

**Features:**

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

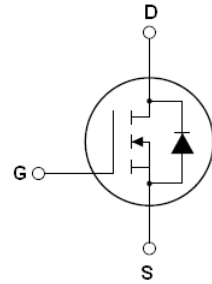
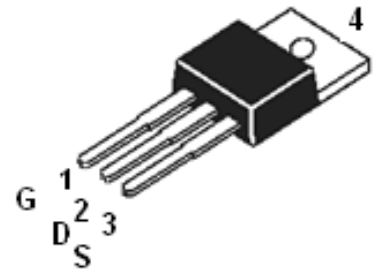
**Description:**

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 =60A**  
**BV=60V**  
**Rdson=10mohm**


**SSF6010 TOP View (TO220)**

**Absolute Maximum Ratings**

	Parameter	Max.	Units
$I_D@T_c=25\text{ C}$	Continuous drain current, $V_{GS}@10V$	60	A
$I_D@T_c=100\text{ C}$	Continuous drain current, $V_{GS}@10V$	45	
$I_{DM}$	Pulsed drain current ①	240	
$P_D@T_c=25\text{ C}$	Power dissipation	100	W
	Linear derating factor	0.74	W/ C
$V_{GS}$	Gate-to-Source voltage	$\pm 20$	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 +150	°C

**Thermal Resistance**

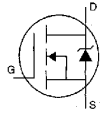
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	1.25	—	C/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	9	10	m $\Omega$	$V_{GS}=10V, I_D=30A$
$V_{GS(th)}$	Gate threshold voltage	2.0		4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
$g_{fs}$	Forward transconductance	-	58	—	S	$V_{DS}=5V, I_D=30A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	2	$\mu A$	$V_{DS}=60V, V_{GS}=0V$
		—	—	10		$V_{DS}=60V,$ $V_{GS}=0V, T_J=150\text{ C}$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS}=20V$
	Gate-to-Source reverse leakage	—	—	-100		$V_{GS}=-20V$

$Q_g$	Total gate charge	—	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	$V_{DD}=30V$ $I_D=2A, R_L=15\Omega$ $R_G=2.5\Omega$ $V_{GS}=10V$
$t_r$	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	—		

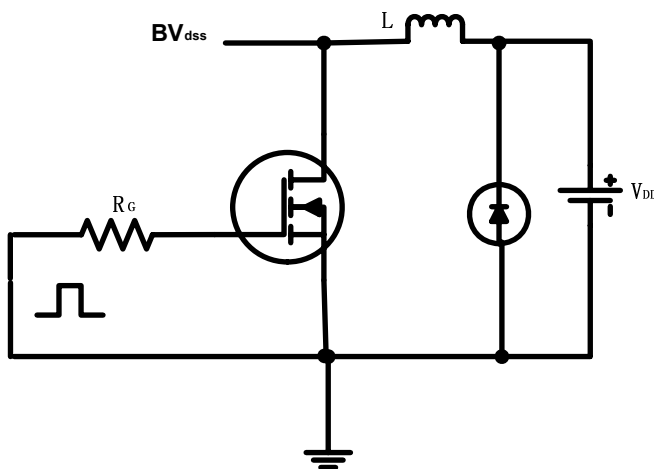
### Source-Drain Ratings and Characteristics

	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	$T_J=25^\circ C, I_S=40A, V_{GS}=0V$ ③
$t_{rr}$	Reverse Recovery Time	—	33	—	nS	$T_J=25^\circ C, I_F=60A$
$Q_{rr}$	Reverse Recovery Charge	—	61	—	nC	$di/dt=100A/\mu s$ ③
$t_{on}$	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$ )				

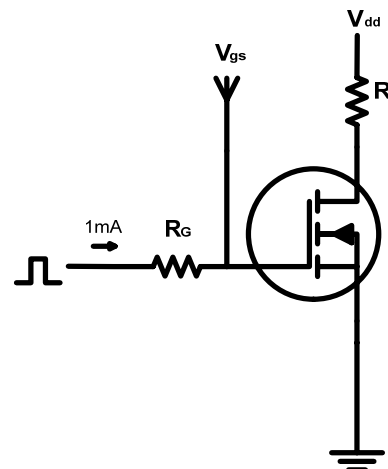
#### Notes:

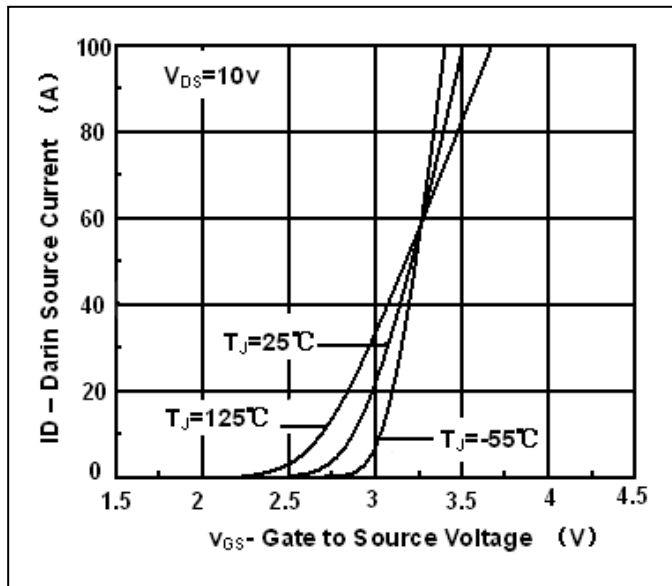
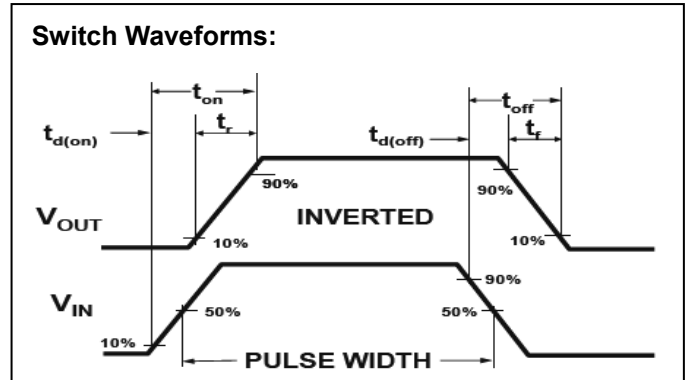
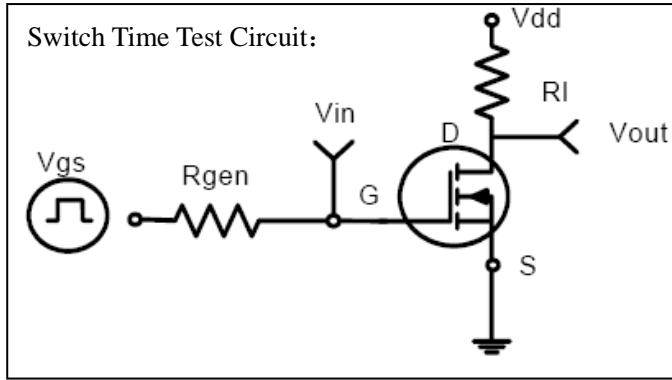
- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Test condition:  $L = 0.3mH, V_{DD} = 30V, I_D=37A$
- ③ Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 1.5\%$ ;  $R_G = 25\Omega$  Starting  $T_J = 25^\circ C$

#### EAS test circuit:

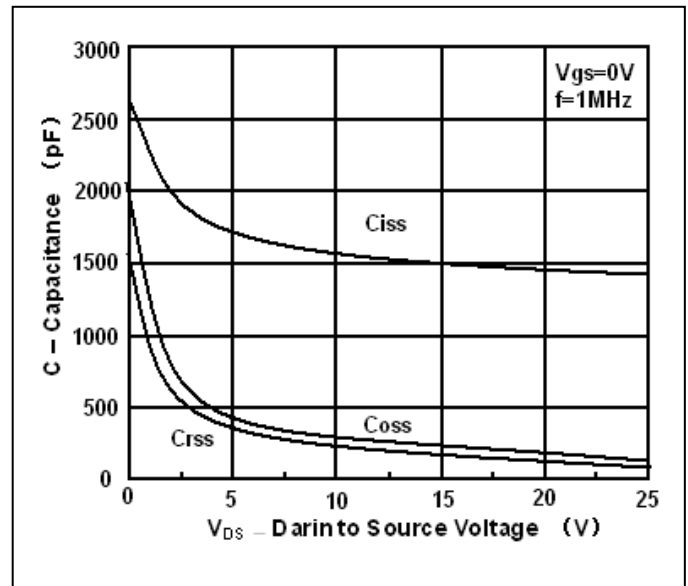


#### Gate charge test circuit:

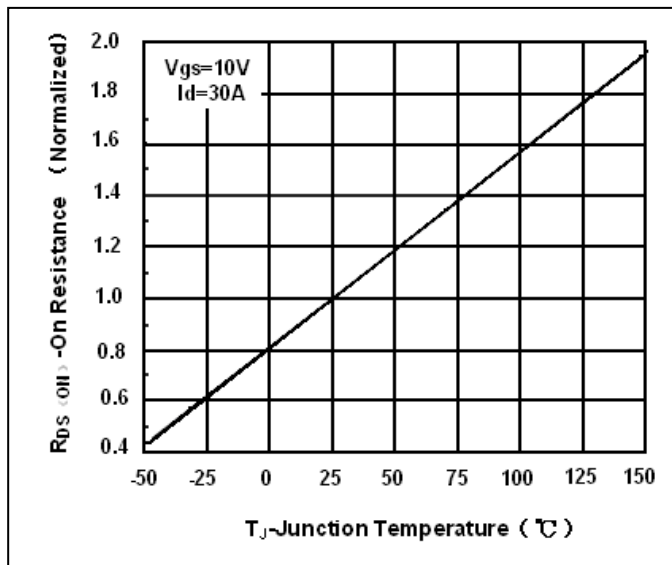




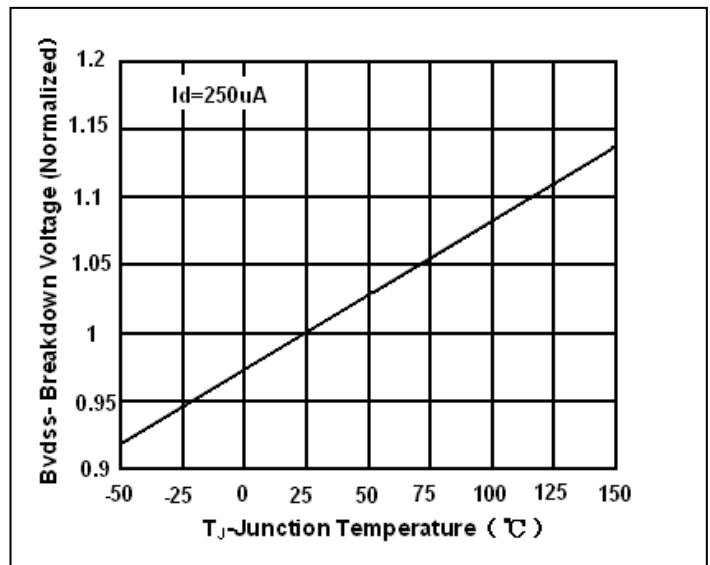
Transfer Characteristic



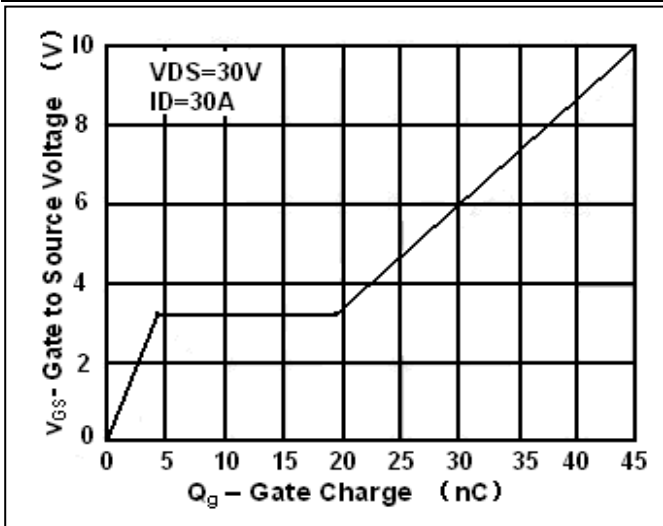
Capacitance



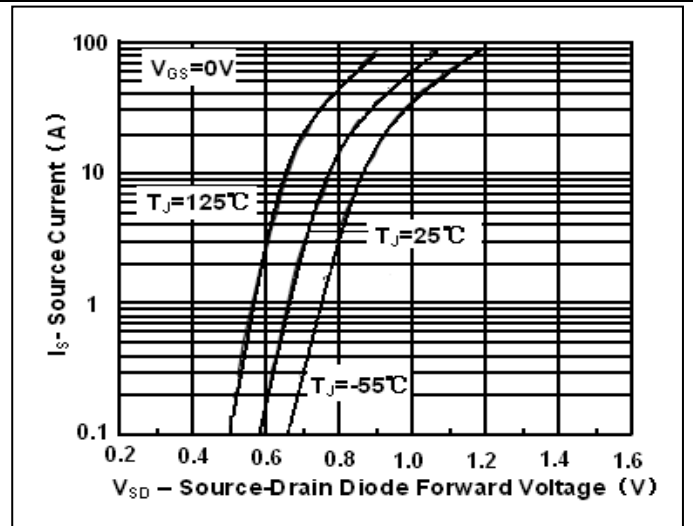
On Resistance vs Junction Temperature



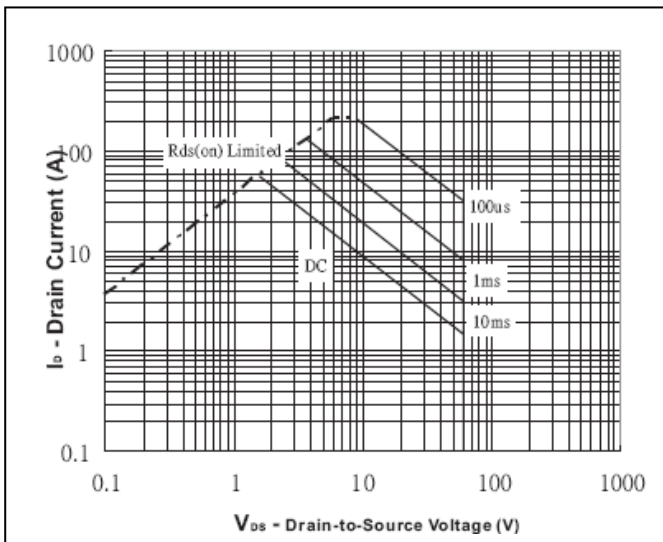
Breakdown Voltage vs Junction Temperature



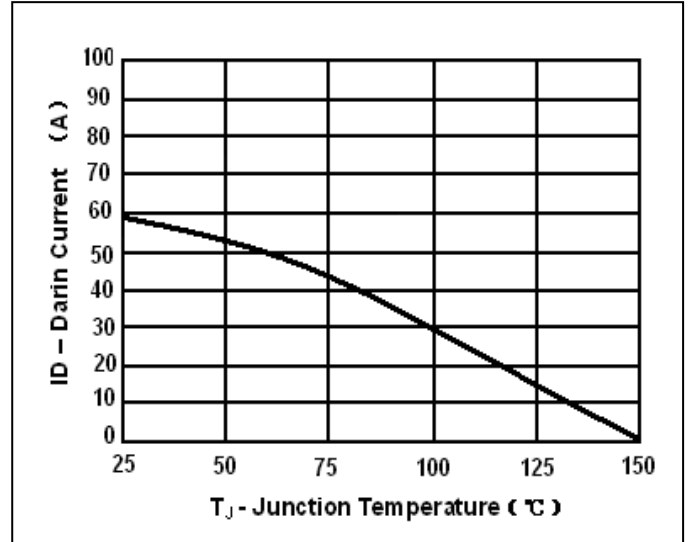
Gate Charge



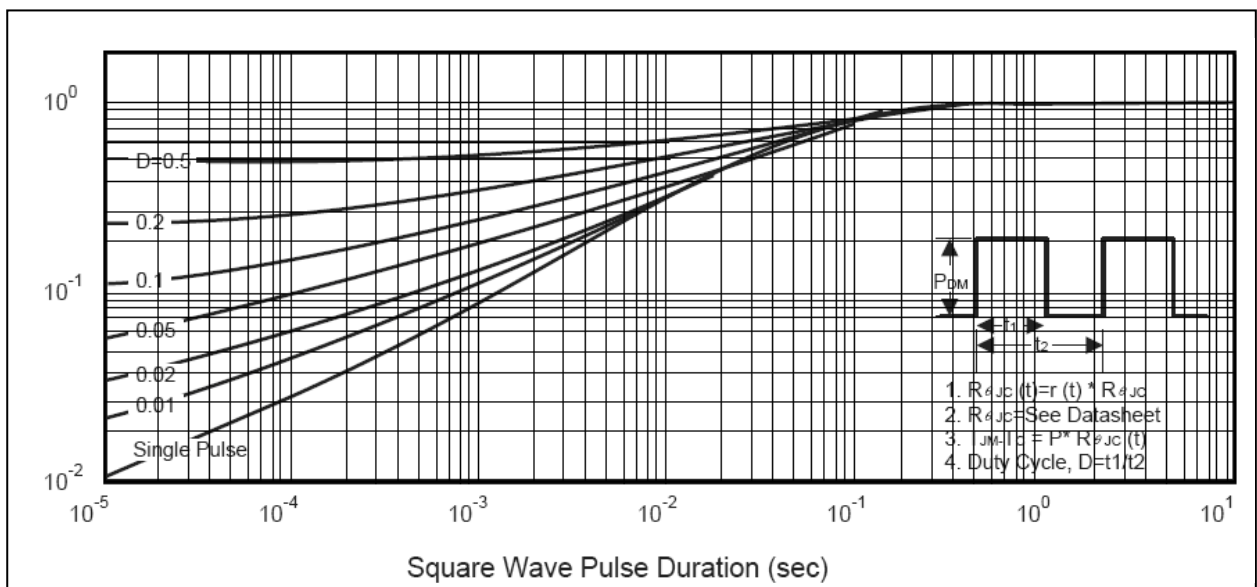
Source-Drain Diode Forward Voltage



Safe Operation Area



Max Drain Current vs Junction Temperature



Transient Thermal Impedance Curve

## TO220 MECHANICAL DATA:

