

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 650V          | 230mΩ@10V       | 14A   |

### Feature

- Super-Junction MOSFET
- Low  $R_{DS(on)}$
- High Ruggedness
- Improved dv/dt Capability
- 100% Avalanche Tested

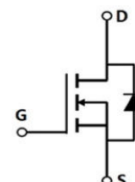
### Application

- PFC/LLC
- PC Power
- LED Lighting

TO-220F



Schematic diagram



### Package Marking and Ordering Information

| Part Number  | Package | Marking  | Packing | Reel Size | Tape Width | Qty   |
|--------------|---------|----------|---------|-----------|------------|-------|
| GPJT65R280TC | TO-220F | JT65R280 | Tube    | NA        | NA         | 50pcs |

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                                  |                           | Symbol          | Value     | Unit               |
|----------------------------------------------------------------------------|---------------------------|-----------------|-----------|--------------------|
| Drain-Source Voltage                                                       |                           | $V_{DS}$        | 650       | V                  |
| Gate-Source Voltage                                                        |                           | $V_{GS}$        | ±30       | V                  |
| Continuous Drain Current <sup>1</sup>                                      | $T_C = 25^\circ\text{C}$  | $I_D$           | 14        | A                  |
|                                                                            | $T_C = 100^\circ\text{C}$ |                 | 8.8       |                    |
| Pulsed Drain Current <sup>2</sup>                                          |                           | $I_{DM}$        | 56        | A                  |
| Single Pulsed Avalanche Current <sup>3</sup>                               |                           | $I_{AS}$        | 5.4       | A                  |
| Single Pulsed Avalanche Energy <sup>3</sup>                                |                           | $E_{AS}$        | 292       | mJ                 |
| Power Dissipation <sup>5</sup>                                             | $T_C = 25^\circ\text{C}$  | $P_D$           | 25        | W                  |
| MOSFET dv/dt Ruggedness( $V_{DS}=0\sim 480\text{V}$ )                      |                           | dv/dt           | 50        | V/ns               |
| Peak Diode Recovery dv/dt( $V_{DS}=0\sim 400\text{V}$ , $I_{SD}\leq I_S$ ) |                           | dv/dt           | 15        | V/ns               |
| Thermal Resistance from Junction to Ambient <sup>6</sup>                   |                           | $R_{\theta JA}$ | 62.5      | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Case                                   |                           | $R_{\theta JC}$ | 5         | $^\circ\text{C/W}$ |
| Operating Junction and Storage Temperature Range                           |                           | $T_J, T_{STG}$  | -55~ +150 | $^\circ\text{C}$   |

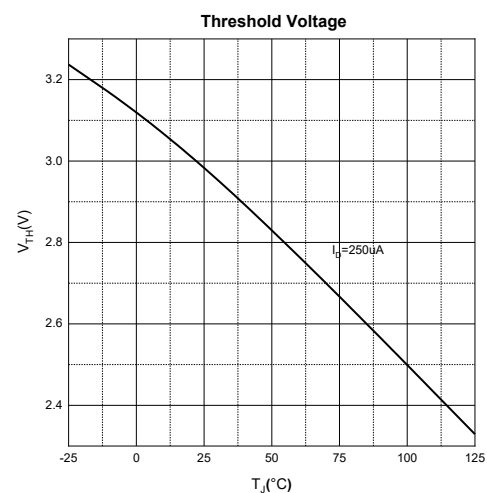
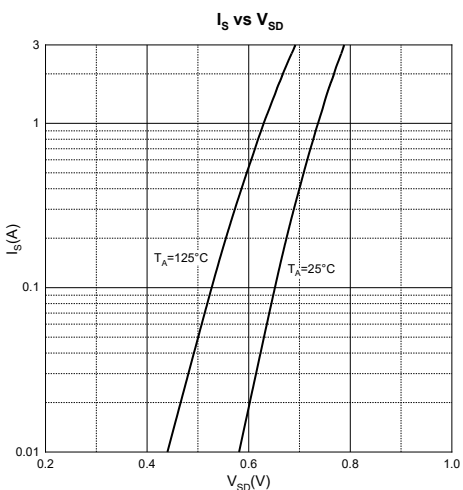
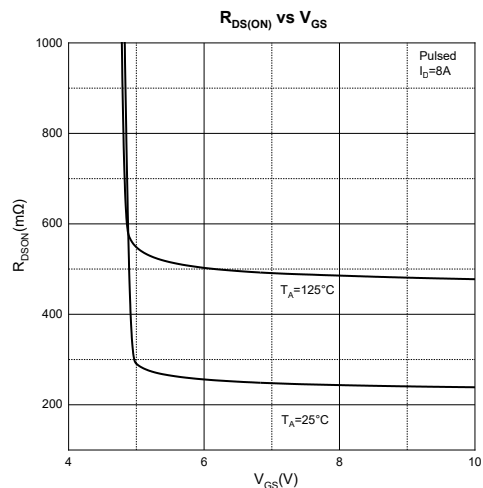
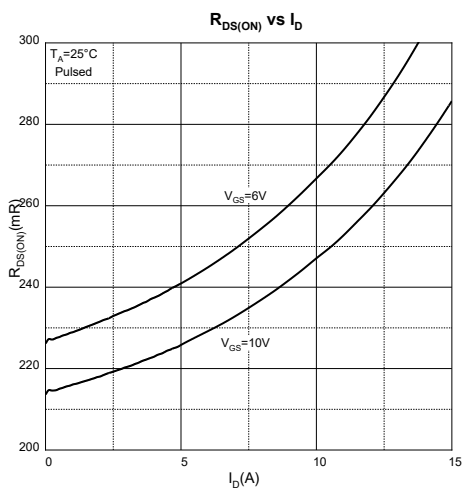
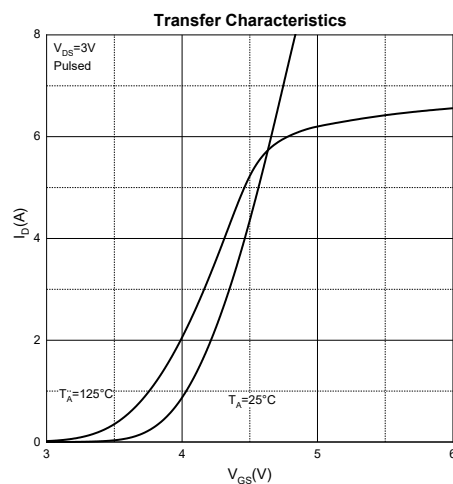
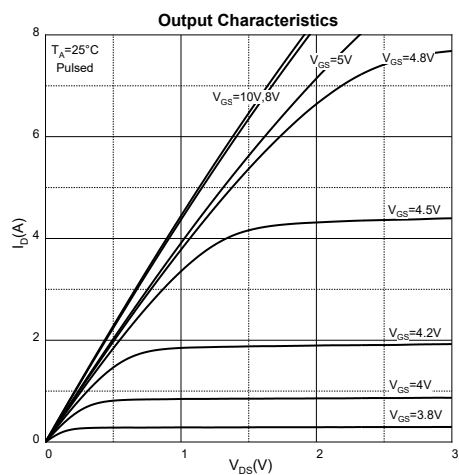
**MOSFET ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**

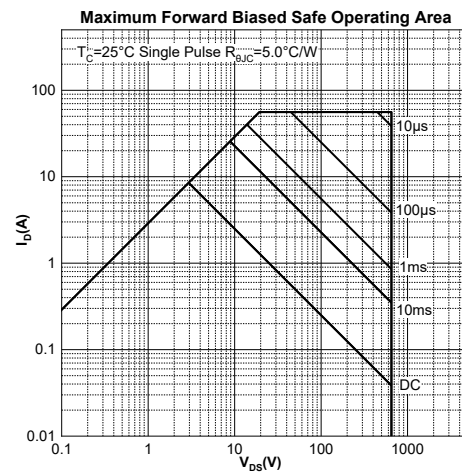
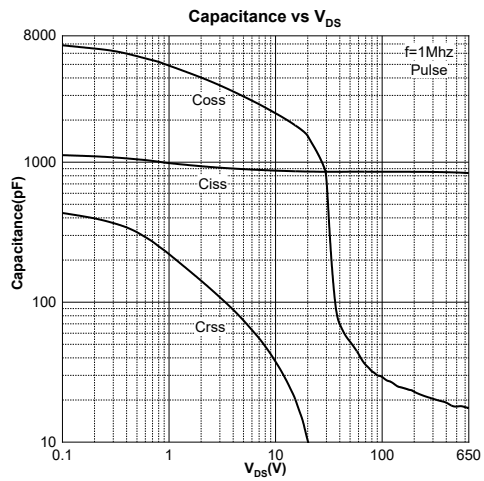
| Parameter                          | Symbol               | Test Condition                                                                               | Min | Type | Max  | Unit |
|------------------------------------|----------------------|----------------------------------------------------------------------------------------------|-----|------|------|------|
| Off Characteristics                |                      |                                                                                              |     |      |      |      |
| Drain-Source Breakdown Voltage     | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                 | 650 |      |      | V    |
| Zero Gate Voltage Drain Current    | I <sub>DSS</sub>     | V <sub>DS</sub> = 650V, V <sub>GS</sub> = 0V                                                 |     |      | 1    | μA   |
| Gate-Body Leakage Current          | I <sub>GSS</sub>     | V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V                                                 |     |      | ±100 | nA   |
| On Characteristics <sup>4</sup>    |                      |                                                                                              |     |      |      |      |
| Gate Threshold Voltage             | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                   | 2.0 | 3.0  | 4.0  | V    |
| Drain-Source On-Resistance         | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A                                                   |     | 230  | 280  | mΩ   |
| Dynamic Characteristics            |                      |                                                                                              |     |      |      |      |
| Input Capacitance                  | C <sub>iss</sub>     | V <sub>DS</sub> = 335V, V <sub>GS</sub> = 0V, f = 1MHz                                       |     | 853  |      | pF   |
| Output Capacitance                 | C <sub>oss</sub>     |                                                                                              |     | 20   |      |      |
| Reverse Transfer Capacitance       | C <sub>rss</sub>     |                                                                                              |     | 2.7  |      |      |
| Gate Resistance                    | R <sub>g</sub>       | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                         |     | 3.5  |      | Ω    |
| Switching Characteristics          |                      |                                                                                              |     |      |      |      |
| Total Gate Charge                  | Q <sub>g</sub>       | V <sub>DS</sub> = 30V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A                            |     | 16   |      | nC   |
| Gate-Source Charge                 | Q <sub>gs</sub>      |                                                                                              |     | 3.8  |      |      |
| Gate-Drain Charge                  | Q <sub>gd</sub>      |                                                                                              |     | 4.2  |      |      |
| Gate Plateau Voltage               | V <sub>plateau</sub> |                                                                                              |     | 4.5  |      | V    |
| Turn-On Delay Time                 | t <sub>d(on)</sub>   | V <sub>DD</sub> = 325V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 24Ω,<br>I <sub>D</sub> = 14A |     | 19   |      | ns   |
| Turn-On Rise Time                  | t <sub>r</sub>       |                                                                                              |     | 44   |      |      |
| Turn-Off Delay Time                | t <sub>d(off)</sub>  |                                                                                              |     | 68   |      |      |
| Turn-Off Fall Time                 | t <sub>f</sub>       |                                                                                              |     | 36   |      |      |
| Source-Drain Diode Characteristics |                      |                                                                                              |     |      |      |      |
| Diode Forward Voltage <sup>4</sup> | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A                                                    |     |      | 1.2  | V    |
| Diode Reverse Recovery Time        | t <sub>rr</sub>      | I <sub>F</sub> = 14A, dI/dt = 100A/μs,<br>V <sub>R</sub> = 50V, V <sub>GS</sub> = 0V         |     | 266  |      | ns   |
| Diode Reverse Recovery Charge      | Q <sub>rr</sub>      |                                                                                              |     | 3.4  |      | μC   |
| Reverse Recovery Of Peak Current   | I <sub>rrm</sub>     |                                                                                              |     | 26   |      | A    |

**Notes:**

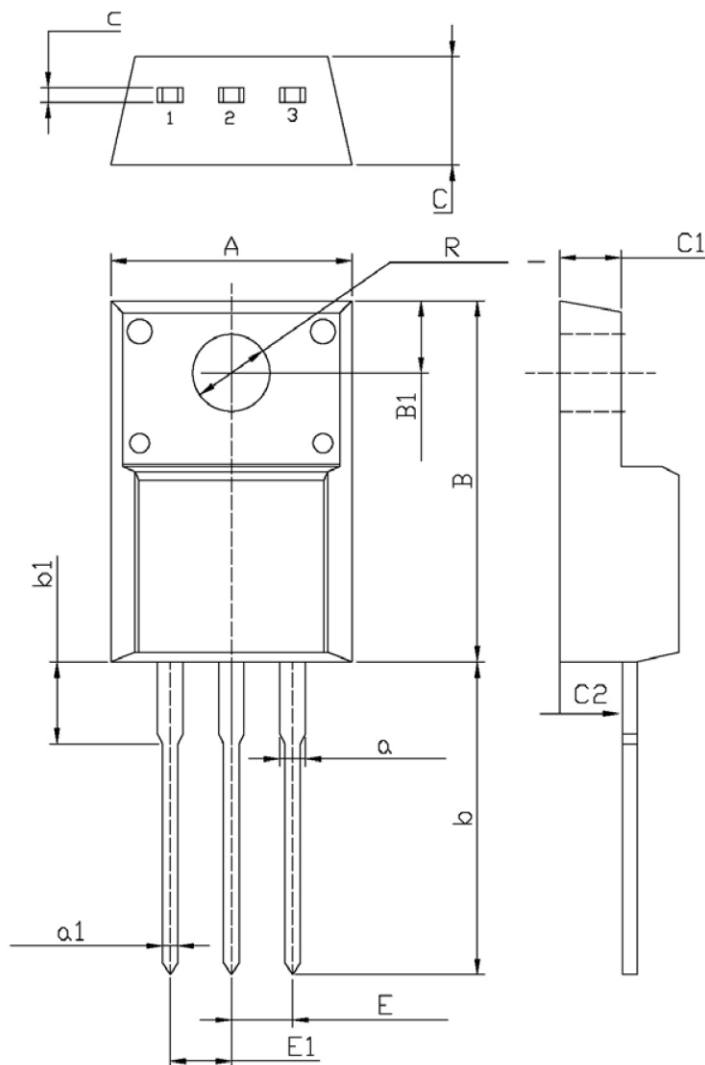
- 1.The maximum current rating is limited by package. And device mounted on a large heatsink.
- 2.Pulse Test: Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
- 3.EAS condition:  $V_{DD} = 100V, V_{GS} = 10V, L = 20mH, R_G = 25\Omega$  Starting  $T_J = 25^\circ C$ .
- 4.Pulse Test: Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 5.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ C$ . And device mounted on a large heatsink.
- 6.Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ .

## Typical Characteristics







**TO-220F Package Information**


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| C      | 4.500                     | 4.900  | 0.177                | 0.193 |
| c      | 0.400                     | 0.600  | 0.016                | 0.024 |
| A      | 9.960                     | 10.360 | 0.392                | 0.408 |
| B      | 15.670                    | 16.070 | 0.617                | 0.633 |
| B1     | 3.300                     | 3.500  | 0.130                | 0.138 |
| R      | 3.080                     | 3.280  | 0.121                | 0.129 |
| b      | 12.480                    | 13.480 | 0.491                | 0.531 |
| b1     | 2.900                     | 3.900  | 0.114                | 0.154 |
| a      | 1.080                     | 1.480  | 0.043                | 0.058 |
| a1     | 0.700                     | 0.900  | 0.028                | 0.035 |
| E      | 2.340                     | 2.740  | 0.092                | 0.108 |
| E1     | 2.340                     | 2.740  | 0.092                | 0.108 |
| C1     | 2.340                     | 2.740  | 0.092                | 0.108 |
| C2     | 2.560                     | 2.960  | 0.101                | 0.117 |

**Attention:**

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
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