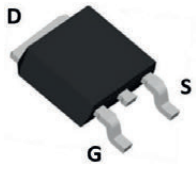
GOOD-ARK SEMICONDUCTOR

GSJD3N100

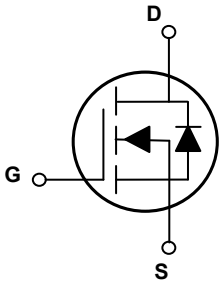
1000V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	1000V
$R_{DS(ON)}$	5.8Ω (Max.)
I_D	3A



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 GSJD3N100 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°C unless otherwise specified)

Parameter		Symbol	Max.	Unit
Drain-Source Voltage		V_{DS}	1000	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current[1]	T_C=25°C	I_D	3	A
	T_C=100°C		1.8	A
Pulsed Drain Current[2]		I_{DM}	12	A
Single Pulsed Avalanche Energy[3]		E_{AS}	31	mJ
Peak Diode Recovery dv/dt[4]		dv/dt	5	V/ns
Power Dissipation (T_C=25°C)		P_D	80	W
Power Dissipation Derating Factor Above 25°C			0.64	W/°C
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.56	°C/W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	53	°C/W
Operating and Storage Temperature Range		T_J/T_{STG}	-50 to +150	°C
Max Lead Temperature for Soldering Purpose		T_L	260	°C

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	1000	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=1000V, V_{GS}=0V	-	-	1	μA
		V_{DS}=800V, T_J=125°C	-	-	50	
Gate to Body Leakage Current	I_{GSS}	V_{GS}=±30V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.8	3.8	4.8	V
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=1.5A	-	-	5.8	Ω
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	618	-	pF
Output Capacitance	C_{oss}		-	49	-	
Reverse Transfer Capacitance	C_{rss}		-	2.7	-	
Total Gate Charge	Q_g	V_{DD}=800V, I_D=3A, V_{GS}=10V	-	15.2	-	nC
Gate-Source Charge	Q_{gs}		-	3.94	-	
Gate-Drain (“Miller”) Charge	Q_{gd}		-	6.06	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=500V, I_D=3A, R_G=25Ω, V_{GS}=10V	-	14.9	-	nS
Turn-On Rise Time	t_r		-	20.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	40.7	-	
Turn-Off Fall Time	t_f		-	73.8	-	
Gate Resistance	R_g	V_{DS}=0V	-	2.6	-	Ω
Source-Drain Ratings and Characteristics						
Maximum Continuous Drain to Source Diode Forward Current	I_S	Integral reverse p-n junction diode in the MOSFET	-	-	3	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}		-	-	12	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=3A, T_J=25°C	-	-	1.3	V
Reverse Recovery Time	T_{rr}	V_{GS}=0V, I_S=3A, di/dt=100A/μS	-	470	-	nS
Reverse Recovery Charge	Q_{rr}		-	2.5	-	μC
Reverse Recovery Charge	Q_{rr}	I_S=3A, di/dt=100A/μS	-	10.5	-	μC

Notes:

1. Drain current is limited by maximum junction temperature.
2. Repetitive rating: pulse width limited by junction temperature.
3. L=10mH, I_{AS}=2.5A, V_{DD}=50V, R_G=25Ω, starting at T_J=25°C.
4. I_{SD} ≤ I_D, di/dt=100A/us, V_{DD} ≤ BV_{DSS}, starting at T_J=25°C.

Typical Electrical and Thermal Characteristic Curves

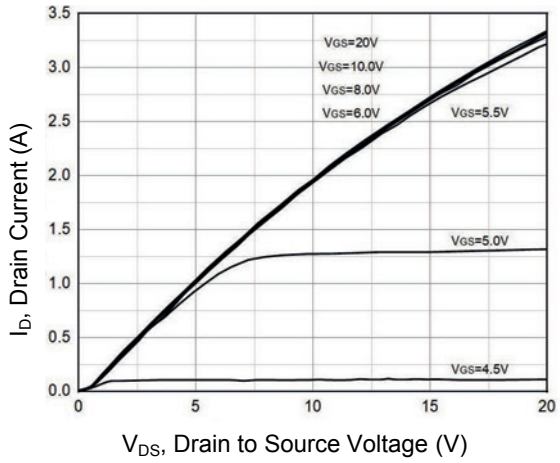


Figure 1. Output Characteristics

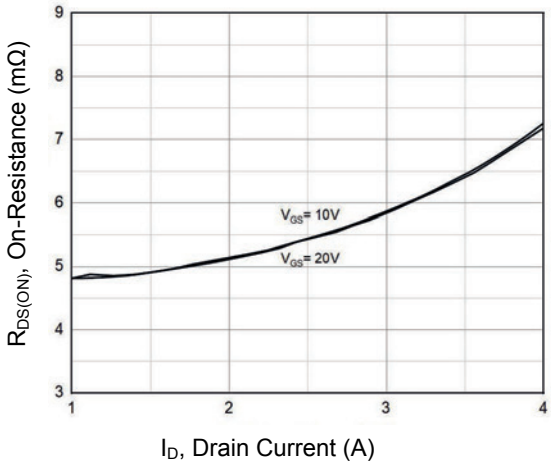


Figure 2. $R_{DS(ON)}$ vs. Drain Current

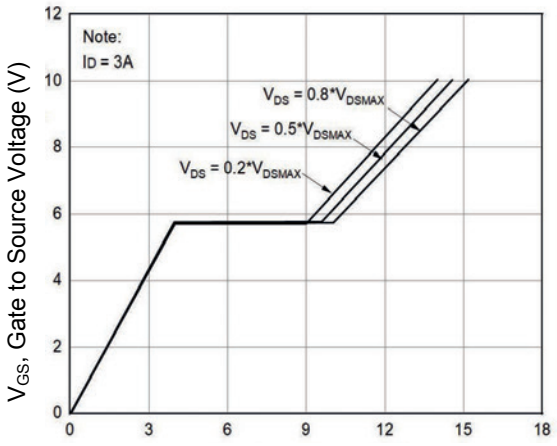


Figure 3. Gate Charge Characteristics

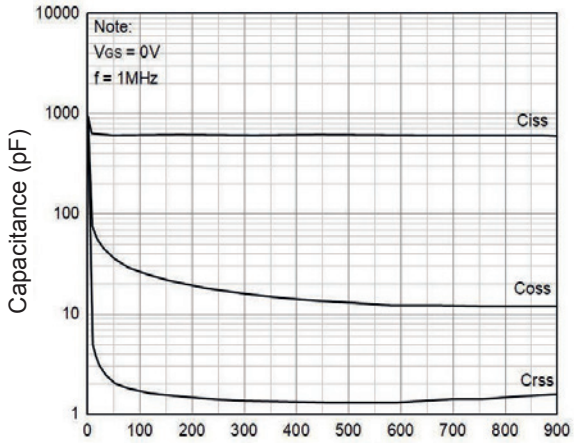


Figure 4. Capacitance Characteristics

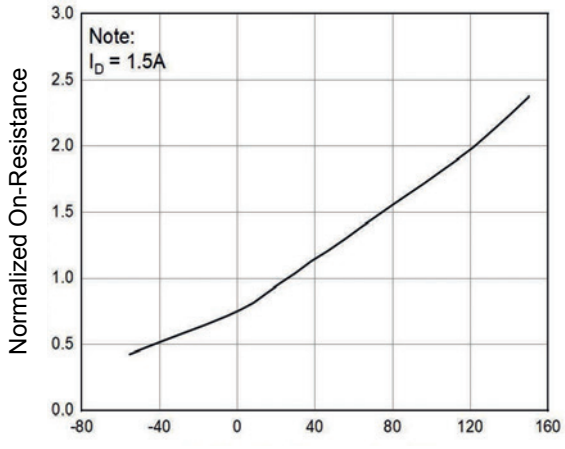


Figure 5. Normalized $R_{DS(ON)}$ vs. T_J

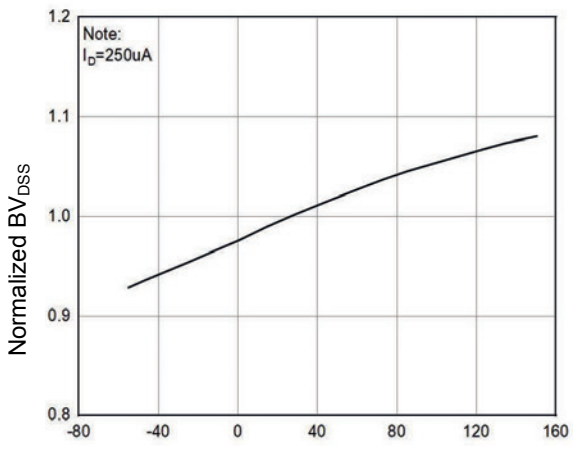


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

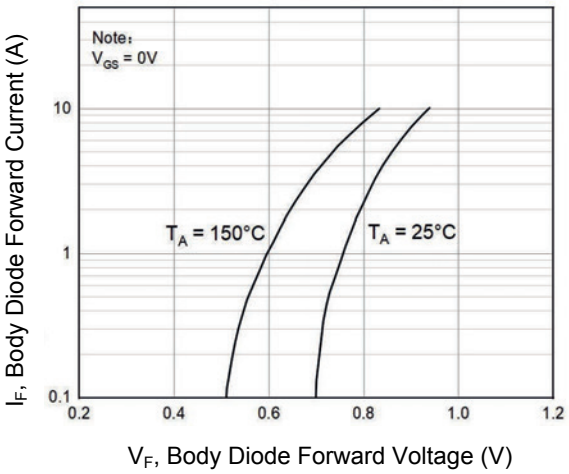


Figure 7. Body Diode Characteristics

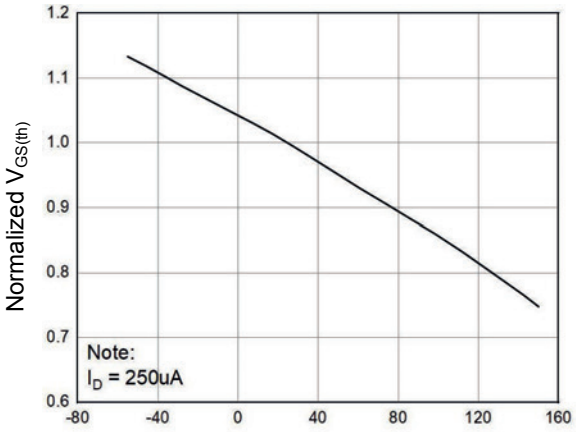


Figure 8. Normalized $V_{GS(th)}$ vs. T_J

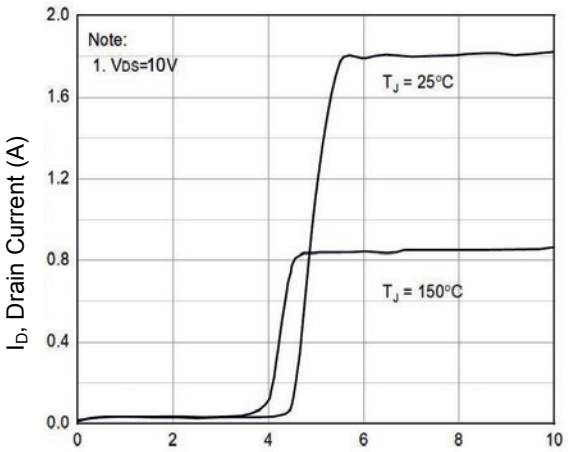


Figure 9. Transfer Characteristics

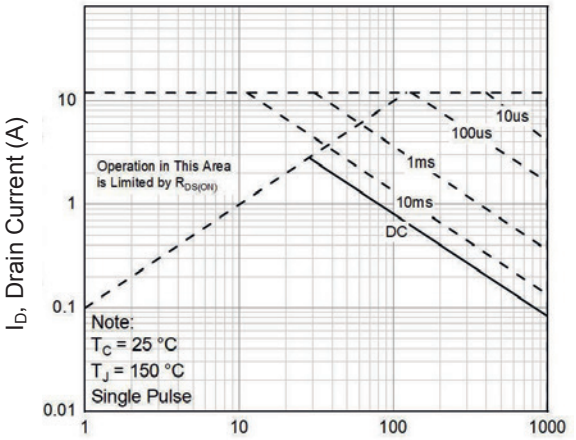


Figure 10. Safe Operation Area

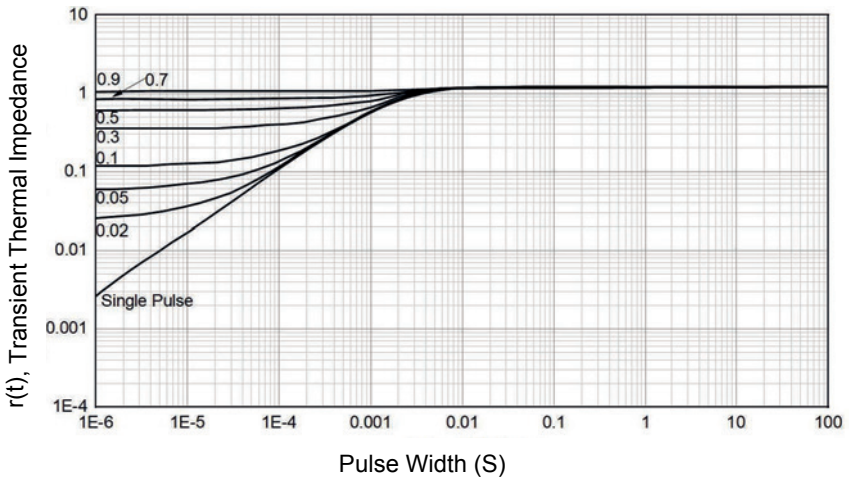
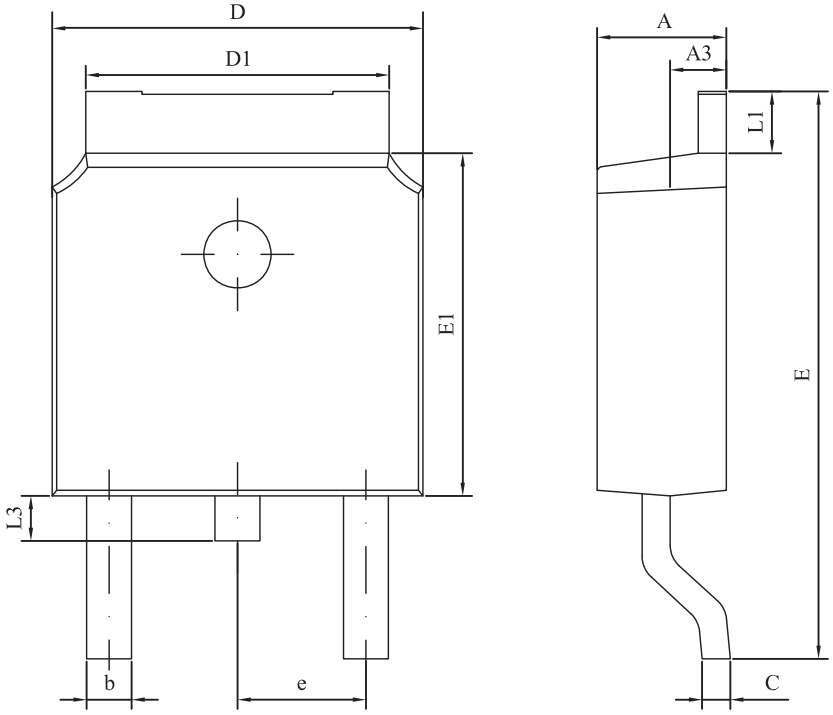


Figure 11. Transient Thermal Impedance

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSJD3N100	TO-252 (DPAK)	D3N100	Tape & Reel	2,500 Pcs / Reel