# SSCU78P100GT4

## N-Channel Enhancement Mode MOSFET

### ➢ Features

| $V_{DS}$ | $V_{GS}$ | $R_{DS(ON)}$ Typ. | $I_D$ |
|---|---|---|---|
| -100V | ±20V | 78mΩ@-10V | -36A |
| | | 84mΩ@-4.5V | |

### ➢ Description

This device is P-Channel enhancement MOSFET. Uses trench technology and design to provide excellent RDSON with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit.

***100% UIS + ΔVDS + Rg Tested!***

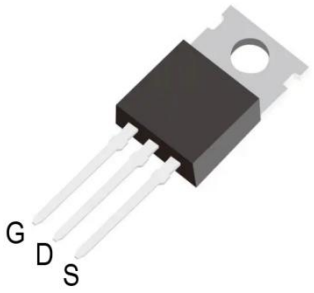
### ➢ Applications

- Load Switch
- PWM Application
- Power Management
- DC-DC Conversion

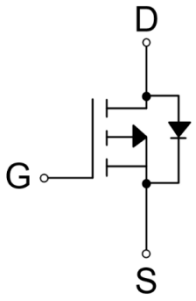
### ➢ Ordering Information

| Device | Package | Shipping |
|---|---|---|
| SSCU78P100GT4 | TO-220-3L | 50/Tube |

### ➢ Pin configuration




**TO-220-3L (Top View)**




**Pin Configuration**


**Marking**

(XXYY: Internal Traceability Code)

## ➢ Absolute Maximum Ratings ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | | Ratings | Unit |
|---|---|---|---|---|
| $V_{DSS}$ | Drain-to-Source Voltage | | -100 | V |
| $V_{GSS}$ | Gate-to-Source Voltage | | ±20 | V |
| $I_D$ | Continuous Drain Current [d] | $T_C$=25℃ | -36 | A |
| | | $T_C$=100℃ | -18 | |
| $I_{DSM}$ | Continuous Drain Current [a] | $T_A$=25℃ | -4.5 | A |
| | | $T_A$=70℃ | -3.2 | |
| $I_{DM}$ | Pulsed Drain Current [b] | | -145 | A |
| $P_D$ | Power Dissipation [c] | $T_C$=25℃ | 148 | W |
| | | $T_C$=100℃ | 60 | |
| $P_{DSM}$ | Power Dissipation [a] | $T_A$=25℃ | 2.5 | W |
| | | $T_A$=70℃ | 1.6 | |
| $I_{AS}$ | Avalanche Current [b] L=0.5mH Single Pulse | | -20 | A |
| $E_{AS}$ | Avalanche Energy [b] L=0.5mH Single Pulse | | 100 | mJ |
| $T_J$ | Operation junction temperature | | -55~150 | ℃ |
| $T_{STG}$ | Storage temperature range | | -55~150 | |

## ➢ Thermal Resistance Ratings ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | Ratings | Unit |
|---|---|---|---|
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance [a] | 50 | ℃/W |
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance | 0.85 | |

Note:

a. The value of $R_{\theta JA}$ is measured with the device mounted on 1 $in^2$ FR-4 board with 2oz.copper, in a still air environment with $T_A$=25℃.The value in any given application depends on the user is specific board design. The power dissipation is based on the t≤10s thermal resistance rating.

b. Repetitive rating, pulse width limited by junction temperature.

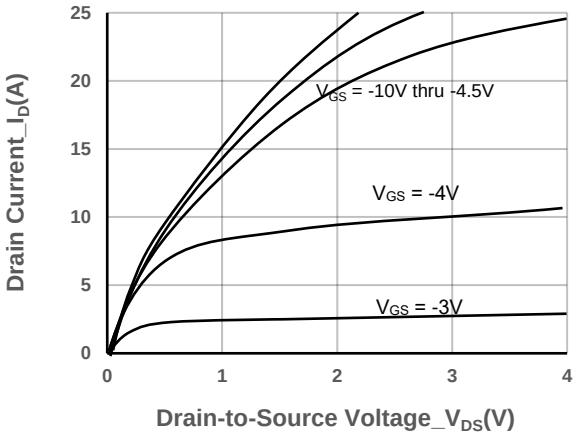
c. The power dissipation $P_D$ is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

d. The maximum current rating is package limited.

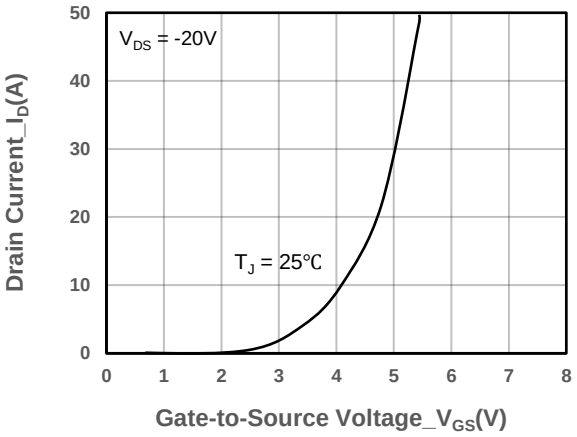
## ➢ Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = -250μA | -100 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -250uA | -1.1 | -1.6 | -2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -20A | | 78 | 105 | mΩ |
| | | $V_{GS}$ = -4.5V, $I_D$ = -10A | | 84 | 135 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -100V, $V_{GS}$ = 0V | | | -1 | μA |
| Gate-Source Leak Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| Transconductance | $G_{FS}$ | $V_{DS}$ = -10V, $I_D$ = -10A | | 25 | | S |
| Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = -10A | | -0.7 | -1.3 | V |
| Gate Resistance | $R_G$ | $V_{DS}$ = 0V, f = 1MHz | | 6.5 | | Ω |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$ = -30V, $V_{GS}$ = 0V, f = 1MHz | | 3210 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 120 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 116 | | |
| Total Gate Charge | $Q_G$ | $V_{GS}$ = -10V, $V_{DS}$ = -50V, $I_D$ = -20A | | 49 | | nC |
| Gate to Source Charge | $Q_{GS}$ | | | 8.5 | | |
| Gate to Drain Charge | $Q_{GD}$ | | | 6 | | |
| Turn-on Delay Time | $T_{D(ON)}$ | $V_{GS}$ = -10V, $V_{DS}$ =- 30V, $I_D$ = -10A, $R_G$ =30Ω, | | 12 | | ns |
| Rise Time | $T_r$ | | | 26 | | |
| Turn-off Delay Time | $T_{D(OFF)}$ | | | 78 | | |
| Fall Time | $T_f$ | | | 50 | | |

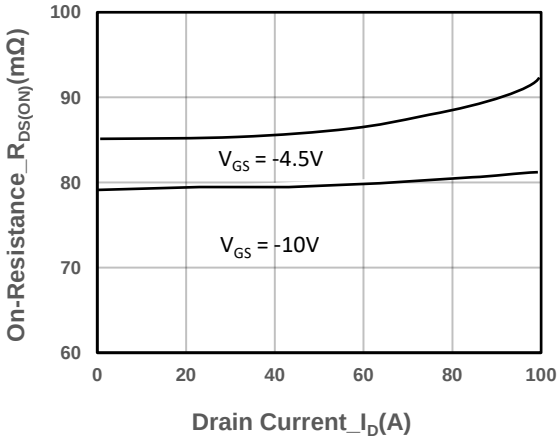
## ➢ Typical Performance Characteristics ($T_A$=25℃ unless otherwise noted)



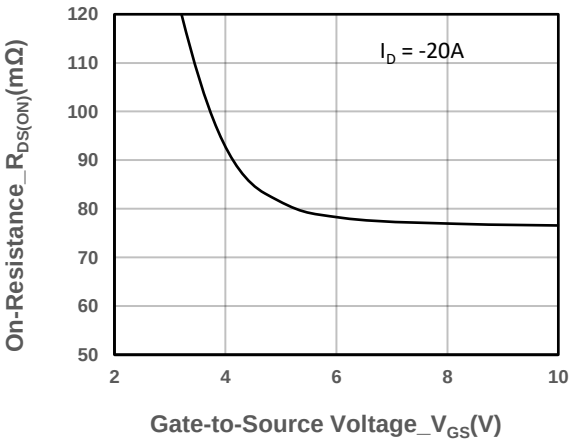

**Output Characteristics**



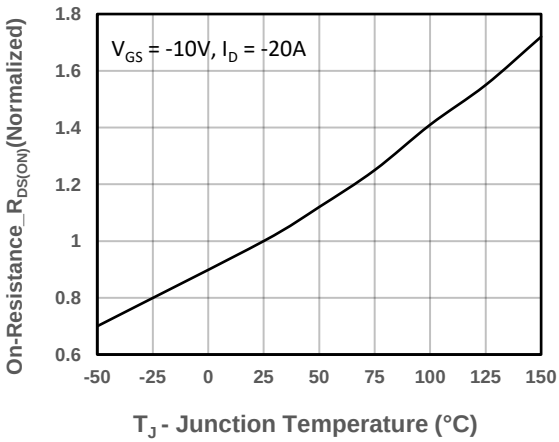

**Transfer Characteristics**



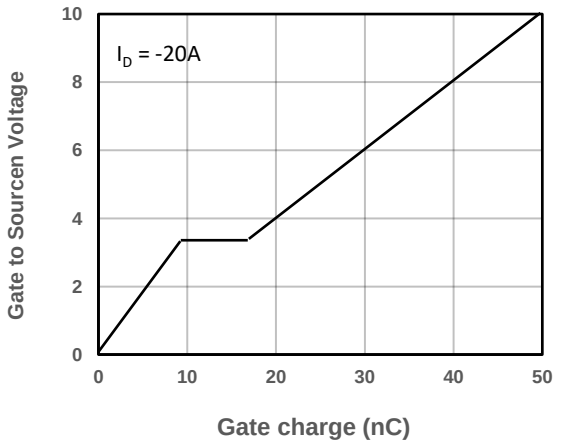

**On-Resistance vs. Drain Current and Gate Voltag**



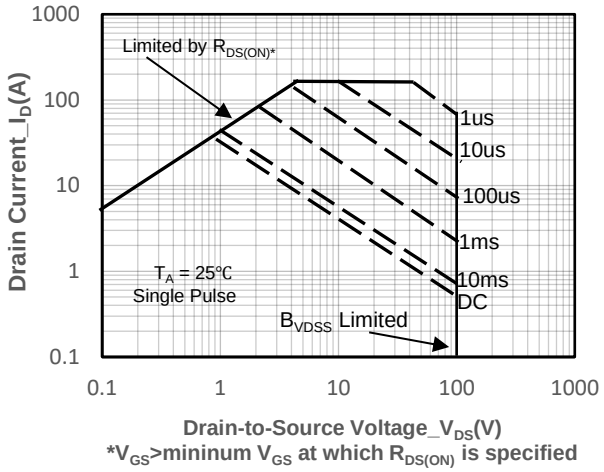

**On-Resistance vs. Gate-to-Source Voltage**




**On-Resistance vs. Junction Temperature**

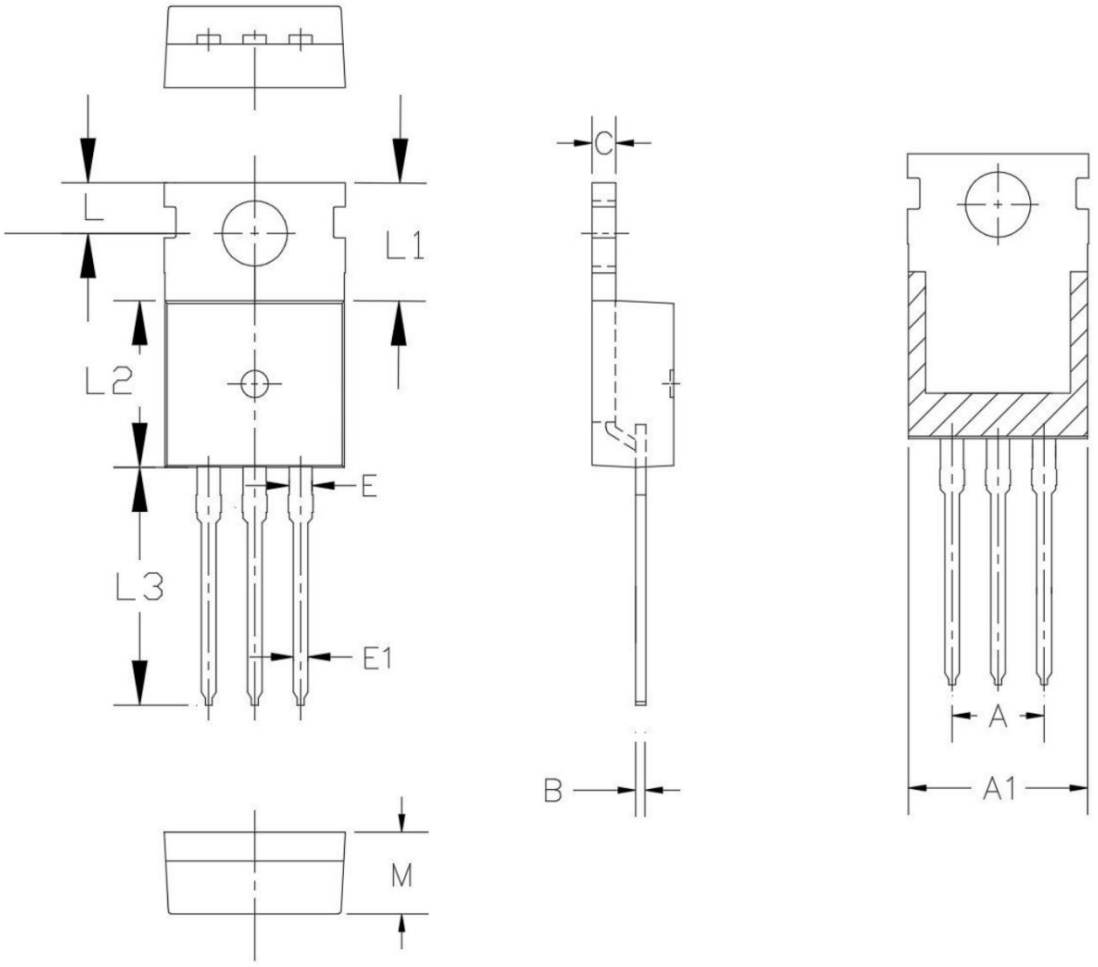



**Gate-Source Voltage vs. Gate charge**




**Safe Operating Area vs. Junction-to-Ambient**

## ➢ Package Information




| Symbol | MILL IMETER | | |
|---|---|---|---|
| | Min | Nom | Max |
| A | | 5.08 BSC | |
| A1 | 9.00 | 10.00 | 11.00 |
| B | 0.33 | -- | 0.65 |
| C | 1.20 | -- | 1.40 |
| E | 1.17 | -- | 1.37 |
| E1 | 0.60 | -- | 1.10 |
| L | 2.50 | -- | 3.00 |
| L1 | 6.3 | 6.5 | 6.7 |
| L2 | 8.95 | -- | 9.75 |
| L3 | 12.88 | -- | 13.40 |
| M | 4.30 | -- | 4.70 |

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