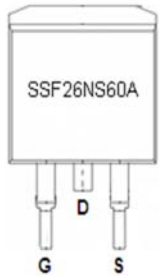
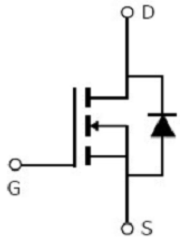
Main Product Characteristics

V_{DSS}	600V
$R_{DS}(on)$	0.135Ω(typ.)
I_D	20A

D2PAK



Marking and Pin Assignment



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 SSF26NS60A series MOSFETs is a new technology, which combines an innovative technology and advance process. This new technology achieves low Rdson, energy saving, high reliability and uniformity, superior power density and space saving.

Absolute Max Rating

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V①	20	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	13	
I_{DM}	Pulsed Drain Current②	80	
P_D @TC = 25°C	Power Dissipation③	208	W
	Linear Derating Factor	1.66	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

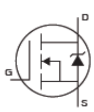
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	0.6	°C/W
$R_{\theta JA}$	Junction-to-ambient ($t \leqslant 10s$) ④	—	62	°C/W

Electrical Characteristics @T_A=25℃ unless otherwise specified

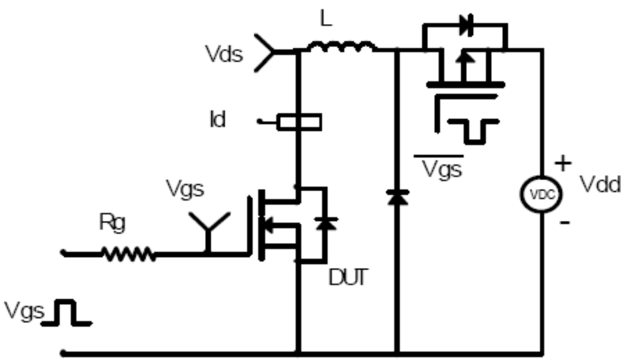
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	600	—	—	V	V_{GS} = 0V, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	0.135	0.165	Ω	V_{GS}=10V,I_D = 10A
		—	0.31	—		T_J = 125°C
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
		—	2.54	—		T_J = 125°C
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 600V,V_{GS} = 0V
		—	—	50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =30V
		—	—	-100		V_{GS} = -30V
Q_g	Total gate charge	—	52	—	nC	I_D = 20A,
Q_{gs}	Gate-to-Source charge	—	11	—		V_{DS}=480V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	25	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	15	—	nS	V_{GS}=10V, V_{DS} =300V,
t_r	Rise time	—	18	—		R_L=30Ω,
$t_{d(off)}$	Turn-Off delay time	—	46	—		R_{GEN}=4.7Ω
t_f	Fall time	—	16	—		I_D =10A
C_{iss}	Input capacitance	—	1474	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	149	—		V_{DS} = 50V
C_{rss}	Reverse transfer capacitance	—	4	—		f = 1MHz

Source-Drain Ratings and Characteristics

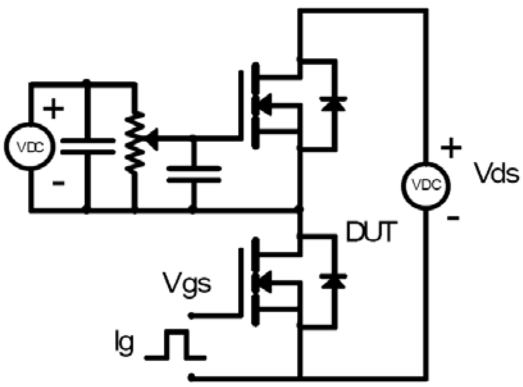
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	20	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	80	A	
V_{SD}	Diode Forward Voltage	—	0.88	1.3	V	I_S=20A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	370	—	nS	T_J = 25°C, I_F =20A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	5	—	uC	

Test circuits and Waveforms

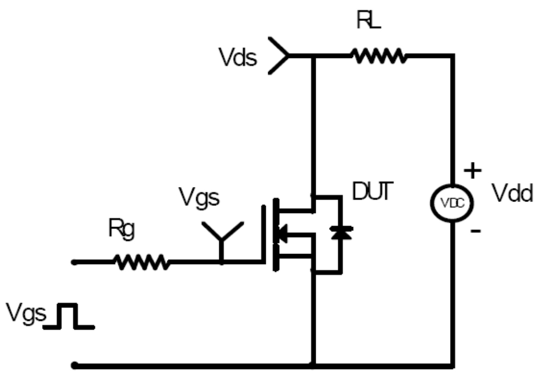
EAS Test Circuit



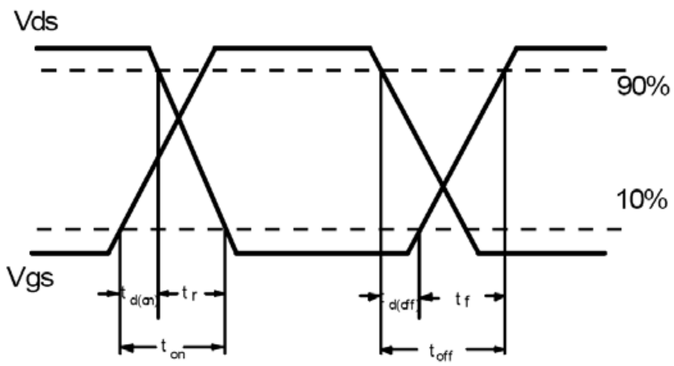
Gate charge test circuit



Switching Time Test Circuit



Switching Waveforms



Notes:

①Calculated continuous current based on maximum allowable junction temperature.

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 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

Typical electrical and thermal characteristics

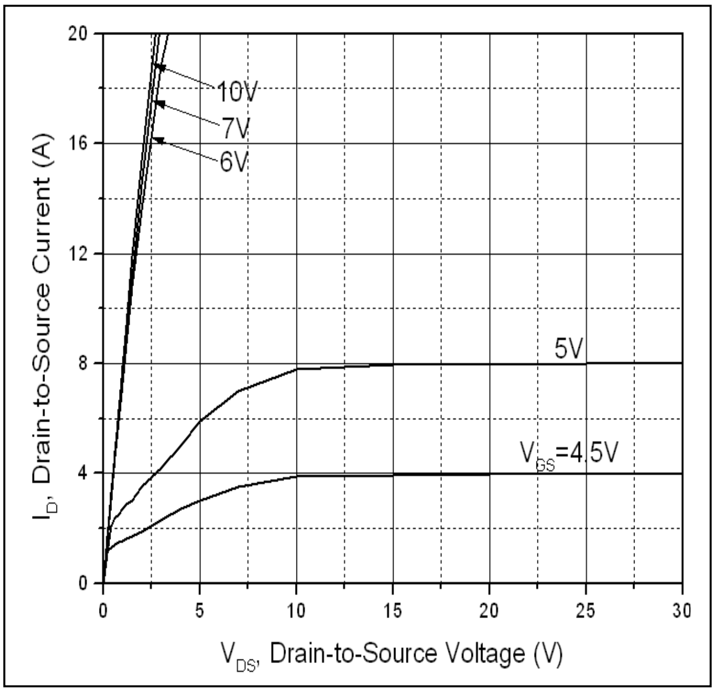


Figure 1: Typical Output Characteristics

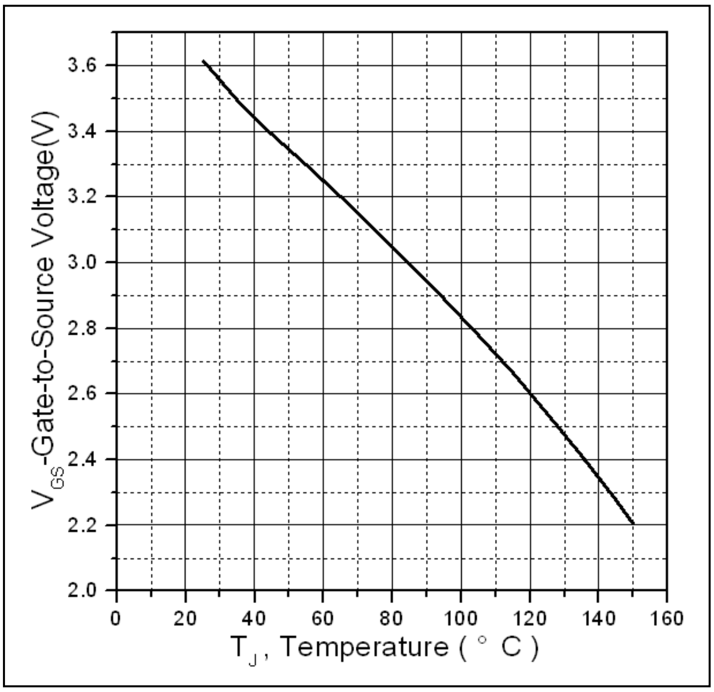


Figure 2. Gate to source cut-off voltage

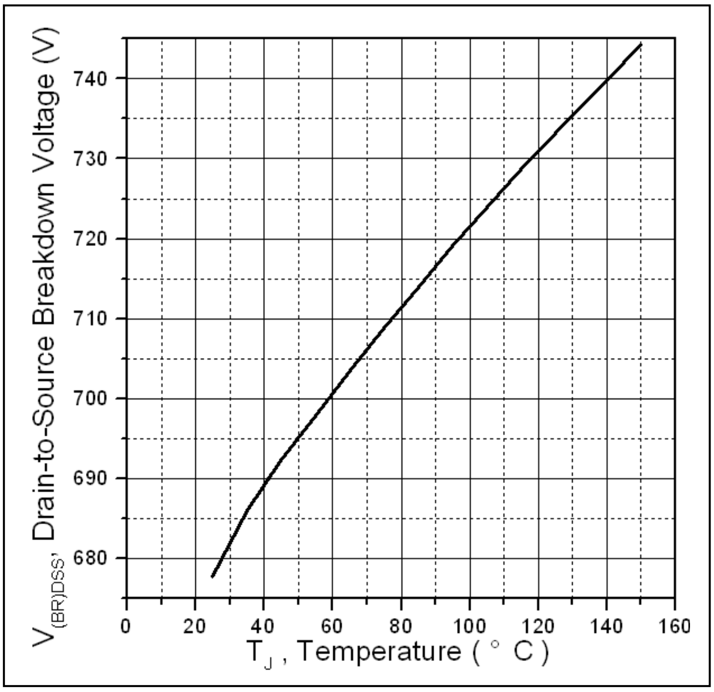


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

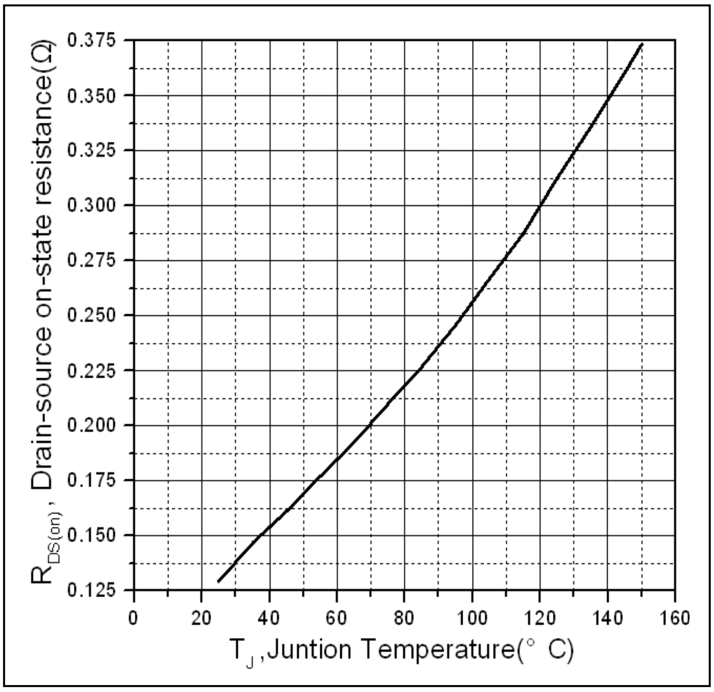


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical electrical and thermal characteristics

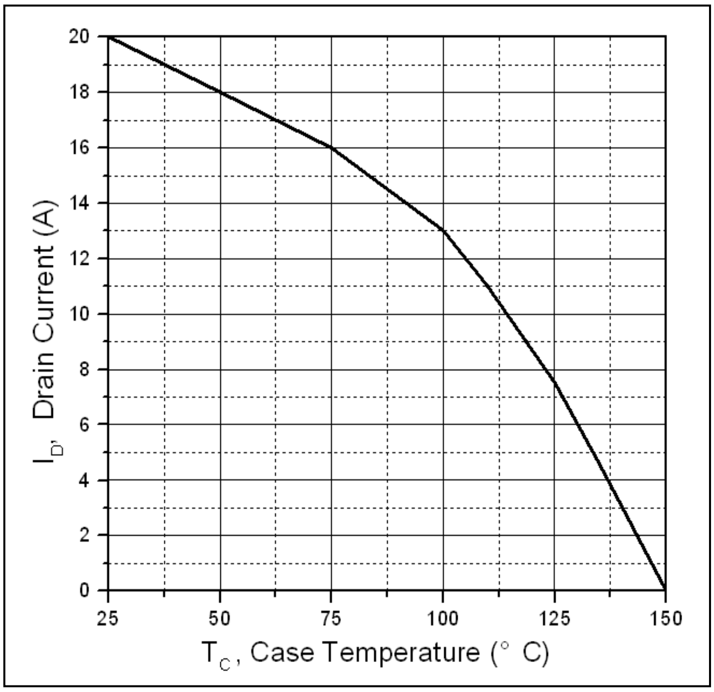


Figure 5. Maximum Drain Current Vs. Case Temperature

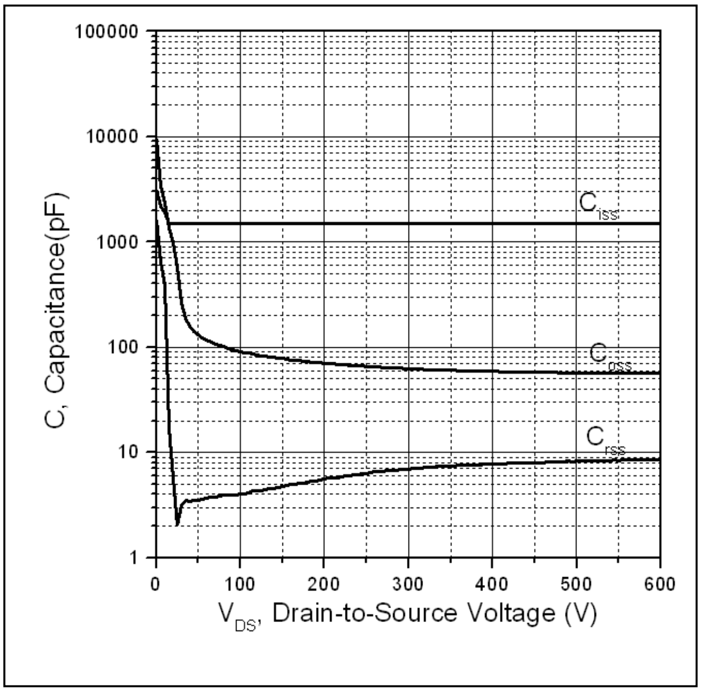
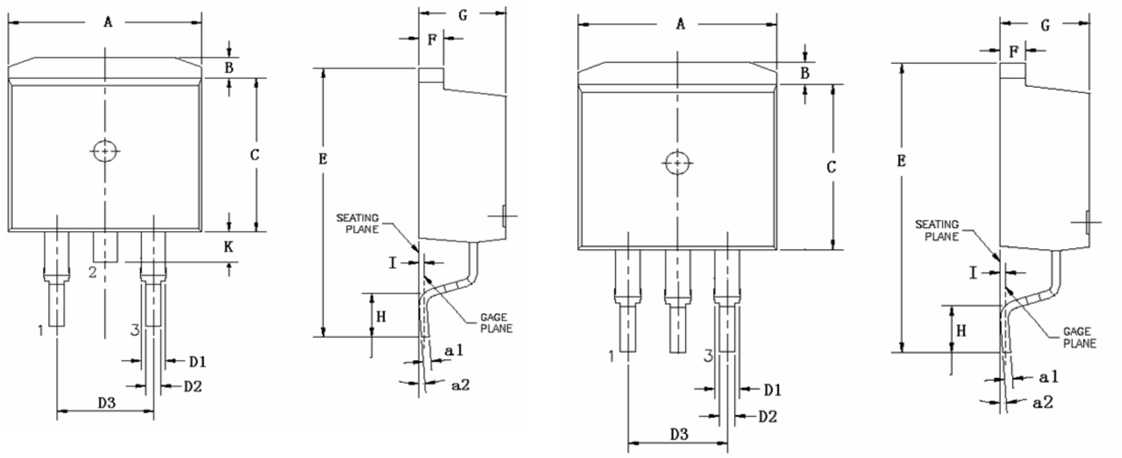


Figure 6.Typical Capacitance Vs. Drain-to-Source Voltage

Mechanical Data：

TO263 PACKAGE OUTLINE DIMENSION



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	9.660	10.280	0.380	0.405
B	1.020	1.320	0.040	0.052
C	8.590	9.400	0.338	0.370
D1	1.140	1.400	0.045	0.055
D2	0.700	0.950	0.028	0.037
D3	5.080 (TYP)		0.200 (TYP)	
E	15.090	15.390	0.594	0.606
F	1.150	1.400	0.045	0.055
G	4.300	4.700	0.169	0.185
H	2.290	2.790	0.090	0.110
I	0.250 (TYP)		0.010 (TYP)	
K	1.300	1.600	0.051	0.063
a1	0.450	0.650	0.018	0.026
a2	0^0	8^0	1^0	8^0

Ordering and Marking Information

Device Marking: SSF26NS60A Package (Available) TO-263(D2PAK) Operating Temperature Range C : -55 to150 ºC

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/ Carton Box
D2PAK	50	20	1000	6	6000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=150℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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