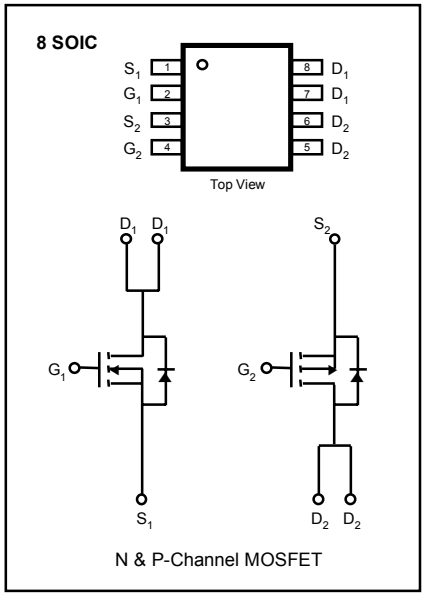
FEATURES

- Lower $R_{DS(ON)}$
- Improved Inductive Ruggedness
- Fast Swtching Times
- Low Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability



Product Summary

SSD2004	BVdss	Rds(on)	I_D
N-Channel	20V	0.125Ω	3.0A
P-Channel	-20V	0.20Ω	-2.5A

Absolute Maximum Ratings

Symbol	Characteristic	N-Channel	P-Channel	Units
V_{DSS}	Drain-to-Source Voltage	20	-20	V
I_D	Continuous Drain Current T_A=25℃	3.0	-2.5	A
	Continuous Drain Current T_A=70℃	2.5	-2.0	
I_{DM}	Drain Current-Pulsed ①	10.0	-10.0	A
V_{GS}	Gate-to-Source Voltage	±20	±20	V
P_D	Total Power Dissipation (T_A=25℃)	2.0		W
	(T_A=70℃)	1.3		
T_J , T_{STG}	Operating and Junction Storage Temperature Range	- 55 to +150		℃

Thermal Resistance

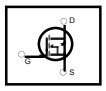
Symbol	Characteristic	Typ.	Max.	Units
$R_{\Theta JA}$	Junction-to-Ambient	--	62.5	℃/W

(N-Channel)

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	20	--	--	V	V_{GS}=0V,I_D=250μA
$V_{GS(th)}$	Gate Threshold Voltage	1.0	--	--	V	V_{DS}= 5V ,I_D=250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	100	nA	V_{GS}=20V
	Gate-Source Leakage , Reverse	--	--	-100	nA	V_{GS}=-20V
I_{DSS}	Drain-to-Source Leakage Current	--	--	2.0	μA	V_{DS}=16V
		--	--	25		V_{DS}=16V,T_C=55℃
I_{DON}	On-State Drain-Source Current	10	--	--	A	V_{DS}=5V ,V_{GS}=10V
$R_{DS(on)}$	Static Drain-Source	--	0.031	0.125	Ω	V_{GS}=10V,I_D=1.0A
	On-State Resistance ②	--	0.042	0.25		V_{GS}=4.5V,I_D=0.5A
g_{fs}	Forward Transconductance ②	--	8.0	--	℧	V_{DS} =15V,I_D=3.0A
$t_{d(on)}$	Turn-On Delay Time	--	13	15	ns	V_{DD}=20V,I_D=1.0A, R_0=6.0Ω, ②③
t_r	Rise Time	--	16	20		
$t_{d(off)}$	Turn-Off Delay Time	--	38	50		
t_f	Fall Time	--	24	50		
Q_g	Total Gate Charge	--	18	25	nC	V_{DS}=10V,V_{GS}=10V, I_D=2.3A ②③
Q_{gs}	Gate-Source Charge	--	2.4	--		
Q_{gd}	Gate-Drain(" Miller ") Charge	--	3.8	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current (Body Diode)	--	--	1.25	A	Modified MOSFET Symbol Showing the Integral Reverse P-N Junction Rectifier 
V_{SD}	Diode Forward Voltage ②	--	--	1.2	V	T_A=25℃,I_S=1.25A,V_{GS}=0V
t_{rr}	Reverse Recovery Time ②	--	100	--	ns	T_A=25℃,I_F=1.25A,di_F/dt=100A/μs

Notes ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② Pulse Test : Pulse Width = 250μs, Duty Cycle ≤ 2%

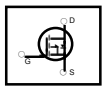
③ Essentially Independent of Operating Temperature

(P-Channel)

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	-20	--	--	V	V_{GS}=0V,I_D=-250μA
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	--	--	V	V_{DS}= -5V ,I_D=-250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	-100	nA	V_{GS}=-20V
	Gate-Source Leakage , Reverse	--	--	100	nA	V_{GS}=20V
I_{DSS}	Drain-to-Source Leakage Current	--	--	-2.0	μA	V_{DS}=-16V
		--	--	-25		V_{DS}=-16V,T_C=55℃
I_{DON}	On-State Drain-Source Current	-2.3	--	--	A	V_{DS}=-5V ,V_{GS}=-10V
$R_{DS(on)}$	Static Drain-Source	--	0.08	0.25	Ω	V_{GS}=-10V,I_D=-1.0A
	On-State Resistance ②	--	0.11	0.35		V_{GS}=-4.5V,I_D=-0.5A
g_{fs}	Forward Transconductance ②	--	5.0	--	℧	V_{DS} =-15V,I_D=-3.0A
$t_{d(on)}$	Turn-On Delay Time	--	17	40	ns	V_{DD}=-20V,I_D=-1.0A, R_0=6.0Ω, ②③
t_r	Rise Time	--	17	40		
$t_{d(off)}$	Turn-Off Delay Time	--	33	90		
t_f	Fall Time	--	19	50		
Q_g	Total Gate Charge	--	17	25	nC	V_{DS}=-10V,V_{GS}=-10V, I_D=-2.3A ②③
Q_{gs}	Gate-Source Charge	--	3.3	--		
Q_{gd}	Gate-Drain(" Miller ") Charge	--	3.6	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current (Body Diode)	--	-- -- --	-1.25	A	Modified MOSFET Symbol Showing the Integral Reverse P-N Junction Rectifier 
V_{SD}	Diode Forward Voltage ②	--	--	-1.6	V	T_A=25℃,I_S=-1.25A,V_{GS}=0V
t_{rr}	Reverse Recovery Time ②	--	100	--	ns	T_A=25℃,I_F=-1.25A,di_F/dt=100A/μs

Notes ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
② Pulse Test : Pulse Width = 250μs, Duty Cycle ≤ 2%
③ Essentially Independent of Operating Temperature

(N-Channel)

Fig 1. Output Characteristics

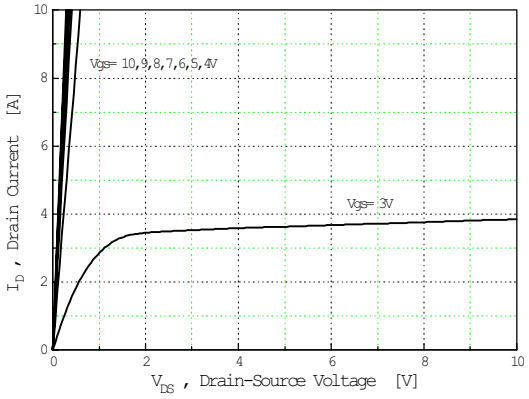


Fig 2. Transfer Characteristics

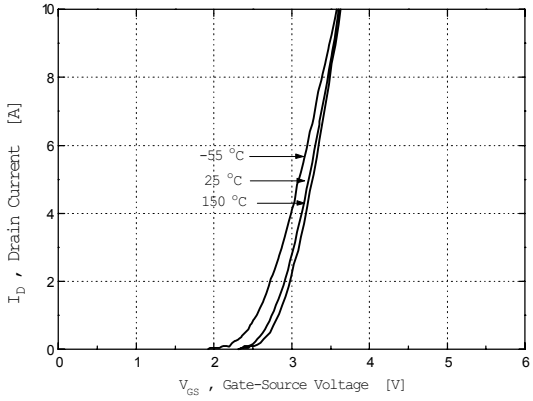


Fig 3. On-Resistance vs. Drain Current

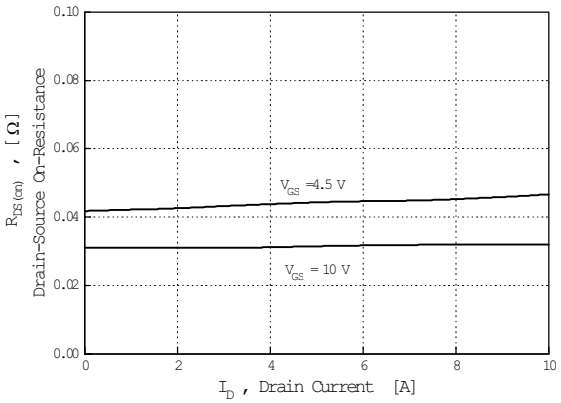


Fig 4. Source-Drain Forward Voltage

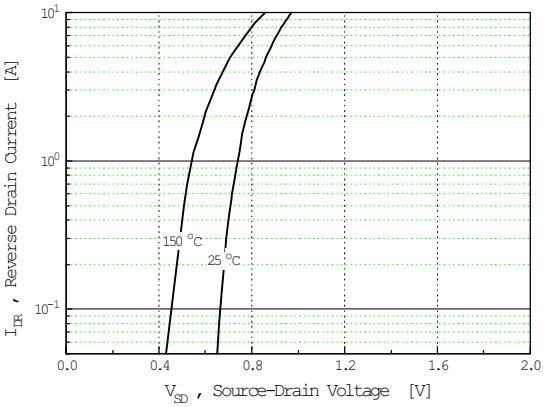


Fig 5. Capacitance vs. Drain-Source Voltage

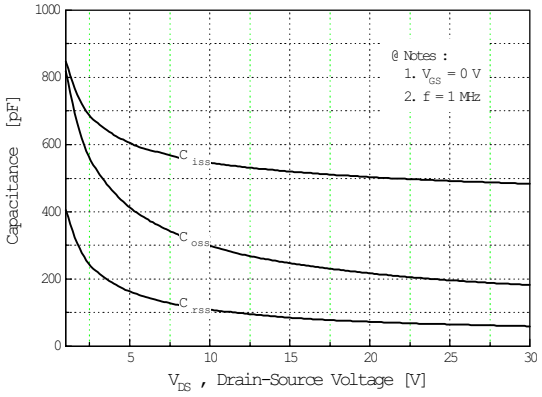
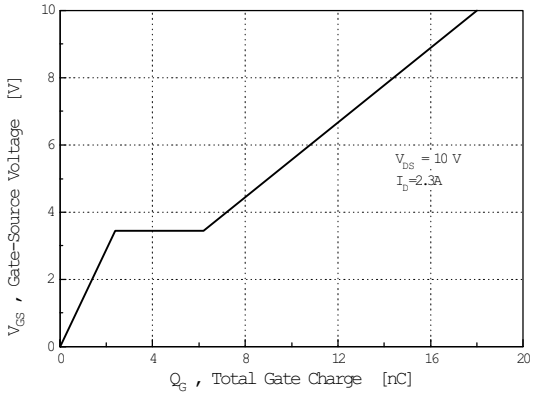


Fig 6. Gate Charge vs. Gate-Source Voltage



(N-Channel)

Fig 7. Breakdown Voltage vs. Temperature

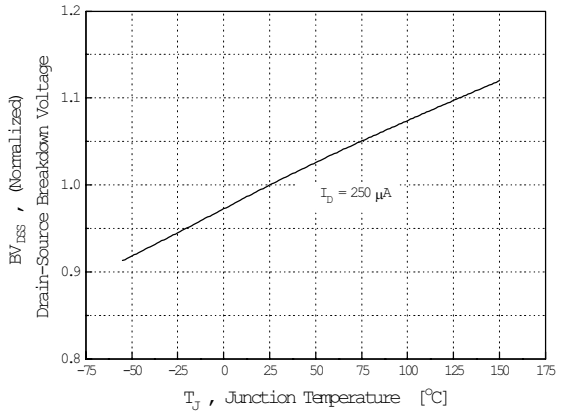


Fig 8. On-Resistance vs. Temperature

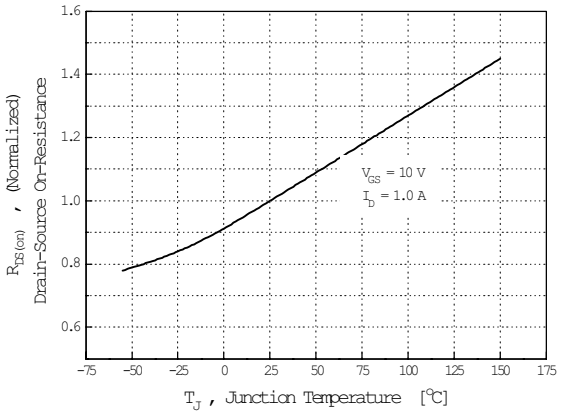
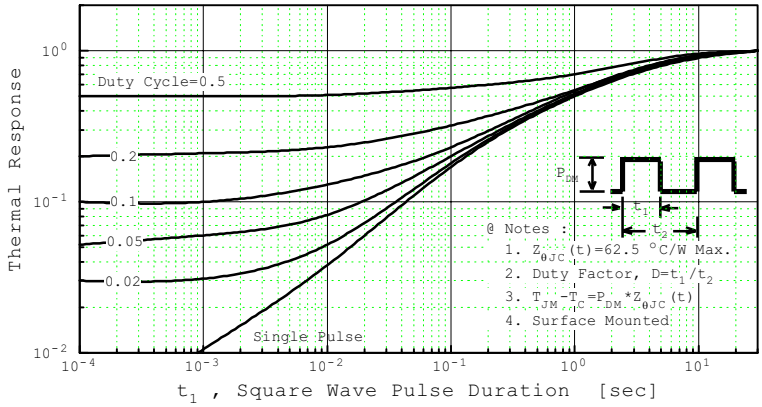


Fig 9. Nomalized Effective Transient Thermal Impedance, Junction-to-Ambient



(P-Channel)

Fig 1. Output Characteristics

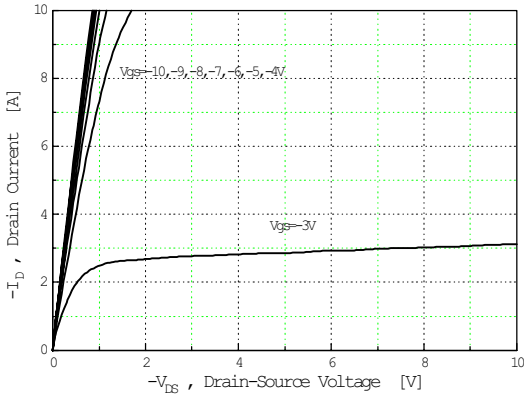


Fig 2. Transfer Characteristics

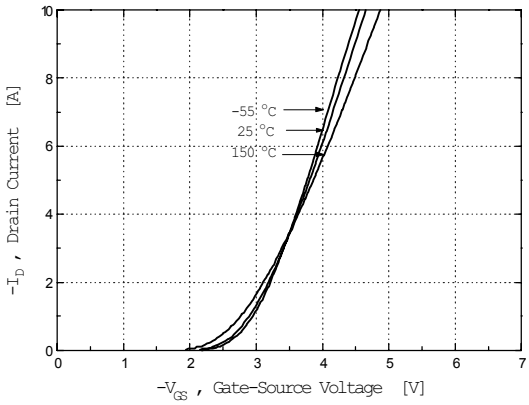


Fig 3. On-Resistance vs. Drain Current

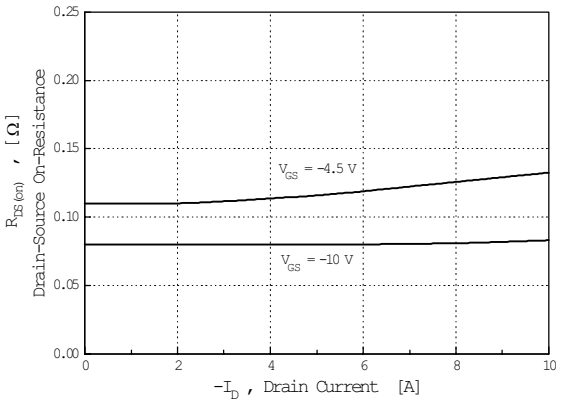


Fig 4. Source-Drain Forward Voltage

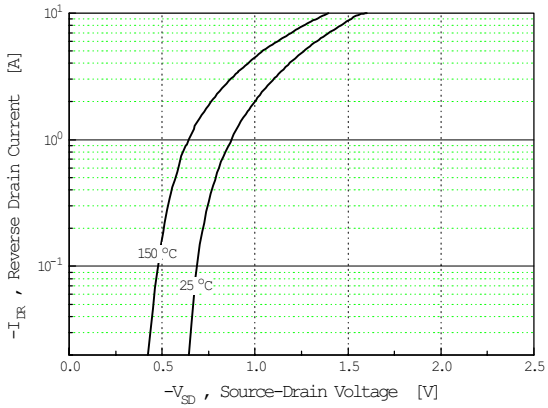


Fig 5. Capacitance vs. Drain-Source Voltage

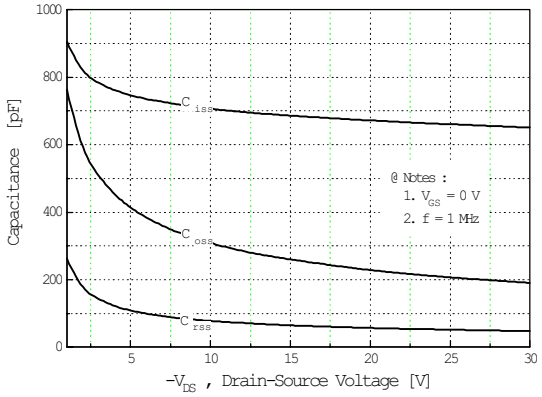
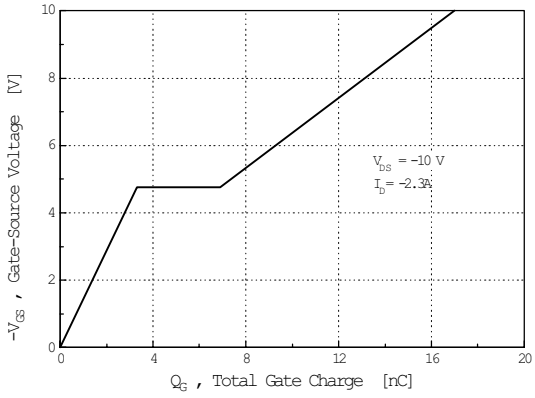


Fig 6. Gate Charge vs. Gate-Source Voltage



(P-Channel)

Fig 7. Breakdown Voltage vs. Temperature

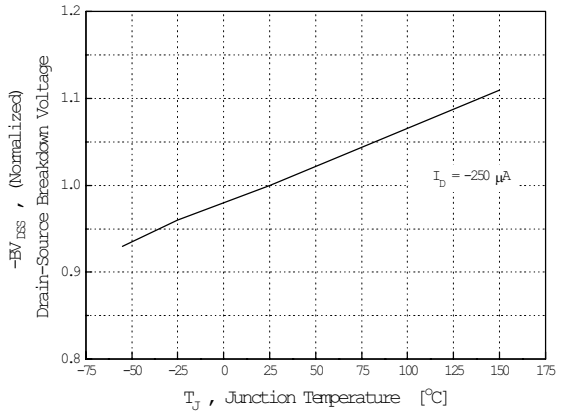


Fig 8. On-Resistance vs. Temperature

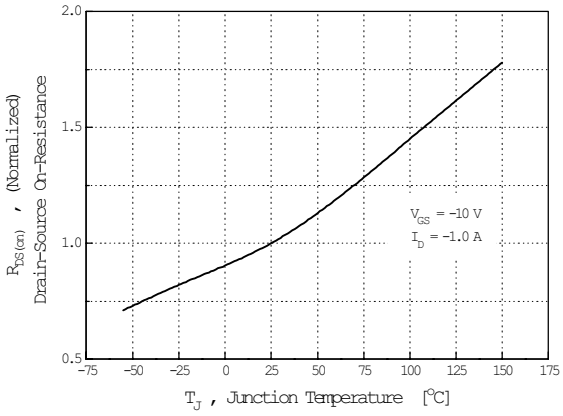


Fig 9. Nomalized Effective Transient Thermal Impedance, Junction-to-Ambient