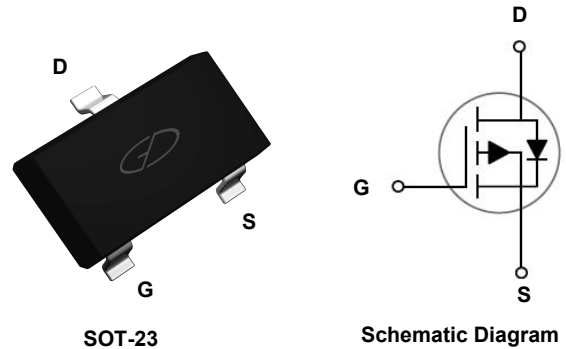


Main Product Characteristics

BV_{DSS}	-100V
$R_{DS(ON)}$	650m Ω
I_D	-840mA



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 GSF1001 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	Max.	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous($T_A=25^\circ\text{C}$)	I_D	-840	mA
Drain Current-Continuous($T_A=70^\circ\text{C}$)		-670	mA
Drain Current-Pulsed ¹	I_{DM}	-3.36	A
Power Dissipation($T_A=25^\circ\text{C}$)	P_D	1.56	W
Power Dissipation-Derate Above 25°C		0.008	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-50 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-50 To +150	$^\circ\text{C}$


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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1mA$	-	0.08	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=-80V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-600mA$	-	540	650	m Ω
		$V_{GS}=-4.5V, I_D=-400mA$	-	590	760	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.8	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-4.6	-	$mV/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-0.5A$	-	2	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=-50V, I_D=-500mA,$ $V_{GS}=-10V$	-	4.4	8.8	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	0.5	1	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	1.8	3.6	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=-50V, R_G=3.3\Omega,$ $V_{GS}=-10V, I_D=-0.5A$	-	5	10	nS
Rise Time ^{2,3}	t_r		-	14.5	29	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	20	40	
Fall Time ^{2,3}	t_f		-	8	16	
Input Capacitance	C_{iss}	$V_{DS}=-50V, V_{GS}=0V,$ $F=1MHz$	-	382	760	pF
Output Capacitance	C_{oss}		-	29	60	
Reverse Transfer Capacitance	C_{rss}		-	18	36	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	31	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$	-	-	-0.84	A
Pulsed Source Current	I_{SM}	Force Current	-	-	-1.68	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A,$ $T_J=25^\circ\text{C}$	-	-	-1	V

Note :

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

Typical Electrical and Thermal Characteristic Curves

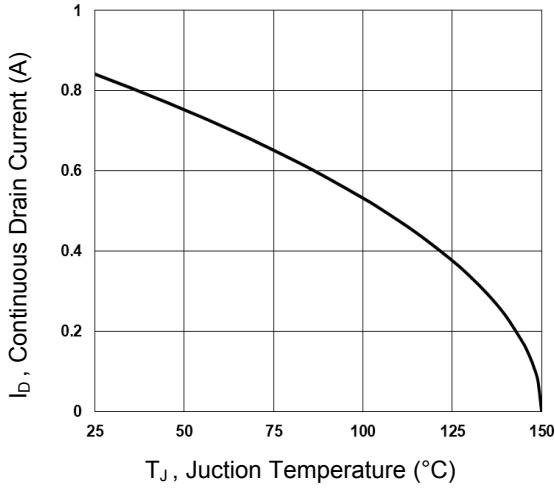


Figure 1. Continuous Drain Current vs. T_J

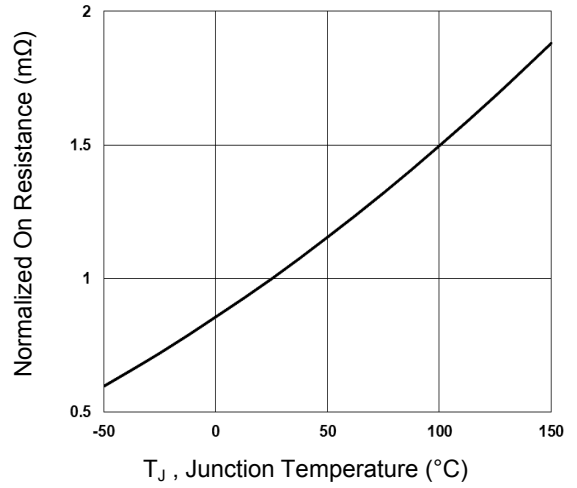


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

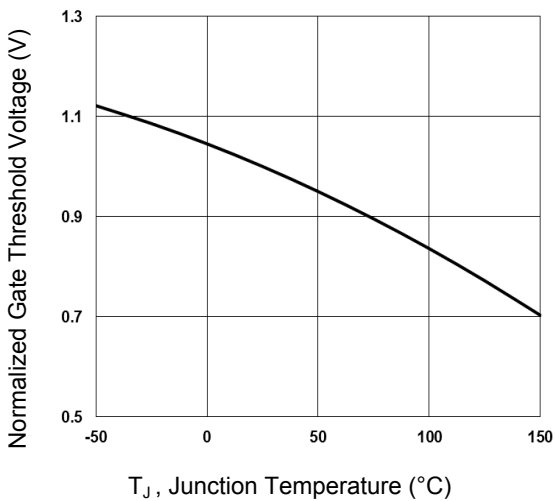


Figure 3. Normalized V_{th} vs. T_J

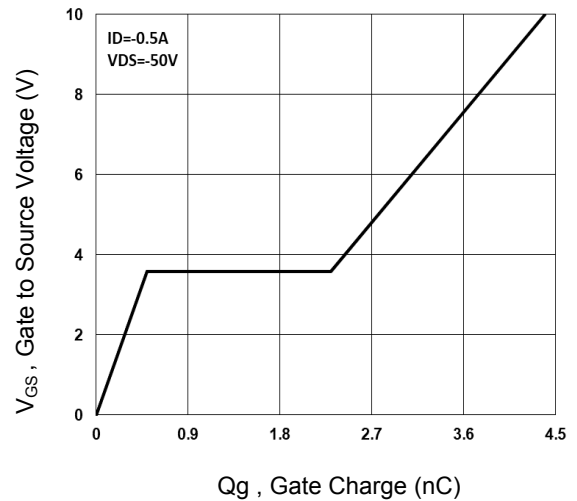


Figure 4. Gate Charge Characteristics

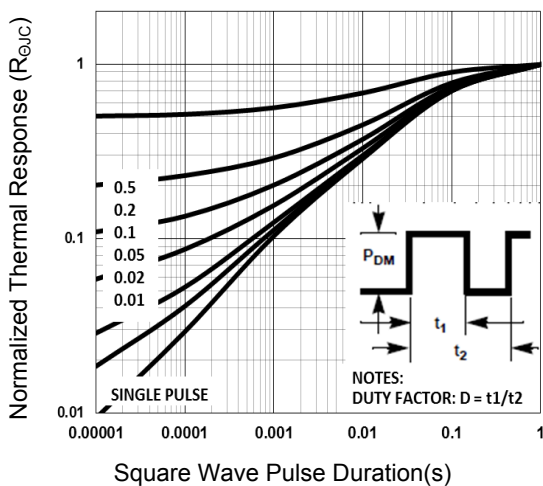


Figure 5. Normalized Transient Response

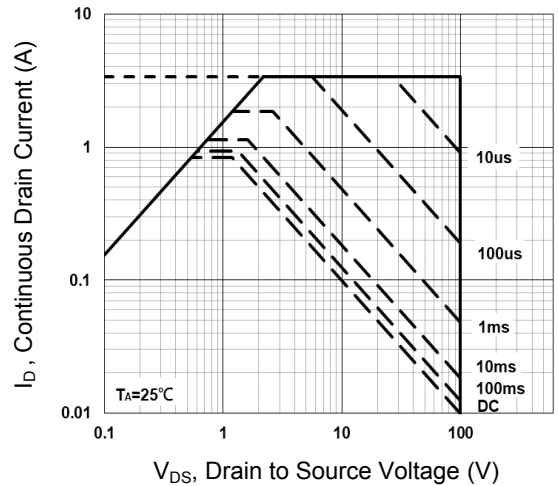


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

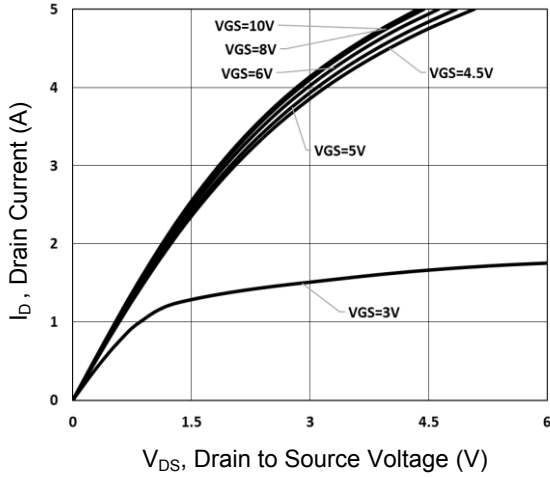


Figure 7. Typical Output Characteristics

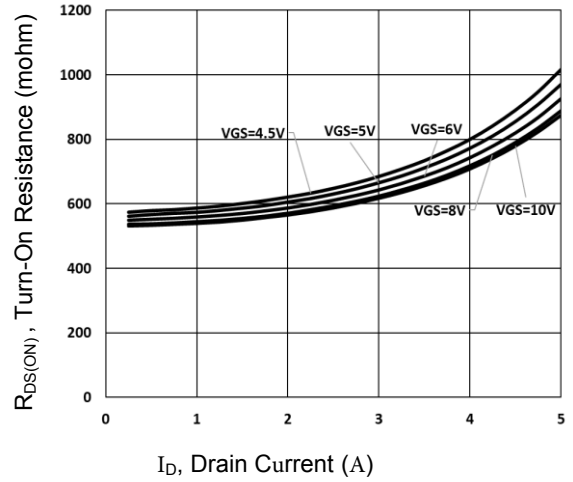


Figure 8. Typical Output Characteristics

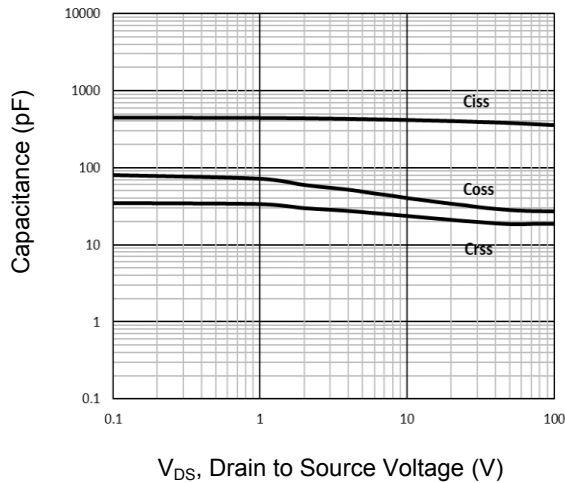


Figure 9. Capacitance Characteristics

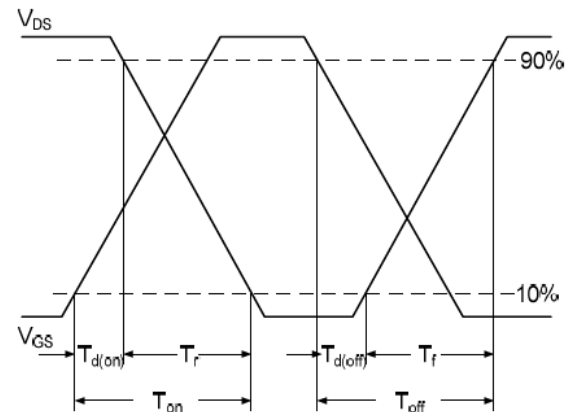


Figure 10. Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

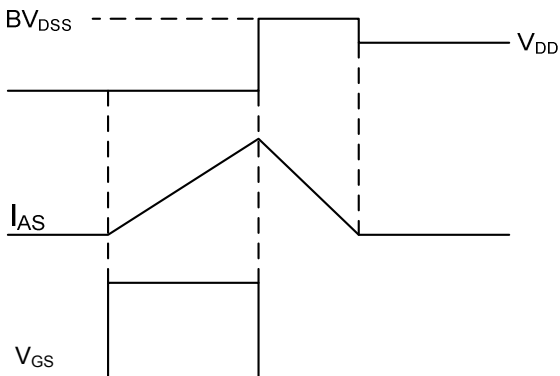
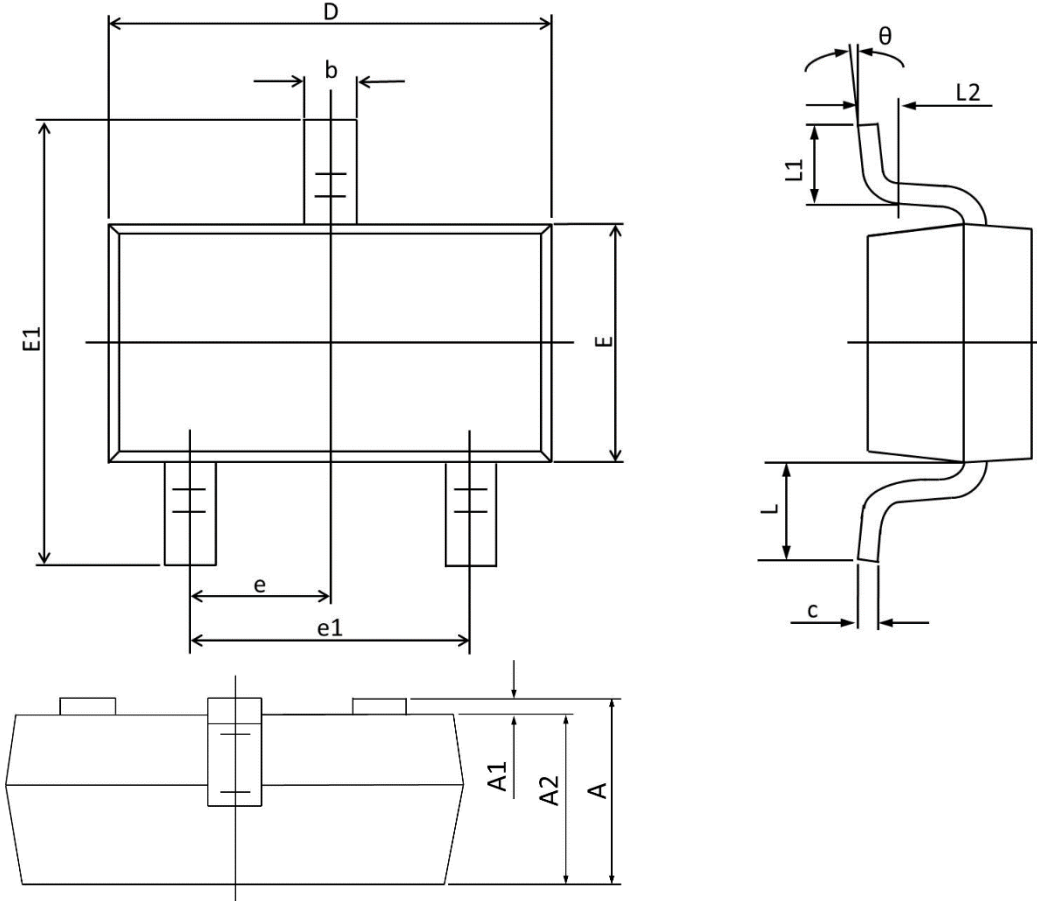


Figure 11. EAS Waveform

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°