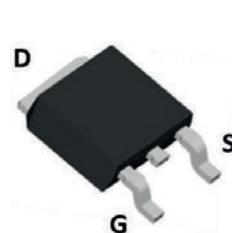
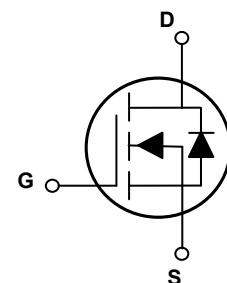


## Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	84mΩ (typ.)
$I_D$	15A



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 GSFD10110 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, @ Steady-State ( $T_A=25^\circ\text{C}$ ) <sup>1</sup>	$I_D$	15	A
Continuous Drain Current, @ Steady-State ( $T_A=100^\circ\text{C}$ )		9.5	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	60	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	34	W
Linear Derating Factor ( $T_A=25^\circ\text{C}$ )		0.19	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	11	mJ
Junction-to-Case	$R_{\theta JC}$	4.4	$^\circ\text{C}/\text{W}$
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +175	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	100	-	-	V
Drain-to-Source Leakage Current	$I_{\text{DS}S}$	$V_{\text{DS}}=100\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	$\mu\text{A}$
		$T_J=125^\circ\text{C}$	-	-	50	
Gate-to-Source Forward Leakage	$I_{\text{GSS}}$	$V_{\text{GS}}=20\text{V}$	-	-	100	$\text{nA}$
		$V_{\text{GS}}=-20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=9\text{A}$	-	84	106	$\text{m}\Omega$
		$V_{\text{GS}}=6\text{V}, I_D=3\text{A}$	-	92	110	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	1.1	1.8	2.9	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_D=5\text{A}$	-	15	-	S
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=50\text{V}, F=1\text{MHz}$	-	446	-	$\text{pF}$
Output Capacitance	$C_{\text{oss}}$		-	57	-	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	2.8	-	
Total Gate Charge	$Q_g$	$I_D=10\text{A}, V_{\text{DS}}=50\text{V}, V_{\text{GS}}=10\text{V}$	-	8.2	-	$\text{nC}$
Gate-to-Source Charge	$Q_{\text{gs}}$		-	2.8	-	
Gate-to-Drain ("Miller") Charge	$Q_{\text{gd}}$		-	1.6	-	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=50\text{V}, R_L=5\Omega, R_{\text{GEN}}=3\Omega$	-	2.6	-	$\text{nS}$
Rise Time	$t_r$		-	22	-	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	8.4	-	
Fall Time	$t_f$		-	12	-	
Gate Resistance	$R_g$	$F=1\text{MHz}$	-	1.4	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	15	A
Pulsed Source Current (Body Diode)	$I_{\text{SM}}$	$I_S=10\text{A}, V_{\text{GS}}=0\text{V}$	-	-	60	A
Diode Forward Voltage	$V_{\text{SD}}$		-	1	1.3	V
Reverse Recovery Time	$T_{\text{rr}}$		-	46	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$	$I_S=10\text{A}, V_{\text{GS}}=0\text{V}, dI_F/dt=100\text{A}/\mu\text{s}$	-	40	-	nC

Note:

1. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $L=0.5\text{mH}$ ,  $R_G=25\Omega$ ,  $V_{\text{DD}}=80\text{V}$ ,  $I_{\text{AS}}=6.5\text{A}$ ,  $T_J=25^\circ\text{C}$ .
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

## Typical Electrical and Thermal Characteristic Curves

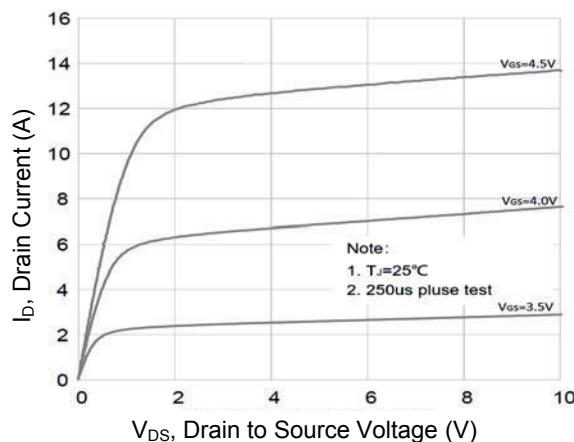


Figure 1. Typical Output Characteristics

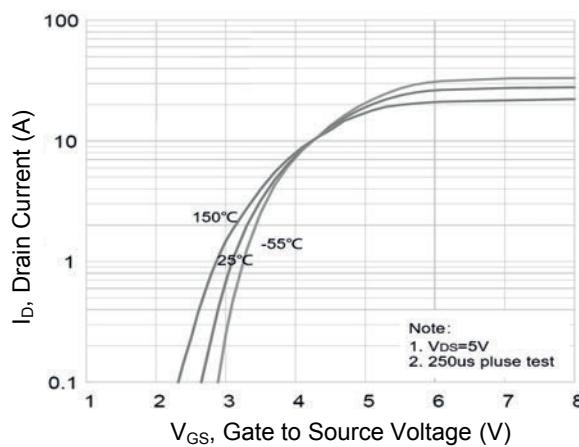


Figure 2. Transfer Characteristics

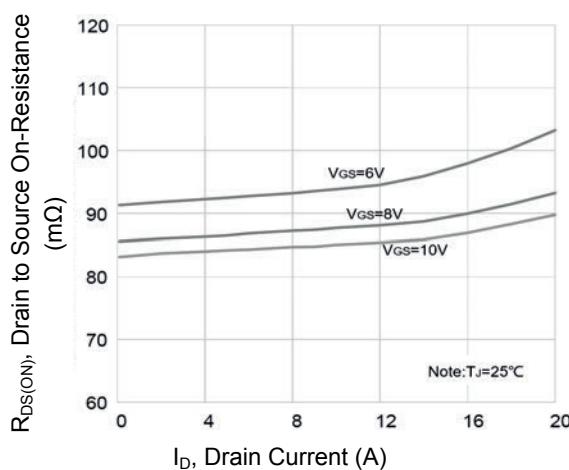


Figure 3.  $R_{DS(ON)}$  Vs. Drain Current

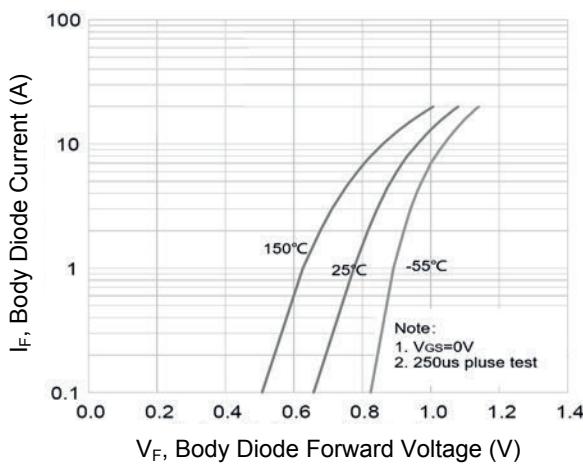


Figure 4. Body Diode Characteristics

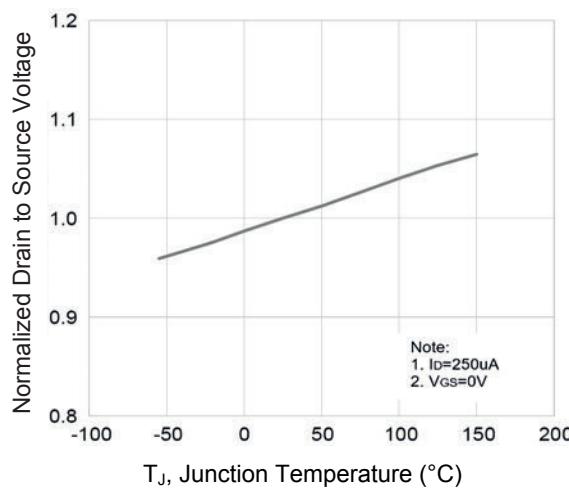


Figure 5. Normalized  $BV_{DSs}$  Vs.  $T_J$

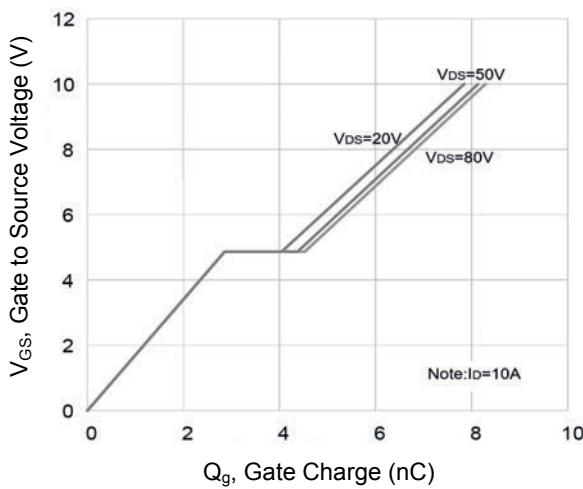
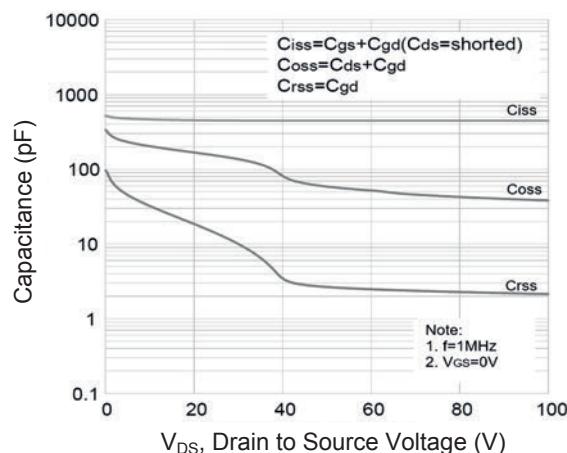
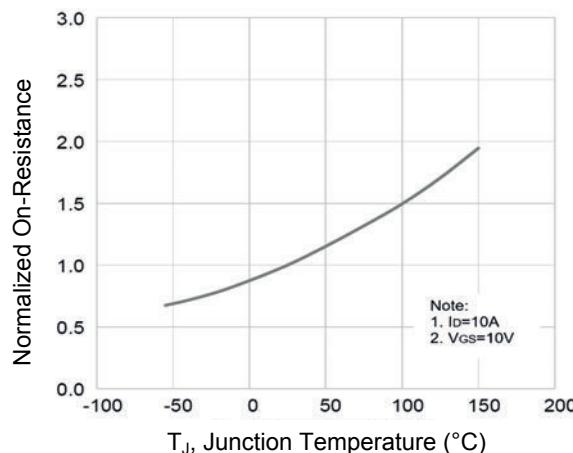


Figure 6. Gate Charge

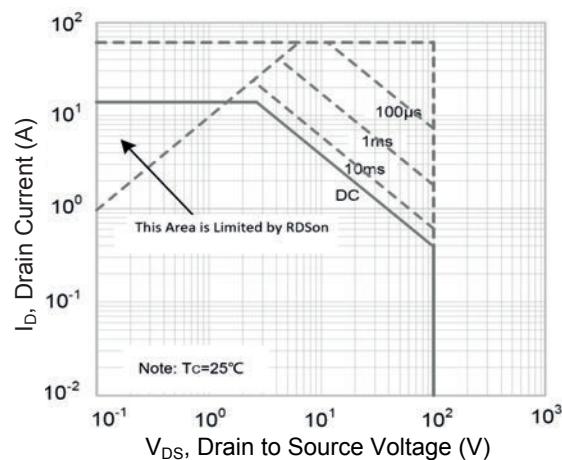
## Typical Electrical and Thermal Characteristic Curves



**Figure 7. Capacitance Characteristics**

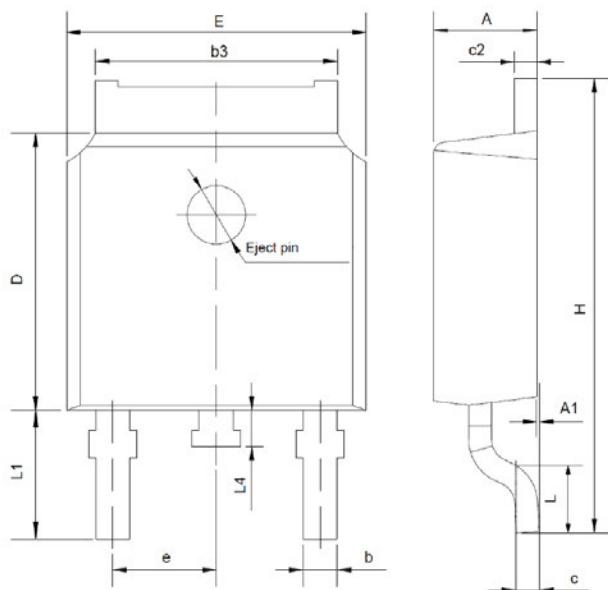


**Figure 8. Normalized  $R_{DS(ON)}$  Vs.  $T_J$**



**Figure 9. Safe Operation Area**

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



<b>Symbol</b>	<b>Dimensions In Millimeters</b>		<b>Dimensions In Inches</b>	
	<b>Min.</b>	<b>Max.</b>	<b>Min.</b>	<b>Max.</b>
A	2.10	2.50	0.083	0.098
A1	0.00	0.13	0.000	0.005
b	0.66	0.89	0.026	0.035
b3	5.10	5.46	0.201	0.215
c	0.45	0.65	0.018	0.026
c2	0.45	0.65	0.018	0.026
D	5.80	6.40	0.228	0.252
E	6.30	6.90	0.248	0.272
e	2.30 TYP		0.091 TYP	
H	9.60	10.60	0.378	0.417
L	1.40	1.70	0.055	0.067
L1	2.90 REF		0.114 REF	
L4	0.60	1.00	0.024	0.039