



## **PTC thermistors for overcurrent protection**

SMDs, EIA size 3225 and 4032, 63 V

**Series/Type:** B59115 ... B59315  
**Date:** March 2006

## Overcurrent protection

SMDs, EIA Size 3225 and 4032, 63 V

P1115, P1215, P1315

### SMD

#### Applications

- Overcurrent protection
- Short-circuit protection

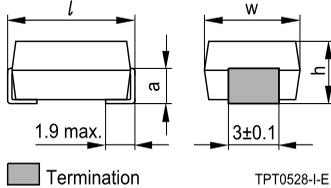
#### Features

- Molded epoxy encapsulation, lead-free tinned solder terminals
- Suitable for wave and reflow soldering
- Suitable for automatic placement
- RoHS-compatible

#### Delivery mode

- Blister tape, 330-mm reel

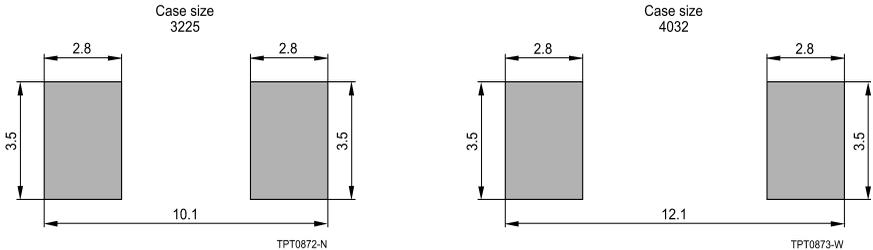
#### Dimensional drawing



#### Dimensions (mm)

Type	h ±0.5	w ±0.5	l ±0.5	a ±0.3	Size
Reference temperature = 80 °C					
P1115	3.3	6.3	8.0	1.7	3225
P1215	3.3	6.3	8.0	1.7	3225
P1315	3.3	8.0	10.0	2.3	4032
Reference temperature = 120 °C					
P1115	3.3	6.3	8.0	1.7	3225
P1215	3.3	6.3	8.0	1.7	3225
P1315	3.3	8.0	10.0	2.3	4032

#### Geometry of solder pads



Recommended maximum dimensions (mm)

#### General technical data

Max. operating voltage	( $T_A = 60\text{ °C}$ )	$V_{\max}$	80	VDC or VAC
Rated voltage		$V_R$	63	VDC or VAC
Switching cycles		N	100	
Tolerance of $R_R$		$\Delta R_R$	±25	%
Operating temperature range	( $V = 0$ )	$T_{\text{op}}$	-40/+125	°C
Operating temperature range	( $V = V_{\max}$ )	$T_{\text{op}}$	-40/+60	°C

**Overcurrent protection**
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**P1115, P1215, P1315**
**SMD**
**Electrical specifications and ordering codes**

Type	$I_R$ mA	$I_S$ mA	$I_{Smax}$ ( $V = V_{max}$ ) A	$I_r$ ( $V = V_{max}$ ) typ. mA	$R_R$ $\Omega$	$R_{min}$ $\Omega$	Ordering code
<b>Reference temperature <math>T_{ref} = 80\text{ }^\circ\text{C}</math></b>							
P1315	80	165	1.6	15.0	16	9.6	B59315P1080A062
P1215	65	135	1.0	11.5	25	15.0	B59215P1080A062
P1115	40	85	0.7	9.0	55	32.2	B59115P1080A062
<b>Reference temperature <math>T_{ref} = 120\text{ }^\circ\text{C}</math></b>							
P1315	150	310	1.6	20.0	16	9.6	B59315P1120A062
P1215	100	210	1.0	14.0	25	15.0	B59215P1120A062
P1115	70	145	0.7	13.0	55	32.2	B59115P1120A062

**Overcurrent protection**

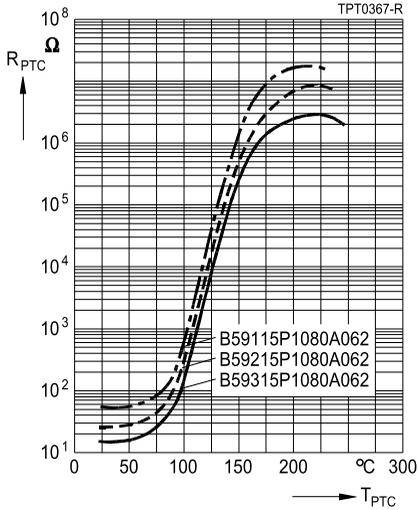
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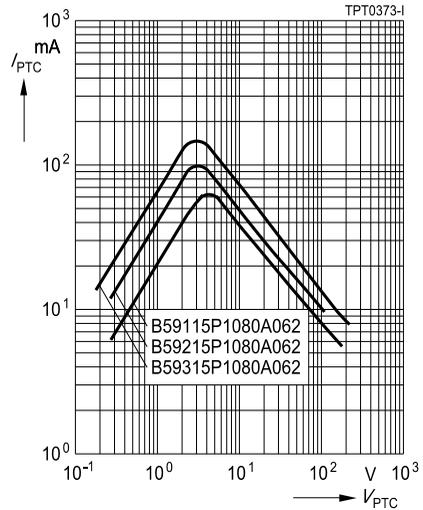


**Characteristics (typical) for  $T_{ref} = 80\text{ }^{\circ}\text{C}$**

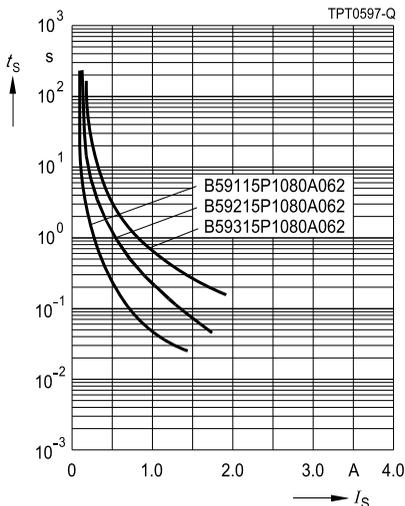
PTC resistance  $R_{PTC}$  versus  
PTC temperature  $T_{PTC}$   
(measured at low signal voltage)



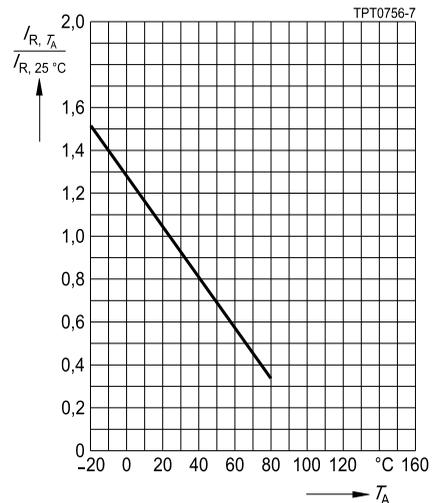
PTC current  $I_{PTC}$  versus PTC voltage  $V_{PTC}$   
(measured at  $25\text{ }^{\circ}\text{C}$  in still air)



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)



**Overcurrent protection**

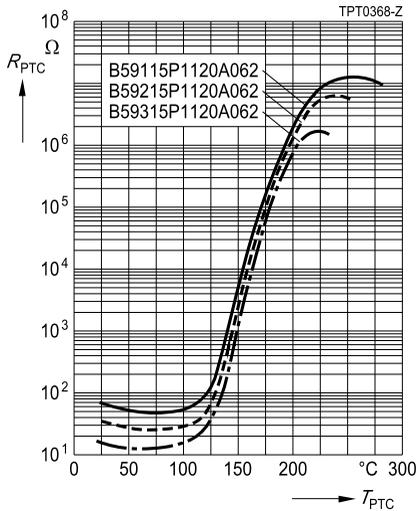
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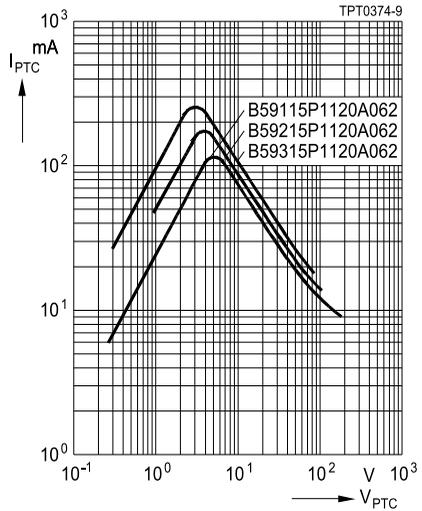


**Characteristics (typical) for  $T_{ref} = 120\text{ }^{\circ}\text{C}$**

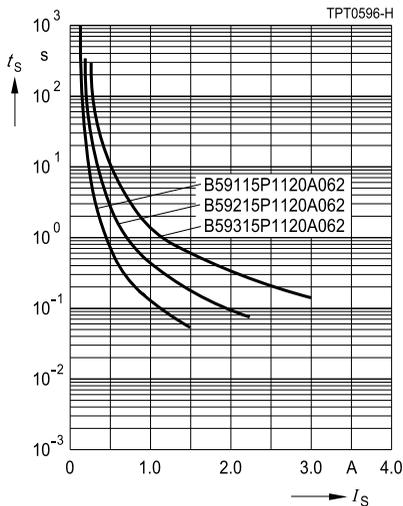
PTC resistance  $R_{PTC}$  versus  
PTC temperature  $T_{PTC}$   
(measured at low signal voltage)



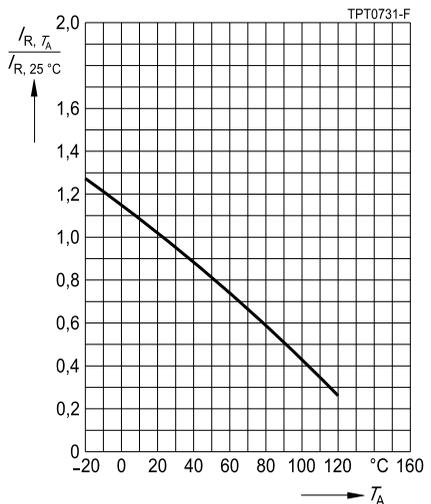
PTC current  $I_{PTC}$  versus PTC voltage  $V_{PTC}$   
(measured at  $25\text{ }^{\circ}\text{C}$  in still air)



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)





## Cautions and warnings

### General

- EPCOS thermistors are designed for specific applications and should not be used for purposes not identified in our specifications, application notes and data books unless otherwise agreed with EPCOS during the design-in-phase.
- Ensure suitability of thermistor through reliability testing during the design-in phase. The thermistors should be evaluated taking into consideration worst-case conditions.

### Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature  $-25\text{ °C} \dots +45\text{ °C}$ , relative humidity  $\leq 75\%$  annual mean, maximum 95%, dew precipitation is inadmissible.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environment with effect on function on long-term operation (examples given under operation precautions).
- Use thermistor within 6 months after delivery.

### Handling

- PTCs must not be dropped. Chip-offs must not be caused during handling of PTCs.
- Components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.

### Soldering

- Use rosin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.

### Mounting

- Electrode must not be scratched before/during/after the mounting process.
- Contacts and housing used for assembly with thermistor have to be clean before mounting. Especially grease or oil must be removed.
- When PTC thermistors are encapsulated with sealing material, the precautions given in chapter "Mounting instructions", "Sealing and potting" must be observed.
- When the thermistor is mounted, there must not be any foreign body between the electrode of the thermistor and the clamping contact.
- The minimum force of the clamping contacts pressing against the PTC must be 10 N.
- During operation, the thermistor's surface temperature can be very high. Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling at the thermistors.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of thermistor. Be sure that surrounding parts and materials can withstand this temperature.
- Avoid contamination of thermistor surface during processing.



### Operation

- Use thermistors only within the specified temperature operating range.
- Use thermistors only within the specified voltage and current ranges.
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions. Avoid use in deoxidizing gases (chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas etc), corrosive agents, humid or salty conditions. Contact with any liquids and solvents should be prevented.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by abnormal function (e.g. use VDR for limitation of overvoltage condition).

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