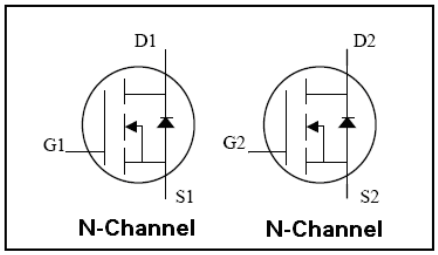
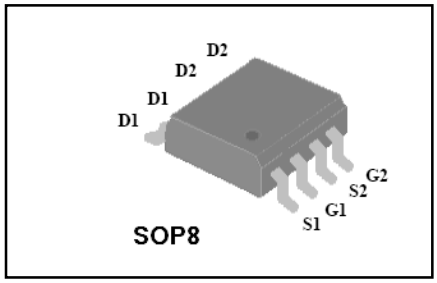
## Features

- ♦BVDSS＞30V, $R_{DS(ON)}$=23mΩ(Typ)@$V_{GS}$=10V
- ♦Low On-Resistance
- ♦Fast Switching
- ♦Lead-Free,Hg-Free, Green Product

PTS4936 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective . These features combine to make this design an extremely efficient and reliable device for variety of DC-DC applications.

## Pin Description




## Absolute Maximum Ratings

| Symbol | Parameter | | Rating NMOS | Unit |
|---|---|---|---|---|
| **Common Ratings ($T_C$=25°C Unless Otherwise Noted)** | | | | |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | | 30 | V |
| $T_J$ | Maximum Junction Temperature | | 175 | °C |
| $T_{STG}$ | Storage Temperature Range | | -50 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | $T_C$=25°C | 5 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DM}$ | Pulse Drain Current Tested (Note 1) | $T_C$=25°C | 20 | A |
| $I_D$ | Continuous Drain Current($V_{GS}$=10V) | $T_C$=25°C | 5.8 | A |
| | | $T_C$=100°C | 4.2 | |
| $P_D$ | Maximum Power Dissipation | $T_C$=25°C | 2 | W |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | | 89 | °C/W |

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** (Note 3) | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V $I_D$=250μA | 30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=24V,$V_{GS}$=0V | -- | -- | 1 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V,$V_{DS}$=0V | -- | -- | ±100 | nA |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1.0 | 1.6 | 2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=10V, $I_D$=5.8A | -- | 23 | 31 | mΩ |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=4.5V, $I_D$=5A | -- | 32 | 43 | mΩ |
| **Dynamic Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** (Note 4) | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V,$V_{GS}$=0V, f=1MHz | -- | 255 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 45 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 35 | -- | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=15V,$I_D$=5A, $V_{GS}$=10V | -- | 5.2 | -- | nC |
| $Q_{gs}$ | GateSource Charge | | -- | 0.85 | -- | nC |
| $Q_{gd}$ | GateDrain Charge | | -- | 1.3 | -- | nC |
| **Switching Characteristics** (Note 4) | | | | | | |
| $t_{d(on)}$ | Turnon Delay Time | $V_{DD}$=15V, $R_L$=3Ω $V_{GS}$=10V, $R_{GS}$=3Ω | -- | 4.5 | -- | ns |
| $t_r$ | Turnon Rise Time | | -- | 2.5 | -- | ns |
| $t_{d(off)}$ | TurnOff Delay Time | | - | 14.5 | -- | ns |
| $t_f$ | TurnOff Fall Time | | -- | 3.5 | -- | ns |
| **Source Drain Diode Characteristics** | | | | | | |
| $I_{SD}$ | Sourcedrain current(Body Diode) (Note 2) | $T_C$=25℃ | 5 | -- | -- | A |
| $V_{SD}$ | Forward on voltage (Note 3) | $T_j$=25℃,$I_{SD}$=3A, $V_{GS}$=0V | -- | 0.82 | 1.3 | V |

Notes:

**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production

## Typical Electrical and Thermal Characteristics

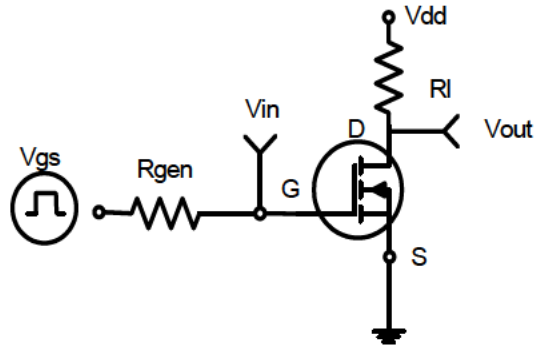



**Figure 1:Switching Test Circuit**

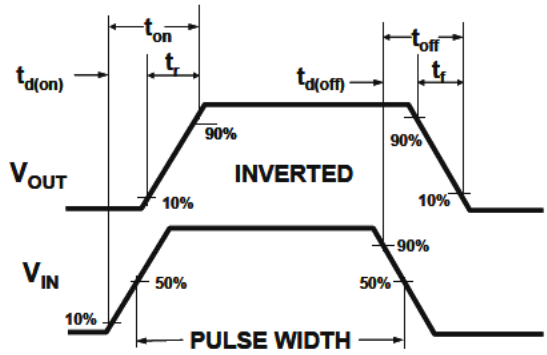



**Figure 2:Switching Waveforms**

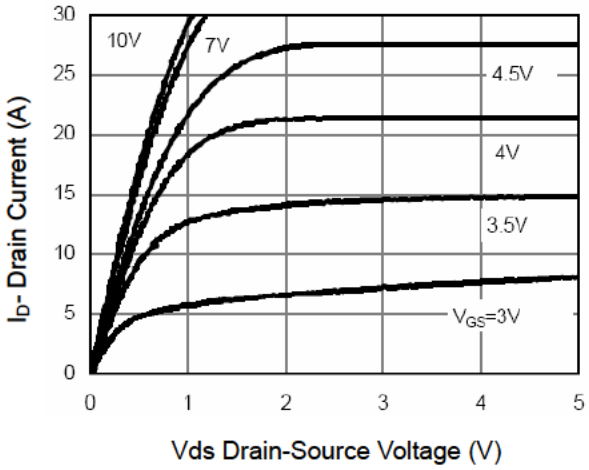



**Figure 3 Output Characteristics**

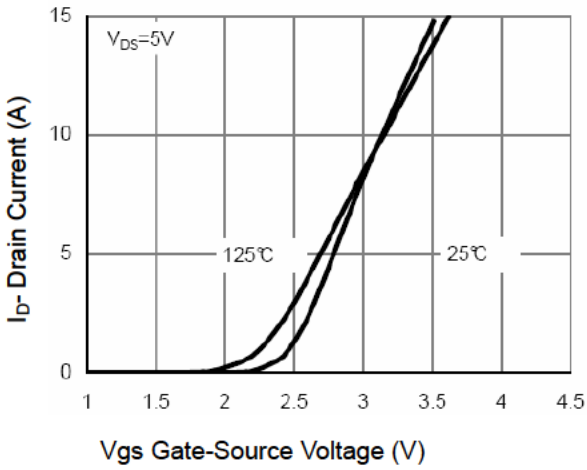



**Figure 4 Transfer Characteristics**

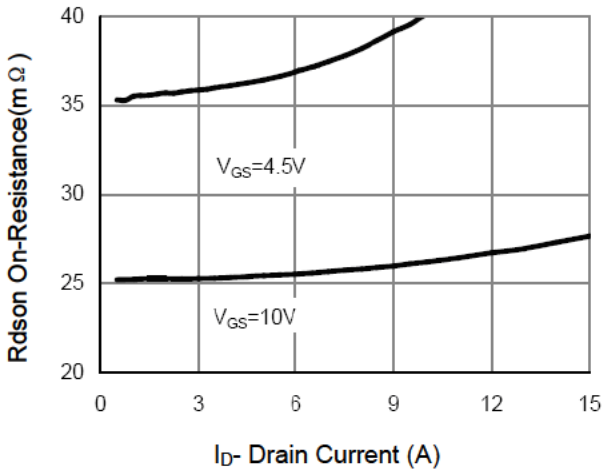



**Figure 5 Drain-Source On-Resistance**

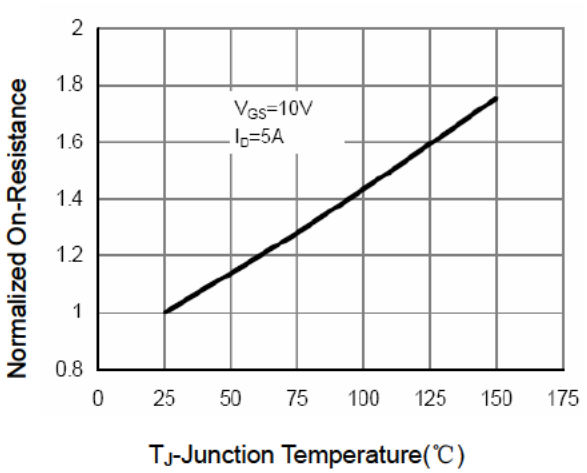



**Figure 6 Drain-Source On-Resistance**

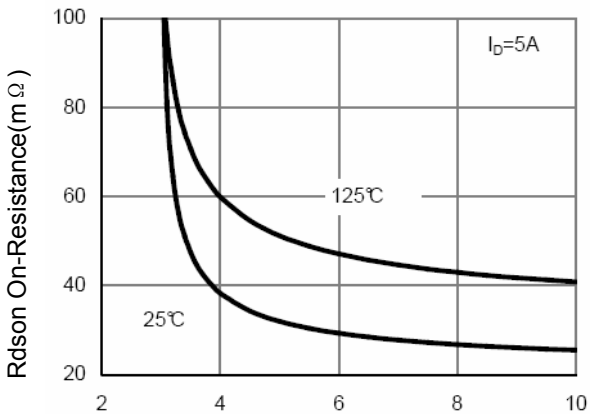



**Figure7 Rdson vs Vgs**

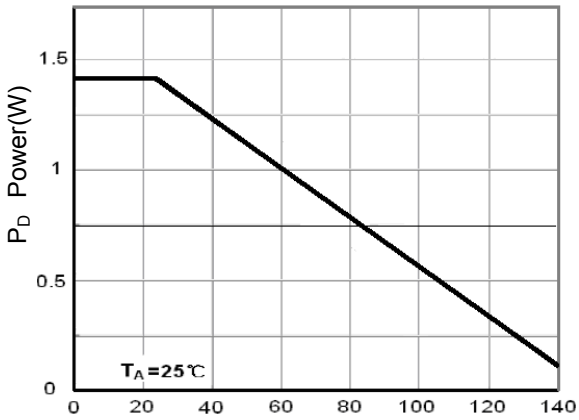



**Figure 8 Power Dissipation**

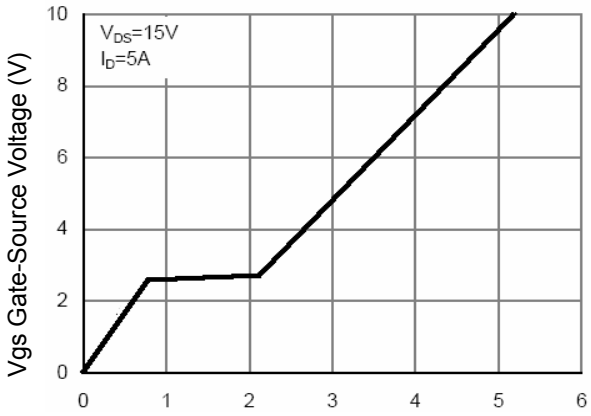



**Figure 9 Gate Charge**

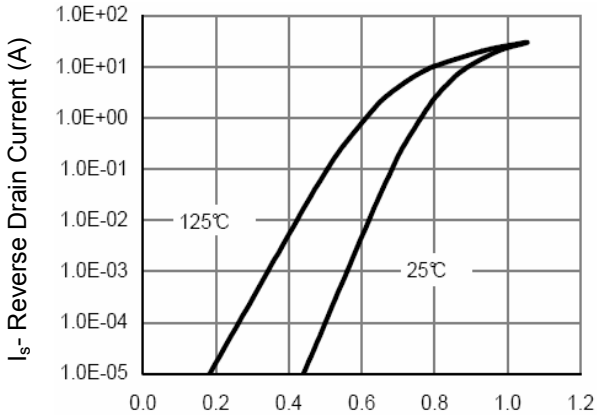



**Figure 10 Source- Drain Diode Forward**

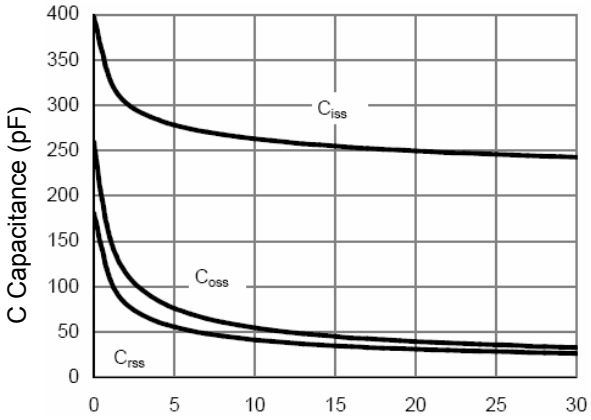



**Figure 11 Capacitance vs Vds**

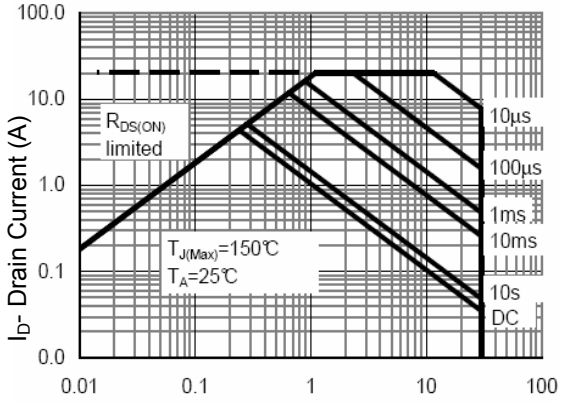



**Figure 12 Safe Operation Area**

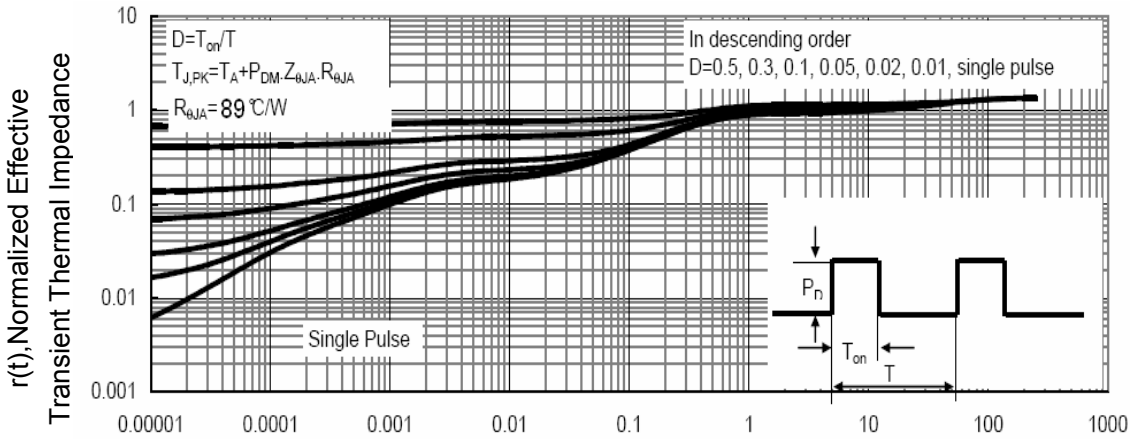



**Figure 13 Normalized Maximum Transient Thermal Impedance**