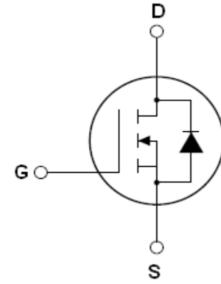
Feathers:

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

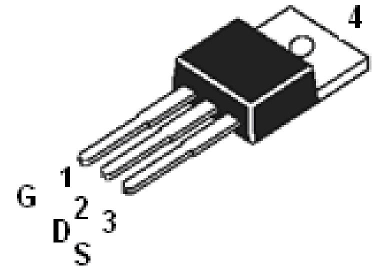
ID =160A
BV=40V
Rdson=0.005Ω



Description:

The SSF4006 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. SSF4006 is assembled in high reliability and qualified assembly house.

SSF4006 TOP View (T0-220)



Application:

- Commercial-industrial application

Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_c=25^\circ C$	Continuous drain current,VGS@10V	160	A
$I_D@T_c=100^\circ C$	Continuous drain current,VGS@10V	100	
I_{DM}	Pulsed drain current ①	640	
$P_D@T_C=25^\circ C$	Power dissipation	150	W
	Linear derating factor	2.0	W/°C
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	480	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

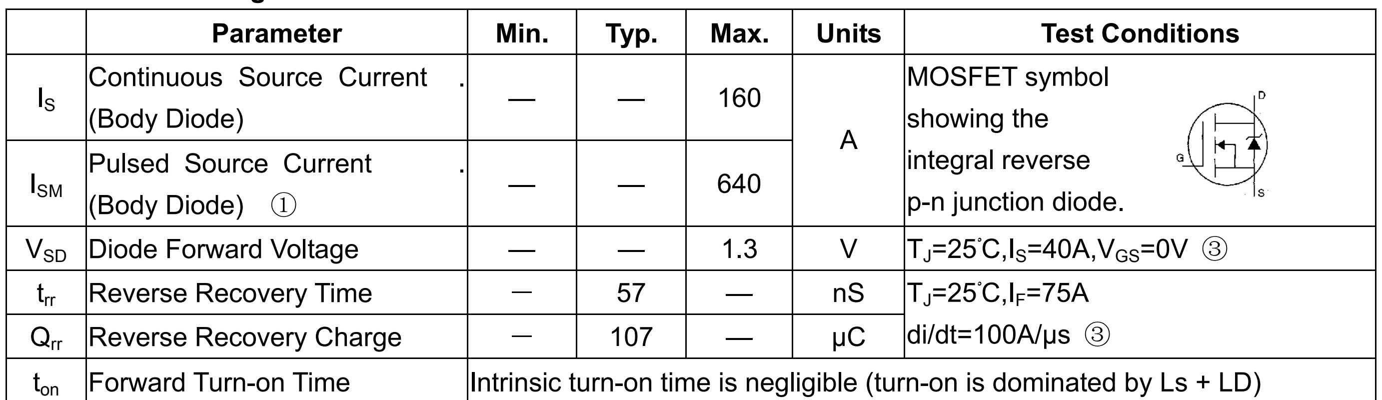
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	0.83	—	°C/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

Electrical Characteristics @TJ=25 °C(unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	40	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	0.0045	0.005	Ω	$V_{GS}=10V, I_D=30A$
$V_{GS(th)}$	Gate threshold voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS}=40V, V_{GS}=0V$
		—	—	10		$V_{DS}=40V$, $V_{GS}=0V, T_J=150^\circ C$
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*	—	90		nC	I_D=30A,V_{GS}=10V V_{DD}=30V
Q_{gs}	*Gate-to-Source charge*	—	14	—		
Q_{gd}	*Gate-to-Drain("Miller") charge*	—	24	—		
$t_{d(on)}$	*Turn-on delay time*	—	18.2		nS	V_{DD}=30V I_D=2A ,R_L=15Ω R_G=2.5Ω 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	—	300			
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	—	—	640		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J=25℃,I_S=40A,V_{GS}=0V ③
t_{rr}	Reverse Recovery Time	–	57	—	nS	T_J=25℃,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 Ls + LD)				

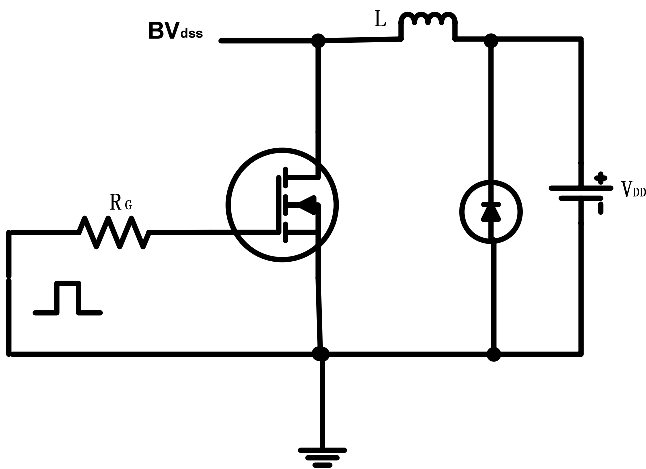
Notes:

① Repetitive rating; pulse width limited by max junction temperature.

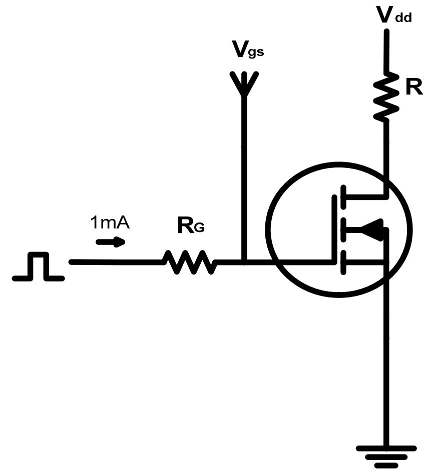
② Test condition: L =0.3mH, VDD = 47V,Id=57A

③ Pulse width≤300μS, duty cycle≤1.5% ; RG = 25Ω Starting TJ = 25°C

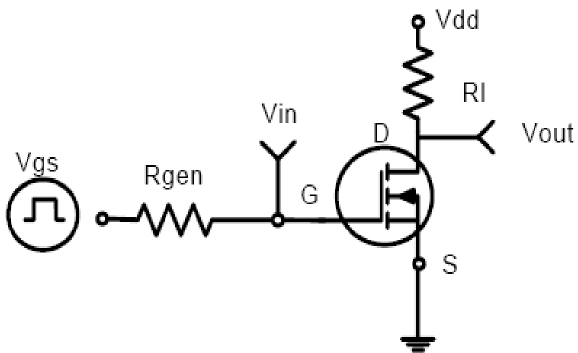
EAS Test Circuit:



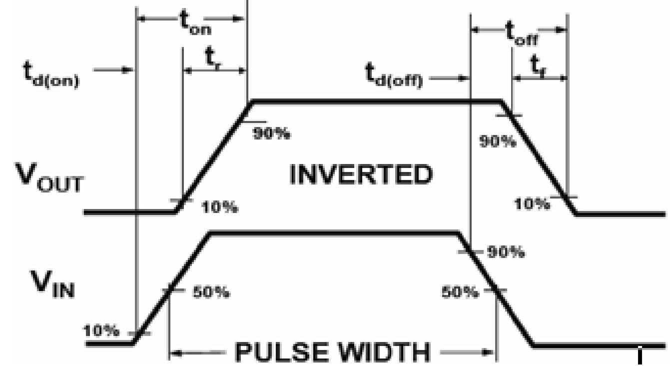
Gate Charge Test Circuit:



Switch Time Test Circuit:



Switch Waveform:



TO-220 MECHANICAL DATA: