



## **PTC thermistors for overcurrent protection**

SMDs, EIA sizes 3225 and 4032, 24 V

**Series/Type:** B59101, B59201, B59301

**Date:** February 2012

## Overcurrent protection

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### SMD

#### Applications

- Overcurrent protection
- Short circuit protection

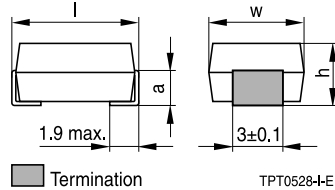
#### Features

- 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

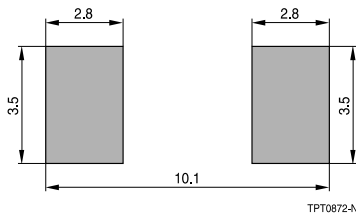


#### Dimensions (mm)

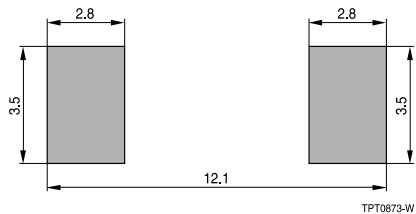
Type	h ±0.5	w ±0.5	l ±0.5	a ±0.3	Size
Reference temperature $T_{ref} = 80\text{ °C}$					
P1101	3.3	6.3	8.0	1.7	3225
P1201	3.3	6.3	8.0	1.7	3225
P1301	3.3	8.0	10.0	2.3	4032
Reference temperature $T_{ref} = 120\text{ °C}$					
P1101	3.3	6.3	8.0	1.7	3225
P1201	3.3	6.3	8.0	1.7	3225
P1301	3.3	8.0	10.0	2.3	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 $R_R$		$\Delta R_R$	±25	%
Operating temperature range	( $V = 0$ )	$T_{op}$	-40/+125	°C
Operating temperature range	( $V = V_{max}$ )	$T_{op}$	-40/+60	°C

**Overcurrent protection**
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**SMD**
**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	$R_R$ $\Omega$	$R_{min}$ $\Omega$	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 <sup>2</sup> 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%

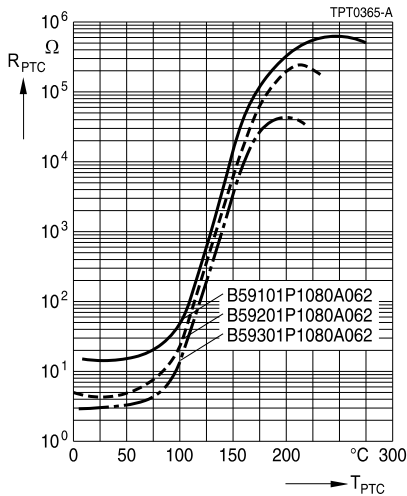
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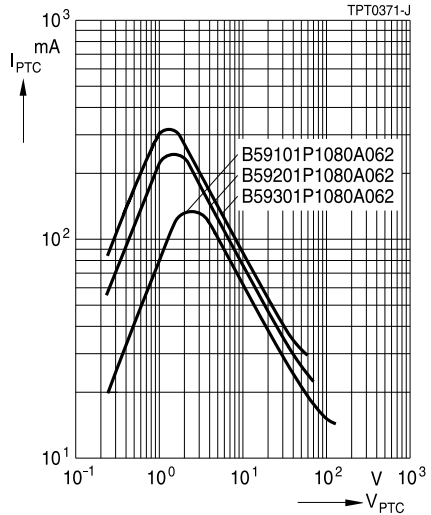
### SMD

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

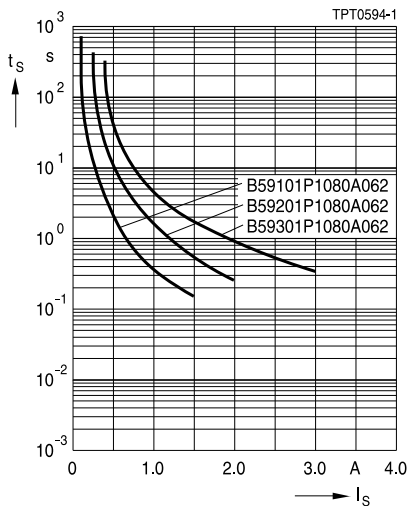
PTC resistance  $R_{PTC}$  versus  
PTC temperature  $T_{PTC}$   
(measured at low signal voltage)



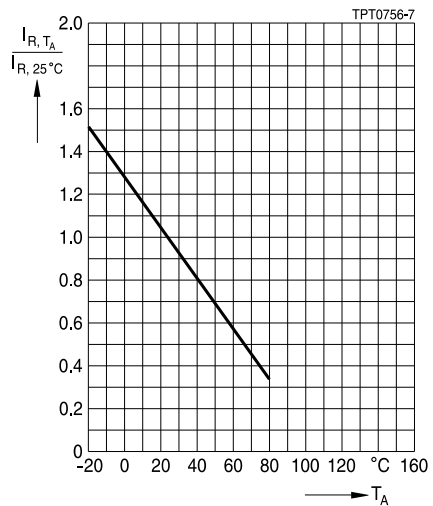
PTC current  $I_{PTC}$  versus PTC voltage  $V_{PTC}$   
(measured at  $25\text{ }^{\circ}\text{C}$  in still air)



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)



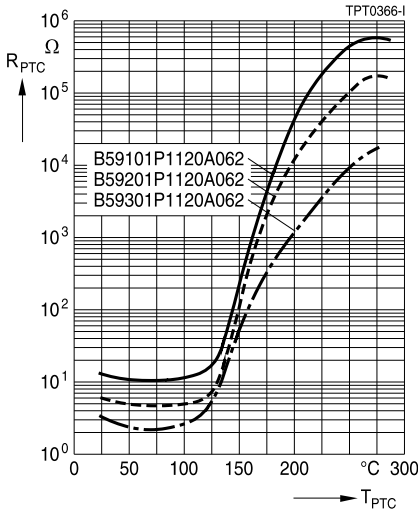
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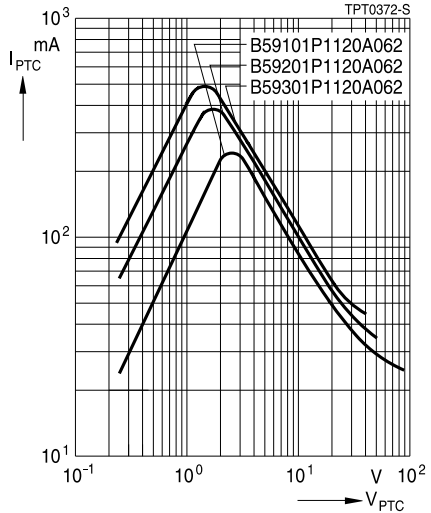
### SMD

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

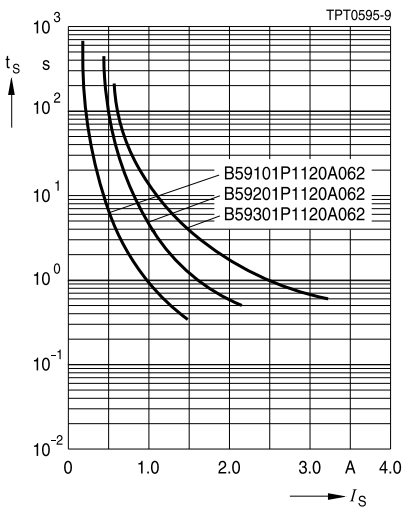
PTC resistance  $R_{PTC}$  versus  
PTC temperature  $T_{PTC}$   
(measured at low signal voltage)



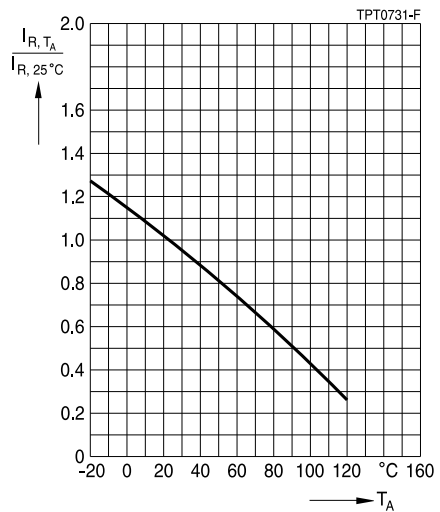
PTC current  $I_{PTC}$  versus PTC voltage  $V_{PTC}$   
(measured at  $25\text{ }^{\circ}\text{C}$  in still air)



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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