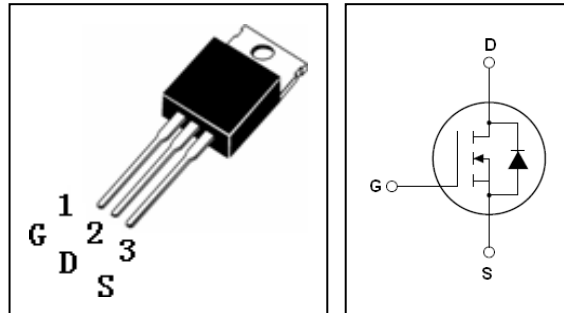


Main Product Characteristics

V_{DSS}	100V (Typ)
$R_{DS(on)}$	6m Ω (Typ)
I_D	130A



SSF1007 Top View (TO-220)

Features and Benefits

- Advanced trench MOSFET process technology
- Ideal for convertors and power controls
- Ultra low on-resistance
- 150°C operating temperature
- High Avalanche capability and 100% tested

Description

The SSF1007 utilizes the latest processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable device for use in power switching applications and a wide variety of other applications.

Absolute Max Ratings

Symbol	Parameter	Max.	Units
I_D @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ^①	130	A
I_D @ $T_C = 100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ^①	91	
I_{DM}	Pulsed Drain Current ^②	520	
I_{SM}	Pulsed Source Current.(Body Diode)	520	
P_D @ $T_C = 25^\circ\text{C}$	Power Dissipation ^③	258	W
	Linear derating factor	1.7	W/ $^\circ\text{C}$
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.3\text{mH}$ ^②	735	mJ
I_{AR}	Avalanche Current @ $L=0.3\text{mH}$ ^②	75	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

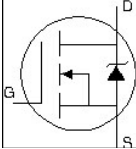
Thermal Resistance

Symbol	Characteristics	Value	Unit
$R_{\theta JC}$	Junction-to-Case ^③	0.58	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient ($t \leq 10\text{s}$) ^④	62	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS} = 0V$, $I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	5	6	m Ω	$V_{GS} = 10V$, $I_D = 75A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	2	—	4	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	$V_{DS} = 100V$, $V_{GS} = 0V$
		—	—	250		$V_{DS} = 80V$, $V_{GS} = 0V$, $T_J = 125^\circ\text{C}$
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	—	243	170	nC	$I_D = 75A$ $V_{DS} = 50V$ $V_{GS} = 10V$ ③
Q_{gs}	Gate-to-Source Charge	—	47	—		
Q_{gd}	Gate-to-Drain ("Miller" Charge)	—	92	—		
$t_{d(on)}$	Turn-on Delay Time	—	28	—	ns	$V_{DD} = 65V$ $I_D = 75A$ $R_G = 2.7 \Omega$ $V_{GS} = 10V$ ③
t_r	Rise Time	—	108	—		
$t_{d(off)}$	Turn-Off Delay Time	—	123	—		
t_f	Fall Time	—	120	—		
C_{iss}	Input Capacitance	—	8456	—	pF	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 500KHz$
C_{oss}	Output Capacitance	—	454	—		
C_{rss}	Reverse Transfer Capacitance	—	417	—		

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	130	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	520		$T_J = 25^{\circ}\text{C}$, $I_S = 75\text{A}$, $V_{GS} = 0\text{V}$ ③
V_{SD}	Diode Forward Voltage	—		1.3	V	$T_J = 25^{\circ}\text{C}$, $I_F = 75\text{A}$, $V_{DD} = 20\text{V}$ $di/dt = 100\text{A}/\mu\text{s}$ ③
t_{rr}	Reverse Recovery Time	—	57	70	ns	$T_J = 25^{\circ}\text{C}$, $I_F = 75\text{A}$, $V_{gs}=0\text{V}$ $di/dt = 100\text{A}/\mu\text{s}$ ③
Q_{rr}	Reverse Recovery Charge	—	156	170	nC	
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Typical Electrical and Thermal Characteristics

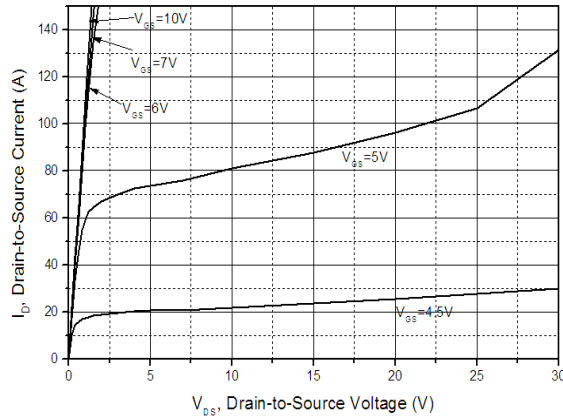


Figure 1. Typical Output Characteristics

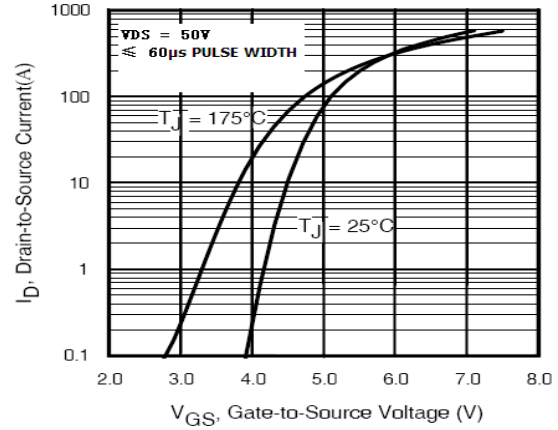


Figure 2. Typical Transfer Characteristics

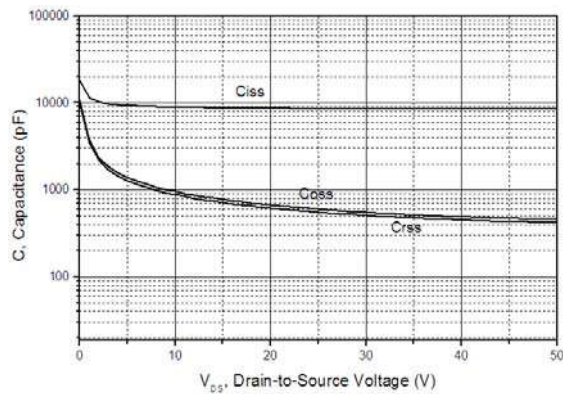


Figure 3. Typical Capacitance Vs. Drain-to-Source Voltage

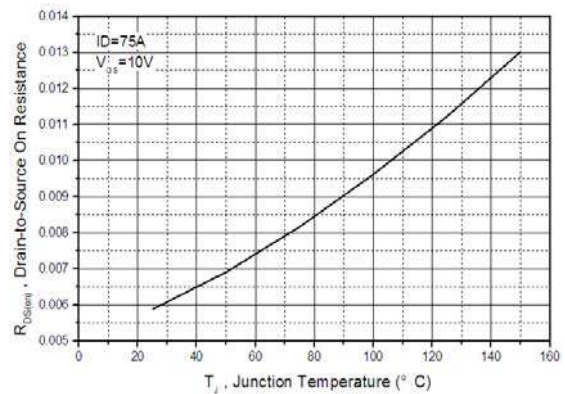


Figure 4. Normalized On-Resistance Vs. Case Temperature

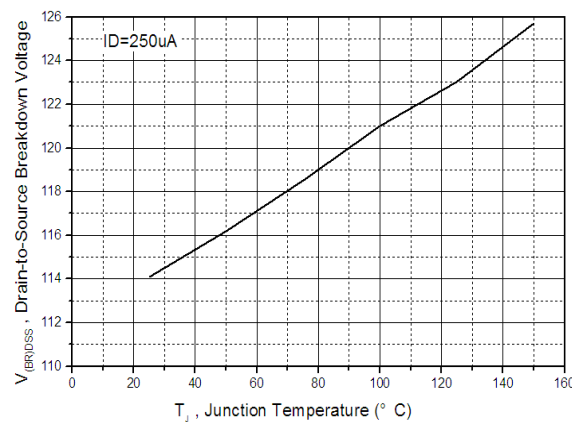


Figure 5. Drain-to-Source Breakdown Voltage vs. Temperature

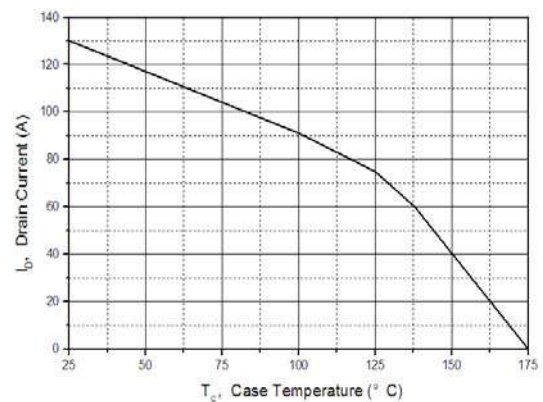


Figure 6. Maximum Drain Current Vs. Case Temperature

Typical Electrical and Thermal Characteristics

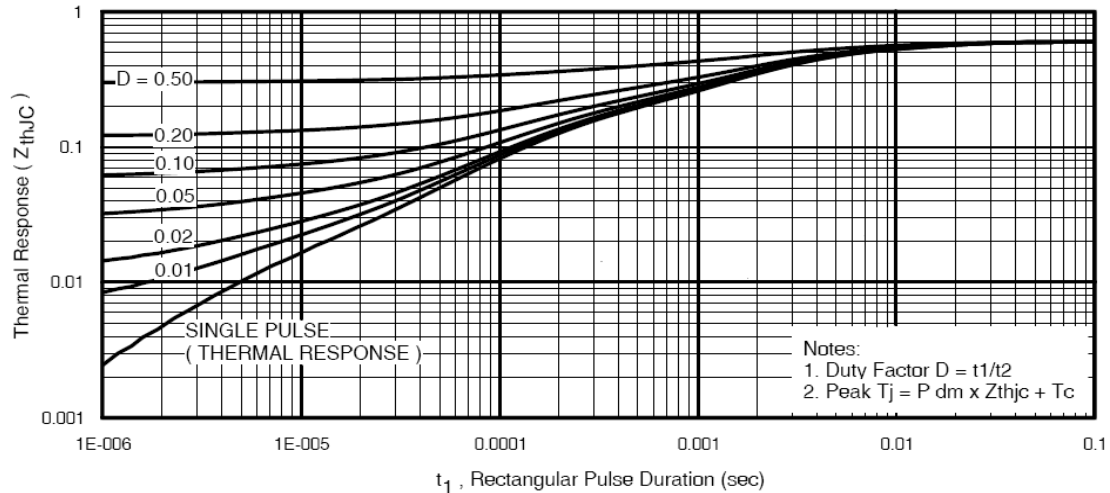
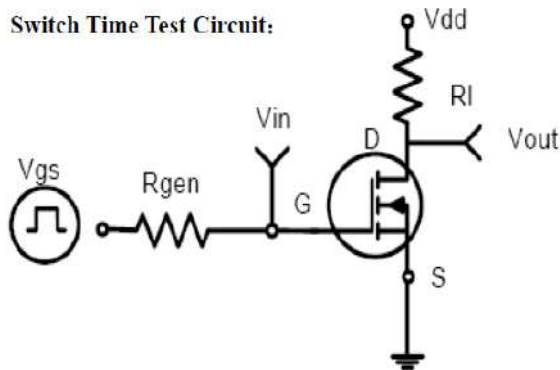
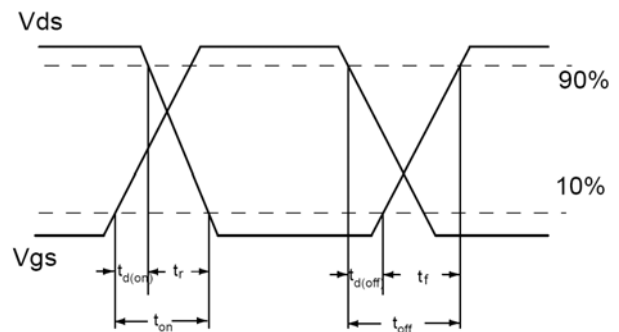


Figure 7. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Switch Time Test Circuit:



Switching Waveforms

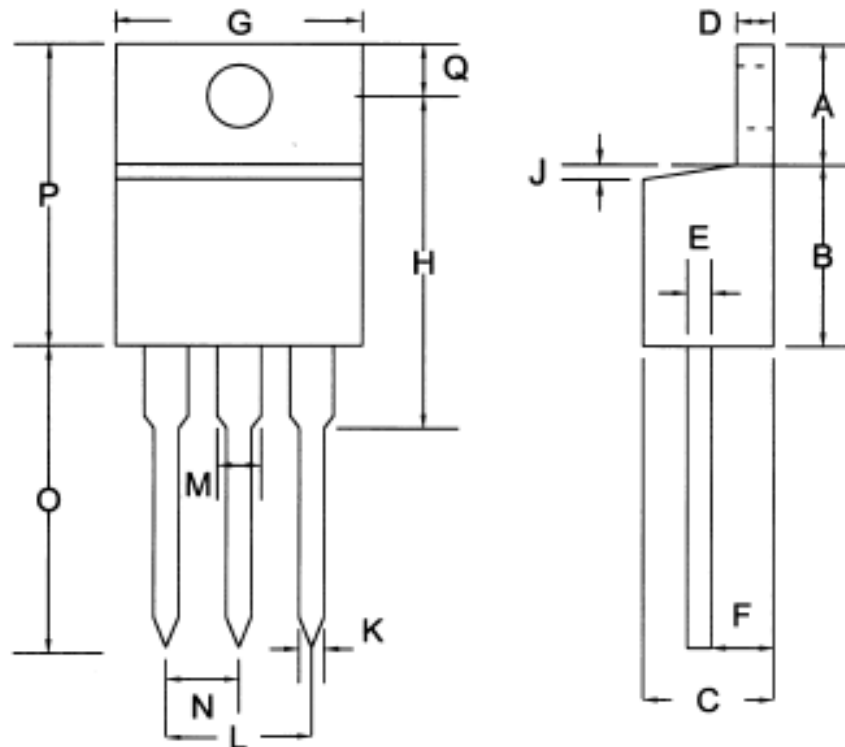


Notes

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{jmax} , starting $T_j = 25^\circ\text{C}$, $L = 0.3\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 70\text{A}$, $V_{GS} = 10\text{V}$. Part not recommended for use above this value.
- ③ Pulse width $< 1.0\text{ms}$; duty cycle $< 2\%$.
- ④ This is only applied to TO-220 package

Mechanical Data

TO-220



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	5.58	6.54	7.49	0.220	0.257	0.295
B	8.38	8.64	8.90	0.330	0.340	0.350
C	4.07	4.45	4.82	0.160	0.175	0.190
D	1.15	1.27	1.39	0.045	0.050	0.055
E	0.35	0.45	0.60	0.014	0.018	0.024
F	2.04	2.42	2.79	0.080	0.095	0.110
G	9.66	9.97	10.28	0.380	0.393	0.405
H	—	16.25	—	—	0.640	—
I	3.68	3.83	3.98	0.145	0.151	0.157
J	—	—	1.27	—	—	0.050
K	0.75	0.85	0.95	0.030	0.033	0.037
L	4.83	5.08	5.33	0.190	0.200	0.210
M	1.15	1.33	1.52	0.045	0.052	0.060
N	2.42	2.54	2.66	0.095	0.100	0.105
O	12.70	13.48	14.27	0.500	0.531	0.562
P	14.48	15.17	15.87	0.570	0.597	0.625
Q	2.54	2.79	3.04	0.100	0.110	0.120