Thermal-Link (ATCO)-Alloy Type

HP Series

Description

Alloy Thermal-Link / Alloy Thermal Cutoff (ATCO) is defined as a non-resettable protective device functioning one time only. It is widely used in electrical equipment. ATCO is mainly consist of fusible alloy, flux resin, case, sealant and lead wires. Normally, fusible alloy is jointed to the two lead wires. Under abnormal conditions, when the temp. reaches to the fusing temp. of ATCO, the fusible alloy melts and quickly retracts to the two lead wire ends with the aid of the flux resin and disconnects the circuit completely.

SETsafe | SETfuse Alloy Thermal-Link (ATCO) HP series Rated Functioning Temp. from 125 ℃ to 145 ℃, Rated Current: 10 A, safety certification Includes UL, cUL, TUV, PSE, CCC, and complies with RoHS and REACH.

Features

- Non-Resettable
- High Accuracy of Functioning Temp.
- High Operating Voltage
- RoHS & REACH Compliant

Applications

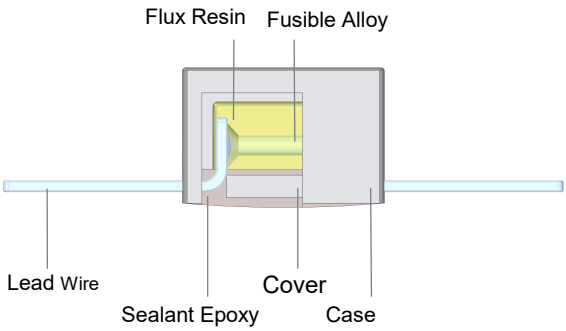
- Surge Protective Devices
- Batteries
- Automobile Electronic

Customization

- Other Temp.
- The Length of Lead Wires
- Leads Forming Types

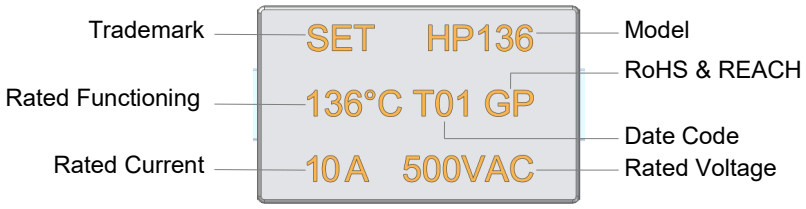
Structure Diagrams

Axial



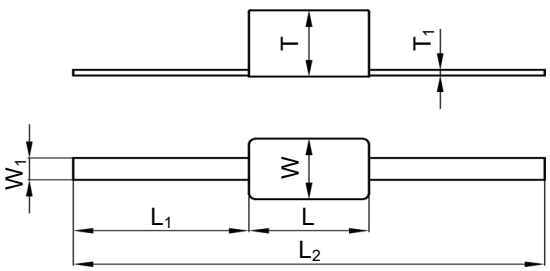
Marking

Axial (Color for reference only)



Remark: The first letter of the Date Code Year/quarter A stands for 2000, B stands for 2001, 01 stands for the first quarter, 02 stands for the second quarter, and so on.

Dimensions (mm)



L	L_1	L_2	W	W_1	T	T_1
8.6 ± 1.0	30.0 ± 2.0	70.0 ± 3.0	7.6 ± 1.0	5.0 ± 1.0	6.0 ± 1.0	0.5 ± 0.1

Specifications

Rated Functioning Temp. (T_f) °C	Model	Fusing Temp.	T_h	T_m	I_r	U_r	UL	cUL	TUV	PSE	CCC	RoHS REACH
		(°C)	(°C)	(°C)	(A)	(V)						
145	HP145	140 ± 2	112 108[a]	250	10	AC 500	●	●	●	●	●	●
						DC 200	●	●	●	○	●	●
136	HP136	131 ± 2	106 102[a]	250	10	AC 500	●	●	●	●	●	●
						DC 200	●	●	●	○	●	●
125	HP125	121 ± 2	90 86[a]	250	10	AC 500	●	●	●	●	●	●
						DC 200	●	●	●	○	●	●

Note:

1: "●"Means certificated, "○"Means non-certificated, RoHS & REACH Compliant .

2: " a ": The temperature measurement point for holding temperature (T_h) shall be positioned 50 mm away from the product body, in accordance with the requirements specified in Appendix I of GB/T 9816.1-2023.

Agency Information

Institution	Standards	The File No. and certification No. obtained by SETsafe | SETfuse
	UL 60691	E214712
	CAN-CSA-E60691	E214712
	EN 60691	R50337988
	J60691	JET2121-32001-2030、JET2121-32001-2031
	GB 9816.1	2020980205000177

Soldering

Hand-Soldering

1. Soldering should be carried out according to Table T-1.
2. The thermal element of ATCO is fusible alloy with low melting point, which is jointed with ATCO lead wires. Improper soldering operation (too high soldering temp. , too long soldering time, too short lead wire etc.) may transfer more heat to the thermal element and ATCO may open in advance.
3. When soldering conditions are more severe than those listed in Table T-1, a heat sink fixture should be used between soldering point and ATCO body.
4. When soldering, please do not pull / push or twist ATCO body or lead wires.
5. After soldering, let it naturally cool for longer than 20 seconds. During cooling, never move the ATCO body or lead wires.

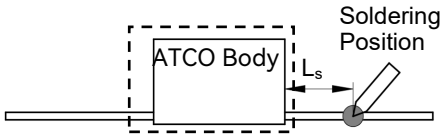


FIGURE T-1

TABLE T-1 Hand-Soldering Time

Rated Functioning Temp. (T_f)	Max. Allowable Soldering Time for Different Lead Wire Length (Fig.T-1)									Max. Soldering Temp.
	L_s Length	Time		L_s Length	Time		L_s Length	Time		
		Tinned Copper Wire	CP Wire		Tinned Copper Wire	CP Wire		Tinned Copper Wire	CP Wire	
(°C)	(mm)	(s)	(s)	(mm)	(s)	(s)	(mm)	(s)	(s)	(°C)
125 to 135	10	1[a]	4	20	3	6	30	5	8	400
136 to 145	10	3	6	20	5	8	30	5	8	400

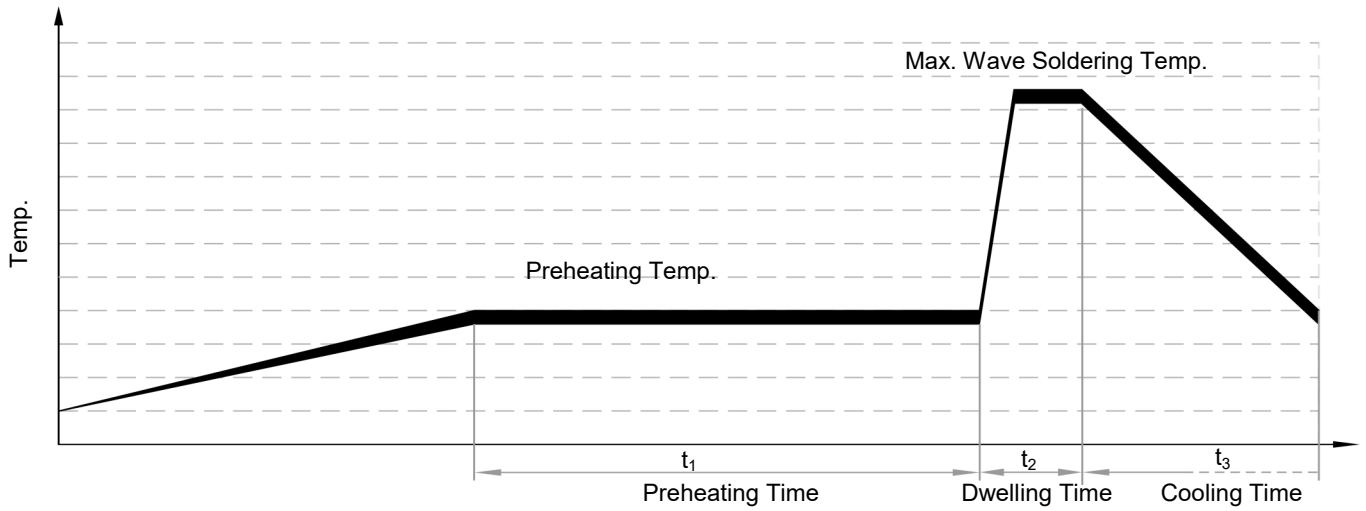
Note:
a: Auxiliary Heat Sink Fixture is Required to Avoid ATCO Cutting off Unexpectedly.

Wave Soldering

The wave soldering parameters as Table T-2, for reference only, when ATCO is for practice use, you need to do some validation experiments. For example, using X-RAY to see the fusible alloy of ATCO whether damage after wave soldering.

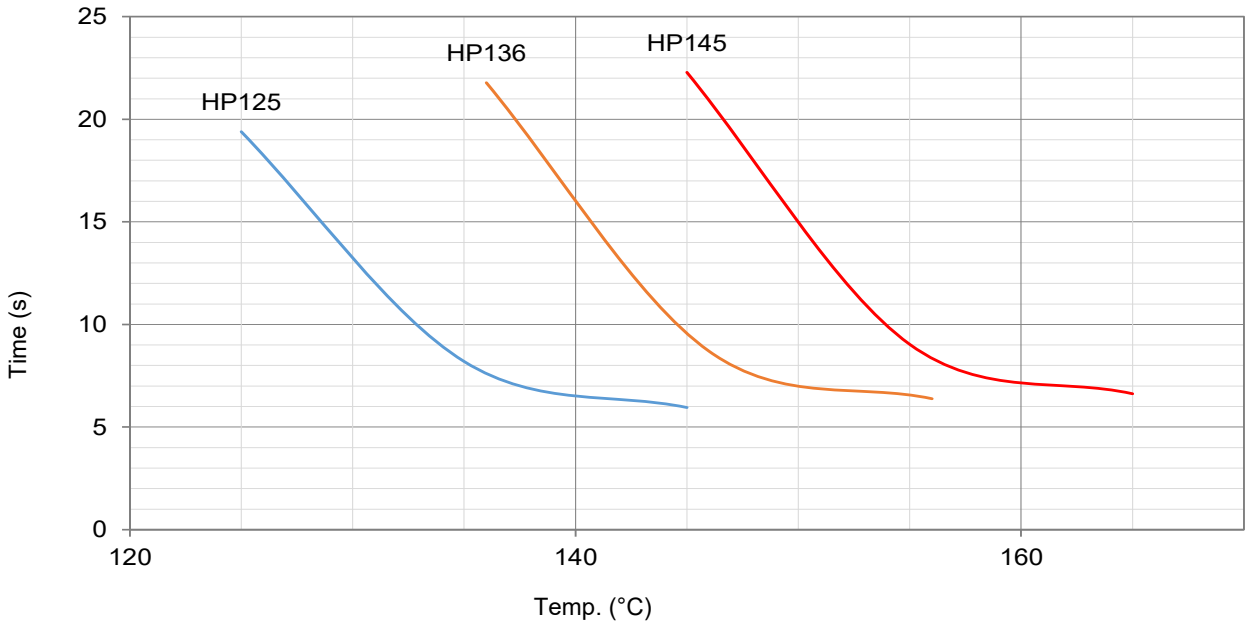
TABLE T-2 Wave Soldering Parameters Setting

Rated Functioning Temp. (T_f)	Max. Allowable Preheating Temp. When the Length of Lead Wire is Different (Fig.T-1)				Preheating Time (t_1)	Max. Wave Soldering Temp.	Dwelling Time (t_2)	Cooling Time (t_3)
	L_s Length	Preheating Temp.	L_s Length	Preheating Temp.				
(°C)	(mm)	(°C)	(mm)	(°C)	(s)	(°C)	(s)	(s)
125 to 130	Recommend Hand-Soldering							
131 to 145	20	80	30	90	< 60	≤ 260	≤ 3	≤ 10



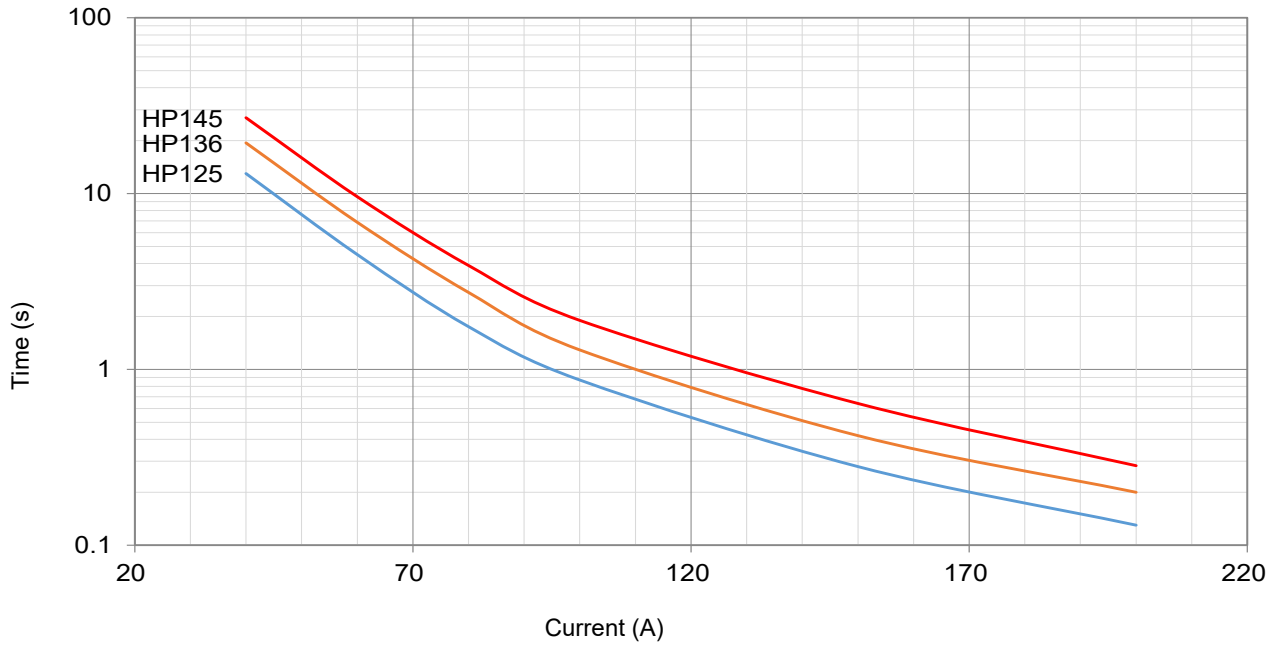
Product Temp.-Time Curve (Reference)

The Temp.-Time Curve of Thermal-Link in different temp. oil bath.



Product Current-Time Curve (Reference)

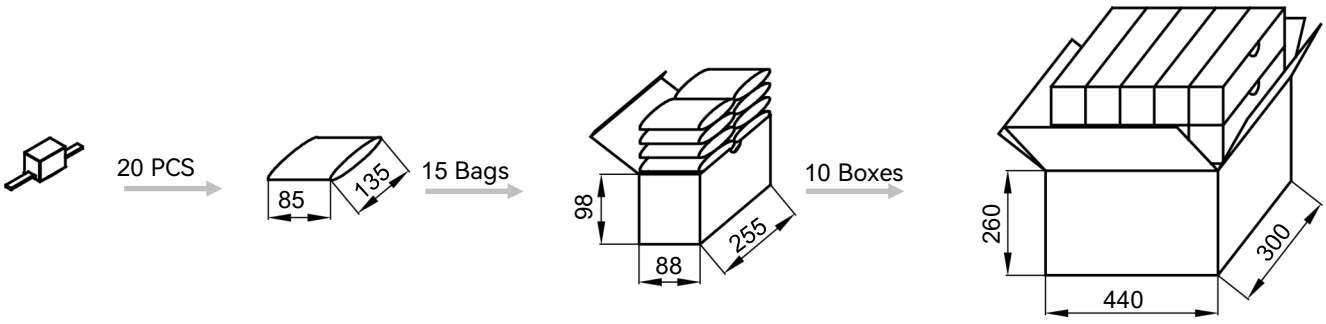
The Current-Time Curve shows functioning time at multi-times rated current at room temperature 25 ± 2 °C.



Packaging Information

Bulk

Item	PE Bag	Box	Carton
Dimensions (mm)	135 × 85	255 × 88 × 98	440 × 300 × 220
Quantity (PCS)	20	300	3000
Gross Weight (kg)			9.0 ± 10%



Part Numbering System

ATCO - HP136 - G N N A B - 001

Other Options

Packing

B	Bulk
T	Taping

Leads Forming

A	Straight Lead
B	Single Lead Bending
C	Leads Bending

Color of Insulation Tube

W	White
R	Red
K	Black
N	None

Insulation Tube Material

T	Teflon
P	Polyester
N	None

Lead Wire Type

G	Flat Electrode Chamber
M	Multi stranded tinned copper wire

Rated Functioning Temp.

136	136 °C, See Specifications

Series

HP	Series See Specifications

Product Category

ATCO	Alloy Thermal-Link

Glossary

Item	Description
TCO	**Thermal-Link** A non-resettable device incorporating a THERMAL ELEMENT which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed. — (GB 9816.1)
ATCO	**Alloy Thermal-Link** Alloy Type Thermal-Link, Alloy is the thermal element. — (GB 9816.1)
T_f	**Rated Functioning Temp.** The temperature of the Alloy Thermal-Link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load. — (GB 9816.1) Tolerance: T_f °C (GB 9816.1, EN 60691, K60691). Tolerance: T_f ± 7 °C (J60691).
Fusing Temp.	**Fusing Temp.** The temperature of the Alloy Thermal-Link which causes it to change its state of conductivity is measured with silicone oil bath in which the temperature is increased at the rate of 0.5 °C to 1 °C / minute, with a detection current up to 10 mA as the only load. — (GB 9816.1)
T_h	**Holding Temp.** The Maximum temperature at which a Alloy Thermal-Link will not change its state of conductivity when conducting rated current for 168 hours. — (GB 9816.1)
T_m	**Maximum Temp. Limit** The temperature of the Alloy Thermal-Link stated by the manufacturer, up to which the mechanical and electrical properties of the Alloy Thermal-Link having changed its state of conductivity, will not be impaired for a given time. — (GB 9816.1)
I_r	**Rated Current** The current used to classify a Alloy Thermal-Link, which is the Maximum current that Alloy Thermal-Link allows to carry and is able to cut off the circuit safely. — (GB 9816.1)
U_r	**Rated Voltage** The voltage used to classify a Alloy Thermal-Link, which is the Maximum voltage that Alloy Thermal-Link allows to carry and is able to cut off the circuit safely. — (GB 9816.1)
I_n	**Nominal Discharge Current** Being able to withstand 15 peak currents of waveform 8/20 μs to test the product's durability of withstanding pulse current. — (UL 1449)
I_{max}	**Max. Discharge Current** Being able to withstand 1 peak current of waveform 8/20 μs to test max. pulse current that the product can withstand. — (UL 1449)

ATTENTION

Usage

1. When atmosphere pressure is from 80 kPa to 106 kPa, the related altitude shall be from 2000 meters to - 500 meters.
2. Operating voltage less than rated voltage of ATCO, operating current less than rated current of ATCO.
3. Do not touch the ATCO body or lead wires directly when power is on, to avoid burn or electric shock.

Replace

ATCO is a non-repairable product. For safety sake, it shall be replaced by an equivalent ATCO from the same manufacturer, and mounted in the same way.

Storage

Do not store the ATCO at the high temp., high humidity or corrosive gas environment, avoid influencing the solder-ability of the lead wires, the product shall be used up within 1 year after receiving the goods.

Installation

Make Sure the Temp. of Installation Position.

1. It is recommended that a dummy ATCO with inbuilt thermo-couple shall be used to determine the proper temp.
2. The terminal product should be tested to ensure that potential abnormal conditions do not cause ambient temp. to exceed the T_m of the ATCO.
3. Mount the ATCO at the location where temp. rises evenly.

Installation position of mechanical performance requirements.

1. Do not locate the ATCO in a place where severe vibration always occurs.
2. Ensure that the lead wire is long enough, and avoid actions such as press, tensile or twist.
3. The seal or body of ATCO must not be damaged, burned or over heated.

Mechanical Connection

Riveting

1. Choose small resistivity riveting material and be riveted.
2. A flexible lead or lead with low resistance should be used to rivet the ATCO.
3. Contact resistance should be minimal, large contact resistance will lead to higher temp., ATCO Functioning in advance.

Crimping

1. Choose small resistivity crimping material and be crimped.
2. A flexible lead or lead with low resistance should be used to rivet the ATCO.
3. Contact resistance should be minimal, large contact resistance will lead to higher Temp., ATCO Functioning in advance.

Lead Wire Forming

1. If lead wire has to be bent, please pay attention to the distance between body and bending point. Refer to Table T-3.
2. When bending leads, please use pincher or similar tools to fix the product as shown in Fig.T-2, to avoid damaging the product.
3. During forming and mounting, lead wire should not be cut, nicked, bent sharply, to avoid breaking the product.
4. Tangential forces on the leads must be avoided (i.e. pushing or pulling on the leads at angle to ATCO body) as such forces may damage the seal of ATCO.

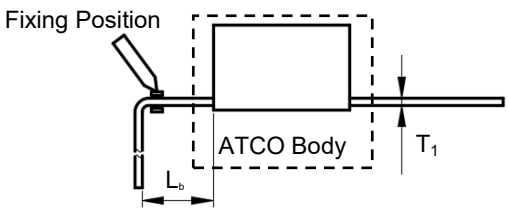


FIGURE T-2

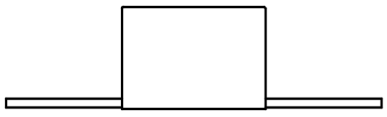
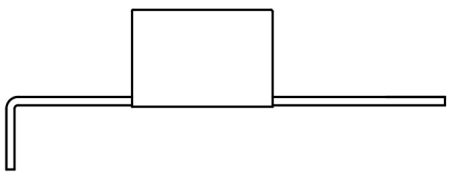
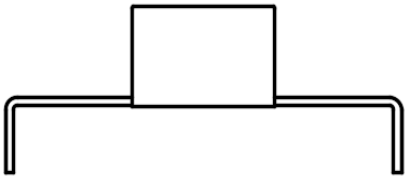
TABLE T-3 Distance between Body and Bending Point

Flat Electrode Chamber	T_1	(mm)	< 0.25	0.25 - 0.5	> 0.5
	L_b	(mm)	≥ 3	≥ 5	≥ 10

Leads Forming Types

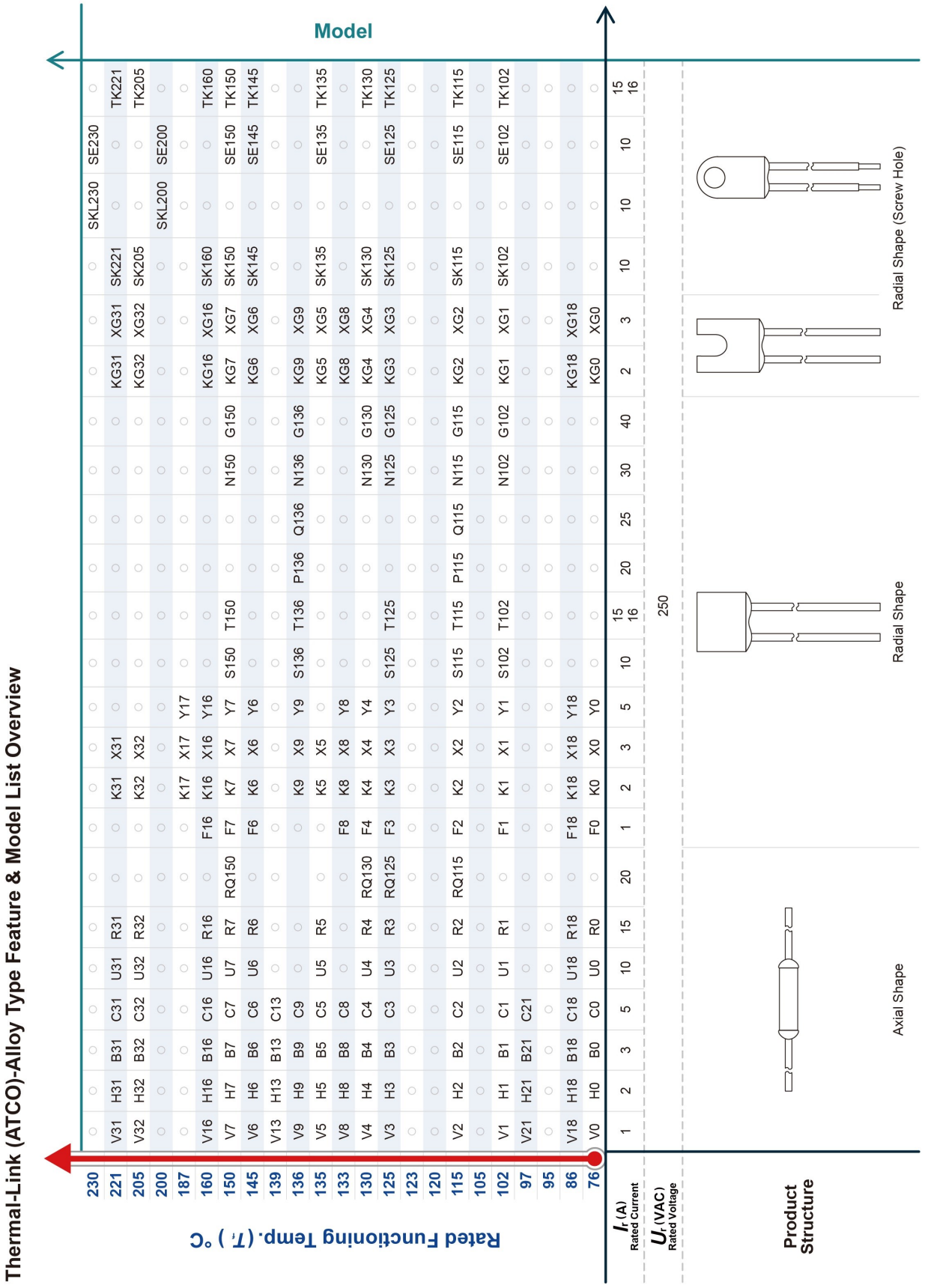
The below leads forming is for reference, more leads forming can be customized.

Axial

A	B	C
		

Thermal-Link (ATCO)-Alloy Type

Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview



Rated Functioning Temp.(Tf) °C	Ir (A) Rated Current	Ur (VAC) Rated Voltage	Product Structure	1	2	3	5	10	15	20	1	2	3	5	10	15	20	25	30	40	2	3	10	10	10	15 16
230				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SKL230	SE230	○
221				V31	H31	B31	C31	U31	R31		○	K31	X31	○	○	○	○	○	○	○	KG31	XG31	SK221	○	○	TK221
205				V32	H32	B32	C32	U32	R32		○	K32	X32	○	○	○	○	○	○	○	KG32	XG32	SK205	○	○	TK205
200				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SKL200	SE200	○
187				○	○	○	○	○	○	○	○	K17	X17	Y17	○	○	○	○	○	○	○	○	○	○	○	○
160				V16	H16	B16	C16	U16	R16	○	F16	K16	X16	Y16	○	○	○	○	○	○	KG16	XG16	SK160	○	○	TK160
150				V7	H7	B7	C7	U7	R7	RQ150	F7	K7	X7	Y7	S150	T150	○	○	○	N150	G150	KG7	XG7	SK150	SE150	TK150
145				V6	H6	B6	C6	U6	R6	○	F6	K6	X6	Y6	○	○	○	○	○	○	○	KG6	XG6	SK145	SE145	TK145
139				V13	H13	B13	C13	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
136				V9	H9	B9	C9	○	○	○	○	K9	X9	Y9	S136	T136	P136	Q136	N136	G136	KG9	XG9	○	○	○	○
135				V5	H5	B5	C5	U5	R5	○	○	K5	X5	○	○	○	○	○	○	○	KG5	XG5	SK135	○	SE135	TK135
133				V8	H8	B8	C8	○	○	○	F8	K8	X8	Y8	○	○	○	○	○	○	KG8	XG8	○	○	○	○
130				V4	H4	B4	C4	U4	R4	RQ130	F4	K4	X4	Y4	○	○	○	○	N130	G130	KG4	XG4	SK130	○	○	TK130
125				V3	H3	B3	C3	U3	R3	RQ125	F3	K3	X3	Y3	S125	T125	○	○	N125	G125	KG3	XG3	SK125	○	SE125	TK125
123				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
120				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
115				V2	H2	B2	C2	U2	R2	RQ115	F2	K2	X2	Y2	S115	T115	P115	Q115	N115	G115	KG2	XG2	SK115	○	SE115	TK115
105				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
102				V1	H1	B1	C1	U1	R1	○	F1	K1	X1	Y1	S102	T102	○	○	N102	G102	KG1	XG1	SK102	○	SE102	TK102
97				V21	H21	B21	C21	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
95				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
86				V18	H18	B18	C18	U18	R18	○	F18	K18	X18	Y18	○	○	○	○	○	○	KG18	XG18	○	○	○	○
76				V0	H0	B0	C0	U0	R0	○	F0	K0	X0	Y0	○	○	○	○	○	○	KG0	XG0	○	○	○	○

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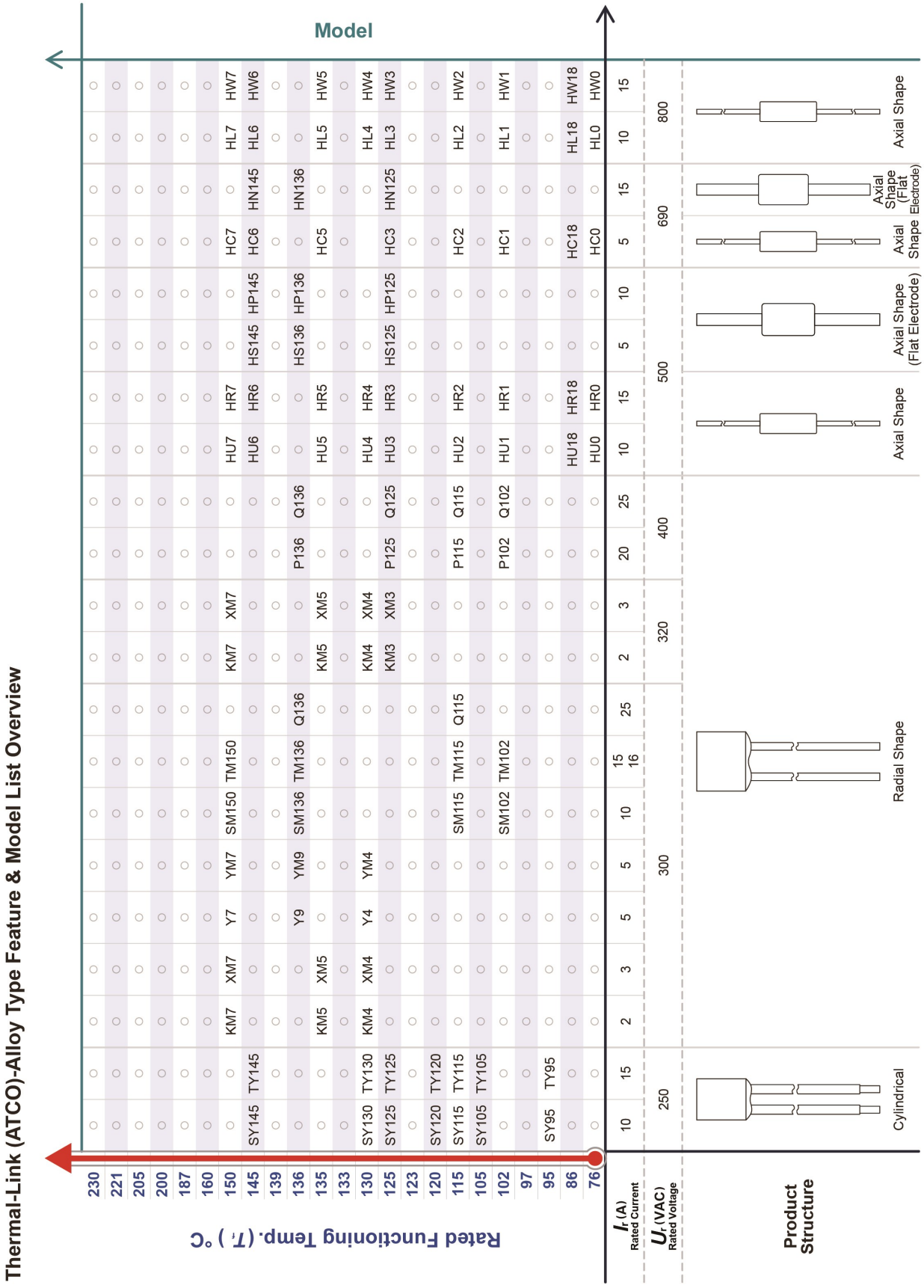
Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview



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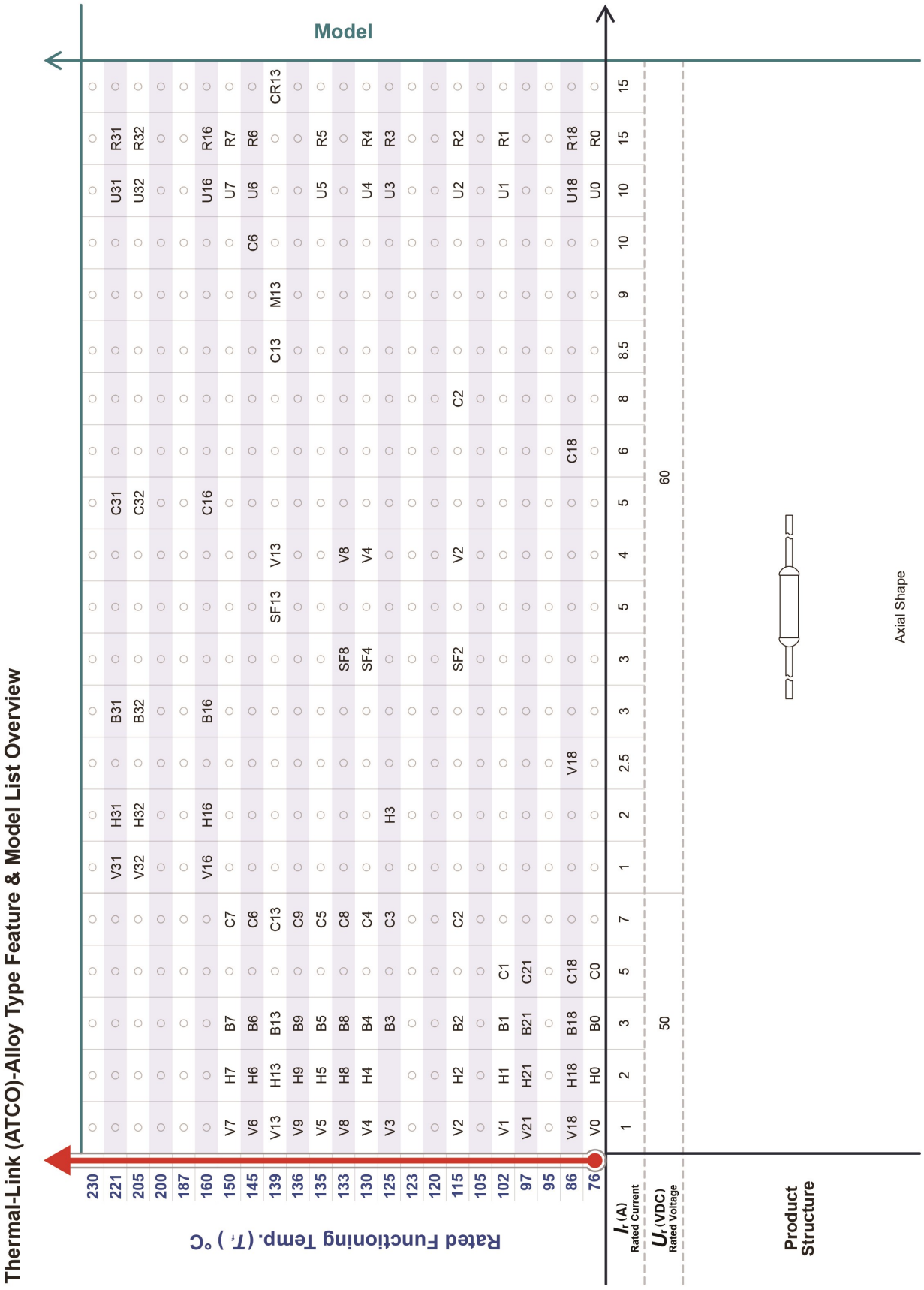
Thermal-Link (ATCO)-Alloy Type Feature & Model List Overview



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