

GC2301**P-CHANNEL ENHANCEMENT MODE POWER MOSFET**

BVDSS	-20V
RDS(ON)	130mΩ
ID	-2.6A

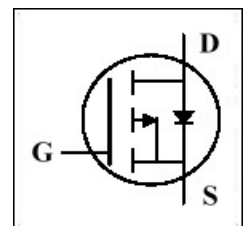
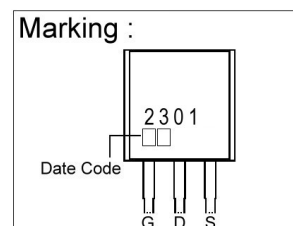
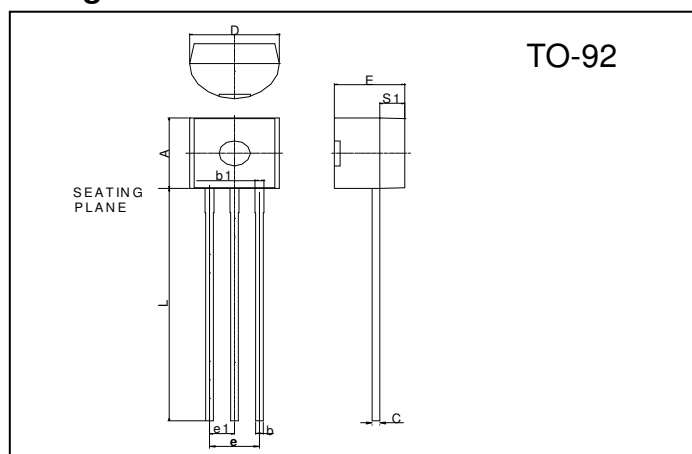
Description

The GC2301 provides the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The GC2301 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Features

- *Simple Drive Requirement
- *Fast Switching

Package Dimensions

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.45	4.7	D	4.44	4.7
S1	1.02	-	E	3.30	3.81
b	0.36	0.51	L	12.70	-
b1	0.36	0.76	e1	1.150	1.390
C	0.36	0.51	e	2.42	2.66

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	$I_D @ T_A = 25^\circ\text{C}$	-2.6	A
Continuous Drain Current	$I_D @ T_A = 70^\circ\text{C}$	-2.1	A
Pulsed Drain Current ^{1,2}	I_{DM}	-10	A
Power Dissipation	$P_D @ T_A = 25^\circ\text{C}$	1.38	W
Linear Derating Factor		0.01	W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 ~ +150	$^\circ\text{C}$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	R_{thj-a}	90	$^\circ\text{C}/\text{W}$

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 =-250uA
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	-	-	V	V _{DS} =V _{GS} , I _D =-250uA
Forward Transconductance	g _{fs}	-	4.4	-	S	V _{DS} =-5V, I _D =-2.8A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±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} =-16V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	130	mΩ	V _{GS} =-5.0V, I _D =-2.8A
		-	-	190		V _{GS} =-2.8V, I _D =-2.0A
Total Gate Charge ²	Q _g	-	5.2	10	nC	I _D =-2.8A
Gate-Source Charge	Q _{gs}	-	1.36	-		V _{DS} =-6V
Gate-Drain ("Miller") Charge	Q _{gd}	-	0.6	-		V _{GS} =-5V
Turn-on Delay Time ²	T _{d(on)}	-	5.2	-	ns	V _{DS} =-15V
Rise Time	T _r	-	9.7	-		I _D =-1A
Turn-off Delay Time	T _{d(off)}	-	19	-		V _{GS} =-10V
Fall Time	T _f	-	29	-		R _G =6Ω R _D =15Ω
Input Capacitance	C _{iss}	-	295	-	pF	V _{GS} =0V
Output Capacitance	C _{oss}	-	170	-		V _{DS} =-6V
Reverse Transfer Capacitance	C _{rss}	-	65	-		f=1.0MHz

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, T _j =25°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}	-	-	-10	A	

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

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

Characteristics Curve

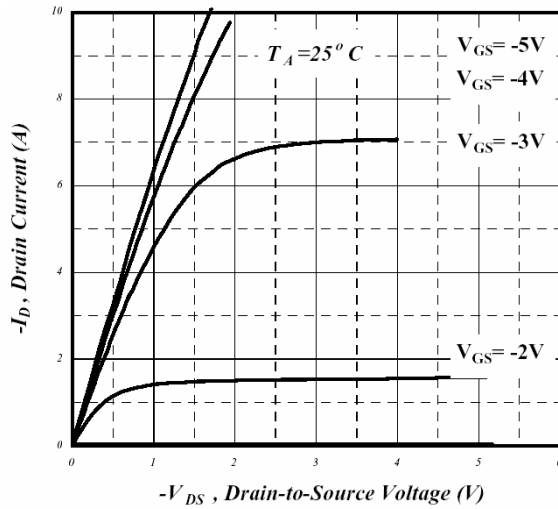


Fig 1. Typical Output Characteristics

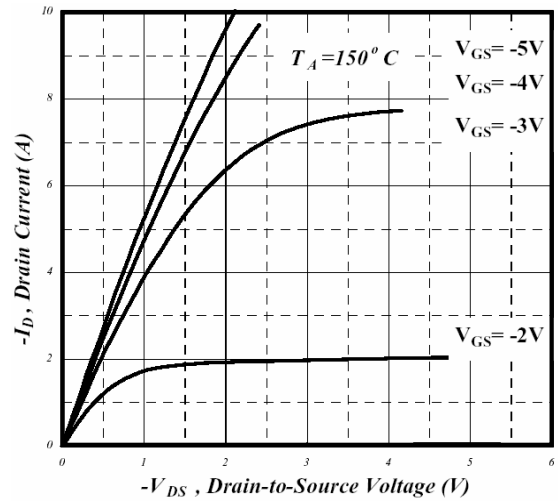


Fig 2. Typical Output Characteristics

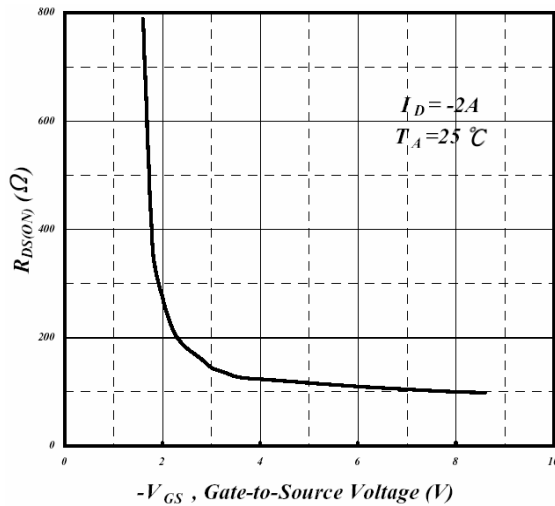


Fig 3. On-Resistance v.s. Gate Voltage

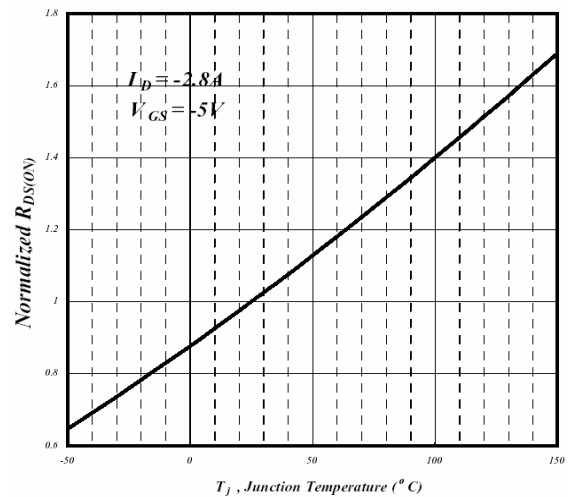


Fig 4. Normalized On-Resistance v.s. Junction Temperature

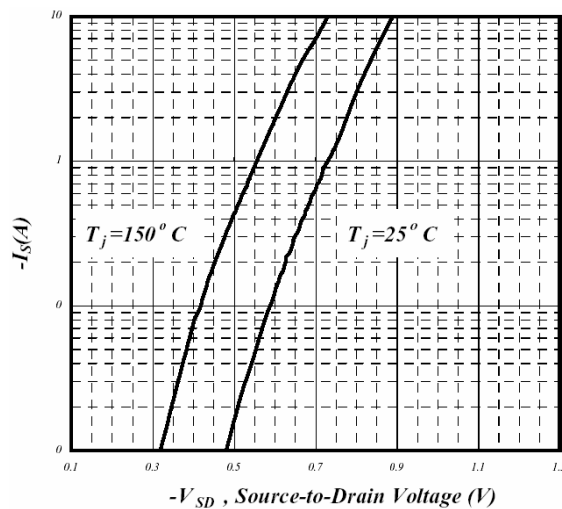


Fig 5. Forward Characteristics of Reverse Diode

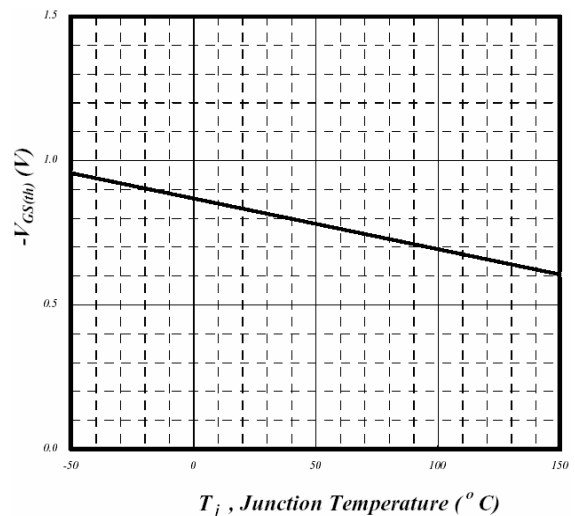


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

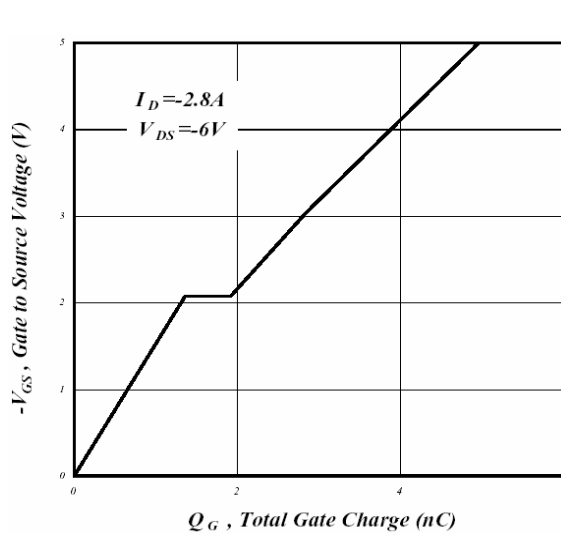


Fig 7. Gate Charge Characteristics

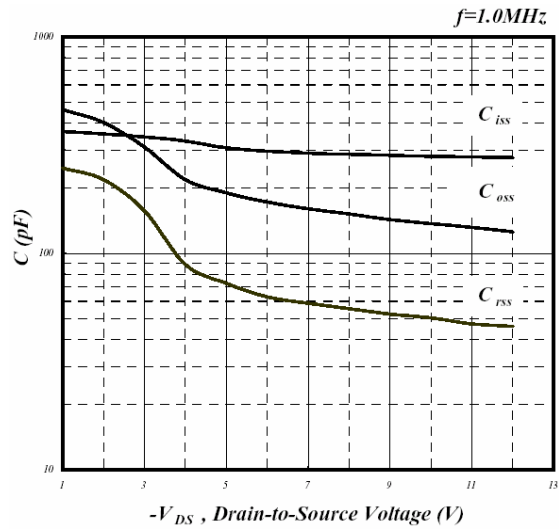


Fig 8. Typical Capacitance Characteristics

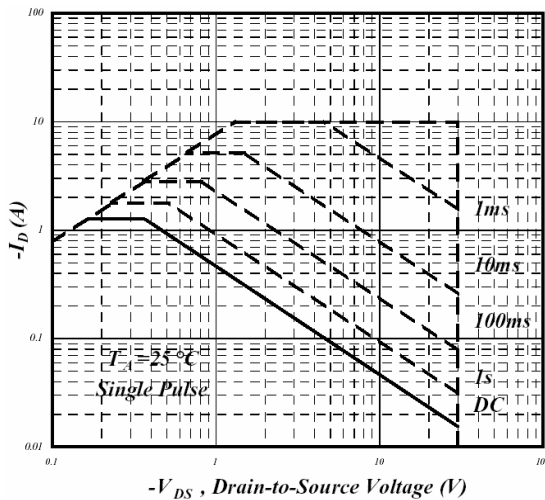


Fig 9. Maximum Safe Operating Area

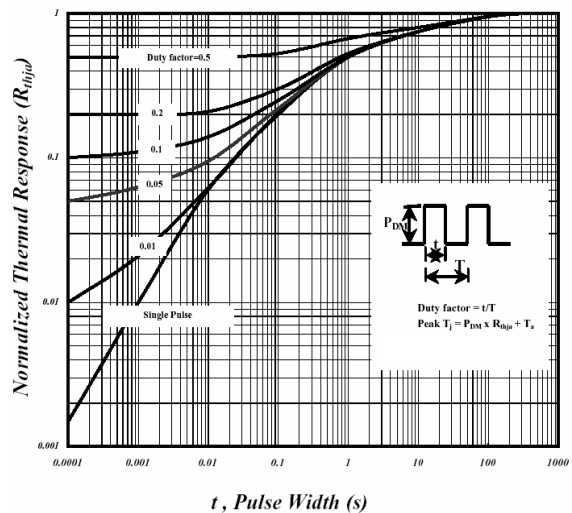


Fig 10. Effective Transient Thermal Impedance

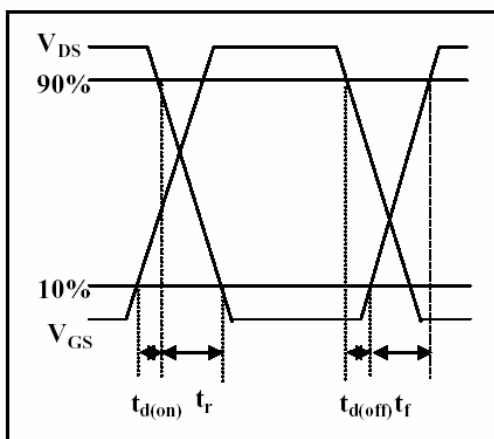


Fig 11. Switching Time Waveform

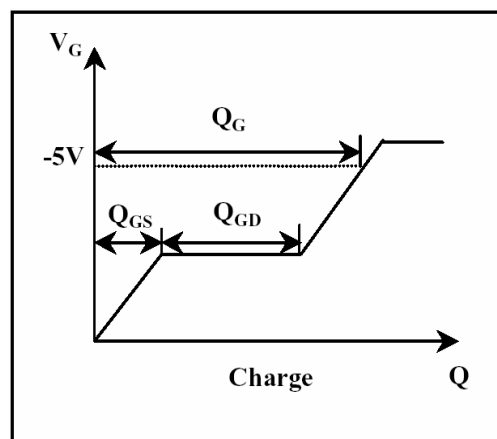


Fig 12. Gate Charge Waveform

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