

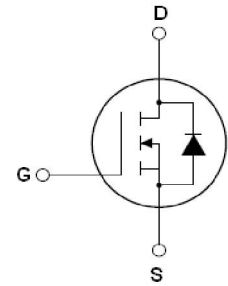
FEATURES

- Advanced trench process technology
- avalanche energy, 100% test
- Fully characterized avalanche voltage and current
- Lead free product

ID =200A

BV=100V

R_{DS(ON)}=4.7mΩ (Typ.)

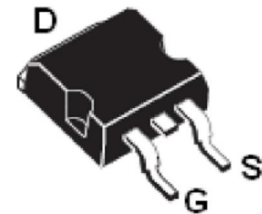


DESCRIPTION

The SSF1006A is a new generation of high voltage and low current N-Channel enhancement mode trench power MOSFET. This new technology increases the device reliability and electrical parameter repeatability. SSF1006A is assembled in high reliability and qualified assembly house.

APPLICATIONS

- Power switching application



SSF1006A Top View (D2PAK)

Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_c=25^{\circ}\text{C}$	Continuous drain current, $V_{GS}@10\text{V}$	200	A
$I_D@T_c=100^{\circ}\text{C}$	Continuous drain current, $V_{GS}@10\text{V}$	130	
I_{DM}	Pulsed drain current ①	800	
$P_D@T_c=25^{\circ}\text{C}$	Power dissipation	272	W
	Linear derating factor	1.5	W/°C
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	960	mJ
E_{AR}	Repetitive avalanche energy	TBD	mJ
dv/dt	Peak diode recovery voltage	31	v/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance

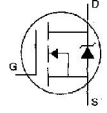
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	0.46	—	°C/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

Electrical Characteristics @ $T_J=25^{\circ}\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	100	—	—	V	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4.7	5.5	mΩ	$V_{GS}=10\text{V}, I_D=30\text{A}$
$V_{GS(th)}$	Gate threshold voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	2	μA	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$

		—	—	10		$V_{DS}=100V$, $V_{GS}=0V, T_J=150C$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS}=20V$
	Gate-to-Source reverse leakage	—	—	-100		$V_{GS}=-20V$
Q_g	Total gate charge	—	108		nC	$I_D=30A, V_{GS}=10V$ $V_{DD}=30V$
Q_{gs}	Gate-to-Source charge	—	24	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	37	—		
$t_{d(on)}$	Turn-on delay time	—	18.2		nS	$V_{DD}=30V$ $I_D=2A, R_L=15\Omega$ $R_G=2.5\Omega$ $V_{GS}=10V$
t_r	Rise time	—	15.6			
$t_{d(off)}$	Turn-Off delay time	—	70.5			
t_f	Fall time	—	13.8			
C_{iss}	Input capacitance	—	3150		pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHZ$
C_{oss}	Output capacitance	—	350			
C_{rss}	Reverse transfer capacitance	—	240			

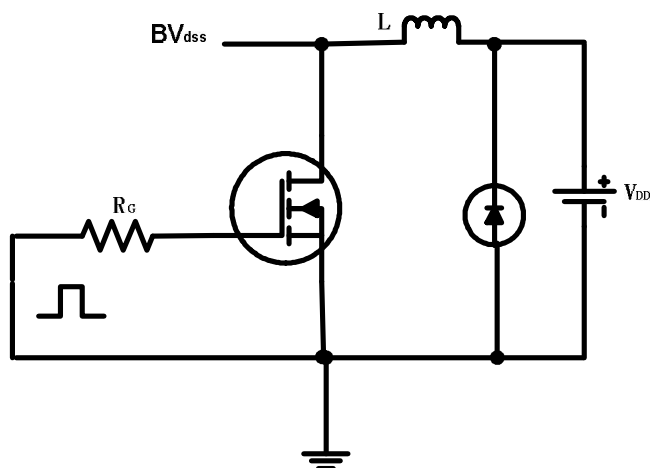
Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	160	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	520		
V _{SD}	Diode Forward Voltage	—	—	1.3	V	T _J =25°C, I _S =60A, V _{GS} =0V ③
t _{rr}	Reverse Recovery Time	—	57	—	nS	T _J =25°C, I _F =75A di/dt=100A/μs ③
Q _{rr}	Reverse Recovery Charge	—	107	—	μC	
t _{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _s + L _D)				

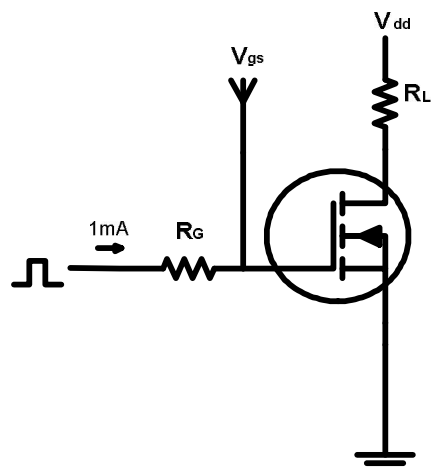
Notes:

- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Test condition: $L = 0.3mH$, $V_{DD} = 50V, I_D=80A$
- ③ Pulse width $\leq 300\mu s$, duty cycle $\leq 1.5\%$; $R_G = 25\Omega$ Starting $T_J = 25^\circ C$

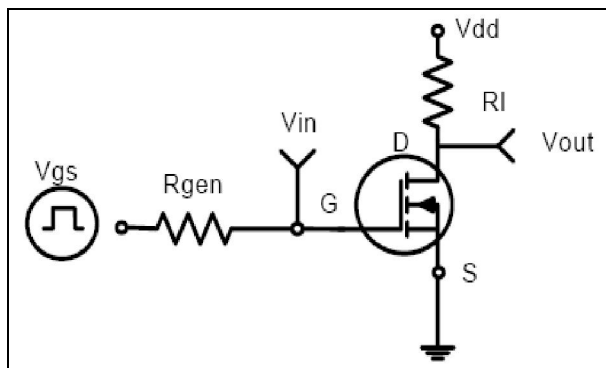
EAS Test Circuit



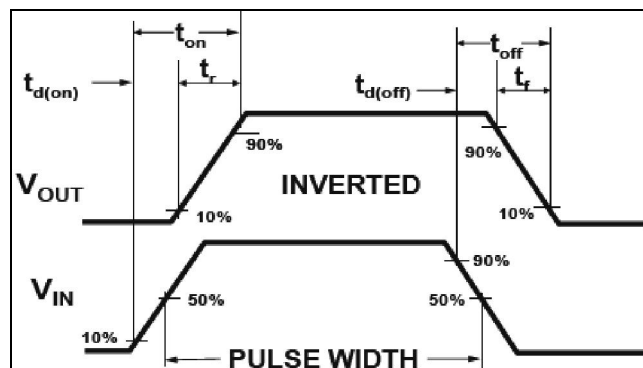
Gate Charge Test Circuit

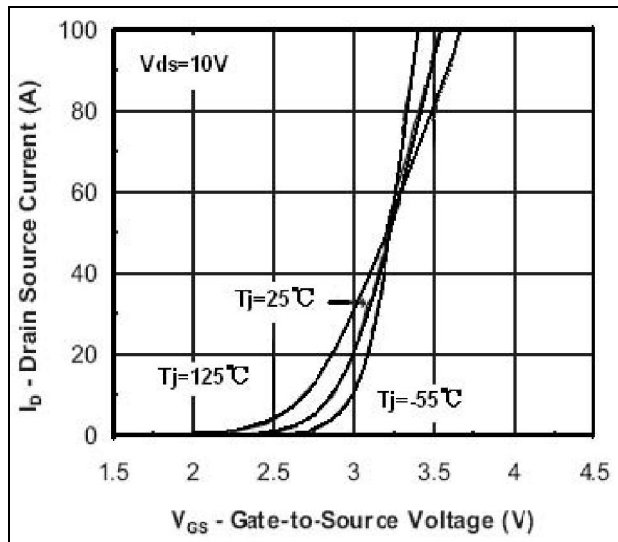


Switch Time Test Circuit

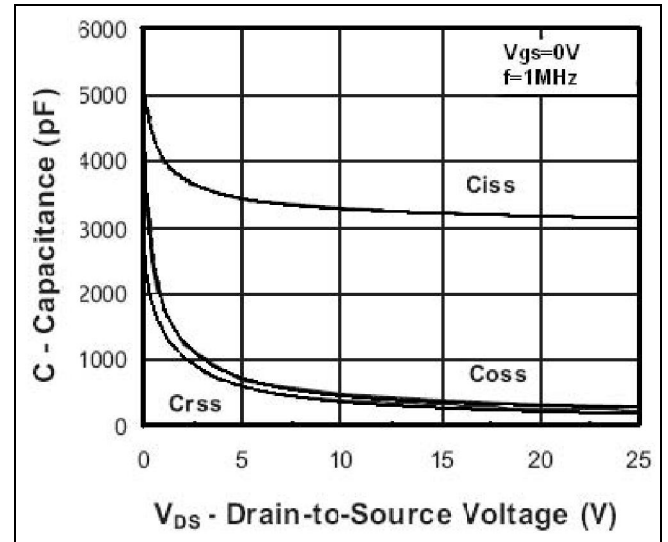


Switch Waveform

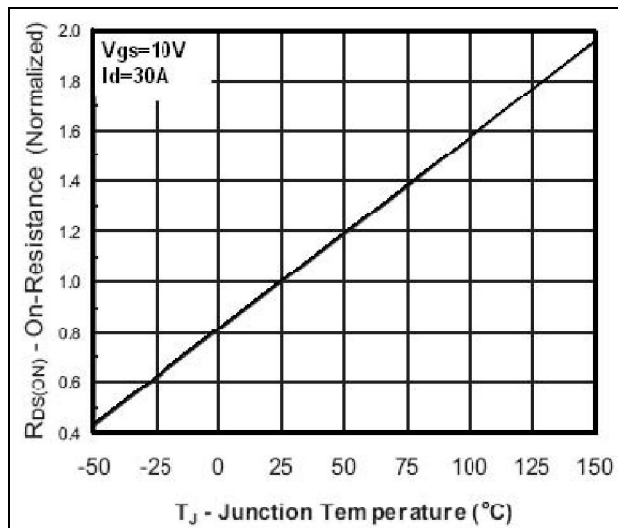




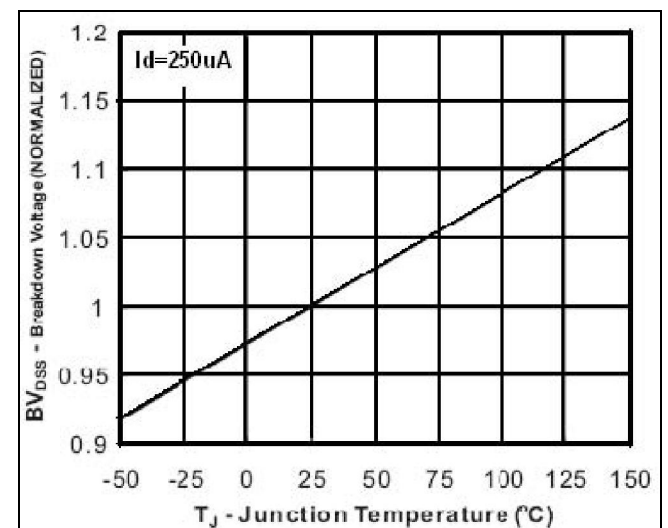
Transfer Characteristic



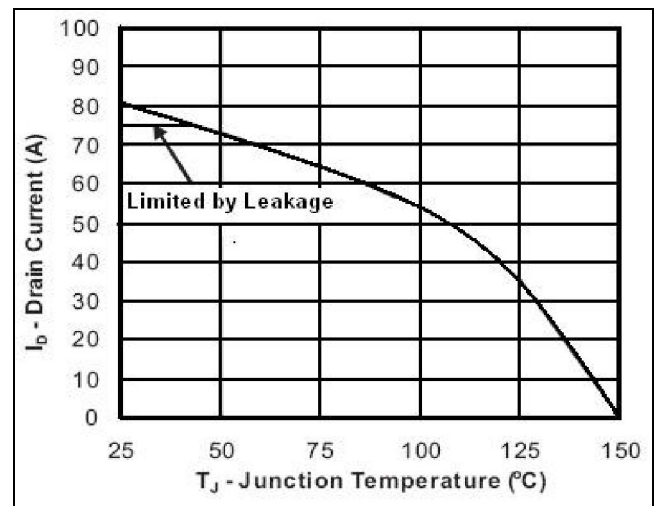
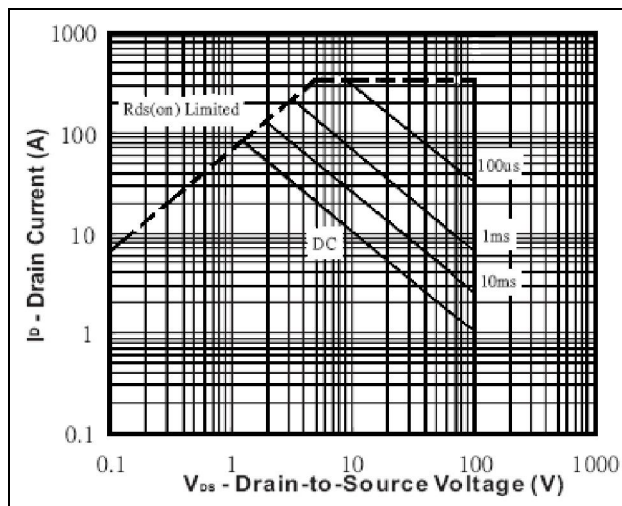
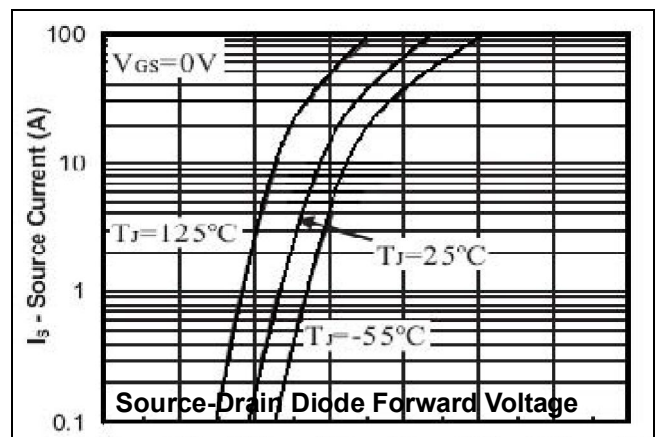
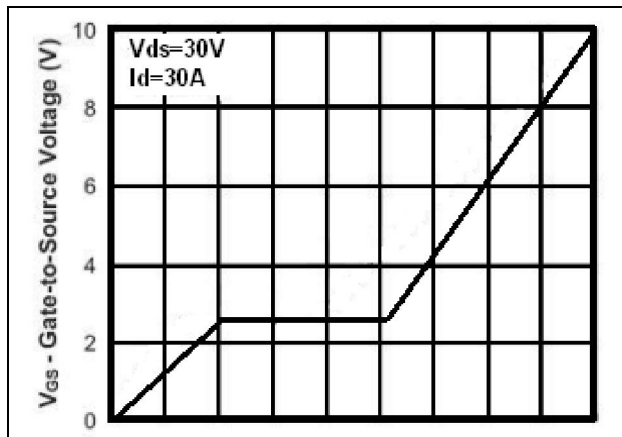
Capacitance



On Resistance vs. Junction Temperature

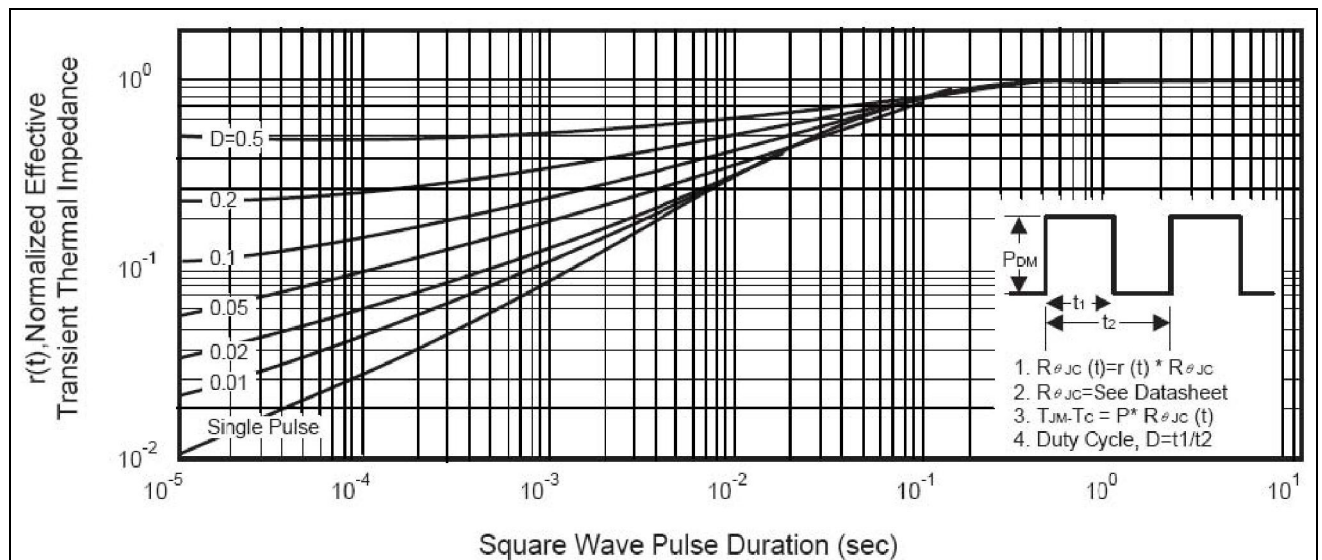


Breakdown Voltage vs. Junction Temperature



Safe Operation Area

Max Drain Current vs. Junction



Transient Thermal Impedance Curve

D2PAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		
E1		8.5			0.334	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.625
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068
M	2.4		3.2	0.094		0.126
R		0.4			0.015	
V2	0°		4°			

