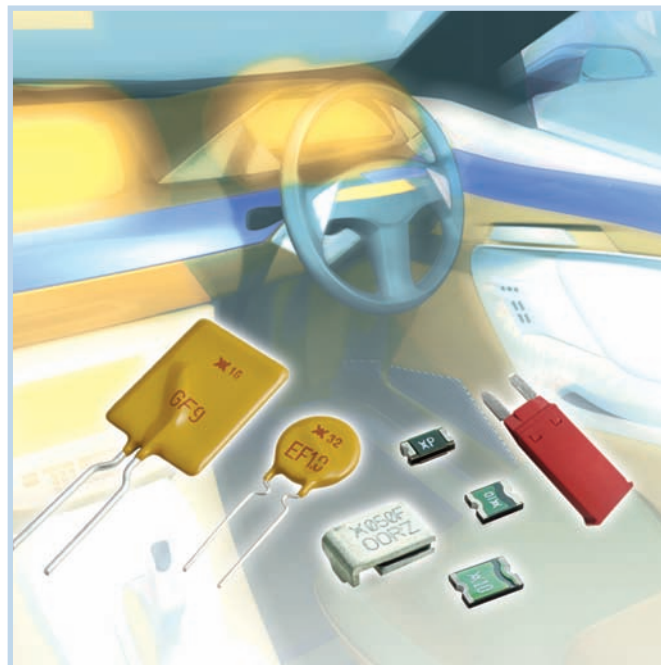




## PolySwitch Resettable Devices Automotive Devices

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
<b>Hold Current (A)</b>									
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
<b>Hold Current (A)</b>								
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
<b>AGRF</b>											
<b>16V — Radial-leaded</b>											
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	—
<b>AHRF (High Temperature)</b>											
<b>30V — Radial-leaded</b>											
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
<b>AHRF (High Temperature)</b>											
<b>16V — Radial-leaded</b>											
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
<b>AHEF (High Temperature)</b>											
<b>32V — Radial-leaded</b>											
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
<b>AHS (High Temperature)</b>											
<b>16V — Surface-mount</b>											
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

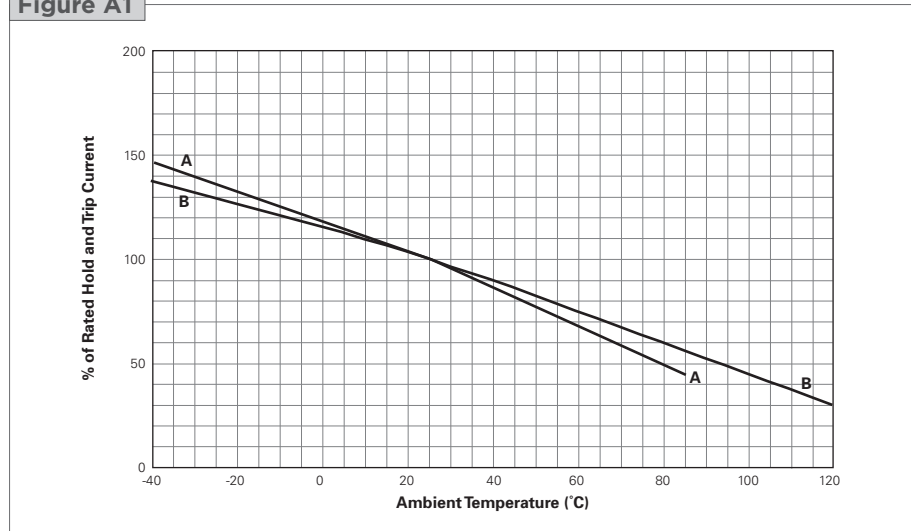
**Table A2 Thermal Derating for Automotive Devices  
[Hold Current (A) at Ambient Temperature (°C)]**

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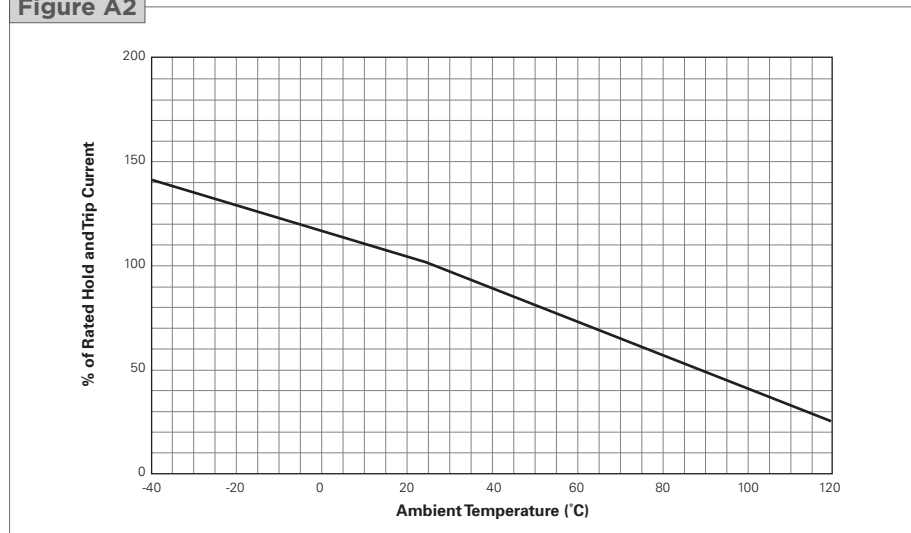
Part Number	Maximum Ambient Temperature										
	-40°C	-20°C	0°C	20°C	25°C	40°C	50°C	60°C	70°C	85°C	125°C
<b>ASMD</b>											
<b>16-60V — Surface-mount</b>											
ASMD030F	0.35	0.31	0.27	0.23	0.22	0.19	0.17	0.15	0.13	0.11	—
ASMD050F	0.59	0.53	0.46	0.39	0.37	0.33	0.29	0.26	0.23	0.18	—
ASMD075F	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	—
<b>NEW</b> 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	—
<b>nanoASMD</b>											
<b>16-48V — Surface-mount</b>											
<b>NEW</b> nanoASMD012F	0.20	0.17	0.15	0.13	0.12	0.11	0.10	0.09	0.08	0.07	—
<b>NEW</b> nanoASMD016F	0.21	0.20	0.18	0.16	0.16	0.14	0.13	0.12	0.11	0.09	—
<b>NEW</b> nanoASMD020F	0.34	0.30	0.26	0.22	0.20	0.17	0.15	0.13	0.11	0.08	—
<b>NEW</b> nanoASMD035F	0.58	0.51	0.44	0.38	0.35	0.31	0.28	0.24	0.21	0.16	—
<b>microASMD</b>											
<b>30V — Surface-mount</b>											
<b>NEW</b> microASMD005F	0.08	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.02	—
<b>NEW</b> microASMD010F	0.15	0.13	0.12	0.10	0.10	0.09	0.08	0.06	0.06	0.05	—
<b>miniASMD</b>											
<b>16-60V — Surface-mount</b>											
<b>NEW</b> miniASMD010F	0.17	0.15	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04	—
<b>NEW</b> miniASMD014F	0.23	0.20	0.17	0.14	0.13	0.11	0.10	0.09	0.07	0.05	—
<b>NEW</b> miniASMD020F	0.30	0.27	0.23	0.20	0.19	0.17	0.15	0.13	0.12	0.09	—
<b>NEW</b> miniASMD030F	0.49	0.44	0.39	0.32	0.30	0.27	0.24	0.22	0.18	0.14	—
<b>NEW</b> miniASMD050F	0.59	0.57	0.55	0.50	0.48	0.45	0.43	0.35	0.30	0.23	—
<b>NEW</b> miniASMD075F/24	1.50	1.25	1.00	0.75	0.73	0.65	0.60	0.55	0.50	0.43	—
<b>NEW</b> miniASMD110F/16	1.68	1.49	1.30	1.10	1.05	0.92	0.83	0.75	0.64	0.50	—
<b>NEW</b> miniASMD110F/24	2.00	1.70	1.40	1.10	1.06	0.95	0.88	0.80	0.73	0.61	—
<b>NEW</b> miniASMD125F/16	2.00	1.69	1.47	1.25	1.17	1.03	0.92	0.90	0.69	0.53	—
<b>NEW</b> miniASMD150F/16	2.40	2.10	1.80	1.50	1.44	1.25	1.13	1.00	0.88	0.69	—
<b>NEW</b> miniASMD150F/24	2.10	1.90	1.70	1.50	1.44	1.25	1.13	1.00	0.88	0.69	—
<b>NEW</b> miniASMD260F/16	3.50	3.20	3.00	2.60	2.53	2.30	2.15	2.00	1.85	1.63	—
<b>BD</b>											
<b>14V — Bladed Device</b>											
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**

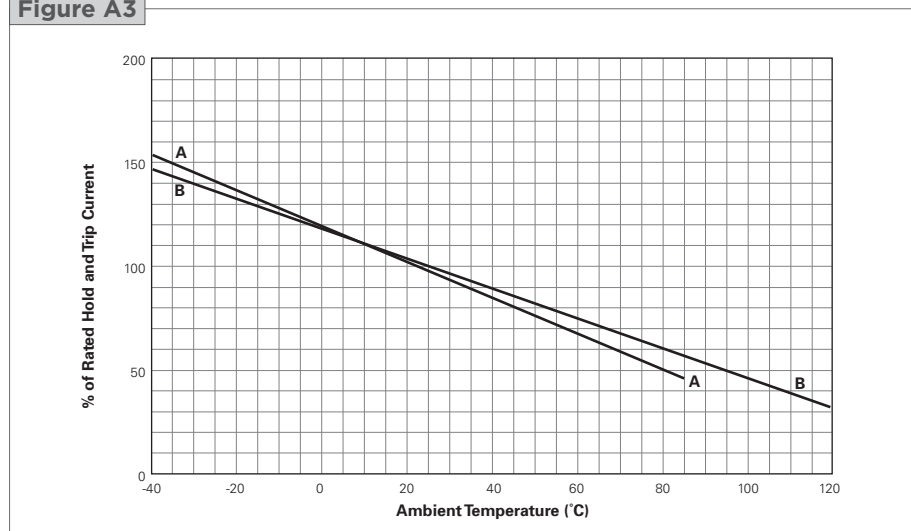
A = AGRF  
B = AHRF

**Figure A1**


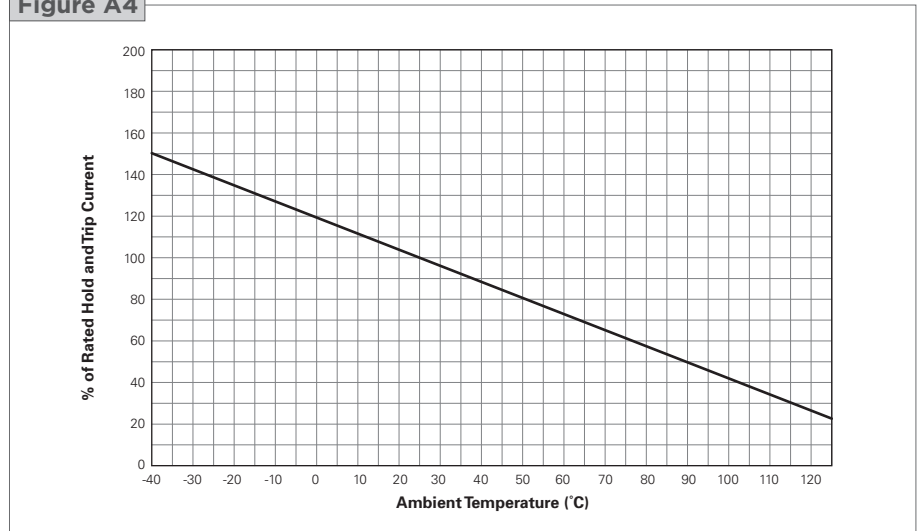
AHEF

**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
<b>AGRF</b>												
<b>16V — Radial-leaded</b>												
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
<b>AHRF (High Temperature)</b>												
<b>30V — Radial-leaded</b>												
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
<b>AHRF (High Temperature)</b>												
<b>16V — Radial-leaded</b>												
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**

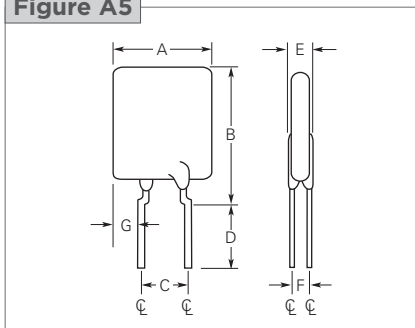
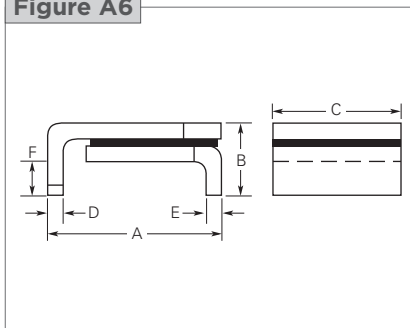
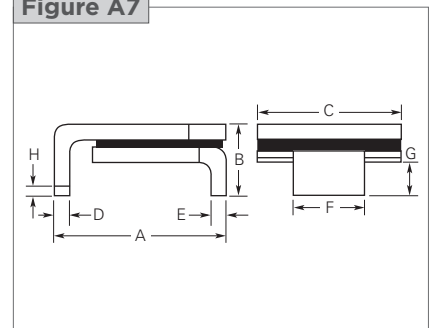
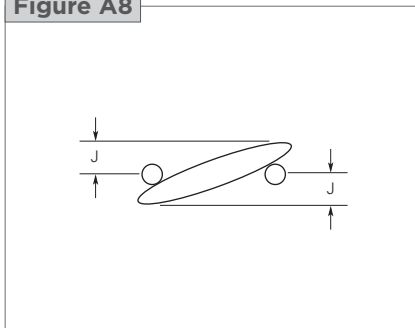
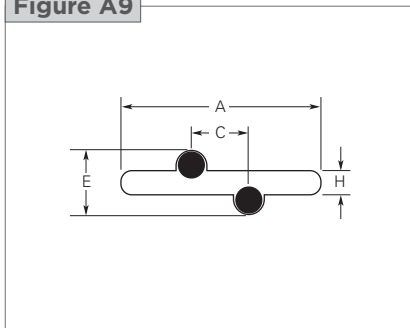
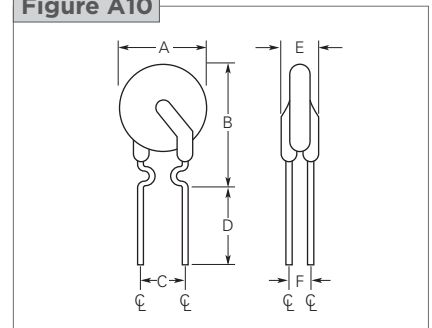
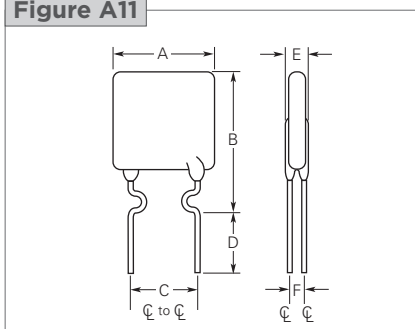
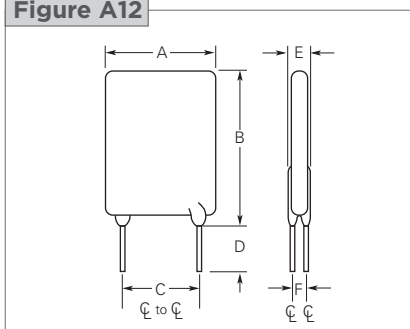
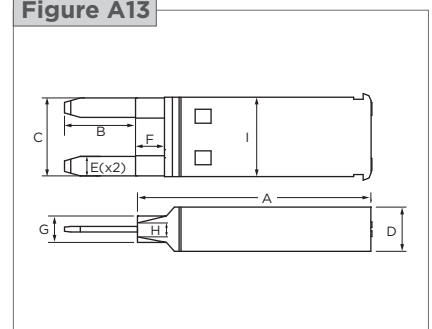
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Part Number	$I_H(A)@$	$I_H(A)@$	$I_T$	$V_{MAX}$	$I_{MAX}$	$P_{DTyp}$	Max. Time-to-trip		$R_{MIN}$	$R_{1MAX}$	$R_{aMAX}$	Figure for Dimensions
	$R_{1MAX}$	$R_{aMAX}$					(A)	(s)				
<b>AHEF (High Temperature)</b>												
<b>32V — Radial-leaded</b>												
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
<b>AHS (High Temperature)</b>												
<b>16V — Surface-mount</b>												
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
<b>ASMD</b>												
<b>16-60V — Surface-mount</b>												
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
<b>NEW</b> 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
<b>nanoASMD</b>												
<b>16-48V — Surface-mount</b>												
<b>NEW</b> nanoASMD012F	0.12	0.12	0.39	48	10	0.5	1.0	0.2	1.400	6.500	6.500	A15
<b>NEW</b> nanoASMD016F	0.16	0.16	0.45	48	10	0.5	1.0	0.3	1.100	5.000	5.000	A15
<b>NEW</b> nanoASMD020F	0.20	0.20	0.42	24	100	0.6	8.0	0.1	0.650	3.100	3.100	A15
<b>NEW</b> nanoASMD035F	0.35	0.75	0.75	16	20	0.6	3.5	0.1	0.450	1.350	1.350	A15
<b>microASMD</b>												
<b>30V — Surface-mount</b>												
<b>NEW</b> microASMD005F	0.05	0.05	0.15	30	10	1.0	0.25	1.5	3.60	50.000	50.000	A15
<b>NEW</b> microASMD010F	0.10	0.10	0.25	30	10	0.8	0.5	1.0	2.10	15.000	15.000	A15
<b>miniASMD</b>												
<b>16-60V — Surface-mount</b>												
<b>NEW</b> miniASMD010F	0.10	0.10	0.30	60	40	0.75	0.5	5.000	0.700	12.700	12.700	A15
<b>NEW</b> miniASMD014F	0.14	0.14	0.28	60	10	0.75	8.0	0.008	1.500	6.000	6.000	A15
<b>NEW</b> miniASMD020F	0.20	0.20	0.40	30	10	0.8	8.0	0.020	0.600	3.300	3.300	A15
<b>NEW</b> miniASMD030F	0.30	0.30	0.60	30	40	0.8	8.0	0.100	0.200	1.750	1.750	A15
<b>NEW</b> miniASMD050F	0.50	0.50	1.00	24	100	0.8	8.0	0.150	0.150	1.000	1.000	A15
<b>NEW</b> miniASMD075F/24	0.75	0.75	1.50	24	40	0.8	8.0	0.300	0.090	0.290	0.290	A15
<b>NEW</b> miniASMD110F/16	1.10	1.10	2.20	16	100	0.8	8.0	0.300	0.060	0.180	0.180	A15
<b>NEW</b> miniASMD110F/24	1.10	1.10	2.20	24	20	0.8	8.0	0.500	0.060	0.180	0.180	A15
<b>NEW</b> miniASMD125F/16	1.25	1.25	2.50	16	100	0.8	8.0	0.400	0.050	0.140	0.140	A15
<b>NEW</b> miniASMD150F/16	1.50	1.50	2.80	16	100	0.8	8.0	0.500	0.040	0.110	0.110	A15
<b>NEW</b> miniASMD150F/24	1.50	1.50	3.00	24	20	1.0	8.0	1.500	0.040	0.120	0.120	A15
<b>NEW</b> 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 <sub>DC</sub> )	$I_{MAX}$ (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)				
<b>BD</b>												
<b>14V — Bladed Device</b>												
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:**

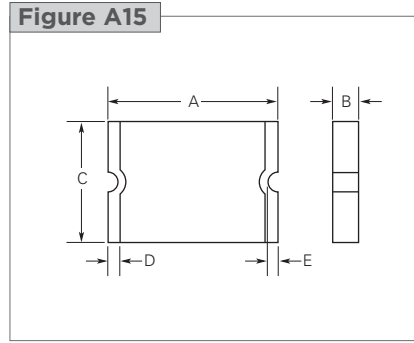
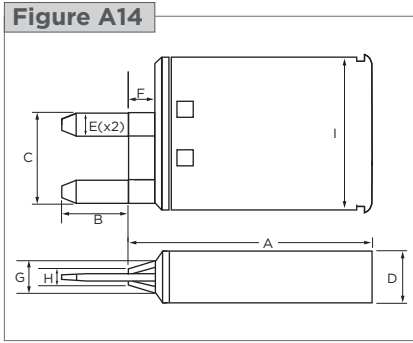
- $I_H$  : Hold current: maximum current device will pass without interruption in 25°C, unless otherwise specified (20°C for ASMD).
- $I_T$  : Trip current: minimum current that will switch the device from low resistance to high resistance in 25°C still air, unless otherwise specified.
- $V_{MAX}$  : 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.	
<b>AGRF</b>																	
<b>16V — Radial-leaded</b>																	
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
<b>AHRF (High Temperature)</b>																	
<b>30V — Radial-leaded</b>																	
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)	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)	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)	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.	
<b>AHRF (High Temperature)</b>																	
<b>16V — Radial-leaded</b>																	
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
<b>AHEF (High Temperature)</b>																	
<b>32V — Radial-leaded</b>																	
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.	
<b>AHS (High Temperature)</b>																	
<b>16V — Surface-mount</b>																	
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
<b>ASMD</b>																	
<b>16-60V — Surface-mount</b>																	
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
<b>NEW</b> 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.		
<b>nanoASMD</b>												
<b>30V — Surface-mount</b>												
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>microASMD</b>												
<b>30V — Surface-mount</b>												
<b>NEW</b> 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
<b>NEW</b> 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)**

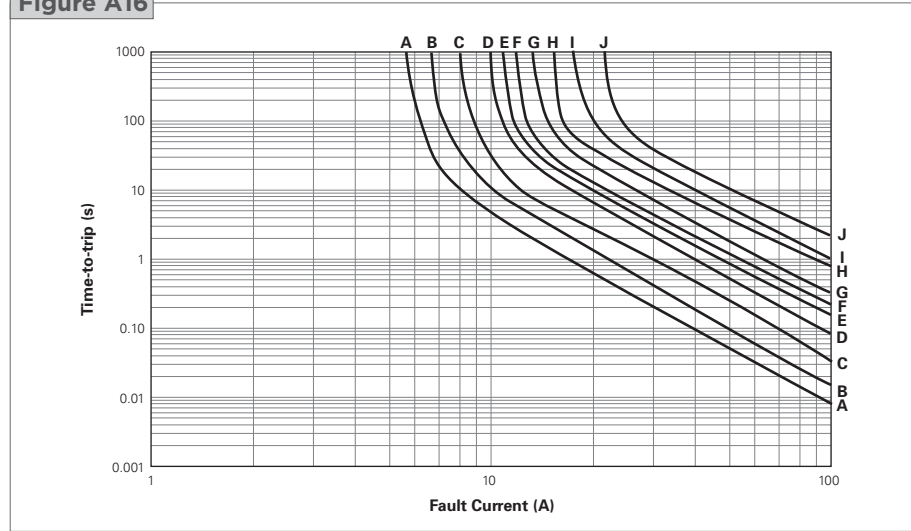
Cont'd

Part Number	A		B		C		D		E		Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
<b>miniASMDC 16-60V — Surface-mount</b>											
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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
<b>NEW</b> 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

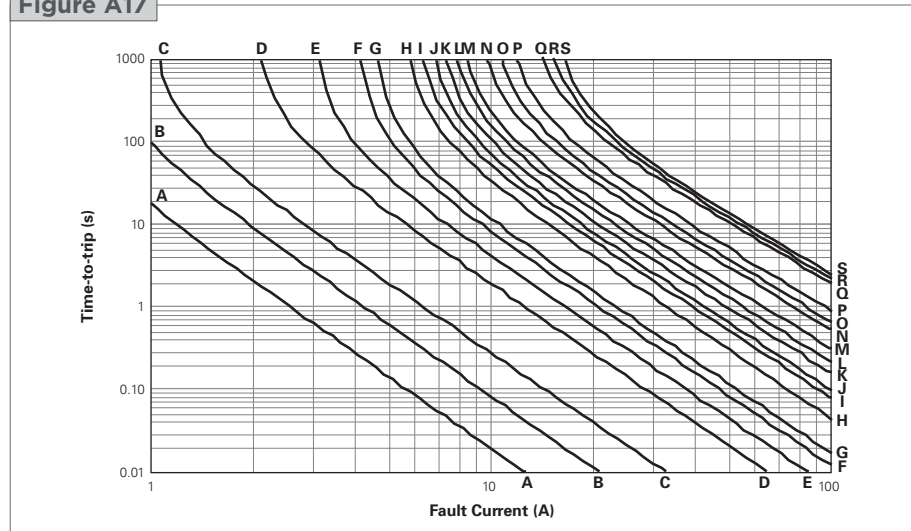
Part Number	A		B		C		D		E(x2)		F		G		H		I		Figure
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
<b>BD 14V — Bladed Device</b>																			
BD280-1130-10/16	29.50 (1.173)	30.10 (1.185)	8.70 (0.343)	9.30 (0.366)	10.75 (0.423)	11.25 (0.443)	6.05 (0.238)	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**

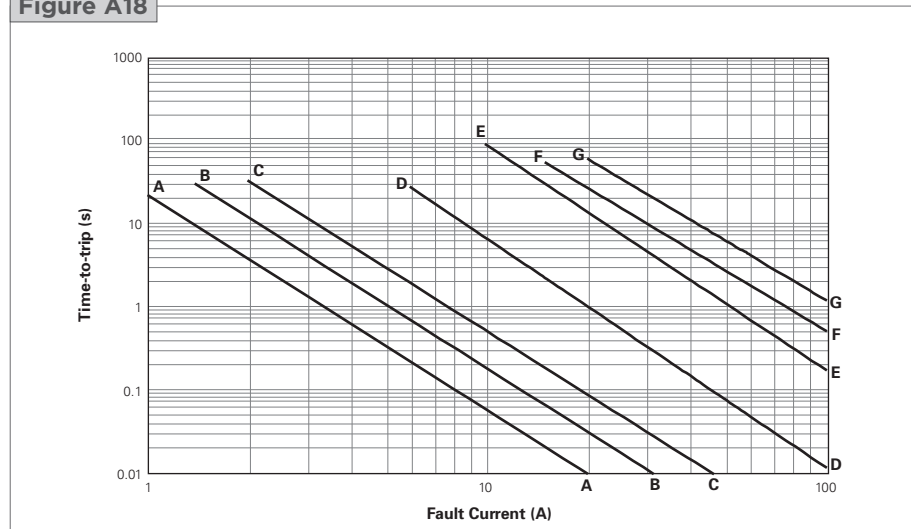
- A = AGRF400
- B = AGRF500
- C = AGRF600
- D = AGRF700
- E = AGRF800
- F = AGRF900
- G = AGRF1000
- H = AGRF1100
- I = AGRF1200
- J = AGRF1400

**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**

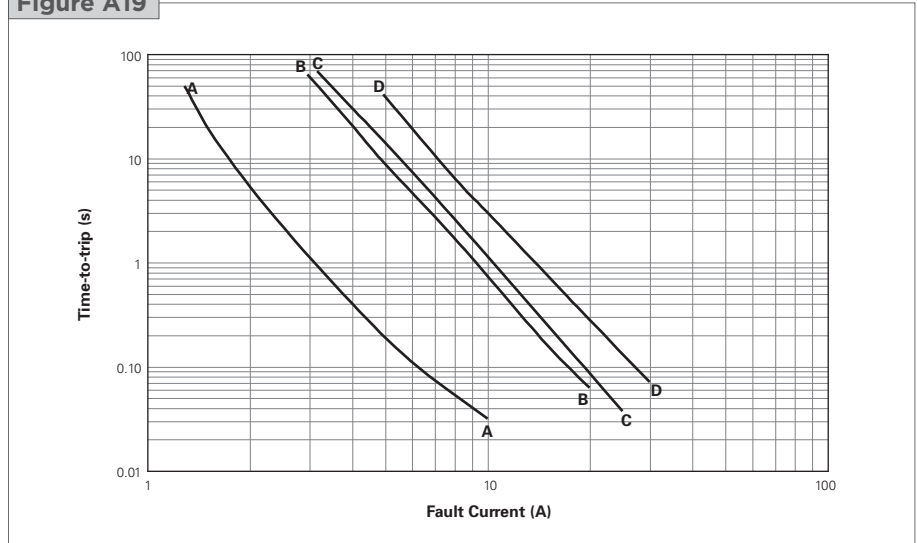
- A = AHEF050
- B = AHEF070
- C = AHEF100
- D = AHEF300
- E = AHEF500
- F = AHEF750
- G = AHEF1000

**Figure A18**


**AHS**

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

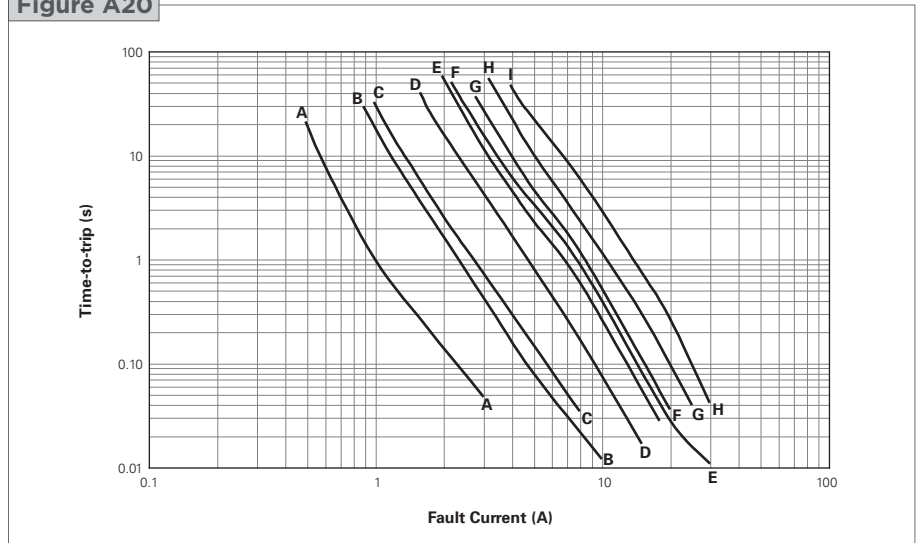
**Figure A19**



**ASMD**

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

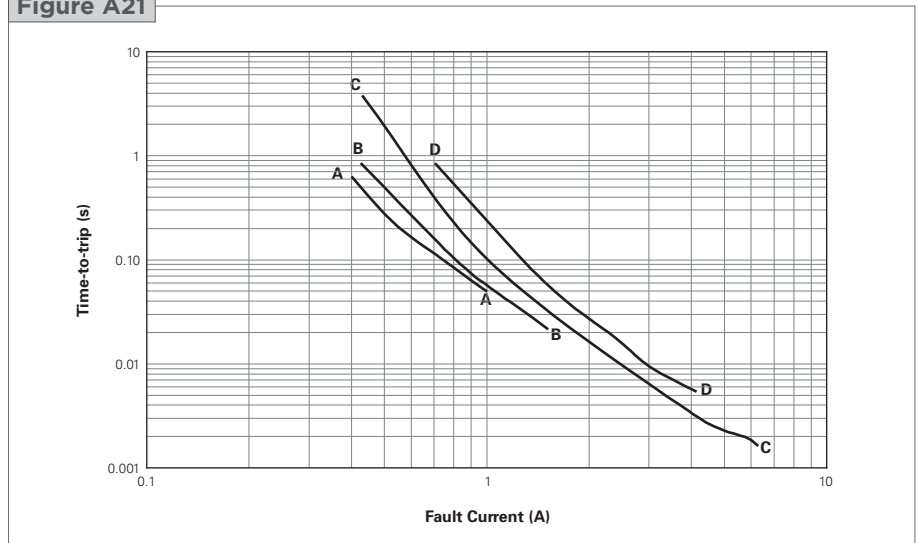
**Figure A20**



**nanoASMDC**

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

**Figure A21**

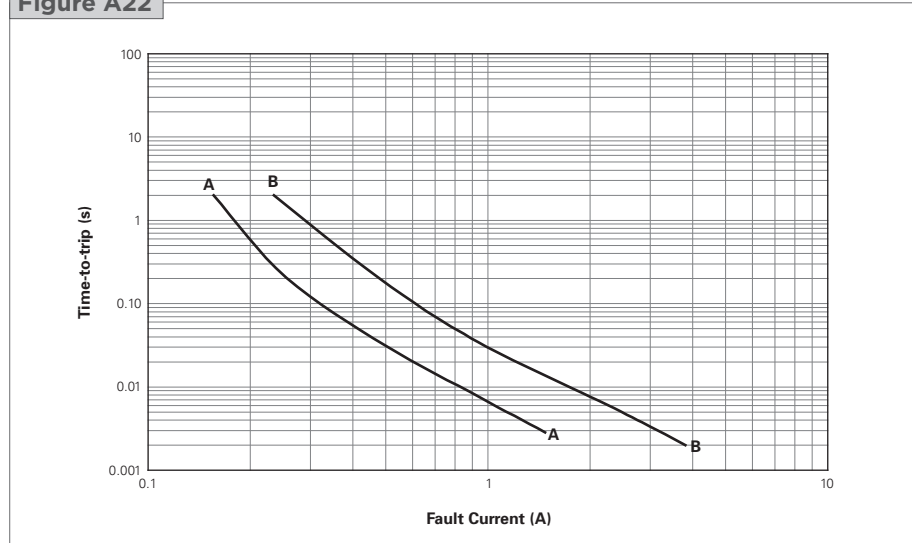


**Figure A16-A24 Typical Time-to-trip at 25°C for Automotive Devices**

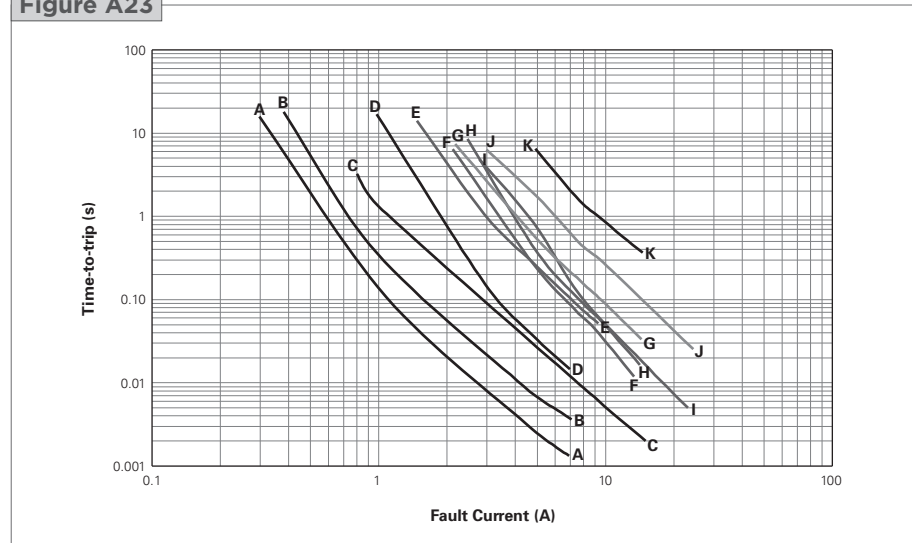
Cont'd

**microASMD**

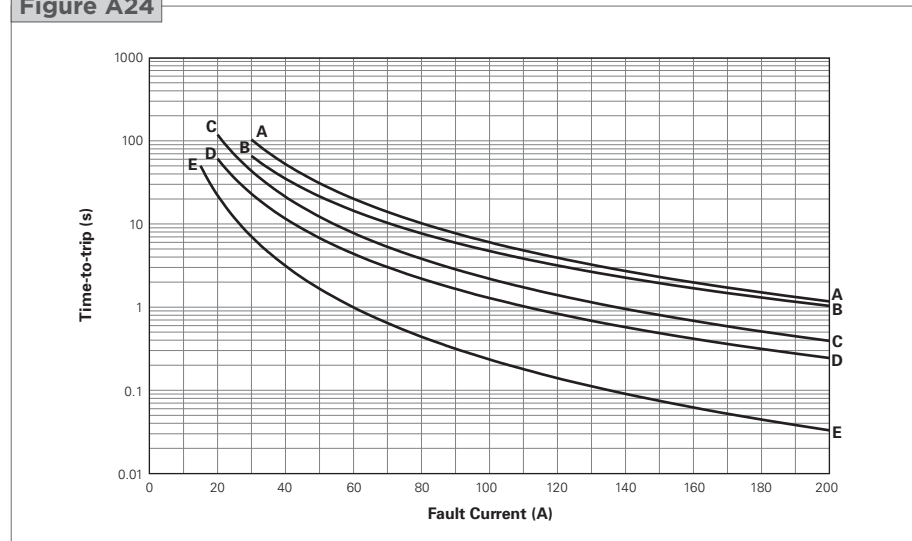
- A = microASMD005F
- B = microASMD010F

**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 <sup>2</sup> (20AWG) $\phi$ 0.8 mm/0.032in AGRF1200 to AGRF1400 : Tin Plated Copper, 0.82mm <sup>2</sup> (18AWG) $\phi$ 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 <sup>2</sup> (24 AWG), $\phi$ 0.51mm/0.020in AHRF300 to AHRF1100 : Tin-plated copper 0.52mm <sup>2</sup> (20 AWG), $\phi$ 0.81mm/0.032 in AHRF1300 to AHRF1500 : Tin-plated copper 0.82mm <sup>2</sup> (18 AWG), $\phi$ 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 <sup>2</sup> (24 AWG), $\phi$ 0.51mm/0.020in. AHEF300 to AHEF750 : Tin-plated Copper 0.52mm <sup>2</sup> (20 AWG), $\phi$ 0.81mm/0.032in AHEF1000 : Tin-plated copper 0.82mm <sup>2</sup> (18 AWG), $\phi$ 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 <sub>HOLD</sub> ), 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
<b>AGRF</b>						
<b>Radial-leaded</b>						
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	*
<b>AHRF (High Temperature)</b>						
<b>Radial-leaded</b>						
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
<b>AHRF (High Temperature)</b>						
<b>Radial-leaded</b>						
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	*
<b>AHEF (High Temperature)</b>						
<b>Radial-leaded</b>						
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

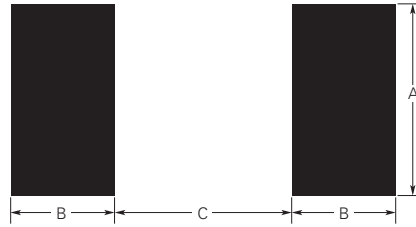
Part Number	Tape & Reel Quantity	Standard Package Quantity	Part Marking	Recommended Pad Layouts [mm(in) See Figure A25]			Agency Recognition
				Dimension A (Min.*/Nom.)	Dimension B (Nom.)	Dimension C (Nom.)	
<b>AHS (High Temperature)</b>							
<b>Surface-mount</b>							
AHS080-2018	4,000	20,000	H08	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)	*
<b>ASMD</b>							
<b>Surface-mount</b>							
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)	*
<b>NEW</b> 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)	*
<b>nanoASMD</b>							
<b>Surface-mount</b>							
<b>NEW</b> nanoASMD012F	3,000	15,000	P	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
<b>NEW</b> nanoASMD016F	3,000	15,000	N	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
<b>NEW</b> nanoASMD020F	3,000	15,000	02	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
<b>NEW</b> nanoASMD035F	3,000	15,000	03	1.60 (0.063)	1.00 (0.039)	2.00 (0.079)	*
<b>microASMD</b>							
<b>Surface-mount</b>							
<b>NEW</b> microASMD005F	4,000	20,000	05	2.50 (0.098)	1.00 (0.039)	2.00 (0.079)	*
<b>NEW</b> microASMD010F	4,000	20,000	10	2.50 (0.098)	1.00 (0.039)	2.00 (0.079)	*
<b>miniASMD</b>							
<b>Surface-mount</b>							
<b>NEW</b> miniASMD010F	2,000	10,000	10	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD014F	2,000	10,000	14	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD020F	2,000	10,000	2	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD030F	2,000	10,000	3	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD050F	2,000	10,000	5	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD075F/24	1,500	7,500	075F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD110F/16	2,000	10,000	110F 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD110F/24	1,500	7,500	110F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD125F/16	2,000	10,000	125F 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD150F/16	2,000	10,000	150 16V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> miniASMD150F/24	1,000	5,000	150F 24V	3.15 (0.124)	1.68 (0.066)	3.10 (0.122)	*
<b>NEW</b> 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
<b>BD</b>				
<b>Bladed Device</b>				
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**

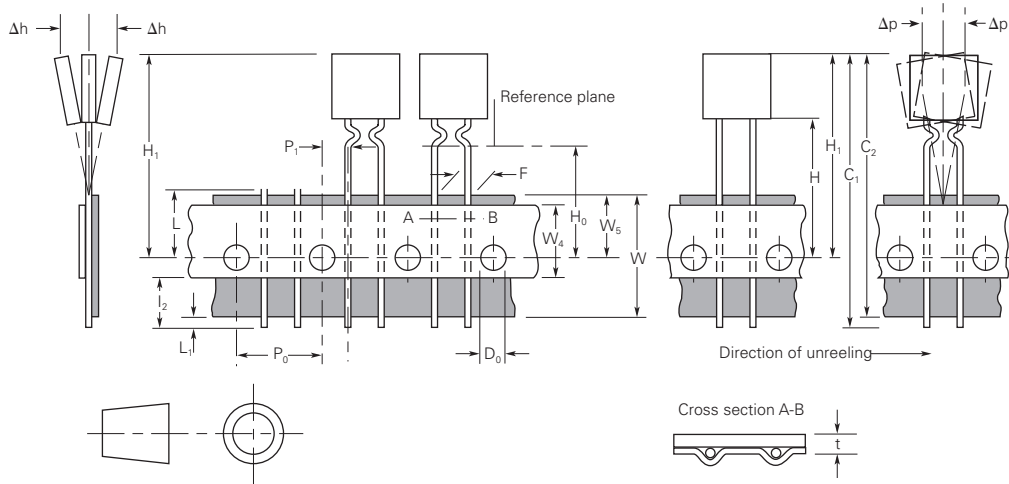
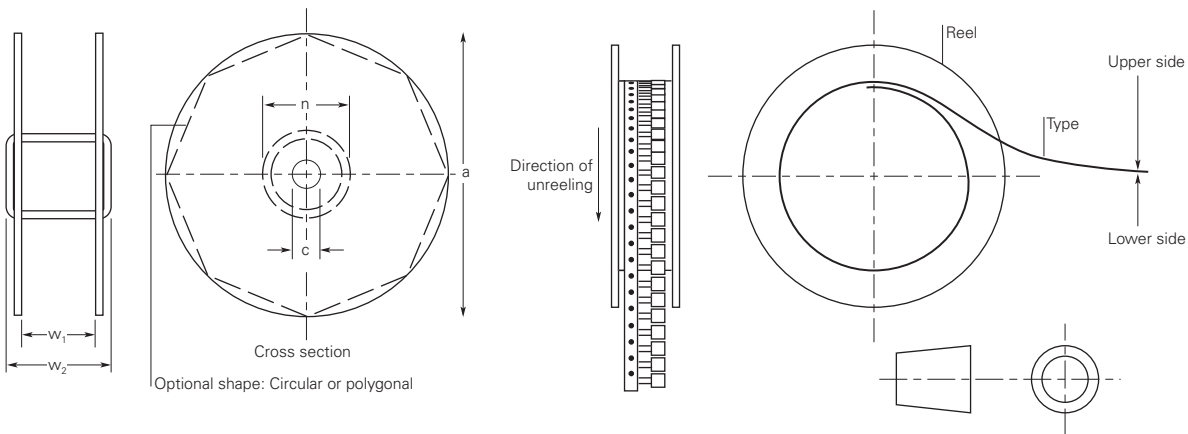


**Table A7 Tape and Reel Specifications for AGRF/AHRF/AHEF Automotive Devices**

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 <sub>4</sub>	11.0	Minimum
Top distance between tape edges	W <sub>6</sub>	3.0	Maximum
Sprocket hole position	W <sub>5</sub>	9.0	-0.5/+0.75
Sprocket hole diameter	D <sub>0</sub>	4.0	±0.2
Abscissa to plane	H <sub>0</sub>	16.0	±0.5
Abscissa to top (AGRF400 to AGRF600, AHRF050 to AHRF450, AHEF050 to AHEF300)	H <sub>1</sub>	32.2	Maximum
Abscissa to top (AGRF700 to AGRF1400, AHRF550 to AHRF1500*, AHEF500 to AHEF1000)	H <sub>1</sub>	45.0	Maximum
Overall width with lead protrusion (AGRF400 to AGRF600 & AHRF050 to AHRF450, AHEF050 to AHEF300)	C <sub>1</sub>	43.2	Maximum
Overall width with lead protrusion (AGRF700 to AGRF1400, AHRF550 to AHRF1500, AHEF500 to AHEF1000)	C <sub>1</sub>	55.0	Maximum
Overall width without lead protrusion (AGRF400 to AGRF600, AHRF050 to AHRF450, AHEF050 to AHEF300)	C <sub>2</sub>	42.5	Maximum
Overall width without lead protrusion (AGRF700 to AGRF1400, AHRF550 to AHRF1500, AHEF500 to AHEF1000)	C <sub>2</sub>	54.0	Maximum
Lead protrusion	L <sub>1</sub>	1.0	Maximum
Protrusion of cut-out	L	11.0	Maximum
Protrusion beyond hold-down tape	l <sub>2</sub>	Not specified	—
Sprocket hole pitch	P <sub>0</sub>	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 <sub>1</sub>	2.0	Maximum
Overall tape and lead thickness (AGRF1200 to AGRF1400, AHRF1300 to AHRF1500*, AHEF1000)	t <sub>1</sub>	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 <sub>1</sub>	3.81	± 0.7
Ordinate to adjacent component lead (AGRF1200 to AGRF1400, AHRF1000 to AHRF1500, AHEF750 to AHEF1000)	P <sub>1</sub>	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 <sub>2</sub>	56.0	Maximum
Reel width (AGRF700 to AGRF1400, AHRF550 to AHRF1500*, AHEF500 to AHEF1000)	w <sub>2</sub>	63.5	Maximum
Reel diameter	a	370.0	Maximum
Space between flanges* (AHEF050 to AHEF300)	w <sub>1</sub>	48.0	Maximum
Space between flanges* (AHEF500 to AHEF1000)	w <sub>1</sub>	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 <sub>0</sub>	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 <sub>1</sub>	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 <sub>2</sub>	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 <sub>0</sub>	1.95 ± 0.10	2.9 ± 0.10	Table A9	5.11 ± 0.15	5.6 ± 0.23	6.9 ± 0.23
B <sub>0</sub>	Table A9	3.50 ± 0.10	Table A9	5.6 ± 0.23	8.1 ± 0.15	9.6 ± 0.15
B <sub>1</sub> max.	4.35	4.35	8.2	12.1	12.1	12.1
D <sub>0</sub>	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 <sub>1</sub>	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 <sub>2</sub> 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 <sub>1</sub> max.	0.1	0.1	0.1	0.1	0.1	0.1
K <sub>0</sub>	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

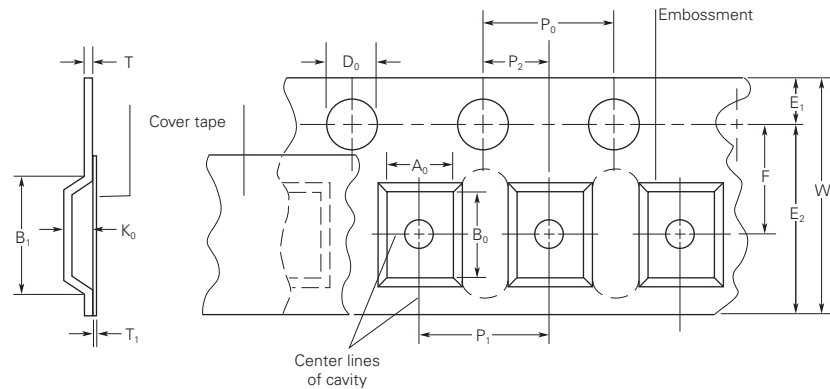
**Table A9** Tape and Reel Specifications for nanoASMD/miniASMD Automotive Devices (in Millimeters)

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

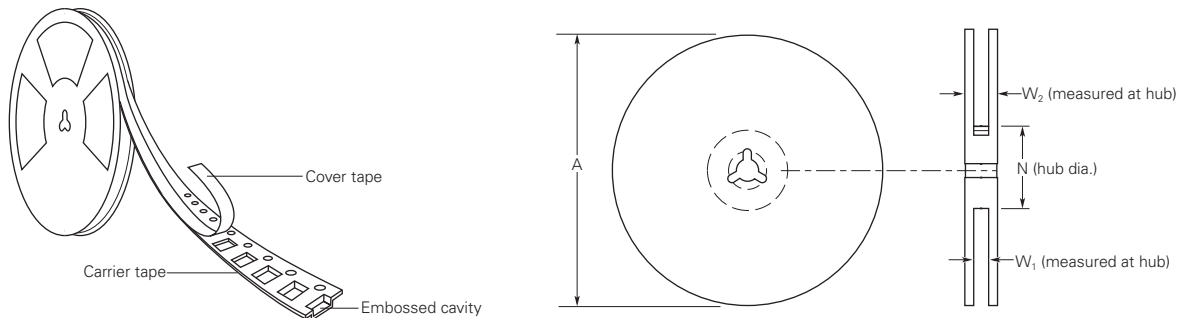
**Table A10** Reel Dimensions for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices (in Millimeters)

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

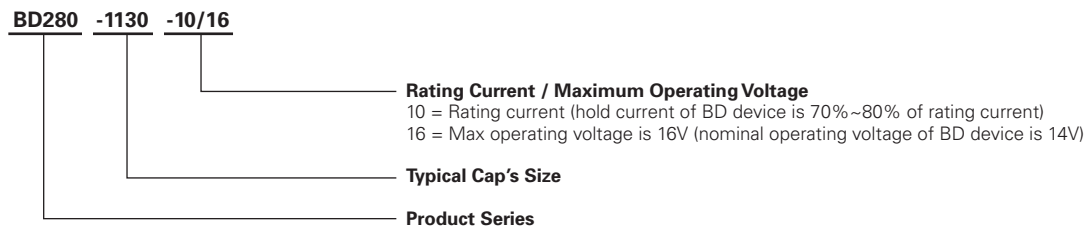
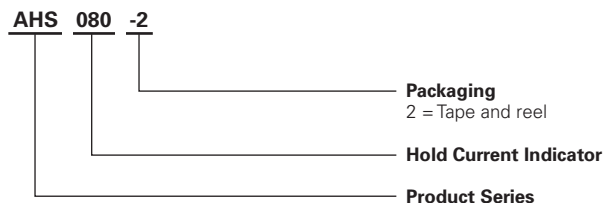
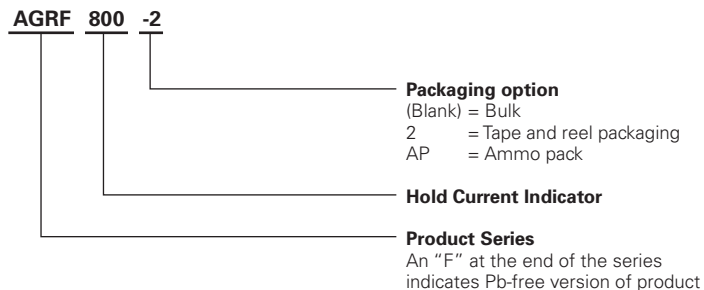
**Figure A28** EIA Referenced Taped Component Dimensions for AHS/ASMD/nanoASMD/microASMD/miniASMD Automotive Devices



**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.

