



# SPN8410

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN8410 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN8410 has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low  $R_{DS(ON)}$  and fast switching speed.

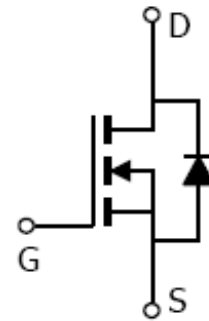
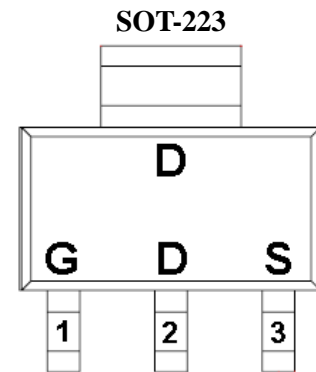
### FEATURES

- ◆ 100V/12A,  $R_{DS(ON)}=120m\Omega@V_{GS}=10V$
- ◆ 100V/8.0A,  $R_{DS(ON)}=150m\Omega@V_{GS}=4.5V$
- ◆ High density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-223 package design

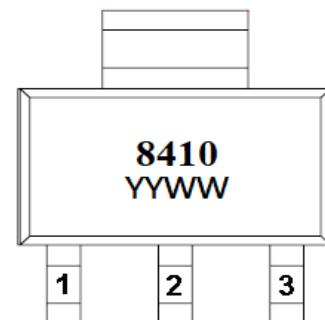
### APPLICATIONS

- High Frequency Small Power Switching for MB/NB/VGA
- Network DC/DC Power System
- Load Switch

### PIN CONFIGURATION



### PART MARKING



Y : Year Code  
W : Week Code



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### PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN8410S22RGB	SOT-223	8410

※ SPN8410S22RGB : Tape Reel ; Pb – Free ; Halogen – Free

※ Date code : YY (year 00~99) , WW(week 01~53)

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	100	V	
Gate –Source Voltage	V <sub>GSS</sub>	±20	V	
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C	12	A
		T <sub>A</sub> =70°C	8.0	
Pulsed Drain Current	I <sub>DM</sub>	24	A	
Avalanche Current	I <sub>AS</sub>	14	A	
Power Dissipation	P <sub>D</sub>	2.8	W	
Operating Junction Temperature	T <sub>J</sub>	150	°C	
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C	
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	70	°C/W	



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	3.0	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			25	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=125^\circ C$			250	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$	12			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$			120	mΩ
		$V_{GS}=4.5V, I_D=8A$			150	mΩ
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=8A$		7.3		S
Diode Forward Voltage	$V_{SD}$	$I_S=8A, V_{GS}=0V$			1.1	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=80V, V_{GS}=10V$ $I_D=10A$		26		nC
Gate-Source Charge	$Q_{gs}$			4.6		
Gate-Drain Charge	$Q_{gd}$			5.1		
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		1535		pF
Output Capacitance	$C_{oss}$			65		
Reverse Transfer Capacitance	$C_{rss}$			36		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, I_D=10A,$ $V_{GEN}=10V, R_G=3.3\Omega$		4.2		nS
	$t_r$			8.2		
Turn-Off Time	$t_{d(off)}$			35.6		
	$t_f$			9.6		



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## TYPICAL CHARACTERISTICS

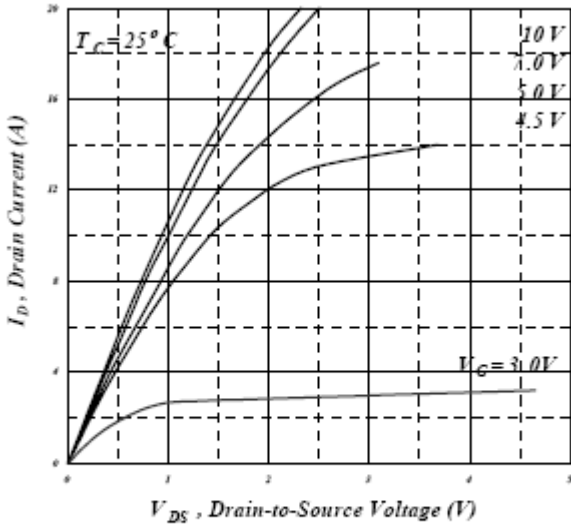


Fig 1. Typical Output Characteristics

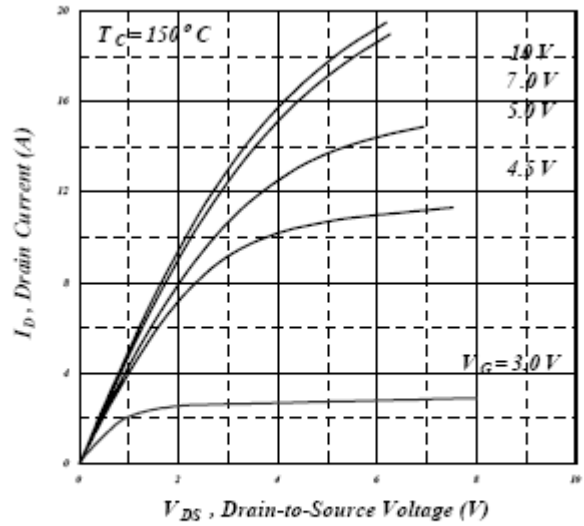


Fig 2. Typical Output Characteristics

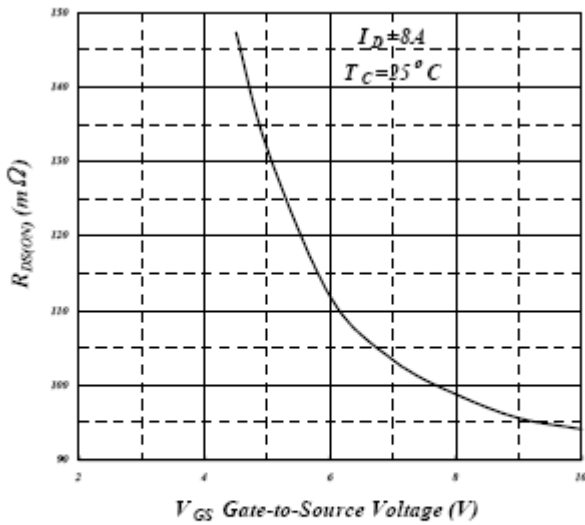


Fig 3. On-Resistance v.s. Gate Voltage

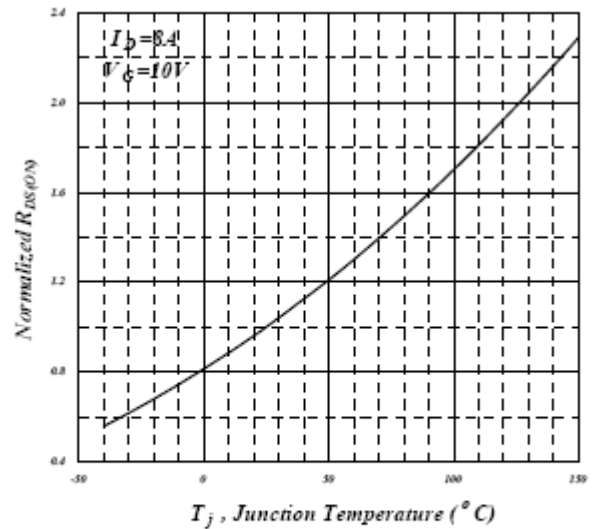


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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## TYPICAL CHARACTERISTICS

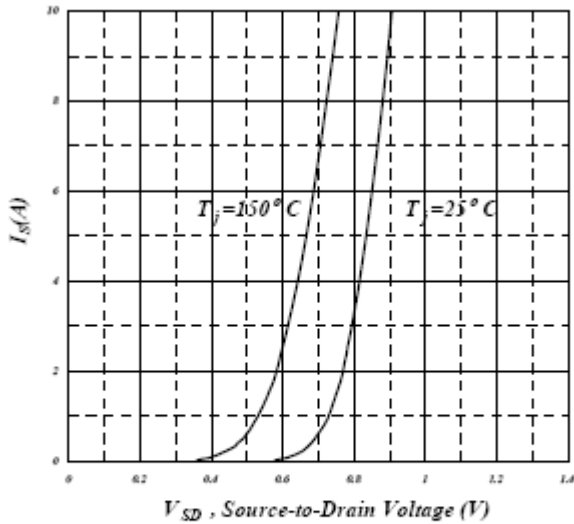


Fig 5. Forward Characteristic of Reverse Diode

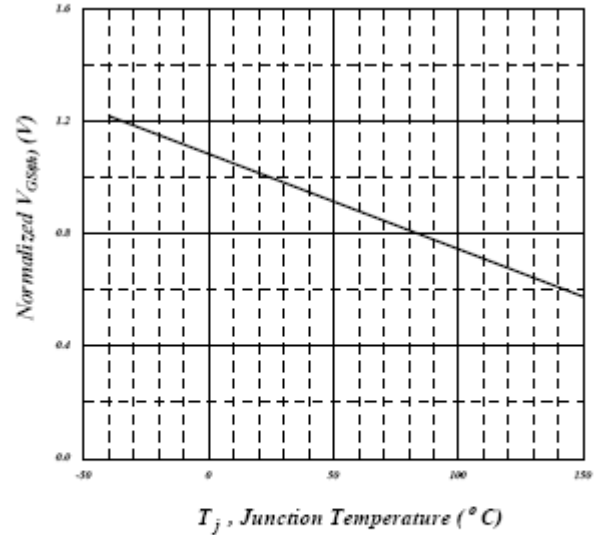


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

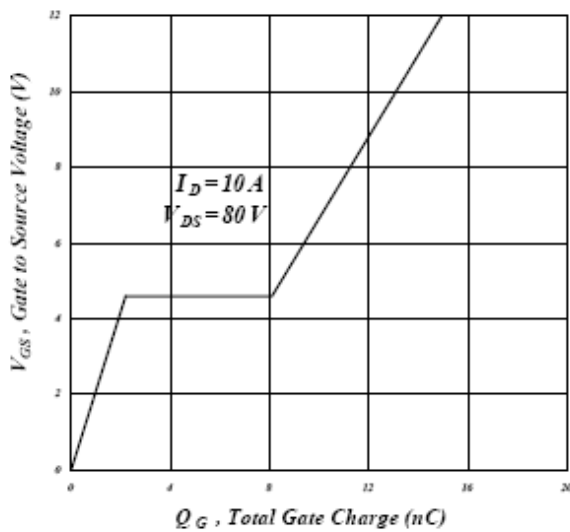


Fig 7. Gate Charge Characteristics

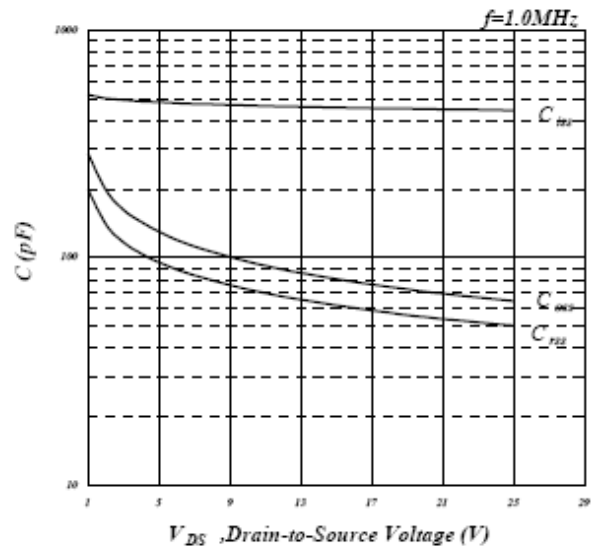


Fig 8. Typical Capacitance Characteristics



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## TYPICAL CHARACTERISTICS

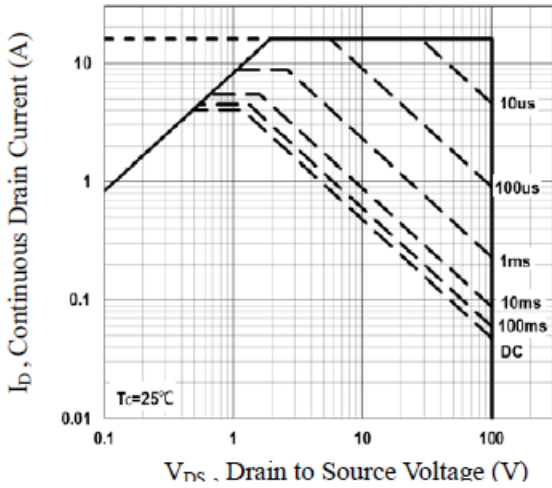


Fig 9. Maximum Safe Operating Area

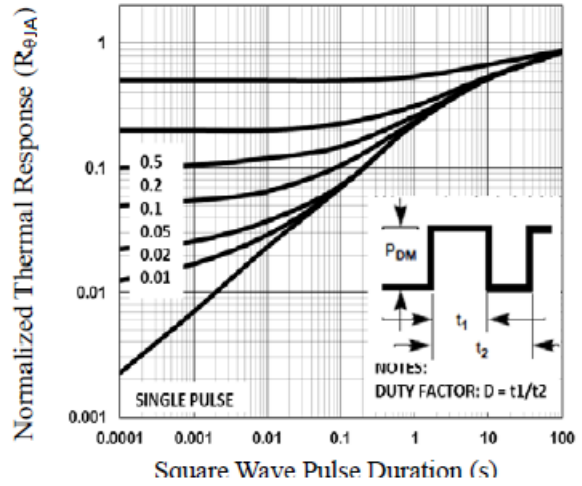


Fig 10. Effective Transient Thermal Impedance

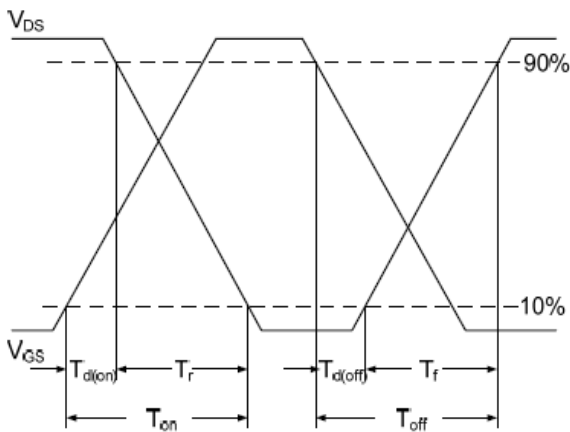


Fig 11. Switching Time Waveform

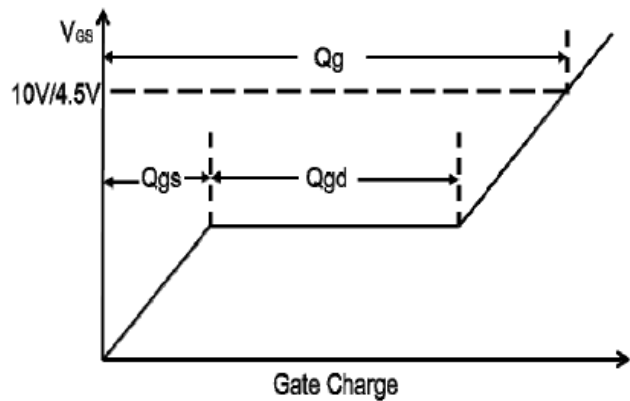


Fig 12. Gate Charge Waveform



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