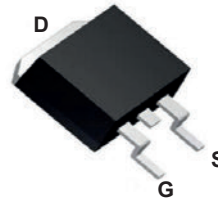
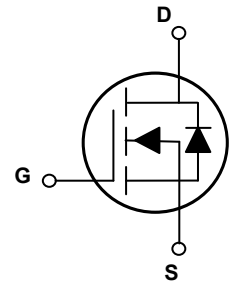


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	9.7mΩ (max.)
I_D	60A



TO-263



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 GSFT9R706 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) ¹	I_D	60	A
Continuous Drain Current, @ Steady-State (T _c =100°C)		42.5	A
Pulsed Drain Current ²	I_{DM}	240	A
Power Dissipation (T _c =25°C)	P_D	60	W
Linear Derating Factor (T _c =25°C)		0.48	W/°C
Single Pulse Avalanche Energy ³	E_{AS}	81	mJ
Junction-to-Case	$R_{\theta JC}$	2.08	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	55	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
		$T_J=125^\circ\text{C}$	-	-	20	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13A$	-	8	9.7	m Ω
		$V_{GS}=4.5V, I_D=11A$	-	11	14	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.5	V
Forward Transconductance	gfs	$V_{DS}=10V, I_D=6A$	-	12	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=30V, F=1\text{MHz}$	-	1064	2200	μF
Output Capacitance	C_{oss}		-	434	870	
Reverse Transfer Capacitance	C_{rss}		-	26	54	
Total Gate Charge	Q_g	$I_D=13A, V_{DS}=48V, V_{GS}=10V$	-	18	-	nC
Gate-to-Source Charge	Q_{gs}		-	5.6	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	2.7	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=30V, I_D=13A, R_{GEN}=3\Omega$	-	8.5	-	nS
Rise Time	t_r		-	52	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Fall Time	t_f		-	8.9	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	1.7	3	Ω
Source-Drain Ratings and Characteristics						
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}	$I_S=13A, V_{GS}=0V$	-	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	-	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, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

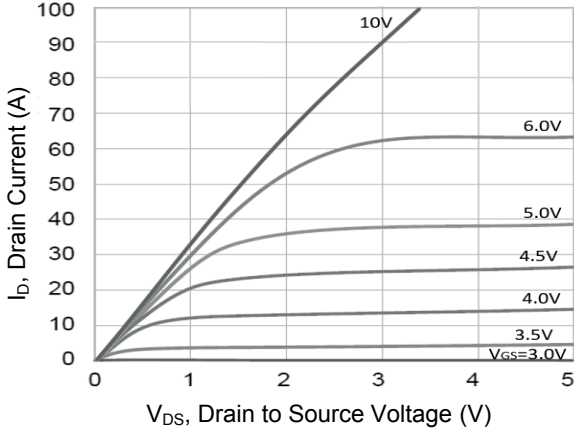


Figure 1. Output Characteristics

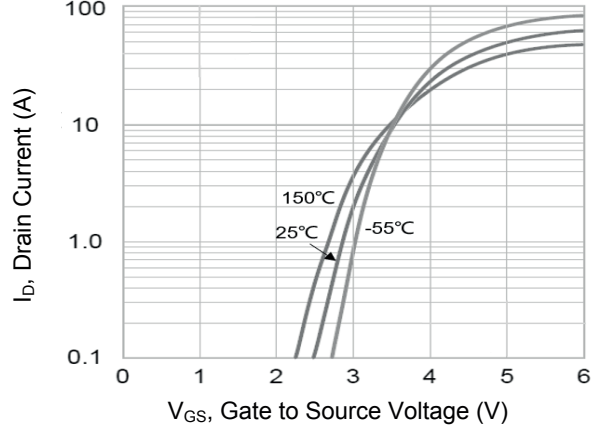


Figure 2. Transfer Characteristics

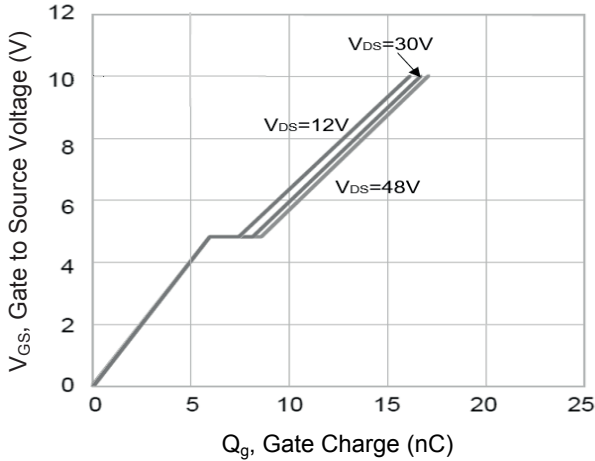


Figure 3. Gate Charge

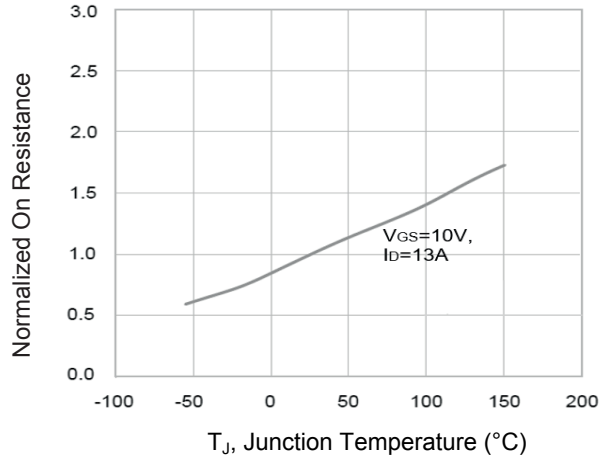


Figure 4. Normalized $R_{DS(ON)}$ Vs. T_J

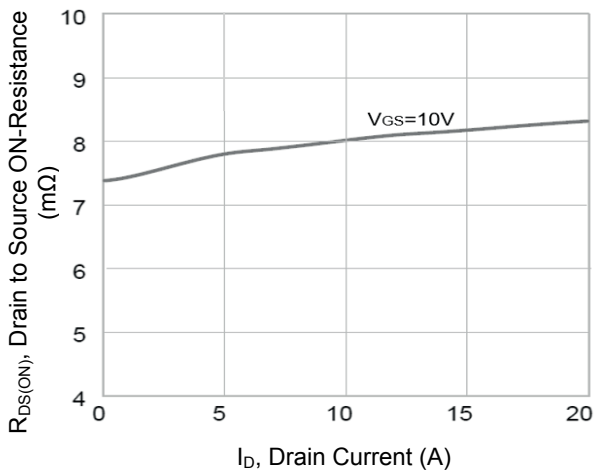


Figure 5. On-Resistance Vs. Drain Current

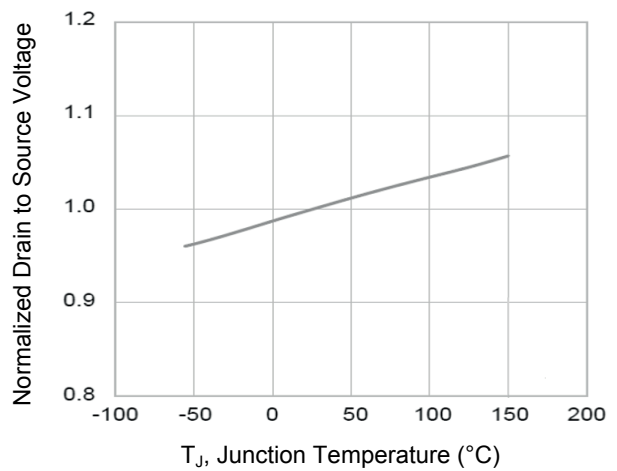


Figure 6. Normalized BV_{DSS} Vs. T_J

Typical Electrical and Thermal Characteristic Curves

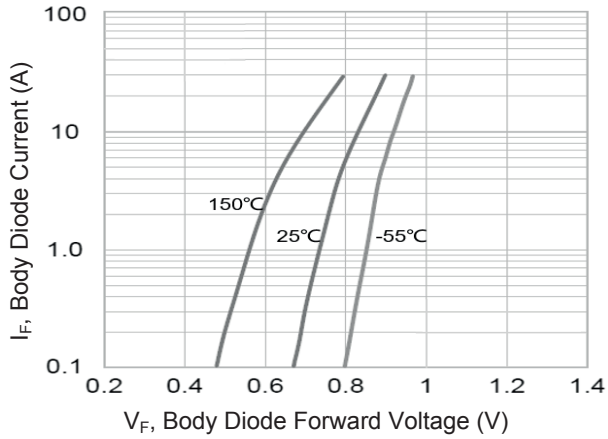


Figure 7. Body Diode Characteristics

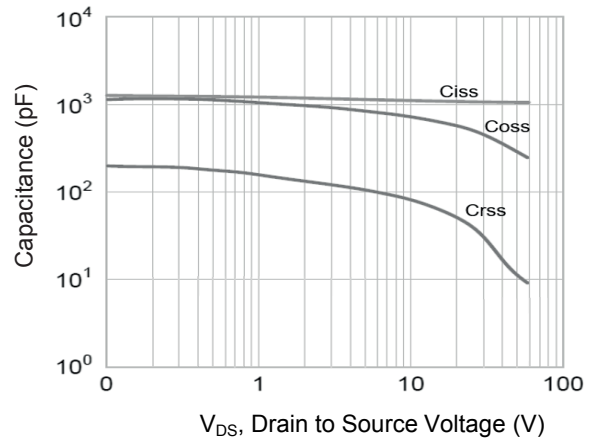


Figure 8. Transfer Characteristics

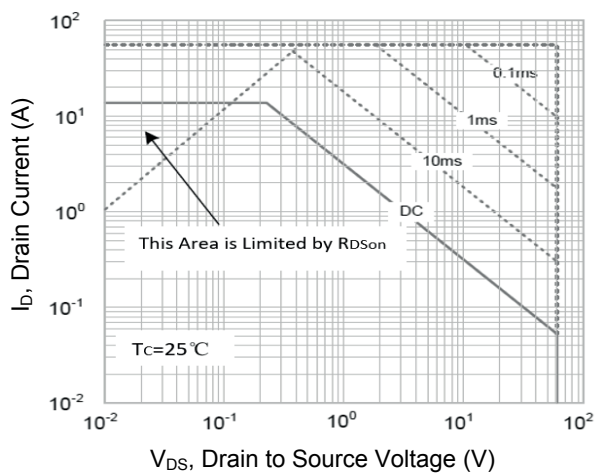
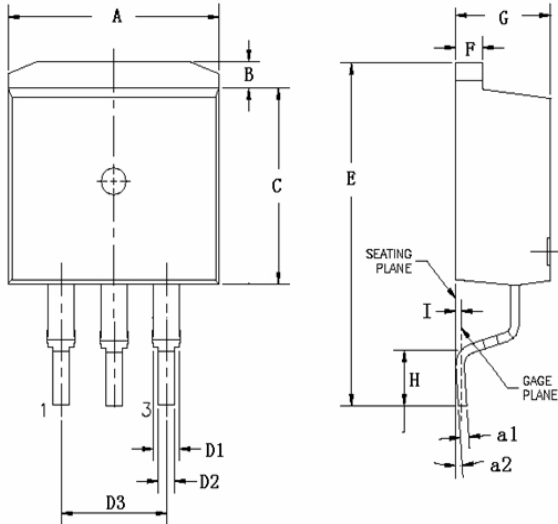


Figure 9. Safe Operation Area

Package Outline Dimensions TO-263(D2PAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.66	10.28	0.380	0.405
B	1.02	1.32	0.040	0.052
C	8.59	9.40	0.339	0.370
D1	1.14	1.40	0.045	0.055
D2	0.70	0.90	0.028	0.037
D3	5.08 TYP.		0.200 TYP.	
E	15.09	15.39	0.594	0.606
F	1.15	1.40	0.045	0.055
I	0.25 TYP.		0.010 TYP.	
G	4.30	4.70	0.169	0.185
H	2.29	2.79	0.090	0.110
K	1.30	1.60	0.051	0.063
a1	0.45	0.65	0.018	0.026
a2	0°	8°	0°	8°