



**THE DATASHEET OF  
PJT7802\_R1\_00001**





# PJT7802

## 20V N-Channel Enhancement Mode MOSFET – ESD Protected

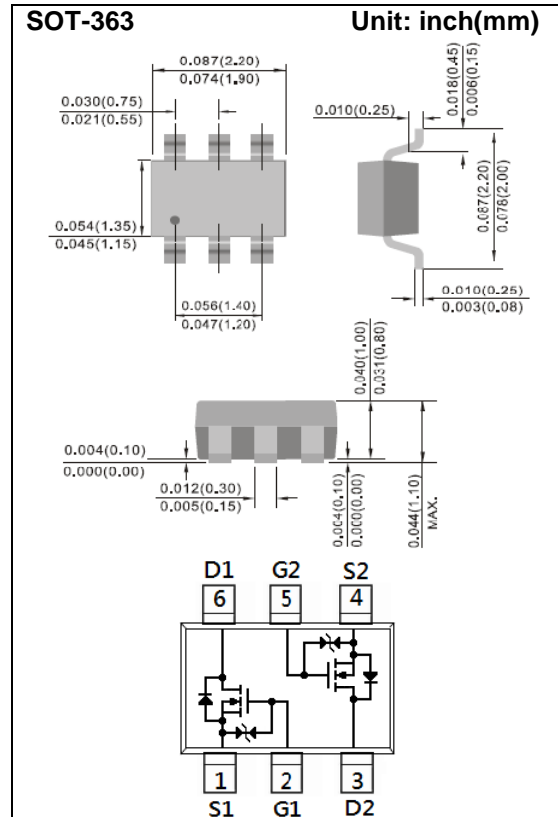
**Voltage**    **20 V**    **Current**    **0.5A**

### Features

- RDS(ON) , VGS@4.5V, ID@0.5A<0.4Ω
- RDS(ON) , VGS@2.5V, ID@0.3A<0.7Ω
- RDS(ON) , VGS@1.8V, ID@0.1A<1.2Ω(typ.)
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std.(Halogen Free)

### Mechanical Data

- Case : SOT-363 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0002 ounces, 0.006 grams
- Marking : T02



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER  | SYMBOL                            | LIMIT                | UNITS |
|--|-----------------------------------|----------------------|-------|
| Drain-Source Voltage                             | V <sub>DS</sub>                   | 20                   | V     |
| Gate-Source Voltage                              | V <sub>GS</sub>                   | ±12                  | V     |
| Continuous Drain Current                         | I <sub>D</sub>                    | 0.5                  | A     |
| Pulsed Drain Current (Note 4)                    | I <sub>DM</sub>                   | 2.0                  | A     |
| Power Dissipation                                | P <sub>D</sub>                    | T <sub>a</sub> =25°C | 350   |
|  |                                   | Derate above 25°C    | 2.8   |
| Operating Junction and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55~150              | °C    |
| Typical Thermal resistance                       | R <sub>θJA</sub>                  | 357                  | °C/W  |
| - Junction to Ambient (Note 3)                   |                                   |                      |       |



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## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER   | SYMBOL              | TEST CONDITION   | MIN. | TYP. | MAX. | UNITS |
|---|---------------------|--|------|------|------|-------|
| <b>Static</b>   |                     |  |      |      |      |       |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA   | 20   | -    | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA   | 0.4  | 0.63 | 1.0  | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A  | -    | 0.32 | 0.4  | Ω     |
|   |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.3A  | -    | 0.6  | 0.7  |       |
|   |                     | V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.1A  | -    | 1.2  | -    |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =16V, V <sub>GS</sub> =0V  | -    | 0.02 | 1    | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V   | -    | ±2   | ±10  | uA    |
| <b>Dynamic (Note 5)</b>                               |                     |  |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A,<br>V <sub>GS</sub> =4.5V (Note 1,2)                        | -    | 0.9  | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |  | -    | 0.3  | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |  | -    | 0.1  | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V,<br>f=1.0MHZ   | -    | 39   | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |  | -    | 18   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |  | -    | 9    | -    |       |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DD</sub> =10V, I <sub>D</sub> =0.5A,<br>V <sub>GS</sub> =4.5V,<br>R <sub>G</sub> =6Ω (Note 1,2) | -    | 3    | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |  | -    | 22   | -    |       |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |  | -    | 7    | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |  | -    | 19   | -    |       |
| <b>Drain-Source Diode</b>                             |                     |  |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---  | -    | -    | 0.4  | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =0.5A, V <sub>GS</sub> =0V  | -    | 0.91 | 1.3  | V     |

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R<sub>ΘJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1 inch FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited
5. Guaranteed by design, not subject to production testing



# PJT7802

## TYPICAL CHARACTERISTIC CURVES

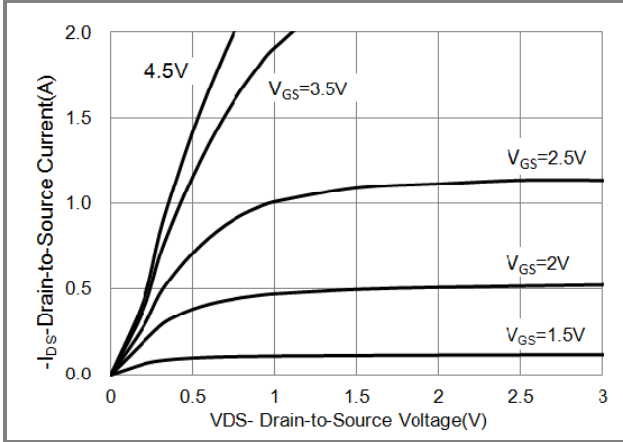


Fig.1 On-Region Characteristics

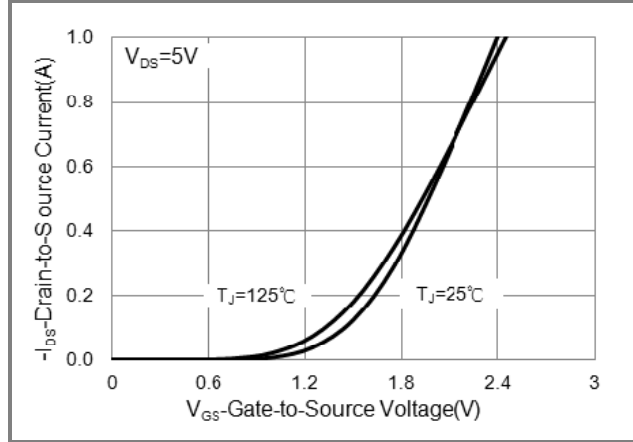


Fig.2 Transfer Characteristics

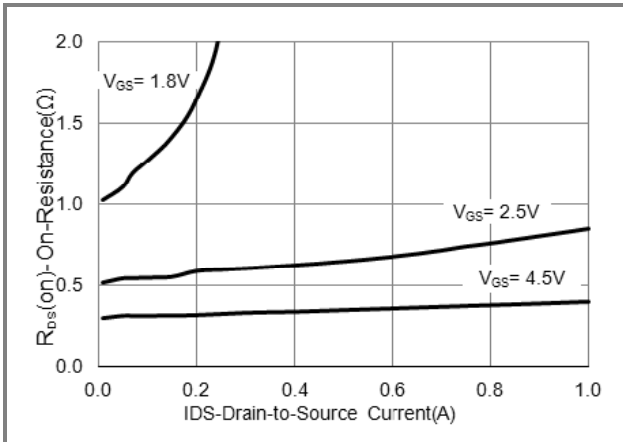


Fig.3 On-Resistance vs. Drain Current

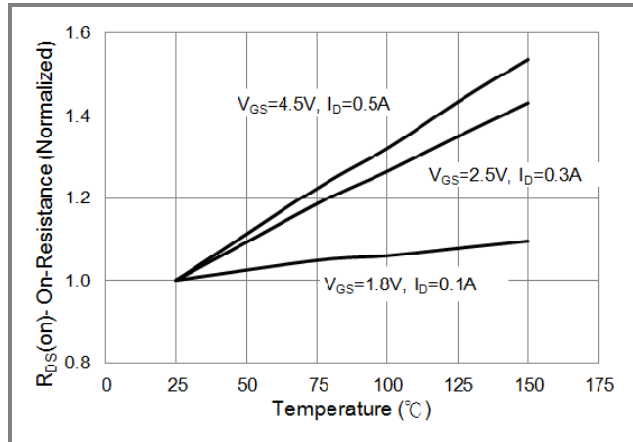


Fig.4 On-Resistance vs. Junction temperature

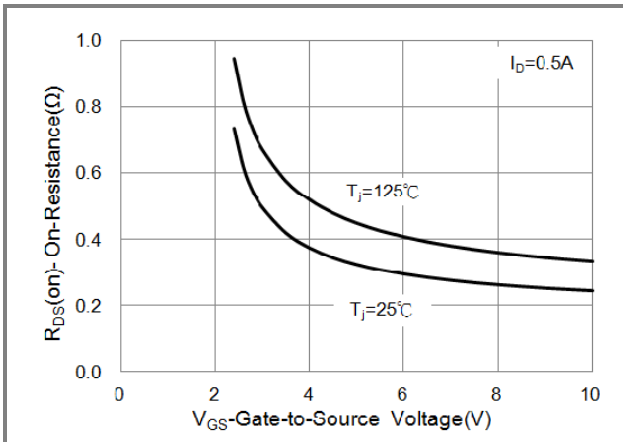


Fig.5 On-Resistance Variation with V\_GS.

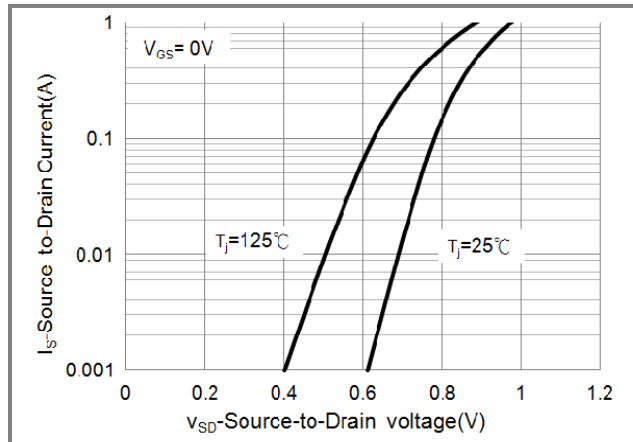


Fig.6 Body Diode Characteristics



# PJT7802

## TYPICAL CHARACTERISTIC CURVES

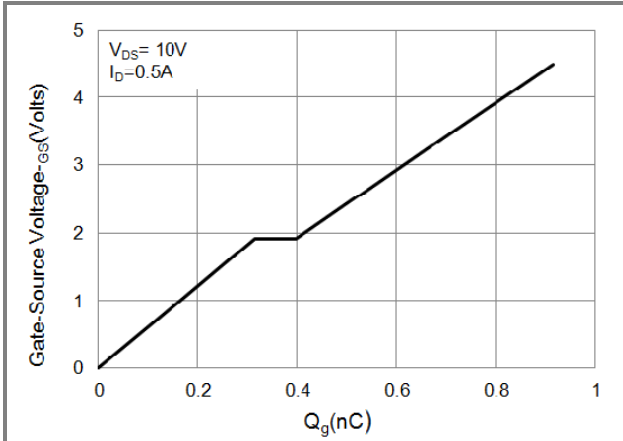


Fig.7 Gate-Charge Characteristics

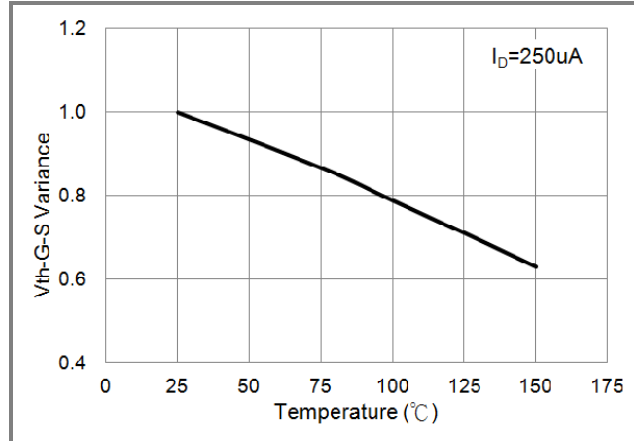


Fig.8 Threshold Voltage Variation with Temperature.

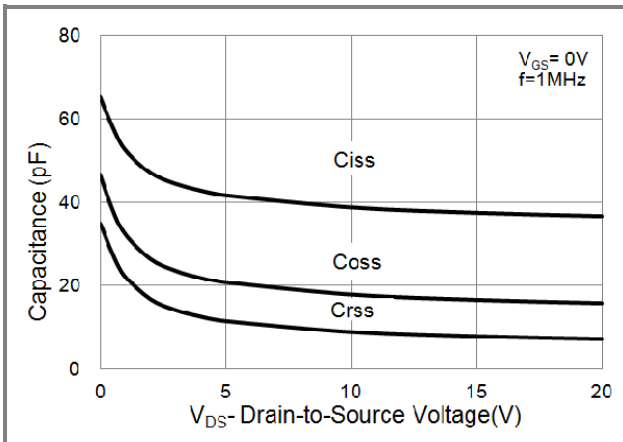


Fig.9 Threshold Voltage Variation with Temperature.

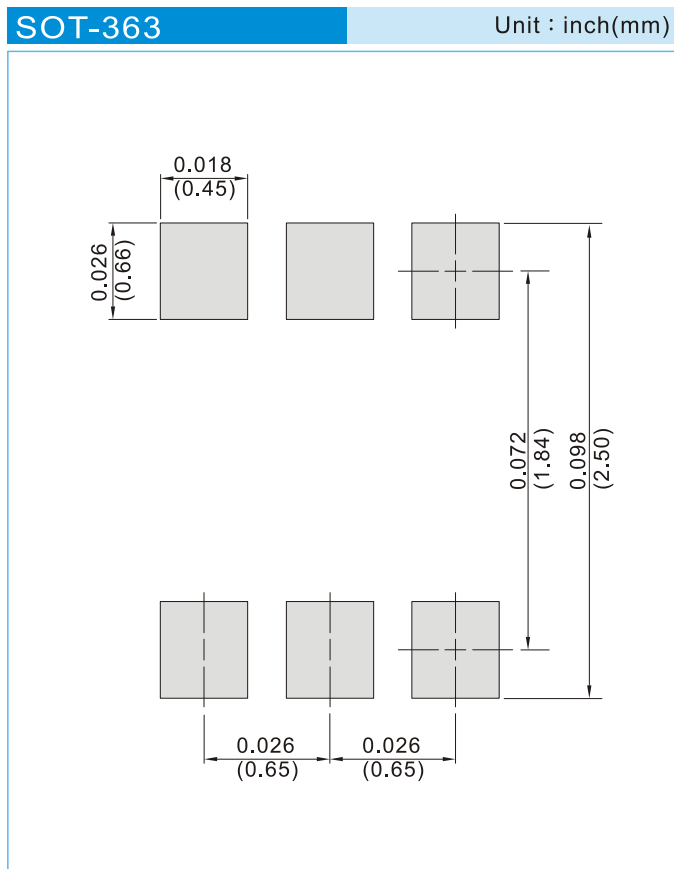


# PJT7802

## PART NO. PACKING CODE VERSION

| Part No. Packing Code | Package Type | Packing Type       | Marking | Version      |
|-----------------------|--------------|--------------------|---------|--------------|
| PJT7802_R1_00001      | SOT-363      | 3K pcs / 7" reel   | T02     | Halogen free |
| PJT7802_R2_00001      | SOT-363      | 10K pcs / 13" reel | T02     | Halogen free |

## MOUNTING PAD LAYOUT






## PJT7802

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