

SSG4403
P-Ch Enhancement Mode Power MOSFET
-6.1 A, -30 V, $R_{DS(ON)}$ 50 m Ω

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

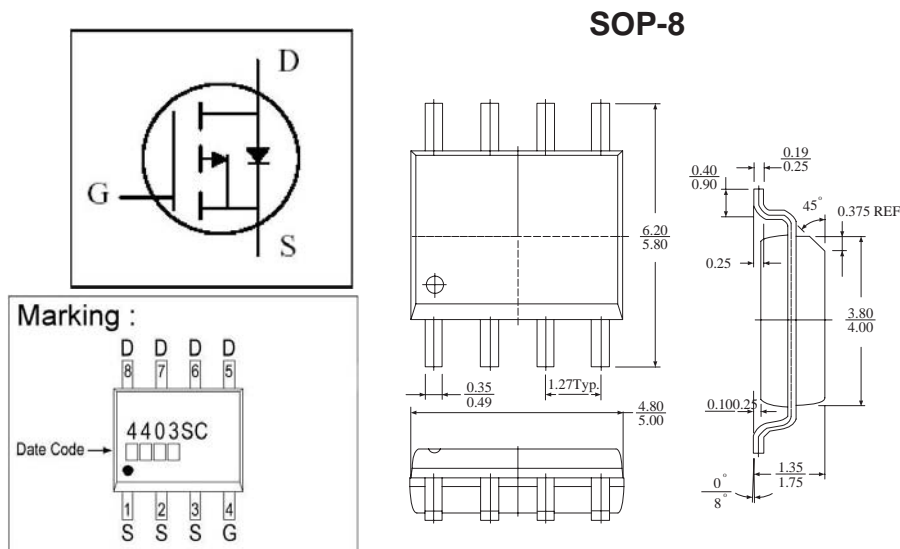
DESCRIPTION

The SSG4403 uses advanced trench technology to provide excellent on-resistance, low gate charge and operation with gate voltages as low as 2.5V. The device is suitable for use as a load switch or in PWM applications.

FEATURES

- Low Gate Charge
- Lower On-resistance
- Fast Switching Characteristic

PACKAGE DIMENSIONS



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Dimensions in millimeters

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|--|-----------------------|------------|---------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current ³ | $I_D @ Ta=25^\circ C$ | -6.1 | A |
| Continuous Drain Current ³ | $I_D @ Ta=70^\circ C$ | -5.1 | A |
| Pulsed Drain Current ¹ | I_{DM} | -60 | A |
| Total Power Dissipation | $P_D @ Ta=25^\circ C$ | 2.5 | W |
| Operating Junction and Storage Temperature Range | T_j, T_{stg} | -55 ~ +150 | $^\circ C$ |
| Linear Derating Factor | | 0.02 | W/ $^\circ C$ |

THERMAL DATA

| Parameter | Symbol | Value | Unit |
|---|--------------------|-------|--------------|
| Thermal Resistance Junction-ambient ³ Max. | $R_{\theta j-amb}$ | 50 | $^\circ C/W$ |

P-CHANNEL ELECTRICAL CHARACTERISTICS (T_j = 25°C unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--|---------------------|------|------|------|------|---|
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | - | - | V | V _{GS} =0, I _D =-250uA |
| Gate Threshold Voltage | V _{GS(th)} | -0.7 | - | -1.3 | V | V _{DS} =V _{GS} , I _D =-250uA |
| Forward Transconductance | g _{fs} | - | 11 | - | S | V _{DS} =-5V, I _D =-5A |
| Gate-Source Leakage Current | I _{GSS} | - | - | ±100 | nA | V _{GS} = ±12V |
| Drain-Source Leakage Current(T _j =25°C) | I _{DSS} | - | - | -1 | uA | V _{DS} =-30V, V _{GS} =0 |
| Drain-Source Leakage Current(T _j =55°C) | | - | - | -5 | uA | V _{DS} =-24V, V _{GS} =0 |
| Static Drain-Source On-Resistance ² | R _{DS(ON)} | - | - | 50 | mΩ | V _{GS} =-10V, I _D =-6.1A |
| | | - | - | 61 | | V _{GS} =-4.5V, I _D =-5A |
| | | - | - | 117 | | V _{GS} =-2.5 V, I _D =-1 A |
| Total Gate Charge ² | Q _g | - | 9.4 | - | nC | I _D =-5 A V _{DS} =-15 V V _{GS} =-4.5 V |
| Gate-Source Charge | Q _{gs} | - | 2 | - | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | - | 3 | - | | |
| Turn-on Delay Time ² | T _{d(on)} | - | 7.6 | - | ns | V _{DS} =-15 V I _D =-10 V R _G =6 Ω R _L =2.4 Ω |
| Rise Time | T _r | - | 8.6 | - | | |
| Turn-off Delay Time | T _{d(off)} | - | 44.7 | - | | |
| Fall Time | T _f | - | 16.5 | - | | |
| Input Capacitance | C _{iss} | - | 940 | - | pF | V _{GS} =0 V V _{DS} =-15 V f=1.0 MHz |
| Output Capacitance | C _{oss} | - | 104 | - | | |
| Reverse Transfer Capacitance | C _{rss} | - | 73 | - | | |

SOURCE-DRAIN DIODE

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--|-----------------|------|------|------|------|--|
| Forward On Voltage ² | V _{SD} | - | - | -1.0 | V | I _S =-1A, V _{GS} =0 V |
| Continuous Source Current (Body Diode) | I _S | - | - | -4.2 | A | |
| Reverse Recovery Time ² | T _{rr} | - | 22.7 | - | ns | I _S = -5A, V _{GS} = 0V, T _j =25°C |
| Reverse Recovery Charge | Q _{rr} | - | 15.9 | - | nC | di/dt = 100A/us |

- Notes:
1. Pulse width limited by Max. junction temperature.
 2. Pulse width ≤ 300us, duty cycle ≤ 2%.
 3. Mounted on 1 in² copper pad of FR4 board; 125 °C/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE

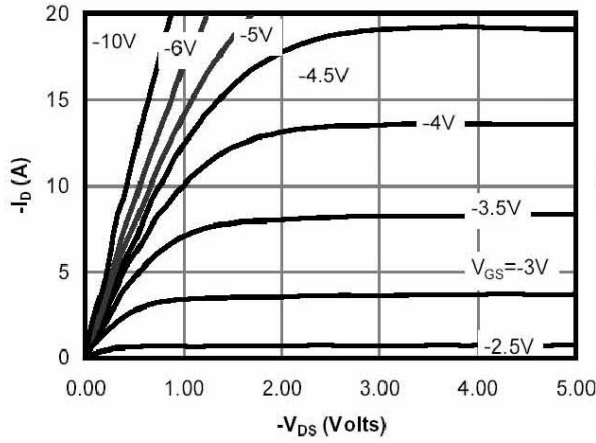


Fig 1. Typical Output Characteristics

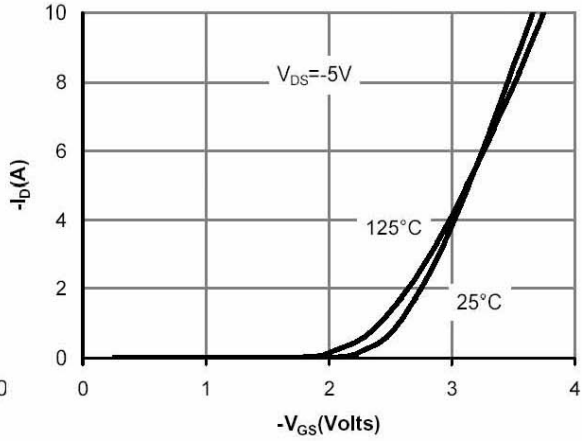


Fig 2. Transfer Characteristics

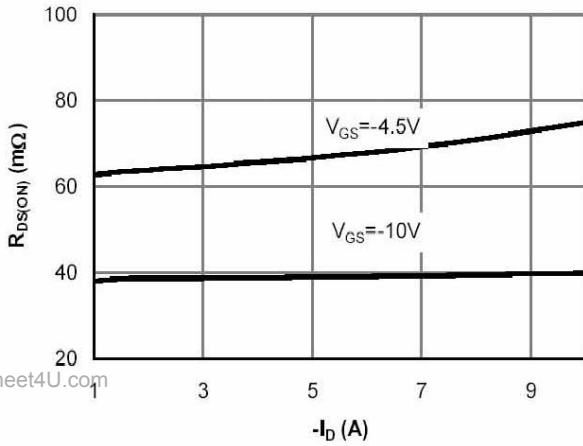


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

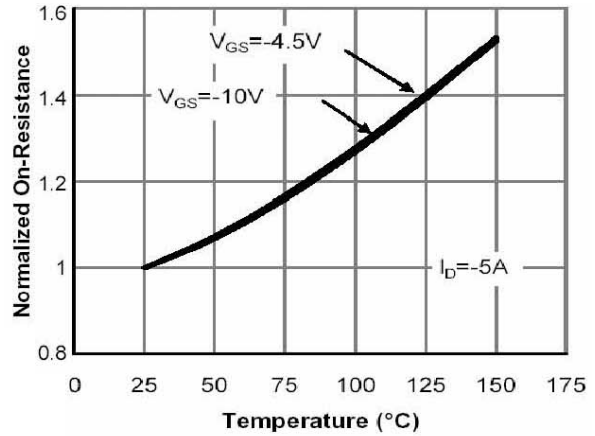


Fig 4. On-Resistance vs. Junction Temperature

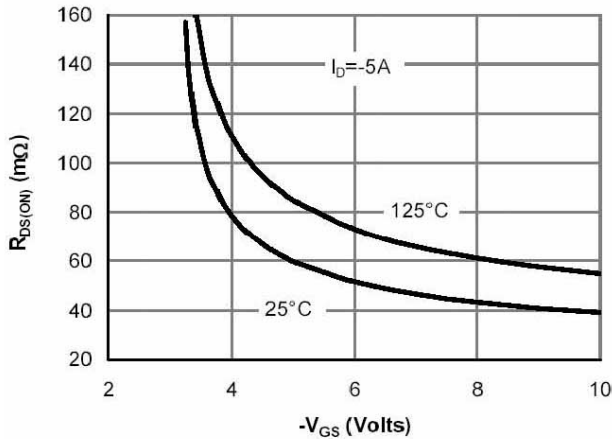


Fig 5. On-Resistance vs. Gate-Source Voltage

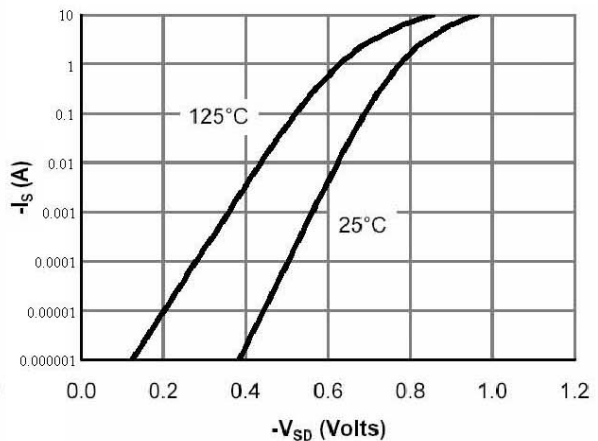


Fig 6. Body Diode Characteristics

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CHARACTERISTIC CURVE (cont'd)

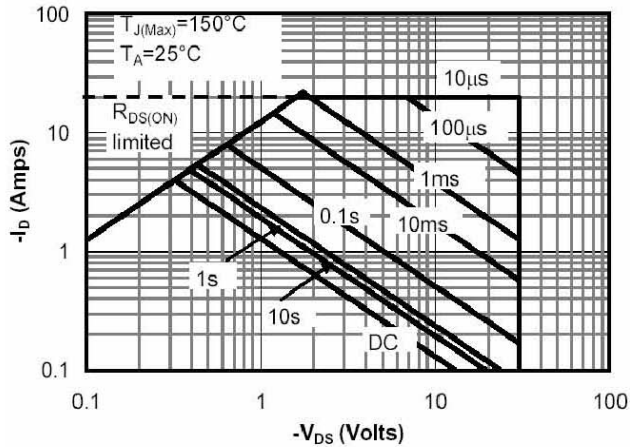
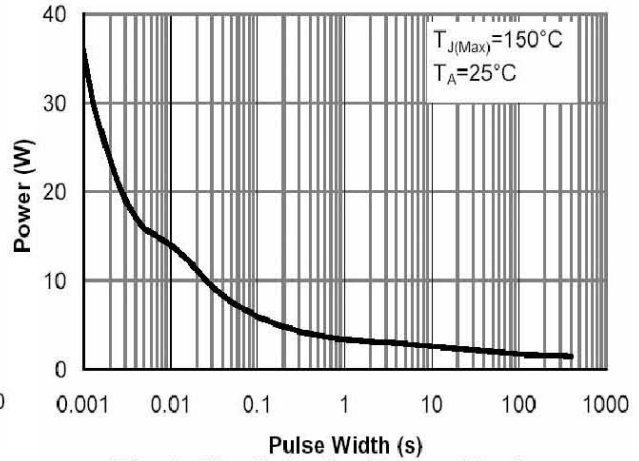


Fig 7. Maximum Safe Operating Area



**Fig 8. Single Pulse Power Rating
Junction-to-Ambient**

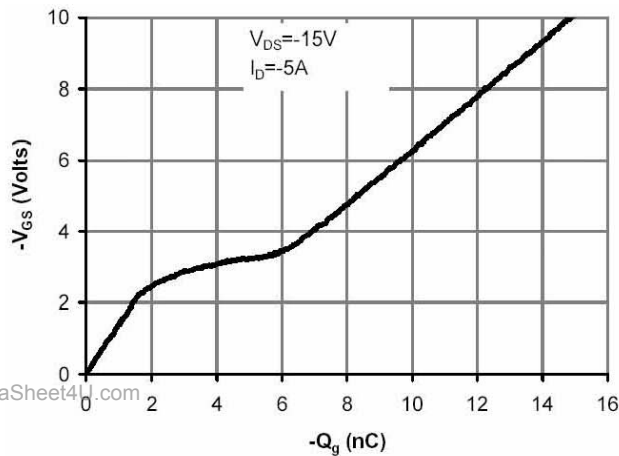


Fig 9. Gate Charge Characteristics

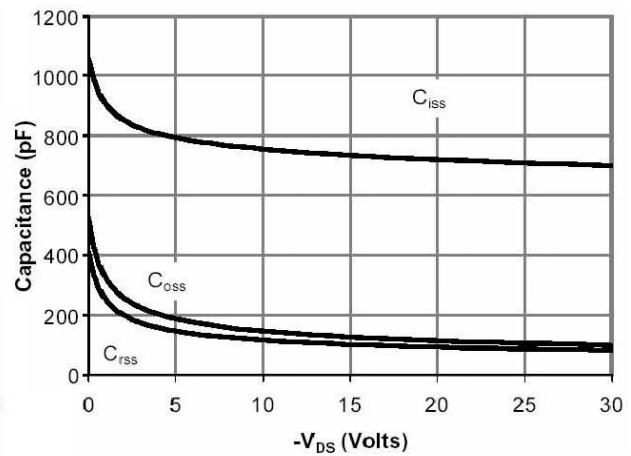


Fig 10. Typical Capacitance Characteristics

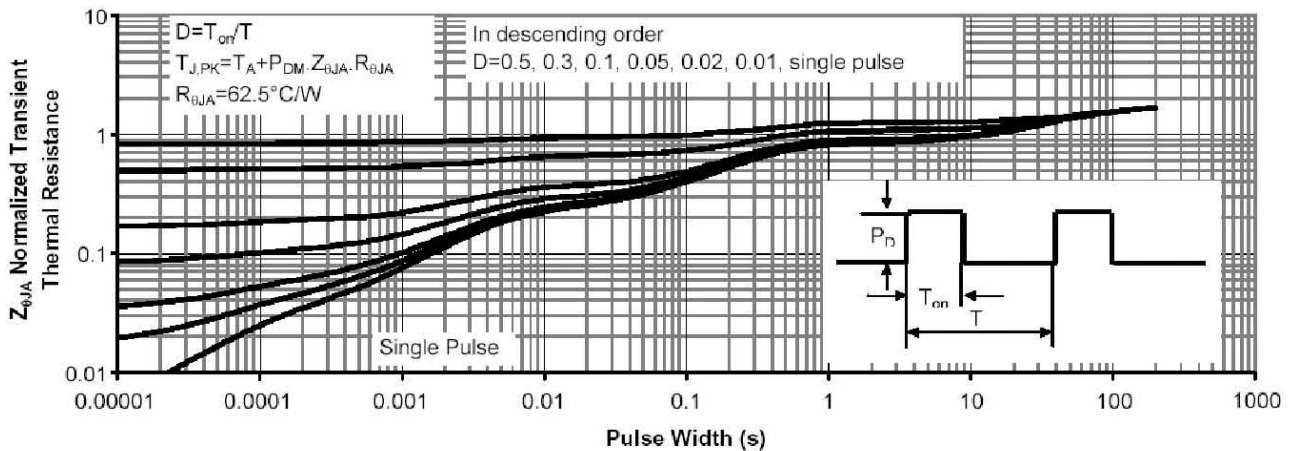


Fig 11. Normalized Maximum Transient Thermal Impedance