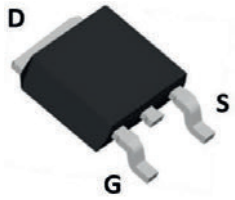
GOOD-ARK SEMICONDUCTOR

GSFD13010

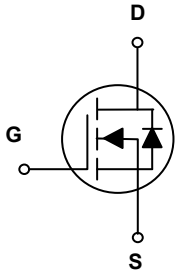
100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	13mΩ (Max.)
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 GSFD13010 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	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	60	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		38	A
Pulsed Drain Current[2]	I_{DM}	240	A
Power Dissipation (T_C=25°C)	P_D	86	W
Linear Derating Factor (T_C=25°C)		0.69	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	31	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.45	°C/W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.0	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	100	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	20	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	11	13	mΩ
		V_{GS}=4.5V, I_D=10A	-	15	20	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.1	-	2.6	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	1716	-	pF
Output Capacitance	C_{oss}		-	171	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Total Gate Charge	Q_g	I_D=20A, V_{DS}=50V, V_{GS}=10V	-	29	-	nC
Gate-to-Source Charge	Q_{gs}		-	7.1	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	7.0	-	
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=10V, V_{DS}=50V, I_D=20A, R_{GEN}=3Ω	-	7.6	-	nS
Rise Time	T_r		-	28	-	
Turn-Off Delay Time	$T_{d(off)}$		-	32	-	
Fall Time	T_f		-	11	-	
Gate Resistance	R_g	f=1MHz	-	2.4	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	60	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	240	A
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	-	1.0	1.3	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=20A, di/dt=100A/μs	-	42	-	nS
Reverse Recovery Charge	Q_{rr}		-	50	-	nC

Notes:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.1mH, V_{DD}=80V, I_{AS}=25A, R_G=25Ω, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

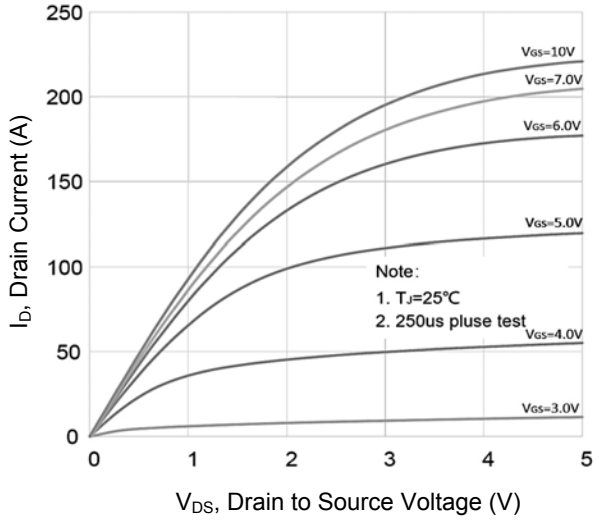


Figure 1. Output Characteristics

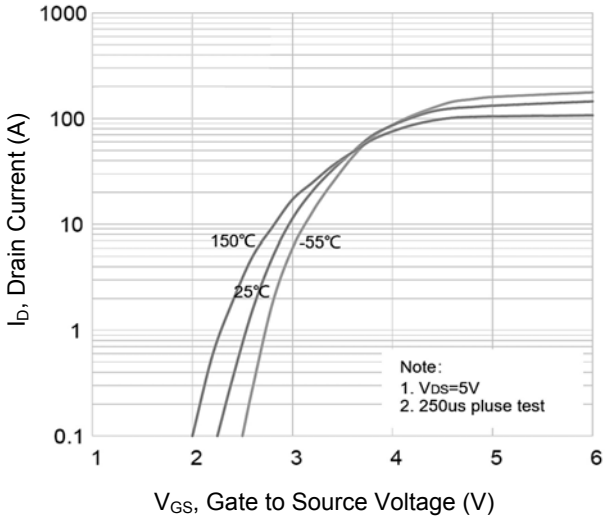


Figure 2. Transfer Characteristics

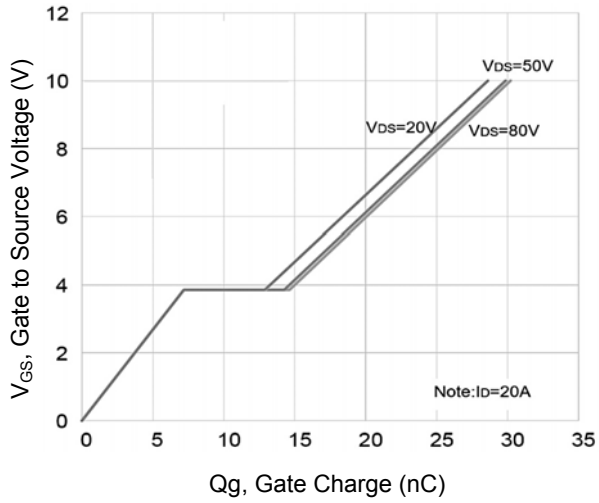


Figure 3. Gate Charge

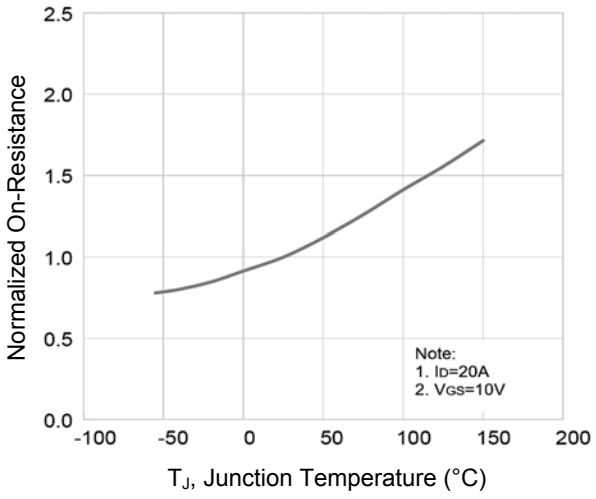


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

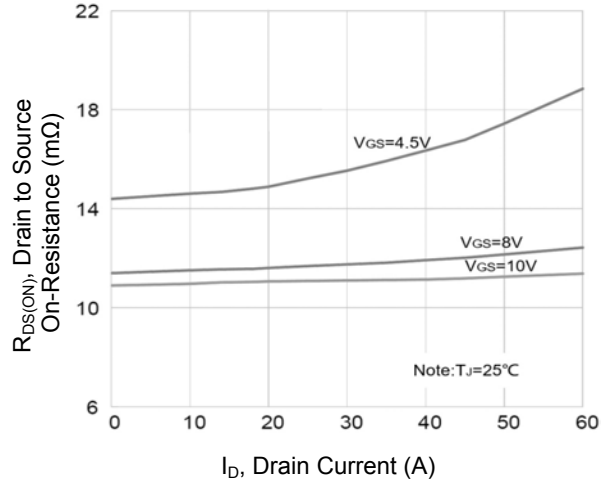


Figure 5. On-Resistance vs. Drain Current

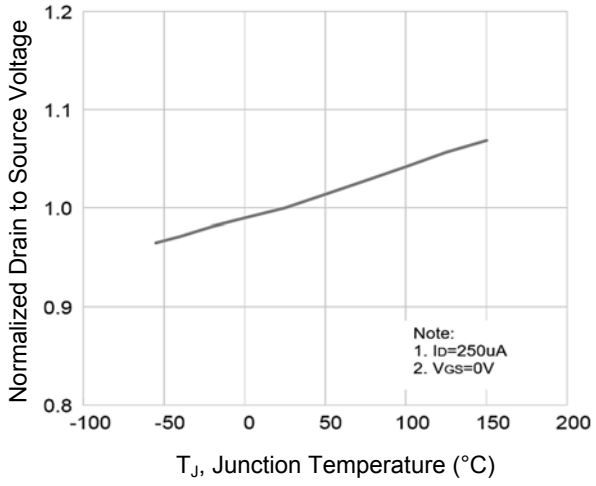


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

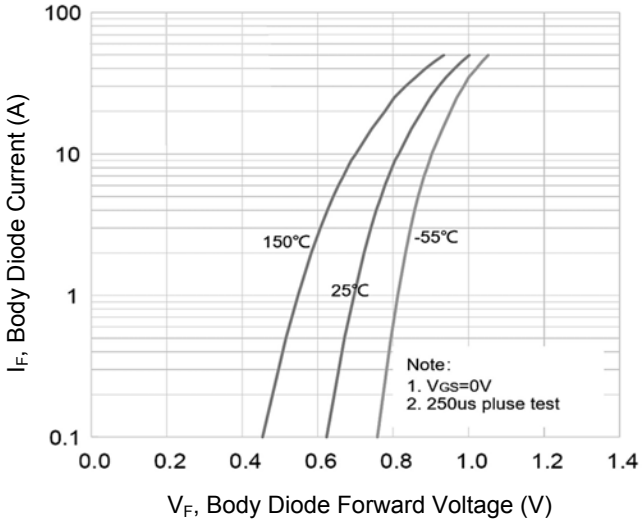


Figure 7. Body Diode Characteristics

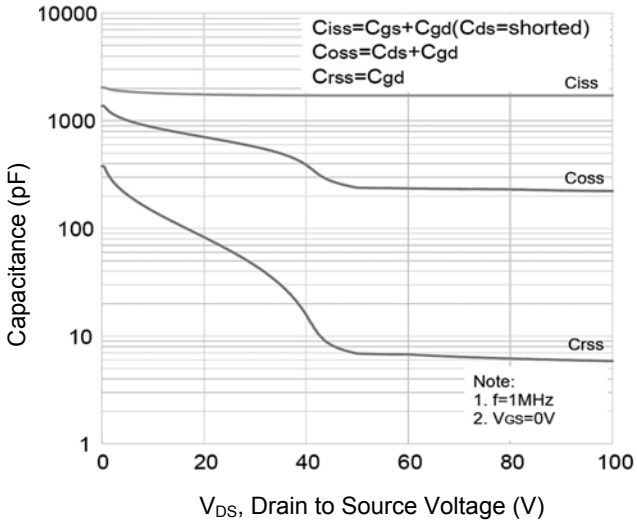


Figure 8. Capacitance Characteristics

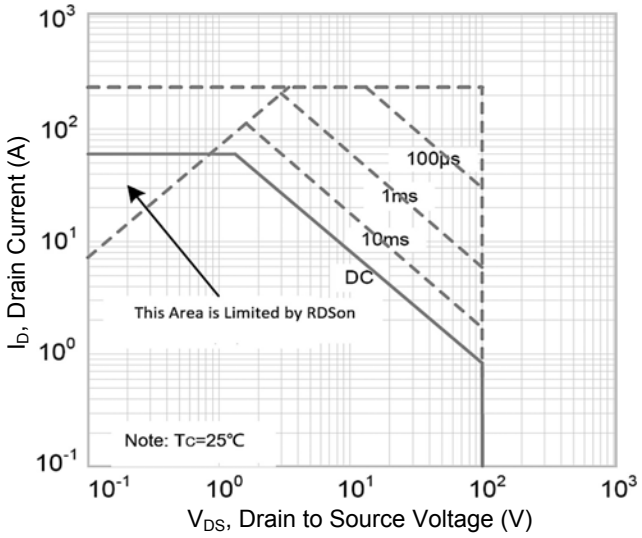
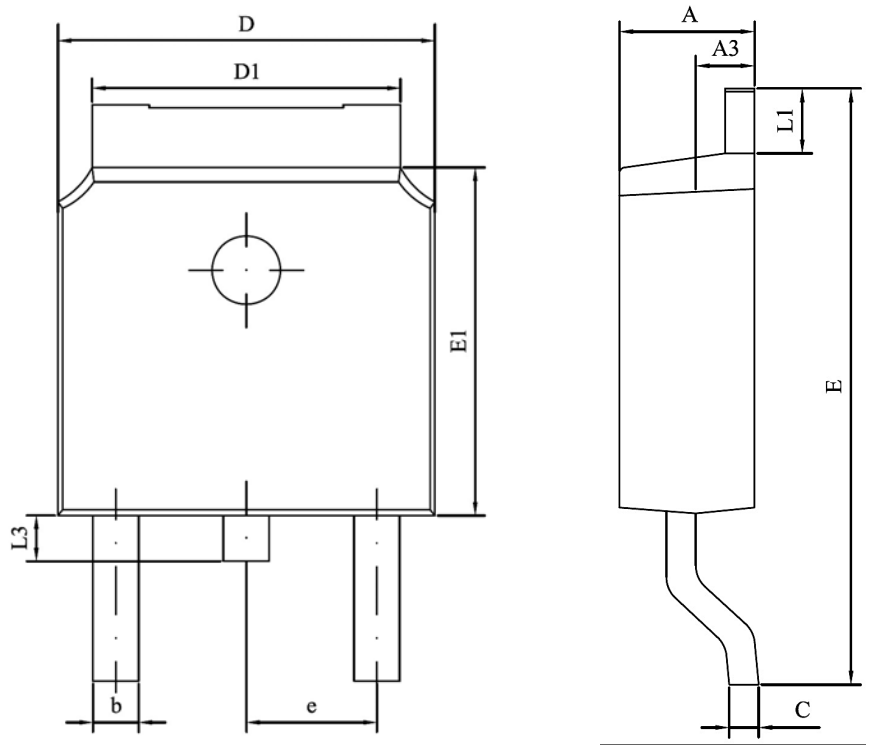


Figure 9. Safe Operation Area

Package Outline Dimensions (TO-252)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.150	2.400	0.085	0.094
A3	0.900	1.100	0.035	0.043
b	0.500	0.900	0.020	0.035
C	0.400	0.650	0.016	0.026
D	6.300	6.900	0.248	0.272
D1	4.950	5.500	0.195	0.217
E	9.400	10.410	0.370	0.410
E1	5.900	6.300	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.890	1.270	0.035	0.050
L3	0.600	1.100	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD13010	TO-252	D13010	Tape & Reel	2,500 Pcs / Reel