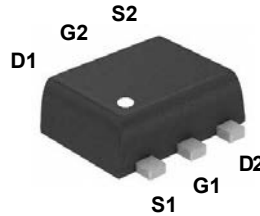
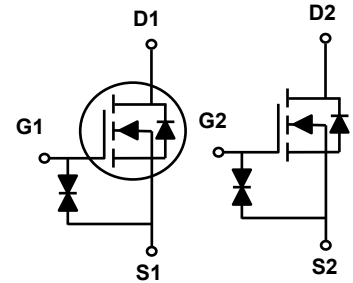


Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	300m Ω
I_D	800mA



SOT-963



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 SSF9220 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}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current – Continuous ($T_c=25^\circ\text{C}$)	I_D	800	mA
Drain Current – Continuous ($T_c=100^\circ\text{C}$)		510	mA
Drain Current – Pulsed ¹	I_{DM}	3.2	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	275	mW
Power Dissipation – Derate above 25°C		2.2	mW/ $^\circ\text{C}$
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 Ambient	$R_{\theta JA}$	---	450	$^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1\text{mA}$	---	-0.01	---	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 6V, V_{DS}=0V$	---	---	± 20	μA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.5A$	---	200	300	m Ω
		$V_{GS}=2.5V, I_D=0.4A$	---	235	400	
		$V_{GS}=1.8V, I_D=0.2A$	---	295	550	
		$V_{GS}=1.5V, I_D=0.1A$	---	365	800	
		$V_{GS}=1.2V, I_D=0.1A$	---	600	1500	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1.0	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	3	---	$\text{mV}/^\circ\text{C}$
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A$	---	1	2	nC
Gate-Source Charge ^{2,3}	Q_{gs}		---	0.26	0.5	
Gate-Drain Charge ^{2,3}	Q_{gd}		---	0.2	0.4	
Turn-On Delay Time ^{2,3}	$T_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, R_G=10\Omega, I_D=0.5A$	---	5	10	nS
Rise Time ^{2,3}	T_r		---	3.5	7	
Turn-Off Delay Time ^{2,3}	$T_{d(off)}$		---	14	28	
Fall Time ^{2,3}	T_f		---	6	12	
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1\text{MHz}$	---	38.2	75	pF
Output Capacitance	C_{oss}		---	14.4	28	
Reverse Transfer Capacitance	C_{rss}		---	6	12	
Drain-Source Diode Characteristics and Maximum Ratings						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	0.8	A
Pulsed Source Current	I_{SM}		---	---	1.6	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=0.2A, T_J=25^\circ\text{C}$	---	---	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{S}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

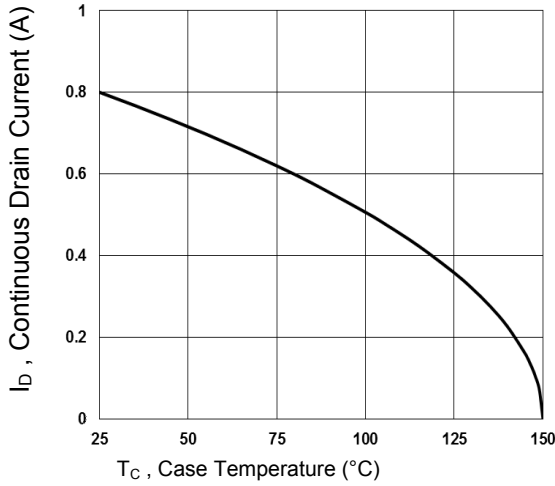


Fig.1 Continuous Drain Current vs. T_C

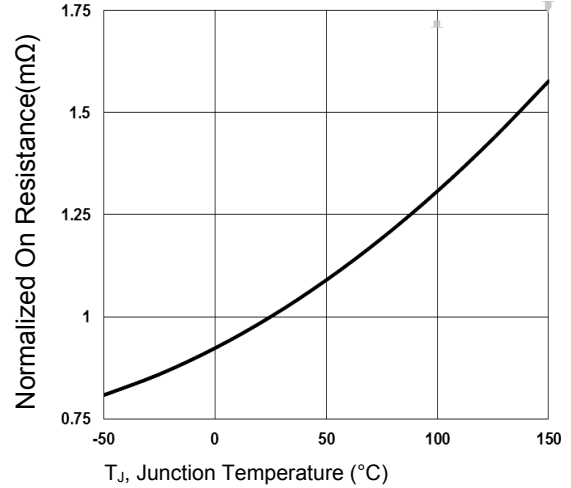


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

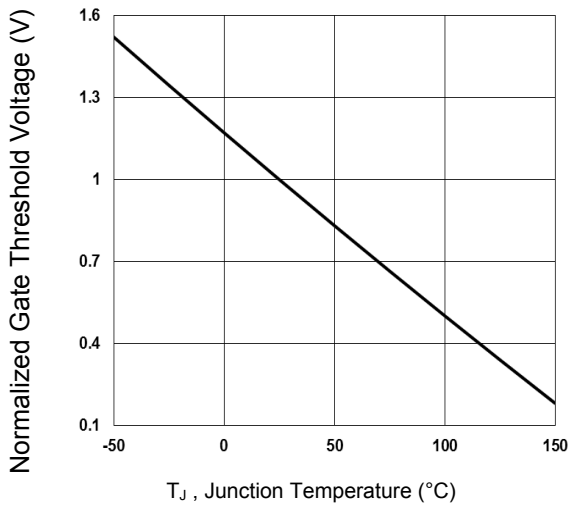


Fig.3 Normalized V_{th} vs. T_J

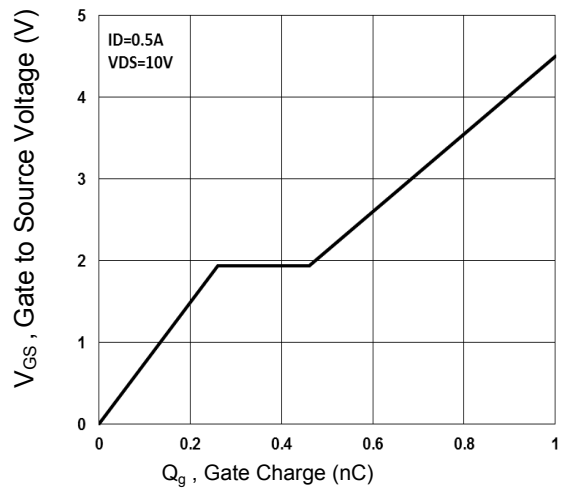


Fig.4 Gate Charge Waveform

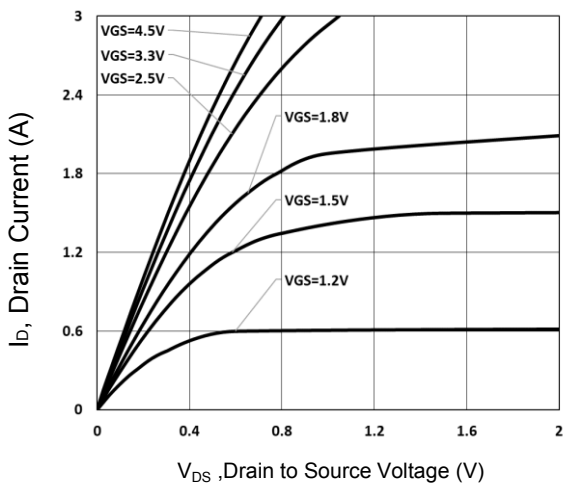


Fig.5 Typical Output Characteristics

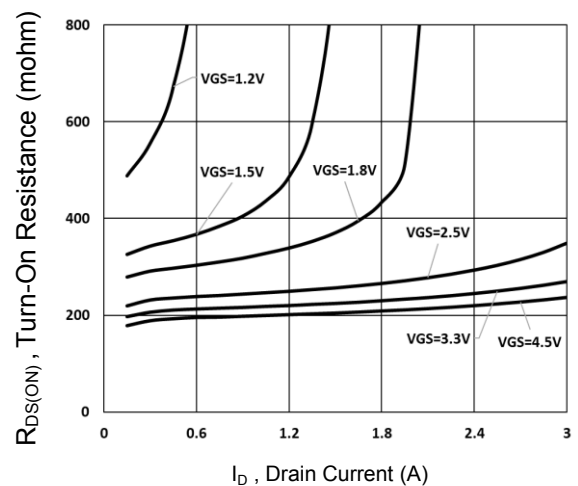


Fig.6 Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

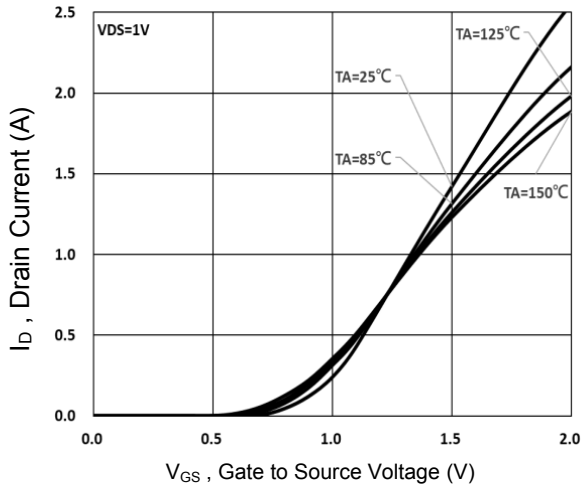


Fig.7 Transfer Characteristics

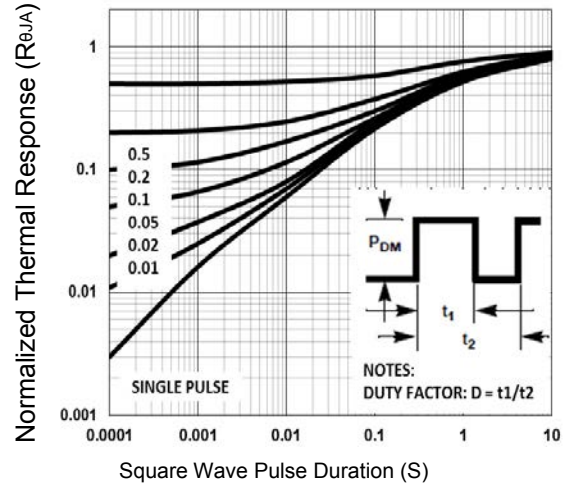


Fig.8 Normalized Transient Impedance

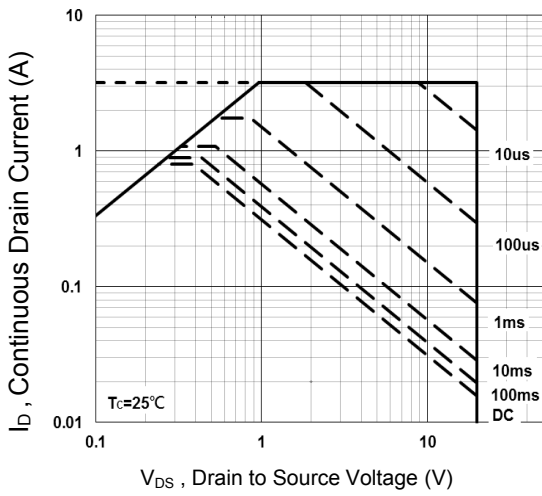
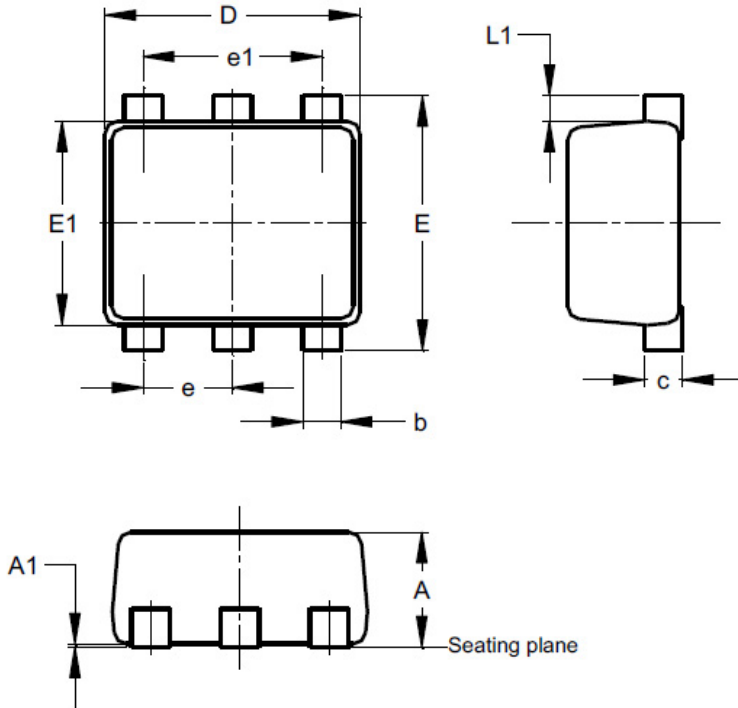


Fig. 9 Maximum Safe Operation Area

Package Outline Dimensions SOT-963



Symbol	Dimensions In Millimeters	
	MIN	MAX
A	0.40	0.50
A1	-	0.05
b	0.10	0.20
c	0.05	0.18
D	0.95	1.05
E	0.95	1.05
E1	0.75	0.85
e	0.35BSC	
e1	0.70BSC	
L1	0.05	0.15