

**DESCRIPTION**

The AM65R085TLF is available in TO-247 Packages.

| BVDSS | RDSON | ID  |
|-------|-------|-----|
| 650V  | 85mΩ  | 36A |

**APPLICATION**

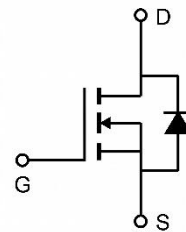
- LCD/TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Power Management
- Charger

**ORDERING INFORMATION**

| Package Type                   | Part Number                 |              |
|--------------------------------|-----------------------------|--------------|
| TO-247                         | TL3F                        | AM65R085TL3F |
| Note                           | SPQ: 30pcs/Tube, 600pcs/Box |              |
| AiT provides all RoHS products |                             |              |

**FEATURE**

- Fast Switching
- $R_{DS(ON)}$ , Typ= 85mΩ @  $V_{GS}=10V$
- Low Gate Charge and  $C_i$
- 100%Single Pulse avalanche energy Test

**PIN DESCRIPTION**

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

**ABSOLUTE MAXIMUM RATINGS**

$T_A = 25^{\circ}\text{C}$ , unless otherwise specified.

| Parameter                                        | Symbol          | Value       | Unit |
|--------------------------------------------------|-----------------|-------------|------|
| Drain-to-Source Voltage                          | $V_{DS}$        | 650         | V    |
| Gate-to-Source Voltage                           | $V_{GS}$        | ±30         | V    |
| Continuous Drain Current                         | $I_D$           | 36          | A    |
| Pulsed Drain Current                             | $I_{DM}$        | 150         | A    |
| Single Pulse Avalanche Energy <sup>1</sup>       | $E_{AS}$        | 500         | mJ   |
| Power Dissipation                                | $P_D$           | 200         | W    |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$  | -55 to +150 | °C   |
| Thermal Resistance Junction to Case              | $R_{\theta JC}$ | 0.61        | °C/W |
| Thermal Resistance Junction to Ambient           | $R_{\theta JA}$ | 63          | °C/W |

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

| Parameter                               | Symbol              | Conditions                                                           | Min | Typ. | Max  | Unit |
|-----------------------------------------|---------------------|----------------------------------------------------------------------|-----|------|------|------|
| Static Characteristics                  |                     |                                                                      |     |      |      |      |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                           | 650 | -    | -    | V    |
| Drain-Source Leakage Current            | I <sub>DSS</sub>    | V <sub>DS</sub> =480V, V <sub>GS</sub> =0V                           | -   | -    | 1    | μA   |
| Gate-Source Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±30V, V <sub>DS</sub> =0V                          | -   | -    | ±100 | nA   |
| Gate-Source Threshold Voltage           | V <sub>GS(TH)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA           | 2.9 | -    | 4.9  | V    |
| Drain-Source On-Resistance              | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =35A                            | -   | 85   | 99   | mΩ   |
| Dynamic Characteristics                 |                     |                                                                      |     |      |      |      |
| Input Capacitance                       | C <sub>iSS</sub>    | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 100V.<br>f = 1.0MHz          | -   | 1880 | -    | pF   |
| Output Capacitance                      | C <sub>oSS</sub>    |                                                                      | -   | 115  | -    |      |
| Reverse Transfer Capacitance            | C <sub>rSS</sub>    |                                                                      | -   | 2    | -    |      |
| Total Gate Charge                       | Q <sub>g</sub>      | V <sub>GS</sub> = 10V, V <sub>DS</sub> =480V,<br>I <sub>D</sub> =17A | -   | 69   | -    | nC   |
| Gate-Source Charge                      | Q <sub>gs</sub>     |                                                                      | -   | 17   | -    |      |
| Gate-Drain Charge                       | Q <sub>gd</sub>     |                                                                      | -   | 45   | -    |      |
| Switching Characteristics               |                     |                                                                      |     |      |      |      |
| Turn-on Delay Time <sup>2</sup>         | t <sub>d(on)</sub>  | V <sub>DD</sub> =400V,<br>I <sub>D</sub> =17A, R <sub>G</sub> =27Ω   | -   | 50   | -    | ns   |
| Rise Time <sup>2</sup>                  | t <sub>r</sub>      |                                                                      | -   | 80   | -    |      |
| Turn-Off Delay Time <sup>2</sup>        | t <sub>d(off)</sub> |                                                                      | -   | 179  | -    |      |
| Fall Time <sup>2</sup>                  | t <sub>f</sub>      |                                                                      | -   | 50   | -    |      |
| Drain-Source Body Diode Characteristics |                     |                                                                      |     |      |      |      |
| Maximum Body-Diode Continuous Current   | I <sub>S</sub>      | -                                                                    | -   | -    | 36   | A    |
| Maximum Pulsed Current (Body Diode)     | I <sub>SM</sub>     | -                                                                    | -   | -    | 105  | A    |
| Diode Forward Voltage                   | V <sub>SD</sub>     | I <sub>S</sub> =17A, V <sub>GS</sub> =0V                             | -   | -    | 1.5  | V    |
| Reverse Recovery Time                   | T <sub>rr</sub>     | I <sub>S</sub> =17A, V <sub>R</sub> =400V,<br>di/dt=100A/μs          | -   | 140  | -    | ns   |
| Reverse Recovery Charge                 | Q <sub>rr</sub>     |                                                                      | -   | 0.9  | -    | nC   |

Pulse test: 300μs pulse width, 2%duty cycle



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig1. Output Characteristics

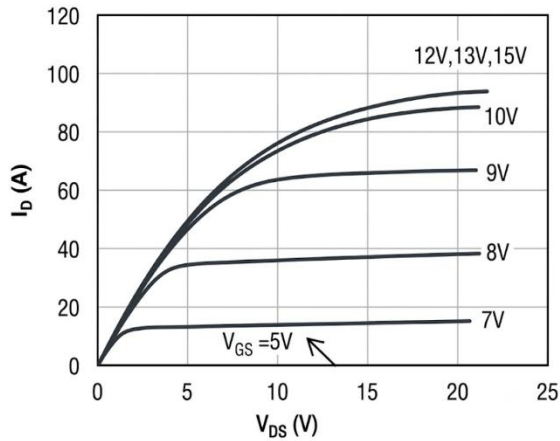


Fig 2. Output Characteristics ( $T_J = 150^\circ\text{C}$ )

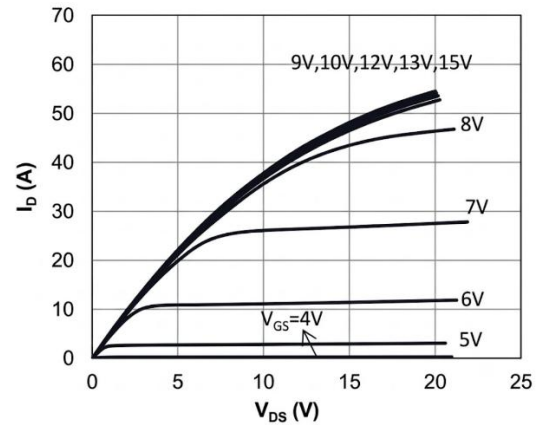


Fig 3. Transfer Characteristics

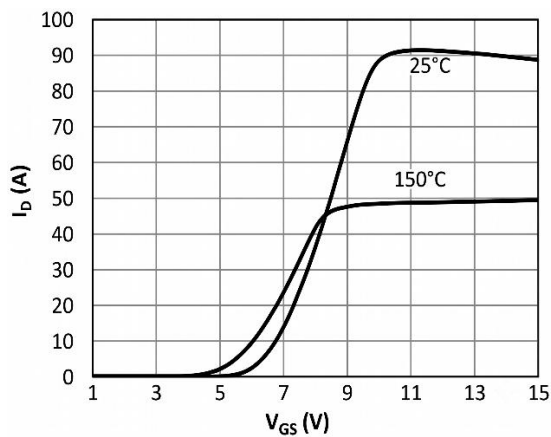


Fig 4.  $V_{TH}$  vs.  $T_J$  Temperature Characteristics

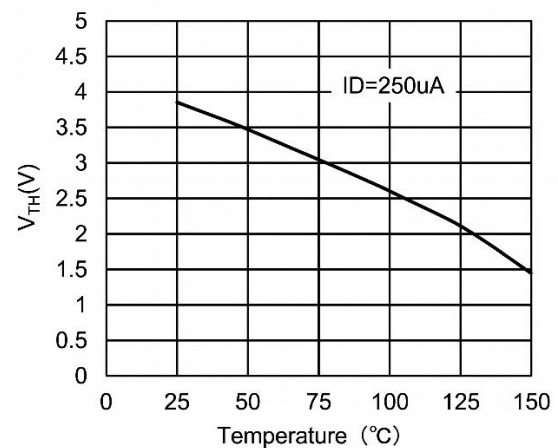


Fig 5.  $R_{DS(on)}$  vs.  $I_D$  Characteristics

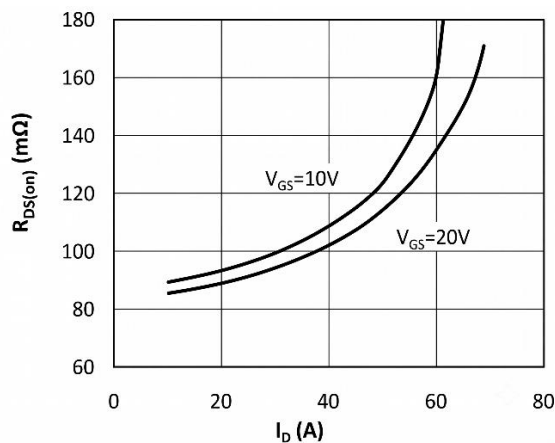


Fig 6.  $R_{DS(on)}$  vs. Temperature

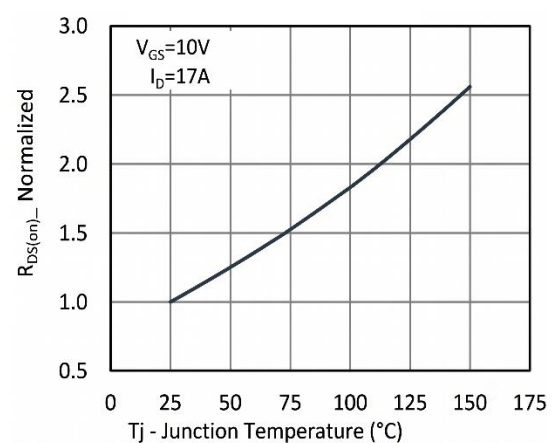




Fig7. BVDSS vs. Temperature

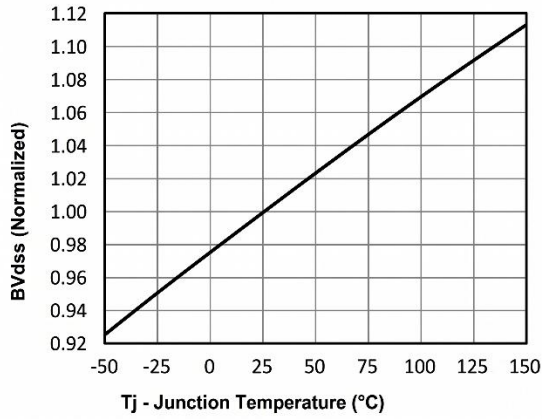


Fig 8. Rds(on) vs Gate Voltage

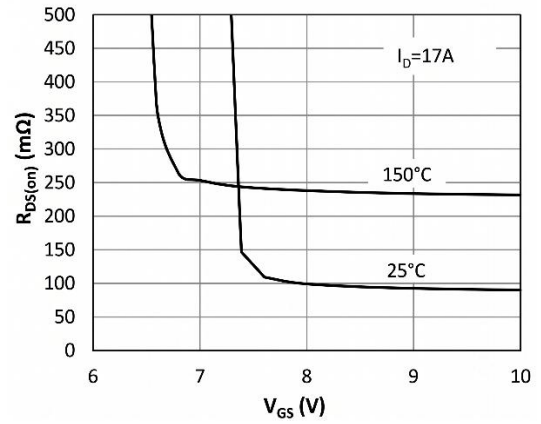


Fig 9. Body-diode Forward Characteristics

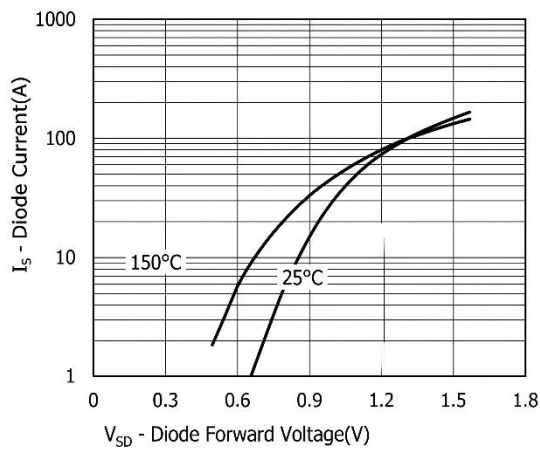


Fig 10. Gate Charge Characteristics

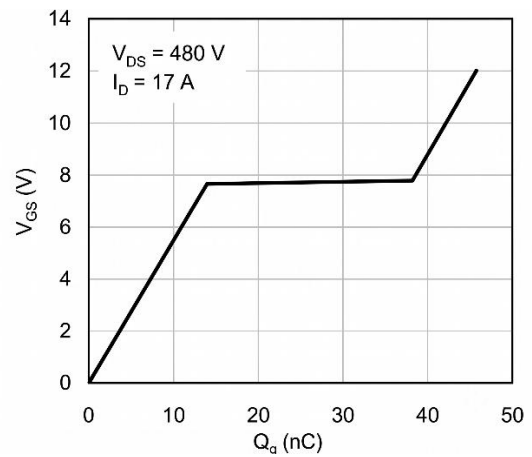


Fig 11. Capacitance Characteristics

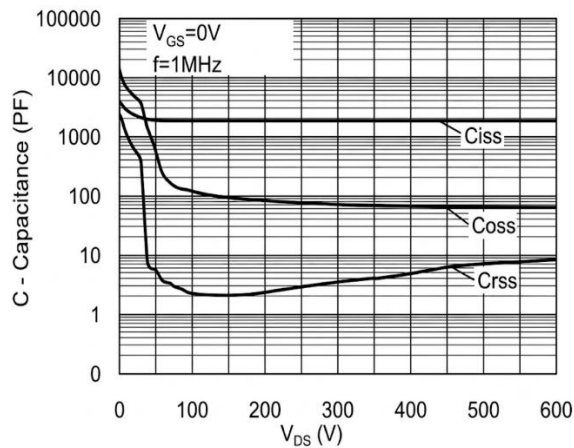
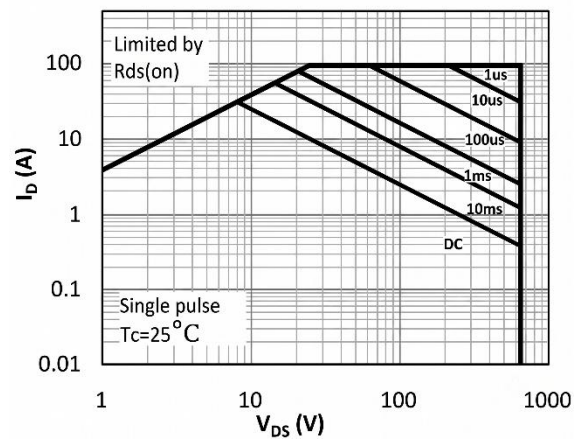


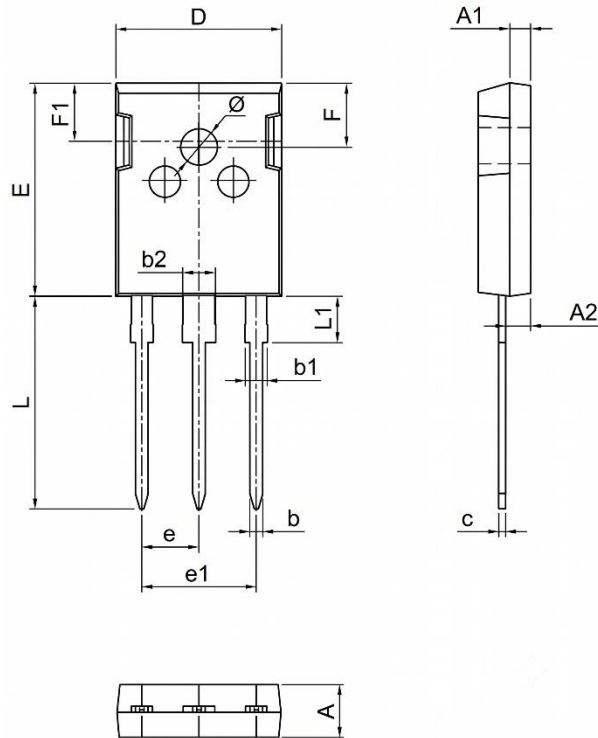
Fig 12. Safe Operating Area





## PACKAGE INFORMATION

Dimension in TO-247 (Unit: mm)



| Symbol | Millimeters |       |
|--------|-------------|-------|
|        | Min         | Max   |
| A      | 4.90        | 5.10  |
| A1     | 1.90        | 2.10  |
| A2     | 2.29        | 2.54  |
| b      | 1.00        | 1.40  |
| b1     | 2.00        | 2.20  |
| b2     | 3.00        | 3.20  |
| c      | 0.50        | 0.70  |
| D      | 15.75       | 16.05 |
| E      | 20.20       | 20.80 |
| e      | 5.45 BSC    |       |
| e1     | 10.90 BSC   |       |
| F      | 6.05        | 6.25  |
| F1     | 5.80        | 6.00  |
| L      | 20.10       | 20.40 |
| L1     | 4.05        | 4.35  |
| $\Phi$ | 3.50        | 3.70  |

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