



SPC4588

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC4588 is the N- Channel and P-Channel enhancement mode power field effect transistor that is 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, motor driver and LCD inverter where low in-line power loss, and resistance to transients are needed.

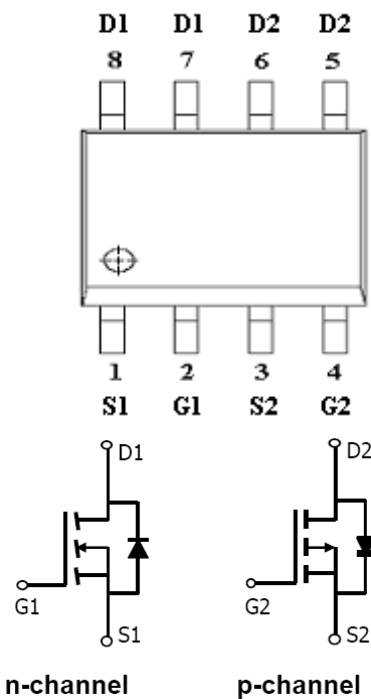
FEATURES

- ◆ N-Channel
 - 60V/8A, $R_{DS(ON)}=38m\Omega@V_{GS}=10V$
 - 60V/6A, $R_{DS(ON)}=44m\Omega@V_{GS}=4.5V$
- ◆ P-Channel
 - 60V/-8A, $R_{DS(ON)}=100m\Omega@V_{GS}=-10V$
 - 60V/-6A, $R_{DS(ON)}=135m\Omega@V_{GS}=-4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP-8 package design

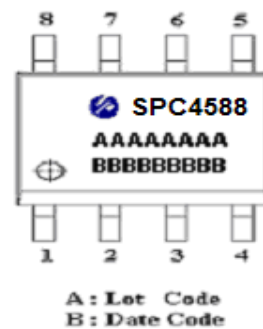
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- DC Fan
- Load Switch
- LCD Display inverter

PIN CONFIGURATION(SOP-8)



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
SPC4588S8RGB	SOP-8	SPC4588

※ SPC4588S8RGB 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V _{DSS}	60	-60	V	
Gate –Source Voltage	V _{GSS}	±20	±20	V	
Continuous Drain Current(T _J =150°C)	I _D	T _A =25°C	-8.0	A	
		T _A =70°C	-6.0		
Pulsed Drain Current	I _{DM}	12	-12	A	
Continuous Source Current(Diode Conduction)	I _S	2.3	-2.3	A	
Power Dissipation	P _D	T _A =25°C	2	W	
		T _A =70°C	1.6		
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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8		2.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$			25	uA
		$V_{DS}=60V, V_{GS}=0V$ $T_J=80^\circ C$			250	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$		0.034	0.038	Ω
		$V_{GS}=4.5V, I_D=6A$		0.038	0.044	Ω
Diode Forward Voltage	V_{SD}	$I_S=2.5A, V_{GS}=0V$			1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V$ $I_D=5.3A$		10	15	nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			3.6		
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V$ $f=1MHz$		890		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			48		
Turn-On Time	$t_{d(on)}$	$V_{DD}=30V, R_D=6.8\Omega$ $I_D=4.4A, V_G=10V$ $R_G=1\Omega$		10	15	nS
	t_r			12	20	
Turn-Off Time	$t_{d(off)}$			25	35	
	t_f			10	15	



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ELECTRICAL CHARACTERISTICS (PMOS)

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.8		-2.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-10V, V_{GS}=0V$			-1	uA
		$V_{DS}=-60V, V_{GS}=0V$ $T_J=85^\circ C$			-25	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-8A$			0.100	Ω
		$V_{GS}=-4.5V, I_D=-6A$			0.135	
Diode Forward Voltage	V_{SD}	$I_S=-2.5A, V_{GS}=0V$			-1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-30V, V_{GS}=10V$ $I_D=-5.3A$		16	25	nC
Gate-Source Charge	Q_{gs}			4.4		
Gate-Drain Charge	Q_{gd}			8.7		
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V$ $f=1MHz$		1590	2550	pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			70		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-30V, R_D=6.8\Omega$ $I_D=-4.4A, V_G=-10V$ $R_G=1\Omega$		9		nS
	t_r			14		
Turn-Off Time	$t_{d(off)}$			45		
	t_f			40		

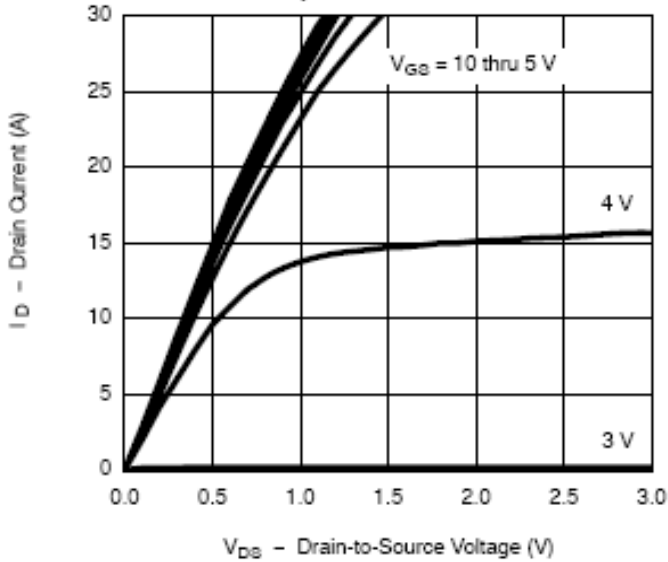


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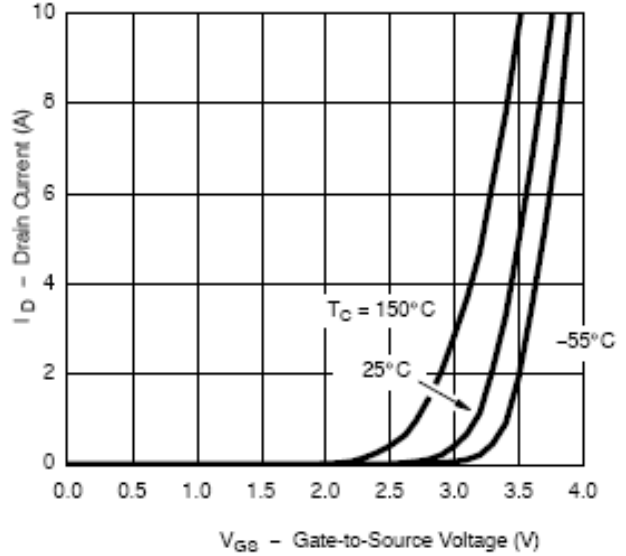
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TYPICAL CHARACTERISTICS (NMOS)

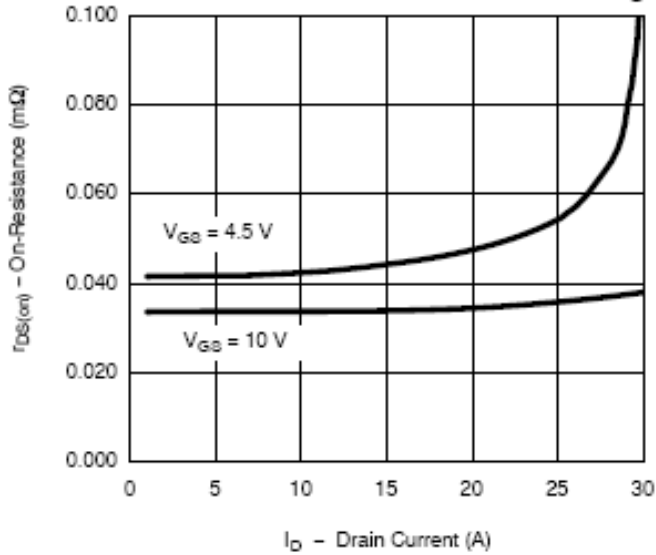
Output Characteristics



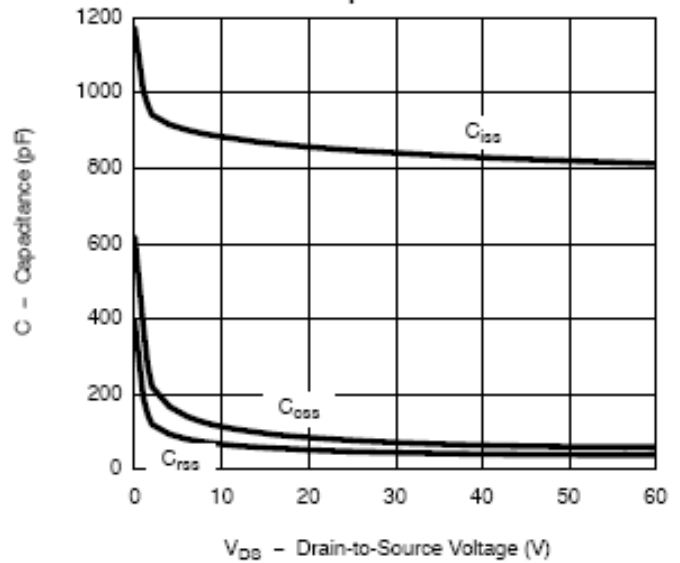
Transfer Characteristics



On-Resistance vs. Drain Current and Gate Voltage



Capacitance

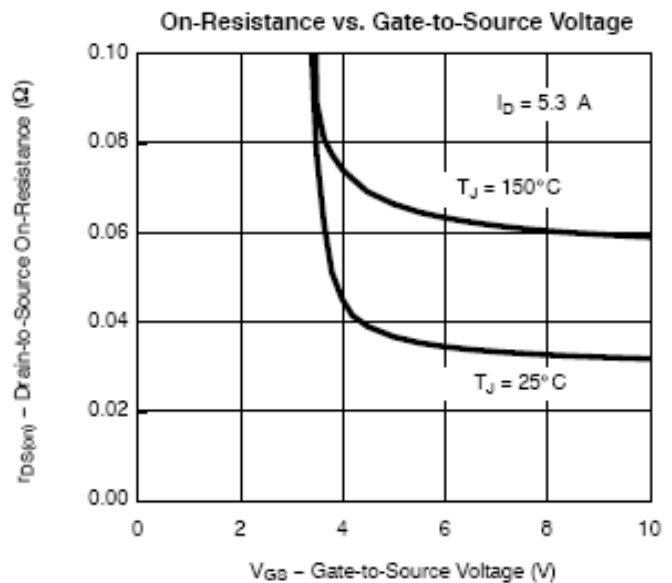
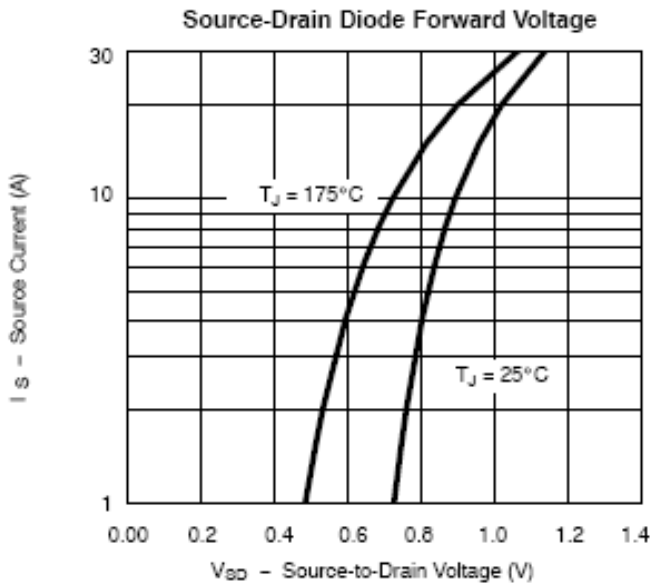
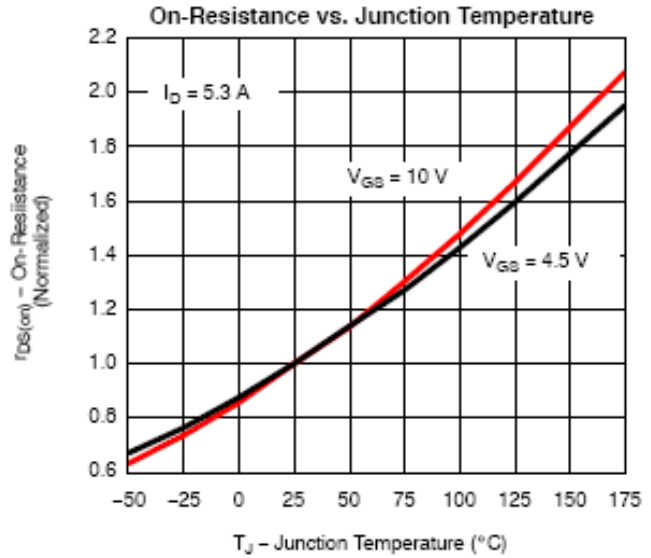
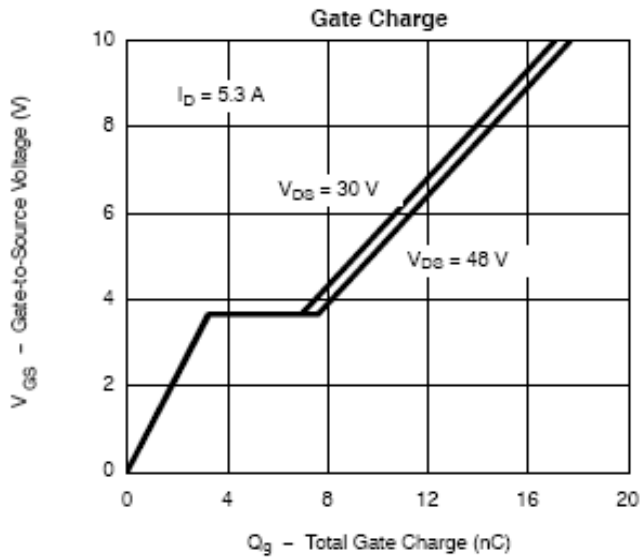




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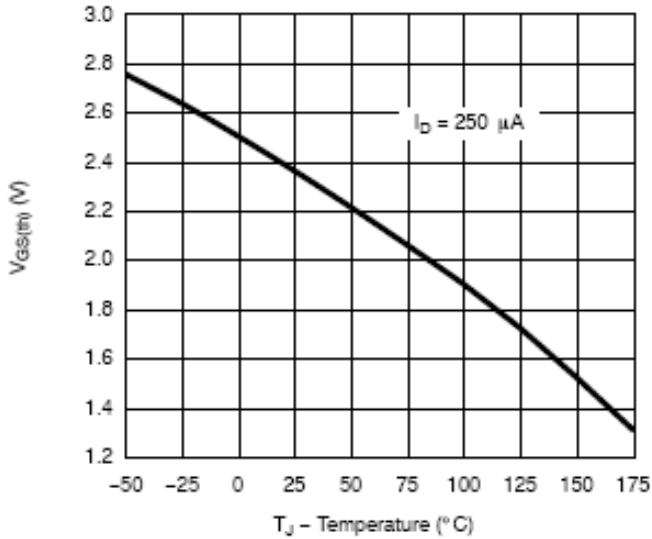




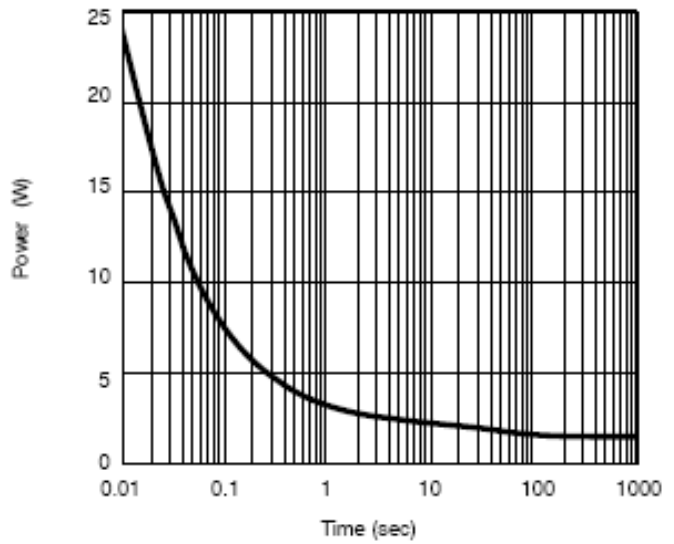
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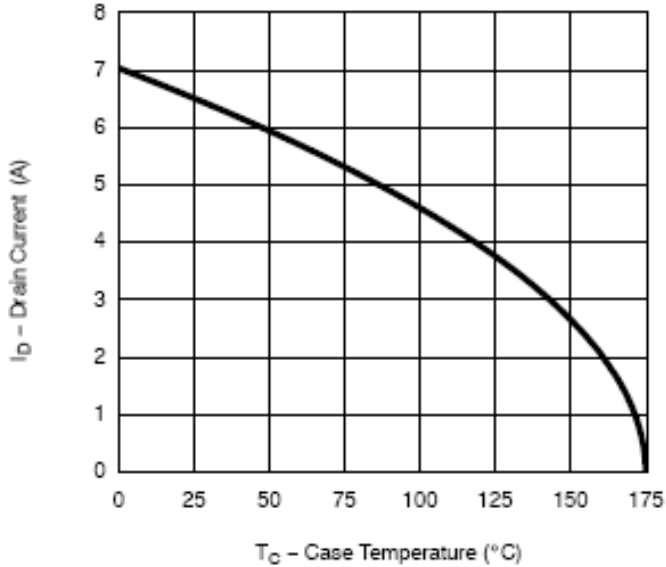
Threshold Voltage



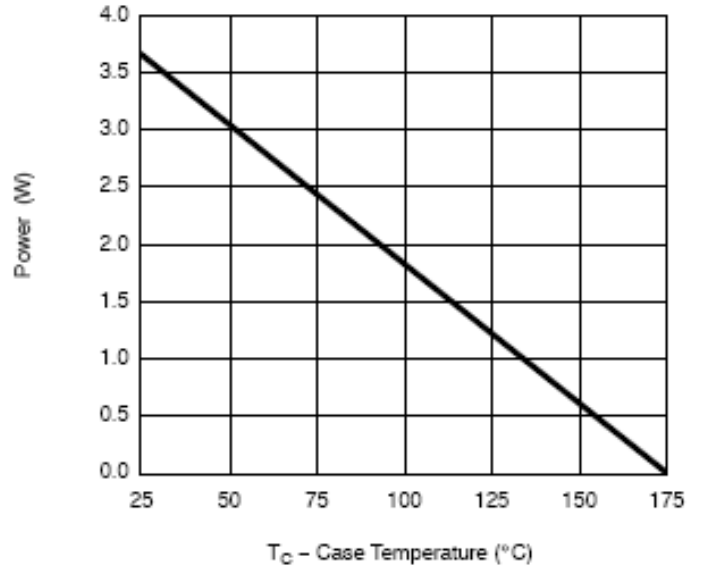
Single Pulse Power, Junction-to-Ambient



Current De-Rating*



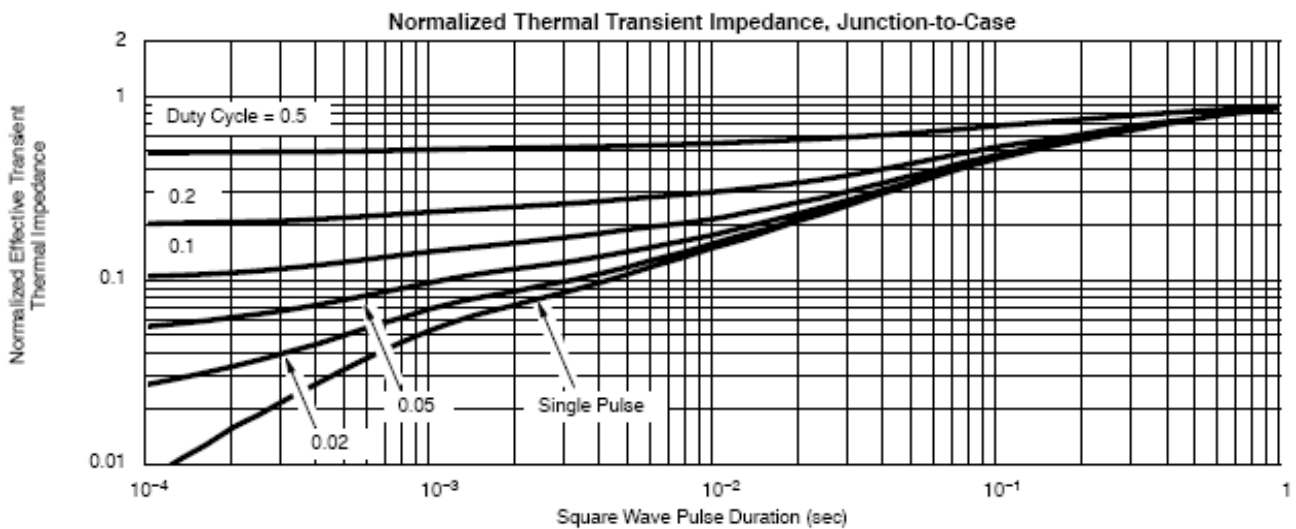
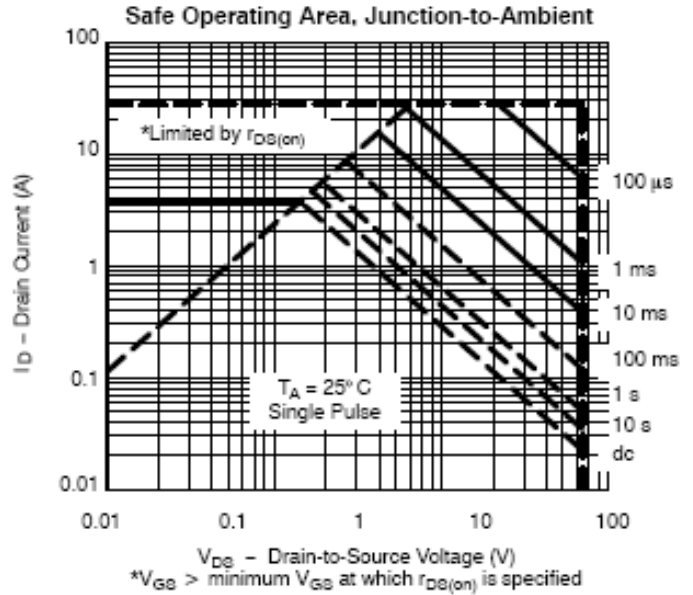
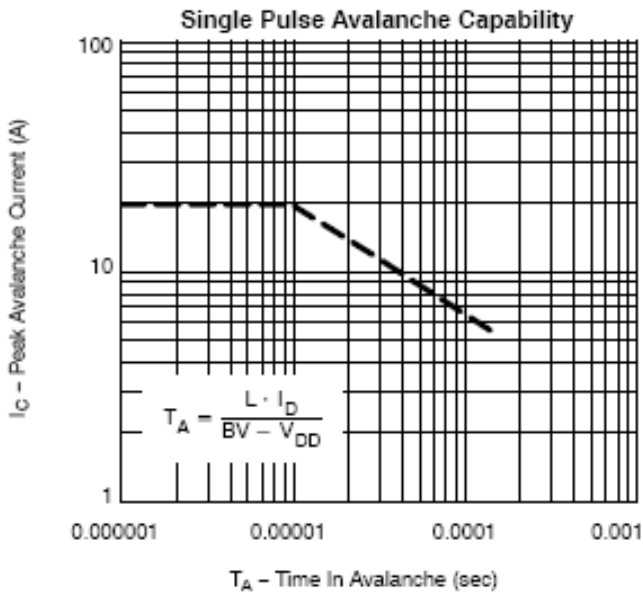
Power, Junction-to-Case





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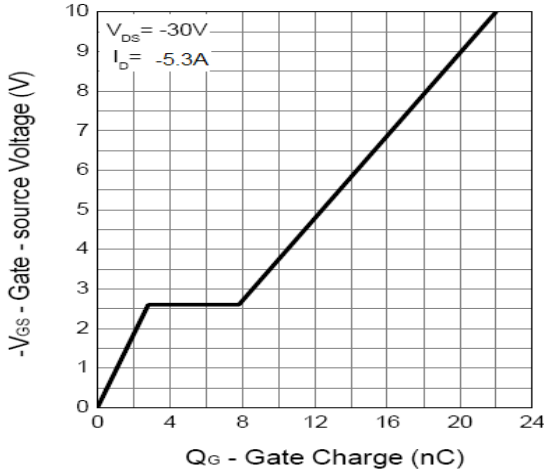
TYPICAL CHARACTERISTICS (NMOS)



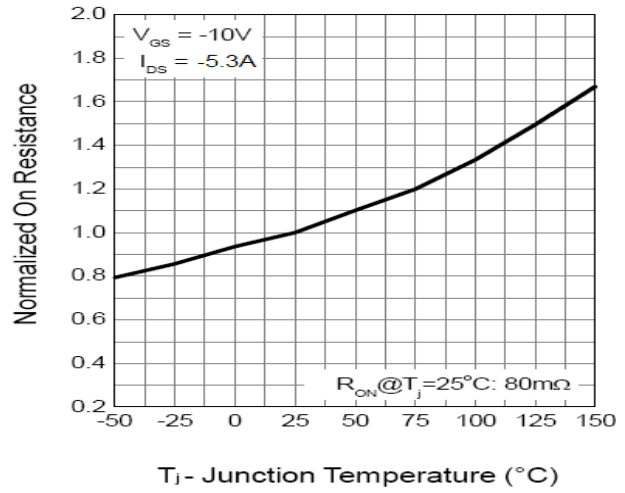


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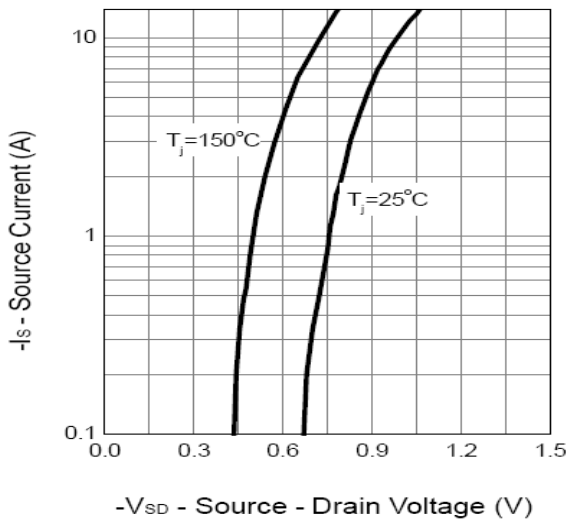
TYPICAL CHARACTERISTICS (PMOS) Gate Charge



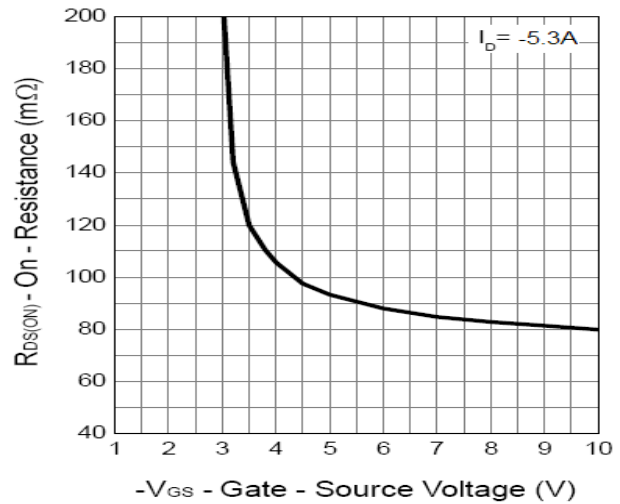
Drain-Source On Resistance



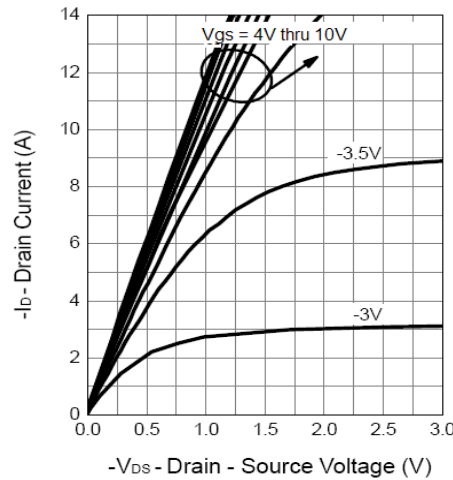
Source-Drain Diode Forward



Drain-Source On Resistance



Output Characteristics





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SYNC Power Corporation

7F-2, No.3-1, Park Street

NanKang District (NKSP), Taipei, Taiwan 115

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

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