

# GSC4435

## P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	-30V
RDS(ON)	20mΩ
ID	-8A

### Description

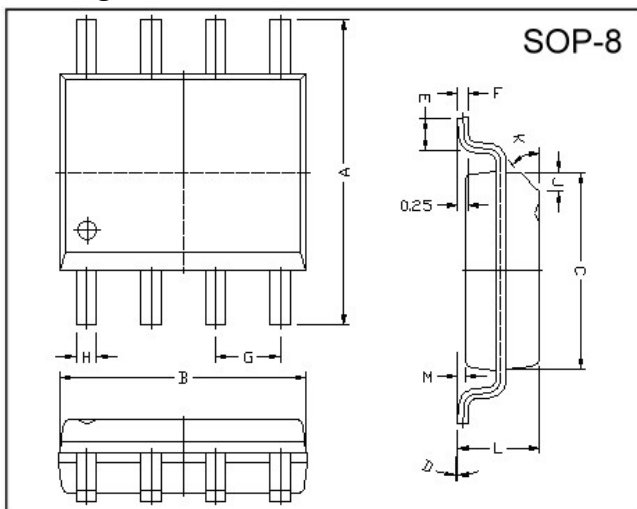
The GSC4435 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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.

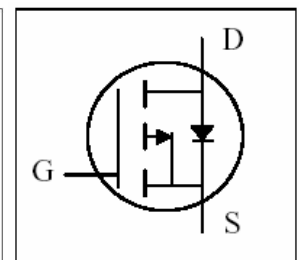
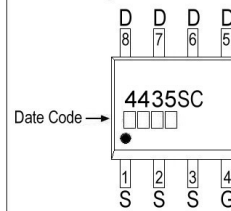
### Features

- \*Simple Drive Requirement
- \*Lower On-resistance
- \*Fast Switching

### Package Dimensions



### Marking :



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	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D @ TA=25^\circ C$	-8	A
Continuous Drain Current	$I_D @ TA=70^\circ C$	-6	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	-50	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 Max.	$R_{thj-amb}$	50	°C/W

**Electrical Characteristics(T<sub>j</sub> = 25°C Unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =-250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	-0.037	-	V/°C	Reference to 25°C, I <sub>D</sub> =-1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	-	-3.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Forward Transconductance	g <sub>fs</sub>	-	20	-	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-8A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =70°C)		-	-	-5	uA	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	20	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A
		-	-	35		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	47	-	nC	I <sub>D</sub> =-4.6A V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V
Gate-Source Charge	Q <sub>gs</sub>	-	9.5	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	8	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	-	30	ns	V <sub>DS</sub> =-15V I <sub>D</sub> =-1A V <sub>GS</sub> =-10V R <sub>G</sub> =6Ω R <sub>D</sub> =15Ω
Rise Time	T <sub>r</sub>	-	-	20		
Turn-off Delay Time	T <sub>d(off)</sub>	-	-	120		
Fall Time	T <sub>f</sub>	-	-	80		
Input Capacitance	C <sub>iss</sub>	-	-	2800	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =-15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	-	1400		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	-	350		

**Source-Drain Diode**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-0.75	-1.2	V	I <sub>S</sub> =-2.1A, V <sub>GS</sub> =0V, T <sub>j</sub> =25°C
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	-2.1	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.2V
Pulsed Source Current (Body Diode) <sup>1</sup>	I <sub>SM</sub>	-	-	-50	A	

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

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

## Characteristics Curve

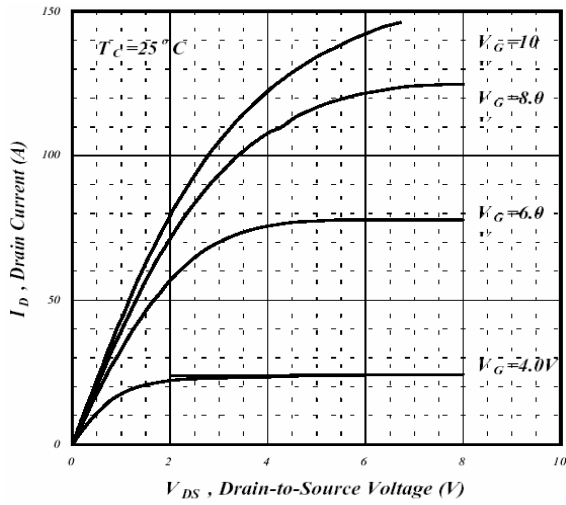


Fig 1. Typical Output Characteristics

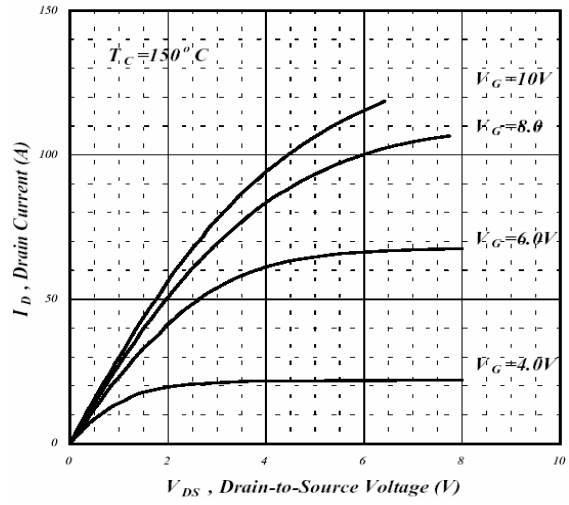


Fig 2. Typical Output Characteristics

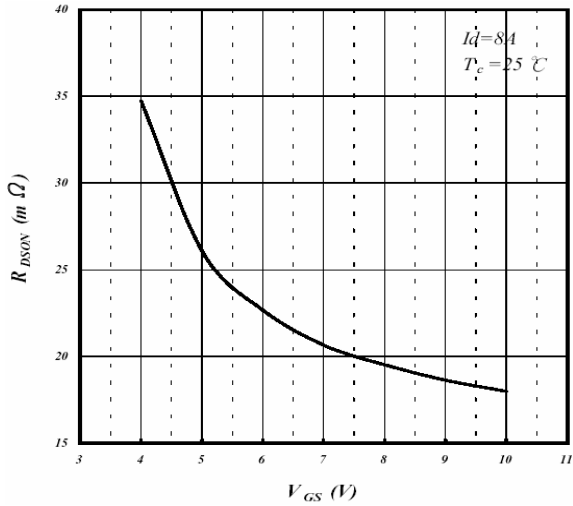


Fig 3. On-Resistance v.s. Gate Voltage

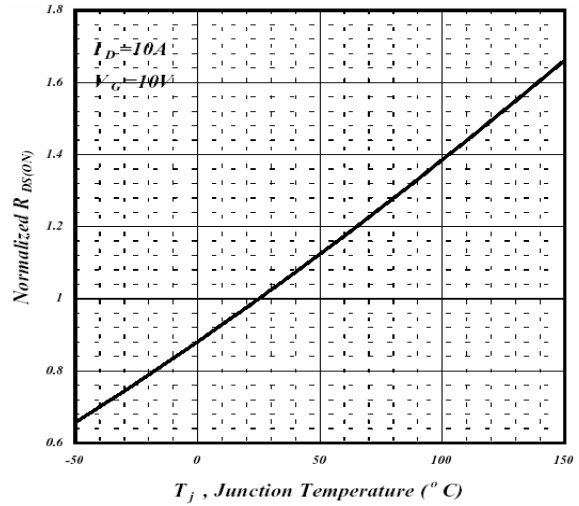


Fig 4. Normalized On-Resistance v.s. Junction Temperature

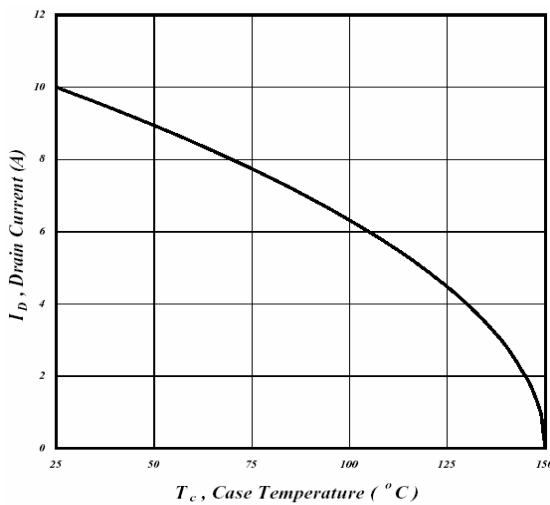


Fig 5. Maximum Drain Current v.s. Case Temperature

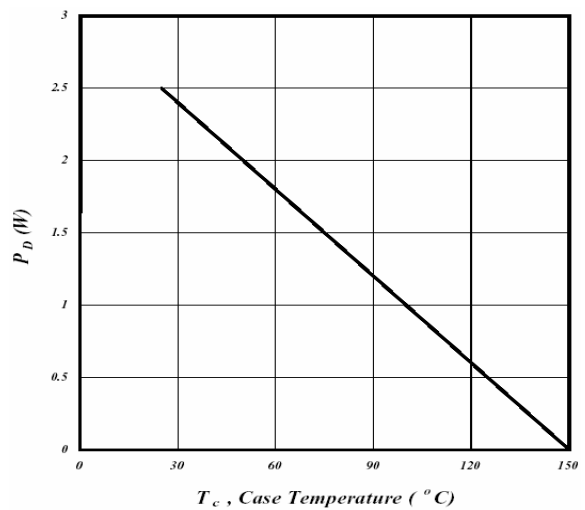


Fig 6. Type Power Dissipation

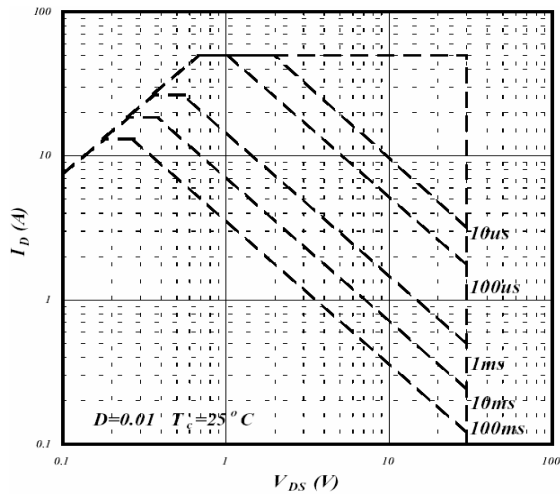


Fig 7. Maximum Safe Operating Area

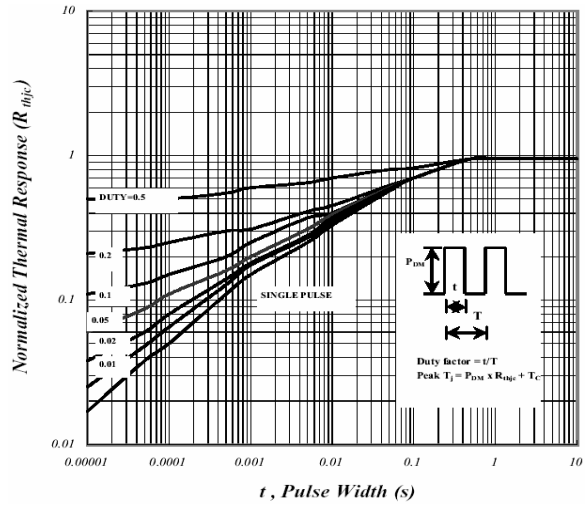


Fig 8. Effective Transient Thermal Impedance

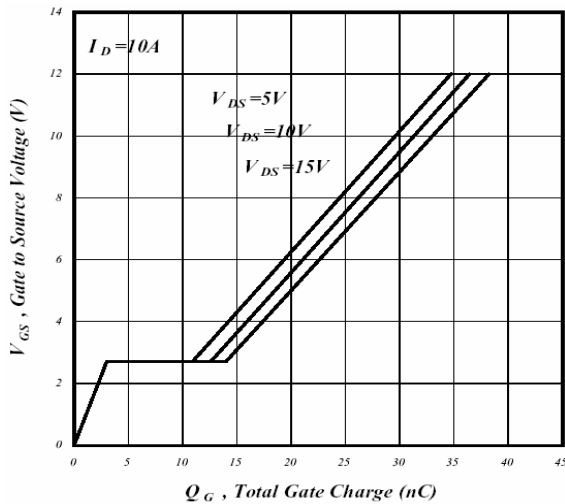


Fig 9. Gate Charge Characteristics

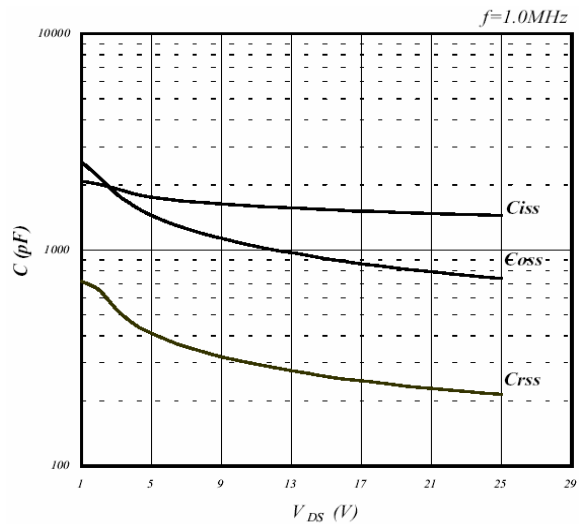


Fig 10. Typical Capacitance Characteristics

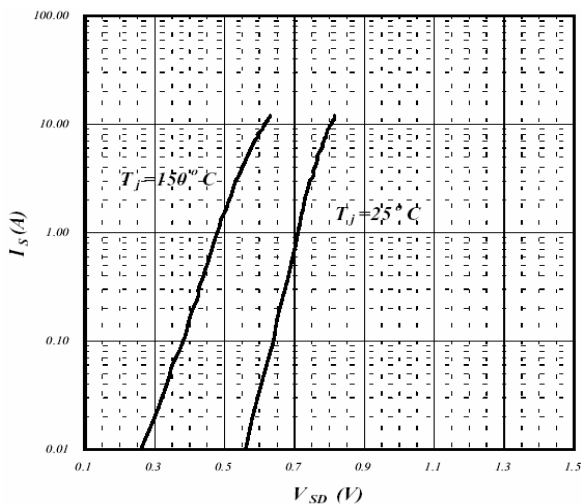


Fig 11. Forward Characteristics of Reverse Diode

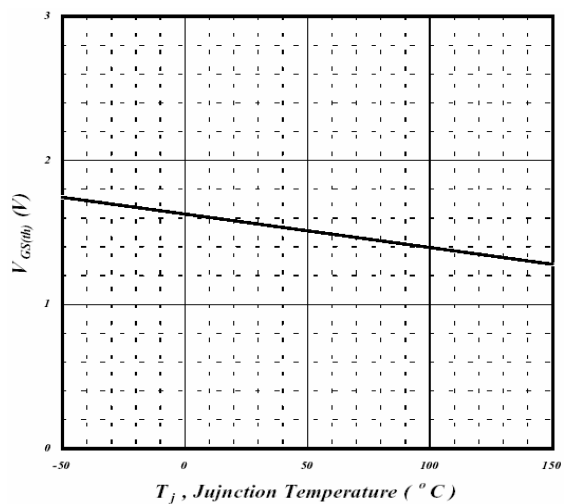
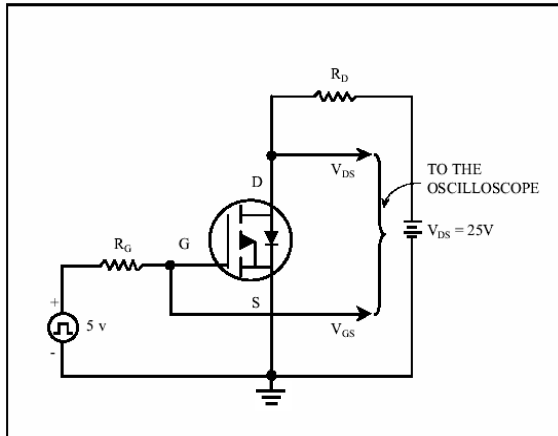
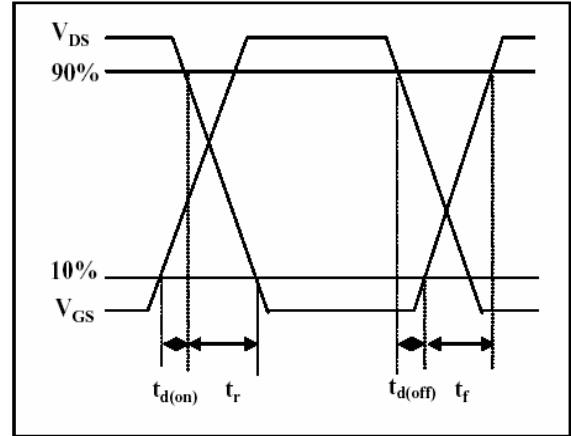


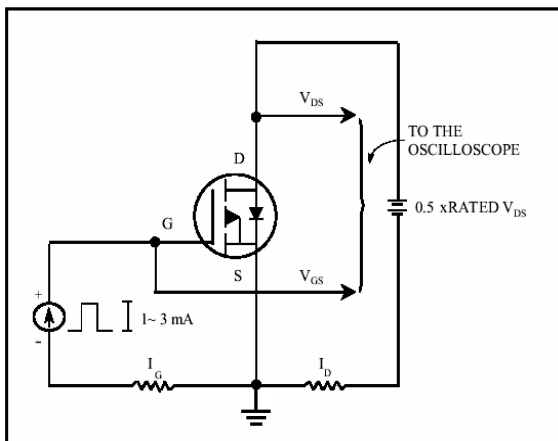
Fig 12. Gate Threshold Voltage v.s. Junction Temperature



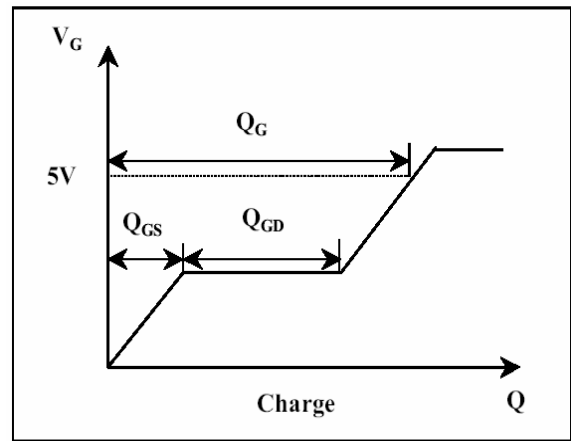
**Fig 13. Switching Time Circuit**



**Fig 14. Switching Time Waveform**



**Fig 15. Gate Charge Circuit**



**Fig 16. Gate Charge Waveform**

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