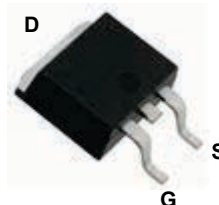
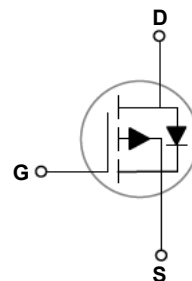


### Main Product Characteristics

$V_{(BR)DSS}$	-100V
$R_{DS(ON)}$	210mΩ
$I_D$	-10A



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

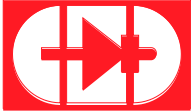


### Description

The GSFD1011 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 ( $T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	-10	A
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		-6.5	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-40	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	54	W
Power Dissipation-Derate above 25°C		0.43	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.3	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

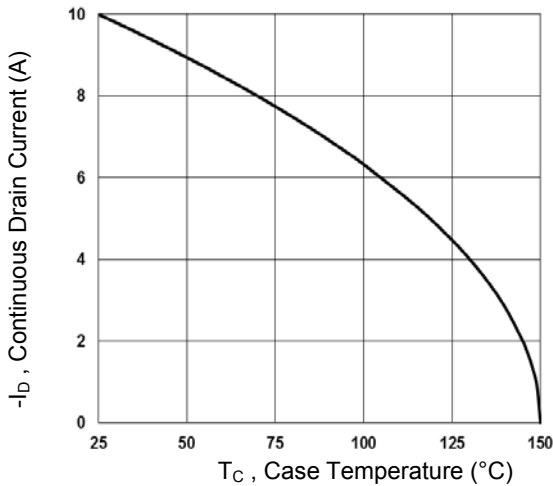

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1mA$	-	-	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-100V,$ $V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-80V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$	-	170	210	m $\Omega$
		$V_{GS}=-4.5V, I_D=-2A$	-	190	230	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1	-	-3	V
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-3A$	-	7	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-80V, I_D=-5A$ $V_{GS}=-10V$	-	20	40	nC
Gate-Source Charge	$Q_{gs}$		-	3.5	7	
Gate-Drain Charge	$Q_{gd}$		-	4.6	9	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-50V, R_G=25\Omega$ $V_{GS}=-10V, I_D=-5A$	-	18	36	nS
Rise Time	$t_r$		-	8	16	
Turn-Off Delay Time	$t_{d(off)}$		-	100	200	
Fall Time	$t_f$		-	30	60	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V,$ $V_{GS}=0V, F=1MHz$	-	1419	2500	pF
Output Capacitance	$C_{oss}$		-	89	170	
Reverse Transfer Capacitance	$C_{rss}$		-	45	90	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	16	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	-10	A
Pulsed Source Current	$I_{SM}$		-	-	-20	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A,$ $T_J=25^\circ\text{C}$	-	-	-1.2	V
Reverse Recovery Time <sup>2</sup>	$t_{rr}$	$V_{GS}=0V, I_S=-5A$ $di/dt=100A/\mu s$ $T_J=25^\circ\text{C}$	-	26.6	-	nS
Reverse Recovery Charge <sup>2</sup>	$Q_{rr}$		-	24.2	-	nC

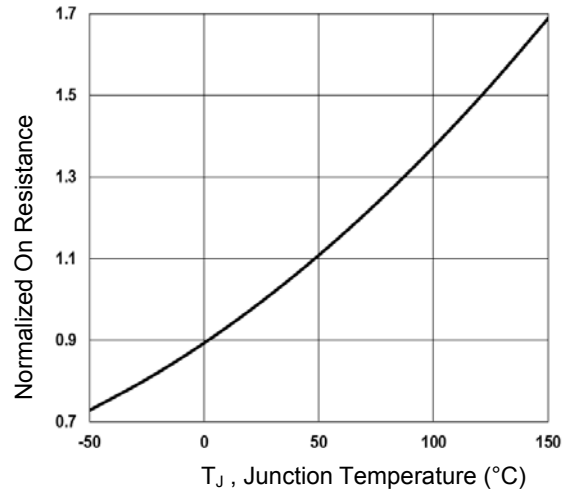
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

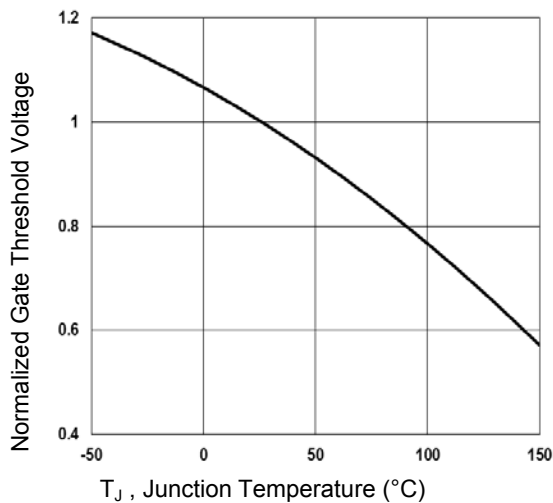
**Typical Electrical and Thermal Characteristic Curves**



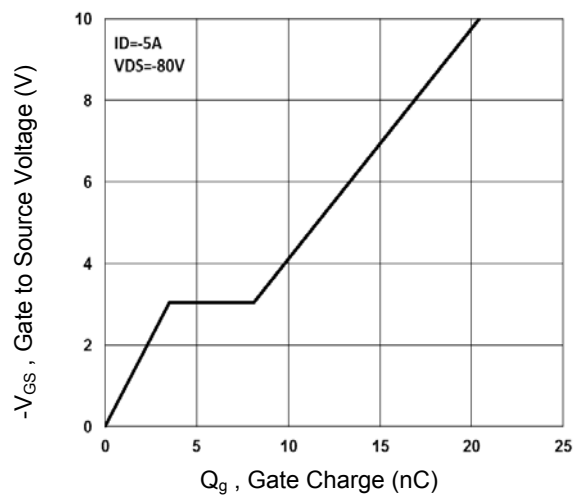
**Figure 1. Continuous Drain Current vs.  $T_c$**



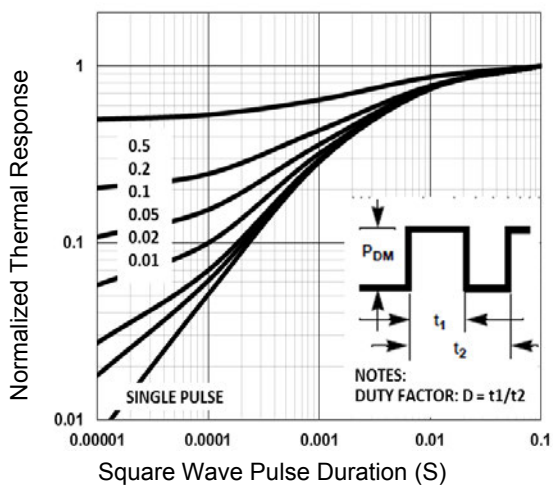
**Figure 2. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



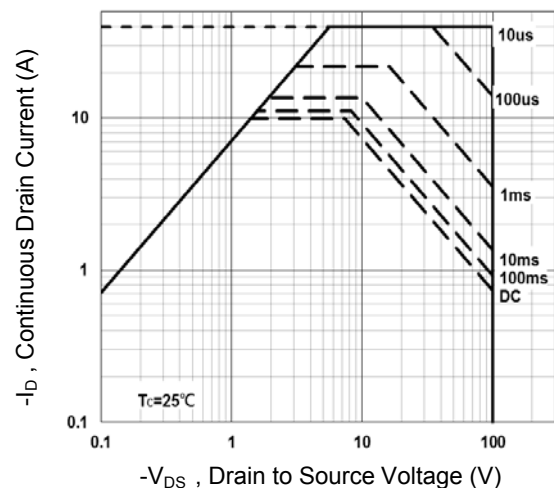
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

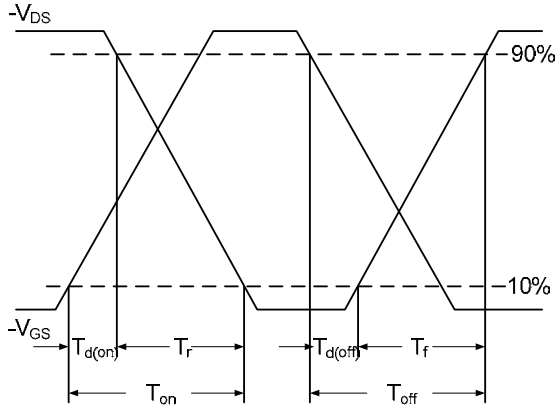


**Figure 5. Normalized Transient Impedance**

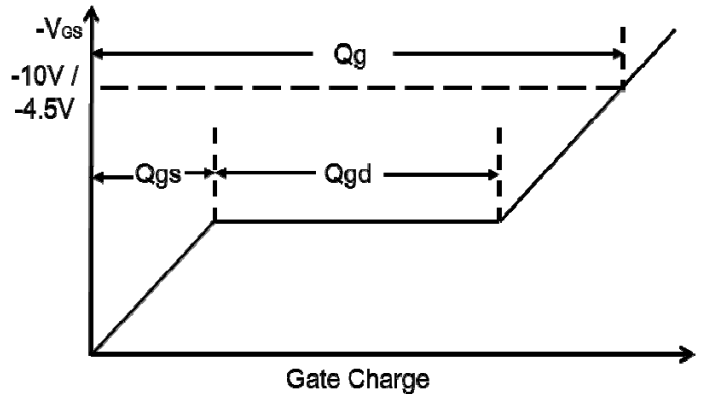


**Figure 6. Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**



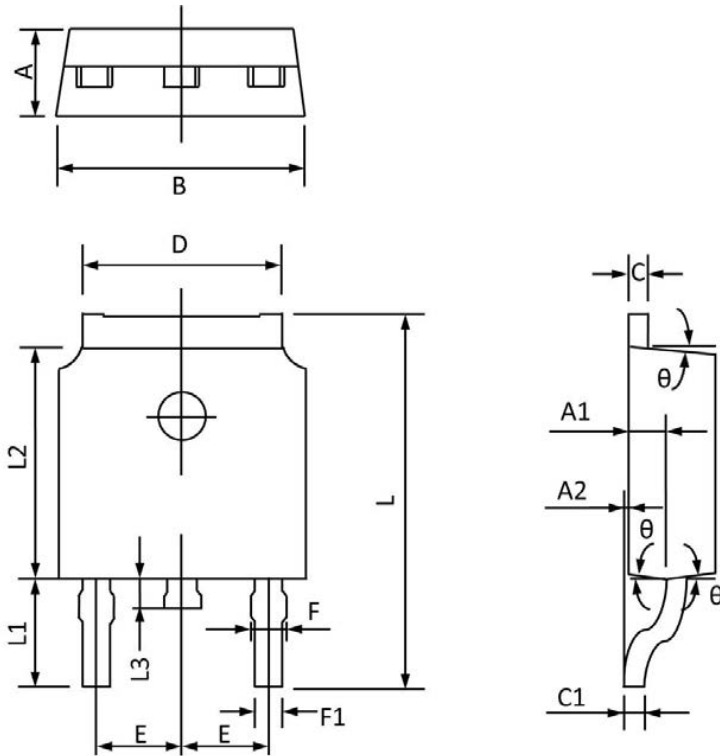
**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

**Package Outline Dimensions**

**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	6.500	6.700	0.256	0.264
C	0.460	0.580	0.018	0.230
C1	0.460	0.580	0.018	0.030
D	5.100	5.460	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.740	0.940	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.800	10.400	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.000	6.200	0.236	0.244
L3	0.600	1.000	0.024	0.039
θ	3°	9°	3°	9°