GOOD-ARK SEMICONDUCTOR

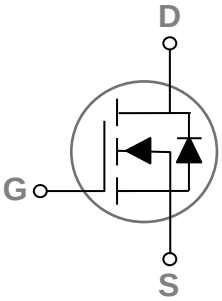
SSF04N100T

1000V N-Channel MOSFET

Main Product Characteristics

V_{BDSS}	1000V
$R_{DS(on)}$	5.5Ω
I_D	4A

TO-220



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for DC-DC converter, power management in portable battery, computer, printer, cellular and general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The SSF04N100T utilizes the latest techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. 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°C unless otherwise specified)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	1000	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current – Continuous (T_C=25°C)	I_D	4	A
Drain Current – Continuous (T_C=100°C)		2.22	A
Drain Current – Pulsed[1]	I_{DM}	16	A
Single Pulse Avalanche Energy[2]	E_{AS}	17.8	mJ
Single Pulse Avalanche Current[2]	I_{AS}	4	A
Power Dissipation (T_C=25°C)	P_D	123	W
Power Dissipation – Derate above 25°C	P_D	0.99	W/°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	1.01	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	1000	---	---	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=1000V , V_{GS}=0V , T_J=25℃	---	---	10	uA
		V_{DS}=800V , V_{GS}=0V , T_J=85℃	---	---	100	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=2A	---	4.2	5.5	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
Forward Transconductance	gfs	V_{DS}=30V , I_D=2A	---	6	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=720V , V_{GS}=10V , I_D=4A	---	25	---	nC
Gate-Source Charge[3,4]	Q_{gs}		---	4.8	---	
Gate-Drain Charge[3,4]	Q_{gd}		---	10.2	---	
Turn-On Delay Time[3,4]	$T_{d(on)}$	V_{DD}=450V , V_{GS}=10V , R_G=25Ω I_D=4A	---	49	---	ns
Rise Time[3,4]	T_r		---	38	---	
Turn-Off Delay Time[3,4]	$T_{d(off)}$		---	146	---	
Fall Time[3,4]	T_f		---	50	---	
Input Capacitance	C_{iss}	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	955	---	pF
Output Capacitance	C_{oss}		---	80	---	
Reverse Transfer Capacitance	C_{rss}		---	13	---	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	4	A
Pulsed Source Current	I_{SM}		---	---	16	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=4A , T_J=25℃	---	---	1.5	V
Reverse Recovery Time[3]	t_{rr}	V_{GS}=0V,I_S=4A , dI/dt=100A/μs T_J=25℃	---	487	---	nS
Reverse Recovery Charge[3]	Q_{rr}		---	2.8	---	uC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V,V_{GS}=10V,L=2.1mH,I_{AS}=4A.,R_G=25Ω,Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

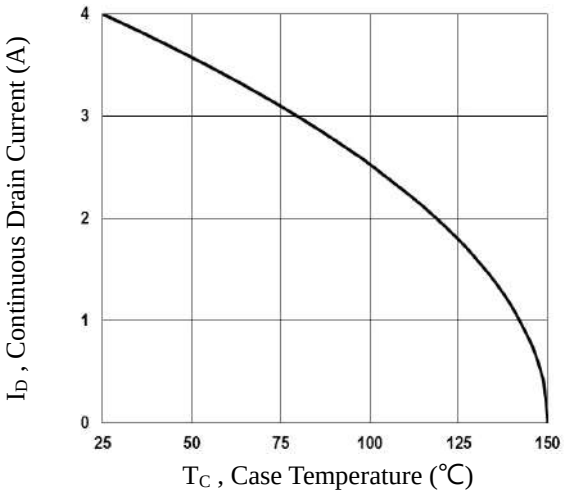


Fig.1 Continuous Drain Current vs. T_C

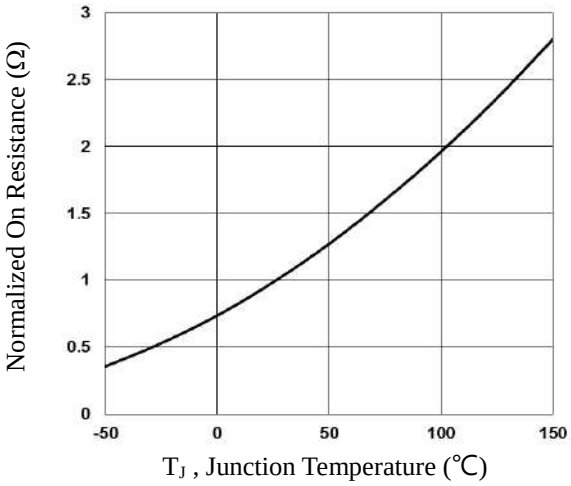


Fig.2 Normalized RDSON vs. T_J

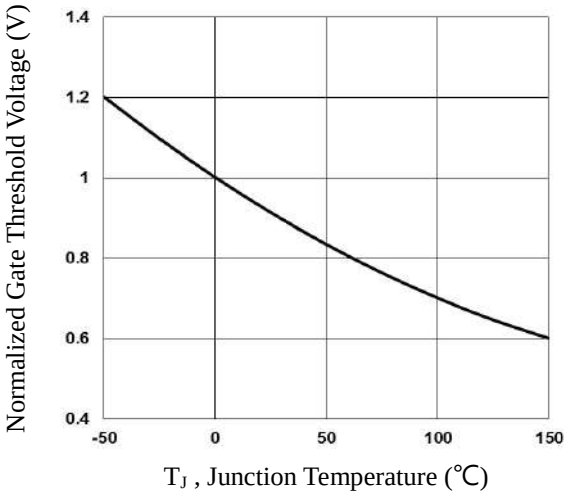


Fig.3 Normalized V_{th} vs. T_J

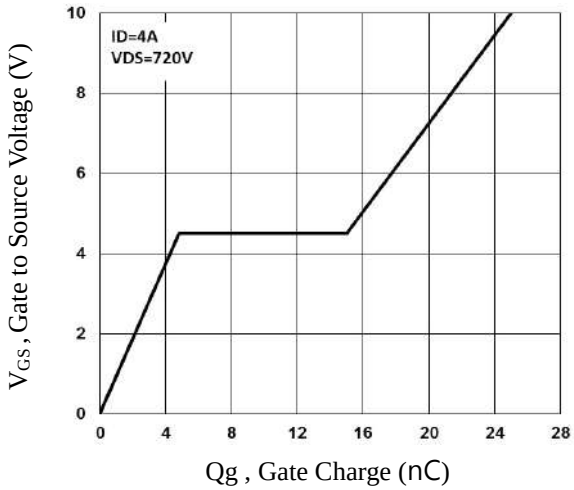


Fig.4 Gate CDharge Waveform

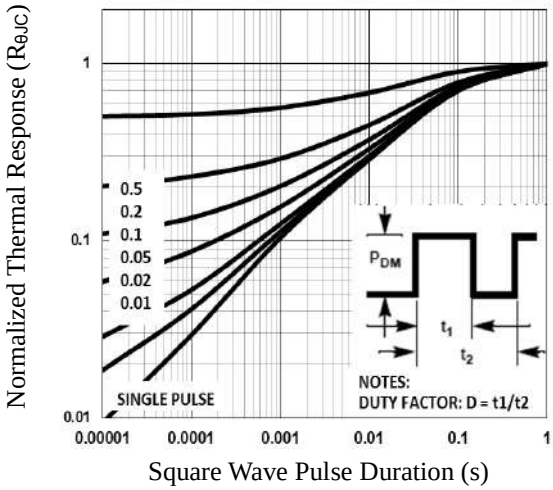


Fig.5 Normalized Transient Impedance

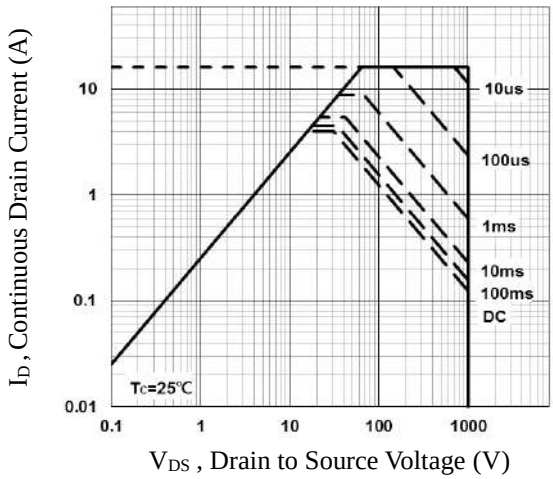


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

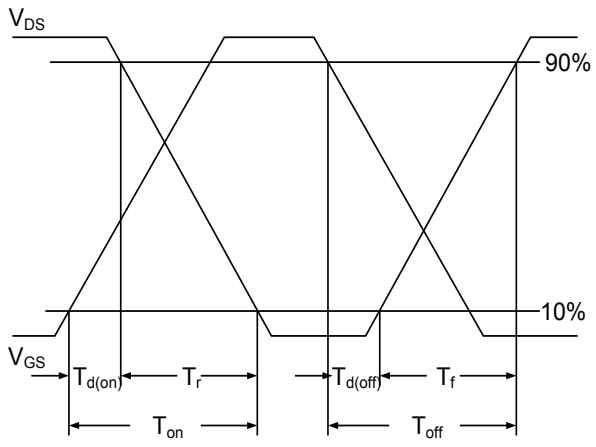


Fig.7 Switching Time Waveform

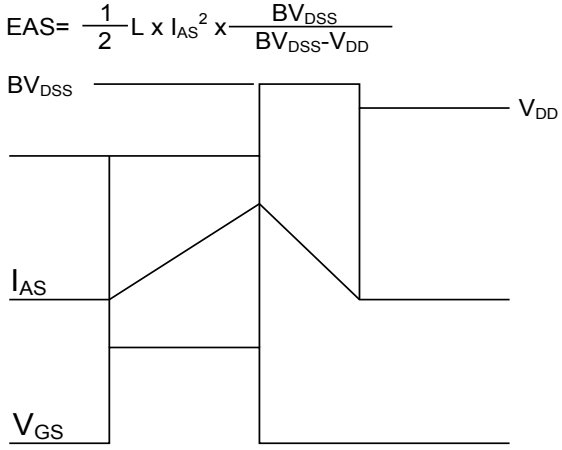
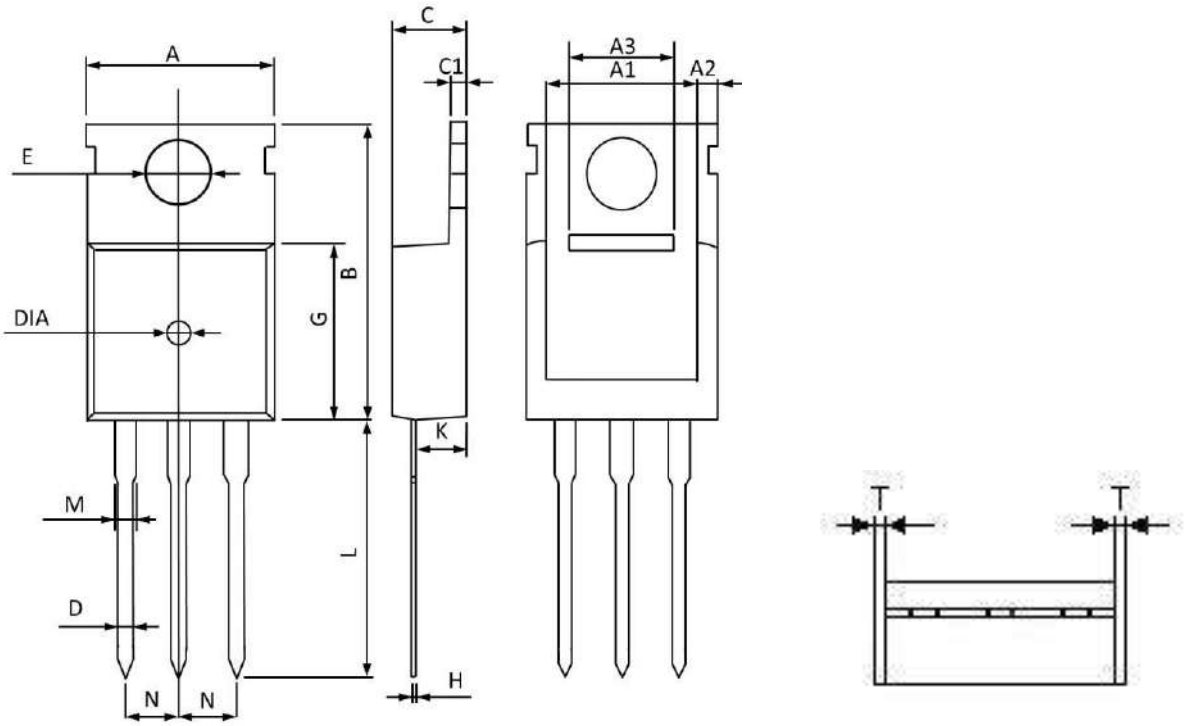


Fig.8 EAS Waveform

Package Outline Dimensions TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.700	10.300	0.382	0.405
A1	8.440	8.840	0.333	0.348
A2	1.050	1.250	0.042	0.049
A3	5.100	5.300	0.201	0.208
B	15.400	16.200	0.607	0.637
C	4.280	4.680	0.169	0.184
C1	1.100	1.500	0.044	0.059
D	0.600	1.000	0.024	0.039
E	3.400	3.800	0.134	0.149
G	8.700	9.300	0.343	0.366
H	0.400	0.600	0.016	0.023
K	2.100	2.700	0.083	0.106
L	12.800	13.600	0.504	0.535
M	1.100	1.500	0.044	0.059
N	2.490	2.590	0.099	0.101
T	0.345	0.355	0.014	0.014
DIA	1.450	1.550	0.058	0.061