Elektronische Bauelemente

SMG2302N

3.4 A, 20 V, $R_{DS(ON)}$ 76 mΩ
N-Channel Enhancement Mode MOSFET

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

DESCRIPTION

These miniature surface mount MOSFETs utilize a High Cell Density trench process to provide Low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are

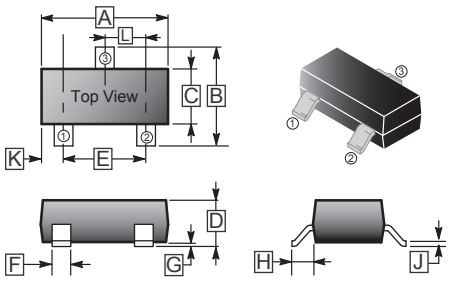
FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper lead frame SC-59 saves board space.
- Fast switching speed.
- High performance trench technology.

Application

DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

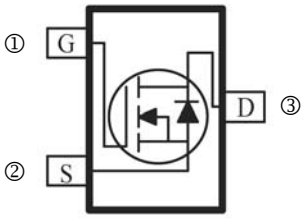
SC-59



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			

PACKAGE INFORMATION

Package	MPQ	LeaderSize
SC-59	3K	7' inch



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current [1]	I_D @ T_A=25°C	I_D	3.4	A
	I_D @ T_A=70°C		2.2	A
Pulsed Drain Current [2]		I_{DM}	10	A
Continuous Source Current (Diode Conduction) [1]		I_S	1.6	A
Power Dissipation [1]	P_D @ T_A=25°C	P_D	1.25	W
	P_D @ T_A=70°C		0.8	W
Operating Junction and Storage Temperature Range		Tj, Tstg	-55 ~ 150	°C
Thermal Resistance Ratings				
Maximum Junction to Ambient [1]	t ≦ 5 sec	$R_{\theta JA}$	100	°C / W
	Steady State		166	

Notes:
1 Surface Mounted on 1" x 1" FR4 Board.
2 Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-Threshold Voltage	$V_{GS(th)}$	0.7	0.8	1.2	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Body Leakage	I_{GSS}	-	-	100	nA	V_{DS}=0, V_{GS}=8V
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	V_{DS}=16V, V_{GS}=0
		-	-	10		V_{DS}=20V, V_{GS}= 0, T_J= 55°C
On-State Drain Current [1]	$I_{D(on)}$	7	-	-	A	V_{DS}=5V, V_{GS}=4.5V
Drain-Source On-Resistance [1]	$R_{DS(ON)}$	-	-	76	mΩ	V_{GS}=4.5V, I_D=3.4A
		-	-	103		V_{GS}=2.5V, I_D=2.9A
Forward Transconductance [1]	g_{fs}	-	7	-	S	V_{DS}=5V, I_D=1.5A
Diode Forward Voltage	V_{SD}	-	0.7	-	V	I_S=1.6A, V_{GS}=0
Dynamic [2]						
Total Gate Charge	Q_g	-	3.5	-	nC	V_{DS}=10V, V_{GS}=4.5V, I_D=3.4A
Gate-Source Charge	Q_{gs}	-	0.55	-		
Gate-Drain Charge	Q_{gd}	-	0.95	-		
Input Capacitance	C_{iss}	-	815	-	pF	V_{DS}=15V, V_{GS}=0, f=1MHz
Output Capacitance	C_{oss}	-	175	-		
Reverse Transfer Capacitance	C_{rss}	-	106	-		
Turn-on Delay Time	$T_{d(on)}$	-	5	-	nS	V_{DD}=10V, V_{GEN}=4.5V, R_L=6Ω, R_G=6Ω
Rise Time	T_r	-	8	-		
Turn-off Delay Time	$T_{d(off)}$	-	11	-		
Fall Time	T_f	-	3	-		

Notes:
1 Pulse test：PW ≦ 300 us duty cycle ≦ 2%.
2 Guaranteed by design, not subject to production testing.

CHARACTERISTIC CURVE

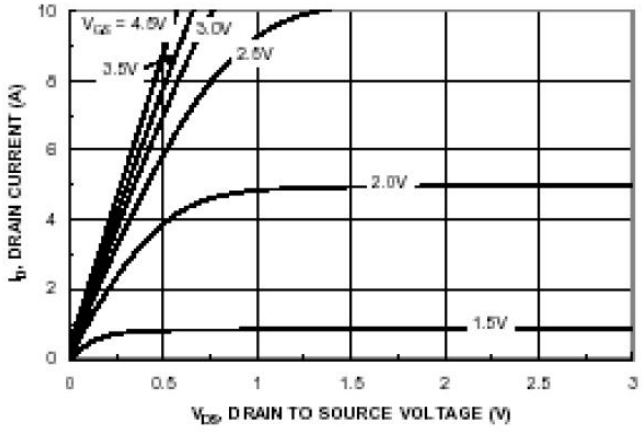


Figure 1. On-Region Characteristics.

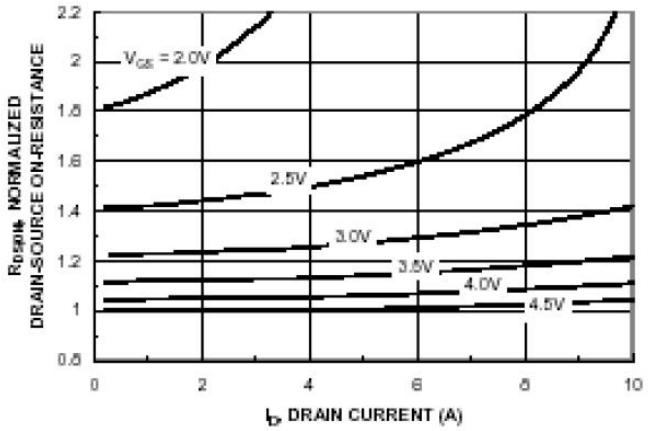


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

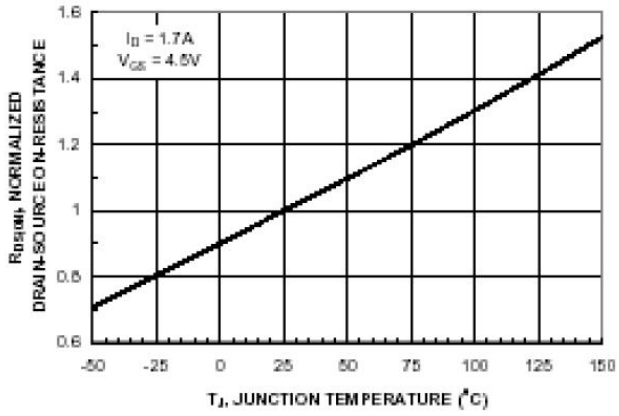


Figure 3. On-Resistance Variation with Temperature.

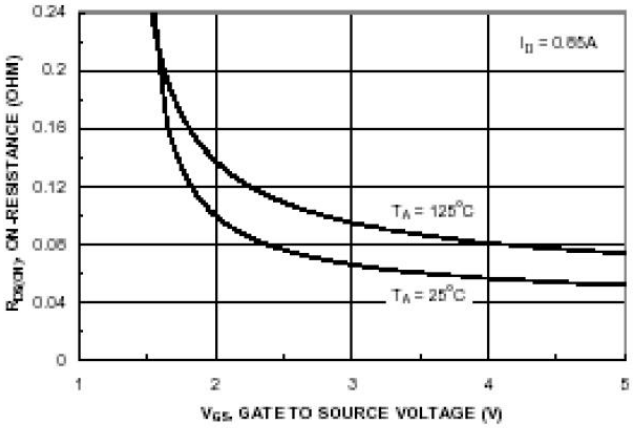


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

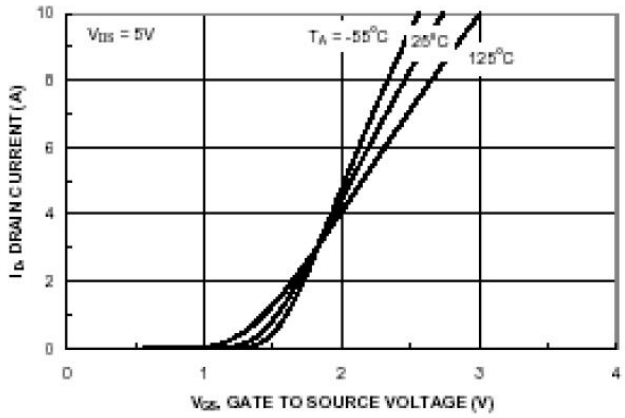


Figure 5. Transfer Characteristics.

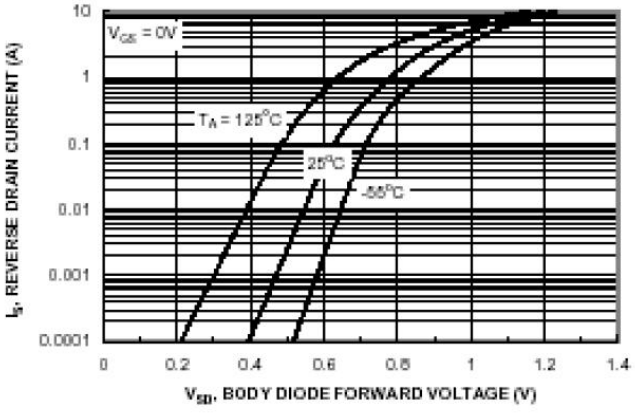


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

CHARACTERISTIC CURVE

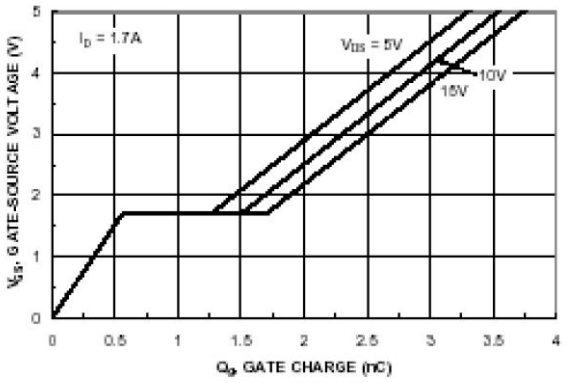


Figure 7. Gate Charge Characteristics.

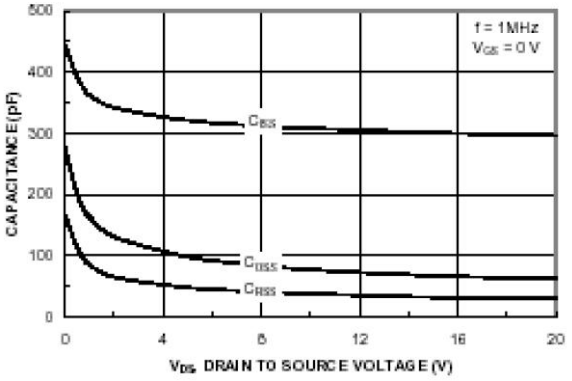


Figure 8. Capacitance Characteristics.

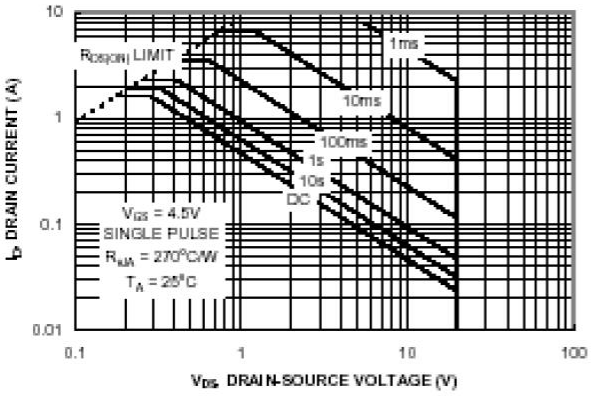


Figure 9. Maximum Safe Operating Area.

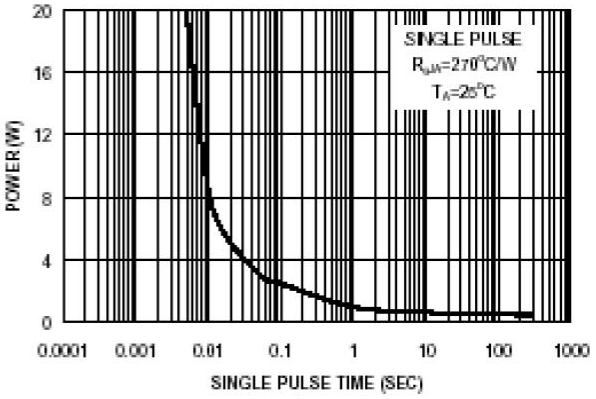


Figure 10. Single Pulse Maximum Power Dissipation.

Normalized Thermal Transient Impedance, Junction to Ambient

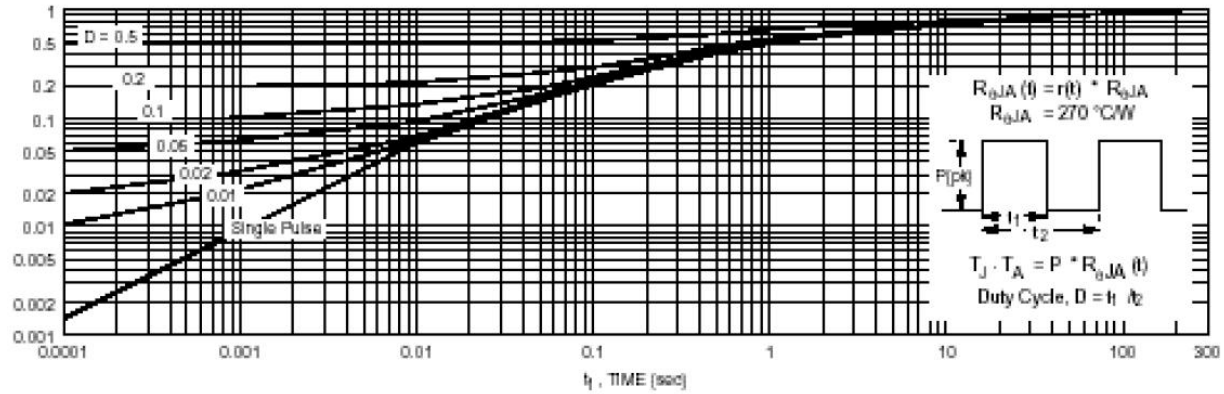


Figure 11. Transient Thermal Response Curve.
Thermal characterization performed using the conditions described in Note 1b.
Transient thermal response will change depending on the circuit board design.