GOOD-ARK SEMICONDUCTOR

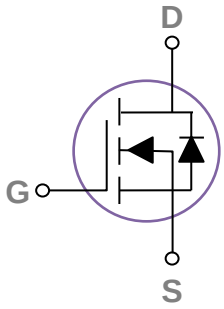
SSJF17N80T

800V N-Channel MOSFET

Features

- 800V,17A, $R_{DS(ON)}$ =0.35Ω@VGS = 10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

TO-220F



Schematic Diagram

Applications

- High efficient switched mode power supplies
- LED Lighting
- Adapter/charger

Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are suitedfor high efficiency fast switching applications.

Absolute Maximum Ratings T_C=25℃ unless otherwise noted

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current – Continuous (T_C=25℃)	I_D	17	A
Drain Current – Continuous (T_C=100℃)		10.7	A
Drain Current – Pulsed[1]	I_{DM}	68	A
Single Pulse Avalanche Energy[2]	E_{AS}	1014	mJ
Single Pulse Avalanche Current[2]	I_{AS}	4.2	A
Power Dissipation (T_C=25℃)	P_D	55	W
Power Dissipation – Derate above 25℃		0.44	W/℃
Storage Temperature Range	T_{STG}	-50 to 150	℃
Operating Junction Temperature Range	T_J	-50 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	-	62	℃/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	-	2.27	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	800	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=1mA	---	0.8	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=800V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=640V , V_{GS}=0V , T_J=85℃	---	---	10	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=20A	---	0.26	0.35	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	2.5	3.5	4.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-7.84	---	mV/℃

Dynamic and switching Characteristics

Total Gate Charge[3,4]	Q_g	V_{DS}=50V , V_{GS}=10V , I_D=1.3A	---	57.2	---	
Gate-Source Charge[3,4]	Q_{gs}		---	6.3	---	nC
Gate-Drain Charge[3,4]	Q_{gd}		---	27.4	---	
Turn-On Delay Time[3,4]	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=6W I_D=0.5A	---	80	---	
Rise Time[3,4]	T_r		---	70	---	
Turn-Off Delay Time[3,4]	$T_{d(off)}$		---	650	---	ns
Fall Time[3,4]	T_f		---	190	---	
Input Capacitance	C_{iss}	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1650	---	
Output Capacitance	C_{oss}		---	580	---	pF
Reverse Transfer Capacitance	C_{rss}		---	25	---	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.36	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	17	A
Pulsed Source Current	I_{SM}		---	---	34	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
Body Diode Reverse Recovery Time	Trr	I_S=13A , V_{GS}=0V di/dt=100A/uS	---	460	---	nS
Body Diode Reverse Recovery Charge	Qrr		---	8.35	---	uC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=115mH,I_{AS}=4.2A.,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

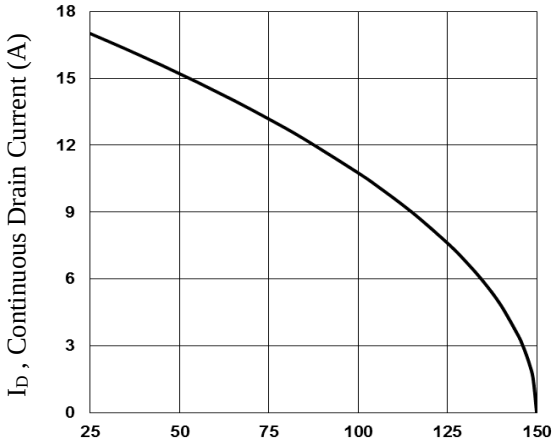


Fig.1 Continuous Drain Current vs. T_C

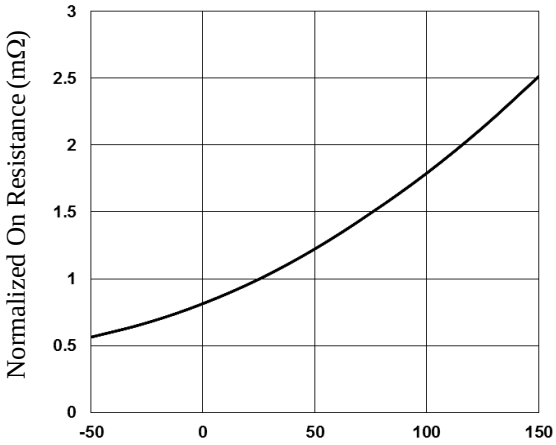


Fig.2 Normalized RDSON vs. T_J

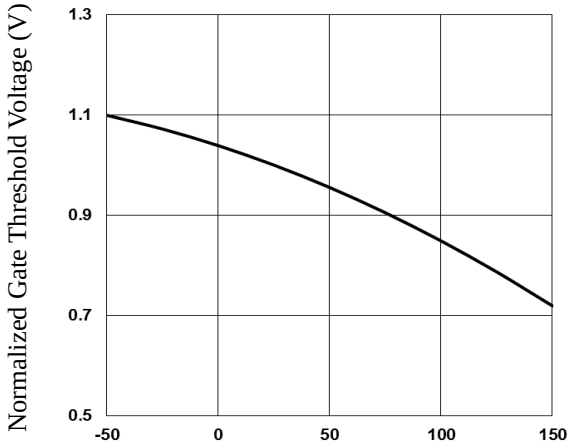


Fig.3 Normalized Vth vs. T_J

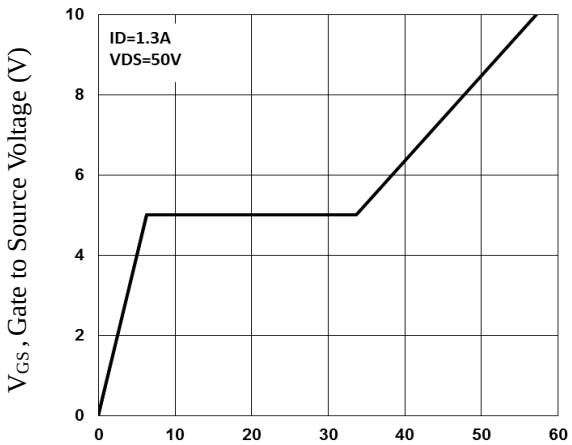


Fig.4 Gate Charge Characteristics

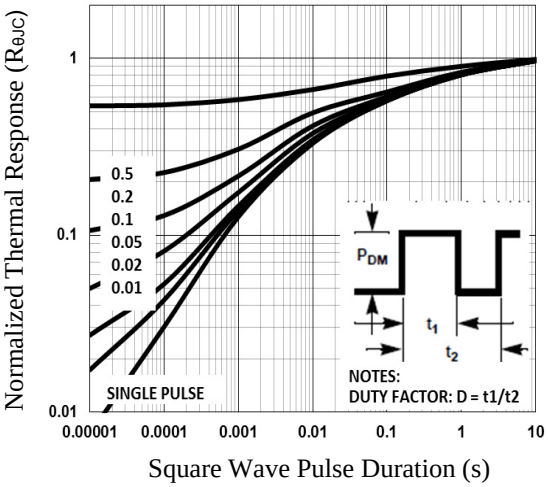


Fig.5 Normalized Transient Impedance

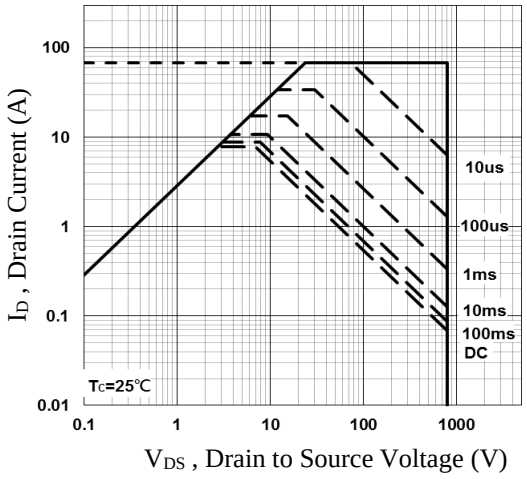


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

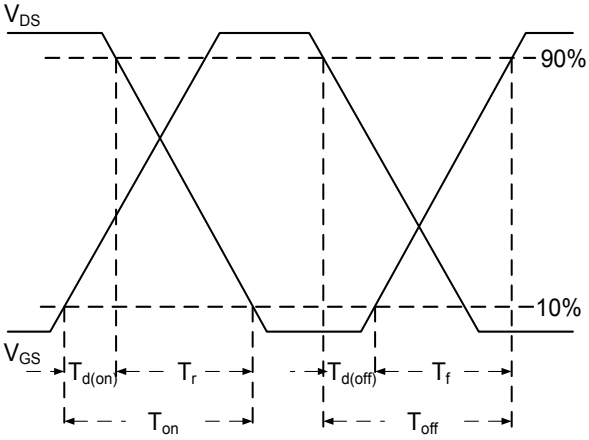


Fig.7 Switching Time Waveform

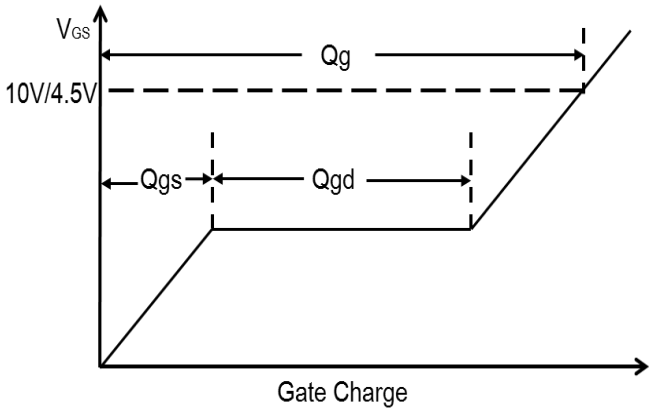


Fig.8 Gate Charge Waveform

Package Outline Dimensions

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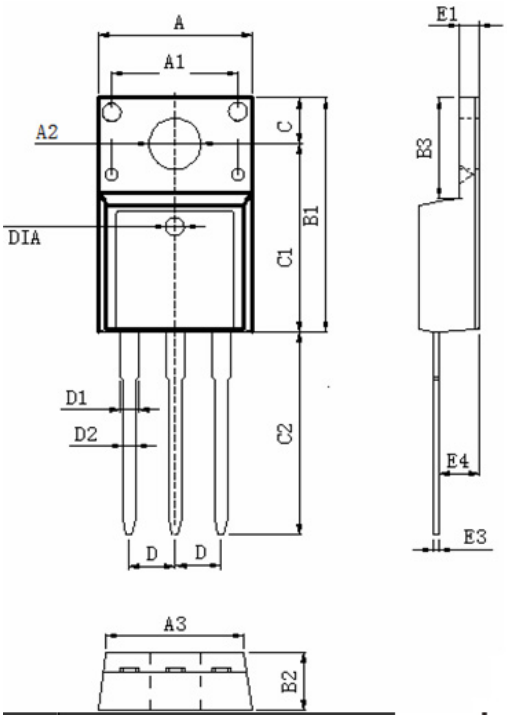

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.460	9.860	0.412	0.388
A1	7.100	6.900	0.280	0.272
A2	3.500	3.100	0.138	0.122
A3	9.900	9.500	0.390	0.374
B1	16.170	15.570	0.637	0.613
B2	4.900	4.500	0.193	0.177
B3	6.880	6.480	0.271	0.255
C	3.500	3.100	0.138	0.122
C1	12.870	12.270	0.507	0.483
C2	13.380	12.580	0.527	0.495
D	2.590	2.490	0.102	0.098
D1	1.470	1.070	0.058	0.042
D2	0.900	0.700	0.035	0.028
E1	2.740	2.340	0.108	0.092
E3	0.600	0.400	0.024	0.016
E4	2.960	2.560	0.117	0.101
DIA	Φ1.5 TYP.	deep0.1 TYP.	Φ0.059 TYP.	deep0.004 TYP.