

GSC4413

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	-20V
RDS(ON)	30mΩ
ID	-7.8A

Description

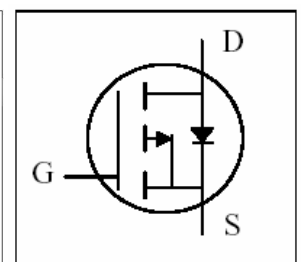
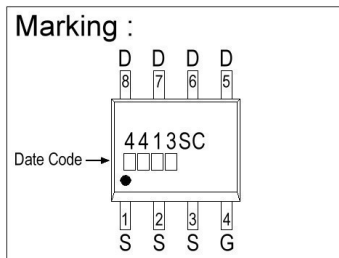
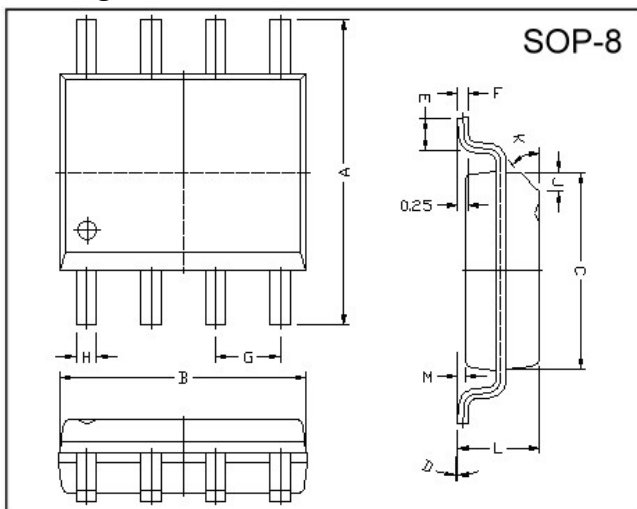
The GSC4413 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package 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
- *Lower On-resistance
- *Fast Switching Characteristics

Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ³	$I_D @ TA=25^\circ C$	-7.8	A
Continuous Drain Current ³	$I_D @ TA=70^\circ C$	-6.2	A
Pulsed Drain Current ¹	I_{DM}	-30	A
Total Power Dissipation	$P_D @ TA=25^\circ C$	2.5	W
Linear Derating Factor		0.02	W/°C
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	$R_{thj-amb}$	50	°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}	-20	-	-	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)}	-0.5	-	-1.5	V	V _{DS} =V _{GS} , I _D =-250uA
Forward Transconductance	g _{fs}	-	16	-	S	V _{DS} =-10V, I _D =-7A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} =±20V
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)		-	-	-25	uA	V _{DS} =-16V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	30	mΩ	V _{GS} =-10V, I _D =-7A
		-	-	40		V _{GS} =-4.5V, I _D =-4A
		-	-	65		V _{GS} =-2.5V, I _D =-2A
Total Gate Charge ²	Q _g	-	17	27	nC	I _D =-7A
Gate-Source Charge	Q _{gs}	-	4	-		V _{DS} =-16V
Gate-Drain ("Miller") Change	Q _{gd}	-	7	-		V _{GS} =-4.5V
Turn-on Delay Time ²	T _{d(on)}	-	12	-	ns	V _{DS} =-10V
Rise Time	T _r	-	11	-		I _D =-2A
Turn-off Delay Time	T _{d(off)}	-	40	-		V _{GS} =-10V
Fall Time	T _f	-	13	-		R _G =3.3Ω R _D =10Ω
Input Capacitance	C _{iss}	-	1140	1820	pF	V _{GS} =0V
Output Capacitance	C _{oss}	-	250	-		V _{DS} =-25V
Reverse Transfer Capacitance	C _{rss}	-	210	-		f=1.0MHz
Gate Resistance	R _g	-	4.3	-	Ω	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 =-2A, V _{GS} =0V
Reverse Recovery Time ²	T _{rr}	-	28	-	ns	I _S =-7A, V _{GS} =0V
Reverse Recovery Charge	Q _{rr}	-	22	-	nC	dI/dt=100A/μs

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; 125°C/W when mounted on Min. copper pad.

Characteristics Curve

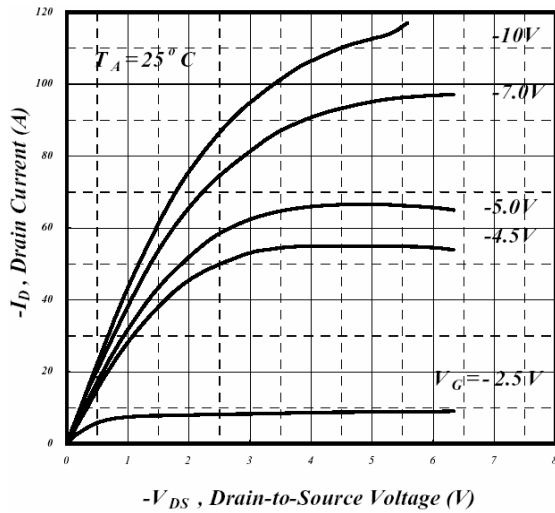


Fig 1. Typical Output Characteristics

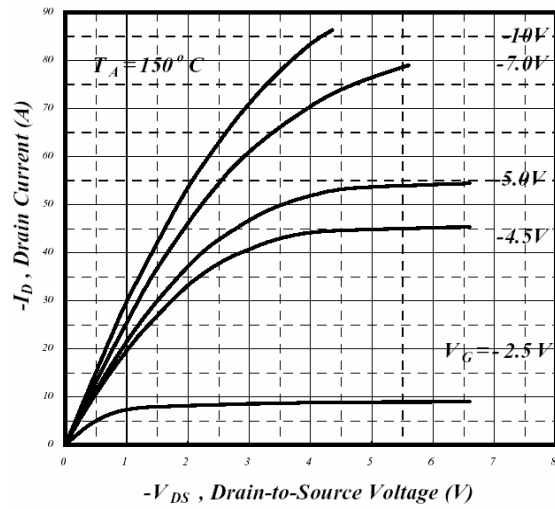


Fig 2. Typical Output Characteristics

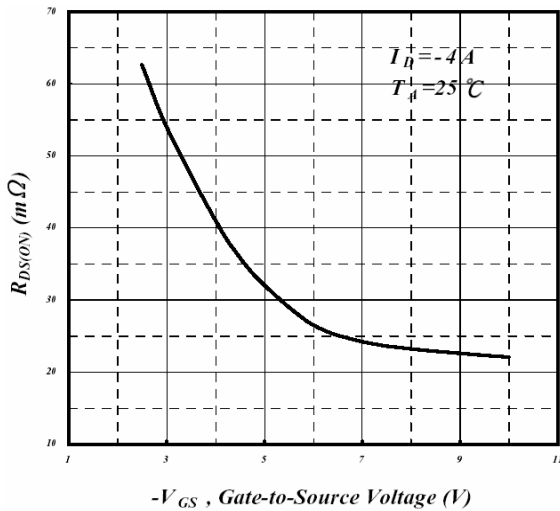


Fig 3. On-Resistance v.s. Gate Voltage

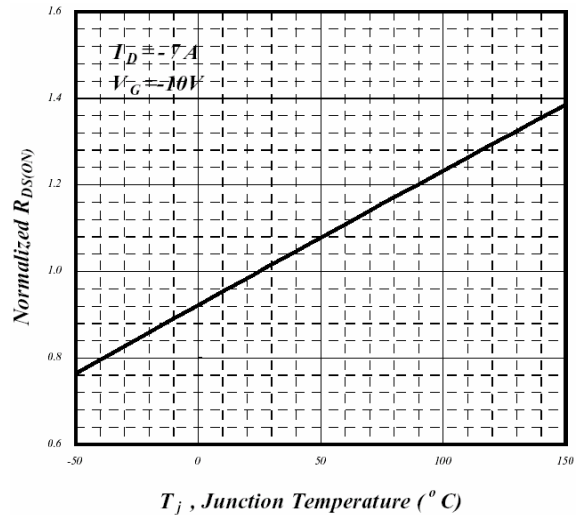


Fig 4. Normalized On-Resistance v.s. Junction Temperature

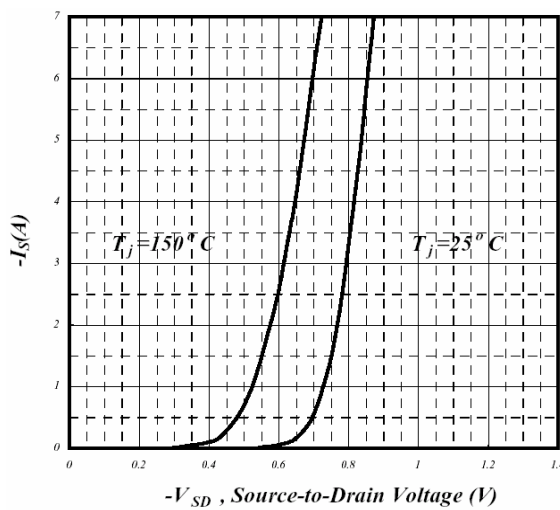


Fig 5. Forward Characteristics of Reverse Diode

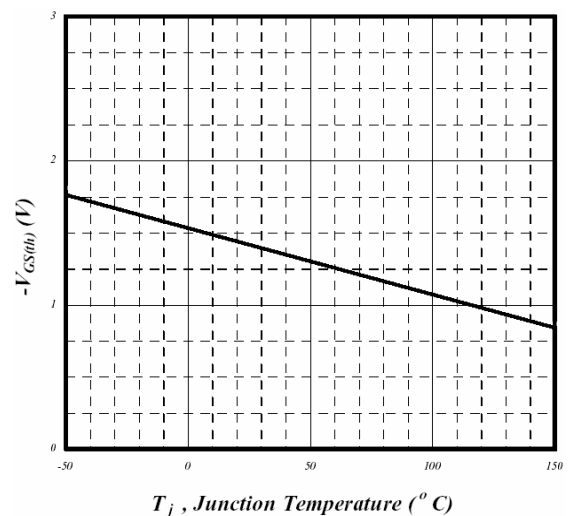


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

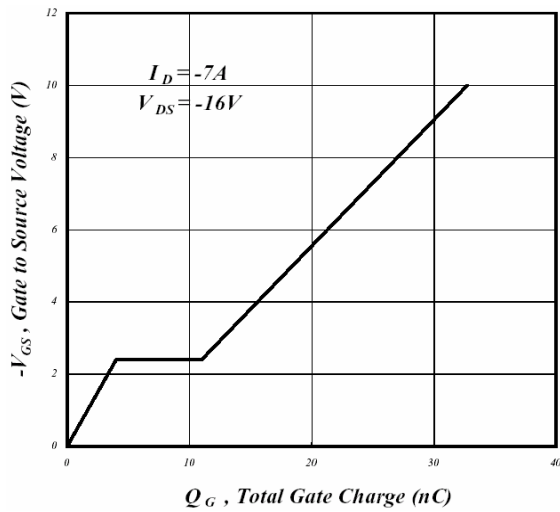


Fig 7. Gate Charge Characteristics

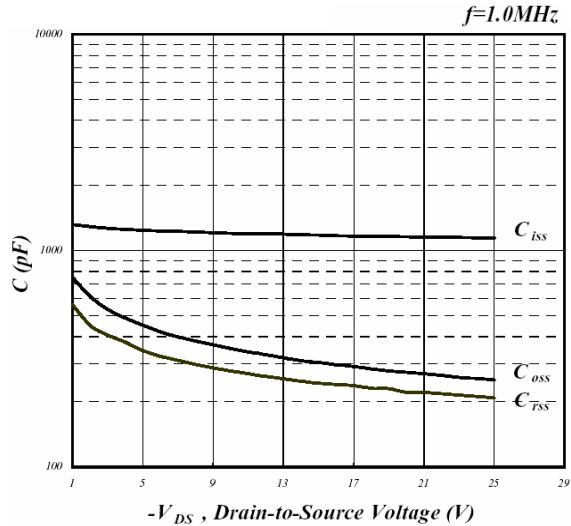


Fig 8. Typical Capacitance Characteristics

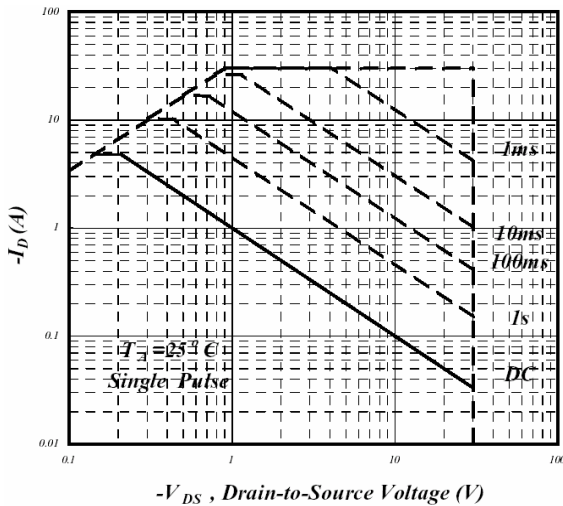


Fig 9. Maximum Safe Operating Area

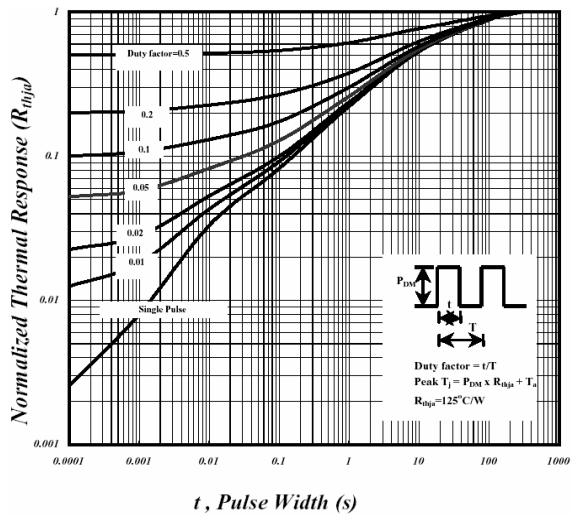


Fig 10. Effective Transient Thermal Impedance



Fig 11. Switching Time Waveform

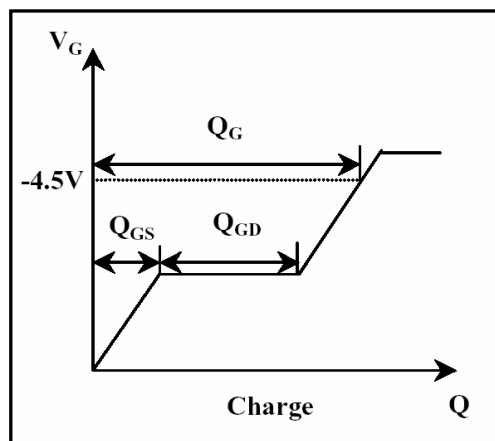


Fig 12. Gate Charge Waveform

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