

G6401

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	-12V
RDS(ON)	50mΩ
ID	-4.3A

Description

The G6401 provides the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The G6401 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

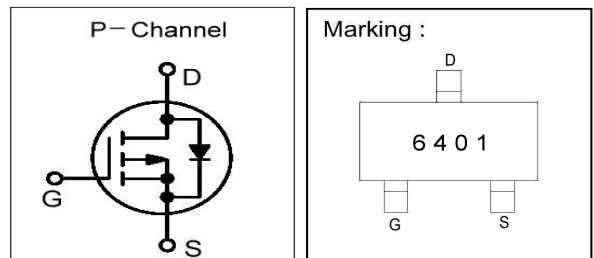
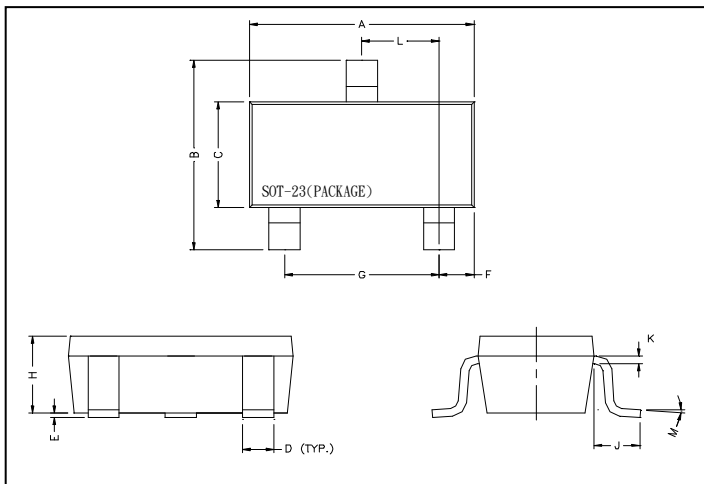
Features

- Ultra Low $R_{DS(ON)}$
- Fast Switching
- 1.8V Gate Rated

Applications

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

Package Dimensions



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}	-12	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ³	$I_D @ TA=25^\circ C$	-4.3	A
Continuous Drain Current ³	$I_D @ TA=70^\circ C$	-3.4	A
Pulsed Drain Current ¹	I_{DM}	-12	A
Power Dissipation	$P_D @ TA=25^\circ C$	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}	-12	-	-	V	V _{GS} =0, I _D =-250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	-	-0.01	-	V/°C	Reference to 25°C, I _D =-1mA
Gate Threshold Voltage	V _{GS(th)}	-	-	-1.0	V	V _{DS} = V _{GS} , I _D =-250uA
Forward Transconductance	g _{fs}	-	12	-	S	V _{DS} =-5.0V, I _D =-4.0A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±8V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	-1	uA	V _{DS} =-16V, V _{GS} =0
Drain-Source Leakage Current(T _j =70°C)		-	-	-25	uA	V _{DS} =-12V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(on)}	-	-	50	mΩ	V _{GS} =-4.5V, I _D =-4.3A
		-	-	85		V _{GS} =-2.5V, I _D =-2.5A
		-	-	125		V _{GS} =-1.8V, I _D =-2.0A
Total Gate Charge ²	Q _g	-	15	24	nC	I _D =-4.0A
Gate-Source Charge	Q _{gs}	-	1.3	-		V _{DS} =-12V
Gate-Drain ("Miller") Change	Q _{gd}	-	4	-		V _{GS} =-4.5V
Turn-on Delay Time ²	T _{d(on)}	-	8	-	ns	V _{DS} =-10V I _D =-1A V _{GS} =-10V R _G =3.3Ω R _D =10Ω
Rise Time	T _r	-	11	-		
Turn-off Delay Time	T _{d(off)}	-	54	-		
Fall Time	T _f	-	36	-		
Input Capacitance	C _{iss}	-	985	1580		
Output Capacitance	C _{oss}	-	180	-	pF	V _{GS} =0V V _{DS} =-15V f=1.0MHz
Reverse Transfer Capacitance	C _{rss}	-	160	-		

Source-Drain Diode

Forward On Voltage ²	V _{SD}	-	-	-1.2	V	I _S =-1.2A, V _{GS} =0
Reverse Recovery Time ²	T _{rr}	-	39	-	ns	I _S =-4.0A, V _{GS} =0
Reverse Recovery Charge	Q _{rr}	-	26	-	nC	di/dt=100A/us

Notes: 1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

Characteristics Curve

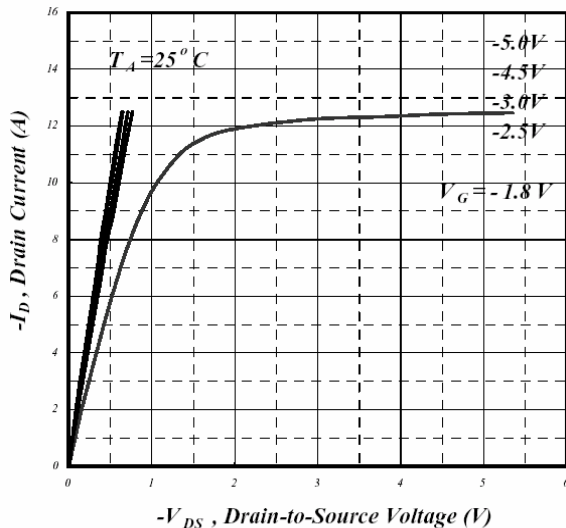


Fig 1. Typical Output Characteristics

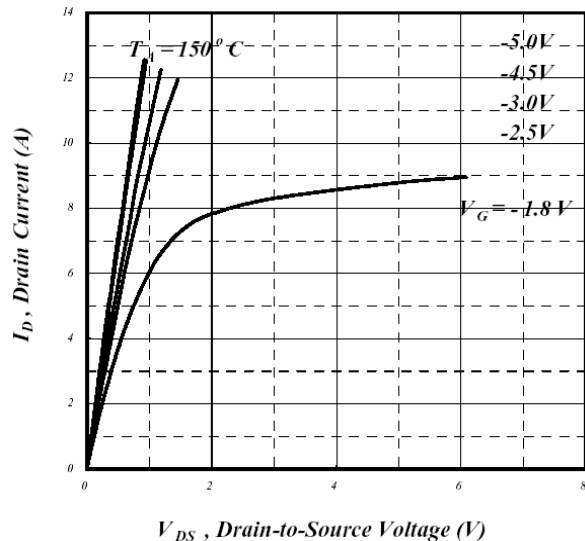


Fig 2. Typical Output Characteristics

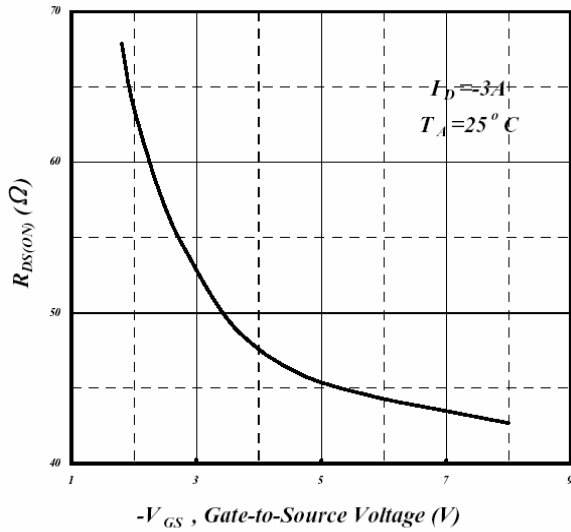


Fig 3. On-Resistance v.s. Gate Voltage

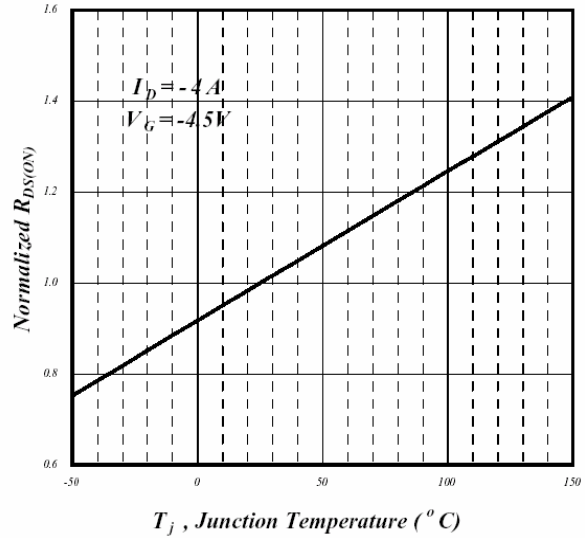


Fig 4. Normalized On-Resistance v.s. Junction Temperature

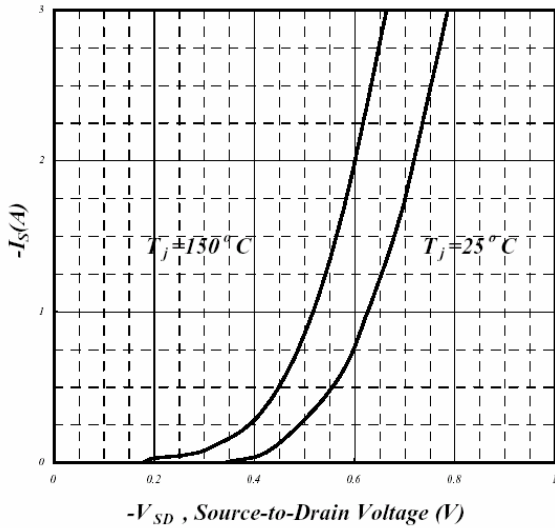


Fig 5. Forward Characteristic of Reverse Diode

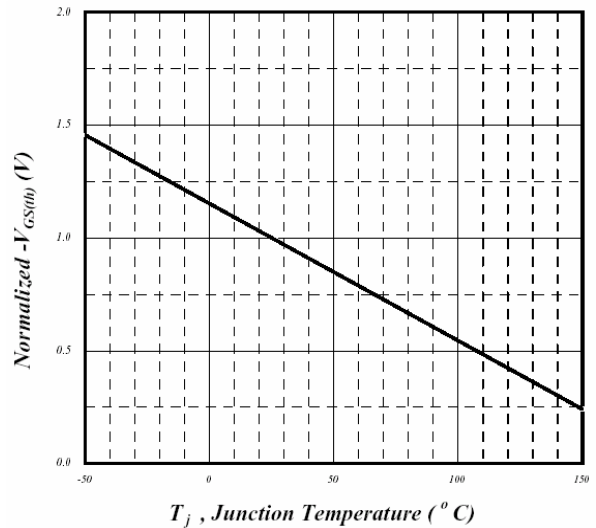


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

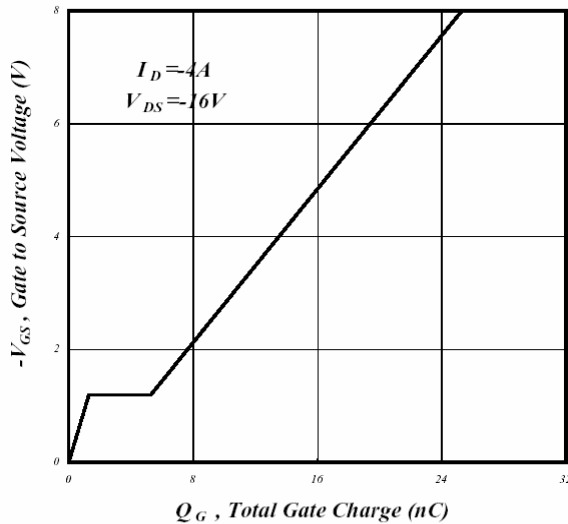


Fig 7. Gate Charge Characteristics

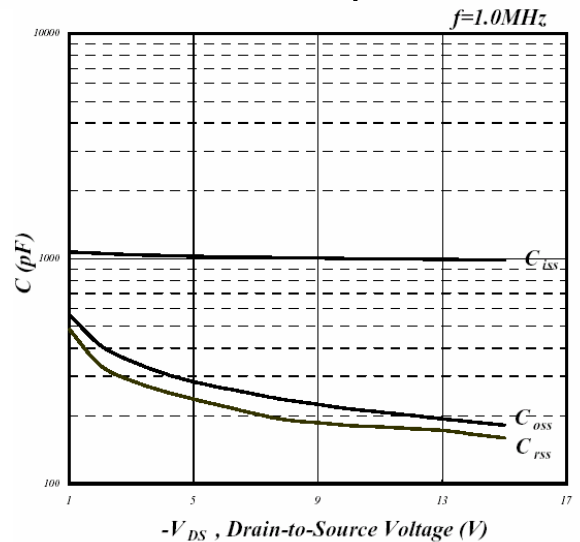


Fig 8. Typical Capacitance Characteristics

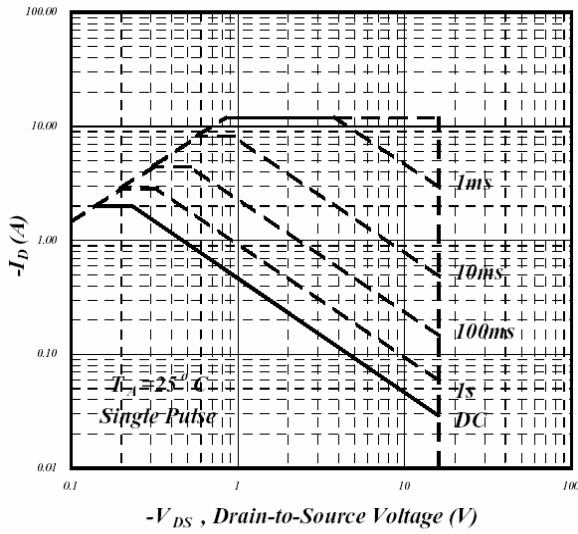


Fig 9. Maximum Safe Operating Area

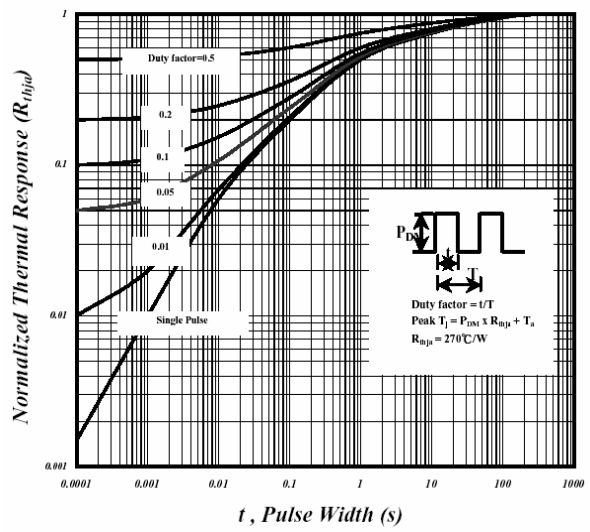


Fig 10. Effective Transient Thermal Impedance

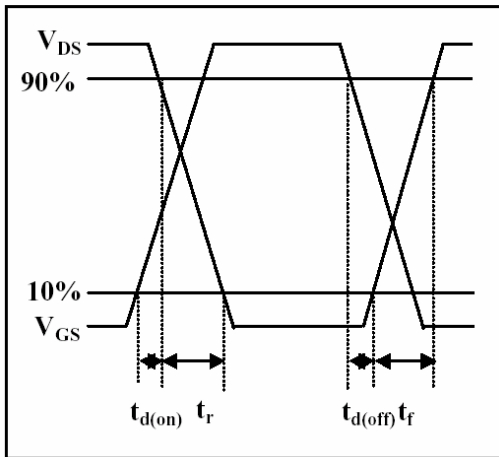


Fig 11. Switching Time Waveform

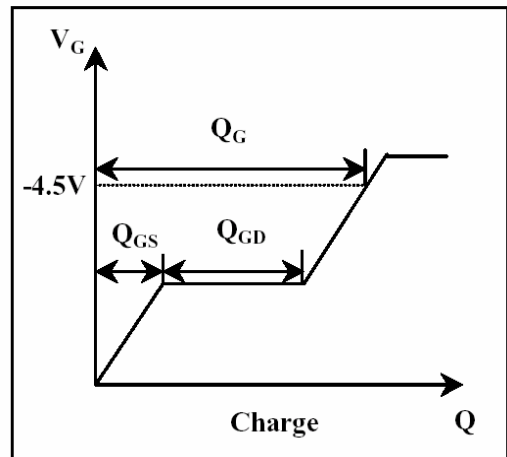


Fig 12. Gate Charge Waveform

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