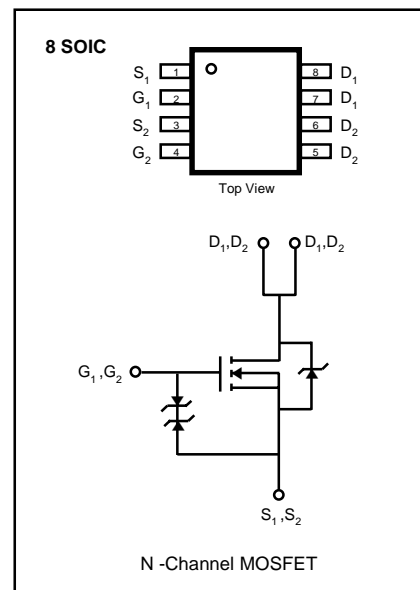


## FEATURES

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

## Product Summary

Part Number	$BV_{DSS}$	$R_{DS(on)}$	$I_D$
SSD2009	50V	0.13 $\Omega$	3.0A



## Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	50	V
$I_D$	Continuous Drain Current $T_A=25^\circ\text{C}$	3.0	A
	Continuous Drain Current $T_A=70^\circ\text{C}$	2.3	
$I_{DM}$	Drain Current-Pulsed <sup>①</sup>	10.0	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$P_D$	Total Power Dissipation ( $T_A=25^\circ\text{C}$ )	2.0	W
	( $T_A=70^\circ\text{C}$ )	1.3	
$T_J, T_{STG}$	Operating and Junction Storage Temperature Range	- 55 to +150	$^\circ\text{C}$


## Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	$^\circ\text{C/W}$

### Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	50	--	--	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	1.0	--	3.0	V	V <sub>DS</sub> =5V, I <sub>D</sub> =250μA
I <sub>GSS</sub>	Gate-Source Leakage, Forward	--	--	100	nA	V <sub>GS</sub> =20V
	Gate-Source Leakage, Reverse	--	--	-100	nA	V <sub>GS</sub> =-20V
I <sub>DSS</sub>	Drain-to-Source Leakage Current	--	--	2.0	μA	V <sub>DS</sub> =40V
		--	--	25		V <sub>DS</sub> =40V, T <sub>C</sub> =55°C
I <sub>DON</sub>	On-State Drain-Source Current	10	--	--	A	V <sub>DS</sub> =5V, V <sub>GS</sub> =10V
R <sub>DS(on)</sub>	Static Drain-Source	--	0.065	0.13	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =3.0A
	On-State Resistance ②	--	0.084	0.2		V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.5A
g <sub>fs</sub>	Forward Transconductance ②	--	7.0	--	S	V <sub>DS</sub> =15V, I <sub>D</sub> =3.0A
t <sub>d(on)</sub>	Turn-On Delay Time	--	16	20	ns	V <sub>DD</sub> =25V, I <sub>D</sub> =1.0A, R <sub>θ</sub> =6.0Ω, ②③
t <sub>r</sub>	Rise Time	--	16	20		
t <sub>d(off)</sub>	Turn-Off Delay Time	--	40	70		
t <sub>f</sub>	Fall Time	--	23	50		
Q <sub>g</sub>	Total Gate Charge	--	17	25	nC	V <sub>DS</sub> =25V, V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A ②③
Q <sub>gs</sub>	Gate-Source Charge	--	1.8	--		
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	--	3.9	--		

### Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I <sub>S</sub>	Continuous Source Current (Body Diode)	--	--	2.0	A	Modified MOSFET Symbol Showing the Integral Reverse P-N Junction Rectifier 
V <sub>SD</sub>	Diode Forward Voltage ②	--	--	1.2	V	T <sub>A</sub> =25°C, I <sub>S</sub> =1.5A, V <sub>GS</sub> =0V
t <sub>rr</sub>	Reverse Recovery Time ②	--	100	--	ns	T <sub>A</sub> =25°C, I <sub>F</sub> =1.5A, di <sub>F</sub> /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

Fig 1. Output Characteristics

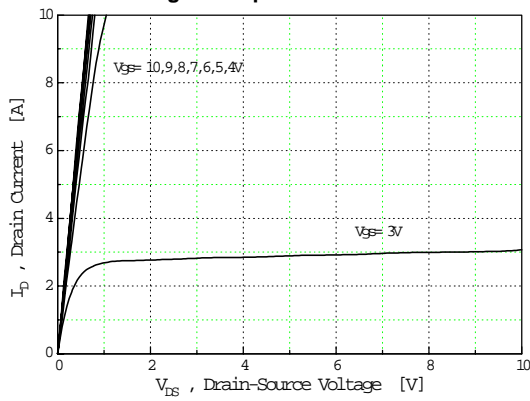


Fig 2. Transfer Characteristics

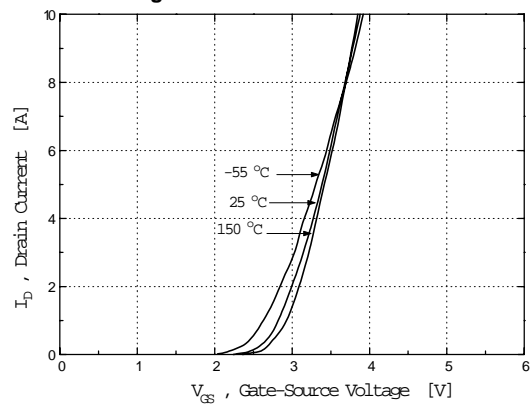


Fig 3. On-Resistance vs. Drain Current

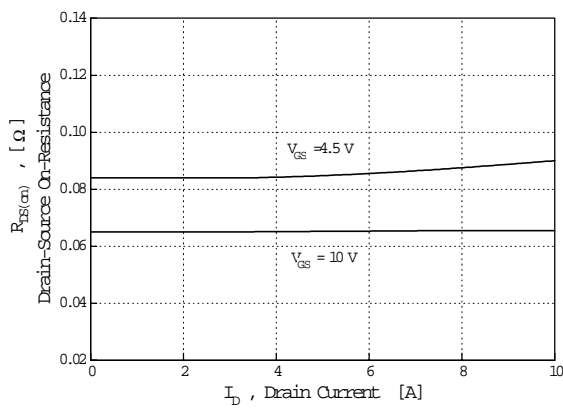


Fig 4. Source-Drain Forward Voltage

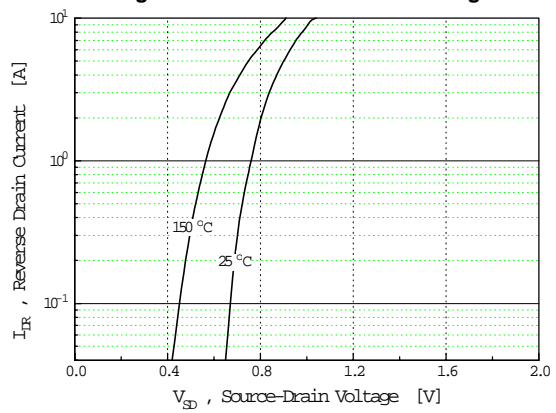


Fig 5. Capacitance vs. Drain-Source Voltage

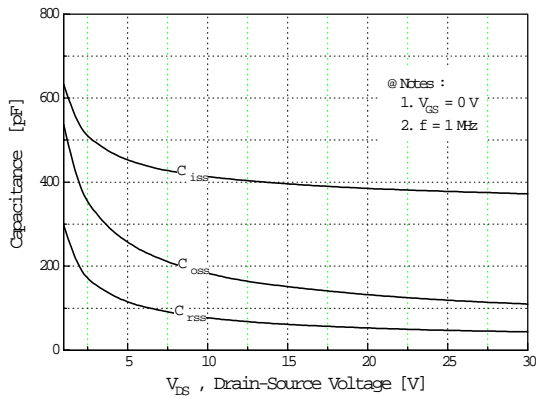
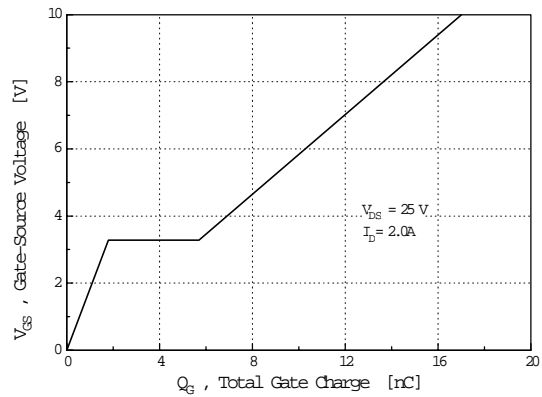
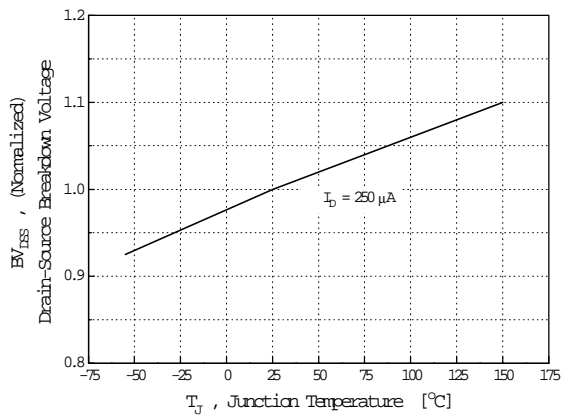


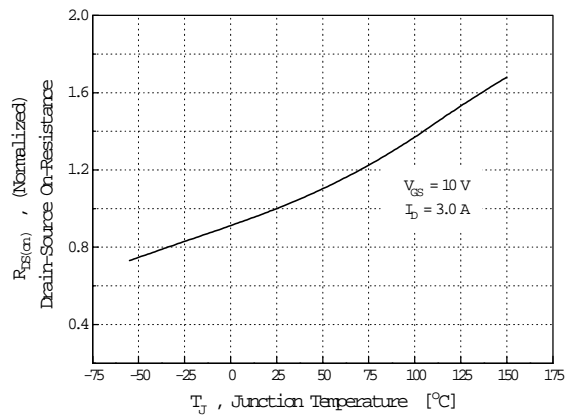
Fig 6. Gate Charge vs. Gate-Source Voltage



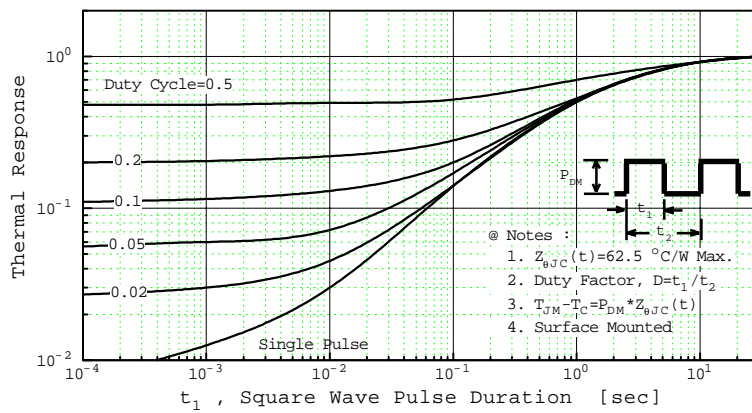
**Fig 7. Breakdown Voltage vs. Temperature**



**Fig 8. On-Resistance vs. Temperature**



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



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E <sup>2</sup> CMOS <sup>™</sup>	ISOPLANAR <sup>™</sup>	QFET <sup>™</sup>	SuperSOT <sup>™</sup> -8	
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