Thermal Turn On

Organic Type

TTO

- Metal Case
- Compact Size
- Non-Resettable
- Low Resistance
- Organic Thermal Pellet
- High Accuracy of Functioning Temp.
- Halogen free and RoHS compliant

Please refer to the datasheet of each series.

https://setsafe.com/Product/Over-Temperature-Protection/Thermal-Link-OTCO-Organic-Type.html

2024

SET safe | SET fuse

Providing a Total Solution for High Standard Safety Circuit Protection

Thermal Turn On(TTO)-Organic Type

Thermal Turn On (TTO)-Organic Type is defined as a non-resettable protective device functioning one time only that uses organic compounds as temperature sensing material. Normally, the solid thermal pellet keeps the isolated lead and disc separating. When the thermal pellet sensed abnormal heat and temp. reaches the predetermined temp., thermal pellet melts and the isolated lead and disc contact, with the assistance of spring, thereby the circuit is connected. TTO mainly consists of metal case, spring and thermal pellet.

TTO products are often used as a remote signaling switch and are widely used in electrical equipment.

SETsafe | SETfuse Thermal Turn On(TTO)-Organic Type product specifications: Rated Functioning Temp. :(73 ~ 217)℃; Rated Current: 1 A; Rated voltage: 250 VAC; and complies with RoHS and REACH.

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Contents

1 Feature & Model List Overview 1

2 Glossary 2

3 Attention 3

4 Product Series 6

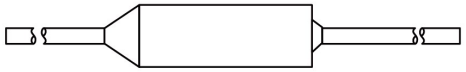
Description, Feature, Applications, Customization, Structure Diagrams, Marking, Dimensions, Specifications, Temp. Rise Curve, Response Time Curve, Agency Information, Packaging Information, Part Numbering System

4.1 R series 6

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

+86-592-571-5838 www.SETfuse.com www.SETsafe.com E-mail : sales@SETfuse.com

Thermal Turn On (TTO) - Organic Type Features & Model List Overview

Rated Functioning Temp. T_f (°C)	Model
217	R217
193	R193
173	R173
167	R167
145	R145
128	R128
108	R108
97	R97
93	R93
85	R85
73	R73
I_r (A) Rated Current	1
U_r (VAC) Rated Voltage	250
Product Structure	

Thermal Turn On (TTO)-Organic Type

SET safe | SET fuse

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Glossary

Item	Description
TTO	**Thermal Turn On** A non-resettable device incorporating a THERMAL ELEMENT which will connect an open circuit once only when exposed for a sufficient time to a temp. in excess of that for which it has been designed.
T_f	**Rated Functioning Temp.** The temp. of the Thermal Turn On which causes it to change the state of open circuit.
Turn On Temp.	The temp. of the Thermal Turn On which causes it to change its state of open circuit is measured with silicone oil bath in which the temp. is increased at the rate of 0.5 K/min to 1 K/min.
I_r	**Rated Current** The current used to classify a Thermal Turn On.
U_r	**Rated Voltage** The voltage used to classify a Thermal Turn On.

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

ATTENTION

Usage

1. Please use TTO without exceeding the rated current and voltage.
2. Do not use the TTO in environments out of the standard specifications, such as those containing sulfur dioxide gas, nitrogen oxide gas, ammonia gas or formic acid. It is also not suitable for using in high humidity environment or immersing in liquid.

Replace

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

Storage

1. TTO must be kept in a place with no sunshine and no corrosive gas, with temperature shall be 10 °C ~ 30 °C and humidity within 30 % ~ 70 %. The validity period of TTO is 12 months after purchase.
2. The case of TTO is silver-plated. Therefore, to avoid vulcanization, the TTO shall not be kept around materials such as cardboard or rubber etc. which generate sulfurous acid gas.

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Lead Process

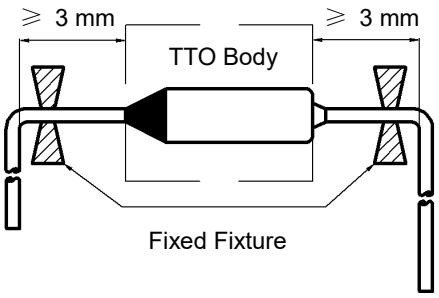


FIGURE 1

1. If lead wires has to be bent, it is important not to apply excessive pressure to the root of the lead wires. The tensile forces applied to the lead wires shall not exceed 15.7N, and the thrust force applied to the lead wires shall not exceed 3.9N.
2. The lead wires shall be bent at a distance 3 mm or above from the body of TTO (see Fig.1).
3. To avoid damaging the TTO, when bending lead wires, please use pincher or similar tools to fix the TTO.

Installation

Selection of Installation Location

1. Do not locate the TTO in a place where severe vibration always occurs.

Make Sure the Temp. of Installation Location

1. It shall be ensured that the ambient temp. at the installation position of TTO does not exceed its allowable operating temp. range.

Mounting TTO

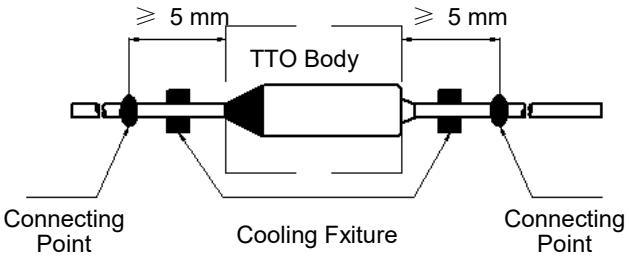


FIGURE 2

1. TTO can be installed by soldering, welding, riveting or crimping. During and after installation, please do not pull, push or twist TTO body and lead wires.
2. The connection point of the lead shall be greater than 5 mm away from the TTO body（See Fig. 2）.

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Soldering

1. Soldering shall be carried out according to below table, if secondary soldering is required, wait until the TTO cools to room temp.
2. Soldering is not recommended for TTO with Tf ≤ 110 °C, while non heating processes such as crimping and riveting are recommended.
3. In the process of soldering, cooling fixture shall be used between soldering point and TTO body (see Fig.2).
4. It is recommended to take X-ray after soldering, to confirm that the thermal pellet has no shrinkage after soldering.

TABLE 1: Max. Allowable Soldering Time for Different Length of Soldering Point from TTO Body

Rated Functioning Temp. (T_f)	Length	Time	Length	Time	Length	Time	Max. Soldering Temp.
(°C)	(mm)	(s)	(mm)	(s)	(mm)	(s)	(°C)
≤ 110	5	N / A	15	N / A	25	N / A	400
111 ~ 150	5	N / A	15	1	25	2	
151 ~ 190	5	1	15	2	25	3	
≥ 191	5	1	15	3	25	5	

Welding

1. During the welding process, the lead wires of the TTO must be supported to avoid the damage of the TTO.
2. In the process of welding, cooling fixture should be used between welding point and TTO body (See Fig.2).
3. It is recommended to take X-ray after welding, to confirm that the thermal pellet has no shrinkage after welding.

Riveting or Crimping

1. Select materials with low resistance (such as copper) for riveting and crimping.
2. It is better to crimp TTO leads to stranded lead wires rather than solid wires as the stranded wire may be crimped tighter and maintain better electrical contact during temp. cycling.
3. During the riveting and crimping process, ensure that the lead wires shall not be reversed, sealing resin shall not be destroyed.
4. When the working temp. exceeds 150°C, soldering reinforcement is recommended after riveting and crimping.

The isolated lead is forbidden to contact TTO body directly to avoid short circuit (See Fig.3).

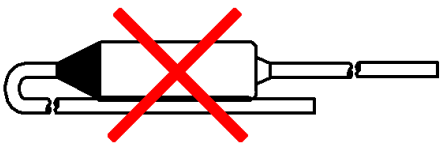


FIGURE 3

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

R Series

Description

Organic Thermal Turn On (TTO) is defined as a non-resettable protective device functioning one time only. TTO is mainly consist of metal case, spring and thermal pellet. Normally, the solid thermal pellet keeps the isolated lead and disc separating. When the thermal pellet sensed abnormal heat and temp. reaches the predetermined temp., thermal pellet melts and the isolated lead and disc contact, with the assistance of spring, thereby the circuit is connected.

SETsafe | SETfuse Organic Thermal Turn On (TTO) R series Rated Functioning Temp. from 73 ℃ to 217 ℃, Rated Current/ Rated Voltage: 1 A/250VAC, complies with RoHS and REACH.

Features

- Normally open to normally closed
- High Accuracy of Functioning Temp.
- Non-Resettable
- Organic Thermal Pellet
- Metal Case
- RoHS & REACH Compliant

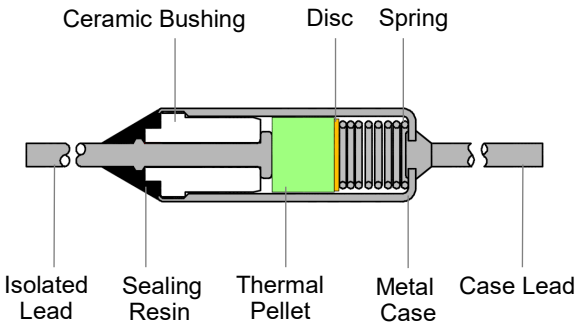
Applications

- Fire-fighting Equipment
- Remote signaling switch

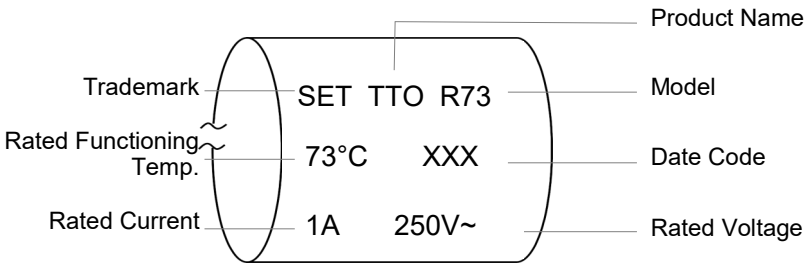
Customization

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

Structure Diagrams

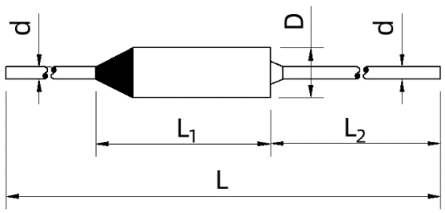


Marking



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.

Dimensions (mm)



Lead Length	L	L_1	L_2	D	d
Standard	65 ± 3	(14)	35 ± 2	Φ 4 ± 0.2	Φ 1 ± 0.1
Long	81 ± 3	(14)	35 ± 2	Φ 4 ± 0.2	Φ 1 ± 0.1
Option	Customization	(14)	Customization	Φ 4 ± 0.2	Φ 1 ± 0.1

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Specifications

Rated Functioning Temp. (T_f) °C

	Model	Fusing Temp. (°C)	I_r (V)	U_r (VAC)	Allowable Operating Temp. Range (°C)	RoHS REACH
217	R217	217 +0/-6	1	AC 250	-40 ~ 202	●
193	R193	193 +0/-6	1	AC 250	-40 ~ 178	●
173	R173	173 +0/-6	1	AC 250	-40 ~ 158	●
167	R167	167 +0/-6	1	AC 250	-40 ~ 152	●
145	R145	145 +0/-6	1	AC 250	-40 ~ 130	●
128	R128	128 +0/-6	1	AC 250	-40 ~ 113	●
108	R108	108 +0/-6	1	AC 250	-40 ~ 93	●
97	R97	97 +0/-6	1	AC 250	-40 ~ 82	●
93	R93	93 +0/-6	1	AC 250	-40 ~ 78	●
85	R85	85 +0/-6	1	AC 250	-40 ~ 70	●
73	R73	73 +0/-6	1	AC 250	-40 ~ 58	●

Note:

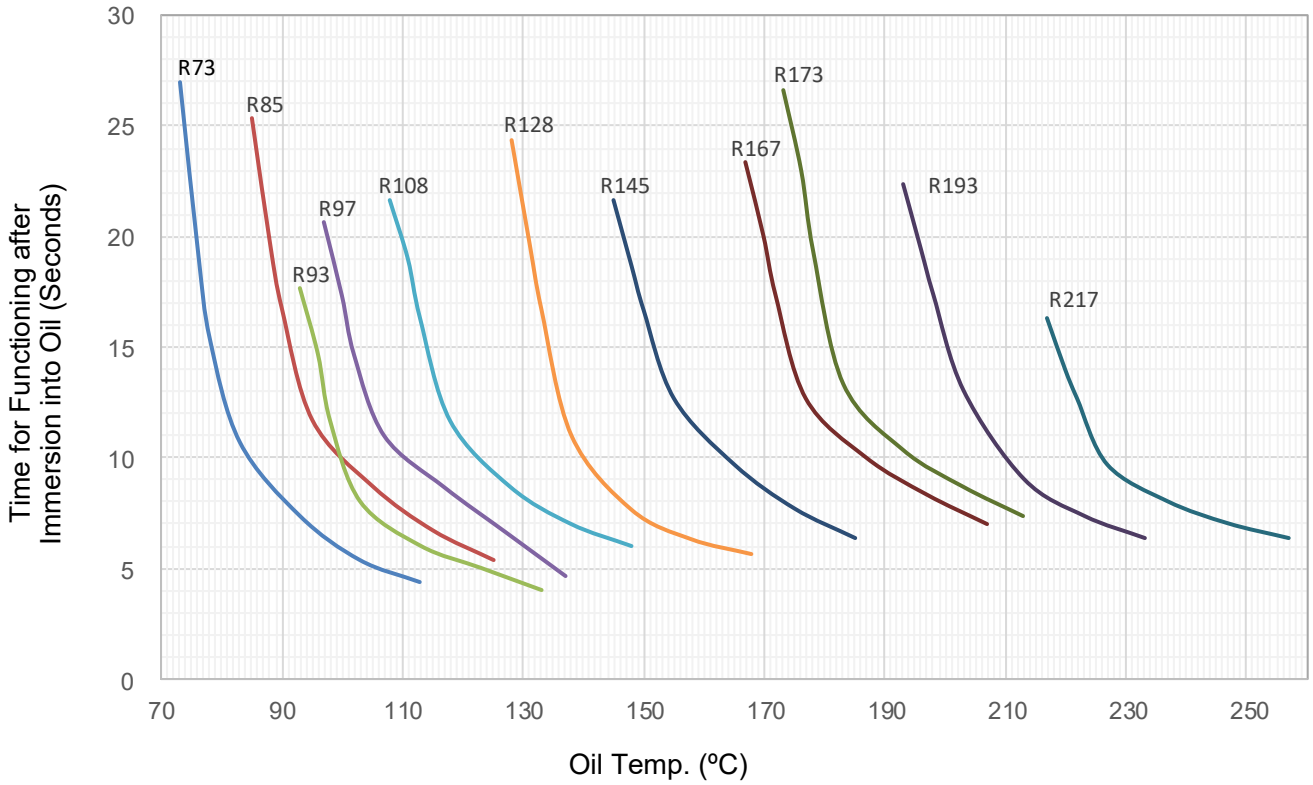
1: "●"Means certificated, "○"Means non-certificated.

2: RoHS & REACH Compliant .

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Response Time (Reference)

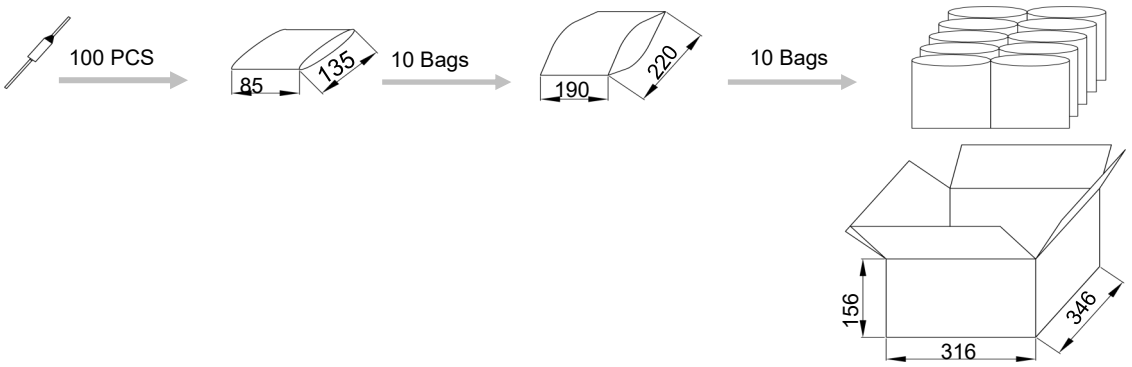


All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Packaging Information

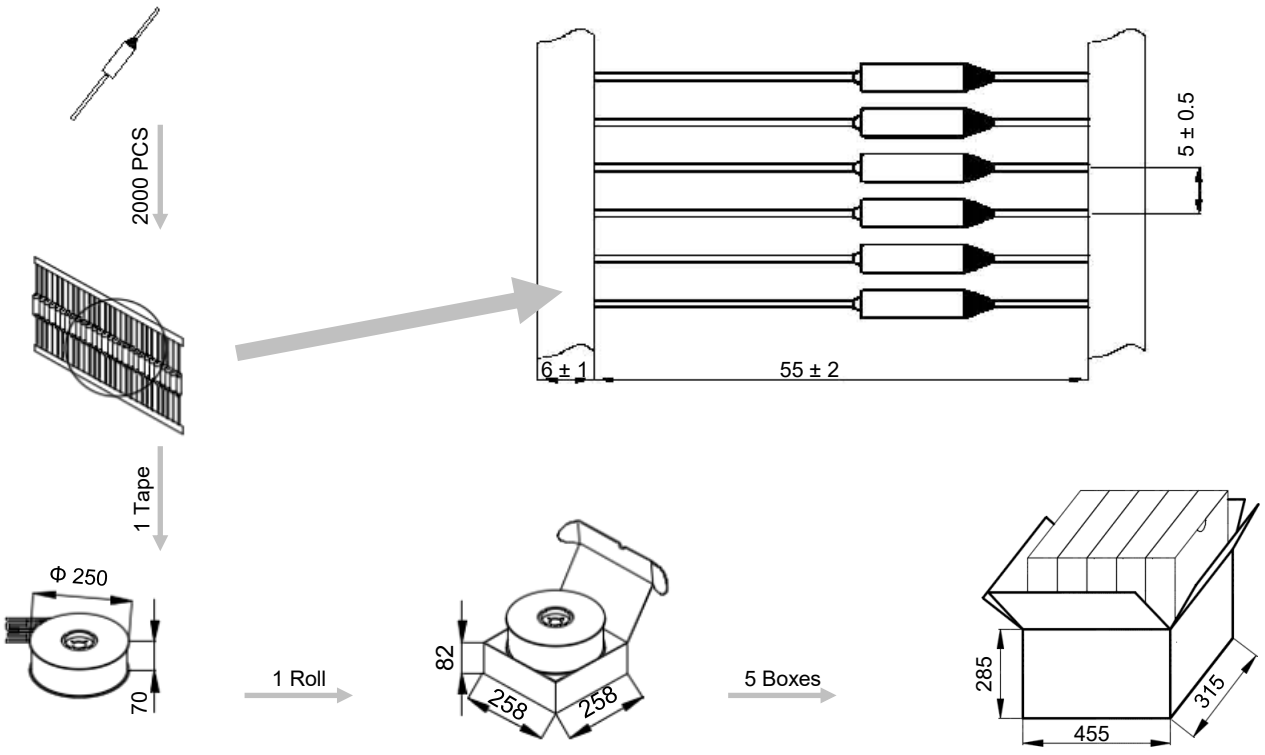
1.Bulk

Item	PE Bag	PE Bag	Carton
Dimensions (mm)	135 x 85	220 x 190	346 x 316 x 156
Quantity (PCS)	100	1000	10000
Gross Weight (kg)			11 ± 10%



2.Taping

Item	**Scroll**	Box	Carton
Dimensions (mm)	Φ 250 x Φ 85 x 70	258 x 258 x 98	455 x 315 x 285
Quantity (PCS)	2,000	2000	8000
Gross Weight (kg)			12.7 ± 10%



All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

Thermal Turn On (TTO)-Organic Type

Part Numbering System

TTO - R 73 - L S A B - 001

Other Options

Packing

B	Bulk
T	Taping

Leads Forming

A	Straight Lead
B	Single Lead Bending
C	Leads Bending

Lead Length

S	Standard
L	Long
O	Option

Process of Mark

L	Laser

Rated Functioning Temp.

73	73 °C, See Specifications

Series

R	Series See Specifications

Product Category

TTO	Thermal Turn On

All Rights Reserved by Xiamen SET Electronics Co., Ltd. 2024-2026 V1.0

www.SETsafe.com
www.SETfuse.com

20+

OVER 20 YEARS OF DESIGNING, MANUFACTURING AND SELLING OF CIRCUIT PROTECTION COMPONENTS

40+

SOLD TO MORE THAN 40 COUNTRIES AND REGIONS

Automatic

AUTOMATIC PROCESS PRODUCTION

500

A BRAND CHOSEN BY FORTUNE 500 COMPANIES

SET safe | SET fuse

NO. 8067, 8001 West Xiang'an Road,Torch High-tech industrial District, Xiang'an 361101 Xiamen P.R. China
+ 86 592-5715-838 sales@SETfuse.com

All Rights Reserved by Xiamen SET Electronics Co., Ltd. Ver. 2024 - 2026