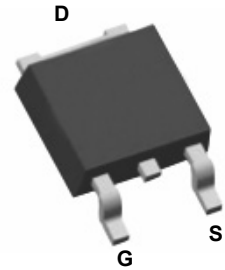
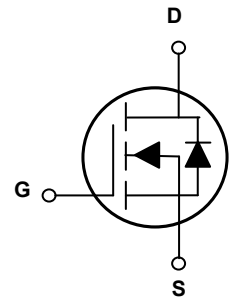


## Main Product Characteristics

$V_{DS}$	200V
$R_{DS(ON)}$	300m $\Omega$ (Max.) @ $V_{GS}=10V$
$I_D$	8A



TO-252 (DPAK)



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The SSFD20N08 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	8	A
Drain Current-Continuous ( $T_c=100^\circ\text{C}$ )	$I_{D(100^\circ\text{C})}$	5.6	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	20	A
Maximum Power Dissipation	$P_D$	55	W
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case <sup>2</sup>	$R_{\theta JC}$	2.3	$^\circ\text{C/W}$

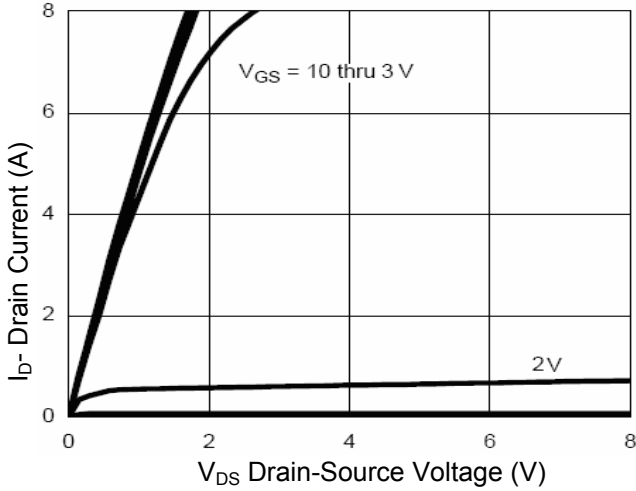
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	200	215	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> <sup>3</sup>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.5A$	-	260	300	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=25V, I_D=4.5A$	3	-	-	S
<b>Dynamic Characteristics</b> <sup>4</sup>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $F=1.0MHz$	-	540	-	PF
Output Capacitance	$C_{oss}$		-	90	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	35	-	PF
<b>Switching Characteristics</b> <sup>4</sup>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=100V, I_D=4.5A,$ $V_{GS}=10V, R_{GEN}=5\Omega$	-	6.4	-	nS
Turn-on Rise Time	$t_r$		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	20	-	nS
Turn-Off Fall Time	$t_f$		-	12	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=160V, I_D=4.5A,$ $V_{GS}=10V$	-	16	-	nC
Gate-Source Charge	$Q_{gs}$		-	3.4	-	nC
Gate-Drain Charge	$Q_{gd}$		-	5.1	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=8A$	-	-	1.2	V
Diode Forward Current <sup>2</sup>	$I_S$		-	-	8	A

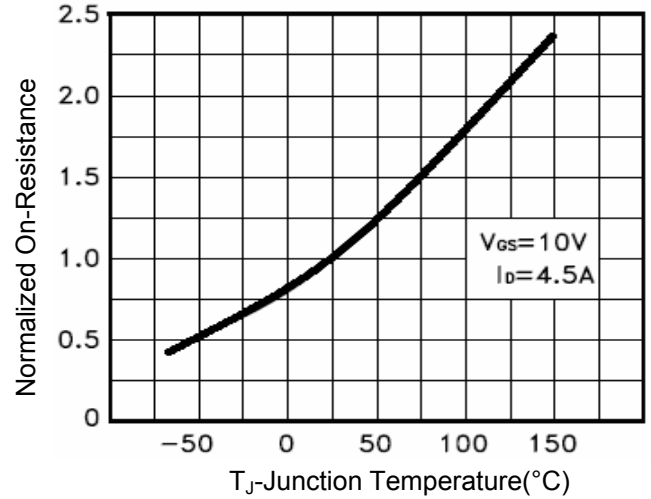
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu S$ , Duty Cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

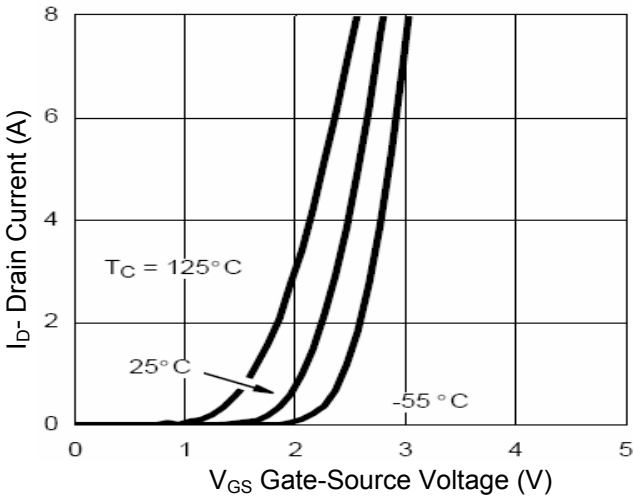
**Typical Electrical and Thermal Characteristic Curves**



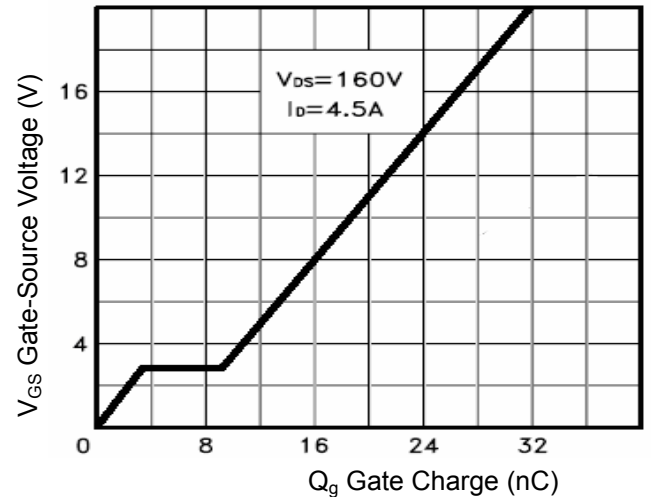
**Fig.1 Output Characteristics**



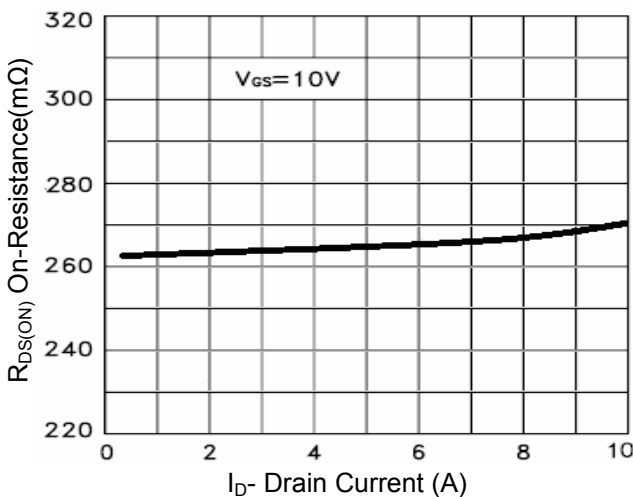
**Fig.2  $R_{DS(ON)}$ -Junction Temperature**



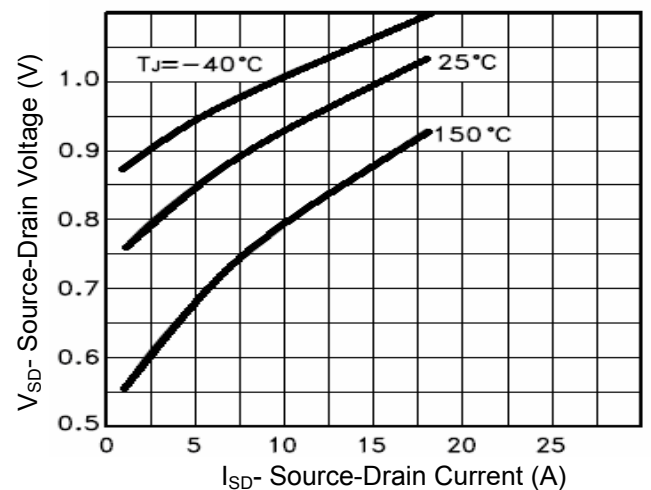
**Fig.3 Transfer Characteristics**



**Fig.4 Gate Charge**

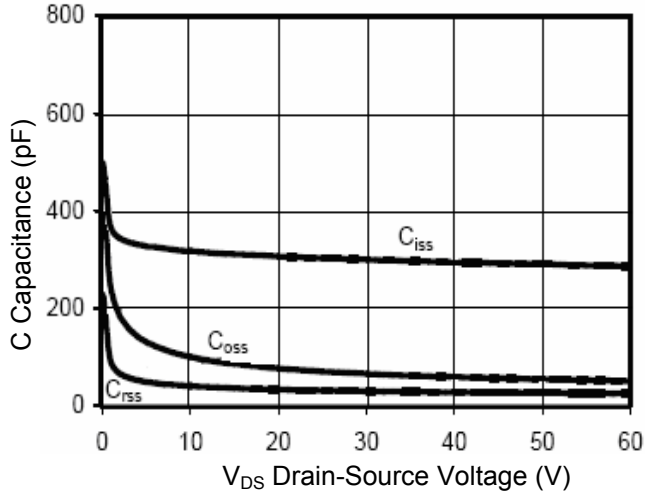


**Fig.5  $R_{DS(ON)}$ - Drain Current**

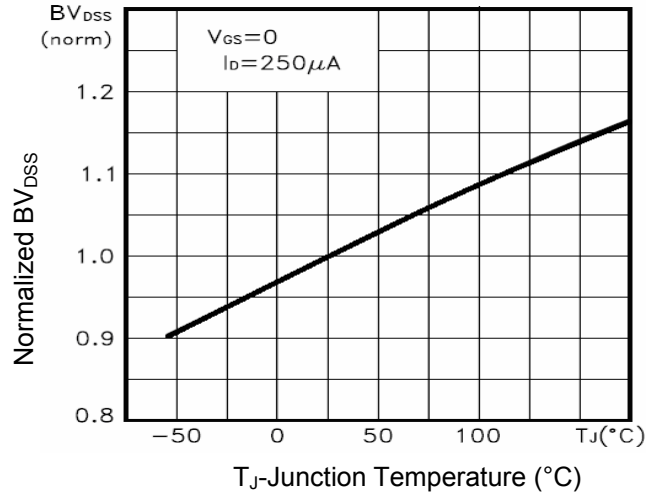


**Fig.6 Source- Drain Diode Forward**

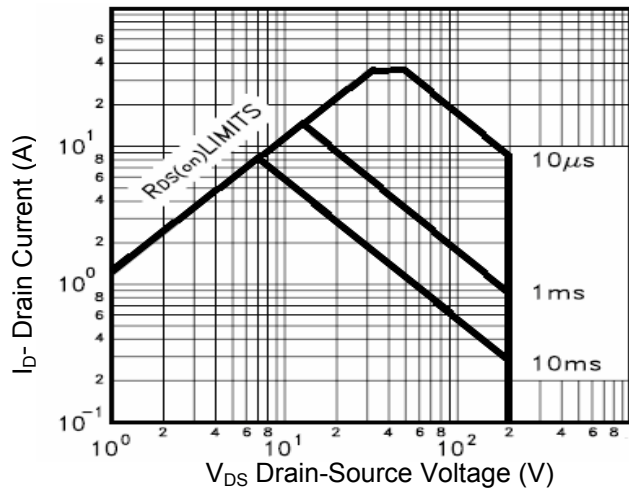
**Typical Electrical and Thermal Characteristic Curves**



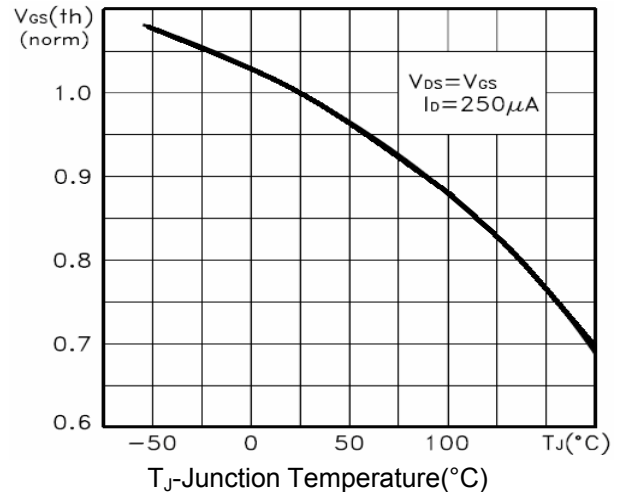
**Fig.7 Capacitance vs  $V_{DS}$**



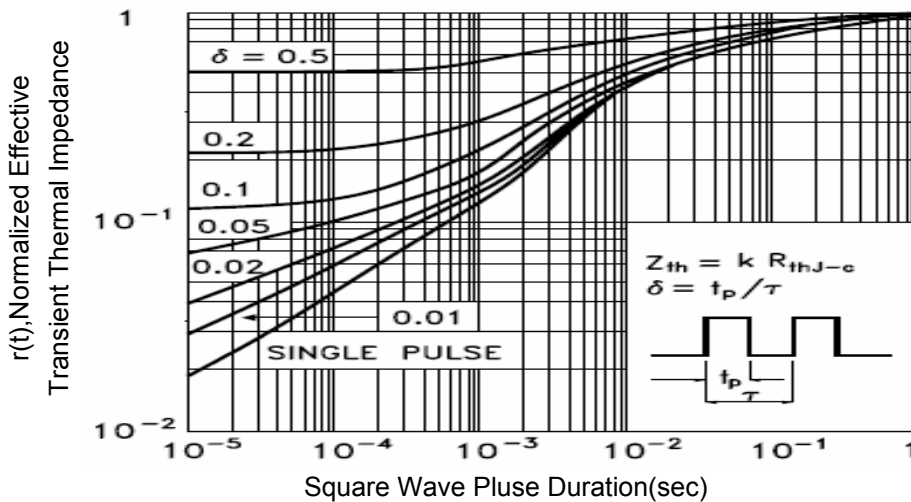
**Fig.8  $BV_{DSS}$  vs Junction Temperature**



**Fig.9 Safe Operation Area**

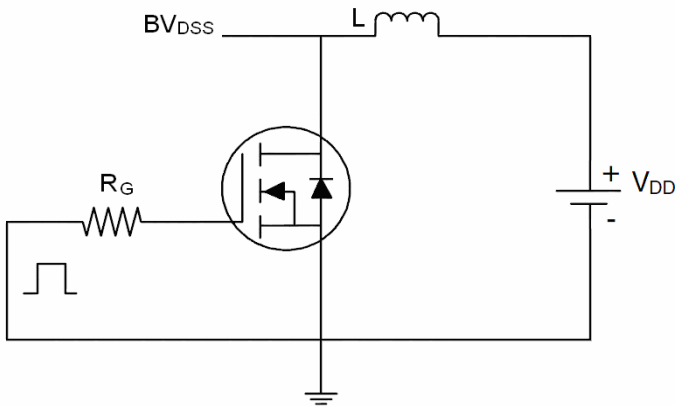


**Fig.10  $V_{GS(th)}$  vs Junction Temperature**

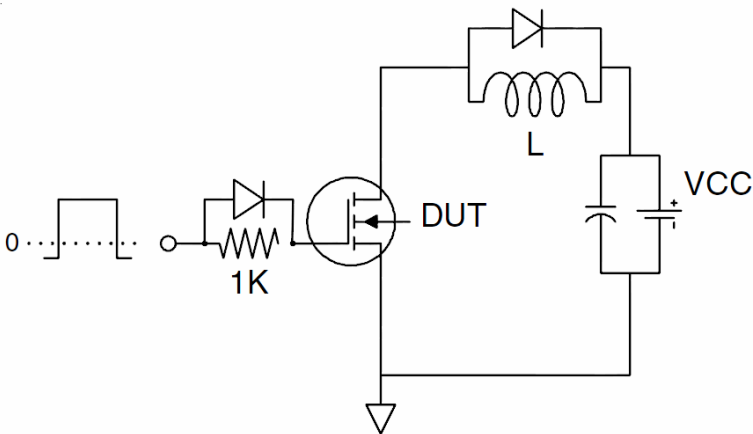


**Fig.11 Normalized Maximum Transient Thermal Impedance**

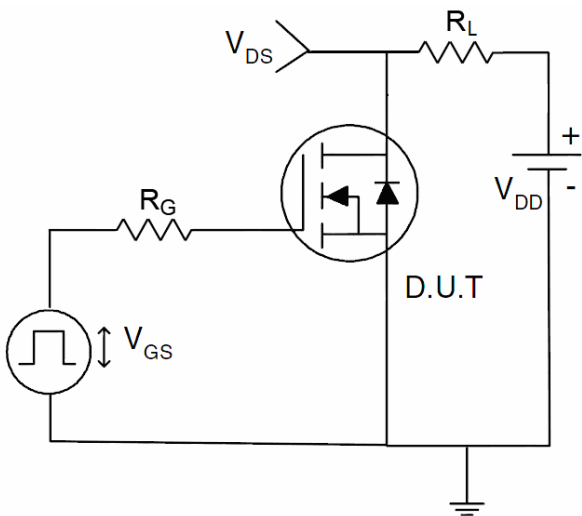
**Test Circuits**



**Fig.12 E<sub>AS</sub> Test Circuit**



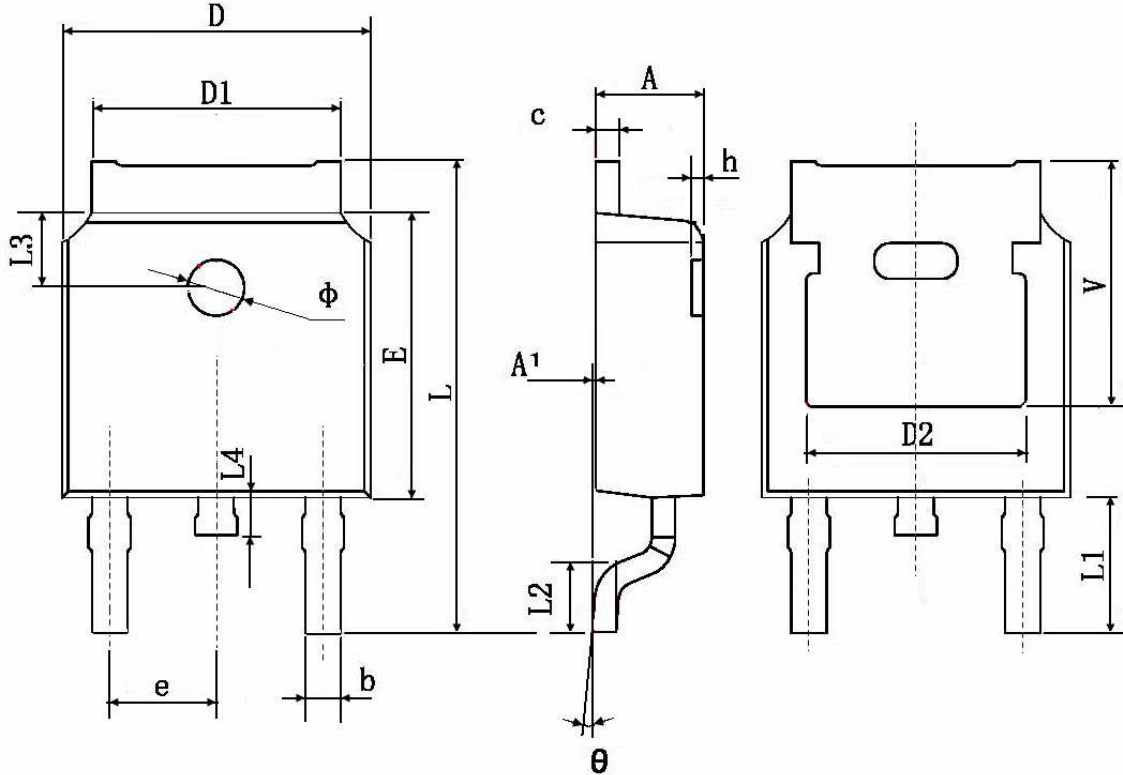
**Fig.13 Gate Charge Test Circuit**



**Fig.14 Switch Time Test Circuit**

**Package Outline Dimensions**

**TO-252(DPAK)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	