

**DESCRIPTION**

The AM075C065TL is available in TO-247-3 Package.

| VDSS | RDSON | ID  |
|------|-------|-----|
| 750V | 65mΩ  | 40A |

**APPLICATIONS**

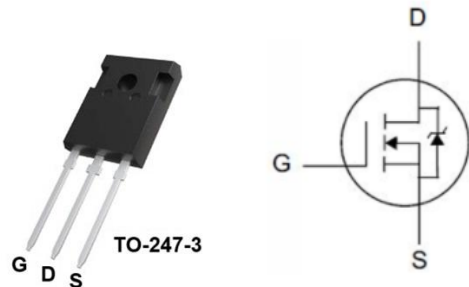
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC-DC Converters
- Battery Chargers

**ORDERING INFORMATION**

| Package Type                               | Part Number |                |
|--------------------------------------------|-------------|----------------|
| TO-247-3<br>SPQ: 30pcs/Tube<br>1980pcs/Box | TL3F        | AM075C065TL3FU |
| Note                                       | U: Tube     |                |
| AiT provides all RoHS products             |             |                |

**FEATURE**

- High Blocking Voltage with Low On-Resistance
- Easy to Parallel and Simple to Drive
- High Speed Switching with Low Capacitances
- Avalanche Ruggedness

**PIN DESCRIPTION**

| Pin # | Symbol | Function |
|-------|--------|----------|
| 1     | G      | Gate     |
| 2     | D      | Drain    |
| 3     | S      | Source   |

**ABSOLUTE MAXIMUM RATINGS**

T<sub>J</sub> = 25°C, unless otherwise specified.

|                                                            |                            |
|------------------------------------------------------------|----------------------------|
| V <sub>DS</sub> , Drain-to-Source Voltage                  | 750V                       |
| V <sub>GS</sub> , Gate-to-Source Voltage                   | -5~+18V                    |
| I <sub>D</sub> , Continuous Drain Current                  | 40A                        |
|                                                            | T <sub>C</sub> = 100°C 28A |
| I <sub>DM</sub> , Pulsed Drain Current                     | 70A                        |
| P <sub>D</sub> , Power Dissipation                         | 166W                       |
| R <sub>θJC</sub> , Thermal Resistance, Junction to Case    | 0.4°C/W                    |
| R <sub>θJA</sub> , Thermal Resistance, Junction-to-Ambient | 38°C/W                     |
| T <sub>STG</sub> , Storage Temperature Range               | -55°C ~ +175°C             |
| T <sub>J</sub> , Operating Junction Temperature Range      | -55°C ~ +175°C             |

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**ELECTRICAL CHARACTERISTICS**T<sub>J</sub> = 25°C, unless otherwise specified.

| Parameter                               | Symbol              | Conditions                                                                                                                         | Min | Typ. | Max  | Unit |
|-----------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|------|
| Off Characteristics                     |                     |                                                                                                                                    |     |      |      |      |
| Drain-to-Source Breakdown Voltage       | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                                                       | 750 | -    | -    | V    |
| Drain-to-Source Leakage Current         | I <sub>DSS</sub>    | V <sub>DS</sub> = 750V, V <sub>GS</sub> =0V<br>T <sub>C</sub> =25°C                                                                | -   | -    | 100  | μA   |
| Gate-to-Source Leakage Current          | I <sub>GSS</sub>    | V <sub>GS</sub> = 18V, V <sub>DS</sub> =0V                                                                                         | -   | 10   | 200  | nA   |
| Gate-to-Source Leakage Current          | I <sub>SGS</sub>    | V <sub>GS</sub> = -8V, V <sub>DS</sub> =0V                                                                                         | -   | -10  | -200 | nA   |
| On Characteristics                      |                     |                                                                                                                                    |     |      |      |      |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 5mA<br>T <sub>J</sub> =25°C                                                   | 2.0 | 2.8  | 4.0  | V    |
|                                         |                     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 5mA<br>T <sub>J</sub> =175°C                                                  | -   | 2.0  | -    |      |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | V <sub>GS</sub> = 18V, I <sub>D</sub> = 15A<br>T <sub>J</sub> =25°C                                                                | -   | 65   | 75   | mΩ   |
|                                         |                     | V <sub>GS</sub> = 18V, I <sub>D</sub> = 15A<br>T <sub>J</sub> =175°C                                                               | -   | 110  | -    |      |
| Transconductance                        | g <sub>fs</sub>     | V <sub>DS</sub> = 18V, I <sub>D</sub> = 15A                                                                                        | -   | 13   | -    | S    |
| Gate resistance                         | R <sub>G</sub>      | V <sub>GS</sub> =0V, V <sub>AC</sub> =25mV,<br>f=1.0MHZ                                                                            | -   | 2.5  | -    | Ω    |
| Dynamic Characteristics                 |                     |                                                                                                                                    |     |      |      |      |
| Input Capacitance                       | C <sub>iss</sub>    | V <sub>DS</sub> = 400V, V <sub>GS</sub> =0V,<br>f=1.0MHZ, V <sub>AC</sub> =25mV                                                    | -   | 2016 | -    | pF   |
| Output Capacitance                      | C <sub>oss</sub>    |                                                                                                                                    | -   | 72.6 | -    |      |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    |                                                                                                                                    | -   | 17.9 | -    |      |
| Total Gate Charge                       | Q <sub>g</sub>      | V <sub>DD</sub> = 400V , I <sub>D</sub> =15A<br>V <sub>GS</sub> =-5V ~ +18V                                                        | -   | 85   | -    | nC   |
| Gate-Source Charge                      | Q <sub>gs</sub>     |                                                                                                                                    | -   | 23   | -    |      |
| Gate-Drain("Miller") Charge             | Q <sub>gd</sub>     |                                                                                                                                    | -   | 26   | -    |      |
| Switching Characteristics               |                     |                                                                                                                                    |     |      |      |      |
| Turn-On Delay Time                      | t <sub>d(on)</sub>  | V <sub>DS</sub> = 400V, I <sub>D</sub> = 15A<br>V <sub>GS</sub> = -5~+18V,<br>R <sub>g</sub> =5Ω, L=200uH,<br>T <sub>J</sub> =25°C | -   | 7    | -    | ns   |
| Rise Time                               | t <sub>r</sub>      |                                                                                                                                    | -   | 9    | -    |      |
| Turn-Off Delay Time                     | t <sub>d(off)</sub> |                                                                                                                                    | -   | 12   | -    |      |
| Fall Time                               | t <sub>f</sub>      |                                                                                                                                    | -   | 19   | -    |      |
| Turn-On Switching Energy                | E <sub>ON</sub>     | V <sub>DS</sub> = 400V, I <sub>D</sub> = 15A<br>V <sub>GS</sub> = -5~+18V,<br>R <sub>g</sub> =5Ω, L=200uH,<br>T <sub>J</sub> =25°C | -   | 0.11 | -    | mJ   |
| Turn-Off Switching Energy               | E <sub>OFF</sub>    |                                                                                                                                    | -   | 0.09 | -    |      |
| Drain-Source Body Diode Characteristics |                     |                                                                                                                                    |     |      |      |      |
| Diode Forward Voltage                   | V <sub>SD</sub>     | V <sub>GS</sub> =-5V, I <sub>SD</sub> = 15A<br>T <sub>J</sub> =25°C                                                                | -   | 3.0  | -    | V    |
|                                         |                     | V <sub>GS</sub> =-5V, I <sub>SD</sub> = 15A<br>T <sub>J</sub> =175°C                                                               | -   | 2.7  | -    |      |
| Reverse Recovery Time                   | t <sub>rr</sub>     | V <sub>GS</sub> =-5~+18V,                                                                                                          | -   | 12   | -    | ns   |
| Reverse Recovery Charge                 | Q <sub>rr</sub>     | I <sub>SD</sub> =15A, V <sub>R</sub> =400V,                                                                                        | -   | 60   | -    | nC   |
| Peak Reverse Recovery Current           | I <sub>rrm</sub>    | T <sub>J</sub> =25°C                                                                                                               | -   | 8    | -    | A    |



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics  $T_J = -55^\circ\text{C}$

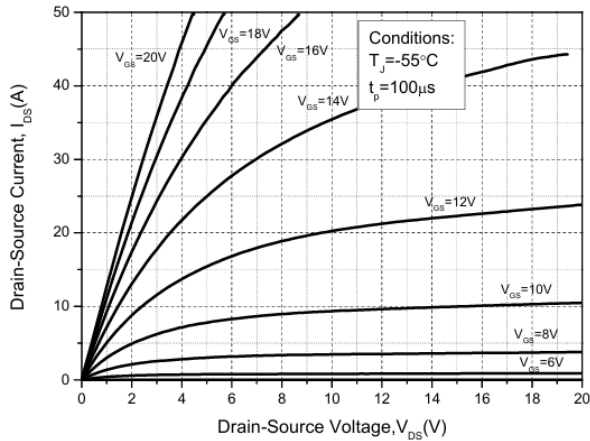


Fig 2. Output Characteristics  $T_J = 25^\circ\text{C}$

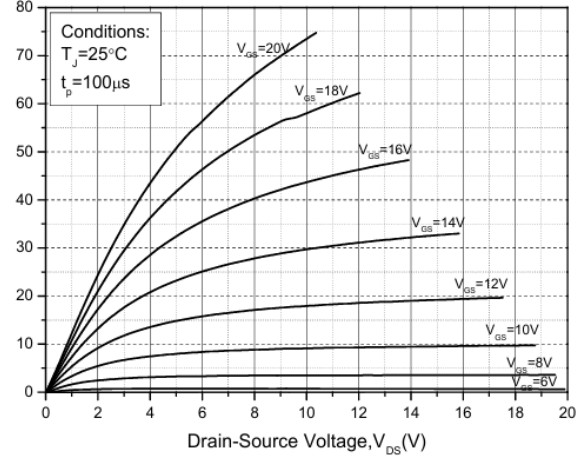


Fig 3. Output Characteristics  $T_J = 150^\circ\text{C}$

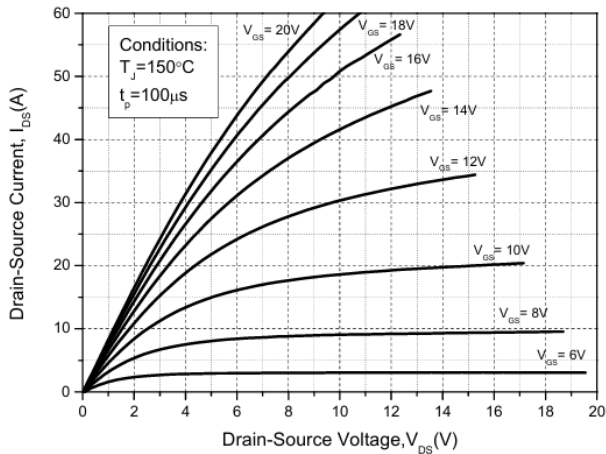


Fig 4. On-Resistance for Various Gate Voltage

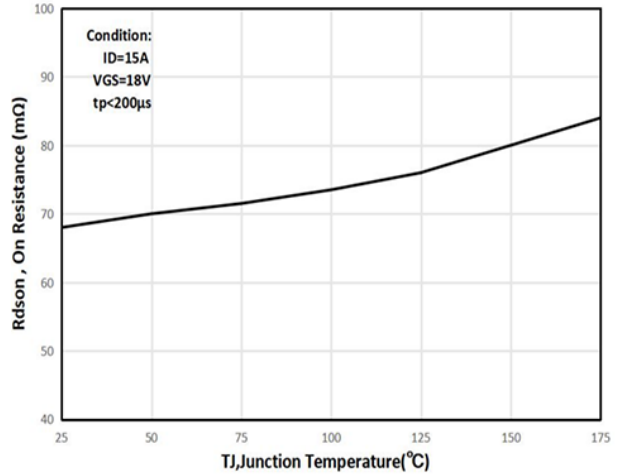


Fig 5. Transfer Characteristic for Various Junction Temperatures

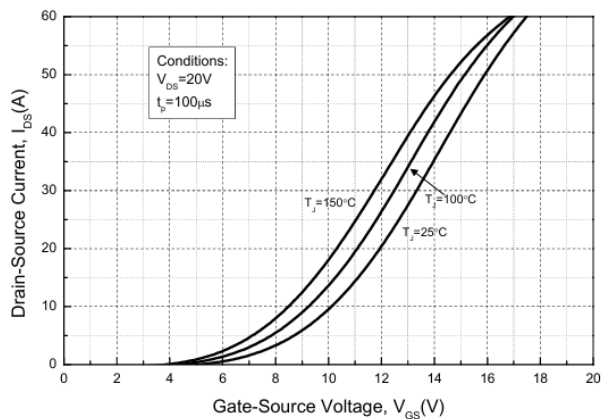


Fig 6. Threshold Voltage vs. Temperature

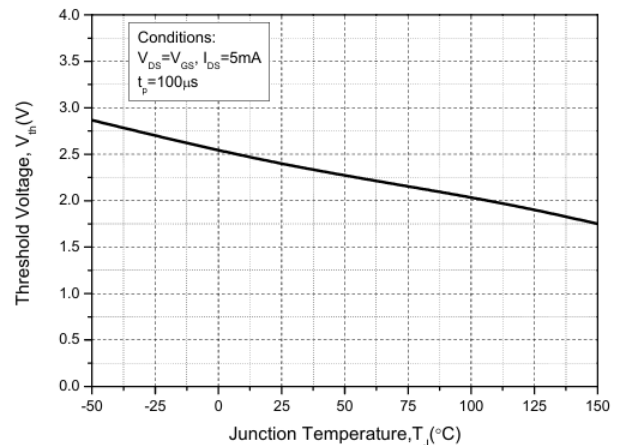




Fig 7. Body Diode Characteristics

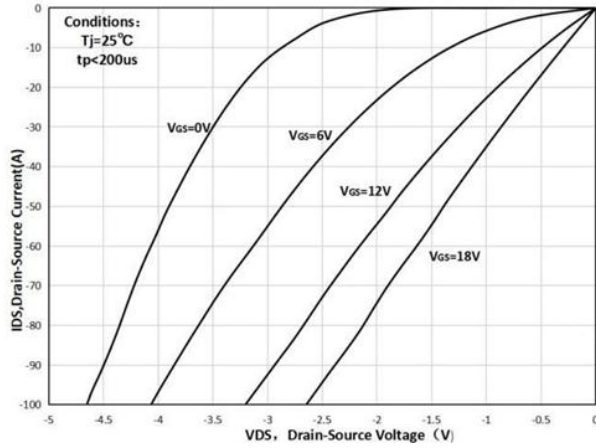


Fig 8. Capacitances vs. Drain-Source Voltage

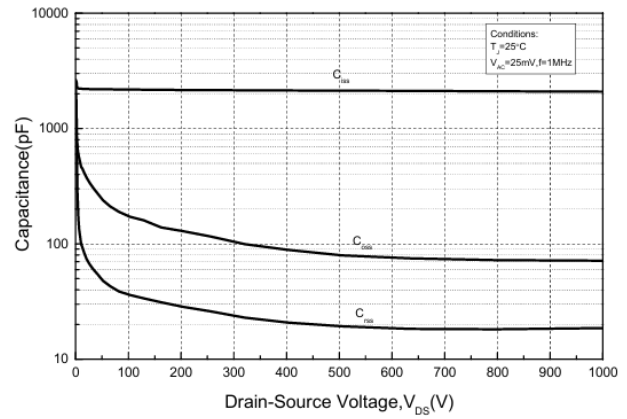


Fig 9. Gate Charge Characteristics

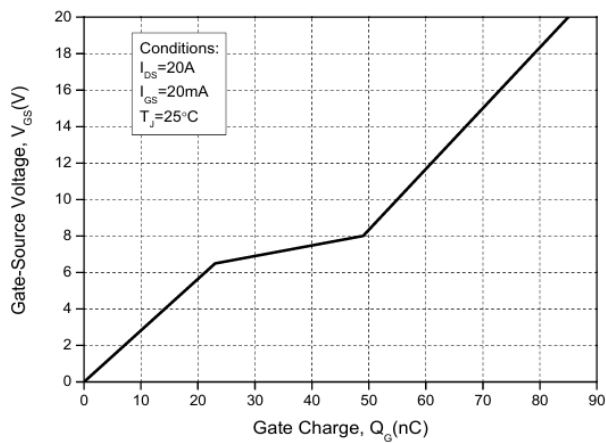


Fig 10. Power Dissipation Derating

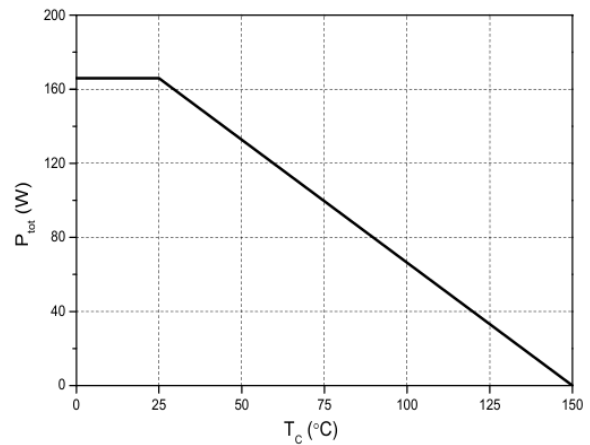


Fig 11. Transient Thermal Impedance

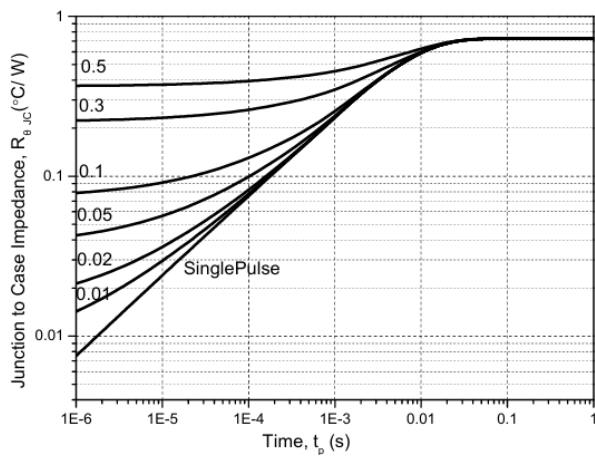




Fig 12. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

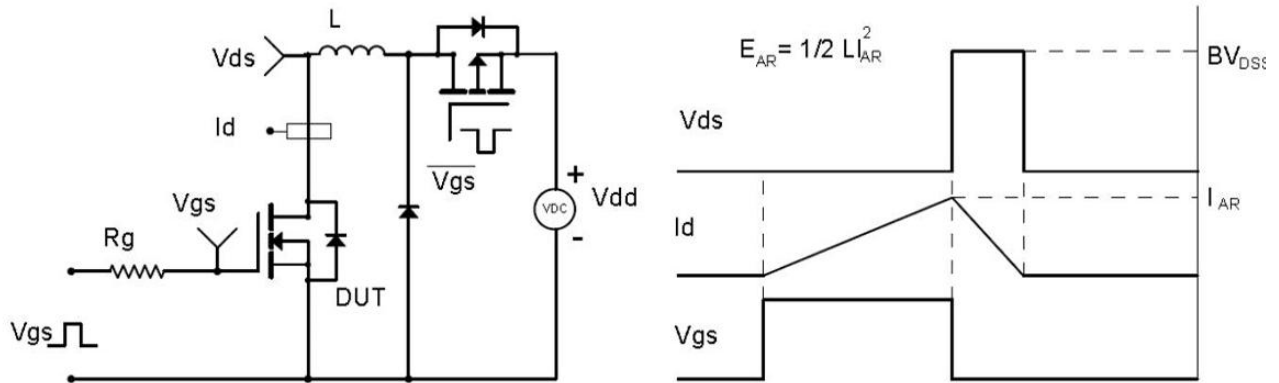
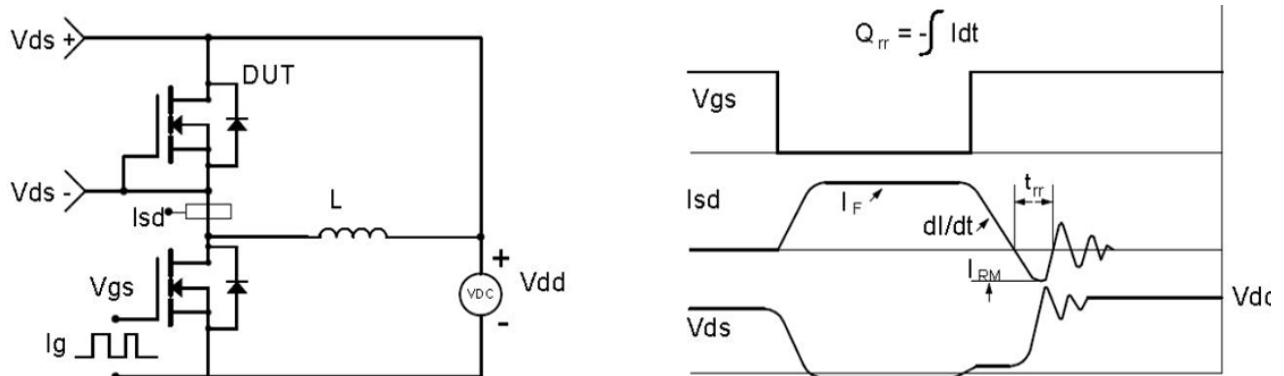


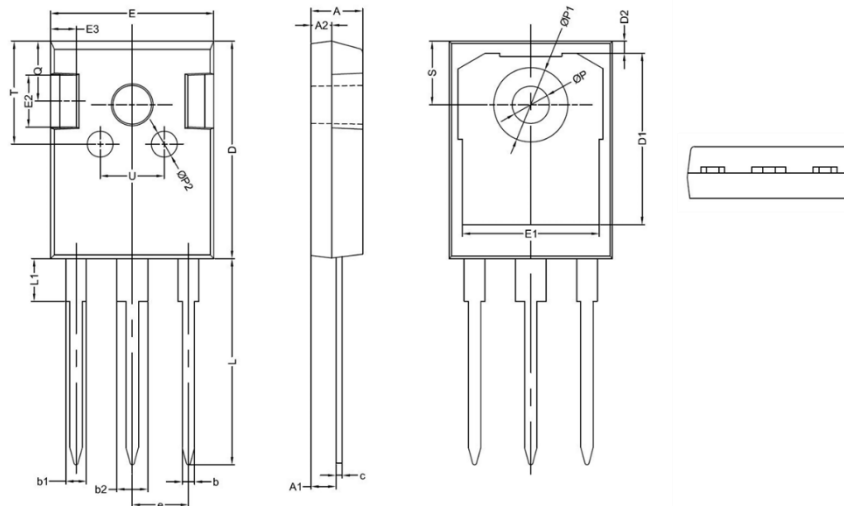
Fig 13. Diode Recovery Test Circuit & Waveforms





## PACKAGE INFORMATION

Dimension in TO-247-3 Package



| SYMBOL | MILLIMETERS |        |
|--------|-------------|--------|
|        | Min.        | Max.   |
| A      | 4.800       | 5.200  |
| A1     | 2.210       | 2.610  |
| A2     | 1.900       | 2.100  |
| b      | 1.100       | 1.350  |
| b1     | 2.000       |        |
| b2     | 3.000       |        |
| c      | 0.550       | 0.750  |
| D      | 20.800      | 21.200 |
| D1     | 16.550      |        |
| D2     | 1.200       |        |
| E      | 15.600      | 16.000 |
| E1     | 13.300      |        |
| E2     | 5.000       |        |
| E3     | 2.500       |        |
| e      | 5.440       |        |
| L      | 19.420      | 20.420 |
| L1     | 4.130       |        |
| P      | 3.500       | 3.700  |
| P1     | -           | 7.400  |
| P2     | 2.500       |        |
| Q      | 5.800       |        |
| S      | 6.050       | 6.250  |
| T      | 10.000      |        |
| U      | 6.200       |        |



## IMPORTANT NOTICE

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