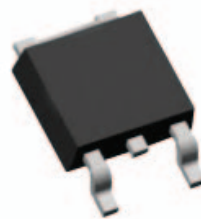
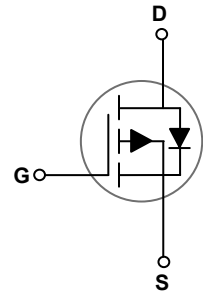


Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	48mΩ
I_D	-16A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for POL applications, load switch and LED lighting
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSF6905 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 ($T_A=25^{\circ}\text{C}$)	I_D	-16	A
Drain Current – Continuous ($T_A=70^{\circ}\text{C}$)		-10	A
Drain Current – Pulsed ¹	I_{DM}	-64	A
Single Pulse Avalanche Energy ²	E_{AS}	51	mJ
Single Pulse Avalanche Current ²	I_{AS}	-32	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	25	W
Power Dissipation – Derate above 25°C		0.2	W/ $^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-50 to +150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	$^{\circ}\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	5	$^{\circ}\text{C/W}$

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	-60	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =-1mA	---	-0.05	---	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-48V, V _{GS} =0V, T _J =125°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 =-8A	---	39	48	mΩ
		V _{GS} =-4.5V, I _D =-4A	---	53	65	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	-1.2	-1.6	-2.2	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	5	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-8A	---	10	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3, 4}	Q _g	V _{DS} =-30V, V _{GS} =-10V, I _D =-8A	---	22.4	31	nC
Gate-Source Charge ^{3, 4}	Q _{gs}		---	4.1	6	
Gate-Drain Charge ^{3, 4}	Q _{gd}		---	5.2	7	
Turn-On Delay Time ^{3, 4}	T _{d(on)}	V _{DD} =-30V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	---	13	25	ns
Rise Time ^{3, 4}	T _r		---	42.4	81	
Turn-Off Delay Time ^{3, 4}	T _{d(off)}		---	64.6	123	
Fall Time ^{3, 4}	T _f		---	16.4	31	
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, F=1MHz	---	1250	1810	pF
Output Capacitance	C _{oss}		---	85	125	
Reverse Transfer Capacitance	C _{rss}		---	65	95	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	15	30	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	25	A
Pulsed Source Current	I _{SM}		---	---	100	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	1	V
Reverse Recovery Time ³	t _{rr}	V _{GS} =0V, I _S =-1A,	---	17	---	ns
Reverse Recovery Charge ³	Q _{rr}	di/dt=100A/μS, T _J =25°C	---	12	---	nC

Notes:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-32A, 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

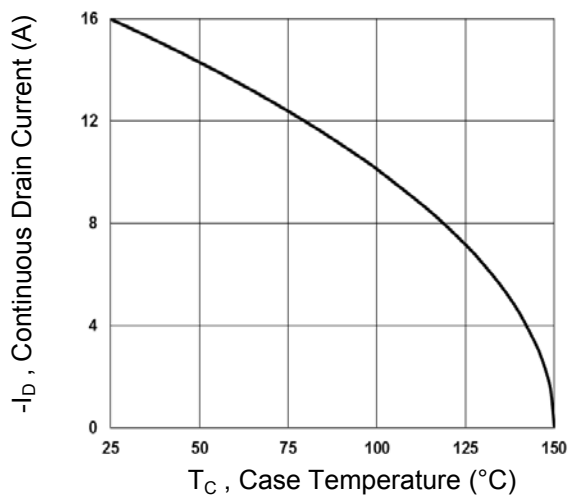


Fig.1 Continuous Drain Current vs. T_C

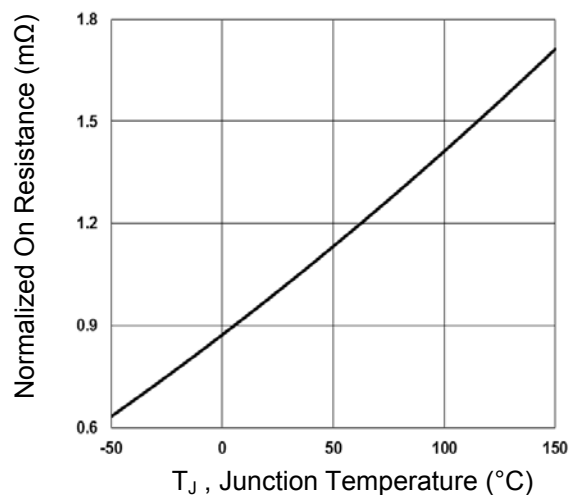


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

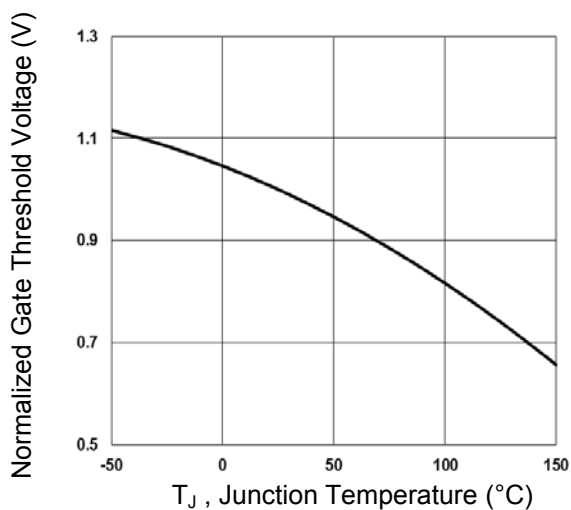


Fig.3 Normalized V_{th} vs. T_J

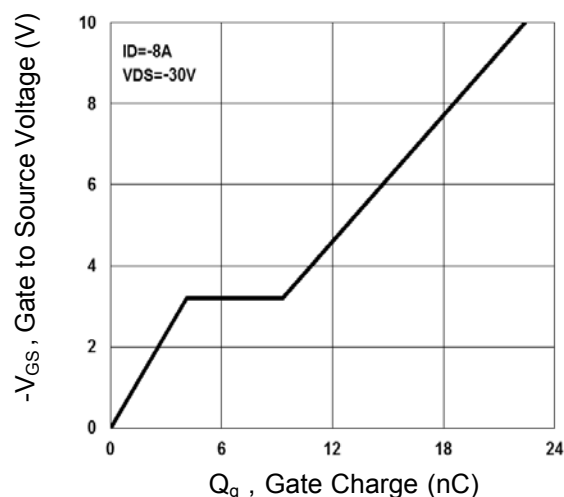


Fig.4 Gate Charge Waveform

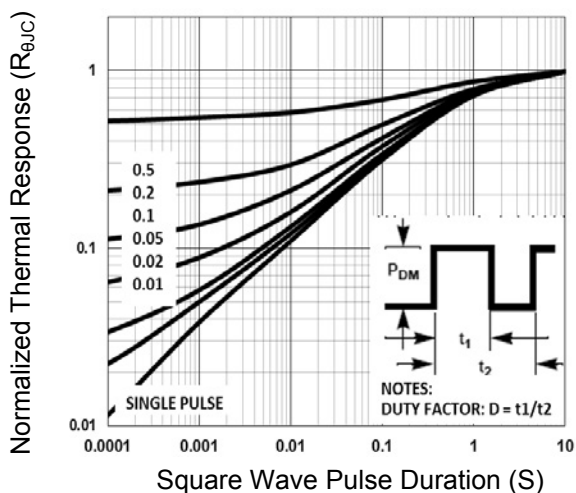


Fig.5 Normalized Transient Impedance

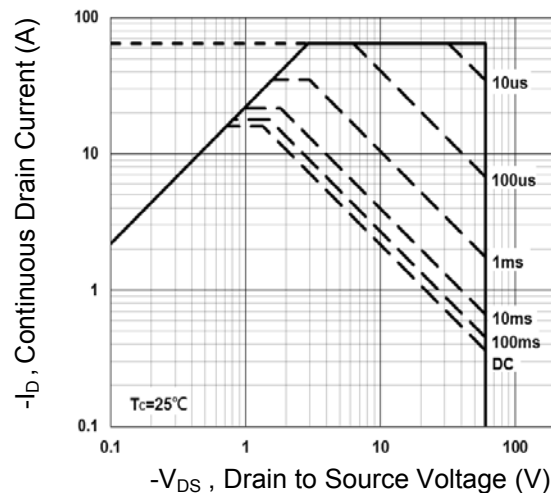


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

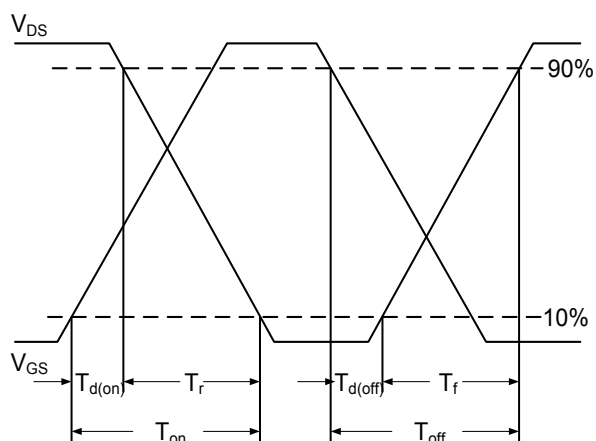


Fig.7 Switching Time Waveform

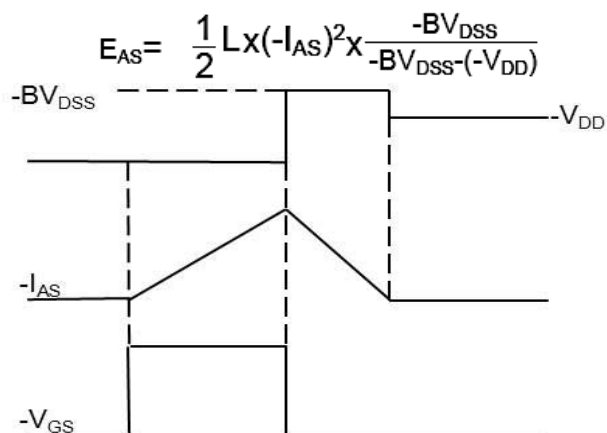
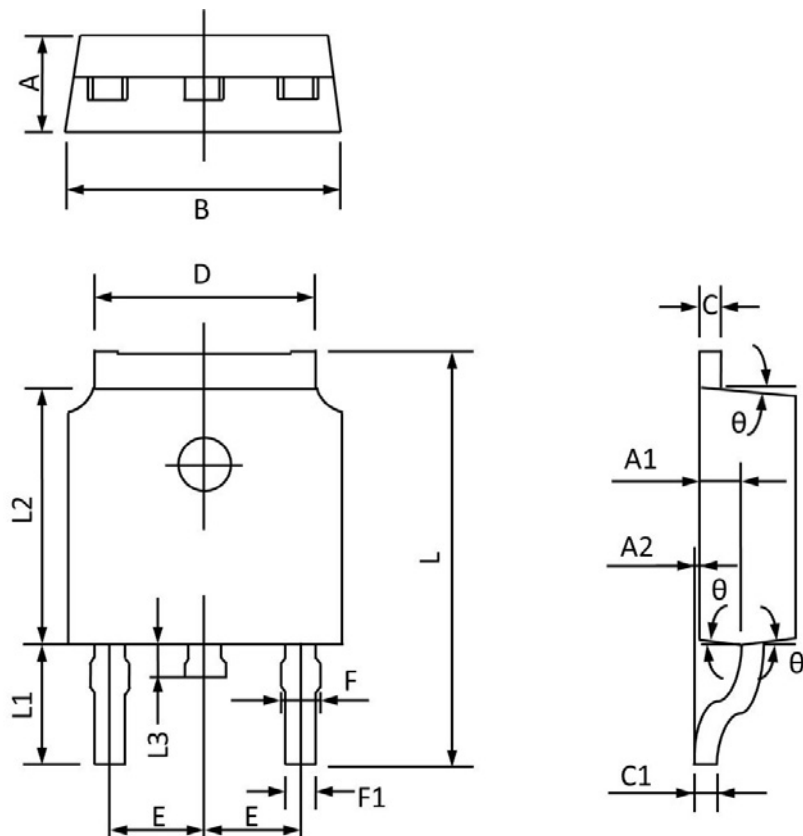


Fig.8 E_{AS} Waveform

Package Outline Dimensions

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°