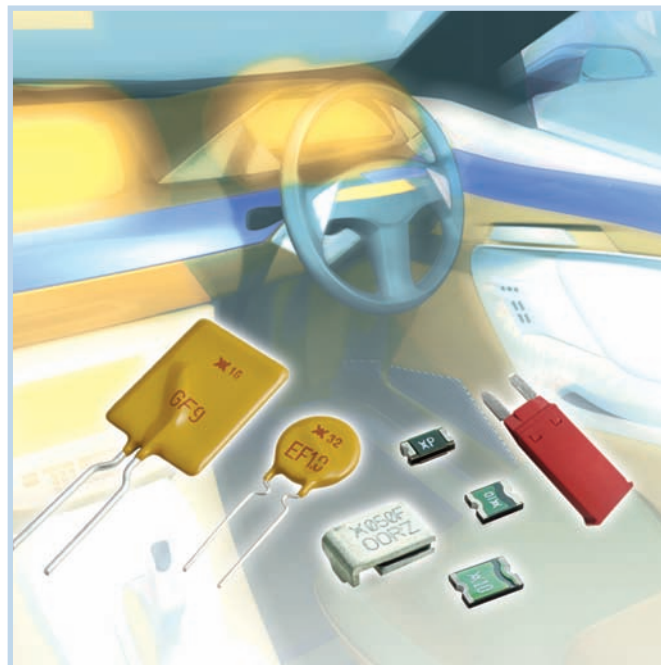




PolySwitch Resettable Devices Automotive Devices

We have provided PPTC resettable devices for the automotive industry for over 25 years. With the advent of TS16949 and our continued involvement in the automotive industry, we developed automotive specific versions of our PolySwitch PPTC devices (nanoASMD, microASMD, miniASMD, AHS, ASMD, AHRF, AHEF, AGRF and BD). These products are qualified and sold under PS400 specification which is derived from AEC-Q200, the standard for electronic components used in the automotive industry. The key difference between these product families and other protection devices in our circuit protection product portfolio is the qualification process followed according to a series of rigorous tests related to the automotive environment. As a result, they are characterized by specific additional values determined post automotive related testing.



Benefits

- Expertise from the world's leading resettable overcurrent protection manufacturer
- High quality products from the world's largest passive component manufacturer
- Worldwide team dedicated to support automotive applications
- Wide range of dedicated automotive surface-mount and radial-leaded resettable overcurrent devices
- High performance transient voltage protection devices

Applications

- Motor and motor circuit protection including power door-locks, mirrors, lumbar pumps, seats, sunroofs and windows
- Electronic Control Unit (ECU) I/O protection
- Heating Ventilation and Cooling (HVAC) motor and I/O protection
- Telematics, infotainment and navigations systems
- Liquid Crystal Display (LCD) back-light heaters
- Power and cigarette lighter outlets, plugs and adapter/chargers

Features

- RoHS compliant
- Overcurrent and overvoltage circuit protection devices
- Resettable and single-use overcurrent devices
- Wide range of form factor and termination methods
- Products meet applicable automotive industry standards
- Devices compatible with high-volume electronics assembly
- Powered networks and busses
- Air-flow detection and overcurrent protection in HVAC and cooling fan systems
- Stall detection in express window and sunroof circuits
- Power distribution, electrical centers and junction box resettable overcurrent protection
- Wire downsizing
- Motor Electromagnetic Interference (EMI) suppression
- Electrostatic Discharge (ESD) damage protection
- Load dump and other transient voltage protection

Table A1 Product Series - Current Rating, Voltage Rating / Typical Resistance for Automotive Devices

Voltage Rating	AGRF 16V	AHRF 16V	AHRF 30V	AHEF 32V	AHS 16V	ASMD 16V	ASMD 30V	ASMD 60V	BD 14V
Hold Current (A)									
0.30	—	—	—	—	—	—	—	2.90Ω	—
0.50	—	—	0.565Ω	0.5650Ω	—	—	—	0.90Ω	—
0.70	—	—	0.385Ω	0.3850Ω	—	—	—	—	—
0.75	—	—	—	—	—	—	0.60Ω	—	—
0.80	—	—	—	—	0.25Ω	—	—	—	—
1.00	—	—	0.225Ω	0.2250Ω	—	—	0.30Ω	—	—
1.25	—	—	—	—	—	0.160Ω	—	—	—
1.50	—	—	—	—	—	0.140Ω	—	—	—
1.60	—	—	—	—	0.10Ω	—	—	—	—
1.85	—	—	—	—	—	0.079Ω	—	—	—
2.00	—	0.0565Ω	—	—	0.07Ω	0.090Ω	—	—	—
2.50	—	—	—	—	—	0.060Ω	—	—	—
3.00	—	0.0410Ω	—	0.0520Ω	0.05Ω	—	—	—	—
4.00	0.0300Ω	0.0305Ω	—	—	—	—	—	—	—
4.50	—	0.0290Ω	—	—	—	—	—	—	—
5.00	0.0192Ω	—	—	0.0200Ω	—	—	—	—	—
5.50	—	0.0190Ω	—	—	—	—	—	—	—
6.00	0.0145Ω	0.0180Ω	—	—	—	—	—	—	—
6.50	—	0.0140Ω	—	—	—	—	—	—	—
7.00	0.0105Ω	0.0126Ω	—	—	—	—	—	—	—
7.50	—	0.0120Ω	—	0.0120Ω	—	—	—	—	—
8.00	0.0086Ω	0.0104Ω	—	—	—	—	—	—	0.0115Ω
9.00	0.0070Ω	0.0100Ω	—	—	—	—	—	—	—
10.00	0.0056Ω	0.0083Ω	—	0.0083Ω	—	—	—	—	—
11.00	0.0050Ω	0.0069Ω	—	—	—	—	—	—	—
12.00	0.0046Ω	—	—	—	—	—	—	—	0.0060Ω
13.00	—	0.0055Ω	—	—	—	—	—	—	—
14.00	0.0040Ω	0.0050Ω	—	—	—	—	—	—	—
15.00	—	0.0050Ω	—	—	—	—	—	—	—
16.00	—	—	—	—	—	—	—	—	0.00365Ω
20.00	—	—	—	—	—	—	—	—	0.00285Ω
21.00	—	—	—	—	—	—	—	—	0.00260Ω

Voltage Rating	nanoASMDC 48V	nanoASMDC 24V	nanoASMDC 16V	microASMDC 30V	miniASMDC 60V	miniASMDC 30V	miniASMDC 24V	miniASMDC 16V
Hold Current (A)								
0.05	—	—	—	26.80Ω	—	—	—	—
0.10	—	—	—	8.55Ω	6.70Ω	—	—	—
0.12	3.95Ω	—	—	—	—	—	—	—
0.14	—	—	—	—	3.75Ω	—	—	—
0.16	3.05Ω	—	—	—	—	—	—	—
0.20	—	1.875Ω	—	—	—	1.950Ω	—	—
0.30	—	—	—	—	—	0.975Ω	—	—
0.35	—	—	0.90Ω	—	—	—	—	—
0.50	—	—	—	—	—	—	0.575Ω	—
0.75	—	—	—	—	—	—	0.190Ω	—
1.10	—	—	—	—	—	—	0.120Ω	0.1200Ω
1.25	—	—	—	—	—	—	—	0.0950Ω
1.50	—	—	—	—	—	—	0.080Ω	0.0750Ω
2.60	—	—	—	—	—	—	—	0.0325Ω

**Table A2 Thermal Derating for Automotive Devices
[Hold Current (A) at Ambient Temperature (°C)]**

Part Number	Maximum Ambient Temperature										
	-40°C	-20°C	0°C	20°C	25°C	40°C	50°C	60°C	70°C	85°C	125°C
AGRF											
16V — Radial-leaded											
AGRF400	5.9	5.3	4.8	4.1	4.0	3.5	3.2	2.8	2.5	1.9	—
AGRF500	7.3	6.6	6.0	5.2	5.0	4.4	4.0	3.6	3.1	2.4	—
AGRF600	8.8	8.0	7.2	6.2	6.0	5.2	4.8	4.2	3.8	2.8	—
AGRF700	10.3	9.3	8.4	7.3	7.0	6.2	5.6	5.0	4.4	3.3	—
AGRF800	11.7	10.7	9.6	8.3	8.0	6.9	6.4	5.6	5.1	3.7	—
AGRF900	13.2	11.9	10.7	9.4	9.0	7.9	7.2	6.4	5.6	4.2	—
AGRF1000	14.7	13.3	12.0	10.3	10.0	8.7	8.0	7.0	6.3	4.7	—
AGRF1100	16.1	14.6	13.1	11.5	11.0	9.7	8.8	7.8	6.9	5.2	—
AGRF1200	17.6	16.0	14.4	12.4	12.0	10.4	9.6	8.4	7.6	5.6	—
AGRF1400	20.5	18.7	16.8	14.5	14.0	12.1	11.2	9.8	8.9	6.5	—
AHRF (High Temperature)											
30V — Radial-leaded											
AHRF050	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.1
AHRF070	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.2
AHRF100	1.4	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.6	0.2
AHRF (High Temperature)											
16V — Radial-leaded											
AHRF200	2.7	2.5	2.3	2.1	2.00	1.8	1.6	1.5	1.3	1.1	0.5
AHRF300	4.1	3.7	3.4	3.1	3.00	2.7	2.4	2.2	2.0	1.7	0.7
AHRF400	5.6	5.1	4.7	4.2	4.00	3.6	3.3	3.0	2.7	2.3	1.0
AHRF450	6.1	5.6	5.1	4.6	4.50	4.0	3.6	3.3	3.0	2.5	1.1
AHRF550	7.5	6.9	6.2	5.7	5.50	4.9	4.4	4.0	3.7	3.1	1.4
AHRF600	8.2	7.5	6.8	6.2	6.00	5.3	4.9	4.4	4.0	3.3	1.5
AHRF650	8.8	8.1	7.4	6.7	6.50	5.7	5.3	4.8	4.3	3.6	1.6
AHRF700	9.5	8.7	8.0	7.2	7.00	6.2	5.6	5.2	4.7	3.9	1.7
AHRF750	10.2	9.4	8.6	7.7	7.50	6.6	6.1	5.6	5.0	4.1	1.9
AHRF800	10.9	10.0	9.1	8.2	8.00	7.1	6.4	5.9	5.3	4.4	2.0
AHRF900	12.2	11.2	10.2	9.3	9.00	8.0	7.2	6.6	6.0	5.0	2.2
AHRF1000	13.6	12.5	11.4	10.3	10.00	8.8	8.1	7.4	6.6	5.5	2.5
AHRF1100	14.9	13.7	12.5	11.3	11.00	9.7	8.8	8.1	7.3	6.1	2.7
AHRF1300	17.7	16.3	14.8	13.4	13.00	11.4	10.5	9.6	8.6	7.2	3.3
AHRF1400	19.0	17.5	15.9	14.4	14.00	12.4	11.2	10.3	9.3	7.8	3.5
AHRF1500	20.4	18.8	17.1	15.5	15.00	13.2	12.1	11.1	9.9	8.3	3.8
AHEF (High Temperature)											
32V — Radial-leaded											
AHEF050	0.7	0.6	0.60	0.5	0.5	0.4	0.400	0.40	0.30	0.300	0.1
AHEF070	1.0	0.9	0.80	0.7	0.7	0.6	0.600	0.50	0.50	0.400	0.2
AHEF100	1.4	1.2	1.10	1.0	1.0	0.9	0.800	0.70	0.70	0.600	0.2
AHEF300	4.1	3.8	3.42	3.1	3.0	2.7	2.430	2.22	1.98	1.650	0.6
AHEF500	6.8	6.3	5.70	5.2	5.0	4.5	4.050	3.70	3.30	2.750	1.0
AHEF750	10.2	9.4	8.55	7.7	7.5	6.7	6.075	5.55	4.95	4.125	1.5
AHEF1000	13.6	12.5	11.40	10.3	10.0	8.9	8.100	7.40	6.60	5.500	2.0
AHS (High Temperature)											
16V — Surface-mount											
AHS080-2018	1.20	1.04	0.90	0.80	0.77	0.68	0.62	0.60	0.53	0.46	0.26
AHS160	2.15	1.96	1.78	1.60	1.55	1.42	1.33	1.24	1.15	1.01	0.64
AHS200	2.90	2.50	2.20	2.00	1.94	1.80	1.75	1.70	1.40	1.18	0.67
AHS300	4.20	3.80	3.70	3.00	2.92	2.63	2.44	2.10	2.00	1.76	1.00

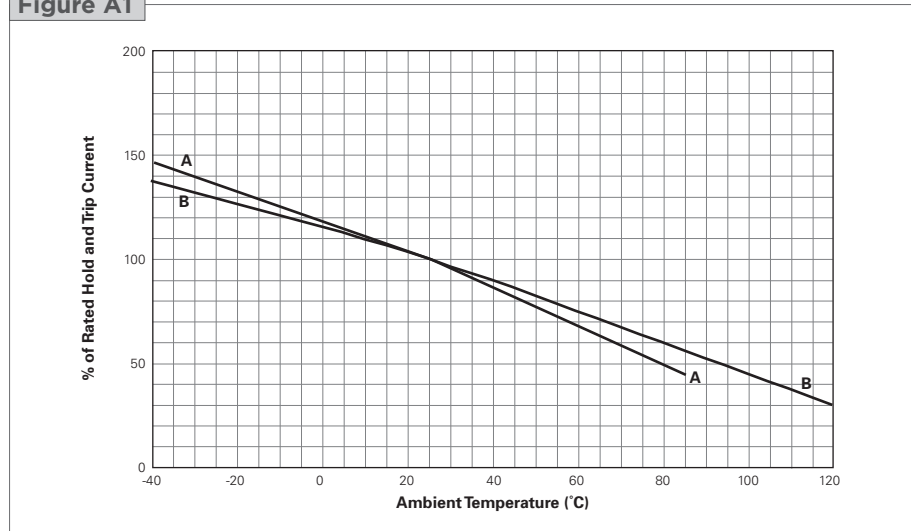
Table A2 Thermal Derating for Automotive Devices
[Hold Current (A) at Ambient Temperature (°C)]

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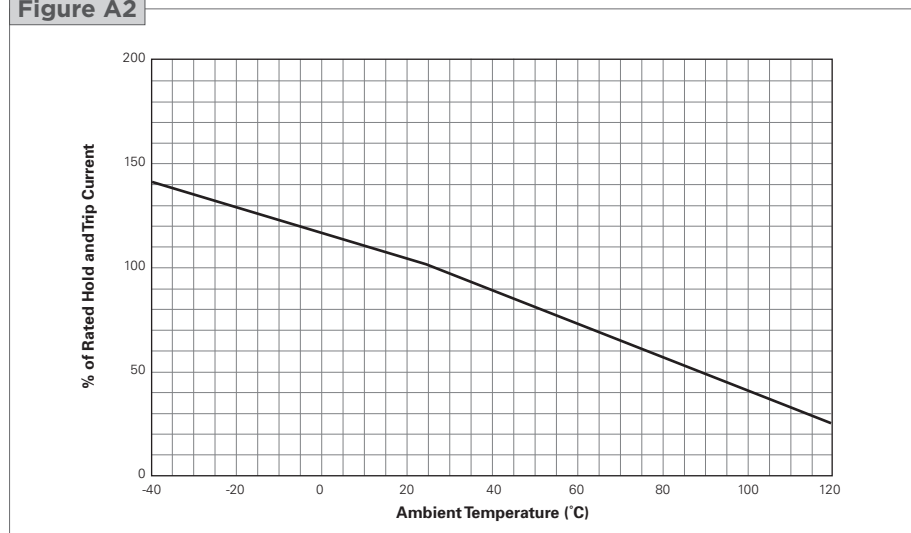
Part Number	Maximum Ambient Temperature										
	-40°C	-20°C	0°C	20°C	25°C	40°C	50°C	60°C	70°C	85°C	125°C
ASMD											
16-60V — Surface-mount											
ASMD030F	0.35	0.31	0.27	0.23	0.22	0.19	0.17	0.15	0.13	0.11	—
ASMD050F	0.59	0.53	0.46	0.39	0.37	0.33	0.29	0.26	0.23	0.18	—
ASMD075F	0.91	0.81	0.71	0.60	0.58	0.50	0.45	0.40	0.35	0.28	—
ASMD100F	1.37	1.22	1.06	0.90	0.86	0.76	0.68	0.60	0.52	0.41	—
ASMD125F	1.58	1.40	1.23	1.04	1.00	0.87	0.78	0.70	0.60	0.48	—
ASMD150F	1.93	1.70	1.50	1.27	1.22	1.07	0.95	0.85	0.74	0.58	—
NEW ASMD185F	2.93	2.58	2.30	1.93	1.85	1.62	1.44	1.30	1.12	0.88	—
ASMD200F	2.63	2.34	2.04	1.73	1.66	1.45	1.30	1.16	1.00	0.80	—
ASMD250F	3.00	2.66	2.32	1.97	1.89	1.65	1.48	1.32	1.14	0.91	—
nanoASMD											
16-48V — Surface-mount											
NEW nanoASMD012F	0.20	0.17	0.15	0.13	0.12	0.11	0.10	0.09	0.08	0.07	—
NEW nanoASMD016F	0.21	0.20	0.18	0.16	0.16	0.14	0.13	0.12	0.11	0.09	—
NEW nanoASMD020F	0.34	0.30	0.26	0.22	0.20	0.17	0.15	0.13	0.11	0.08	—
NEW nanoASMD035F	0.58	0.51	0.44	0.38	0.35	0.31	0.28	0.24	0.21	0.16	—
microASMD											
30V — Surface-mount											
NEW microASMD005F	0.08	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.02	—
NEW microASMD010F	0.15	0.13	0.12	0.10	0.10	0.09	0.08	0.06	0.06	0.05	—
miniASMD											
16-60V — Surface-mount											
NEW miniASMD010F	0.17	0.15	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04	—
NEW miniASMD014F	0.23	0.20	0.17	0.14	0.13	0.11	0.10	0.09	0.07	0.05	—
NEW miniASMD020F	0.30	0.27	0.23	0.20	0.19	0.17	0.15	0.13	0.12	0.09	—
NEW miniASMD030F	0.49	0.44	0.39	0.32	0.30	0.27	0.24	0.22	0.18	0.14	—
NEW miniASMD050F	0.59	0.57	0.55	0.50	0.48	0.45	0.43	0.35	0.30	0.23	—
NEW miniASMD075F/24	1.50	1.25	1.00	0.75	0.73	0.65	0.60	0.55	0.50	0.43	—
NEW miniASMD110F/16	1.68	1.49	1.30	1.10	1.05	0.92	0.83	0.75	0.64	0.50	—
NEW miniASMD110F/24	2.00	1.70	1.40	1.10	1.06	0.95	0.88	0.80	0.73	0.61	—
NEW miniASMD125F/16	2.00	1.69	1.47	1.25	1.17	1.03	0.92	0.90	0.69	0.53	—
NEW miniASMD150F/16	2.40	2.10	1.80	1.50	1.44	1.25	1.13	1.00	0.88	0.69	—
NEW miniASMD150F/24	2.10	1.90	1.70	1.50	1.44	1.25	1.13	1.00	0.88	0.69	—
NEW miniASMD260F/16	3.50	3.20	3.00	2.60	2.53	2.30	2.15	2.00	1.85	1.63	—
BD											
14V — Bladed Device											
BD280-1130-10/16	12.4	11.0	9.7	8.3	8.0	7.0	6.3	5.6	5.0	4.0	—
BD280-1130-15/16	17.4	15.7	14.1	12.4	12.0	10.8	9.9	9.1	8.3	7.0	—
BD280-1130-20/16	24.0	21.6	19.1	16.6	16.0	14.1	12.9	11.7	10.4	8.6	—
BD280-1927-25/16-W	32.0	28.3	24.6	20.9	20.0	17.2	15.4	13.5	11.7	8.9	—
BD280-1927-30/16-W	34.1	30.1	26.0	22.0	21.0	18.0	16.0	14.0	11.9	9.1	—

Figure A1-A4 Thermal Derating Curves for Automotive Devices

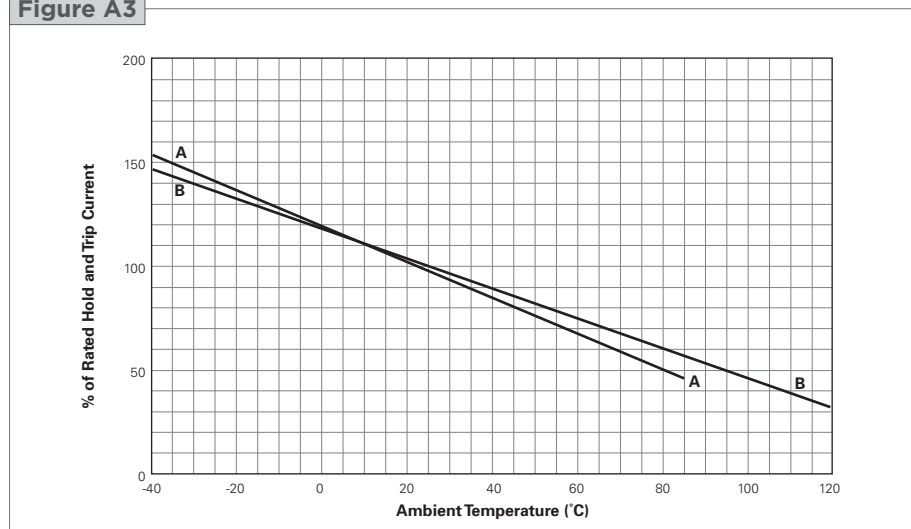
A = AGRF
B = AHRF

Figure A1


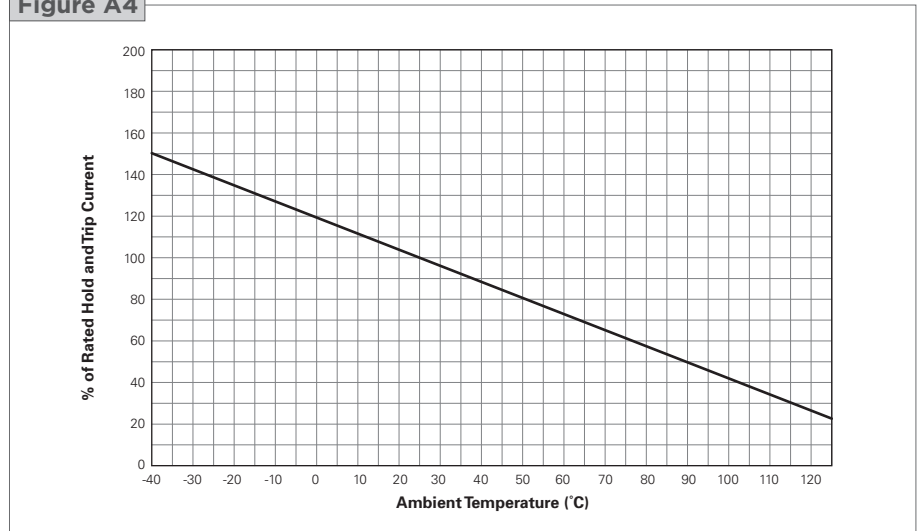
AHEF

Figure A2


A = ASMD, nanoASMD, microASMD, miniASMD
B = AHS

Figure A3


BD

Figure A4

Table A3 Electrical Characteristics for Automotive Devices

Part Number	$I_H(A)@R_{1MAX}$	$I_H(A)@R_{aMAX}$	$I_T (A)$	$V_{MAX} (V_{DC})$	$I_{MAX} (A)$	$P_{D Typ} (W)$	Max. Time-to-trip (A) (s)		$R_{MIN} (\Omega)$	$R_{1MAX} (\Omega)$	$R_{aMAX} (\Omega)$	Figure for Dimensions
AGRF												
16V — Radial-leaded												
AGRF400	4.0	3.0	7.6	16	100	2.5	20.0	2.0	0.0186	0.0610	0.0850	A5, A8, A9
AGRF500	5.0	4.3	9.4	16	100	2.7	25.0	2.5	0.0140	0.0340	0.0480	A5, A8, A9
AGRF600	6.0	5.3	10.7	16	100	2.8	30.0	3.5	0.0095	0.0280	0.0320	A5, A8, A9
AGRF700	7.0	6.5	13.2	16	100	3.0	35.0	4.0	0.0066	0.0200	0.0220	A5, A8, A9
AGRF800	8.0	7.6	15.0	16	100	3.2	40.0	5.5	0.0049	0.0175	0.0181	A5, A8, A9
AGRF900	9.0	8.6	16.5	16	100	3.4	45.0	6.0	0.0041	0.0135	0.0140	A5, A8, A9
AGRF1000	10.0	9.6	18.5	16	100	3.6	50.0	7.0	0.0034	0.0102	0.0106	A5, A8, A9
AGRF1100	11.0	10.5	20.3	16	100	3.7	55.0	7.5	0.0033	0.0089	0.0093	A5, A8, A9
AGRF1200	12.0	11.5	22.1	16	100	4.2	60.0	8.0	0.0030	0.0086	0.0091	A5, A8, A9
AGRF1400	14.0	13.0	27.3	16	100	4.6	70.0	9.0	0.0022	0.0064	0.0067	A5, A8, A9
AHRF (High Temperature)												
30V — Radial-leaded												
AHRF050	0.5	0.5	1.0	30	40	0.9	2.5	3.0	0.3500	1.100	1.100	A8, A9, A10
AHRF070	0.7	0.7	1.4	30	40	1.4	3.5	3.2	0.2300	0.800	0.800	A5, A8, A9
AHRF100	1.0	1.0	1.9	30	40	1.4	5.0	6.2	0.1500	0.430	0.430	A8, A9, A10
AHRF (High Temperature)												
16V — Radial-leaded												
AHRF200	2.0	2.0	3.8	16	100	1.4	10.0	4.8	0.0390	0.110	0.110	A8, A9, A10
AHRF300	3.0	3.0	6.5	16	100	3.0	15.0	5.0	0.0290	0.079	0.079	A5, A8, A9
AHRF400	4.0	4.0	7.4	16	100	3.3	20.0	5.0	0.0210	0.060	0.060	A5, A8, A9
AHRF450	4.5	4.5	8.7	16	100	3.6	22.5	4.0	0.0170	0.054	0.054	A5, A8, A9
AHRF550	5.5	5.5	10.0	16	100	3.5	27.5	6.0	0.0130	0.037	0.037	A5, A8, A9
AHRF600	6.0	6.0	12.0	16	100	4.1	30.0	6.5	0.0100	0.032	0.032	A5, A8, A9
AHRF650	6.5	6.5	13.7	16	100	4.3	32.5	7.0	0.0090	0.026	0.026	A5, A8, A9
AHRF700	7.0	7.0	13.1	16	100	4.0	35.0	7.0	0.0087	0.025	0.025	A5, A8, A9
AHRF750	7.5	7.5	14.8	16	100	4.5	37.5	8.0	0.0074	0.022	0.022	A5, A8, A9
AHRF800	8.0	8.0	15.0	16	100	4.2	40.0	8.0	0.0072	0.020	0.020	A5, A8, A9
AHRF900	9.0	9.0	18.5	16	100	5.0	45.0	11.5	0.0061	0.017	0.017	A5, A8, A9
AHRF1000	10.0	10.0	20.5	16	100	5.3	50.0	10.5	0.0051	0.015	0.015	A5, A8, A9
AHRF1100	11.0	11.0	21.2	16	100	5.5	55.0	11.0	0.0048	0.013	0.013	A5, A8, A9
AHRF1300	13.0	13.0	27.0	16	100	6.9	65.0	15.0	0.0034	0.010	0.010	A5, A8, A9
AHRF1400	14.0	14.0	28.3	16	100	6.9	70.0	15.5	0.0029	0.009	0.009	A5, A8, A9
AHRF1500	15.0	15.0	33.0	16	100	7.0	75.0	20.0	0.0027	0.0092	0.0092	A5, A8, A9

Table A3 Electrical Characteristics for Automotive Devices

Cont'd

Part Number	$I_H(A)@$	$I_H(A)@$	I_T	V_{MAX}	I_{MAX}	P_{DTyp}	Max. Time-to-trip		R_{MIN}	R_{1MAX}	R_{aMAX}	Figure for Dimensions
	R_{1MAX}	R_{aMAX}					(A)	(s)				
AHEF (High Temperature)												
32V — Radial-leaded												
AHEF050	0.5	0.5	1.0	32	100	0.9	2.5	3.0	0.3500	1.100	1.100	A8, A9, A10
AHEF070	0.7	0.7	1.4	32	100	0.9	3.5	3.2	0.2300	0.800	0.800	A8, A9, A11
AHEF100	1.0	1.0	1.9	32	100	1.4	5.0	6.2	0.1500	0.430	0.430	A8, A9, A10
AHEF300	3.0	3.0	6.0	32	100	3.2	15.0	5.0	0.0350	0.110	0.110	A8, A9, A12
AHEF500	5.0	5.0	10.0	32	100	5.3	25.0	9.0	0.0150	0.040	0.040	A8, A9, A12
AHEF750	7.5	7.5	15.0	32	100	6.5	37.5	13.0	0.0074	0.023	0.023	A8, A9, A12
AHEF1000	10.0	10.0	20.0	32	100	7.0	50.0	15.0	0.0060	0.016	0.016	A8, A9, A12
AHS (High Temperature)												
16V — Surface-mount												
AHS080-2018	0.80	0.80	2.00	16	70	1.5	8.0	9.0	0.130	0.550	0.550	A6
AHS160	1.60	1.60	3.20	16	70	2.2	8.0	15.0	0.050	0.150	0.150	A7
AHS200	2.00	2.00	4.00	16	70	2.3	8.0	13.4	0.050	0.140	0.140	A7
AHS300	3.00	3.00	6.00	16	70	3.0	15.0	8.0	0.024	0.083	0.083	A7
ASMD												
16-60V — Surface-mount												
ASMD030F	0.23	0.23	0.59	60	10	1.1	1.15	12.0	0.980	4.800	4.800	A7
ASMD050F	0.37	0.37	0.98	60	10	1.7	1.95	20.0	0.290	1.400	1.400	A7
ASMD075F	0.60	0.60	1.48	30	40	1.1	3.00	20.0	0.290	1.000	1.000	A7
ASMD100F	0.90	0.90	2.16	30	40	1.1	4.50	20.0	0.098	0.480	0.480	A7
ASMD125F	1.04	1.04	2.46	16	40	1.1	5.20	20.0	0.057	0.250	0.250	A7
ASMD150F	1.27	1.27	2.95	16	40	1.2	6.35	25.0	0.049	0.250	0.250	A7
NEW ASMD185F	1.85	1.85	3.70	16	40	1.5	9.25	11.3	0.032	0.126	0.126	A7
ASMD200F	1.73	1.73	3.93	16	40	1.2	8.65	30.0	0.050	0.120	0.120	A7
ASMD250F	1.97	1.97	5.00	16	40	1.2	9.85	30.0	0.035	0.085	0.085	A7
nanoASMD												
16-48V — Surface-mount												
NEW nanoASMD012F	0.12	0.12	0.39	48	10	0.5	1.0	0.2	1.400	6.500	6.500	A15
NEW nanoASMD016F	0.16	0.16	0.45	48	10	0.5	1.0	0.3	1.100	5.000	5.000	A15
NEW nanoASMD020F	0.20	0.20	0.42	24	100	0.6	8.0	0.1	0.650	3.100	3.100	A15
NEW nanoASMD035F	0.35	0.75	0.75	16	20	0.6	3.5	0.1	0.450	1.350	1.350	A15
microASMD												
30V — Surface-mount												
NEW microASMD005F	0.05	0.05	0.15	30	10	1.0	0.25	1.5	3.60	50.000	50.000	A15
NEW microASMD010F	0.10	0.10	0.25	30	10	0.8	0.5	1.0	2.10	15.000	15.000	A15
miniASMD												
16-60V — Surface-mount												
NEW miniASMD010F	0.10	0.10	0.30	60	40	0.75	0.5	5.000	0.700	12.700	12.700	A15
NEW miniASMD014F	0.14	0.14	0.28	60	10	0.75	8.0	0.008	1.500	6.000	6.000	A15
NEW miniASMD020F	0.20	0.20	0.40	30	10	0.8	8.0	0.020	0.600	3.300	3.300	A15
NEW miniASMD030F	0.30	0.30	0.60	30	40	0.8	8.0	0.100	0.200	1.750	1.750	A15
NEW miniASMD050F	0.50	0.50	1.00	24	100	0.8	8.0	0.150	0.150	1.000	1.000	A15
NEW miniASMD075F/24	0.75	0.75	1.50	24	40	0.8	8.0	0.300	0.090	0.290	0.290	A15
NEW miniASMD110F/16	1.10	1.10	2.20	16	100	0.8	8.0	0.300	0.060	0.180	0.180	A15
NEW miniASMD110F/24	1.10	1.10	2.20	24	20	0.8	8.0	0.500	0.060	0.180	0.180	A15
NEW miniASMD125F/16	1.25	1.25	2.50	16	100	0.8	8.0	0.400	0.050	0.140	0.140	A15
NEW miniASMD150F/16	1.50	1.50	2.80	16	100	0.8	8.0	0.500	0.040	0.110	0.110	A15
NEW miniASMD150F/24	1.50	1.50	3.00	24	20	1.0	8.0	1.500	0.040	0.120	0.120	A15
NEW miniASMD260F/16	2.60	2.60	5.00	16	100	1.2	8.0	5.000	0.015	0.050	0.050	A15

Part Number	$I_H(A)@$	$I_H(A)@$	I_T (A)	V_{MAX} (V _{DC})	I_{MAX} (A)	$P_{D Typ}$ (W)	Max. Time-to-trip		R_{MIN} (Ω)	R_{1MAX} (Ω)	R_{aMAX} (Ω)	Figure for Dimensions
	R_{1MAX}	R_{aMAX}					(A)	(s)				
BD												
14V — Bladed Device												
BD280-1130-10/16	8	8	13	14	100	4.4	40	8	0.0095	0.0185	0.0185	A13
BD280-1130-15/16	12	12	20	14	100	4.5	60	8	0.0050	0.0070	0.0070	A13
BD280-1130-20/16	16	16	26	14	100	5.2	80	10	0.0028	0.0064	0.0064	A13
BD280-1927-25/16-W	20	20	32	14	100	6.0	100	13	0.0024	0.0042	0.0042	A14
BD280-1927-30/16-W	21	21	38	14	100	6.2	120	13	0.0021	0.0043	0.0043	A14

Notes:

- I_H : Hold current: maximum current device will pass without interruption in 25°C, unless otherwise specified (20°C for ASMD).
- I_T : 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_{MIN} : Minimum resistance of device as supplied at 25°C, unless otherwise specified.
- R_{1MAX} : Maximum resistance of device when measured one hour post reflow (surface-mount device) or one hour post trip (radial-leaded device) 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_{aMIN} : Minimum functional resistance of device after being subjected to the stresses described in PS400 at 25°C, unless otherwise specified.

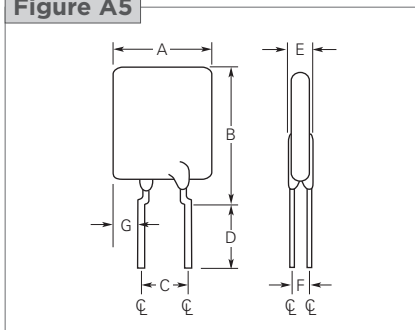
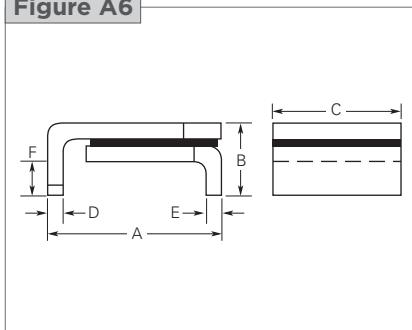
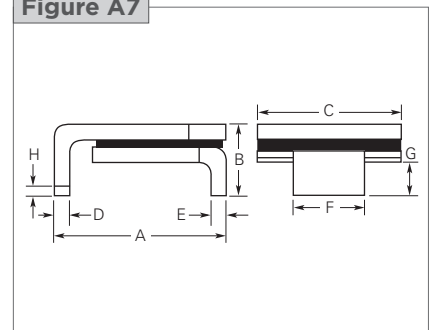
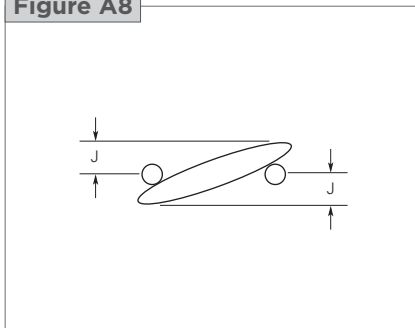
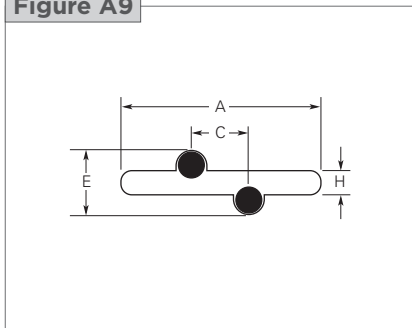
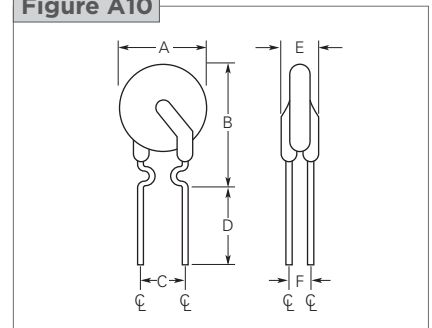
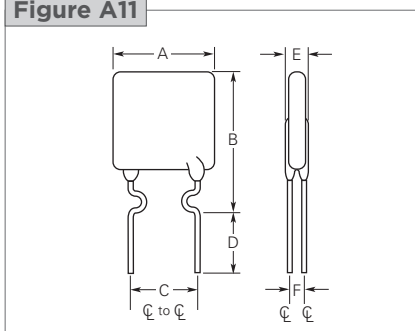
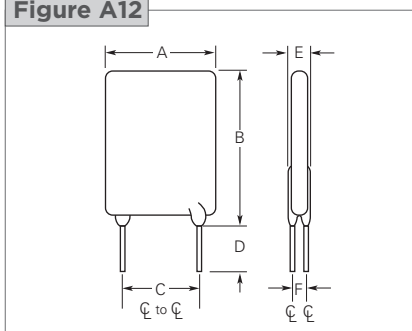
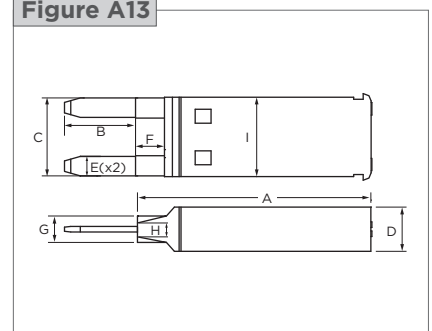
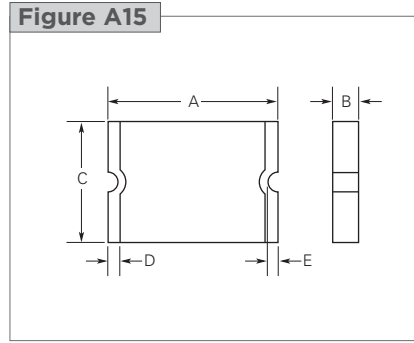
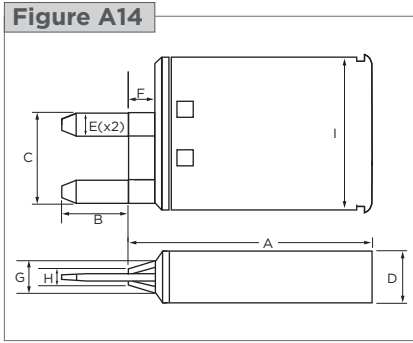
Figure A5-A15 Dimension Figures for Automotive Devices
Figure A5

Figure A6

Figure A7

Figure A8

Figure A9

Figure A10

Figure A11

Figure A12

Figure A13


Figure A5-A15 Dimension Figures for Automotive Devices

Cont'd


Table A4 Dimensions for Automotive Devices in Millimeters (Inches)

Part Number	A		B		C		D		E		F		G		H	J	Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	Max.	
AGRF																	
16V — Radial-leaded																	
AGRF400	—	8.9 (0.35)	—	14.1 (0.56)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.15)	—	—	3.10 (0.120)	1.24 (0.049)	1.4 (0.06)	A5, A8, A9
AGRF500	—	10.4 (0.41)	—	15.6 (0.61)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	3.94 (0.155)	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AGRF600	—	10.7 (0.42)	—	18.4 (0.73)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	4.07 (0.160)	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AGRF700	—	11.2 (0.44)	—	21.0 (0.73)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	4.49 (0.177)	1.24 (0.049)	1.7 (0.07)	A5, A8, A9
AGRF800	—	12.7 (0.50)	—	22.2 (0.88)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	5.08 (0.200)	1.24 (0.049)	1.8 (0.07)	A5, A8, A9
AGRF900	—	14.0 (0.55)	—	23.0 (0.91)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	5.69 (0.224)	1.24 (0.049)	2.0 (0.08)	A5, A8, A9
AGRF1000	—	16.51 (0.65)	—	25.7 (1.01)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	6.96 (0.274)	1.24 (0.049)	2.0 (0.08)	A5, A8, A9
AGRF1100	—	17.5 (0.69)	—	26.5 (1.04)	—	3.0 (0.12)	7.6 (0.3)	—	4.3 (0.17)	5.8 (0.20)	1.2 (0.05)	—	—	7.47 (0.294)	1.24 (0.049)	2.4 (0.09)	A5, A8, A9
AGRF1200	—	17.5 (0.69)	—	28.8 (1.14)	—	3.5 (0.14)	7.6 (0.3)	—	9.4 (0.37)	10.9 (0.43)	1.4 (0.06)	—	—	4.83 (0.190)	1.45 (0.057)	1.5 (0.06)	A5, A8, A9
AGRF1400	—	23.5 (0.925)	—	28.7 (1.13)	—	3.5 (0.14)	7.6 (0.3)	—	9.4 (0.37)	10.9 (0.43)	1.4 (0.06)	—	—	7.82 (0.308)	1.45 (0.057)	1.9 (0.07)	A5, A8, A9
AHRF (High Temperature)																	
30V — Radial-leaded																	
AHRF050	—	7.4 (0.29)	—	12.7 (0.50)	—	3.3 (0.13)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	1.24 (0.049)	1.6 (0.06)	1.6 (0.06)	A8, A9, A10
AHRF070	—	6.9 (0.27)	—	10.8 (0.43)	—	3.3 (0.13)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	1.24 (0.049)	1.6 (0.06)	1.6 (0.06)	A5, A8, A9
AHRF100	—	9.7 (0.38)	—	13.6 (0.54)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	1.24 (0.049)	1.6 (0.06)	1.6 (0.06)	A8, A9, A10

Table A4 Dimensions for Automotive Devices in Millimeters (Inches)

Cont'd

Part Number	A		B		C		D		E		F		G		H	J	Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typ.	Max.	
AHRF (High Temperature)																	
16V — Radial-leaded																	
AHRF200	—	9.4 (0.37)	—	14.4 (0.57)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A8, A9, A10
AHRF300	—	8.8 (0.35)	—	13.8 (0.55)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF400	—	10.0 (0.39)	—	15.0 (0.59)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF450	—	10.4 (0.41)	—	15.6 (0.61)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	3.94 (0.155)	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF550	—	11.2 (0.44)	—	18.9 (0.74)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF600	—	11.2 (0.44)	—	21.0 (0.73)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	4.49 (0.177)	1.24 (0.049)	1.7 (0.07)	A5, A8, A9
AHRF650	—	12.7 (0.50)	—	22.2 (0.88)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	5.08 (0.200)	1.24 (0.049)	1.8 (0.07)	A5, A8, A9
AHRF700	—	14.0 (0.55)	—	21.9 (0.86)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF750	—	14.0 (0.55)	—	23.5 (0.93)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	5.69 (0.224)	1.24 (0.049)	2.0 (0.08)	A5, A8, A9
AHRF800	—	16.5 (0.65)	—	22.5 (0.88)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF900	—	16.5 (0.65)	—	25.7 (1.01)	—	3.0 (0.12)	7.6 (0.30)	—	4.3 (0.17)	5.8 (0.23)	1.2 (0.05)	—	—	—	—	—	A5, A8, A9
AHRF1000	—	17.5 (0.69)	—	26.5 (1.04)	—	3.0 (0.12)	7.6 (0.30)	—	9.4 (0.37)	10.9 (0.43)	1.2 (0.05)	—	—	7.47 (0.294)	1.24 (0.049)	1.5 (0.06)	A5, A8, A9
AHRF1100	—	21.0 (0.83)	—	26.1 (1.03)	—	3.0 (0.12)	7.6 (0.30)	—	9.4 (0.37)	10.9 (0.43)	1.2 (0.05)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF1300	—	23.5 (0.925)	—	28.7 (1.13)	—	3.5 (0.14)	7.6 (0.30)	—	9.4 (0.37)	10.9 (0.43)	1.4 (0.06)	—	—	7.82 (0.308)	1.45 (0.057)	1.9 (0.08)	A5, A8, A9
AHRF1400	—	23.5 (0.93)	—	28.7 (1.13)	—	3.6 (0.14)	7.6 (0.30)	—	9.4 (0.37)	10.9 (0.43)	1.4 (0.06)	—	—	—	1.24 (0.049)	1.6 (0.06)	A5, A8, A9
AHRF1500	—	23.5 (0.93)	—	28.7 (1.13)	—	3.5 (0.14)	7.6 (0.30)	—	9.4 (0.37)	10.9 (0.43)	1.4 (0.06)	—	—	7.82 (0.308)	—	—	A5, A8, A9
AHEF (High Temperature)																	
32V — Radial-leaded																	
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)	—	—	—	—	—	—	A8, A9, A10
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)	—	—	—	—	—	—	A8, A9, A11
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)	—	—	—	—	—	—	A8, A9, A10
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)	—	—	—	—	—	—	A8, A9, A12
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)	—	—	—	—	—	—	A8, A9, A12
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)	—	—	—	—	—	—	A8, A9, A12
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)	—	—	—	—	—	—	A8, A9, A12

Table A4 Dimensions for Automotive Devices in Millimeters (Inches)

Cont'd

Part Number	A		B		C		D		E		F		G		H		Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
AHS (High Temperature)																	
16V — Surface-mount																	
AHS080-2018	4.72 (0.186)	5.44 (0.214)	—	1.52 (0.060)	4.22 (0.166)	4.93 (0.194)	0.25 (0.010)	0.36 (0.014)	0.25 (0.010)	0.36 (0.014)	0.30 (0.012)	0.46 (0.018)	—	—	—	—	A6
AHS160	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.24)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
AHS200	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.240)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
AHS300	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.240)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD																	
16-60V — Surface-mount																	
ASMD030F	6.73 (0.265)	7.98 (0.314)	—	3.18 (0.125)	4.8 (0.19)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD050F	6.73 (0.265)	7.98 (0.314)	—	3.18 (0.125)	4.8 (0.19)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD075F	6.73 (0.265)	7.98 (0.314)	—	3.18 (0.125)	4.8 (0.19)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD100F	6.73 (0.265)	7.98 (0.314)	—	3.00 (0.118)	4.8 (0.19)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD125F	6.73 (0.265)	7.98 (0.314)	—	3.00 (0.118)	4.8 (0.19)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD150F	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.24)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
NEW ASMD185F	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.24)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD200F	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.24)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7
ASMD250F	8.00 (0.315)	9.40 (0.370)	—	3.00 (0.118)	6.0 (0.24)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)	—	A7

Part Number	A		B		C		D		E		Figure	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
nanoASMD												
30V — Surface-mount												
NEW nanoASMD012F		3.00 (0.118)	3.40 (0.134)	0.62 (0.024)	1.00 (0.039)	1.37 (0.054)	1.80 (0.071)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15
NEW nanoASMD016F		3.00 (0.118)	3.40 (0.134)	0.62 (0.024)	1.00 (0.039)	1.37 (0.054)	1.80 (0.071)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15
NEW nanoASMD020F		3.00 (0.118)	3.40 (0.134)	0.58 (0.023)	0.82 (0.032)	1.37 (0.054)	1.80 (0.071)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15
NEW nanoASMD035F		3.00 (0.118)	3.40 (0.134)	0.58 (0.023)	0.82 (0.032)	1.37 (0.054)	1.80 (0.071)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15
microASMD												
30V — Surface-mount												
NEW microASMD005F		3.0 (0.118)	3.43 (0.135)	0.50 (0.019)	0.85 (0.034)	2.35 (0.092)	2.80 (0.110)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15
NEW microASMD010F		3.0 (0.118)	3.43 (0.135)	0.50 (0.019)	0.85 (0.034)	2.35 (0.092)	2.80 (0.110)	0.25 (0.010)	0.75 (0.030)	0.076 (0.003)	—	A15

Table A4 Dimensions for Automotive Devices in Millimeters (Inches)

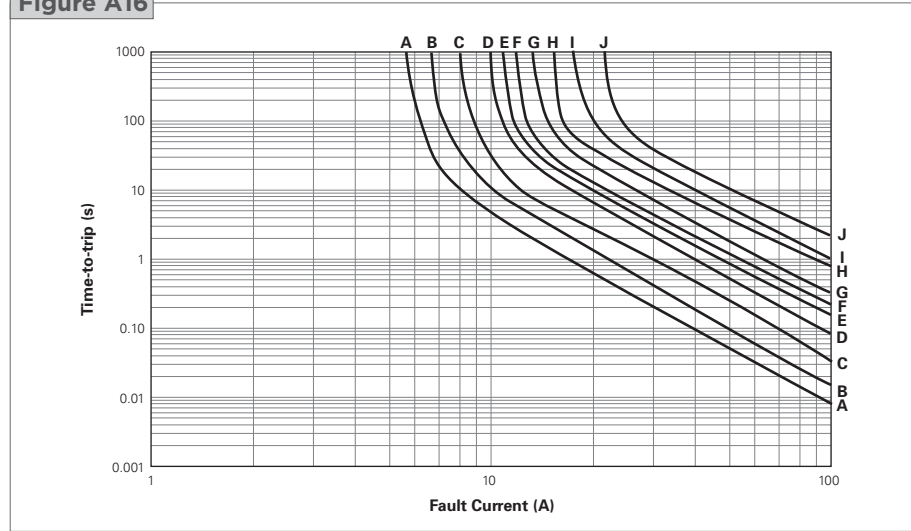
Cont'd

Part Number	A		B		C		D		E		Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
miniASMDC 16-60V — Surface-mount											
NEW miniASMDC010F	4.37 (0.172)	4.73 (0.186)	0.635 (0.025)	0.89 (0.035)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC014F	4.37 (0.172)	4.73 (0.186)	0.635 (0.025)	0.89 (0.035)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC020F	4.37 (0.172)	4.73 (0.186)	0.635 (0.025)	0.89 (0.035)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC030F	4.37 (0.172)	4.73 (0.186)	0.635 (0.025)	0.89 (0.035)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC050F	4.37 (0.172)	4.73 (0.186)	0.38 (0.015)	0.62 (0.025)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC075F/24	4.37 (0.172)	4.83 (0.190)	0.81 (0.032)	1.46 (0.057)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC110F/16	4.37 (0.172)	4.83 (0.190)	0.28 (0.011)	0.48 (0.019)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC110F/24	4.37 (0.172)	4.83 (0.190)	0.81 (0.032)	1.46 (0.057)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC125F/16	4.37 (0.172)	4.83 (0.190)	0.28 (0.011)	0.48 (0.019)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC150F/16	4.37 (0.172)	4.83 (0.190)	0.28 (0.011)	0.48 (0.019)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC150F/24	4.37 (0.172)	4.83 (0.190)	1.00 (0.040)	1.94 (0.077)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15
NEW miniASMDC260F/16	4.37 (0.172)	4.83 (0.190)	1.02 (0.042)	1.52 (0.060)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.95 (0.040)	0.20 (0.008)	—	A15

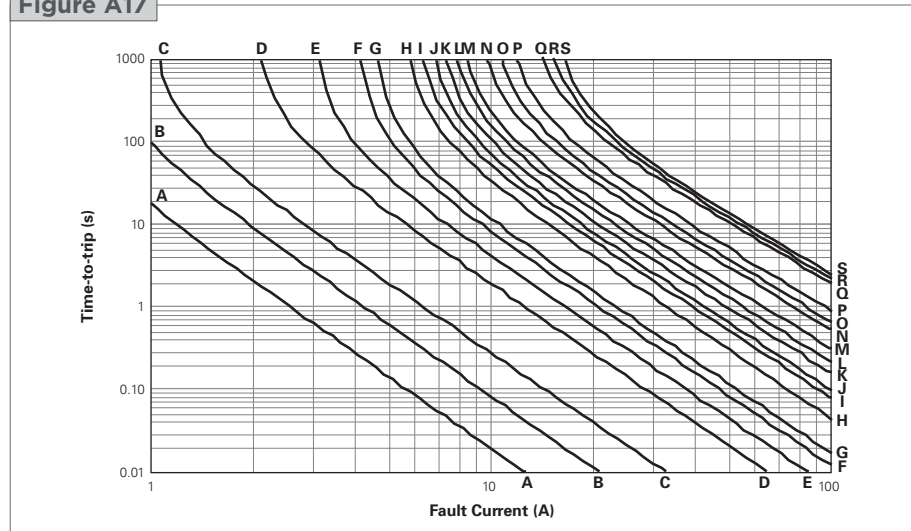
Part Number	A		B		C		D		E(x2)		F		G		H		I		Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
BD 14V — Bladed Device																			
BD280-1130-10/16	29.50 (1.173)	30.10 (1.185)	8.70 (0.343)	9.30 (0.366)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	6.65 (0.262)	2.55 (0.100)	3.05 (0.120)	3.30 (0.130)	3.90 (0.154)	3.40 (0.134)	4.00 (0.157)	1.70 (0.067)	2.30 (0.091)	10.90 (0.429)	11.50 (0.453)	A13
BD280-1130-15/16	29.50 (1.173)	30.10 (1.185)	8.70 (0.343)	9.30 (0.366)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	6.65 (0.262)	2.55 (0.100)	3.05 (0.120)	3.30 (0.130)	3.90 (0.154)	3.40 (0.134)	4.00 (0.157)	1.70 (0.067)	2.30 (0.091)	10.90 (0.429)	11.50 (0.453)	A13
BD280-1130-20/16	29.50 (1.173)	30.10 (1.185)	8.70 (0.343)	9.30 (0.366)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	6.65 (0.262)	2.55 (0.100)	3.05 (0.120)	3.30 (0.130)	3.90 (0.154)	3.40 (0.134)	4.00 (0.157)	1.70 (0.067)	2.30 (0.091)	10.90 (0.429)	11.50 (0.453)	A13
BD280-1927-25/16-W	26.65 (1.049)	27.35 (1.077)	8.60 (0.339)	9.20 (0.362)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	6.65 (0.262)	2.55 (0.100)	3.05 (0.120)	1.80 (0.071)	2.20 (0.087)	3.50 (0.138)	3.90 (0.154)	1.70 (0.067)	2.30 (0.091)	19.00 (0.748)	19.40 (0.764)	A14
BD280-1927-30/16-W	26.65 (1.049)	27.35 (1.077)	8.60 (0.339)	9.20 (0.362)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	6.65 (0.262)	2.55 (0.100)	3.05 (0.120)	1.80 (0.071)	2.20 (0.087)	3.50 (0.138)	3.90 (0.154)	1.70 (0.067)	2.30 (0.091)	19.00 (0.748)	19.40 (0.764)	A14

Figure A16-A24 Typical Time-to-trip at 25°C for Automotive Devices
AGRF

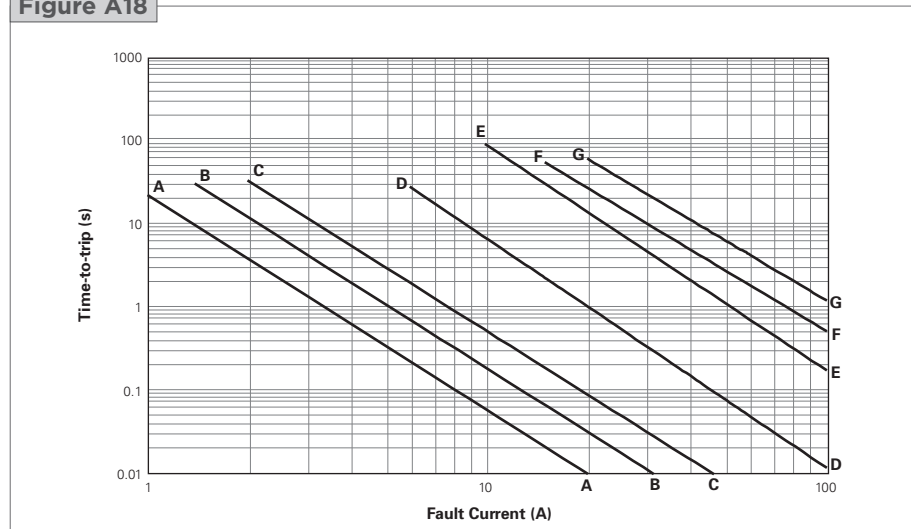
- A = AGRF400
- B = AGRF500
- C = AGRF600
- D = AGRF700
- E = AGRF800
- F = AGRF900
- G = AGRF1000
- H = AGRF1100
- I = AGRF1200
- J = AGRF1400

Figure A16

AHRF

- | | |
|-------------|--------------|
| A = AHRF050 | K = AHRF700 |
| B = AHRF070 | L = AHRF750 |
| C = AHRF100 | M = AHRF800 |
| D = AHRF200 | N = AHRF900 |
| E = AHRF300 | O = AHRF1000 |
| F = AHRF400 | P = AHRF1100 |
| G = AHRF450 | Q = AHRF1300 |
| H = AHRF550 | R = AHRF1400 |
| I = AHRF600 | S = AHRF1500 |
| J = AHRF650 | |

Figure A17

AHEF

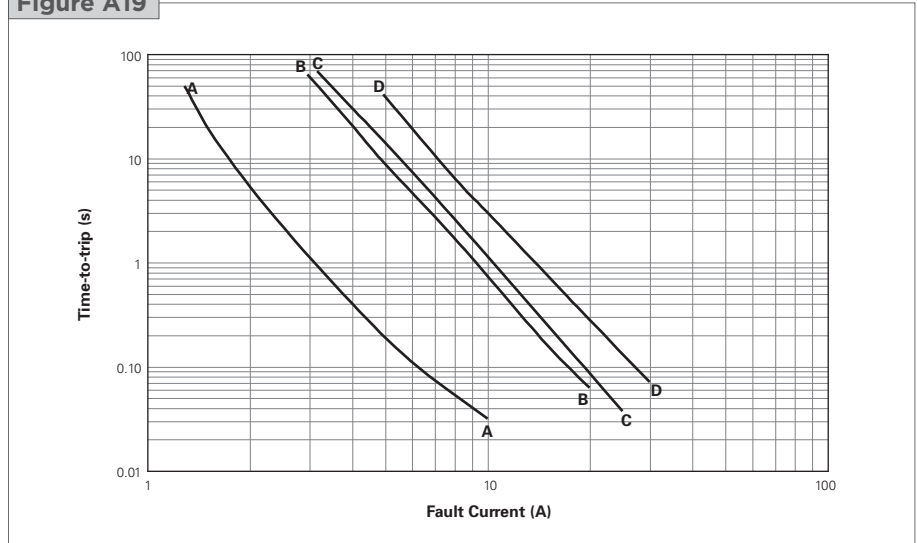
- A = AHEF050
- B = AHEF070
- C = AHEF100
- D = AHEF300
- E = AHEF500
- F = AHEF750
- G = AHEF1000

Figure A18


AHS

- A = AHS080-2018
- B = AHS160
- C = AHS200
- D = AHS300

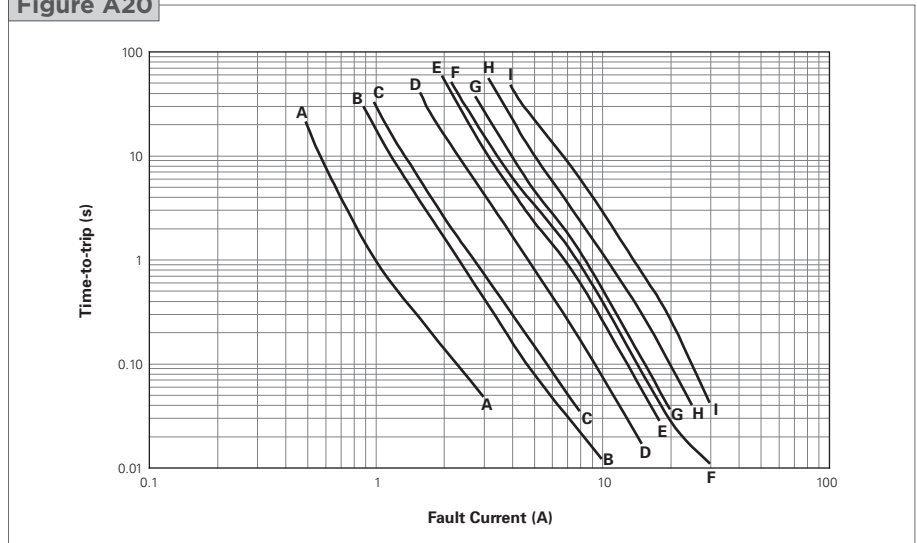
Figure A19



ASMD

- A = ASMD030F
- B = ASMD050F
- C = ASMD075F
- D = ASMD100F
- E = ASMD125F
- F = ASMD150F
- G = ASMD185F
- H = ASMD200F
- I = ASMD250F

Figure A20



nanoASMDC

- A = nanoASMDC012F
- B = nanoASMDC016F
- C = nanoASMDC020F
- D = nanoASMDC035F

Figure A21

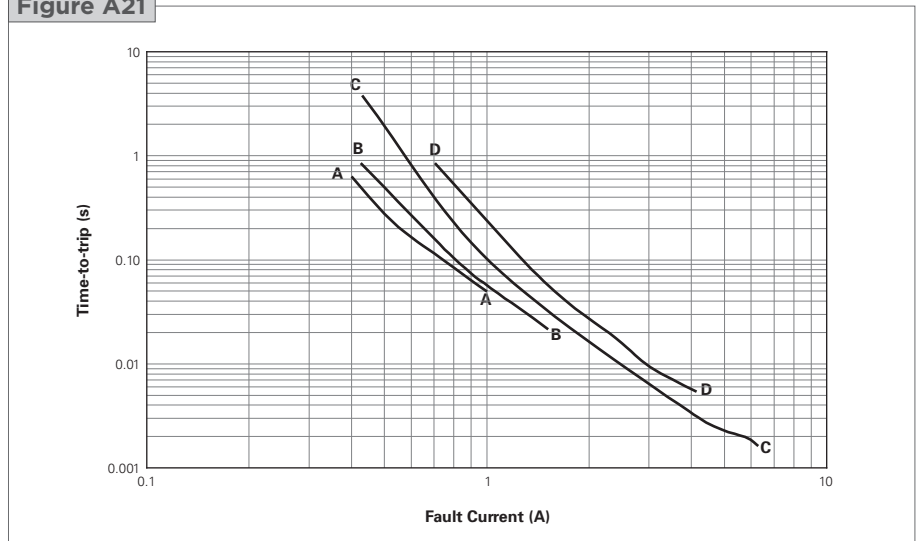
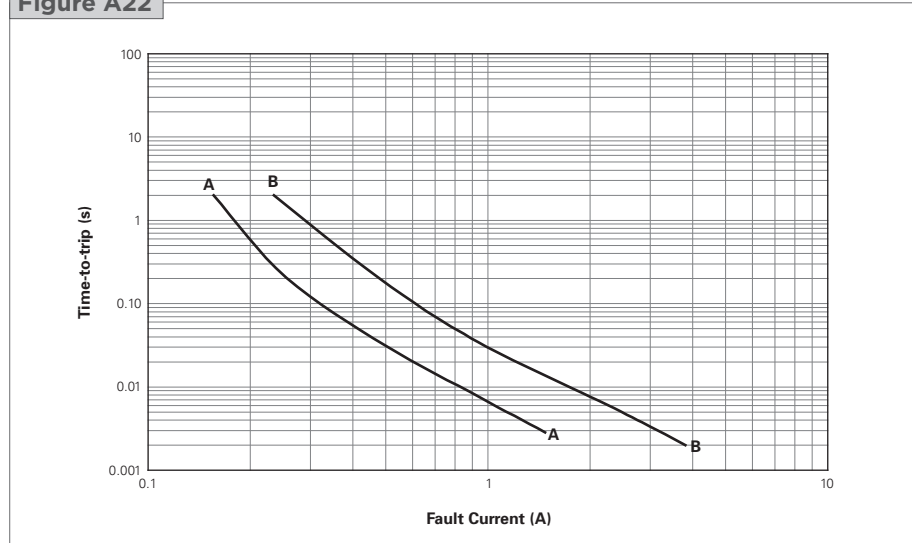


Figure A16-A24 Typical Time-to-trip at 25°C for Automotive Devices

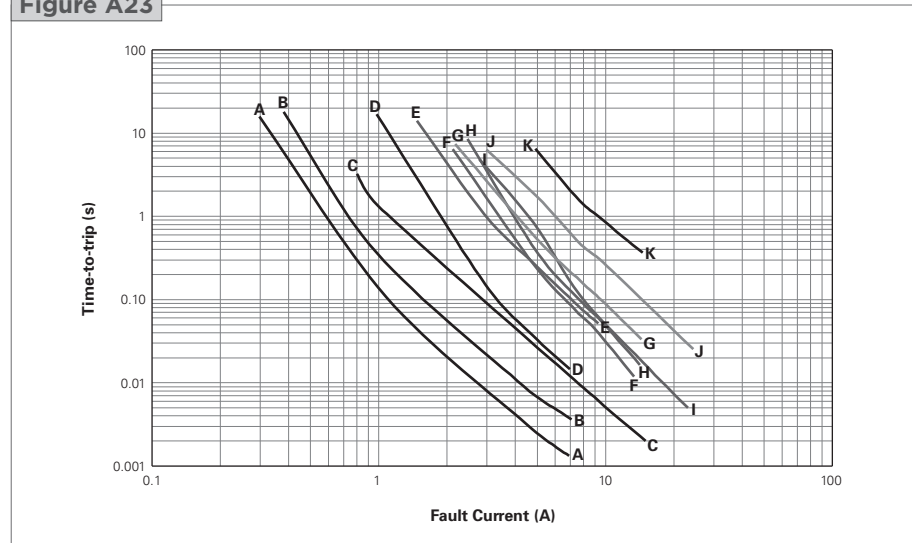
Cont'd

microASMD

- A = microASMD005F
- B = microASMD010F

Figure A22

miniASMDC

- A = miniASMDC010F, miniASMDC014F
- B = miniASMDC020F
- C = miniASMDC030F
- D = miniASMDC050F
- E = miniASMDC075F/24
- F = miniASMDC110F/16
- G = miniASMDC110F/24
- H = miniASMDC125F/16
- I = miniASMDC150F/16
- J = miniASMDC150F/24
- K = miniASMDC260F/16

Figure A23

BD

- A = BD30A
- B = BD25A
- C = BD20A
- D = BD15A
- E = BD10A

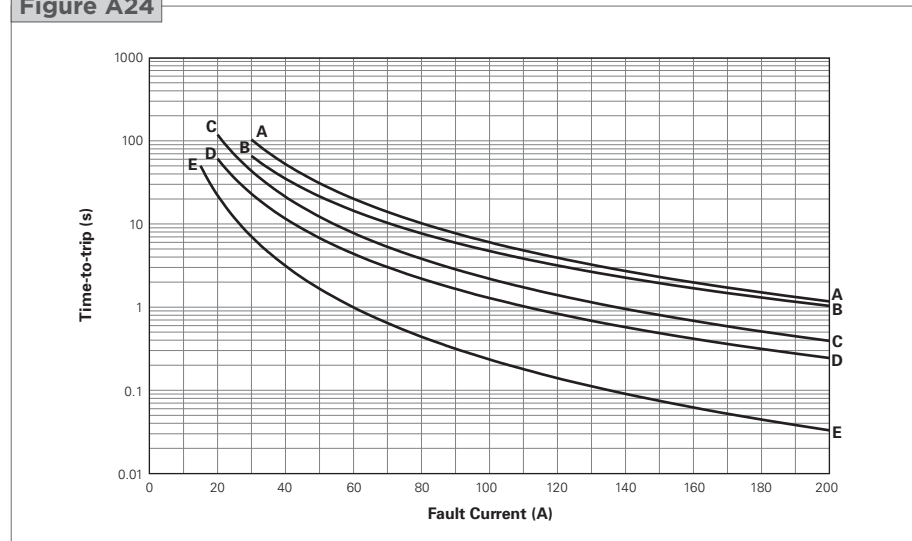
Figure A24


Table A5 Physical Characteristics and Environmental Specifications for Automotive Devices
AGRF
Physical Characteristics

Lead material	AGRF400 to AGRF1100 : Tin Plated Copper, 0.52mm ² (20AWG) ϕ 0.8 mm/0.032in AGRF1200 to AGRF1400 : Tin Plated Copper, 0.82mm ² (18AWG) ϕ 1.0mm/0.040in
Soldering characteristics	Solderability per ANSI/J-STD-002 Category 3
Solder heat withstand	AGRF400: per IEC68-2-20 Test Tb, Method 1A, Condition A: can withstand 5 seconds at 260°C \pm 5°C AGRF500-AGRF1400: per IEC68-2-20 Test Tb, Method 1A, Condition B: can withstand 10 seconds at 260°C \pm 5°C
Insulating material	Cured, flame-retardant epoxy polymer; meets UL 94V-0
Operation temperature	-40°C~85°C

Note: See PS400 for other physical characteristics.
Devices are not designed to be placed through a reflow process.

Environmental Specifications

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

Note: See PS400 for other environmental specifications.

AHRF
Physical Characteristics

Lead material	AHRF050 to AHRF200 : Tin-plated Copper Clad Steel, 0.205mm ² (24 AWG), ϕ 0.51mm/0.020in AHRF300 to AHRF1100 : Tin-plated copper 0.52mm ² (20 AWG), ϕ 0.81mm/0.032 in AHRF1300 to AHRF1500 : Tin-plated copper 0.82mm ² (18 AWG), ϕ 1.0mm/0.04 in
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 \pm 5°C
Insulating material	Cured, flame-retardant epoxy polymer; meets UL 94V-0 requirements
Operation temperature	-40°C~125°C

Note: See PS400 for other physical characteristics.
Devices are not designed to be placed through a reflow process.

Environmental Specifications

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

Note: See PS400 for other environmental specifications.

AHEF
Physical Characteristics

Lead material	AHEF050 to AHEF100 : Tin-plated Copper Clad Steel, 0.205mm ² (24 AWG), ϕ 0.51mm/0.020in. AHEF300 to AHEF750 : Tin-plated Copper 0.52mm ² (20 AWG), ϕ 0.81mm/0.032in AHEF1000 : Tin-plated copper 0.82mm ² (18 AWG), ϕ 1.0mm/0.04 in
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 \pm 5°C
Insulating material	Cured, flame-retardant epoxy polymer; meets UL 94V-0 requirements
Operation temperature	-40°C~125°C

Note: See PS400 for other physical characteristics.
Devices are not designed to be placed through a reflow process.

Table A5 Physical Characteristics and Environmental Specifications for Automotive Devices Cont'd
AHEF
Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	70°C, 1000 hours	±5%
	85°C, 1000 hours	±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

Note: See PS400 for other environmental specifications.

AHS
Physical Characteristics

Lead material	Tin-plated brass to MIL-T-10727B
Soldering characteristics	Solderability per ANSI-J-STD-002 Category 1
Solder heat withstand	per IEC-STD 68-2-20, Test Tb, Section 5, Method 1A
Flammability	per IEC 695-2-2 Needle flame test for 20 seconds
Operation temperature	-40°C~125°C

Note: See PS400 for other physical characteristics.

Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	70°C, 1000 hours	±3% Typical
	85°C, 1000 hours	±5% Typical
Humidity aging	85°C, 85% RH, 1000 hours	±1.2% Typical
Thermal shock	125°C, -40°C (20 times)	-33% Typical
Solvent resistance	Freon	No change
	Trichloroethane	No change
	Hydrocarbons	No change

Note: See PS400 for other environmental specifications.

ASMD
Physical Characteristics

Terminal pad material	98%+ Tin-plated Brass
Soldering characteristics	Solderability per ANSI-J-STD-002 Category 1
Solder heat withstand	per IEC-STD 68-2-20, Test Tb, Section 5, Method 1A
Flammability resistance	per IEC 695-2-2 Needle flame test for 20 seconds
Recommended storage conditions	40°C max, 70% RH max; devices may not meet specified ratings if storage conditions are exceeded
Operation temperature	-40°C~85°C

Note: See PS400 for other physical characteristics.

Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	60°C, 1000 hours	±3% typical
	85°C, 1000 hours	±5% typical
Humidity aging	85°C, 85% RH, 100 hours	±1.2% typical
Thermal shock	85°C, -40°C (20 times)	-33% typical
	125°C, -55°C (10 times)	-33% typical
Solvent resistance	Freon	No change
	Trichloroethane	No change
	Hydrocarbons	No change

Note: See PS400 for other environmental specifications.

nanoASMD/microASMD/miniASMD
Physical Characteristics

Terminal pad material	100% matte tin with nickel underplate
Soldering characteristics	Solderability per ANSI-J-STD-002 Category 3
Solder heat withstand	per IEC-STD 68-2-20, Test Tb, Section 5, Method 1A
Flammability resistance	per IEC 695-2-2 Needle flame test for 20 seconds
Recommended storage conditions	40°C max, 70% RH max; devices may not meet specified ratings if storage conditions are exceeded
Operation temperature	-40°C~85°C

Note: See PS400 for other physical characteristics.

Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	60°C, 1000 hours	±3% typical
	85°C, 1000 hours	±5% typical
Humidity aging	85°C, 85% RH, 100 hours	±1.2% typical
Thermal shock	85°C, -40°C (20 times)	-33% typical
	125°C, -55°C (10 times)	-33% typical
Solvent resistance	Freon	No change
	Trichloroethane	No change
	Hydrocarbons	No change

Note: See PS400 for other environmental specifications.

BD
Physical Characteristics

Lead material	Brass H65, thickness: 0.8mm , tin plating thickness: 5µm
Soldering characteristics	NA
Solder heat withstand	NA
Insulating material	Colored PBT, meets UL94V-0 requirements
Operation temperature	-40°C~125°C

Note: See PS400 for other physical characteristics.

Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	85°C, 1000 hours	±5%
Humidity aging	85°C, 85% RH, 1000 hours	±5%
	85°C, 85% RH (with 10% I _{HOLD}), 500 hours	±5%
Thermal shock	85°C to -40°C (5 times)	meet SCD
Solvent resistance	MIL-STD-202, Method 215F	No change

Note: See PS400 for other environmental specifications.

Table A6 Packaging and Marking Information for Automotive Devices

Part Number	Bag Quantity	Tape & Reel Quantity	Ammo Pack Quantity	Standard Package Quantity	Part Marking	Agency Recognition
AGRF						
Radial-leaded						
AGRF400	500	—	—	10,000	GF4	*
AGRF400-2	—	2,500	—	12,500	GF4	*
AGRF400-AP	—	—	2,000	10,000	GF4	*
AGRF500	500	—	—	10,000	GF5	*
AGRF500-2	—	2,000	—	10,000	GF5	*
AGRF500-AP	—	—	2,000	10,000	GF5	*
AGRF600	500	—	—	10,000	GF6	*
AGRF600-2	—	2,000	—	10,000	GF6	*
AGRF600-AP	—	—	2,000	10,000	GF6	*
AGRF700	500	—	—	10,000	GF7	*
AGRF700-2	—	1,500	—	7,500	GF7	*
AGRF700-AP	—	—	1,500	7,500	GF7	*
AGRF800	500	—	—	10,000	GF8	*
AGRF800-2	—	1,000	—	5,000	GF8	*
AGRF800-AP	—	—	1,000	5,000	GF8	*
AGRF900	500	—	—	10,000	GF9	*
AGRF900-2	—	1,000	—	5,000	GF9	*
AGRF900-AP	—	—	1,000	5,000	GF9	*
AGRF1000	250	—	—	5,000	GF10	*
AGRF1000-2	—	1,000	—	5,000	GF10	*
AGRF1000-AP	—	—	1,000	5,000	GF10	*
AGRF1100	250	—	—	5,000	GF11	*
AGRF1100-2	—	1,000	—	5,000	GF11	*
AGRF1100-AP	—	—	1,000	5,000	GF11	*
AGRF1200	250	—	—	5,000	GF12	*
AGRF1200-2	—	1,000	—	5,000	GF12	*
AGRF1200-AP	—	—	1,000	5,000	GF12	*
AGRF1400	250	—	—	5,000	GF14	*
AGRF1400-2	—	1,000	—	5,000	GF14	*
AGRF1400-AP	—	—	1,000	5,000	GF14	*
AHRF (High Temperature)						
Radial-leaded						
AHRF050	500	—	—	10,000	HF0.5	*
AHRF050-2	—	2,500	—	12,500	HF0.7	*
AHRF050-AP	—	—	2,500	12,500	HF0.7	*
AHRF070	500	—	—	10,000	HF0.7	*
AHRF070-2	—	2,500	—	12,500	HF0.7	*
AHRF070-AP	—	—	2,500	12,500	HF0.7	*
AHRF100	500	—	—	10,000	HF1.0	*
AHRF100-2	—	2,500	—	12,500	HF1.0	*
AHRF100-AP	—	—	2,500	12,500	HF1.0	*
AHRF200	500	—	—	10,000	HF2	*
AHRF200-2	—	2,500	—	12,500	HF2	*
AHRF200-AP	—	—	2,500	12,500	HF2	*
AHRF300	500	—	—	10,000	HF3	*
AHRF300-2	—	2,000	—	10,000	HF3	*
AHRF300-AP	—	—	2,000	10,000	HF3	*
AHRF400	500	—	—	10,000	HF4	*
AHRF400-2	—	1,500	—	7,500	HF4	*
AHRF400-AP	—	—	1,500	7,500	HF4	*

* These devices have been designed for use in automotive applications.
 For commercial alternatives to these product series please see the radial-leaded devices section or surface-mount devices section.

Table A6 Packaging and Marking Information for Automotive Devices

Cont'd

Part Number	Bag Quantity	Tape & Reel Quantity	Ammo Pack Quantity	Standard Package Quantity	Part Marking	Agency Recognition
AHRF (High Temperature)						
Radial-leaded						
AHRF450	500	—	—	10,000	HF4.5	*
AHRF450-2	—	1,500	—	7,500	HF4.5	*
AHRF450-AP	—	—	1,500	7,500	HF4.5	*
AHRF550	500	—	—	10,000	HF5.5	*
AHRF550-2	—	2,000	—	10,000	HF5.5	*
AHRF550-AP	—	—	2,000	10,000	HF5.5	*
AHRF600	500	—	—	10,000	HF6	*
AHRF600-2	—	2,000	—	10,000	HF6	*
AHRF600-AP	—	—	2,000	10,000	HF6	*
AHRF650	500	—	—	10,000	HF6.5	*
AHRF650-2	—	1,500	—	7,500	HF6.5	*
AHRF650-AP	—	—	1,500	7,500	HF6.5	*
AHRF700	500	—	—	10,000	HF7	*
AHRF700-2	—	1,500	—	7,500	HF7	*
AHRF700-AP	—	—	1,500	7,500	HF7	*
AHRF750	500	—	—	10,000	HF7.5	*
AHRF750-2	—	1,000	—	5,000	HF7.5	*
AHRF750-AP	—	—	1,000	5,000	HF7.5	*
AHRF800	500	—	—	10,000	HF8	*
AHRF800-2	—	1,000	—	5,000	HF8	*
AHRF800-AP	—	—	1,000	5,000	HF8	*
AHRF900	250	—	—	5,000	HF9	*
AHRF900-2	—	1,000	—	5,000	HF9	*
AHRF900-AP	—	—	1,000	5,000	HF9	*
AHRF1000	250	—	—	5,000	HF10	*
AHRF1000-2	—	1,000	—	5,000	HF10	*
AHRF1000-AP	—	—	1,000	5,000	HF10	*
AHRF1100	250	—	—	5,000	HF11	*
AHRF1100-2	—	1,000	—	5,000	HF11	*
AHRF1100-AP	—	—	1,000	5,000	HF11	*
AHRF1300	250	—	—	5,000	HF13	*
AHRF1300-2	—	1,000	—	5,000	HF13	*
AHRF1300-AP	—	—	1,000	5,000	HF13	*
AHRF1400	250	—	—	5,000	HF14	*
AHRF1400-2	—	1,000	—	5,000	HF14	*
AHRF1400-AP	—	—	1,000	5,000	HF14	*
AHRF1500	250	—	—	5,000	HF15	*
AHRF1500-2	—	1,000	—	5,000	HF15	*
AHRF1500-AP	—	—	1,000	5,000	HF15	*
AHEF (High Temperature)						
Radial-leaded						
AHEF050	500	—	—	10,000	EF0.5	*
AHEF070	500	—	—	10,000	EF0.7	*
AHEF100	500	—	—	10,000	EF1.0	*
AHEF300	500	—	—	10,000	EF3	*
AHEF500	250	—	—	5,000	EF5	*
AHEF750	250	—	—	5,000	EF7.5	*
AHEF1000	250	—	—	5,000	EF10	*

* These devices have been designed for use in automotive applications.
For commercial alternatives to these product series please see the radial-leaded devices section or surface-mount devices section.

Table A6 Packaging and Marking Information for Automotive Devices

Cont'd

Part Number	Tape & Reel Quantity	Standard Package Quantity	Part Marking	Recommended Pad Layouts [mm(in) See Figure A25]			Agency Recognition
				Dimension A (Min.*/Nom.)	Dimension B (Nom.)	Dimension C (Nom.)	
AHS (High Temperature)							
Surface-mount							
AHS080-2018	4,000	20,000	H08	4.6 (0.18)	1.5 (0.06)	3.4 (0.134)	*
AHS160	1,500	7,500	160	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
AHS200	1,500	7,500	H200	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
AHS300	1,500	7,500	H300	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
ASMD							
Surface-mount							
ASMD030F	2,000	10,000	030F	3.1 (0.12)	2.3 (0.09)	5.1 (0.201)	*
ASMD050F	2,000	10,000	050F	3.1 (0.12)	2.3 (0.09)	5.1 (0.201)	*
ASMD075F	2,000	10,000	075F	3.1 (0.12)	2.3 (0.09)	5.1 (0.201)	*
ASMD100F	2,000	10,000	100F	3.1 (0.12)	2.3 (0.09)	5.1 (0.201)	*
ASMD125F	2,000	10,000	125F	3.1 (0.12)	2.3 (0.09)	5.1 (0.201)	*
ASMD150F	1,500	7,500	150F	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
NEW ASMD185F	1,500	7,500	185A	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
ASMD200F	1,500	7,500	200F	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
ASMD250F	1,500	7,500	250F	4.6 (0.18)	2.3 (0.09)	6.1 (0.240)	*
nanoASMD							
Surface-mount							
NEW nanoASMD012F	3,000	15,000	P	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
NEW nanoASMD016F	3,000	15,000	N	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
NEW nanoASMD020F	3,000	15,000	02	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
NEW nanoASMD035F	3,000	15,000	03	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
microASMD							
Surface-mount							
NEW microASMD005F	4,000	20,000	05	2.50 (0.098)	1.00 (0.039)	2.00 (0.079)	*
NEW microASMD010F	4,000	20,000	10	2.50 (0.098)	1.00 (0.039)	2.00 (0.079)	*
miniASMD							
Surface-mount							
NEW miniASMD010F	2,000	10,000	10	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD014F	2,000	10,000	14	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD020F	2,000	10,000	2	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD030F	2,000	10,000	3	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD050F	2,000	10,000	5	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD075F/24	1,500	7,500	075F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD110F/16	2,000	10,000	110F 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD110F/24	1,500	7,500	110F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD125F/16	2,000	10,000	125F 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD150F/16	2,000	10,000	150 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD150F/24	1,000	5,000	150F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
NEW miniASMD260F/16	1,500	7,500	260F 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*

* These devices have been designed for use in automotive applications.
For commercial alternatives to these product series please see the radial-leaded devices section or surface-mount devices section.

Part Number	Bag Quantity	Standard Package Quantity	Part Marking	Agency Recognition
BD				
Bladed Device				
BD280-1130-10/16	200	1600	BD280-1130-10	*
BD280-1130-15/16	200	1600	BD280-1130-15	*
BD280-1130-20/16	200	1600	BD280-1130-20	*
BD280-1927-25/16-W	200	1600	BD280-1927-25	*
BD280-1927-30/16-W	200	1600	BD280-1927-30	*

* These devices have been designed for use in automotive applications.
For commercial alternatives to these product series please see the radial-leaded devices section or surface-mount devices section.

Figure A25 Recommended Pad Layout for Automotive Devices

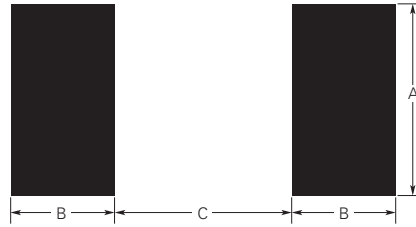
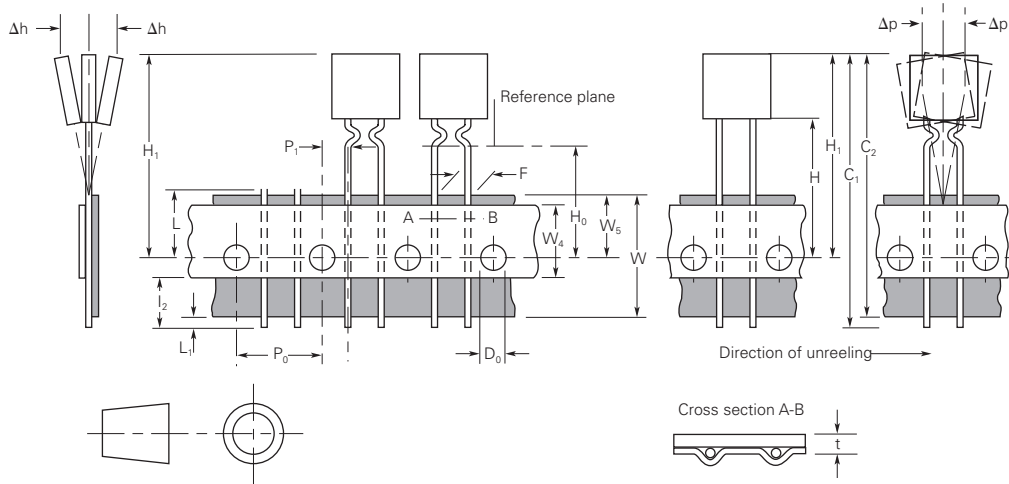
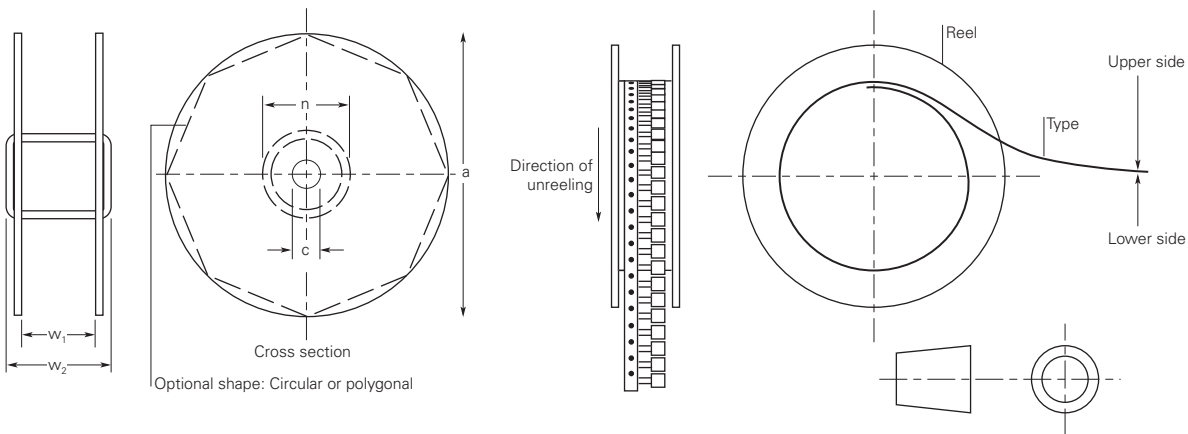


Table A7 Tape and Reel Specifications for AGRF/AHRF/AHEF Automotive Devices

AGRF, AHRF and AHEF devices are available in tape and reel packaging per EIA468-B/IEC286-2 and EIA 481-2 standards. See Figures A26 and A27 for details.

Description	EIA Mark	Dimension (mm)	Tolerance
Carrier tape width	W	18.0	-0.5/+1.0
Hold down tape width	W ₄	11.0	Minimum
Top distance between tape edges	W ₆	3.0	Maximum
Sprocket hole position	W ₅	9.0	-0.5/+0.75
Sprocket hole diameter	D ₀	4.0	±0.2
Abscissa to plane	H ₀	16.0	±0.5
Abscissa to top (AGRF400 to AGRF600, AHRF050 to AHRF450, AHEF050 to AHEF300)	H ₁	32.2	Maximum
Abscissa to top (AGRF700 to AGRF1400, AHRF550 to AHRF1500*, AHEF500 to AHEF1000)	H ₁	45.0	Maximum
Overall width with lead protrusion (AGRF400 to AGRF600 & AHRF050 to AHRF450, AHEF050 to AHEF300)	C ₁	43.2	Maximum
Overall width with lead protrusion (AGRF700 to AGRF1400, AHRF550 to AHRF1500, AHEF500 to AHEF1000)	C ₁	55.0	Maximum
Overall width without lead protrusion (AGRF400 to AGRF600, AHRF050 to AHRF450, AHEF050 to AHEF300)	C ₂	42.5	Maximum
Overall width without lead protrusion (AGRF700 to AGRF1400, AHRF550 to AHRF1500, AHEF500 to AHEF1000)	C ₂	54.0	Maximum
Lead protrusion	L ₁	1.0	Maximum
Protrusion of cut-out	L	11.0	Maximum
Protrusion beyond hold-down tape	l ₂	Not specified	—
Sprocket hole pitch	P ₀	12.7	± 0.3
Device pitch (AGRF400 to AGRF700, AHRF050 to AHRF600, AHEF050 to AHEF300)	—	12.7	± 0.3
Device pitch (AGRF800 to AGRF1400, AHRF650 to AHRF1500, AHEF500 to AHEF1000)	—	25.4	± 0.6
Pitch tolerance	—	20 consec.	± 0.1
Tape thickness	t	0.9	Maximum
Overall tape and lead thickness (AGRF400 to AGRF1100, AHRF050 to AHRF1100*, AHEF050 to AHEF750)	t ₁	2.0	Maximum
Overall tape and lead thickness (AGRF1200 to AGRF1400, AHRF1300 to AHRF1500*, AHEF1000)	t ₁	2.3	Maximum
Splice sprocket hole alignment	—	0	± 0.3
Body lateral deviation	Δh	0	± 1.0
Body tape plane deviation	Δp	0	± 1.3
Ordinate to adjacent component lead (AGRF400 to AGRF1100, AHRF050 to AHRF900, AHEF050 to AHEF500)	P ₁	3.81	± 0.7
Ordinate to adjacent component lead (AGRF1200 to AGRF1400, AHRF1000 to AHRF1500, AHEF750 to AHEF1000)	P ₁	7.62	± 0.7
Lead spacing (AGRF400 to AGRF1100, AHRF050 to AHRF900*, AHEF050 to AHEF500)	F	5.05	± 0.75
Lead spacing (AGRF1200 to AGRF1400, AHRF1000 to AHRF1500*, AHEF750 to AHEF1000)	F	10.15	± 0.75
Reel width (AGRF400 to AGRF600 & AHRF050 to AHRF450, AHEF050 to AHEF300)	w ₂	56.0	Maximum
Reel width (AGRF700 to AGRF1400, AHRF550 to AHRF1500*, AHEF500 to AHEF1000)	w ₂	63.5	Maximum
Reel diameter	a	370.0	Maximum
Space between flanges* (AHEF050 to AHEF300)	w ₁	48.0	Maximum
Space between flanges* (AHEF500 to AHEF1000)	w ₁	55.0	Maximum
Arbor hold diameter	c	26.0	±12.0
Core diameter*	n	91.0	Maximum
Box	—	64/372/362	Maximum
Consecutive missing places	—	None	—
Empty places per reel	—	0.1%	Maximum

*Differs from EIA specification.

Figure A26 EIA Referenced Taped Component Dimensions for AGRF/AHRF/AHEF Automotive Devices

Figure A27 EIA Referenced Reel Dimensions for AGRF/AHRF/AHEF Automotive Devices

Table A8 Tape and Reel Specifications for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices (in Millimeters)

Description	nanoASMDC	microASMD	miniASMDC	AHS080-2018	ASMD030F~ASMD125F	AHS160~AHS300
	EIA 481-1	EIA 481-1	EIA 481-1	EIA 481-2	EIA 481-2	ASMD150F~ASMD250F EIA 481-2
W	8.0 ± 0.30	8.0 ± 0.30	12.0 ± 0.30	16.0 ± 0.30	16.0 ± 0.30	16.0 ± 0.30
P ₀	4.0 ± 0.10	4.0 ± 0.10	4.0 ± 0.10	4.0 ± 0.10	4.0 ± 0.10	4.0 ± 0.10
P ₁	4.0 ± 0.10	4.0 ± 0.10	8.0 ± 0.10	8.0 ± 0.10	8.0 ± 0.10	12.0 ± 0.10
P ₂	2.0 ± 0.05	2.0 ± 0.05	2.0 ± 0.05	2.0 ± 0.10	2.0 ± 0.10	2.0 ± 0.10
A ₀	1.95 ± 0.10	2.9 ± 0.10	Table A9	5.11 ± 0.15	5.6 ± 0.23	6.9 ± 0.23
B ₀	Table A9	3.50 ± 0.10	Table A9	5.6 ± 0.23	8.1 ± 0.15	9.6 ± 0.15
B ₁ max.	4.35	4.35	8.2	12.1	12.1	12.1
D ₀	1.55 ± .05	1.55 ± .05	1.5 + 0.10/ -.00	1.5 + 0.10/ -.00	1.5 + 0.10/ -.00	1.5 + 0.10/ -.00
F	3.50 ± 0.05	3.50 ± 0.05	5.50 ± 0.05	7.50 ± 0.10	7.50 ± 0.10	7.50 ± 0.10
E ₁	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10
E ₂ min.	6.25	6.25	10.25	14.25	14.25	14.25
T max.	0.6	0.6	0.6	0.6	0.6	0.6
T ₁ max.	0.1	0.1	0.1	0.1	0.1	0.1
K ₀	Table A9	0.9 ± 0.1	Table A9	1.8 ± 0.15	3.2 ± 0.15	3.4 ± 0.15
Leader min.	390	390	390	400	400	400
Trailer min.	160	160	160	160	160	160

Table A9 Tape and Reel Specifications for nanoASMD/miniASMD Automotive Devices (in Millimeters)

Description	nanoASMD		miniASMD		miniASMD150F/24
	nanoASMD020F nanoASMD035F	nanoASMD012F nanoASMD016F	miniASMD010F~050F miniASMD110F/16 miniASMD125F/16 miniASMD150F/16	miniASMD075F/24 miniASMD110F/24 miniASMD260F/16	
A ₀	1.95 ± 0.1	1.95 ± 0.1	3.5 ± 0.1	3.7 ± 0.1	3.7 ± 0.1
B ₀	3.50 +0.1/-0.08	3.5 ± 0.1	4.95 ± 0.1	4.9 ± 0.1	4.9 ± 0.1
K ₀	0.89 ± 0.1	1.27 ± 0.1	0.9 ± 0.1	1.4 ± 0.1	1.78 ± 0.1

Table A10 Reel Dimensions for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices (in Millimeters)

Description	nanoASMD microASMD	miniASMD	AHS ASMD
A max.	185	185	330
N min.	50	50	50
W ₁	8.4 + 1.5/-0.00	12.4 + 2.0/-0.00	16.4 + 2.0/-0.00
W ₂ max.	14.4	18.4	22.4

Figure A28 EIA Referenced Taped Component Dimensions for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices

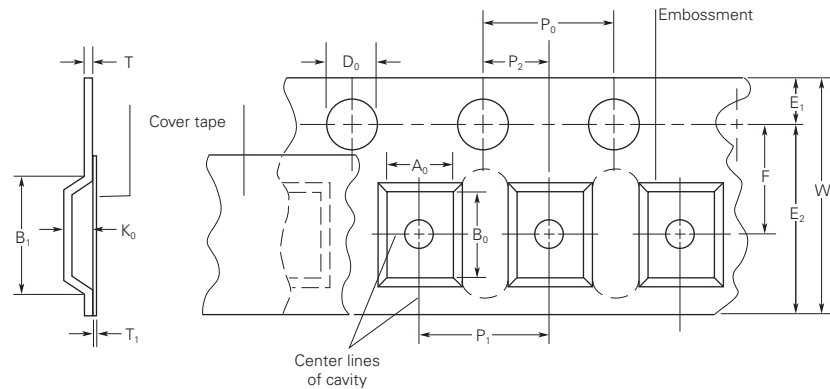
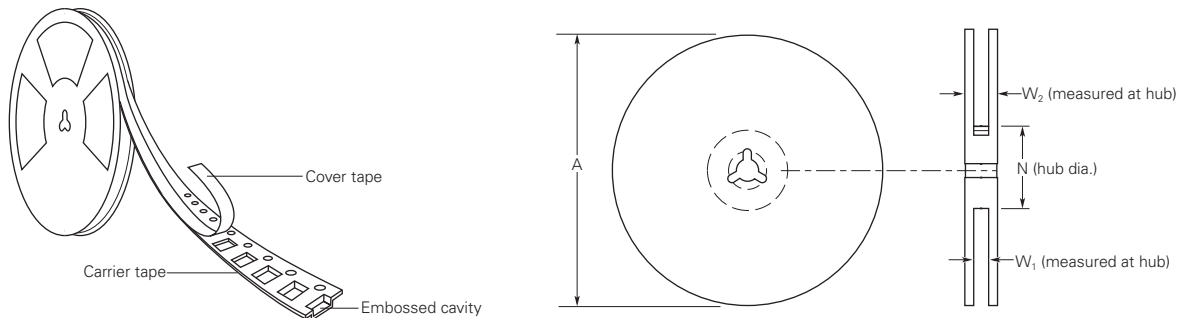
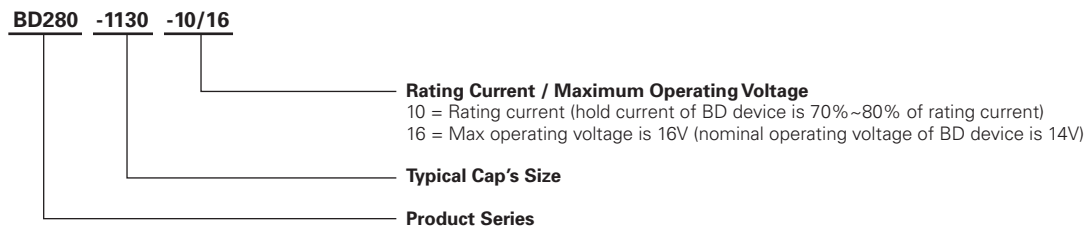
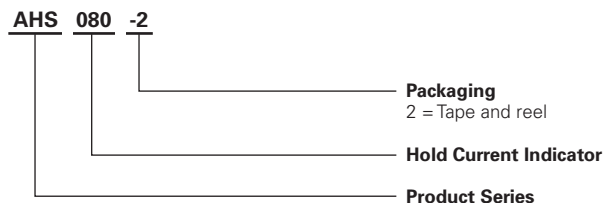
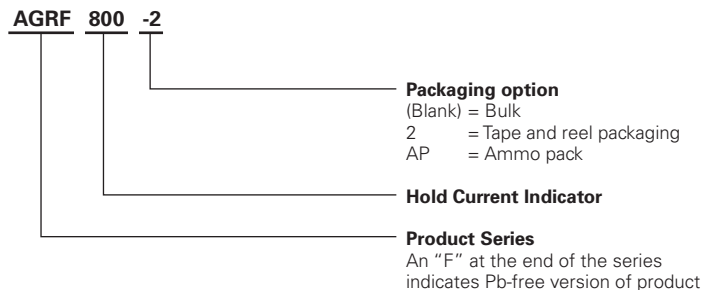


Figure A29 EIA Referenced Reel Dimensions for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices



Part Numbering System for Automotive Devices

Warning :

- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage (Ldi/dt) above the rated voltage of the device.

