

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

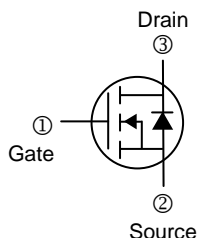
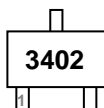
### DESCRIPTIONS & FEATURES

- 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

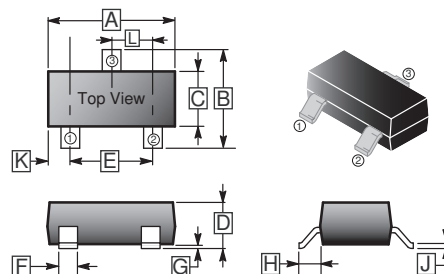
### PACKAGE INFORMATION

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	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>3</sup>	$I_D @ T_A=25^\circ C$	4.6	A
Continuous Drain Current <sup>3</sup>	$I_D @ T_A=70^\circ C$	3.7	A
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	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 <sup>3</sup> Max	$R_{\theta J-AMB}$	90	$^\circ C/W$

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

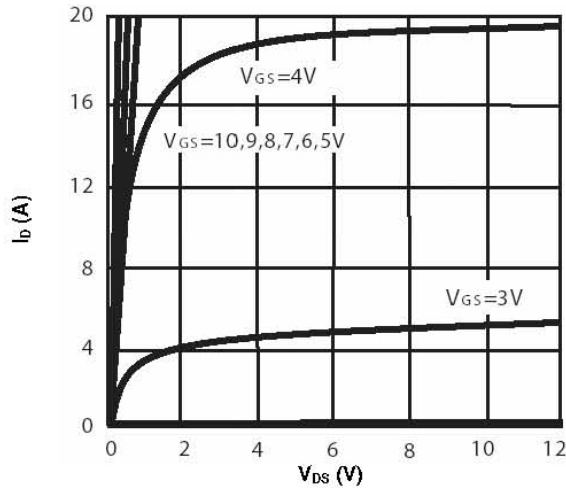
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS} = 0, I_D = 250 \mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	2.5	V	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$
Forward Transconductance	$g_{fs}$	-	5	-	S	$V_{DS} = 5 \text{ V}, I_D = 4.6 \text{ A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20 \text{ V}$
Drain-Source Leakage Current( $T_j=25^\circ\text{C}$ )	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
Drain-Source Leakage Current( $T_j=55^\circ\text{C}$ )		-	-	5	$\mu\text{A}$	$V_{DS} = 24 \text{ V}, V_{GS} = 0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	30	m $\Omega$	$V_{GS} = 10 \text{ V}, I_D = 4.6 \text{ A}$
		-	-	42		$V_{GS} = 4.5 \text{ V}, I_D = 4.0 \text{ A}$
Total Gate Charge <sup>2</sup>	$Q_g$	-	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 <sup>2</sup>	$T_{d(on)}$	-	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**

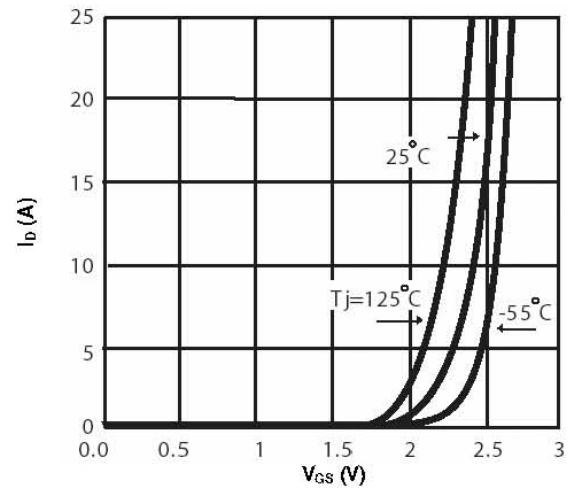
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S = 1.25 \text{ A}, V_{GS} = 0\text{V}$

- 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 1in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

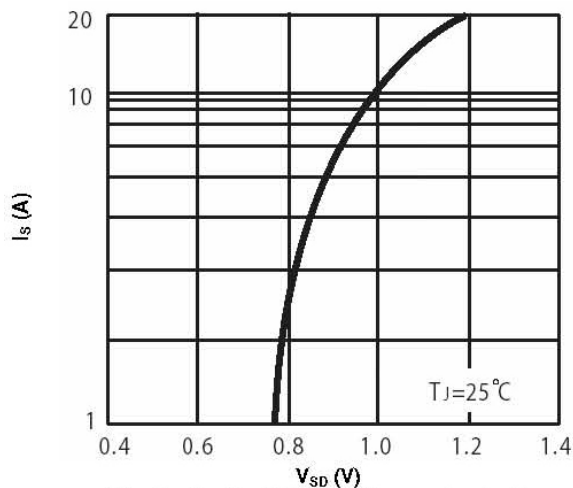
**CHARACTERISTIC CURVE**



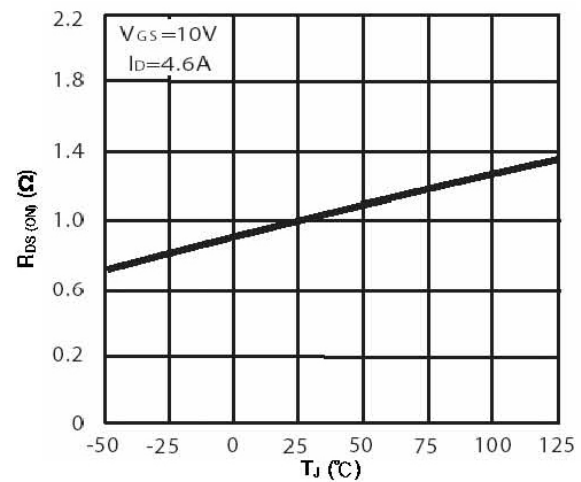
**Fig 1. Typical Output Characteristics**



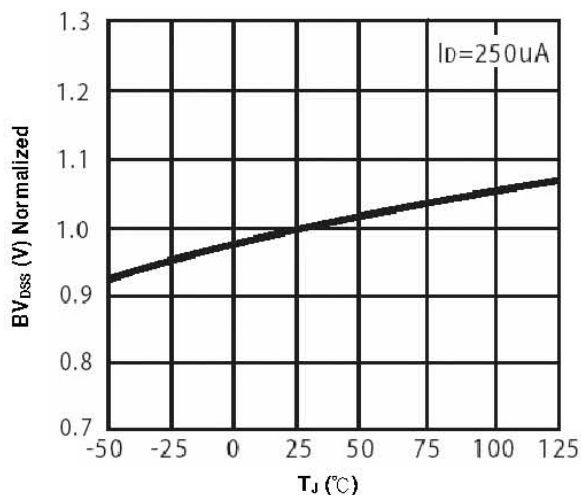
**Fig 2. Transfer Characteristics**



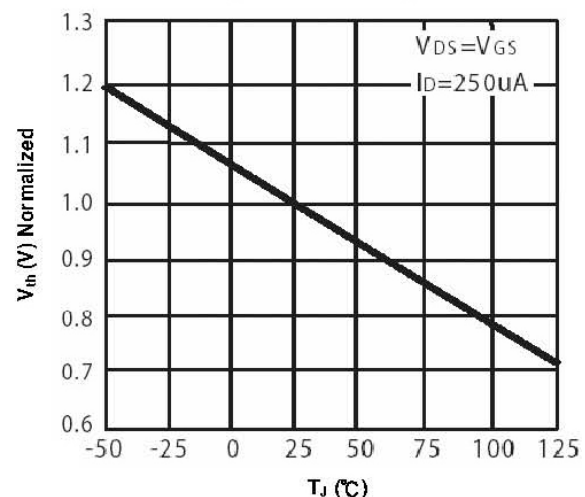
**Fig 3. Body Diode Characteristics**



**Fig 4. On-Resistance vs. Junction Temperature**

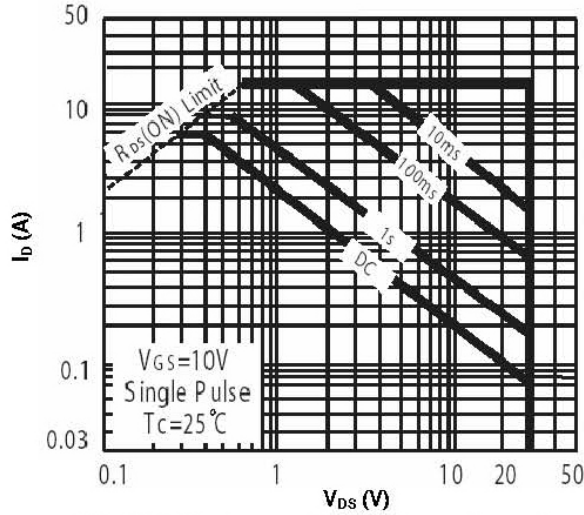


**Fig 5. Breakdown Voltage vs. Junction Temperature**

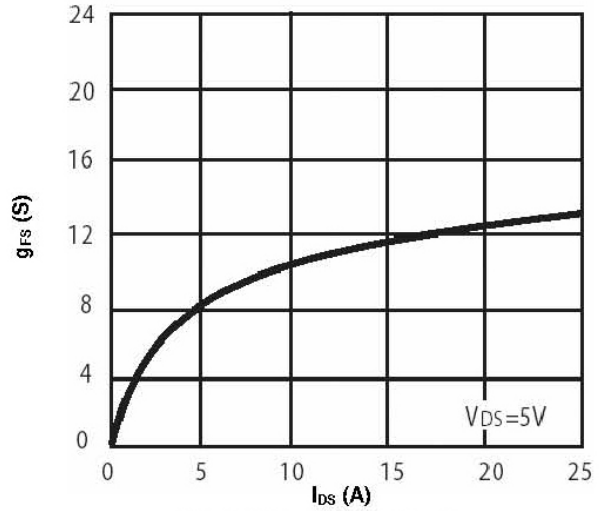


**Fig 6. Gate Threshold Voltage vs. Junction Temperature**

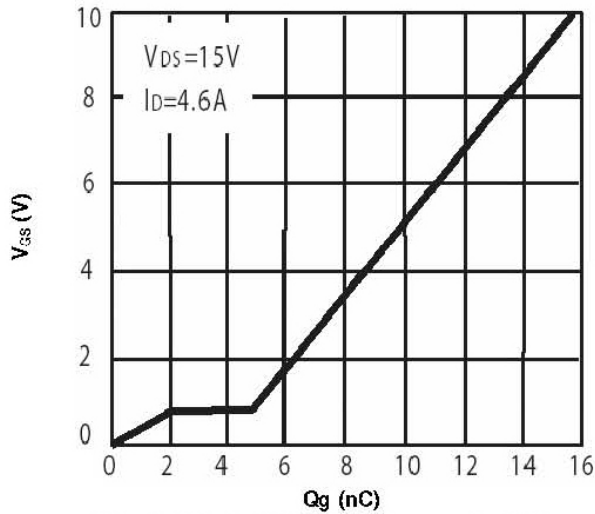
**CHARACTERISTIC CURVES (cont'd)**



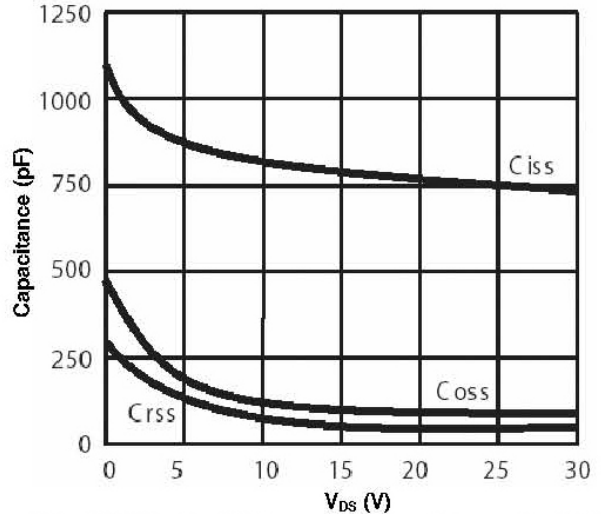
**Fig 7. Maximum Safe Operating Area**



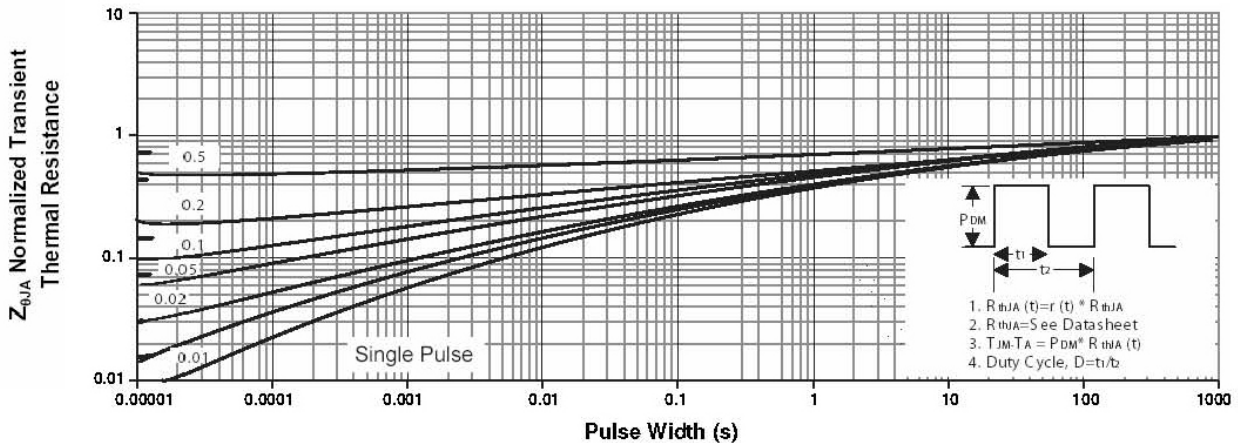
**Fig 8. Transconductance vs. Drain Current**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Typical Capacitance Characteristics**



**Fig 11. Normalized Maximum Transient Thermal Impedance**