



KTY82 series

Silicon temperature sensors

Rev. 04 — 14 January 2008

Product data sheet

1. Product profile

1.1 General description

The temperature sensors in the KTY82 series have a positive temperature coefficient of resistance and are suitable for use in measurement and control systems. The sensors are encapsulated in the small plastic Surface Mounted Device (SMD) SOT23 package.

Other special selections are available on request.

1.2 Features

- High accuracy and reliability
- Long-term stability
- Positive temperature coefficient; fail-safe behavior
- Virtually linear characteristics

1.3 Quick reference data

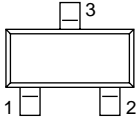
Table 1. Quick reference data

$T_{amb} = 25\text{ }^{\circ}\text{C}$; in liquid; unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------|-------------------|-------------------------------|------|-----|------|----------|
| R ₂₅ | sensor resistance | $I_{sen(cont)} = 1\text{ mA}$ | | | | |
| | | KTY82/110 | 990 | - | 1010 | Ω |
| | | KTY82/120 | 980 | - | 1020 | Ω |
| | | KTY82/121 | 980 | - | 1000 | Ω |
| | | KTY82/122 | 1000 | - | 1020 | Ω |
| | | KTY82/150 | 950 | - | 1050 | Ω |
| | | KTY82/151 | 950 | - | 1000 | Ω |
| | | KTY82/210 | 1980 | - | 2020 | Ω |
| | | KTY82/220 | 1960 | - | 2040 | Ω |
| | | KTY82/221 | 1960 | - | 2000 | Ω |
| | | KTY82/222 | 2000 | - | 2040 | Ω |
| | | KTY82/250 | 1900 | - | 2100 | Ω |
| | | KTY82/251 | 1900 | - | 2000 | Ω |
| | | KTY82/252 | 2000 | - | 2100 | Ω |

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline |
|-----|--|---|
| 1 | electrical contact |  |
| 2 | electrical contact | |
| 3 | substrate (must remain potential free) | |

3. Ordering information

Table 3. Ordering information

| Type number | Package | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| KTY82/110 | - | plastic surface-mounted package; 3 leads | SOT23 |
| KTY82/120 | | | |
| KTY82/121 | | | |
| KTY82/122 | | | |
| KTY82/150 | | | |
| KTY82/151 | | | |
| KTY82/210 | | | |
| KTY82/220 | | | |
| KTY82/221 | | | |
| KTY82/222 | | | |
| KTY82/250 | | | |
| KTY82/251 | | | |
| KTY82/252 | | | |

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| KTY82/110 | 110 |
| KTY82/120 | 120 |
| KTY82/121 | 121 |
| KTY82/122 | 122 |
| KTY82/150 | 150 |
| KTY82/151 | 151 |
| KTY82/210 | 210 |
| KTY82/220 | 220 |
| KTY82/221 | 221 |
| KTY82/222 | 222 |
| KTY82/250 | 250 |
| KTY82/251 | 251 |
| KTY82/252 | 252 |

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------------|---------------------------|---|-----|------|------|
| $I_{\text{sen(cont)}}$ | continuous sensor current | in free air; $T_{\text{amb}} = 25\text{ °C}$ | - | 10 | mA |
| | | in free air; $T_{\text{amb}} = 150\text{ °C}$ | - | 2 | mA |
| T_{amb} | ambient temperature | | -55 | +150 | °C |

6. Characteristics

Table 6. Characteristics
T_{amb} = 25 °C; in liquid; unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------------------|-------------------------------------|---|-------|-------|-------|------|
| R ₂₅ | sensor resistance | I _{sen(cont)} = 1 mA | | | | |
| | | KTY82/110 | 990 | - | 1010 | Ω |
| | | KTY82/120 | 980 | - | 1020 | Ω |
| | | KTY82/121 | 980 | - | 1000 | Ω |
| | | KTY82/122 | 1000 | - | 1020 | Ω |
| | | KTY82/150 | 950 | - | 1050 | Ω |
| | | KTY82/151 | 950 | - | 1000 | Ω |
| | | KTY82/210 | 1980 | - | 2020 | Ω |
| | | KTY82/220 | 1960 | - | 2040 | Ω |
| | | KTY82/221 | 1960 | - | 2000 | Ω |
| | | KTY82/222 | 2000 | - | 2040 | Ω |
| | | KTY82/250 | 1900 | - | 2100 | Ω |
| | | KTY82/251 | 1900 | - | 2000 | Ω |
| KTY82/252 | 2000 | - | 2100 | Ω | | |
| TC | temperature coefficient | | - | 0.79 | - | %/K |
| R ₁₀₀ /R ₂₅ | resistance ratio | T _{amb} = 100 °C and 25 °C | 1.676 | 1.696 | 1.716 | |
| R ₋₅₅ /R ₂₅ | resistance ratio | T _{amb} = -55 °C and 25 °C | 0.480 | 0.490 | 0.500 | |
| ΔR ₂₅ | drift of sensor resistance at 25 °C | 10000 h continuous operation; T _{amb} = 150 °C | | | | |
| | | KTY82/1 series | - | 1.6 | - | Ω |
| | | KTY82/2 series | - | 3.2 | - | Ω |
| τ _{th} | thermal time constant | in still air | [1] - | 7 | - | s |
| | | in still liquid | [1] - | 1 | - | s |
| | | in flowing liquid | [1] - | 0.5 | - | s |

[1] The thermal time constant is the time taken for the sensor to reach 63.2 % of the total temperature difference. For example, if a sensor with a temperature of 25 °C is moved to an environment with an ambient temperature of 100 °C, the time for the sensor to reach a temperature of 72.4 °C is the thermal time constant.

Table 7. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/110 and KTY82/120 $I_{sen(cont)} = 1\text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/110 | | | | KTY82/120 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 475 | 490 | 505 | ±3.02 | 470 | 490 | 510 | ±4.02 |
| -50 | -58 | 0.98 | 500 | 515 | 530 | ±2.92 | 495 | 515 | 535 | ±3.94 |
| -40 | -40 | 0.96 | 552 | 567 | 582 | ±2.74 | 547 | 567 | 588 | ±3.78 |
| -30 | -22 | 0.93 | 609 | 624 | 638 | ±2.55 | 603 | 624 | 645 | ±3.62 |
| -20 | -4 | 0.91 | 669 | 684 | 698 | ±2.35 | 662 | 684 | 705 | ±3.45 |
| -10 | 14 | 0.88 | 733 | 747 | 761 | ±2.14 | 726 | 747 | 769 | ±3.27 |
| 0 | 32 | 0.85 | 802 | 815 | 828 | ±1.91 | 793 | 815 | 836 | ±3.08 |
| 10 | 50 | 0.83 | 874 | 886 | 898 | ±1.67 | 865 | 886 | 907 | ±2.88 |
| 20 | 68 | 0.80 | 950 | 961 | 972 | ±1.41 | 941 | 961 | 982 | ±2.66 |
| 25 | 77 | 0.79 | 990 | 1000 | 1010 | ±1.27 | 980 | 1000 | 1020 | ±2.54 |
| 30 | 86 | 0.78 | 1029 | 1040 | 1051 | ±1.39 | 1018 | 1040 | 1061 | ±2.68 |
| 40 | 104 | 0.75 | 1108 | 1122 | 1136 | ±1.64 | 1097 | 1122 | 1147 | ±2.97 |
| 50 | 122 | 0.73 | 1192 | 1209 | 1225 | ±1.91 | 1180 | 1209 | 1237 | ±3.28 |
| 60 | 140 | 0.71 | 1278 | 1299 | 1319 | ±2.19 | 1265 | 1299 | 1332 | ±3.61 |
| 70 | 158 | 0.69 | 1369 | 1392 | 1416 | ±2.49 | 1355 | 1392 | 1430 | ±3.94 |
| 80 | 176 | 0.67 | 1462 | 1490 | 1518 | ±2.8 | 1447 | 1490 | 1532 | ±4.3 |
| 90 | 194 | 0.65 | 1559 | 1591 | 1623 | ±3.12 | 1543 | 1591 | 1639 | ±4.66 |
| 100 | 212 | 0.63 | 1659 | 1696 | 1733 | ±3.46 | 1642 | 1696 | 1750 | ±5.05 |
| 110 | 230 | 0.61 | 1762 | 1805 | 1847 | ±3.83 | 1744 | 1805 | 1865 | ±5.48 |
| 120 | 248 | 0.58 | 1867 | 1915 | 1963 | ±4.33 | 1848 | 1915 | 1982 | ±6.07 |
| 125 | 257 | 0.55 | 1919 | 1970 | 2020 | ±4.66 | 1899 | 1970 | 2040 | ±6.47 |
| 130 | 266 | 0.52 | 1970 | 2023 | 2077 | ±5.07 | 1950 | 2023 | 2097 | ±6.98 |
| 140 | 284 | 0.45 | 2065 | 2124 | 2184 | ±6.28 | 2043 | 2124 | 2205 | ±8.51 |
| 150 | 302 | 0.35 | 2145 | 2211 | 2277 | ±8.55 | 2123 | 2211 | 2299 | ±11.43 |

Table 8. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/121 and KTY82/122

$I_{sen(cont)} = 1\text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/121 | | | | KTY82/122 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 471 | 485 | 500 | ±3.02 | 480 | 495 | 510 | ±3.02 |
| -50 | -58 | 0.98 | 495 | 510 | 524 | ±2.92 | 505 | 520 | 535 | ±2.92 |
| -40 | -40 | 0.96 | 547 | 562 | 576 | ±2.74 | 558 | 573 | 588 | ±2.74 |
| -30 | -22 | 0.93 | 603 | 617 | 632 | ±2.55 | 615 | 630 | 645 | ±2.55 |
| -20 | -4 | 0.91 | 662 | 677 | 691 | ±2.35 | 676 | 690 | 705 | ±2.35 |
| -10 | 14 | 0.88 | 726 | 740 | 754 | ±2.14 | 741 | 755 | 769 | ±2.14 |
| 0 | 32 | 0.85 | 794 | 807 | 820 | ±1.91 | 810 | 823 | 836 | ±1.91 |
| 10 | 50 | 0.83 | 865 | 877 | 889 | ±1.67 | 883 | 895 | 907 | ±1.67 |
| 20 | 68 | 0.80 | 941 | 951 | 962 | ±1.41 | 960 | 971 | 982 | ±1.41 |
| 25 | 77 | 0.79 | 980 | 990 | 1000 | ±1.27 | 1000 | 1010 | 1020 | ±1.27 |
| 30 | 86 | 0.78 | 1018 | 1029 | 1041 | ±1.39 | 1039 | 1050 | 1062 | ±1.39 |
| 40 | 104 | 0.75 | 1097 | 1111 | 1125 | ±1.64 | 1120 | 1134 | 1148 | ±1.64 |
| 50 | 122 | 0.73 | 1180 | 1196 | 1213 | ±1.91 | 1204 | 1221 | 1238 | ±1.91 |
| 60 | 140 | 0.71 | 1266 | 1286 | 1305 | ±2.19 | 1291 | 1312 | 1332 | ±2.19 |
| 70 | 158 | 0.69 | 1355 | 1378 | 1402 | ±2.49 | 1382 | 1406 | 1430 | ±2.49 |
| 80 | 176 | 0.67 | 1447 | 1475 | 1502 | ±2.8 | 1477 | 1505 | 1533 | ±2.8 |
| 90 | 194 | 0.65 | 1543 | 1575 | 1607 | ±3.12 | 1574 | 1607 | 1639 | ±3.12 |
| 100 | 212 | 0.63 | 1642 | 1679 | 1716 | ±3.46 | 1676 | 1713 | 1750 | ±3.46 |
| 110 | 230 | 0.61 | 1745 | 1786 | 1828 | ±3.83 | 1780 | 1823 | 1865 | ±3.83 |
| 120 | 248 | 0.58 | 1849 | 1896 | 1943 | ±4.33 | 1886 | 1934 | 1982 | ±4.33 |
| 125 | 257 | 0.55 | 1900 | 1950 | 2000 | ±4.66 | 1938 | 1989 | 2041 | ±4.66 |
| 130 | 266 | 0.52 | 1950 | 2003 | 2056 | ±5.07 | 1989 | 2044 | 2098 | ±5.07 |
| 140 | 284 | 0.45 | 2044 | 2103 | 2162 | ±6.28 | 2085 | 2146 | 2206 | ±6.28 |
| 150 | 302 | 0.35 | 2124 | 2189 | 2254 | ±8.55 | 2167 | 2233 | 2299 | ±8.55 |

Table 9. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/150 and KTY82/151 $I_{sen(cont)} = 1 \text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/150 | | | | KTY82/151 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 456 | 490 | 524 | ±7.04 | 456 | 478 | 499 | ±4.52 |
| -50 | -58 | 0.98 | 479 | 515 | 550 | ±6.99 | 480 | 502 | 524 | ±4.45 |
| -40 | -40 | 0.96 | 530 | 567 | 605 | ±6.91 | 530 | 553 | 576 | ±4.3 |
| -30 | -22 | 0.93 | 584 | 624 | 663 | ±6.84 | 584 | 608 | 632 | ±4.16 |
| -20 | -4 | 0.91 | 642 | 684 | 725 | ±6.77 | 642 | 667 | 691 | ±4.01 |
| -10 | 14 | 0.88 | 703 | 747 | 791 | ±6.69 | 704 | 729 | 753 | ±3.84 |
| 0 | 32 | 0.85 | 769 | 815 | 861 | ±6.61 | 770 | 794 | 819 | ±3.67 |
| 10 | 50 | 0.83 | 838 | 886 | 934 | ±6.51 | 839 | 864 | 889 | ±3.48 |
| 20 | 68 | 0.80 | 912 | 961 | 1010 | ±6.41 | 912 | 937 | 962 | ±3.28 |
| 25 | 77 | 0.79 | 950 | 1000 | 1050 | ±6.35 | 950 | 975 | 1000 | ±3.18 |
| 30 | 86 | 0.78 | 987 | 1040 | 1093 | ±6.55 | 988 | 1014 | 1040 | ±3.33 |
| 40 | 104 | 0.75 | 1064 | 1122 | 1181 | ±6.97 | 1064 | 1094 | 1124 | ±3.64 |
| 50 | 122 | 0.73 | 1143 | 1209 | 1274 | ±7.4 | 1144 | 1178 | 1212 | ±3.97 |
| 60 | 140 | 0.71 | 1226 | 1299 | 1371 | ±7.85 | 1227 | 1266 | 1305 | ±4.31 |
| 70 | 158 | 0.69 | 1313 | 1392 | 1472 | ±8.31 | 1314 | 1357 | 1401 | ±4.67 |
| 80 | 176 | 0.67 | 1402 | 1490 | 1577 | ±8.79 | 1404 | 1453 | 1501 | ±5.05 |
| 90 | 194 | 0.65 | 1495 | 1591 | 1687 | ±9.29 | 1497 | 1551 | 1606 | ±5.43 |
| 100 | 212 | 0.63 | 1591 | 1696 | 1801 | ±9.81 | 1593 | 1654 | 1714 | ±5.84 |
| 110 | 230 | 0.61 | 1690 | 1805 | 1919 | ±10.4 | 1692 | 1759 | 1827 | ±6.3 |
| 120 | 248 | 0.58 | 1791 | 1915 | 2039 | ±11.28 | 1792 | 1867 | 1942 | ±6.94 |
| 125 | 257 | 0.55 | 1840 | 1970 | 2099 | ±11.91 | 1842 | 1920 | 1999 | ±7.38 |
| 130 | 266 | 0.52 | 1889 | 2023 | 2158 | ±12.72 | 1891 | 1973 | 2055 | ±7.94 |
| 140 | 284 | 0.45 | 1980 | 2124 | 2269 | ±15.21 | 1982 | 2071 | 2161 | ±9.63 |
| 150 | 302 | 0.35 | 2057 | 2211 | 2365 | ±20.09 | 2059 | 2156 | 2252 | ±12.88 |

Table 10. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/210 and KTY82/220 $I_{sen(cont)} = 1 \text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/210 | | | | KTY82/220 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 951 | 980 | 1009 | ±3.02 | 941 | 980 | 1019 | ±4.02 |
| -50 | -58 | 0.98 | 1000 | 1030 | 1059 | ±2.92 | 990 | 1030 | 1070 | ±3.94 |
| -40 | -40 | 0.96 | 1105 | 1135 | 1165 | ±2.74 | 1094 | 1135 | 1176 | ±3.78 |
| -30 | -22 | 0.93 | 1218 | 1247 | 1277 | ±2.55 | 1205 | 1247 | 1289 | ±3.62 |
| -20 | -4 | 0.91 | 1338 | 1367 | 1396 | ±2.35 | 1325 | 1367 | 1410 | ±3.45 |
| -10 | 14 | 0.88 | 1467 | 1495 | 1523 | ±2.14 | 1452 | 1495 | 1538 | ±3.27 |
| 0 | 32 | 0.85 | 1603 | 1630 | 1656 | ±1.91 | 1587 | 1630 | 1673 | ±3.08 |
| 10 | 50 | 0.83 | 1748 | 1772 | 1797 | ±1.67 | 1730 | 1772 | 1814 | ±2.88 |
| 20 | 68 | 0.80 | 1901 | 1922 | 1944 | ±1.41 | 1881 | 1922 | 1963 | ±2.66 |
| 25 | 77 | 0.79 | 1980 | 2000 | 2020 | ±1.27 | 1960 | 2000 | 2040 | ±2.54 |
| 30 | 86 | 0.78 | 2057 | 2080 | 2102 | ±1.39 | 2036 | 2080 | 2123 | ±2.68 |
| 40 | 104 | 0.75 | 2217 | 2245 | 2272 | ±1.64 | 2194 | 2245 | 2295 | ±2.97 |
| 50 | 122 | 0.73 | 2383 | 2417 | 2451 | ±1.91 | 2359 | 2417 | 2475 | ±3.28 |
| 60 | 140 | 0.71 | 2557 | 2597 | 2637 | ±2.19 | 2531 | 2597 | 2663 | ±3.61 |
| 70 | 158 | 0.69 | 2737 | 2785 | 2832 | ±2.49 | 2709 | 2785 | 2860 | ±3.94 |
| 80 | 176 | 0.67 | 2924 | 2980 | 3035 | ±2.8 | 2894 | 2980 | 3065 | ±4.3 |
| 90 | 194 | 0.65 | 3118 | 3182 | 3246 | ±3.12 | 3086 | 3182 | 3278 | ±4.66 |
| 100 | 212 | 0.63 | 3318 | 3392 | 3466 | ±3.46 | 3284 | 3392 | 3500 | ±5.05 |
| 110 | 230 | 0.59 | 3523 | 3607 | 3691 | ±3.93 | 3487 | 3607 | 3728 | ±5.61 |
| 120 | 248 | 0.53 | 3722 | 3817 | 3912 | ±4.7 | 3683 | 3817 | 3950 | ±6.59 |
| 125 | 257 | 0.49 | 3815 | 3915 | 4016 | ±5.26 | 3775 | 3915 | 4055 | ±7.31 |
| 130 | 266 | 0.44 | 3901 | 4008 | 4114 | ±6 | 3861 | 4008 | 4154 | ±8.27 |
| 140 | 284 | 0.33 | 4049 | 4166 | 4283 | ±8.45 | 4008 | 4166 | 4325 | ±11.46 |
| 150 | 302 | 0.20 | 4153 | 4280 | 4407 | ±14.63 | 4110 | 4280 | 4450 | ±19.56 |

Table 11. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/221 and KTY82/222

$I_{sen(cont)} = 1 \text{ mA}$.

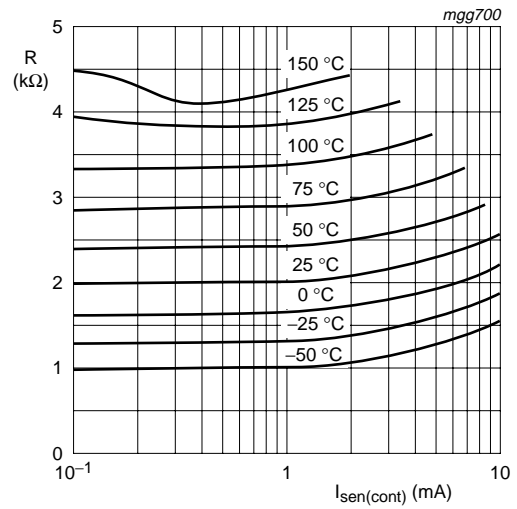
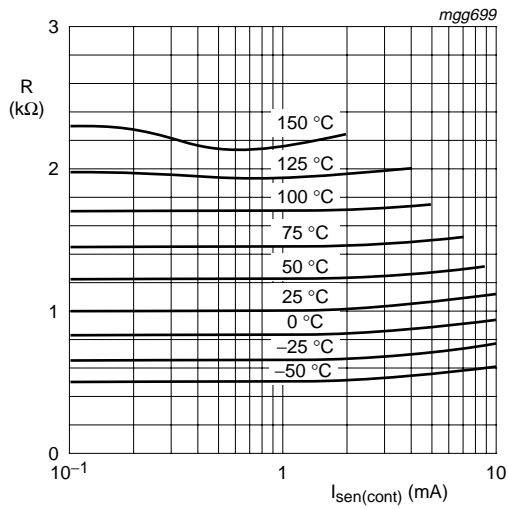
| Ambient temperature | | Temperature coefficient (%/K) | KTY82/221 | | | | KTY82/222 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 941 | 970 | 999 | ±3.02 | 960 | 990 | 1020 | ±3.02 |
| -50 | -58 | 0.98 | 990 | 1019 | 1049 | ±2.92 | 1010 | 1040 | 1070 | ±2.92 |
| -40 | -40 | 0.96 | 1094 | 1123 | 1153 | ±2.74 | 1116 | 1146 | 1176 | ±2.74 |
| -30 | -22 | 0.93 | 1205 | 1235 | 1264 | ±2.55 | 1230 | 1260 | 1290 | ±2.55 |
| -20 | -4 | 0.91 | 1325 | 1354 | 1382 | ±2.35 | 1352 | 1381 | 1410 | ±2.35 |
| -10 | 14 | 0.88 | 1452 | 1480 | 1508 | ±2.14 | 1481 | 1510 | 1538 | ±2.14 |
| 0 | 32 | 0.85 | 1587 | 1613 | 1640 | ±1.91 | 1619 | 1646 | 1673 | ±1.91 |
| 10 | 50 | 0.83 | 1730 | 1754 | 1779 | ±1.67 | 1765 | 1790 | 1815 | ±1.67 |
| 20 | 68 | 0.80 | 1882 | 1903 | 1924 | ±1.41 | 1920 | 1941 | 1963 | ±1.41 |
| 25 | 77 | 0.79 | 1960 | 1980 | 2000 | ±1.27 | 2000 | 2020 | 2040 | ±1.27 |
| 30 | 86 | 0.78 | 2037 | 2059 | 2081 | ±1.39 | 2078 | 2100 | 2123 | ±1.39 |
| 40 | 104 | 0.75 | 2195 | 2222 | 2250 | ±1.64 | 2239 | 2267 | 2295 | ±1.64 |
| 50 | 122 | 0.73 | 2360 | 2393 | 2426 | ±1.91 | 2407 | 2441 | 2475 | ±1.91 |
| 60 | 140 | 0.71 | 2531 | 2571 | 2611 | ±2.19 | 2582 | 2623 | 2664 | ±2.19 |
| 70 | 158 | 0.69 | 2710 | 2757 | 2804 | ±2.49 | 2764 | 2812 | 2860 | ±2.49 |
| 80 | 176 | 0.67 | 2895 | 2950 | 3005 | ±2.8 | 2953 | 3009 | 3065 | ±2.8 |
| 90 | 194 | 0.65 | 3086 | 3150 | 3214 | ±3.12 | 3149 | 3214 | 3279 | ±3.12 |
| 100 | 212 | 0.63 | 3285 | 3358 | 3431 | ±3.46 | 3351 | 3426 | 3501 | ±3.46 |
| 110 | 230 | 0.59 | 3488 | 3571 | 3655 | ±3.93 | 3558 | 3643 | 3728 | ±3.93 |
| 120 | 248 | 0.53 | 3684 | 3779 | 3873 | ±4.7 | 3759 | 3855 | 3951 | ±4.7 |
| 125 | 257 | 0.49 | 3776 | 3876 | 3976 | ±5.26 | 3853 | 3955 | 4056 | ±5.26 |
| 130 | 266 | 0.44 | 3862 | 3967 | 4073 | ±6 | 3940 | 4048 | 4155 | ±6 |
| 140 | 284 | 0.33 | 4009 | 4125 | 4241 | ±8.45 | 4090 | 4208 | 4326 | ±8.45 |
| 150 | 302 | 0.20 | 4112 | 4237 | 4363 | ±14.63 | 4195 | 4323 | 4451 | ±14.63 |

Table 12. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/250 and KTY82/251 $I_{sen(cont)} = 1 \text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/250 | | | | KTY82/251 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 911 | 980 | 1049 | ±7.04 | 913 | 956 | 999 | ±4.52 |
| -50 | -58 | 0.98 | 959 | 1030 | 1101 | ±6.99 | 960 | 1004 | 1048 | ±4.45 |
| -40 | -40 | 0.96 | 1060 | 1135 | 1210 | ±6.91 | 1061 | 1106 | 1152 | ±4.3 |
| -30 | -22 | 0.93 | 1168 | 1247 | 1327 | ±6.84 | 1169 | 1216 | 1263 | ±4.16 |
| -20 | -4 | 0.91 | 1283 | 1367 | 1451 | ±6.77 | 1285 | 1333 | 1381 | ±4.01 |
| -10 | 14 | 0.88 | 1407 | 1495 | 1583 | ±6.69 | 1408 | 1457 | 1507 | ±3.84 |
| 0 | 32 | 0.85 | 1538 | 1630 | 1721 | ±6.61 | 1539 | 1589 | 1639 | ±3.67 |
| 10 | 50 | 0.83 | 1677 | 1772 | 1867 | ±6.51 | 1678 | 1728 | 1778 | ±3.48 |
| 20 | 68 | 0.80 | 1824 | 1922 | 2021 | ±6.41 | 1825 | 1874 | 1923 | ±3.28 |
| 25 | 77 | 0.79 | 1900 | 2000 | 2100 | ±6.35 | 1900 | 1950 | 2000 | ±3.18 |
| 30 | 86 | 0.78 | 1974 | 2080 | 2185 | ±6.55 | 1975 | 2028 | 2080 | ±3.33 |
| 40 | 104 | 0.75 | 2127 | 2245 | 2362 | ±6.97 | 2129 | 2189 | 2248 | ±3.64 |
| 50 | 122 | 0.73 | 2287 | 2417 | 2547 | ±7.4 | 2289 | 2357 | 2425 | ±3.97 |
| 60 | 140 | 0.71 | 2453 | 2597 | 2741 | ±7.85 | 2455 | 2532 | 2609 | ±4.31 |
| 70 | 158 | 0.69 | 2626 | 2785 | 2943 | ±8.31 | 2628 | 2715 | 2802 | ±4.67 |
| 80 | 176 | 0.67 | 2805 | 2980 | 3154 | ±8.79 | 2807 | 2905 | 3003 | ±5.05 |
| 90 | 194 | 0.65 | 2990 | 3182 | 3374 | ±9.29 | 2993 | 3102 | 3212 | ±5.43 |
| 100 | 212 | 0.63 | 3182 | 3392 | 3602 | ±9.81 | 3185 | 3307 | 3429 | ±5.84 |
| 110 | 230 | 0.59 | 3379 | 3607 | 3836 | ±10.65 | 3382 | 3517 | 3652 | ±6.45 |
| 120 | 248 | 0.53 | 3569 | 3817 | 4065 | ±12.25 | 3573 | 3721 | 3870 | ±7.53 |
| 125 | 257 | 0.49 | 3658 | 3915 | 4173 | ±13.45 | 3662 | 3817 | 3973 | ±8.33 |
| 130 | 266 | 0.44 | 3741 | 4008 | 4274 | ±15.06 | 3745 | 3907 | 4070 | ±9.4 |
| 140 | 284 | 0.33 | 3883 | 4166 | 4450 | ±20.49 | 3887 | 4062 | 4237 | ±12.96 |
| 150 | 302 | 0.20 | 3982 | 4280 | 4578 | ±34.35 | 3987 | 4173 | 4359 | ±22.02 |

Table 13. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY82/252 $I_{sen(cont)} = 1\text{ mA}$.

| Ambient temperature | | Temperature coefficient (%/K) | KTY82/252 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | Temperature error (K) |
| | | | Min | Typ | Max | |
| -55 | -67 | 0.99 | 959 | 1005 | 1050 | ±4.52 |
| -50 | -58 | 0.98 | 1009 | 1055 | 1102 | ±4.45 |
| -40 | -40 | 0.96 | 1115 | 1163 | 1211 | ±4.3 |
| -30 | -22 | 0.93 | 1229 | 1278 | 1328 | ±4.16 |
| -20 | -4 | 0.91 | 1351 | 1401 | 1452 | ±4.01 |
| -10 | 14 | 0.88 | 1480 | 1532 | 1584 | ±3.84 |
| 0 | 32 | 0.85 | 1618 | 1670 | 1723 | ±3.67 |
| 10 | 50 | 0.83 | 1764 | 1817 | 1869 | ±3.48 |
| 20 | 68 | 0.80 | 1919 | 1970 | 2022 | ±3.28 |
| 25 | 77 | 0.79 | 2000 | 2050 | 2100 | ±3.18 |
| 30 | 86 | 0.78 | 2077 | 2132 | 2187 | ±3.33 |
| 40 | 104 | 0.75 | 2238 | 2301 | 2364 | ±3.64 |
| 50 | 122 | 0.73 | 2406 | 2478 | 2549 | ±3.97 |
| 60 | 140 | 0.71 | 2581 | 2662 | 2743 | ±4.31 |
| 70 | 158 | 0.69 | 2763 | 2854 | 2946 | ±4.67 |
| 80 | 176 | 0.67 | 2951 | 3054 | 3157 | ±5.05 |
| 90 | 194 | 0.65 | 3147 | 3262 | 3376 | ±5.43 |
| 100 | 212 | 0.63 | 3349 | 3477 | 3605 | ±5.84 |
| 110 | 230 | 0.59 | 3556 | 3697 | 3839 | ±6.45 |
| 120 | 248 | 0.53 | 3756 | 3912 | 4068 | ±7.53 |
| 125 | 257 | 0.49 | 3850 | 4013 | 4177 | ±8.33 |
| 130 | 266 | 0.44 | 3937 | 4108 | 4278 | ±9.4 |
| 140 | 284 | 0.33 | 4087 | 4271 | 4455 | ±12.96 |
| 150 | 302 | 0.20 | 4191 | 4387 | 4583 | ±22.02 |

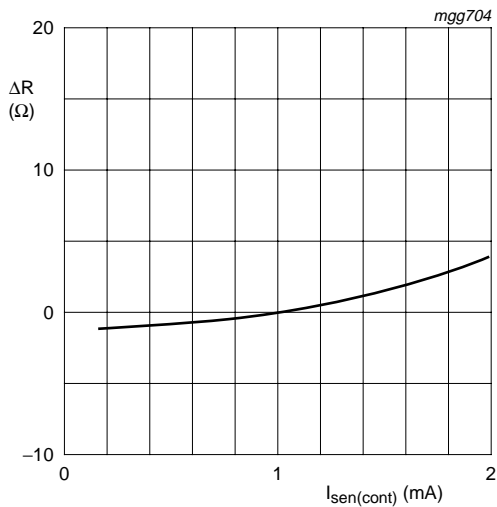


To keep the temperature error low, an operating current of $I_{sen(cont)} = 1 \text{ mA}$ is recommended for temperatures above 100 °C

a. KTY82/1 series

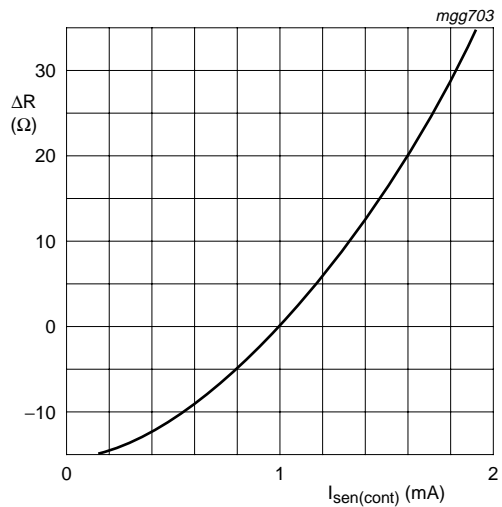
b. KTY82/2 series

Fig 1. Sensor resistance as a function of operating current



$T_{amb} = 25 \text{ °C}$

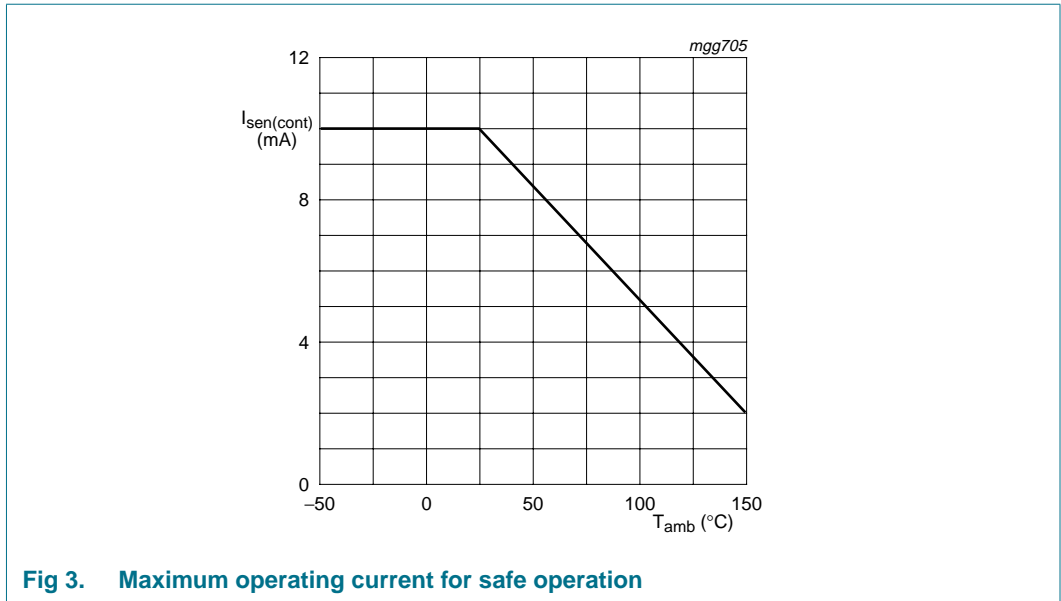
a. KTY82/1 series



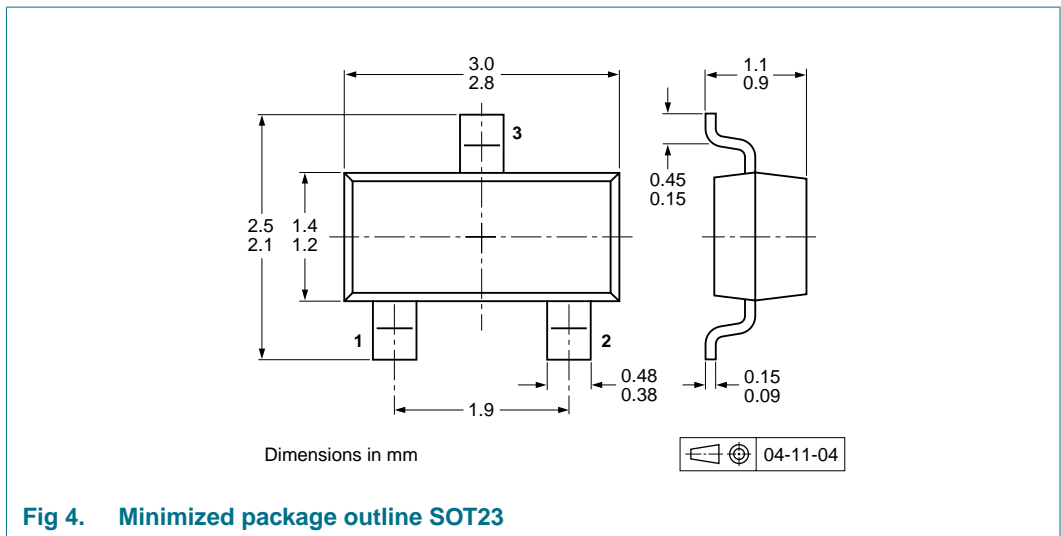
$T_{amb} = 25 \text{ °C}$

b. KTY82/2 series

Fig 2. Deviation of sensor resistance as a function of operating current



7. Package outline



8. Handling information

KTY82 series temperature sensors are sensitive to ElectroStatic Discharge (ESD). ESD can lead to irreversible changes of the characteristic.

9. Soldering

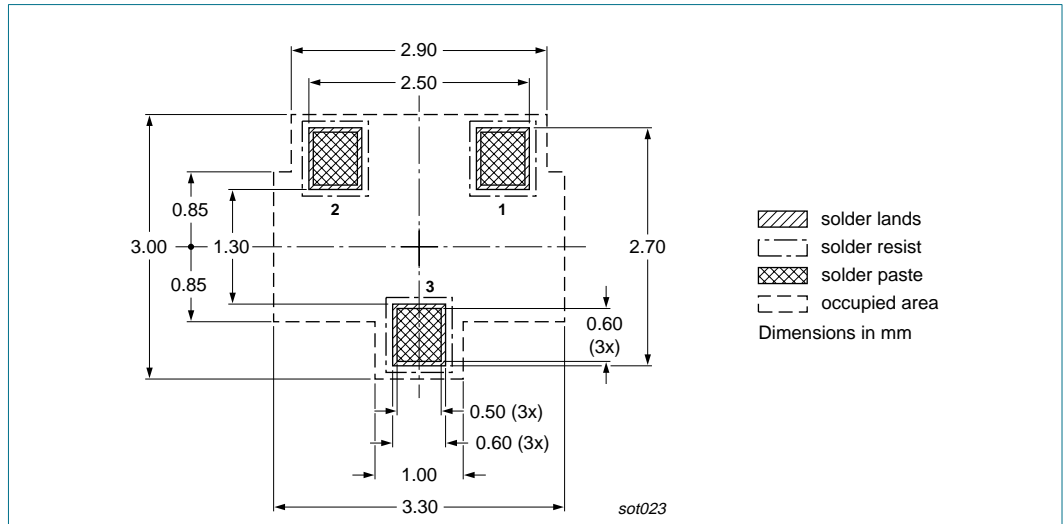


Fig 5. Reflow soldering footprint SOT23

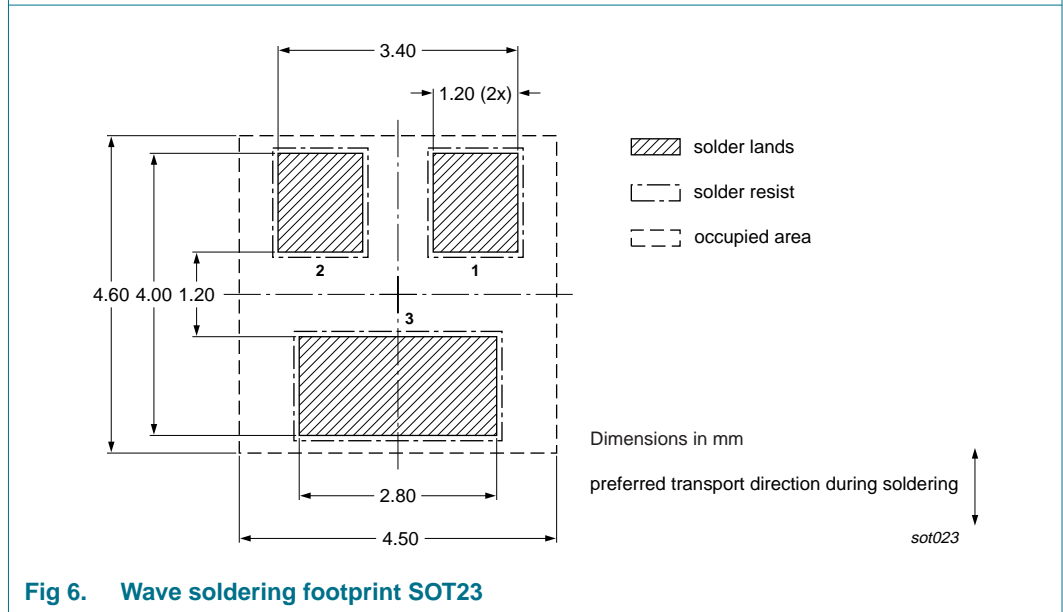


Fig 6. Wave soldering footprint SOT23

10. Revision history

Table 14. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|--------------|--|---------------|------------------------------------|
| KTY82_SER_4 | 20080114 | Product data sheet | - | KTY82-2SERIES_3 KTY82-1SERIES_3 |
| Modifications: | | <ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.• Legal texts have been adapted to the new company name where appropriate. | | |
| KTY82-2SERIES_3 | 19980326 | Product specification | - | - |
| KTY82-1SERIES_3 | 19980326 | Product specification | - | - |

11. Legal information

11.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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13. Contents

1 Product profile 1

1.1 General description 1

1.2 Features 1

1.3 Quick reference data 1

2 Pinning information 2

3 Ordering information 2

4 Marking 3

5 Limiting values 3

6 Characteristics 4

7 Package outline 13

8 Handling information 13

9 Soldering 14

10 Revision history 15

11 Legal information 16

11.1 Data sheet status 16

11.2 Definitions 16

11.3 Disclaimers 16

11.4 Trademarks 16

12 Contact information 16

13 Contents 17

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