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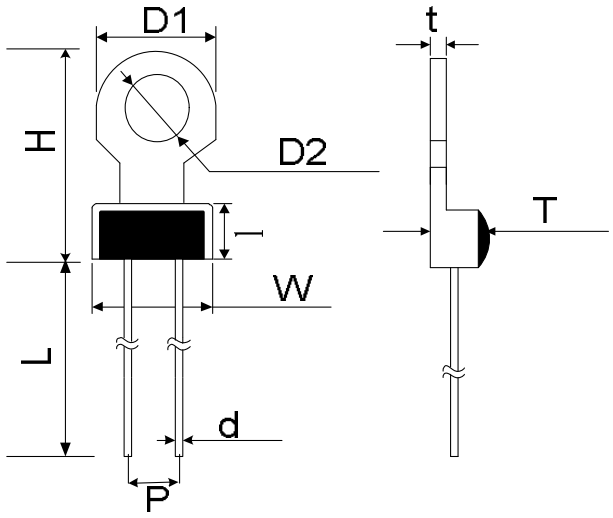
## *Part Number Code*

Example :

| **PT** | **M** | **S2** | **331** | **R** | **P7** | **30** | **Y** |
|---|---|---|---|---|---|---|---|
| **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |

| No. | Item | Digit | Specification |
|---|---|---|---|
| (1) | Product Type | PT | Thinking PTC thermistor for temperature sensor |
| (2) | Type Series | M | Metal terminal type |
| (3) | Dimensions | S2 | 2mm square |
| (4) | Resistance($R_{25}$) | 331 | $33*10^{1}\Omega$=330 Ω |
| (5) | Tolerance of $R_{25}$ | R | 0%~-100% |
| (6) | Curie Temperature | P7 | 70℃ |
| (7) | Maximum Voltage | 30 | 30V |
| (8) | Optional Suffix | Y | RoHS compliance & bulk |

## Structure and Dimensions




(Unit:mm)

| Item. | D1 | D2 | T | t | d | P | L | l | H | W |
|---|---|---|---|---|---|---|---|---|---|---|
| Max | 8 | 3.8 | 4.5 | 0.6 | 0.52 | 3.5 | --- | 6.1 | 15.5 | 7.8 |
| Min | 7 | 3.4 | --- | 0.4 | 0.48 | 1.5 | 25 | 5.1 | 14.5 | 6.8 |

## Electrical Characteristics

| Part no. | Curie Temperature | Sensing Temperature | Max. Permissible Voltage | Max. Permissible Current |
|---|---|---|---|---|
| | Tc (℃) | Ts (℃) | Vmax (V) | Imax (mA) |
| PTMS2331RP730Y | 70±10 | 85 | 30 | 100 |

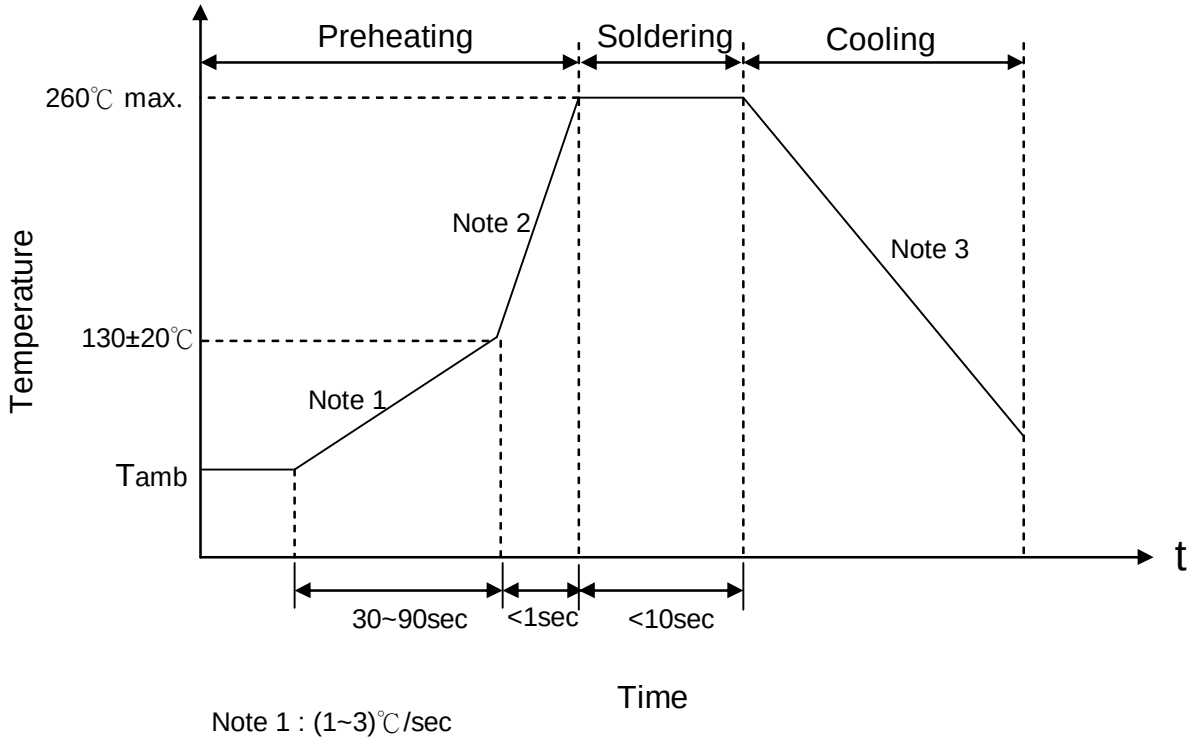
| Part no. | Max. Operating Current | Resistance Value | | | Operating Temperature Range | Storage Temperature Range |
|---|---|---|---|---|---|---|
| | I (mA) | 25℃ (O) | Ts-5℃ (O) | Ts+5℃ (O) | (℃) | (℃) |
| PTMS2331RP730Y | 2 | ≦330 | ≦1500 | ≧2200 | -25~+110 | -25~+125 |

## *Reliability*

| Item | Standard | Test conditions / Methods | Specifications |
|---|---|---|---|
| Tensile Strength of Terminals | IEC60068-2-21 | Gradually applying the force specified and keeping the unit fixed for 10±1 sec.<br>Terminal diameter (mm) / Force T±10%(N)<br>0.35<d≦0.5 : 5.0<br>0.5<d≦0.8 : 10.0 | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Solderability | IEC60068-2-20 | 255±5℃ ,3±0.5sec,<br>4±1mm from body . | At least 95% of terminal electrode is covered by new solder |
| Resistance to Soldering Heat | IEC60068-2-20 | 350±10℃ ,3 4 sec,<br>4±1mm from body | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Vibration | IEC60068-2-6 | Frequency range:10~55Hz<br>Amplitude:0.75mm or 98m/$S^2$<br>Direction:3 mutually perpendicular directions<br>Duration :6HRS(3x2HRS) | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Shock | IEC60068-2-27 | Wave:half-sine<br>⊿V:1.0m/s<br>Acceleration:50m/$S^2$ | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Insulation Resistance | CECC42000 | 100±15$V_{DC}$ , 60±5S | ≧100MO |
| Insulation Voltage | CECC42000 | 1000±10Vrms , 60±5S | No visible damage |
| High Temperature Continuous Load | IEC60738-1 | 110℃ , 30Vrms,100mA for 1000hrs | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| High Temperature Storage | IEC60068-2-2 | 110℃, for 1000±2hrs | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Damp Heat, Steady State | IEC60068-2-3 | 40 ± 2℃ , 9 0~95%RH ,12± 2$V_{DC}$ for 1000 ± 2 hrs | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |
| Rapid Change of Temperature | IEC60068-2-14 | The thermal shock conditions shown below shall be repeated 5 cycles<br>Step / Temperature(℃) / Period(minutes)<br>1 / -40 ± 3 / 30 ± 3<br>2 / Room temperature / 5 ± 3<br>3 / 85 ± 2 / 30 ± 3<br>4 / Room temperature / 5 ± 3 | I △$R_{25}/R_{25}$ I ≦20%<br>No visible damage |

# *Soldering Recommendation*

## ■ Wave Soldering Profile




Note 1 : (1~3)℃/sec
Note 2 : Approx. 200℃/sec
Note 3 : 5℃/sec Max

## ■ Recommended Reworking Conditions with Soldering Iron

| Item | Conditions |
|---|---|
| Temperature of Soldering Iron-tip | 360℃ (max.) |
| Soldering Time | 3 sec (max.) |
| Distance from Thermistor | 2 mm (min.) |

## *RoHS Compliant Declaration*

We hereby declare the components delivered to your company are compliant with RoHS Directive 2002/95/EC .

## *Storage Conditions of Products*

(I) Storage Conditions :

1.Storage Temperature : -10℃~+40℃

2.Relative Humidity : ≦75%RH

3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

## *Safety Approvals*

* UL 1434 / cUL recognized (File # E138827)

* CQC recognized (File# CQC03001008130)

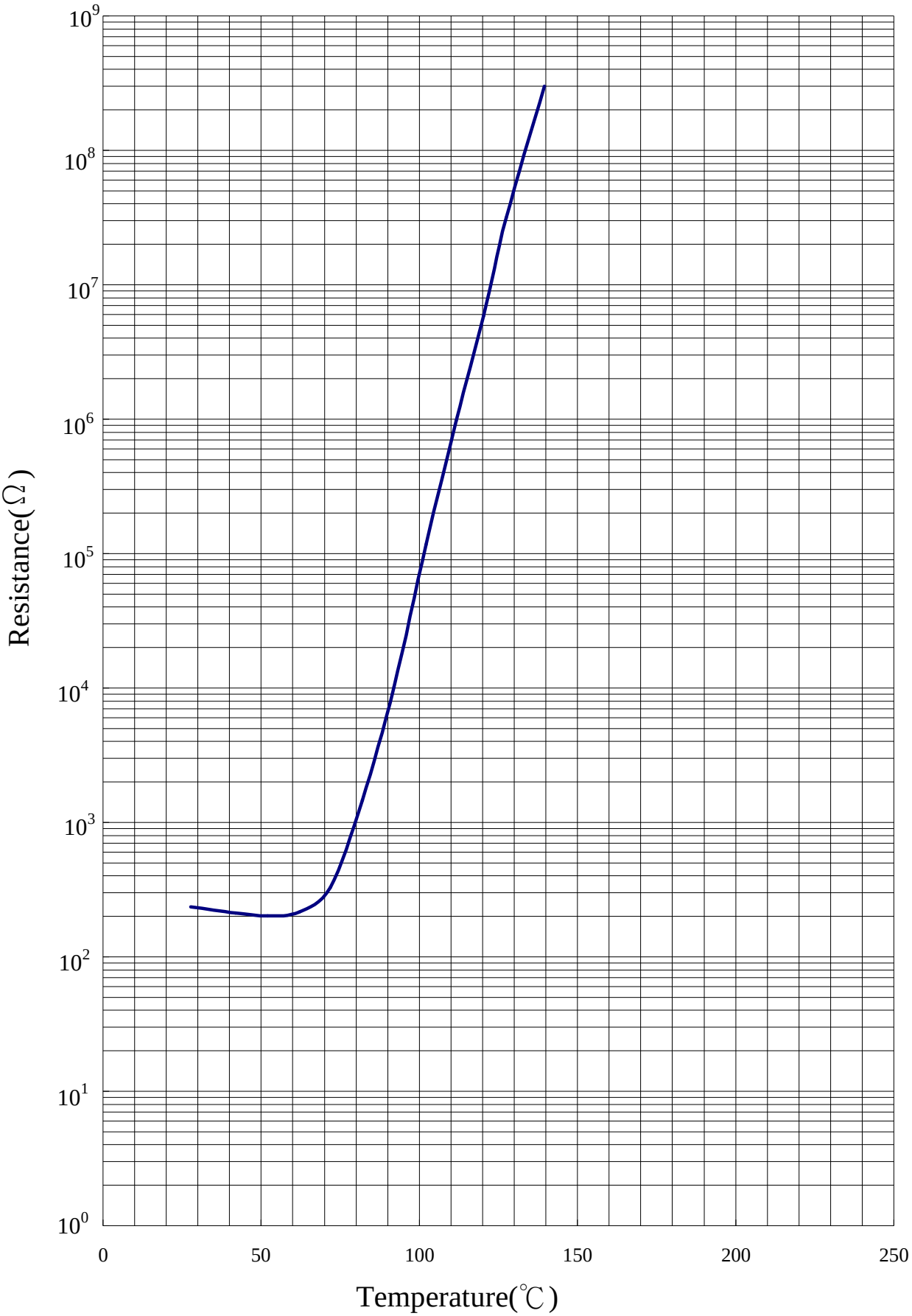
## *Certificates*

(1) ISO 9001 certificate

## *Test Report*

(1) RoHS test report

## *Resistance -Temperature Curve*



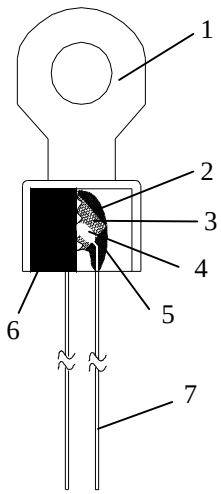
# *Material Safety Data Sheet*

## 1. Product and Company Identification

| |
|---|
| Product name：CPTC Themistor PTM Series |
| Product Use：Use for electronic component |
| Supplier Information：<br>THINKING ELECTRONIC INDUSTRIAL CO.,LTD<br>• Kaohsiung Factory：21, Lane 373, Min-Tzu 1st Rd., Kaohsiung, Taiwan<br>Tel：886-7-3862591 Fax：886-7-3866990<br>• Changzhou Factory：Wujin High & New Tech Ind. Development Zone, Hutang, Wujin, Changzhou City, Jiangsu 213161, China<br>Tel：86-519-6578999 Fax：86-519-6558643<br>• Dong Guan Factory：Chiao-Tou Tsun. Sha-Tao Hsiang. Chang-An Town. Dong-Guan City, Guang-Dong, China<br>Tel：86-769-5542016 Fax：86-769-5546890 |

## 2. Composition, Information on Ingredients

**PTM Series Structure**




| NO | Component | Material | Content |
|---|---|---|---|
| (1) | Terminal | Copper | 65~75% |
| (2) | Ceramic Disc | BaTiO3 | 3~7% |
| (3) | Electrode | Ag | 0.03~0.07% |
| (4) | Solder | 96.5Sn-3.5Ag | 0.05-0.1% |
| (5) | Coating | Silicon Resin | 3~7% |
| (6) | Black glue | Epoxy Resin | 10~20% |
| (7) | Lead | Tinned copper clad steel wire | 3~7% |

## 3. Hazards Identification

| |
|---|
| Emergency Overview： |
| Adverse Human Health Effects：Inhalation or eyes contact will effect respiration systemand and feel irritancy. |
| Environmental Effects：- |
| Physical and Chemical Hazards：-- |
| Specific Hazards：- |

## 4. First-Aid Measures

| |
|---|
| Inhalation： 1.Remove the pollutant or move the sufferer to the fresh-I place<br>2.If stop breathing, should take artificial respiration by the man who has been received the training, if stop the heartbeat, have to make CPR.<br>3.If breathe hard, should provide oxygen.<br>4.Attention: Maybe the" pulmonary edema" will come up later, should observe the one who over- exposed in it closely. |
| Ingestion：1.If the sufferer lost consciousness, don't feed in anything.<br>2.Wasning the oral cavity with water.<br>3.If the sufferer stop breathing, should be use artificial breathe; if stop heartbeat, should be use CPR. |
| Skin Contact：1.Washing the affected part with warm water as soon as possible at least 20minutes.<br>2.Should remove the clothing, shoes, leather product of the pollutant when rinsing it.<br>3 If still feel malaise consult a physician immediately. |
| Eye Contact：Flush eyes with plenty of clean water. |
| Protection of First-aiders：Take protection gloves to avoid touching the Pollutant. |
| Notes to Physician：If swallow it, considering to make gastric lavage. |

## 5. Fire-Fighting Measures

| |
|---|
| Extinguishing Media：Carbon dioxide, dry chemical and form. |
| Fire and Explosion Hazards：Silicon Resin will crack when it occur fire accident, and bring methanol, formaldehyde,Silica steam. |
| Special Firefighting Procedures：Don't put off a fire by wate, could make use of water fog with absorption of heat to cool the container. |
| Special Equipment for the Protection of Firefighters：Should take protective equipment, clothing and air inspirator. |

## 6. Accidental Release Measures

| |
|---|
| Personal Precautions：The worker Should take protective equipment. |
| Environmental Precautions：1.Use with adequate ventilation.<br>2.Remove all sources of ignition. |
| Methods for Cleaning Up：1.Segregate the dangerous area, and avoid person into.<br>2.Avoid into the slot and the obturate space. |

## 7. Handling and Storage

| |
|---|
| Handling：1. Avoid breathing dust. Avoid contact with skin and eyes. Take precautionary measures against static discharges.<br>2. Use with adequate ventilation.<br>3. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. |
| Storage：1.Store in a cool, dry place.<br>2.Avoid extruding and shocking.<br>3. Keep away from sources of ignition.<br>4.The store area should have enough extinguish equipment. |

## 8. Exposure Controls/Personal Protection

| |
|---|
| Engineering Measure：1.Good house keeping and controlling dusts are necessary for safe handing of product.<br>2.Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. |
| Control parameters：<br>• Limit values：-<br>• Biological Standards：- |
| Personal Protective Equipment：<br>• Respiratory Protection：Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.<br>• Hand Protection：Wear appropriate protective gloves to prevent skin exposure.<br>• Eye Protection：Wear appropriate protective eyeglasses<br>• Skin and Body Protection：Wear appropriate protective clothing to prevent skin exposure. |

## 9. Physical and Chemical Properties

| | |
|---|---|
| Physical State：Solid | Form：Disk type |
| Color：Gray | Odor：a little propanone-like |
| pH：- | Boiling Point/Boiling Range：- |
| Decomposition Temperature：- | Flash Point：- |
| Auto Ignition Temperature：- | Explosion Properties：- |
| Vapor pressure：- | Vapor density：- |
| Density：- | Solubility：Can't solve in water. |

## 10. Stability and Reactivity

| |
|---|
| Stability：Stable |
| Possible Hazardous Reactions Occurring under Specific Conditions：Maybe solve in water. |
| Conditions to Avoid：Incompatible materials, ignition sources, exposure to moist air or water. |
| Materials to Avoid：Strong acids, strong oxidizers, and water. |
| Hazardous Decomposition Products：Dust, Carbon monoxide |

## 11. Toxicological Information

| |
|---|
| Acute toxicity：If swallow it,maybe give rise to cancer. |
| Local effects：-- |
| Sensitization：-- |
| Chronic Toxicity or Long Term Toxicity：-- |
| Specific effects：-- |

## 12. Ecological Information

| |
|---|
| Possible Environmental Effects, Behavior and Fate：<br>1. Can't be solve spontaneously in atmosphere.<br>2. Can't be solve spontaneously in water.<br>3. Can't be solve spontaneously in soil. |

## 13. Disposal Considerations

Recommended Methods for Safe and Environmentally Preferred Disposal：

1. Should separate product into lead,coating and main body.
2. The part of Case can mixture with combustible solution, and incinerate by chemistry incinerator.
3. The part of lead is copper mostly, and classfied as metal is reclaimable.
4. The main body is metal oxide, processing like general waste.

## 14. Transport Information

Not classfied as dangerous or hazardous for transporting.

## 15. Regulatory Information

Applicable Regulations：

1. Labor safety and Health Action.(In Taiwan)
2. Waste Disposal Action. (In Taiwan)
3. Water Pollution Control Action.(In Taiwan)

## 16. Other Information

Revision Date：SEP. 15, 2006

Tabulation:R&D Dept.

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