

RoHS Compliant Product

Description

The SMG2402 provides the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

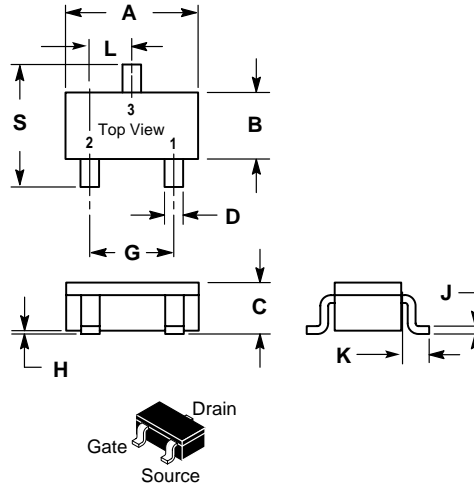
Features

- * Fast Switching
- * Ultra Low On-Resistance

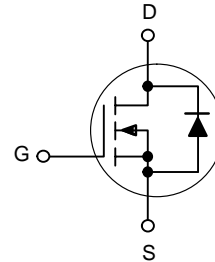
Applications

- * Power Management in Notebook Computer
- * Portable Equipment
- * Battery Powered System

Marking : 2402



SC-59		
Dim	Min	Max
A	2.70	3.10
B	1.40	1.60
C	1.00	1.30
D	0.35	0.50
G	1.70	2.10
H	0.00	0.10
J	0.10	0.26
K	0.20	0.60
L	0.85	1.15
S	2.40	2.80
All Dimension in mm		



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current ³ V _{GS} @4.5V	I _D @T _A =25°C	3.2	A
Continuous Drain Current ³ V _{GS} @4.5V	I _D @T _A =70°C	2.6	A
Pulsed Drain Current ^{1,2}	I _{DM}	7.4	A
Total Power Dissipation	P _D @T _A =25°C	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient ³ Max.	R _{thj-a}	90	°C/W

Electrical Characteristics($T_j=25^\circ\text{C}$ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DS}/\Delta T_j$	-	0.1	-	V/	Reference to $25^\circ\text{C}, I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	0.7	-	1.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 12V$
Drain-Source Leakage Current ($T_j=25^\circ\text{C}$)	I_{DSS}	-	-	1	μA	$V_{DS}=20V, V_{GS}=0$
Drain-Source Leakage Current ($T_j=70^\circ\text{C}$)		-	-	10	μA	$V_{DS}=20V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	250	m Ω	$V_{GS}=4.5V, I_D=0.93A$
		-	-	350		$V_{GS}=2.7V, I_D=0.47A$
Total Gate Charge ²	Q_g	-	4.4	-	nC	$I_D=3.6A$ $V_{DS}=10V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	0.6	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	1.9	-		
Turn-on Delay Time ²	$T_{d(ON)}$	-	5.2	-	nS	$V_{DS}=10V$ $I_D=3.6A$ $V_{GS}=5V$ $R_G=6\Omega$ $R_D=2.8\Omega$
Rise Time	T_r	-	37	-		
Turn-off Delay Time	$T_{d(OFF)}$	-	15	-		
Fall Time	T_f	-	5.7	-		
Input Capacitance	C_{iss}	-	145	-	pF	$V_{GS}=0V$ $V_{DS}=10V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	100	-		
Reverse Transfer Capacitance	C_{rss}	-	50	-		
Forward Transconductance	G_{fs}	-	6	-	S	$V_{DS}=10V, I_D=0.47A$

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1.6A, V_{GS}=0, T_j=25^\circ\text{C}$
Continuous Source Current(Body Diode)	I_S	-	-	1	A	$V_D=V_G=0V, V_S=1.2V$
Pulsed Source Current(Body Diode) ¹	I_{SM}	-	-	7.4	A	

Notes: 1.Pulse width limited by Max. junction temperature.

 2.Pulse width $\leq 300\mu s$, dutycycle $\leq 2\%$.

 3.Surface mounted on 1 inch² copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

Characteristics Curve

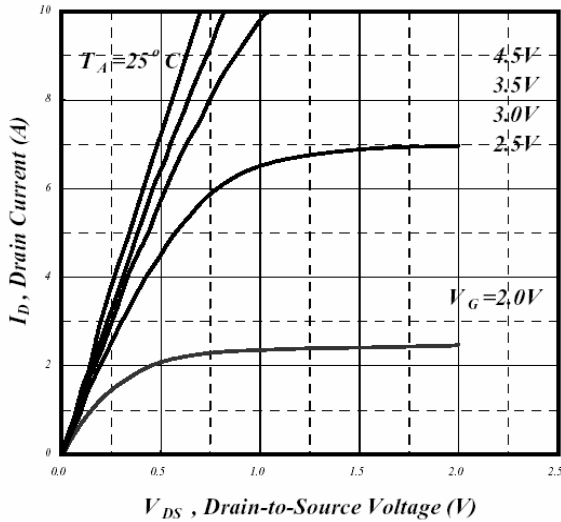


Fig 1. Typical Output Characteristics

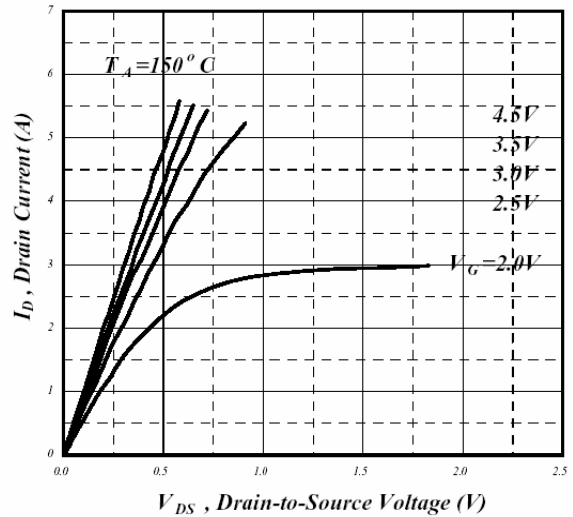


Fig 2. Typical Output Characteristics

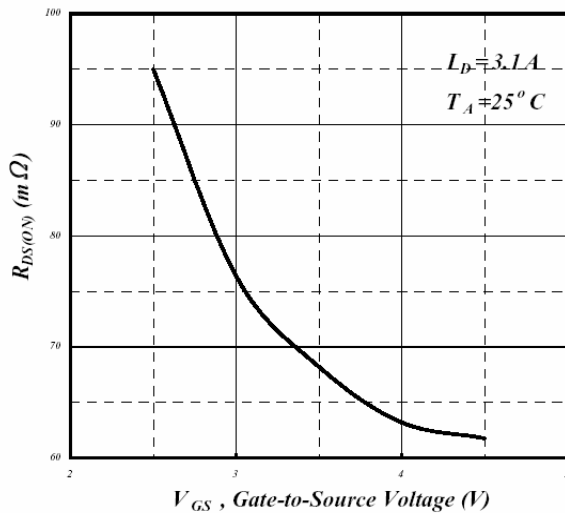


Fig 3. On-Resistance v.s. Gate Voltage

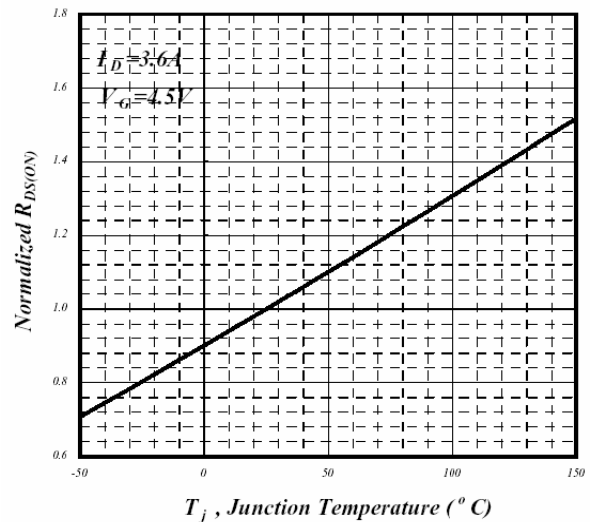


Fig 4. Normalized On-Resistance

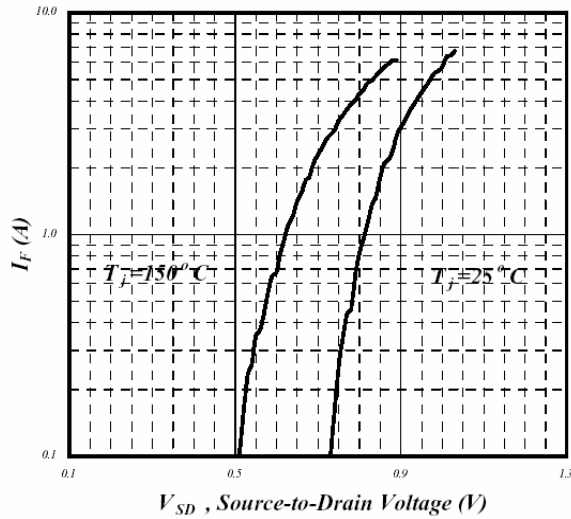


Fig 5. Forward Characteristic of Reverse Diode

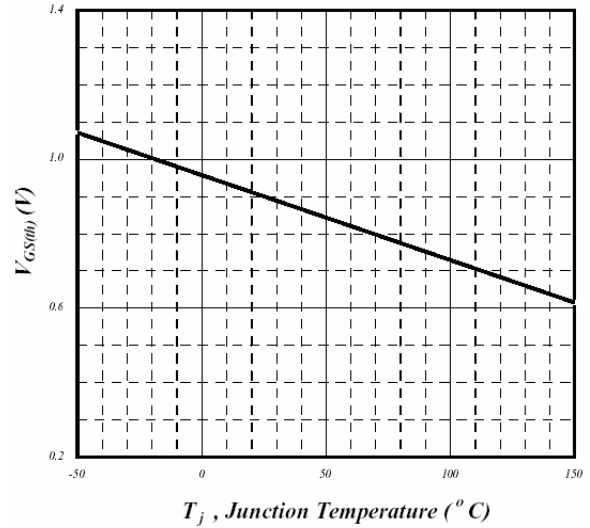


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

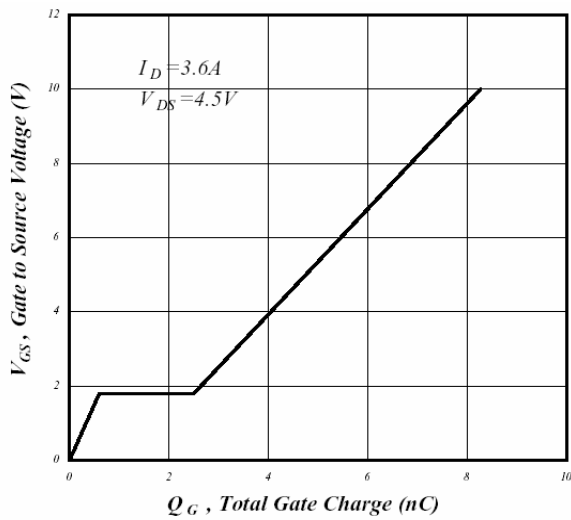


Fig 7. Gate Charge Characteristics

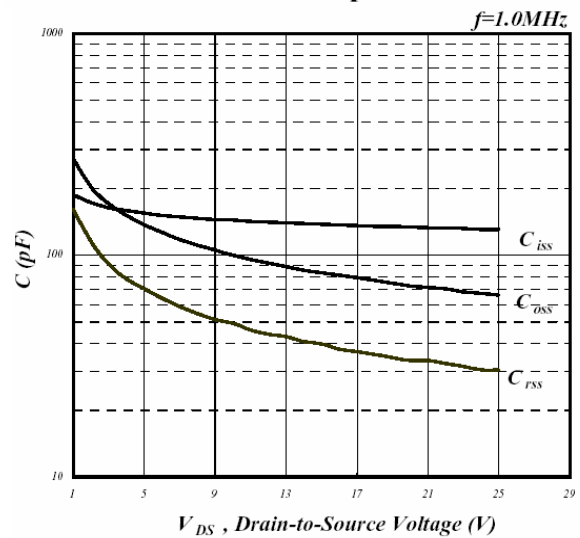


Fig 8. Typical Capacitance Characteristics

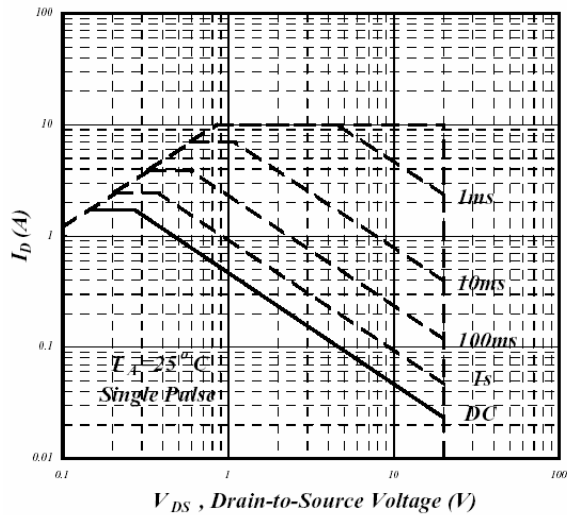


Fig 9. Maximum Safe Operating Area

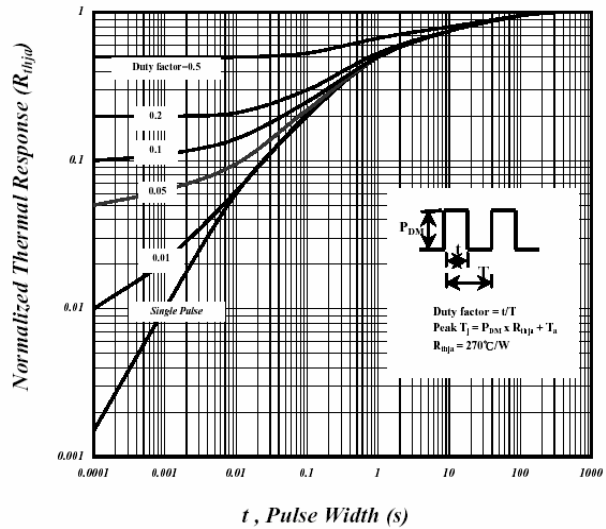


Fig10. Effective Transient Thermal Impedance

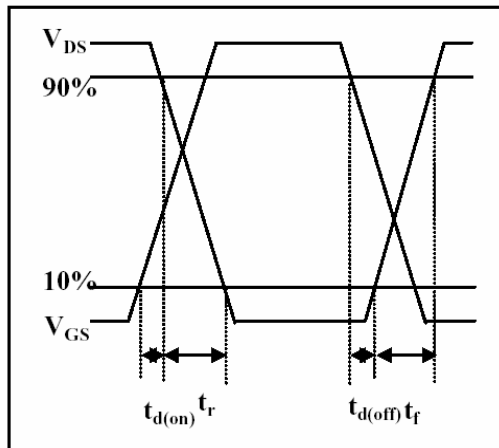


Fig 11. Switching Time Waveform

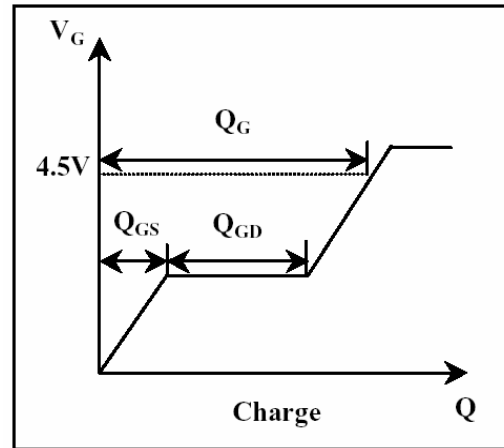


Fig 12. Gate Charge Waveform