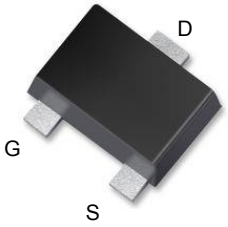
GOOD-ARK SEMICONDUCTOR

SSF7320

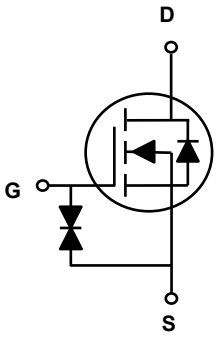
20V N-Channel MOSFET

Main Product Characteristics

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



SOT-723



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 SSF7320 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 supplies 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}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current – Continuous (T_A=25°C)	I_D	800	mA
Drain Current – Continuous (T_A=70°C)		640	mA
Drain Current – Pulsed[1]	I_{DM}	3.2	A
Power Dissipation (T_A=25°C)	P_D	450	mW
Power Dissipation – Derate above 25°C		3.6	mW/°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	280	°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	20	-	-	V
BV_{DSS} Temperature Coeffient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA	-	-0.01	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V, T_J=25°C	-	-	1	uA
		V_{DS}=16V, V_{GS}=0V, T_J=125°C	-	-	10	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±50	uA
		V_{GS}=±8V, V_{DS}=0V	-	-	±10	uA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.5A	---	200	300	mΩ
		V_{GS}=2.5V, I_D=0.4A	---	300	450	
		V_{GS}=1.8V, I_D=0.2A	---	500	700	
		V_{GS}=1.5V, I_D=0.1A	---	800	1200	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D =250uA	0.3	0.5	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	3	---	mV/°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=10Ω 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=1MHz	---	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, 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°C	---	---	1	V

Notes:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

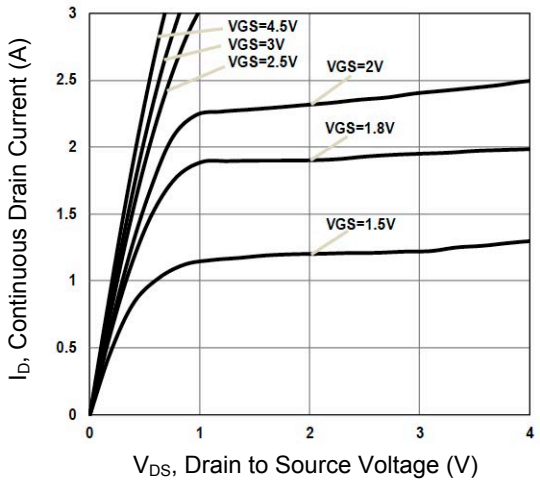


Figure 1. Typical Output Characteristics

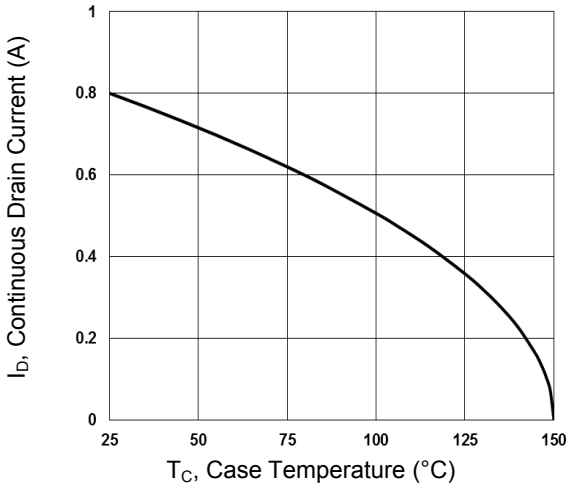


Figure 2. Continuous Drain Current vs. T_C

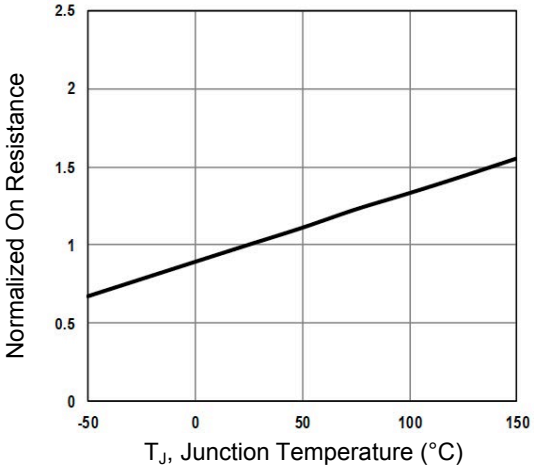


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

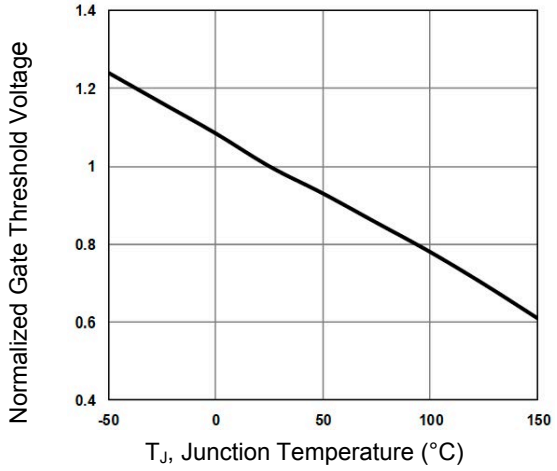


Figure 4. Normalized V_{th} vs. T_J

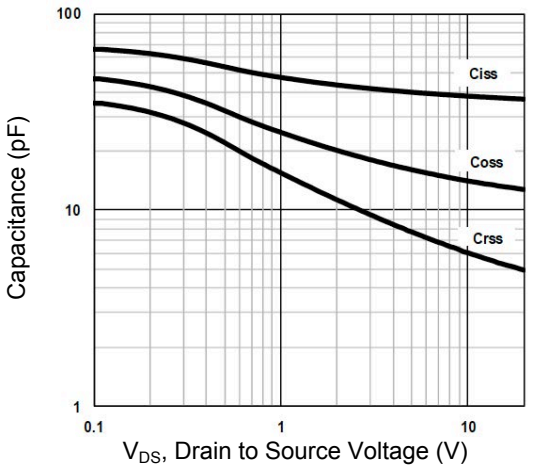


Figure 5. Capacitance Characteristics

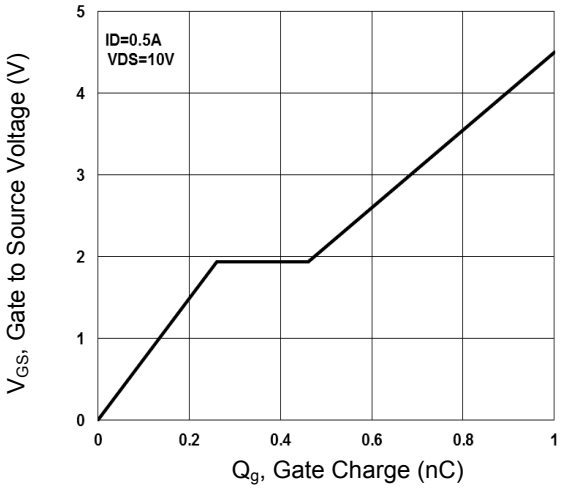


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

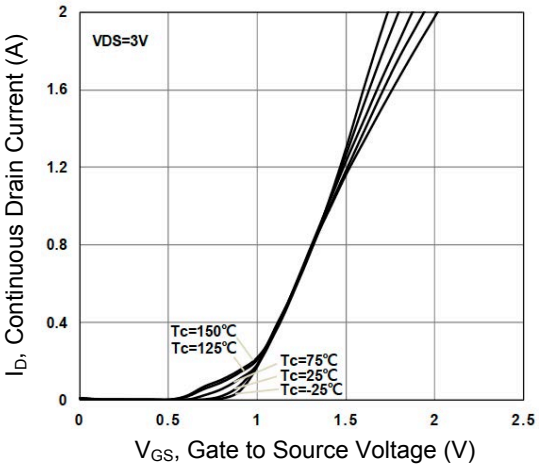


Figure 7. Transfer Characteristics

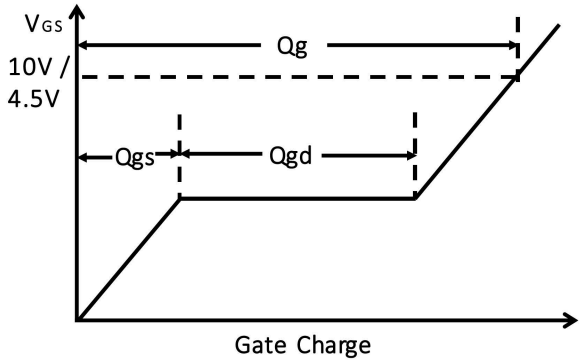


Figure 8. Gate Charge Waveform

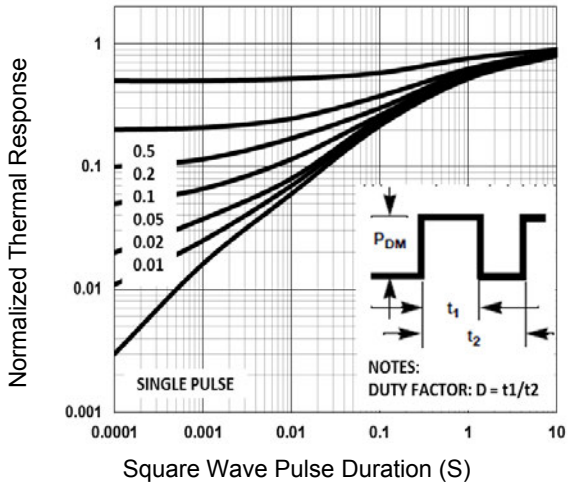


Figure 9. Normalized Transient Impedance

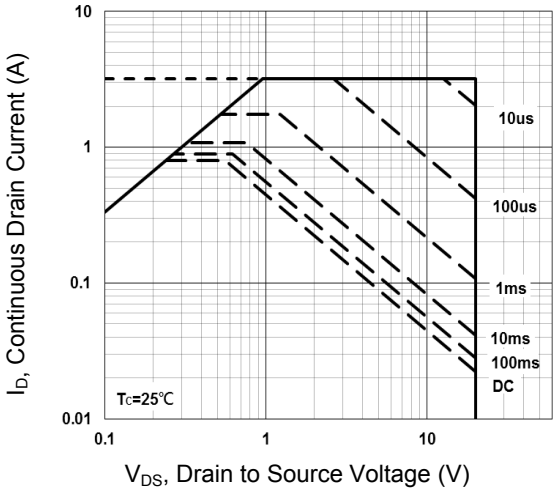
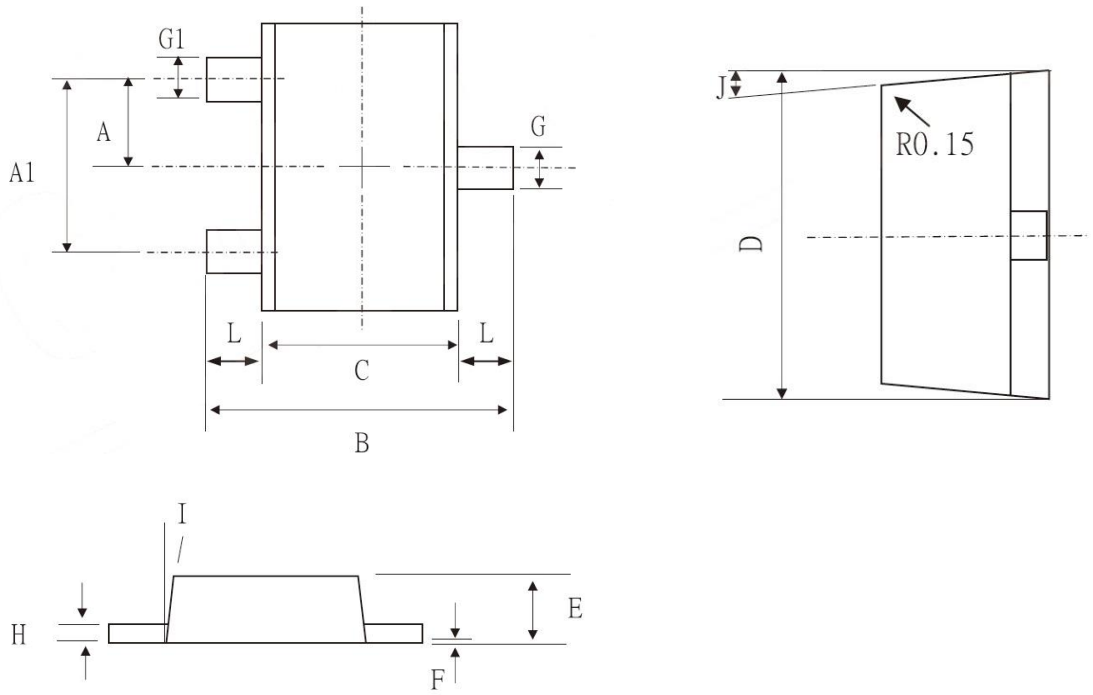


Figure 10. Maximum Safe Operation Area

Package Outline Dimensions (SOT-723)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.400 BSC		0.016 BSC	
A1	0.800 BSC		0.031 BSC	
B	1.150	1.250	0.045	0.049
C	0.750	0.850	0.030	0.033
D	1.150	1.250	0.045	0.049
E	0.370	0.390	0.015	0.015
F	0.000	0.050	0.000	0.002
G	0.220	0.270	0.009	0.011
G1	0.170	0.250	0.007	0.010
H	0.080	0.150	0.003	0.006
I	9°	13°	9°	13°
L	0.150	0.250	0.006	0.010
J	7°	11°	7°	11°