



PTC thermistors for overcurrent protection

SMDs, EIA sizes 3225 and 4032, 24 V

Series/Type: B59101, B59201, B59301

Date: November 2013

Overcurrent protection

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SMD

Applications

- Overcurrent protection
- Short circuit protection

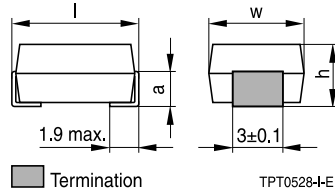
Features

- 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
- Moisture sensitivity level (MSL) 1 acc. to JEDEC J-STD-020D
- RoHS-compatible

Delivery mode

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

Dimensional drawing

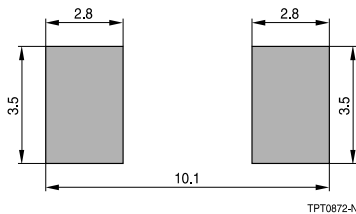


Dimensions (mm)

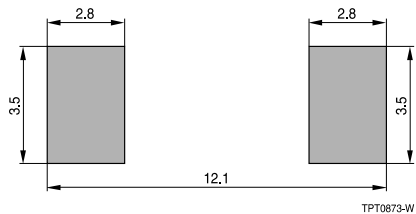
Type	h ±0.5	w ±0.5	l ±0.5	a ±0.3	Size
Reference temperature $T_{ref} = 80\text{ °C}$					
P1101	3.3	6.3	8.0	1.7	3225
P1201	3.3	6.3	8.0	1.7	3225
P1301	3.3	8.0	10.0	2.3	4032
Reference temperature $T_{ref} = 120\text{ °C}$					
P1101	3.3	6.3	8.0	1.7	3225
P1201	3.3	6.3	8.0	1.7	3225
P1301	3.3	8.0	10.0	2.3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

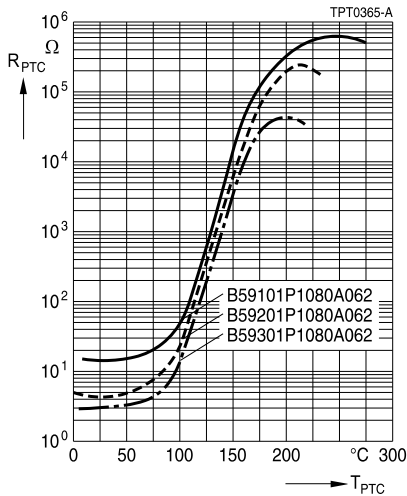
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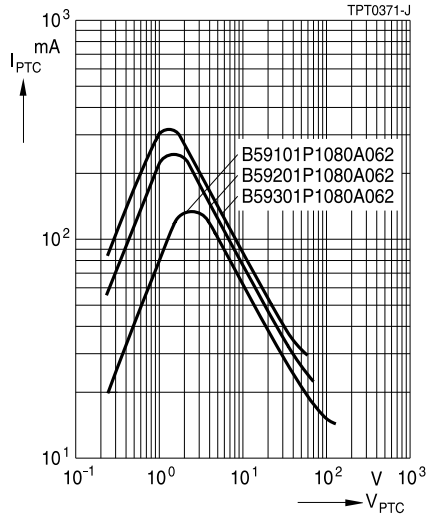
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Characteristics (typical) for $T_{ref} = 80\text{ }^{\circ}\text{C}$

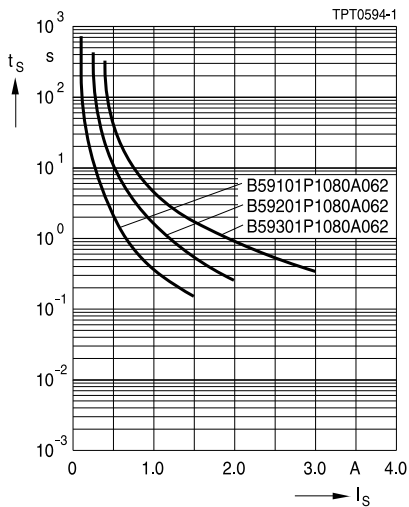
PTC resistance R_{PTC} versus
PTC temperature T_{PTC}
(measured at low signal voltage)



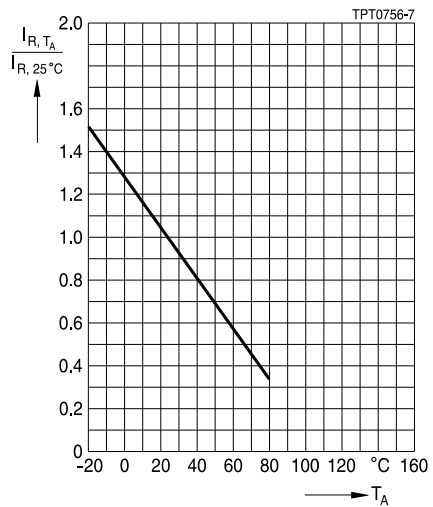
PTC current I_{PTC} versus PTC voltage V_{PTC}
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



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)



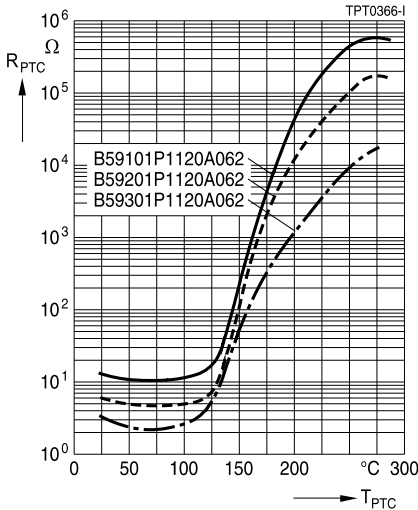
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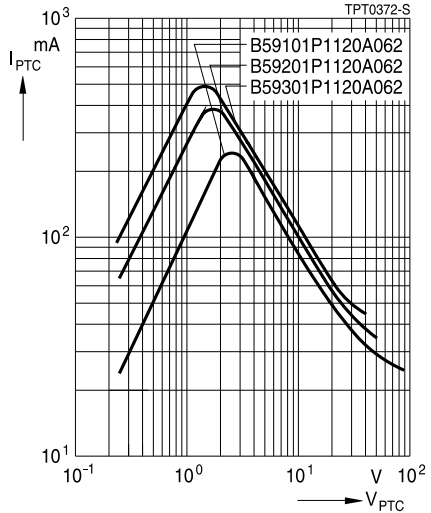
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Characteristics (typical) for $T_{ref} = 120\text{ }^{\circ}\text{C}$

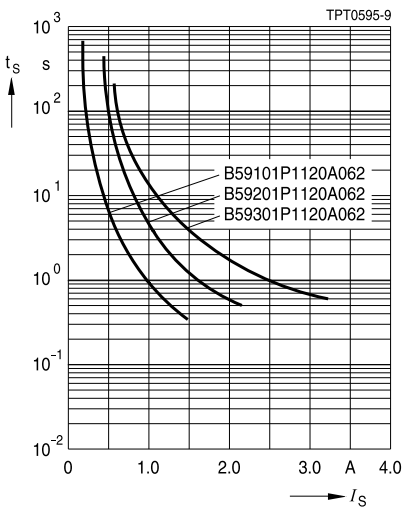
PTC resistance R_{PTC} versus
PTC temperature T_{PTC}
(measured at low signal voltage)



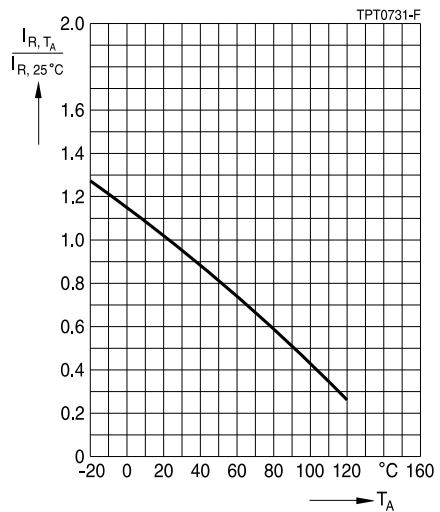
PTC current I_{PTC} versus PTC voltage V_{PTC}
(measured at $25\text{ }^{\circ}\text{C}$ in still air)



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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