Dual Enhancement Mode MOSFET (N-and P-Channel)

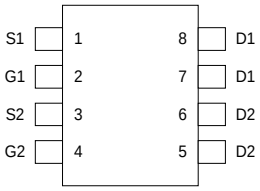
Features

- N-Channel
  30V/6.9A, $R_{DS(ON)}$=27.44mΩ @V_{GS}=10V
  $R_{DS(ON)}$=41.16mΩ @V_{GS}=4.5V
- P-Channel
  -30V/-6.9A, $R_{DS(ON)}$=32.00mΩ @V_{GS}=10.0V
  $R_{DS(ON)}$=50.00mΩ @V_{GS}=4.5V
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Reliable and Rugged
- SO-8 Package

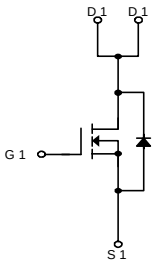
Applications

- Power Management in Notebook Computer , Portable Equipment and Battery Powered Systems.

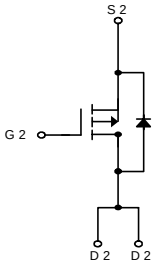
Pin Description



SO-8



N-Channel MOSFET



P-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter		N-Channel	P-Channel	Unit
V_{DSS}	Drain-Source Voltage		30	-30	V
V_{GSS}	Gate-Source Voltage		±20	±20	
I_D*	Maximum Drain Current – Continuous		6.9	-6.9	A
I_{DM}	Maximum Drain Current – Pulsed		28	-20	
P_D	Maximum Power Dissipation	T_A=25 C°	2	2	W
T_J	Maximum Junction Temperature		150		°C
T_{STG}	Storage Temperature Range		-55 to 150		°C
$R_{\theta jA}$	Thermal Resistance – Junction to Ambient		62.5		°C/W

* Surface Mounted on FR4 Board, t ≤ 10 sec.

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		4542 Min.	4542 Typ.	4542 Max.	Unit
Static							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_{DS}=250μA	N-Ch	30			V
			P-Ch	-30			
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V , V_{GS}=0V	N-Ch			1	μA
		V_{DS}=-24V , V_{GS}=0V	P-Ch			-1	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_{DS}=250μA	N-Ch	1	1.5	2	V
		V_{DS}=V_{GS} , I_{DS}=-250μA	P-Ch	-1	-1.5	-2	
I_{GSS}	Gate Leakage Current	V_{GS}=±20V , V_{DS}=0V	N-Ch			±100	nA
		V_{GS}=±20V , V_{DS}=0V	P-Ch			±100	
$R_{DS(ON)}$[a]	Drain-Source On-state Resistance	V_{GS}=10V , I_{DS}=6.9A	N-Ch			28	mΩ
		V_{GS}=4.5V , I_{DS}=5A				42	
		V_{GS}=-10V , I_{DS}=-6.9A	P-Ch			32	
		V_{GS}=-4.5V , I_{DS}=-5A				50	
V_{SD}[a]	Diode Forward Voltage	I_{SD}=2.0A , V_{GS}=0V	N-Ch		0.7	1.0	V
		I_{SD}=-2.0A , V_{GS} =0V	P-Ch		-0.7	-1.0	

Notes

[a] : Pulse test ; pulse width ≤300μs, duty cycle ≤ 2%

Electrical Characteristics (Cont.) (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		4542 Min.	4542 Typ.	4542 Max.	Unit
Dynamic[b]							
Q_g	Total Gate Charge	N-Channel	N-Ch		19	28	nC
		V_{DS}=15V , I_{DS}= 6.9A	P-Ch		28	36	
Q_{gs}	Gate-Source Charge	V_{GS}=10V	N-Ch		1.6		
		P-Channel	P-Ch		5		
Q_{gd}	Gate-Drain Charge	V_{DS}=-15V , I_{DS}=-6.9A	N-Ch		3.6		
		V_{GS}=-10V	P-Ch		4		
$t_{d(ON)}$	Turn-on Delay Time	N-Channel	N-Ch		11	20	ns
		V_{DD}=15V , I_{DS}=2A ,	P-Ch		12	24	
T_r	Turn-on Rise Time	V_{GEN}=10V , R_G=6Ω ,	N-Ch		17	28	
		R_L=7.5Ω	P-Ch		15	29	
$t_{d(OFF)}$	Turn-off Delay Time	P-Channel	N-Ch		36	62	
		V_{DD}=-15V , I_{DS}=-2A ,	P-Ch		35	60	
T_f	Turn-off Fall Time	V_{GEN}=-10V , R_G=6Ω ,	N-Ch		20	36	
		R_L=7.5Ω	P-Ch		15	30	
C_{iss}	Input Capacitance	N-Channel	N-Ch		835		pF
		V_{GS}=0V, V_{DS}=25V	P-Ch		950		
C_{oss}	Output Capacitance	Frequency=1.0MHz	N-Ch		145		
		P-Channel	P-Ch		160		
C_{rss}	Reverse Transfer Capacitance	V_{GS}=0V, V_{DS}=-25V	N-Ch		15		
		Frequency=1.0MHz	P-Ch		110		

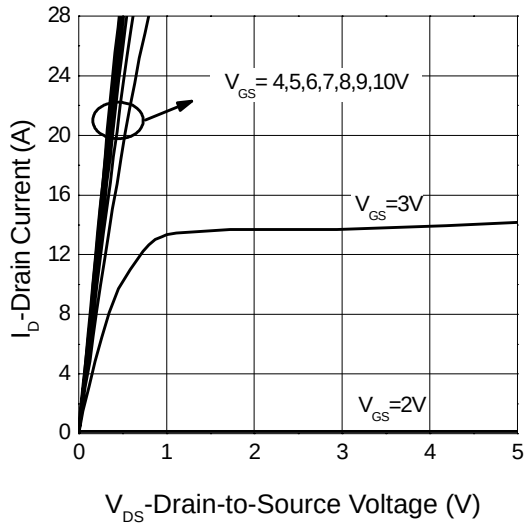
Notes

[b] : Guaranteed by design, not subject to production testing

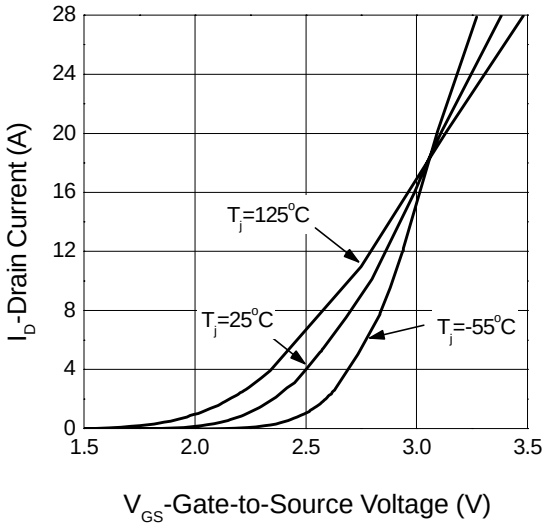
Typical Characteristics

N-Channel

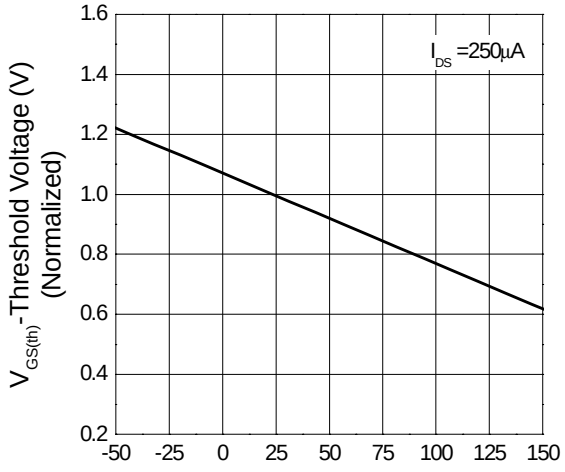
Output Characteristics



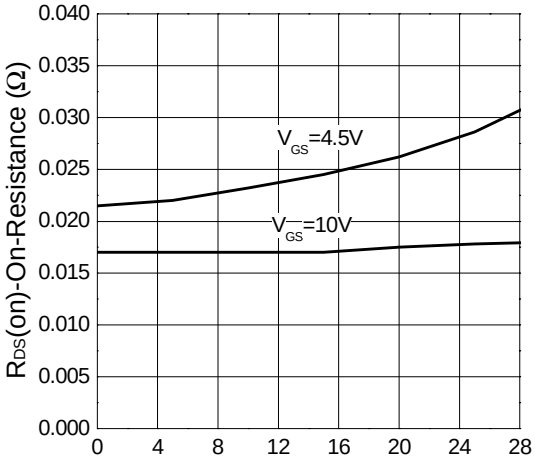
Transfer Characteristics



Threshold Voltage vs. Junction Temperature



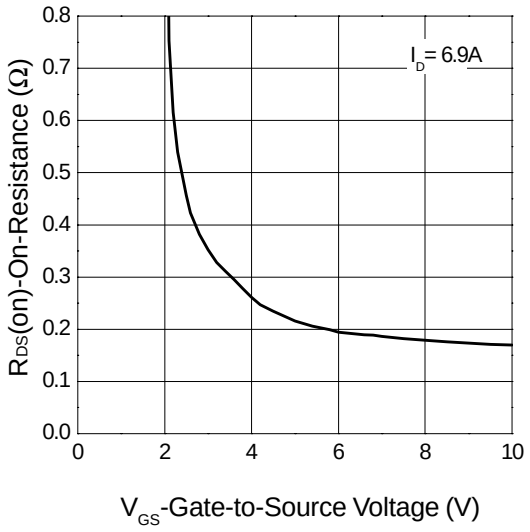
On-Resistance vs. Drain Current



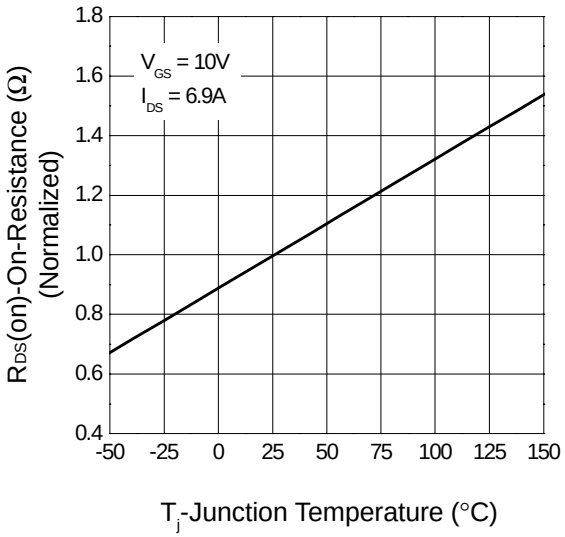
Typical Characteristics (Cont.)

N-Channel

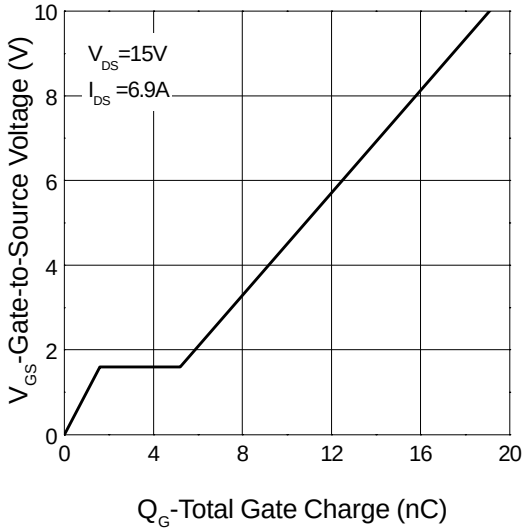
On-Resistance vs. Gate-to-Source Voltage



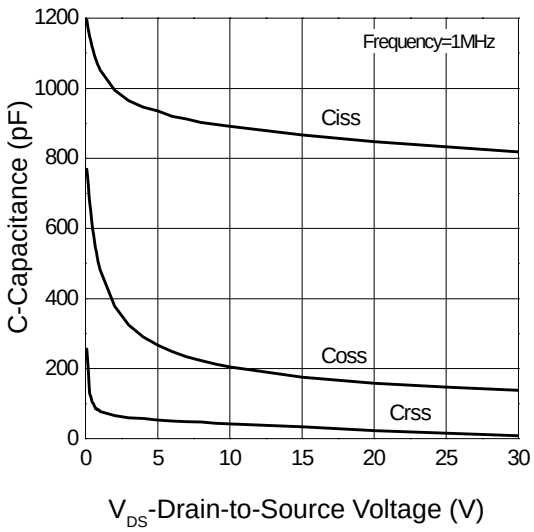
On-Resistaence vs. Junction Temperature



Gate Charge



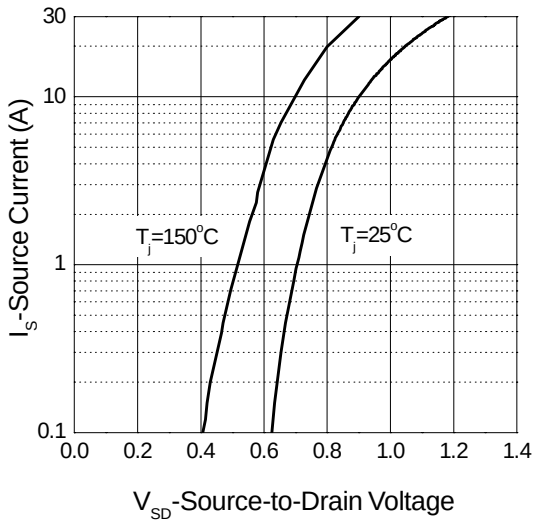
Capacitance Characteristics



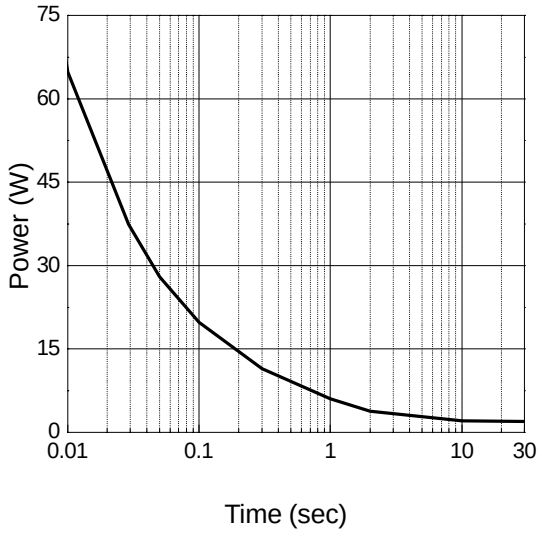
Typical Characteristics (Cont.)

N-Channel

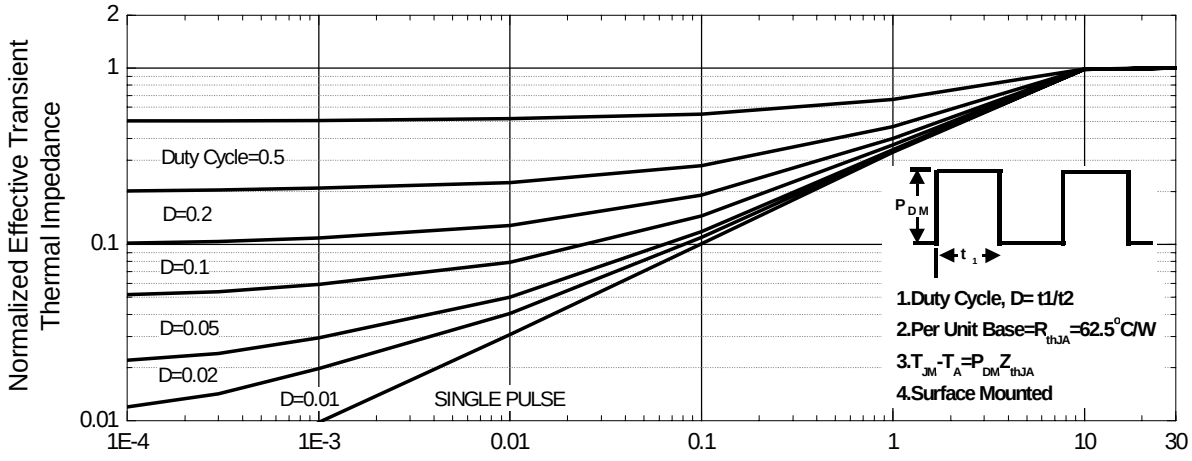
Source-Drain Diode Forward Voltage



Single Pulse Power



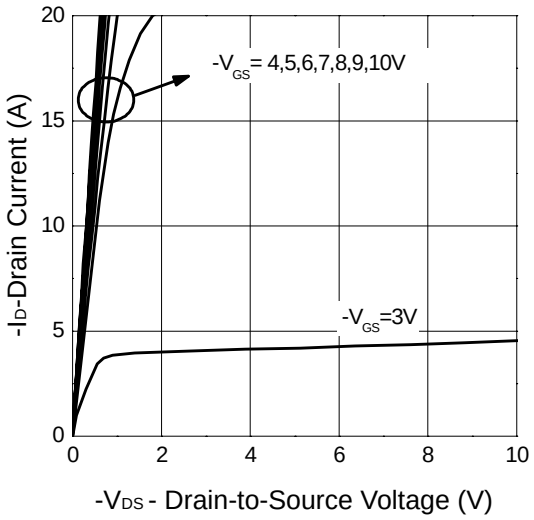
Normalized Transient Thermal Transient Impedence, Junction to Ambient



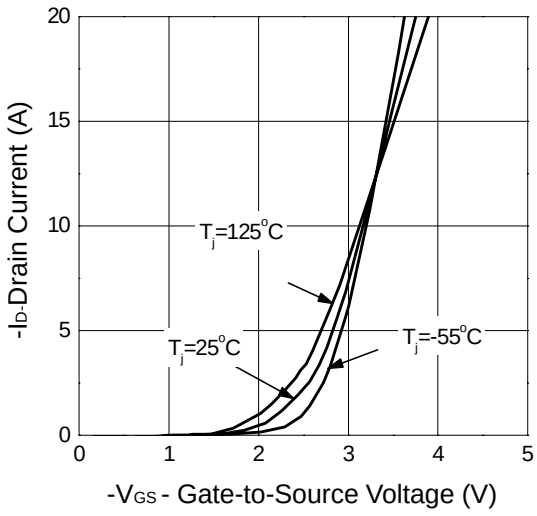
Typical Characteristics

P-Channel

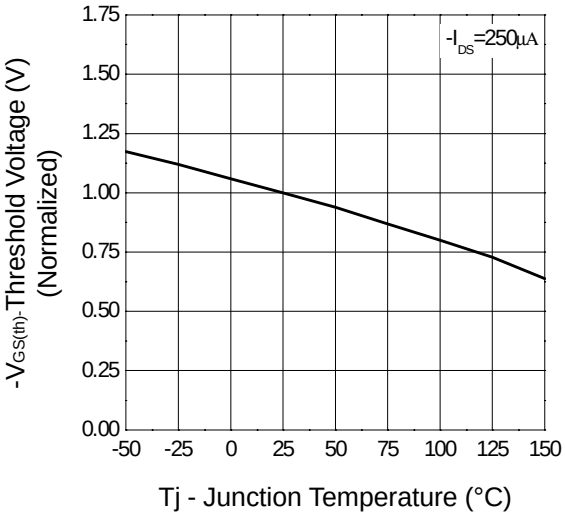
Output Characteristics



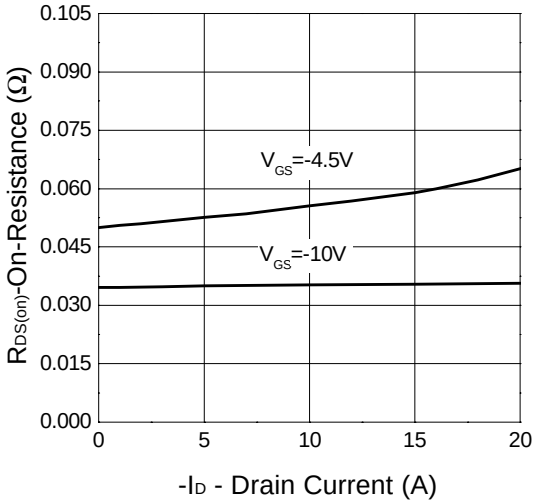
Transfer Characteristics



Threshold Voltage vs. Junction Temperature



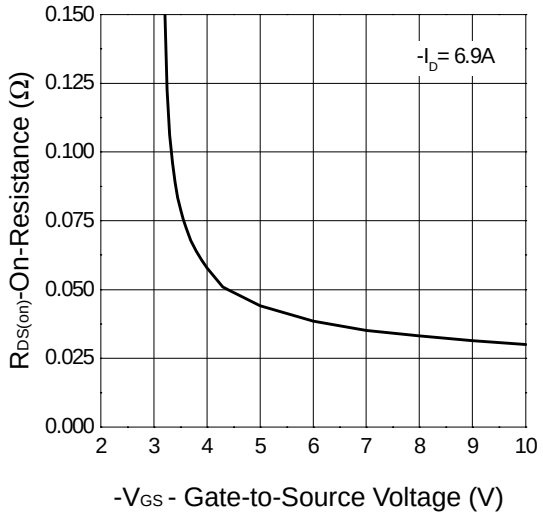
On-Resistance vs. Drain Current



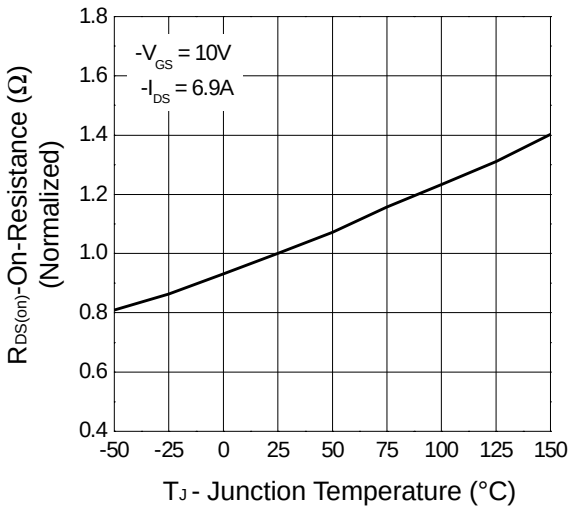
Typical Characteristics (Cont.)

P-Channel

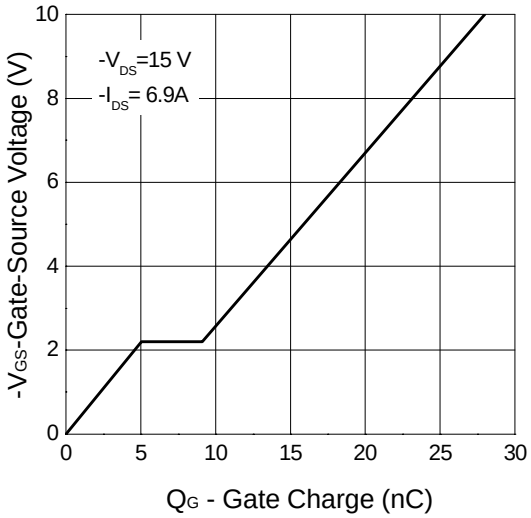
On-Resistance vs. Gate-to-Source Voltage



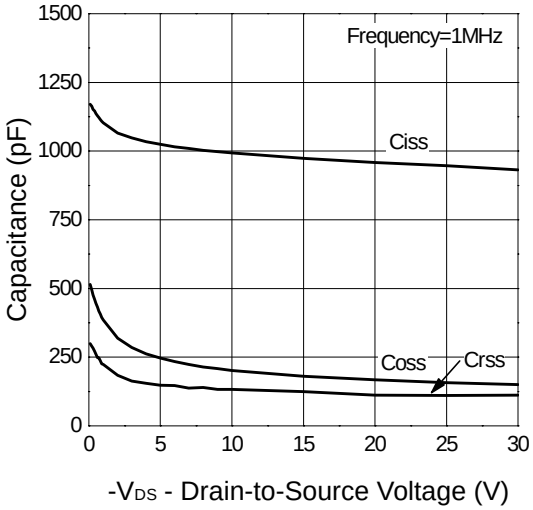
On-Resistance vs. Junction Temperature



Gate Charge



Capacitance



Typical Characteristics (Cont.)

P-Channel