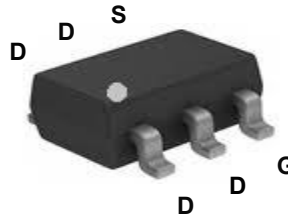
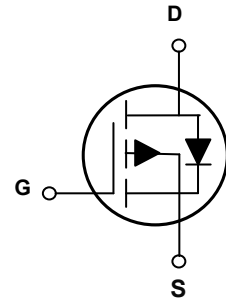


Main Product Characteristics

BV_{DSS}	-60V
$R_{DS(ON)}$	96mΩ
I_D	-3.3A



SOT-23-6L



Schematic Diagram



Features and Benefits

- High efficiency and low on-resistance
- Small size and low cost
- High reliability and long life
- Wide operating temperature range

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The GSFR0603 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.

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Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous ($T_A=25^{\circ}C$)	I_D	-3.3	A
Drain Current-Continuous ($T_A=70^{\circ}C$)		-2.6	A
Drain Current-Pulsed ¹	I_{DM}	-13.2	A
Single Pulse Avalanche Energy ²	E_{AS}	25	mJ
Single Pulse Avalanche Current ²	I_{AS}	-18	A
Power Dissipation ($T_A=25^{\circ}C$)	P_D	2	W
Power Dissipation-De-rate Above 25°C		0.016	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°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
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-60V,$ $V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{DS}=-48V,$ $V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-2A$	-	80	96	m Ω
		$V_{GS}=-4.5V, I_D=-1A$	-	100	130	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.6	-2.5	V
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-1A$	-	3	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=-30V,$ $I_D=-1A, V_{GS}=-10V$	-	10	15	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	1.6	3.2	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	3	6	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=-30V,$ $R_G=6\Omega,$ $V_{GS}=-10V, I_D=-1A$	-	8	16	nS
Rise Time ^{2,3}	t_r		-	15.4	30	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	42.8	80	
Fall Time ^{2,3}	t_f		-	8.4	16	
Input Capacitance	C_{iss}	$V_{DS}=-30V,$ $V_{GS}=0V, F=1\text{MHz}$	-	720	1080	pF
Output Capacitance	C_{oss}		-	42	63	
Reverse Transfer Capacitance	C_{rss}		-	32	48	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V,$ $F=1\text{MHz}$	-	22	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$ Force Current	-	-	-3.3	A
Pulsed Source Current	I_{SM}		-	-	-6.6	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V,$ $I_S=-1A, T_J=25^\circ\text{C}$	-	-	-1	V
Reverse Recovery Time	T_{rr}	$V_R=-50V, I_S=-1A,$ $di/dt=100A/\mu s,$ $T_J=25^\circ\text{C}$	-	30	-	nS
Reverse Recovery Charge	Q_{rr}		-	15	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-25V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-18A, R_G=25\Omega,$ starting $T_J=25^\circ\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s,$ duty cycle $\leq 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

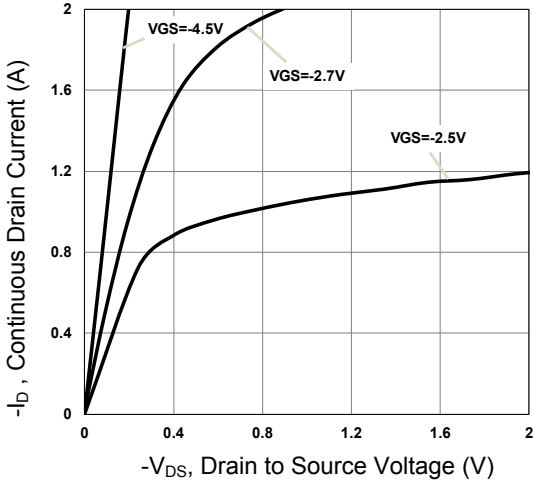


Fig.1 Typical Output Characteristics

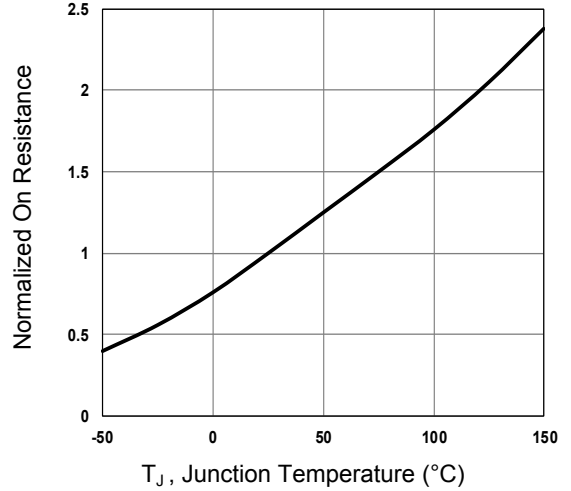


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

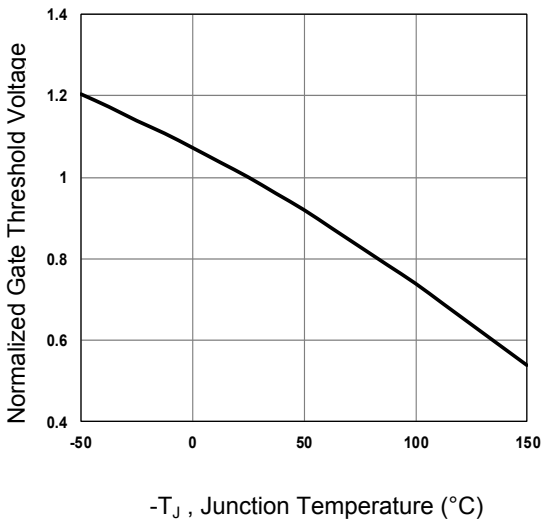


Fig.3 Normalized V_{th} vs. T_J

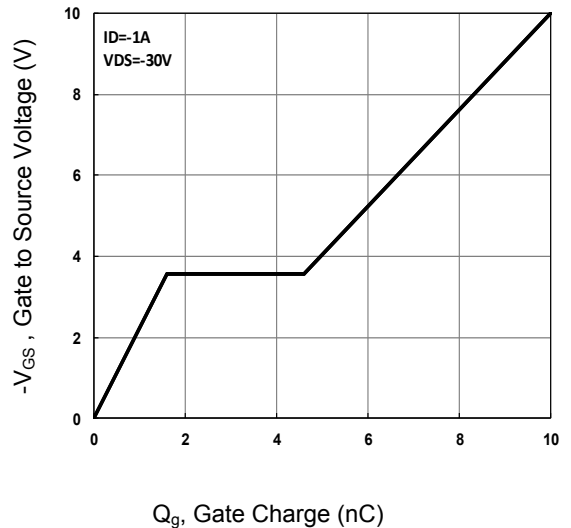


Fig.4 Gate Charge Waveform

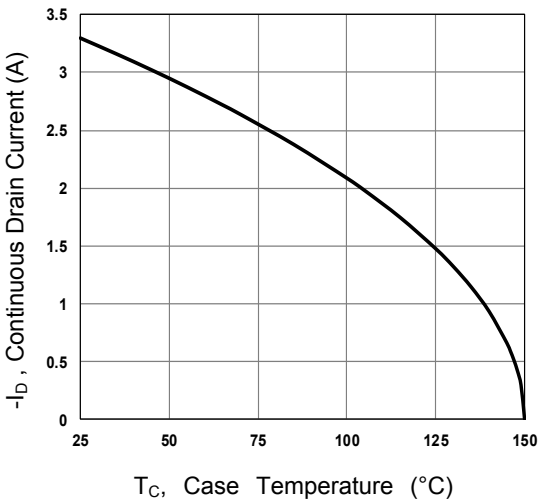


Fig.5 Continuous Drain Current vs. T_C

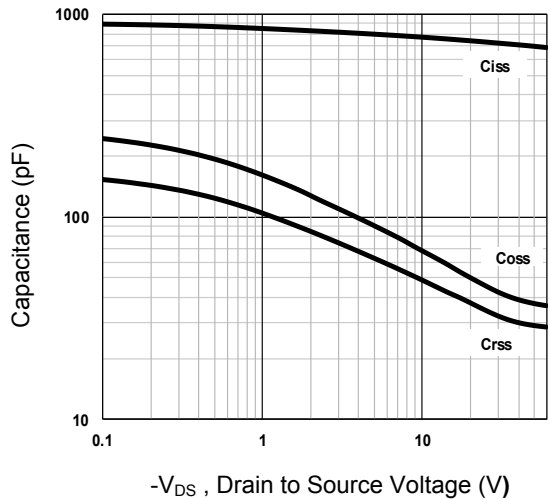


Fig.6 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

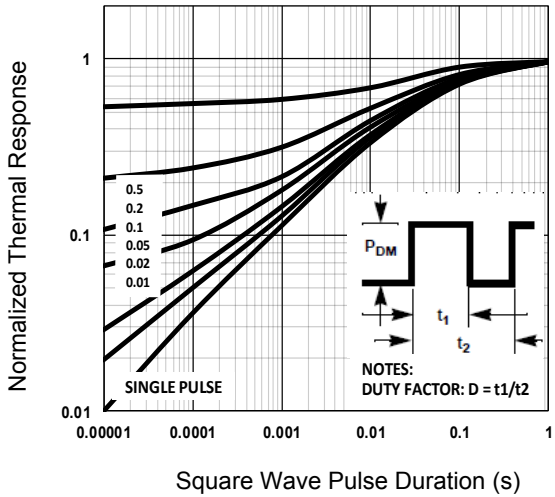


Fig.7 Normalized Transient Impedance

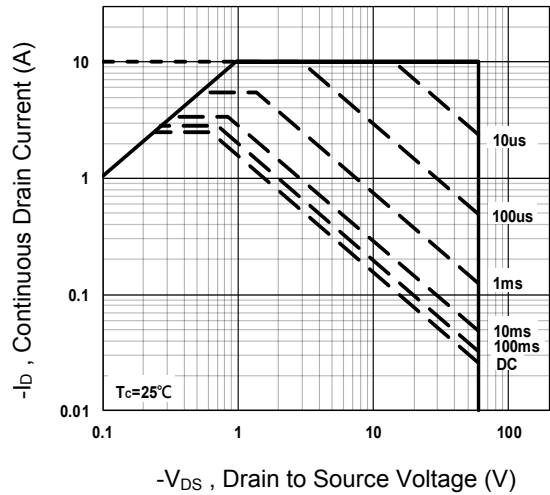


Fig.8 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

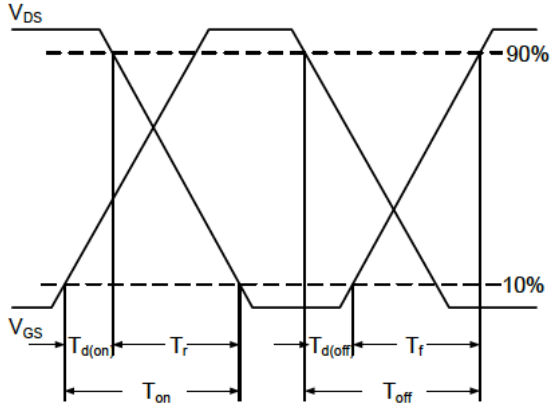


Fig.9 Switching Time Waveform

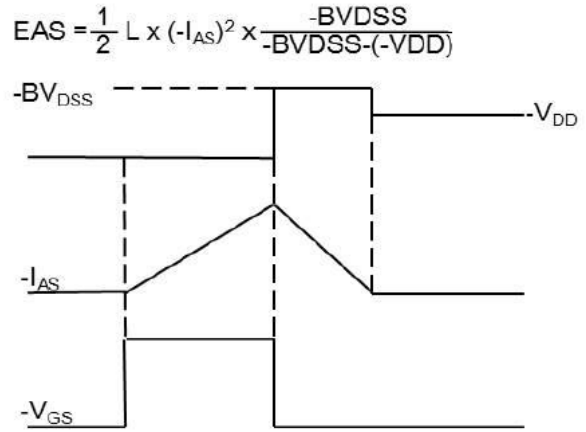
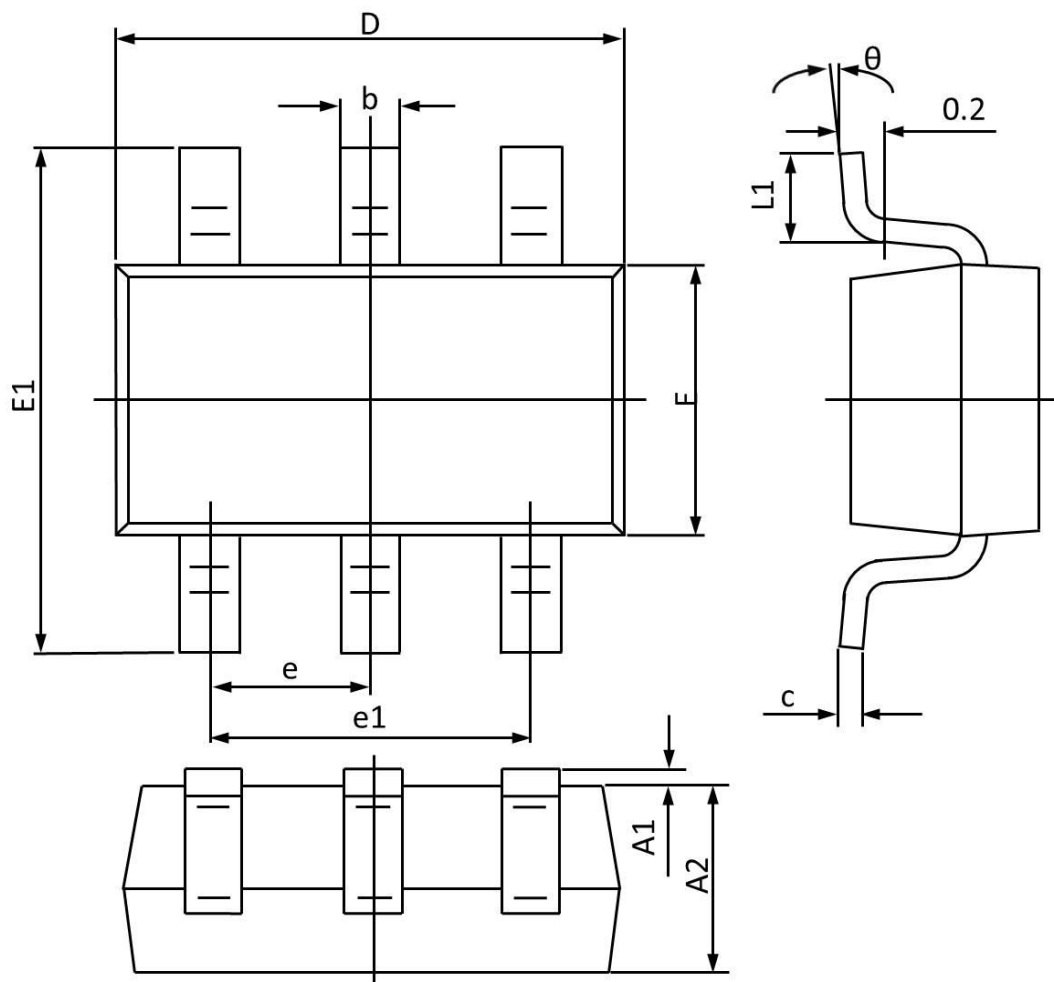


Fig.10 EAS Waveform

Package Outline Dimensions

SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	---	0.150	---	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.019
c	0.100	0.200	0.004	0.008
D	2.800	3.050	0.110	0.120
E1	2.600	3.000	0.103	0.118
F	1.500	1.800	0.059	0.071
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.600	0.010	0.024
θ	0°	8°	0°	8°