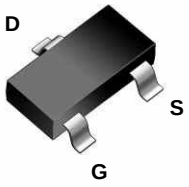
GOOD-ARK SEMICONDUCTOR

SSF2320Y

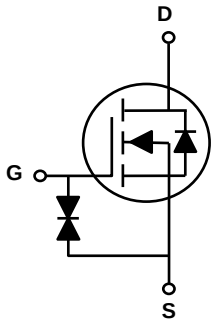
20V N-Channel MOSFET

Main Product Characteristics

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



SOT-523



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 SSF2320Y 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}	±8	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	312	mW
Power Dissipation – Derate above 25°C		2.5	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	$R_{\theta JA}$	---	400	°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 Coefficient	$\triangle BV_{DSS}/\triangle T_J$	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	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±6V , V_{DS}=0V	---	---	±20	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	---	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 =250uA	0.3	0.6	1.0	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

Note:
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

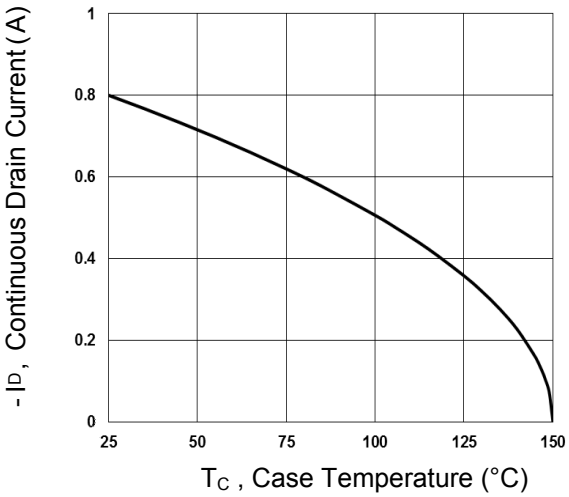


Fig.1 Continuous Drain Current vs. T_C

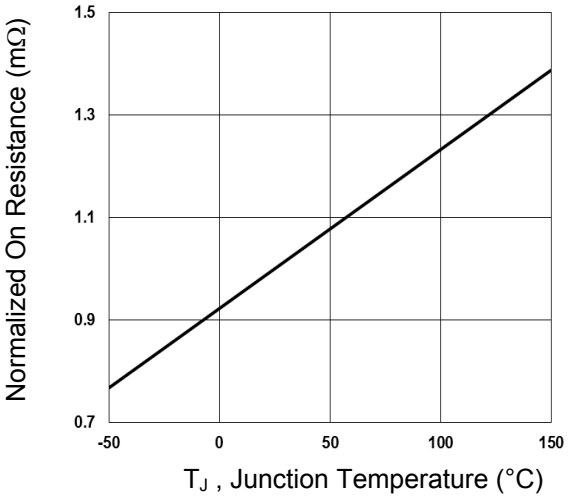


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

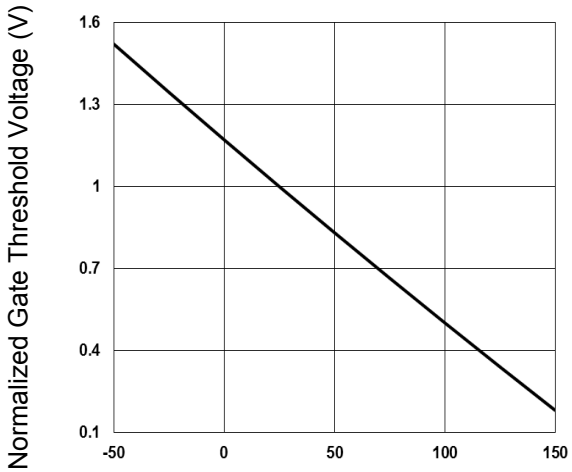


Fig.3 Normalized V_{th} vs T_J

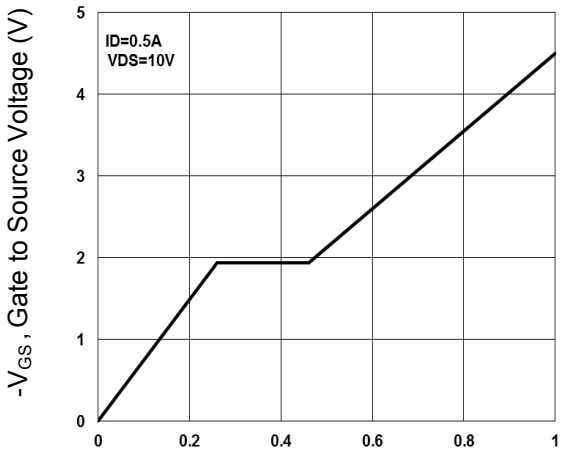


Fig.4 Gate Charge Waveform

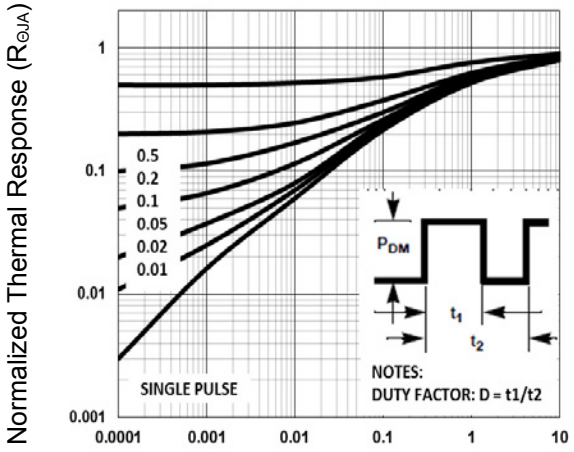


Fig.5 Normalized Transient Impedance

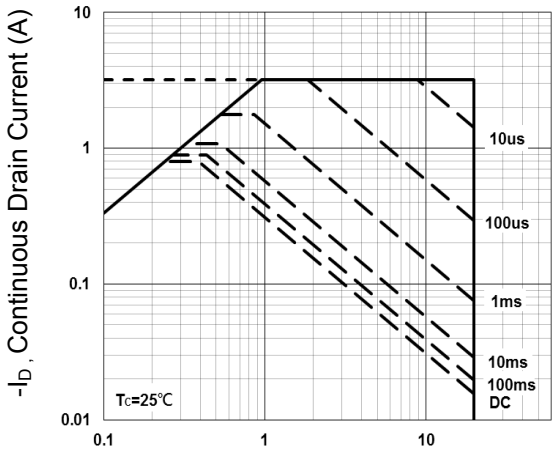


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

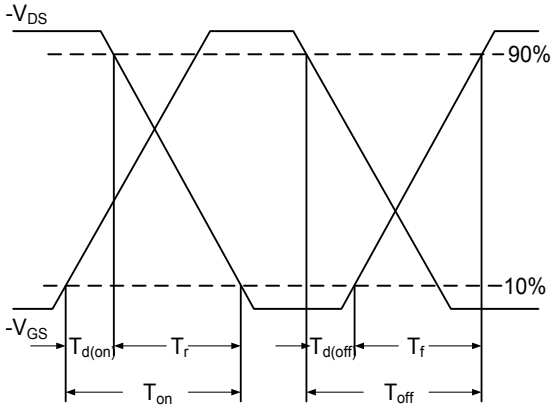


Fig.7 Switching Time Waveform

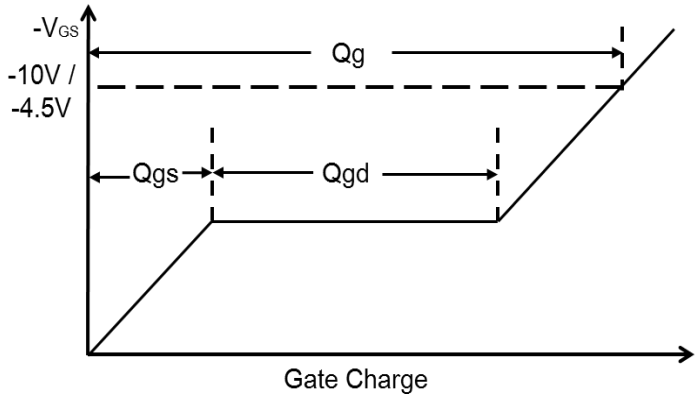
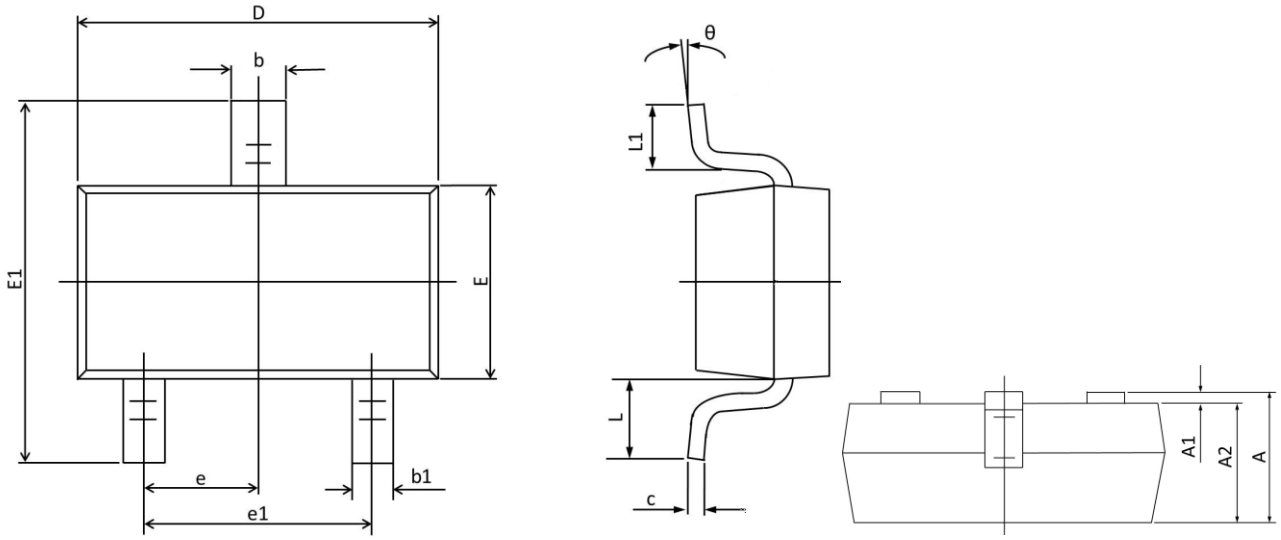


Fig.8 Gate Charge Waveform

Package Outline Dimensions SOT-523



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
A1	0.100	0.000	0.004	0.000
A2	0.800	0.700	0.031	0.028
b	0.350	0.250	0.014	0.010
b1	0.250	0.150	0.010	0.006
c	0.200	0.100	0.008	0.004
D	1.750	1.500	0.069	0.059
E	0.900	0.700	0.035	0.028
E1	1.750	1.400	0.069	0.055
e	0.5TYP.		0.02TYP.	
e1	1.100	0.900	0.043	0.035
L	0.460	0.300	0.018	0.012
L1	0.460	0.260	0.018	0.010
θ	8°	0°	8°	0°

Order Information

Device	Package	Marking Code	Carrier	Quantity	HSF Status
SSF2320Y	SOT-523	B	Tape & Reel	3000/Reel	RoHS Compliant