

G2302

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV _{DSS}	20V
R _{DS(ON)}	85mΩ
I _D	3.2A

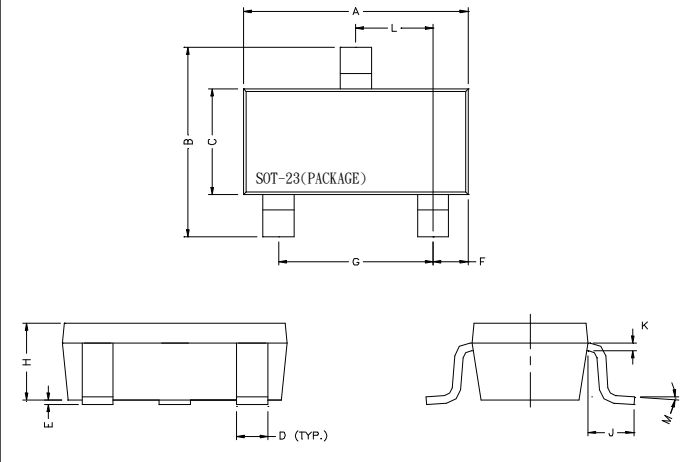
Description

The G2302 provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

Features

- *Capable of 2.5V gate drive
- *Small Package Outline

Package Dimensions



The diagram shows the SOT-23 package with dimensions A through M. Dimensions A, B, C, D, E, F, G, H, J, K, L, and M are indicated in millimeters. Dimension D is noted as typical (TYP.).

N-Channel symbol shows the internal structure with Drain (D), Gate (G), and Source (S) terminals.

Marking : The package is marked with the number 2302. The terminals are labeled G (Gate), S (Source), and D (Drain).

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

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 @TA =25°C	3.2	A
Continuous Drain Current ³ , V _{GS} @4.5V	I _D @TA =70°C	2.6	A
Pulsed Drain Current ^{1,2}	I _{DM}	10	A
Power Dissipation	P _D @TA =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°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	$V_{GS}=0, I_D=250\mu A$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.1	-	V/°C	Reference to 25°C, $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	6	-	S	$V_{DS}=5V, I_D=3.6A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current(T _j =25°C)	I_{DSS}	-	-	1	uA	$V_{DS}=20V, V_{GS}=0$
Drain-Source Leakage Current(T _j =70°C)		-	-	10	uA	$V_{DS}=20V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	85	mΩ	$V_{GS}=4.5V, I_D=3.6A$
		-	-	115		$V_{GS}=2.5V, I_D=3.1A$
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	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1.6A, V_{GS}=0V$
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}	-	-	10	A	

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

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

3. Surface mounted on 1 in² copper pad of FR4 board;270°C/W when mounted on min. copper pad.

Characteristics Curve

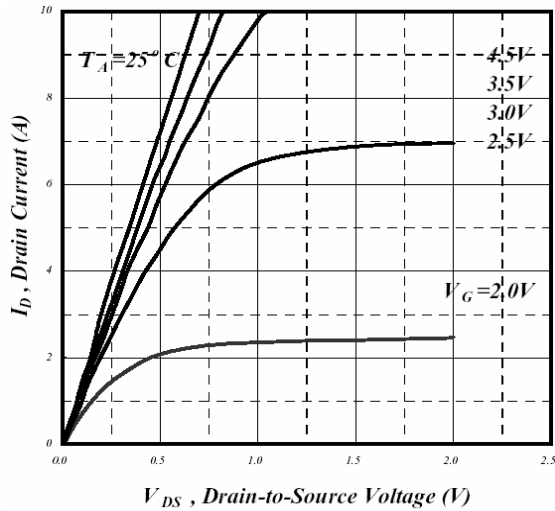


Fig 1. Typical Output Characteristics

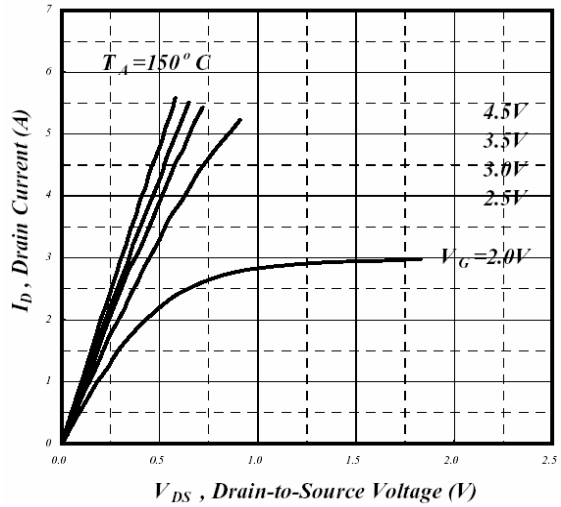


Fig 2. Typical Output Characteristics

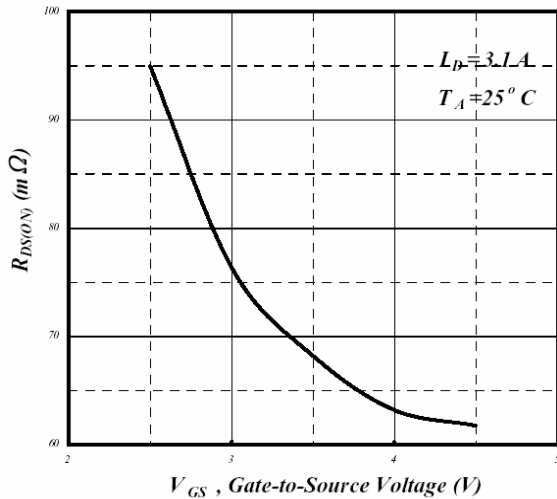


Fig 3. On-Resistance v.s. Gate Voltage

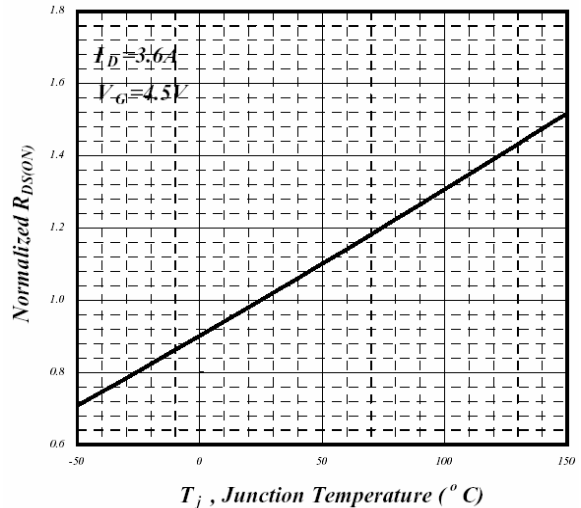


Fig 4. Normalized On-Resistance v.s. Junction Temperature

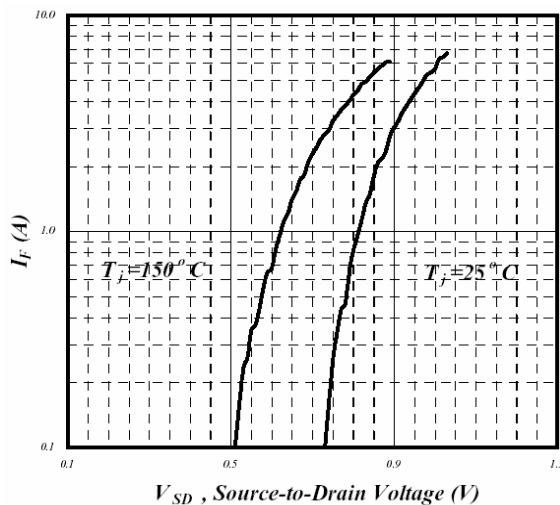


Fig 5. Forward Characteristics of Reverse Diode

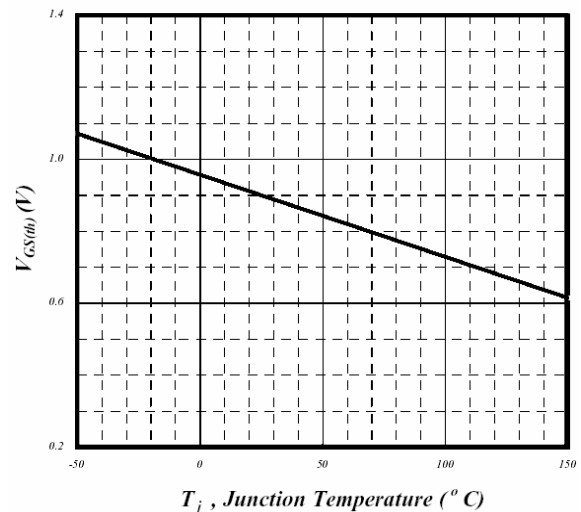


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

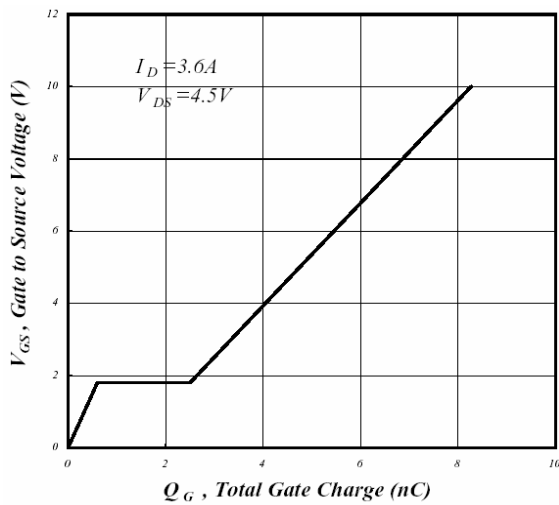


Fig 7. Gate Charge Characteristics

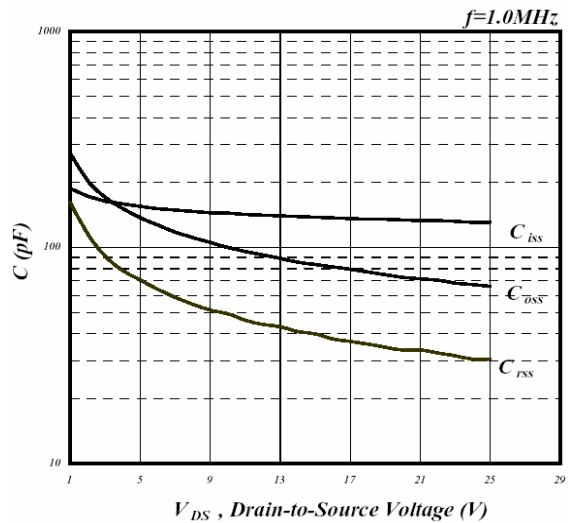


Fig 8. Typical Capacitance Characteristics

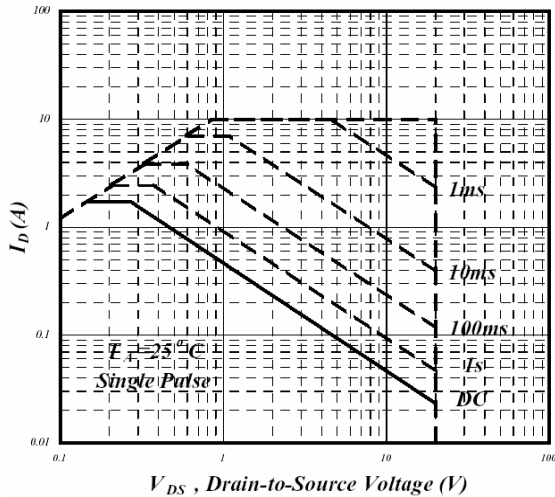


Fig 9. Maximum Safe Operating Area

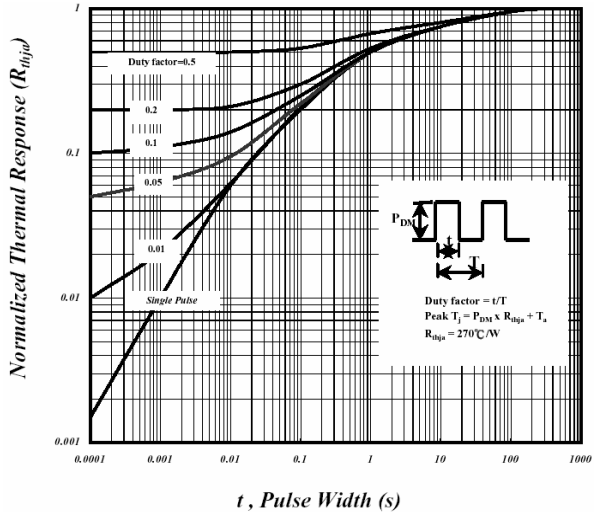


Fig 10. Effective Transient Thermal Impedance

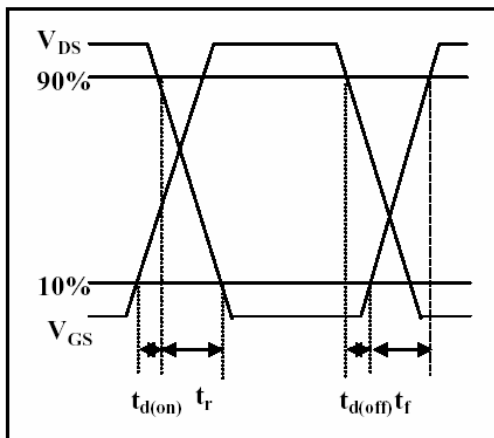


Fig 11. Switching Time Waveform

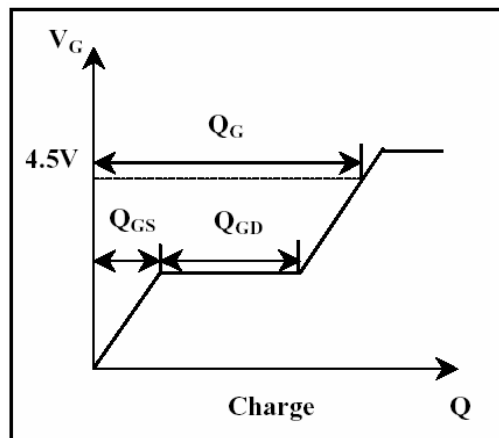


Fig 12. Gate Charge Waveform

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