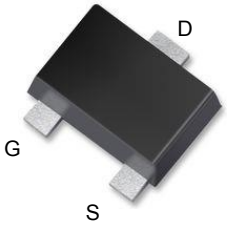
GOOD-ARK SEMICONDUCTOR

SSF7320

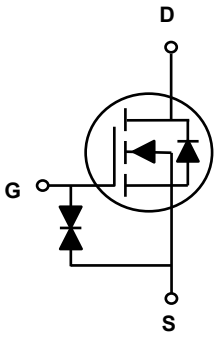
20V N-Channel MOSFET

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 supply 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_C=25°C)	I_D	800	mA
Drain Current – Continuous (T_C=100°C)		510	mA
Drain Current – Pulsed[1]	I_{DM}	3.2	A
Power Dissipation (T_C=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} Tempreature 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

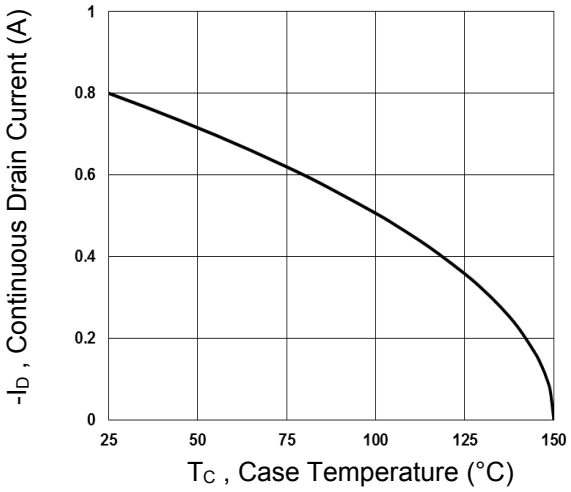


Fig.1 Continuous Drain Current vs. T_C

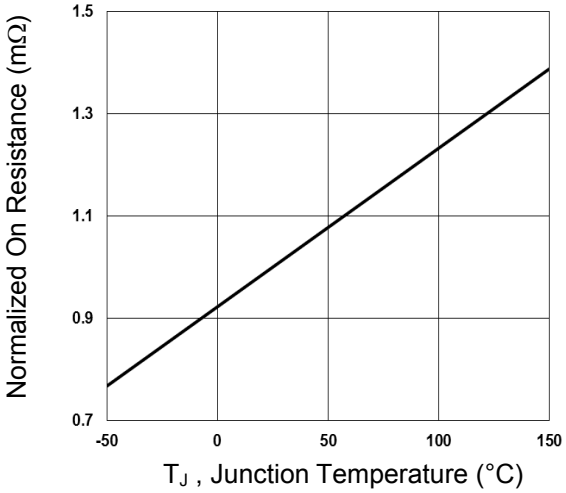


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

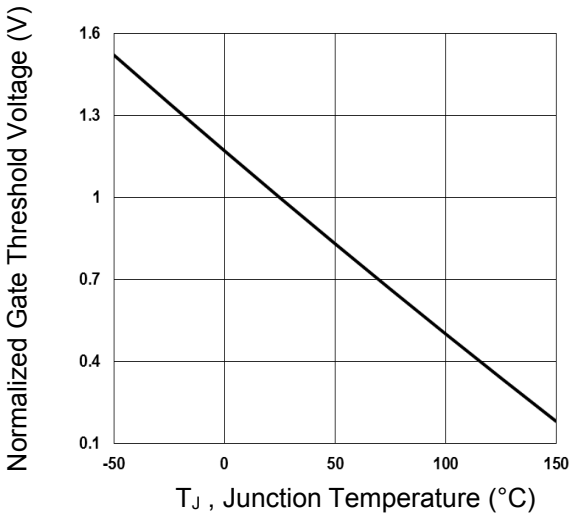


Fig.3 Normalized V_{th} vs. T_J

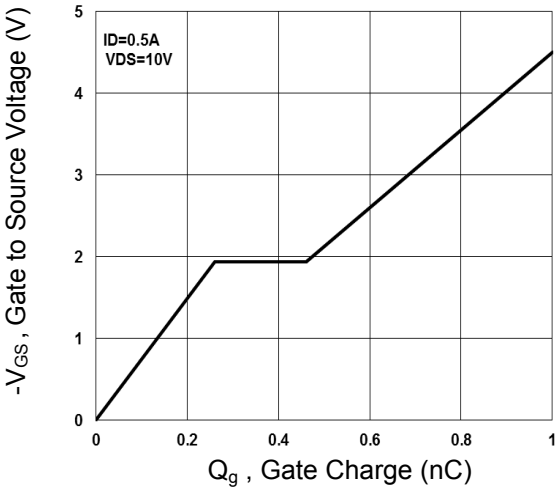


Fig.4 Gate Charge Waveform

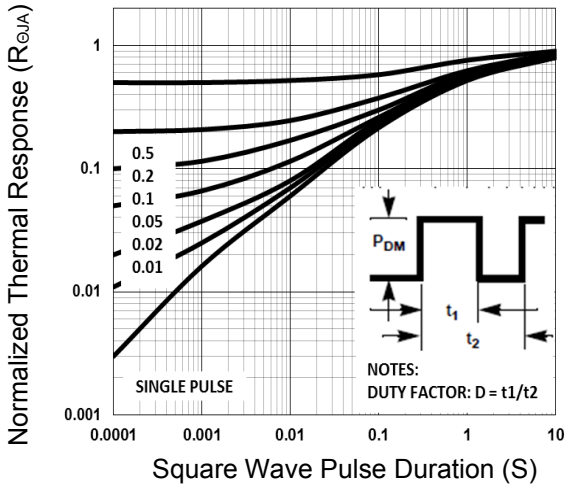


Fig.5 Normalized Transient Response

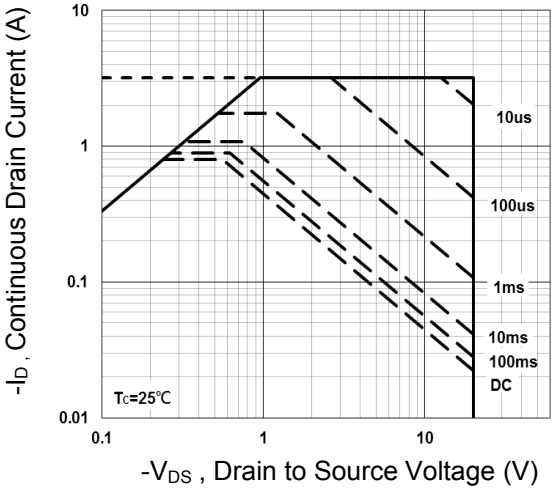


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

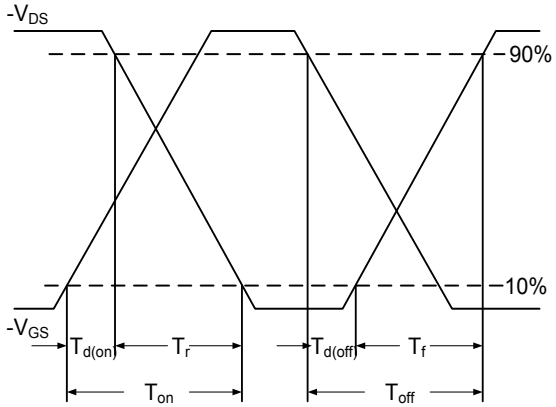


Fig.7 Switching Time Waveform

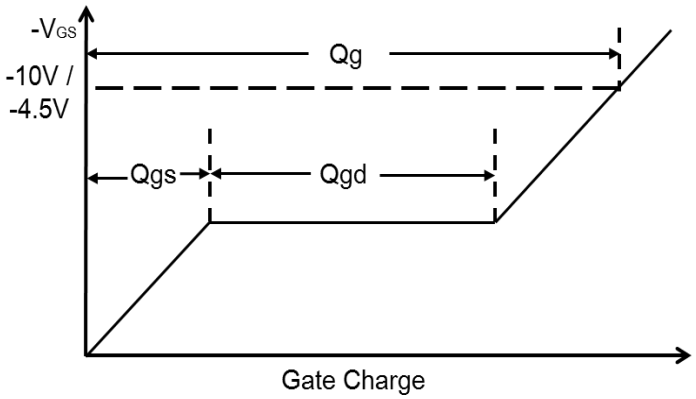
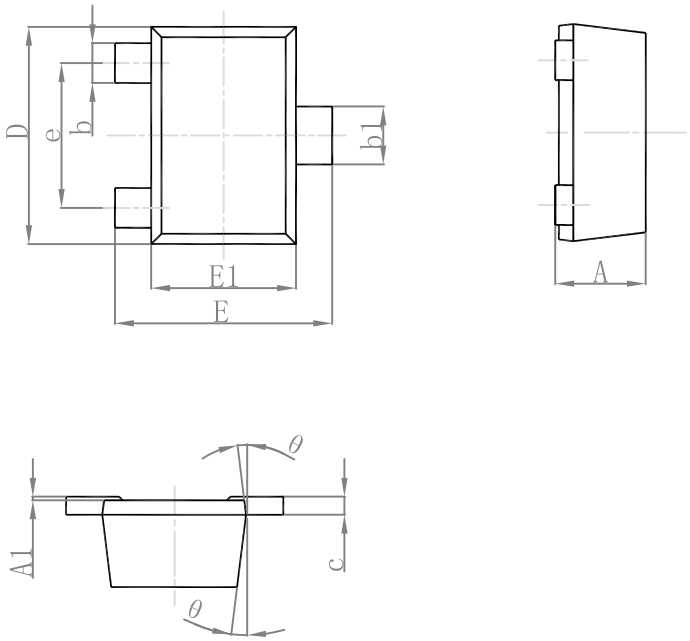


Fig.8 E_{AS} Waveform

Package Outline Dimensions SOT-723



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.370	0.500	0.015	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	