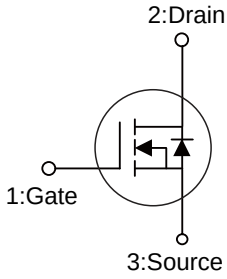
## ■ PRODUCT CHARACTERISTICS

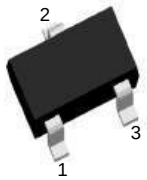
| | |
|---|---|
| $V_{DSS}$ | 100V |
| $R_{DS(ON)}$ Typ(@$V_{GS}$=10V) | 207mΩ |
| $R_{DS(ON)}$ Typ(@$V_{GS}$=4.5V) | 220mΩ |
| $I_D$ | 3A |

Symbol




## ■ APPLICATIONS

* High efficiency switch mode power supplies
* Electronic lamp ballasts based on half bridge
* LED power supplies




SOT-23A-3L

## ■ FEATURE

* High Switching Speed
* Improved dv/dt capability

## ■ ORDER INFORMATION

| Order Codes | | Package | Packing |
|---|---|---|---|
| Halogen-Free | Halogen | | |
| N/A | MOT3N10A3 | SOT-23A-3L | 3000 pieces/Reel |

## ■ ABSOLUTE MAXIMUM RATINGS($T_A$=25°C,unless otherwise specified)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 100 | V |
| Gate-Source Voltage | $V_{GSS}$ | ±20 | V |
| Drain Current Continuous(@$V_{GS}$=10V ,$T_A$=25°C ) | $I_D$ | 3 | A |
| Drain Current Pulsed | $I_{DM}$ | 12 | A |
| Avalanche Energy * | $E_{AS}$ | 9 | mJ |
| Power Dissipation | $P_D$ | 0.35 | W |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55~ +150 | °C |

## ■ THERMAL CHARACTERISTICS

| Parameter | Symbol | Typ | Unit |
|---|---|---|---|
| Junction to Ambient | $R_{thJA}$ | 350 | °C/W |

Note: * EAS condition: $T_J$=25°C ,$V_{DD}$=20V,$V_G$=10V ,L=0.5mH,$R_g$ =25Ω

■ ELECTRICAL CHARACTERISTICS ($T_C$=25°C, unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Off characteristics | | | | | | |
| Drain to Source Breakdown Voltage | $V_{DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 100 | - | - | V |
| Drain to Source Leakage Current | $I_{DSS}$ | $V_{DS}$=100V,$V_{GS}$=0V | - | - | 1 | μA |
| Gate to Source Forward Leakage | $I_{GSS(F)}$ | $V_{DS}$=0V, $V_{GS}$=+20V | - | - | 100 | nA |
| Gate to Source Reverse Leakage | $I_{GSS(R)}$ | $V_{DS}$=0V, $V_{GS}$=-20V | - | - | -100 | nA |
| On characteristics | | | | | | |
| Drain to Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V,$I_D$=1.5A | - | 207 | 260 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=1A | - | 220 | 280 | mΩ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1 | 1.5 | 2.5 | V |
| Dynamic characteristics | | | | | | |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$=10V,$I_D$=1A | 2 | - | - | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=15V,$V_{GS}$=0V<br>f=1.0MHz | - | 380 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 16 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 14 | - | pF |
| Resistive Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(ON)}$ | $I_D$=3A, $V_{DS}$=80V<br>$R_G$=25Ω ,$V_{GS}$=10V | - | 6 | - | ns |
| Rise Time | $t_r$ | | - | 15 | - | ns |
| Turn-off Delay Time | $t_{d(OFF)}$ | | - | 44 | - | ns |
| Fall Time | $t_f$ | | - | 25 | - | ns |
| Total Gate Charge | $Q_g$ | $I_D$=3 A, $V_{DS}$=80V<br>$V_{GS}$=10V | - | 18.2 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | | - | 3 | - | nC |
| Gate to Drain("Miller") Charge | $Q_{gd}$ | | - | 4.1 | - | nC |
| Source-Drain Diode Characteristics | | | | | | |
| Continuous Source Current(Body Diode) | $I_S$ | | - | - | 3 | A |
| Maximum Pulsed Current(Body Diode) | $I_{SM}$ | | - | - | 12 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_{SD}$=1A, $V_{GS}$=0V | - | 0.81 | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{SD}$ =3A, $T_J$=25°C<br>dI/dt=100A/μs | - | 39 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 40 | - | nC |

## ■ TYPICAL CHARACTERISTICS

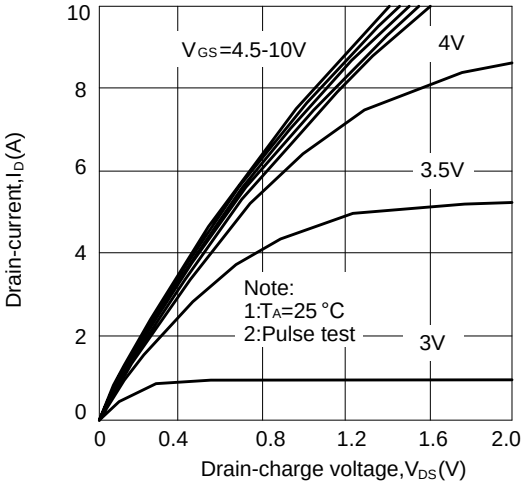



Figure 1:Drain current vs.drain-source voltage

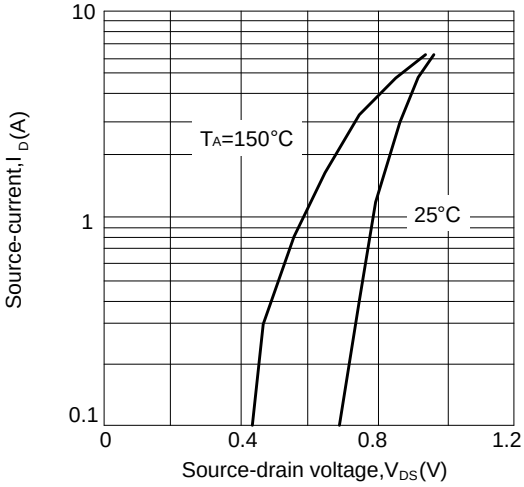



Figure 2:Source currentvs.source-drain

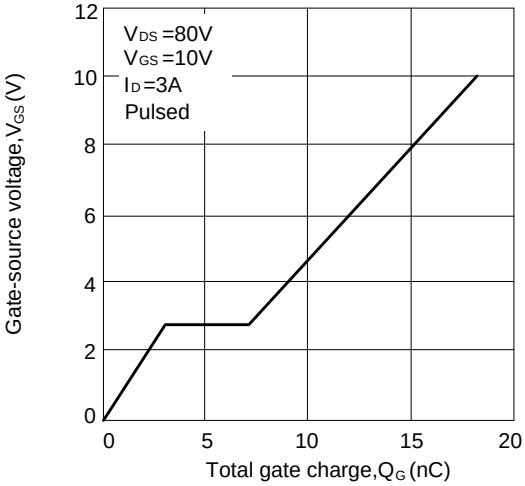



Figure 3:Gate charge characteristics

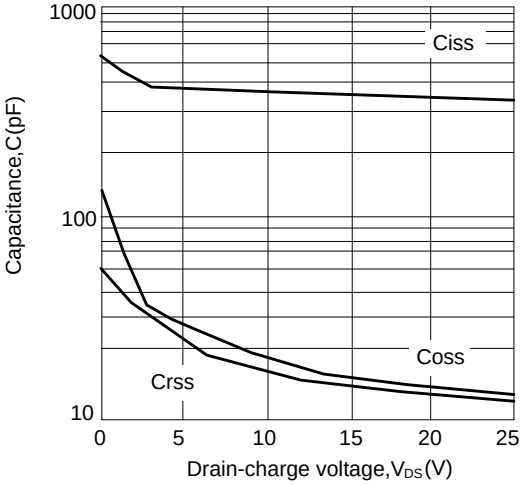



Figure 4:Capacitance characteristics

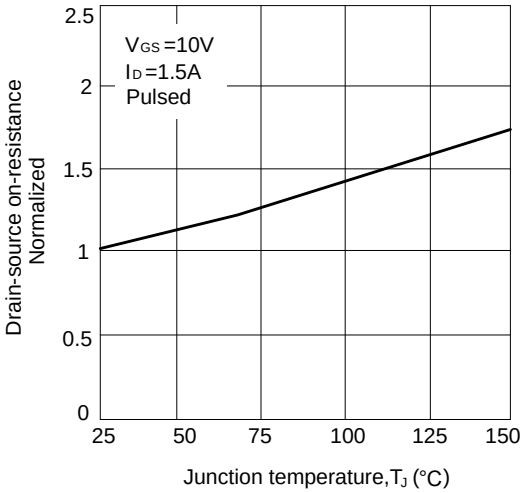



Figure 5:Drain-source on-resistance vs. junction temperature

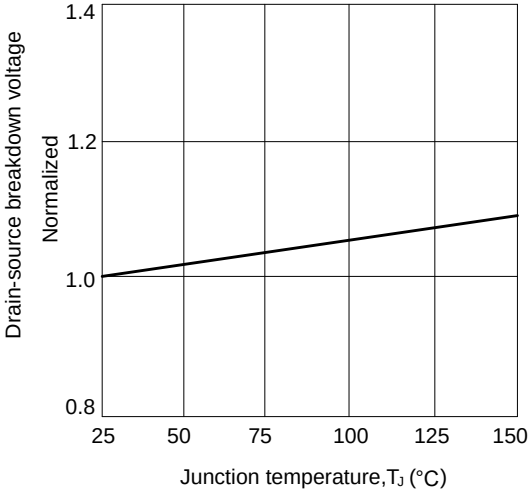



Figure 6:Breakdown voltage vs. junction temperature

■ TYPICAL CHARACTERISTICS(Cont.)

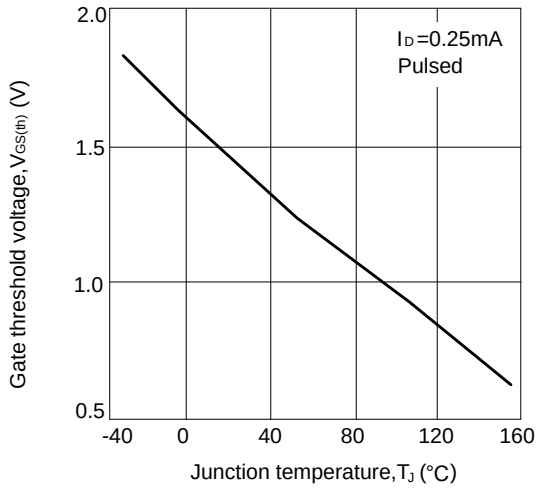



Figure 7:Gate threshlid voltage vs junction temperature

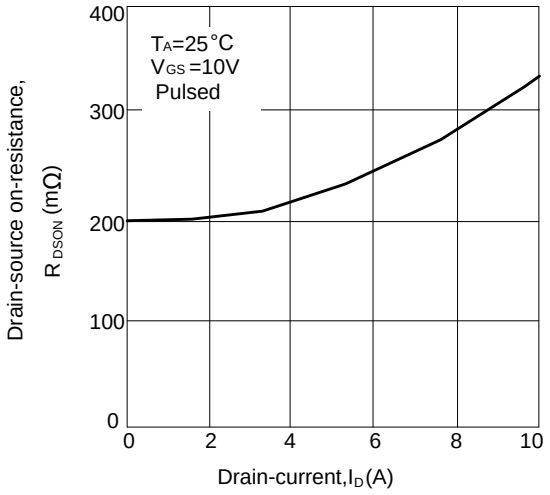



Figure 8:Drain-source on-resistance vs. drain-current

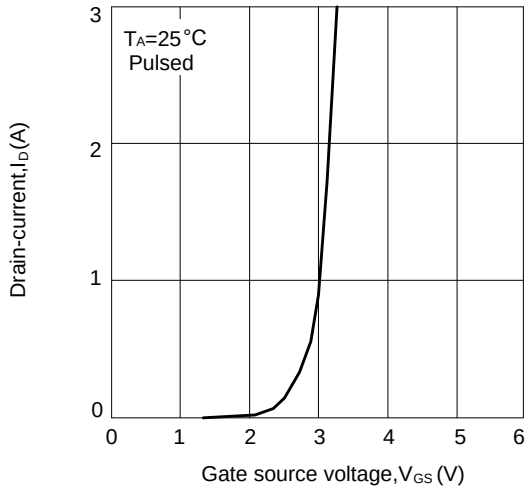



Figure 9:Drain-current vs. gate-source Voltage

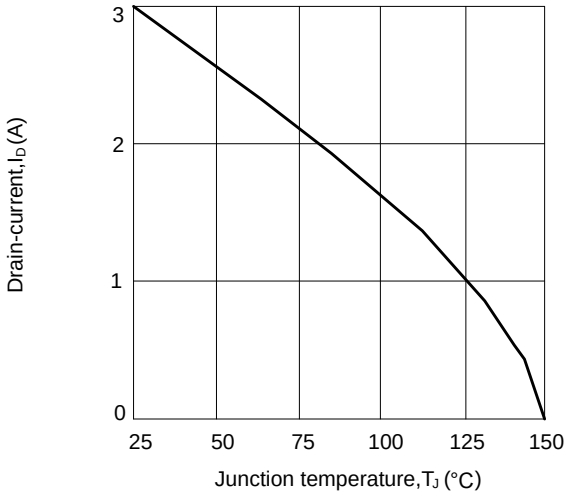



Figure 10:Drain current vs.junction temperature

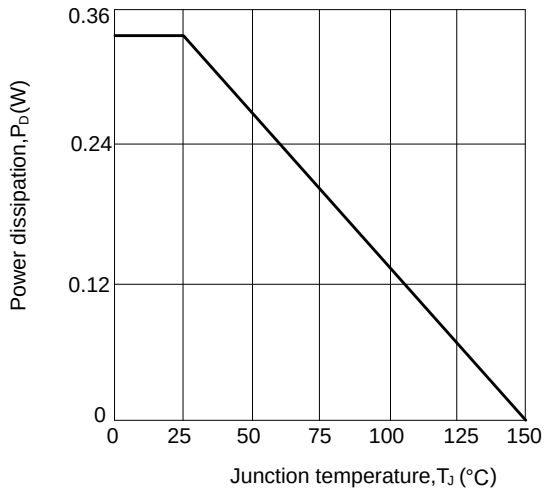



Figure 11:Power dissipation vs.junction temperature

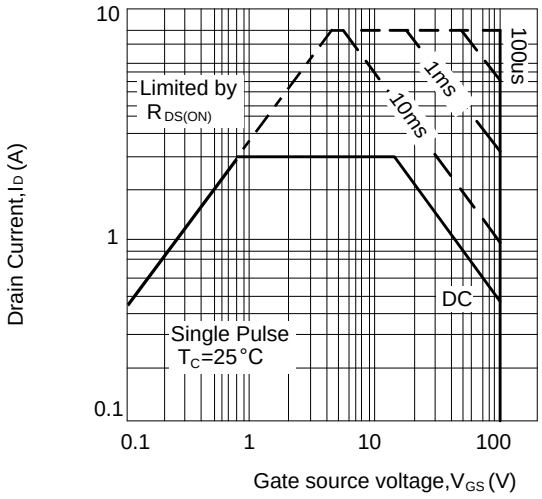
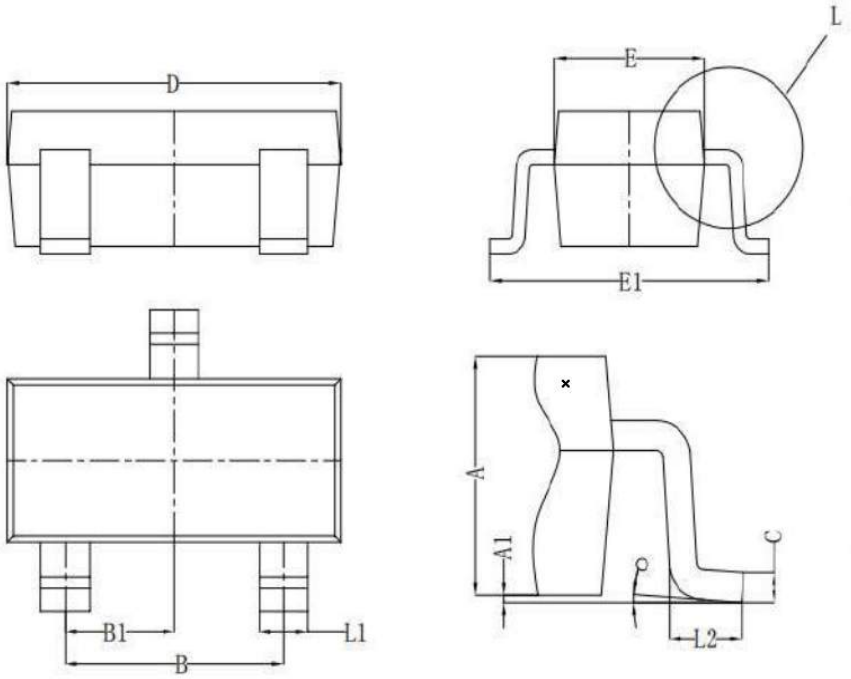



Figure 12:Safe operating area

■ SOT-23A-3L PACKAGE OUTLINE DIMENSIONS




| Symbol | Dim in mm | | |
|---|---|---|---|
| | Min | Nor | Max |
| A | 1.050 | 1.100 | 1.150 |
| A1 | 0.000 | 0.050 | 0.100 |
| L1 | 0.300 | 0.400 | 0.500 |
| C | 0.100 | 0.150 | 0.200 |
| D | 2.820 | 2.920 | 3.020 |
| E | 1.500 | 1.600 | 1.700 |
| E1 | 2.650 | 2.800 | 2.950 |
| B | 1.800 | 1.900 | 2.000 |
| B1 | 0.950 TYP | | |
| L2 | 0.300 | 0.450 | 0.600 |
| o | 0° | 4° | 8° |