SSF1016

100V N-Channel MOSFET

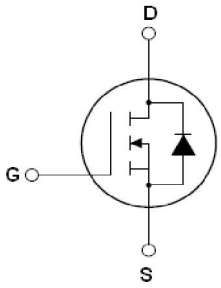
FEATURES

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

ID =75A

BV=100V

$R_{DS\ (ON)}$ =16mΩ (Max.)

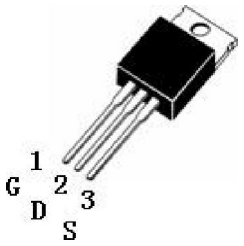


DESCRIPTION

The SSF1016 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. SSF1016 is assembled in high reliability and qualified assembly house.

APPLICATIONS

- Power switching application



SSF1016 Top View (T0-220)

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	65	
I_{DM}	Pulsed drain current ①	300	
P_D@T_C=25℃	Power dissipation	273	W
	Linear derating factor	1.5	W/℃
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	380	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 +175	℃

Thermal Resistance

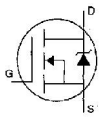
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	0.55	—	℃/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	100	—	—	V	V_{GS}=0V,I_D=250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	11	16	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
I_{DSS}	Drain-to-Source leakage current	—	—	2	μA	V_{DS}=100V,V_{GS}=0V
		—	—	10		V_{DS}=100V, 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	—	90		nC	I_D=30A,V_{GS}=10V V_{DD}=30V
Q_{gs}	Gate-to-Source charge	—	20	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	31	—		
$t_{d(on)}$	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	—	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)	—	—	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=60A,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)				

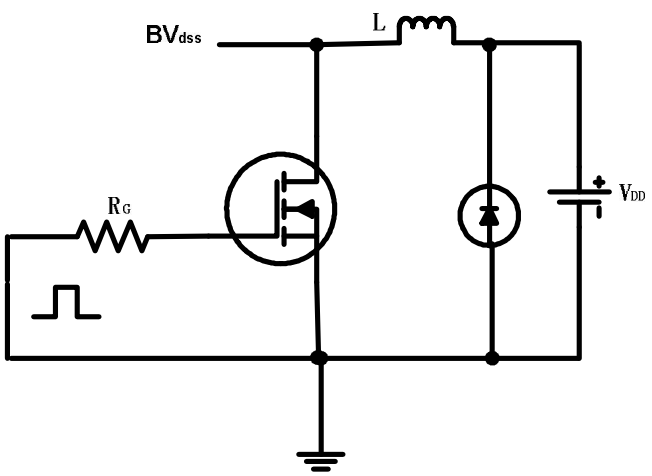
Notes:

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

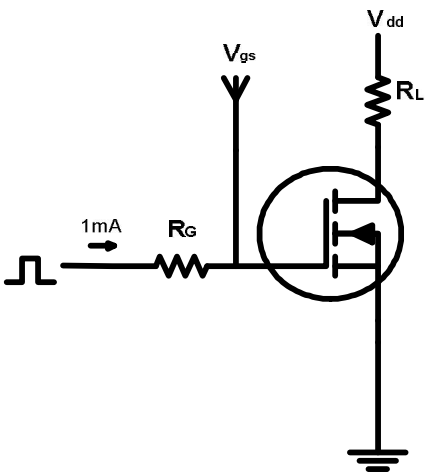
② Test condition: L =0.3mH, VDD = 50V,Id=37A

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

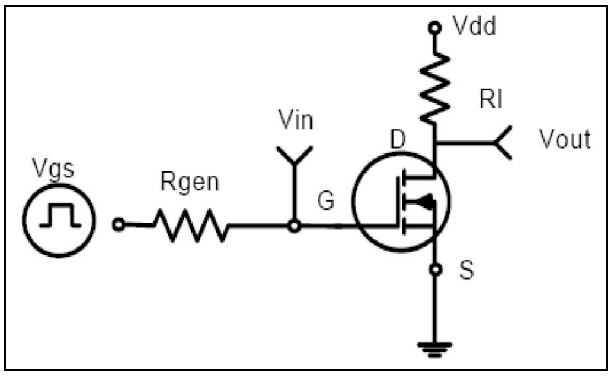
EAS Test Circuit



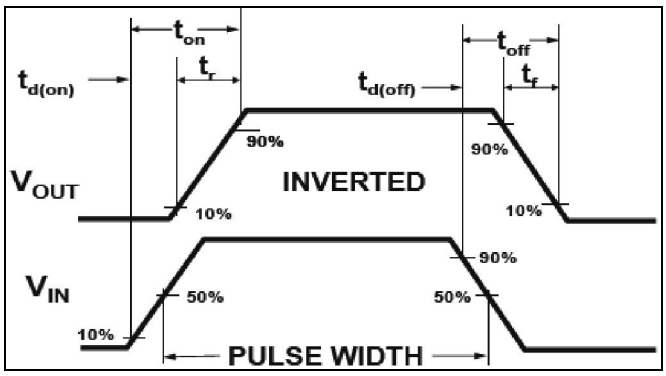
Gate Charge Test Circuit

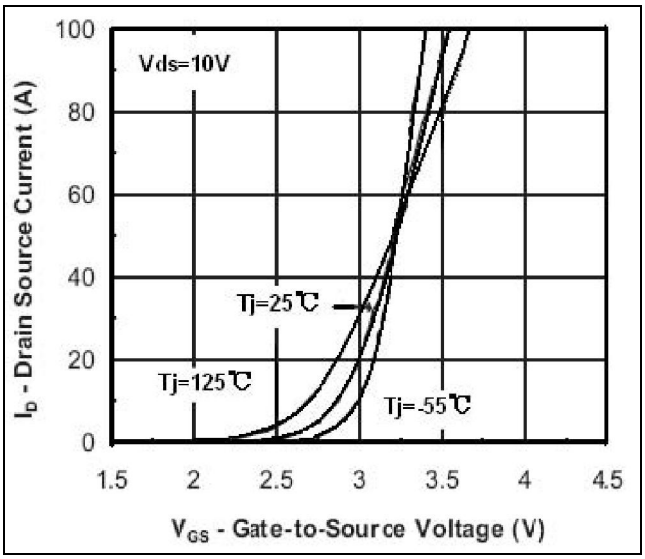


Switch Time Test Circuit

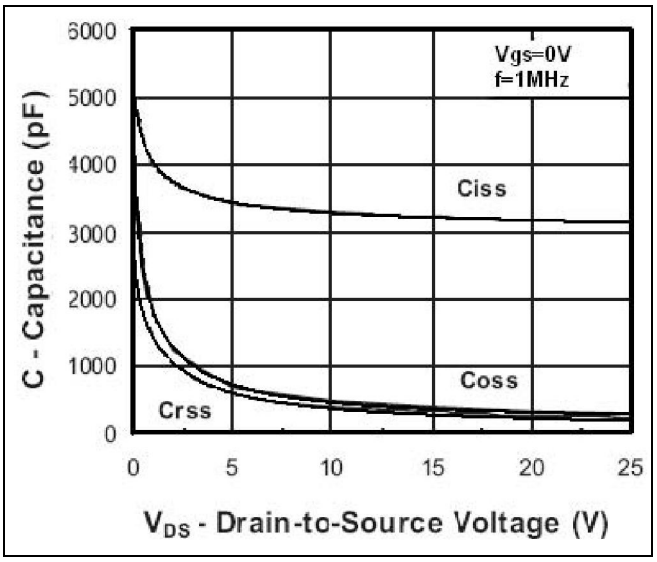


Switch Waveform

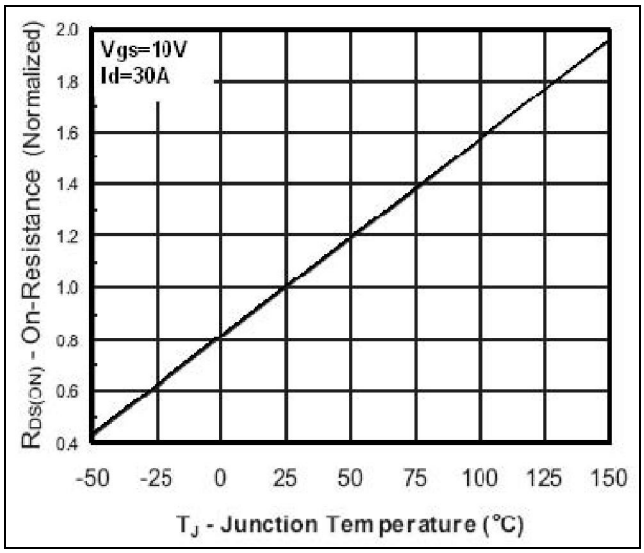




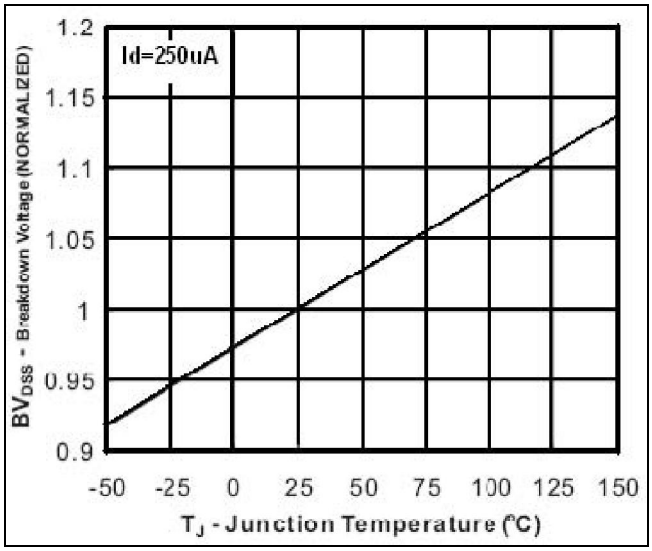
Transfer Characteristic



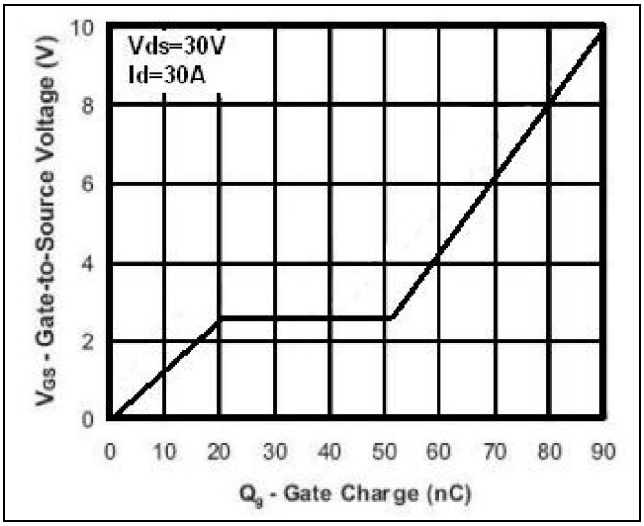
Capacitance



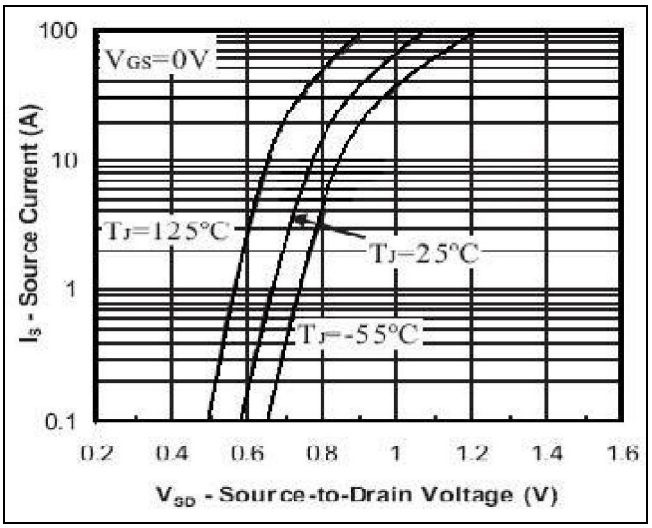
On Resistance vs. Junction Temperature



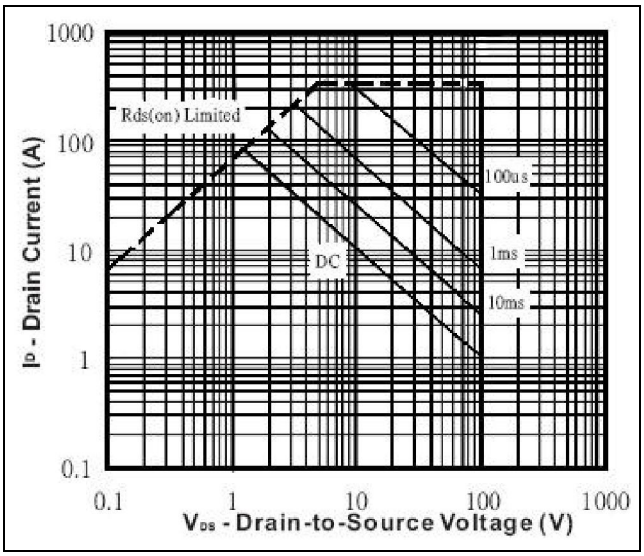
Breakdown Voltage vs. Junction Temperature



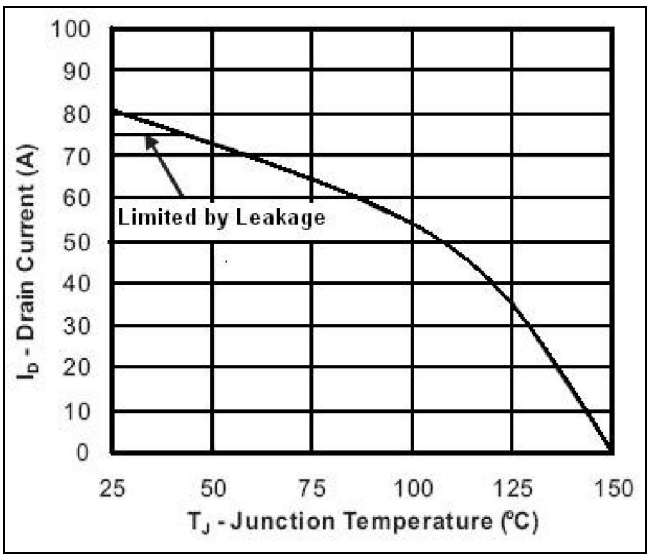
Gate Charge



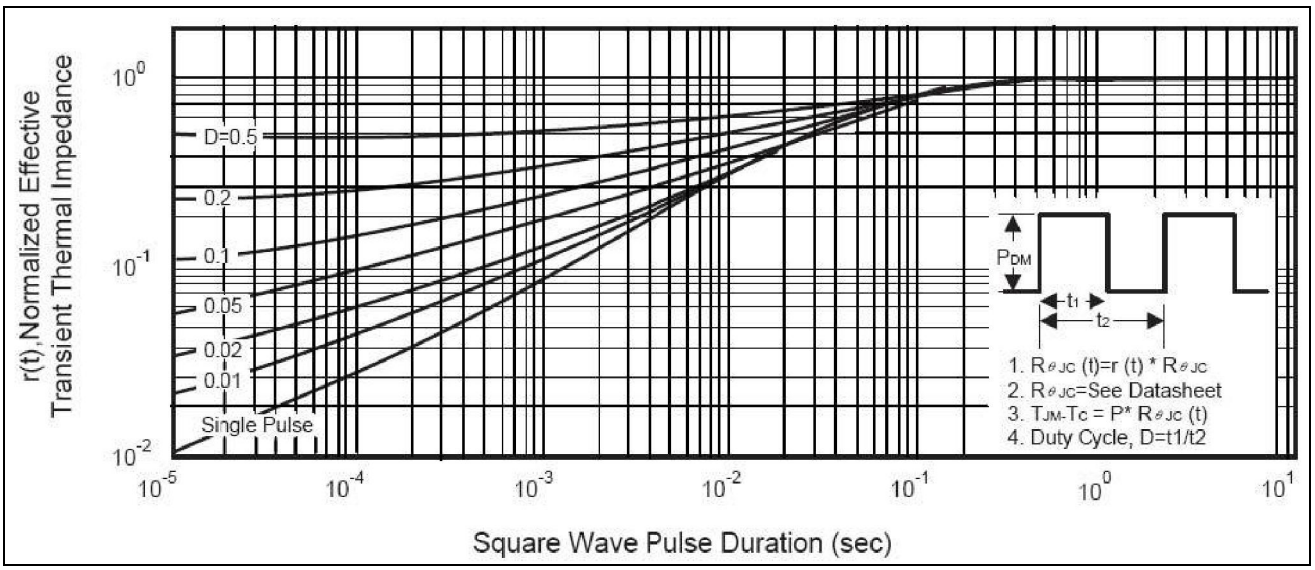
Source-Drain Diode Forward Voltage



Safe Operation Area

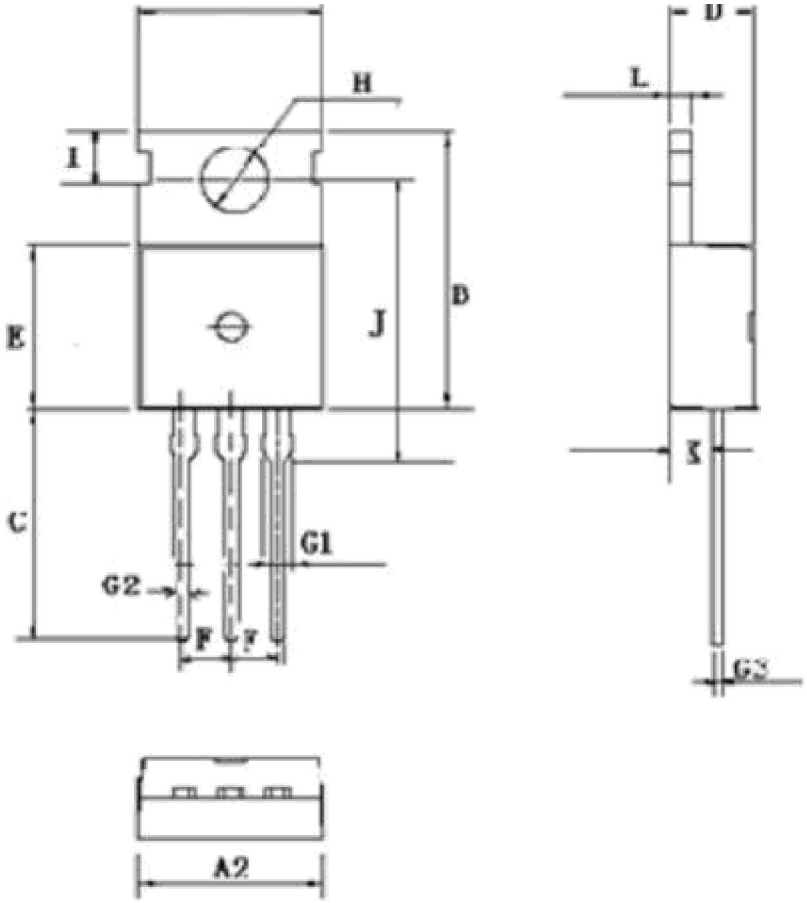


Max Drain Current vs. Junction



Transient Thermal Impedance Curve

TO-220 MECHANICAL DATA



TO-220 3L

SYMBOL	DIMENSIONS
A(mm)	9.66~10.28
A2(mm)	9.80~10.20
B(mm)	15.6~15.8
C(mm)	12.70~14.27
D(mm)	4.30~4.70
E(mm)	8.59~9.40
F(mm)	2.54 (nom)
G1(mm)	1.42~1.62
G2(mm)	0.70~0.95
G3(mm)	0.45~0.60
H(mm) dia.	3.50~3.70
I(mm)	2.7~2.9
J(mm)	15.70~16.25
K(mm)	2.20~2.90
L(mm)	1.15~1.40
M(mm)	0.5