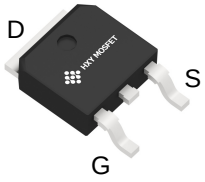
# SUD19P06-60-GE3

P-Channel Enhancement Mode MOSFET

## Description

The SUD19P06-60-GE3 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.




**TO-252-2L**
**(TO-252(DPAK))**

## General Features

$V_{DS}$ =- 60V,$I_D$ =-30A

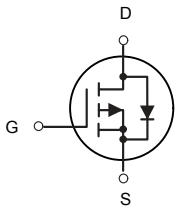
$R_{DS(ON)}$ < 33mΩ @ $V_{GS}$=-10V

## Application

PWM applications

Load switch

Power management




P-Channel MOSFET

### Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---|---|---|---|
| SUD19P06-60-GE3 | TO-252-2L(TO-252(DPAK)) | HXY MOSFET | 2500 |

### ABSOLUTE MAXIMUM RATINGS(TA=25℃unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage ($V_{GS}$=0V) | -60 | V |
| $V_{GS}$ | Gate-Source Voltage ($V_{DS}$=0V) | ±20 | V |
| $I_D$ | Drain Current-Continuous($T_C$=25℃) | -30 | A |
| | Drain Current-Continuous($T_C$=100℃) | -25.5 | A |
| $I_{DM\ (pluse)}$ | Drain Current-Continuous@ Current-Pulsed (Note 1) | -144 | A |
| $P_D$ | Maximum Power Dissipation($T_C$=25℃) | 79 | W |
| | Maximum Power Dissipation($T_C$=100℃) | 39.5 | W |
| $E_{AS}$ | Avalanche energy (Note 2) | 196 | mJ |
| $T_J$, $T_{STG}$ | Operating Junction and Storage Temperature Range | -55 To 175 | ℃ |

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V $I_D$=-250μA | -60 | | | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-60V, $V_{GS}$=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 | -1.8 | -2.5 | V |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$=-5V, $I_D$=-15A | | 35 | | S |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=-10V, $I_D$=-15A | | 29 | 33 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-10A | | 35 | 46 | mΩ |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-25V, $V_{GS}$=0V, f=1.0MHz | | 4026 | | pF |
| $C_{oss}$ | Output Capacitance | | | 134 | | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 98 | | pF |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS}$=-10V, $V_{DS}$=-30V, $R_L$=1.5Ω, $R_{GEN}$=3Ω | | 12.2 | | nS |
| $t_r$ | Turn-on Rise Time | | | 10 | | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 64 | | nS |
| $t_f$ | Turn-Off Fall Time | | | 14 | | nS |
| $Q_g$ | Total Gate Charge | $V_{GS}$=-10V, $V_{DS}$=-30V, $I_D$=-20A | | 68 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 10.5 | | nC |
| $Q_{gd}$ | Gate-Drain Charge | | | 13 | | nC |
| $I_{SD}$ | Source-Drain Current (Body Diode) | | | | 30 | A |
| $V_{SD}$ | Forward on Voltage (Note 3) | $V_{GS}$=0V, $I_S$=-15A | | | -1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_F$=-20A, di/dt=100A/μs | | 26 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | $I_F$=-20A, di/dt=100A/μs | | 29 | | nC |

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.$E_{AS}$ condition: $T_J$=25℃,$V_{DD}$=40V,$V_G$=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

## Typical Electrical And Thermal Characteristics (Curves)

**Figure 1. Output Characteristics**

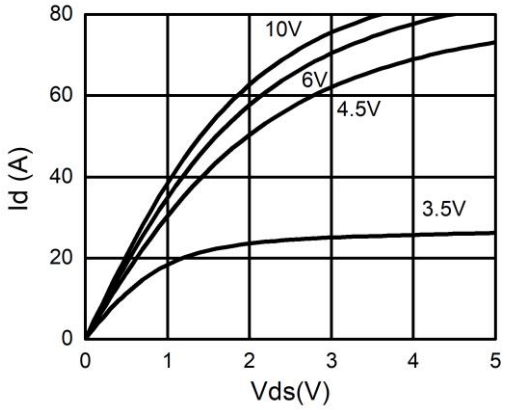



**Figure 2. Transfer Characteristics**

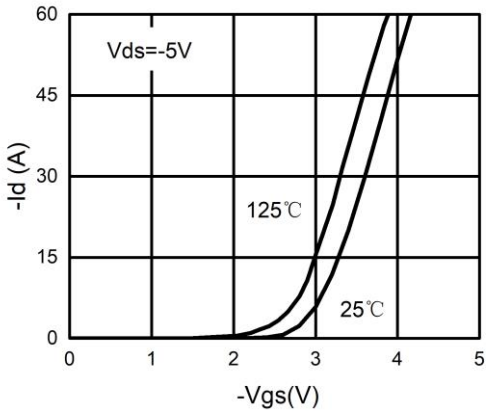



**Figure 3. Power Dissipation**

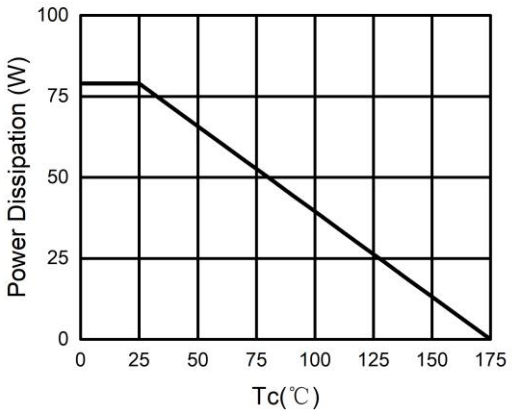



**Figure 4. Drain Current**

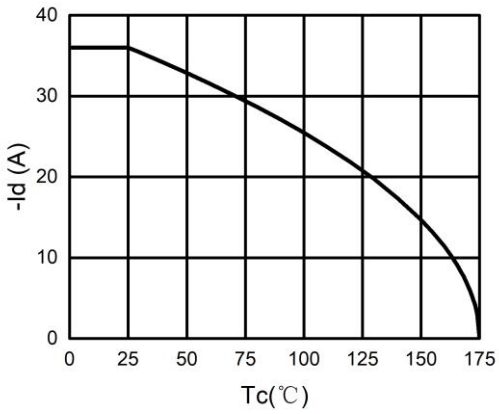



**Figure 5. $BV_{DSS}$ vs Junction Temperature**

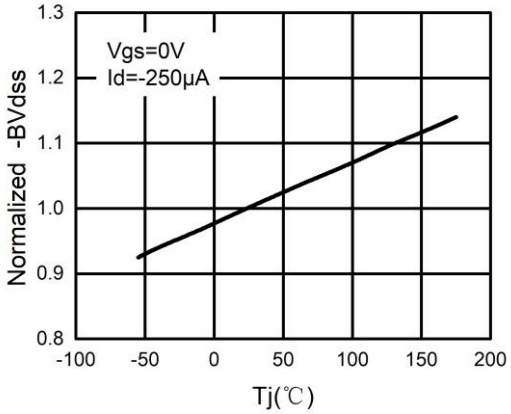



**Figure 6. $R_{DS(ON)}$ vs Junction Temperature**

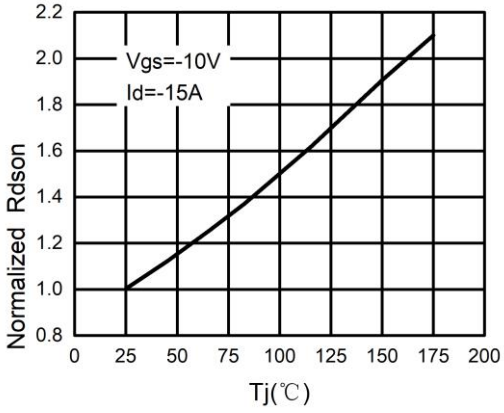


**Figure 7. Gate Charge Waveforms**

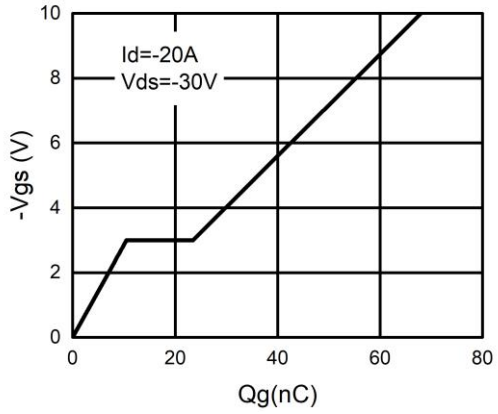



**Figure 8. Capacitance**

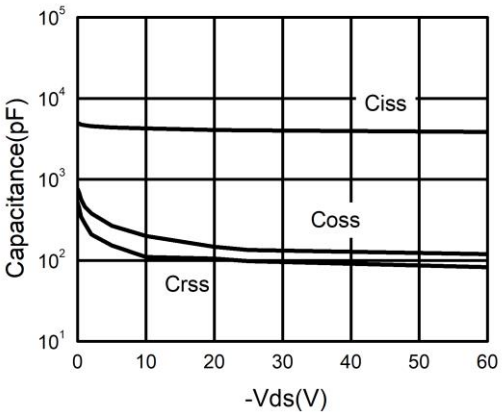



**Figure 9. Body-Diode Characteristics**

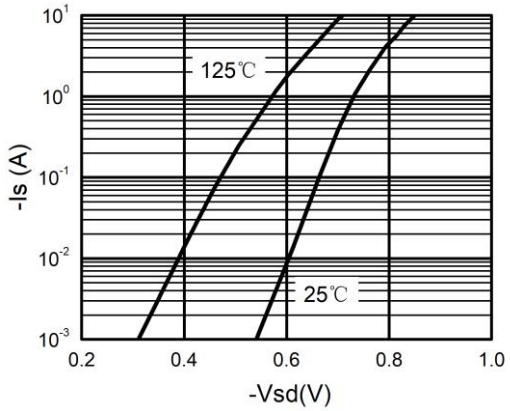
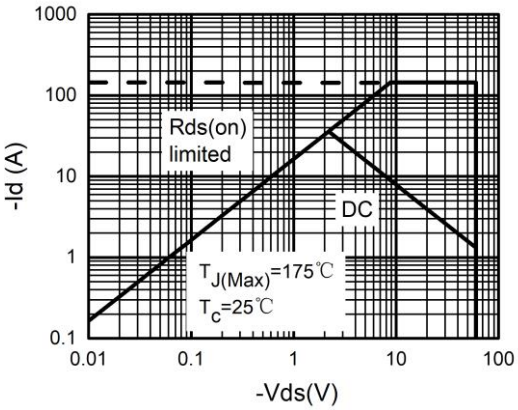
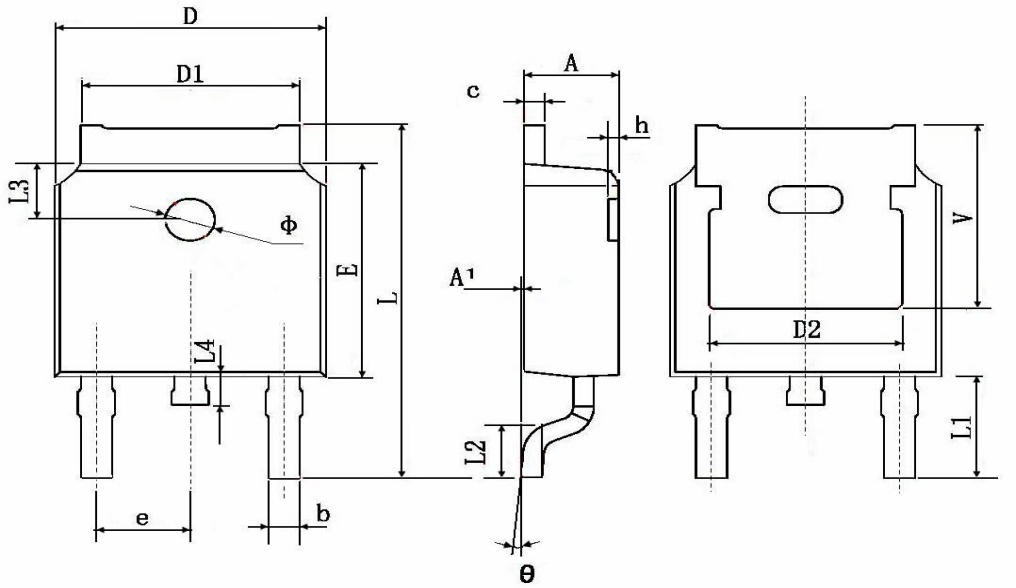



**Figure 10. Maximum Safe Operating Area**



## TO-252-2L(TO-252(DPAK)) Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 TYP. | | 0.190 TYP. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 TYP. | | 0.114 TYP. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 TYP. | | 0.063 TYP. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 TYP. | | 0.211 TYP. | |

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