



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.

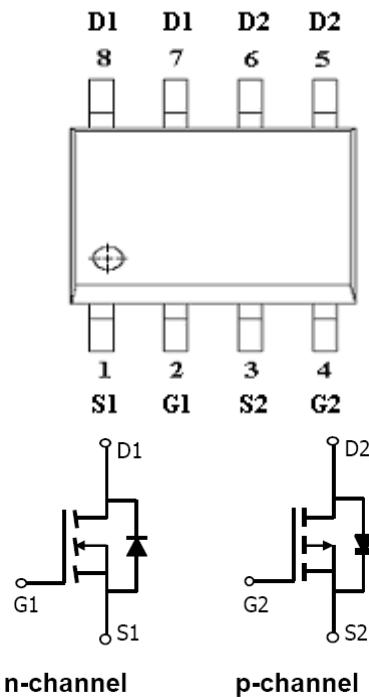
FEATURES

- ◆ 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

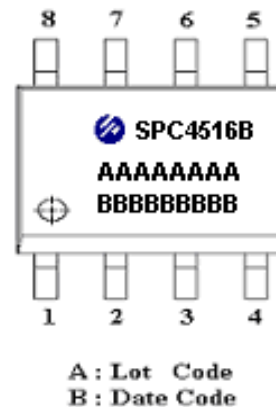
APPLICATIONS

- 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}	± 20	± 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)

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Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
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}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 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	Ω
		$V_{GS}=4.5V, I_D=7.8A$		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
Dynamic						
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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ELECTRICAL CHARACTERISTICS (PMOS)

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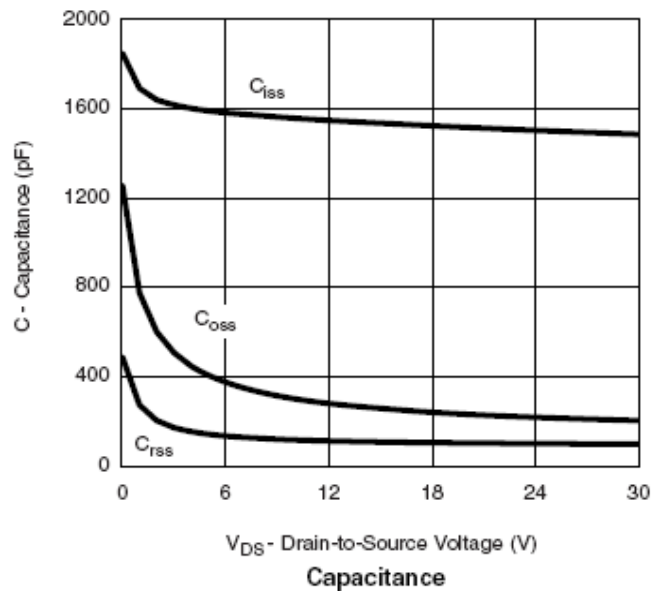
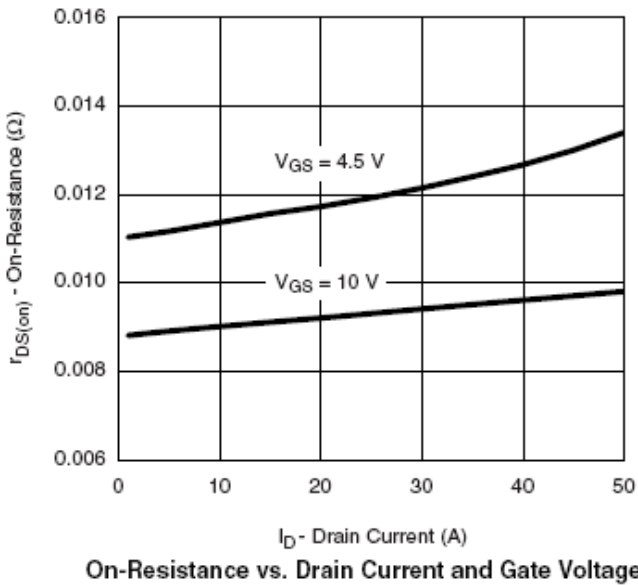
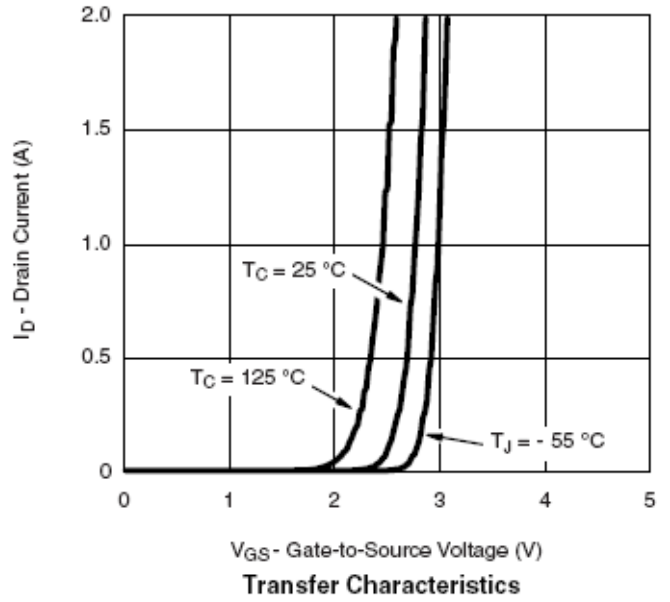
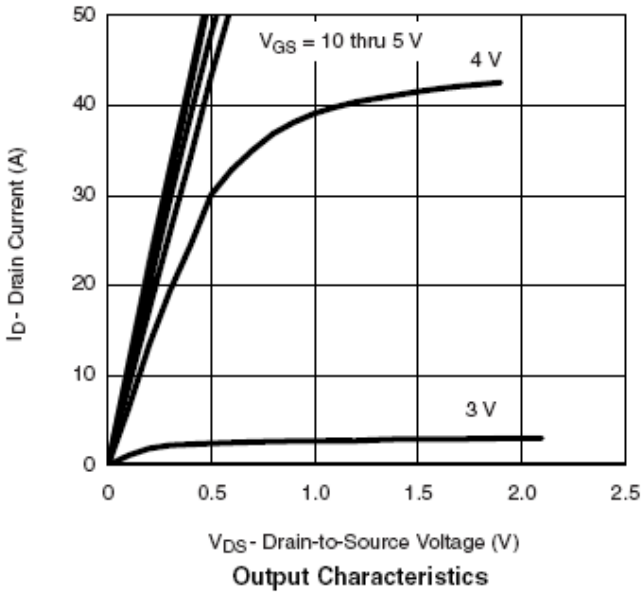
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7		-1.6	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage 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	Ω
		$V_{GS}=-4.5V, I_D=-7.2A$		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
Dynamic						
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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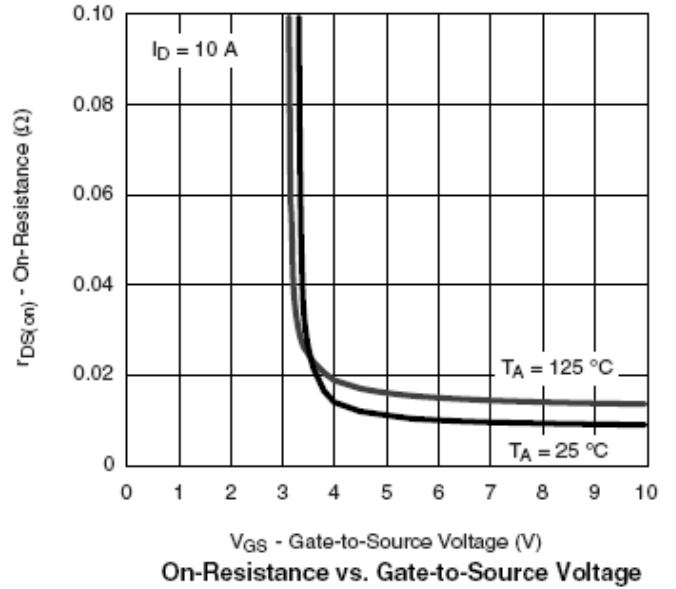
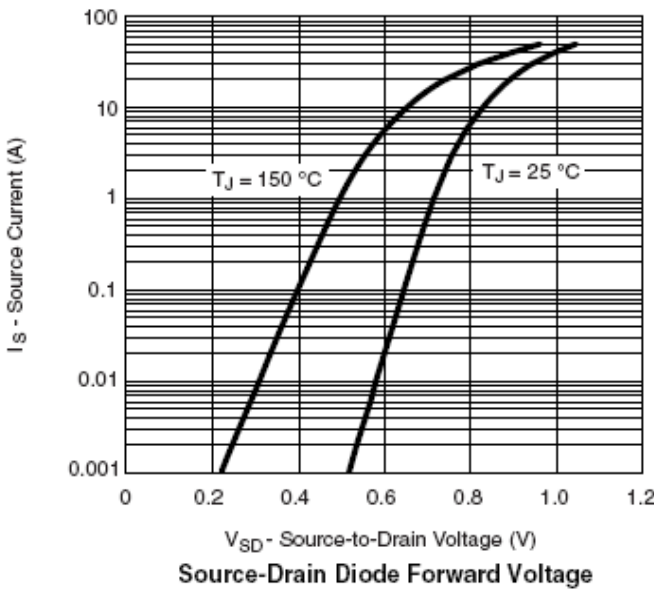
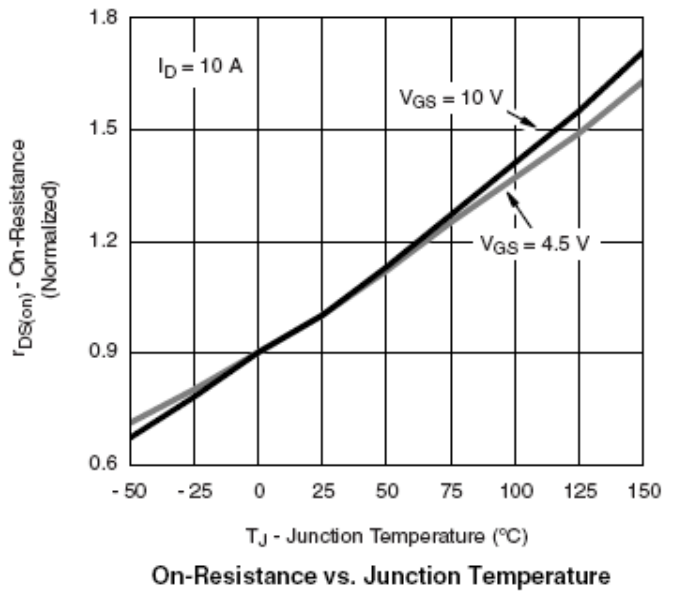
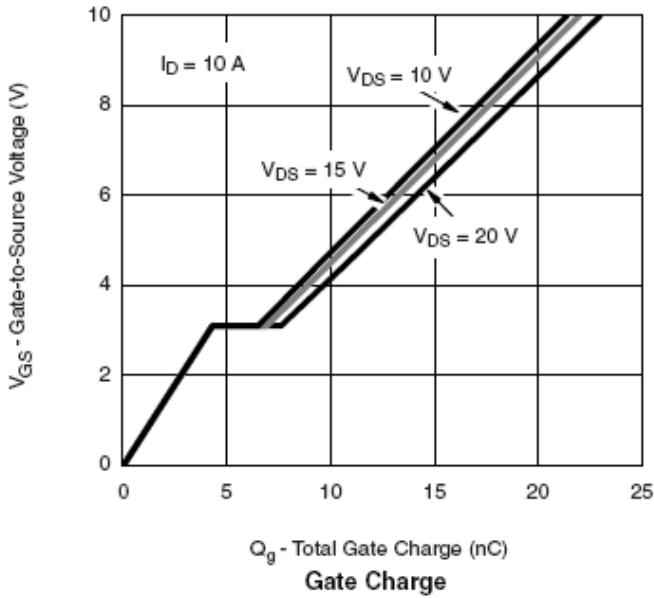




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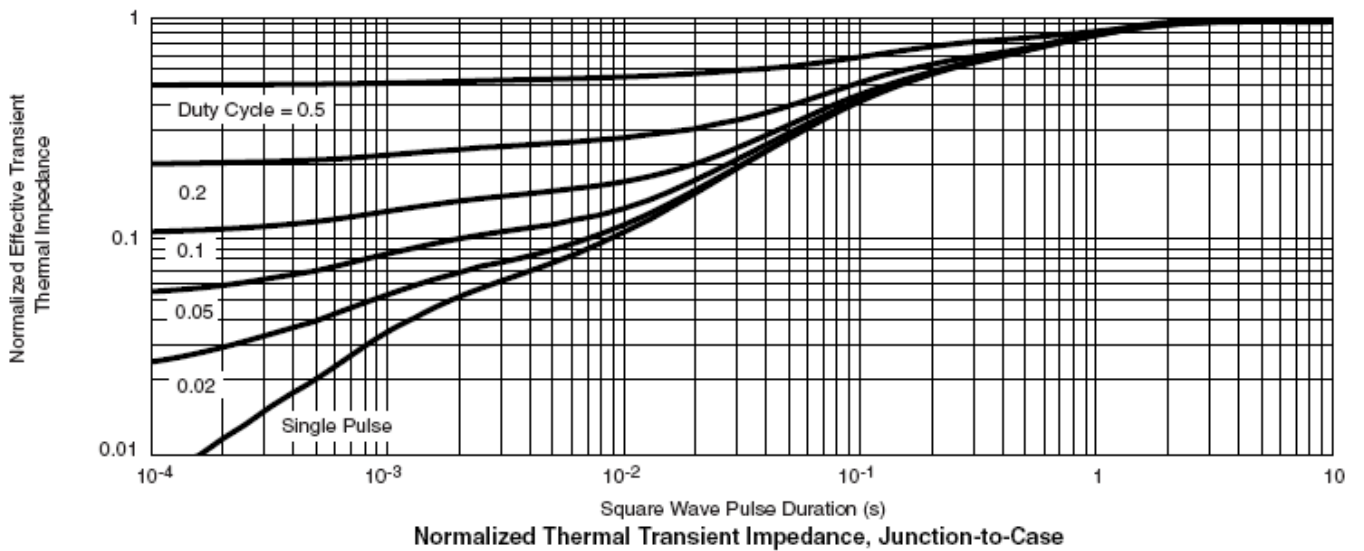
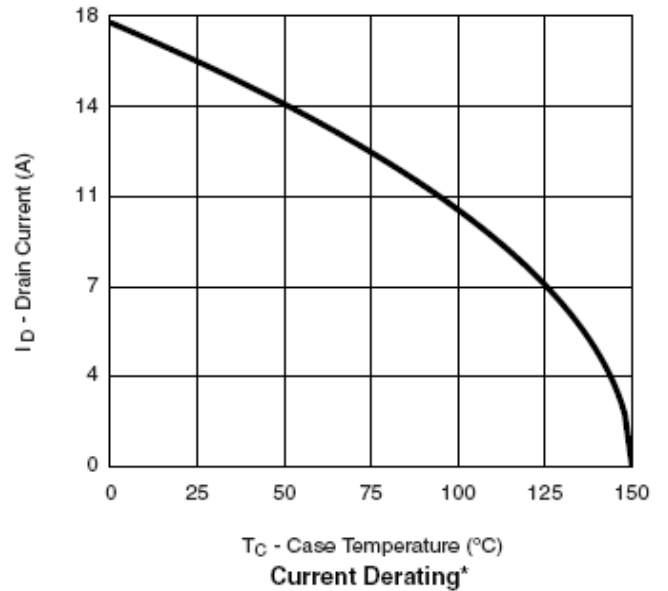
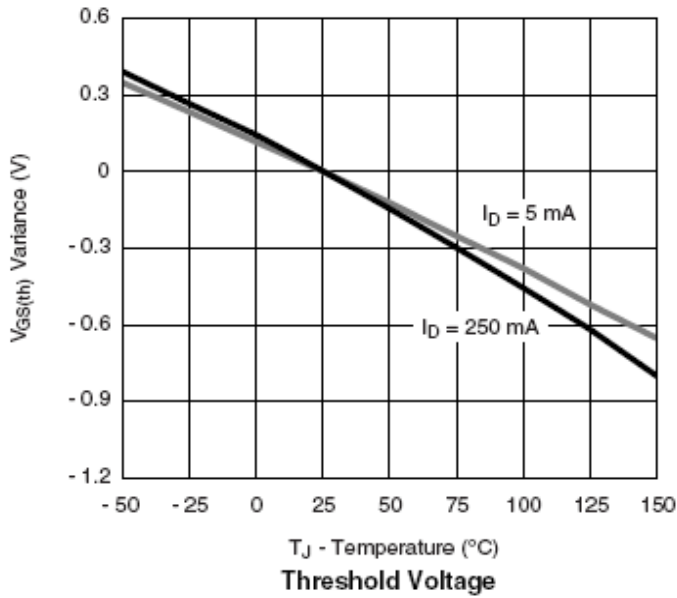




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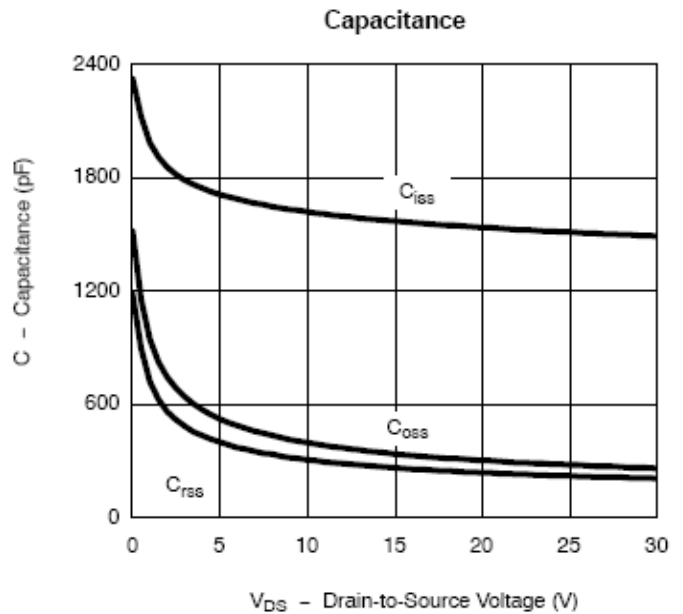
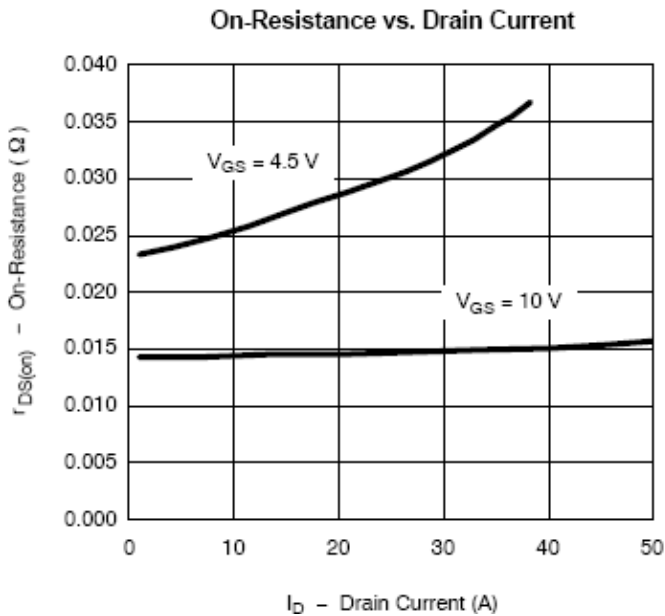
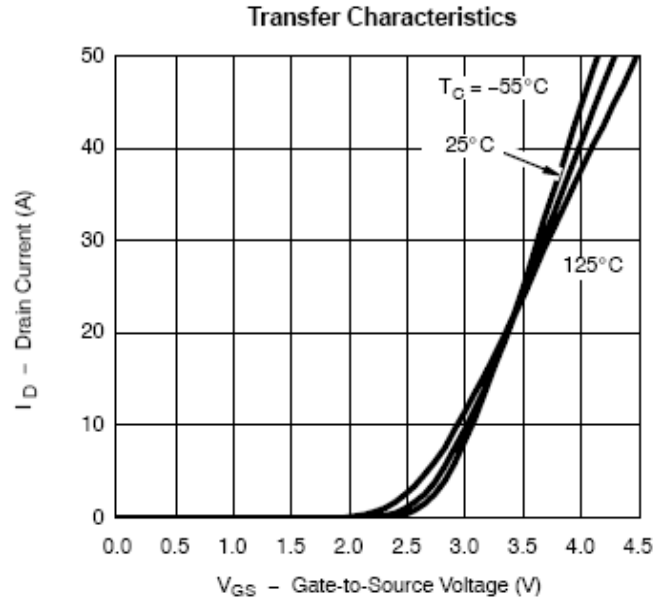
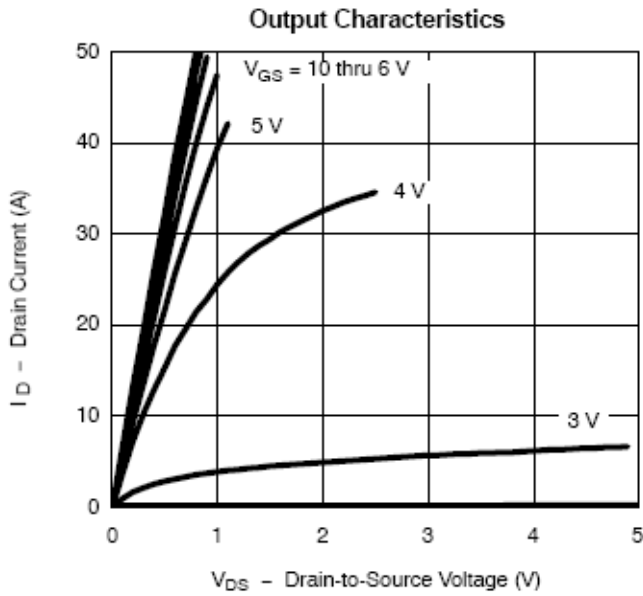
TYPICAL CHARACTERISTICS (NMOS)





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TYPICAL CHARACTERISTICS (PMOS)

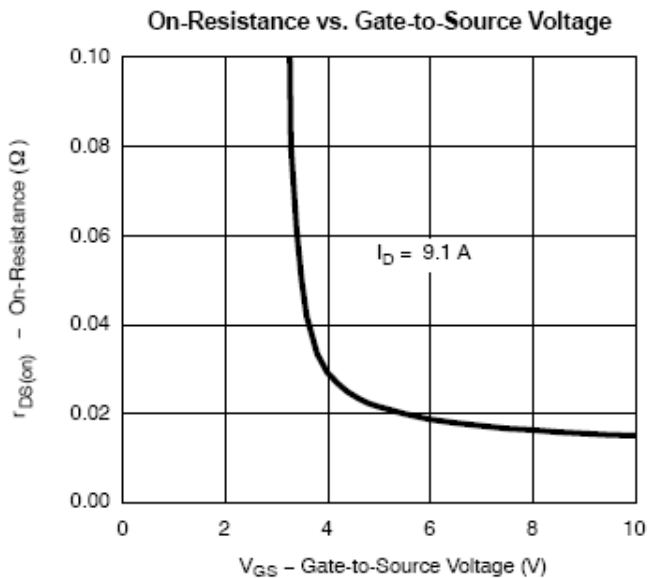
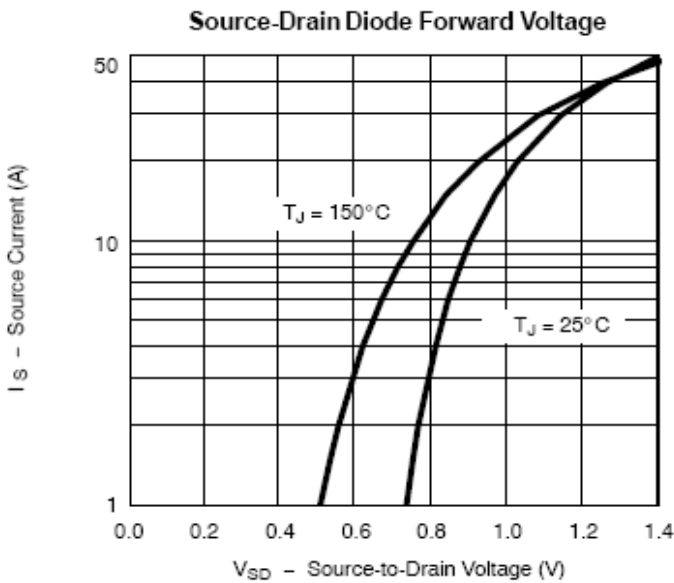
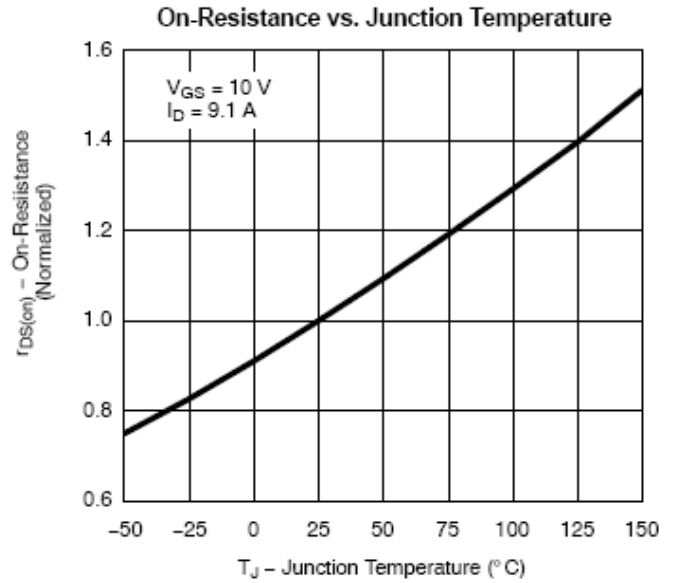
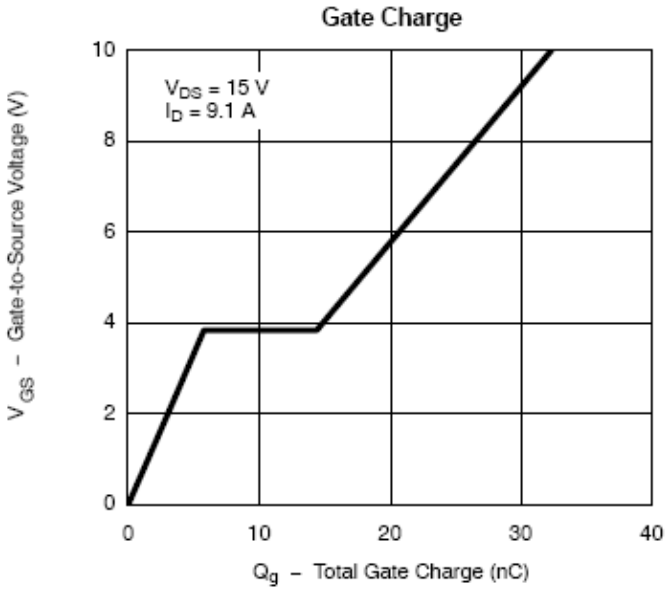




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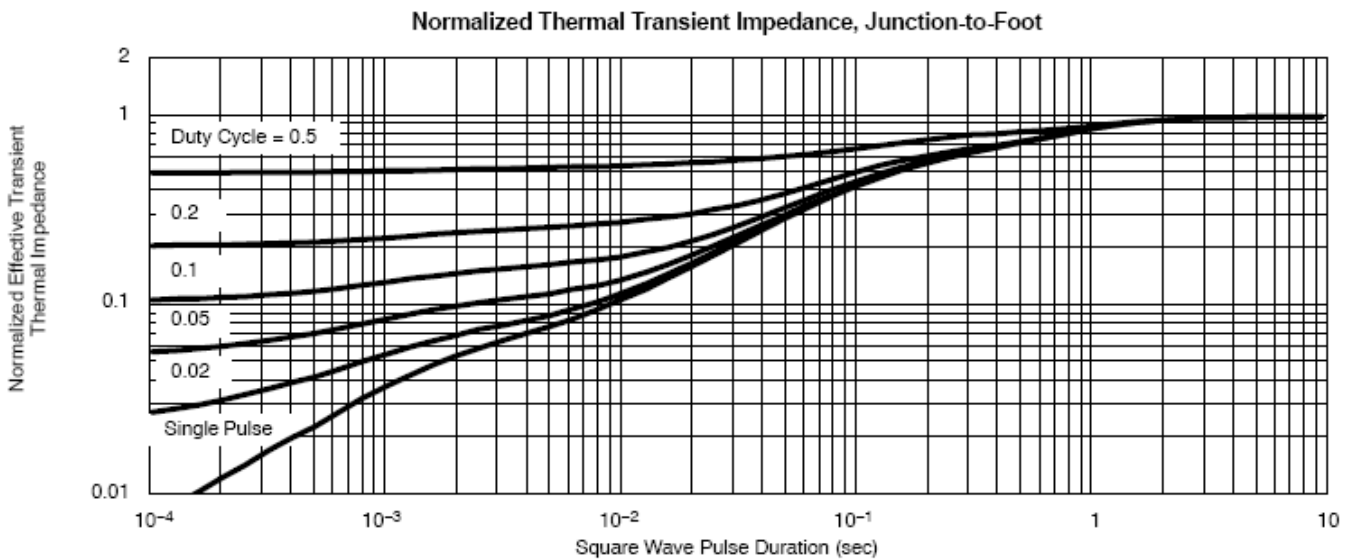
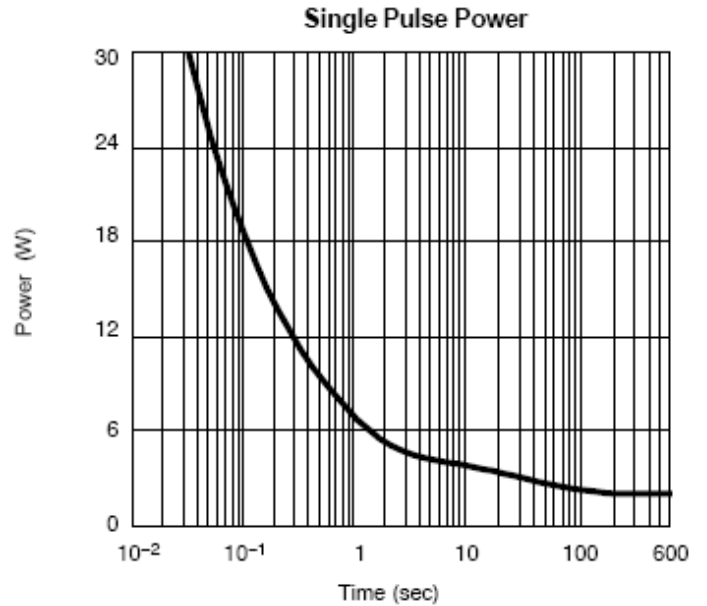
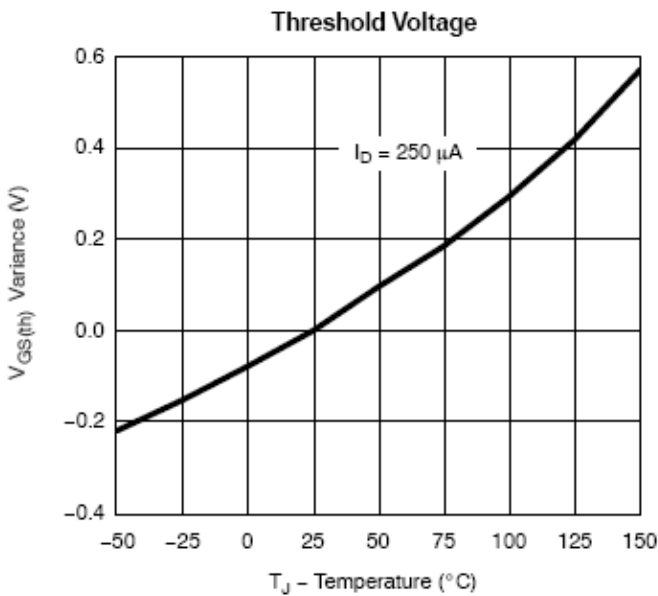
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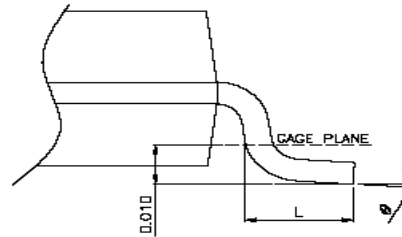
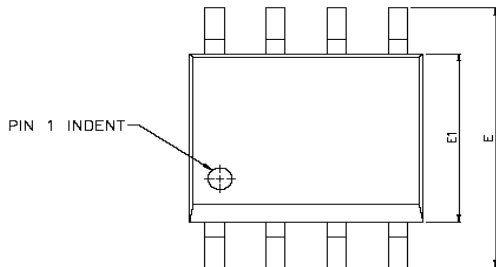
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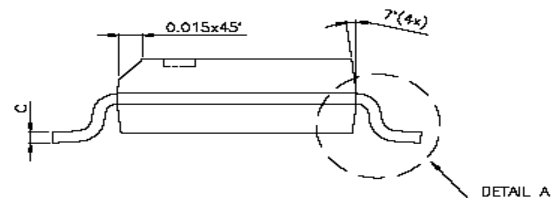
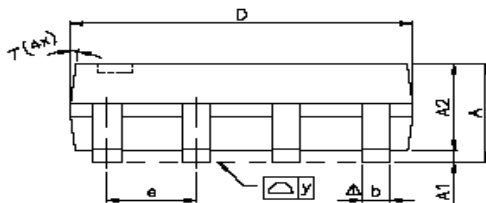


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SOP- 8 PACKAGE OUTLINE



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



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