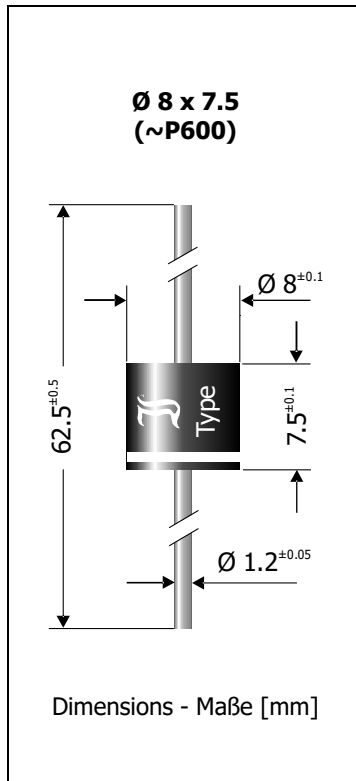


**5KP6.5 ... 5KP120CA**  
**Transient Voltage Suppressor Diodes**  
**Spannungs-Begrenzer-Dioden**

$P_{PPM} = 5000 \text{ W}$      $V_{WM} = 6.5 \dots 120 \text{ V}$   
 $P_{M(AV)} = 8.0 \text{ W}$      $V_{BR \min} = 7.2 \dots 133 \text{ V}$   
 $T_{jmax} = 175^\circ\text{C}$

Version 2019-12-11

**Typical Applications**

Over-voltage protection  
 Free-wheeling diodes  
 Load-dump protection in automotive supply systems  
 Commercial grade  
 Suffix -Q: AEC-Q101 compliant <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 qualification <sup>1)</sup>

**Features**

Uni- and Bidirectional versions  
 Peak pulse power of 5000 W (10/1000  $\mu\text{s}$  waveform)  
 Very fast response time  
 Package smaller than industry standard  
 Compliant to RoHS, REACH, Conflict Minerals <sup>1)</sup>

**Mechanical Data <sup>1)</sup>**

Taped in ammo pack 500  
 Weight approx. 1.5 g  
 Case material UL 94V-0  
 Solder & assembly conditions 260°C/10s  
 MSL N/A

**Typische Anwendungen**

Schutz gegen Überspannung  
 Freilauf-Dioden  
 Schutz bei Lastabwurf in KFZ-Bordnetzen  
 Standardausführung  
 Suffix -Q: AEC-Q101 konform <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 Qualifikation <sup>1)</sup>

**Besonderheiten**

Uni- und Bidirektionale Versionen  
 5000 W Impuls-Verlustleistung (10/1000  $\mu\text{s}$  Strom-Impuls)  
 Sehr schnelle Ansprechzeit  
 Gehäuse kleiner als Industriestandard  
 Konform zu RoHS, REACH, Konfliktmineralien <sup>1)</sup>

**Mechanische Daten <sup>1)</sup>**

Gegurtet in Ammo-Pack  
 Gewicht ca. 1.5 g  
 Gehäusematerial UL 94V-0  
 Löt- und Einbaubedingungen 260°C/10s

For bidirectional types (add suffix "C" or "CA"), electrical characteristics apply in both directions.  
 Für bidirektionale Dioden (ergänze Suffix "C" oder "CA") gelten die elektrischen Werte in beiden Richtungen.

**Maximum ratings <sup>2)</sup>****Grenzwerte <sup>2)</sup>**

|                                                                                                                               |                |                              |
|-------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------|
| Peak pulse power dissipation (10/1000 $\mu\text{s}$ waveform)<br>Impuls-Verlustleistung (Strom-Impuls 10/1000 $\mu\text{s}$ ) | $P_{PPM}$      | 5000 W <sup>3)</sup>         |
| Steady state power dissipation – Verlustleistung im Dauerbetrieb<br>$T_A = 50^\circ\text{C}$                                  | $P_{M(AV)}$    | 8 W <sup>4)</sup>            |
| Peak forward surge current<br>Stoßstrom in Fluss-Richtung                                                                     | $I_{FSM}$      | 400 A <sup>5)</sup>          |
| Operating junction temperature – Sperrschichttemperatur<br>Storage temperature – Lagerungstemperatur                          | $T_j$<br>$T_s$ | -50...+175°C<br>-50...+175°C |

**Characteristics****Kennwerte**

|                                                                                               |                                                 |           |                       |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------|-----------|-----------------------|
| Max. instantaneous forward voltage<br>Augenblickswert der Durchlass-Spannung                  | $I_F = 100\text{A}$<br>$T_j = 25^\circ\text{C}$ | $V_F$     | < 3.5 V <sup>5)</sup> |
| Typ. thermal resistance junction to ambient – Typ. Wärmewiderstand Sperrschicht – Umgebung    |                                                 | $R_{thA}$ | 16 K/W <sup>4)</sup>  |
| Typ. thermal resistance junction to lead – Typ. Wärmewiderstand Sperrschicht – Anschlussdraht |                                                 | $R_{thL}$ | 4 K/W                 |

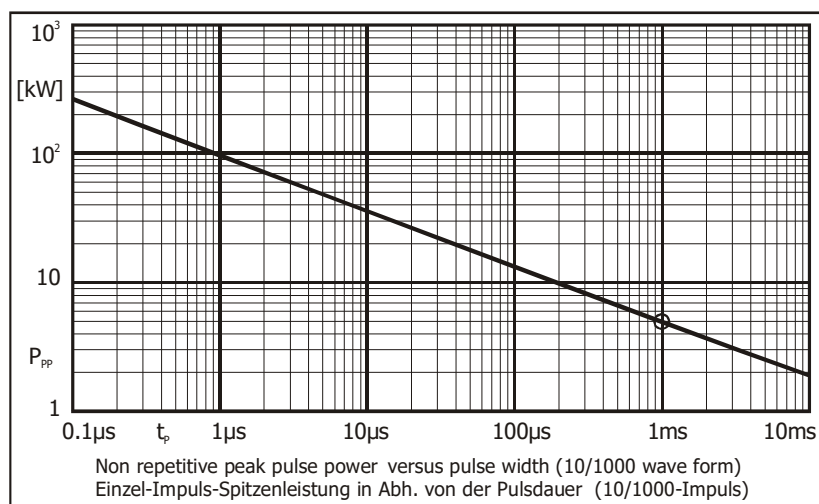
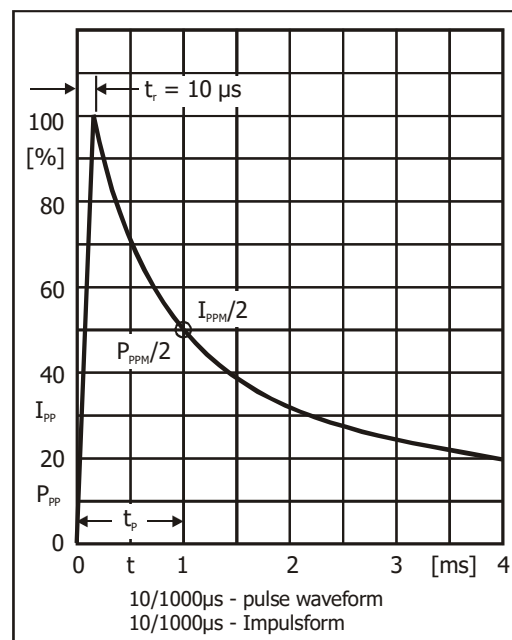
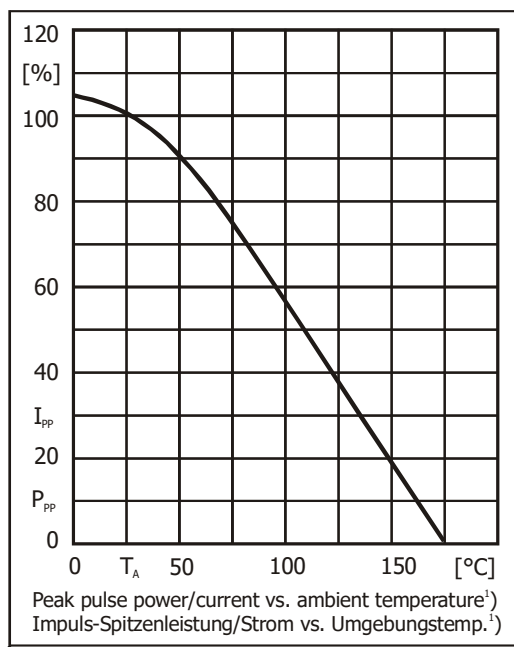
- Please note the [detailed information on our website](#) or at the beginning of the data book  
Bitte beachten Sie die [detaillierten Hinweise auf unserer Internetseite](#) bzw. am Anfang des Datenbuches
- $T_A = 25^\circ\text{C}$  unless otherwise specified –  $T_A = 25^\circ\text{C}$  wenn nicht anders angegeben
- Non-repetitive pulse see curve  $I_{pp} = f(t)$  /  $P_{pp} = f(t)$   
Höchstzulässiger Spitzenwert eines einmaligen Impulses, siehe Kurve  $I_{pp} = f(t)$  /  $P_{pp} = f(t)$
- Valid, if leads are kept at ambient temperature at a distance of 10 mm from case  
Gültig, wenn die Anschlussdrähte in 10 mm Abstand vom Gehäuse auf Umgebungstemperatur gehalten werden
- Unidirectional diodes only – Nur für unidirektionale Dioden

**Characteristics ( $T_j = 25^\circ\text{C}$ )**
**Kennwerte ( $T_j = 25^\circ\text{C}$ )**

| Type<br>Typ    |               | Stand-off voltage<br>Sperrspannung | Max. rev. current<br>Max. Sperrstrom<br>at / bei $V_{WM}$ | Breakdown voltage at $I_T = 5\text{ mA}$<br>Abbruch-Spannung bei $I_T = 5\text{ mA}$<br>) at / bei $I_T = 50\text{ mA}$ |                 | Max. clamping voltage<br>Max. Begrenzer-Spannung<br>at / bei $I_{PPM}$ (10/1000 $\mu\text{s}$ ) |               |
|----------------|---------------|------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------|---------------|
| unidirectional | bidirectional | $V_{WM}$ [V]                       | $I_D$ [ $\mu\text{A}$ ]                                   | $V_{BRmin}$ [V]                                                                                                         | $V_{BRmax}$ [V] | $V_C$ [V]                                                                                       | $I_{PPM}$ [A] |
| 5KP6.5         | 5KP6.5C       | 6.5                                | 4000                                                      | 7.22 *)                                                                                                                 | 9.14 *)         | 12.3                                                                                            | 407           |
| 5KP6.5A        | 5KP6.5CA      | 6.5                                | 4000                                                      | 7.22 *)                                                                                                                 | 8.30 *)         | 11.2                                                                                            | 446           |
| 5KP7.0         | 5KP7.0C       | 7.0                                | 2000                                                      | 7.78 *)                                                                                                                 | 9.86 *)         | 13.3                                                                                            | 376           |
| 5KP7.0A        | 5KP7.0CA      | 7.0                                | 2000                                                      | 7.78 *)                                                                                                                 | 8.95 *)         | 12.0                                                                                            | 417           |
| 5KP7.5         | 5KP7.5C       | 7.5                                | 500                                                       | 8.33                                                                                                                    | 10.67           | 14.3                                                                                            | 350           |
| 5KP7.5A        | 5KP7.5CA      | 7.5                                | 500                                                       | 8.33                                                                                                                    | 9.58            | 12.9                                                                                            | 388           |
| 5KP8.0         | 5KP8.0C       | 8.0                                | 300                                                       | 8.89                                                                                                                    | 11.30           | 15.0                                                                                            | 333           |
| 5KP8.0A        | 5KP8.0CA      | 8.0                                | 300                                                       | 8.89                                                                                                                    | 10.23           | 13.6                                                                                            | 368           |
| 5KP8.5         | 5KP8.5C       | 8.5                                | 100                                                       | 9.44                                                                                                                    | 11.92           | 15.6                                                                                            | 321           |
| 5KP8.5A        | 5KP8.5CA      | 8.5                                | 100                                                       | 9.44                                                                                                                    | 10.82           | 14.4                                                                                            | 347           |
| 5KP9.0         | 5KP9.0C       | 9.0                                | 40                                                        | 10.0                                                                                                                    | 12.7            | 16.9                                                                                            | 296           |
| 5KP9.0A        | 5KP9.0CA      | 9.0                                | 40                                                        | 10.0                                                                                                                    | 11.5            | 15.4                                                                                            | 325           |
| 5KP10          | 5KP10C        | 10                                 | 10                                                        | 11.1                                                                                                                    | 14.1            | 18.8                                                                                            | 266           |
| 5KP10A         | 5KP10CA       | 10                                 | 10                                                        | 11.1                                                                                                                    | 12.8            | 17.0                                                                                            | 294           |
| 5KP11          | 5KP11C        | 11                                 | 10                                                        | 12.2                                                                                                                    | 15.4            | 20.1                                                                                            | 249           |
| 5KP11A         | 5KP11CA       | 11                                 | 10                                                        | 12.2                                                                                                                    | 14.0            | 18.2                                                                                            | 275           |
| 5KP12          | 5KP12C        | 12                                 | 10                                                        | 13.3                                                                                                                    | 16.9            | 22.0                                                                                            | 227           |
| 5KP12A         | 5KP12CA       | 12                                 | 10                                                        | 13.3                                                                                                                    | 15.3            | 19.9                                                                                            | 251           |
| 5KP13          | 5KP13C        | 13                                 | 10                                                        | 14.4                                                                                                                    | 18.2            | 23.8                                                                                            | 210           |
| 5KP13A         | 5KP13CA       | 13                                 | 10                                                        | 14.4                                                                                                                    | 16.5            | 21.5                                                                                            | 233           |
| 5KP14          | 5KP14C        | 14                                 | 10                                                        | 15.6                                                                                                                    | 19.8            | 25.8                                                                                            | 194           |
| 5KP14A         | 5KP14CA       | 14                                 | 10                                                        | 15.6                                                                                                                    | 17.9            | 23.2                                                                                            | 216           |
| 5KP15          | 5KP15C        | 15                                 | 10                                                        | 16.7                                                                                                                    | 21.1            | 26.9                                                                                            | 186           |
| 5KP15A         | 5KP15CA       | 15                                 | 10                                                        | 16.7                                                                                                                    | 19.2            | 24.4                                                                                            | 205           |
| 5KP16          | 5KP16C        | 16                                 | 10                                                        | 17.8                                                                                                                    | 22.6            | 28.8                                                                                            | 174           |
| 5KP16A         | 5KP16CA       | 16                                 | 10                                                        | 17.8                                                                                                                    | 20.5            | 26.0                                                                                            | 192           |
| 5KP17          | 5KP17C        | 17                                 | 10                                                        | 18.9                                                                                                                    | 23.9            | 30.5                                                                                            | 164           |
| 5KP17A         | 5KP17CA       | 17                                 | 10                                                        | 18.9                                                                                                                    | 21.7            | 27.6                                                                                            | 181           |
| 5KP18          | 5KP18C        | 18                                 | 10                                                        | 20.0                                                                                                                    | 25.3            | 32.2                                                                                            | 155           |
| 5KP18A         | 5KP18CA       | 18                                 | 10                                                        | 20.0                                                                                                                    | 23.3            | 29.2                                                                                            | 171           |
| 5KP20          | 5KP20C        | 20                                 | 10                                                        | 22.2                                                                                                                    | 28.1            | 35.8                                                                                            | 140           |
| 5KP20A         | 5KP20CA       | 20                                 | 10                                                        | 22.2                                                                                                                    | 25.5            | 32.4                                                                                            | 154           |
| 5KP22          | 5KP22C        | 22                                 | 10                                                        | 24.4                                                                                                                    | 30.9            | 39.4                                                                                            | 127           |
| 5KP22A         | 5KP22CA       | 22                                 | 10                                                        | 24.4                                                                                                                    | 28.0            | 35.5                                                                                            | 141           |
| 5KP24          | 5KP24C        | 24                                 | 10                                                        | 26.7                                                                                                                    | 33.8            | 43.0                                                                                            | 116           |
| 5KP24A         | 5KP24CA       | 24                                 | 10                                                        | 26.7                                                                                                                    | 30.7            | 38.9                                                                                            | 129           |
| 5KP26          | 5KP26C        | 26                                 | 10                                                        | 28.9                                                                                                                    | 36.6            | 46.6                                                                                            | 107           |
| 5KP26A         | 5KP26CA       | 26                                 | 10                                                        | 28.9                                                                                                                    | 33.2            | 42.1                                                                                            | 119           |
| 5KP28          | 5KP28C        | 28                                 | 10                                                        | 31.1                                                                                                                    | 39.4            | 50.0                                                                                            | 100           |
| 5KP28A/-Q      | 5KP28CA       | 28                                 | 10                                                        | 31.1                                                                                                                    | 35.8            | 45.4                                                                                            | 110           |

**Characteristics (T<sub>j</sub> = 25°C)****Kennwerte (T<sub>j</sub> = 25°C)**

| Type<br>Typ    |               | Stand-off voltage<br>Sperrspannung | Max. rev. current<br>Max. Sperrstrom<br>at / bei V <sub>WM</sub> | Breakdown voltage at I <sub>T</sub> = 5 mA<br>Abbruch-Spannung bei I <sub>T</sub> = 5 mA<br>) at / bei I <sub>T</sub> = 50 mA |                        | Max. clamping voltage<br>Max. Begrenzer-Spannung<br>at / bei I <sub>PPM</sub> (10/1000 µs) |                      |
|----------------|---------------|------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------|----------------------|
| unidirectional | bidirectional | V <sub>WM</sub> [V]                | I <sub>D</sub> [µA]                                              | V <sub>BRmin</sub> [V]                                                                                                        | V <sub>BRmax</sub> [V] | V <sub>C</sub> [V]                                                                         | I <sub>PPM</sub> [A] |
| 5KP30          | 5KP30C        | 30                                 | 10                                                               | 33.3                                                                                                                          | 42.2                   | 53.5                                                                                       | 93                   |
| 5KP30A         | 5KP30CA       | 30                                 | 10                                                               | 33.3                                                                                                                          | 38.3                   | 48.4                                                                                       | 103                  |
| 5KP33          | 5KP33C        | 33                                 | 10                                                               | 36.7                                                                                                                          | 46.5                   | 59.0                                                                                       | 85                   |
| 5KP33A         | 5KP33CA/-Q    | 33                                 | 10                                                               | 36.7                                                                                                                          | 42.2                   | 53.3                                                                                       | 94                   |
| 5KP36          | 5KP36C        | 36                                 | 10                                                               | 40.0                                                                                                                          | 50.7                   | 64.3                                                                                       | 78                   |
| 5KP36A         | 5KP36CA       | 36                                 | 10                                                               | 40.0                                                                                                                          | 46.0                   | 58.1                                                                                       | 86                   |
| 5KP40          | 5KP40C        | 40                                 | 10                                                               | 44.4                                                                                                                          | 56.3                   | 71.4                                                                                       | 70                   |
| 5KP40A         | 5KP40CA       | 40                                 | 10                                                               | 44.4                                                                                                                          | 51.1                   | 64.5                                                                                       | 78                   |
| 5KP43          | 5KP43C        | 43                                 | 10                                                               | 47.8                                                                                                                          | 60.5                   | 76.7                                                                                       | 65                   |
| 5KP43A         | 5KP43CA       | 43                                 | 10                                                               | 47.8                                                                                                                          | 54.9                   | 69.4                                                                                       | 72                   |
| 5KP45          | 5KP45C        | 45                                 | 10                                                               | 50.0                                                                                                                          | 63.3                   | 80.3                                                                                       | 62                   |
| 5KP45A         | 5KP45CA       | 45                                 | 10                                                               | 50.0                                                                                                                          | 57.5                   | 72.7                                                                                       | 69                   |
| 5KP48          | 5KP48C        | 48                                 | 10                                                               | 53.3                                                                                                                          | 67.5                   | 85.5                                                                                       | 58                   |
| 5KP48A         | 5KP48CA       | 48                                 | 10                                                               | 53.3                                                                                                                          | 61.3                   | 77.4                                                                                       | 65                   |
| 5KP51          | 5KP51C        | 51                                 | 10                                                               | 56.7                                                                                                                          | 71.8                   | 91.1                                                                                       | 55                   |
| 5KP51A         | 5KP51CA       | 51                                 | 10                                                               | 56.7                                                                                                                          | 65.2                   | 82.4                                                                                       | 61                   |
| 5KP54          | 5KP54C        | 54                                 | 10                                                               | 60.0                                                                                                                          | 76.0                   | 96.3                                                                                       | 52                   |
| 5KP54A         | 5KP54CA       | 54                                 | 10                                                               | 60.0                                                                                                                          | 69.0                   | 87.1                                                                                       | 57                   |
| 5KP58          | 5KP58C        | 58                                 | 10                                                               | 64.4                                                                                                                          | 81.6                   | 103                                                                                        | 49                   |
| 5KP58A         | 5KP58CA       | 58                                 | 10                                                               | 64.4                                                                                                                          | 74.1                   | 93.6                                                                                       | 53                   |
| 5KP60          | 5KP60C        | 60                                 | 10                                                               | 66.7                                                                                                                          | 84.5                   | 107                                                                                        | 47                   |
| 5KP60A         | 5KP60CA       | 60                                 | 10                                                               | 66.7                                                                                                                          | 76.7                   | 96.8                                                                                       | 52                   |
| 5KP64          | 5KP64C        | 64                                 | 10                                                               | 71.1                                                                                                                          | 90.1                   | 114                                                                                        | 44                   |
| 5KP64A         | 5KP64CA       | 64                                 | 10                                                               | 71.1                                                                                                                          | 81.8                   | 103                                                                                        | 49                   |
| 5KP70          | 5KP70C        | 70                                 | 10                                                               | 77.8                                                                                                                          | 98.6                   | 125                                                                                        | 40                   |
| 5KP70A         | 5KP70CA       | 70                                 | 10                                                               | 77.8                                                                                                                          | 89.5                   | 113                                                                                        | 44                   |
| 5KP75          | 5KP75C        | 75                                 | 10                                                               | 83.3                                                                                                                          | 105.7                  | 134                                                                                        | 37                   |
| 5KP75A         | 5KP75CA       | 75                                 | 10                                                               | 83.3                                                                                                                          | 95.8                   | 121                                                                                        | 41                   |
| 5KP78          | 5KP78C        | 78                                 | 10                                                               | 86.7                                                                                                                          | 109.8                  | 139                                                                                        | 36                   |
| 5KP78A         | 5KP78CA       | 78                                 | 10                                                               | 86.7                                                                                                                          | 99.7                   | 126                                                                                        | 40                   |
| 5KP85          | 5KP85C        | 85                                 | 10                                                               | 94.4                                                                                                                          | 119.2                  | 151                                                                                        | 33                   |
| 5KP85A         | 5KP85CA       | 85                                 | 10                                                               | 94.4                                                                                                                          | 108.2                  | 137                                                                                        | 36                   |
| 5KP90          | 5KP90C        | 90                                 | 10                                                               | 100                                                                                                                           | 126.5                  | 160                                                                                        | 31                   |
| 5KP90A         | 5KP90CA       | 90                                 | 10                                                               | 100                                                                                                                           | 115.5                  | 146                                                                                        | 34                   |
| 5KP100         | 5KP100C       | 100                                | 10                                                               | 111                                                                                                                           | 141.0                  | 179                                                                                        | 28                   |
| 5KP100A        | 5KP100CA      | 100                                | 10                                                               | 111                                                                                                                           | 128.0                  | 162                                                                                        | 31                   |
| 5KP110         | 5KP110C       | 110                                | 10                                                               | 122                                                                                                                           | 154.5                  | 196                                                                                        | 26                   |
| 5KP110A        | 5KP110CA      | 110                                | 10                                                               | 122                                                                                                                           | 140.5                  | 177                                                                                        | 28                   |
| 5KP120A        | 5KP120CA      | 120                                | 10                                                               | 133                                                                                                                           | 147.0                  | 193                                                                                        | 26                   |



**Disclaimer:** See data book page 2 or [website](#)  
**Haftungsausschluss:** Siehe Datenbuch Seite 2 oder [Internet](#)

1 Valid, if leads are kept at ambient temperature at a distance of 10 mm from case  
Gültig, wenn die Anschlussdrähte in 10 mm Abstand von Gehäuse auf Umgebungstemperatur gehalten werden