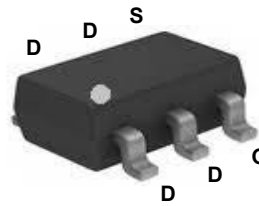
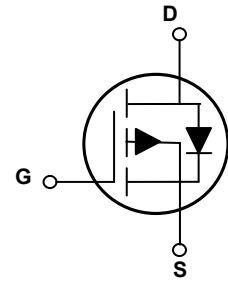


### Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(on)}$	65mΩ
$I_D$	-4.1A



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 GSFR0305 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 ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	-4.1	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		-2.6	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-16.4	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.56	W
Power Dissipation-Derate Above 25°C		0.012	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	°C/W
Storage Temperature Range	$T_{STG}$	-55 To +150	°C
Operating Junction Temperature Range	$T_J$	-55 To +150	°C

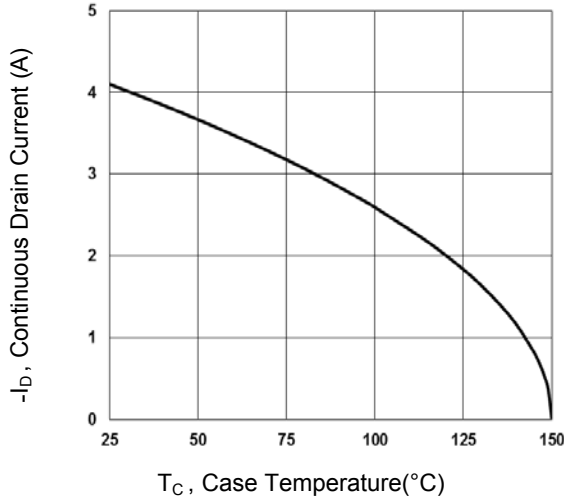
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1mA$	-	-0.03	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-3A$	-	47	56	m $\Omega$
		$V_{GS}=-4.5V, I_D=-2A$	-	75	100	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS},$ $I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	4	-	$mV/^\circ\text{C}$
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-3A$	-	3.5	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-15V, I_D=-3A,$ $V_{GS}=-4.5V$	-	5.1	7	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	2	3	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	2.2	4	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=-15V, R_G=6\Omega$ $V_{GS}=-10V, I_D=-1A$	-	3.4	6	nS
Rise Time <sup>2,3</sup>	$t_r$		-	10.8	21	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	26.9	51	
Fall Time <sup>2,3</sup>	$t_f$		-	6.9	13	
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V,$ $F=1MHz$	-	560	810	pF
Output Capacitance	$C_{oss}$		-	55	80	
Reverse Transfer Capacitance	$C_{rss}$		-	40	60	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	-4.1	A
Pulsed Source Current	$I_{SM}$		-	-	-16.4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A,$ $T_J=25^\circ\text{C}$	-	-	-1	V

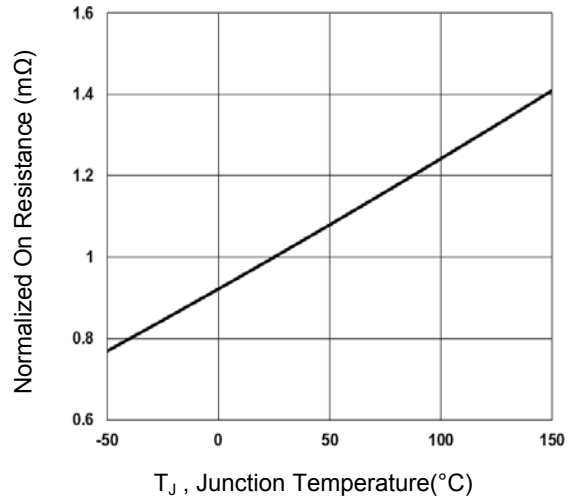
**Notes:**

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
3. Essentially independent of operating temperature.

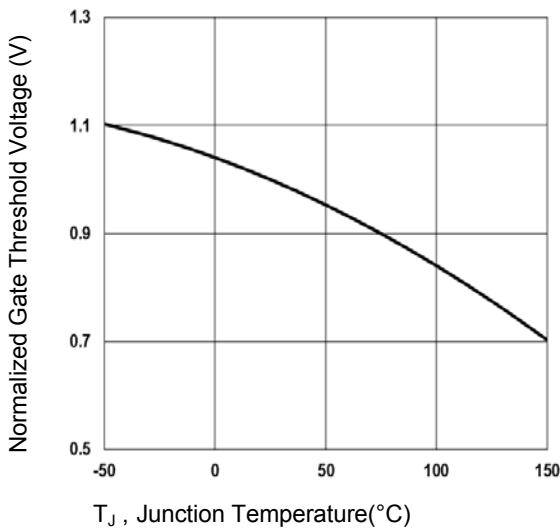
### Typical Electrical and Thermal Characteristic Curves



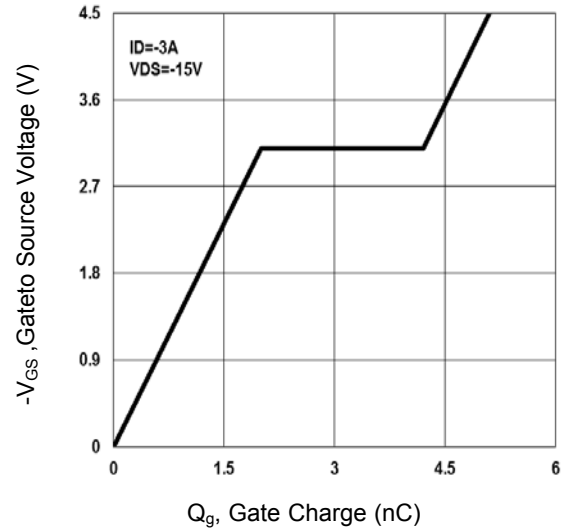
**Fig.1** Continuous Drain Current vs. T<sub>C</sub>



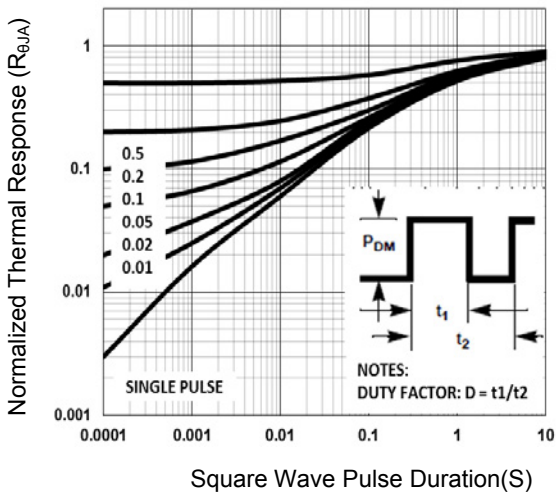
**Fig.2** Normalized RDSON vs. T<sub>J</sub>



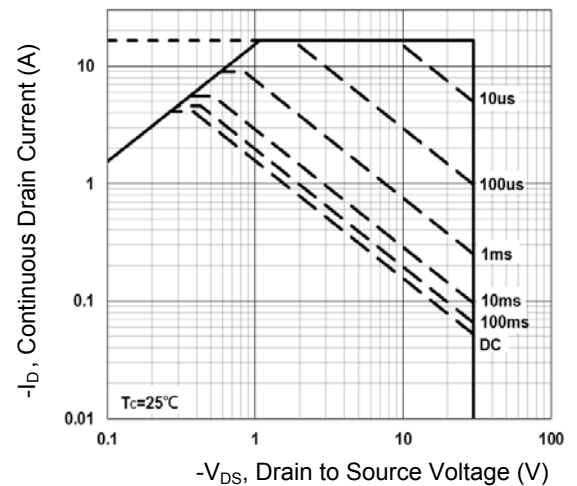
**Fig.3** Normalized V<sub>th</sub> vs. T<sub>J</sub>



**Fig.4** Gate Charge Waveform

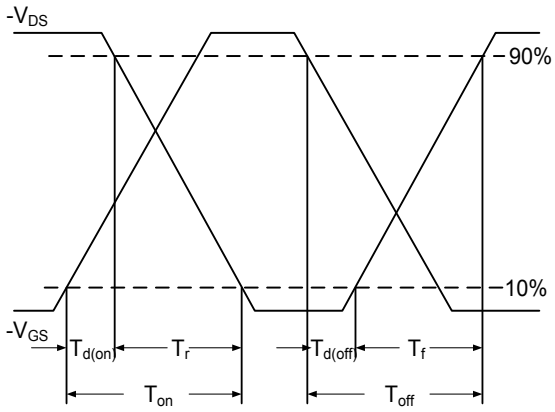


**Fig.5** Normalized Transient Impedance

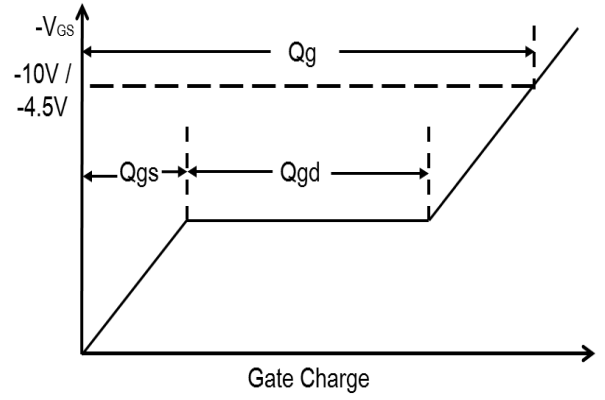


**Fig.6** Maximum Safe Operation Area

**Typical Electrical and Thermal Characteristic Curves**



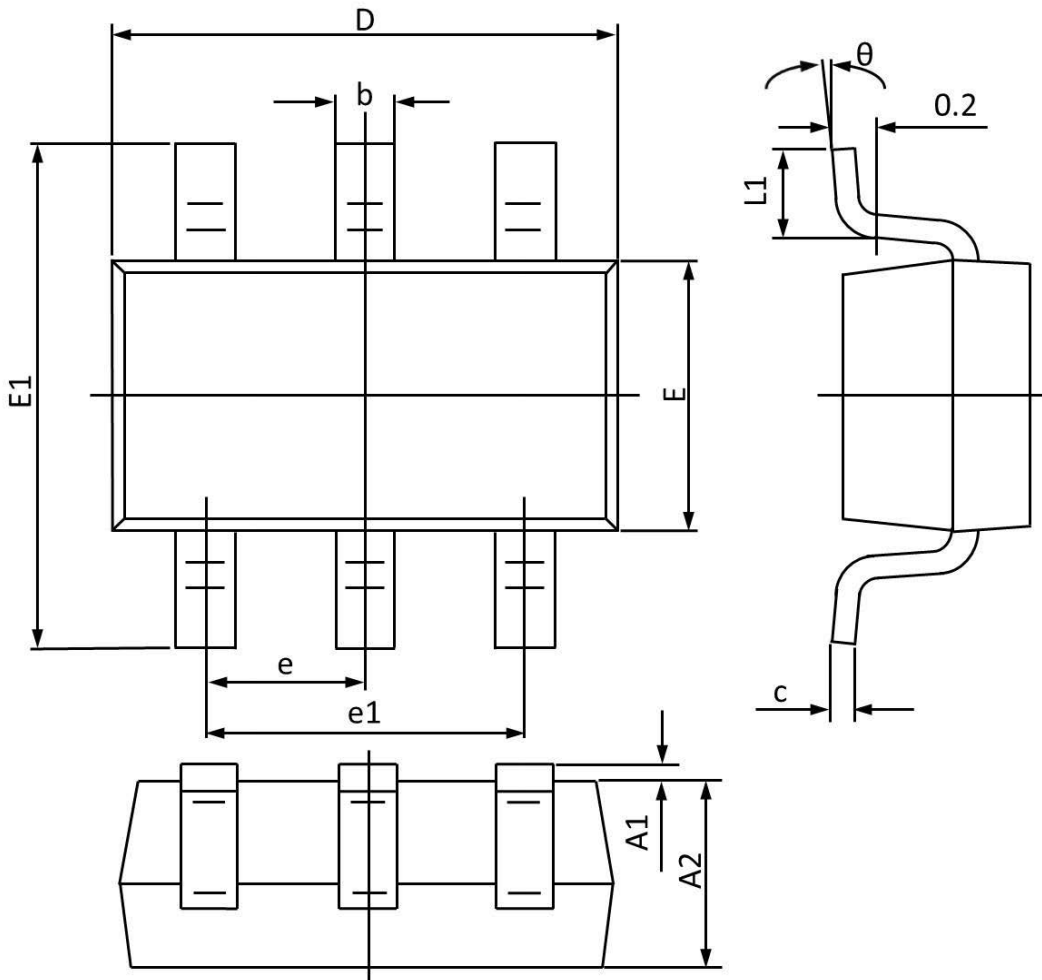
**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

**Package Outline Dimensions**

**SOT-23-6L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.800	0.059	0.070
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
θ	0°	8°	0°	8°