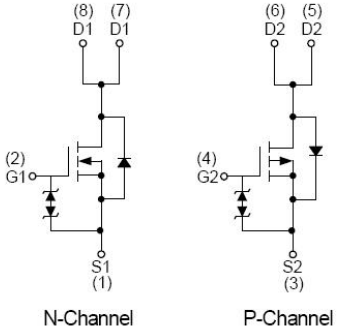
Si4626

Features

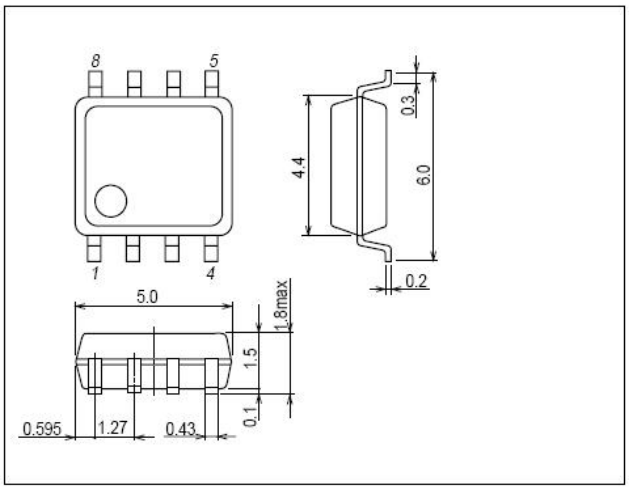
- Low On resistance.
- 2.5V drive.
- RoHS compliant.



Package Dimensions

unit : mm

SOP-8



Specifications

N-Channel

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

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		7	A
Drain Current (Pulse)	I_{DP}	PW≤10uS, duty cycle≤1%	30	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm^2×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm^2×0.8mm)	1.7	W
Channel Temperature	T_{ch}		150	^{0}C
Storage Temperature	T_{stg}		-55~+150	^{0}C

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	20	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	0.55	0.7	0.95	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	I_D=5A, V_{GS}=4.5V	-	12	15	mΩ
	$R_{DS(ON)}$	I_D=4A, V_{GS}=2.5V	-	14	18	mΩ
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	-	500	-	pF
Output Capacitance	C_{oss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	-	300	-	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	-	140	-	pF

Electrical Characteristics at T_a=25^{0}C (Continued)

Parameter	Symbol	Conditions	Ratings			Unit
			min	Typ	max	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V , R_L=1.35Ω, R_{GEN}=3Ω, V_{GEN}=5V	-	20	-	nS
Rise Time	t_r		-	19	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	65	-	nS
Fall Time	t_f		-	25	-	nS
Total Gate Charge	Q_g	V_{DS}=10V, V_{GS}=4.5V, I_D=5A	-	10	-	nC
Gate-to-Source Charge	Q_{gs}		-	2.3	-	nC
Gate-to-Drain “Miller” Charge	Q_{gd}		-	2.9	-	nC
Diode Forward Voltage	V_{SD}	I_S=1.7A, V_{GS}=0V	-	0.76	1.2	V

Typical Characteristics at T_a=25^{0}C

Figure1. Power Dissipation

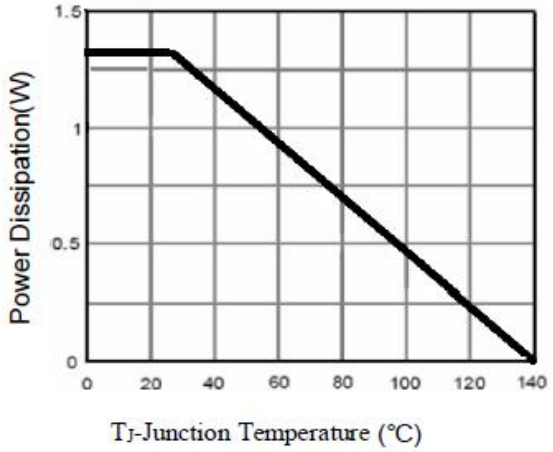


Figure2. Drain Current

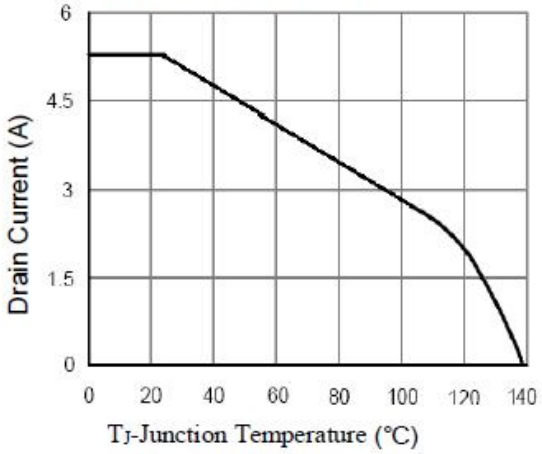


Figure3. Output Characteristics

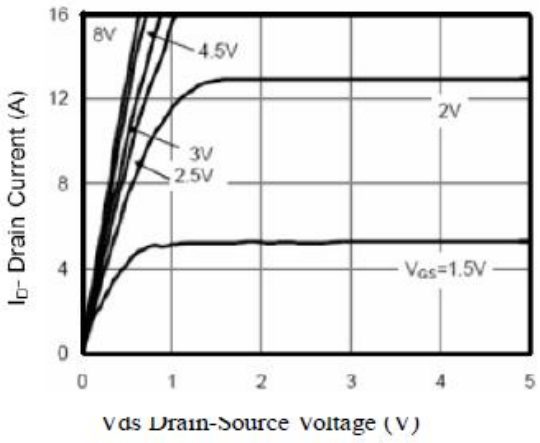


Figure4. Transfer Characteristics

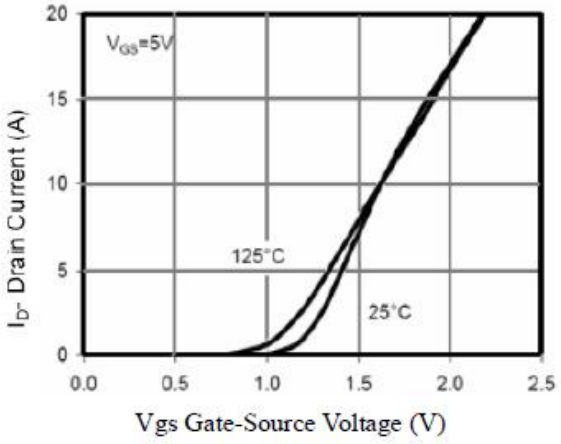


Figure5. Capacitance

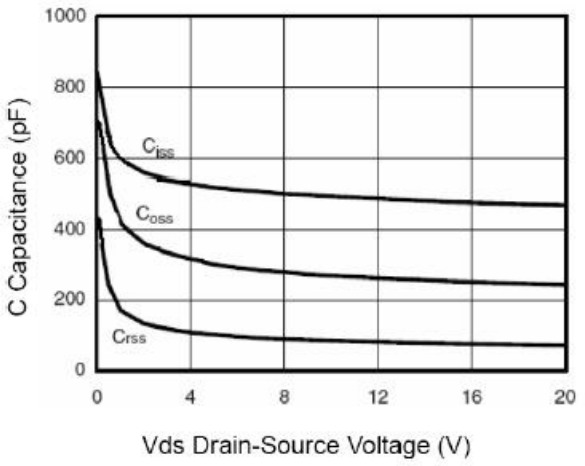


Figure6. $R_{DS(ON)}$ vs Junction Temperature

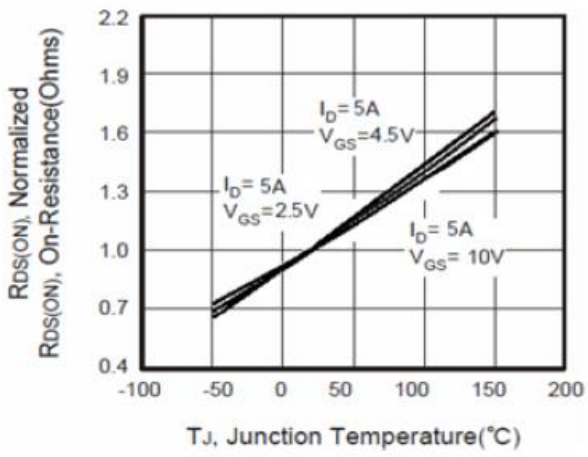


Figure7. Max BV_{DSS} vs Junction Temperature

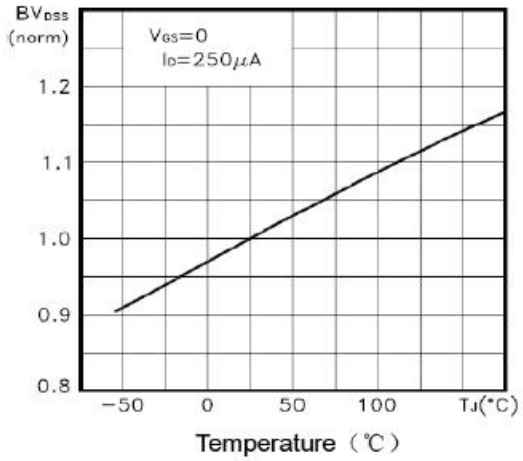


Figure8. $V_{GS(th)}$ vs Junction Temperature

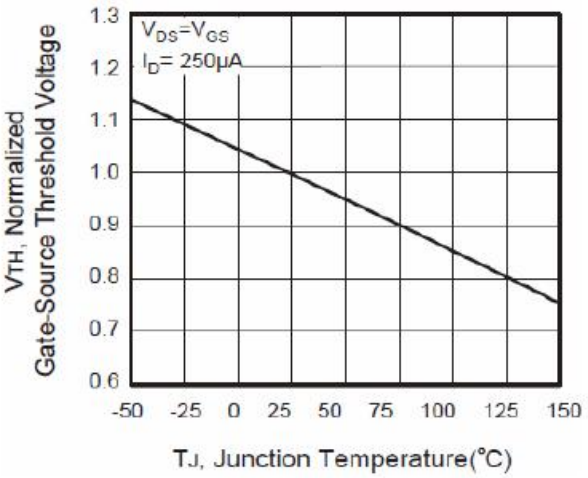


Figure9. Gate Charge Waveforms

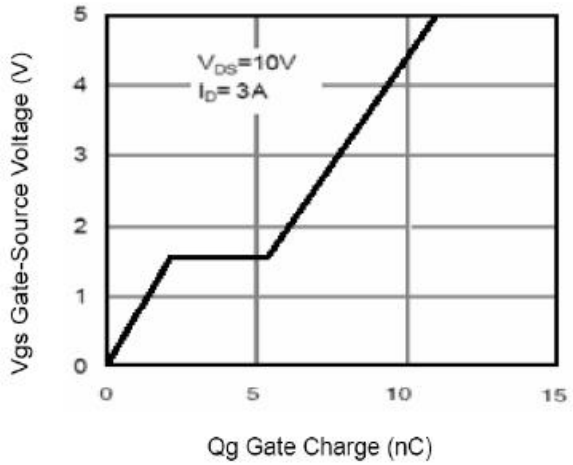


Figure10. Maximum Safe Operating Area

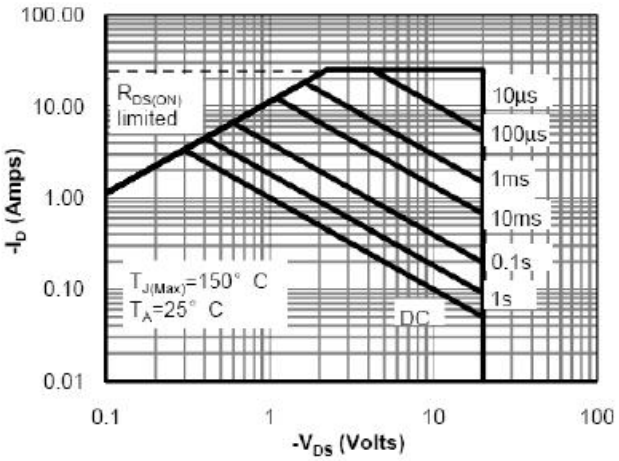
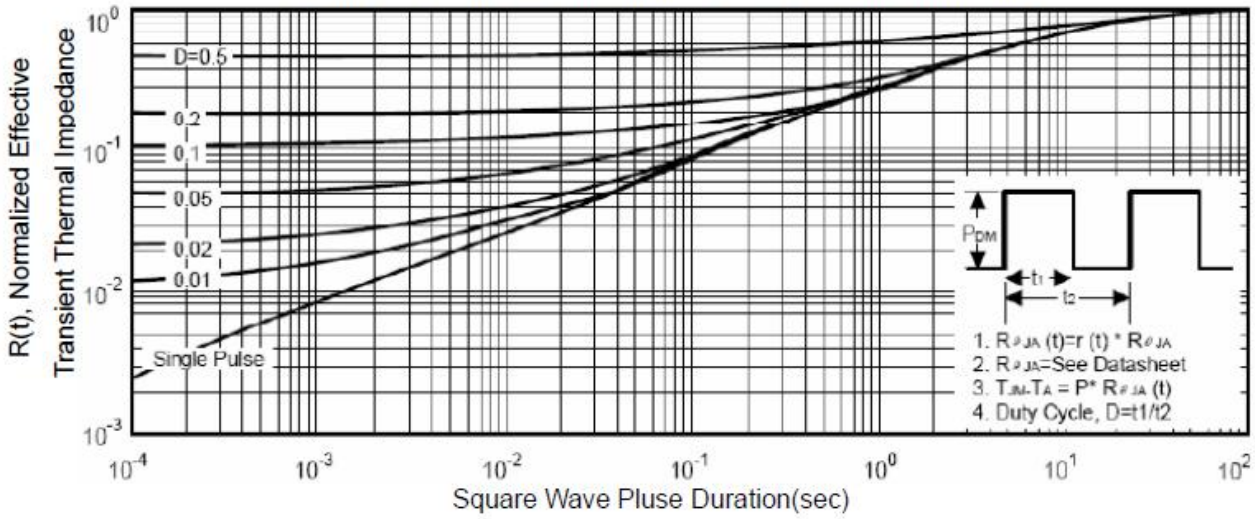


Figure11. Normalized Maximum Transient Thermal Impedance



Specifications

P-Channel

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		-18	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		-7	A
Drain Current (Pulse)	I_{DP}	PW≤10uS, duty cycle≤1%	-40	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm²×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm²×0.8mm)	1.7	W
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		-55~+150	°C

Electrical Characteristics at T_a=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250uA, V_{GS}=0V	-18	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	uA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250uA	-0.5	-0.7	-1.4	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	I_D=-5A, V_{GS}=-4.5V	-	25	32	mΩ
	$R_{DS(ON)}$	I_D=-4A, V_{GS}=-2.5V	-	35	46	mΩ
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	740	-	pF
Output Capacitance	C_{oss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	290	-	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	190	-	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V , I_D=-1A, R_{GEN}=6Ω, V_{GEN}=-4.5V	-	12	-	nS
Rise Time	t_r		-	35	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	30	-	nS
Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-5A	-	7.8	-	nC

Gate-to-Source Charge	Q_{gs}		-	1.2	-	nC
Gate-to-Drain “Miller” Charge	Q_{gd}		-	1.6	-	nC
Diode Forward Voltage	V_{SD}	I_S=-1.7A, V_{GS}=0V	-	-0.8	-1.2	V

Typical Characteristics at T_a=25^{0}C

Figure 1:Switching Test Circuit

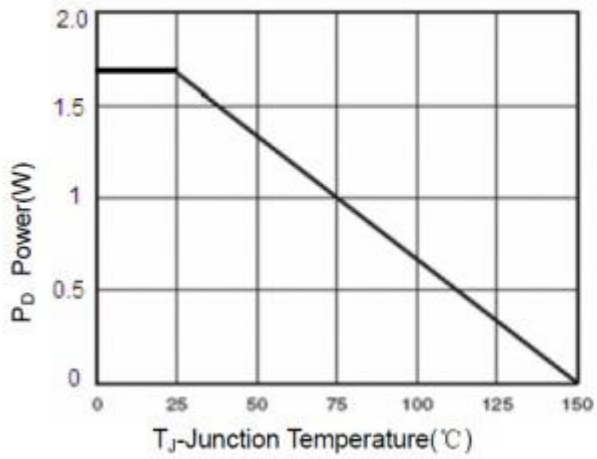


Figure 2:Switching Waveforms

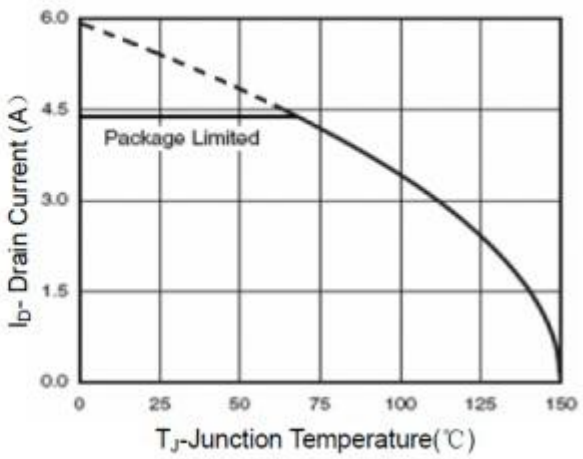


Figure 3 Power Dissipation

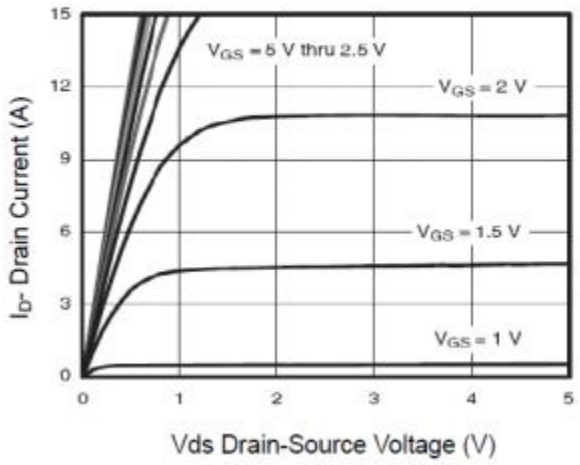


Figure 4 Drain Current

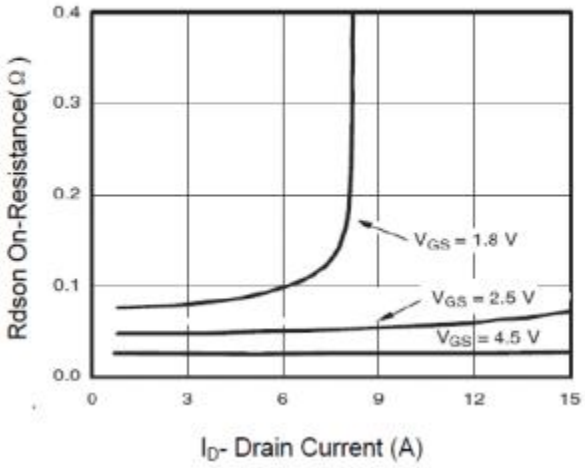


Figure 5 Output Characteristics

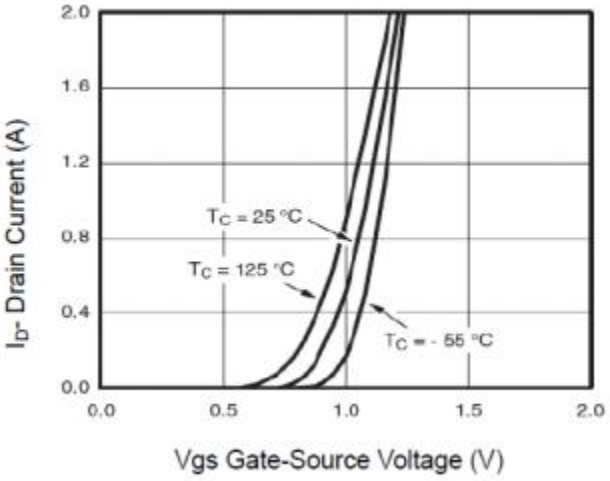


Figure 6 Drain-Source On-Resistance

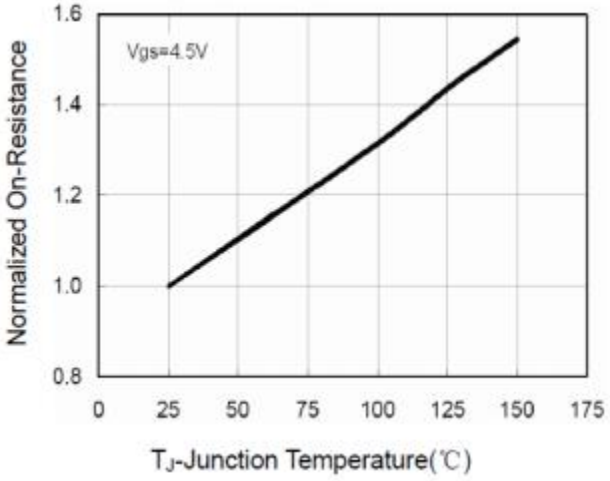


Figure 7 Transfer Characteristics

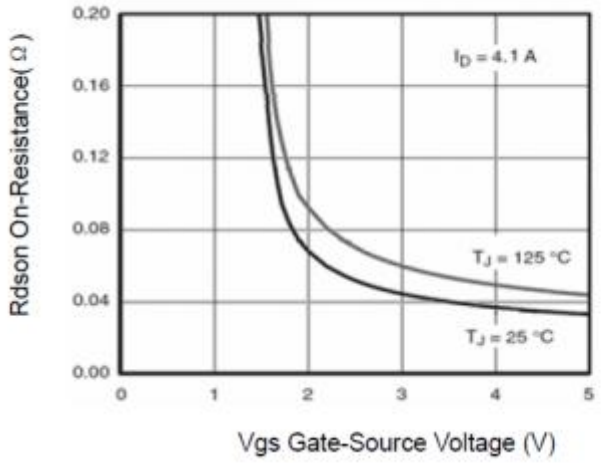


Figure 8 Drain-Source On-Resistance

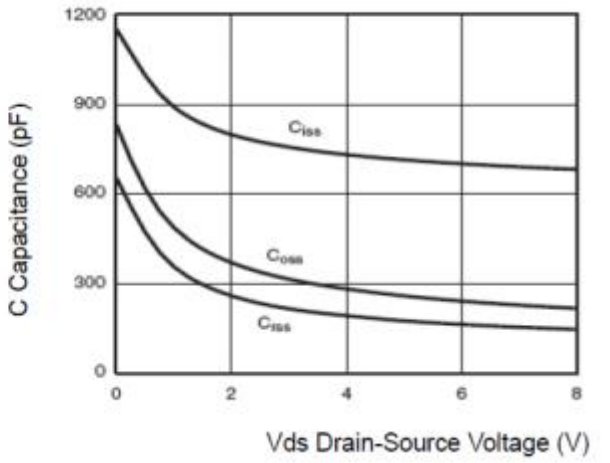


Figure 9 Rdson vs Vgs

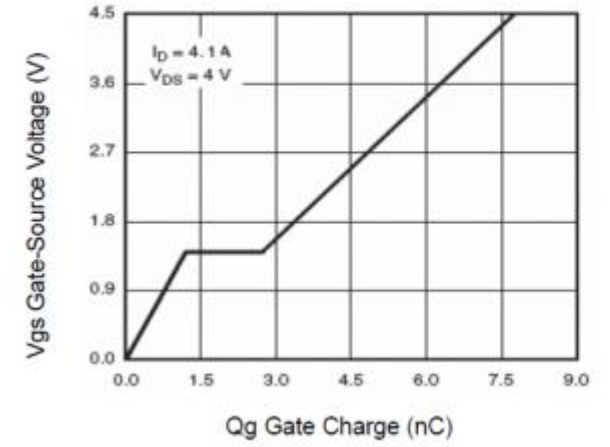


Figure 10 Capacitance vs Vds

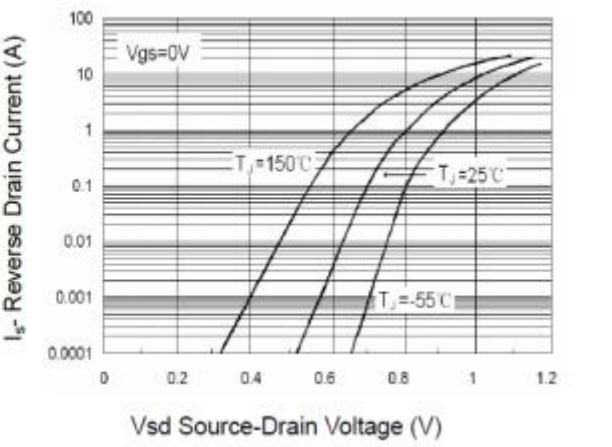


Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

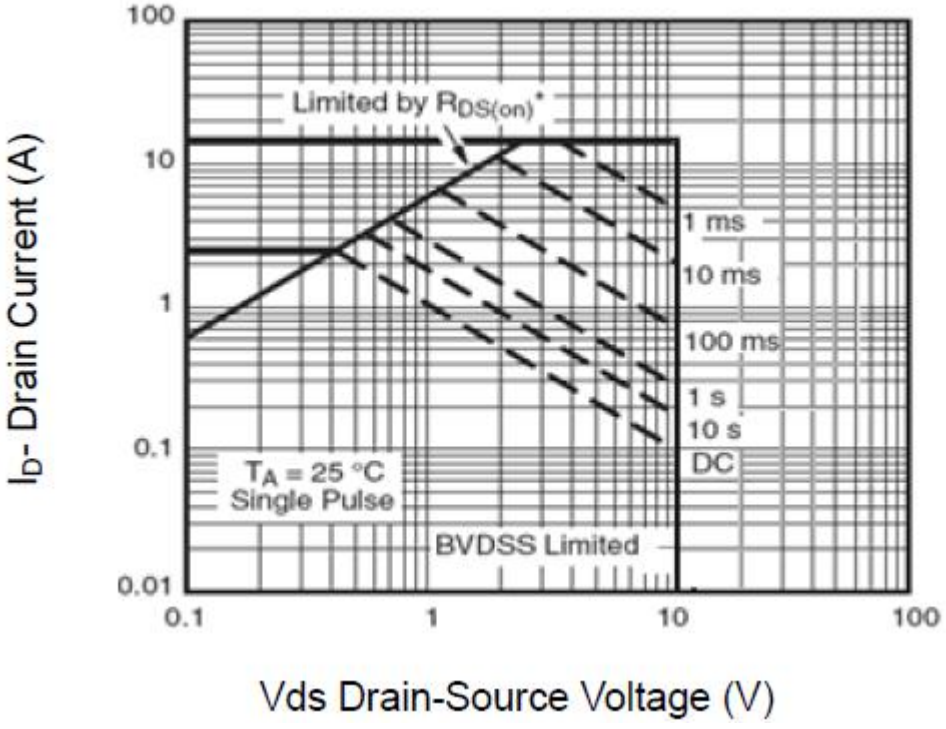


Figure 13 Safe Operation Area