# Dual N-channel Enhancement Mode Power MOSFET

## Features

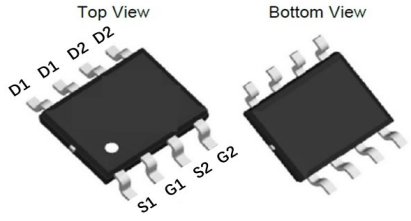
- $V_{DS}$= 30V, $I_D$= 9 A
  $R_{DS(ON)}$ < 16 mΩ @ $V_{GS}$ = 10V
  $R_{DS(ON)}$ < 24 mΩ @ $V_{GS}$ = 4.5V

## General Features

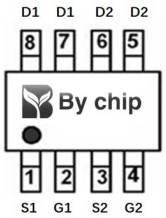
- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead Free and Green Available

*100% UIS TESTED!*
*100% ΔVds TESTED!*

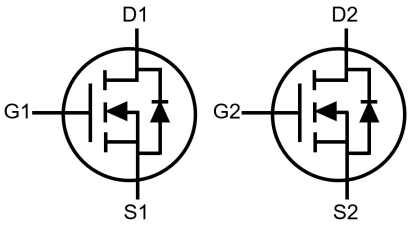
RoHS




SOP-8 (Dual)




Pin Assignment




Schematic diagram

## Maximum ratings, at $T_j$=25 °C, unless otherwise specified

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-Source breakdown voltage | | 30 | V |
| $I_S$ | Diode continuous forward current | $T_A$=25°C | 2.3 | A |
| $I_D$ | Continuous drain current @$V_{GS}$=10V | $T_A$=25°C | 9 | A |
| | | $T_A$=100°C | 5.7 | A |
| $I_{DM}$ | Pulse drain current tested ① | $T_A$=25°C | 36 | A |
| EAS | Avalanche energy, single pulsed ② | | 9 | mJ |
| $P_D$ | Maximum power dissipation | $T_A$=25°C | 2 | W |
| $V_{GS}$ | Gate-Source voltage | | ±20 | V |
| MSL | | | Level 3 | |
| $T_{STG}$ $T_J$ | Storage and operating temperature range | | -55 to 150 | °C |

## Thermal Characteristics

| Symbol | Parameter | Typical | Unit |
|---|---|---|---|
| $R_{\theta JL}$ | Thermal Resistance-Junction to Lead | 40 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 62.5 | °C/W |

## Electrical Characteristics

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current(Tc=25℃) | $V_{DS}$=30V,$V_{GS}$=0V | -- | -- | 1 | μA |
| | Zero Gate Voltage Drain Current(Tc=125℃) | $V_{DS}$=30V,$V_{GS}$=0V | -- | -- | 100 | 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 | | 2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance ② | $V_{GS}$=10V, $I_D$=8A | -- | | 16 | mΩ |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance ② | $V_{GS}$=4.5V, $I_D$=4A | -- | | 24 | mΩ |
| **Dynamic Electrical Characteristics @ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V,$V_{GS}$=0V, f=1MHz | -- | 455 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 75 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 60 | -- | pF |
| $R_g$ | Gate Resistance | f=1MHz | -- | 3.3 | -- | Ω |
| $Q_g$ | Total Gate Charge | $V_{DS}$=15V,$I_D$=8A, $V_{GS}$=10V | -- | 11 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 3 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 4 | -- | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=15V, $I_D$=8A, $R_G$=3Ω, $V_{GS}$=10V | -- | 7 | -- | ns |
| $t_r$ | Turn-on Rise Time | | -- | 10 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 22 | -- | ns |
| $t_f$ | Turn-Off Fall Time | | -- | 7 | -- | ns |
| **Source- Drain Diode Characteristics@ $T_J$ = 25°C (unless otherwise stated)** | | | | | | |
| $V_{SD}$ | Forward on voltage | $I_{SD}$=8A,$V_{GS}$=0V | -- | 0.9 | 1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $T_j$=25℃,$I_{sd}$=8A, $V_{GS}$=0V di/dt=500A/μs | -- | 9.5 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | -- | 11.8 | -- | nC |

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Limited by $T_{Jmax}$, starting $T_J$ = 25°C, L = 0.5mH,$R_G$ = 25Ω, $I_{AS}$ = 6A, $V_{GS}$ =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

## Typical Characteristics

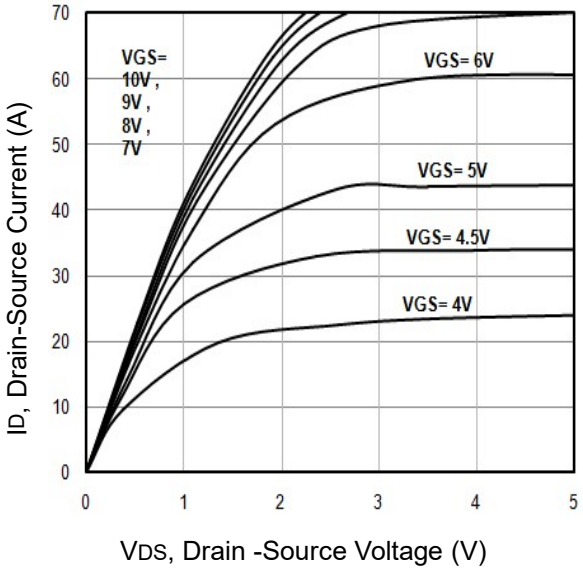



**Fig1.** Typical Output Characteristics

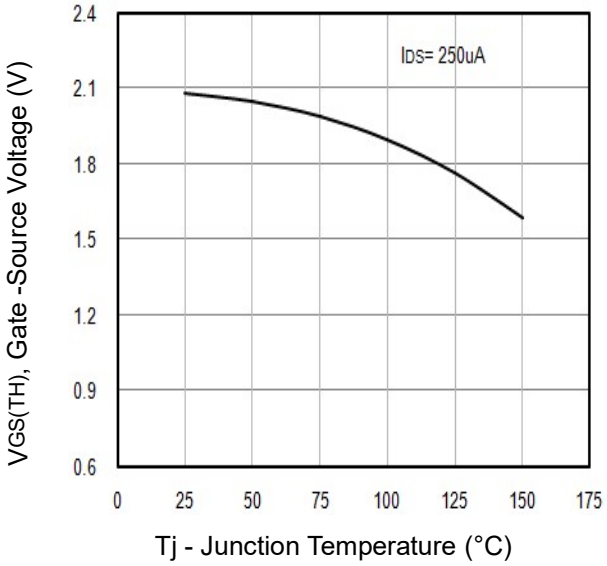



**Fig2.** Threshold Voltage Vs. Temperature

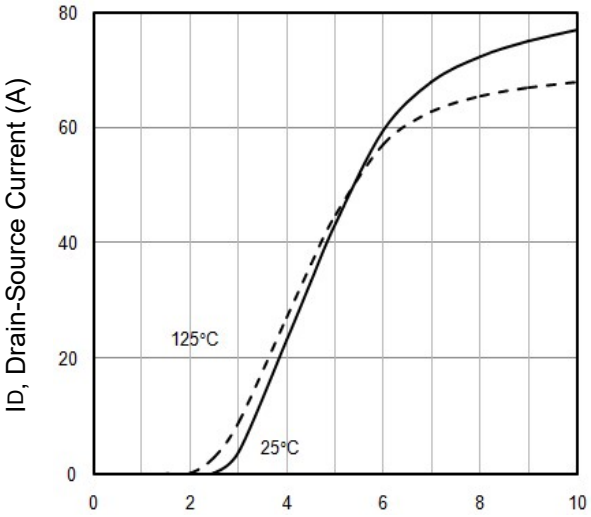



**Fig3.** Typical Transfer Characteristics

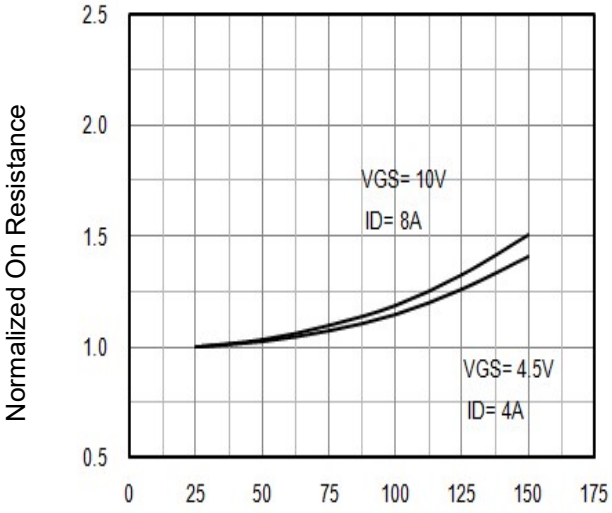



**Fig4.** Normalized On-Resistance Vs. Temperature

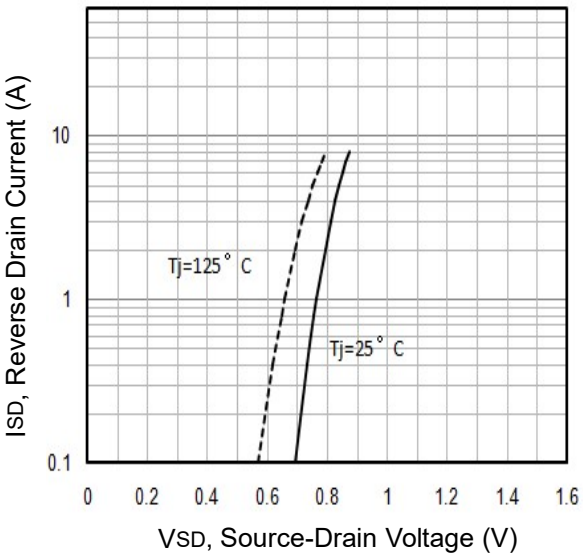



**Fig5.** Typical Source-Drain Diode Forward Voltage

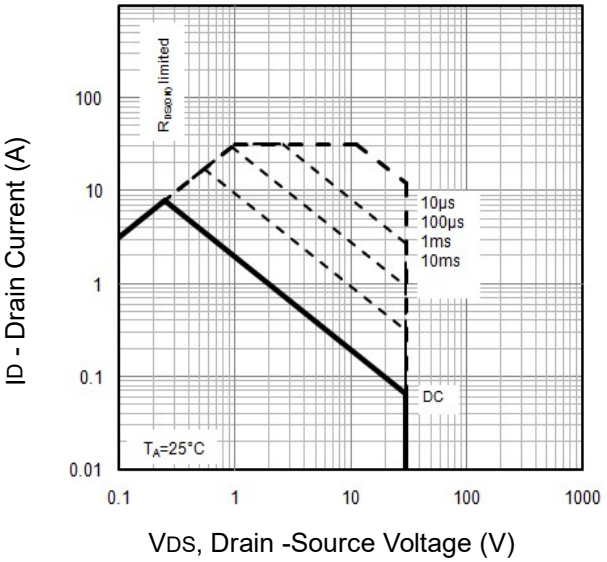



**Fig6.** Maximum Safe Operating Area

## Typical Characteristics

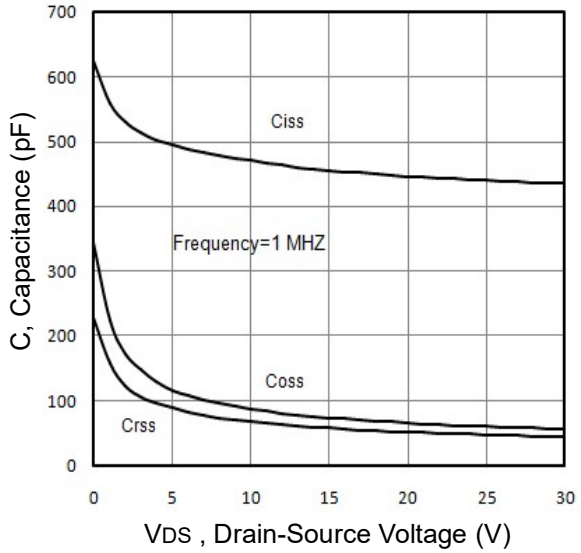



**Fig7.** Typical Capacitance Vs.Drain-Source Voltage

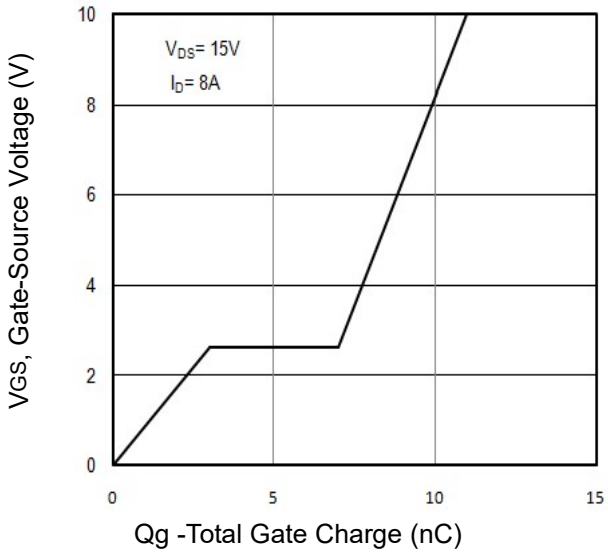



**Fig8.** Typical Gate Charge Vs.Gate-Source Voltage

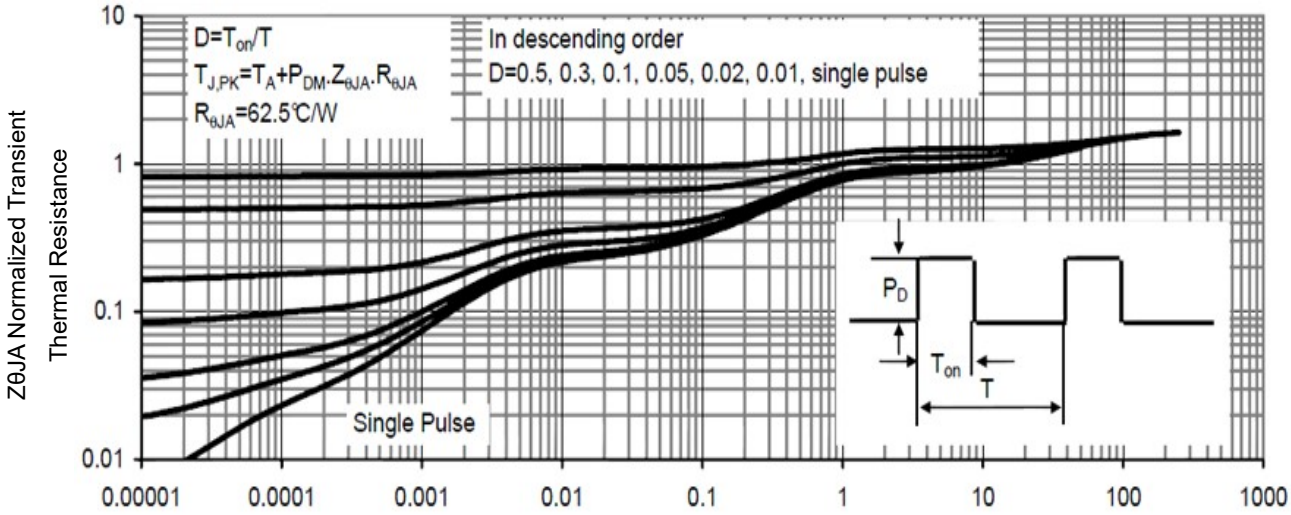



**Fig9.** T1 ,Transient Thermal Response Curve

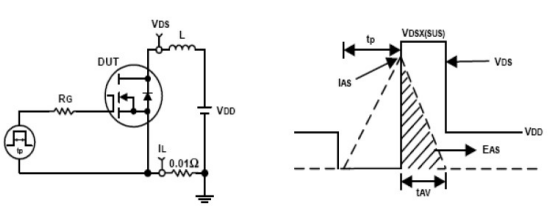



**Fig10.** Unclamped Inductive Test Circuit and waveforms

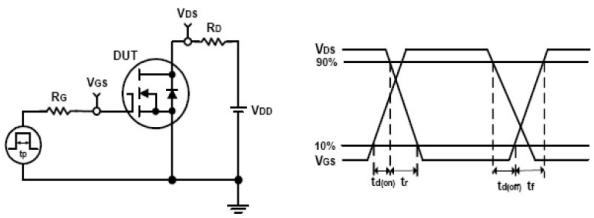



**Fig11.** Switching Time Test Circuit and waveforms