



**UT136F/G**

Preliminary

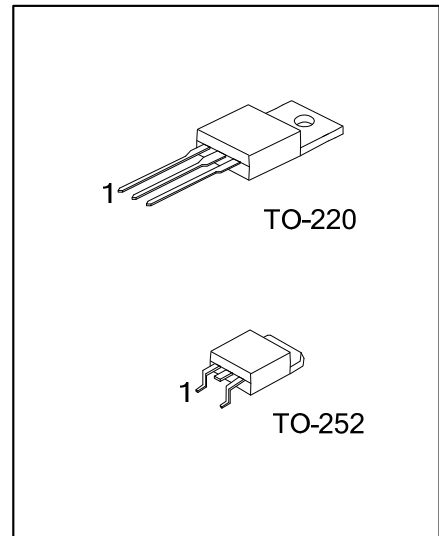
**TRIAC**

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■ DESCRIPTION

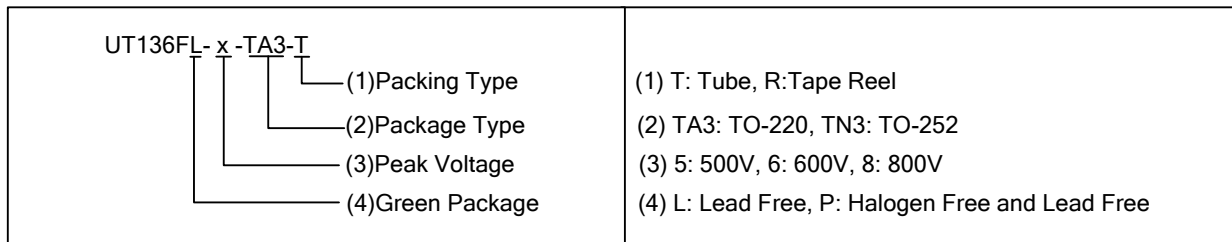
Passivated triac in a plastic envelope, suitable for surface mounting, intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating and static switching.

■ SYMBOL

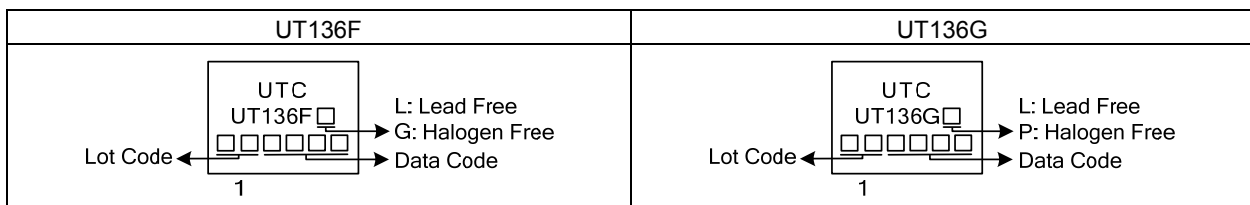


■ ORDERING INFORMATION

| Ordering Number |                 | Package | Pin Assignment |     |   | Packing   |
|-----------------|-----------------|---------|----------------|-----|---|-----------|
| Lead Free       | Halogen Free    |         | 1              | 2   | 3 |           |
| UT136FL-x-TA3-T | UT136FG-x-TA3-T | TO-220  | MT1            | MT2 | G | Tube      |
| UT136FL-x-TN3-R | UT136FG-x-TN3-R | TO-252  | MT1            | MT2 | G | Tape Reel |
| UT136GL-x-TA3-T | UT136GP-x-TA3-T | TO-220  | MT1            | MT2 | G | Tube      |
| UT136GL-x-TN3-R | UT136GP-x-TN3-R | TO-252  | MT1            | MT2 | G | Tape Reel |



■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER   |                     | SYMBOL       | RATINGS      | UNIT                 |
|---|---------------------|--------------|--------------|----------------------|
| Repetitive Peak Off-State Voltages  | UT136F/G-5          | $V_{DRM}$    | 500 (Note 2) | V                    |
|   | UT136F/G-6          |              | 600 (Note 2) |                      |
|   | UT136F/G-8          |              | 800          |                      |
| RMS On-State Current Full Sine Wave, $T_{mb} \leq 107^\circ\text{C}$  |                     | $I_{T(RMS)}$ | 4            | A                    |
| Non-Repetitive Peak On-State Current<br>(Full Sine Wave, $T_J = 25^\circ\text{C}$ Prior To Surge)   | $t = 20\text{ms}$   | $I_{TSM}$    | 25           | A                    |
|   | $t = 16.7\text{ms}$ |              | 27           |                      |
| $I^2t$ For Fusing ( $t = 10\text{ms}$ )   |                     | $I^2t$       | 3.1          | $\text{A}^2\text{s}$ |
| Repetitive Rate Of Rise Of On-State<br>Current After Triggering $I_{TM} = 6\text{A}$ , $I_G = 0.2\text{A}$ ,<br>$dI_G/dt = 0.2\text{A}/\mu\text{s}$ | T2+ G+              | $di_T/dt$    | 50           | A/ $\mu\text{s}$     |
|   | T2+ G-              |              | 50           |                      |
|   | T2- G-              |              | 50           |                      |
|   | T2- G+              |              | 10           |                      |
| Peak Gate Voltage   |                     | $V_{GM}$     | 5            | V                    |
| Peak Gate Current   |                     | $I_{GM}$     | 2            | A                    |
| Peak Gate Power   |                     | $P_{GM}$     | 5            | W                    |
| Average Gate Power (Over Any 20ms Period)   |                     | $P_{G(AV)}$  | 0.5          | W                    |
| Junction Temperature  |                     | $T_J$        | 125          | $^\circ\text{C}$     |
| Storage Temperature   |                     | $T_{STG}$    | -40 ~ +150   | $^\circ\text{C}$     |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 3A/ $\mu\text{s}$ .

### ■ THERMAL DATA

| PARAMETER           |        | SYMBOL        | RATINGS | UNIT |
|---------------------|--------|---------------|---------|------|
| Junction to Ambient | TO-220 | $\theta_{JA}$ | 60      | K/W  |
|                     | TO-252 |               | 75      |      |

### ■ STATIC CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                 | SYMBOL   | TEST CONDITIONS   | MIN  | TYP | MAX    |        | UNIT |     |    |
|---------------------------|----------|---|------|-----|--------|--------|------|-----|----|
|                           |          |   |      |     | UT136F | UT136G |      |     |    |
| Gate Trigger Current      | $I_{GT}$ | $V_D = 12\text{V}$ , $I_T = 0.1\text{A}$                              |      |     | T2+G+  | 5      | 25   | 50  | mA |
|                           |          |   |      |     | T2+G-  | 8      | 25   | 50  |    |
|                           |          |   |      |     | T2-G-  | 11     | 25   | 50  |    |
|                           |          |   |      |     | T2-G+  | 30     | 70   | 100 |    |
| Latching Current          | $I_L$    | $V_D = 12\text{V}$ , $I_{GT} = 0.1\text{A}$                           |      |     | T2+G+  | 7      | 20   | 30  | mA |
|                           |          |   |      |     | T2+G-  | 16     | 30   | 45  |    |
|                           |          |   |      |     | T2-G-  | 5      | 20   | 30  |    |
|                           |          |   |      |     | T2-G+  | 7      | 30   | 45  |    |
| Holding Current           | $I_H$    | $V_D = 12\text{V}$ , $I_{GT} = 0.1\text{A}$                           |      |     | 5      | 15     | 30   | mA  |    |
| On-State Voltage          | $V_T$    | $I_T = 5\text{A}$   |      |     | 1.4    | 1.70   |      | V   |    |
| Gate Trigger Voltage      | $V_{GT}$ | $V_D = 12\text{V}$ , $I_T = 0.1\text{A}$                              |      |     | 0.7    | 1.5    |      | V   |    |
|                           |          | $V_D = 400\text{V}$ , $I_T = 0.1\text{A}$ , $T_J = 125^\circ\text{C}$ | 0.25 | 0.4 |        |        | V    |     |    |
| Off-State Leakage Current | $I_D$    | $V_D = V_{DRM(max)}$ , $T_J = 125^\circ\text{C}$                      |      |     | 0.1    | 0.5    |      | mA  |    |

■ DYNAMIC CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                                      | SYMBOL        | TEST CONDITIONS   | MIN    |        | TYP | MAX | UNIT             |
|--|---------------|---|--------|--------|-----|-----|------------------|
|  |               |   | UT136F | UT136G |     |     |                  |
| Critical Rate Of Rise Of Off-State Voltage     | $dV_D/dt$     | $V_{DM}=67\% V_{DRM(max)}$ , $T_J=125^\circ\text{C}$ , exponential waveform, gate open circuit                            | 50     | 200    | 250 |     | V/ $\mu\text{s}$ |
| Critical Rate Of Change Of Commutating Voltage | $dV_{com}/dt$ | $V_{DM}=400\text{V}$ , $T_J=95^\circ\text{C}$ , $I_{T(RMS)}=4\text{A}$ , $dI_{com}/dt=1.8\text{A/ms}$ , gate open circuit |        | 10     | 50  |     | V/ $\mu\text{s}$ |
| Gate Controlled Turn-On Time                   | $t_{gt}$      | $I_{TM}=6\text{A}$ , $V_D=V_{DRM(max)}$ , $I_G=0.1\text{A}$ , $dI_G/dt=5\text{A}/\mu\text{s}$                             |        |        | 2   |     | $\mu\text{s}$    |

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