GOOD-ARK
SEMICONDUCTOR

GSFL1004
100V N-Channel MOSFET

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

RoHS Compliant

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°C unless otherwise specified)

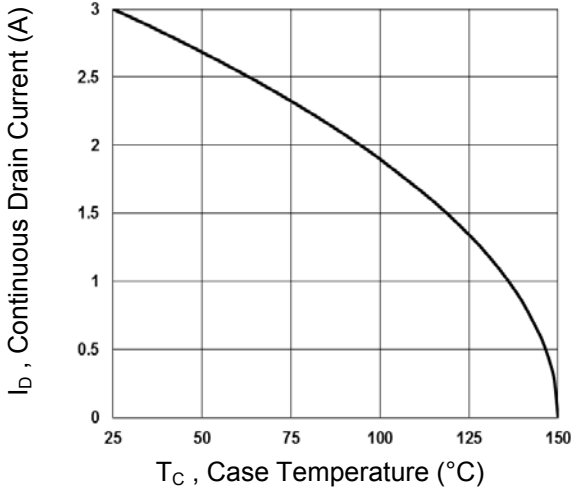| Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous(T_C=25°C)	I_D	3	A
Drain Current-Continuous(T_C=100°C)		1.8	A
Drain Current-Pulsed[1]	I_{DM}	12	A
Power Dissipation(T_C=25°C)	P_D	1.78	W
Power Dissipation-Derate Above 25°C		0.014	W/°C
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 $(T_J=25°C$ unless otherwise specified)

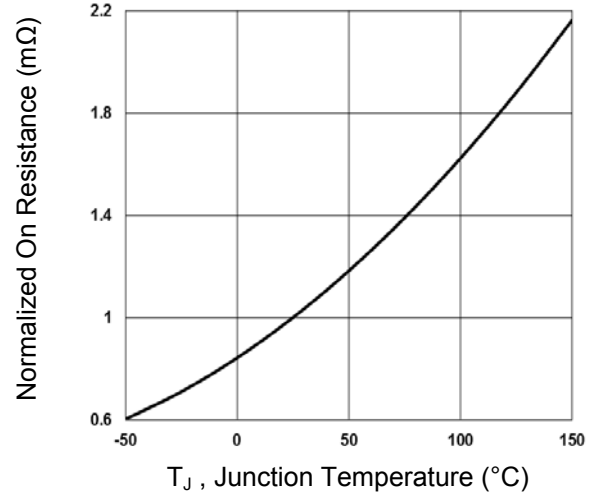| Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=250\mu A$	100	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, $I_D=1mA$	-	0.1	-	V/°C
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V$, $V_{GS}=0V$, $T_J=25°C$	-	-	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=125°C$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm20V$, $V_{DS}=0V$	-	-	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=2A$	-	160	185	mΩ
		$V_{GS}=4.5V$, $I_D=1A$	-	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	$\triangle V_{GS(th)}$		-	-4	-	mV/°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]	tf		-	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	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
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}	$V_{GS}=0V$, $I_S=1A$, $T_J=25°C$	-	-	1	V

Note:
1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leqq$ 300 uS, duty cycle $\leqq$ 2%.
3. Essentially independent of operating temperature.
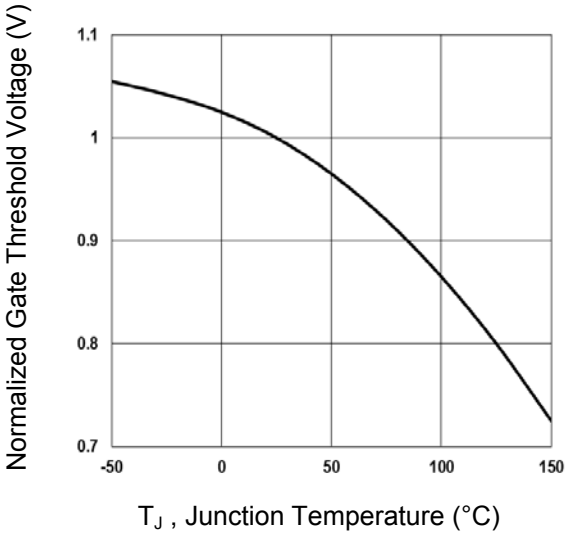
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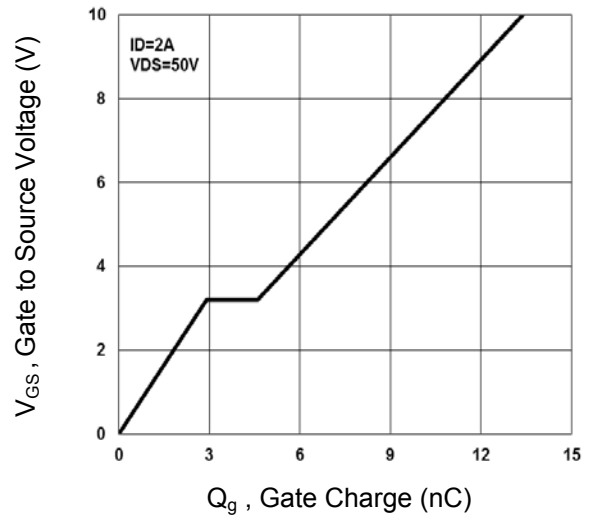## Typical Electrical and Thermal Characteristic Curves

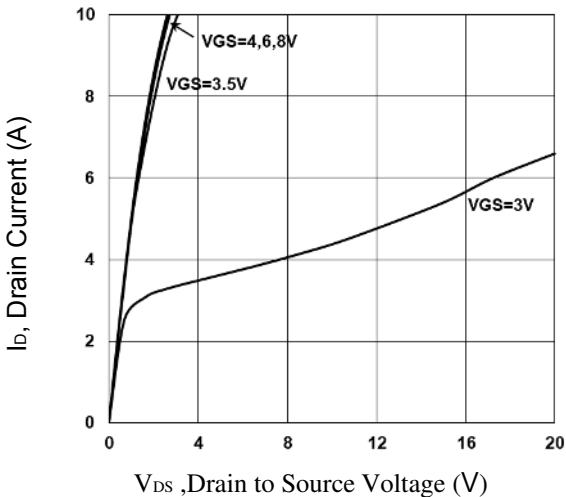**Fig.1 Continuous Drain Current vs. T_C**
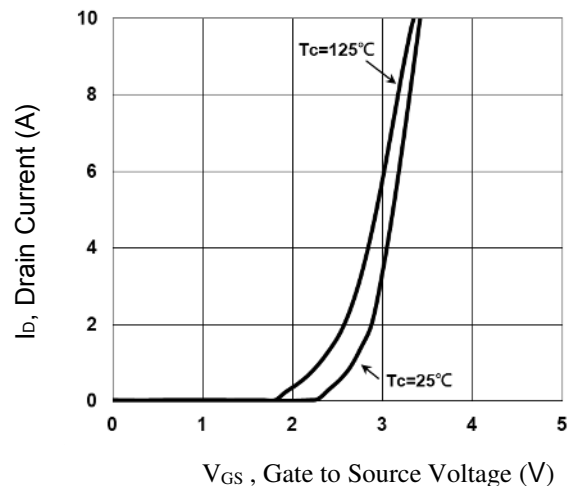
Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

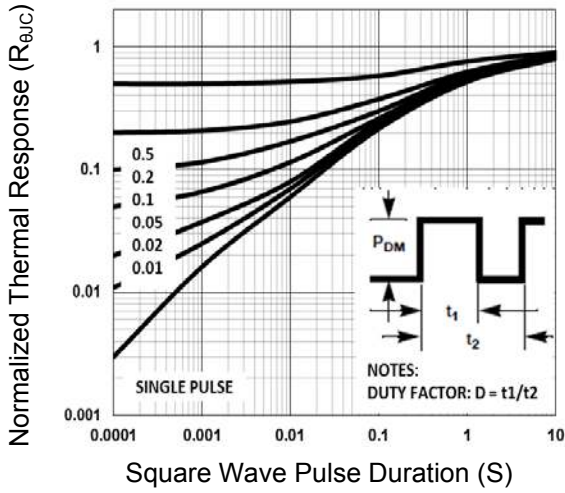**Fig.3 Normalized V_{th} vs. T_J**

Fig.4 Gate Charge Waveform

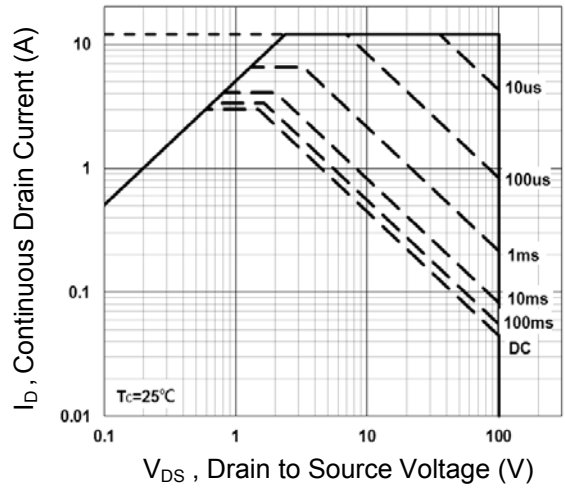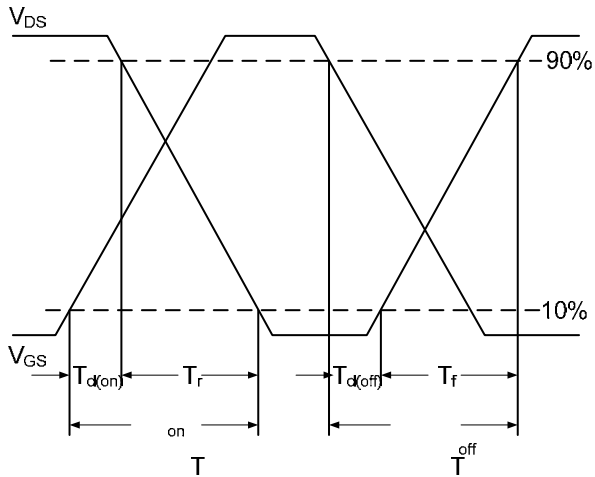**Fig.5 Typical Output Characteristics**

Fig.6 Transfer Characteristics
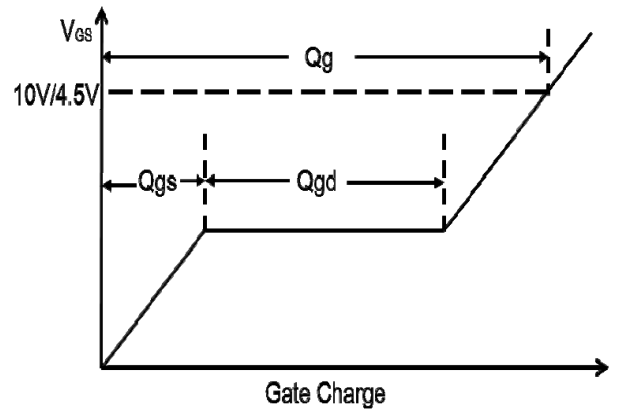
Typical Electrical and Thermal Characteristic Curves

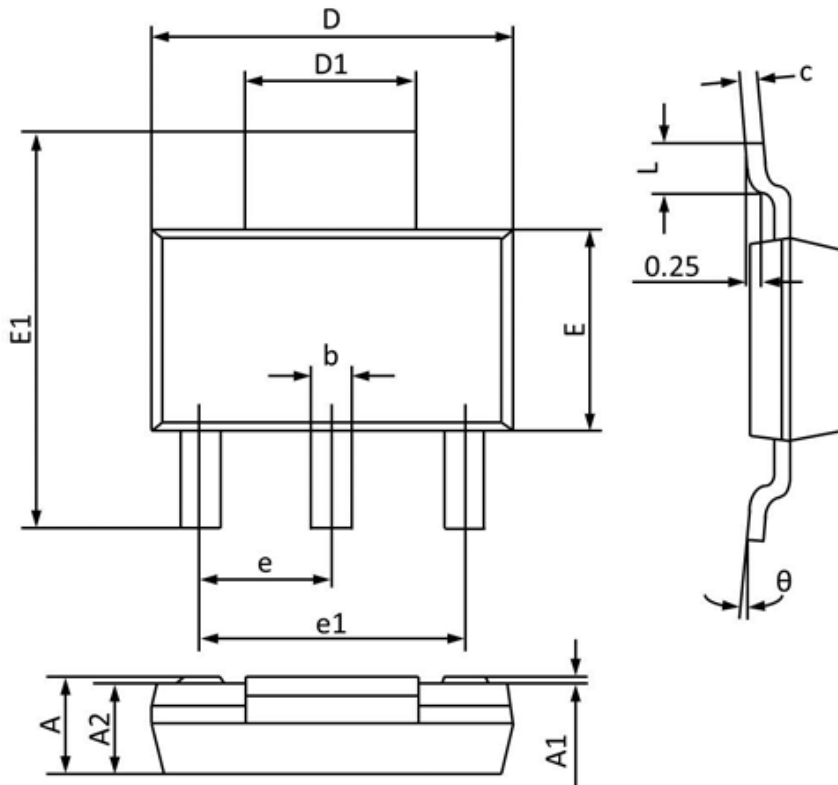Fig.7 Normalized Transient Impedance

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°