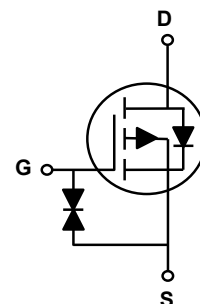


Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	39mΩ (Max)
I_D	-6.0A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Low on-resistance and low gate charge
- Featuring low switching and drive losses
- Fast switching and reverse body recovery
- High ruggedness and robustness
- AEC-Q101 qualified



Description

The GSFC2039EAU 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}	-20	V
Gate-to-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)	I_D	-6.0	A
Drain Current-Continuous ($T_A=100^{\circ}\text{C}$)		-3.6	A
Drain Current-Pulsed ¹	I_{DM}	-24	A
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	1.5	W
Power Dissipation-Derate above 25°C		0.012	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	90	°C/W
Operating Junction and Storage Temperature Range	T_J / T_{STG}	-55 to +150	°C

Electrical Characteristics (T_J=25°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 =250μA	-20	-	-	V
BV _{DSS} Temperature Coefficient	△BV _{DSS} /△T _J	Reference to 25°C, I _D =1mA	-	-0.02	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	-	-	-1	μA
		V _{DS} =-16V, V _{GS} =0V, T _J =125°C	-	-	-10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
Static Drain Source On Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-4A	-	30	39	mΩ
		V _{GS} =-2.5V, I _D =-4A	-	39	51	
		V _{GS} =-1.8V, I _D =-2A	-	52	69	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	-0.5	-0.75	-1	V
V _{GS(th)} Temperature Coefficient	△V _{GS(th)}		-	-2	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-5V, I _D =-5A	-	14	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =-10V, I _D =-5A, V _{GS} =-4.5V	-	9.4	-	nC
Gate-Source Charge ^{2,3}	Q _{gs}		-	1.7	-	
Gate-Drain Charge ^{2,3}	Q _{gd}		-	2.2	-	
Turn-On Delay Time ^{2,3}	t _{d(on)}	V _{DD} =-10V, R _G =3Ω, V _{GS} =-4.5V, I _D =-5A	-	11	-	nS
Rise Time ^{2,3}	t _r		-	34	-	
Turn-Off Delay Time ^{2,3}	t _{d(off)}		-	51	-	
Fall Time ^{2,3}	t _f		-	48	-	
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, F=1MHz	-	684	-	pF
Output Capacitance	C _{oss}		-	149	-	
Reverse Transfer Capacitance	C _{rss}		-	91	-	
Source-Drain Ratings and Characteristics						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	-6.4	A
Pulsed Source Current	I _{SM}		-	-	-25.6	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-3A, T _J =25°C	-	-	-1.3	V

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

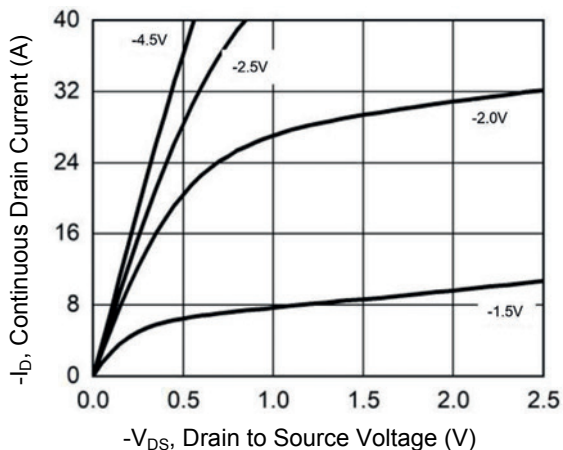


Figure 1. Output Characteristics

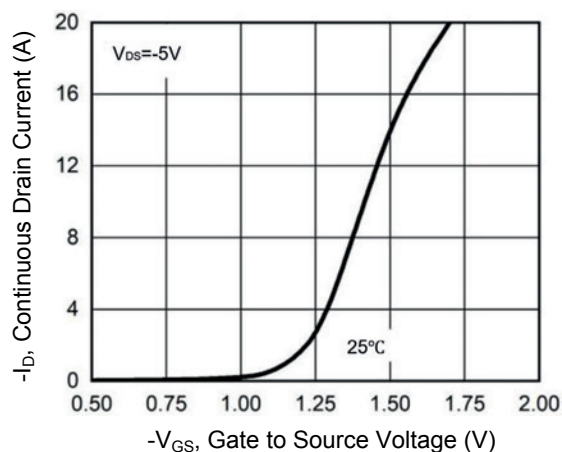


Figure 2. Transfer Characteristics

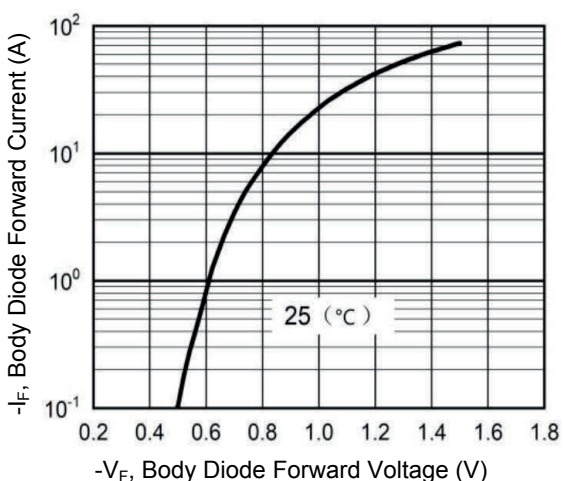


Figure 3. Body Diode Characteristics

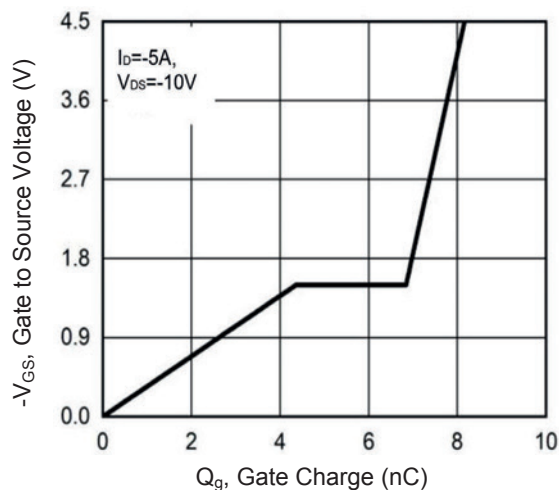


Figure 4. Gate Charge Waveform

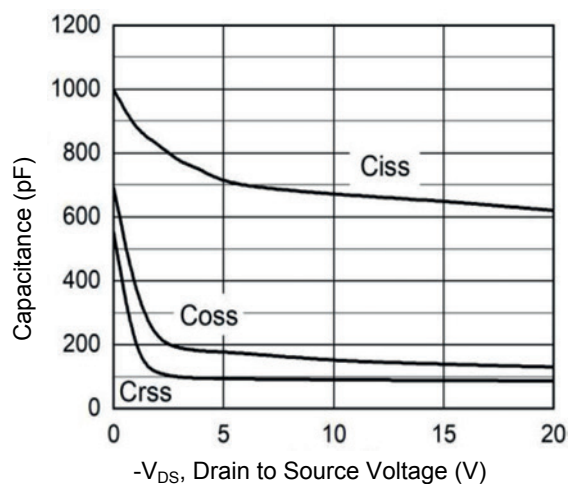


Figure 5. Capacitance Characteristics

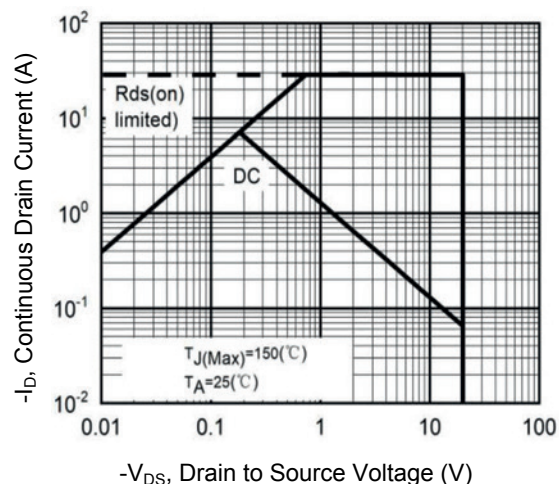
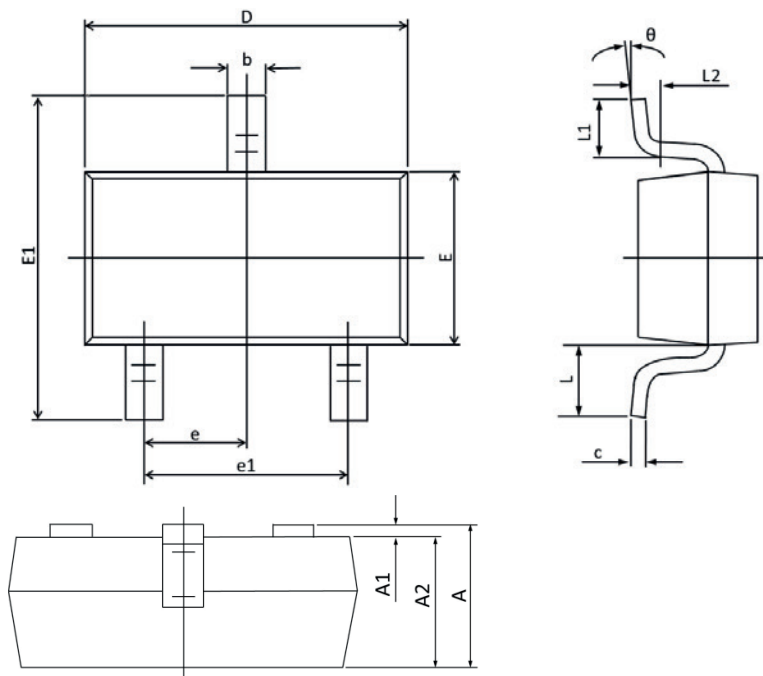


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		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	0.95 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.55 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
L2	0.25 TYP.		0.01 TYP.	
θ	0°	8°	0°	8°