



SPC1810

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC1810 is the N- and P-Channel enhancement mode power field effect transistors are 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 devices are particularly suited for low voltage 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 needed.

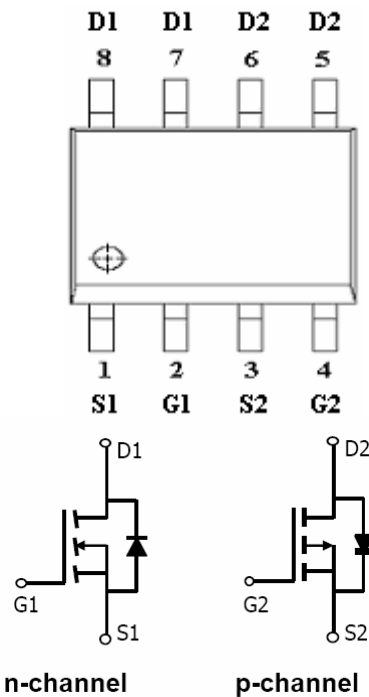
FEATURES

- ◆ N-Channel
100V/5A, $R_{DS(ON)} = 160m\Omega @ V_{GS} = 10V$
- ◆ P-Channel
-100V/-8A, $R_{DS(ON)} = 160m\Omega @ V_{GS} = -10V$
-100V/-4A, $R_{DS(ON)} = 200m\Omega @ V_{GS} = -4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

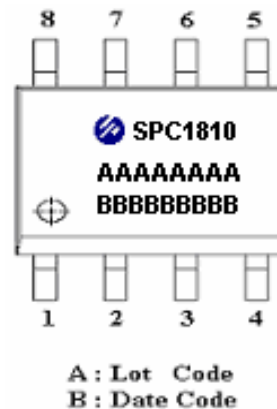
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION(SOP – 8P)



PART MARKING





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PIN DESCRIPTION

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	S2	Source 2
4	G2	Gate 2
5	D2	Drain 2
6	D2	Drain 2
7	D1	Drain 1
8	D1	Drain 1

ORDERING INFORMATION

Part Number	Package	Part Marking
SPC1810S8RGB	SOP- 8P	SPC1810

※ SPC1810S8RGB 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V _{DSS}	100	-100	V
Gate –Source Voltage	V _{GSS}	±20	±20	V
Continuous Drain Current(T _J =150°C)	I _D	TA=25°C	-8.0	A
		TA=70°C	-6.0	
Pulsed Drain Current	I _{DM}	12	-12	A
Continuous Source Current(Diode Conduction)	I _S	2.3	-2.3	A
Power Dissipation	P _D	TA=25°C	2.8	W
		TA=70°C	1.8	
Operating Junction Temperature	T _J	-55/150		°C
Storage Temperature Range	T _{STG}	-55/150		°C
Thermal Resistance-Junction to Ambient	R _{θJA}	T ≤ 10sec	52	°C/W
		Steady State	80	



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ELECTRICAL CHARACTERISTICS (NMOS)

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
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	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			25	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=80^\circ C$			250	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$			0.16	Ω
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=5.0A$		5.6		S
Diode Forward Voltage	V_{SD}	$I_S=8.0A, V_{GS}=0V$			1.3	V
Dynamic						
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}			4.5		
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		425	680	pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			33		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_D=10\Omega$ $I_D=5.0A, V_G=10V$ $R_G=3.3\Omega$		6.5		nS
	t_r			10		
Turn-Off Time	$t_{d(off)}$			13		
	t_f			3.4		



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ELECTRICAL CHARACTERISTICS (PMOS)

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
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	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-10V, V_{GS}=0V$			-1	uA
		$V_{DS}=-80V, V_{GS}=0V$ $T_J=85^\circ C$			-25	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-8A$			0.16	Ω
		$V_{GS}=-4.5V, I_D=-6A$			0.20	
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-8A$		8		S
Diode Forward Voltage	V_{SD}	$I_S=-12A, V_{GS}=0V$			-1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-80V, V_{GS}=-4.5V$ $I_D=-8.0A$		16	25	nC
Gate-Source Charge	Q_{gs}			4.4		
Gate-Drain Charge	Q_{gd}			8.7		
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V$ $f=1MHz$		1590	2550	pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			70		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-50V, R_D=6.25\Omega$ $I_D=-8.0A, V_G=-10V$ $R_G=3.3\Omega$		9		nS
	t_r			14		
Turn-Off Time	$t_{d(off)}$			45		
	t_f			40		



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TYPICAL CHARACTERISTICS (NMOS)

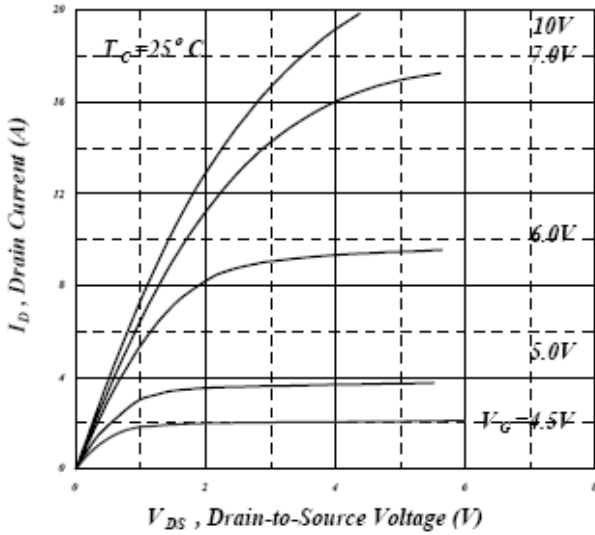


Fig 1. Typical Output Characteristics

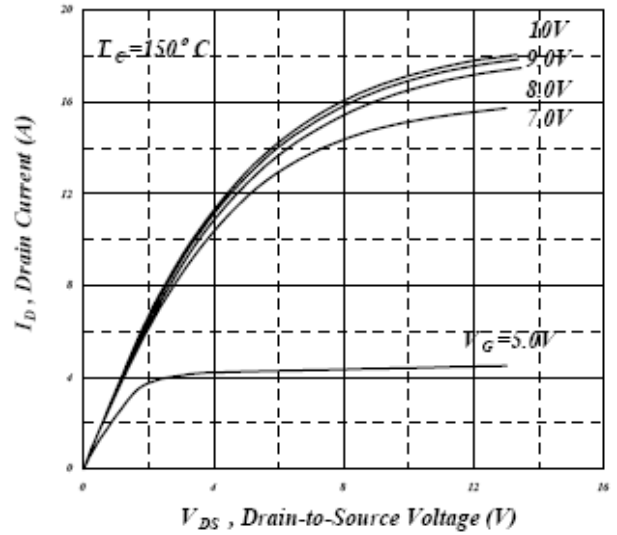


Fig 2. Typical Output Characteristics

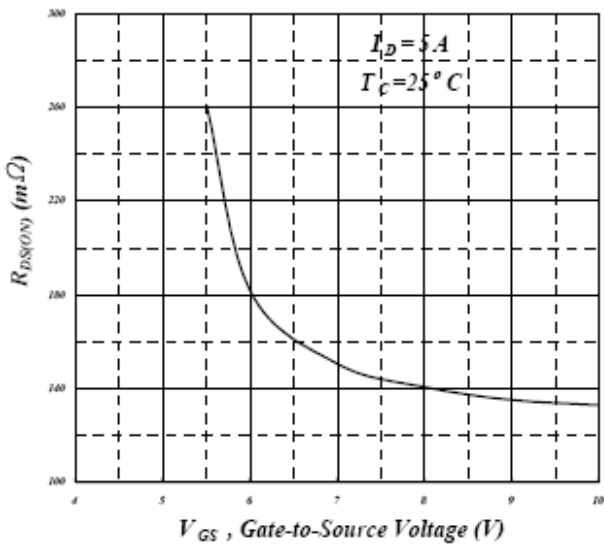


Fig 3. On-Resistance v.s. Gate Voltage

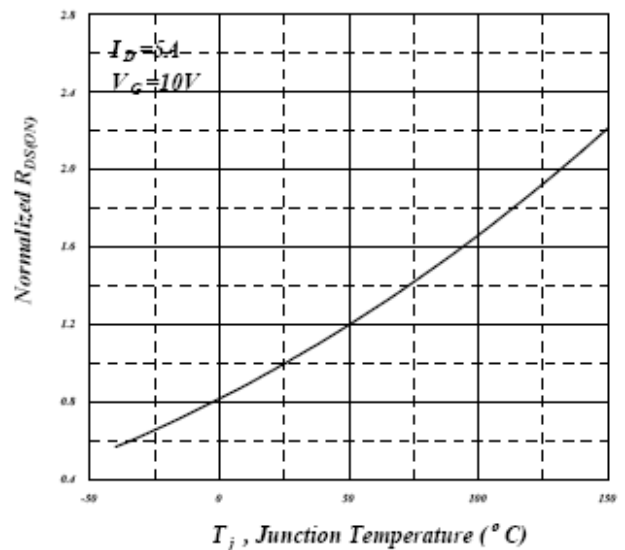


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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TYPICAL CHARACTERISTICS (NMOS)

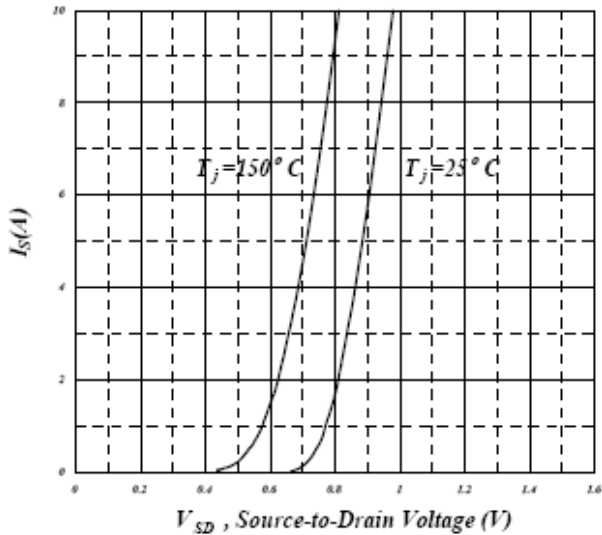


Fig 5. Forward Characteristic of Reverse Diode

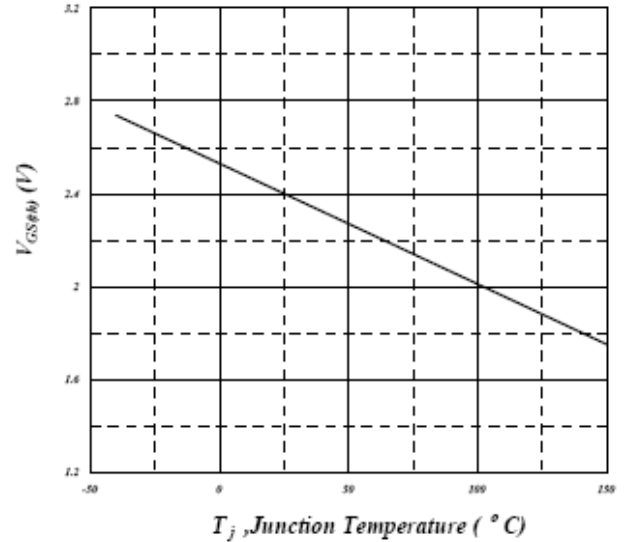


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

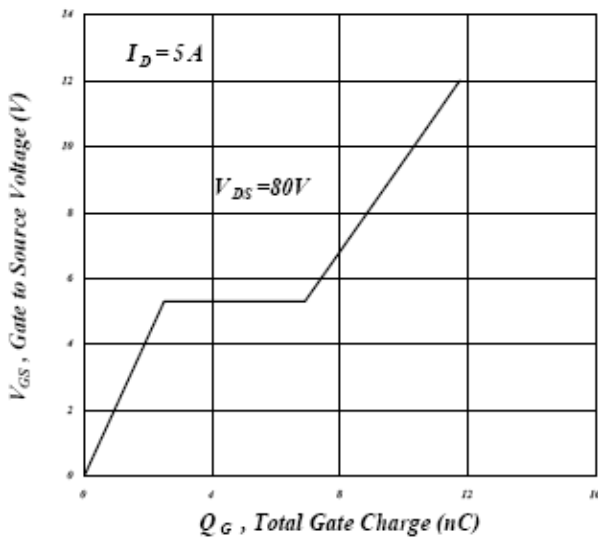


Fig 7. Gate Charge Characteristics

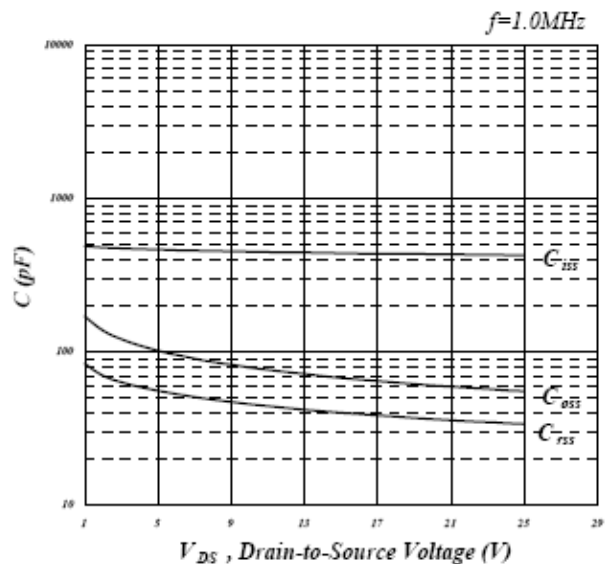


Fig 8. Typical Capacitance Characteristics



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TYPICAL CHARACTERISTICS (NMOS)

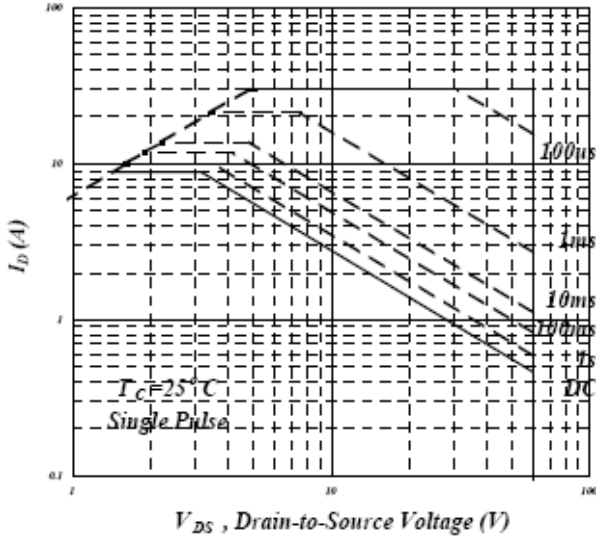


Fig 9. Maximum Safe Operating Area

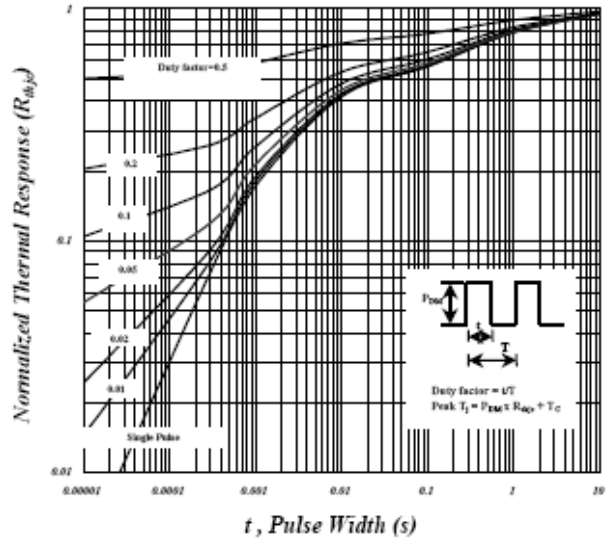


Fig 10. Effective Transient Thermal Impedance

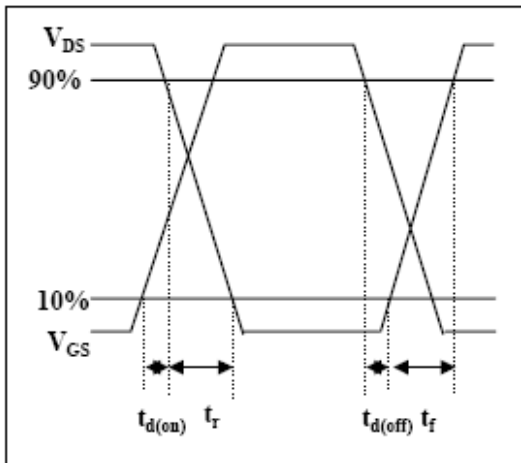


Fig 11. Switching Time Waveform

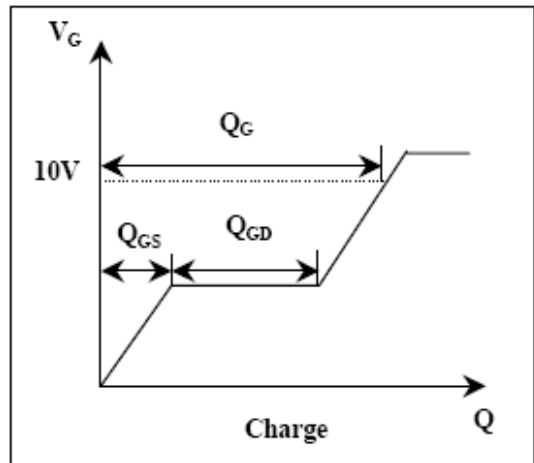


Fig 12. Gate Charge Waveform



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TYPICAL CHARACTERISTICS (PMOS)

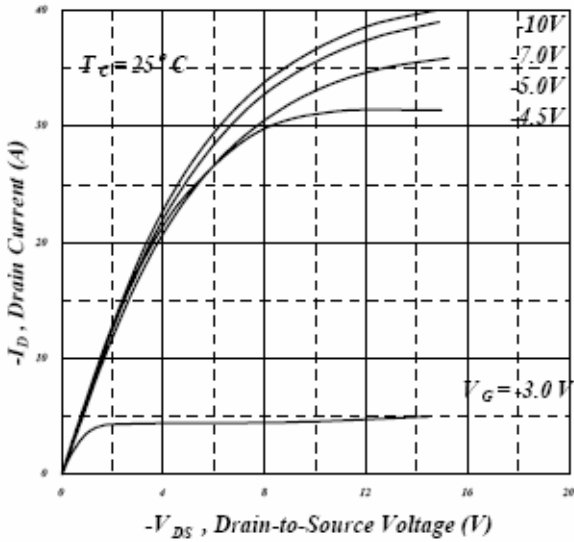


Fig 1. Typical Output Characteristics

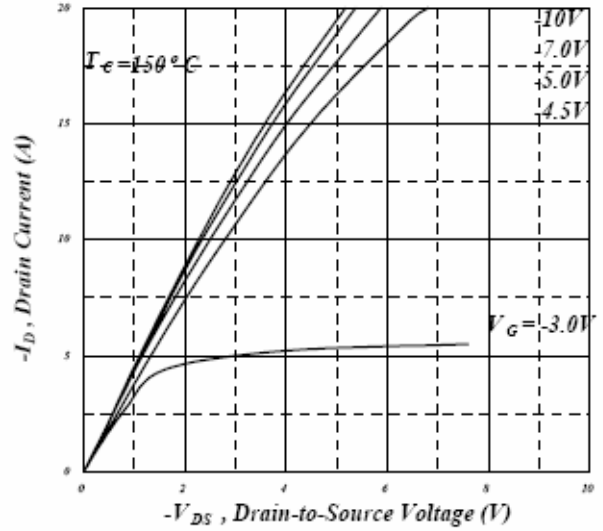


Fig 2. Typical Output Characteristics

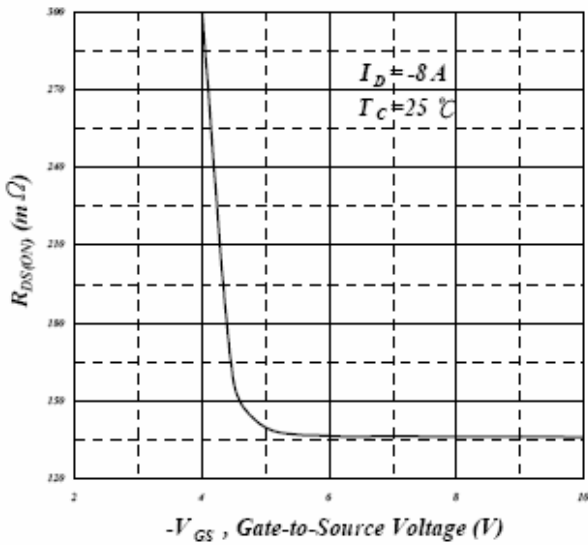


Fig 3. On-Resistance v.s. Gate Voltage

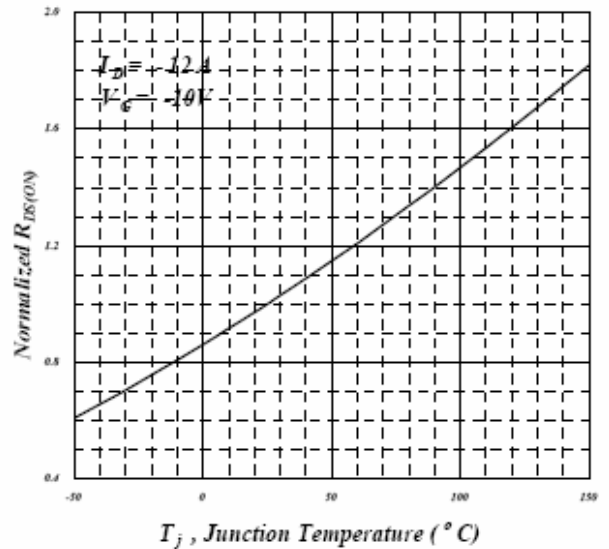


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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TYPICAL CHARACTERISTICS (PMOS)

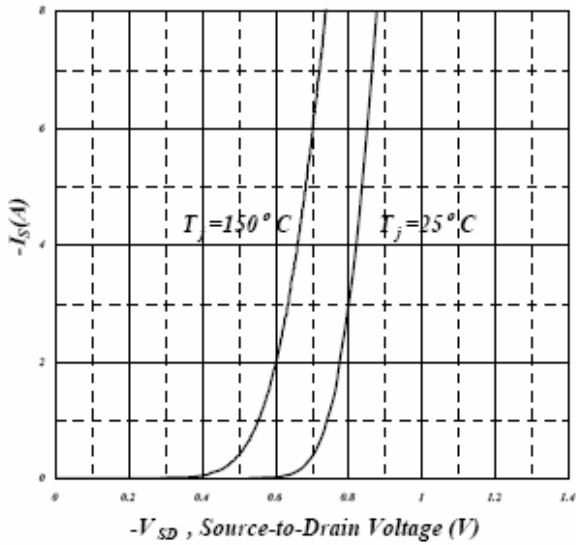


Fig 5. Forward Characteristic of Reverse Diode

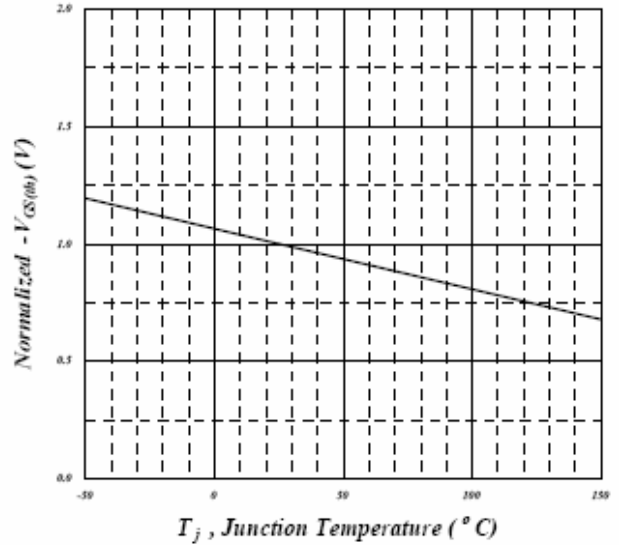


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

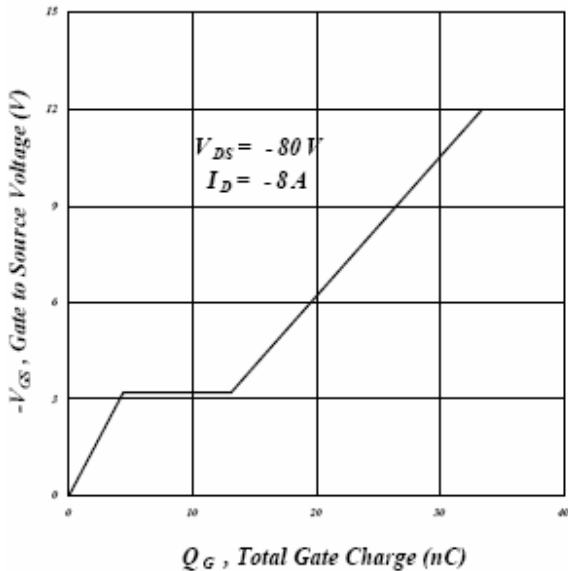


Fig 7. Gate Charge Characteristics

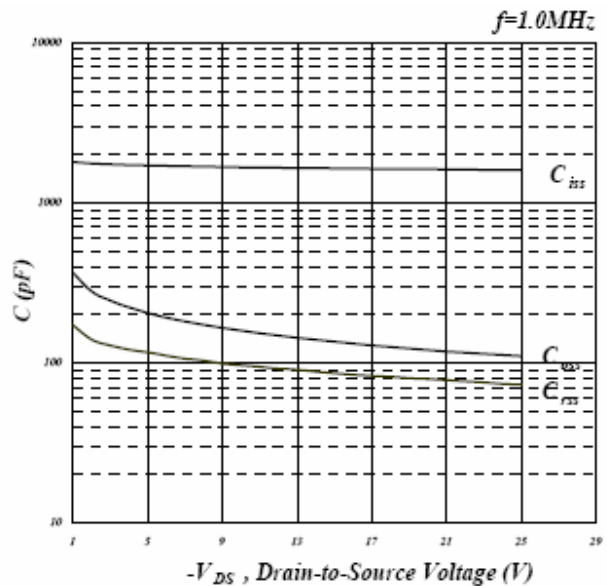


Fig 8. Typical Capacitance Characteristics



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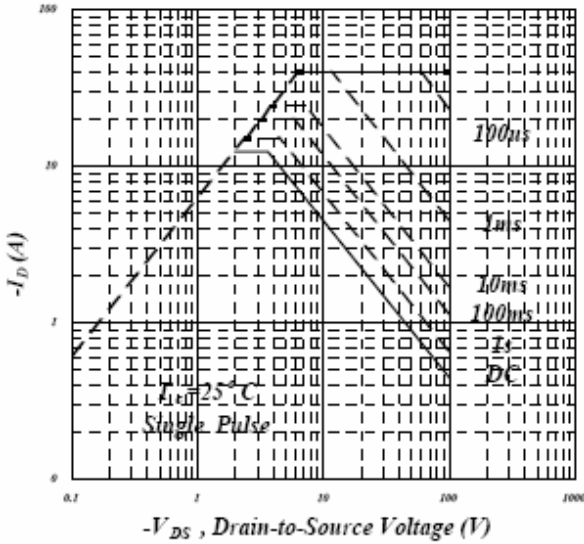


Fig 9. Maximum Safe Operating Area

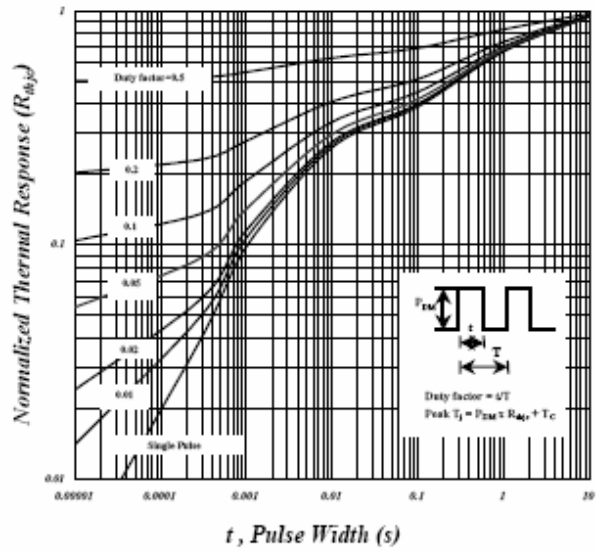


Fig 10. Effective Transient Thermal Impedance

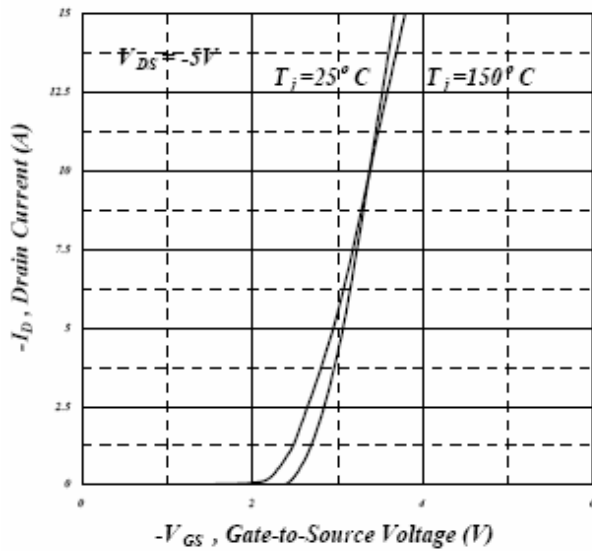


Fig 11. Transfer Characteristics

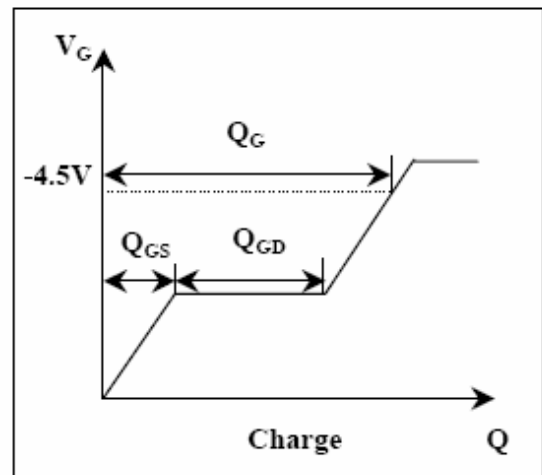
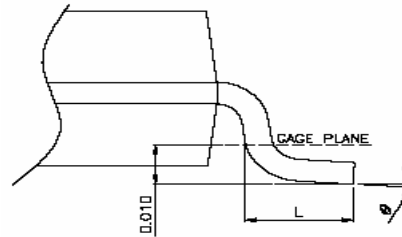
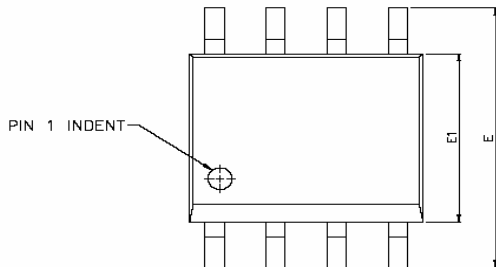


Fig 12. Gate Charge Waveform

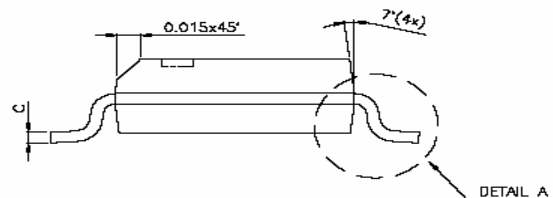
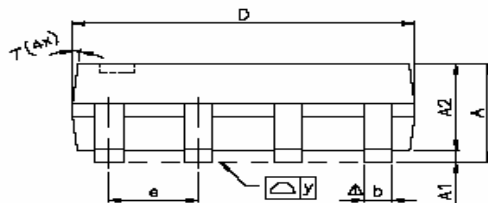


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SOP- 8 PACKAGE OUTLINE



DETAIL A



DETAIL A

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
Δ y	—	—	0.076	—	—	0.003
θ	0°	—	8°	0°	—	8°



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