DATASHEET

PolySwitch AHEF Devices

For use in helping to provide resettable overcurrent protection for bus and truck wire harnesses utilizing 24V electrical systems, PolySwitch AHEF devices are rated for a maximum operating temperature of 125°C, permitting their use in both passenger and engine compartments. The product family of seven devices includes hold-current ratings from 0.50A to 10A, with a maximum fault-current rating of 100A, and a maximum operating voltage rating of 32V for all devices. The radial-leaded devices are tested to the AECQ200 standard and are RoHS and ELV compliant.

Next-generation wire harnesses generally utilize a hierarchal structure with main power trunks dividing into smaller branches and containing overcurrent protection at each node. The PolySwitch AHEF devices facilitate new harness architectures by providing resettable protection, which allows placement in inaccessible locations, such as under the seat or in door panels.

PolySwitch AHEF devices give designers the ability to locate junction boxes close to their intended electronics, whether in the passenger compartment to help protect BCUs (Body Control Units)/or in the engine compartment to help protect HVAC controls.

Benefits:

- Resettable functionality permits placement in inaccessible locations
- High temperature rating permits use in harsh underhood applications
- Worldwide team dedicated to supporting automotive design applications

Features:

- Wide range of form factor and termination methods
- Products meet all applicable automotive industry standards
- Devices compatible with high-volume electronics assembly

Applications:

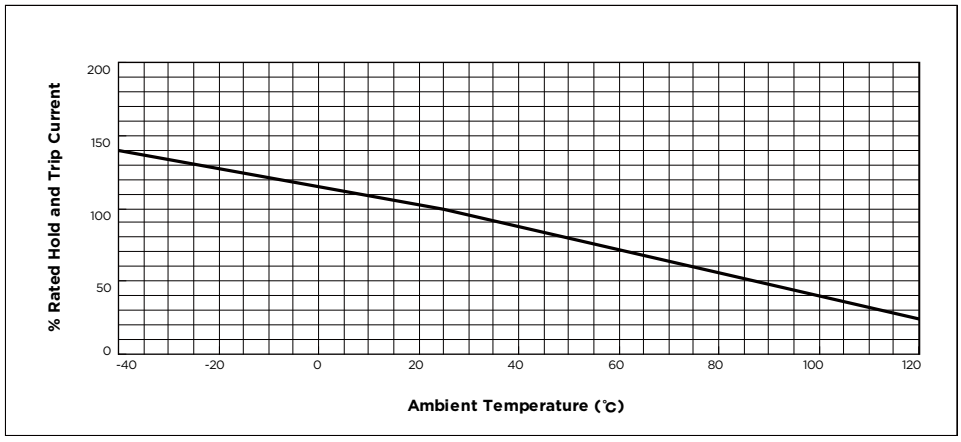
- 24V battery automotive applications
- Automobile harnesses
- Junction boxes
- Electronic control modules
- Automotive actuators
- Medium-sized DC motors

Thermal Derating [Hold Current (A) at Ambient Temperature (°C)]

		Maximum Ambient Temperature										
	Part Number	**-40°C**	**-20°C**	**0°C**	**20°C**	**25°C**	**40°C**	**50°C**	**60°C**	**70°C**	**85°C**	**125°C**
	AHEF (High Temperature) 32V—Radial-leaded											
NEW	AHEF050	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.1
NEW	AHEF070	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.2
NEW	AHEF100	1.4	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.6	0.2
NEW	AHEF300	4.1	3.8	3.4	3.1	3.0	2.7	2.4	2.2	2.0	1.7	0.6
NEW	AHEF500	6.8	6.3	5.7	5.2	5.0	4.5	4.1	3.7	3.3	2.8	1
NEW	AHEF750	10.2	9.4	8.6	7.7	7.5	6.7	6.1	5.6	5.0	4.1	1.5
NEW	AHEF1000	13.6	12.5	11.4	10.3	10.0	8.9	8.1	7.4	6.6	5.5	2

Thermal Derating Curves

AHEF



Electrical Characteristics

	Part Number	IH(A)@ R_{1Max}	IH(A)@ R_{aMax}	IT (A)	V_{Max} (V_{DC})	I_{Max} (A)	$P_{D\ TYP}$ (W)	Max. Time-to-trip (A)	(S)	R_{Min} (Ω)	R_{1Max} (Ω)	R_{aMax} (Ω)
	AHEF											
	32V - Radial-leaded (High Temperature)											
NEW	AHEF 050	0.5	0.5	1.0	32	100	0.9	2.5	3.0	0.3500	1.100	1.100
NEW	AHEF 070	0.7	0.7	1.4	32	100	0.9	3.5	3.2	0.2300	0.800	0.800
NEW	AHEF 100	1.0	1.0	1.9	32	100	1.4	5.0	6.2	0.1500	0.430	0.430
NEW	AHEF 300	3.0	3.0	6.0	32	100	3.2	15.0	5.0	0.0350	0.110	0.110
NEW	AHEF 500	5.0	5.0	10.0	32	100	5.3	25.0	9.0	0.0150	0.040	0.040
NEW	AHEF 750	7.5	7.5	15.0	32	100	6.5	37.5	13.0	0.0074	0.023	0.023
NEW	AHEF 1000	10.0	10.0	20.0	32	100	7.0	50.0	15.0	0.0060	0.016	0.016

Notes :

IH = Hold current: maximum current device will pass without interruption in 25°C still air, unless otherwise specified.

IT = Trip current: minimum current that will switch the device from low resistance to high resistance in 25°C still air, unless otherwise specified.

V_{MAX} = Maximum voltage device can withstand without damage at rated current.

I_{MAX} = Maximum fault current device can withstand without damage at rated voltage.

P_D = Power dissipated from device when in the tripped state in 25°C still air, unless otherwise specified.

R_{1MAX} = Maximum resistance of device when measured one hour post trip at 25°C unless otherwise specified.

R_{aMAX} = Maximum functional resistance of device after being subjected to the stresses described in PS400 at 25°C, unless otherwise specified.

R_{MIN} = Minimum resistance of device as supplied at 25°C, unless otherwise specified.

Dimension Figures

Figure 1

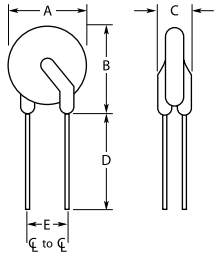


Figure 2

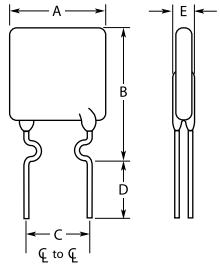


Figure 3

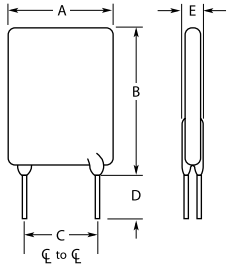
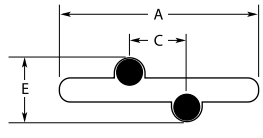


Figure 4



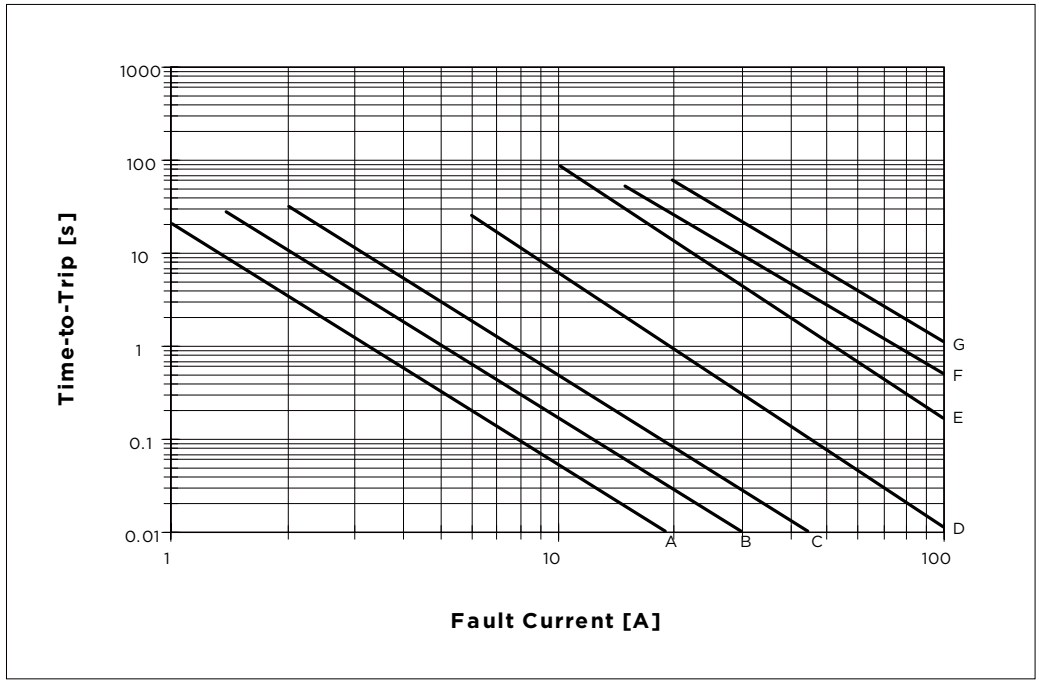
Dimensions in Millimeters (Inches)

	Part Number	Dimension A Min.	A Max.	B Min.	B Max.	C Min.	C Max.	D Min.	D Max.	E Min.	E Max.	Figure
	AHEF 32V - Radial-leaded (High Temperature)											
NEW	AHEF050	—	7.4 (0.29)	—	12.7 (0.50)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.3 (0.13)	1, 4
NEW	AHEF070	—	6.9 (0.27)	—	10.8 (0.43)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	2, 4
NEW	AHEF100	—	9.7 (0.38)	—	13.6 (0.54)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	1, 4
NEW	AHEF300	—	10.2 (0.40)	—	15.5 (0.61)	4.32 (0.17)	5.84 (0.23)	7.6 (0.30)	—	—	3.8 (0.15)	3, 4
NEW	AHEF500	—	14.0 (0.55)	—	24.1 (0.95)	4.3 (0.17)	5.8 (0.23)	11.5 (0.45)	—	—	3.8 (0.15)	3, 4
NEW	AHEF750	—	21.1 (0.83)	—	24.9 (0.98)	9.4 (0.37)	10.9 (0.43)	7.6 (0.30)	—	—	3.8 (0.15)	3, 4
NEW	AHEF1000	—	23.5 (0.93)	—	27.9 (1.10)	9.4 (0.37)	10.9 (0.43)	7.6 (0.30)	—	—	4.0 (0.16)	3, 4

Typical Time-to-trip at 25°C

AHEF

A = AHEF050
B = AHEF070
C = AHEF100
D = AHEF300
E = AHEF500
F = AHEF750
G = AHEF1000



Physical Characteristics and Environmental Specifications

AHEF
Physical Characteristics

Lead material	AHEF050 to AHEF100: Tin-plated Copper Clad Steel, 0.205mm² (24AWG), ø0.51mm/0.020in AHEF300 to AHEF750: Tin-plated Copper 0.52mm² (20 AWG), ø0.81mm/0.032in AHEF1000: Tin-plated Copper 0.82mm² (18AWG), ø1.0mm/0.04in
Soldering characteristics	Solderability per ANSI/J-STD 002 Category 3
Solder heat withstand	per IEC 68-2-20, Test Tb, Method 1A, Condition B; can withstand 10 seconds at 260°C ± 5°C
Insulating material	Cured, flame-retardant epoxy polymer; meets UL 94V-0 requirements

Note: Devices are not designed to be placed through a reflow process.

AHEF
Physical Characteristics

Test	Conditions	Resistance Change
Passive aging	70°C, 1000 hours 85°C, 1000 hours	±5% ±5%
Humidity aging	85°C, 85% RH, 1000 hours	±5%
Thermal shock	125°C, -40°C (10 times)	±5%
Solvent resistance	MIL-STD-202, Method 215F	No change

Packaging and Marking Information

	Part Number	Bag Quantity	Tape & Reel Quantity	Ammo Quantity	Standard Package Quantity	Part Marking
NEW	AHEF050	500	—	—	10,000	EF0.5
NEW	AHEF070	500	—	—	10,000	EF0.7
NEW	AHEF100	500	—	—	10,000	EF1.0
NEW	AHEF300	500	—	—	10,000	EF3
NEW	AHEF500	250	—	—	5,000	EF5
NEW	AHEF750	250	—	—	5,000	EF7.5
NEW	AHEF1000	250	—	—	5,000	EF10

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