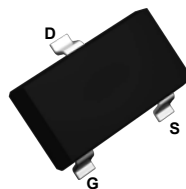
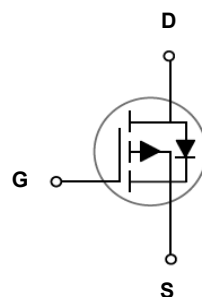


Main Product Characteristics

BV_{DSS}	-60V
$R_{DS(ON)}$	95mΩ
I_D	-3A



SOT-23



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 GSFC0603 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}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)	I_D	-3	A
Drain Current-Continuous ($T_A=70^{\circ}\text{C}$)		-2.4	
Drain Current-Pulsed ¹	I_{DM}	-12	A
Single Pulse Avalanche Energy ²	E_{AS}	25	mJ
Single Pulse Avalanche Current ²	I_{AS}	-18	A
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	1.56	W
Power Dissipation-Derate above 25°C		0.0125	W/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-60	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V, T _J =25°C	-	-	-1	μA
		V _{DS} =-48V, V _{GS} =0V, T _J =125°C	-	-	-10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-2A	-	79	95	mΩ
		V _{GS} =-4.5V, I _D =-1A	-	99	129	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
Forward Transconductance	g _{fs}	V _{DS} =-10V , I _D =-1A	-	3	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =-30V, I _D =-1A V _{GS} =-10V	-	10	15	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	1.6	2.4	
Gate-Drain Charge ^{3,4}	Q _{gd}		-	3	4.5	
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =-30V, R _G =6Ω V _{GS} =-10V, I _D =-1A	-	8	12	nS
Rise Time ^{3,4}	t _r		-	15.4	23	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	42.8	64	
Fall Time ^{3,4}	t _f		-	8.4	13	
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, F=1MHz	-	785	1178	pF
Output Capacitance	C _{oss}		-	175	263	
Reverse Transfer Capacitance	C _{rss}		-	112	168	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	-3	A
Pulsed Source Current	I _{SM}		-	-	-6	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25°C	-	-	-1	V

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 operating temperature.

Typical Electrical and Thermal Characteristic Curves

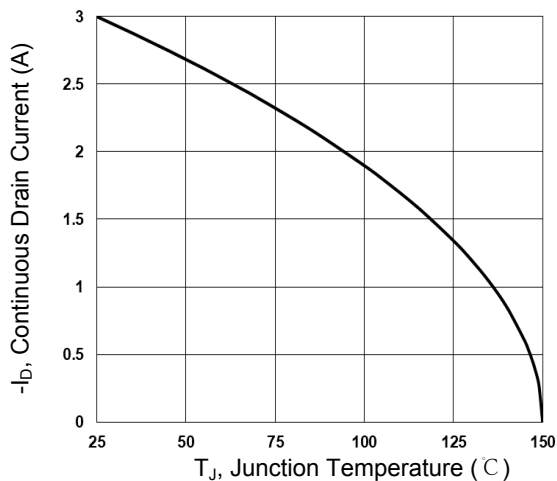


Figure 1. Continuous Drain Current vs. T_J

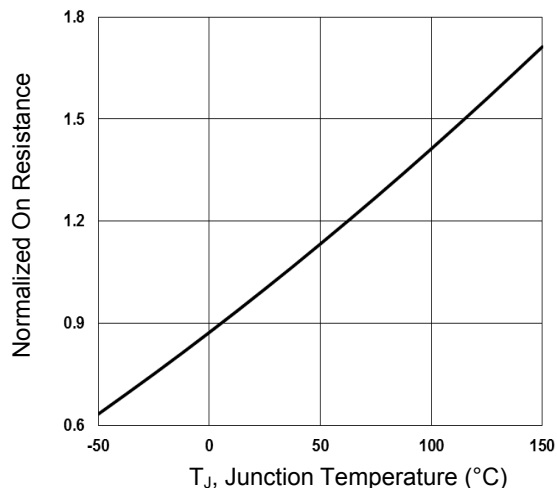


Figure 2. Normalized R_{DS(on)} vs. T_J

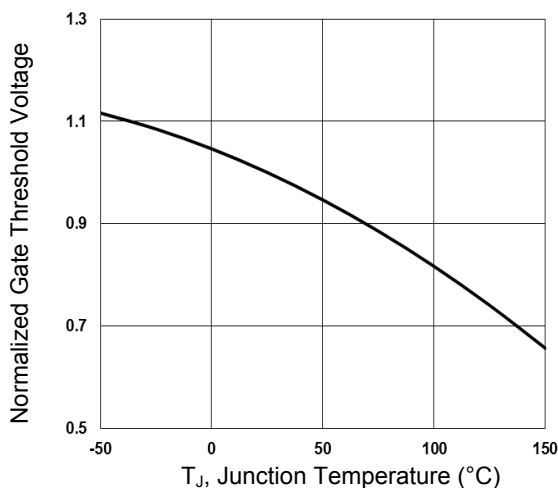


Figure 3. Normalized V_{th} vs. T_J

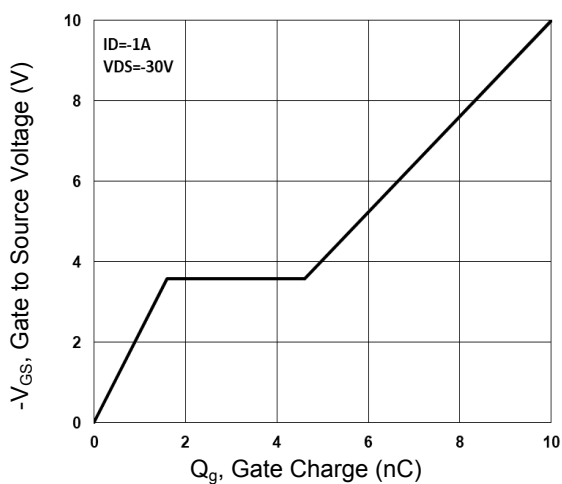


Figure 4. Gate Charge Waveform

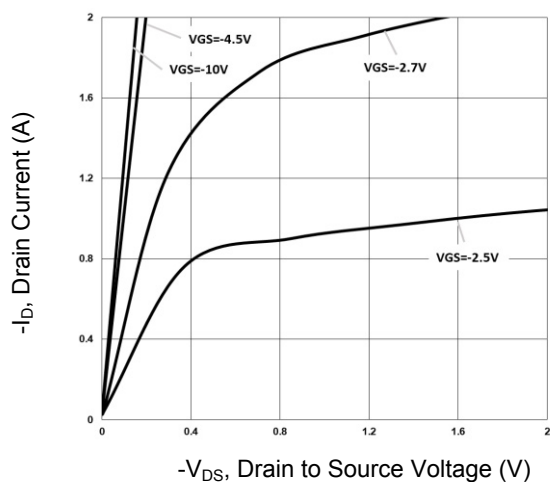


Figure 5. Typical Output Characteristics

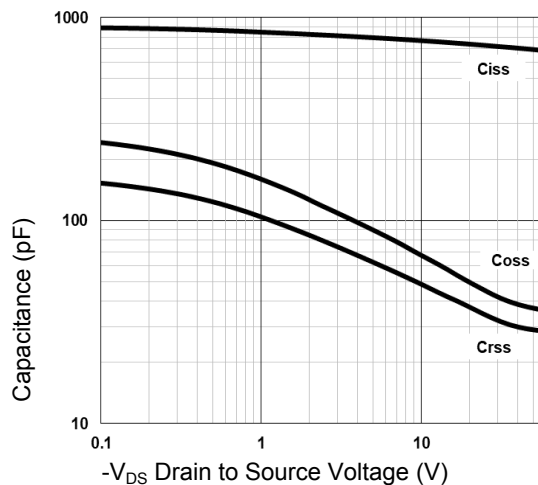


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

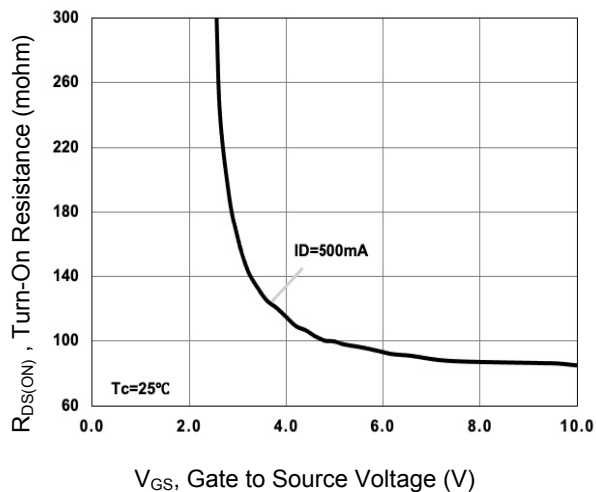


Figure 7. Turn-On Resistance vs. V_{GS}

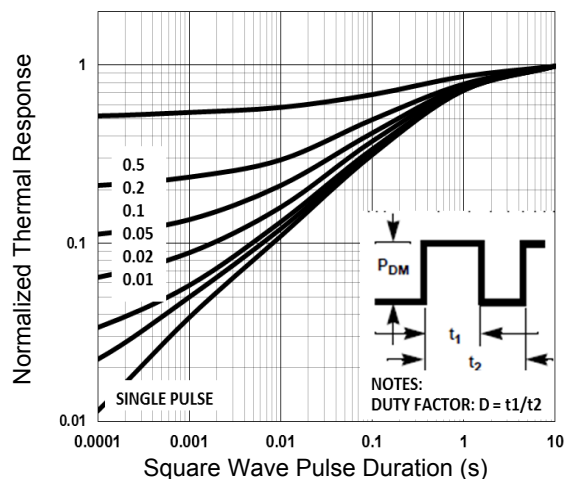


Figure 8. Normalized Transient Impedance

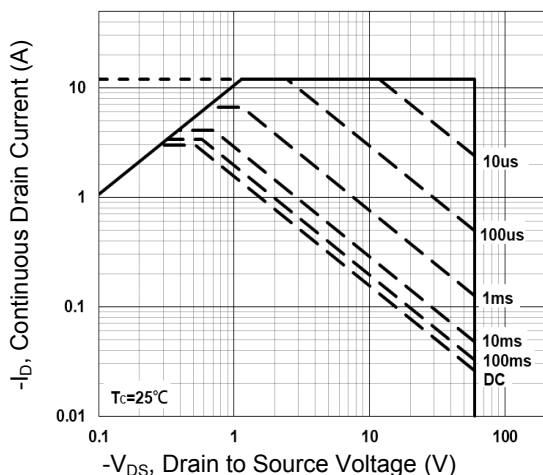


Figure 9. Maximum Safe Operation Area

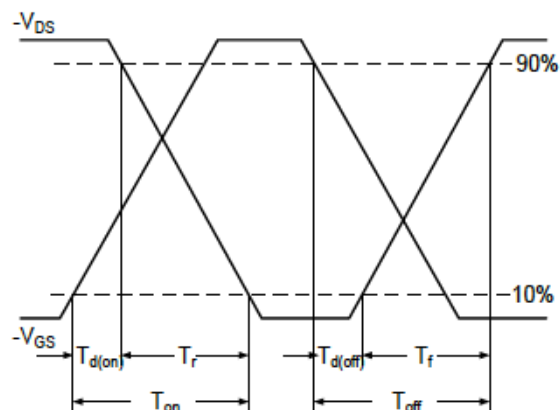


Figure 10. Switching Time Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS})^2 \times \frac{-BV_{DSS}}{-BV_{DSS} - (-V_{DD})}$$

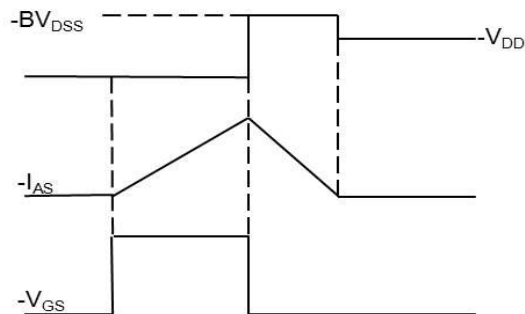
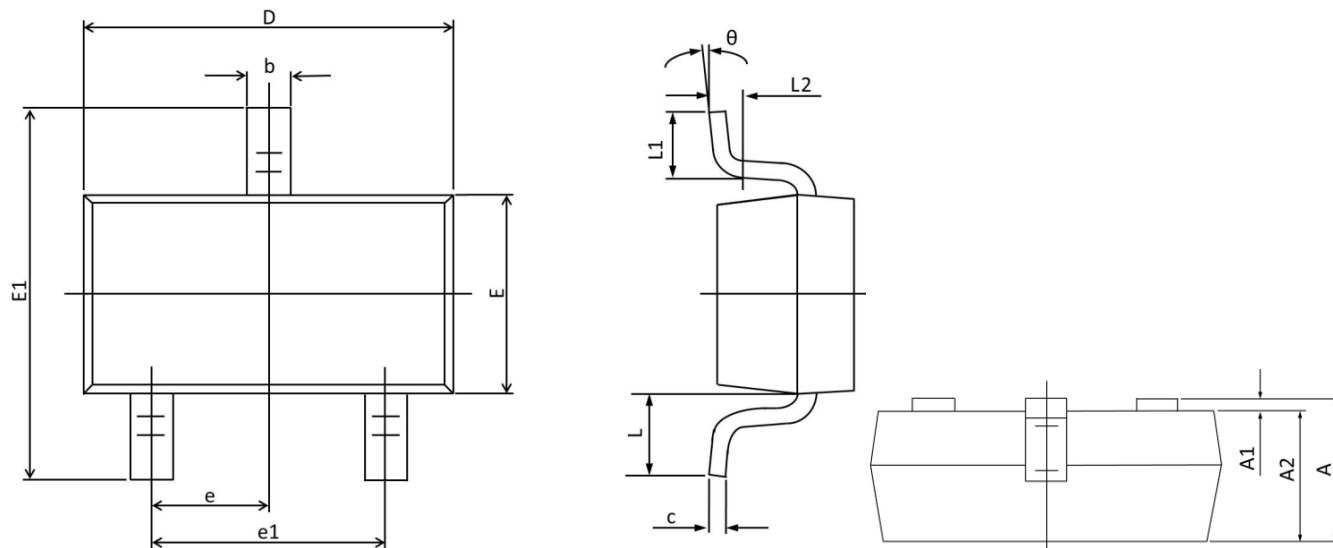


Figure 11. EAS Waveform

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.450	0.041	0.057
A1	-	0.150	-	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.490	0.012	0.019
c	0.100	0.200	0.004	0.008
D	2.820	3.050	0.111	0.120
E	1.500	1.750	0.059	0.069
E1	2.600	3.000	0.102	0.118
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.700 REF.		0.028 REF.	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Order Information

MPN	Package	Marking	Quantity	HSF Status
GSFC0603	SOT-23	6	3000pcs / Reel	RoHS compliant