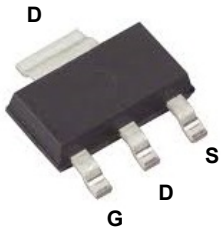
GOOD-ARK SEMICONDUCTOR

GSFL65R900

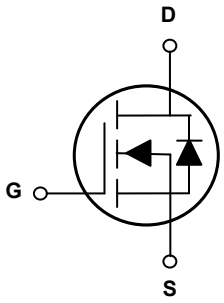
650V N-Channel MOSFET

Main Product Characteristics

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



SOT-223



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 GSFL65R900 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 supply and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Parameter.	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-to-Source Voltage	V_{GS}	±30	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	5	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		3.2	A
Pulsed Drain Current	I_{DM}	20	A
Power Dissipation (T_C=25°C)	P_D	20	W
		0.16	W/°C
Single Pulse Avalanche Energy[1]	E_{AS}	214	mJ
Single Pulse Avalanche Current	I_{AS}	2.8	A
Body Diode Reverse Voltage Slope[2]	dv/dt	15	V/ns
MOS dv/dt Ruggedness[3]	dv/dt	50	V/ns
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.0	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	6.25	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C
Soldering Temperature	T_{sold}	260	°C

Electrical Characteristics (T_J=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	650	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V, T_J=25°C	-	-	1.0	μA
		V_{DS}=650V, V_{GS}=0V, T_J=125°C	-	1.5	-	μA
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	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=100V, f=1MHz	-	300	-	pF
Output Capacitance	C_{oss}		-	20	-	
Reverse Transfer Capacitance	C_{rss}		-	2.4	-	
Total Gate Charge[4,5]	Q_g	I_D=5A, V_{DD}=520V, V_{GS}=10V	-	13	-	nC
Gate-to-Source Charge[4,5]	Q_{gs}		-	3.0	-	
Gate-to-Drain ("Miller") Charge[4,5]	Q_{gd}		-	6.8	-	
Gate Plateau[4,5]	$V_{plateau}$		-	6.5	-	V
Turn-on Delay Time[4,5]	$t_{d(on)}$	V_{DD}=325V, V_{GS}=10V, R_G=24Ω I_D=5A	-	8.7	-	nS
Rise Time[4,5]	t_r		-	25	-	
Turn-Off Delay Time[4,5]	$t_{d(off)}$		-	30	-	
Fall Time[4,5]	t_f		-	23	-	
Gate Resistance	R_g	f=1MHz	-	7.2	-	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.	-	-	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[4]	T_{rr}	I_S=5A, V_{GS}=0V, dI_F/dt=100A/us	-	334	-	nS
Reverse Recovery Charge[4]	Q_{rr}		-	2.2	-	μC

Notes:

1. L=79mH, V_{DD}=100V, R_G=25Ω, starting temperature T_J=25°C .
2. V_{DS}=0-400V, I_{SD}<=I_S, T_J=25°C.
3. V_{DS}=0-480V.
4. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

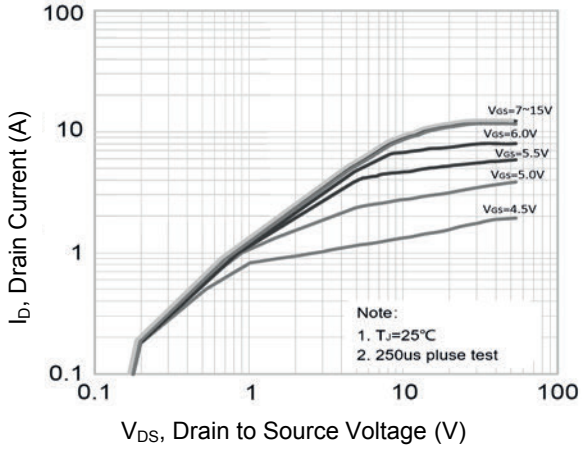


Figure 1. Typical Output Characteristics

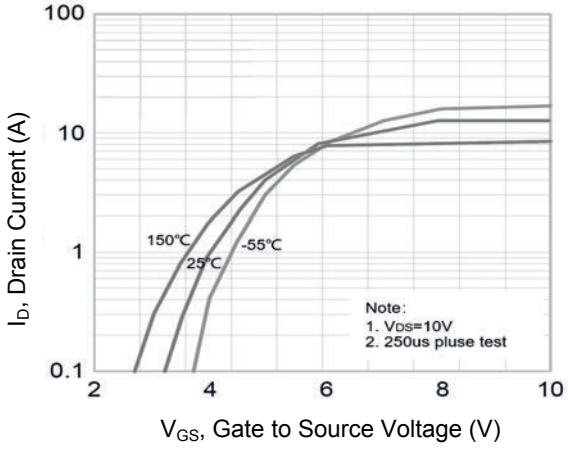


Figure 2. Transfer Characteristics

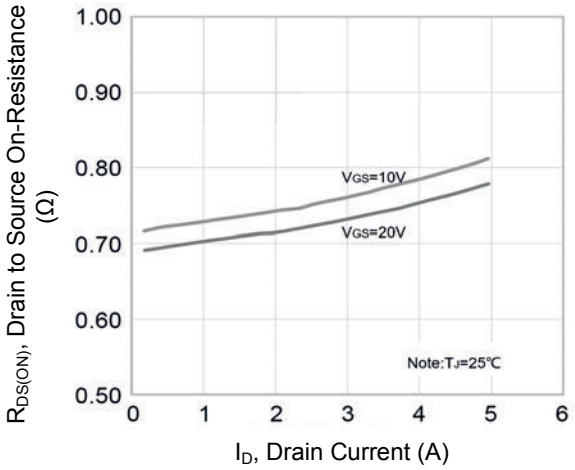


Figure 3. $R_{DS(ON)}$ vs. Drain Current

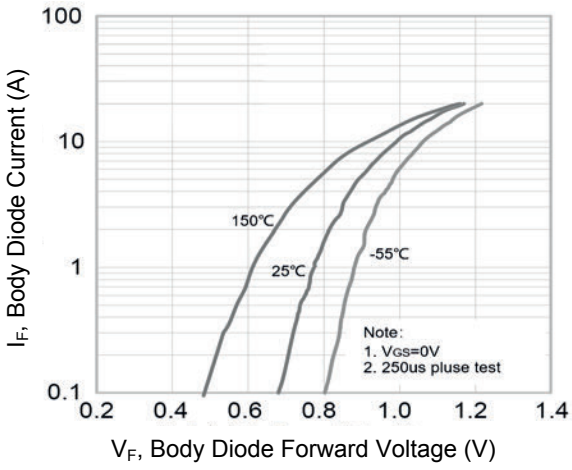


Figure 4. Body Diode Characteristics

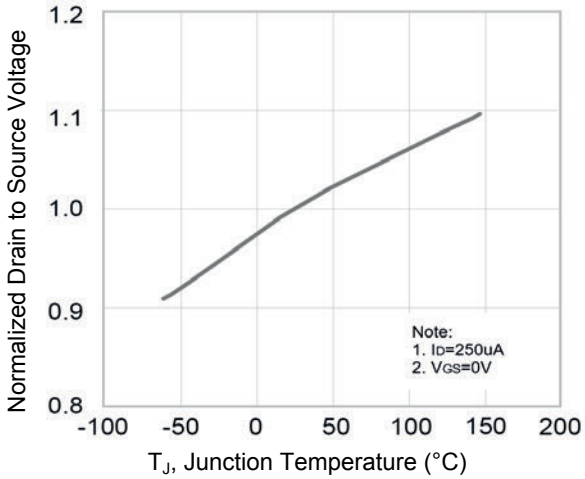


Figure 5. Normalized BV_{DSS} vs. T_J

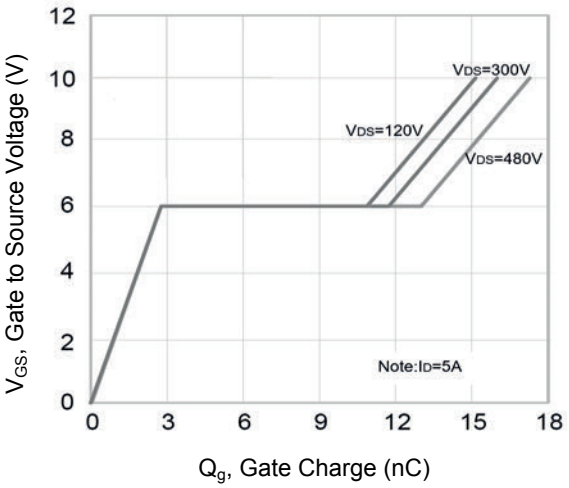


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

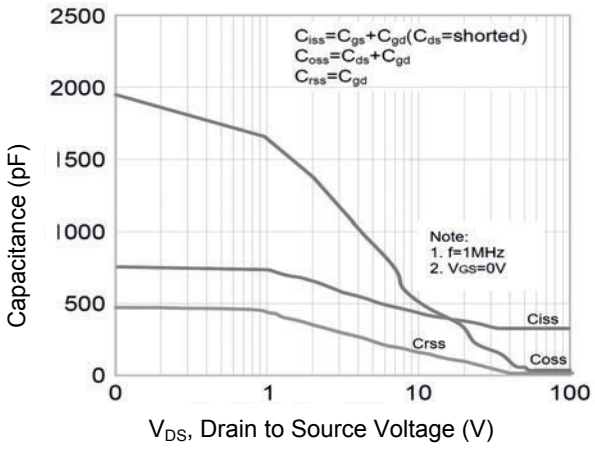


Figure 7. Capacitance Characteristics

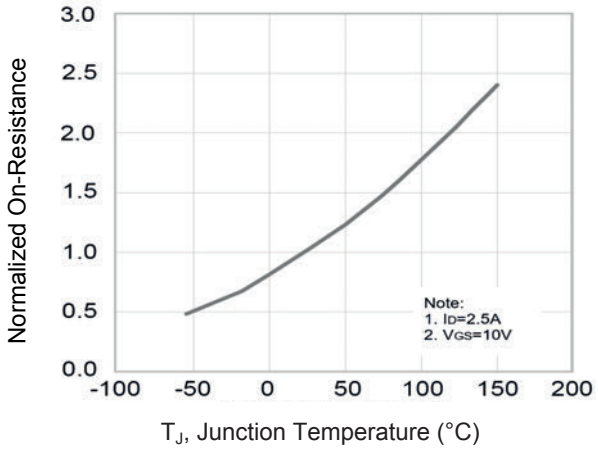


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

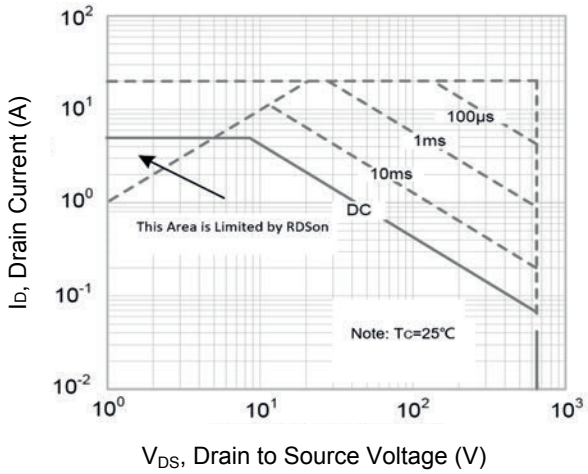
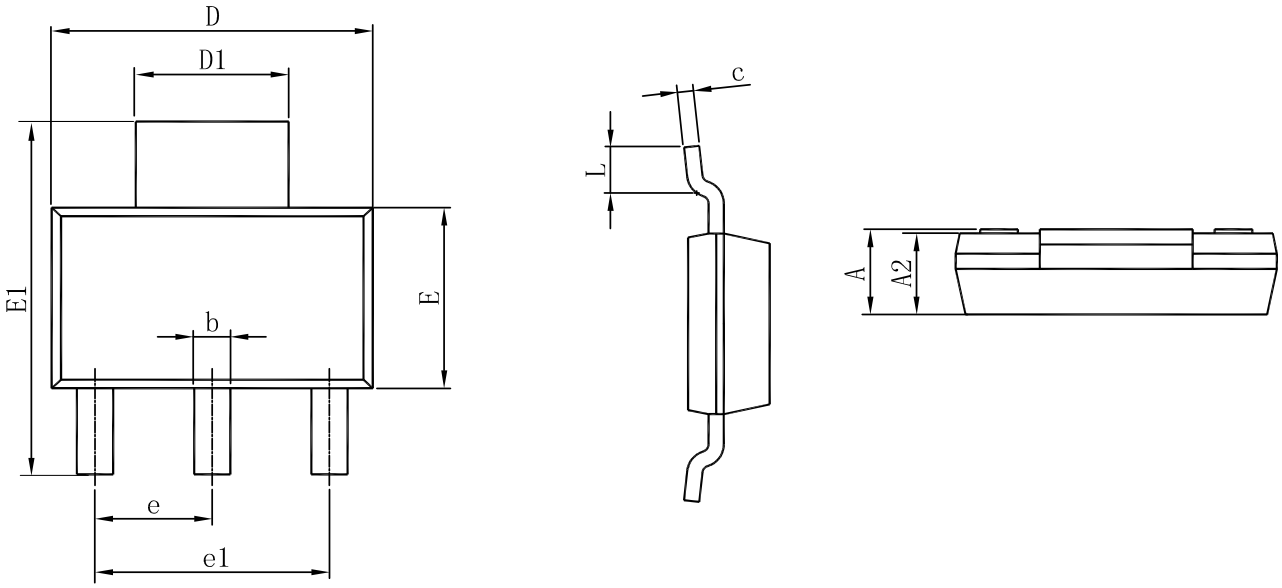


Figure 9. Safe Operation Area

Package Outline Dimensions (SOT-223)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.50	1.80	0.059	0.071
A2	1.45	1.80	0.057	0.071
b	0.60	0.84	0.024	0.033
c	0.20	0.35	0.008	0.014
D	6.20	6.70	0.244	0.264
D1	2.90	3.10	0.114	0.122
E	3.30	3.70	0.130	0.146
E1	6.70	7.30	0.264	0.287
e	2.30 TYP		0.091 TYP	
e1	4.40	4.70	0.173	0.185
L	0.70	1.10	0.028	0.043

Order Information

Device	Package	Marking	Packaging	SPQ
GSFL65R900	SOT-223	L65R900	Tape & Reel	3,000pcs / Reel