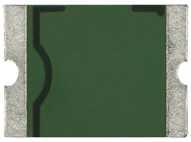
PTSA1812

Automotive SMD PTC fuses



Applications

- Infotainment
- In-vehicle navigation
- Telematics
- Car lighting
- Power window and seat control
- Instrument clusters
- PCB trace protection

Product features

- AEC-Q200 qualified
- Positive temperature coefficient (PTC)
- Surface mount resettable fuse
- Compact 1812 (4532 metric) footprint
- Low resistance
- Fast time-to-trip
- Current rating from 0.10 A to 2.60 A
- Voltage rating from 16 V to 60 V

Environmental compliance

Pb HALOGEN HF FREE RoHS

Part number system/ordering:

PTSA181260V010

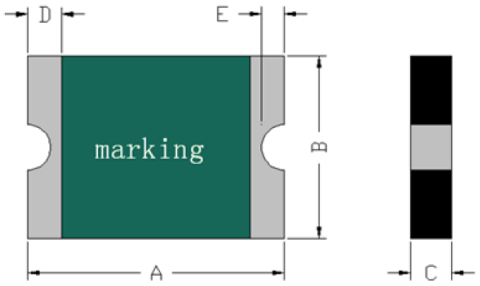
- PT= PTC resettable fuse
- S= Surface mount
- A= Automotive
- 1812= Dimension code
- 60V= Maximum voltage
- 010= Ihold current rating (010= 0.10 A)

Product specifications

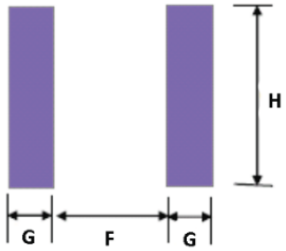
Part number	Vmax[1] (V_{dc})	Imax[2] (A)	Ihold[3] (A)	Itrip[4] (A)	Pd[5] typical (W)	Time-to-trip (maximum) (A)	Time-to-trip (maximum) (seconds)	Resistance[6] Initial (R_i) minimum (Ω)	Resistance[6] Post trip (R_1) maximum (Ω)	Part marking
PTSA181260V010	60	10	0.10	0.3	1.0	1.5	0.15	0.70	15.0	W010
PTSA181260V014	60	10	0.14	0.34	1.0	1.5	0.30	0.65	6.00	W014
PTSA181230V020	30	10	0.20	0.4	1.0	6.0	0.02	0.60	5.00	W020
PTSA181230V030	30	40	0.30	0.6	1.0	8.0	0.15	0.20	1.75	W030
PTSA181224V050	24	50	0.50	1.0	1.0	8.0	0.15	0.10	1.00	W050
PTSA181233V075	33	100	0.75	1.5	1.0	8.0	0.30	0.07	0.48	W075
PTSA181224V110	24	40	1.10	2.2	1.0	8.0	0.30	0.04	0.26	W110
PTSA181216V150	16	40	1.50	3.0	1.0	8.0	0.50	0.03	0.12	W150
PTSA181224V150	24	40	1.50	3.0	1.0	8.0	1.50	0.03	0.12	W150
PTSA181216V200	16	40	2.00	4.0	1.0	8.0	5.00	0.02	0.085	W200
PTSA181216V260	16	40	2.60	5.2	1.0	8.0	5.00	0.015	0.07	W260

1. Vmax: Maximum continuous voltage the device can withstand without damage at rated current
2. Imax: Maximum fault current the device can withstand without damage at rated voltage
3. Ihold: Maximum current the device will pass without interruption at +23 °C still air
4. Itrip: Minimum current that will transition the device from low resistance to high resistance at +23 °C still air
5. Pd: Power dissipated from the device when in tripped state at +23 °C still air
6. R_i: Minimum resistance of the device at +23 °C
   R_1: Maximum resistance of the device one hour after tripping at +23 °C

Dimensions–mm



Recommended pad layout



Part number	A typ	A max	B typ	B max	C typ	C max	D min	E min	F	G	H
PTSA181260V010	4.50	4.73	3.20	3.41	0.79	1.0	0.3	0.2	3.10	1.68	3.2
PTSA181260V014	4.50	4.73	3.20	3.41	0.79	1.0	0.3	0.2	3.10	1.68	3.2
PTSA181230V020	4.50	4.73	3.20	3.41	0.79	1.0	0.3	0.2	3.10	1.68	3.2
PTSA181230V030	4.50	4.73	3.20	3.41	0.79	1.0	0.3	0.2	3.10	1.68	3.2
PTSA181224V050	4.50	4.73	3.20	3.41	0.75	1.05	0.3	0.2	3.10	1.68	3.2
PTSA181233V075	4.53	4.73	3.20	3.41	1.15	1.3	0.3	0.2	3.10	1.68	3.2
PTSA181224V110	4.50	4.73	3.20	3.41	0.79	1.3	0.3	0.2	3.10	1.68	3.2
PTSA181216V150	4.53	4.73	3.20	3.41	1.20	1.7	0.3	0.2	3.10	1.68	3.2
PTSA181224V150	4.53	4.73	3.20	3.41	1.20	1.7	0.3	0.2	3.10	1.68	3.2
PTSA181216V200	4.53	4.73	3.20	3.41	1.20	2.0	0.3	0.2	3.10	1.68	3.2
PTSA181216V260	4.53	4.83	3.20	3.41	1.20	2.0	0.3	0.2	3.10	1.68	3.2

Thermal derating chart - Ihold (A)

Part number	Maximum ambient temperature (°C)								
	-40	-20	0	25	40	50	60	70	85
PTSA181260V010	0.18	0.16	0.14	0.10	0.08	0.07	0.06	0.05	0.04
PTSA181260V014	0.23	0.20	0.18	0.14	0.12	0.11	0.09	0.07	0.05
PTSA181230V020	0.33	0.29	0.26	0.20	0.175	0.16	0.15	0.13	0.09
PTSA181230V030	0.49	0.44	0.39	0.30	0.27	0.24	0.22	0.18	0.14
PTSA181224V050	0.78	0.69	0.59	0.50	0.45	0.41	0.37	0.33	0.23
PTSA181233V075	1.12	1.02	0.89	0.75	0.66	0.58	0.53	0.47	0.39
PTSA181224V110	1.65	1.49	1.29	1.10	0.95	0.85	0.79	0.66	0.53
PTSA181216V150	2.28	2.05	1.85	1.50	1.26	1.14	1.05	0.92	0.73
PTSA181224V150	2.28	2.05	1.85	1.50	1.26	1.14	1.05	0.92	0.73
PTSA181216V200	2.90	2.61	2.40	2.00	1.70	1.51	1.41	1.21	0.95
PTSA181216V260	3.80	3.51	3.12	2.60	2.28	2.10	1.85	1.61	1.29

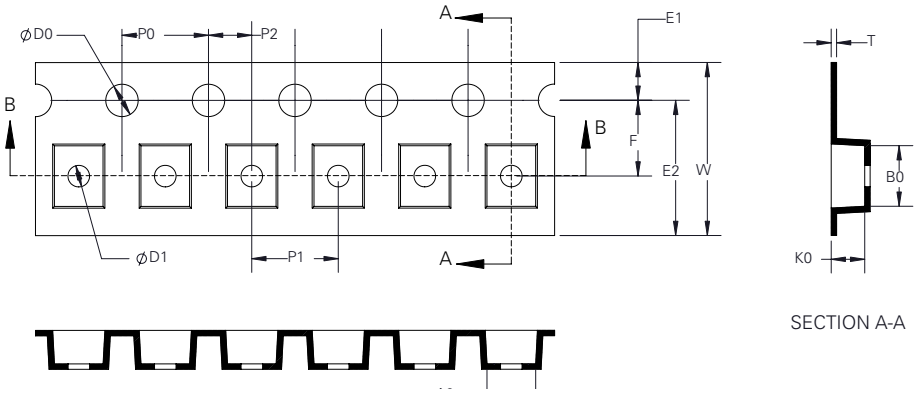
General specifications

Operating temperature: -40 °C to + 85 °C (with derating)
Storage temperature: -10 °C to + 40 °C
Storage relative humidity: ≤70%
Storage conditon: Keep away form corrosive atmosphere and sunlight
Passive aging: IEC60738-1 , +60 °C, 1000 hours, ≤ 20% IEC60738-1 , +85 °C, 1000 hours, ≤ 20%
Humidity aging: +85 °C, 85% RH, 100 hours, ≤ 20%
Thermal shock: IEC60738-1, +85 °C/ -40 °C, 20 cycles, ≤ 50%
Trip cycle life: UL1434, Vmax, Imax, 100 cycles, no arcing or burning
Trip endurance: UL1434, Vmax, Itrip ≤ I ≤ Imax, 2 hours, no arcing or burning
MSL test: J-STD-020, MSL=1, pass and no visible damage

Packaging information

PTSA181260V010, PTSA181260V014, PTSA181230V020, PTSA181230V030, PTSA181224V050, PTSA181224V110
Supplied in tape and reel packaging, 2000 parts per 7.0" (178 mm) diameter reel (EIA-481 compliant)

PTSA181233V075, PTSA181224V150, PTSA181216V150, PTSA181216V200, PTSA181216V260
Supplied in tape and reel packaging, 1000 parts per 7.0" (178 mm) diameter reel (EIA-481 compliant)



PTSA181260V010, PTSA181260V014, PTSA181230V020, PTSA181230V030, PTSA181224V050

W	F	E1	E2	P0	P1	P2	D0	D1	A0	B0	K0	T
12.00 ± 0.30	5.50 ± 0.10	1.75 ± 0.10	-	4.00 ± 0.10	8.00 ± 0.10	1.75 ± 0.10	1.50 + 0.10/-0	-	3.55 ± 0.10	4.90 ± 0.10	0.80 ± 0.10	0.25 ± 0.05

PTSA181233V075, PTSA181224V150, PTSA181224V110, PTSA181216V150, PTSA181216V200, PTSA181216V260

W	F	E1	E2	P0	P1	P2	D0	D1	A0	B0	K0	T
12.00 ± 0.30	5.50 ± 0.10	1.75 ± 0.10	-	4.00 ± 0.10	8.00 ± 0.10	1.75 ± 0.10	1.50 + 0.10/-0	-	3.66 ± 0.10	4.95 ± 0.10	1.85 ± 0.10	0.24 ± 0.05

Solder reflow profile

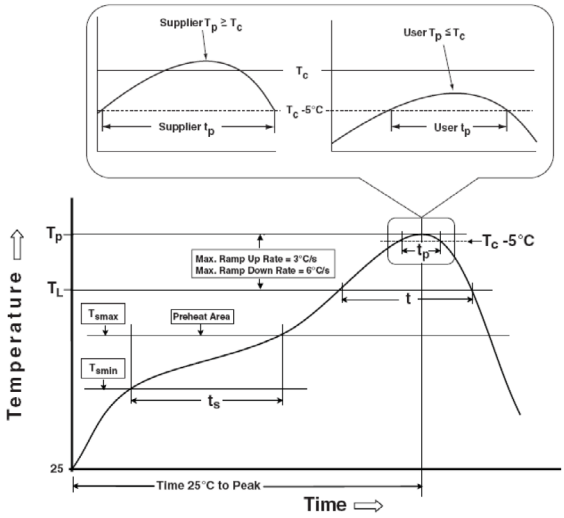


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) Free Solder (T_C)

Package thickness	Volume mm^3 <350	Volume mm^3 350 - 2000	Volume mm^3 >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_C)		20 seconds*	30 seconds*
Ramp-down rate (T_p to T_L)		6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature		6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

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Printed in USA
Publication No. ELX1051 BU-ELX21051
June 2021