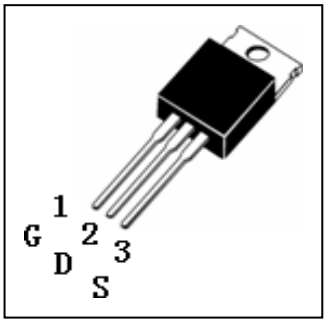
GOOD-ARK SEMICONDUCTOR

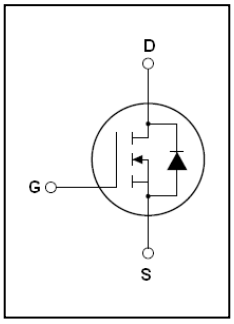
SSF1007

100V N-Channel MOSFET

Main Product Characteristics

V_{DSS}	100V (Typ)
$R_{DS(on)}$	6mΩ (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°C	Continuous Drain Current, V_{GS} @ 10V①	130	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V①	91	
I_{DM}	Pulsed Drain Current②	520	
I_{SM}	Pulsed Source Current.(Body Diode)	520	
P_D @T_C = 25°C	Power Dissipation③	258	W
	Linear derating factor	1.7	W/°C
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH②	735	mJ
I_{AR}	Avalanche Current @ L=0.3mH②	75	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C

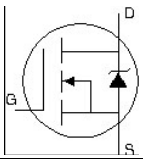
Thermal Resistance

Symbol	Characteristics	Value	Unit
$R_{\theta JC}$	Junction-to-Case③	0.58	°C/W
$R_{\theta JA}$	Junction-to-Ambient (t ≤ 10s) ④	62	°C/W

Electrical Characteristics (T_A=25°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 = 250μA
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	5	6	mΩ	V_{GS} = 10V, I_D = 75A③
$V_{GS(th)}$	Gate Threshold Voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
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°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
Q_{gs}	Gate-to-Source Charge	—	47	—		V_{DS} = 50V
Q_{gd}	Gate-to-Drain ("Miller" Charge)	—	92	—		V_{GS} = 10V③
$t_{d(on)}$	Turn-on Delay Time	—	28	—	ns	V_{DD} = 65V
t_r	Rise Time	—	108	—		I_D = 75A
$t_{d(off)}$	Turn-Off Delay Time	—	123	—		R_G = 2.7 Ω
t_f	Fall Time	—	120	—		V_{GS} = 10V③
C_{iss}	Input Capacitance	—	8456	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	454	—		V_{DS} = 50V
C_{rss}	Reverse Transfer Capacitance	—	417	—		f = 500KHz

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°C, I_S = 75A, V_{GS} = 0V③
V_{SD}	Diode Forward Voltage	—		1.3	V	T_J = 25°C, I_F = 75A, V_{DD} = 20V di/dt = 100A/μs③
t_{rr}	Reverse Recovery Time	—	57	70	ns	T_J = 25°C, I_F = 75A,V_{gs}=0V di/dt = 100A/μs③
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

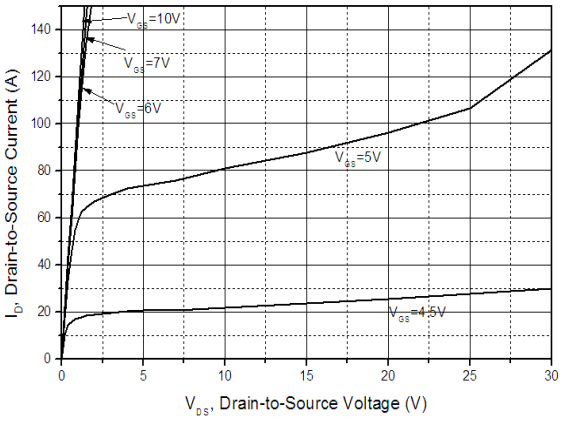


Figure 1. Typical Output Characteristics

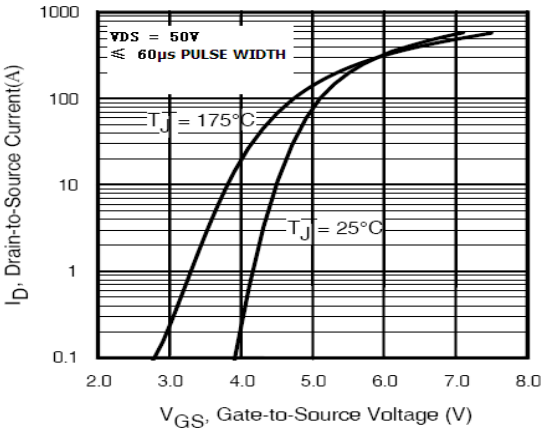


Figure 2. Typical Transfer Characteristics

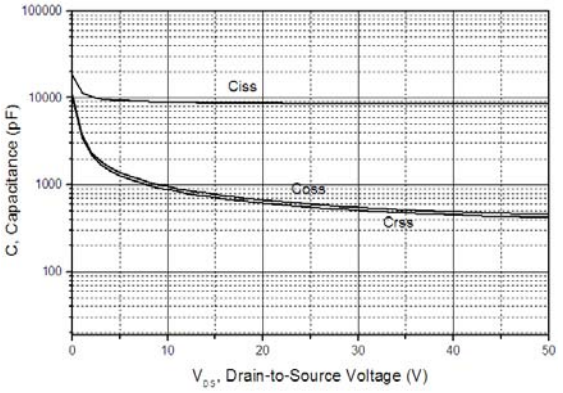


Figure 3.Typical Capacitance Vs. Drain-to-Source Voltage

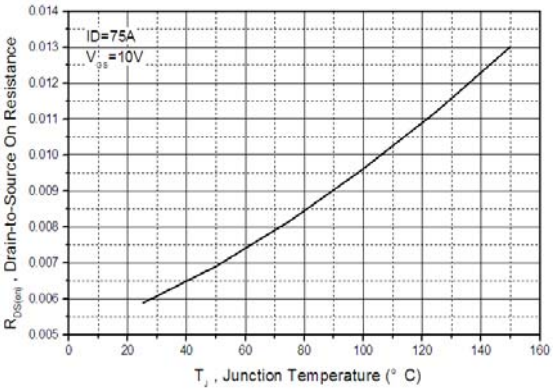


Figure 4. Normalized On-Resistance Vs. Case Temperature

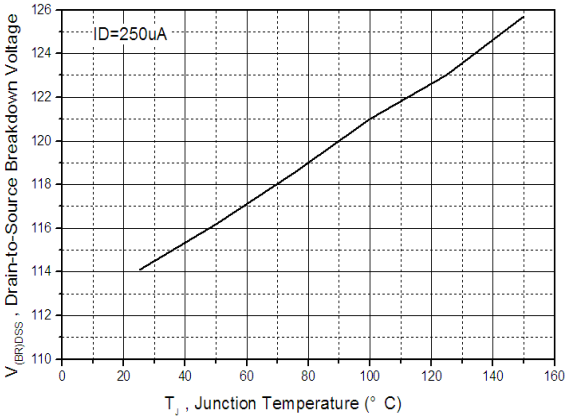


Figure 5. Drain-to-Source Breakdown Voltage vs. Temperature

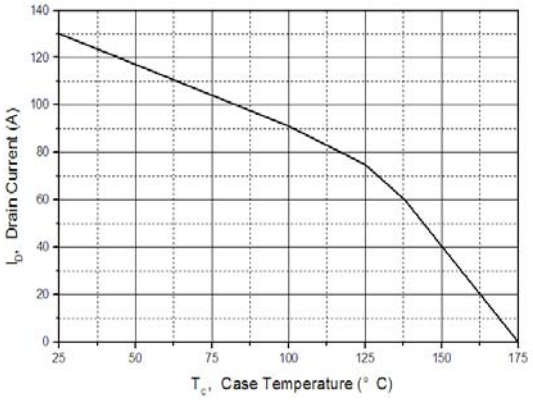


Figure 6. Maximum Drain Current Vs. Case Temperature

Typical Electrical and Thermal Characteristics

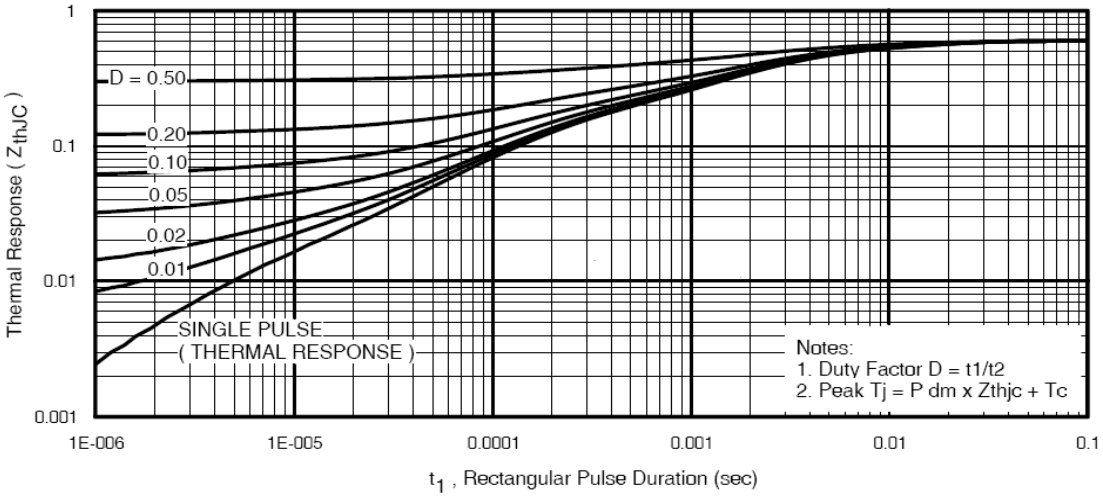
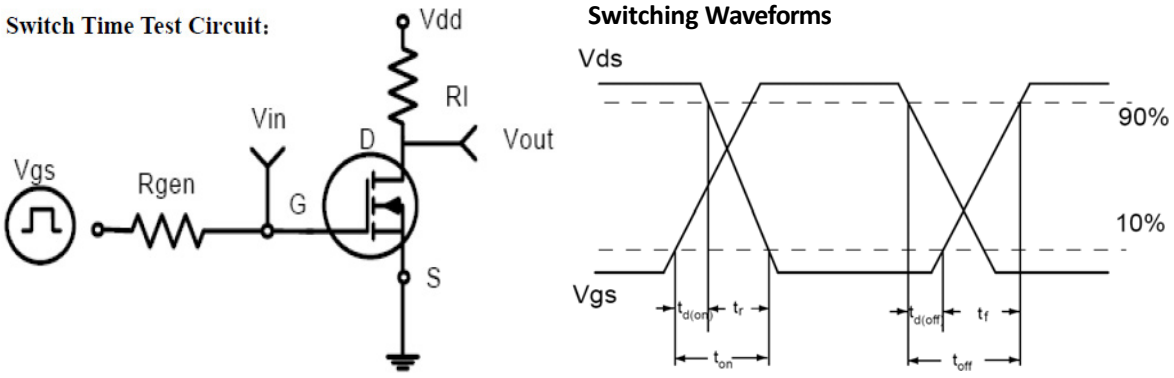


Figure 7. Maximum Effective Transient Thermal Impedance, Junction-to-Case



Notes

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

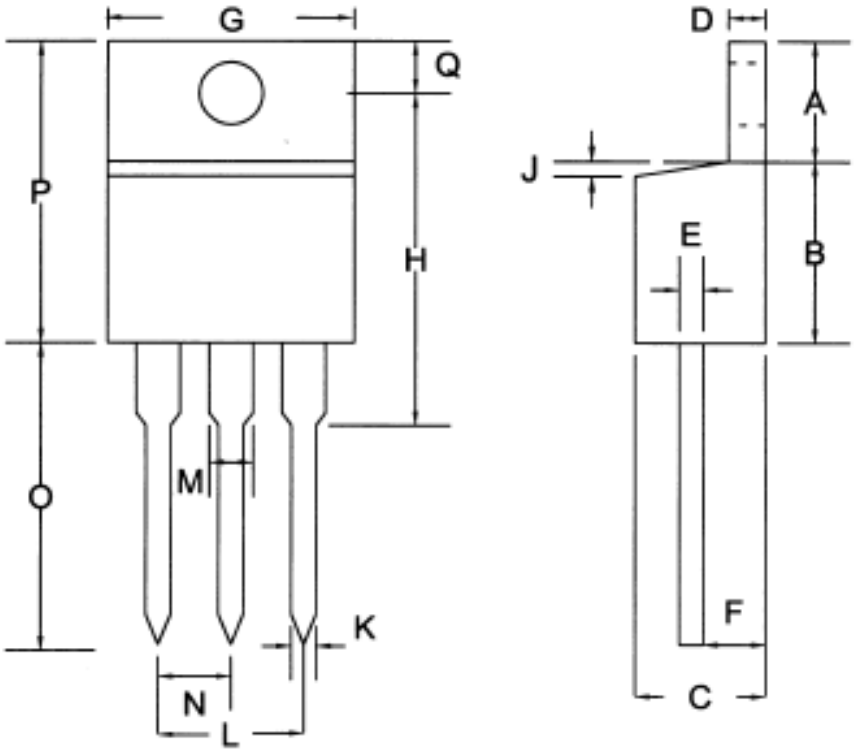
②Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH R_G =50Ω, I_{AS} = 70A, V_{GS} =10V. Part not recommended for use above this value.

③Pulse width < 1.0ms; duty cycle<2%.

④This is only applied to TO-220 package

Mechanical Data

TO-220



Symbol	Dimensions In Millmeters			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