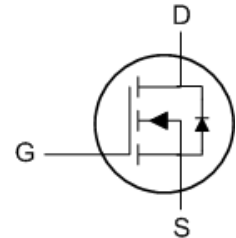
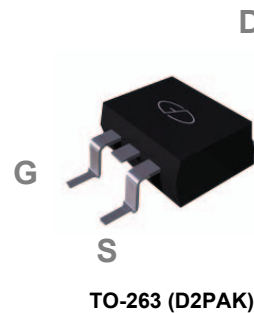


Main Product Characteristics

V_{BDSS}	40V
$R_{DS(on)}$	3.8mΩ (max)
I_D	150A



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for DC-DC converter, power management in portable battery, computer, printer, cellular and general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSF4960 utilizes the latest trench techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in power switching applications and a wide variety of other applications.

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous ($T_C=25^{\circ}C$)	I_D	150	A
Drain Current – Continuous ($T_C=100^{\circ}C$)		95	A
Drain Current – Pulsed ₁	I_{DM}	600	A
Single Pulse Avalanche Energy ₂	EAS	312	mJ
Single Pulse Avalanche Current ₂	IAS	79	A
Power Dissipation ($T_C=25^{\circ}C$)	P_D	166	W
Power Dissipation – Derate above $25^{\circ}C$		1.33	W/ $^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	$^{\circ}C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	0.75	$^{\circ}C/W$

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	40	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	---	0.03	---	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =32V, 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 ³	R _{DS(ON)}	V _{GS} =10V, I _D =25A	---	3.1	3.8	mΩ
		V _{GS} =4.5V, I _D =12A	---	4	5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	-5	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =2A	---	16	---	S
Dynamic Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =20V, V _{GS} =4.5V, I _D =10A	---	44.4	80	nC
Gate-Source Charge ^{3,4}	Q _{gs}		---	9.6	18	
Gate-Drain Charge ^{3,4}	Q _{gd}		---	16	30	
Turn-On Delay Time ^{3,4}	T _{d(on)}	V _{DD} =20V, V _{GS} =10V, R _G =6W I _D =1A	---	28	50	ns
Rise Time ^{3,4}	T _r		---	3.2	6.5	
Turn-Off Delay Time ^{3,4}	T _{d(off)}		---	89	160	
Fall Time ^{3,4}	T _f		---	14	28	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	---	4940	7800	pF
Output Capacitance	C _{oss}		---	425	800	
Reverse Transfer Capacitance	C _{rss}		---	170	330	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.4	2.8	Ω
Drain-Source Diode Characteristics						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	150	A
Pulsed Source Current ³	I _{SM}		---	---	300	A
Diode Forward Voltage ³	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}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=79A., 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 Characteristics

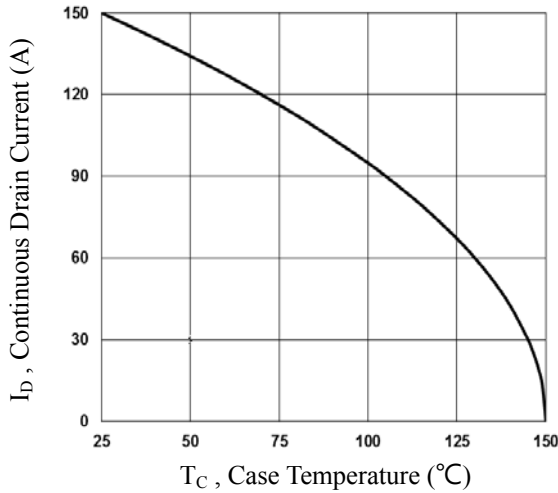


Fig.1 Continuous Drain Current vs. T_C

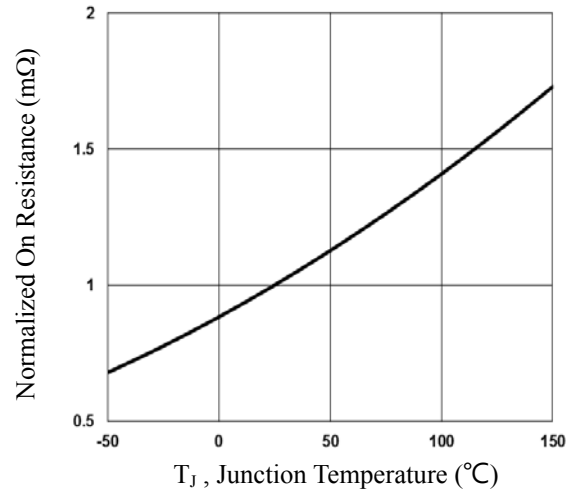


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

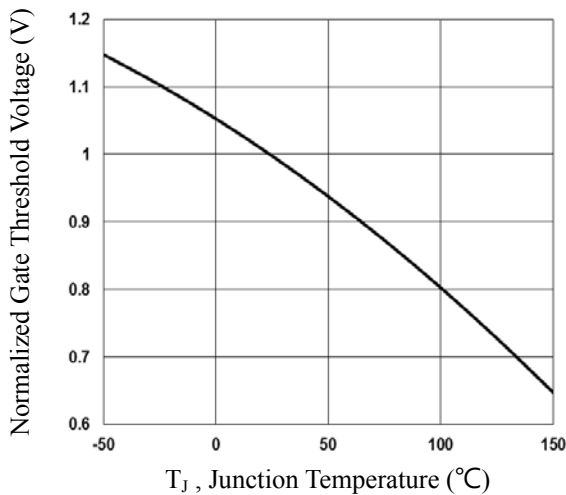


Fig.3 Normalized V_{th} vs. T_J

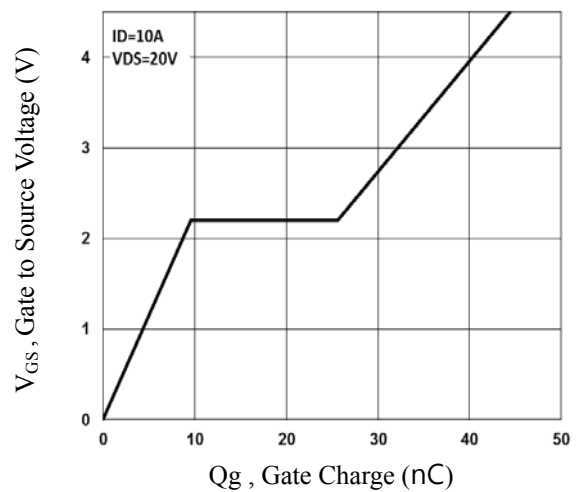


Fig.4 Gate Charge Waveform

Typical Electrical and Thermal Characteristics

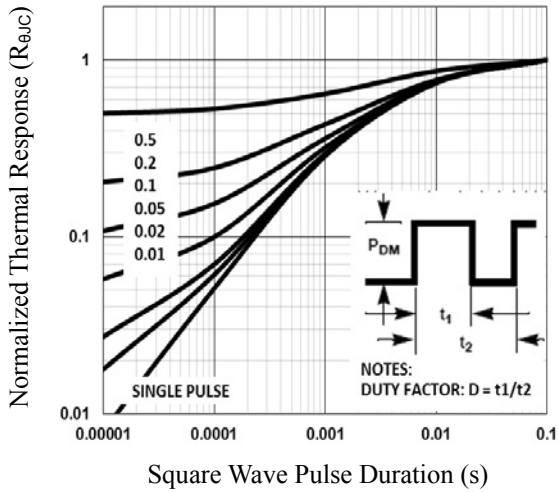


Fig.5 Normalized Transient Impedance

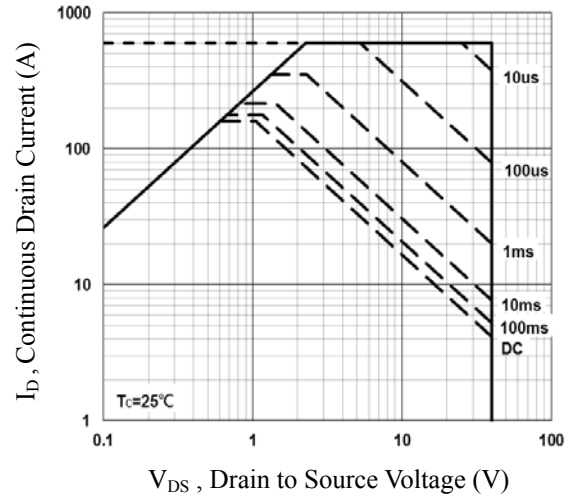


Fig.6 Maximum Safe Operation Area

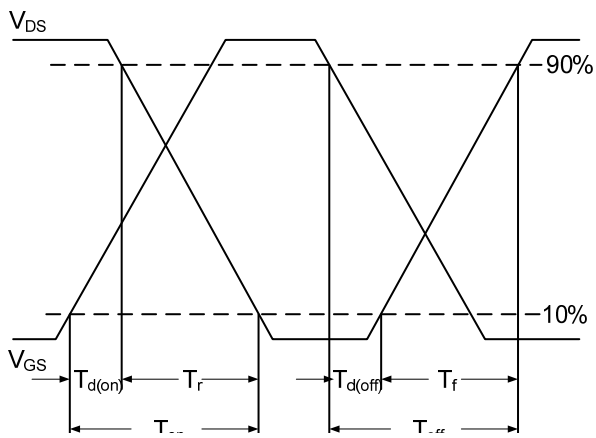


Fig.7 Switching Time Waveform

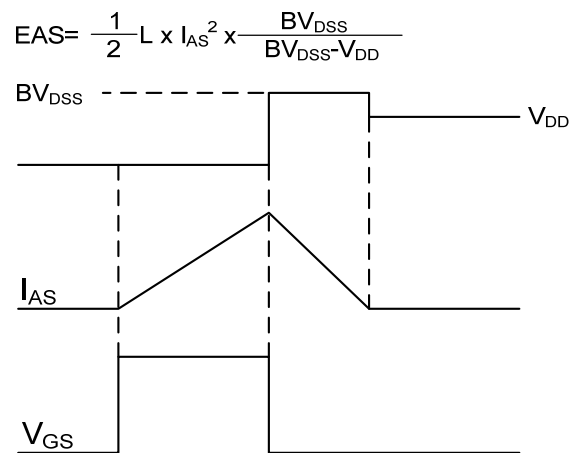


Fig.8 EAS Waveform

Package Outline Dimensions TO-263 (D2PAK)

