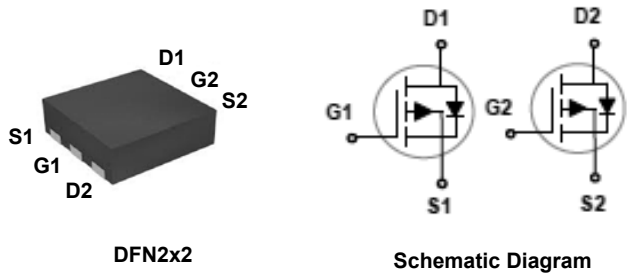


### Main Product Characteristics

$BV_{DSS}$	-20V
$R_{DS(ON)}$	85m $\Omega$
$I_D$	-3A



### 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 GSFB0203D 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	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current – Continuous ( $T_A=25^\circ\text{C}$ )	$I_D$	-3	A
Drain Current – Continuous ( $T_A=70^\circ\text{C}$ )		-2.4	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	-12	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1.25	W
Power Dissipation – Derate above 25 $^\circ\text{C}$		0.01	W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1mA$	-	0.01	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-16V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-3A$	-	70	85	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2A$	-	95	120	
		$V_{GS}=-1.8V, I_D=-1A$	-	130	170	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.3	-0.6	-1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	3	-	$mV/^\circ\text{C}$
Forward Transconductance	gfs	$V_{DS}=-10V, I_S=-1A$	-	2.2	-	S
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-10V,$ $V_{GS}=-4.5V, I_D=-3A$	-	4.8	8	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.5	1	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	1.9	4	
Turn-On Delay Time <sup>2,3</sup>	$T_{d(on)}$	$V_{DD}=-10V,$ $V_{GS}=-4.5V, R_G=25\Omega,$ $I_D=-1A$	-	3.5	7	ns
Rise Time <sup>2,3</sup>	$T_r$		-	12.6	24	
Turn-Off Delay Time <sup>2,3</sup>	$T_{d(off)}$		-	32.6	62	
Fall Time <sup>2,3</sup>	$T_f$		-	8.4	16	
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V,$ $F=1MHz$	-	350	510	pF
Output Capacitance	$C_{oss}$		-	65	95	
Reverse Transfer Capacitance	$C_{rss}$		-	50	75	

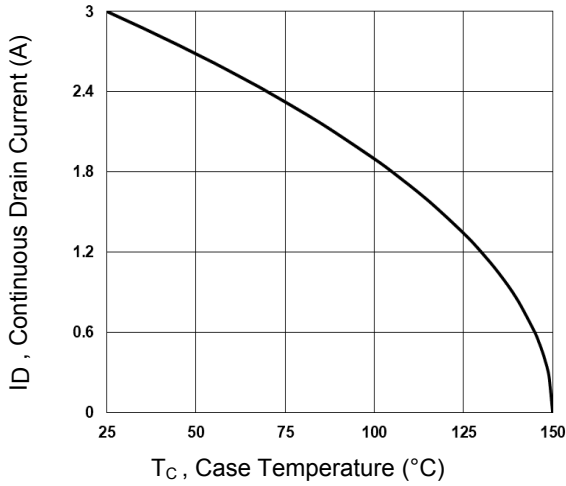
**Source-Drain Ratings and Characteristics**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	-3	A
Pulsed Source Current	$I_{SM}$		-	-	-6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A,$ $T_J=25^\circ\text{C}$	-	-	-1	V

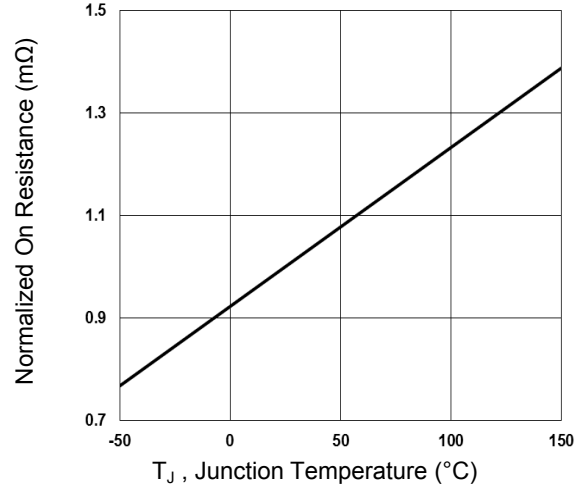
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

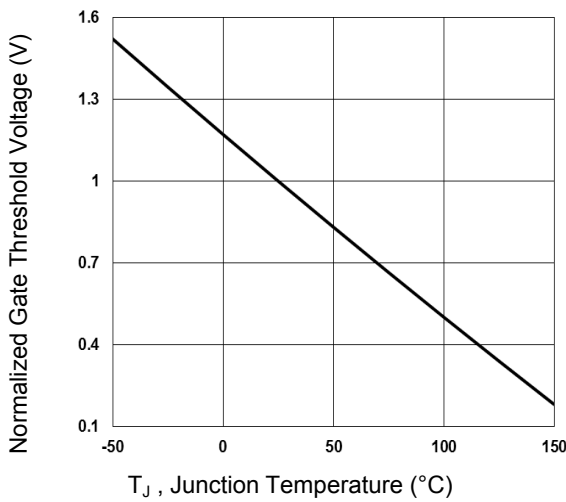
**Typical Electrical and Thermal Characteristic Curves**



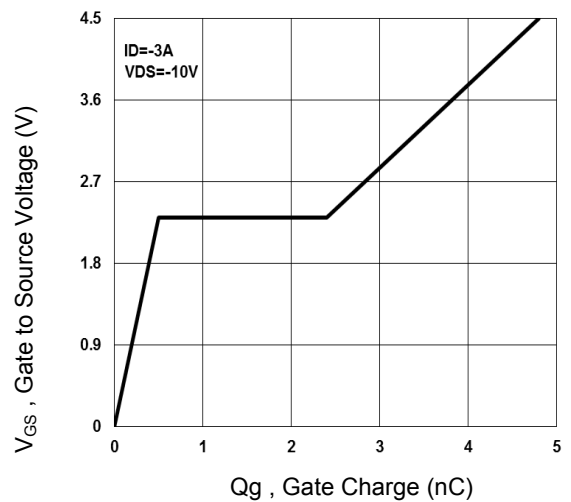
**Figure 1. Continuous Drain Current vs.  $T_c$**



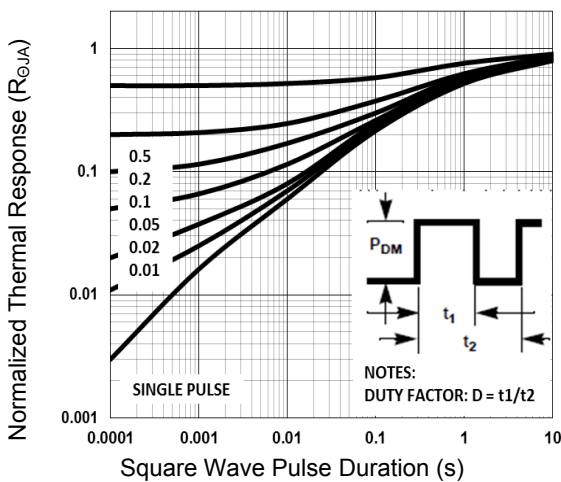
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_j$**



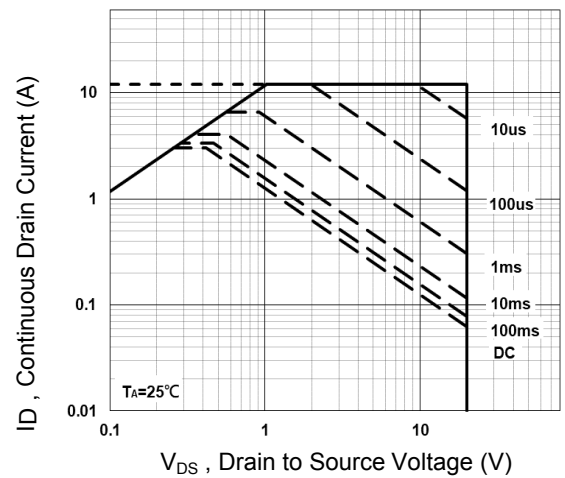
**Figure 3. Normalized  $V_{th}$  vs.  $T_j$**



**Figure 4. Gate Charge Characteristics**

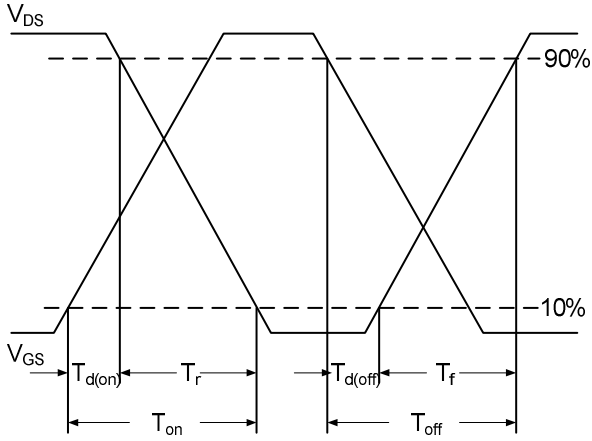


**Figure 5. Normalized Transient Response**

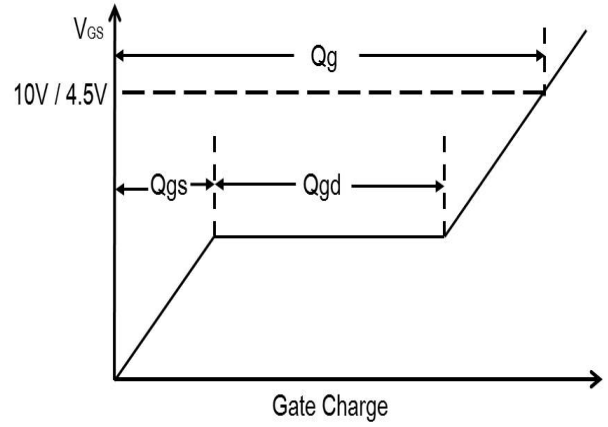


**Figure 6. Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

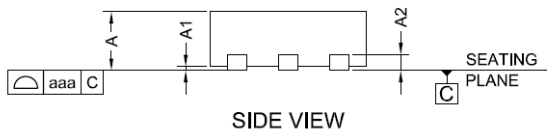
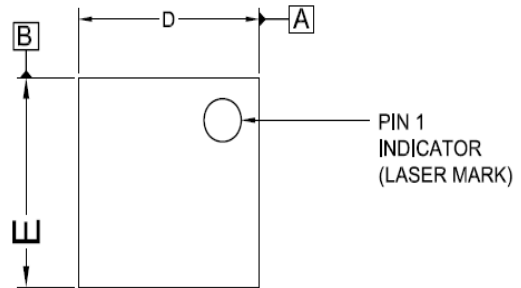
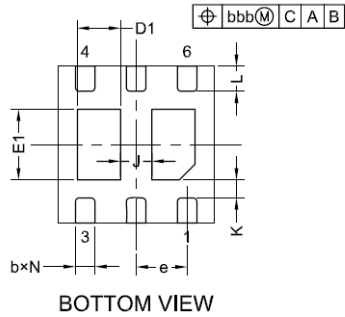


**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

## Package Outline Dimensions (PPAK 2x2)



COMMON DIMENSIONS  
 (UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.203		
b	0.20	0.25	0.30
D	1.95	2.00	2.05
D1	0.50	0.55	0.60
E	1.95	2.00	2.05
E1	0.85	0.90	0.95
e	0.65BSC		
L	0.27	0.32	0.37
J	0.40BSC		
K	0.20MIN		
N	6		
aaa	0.08		
bbb	0.10		