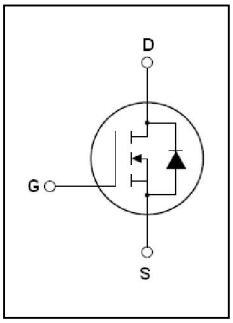
SSF5508D

Preliminary

Main Product Characteristics

V_{DSS}	60V（Typ）
R_{DS}(on)	3.8mohm（Typ）
I_D	110A



SSF5508D Top View (DPAK)

Features and Benefits

- Advanced trench MOSFET process technology
- Special designed for convertors and power controls
- Ultra low on-resistance
- 150℃ operating temperature
- High Avalanche capability and 100% tested
- Lead free product

Description

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating

Symbol	Parameter	Max.	Units
ID @ TC = 25°C	Continuous Drain Current, VGS @ 10V①	110	A
ID @ TC = 100°C	Continuous Drain Current, VGS @ 10V①	80	
IDM	Pulsed Drain Current②	440	
I_{SM}	Pulsed Source Current. (Body Diode)	400	
PD @TC = 25°C	Power Dissipation③	170	W
	Linear derating factor	2	W/ C°
VDS	Drain-Source Voltage	55	V
VGS	Gate-to-Source Voltage	± 20	V
dv/dt	Peak diode recovery voltage	35	v/ns
EAS	Single Pulse Avalanche Energy @ L=0.3mH②	735	mJ
IAR	Avalanche Current @ L=0.3mH②	65	A
TJ TSTG	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

Symbol	Characterizes	Value	Unit
$R_{\theta JC}$	Junction-to-case③	0.73	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	50	℃/W

Electrical Characteristics @T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max	Units	Conditions
BVDSS	Drain-to-Source breakdown voltage	55	60	—	V	VGS = 0V, ID = 250μA
RDS(on)	Static Drain-to-Source on-resistance	—	3.8	5	mΩ	VGS = 10V, ID = 20A
VGS(th)	Gate threshold voltage	2	3	4	V	VDS = VGS, ID = 250μA
IDSS	Drain-to-Source leakage current	—	—	1	μA	VDS = 55V, VGS = 0V
		—	—	10		VDS = 55V, VGS = 0V, TJ = 150°C
IGSS	Gate-to-Source forward leakage	—	—	100	nA	VGS =20V
	Gate-to-Source reverse leakage	-100	—	—		VGS = -20V
Qg	Total gate charge	—	124.77	120	nC	ID=30A VDD=30V VGS=10V
Qgs	Gate-to-Source charge	—	24.46	30		
Qgd	Gate-to-Drain("Miller") charge	—	48.68	30		
Qg(th)	Gate charge at shreshold	—	16	20		
Vplateau	gate plateau voltage	—	4.7	6	V	
td(on)	Turn-on delay time	—	19.62	—	ns	VDD=30V ID=2A ，RL=15Ω RG=2.5Ω VGS=10V
tr	Rise time	—	18.82	—		
td(off)	Turn-Off delay time	—	69.76	—		
tf	Fall time	—	30.12	—		
Ciss	Input capacitance	—	5607	—	pF	VGS = 0V, VDS = 25V, f = 1.0MHz
Coss	Output capacitance	—	463	—		
Crss	Reverse transfer capacitance	—	454	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max	Units	Conditions
IS	Maximum Body-Diode Continuous Current		110	—	A	
VSD	Diode Forward Voltage	—	0.77	1	V	IS=40A, VGS=0V
trr	Reverse Recovery Time	—	36	—	ns	TJ = 25°C, IF =68A, , di/dt = 100A/μs
Qrr	Reverse Recovery Charge	—	57	—	nC	
ton	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Typical Electrical and Thermal Characteristics

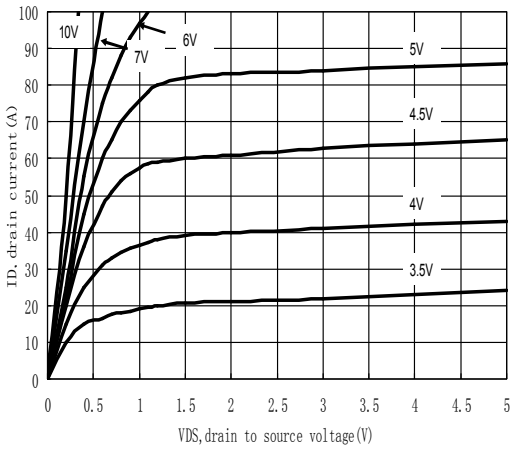


Figure 1: Typical Output Characteristics

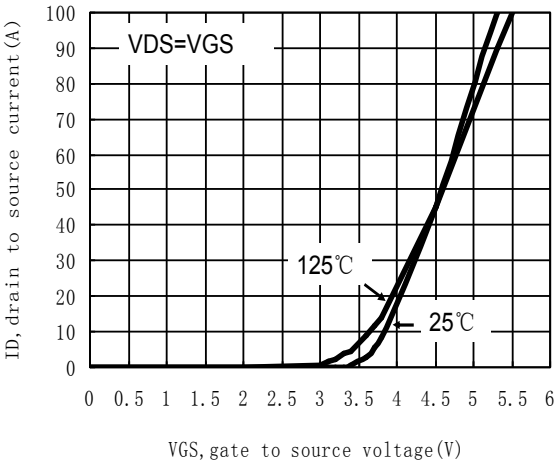


Figure 2: Typical Transfer Characteristics

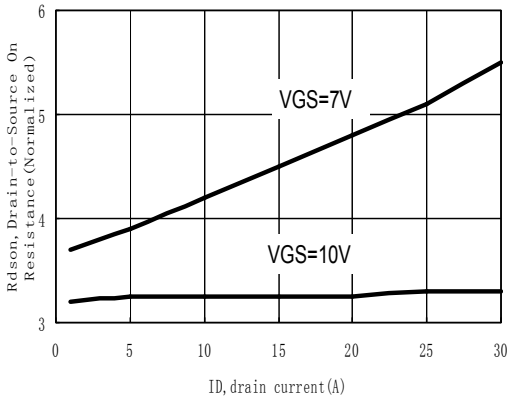


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

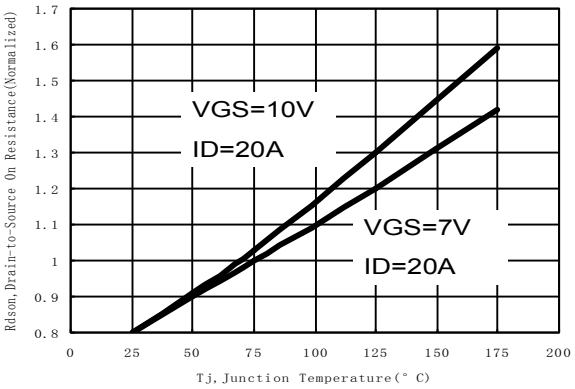


Figure 4: On-Resistance vs. Junction Temperature

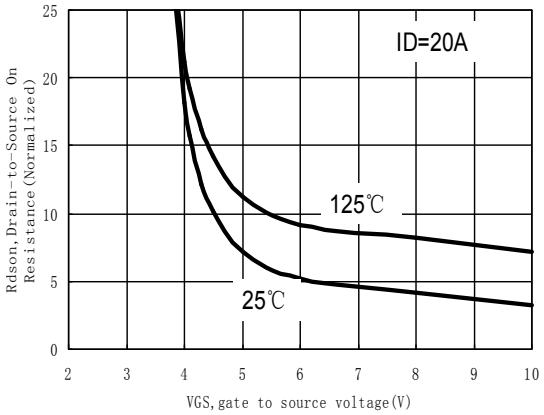


Figure 5: On-Resistance vs. Gate-Source Voltage

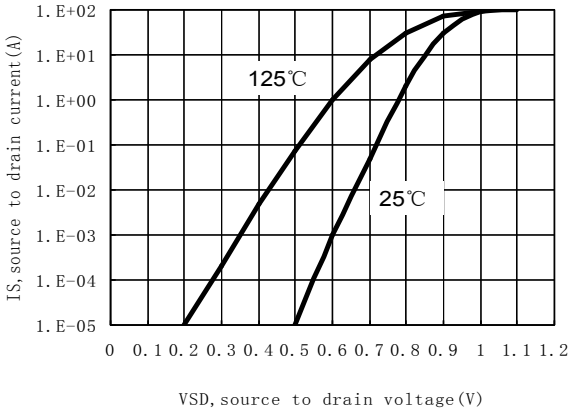
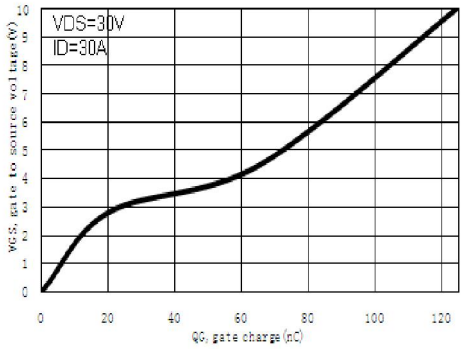


Figure 6: Body-Diode Characteristics

Typical Electrical and Thermal Characteristics



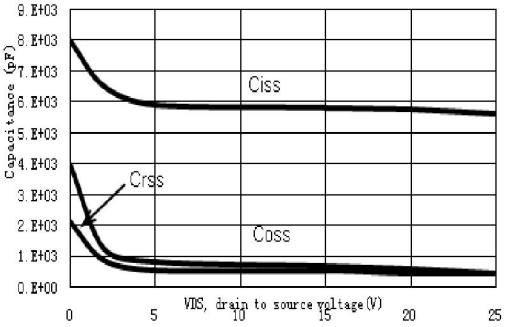
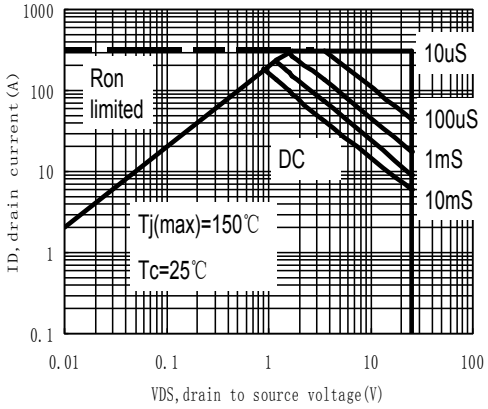


Figure 7: Gate-Charge Characteristics Figure

8: Capacitance Characteristics



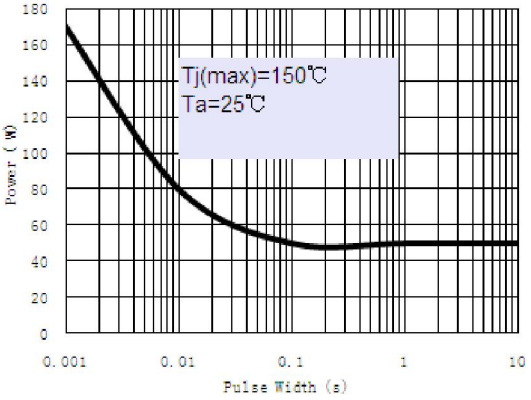
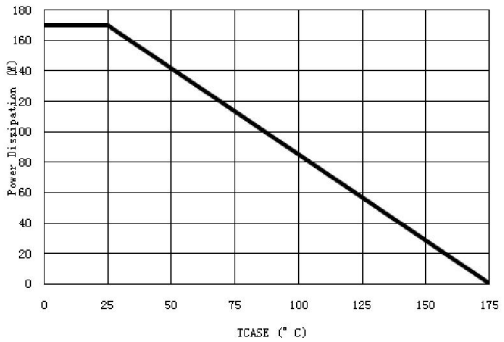


Figure 9: Maximum Forward Biased Safe Operating Area(⑤)

Figure 10: Single Pulse Power Rating Junction-to-Case (⑤)



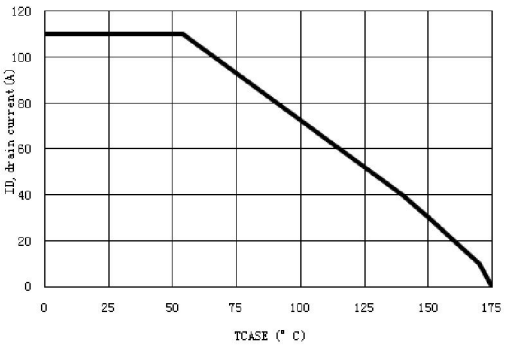


Figure 11: Power De-rating (③)

Figure 12: Current De-rating (③)

Typical Electrical and Thermal Characteristics

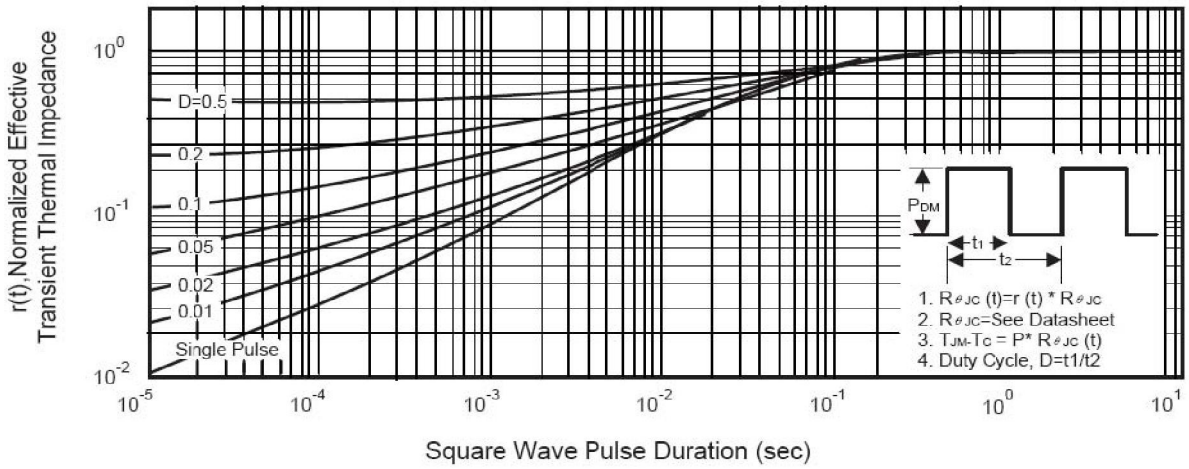
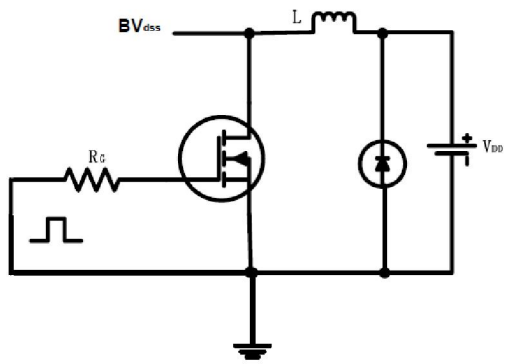
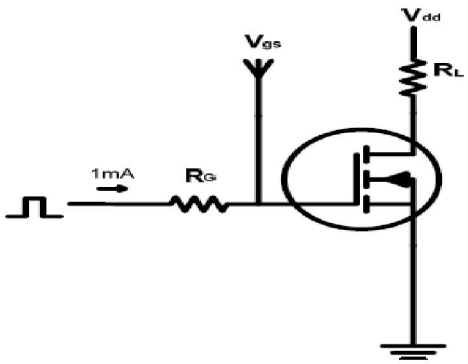


Figure 13:Transient Thermal Impedance Curve

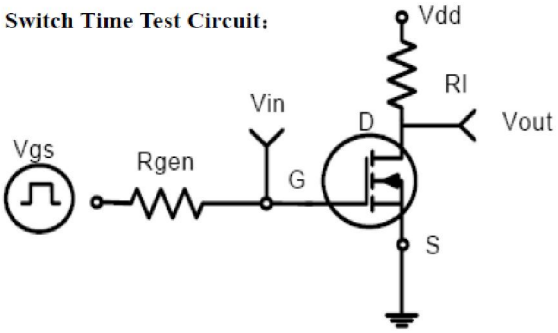
EAS test circuits:



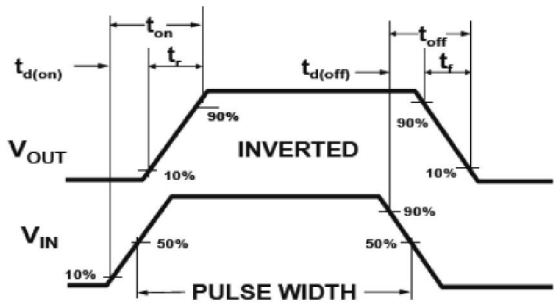
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



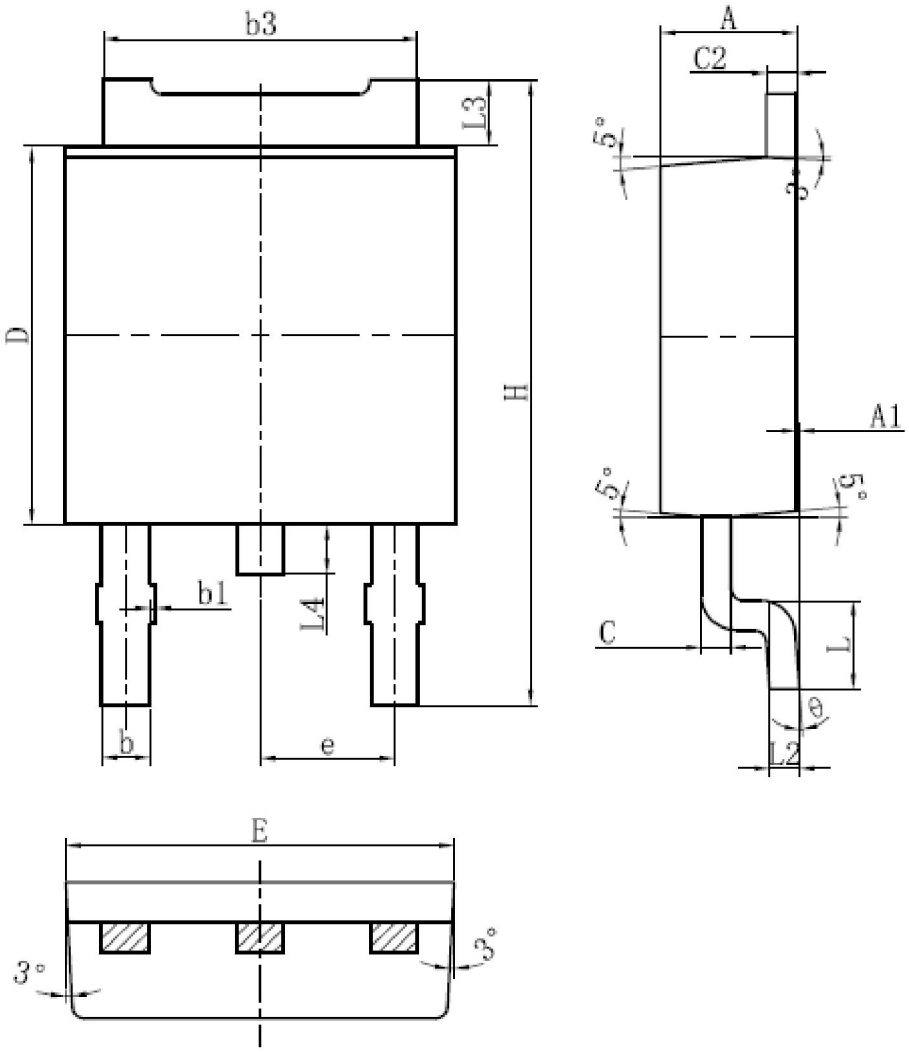
Notes: ①The maximum current rating is limited by bond-wires.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.

DPAK (TO-252) Mechanical Data



Symbol	Min.	Normal	Max.
E	6.55	6.6	6.65
L	1.40	1.5	1.60
L2	-	0.51BSC	-
L3	0.93	1.08	1.23
L4	0.7	0.8	0.9
D	6.05	6.1	6.15
H	9.9	10.1	10.3
b	0.763	0.813	0.863
b1	0	-	0.1
b3	5.28	5.33	5.38
e	2.23	2.28	2.33
A	2.25	2.3	2.35
A1	0	0.05	0.10
C	0.498	0.508	0.518
C2	0.498	0.508	0.518
θ	0	-	8°

NOTE:
1.Package body size exclude flash and gate burrs.
2.Dimension L is measured in gage plane.
3.Tolerance 0.10mm unless otherwise specified.
4.Controlling dimension is millimeter.Converted inch dimension are not necessarily exact.