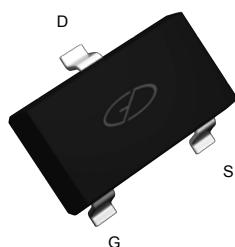
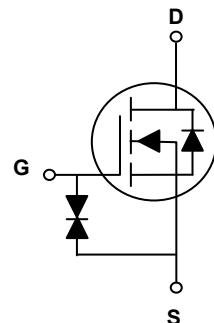


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	1.5Ω
I_D	0.50A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for motor drive, power tools and LED lighting
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSFC0300 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous (Steady State) ($T_A=25^\circ\text{C}$) ¹	I_D	0.5	A
Drain Current-Continuous (Steady State) ($T_A=85^\circ\text{C}$) ¹		0.37	
Drain Current-Continuous ($t<10\text{s}$) ($T_A=25^\circ\text{C}$) ¹	I_D	0.56	A
Drain Current-Continuous ($t<10\text{s}$) ($T_A=85^\circ\text{C}$) ¹		0.4	
Drain Current-Pulsed ($T_P=10\mu\text{s}$)	I_{DM}	1.7	A
Power Dissipation (Steady State) ¹	P_D	0.69	W
Power Dissipation ($t<5\text{s}$) ¹		0.83	W
Source Current (Body Diode)	I_S	1	A
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
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=100\mu\text{A}$	30	-	-	V
$V_{(\text{BR})\text{DSS}}$ Temperature Coefficient	$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	-	-	40	-	mV/°C
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 10\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 1.0	μA
Static Drain-Source On-Resistance ²	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=4.0\text{V}, I_D=10\text{mA}$	-	1.0	1.5	Ω
		$V_{\text{GS}}=2.5\text{V}, I_D=10\text{mA}$	-	1.5	2.0	
Gate Threshold Voltage ²	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_D=250\mu\text{A}$	0.8	-	1.4	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient ²	$\Delta V_{\text{GS}(\text{th})}$	-	-	3.4	-	mV/°C
Forward Transconductance ²	g_{fs}	$V_{\text{DS}}=3.0\text{V}, I_D=10\text{mA}$	-	0.33	-	S
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{\text{DS}}=24\text{V}, I_D=0.1\text{A}$ $V_{\text{GS}}=5.0\text{V}$	-	1.15	-	nC
Threshold Gate Charge	$Q_{g(\text{th})}$		-	0.15	-	
Gate-Source Charge	Q_{gs}		-	0.32	-	
Gate-Drain Charge	Q_{gd}		-	0.23	-	
Turn-On Delay Time ³	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=5.0\text{V}, R_G=50\Omega$ $V_{\text{GS}}=4.5\text{V}, I_D=0.1\text{A}$	-	16.7	-	nS
Rise Time ³	t_r		-	47.9	-	
Turn-Off Delay Time ³	$t_{\text{d}(\text{off})}$		-	65.1	-	
Fall Time ³	t_f		-	64.2	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=5.0\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	21	42	pF
Output Capacitance	C_{oss}		-	19.7	40	
Reverse Transfer Capacitance	C_{rss}		-	8.1	16	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_s=10\text{mA}, T_J=25^\circ\text{C}$	-	0.65	0.7	V
		$V_{\text{GS}}=0\text{V}, I_s=10\text{mA}, T_J=125^\circ\text{C}$	-	0.45	-	
Reverse Recovery Time	t_{rr}	$V_{\text{GS}}=0\text{V}, I_s=10\text{mA}$ $dI/dt=8\text{A}/\mu\text{s}$	-	14	-	nS

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

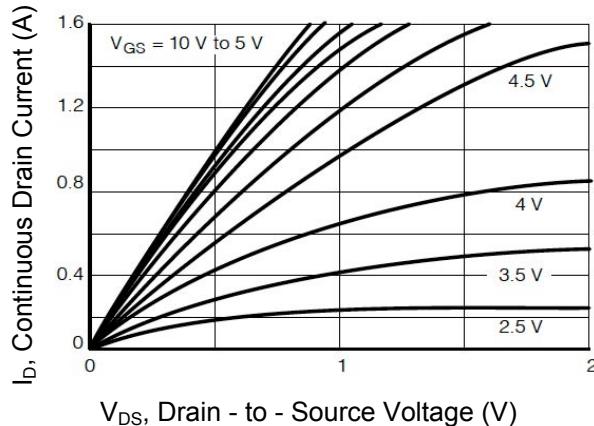


Figure 1. On - Region Characteristics

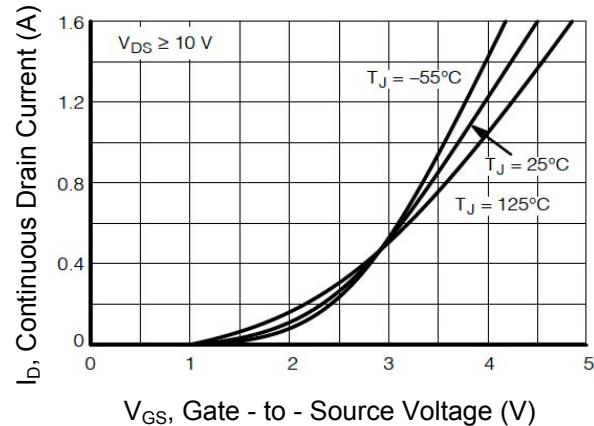


Figure 2. Transfer Characteristics

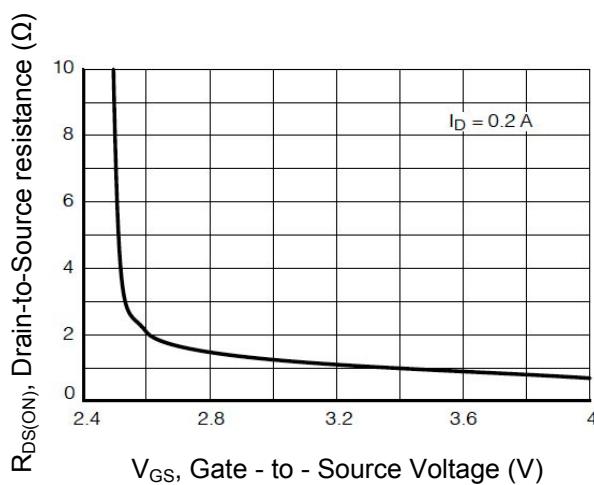


Figure 3. On Resistance vs. Gate-to-Source Voltage

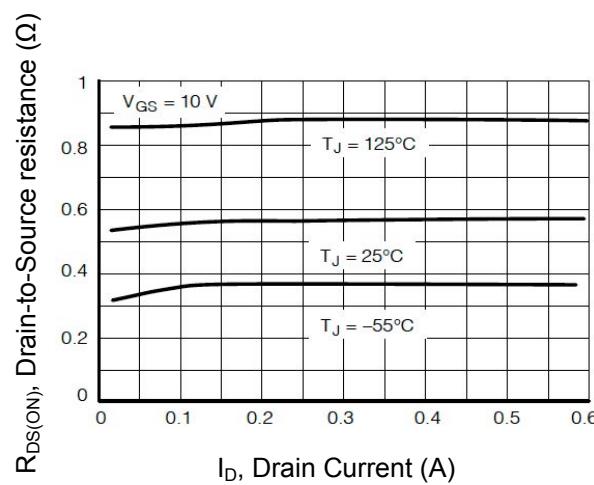


Figure 4. On Resistance vs. Drain Current and Temperature

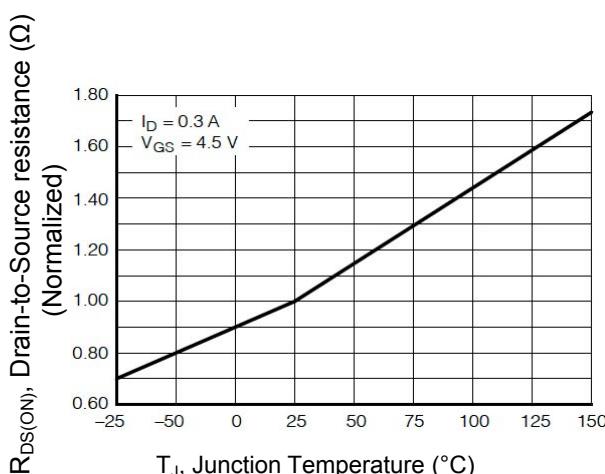


Figure 5. On Resistance Variation with Temperature

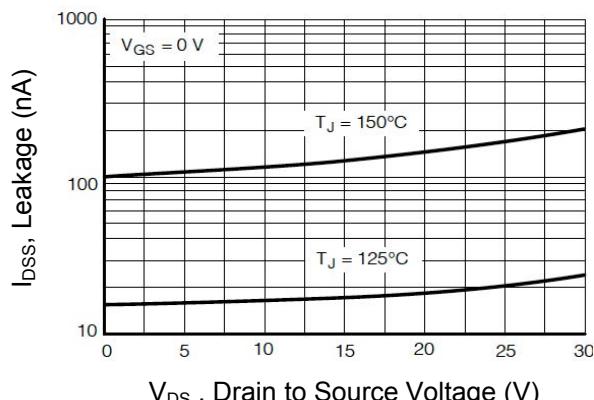


Figure 6. Drain - to - Source Leakage Current vs. Voltage

Typical Electrical and Thermal Characteristic Curves

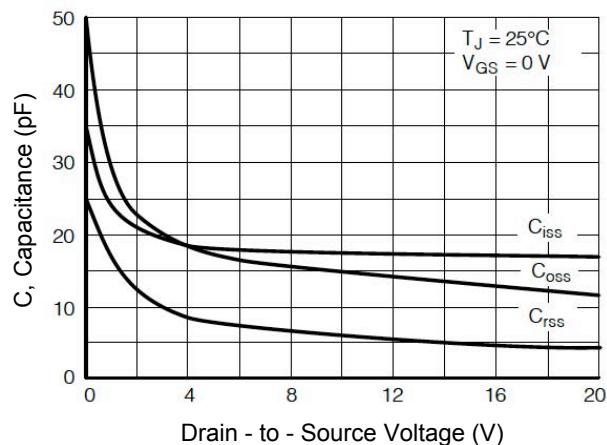


Figure 7. Capacitance Variation

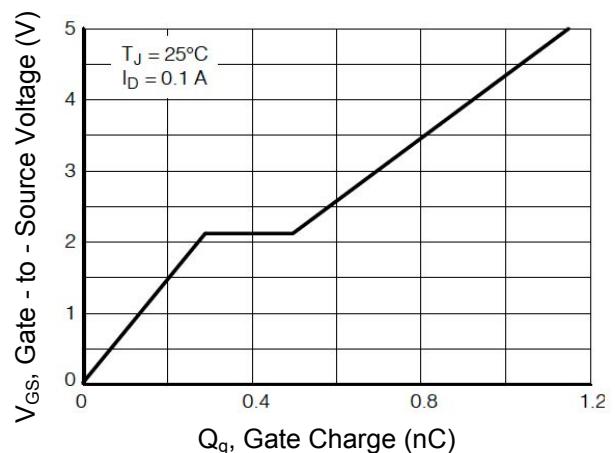


Figure 8. Gate-to-Source & Drain-to-Source Voltage vs. Total Charge

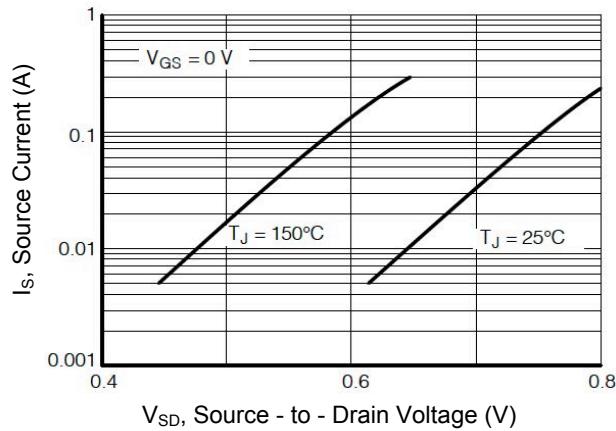
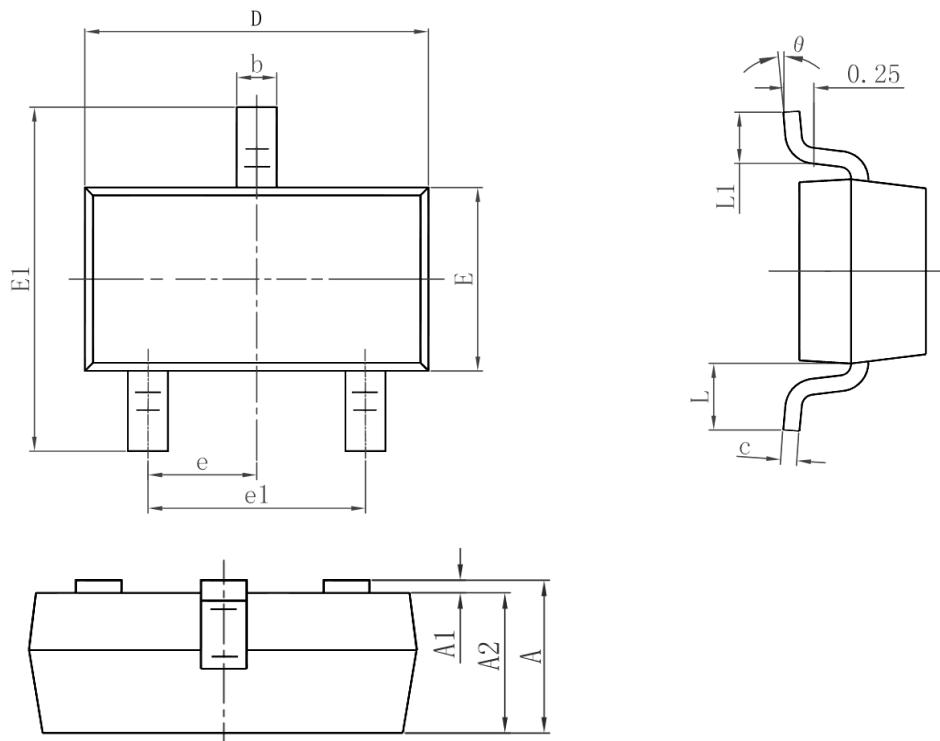


Figure 9. Diode Forward Voltage vs. Current

Package Outline Dimensions (SOT-23)



Symbol	Dimensions in Milimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°