# UTA08-15A06

## SCR

Pb-Free RoHS COMPLIANT

| VOLTAGE: | 600 Volts | CURRENT: | 8 Ampers | Package: | TO-220A |
|---|---|---|---|---|---|

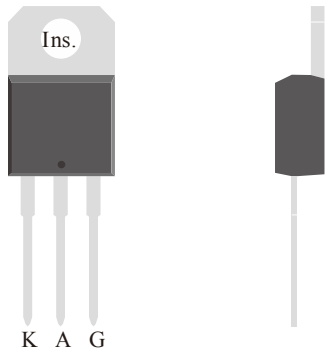
### FEATURES

- Highly dv/dt For High Reliability
- Low Thermal Resistance Insulation Ceramic For Insulated Package
- Strongresistance To Electromagnetic Interference.
- With High Ability To Withstand The Shock Loading Of Large Current

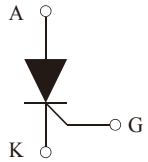
### TYPICAL APPLICATIONS

- Phase Control Operation Of Light Dimmers And Motor Speed Controllers
- ON/OFF Control Operation Of Heating Regulation And Induction Motor

**Diagram:**




**Polarity:**




### PRODUCT SUMMARY

| Gear | Value | Unit |
|---|---|---|
| $I_{GT}$Max. | 15 | mA |
| $V_{DRM}/V_{RRM}$ Min. | 600 | V |
| $I_{T(RMS)}$ | 8 | A |

### Absolute Maximum Ratings (Ta=25℃ Unless otherwise specified)

| Parameter | Test Conditions | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Repetitive Peak Off-State Voltage | | $V_{DRM}$ | 600 | V |
| Repetitive Peak Reverse Voltage | | $V_{RRM}$ | 600 | V |
| RMS On-State Current | Tc≤ 110 ℃ | $I_{T(RMS)}$ | 8 | A |
| Average On-State Current | Tc≤ 110 ℃ | $I_{T(AV)}$ | 5 | |
| Non Repetitive Surge Peak On-State Current | F= 50 Hz,Tp= 10 ms<br>F= 50 Hz,Tp= 8.3 ms | $I_{TSM}$ | 95<br>104 | A |
| $I^2T$ Value For Fusing | Tp= 10 ms | $I^2t$ | 45 | A |
| Critical Rate Of Rise Of On-State Current | IG=2*IGT, tr≤100ns<br>F=100Hz,Tj=125℃ | di/dt | 50 | A/μs |
| Peak Gate Current | Tp=20μs,Tj=125℃ | $I_{GM}$ | 4 | A |
| Average Gate Power Dissipation | Tj= 125 ℃ | $P_{G(AV)}$ | 1.0 | W |
| Maximum Mounting Torque | M3 srew | $T_{MM}$ | 1.1 | N.m |

### Thermal Characteristcs (Ta=25℃ Unless otherwise specified )

| Parameter | Test Conditions | Symbol | Typ. | Unit |
|---|---|---|---|---|
| Operating Junction Temperature Range | | $T_J$ | -40 to 125 | ℃ |
| Storage Temperature Range | | $T_{STD}$ | -40 to 150 | |
| Thermal Resistance Junction To Ambient With Steady-State | Still Air Environment With Ta=25℃ | $R_{\theta JA}$ | 60 | ℃/W |
| Thermal Resistance Junction-Case With Steady-State | Device Mounted On 75mm x 45mm x 2.5mm Alu. Heat. | $R_{\theta JC}$ | 1.3 | |

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### Electrical Characteristcs (Ta=25℃ Unless otherwise specified )

| Parameter | Test Conditions | Symbol | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Gate Trigger Current | $V_D$=12V,$R_L$=33Ω | $I_{GT}$ | - | - | 15.0 | mA |
| Max. Gate Trigger Voltage | $V_D$=12V,$R_L$=33Ω | $V_{GT}$ | - | - | 1.3 | V |
| Min. Gate Trigger Voltage | $V_D$ =$V_{DRM}$,$T_j$ =125℃,$R_L$=3.3KΩ | $V_{GD}$ | 0.2 | - | - | V |
| Holding Current | $I_T$= 100 mA | $I_H$ | - | - | 30.0 | mA |
| Latching Current | $I_G$=1.2*$I_{GT}$ | $I_L$ | - | - | 70.0 | mA |
| Rise Of Off- State Voltage | $V_D$ =2/3$V_{DRM}$,$T_j$ =125℃,Gate Open | dv/dt | 150.0 | - | - | V/us |

### Static Characteristcs (Ta=25℃ Unless otherwise specified )

| Parameter | Test Conditions | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak On-State Voltage | $I_T$= 16 A,Tp=380uS,Tj =25℃ | $V_{TM}$ $M_{AX.}$ | 1.6 | V |
| Threshold Voltage | $T_j$ =125℃ | $V_{TO}$ $M_{AX.}$ | 0.85 | V |
| Dynamic resistance | $T_j$ =125℃ | $R_D$ $M_{AX.}$ | 46 | mΩ |
| Peak Repetitive Forward Blocking Current | $V_D$=$V_{DRM}$ Tj =25℃ | $I_{DRM}$ $M_{AX.}$ | 5 | uA |
| Peak Repetitive Reverse Blocking Current | $V_R$=$V_{RRM}$ Tj =125℃ | $I_{RRM}$ $M_{AX.}$ | 2 | mA |

### Model and identification instructions

UT A 08 - 15. A 06

Productor Type
UT=SCR

Insulation Spec.:
A=Ins.=Insulation
Empty=No Ins.=No Insulation

$I_{T(RMS)}$ Spec.:
08=8A

"-"=Connection Symbol
Constant And Unchanging

IGT Spec.
15.=15mA

Package Spec.:
A=TO-220A

VDRM/VRRM Spec.:
06=600V

Temperature Spec.:
Empty=Standard Temperature
H=high temperature

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## Typical Characteristics Curves

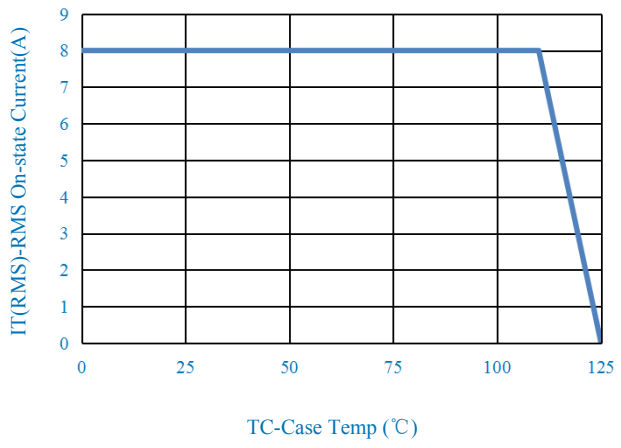


**Fig.1-RMS on-state current vs. case temperature**

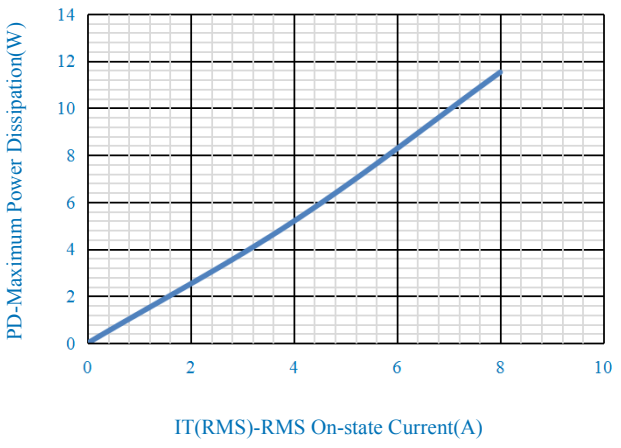


**Fig.2- Maximum Power Dissipation Vs. on-state current**

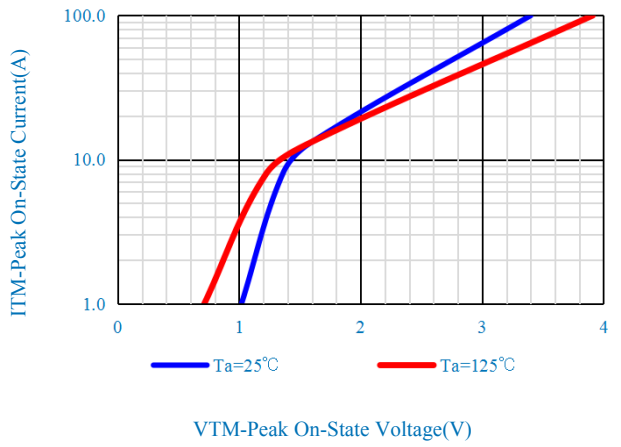


**Fig.3-On-State Characteristics**

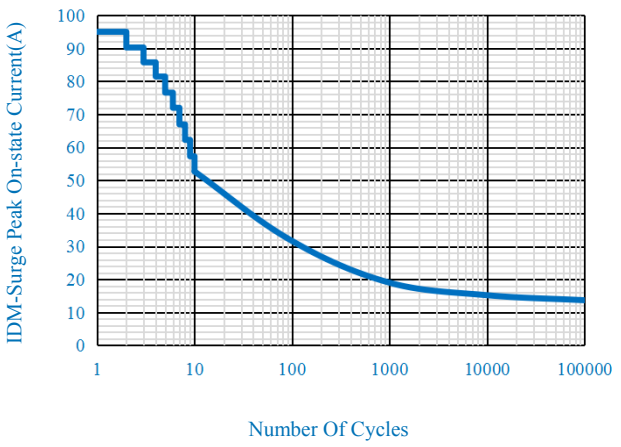


**Fig.4- Surge Peak On-state Current Vs. Number Cycles**

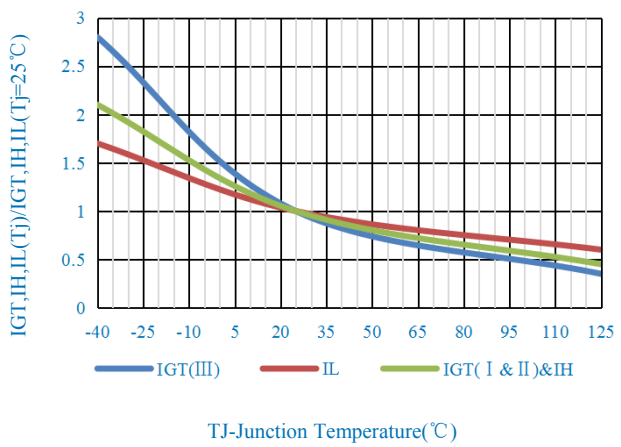


**Fig.5- Relative Variation Of Gate Trigger Current , Holding Current And Latching Current Versus Junction Temperature (Typical Value)**

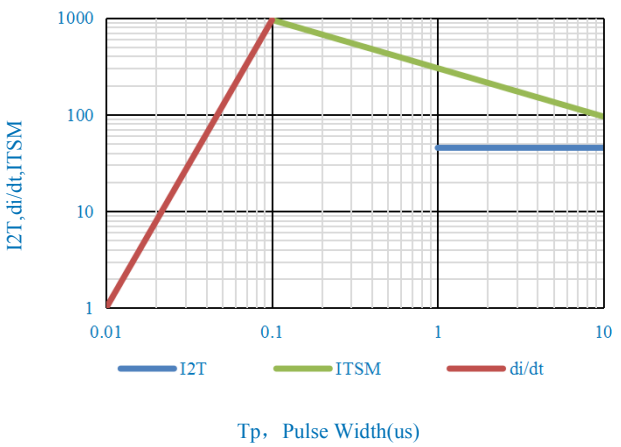


**Fig.6- Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<20ms, and corresponding value of I2t (dI/dt<50A/μs)**

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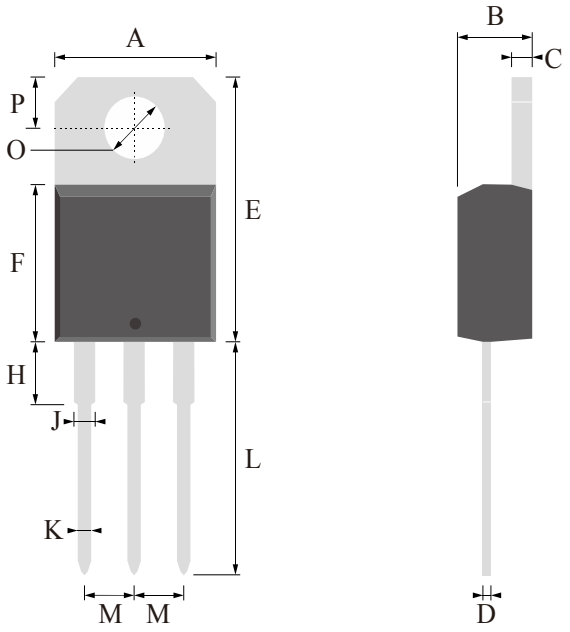
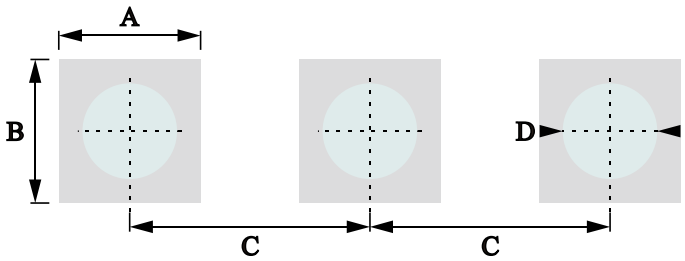
## OUTLINE DRAWINGS




## TO-220A

| OUTLINE DIMENSIONS | | | | | | |
|---|---|---|---|---|---|---|
| Dim. | Milimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 9.25 | - | 10.75 | 0.3642 | - | 0.4232 |
| B | 4.20 | - | 4.70 | 0.1654 | - | 0.1850 |
| C | 1.15 | - | 1.45 | 0.0453 | - | 0.0571 |
| D | 0.45 | - | 0.65 | 0.0177 | - | 0.0256 |
| E | 14.70 | - | 16.70 | 0.5787 | - | 0.6575 |
| F | 8.55 | - | 10.05 | 0.3366 | - | 0.3957 |
| L | 12.50 | - | 14.50 | 0.4921 | - | 0.5709 |
| H | 3.00 | - | 4.00 | 0.1181 | - | 0.1575 |
| J | 1.20 | - | 1.40 | 0.0472 | - | 0.0551 |
| K | 0.70 | - | 1.00 | 0.0276 | - | 0.0394 |
| M | 2.20 | - | 3.00 | 0.0866 | - | 0.1181 |
| O | 3.45 | - | 4.15 | 0.1358 | - | 0.1634 |
| P | 2.40 | - | 3.40 | 0.0945 | - | 0.1339 |

## RECOMMEDNED LAYOUT DRAWINGS




## TO-220A

| OUTLINE DIMENSIONS | | | | | | |
|---|---|---|---|---|---|---|
| Dim. | Milimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | - | 1.60 | - | - | 0.0630 | - |
| B | - | 1.60 | - | - | 0.0630 | - |
| C | - | 2.54 | - | - | 0.1000 | - |
| D | - | 1.00 | - | - | 0.0394 | - |

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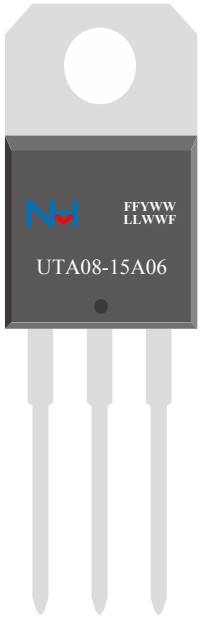
## MARKING INFORMATION




## MARKING INSTRUCTIONS

**NH=Niuhang Trademark**

**FF=Product Line Code,According To Actual Changes**

**YWW=Date Code,According To Actual Changes**

**LLWWF=Inernal Code,According To Actual Changes**

**UTA08-15A06=Model**

## PACKING INFORMATION

| Package Type | Package Code | Productor Weight Approx(g/Pcs) | Package Method | Quantity (Pcs/Min. Pack.) | Quantity (Pcs/Inner Box) | Quantity (Pcs/Carton) |
|---|---|---|---|---|---|---|
| TO-220A | P1 | 2.057 | Tube | 50 | 1000 | 5000 |

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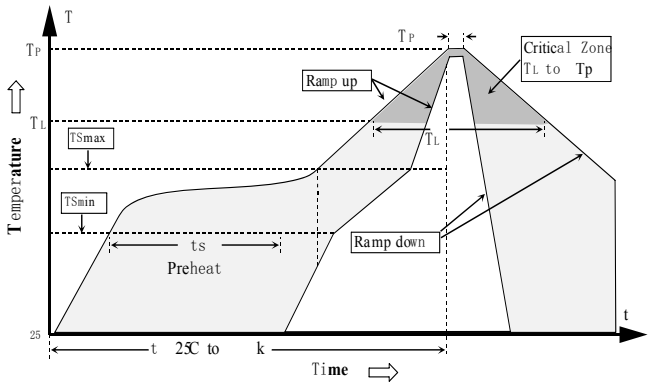
## Recommended wave soldering condition

| Product | Peak Temperature | Soldering Time |
|---|---|---|
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

## Recommended temperature profile for IR reflow




| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|---|---|
| Average ramp-up rate (Tsmax to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat−Temperature Min (TS min)<br>−Temperature Max (TS max)<br>−Time(ts min to ts max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature (TL)<br>− Time (tL) | 183°C<br>60-150 seconds | 217°C<br>60-150 seconds |
| Peak Temperature(TP) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature (tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

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

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## Specification Revision History

| Rev. | Date | Changed Items | Pre-Changed Content | Changed Content |
|---|---|---|---|---|
| A/1 | 2014-10-20 | First Issue | | |

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