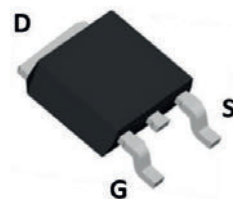
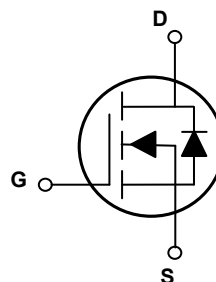


Main Product Characteristics

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



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 GSFD65R900 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 ($T_A=25^{\circ}\text{C}$ 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 ($T_C=25^{\circ}\text{C}$)	I_D	5	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		3.2	A
Pulsed Drain Current	I_{DM}	20	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	42	W
		0.34	W/ $^{\circ}\text{C}$
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
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62	$^{\circ}\text{C/W}$
Junction-to-Case	$R_{\theta JC}$	2.97	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^{\circ}\text{C}$
Soldering Temperature	T_{sld}	260	$^{\circ}\text{C}$

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	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	0.9	Ω
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	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	-	
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

Note:

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

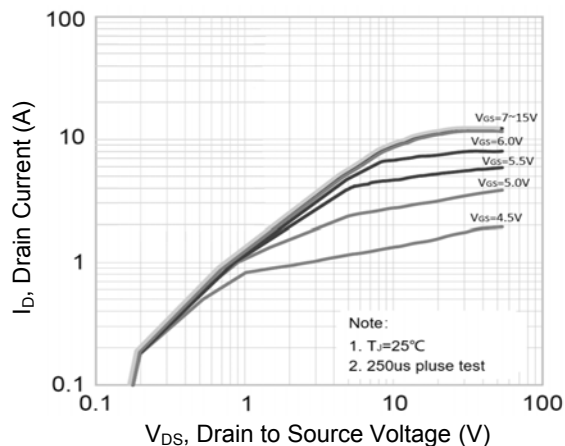


Figure 1. Typical Output Characteristics

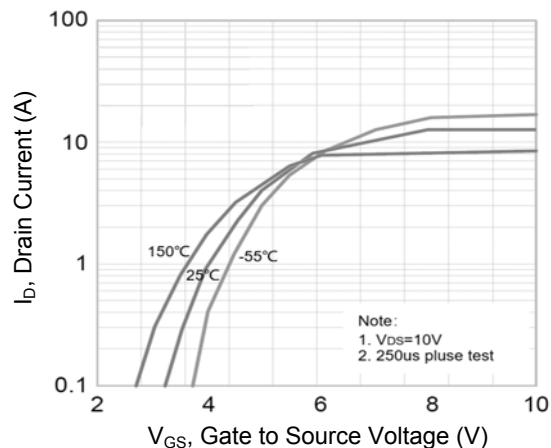


Figure 2. Transfer Characteristics

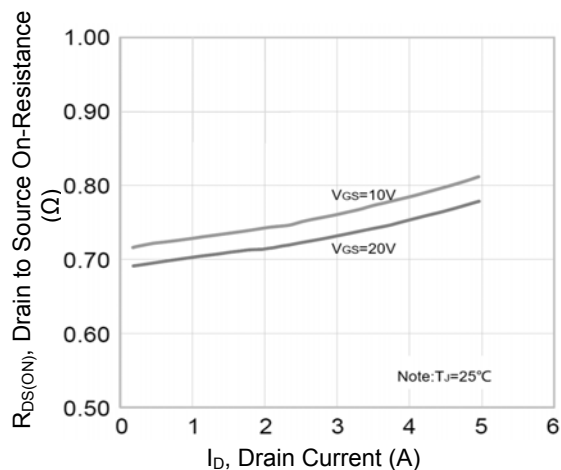


Figure 3. $R_{DS(on)}$ Vs. Drain Current

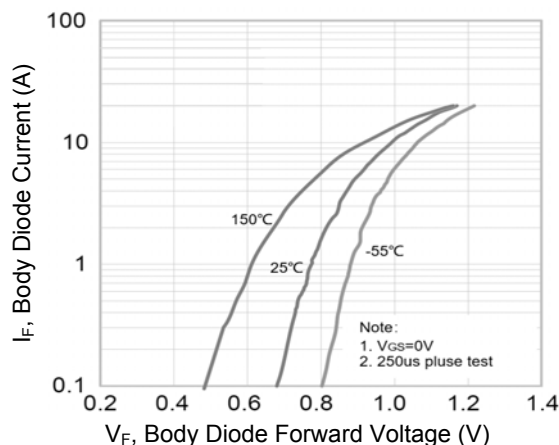


Figure 4. Body Diode Characteristics

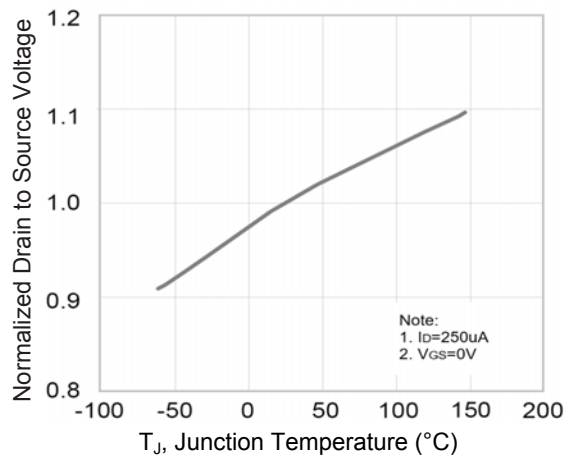


Figure 5. Normalized BV_{DSS} Vs. T_J

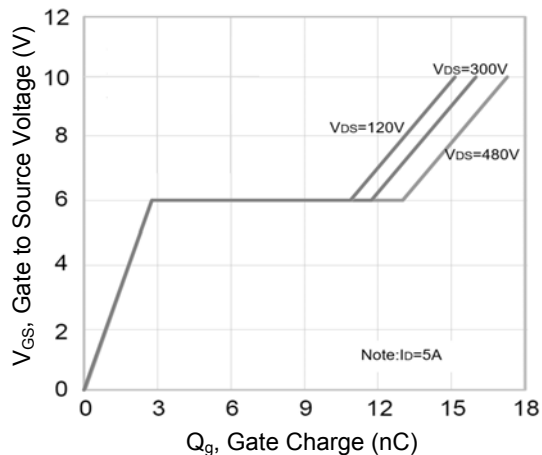


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

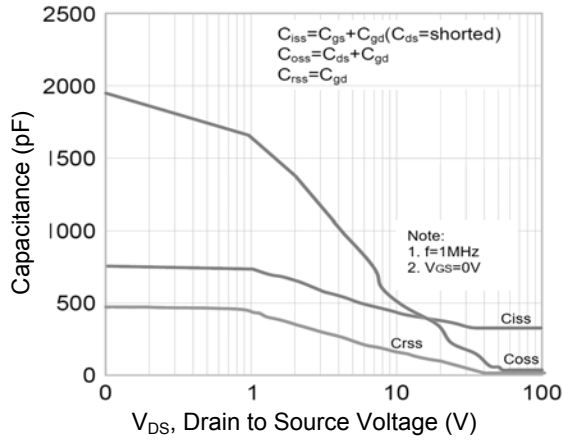


Figure 7. Capacitance Characteristics

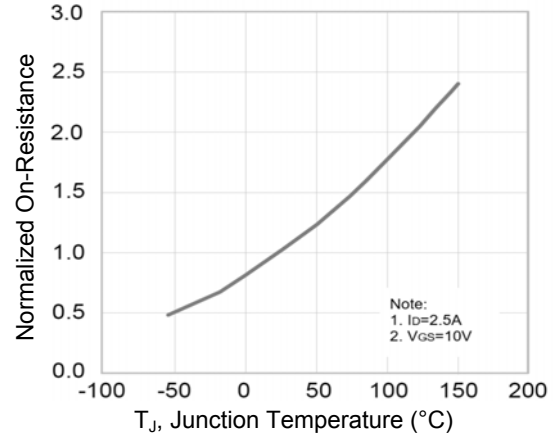


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

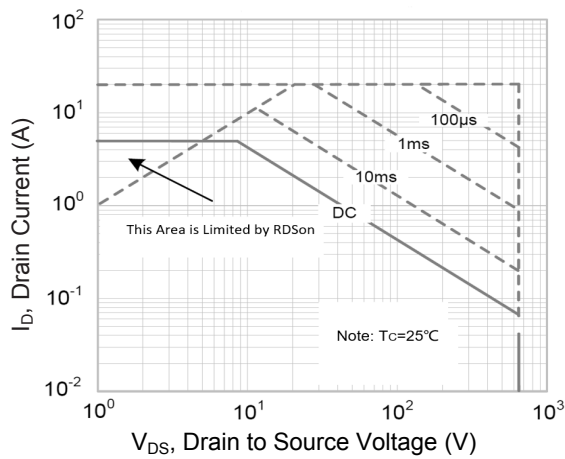
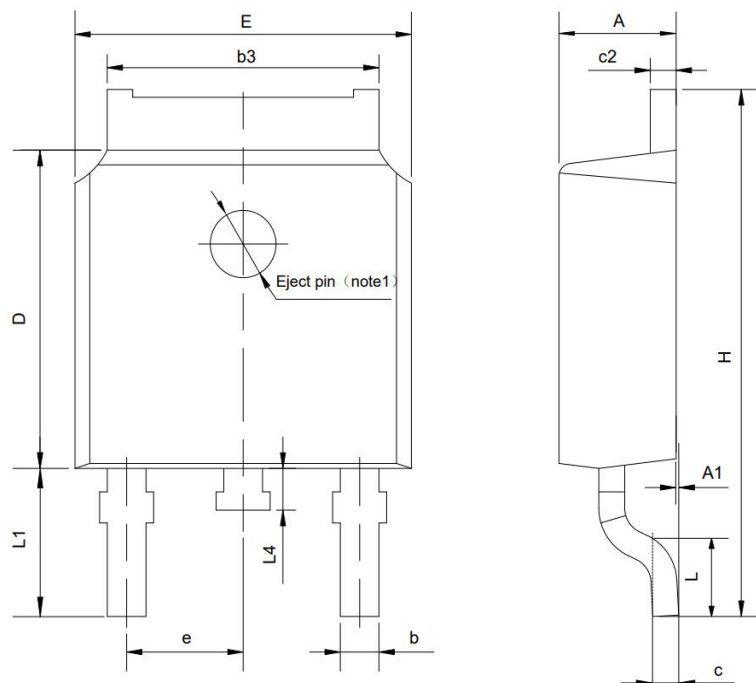


Figure 9. Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.50	0.083	0.098
A1	0.00	0.13	0.000	0.005
b	0.66	0.89	0.026	0.035
b3	5.10	5.46	0.201	0.215
c	0.45	0.65	0.018	0.026
c2	0.45	0.65	0.018	0.026
D	5.80	6.40	0.228	0.252
E	6.30	6.90	0.248	0.272
e	2.30 TYP		0.091 TYP	
H	9.60	10.60	0.378	0.417
L	1.40	1.70	0.055	0.067
L1	2.90 REF		0.114 REF	
L4	0.60	1.00	0.024	0.039