

TD Series



Description

The Direct Current Thermal-Link Alloy Type (DC-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 Direct Current Thermal-Link Alloy Type (DC-ATCO) TD series Rated Functioning Temp. from 102 °C to 150 °C, Rated Current: 15 A,16 A, complies with RoHS and REACH.

Features

- Non-Resettable
- High Accuracy of Functioning
- RoHS & REACH Compliant

Applications

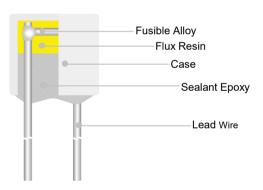
- Surge Protective Devices
- Switched-Mode Power Supplies
- **Batteries**

Customization

- Other Temp.
- The Length of Lead Wires
- Taping Packing Available
- Lead Wires can be Insulated
- Leads Forming Types

Structure Diagrams

Radial

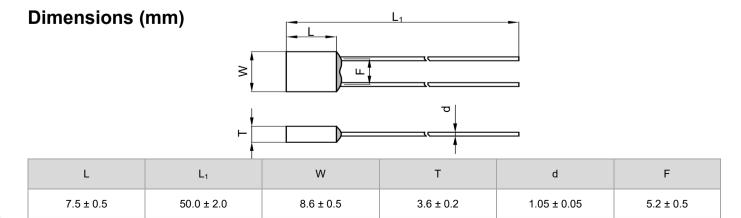


Marking

Radial (Color for reference only)



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





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Specifications

(<i>T</i> _f) °C		Model	Fusing Temp.	(°C)	T _m	/ _r (A)	<i>U</i> _r (V)	RoHS REACH
	150	TD150	145 ± 2	120	160	15 / 16	DC 125	•
Jg Te	136	TD136	131 ± 2	106	160	15 / 16	DC 125	•
Functioning Temp.	130	TD130	125 ± 2	100	160	15 / 16	DC 125	•
Func	125	TD125	121 ± 2	95	160	15 / 16	DC 125	•
Rated	115	TD115	111 ± 2	85	160	15 / 16	DC 125	•
~ ~	102	TD102	98 ± 2	72	160	15 / 16	DC 125	•

Note:

^{1: &}quot;●"Means certificated, "○"Means non-certificated.

^{2:} RoHS & REACH Compliant .





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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.

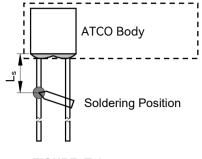


FIGURE T-1

TABLE T-1 Hand-Soldering Time

Rated Functioning Temp.		Max. Allow	able Sol	dering Tir	ne for Differer	nt Lead V	Vire Lengt	h (Fig.T-1)		Max. Soldering Temp.
$(T_{\rm f})$	L _s Length	Time	•	L _s Length	Time		L _s Length	Tim		
(°C)	Length	Tinned Copper Wire CP		Length	Tinned Copper Wire	CP Wire	Lengui	Tinned Copper Wire	CP Wire	
(°C)	(mm)	(s)	(s)	(mm)	(s)	(s)	(mm)	(s)	(s)	(°C)
102 to 115	10	1 ^a	4	20	2	5	30	3	6	
116 to 135	10	1 ^a	4	20	3	6	30	5	8	400
136 to 150	10	3	6	20	5	8	30	5	8	

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

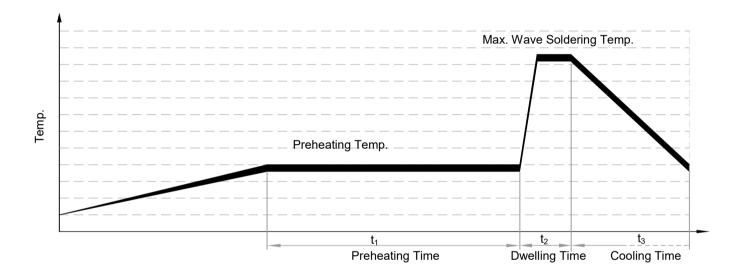
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Wave Soldering

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.	Who	_		ng Temp. e is Different	Preheating Time (t₁)	Max. Wave Soldering	Dwelling Time (t ₂)	Cooling Time (t ₃)
(T _f)	L _s Length	Preheating Temp.	L _s Length	Preheating Temp.		Temp.		
(°C)	(mm)	(°C)	(mm)	(°C)	(s)	(°C)	(s)	(s)
102 to 130				建议	手工焊接			
131 to 150	20	80	30	90	< 60	≤ 260	≤ 3	≤ 10

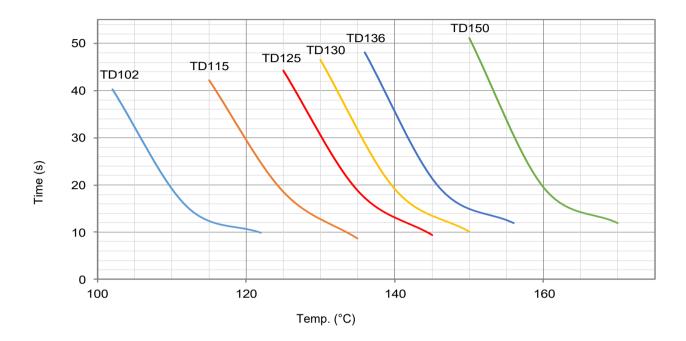




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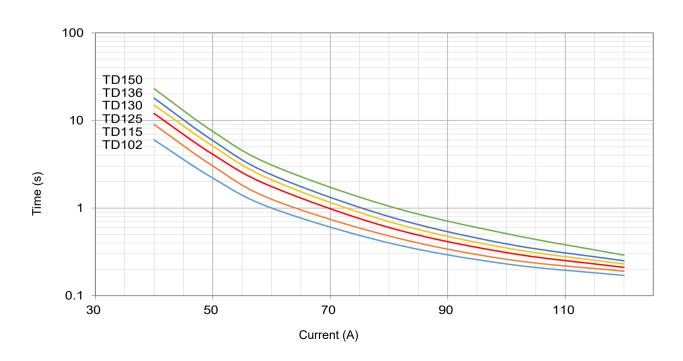
Product Temp.-Time Curve (Reference)

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.

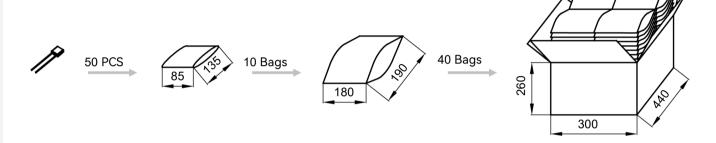


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Packaging Information

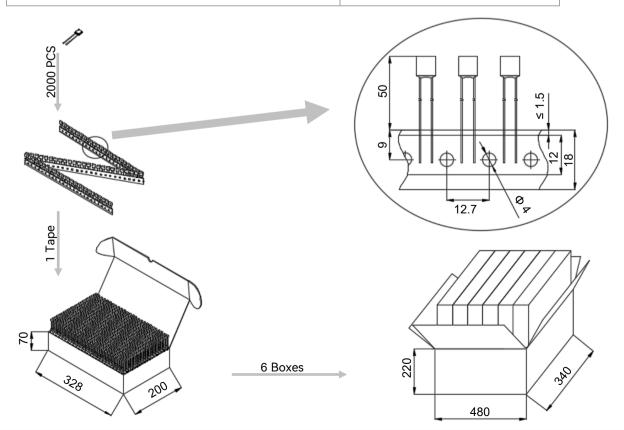
Bulk

Item	PE Bag	PE Bag	Carton
Dimensions (mm)	135 × 85	190 × 180	440 × 300 × 260
Quantity (PCS)	50	500	20000
Gross Weight (kg)			22.0 ± 10%

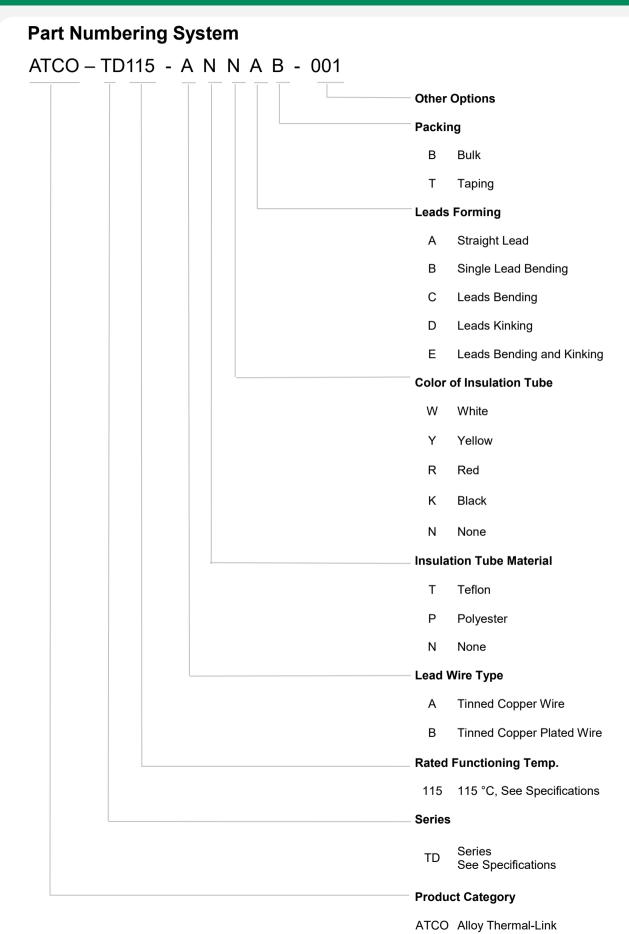


Taping

Item	Вох	Carton
Dimensions (mm)	328 × 200 × 70	480 × 340 × 220
Quantity (PCS)	2000	12000
Gross Weight (kg)		14.0 ± 10%



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Glossary

Item	Description
тсо	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.
ATCO	Alloy Thermal-Link Alloy Type Thermal-Link, Alloy is the thermal element. — (GB 9816.
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.
11	— (GB 9816. Tolerance: $T_{\rm f}$ °C (GB 9816.1, EN 60691, K60691). Tolerance: $T_{\rm f} \pm 7$ °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.
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.
T _m	Maximum Temp. Limit The temperature of the Alloy Thermal-Link stated by the manufacturer, up to which the mechanical and electrical propertie of the Alloy Thermal-Link having changed its state of conductivity, will not be impaired for a given time. — (GB 9816.
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 ar is able to cut off the circuit safely. — (GB 9816.
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 are is able to cut off the circuit safely. — (GB 9816.
<i>I</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 144)
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 144)



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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 $T_{\rm m}$ 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.



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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.
- 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.

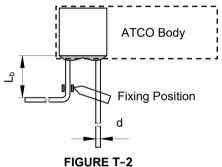


TABLE T-3 Distance between Body and Bending Point

	d	(mm)	< 1.0	1.0 - 1.2	> 1.2
Circular lead	L _b	(mm)	≥ 3	≥ 5	≥ 10

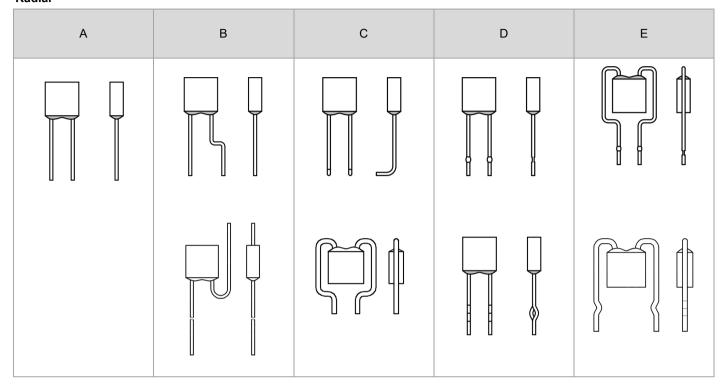


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Leads Forming Types

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

Radial



	4									,	^
	230	0	0	0	0	0	0	0	0	0	
	221	0	0							0	
	205	0	0							0	
	200	0	0							0	
O	187	TGH187-HVS^	ASL187A-LSF^	RSK187A-KSS [^]	RVH187-HSF [^]	ARL187-LRA^			RQF187-FQS^	0	
°	160	0									
7	150	TGH150-HVS^	ASL150A-LSF^	RSK150A-KSS [^]	RVH150-HSF [^]	ARL150-LRA^	RPK150-HRZ [^]	TG150C-HQZ [^]	RQF150-FQS^	TG150C-JPZ^	
•	145	0									
u du	139	0	0							0	
e,	136	TGH136-HVS^	ASL136A-LSF^	RSK136A-KSS [^]	RVH136-HSF [^]	ARL136-LRA^	RPK136-HRZ [^]	TG136C-HQZ [^]	RQF136-FQS^	TG136C-JPZ^	
	135	0	0							0	3
Ĭ.	133	0	0			0				0	Model
Rated Functioning Temp. (7,) °C	130	TGH130-HVS^			RVH130-HSF [^]				RQF130-FQS^	0	0
蓑	125	TGH125-HVS^	ASL125A-LSF^	RSK125A-KSS [^]	RVH125-HSF [^]	ARL125-LRA^	RPK125-HRZ^	TG125C-HQZ [^]	RQF125-FQS^	TG125C-JPZ^	
Ĕ	123	0	0			0				0	
五	120	0	0							0	
D	115	TGH115-HVS^	ASL115A-LSF^	RSK115A-KSS [^]	RVH115-HSF [^]	ARL115-LRA^	RPK115-HRZ [^]	TG115C-HQZ^	RQF115-FQS^	TG115C-JPZ^	
ate	105	0	0							0	
	102	TGH102-HVS^	ASL102A-LSF^	RSK102A-KSS [^]	RVH102-HSF [^]	ARL102-LRA^	RPK102-HRZ [^]	TG102C-HQZ [^]	RQF102-FQS^	TG102C-JPZ^	
	97	0	0							0	
	93	0	0							0	
	86	0	0			ARL86-LRA^		TG86C-HQZ^	RQF86-FQS^	0	
	76) 0	0	0	0	0	0	0	0	0	
r (<i>I</i> Rated C	A) Surrent	15	30	25	15	30	15	15	10	20	
U _r (VI Rated V	DC)^	850		600		5	00	4	50	400	
U _r (V) Rated V	AC)* ′oltage	0		0			0		o T	0	
Prod Struc	Product Structure							0	0		
		Axial	Shape	U U U U Radial	∬ ∬ ∬ ∬ Shape	Axial Shape	Radial Shape	O Axial Shape	Radial Shape	O Axial Shape	

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J _r (VAC)* ated Voltage	60	00	0	0	690	50	00	0		(
J _r (VDC) ^Λ ated Voltage			400		200			180		16	25	
r (A)	20	15	10	15	15	10	5	60	20	15	10	25
86 76(TG86C-HSZ*	RPF86-FPF^									
93	0	O TO000 H07*	O DDEGG EDEA									
97	0											
102	TG102C-JSZ*							ALP102-PLZ^	QD102^	PD102^	TD102^	SD102^
187 160 150 145 139 136 135 133 130 125 123 120 105 105	0											
115	TG115C-JSZ*			ALP115-HLZ^					QD115^	PD115^	TD115^	SD115^
120	0											
123	0											
125	TG125C-JSZ*				HN125^*	HP125^*	HS125^*	ALP125-PLZ^	QD125^	PD125^	TD125^	SD125^
130	0								QD130^	PD130^	TD130^	SD130^
133	0											
135	0											
136	TG136C-JSZ*				HN136^*	HP136^*	HS136^*		QD136^	PD136^	TD136^	SD136^
139	0											
145	0				0	0	HS150^*		QD 150··	0	0	SD150^
160 150	TG150C-JSZ*				HN150^*	HP150^*			QD150^	PD150^	TD150^	
187	0											
200	0											
205	0											
221	0											
230	0											

Ur (VAC)* Rated Voltage Product Structure								0		•				
		400	300	250	400	300	250	0	125	0	125		· · · · · · ·	· · · · · · · · · · · · · · · · · · ·
U _r (VE	OC)^			12	20			100	0	100	0	1	00	60
r (A	A)		25			20		20	00	10	00	10	15 16	50
	76	0	0	0	0	0	0	0	0	0	0	0	0	0
	86	0												
	93	0												0
	97	0			0	0	0	0	0	0	0	0	0	0
ק ב	103	Q102^*			P102^*	P102*	P102*	TB102-UHZ^	TB102-UJZ*	TS102-RHZ [^]	TS102-RJZ*	S102 [^]	T102^	0
ŢĘ.	115 105	Q115^*	Q115*	Q115*	P115^*	P115*	P115*	TB115-UHZ^	TB115-UJZ*	TS115-RHZ [^]	TS115-RJZ*	S115^	T115^	0
	120	0	0	0	0	0	0	O TD 445 LULZA	O TD 445 1117#	0	0	0	0	0
5	123	0												0
5	125	Q125^*			P125^*			TB125-UHZ^	TB125-UJZ*	TS125-RHZ [^]	TS125-RJZ*			
0	130	0						TB130-UHZ [^]	TB130-UJZ*					0
<u>ב</u>	133	0												
_ 	135	0												0
e	136	Q136^*	Q136*	Q136*	P136^*	P136*	P136*	TB136-UHZ^	TB136-UJZ*	TS136-RHZ [^]	TS136-RJZ*	S136^	T136^	
<u>م</u>	139	0												0
	145	0										0	0	0
Ţ.	150	0										S150^	T150^	0
Kated Functioning lemp. ($I_{ m c}$) $^\circ { m C}$	160	0												0
	187	0												0
	205 200	0												0
	221	0												0
	230	0												ADN230B-NEZ

Produc tructu									□ :	=(≕ ⊏												
J _r (VAC)	r (VDC)^ ted Voltage r (VAC)* ted Voltage		0	250			0			250				2	50	0	2	50	125		0		250	
)^	15 10 9 8.5 8 6 5 4 3 2.5																						
/ r (A)		ĺ ·	5		0	9	8.5	8	6						3	2.5	2			4		3	2	1
	86 76	R18^*		U18^*					C18^							V18^					F18^	X18^* X0*	K18^*	F18*
	93	D100*		11100*					0							0					C F100	O V40A*	O	C10*
	97	0																						
	102	R1^*		U1^*																	F1^	X1^*	K1^*	F1*
	105	0																						
5	115	R2^*		U2^*				C2^				V2^		SF2^							F2^	X2^*	K2^*	F2*
	120	0																						
	123	0		03													0					\\ \frac{1}{3}	0	0
_	130 125	R4^*		U4^* U3^*								V4^		SF4^			H3^*				F4^	X4* X3^*	K4*	F4*
	133	0		0								V8^		SF8^							F8^	X8*	K8*	F8*
<u>ת</u>	135	R5^*		U5^*								0		0							0	X5*	K5*	0
	136	0											X9^							K9^		X9*	K9*	
_	139	0	CR13^			M13^	C13^				SF13^	V13^									F13^			F13*
-	145	R6^*		U6^*	C6^								X6^							K6^	F6^	X6*	K6*	F6*
_	160 150	R16^*		U7^*						C16^*							H16^*	V16^*				X16^* X7*	K16^*	F16*
	187	D464*		U16^*						0							0	0				X17^*	K17^*	C16*
	200	0																						
	205	R32^*		U32^*						C32^*					B32^*		H32^*	V32^*	V32*			X32*	K32*	
	221	R31^*		U31^*						C31^*					B31^*		H31^*	V31^*	V31*			X31*	K31*	
	230																							

	4																1
	230	0	0	0	0	0	0	0	0	0	0	0	ADN230B-NDZ^	ADN230B-PDZ^	0	ADN230B-QBZ^	+-
	221	XG31*	KG31*			C31*		B31*		H31*				0	ADN205B-NDZ^	0	
	205	XG32*	KG32*			C33*		B32*		H32*				0		0	1
	200	0												0		0	
O	187	0														0	1
•	160	XG16*	KG16*				B16*							0		0	1
F	150	XG7*	KG7*	C7^	C7*		B7^*		H7^*		V7^*			0		0	1
<u> </u>	145	XG6*	KG6*	C6^	C6*		B6^*		H6^*		V6^*					0	1
du	139	0		C13^	C13*		B13^*		H13^*		V13^*			0		0	1
e.	136	XG9*	KG9*	C9^	C9*		B9^*		H9^*		V9^*			0		0	1
	135	XG5*	KG5*	C5^	C5*		B5^*		H5^*		V5^*			0		0] ≥
Ĕ.	133	XG8*	KG8*	C8^	C8*		B8^*		H8^*		V8^*			0		0	Model
Rated Functioning Temp. (7,) °C	130	XG4*	KG4*	C4^	C4*		B4^*		H4^*		V4^*			0		0	0
ŧ	125	XG3^*	KG3^*	C3^	C3*		B3^*				V3^*			0		0	
Ĕ	123	0												0		0	1
Ŀ	120	0												0		0	
p	115	XG2^*	KG2^*	C2^	C2*		B2^*		H2^*		V2^*			0		0	1
ate	105	0												0		0	1
œ	102	XG1^*	KG1^*		C1^*	C1*	B1^*	B1*	H1^*	H1*	V1^*	V1*		0		0	1
	97	0				C21^*		B21^*		H21^*		V21^*				0	
	93	0												0		0	1
	86	XG18^*	KG18^*		C18^*	C18*	B18^*	B18*	H18^*	H18*	V18^*	V18*		0		0	
	76	XG0*	KG0*	0	C0*	0	B0^*	B0*	H0^*	H0*	V0^*	V0*	0	0	0	0	┺
r (A	A) urrent	3	2	7		5	3			2		1	50	55	50	80	
U _r (VE)C)^	6	0					50					49	4	l8	24	1
U r(VA	AC)*	2	 50		250	125	250	125	250	125	250	125		J		J	1
Prod	U,(VAC)* Rated Voltage Product Structure					c	⇒⊱—(
		Radial			Axial Shape												