



PJT7600

20V Complementary Enhancement Mode MOSFET – ESD Protected

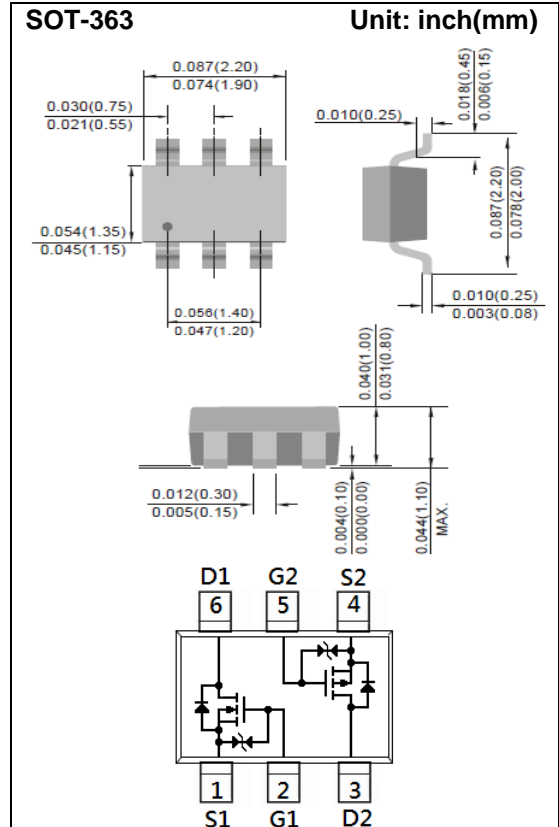
Voltage 20 / -20V **Current** 1 / -0.7A

Features

- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected
- Lead free in comply with EU RoHS 2011/65/EU directives.
- 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: T60



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

| PARAMETER | | SYMBOL | N-Ch LIMIT | P-Ch LIMIT | UNITS |
|--|---------------------------------|-----------------|------------|------------|----------------------|
| Drain-Source Voltage | | V_{DS} | 20 | -20 | V |
| Gate-Source Voltage | | V_{GS} | ± 8 | ± 8 | V |
| Continuous Drain Current | | I_D | 1 | -0.7 | A |
| Pulsed Drain Current (Note 4) | | I_{DM} | 4 | -2.8 | A |
| Power Dissipation | $T_a=25^\circ\text{C}$ | P_D | 350 | | mW |
| | Derate above 25°C | | 2.8 | | mW/ $^\circ\text{C}$ |
| Operating Junction and Storage Temperature Range | | T_J, T_{STG} | -55~150 | | $^\circ\text{C}$ |
| Thermal resistance | | $R_{\theta JA}$ | 357 | | $^\circ\text{C/W}$ |
| - Junction to Ambient (Note 3) | | | | | |



PJT7600

N-Channel 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} | $V_{GS}=0V, I_D=250\mu A$ | 20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.5 | 0.8 | 1.0 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=1A$ | - | 114 | 150 | m Ω |
| | | $V_{GS}=2.5V, I_D=0.7A$ | - | 160 | 215 | |
| | | $V_{GS}=1.8V, I_D=0.3A$ | - | 280 | 400 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | - | 0.01 | 1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0V$ | - | ± 2 | ± 10 | μA |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, I_D=1A,$ $V_{GS}=4.5V$ (Note 1,2) | - | 1.6 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.3 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 0.41 | - | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V,$ $f=1.0\text{MHz}$ | - | 92 | - | pF |
| Output Capacitance | C_{oss} | | - | 25 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 9.1 | - | |
| Switching | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=10V, I_D=1A,$ $V_{GS}=4.5V, R_G=6\Omega$ (Note 1,2) | - | 5.8 | - | ns |
| Turn-On Rise Time | t_r | | - | 25.7 | - | |
| 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 | --- | - | - | 1 | A |
| Diode Forward Voltage | V_{SD} | $I_S=1A, V_{GS}=0V$ | | 0.85 | 1.2 | V |



PJT7600

P-Channel 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} | $V_{GS}=0V, I_D=-250\mu A$ | -20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -0.5 | -0.64 | -1 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=-4.5V, I_D=-0.7A$ | - | 260 | 325 | mΩ |
| | | $V_{GS}=-2.5V, I_D=-0.6A$ | - | 310 | 420 | |
| | | $V_{GS}=-1.8V, I_D=-0.5A$ | - | 400 | 600 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-20V, V_{GS}=0V$ | - | -0.01 | -1 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0V$ | - | ± 3.5 | ± 10 | μA |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=-10V, I_D=-0.7A,$ $V_{GS}=-4.5V$ (Note 1,2) | - | 2.2 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.4 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 0.5 | - | |
| Input Capacitance | C_{iss} | $V_{DS}=-10V, V_{GS}=0V,$ $f=1.0\text{MHZ}$ | - | 151 | - | pF |
| Output Capacitance | C_{oss} | | - | 27 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 8.8 | - | |
| Switching | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=-10V, I_D=-0.7A,$ $V_{GS}=-4.5V, R_G=6\Omega$ (Note 1,2) | - | 2.2 | - | ns |
| Turn-On Rise Time | t_r | | - | 19.2 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 6.2 | - | |
| Turn-Off Fall Time | t_f | | - | 23 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I_S | --- | - | - | -1 | A |
| Diode Forward Voltage | V_{SD} | $I_S=-1A, V_{GS}=0V$ | | -0.86 | -1.2 | 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.



PJT7600

N-Channel TYPICAL CHARACTERISTIC CURVES

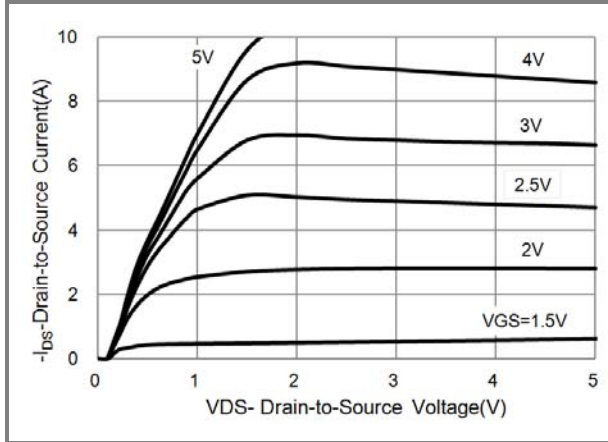


Fig.1 On-Region Characteristics

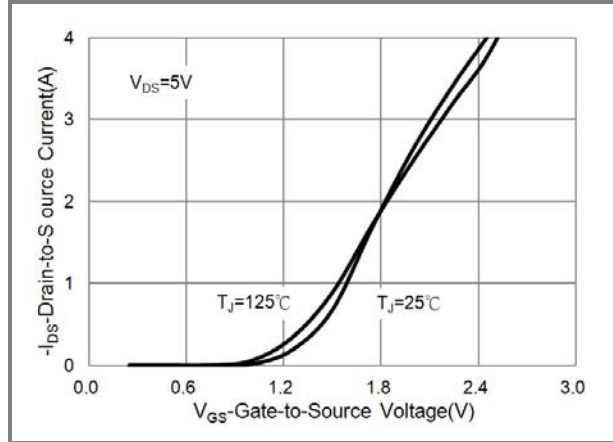


Fig.2 Transfer Characteristics

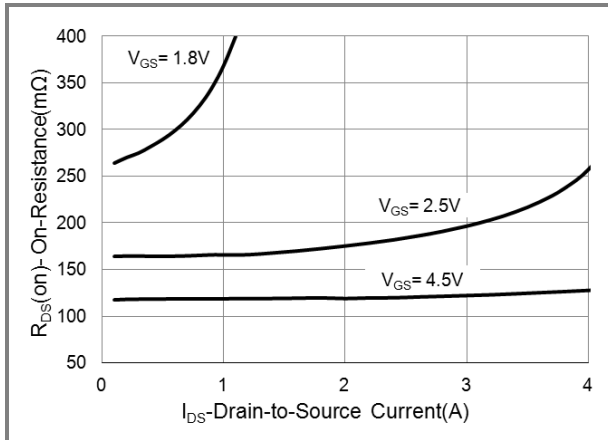


Fig.3 On-Resistance vs. Drain Current

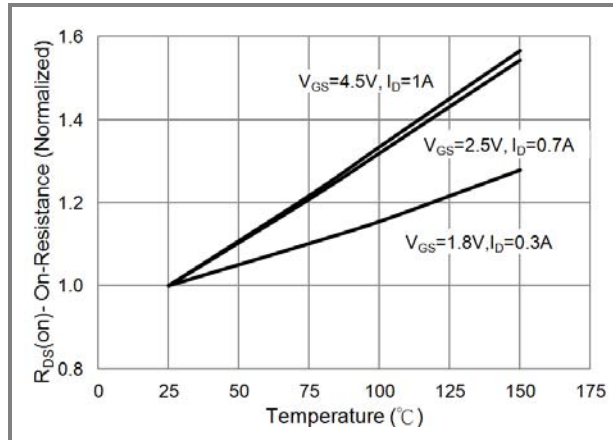


Fig.4 On-Resistance vs. Junction temperature

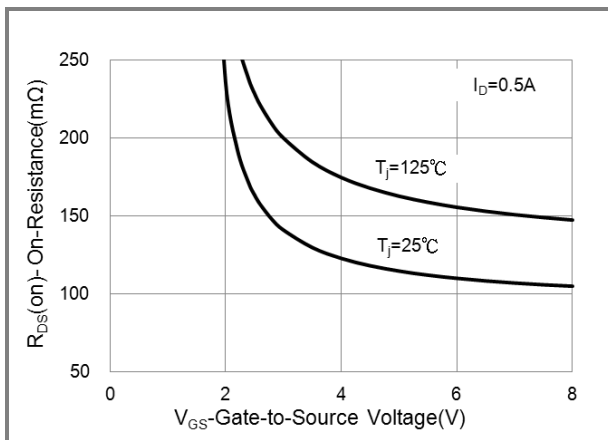


Fig.5 On-Resistance Variation with V_GS.

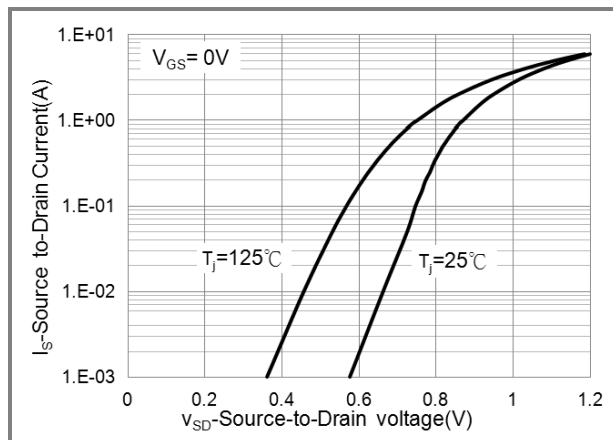


Fig.6 Body Diode Characteristic



PJT7600

N-Channel TYPICAL CHARACTERISTIC CURVES

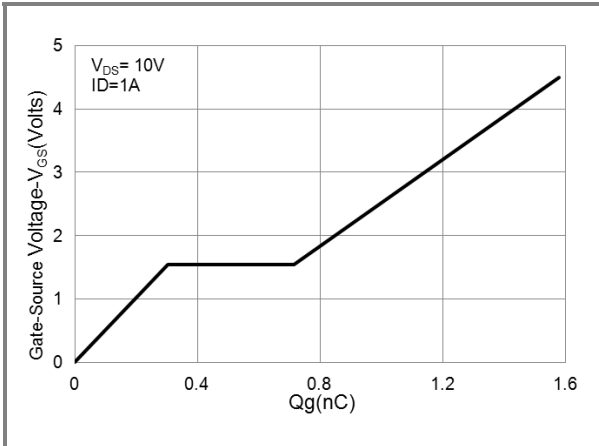


Fig.7 Gate-Charge Characteristics

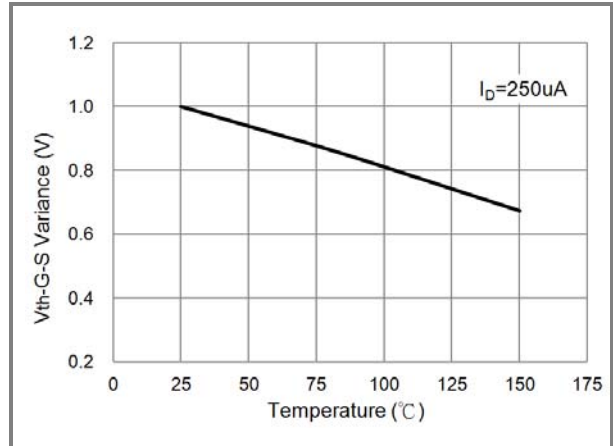


Fig.8 Threshold Voltage Variation with Temperature.

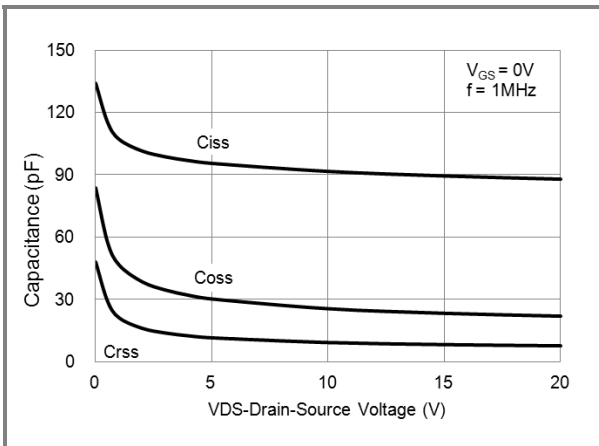


Fig.9 Capacitance vs. Drain-Source Voltage.



PJT7600

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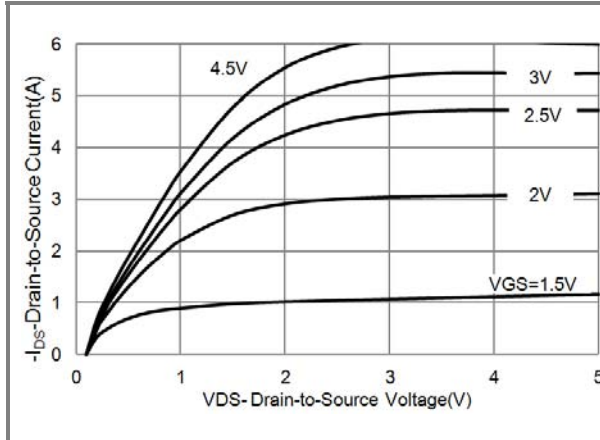


Fig.1 On-Region Characteristics

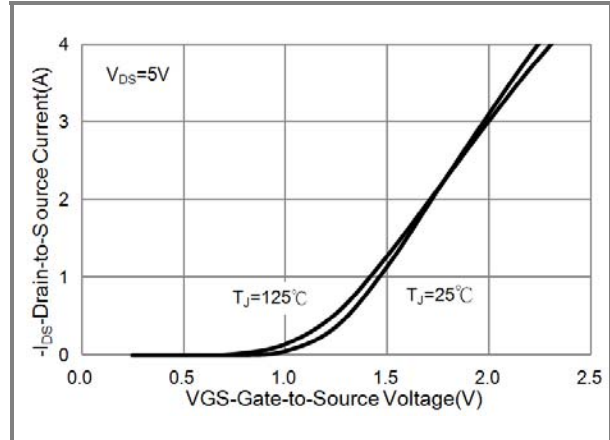


Fig.2 Transfer Characteristics

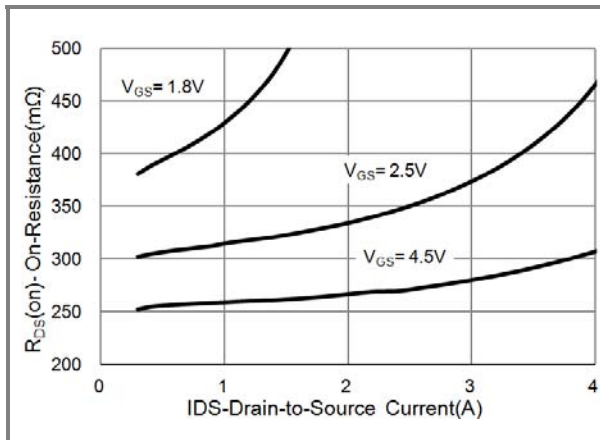


Fig.3 On-Resistance vs. Drain Current

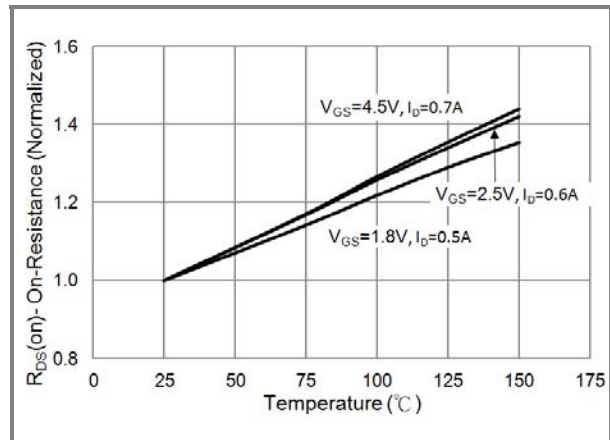


Fig.4 On-Resistance vs. Junction temperature

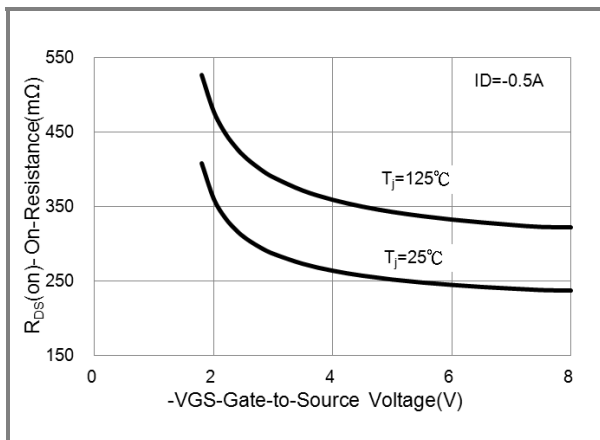


Fig.5 On-Resistance Variation with V_GS.

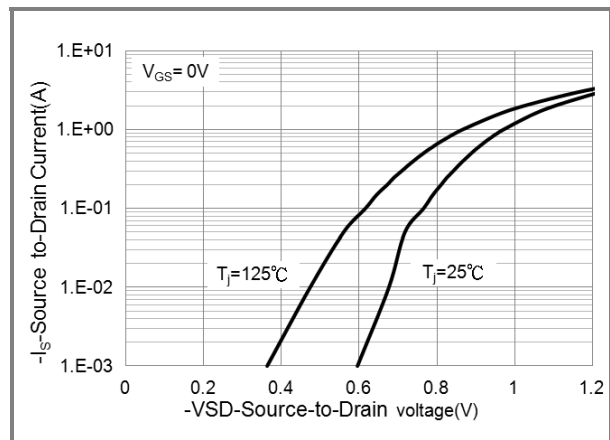


Fig.6 Body Diode Characteristics



PJT7600

P-Channel TYPICAL CHARACTERISTIC CURVES

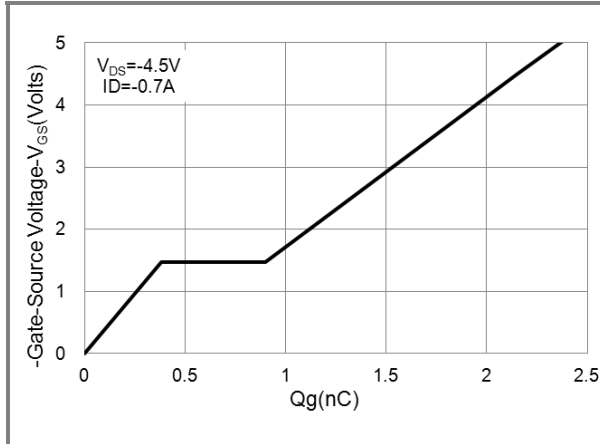


Fig.7 Gate-Charge Characteristics

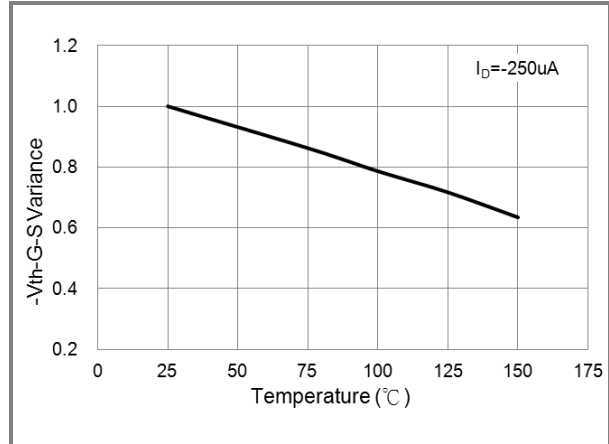


Fig.8 Threshold Voltage Variation with Temperature.

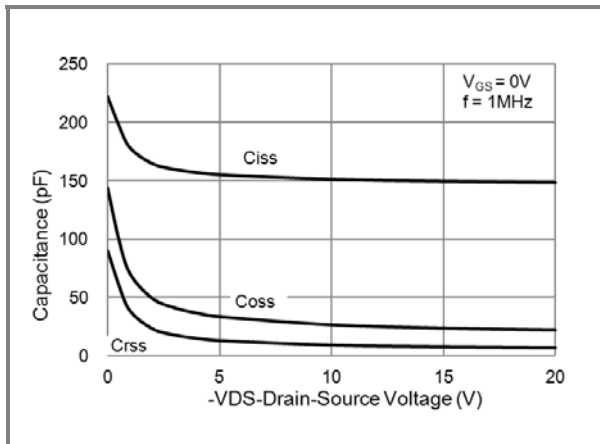


Fig.9 Threshold Voltage Variation with Temperature.

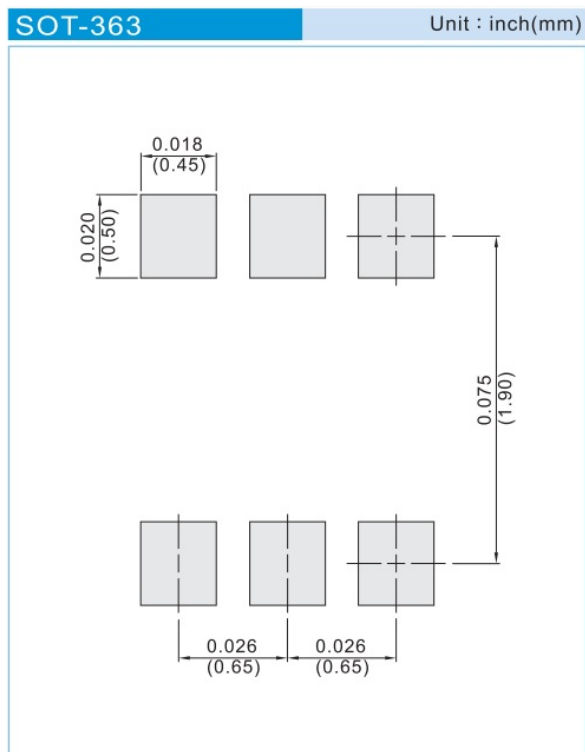


PJT7600

PART NO PACKING CODE VERSION

| Part No Packing Code | Package Type | Packing type | Marking | Version |
|----------------------|--------------|--------------------|---------|--------------|
| PJT7600_R1_00001 | SOT-363 | 3K pcs / 7" reel | T60 | Halogen free |
| PJT7600_R2_00001 | SOT-363 | 10K pcs / 13" reel | T60 | Halogen free |

MOUNTING PAD LAYOUT





PJT7600

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