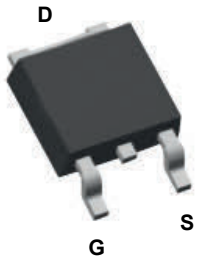
GOOD-ARK SEMICONDUCTOR

GSFD6014

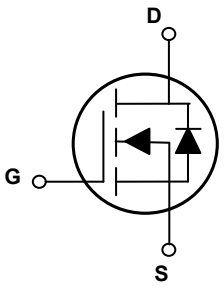
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	14mΩ (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 GSFD6014 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}	60	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	60	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		41	A
Pulsed Drain Current[1]	I_{DM}	240	A
Single Pulse Avalanche Energy[2]	E_{AS}	196	mJ
Power Dissipation (T_C=25°C)	P_D	116	W
Linear Derating Factor (T_C=25°C)		0.93	W/°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.08	°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	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=65V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=65V, V_{GS}=0V, T_J=125°C	-	-	100	
Gate-to-Source Forward Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=20V	-	-	100	nA
		V_{DS}=0V,V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	11.6	14	mΩ
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=20A	-	28	-	S
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	-	4	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	-	2530	-	pF
Output Capacitance	C_{oss}		-	141	-	
Reverse Transfer Capacitance	C_{rss}		-	131	-	
Total Gate Charge[3,4]	Q_g	I_D=20A, V_{DS}=30V, V_{GS}=10V	-	50.6	-	nC
Gate-to-Source Charge[3,4]	Q_{gs}		-	14.6	-	
Gate-to-Drain ("Miller") Charge[3,4]	Q_{gd}		-	14.2	-	
Turn-on Delay Time[3,4]	$t_{d(on)}$	V_{GS}=10V, V_{DS}=30V, R_L=1.5Ω, R_{GEN}=6Ω	-	17.9	-	nS
Rise Time[3,4]	t_r		-	10.8	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	42.4	-	
Fall Time[3,4]	t_f		-	10.4	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	2	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	60	A
Diode Forward Voltage[3]	V_{SD}	I_S=20A, V_{GS}=0V	-	-	1.2	V
Reverse Recovery Time	T_{rr}	I_F=20A, di_F/dt=100A/μs	-	36.1	-	nS
Reverse Recovery Charge	Q_{rr}		-	44.6	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=40V, V_{GS}=10V, L=0.5mH, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

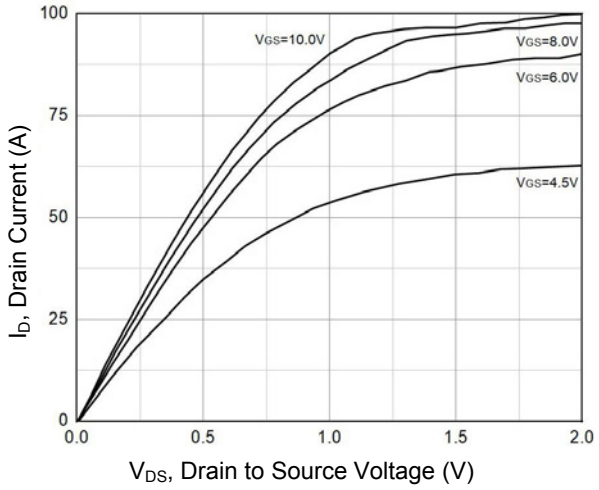


Figure 1. Typical Output Characteristics

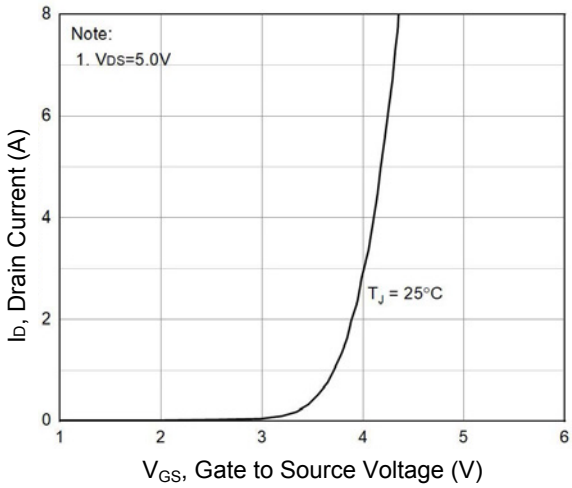


Figure 2. Transfer Characteristics

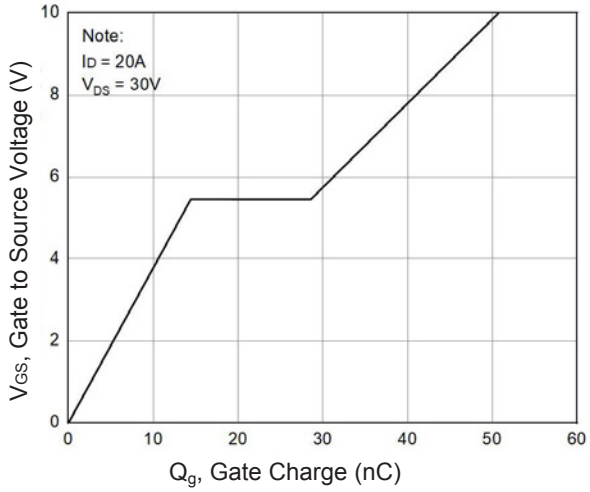


Figure 3. Gate Charge

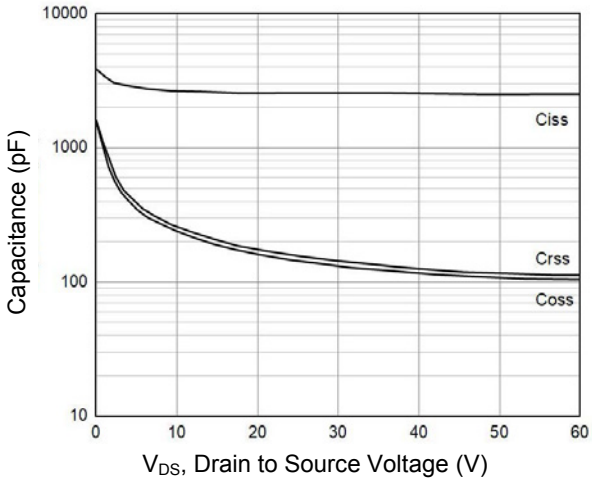


Figure 4. Capacitance Characteristics

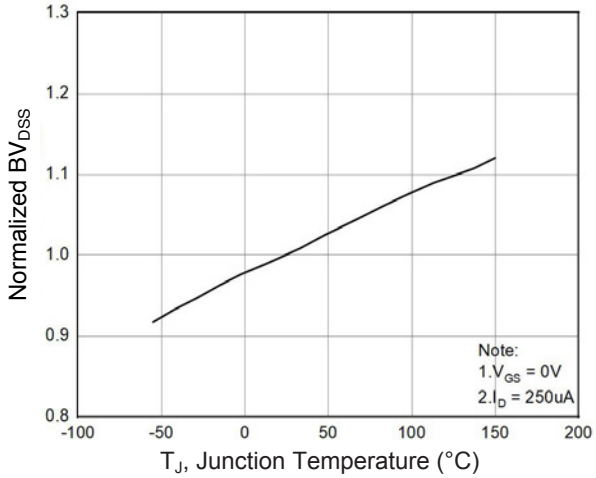


Figure 5. Normalized BV_{DSS} vs. T_J

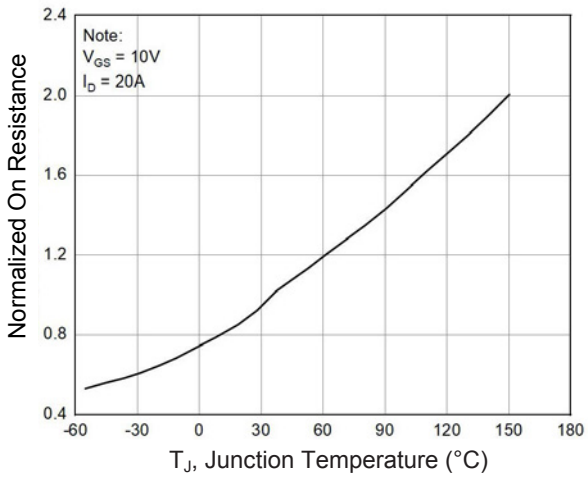


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

Typical Electrical and Thermal Characteristic Curves

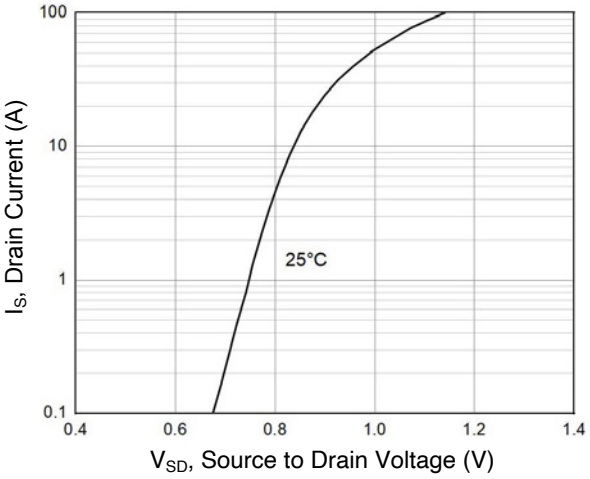


Figure 7. Body Diode Characteristics

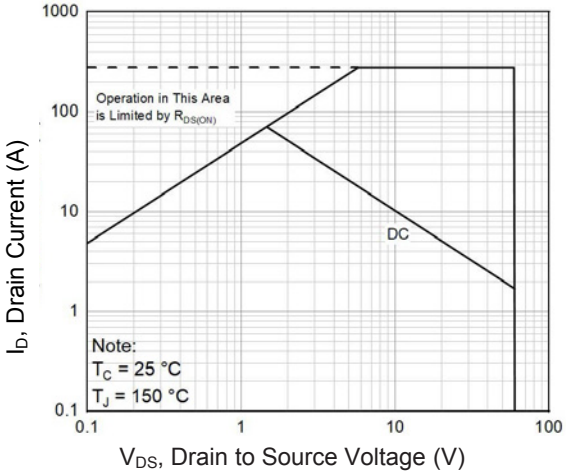
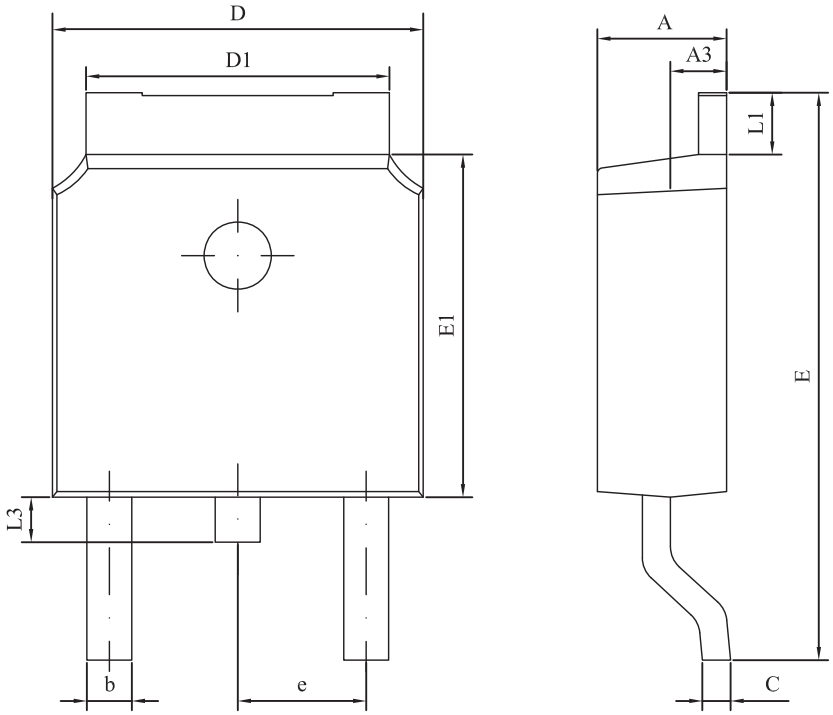


Figure 8. Safe Operating Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD6014	TO-252 (DPAK)	D6014	Tape & Reel	2,500 Pcs / Reel