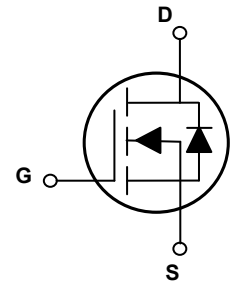


## Main Product Characteristics

$V_{(BR)DSS}$	650V
$R_{DS(ON)}$	0.78 $\Omega$ (Typ.)
$I_D$	5A



TO-251



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 GSFG65R900 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<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =25°C)	$I_D$	5	A
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =100°C)		3.2	A
Pulsed Drain Current	$I_{DM}$	20	A
Power Dissipation (T <sub>C</sub> =25°C)	$P_D$	42	W
		0.34	W/°C
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	214	mJ
Single Pulse Avalanche Current	$I_{AS}$	2.8	A
Body Diode Reverse Voltage Slope <sup>2</sup>	dv/dt	15	V/ns
MOS dv/dt Ruggedness <sup>3</sup>	dv/dt	50	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.0	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.97	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C
Soldering Temperature	T <sub>sold</sub>	260	°C

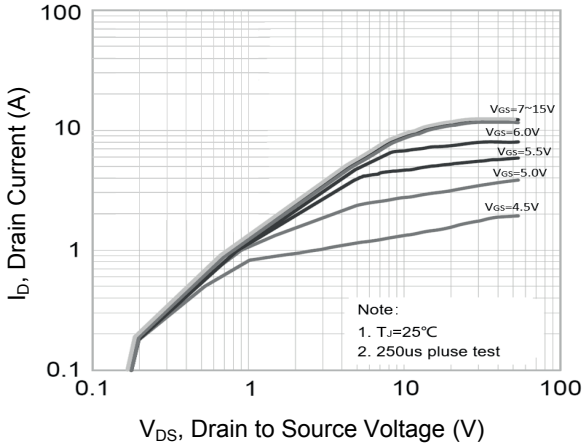
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1.0	$\mu A$
		$V_{DS}=650V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	1.5	-	$\mu A$
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.5A$	-	0.78	0.90	$\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=100V, F=1\text{MHz}$	-	300	-	pF
Output Capacitance	$C_{oss}$		-	20	-	
Reverse Transfer Capacitance	$C_{rss}$		-	2.4	-	
Total Gate Charge <sup>4,5</sup>	$Q_g$	$I_D=5A, V_{DD}=520V, V_{GS}=10V$	-	13	-	nC
Gate-to-Source Charge <sup>4,5</sup>	$Q_{gs}$		-	3.0	-	
Gate-to-Drain ("Miller") Charge <sup>4,5</sup>	$Q_{gd}$		-	6.8	-	
Gate Plateau <sup>4,5</sup>	$V_{plateau}$		-	6.5	-	V
Turn-On Delay Time <sup>4,5</sup>	$t_{d(on)}$	$V_{DD}=325V, V_{GS}=10V, R_G=24\Omega, I_D=5A$	-	8.7	-	nS
Rise Time <sup>4,5</sup>	$t_r$		-	25	-	
Turn-Off Delay Time <sup>4,5</sup>	$t_{d(off)}$		-	30	-	
Fall Time <sup>4,5</sup>	$t_f$		-	23	-	
Gate Resistance	$R_g$	$F=1\text{MHz}$	-	7.2	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	$T_C=25^\circ\text{C}$ , MOSFET symbol showing the integral reverse p-n junction diode.	-	-	5	A
Diode Pulse Current	$I_{S, pulse}$		-	-	20	A
Diode Forward Voltage	$V_{SD}$	$I_S=5A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time <sup>4</sup>	$T_{rr}$	$I_S=5A, V_{GS}=0V, di_f/dt=100A/\mu s$	-	334	-	nS
Reverse Recovery Charge <sup>4</sup>	$Q_{rr}$		-	2.2	-	$\mu C$

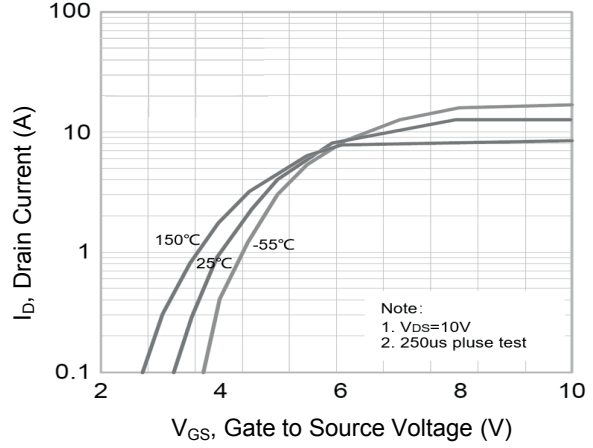
Notes:

1.  $L=79\text{mH}, V_{DD}=100V, R_G=25\Omega$ , starting temperature  $T_J=25^\circ\text{C}$ .
2.  $V_{DS}=0-400V, I_{SD} \leq I_S, T_J=25^\circ\text{C}$ .
3.  $V_{DS}=0-480V$ .
4. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
5. Essentially independent of operating temperature.

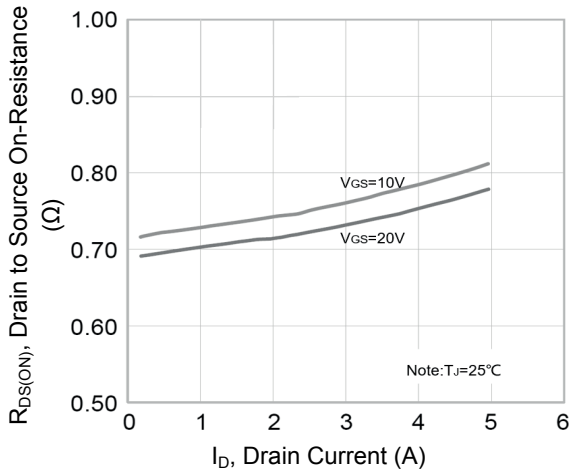
### Typical Electrical and Thermal Characteristic Curves



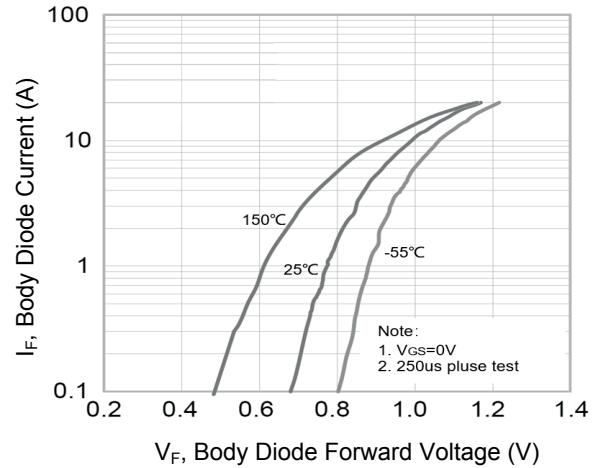
**Figure 1. Typical Output Characteristics**



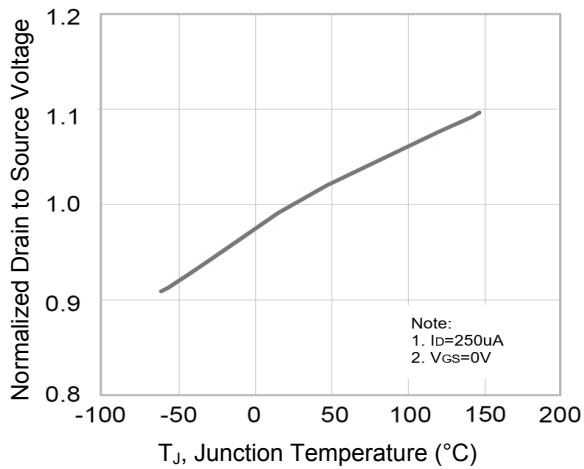
**Figure 2. Transfer Characteristics**



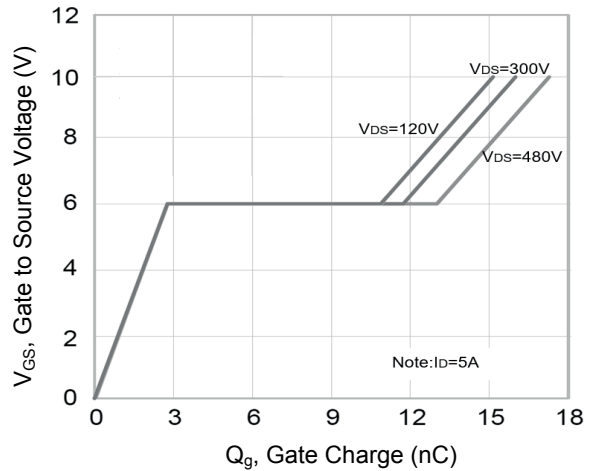
**Figure 3.  $R_{DS(ON)}$  vs. Drain Current**



**Figure 4. Body Diode Characteristic**



**Figure 5. Normalized  $BV_{DSS}$  vs.  $T_J$**



**Figure 6. Gate Charge Characteristic**

### Typical Electrical and Thermal Characteristic Curves

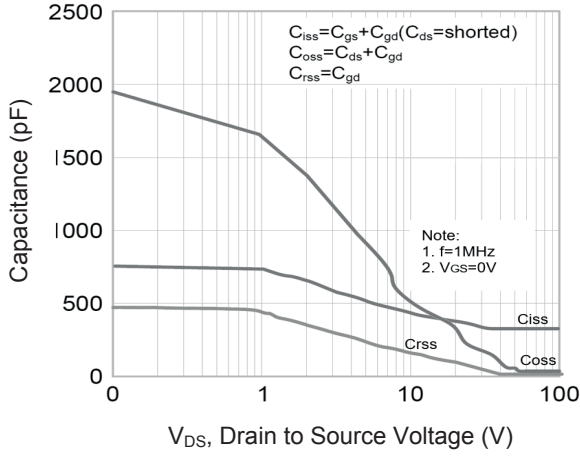


Figure 7. Capacitance Characteristic

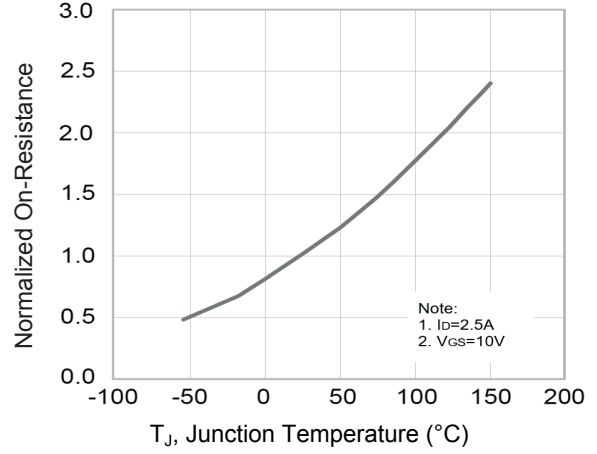


Figure 8. Normalized  $R_{DS(ON)}$  vs.  $T_J$

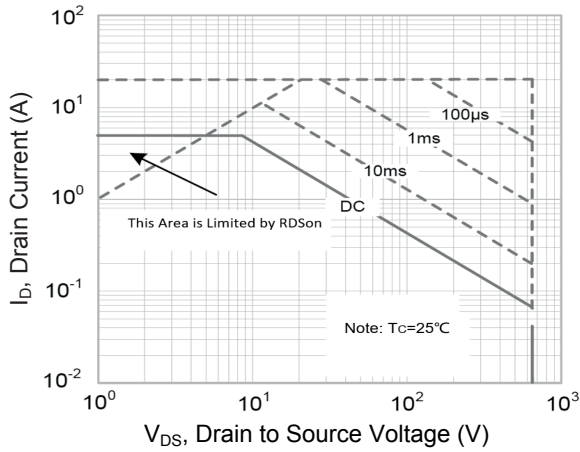
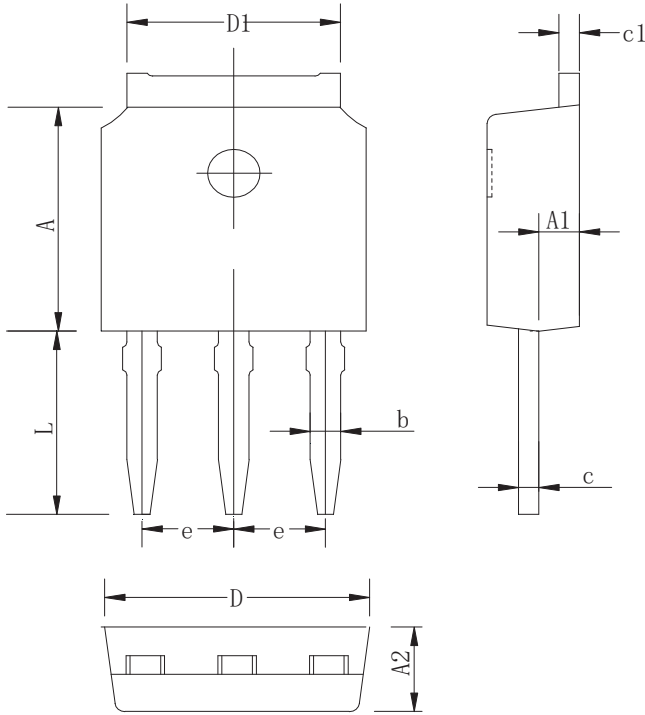


Figure 9. Safe Operation Area

**Package Outline Dimensions (TO-251)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.90	7.15	0.272	0.281
A1	0.91	1.11	0.036	0.044
A2	2.20	2.40	0.087	0.094
b	0.66	0.86	0.026	0.034
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	6.50	6.70	0.256	0.264
D1	5.10	5.46	0.201	0.215
e	0.90	1.05	0.035	0.041
L	4.80	5.20	0.189	0.205

**Order Information**

Device	Package	Marking	Carrier	Quantity
GSFG65R900	TO-251	G65R900	Tube	80 Pcs / Tube

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)