SSF6010

Feathers:

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

Description:

The SSF6010 is a new generation of middle voltage and high current N–Channel enhancement mode trench power MOSFET. This new technology increases the device reliability and electrical parameter repeatability. SSF6010 is assembled in high reliability and qualified assembly house.

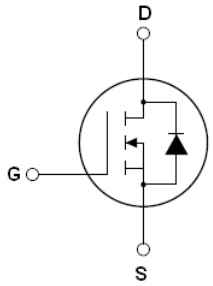
Application:

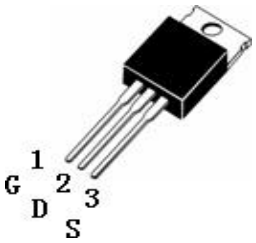
- Power switching application

ID =75A

BV=60V

Rdson=8mΩ (typ.)





SSF6010 TOP View (TO220)

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D@T_c=25℃	Continuous drain current,VGS@10V	75	A
I_D@T_c=100℃	Continuous drain current,VGS@10V	45	
I_{DM}	Pulsed drain current ①	300	
P_D@T_C=25℃	Power dissipation	144	W
	Linear derating factor	0.74	W/℃
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	220	mJ
E_{AR}	Repetitive avalanche energy	TBD	
T_J T_{STG}	Operating Junction and Storage Temperature Range	–55 to +175	℃

Thermal Resistance

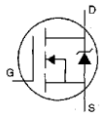
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	1.04	—	℃/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

Electrical Characteristics @TJ=25 ℃ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS}=0V,I_D=250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	8	10	mΩ	V_{GS}=10V,I_D=30A
$V_{GS(th)}$	Gate threshold voltage	2.0		4.0	V	V_{DS}=V_{GS},I_D=250μA
g_{fs}	Forward transconductance	—	58	—	S	V_{DS}=5V,I_D=30A
I_{DSS}	Drain-to-Source leakage current	—	—	2	μA	V_{DS}=60V,V_{GS}=0V
		—	—	10		V_{DS}=60V, V_{GS}=0V,T_J=150℃
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	—	45	—	nC	I_D=30A V_{DD}=30V V_{GS}=10V
Q_{gs}	Gate-to-Source charge	—	4.2	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	15	—		
$t_{d(on)}$	Turn-on delay time	—	14.6	—	nS	V_{DD}=30V I_D=2A ,R_L=15Ω R_G=2.5Ω V_{GS}=10V
t_r	Rise time	—	14.2	—		
$t_{d(off)}$	Turn-Off delay time	—	40	—		
t_f	Fall time	—	7.3	—		
C_{iss}	Input capacitance	—	1480	—	pF	V_{GS}=0V V_{DS}=25V f=1.0MHZ
C_{oss}	Output capacitance	—	190	—		
C_{rss}	Reverse transfer capacitance	—	135	—		

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	75	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	300		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J=25℃,I_S=40A,V_{GS}=0V ③
t_{rr}	Reverse Recovery Time	—	33	—	nS	T_J=25℃,I_F=60A di/dt=100A/μs ③
Q_{rr}	Reverse Recovery Charge	—	61	—	nC	
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by Ls + LD)				

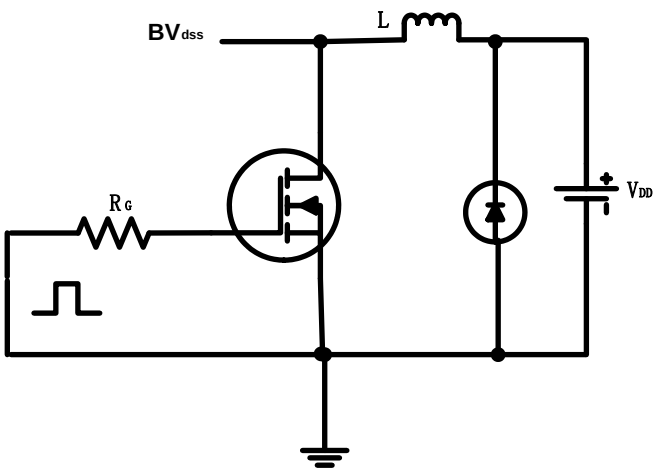
Notes:

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

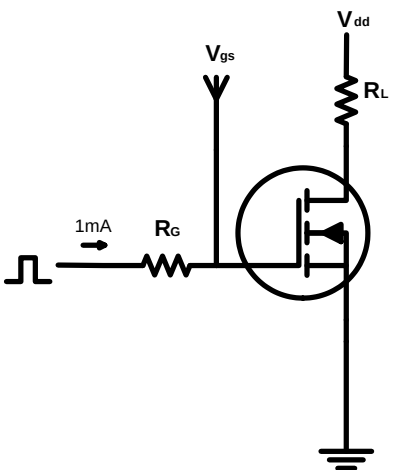
② Test condition: L =0.3mH, VDD = 30V,Id=37A

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

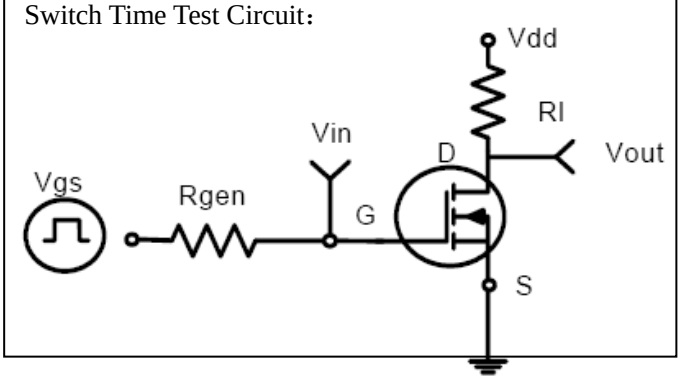
EAS test circuit:



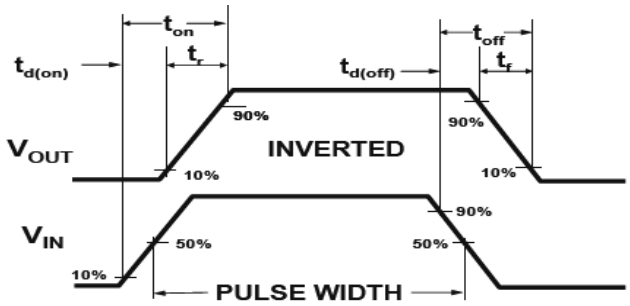
Gate charge test circuit:

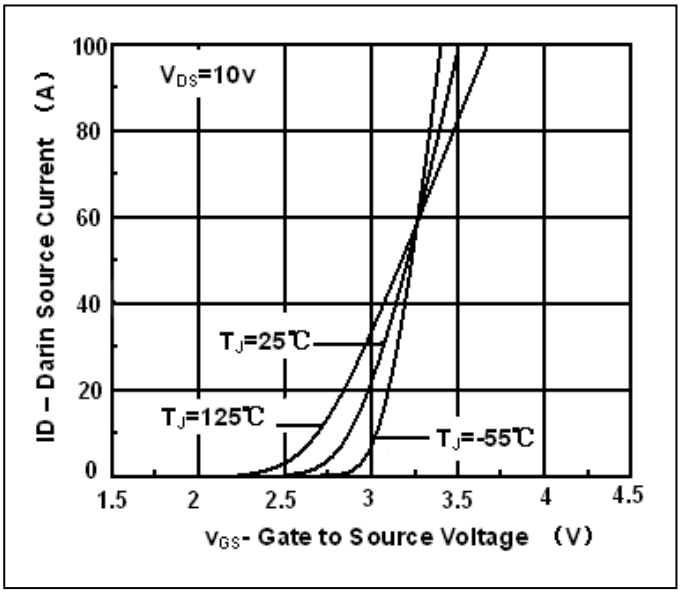


Switch Time Test Circuit：

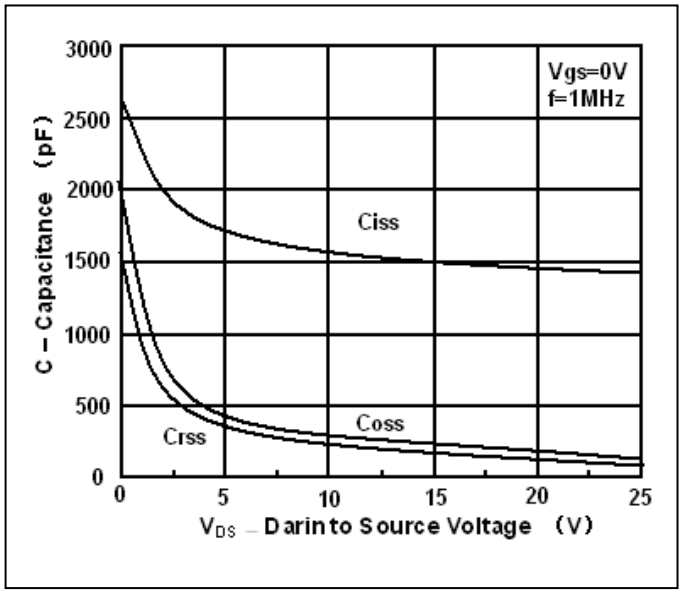


Switch Waveforms:

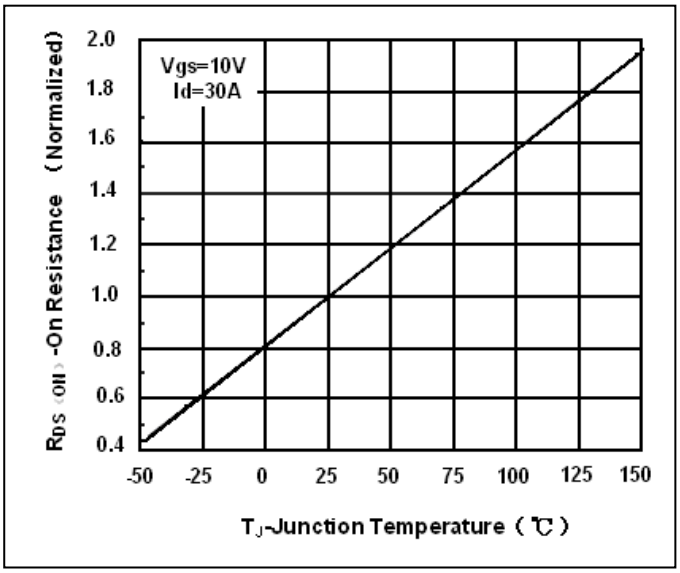




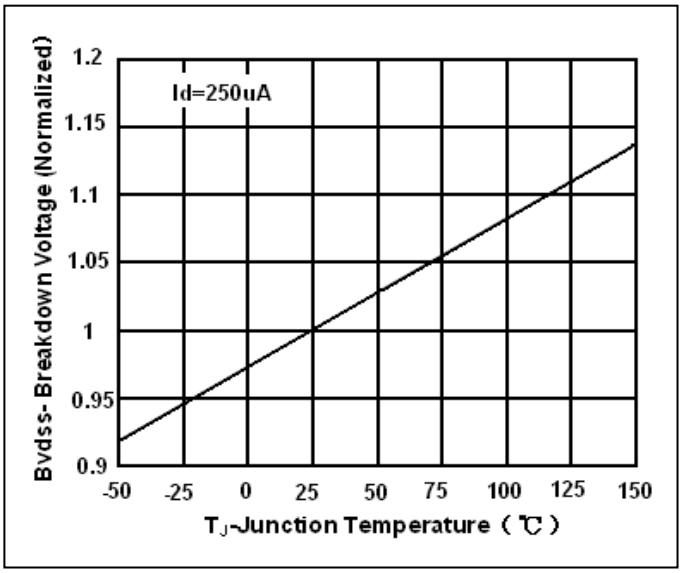
Transfer Characteristic



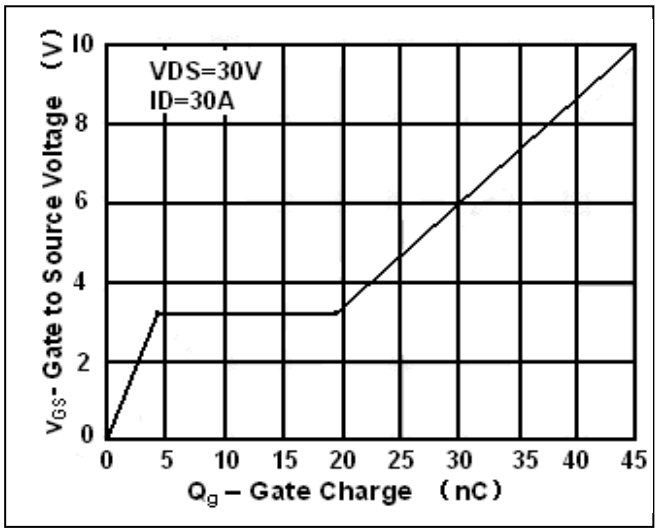
Capacitance



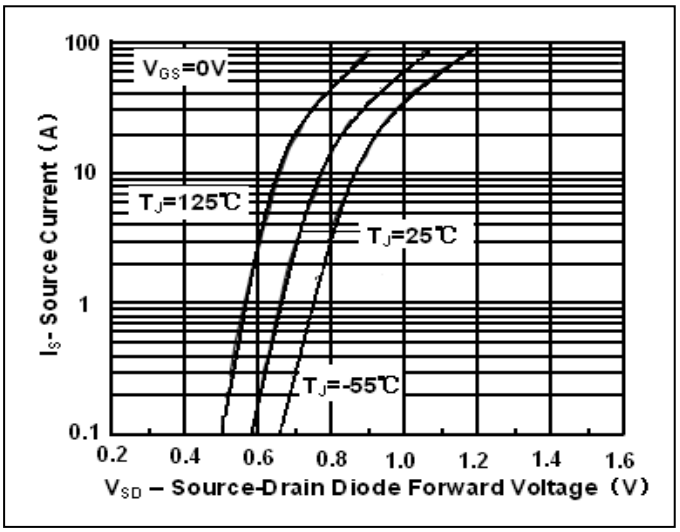
On Resistance vs. Junction Temperature



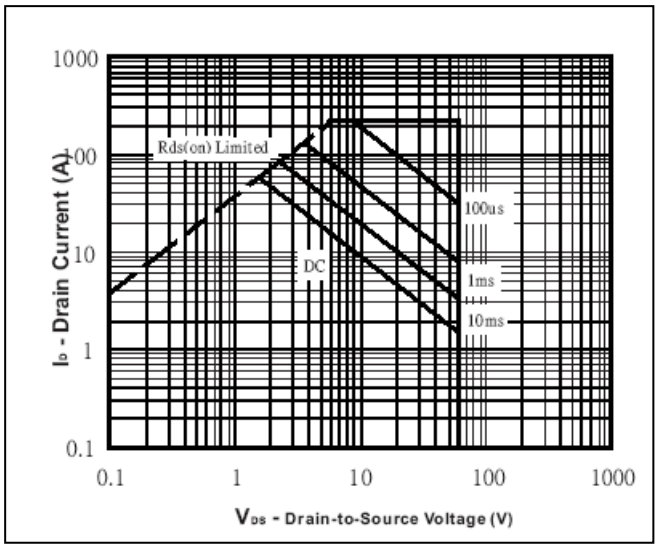
Breakdown Voltage vs. Junction Temperature



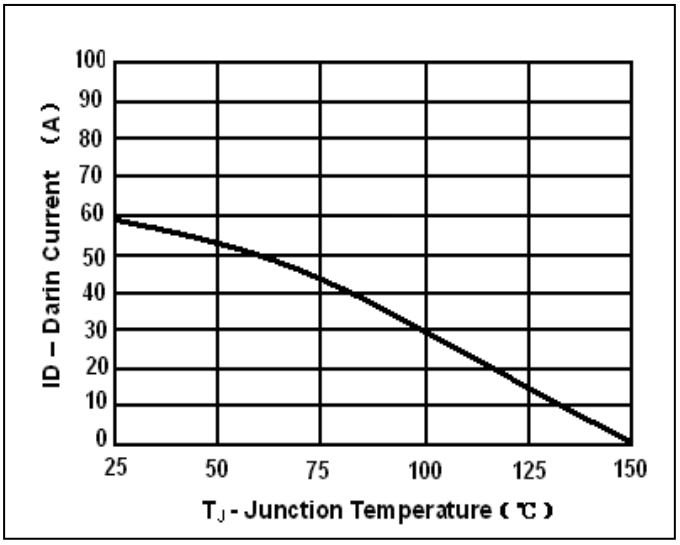
Gate Charge



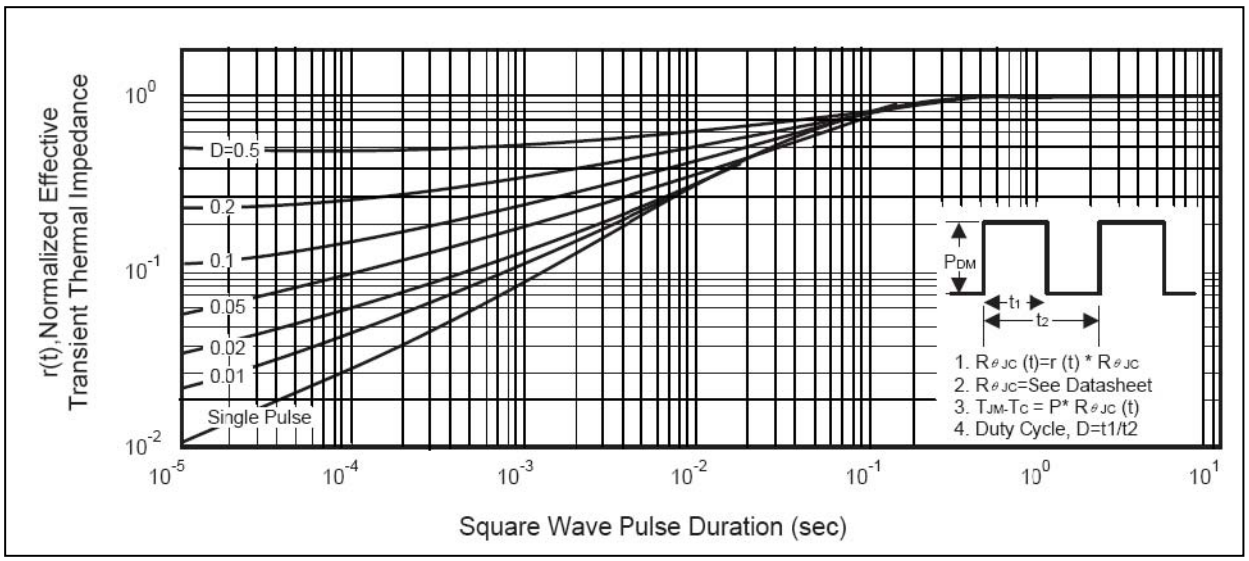
Source-Drain Diode Forward Voltage



Safe Operation Area



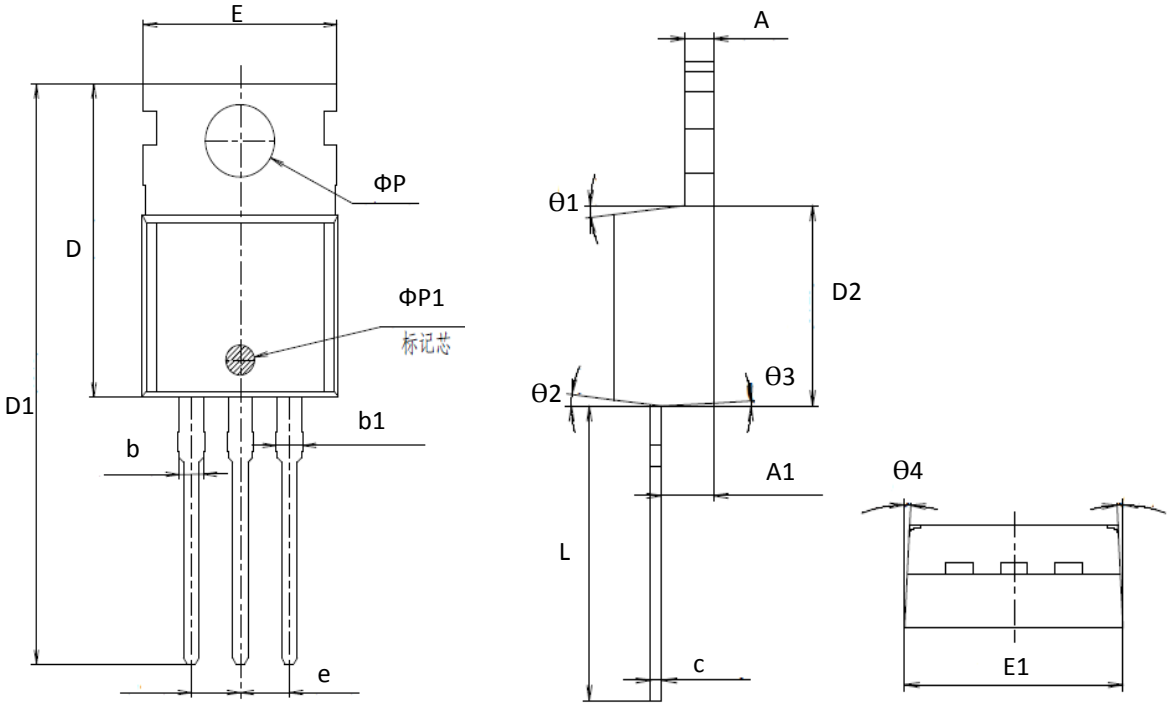
Max Drain Current vs. Junction Temperature



Transient Thermal Impedance Curve

TO220 MECHANICAL DATA:

TO220 PACKAGE OUTLINE DIMENSION_GN



Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	-	1.300	-	-	0.051	-
A1	2.200	2.400	2.600	0.087	0.094	0.102
b	-	1.270	-	-	0.050	-
b1	1.270	1.370	1.470	0.050	0.054	0.058
c	-	0.500	-	-	0.020	-
D	-	15.600	-	-	0.614	-
D1	-	28.700	-	-	1.130	-
D2	-	9.150	-	-	0.360	-
E	9.900	10.000	10.100	0.390	0.394	0.398
E1	-	10.160	-	-	0.400	-
ΦP	-	3.600	-	-	0.142	-
ΦP1		1.500		0.059		
e	2.54BSC			0.1BSC		
L	12.900	13.100	13.300	0.508	0.516	0.524
θ1	-	7^0	-	-	7^0	-
θ2	-	7^0	-	-	7^0	-
θ3	-	3^0	-	5^0	7^0	9^0
θ4	-	3^0	-	1^0	3^0	5^0