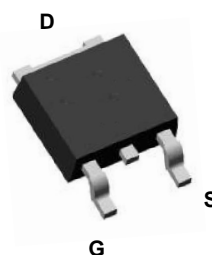
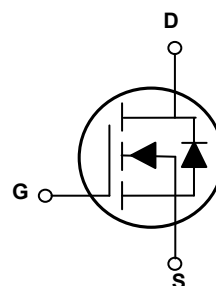


Main Product Characteristics

BV_{DSS}	60V
$R_{DS(ON)}$	9.7mΩ (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 ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, @ Steady-State ¹ ($T_C=25^{\circ}\text{C}$)	I_D	60	A
Drain Current-Continuous, @ Steady-State ($T_C=100^{\circ}\text{C}$)		42.5	
Drain Current-Pulsed ²	I_{DM}	240	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	60	W
Linear Derating Factor ($T_C=25^{\circ}\text{C}$)		0.48	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ³	E_{AS}	81	mJ
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction-to-Case	$R_{\theta JC}$	2.08	$^{\circ}\text{C}/\text{W}$
Maximum Junction Temperature	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ 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 =250uA	60	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
		T _J =125°C	-	-	20	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V	-	-	±100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =13A	-	8	9.7	mΩ
		V _{GS} =4.5V, I _D =11A	-	11	14	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.2	1.7	2.5	V
Gate Resistance	R _G	F=1MHz	-	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} =3Ω, 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=1MHz	-	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°C, I _F =13A, di/dt=100A/μs	-	54	-	nS
Reverse Recovery Charge	Q _{rr}		-	0.052	-	uC

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, 1inch x 0.85inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

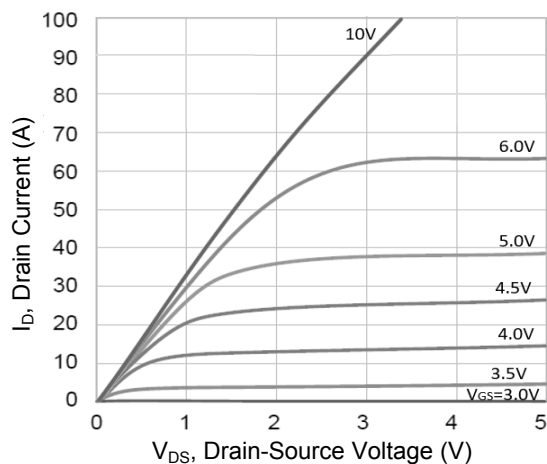


Figure 1. Output Characteristics

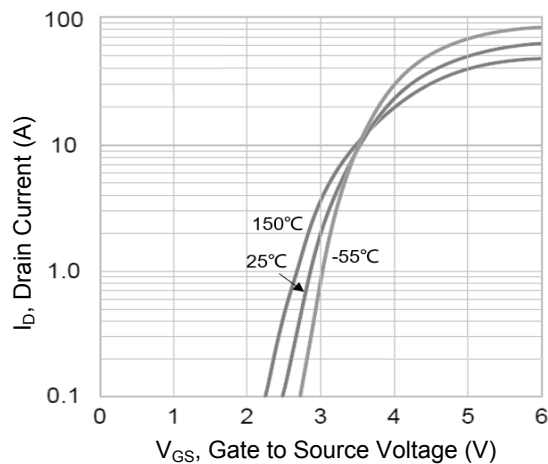


Figure 2. Transfer Characteristics

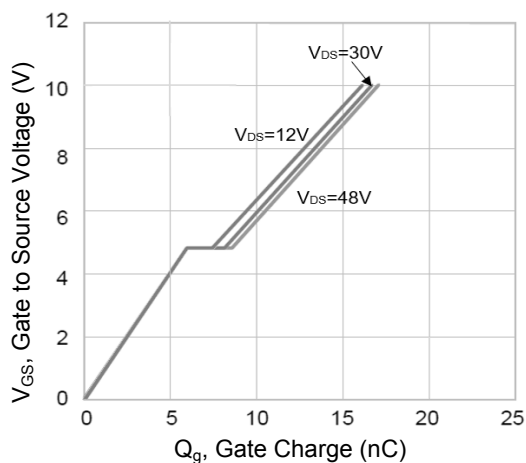


Figure 3. Gate Charge Characteristics

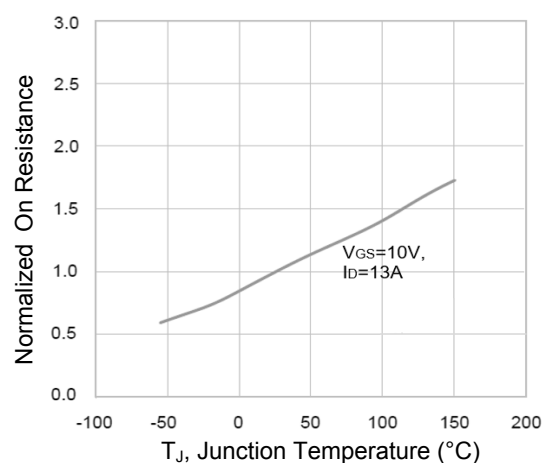


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

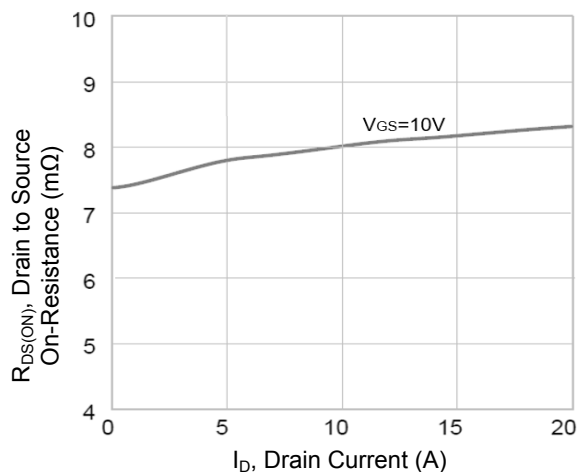


Figure 5. On-Resistance vs. Drain Current

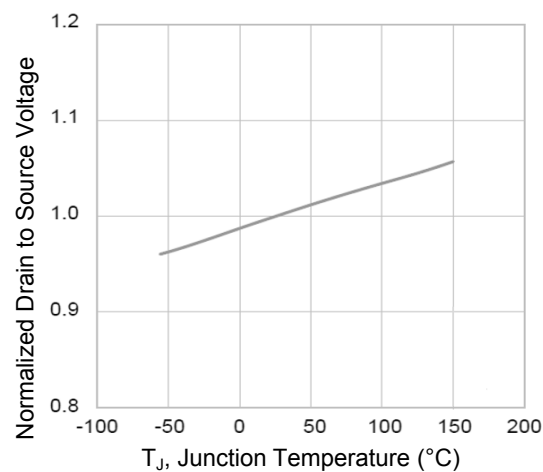


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

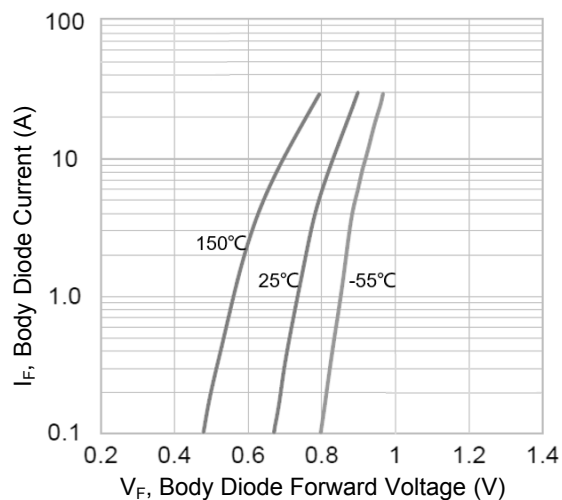


Figure 7. Body Diode Characteristic

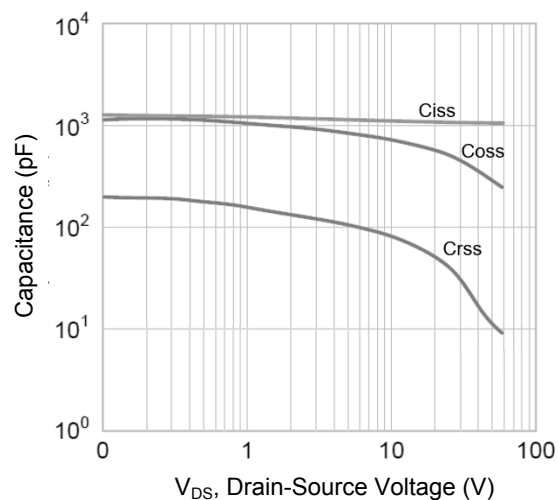


Figure 8. Capacitance Characteristic

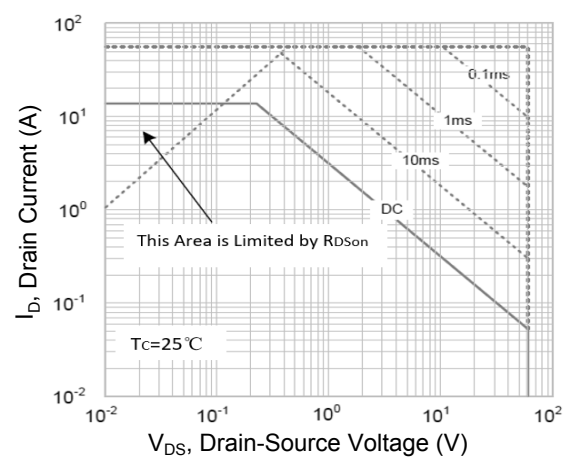
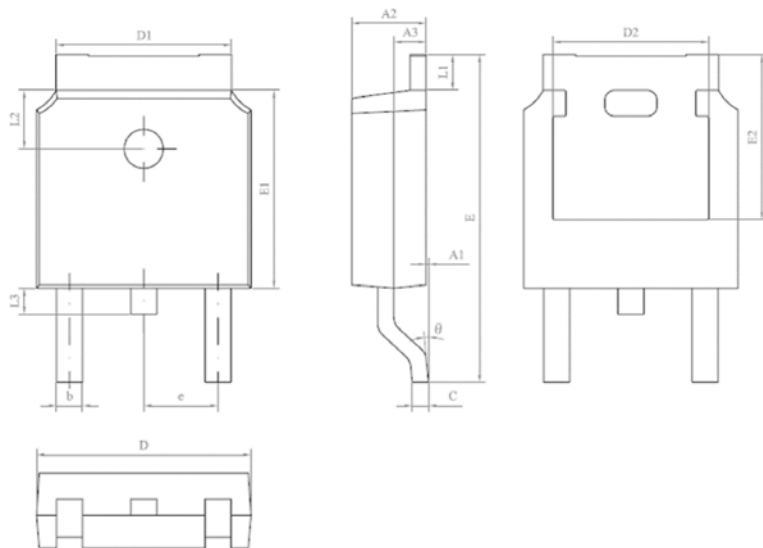


Figure 9. Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	2.200	2.400	0.087	0.094
A3	0.090	1.100	0.004	0.043
b	0.750	0.850	0.030	0.033
C	0.500	0.600	0.020	0.024
D	6.500	6.700	0.256	0.264
D1	5.300	5.500	0.209	0.217
D2	4.700	4.900	0.185	0.193
E	9.900	10.300	0.390	0.406
E1	6.000	6.200	0.236	0.244
E2	5.000	5.200	0.197	0.205
e	2.400	2.200	0.094	0.087
L1	0.900	1.250	0.035	0.049
L2	1.700	1.900	0.067	0.075
L3	0.600	1.000	0.024	0.039
θ	0°	8°	0°	8°