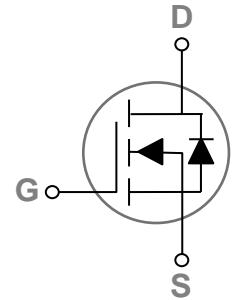


**Main Product Characteristics**

$V_{BDSS}$	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** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	1000	V
Gate-Source Voltage	$V_{GS}$	±30	V
Drain Current – Continuous ( $T_C=25^{\circ}C$ )	$I_D$	4	A
Drain Current – Continuous ( $T_C=100^{\circ}C$ )		2.22	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	16	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	17.8	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	4	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	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

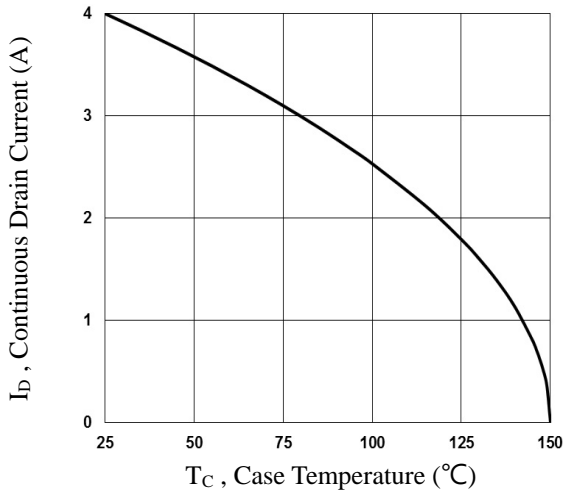
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

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

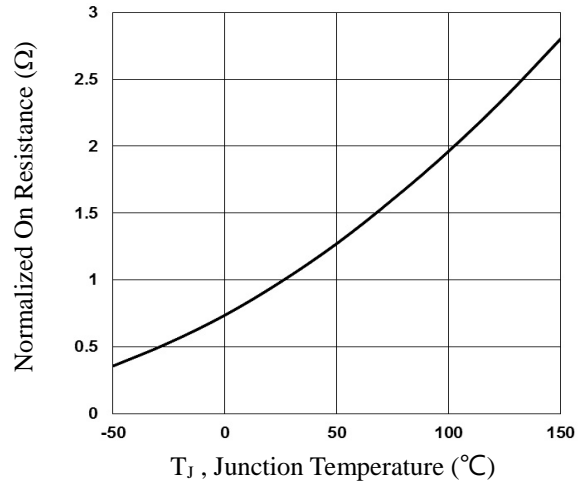
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=2.1\text{mH}, I_{AS}=4A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$ .
3. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

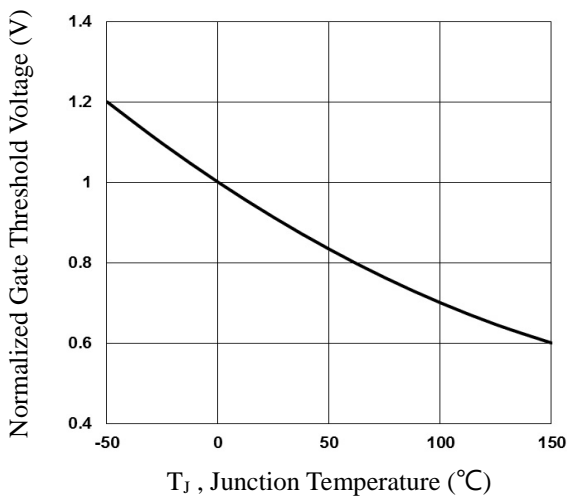
**Typical Electrical and Thermal Characteristics**



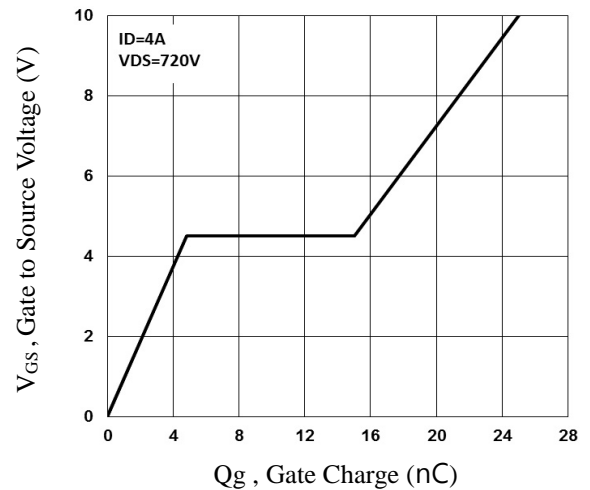
**Fig.1 Continuous Drain Current vs. T<sub>c</sub>**



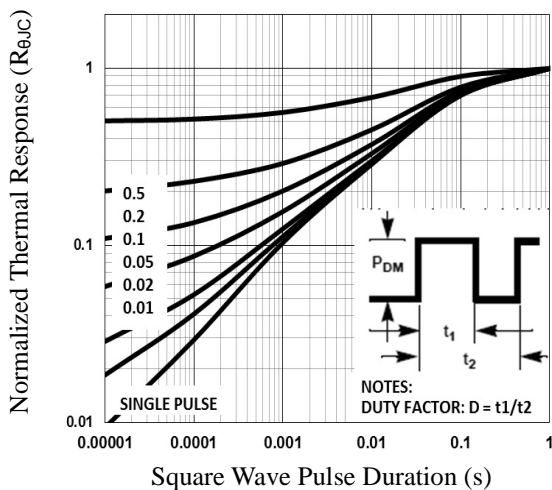
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>**



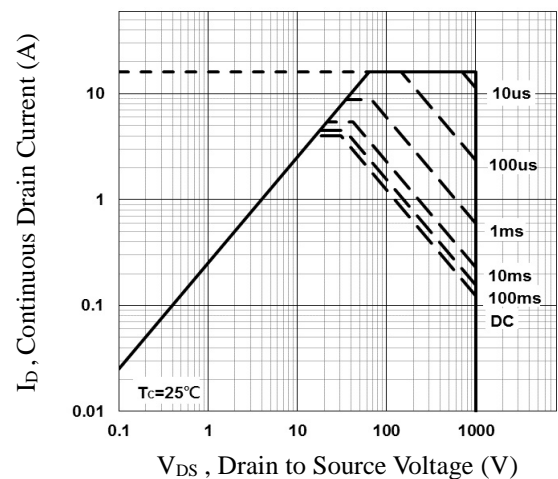
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



**Fig.4 Gate CDcharge Waveform**

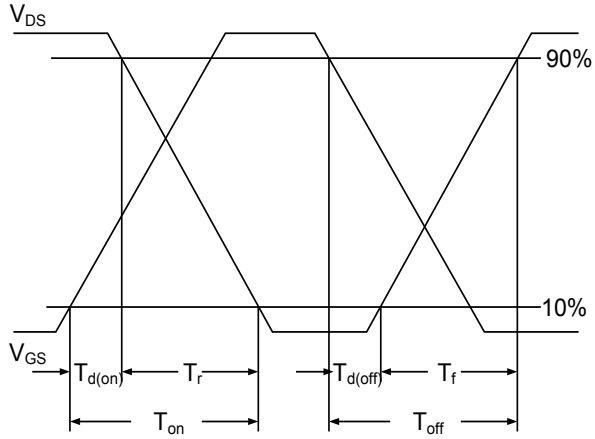


**Fig.5 Normalized Transient Impedance**

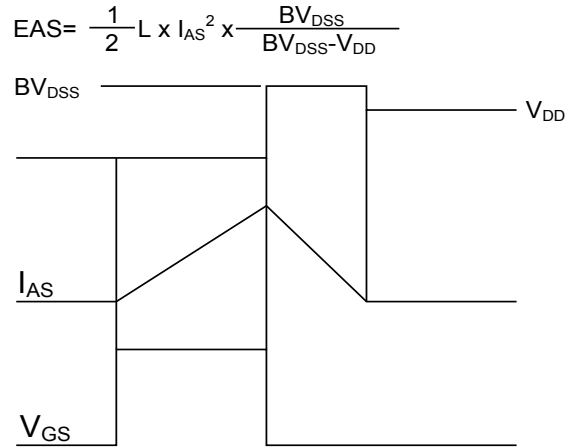


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristics**



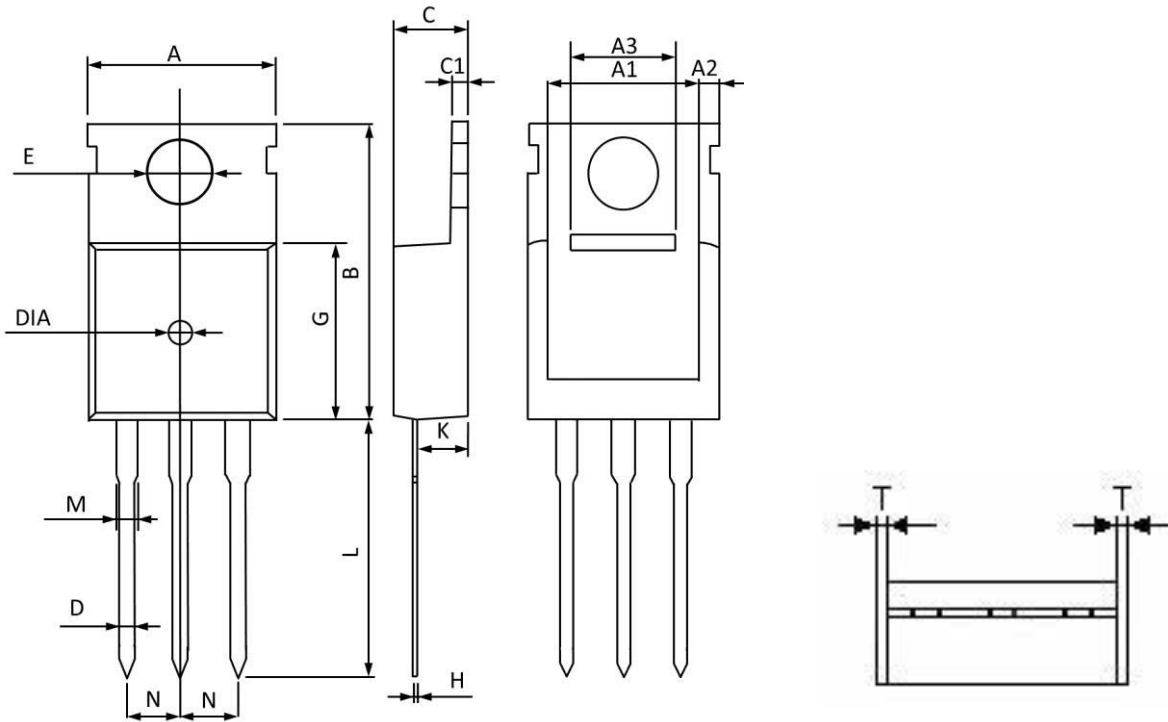
**Fig.7 Switching Time Waveform**



**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