SSF5510G

Preliminary

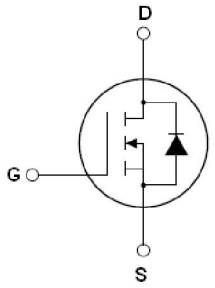
FEATURES

- Advanced trench process technology
- Ultra low Rdson, typical 8mohm
- High avalanche energy, 100% test
- Fully characterized avalanche voltage and current
- Lead free product

ID =56A

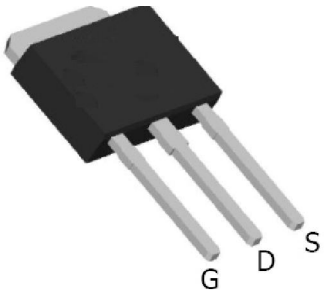
BV=55V

$R_{DS(ON)}$ =8mohm （typ.）



DESCRIPTION

The SSF5510G 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. SS5510G is assembled in high reliability and qualified assembly house.



SSF5510G Top View

APPLICATIONS

- Power switching application

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D@T_c=25℃	Continuous drain current,VGS@10V	56	A
I_D@T_c=100℃	Continuous drain current,VGS@10V	40	
I_{DM}	Pulsed drain current ①	224	
P_D@T_C=25℃	Power dissipation	90	W
	Linear derating factor	0.9	W/℃
V_{GS}	Gate-to-Source voltage	±20	V
dv/dt	Peak diode recovery voltage	5.0	v/ns
E_{AS}	Single pulse avalanche energy ②	405	mJ
E_{AR}	Repetitive avalanche energy	TBD	
T_J T_{STG}	Operating Junction and Storage Temperature Range	–55 to +150	℃

Thermal Resistance

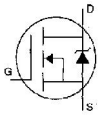
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	—	1.4	℃/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	55	—	—	V	V_{GS}=0V,I_D=250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	8	10	mΩ	V_{GS}=10V,I_D=34A
$V_{GS(th)}$	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}=55V,V_{GS}=0V
		—	—	10		V_{DS}=44V, 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	—	72	—	nC	I_D=34A
Q_{gs}	Gate-to-Source charge	—	18	—		V_{DD}=44V
Q_{gd}	Gate-to-Drain("Miller") charge	—	20	—		V_{GS}=10V
$t_{d(on)}$	Turn-on delay time	—	14	—	nS	V_{DD}=28V
t_r	Rise time	—	110	—		I_D=34A
$t_{d(off)}$	Turn-Off delay time	—	53	—		R_G=6.8Ω
t_f	Fall time	—	76	—		V_{GS}=10V
C_{iss}	Input capacitance	—	2580	—	pF	V_{GS}=0V
C_{oss}	Output capacitance	—	480	—		V_{DS}=25V
C_{rss}	Reverse transfer capacitance	—	110	—		f=1.0MHZ

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	52	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	203		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J=25℃,I_S=34A,V_{GS}=0V ③
t_{rr}	Reverse Recovery Time	—	60	—	nS	T_J=25℃,I_F=34A
Q_{rr}	Reverse Recovery Charge	—	156	—	nC	di/dt=100A/μs ③
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by Ls + LD)				

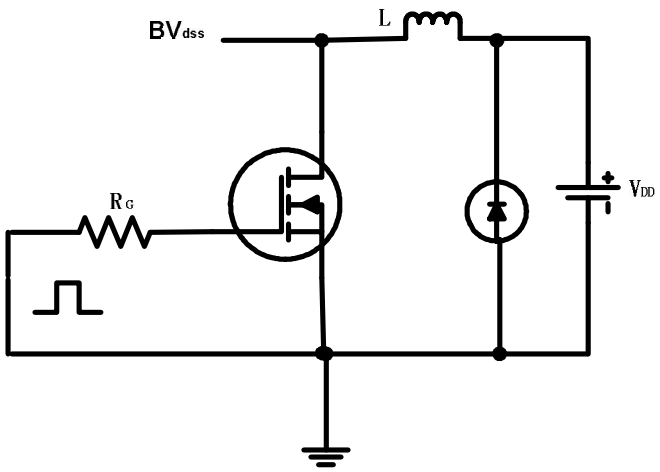
Notes:

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

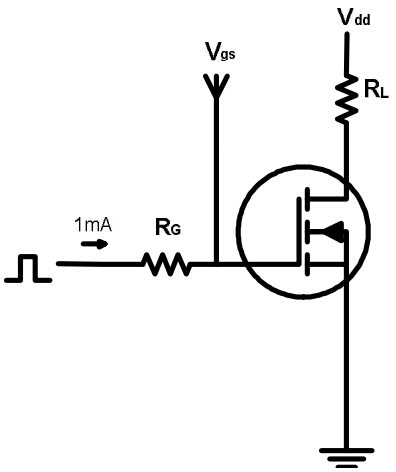
② Test condition: L =0.3mH, ID = 52A, VDD = 30V

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

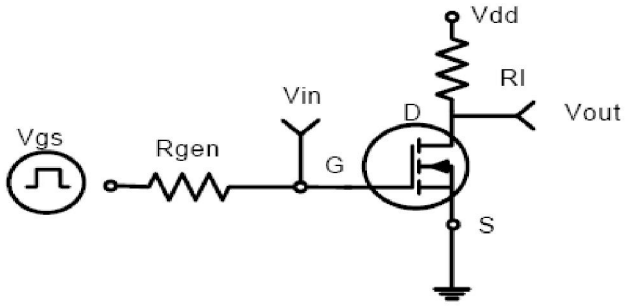
EAS test circuit



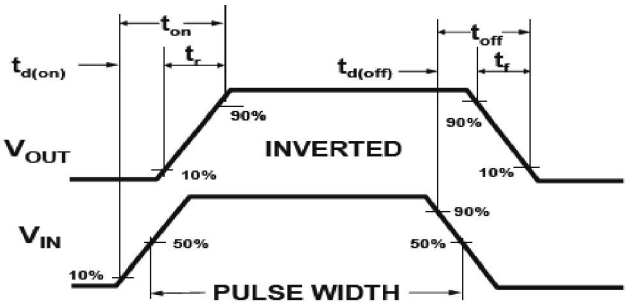
Gate charge test circuit

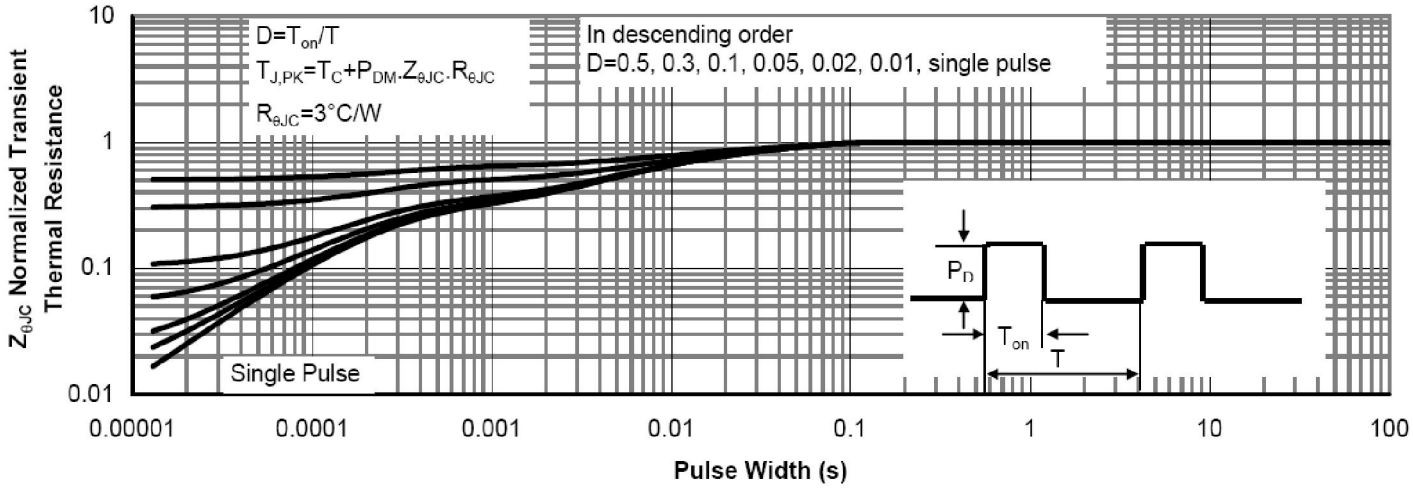


Switch Time Test Circuit



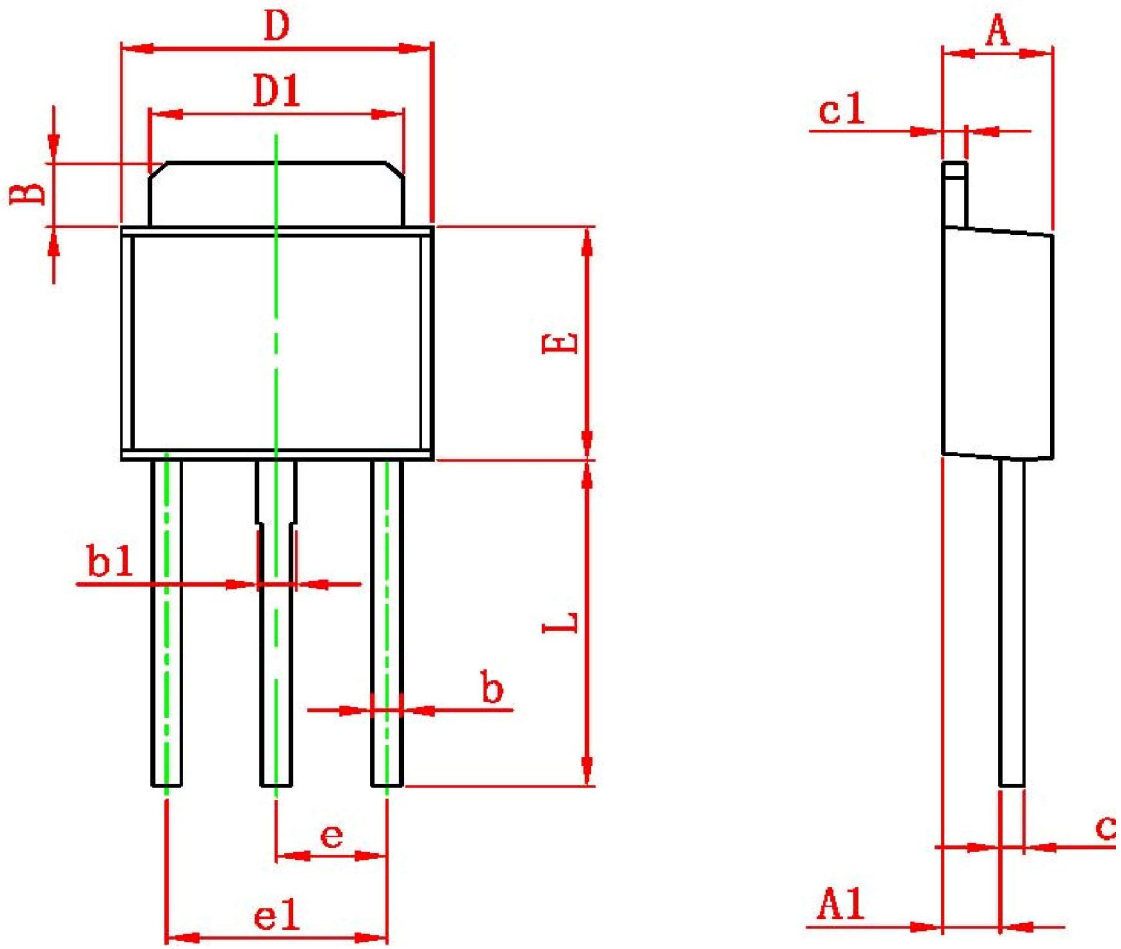
Switch Waveforms





Transient Thermal Impedance Curve

TO-251 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311