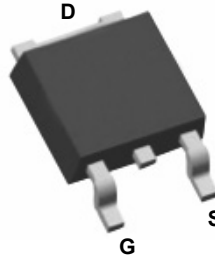
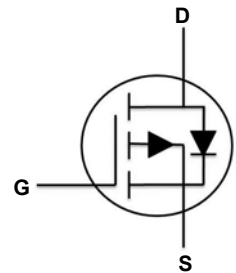


Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	22m Ω
I_D	-50A



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 SSFD6965 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous ($T_C=25^\circ\text{C}$)	I_D	-50	A
Drain Current – Continuous ($T_C=100^\circ\text{C}$)		-31	A
Drain Current – Pulsed ¹	I_{DM}	-200	A
Single Pulse Avalanche Energy ²	E_{AS}	245	mJ
Single Pulse Avalanche Current ²	I_{AS}	-70	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	102	W
Power Dissipation – Derate above 25°C		0.82	W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	1.22	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	$^\circ\text{C/W}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	---	---	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-48V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$	---	18	22	$m\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	---	30	40	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1	-2	-3	V
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-5A$	---	10	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-48V, V_{GS}=-10V, I_D=-10A$	---	37.5	55	nC
Gate-Source Charge ^{3,4}	Q_{gs}		---	6.3	15	
Gate-Drain Charge ^{3,4}	Q_{gd}		---	10.3	16	
Turn-On Delay Time ^{3,4}	$T_{d(on)}$	$V_{DD}=-48V, V_{GS}=-10V, R_G=25\Omega, I_D=-5A$	---	22.1	46	nS
Rise Time ^{3,4}	T_r		---	71.2	150	
Turn-Off Delay Time ^{3,4}	$T_{d(off)}$		---	103.5	220	
Fall Time ^{3,4}	T_f		---	24.6	56	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	---	2120	3200	pF
Output Capacitance	C_{oss}		---	315	480	
Reverse Transfer Capacitance	C_{rss}		---	127	190	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	-50	A
Pulsed Source Current	I_{SM}		---	---	-100	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-30V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-70A, \text{Starting } T_J=25^\circ\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

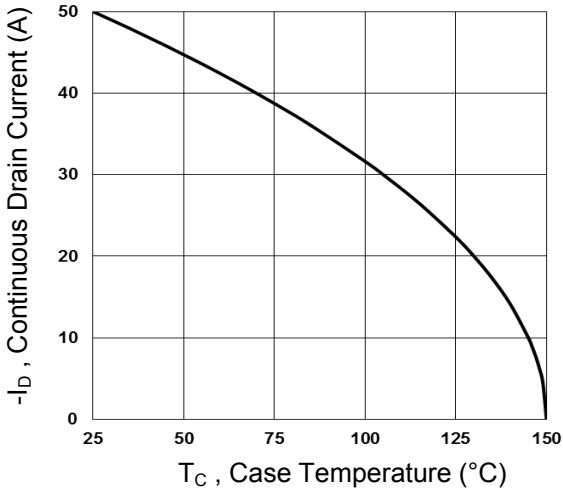


Fig.1 Continuous Drain Current vs. T_C

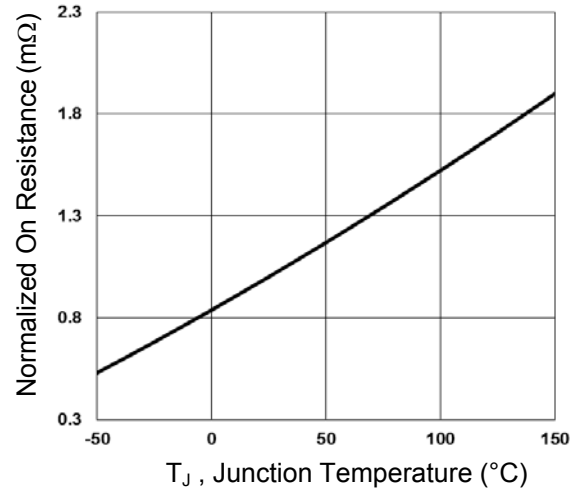


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

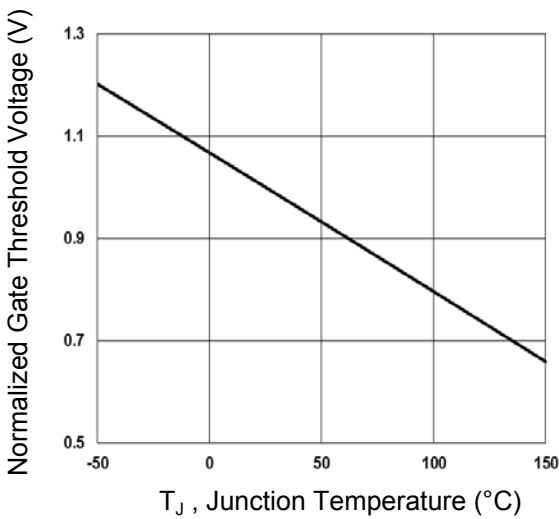


Fig.3 Normalized V_{th} vs. T_J

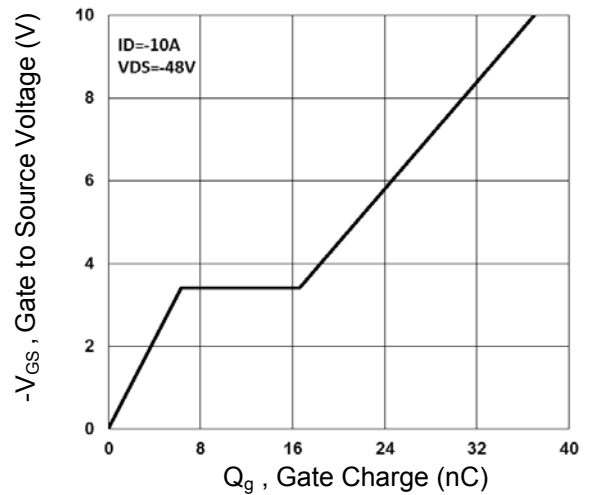


Fig.4 Gate Charge Waveform

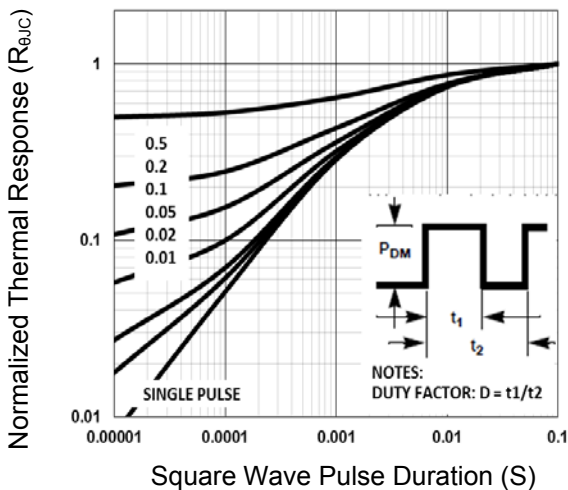


Fig.5 Normalized Transient Response

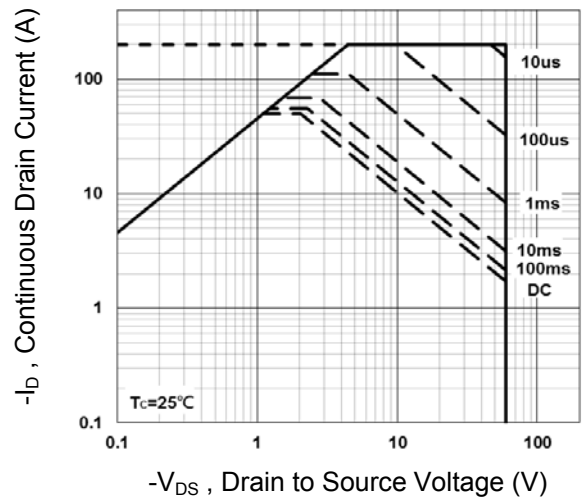


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

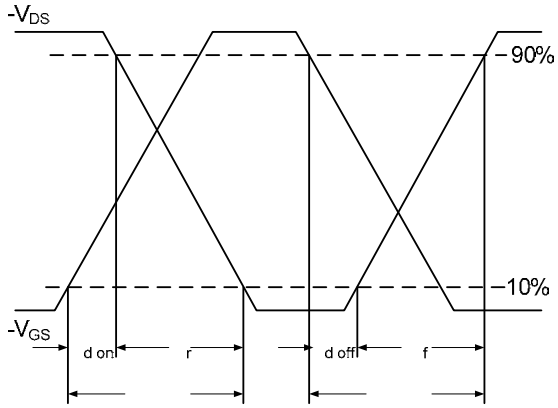


Fig.7 Switching Time Waveform

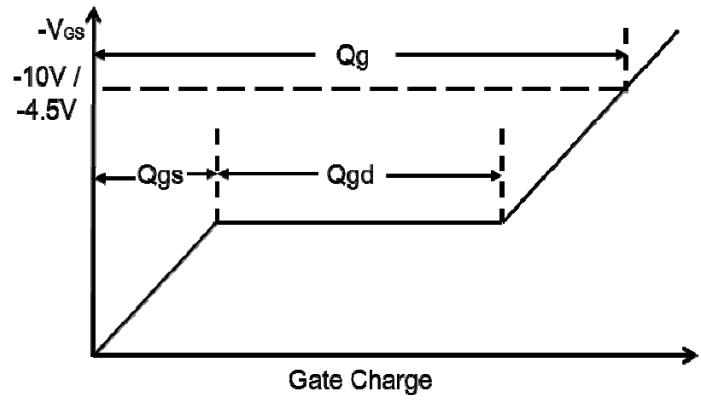
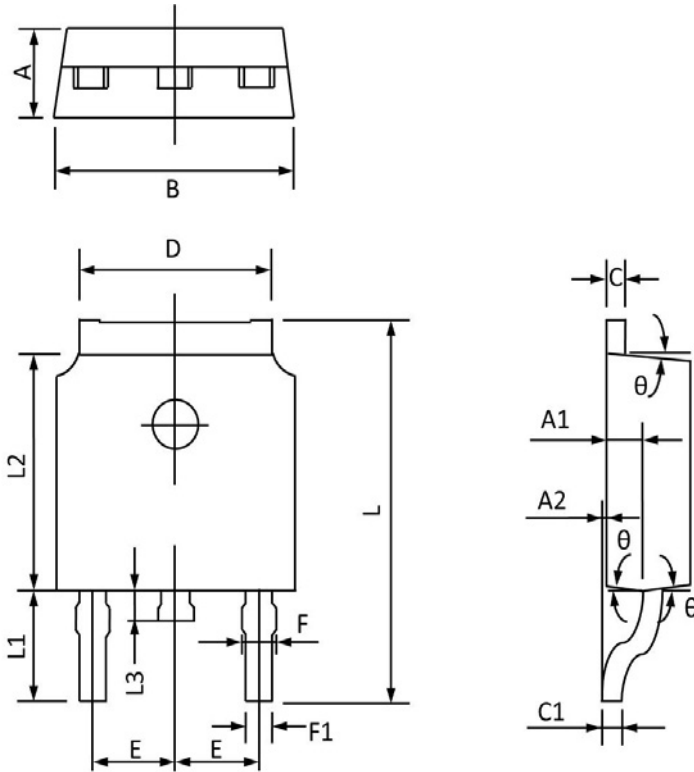


Fig.8 Gate Charge Waveform

Package Outline Dimensions

TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	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°