

# G2304

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV <sub>DSS</sub>	25V
R <sub>DS(ON)</sub>	117mΩ
I <sub>D</sub>	2.7A

### Description

The G2304 provides the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

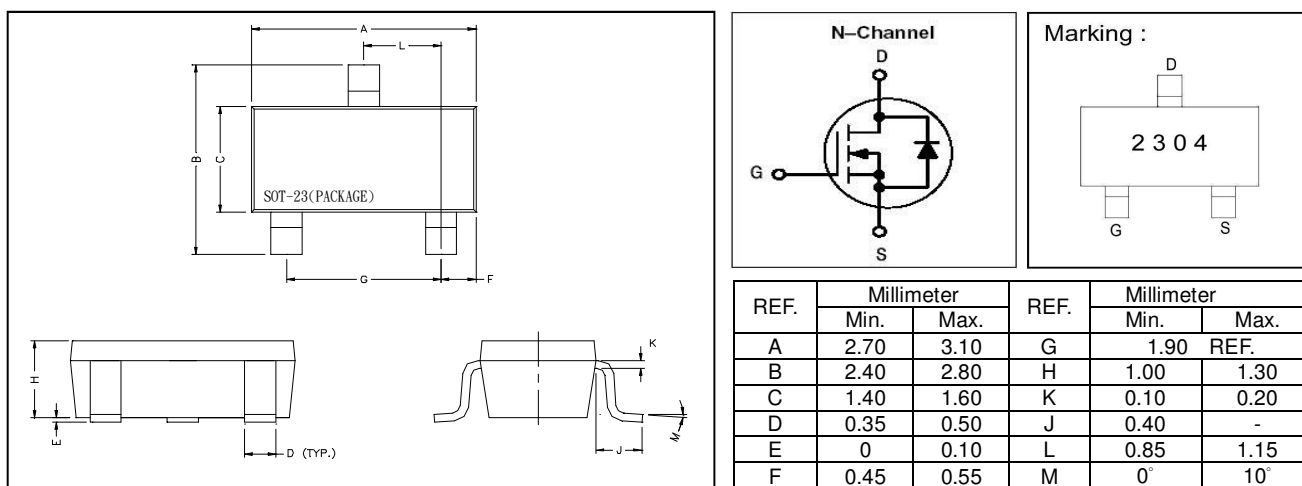
### Features

- Super High Dense Cell Design for Extremely Low R<sub>DS(ON)</sub>
- 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	V <sub>DS</sub>	25	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @4.5V	I <sub>D</sub> @TA=25°C	2.7	A
Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @4.5V	I <sub>D</sub> @TA=70°C	2.2	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	10	A
Power Dissipation	P <sub>D</sub> @TA=25°C	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	R <sub>thj-a</sub>	90	°C/W

## Electrical Characteristics(Tj = 25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	25	-	-	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	$V_{GS(th)}$	1.0	-	3.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	$g_{fs}$	-	3.4	-	S	$V_{DS}=4.5V, I_D=2.5A$
Gate-Source Leakage Current	$I_{GSS}$	-	-	±100	nA	$V_{GS}= \pm 20V$
Drain-Source Leakage Current(Tj=25°C)	$I_{DSS}$	-	-	1	uA	$V_{DS}=25V, V_{GS}=0$
Drain-Source Leakage Current(Tj=70°C)		-	-	10	uA	$V_{DS}=25V, V_{GS}=0$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(on)}$	-	-	117	mΩ	$I_D=2.5A, V_{GS}=10V$
		-	-	190		$I_D=2.0A, V_{GS}=4.5V$
Total Gate Charge <sup>2</sup>	$Q_g$	-	5.9	10	nC	$I_D=2.5A$
Gate-Source Charge	$Q_{gs}$	-	0.8	-		$V_{DS}=15V$
Gate-Drain ("Miller") Change	$Q_{gd}$	-	2.1	-		$V_{GS}=10V$
Turn-on Delay Time <sup>2</sup>	$T_{d(on)}$	-	4.5	-	ns	$V_{DS}=15V$ $I_D=1A$ $V_{GS}=10V$ $R_G=6\Omega$ $R_D=15\Omega$
Rise Time	$T_r$	-	11.5	-		
Turn-off Delay Time	$T_{d(off)}$	-	12	-		
Fall Time	$T_f$	-	3	-		
Input Capacitance	$C_{iss}$	-	110	-	pF	$V_{GS}=0V$ $V_{DS}=15V$ $f=1.0MHz$
Output Capacitance	$C_{oss}$	-	85	-		
Reverse Transfer Capacitance	$C_{rss}$	-	39	-		

## Source-Drain Diode

Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S=1.25A, V_{GS}=0 T_j=25^\circ C$
Continuous Source Current(Body Diode)	$I_S$	-	-	1	A	$V_D=V_G=0V, V_S=1.2V$
Pulsed Source Current (Body Diode) <sup>1</sup>	$I_{SM}$	-	-	10	A	

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

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board;270°C/w when mounted on min. copper pad.

## Characteristics Curve

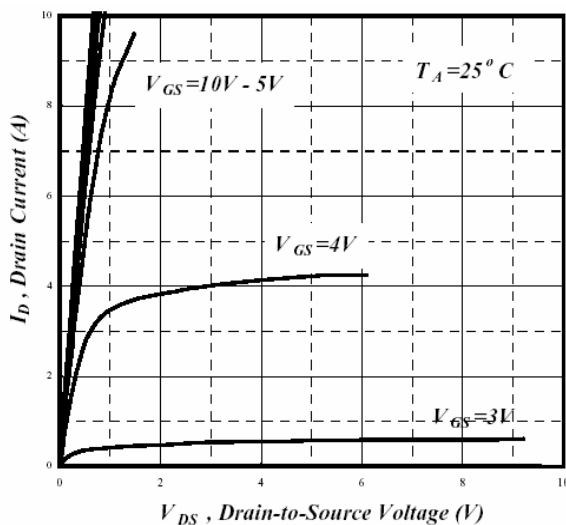


Fig 1. Typical Output Characteristics

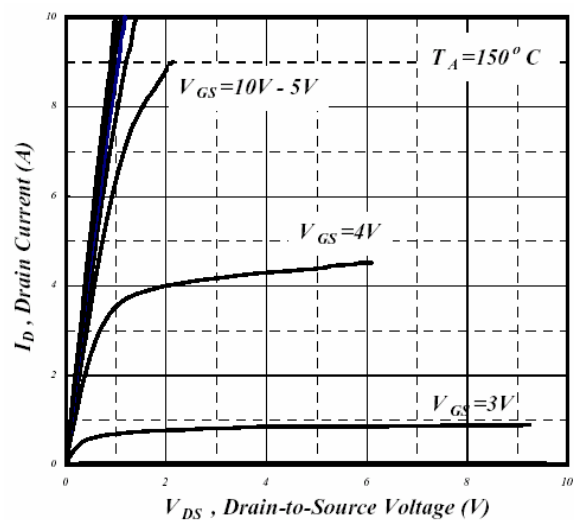
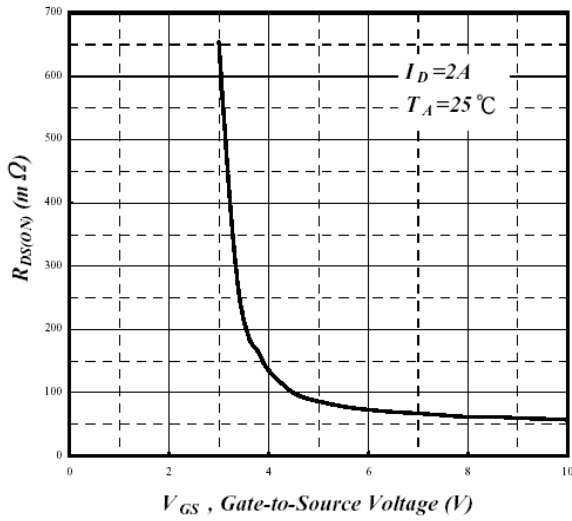
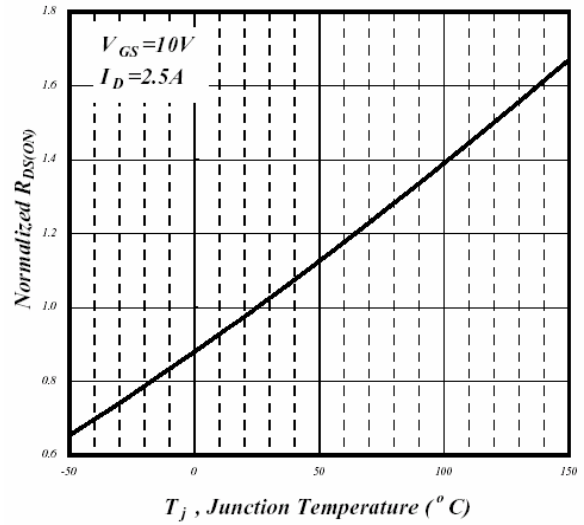


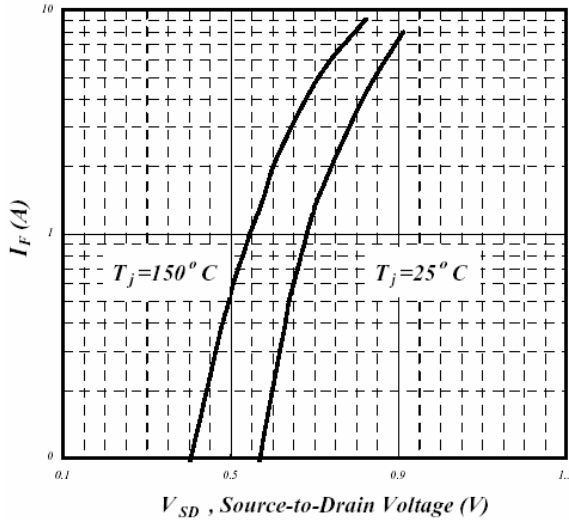
Fig 2. Typical Output Characteristics



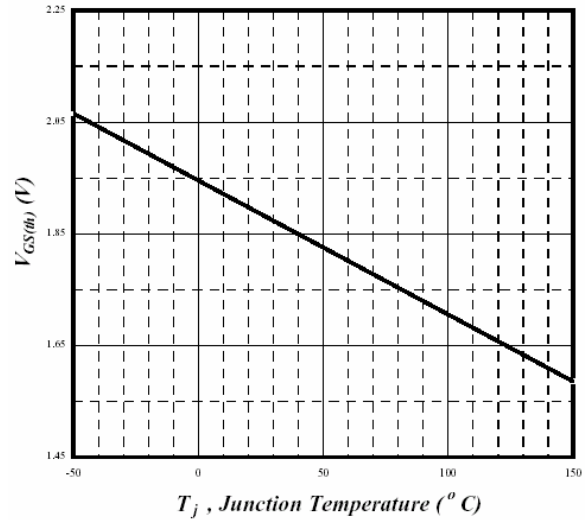
**Fig 3. On-Resistance v.s. Gate Voltage**



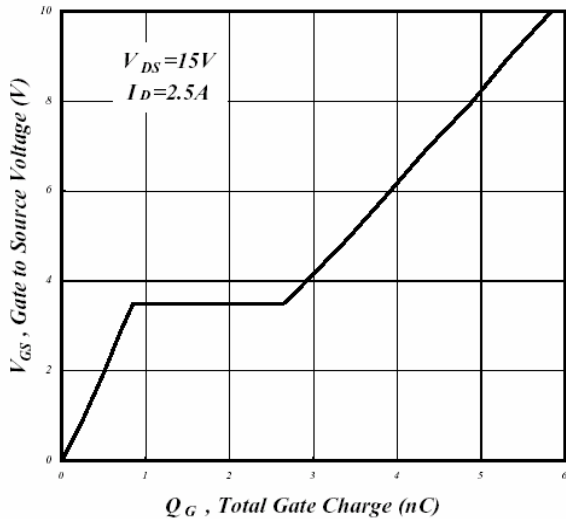
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



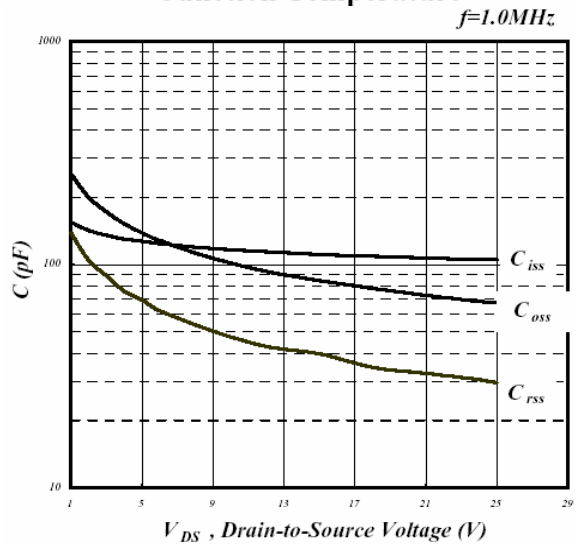
**Fig 5. Forward Characteristic of Reverse Diode**



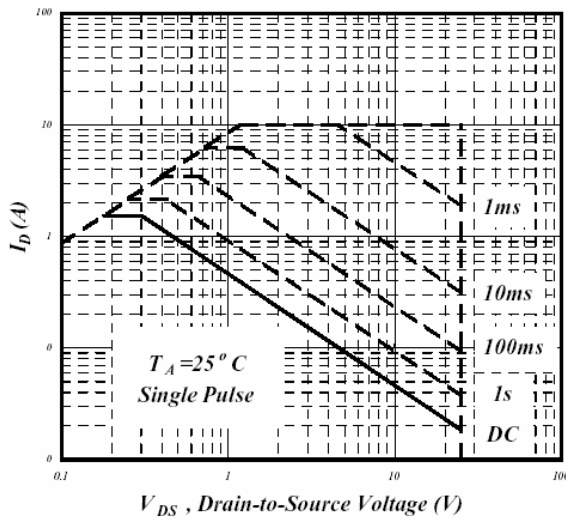
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



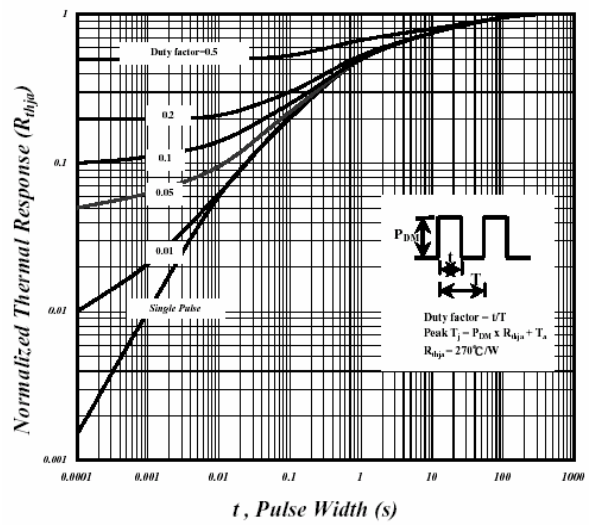
**Fig7. Gate Charge Characteristics**



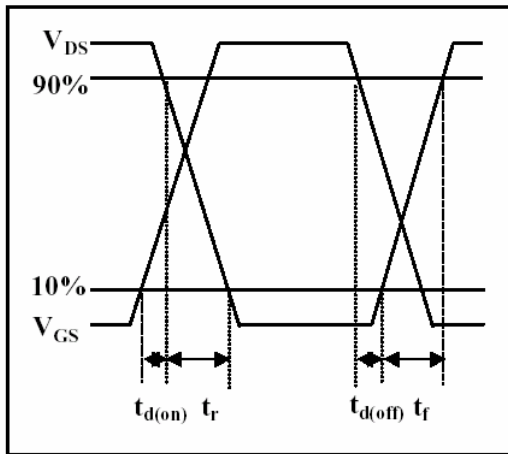
**Fig 8. Typical Capacitance Characteristics**



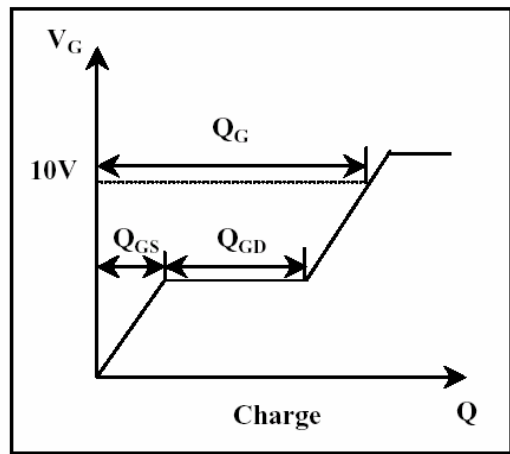
**Fig 9. Maximum Safe Operating Area**



**Fig10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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