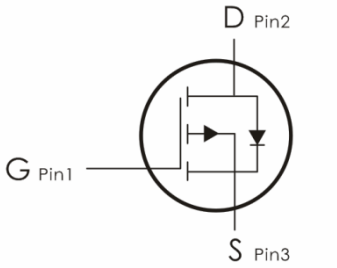
## Description：

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.


## Features：

1) $V_{DS}$=-60V,$I_D$=-35A,$R_{DS(ON)}$<28m Ω @$V_{GS}$=-10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

## Absolute Maximum Ratings： ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | Ratings | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -60 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Continuous Drain Current | -35 | A |
| | Continuous Drain Current-TC=100℃ | -22.1 | |
| | Pulsed Drain Current[1] | -140 | |
| $E_{AS}$ | Single Pulse Avalanche Energy | --- | mJ |
| $P_D$ | Power Dissipation | 72.6 | W |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | ℃ |

## Thermal Characteristics：

| Symbol | Parameter | Max | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance,Junction to Case | 1.72 | ℃/W |
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | 62 | |

## Electrical Characteristics: ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Sourtce Breakdown Voltage | $V_{GS}$=0V,$I_D$=250μA | -60 | --- | --- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{GS}$=0V, $V_{DS}$=-60V | --- | --- | -1 | μA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0A | --- | --- | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | -1 | -1.6 | -2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance | $V_{GS}$=-10V,$I_D$=-8A | --- | 22 | 28 | mΩ |
| | | $V_{GS}$=-4.5V,$I_D$=-6A | --- | 26 | 35 | |
| $G_{FS}$ | Forward Transconductance | $V_{DS}$=-10V, $I_D$=-3A | --- | 18 | --- | S |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-25V, $V_{GS}$=0V, f=1MHz | --- | 2595 | 3900 | pF |
| $C_{oss}$ | Output Capacitance | | --- | 162 | 240 | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 115 | 170 | |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time[2,3] | $V_{DS}$=-30V, $I_D$=-1A, $R_{GEN}$=6Ω, $V_{GS}$=-10V | --- | 25 | 50 | ns |
| $t_r$ | Rise Time[2,3] | | --- | 13.8 | 28 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time[2,3] | | --- | 148 | 290 | ns |
| $t_f$ | Fall Time[2,3] | | --- | 51 | 100 | ns |
| $Q_g$ | Total Gate Charge[2,3] | $V_{GS}$=-10V, $V_{DS}$=-30V, $I_D$=-5A | --- | 43.8 | 88 | nC |
| $Q_{gs}$ | Gate-Source Charge[2,3] | | --- | 4.6 | 9 | nC |
| $Q_{gd}$ | Gate-Drain “Miller” Charge[2,3] | | --- | 8.3 | 17 | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| $V_{SD}$ | Source-Drain Diode Forward Voltage[2] | $V_{GS}$=0V,$I_S$=-1A, $T_J$=25℃ | --- | --- | -1 | V |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Ls** | Continuous Source Current | $V_G=V_D=0V$ , Force Current | --- | --- | -35 | A |
| **Ism** | Pulsed Source Current[3] | | --- | --- | -70 | A |

## Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

## Typical Characteristics: ($T_C$=25℃ unless otherwise noted)

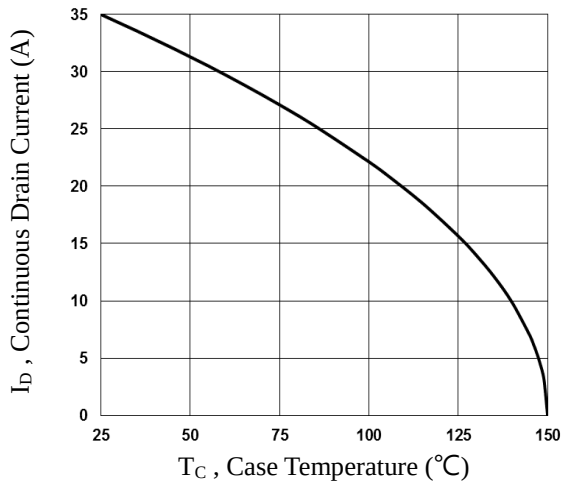



**Fig.1 Continuous Drain Current vs. $T_C$**

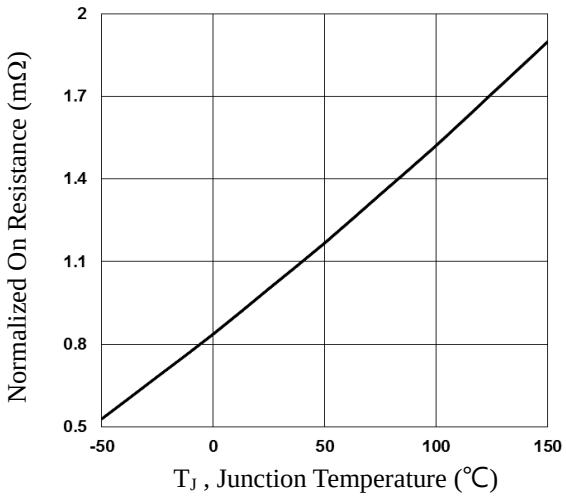



**Fig.2 Normalized RDSON vs. $T_J$**

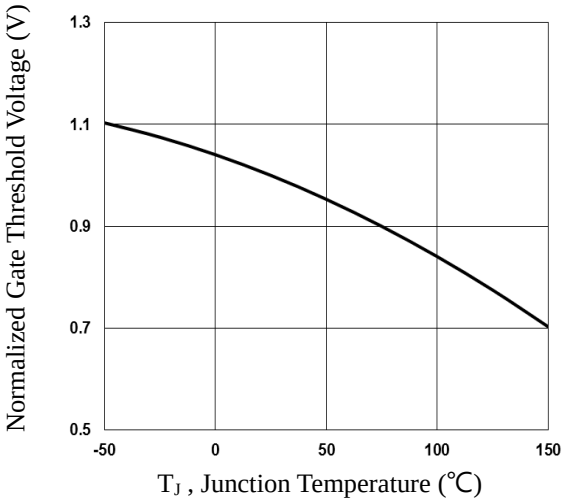



**Fig.3 Normalized $V_{th}$ vs. $T_J$**

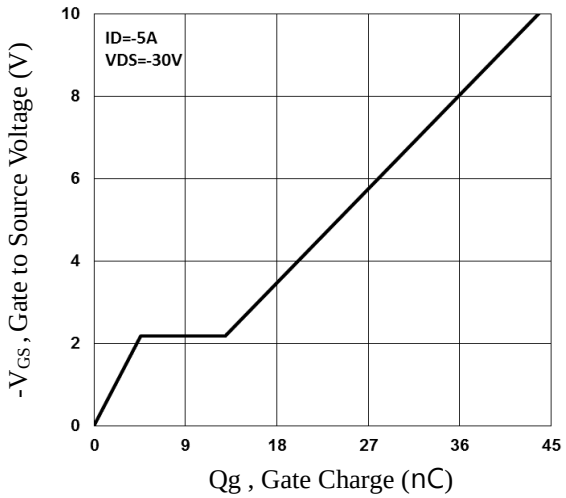



**Fig.4 Gate Charge Waveform**

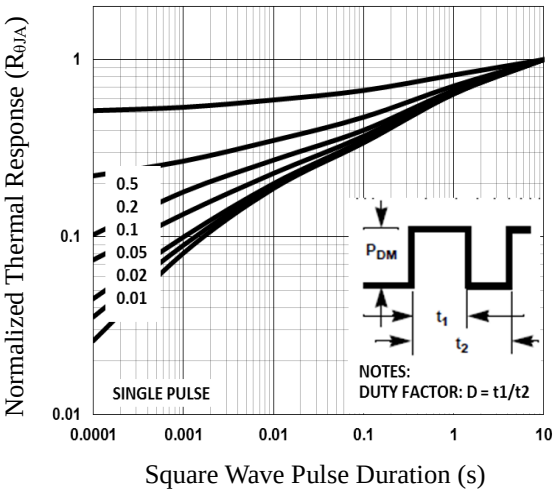



**Fig.5 Normalized Transient Impedance**

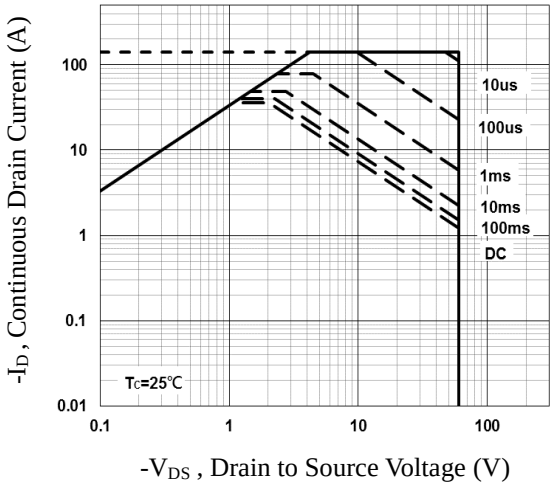



**Fig.6 Maximum Safe Operation Area**

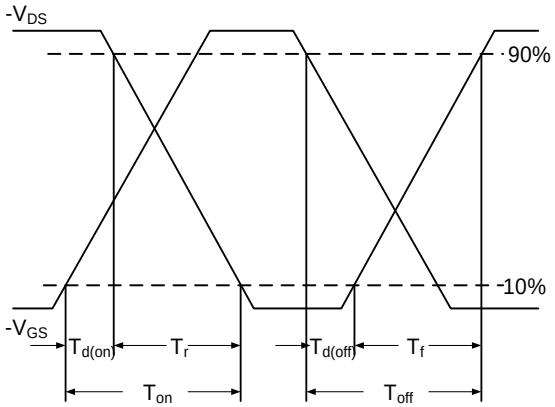



**Fig.7 Switching Time Waveform**

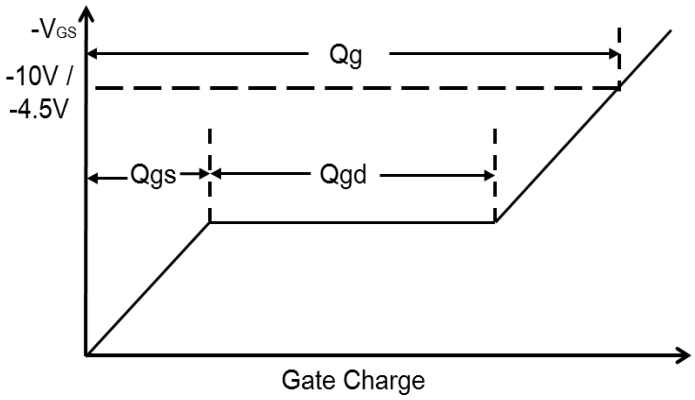



**Fig.8 Gate Charge Waveform**