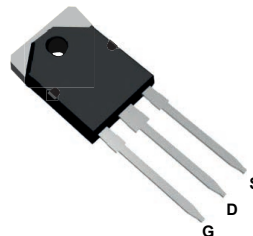
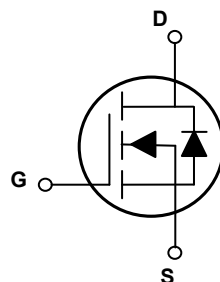


Main Product Characteristics

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



TO-3P



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 GSJV9N90 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	Value	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/ $^\circ\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	822	mJ
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.0	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.60	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	900	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=900V, V_{GS}=0V$	-	-	1	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	1.08	1.4	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	-	1688	-	pF
Output Capacitance	C_{oss}		-	140.5	-	
Reverse Transfer Capacitance	C_{rss}		-	7.5	-	
Total Gate Charge ^{2,3}	Q_g	$I_D=9A, V_{DD}=720V, V_{GS}=10V$	-	38.5	-	nC
Gate-to-Source Charge ^{2,3}	Q_{gs}		-	11.2	-	
Gate-to-Drain ("Miller") Charge ^{2,3}	Q_{gd}		-	13.5	-	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=450V, V_{GS}=10V, R_G=25\Omega, I_D=9A$	-	28	-	nS
Rise Time ^{2,3}	t_r		-	39	-	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	110	-	
Fall Time ^{2,3}	t_f		-	47	-	
Gate Resistance	R_g	$f=1MHz$	-	4.8	-	Ω
Drain-Source Ratings and Characteristics						
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	-	μC

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

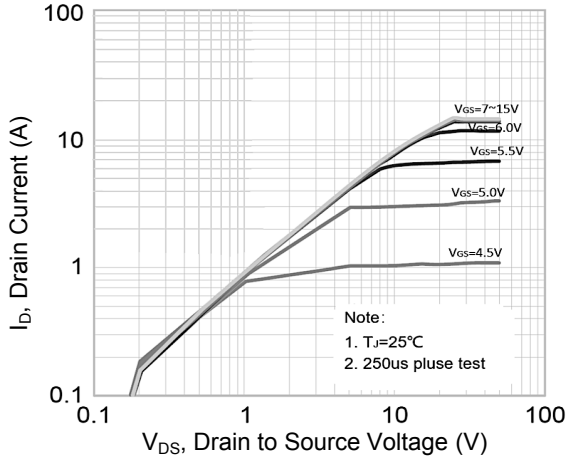


Figure 1. Typical Output Characteristics

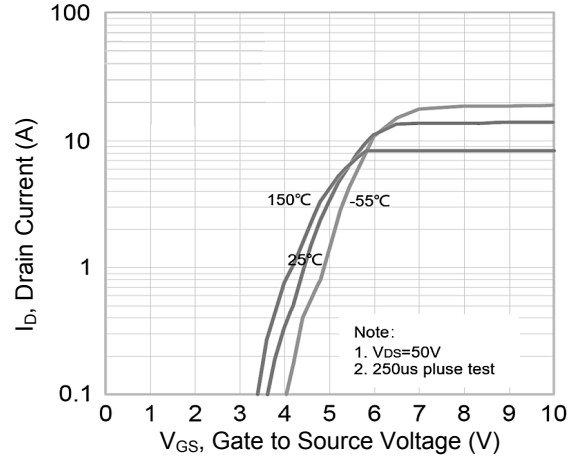


Figure 2. Transfer Characteristics

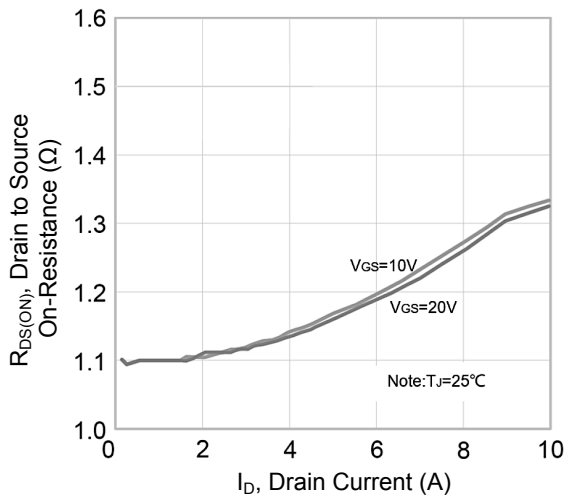


Figure 3. $R_{DS(ON)}$ vs. Drain Current

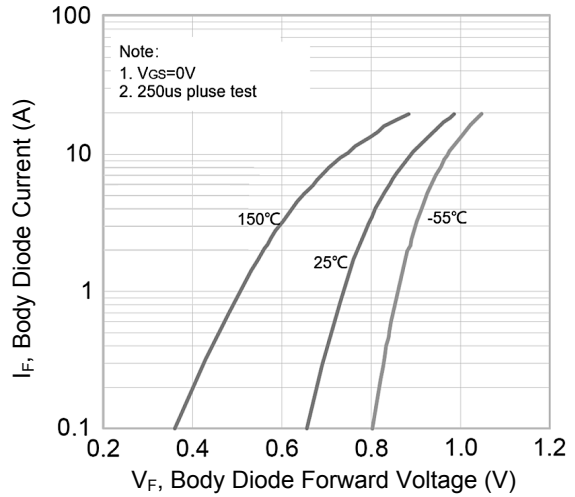


Figure 4. Body Diode Characteristics

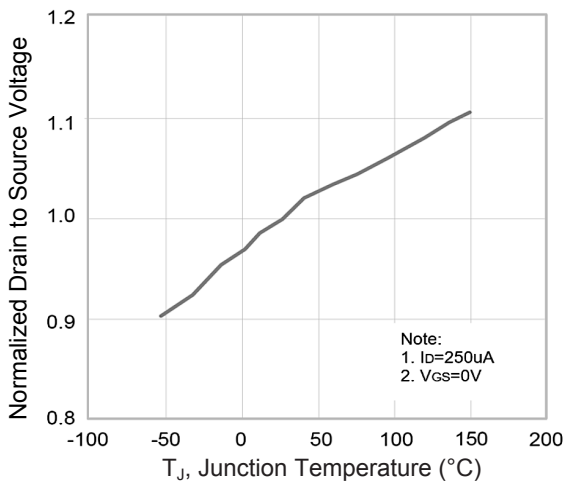


Figure 5. Normalized BV_{DS} vs. T_J

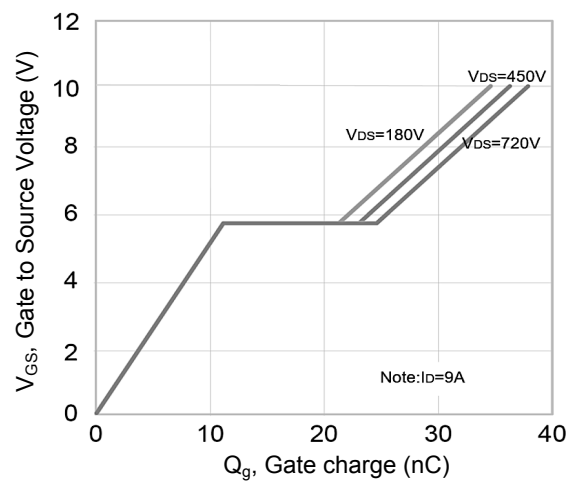


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

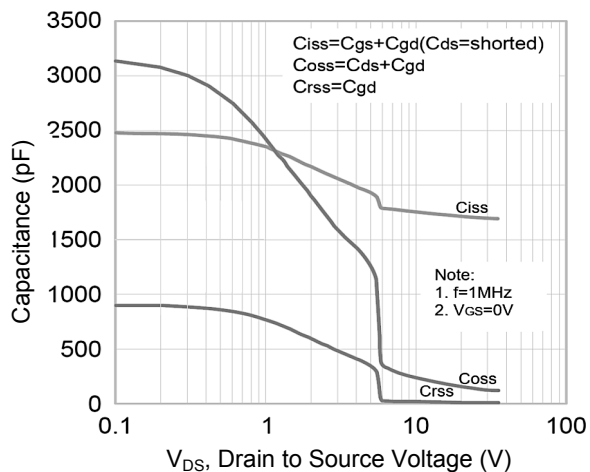


Figure 7. Capacitance Characteristics

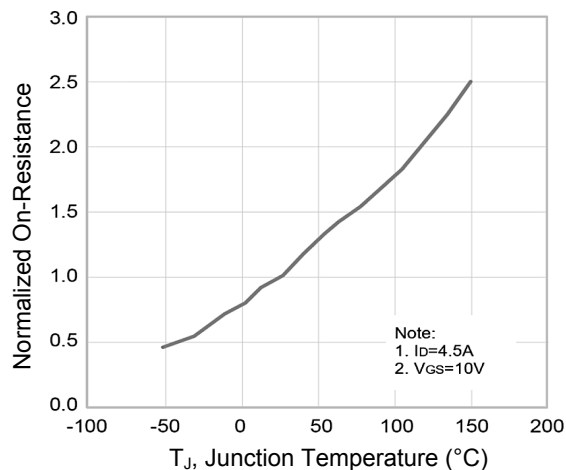


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

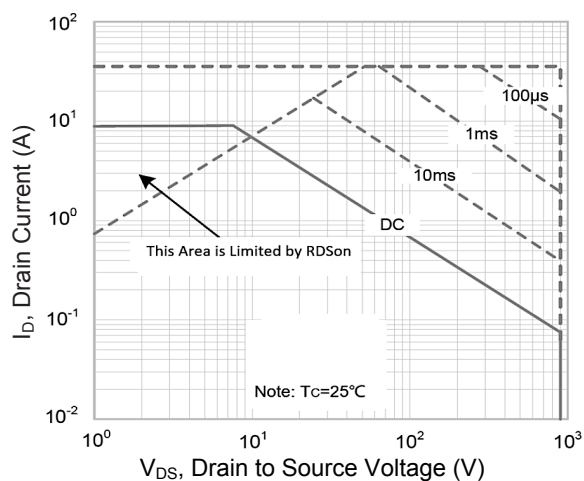
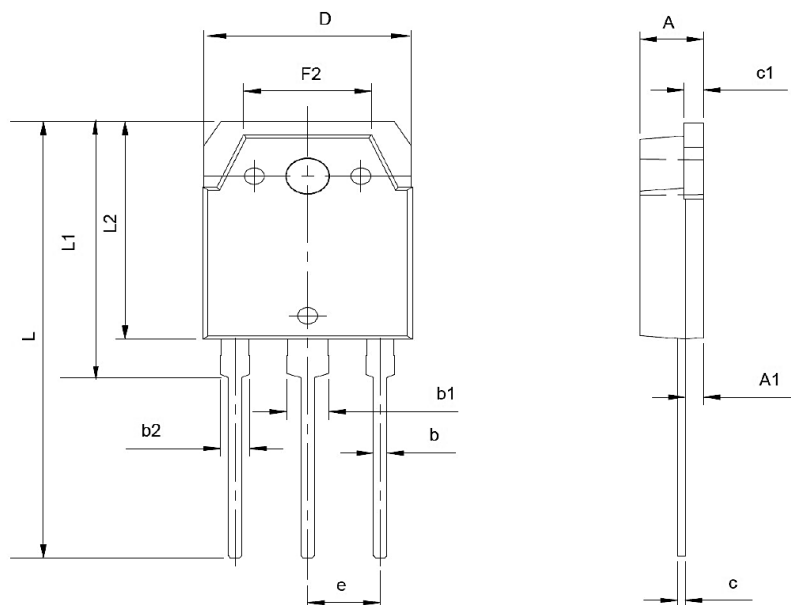


Figure 9. Safe Operation Area

Package Outline Dimensions (TO-3P)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	5.20	0.173	0.205
c1	1.20	1.80	0.047	0.071
A1	1.20	2.00	0.047	0.079
b	0.70	1.30	0.028	0.051
b1	2.70	3.30	0.106	0.130
b2	1.70	2.30	0.067	0.091
D	15.00	16.00	0.591	0.630
c	0.40	0.80	0.016	0.031
F2	8.50	10.00	0.335	0.394
e	5.45 TYP		0.215 TYP	
L1	22.60	23.60	0.890	0.929
L	39.00	41.50	1.535	1.634
L2	19.50	21.00	0.768	0.827

Order Information

Device	Package	Marking	Packaging	SPQ
GSJV9N90	TO-3P	V9N90	Tube	30 Pcs / Tube