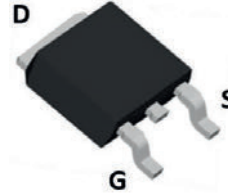
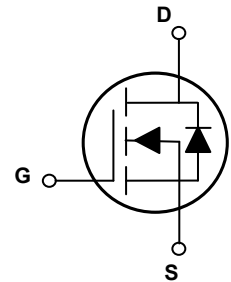


### Main Product Characteristics

$BV_{DSS}$	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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	60	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		38	
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	240	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	76	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	39	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	62	W
Power Dissipation-Derate above 25°C		0.496	
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	2.01	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55 To +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 To +150	°C

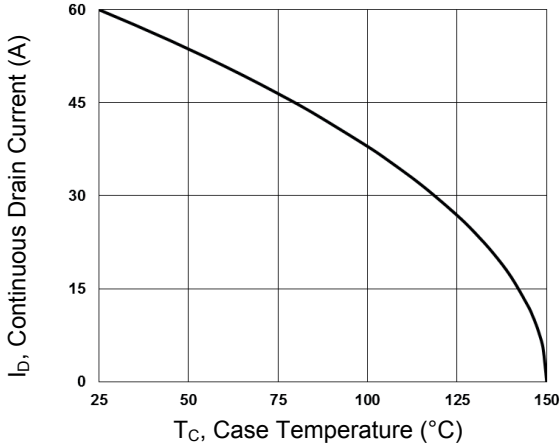
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	40	-	-	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =1mA	-	0.03	-	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	-	-	1	μA
		V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	-	-	10	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	-	7.1	10	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	-	10	14	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1.2	1.6	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		-	-5	-	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	-	16	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =10A, V <sub>GS</sub> =4.5V	-	16.2	32	nC
Gate-Source Charge <sup>3,4</sup>	Q <sub>gs</sub>		-	3.85	7	
Gate-Drain Charge <sup>3,4</sup>	Q <sub>gd</sub>		-	6.05	12	
Turn-On Delay Time <sup>3,4</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V, I <sub>D</sub> =1A	-	13.6	25	nS
Rise Time <sup>3,4</sup>	t <sub>r</sub>		-	2.5	5	
Turn-Off Delay Time <sup>3,4</sup>	t <sub>d(off)</sub>		-	68	120	
Fall Time <sup>3,4</sup>	t <sub>f</sub>		-	5	10	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1MHz	-	1540	2500	pF
Output Capacitance	C <sub>oss</sub>		-	171	330	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	115	220	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1.2	2.2	Ω
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	-	-	60	A
Pulsed Source Current <sup>3</sup>	I <sub>SM</sub>		-	-	120	A
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	-	-	1	V

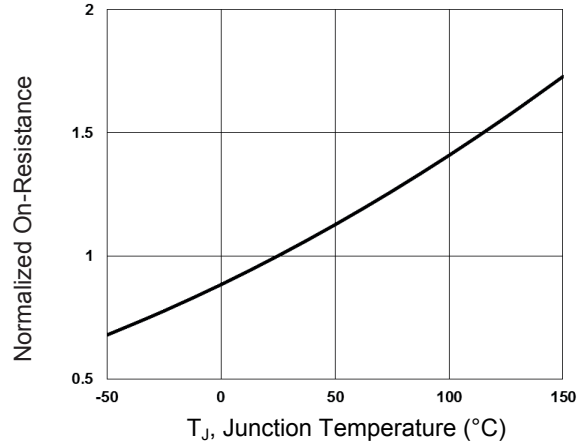
Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=39A, starting T<sub>J</sub>=25°C.
3. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operation temperature.

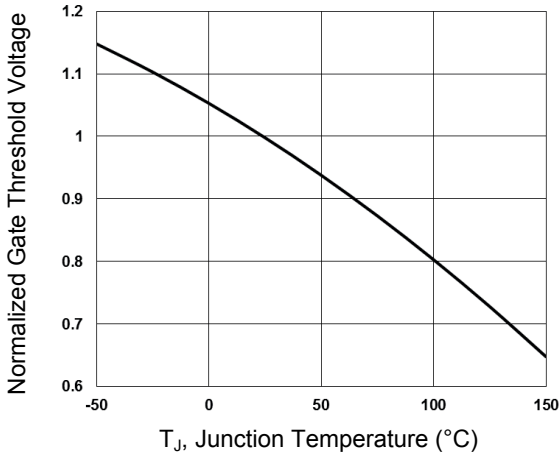
**Typical Electrical and Thermal Characteristic Curves**



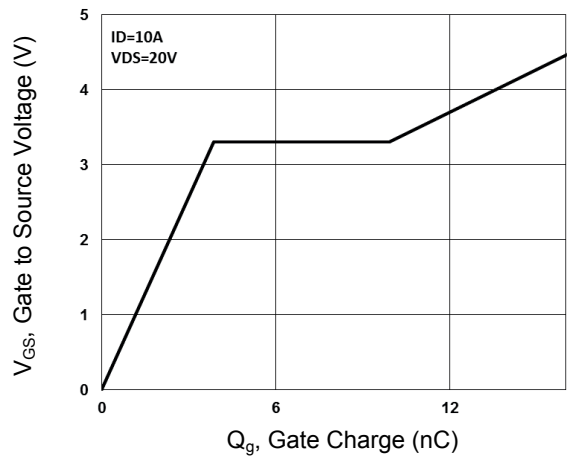
**Figure 1. Continuous Drain Current vs. T<sub>c</sub>**



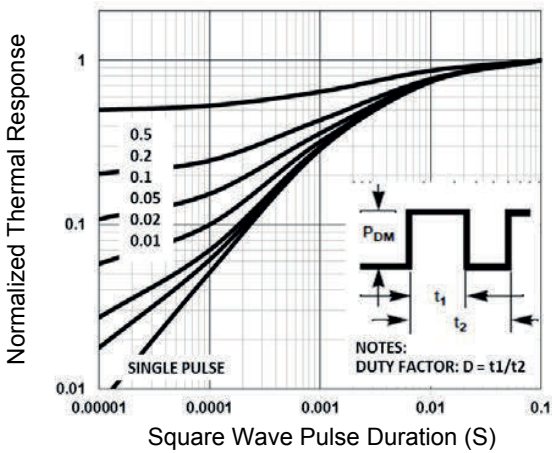
**Figure 2. Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>**



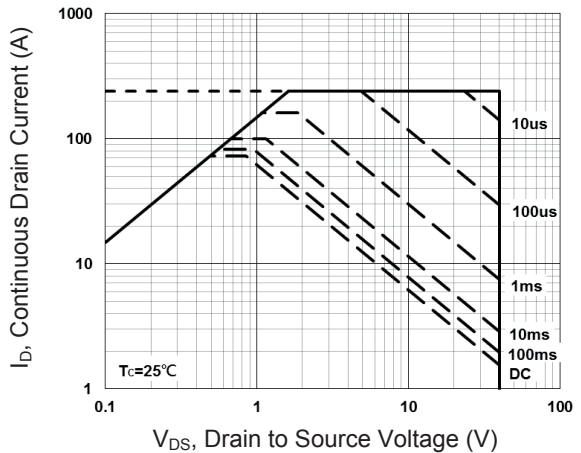
**Figure 3. Normalized V<sub>th</sub> vs. T<sub>J</sub>**



**Figure 4. Gate Charge Waveform**

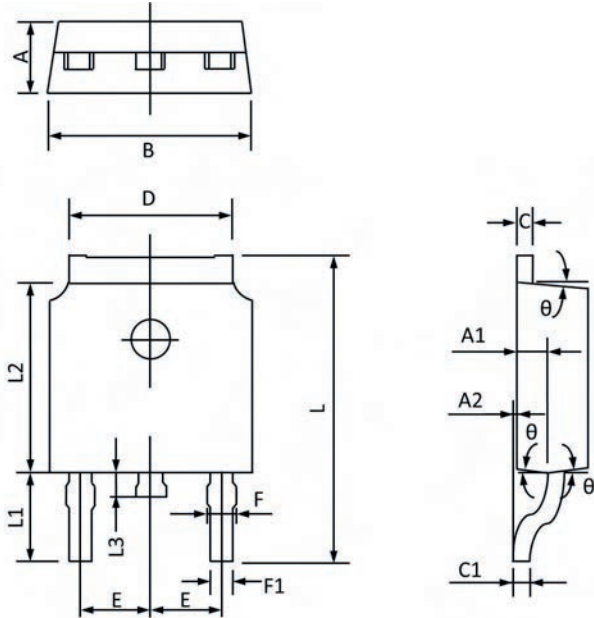


**Figure 5. Normalized Transient Impedance**



**Figure 6. Maximum Safe Operation Area**

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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.910	1.110	0.036	0.044
A2	0.000	0.150	0.000	0.006
B	6.400	6.800	0.252	0.268
C	0.450	0.580	0.018	0.023
C1	0.460	0.580	0.018	0.023
D	5.100	5.500	0.201	0.217
E	2.186	2.386	0.086	0.094
F	0.600	0.940	0.024	0.037
F1	0.500	0.860	0.020	0.034
L	9.400	10.400	0.370	0.409
L1	2.400	3.000	0.094	0.118
L2	5.400	6.200	0.213	0.244
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°

### Order Information

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

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