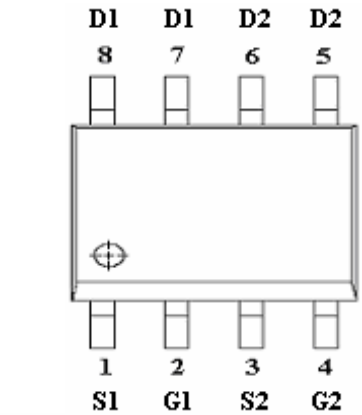
SPC4539
N & P Pair Enhancement Mode MOSFET

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

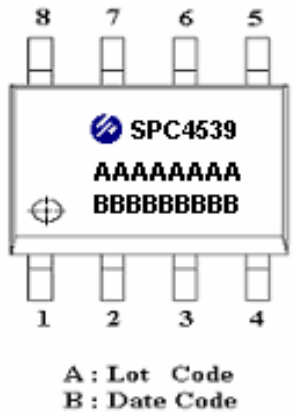
APPLICATIONS
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION(SOP – 8P)



n-channel p-channel

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

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ 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℃)	T_A=25℃	I_D	6.8	-6.2	A
	T_A=70℃		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	T_A=25℃	P_D	2.5	2.8	W
	T_A=70℃		1.6	1.8	
Operating Junction Temperature		T_J	-55/150		℃
Storage Temperature Range		T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	T ≤ 10sec	$R_{\theta JA}$	50	52	℃/W
	Steady State		80	80	

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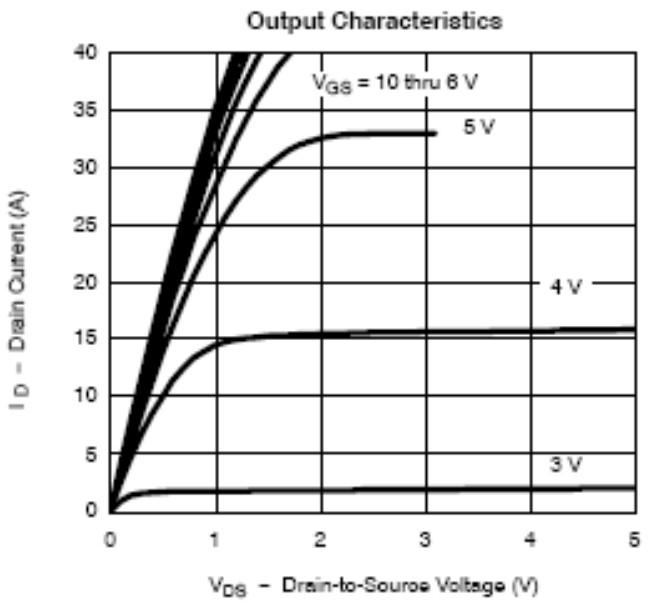
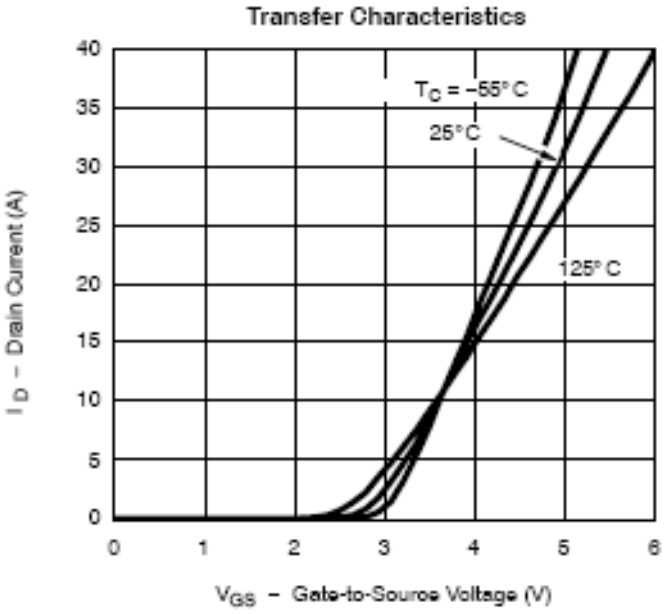
ELECTRICAL CHARACTERISTICS

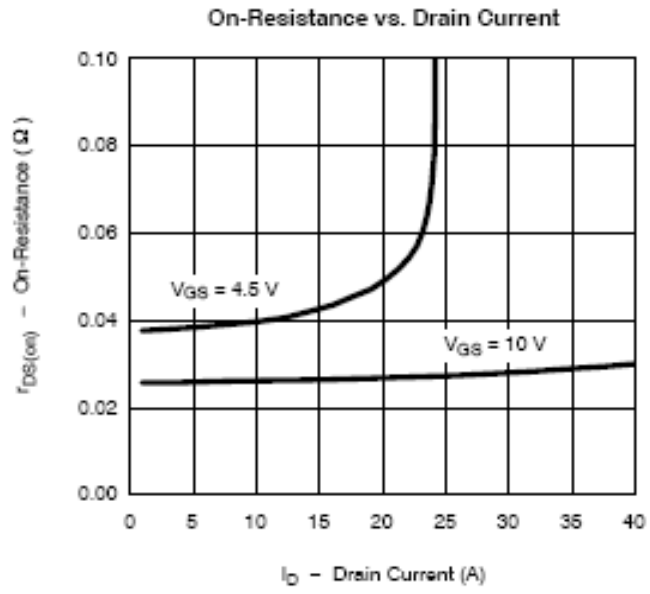
(T_A=25℃ Unless otherwise noted)

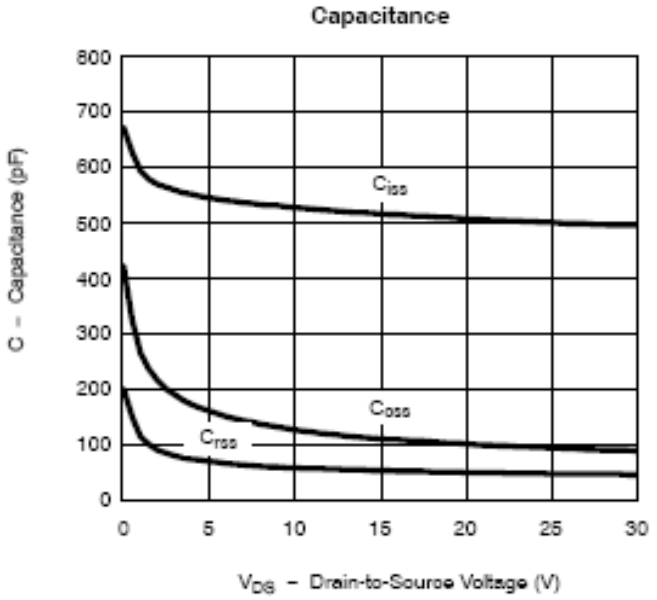
Parameter	Symbol	Conditions		Min.	Typ	Max.	Unit
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= 250uA	N-Ch	30			V
		V_{GS}=0V,I_D=-250uA	P-Ch	-30			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	N-Ch	1.0		3.0	
		V_{DS}=V_{GS},I_D=-250uA	P-Ch	-1.0		-3.0	
Gate Leakage 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℃	N-Ch			5	
		V_{DS}=-24V,V_{GS}=0V T_J=55℃	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	gfs	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 P-Channel V_{DS}=-15V,V_{GS}=-10V , I_D= -5.0A	N-Ch		13	20	nC
			P-Ch		15	25	
Gate-Source Charge	Q_{gs}		N-Ch		2.3		
			P-Ch		4		
Gate-Drain Charge	Q_{gd}		N-Ch		2		
			P-Ch		2		
Turn-On Time	$t_{d(on)}$	N-Channel V_{DD}=15V,R_L=15Ω I_D≡1.0A,V_{GEN}=10V R_G=6Ω P-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	
	t_r		N-Ch		14	25	
			P-Ch		10	20	
Turn-Off Time	$t_{d(off)}$		N-Ch		30	60	
			P-Ch		40	80	
	t_f		N-Ch		5	10	
			P-Ch		20	40	

TYPICAL CHARACTERISTICS (NMOS)



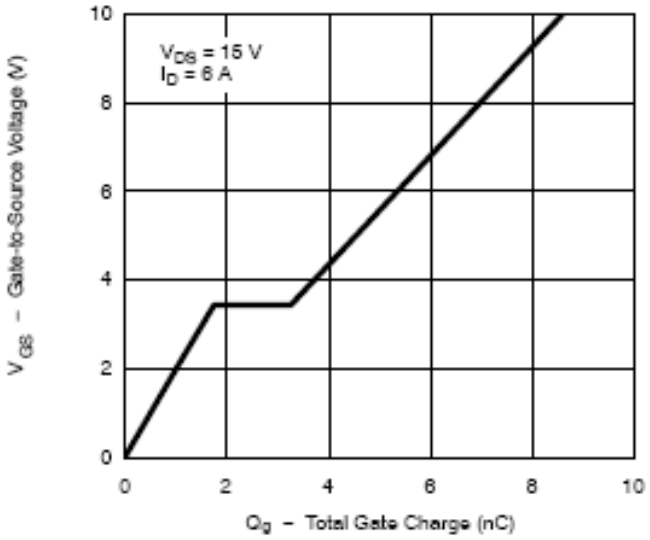




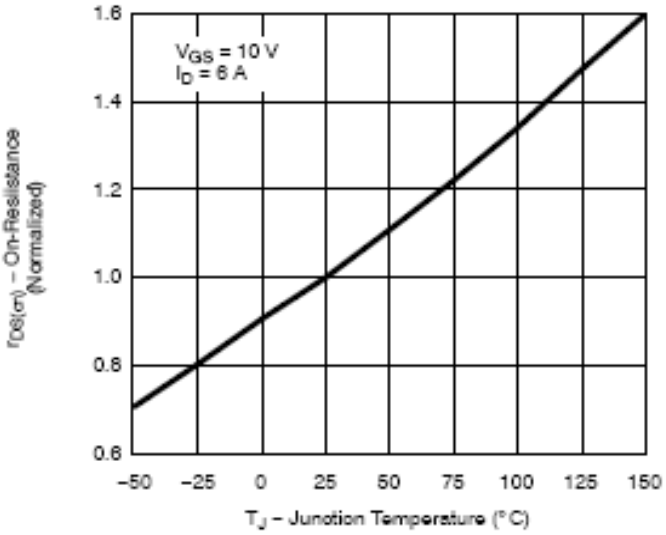


TYPICAL CHARACTERISTICS (NMOS)

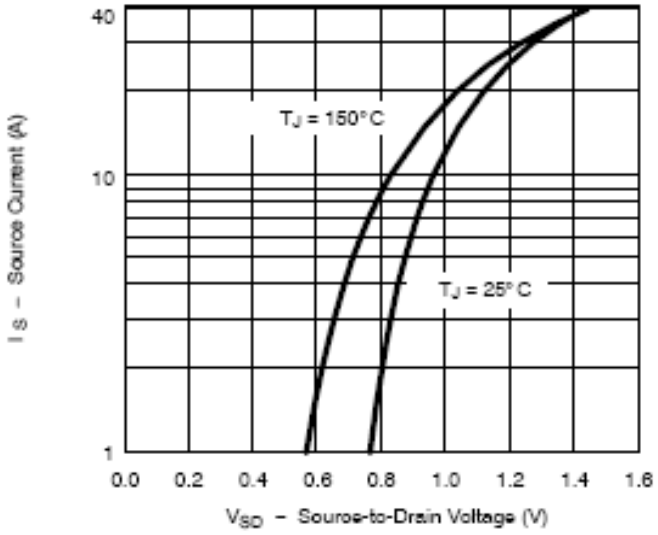
Gate Charge



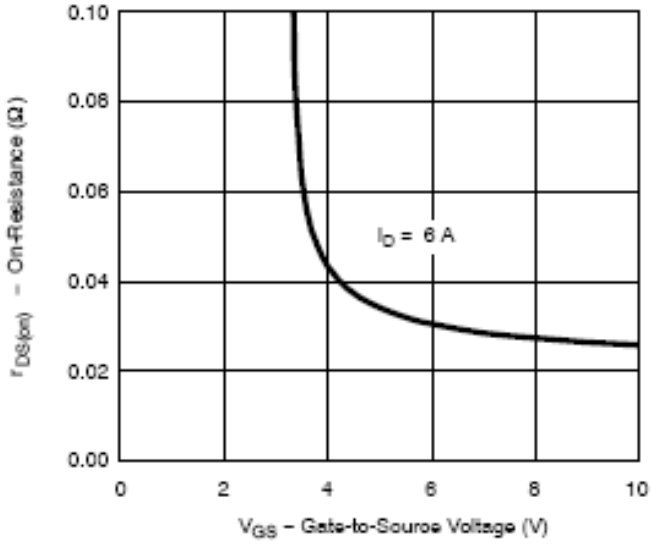
On-Resistance vs. Junction Temperature



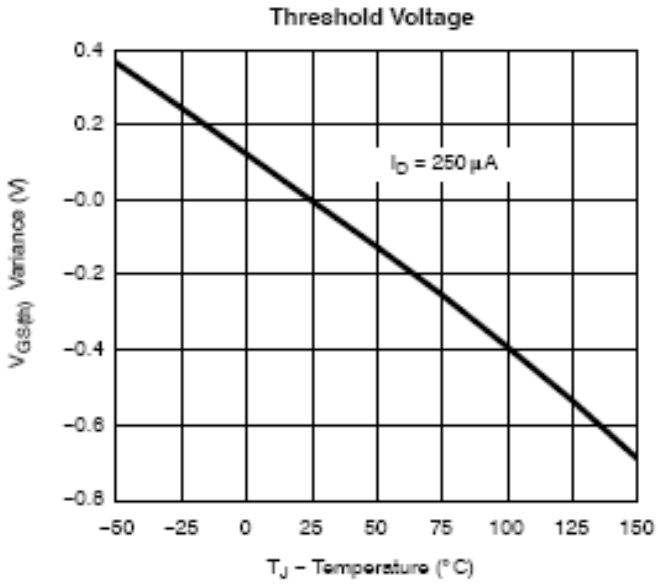
Source-Drain Diode Forward Voltage

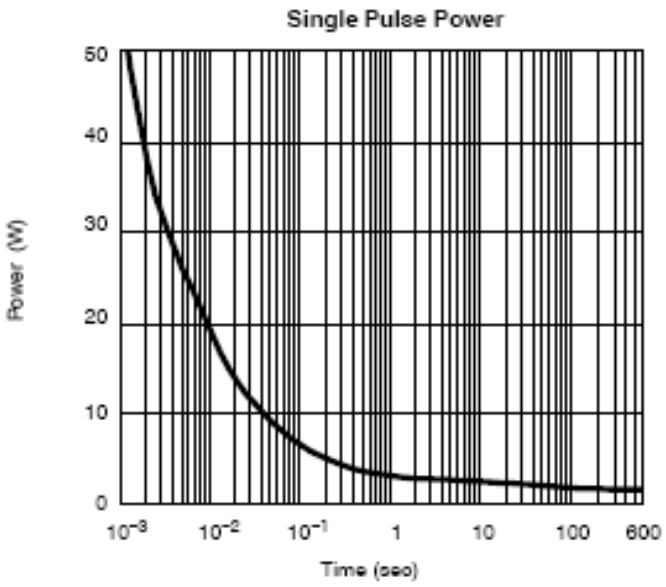


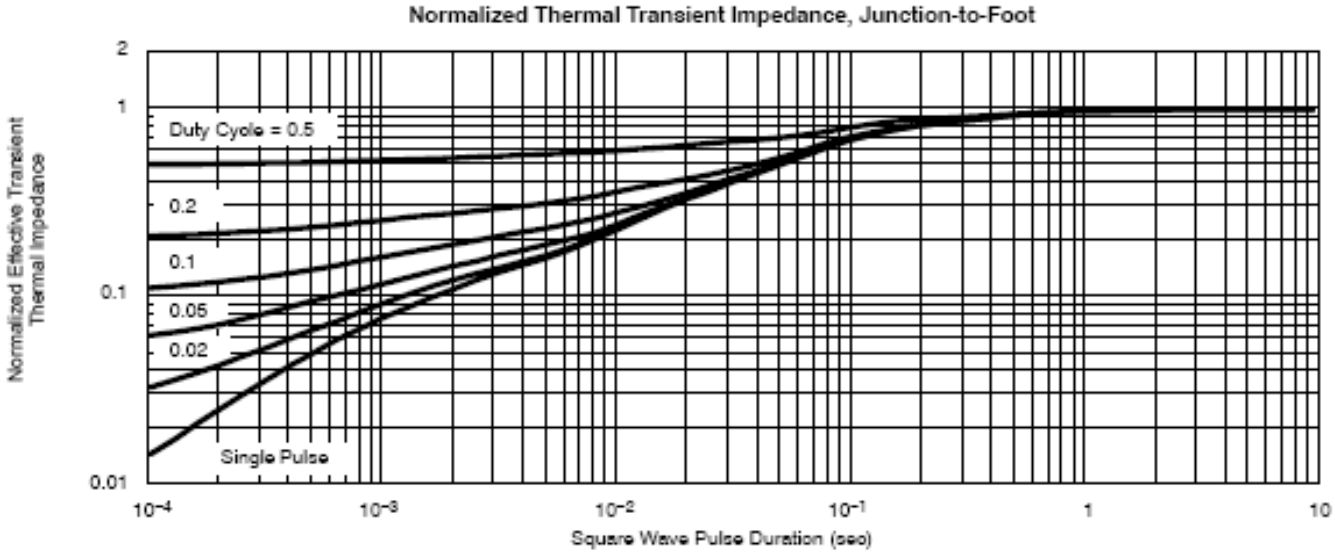
On-Resistance vs. Gate-to-Source Voltage



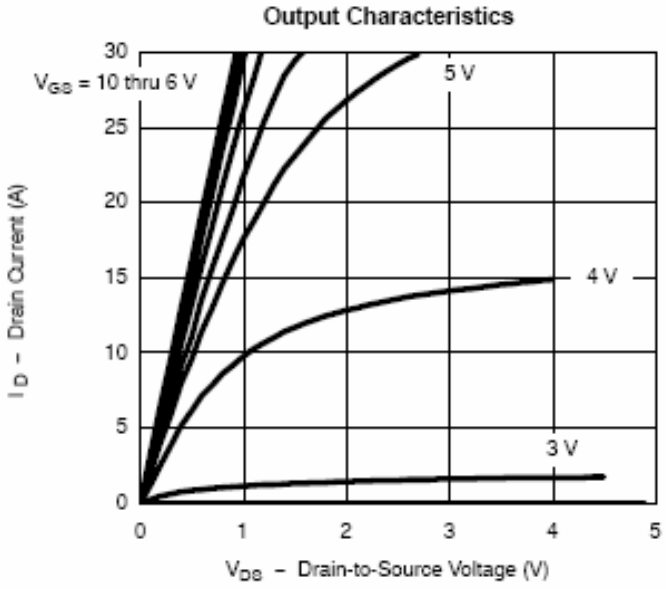
TYPICAL CHARACTERISTICS (NMOS)

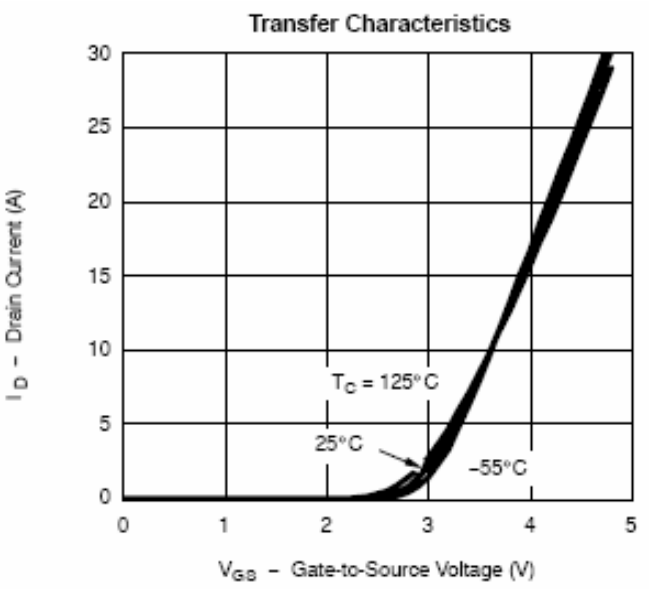


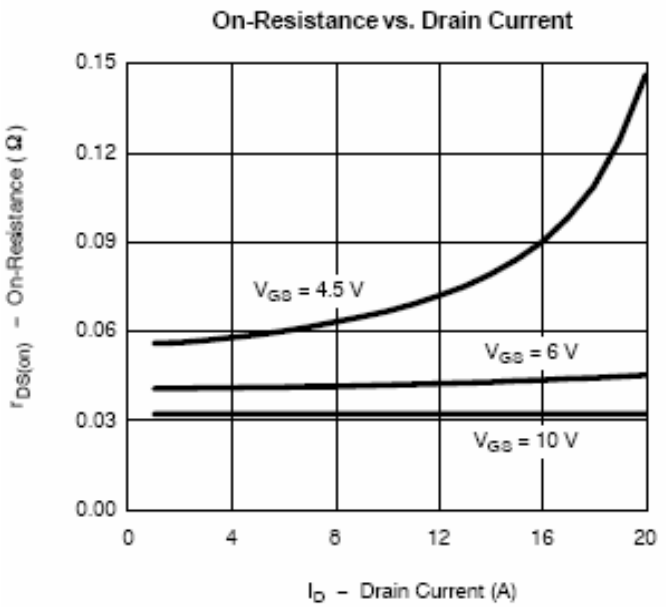


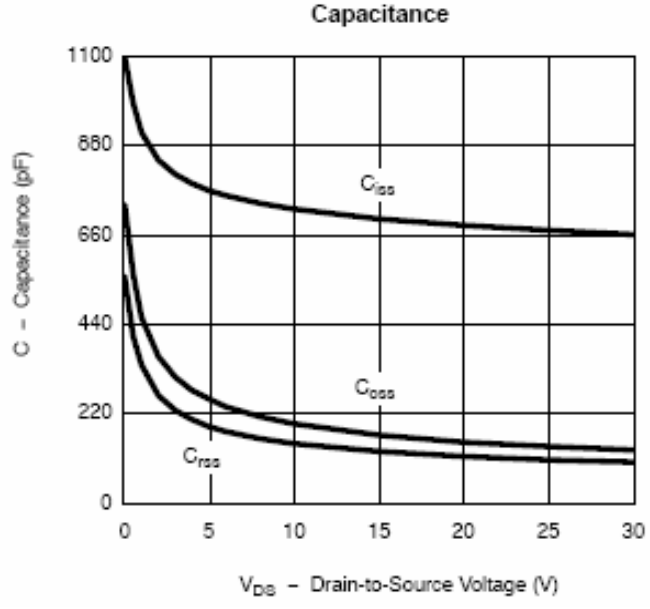


TYPICAL CHARACTERISTICS (PMOS)









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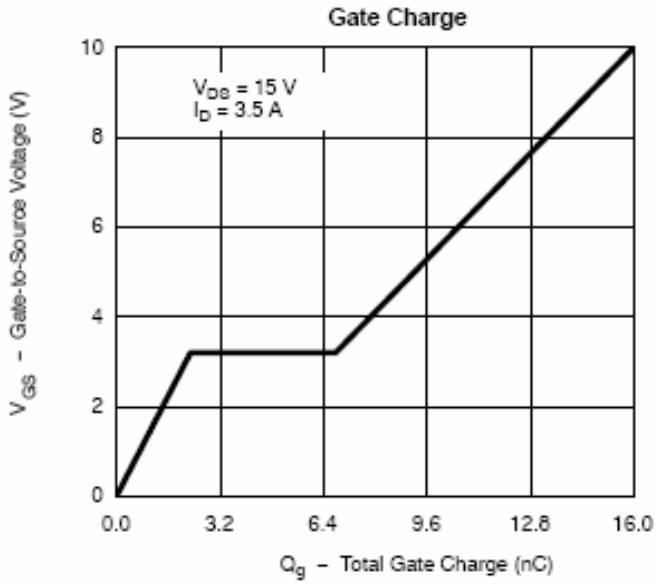

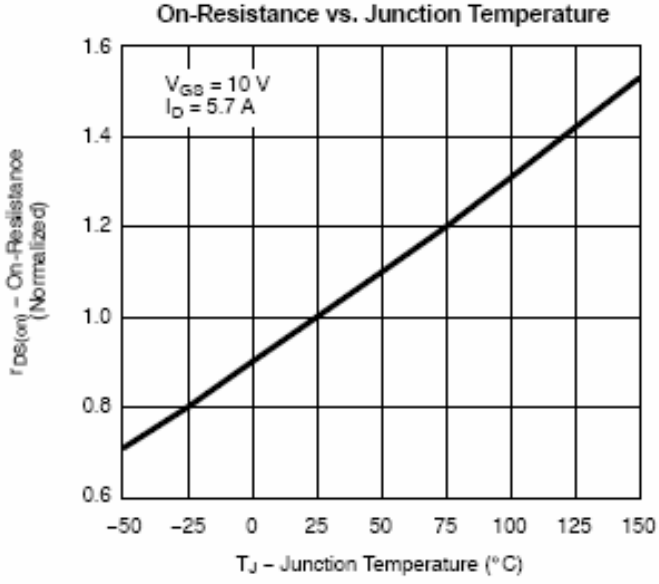

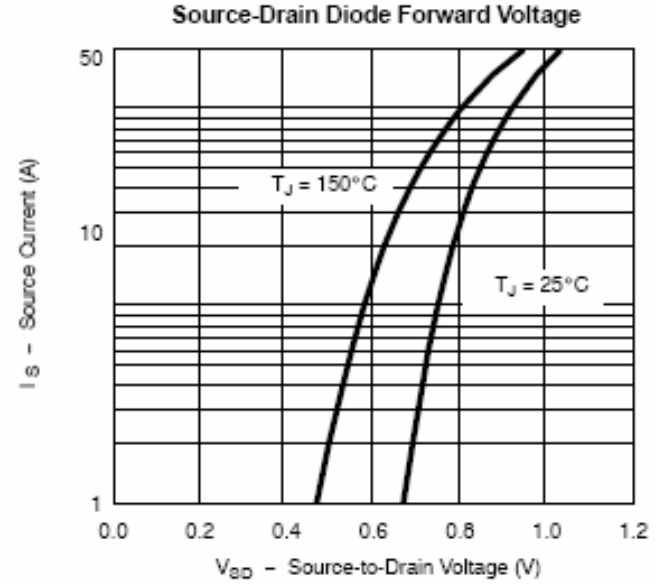

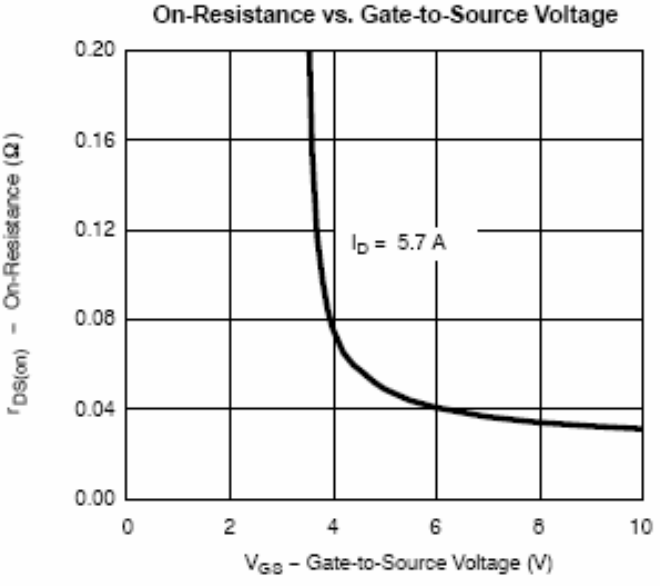

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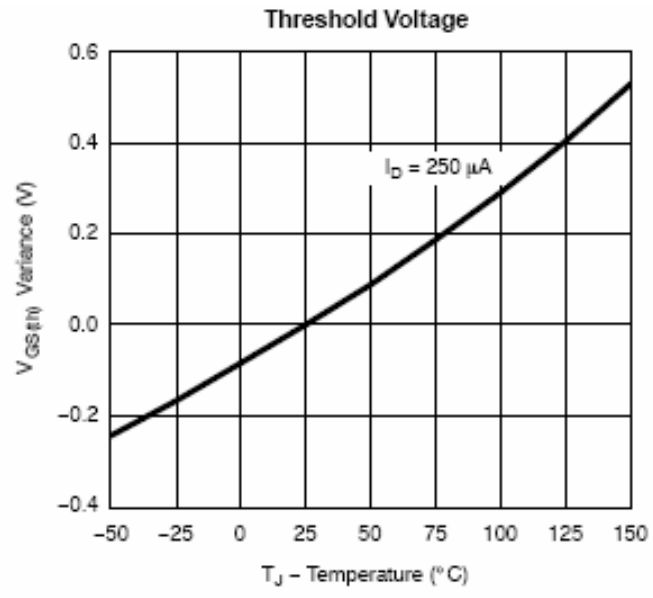
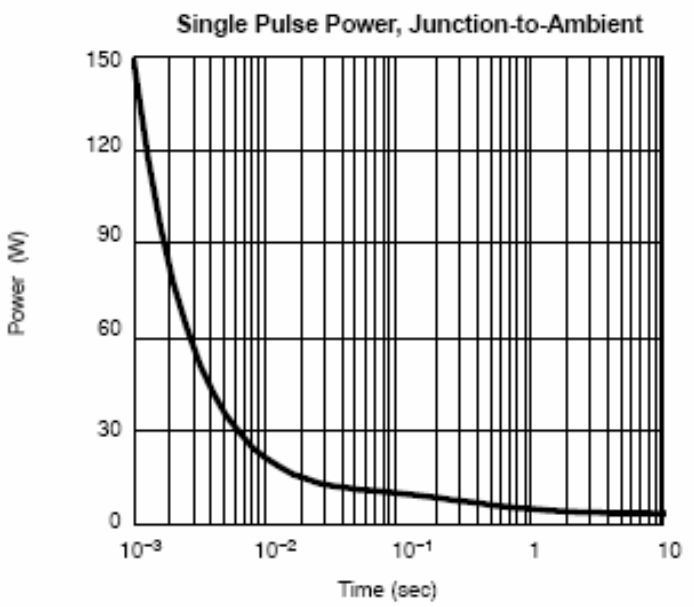
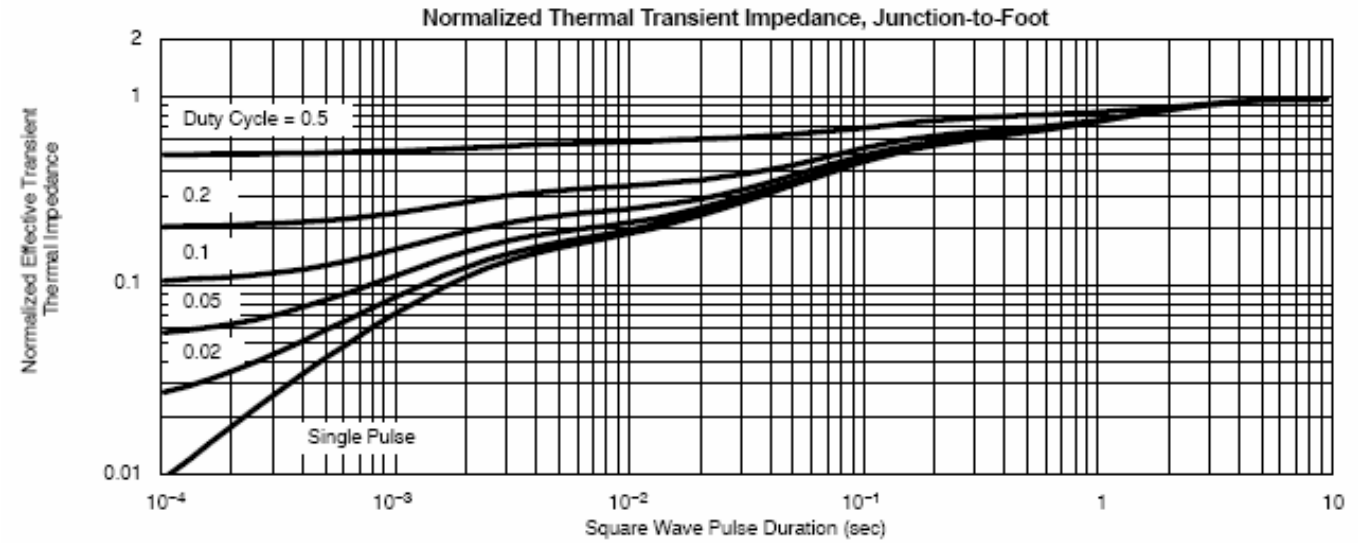
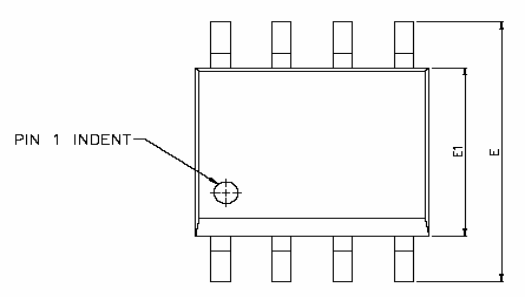
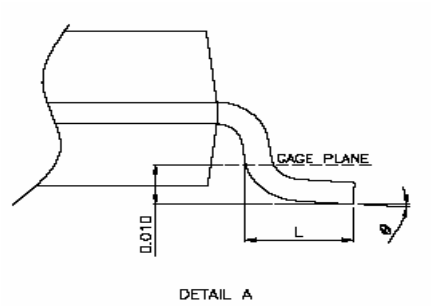


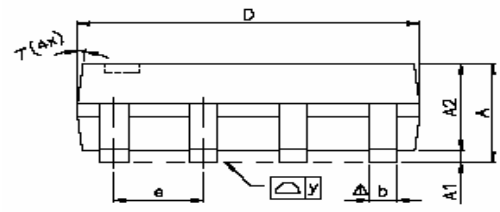


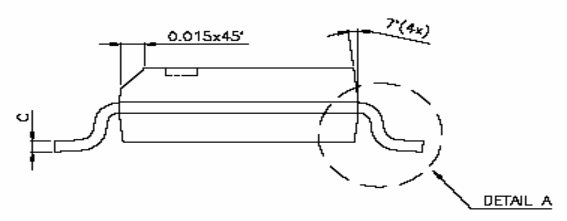


SOP- 8 PACKAGE OUTLINE









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

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