



PTC thermistors for overcurrent protection

SMDs, EIA sizes 3225 and 4032, 24 V

Series/Type: B59101, B59201, B59301

Date: February 2012

Overcurrent protection

SMDs, EIA sizes 3225 and 4032, 24 V

SMD

Applications

- Overcurrent protection
- Short circuit protection

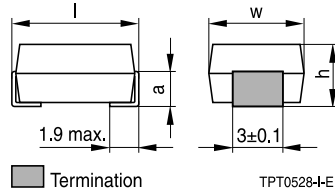
Features

- Molded epoxy encapsulation, lead-free tinned solder terminals
- Suitable for wave and reflow soldering
- Suitable for automatic placement
- Qualification based on AEC-Q200, Rev. D
- RoHS-compatible

Delivery mode

- Blister tape, 330-mm reel with 16-mm tape, taping to IEC 60286-3

Dimensional drawing

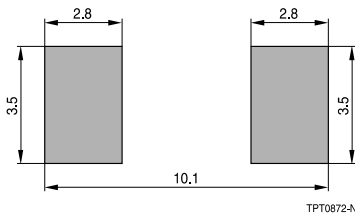


Dimensions (mm)

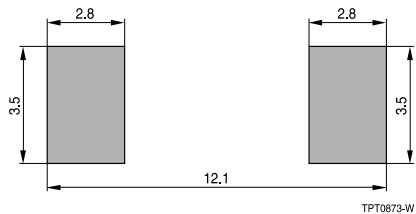
| Type | h ±0.5 | w ±0.5 | l ±0.5 | a ±0.3 | Size |
|---|--------|--------|--------|--------|------|
| Reference temperature $T_{ref} = 80\text{ °C}$ | | | | | |
| P1101 | 3.3 | 6.3 | 8.0 | 1.7 | 3225 |
| P1201 | 3.3 | 6.3 | 8.0 | 1.7 | 3225 |
| P1301 | 3.3 | 8.0 | 10.0 | 2.3 | 4032 |
| Reference temperature $T_{ref} = 120\text{ °C}$ | | | | | |
| P1101 | 3.3 | 6.3 | 8.0 | 1.7 | 3225 |
| P1201 | 3.3 | 6.3 | 8.0 | 1.7 | 3225 |
| P1301 | 3.3 | 8.0 | 10.0 | 2.3 | 4032 |

Geometry of solder pads

EIA case size 3225



EIA case size 4032



Recommended maximum dimensions (mm)

General technical data

| | | | | |
|-----------------------------|--------------------------|--------------|----------|--------------|
| Max. operating voltage | ($T_A = 60\text{ °C}$) | V_{max} | 30 | V DC or V AC |
| Rated voltage | | V_R | 24 | V DC or V AC |
| Switching cycles | | N | 100 | |
| Tolerance of R_R | | ΔR_R | ±25 | % |
| Operating temperature range | ($V = 0$) | T_{op} | -40/+125 | °C |
| Operating temperature range | ($V = V_{max}$) | T_{op} | -40/+60 | °C |

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Electrical specifications and ordering codes

| Type | I_R mA | I_S mA | I_{Smax} ($V = V_{max}$) A | I_r (typ.) ($V = V_{max}$) mA | R_R Ω | R_{min} Ω | Ordering code |
|---|-------------|-------------|--------------------------------------|--|-------------------|-----------------------|-----------------|
| Reference temperature $T_{ref} = 80\text{ }^\circ\text{C}$ | | | | | | | |
| P1301 | 205 | 420 | 1.6 | 38 | 3.1 | 1.85 | B59301P1080A062 |
| P1201 | 165 | 340 | 1.0 | 34 | 4.6 | 2.70 | B59201P1080A062 |
| P1101 | 90 | 185 | 0.7 | 25 | 13 | 7.80 | B59101P1080A062 |
| Reference temperature $T_{ref} = 120\text{ }^\circ\text{C}$ | | | | | | | |
| P1301 | 310 | 640 | 1.6 | 53 | 3.1 | 1.85 | B59301P1120A062 |
| P1201 | 265 | 545 | 1.0 | 45 | 4.6 | 2.70 | B59201P1120A062 |
| P1101 | 170 | 355 | 0.7 | 35 | 13 | 7.80 | B59101P1120A062 |

Reliability data

| Test | Standard | Test conditions | $ \Delta R_{25}/R_{25} $ |
|--------------------------------|-------------|---|--------------------------|
| Electrical endurance, cycling | IEC 60738-1 | Room temperature, I_{Smax} , V_{max} Number of cycles: 100 | < 25% |
| Electrical endurance, constant | IEC 60738-1 | Storage at $V_{max}/T_{op,max}$ (V_{max}) Test duration: 1000 h | < 25% |
| Damp heat | IEC 60738-1 | Temperature of air: 40 °C Relative humidity of air: 93% Duration: 56 days Test according to IEC 60068-2-78 | < 10% |
| Rapid change of temperature | IEC 60738-1 | $T_1 = T_{op,min}$ (0 V), $T_2 = T_{op,max}$ (0 V) Number of cycles: 5 Test duration: 30 min Test according to IEC 60068-2-14, test Na | < 10% |
| Shock | IEC 60738-1 | Acceleration: 390 m/s ² Pulse duration: 6 ms; 6 × 4000 pulses | < 5% |
| Bending test | IEC 60738-1 | Components reflow-soldered to test board Maximum bending: 2 mm Test according to IEC 60068-2-21, test Ue | < 10% |

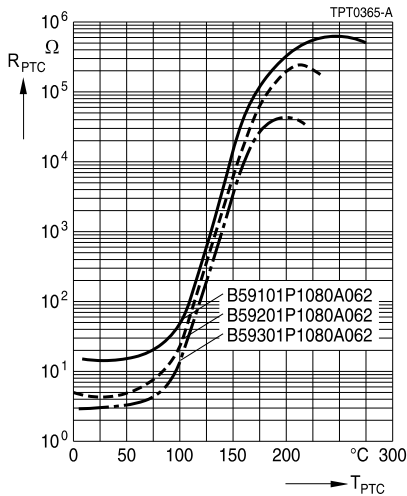
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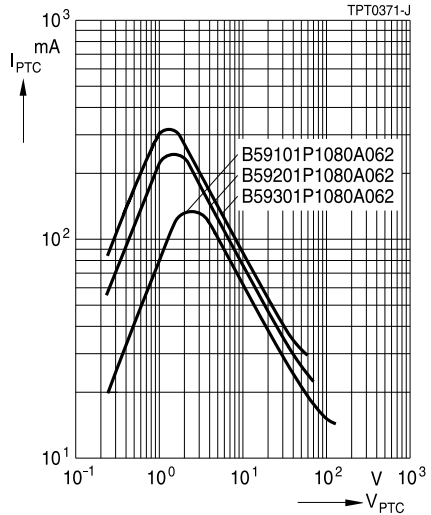
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Characteristics (typical) for $T_{ref} = 80\text{ }^{\circ}\text{C}$

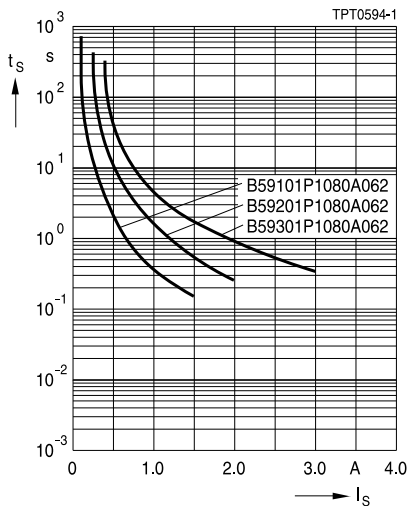
PTC resistance R_{PTC} versus
PTC temperature T_{PTC}
(measured at low signal voltage)



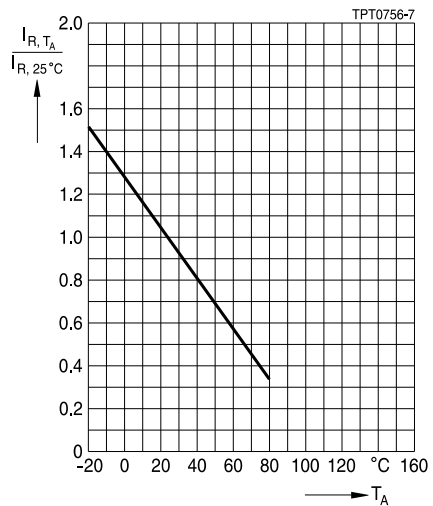
PTC current I_{PTC} versus PTC voltage V_{PTC}
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



Switching time t_s versus switching current I_s
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



Rated current I_R versus ambient temperature T_A
(measured in still air)



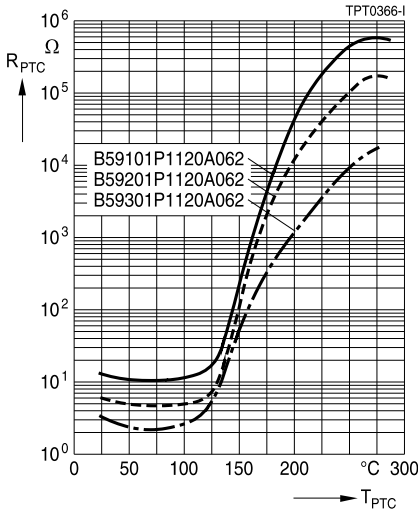
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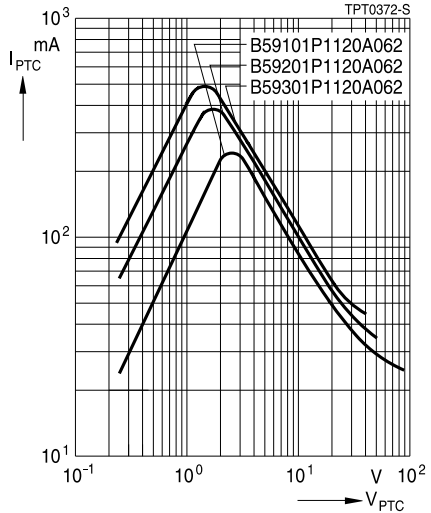
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Characteristics (typical) for $T_{ref} = 120\text{ }^{\circ}\text{C}$

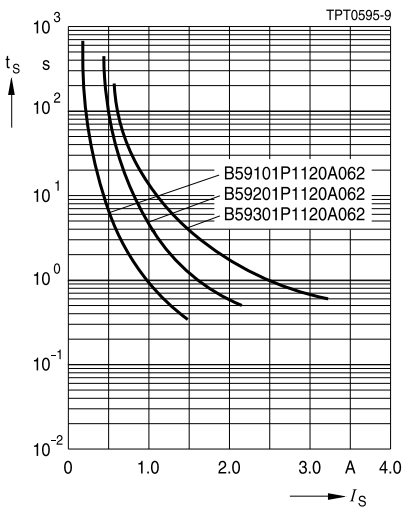
PTC resistance R_{PTC} versus
PTC temperature T_{PTC}
(measured at low signal voltage)



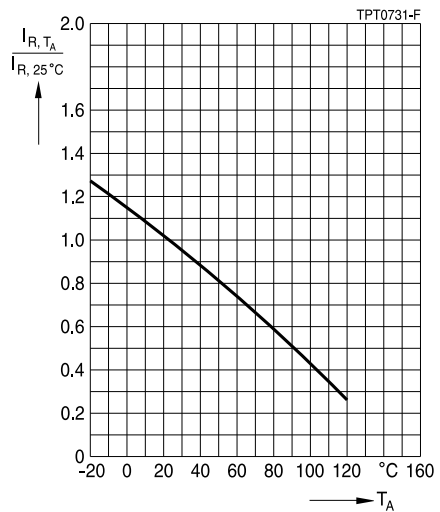
PTC current I_{PTC} versus PTC voltage V_{PTC}
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



Switching time t_s versus switching current I_S
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



Rated current I_R versus ambient temperature T_A
(measured in still air)



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