

# GI3303

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	25V
RDS(ON)	25mΩ
ID	28A

### Description

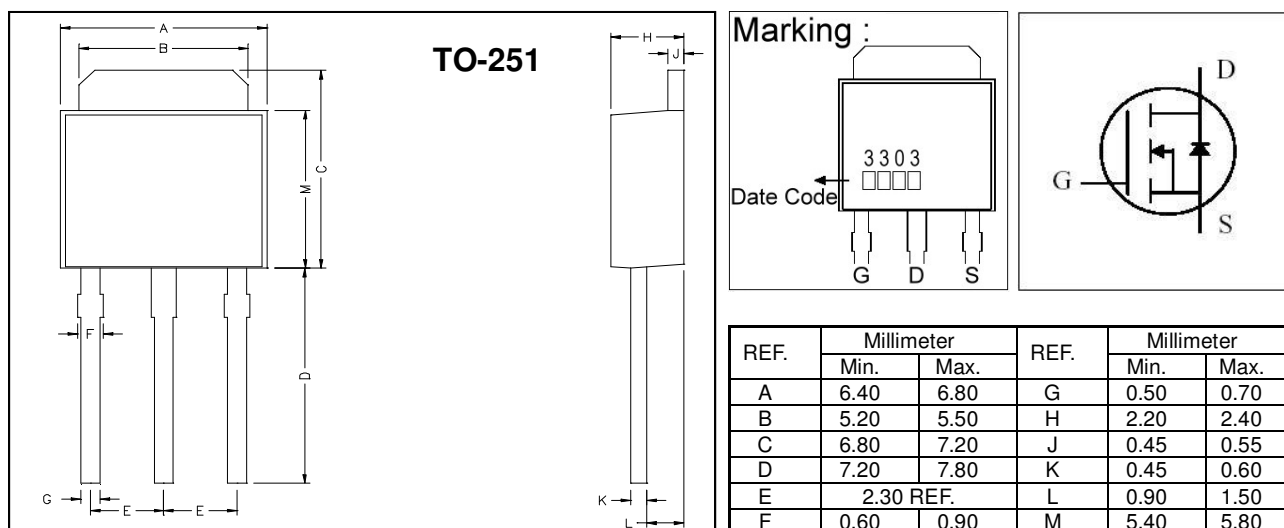
The GI3303 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The through-hole version (TO-251) is available for low-profile applications and suited for low voltage applications such as DC/DC converters.

### Features

- \*Low Gate Charge
- \*Simple Drive Requirement
- \*Fast Switching

### Package Dimensions



### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	25	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^\circ C$	28	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^\circ C$	18	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	130	A
Total Power Dissipation	$P_D @T_C=25^\circ C$	31	W
Linear Derating Factor		0.25	W/ $^\circ C$
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ +150	$^\circ C$

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case Max.	$R_{thj-case}$	4.0	$^\circ C/W$
Thermal Resistance Junction-ambient Max.	$R_{thj-amb}$	110	$^\circ C/W$

**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	$\Delta BV_{DSS} / \Delta T_j$	-	0.02	-	V/°C	Reference to 25°C, $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	$g_{fs}$	-	20	-	S	$V_{DS}=10V, I_D=20A$
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=150°C)		-	-	100	uA	$V_{DS}=20V, V_{GS}=0$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	25	mΩ	$V_{GS}=10V, I_D=20A$
Total Gate Charge <sup>2</sup>	$Q_g$	-	14.5	24	nC	$I_D=20A$ $V_{DS}=20V$ $V_{GS}=10V$
Gate-Source Charge	$Q_{gs}$	-	3	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	8.5	-		
Turn-on Delay Time <sup>2</sup>	$T_{d(on)}$	-	8.8	-	ns	$V_{DS}=15V$ $I_D=20A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=0.75\Omega$
Rise Time	$T_r$	-	65	-		
Turn-off Delay Time	$T_{d(off)}$	-	11	-		
Fall Time	$T_f$	-	7	-		
Input Capacitance	$C_{iss}$	-	340	540	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	$C_{oss}$	-	250	-		
Reverse Transfer Capacitance	$C_{rss}$	-	98	-		

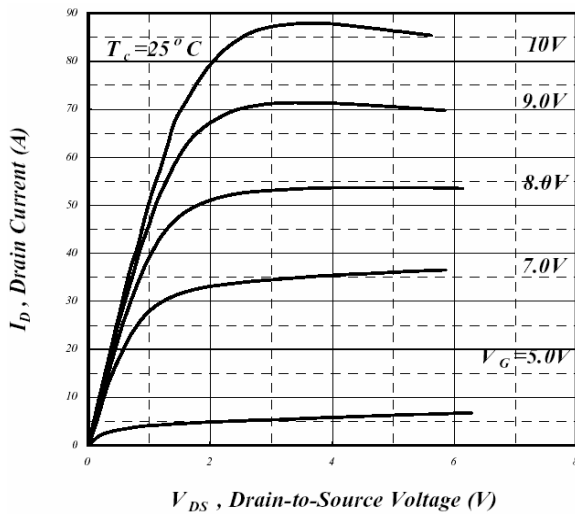
**Source-Drain Diode**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.5	V	$I_S=20A, V_{GS}=0V$
Reverse Recovery Time	$T_{rr}$	-	30.5	-	ns	$I_S=20A, V_{GS}=0V$
Reverse Recovery Charge	$Q_{rr}$	-	29	-	nC	$di/dt=100A/\mu s$

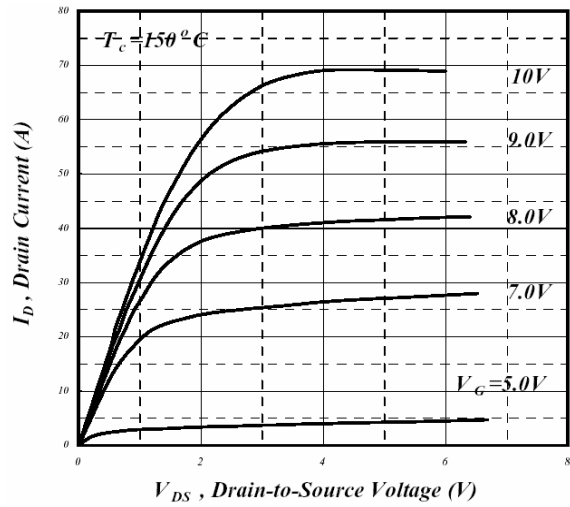
Notes: 1. Pulse width limited by safe operating area.

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

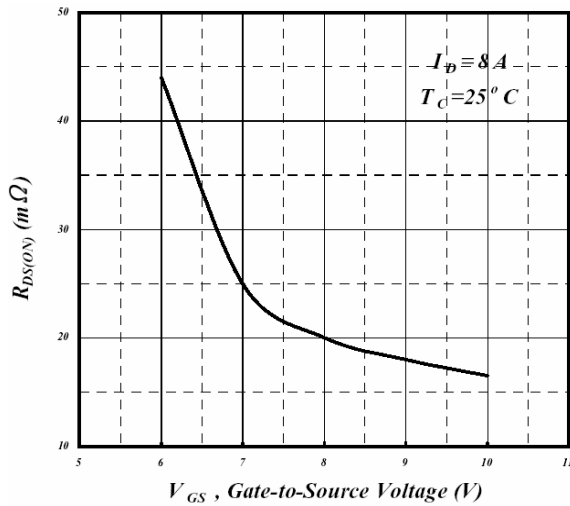
## Characteristics Curve



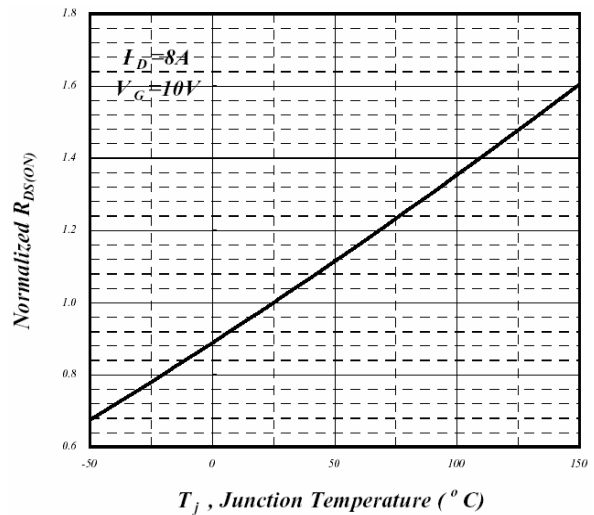
**Fig 1. Typical Output Characteristics**



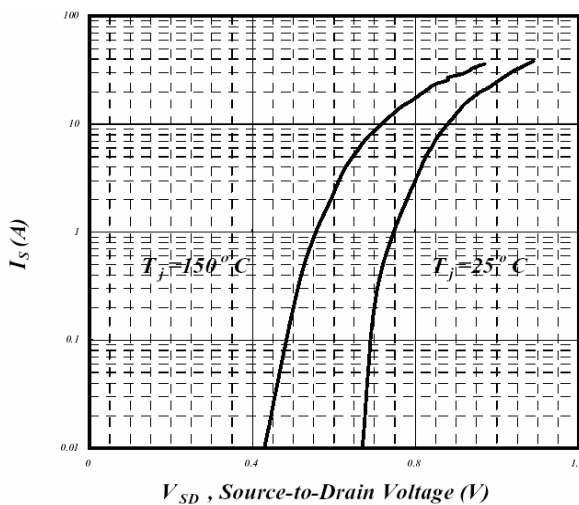
**Fig 2. Typical Output Characteristics**



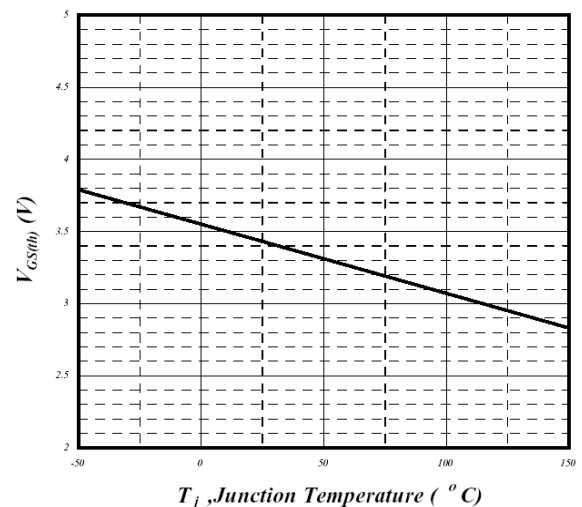
**Fig 3. On-Resistance v.s. Gate Voltage**



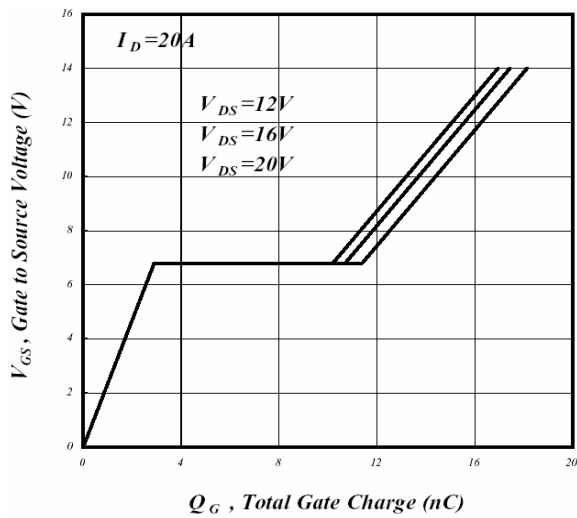
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



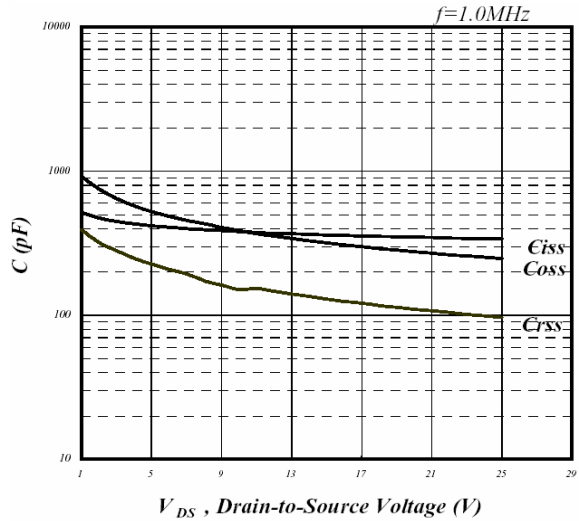
**Fig 5. Forward Characteristics of Reverse Diode**



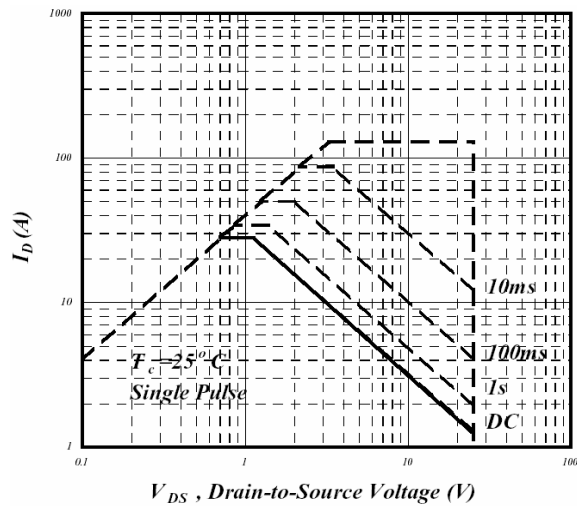
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



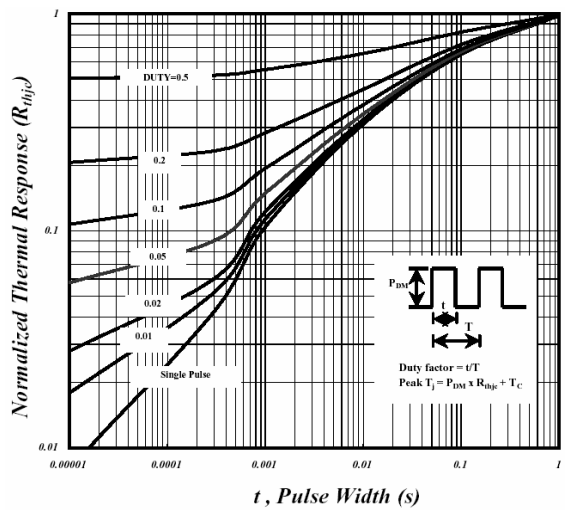
**Fig 7. Gate Charge Characteristics**



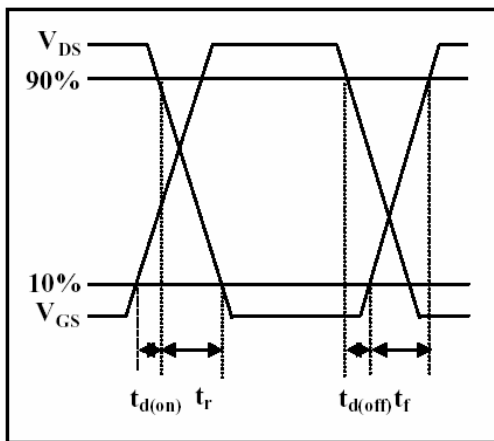
**Fig 8. Typical Capacitance Characteristics**



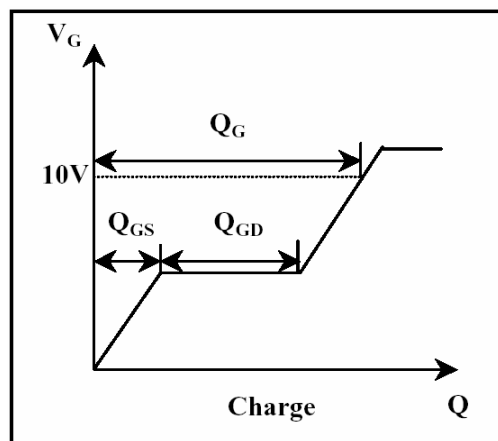
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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