

G2306

Power MOSFET 5.3Amps, 20Volts

N-Channel SOT-23

Description

The G2306 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-23 package is universally used for all commercial-industrial applications.

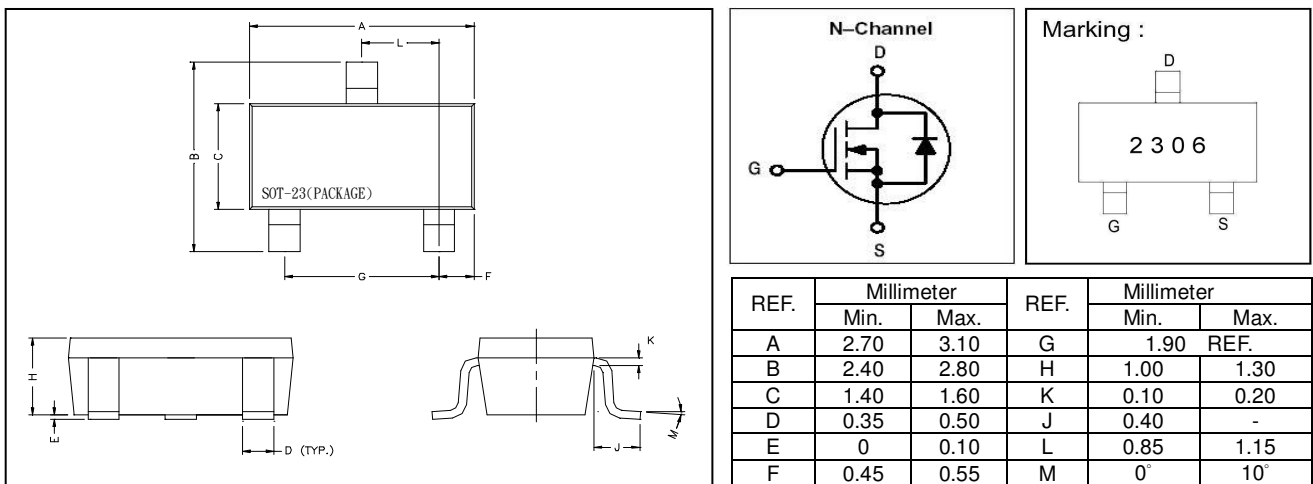
Features

- Capable of 2.5V gate drive
- Lower on-resistance
- Reliable and Rugged

Applications

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

Package Dimensions



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	VDSS	20	V
Gate-Source Voltage	VGS	±12	V
Continuous Drain Current ³ , VGS@4.5V	ID @Ta=25°C	5.3	A
Continuous Drain Current ³ , VGS@4.5V	ID @Ta=70°C	4.3	A
Pulsed Drain Current ^{1,2}	IDM	10	A
Power Dissipation	PD@Ta=25°C	1.38	W
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	°C
Linear Derating Factor		0.01	W/°C

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient ³ Max.	Rthj-a	90	°C/W

Electrical Characteristics(Tj = 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}	-	13	-	S	$V_{DS}=5.0V, I_D=5.3A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current(Tj=25°C)	I_{DSS}	-	-	1	uA	$V_{DS}=20V, V_{GS}=0$
Drain-Source Leakage Current(Tj=70°C)		-	-	10	uA	$V_{DS}=16V, V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	-	30	mΩ	$I_D=5.5A, V_{GS}=10V$
		-	-	35		$I_D=5.3A, V_{GS}=4.5V$
		-	-	50		$I_D=2.6A, V_{GS}=2.5V$
		-	-	90		$I_D=1.0A, V_{GS}=1.8V$
Total Gate Charge ²	Q_g	-	8.7	-	nC	$I_D=5.3A$
Gate-Source Charge	Q_{gs}	-	1.5	-		$V_{DS}=10V$
Gate-Drain ("Miller") Charge	Q_{gd}	-	3.6	-		$V_{GS}=4.5V$
Turn-on Delay Time ²	$T_{d(on)}$	-	6	-	ns	$V_{DS}=15V$
Rise Time	T_r	-	14	-		$I_D=1A$
Turn-off Delay Time	$T_{d(off)}$	-	18.4	-		$V_{GS}=10V$
Fall Time	T_f	-	2.8	-		$R_G=2\Omega$ $R_D=15\Omega$
Input Capacitance	C_{iss}	-	603	-	pF	$V_{GS}=0V$
Output Capacitance	C_{oss}	-	144	-		$V_{DS}=15V$
Reverse Transfer Capacitance	C_{rss}	-	111	-		$f=1.0MHz$

Source-Drain Diode

Forward On Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1.2A, V_{GS}=0, T_j=25^\circ C$
Reverse Recovery Time	T_{rr}	-	16.8	-	ns	$I_S=5.0A, V_{GS}=0$
Reverse Recovery Charge	Q_{rr}	-	11	-	nC	$dI/dt=100A/\mu s$

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

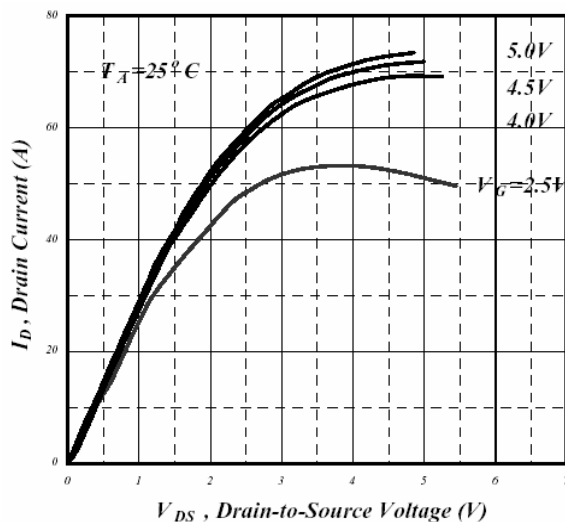


Fig 1. Typical Output Characteristics

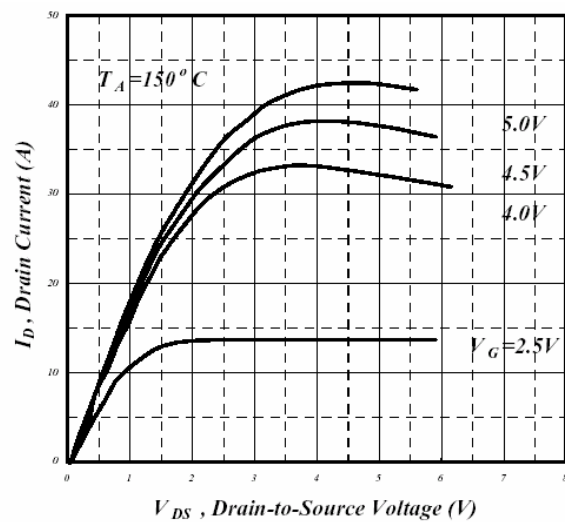


Fig 2. Typical Output Characteristics

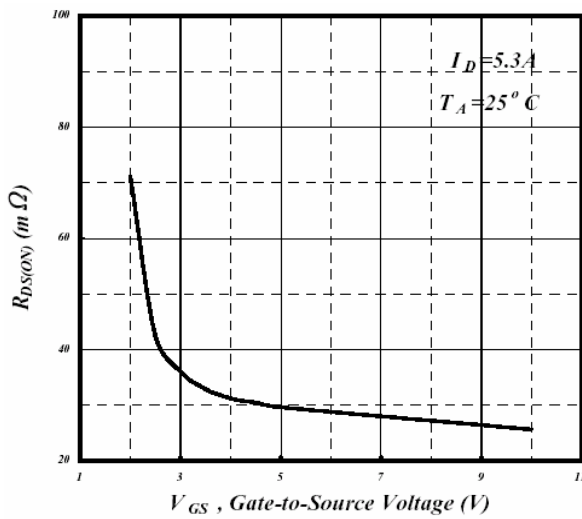


Fig 3. On-Resistance v.s. Gate Voltage

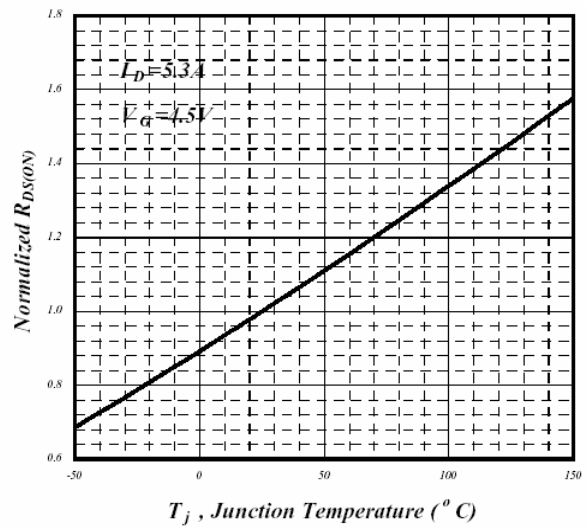


Fig 4. Normalized On-Resistance v.s. Junction Temperature

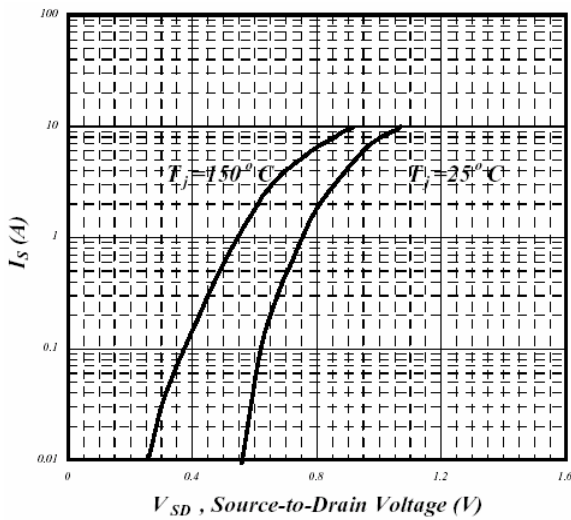


Fig 5. Forward Characteristic of Reverse Diode

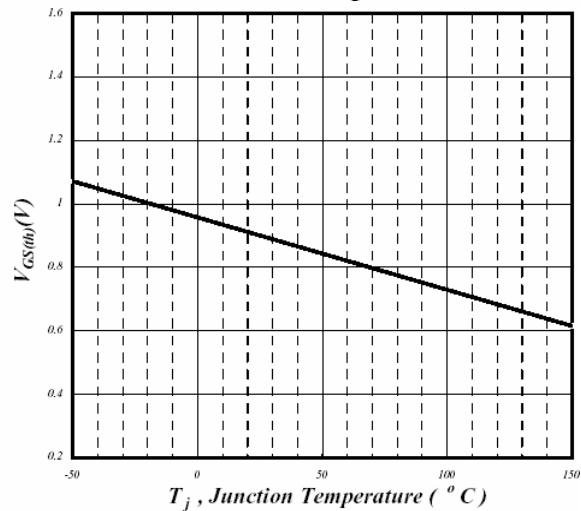


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

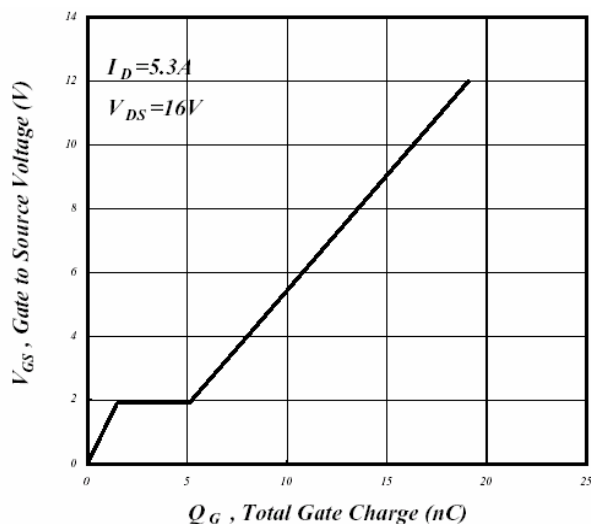


Fig 7. Gate Charge Characteristics

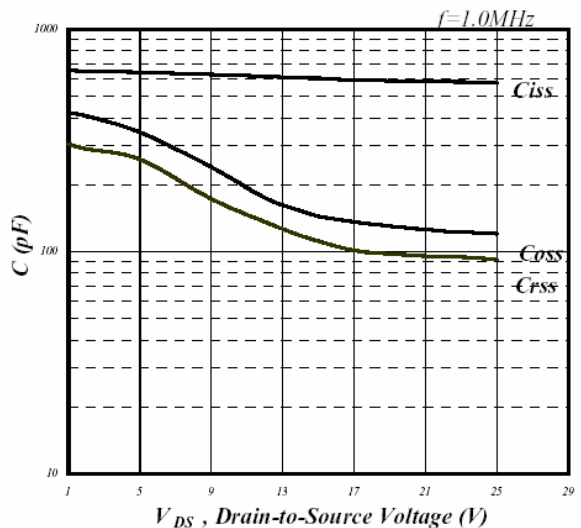


Fig 8. Typical Capacitance Characteristics

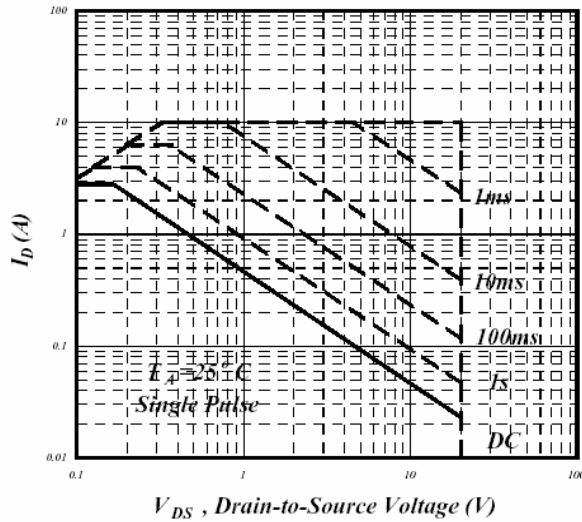


Fig 9. Maximum Safe Operating Area

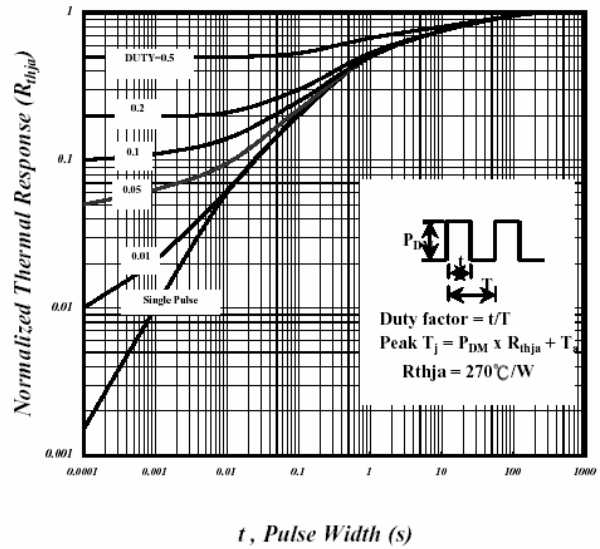


Fig10. Effective Transient Thermal Impedance

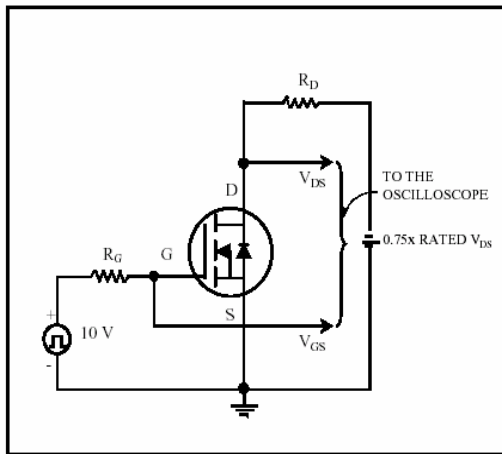


Fig 11. Switching Time Circuit

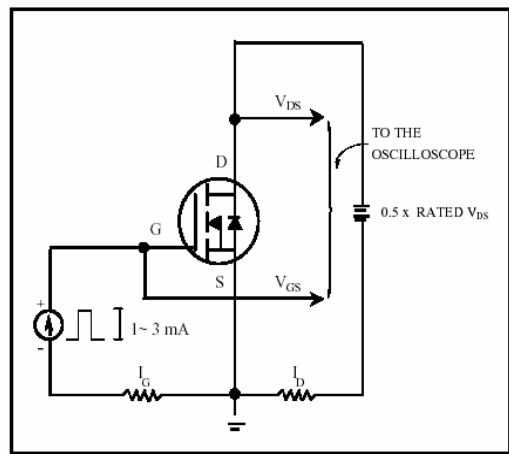


Fig 12. Gate Charge Circuit

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