LP33 Series

Polymer PTC Devices - R-line

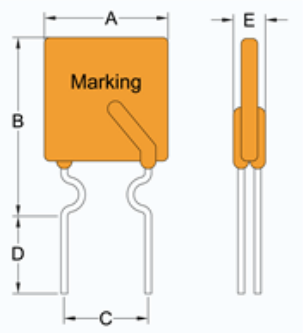
Features

- Radial leaded devices
- Rated voltage up to 33V
- Lead-free and compliant with the European Union RoHS Directive (EU)2015/863
- UL94 V-0 insulating material
- Normal working temperature with -40ºC ~85ºC
- Agency Recognition: UL

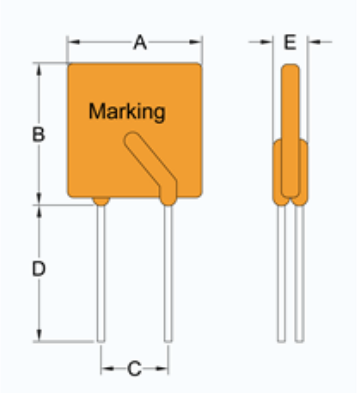


Product Dimension (mm)

Part number	A	B	C		D	E	Lead	
	Max.	Max.	Min.	Max.	Min.	Max.	Style	Size(ϕ)
LP33-090F	6.0	13.0	4.4	5.8	7.6	3.0	1	0.6
LP33-110F	6.0	14.0	4.4	5.8	7.6	3.0	1	0.6
LP33-120F	7.4	12.2	4.4	5.8	7.6	3.0	1	0.6
LP33-135F	8.2	14.0	4.4	5.8	7.6	3.0	1	0.6
LP33-160F	8.0	15.5	4.4	5.8	7.6	3.0	1	0.6
LP33-185F	9.0	16.5	4.4	5.8	7.6	3.0	1	0.6
LP33-190F	9.0	16.5	4.4	5.8	7.6	3.0	1	0.6
LP33-250F	9.0	19.0	4.4	5.8	7.6	3.0	1	0.6
LP33-300F	11.0	17.0	4.4	5.8	7.6	3.0	2	0.8
LP33-400F	14.2	19.5	4.4	5.8	7.6	3.0	2	0.8
LP33-500F	15.1	21.1	9.5	10.9	7.6	3.0	2	0.8
LP33-600F	15.1	24.1	9.5	10.9	7.6	3.0	2	0.8
LP33-700F	17.0	30.0	9.5	10.9	7.6	3.0	2	0.8
LP33-800F	18.0	31.0	9.5	10.9	7.6	3.0	2	0.8
LP33-900F	23.5	28.5	9.5	10.9	7.6	3.0	2	0.8

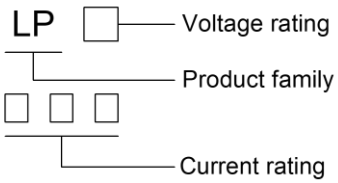


Style1



Style2

Marking system



* Lead materials: Tin-plate metal wire.

Electrical Characteristics

Part number	I_H	I_T	Max.Time-to-trip		V_{max}	I_{max}	Pd_{typ}	R_{min}	R_{max}	R_{1max}
	(A)	(A)	(A)	(S)	(V)	(A)	(W)	(Ω)	(Ω)	(Ω)
LP33-090F	0.90	1.80	4.50	7.1	33	40	0.91	0.070	0.120	0.220
LP33-110F	1.10	2.20	5.50	6.6	33	40	1.00	0.050	0.100	0.170
LP33-120F	1.20	2.40	6.00	3.5	33	40	0.78	0.074	0.120	0.180
LP33-135F	1.35	2.70	6.75	4.5	33	40	0.84	0.059	0.100	0.143
LP33-160F	1.60	3.20	8.00	8.0	33	40	1.20	0.030	0.070	0.110
LP33-185F	1.85	3.70	9.25	8.7	33	40	1.27	0.030	0.060	0.090
LP33-190F	1.90	3.80	9.50	3.5	33	40	0.90	0.045	0.063	0.092
LP33-250F	2.50	5.00	12.50	10.3	33	40	1.34	0.020	0.040	0.070
LP33-300F	3.00	6.00	15.00	10.8	33	40	2.00	0.020	0.050	0.080
LP33-400F	4.00	8.00	20.00	12.7	33	40	2.50	0.010	0.030	0.050
LP33-500F	5.00	10.00	25.00	14.5	33	40	3.00	0.010	0.030	0.050
LP33-600F	6.00	12.00	30.00	16.0	33	40	3.50	0.005	0.020	0.040
LP33-700F	7.00	14.00	35.00	17.5	33	40	3.80	0.005	0.020	0.030
LP33-800F	8.00	16.00	40.00	18.8	33	40	4.00	0.005	0.020	0.020
LP33-900F	9.00	18.00	45.00	20.0	33	40	4.20	0.005	0.010	0.020

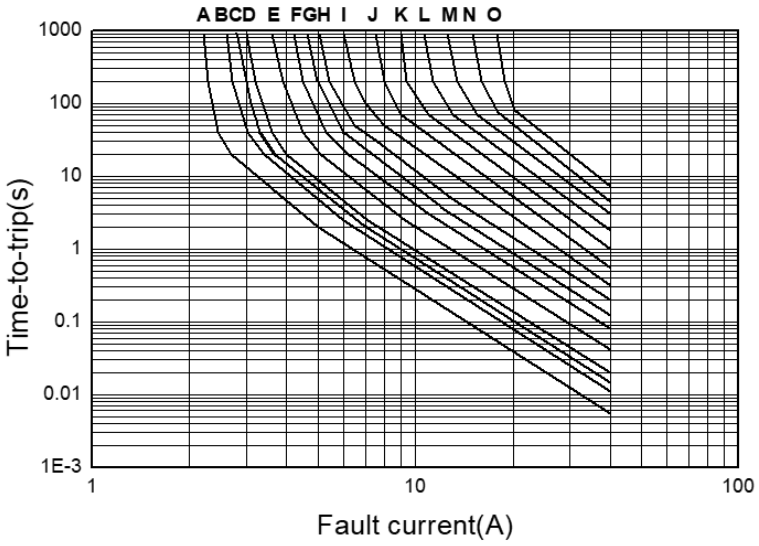
IH=Hold current: maximum current at which the device will not trip at 25ºC still air.
IT=Trip current: minimum current at which the device will always trip at 25ºC still air.
Vmax=Maximum voltage device can withstand without damage at rated current.
Imax=Maximum fault current device can withstand without damage at rated voltage.
Max.Time-to-trip =Maximum time to trip(s) at assigned current.
Pdtyp=Typical power dissipation: typical amount of power dissipated by the device when in state air environment.
Rmin=Minimum device resistance at 25ºC prior to tripping.
Rmax=Maximum device resistance at 25ºC prior to tripping.
R1max= Maximum resistance of device when measured one hour post trip at 25ºC.

Thermal Derating

Part number	Maximum Ambient Temperature								
	-40ºC	-20ºC	0ºC	25ºC	40ºC	50ºC	60ºC	70ºC	85ºC
LP33-090F	1.40	1.25	1.10	0.90	0.75	0.69	0.65	0.60	0.50
LP33-110F	1.75	1.52	1.33	1.10	0.99	0.90	0.80	0.73	0.63
LP33-120F	1.74	1.56	1.38	1.20	1.00	0.92	0.82	0.73	0.60
LP33-135F	1.96	1.76	1.55	1.35	1.12	1.04	0.92	0.82	0.68
LP33-160F	2.49	2.21	1.94	1.60	1.42	1.31	1.19	1.03	0.88
LP33-185F	2.87	2.59	2.28	1.85	1.63	1.52	1.33	1.21	1.05

LP33-190F	2.76	2.47	1.55	1.90	1.58	1.50	1.29	1.16	0.95
LP33-250F	3.82	3.44	3.03	2.50	2.17	2.00	1.81	1.59	1.39
LP33-300F	4.55	4.10	3.60	3.00	2.65	2.51	2.24	2.01	1.74
LP33-400F	6.00	5.40	4.74	4.00	3.47	3.28	2.82	2.63	2.26
LP33-500F	7.44	6.68	5.80	5.00	4.30	4.03	3.58	3.22	2.77
LP33-600F	8.90	7.99	7.08	6.00	5.13	4.82	4.27	3.84	3.30
LP33-700F	10.35	9.30	8.21	7.00	5.95	5.58	4.96	4.46	3.84
LP33-800F	11.60	10.60	9.35	8.00	6.79	6.36	5.64	5.07	4.36
LP33-900F	13.25	11.90	10.49	9.00	7.53	7.12	6.32	5.69	4.88

Typical Time-to-Trip Curves at 25ºC



A=LP33-090F
B=LP33-110F
C=LP33-120F
D=LP33-135F
E=LP33-160F
F=LP33-185F
G=LP33-190F
H=LP33-250F
I =LP33-300F
J=LP33-400F
K=LP33-500F
L=LP33-600F
M=LP33-700F
N=LP33-800F
O=LP33-900F

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25ºC	$R_{min} \leqslant R \leqslant R_{max}$
Time to Trip	Specified current, V_{max}, 25ºC	T≤maximum Time to Trip
Hold Current	60min, at I_H	No trip
Trip Cycle Life	V_{max}, I_{max}, 100cycles	No arcing or burning
Trip Endurance	V_{max}, 2hours	No arcing or burning

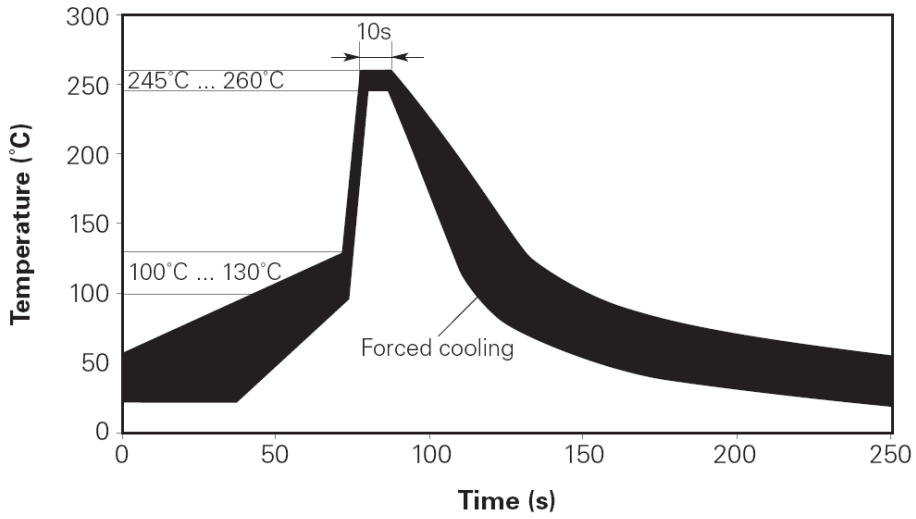
Packaging Information

Bulk:
LP33-090F~LP33-185F……1000pcs per bag
LP33-250F~LP33-900F…….500pcs per bag

Tape & Reel:
LP33-090~LP33-160…….3000pcs per reel
LP33-185~LP33-900…….1500pcs per reel

Soldering Recommendations

Wave Soldering



Hand Soldering

Soldering temperature：350ºC±5ºC.

Soldering time：no more than 3s.

Soldering position：at least 4 mm away from PTC chip.

Contact Information

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For additional information, please contact your local Sales Representative.
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Product Specification Statement

1.The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

2.The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

3.WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

4.Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

5.The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

6.Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.

Cautions for PTC Use

1.Operation beyond the maximum voltage or current may result in device damage, PTC arcing, resistance increasing, even burning.

2.The Hold current specified at different temperatures in the datasheet is the conventional performance of after one wave-soldering or manual soldering. PTC can hold 1 hour at the current corresponding to different temperatures. But this current is not the condition that PTC can charging or discharging current for long time.

3.All resistance and the electronic characteristics specified in the datasheet are based on the test tested on Wayon Lab. The applicability needs to be verified because above parameters may be attenuated if customer has other processes, like twice soldering or injection. Customer needs to independently evaluate and test to select appropriate products for their applications.

4.PTC is thermal sensitive device. It is recommended that no heat source devices be designed to around in order to reduce the outside heat source impact.

5.Wave Soldering or Hand Soldering are recommended for R-line PTC. Please refer to the Wayon recommended soldering curve. If the soldering temperature exceeds the recommended value, the PTC might be damaged.

6.When assembling and applying PTC, the material mark and application parameters (Temperature, Time, and etc.) of all injection or plastic materials, like dhesives, silica gels and etc. should be verified to ensure the consistency between the products and the processing technology. Only it is confirmed that would not influent PTC then can be used.

7.When assembling and applying PTC, it is not recommended that using washer water or other cleaner to clean PTC. If it is required, it is necessary to verify the applicability of various cleaner, washer water and solvents, it is also confirmed that they will not affect the PTC performance. Chemicals that are known to have an effect on PTC include, but are not limited to, highly solubility and destructive organic compounds such as ethers, benzenes, ketones, and lipids. Placing the product in open environment for at least 24 hours to volatilize the residual solvents.

8.Please do not smash, clamp, pull, dent, twist and etc. to PTC during assembling process to avoid the performance degradation.

9.PTC is a secondary protector, which is only can be used as sporadic, accidental over-current or over-temperature, the continuous or repeated failure can not use PTC.

10.PTC is not recommend installation in space-constrained environments, which can inhibit its performance.

11.When the product is finally discarded, it can be treated recycled in accordance with local laws and regulations, and raw material compositions of PPTC can be referred to MSDS.