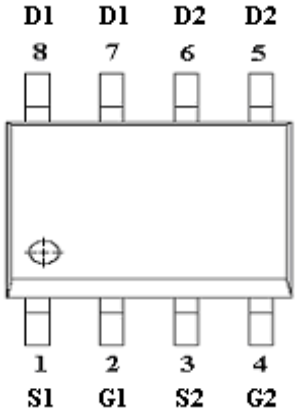
SPC4516
N & P Pair Enhancement Mode MOSFET

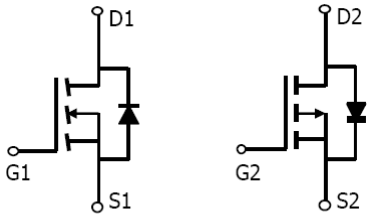
DESCRIPTION
The SPC4516 is the N- and P-Channel enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are 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.

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

FEATURES
- N-Channel
  30V/8.5A,$R_{DS(ON)}$=14mΩ@V_{GS}=10V
  30V/7.8A,$R_{DS(ON)}$=20mΩ@V_{GS}=4.5V
- P-Channel
  -30V/-7.2A,$R_{DS(ON)}$=25mΩ@V_{GS}=-10V
  -30V/-5.6A,$R_{DS(ON)}$=40mΩ@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

PIN CONFIGURATION(SOP–8)





n-channel p-channel

PART MARKING

A : Lot Code
B : Date Code

SPC4516
N & P Pair Enhancement Mode MOSFET

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
SPC4516S8RGB	SOP-8	SPC4516
SPC4516S8TGB	SOP-8	SPC4516

※ SPC4516S8RGB : 13” Tape Reel ; Pb – Free ; Halogen – Free
※ SPC4516S8TGB : Tube ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=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℃)	T_A=25℃	I_D	8.5	-7.2	A
	T_A=70℃		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	T_A=25°C	P_D	2.5	2.8	W
	T_A=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	T ≤ 10sec	$R_{\theta JA}$	50	52	°C/W
	Steady State		80	80	

ELECTRICAL CHARACTERISTICS (NMOS)

(T_A=25℃ Unless otherwise noted)

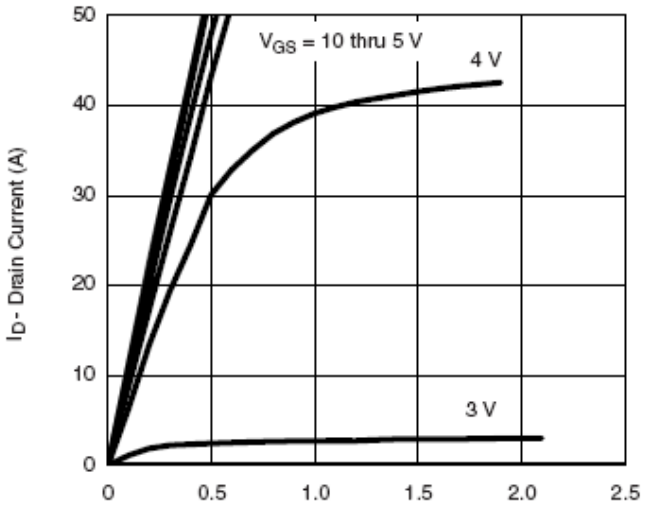
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		3.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V			1	uA
		V_{DS}=24V,V_{GS}=0V T_J=85℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≥5V,V_{GS} =10V	25			A
Drain-Source On-Resistance	$R_{DS(on)}$	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	gfs	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_{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	

ELECTRICAL CHARACTERISTICS (PMOS)

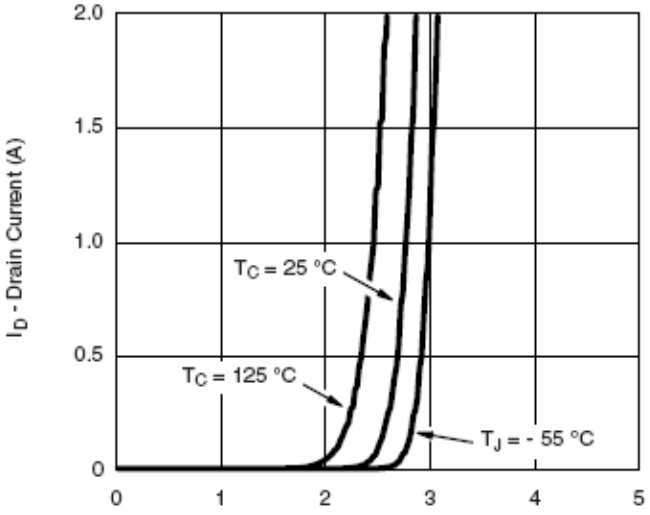
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-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℃			-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	gfs	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=15Ω I_D=-1.0A,V_{GEN}=-10V R_G=6Ω		16	30	nS
	t_r			17	30	
Turn-Off Time	$t_{d(off)}$			65	110	
	t_f			35	80	

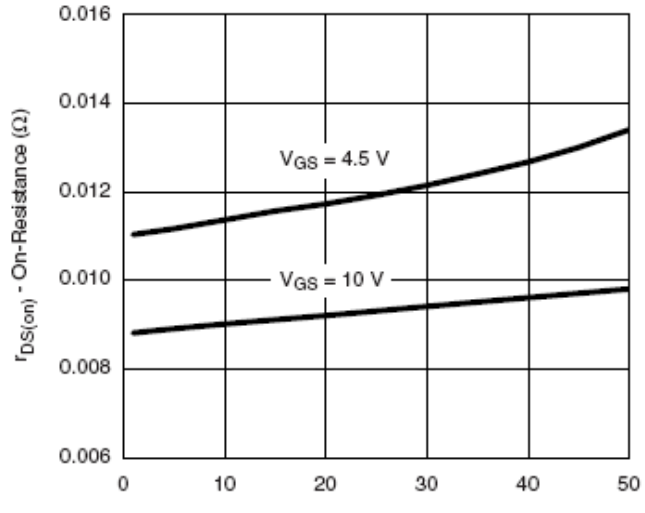
TYPICAL CHARACTERISTICS (NMOS)



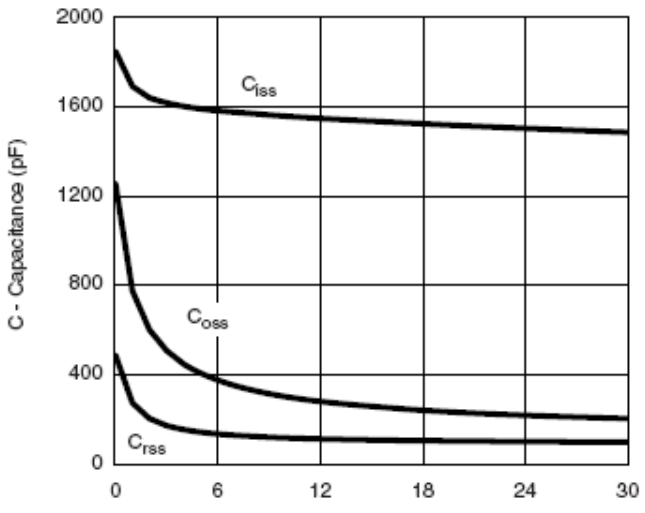
Output Characteristics



Transfer Characteristics

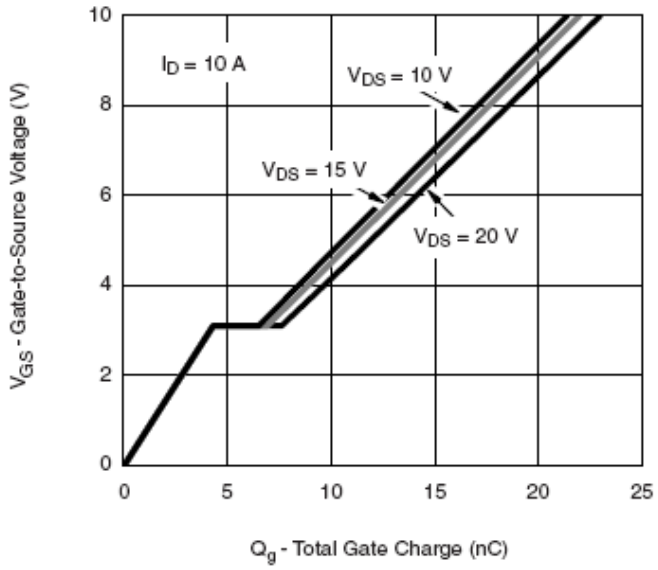


On-Resistance vs. Drain Current and Gate Voltage

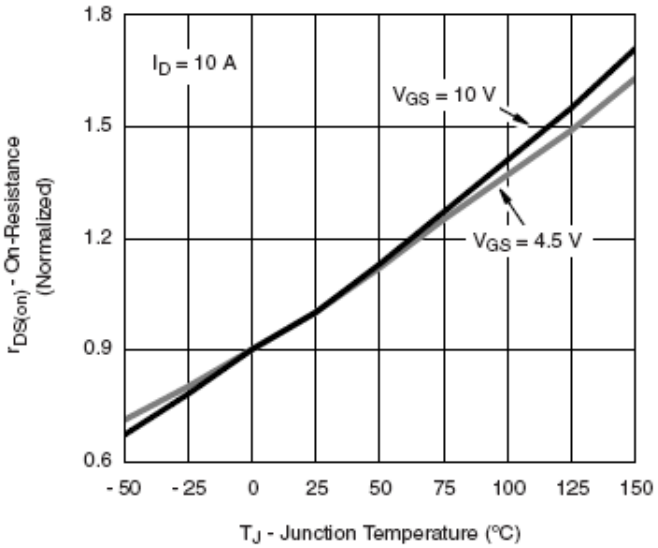


Capacitance

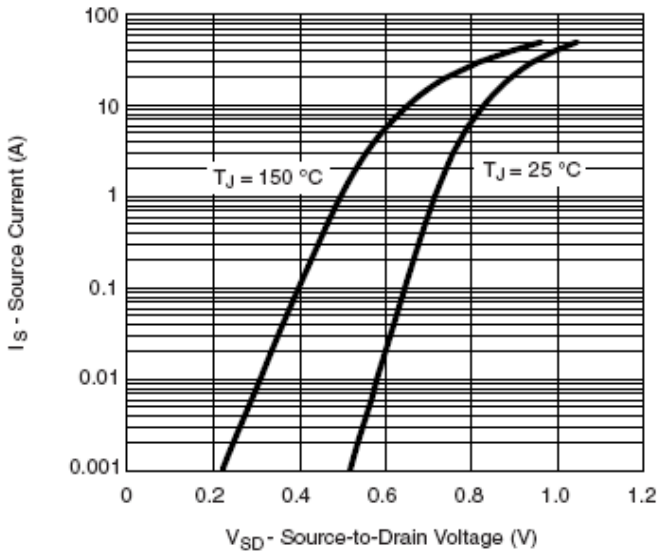
TYPICAL CHARACTERISTICS (NMOS)



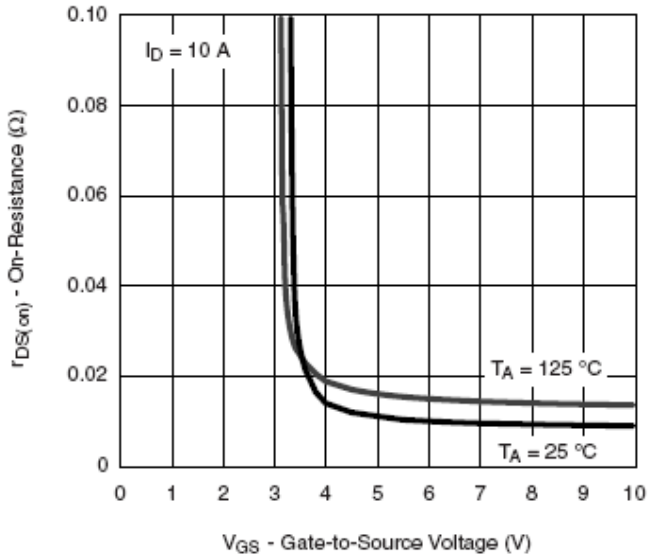
Gate Charge



On-Resistance vs. Junction Temperature

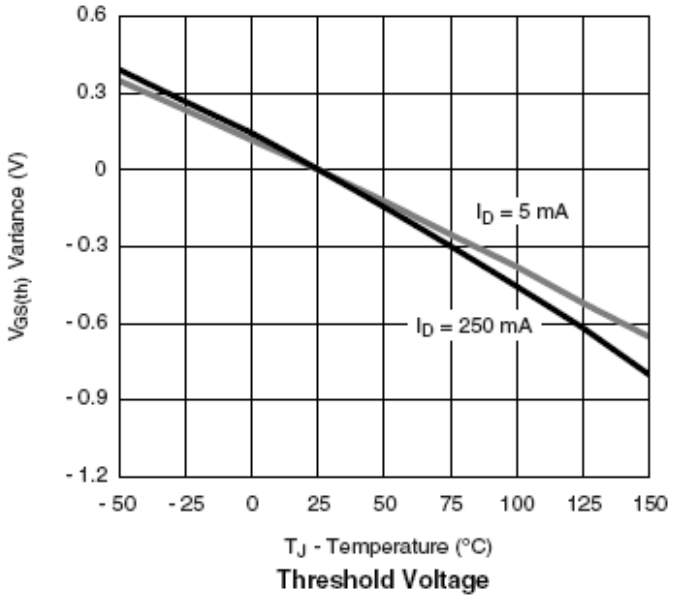


Source-Drain Diode Forward Voltage

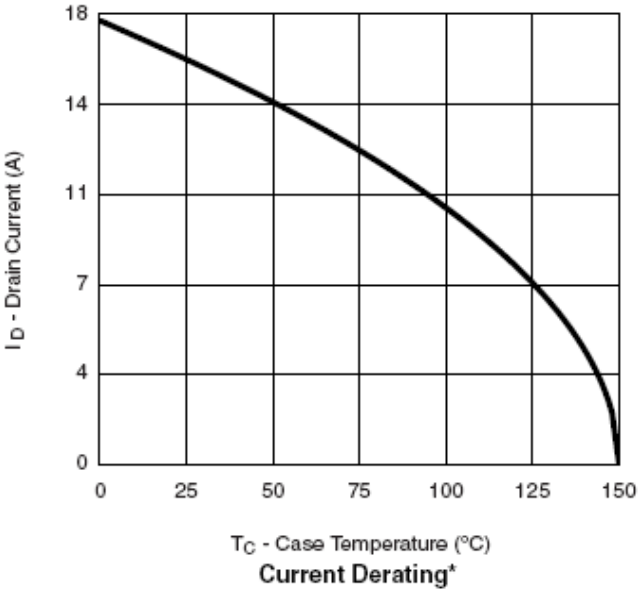


On-Resistance vs. Gate-to-Source Voltage

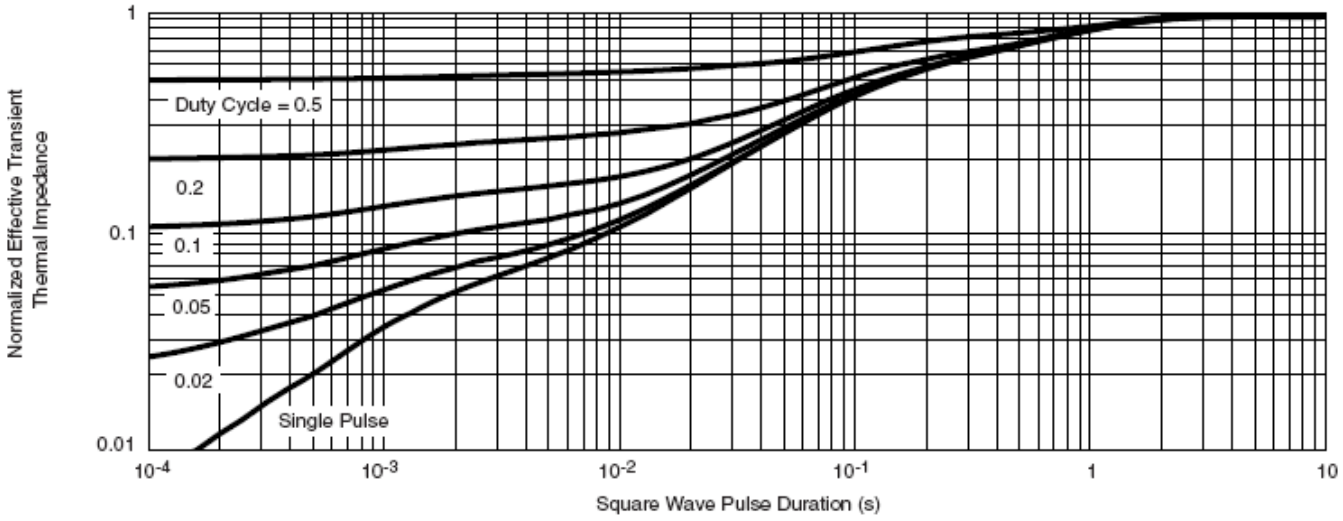
TYPICAL CHARACTERISTICS (NMOS)



Threshold Voltage



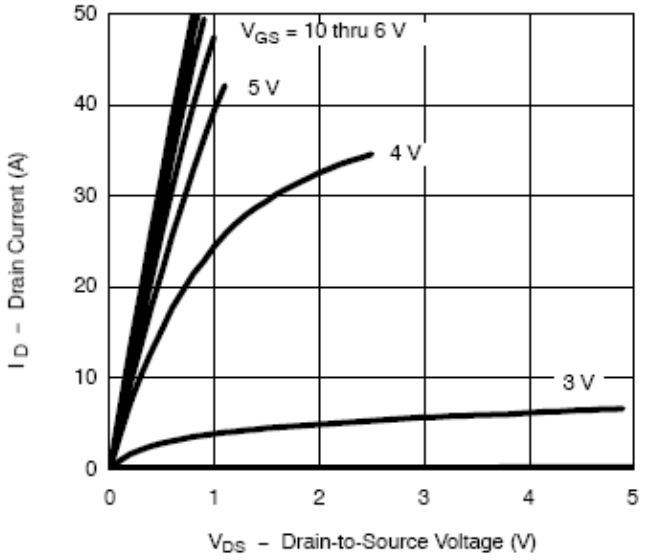
Current Derating*



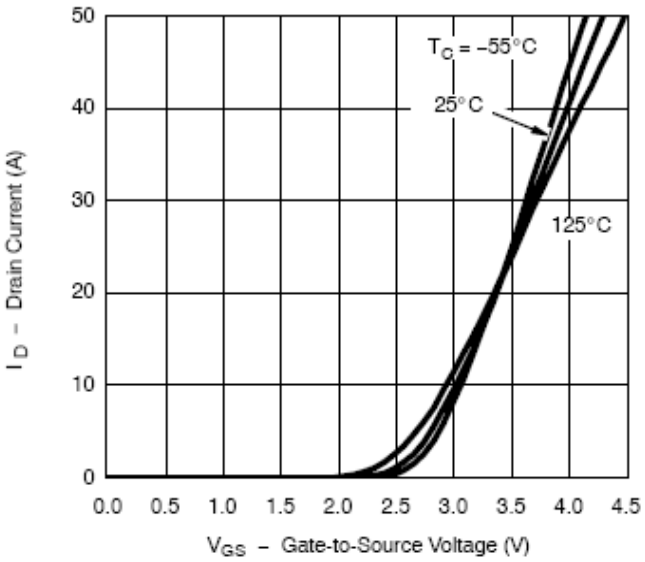
Normalized Thermal Transient Impedance, Junction-to-Case

TYPICAL CHARACTERISTICS (PMOS)

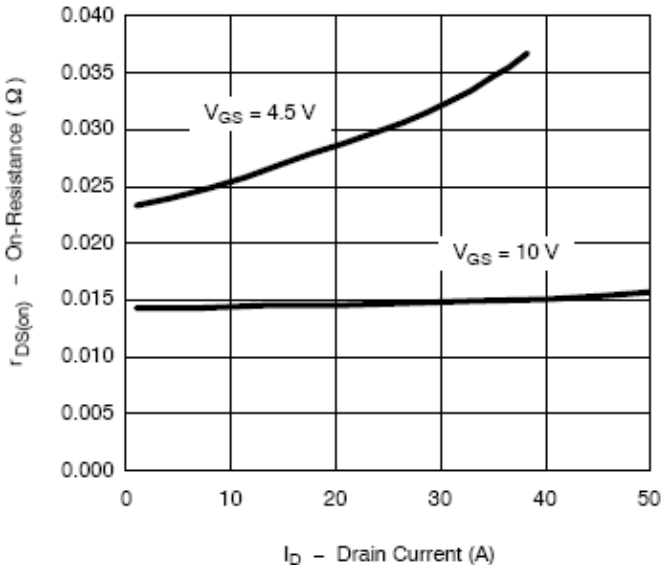
Output Characteristics



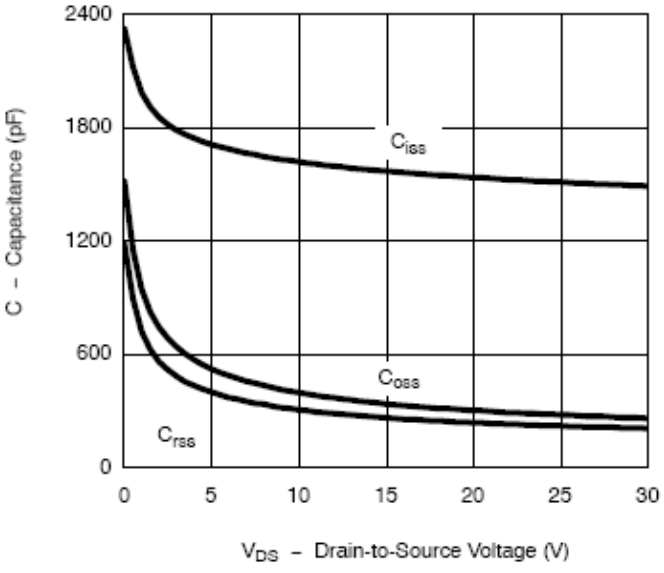
Transfer Characteristics



On-Resistance vs. Drain Current

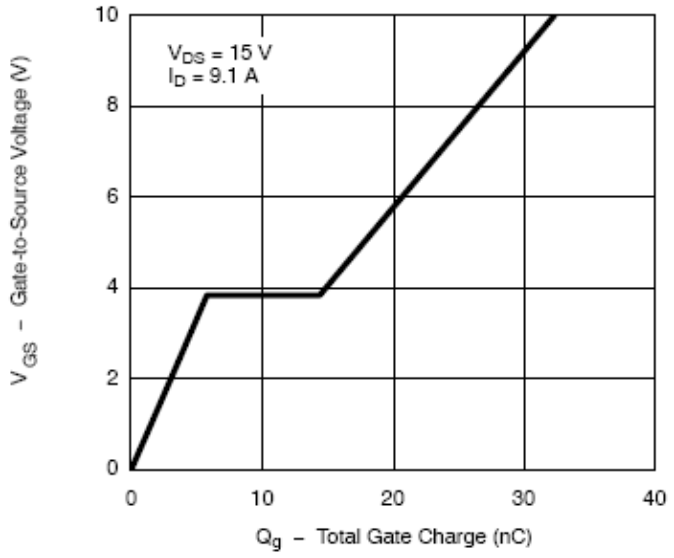


Capacitance

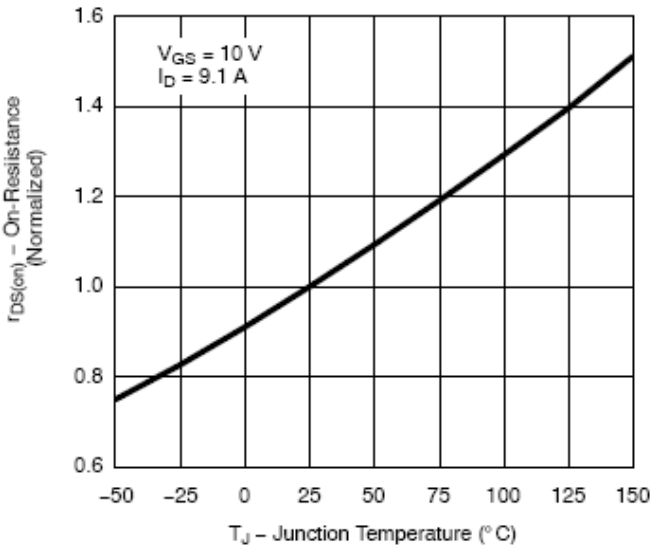


TYPICAL CHARACTERISTICS (PMOS)

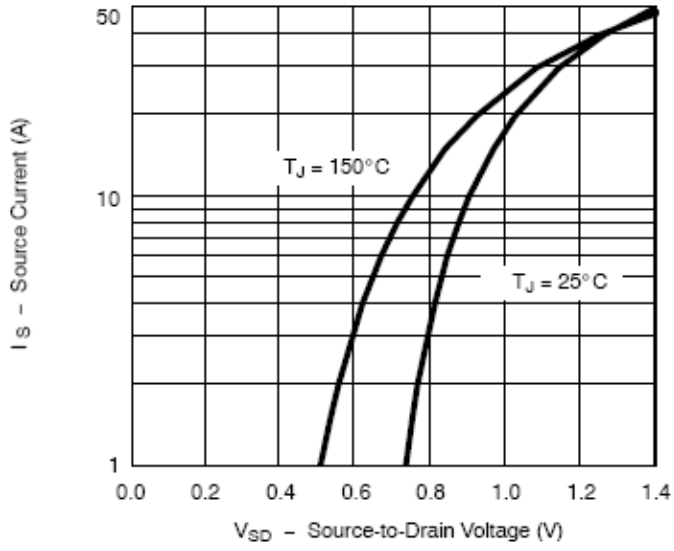
Gate Charge



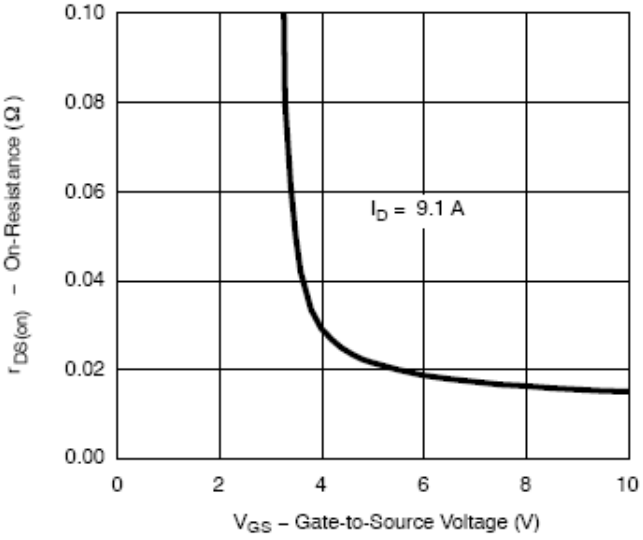
On-Resistance vs. Junction Temperature



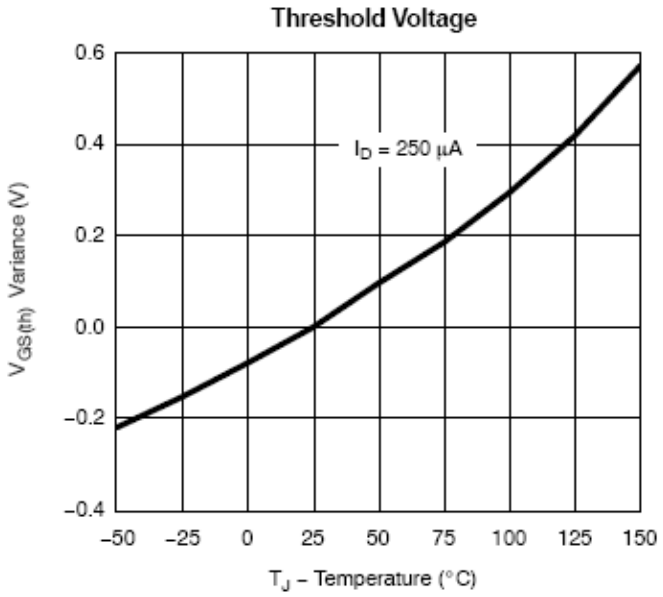
Source-Drain Diode Forward Voltage

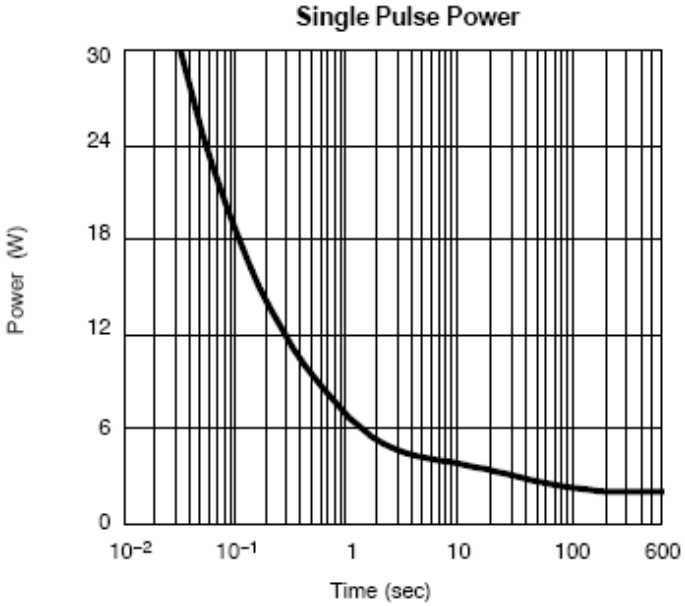


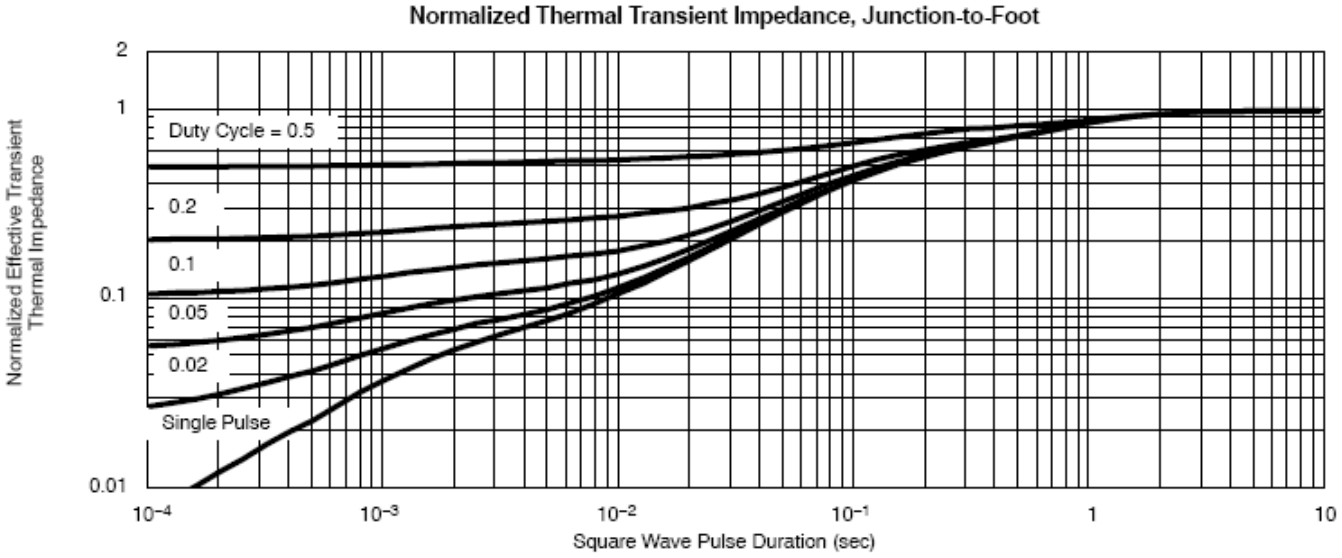
On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (PMOS)







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