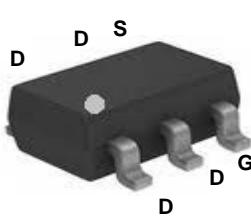
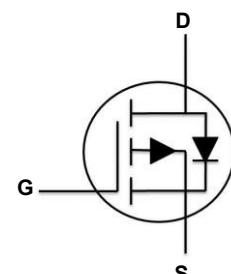


### Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	33mΩ @ -10V (Typ)
	45mΩ @ -4.5V (Typ)
$I_D$	-7.0A



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 GSFR0307 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{(BR)DSS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_A=25^\circ\text{C}$ )	$I_D$	-7.0	A
Drain Current-Continuous ( $T_A=70^\circ\text{C}$ )		-5.6	
Drain Current-Pulsed ( $T_A=25^\circ\text{C}$ ) <sup>1</sup>	$I_{DM}$	-30	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	2	W
Avalanche Current	$I_{AS}$	24	A
Single Pulse Avalanche Energy	$E_{AS}$	28.8	mJ
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	110	°C/W
Operating Junction Temperature Range	$T_J$	-50 To +150	°C
Storage Temperature Range	$T_{STG}$	-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	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=-250\mu\text{A}$	-30	-	-	V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}, T_A=25^\circ\text{C}$	-	-	-1	$\mu\text{A}$
		$V_{\text{DS}}=-24\text{V}, V_{\text{GS}}=0\text{V}, T_A=125^\circ\text{C}$	-	-	-100	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm100$	nA
Static Drain-Source On-Resistance <sup>2</sup>	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_D=-3\text{A}$	-	33	45	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_D=-2\text{A}$	-	45	60	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_D=-250\mu\text{A}$	-1	-1.5	-2.5	V
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{\text{DS}}=-15\text{V}, I_D=-2\text{A}, V_{\text{GS}}=-10\text{V}$	-	18	-	nC
Gate-Source Charge	$Q_{\text{gs}}$		-	3	-	
Gate-Drain Charge	$Q_{\text{gd}}$		-	6	-	
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=-15\text{V}, R_G=3.3\Omega, V_{\text{GS}}=-10\text{V}, I_D=-2\text{A}$	-	4.5	-	nS
Rise Time	$t_r$		-	6.4	-	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	19	-	
Fall Time	$t_f$		-	3.6	-	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=-15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	906	-	pF
Output Capacitance	$C_{\text{oss}}$		-	97	-	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	89	-	
<b>Drain-Source Diode Characteristics and Maximum</b>						
Source Drain Current (Body Diode)	$I_{\text{SD}}$	$T_A=25^\circ\text{C}$	-	-	-2	A
Diode Forward Voltage <sup>2</sup>	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_{\text{SD}}=-2\text{A}, T_J=25^\circ\text{C}$	-	-0.84	-1.2	V

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
3.  $L=0.1\text{mH}, I_{\text{AS}}=-24\text{A}, V_{\text{DD}}=-20\text{V}, V_{\text{GS}}=-10\text{V}$ , starting  $T_J=25^\circ\text{C}$ .

## Typical Electrical and Thermal Characteristic Curves

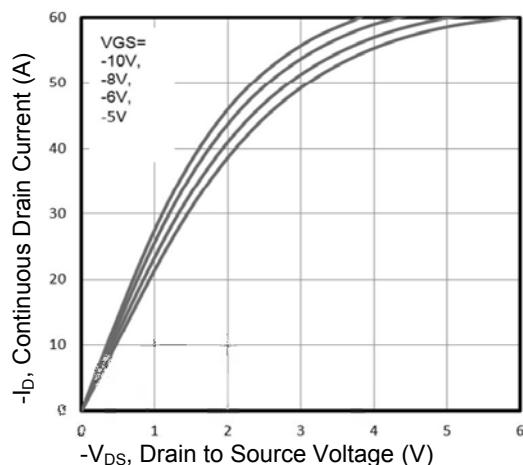


Figure 1. Typical Output Characteristics

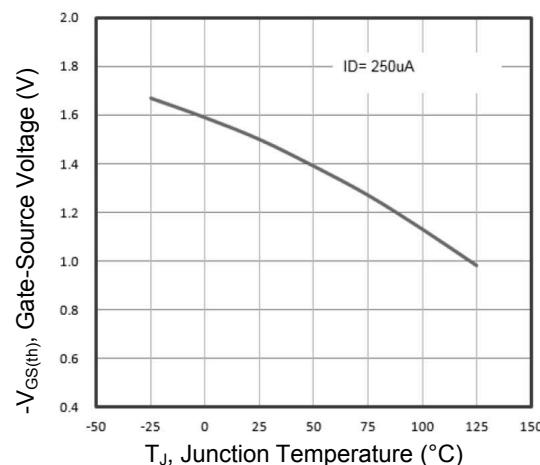


Figure 2. Normalized Threshold Voltage vs.  $T_J$

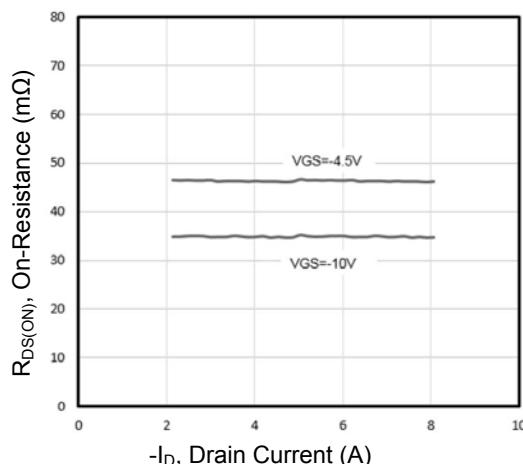


Figure 3. On-Resistance vs. Drain Current and Gate

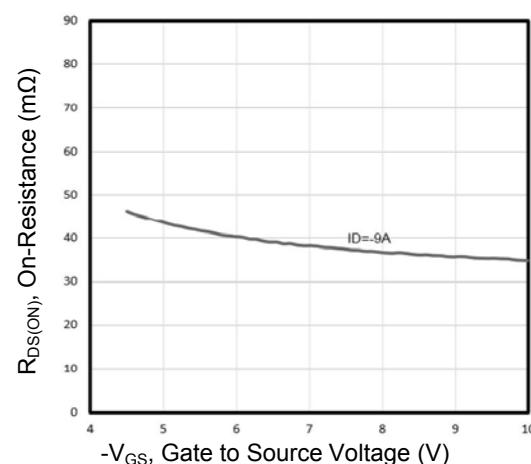


Figure 4. On-Resistance vs. Gate Source Voltage

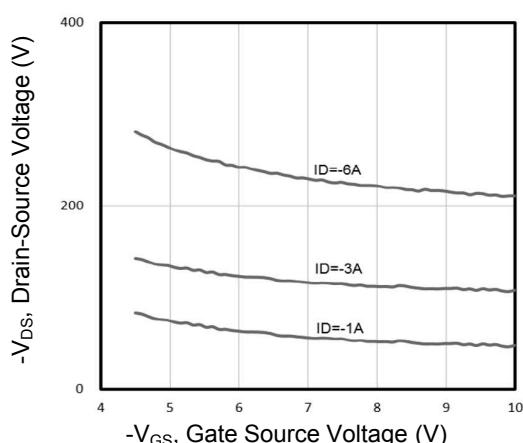


Figure 5. Drain-Source Voltage vs. Gate-Source Voltage

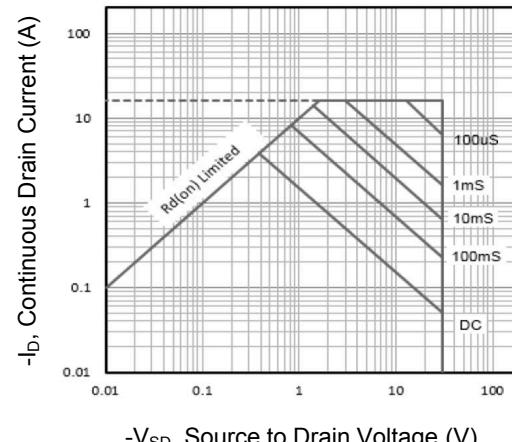


Figure 6. Maximum Safe Operating Area

## Typical Electrical and Thermal Characteristic Curves

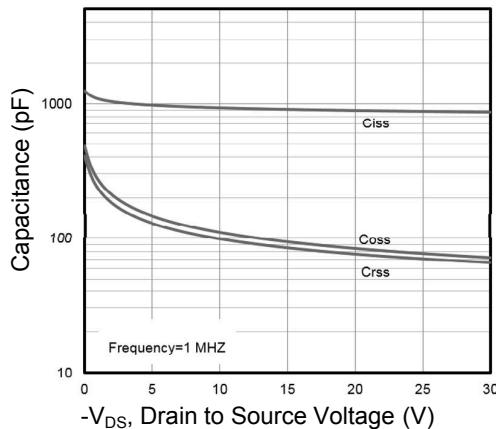


Figure 7. Capacitance Characteristics

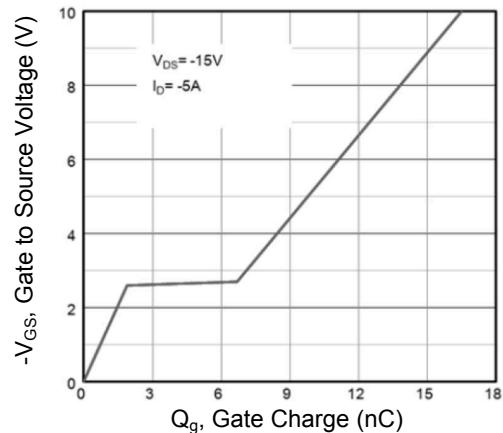


Figure 8. Gate Charge Characteristics

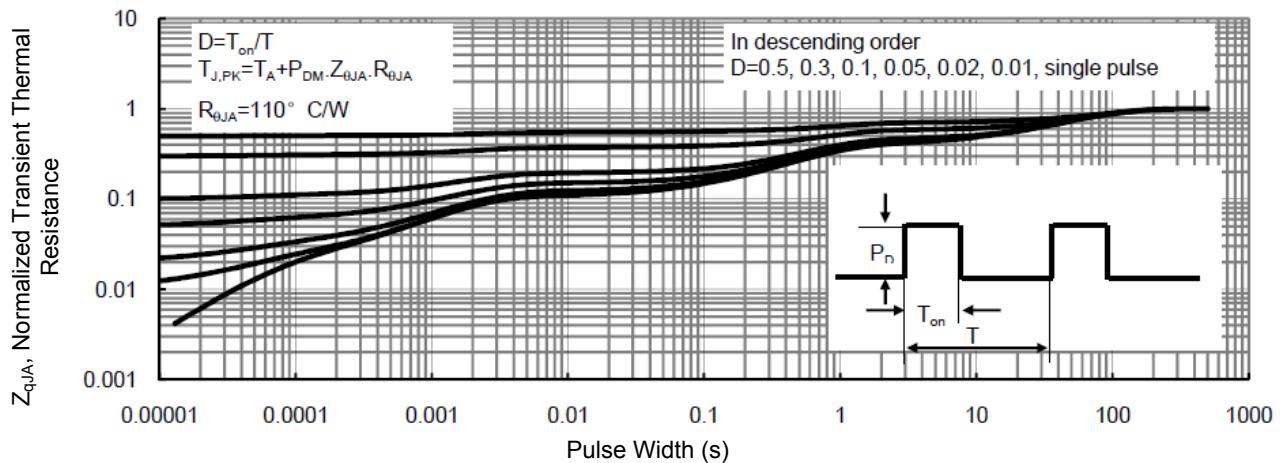


Figure 9. Normalized Maximum Transient Thermal Impedance

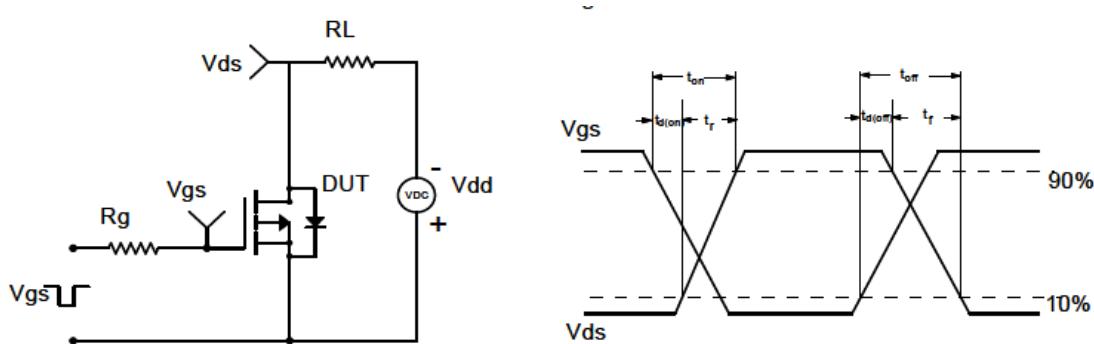
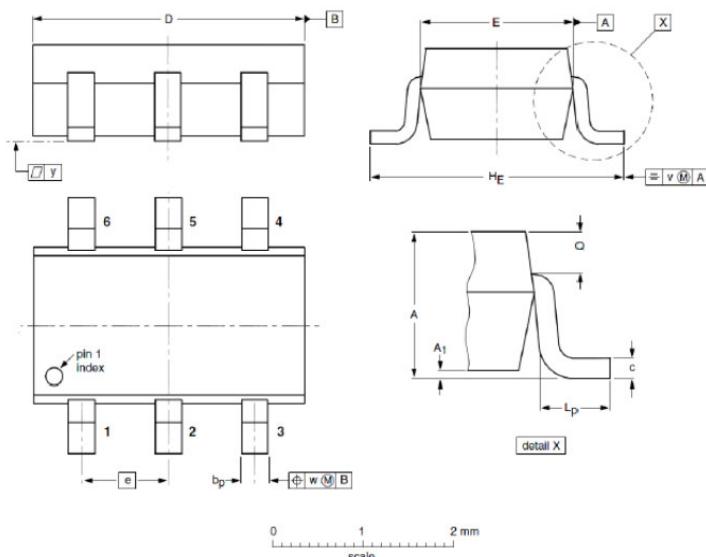


Figure 10. Switching Time Test Circuit and Waveforms

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



Dimensions In Millimeters							
Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.10	1.25	A <sub>1</sub>	0.01	0.05	0.10
b <sub>p</sub>	0.25	0.35	0.40	c	0.10	0.18	0.26
D	2.70	2.92	3.10	E	1.30	1.60	1.70
e	-	0.95	-	H <sub>E</sub>	2.50	2.80	3.00
L <sub>p</sub>	0.20	0.38	0.60	Q	0.23	0.29	0.33
v	-	0.20	-	W	-	0.20	-
y	-	0.10	-				

### Order Information

Device	Package	Marking	Carrier	Quantity
GSFR0307	SOT-23-6L	307	Tape & Reel	3,000 pcs / Reel