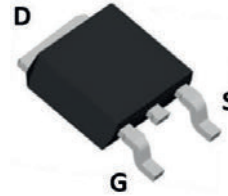
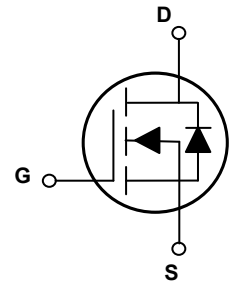


### Main Product Characteristics

$BV_{DSS}$	40V
$R_{DS(ON)}$	7.1m $\Omega$ (Typ.)
$I_D$	60A



TO-252 (DPAK)



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 GSFD4010 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	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	60	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		38	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	240	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	76	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	39	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	62	W
Power Dissipation-Derate above $25^\circ\text{C}$		0.496	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.01	$^\circ\text{C/W}$
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
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$	-	0.03	-	$V/^\circ\text{C}$
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 <sup>3</sup>	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	7.1	10	m $\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	10	14	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5	-	$mV/^\circ\text{C}$
Forward Transconductance	gfs	$V_{DS}=10V, I_D=3A$	-	16	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=20V, I_D=10A,$ $V_{GS}=4.5V$	-	16.2	32	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	3.85	7	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	6.05	12	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=15V, R_G=6\Omega,$ $V_{GS}=10V, I_D=1A$	-	13.6	25	nS
Rise Time <sup>3,4</sup>	$t_r$		-	2.5	5	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	68	120	
Fall Time <sup>3,4</sup>	$t_f$		-	5	10	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $F=1MHz$	-	1540	2500	pF
Output Capacitance	$C_{oss}$		-	171	330	
Reverse Transfer Capacitance	$C_{rss}$		-	115	220	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	1.2	2.2	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	60	A
Pulsed Source Current <sup>3</sup>	$I_{SM}$		-	-	120	A
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	1	V

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=39A,$  starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\mu s,$  duty cycle  $\leq 2\%$ .
4. Essentially independent of operation temperature.

### Typical Electrical and Thermal Characteristic Curves

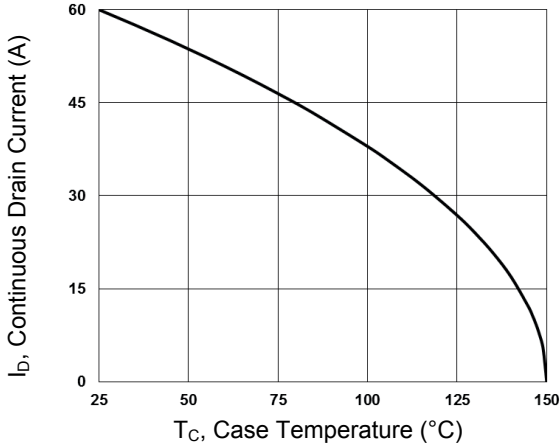


Figure 1. Continuous Drain Current vs. T<sub>C</sub>

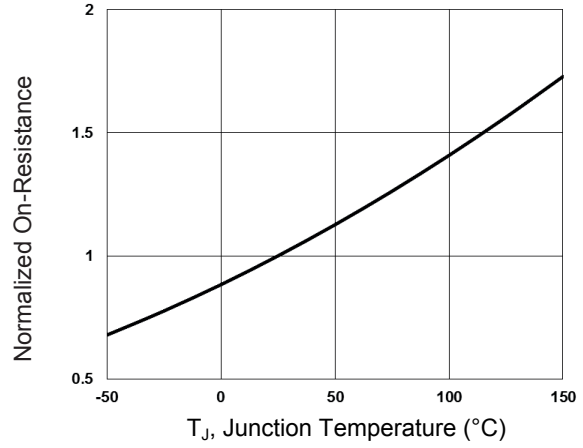


Figure 2. Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>

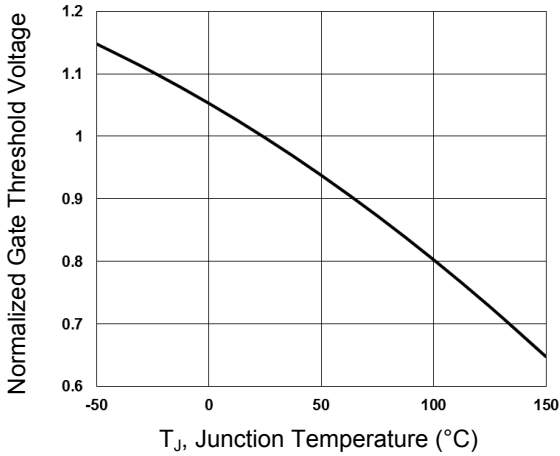


Figure 3. Normalized V<sub>th</sub> vs. T<sub>J</sub>

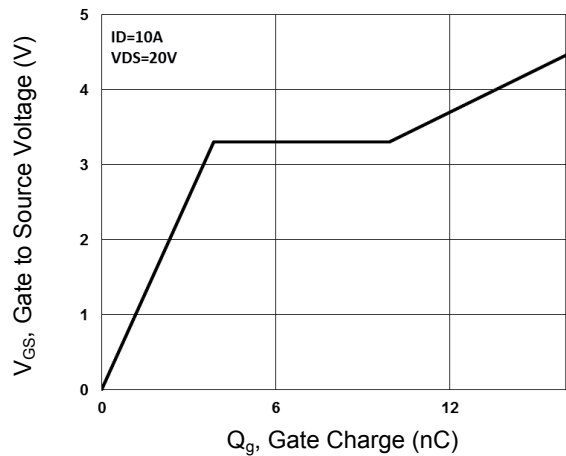


Figure 4. Gate Charge Waveform

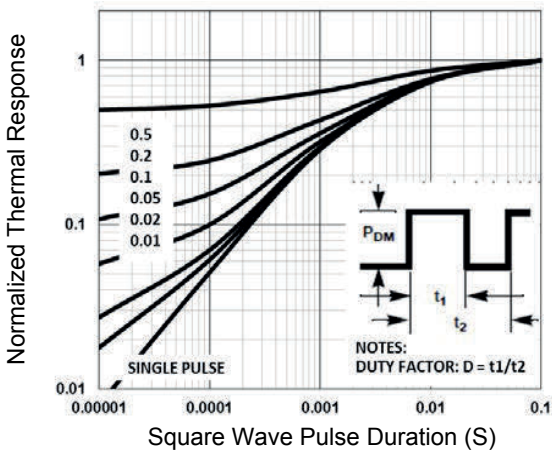


Figure 5. Normalized Transient Impedance

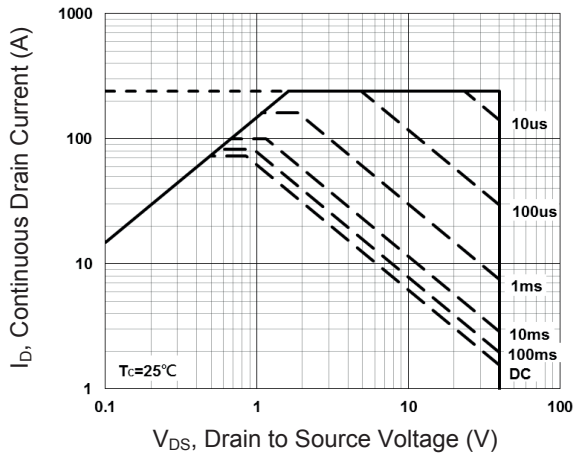
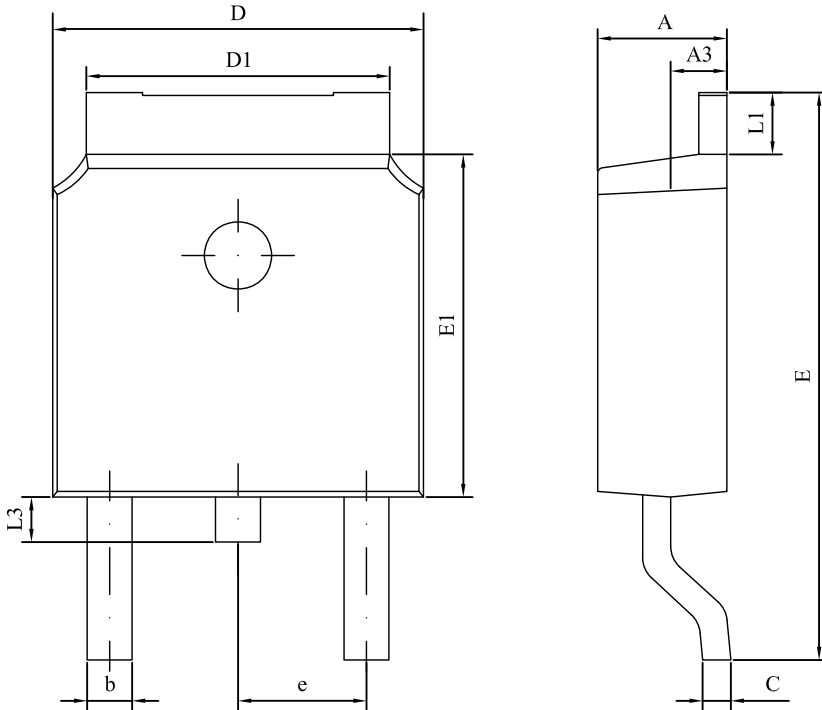


Figure 6. Maximum Safe Operation Area

**Package Outline Dimensions TO-252 (DPAK)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

**Order Information**

Device	Package	Marking	Carrier	Quantity
GSFD4010	TO-252 (DPAK)	D4010	Tape & Reel	2,500 Pcs / Reel

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)