



# SPC4516B

## N & P Pair Enhancement Mode MOSFET

### DESCRIPTION

The SPC4516B 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.

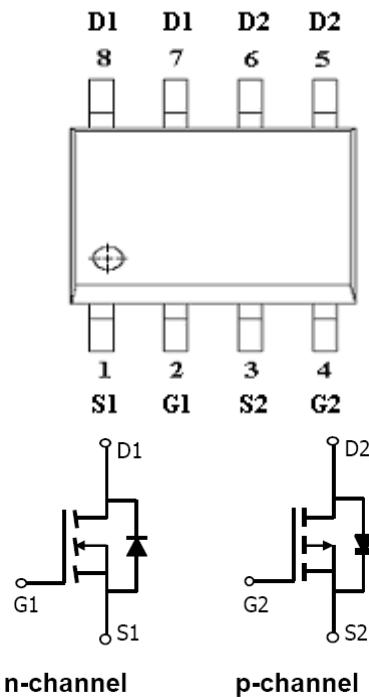
### FEATURES

- ◆ N-Channel  
30V/8.5A,  $R_{DS(ON)} = 17m\Omega @ V_{GS} = 10V$   
30V/7.8A,  $R_{DS(ON)} = 20m\Omega @ V_{GS} = 4.5V$
- ◆ P-Channel  
-30V/-8.2A,  $R_{DS(ON)} = 24m\Omega @ V_{GS} = -10V$   
-30V/-7.2A,  $R_{DS(ON)} = 30m\Omega @ V_{GS} = -4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

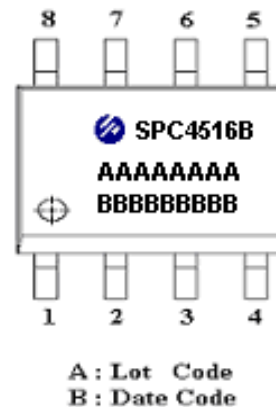
### APPLICATIONS

- 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
SPC4516BS8RGB	SOP- 8P	SPC4516B

※ SPC4516BS8RGB : 13" Tape Reel ; Pb – Free ; Halogen - Free

### ABSOLUTE MAXIMUM RATINGS

( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	$V_{DSS}$	30	-30	V	
Gate –Source Voltage	$V_{GSS}$	$\pm 20$	$\pm 20$	V	
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$	8.5	-8.2	A
		$T_A=70^{\circ}\text{C}$	7.5	-5.6	
Pulsed Drain Current	$I_{DM}$	20	-20	A	
Continuous Source Current(Diode Conduction)	$I_S$	2.3	-2.3	A	
Power Dissipation	$P_D$	$T_A=25^{\circ}\text{C}$	2.5	2.8	W
		$T_A=70^{\circ}\text{C}$	1.6	1.8	
Operating Junction Temperature	$T_J$	-55/150		$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-55/150		$^{\circ}\text{C}$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	$T \leq 10\text{sec}$	50	52	$^{\circ}\text{C}/\text{W}$
		Steady State	80	80	



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### ELECTRICAL CHARACTERISTICS ( NMOS )

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6		1.8	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$V_{DS}=24V, V_{GS}=0V$ $T_J=85^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$	25			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8.5A$		0.014	0.017	$\Omega$
		$V_{GS}=4.5V, I_D=7.8A$		0.017	0.020	
Forward Transconductance	$g_{fs}$	$V_{DS}=15V, I_D=6.2A$		13		S
Diode Forward Voltage	$V_{SD}$	$I_S=2.3A, V_{GS}=0V$		0.5	1.0	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=10V$ $I_D=2A$		10	18	nC
Gate-Source Charge	$Q_{gs}$			2.8		
Gate-Drain Charge	$Q_{gd}$			2.0		
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V$ $f=1MHz$		850		pF
Output Capacitance	$C_{oss}$			158		
Reverse Transfer Capacitance	$C_{rss}$			120		
Turn-On Time	$t_{d(on)}$	$V_{DD}=15V, R_L=15\Omega$ $I_D=5.0A, V_{GEN}=10V$ $R_G=1\Omega$		10	15	nS
	$t_r$			4	12	
Turn-Off Time	$t_{d(off)}$			15	30	
	$t_f$			10	15	



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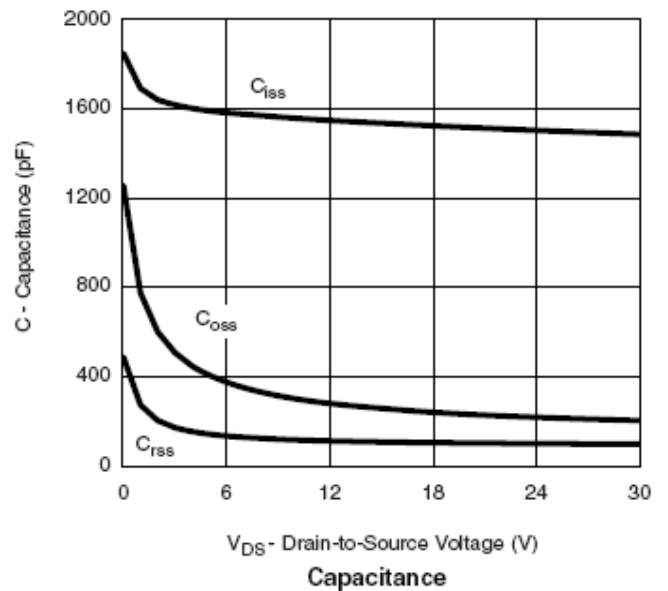
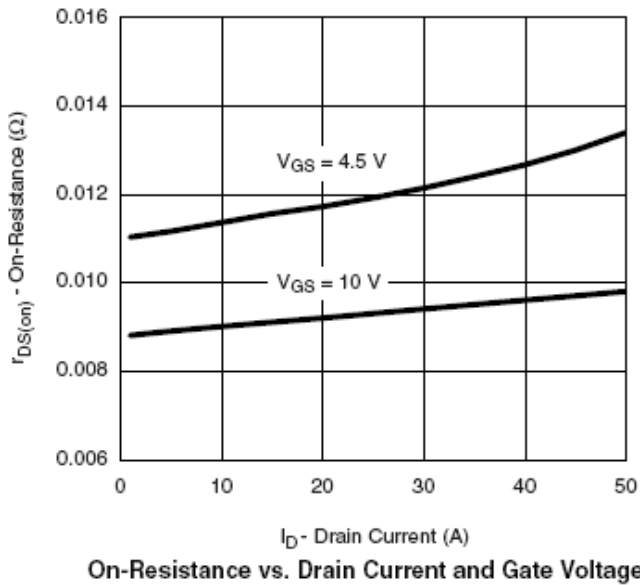
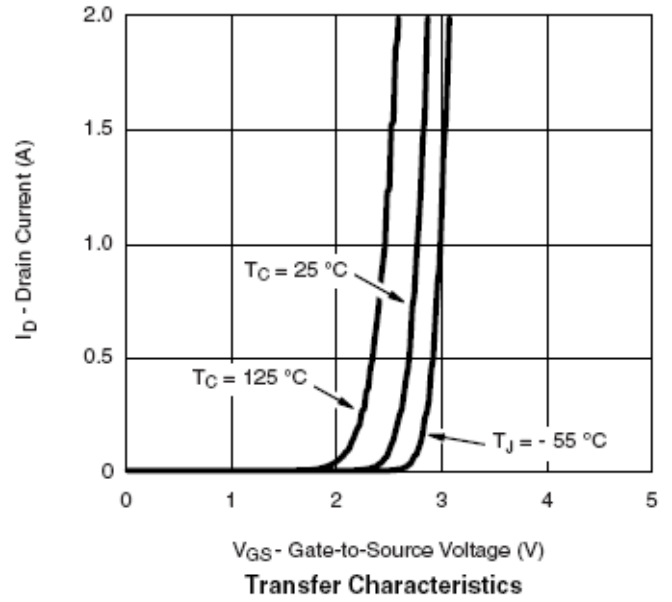
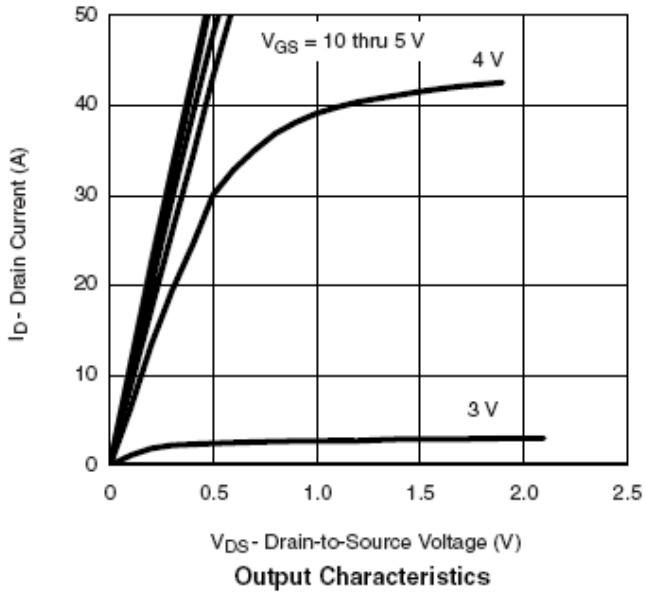
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7		-1.6	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V$ $T_J=85^\circ C$			-5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=-5V, V_{GS}=-4.5V$	-40			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-8.2A$		0.020	0.024	$\Omega$
		$V_{GS}=-4.5V, I_D=-7.2A$		0.025	0.030	
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-9.0A$		24		S
Diode Forward Voltage	$V_{SD}$	$I_S=-2.3A, V_{GS}=0V$		-0.8	-1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-9.0A$		20	30	nC
Gate-Source Charge	$Q_{gs}$			3.5		
Gate-Drain Charge	$Q_{gd}$			4.8		
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V$ $f=1MHz$		1850		pF
Output Capacitance	$C_{oss}$			450		
Reverse Transfer Capacitance	$C_{rss}$			335		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=15\Omega$ $I_D=-1.0A, V_{GEN}=-10V$ $R_G=6\Omega$		20	30	nS
	$t_r$			20	30	
Turn-Off Time	$t_{d(off)}$			75	110	
	$t_f$			40	80	



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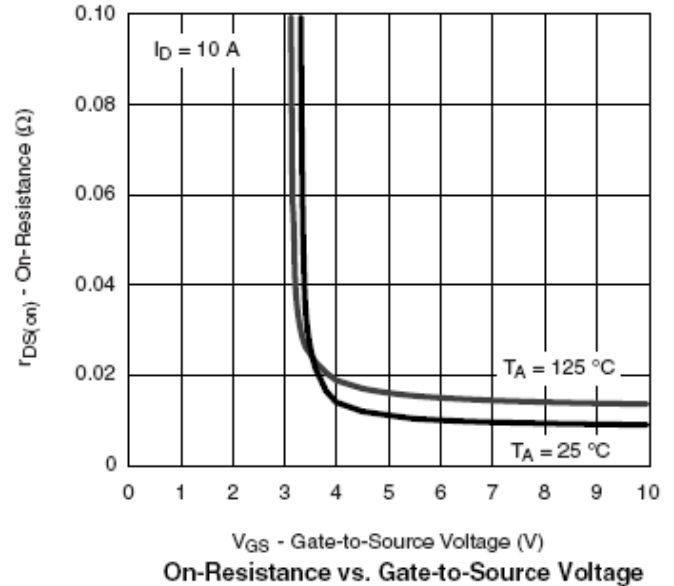
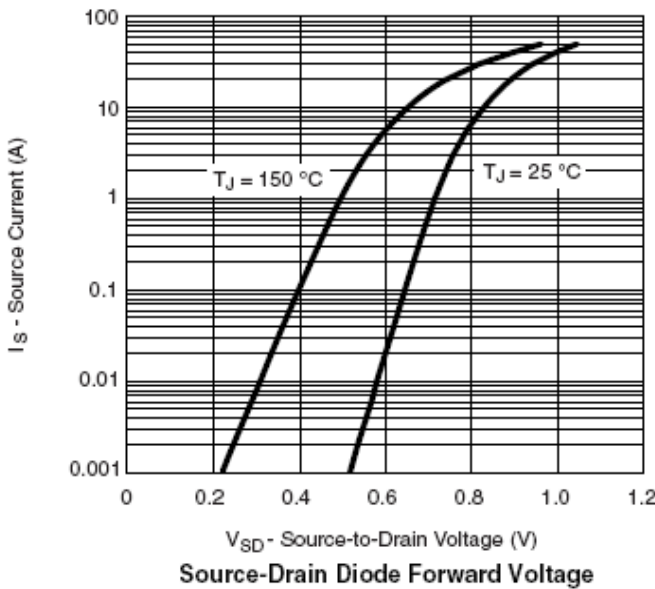
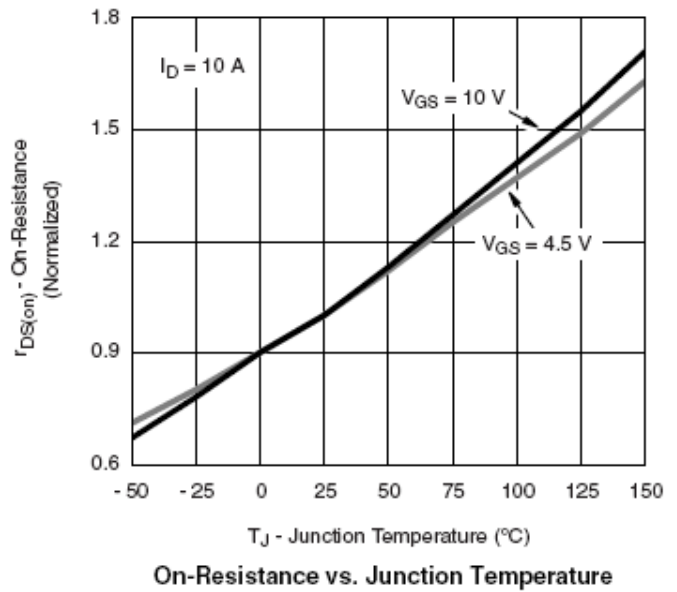
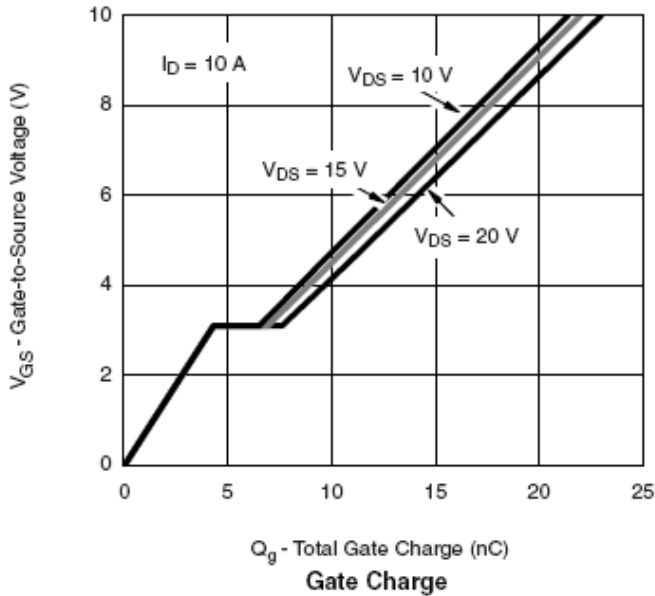




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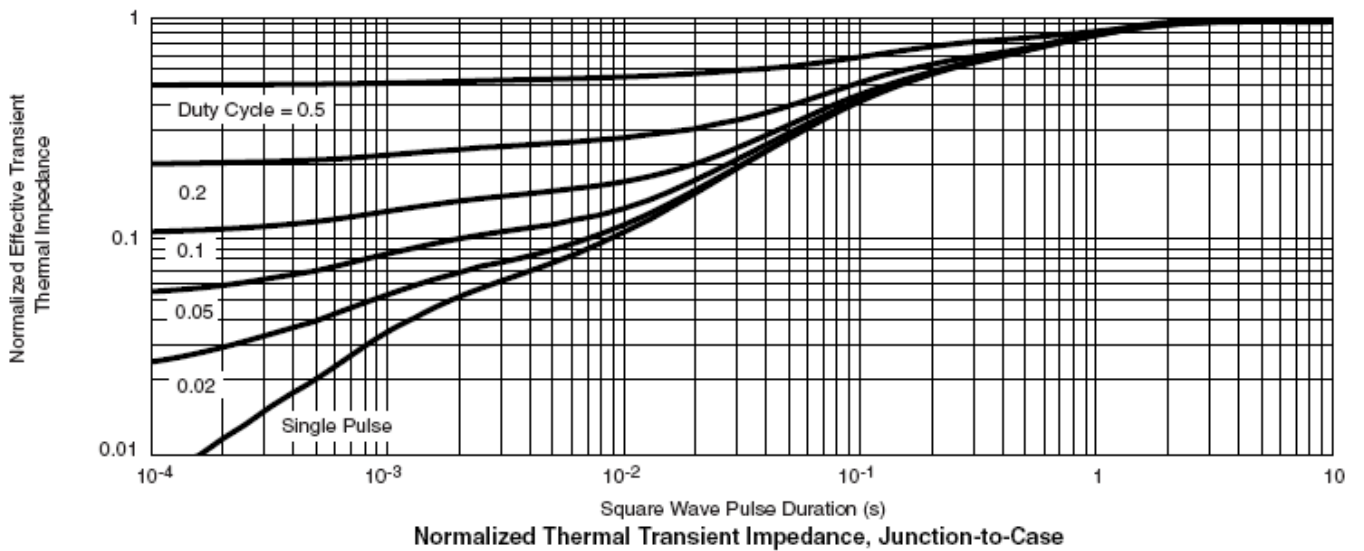
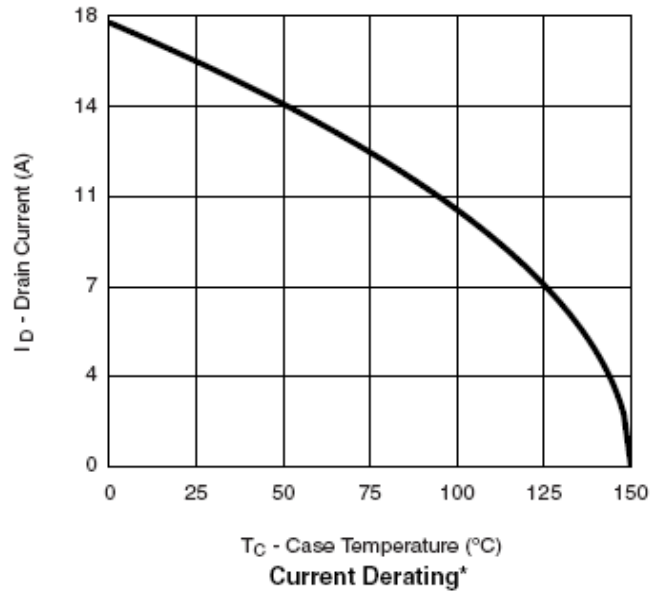
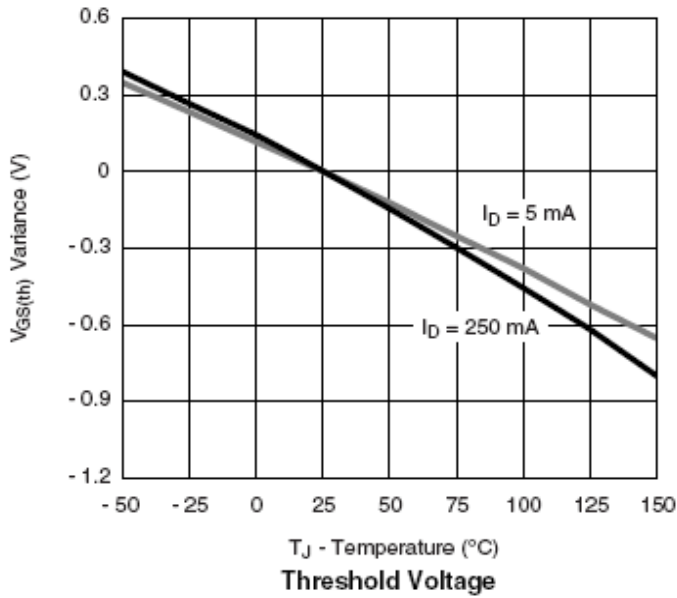




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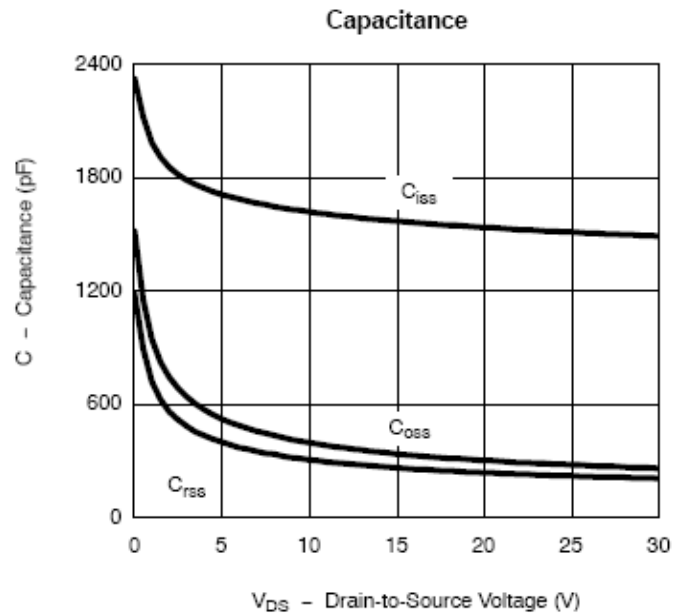
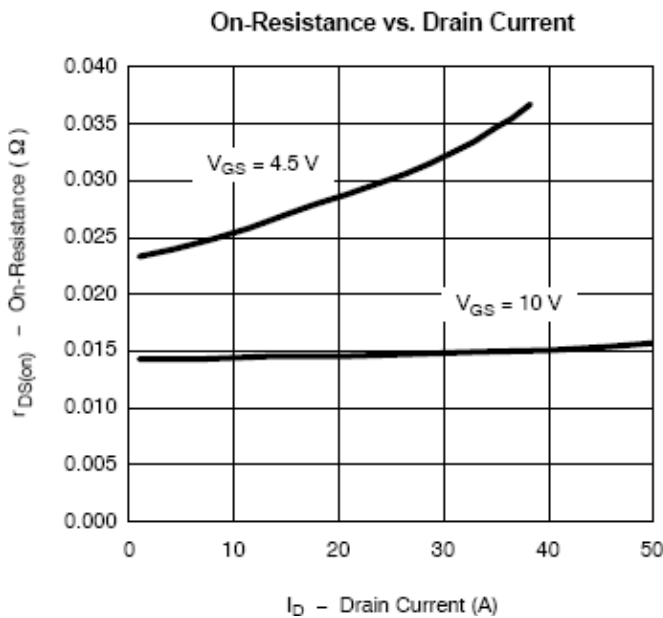
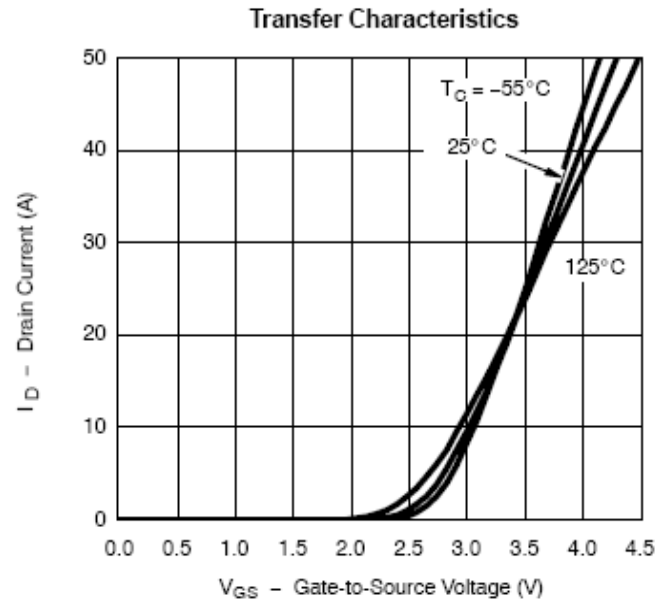
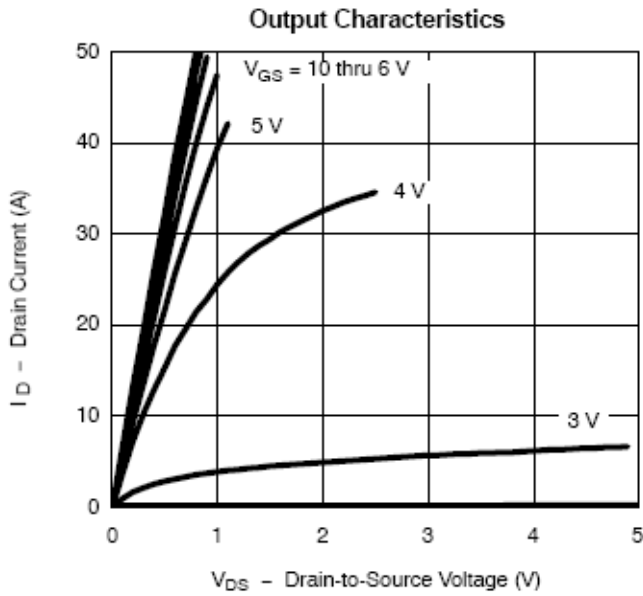
### TYPICAL CHARACTERISTICS (NMOS)





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## TYPICAL CHARACTERISTICS ( PMOS )



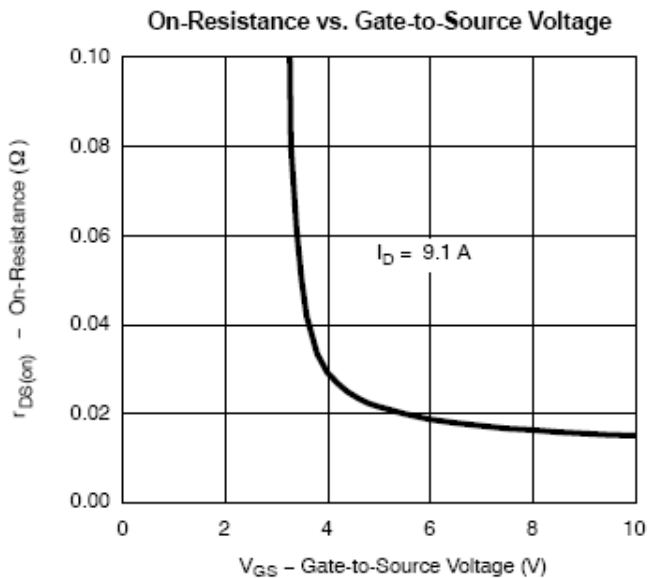
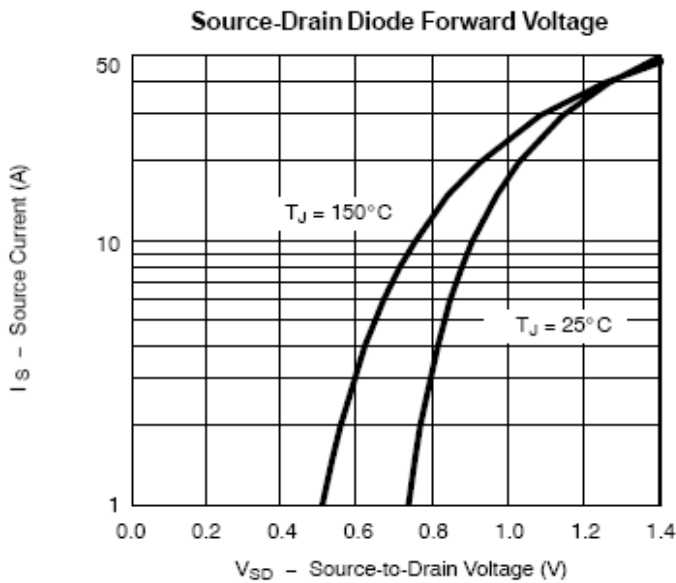
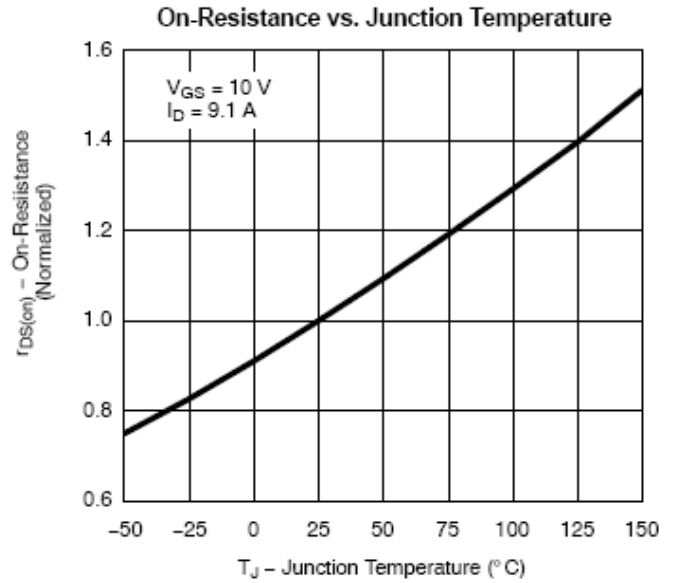
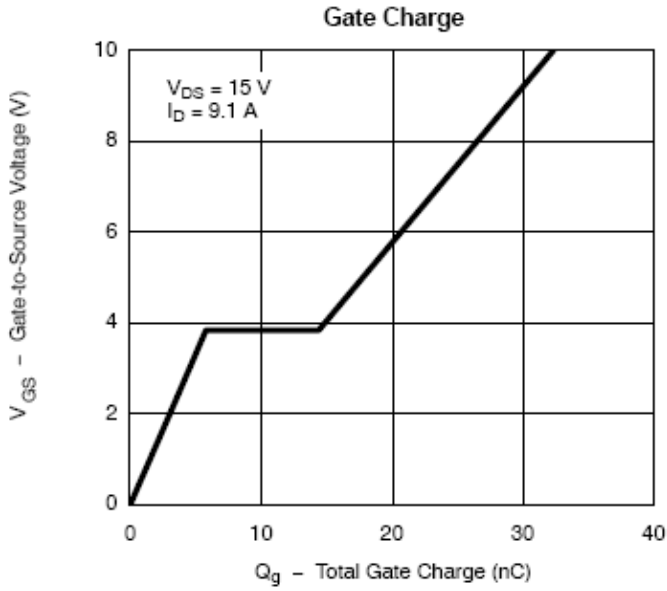




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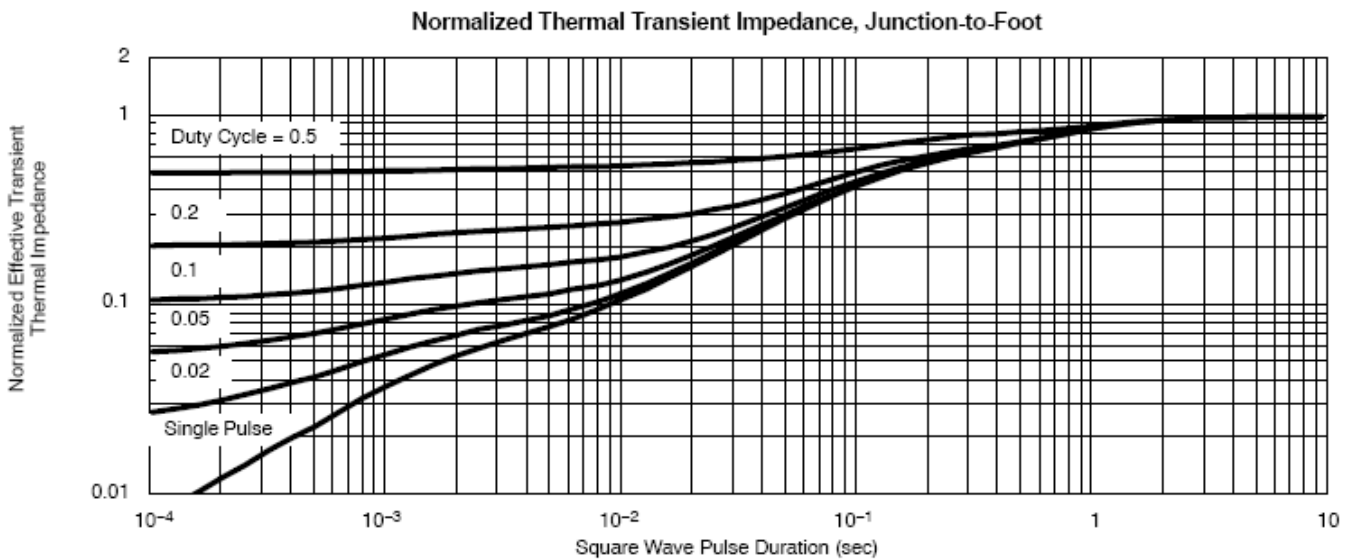
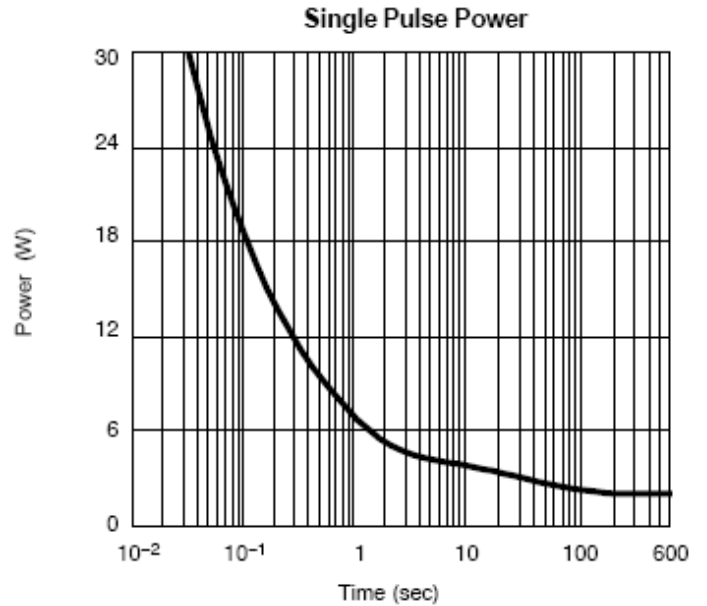
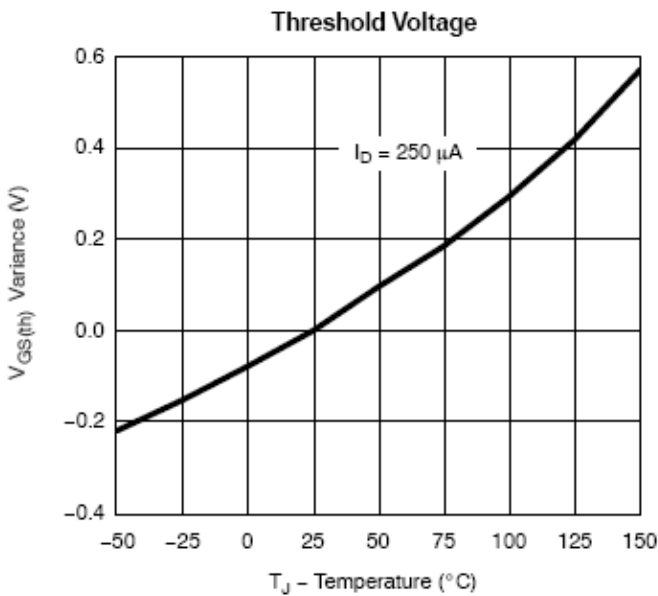
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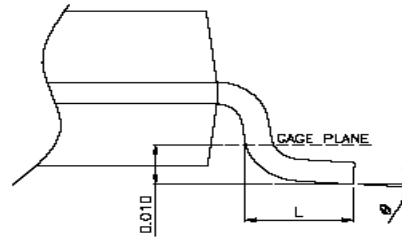
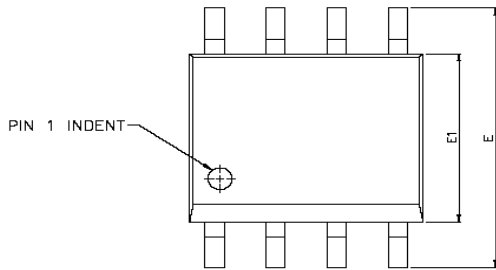
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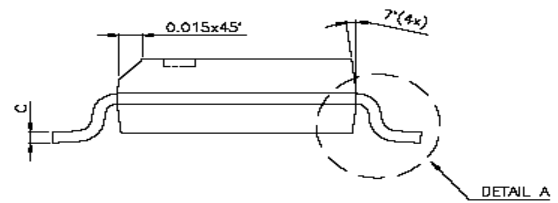
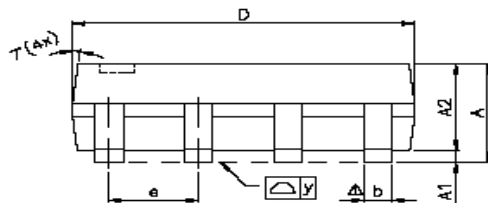


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## SOP- 8 PACKAGE OUTLINE



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
$\Delta y$	—	—	0.076	—	—	0.003
$\theta$	0°	—	8°	0°	—	8°



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