



PJT7812

30V N-Channel Enhancement Mode MOSFET – ESD Protected

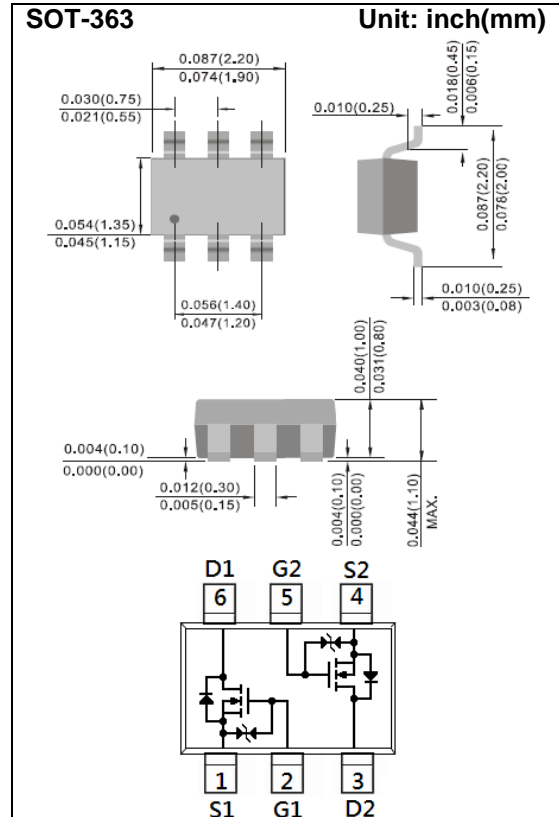
Voltage 30 V **Current** 500mA

Features

- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@500mA < 1.2\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@200mA < 1.6\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_D@100mA < 2.3\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.5V$, $I_D@10mA < 2.3\Omega$ (typ.)
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected 2KV HBM
- 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: T12



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ C$ unless otherwise noted)

| PARAMETER | SYMBOL | LIMIT | UNITS |
|--|---------------------------|----------|----------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 10 | V |
| Continuous Drain Current | I_D | 500 | mA |
| Pulsed Drain Current ^(Note 4) | I_{DM} | 1500 | mA |
| Power Dissipation | $T_a=25^\circ C$ | 350 | mW |
| | Derate above $25^\circ C$ | 2.8 | mW/ $^\circ C$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ C$ |
| Typical Thermal resistance | $R_{\theta JA}$ | 357 | $^\circ C/W$ |
| - Junction to Ambient ^(Note 3) | | | |



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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|--------------|---|------|------|----------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 30 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.6 | 0.85 | 1.1 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=500mA$ | - | 0.87 | 1.2 | Ω |
| | | $V_{GS}=2.5V, I_D=200mA$ | - | 1.25 | 1.6 | |
| | | $V_{GS}=1.8V, I_D=100mA$ | - | 1.6 | 2.3 | |
| | | $V_{GS}=1.5V, I_D=10mA$ | - | 2.3 | - | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0V$ | - | 0.01 | 1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0V$ | - | - | ± 10 | |
| | | $V_{GS}=\pm 5V, V_{DS}=0V$ | - | - | ± 1 | |
| Dynamic (Note 5) | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, I_D=500mA,$ $V_{GS}=4.5V$ (Note 1,2) | - | 0.87 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.26 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 0.16 | - | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V,$ $f=1.0MHz$ | - | 34 | - | pF |
| Output Capacitance | C_{oss} | | - | 8.9 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 2.5 | - | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=15V, I_D=80mA,$ $V_{GS}=4.0V,$ $R_G=6\Omega$ (Note 1,2) | - | 7.1 | - | ns |
| Turn-On Rise Time | t_r | | - | 20 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 41 | - | |
| Turn-Off Fall Time | t_f | | - | 31 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | --- | - | - | 500 | mA |
| Diode Forward Voltage | V_{SD} | $I_S=500mA, V_{GS}=0V$ | - | 0.88 | 1.3 | V |

NOTES :

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\theta JA}$ 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.



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TYPICAL CHARACTERISTIC CURVES

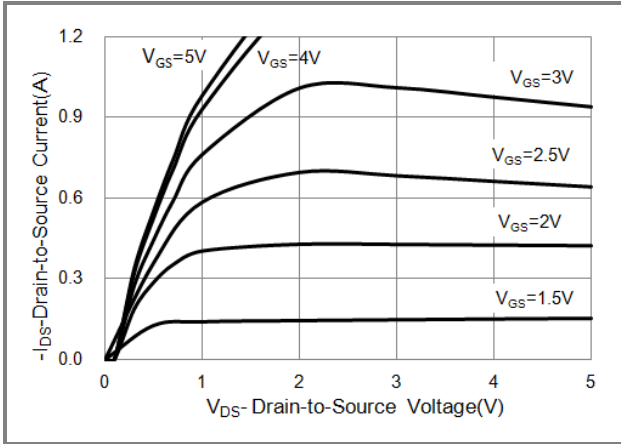


Fig.1 On-Region Characteristics

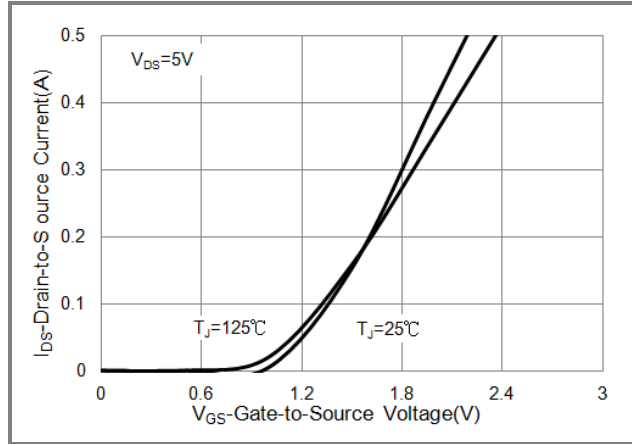


Fig.2 Transfer Characteristics

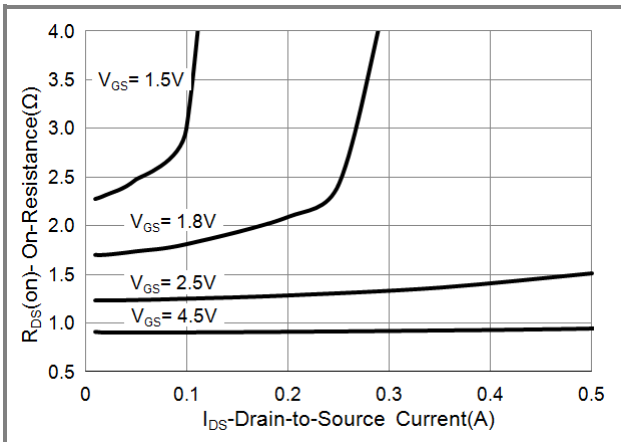


Fig.3 On-Resistance vs. Drain Current

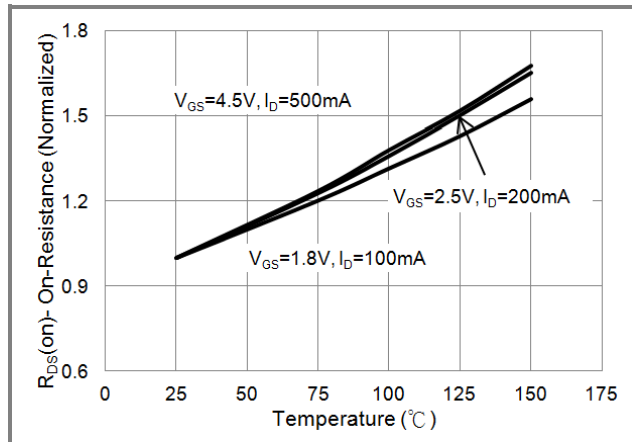


Fig.4 On-Resistance vs. Junction temperature

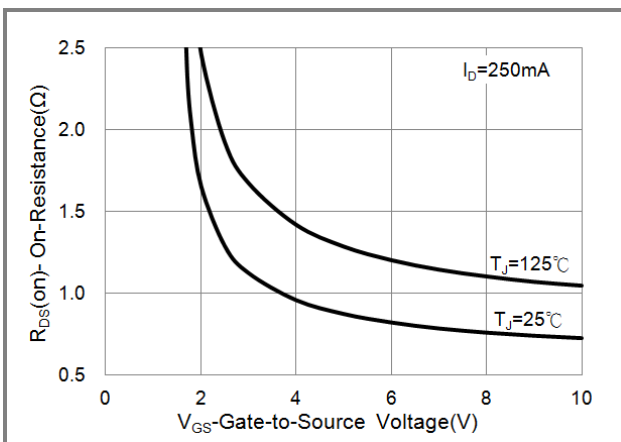


Fig.5 On-Resistance Variation with V_{GS} .

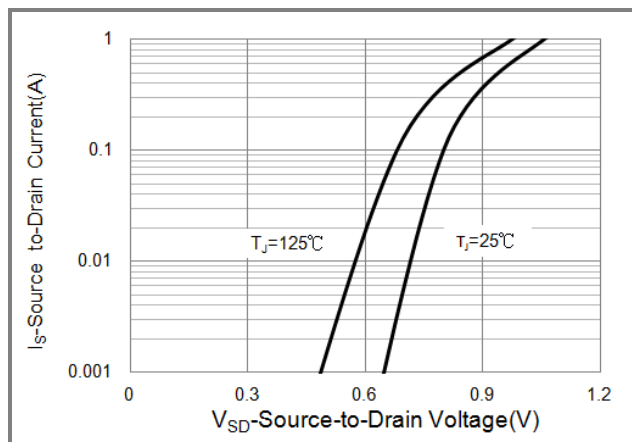


Fig.6 Body Diode Characteristics



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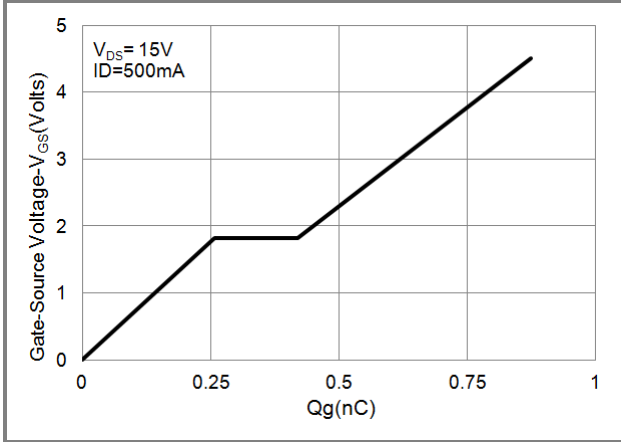


Fig.7 Gate-Charge Characteristics

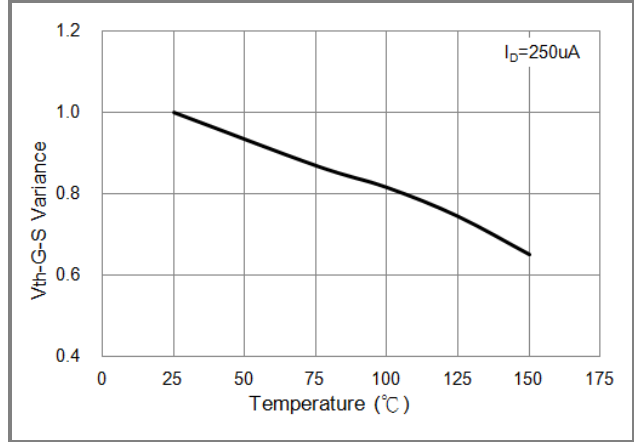


Fig.8 Threshold Voltage Variation with Temperature.

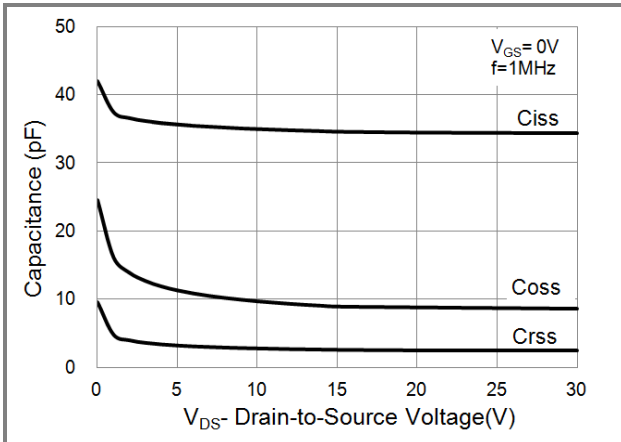


Fig.9 Capacitance vs. Drain-Source Voltage.

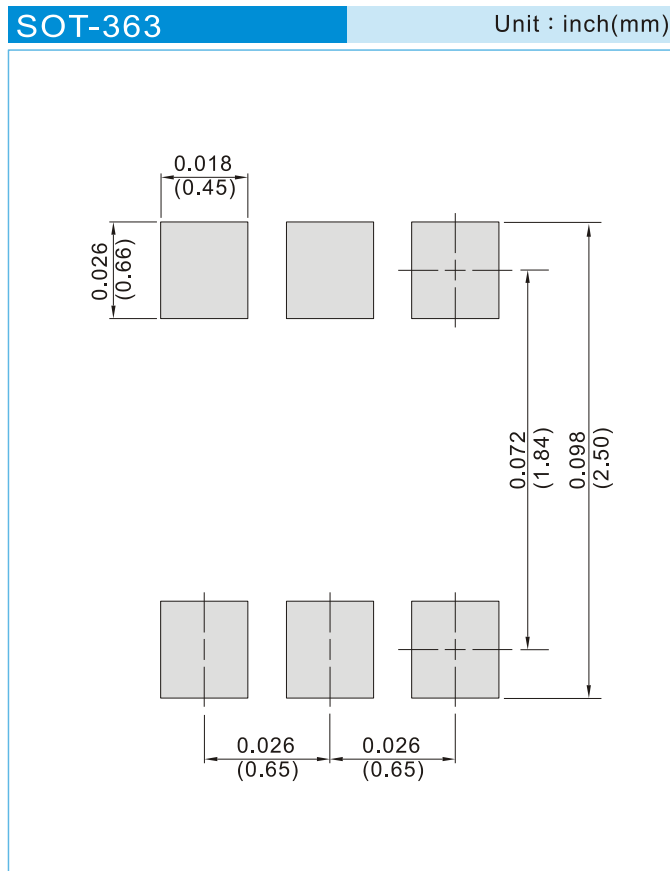


PJT7812

PART NO PACKING CODE VERSION

| PART NO PACKING CODE | Package Type | Packing type | Marking | Version |
|----------------------|--------------|--------------------|---------|--------------|
| PJT7812_R1_00001 | SOT-363 | 3K pcs / 7" reel | T12 | Halogen free |
| PJT7812_R2_00001 | SOT-363 | 12K pcs / 13" reel | T12 | Halogen free |

MOUNTING PAD LAYOUT





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