Elektronische Bauelemente

SMG5402

4A , 30V , $R_{DS(ON)}$ 55 mΩ
N-Channel Enhancement Mode MOSFET

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

DESCRIPTION

The SMG5406 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SMG5406 is universally used for all commercial-industrial applications.

FEATURES

- Simple Drive Requirement
- Small Package Outline

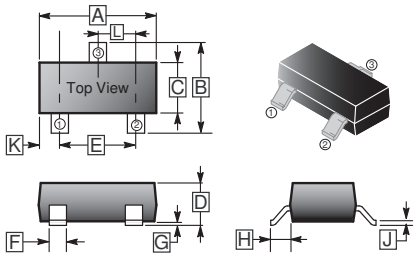
MARKING

5402

PACKAGE INFORMATION

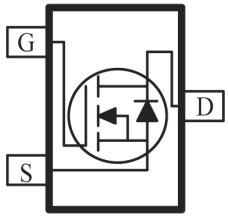
Package	MPQ	Leader Size
SC-59	3K	7 inch

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			

TOP VIEW



ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current [3] , V_{GS}@4.5V	T_A=25℃	I_D	4	A
	T_A=70℃		3	
Pulsed Drain Current [1,2]		I_{DM}	16	A
Power Dissipation	T_A=25℃	P_D	1.38	W
Linear Derating Factor			0.01	W / ℃
Operating Junction and Storage Temperature Range		T_j, T_{stg}	-55~150	℃
Thermal Resistance Rating				
Maximum Junction to Ambient [3]		$R_{\theta JA}$	90	℃ / W

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static							
Drain-Source Breakdown Voltage		BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	0.5	-	1.5	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Body Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}=±12V
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0
	T_J=70℃		-	-	25		V_{DS}=24V, V_{GS}=0
Drain-Source On-Resistance		$R_{DS(ON)}$	-	-	55	mΩ	V_{GS}=10V, I_D=4A
			-	-	70		V_{GS}=4.5V, I_D=3A
			-	-	110		V_{GS}=2.5V, I_D=2A
Forward Transconductance		g_{fs}	-	3	-	S	V_{DS}=10V, I_D=3A
Dynamic							
Total Gate Charge[2]		Q_g	-	6	-	nC	V_{DS}=15V, V_{GS}=4.5V, I_D=3A
Gate-Source Charge		Q_{gs}	-	1	-		
Gate-Drain (“Miller”) Charge		Q_{gd}	-	2.8	-		
Turn-on Delay Time[2]		$T_{d(on)}$	-	5.8	-	nS	V_{DS}=15V, V_{GS}=5V, R_G=3.3Ω, R_D=15Ω, I_D=1A
Rise Time		T_r	-	9.6	-		
Turn-off Delay Time[2]		$T_{d(off)}$	-	14.4	-		
Fall Time		T_f	-	3.9	-		
Input Capacitance		Ciss	-	335	-	pF	V_{GS}=0, V_{DS}=25V, f=1.0MHz
Output Capacitance		Coss	-	50	-		
Reverse Transfer Capacitance		Crss	-	45	-		
Source-Drain Diode							
Diode Forward Voltage[2]		V_{SD}	-	-	1.2	V	I_S=1.2A, V_{GS}=0
Reverse Recovery Time[2]		T_{RR}	-	15	-	ns	I_S=3A, V_{GS}=0 dI/dt=100A/μs
Reverse Recovery Charge		Q_{RR}	-	8	-	nC	

Notes:
1. Pulse width limited by Max. junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in2 copper pad of FR4 board; 270℃ /W when mounted on Min. copper pad.

CHARACTERISTIC CURVES

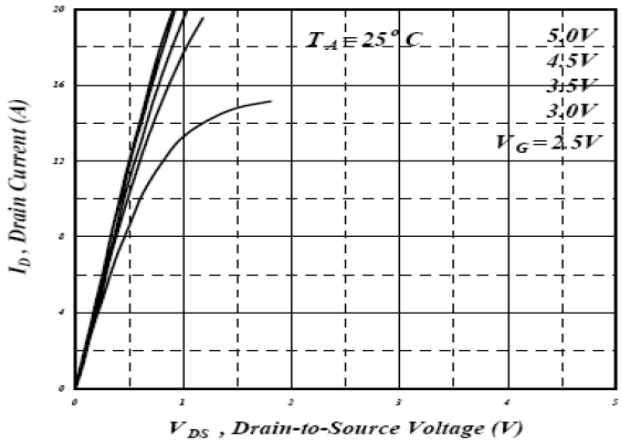


Fig 1. Typical Output Characteristics

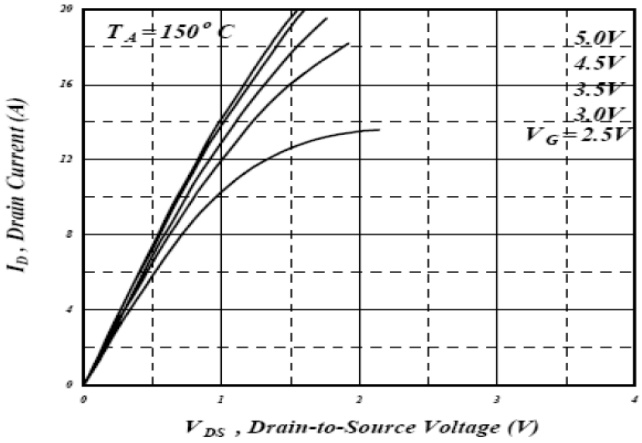


Fig 2. Typical Output Characteristics

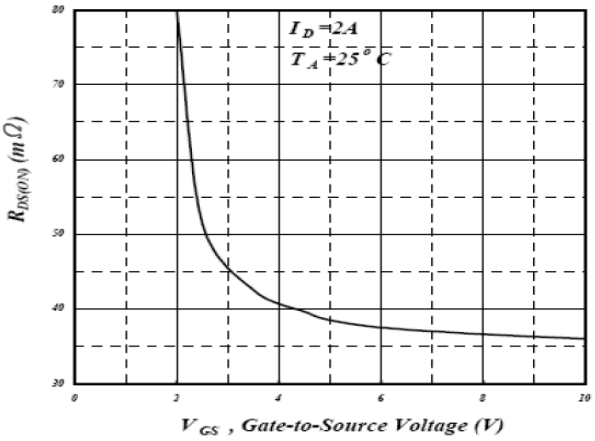


Fig 3. On-Resistance v.s. Gate Voltage

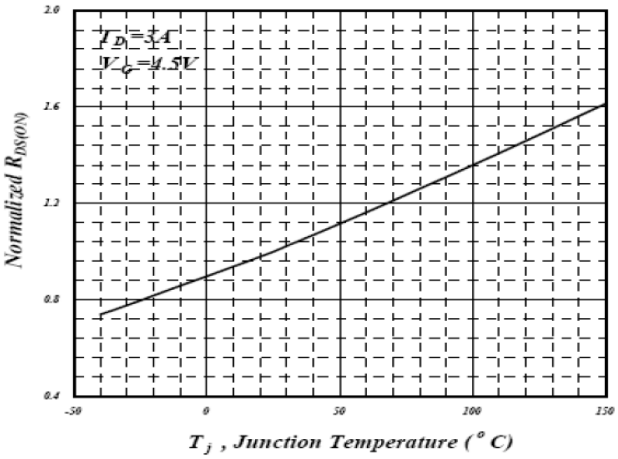


Fig 4. Normalized On-Resistance v.s. Junction Temperature

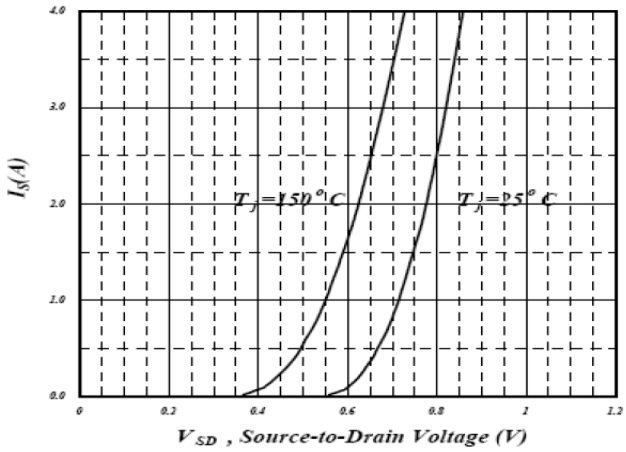


Fig 5. Forward Characteristic of Reverse Diode

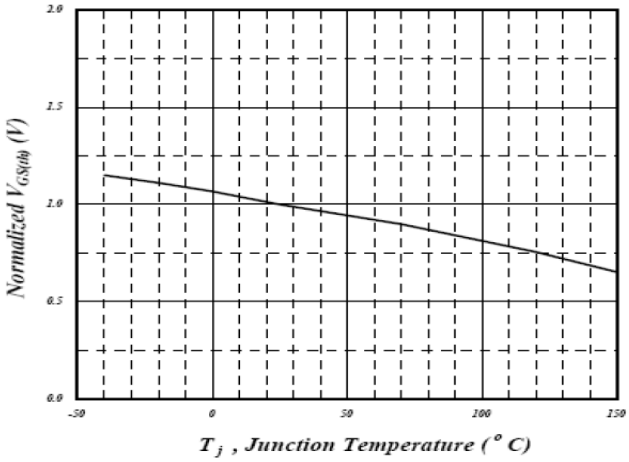


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CHARACTERISTIC CURVES

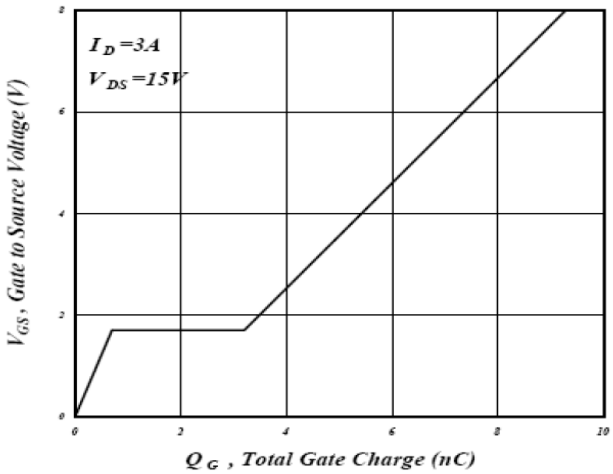


Fig 7. Gate Charge Characteristics

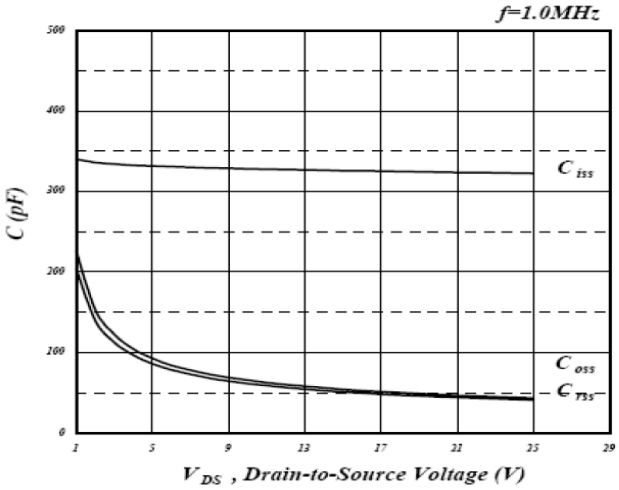


Fig 8. Typical Capacitance Characteristics

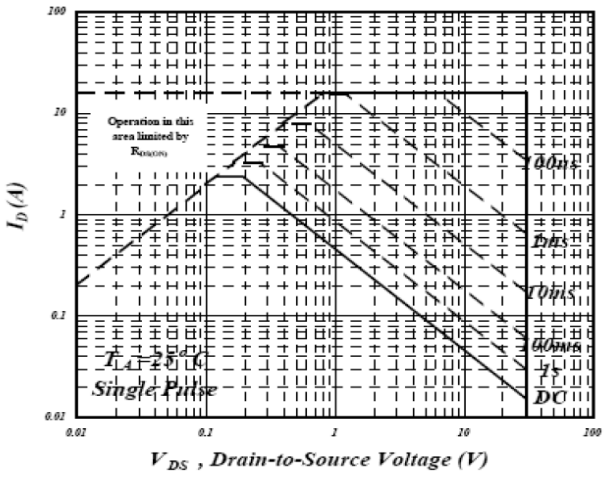


Fig 9. Maximum Safe Operating Area

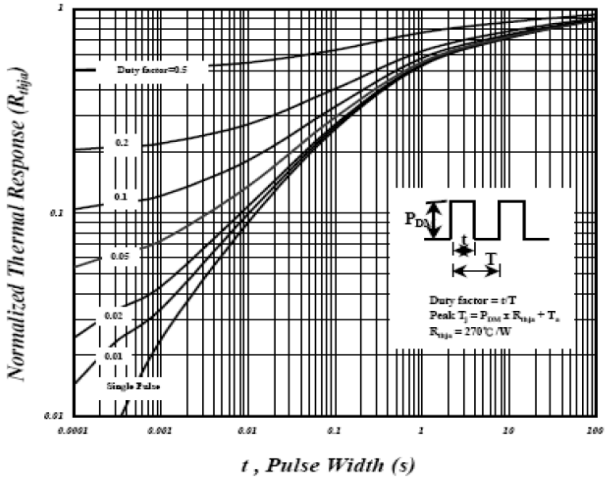


Fig 10. Effective Transient Thermal Impedance

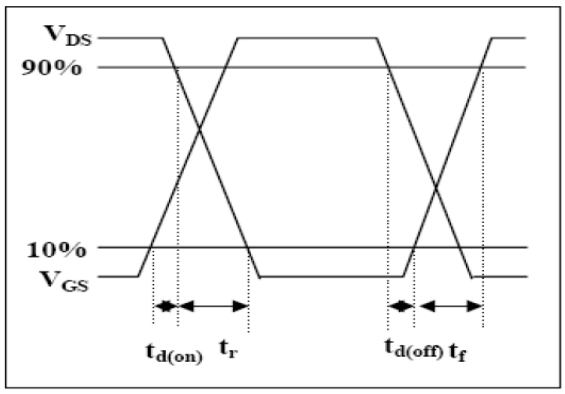


Fig 11. Switching Time Waveform

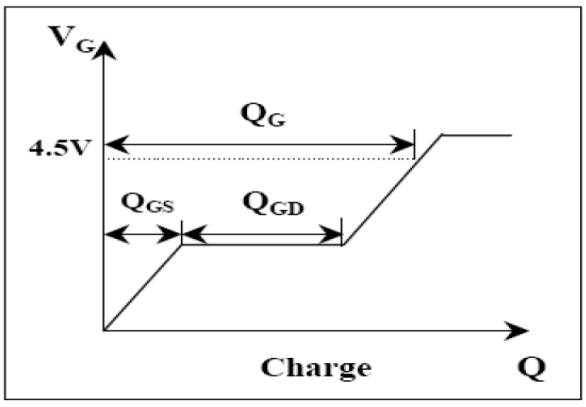


Fig 12. Gate Charge Circuit