

- The High Voltage Radial devices (HVR Series), a Polymer-based Positive Temperature Coefficient (PPTC) device is suitable to protect telephony equipment against lightning and power cross strike, that is fully compatible with telecommunication standards.
- The High Voltage Radial devices are designed to provide different hold current product series offering 250Vac (Vmax interrupting) and 60Vdc (Vmax operating) and with low resistance.
- Applications: The High Voltage Radial Leaded product series is ideal for telecommunication and networking, ISDN and XSDN equipments. It also help networking equipment manufacturers pass ITU K20, K21 and Telcordia requirements.
- Agency Approval: UL/CSA File # 09CA13257

TÜV Certificate # R 50103297



Electrical Characteristics

Part Number	I hold (A)	Itrip (A)	Vmax (Vdc) Vint/Vop	I max (A)	Pd typ. (W)	Time-to-trip @1A(sec)		Resistance (Ohms)		
						typ.	max	Rmin.	Rmax.	R1max.
HVS250P130F	0.13	0.26	250/60	3	1.2	0.9	4.0	6.5	13	20
HVS250P130F-RA	0.13	0.26	250/60	3	1.2	1.4	4.0	6.5	10	15
HVS250P130F-RB	0.13	0.26	250/60	3	1.2	0.7	4.0	9.0	13	20
HVS250P130F-RC	0.13	0.26	250/60	3	1.2	1.1	4.0	7.0	11	17
HVS250P130FV	0.13	0.26	250/60	3	1.2	2.0	4.0	4.0	13	20

F: lead free device V: vertical device

Note: I hold = Maximum current the device will pass without tripping in 23°C still air.

I trip = Minimum current at which the device will trip in 23°C still air.

Vint = Maximum interrupted voltage the device can withstand without damage at rated current (I max)

Vop = The nominal voltage to obtain the certification and tested for the electrical characteristics.

I max = Maximum fault current the device can withstand without damage at rated maximum voltage (Vmax)

Pd = Power dissipated from device when in the tripped state at 23°C still air.

Rmin = Minimum resistance of device in initial (un-soldered) state.

Rmax = Maximum resistance of device in initial (un-soldered) state.

R1max = Maximum resistance of device at 23°C measured one hour after tripping.



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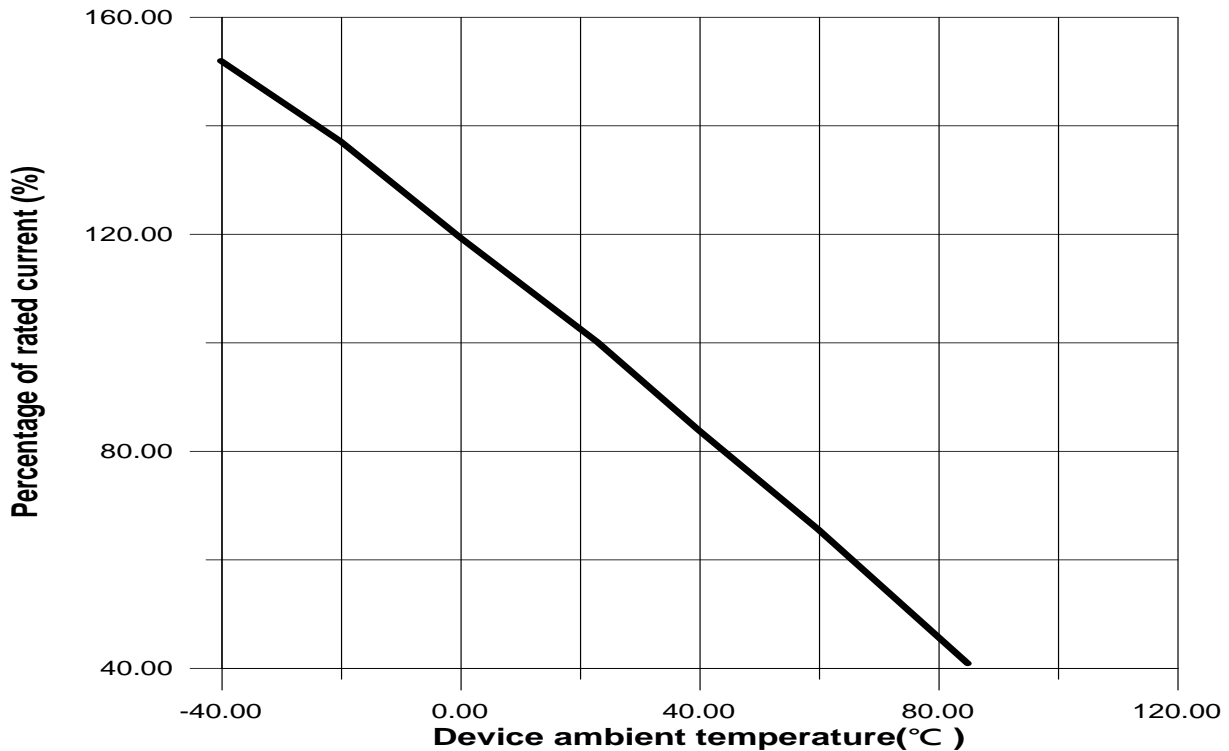
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Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

Recognitions: UL/TÜV

How to select a high voltage PPTC fuse:

- (1) Determine the following operating parameters for the circuits:
 - (A) Normal Operating Current (I hold)
 - (B) Maximum Circuit Voltage (V max)
 - (C) Maximum Interrupt Current (I max)
 - (D) Normal Operating Temperature (min °C / max °C)
- (2) Select the device form factor and dimension suitable for the application:
 - Surface Mount Device (SMD Series)
 - Radial Leaded Device (RLD Series)
 - Axial Leaded Strap Device (STD Series)
 - Other Custom-designed Device (Disc/Chip)
 - The High Voltage Radial devices (HVR Series)
 - The High Voltage Surface Mount Devices (HVS series)
 - The High Voltage Chip Device (HVC series)
- (3) Compare the maximum ratings for V max and I max of the PTC device with the circuit in application and make sure that the circuit's requirement does not exceed the device ratings.
- (4) Check that the PPTC device's trip time (time-to-trip) will protect the circuit.
- (5) Verify that the circuit operating temperatures are within the PPTC devices normal operating temperature range.
- (6) Verify the performance and suitability of the chosen PPTC device in the application.
- (7) Verify the final equipment have to enclose which telecom standard requirement.

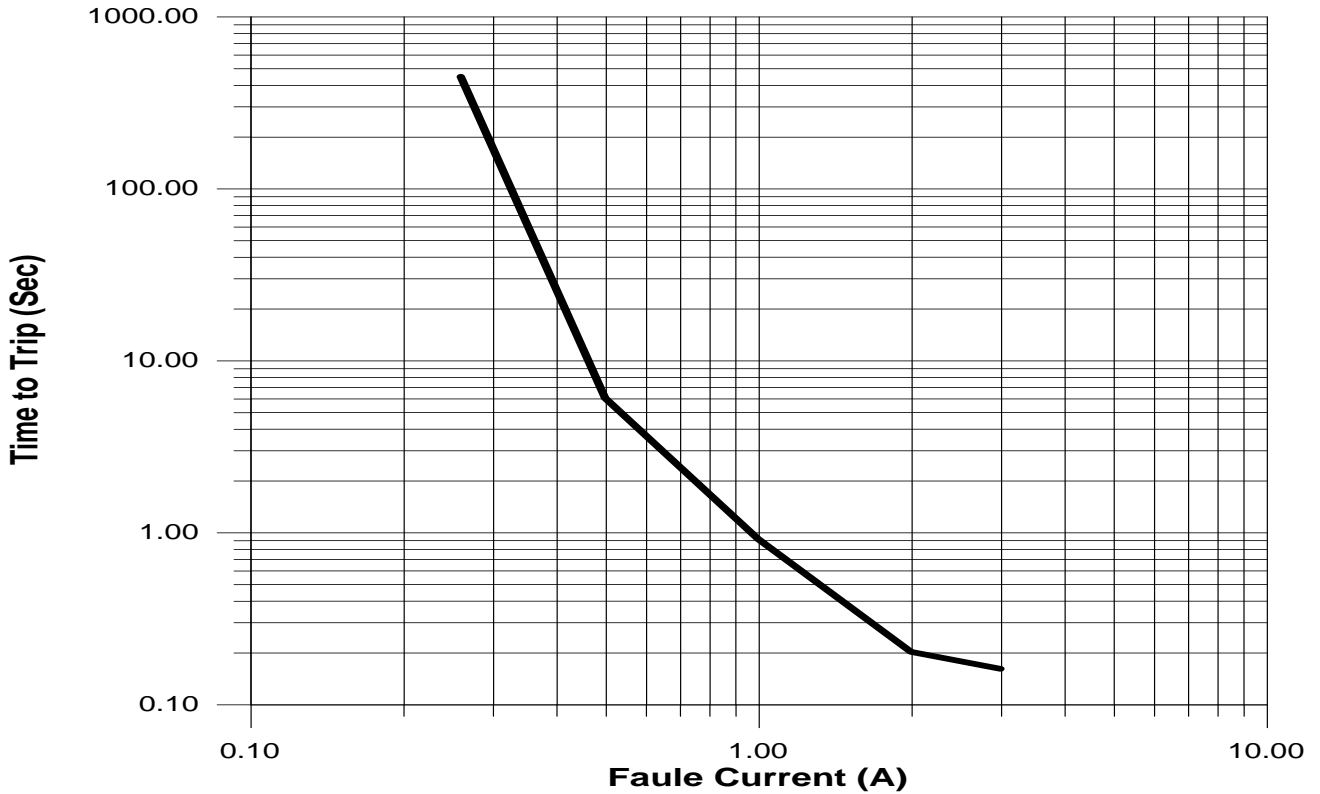
THERMAL DERATING CURVE FOR HVR SERIES

THERMAL DERATING CHART FOR HVR SERIES – Ihold (Amps)

Model	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
HVS250P130F	0.21	0.19	0.17	0.13	0.11	0.10	0.09	0.07	0.05
HVS250P130FV	0.21	0.19	0.17	0.13	0.11	0.10	0.09	0.07	0.05

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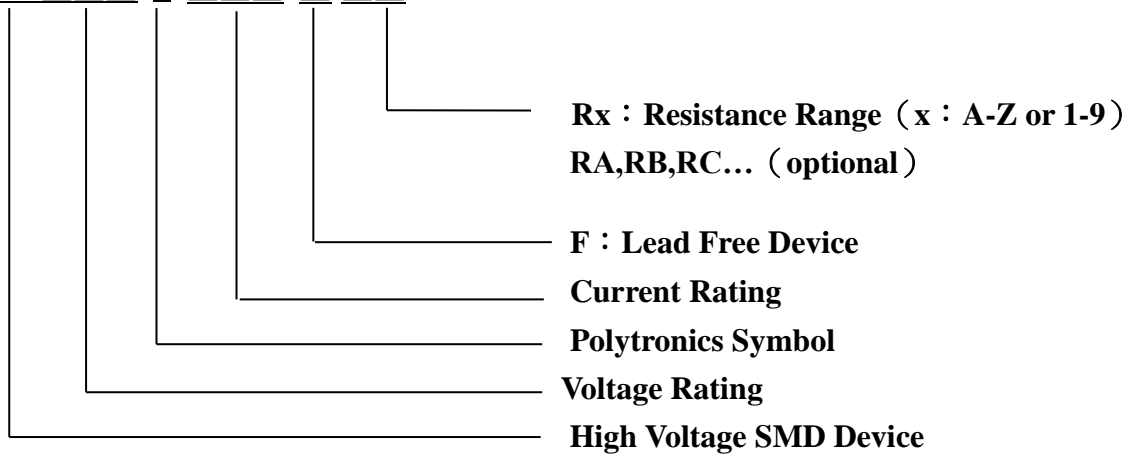


AVERAGE TIME-CURRENT CURVE FOR HVS 250Vac SERIES



NUMBERING SYSTEM

HVS□□□ P □□□ □-□□



HVS 250P Series Devices Figure

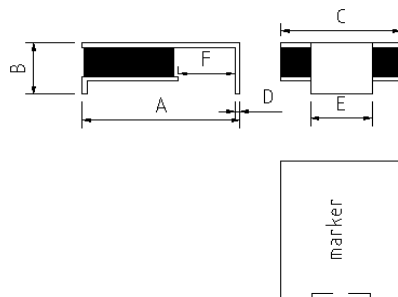


Figure. 1

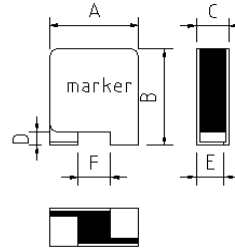


Figure. 2

Physical Dimension (mm)

Part Number	A (max.)	B (max.)	C (max.)	D (max.)	E (max.)	F (max.)	Figure	Physical Characteristics Material
HVS250P130F	9.4	3.7	7.4	0.4	3.8	4.2	1	Sn/Ni/Cu
HVS250P130F-RA	9.4	3.7	7.4	0.4	3.8	4.2	1	Sn/Ni/Cu
HVS250P130F-RB	9.4	3.7	7.4	0.4	3.8	4.2	1	Sn/Ni/Cu
HVS250P130F-RC	9.4	3.7	7.4	0.4	3.8	4.2	1	Sn/Ni/Cu
HVS250P130FV	6.1	6.9	3.2	1.6	1.9	2.3	2	Sn/Ni/Cu

Recommend PCB pad Layout (mm)

Part Number	A	B	C	D	Figure
HVS250P130F	4.6	1.8	6.1	-	3
HVS250P130FV	2.3	2.4	6.4	3.43	4

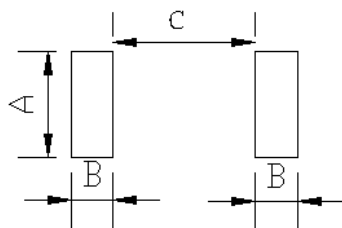


Figure 3

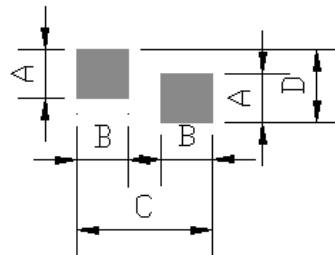


Figure 4

Recommend Reflow Condition

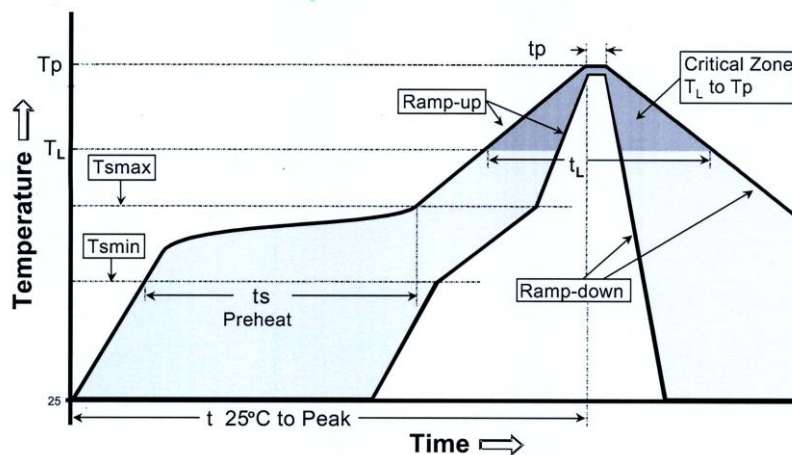
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Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	
-Temperature Min (T_{Smin})	150°C
-Temperature Max (T_{Smax})	200°C
-Time (min to max) (ts)	60-180 seconds
T_{Smax} to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (tp)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.
Storage Condition	0°C~35°C, ≤70%RH



Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.
- Devices can be reworked using the standard industry practices.

Tape & Reel Specifications for HVS250P Series Devices



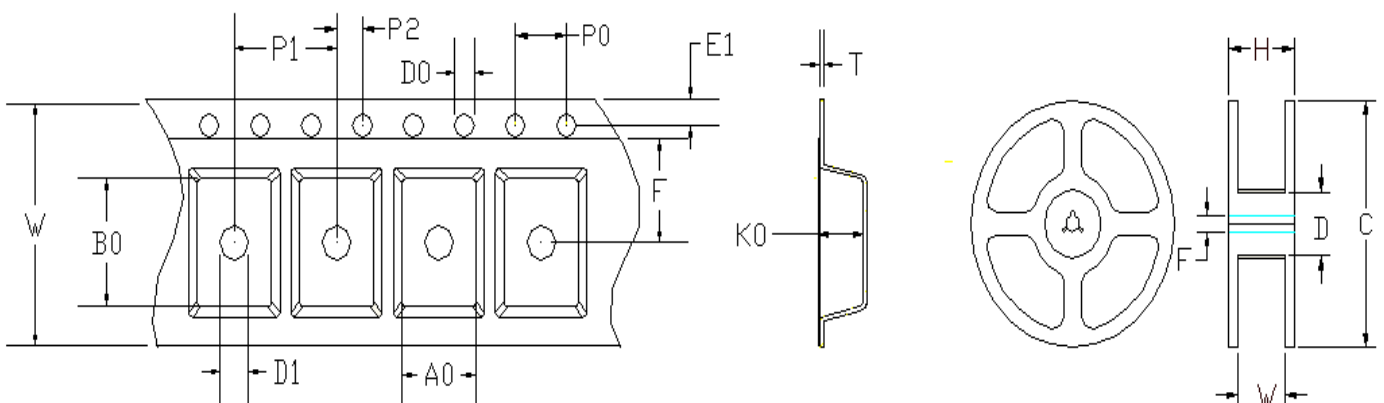
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	250P130F	250P130FV		250P130F	250P130FV
W	16 +/-0.30	16 +0.3/-0.1	H	22.0+/-2.0	22.0+/-2.0
F	7.5 +/-0.10	7.5 +/-0.10	W	16.4 +2.0/-0.0	16.4 +2.0/-0.0
E ₁	1.75 +/-0.10	1.75 +/-0.10	D	Ø100+/-4.0	Ø100+/-4.0
D ₀	1.5 +0.1/-0.0	1.5 +0.1/-0.0	F	Ø13.2+/-0.2	Ø13.2+/-0.2
D ₁	1.5(MIN)	1.5(MIN)	C	Ø330+/-2.0	Ø330+/-2.0
P ₀	4.0 +/-0.10	4.0 +/-0.10			
P ₁	12.0 +/-0.10	8.0 +/-0.10			
P ₂	2.00 +/-0.10	2.00 +/-0.10			
A ₀	6.0 +/-0.10	2.95 +/-0.1			
B ₀	9.31 +/-0.10	5.92 +/-0.1			
T	0.35 +/-0.05	0.5 +/-0.05			
K ₀	3.67 +/-0.10	7.15 +/-0.1			
Leader min.	300	390			
Trailer min.	300	160			

HVS250P devices are packaged per EIA481 and EIA-2 standard



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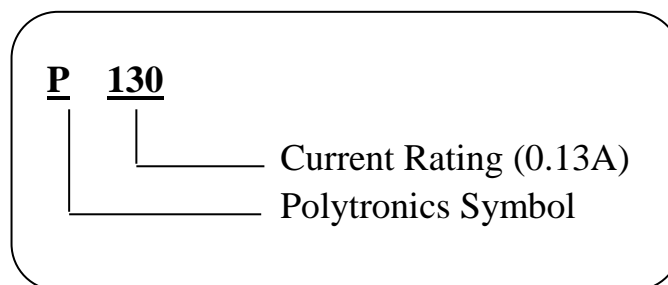
Figure. Tape & Reel

Packaging Informaiton

Part Number	Tape & Reel Quantity
HVS250P130F	1500
HVS250P130FV	1200

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Device Marking System



CROSS REFERENCE

Polytronics/ EVERFUSE™	Cross Reference	
	Raychem/ PolySwitch®	Bourns/ Multifuse®
HVS250P130F HVS250P130F-RA HVS250P130F-RB HVS250P130F-RC HVS250P130FV	TS250-130 TS250-130-RA TS250-130-RB TS250-130-RC TSV250-130	MF-SM013/250-2 MF-SM013//250-A-2 MF-SM013//250-B-2 MF-SM13/250-C-2 MF-SM/250V

“EVERFUSE” is a registered trademark of Polytronics Technology Corp.

“Multifuse” is a registered trademark of Bourns , Inc.

“PolySwitch” is a registered trademark of Raychem Corporation.

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