

**NPN-Silizium-Fototransistor in SMT-Gehäuse mit Linse**  
**Silicon NPN Phototransistor in SMT-Package with lens**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 3219**



**This data sheet is under PCN-revision (see separate data sheet with respect to OS-PCN-2010-033-A). Do not use this version for design-in**

**Wesentliche Merkmale**

- TOPLED mit Linse
- Speziell geeignet für Anwendungen im Bereich von 430 nm bis 1150 nm
- Hohe Linearität
- Für alle Lötverfahren geeignet
- Gehäusegleich mit SFH 4209, SFH 4219, SFH 4289

**Features**

- TOPLED with lens
- Especially suitable for applications from 430 nm to 1150 nm
- High linearity
- Suitable for all soldering methods
- Same package as SFH 4209, SFH 4219, SFH 4289

**Anwendungen**

- Miniaturlichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“
- Sensorik

**Applications**

- Miniature photointerrupters
- Industrial electronics
- For control and drive circuits
- Sensor technology

| Typ<br>Type | Bestellnummer<br>Ordering Code | Fotostrom , ( $E_g=0,1\text{mW/cm}^2, \lambda=950\text{nm}$ $V_{CE} = 5\text{ V}$ )<br>Photocurrent<br>$I_{pce}$ ( $\mu\text{A}$ ) |
|-------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| SFH 3219    | Q65110A2651                    | > 63                                                                                                                               |

**Grenzwerte**  
**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              |
| Kollektor-Emitterspannung<br>Collector-emitter voltage                             | $V_{CE}$          | 35             | V               |
| Kollektorstrom<br>Collector current                                                | $I_C$             | 15             | mA              |
| Kollektorspitzenstrom, $\tau < 10 \mu s$<br>Collector surge current                | $I_{CS}$          | 75             | mA              |
| Verlustleistung, $T_A = 25 \text{ °C}$<br>Total power dissipation                  | $P_{tot}$         | 165            | mW              |
| Wärmewiderstand für Montage auf PC-Board<br>Thermal resistance for mounting on pcb | $R_{thJA}$        | 450            | K/W             |

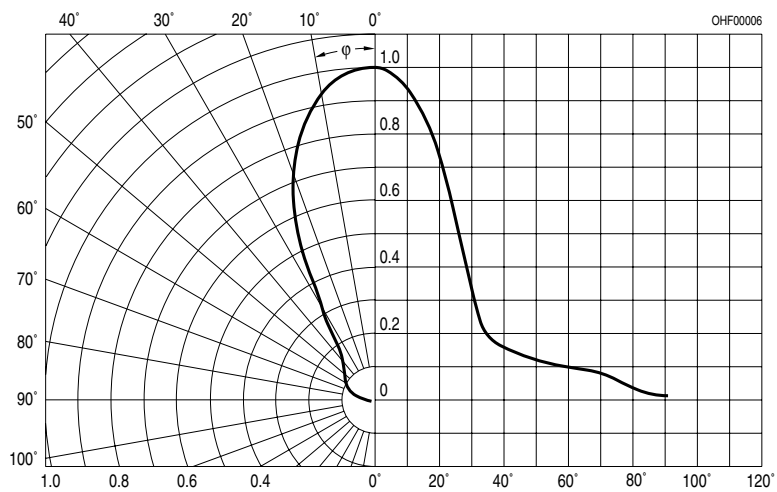
**Kennwerte** ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )

**Characteristics**

| Bezeichnung<br>Parameter                                                                                                                         | Symbol<br>Symbol             | Wert<br>Value      | Einheit<br>Unit              |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------|------------------------------|
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity                                                                       | $\lambda_{S\text{ max}}$     | 990                | nm                           |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\text{max}}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                    | 430 ... 1150       | nm                           |
| Bestrahlungsempfindliche Fläche ( $\varnothing 220\text{ }\mu\text{m}$ )<br>Radiant sensitive area                                               | $A$                          | 0.038              | $\text{mm}^2$                |
| Abmessung der Chipfläche<br>Dimensions of chip area                                                                                              | $L \times B$<br>$L \times W$ | $0.45 \times 0.45$ | $\text{mm} \times \text{mm}$ |
| Halbwinkel<br>Half angle                                                                                                                         | $\varphi$                    | $\pm 25$           | Grad<br>deg.                 |
| Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance                                                            | $C_{\text{CE}}$              | 5.0                | pF                           |
| Dunkelstrom<br>Dark current<br>$V_{\text{CE}} = 20\text{ V}$ , $E = 0$                                                                           | $I_{\text{CEO}}$             | 1 ( $\leq 50$ )    | nA                           |
| Fotostrom<br>Photo current<br>$E_e = 0.1\text{ mW/cm}^2$ , $V_{\text{CE}} = 5\text{ V}$                                                          | $I_{\text{PCE}}$             | $\geq 63$          | $\mu\text{A}$                |
| Anstiegszeit/Abfallzeit<br>Rise and fall time<br>$I_C = 1\text{ mA}$ , $V_{\text{CC}} = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$                   | $t_r$ , $t_f$                | 7                  | $\mu\text{s}$                |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter saturation voltage<br>$I_C = 20\text{ }\mu\text{A}$<br>$E_e = 0.1\text{ mW/cm}^2$      | $V_{\text{CEsat}}$           | 150                | mV                           |

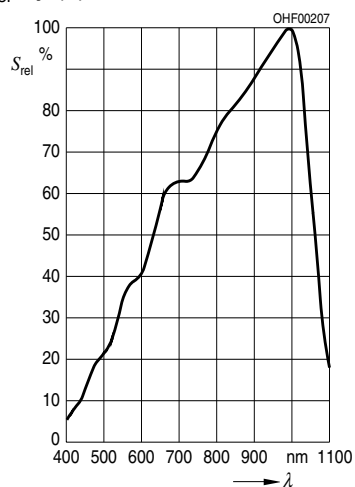
**Directional Characteristics**

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

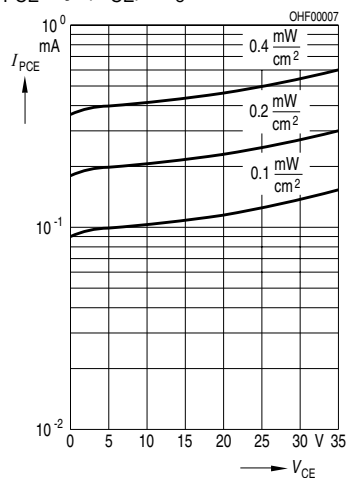


**Relative Spectral Sensitivity**

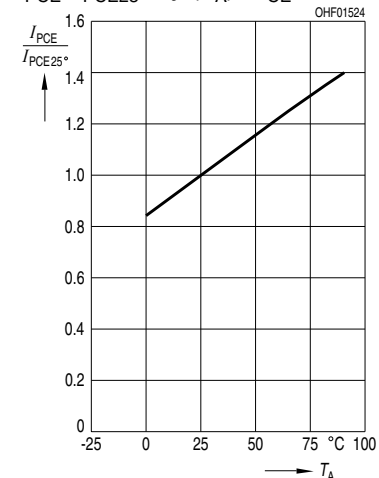
$$S_{\text{rel}} = f(\lambda)$$

**Photocurrent**

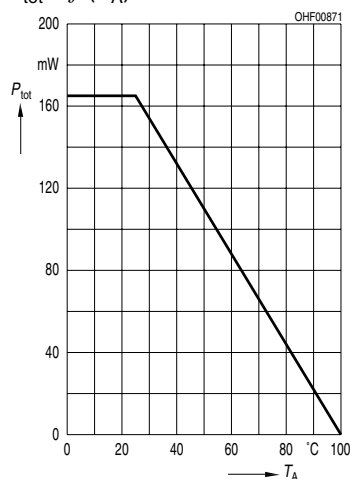
$$I_{\text{PCE}} = f(V_{\text{CE}}), E_{\text{e}} = \text{Parameter}$$

**Photocurrent**

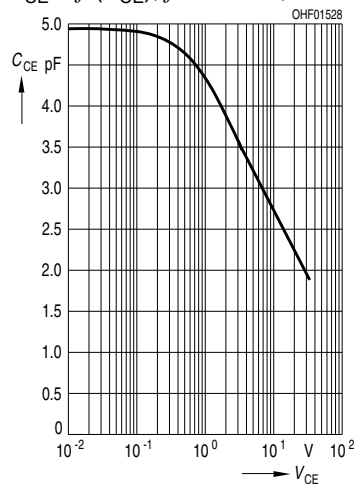
$$I_{\text{PCE}} / I_{\text{PCE}25^\circ} = f(T_{\text{A}}), V_{\text{CE}} = 5 \text{ V}$$

**Total Power Dissipation**

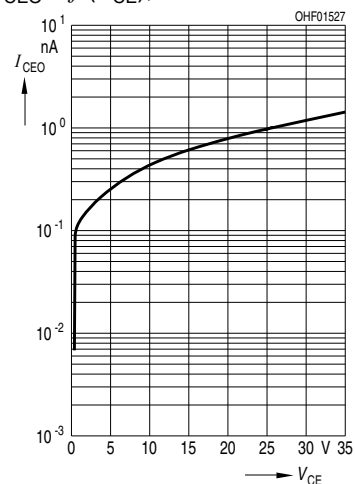
$$P_{\text{tot}} = f(T_{\text{A}})$$

**Capacitance**

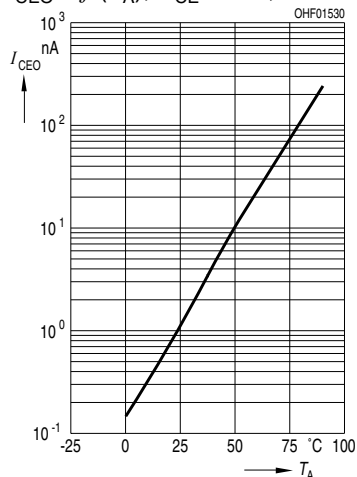
$$C_{\text{CE}} = f(V_{\text{CE}}), f = 1 \text{ MHz}, E = 0$$

**Dark Current**

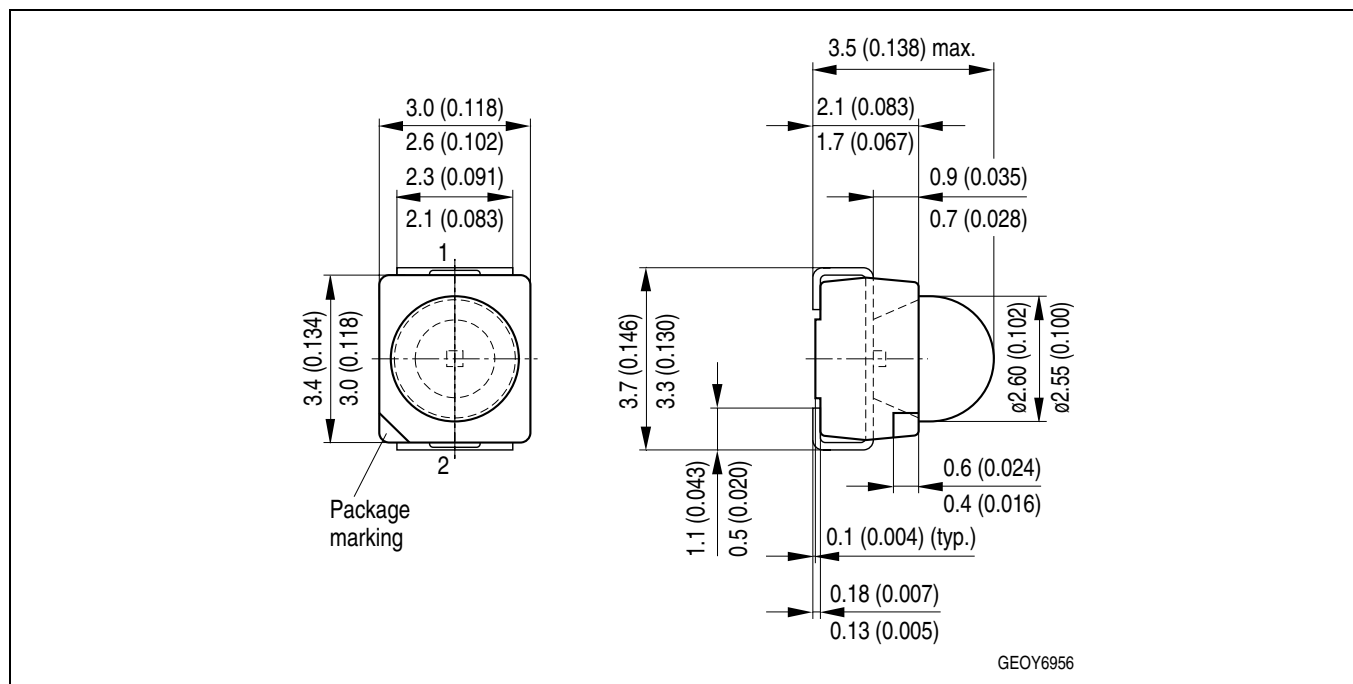
$$I_{\text{CEO}} = f(V_{\text{CE}}), E = 0$$

**Dark Current**

$$I_{\text{CEO}} = f(T_{\text{A}}), V_{\text{CE}} = 5 \text{ V}, E = 0$$



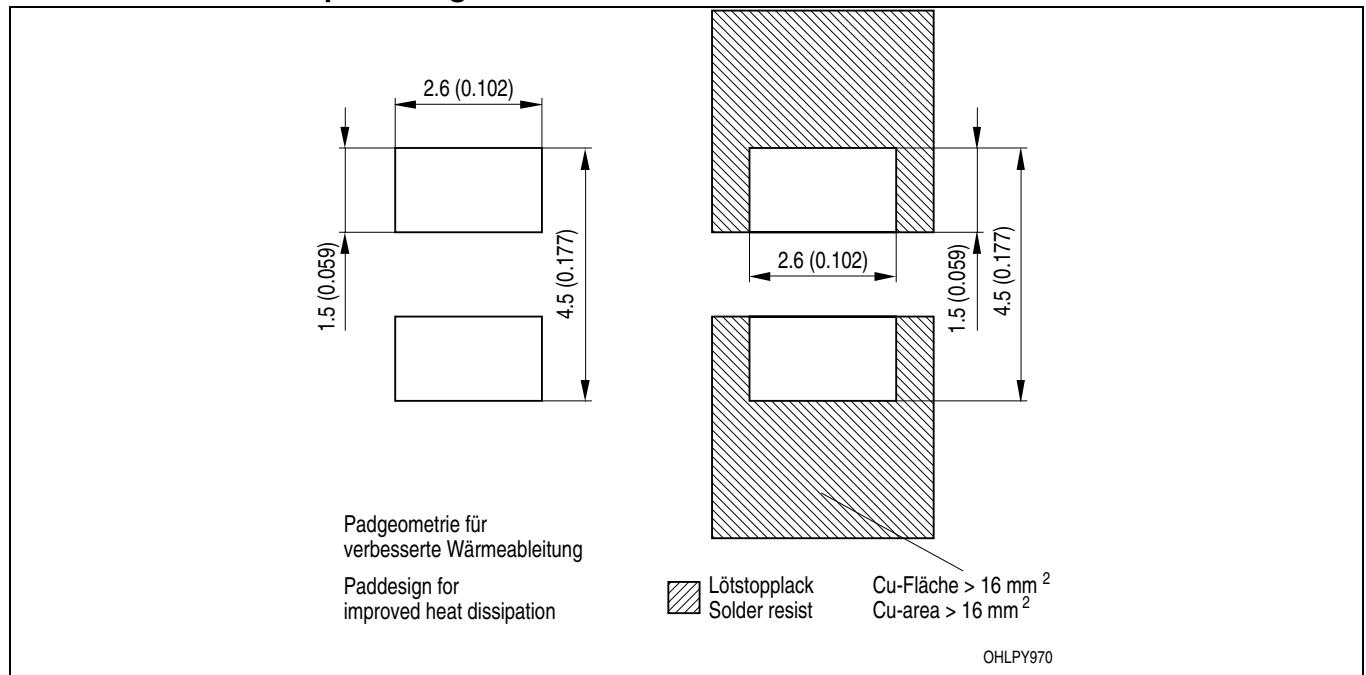
## Maßzeichnung Package Outlines



Maße in mm (inch) / Dimensions in mm (inch).

|                                        |                                                           |
|----------------------------------------|-----------------------------------------------------------|
| Gehäuse / Package                      | TOPLED® mit Linse (P-LCC-2) / TOPLED® with lens (P-LCC-2) |
| Anschlussbelegung<br>pin configuration | 1 = Emitter / emitter<br>2 = Kollektor / collector        |
| Farbe<br>Color                         | weiß<br>white                                             |

## Empfohlenes Lötpaddesign Recommended Solderpad Design



## Lötbedingungen

### Soldering Conditions

### Reflow Lötprofil für bleifreies Löt

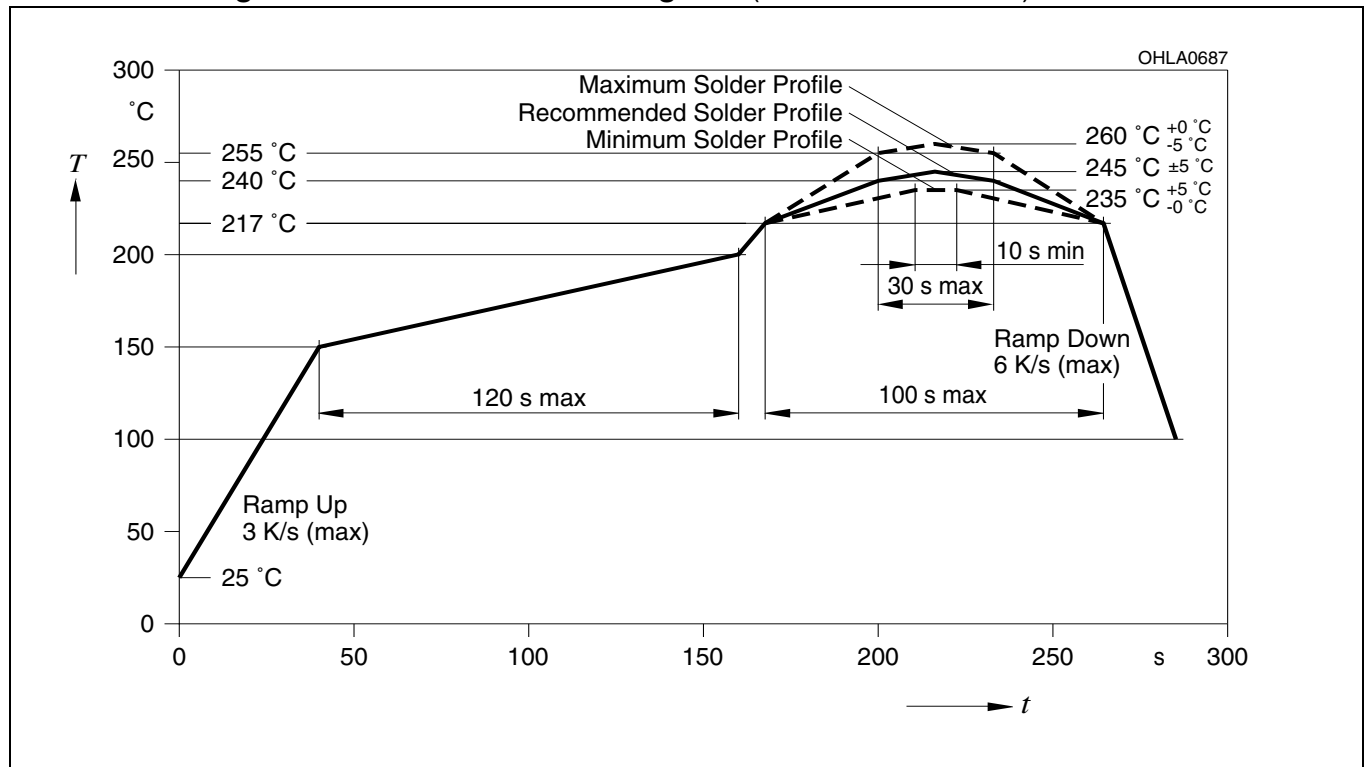
### Reflow Soldering Profile for lead free soldering

## Vorbehandlung nach JEDEC Level 2

### Preconditioning acc. to JEDEC Level 2

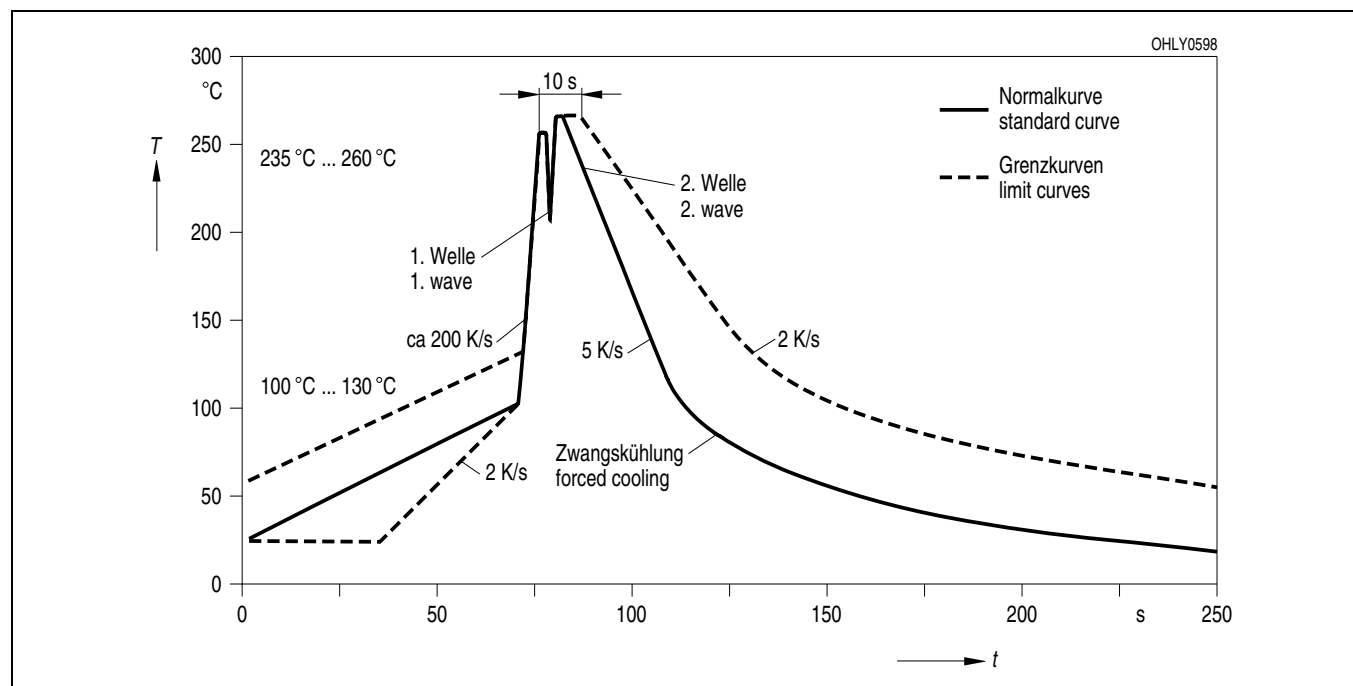
### (nach J-STD-020C)

### (acc. to J-STD-020C)



## Wellenlöten (TTW) TTW Soldering

(nach CECC 00802)  
(acc. to CECC 00802)



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