

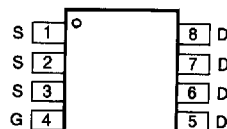
FEATURES

- 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

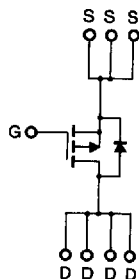
PRODUCT SUMMARY

Part Number	BV_{DSS}	$R_{DS(on)}$	I_D
SSD2104	-30V	$0.07\ \Omega$	-4.6A

8 SOIC



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSD2104	Unit
Drain-Source Voltage (1)	V_{DSS}	-30	Vdc
Drain-Gate Voltage ($R_{GS}=1.0M\Omega$) (1)	V_{DGR}	-30	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
Continuous Drain Current $T_A=25^\circ C$	I_D	-4.6	Adc
Continuous Drain Current $T_A=70^\circ C$	I_D	-4.1	Adc
Drain Current - Pulsed (3)	I_{DM}	-15	Adc
Total Power Dissipation at $T_A=25^\circ C$	P_D	2.5	Watts
$T_A=70^\circ C$		1.6	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Notes : (1) $T_J=25^\circ C$ to $150^\circ C$ (2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by junction temperature

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DS}	Drain-Source Breakdown Voltage	-30	-	-	V	$V_{GS}=0V, I_D=-250\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	-	-	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
I_{GSS}	Gate-Source Leakage Forward	-	-	-100	nA	$V_{GS}=-20V$
I_{GSS}	Gate-Source Leakage Reverse	-	-	100	nA	$V_{GS}=20V$
I_{OSS}	Zero Gate Voltage Drain Current	-	-	-2.0	μA	$V_{DS}=-24V, V_{GS}=0V$
		-	-	-25	μA	$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ\text{C}$
$I_{D(on)}$	On-State Drain-Source Current(2)	-15	-	-	A	$V_{DS}=-5V, V_{GS}=-10V$
$R_{DS(on)}$	Static Drain-Source On-Resistance(2)	-	-	0.070	Ω	$V_{GS}=-10V, I_D=-4.6A$
		-	-	0.135	Ω	$V_{GS}=-4.5V, I_D=-2.0A$
g_{fs}	Forward Transconductance (2)	-	7.0	-	S	$V_{DS}=-15V, I_D=-4.6A$
$t_{d(on)}$	Turn-On Delay Time	-	-	30	ns	$V_{DD}=-15V, I_D=-1.0A, Z_o=6.0\Omega$ (MOSFET switching times are essentially independent of operating temp.)
t_r	Rise Time	-	-	60	ns	
$t_{d(off)}$	Turn-Off Delay Time	-	-	120	ns	
t_f	Fall Time	-	-	100	ns	
Q_g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	50	nC	$V_{GS}=-10V, I_D=-4.6A, V_{DS}=-15V$ (Gate charge is essentially independent of operating temperature.)
Q_{gs}	Gate-Source Charge	-	5	-	nC	
Q_{gd}	Gate-Drain ("Miller") Charge	-	14	-	nC	

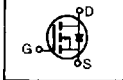
THERMAL RESISTANCE

Symbol	Characteristics		SSD2104	Units	Remark
R_{thJA}	Junction-to-Ambient	MAX	50	K/W	Free Air Operation

Notes : (1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(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)	-	-	-2.6	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
V_{SD}	Diode Forward Voltage(2)	-	-	-1.2	V	$T_A=25^\circ\text{C}$, $I_S=-2.6\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	70	-	ns	$T_A=25^\circ\text{C}$, $I_F=-2.6\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

Notes : (1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test : Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by max. junction temperature