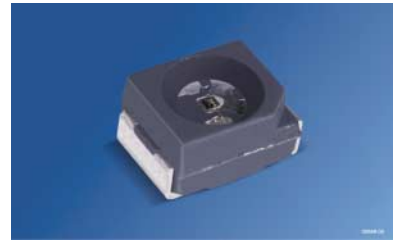


# IR-Lumineszenzdiode Infrared Emitter

## SFH 4271



### Wesentliche Merkmale

- Schwarz eingefärbtes TOPLED-Gehäuse
- Typische Emissionswellenlänge 880nm
- Verbesserte Abbildungseigenschaften durch Absorption der Seitenstrahlung
- Größe der Leuchtquelle 300µm x 300µm
- IR Reflow und TTW Löten geeignet
- Feuchte-Empfindlichkeitsstufe 2 nach JEDEC Standard J-STD-020A

### Anwendungen

- Miniaturlichtschranken und Lichtschranken über große Entfernungen
- Industrieelektronik
- „Messen/Steuern/Regeln“
- Automobiltechnik
- Sensorik
- Alarm- und Sicherungssysteme
- IR-Freiraumübertragung

### Features

- Black coloured TOPLED-package
- Typical Peakwavelength 880nm
- Improved imaging characteristics due to absorption of side emission
- Size of emitting area 300µm x 300µm
- Suited for IR Reflow and TTW-soldering
- Moisture sensitivity level 2 according to JEDEC Standard J-STD-020A

### Applications

- Miniature and long distance photointerrupters
- Industrial electronics
- For drive and control circuits
- Automotive technology
- Sensor technology
- Alarm and safety equipment
- IR free air transmission

| Typ<br>Type | Bestellnummer<br>Ordering Code | Strahlstärkegruppierung <sup>1)</sup> ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ )<br>Radiant intensity grouping <sup>1)</sup><br>$I_e \text{ (mW/sr)}$ |
|-------------|--------------------------------|---|
| SFH 4271    | Q65110A1013                    | 1 ... 5   |

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.01 \text{ sr}$  / measured at a solid angle of  $\Omega = 0.01 \text{ sr}$

Grenzwerte ( $T_A = 25\text{ °C}$ )

## Maximum Ratings

| Bezeichnung<br>Parameter  | Symbol<br>Symbol  | Wert<br>Value | Einheit<br>Unit |
|---|-------------------|---------------|-----------------|
| Betriebs- und Lagertemperatur<br>Operating and storage temperature range  | $T_{op}; T_{stg}$ | - 40 ...+ 100 | °C              |
| Sperrspannung<br>Reverse voltage  | $V_R$             | 5             | V               |
| Durchlaßstrom<br>Forward current  | $I_F$             | 100           | mA              |
| Stoßstrom, $\tau = 10\ \mu\text{s}$ , $D = 0$<br>Surge current  | $I_{FSM}$         | 2.5           | A               |
| Verlustleistung<br>Power dissipation  | $P_{tot}$         | 180           | mW              |
| Wärmewiderstand Sperrschicht - Umgebung bei<br>Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$<br>Thermal resistance junction - ambient mounted<br>on PC-board (FR4), padsize $16\ \text{mm}^2$ each | $R_{thJA}$        | 450           | K/W             |
| Wärmewiderstand Sperrschicht - Lötstelle bei<br>Montage auf Metall-Block<br>Thermal resistance junction - soldering point,<br>mounted on metal block  | $R_{thJS}$        | $\approx 200$ | K/W             |

Kennwerte ( $T_A = 25 \text{ }^\circ\text{C}$ )

## Characteristics

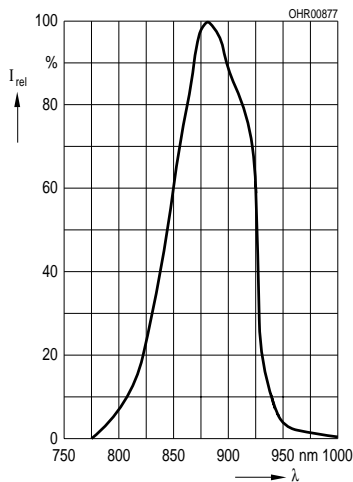
| Bezeichnung<br>Parameter  | Symbol<br>Symbol             | Wert<br>Value                            | Einheit<br>Unit |
|---|------------------------------|--|-----------------|
| Wellenlänge der Strahlung<br>Wavelength at peak emission<br>$I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$  | $\lambda_{\text{peak}}$      | 880                                      | nm              |
| Spektrale Bandbreite bei 50% von $I_{\text{max}}$<br>Spectral bandwidth at 50% of $I_{\text{max}}$<br>$I_F = 100 \text{ mA}$  | $\Delta\lambda$              | 80                                       | nm              |
| Abstrahlwinkel<br>Half angle  | $\varphi$                    | $\pm 60$                                 | Grad<br>deg.    |
| Aktive Chipfläche<br>Active chip area   | $A$                          | 0.09                                     | $\text{mm}^2$   |
| Abmessungen der aktiven Chipfläche<br>Dimensions of the active chip area  | $L \times B$<br>$L \times W$ | $0.3 \times 0.3$                         | mm              |
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90%<br>auf 10%, bei $I_F = 100 \text{ mA}$ , $R_L = 50 \text{ } \Omega$<br>Switching times, $I_e$ from 10% to 90% and from<br>90% to 10%, $I_F = 100 \text{ mA}$ , $R_L = 50 \text{ } \Omega$ | $t_r$ , $t_f$                | 0.5                                      | $\mu\text{s}$   |
| Kapazität,<br>Capacitance<br>$V_R = 0 \text{ V}$ , $f = 1 \text{ MHz}$  | $C_o$                        | 15                                       | pF              |
| Durchlaßspannung,<br>Forward voltage<br>$I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$<br>$I_F = 1 \text{ A}$ , $t_p = 100 \text{ } \mu\text{s}$  | $V_F$<br>$V_F$               | 1.5 ( $\leq 1.8$ )<br>3.0 ( $\leq 3.8$ ) | V<br>V          |
| Sperrstrom,<br>Reverse current<br>$V_R = 5 \text{ V}$   | $I_R$                        | 0.01 ( $\leq 1$ )                        | $\mu\text{A}$   |
| Gesamtstrahlungsfluß,<br>Total radiant flux<br>$I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$   | $\Phi_e$                     | 5  | mW              |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ ,<br>$I_F = 100 \text{ mA}$<br>Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100 \text{ mA}$  | $TC_I$                       | - 0.5                                    | %/K             |
| Temperaturkoeffizient von $V_F$ , $I_F = 100 \text{ mA}$<br>Temperature coefficient of $V_F$ , $I_F = 100 \text{ mA}$   | $TC_V$                       | - 2                                      | mV/K            |
| Temperaturkoeffizient von $\lambda$ , $I_F = 100 \text{ mA}$<br>Temperature coefficient of $\lambda$ , $I_F = 100 \text{ mA}$   | $TC_\lambda$                 | + 0.25                                   | nm/K            |

**Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

| Bezeichnung<br>Parameter  | Symbol                                     | Werte<br>Values |            |            | Einheit<br>Unit |
|---|--|-----------------|------------|------------|-----------------|
|   |  | - L             | - M        | - N        |                 |
| Strahlstärke<br>Radiant intensity<br>$I_F = 100$ mA, $t_p = 20$ ms    | $I_{e \text{ min}}$<br>$I_{e \text{ max}}$ | 1<br>2          | 1.6<br>3.2 | 2.5<br>5.0 | mW/sr           |
| Strahlstärke<br>Radiant intensity<br>$I_F = 1$ A, $t_p = 100$ $\mu$ s | $I_{e \text{ typ}}$                        | 16              | 20         | 24         | mW/sr           |

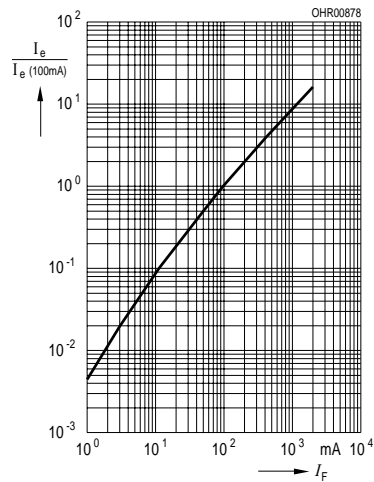
**Relative Spectral Emission**

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



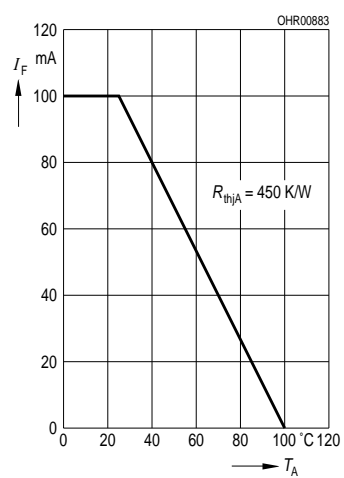
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 20 \mu\text{s}$



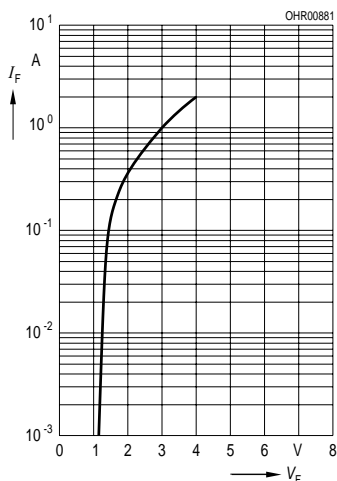
**Max. Permissible Forward Current**

$I_F = f(T_A)$



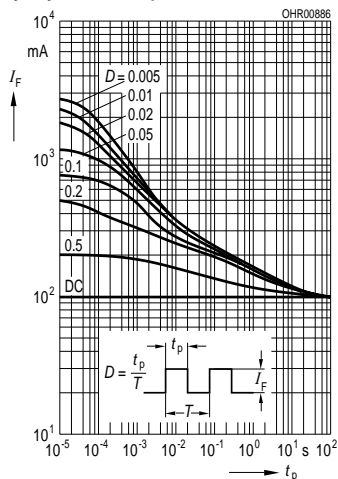
**Forward Current**

$I_F = f(V_F)$  single pulse,  $t_p = 20 \mu\text{s}$

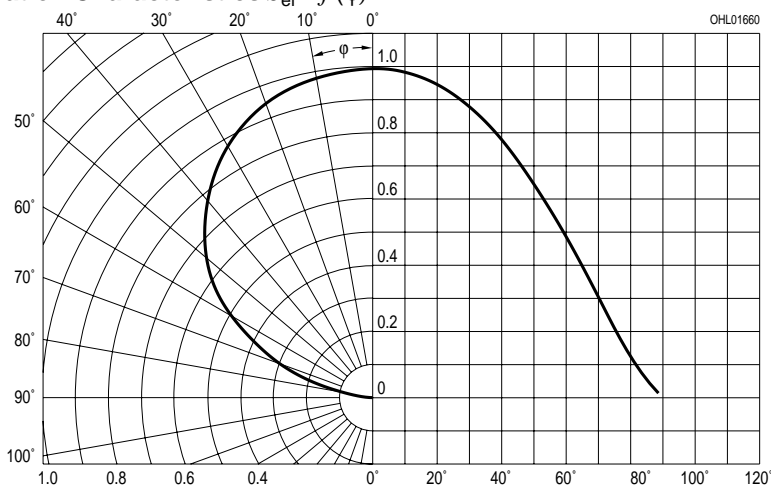


**Permissible Pulse Handling Capability**

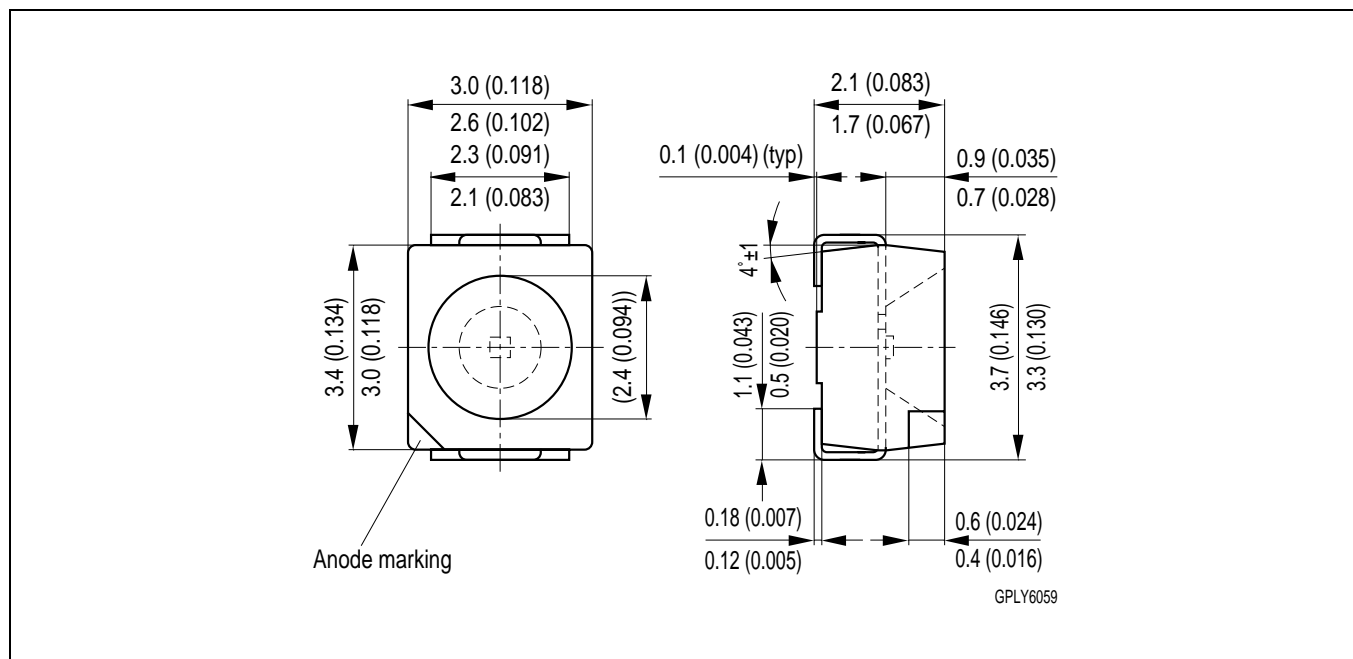
$I_F = f(t_p), T_A = 25^\circ\text{C}$   
duty cycle  $D =$  parameter



**Radiation Characteristics**  $S_{el} = f(\varphi)$



## Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Gehäusefarbe: schwarz, Verguss klar

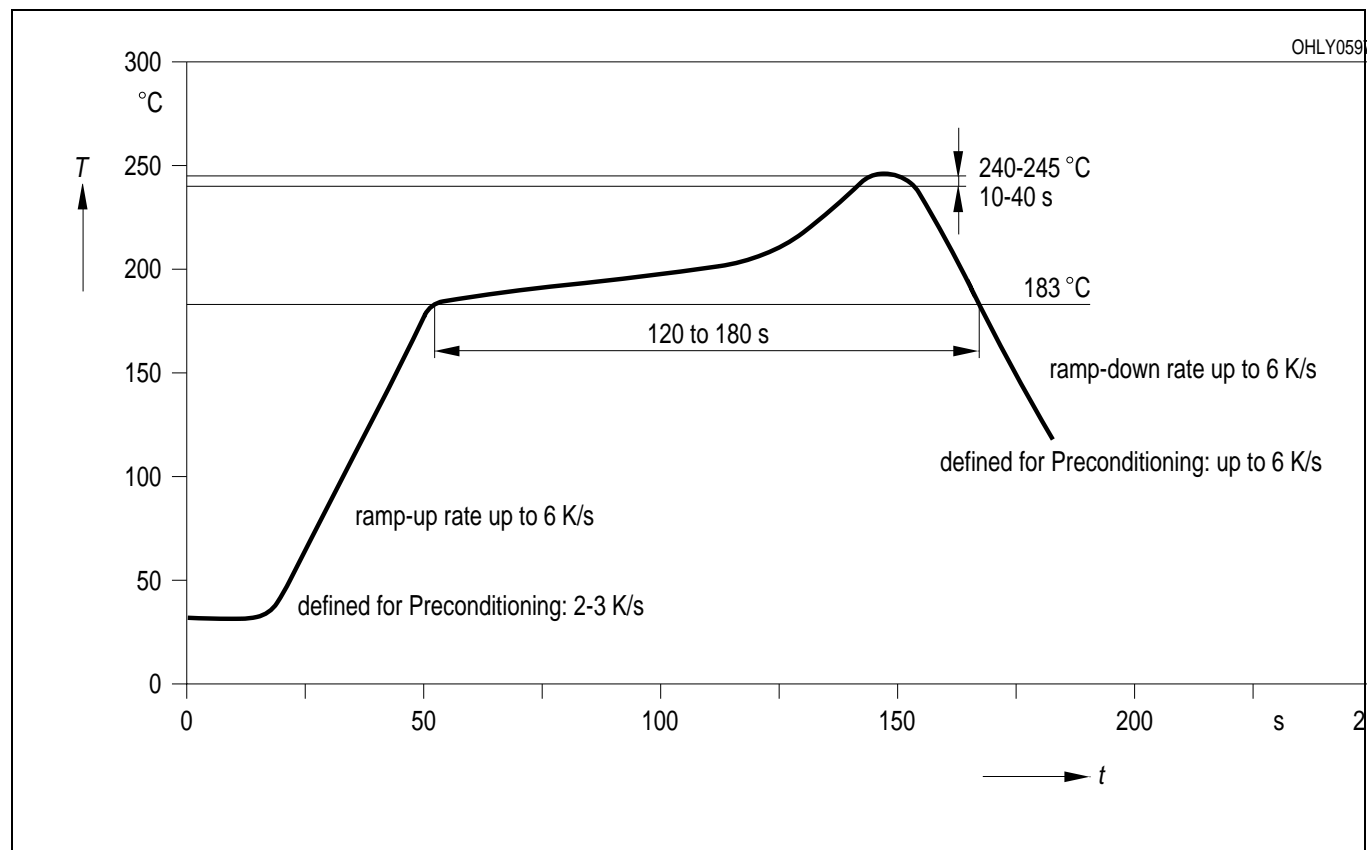
Brechungsindex Verguss: 1.53

Package Colour: black, resin colourless clear

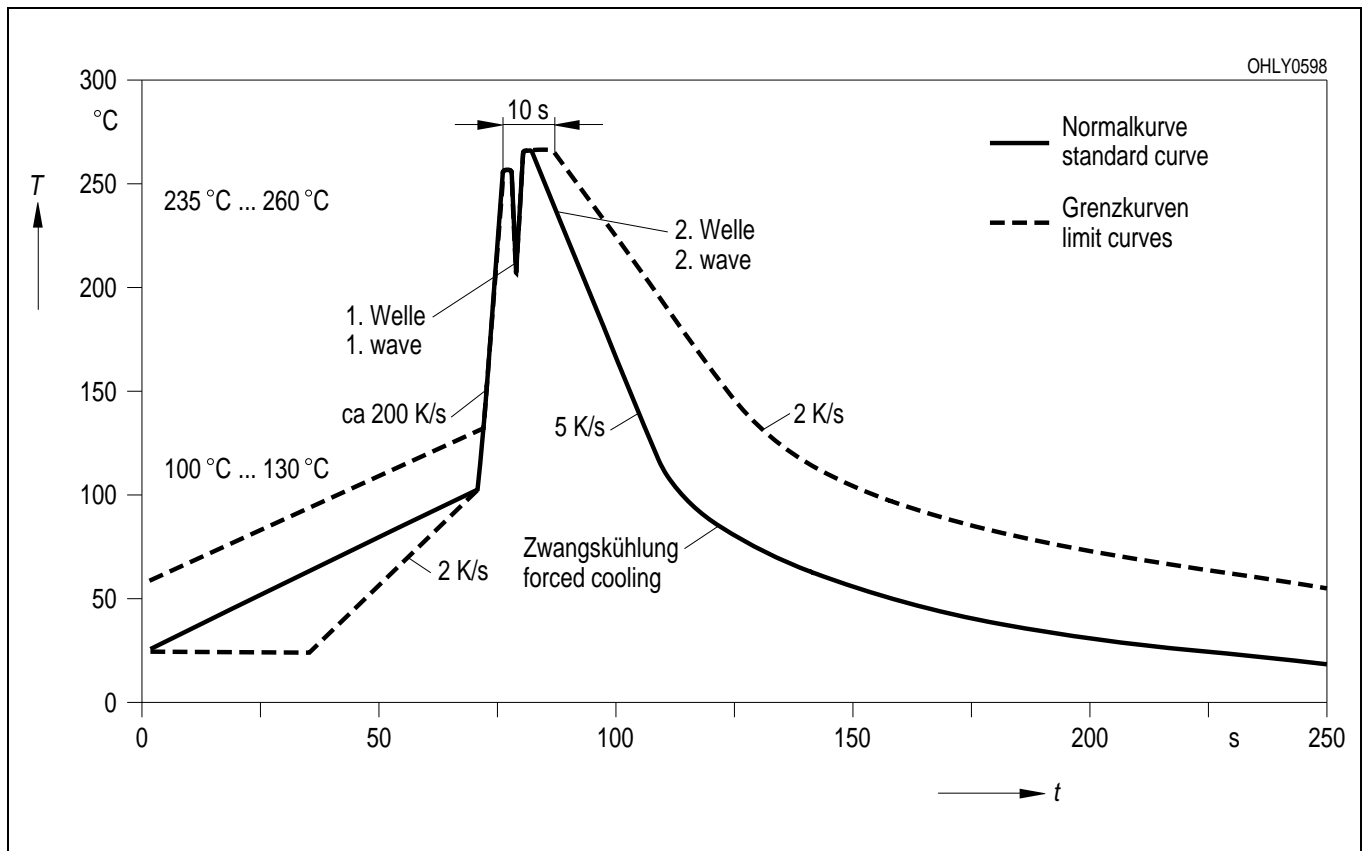
Refractive index resin: 1.53

**Lötbedingungen** Vorbehandlung nach JEDEC Level 2  
**Soldering Conditions** Preconditioning acc. to JEDEC Level 2

**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)

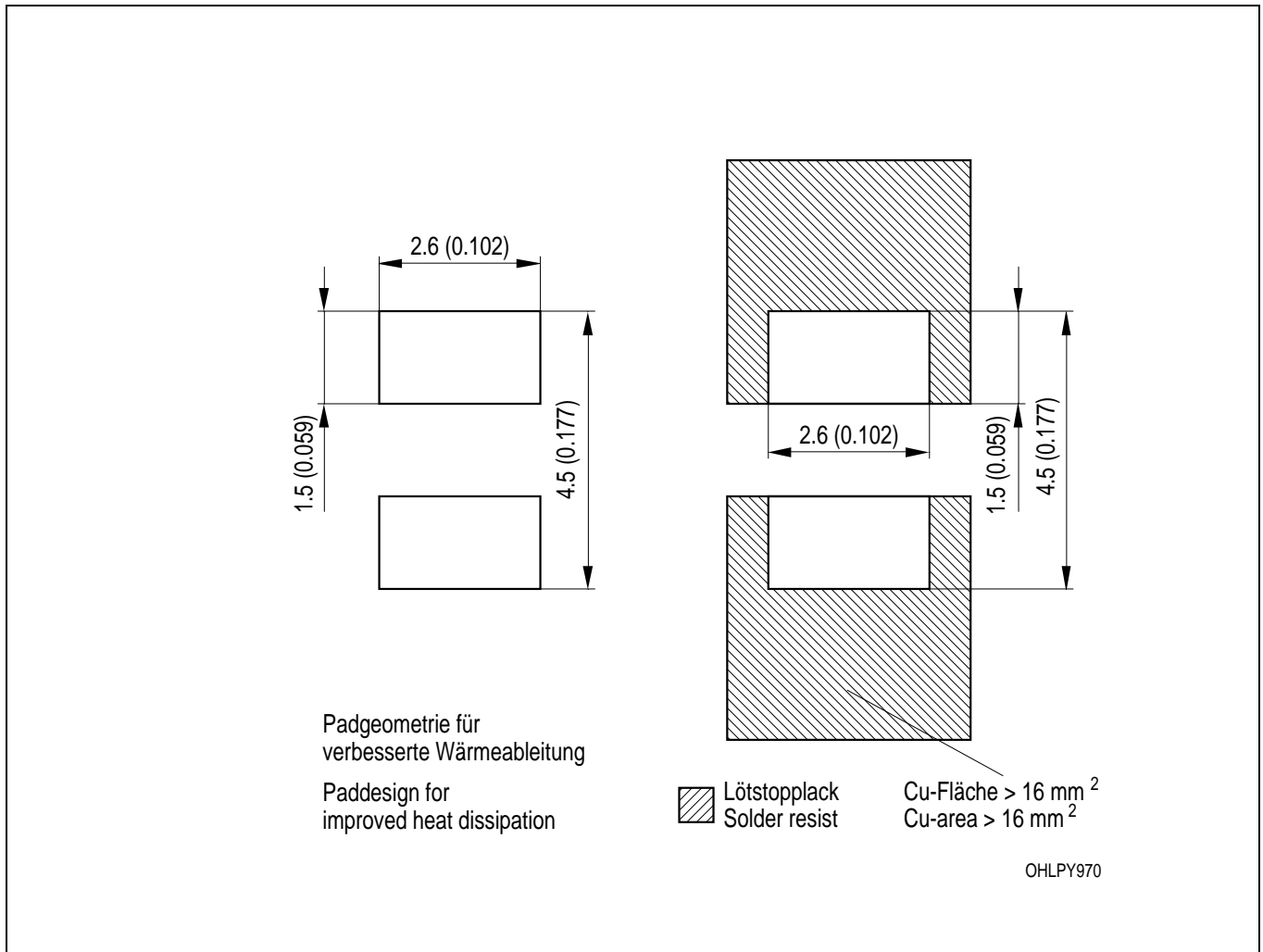


**Wellenlötten (TTW)** (nach CECC 00802)  
**TTW Soldering** (acc. to CECC 00802)





**Empfohlenes Lötpad design** IR-Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)  
Gehäuse für Wellenlöten (TTW) geeignet / Package suitable for TTW-soldering

Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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