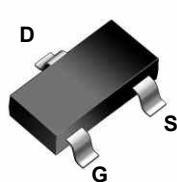
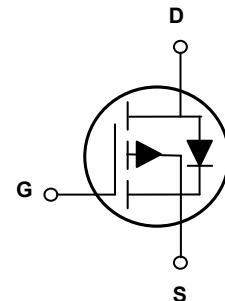


## Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(on)}$	33mΩ
$I_D$	-5.8A



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 GSFC0205 utilizes the latest processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable device for use in power switching applications and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	-5.8	A
Drain Current – Continuous ( $T_C=100^\circ\text{C}$ )		-3.7	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	-23.2	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
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)

D <sub>U</sub> R <sub>a</sub> Y <sub>Hf</sub>	G <sub>m</sub> V <sub>c</sub>	7 c <sub>bX</sub> I <sub>Hcbg</sub>	A <sub>Jb</sub> "	H <sub>nd</sub> "	A U "	I b j
<b>CZ7\ UFUWYf]ghWg</b>						
Drain-Source Breakdown Voltage	B <sub>VDSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	△BV <sub>DSS</sub> △T <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.02	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	-10	uA
Gate-Source Leakage Current	I <sub>GS</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =0V	---	---	±100	nA
<b>Cb7\ UFUWYf]ghWg</b>						
Static Drain-Source On-Resistance	R <sub>DSS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	---	28	33	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A	---	37	45	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2A	---	49	65	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-0.3	-0.6	-1	V
V <sub>GS(th)</sub> Temperature Coefficient	△V <sub>GS(th)</sub>		---	2	---	mV/°C
Forward Transconductance	g <sub>fS</sub>	V <sub>DS</sub> =-10V, I <sub>S</sub> =-3A	---	8.4	---	S
<b>8 m<sub>b</sub>Ua J WUbX'Gk JHW ]b[ 7\ UFUWYf]ghWg</b>						
Total Gate Charge <sup>2, 3</sup>	Q <sub>g</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	---	16.1	25	nC
Gate-Source Charge <sup>2, 3</sup>	Q <sub>gs</sub>		---	1.8	3	
Gate-Drain Charge <sup>2, 3</sup>	Q <sub>gd</sub>		---	3.8	7	
Turn-On Delay Time <sup>2, 3</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =-10V, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =25Ω, I <sub>D</sub> =-1A	---	8.2	16	nS
Rise Time <sup>2, 3</sup>	T <sub>r</sub>		---	30	57	
Turn-Off Delay Time <sup>2, 3</sup>	T <sub>d(off)</sub>		---	71.1	135	
Fall Time <sup>2, 3</sup>	T <sub>f</sub>		---	19.8	38	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, F=1MHz	---	1440	2100	pF
Output Capacitance	C <sub>oss</sub>		---	155	230	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	115	170	
<b>8 fUjb!Gci fWY8 ]cXY7\ UFUWYf]ghWg UbX'AU ]a i a 'FUjh[g</b>						
Continuous Source Current	I <sub>s</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-5.8	A
Pulsed Source Current	I <sub>SM</sub>		---	---	-23.2	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1	V

Note:

- Repetitive Rating: Pulsed width limited by maximum junction temperature.
- The data tested by pulsed, pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Essentially independent of operating temperature.

## Typical Electrical and Thermal Characteristic Curves

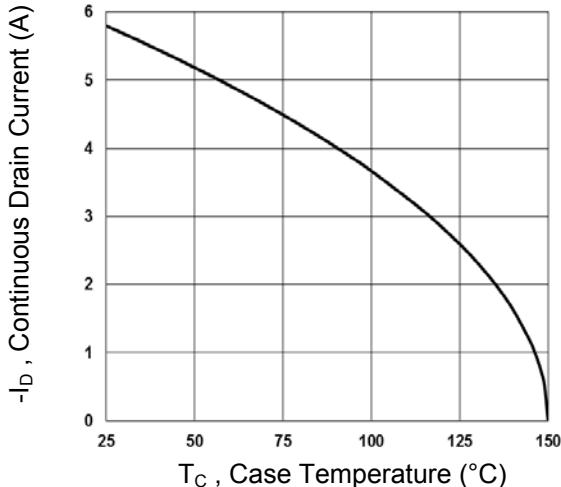


Fig.1 Continuous Drain Current vs.  $T_C$

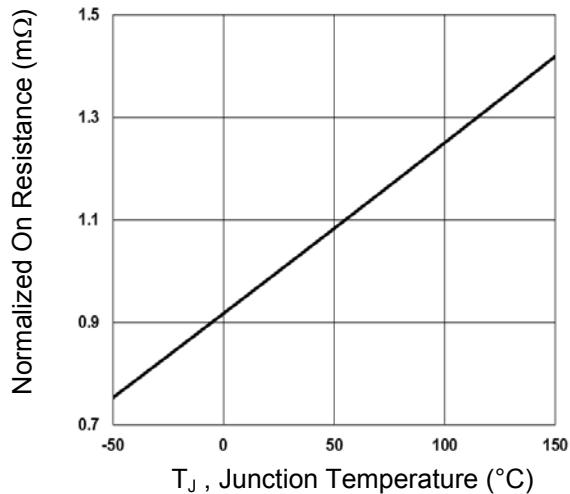


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$

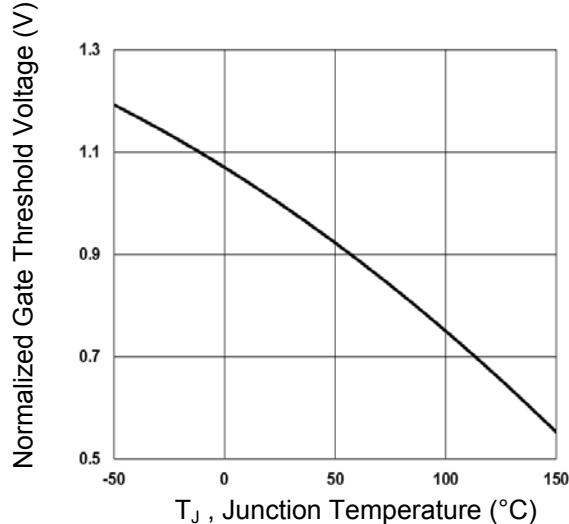


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

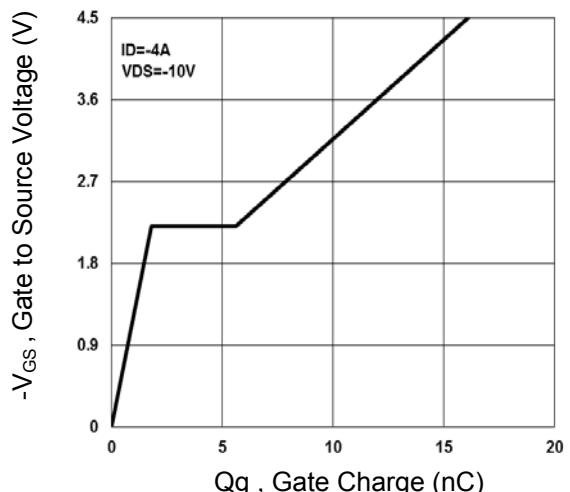


Fig.4 Gate Charge Waveform

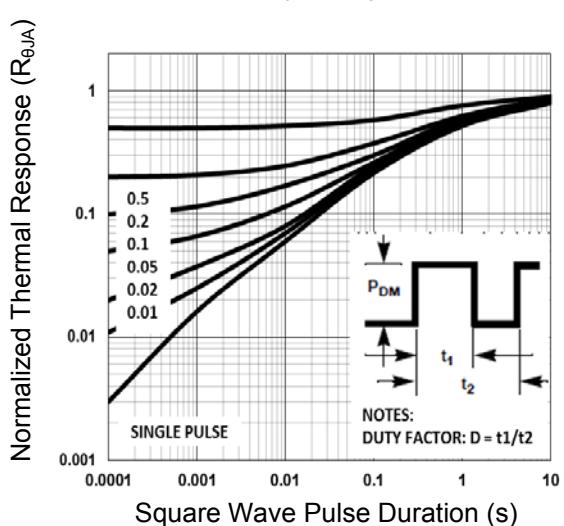


Fig.5 Normalized Transient Impedance

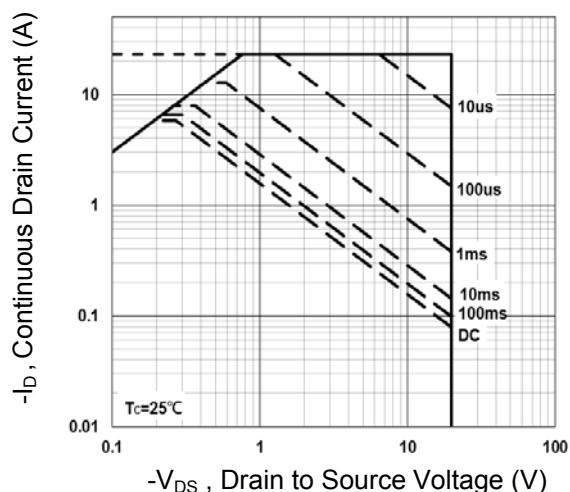


Fig.6 Maximum Safe Operation Area

## Typical Electrical and Thermal Characteristic Curves

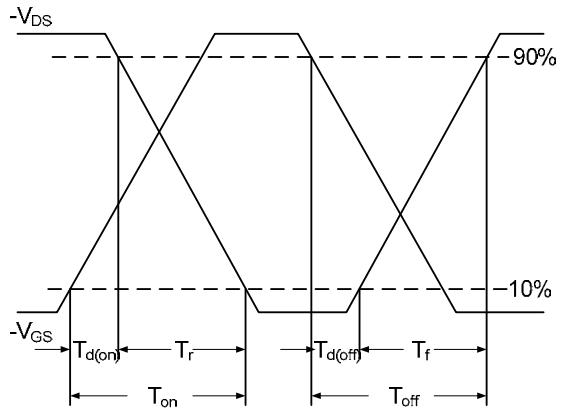


Fig.7 Switching Time Waveform

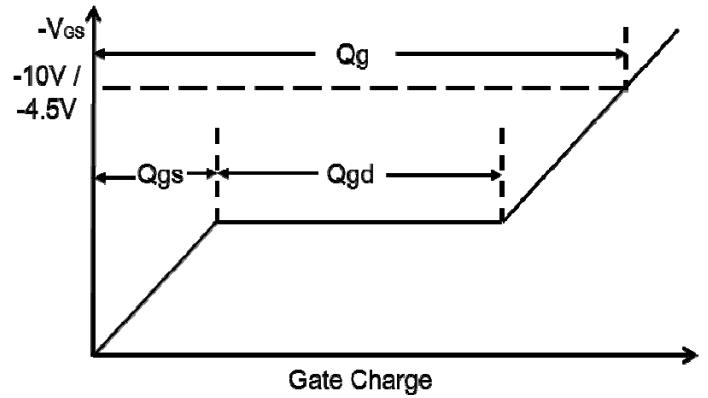
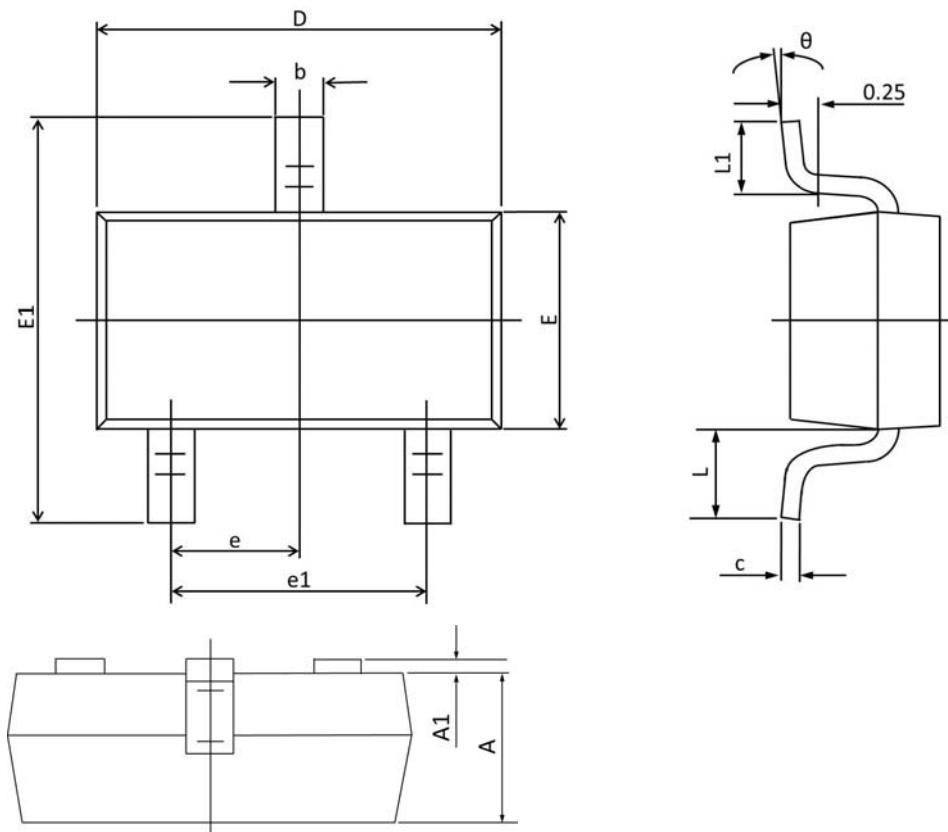


Fig.8 Gate Charge Waveform

## Package Outline Dimensions

## SOT-23-3S



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.9	1	0.035	0.039
A1	0	0.1	0	0.004
b	0.3	0.5	0.012	0.02
c	0.09	0.11	0.003	0.004
D	2.8	3	0.11	0.118
E	1.2	1.4	0.047	0.055
E1	2.25	2.55	0.089	0.1
e	0.950 TYP.		0.037 TYP.	
e1	1.8	2	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.3	0.5	0.012	0.02
$\theta$	1°	7°	1°	7°