## -30V P-Channel Power MOSFET

DESCRIPTION：

| | |
|---|---|
| $V_{DSS}$ | -30V |
| $I_D$ (Tc=25℃) | -4.2A |
| $R_{DS(ON)_Typ.}$ @$V_{GS}$=-10V | 36mΩ |

·Advanced Trench Technology

·Provide Excellent $R_{DS(ON)}$ and Low Gate Charge

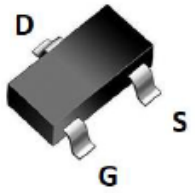
·Lead free

TYPICAL APPLICATIONS：

· Load Switch

· PWM Application

· Power management




SOT-23

MAXIMUM RATINGS (at $T_C$ = 25 °C, unless otherwise specified)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | -30 | V |
| Gate-Source Voltage | $V_{GSS}$ | ±12 | V |
| Continuous Drain Current<br>$T_C$ = 25℃<br>$T_C$ = 100℃ | $I_D$ | -4.2<br>-3 | A |
| Pulsed Drain Current (1) | $I_{DM}$ | -17 | A |
| Power dissipation | $P_D$ | 1.2 | mW |
| Junction & Storage temperature Range | $T_J$, $T_{STG}$ | -55~+150 | ℃ |
| Thermal Resistance, Junction to Case | $R_{\theta JA}$ | 108 | ℃/W |

**Notes**:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. $R_{\theta JA}$ is measured with the device mounted on a 1inch2 pad of 2oz copper FR4 PCB

ELECTRICAL CHARATERISTICS (at $T_J$ = 25 °C, unless otherwise specified)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage<br>VGS = 0V, ID = 250uA | $V_{(BR)DSS}$ | -30 | | | V |
| Zero Gate Voltage Drain Current<br>VDS = -30 V, VGS = 0 V | $I_{DSS}$ | | | 1.0 | uA |
| Gate-Source Leakage Current<br>VGS = ±12V, VDS = 0V | $I_{GSS}$ | | | ±100 | nA |
| Gate-Source threshold voltage<br>VDS = VGS, ID = -250uA | $V_{GS(th)}$ | -0.6 | -0.9 | -1.3 | V |
| Drain-Source On-State Resistance<br>VGS = -10V, ID = -4A<br>VGS = -4.5V, ID = -3A<br>VGS = -2.5V, ID = -1A | $R_{DS(on)}$ | | 36<br>41<br>52 | 47<br>53<br>68 | mΩ |
| Input capacitance<br>f=1MHz, VDS=-15 V, VGS=0 V | $C_{iss}$ | | 762 | | pF |
| Output capacitance<br>f=1MHz, VDS=-15 V, VGS=0 V | $C_{oss}$ | | 74 | | pF |
| Reverse transfer capacitance<br>f=1MHz, VDS=-15 V, VGS=0 V | $C_{rss}$ | | 61 | | pF |
| Total Gate Charge<br>VDS =-15V, ID =-3A,VGS =0 to -4.5V | Qg | | 8 | | nC |
| Gate-Source Charge<br>VDS =-15V, ID =-3A,VGS =0 to -4.5V | $Qg_S$ | | 2 | | nC |
| Gate-Drain("Miller") Charge<br>VDS =-15V, ID =-3A,VGS =0 to -4.5V | Qgd | | 2 | | nC |
| Turn-on delay time<br>VDD= -15V, VGS= -4.5V, ID=-3A, $R_{GEN}$=3Ω | td (ON) | | 8 | | ns |
| Rise time<br>VDD= -15V, VGS= -4.5V, ID=-3A, $R_{GEN}$=3Ω | tr | | 16 | | ns |
| Turn-off delay time<br>VDD= -15V, VGS= -4.5V, ID=-3A, $R_{GEN}$=3Ω | td (OFF) | | 46 | | ns |
| Fall time<br>VDD= -15V, VGS= -4.5V, ID=-3A, $R_{GEN}$=3Ω | tf | | 34 | | ns |
| Maximum Continuous Drain to Source Diode Forward Current | $I_S$ | | | -4.2 | A |
| Maximum Pulsed Drain to Source Diode Forward Current | $I_{SM}$ | | | -17 | A |
| Drain to Source Diode Forward Voltage<br>VGS = 0V, IS =-4.2A | $V_{SD}$ | | | -1.2 | V |
| Body Diode Reverse Recovery Time<br>$I_F$ = -3A, di/dt = 100A/us | Trr | | 8 | | ns |
| Body Diode Reverse Recovery Charge<br>$I_F$ = -3A, di/dt = 100A/us | Qrr | | 3 | | nC |

## Typical Performance Characteristics

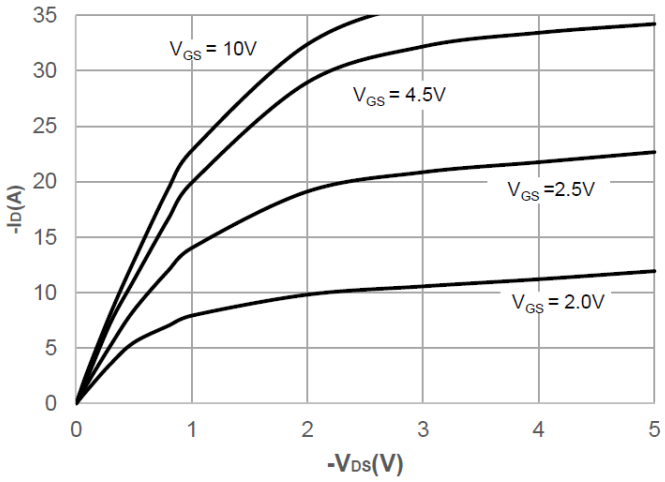



Figure 1. Output Characteristics

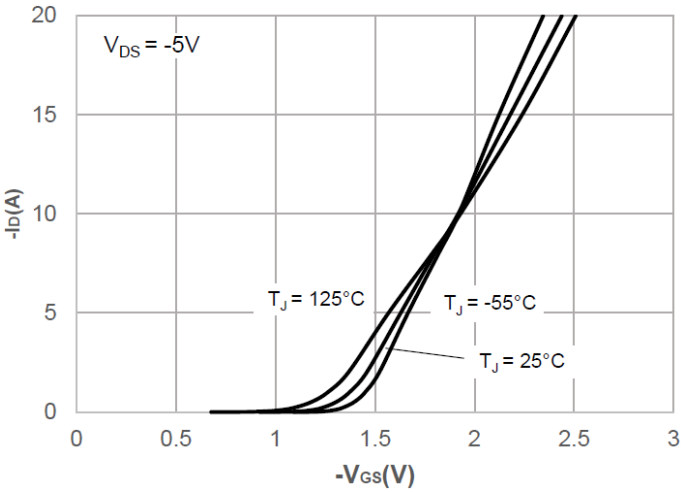



Figure 2. Typical Transfer Characteristics

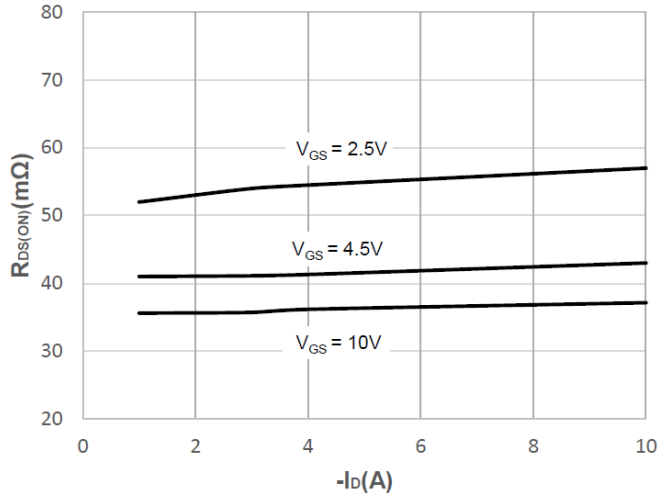



Figure 3. On-resistance vs. Drain Current

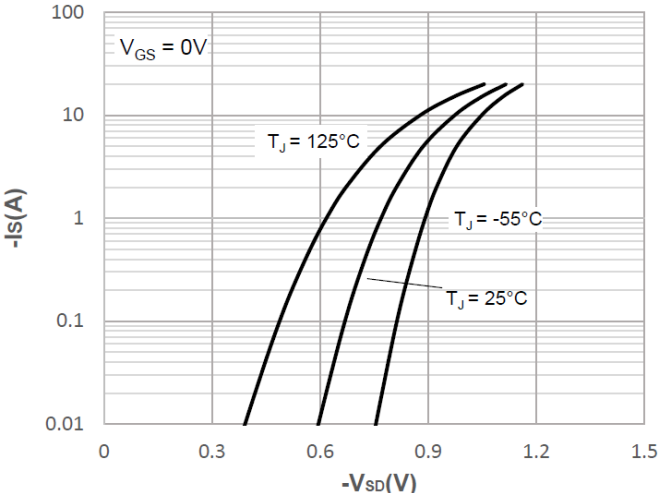



Figure 4. Body Diode Characteristics

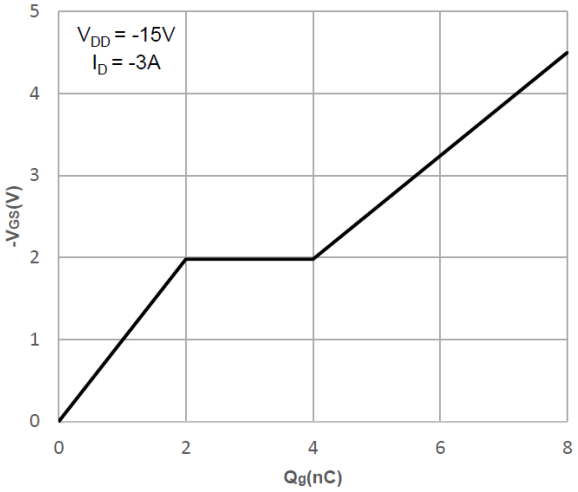



Figure 5. Gate Charge Characteristics

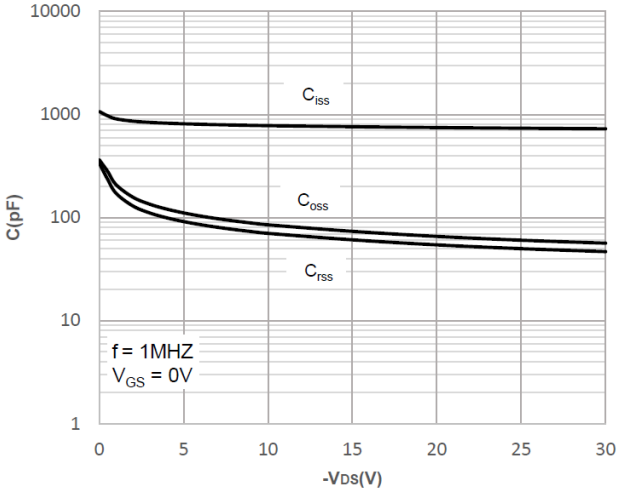



Figure 6. Capacitance Characteristics

Typical Performance Characteristics

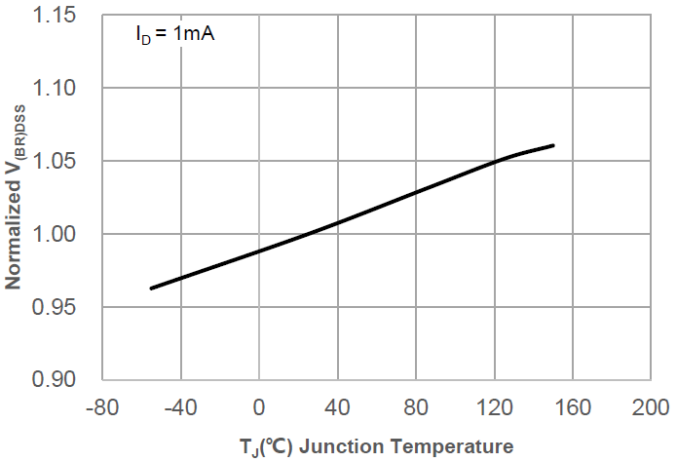



Figure 7. Normalized Breakdown Voltage vs. Junction Temperature

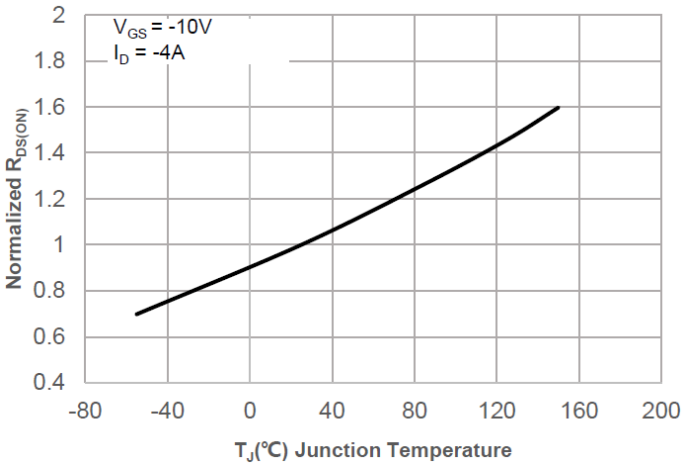



Figure 8. Normalized on Resistance vs. Junction Temperature

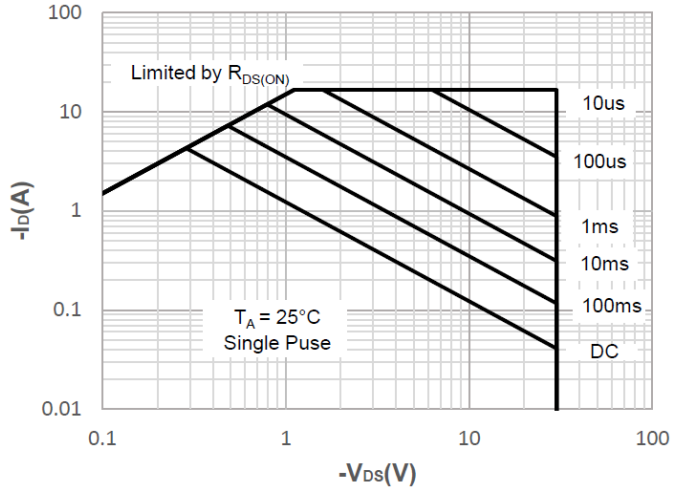



Figure 9. Maximum Safe Operating Area

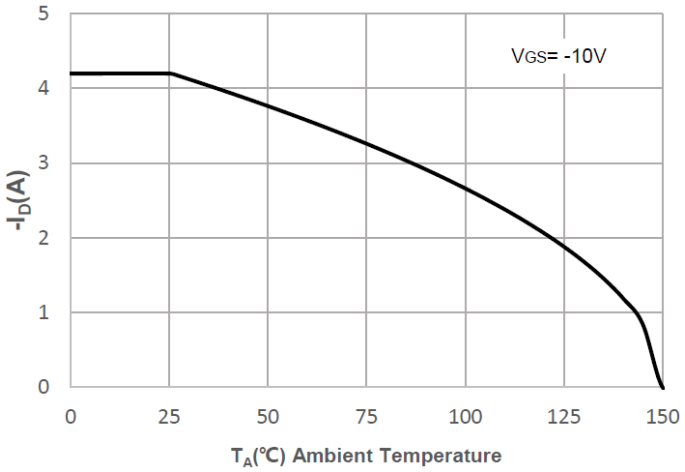



Figure 10. Maximum Continuous Drian Current vs. Ambient Temperature

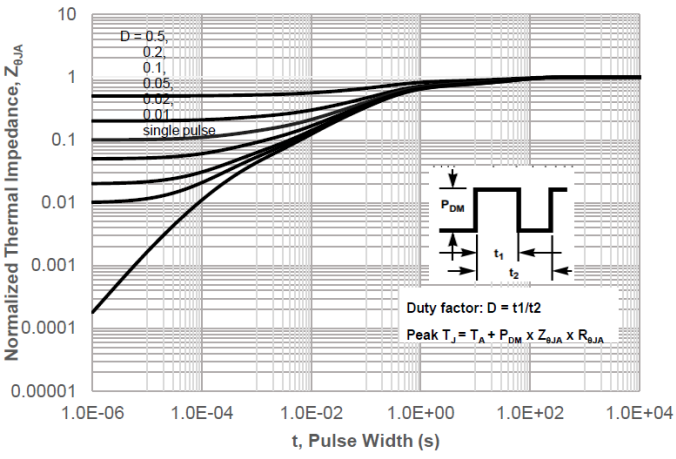



Figure 11. Normalized Maximum Transient Thermal Impedance

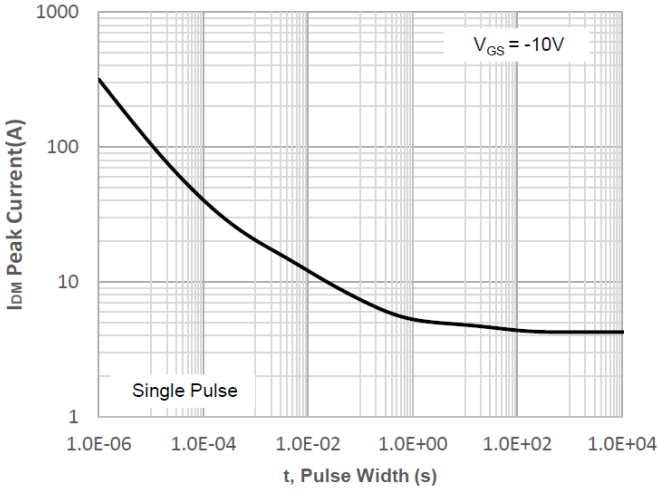
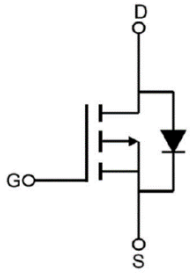
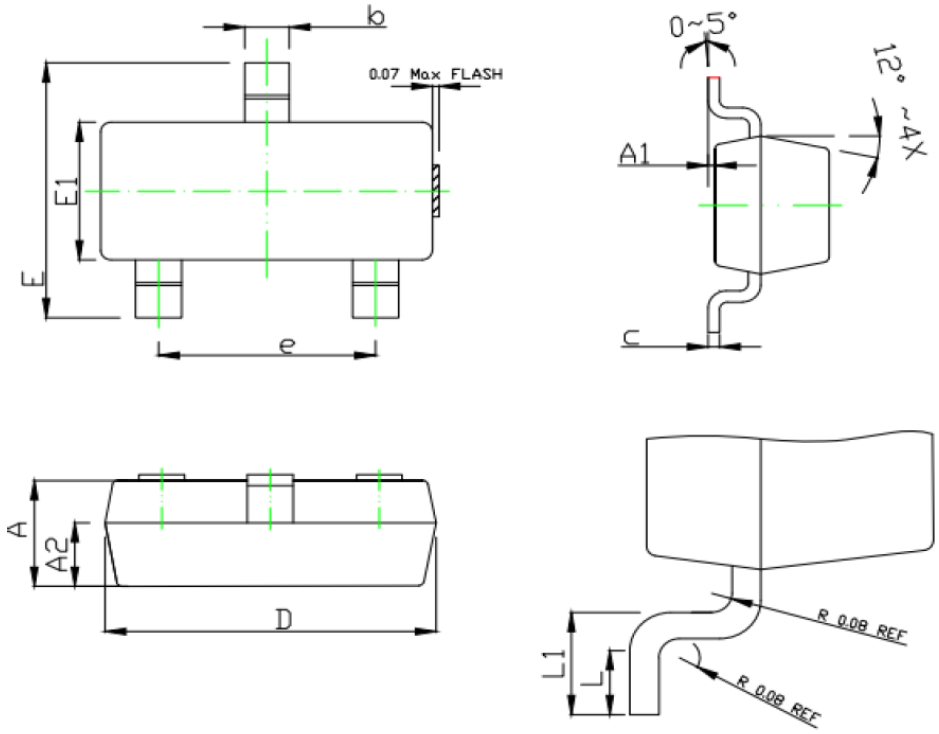



Figure 12: Peak Current Capacity

·Circuit diagram




·Package outlines : Dimensions in (mm)




| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 0.95 | 1.00 | 1.05 |
| A1 | 0.01 | 0.05 | 0.10 |
| b | 0.35 | 0.40 | 0.45 |
| c | | 0.11 BSC | |
| D | 2.80 | 2.90 | 3.00 |
| E | 2.30 | 2.40 | 2.50 |
| E1 | 1.20 | 1.30 | 1.40 |
| e | | 1.90 BSC | |
| L | 0.20 | – | – |
| L1 | 0.30 | 0.40 | 0.50 |
| A2 | | 0.60 REF | |

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