




**STN1810**   
Lead-free

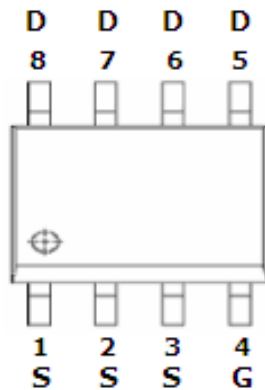
N Channel Enhancement Mode MOSFET

8.0A

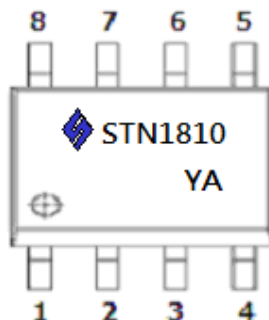
## DESCRIPTION

STN1810 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These applications such as notebook computer power management and other battery powered circuits where high-side switching, low in-line power loss and resistance to transients are melded.

## PIN CONFIGURATION SOP-8



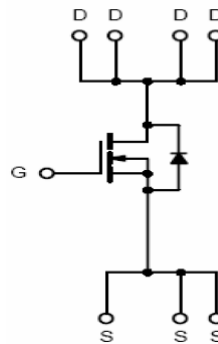
## PART MARKING




**Y: Year Code A: Process Code**

## FEATURE

- 60V/8.0A,  $R_{DS(ON)} = 140m\Omega$  (Typ.)  
@ $V_{GS} = 10V$
- 60V/6.5.0A,  $R_{DS(ON)} = 150m\Omega$   
@ $V_{GS} = 7.0V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8 package design





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**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C Unless otherwise noted )

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	VDSS	100	V
Gate-Source Voltage	VGSS	±20	V
Continuous Drain Current (TJ=150°C)	ID	TA=25°C 8.0	A
		TA=70°C 6.0	
Pulsed Drain Current	IDM	12	A
Continuous Source Current (Diode Conduction)	IS	2.3	A
Power Dissipation	PD	TA=25°C 2.8	W
		TA=70°C 1.8	
Operation Junction Temperature	TJ	150	°C
Storage Temperature Range	TSTG	-55/150	°C
Thermal Resistance-Junction to Ambient	RθJA	80	°C/W



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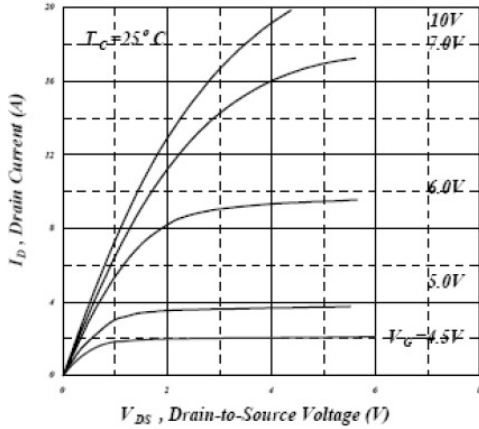
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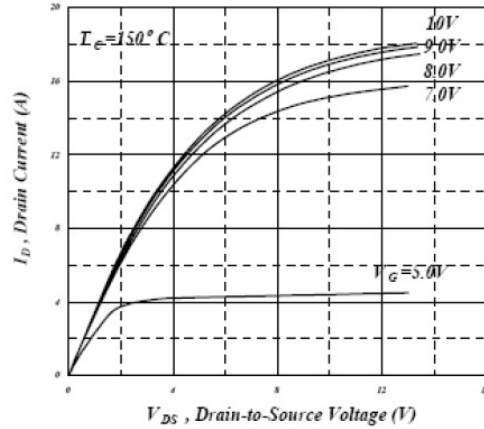
**ELECTRICAL CHARACTERISTICS** ( Ta = 25°C Unless otherwise noted )

Parameter	Symbol	Condition	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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			250	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=5^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	8			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		140	155	mΩ
		$V_{GS}=7.0V, I_D=6.5A$		150	170	
Forward Transconductance	gfs	$V_{DS}=5V, I_D=6.2AV$		5.6		S
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$			1.3	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=80V, V_{GS}=5V$ $I_D=5A$		10	16	nC
Gate-Source Charge	$Q_{gs}$			2.5		
Gate-Drain Charge	$Q_{gd}$			4.2		
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS}=0V$ $F=1MHz$		430		pF
Output Capacitance	$C_{oss}$			58		
Reverse Transfer Capacitance	$C_{rss}$			33		
Turn-On Time	$t_{d(on)}$ $t_r$	$V_{DD}=50V, R_D=10\Omega$ $V_{DS}=30V, R_G=3.3\Omega$ $I_D=5A$		6.5		nS
				10		
Turn-Off Time	$t_{d(off)}$ $t_f$				13	
				3.4		

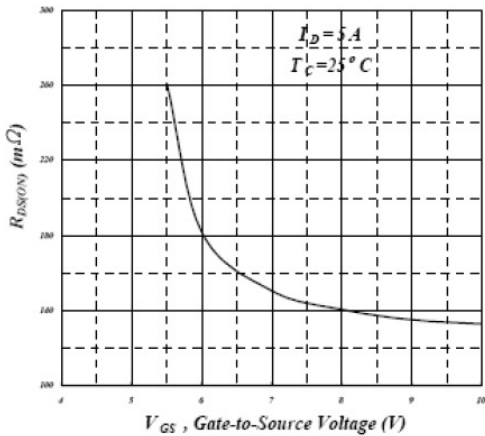
**TYPICAL CHARACTERISTICS**



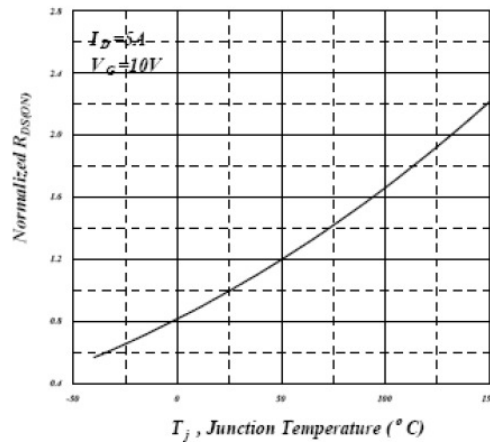
**Fig 1. Typical Output Characteristics**



**Fig 2. Typical Output Characteristics**

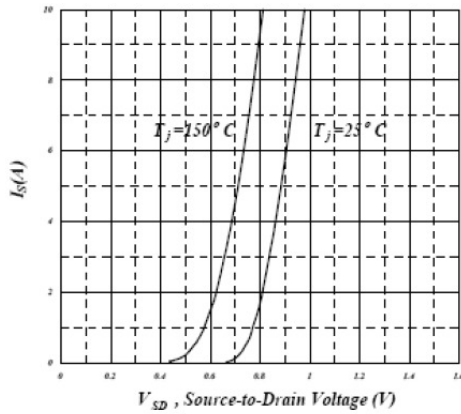


**Fig 3. On-Resistance v.s. Gate Voltage**

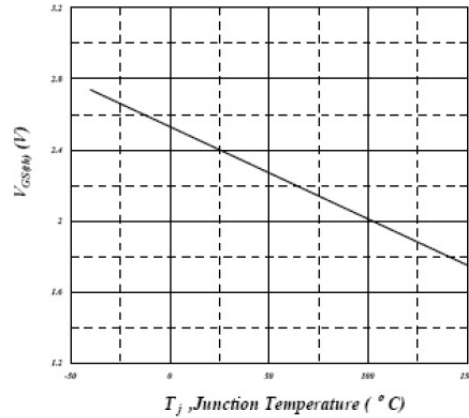


**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

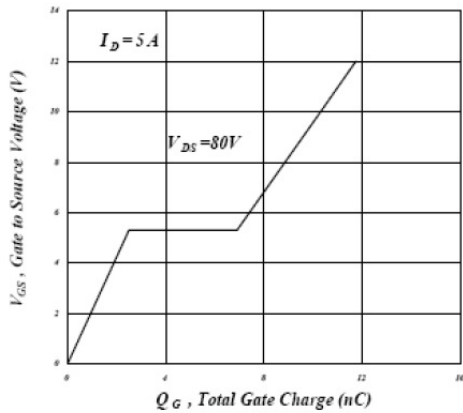
**TYPICAL CHARACTERISTICS**



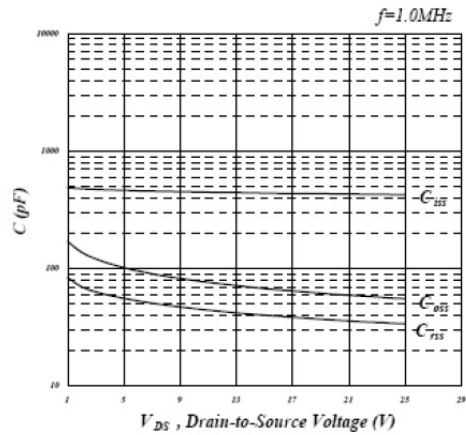
**Fig 5. Forward Characteristic of Reverse Diode**



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

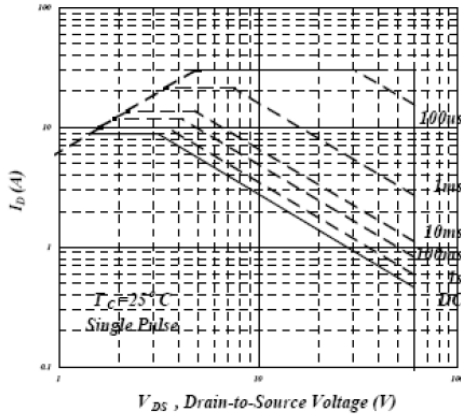


**Fig 7. Gate Charge Characteristics**

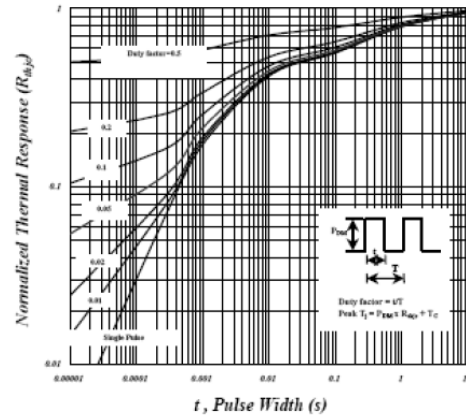


**Fig 8. Typical Capacitance Characteristics**

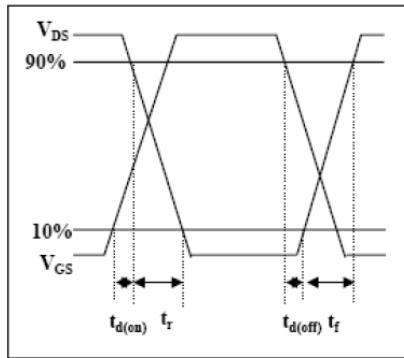
**TYPICAL CHARACTERISTICS**



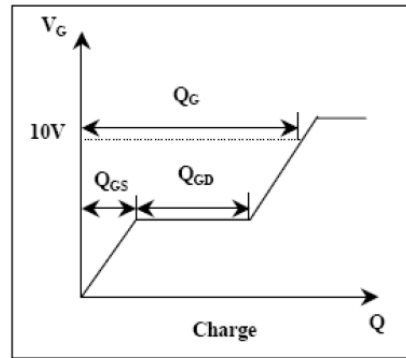
**Fig 9. Maximum Safe Operating Area**



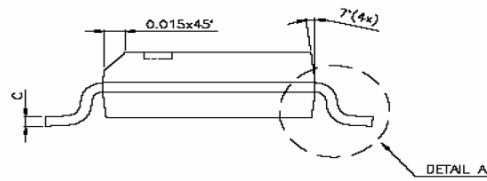
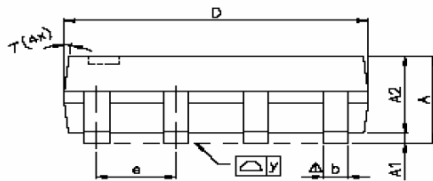
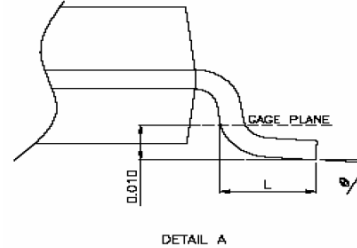
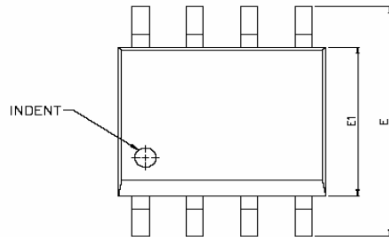
**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

**PACKAGE OUTLINE SOP-8P**


SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	—	0.25	0.004	—	0.010
A2	—	1.45	—	—	0.057	—
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	—	1.27	—	—	0.050	—
L	0.38	0.71	1.27	0.015	0.028	0.050
$\Delta$ y	—	—	0.076	—	—	0.003
$\theta$	0°	—	8°	0°	—	8°