# SSC8L414TN4

## N-Channel Enhancement Mode MOSFET

### ➢ Features

| $V_{DS}$ | $V_{GS}$ | $R_{DS(ON)}$ Typ. | $I_D$ |
|---|---|---|---|
| 40V | ±20V | 6.3mΩ@10V | 50A |
| | | 9.0mΩ@4.5V | |

### ➢ Description

This device is N-Channel enhancement MOSFET. Uses SGT 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!***

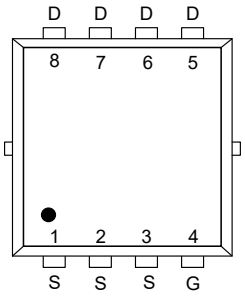
### ➢ Applications

- Motor Drive Control
- DCDC Conversion
- Power Supplies
- Synchronous Rectification

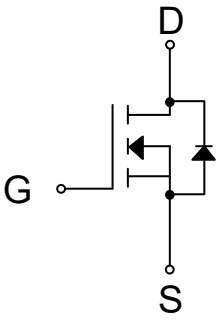
### ➢ Ordering Information

| Device | Package | Shipping |
|---|---|---|
| SSC8L414TN4 | PDFN3.3X3.3-8L | 5000/Reel |

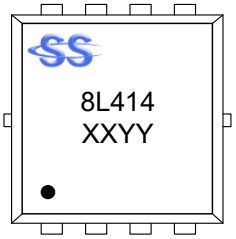
### ➢ Pin Configuration




**PDFN3.3X3.3-8L (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 | | 40 | V |
| $V_{GSS}$ | Gate-to-Source Voltage | | ±20 | V |
| $I_D$ | Continuous Drain Current [d] | $T_C$=25℃ | 50 | A |
| | | $T_C$=100℃ | 28 | |
| $I_{DSM}$ | Continuous Drain Current [a] | $T_A$=25℃ | 14 | A |
| | | $T_A$=70℃ | 10 | |
| $I_{DM}$ | Pulsed Drain Current [b] | | 200 | A |
| $P_D$ | Power Dissipation [c] | $T_C$=25℃ | 26 | W |
| | | $T_C$=100℃ | 10.4 | |
| $P_{DSM}$ | Power Dissipation [a] | $T_A$=25℃ | 2 | W |
| | | $T_A$=70℃ | 1.3 | |
| $I_{AS}$ | Avalanche Current [b] L=0.5mH Single Pulse | | 12 | A |
| $E_{AS}$ | Avalanche Energy [b] L=0.5mH Single Pulse | | 36 | 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] | 62 | ℃/W |
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance | 4.8 | |

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.

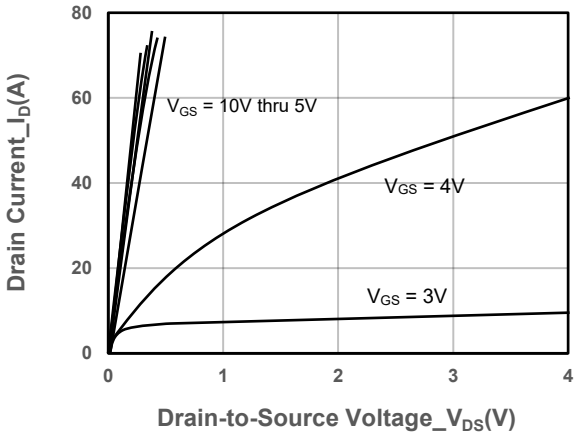
c. The power dissipation $P_D$ is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

d. The maximum current rating is package limited.

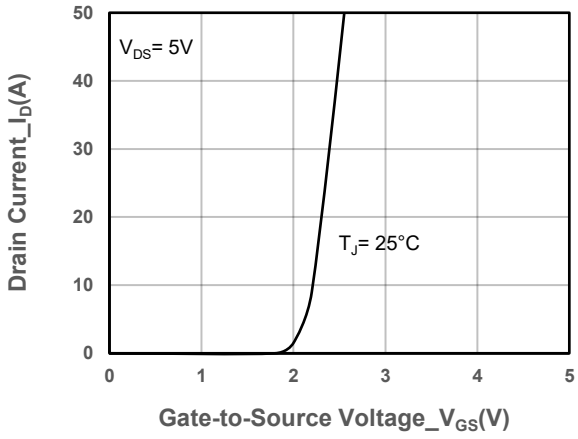
## ➢ Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 40 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250uA | 1 | 1.6 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 12A | | 6.3 | 8.2 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 10A | | 9.0 | 13.5 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 40V, $V_{GS}$ = 0V | | | 1 | μA |
| Gate-Source Leak Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = 1A | | 0.75 | 1.3 | V |
| Gate Resistance | $R_G$ | $V_{DS}$ = 0V, f = 1MHz | | 1.2 | | Ω |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$ = 20V, $V_{GS}$ = 0V, f = 1MHz | | 648 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 360 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 17 | | |
| Total Gate Charge | $Q_G$ | $V_{GS}$ = 10V, $V_{DS}$ = 20V, $I_D$ = 12A | | 11.5 | | nC |
| Gate to Source Charge | $Q_{GS}$ | | | 2.1 | | |
| Gate to Drain Charge | $Q_{GD}$ | | | 2.2 | | |
| Turn-on Delay Time | $T_{D(ON)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 15V, $I_D$ = 1A, $R_G$ = 3.3Ω | | 8 | | ns |
| Rise Time | $T_r$ | | | 6 | | |
| Turn-off Delay Time | $T_{D(OFF)}$ | | | 34 | | |
| Fall Time | $T_f$ | | | 10 | | |
| Diode Recovery Time | $T_{rr}$ | $I_F$=20A, di/dt=500A/us | | 25 | | ns |
| Diode Recovery Charge | $Q_{rr}$ | $I_F$=20A, di/dt=500A/us | | 60 | | nC |

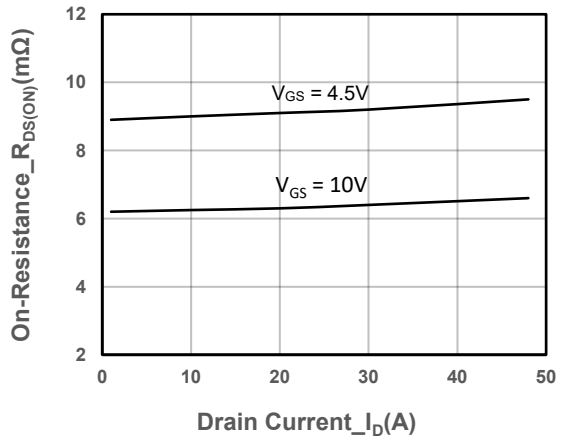
## ➢ Typical Performance Characteristics ($T_A$=25℃ unless otherwise noted)



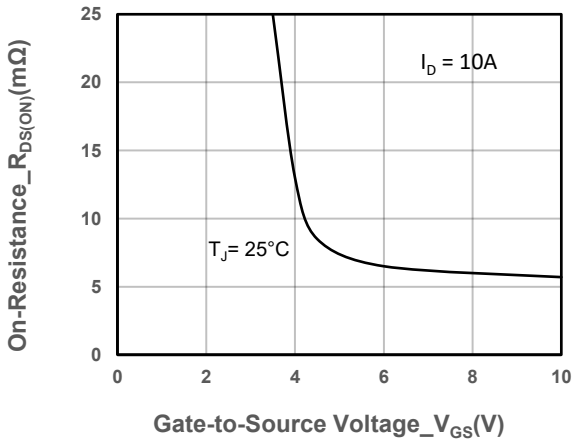

**Output Characteristics**



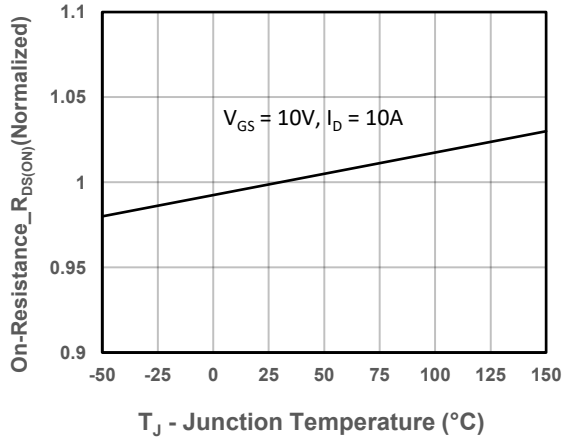

**Transfer Characteristics**



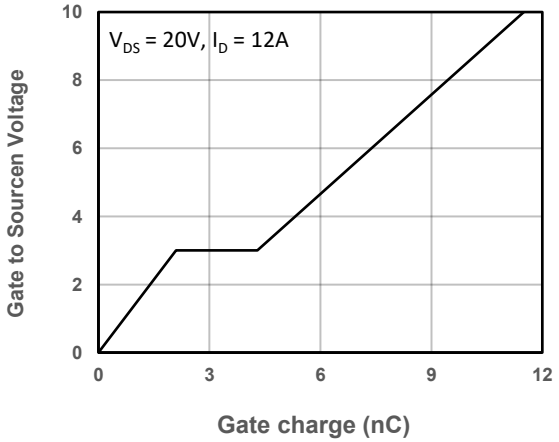

**On-Resistance vs. Drain Current and Gate Voltage**



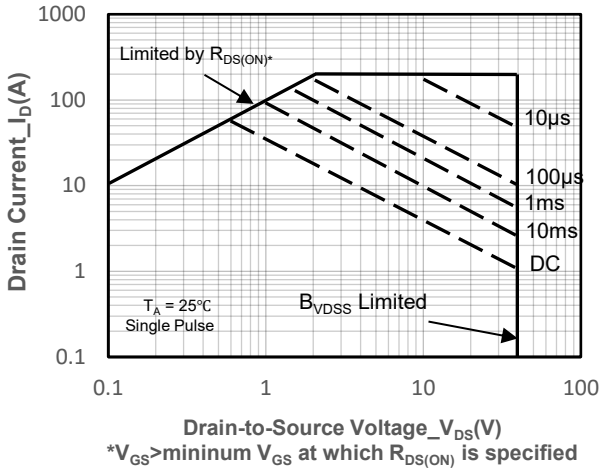

**On-Resistance vs. Gate-to-Source Voltage**




**On-Resistance vs. Junction Temperature**

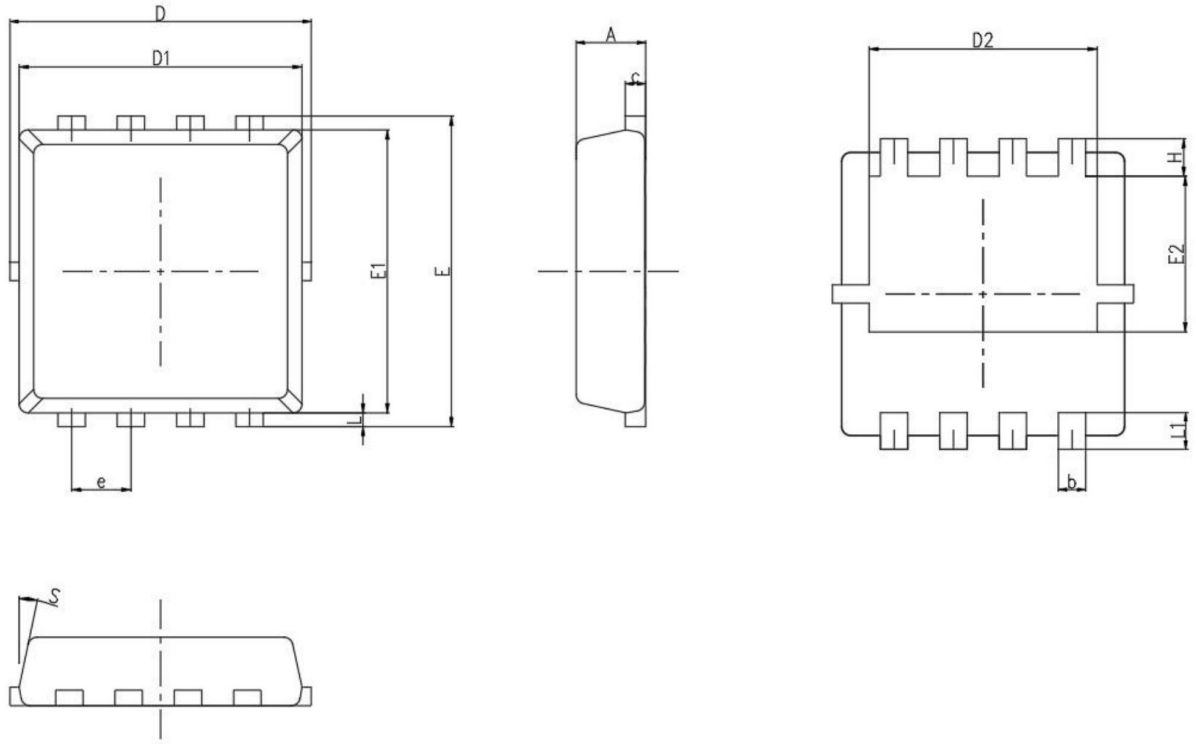



**Gate-Source Voltage vs. Gate charge**




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

## ➢ Package Information




| Symbol | MILL IMETER | | |
|---|---|---|---|
| | Min | Nom | Max |
| A | 0.65 | 0.75 | 0.9 |
| b | 0.20 | 0.3 | 0.40 |
| c | 0.1 | / | 0.22 |
| D | 3.1 | 3.3 | 3.45 |
| D1 | 3 | 3.15 | 3.2 |
| D2 | 2.55 | 2.5 | 2.75 |
| E | 3.15 | 3.3 | 3.45 |
| E1 | 2.9 | 3.05 | 3.2 |
| E2 | 1.55 | 1.75 | 1.95 |
| e | 0.65BSC | | |
| L | 0.06 | 0.15 | 0.2 |
| L1 | 0.25 | 0.4 | 0.55 |
| H | 0.31 | 0.35 | 0.6 |
| S | 10° | 12° | 14° |

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