



SPC4516

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC4516 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.

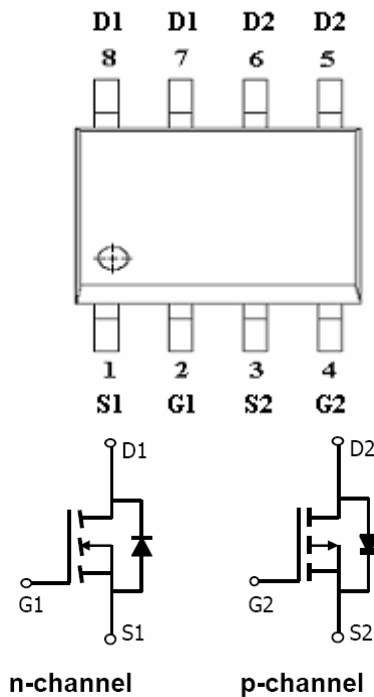
FEATURES

- ◆ N-Channel
 - 30V/8.5A, $R_{DS(ON)} = 14m\Omega @ V_{GS} = 10V$
 - 30V/7.8A, $R_{DS(ON)} = 20m\Omega @ V_{GS} = 4.5V$
- ◆ P-Channel
 - 30V/-7.2A, $R_{DS(ON)} = 25m\Omega @ V_{GS} = -10V$
 - 30V/-5.6A, $R_{DS(ON)} = 40m\Omega @ V_{GS} = -4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

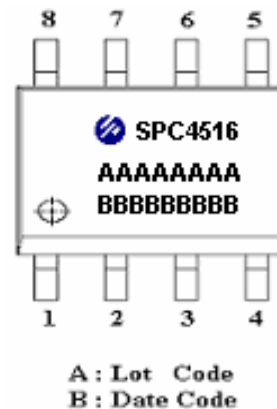
APPLICATIONS

- 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
SPC4516S8RG	SOP- 8P	SPC4516
SPC4516S8TG	SOP- 8P	SPC4516

※ SPC4516S8RG : 13" Tape Reel ; Pb – Free

※ SPC4516S8TG : Tube ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°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°C)	I _D	TA=25°C	8.5	-7.2	A
		TA=70°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	TA=25°C	2.5	2.8	W
		TA=70°C	1.6	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	50	52	°C/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 =250uA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0		3.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±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°C			5	
On-State Drain Current	I _{D(on)}	V _{DS} ≥5V, V _{GS} =10V	25			A
Drain-Source On-Resistance	R _{DSS(on)}	V _{GS} =10V, I _D =8.5A		0.010	0.013	Ω
		V _{GS} =4.5V, I _D =7.8A		0.013	0.018	
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		0.8	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V I _D =2A		16	24	nC
Gate-Source Charge	Q _{gs}			4.2		
Gate-Drain Charge	Q _{gd}			2.5		
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f=1MHz		1350		pF
Output Capacitance	C _{oss}			258		
Reverse Transfer Capacitance	C _{rss}			150		
Turn-On Time	t _{d(on)}	V _{DD} =15V, R _L =15Ω I _D =5.0A, V _{GEN} =10V R _G =1Ω		15	20	nS
	t _r			6	16	
Turn-Off Time	t _{d(off)}			20	40	
	t _f			12	20	



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ELECTRICAL CHARACTERISTICS (PMOS)

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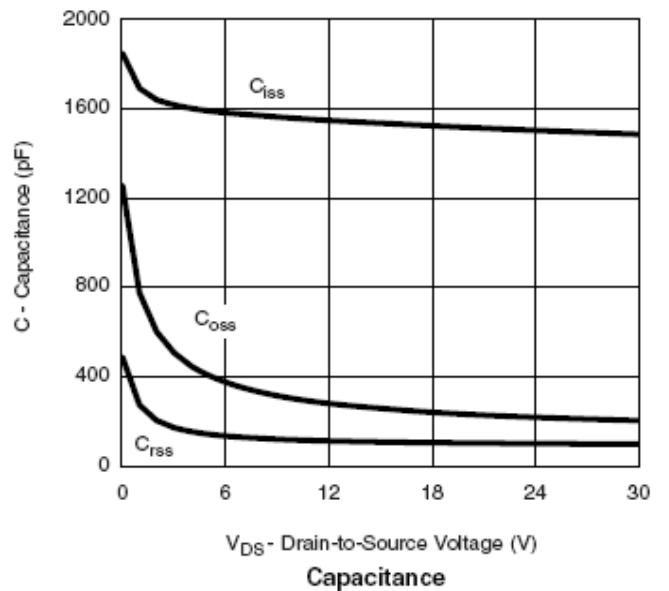
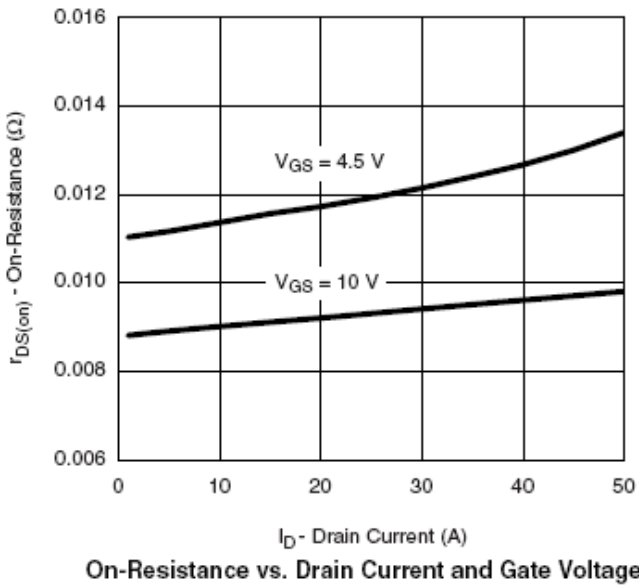
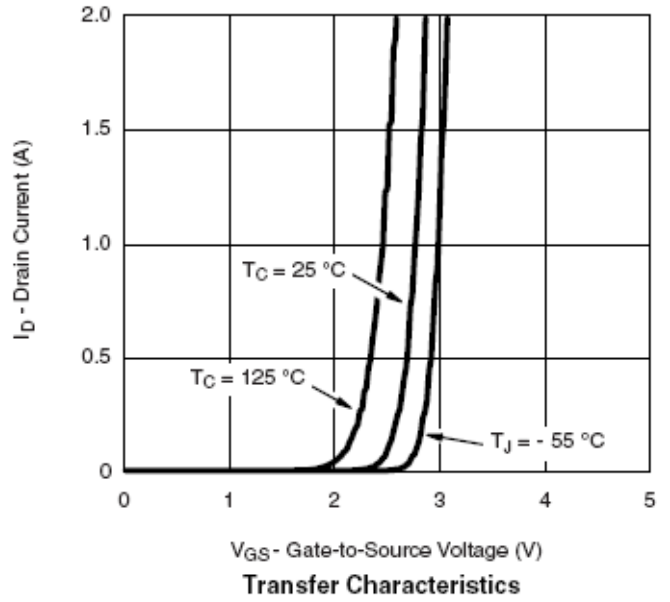
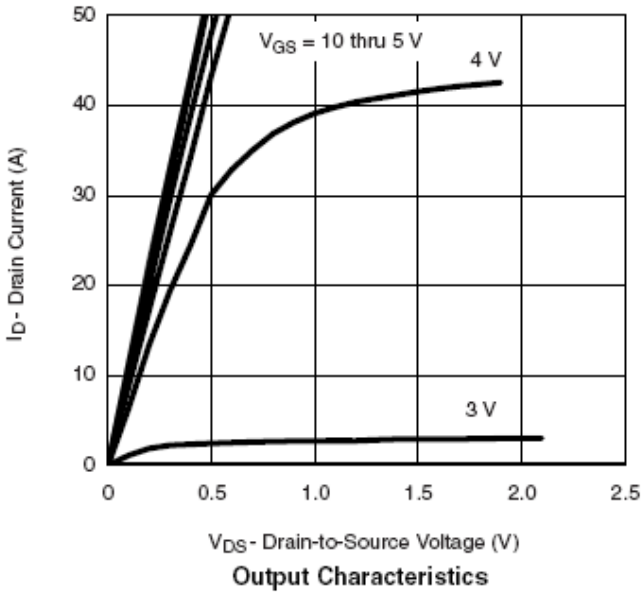
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-3.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-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	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7.2A$		0.022	0.025	Ω
		$V_{GS}=-4.5V, I_D=-5.6A$		0.030	0.040	
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	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-9.0A$		16	24	nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			4.5		
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V$ $f=1MHz$		1650		pF
Output Capacitance	C_{oss}			350		
Reverse Transfer Capacitance	C_{rss}			235		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=15\Omega$ $I_D=-1.0A, V_{GEN}=-10V$ $R_G=6\Omega$		16	30	nS
	t_r			17	30	
Turn-Off Time	$t_{d(off)}$			65	110	
	t_f			35	80	



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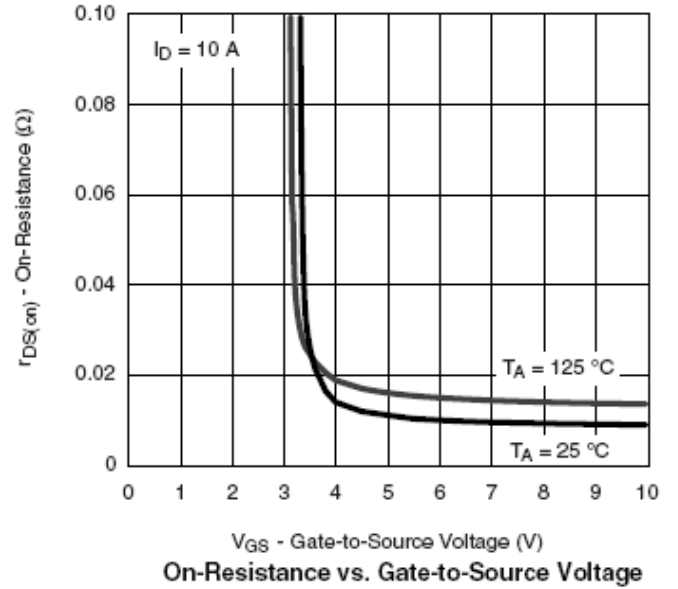
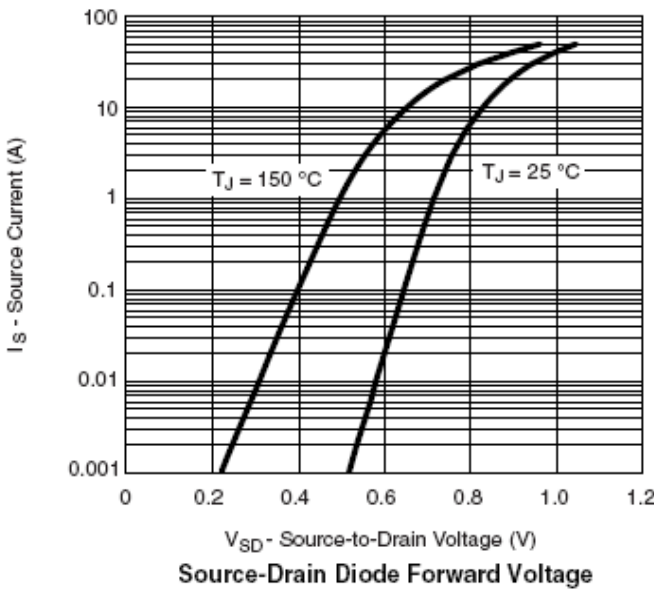
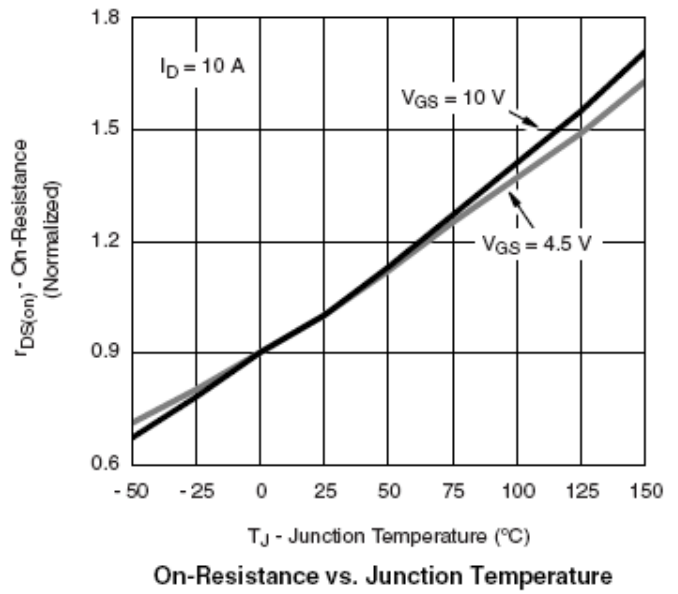
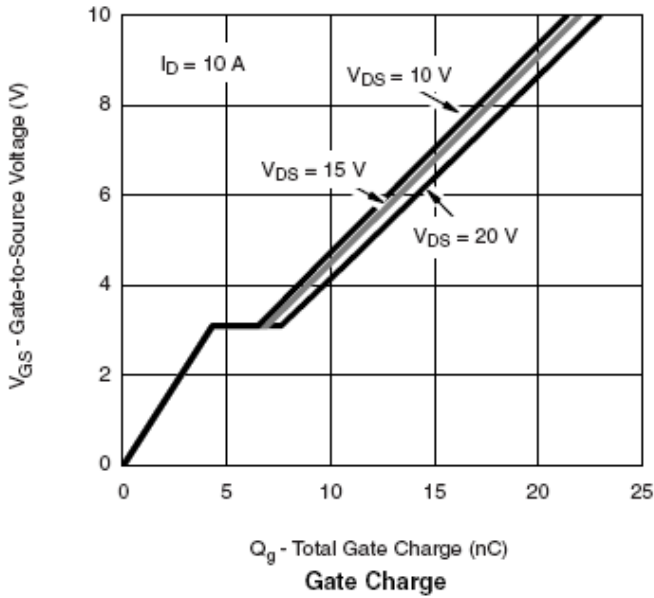




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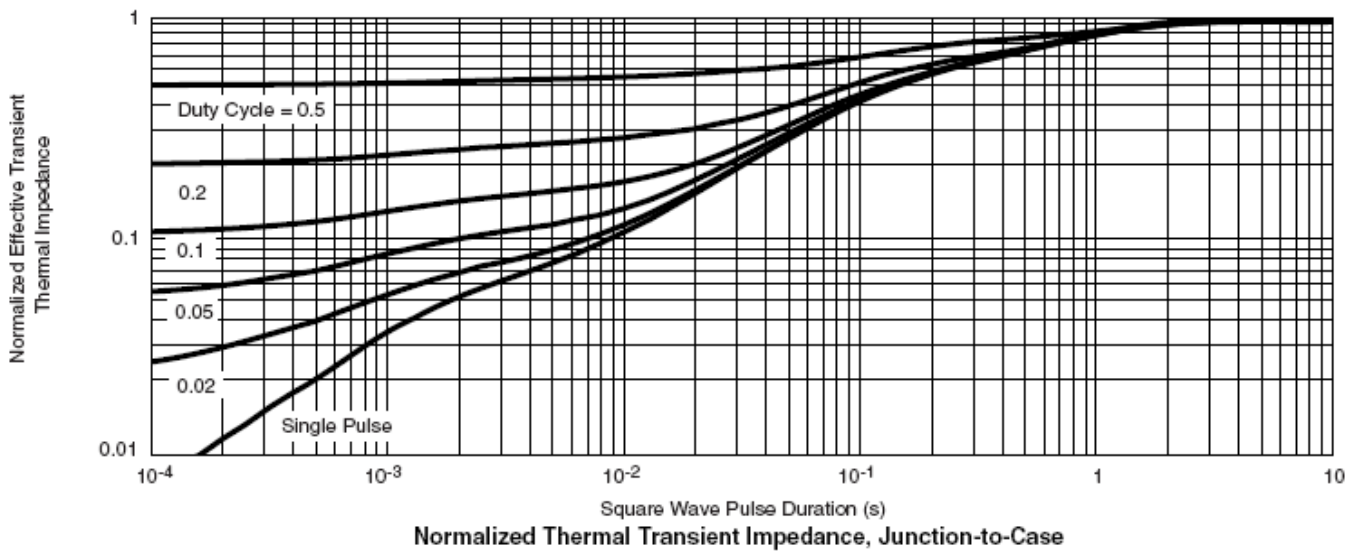
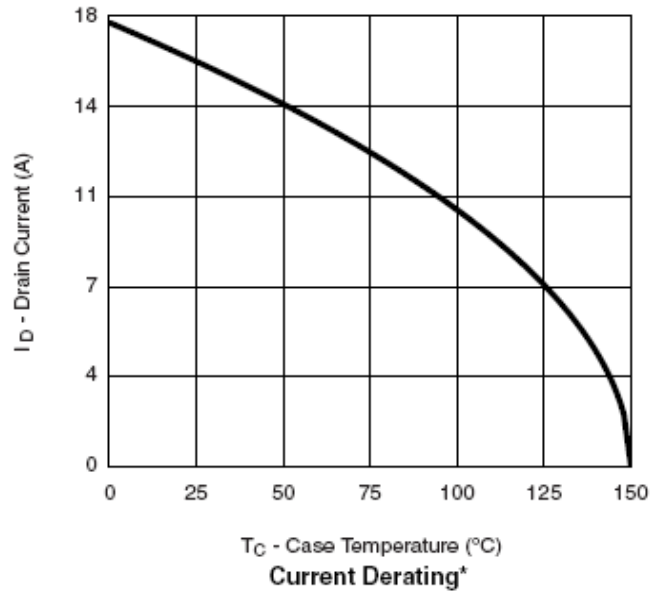
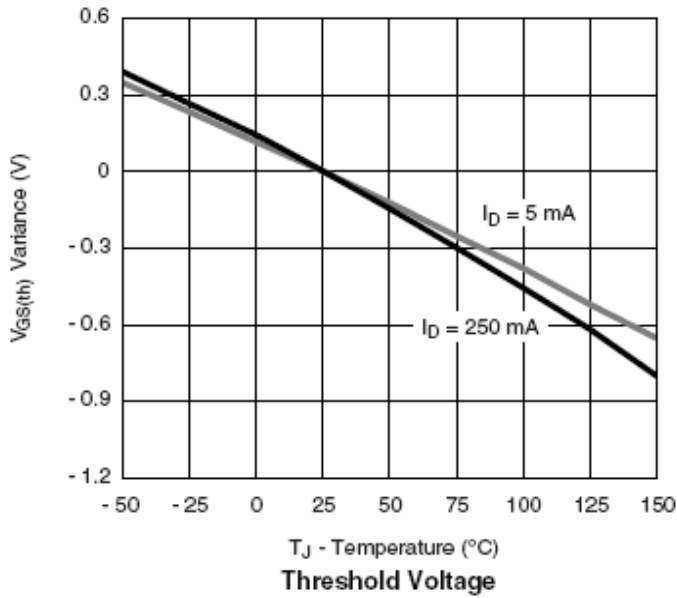




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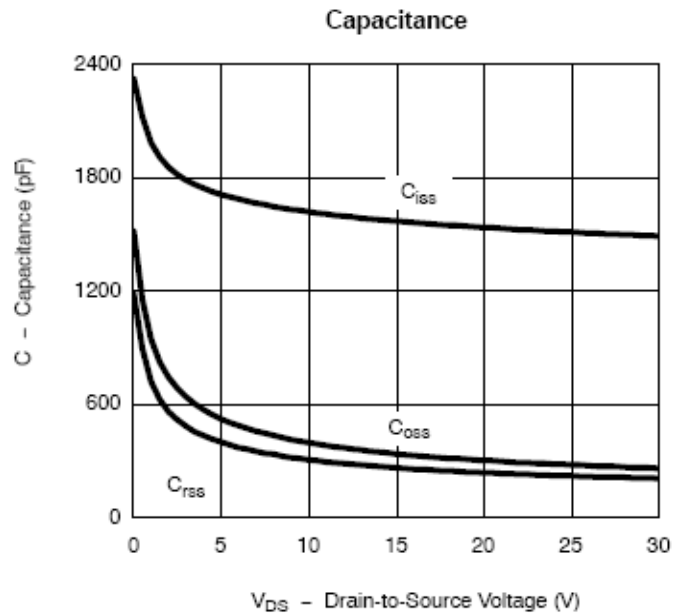
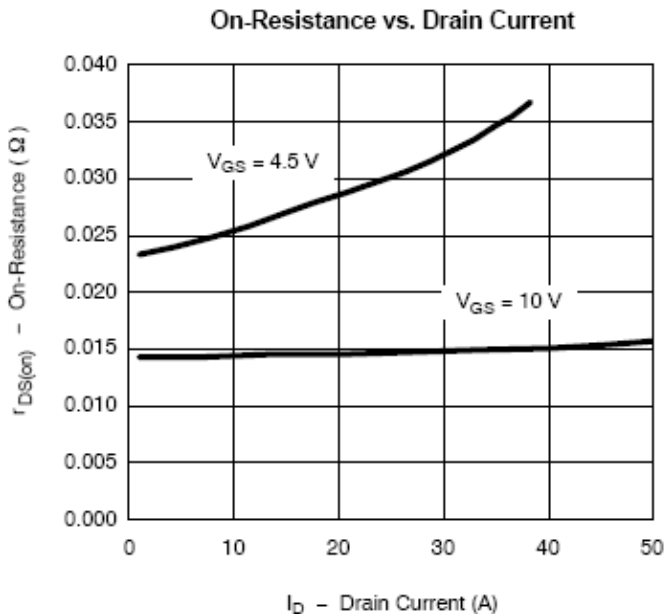
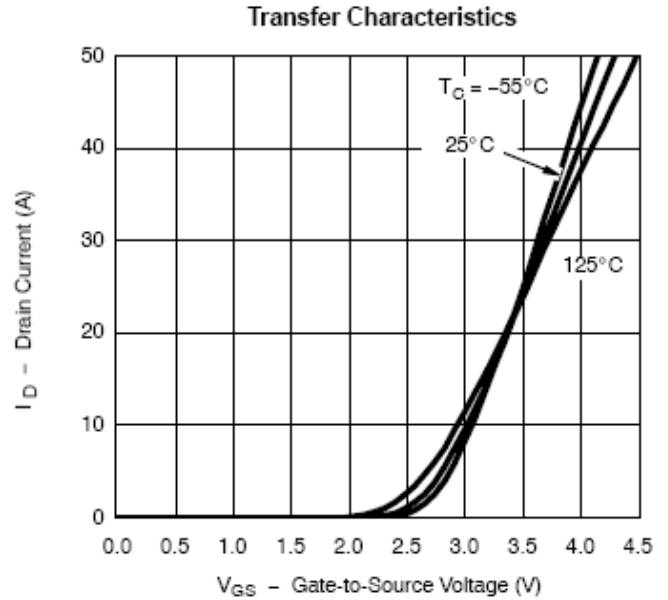
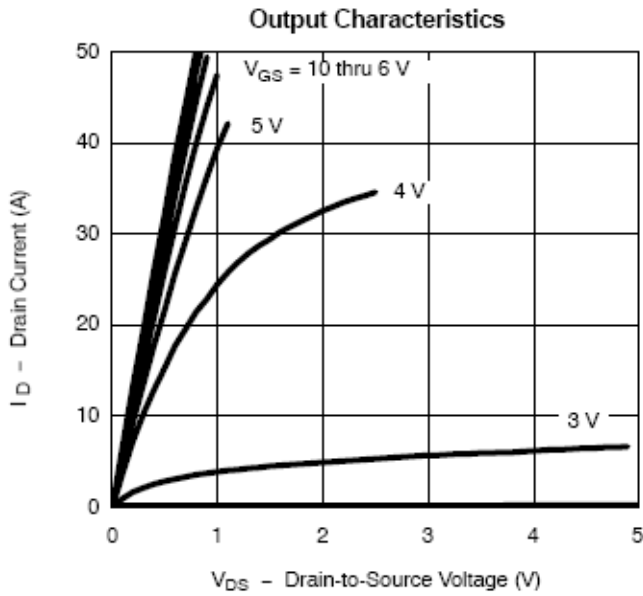
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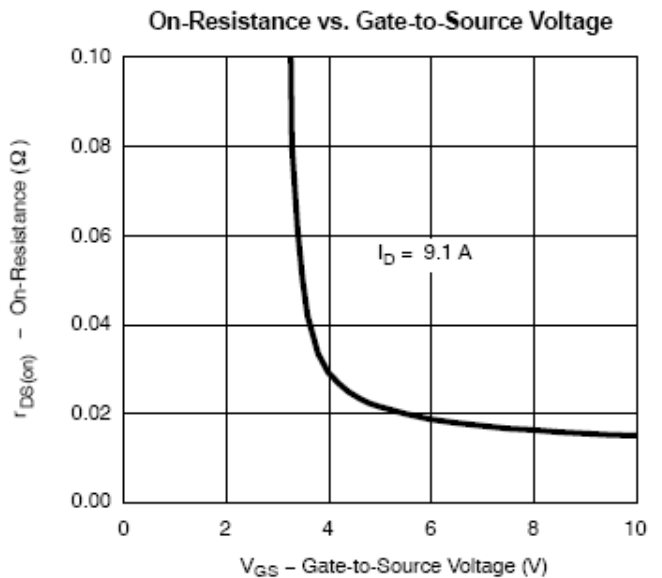
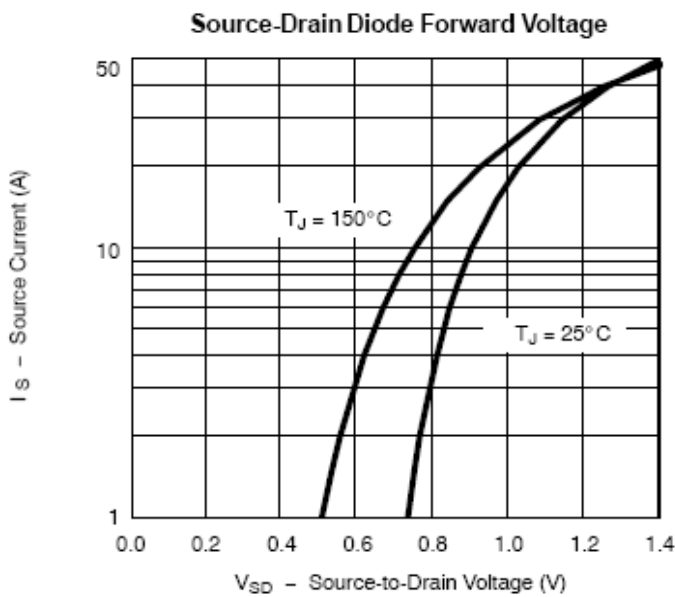
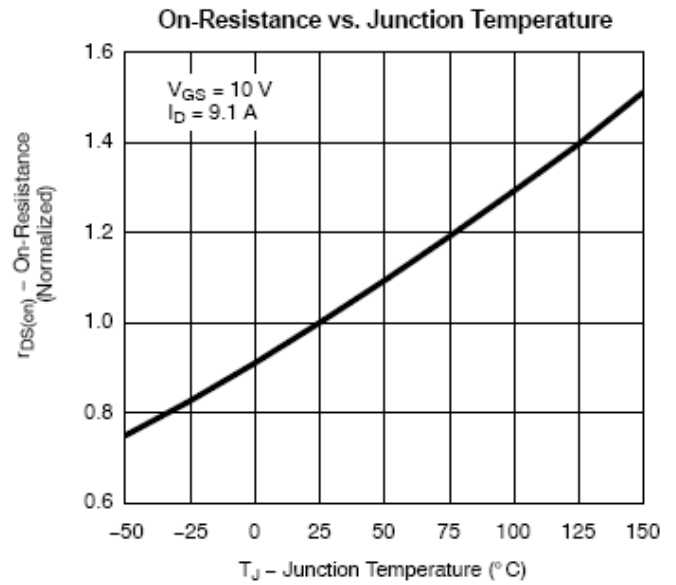
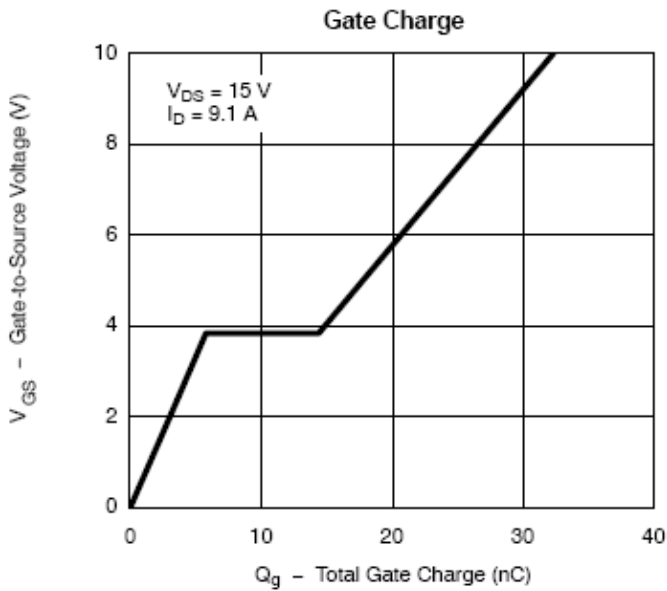
TYPICAL CHARACTERISTICS (PMOS)





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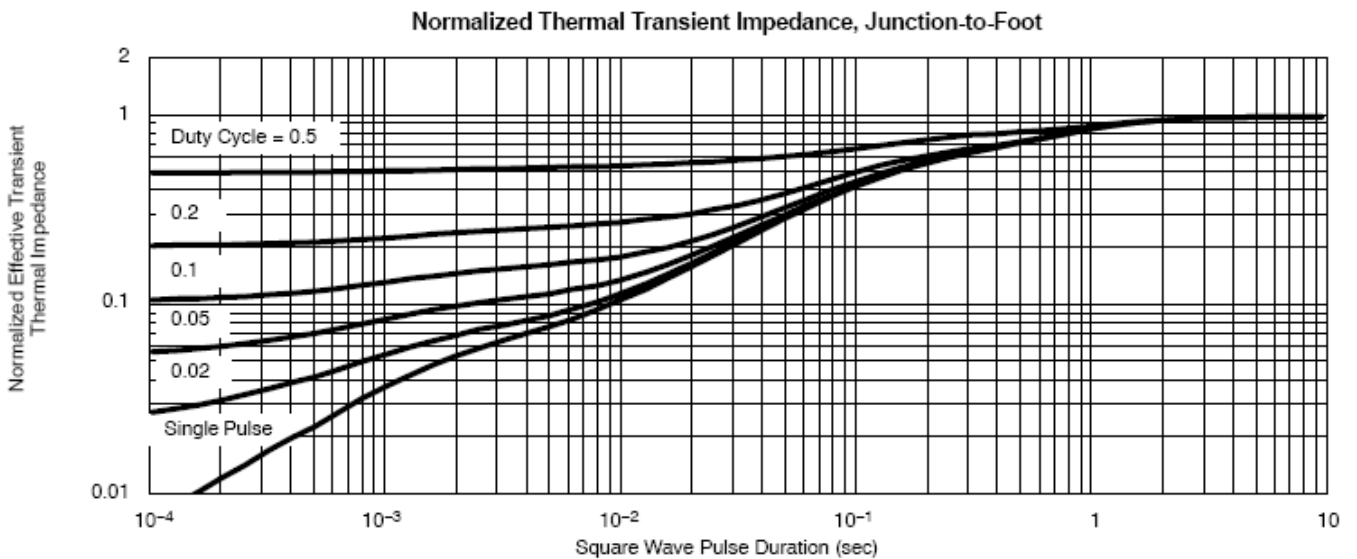
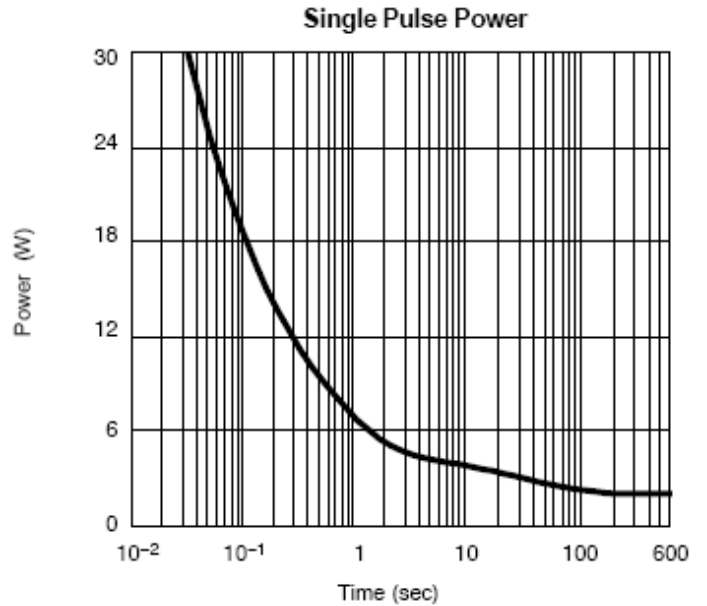
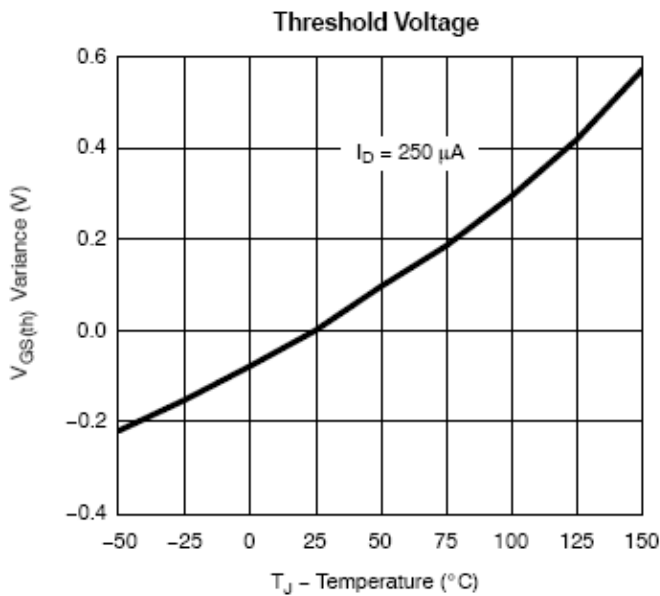
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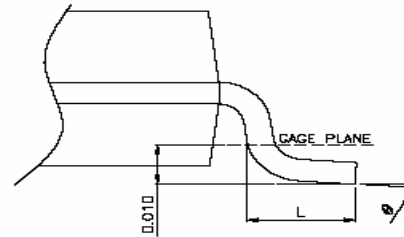
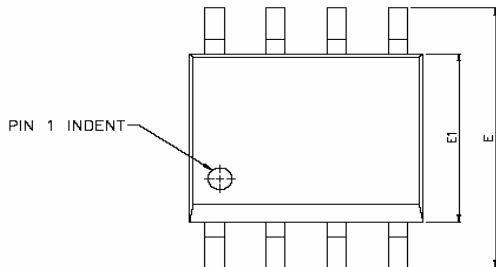
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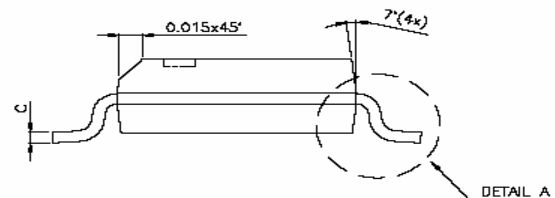
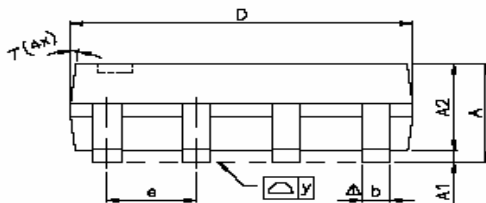


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SOP- 8 PACKAGE OUTLINE



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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