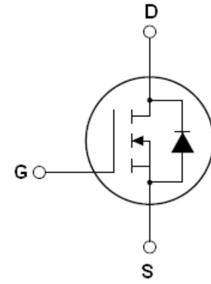
SSF6014

Feathers:

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

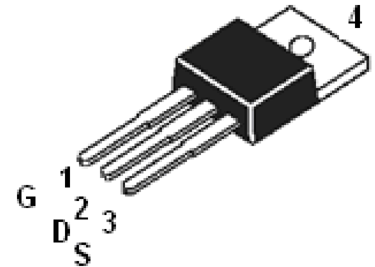
ID =60A
BV=60V
Rdson=14mΩ（max.）



Description:

The SSF6014 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. SSF6014 is assembled in high reliability and qualified assembly house.

SSF6014 TOP View (TO220)



Application:

- Power switching application

Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_c$=25 ℃	Continuous drain current,VGS@10V	60	A
$I_D@T_c$=100℃	Continuous drain current,VGS@10V	42	
I_{DM}	Pulsed drain current ①	240	
$P_D@T_C$=25℃	Power dissipation	120	W
	Linear derating factor	0.74	W/ ℃
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	235	mJ
E_{AR}	Repetitive avalanche energy	TBD	
T_J T_{STG}	Operating Junction and Storage Temperature Range	–55 to +150	℃

Thermal Resistance

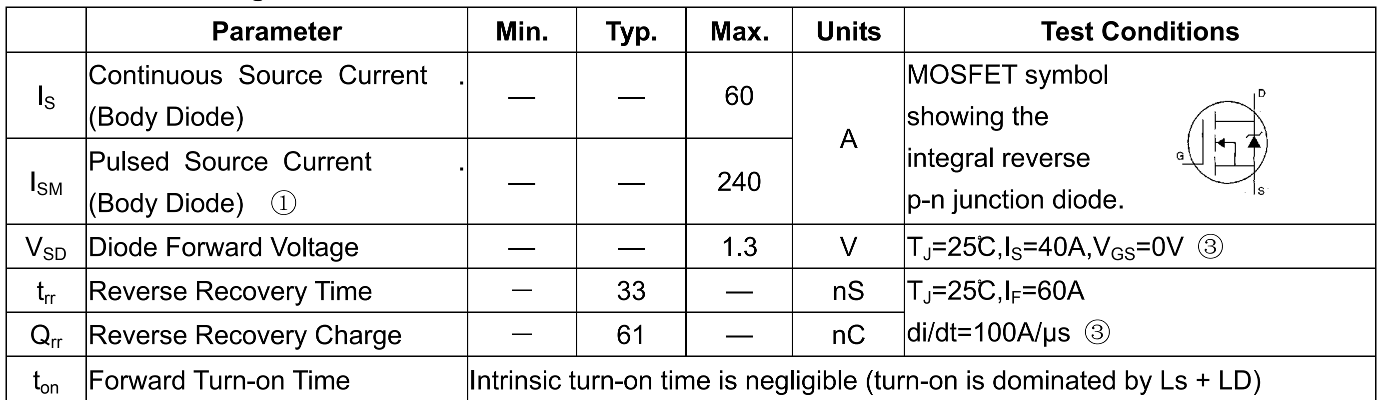
	Parameter	Min.	Typ.	Max.	Units
$R_{θJC}$	Junction-to-case	—	1.03	—	℃/W
$R_{θJA}$	Junction-to-ambient	—	—	62	

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	—	12	14	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	-	60	—	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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Q_g	Total gate charge	—	45	—	nC	I_D=30A V_{DD}=30V V_{GS}=10V
Q_{gs}	Gate-to-Source charge	—	4	—		
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)	—	—	60	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	240		
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)				

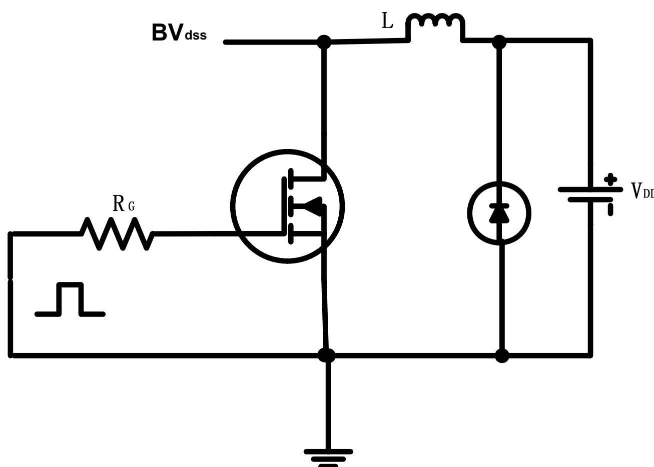
Notes:

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

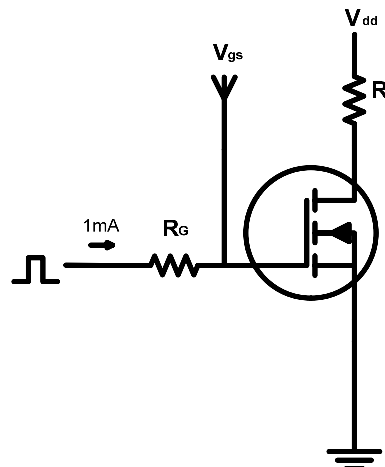
② Test condition: L =0.3mH, VDD = 30V,Id=37A

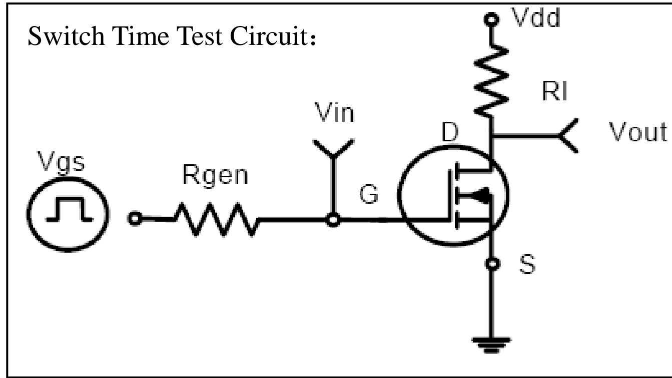
③ Pulse width≤300μS, duty cycle≤1.5% ; RG = 25Ω   Starting TJ = 25°C

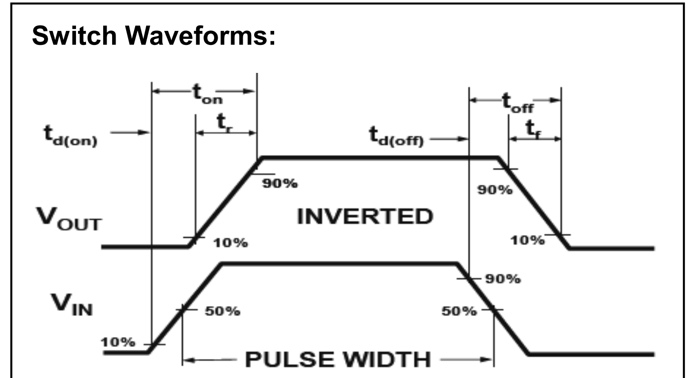
EAS test circuit:

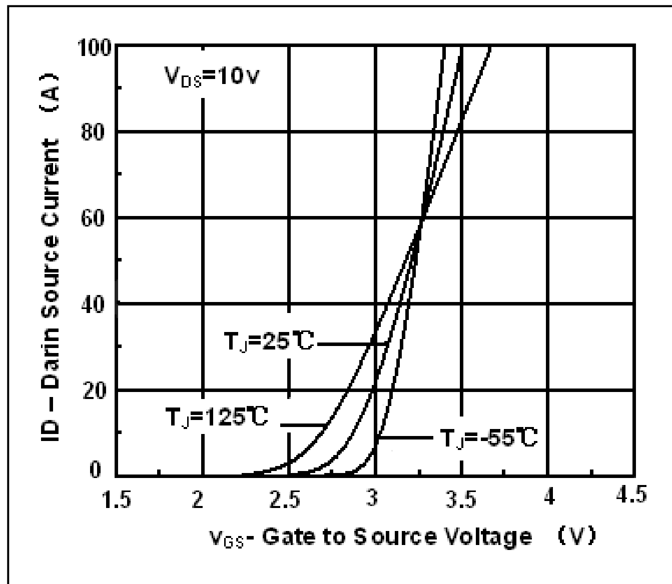


Gate charge test circuit:

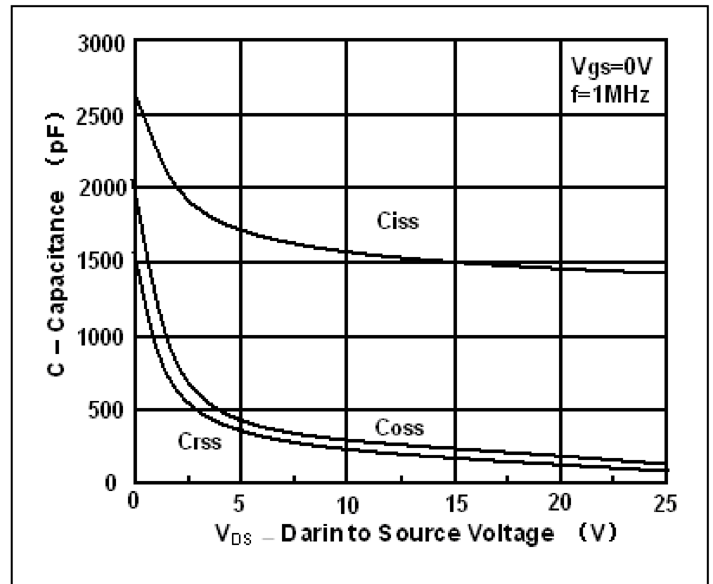




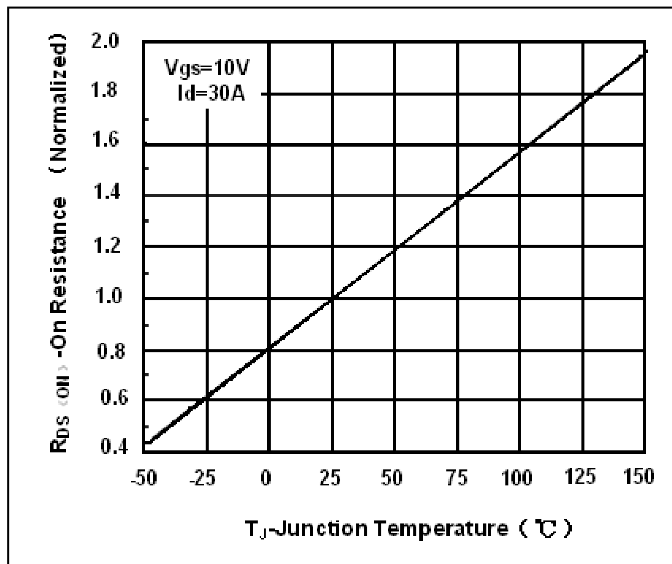




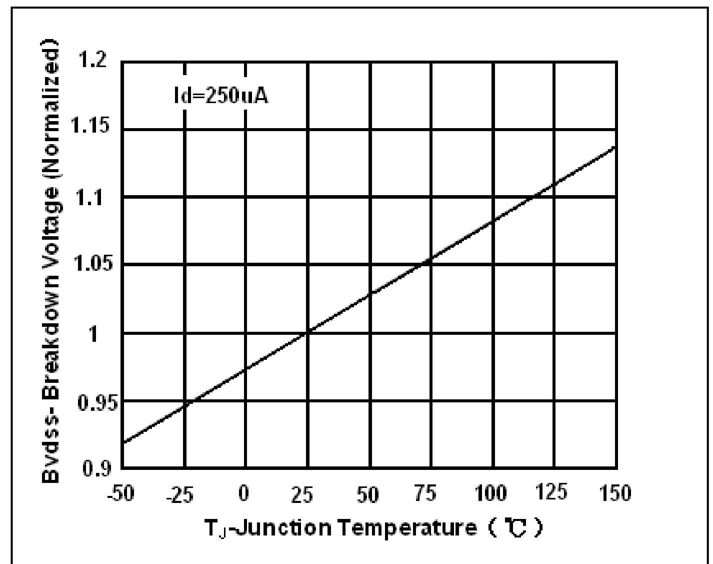
Transfer Characteristic



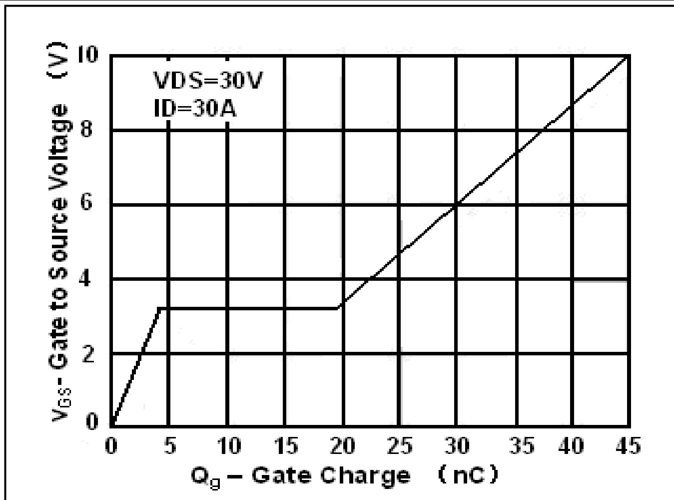
Capacitance

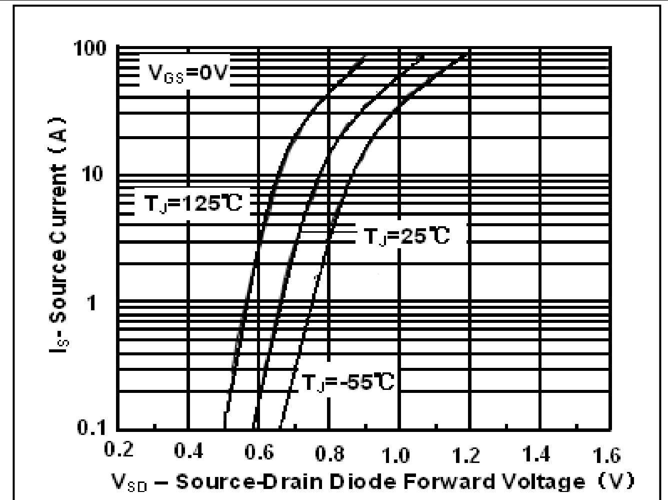


On Resistance vs Junction Temperature



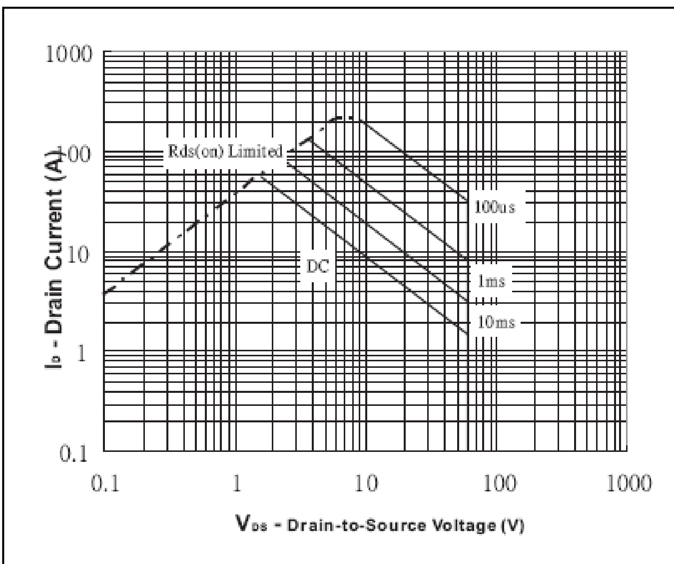
Breakdown Voltage vs Junction Temperature

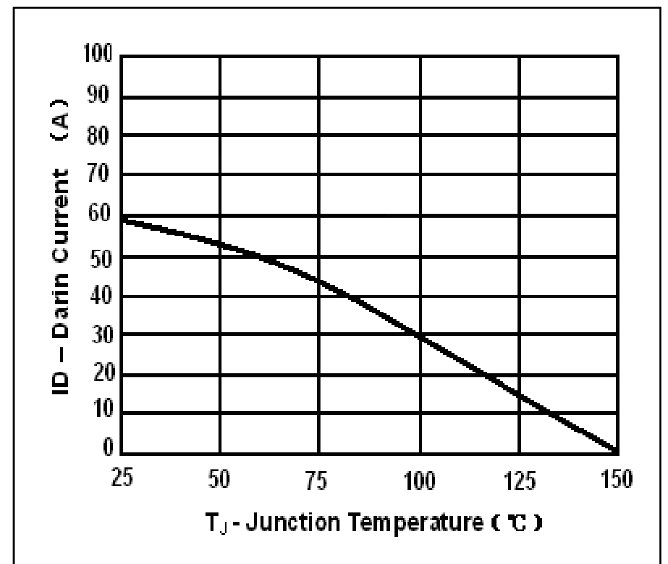




Gate Charge

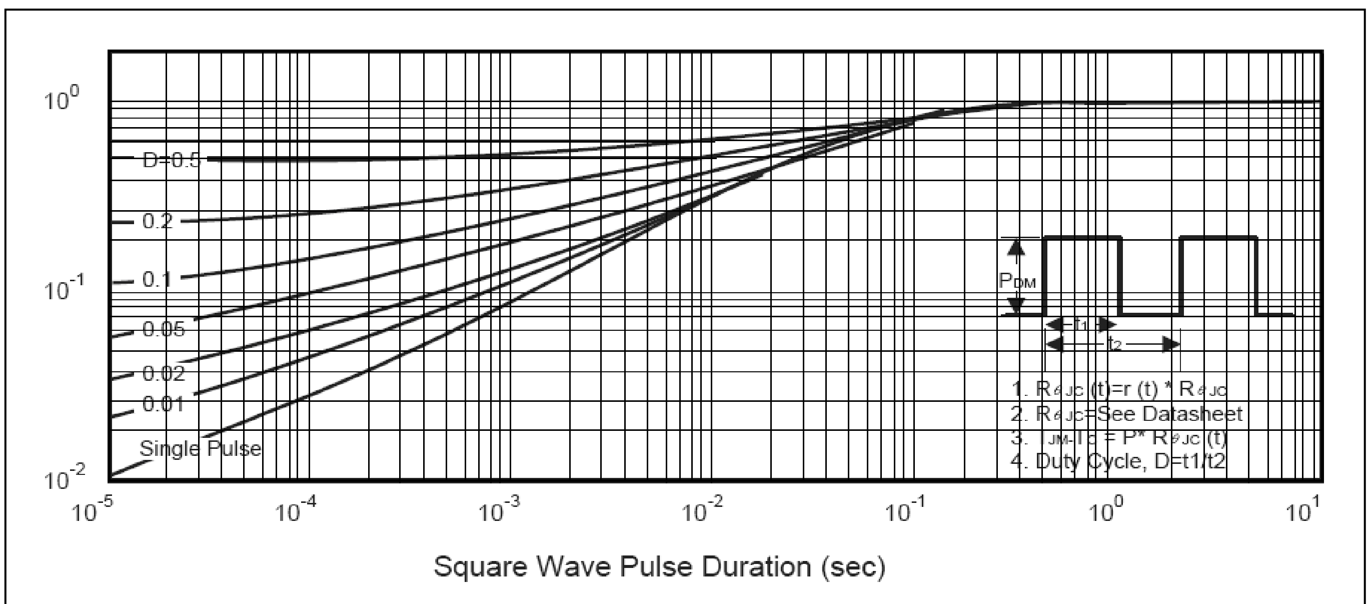
Source-Drain Diode Forward Voltage





Safe Operation Area

Max Drain Current vs Junction Temperature



Transient Thermal Impedance Curve

TO220 MECHANICAL DATA: