

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

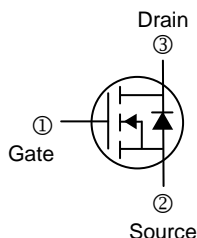
DESCRIPTIONS & FEATURES

- The SMG3402 uses advanced trench technology to provide excellent on-resistance.
- The device is suitable for use as a load switch or in PWM applications.
- Lower On-resistance

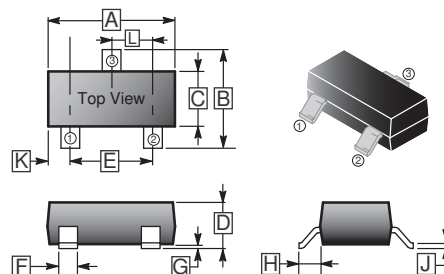
PACKAGE INFORMATION

Weight: 0.07800g

MARKING CODE



SC-59



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 2.70 | 3.10 | G | 0.10 REF. | |
| B | 2.25 | 3.00 | H | 0.40 REF. | |
| C | 1.30 | 1.70 | J | 0.10 | 0.20 |
| D | 1.00 | 1.40 | K | 0.45 | 0.55 |
| E | 1.70 | 2.30 | L | 0.85 | 1.15 |
| F | 0.35 | 0.50 | | | |

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|--|------------------------|------------|---------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ³ | $I_D @ T_A=25^\circ C$ | 4.6 | A |
| Continuous Drain Current ³ | $I_D @ T_A=70^\circ C$ | 3.7 | A |
| Pulsed Drain Current ^{1,2} | I_{DM} | 16 | A |
| Total Power Dissipation | $P_D @ T_A=25^\circ C$ | 1.38 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 ~ +150 | $^\circ C$ |
| Linear Derating Factor | | 0.01 | W/ $^\circ C$ |

THERMAL DATA

| Parameter | Symbol | Value | Unit |
|--|--------------------|-------|--------------|
| Thermal Resistance Junction-ambient ³ Max | $R_{\theta J-AMB}$ | 90 | $^\circ C/W$ |

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--|--------------|------|------|-----------|---------------|--|
| Drain-Source Breakdown Voltage | BV_{DSS} | 30 | - | - | V | $V_{GS} = 0, I_D = 250 \mu\text{A}$ |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1.0 | - | 2.5 | V | $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$ |
| Forward Transconductance | g_{fs} | - | 5 | - | S | $V_{DS} = 5 \text{ V}, I_D = 4.6 \text{ A}$ |
| Gate-Source Leakage Current | I_{GSS} | - | - | ± 100 | nA | $V_{GS} = \pm 20 \text{ V}$ |
| Drain-Source Leakage Current($T_j=25^\circ\text{C}$) | I_{DSS} | - | - | 1 | μA | $V_{DS} = 30 \text{ V}, V_{GS} = 0$ |
| Drain-Source Leakage Current($T_j=55^\circ\text{C}$) | | - | - | 5 | μA | $V_{DS} = 24 \text{ V}, V_{GS} = 0$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | - | - | 30 | m Ω | $V_{GS} = 10 \text{ V}, I_D = 4.6 \text{ A}$ |
| | | - | - | 42 | | $V_{GS} = 4.5 \text{ V}, I_D = 4.0 \text{ A}$ |
| Total Gate Charge ² | Q_g | - | 15.8 | - | nC | $I_D = 4.6 \text{ A}$ $V_{DS} = 15 \text{ V}$ $V_{GS} = 10 \text{ V}$ |
| Gate-Source Charge | Q_{gs} | - | 2 | - | | |
| Gate-Drain ("Miller") Charge | Q_{gd} | - | 3 | - | | |
| Turn-on Delay Time ² | $T_{d(on)}$ | - | 4.8 | - | ns | $V_{DS} = 15 \text{ V}$ $I_D = 1 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_G = 6 \Omega$ $R_L = 15 \Omega$ |
| Rise Time | T_r | - | 3.9 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 27.7 | - | | |
| Fall Time | T_f | - | 5.5 | - | | |
| Input Capacitance | C_{iss} | - | 782 | - | pF | $V_{GS} = 0 \text{ V}$ $V_{DS} = 15 \text{ V}$ $f = 1.0 \text{ MHz}$ |
| Output Capacitance | C_{oss} | - | 135 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 93 | - | | |

SOURCE-DRAIN DIODE

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---------------------------------|----------|------|------|------|------|--|
| Forward On Voltage ² | V_{SD} | - | - | 1.2 | V | $I_S = 1.25 \text{ A}, V_{GS} = 0\text{V}$ |

- Notes:
1. Pulse width limited by Max. junction temperature.
 2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 3. Surface mounted on 1in² copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE

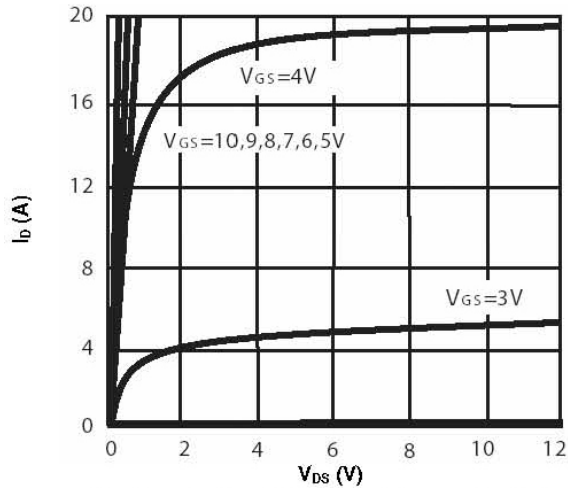


Fig 1. Typical Output Characteristics

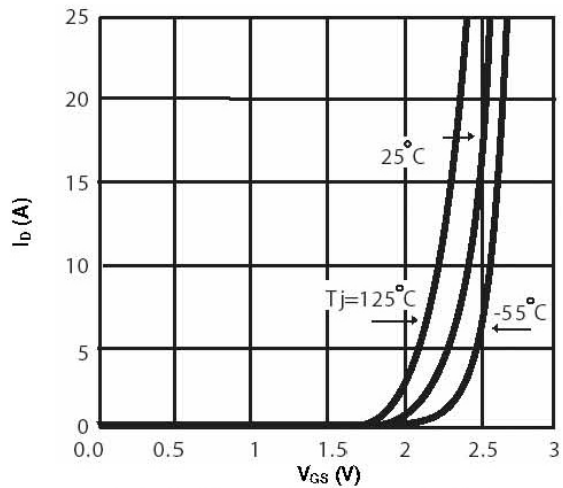


Fig 2. Transfer Characteristics

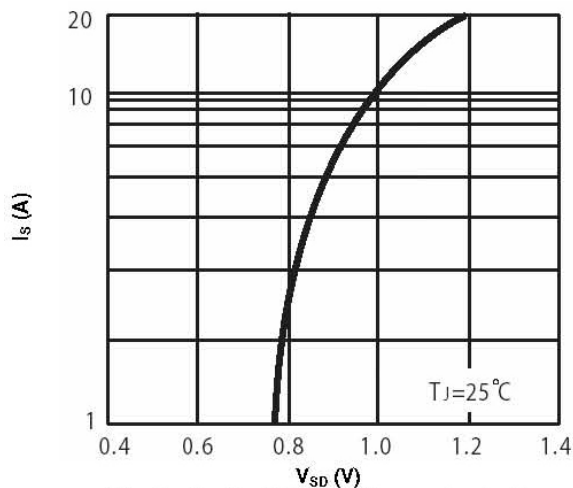


Fig 3. Body Diode Characteristics

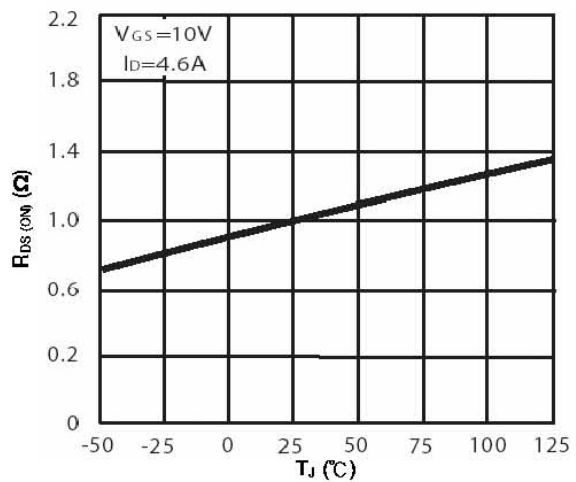


Fig 4. On-Resistance vs. Junction Temperature

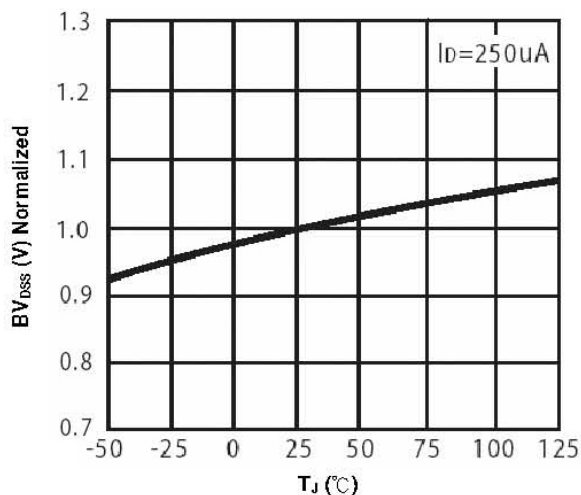


Fig 5. Breakdown Voltage vs. Junction Temperature

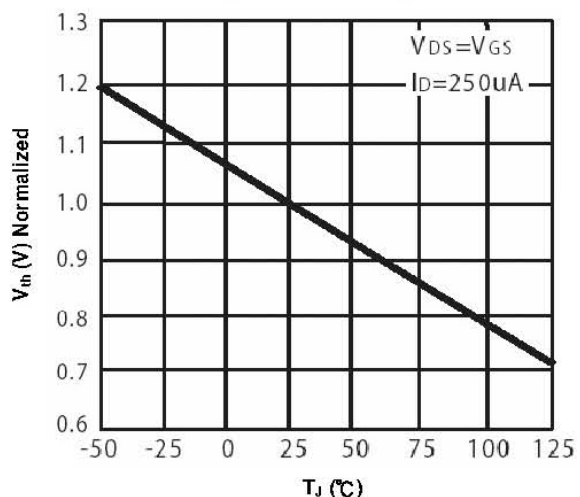


Fig 6. Gate Threshold Voltage vs. Junction Temperature

CHARACTERISTIC CURVES (cont'd)

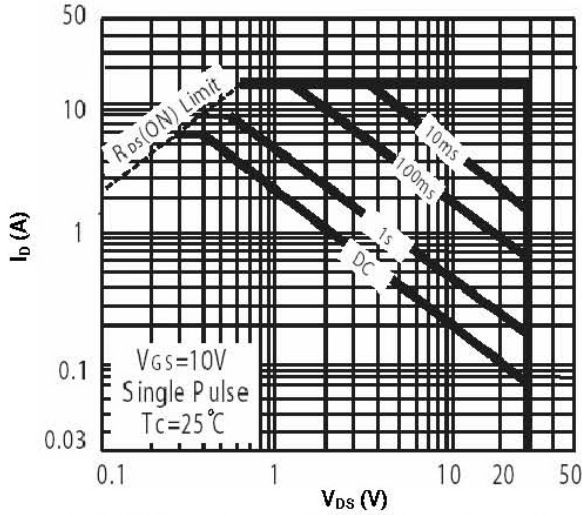


Fig 7. Maximum Safe Operating Area

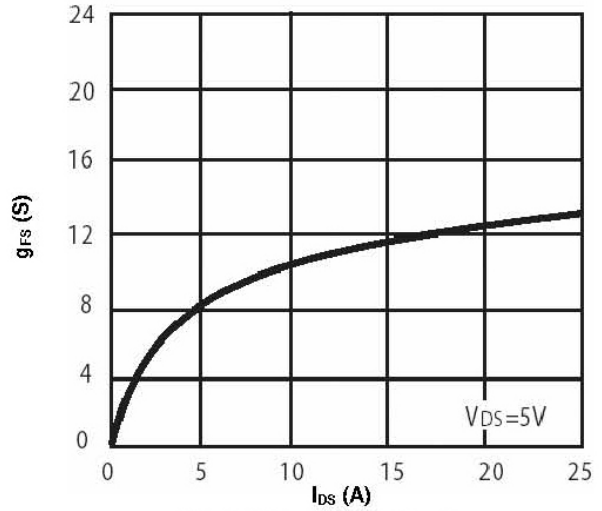


Fig 8. Transconductance vs. Drain Current

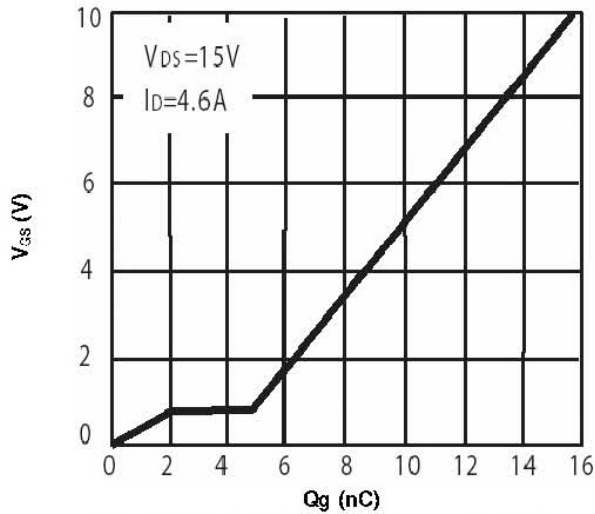


Fig 9. Gate Charge Characteristics

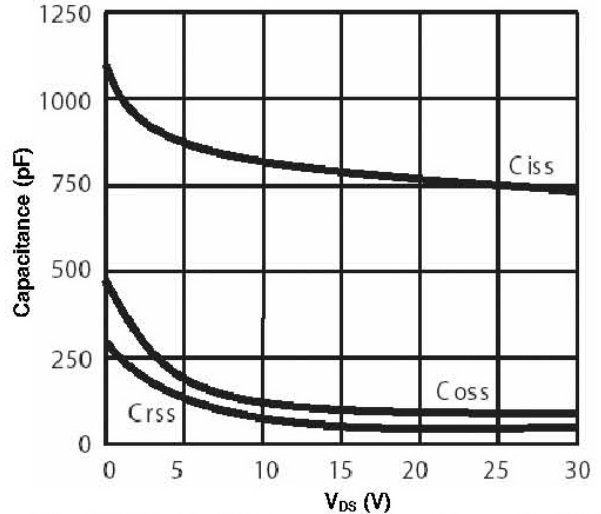


Fig 10. Typical Capacitance Characteristics

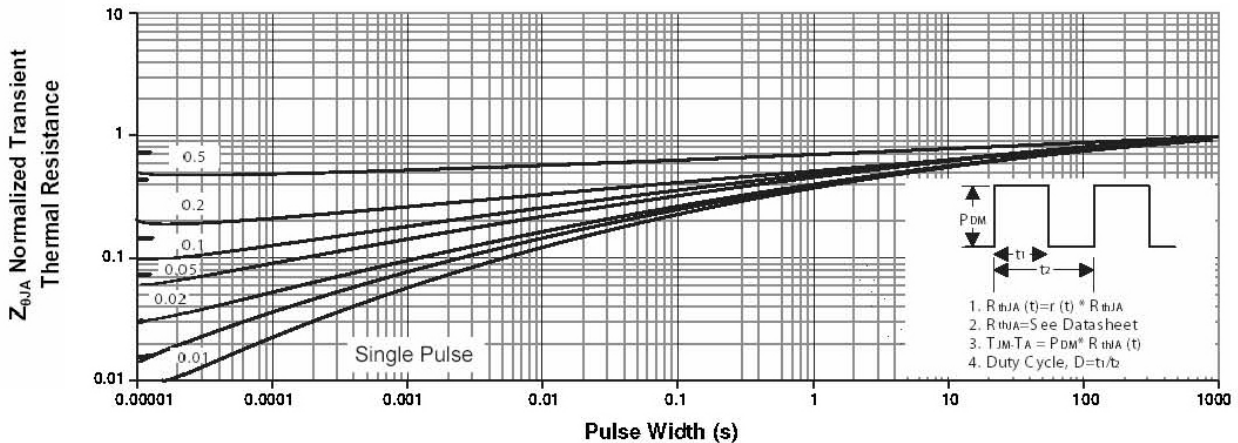


Fig 11. Normalized Maximum Transient Thermal Impedance