |
| Capacitance<br>$V_R$ = 0 V; f = 1 MHz; E = 0 | $C_0$ | typ. | 22.8 pF |

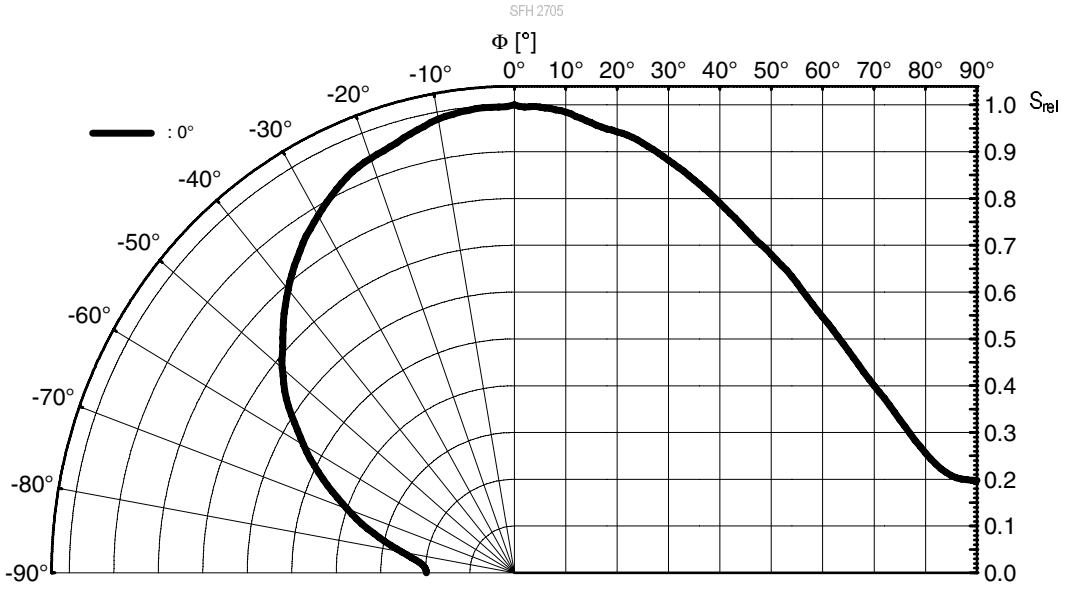
## Relative Spectral Sensitivity [1], [2]

$S_{rel} = f(\lambda)$



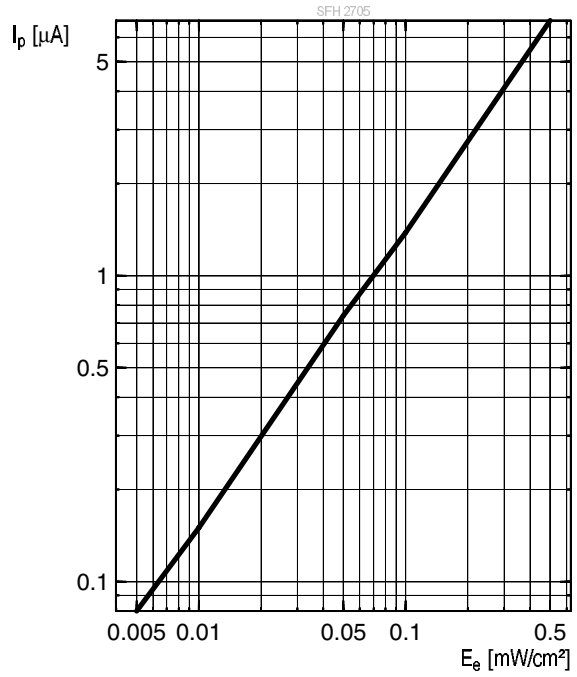

## Directional Characteristics [1], [2]

$S_{rel} = f(\varphi)$



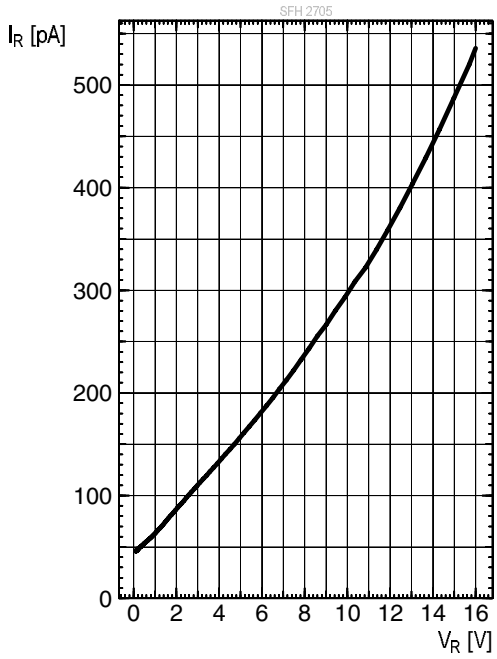
## Photocurrent [1], [2]

$I_P = f(E_e)$; λ = 535 nm; $V_R$ = 5 V



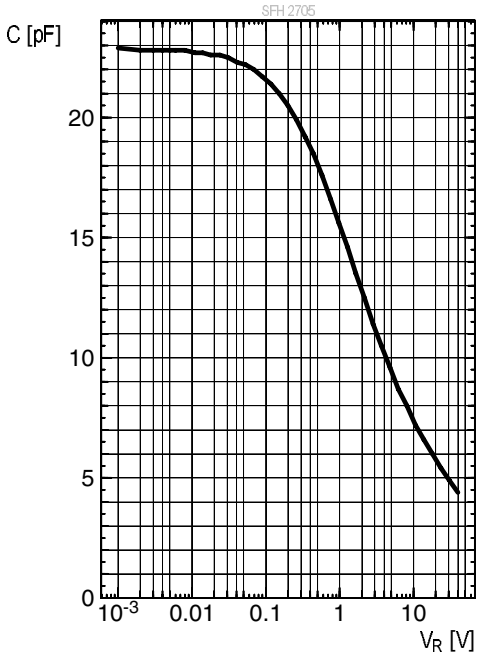

## Dark Current [1], [2]

$I_R = f(V_R)$; E = 0

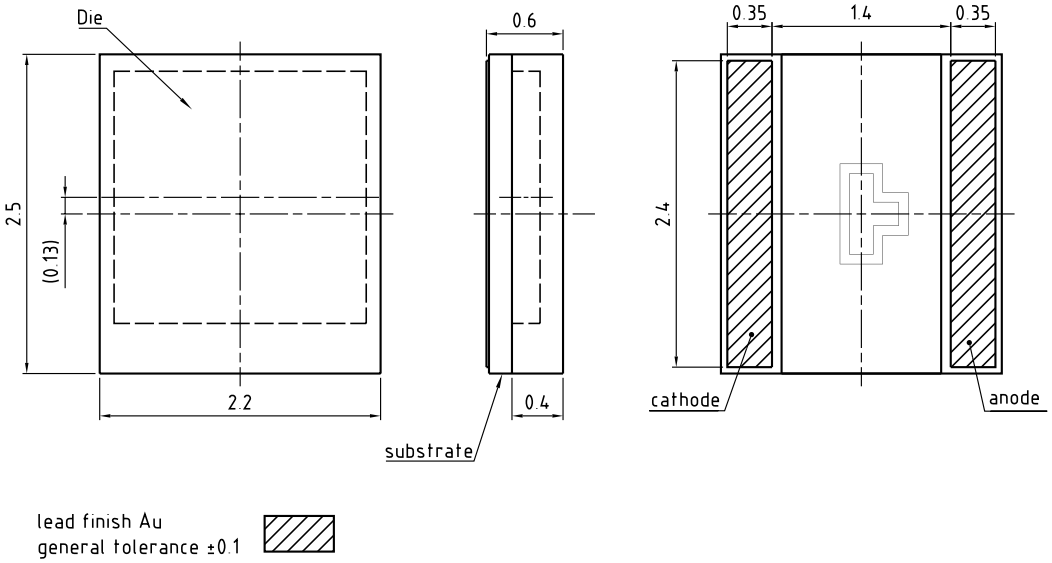



## Capacitance [1], [2]

$C = f(V_R)$; f = 1MHz; E = 0; $T_A$ = 25°C



## Dimensional Drawing [3)]

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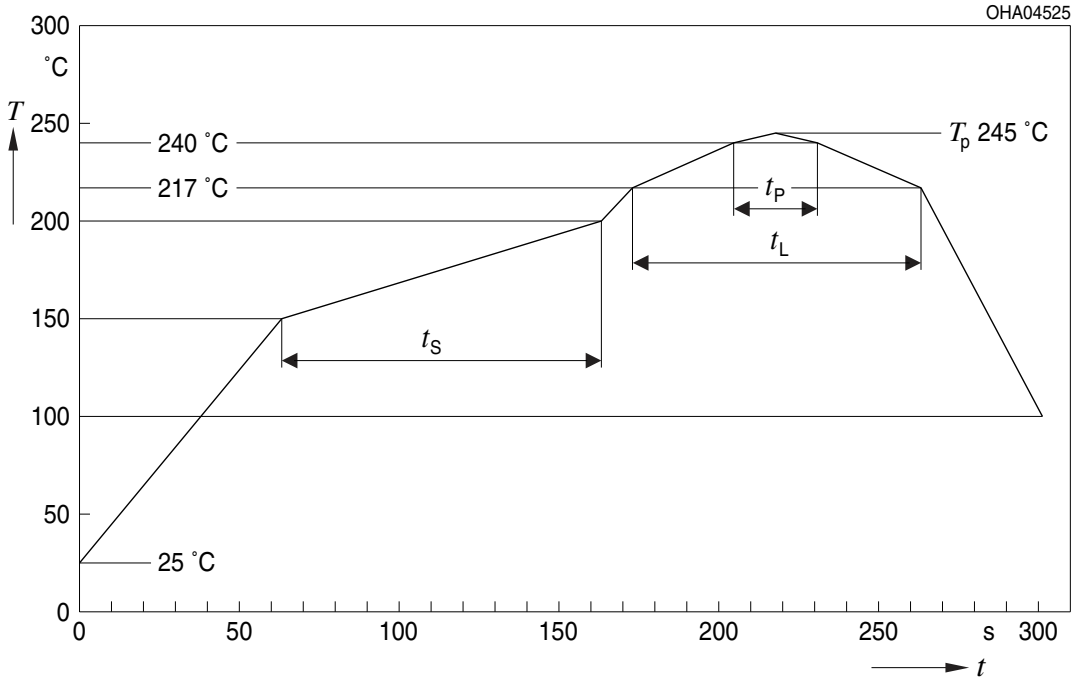
## Further Information:

**Approximate Weight:** 7.0 mg

**Package marking:** Anode

## Reflow Soldering Profile

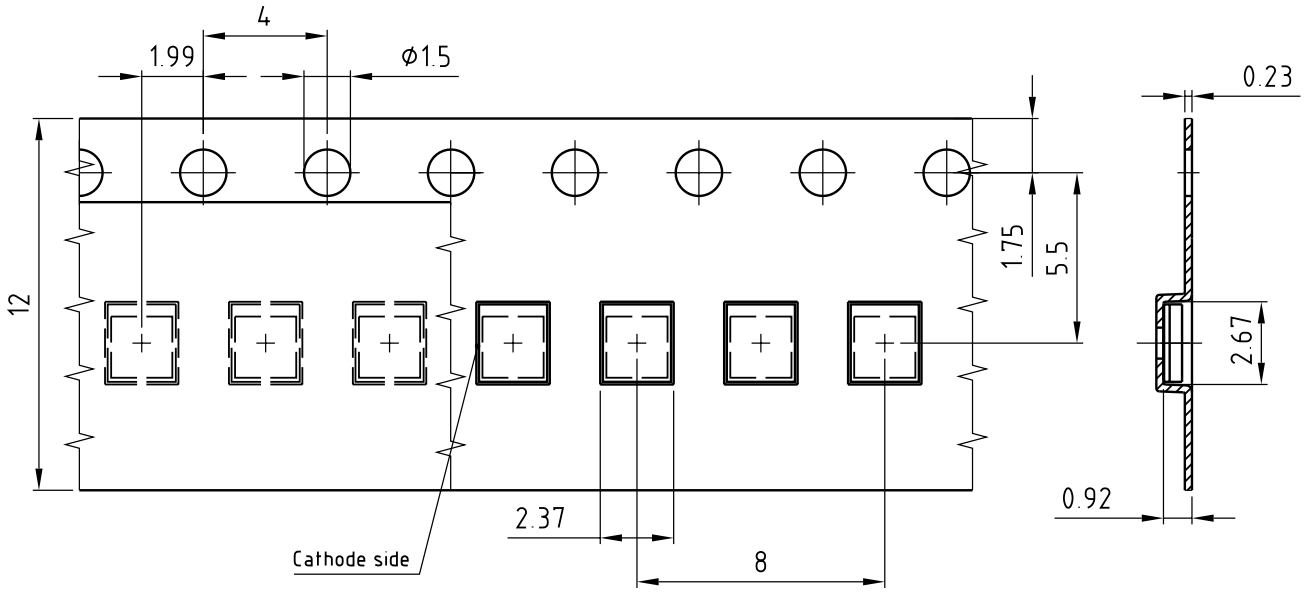
Product complies to MSL Level 3 acc. to JEDEC J-STD-020E




| Profile Feature | Symbol | Pb-Free (SnAgCu) Assembly | | | Unit |
|---|---|---|---|---|---|
| | | Minimum | Recommendation | Maximum | |
| Ramp-up rate to preheat*) 25 °C to 150 °C | | | 2 | 3 | K/s |
| Time $t_S$ $T_{Smin}$ to $T_{Smax}$ | $t_S$ | 60 | 100 | 120 | s |
| Ramp-up rate to peak*) $T_{Smax}$ to $T_P$ | | | 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* $T_P$ to 100 °C | | | 3 | 6 | K/s |
| Time 25 °C to $T_P$ | | | | 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)]

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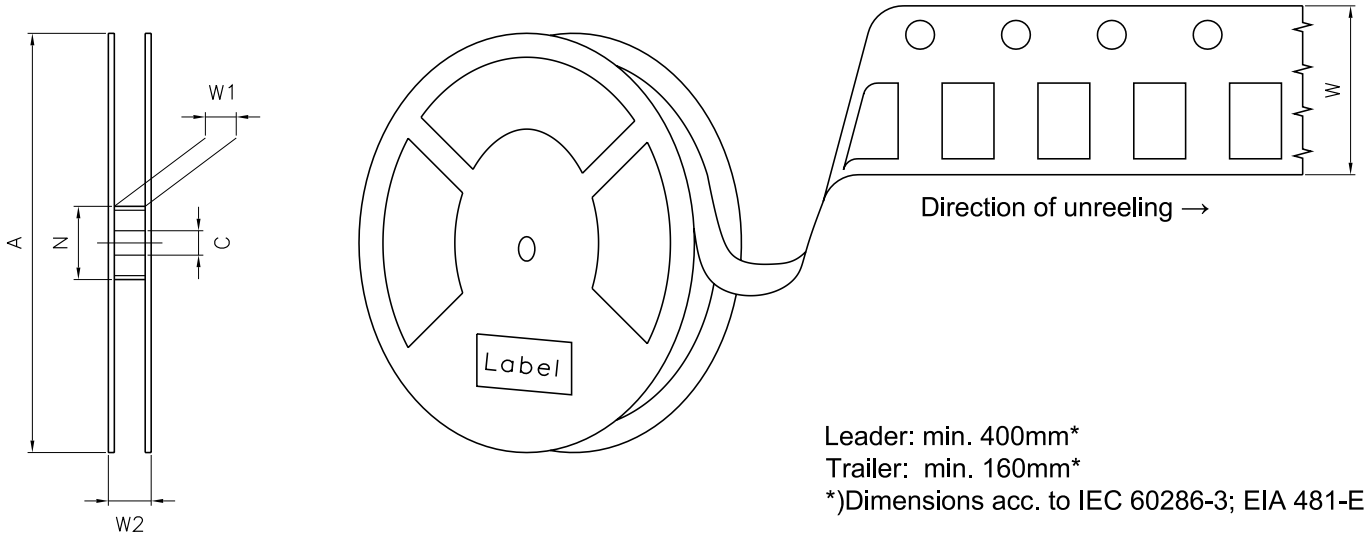
## Tape and Reel [4)]




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

## Reel Dimensions

| A | W | $N_{min}$ | $W_1$ | $W_{2\,max}$ | Pieces per PU |
|---|---|---|---|---|---|
| 180 mm | 8 + 0.3 / - 0.1 mm | 60 mm | 8.4 + 2 mm | 14.4 mm | 3000 |

## Notes

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 information please visit www.osram-os.com/appnotes

## Disclaimer

### 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 on our website.

### 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 and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us 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:** TA = 25°C (unless otherwise specified)

3) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±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.

## Revision History

| Version | Date | Change |
|---|---|---|
| 1.0 | 2022-06-09 | Initial Version |
| 1.1 | 2022-12-15 | Electro - Optical Characteristics (Diagrams) |

EU RoHS and China RoHS compliant product
此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，
不含有毒有害物质或元素。

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