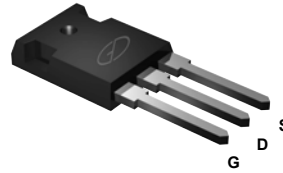
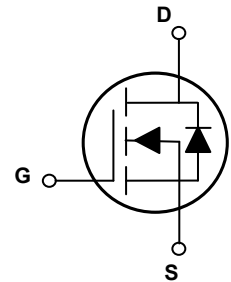


### Main Product Characteristics

$V_{(BR)DSS}$	900V
$R_{DS(ON)}$	1.4Ω (Max.)
$I_D$	9A



TO-247



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 GSJA9N90 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	Parameter	Unit
Drain-Source Voltage	$V_{DS}$	900	V
Gate-to-Source Voltage	$V_{GS}$	±30	V
Continuous Drain Current, @ Steady-State ( $T_C=25^\circ\text{C}$ )	$I_D$	9	A
Continuous Drain Current, @ Steady-State ( $T_C=100^\circ\text{C}$ )		5.9	A
Pulsed Drain Current	$I_{DM}$	36	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	210	W
		1.68	W/°C
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	822	mJ
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.0	°C/W
Junction-to-Case	$R_{\theta JC}$	0.60	°C/W
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +150	°C

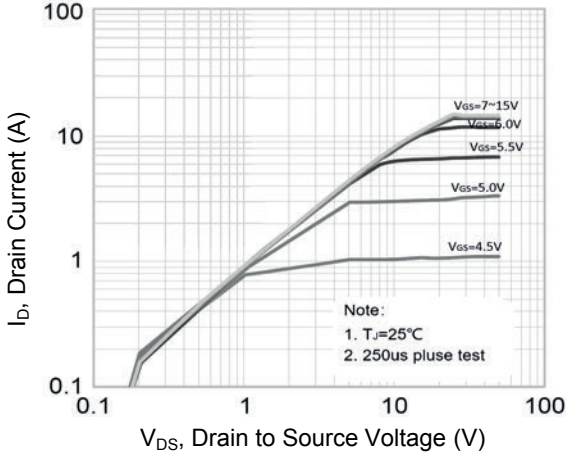
### Electrical Characteristics ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	900	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=900V, V_{GS}=0V$	-	-	1	$\mu A$
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	1.08	1.4	$\Omega$
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	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	-	1688	-	$\mu F$
Output Capacitance	$C_{oss}$		-	140.5	-	
Reverse Transfer Capacitance	$C_{rss}$		-	7.5	-	
Total Gate Charge <sup>2,3</sup>	$Q_g$	$I_D=9A, V_{DD}=720V, V_{GS}=10V$	-	38.5	-	nC
Gate-to-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	11.2	-	
Gate-to-Drain ("Miller") Charge <sup>2,3</sup>	$Q_{gd}$		-	13.5	-	
Turn-on Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=450V, V_{GS}=10V, R_G=25\Omega, I_D=9A$	-	28	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	39	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	110	-	
Fall Time <sup>2,3</sup>	$t_f$		-	47	-	
Gate Resistance	$R_g$	$f=1MHz$	-	4.8	-	$\Omega$
<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.	-	-	9	A
Source Pulse Current	$I_{SM}$		-	-	36	A
Diode Forward Voltage	$V_{SD}$	$I_S=5A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$T_{rr}$	$I_F=9A, V_{GS}=0V, di_F/dt=100A/\mu s$	-	646	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	5.22	-	$\mu C$

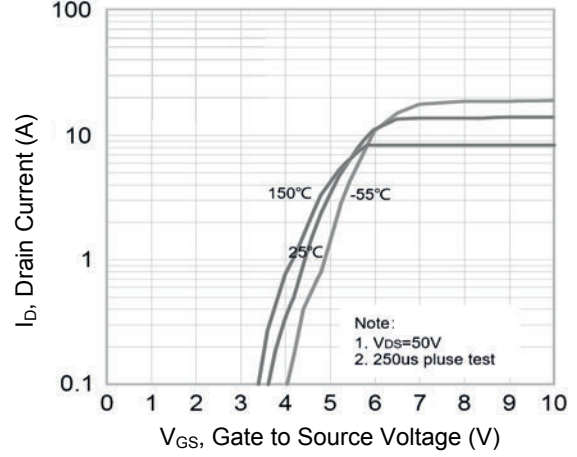
Notes:

1.  $L=30mH, V_{DD}=100V, R_g=25\Omega$ , starting temperature  $T_J=25^\circ\text{C}$ .
2. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

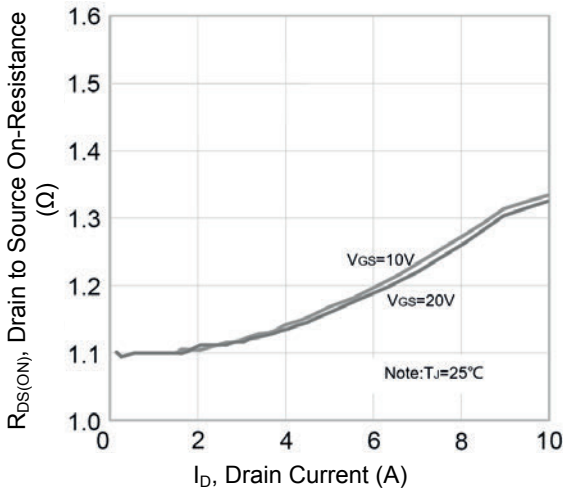
**Typical Electrical and Thermal Characteristic Curves**



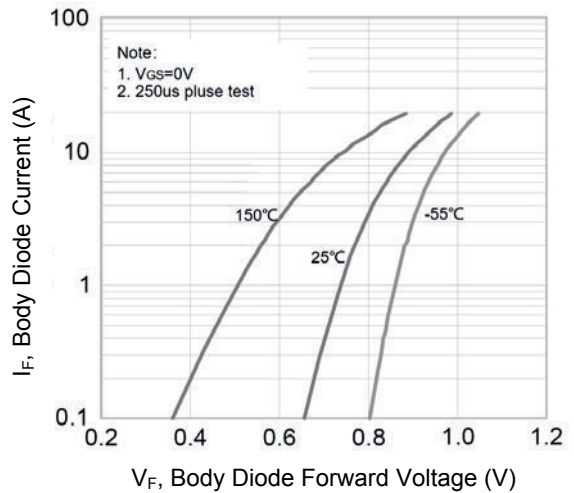
**Figure 1. Typical Output Characteristics**



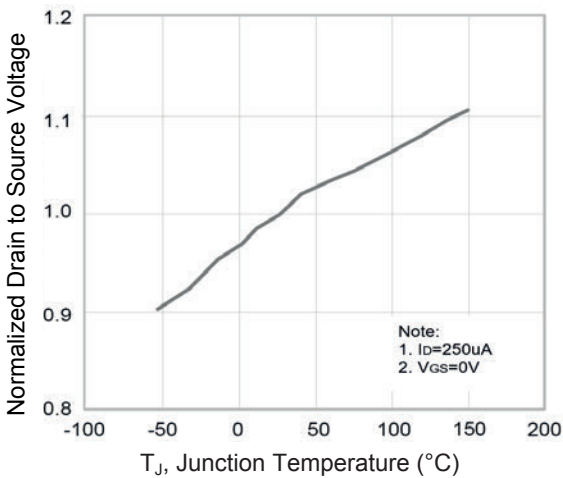
**Figure 2. Transfer Characteristics**



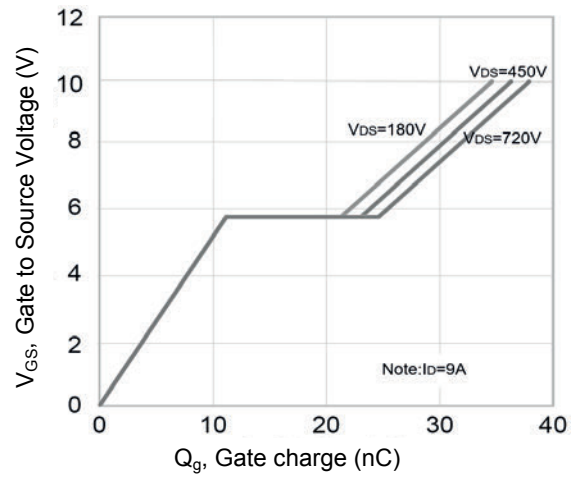
**Figure 3.  $R_{DS(on)}$  vs. Drain Current**



**Figure 4. Body Diode Characteristics**

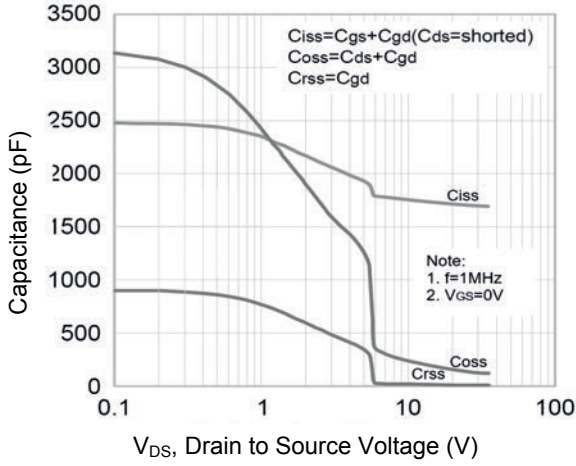


**Figure 5. Normalized  $BV_{dss}$  vs.  $T_J$**

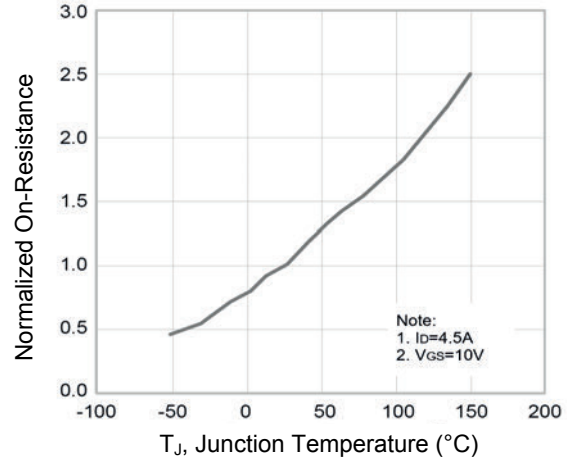


**Figure 6. Gate Charge**

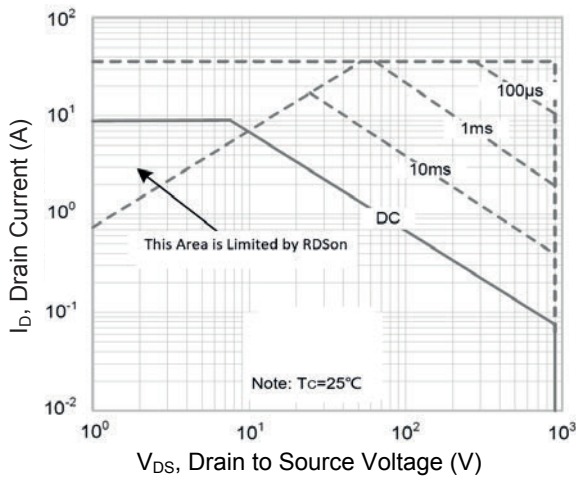
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Capacitance Characteristics**

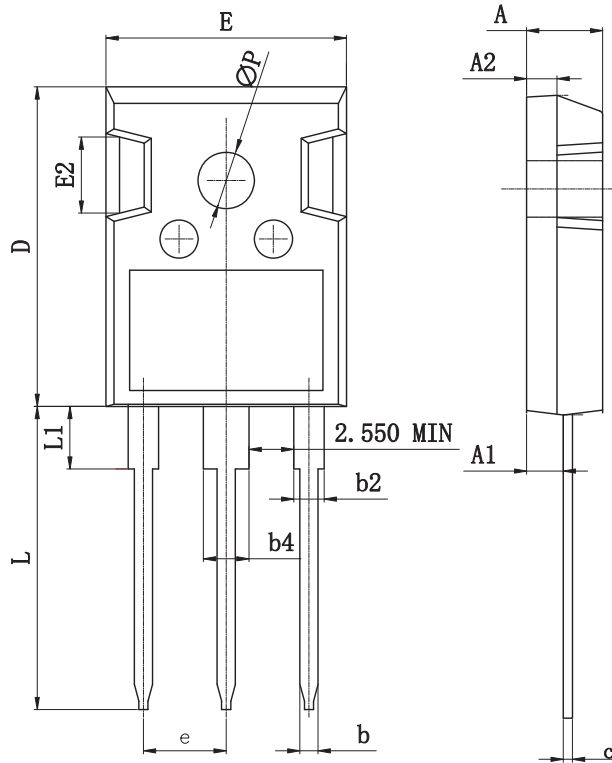


**Figure 8. Normalized  $R_{DS(on)}$  vs.  $T_J$**



**Figure 9. Safe Operation Area**

### Package Outline Dimensions (TO-247)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.75	5.20	0.187	0.205
A1	2.21	2.65	0.087	0.104
A2	1.85	2.15	0.073	0.085
b	1.00	1.36	0.039	0.054
b2	1.80	2.25	0.071	0.089
b4	2.91	3.25	0.115	0.128
c	0.51	0.75	0.020	0.030
D	20.80	21.30	0.819	0.839
E	15.50	16.10	0.610	0.634
E2	4.40	5.20	0.173	0.205
e	5.44 BSC		0.214 BSC	
L	19.72	20.22	0.776	0.796
L1	-	4.30	-	0.169
P	3.40	3.80	0.134	0.150

### Order Information

Device	Package	Marking	Carrier	Quantity
GSJA9N90	TO-247	A9N90	Tube	30pcs / Tube

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