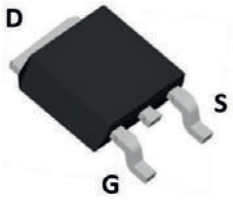
GOOD-ARK SEMICONDUCTOR

GSFD3110

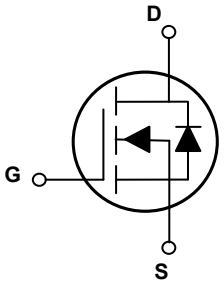
30V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	10mΩ (Max.)
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

RoHS Compliant

Description

The GSFD3110 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°C unless otherwise specified)

Parameter	Symbol	Parameter	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	50	A
Continuous Drain Current, @ Steady-State (T_C=70°C)		36	A
Pulsed Drain Current[1]	I_{DM}	200	A
Power Dissipation (T_C=25°C)	P_D	45	W
Power Dissipation - Derate above 25°C		0.36	W/°C
Single Pulse Avalanche Energy[2]	E_{AS}	13	mJ
Single Pulse Avalanched Current[2]	I_{AS}	16	A
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	2.78	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.04	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=30V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=11A	-	7.1	10	mΩ
		V_{GS}=4.5V, I_D=7A	-	10.5	16	mΩ
Forward Transconductance	gfs	V_{DS}=10V, I_D=3A	-	6	-	S
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1.1	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-4	-	mV/°C
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=15V, I_D=5A V_{GS}=4.5V	-	8.6	-	nC
Gate-Source Charge[3,4]	Q_{gs}		-	2.3	-	
Gate-to-Drain Charge[3,4]	Q_{gd}		-	3	-	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=15V, R_G=6Ω V_{GS}=10V, I_D=1A	-	3.8	-	nS
Rise Time[3,4]	t_r		-	10	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	22	-	
Fall Time[3,4]	t_f		-	6.6	-	
Input Capacitance	C_{lss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	880	-	pF
Output Capacitance	C_{oss}		-	89	-	
Reverse Transfer Capacitance	C_{rss}		-	68	-	
Gate Resistance	R_G	V_{DS}=0V, V_{GS}=0V, F=1MHz	-	2.8	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	50	A
Pulsed Source Current[3]	I_{SM}		-	-	200	A
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=1A T_J=25°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}=16A, R_G=25Ω, Starting T_J=25°C.
3. Pulse test: pulse width ≦ 300us, duty cycle ≦ 2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

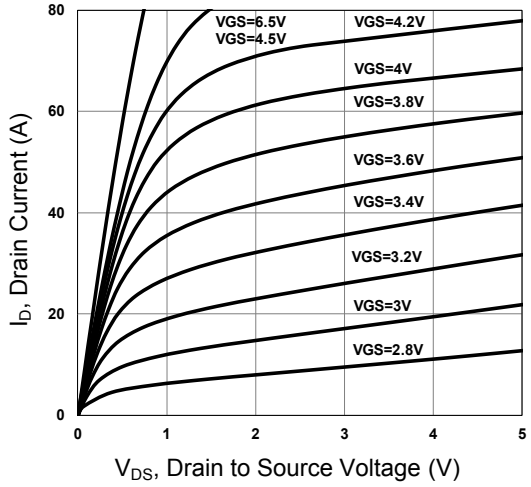


Figure 1. Typical Output Characteristics

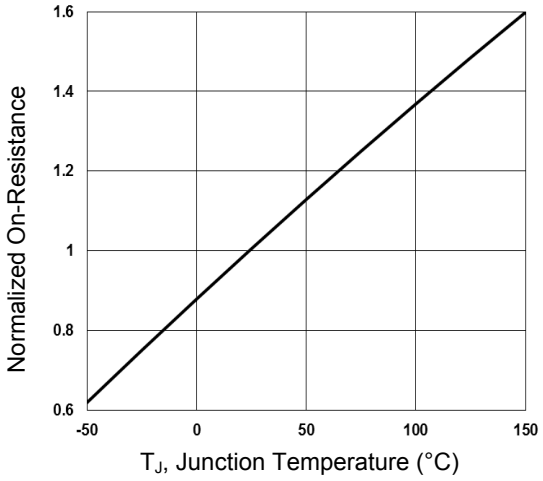


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

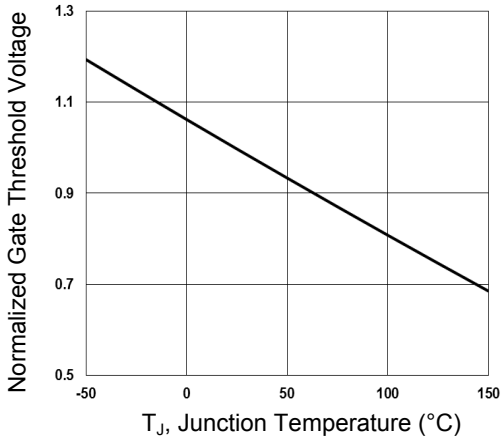


Figure 3. Normalized V_{th} vs. T_J

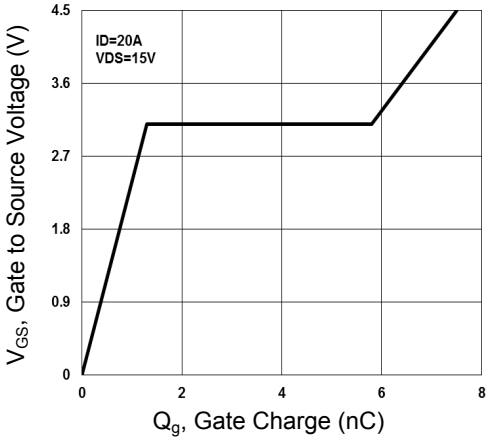


Figure 4. Gate Charge Characteristics

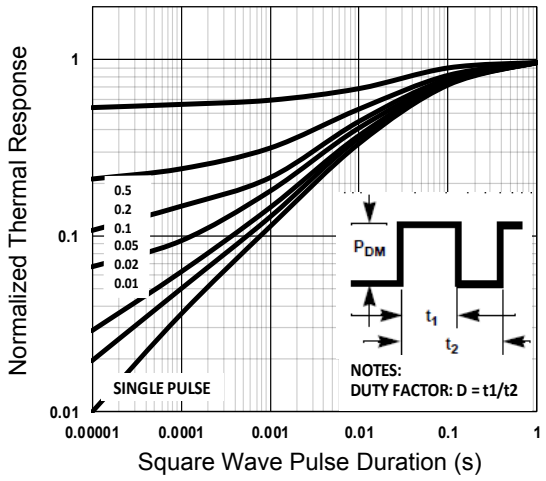


Figure 5. Normalized Transient Impedance

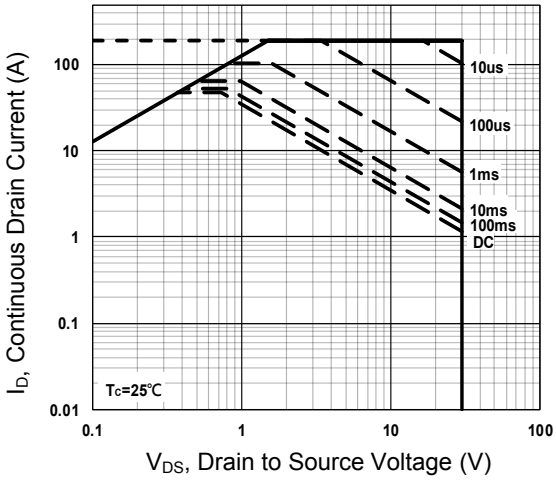
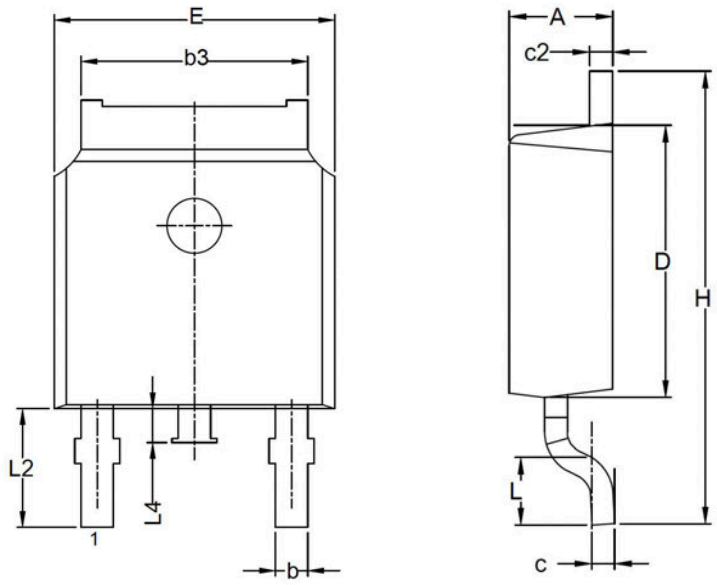


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	2.500	0.055	0.098
b	0.500	0.900	0.020	0.035
b3	5.100	5.500	0.201	0.217
c	0.400	0.650	0.016	0.026
c2	0.460	0.580	0.018	0.023
D	5.400	6.400	0.213	0.252
E	6.300	6.900	0.248	0.272
e	2.186	2.386	0.086	0.094
H	9.400	10.300	0.370	0.406
L	1.390	1.770	0.055	0.070
L4	0.600	1.100	0.024	0.043
L2	2.850REF		0.112REF	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD3110	TO-252 (DPAK)	D3110	Tape & Reel	2,500pcs / Reel