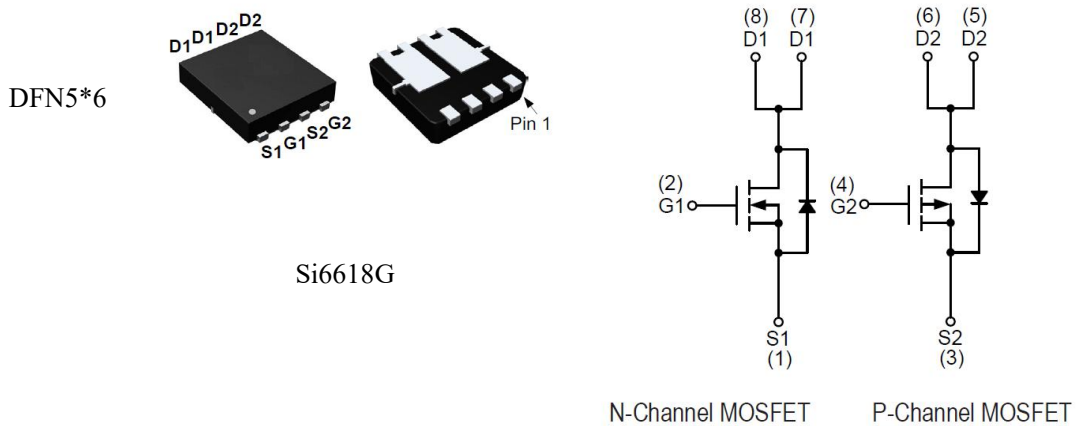


Features

- N Channel : 60V/15A,
 $R_{DS(ON)}=48m\Omega(max.)@V_{GS}=10V$
 $R_{DS(ON)}=56m\Omega(max.)@V_{GS}=4.5V$
- P Channel : -60V/-12A,
 $R_{DS(ON)}=90m\Omega(max.)@V_{GS}=-10V$
 $R_{DS(ON)}=100m\Omega(max.)@V_{GS}=-4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available



Specifications

Absolute Maximum Ratings at $T_a=25^{\circ}C$

Parameter	Symbol	Conditions	N-Ch	P-Ch	Unit
Drain-to-Source Voltage	V_{DSS}		60	-60	V
Gate-to-Source Voltage	V_{GSS}		± 20	± 20	V
Drain Current (DC)	I_D		15	-12	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s, \text{ duty cycle} \leq 1\%$	22	-18	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm ² ×0.8mm) 1unit	30	30	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm ² ×0.8mm)	5	5	W
Avalanche Energy	E_{AS}	$T_J=25^{\circ}C, V_{DS}=20V, V_{GS}=10V$	58	58	mJ
Channel Temperature	T_{ch}		150	150	$^{\circ}C$
Storage Temperature	T_{stg}		-55~+150	-55~+150	$^{\circ}C$

Electrical Characteristics (N-Channel) at $T_a=25^{\circ}C$

Si6618U/G

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu A, V_{GS}=0V$	60	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.80	2.5	V
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=7A, V_{GS}=10V$	-	42	48	m Ω
	$R_{DS(on)}$	$I_D=5A, V_{GS}=4.5V$	-	48	56	m Ω
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	880	-	pF
Output Capacitance	C_{oss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	140	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	90	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V, R_L=0.75\Omega, R_{GEN}=1\Omega, V_{GS}=10V$	-	13	-	nS
Rise Time	t_r		-	18	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	30	-	nS
Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g		$V_{DS}=15V, V_{GS}=10V, I_D=20A$	-	24	-
Gate-to-Source Charge	Q_{gs}	-		20	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}	-		27	-	nC
Diode Forward Voltage	V_{SD}	$I_S=3A, V_{GS}=0V$	-	0.80	-	V

Electrical Characteristics (P-Channel) at $T_a=25^{\circ}C$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu A, V_{GS}=0V$	-60	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	-1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-1	-1.85	-2.5	V
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=-5A, V_{GS}=-10V$	-	78	90	m Ω
	$R_{DS(on)}$	$I_D=-3.5A, V_{GS}=-4.5V$	-	82	100	m Ω
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	1120	-	pF
Output Capacitance	C_{oss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	190	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	100	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V, R_L=0.75\Omega, R_{GEN}=1\Omega, V_{GS}=10V$	-	12	-	nS
Rise Time	t_r		-	16	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	40	-	nS
Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g		$V_{DS}=15V, V_{GS}=10V, I_D=10A$	-	22	-
Gate-to-Source Charge	Q_{gs}	-		25	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}	-		30	-	nC
Diode Forward Voltage	V_{SD}	$I_S=3A, V_{GS}=0V$	-	-0.75	-	V

Typical Characteristics (N-Channel) at $T_a=25^{\circ}C$

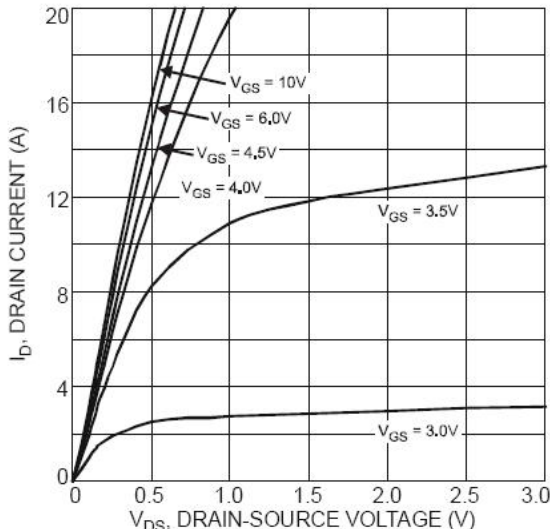


Fig. 1 Typical Output Characteristic

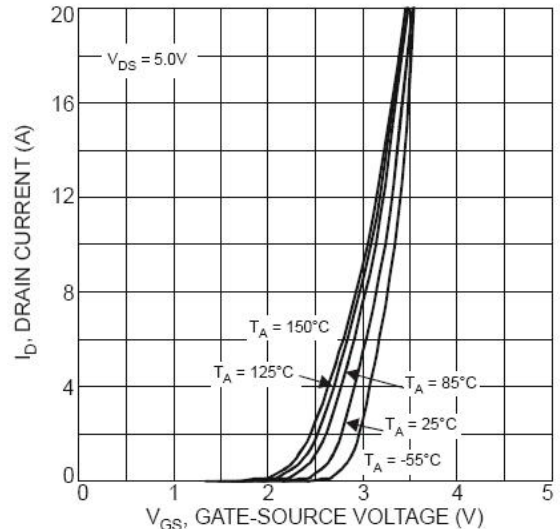


Fig. 2 Typical Transfer Characteristics

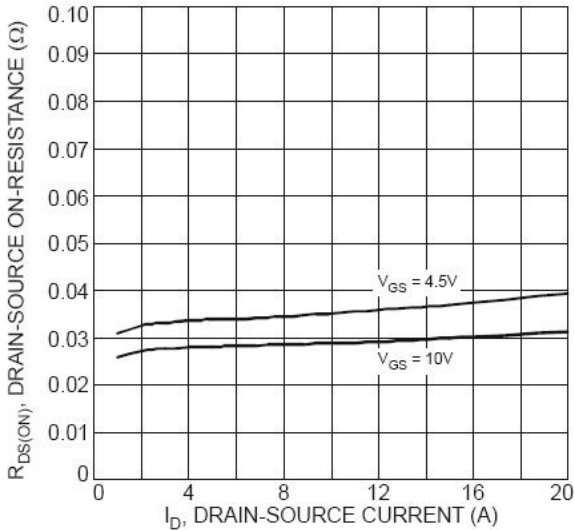


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

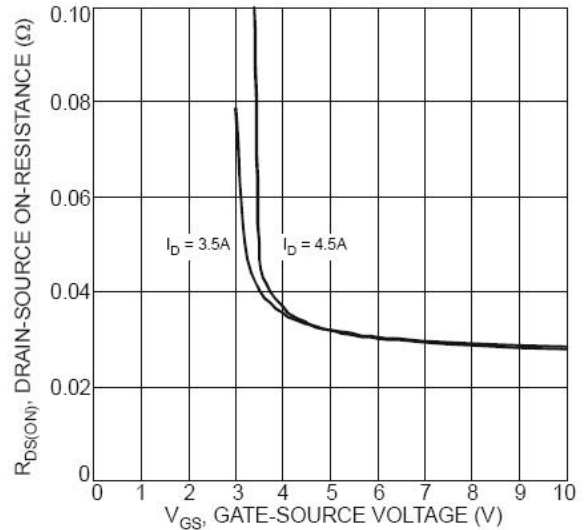


Fig. 4 Typical On-Resistance vs. Drain Current and Gate Voltage

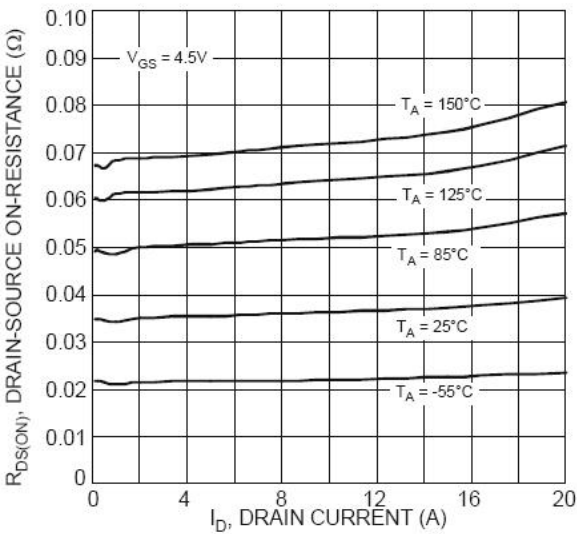


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

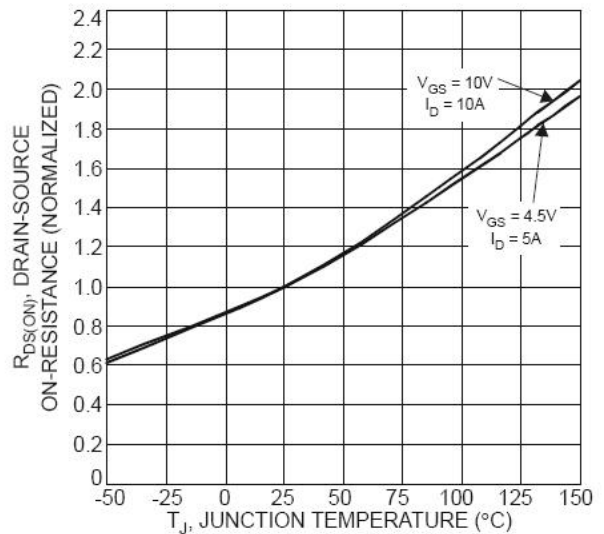


Fig. 6 On-Resistance Variation with Temperature

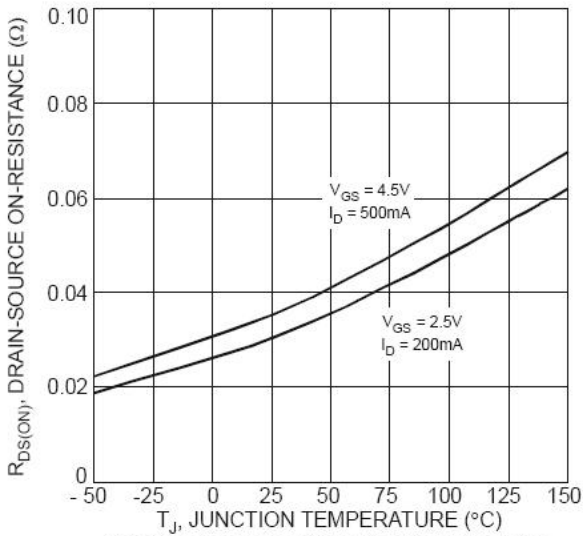


Fig. 7 On-Resistance Variation with Temperature

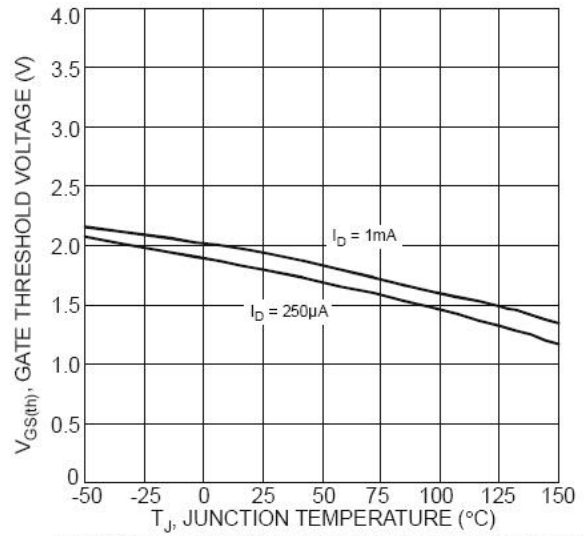


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

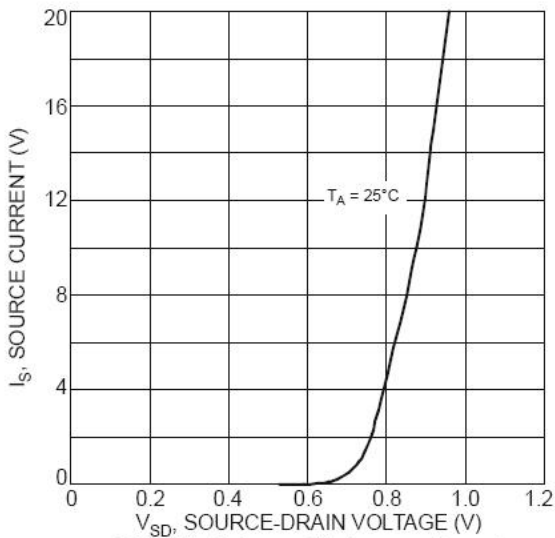


Fig. 9 Diode Forward Voltage vs. Current

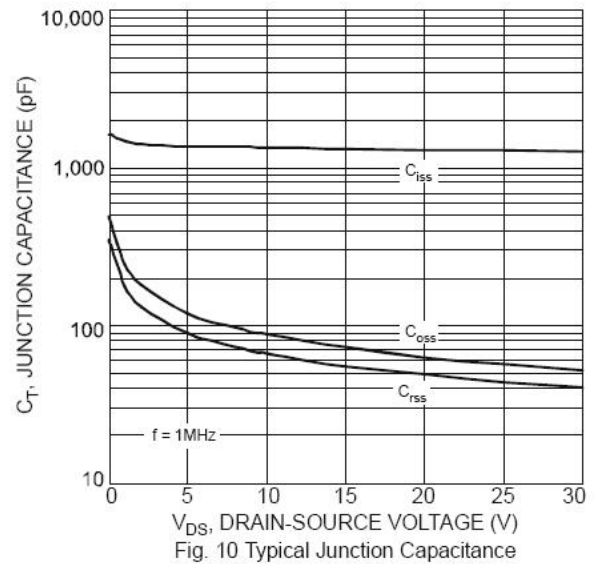


Fig. 10 Typical Junction Capacitance

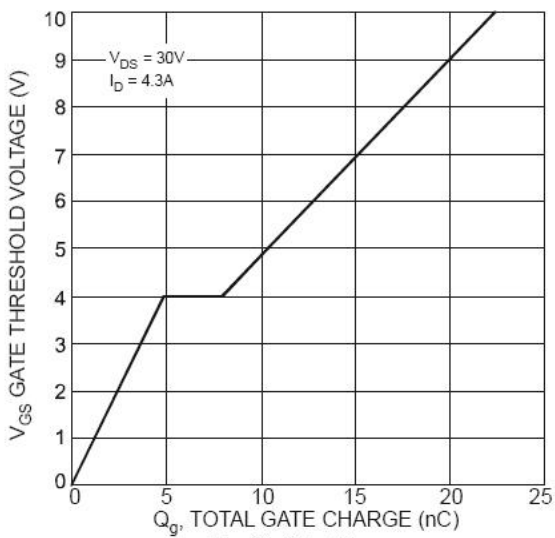


Fig. 11 Gate Charge

Typical Characteristics (P-Channel) at $T_a=25^{\circ}\text{C}$

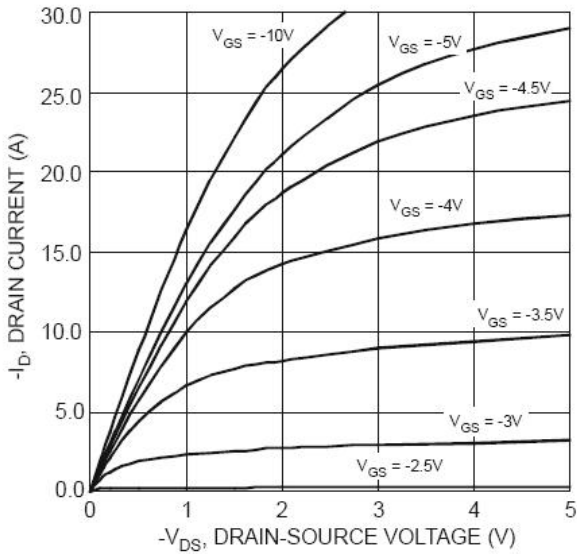


Figure 1 Typical Output Characteristics

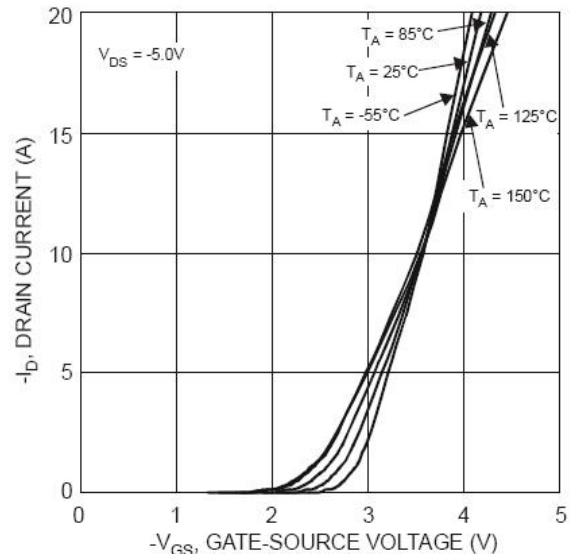


Figure 2 Typical Transfer Characteristics

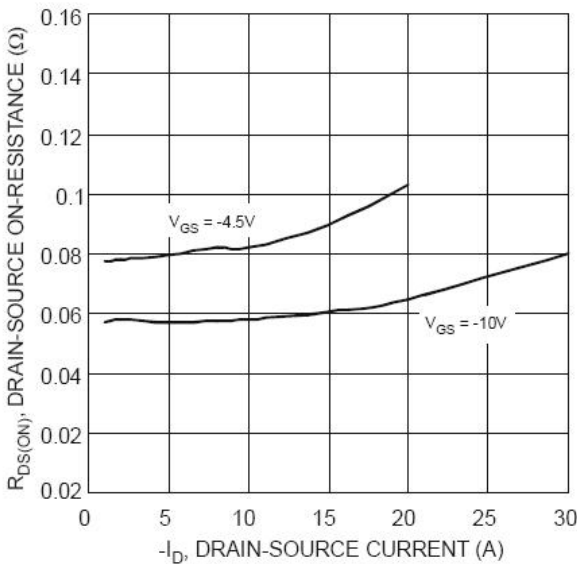


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

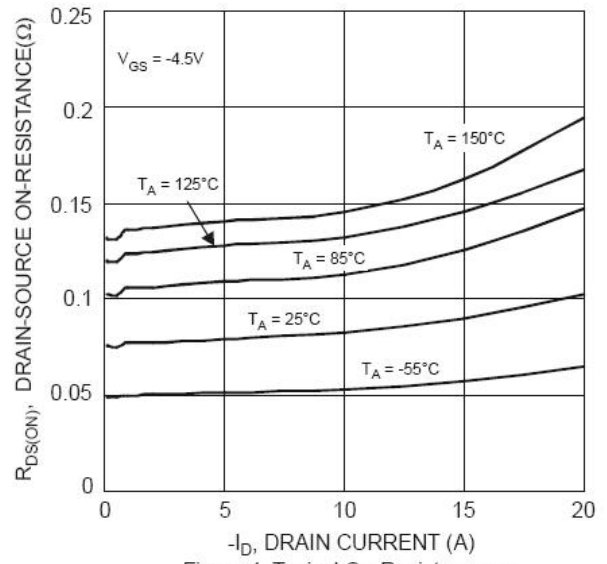


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

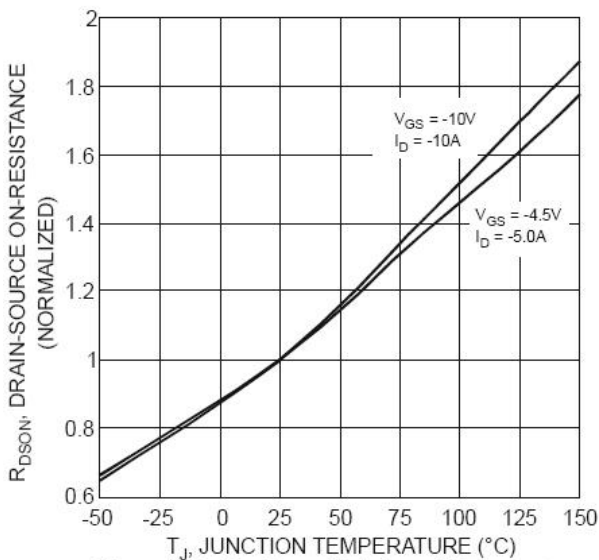


Figure 5 On-Resistance Variation with Temperature

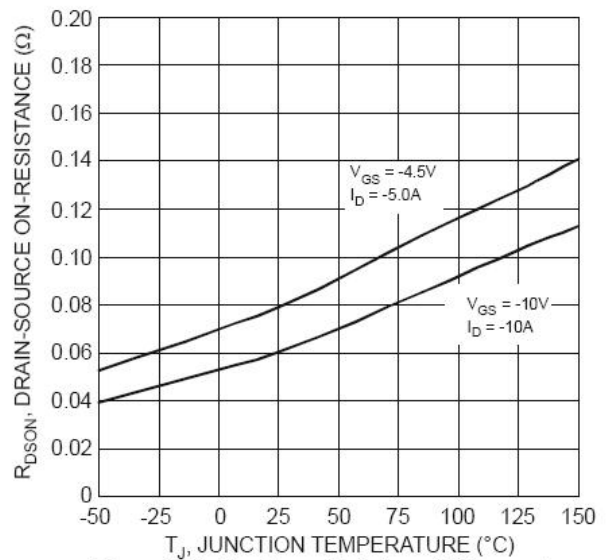


Figure 6 On-Resistance Variation with Temperature

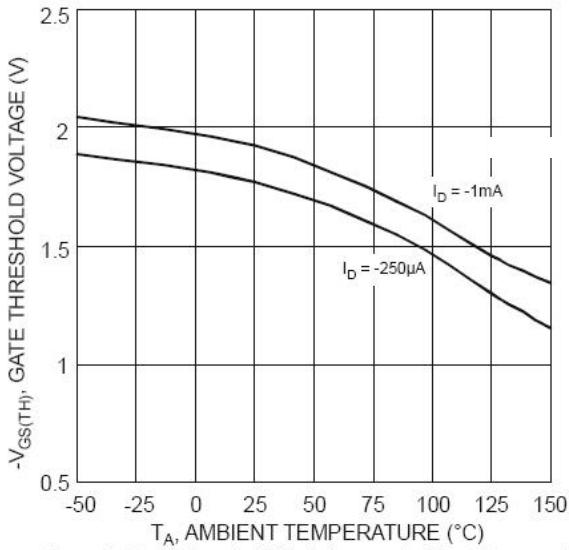


Figure 7 Gate Threshold Variation vs. Ambient Temperature

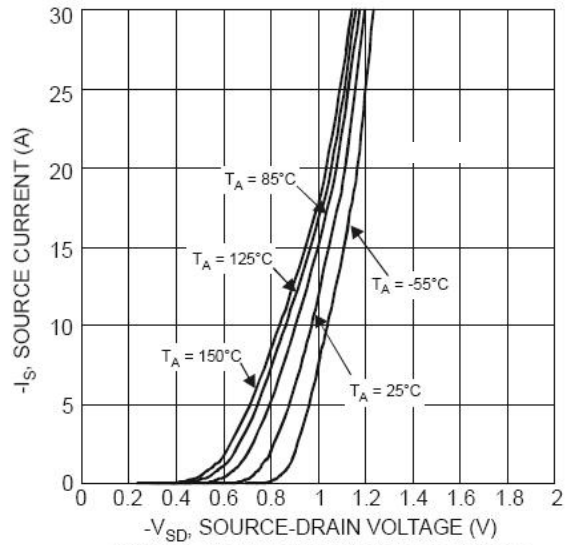


Figure 8 Diode Forward Voltage vs. Current

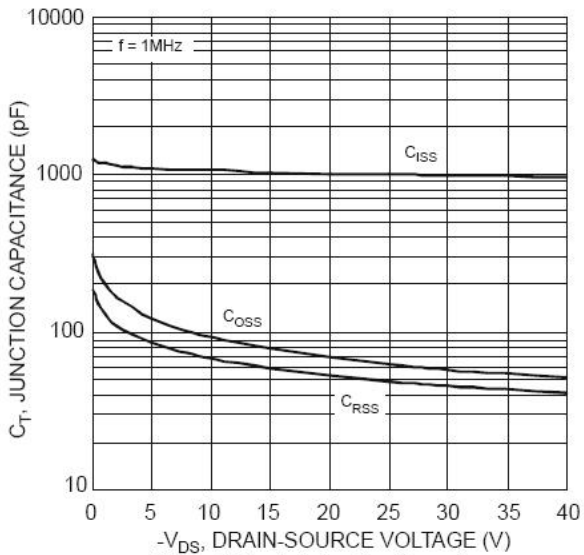


Figure 9 Typical Junction Capacitance

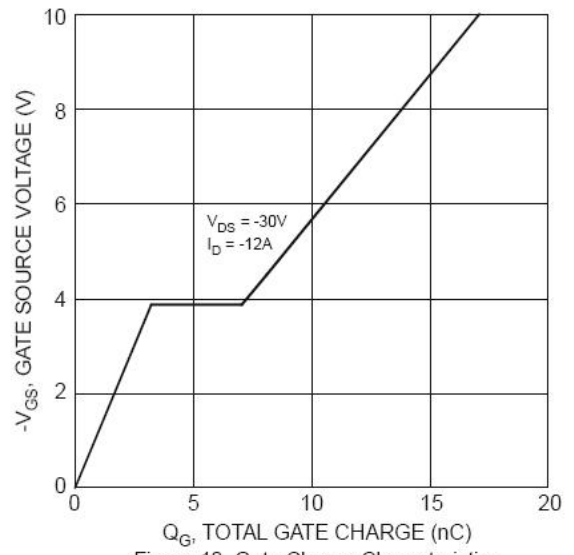


Figure 10 Gate Charge Characteristics