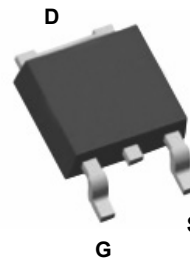
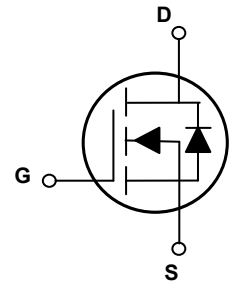


### Main Product Characteristics

$BV_{DSS}$	100V
$R_{DS(ON)}$	10.8m $\Omega$
$I_D$	50A



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 GSFD0982 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<sub>C</sub>=25°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 <sub>C</sub> =25°C)	$I_D$	50	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		32	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	200	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	115	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	48	A
Power Dissipation (T <sub>C</sub> =25°C)	$P_D$	78	W
Power Dissipation-Derate above 25°C		0.624	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.61	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

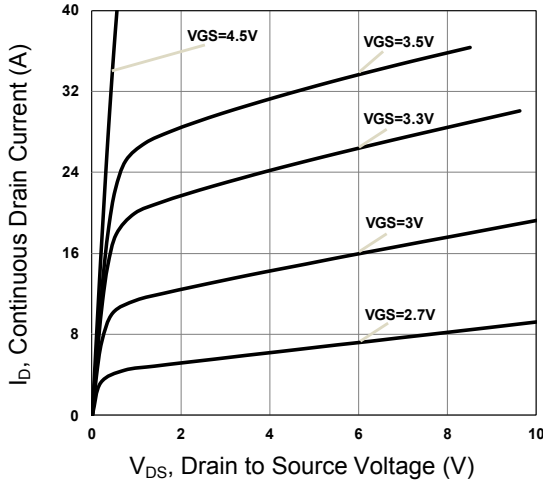
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

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
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=80V, V_{GS}=0V, T_J=85^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	9	10.8	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$	-	11.7	15.2	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.6	2.5	V
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=50V, I_D=10A, V_{GS}=10V$	-	26.1	39	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	6.5	10	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	5.3	8	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=50V, R_G=6\Omega, V_{GS}=10V, I_D=10A$	-	14.2	28	nS
Rise Time <sup>3,4</sup>	$t_r$		-	20.8	42	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	42	84	
Fall Time <sup>3,4</sup>	$t_f$		-	30	60	
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	-	1450	2145	pF
Output Capacitance	$C_{oss}$		-	215	322	
Reverse Transfer Capacitance	$C_{rss}$		-	8	20	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.04	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	50	A
Pulsed Source Current <sup>3</sup>	$I_{SM}$		-	-	100	A
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time <sup>3</sup>	$t_{rr}$	$V_R=100V, I_S=10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	155	-	nS
Reverse Recovery Charge <sup>3</sup>	$Q_{rr}$		-	230	-	nC

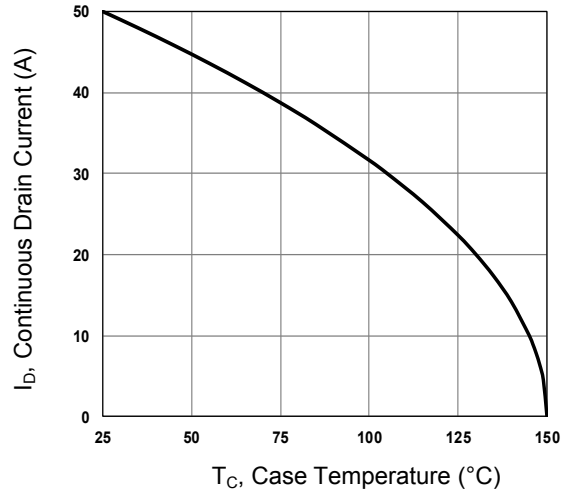
Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=48A, R_G=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

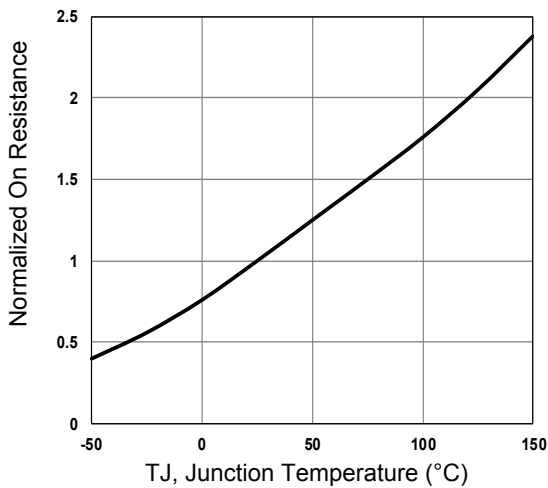
**Typical Electrical and Thermal Characteristic Curves**



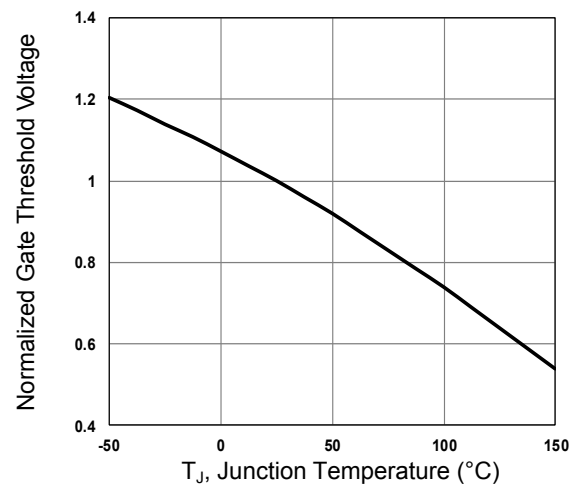
**Figure 1. Typical Output Characteristics**



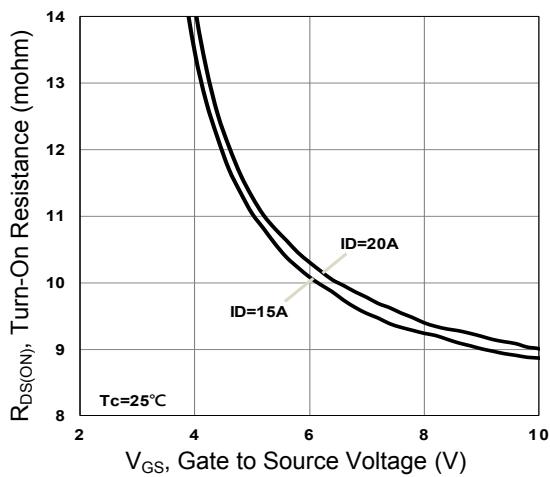
**Figure 2. Continuous Drain Current vs.  $T_C$**



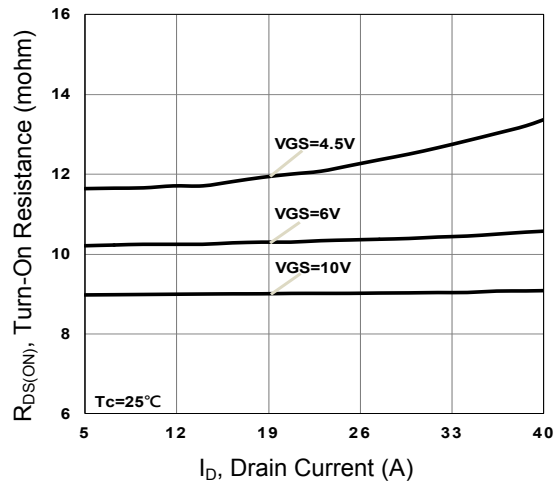
**Figure 3. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**Figure 4. Normalized  $V_{th}$  vs.  $T_J$**

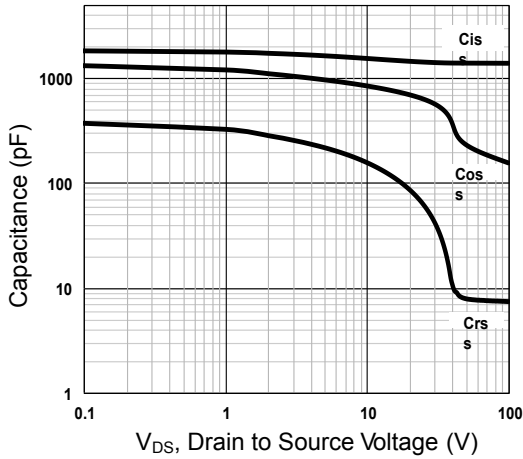


**Figure 5. Turn-On Resistance vs.  $V_{GS}$**

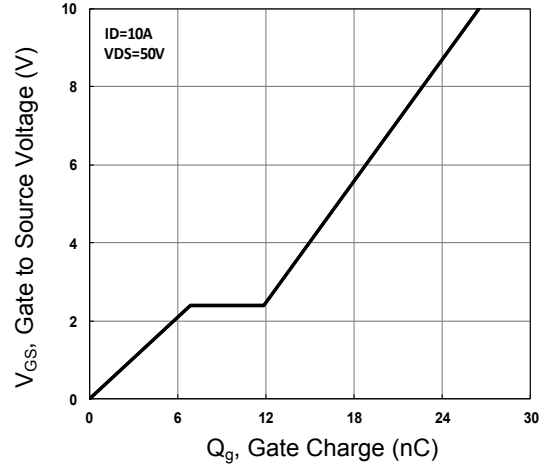


**Figure 6. Turn-On Resistance vs.  $I_D$**

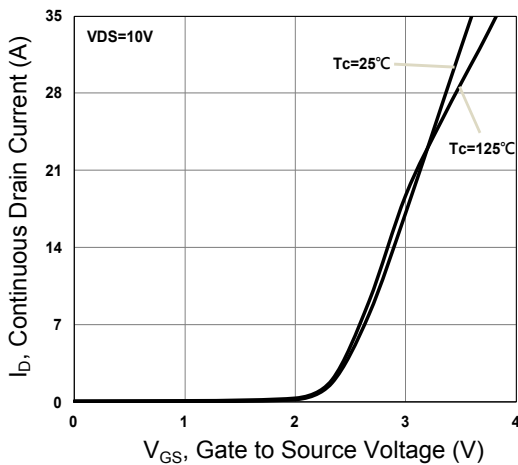
**Typical Electrical and Thermal Characteristic Curves**



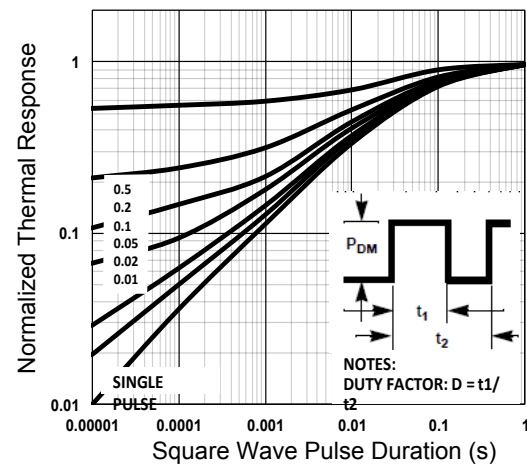
**Figure 7. Capacitance Characteristics**



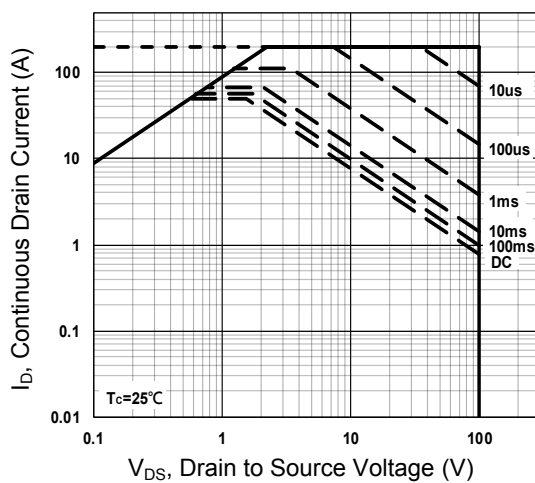
**Figure 8. Gate Charge Characteristics**



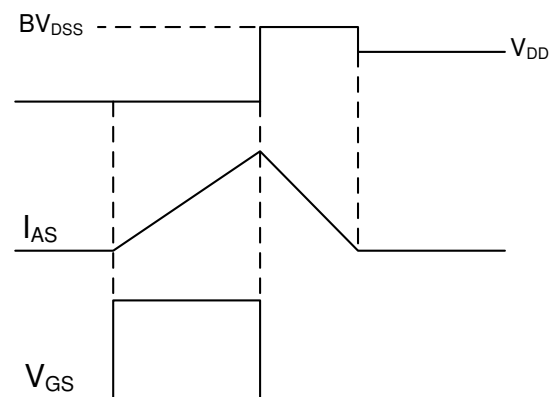
**Figure 9. Transfer Characteristics**



**Figure 10. Normalized Transient Impedance**

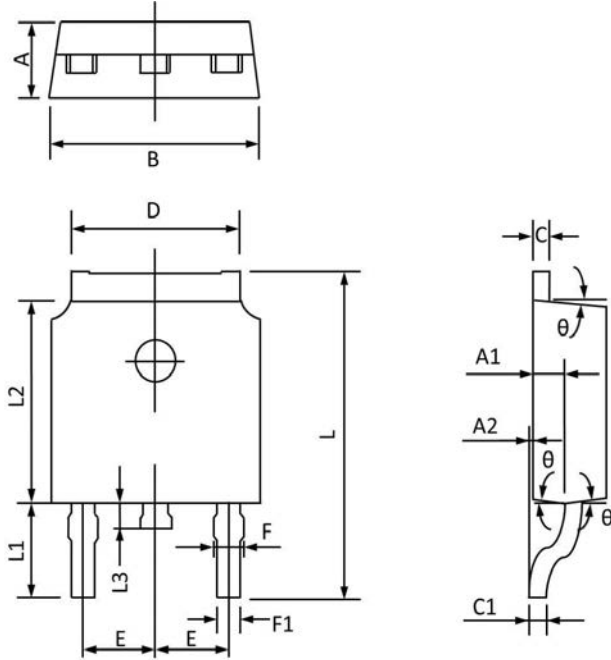


**Figure 11. Maximum Safe Operation Area**



**Figure 12. EAS Waveform**

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



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Max	Min	Max	Min
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
$\theta$	9°	3°	9°	3°