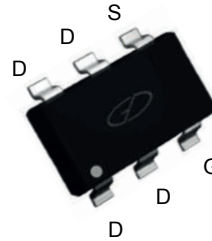
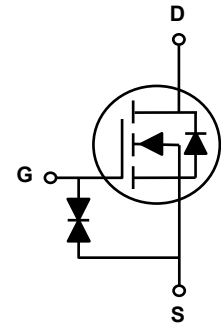


**Main Product Characteristics**

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	16mΩ (max.)
$I_D$	8.2A



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 GSFR2416 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	Max.	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Drain Current-Continuous ( $T_A=25^{\circ}C$ )	$I_D$	8.2	A
Drain Current-Continuous ( $T_A=100^{\circ}C$ )		5.7	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	32.8	A
Power Dissipation ( $T_A=25^{\circ}C$ )	$P_D$	2	W
Power Dissipation-Derate above 25°C		0.016	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

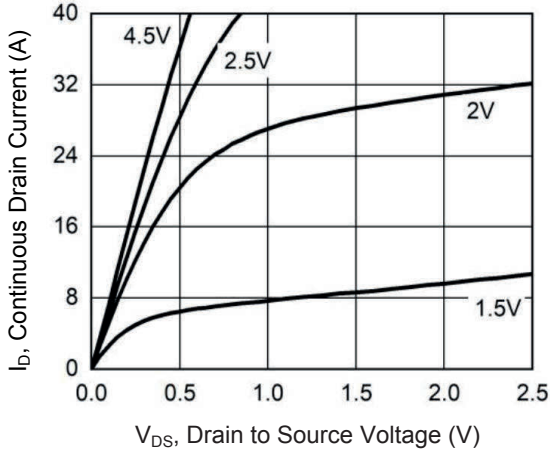

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1\text{mA}$	-	0.02	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=5A$	-	12	16	m $\Omega$
		$V_{GS}=2.5V, I_D=4A$	-	16	24	
		$V_{GS}=1.8V, I_D=4A$	-	25	32	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.7	1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-2	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_S=5A$	-	14	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=10V, I_D=5A, V_{GS}=4.5V$	-	9.2	-	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	1.6	-	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	2.1	-	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=10V, R_G=3\Omega, V_{GS}=4.5V, I_D=5A$	-	11	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	34	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	54	-	
Fall Time <sup>2,3</sup>	$t_f$		-	52	-	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, F=1\text{MHz}$	-	670	-	pF
Output Capacitance	$C_{oss}$		-	150	-	
Reverse Transfer Capacitance	$C_{rss}$		-	90	-	
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$	-	-	7.2	A
Pulsed Source Current	$I_{SM}$	Force Current	-	-	28.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=3A, T_J=25^\circ\text{C}$	-	-	1.2	V

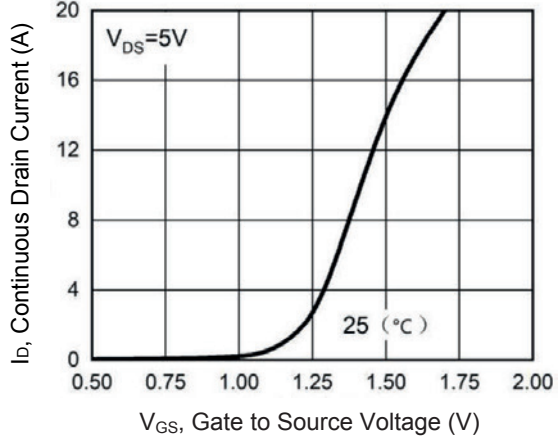
## Notes:

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 operation temperature.

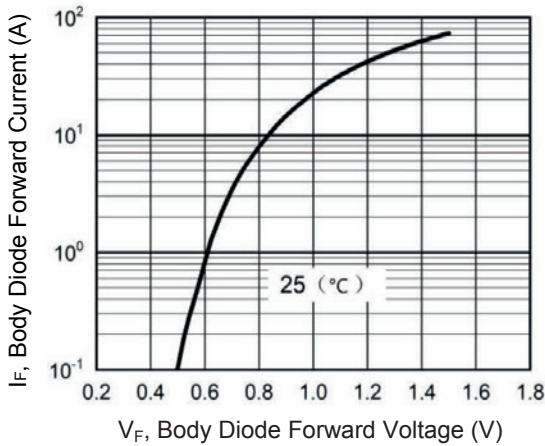
**Typical Electrical and Thermal Characteristic Curves**



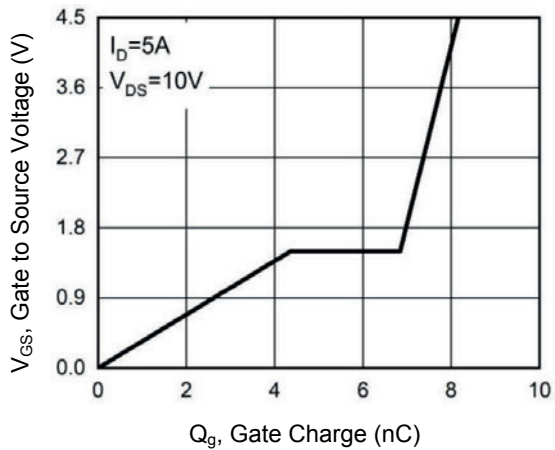
**Figure 1. Output Characteristics**



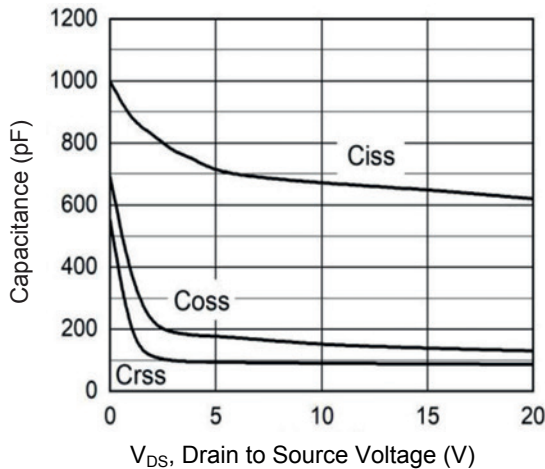
**Figure 2. Transfer Characteristics**



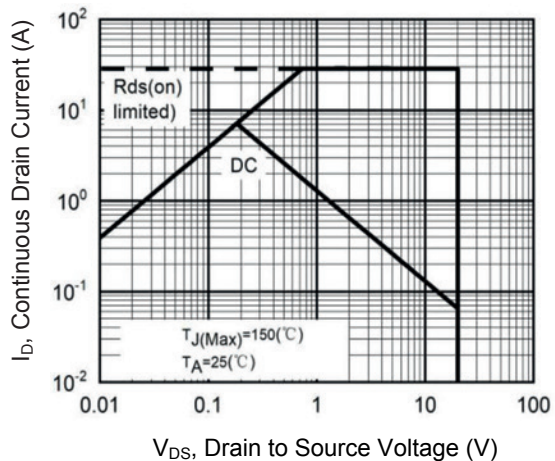
**Figure 3. Body Diode Characteristics**



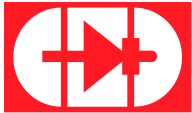
**Figure 4. Gate Charge Waveform**



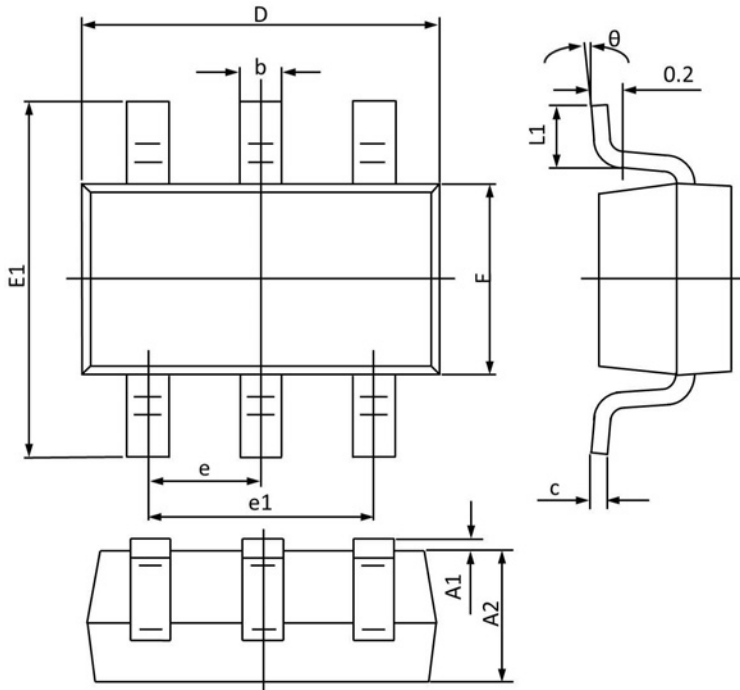
**Figure 5. Capacitance Characteristics**



**Figure 6. Maximum Safe Operation Area**



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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	-	0.15	-	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.019
c	0.10	0.20	0.004	0.008
D	2.80	3.05	0.110	0.120
E1	2.60	3.00	0.103	0.118
F	1.50	1.80	0.059	0.071
e	0.95 TYP		0.037 TYP	
e1	1.90 TYP		0.075 TYP	
L1	0.25	0.60	0.010	0.024
$\theta$	0°	8°	0°	8°