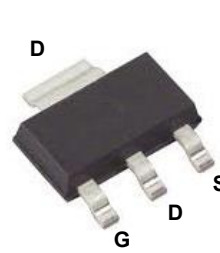
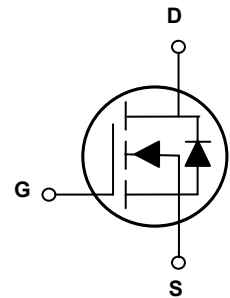


**Main Product Characteristics**

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	185mΩ
$I_D$	3A



SOT-223



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 GSFL1004 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** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous( $T_C=25^{\circ}C$ )	$I_D$	3	A
Drain Current-Continuous( $T_C=100^{\circ}C$ )		1.8	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	12	A
Power Dissipation( $T_C=25^{\circ}C$ )	$P_D$	1.78	W
Power Dissipation-Derate Above 25°C		0.014	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	70	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	30	°C/W
Storage Temperature Range	$T_{STG}$	-50 To +150	°C
Operating Junction Temperature Range	$T_J$	-50 To +150	°C

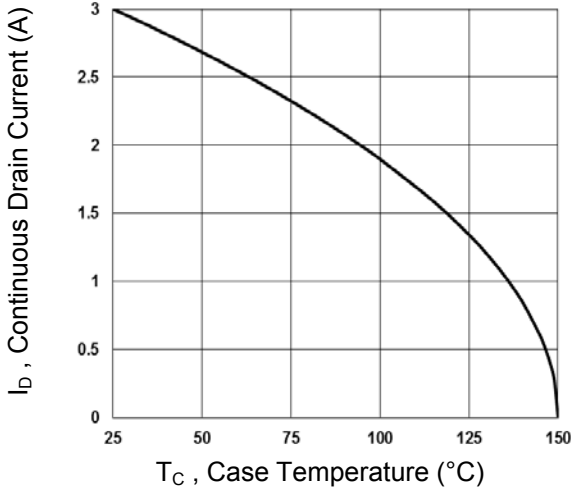
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
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 $25^\circ\text{C}$ , $I_D=1mA$	-	0.1	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=80V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	-	160	185	m $\Omega$
		$V_{GS}=4.5V, I_D=1A$	-	170	195	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-4	-	mV/ $^\circ\text{C}$
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=1A$	-	5	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=50V, I_D=2A,$ $V_{GS}=10V$	-	13.4	21	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	2.9	6	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	1.7	4	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=30V, R_G=3.3\Omega$ $V_{GS}=10V, I_D=1A$	-	1.6	3	nS
Rise Time <sup>2,3</sup>	$t_r$		-	6.6	13	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	11.5	22	
Fall Time <sup>2,3</sup>	$t_f$		-	3.6	7	
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V,$ $F=1MHz$	-	820	1190	pF
Output Capacitance	$C_{oss}$		-	35	55	
Reverse Transfer Capacitance	$C_{rss}$		-	20	30	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	1.3	2.6	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	3	A
Pulsed Source Current	$I_{SM}$		-	-	6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A,$ $T_J=25^\circ\text{C}$	-	-	1	V

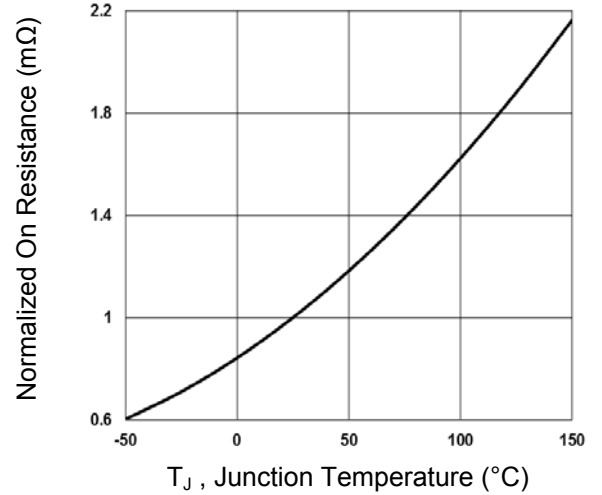
Note:

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.

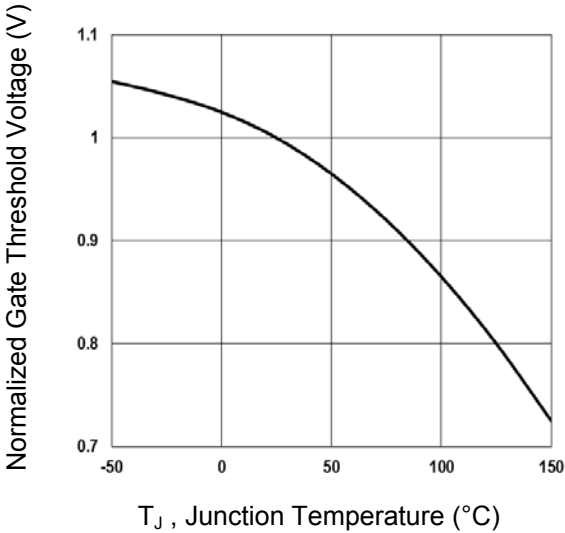
**Typical Electrical and Thermal Characteristic Curves**



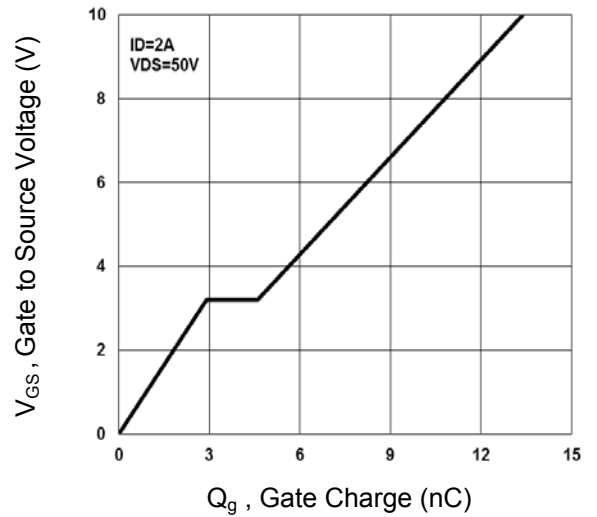
**Fig.1 Continuous Drain Current vs.  $T_C$**



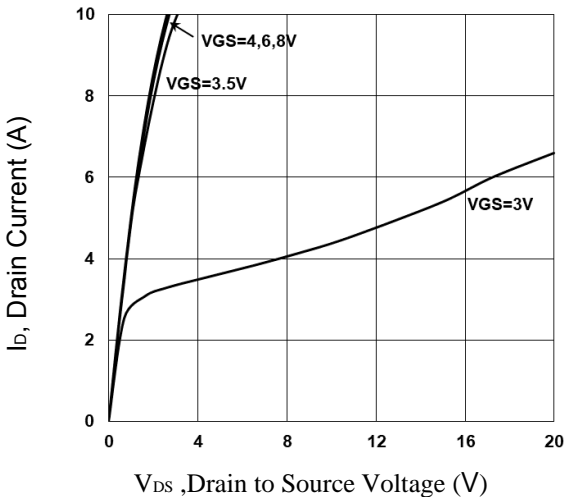
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



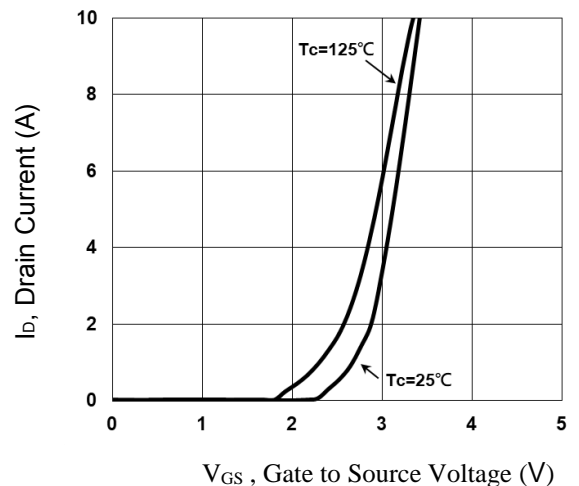
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**

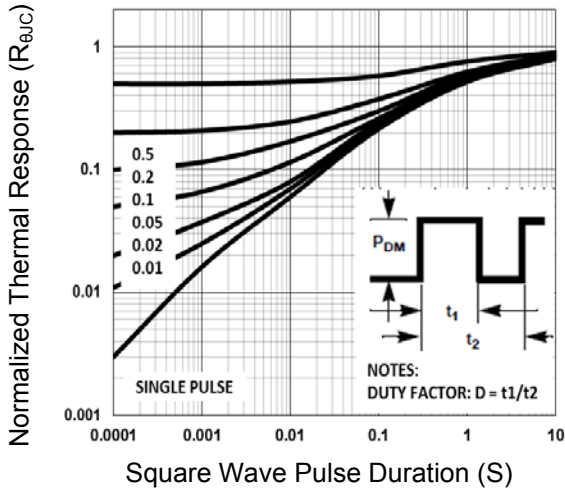


**Fig.5 Typical Output Characteristics**

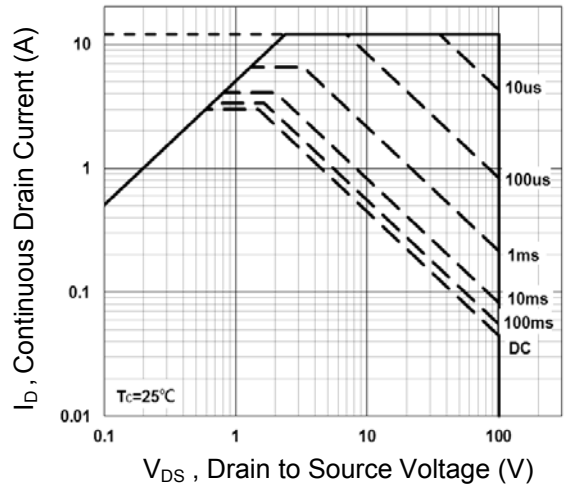


**Fig.6 Transfer Characteristics**

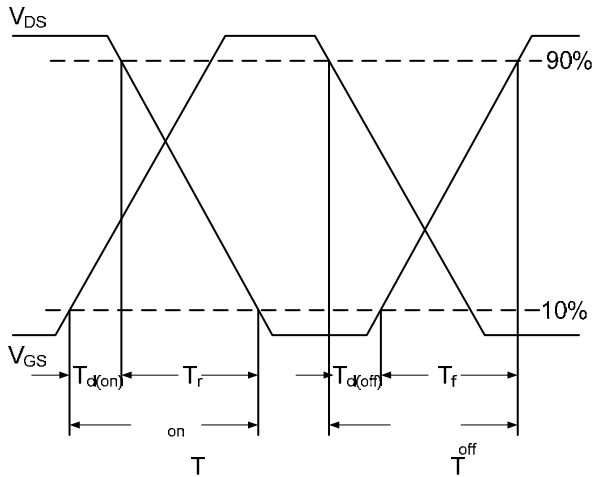
**Typical Electrical and Thermal Characteristic Curves**



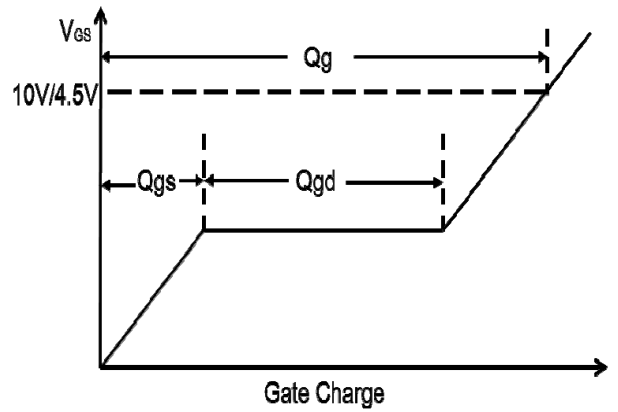
**Fig.7 Normalized Transient Impedance**



**Fig.8 Maximum Safe Operation Area**



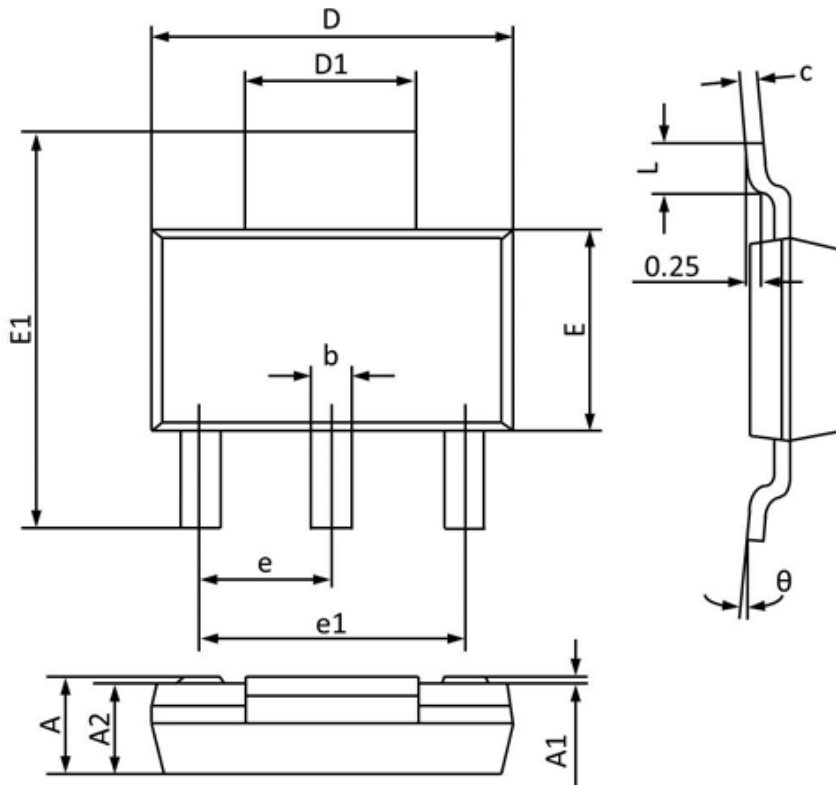
**Fig.9 Switching Time Waveform**



**Fig.10 Gate Charge Waveform**

**Package Outline Dimensions**

**SOT-223**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	°0	10°