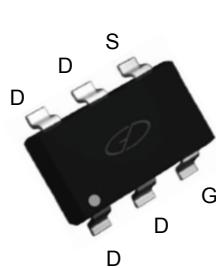
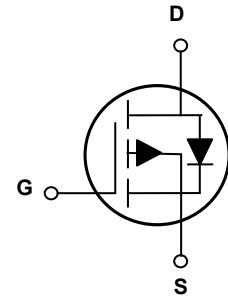


## Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	120mΩ (Typ.)
$I_D$	-2A



SOT-23-6L



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 GSFR0601 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 ( $T_C=25^\circ\text{C}$ 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 ( $T_C=25^\circ\text{C}$ )	$I_D$	-2	A
Drain Current–Continuous ( $T_C=100^\circ\text{C}$ )		-1.25	A
Drain Current–Pulsed <sup>1</sup>	$I_{DM}$	-8	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.56	W
Power Dissipation–Derate above 25°C		0.012	W/°C
Max Thermal Resistance Junction to Ambient	$R_{\theta JA}$	80	°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	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-1.8\text{A}$	-	120	189	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-1.2\text{A}$	-	160	239	
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=-250\mu\text{A}$	-1.2	-1.9	-2.5	V
$V_{\text{GS(th)}}$ Temperature Coefficient	$\Delta V_{\text{GS(th)}}$		-	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>	$t_{\text{d(on)}}$	$V_{\text{DD}}=-30\text{V}, V_{\text{GS}}=-10\text{V}, R_{\text{G}}=6\Omega, I_{\text{D}}=-1\text{A}$	-	5.2	10	nS
Rise Time <sup>2,3</sup>	$t_r$		-	19	36	
Turn-Off Delay Time <sup>2,3</sup>	$t_{\text{d(off)}}$		-	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	$I_{\text{S}}$	$V_{\text{G}}=V_{\text{D}}=0\text{V}$ , 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

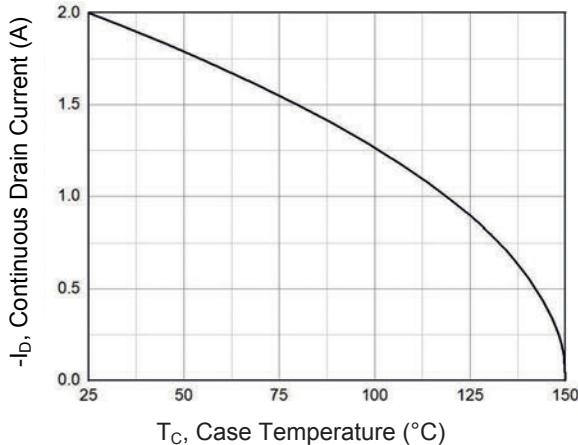


Figure 1. Continuous Drain Current Vs. T<sub>c</sub>

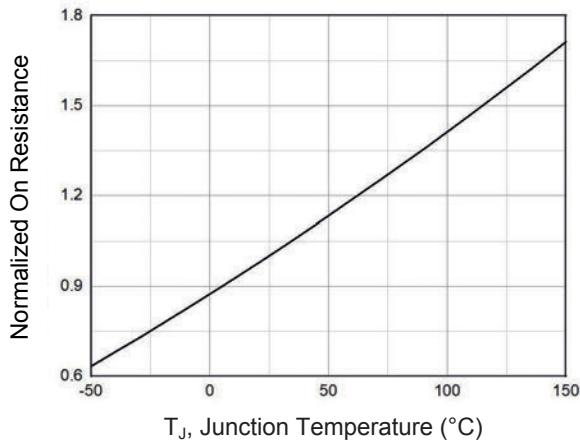


Figure 2. Normalized R<sub>DS(ON)</sub> Vs. T<sub>J</sub>

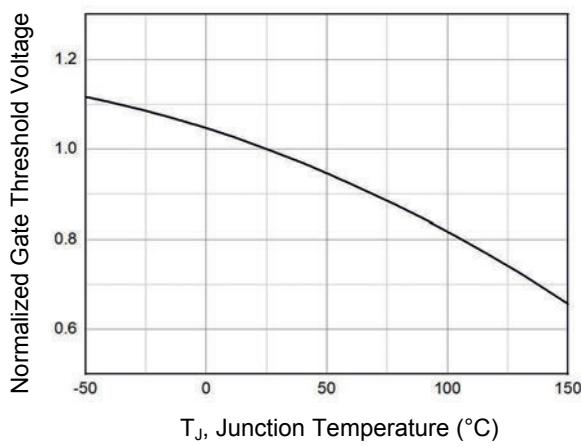


Figure 3. Normalized V<sub>th</sub> Vs. T<sub>J</sub>

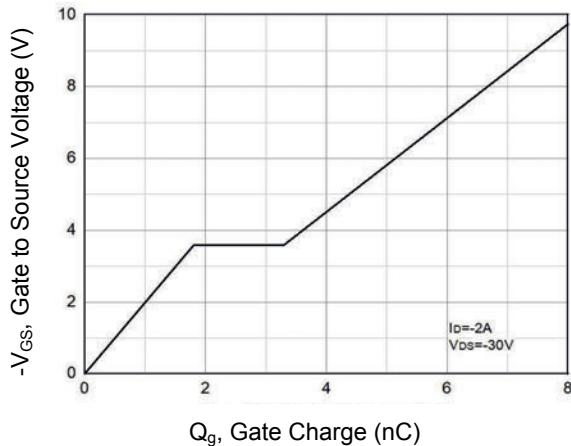


Figure 4. Gate Charge Waveform

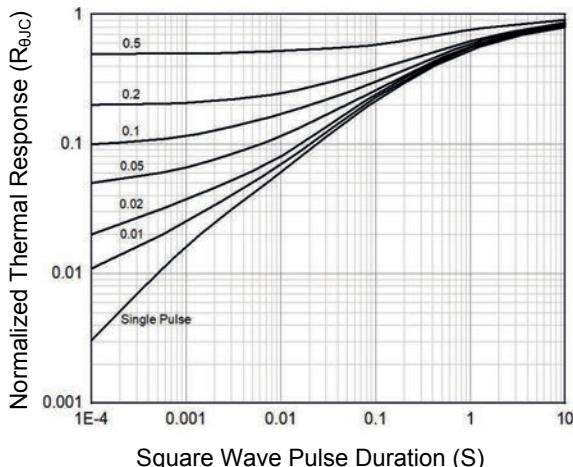


Figure 5. Normalized Transient Impedance

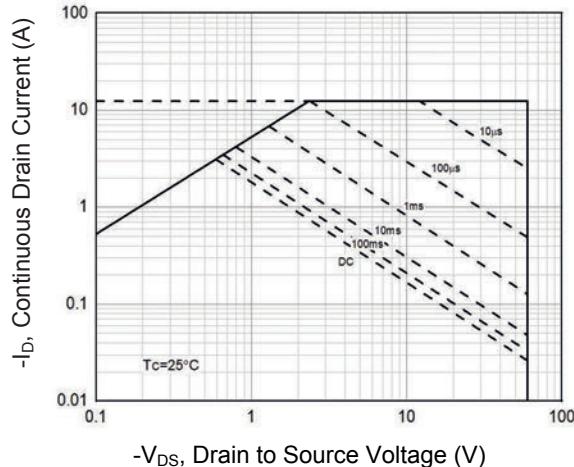
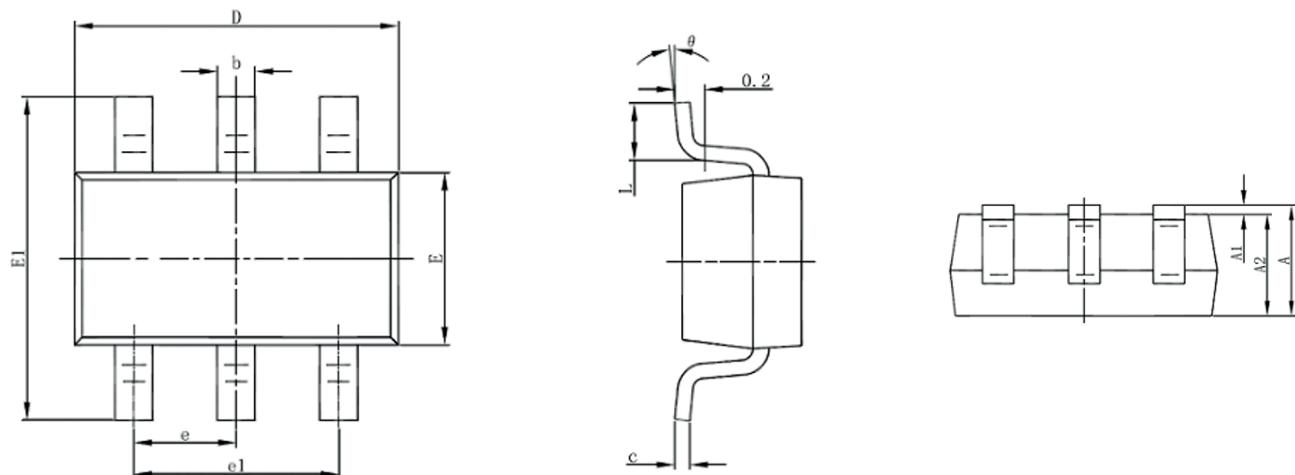


Figure 6. Maximum Safe Operation Area

### Package Outline Dimensions (SOT-23-6L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.450	0.041	0.057
A1	0.000	0.150	0.000	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°