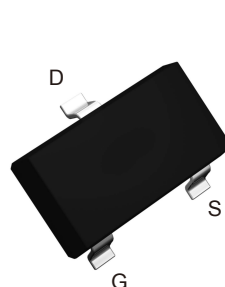
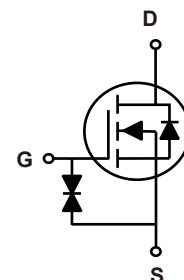


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	650m Ω (Max.)
I_D	0.6A



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 GSFC0301K 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 ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous ($T_C=25^{\circ}\text{C}$)	I_D	600	mA
Drain Current-Continuous ($T_C=75^{\circ}\text{C}$)		460	mA
Drain Current-Pulsed ¹	I_{DM}	2.4	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	310	mW
Power Dissipation-Derate Above 25°C		2.5	mW/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	400	$^{\circ}\text{C/W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-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 =250μA	30	-	-	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	-	-	10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±20	μA
		V _{GS} =±5V, V _{DS} =0V, T _J =85°C	-	-	±1	μA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =0.3A	-	480	650	mΩ
		V _{GS} =2.5V, I _D =0.2A	-	600	800	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	0.5	0.7	1.2	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		-	-1.74	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =4V, I _D =0.3A	-	1	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =15V, I _D =0.3A, V _{GS} =4.5V	-	2.6	5.2	nC
Gate-Source Charge ^{2,3}	Q _{gs}		-	0.9	1.8	
Gate-Drain Charge ^{2,3}	Q _{gd}		-	0.6	1.2	
Turn-On Delay Time ^{2,3}	t _{d(on)}	V _{DD} =15V, R _G =10Ω, V _{GS} =4.5V, I _D =0.3A	-	5.5	11	nS
Rise Time ^{2,3}	t _r		-	4	8	
Turn-Off Delay Time ^{2,3}	t _{d(off)}		-	14.5	29	
Fall Time ^{2,3}	t _f		-	6.5	13	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1MHz	-	72.9	146	PF
Output Capacitance	C _{oss}		-	18.3	36.6	
Reverse Transfer Capacitance	C _{rss}		-	7.4	14.8	
Drain-Source Ratings and Characteristics						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	0.6	A
Pulsed Source Current	I _{SM}		-	-	1.2	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =0.3A, T _J =25°C	-	-	1	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _S =0.3A, di/dt=100A/μs, T _J =25°C	-	13	-	nS
Reverse Recovery Charge	Q _{rr}		-	6	-	nC

Notes:

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

Typical Electrical and Thermal Characteristic Curves

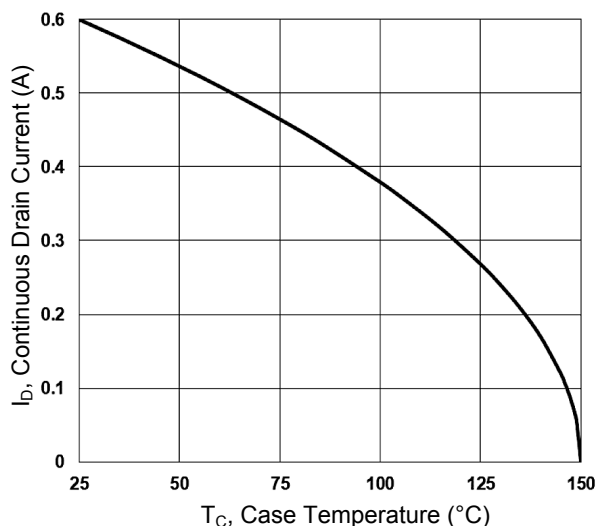


Figure 1. Continuous Drain Current vs. T_C

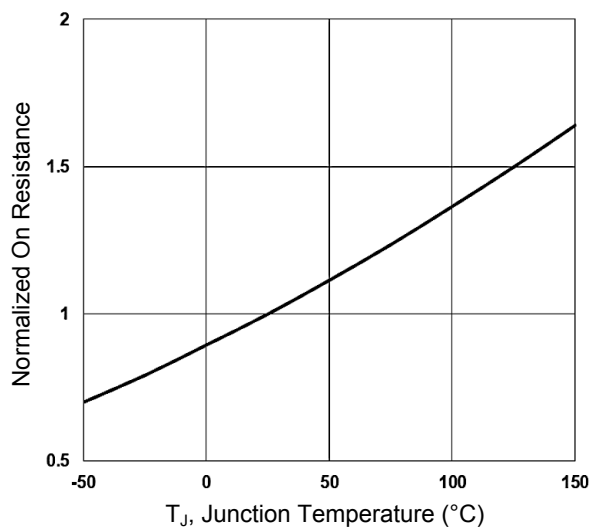


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

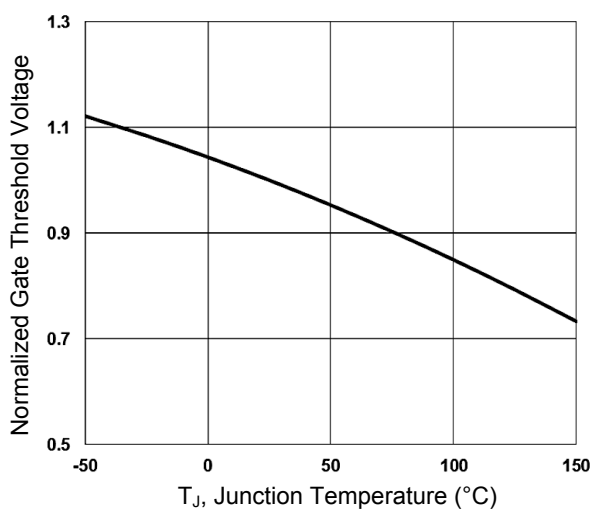


Figure 3. Normalized V_{th} vs. T_J

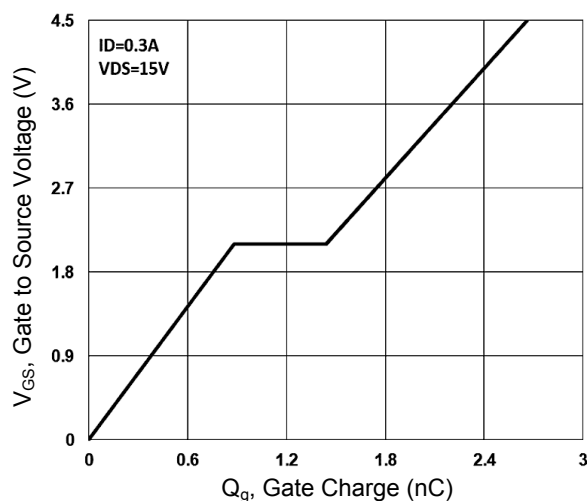


Figure 4. Gate Charge Waveform

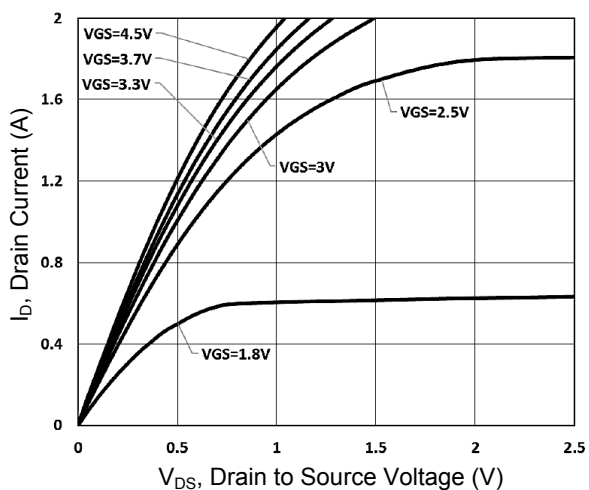


Figure 5. Typical Output Characteristics

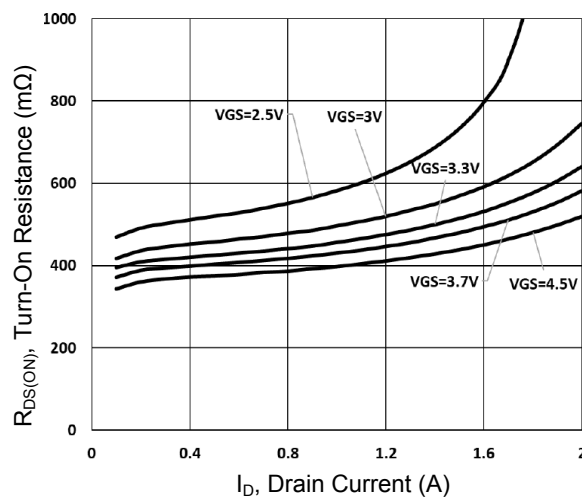


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

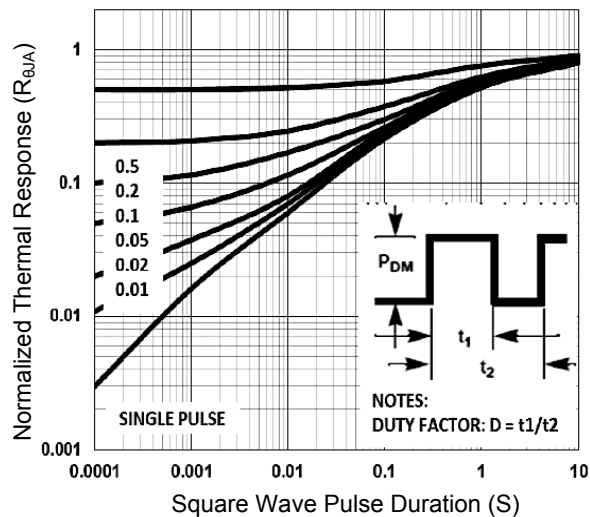


Figure 7. Normalized Transient Response

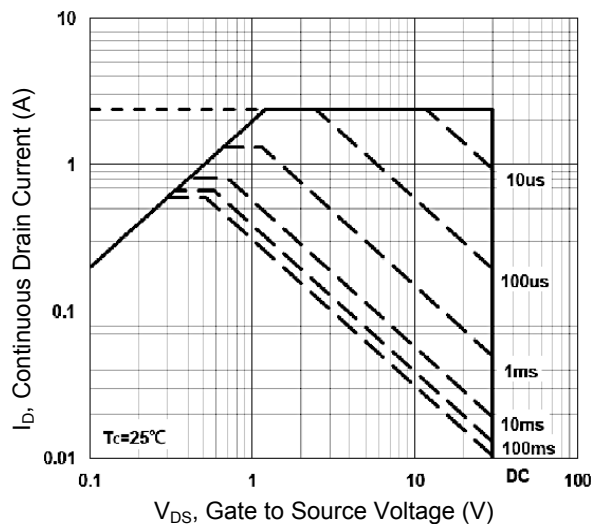
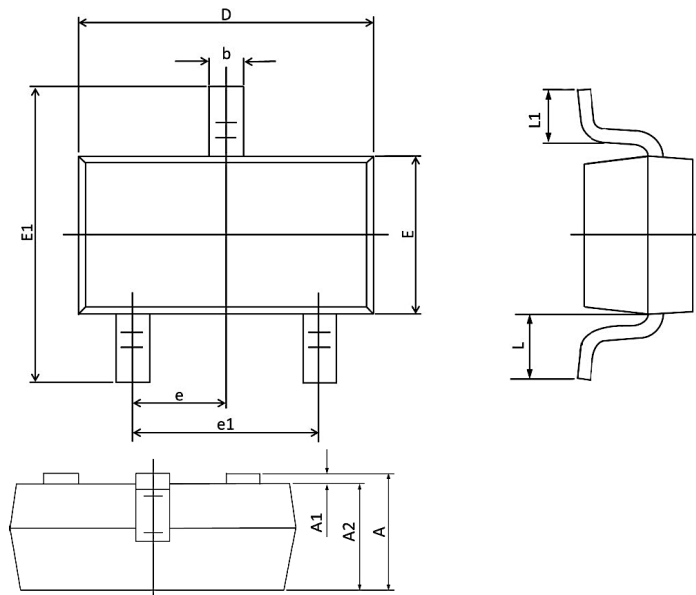


Figure 8. Maximum Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.047
A1	0.000	0.100	0.000	0.004
A2	0.900	1.150	0.035	0.045
b	0.300	0.500	0.012	0.020
D	2.800	3.040	0.110	0.120
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

Order Information

Device	Package	Marking	Carrier	Quantity
GSFC0301K	SOT-23	O** ** varied by lot	Tape & Reel	3,000 Pcs / Reel