Elektronische Bauelemente

SMG2301P

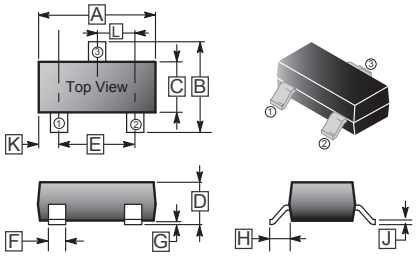
-2.6 A, -20 V, $R_{DS(ON)}$ 130 mΩ
P-Channel Enhancement MOSFET

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

DESCRIPTION

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

SC-59



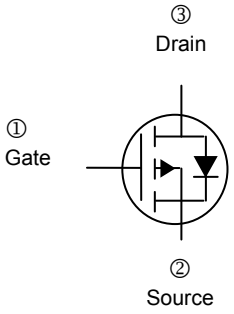
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.10 REF.	
B	2.25	3.00	H	0.40 REF.	
C	1.30	1.70	J	0.10	0.20
D	1.00	1.40	K	0.45	0.55
E	1.70	2.30	L	0.85	1.15
F	0.35	0.50			

FEATURES

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

PACKAGE INFORMATION

Package	MPQ	LeaderSize
SC-59	3K	7' inch



MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current [1]	T_A=25°C	I_D	-2.6	A
	T_A=70°C		-1.5	
Pulsed Drain Current [2]		I_{DM}	-10	A
Continuous Source Current (Diode Conduction) [1]		I_S	±1.6	A
Power Dissipation [1]	T_A=25°C	P_D	1.25	W
	T_A=70°C		0.8	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-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	Teat Conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	-0.4	-	-1	V	V_{DS} = V_{GS}, I_D = -250μA
Gate-Body Leakage	I_{GSS}	-	-	±100	nA	V_{DS} = 0V, V_{GS}= ±8V
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	V_{DS} = -16V, V_{GS}= 0V
		-	-	-10		V_{DS} = -16V, V_{GS}= 0V, T_J=55°C
On-State Drain Current [1]	$I_{D(ON)}$	-3	-	-	A	V_{DS} = -5V, V_{GS}= -4.5V
Drain-Source On-Resistance [1]	$R_{DS(ON)}$	-	-	0.130	Ω	V_{GS}= -4.5V, I_D = -2.6A
		-	-	0.190		V_{GS}= -2.5V, I_D = -2.1A
Forward Transconductance [1]	g_{FS}	-	3	-	S	V_{DS}= -5V,, I_D = -2.8A
Diode Forward Voltage	V_{SD}	-	-0.70	-	V	I_S= -1.6A, V_{GS}= 0V
Dynamic [2]						
Total Gate Charge	Q_g	-	12.2	-	nC	I_D= -2.6A V_{DS}= -5V V_{GS}= -4.5V
Gate-Source Charge	Q_{gs}	-	1.1	-		
Gate-Drain Charge	Q_{gd}	-	1.5	-		
Turn-On Delay Time	$Td_{(ON)}$	-	6.5	-	nS	V_{DD}= -5V V_{GEN}= -4.5V R_G= 6Ω R_L= 5Ω
Rise Time	T_r	-	20	-		
Turn-Off Delay Time	$Td_{(OFF)}$	-	31	-		
Fall Time	T_f	-	21	-		

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

CHARACTERISTIC CURVE

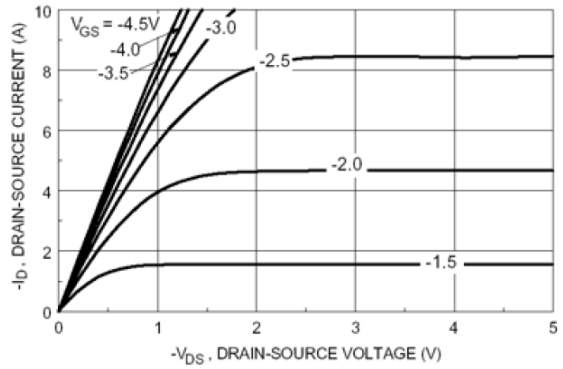


Figure 1. On-Region Characteristics.

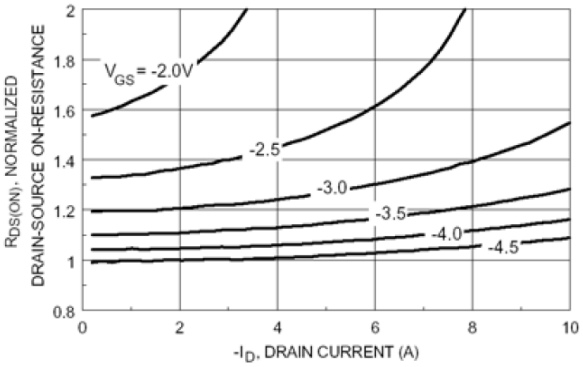


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

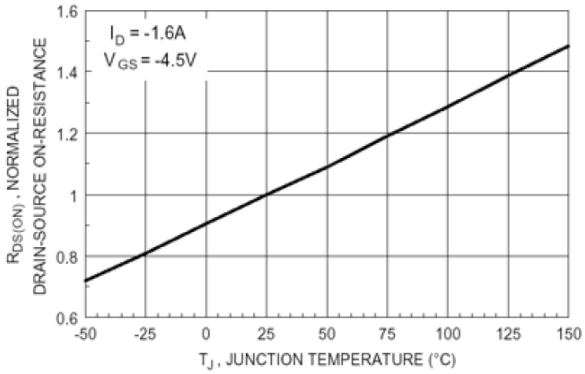


Figure 3. On-Resistance Variation with Temperature.

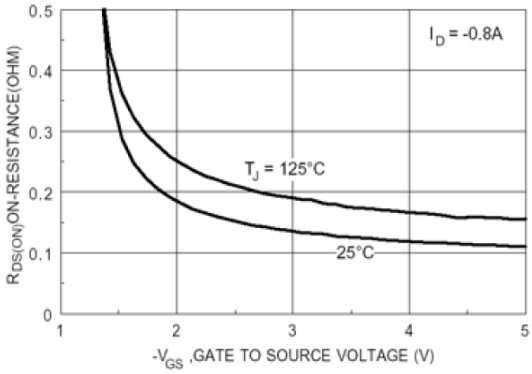


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

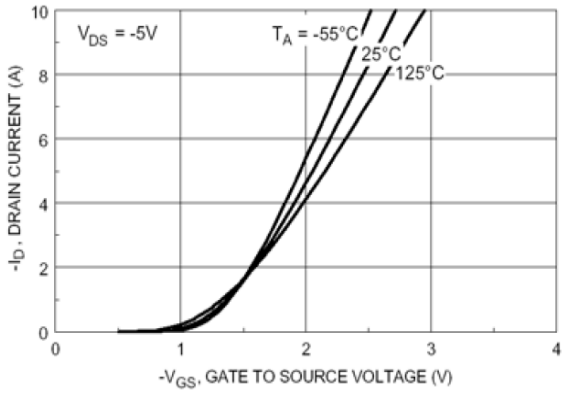


Figure 5. Transfer Characteristics.

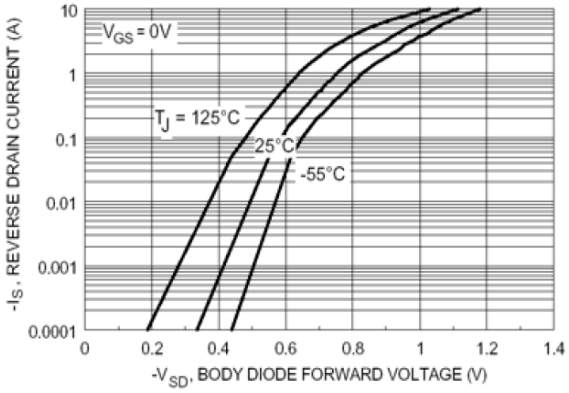


Figure 6 . Body Diode Forward Voltage Variation with Source Current and Temperature.

CHARACTERISTIC CURVE

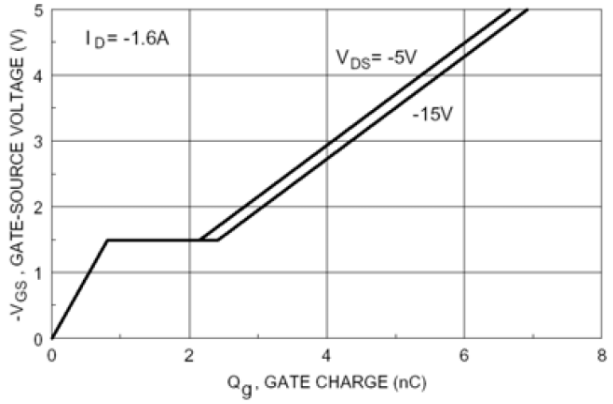


Figure 7. Gate Charge Characteristics.

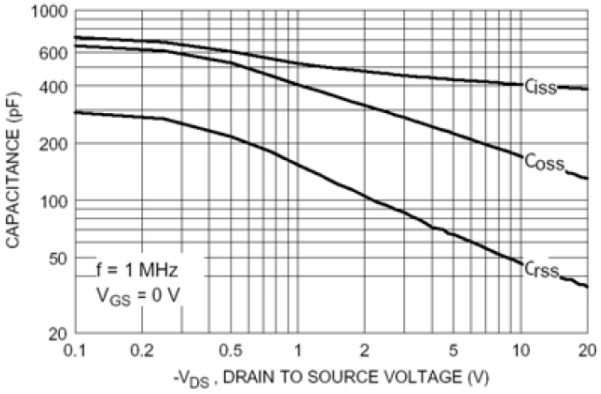


Figure 8. Capacitance Characteristics.

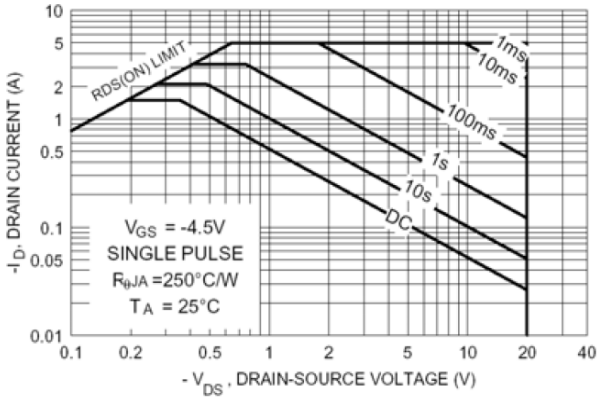


Figure 9. Maximum Safe Operating Area.

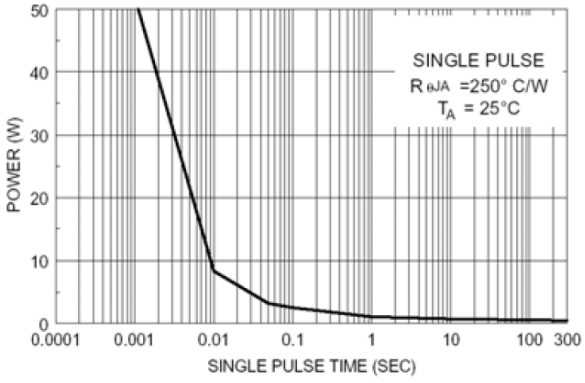


Figure 10. Single Pulse Maximum Power Dissipation.

Normalized Thermal Transient Junction to Ambient

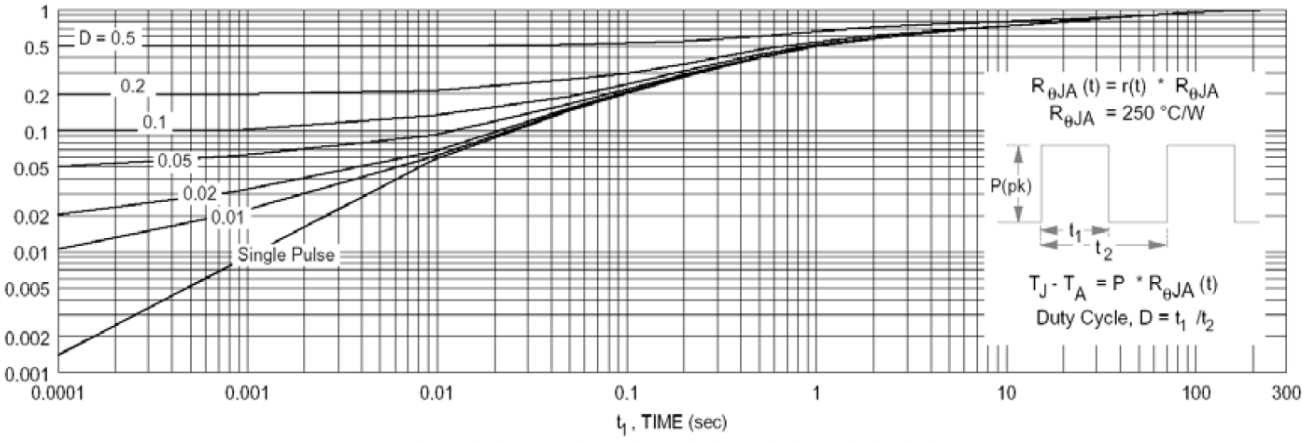


Figure 11. Transient Thermal Response Curve.