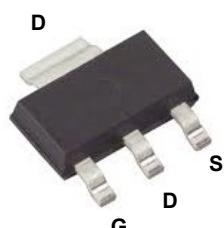
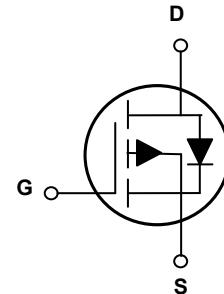


## Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	120mΩ (Typ.)
$I_D$	-7A



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 GSFL0601 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 supplies and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ C$ )	$I_D$	-7	A
Drain Current-Continuous ( $T_C=100^\circ C$ )		-4.5	A
Drain Current Pulsed <sup>1</sup>	$I_{DM}$	-28	A
Power Dissipation ( $T_C=25^\circ C$ )	$P_D$	8	W
Power Dissipation-Derate above 25°C		0.064	W/°C
Max Thermal Resistance Junction to Case	$R_{\theta JC}$	15.6	°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>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-60	-	-	V
$\text{BV}_{\text{DSS}}$ Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_{\text{D}}=-1\text{mA}$	-	-0.05	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=-60\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	-1	$\mu\text{A}$
		$V_{\text{DS}}=-48\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	-10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	$\mu\text{A}$
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-3\text{A}$	-	120	189	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-1.2\text{A}$	-	160	239	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=-250\mu\text{A}$	-1.2	-1.9	-2.5	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	5	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=-10\text{V}, I_{\text{S}}=-2\text{A}$	-	3.5	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-2\text{A}$	-	8.2	12	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{\text{gs}}$		-	1.8	3.6	
Gate-Drain Charge <sup>2,3</sup>	$Q_{\text{gd}}$		-	1.5	3	
Turn-On Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=-30\text{V}, V_{\text{GS}}=-10\text{V}, R_{\text{G}}=6\Omega, I_{\text{D}}=-1\text{A}$	-	5.2	10	nS
Rise Time <sup>2,3</sup>	$t_r$		-	19	36	
Turn-Off Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{off})}$		-	35	67	
Fall Time <sup>2,3</sup>	$t_f$		-	10.6	20	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	425	615	pF
Output Capacitance	$C_{\text{oss}}$		-	35	50	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	20	30	
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current	$I_{\text{S}}$	$V_G=V_D=0\text{V}$ , Force Current	-	-	-2	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	-4	A
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-1\text{A}, T_J=25^\circ\text{C}$	-	-0.81	-1	V

Notes:

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

## Typical Electrical and Thermal Characteristic Curves

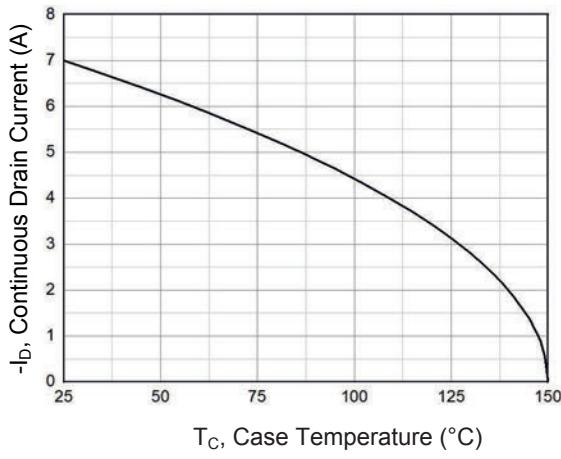


Figure 1. Continuous Drain Current Vs. T<sub>c</sub>

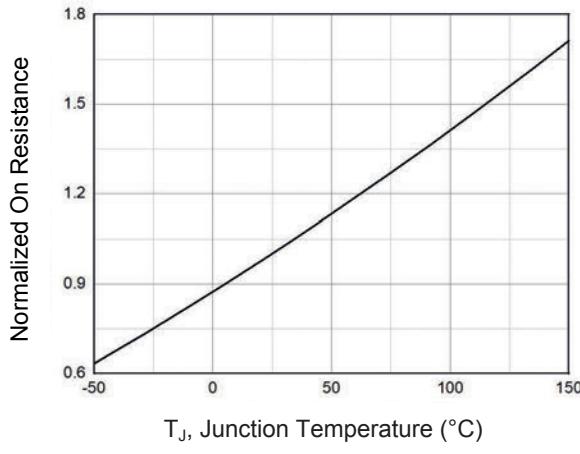


Figure 2. Normalized R<sub>DS(ON)</sub> Vs. T<sub>J</sub>

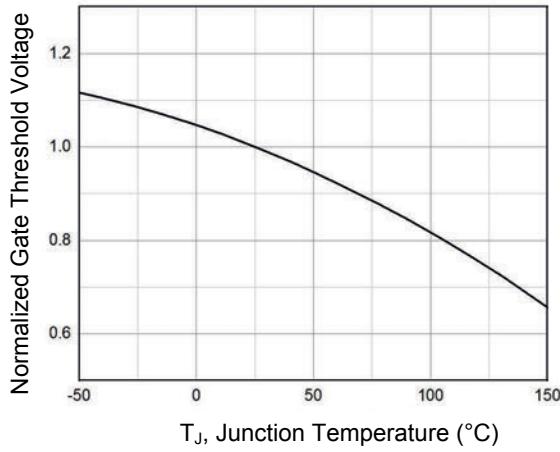


Figure 3. Normalized V<sub>th</sub> Vs. T<sub>J</sub>

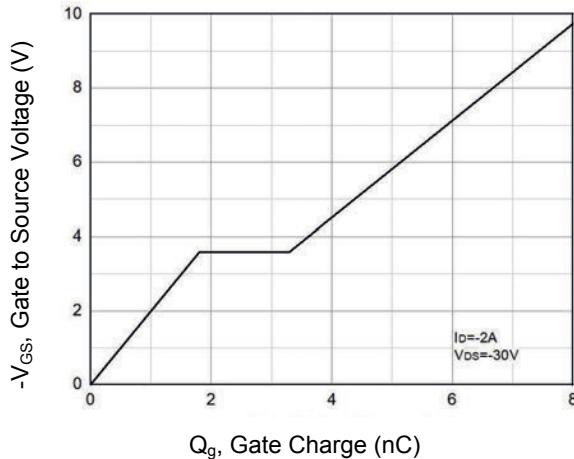


Figure 4. Gate Charge Waveform

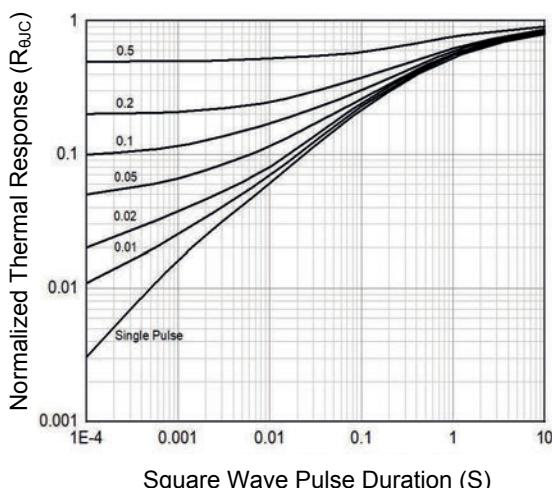


Figure 5. Normalized Transient Impedance

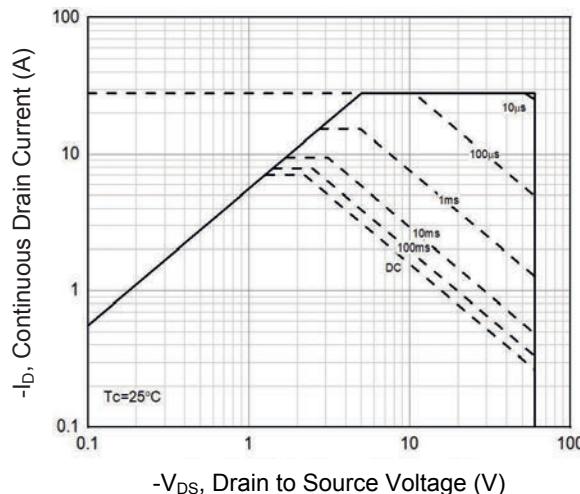
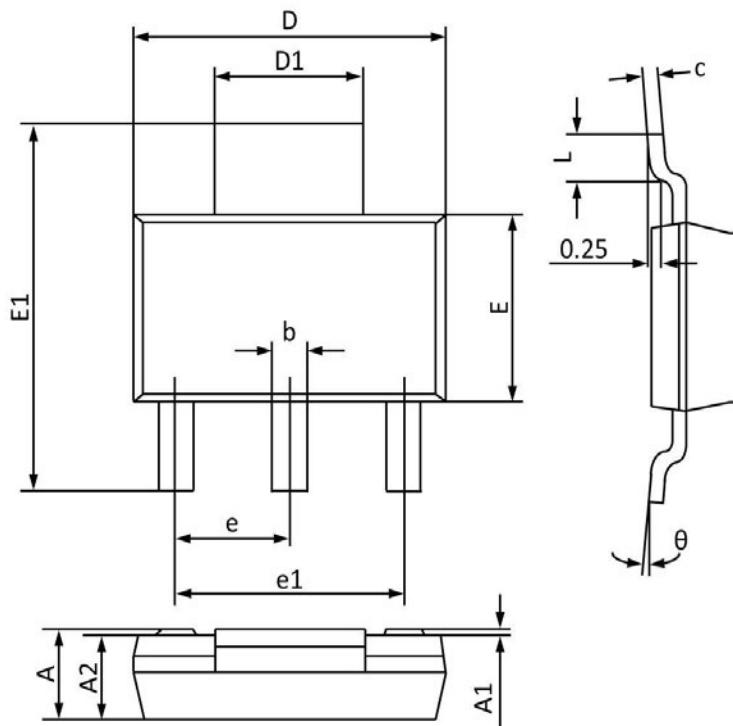


Figure 6. Maximum Safe Operation Area

### Package Outline Dimensions (SOT-223)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.50	1.80	0.060	0.071
A1	0.00	0.12	0.000	0.005
A2	1.45	1.75	0.057	0.069
b	0.60	0.82	0.024	0.032
c	0.20	0.35	0.008	0.014
D	6.20	6.70	0.244	0.264
D1	2.90	3.10	0.114	0.122
E	3.30	3.70	0.130	0.146
E1	6.70	7.30	0.264	0.287
e	2.30 BSC		0.091 BSC	
e1	4.40	4.70	0.173	0.185
L	0.90	1.15	0.035	0.045
θ	0°	10°	0°	10°