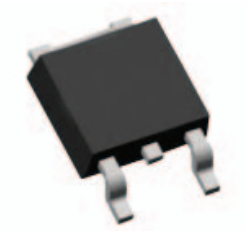
GOOD-ARK
SEMICONDUCTOR

SSFD7N65

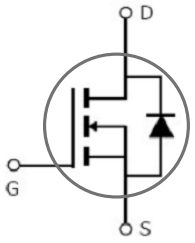
650V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	650V
$R_{DS(ON)}$	0.57Ω
I_D	7A



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 SSFD7N65 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}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current – Continuous (T_C=25°C)	I_D	7	A
Drain Current – Continuous (T_c =100°C)		4.4	A
Drain Current – Pulsed[1]	I_{DM}	28	A
Single Pulse Avalanche Energy[2]	E_{AS}	120	mJ
Single Pulse Avalanched Current[2]	I_{AS}	4.9	A
Power Dissipation (T_C=25°C)	P_D	50	W
Power Dissipation – Derate above 25°C		0.4	W/°C
Storage Temperature Range	T_{STG}	-50 to +150	°C
Operating Junction Temperature Range	T_J	-50 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	80	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	2.5	°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	650	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=1mA	---	0.59	---	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=650V , V_{GS}=0V , T_J=125°C	---	10	---	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V , I_D=3.5A, T_J=25°C	---	0.47	0.57	Ω
		V_{GS}=10V , I_D=3.5A, T_J=150°C	---	1.9	---	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	$\triangle V_{GS(th)}$		---	-9.3	---	mV/°C
Dynamic and Switching Characteristics						
Total Gate Charge[3, 4]	Q_g	V_{DS}=480V , V_{GS}=10V , I_D=3.5A	---	15	---	nC
Gate-Source Charge[3, 4]	Q_{gs}		---	2.4	---	
Gate-Drain Charge[3, 4]	Q_{gd}		---	6.8	---	
Turn-On Delay Time[3, 4]	$T_{d(on)}$	V_{DD}=300V , V_{GS}=10V , R_G=12Ω I_D=3.5A	---	11	---	nS
Rise Time[3, 4]	T_r		---	10	---	
Turn-Off Delay Time[3, 4]	$T_{d(off)}$		---	30	---	
Fall Time[3, 4]	T_f		---	6	---	
Input Capacitance	C_{iss}	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	604	---	pF
Output Capacitance	C_{oss}		---	278	---	
Reverse Transfer Capacitance	C_{rss}		---	0.6	---	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	7	A
Pulsed Source Current	I_{SM}		---	---	14	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=3.5A , T_J=25°C	---	---	1.2	V
Reverse Recovery Time[3]	t_{rr}	I_S=7A , dI/dt=100A/μS, T_J=25°C	---	262	---	nS
Reverse Recovery Charge[3]	Q_{rr}		---	3.5	---	uC
Peak Reverse Recovery Current	I_{rrm}		---	15	---	A

Notes:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=60V, V_{GS}=4.9A, L=10mH, R_G=25Ω, 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

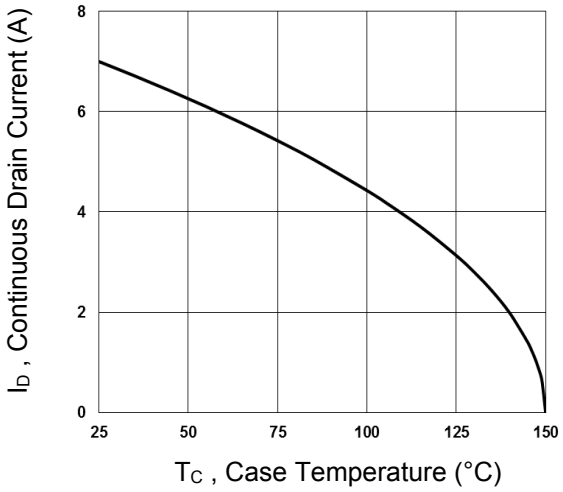


Fig.1 Continuous Drain Current vs. T_C

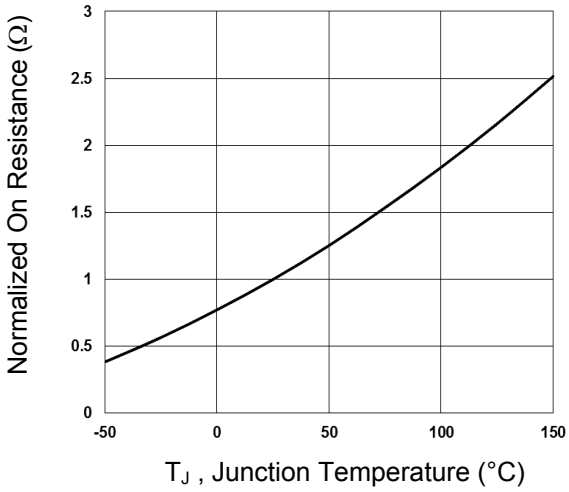


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

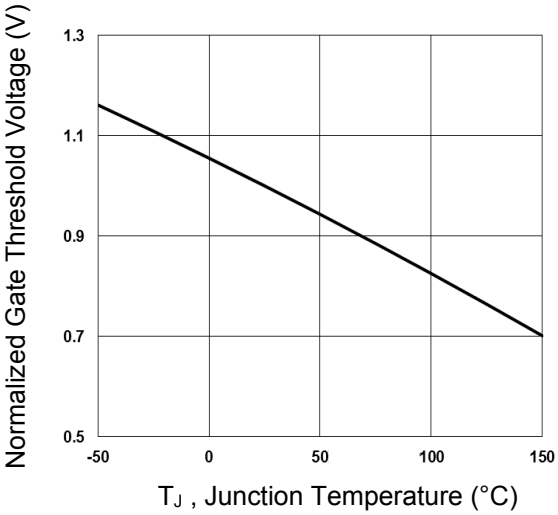


Fig.3 Normalized V_{th} vs. T_J

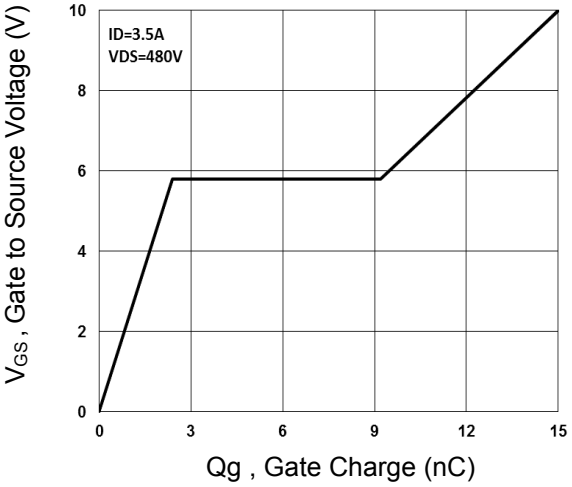


Fig.4 Gate Charge Waveform

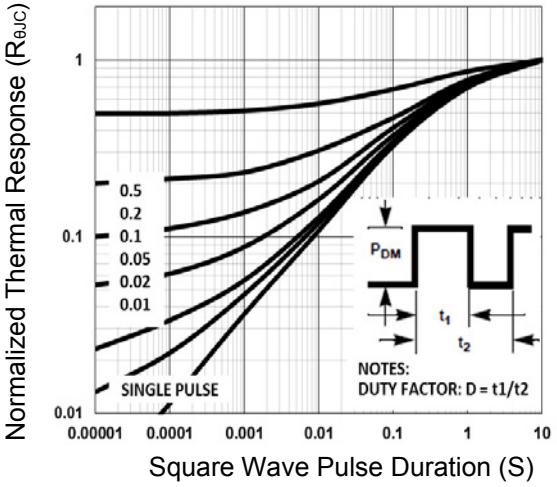


Fig.5 Normalized Transient Impedance

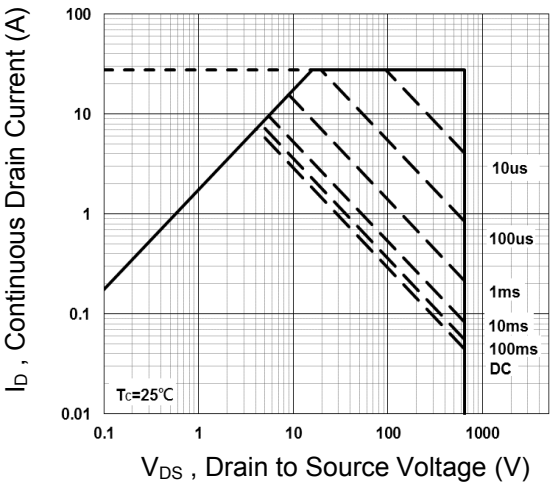


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

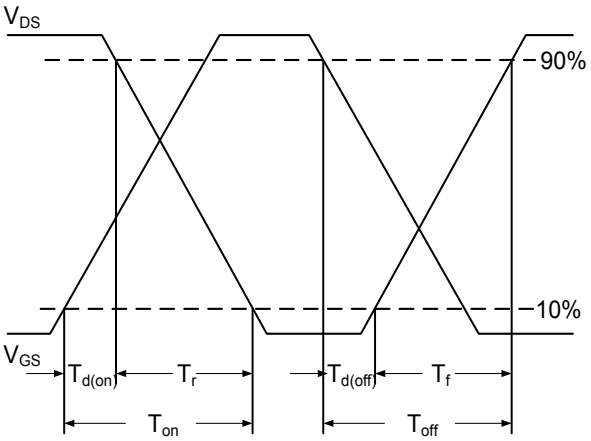


Fig.7 Switching Time Waveform

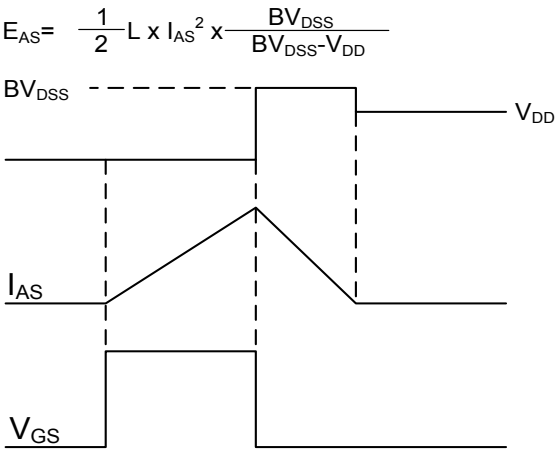
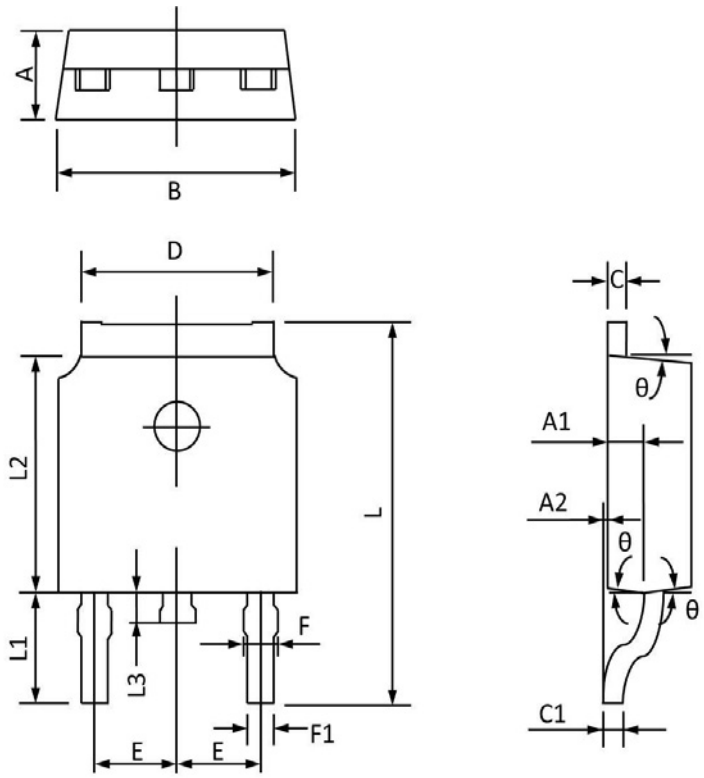


Fig.8 E_{AS} Waveform

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°