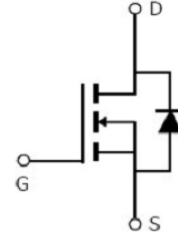


Main Product Characteristics

V_{DSS}	600V
$R_{DS(on)}$	0.116Ω (typ.)
I_D	26A



TO-220F



Schematic Diagram

Features and Benefits

- High dv/dt and avalanche capabilities
- 100% avalanche tested
- Low input capacitance and gate charge
- Low gate input resistance



Description

The SSF26NS60UF 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 Rating

Symbol	Parameter	Max.	Unit
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	26	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	16	
I_{DM}	Pulsed Drain Current②	104	
$P_D @ T_C = 25^\circ C$	Power Dissipation③	36	W
	Linear Derating Factor	0.29	W/°C
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ L=13.8mH	248	mJ
I_{AS}	Avalanche Current @ L=13.8mH	6	A
$T_J T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

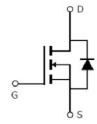
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Unit
$R_{\theta JC}$	Junction-to-Case ^③	—	3.6	°C /W
$R_{\theta JA}$	Junction-to-Ambient ($t \leq 10s$) ^④	—	62.5	°C /W

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

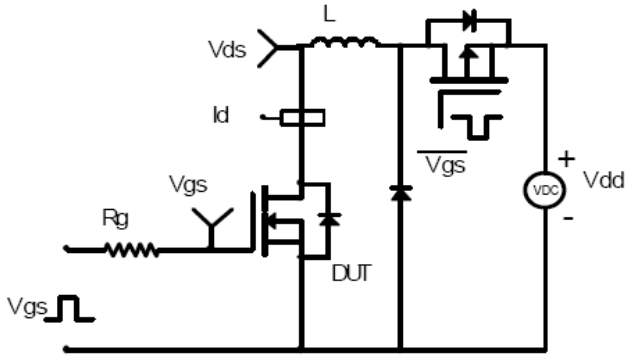
Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	600	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.116	0.13	Ω	$V_{GS}=10V, I_D = 13A$
$V_{GS(th)}$	Gate Threshold Voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$ $T_J = 125^\circ\text{C}$
		—	2.17	—		
I_{DSS}	Drain-to-Source Leakage Current	—	—	1	μA	$V_{DS} = 600V, V_{GS} = 0V$ $T_J = 125^\circ\text{C}$
		—	—	50		
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 30V$ $V_{GS} = -30V$
		—	—	-100		
Q_g	Total Gate Charge	—	44	—	nC	$I_D = 6A,$ $V_{DS} = 200V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source Charge	—	8.6	—		
Q_{gd}	Gate-to-Drain("Miller") Charge	—	16	—		
$t_{d(on)}$	Turn-on Delay Time	—	14	—	ns	$V_{GS}=10V, V_{DS}=400V,$ $R_L=50\Omega, R_{GEN}=10\Omega$ $I_D=15.8A$
t_r	Rise Time	—	15	—		
$t_{d(off)}$	Turn-Off Delay Time	—	68	—		
t_f	Fall Time	—	23	—		
C_{iss}	Input Capacitance	—	1590	—	pF	$V_{GS} = 0V$ $V_{DS} = 300V$ $f = 600\text{KHz}$
C_{oss}	Output Capacitance	—	46	—		
C_{rss}	Reverse Transfer Capacitance	—	5.3	—		

Source-Drain Ratings and Characteristics

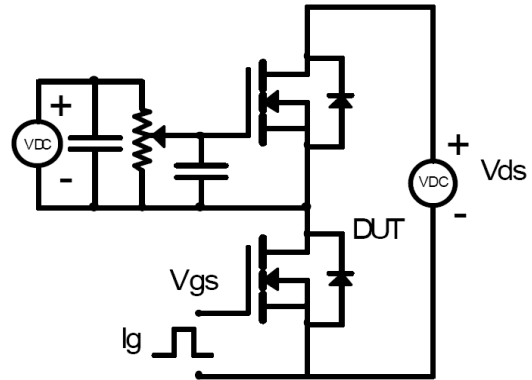
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	26	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	104	A	
V_{SD}	Diode Forward Voltage	—	0.95	1.6	V	$I_S=26A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	450	—	ns	$T_J = 25^\circ\text{C}, I_F = 26A,$ $di/dt = 100A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	7.3	—	μC	

Test Circuits and Waveforms

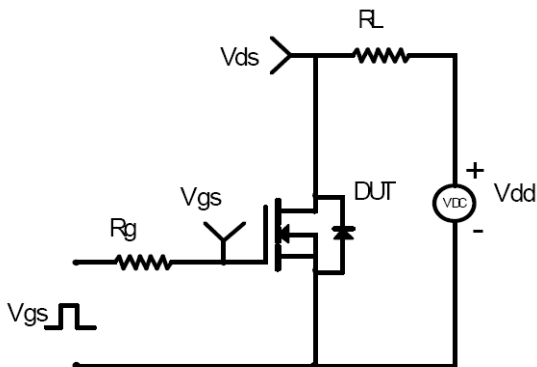
EAS Test Circuit



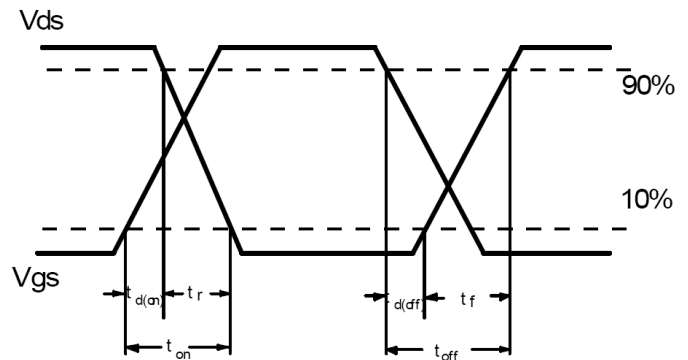
Gate Charge Test Circuit



Switching Time Test Circuit



Switching Waveforms



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ$

Typical Electrical and Thermal Characteristics

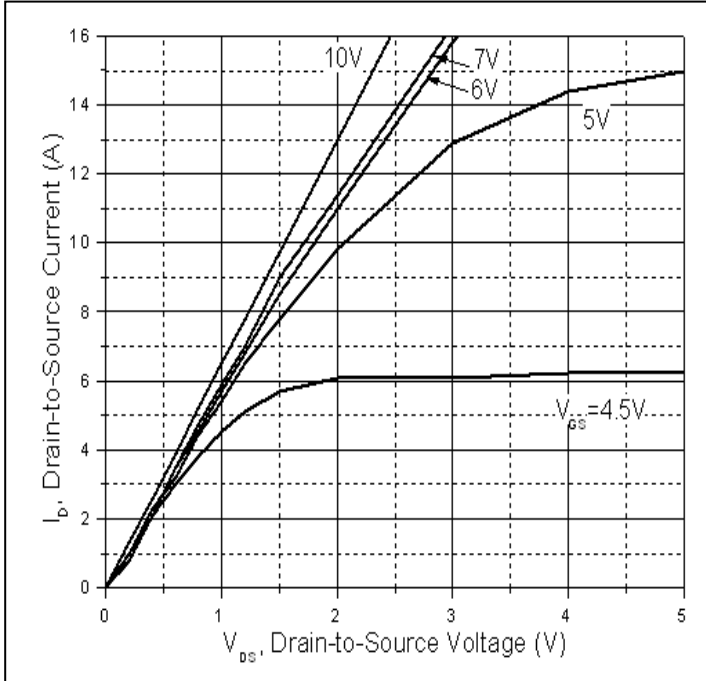


Figure 1. Typical Output Characteristics

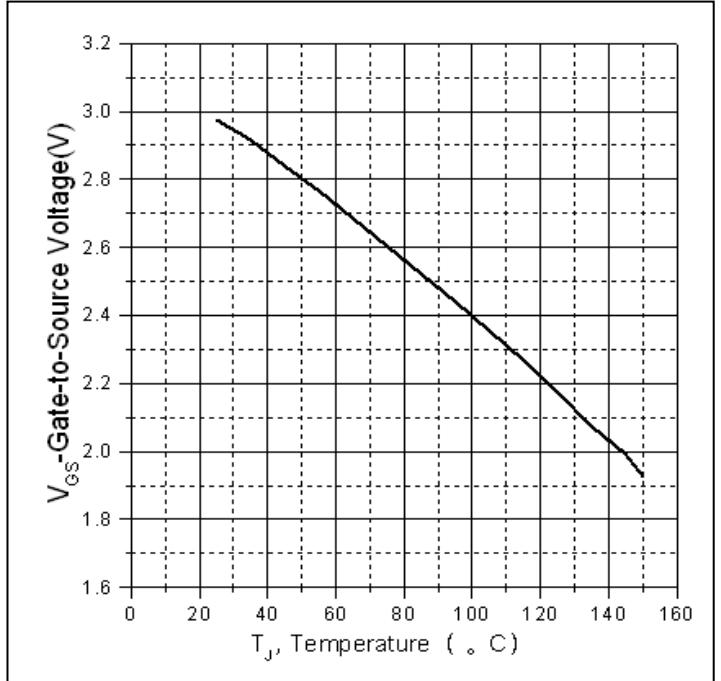


Figure 2. Gate to source cut-off voltage

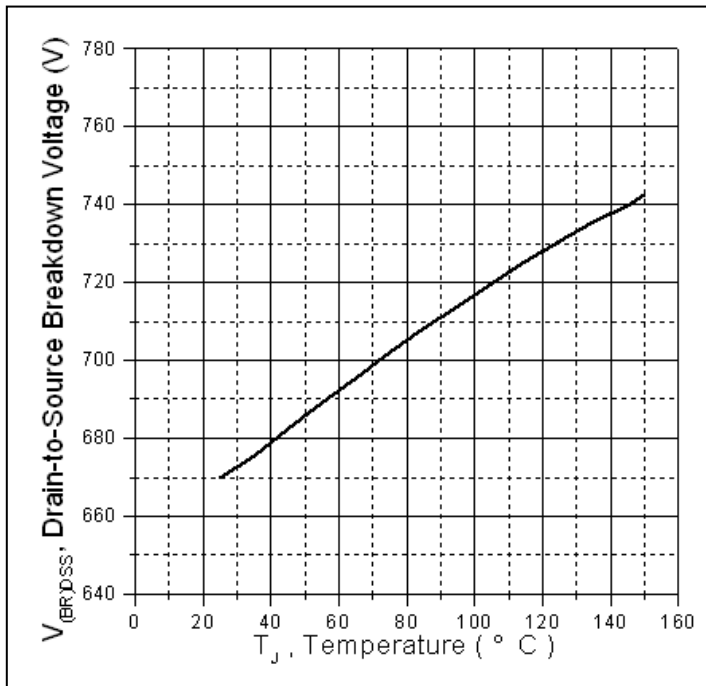


Figure 3. Drain-to-Source Breakdown Voltage Vs. Case Temperature

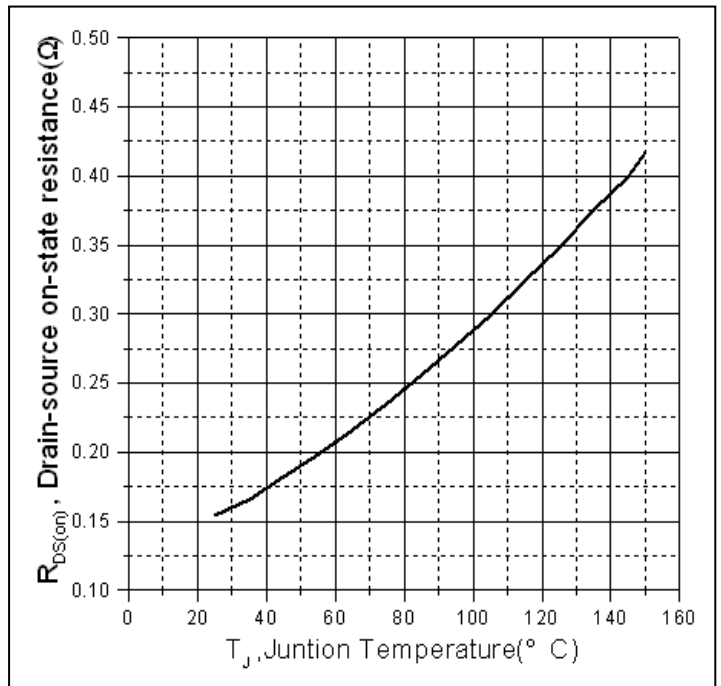


Figure 4. Normalized On-Resistance Vs. Case Temperature

Typical Electrical and Thermal Characteristics

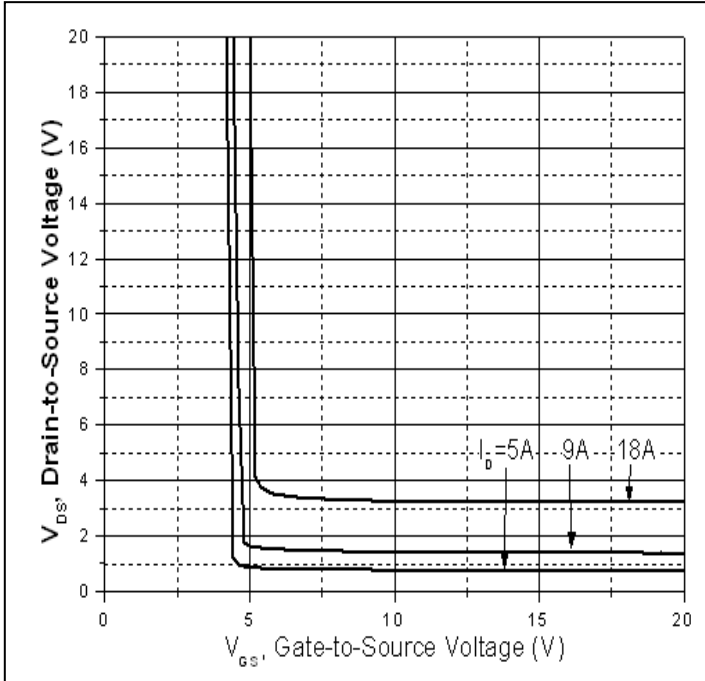


Figure 5. Drain-to-Source Voltage Vs. Gate-to-Source Voltage

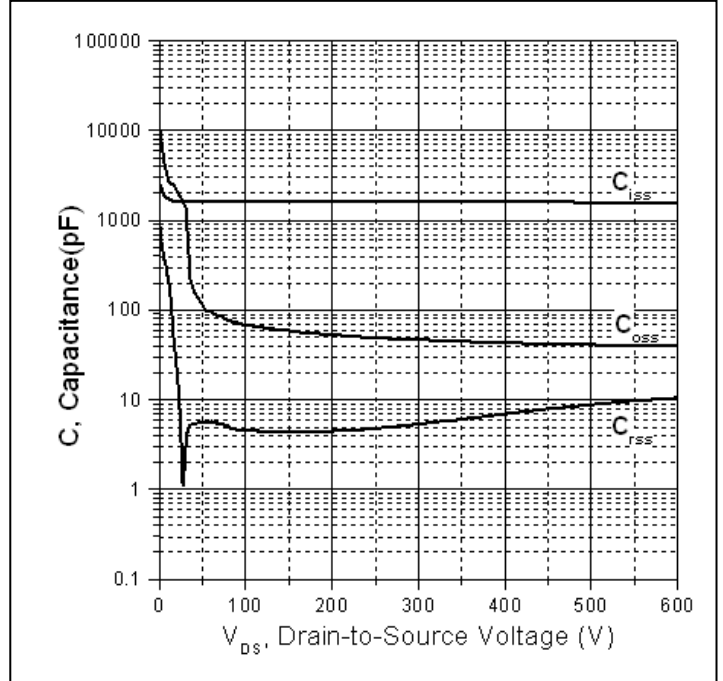
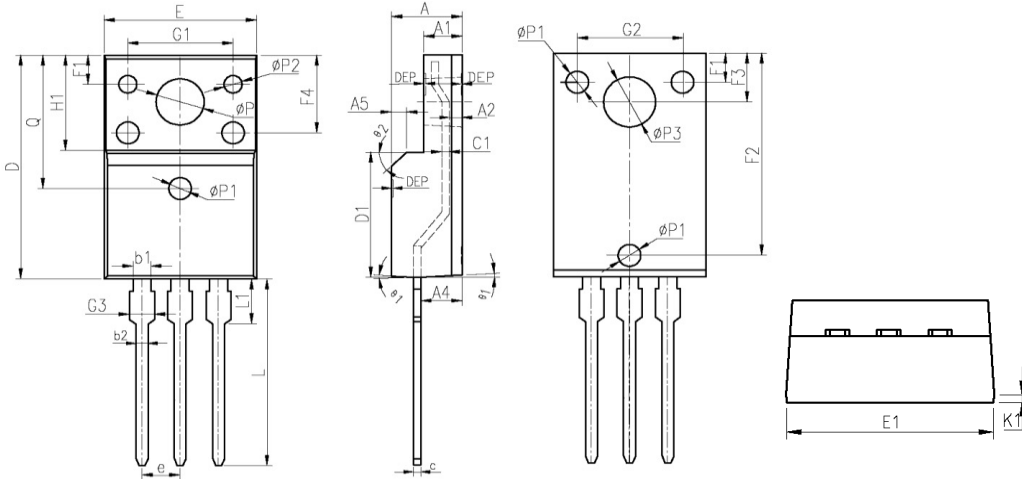


Figure 6. Typical Capacitance Vs. Drain-to-Source Voltage

Mechanical Data

TO-220F Package Outline Dimensions



Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
E	10.040	10.200	10.360	0.395	0.402	0.408
A	4.500	4.700	4.900	0.177	0.185	0.193
A1	2.340	2.540	2.740	0.092	0.100	0.108
A2	0.950	1.050	1.150	0.037	0.041	0.045
A4	2.650	2.750	2.850	0.104	0.108	0.112
A5	1.00REF			0.039REF		
c	0.420	0.500	0.580	0.017	0.020	0.023
c1	0.420	0.500	0.580	0.017	0.020	0.023
D	15.670	15.870	16.070	0.617	0.625	0.633
Q	9.20REF			0.362REF		
H1	6.70REF			0.264REF		
e	2.54BSC			0.10BSC		
ϕP	3.183REF			0.125REF		
L	12.780	12.980	13.180	0.503	0.511	0.519
L1	3.250	3.450	3.650	0.128	0.136	0.144
D1	9.17REF			0.362REF		
$\phi P1$	1.400	1.500	1.600	0.055	0.059	0.063
$\phi P2$	1.150	1.200	1.250	0.045	0.047	0.049
$\phi P3$	3.45REF			0.136REF		
$\theta 1$	5°	7°	9°	5°	7°	9°
$\theta 2$	-	45°	-	-	45°	-
DEP	0.050	0.100	0.150	0.002	0.004	0.006
F1	1.900	2.000	2.100	0.075	0.079	0.083
F2	13.800	13.900	14.000	0.543	0.547	0.551
F3	3.200	3.300	3.400	0.126	0.130	0.134
F4	5.300	5.400	5.500	0.209	0.213	0.217
G1	6.600	6.700	6.800	0.260	0.264	0.268
G2	6.900	7.000	7.100	0.272	0.276	0.280
G3	1.100	1.300	1.500	0.043	0.051	0.059
E1	9.900	10.000	10.100	0.390	0.394	0.398
K1	0.650	0.700	0.750	0.026	0.028	0.030
b1	1.050	1.200	1.350	0.041	0.047	0.053
b2	0.700	0.800	0.850	0.028	0.031	0.033

Ordering and Marking Information

<p>Device Marking: SSF26NS60UF</p> <p style="text-align: center;">Package (Available) TO-220F Operating Temperature Range C : -55 to 150°C</p>
--

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-220F	50	20	1000	6	6000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_J=150^{\circ}\text{C}$ @ 80% of Max $V_{DSS}/V_{CES}/V_R$	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_J=150^{\circ}\text{C}$ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices