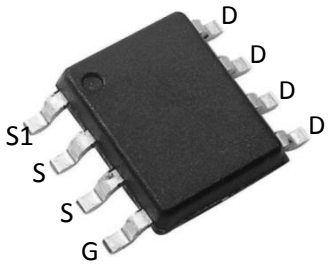
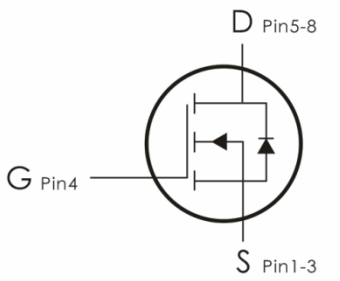
## Description：

This N-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,$I_D$=7A,$R_{DS(ON)}$<32mΩ @$V_{GS}$=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 |
| $I_D$ | Drain Current – Continuous ($T_C$=25℃) | 7 | A |
| | Drain Current – Continuous ($T_C$=100℃) | 3.8 | |
| $I_{DM}$ | Drain Current – Pulsed[1] | 20 | |
| $P_D$ | Power Dissipation ($T_C$=25℃) | 1.5 | W |
| | Power Dissipation – Derate above 25℃ | --- | |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | ℃ |

## Thermal Characteristics：

| Symbol | Parameter | Max | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance,Junction to Case | 36 | ℃/W |
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | 85 | |

## Package Marking and Ordering Information：

| Part NO. | Marking | Package |
|---|---|---|
| DOS7N06 | 7N60 | SOP-8 |

## 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 |
| △BVDSS/△TJ | BVDSS Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | 0.63 | --- | V/℃ |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=48V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=0V , $V_{GS}$=0V , $T_J$=125℃ | --- | --- | 10 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | --- | --- | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | 1.2 | --- | 2.5 | V |
| △VGS(th) | VGS(th) Temperature Coefficient | | --- | -5.24 | --- | mV/℃ |
| $R_{DS(ON)}$ | Static Drain-Source On Resistance | $V_{GS}$=10V,$I_D$=4A | --- | --- | 32 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=2A | --- | --- | 45 | |
| $G_{FS}$ | Forward Transconductance | $V_{DS}$=5V, $I_D$=4A | --- | 21 | --- | S |
| **Dynamic Characteristics**[4] | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V, $V_{GS}$=0V, f=1MHz | --- | 1350 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 85 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 60 | --- | |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time[2,3] | $V_{DD}$=30V, $I_D$=4A, $R_{GEN}$=3.3Ω , $V_{GS}$=10V | --- | 8 | --- | ns |
| $t_r$ | Rise Time[2,3] | | --- | 14.2 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time[2,3] | | --- | 24.4 | --- | ns |
| $t_f$ | Fall Time[2,3] | | --- | 4.6 | --- | ns |

| | | | | | | |
|---|---|---|---|---|---|---|
| $Q_g$ | Total Gate Charge[2,3] | $V_{GS}$=4.5V, $V_{DS}$=48V, $I_D$=4A | --- | 12.6 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge[2,3] | | --- | 3.2 | --- | nC |
| $Q_{gd}$ | Gate-Drain "Miller" Charge[2,3] | | --- | 6.3 | --- | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| $V_{SD}$ | Source-Drain Diode Forward Voltage[3] | $V_{GS}$=0V,$I_S$=1A,$T_J$=25℃ | --- | --- | 1.2 | V |
| $I_S$ | Continuous Source Current | VG=VD=0V , Force Current | --- | --- | 4.8 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 9.6 | A |

## Notes:

1.The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is $V_{DD}$=25V,$V_{GS}$=10V,L=0.1mH,$I_{AS}$=22.6A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as $I_D$ and $I_{DM}$ , in real applications , should be limited by total power dissipation.

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

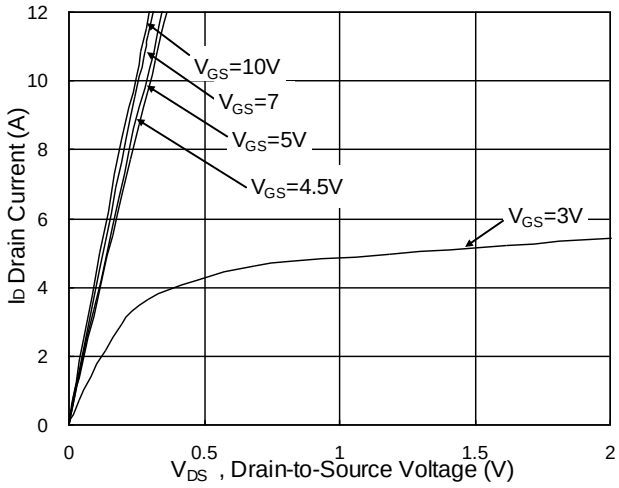



**Fig.1 Typical Output Characteristics**

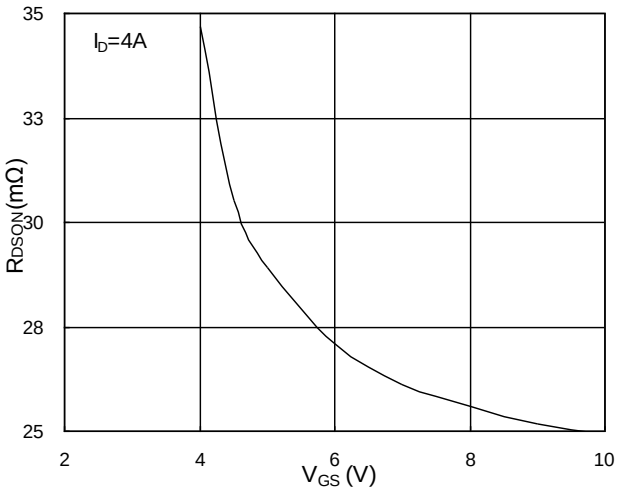



**Fig.2 On-Resistance v.s Gate-Source**

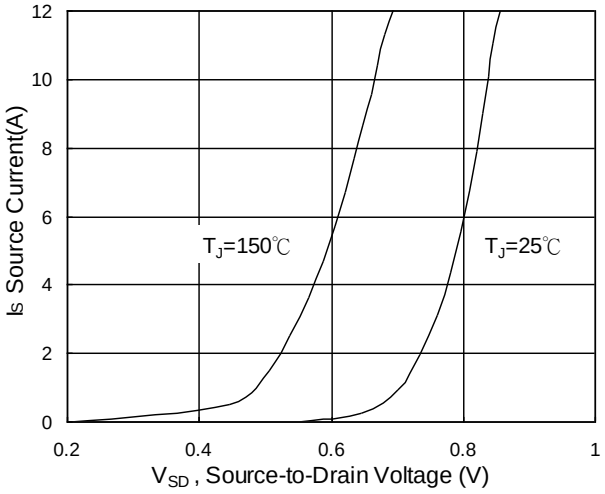



**Fig.3 Forward Characteristics of Reverse**

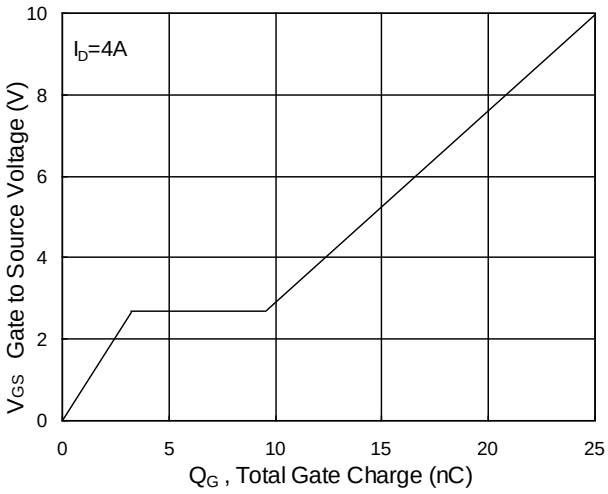



**Fig.4 Gate-Charge Characteristics**

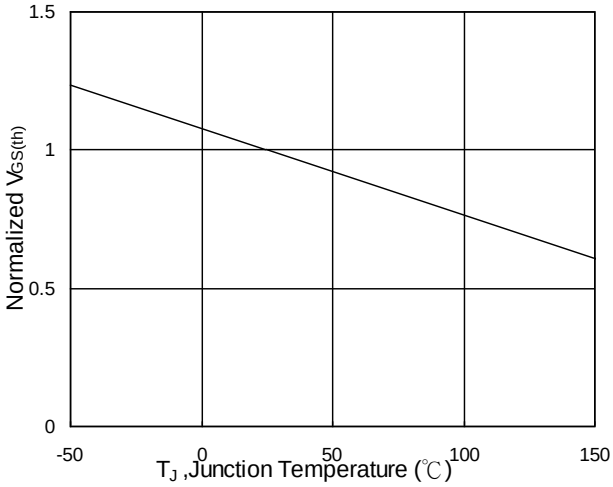



**Fig.5 Normalized $V_{GS(th)}$ v.s $T_J$**

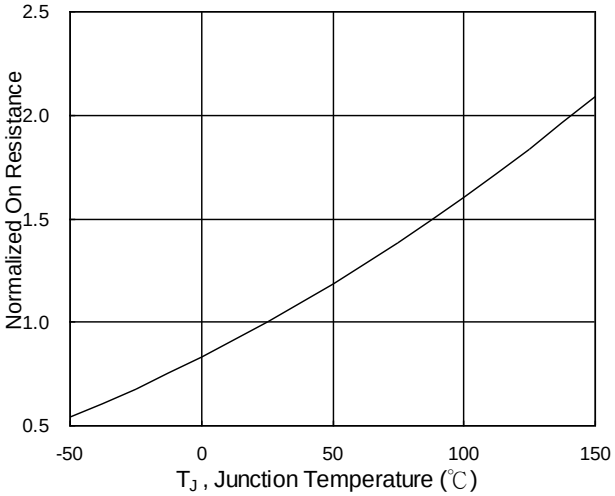



**Fig.6 Normalized $R_{DSON}$ v.s $T_J$**

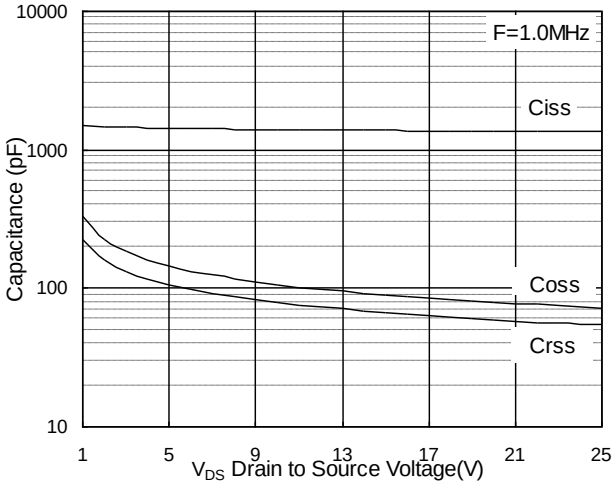



**Fig.7 Capacitance**

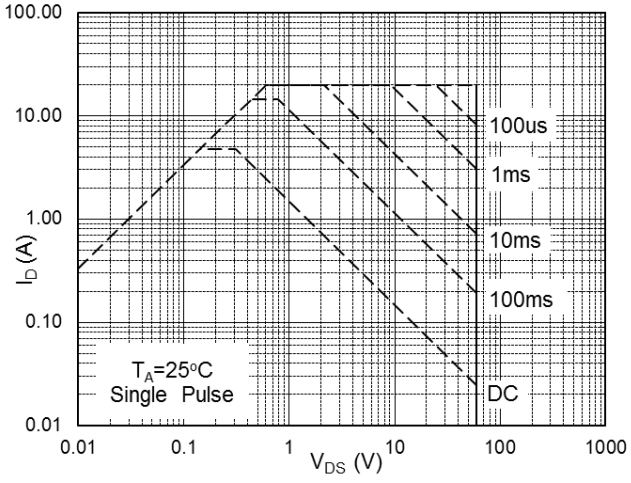



**Fig.8 Safe Operating Area**

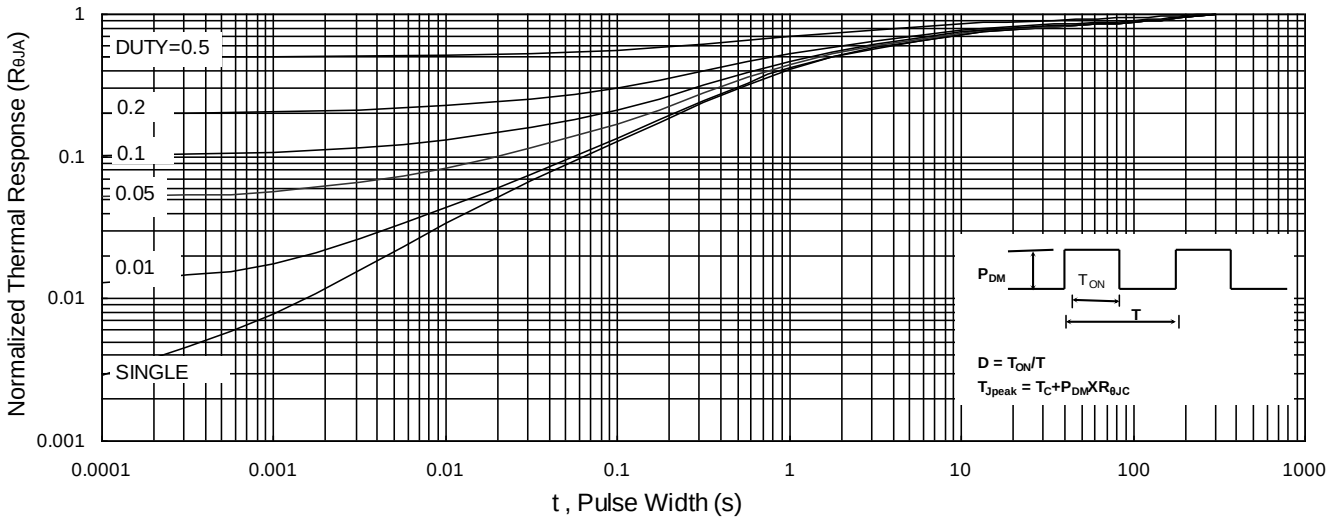



**Fig.9 Normalized Maximum Transient Thermal Impedance**

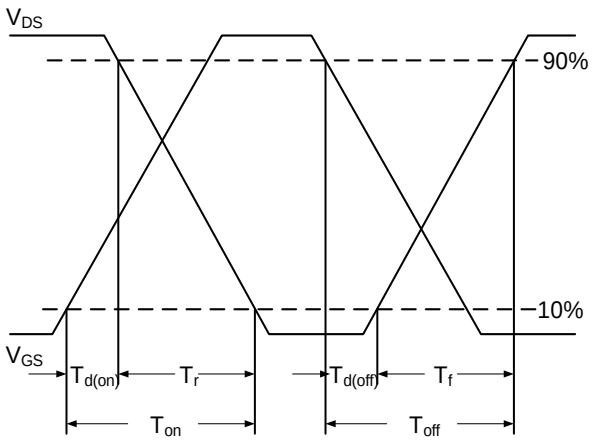



**Fig.10 Switching Time Waveform**

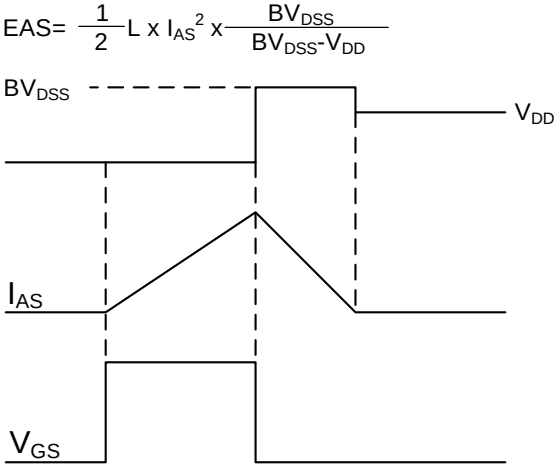



**Fig.11 Unclamped Inductive Waveform**