



SPC4539

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC4539 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.

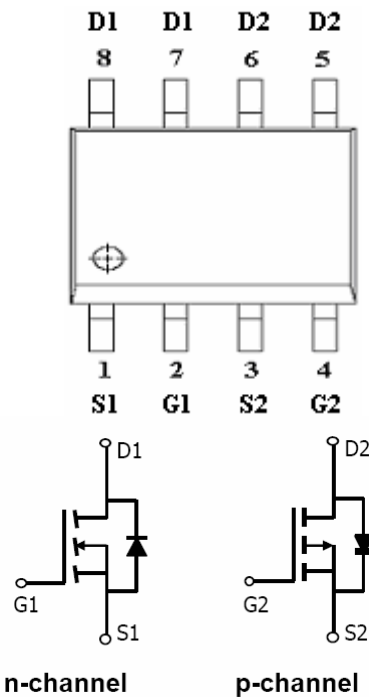
FEATURES

- ◆ N-Channel
30V/6.8A, $R_{DS(ON)} = 34m\Omega @ V_{GS} = 10V$
30V/5.6A, $R_{DS(ON)} = 46m\Omega @ V_{GS} = 4.5V$
- ◆ P-Channel
-30V/-5.7A, $R_{DS(ON)} = 60m\Omega @ V_{GS} = -10V$
-30V/-4.4A, $R_{DS(ON)} = 80m\Omega @ V_{GS} = -4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

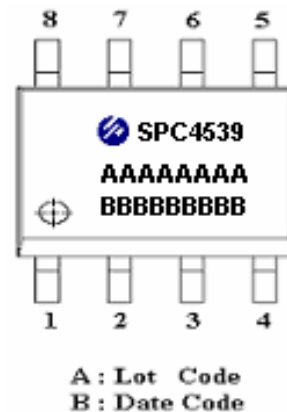
APPLICATIONS

- 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
SPC4539S8RG	SOP- 8P	SPC4539
SPC4539S8TG	SOP- 8P	SPC4539

※ SPC4539S8RG : 13" Tape Reel ; Pb – Free

※ SPC4539S8TG : Tube ; Pb – 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	$T_A=25^{\circ}\text{C}$	6.8	-6.2	A
		$T_A=70^{\circ}\text{C}$	5.6	-4.6	
Pulsed Drain Current	I_{DM}	30	-30	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

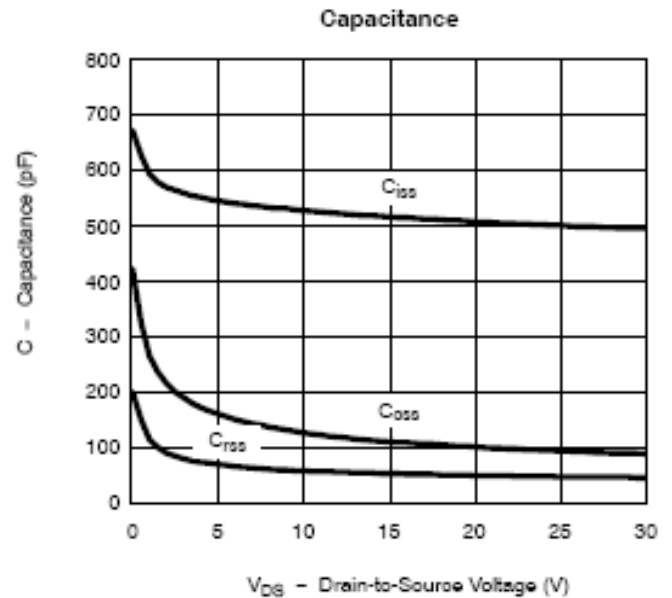
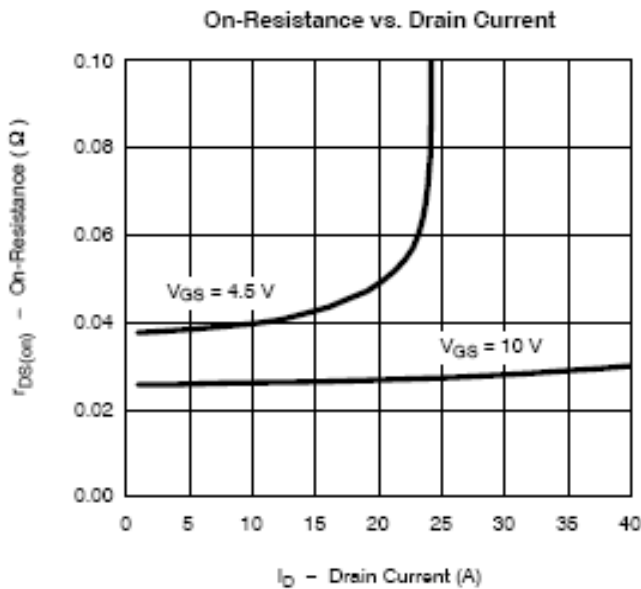
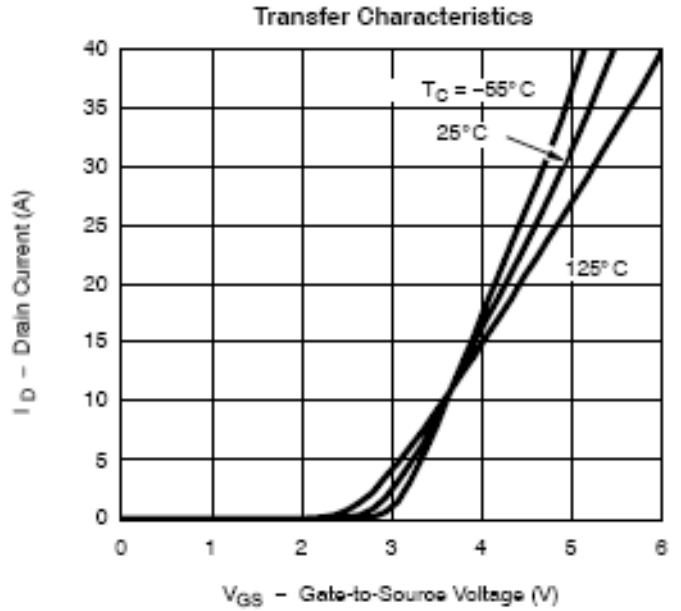
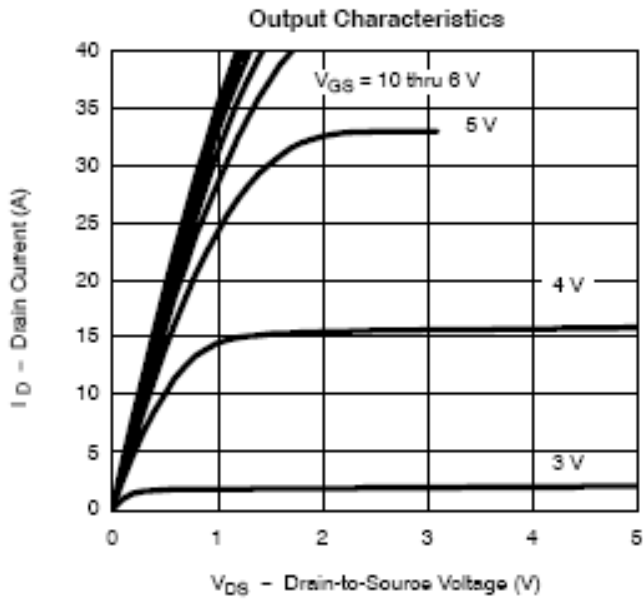
(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D = 250uA	N-Ch	30		V	
		V _{GS} =0V, I _D =-250uA	P-Ch	-30			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	N-Ch	1.0	3.0		
		V _{DS} =V _{GS} , I _D =-250uA	P-Ch	-1.0	-3.0		
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	N-Ch		±100	nA	
		V _{DS} =0V, V _{GS} =±20V	P-Ch		±100		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24V, V _{GS} =0V	N-Ch		1	uA	
		V _{DS} =-24V, V _{GS} =0V	P-Ch		-1		
		V _{DS} = 24V, V _{GS} =0V T _J =55°C	N-Ch		5		
		V _{DS} =-24V, V _{GS} =0V T _J =55°C	P-Ch		-5		
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 5V, V _{GS} = 10V	N-Ch	30		A	
		V _{DS} ≤ -5V, V _{GS} = -10V	P-Ch	-30			
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 6.8A	N-Ch		0.026	0.034	Ω
		V _{GS} =-10V, I _D =-5.7A	P-Ch		0.045	0.060	
		V _{GS} = 4.5V, I _D = 5.6A	N-Ch		0.036	0.046	
		V _{GS} =-4.5V, I _D =-4.4A	P-Ch		0.060	0.080	
Forward Transconductance	g _{fs}	V _{DS} = 15V, I _D =-5.9A	N-Ch		15	S	
		V _{DS} =-15V, I _D =-5.0A	P-Ch		9		
Diode Forward Voltage	V _{SD}	I _S = 1.7A, V _{GS} =0V	N-Ch		0.8	1.2	V
		I _S =-1.7A, V _{GS} =0V	P-Ch		-0.8	-1.2	
Dynamic							
Total Gate Charge	Q _g	N-Channel V _{DS} = 15V, V _{GS} = 10V , I _D = 5.9A	N-Ch		13	20	nC
Gate-Source Charge	Q _{gs}		P-Ch		15	25	
Gate-Drain Charge	Q _{gd}	P-Channel V _{DS} =-15V, V _{GS} =-10V , I _D = -5.0A	N-Ch		2.3		
			P-Ch		4		
Turn-On Time	t _{d(on)}	N-Channel V _{DD} =15V, R _L =15Ω I _D =1.0A, V _{GEN} =10V R _G =6Ω	N-Ch		6	12	nS
			P-Ch		7	15	
	N-Ch			14	25		
	P-Ch			10	20		
Turn-Off Time	t _{d(off)}	P-Channel V _{DD} =-15V, R _L =15Ω I _D =-1.0A, V _{GEN} =-10V R _G =6Ω	N-Ch		30	60	
			P-Ch		40	80	
	t _f		N-Ch		5	10	
			P-Ch		20	40	



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TYPICAL CHARACTERISTICS (NMOS)

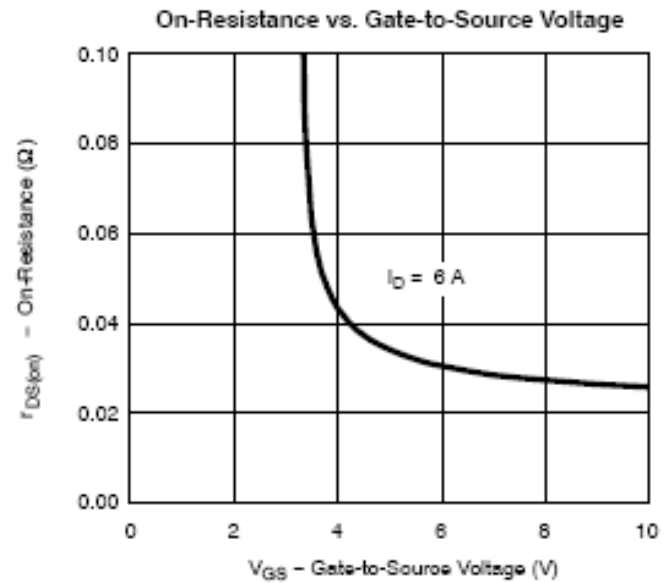
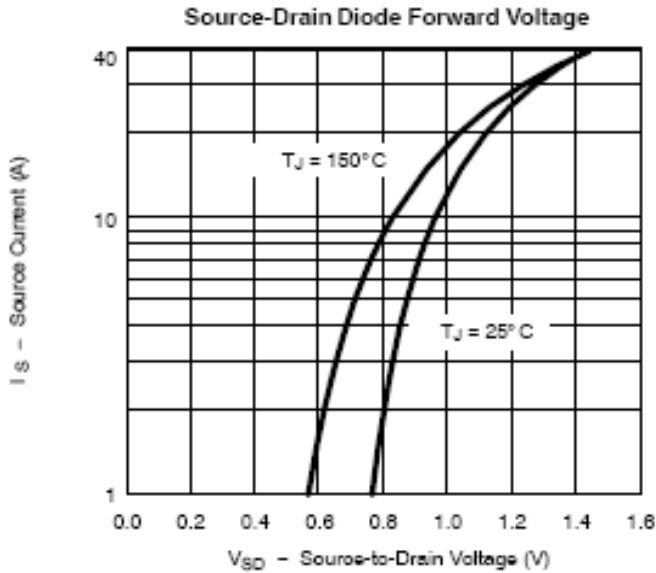
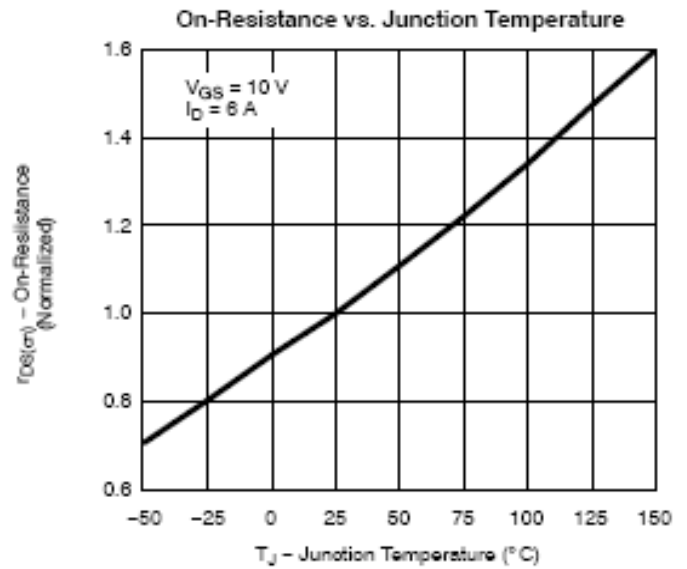
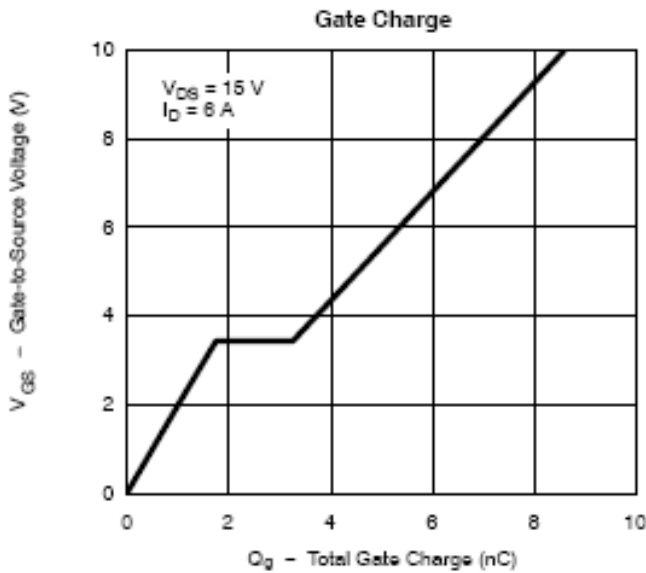




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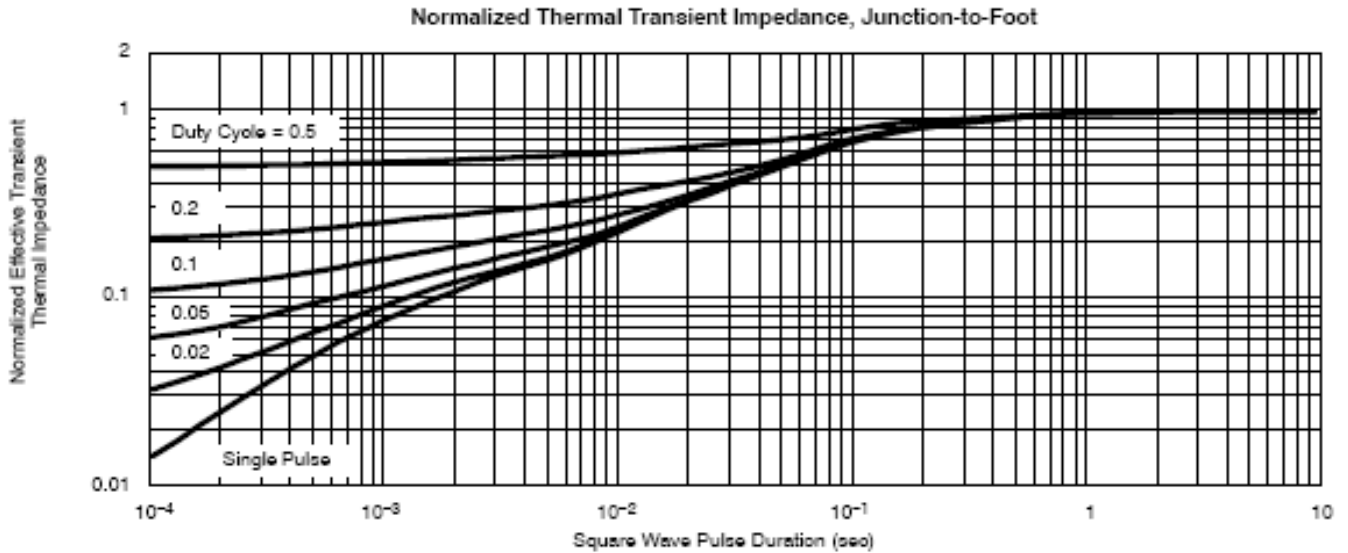
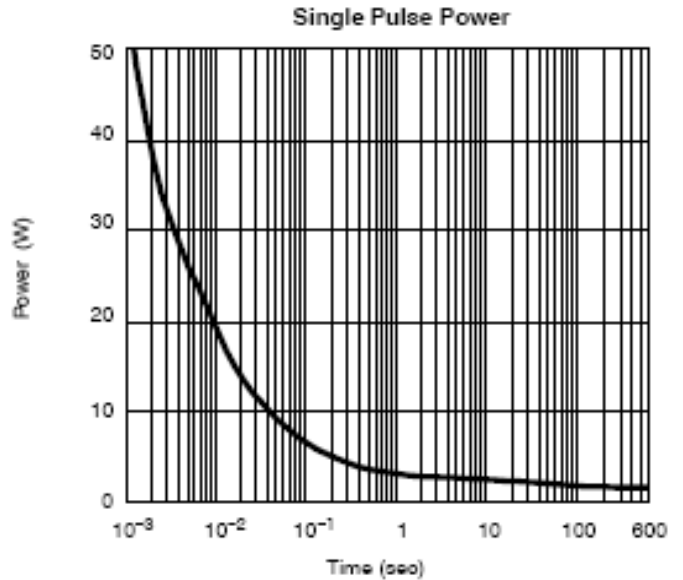
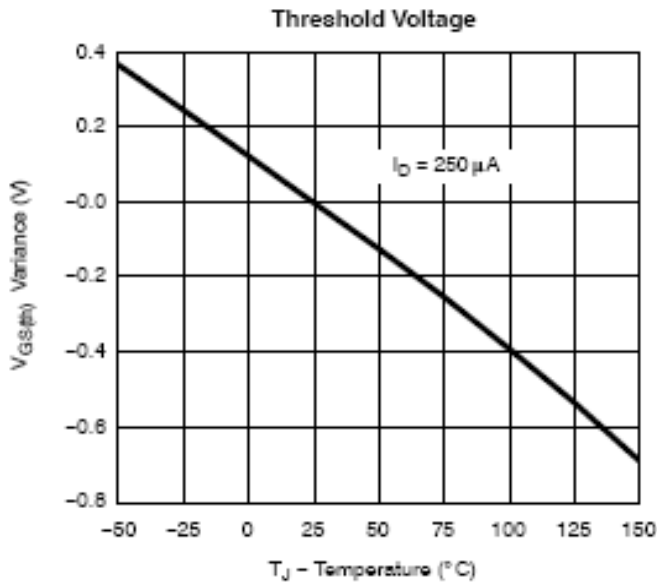
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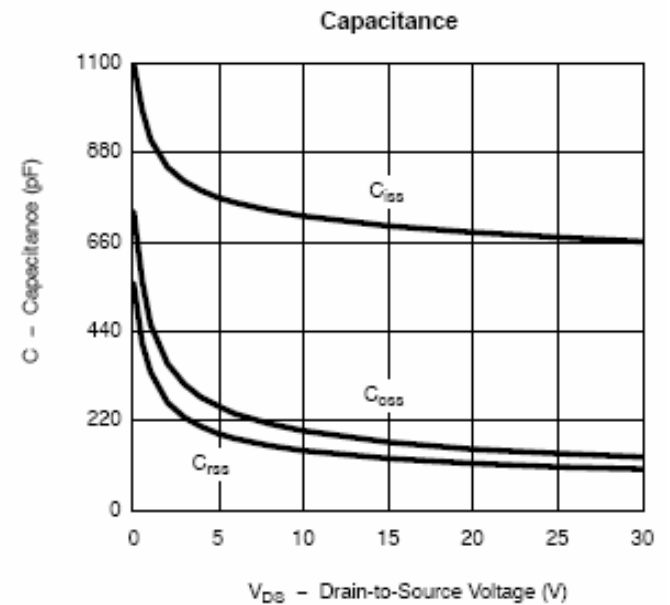
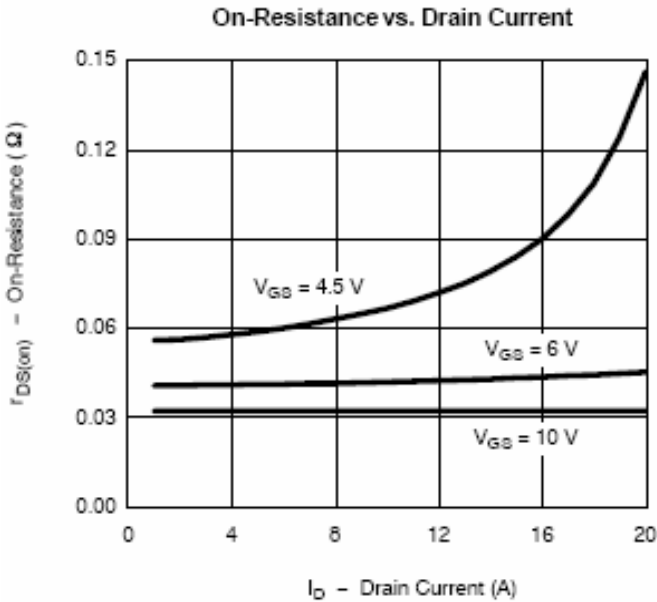
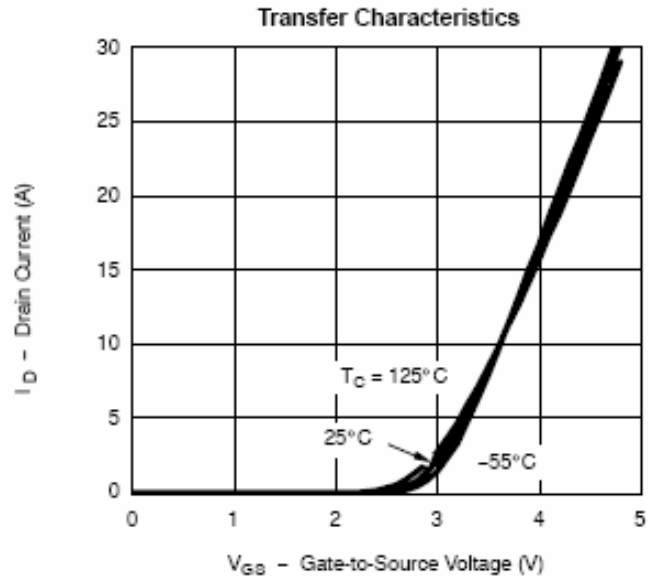
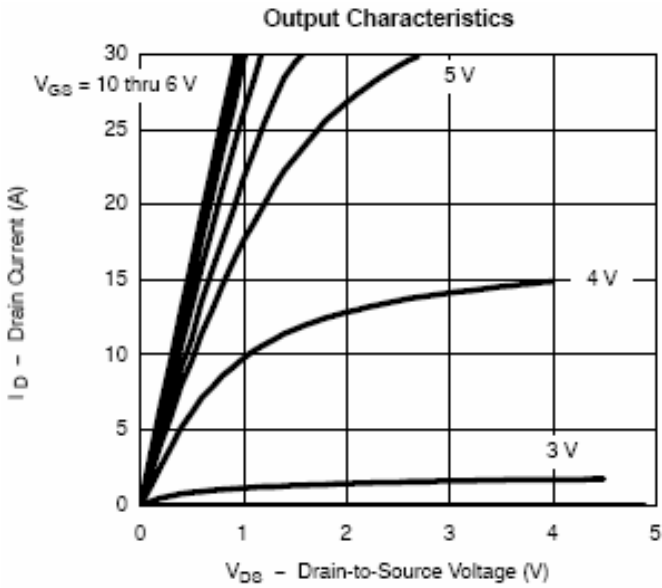
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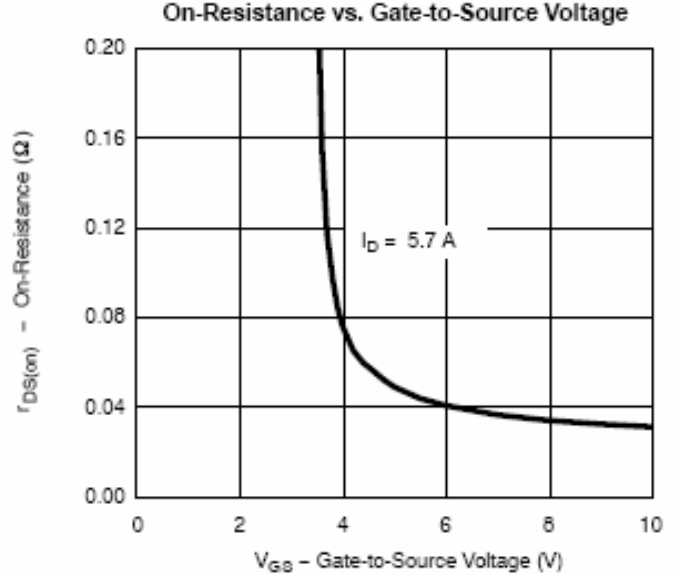
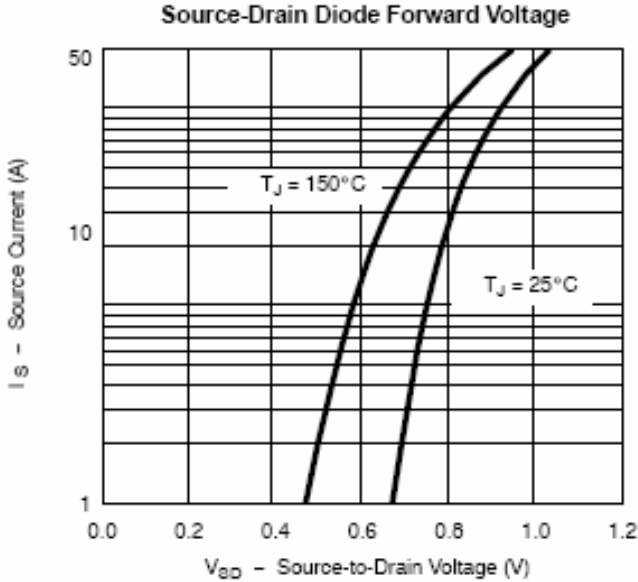
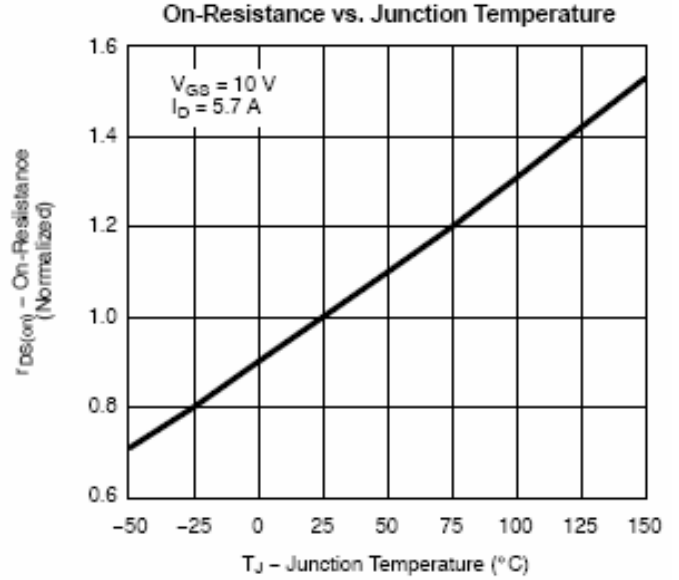
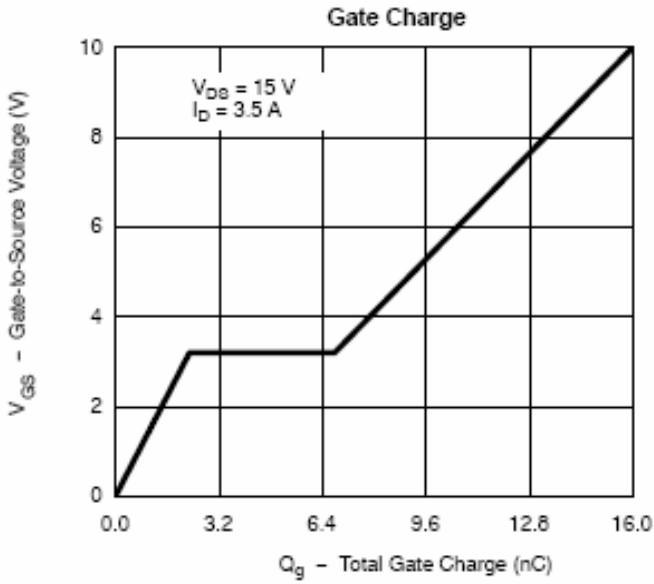
TYPICAL CHARACTERISTICS (PMOS)





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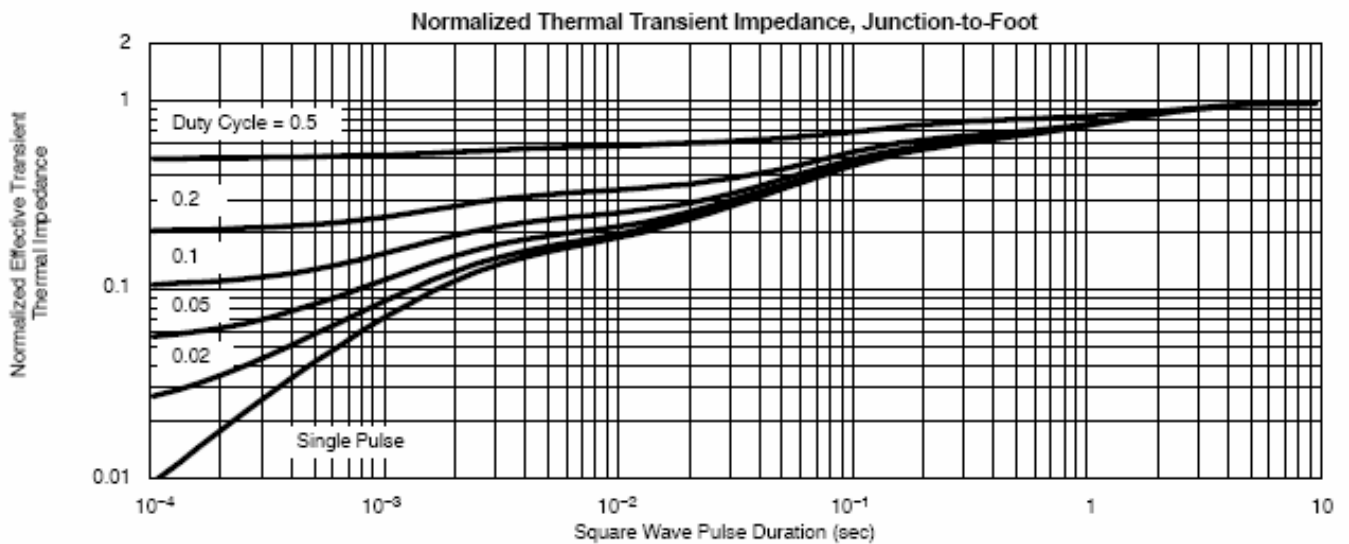
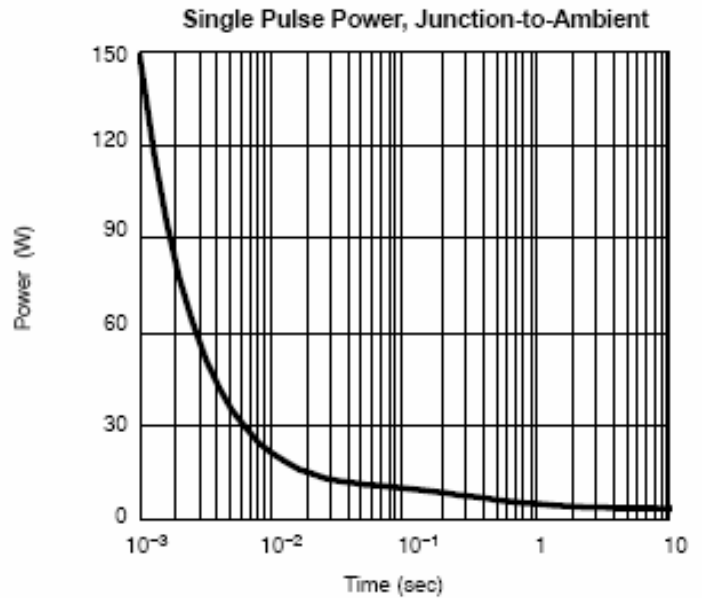
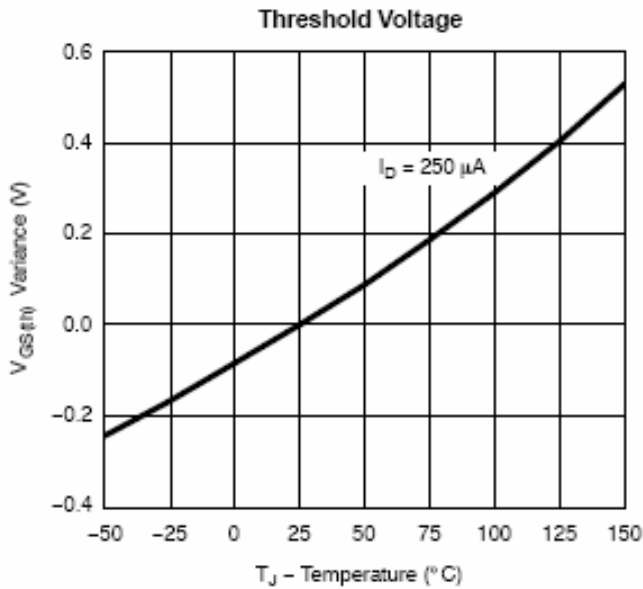
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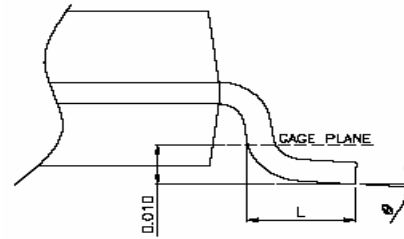
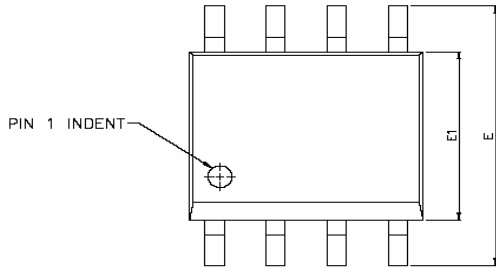




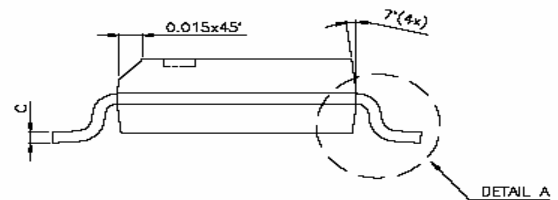
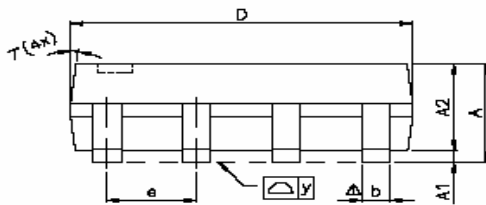
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SOP- 8 PACKAGE OUTLINE



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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