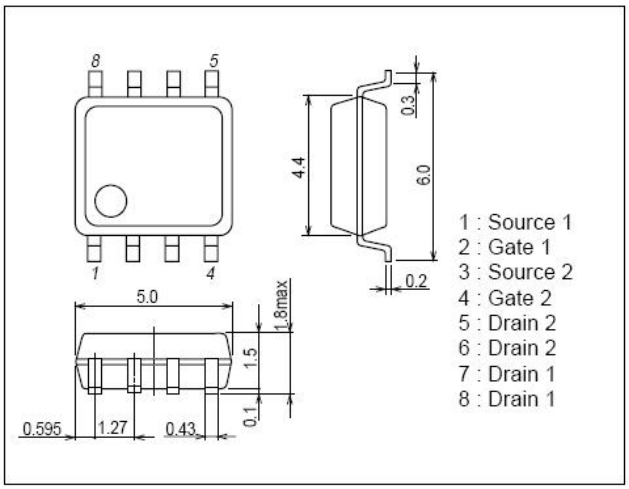
Si4606

Features

- Low On resistance.
- ±4.5V drive.
- RoHS compliant.

Package Dimensions

unit : mm
SOP-8

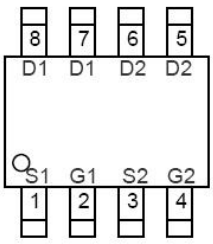


Specifications

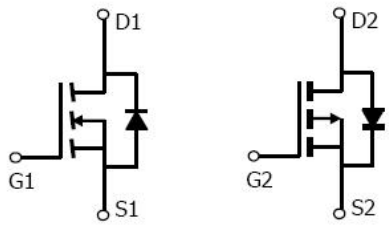
Absolute Maximum Ratings at T_a=25^{0}C

Parameter	Symbol	Conditions	Ratings		Unit
			N-Ch	P-Ch	
Drain-to-Source Voltage	V_{DSS}		30	-30	V
Gate-to-Source Voltage	V_{GSS}		±12	±20	V
Drain Current (DC)	I_D		6.9	-6	A
Drain Current (Pulse)	I_{DP}	PW≤10uS, duty cycle≤1%	30	-30	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm^2×0.8mm) 1unit	1.3	1.3	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm^2×0.8mm)	1.7	1.7	W
Channel Temperature	T_{ch}		150		^{0}C
Storage Temperature	T_{stg}		-55~+150		^{0}C

Pin Description



TOP VIEW
SOP-8

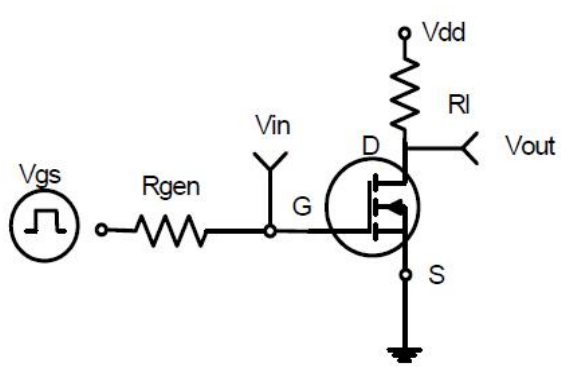


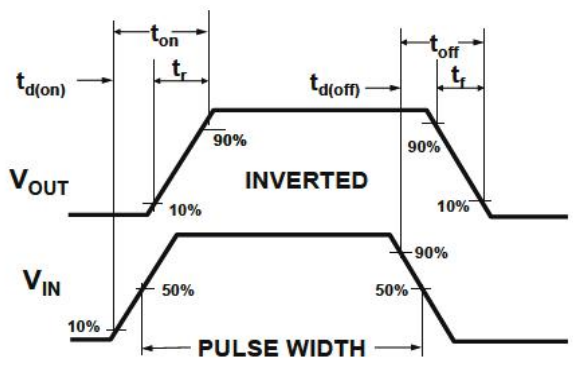
n-channel p-channel

N-Channel Electrical Characteristics at T_a=25^{0}C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=250uA, V_{GS}=0V	30	35		V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	0.6	0.8	1	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	I_D=5A, V_{GS}=10V		24	26	mΩ
	$R_{DS(ON)}$	I_D=4A, V_{GS}=4.5V		27	29	mΩ
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz		820		pF
Output Capacitance	C_{oss}	V_{DS}=15V, V_{GS}=0V, f=1MHz		99		pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=15V, V_{GS}=0V, f=1MHz		77		pF
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=2.2Ω, R_{GEN}=3Ω		3.3		nS
Rise Time	t_r			4.8		nS
Turn-off Delay Time	$t_{d(off)}$			26		nS
Fall Time	t_f			4		nS
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=10V, I_D=6.9A		9.5	8.1	nC
Gate-to-Source Charge	Q_{gs}			1.5		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			3.0		nC
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.78	1.0	V

N-Channel Typical Characteristics at T_a=25^{0}C





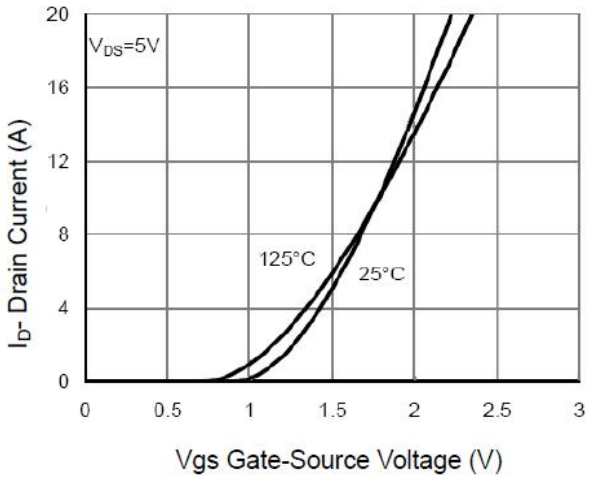


Figure 7 Transfer Characteristics

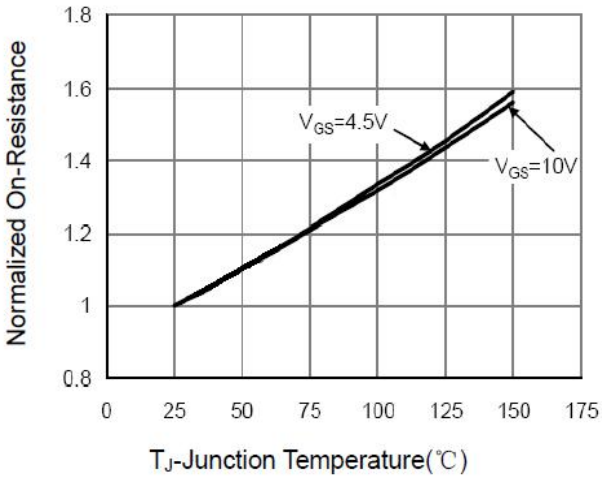


Figure 8 Drain-Source On-Resistance

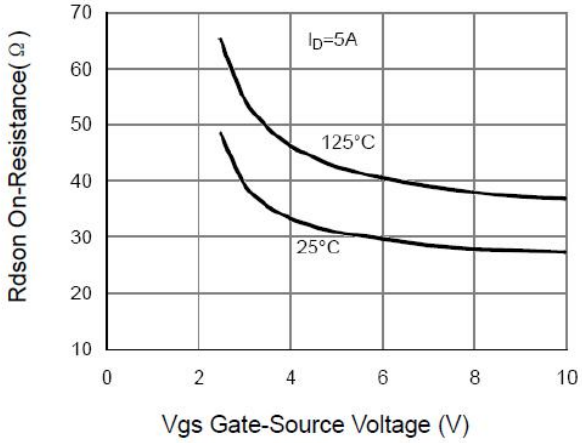


Figure 9 Rdson vs Vgs

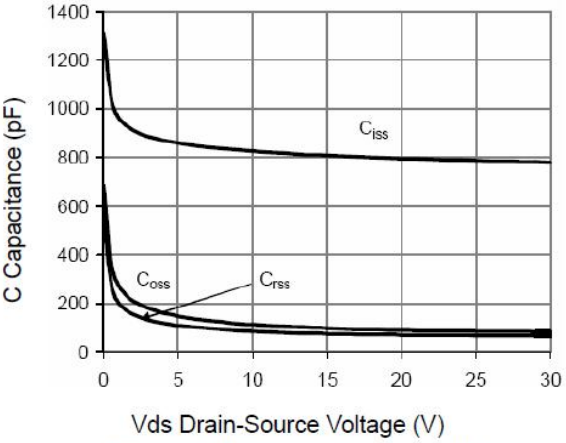


Figure 10 Capacitance vs Vds

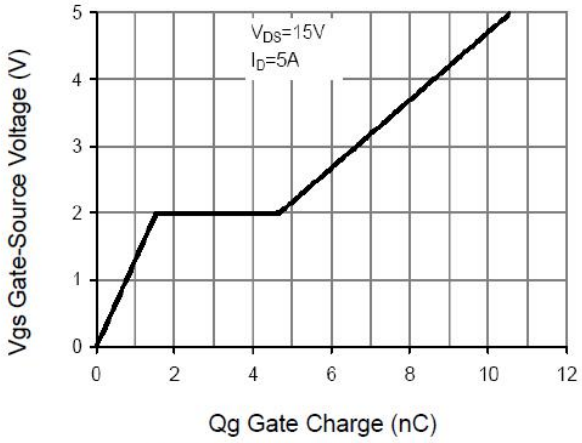


Figure 11 Gate Charge

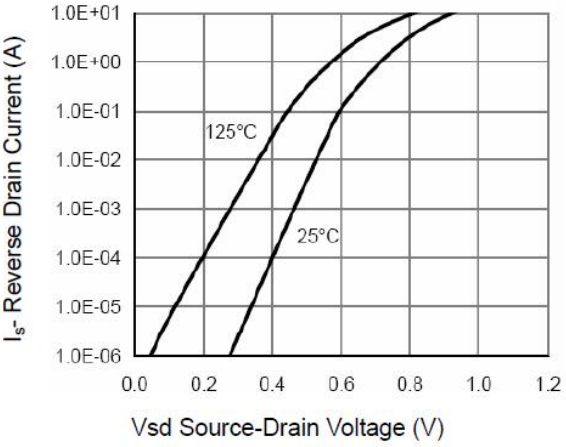


Figure 12 Source- Drain Diode Forward

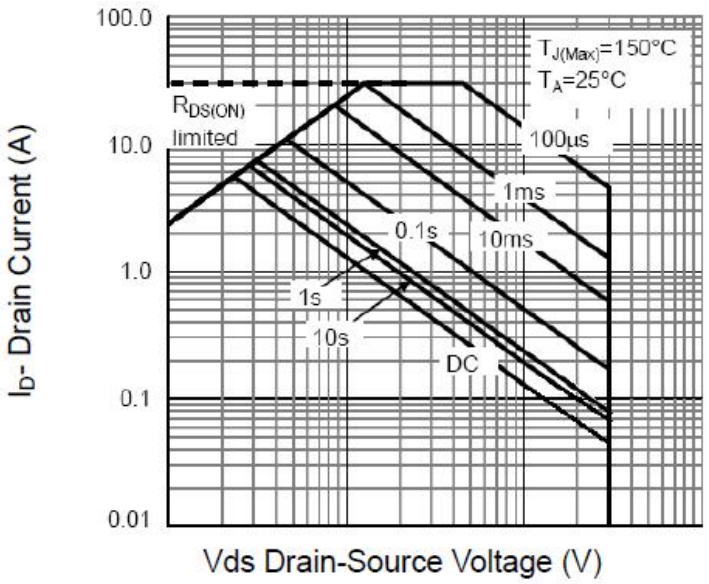
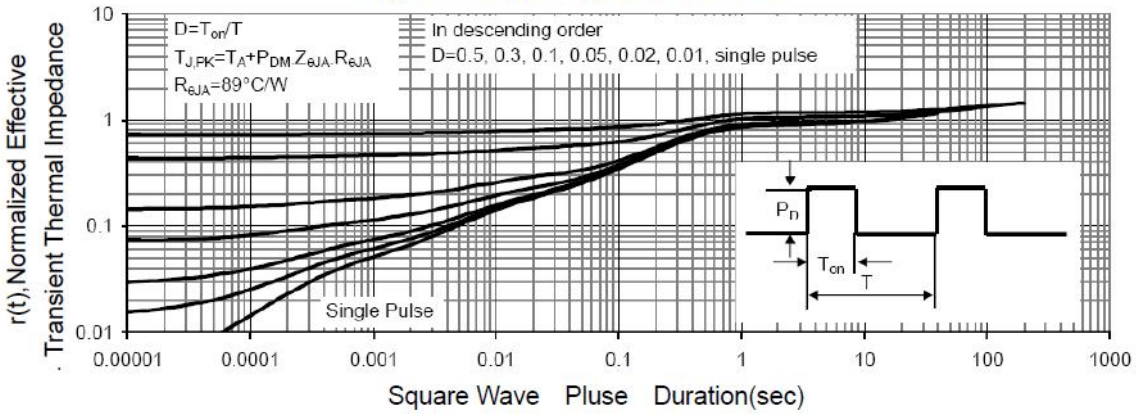


Figure 13 Safe Operation Area

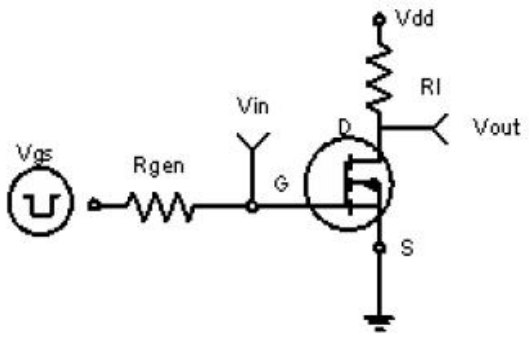


P-Channel Electrical Characteristics at T_a=25^{0}C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250uA, V_{GS}=0V	-30	-36		V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	uA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	-1.2	-1.45	-2.0	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	I_D=-6A, V_{GS}=-10V		45	50	mΩ
	$R_{DS(ON)}$	I_D=-5A, V_{GS}=-4.5V		60	68	mΩ
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		520	1100	pF
Output Capacitance	C_{oss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		130		pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		70		pF
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=2.7Ω,		7.		nS
Rise Time	t_r	R_{GEN}=3Ω		13		nS

Turn-off Delay Time	$t_{d(off)}$			14		nS
Fall Time	t_f			9		nS
Total Gate Charge	Q_g	V_{DS}=-15V, V_{GS}=-10V, I_D=-6A		11		nC
Gate-to-Source Charge	Q_{gs}			2.2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			3		nC
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0V		-0.78	-1.0	V

P-Channel Typical Characteristics at T_a=25^{0}C



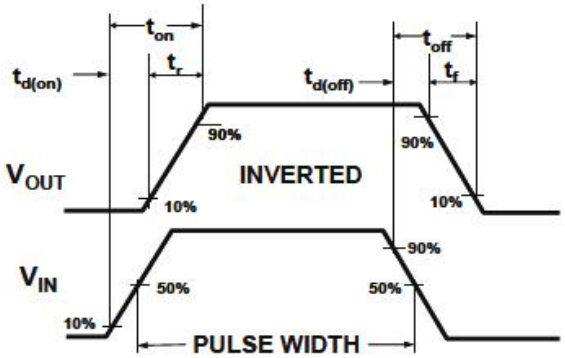


Figure 1:Switching Test Circuit

Figure 2:Switching Waveforms

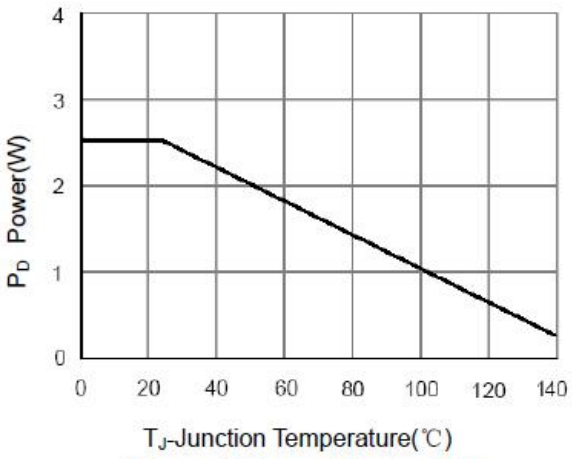


Figure 3 Power Dissipation

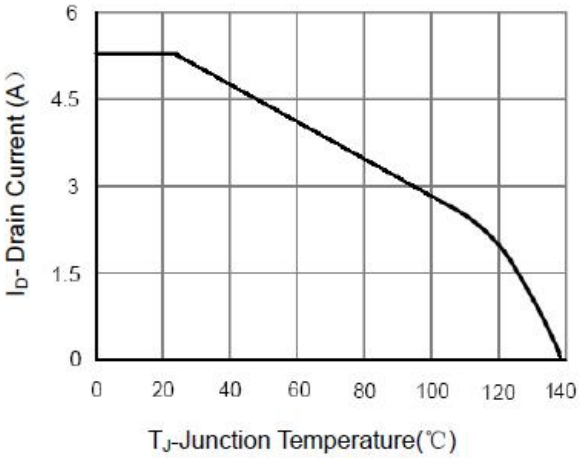


Figure 4 Drain Current

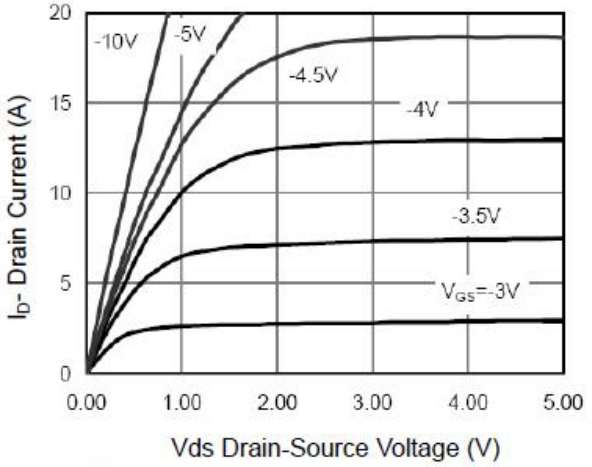


Figure 5 Output Characteristics

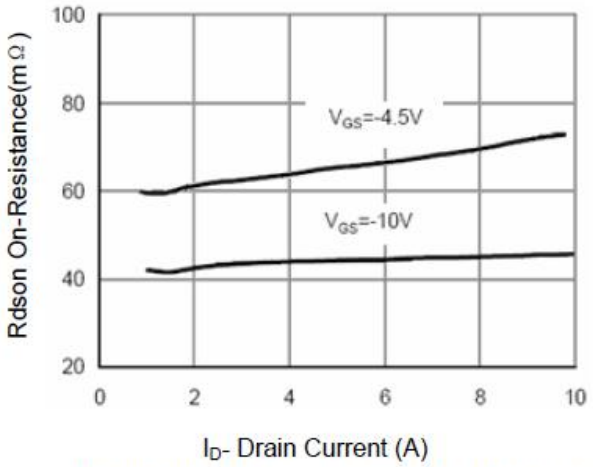


Figure 6 Drain-Source On-Resistance

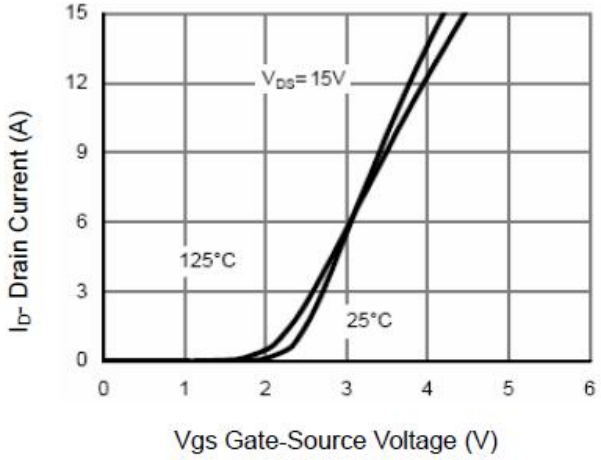


Figure 7 Transfer Characteristics

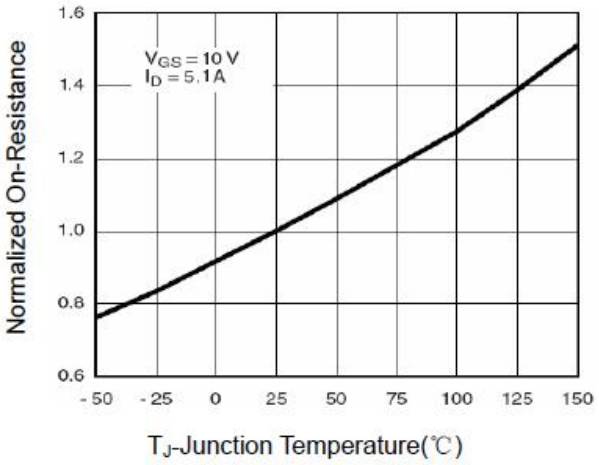
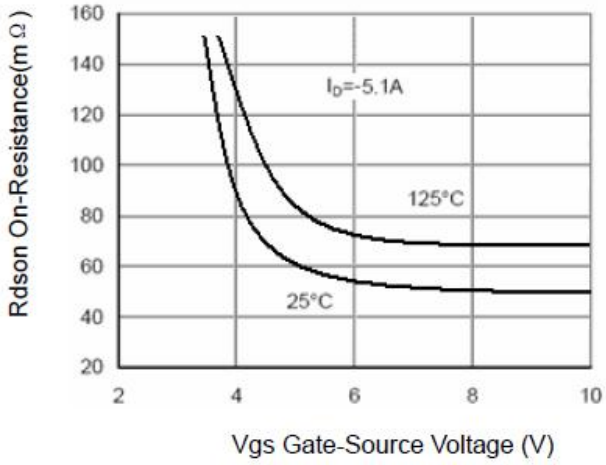


Figure 8 Drain-Source On-Resistance



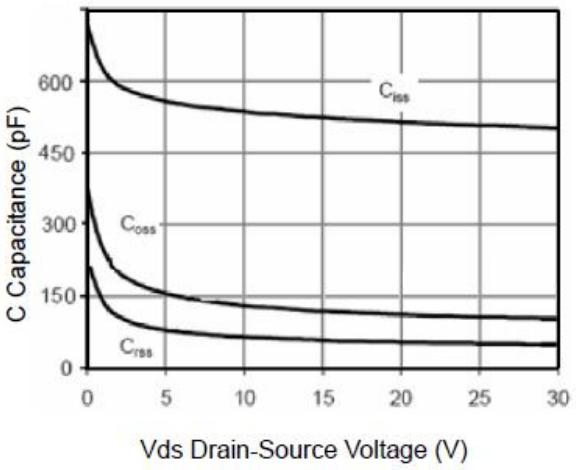


Figure 9 Rdson vs Vgs

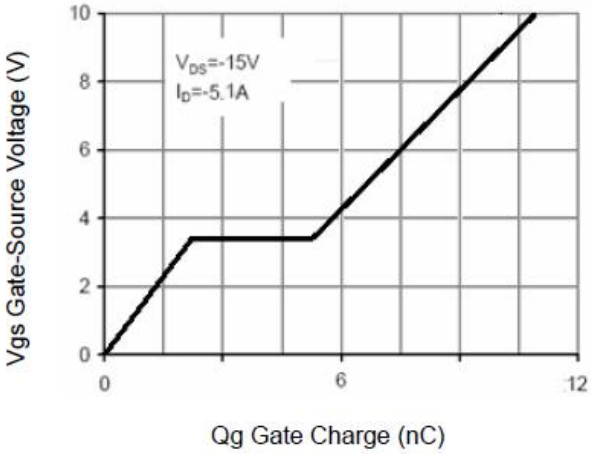


Figure 11 Gate Charge

Figure 10 Capacitance vs Vds

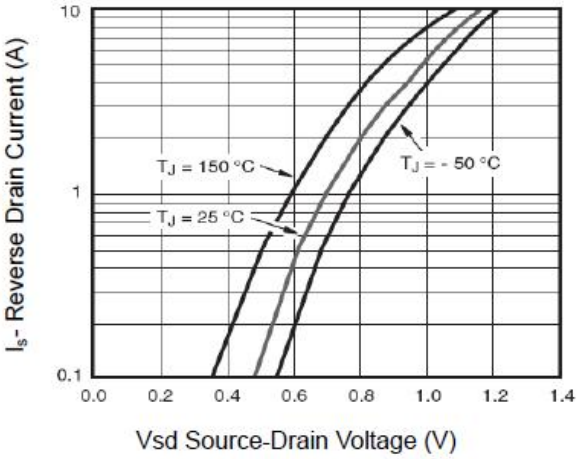


Figure 12 Source- Drain Diode Forward

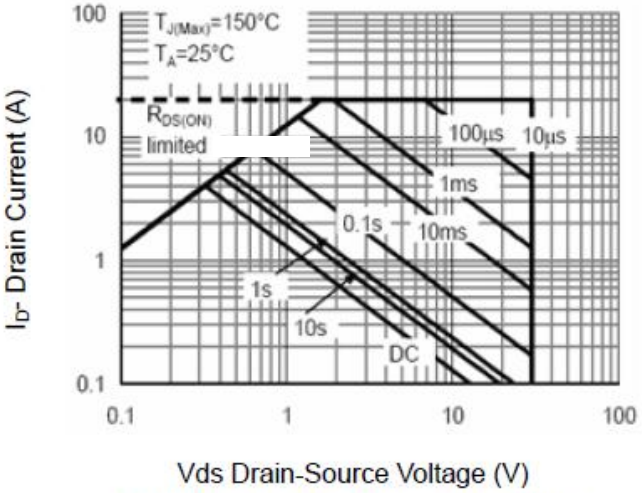


Figure 13 Safe Operation Area