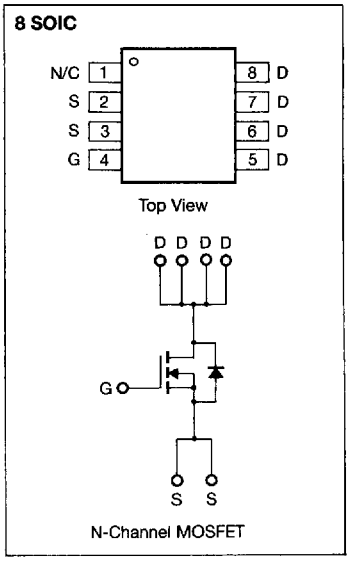
FEATURES

- **Lower $R_{DS(ON)}$**
- **Improved inductive ruggedness**
- **Fast switching times**
- **Rugged polysilicon gate cell structure**
- **Lower input capacitance**
- **Extended safe operating area**
- **Improved high temperature reliability**



PRODUCT SUMMARY

Part Number	V_{DS}	$R_{DS(on)}$	I_D
SSD2101	30V	0.03Ω	7.0A

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSD2101	Unit
Drain-Source Voltage (1)	V_{DSS}	30	Vdc
Drain-Gate Voltage (R_{GS}=1.0MΩ)(1)	V_{DGR}	30	Vdc
Gate-Source Voltage	V_{GS}	±20	Vdc
Continuous Drain Current T_A=25 °C	I_D	7.0	Adc
Continuous Drain Current T_A=70°C	I_D	5.8	Adc
Drain Current - Pulsed (3)	I_{DM}	20.0	Adc
Total Power Dissipation at T_A=25 °C	P_D	2.5	Watts
T_A=70°C		1.6	W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by junction temperature

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

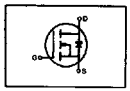
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	Gate Threshold Voltage	1.0	-	-	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	Gate-Source Leakage Forward	-	-	100	nA	V_{GS}=20V
I_{GSS}	Gate-Source Leakage Reverse	-	-	-100	nA	V_{GS}=-20V
I_{DSS}	Zero Gate Voltage Drain Current	-	-	2.0	μA	V_{DS}=24V, V_{GS}=0V
		-	-	25	μA	V_{DS}=24V, V_{GS}=0V, T_J=55°C
$I_{D(on)}$	On-State Drain-Source Current	20	-	-	A	V_{DS}=5V, V_{GS}=10V
$R_{DS(on)}$	Static Drain-Source On-Resistance(2)	-	-	0.03	Ω	V_{GS}=10V, I_D=7.0A
		-	-	0.05	Ω	V_{DS}=4.5V, I_D=3.5A
g_{fs}	Forward Transconductance (2)	-	14	-	Ʊ	V_{DS}≥15V, I_D=7.0A
$t_{d(on)}$	Turn-On Delay Time	-	-	30	ns	V_{DD}=25V, I_D=1.0A, Z_O=6.0Ω
t_r	Rise Time	-	-	60	ns	(MOSFET switching times are essentially
$t_{d(off)}$	Turn-Off Delay Time	-	-	150	ns	independent of operating temperature)
t_f	Fall Time	-	-	140	ns	
Q_g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	50	nC	V_{GS}=10V, I_D=2.0A, V_{DS}=15V (Gate charge is essentially independent of
Q_{gs}	Gate-Source Charge	-	3.4	-	nC	operating temperature)
Q_{gd}	Gate-Drain ("Miller") Charge	-	10.5	-	nC	

THERMAL RESISTANCE

Symbol	Characteristics		SSD2101	Units	Remark
R_{thJA}	Junction-to-Ambient	MAX	50	K/W	Surface mounting

Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	2.8	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
V_{SD}	Diode Forward Voltage(2)	-	-	1.1	V	T_A=25°C, I_S=2.0A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	100	-	ns	T_A=25°C, I_F=2.0A, dI_F/dt=100A/μS

Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width $\leq$ 300μs, Duty Cycle $\leq$ 2%
(3) Repetitive rating : Pulse width limited by max. junction temperature

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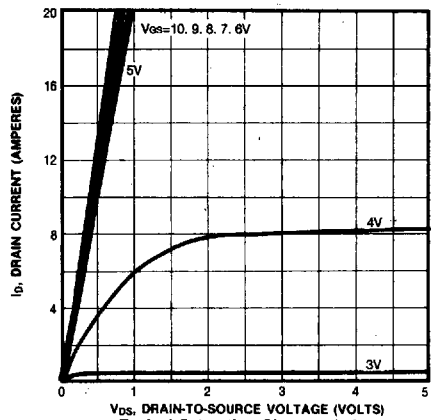
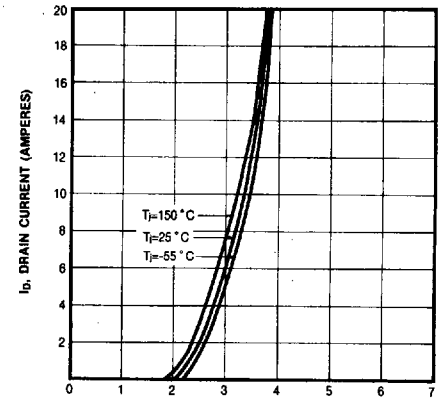
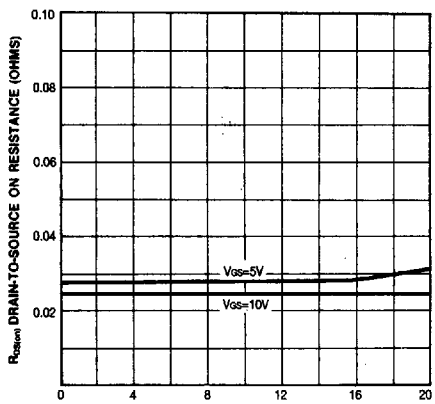


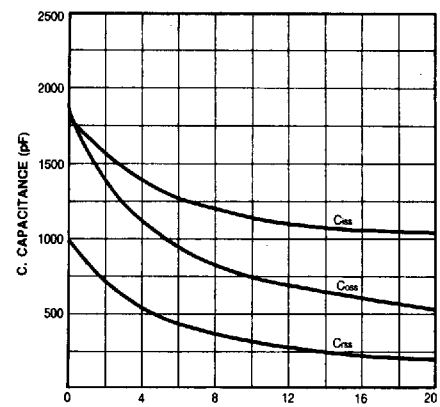
Typical Saturation Characteristics



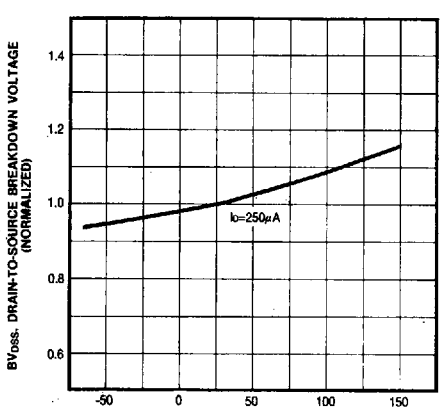
Typical Transfer Characteristics



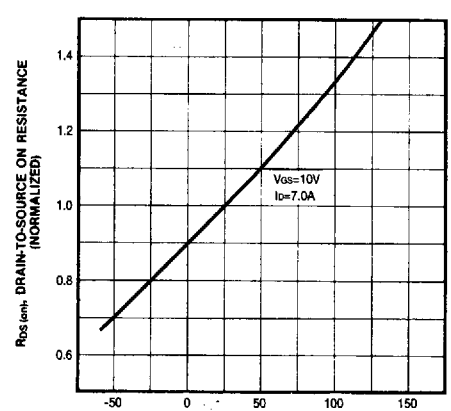
Typical On-Resistance Vs. Drain Current



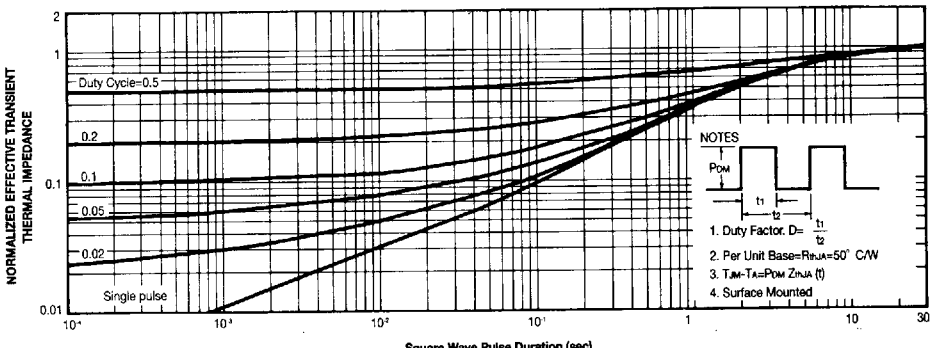
Typical Capacitance Vs. Drain to Source Voltage



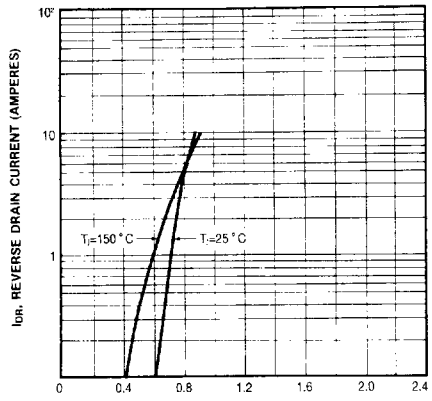
Breakdown Voltage Vs. Temperature



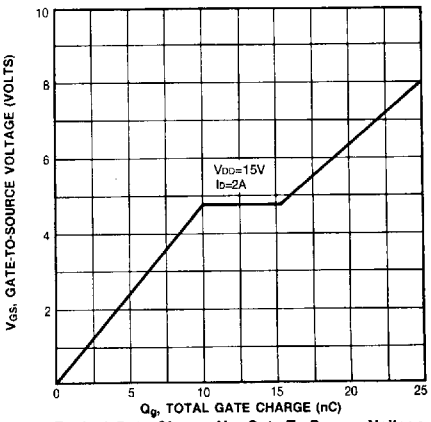
Normalized On-Resistance Vs. Temperature



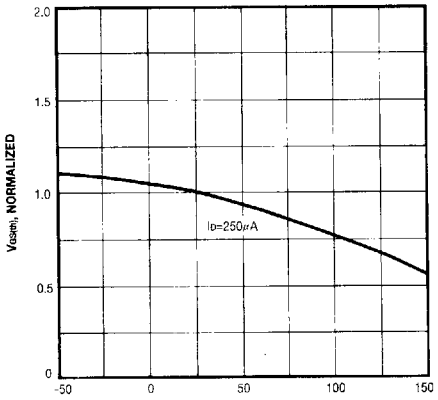
Normalized Effective Transient Thermal Impedance, Junction-to-Ambient



Typical Source—Drain Diode Forward Voltage



Typical Gate Charge Vs. Gate-To-Source Voltage



Threshold Voltage