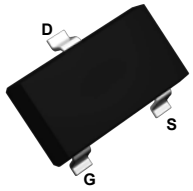
GOOD-ARK SEMICONDUCTOR

GSFC04031

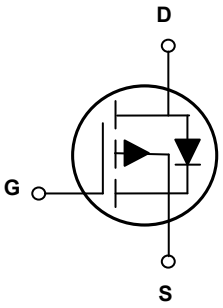
40V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-40V
$R_{DS(ON)}$	105mΩ (Max)
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 GSFC04031 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°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_A=25°C)	I_D	-3	A
Drain Current-Continuous (T_A=70°C)		-2.4	
Drain Current-Pulsed[1]	I_{DM}	-12	A
Power Dissipation (T_A=25°C)	P_D	1.56	W
Power Dissipation-Derate above 25°C		0.0125	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°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	-40	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-32V, 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	-	88	105	mΩ
		V_{GS}=-4.5V, I_D=-1.5A	-	128	166	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.2	-1.8	-2.5	V
Forward Transconductance	g_{fs}	V_{DS}=-10V, I_D=-2A	-	4	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-20V, I_D=-1.5A V_{GS}=-10V	-	3	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	0.2	-	
Gate-Drain Charge[2,3]	Q_{gd}		-	1.2	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-20V, R_G=6Ω V_{GS}=-10V, I_D=-1.5A	-	2.9	-	nS
Rise Time[2,3]	t_r		-	8.4	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	19.2	-	
Fall Time[2,3]	t_f		-	5.6	-	
Input Capacitance	C_{lss}	V_{DS}=-20V, V_{GS}=0V, F=1MHz	-	310	-	pF
Output Capacitance	C_{oss}		-	35	-	
Reverse Transfer Capacitance	C_{rss}		-	24	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	16	-	Ω
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. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

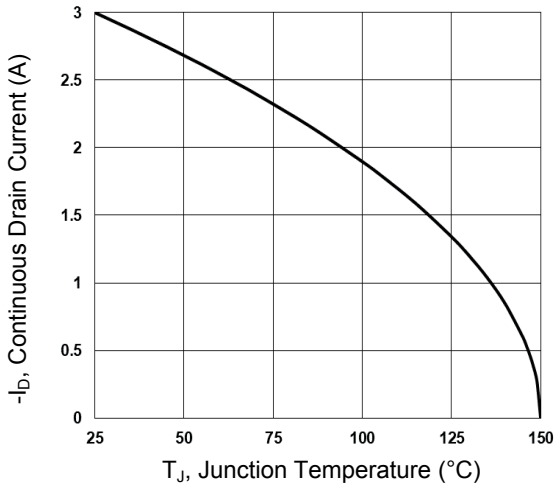


Figure 1. Continuous Drain Current vs. T_J

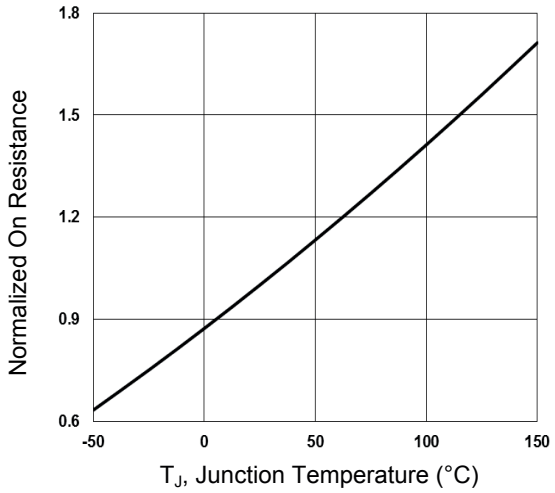


Figure 2. Normalized R_{DSON} vs. T_J

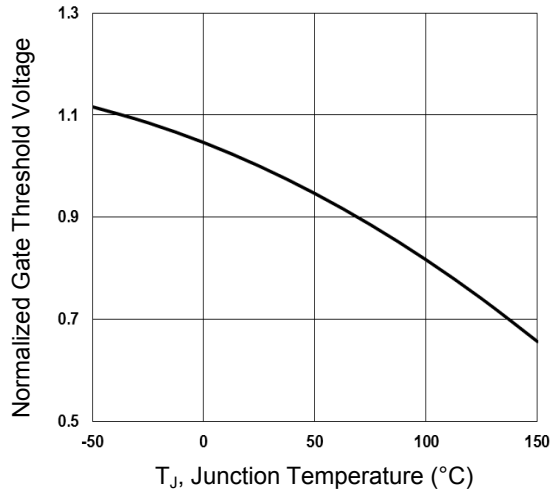


Figure 3. Normalized V_{th} vs. T_J

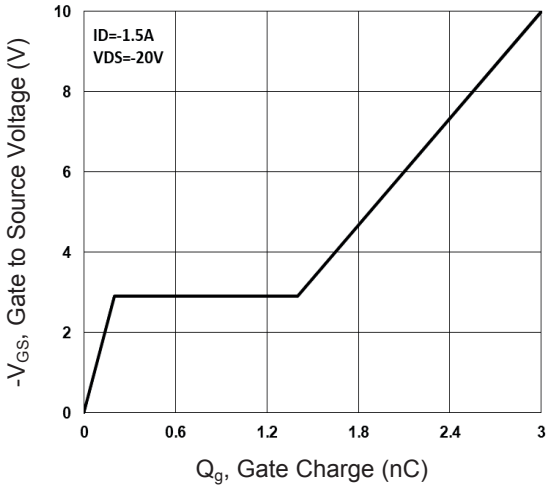


Figure 4. Gate Charge Characteristics

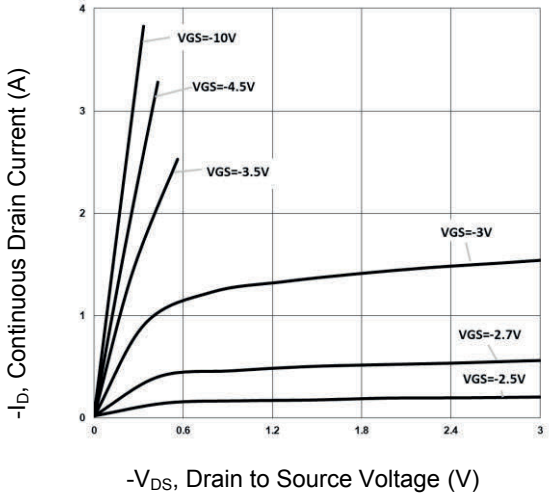


Figure 5. Typical Output Characteristics

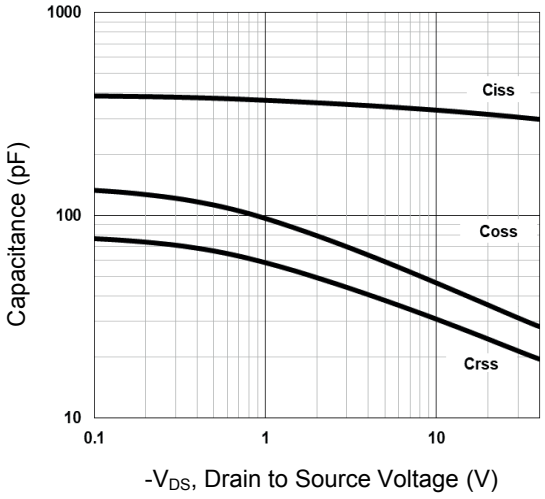


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

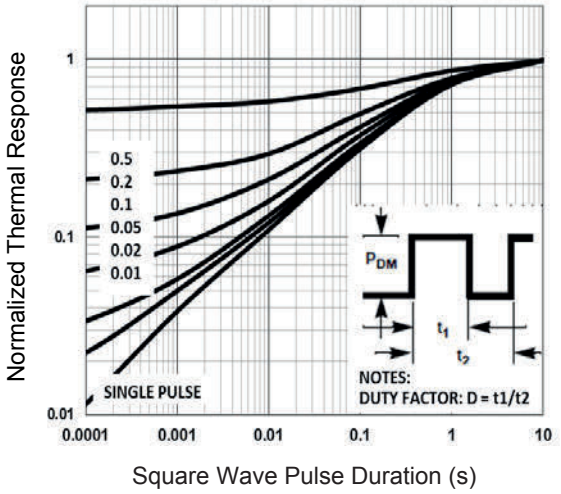


Figure 7. Normalized Transient Impedance

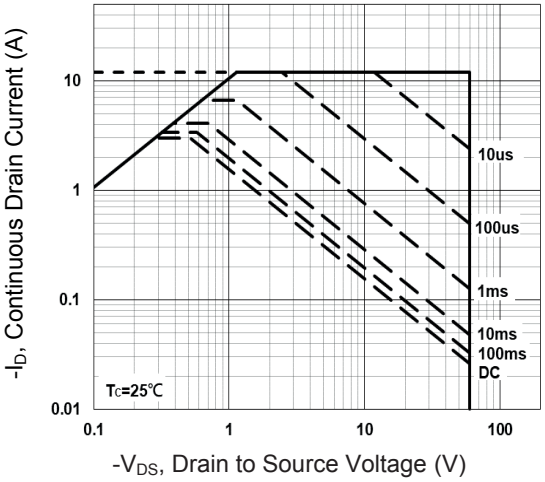
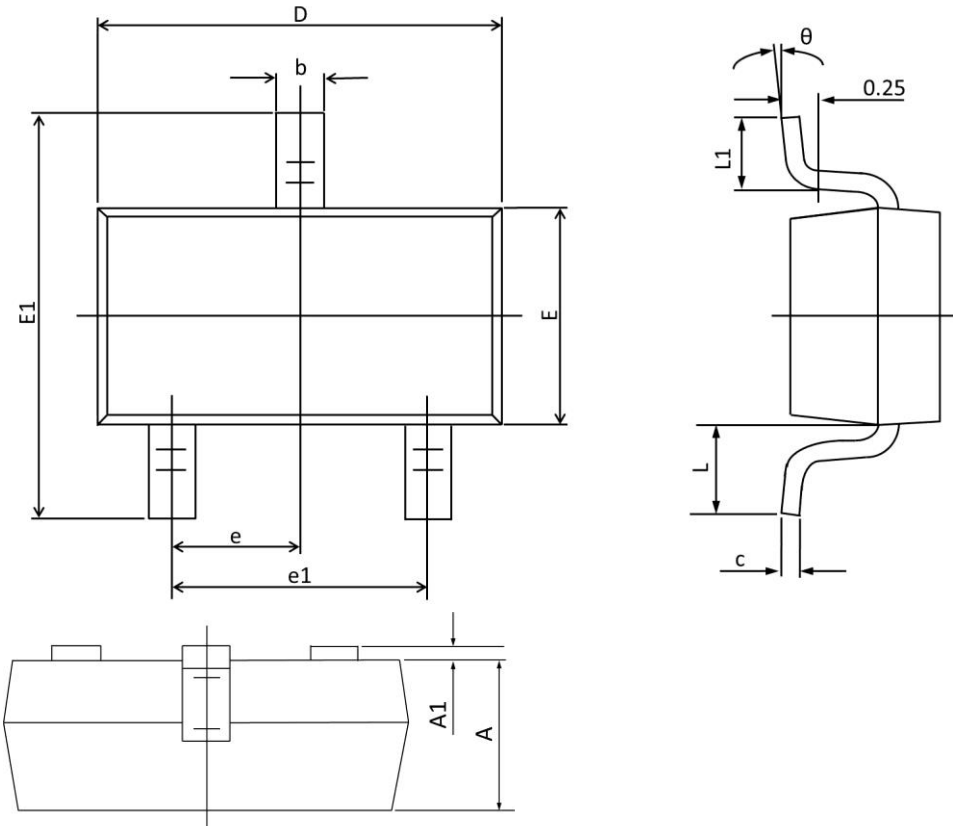


Figure 8. Maximum Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions in Milimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.110	0.035	0.044
A1	0.001	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.080	0.180	0.003	0.008
D	2.800	3.040	0.110	0.120
E	1.200	1.400	0.047	0.055
E1	2.100	2.640	0.080	0.104
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.040	0.070	0.080
L	0.550 REF.		0.022 REF.	
L1	0.100	0.500	0.004	0.020
θ	1°	10°	1°	10°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFC04031	SOT-23	C4099	Tape & Reel	3,000 Pcs / Reel