# MU0E100AP

## -40V/-100A P-Channel MOSFET

### Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

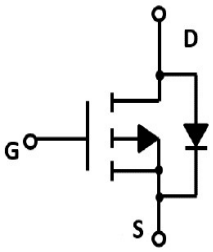
### Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|---|---|---|
| -40V | 5.6mΩ@-10V | -100A |
| | 7.8mΩ@-4.5V | |

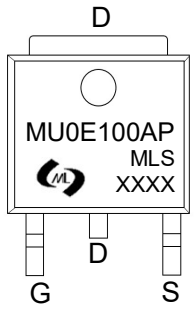
### Application

- PWM applications
- Power management
- Load switch


TO-252 top view




Schematic diagram




MU0E100AP: Device code
XXXX: Code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

**Absolute Maximum Ratings (TA=25℃unless otherwise noted)**

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings (TC=25°C Unless Otherwise Noted)** | | | | |
| $V_{DS}$ | Drain-Source Breakdown Voltage | | -40 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | Tc=25°C | -100 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DM}$ | Pulse Drain Current Tested | Tc=25°C | -400 | A |
| $I_D$ | Continuous Drain Current | Tc=25°C | -100 | A |
| $P_D$ | Maximum Power Dissipation | Tc=25°C | 85 | W |
| $R_{\theta JA}$ | Thermal Resistance Junction-to-Ambient | | 45 | °C/W |

**Ordering Information (Example)**

| Type | Package | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|---|---|---|---|---|---|---|
| MU0E100AP | TO-252 | MU0E100AP | 2,500 | 5,000 | 350,000 | 13"reel |

| Electrical Characteristics (TJ=25℃ unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Parameter** | **Condition** | **Min** | **Typ** | **Max** | **Unit** |
| **Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $BV_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V，$I_D$=-250μA | -40 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-40V，$V_{GS}$=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 | -1.0 | -- | -2.5 | V |
| $R_{DS(on)}$ | Drain-Source On-State Resistance | $V_{GS}$=-10V，$I_D$=-20A | -- | 4.3 | 5.6 | mΩ |
| | | $V_{GS}$=-4.5V，$I_D$=-15A | -- | 5.6 | 7.8 | mΩ |
| **Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{DS}$=-20V，$V_{GS}$=0V， f=1MHz | -- | 6638 | -- | pF |
| $C_{OSS}$ | Output Capacitance | | -- | 545 | -- | pF |
| $C_{RSS}$ | Reverse Transfer Capacitance | | -- | 345 | -- | pF |
| **Switching Characteristics** | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-20V，$I_D$=-20A，$V_{GS}$=-10V | -- | 118 | -- | nC |
| $Q_{gs}$ | Gate Source Charge | | -- | 13 | -- | nC |
| $Q_{gd}$ | Gate Drain Charge | | -- | 22 | -- | nC |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=-20V，$I_D$=-20A，$V_{GS}$=-10V，$R_G$=3Ω | -- | 16 | -- | nS |
| $t_r$ | Turn-on Rise Time | | -- | 17 | -- | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 68 | -- | nS |
| $t_f$ | Turn-Off Fall Time | | -- | 31 | -- | nS |
| **Source- Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Forward on voltage | Tj=25℃，Is=-10A | -- | -- | -1.2 | V |

## Typical Operating Characteristics

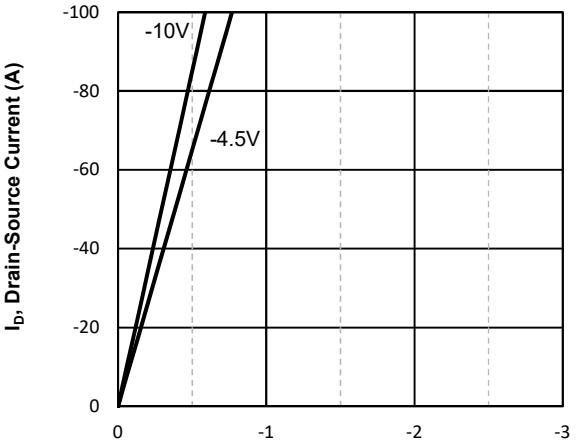



Fig1. Typical Output Characteristics

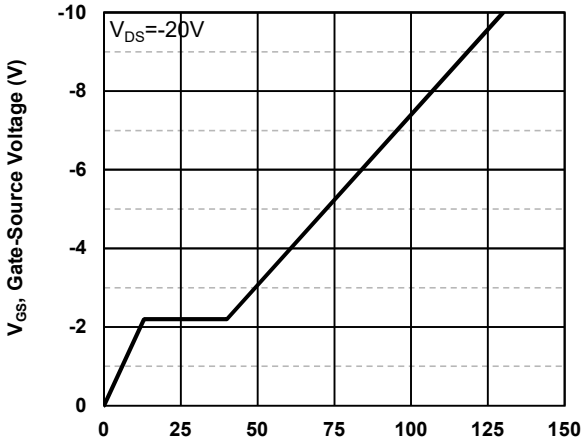



Fig2. Typical Gate Charge Vs.Gate-Source Voltage

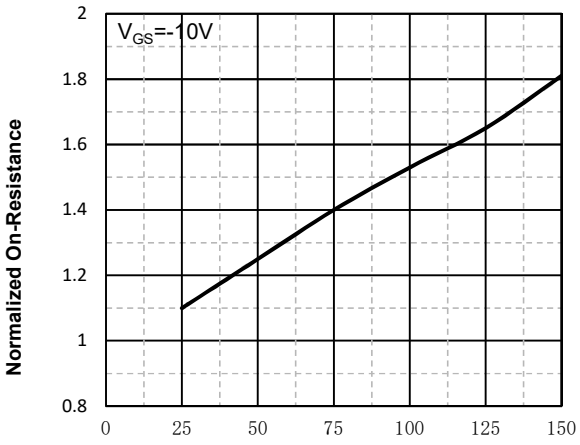



Fig3. Normalized On-Resistance Vs. Temperature

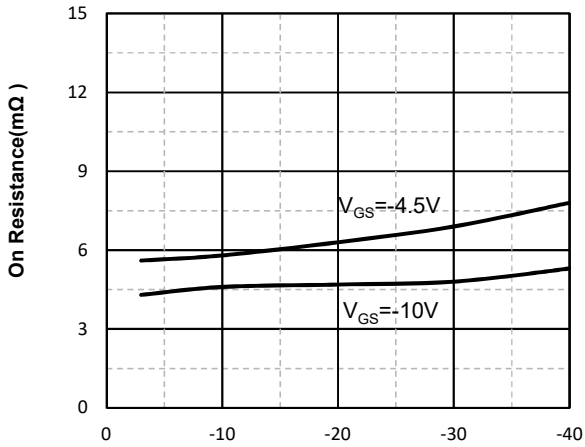



Fig4. On Resistance Vs. Drain-Source Current

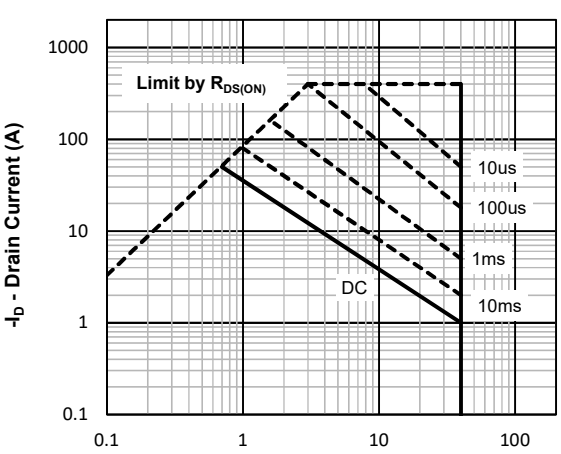



Fig5. Maximum Safe Operating Area

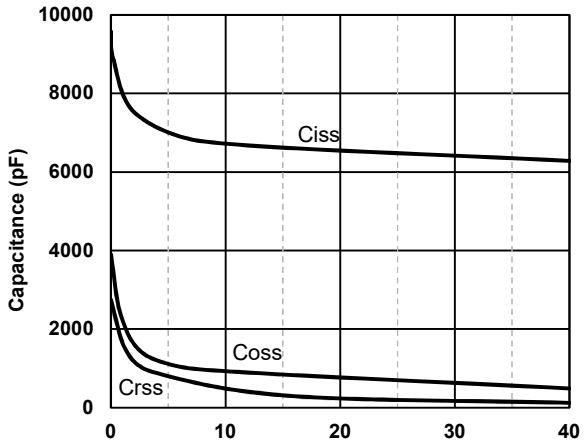
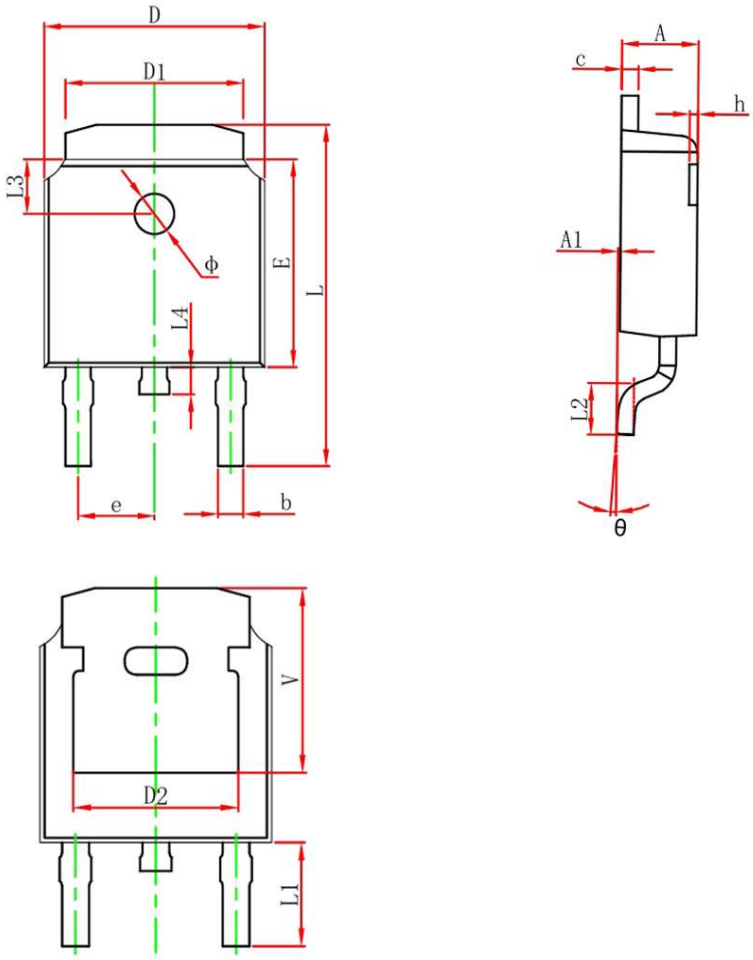



Fig6 Typical Capacitance Vs.Drain-Source Voltage

## TO-252 Package information




| Symbol | Dimensions in Millimeters(mm) | | 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 | 0.635 | 0.770 | 0.025 | 0.030 |
| c | 0.450 | 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 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.712 | 10.312 | 0.386 | 0.406 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| 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 | 5.250 REF. | | 0.207 REF. | |