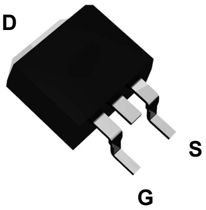
SSFD0959

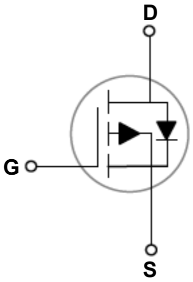
100V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-100V
$R_{DS(ON)}$	45mΩ
I_D	-30A



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 SSFD0959 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°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous (T_C=25°C)	I_D	-30	A
Drain Current – Continuous (T_C=100°C)		-19	A
Drain Current – Pulsed^1	I_{DM}	-120	A
Single Pulse Avalanche Energy^2	E_{AS}	180	mJ
Single Pulse Avalanche Current^2	I_{AS}	-60	A
Power Dissipation (T_C=25°C)	P_D	102	W
Power Dissipation – Derate above 25°C		0.82	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 Case	$R_{\theta JC}$	---	1.22	°C/W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	°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	-100	---	---	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V, T_J=25°C	---	---	-1	uA
		V_{DS}=-80V, V_{GS}=0V, T_J=85°C	---	---	-10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-15A	---	36	45	mΩ
		V_{GS}=-4.5V, I_D=-10A	---	40	55	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D =-250uA	-1.2	---	-2.5	V
Forward Transconductance	gfs	V_{DS}=-10V, I_D=-5A	---	22	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[3, 4]	Q_g	V_{DS}=-50V, V_{GS}=-10V, I_D=-10A	---	98	150	nC
Gate-Source Charge[3, 4]	Q_{gs}		---	16.2	30	
Gate-Drain Charge[3, 4]	Q_{gd}		---	13.8	26	
Turn-On Delay Time[3, 4]	$T_{d(on)}$	V_{DD}=-50V, V_{GS}=-10V, R_G=25Ω, I_D=-5A	---	58	105	nS
Rise Time[3, 4]	T_r		---	24	50	
Turn-Off Delay Time[3, 4]	$T_{d(off)}$		---	215	450	
Fall Time[3, 4]	T_f		---	94	180	
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, F=1MHz	---	6315	9000	pF
Output Capacitance	C_{oss}		---	220	330	
Reverse Transfer Capacitance	C_{rss}		---	50	100	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	-30	A
Pulsed Source Current	I_{SM}		---	---	-60	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25°C	---	---	-1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=-50V, V_{GS}=-10V, L=0.1mH, I_{AS}=-60A, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≦ 300uS, duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

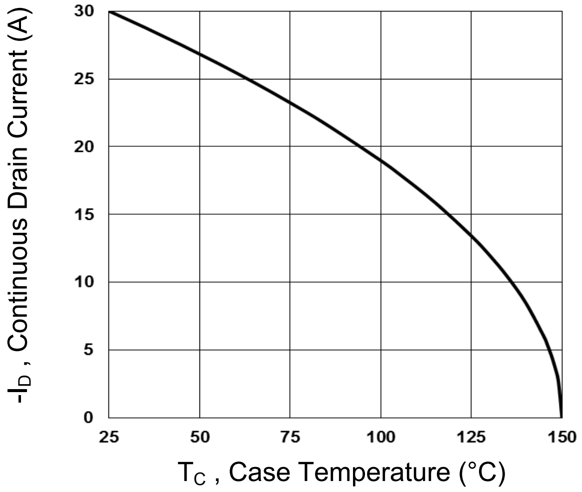


Fig.1 Continuous Drain Current vs. T_C

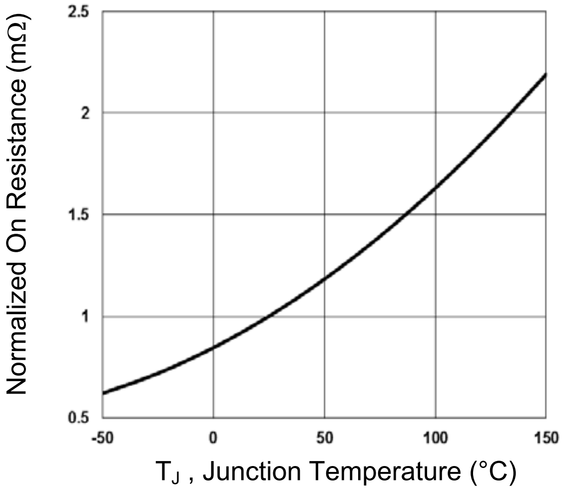


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

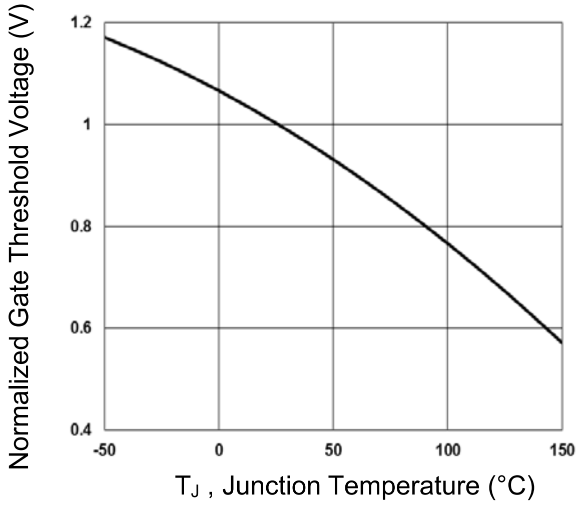


Fig.3 Normalized V_{th} vs. T_J

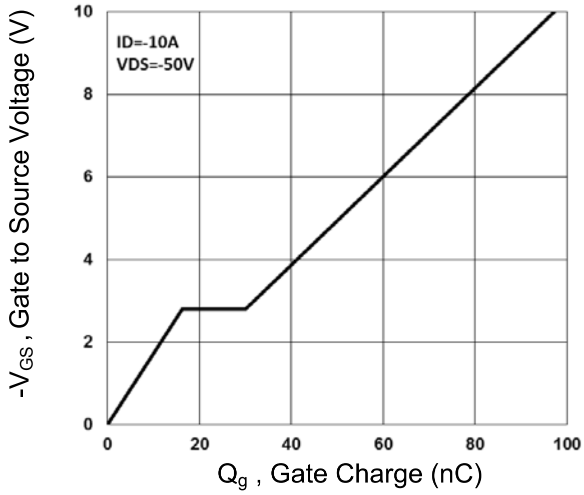


Fig.4 Gate Charge Waveform

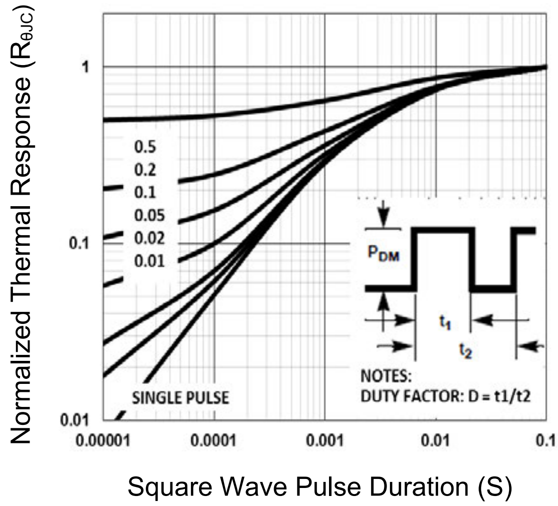


Fig.5 Normalized Transient Impedance

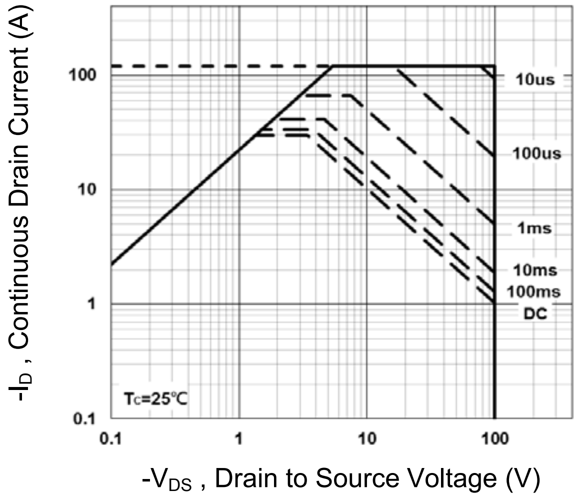


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

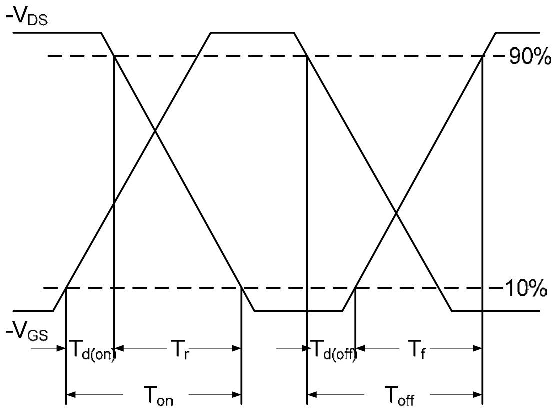


Fig.7 Switching Time Waveform

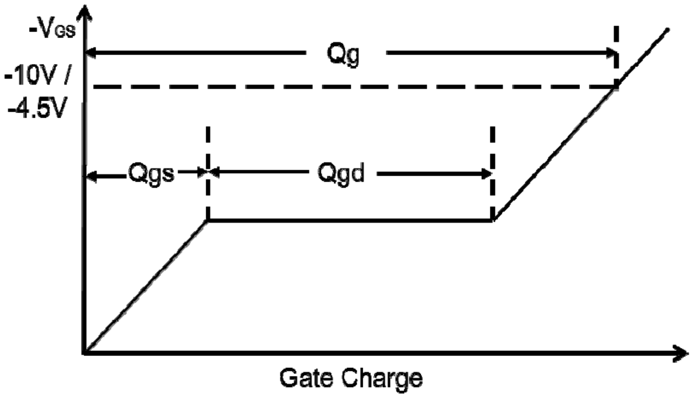
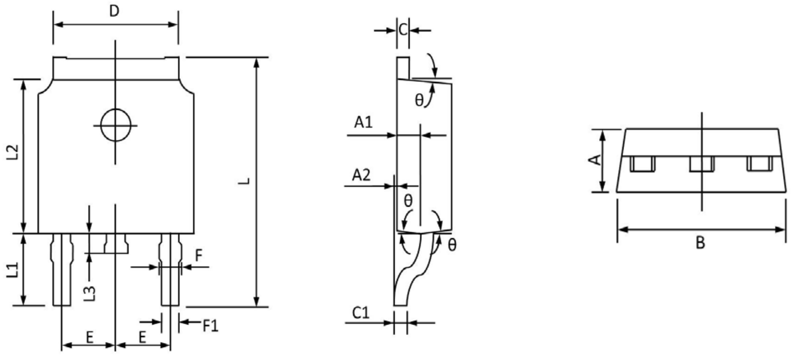


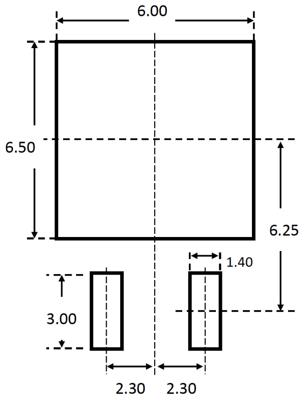
Fig.8 Gate Charge Waveform

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	0.910	1.110	0.036	0.044
A2	0.000	0.150	0.000	0.006
B	6.400	6.800	0.252	0.268
C	0.450	0.580	0.018	0.023
C1	0.460	0.580	0.018	0.023
D	5.100	5.500	0.201	0.217
E	2.186	2.386	0.086	0.094
F	0.600	0.940	0.024	0.037
F1	0.500	0.860	0.020	0.034
L	9.400	10.400	0.370	0.409
L1	2.400	3.000	0.094	0.118
L2	5.400	6.200	0.213	0.244
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°

Recommended Pad Layout



unit : mm

For more information, please contact us at: inquiry@goodarksemi.com