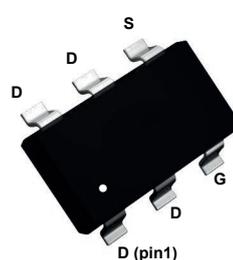
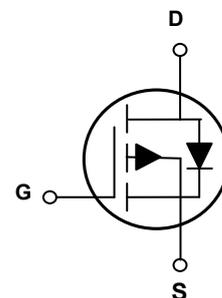


## Main Product Characteristics

$BV_{DSS}$	-40V
$R_{DS(ON)}$	102mΩ (Max.)
$I_D$	-5A



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 GSFR4097 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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous ( $T_A=25^\circ\text{C}$ )	$I_D$	-5	A
Drain Current-Continuous ( $T_A=70^\circ\text{C}$ )		-3.8	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-28	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	2.3	W
Power Dissipation-Derate above 25°C		0.0184	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

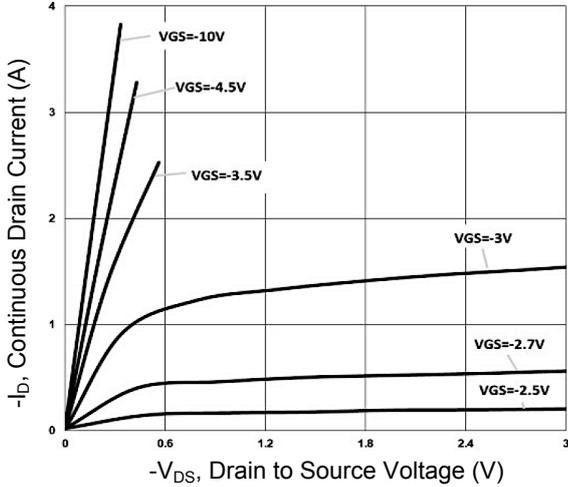
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-32V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-3.4A$	-	78	102	m $\Omega$
		$V_{GS}=-4.5V, I_D=-2.7A$	-	89	156	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.8	-2.5	V
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-2A$	-	4	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-20V, I_D=-1.5A, V_{GS}=-10V$	-	3.3	-	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.22	-	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	1.23	-	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=-20V, R_G=6\Omega, V_{GS}=-10V, I_D=-1.5A$	-	3.1	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	8.6	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	19.5	-	
Fall Time <sup>2,3</sup>	$t_f$		-	5.8	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-20V, V_{GS}=0V, F=1\text{MHz}$	-	315	-	pF
Output Capacitance	$C_{oss}$		-	37	-	
Reverse Transfer Capacitance	$C_{rss}$		-	25	-	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	16	-	$\Omega$
<b>Drain-Source Ratings and Characteristics</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0V, \text{Force Current}$	-	-	-5.0	A
Pulsed Source Current	$I_{SM}$		-	-	-28	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_s=-2A, T_J=25^{\circ}\text{C}$	-	-	-1.2	V

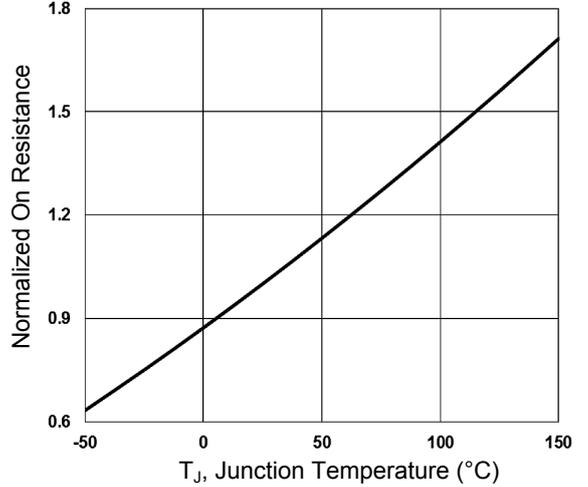
Notes:

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 operating temperature.

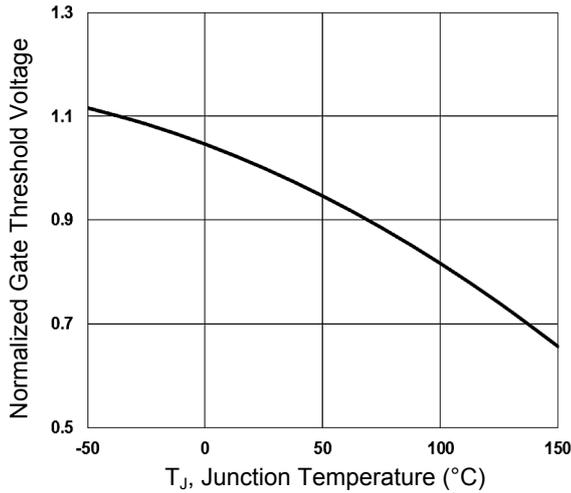
**Typical Electrical and Thermal Characteristic Curves**



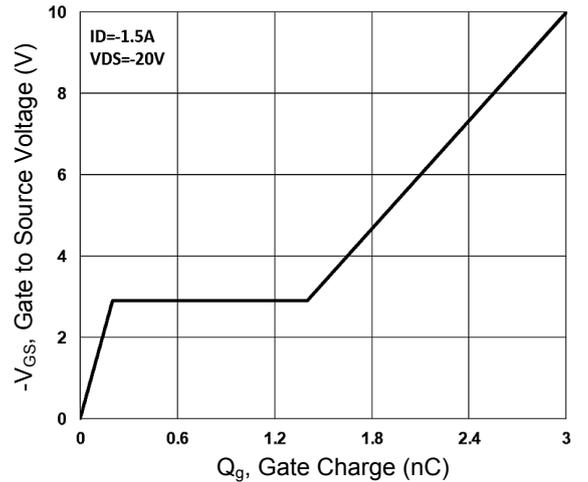
**Figure 1. Typical Output Characteristics**



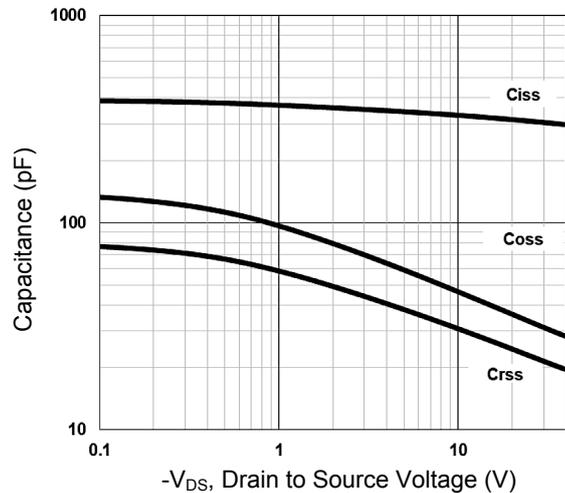
**Figure 2. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



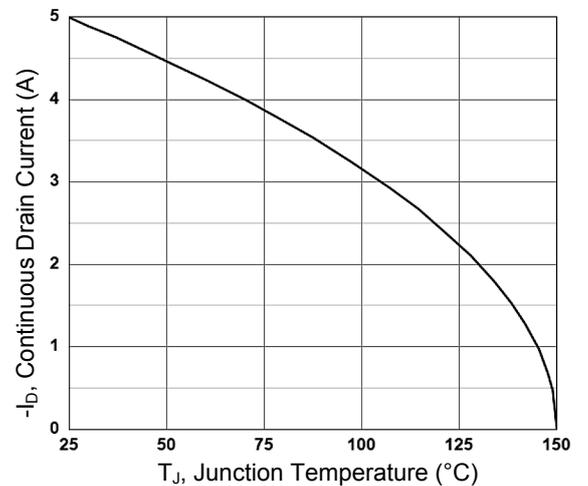
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Characteristics**

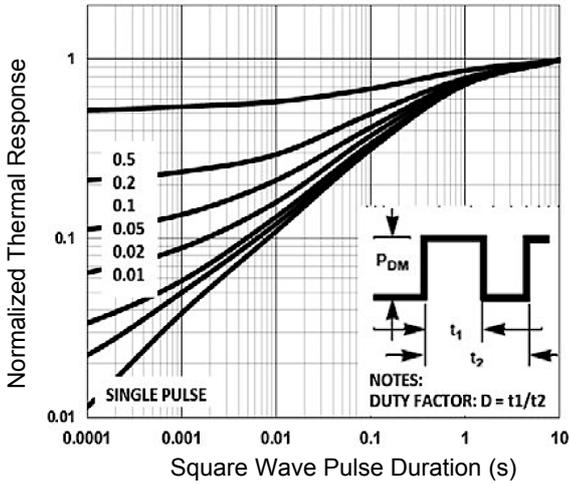


**Figure 5. Capacitance Characteristics**

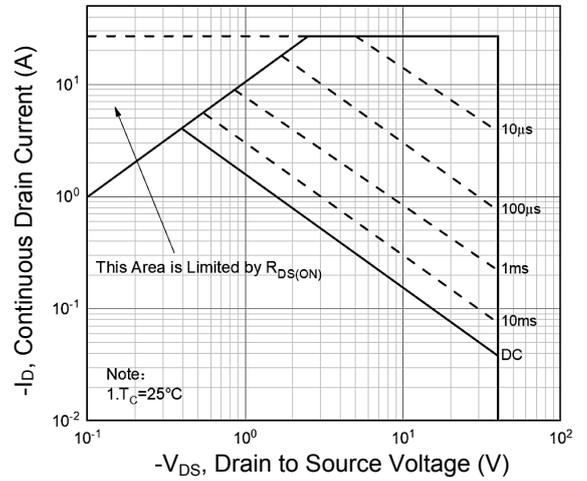


**Figure 6. Continuous Drain Current vs.  $T_J$**

**Typical Electrical and Thermal Characteristic Curves**

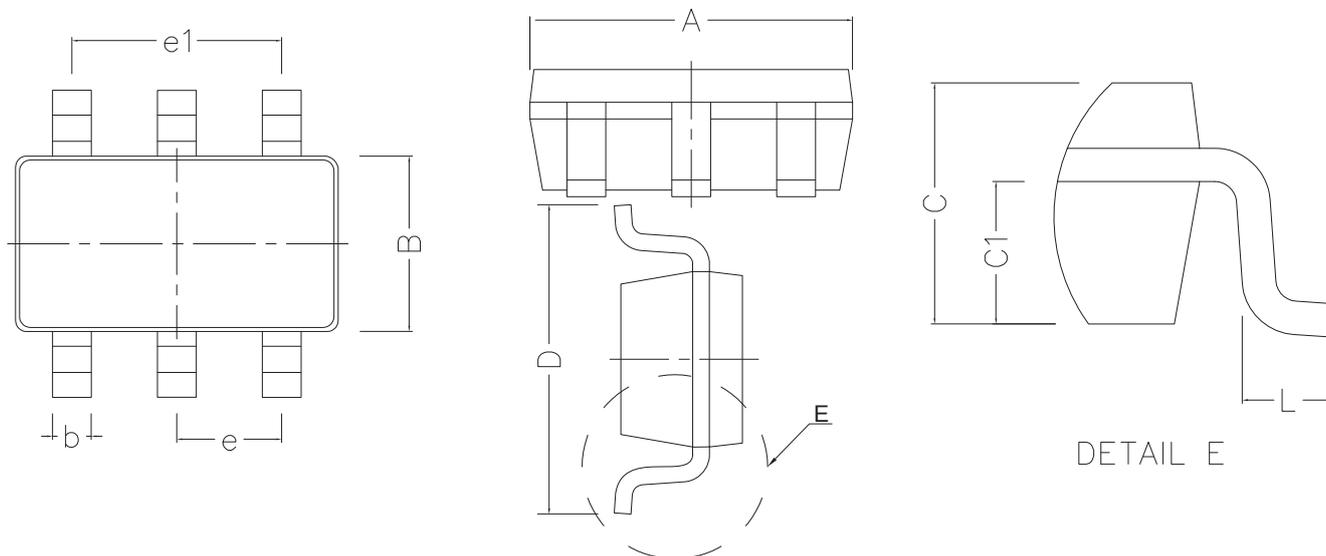


**Figure 7. Normalized Transient Impedance**



**Figure 8. Maximum Safe Operation Area**

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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.82	3.02	0.111	0.119
B	1.50	1.70	0.059	0.067
C	1.05	1.15	0.041	0.045
C1	0.60	0.70	0.024	0.028
D	2.65	2.95	0.104	0.116
L	0.30	0.60	0.012	0.024
b	0.28	0.42	0.011	0.017
e	0.95 TYP		0.037 TYP	
e1	1.90 TYP		0.075 TYP	

**Order Information**

Device	Package	Marking	Packaging	SPQ
GSFR4097	SOT-23-6L	R4097	Tape / Reel	3,000 Pcs / Reel