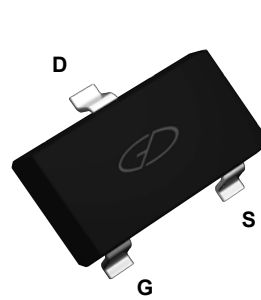
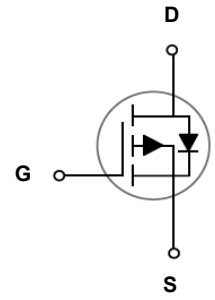


### Main Product Characteristics

$BV_{DSS}$	-40V
$R_{DS(ON)}$	68m $\Omega$
$I_D$	-2.9A



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 GSFC0403 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 supply 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	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_A=25^\circ\text{C}$ )	$I_D$	-2.9	A
Drain Current-Continuous ( $T_A=100^\circ\text{C}$ )		-2.32	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-11.6	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1	W
Power Dissipation-De-rate above 25 $^\circ\text{C}$		8	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

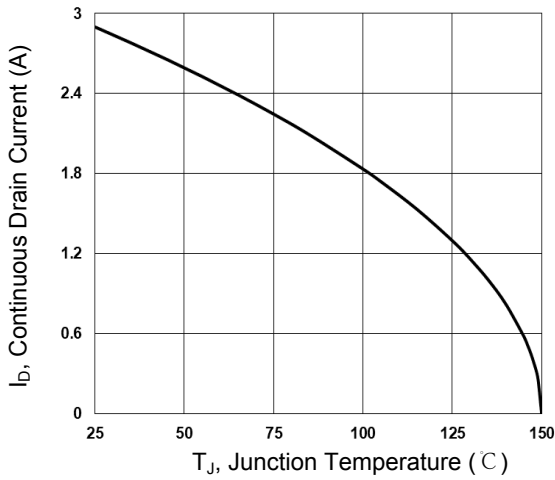
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-32V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-2A$	-	55	68	m $\Omega$
		$V_{GS}=-4.5V, I_D=-1A$	-	75	100	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-1.65	-2.5	V
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-1A$	-	3	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-32V, I_D=-2A, V_{GS}=-10V$	-	6.4	13	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.5	2	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	2.7	6	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=-20V, R_G=6\Omega, V_{GS}=-10V, I_D=-1A$	-	12	24	nS
Rise Time <sup>2,3</sup>	$t_r$		-	9	20	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	45	90	
Fall Time <sup>2,3</sup>	$t_f$		-	5	10	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	-	600	1200	pF
Output Capacitance	$C_{oss}$		-	60	120	
Reverse Transfer Capacitance	$C_{rss}$		-	43	80	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	-2.9	A
Pulsed Source Current	$I_{SM}$		-	-	-5.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}\text{C}$	-	-	-1	V

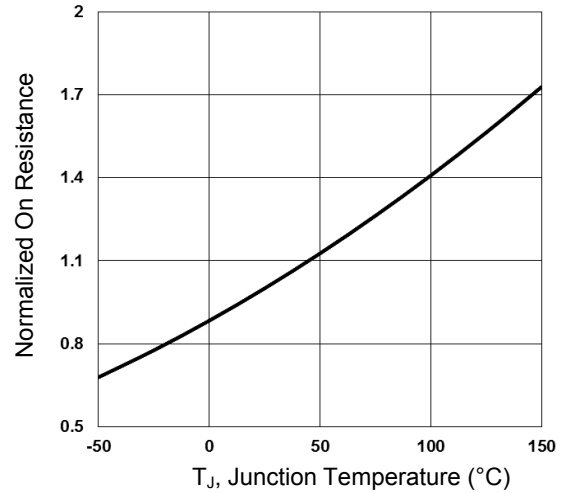
Note:

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.

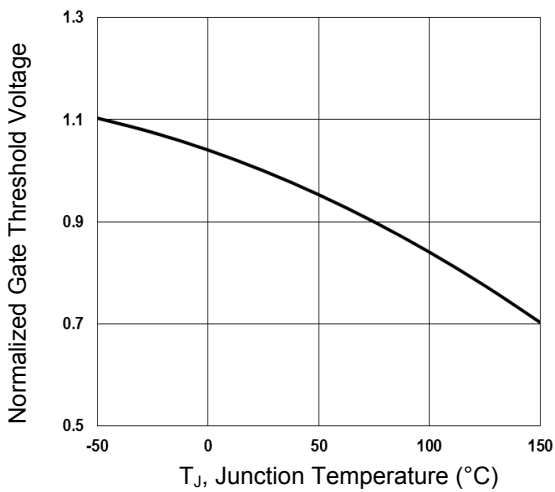
**Typical Electrical and Thermal Characteristic Curves**



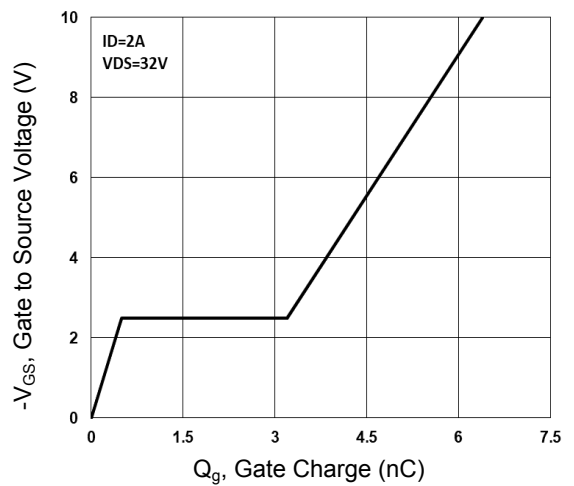
**Figure 1. Continuous Drain Current vs.  $T_J$**



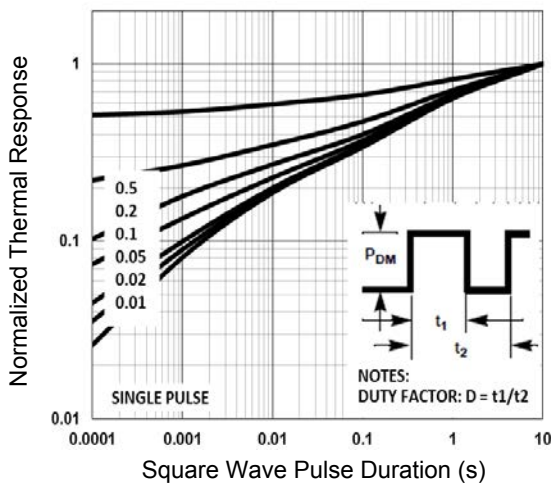
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_J$**



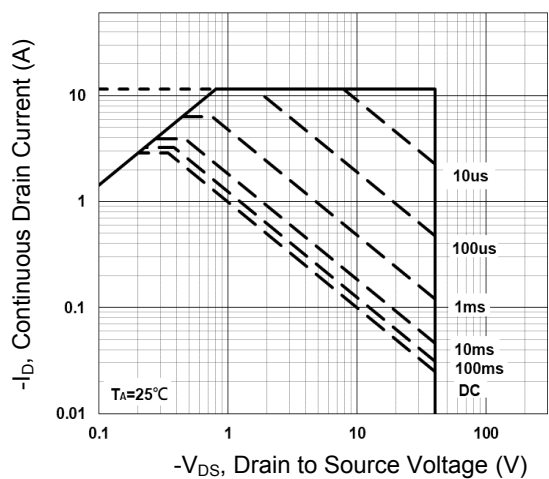
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

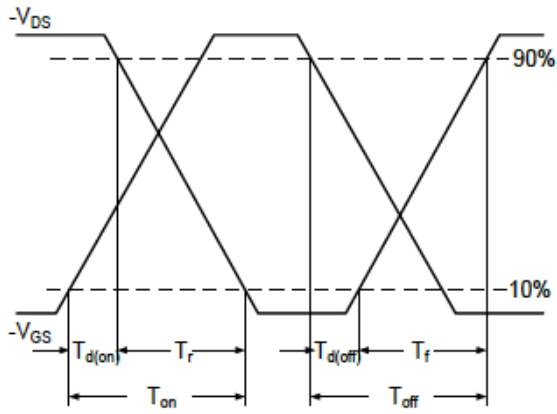


**Figure 5. Normalized Transient Impedance**

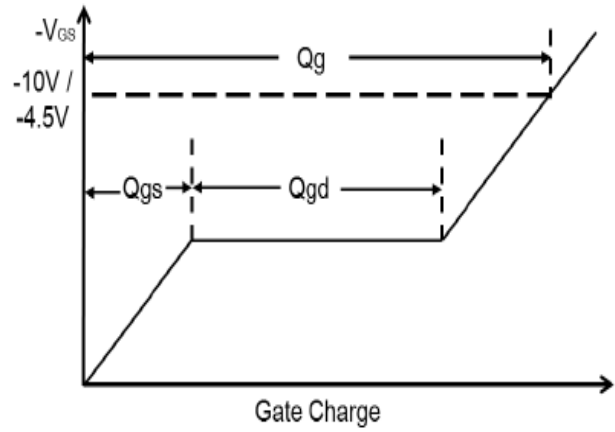


**Figure 6. Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

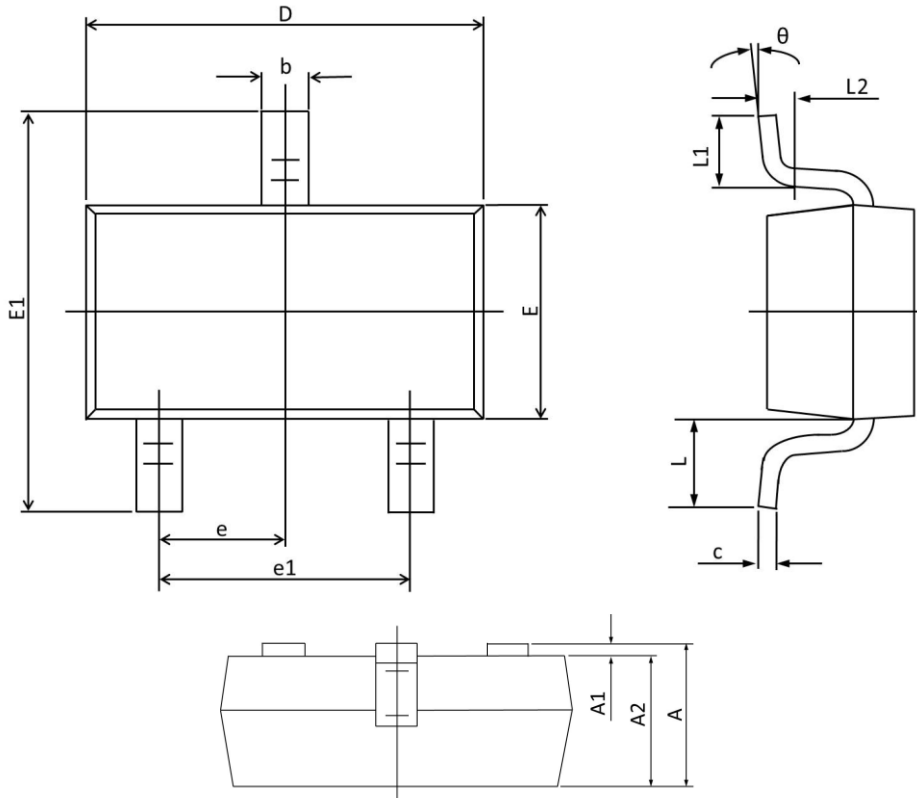


**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

**Package Outline Dimensions (SOT-23)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	1.150	0.900	0.045	0.035
A1	0.100	0.000	0.004	0.000
A2	1.050	0.900	0.041	0.035
b	0.500	0.300	0.020	0.012
c	0.150	0.080	0.006	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.95 TYP.		0.037 TYP.	
e1	2.000	1.800	0.079	0.071
L	0.55 REF.		0.022 REF.	
L1	0.500	0.300	0.020	0.012
L2	0.25 TYP.		0.01 TYP.	
θ	8°	0°	8°	0°