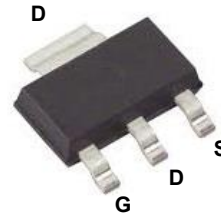
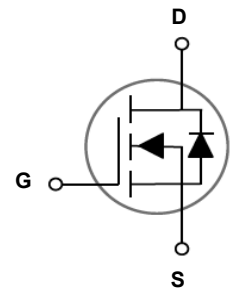


Main Product Characteristics

$V_{(BR)DSS}$	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 ¹	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
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 , $I_D=1mA$	-	0.1	-	$V/^\circ\text{C}$
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
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	-	160	185	m Ω
		$V_{GS}=4.5V, I_D=1A$	-	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
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=50V, I_D=2A,$ $V_{GS}=10V$	-	13.4	21	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.9	6	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	1.7	4	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=30V, R_G=3.3\Omega$ $V_{GS}=10V, I_D=1A$	-	1.6	3	nS
Rise Time ^{2,3}	t_r		-	6.6	13	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	11.5	22	
Fall Time ^{2,3}	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_{riss}		-	20	30	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	1.3	2.6	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$	-	-	3	A
Pulsed Source Current	I_{SM}	Force Current	-	-	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

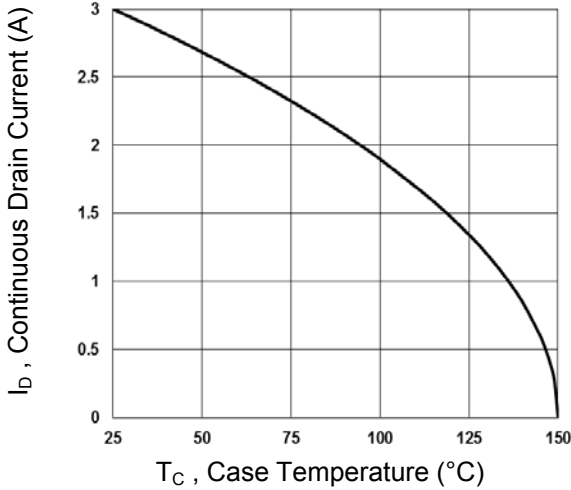


Fig.1 Continuous Drain Current vs. T_C

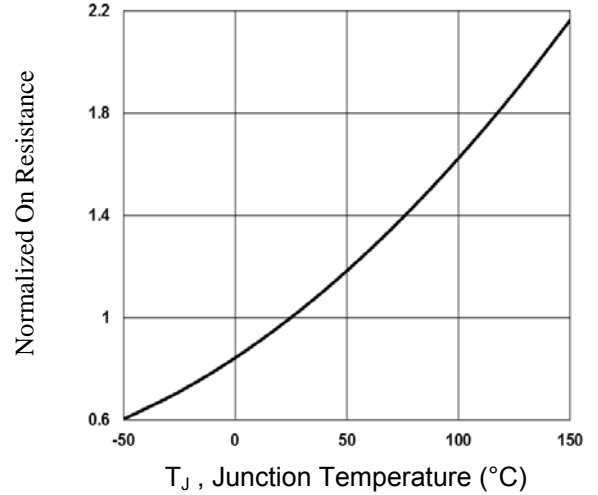


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

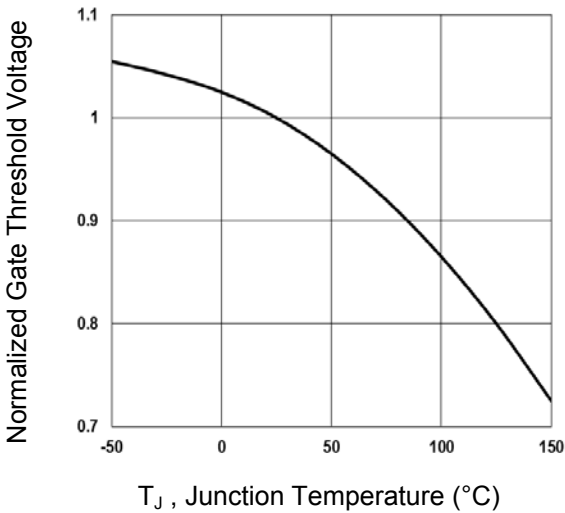


Fig.3 Normalized V_{th} vs. T_J

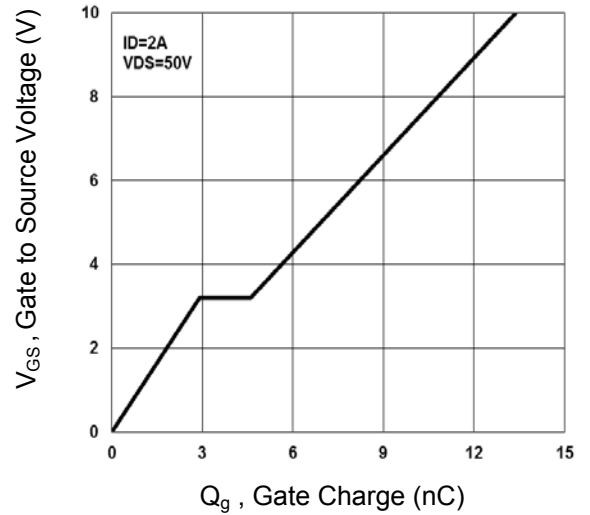


Fig.4 Gate Charge Waveform

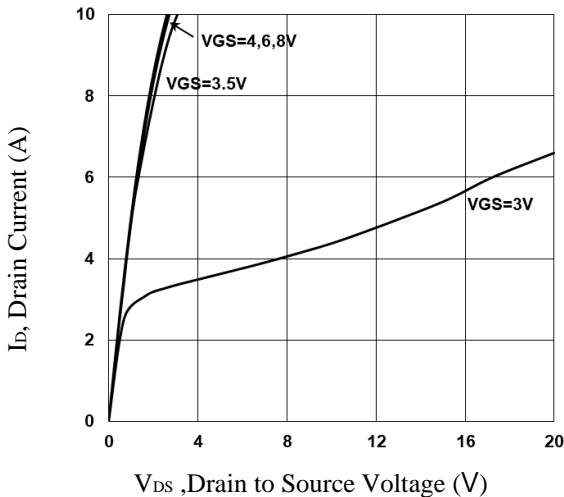


Fig.5 Typical Output Characteristics

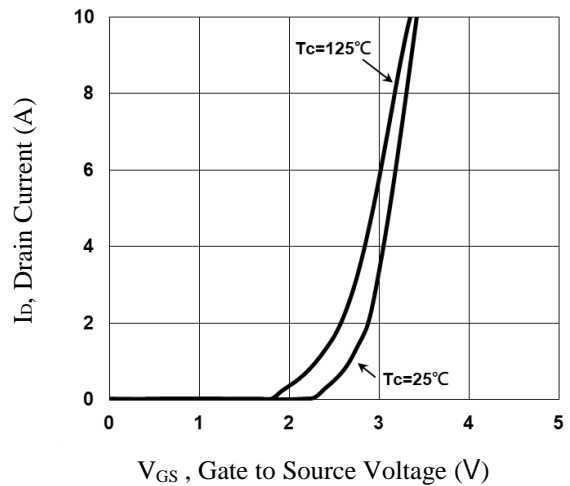


Fig.6 Transfer Characteristics

Typical Electrical and Thermal Characteristic Curves

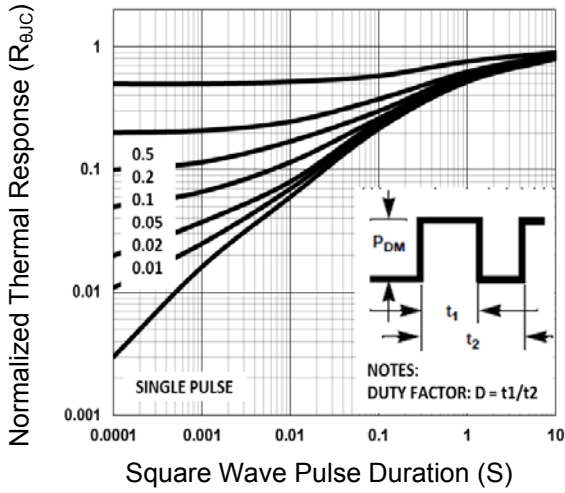


Fig.7 Normalized Transient Impedance

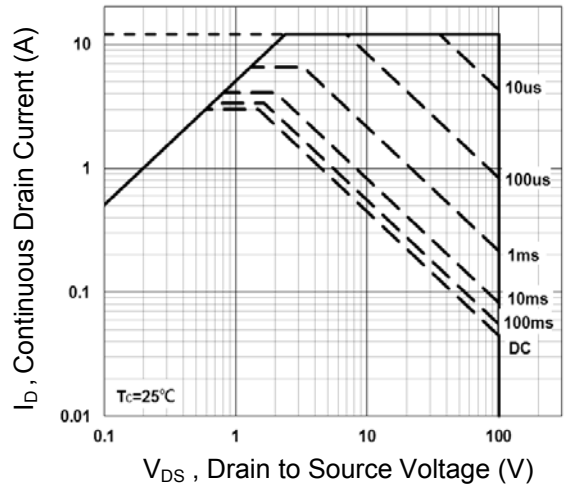


Fig.8 Maximum Safe Operation Area

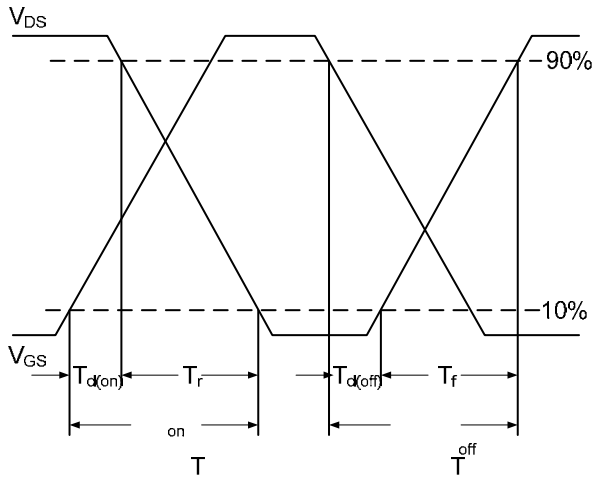


Fig.9 Switching Time Waveform

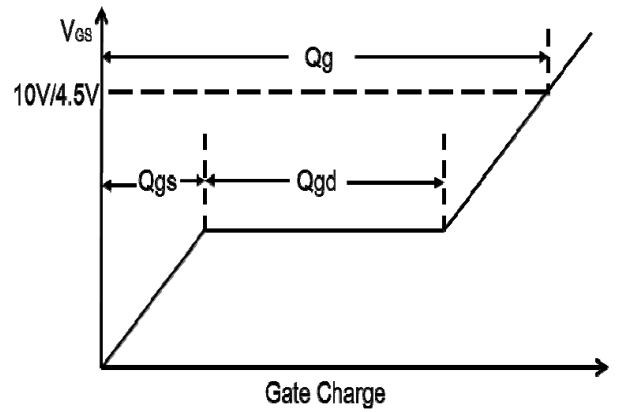
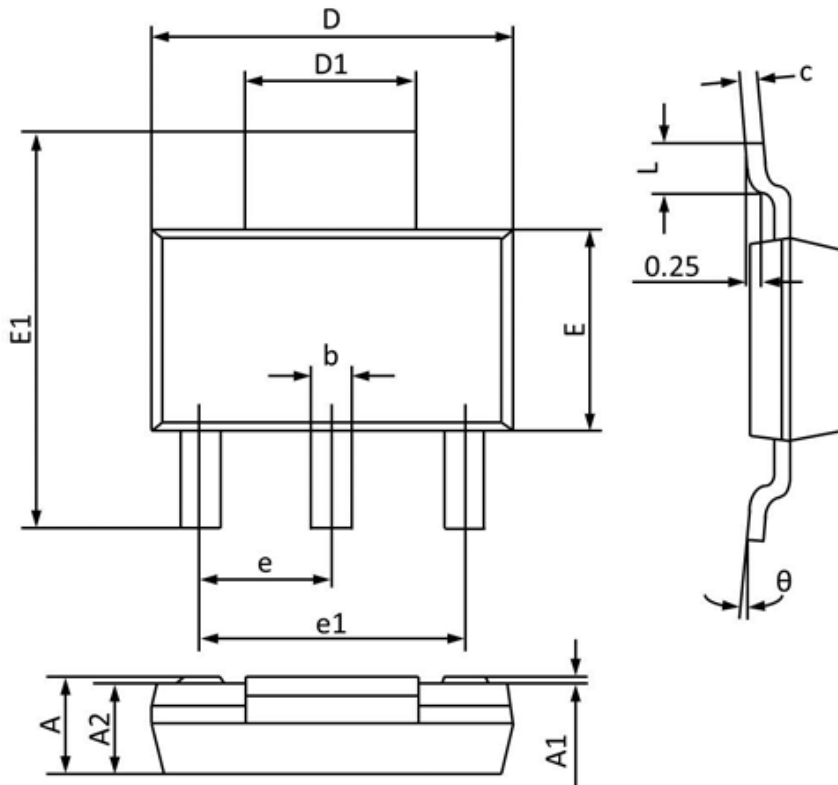


Fig.10 Gate Charge Waveform

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°