

## ➤ Features

- 60Vdc max voltage
- RoHS compliant, lead-free and halogen-free
- Resettable feature
- Ideal for a broad range of general electronics using a low voltage power supply

## ➤ Applications

- Load protection on wide range of low voltage power supplies
- Computers, Computers peripherals
- General electronics

## ➤ Electrical Characteristics (25°C)

Part Number	$I_{hold}$	$I_{trip}$	$V_{max}$	$I_{max}$	$P_{d\ typ}$	Time to trip		$R_{i\ min}$	$R_{1\ max}$
	(A)	(A)	(V <sub>dc</sub> )	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)
BH60-003	0.03	0.09	60	40	1.00	0.15	10.0	33.0	110.5
BH60-005	0.05	0.15	60	40	1.00	0.25	10.0	7.50	44.2
BH60-010	0.10	0.25	60	40	1.00	0.50	10.0	2.50	6.75
BH60-017	0.17	0.35	60	40	1.00	0.85	10.0	2.00	4.80
BH60-020	0.20	0.40	60	40	1.00	1.00	10.0	1.50	4.26
BH60-025	0.25	0.50	60	40	1.00	1.25	10.0	1.00	2.93
BH60-030	0.30	0.60	60	40	1.00	1.50	10.0	0.76	2.04
BH60-040	0.40	0.80	60	40	1.00	2.00	10.0	0.52	1.29
BH60-050	0.50	1.00	60	40	1.00	2.50	10.0	0.41	1.16
BH60-065	0.65	1.30	60	40	1.00	3.25	10.0	0.27	0.72
BH60-075	0.75	1.50	60	40	1.00	3.75	10.0	0.18	0.60
BH60-090	0.90	1.80	60	40	1.00	4.50	10.0	0.14	0.465
BH60-110	1.10	2.20	60	40	1.51	5.50	10.0	0.14	0.375
BH60-135	1.35	2.70	60	40	1.71	6.75	10.0	0.12	0.285
BH60-160	1.60	3.20	60	40	1.98	8.00	11.4	0.09	0.21
BH60-185	1.85	3.70	60	40	2.10	9.25	12.6	0.08	0.18
BH60-250	2.50	5.00	60	40	2.50	12.5	15.6	0.05	0.12
BH60-300	3.00	6.00	60	40	2.80	15.0	19.8	0.04	0.09
BH60-375	3.75	7.50	60	40	3.20	18.75	24.0	0.03	0.075
BH60-500	5.00	10.0	60	40	3.50	25.00	30.0	0.015	0.075

## ➤ Vocabulary

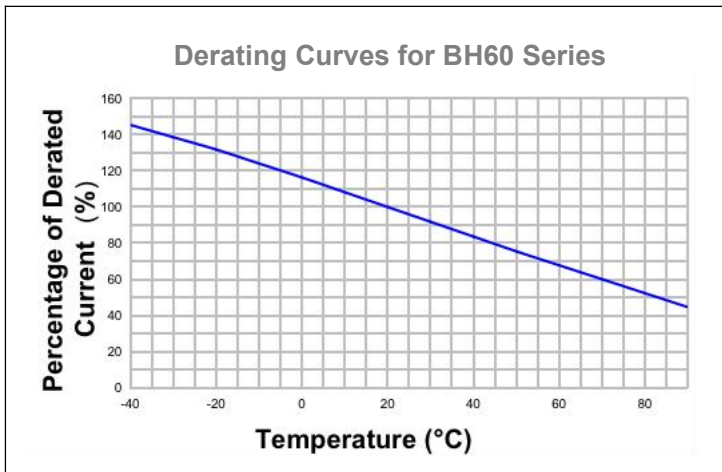
- I<sub>hold</sub>** = Hold current: maximum current device will pass without tripping in 25°C still air.
- I<sub>trip</sub>** = Trip current: minimum current at which the device will trip in 25°C still air.
- V<sub>max</sub>** = Maximum voltage device can withstand without damage at rated current (**I<sub>max</sub>**).
- I<sub>max</sub>** = Maximum fault current device can withstand without damage at rated voltage (**V<sub>max</sub>**).
- P<sub>d typ.</sub>** = Typical power dissipated from device when in the tripped state at 25°C still air.
- R<sub>min</sub>** = Minimum resistance of device in initial (un-soldered) state.
- R<sub>1max</sub>** = Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

**Caution: Operation beyond the specified ratings may result in damage and possible arcing and flame.**

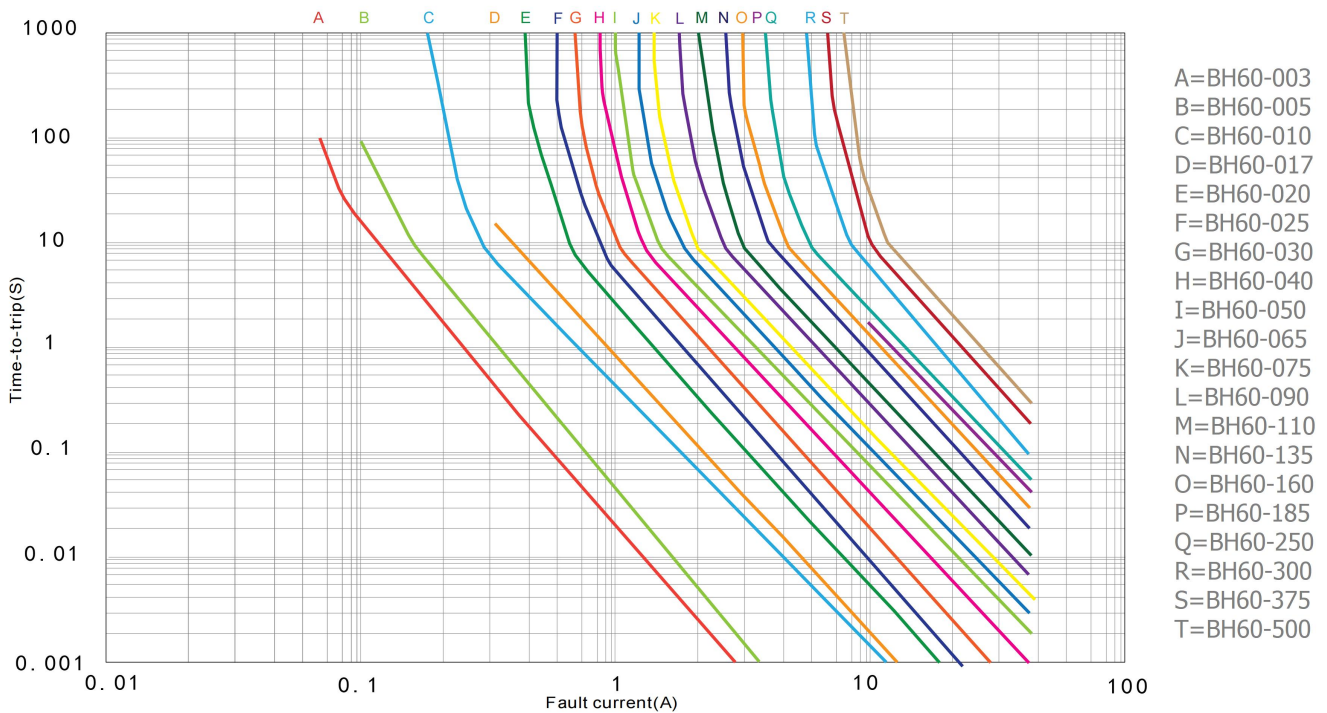
## ➤ Warning

- Users shall independently assess the suitability of these devices for each of their applications.
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire.
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration.
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the prolonged of these PPTC devices.
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses.
- Circuits with inductance may generate a voltage ( $L di/dt$ ) above the rated voltage of the PPTC device.

➤ Thermal Derating Curve



➤ Average Time-Current Curve



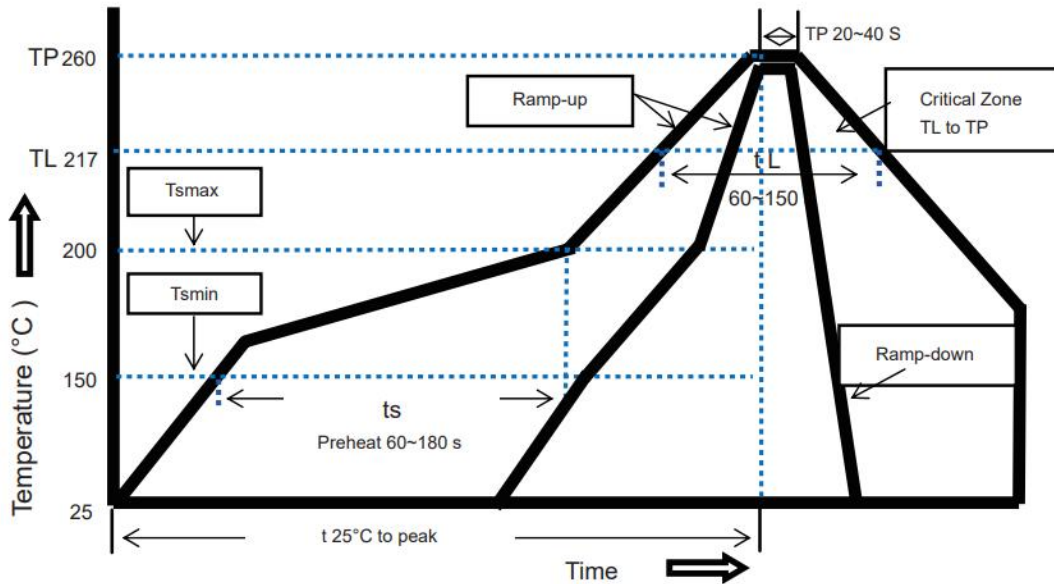
## ➤ Thermal Derating Chart

Part Number	Ambient operating temperature hold current( $I_{hold}$ )								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
BH60-003	0.047	0.041	0.036	0.030	0.024	0.021	0.018	0.015	0.011
BH60-005	0.079	0.069	0.060	0.050	0.041	0.035	0.030	0.025	0.018
BH60-010	0.158	0.138	0.119	0.100	0.081	0.070	0.060	0.050	0.036
BH60-017	0.269	0.235	0.202	0.170	0.138	0.119	0.102	0.085	0.061
BH60-020	0.316	0.276	0.238	0.200	0.162	0.140	0.120	0.100	0.072
BH60-025	0.395	0.345	0.298	0.250	0.203	0.175	0.150	0.125	0.090
BH60-030	0.474	0.414	0.357	0.300	0.243	0.210	0.180	0.150	0.108
BH60-040	0.632	0.552	0.476	0.400	0.324	0.280	0.240	0.200	0.144
BH60-050	0.790	0.690	0.595	0.500	0.405	0.350	0.300	0.250	0.180
BH60-065	1.027	0.897	0.774	0.650	0.527	0.455	0.390	0.325	0.234
BH60-075	1.185	1.035	0.893	0.750	0.608	0.525	0.450	0.375	0.270
BH60-090	1.422	1.242	1.071	0.900	0.729	0.630	0.540	0.450	0.324
BH60-110	1.738	1.518	1.309	1.100	0.891	0.770	0.660	0.550	0.396
BH60-135	2.133	1.863	1.607	1.350	1.094	0.945	0.810	0.675	0.486
BH60-160	2.528	2.208	1.904	1.600	1.296	1.120	0.960	0.800	0.576
BH60-185	2.923	2.553	2.202	1.850	1.499	1.295	1.110	0.925	0.666
BH60-250	3.950	3.450	2.975	2.500	2.025	1.750	1.500	1.250	0.900
BH60-300	4.740	4.140	3.570	3.000	2.430	2.100	1.800	1.500	1.080
BH60-375	5.925	5.175	4.463	3.750	3.038	2.625	2.250	1.875	1.350
BH60-500	7.900	6.900	5.950	5.000	4.050	3.500	3.000	2.500	1.800

## ➤ Environmental Specifications

Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hours	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202, Method 215	No change
Vibration	MIL-STD-202, Method 201	No change
Ambient operating conditions : - 40 °C to +85 °C		
Maximum surface temperature of the device in the tripped state is 125 °C		

➤ **Soldering Parameters**



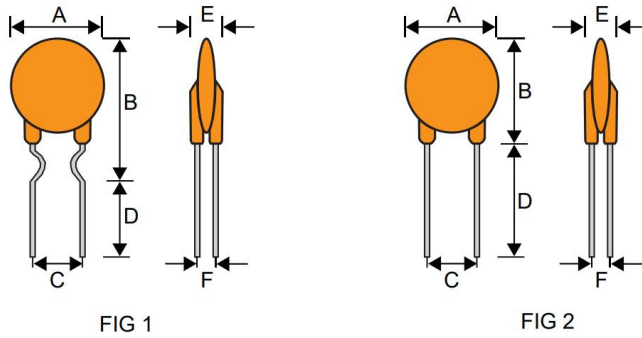
Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate( $T_{s_{max}}$ to $T_p$ )	3°C/second max
Preheat	
-Temperature Min( $T_{s_{min}}$ )	150°C
-Temperature Max( $T_{s_{max}}$ )	200°C
-Time( $T_{s_{min}}$ to $T_{s_{max}}$ )	60~180 seconds
Time maintained above:	
-Temperature( $T_L$ )	217°C
-Time( $t_L$ )	60~150 seconds
Peak Temperature( $T_p$ )	260°C
Ramp-Down Rate	6°C/second max
Time 25°C to Peak Temperature	8 minutes max
Storage Condition	0°C~30°C,30%-60%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N<sub>2</sub> environment for lead-free.
- Recommended maximum paste thickness is 0.25mm.
- Devices can be cleaned using standard industry methods and solvents.

**Note 1:** All temperature refer to topside of the package, measured on the package body surface.

**Note 2:** If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

➤ **Physical Dimensions & Recommended Pad Layout (mm)**



Part Number	Quantity	A	B	C	D	E	F	Lead	
		Min	Max	Typ	Max	Min	Typ	φ	FIG
BH60-003	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-005	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-010	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-017	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-020	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-025	500	7.4	12.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-030	500	7.4	13.0	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-040	500	7.6	13.5	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-050	500	7.9	13.7	5.1±0.5	7.6	3.1	1.1	0.5	1
BH60-065	500	9.4	15.6	5.1±0.5	7.6	3.1	1.2	0.6	1
BH60-075	500	10.2	16.4	5.1±0.5	7.6	3.1	1.2	0.6	1
BH60-090	500	11.2	16.7	5.1±0.5	7.6	3.1	1.2	0.6	1
BH60-110	500	12.8	17.7	5.1±0.5	7.6	3.1	1.4	0.8	2
BH60-135	500	14.5	18.7	5.1±0.5	7.6	3.1	1.4	0.8	2
BH60-160	500	16.3	20.5	5.1±0.5	7.6	3.1	1.4	0.8	2
BH60-185	500	17.5	21.6	5.1±0.5	7.6	3.1	1.4	0.8	2
BH60-250	500	21.0	25.3	10.2±0.5	7.6	3.1	1.4	0.8	2
BH60-300	500	24.5	28.6	10.2±0.5	7.6	3.1	1.4	0.8	2
BH60-375	500	27.2	31.8	10.2±0.5	7.6	3.1	1.4	0.8	2
BH60-500	500	27.2	31.8	10.2±0.5	7.6	3.1	1.4	0.8	2

➤ **Contact information**

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