

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
- Positive temperature coefficient; fail-safe behavior
- Long-term stability
- Virtually linear characteristics

1.3 Quick reference data

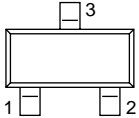
Table 1. Quick reference data

$T_{amb} = 25\text{ }^{\circ}\text{C}$; 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 $I_{sen(cont)} = 1 \text{ mA}$.

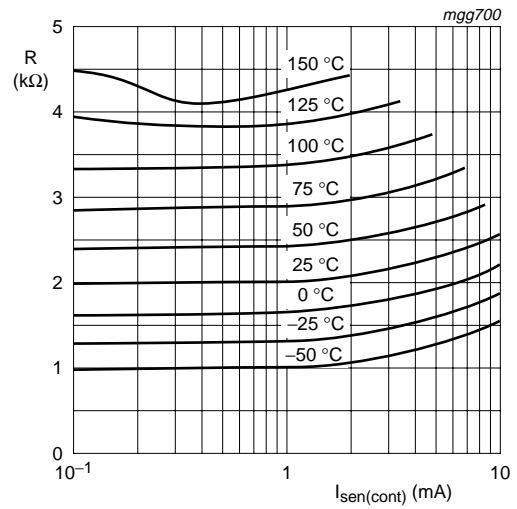
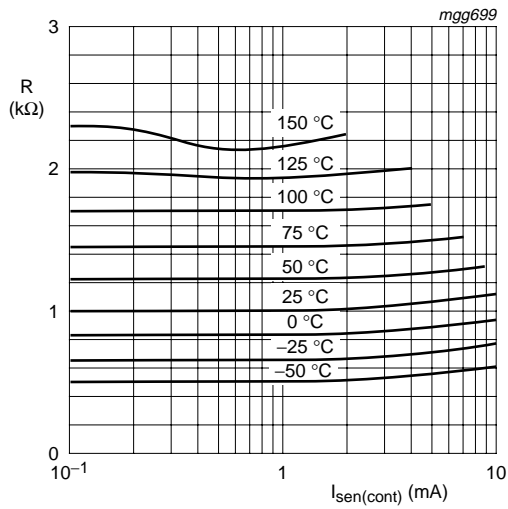
| Ambient temperature | | Temperature coefficient (%/K) | KTY82/221 | | | | KTY82/222 | | | |
|---------------------|------|-------------------------------|----------------|------|------|-----------------------|----------------|------|------|-----------------------|
| (°C) | (°F) | | Resistance (Ω) | | | 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 |

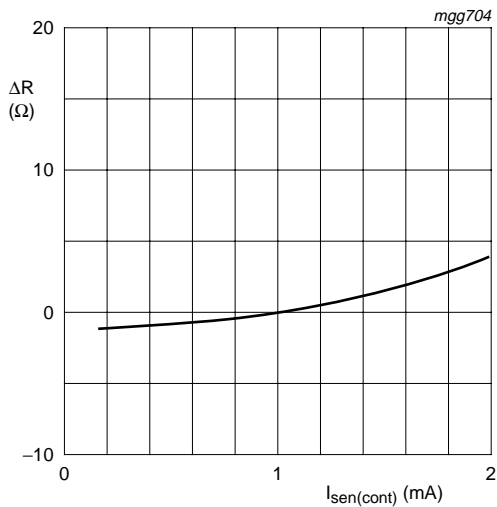


To keep the temperature error low, an operating current of $I_{sen(cont)} = 1 \text{ mA}$ is recommended for temperatures above 100 °C

a. KTY82/1 series

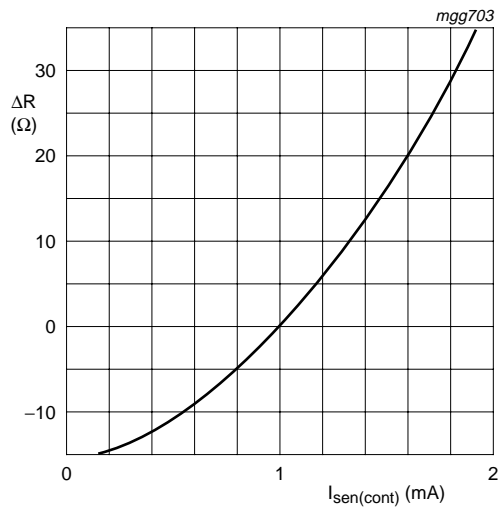
b. KTY82/2 series

Fig 1. Sensor resistance as a function of operating current



$T_{amb} = 25 \text{ °C}$

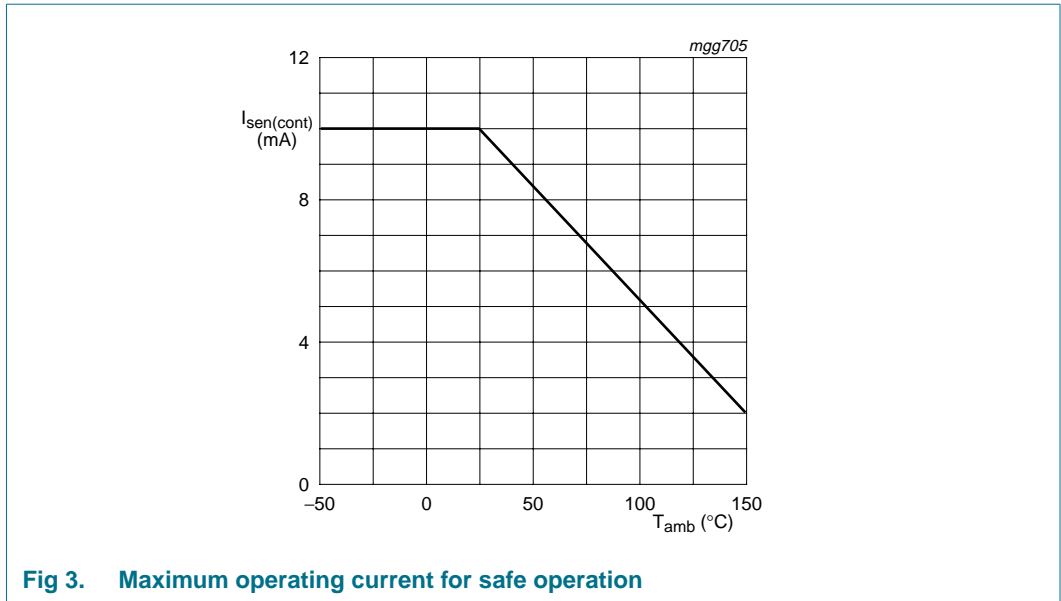
a. KTY82/1 series



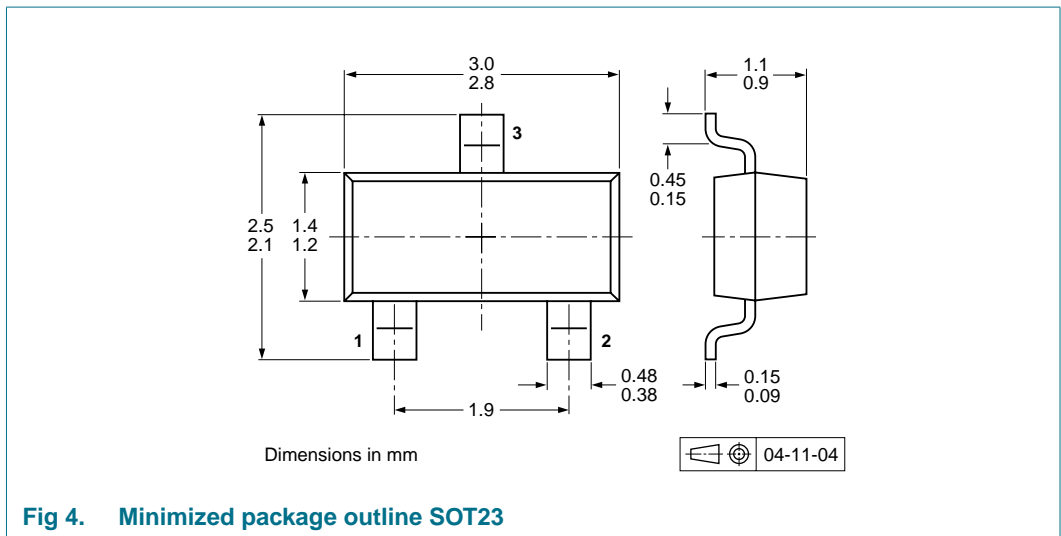
$T_{amb} = 25 \text{ °C}$

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

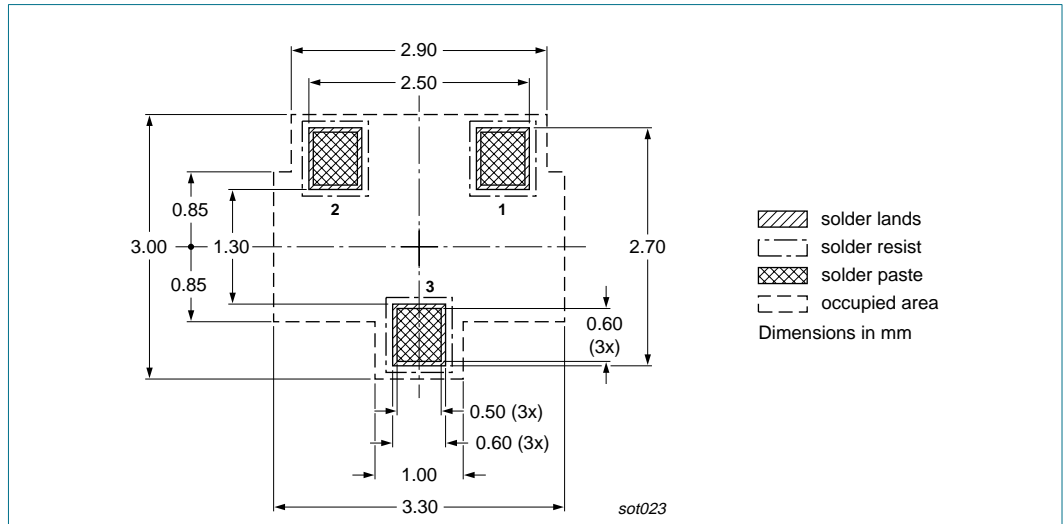


Fig 5. Reflow soldering footprint SOT23

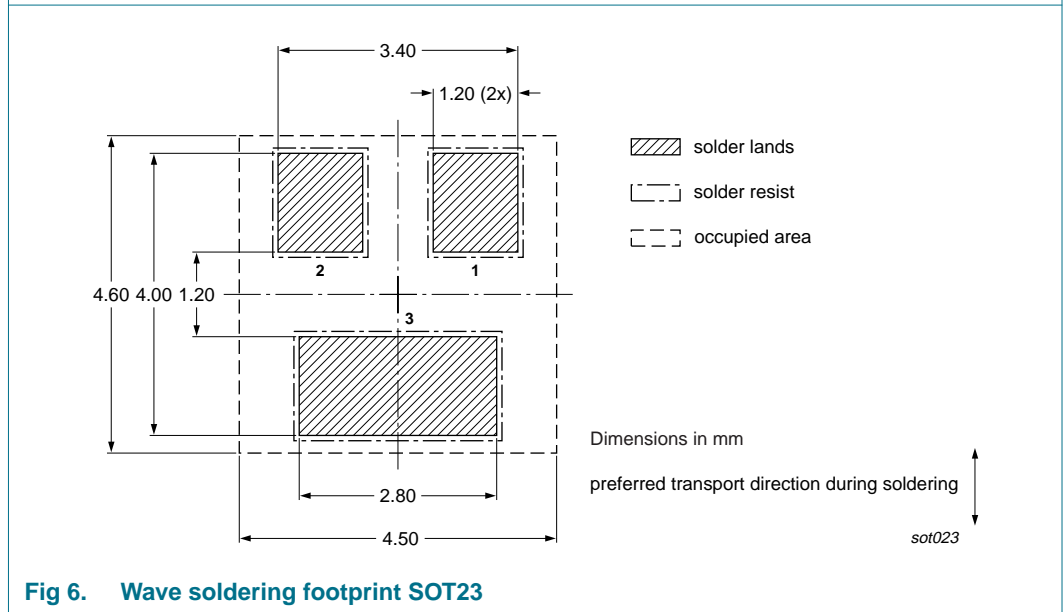


Fig 6. Wave soldering footprint SOT23

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>.

11.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

11.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental

damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

11.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

12. Contact information

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

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

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.



© NXP B.V. 2008.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 14 January 2008

Document identifier: KTY82_SER_4

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- [View **KTY82/110,215** on WIN SOURCE](#)
- [NXP / Nexperia Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management