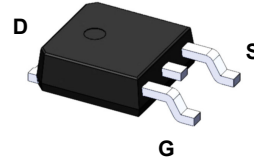
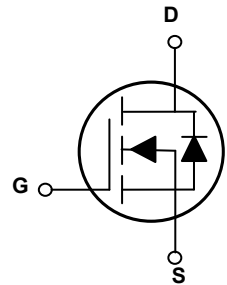


Main Product Characteristics

BV_{DSS}	60V
$R_{DS(ON)}$	9.7m Ω (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 GSFD9R706 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-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, @ Steady-State (T _C =25°C) ¹	I_D	60	A
Drain Current-Continuous, @ Steady-State (T _C =100°C)		42.5	
Drain Current-Pulsed ²	I_{DM}	240	A
Power Dissipation (T _C =25°C)	P_D	60	W
Linear Derating Factor (T _C =25°C)		0.48	
Single Pulse Avalanche Energy ³	E_{AS}	81	mJ
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.08	°C/W
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
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
		$T_J=125^\circ\text{C}$	-	-	20	
Gate-Source Forward Leakage	I_{GSS}	$V_{GS}=\pm 20V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13A$	-	8	9.7	m Ω
		$V_{GS}=4.5V, I_D=11A$	-	11	14	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.7	2.5	V
Gate Resistance	R_G	$F=1\text{MHz}$	-	1.7	3	Ω
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=6A$	-	12	-	S
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=48V, I_D=13A, V_{GS}=10V$	-	18	-	nC
Gate-Source Charge	Q_{gs}		-	5.6	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	2.7	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=30V, R_{GEN}=3\Omega, V_{GS}=10V, I_D=13A$	-	8.5	-	nS
Rise Time	t_r		-	52	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Fall Time	t_f		-	8.9	-	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, F=1\text{MHz}$	-	1064	2200	pF
Output Capacitance	C_{oss}		-	434	870	
Reverse Transfer Capacitance	C_{rss}		-	26	54	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	75	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	300	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=13A$	-	1	1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ\text{C}, I_F=13A, di/dt=100A/\mu s$	-	54	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.052	-	μC

Note:

1. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. $L=0.5\text{mH}, R_G=10\Omega, V_{DD}=50V, T_J=25^\circ\text{C}$.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

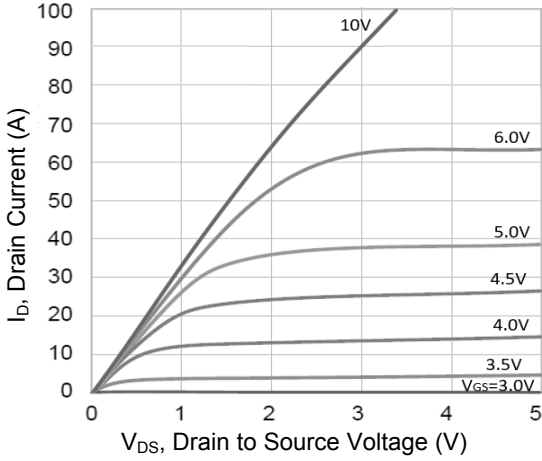


Figure 1. Output Characteristics

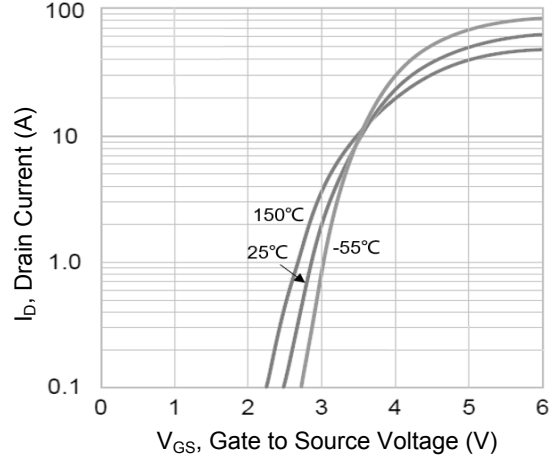


Figure 2. Transfer Characteristics

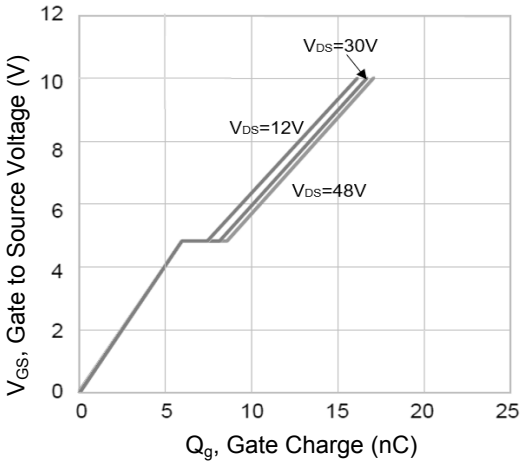


Figure 3. Gate Charge

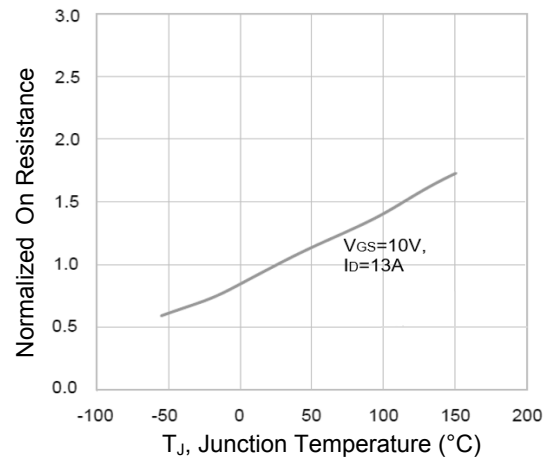


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

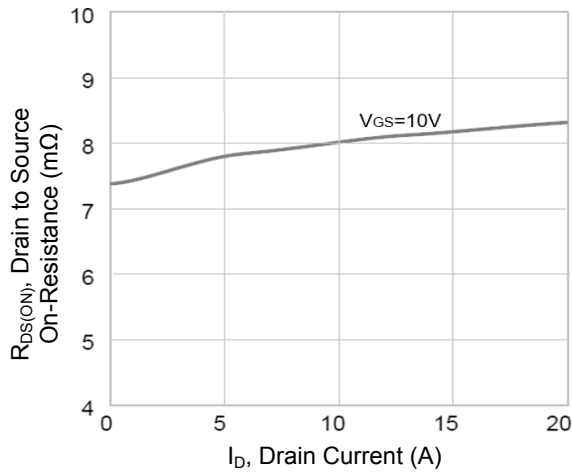


Figure 5. On-Resistance vs. Drain Current

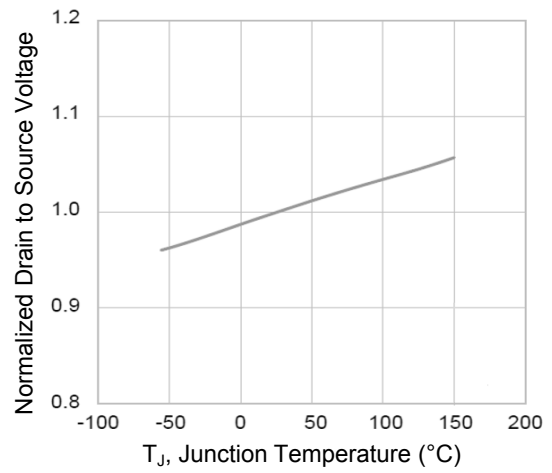


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

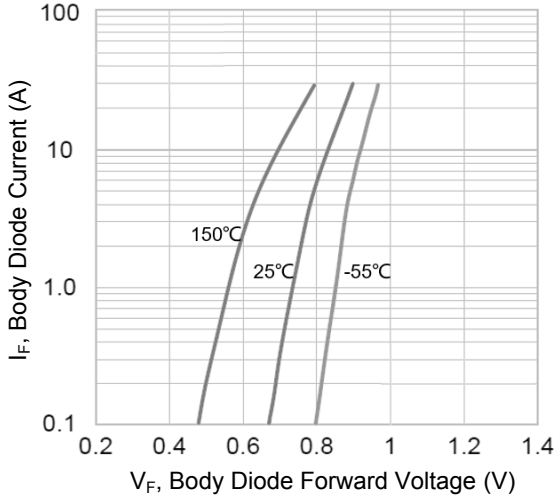


Figure 7. Body Diode Characteristics

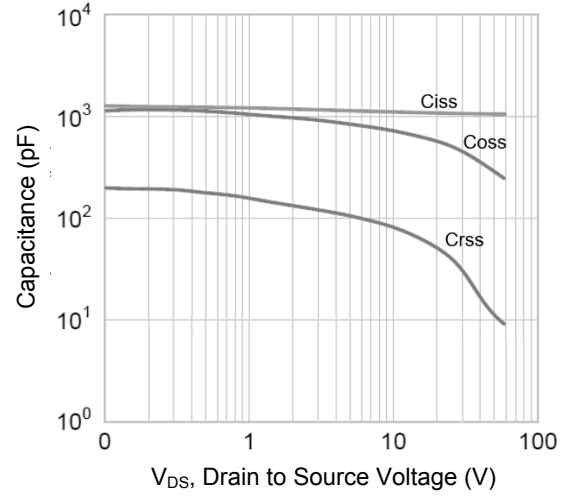


Figure 8. Capacitance Characteristics

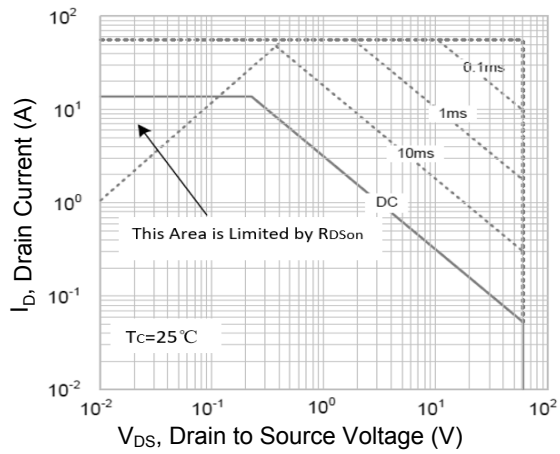
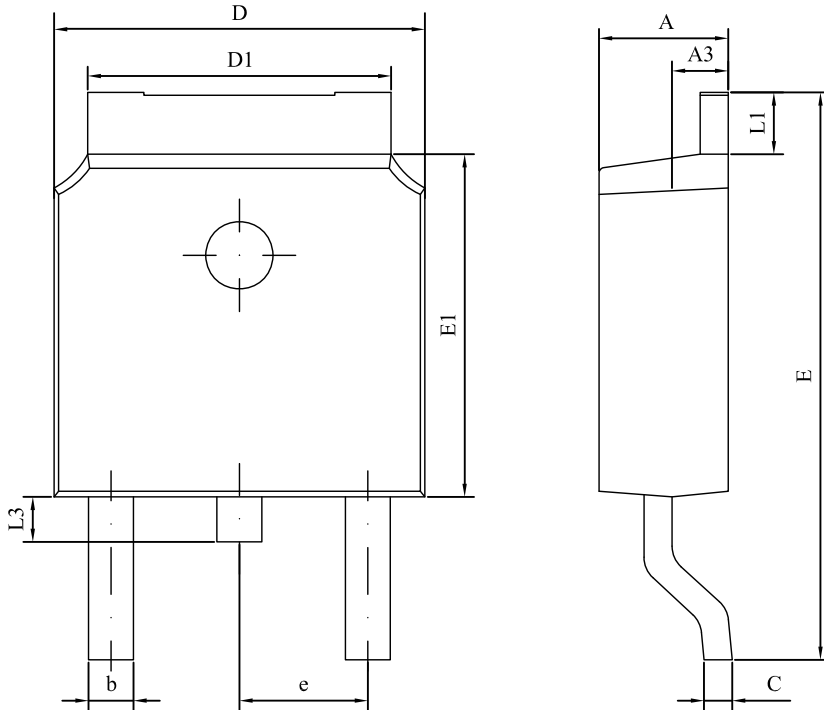


Figure 9. Safe Operation Area

Package Outline Dimensions TO-252 (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
GSFD9R706	TO-252 (DPAK)	D9R706	Tape & Reel	2,500 Pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com